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SUMMARY

The flow rates and pipeline pressures required to deliver high-level waste (HLW) slurries to the planned Waste Treatment Plant depend in part on the quantities, sizes and densities of the particles in the waste sludges. A laboratory program has been performed to provide more firmly grounded information regarding these properties for seven HLW feed tanks, namely Tanks AW-103, AY-101, AY-102, AZ-102, C-104, C-107, and SY-102. The program consisted of eight interdependent efforts. They were:

- Assess the accuracy and comparability of light scattering particle size distribution (PSD) analysis in the laboratory used for routine analysis of tank wastes (the 222-S Laboratory, operated by Fluor Hanford, Inc.) and an independent laboratory (the 325 Building Laboratory, operated at the Pacific Northwest National Laboratory by Battelle Memorial Institute) by parallel determinations on the size distributions of two certified standards. Also assess the possible effects of instrumental parameter settings on the values returned.
- Prepare representative composite samples of seven HLW slurries for determination of PSD.
- Assess the comparability of the same two instruments as a function of instrumental parameter adjustments by parallel particle size determinations of the sludges from three HLW tanks.
- Use the 222-S particle size analyzer to determine the size distributions of the sludges of the remaining four HLW tanks.
- Corroborate the 222-S PSD results on four HLW tanks by wet sieve analysis of four tank composites.
- Provide additional validation of PSD results and look for the possible occurrence of particle agglomeration by examining the major sieve fractions from the four tanks using the 222-S Laboratory particle size analyzer, polarized light microscopy (PLM), and image analysis (IA).
- Assess the percentages of the same four tank sludges having fast settling rates of concern to successful slurry transport of sludges, and estimate the effective settling densities of the fast-settling particles.
- Support the determination of effective particle settling densities by examining the fast-settling fractions from the four tanks using the 222-S Laboratory PSD, PLM and IA.

PSD Results on Certified Standards

Two certified, broadly dispersed quartz particle size standards were measured for PSD by the 222-S Laboratory and the 325 Laboratory using light-scattering-based particle-sizing instruments. These measurements were performed to establish proper operating conditions and measurement method performance at those conditions. For one standard, the two laboratories measured the median particle size to be within 27% of the certified median value and within 33% of each other. For the other standard, the median values measured at the two laboratories were within 20% of the certified value and within 8% of each other. Both instruments employ the laser light scattering principle, while the standards were certified using more traditional sieving or free-settling methods.

PSD Results on HLW Samples

For each of the seven HLW tanks listed above, except Tank C-107, a composite sample was made from archived, partially dried sludge core samples. The Tank C-107 composite was made from wet core samples prepared four months or less previously.

Due to particle agglomeration, both particle size and particle density are dependent on the composition and flow conditions of the liquid in which the particles are suspended. A solution containing one molar sodium hydroxide and one molar sodium nitrate was used throughout these studies to simulate (approximate) the liquid present during pipeline transport of the waste.

Parallel parametric studies were conducted at both 222-S Laboratory and 325 Laboratory on the three composites of Tanks AW-103, AY-101 and C-104. The 222-S Laboratory generally detected the large particles, while the 325 Laboratory did not. The range of circulation rates in the sample dispersion system of 325 Laboratory's particle size analyzer was much higher than that at 222-S Laboratory, and, as a result, the large, fragile particles seen at 222-S Laboratory were probably broken up in the 325 Laboratory's instrument before they could be detected.

The 222-S Laboratory often detected large particles greater than 200 μm in diameter in these composites when using the gentlest degree of sample agitation in the instrument's recirculating, stirred dispersion system. However the detection of these large particles was poorly reproducible, partially due to sample aliquotting techniques too small to provide adequate representation of large particles. The 222-S PSD analysis demonstrated through parametric studies that more rigorous stirring rates and/or ultrasonic treatment (sonication) would break up these large particles.

PSD analysis exhibited significant quantities of particles >200 μm in size in samples from several tanks (e.g., Tanks AW-103, C-104, and AY-101). These large particles broke up in the recirculating streams of the analyzers. Such large particles were not seen in samples from other tanks (e.g., AY-102 and C-107).

Wet-sieving analysis

Aliquots of sludge composites from each of Tanks AW-103, AY-101, C-104 and SY-102 were wet-sieved in a stack consisting of 53, 106, 212, and 500 μm mesh sieves, using the same composition of wash liquid as was used to disperse samples for particle sizing. Weight fractions on each sieve were determined on a wet, drained basis. For each and every tank, the largest mass fraction passed through all sieves. The next largest mass fraction was retained on the 500 μm sieve for all tanks except C-104; the second largest fraction for this tank was retained on the 53 μm sieve.

As mentioned above, particles greater than 200 μm were observed in the PSD results under conditions of gentle agitation. These large particles were also detected in the sieving tests. Mass fractions representing sizes greater than 212 μm were 20% for AW-103 sludge, 10.8% for AY-101 sludge, 4.9% for C-104 sludge and 12.7% for SY-102 sludge. The estimated relative

measurement error varied from 1 to 49%, while the estimated relative sampling error varied from 20 to 39% for the four tanks.

Visual indications during sieving operations were that the largest particles were not monolithic, but were compact consolidates of finer materials. Some of the larger particles could be seen to slough off small amounts of fines under the action of the sieve shaker/vibrator. Visual observations of large-particle sieve fraction samples 2½ months after sieving revealed that many had generated large amounts of suspendible fines while undisturbed under wash liquid.

Samples of the sieve fractions passing the 53-μm sieve for all four tanks were particle sized at 222-S Laboratory. All four fractions possessed a large distribution mode between 100-150 μm, which was stable to the most rigorous stirring or ultrasound applied. This may have been a manifestation of re-agglomeration occurring in approximately six weeks that the samples sat under wash liquid before they were particle sized.

A sample of the C-104 sieve fraction representing particles between 53 and 106 μm was particle sized to yield a single mode very close to expectation, also stable towards the most rigorous stirring or ultrasound.

Samples of the sieve fractions from Tanks AW-103, AY-101 and SY-102 retained on the 500 μm sieve were particle sized, though the aliquotting technique for particle sizing was inadequate to properly represent the largest particles. The major mode of these fractions was much less than 500 μm except for Tank SY-102. These sieve fractions were moderately to largely unstable towards increased stirring or ultrasound. The SY-102 sieve fraction indicated some large particles were difficult to break up. The best representation of complete PSDs for Tanks AW-103, AY-101, C-104 and SY-102 was derived by splicing the sieve test results to the PSD results.

Settling Tests

Tests of unhindered settling velocity were conducted on composite samples from Tanks AW-103, AY-101, C-104 and SY-102 dispersed in the same 1M NaOH, 1M $NaNO_3$ wash liquid used for dispersing PSD samples and conducting wet sieve tests. In these tests, the fractions of the particulates in the samples that settled at rates faster than 0.0865 cm/s were collected. In two trials conducted for each tank sample, the volume fractions collected were 4% and 4% for AW-103 sludge, 7% and 9% for AY-101 sludge, 4% and 9% for C-104 sludge, and 6% and 4% for SY-102 sludge. Observations of coarse particle layers in the settled fractions, and their variation with changes in plunger mixing operations, suggested that some breakup of the coarser particles was being caused by the stirring operations required to suspend the particles prior to settling.

Attempts to estimate the effective settling densities of the particles were confounded for all four tank studies, apparently by this instability of the particle populations toward mixing during the settling tests and toward stirring during particle sizing. Inadequate representation of large particles due to the small aliquots taken for sizing may also have played a role. Alternative estimates using the settled fraction percentages and the sieve test results yielded density estimates in the 1.1 g/cm^3 range. The effective settling density estimates of the two methods for

all four tank sludges fell between 1.106 g/cm^3 and 8 g/cm^3. Further development would be needed to provide more useful estimates of effective particle density.

Particle sizing showed that a large fraction of the particle volume in the settled sludge fractions of all four tanks was present in particles greater than 100 μm. These large particles were not as susceptible as the original tank composite samples to breakup by sonication.

Microscopic Examinations

PLM and IA particle sizing were performed on composite samples, sieved fraction samples and settled samples from Tanks AW-103, AY-101, C-104 and SY-102. The techniques used to prepare and observe the PLM/IA images were not suitable for sizing fragile particles greater than 50 μm in size, nor for sizing populations of wide dispersion. The PLM and IA results reflected this by generally being unable to observe the larger particles of principal interest to this program.

Conclusion

Large particles greater than 200 μm in diameter do exist in sludge composites from HLW Tanks AW-103, AY-101, C-104, and SY-102 made from archived core samples. These large particles are present in amounts ranging from 5 vol% to 20 vol%, though only 4% to 9% of the particle volume in these sludges has free settling speeds large enough to be of concern in the Waste Feed Delivery system. The large particles appear to be more-or-less loose consolidates of smaller particles.

The particle size analyzer at 222-S Laboratory, equipped with the recirculating sample loop, can detect particles greater than 200 μm, using the sample agitation parameters developed in this work. However, current PSD sampling, aliquotting, and measurement techniques are inadequate for quantitative measurement of particle fractions larger than 200 μm. These large particles should first be sieved out of sample aliquots in the 15 g range before proceeding with the routine PSD analysis. The results of the sieving and PSD measurements can be spliced together to provide an overall size distribution.
When particles greater than 200 μm are not detected, it must mean that either they were not in the sample aliquot taken or they were too fragile to withstand the agitation necessary for measurement. Conversely, if the analyzer does report large particles, they are indeed present. These large particles generally break up while being analyzed.

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LIST OF ABBREVIATIONS

BCR	(European) Community Bureau of Reference
cm	centimeters
g	grams
HLW	high-level waste
IA	image analysis
mL	milliliters
mm	millimeters
PLM	polarized light microscopy
PSD	particle size distribution (analysis)
RPP	River Protection Project
s	seconds
Sec.	Section
USDOE	United States Department of Energy
WPPA	Waste Particle Properties Analysis
WTP	Waste Treatment Plant

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1. INTRODUCTION

The primary goal of the River Protection Project (RPP; see DOE 2001) is to vitrify the waste stored in Hanford's underground waste tanks. The major facility to accomplish this goal is the Waste Treatment Plant (WTP), which is now in the first phases of construction. A significant part of the RPP is to transfer the waste by pipeline from the Hanford underground tank farms to WTP.

The flow rates and pipeline pressures required to deliver high-level waste (HLW) slurries to the WTP are estimated in the Waste Feed Delivery Transfer System Analysis (Julyk 2001). However, these estimates have depended strongly on some fairly speculative input values for the waste properties – specifically, the sizes and densities of the particles in the wastes. In the summer of the year 2000, it was established that the available particle size distribution (PSD) data for HLW were widely scattered (Jewett 2000). A conservative statistical projection estimated that the median particle size in one or more HLW tanks could be as high as 275 μm. No measurements at all were available for the densities of the particles. This state of affairs led to an estimate (Julyk 2001) that design pressures for the transfer system would have to be substantially higher than those previously planned.

In order to avoid costly design changes, money was allocated in February 2001 for an ambitious laboratory program to obtain more definitive measurements of waste particle properties (Jewett 2001). The results of that program, dubbed Waste Particle Properties Analysis (WPPA) are reported here.

The WPPA work was performed at two USDOE laboratories on the Hanford Site. The first, located in the 222-S Building, is the main process control laboratory in Hanford's chemical processing plateau (the 200 Areas). It provides most of the routine chemical and radiochemical analysis services for the Hanford tank farms and is operated by Fluor Hanford, Inc. The second laboratory, located in the 325 Building, is operated by Battelle Memorial Institute as part of the Pacific Northwest National Laboratory. The 325 Laboratory conducts chemical and radiochemical analysis work for USDOE projects both on the Hanford Site and elsewhere.

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2. PURPOSE

The plan for this work was formulated to:

(1) Provide a validated method for particle size analysis at 222-S Laboratory

(2) Obtain additional particle size measurements for solids in seven HLW tanks using PSD analyzers at two independent laboratories.

(3) Perform sieving tests that could be compared to the light-scattering-based PSD measurements.

(4) Perform settling tests to provide some information about the fractions of tank sludges that settle rapidly, and to estimate the effective particle densities.

(5) Perform microscopic observations to obtain qualitative information about agglomeration and other characteristics of the waste particles.

(6) Perform computer-assisted image analysis (IA) of the microscopic images to explore the method as a method for PSD analysis.

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3. TEST DESCRIPTION

The test program was founded on three assumptions.

- The solids in HLW are subject to agglomeration. Although the fundamental particles in the waste may be quite small (on the order of nanometers; see Bunker 2000), under most storage and operating conditions, the particles assemble into agglomerate particles with sizes in the micrometer range.
- The HLW will be adjusted to approximately 10% solids by volume before pipeline transfer.
- The slurry liquor during the transfer can be adequately represented for all tanks by a solution of one molar sodium nitrate and one molar sodium hydroxide.

In broad terms, the program consisted of eight interdependent efforts. They were:

- Assess the accuracy and comparability of light scattering PSD analysis in the 222-S Laboratory and the 325 Laboratory by parallel determinations on the size distributions of two certified standards. Also assess the possible effects of instrumental parameter settings on the values returned.
- Prepare representative composite samples of seven HLW slurries for PSD determination.
- Assess the comparability of the same two instruments as a function of instrumental parameter adjustments by parallel PSD determinations of the sludges from three HLW tanks.
- Determine the size distributions of the sludges of the remaining four HLW tanks with the 222-S Laboratory particle size analyzer.
- Corroborate the 222-S PSD results on four HLW tanks by wet sieve analysis of four tank composites.
- Provide additional validation of PSD results and look for the possible occurrence of particle agglomeration by examining the major sieve fractions from the four tanks using the 222-S Laboratory particle size analyzer, polarized light microscopy (PLM), and IA.
- Estimate the percentages of the same four tank sludges having fast settling rates of concern to successful slurry transport of sludges, and estimate the effective settling densities of the fast-settling particles.
- Support the determination of effective particle settling densities by examining the fast-settling fractions from the four tanks using the 222-S Laboratory PSD, PLM, and IA.

These efforts are detailed in the sections that follow.

3.1. Tank Samples

3.1.1. Tank Sample Selection

The WPPA program required experimental observations on sludges from seven HLW tanks. The governing plan for sample selection was Bechtold (2001a). The guiding philosophy was to secure representative composites for each of eight tanks that had not dried out from extensive archival periods, and that had not been subjected to treatments likely to alter the native sludge

PSD, such as tissue homogenization. The overriding need was for sufficient quantities (approximately 100 grams each) to perform the suite of WPPA tasks.

Samples were selected for these tests from the sample archives stored in the 222-S Laboratory hot cells, or, in the case of Tank C-107, from samples remaining from current analytical projects. The samples were selected to form approximate composites of all the solids in each of seven waste tanks to be used for high-level waste feed in Phase 1 of the River Protection Project (DOE 2001). This objective resulted in selecting only core samples; core sampling preserves positional representation better than other available sampling methods. Samples that had been stored directly after removal from the core sampler were favored; samples that had been blended or homogenized (except by gentle hand-mixing) were rejected, in order to preserve the innate nature of the particles.

3.1.2. Tank Sample History

The seven tank composite samples actually used were prepared from the archive samples (or fresher, current samples, in the case of Tank C-107) as shown in Tables 1a and 1b. These tables also trace the samples back to the sampling date and tank location. This information was obtained from the laboratory archive sample records and verified with the LABCORE sample tracking system.

Table 1a. History of Samples for Tanks AW-103, AY-101, C-104, and SY-102.

Tank	Composite(*)	Core Sample Analysis Report	Used in Test(s)(**)	Component Samples		Core	Seg. (***)	Tank Sample Date	Extrude Date	Other Transfers	Comment
				Jar #	Lab ID						
AW-103	S01T001018	Steen 2000a	a,c	14922	S99T001491 S01T001306	265	5	9/3/99	9/9/99	--	
				15487	S99T001492 S01T001307	265	6	9/3/99	9/9/99	--	
				15497	S99T001493 S01T001310	265	7	9/3/99	9/9/99	--	
				15490	S99T001494 S01T001308	265	8	9/3/99	9/9/99	--	
				15496	S99T001495 S01T001309	265	9	9/3/99	9/9/99	--	
				17060	S99T001496 S01T001311	265	10	9/3/99	9/10/99	--	
AY-101	S01T001015	Bell 2000	a,c	18303	S01T001236	275	2U	1/17/00	2/7/00	12/18/00	From jar #17015 (S00T000581).
				16992	S00T000585 S01T001237	275	2L	1/17/00	2/7/00	--	
				17013	S01T001238	275	3	1/17/00	2/7/00	--	
				15946	S00T000668 S01T001239	277	2U	1/17/00	2/15/00	--	
				15951	S00T000673 S01T001240	277	2L	1/17/00	2/15/00	--	
				15952	S00T000678 S01T001241	277	3	1/17/00	2/15/00	--	
C-104	S01T001012	Fritts 1997	a,c	11350	S96T004844 S01T001255	162	1U	7/31/96	9/3/96	9/15/96	From jar #11088 (S96T004832)
				10968	S96T004372 S01T001256	165	2U	7/31/96	8/12/96	8/16/96	From jar #10605 (S96T004370)
				11357	S96T004882 S01T001303	165	3A	7/31/96	9/4/96	9/16/96	From jar #11141 (S96T004862).
				11356	S96T004849 S01T001304	162	4L	7/31/96	9/3/96	9/15/96	From jar #10984 (S96T004837)
				11366	S96T004887 S01T001305	165	6A	7/31/96	9/4/96	9/16/96	From jar #11142 (S96T004864)
SY-102	S01T001027	Steen 1998	b,c	13081	S97T001914 S01T001251	211	11RL	7/25/97	8/14/97	8/11/97	From jar #11910
				13082	S97T001915 S01T001252	211	11RU	7/25/97	8/14/97	8/11/97	From jar #11909
				13084	S97T001931 S01T001254	211	12U	7/28/97	8/14/97	8/11/97	From jar #11911
				13083	S97T001926 S01T001253	211	12L	7/28/97	8/14/97	8/11/97	From jar #11912

Table 1b. History of Samples for Tanks AY-102, AZ-102, and C-107.

Tank	Composite(*)	Core Sample Analysis Report	Used in Test(s)(**)	Component Samples		Core	Seg. (***)	Tank Sample Date	Extrude Date	Other Transfers	Comment
AY-102	S01T001029	Steen 2001	b	18683	S01T000151 S01T001248	281	10L	6/28/00	7/24/00	1/10/01	From jar #16031
				18685	S01T000152 S01T001249	281	11U	6/28/00	7/24/00	1/10/01	From jar #16048
				18687	S01T000154 S01T001250	281	12U	6/28/00	7/24/00	1/10/01	From jar #15955
AZ-102	S01T001023	Steen 2000b	b	15430	S98T003166 S01T001234	254	16	7/31/98	10/19/98		
				15610	S98T003165 S01T001235	254	17	7/31/98	10/19/98	11/25/98	From jar #15431
C-107	S01T001673	McKinney 2001	b	--	S01T000336	287	1U	1/31/01	2/12/01		
				--	S01T000350	287	2U	1/31/01	2/12/01		
				--	S01T000351	287	3U	1/31/01	2/20/01		
				--	S01T000353	287	4RU	1/31/01	2/21/01		
				--	S01T000355	287	5RU	1/31/01	2/20/01		
				--	S01T000375	288	1U	2/21/01	2/20/01		
				--	S01T000376	288	2U	2/21/01	2/20/01		
				--	S01T000458	288	3R1U	2/21/01	3/8/01		
				--	S01T000456	288	4R1U	2/21/01	3/8/01		
				--	S01T000459	288	5RU	2/21/01	3/9/01		

*The 222-S Laboratory information management system assigns a "Sample ID Number" of the form SyyTnnnnnn, where yy indicates the calendar year and nnnnnn is a serial number. In this report, for convenience, this number is sometimes shortened to a "vial number," consisting of the last four digits of the serial number. The complete Sample ID Number can be reconstructed from the "vial number" by prefixing it with "S01T00".
**Test identifiers: (a) Parametric PSD studies, (b) PSD measurement, (c) sieving and settling tests.

***Segment notation: (U) upper half, (L) lower half, (A) topmost subsegment; R and R1 represent the 2nd and 3rd attempts, respectively, to obtain the segment from the tank.

It is of interest in this work to understand the solubility of the solids in the waste samples shown in Tables 1a and 1b; this understanding requires knowledge of the composition of the solids. Chemical characterization of the tank solids has been reported in the documents cited in the table. These results, however, generally do not distinguish between the components actually present in solid phases and those dissolved in the interstitial liquor of a sludge or slurry. Also, other available sources should be considered to get best possible estimates of waste compositions. The "best-basis" chemical inventories for the wastes in each of Hanford's underground waste tanks are maintained on the "TWINS" web site (http://twins.pnl.gov). The "best-basis" inventories for the wastes to be delivered to WTP during Phase 1 of RPP have been evaluated using the ESP™ chemical equilibrium program to obtain the compositions of the actual solids in the wastes (Orme 2001). Table 2 exhibits the concentrations of the major constituents in the solids of the tanks listed in Tables 1a and 1b.

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Table 2. Compositions of solids in HLW tanks.

Component	AW-103	AY-101	AY-102	AZ-101	AZ-102	C-104	C-107	SY-102
$Al(OH)_3$	9.0%	26.4%	30.6%	57.8%	46.9%	39.6%	25.4%	53.6%
Bi_2O_3							5.9%	
$Cr_{III}(OH)_3$								9.2%
$NaAlCO_3(OH)_2$		9.3%	15.1%					
$Na_2U_2O_7$	11.4%					12.1%		
$Fe_{III}O(OH)$		27.9%	37.4%	26.1%	33.6%	7.5%	17.5%	7.3%
$KAlSiO_4$					6.1%			
$Mn(OH)_2$			8.2%					
NaAlSiO4		14.9%				8.5%	15.2%	
NaF	36.5%					9.4%		
$Na_7F(PO_4)_2 \cdot 19H_2O$							30.6%	19.3%
$Na_2C_2O_4$		13.7%						
ZrO_2	36.4%			7.3%		14.9%		

3.1.3. Tank Sample Utilization

Table 3 shows how the tank waste composite samples were used in the WPPA project.

Table 3. Utilization of tank waste composite samples.

Tank	Test & Laboratory				
	Particle Size		Sieving	Settling	PLM & IA
	222-S	325	222-S	222-S	222-S
AW-103	X	X	X	X	X
AY-101	X	X	X	X	X
C-104	X	X	X	X	X
AY-102	X				
AZ-102	X				
C-104	X				
SY-102	X			X	X

3.1.4. Tank Sample Preparation

Once prepared, the archival composites in large jars were mixed with soft, rubber kitchen spatulas, then subsampled for particle sizing according to test procedures designed to render them homogeneous. The procedures are attached as Appendix A.

The one exception was the C-107 composite used. There was no need reconstitute the moisture of this composite, because it was built from fresh samples only three to four months old, as shown in Table 1b. These component sludge samples had been kept wet under water while awaiting PSD analyses, and the entire contents of each, water and all, were used to prepare the composite (Duncan 2001a).

Two 25-g samples were taken from each of the original Tank AW-103, AY-101, and C-104 composites. One sample for each tank was sent to 325 Laboratory for PSD analysis; the other was set aside in the 11-A hotcells for PSD analyses at the 222-S Laboratory.

Further subsampling from the original and PSD composite jars is described in subsequent sections of this report, in connection with the specific analyses and tests.

3.2. PSD Comparison Tests

The plan for the comparative and optimizing studies of PSD analyzers (Duncan 2001b) employed analyzers at the 222-S and 325 Laboratories. Both laboratories used instruments based on the light-scattering principle, but the instruments were of different makes and models. Each provided different designs for dispersion of the particles and presenting them to the interrogating light beams. These designs involved sonication, pumping, and circulation of the particulate suspension.

The PSD measurements at the 222-S Laboratory were made using a Horiba™ LA-910 "Laser Scattering Particle Size Distribution Analyzer." The flow cell configuration was used for all measurements. The analyzer and the components of the measurement flow loop are described in Appendix B. The basic operational sequence followed in performing all the 222-S PSD measurements presented in this report is also described in Appendix B.

The PSDs were measured at the 325 Laboratory with a Microtrac® X100 particle size analyzer. Like the Horiba LA-910 analyzer used at the 222-S Laboratory, the Microtrac circulates the sample suspension through the measurement cell from a reservoir. However, the Microtrac does not have a stirrer in the sample reservoir. The outlet of the Microtrac reservoir is located at the funnel-shaped bottom of the reservoir, obviating the need for a stirrer.

The purpose of the PSD comparison tests was threefold: to evaluate the impacts that adjustments to the sample circulation and dispersion options of the two analyzers have on the measured PSDs; to compare the results of PSD analyses generated by the two instruments and laboratories; and to generate PSD data on composites of waste material from three Hanford tanks. To these ends, two series of PSD measurements, at predefined circulation and dispersion conditions, were made at each laboratory.

First, a series of PSD measurements were made on two, certified, quartz powder particle size standards: BCR No. 67 and BCR No. 130. Each laboratory received its own standards in jars dispensed by the purveyor. The PSDs of these two standards are certified by the Commission of the European Communities, Community Bureau of Reference — BCR. Copies of the certification documents are included in Appendix F. The nominal range of particle diameters for standard BCR 67 is 3 μm to 20 μm. Certified Stokes particle diameters for standard BCR 67, from gravitational sedimentation tests, extend from 2.40 μm for the 1.2 mass-percent undersize

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cut to 32.00 μm for the 99.1 mass-percent undersize cut. The nominal range of particle diameters for standard BCR 130 is 50 μm to 220 μm. Certified volume equivalent diameters for BCR 130, from sieve analyses, extend from 46.4 μm for the 1 mass-percent undersize cut to 244.6 μm for the 99 mass percent undersize cut. The range of sample circulation and dispersion conditions evaluated during PSD measurements on the quartz powder standards at the two laboratories were prescribed in the project test plan (Duncan 2001b).

Second, a series of PSD measurements were made on composite samples of solids from three Hanford tanks: AW-103 (Composite Sample S01T001018), AY-101 (Composite Sample S01T001015), and C-104 (Composite Sample S01T001012). Preparation of these composites from archived samples was described in Sec. 3.1.4. Samples of these composites (~25 g each) were transported to the two laboratory facilities for PSD analysis. As for the measurements on the quartz standards, the range of sample circulation and dispersion conditions evaluated during PSD measurements on the three tank composites were also prescribed in the project test plan (Duncan 2001b).

PSD measurements require the use of a liquid to disperse the particles. Since agglomeration of solids is greatly affected by the ionic strength of the surrounding liquid, and since the objective of this work is to determine waste properties under the conditions of pipeline transport, the dispersant PSD measurements in these two series was selected to roughly approximate the liquid compositions expected during pipeline transport. The composition selected was a solution of 1M NaOH and 1M $NaNO_3$ in water. This dispersant was used for all the HLW PSD measurements, except as noted for some measurements of BCR standards at the 325 Laboratory. Dispersant of the same composition was used in the sieving and settling tests as well.

3.2.1. PSD Measurements at 222-S Laboratory

Dispersant Liquid. The 1M NaOH, 1M $NaNO_3$ dispersant liquid discussed above was prepared by the 222-S Standards Laboratory and filtered through 0.45 μm filters prior to use. A volume of 160 mL to 170 mL of the dispersant liquid was used in each measurement.

Circulation/Dispersion. The LA-910 analyzer used by the 222-S Laboratory utilizes a combination of stirring and pumping to distribute sample solids in the liquid dispersant and pass the specimen slurry through the analyzer's flow cell. A three-bladed, mechanical stirrer that operates in the analyzer's sample tank stirs the specimen slurry. Two stirring speeds were evaluated: a minimal "Step 1" (a few revolutions per second) and a maximum "Step 3" at which the liquid vortex in the sample tank was just above the stirrer blades. For reference, the maximum speed of the stirrer, 1000 rpm, is at "Step 7" in distilled water.

A peristaltic pump positioned between the sample tank and the measurement flow cell effects sample circulation in the LA-910 flow loop. A full description of the pump and tubing system, and measured pump curve (mL/s *vs.* Step Setting) data is presented in Appendix B. A default "Step 6" pump speed, 14.4 mL/s flow rate, was prescribed for all 222-S PSD measurements; this speed was determined in preliminary tests to provide adequate suspension of even the largest particles of the BCR 130 standard and not high enough to introduce air bubbles into the circulating sample stream.

Ultrasonic Treatment. All PSD measurement sets included treatment of the specimens in an ultrasonic bath for periods of 2 or 20 minutes. All these "sonications" were made with the 40 W, 39 kHz, ultrasonic bath integrated with the LA-910 analyzer's sample tank.

Each measurement set for the comparison tests on the tank composites also included a quiescent delay period of 60 minutes following the ultrasonic treatment. The specimen/dispersant liquid mixtures remained in the analyzer during these delay periods. The mechanical stirrer in the sample tank was turned off during the delay periods. For the AW-103 composite measurements, the specimen circulation rate (i.e. the pump speed) was reduced to the minimum "Step 1" value (2.1 mL/s) during the delay period; for the AY-101 and C-104 composites the circulation pump was turned off.

Test Sequence. The PSD data for all the WPPA measurements was collected in "Sets" of consecutive PSD "Runs" on individual analytical specimens. At the beginning of each set, the sample solids were gradually added until light scattering by the sample particles reduced the initial measured intensities of the dual light beams of the LA-910 analyzer by 5% to 30%. The actual amounts of sample solids added in each PSD measurement are estimated to be ≤ 0.1% by volume of the specimen slurry.

The circulation and dispersion conditions – speed of the flow loop peristaltic pump, speed of the sample tank mechanical stirrer, and ultrasonic treatment time – were manually set for each individual PSD run. For the PSD comparison test measurements, the specific circulation/dispersion conditions selected for each run and the order in which the runs were made within a measurement set were prescribed in the project test plan (Duncan 2001b).

Refractive Index Effects. The proprietary calculations internal to the Horiba LA-910 PSD analyzer that convert the measured light scattering patterns into PSDs were repeated with three different input values of refractive index for the sample solids. These calculations, demonstrating the effects the selection of refractive index can have on the calculated PSDs, were made on a subset of the PSD data from measurements on the quartz powder standards and the AW-103, AY-101, and C-104 composites. The selection of the refractive index values for the quartz powder standards and the tank composites is discussed in Sec. 4.4.1.

Quality Control Measurements. Two, interlaced series of quality control measurements were made over the course of the PSD measurements described in this report. The first series includes measurements on a set of monodisperse polystyrene microsphere standards with nominal particle diameters ranging from 200 nm to 140 μm. The second series consists of a set of repeated measurements on a third quartz powder standard, BCR 69. The nominal particle size range for BCR 69 is 12 μm to 90 μm. All quality control measurements in both series were made using deionized water as the dispersant liquid. The certification documentation for the standards, the run conditions used, and the results of the PSD measurements are included in Appendix F.

3.2.1.1. Certified Standards

Sampling. The BCR 67 standard was received from the vendor (Duke Scientific Corp., Palo Alto, California) as a 9.0 g sample identified as No. 1448. Standard BCR 130 was received (from the same vendor) as a 45 g sample identified as No. 618. The BCR 67 sample was subdivided into eight aliquot portions using a rotary riffler (Model RR-5 Rotary Micro Riffler, Quantachrome Corp., Boynton Beach, Florida). The BCR 130 sample was riffled into 16 aliquot portions, using a two-stage riffling process. In this procedure, the eight test tubes of material from the first stage were re-combined into two tubes, and these were each individually riffled to give the 16 aliquots.

Specimen Introduction. Analytical specimens of the quartz powder standards were withdrawn from the riffled aliquot portions in the following way. Sufficient deionized water was added directly to an aliquot vial to form a thick paste. This paste was thoroughly mixed by gentle stirring with a micro-spatula. An analytical specimen was then taken by transferring the required amount of this paste from the aliquot vial to a fresh charge of the $NaOH/NaNO_3$ dispersant liquid circulating in the analyzer sample tank.

3.2.1.2. Composite Samples from Tanks AW-103, AY-101 and C-104

Sampling. To satisfy radiological safety objectives, the 25-g composite subsamples for 222-S PSD measurements were further subdivided into 0.5- to-1-g samples in the 11-A hotcells. The AW-103 composite (S01T001020) was stirred in its jar using a laboratory scoopula. Significant amounts of the composite adhered to the scoopula that was then held over a pre-labeled sample vial and gently shaken and tapped with another spatula until sufficient material had exuded from the composite mass and fallen into the sample vial. This process was repeated until six one-gram subsamples had been taken. Approximately 0.5 mL of deionized water was then added to each of the analytical samples to mitigate any sample drying. The samples were then sealed, loaded out of the hotcells and transported to the PSD analyzer for analysis.

It was soon suspected that this sampling technique might have produced subsamples with concentrations of smaller particles that were artificially high relative to that in the source AW-103 composite. It was decided, however, that the initial set of AW-103 analytical samples collected were adequate for an evaluation of run parameters, which was the primary focus of the initial set of PSD measurements.

An improved technique was developed for subdividing tank composite splits into analytical samples. The AW-103 measurements were repeated with this improved technique, and it was used for all the other tank samples as well. This improved subsampling method is described as follows: The composite was gently stirred in its source jar using a metal spatula. The end of a disposable, plastic transfer pipette was trimmed back until the inner diameter of the pipette tip was approximately 5 mm. Several milliliters of the thick composite slurry/paste was then removed from the source jar with the pipette and expelled into the sample vial. This process was repeated, using the same modified pipette, until all the analytical samples for a composite had been collected. Approximately 0.5 mL of deionized water was then added to each sample vial before sealing them and loading them out of the hotcells.

Specimen Introduction. Shortly prior to initiating a PSD measurement set, ~10 mL of the $NaOH/NaNO_3$ dispersant liquid was added to the sample vial. The sample was gently stirred in the vial using a flat-bladed, plastic stir rod. Immediately prior to withdrawing the analytical specimen the sample was repeatedly mixed by taking up and expelling 1 to 2 mL of the sample slurry with a disposable plastic transfer pipette (a process hereafter called "liquid-sparging." Prior to use, the tips of the pipettes were trimmed and/or formed until they had a round opening with an inner diameter of 2 mm. Following the sparging, a portion of the sample slurry was immediately taken up into the transfer pipette and quantitatively transferred into a 160 mL charge of filtered, $NaOH/NaNO_3$ dispersant liquid circulating in the PSD analyzer's tank. This specimen introduction process was used for all PSD measurement sets on the AY-101 and C-104 composites and for AW-103 sample(s) S01T001424, S01T001425, S01T001426, and S01T001427.

The method used to introduce Tank AW-103 samples S01T001669 and S01T001670 was patterned after the method described below for the Tank AY-102 and AZ-102 samples. PLM/IA specimens had been withdrawn from subsample S01T001670 prior to PSD analysis. Although several milliliters of NaOH/NaNO3 solution had been added to this subsample in connection with taking the PLM/IA specimens, little cover liquid remained when PSD analysis was initiated. Therefore, the same specimen introduction steps described above for S01T001669 were also followed for subsample S01T001670.

3.2.1.3. Composite Samples from Tanks AY-102, AZ-102, C-107, and SY-102

The 222-S Laboratory PSD measurement results were reviewed by WPPA project personnel following the completion of the PSD measurements on the certified quartz powder standard materials and the AW-103, AY-101, and C-104 composite subsamples (Sec. 3.2). A primary focus of this review was evaluation of the apparent impacts of the various circulation and dispersion options tested at the 222-S facility. As a result of this review, a simplified measurement set of four PSD runs was developed and prescribed for all subsequent PSD measurements undertaken in the WPPA project.

This four-run measurement set is diagramed in Appendix B ("Tank Waste Composite"). The measurement sequence is further described here. Following "Load-In" of the analytical specimen, an initial PSD run is made at a pump rate of "6," a stir rate of "1," and without sonication to capture the specimen PSD under mild circulation and dispersion conditions. For the second PSD run, the stirring rate is increased to "3" to insure that large or dense particles that may not have been adequately dispersed in the specimen slurry at the slower stir rate are observed. In the third PSD run the pump rate of "6" and stir rate of "3" are maintained, and the specimen is subjected to ultrasonic treatment for two minutes immediately prior to collection of the PSD data. In the fourth and final PSD run, the stirring speed is reduced from "3" to "1" prior to collection of the PSD data. Disappearance of portions of the specimen PSD when the stir rate is reduced could provide indirect information concerning particle densities.

The quiescent delay periods, which were evaluated during the previous measurements on the AW-103, AY-101, and C-104 composites and found to have little observable impact on the PSD measurements, were eliminated.

The initial PSD measurements on some of the tank composite materials (Sec. 3.2.1.2) indicated that the pumping and stirring applied in the 222-S LA-910 PSD analyzer were sufficient to quickly alter the PSDs of some materials. The use of milder load-in conditions (pump rate "3," stir rate "3") and extension of the time tracking for the measurement set to include the load-in period were used in response to this observation. These modifications were, however, inadvertently discontinued shortly after they were initiated.

Sampling. Subdivision of the composite samples for Tanks AY-102 (S01T001030), AZ-102 (S01T001024), and SY-102 (S01T001028) into analytical subsamples was performed using the large bore transfer pipette method described above.

As noted in Sec. 3.1.4, a composite sample of Tank C-107 wastes was prepared by combining ten subsamples taken from segments of C-107 Core Samples 287 and 288 (retrieved February 2001). The composite was prepared on August 29, 2001 by transferring (as completely as possible) the contents of the ten samples listed in Table 1b into a single 120 mL bottle. Rinsing with deionized water facilitated transfer of the samples into the composite container. The prepared composite (S01T001673) was a 110 mL aqueous slurry containing <10 g of C-107 solids. This composite was prepared outside of the 222-S, 11-A hotcells; therefore subdivision into analytical samples prior to hotcell load-out was not required.

Specimen Introduction. The analytical specimens from SY-102 composite subsamples S01T001648 and S01T001649 and from AZ-102 composite subsample S01T001651 were introduced into the PSD analyzer following the same technique previously described for the AW-103, AY-101, and C-104 composite specimens (Sec. 3.2.1.2).

The analytical specimens from the AY-102 composite subsamples and from the remaining AZ-102 composite subsamples, S01T001652 and S01T001653, were introduced to the PSD analyzer in a different manner. First, 2 to 3 mL of filtered (0.45 μm), deionized water was added to the 20 mL sample vial. The sample slurry was not stirred following addition of the water. The sample slurry was liquid-sparged in the sample vial using an unmodified, disposable plastic transfer pipette. The tip opening in these pipettes is circular to slightly oval in shape with an inner diameter of 1.5 to 2 mm. Following this sparging, a quantity of the slurry was withdrawn from the sample vial with the transfer pipette and transferred, dropwise, to a fresh, 160 to 170 mL charge of the $NaOH/NaNO_3$ solution circulating in the PSD analyzer. Addition of sample was continued until the circulating specimen slurry had sufficient solids loading for PSD measurement.

The C-107 composite (described above) used in this study was an aqueous slurry with fairly low solids loading. The analytical specimens were all removed directly from the composite jar. Transfer to the PSD analyzer was effected by gently stirring and liquid-sparging the composite with an unmodified, disposable plastic transfer pipette. An appropriately sized specimen was then transferred, dropwise, to a fresh $NaOH/NaNO_3$ solution charge circulating in the PSD analyzer.

3.2.2. PSD Measurements at 325 Laboratory

The standards and samples were added to the reservoir of the Microtrac X100 analyzer while the suspending medium was circulating at the desired flow rate. The particle size analyzer software indicated when sufficient particles had been added to obtain meaningful results.

The BCR standards were subdivided for PSD analysis into equal aliquot portions using the same model rotary riffler and the same procedure as was used at the 222-S Laboratory (Sec. 3.2.1.1). Small portions of these aliquots were transferred to the analyzer as dry powders without re-mixing, using a microspatula.

The tank composite samples analyzed at 325 Laboratory were from Tank AW-103 (Sample # 16981), Tank C-104 (Sample # 17009), and Tank AY-101 (Sample # 18730). The samples were composites from archive samples as described in Sec. 3.1.

If the viscosity of a waste sample was low enough that the suspension could be pipetted and particles would not clog the opening of the pipette, the samples were introduced into the analyzer with a plastic transfer pipette having an opening of approximately 2 mm. Prior to sampling, the waste sample was stirred with the pipette, and the subsample was taken near the bottom of the vial.

If a representative subsample of the waste could not be obtained with a transfer pipette, a microspatula was used to obtain the sample. The sample was gently stirred with the microspatula prior to subsampling, and the subsample was taken near the bottom of the vial. The tip of the spatula was immersed in the suspending medium to transfer a small portion of the sample into the analyzer.

Particle size distributions of the waste samples were measured at flow rates between 17 and 60 mL/s prior to and after sonication at varying durations and delay times. Particle size distributions were calculated using various particle refractive indices for each measurement condition. Particle size distribution was measured under a series of different conditions on each aliquot. The sample was generally changed out when the sample had been sonicated, and the next measurement required an unsonicated sample. The table of contents to Appendix G shows the measurement sequence and the measurement conditions for each sample. The points in the measurements sequence where samples were changed out of the analyzer are shown as solid horizontal bars.

For samples requiring PSD measurement immediately after 2- and 20-minute sonications, the sonication was done at 40 watts directly in the recirculation system of the Microtrac® analyzer. For sonication of samples requiring delays before measurement, vials containing concentrated slurries of the samples in the suspending medium were sonicated at 40 watts in an ultrasonic cleaner (Model FS15, Fisher Scientific International, Inc., Hampton, New Hampshire). The concentrated slurries were prepared by gently stirring the tank waste sample with a microspatula, transferring a subsample from the bottom of the sample to a 2 mL vial having a V-shaped bottom, then adding the suspending medium to the subsample. The sonicated particles were added to the PSD analyzer just prior to the measurement.

To obtain some understanding of the effect of the refractive index value used in the proprietary Microtrac PSD calculation, particle refractive indices of 1.5, 1.7, and 2.0 were used to calculate the particle size distributions of the tank wastes. These refractive indices are representative of sodium aluminosilicates (1.5), aluminum oxides (1.7), and iron oxides (2.0). For the BCR standards, the refractive index of quartz, 1.54, was used. The PSD of the standards was also calculated with a particle refractive index of 2.0 to determine the impact on the results.

3.3. Sieve Testing

3.3.1. Sieve Test Plan

The sludge composites from four HLW tanks (Tanks AW-103, AY-101, C-104, and SY-102) were sieved to provide an additional basis for assessing the validity of the PSD results. The sludges could not be dry-sieved, because their interstitial liquor contained substantial amounts of dissolved solids, such as sodium nitrate, sodium hydroxide, etc., that would artificially consolidate the particles of a sludge if it were dried. Furthermore, it was desired to maintain an approximation to the actual slurry condition the sludges would experience when retrieved from the tanks, so that any effects of particle agglomeration could be observed if agglomeration occurred before, during or after sieving. This meant the sludges had to be wet-sieved with a liquor that at least vaguely approximated the suspending fluid obtained when sluicing the tanks. The composition chosen for the synthetic liquor in all the WPPA tests was an aqueous solution one molar each in sodium hydroxide and sodium nitrate. This "wash liquid" contained approximately 9% dissolved solids, so, to obtain values for the relative amounts of material left on each sieve, both the sample to be sieved and the resulting sieve fractions had to be weighed in the "wet, drained" state – not the dried state. Even if the consolidating crystallites that formed in an attempt to dry a sludge were to reversibly re-dissolve and release the sludge particles upon re-slurrying, the added weight of the dissolved solids would not be accounted for in a mass dried for weighing. If the sieve fractions were to be washed with a dilute electrolyte and dried, they could then only be compared to a washed and dried portion of sludge equal in weight to the original sieved sludge aliquot. The practicalities of performing these extra operations with hot cell manipulators led to the judgment that measurement error was not likely to be improved by such a refinement.

The plan for conducting the wet sieving was Bechtold (2001b). The detailed procedure for conducting the wet sieving in a hot cell is found in Appendix C.

3.3.2. Sieve Test Reagents and Equipment

The reagent for wet sieving was the same as for all WPPA tasks – the 1M NaNO3, 1M NaOH wash liquid, pre-filtered through a 0.45μm membrane.

The equipment was arranged as shown in Figure 1. The sieves consisted of Gilson Co. part numbers SV-135 #35, SV-155 #70, SV-165 #140 and SV-185 #270, which are three-inch diameter clear plastic sieves in mesh sizes 500, 212, 106 and 53 μm, respectively. They were mounted on a Gilson Co. part # SV-217, wet test pan to collect the eluate. The whole affair was

held by a Gilson Co. part# SS-28 Vibra-Pad™ shaker on a lab jack, leveled by a 10-inch square leveling plate.

The general procedure was to tare the sieves as wetted and shaken, stack the sieves in increasing order of mesh size, weigh a portion of wet sludge, slurry it in wash liquid, and pour the slurry on the top sieve while the shaker was on. Additional wash liquid was poured through the sieves until the individual eluates from all sieves ran clear. Reweighing of each sieve after draining provided net weight fractions of original sludge, while the eluate fraction was determined by difference. Samples of each mesh fraction were then put in vials under fresh wash liquid for subsequent analysis by PSD, PLM, and IA for those samples representing fractions greater than 5% of the whole.

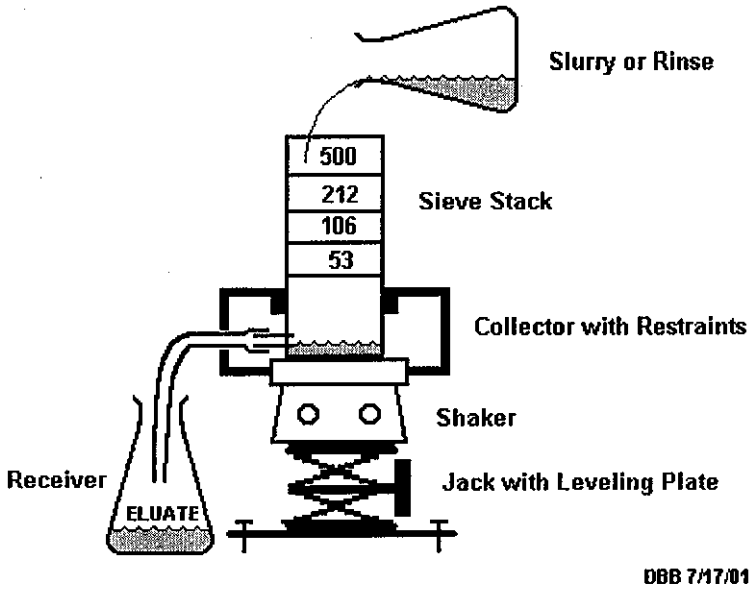

Figure 1: Sieve Test Equipment Arrangement.

3.4. Settling Tests

Rough, exploratory slurry transport calculations determined that slurry particles whose unhindered settling rate is less than 0.0865 cm/s can be transported from the tank farms to the Waste Treatment Plant without exceeding the current system design pressures. Any particles that settled faster than this would begin to present a problem of increasing degree as their free settling speed and percent-of-slurry increased.

To complicate matters, the design basis slurry transport model does not accept particle settling speeds directly as an input parameter. Rather, it requires an intrinsic particle effective density. Hence it was important to find a method to determine an "effective settling density" (i.e., a parameter for density to be inserted into a free-settling velocity equation that results in a correct

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settling speed) for HLW particles in their possibly agglomerated, porous states. This ruled out gas pycnometry, even if the particles could somehow be rinsed and dried beforehand.

The means selected to estimate both the fast-settling fraction and effective particle densities of slurries was a variation on the traditional sedimentation-fractionation method of determining particle size, wherein particles are fractionated according to their settling speeds in fluids (Herndan 1953). In this kind of experiment, a dilute, homogeneous suspension of particles is allowed to settle in a fixed column of liquid having a known density and viscosity, for a fixed length of time. When the settling time is up, a fixed, upper portion of the liquid column is relatively quickly stripped away by vacuum decantation to leave the remaining lower portion. This lower portion contains the particles that settled rapidly enough to escape the upper, decanted, portion of the column. Some of them did so by starting the settling period very close to the decantation boundary, while others may have had to fall all the way from the top of the fluid column. If the fluid column is re established to its full height with fresh, fluid, and stirred to re-homogenize, then the remaining particles are randomly redistributed over the full column height, making some of the slower ones vulnerable to decantation. The settling and decantation is undertaken again to remove more of the slower particles, leaving the remainder relatively enriched in those particles that can fall at least over the full column height fast enough to escape being decanted. Repeating the refilling, re-homogenization and settling enough times would eventually leave behind only those particles able to fall faster than a minimum critical speed defined by the column height, the decanted height, and the settling time. Free settling theory (Allen 1990) can be used to relate this critical speed to the size of the particles through their density and the fluid properties. Conversely, one could then use an independent size estimate to estimate the density through the fluid properties and the speed. Practicalities usually dictate a finite number of settle-strip operations leaving an approximate separation of the original particle distribution between slow (decanted) and fast (remaining) fractions.

3.4.1. Settling Test Plan

The settling fractionation described above is usually performed on small-sized particles having slow settling speeds, so there is ample time over the settling period to allow the stirring currents to settle down and the decantation to take place without appreciably disturbing the settling particles. In this program, however, the fairly fast settling speeds and need for slurry fraction data called for some departure from and compromise to the traditional experiment.

- Decantation rates had to be fast so that the decantation time would be short compared to the settling time. This meant that the decantation tube and associated orifices had to be of substantial diameter to pass liquid quickly. It also meant that the decantation withdrawal point in the settling apparatus could not be as close as desired to the bottom, else the currents caused by rapid decantation could sweep up and remove particles that had legitimately passed below the withdrawal point.
- Settling times were restricted by the practical height limitations of any settling apparatus to be used in a hot cell. Hence, it was not possible to completely remove the effects of initial stirring currents on the fractionation of high-speed particles.
- The need to measure fractions of remaining particles meant that as much volume of fluid be used as practical to accommodate substantial quantities of particulate, yet still provide an approximation to free settling.

- The settling had to be done on a dilute suspension basis (~1% by volume of particulate) to ensure that the separate particles don't hinder each other. Consequently the determination of fractions by weight was impractical. Instead, the volume fractions of particulate before and after the fractionations were determined with the use of a standard Imhoff settling cone available from chemical equipment suppliers.

The settling test plan (Bechtold 2001b) and test procedure (Appendix D) together were formulated to meet these requirements and to measure fast settling volume fractions and effective particulate densities for sludge composites from Tanks AW-103, AY-101, C-104 and SY-102. To estimate densities, the settling theory in Allen (1990) had to be generalized to include turbulent, non-Stokes settling. This is discussed in Sec. 5.7.

3.4.2. Settling Test Equipment and Reagents

A fast sedimentation pipette was designed and fabricated in glass, as shown in Figure 2. The o-ring joint permitted easy access to settled fractions when necessary. The pipette and vacuum system (40 mm body, 9 mm dip tube, 6 mm bore stopcock) were sized to permit rapid stripping of most of the settling column. The decantation ports were placed on the sides of the decantation tube to minimize the disturbance of the sediment below the dip tube when decantation was in progress. The essential measurements of the actual pipette used were from as-built measurements: Total liquid height = 28.0 cm; Height to bottom of dip port = 3.4 cm; and settling column volume 360.7 mL. These measurements realize a maximum settling distance of 24.6 cm to the decantation point. This distance was calculated to be perturbed by less than 2% when the decantation tube was inserted, because the decantation tubes dimensions are 9mm by <1mm wall, and the tube fills with fluid upon insertion.

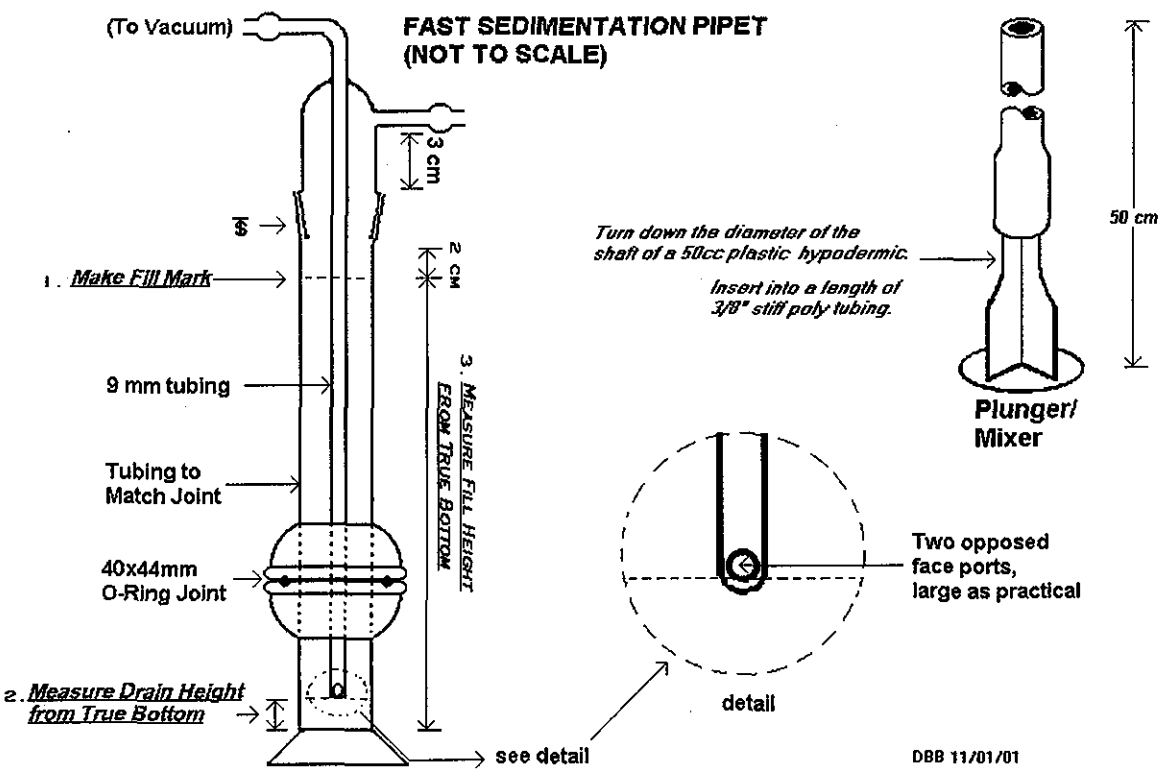


Figure 2: Settling Test Pipette Details.

The original mixing plunger, designed in the plan and fabricated from glass, proved too fragile for hot cell use. Instead, a plunger was fabricated by removing the piston from a 50 mL plastic syringe plunger, and turning the stub down so it would fit 2 cm into a length of 3/8" stiff poly tubing. The syringe part of the new mixer provided a flat disc agitator that fit nicely into the bore of the settling pipette, having just enough relief from the sides to efficiently mix the pipette contents when the plunger was stroked up and down using the tubing end as a handle.

The pipette was arranged with a vacuum pump and nearby Imhoff cone in a hot cell as in Figure 3. A one-liter vacuum flask and a Cole Parmer Air Cadet® vacuum pump, catalog # U-07530-40, were used.

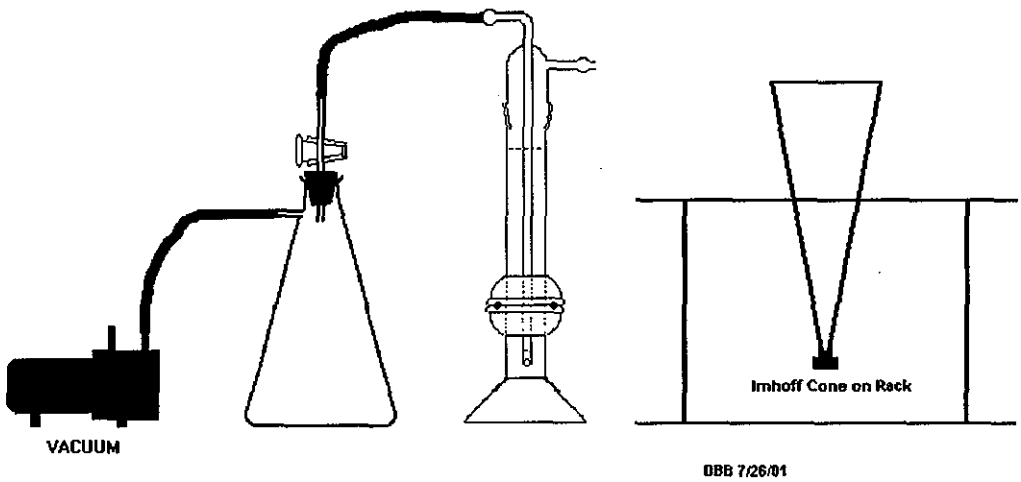


Figure 3: Settling Test Equipment Arrangement.

The reagent used to slurry, disperse and settle the sludge composites was identical to the wash liquid used in the particle sizing and sieving tasks – the 1M $NaNO_3$, 1M NaOH aqueous wash liquid that had been pre-filtered through a 0.45 μm membrane to lessen the particulate background. Over 20 liters of the liquid were necessary for this task.

3.4.3. Settling Test Procedure

Samples were prepared by first weighing an aliquot of the wet solids in a 50-mL cone (after mixing the source material with a spatula). The cone was then filled to about 37 to 38 mL with the wash liquid and shaken to mix the slurry. The slurry was then transferred into the Imhoff cone using more wash liquid to give a total Imhoff cone volume around 100 to 115 mL). The sample was usually allowed to settle for anywhere from one hour to four nights' time, depending on the visual settling behavior, before its settled volume was read.

® Air-Cadet is a registered trademark of Cole-Parmer Instrument Company, Vernon Hills, Illinois.

Then the sample was rinsed out of the Imhoff cone into the opened pipette, and more wash liquid was added to the pipette to bring the level to the fill mark. The stirrer was inserted and a plunging motion was used to completely and evenly suspend the entire sample, while keeping track of the number of plunges. The plunger was then removed, and the timer was started while the decantation tube was quickly inserted into the pipette. Cold testing revealed the best method to decant was to start pumping from atmospheric pressure, so the stopcock was left open.

The time corresponding to a settling speed of 0.0865 cm/s was 284 seconds. About three seconds before the nominal settling time was up, the vacuum pump was started. This allowed time to build vacuum and begin the rapid decantation of the pipette contents down to the decantation ports. After decantation, the decantation tube was removed and fresh wash liquid was added to the pipette to the fill mark to make ready for another stir, settle and decant cycle at the same settling time.

Eight settling cycles were performed on each aliquot of tank sludge. When completed, the pipette was opened at the o-ring joint and the remaining sediment was washed into the Imhoff cone with more wash liquid for the final settled volume measurement. The settled volume fraction was then calculated to be this final volume divided by the original slurried aliquot settled volume. The settled fraction was then washed into a sample vial for PSD, PLM, and IA. The procedure to estimate the particle density is discussed in Sec. 5.7.

The settling test was performed in duplicate for each tank composite at the slowest settling rate equal to 0.0865 cm/s.

3.5. Polarized Light Microscopy Tests

PLM was performed on the sludges from four HLW feed tanks – AY-101, SY-102, AW-103, and C-104. In addition, the sieve tests generated eight samples of sludges to be examined further, while the settling tests generated another four. Follow-up analyses of these fractions by PSD were performed not only to corroborate the PSD instrument response to the effects of sieving or settling on the particle population, but also to look for signs of agglomeration. PLM analyses were also performed on samples before and after sieving or settling to provide a more direct indication of the presence or absence of agglomeration, along with corroboration of the PSD results. Also, other information about the particles would be useful—for example, their shape or perhaps their composition.

Each sludge sample, stored under wash liquid, was prepared for PLM analysis by stirring it into suspension with a disposable pipette. One quarter to one half milliliter of the suspended particulate was withdrawn into the 2 mm bore of the pipette, then one half to one full drop was deposited onto a glass slide. A glass cover slip was placed on top and pressed down to disperse the particles. The sample preparations were examined on a Leitz Laborlux® 12 polarized light microscope with a "Colorview™ 12" digital color camera. A conventional tungsten filament light

® Laborlux is a registered trademark of Ernst Leitz Wetzlar GmbH, Wetzlar, Lahn, Germany.
™ Colorview is a trade name of Ernst Leitz Wetzlar GmbH, Wetzlar, Lahn, Germany.

source was used, shining through a translucent diffuser. Digital photographic images were acquired and examined using AnalySIS Opti™ software.

The objective lens selected for each image was a compromise to provide sufficient magnification to measure the area of the smallest particles observed, while at the same time providing a field size containing enough particles to yield adequate counting statistics.

Microscope images of empty slides were obtained for use in background subtraction in the IA (discussed below.) Microscope images of a commercial microscope calibration scale, scribed on a glass microscope slide at 10 μm intervals, were obtained for each objective lens of the microscope. These images were used with the AnalySIS Opti software to transfer a size bar onto each sample image.

3.6. Image Analysis (IA) Tests

The impression one receives about size distribution of large numbers of particles from examination of a PLM image is largely number-based, because the eye is drawn to the numbers, not the areas or volumes. Unless detailed measurements are taken of a collection of particle images, the PLM analyst cannot make meaningful statements about size or volume distributions except for comments relating to maximum, minimum or typical sizes observed. Detailed measurements can be made manually, but are labor intensive. Alternatively, computer software can be utilized to manipulate the information contained in a digital image. IA techniques can be used to enhance the differences between particulate and background, and to accurately detect large numbers of particles. Under the right circumstances IA can provide a quantitative tally of particle shapes on an image, and can convert that tally to any choice of distribution types using reasonable assumptions. Therefore, IA processing was performed on the images taken during the PLM examinations as a further corroboration of PSD measurements on the fractionated samples.

Images obtained by PLM were manipulated using processing routines available in the AnalySIS Opti® software package. The images selected for analysis were of particulates that were widely dispersed across the surface of the slide so that few particles were touching. The images were collected in plain, non-polarized light. A blank background image was collected under similar light intensity at the same magnification in order to allow for background subtraction, if necessary.

The basic image processing sequence was worked out using the standard quartz particle specimens to yield maximum contrast between background and the particulates. The sequence finally selected, which provided for optimum particle detection and mensuration, is as follows:

- The image was optimized for maximum contrast.

™ AnalySIS Opti is a trademark of Soft Imaging System Corp., Lakewood, Colorado.

- The image was separated into four individual images, each corresponding to a fundamental CMYK (cyan-magenta-yellow-black) color component.
- The component images with lighter-colored particulates (always C and K, and often M) were recombined using absolute addition.
- The resulting image was optimized for maximum contrast, and the colors were inverted.
- The image threshold was adjusted so that software applied color to the maximum number of particles, while coloring few, if any, background pixels.
- The particles were detected with the "corner detection" and "feature-fill" functions enabled. These functions tend to fill in pixels that may be missing from the images of light-colored or partially transparent particles.

When these steps did not permit the particulate to be distinguished from background, improved distinction could be achieved by first subtracting the background, then proceeding with the above listed steps. After development of the procedure with the quartz standards, it was found to work even better for the HLW samples.

4. RESULTS

4.1. Condition of Composites

Appendix E contains the data accrued when the composite samples were prepared. It can be seen from Tables 1a and 1b that some archive samples were stored for over four years. It is not surprising, then, that the most important result was the finding that many of the archive component jars were dry, because the hot cell temperature is a warm 27°C, the intense illumination heats dark-colored materials (like tank wastes), and there is a constant, strong ventilation. The compositing plan had called for the use of samples that were not dried. However, this would have left the program without many of the necessary 100 g amounts of composite. Therefore, the strategy changed to accept even the driest samples if they could be broken up sufficiently to be representatively sampled, and on that basis all selected archive samples were used, wet or dry, as even the worst of them was able to be broken up into crumbs in the hot cell with a Phillips screwdriver.

Except for the C-107 composite, mixing the composites provided the second important result – that the materials readily reconstituted to a batter-like consistency when water was mixed in; that there was no indication any portion failed to re-soften. Composites were gently homogenized using rubber kitchen spatulas and sufficient deionized water to produce a consistency soft enough to be thoroughly mixed, but not so wet that it would spontaneously separate into a sludge and liquid layer. The latter situation was undesirable because it would raise the possibility of non-representativity by rapid settling when subsamples were taken later. Importantly, even the driest composites readily reconstituted and softened to be mixed when the water was added. There was no indication by view or by feel (from outside the hot cell) that any unbroken chunks or crumbs existed in the final mixtures. The composites identified in Appendix E were the sources of the daughter and granddaughter subsamples used for PSD, sieve tests and settling tests.

The composite for Tank C-107 was the exception because it was prepared from fresh samples that had retained much of their native moisture. Indeed, the sample had been deliberately kept wet by periodic additions of water as needed. Thus, the condition of the C-107 composite probably represented its respective tank more faithfully than any of the other (partially dried) tank samples used.

4.2. Particle Size Distribution Results on Standards

Complete compilations of all PSD results from the 222-S Laboratory and the 325 Laboratory are found in Appendix F and Appendix G, respectively. These compilations give sample identifications, instrument operating conditions, plots and tabulations of the particle distributions (volume basis), particle sizes at selected percentiles, and summary statistics such as mode, median, and mean particle sizes. In addition, the 325 Laboratory results also include summary statistics for each peak detected by the Microtrac® software.

4.2.1. Standards at 222-S Laboratory

Data Reporting Format. All PSD measurement data from the 222-S Laboratory presented in this report is summarized using a common format. The PSD measurement results for each specimen are presented in a four-part summary described below. Copies of all analyzer output data and recalculated distributions from which the summary figures and tables are populated are included in Appendix F.

First, the PSDs from the series of runs in each measurement set are displayed, in order, in a single figure. Where necessary, the volume-based, frequency-% histograms have been rescaled so that each PSD in a measurement set is displayed at the same frequency-% scale. A header including the PSD run file name and a listing of the applicable circulation/dispersion conditions precedes each histogram. The run file names are identical to those found on the data sheets in Appendix F. The run circulation/dispersion conditions following the file names are given, in order, as shown in Table 4.

Table 4. Key to figures showing results of PSD test runs.

Condition	Key	Values or Range
Circulation **P**ump Speed	P[Speed Setting]	P1 = 2.1 mL/s P3 = 7.1 mL/s P6 = 14.4 mL/s
Mechanical **S**tirrer Speed	S[Speed Setting]	Increasing from 1 to 3
Ultra**S**onic ON Time	US[minutes]	2 or 20 minutes
Post Ultrasonic **D**elay **T**ime	DT[minutes]	Total time from termination of ultrasonic treatment to initiation of PSD run

The condition settings associated with an individual run are bolded and highlighted in the run header. The time figures (in minutes) following the "=" signs following the header condition keys indicate the cumulative times the specimen has been held at the identified run conditions at that point in the measurement set. Key action steps in each measurement set during which no PSD data is collected, i.e. specimen "Load-In" and post-ultrasonic "Delay" periods, are captured in these figures using the same run condition format.

Second, the mean particle diameters and standard deviations of each of the volume-based PSDs are tabulated. Each value is identified by the measurement set to which it belongs, the PSD run file name, and the run condition settings (following the same **P**ump speed/**S**tirrer speed/**U**ltra**S**onic time/**D**elay **T**ime sequence described above).

Third, the volume equivalent particle diameters associated with predefined %-undersize cut points for each PSD are tabulated. These values may be interpreted as follows: the PSD calculated for this measurement run indicates that the percentage of the total particulate volume in the specimen defined by any of the seven predefined values at the top of the table is associated with an ensemble of spherical particles the largest of which has the diameter shown. The 5%,

25%, 50%, 75% and 95% undersize values were requested by client representatives. Values for the 1% and 99% undersize cuts are provided for information. The measurement set groupings and internal run sequences are maintained in this tabulation. The %-undersize percentile values associated with each PSD run are identified with a concatenation of the PSD run file name and the P[#]/S[#]/US[min]/DT[min] run conditions key described above.

Fourth, the %-undersize PSD data, tabulated as described above, is displayed in a series of linear scale, horizontal bar charts. The PSD data for each measurement set is presented in a separate chart. Each horizontal row in a chart displays the data for an individual PSD run and is labeled with the same identification used in the preceding %-undersize tabulation. Where observable, the vertical lines appearing within the central, "25% to 75%" bar segments locate the median particle diameters of the volume based distributions.

Observations and Data—BCR 67. The measurement results for the BCR 67 standard are summarized in Figures 4 through 7 and Tables 5 and 6.

Measurement of the PSD of the BCR 67 standard (3 to 20 μm nominal diameters) was unaffected by changes in stirring speed or two minute periods of ultrasonic treatment.

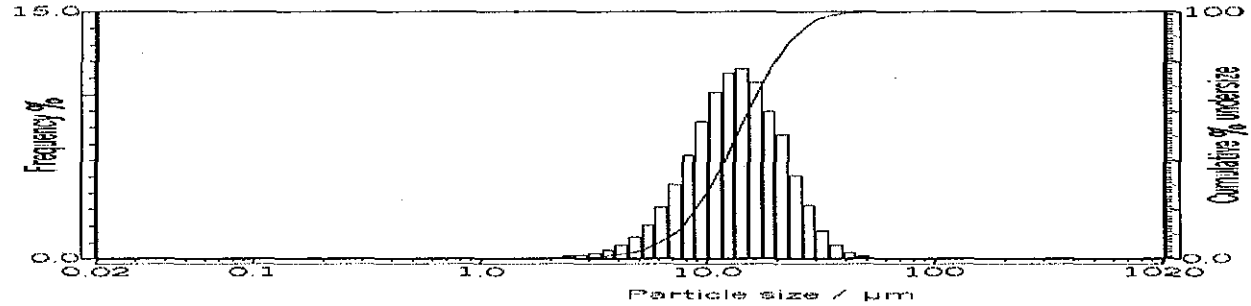
The calculated PSDs generally agree with the certified distribution data. The results of PSD runs from the first measurement set are plotted with the BCR 67 certified data in Figure 7. A small but consistent shift of the calculated PSD results to greater particle diameters is observed. The calculated PSDs also appear to tail off to slightly higher particle diameters than those certified to be present. The insensitivity of the PSD measurements to either stirring speed or ultrasonic treatment is clear.

Figure 4: Quartz Powder Standard BCR 67: Volume-based PSDs from first set of runs.

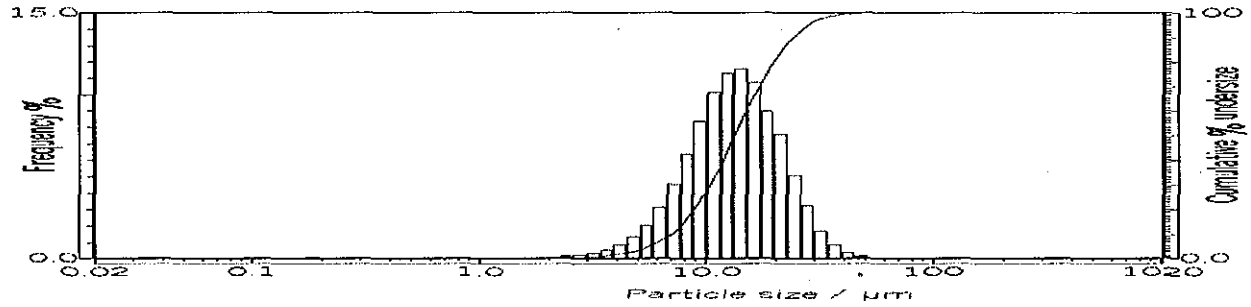
File Name: Cumulative times at run conditions with settings of individual runs highlighted.

[LOAD-IN]: P6 = ? min; S1 = ? min

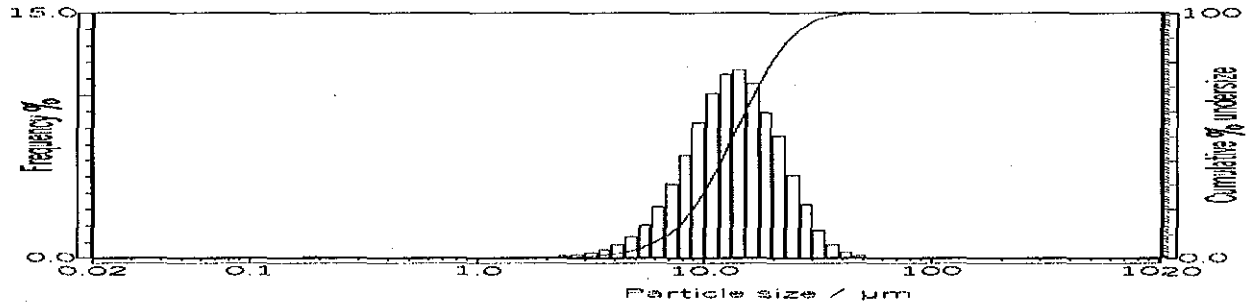
BC67668: P6 = 4 min; S1 = 4 min; S3 = 0 min; US = 0 min; DT = 0 min



BC67669: P6 = 7 min; S1 = 4 min; S3 = 3 min; US = 0 min; DT = 0 min



BC67670: P6 = 12 min; S1 = 9 min; S3 = 3 min; US = 2 min; DT = 0 min



BC67671: P6 = 15 min; S1 = 9 min; S3 = 6 min; US = 2 min; DT = 3 min

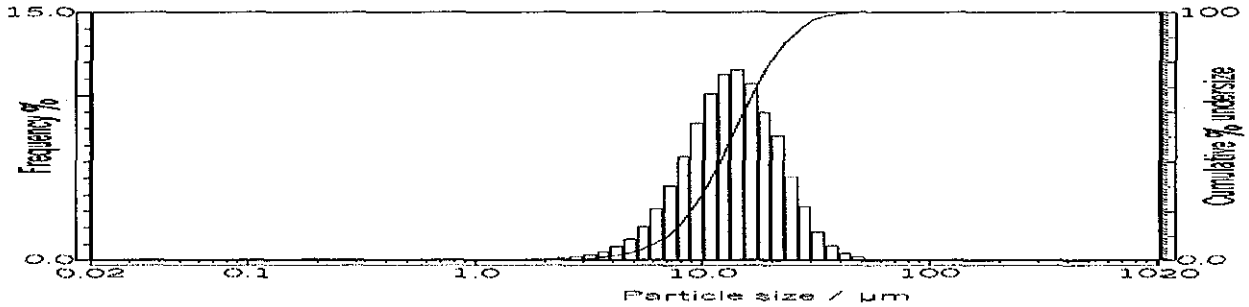
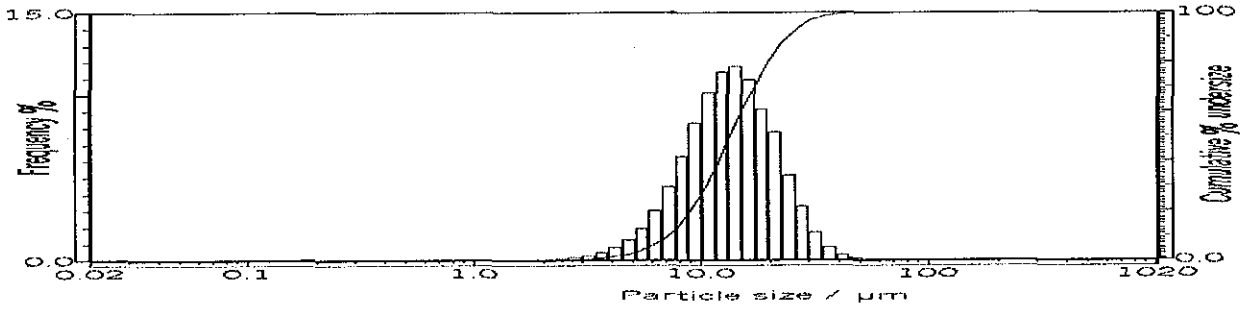


Figure 5: Quartz Powder Standard BCR 67: Volume-based PSDs from second set of runs.

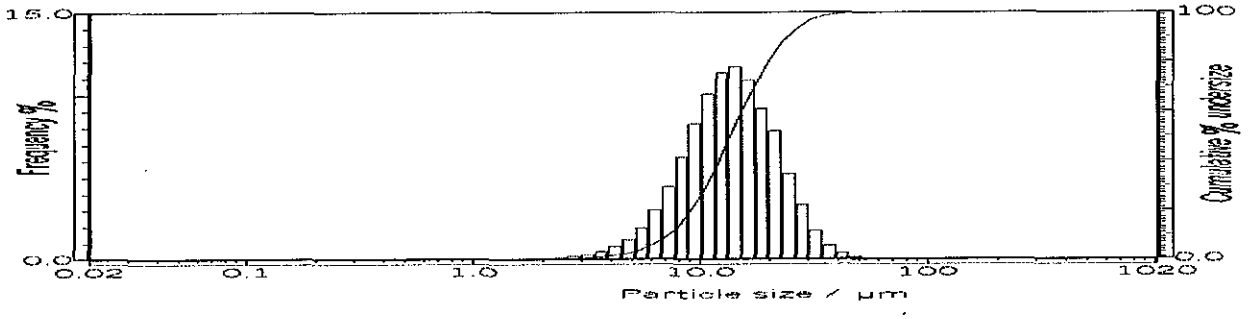
File Name: Cumulative times at run conditions with settings of individual runs **highlighted**.

[LOAD-IN]: **P6** = ? min; **S1** = ? min

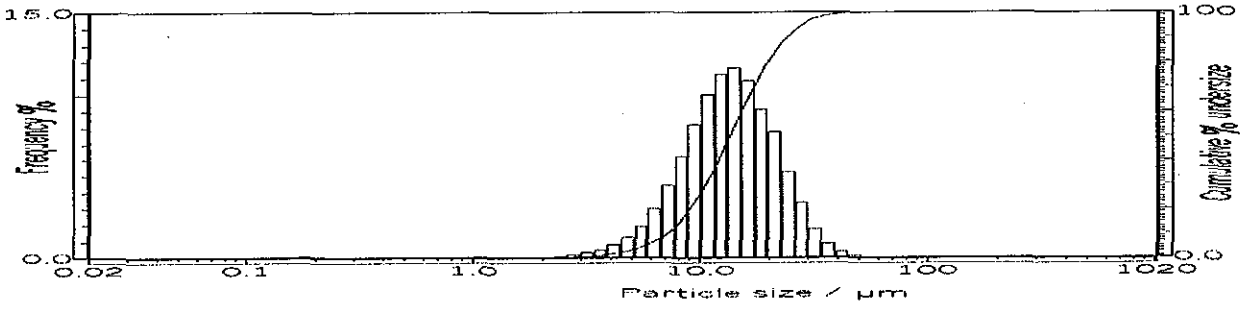
BC67673: **P6** = 3 min; **S1** = 3 min; S3 = 0 min; US = 0 min; DT = 0 min



BC67674: **P6** = 7 min; S1 = 3 min; **S3** = 4 min; US = 0 min; DT = 0 min



BC67675: **P6** = 12 min; **S1** = 8 min; S3 = 4 min; **US** = 2 min; **DT** = 0 min



BC67676: **P6** = 14 min; S1 = 8 min; **S3** = 6 min; US = 2 min; DT = 3 min

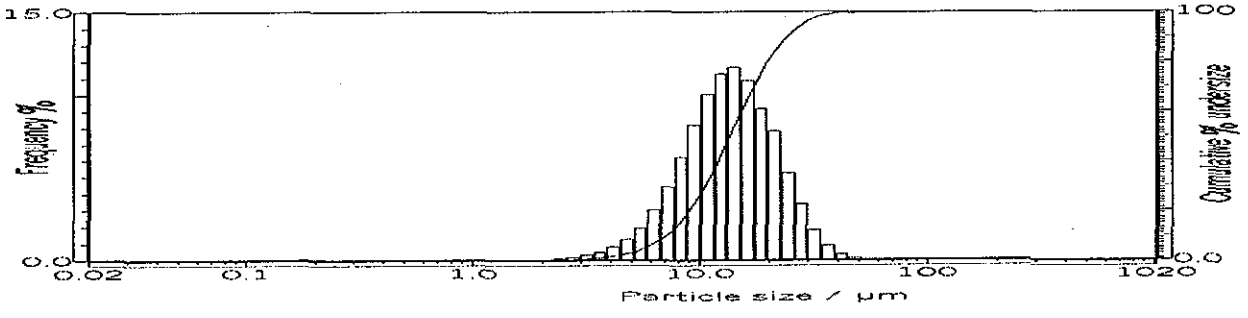


Table 5. Quartz Powder Standard BCR 67: Mean particle diameters of volume-based PSDs.

Sample	PSD Run File Name	Run Conditions				Mean Diameter (μm)	Standard Deviation (μm)
		P	S	US	DT		
BCR 67	CALCULATED					17.0	7.4
SET 1	BC67668	6	1	0	0	14.5	6.9
	BC67669	6	3	0	0	14.5	6.9
	BC67670	6	1	2	0	14.5	6.9
	BC67671	6	3	0	0	14.5	7.0
SET 2	BC67673	6	1	0	0	14.6	6.8
	BC67674	6	3	0	0	14.7	6.9
	BC67675	6	1	2	0	14.7	6.9
	BC67676	6	3	0	0	14.7	6.9

Table 6. Quartz Powder Standard BCR 67: Percentages of particles in volume-based PSDs with diameters (μm) less than the indicated values.

	In Distributions Based on the Total Volume of Spherical Particles						
	1 %	5 %	25 %	50 %	75 %	95 %	99 %
	Of Particles Have Diameters Less Than (μm)						
CERTIFIED *	2.40						32.00
SET 1							
BC67668 - 6/1/ 0/ 0	3.4	5.6	9.6	13.3	18.2	27.7	36.7
BC67669 - 6/3/ 0/ 0	3.4	5.6	9.6	13.3	18.2	27.7	36.7
BC67670 - 6/1/ 2/ 0	3.3	5.5	9.6	13.3	18.2	27.8	36.9
BC67671 - 6/3/ 0/ 0	3.3	5.6	9.6	13.3	18.3	27.9	37.1
SET 2							
BC67673 - 6/1/ 0/ 0	3.6	5.8	9.7	13.4	18.3	27.6	36.3
BC67674 - 6/3/ 0/ 0	3.6	5.8	9.8	13.5	18.4	27.9	36.7
BC67675 - 6/1/ 2/ 0	3.5	5.7	9.7	13.5	18.4	27.9	36.8
BC67676 - 6/3/ 0/ 0	3.5	5.7	9.7	13.8	18.5	28.0	36.9

* The certified values given for the BCR 67 standard are the Stokes diameters (μm) of quartz grains at the 1.20% and 99.10% mass fraction undersize cut points as determined from sedimentation measurements.

Figure 6. Quartz Powder Standard BCR 67: Diameters of particles (μm) within defined, volume-based, percentile ranges.

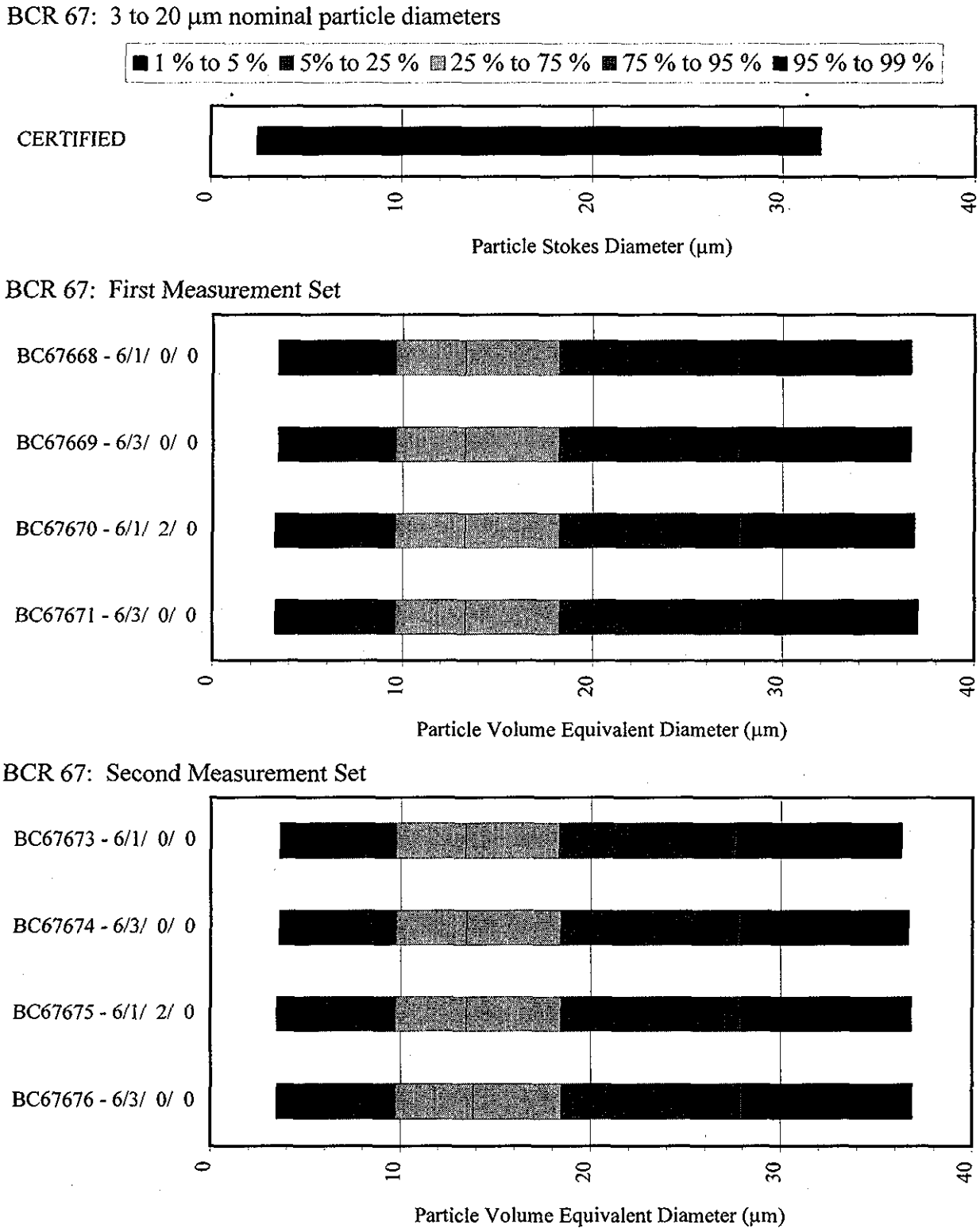
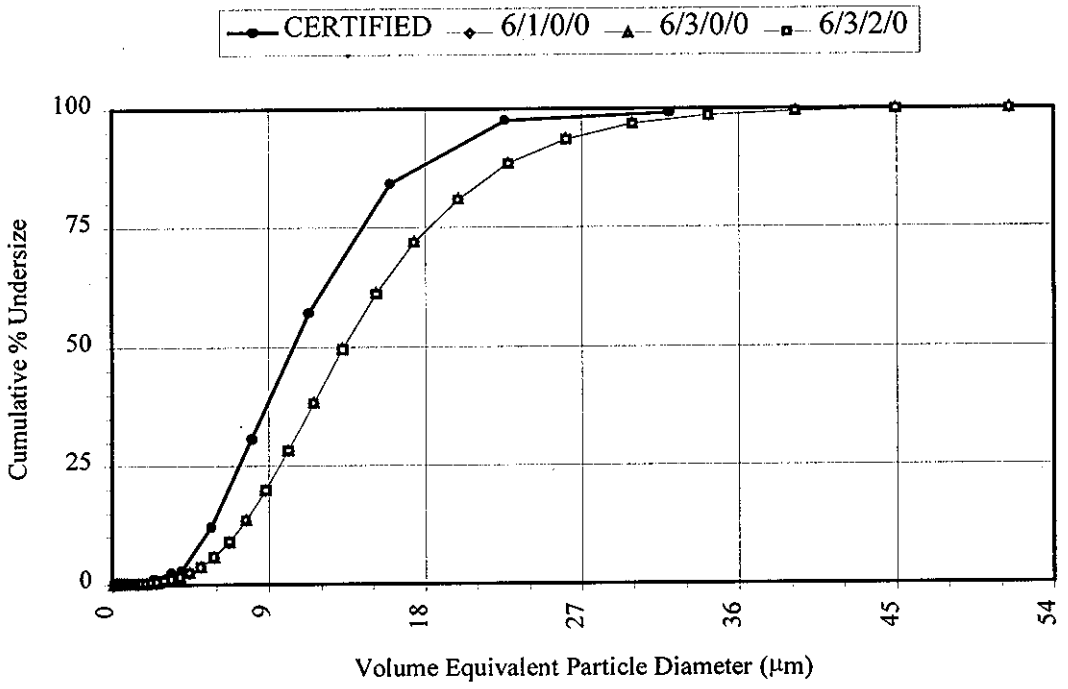
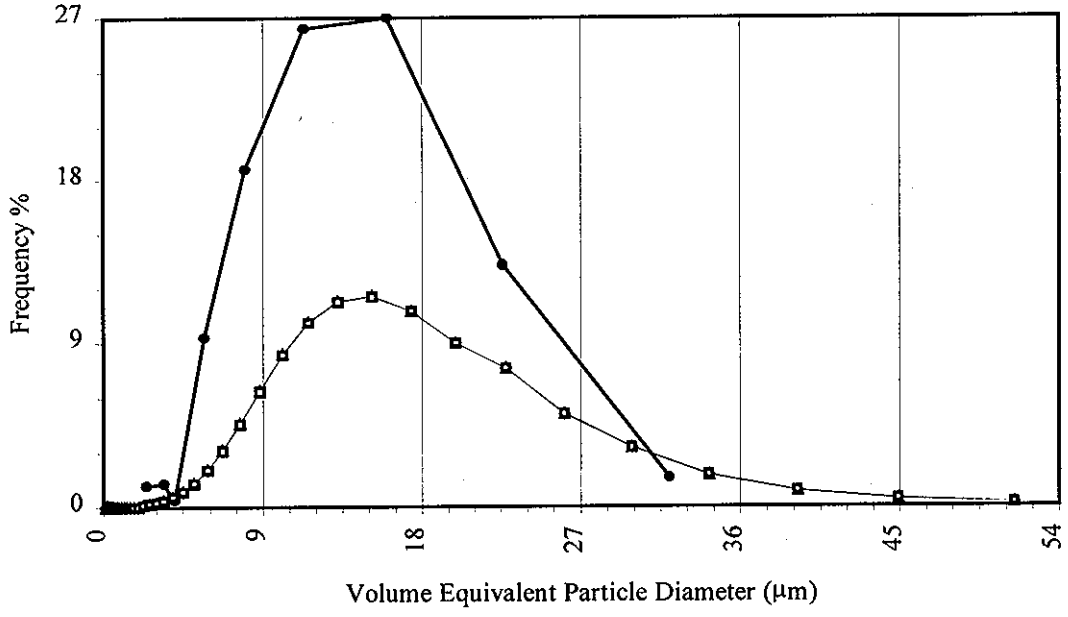


Figure 7. Quartz Powder Standard BCR 67: Comparison of certified sedimentation sizing data and 222-S PSD data.

Data Key: Pump Setting / Stirrer Setting / Ultrasonic Time (min) / Delay Time (min)





Observations and Data—BCR 130. The measurement results summarized in Figures 8 through 11 and Tables 7 and 8 are presented in the format previously described in Sec. 4.2.1.

Measurement of the PSD of the BCR 130 standard was also found to be unaffected by two-minute periods of ultrasonic treatment. However, the calculated PSDs were consistently shifted to greater diameter values when the speed of the mechanical stirrer was increased from 1 to 3. This increase in stirrer speed was required to keep the larger particles (50 to 220 μm nominal diameters) of the BCR 130 standard uniformly suspended in the dispersant liquid during the PSD measurements.

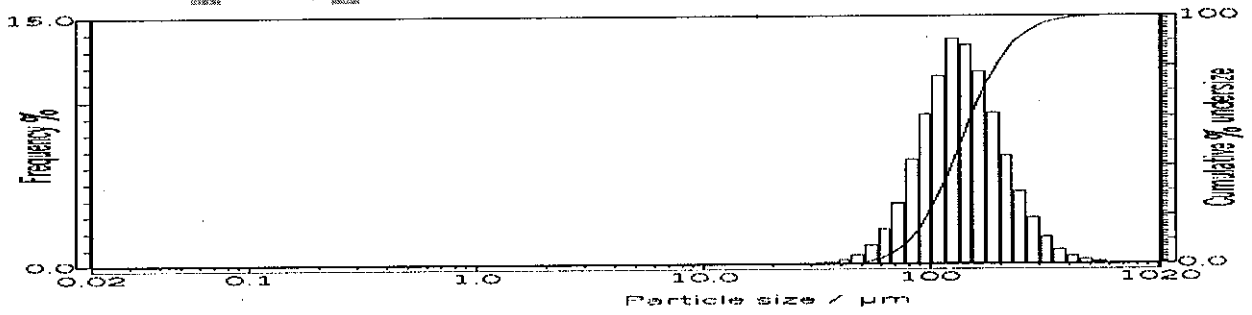
The results of PSD runs from the first measurement set are plotted with the BCR 130 certified data in Figure 11. The shift of the calculated distributions to larger particle diameters when the stirrer speed is increased is clear. As noted for BCR 67, the calculated PSDs, at all run conditions, are consistently shifted to slightly larger particle diameters relative to the certified data. In particular, the tailing of the upper percentiles of the calculated, %-undersize, PSDs toward larger particles is much more pronounced in the BCR 130 measurements.

Figure 8. Quartz Powder Standard BCR 130: Volume-based PSDs from first set of runs.

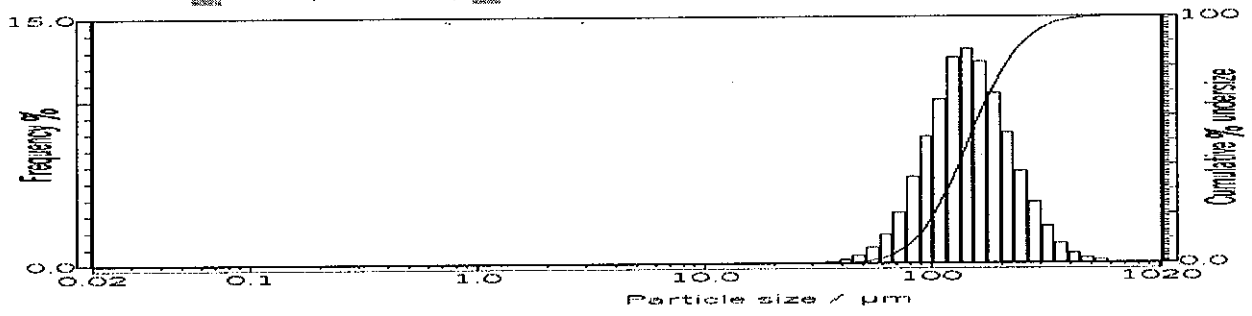
File Name: Cumulative times at run conditions with settings of individual runs highlighted.

[LOAD-IN]: P6 = ? min; S1 = ? min

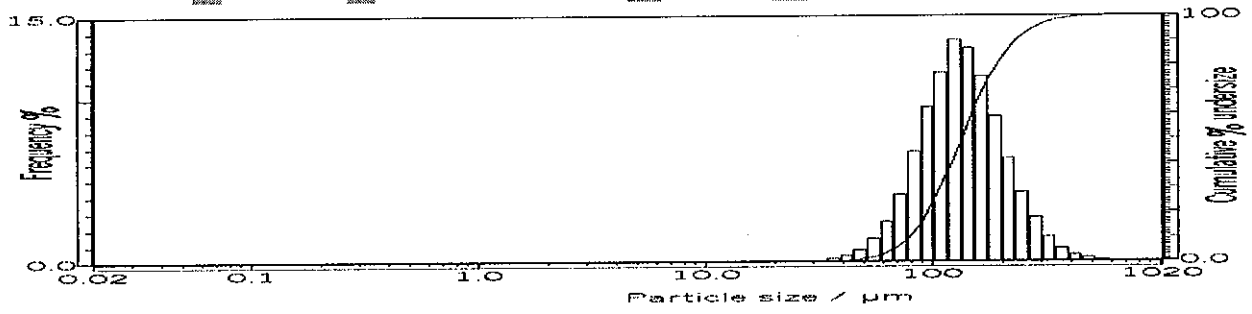
BC130677: P6 = 3 min; S1 = 3 min; S3 = 0 min; US = 0 min; DT = 0 min



BC130678: P6 = 6 min; S1 = 3 min; S3 = 3 min; US = 0 min; DT = 0 min



BC130679: P6 = 11 min; S1 = 8 min; S3 = 3 min; US = 2 min; DT = 0 min



BC130680: P6 = 14 min; S1 = 8 min; S3 = 6 min; US = 2 min; DT = 3 min

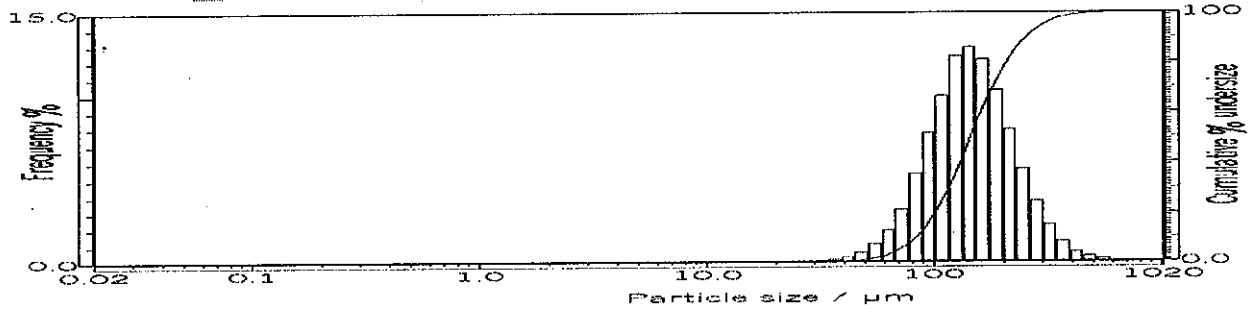
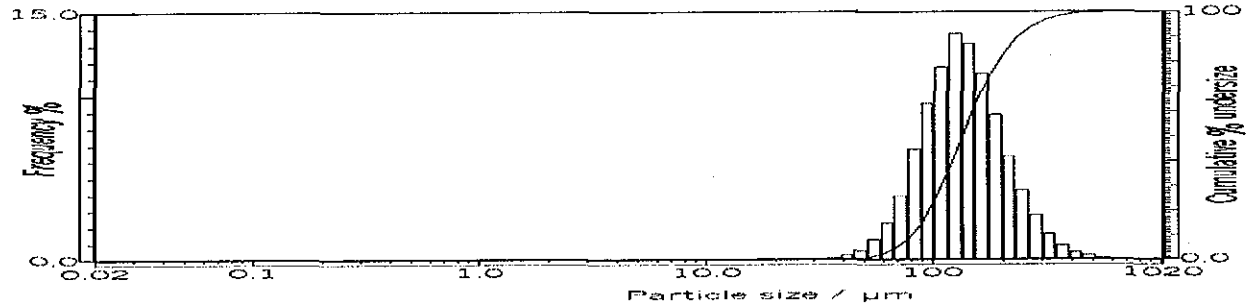


Figure 9. Quartz Powder Standard BCR 130: Volume-based PSDs from second set of runs.

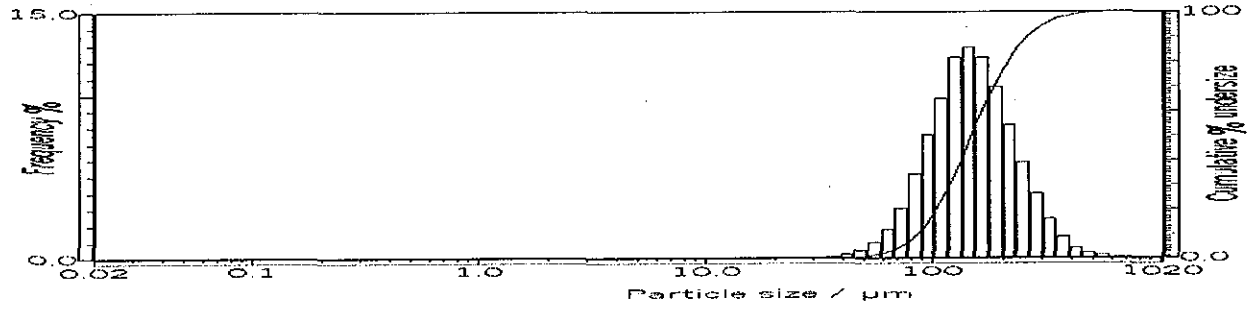
File Name: Cumulative times at run conditions with settings of individual runs **highlighted**.

[LOAD-IN]: **P6** = ? min; **S1** = ? min

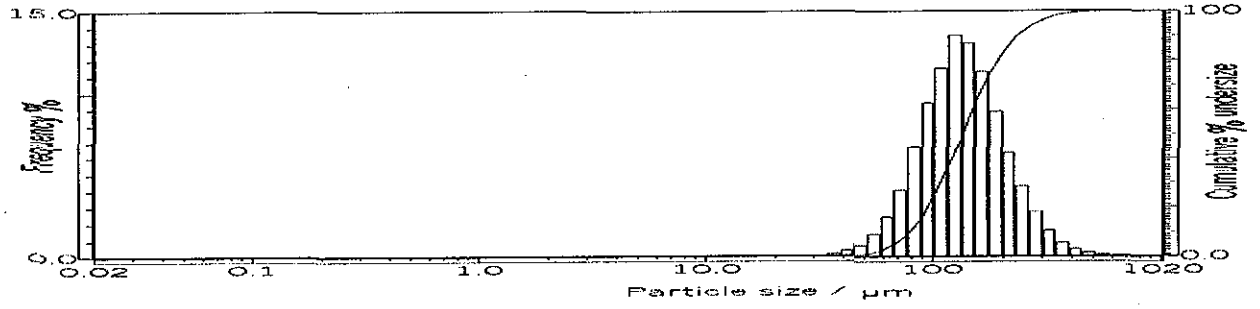
BC130682: **P6** = 8 min; **S1** = 3 min; S3 = 0 min; US = 0 min; DT = 0 min



BC130683: **P6** = 11 min; S1 = 3 min; **S3** = 3 min; US = 0 min; DT = 0 min



BC130684: **P6** = 16 min; **S1** = 8 min; S3 = 3 min; **US** = 2 min; **DT** = 0 min



BC130685: **P6** = 18 min; S1 = 8 min; **S3** = 5 min; US = 2 min; DT = 3 min

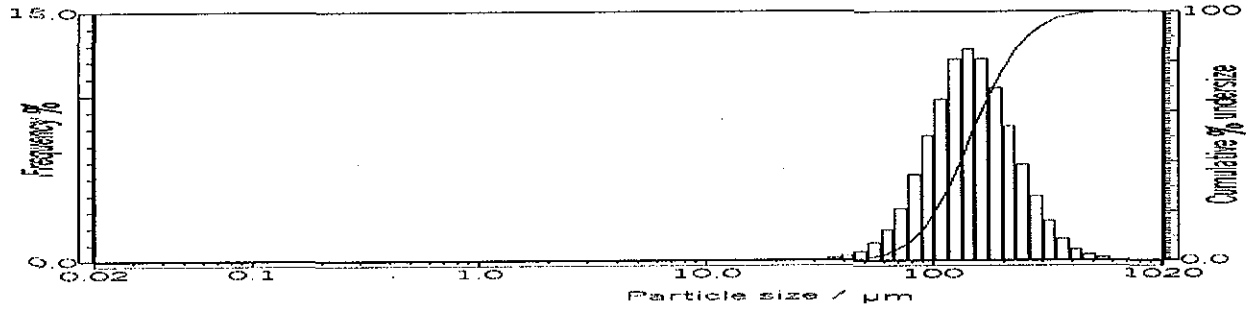


Table 7. Quartz Powder Standard BCR 130: Mean particle diameters of volume-based PSDs.

Sample	PSD Run File Name	Run Conditions				Mean Diameter (μm)	Standard Deviation (μm)
		P	S	US	DT		
BCR 130	CALCULATED					156	45
SET 1	BC130677	6	1	0	0	149	68
	BC130678	6	3	0	0	159	72
	BC130679	6	1	2	0	146	67
	BC130680	6	3	0	0	158	73
SET 2	BC130682	6	1	0	0	147	67
	BC130683	6	3	0	0	161	74
	BC130684	6	1	2	0	147	68
	BC130685	6	3	0	0	160	74

Table 8. Quartz Powder Standard BCR 130: Percentages of particles in volume-based PSDs with diameters (μm) less than the indicated values.

Sample	In Distributions Based on the Total Volume of Spherical Particles						
PSD Run	1 %	5 %	25 %	50 %	75 %	95 %	99 %
	Of the Particles Have Diameters Less Than (μm)						
CERTIFIED *	46	53	80	124	171	216	245
SET 1							
BC130677 - 6/1/ 0/ 0	52	69	103	135	179	280	389
BC130678 - 6/3/ 0/ 0	52	72	109	145	193	297	410
BC130679 - 6/1/ 2/ 0	49	67	101	133	175	274	384
BC130680 - 6/3/ 0/ 0	51	70	108	144	193	297	410
SET 2							
BC130682 - 6/1/ 0/ 0	51	69	102	133	176	277	388
BC130683 - 6/3/ 0/ 0	52	72	110	146	195	301	416
BC130684 - 6/1/ 2/ 0	49	67	101	133	176	277	387
BC130685 - 6/3/ 0/ 0	51	71	109	146	195	301	416

* The certified values given for standard BCR 130 are "equivalent volume" diameters (μm) of quartz grains at the indicated mass fraction undersize values as determined by sieve analysis.

Figure 10. Quartz Powder Standard BCR 130: Diameters of particles (μm) within defined, volume-based, percentile ranges.

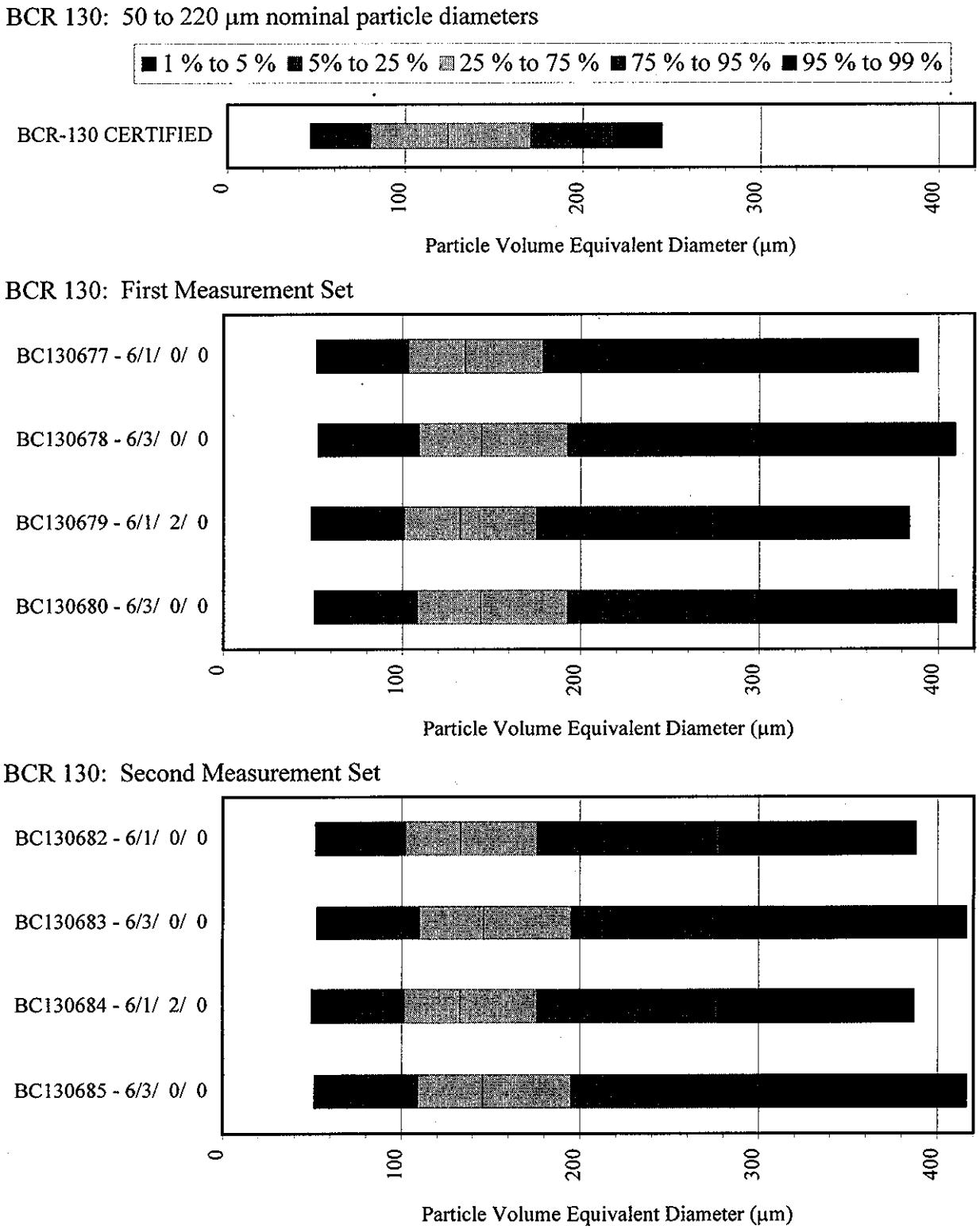
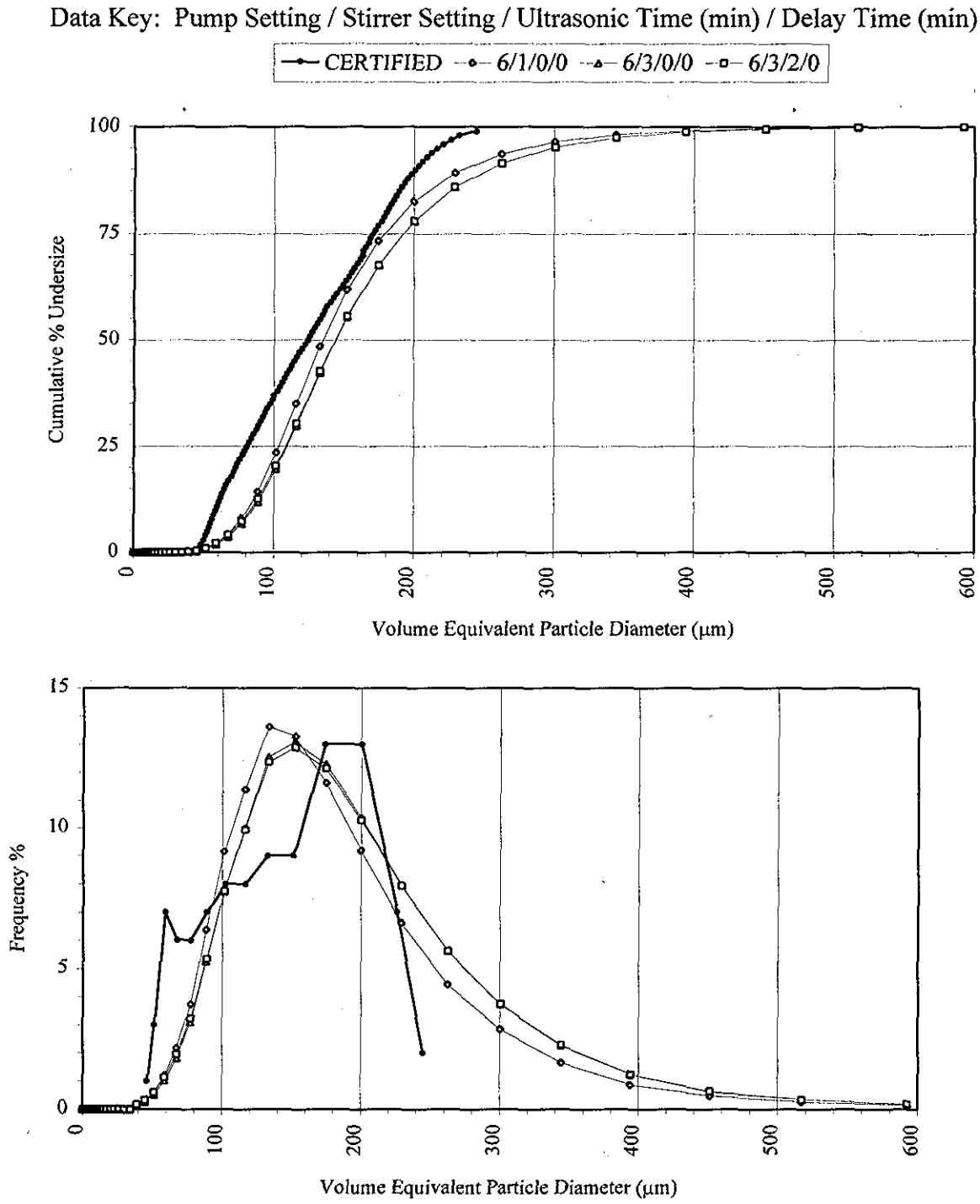


Figure 11. Quartz Powder Standard BCR 130: Comparison of certified sieve analysis data and 222-S PSD data.



4.2.2. Standards at 325 Laboratory

The PSDs of the two standards, BCR 67 and BCR 130, measured at the 325 Laboratory are very reproducible. Representative plots of the particles size distribution of these standards compared to the reported data are provided in Figures 12 and 13. At flow rates below 40 mL/s, the BCR 130 particles do not remain suspended long enough to make accurate measurements of the PSD. After sonication, at flow rates of 40 and 60 mL/s, the distribution of the BCR 130 standard matches the reported data fairly well, but a tail is observed in the measured data at the upper and lower ends of the particle diameters. This same behavior is observed in the BCR 67 standard and is much more pronounced in this standard.

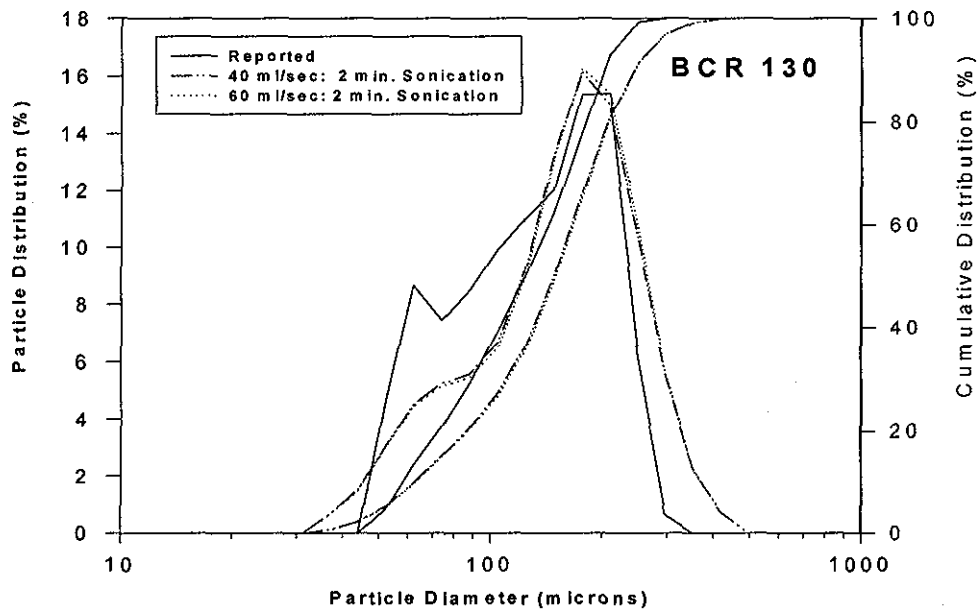


Figure 12. PSDs of BCR 130 Standard Compared to Reported Value.
(Aqueous solution of 1 M NaOH and 1 M $NaNO_3$,
at flow rates of 40 and 60 mL/s
after 2 minutes of sonication)

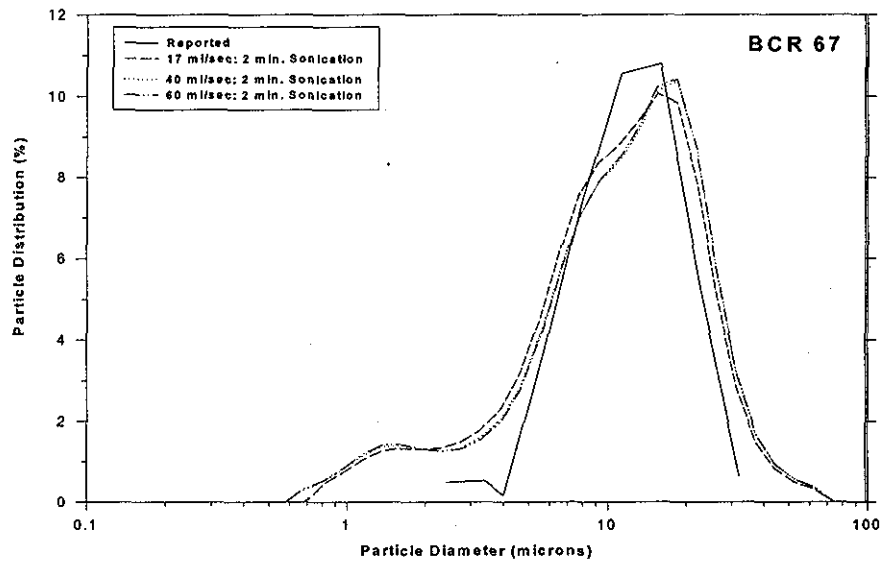


Figure 13. PSD of BCR 67 Standard Compared to Reported Value.
(In an aqueous solution of 1 M NaOH and 1 M NaNO3
at flow rates of 17, 40, and 60 mL/s
after 2 minutes of sonication.)

4.2.3. Statistics of Standards Results

In this section, the PSD results obtained for standards BCR 67 and BCR 130 standards at the two laboratories are compared with each other and with the standard values. The effects of varying the instrument operating parameters are also examined. The PSD data for the standards are given in Appendices F and G. The 325 Laboratory reported some measurements using water as the suspension medium; this statistical analysis considers only the measurements obtained in the 1M NaOH/1M $NaNO_3$ suspension medium.

The experimental and certified particle distributions are compared at fixed percentiles. The particle size corresponding to a given percentile indicates that the stated percentage of the solids volume is present in particles of less than that size. For BCR 130 the certified values were stated at all integral percentiles from 1 to 99 (Wilson 1985). However, the certified values for BCR 67 (Wilson 1980) are substantially sparser, the distribution being described by only nine points, given here in the first two columns of Table 9. To assist in the comparison to our experimental data, additional percentile points were estimated using linear interpolation and least squares methods. These interpolated values are given in the last two columns of Table 9.

Table 9. Standard Values and Interpolated Values for Standard BCR 67.

Standard Value		Interpolated Value	
Diameter (μm)	Percentile	Diameter (μm)	Percentile
2.4	1.2%	1.6	1%
3.4	2.5%	4.1	5%
4	2.9%	5.0	10%
5.7	12.2%	6.6	20%
8	30.8%	7.3	25%
11.3	57.2%	7.9	30%
16	84.2%	9.2	40%
22.6	97.5%	10.5	50%
32	99.1%	11.9	60%
		13.3	70%
		14.2	75%
		15.1	80%
		17.4	90%
		19.3	95%
		31.4	99%

The 1st and 99th percentiles for the BCR 67 standard were estimated using straight-line approximations, P = 0.62×dia. and P = 93.65 + 0.1702×dia., respectively. The other percentiles were estimated using the least squares equation

$$P = -0.82525 - 3.11617 \times \text{dia.} + 1.359241\times (\text{dia.})^2 - 0.06749\times (\text{dia.})^3 + (9.72E\text{-}4)\times (\text{dia.})^4$$

These estimated values are presented in the "Std.Val" row of Tables 10 and 11.

Some basic summary statistics on particle diameters (μm) are given in Table 10 and 11 for the data obtained from measurements on the BCR 67 standard by the 222-S Laboratory and 325 Laboratories, respectively. Tables 12 and 13 give corresponding results from analysis of the BCR 130 standard.

In these tables, the mean is the ordinary arithmetic mean of the particle diameters corresponding to various percentile points. The RSD (%) is the relative standard deviation of these diameters. The RSD is the standard deviation stated as a percent of the mean.

$$\text{RSD (\%)} = 100 \times \text{SD}/\overline{\text{X}}$$

The RSD can be used as a rough measure of the variability in the particle diameters. The number of PSDs used in the computations is noted in the table title. Usually, all of the available PSDs were used. The tables also include the lower limits (LL(95%)) and upper limits

(UL(95%)) to a 95% confidence interval on the mean diameter. The equations for these limits are

$$LL(95\%) = \overline{X} - t_{(0.05,N-1)} \times SD(Mean)$$

$$UL(95\%) = \overline{X} + t_{(0.05,N-1)} \times SD(Mean)$$

$$SD(Mean) = SD/\sqrt{N}$$

The N is the number of PSDs. The mean is $\overline{X}$ and $t_{(0.05,\,N-1)}$ is the appropriate quantile from Student's t distribution for a two-sided 95% confidence interval with N-1 degrees of freedom.

Tables 10 and 11 list the summary statistics for the experimental results obtained at the 222-S and 325 laboratories, respectively, for the certified standard BCR 67. In these tables all of the PSD data were pooled in the summary statistics. That is, the PSD data from different flow rates and sonication times were pooled together.

Tables 12 and 13 list the corresponding summary statistics for the certified standard BCR 130. For the 222-S Laboratory data (Table 12), all of the PSD data from different flow rates and sonication times were pooled. For 325 Laboratory (Table 13), the summary statistics are based on only 12 of the 28 PSD determinations performed. The tests performed at 17 mL/s flow rate and those performed at 40 mL/s flow rate with no sonication were rejected. In these 16 tests there was insufficient agitation to reliably suspend the larger particles in the standard.

The confidence intervals were computed by assuming that the PSDs obtained from different flow rates, sonication times and delay times were independent of each other. Since the PSDs were obtained sequentially by changing the flow rates, sonication times, and delay times the assumption of independence is questionable. Consequently, the information given by the confidence intervals should be used with caution.

The PSD values for the BCR 67 standard reported from the 222-S Laboratory are higher than the standard values. For the 325 Laboratory, the reported values are lower than the standard value for the left end of the PSD and higher than the standard values for the right end of the PSD. The common percentile points reported by both laboratories are the 50th percentile (the median) and the 95th percentile. The diameters estimated by the 222-S Laboratory are larger at both percentiles.

For both laboratories, the value of the RSD and the width of the confidence intervals show that each laboratory "reproduces" the particle diameters quite well. That is, for the BCR 67 standard, the flow rates and sonication times do not appear to change the PSDs.

Table 10. Summary Statistics by Percentile, Standard BCR 67, 222-S Laboratory (eight PSDs, all data)

Percentile	1%	5%	25%	50%	75%	95%	99%
Mean (μm)	3.4	5.6	9.7	13.4	18.3	27.8	36.8
RSD (%)	3.6%	1.6%	0.8%	1.4%	0.5%	0.4%	0.6%
LL(95%).(μm)	3.3	5.6	9.6	13.3	18.2	27.7	36.6
UL(95%) (μm)	3.5	5.7	9.7	13.6	18.4	27.9	36.9
Std.Value (μm)	1.6	4.1	7.3	10.5	14.2	19.3	31.4
Measurement Bias	High	High	High	High	High	High	High

Table 11. Summary Statistics by Percentile, Standard BCR 67, 325 Laboratory (25 PSDs, all data)

Percentile	10%	20%	30%	40%	50%	60%	70%	80%	90%	95%
Mean (μm)	2.8	5.1	6.7	8.2	9.9	11.9	14.1	16.9	21.3	25.9
RSD (%)	5.1%	8.1%	9.2%	10.7%	12.3%	13.3%	13.3%	12.6%	11.4%	10.9%
LL(95%) (μm)	2.7	4.9	6.4	7.9	9.4	11.2	13.3	16.0	20.3	24.7
UL(95%) (μm)	2.8	5.2	6.9	8.6	10.4	12.5	14.9	17.8	22.3	27.0
Std.Value (μm)	5.0	6.6	7.9	9.2	10.5	11.9	13.3	15.1	17.4	19.3
Measurement Bias	Low	Low	Low	Low	High	OK	OK	High	High	High

Tables 12 and 13 are similar summary statistics for the PSD data from the BCR 130 standard. The RSDs and widths of the confidence intervals are again quite small. However, the PSD obtained at the 222-S Laboratory is higher than the certified value. The common percentile points for the two laboratories are the 50th (the median) and the 95th. The diameter estimated for the 50th percentile by the 222-S Laboratory is smaller than that estimated by the 325 Laboratory; at the 95th percentile, the situation is reversed.

Table 12. Summary Statistics by Percentile, Standard BCR 130, 222-S Laboratory (eight PSDs, all data)

Percentile	1%	5%	25%	50%	75%	95%	99%
Mean (μm)	50.9	69.6	105.5	139.2	185.2	288.1	400.1
RSD (%)	2.6%	2.6%	3.8%	4.5%	5.0%	4.1%	3.5%
LL(95%) (μm)	49.8	68.1	102.2	133.9	177.4	278.1	388.2
UL(95%) (μm)	52.1	71.1	108.8	144.5	193.0	298.1	411.9
Std.Value (μm)	46.4	52.7	80.3	124.0	170.7	216.3	244.6
Measurement Bias	High	High	High	High	High	High	High

Table 13. Summary Statistics by Percentile, Standard BCR 130, 325 Laboratory (12 PSDs, a subset of the data).

Percentile	10%	20%	30%	40%	50%	60%	70%	80%	90%	95%
Mean (μm)	65.8	90.3	113.8	132.8	149.2	165.0	182.1	202.8	233.6	261.6
RSD (%)	2.8%	2.4%	1.3%	1.1%	1.7%	2.5%	3.4%	4.5%	6.0%	7.2%
LL(95%) (μm)	64.6	88.9	112.9	131.8	147.5	162.4	178.1	197.0	224.7	249.7
UL(95%) (μm)	67.0	91.6	114.7	133.7	150.8	167.6	186.0	208.6	242.5	273.6
Std.Value (μm)	58.3	72.8	89.1	106.0	124.0	143.0	163.6	180.2	200.6	216.3
Measurement Bias	High	High	High	High	High	High	High	High	High	High

4.3. PSD Results on AW-103, AY-101 and C-104 Composites

4.3.1. Tank Waste Results at 222-S Laboratory

PSD Measurements. The dates the tank composites were subsampled in the hotcells, the sample numbers assigned to the subsamples, and the dates of the PSD analyses are indicated in Table 14. All PSD measurement sets generated for analytical specimens are identified by the number of the analytical subsample from which the specimens were taken.

Table 9. Waste tank samples used for PSD analysis.

Source Tank	Composite #	Subsampled	Sample #	PSD Analyses
AW-103	S01T001020	08/06/2001	S01T001424 S01T001425 S01T001426	08/10/2001
			S01T001427	08/13/2001
AY-101	S01T001017	08/15/2001	S01T001489 S01T001490 S01T001491 S01T001492	08/17/2001
C-104	S01T001014	08/13/2001	S01T001447 S01T001448 S01T001449 S01T001451	08/16/2001

The initial amount of AW-103 composite subsample S01T001426 added to the PSD analyzer's sample tank was too large. The circulating specimen slurry was diluted, in the analyzer sample tank, by replacing 40 mL of the slurry with fresh $NaOH/NaNO_3$ solution. The solids loading of the diluted slurry was then in an acceptable measurement range. This concentration adjustment added several minutes to the specimen "Load-In" process.

Data and Observations—AW-103. The measurement results summarized in Figures 14 through 19 and Tables 15 and 16 are presented in the format previously described in Sec. 4.2.1.

PSD measurements suggest that the AW-103 composite material, as-received, had three general populations of particle diameters: a small population of particles with diameters of approximately 0.1 μm to 0.5 μm; a dominant population of particles with diameters from 1 μm to 30 μm; and a small to medium population of particles with diameters >200 μm.

Figures 14 through 19 clearly indicate that the large particles are very fragile, probably loose agglomerates. Merely increasing the speed of the in-tank stirrer from S1 to S3 was sufficient to break up these particles. This observation is emphasized for sample S01T001426 (Figures 16, 18, and 19). This sample was stirred at S3 for a few extra minutes before the initial PSD was measured while the solids loading of the specimen slurry was adjusted. As a result, the >200 μm peak is completely missing in the first PSD (AW130746). For sample S01T001427 (Figure 17), where the period of stirring at S3 was somewhat shorter, the magnitude of the >200 μm peak is significantly reduced but still observable. Figures 14, 15, 18, and 19 suggest that the large particles survive pumping and very gentle, S1, stirring for at least a few minutes and are of sufficiently low density to be effectively suspended at these mild conditions.

Ultrasonic treatment for 2 minutes is sufficient to begin visibly shifting the particle diameters of the dominant 1 μm to 30 μm population to smaller values, around 3 μm. This shifting is more evident after 20 minutes of sonication but clearly still not complete.

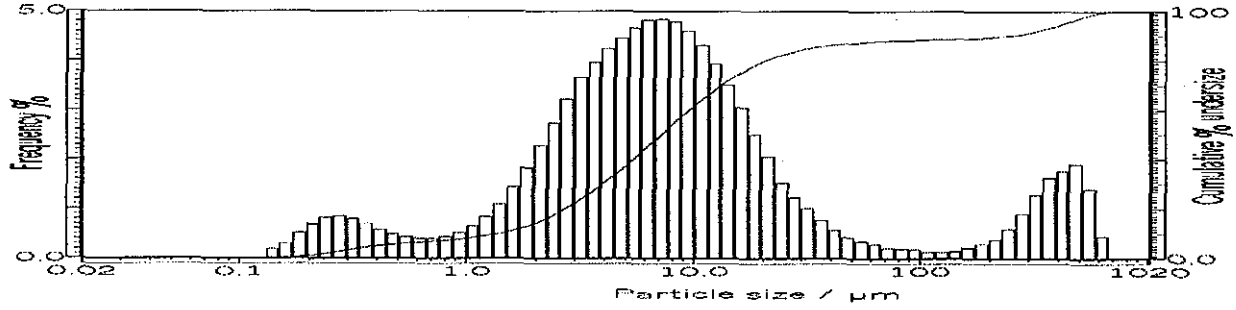
For the AW-103 composite measurement sets, circulation of the specimen slurries was maintained at the minimum pump speed of P1 (2.1 mL/s flow rate) during the 60-minute, quiescent delay periods. In each of the four measurement sets, the shifting of the middle 1 μm to 30 μm population towards smaller diameters noted as a result of ultrasonic treatment was observed to have progressed during the delay period. The action of the peristaltic pump, even at minimum speed, may be sufficient to continue the breakup of these particles. It is also possible that the restart of the P6 and S1/S3 measurement conditions destroys any agglomerates that may have formed during the delay period and re-initiates the breakup process so quickly that it appears to be continuous.

Figure 14. AW-103 Composite: Volume-based PSDs from set of runs on sample S01T001424. (Two Pages)

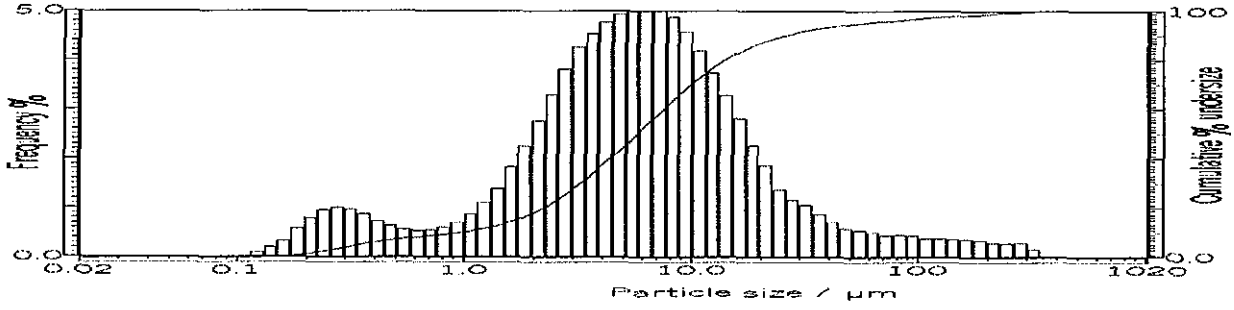
File Name: Cumulative times at run conditions with individual run settings **highlighted**.

[LOAD-IN]: **P6** = ? min; **S1** = ? min

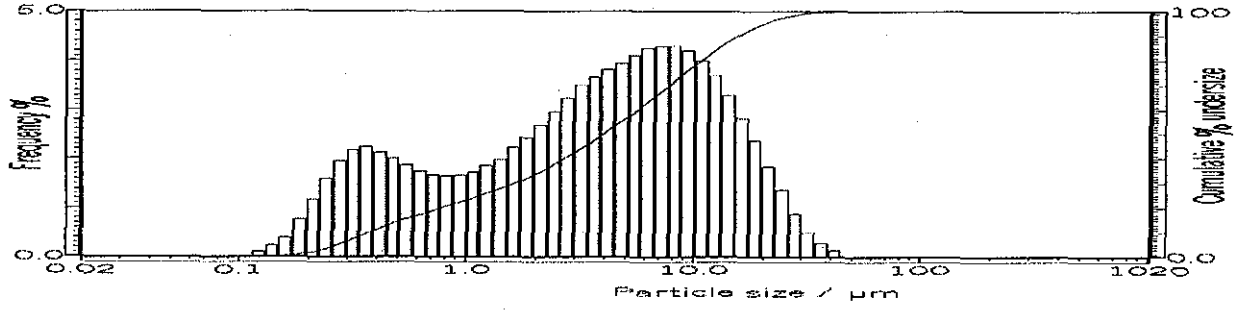
AW103733: **P6** = 7 min; **S1** = 7 min; S3 = 0 min; US = 0 min; DT = 0 min



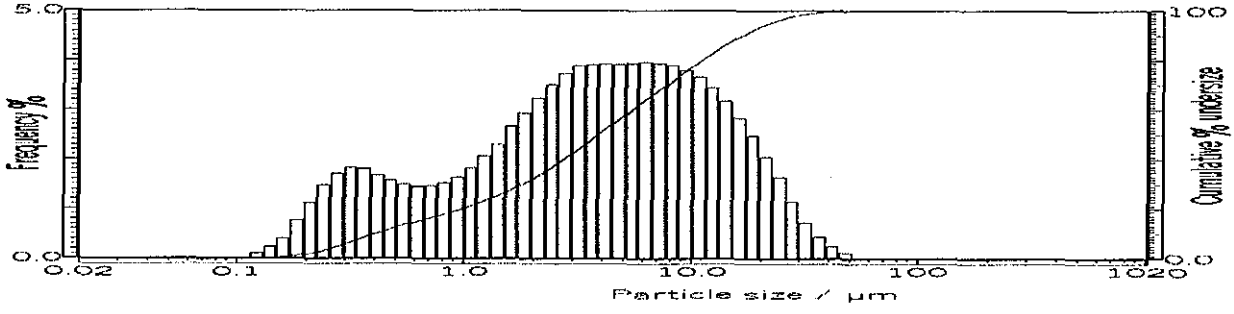
AW103734: **P6** = 11 min; S1 = 7 min; **S3** = 4 min; US = 0 min; DT = 0 min



AW103735: **P6** = 16 min; **S1** = 12 min; S3 = 4 min; **US** = 2 min; **DT** = 0 min



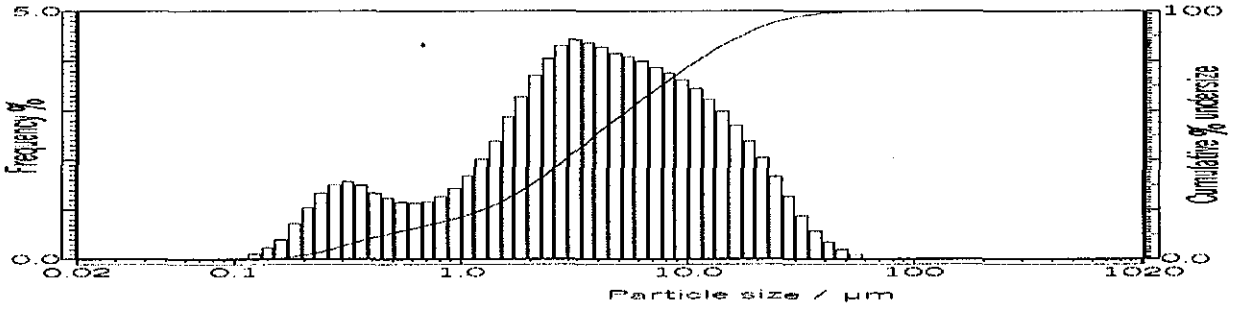
AW103736: **P6** = 19 min; S1 = 12 min; **S3** = 7 min; US = 2 min; DT = 3 min



Continued: AW-103 Composite: Sample S01T001424.

[DELAY]: **P1** (2.1 mL/s) = 60 min; **S0** (Stirrer OFF); **DT** = 60 min

AW103738: **P6** = 22 min; **S1** = 15 min; S3 = 7 min; US = 2 min; DT = 66 min



AW103739: **P6** = 25 min; S1 = 15 min; **S3** = 10 min; US = 2 min; DT = 69 min

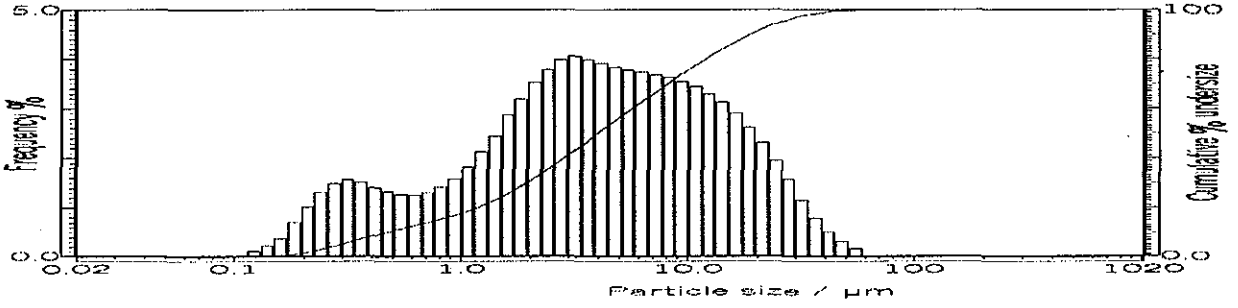
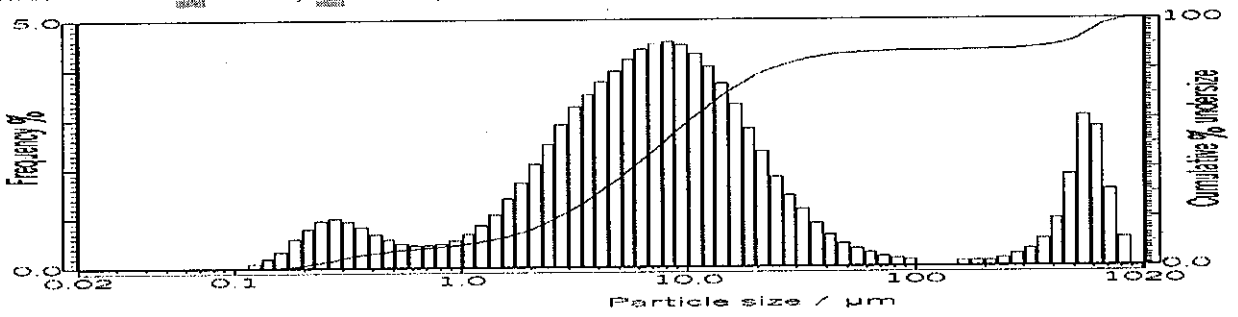


Figure 15. AW-103 Composite: Volume-based PSDs from set of runs on sample S01T001425. (Two Pages)

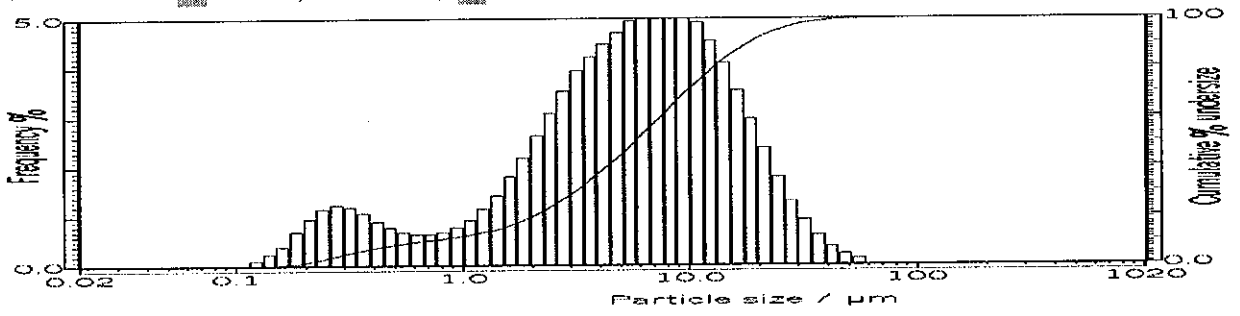
File Name: Cumulative times at run conditions with individual run settings highlighted.

[LOAD-IN]: P6 = ? min; S1 = ? min

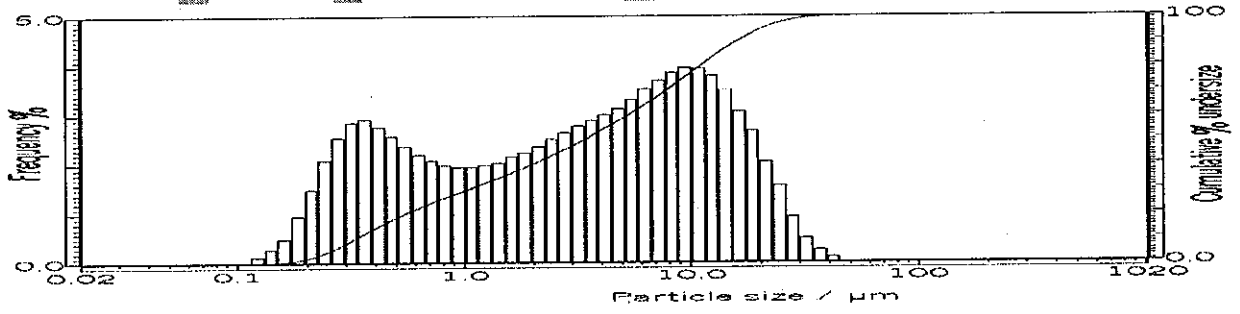
AW103740: P6 = 3 min; S1 = 3 min; S3 = 0 min; US = 0 min; DT = 0 min



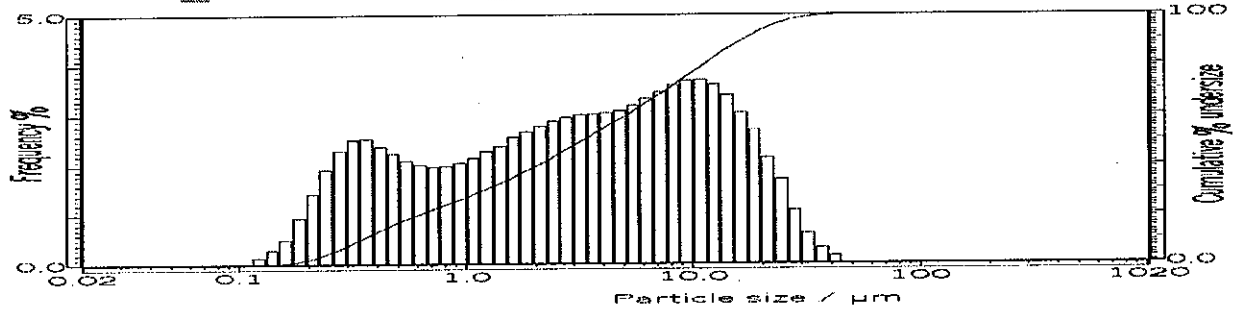
AW103741: P6 = 6 min; S1 = 3 min; S3 = 3 min; US = 0 min; DT = 0 min



AW103742: P6 = 30 min; S1 = 27 min; S3 = 3 min; US = 20 min; DT = 0 min



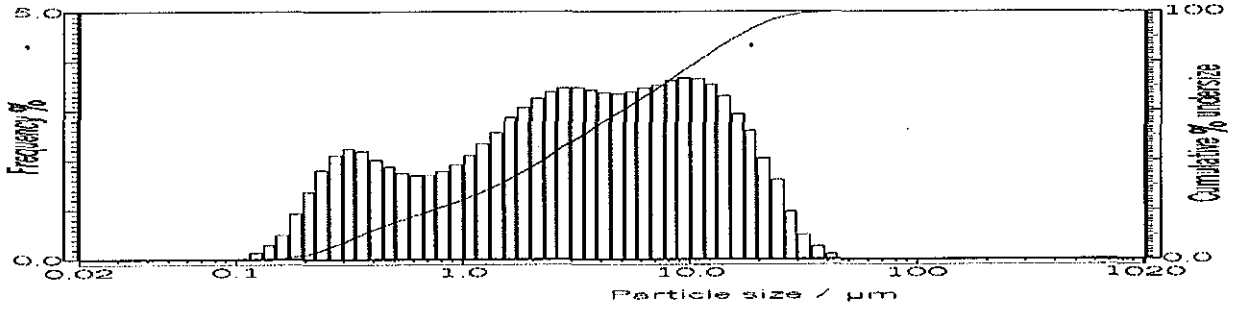
AW103743: P6 = 33 min; S1 = 27 min; S3 = 6 min; US = 20 min; DT = 4 min



Continued. AW-103 Composite: Sample S01T001425.

[DELAY]: **P1** (2.1 mL/s) = 60 min; **S0** (Stirrer OFF); **DT** = 60 min

AW103744: **P6** = 35 min; **S1** = 29 min; S3 = 6 min; US = 20 min; DT = 67 min



AW103745: **P6** = 37 min; S1 = 29 min; **S3** = 8 min; US = 20 min; DT = 69 min

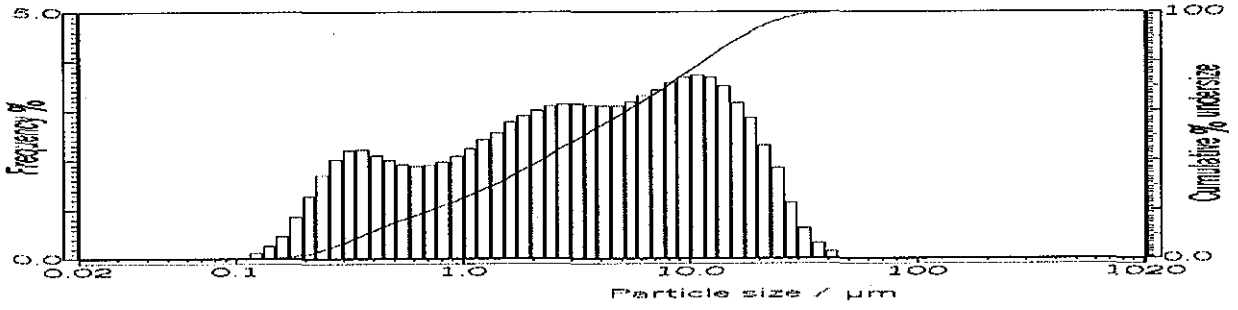
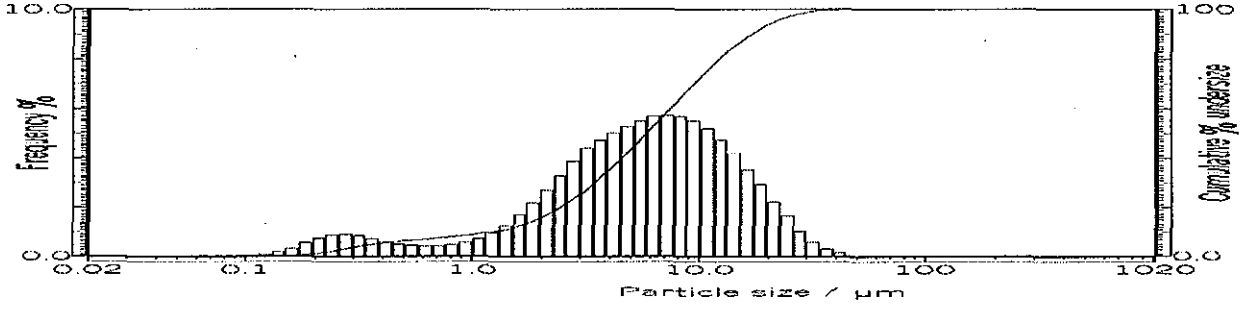


Figure 16. AW-103 Composite: Volume-based PSDs from set of runs on sample S01T001426. (Two Pages)

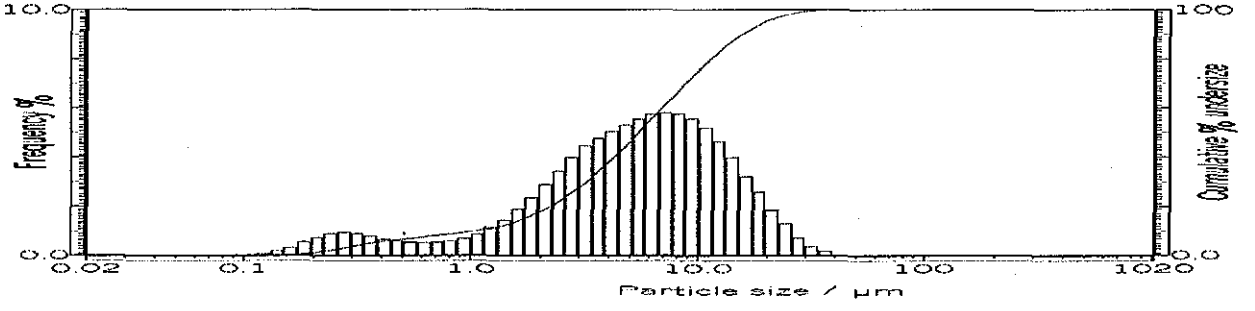
File Name: Cumulative times at run conditions with individual run settings **highlighted**.

[LOAD-IN]: **P6** = ? min; **S3** = ? min

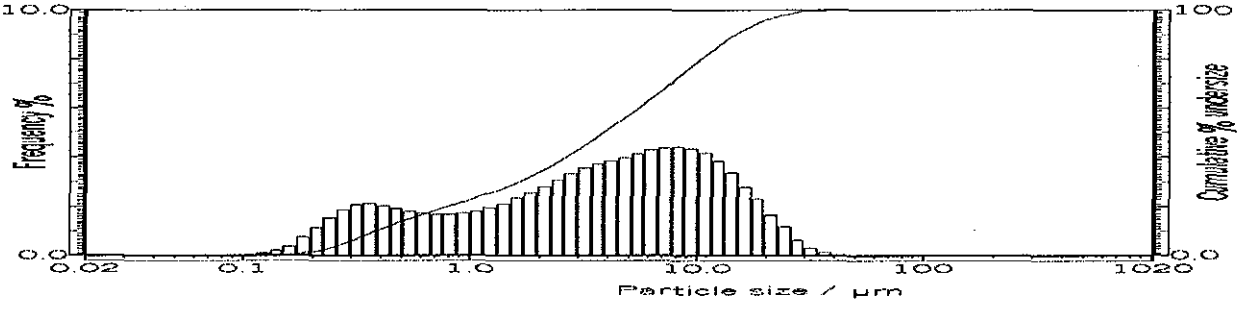
AW103746: **P6** = 3 min; S1 = 0 min; **S3** = 3 min; US = 0 min; DT = 0 min



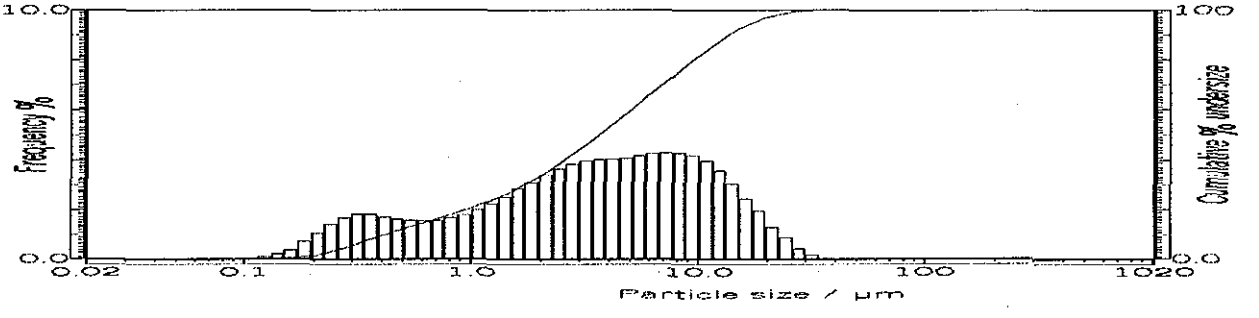
AW103747: **P6** = 7 min; **S1** = 4 min; S3 = 3 min; US = 0 min; DT = 0 min



AW103748: **P6** = 12 min; S1 = 4 min; **S3** = 8 min; **US** = 2 min; **DT** = 0 min



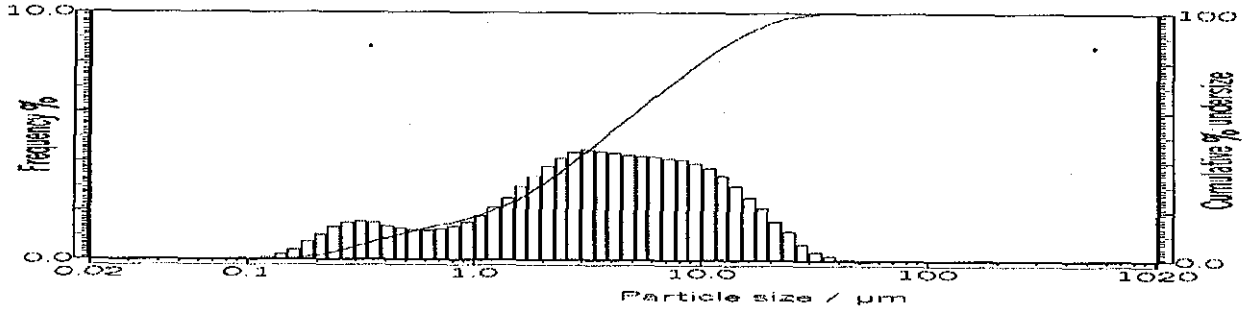
AW103749: **P6** = 15 min; **S1** = 7 min; S3 = 8 min; US = 2 min; DT = 3 min



Continued: AW-103 Composite: Sample S01T001426.

[DELAY]: **P1** (2.1 mL/s) = 60 min; **S0** (Stirrer OFF); **DT = 60** min

AW103750: **P6** = 18 min; S1 = 7 min; **S3** = 11 min; US = 2 min; DT = 66 min



AW103751: **P6** = 21 min; **S1** = 10 min; S3 = 11 min; US = 2 min; DT = 69 min

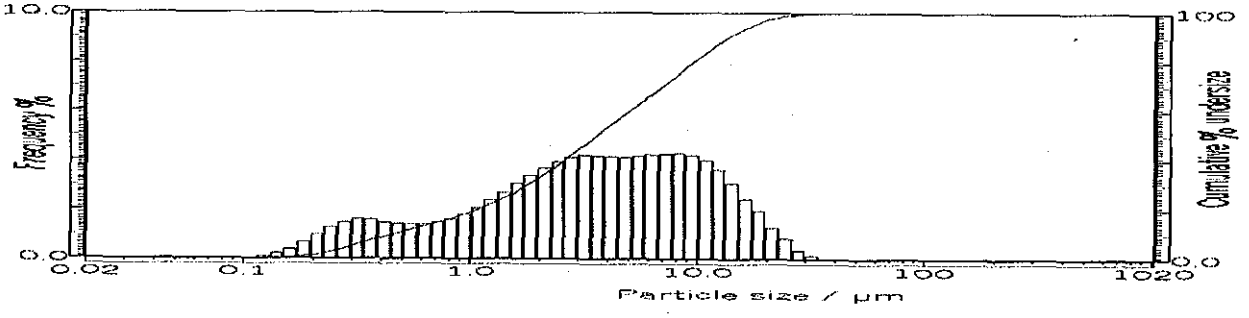
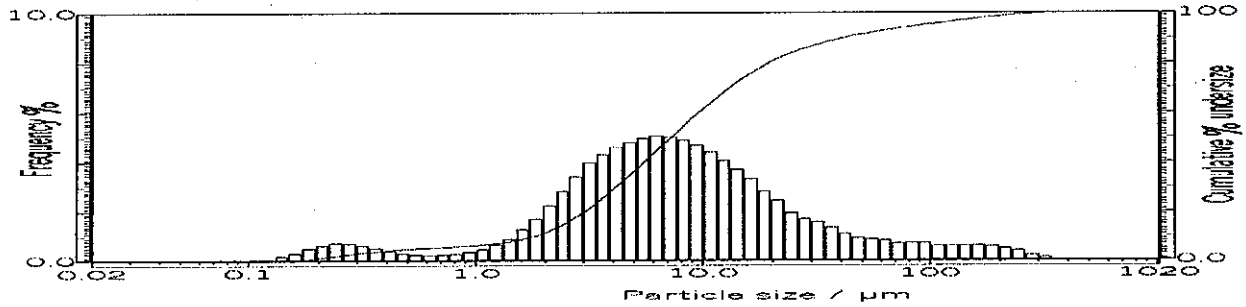


Figure 17. AW-103 Composite: Volume-based PSDs from set of runs on sample S01T001427. (Two Pages)

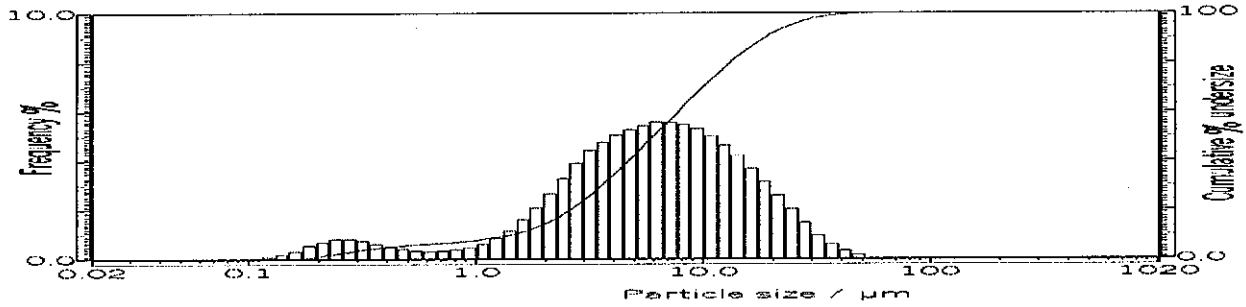
File Name: Cumulative times at run conditions with individual run settings **highlighted**.

[LOAD-IN]: **P6** = ? min; **S3** = ? min

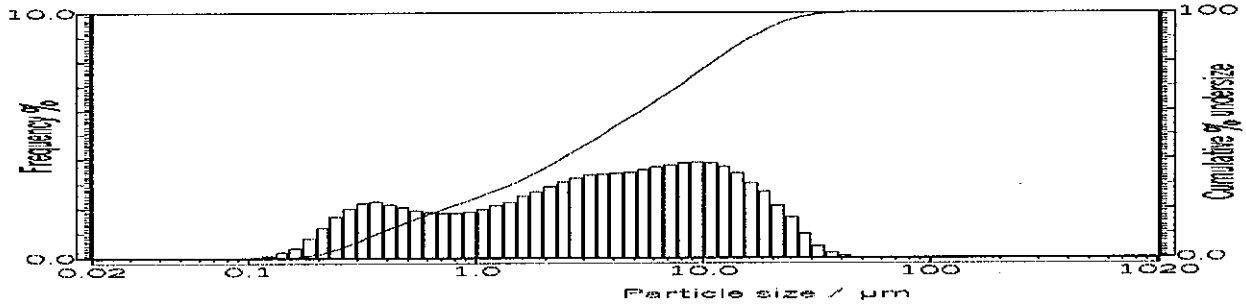
AW103752: **P6** = 3 min; S1 = 0 min; **S3** = 3 min; US = 0 min; DT = 0 min



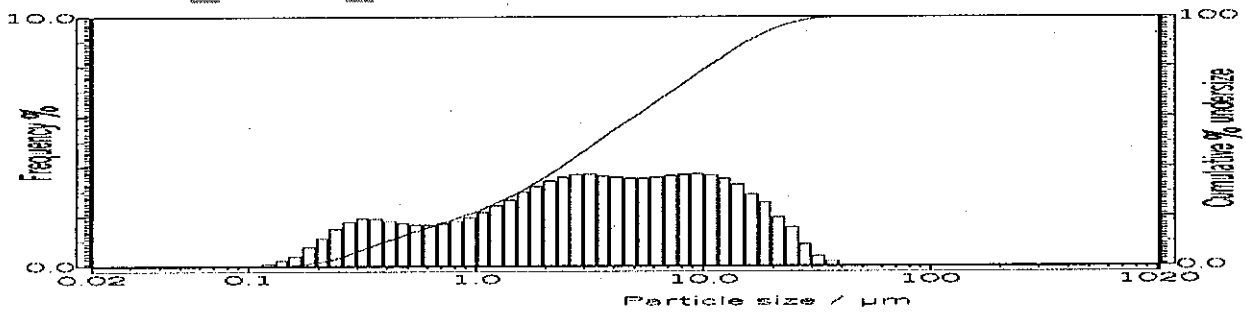
AW103753: **P6** = 6 min; **S1** = 3 min; S3 = 3 min; US = 0 min; DT = 0 min



AW103754: **P6** = 30 min; S1 = 3 min; **S3** = 27 min; **US** = 20 min; **DT** = 0 min



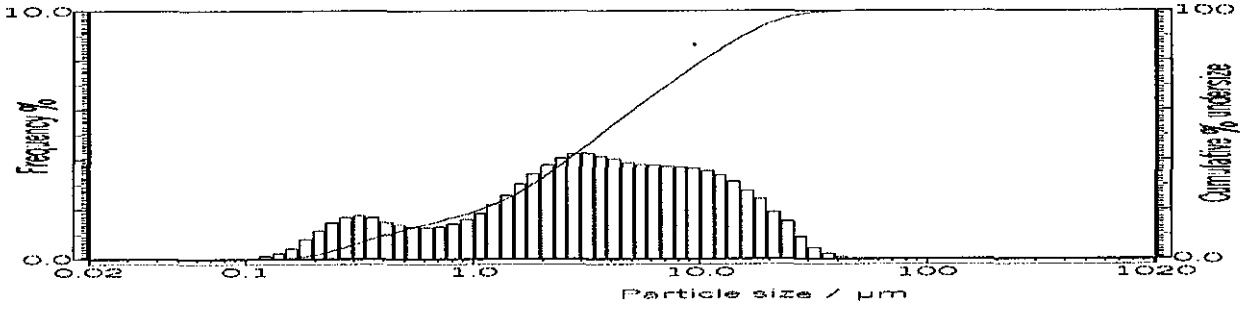
AW103755: **P6** = 33 min; **S1** = 6 min; S3 = 27 min; US = 20 min; DT = 4 min



Continued. AW-103 Composite: Sample S01T001427.

[DELAY]: **P1** (2.1 mL/s) = 60 min; **S0** (Stirrer OFF); **DT** = 60 min

AW103756: **P6** = 36 min; S1 = 6 min; **S3** = 30 min; US = 20 min; DT = 67 min



AW103757: **P6** = 39 min; **S1** = 9 min; S3 = 30 min; US = 20 min; DT = 70 min

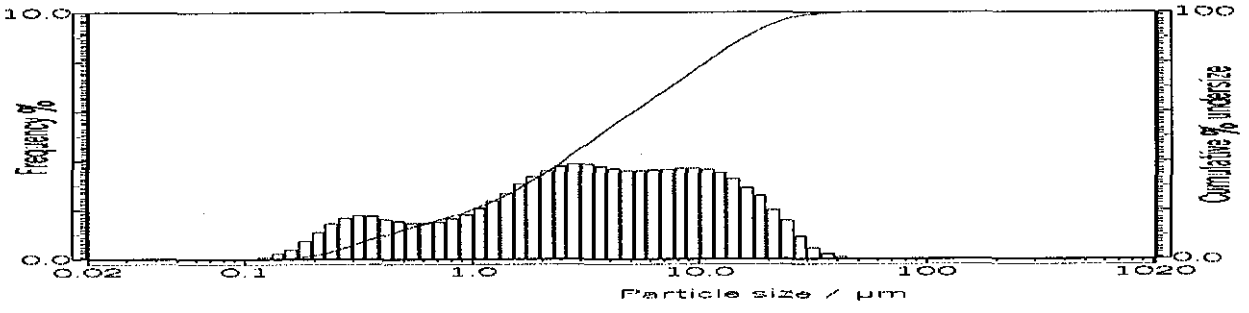


Table 10. AW-103 Composite: Mean particle diameters of volume-based PSDs.

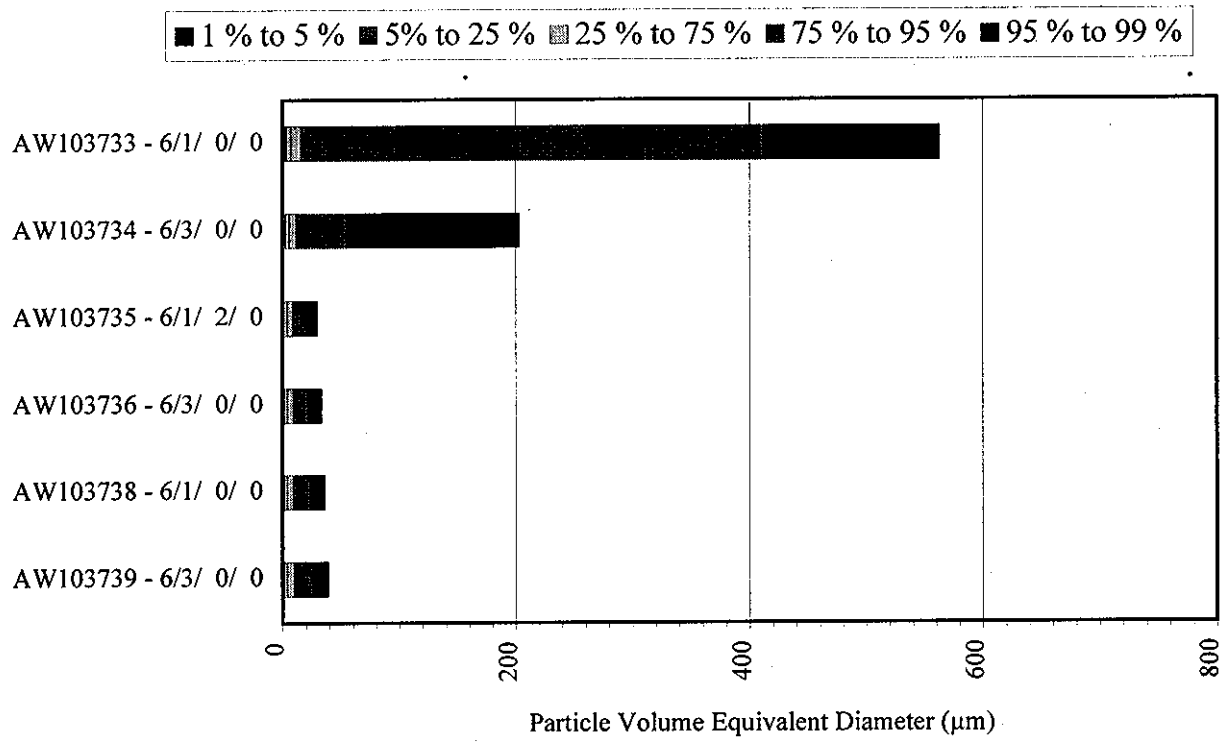
Sample	PSD Run File Name	Run Conditions				Mean Diameter (μm)	Standard Deviation (μm)
		P	S	US	DT		
S01T001424	AW103733	6	1	0	0	52.1	127.5
	AW103734	6	3	0	0	14.5	33.8
	AW103735	6	1	2	0	6.2	6.7
	AW103736	6	3	0	0	6.5	7.3
	AW103738	6	1	0	0	6.7	7.7
	AW103739	6	3	0	0	7.2	8.5
S01T001425	AW103740	6	1	0	0	77.4	186.5
	AW103741	6	3	0	0	8.0	7.8
	AW103742	6	1	20	0	6.1	6.9
	AW103743	6	3	0	0	6.2	7.1
	AW103744	6	1	0	0	6.1	6.8
	AW103745	6	3	0	0	6.3	7.2
S01T001426	AW103746	6	3	0	0	7.6	6.6
	AW103747	6	1	0	0	7.1	6.0
	AW103748	6	3	2	0	5.9	6.1
	AW103749	6	1	0	0	5.5	5.6
	AW103750	6	3	0	0	5.9	6.1
	AW103751	6	1	0	0	5.5	5.5
S01T001427	AW103752	6	3	0	0	19.3	38.5
	AW103753	6	1	0	0	8.3	7.5
	AW103754	6	3	20	0	6.2	6.8
	AW103755	6	1	0	0	6.0	6.5
	AW103756	6	3	0	0	6.1	6.6
	AW103757	6	1	0	0	6.1	6.7

Table 11. AW-103 Composite: Percentages of particles in volume-based PSDs with diameters (μm) less than the indicated values.

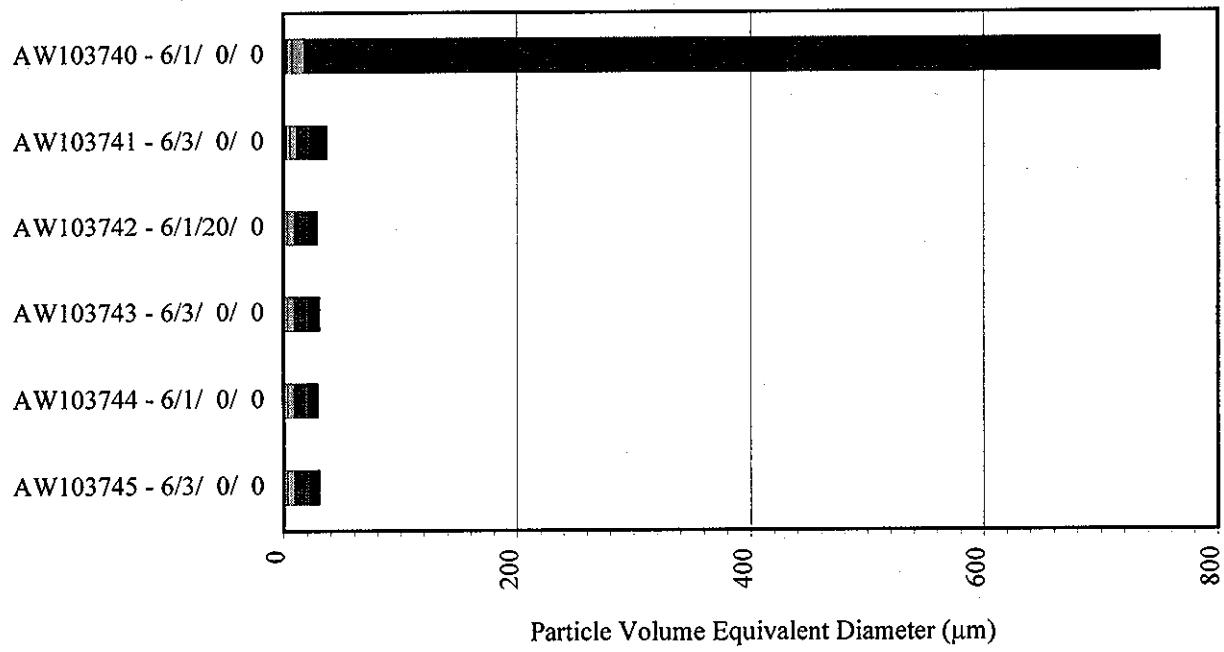
Sample	In Distributions Based on the Total Volume of Spherical Particles						
PSD Run	1 %	5 %	25%	50 %	75 %	95 %	99 %
	Of the Particles Have Diameters Less Than (μm)						
S01T001424							
AW103733 - 6/1/ 0/ 0	0.20	0.40	3.29	7.09	15.74	411.8	563.4
AW103734 - 6/3/ 0/ 0	0.19	0.34	2.73	5.70	11.56	54.8	203.2
AW103735 - 6/1/ 2/ 0	0.18	0.27	1.14	3.94	8.97	20.0	29.6
AW103736 - 6/3/ 0/ 0	0.18	0.28	1.38	3.84	9.11	21.9	33.3
AW103738 - 6/1/ 0/ 0	0.18	0.29	1.64	3.87	9.00	23.0	36.4
AW103739 - 6/3/ 0/ 0	0.18	0.29	1.57	3.95	9.80	25.3	39.3
S01T001425							
AW103740 - 6/1/ 0/ 0	0.19	0.34	3.29	7.64	17.63	591.7	750.9
AW103741 - 6/3/ 0/ 0	0.18	0.30	2.56	5.69	10.96	23.5	37.3
AW103742 - 6/1/20/ 0	0.17	0.25	0.73	3.37	9.25	20.5	29.3
AW103743 - 6/3/ 0/ 0	0.17	0.25	0.86	3.25	9.24	21.3	30.8
AW103744 - 6/1/ 0/ 0	0.17	0.26	1.06	3.32	8.88	20.6	29.5
AW103745 - 6/3/ 0/ 0	0.18	0.26	1.00	3.37	9.51	21.7	30.7
S01T001426							
AW103746 - 6/3/ 0/ 0	0.19	0.36	2.91	5.78	10.55	21.1	30.2
AW103747 - 6/1/ 0/ 0	0.19	0.35	2.69	5.45	9.88	19.4	27.7
AW103748 - 6/3/ 2/ 0	0.18	0.27	1.17	3.87	8.76	18.8	26.7
AW103749 - 6/1/ 0/ 0	0.18	0.28	1.30	3.58	8.06	17.2	24.7
AW103750 - 6/3/ 0/ 0	0.18	0.29	1.58	3.71	8.24	18.7	27.4
AW103751 - 6/1/ 0/ 0	0.18	0.29	1.42	3.57	8.03	17.1	24.4
S01T001427							
AW103752 - 6/3/ 0/ 0	0.20	0.52	3.54	7.18	15.57	90.3	216.9
AW103753 - 6/1/ 0/ 0	0.19	0.39	3.06	6.01	11.26	23.9	35.6
AW103754 - 6/3/20/ 0	0.18	0.27	1.04	3.59	9.21	20.7	29.3
AW103755 - 6/1/ 0/ 0	0.18	0.28	1.19	3.39	8.71	20.0	28.3
AW103756 - 6/3/ 0/ 0	0.18	0.27	1.44	3.56	8.55	20.2	29.2
AW103757 - 6/1/ 0/ 0	0.18	0.28	1.32	3.50	8.82	20.3	29.0

Figure 18. AW-103 Composite: Diameters of particles (μm) within defined, volume-based, percentile ranges. (Two Pages)

AW-103 Composite: S01T001424

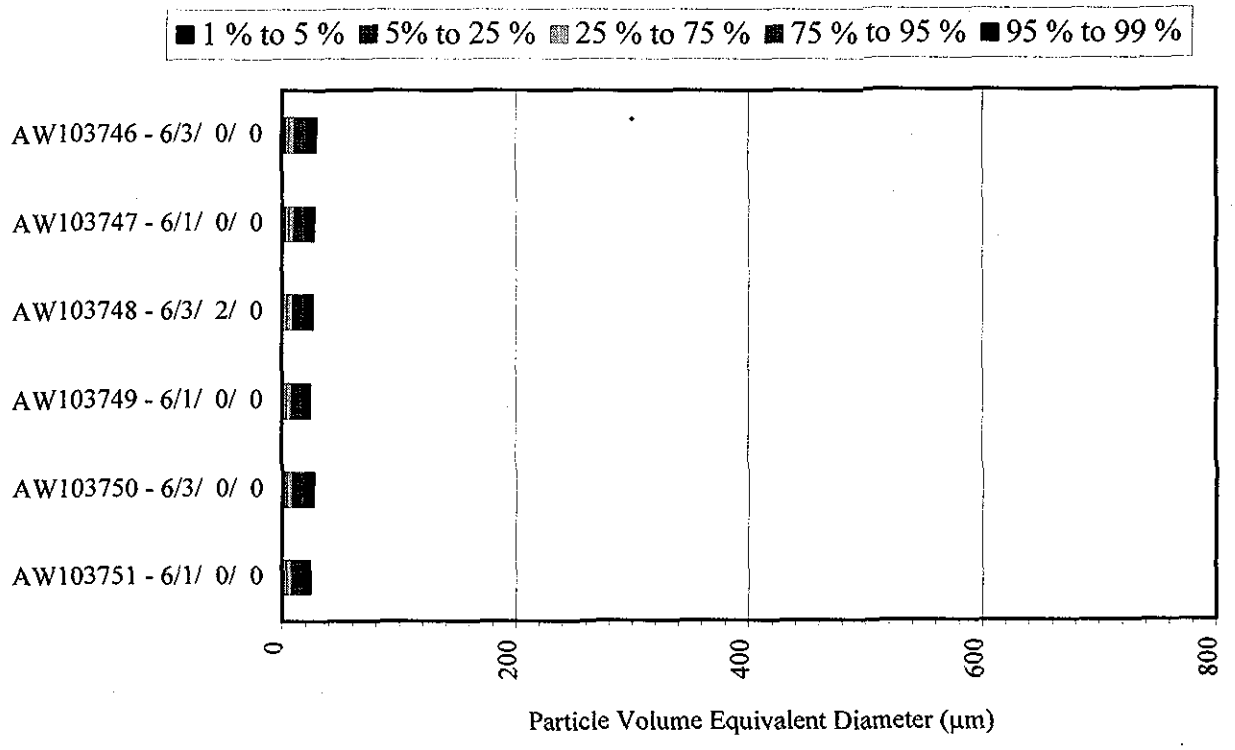


AW-103 Composite: S01T001425



Continued:

AW-103 Composite: S01T001426



AW-103 Composite: S01T001427

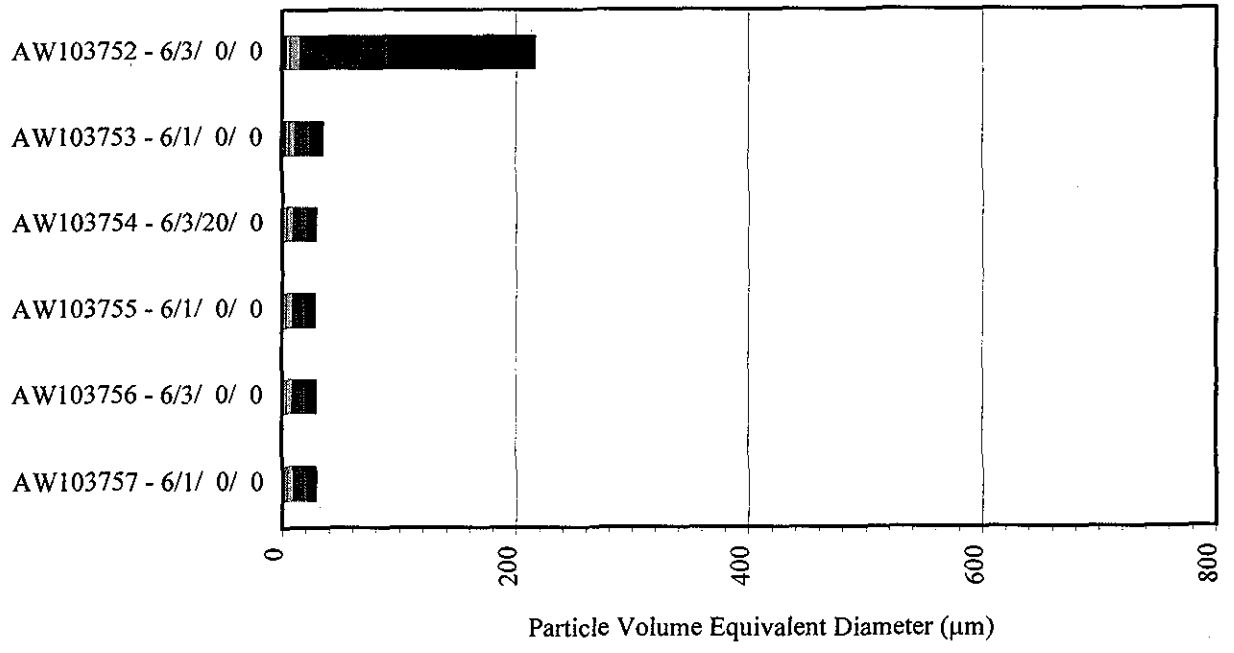
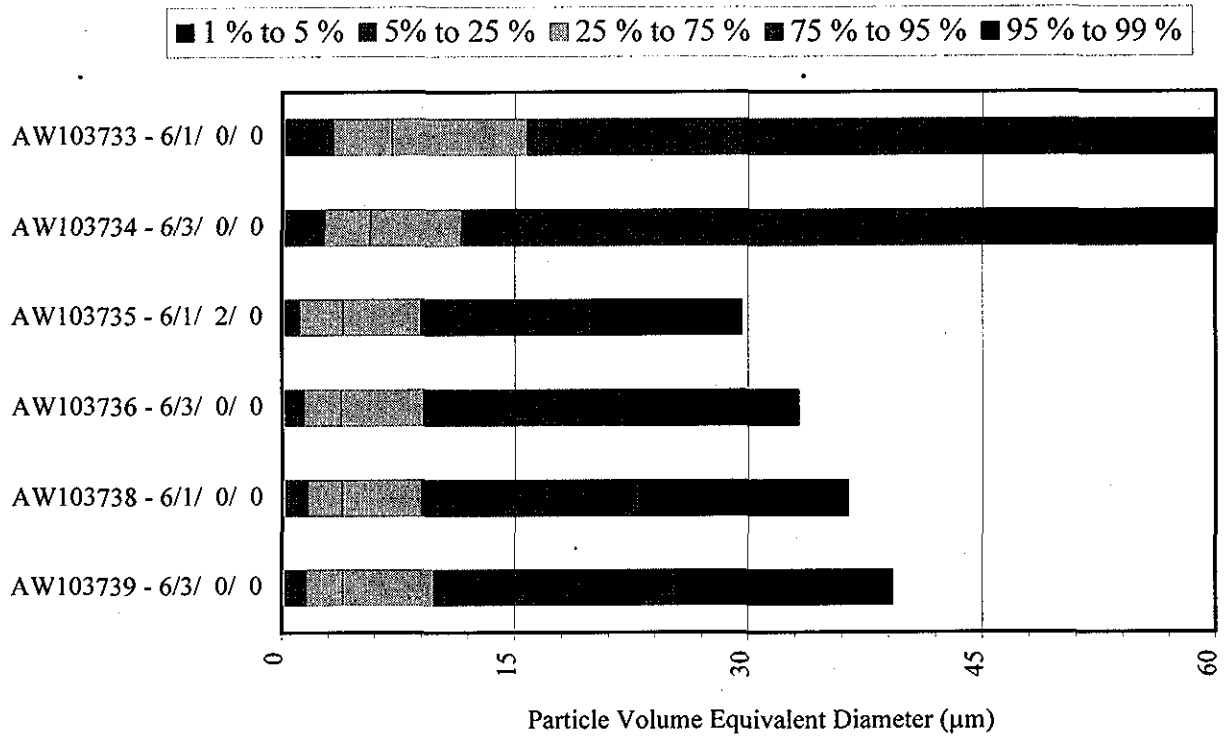
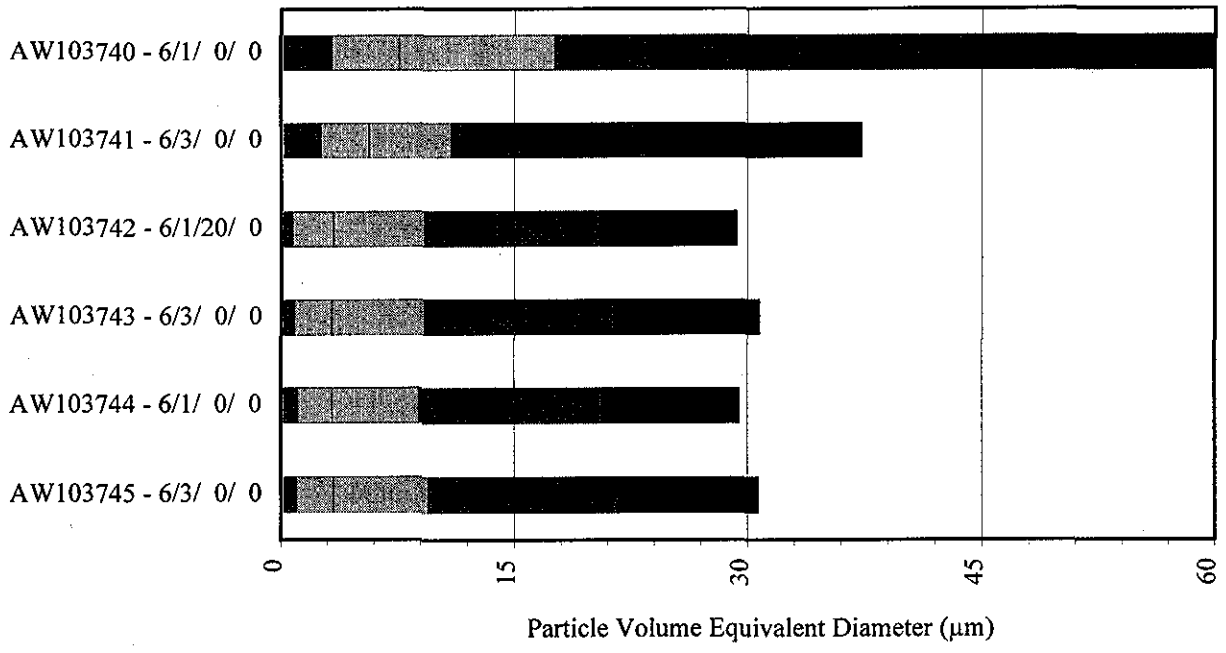


Figure 19. AW-103 Composite: Expanded scale plots of diameters of particles within defined, volume-based, percentile ranges. (Two Pages)

AW-103 Composite: S01T001424

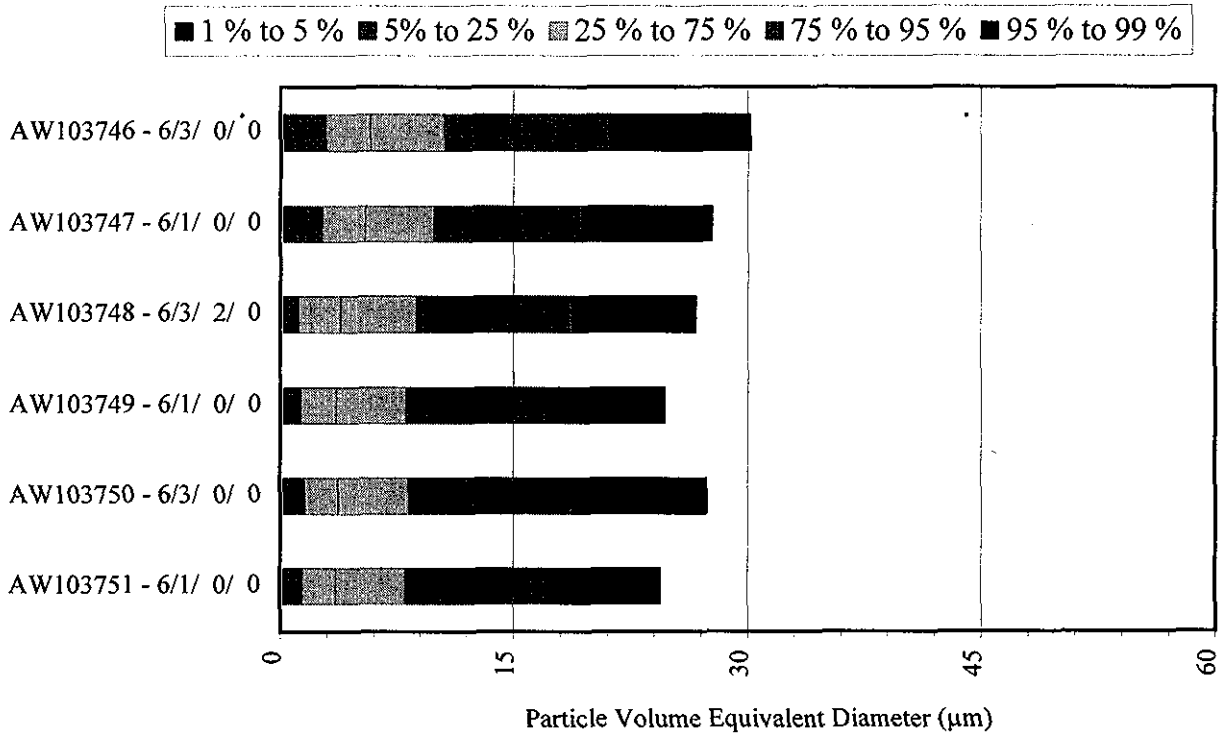


AW-103 Composite: S01T001425

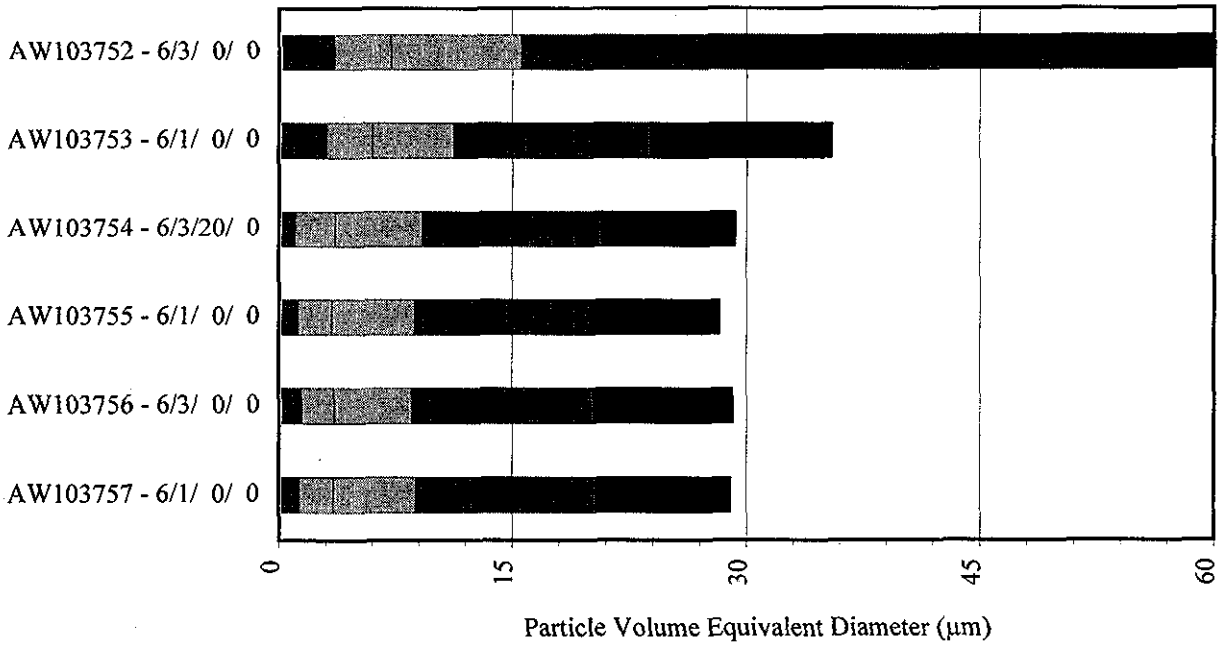


Continued:

AW-103 Composite: S01T001426



AW-103 Composite: S01T001427



4.3.2. PSD Results on AW-103 Vials 1669 and 1670

PSD Measurements. As mentioned previously, it was suspected that the subsampling methods used in Sec. 4.3.1 resulted in a bias in favor of small particle sizes. Therefore, PSD measurements were made on additional subsamples. The subsampling dates, the sample numbers assigned to the subsamples, and the dates of the PSD analyses are indicated below for these additional measurements. For the reasons discussed in connection with the measurements of Tank AY-102, AZ-102, C-107, and SY-102 samples in Sec. 3.2.1.3 above, abbreviated, measurement sets of four runs each were used, instead of the six-run measurements used for the first measurements. The additional PSD measurement sets obtained for Tank AW-103 are identified in Table 17 by the number of the analytical subsample from which the specimens were taken.

Table 12. Additional PSD samples for Tank AW-103.

Source Tank	Composite #	Subsampled	Subsample #	PSD Analyses
AW-103	S01T001020	08/29/2001	S01T001669 S01T001670	09/26/2001

Data and Observations—AW-103. The measurement results summarized in Figures 20 through 25 and Tables 18 and 19 are presented in the format previously described in Sec. 4.2.1.

The suspicion that the initial subsamples of the AW-103 composite (Sec. 4.3.1) were biased towards having non-representatively high populations of small particles was borne out by PSD measurements on subsamples S01T001669 and S01T001670. None of the PSDs measured for these subsamples indicates the presence of observable populations of <1 μm particles; small populations of <1 μm particles were observed in all the PSDs for the original four subsamples. While the <1 μm particles may very well be present in the AW-103 composites, these measurements indicate that they represent only a very small percentage of the particulate volume in these samples.

S01T001669. The measurement sets for both specimens withdrawn from subsample S01T001669 suggest very similar PSDs. The initial PSDs indicate the presence of a single population of particles with diameters ranging from 1 μm to 20 μm and a modal value of 5 μm to 6 μm. These particles are assumed to be the same as those in the major, 1 μm to 30 μm populations in the original measurement sets. The combination of ultrasonic treatment and continuous pumping and stirring has the effect of shifting the lower diameters of the observed population to around 0.5 μm and to shift the mode to downward to around 3 μm. This is very similar to the behavior observed in the previous samples.

The absence of any large diameter component to the observed PSDs essentially repeats the observations previously noted for S01T001426 (Sec. 4.3.1). In both cases, the absence could be the result of either poor precision in subsampling and/or specimen introduction; or breakup of large, fragile agglomerates before they can be observed; or both.

S01T001670. As for S01T001669, both PSD measurement sets for subsample S01T001670 also show the presence of a population of 1 μm to 20–30 μm particles and essentially no contribution from smaller particles. There the similarities end. The first PSD runs with a stirring speed of S3 suggest the presence of two additional populations of particles with diameters ranging from around 30 μm to 900 μm. Note that the S3 run was the first PSD run for the second measurement set (Figure 23). The population with the largest diameters in each set appears to represent particles of sufficient density to require the faster S3 stirring to be observed.

The population with the smaller particle diameters, 30 μm to 300 μm, is relatively unaffected by either ultrasonic treatment or continued pumping and stirring: note PSDs AW103958 and AW103959 in Figure 22 and PSDs AW103962 and AW103963 in Figure 23. In the first measurement set (Figure 22), the population of the larger, 400 μm to 900 μm, denser particles also appears to be resistant to breakup by two minutes of ultrasonic treatment. In the second measurement set (Figure 23) the population of the larger particles, with diameters extending up to ≈ 600 μm, appears to be eliminated by the sonication step.

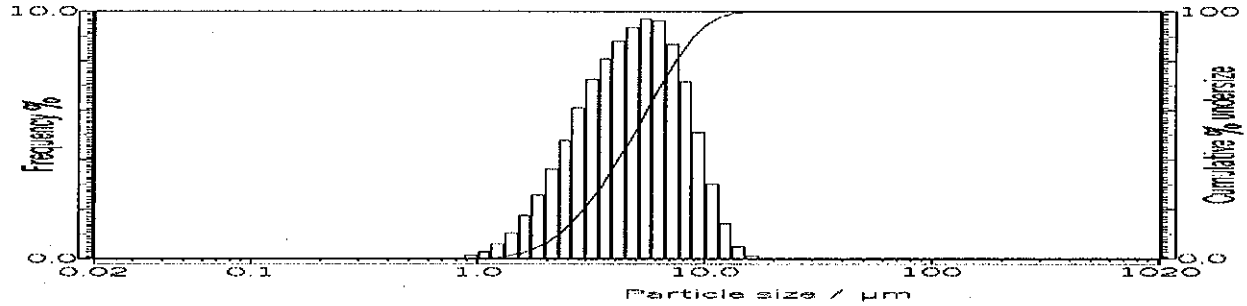
The appearance and anomalous character of these populations of large particles in the S01T001670 subsample specimens is largely unexplained. Causative factors may include any or all of: (1) non-representative sampling, (2) contamination/alteration during prior PLM/IA sampling, (3) extended period of sitting (several days) with $NaOH/NaNO_3$ solution (added during PLM/IA specimen withdrawal) prior to PSD analyses, and (4) contamination during PSD measurements.

Figure 20. AW-103 Composite: Volume-based PSDs from first set of runs on sample S01T001669.

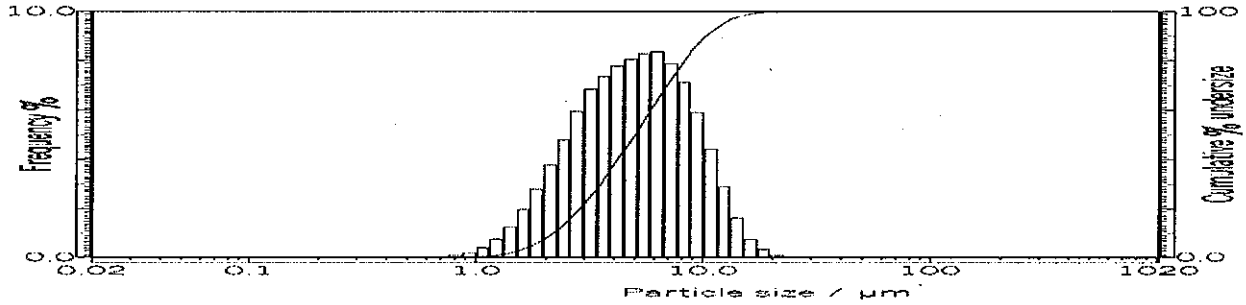
File Name: Cumulative times at run conditions with individual run settings **highlighted**.

[LOAD-IN]: **P6** = ? min; **S1** = ? min

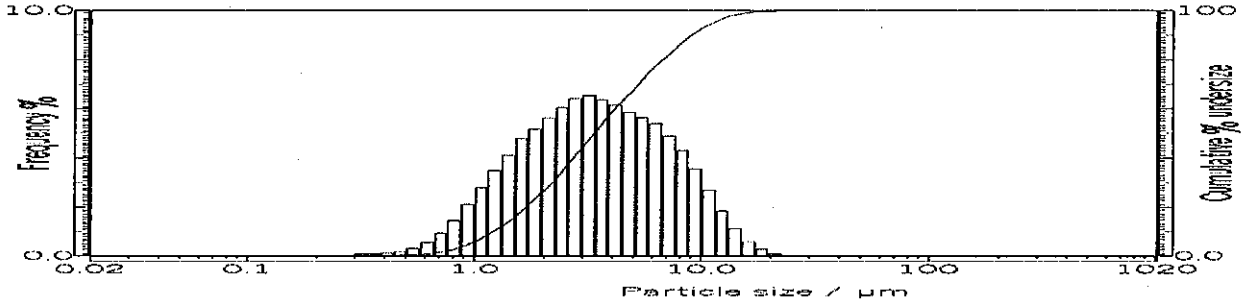
AW103946: **P6** = 4 min; **S1** = 4 min; S3 = 0 min; US = 0 min; DT = 0 min



AW103947: **P6** = 8 min; S1 = 4 min; **S3** = 4 min; US = 0 min; DT = 0 min



AW103948: **P6** = 14 min; S1 = 4 min; **S3** = 10 min; **US** = 2 min; **DT** = 0 min



AW103949: **P6** = 17 min; **S1** = 7 min; S3 = 10 min; US = 2 min; DT = 4 min

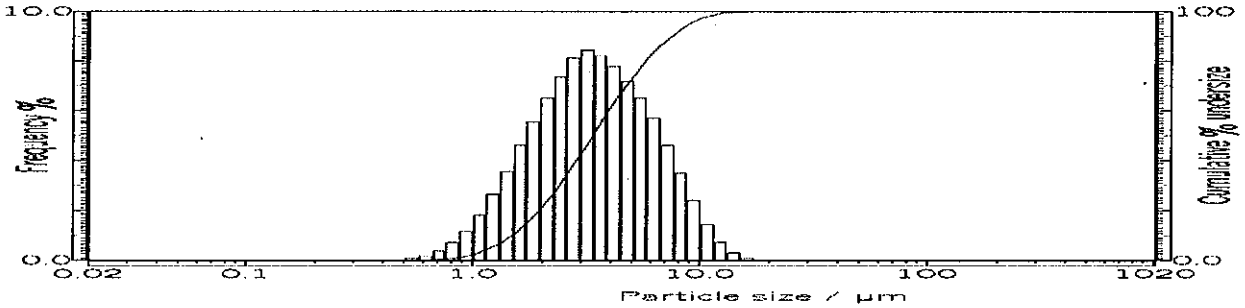
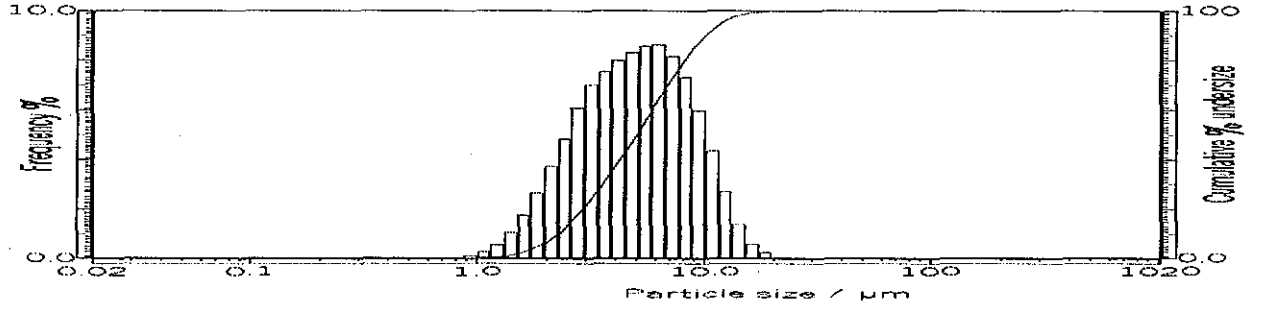


Figure 21. AW-103 Composite: Volume-based PSDs from second set of runs on sample S01T001669.

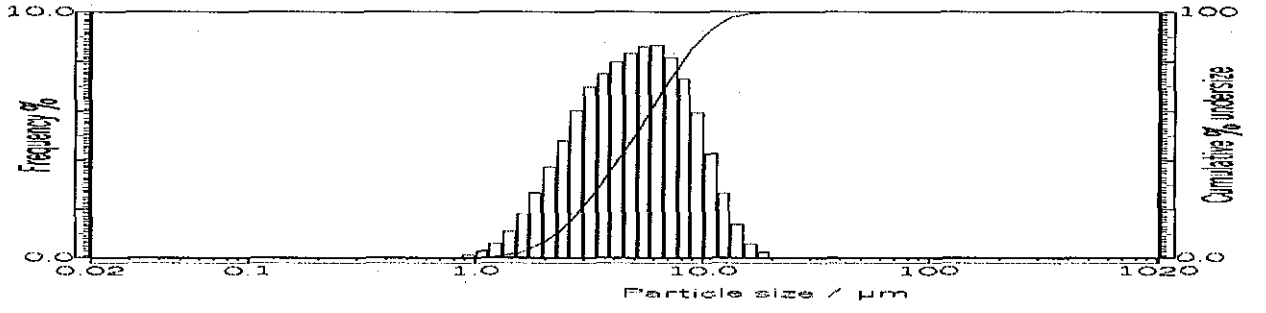
File Name: Cumulative times at run conditions with individual run settings highlighted.

[LOAD-IN]: P6 = ? min; S1 = ? min

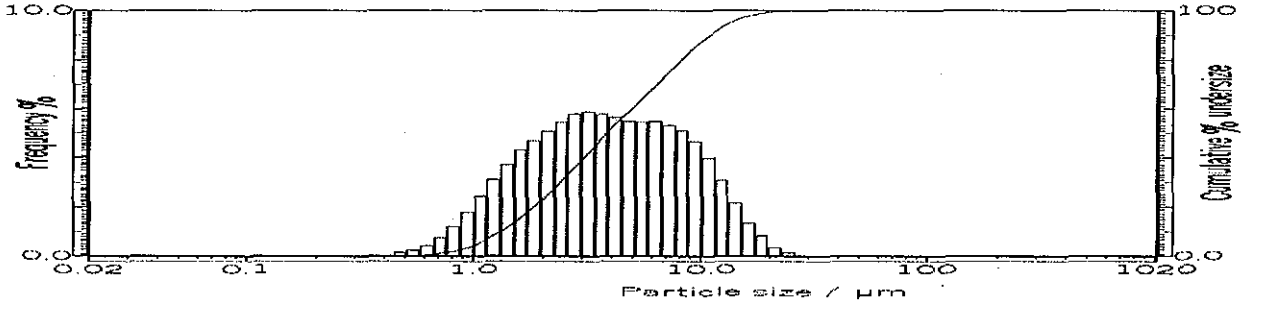
AW103950: P6 = 3 min; S1 = 3 min; S3 = 0 min; US = 0 min; DT = 0 min



AW103951: P6 = 7 min; S1 = 3 min; S3 = 4 min; US = 0 min; DT = 0 min



AW103952: P6 = 13 min; S1 = 3 min; S3 = 10 min; US = 2 min; DT = 0 min



AW103953: P6 = 15 min; S1 = 5 min; S3 = 10 min; US = 2 min; DT = 4 min

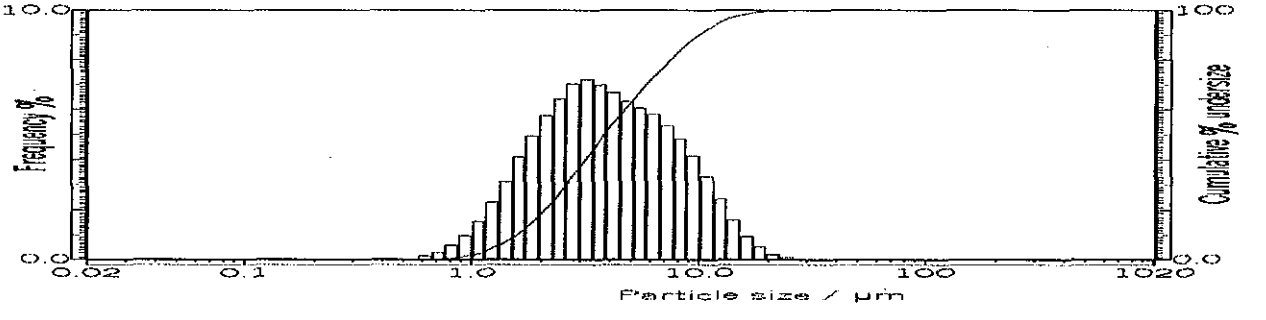
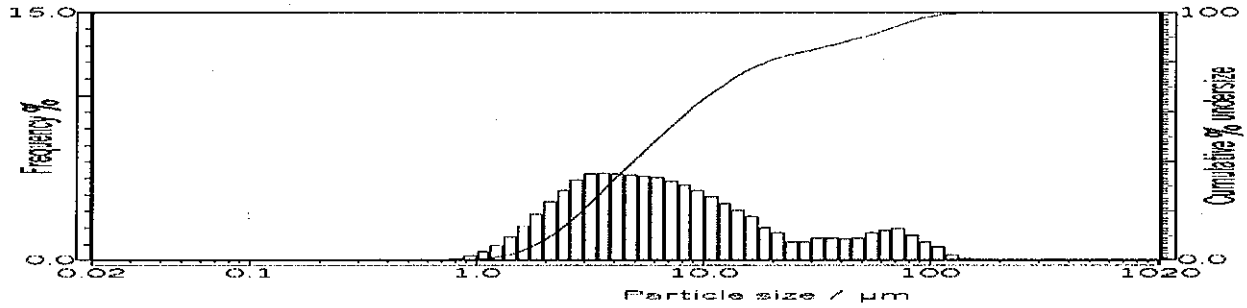


Figure 22. AW-103 Composite: Volume-based PSDs from first set of runs on sample S01T001670.

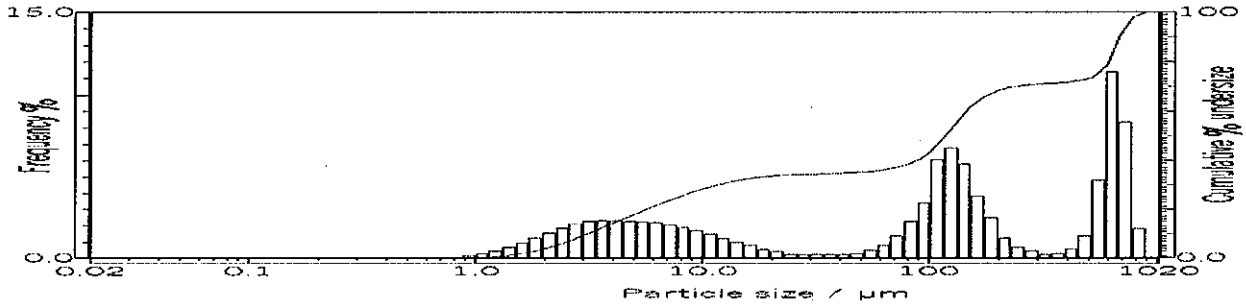
File Name: Cumulative times at run conditions with individual run settings **highlighted**.

[LOAD-IN]: **P6** = ? min; **S1** = ? min

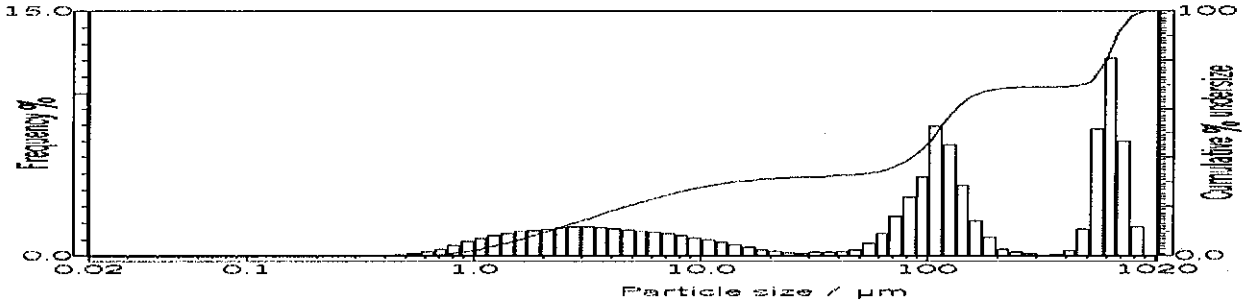
AW103956: **P6** = 7 min; **S1** = 7 min; S3 = 0 min; US = 0 min; DT = 0 min



AW103957: **P6** = 10 min; S1 = 7 min; **S3** = 3 min; US = 0 min; DT = 0 min



AW103958: **P6** = 16 min; S1 = 7 min; **S3** = 9 min; **US** = 2 min; **DT** = 0 min



AW103959: **P6** = 18 min; **S1** = 9 min; S3 = 9 min; US = 2 min; DT = 4 min

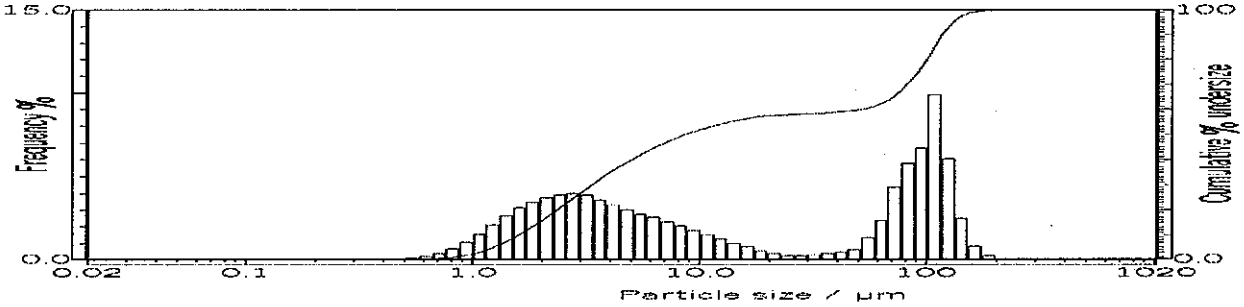
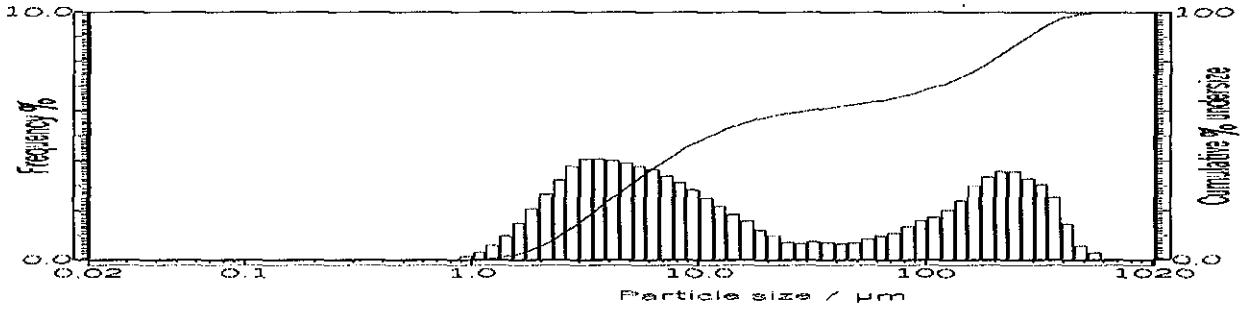


Figure 23. AW-103 Composite: Volume-based PSDs from second set of runs on sample S01T001670.

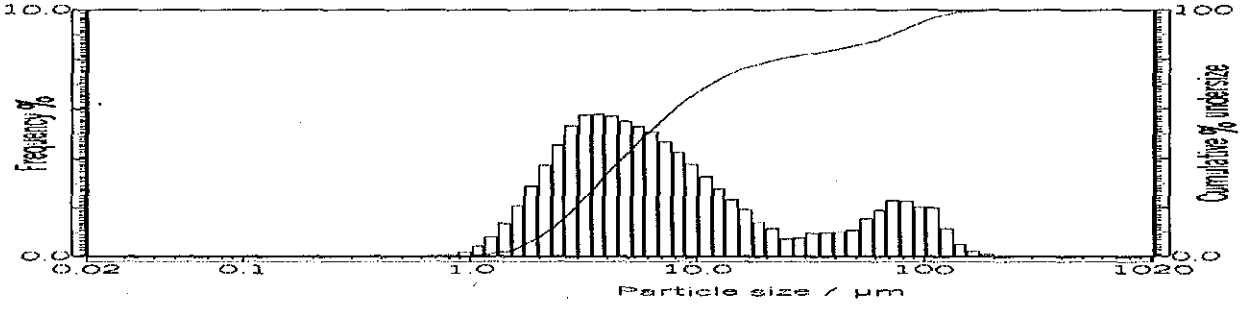
File Name: Cumulative times at run conditions with individual run settings highlighted.

[LOAD-IN]: P6 = ? min; S3 = ? min

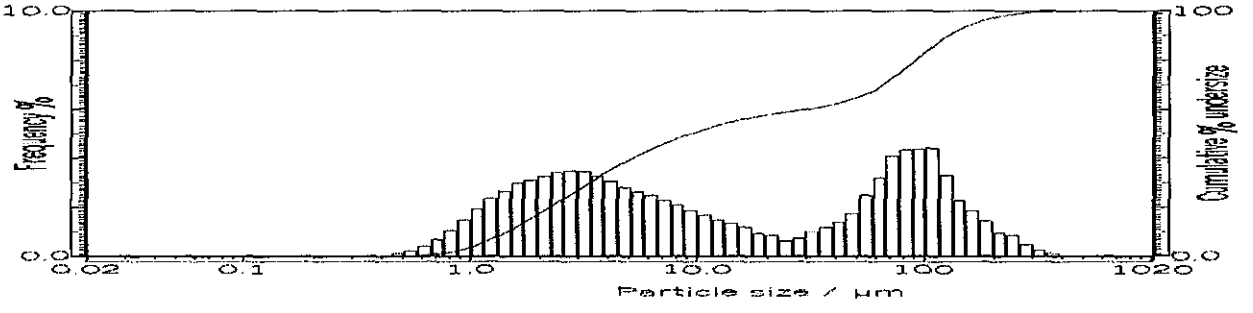
AW103961: P6 = 5 min; S1 = 0 min; S3 = 5 min; US = 0 min; DT = 0 min



AW103960: P6 = 13 min; S1 = 8 min; S3 = 5 min; US = 0 min; DT = 0 min



AW103962: P6 = 19 min; S1 = 8 min; S3 = 11 min; US = 2 min; DT = 0 min



AW103963: P6 = 22 min; S1 = 11 min; S3 = 14 min; US = 2 min; DT = 4 min

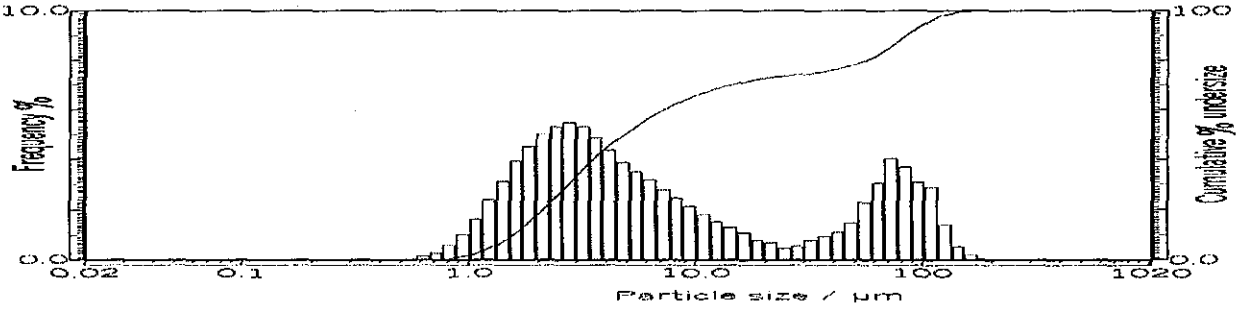


Table 13. AW-103 Composite: Mean particle diameters of volume-based PSDs.

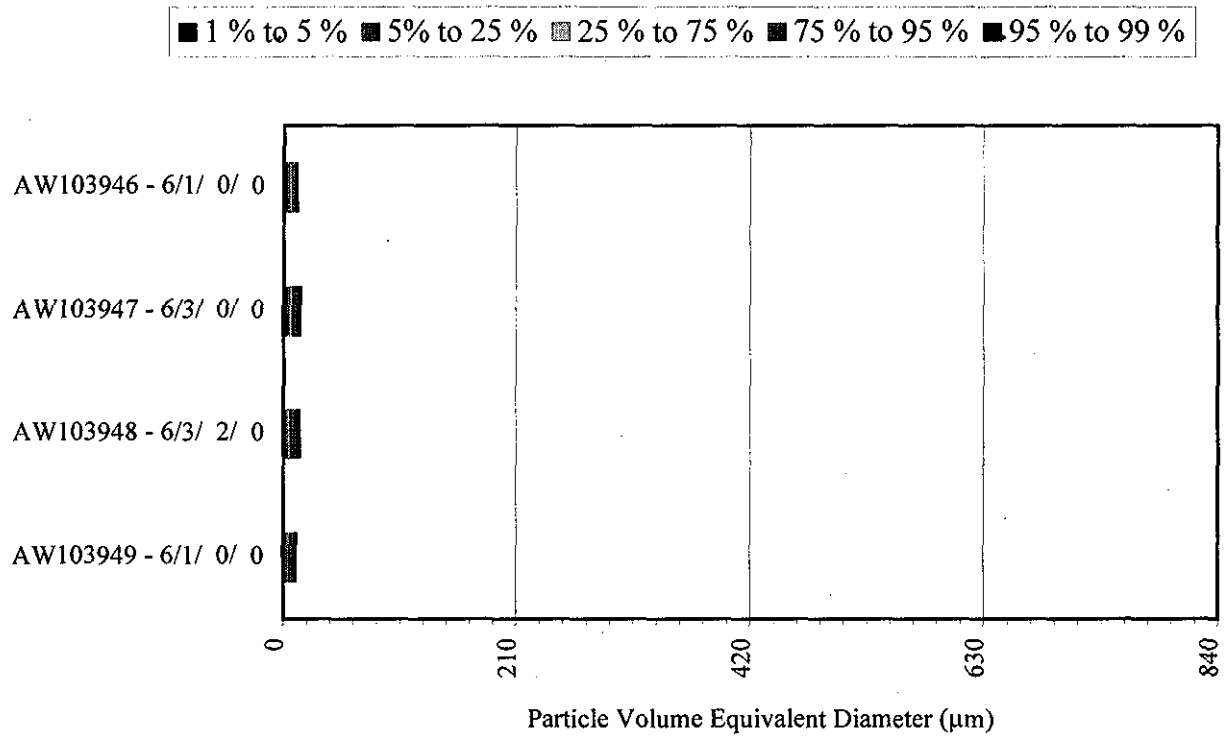
Sample	PSD Run File Name	Run Conditions				Mean Diameter (μm)	Standard Deviation (μm)
		P	S	US	DT		
S01T001669	AW103946	6	1	0	0	5.2	2.6
	AW103947	6	3	0	0	5.7	3.3
	AW103948	6	3	2	0	4.3	3.3
	AW103949	6	1	0	0	4.0	2.5
S01T001669	AW103950	6	1	0	0	5.6	3.1
	AW103951	6	3	0	0	5.6	3.1
	AW103952	6	3	2	0	5.1	4.0
	AW103953	6	1	0	0	4.9	3.6
S01T001670	AW103956	6	1	0	0	15.7	23.1
	AW103957	6	3	0	0	234.8	271.4
	AW103958	6	3	2	0	238.6	273.1
	AW103959	6	1	0	0	43.6	49.3
S01T001670	AW103961	6	3	0	0	84.5	119.5
	AW103960	6	1	0	0	19.4	30.8
	AW103962	6	3	2	0	44.3	59.7
	AW103963	6	1	0	0	23.6	34.8

Table 14. AW-103 Composite: Percentages of particles in volume-based PSDs with diameters less than the indicated values.

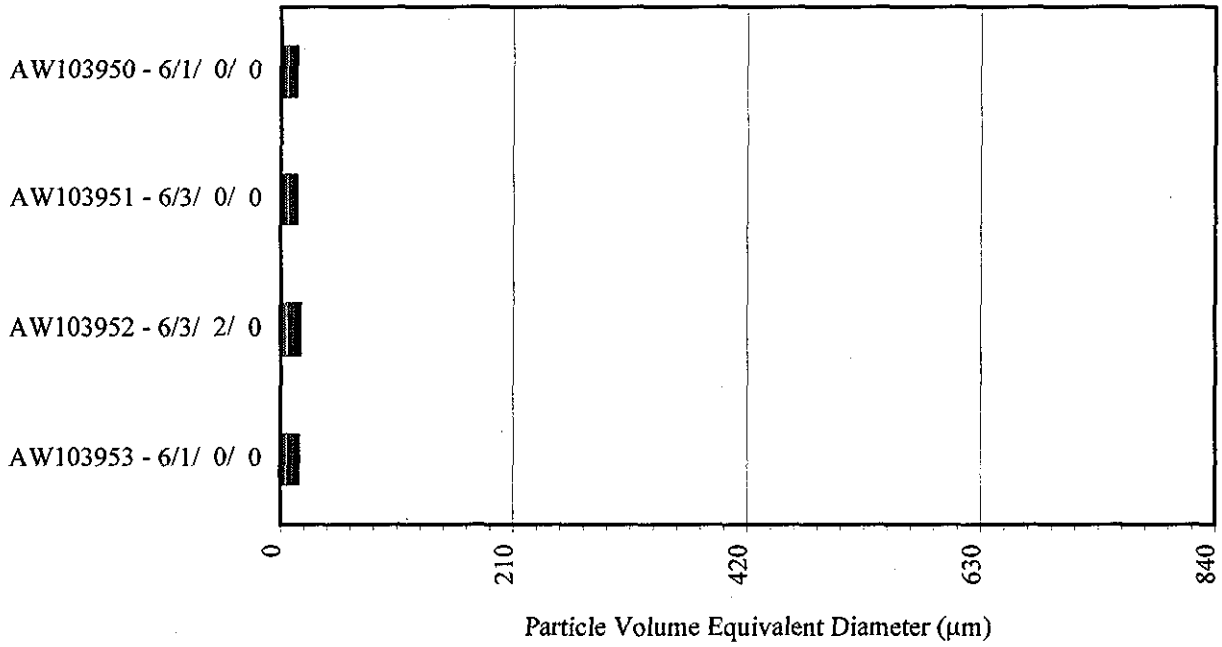
Sample	In Distributions Based on the Total Volume of Spherical Particles						
PSD Run	1 %	5 %	25 %	50 %	75 %	95 %	99 %
	Of the Particles Have Diameters Less Than (μm)						
S01T001669							
AW103946 - 6/1/ 0/ 0	1.30	1.84	3.21	4.8	6.8	10.2	12.8
AW103947 - 6/3/ 0/ 0	1.21	1.75	3.16	4.9	7.5	12.0	15.9
AW103948 - 6/3/ 2/ 0	0.60	0.94	1.91	3.3	5.9	11.1	15.3
AW103949 - 6/1/ 0/ 0	0.80	1.18	2.16	3.3	5.2	8.9	12.0
S01T001669							
AW103950 - 6/1/ 0/ 0	1.32	1.84	3.21	5.0	7.4	11.6	15.0
AW103951 - 6/3/ 0/ 0	1.30	1.82	3.21	5.0	7.4	11.5	14.9
AW103952 - 6/3/ 2/ 0	0.69	1.03	2.10	3.8	7.1	13.2	18.5
AW103953 - 6/1/ 0/ 0	0.87	1.25	2.33	3.8	6.5	12.2	17.1
S01T001670							
AW103956 - 6/1/ 0/ 0	1.16	1.68	3.30	6.3	14.4	72.6	107.5
AW103957 - 6/3/ 0/ 0	1.35	2.20	7.74	116.6	538.5	739.5	827.8
AW103958 - 6/3/ 2/ 0	0.77	1.34	7.31	108.6	552.9	731.8	826.7
AW103959 - 6/1/ 0/ 0	0.82	1.23	2.79	8.6	90.9	129.1	154.3
S01T001670							
AW103961 - 6/3/ 0/ 0	1.29	1.90	4.10	11.0	150.9	343.1	447.5
AW103960 - 6/1/ 0/ 0	1.20	1.73	3.24	5.9	14.5	95.4	131.1
AW103962 - 6/3/ 2/ 0	0.70	1.08	2.74	9.3	76.7	164.5	258.0
AW103963 - 6/1/ 0/ 0	0.86	1.24	2.41	4.8	33.2	101.7	130.2

Figure 24. AW-103 Composite: Diameters of particles (μm) within defined, volume-based percentile ranges. (Two Pages)

AW-103 Composite: S01T001669: First Measurement Set

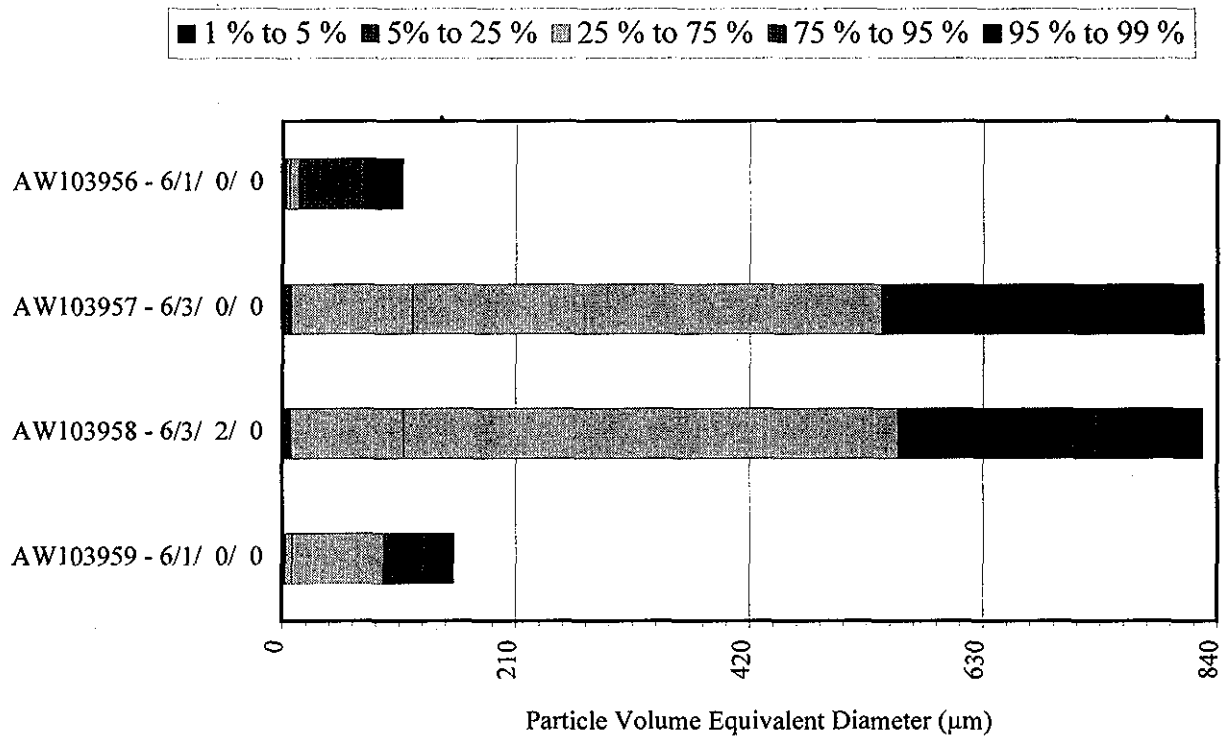


AW-103 Composite: S01T001669: Second Measurement Set



Continued:

AW-103 Composite: S01T001670: First Measurement Set



AW-103 Composite: S01T001670: Second Measurement Set

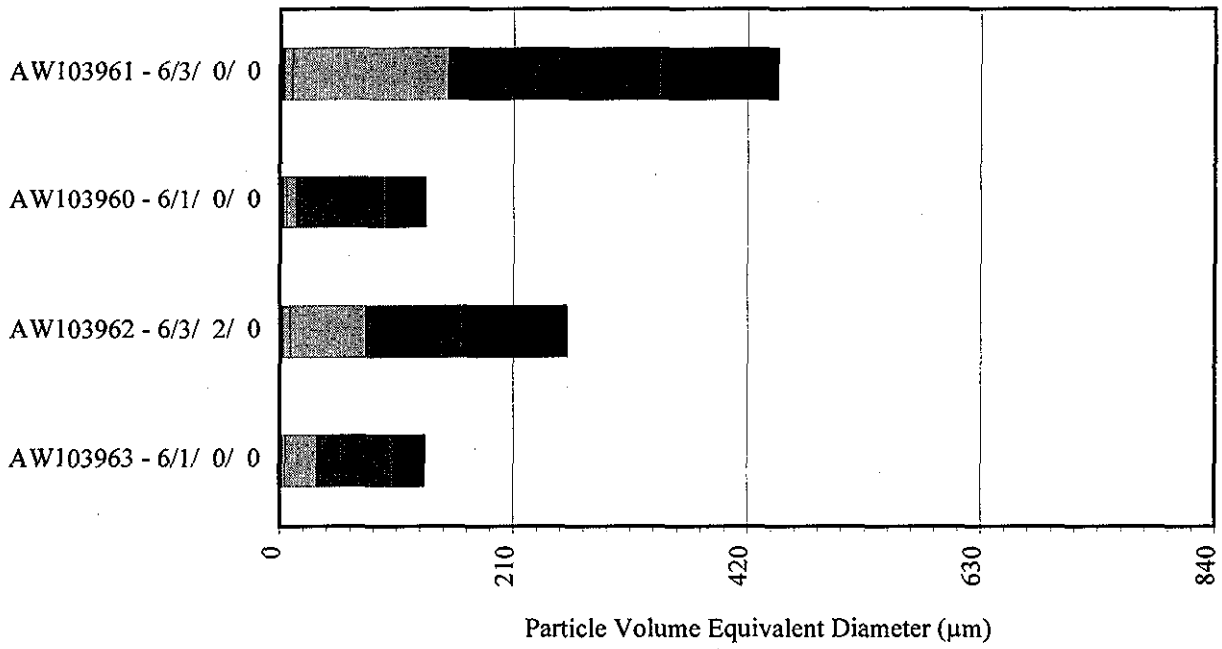
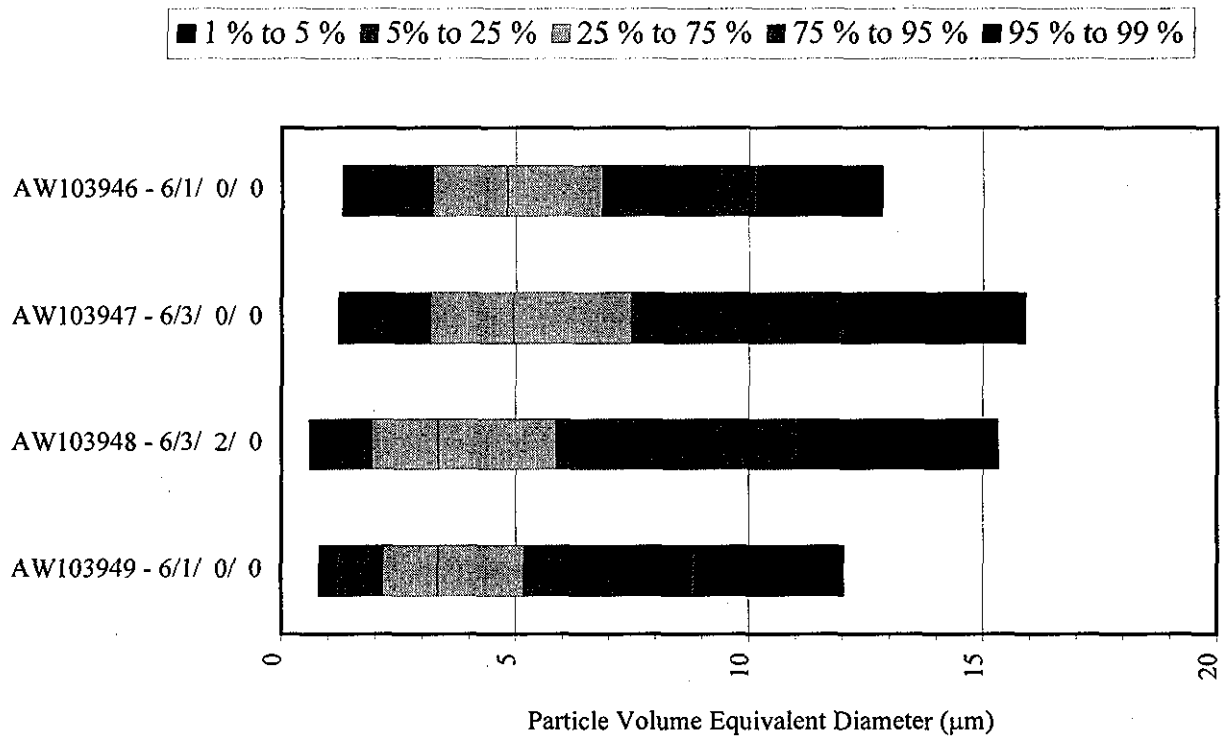
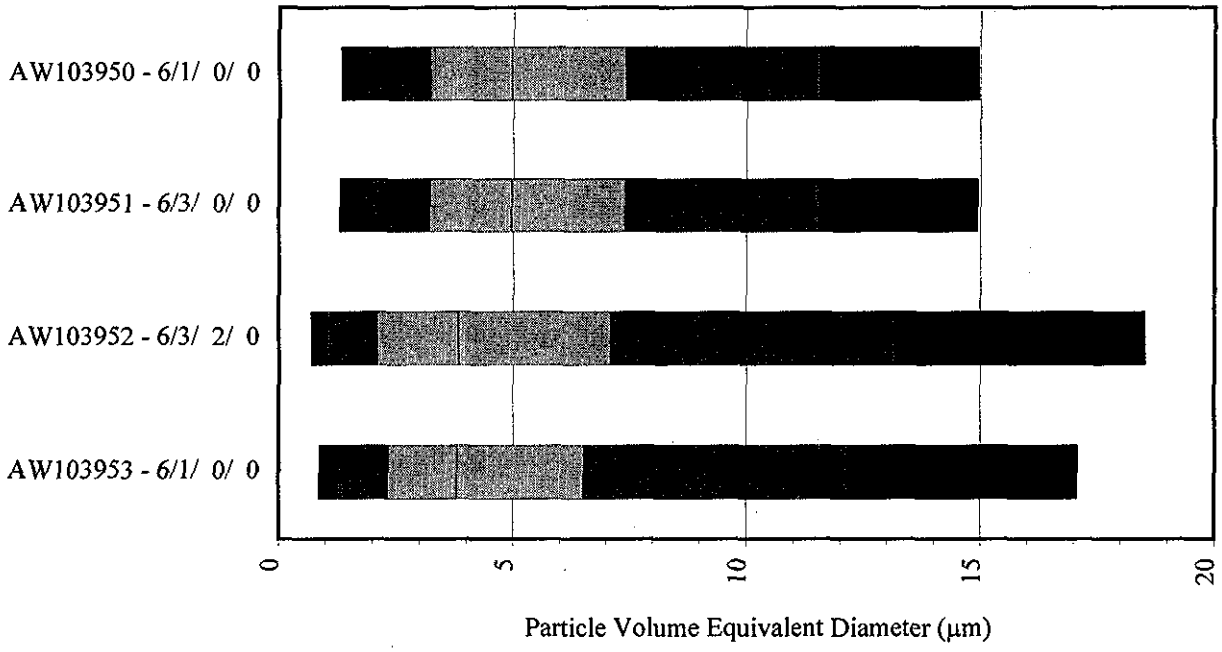


Figure 25. AW-103 Composite: Expanded scale plots of diameters of particles (μm) within defined, volume-based, percentile ranges.

AW-103 Composite: S01T001669: First Measurement Set



AW-103 Composite: S01T001669: Second Measurement Set



Data and Observations—AY-101. The measurement results summarized in Figures 26 through 31 and Tables 20 and 21 are presented in the format previously described in Sec. 4.2.1.

The AY-101 composite samples also contain three general populations of particle diameters: a small population with diameters ranging from approximately 0.2 μm to 2 μm; a dominant population with diameters ranging from approximately 2 μm to 30 μm; and another small population of large particles with diameters ranging from 100 μm to 500 μm.

The large particles, or agglomerates, in the AY-101 composite are more robust than those observed in AW-103. In three of the four measurement sets they are relatively unaffected by pumping and stirring within the analyzer. The disappearance of the large diameter peak in the second PSD run for sample S01T001492 (Figure 27) suggests the initial presence of loosely bound agglomerates; the shift of the large diameter peak in the second PSD run for S01T001490 (Figure 28) to even larger diameters is puzzling. In both cases these PSDs may represent physical changes in the specimens that are exaggerated to an unknown degree by the difficulty in making accurate quantitative measurements of a small number of large particles in a dynamic system otherwise dominated by much smaller particles.

In each of the four measurement sets, the large particle population is completely eliminated by ultrasonic treatment for either 2 or 20 minutes. For both sonication periods, the dominant 2 μm to 30 μm population is observed to shift slightly to smaller diameters. This can be observed both qualitatively and in the trending of the median particle diameter values in Table 13 and Figures 30 and 31. Extending the sonication period from 2 to 20 minutes merely increases this shift slightly (by 1 to 2 μm). The overall shapes of the PSDs are not affected.

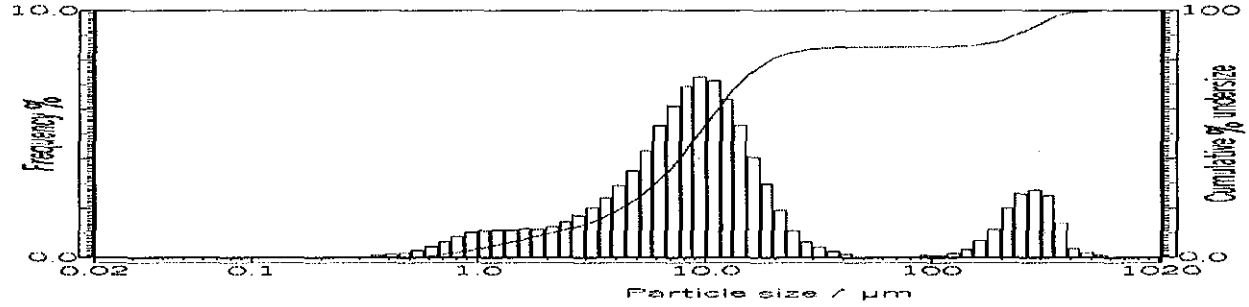
After the ultrasonic treatment is terminated, the PSDs remained invariant throughout the remainder of the measurement sets. They were affected neither by the continued pumping and stirring in the analyzer nor by the 60-minute, quiescent, delay periods. It should be noted that both the analyzer stirrer and pump were turned off (S0 and P0) during the delay periods for both these AY-101 composite measurements and also for the following C-104 composite measurements.

Figure 26. AY-101 Composite: Volume-based PSDs from set of runs on sample S01T001489. (Two Pages)

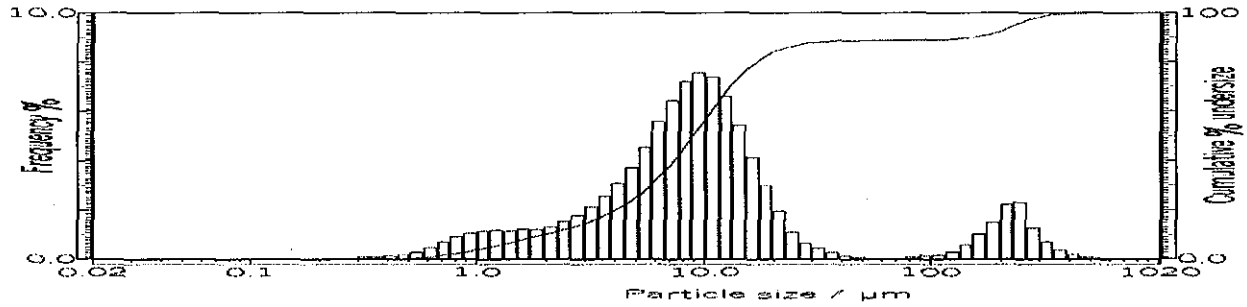
File Name: Cumulative times at run conditions with individual run settings highlighted.

[LOAD-IN]: P6 = ? min; S1 = ? min

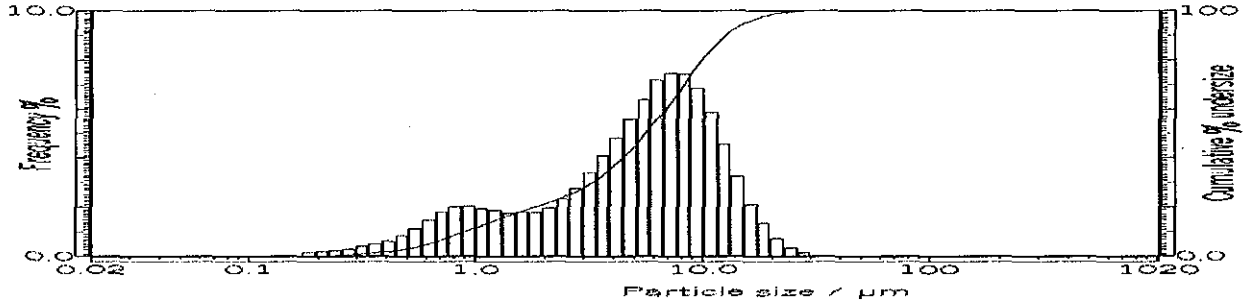
AY101829: P6 = 4 min; S1 = 4 min; S3 = 0 min; US = 0 min; DT = 0 min



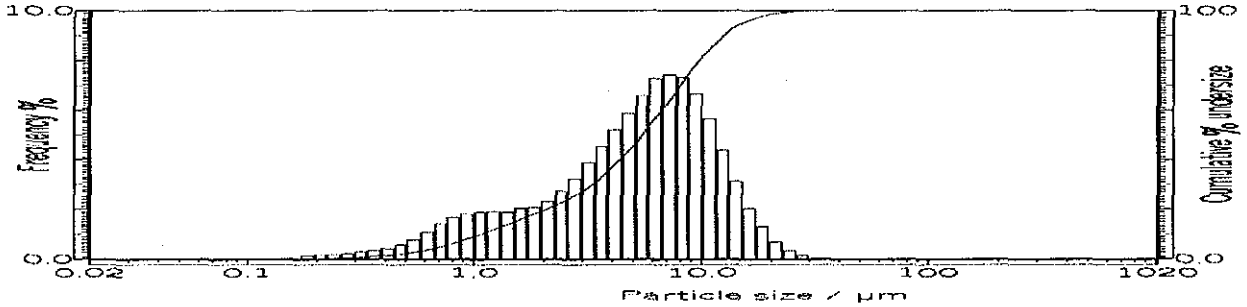
AY101830: P6 = 7 min; S1 = 4 min; S3 = 3 min; US = 0 min; DT = 0 min



AY101831: P6 = 12 min; S1 = 9 min; S3 = 3 min; US = 2 min; DT = 0 min



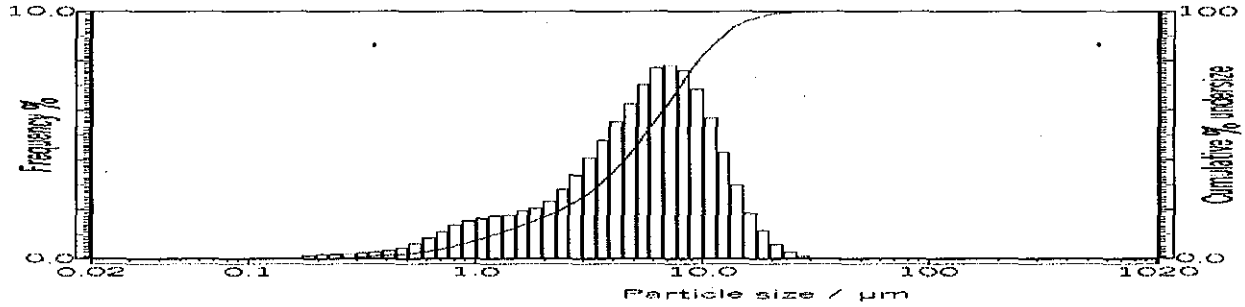
AY101832: P6 = 16 min; S1 = 9 min; S3 = 7 min; US = 2 min; DT = 3 min



Continued: AY-101 Composite: Sample S01T001489.

[DELAY]: **P0** (Pump OFF); **S0** (Stirrer OFF); **DT** = 60 min

AY101838: **P6** = 19 min; **S1** = 12 min; S3 = 7 min; US = 2 min; DT = 67 min



AY101839: **P6** = 23 min; S1 = 12 min; **S3** = 11 min; US = 2 min; DT = 70 min

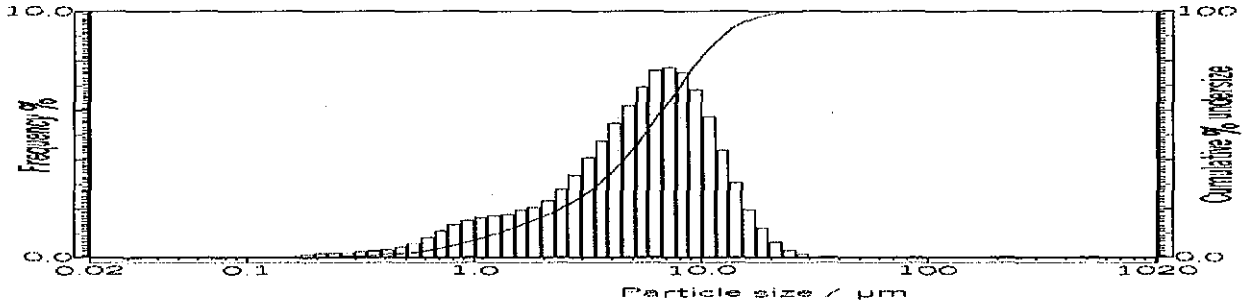
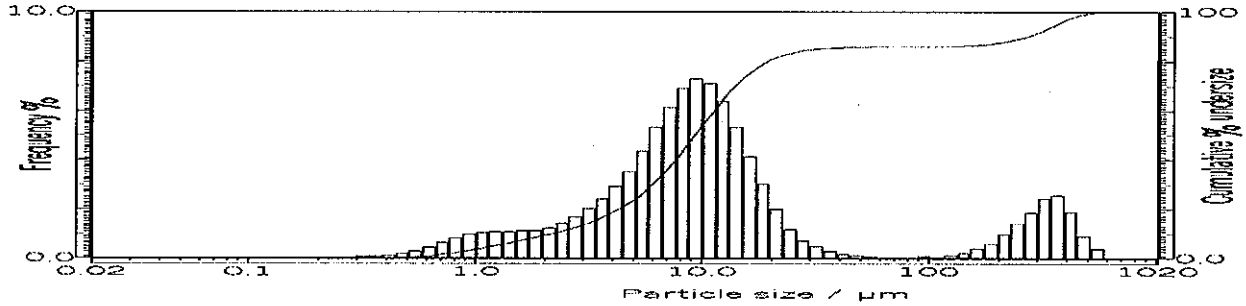


Figure 27. AY-101 Composite: Volume-based PSDs from set of runs on sample S01T001492. (Two Pages)

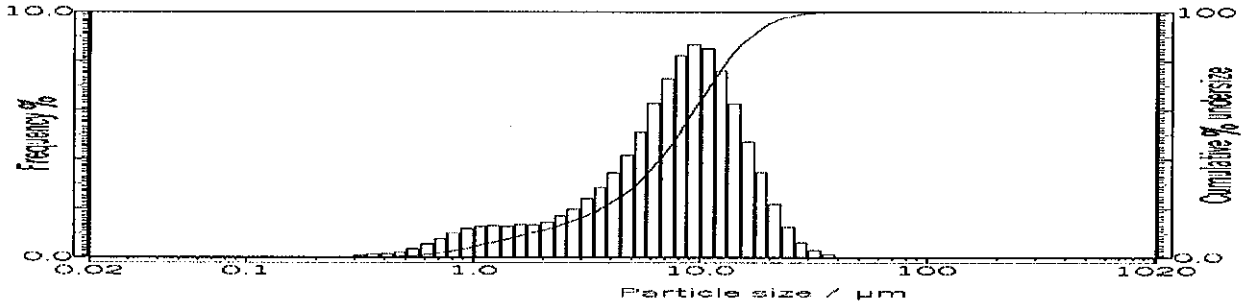
File Name: Cumulative times at run conditions with individual run settings **highlighted**.

[LOAD-IN]: **P6** = ? min; **S1** = ? min

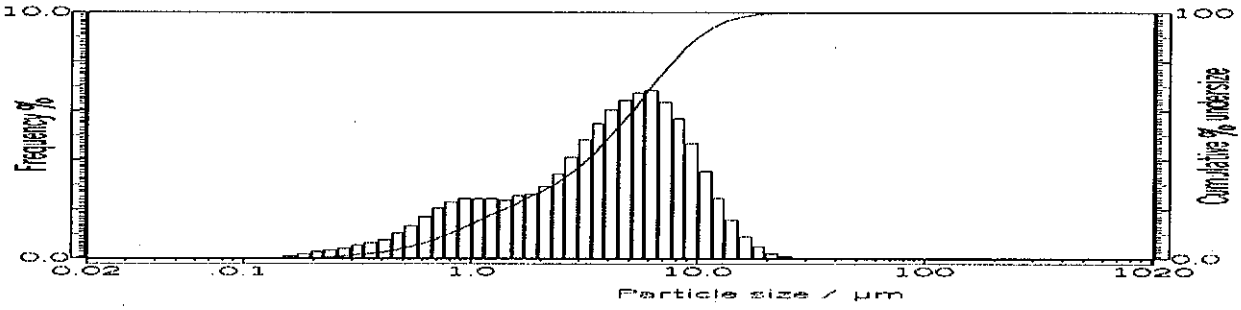
AY101840: **P6** = 3 min; **S1** = 3 min; S3 = 0 min; US = 0 min; DT = 0 min



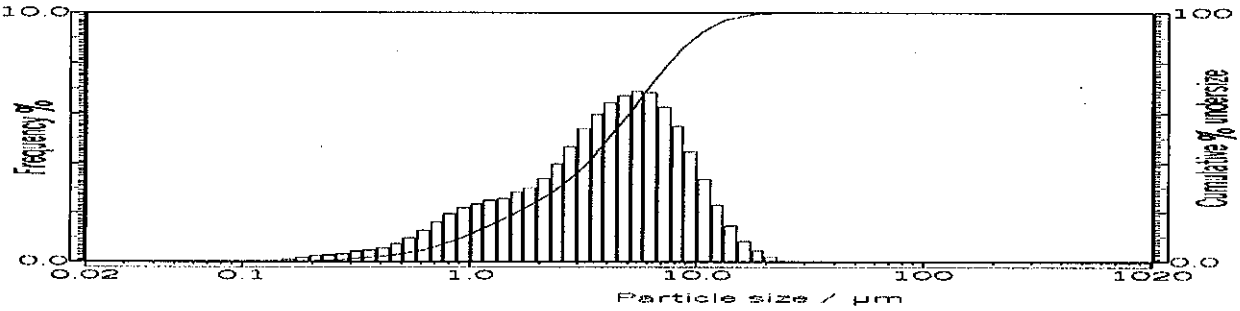
AY101841: **P6** = 7 min; S1 = 3 min; **S3** = 4 min; US = 0 min; DT = 0 min



AY101842: **P6** = 31 min; **S1** = 27 min; S3 = 4 min; **US** = 20 min; **DT** = 0 min



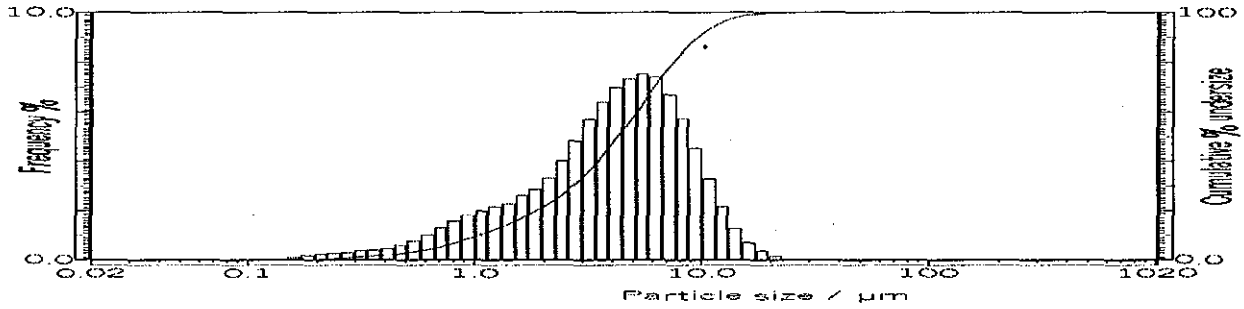
AY101843: **P6** = 34 min; S1 = 27 min; **S3** = 7 min; US = 20 min; DT = 4 min



Continued: AY-101 Composite: Sample S01T001492.

[DELAY]: **P0** (Pump OFF); **S0** (Stirrer OFF); **DT** = 60 min

AY101849: **P6** = 38 min; **S1** = 31 min; S3 = 7 min; US = 20 min; DT = 67 min



AY101850: **P6** = 40 min; S1 = 31 min; **S3** = 9 min; US = 20 min; DT = 71 min

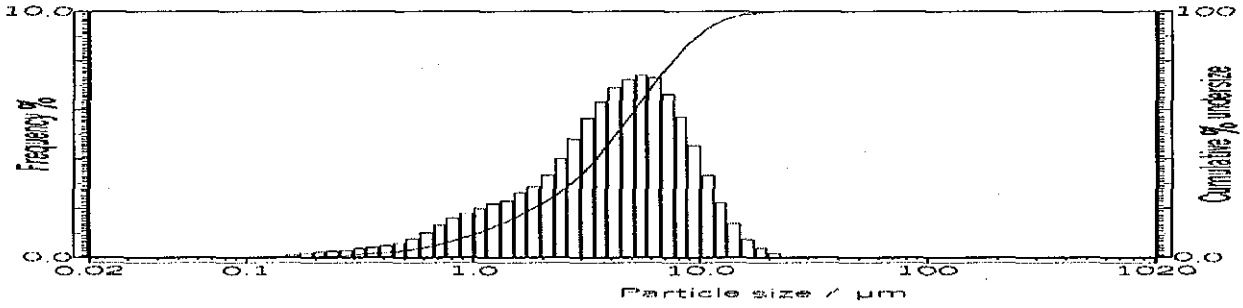
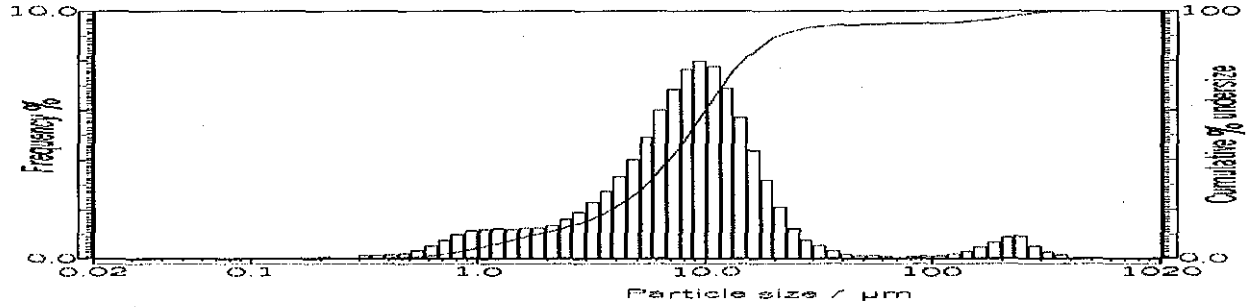


Figure 28. AY-101 Composite: Volume-based PSDs from set of runs on sample S01T001490. (Two Pages)

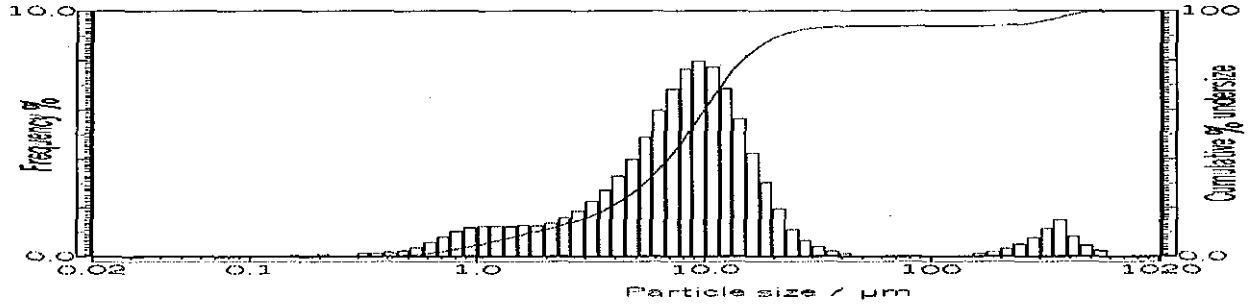
File Name: Cumulative times at run conditions with individual run settings **highlighted**.

[LOAD-IN]: **P6** = ? min; **S3** = ? min

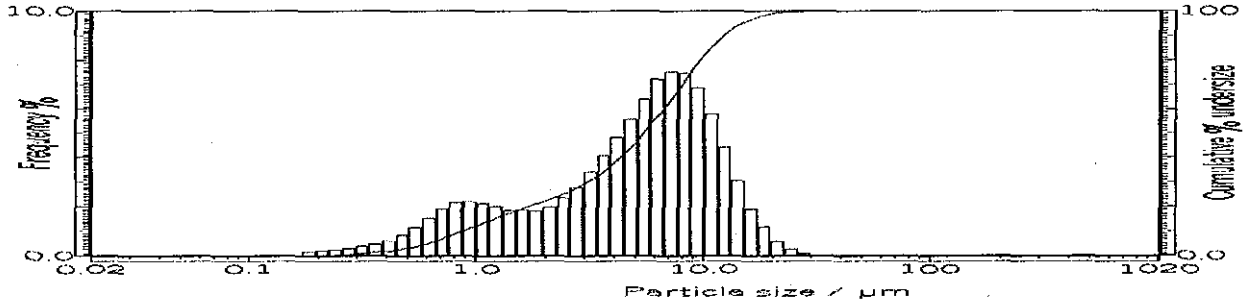
AY101851: **P6** = 3 min; S1 = 0 min; **S3** = 3 min; US = 0 min; DT = 0 min



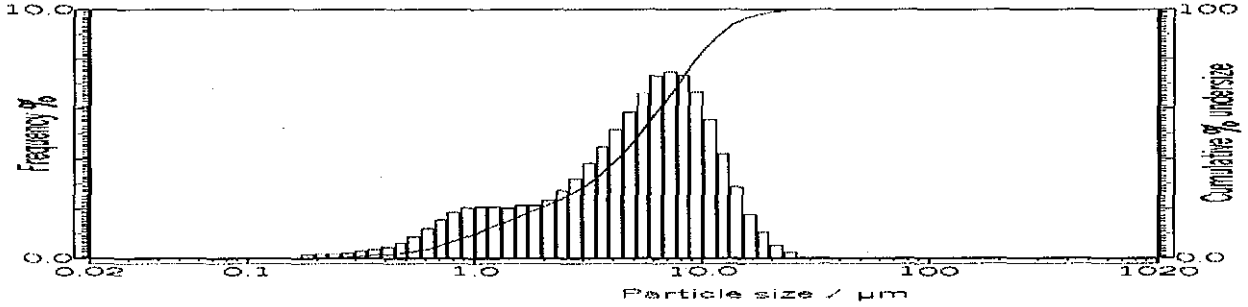
AY101852: **P6** = 6 min; **S1** = 3 min; S3 = 3 min; US = 0 min; DT = 0 min



AY101853: **P6** = 11 min; S1 = 3 min; **S3** = 8 min; **US** = 2 min; **DT** = 0 min



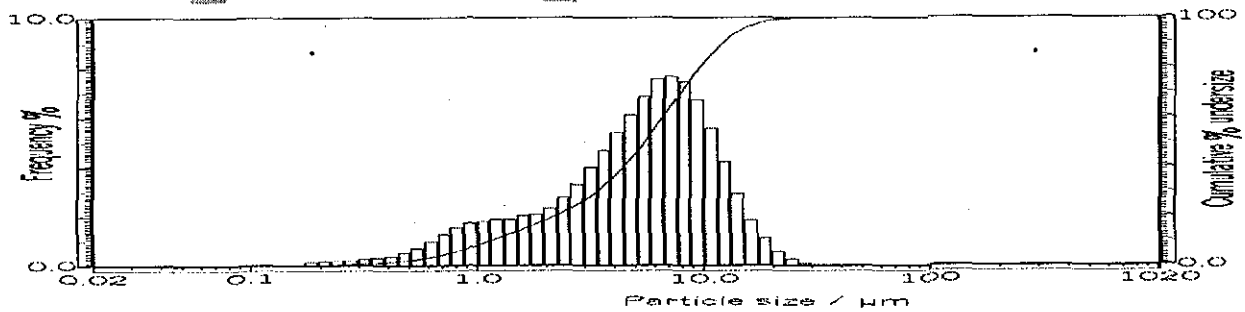
AY101854: **P6** = 14 min; **S1** = 6 min; S3 = 8 min; US = 2 min; DT = 3 min



Continued: AY-101 Composite: Sample S01T001490.

[DELAY]: **P0** (Pump OFF); **S0** (Stirrer OFF); **DT** = 60 min

AY101860: **P6** = 17 min; S1 = 6 min; **S3** = 11 min; US = 2 min; DT = 66 min



AY101861: **P6** = 20 min; **S1** = 9 min; S3 = 11 min; US = 2 min; DT = 69 min

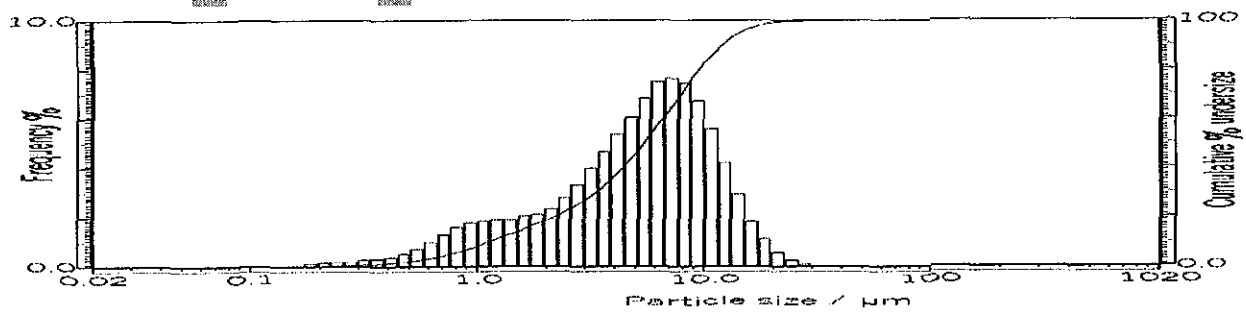
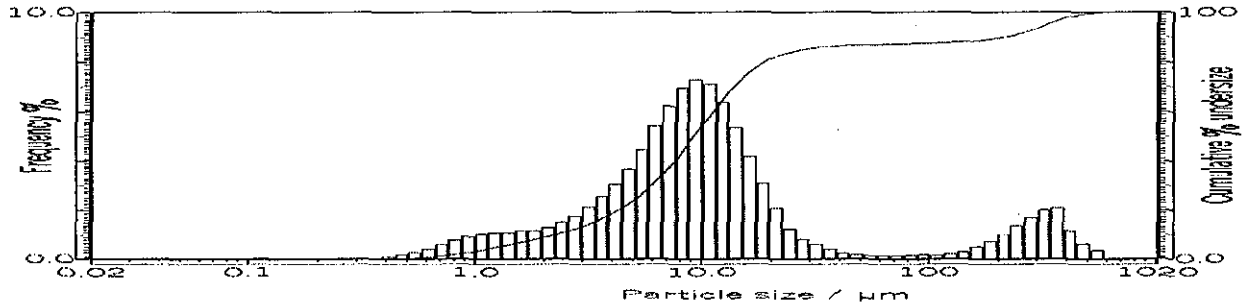


Figure 29. AY-101 Composite: Volume-based PSDs from set of runs on sample S01T001491. (Two Pages)

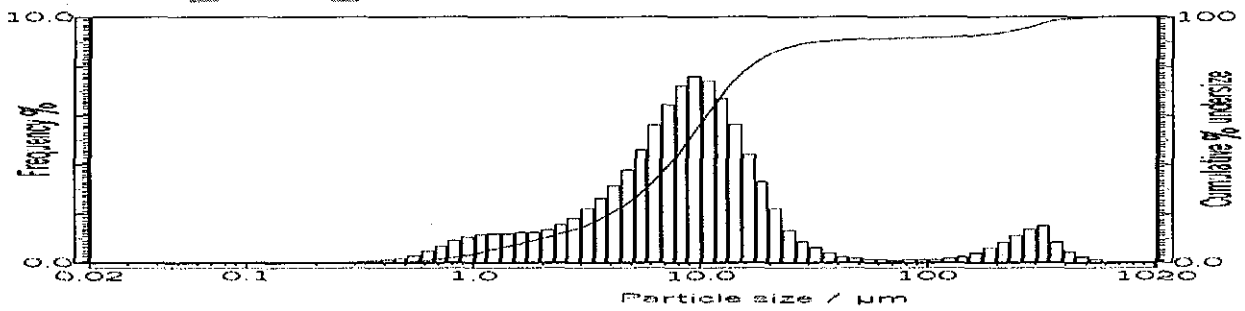
File Name: Cumulative times at run conditions with individual run settings **highlighted**.

[LOAD-IN]: **P6** = ? *min*; **S3** = ? *min*

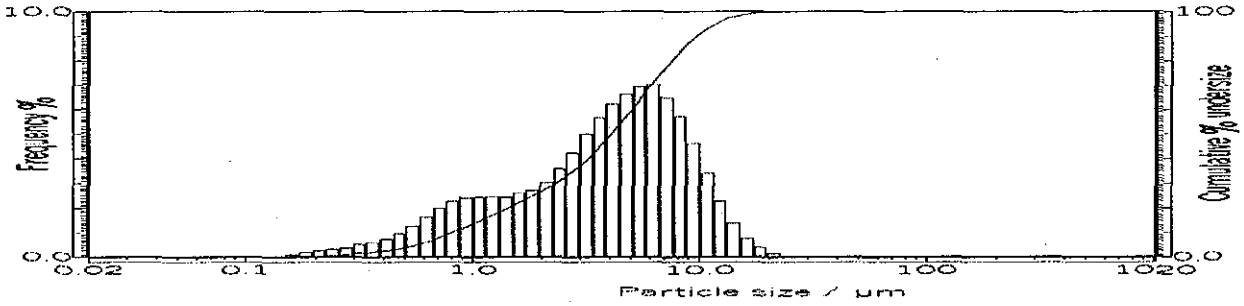
AY101862: **P6** = 3 min; S1 = 0 min; **S3** = 3 min; US = 0 min; DT = 0 min



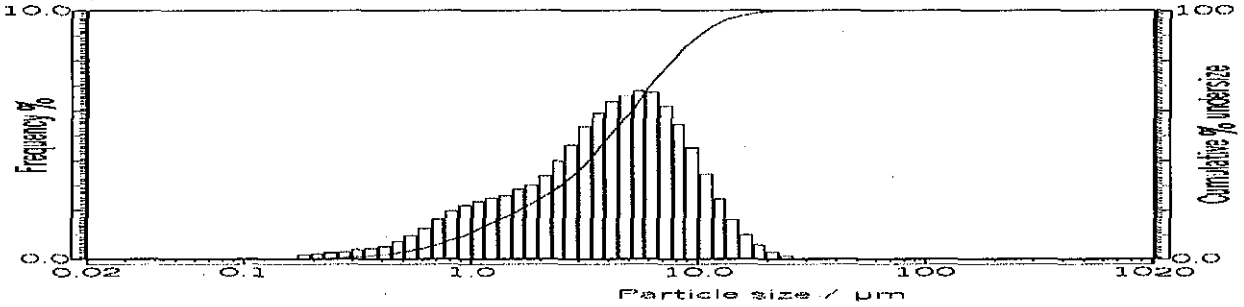
AY101863: **P6** = 6 min; **S1** = 3 min; S3 = 3 min; US = 0 min; DT = 0 min



AY101864: **P6** = 30 min; S1 = 3 min; **S3** = 27 min; **US** = 20 min; **DT** = 0 min



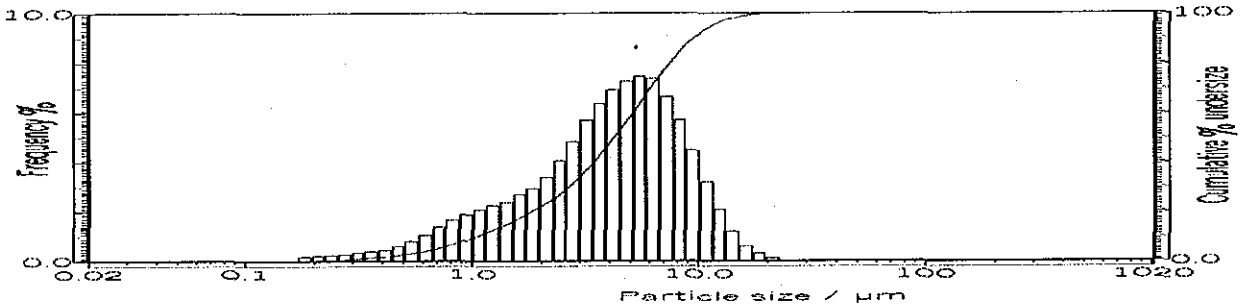
AY101865: **P6** = 33 min; **S1** = 6 min; S3 = 27 min; US = 20 min; DT = 4 min



Continued: AY-101 Composite: Sample S01T001491.

[DELAY]: **P0** (Pump OFF); **S0** (Stirrer OFF); **DT** = 60 min

AY101871: **P6** = 37 min; S1 = 6 min; **S3** = 31 min; US = 20 min; DT = 67 min



AY101872: **P6** = 39 min; **S1** = 8 min; S3 = 31 min; US = 20 min; DT = 71 min

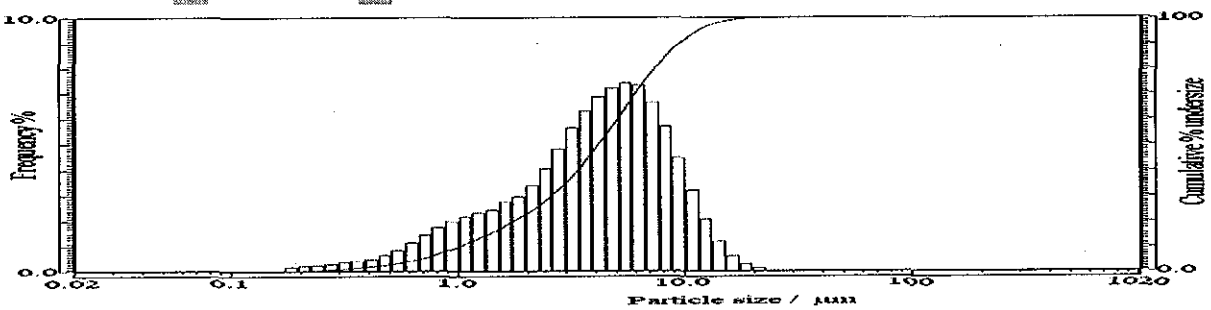


Table 15. AY-101 Composite: Mean particle diameters of volume-based PSDs.

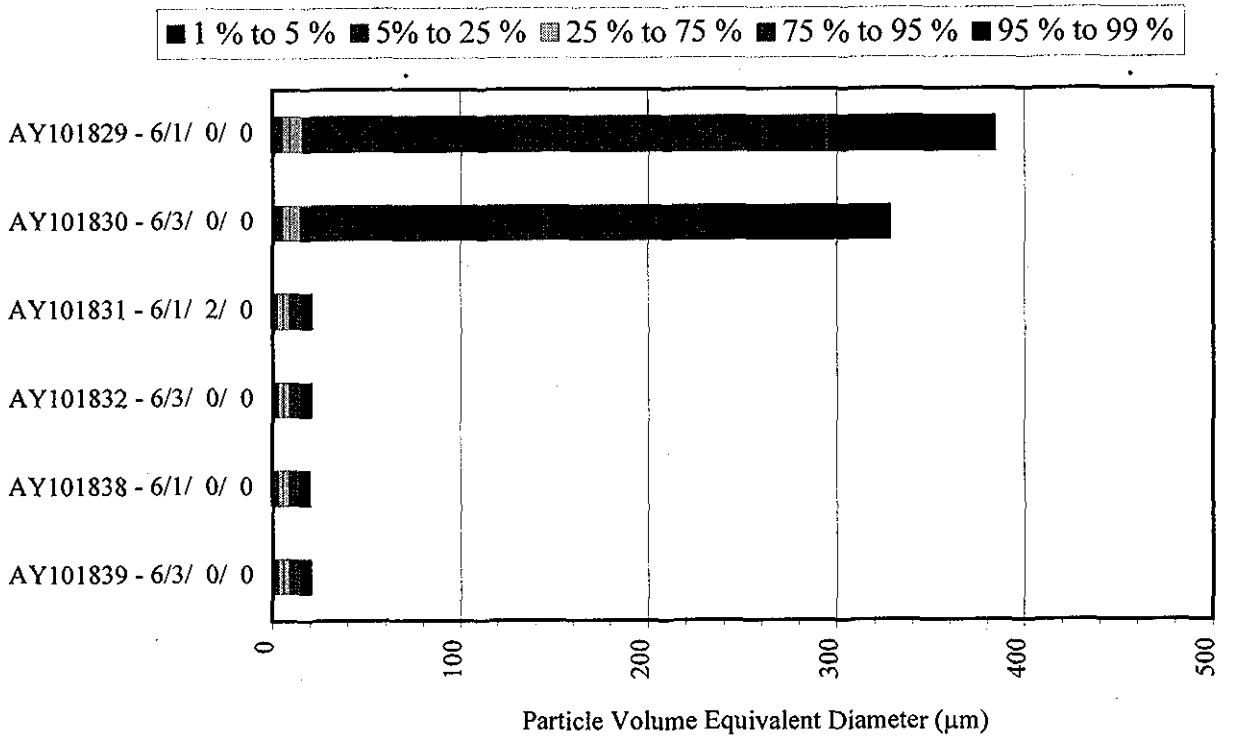
Sample	PSD Run File Name	Run Conditions				Mean Diameter (μm)	Standard Deviation (μm)
		P	S	US	DT		
S01T001489	AY101829	6	1	0	0	46.9	9.4
	AY101830	6	3	0	0	33.5	73.4
	AY101831	6	1	2	0	6.3	4.7
	AY101832	6	3	0	0	6.2	4.6
	AY101838	6	1	0	0	6.3	4.4
	AY101839	6	3	0	0	6.3	4.4
S01T001492	AY101840	6	1	0	0	53.0	114.9
	AY101841	6	3	0	0	8.7	5.8
	AY101842	6	1	20	0	4.9	3.8
	AY101843	6	3	0	0	4.8	3.6
	AY101849	6	1	0	0	4.9	3.4
	AY101850	6	3	0	0	4.9	3.5
S01T001490	AY101851	6	3	0	0	19.0	46.6
	AY101852	6	1	0	0	29.5	84.0
	AY101853	6	3	2	0	6.1	4.5
	AY101854	6	1	0	0	6.0	4.3
	AY101860	6	3	0	0	6.2	4.4
	AY101861	6	1	0	0	6.1	4.4
S01T001491	AY101862	6	3	0	0	46.1	103.6
	AY101863	6	1	0	0	31.8	79.2
	AY101864	6	3	20	0	4.8	3.6
	AY101865	6	1	0	0	4.9	3.8
	AY101871	6	3	0	0	4.8	3.4
	AY101872	6	1	0	0	4.8	3.4

Table 16. AY-101 Composite: Percentages of particles in volume-based PSDs with diameters less than the indicated values.

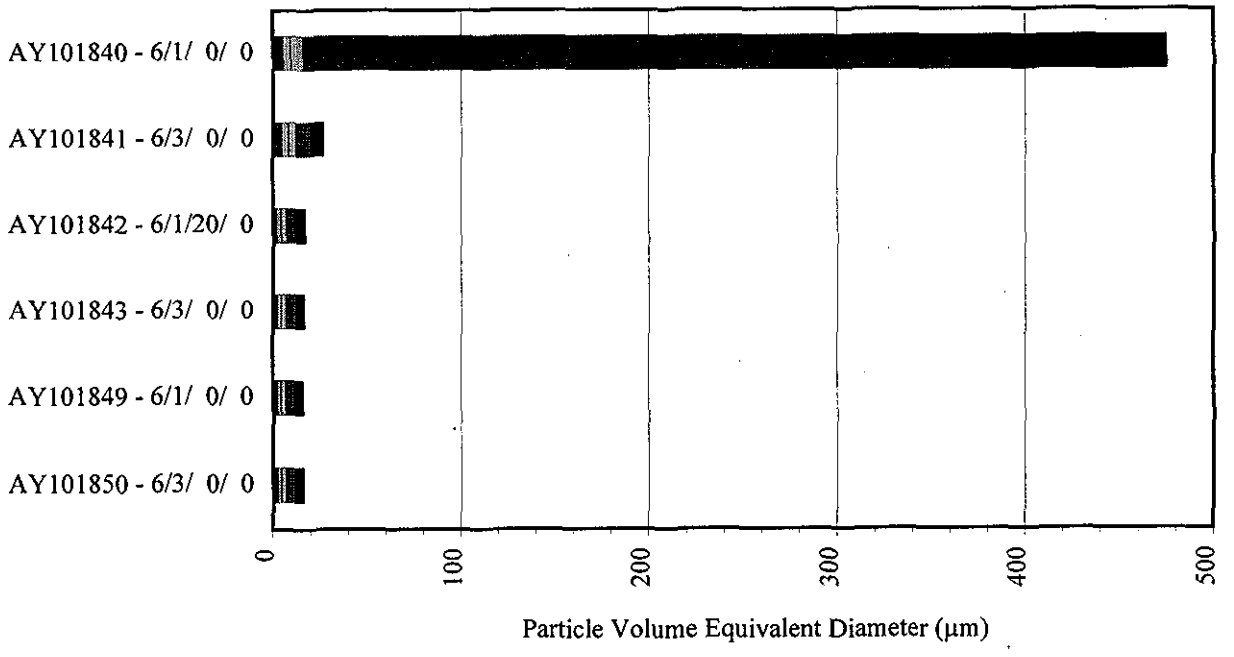
Sample	In Distributions Based on the Total Volume of Spherical Particles						
PSD Run	1 %	5 %	25 %	50 %	75 %	95 %	99 %
	Of the Particles Have Diameters Less Than (μm)						
S01T001489							
AY101829 - 6/1/ 0/ 0	0.63	1.17	5.1	9.2	15.8	295.6	384.3
AY101830 - 6/3/ 0/ 0	0.60	1.12	4.9	8.8	14.5	229.8	328.2
AY101831 - 6/1/ 2/ 0	0.30	0.61	2.5	5.6	8.9	15.0	20.9
AY101832 - 6/3/ 0/ 0	0.32	0.71	2.7	5.5	8.7	14.9	20.7
AY101838 - 6/1/ 0/ 0	0.34	0.79	2.9	5.5	8.6	14.5	19.9
AY101839 - 6/3/ 0/ 0	0.34	0.80	2.9	5.6	8.7	14.8	20.4
S01T001492							
AY101840 - 6/1/ 0/ 0	0.60	1.17	5.2	9.3	15.9	359.3	475.1
AY101841 - 6/3/ 0/ 0	0.58	1.05	4.5	8.0	11.9	19.6	26.7
AY101842 - 6/1/20/ 0	0.26	0.54	1.8	4.1	6.9	12.1	17.1
AY101843 - 6/3/ 0/ 0	0.27	0.63	2.0	4.1	6.7	11.8	16.6
AY101849 - 6/1/ 0/ 0	0.28	0.68	2.3	4.2	6.7	11.4	15.9
AY101850 - 6/3/ 0/ 0	0.27	0.67	2.3	4.2	6.8	11.6	16.3
S01T001490							
AY101851 - 6/3/ 0/ 0	0.56	1.05	4.6	8.3	13.0	60.2	261.6
AY101852 - 6/1/ 0/ 0	0.55	1.03	4.6	8.3	12.9	263.2	432.6
AY101853 - 6/3/ 2/ 0	0.30	0.61	2.4	5.5	8.7	14.6	19.9
AY101854 - 6/1/ 0/ 0	0.32	0.69	2.5	5.3	8.5	14.3	19.4
AY101860 - 6/3/ 0/ 0	0.33	0.74	2.8	5.5	8.6	14.5	19.9
AY101861 - 6/1/ 0/ 0	0.33	0.74	2.7	5.4	8.6	14.5	19.8
S01T001491							
AY101862 - 6/3/ 0/ 0	0.67	1.25	5.2	9.2	16.7	327.8	451.7
AY101863 - 6/1/ 0/ 0	0.62	1.14	4.9	8.8	14.3	249.7	386.4
AY101864 - 6/3/20/ 0	0.26	0.56	1.8	4.1	6.8	11.6	16.1
AY101865 - 6/1/ 0/ 0	0.29	0.64	2.0	4.1	6.8	12.3	17.5
AY101871 - 6/3/ 0/ 0	0.30	0.69	2.2	4.2	6.7	11.3	15.5
AY101872 - 6/1/ 0/ 0	0.30	0.68	2.2	4.2	6.6	11.3	15.4

Figure 30. AY-101 Composite: Diameters of particles (μm) within defined, volume-based, percentile ranges.. (Two Pages)

AY-101 Composite: S01T001489

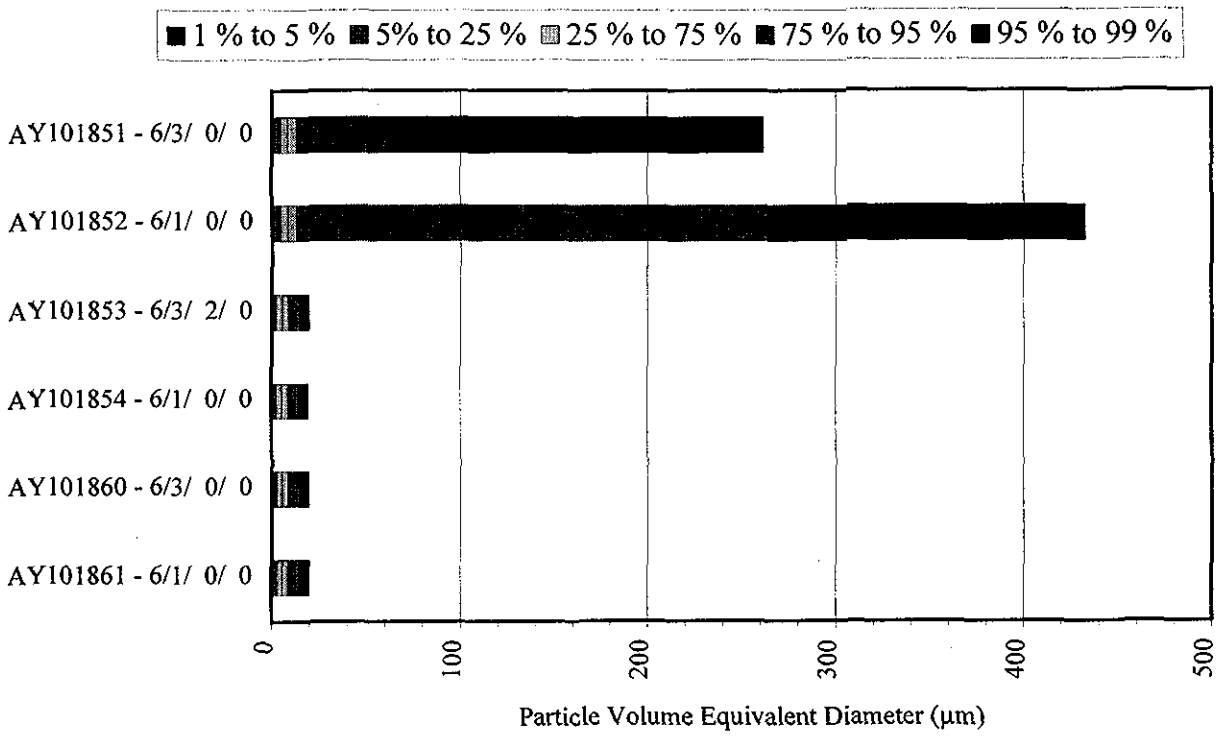


AY-101 Composite: S01T001492



Continued:

AY-101 Composite: S01T001490



AY-101 Composite: S01T001491

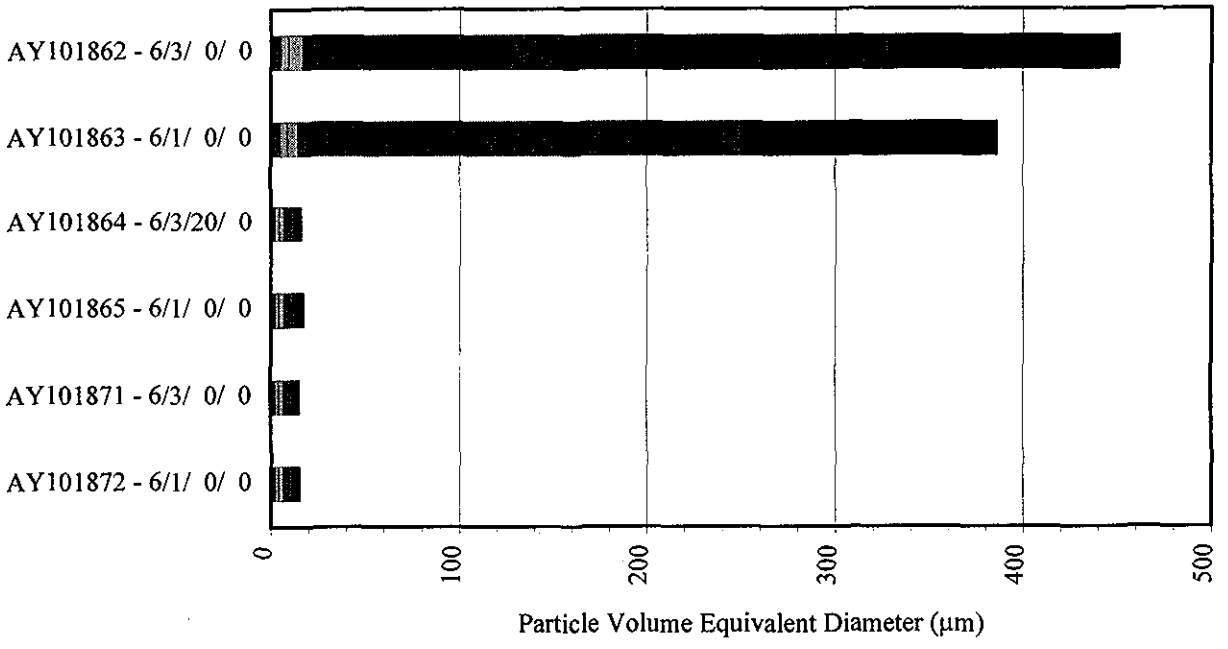
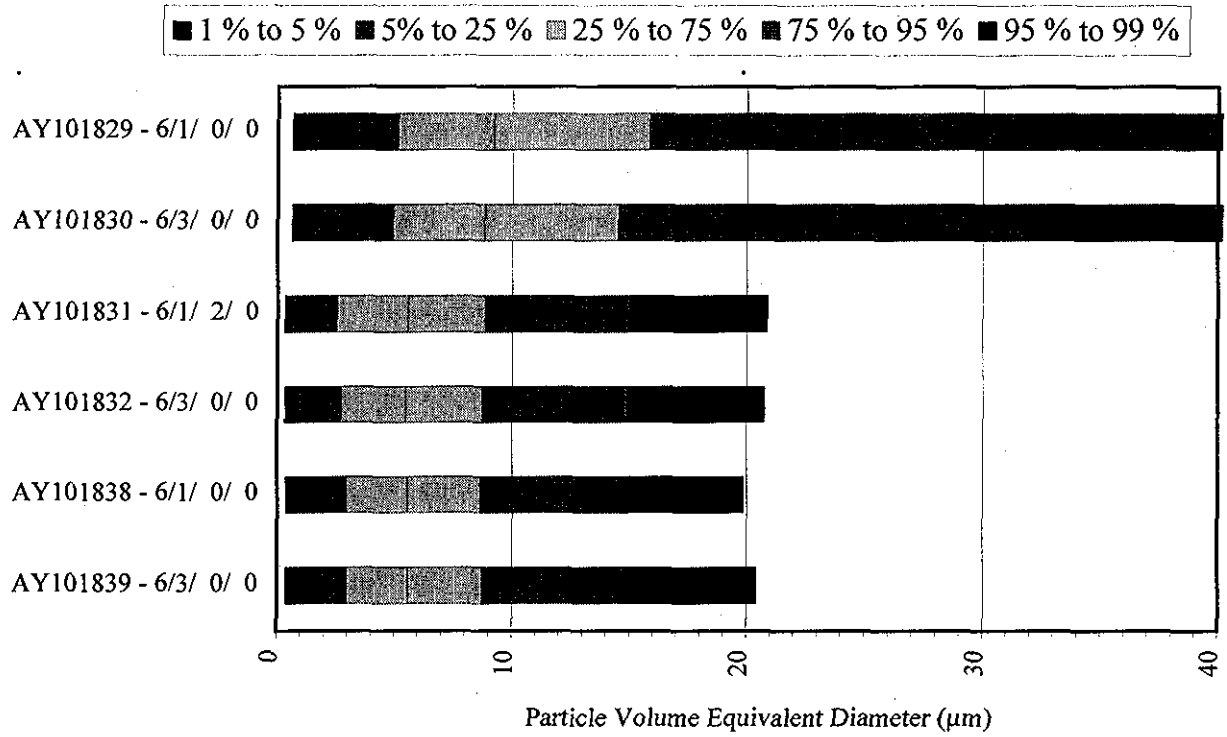
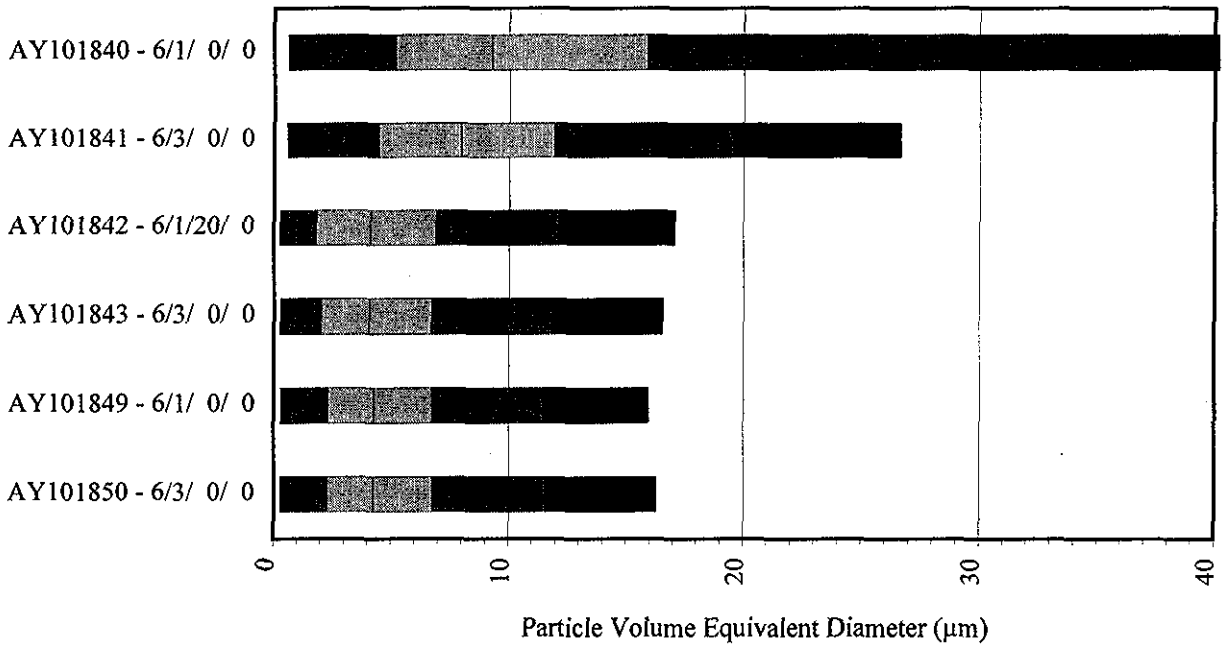


Figure 31. AY-101 Composite: Expanded scale plots of diameters of particles (μm) within defined, volume-based, percentile ranges. (Two Pages)

AY-101 Composite: S01T001489

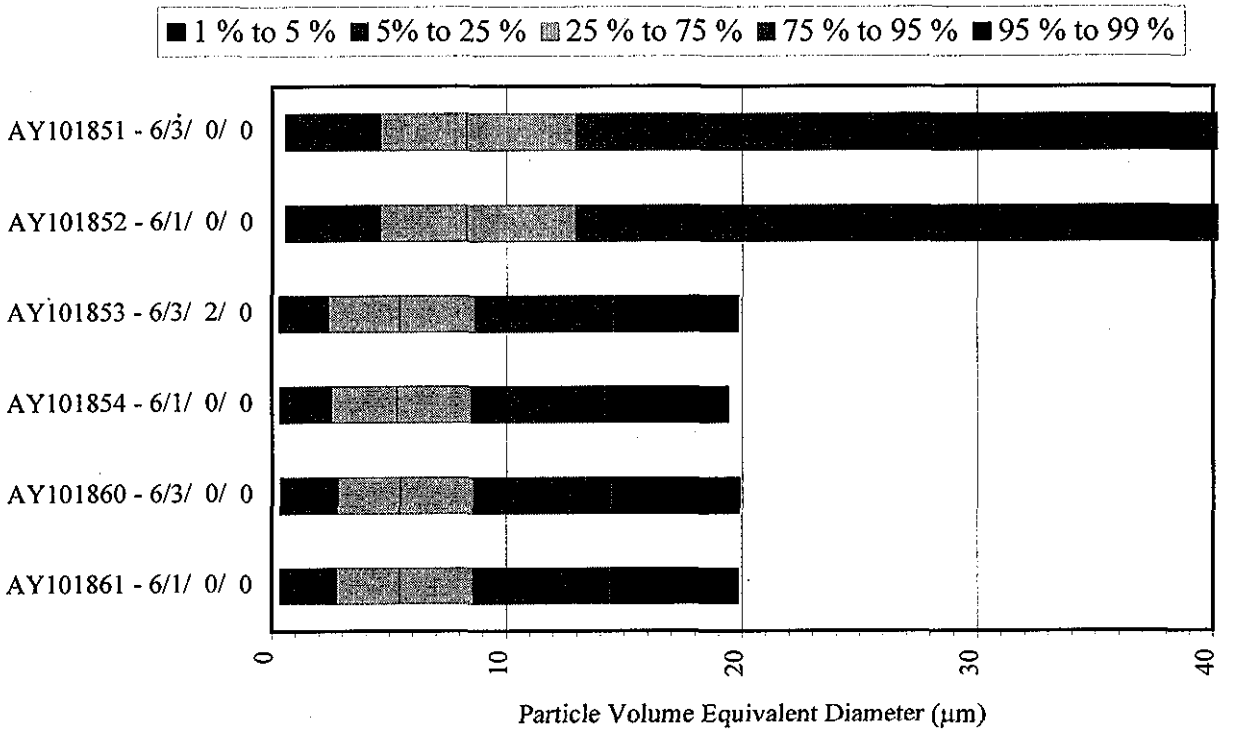


AY-101 Composite: S01T001492

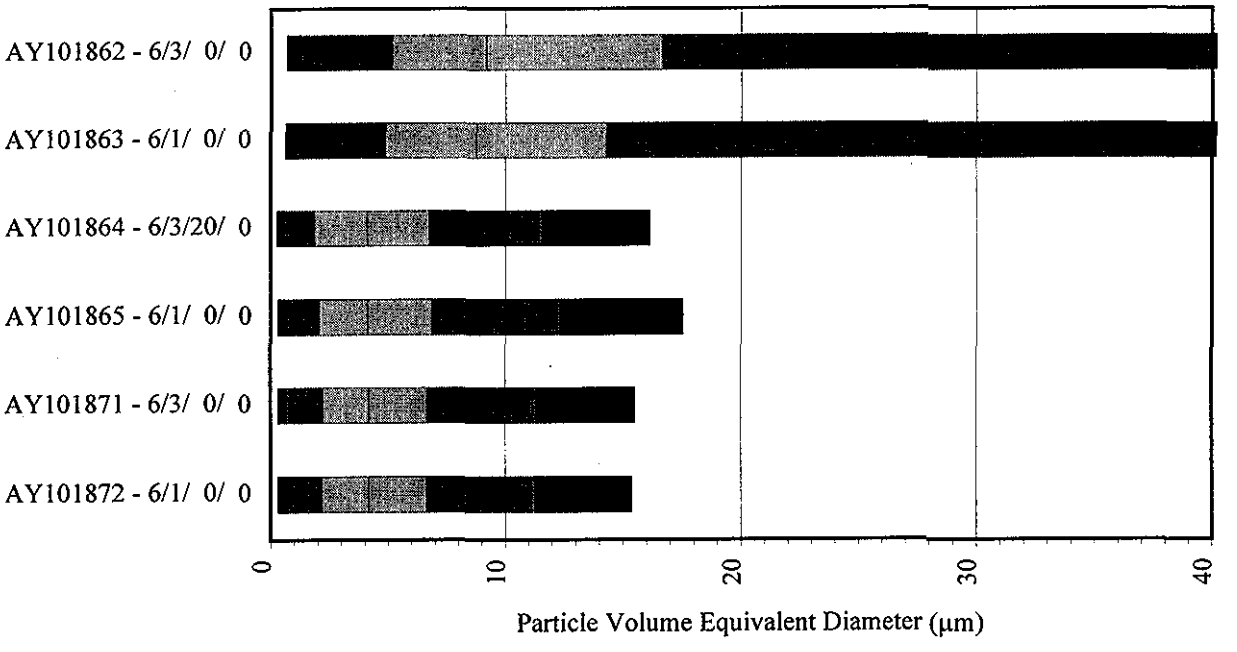


Continued:

AY-101 Composite: S01T001490



AY-101 Composite: S01T001491



Data and Observations—C-104. The measurement results summarized in Figures 32 through 36 and Tables 22 and 23 are presented in the format previously described in Sec. 4.2.1.

The initial PSDs for the C-104 composite samples are quite broad with varying contributions from particles with diameters ranging from 0.2 μm to 600 μm. The first two PSDs in each measurement set vary, qualitatively, little either within or between sets indicating that the particulates in the C-104 samples are not overly sensitive to the pumping and stirring regimes in the analyzer. The modal particle diameter for all these PSDs is in the range of 3 μm to 5 μm. There is a much greater contribution to the C-104 PSDs from particles with diameters in the 10 μm to 100 μm range than was observed for either the AW-103 or the AY-101 composites.

Ultrasonic treatment for 20 minutes (Figures 33, 35, and 36) completely eliminates particles with diameters >70 μm from the PSDs. The sonication is observed to shift the particle diameters to smaller values throughout the entire distribution. As a result, the <1 μm populations significantly increase relative to the original 1 μm to 10 μm components. The primary modes of the PSDs also increase, as the contributions from particles with diameters from 10 μm to 100 μm are enhanced, presumably, by the breakup of the >100 μm particles.

Ultrasonic treatment for 2 minutes (Figures 32, 34, and 36) significantly reduces but does not completely eliminate the contribution of particles with diameters >100 μm to the PSDs. Otherwise, the same distribution-wide shift to smaller particle diameters observed for the 20-minute sonication sets was also observed for the 2-minute sonication sets. Of particular note, following the 2-minute sonications, the contribution to the PSDs by >100 μm particles was greater when the stirrer speed was at the higher S3 setting than when the slower S1 stir speed was used.

The post-ultrasonic treatment PSDs suggest that there may be two different populations of larger particles in the C-104 composites: >100 μm particles/agglomerates that are broken up by two minutes of sonication and have a low enough density to allow them to be easily suspended by mild stirring; and more robust >100 μm particles/agglomerates that are still present after 20 minutes of sonication and have a high enough density to require stirring at the higher S3 speed to efficiently suspend them in the specimen slurries.

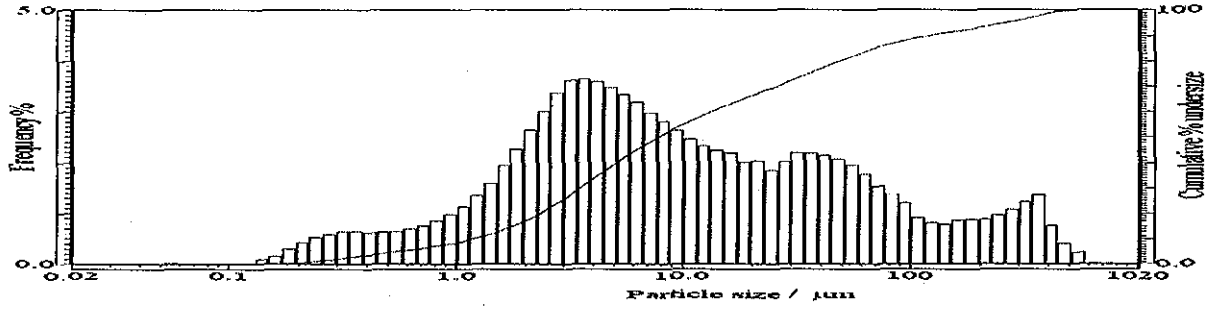
The PSDs observed in all four measurement sets were unaffected by imposition of the 60-minute delay periods. The apparent differences observed in the PSDs following the delay periods for the measurement sets with 2 minute sonication periods (Figures 32 and 34) are attributed to the stirring rate effects described above.

Figure 32. C-104 Composite: Volume-based PSDs from set of runs on sample S01T001447. (Two Pages)

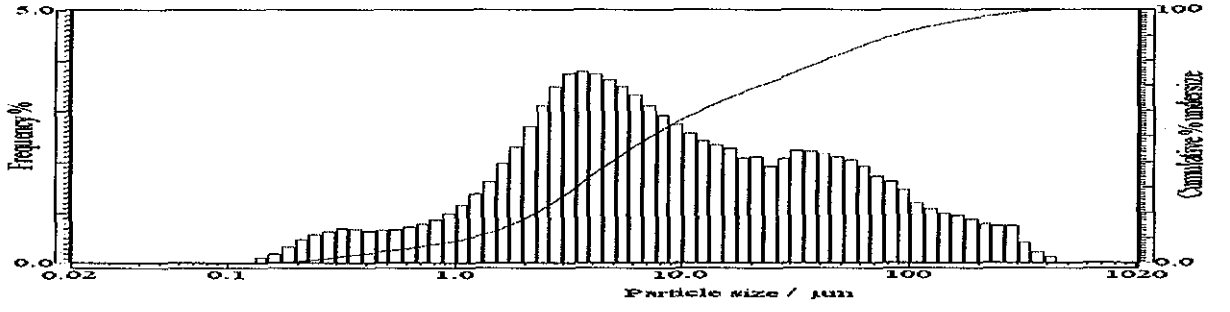
File Name: Cumulative times at run conditions with individual run settings highlighted.

[LOAD-IN]: P6 = ? min; S1 = ? min

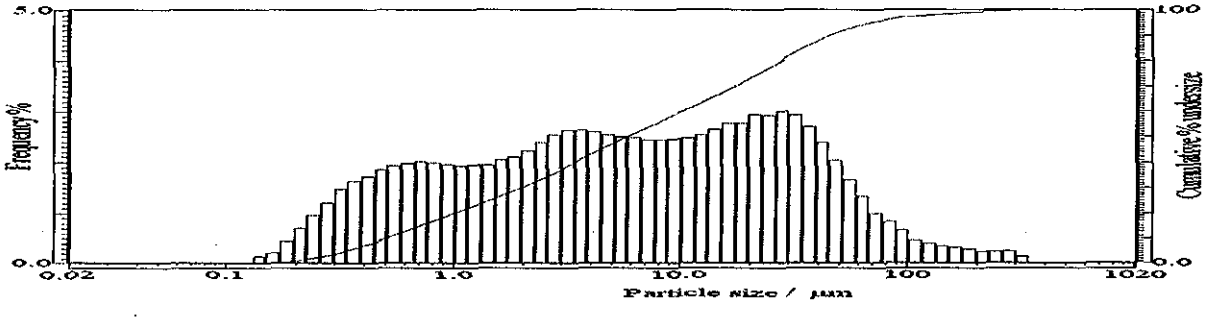
C104780: P6 = 4 min; S1 = 4 min; S3 = 0 min; US = 0 min; DT = 0 min



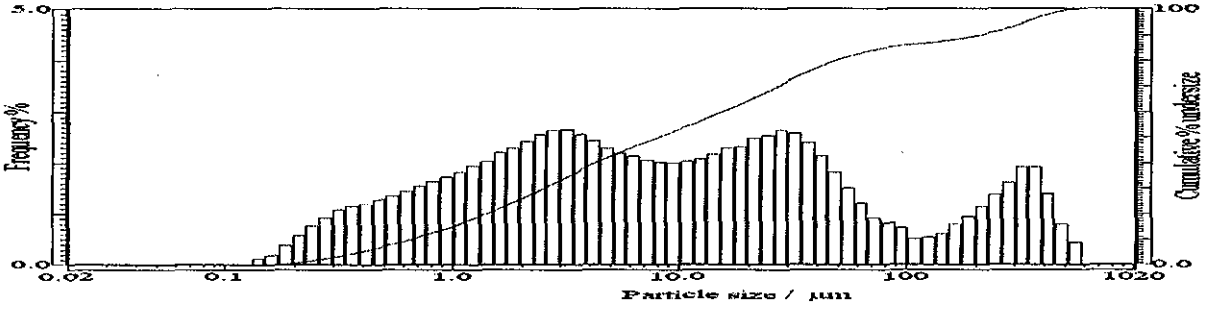
C104781: P6 = 8 min; S1 = 4 min; S3 = 4 min; US = 0 min; DT = 0 min



C104782: P6 = 13 min; S1 = 9 min; S3 = 4 min; US = 2 min; DT = 0 min



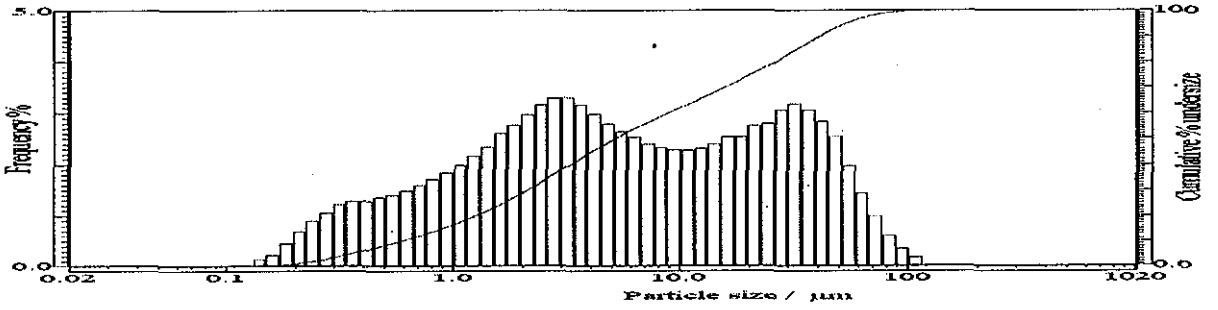
C104783: P6 = 17 min; S1 = 9 min; S3 = 8 min; US = 2 min; DT = 3 min



Continued: C-104 Composite: Sample S01T001447.

[DELAY]: **P0** (Pump OFF); **S0** (Stirrer OFF); **DT** = 60 min

C104789: **P6** = *20 min;* **S1** = *12 min;* S3 = *8 min;* US = *2 min;* DT = *67 min*



C104790: **P6** = *23 min;* S1 = *12 min;* **S3** = *11 min;* US = *2 min;* DT = *70 min*

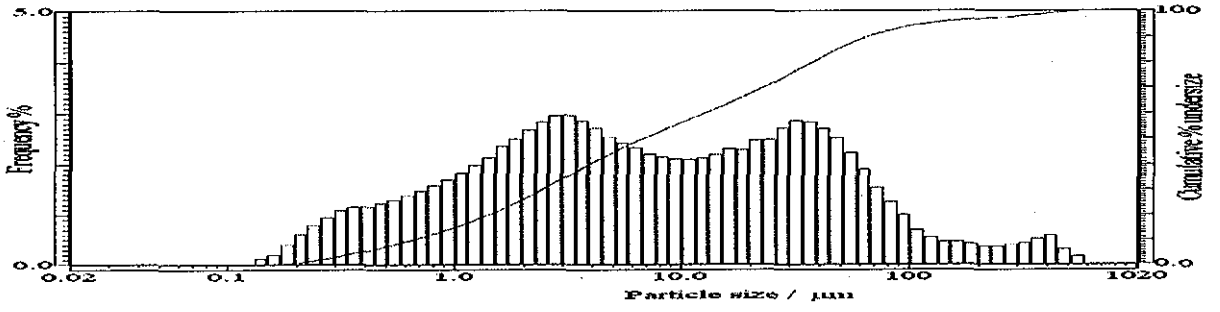
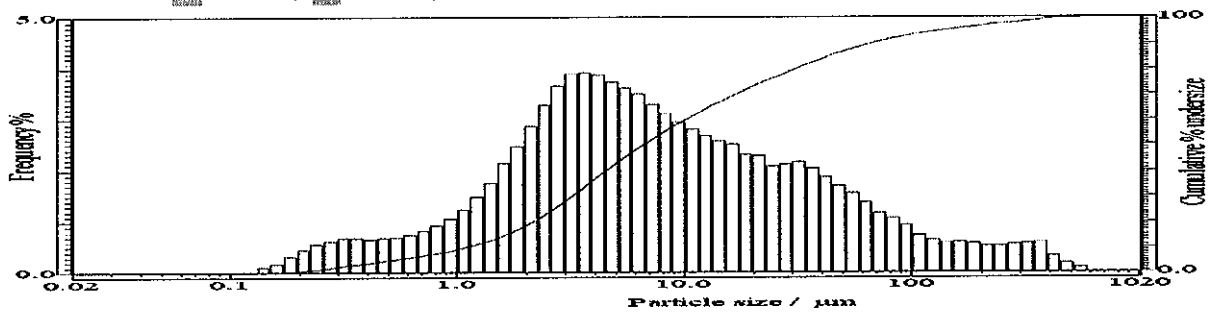


Figure 33. C-104 Composite: Volume-based PSDs from set of runs on sample S01T001448. (Two Pages)

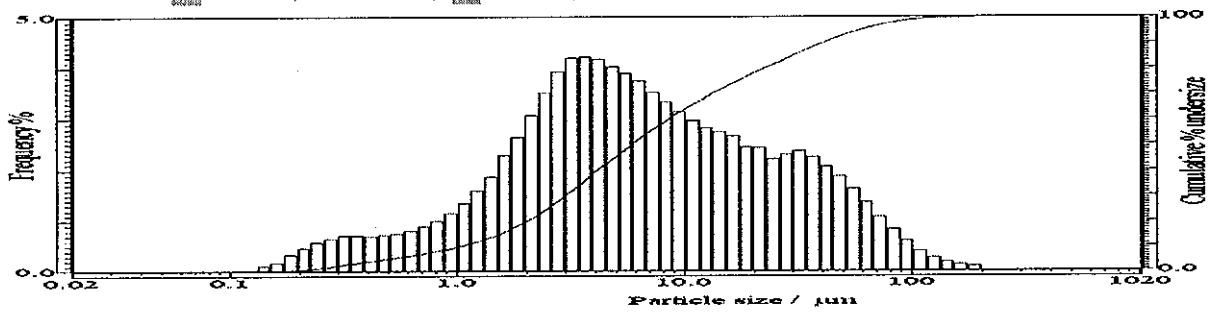
File Name: Cumulative times at run conditions with individual run settings highlighted.

[LOAD-IN]: P6 = ? min; S1 = ? min

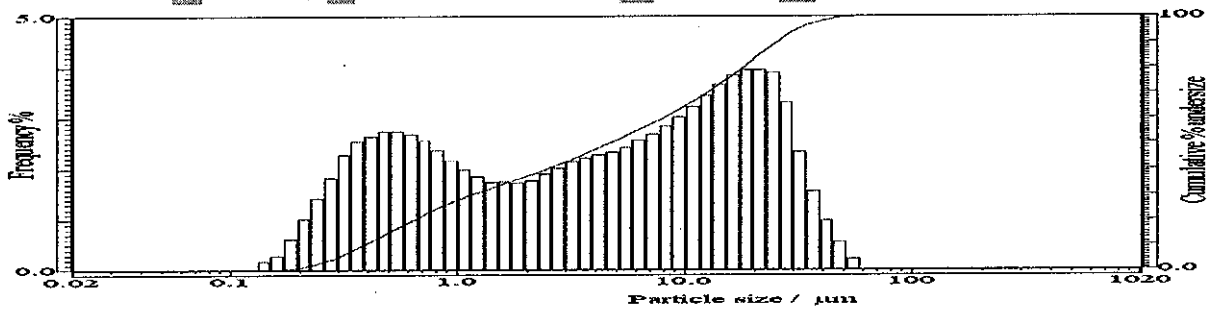
C104791: P6 = 4 min; S1 = 4 min; S3 = 0 min; US = 0 min; DT = 0 min



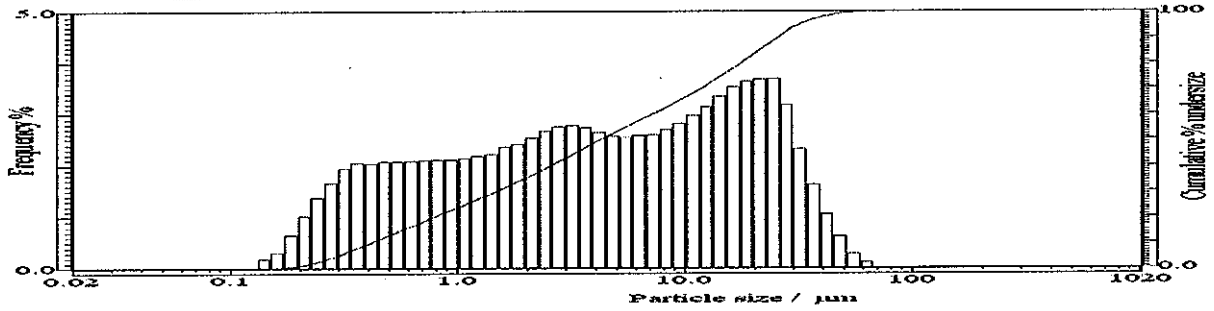
C104792: P6 = 8 min; S1 = 4 min; S3 = 4 min; US = 0 min; DT = 0 min



C104793: P6 = 32 min; S1 = 28 min; S3 = 4 min; US = 20 min; DT = 0 min



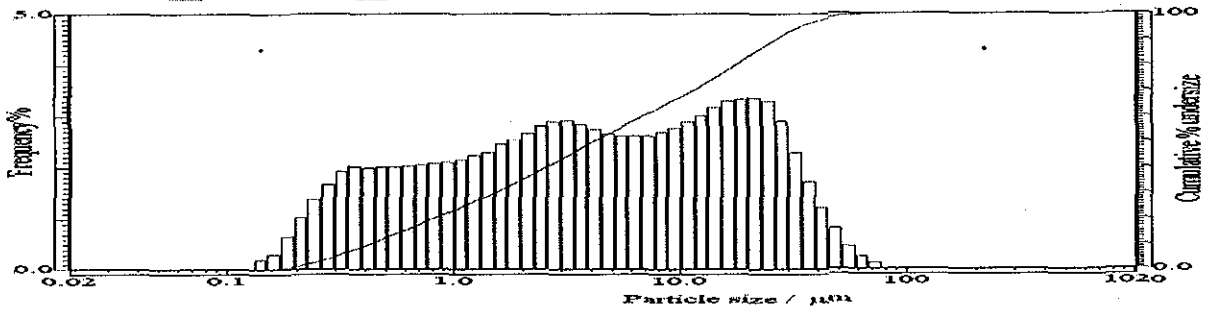
C104794: P6 = 35 min; S1 = 28 min; S3 = 7 min; US = 20 min; DT = 4 min



Continued: C-104 Composite: Sample S01T001448.

[DELAY]: **P0** (Stirrer OFF); **S0** (Stirrer OFF); **DT** = 60 min

C104800: **P6** = 39 min; **S1** = 32 min; S3 = 7 min; US = 20 min; DT = 67 min



C104801: **P6** = 41 min; S1 = 32 min; **S3** = 9 min; US = 20 min; DT = 71 min

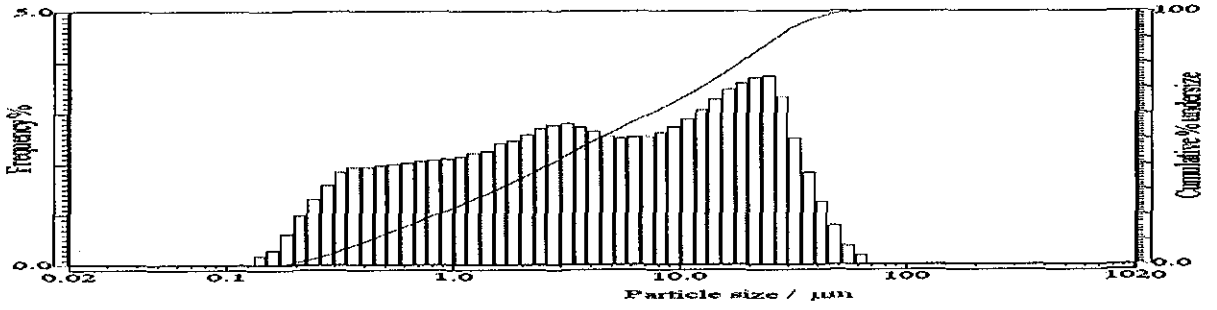
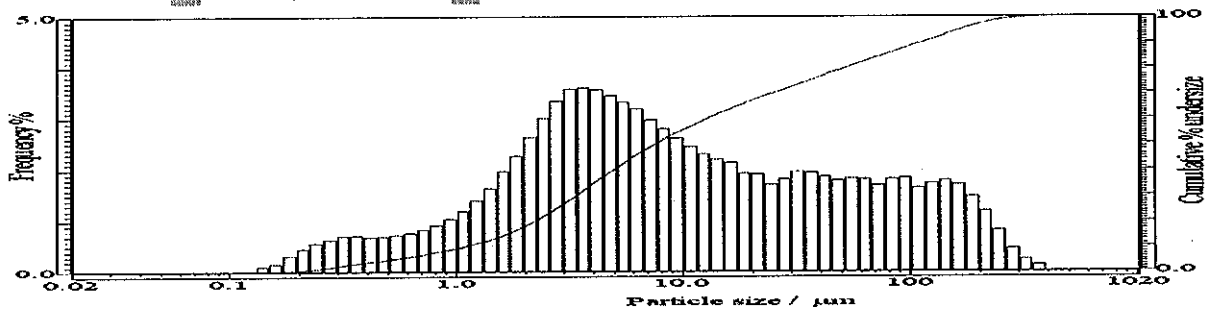


Figure 34: C-104 Composite: Volume-based PSDs from set of runs on sample S01T001449. (Two Pages)

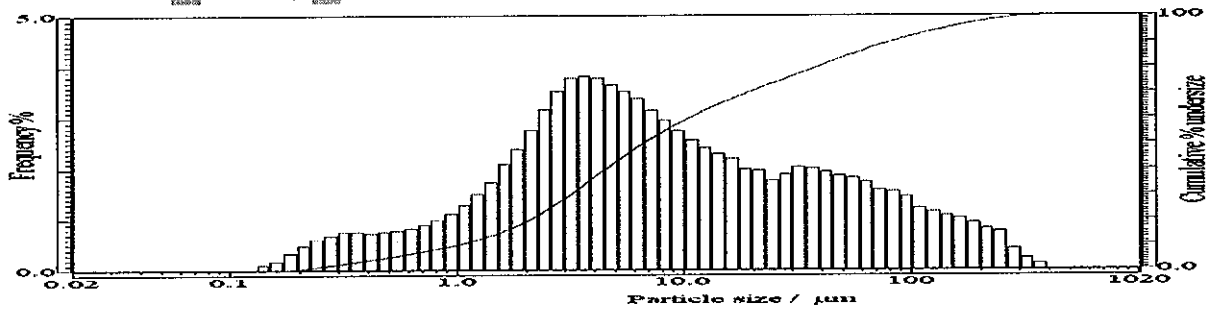
File Name: Cumulative times at run conditions with individual run settings highlighted.

[LOAD-IN]: P6 = ? min; S3 = ? min

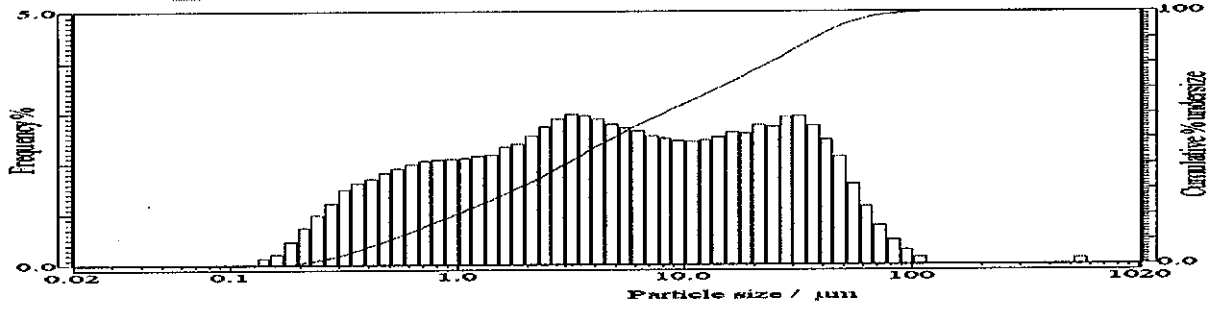
C104802: P6 = 4 min; S1 = 0 min; S3 = 4 min; US = 0 min; DT = 0 min



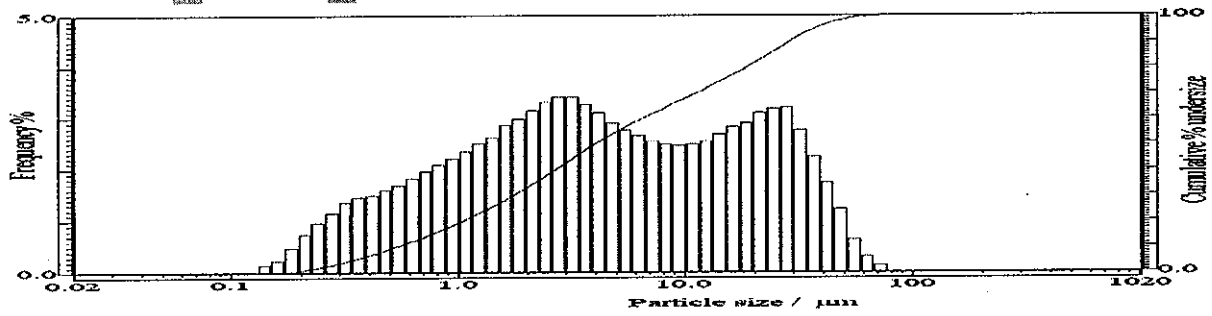
C104803: P6 = 7 min; S1 = 3 min; S3 = 4 min; US = 0 min; DT = 0 min



C104804: P6 = 12 min; S1 = 3 min; S3 = 9 min; US = 2 min; DT = 0 min



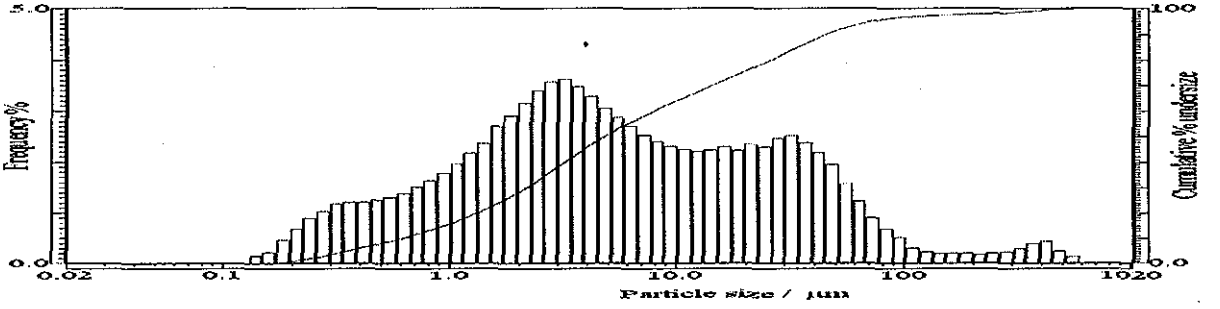
C104805: P6 = 16 min; S1 = 7 min; S3 = 9 min; US = 2 min; DT = 3 min



Continued: C-104 Composite: Sample S01T001449.

[DELAY]: **P0** (Pump OFF); **S0** (Stirrer OFF); **DT = 60** min

C104811: **P6** = 20 min; S1 = 7 min; **S3** = 13 min; US = 2 min; DT = 67 min



C104812: **P6** = 22 min; **S1** = 9 min; S3 = 13 min; US = 2 min; DT = 71 min

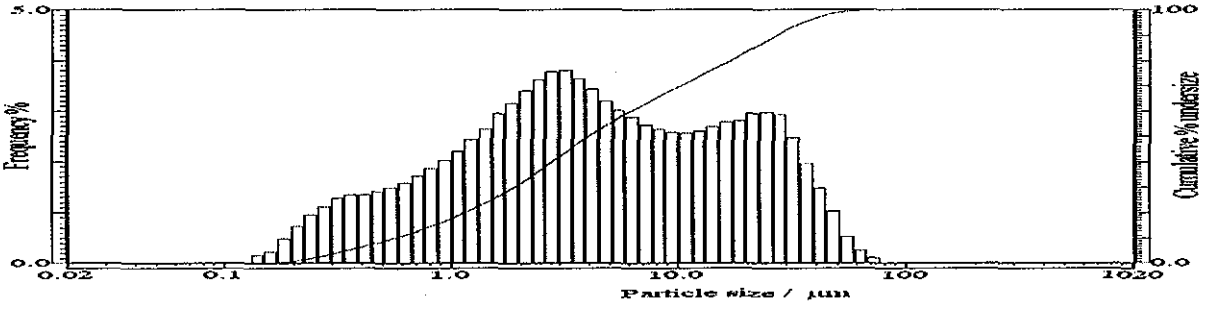
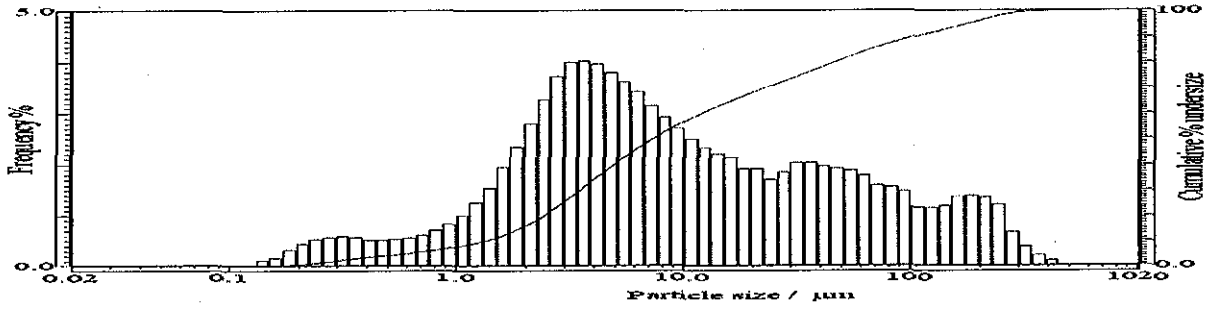


Figure 35. C-104 Composite: Volume-based PSDs from set of runs on sample S01T001451. (Two Pages)

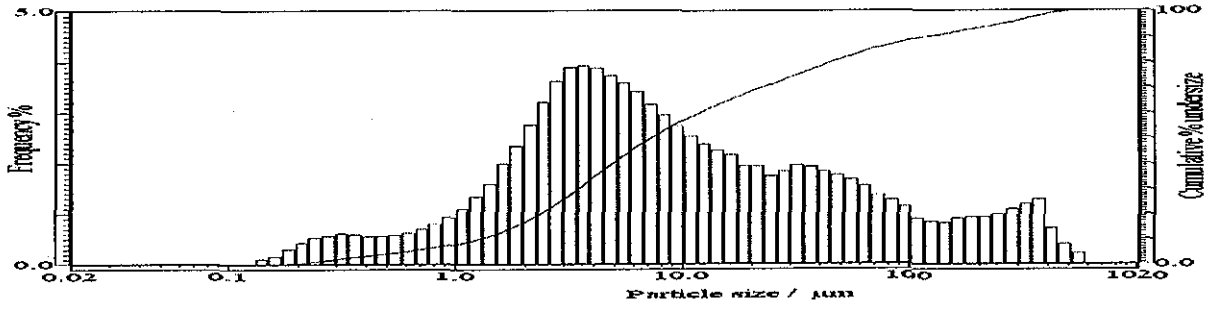
File Name: Cumulative times at run conditions with individual run settings **highlighted**.

[LOAD-IN]: **P6** = ? min; **S3** = ? min

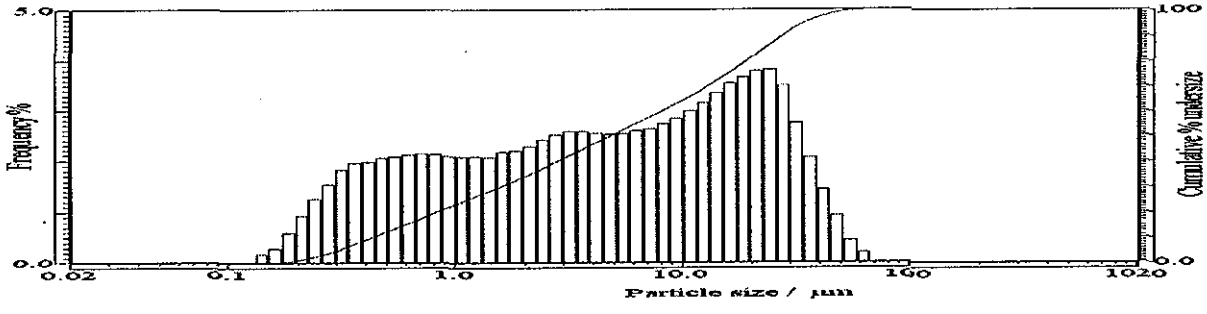
C104815: **P6** = 3 min; S1 = 0 min; **S3** = 3 min; US = 0 min; DT = 0 min



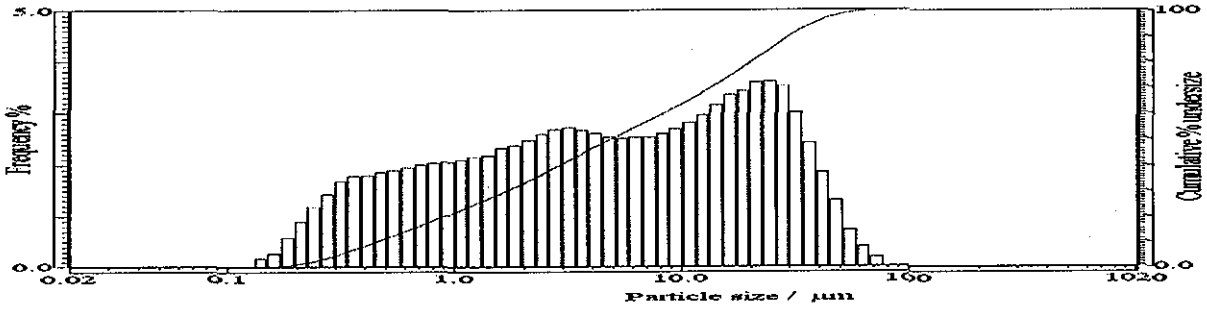
C104816: **P6** = 8 min; **S1** = 5 min; S3 = 3 min; US = 0 min; DT = 0 min



C104817: **P6** = 34 min; S1 = 5 min; **S3** = 29 min; **US** = 20 min; **DT** = 0 min



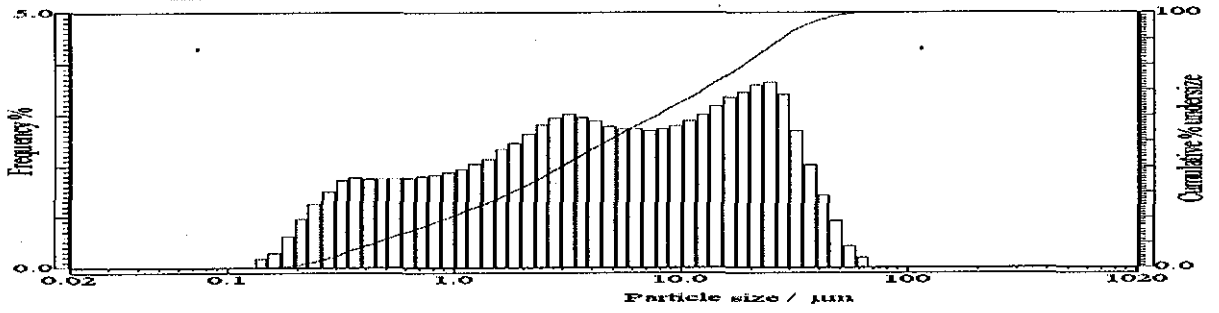
C104818: **P6** = 37 min; **S1** = 8 min; S3 = 29 min; US = 20 min; DT = 6 min



Continued: C-104 Composite: Sample S01T001451.

[DELAY]: **P0** (Stirrer OFF); **S0** (Stirrer OFF); **DT** = 60 min

C104824: **P6** = 42 min; S1 = 8 min; **S3** = 34 min; US = 20 min; DT = 69 min



C104825: **P6** = 44 min; **S1** = 10 min; S3 = 34 min; US = 20 min; DT = 74 min

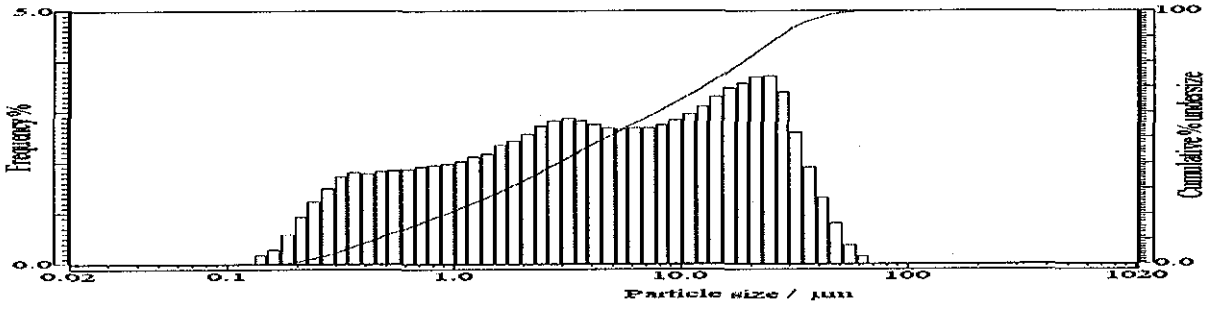


Table 17. C-104 Composite: Mean particle diameters of volume-based PSDs.

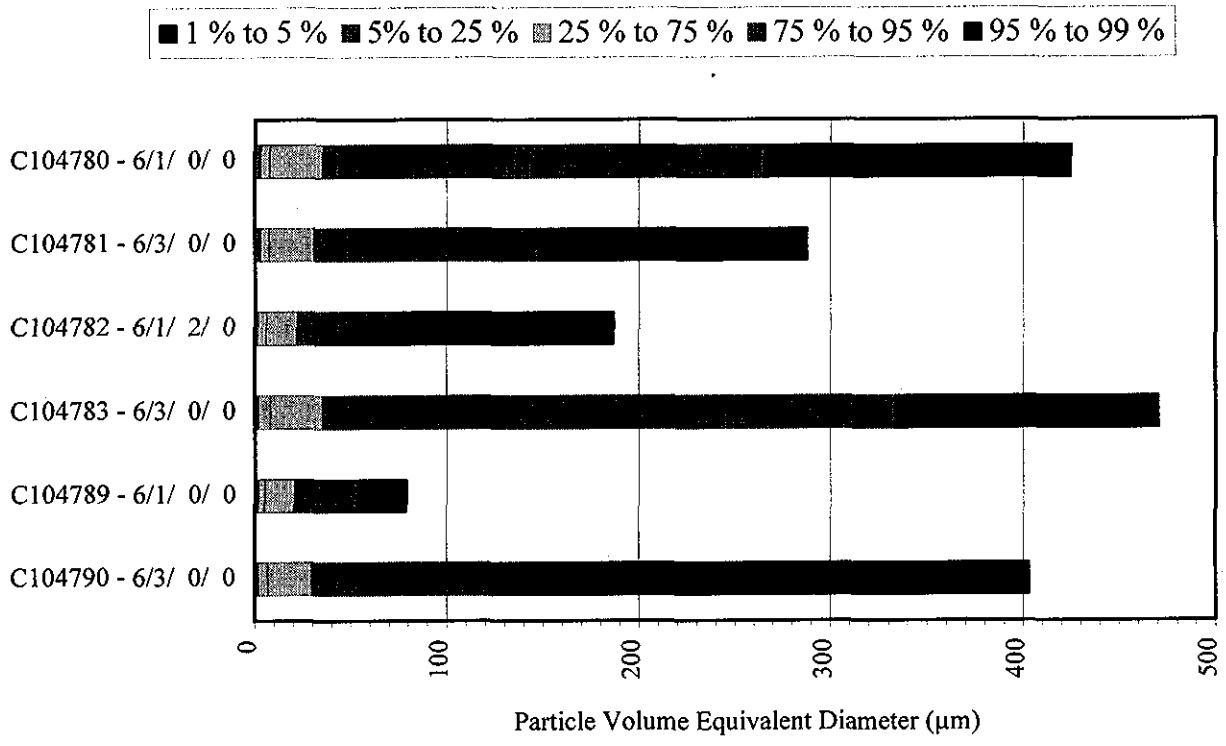
Sample	PSD Run File Name	Run Conditions				Mean Diameter (μm)	Standard Deviation (μm)
		P	S	US	DT		
S01T001447	C104780	6	1	0	0	43.0	87.7
	C104781	6	3	0	0	30.3	56.1
	C104782	6	1	2	0	18.2	33.8
	C104783	6	3	0	0	52.9	106.5
	C104789	6	1	0	0	14.0	18.3
	C104790	6	3	0	0	29.9	67.3
S01T001448	C104791	6	1	0	0	28.6	64.4
	C104792	6	3	0	0	14.7	21.9
	C104793	6	1	20	0	9.3	10.6
	C104794	6	3	0	0	9.2	10.9
	C104800	6	1	0	0	9.3	11.5
	C104801	6	3	0	0	9.6	11.3
S01T001449	C104802	6	3	0	0	33.8	56.6
	C104803	6	1	0	0	27.9	50.8
	C104804	6	3	2	0	13.5	25.6
	C104805	6	1	0	0	9.9	12.5
	C104811	6	3	0	0	21.6	56.8
	C104812	6	1	0	0	9.4	11.8
S01T001451	C104815	6	3	0	0	33.7	60.7
	C104816	6	1	0	0	41.8	86.7
	C104817	6	3	20	0	10.1	11.7
	C104818	6	1	0	0	10.8	12.9
	C104824	6	3	0	0	9.9	11.6
	C104825	6	1	0	0	9.8	11.4

Table 18. C-104 Composite: Percentages of particles in volume-based PSDs with diameters less than the indicated values.

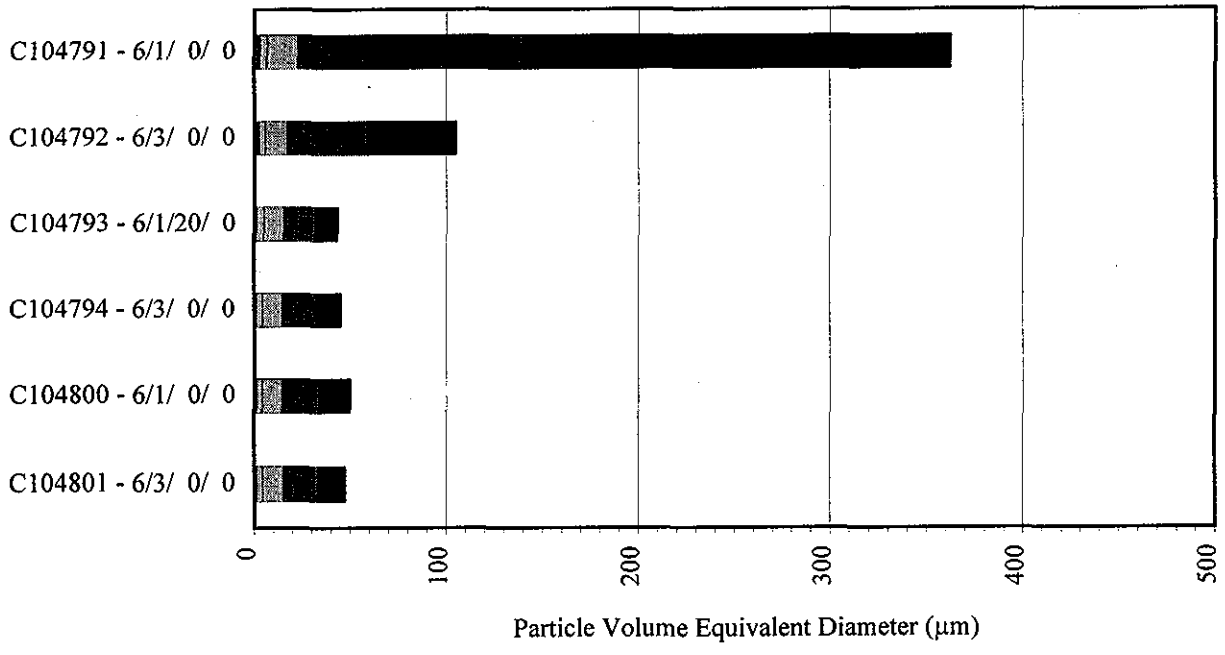
Sample	In Distributions Based on the Total Volume of Spherical Particles						
PSD Run	1 %	5 %	25 %	50 %	75 %	95 %	99 %
	Of Particles Have Diameters Less Than (μm)						
S01T001447							
C104780 - 6/1/ 0/ 0	0.23	0.54	2.87	7.8	35.2	265.2	425.3
C104781 - 6/3/ 0/ 0	0.22	0.52	2.81	7.3	30.7	147.6	288.2
C104782 - 6/1/ 2/ 0	0.21	0.34	1.42	5.8	21.9	68.9	187.1
C104783 - 6/3/ 0/ 0	0.21	0.38	1.92	8.0	35.2	333.6	470.8
C104789 - 6/1/ 0/ 0	0.21	0.35	1.67	5.1	20.6	53.4	79.4
C104790 - 6/3/ 0/ 0	0.21	0.38	1.89	6.6	29.4	119.8	403.3
S01T001448							
C104791 - 6/1/ 0/ 0	0.22	0.51	2.65	6.5	22.5	140.2	362.8
C104792 - 6/3/ 0/ 0	0.22	0.50	2.50	5.8	17.0	59.0	105.5
C104793 - 6/1/20/ 0	0.19	0.29	0.84	4.7	15.0	31.1	43.6
C104794 - 6/3/ 0/ 0	0.19	0.29	1.09	4.2	14.4	31.8	45.4
C104800 - 6/1/ 0/ 0	0.19	0.29	1.12	4.1	14.0	33.5	50.2
C104801 - 6/3/ 0/ 0	0.19	0.30	1.15	4.3	15.0	33.2	47.8
S01T001449							
C104802 - 6/3/ 0/ 0	0.22	0.51	2.78	7.6	36.3	166.1	256.2
C104803 - 6/1/ 0/ 0	0.22	0.48	2.62	6.6	27.4	140.2	252.9
C104804 - 6/3/ 2/ 0	0.20	0.33	1.35	4.8	18.2	50.2	79.0
C104805 - 6/1/ 0/ 0	0.20	0.34	1.38	4.1	14.6	37.1	52.6
C104811 - 6/3/ 0/ 0	0.20	0.36	1.72	4.8	19.1	71.5	371.6
C104812 - 6/1/ 0/ 0	0.20	0.34	1.51	4.0	13.2	35.2	50.9
S01T001451							
C104815 - 6/3/ 0/ 0	0.22	0.61	2.94	7.3	33.1	180.8	283.7
C104816 - 6/1/ 0/ 0	0.22	0.58	2.87	7.2	31.7	258.9	420.8
C104817 - 6/3/20/ 0	0.20	0.30	1.14	4.9	15.9	34.4	48.9
C104818 - 6/1/ 0/ 0	0.20	0.31	1.26	4.9	16.7	38.1	54.6
C104824 - 6/3/ 0/ 0	0.19	0.30	1.32	4.7	15.3	34.3	48.9
C104825 - 6/1/ 0/ 0	0.19	0.30	1.27	4.7	15.2	33.6	47.9

Figure 36. C-104 Composite: Diameters of particles (μm) within defined, volume-based, percentile ranges. (Two Pages)

C-104 Composite: S01T001447

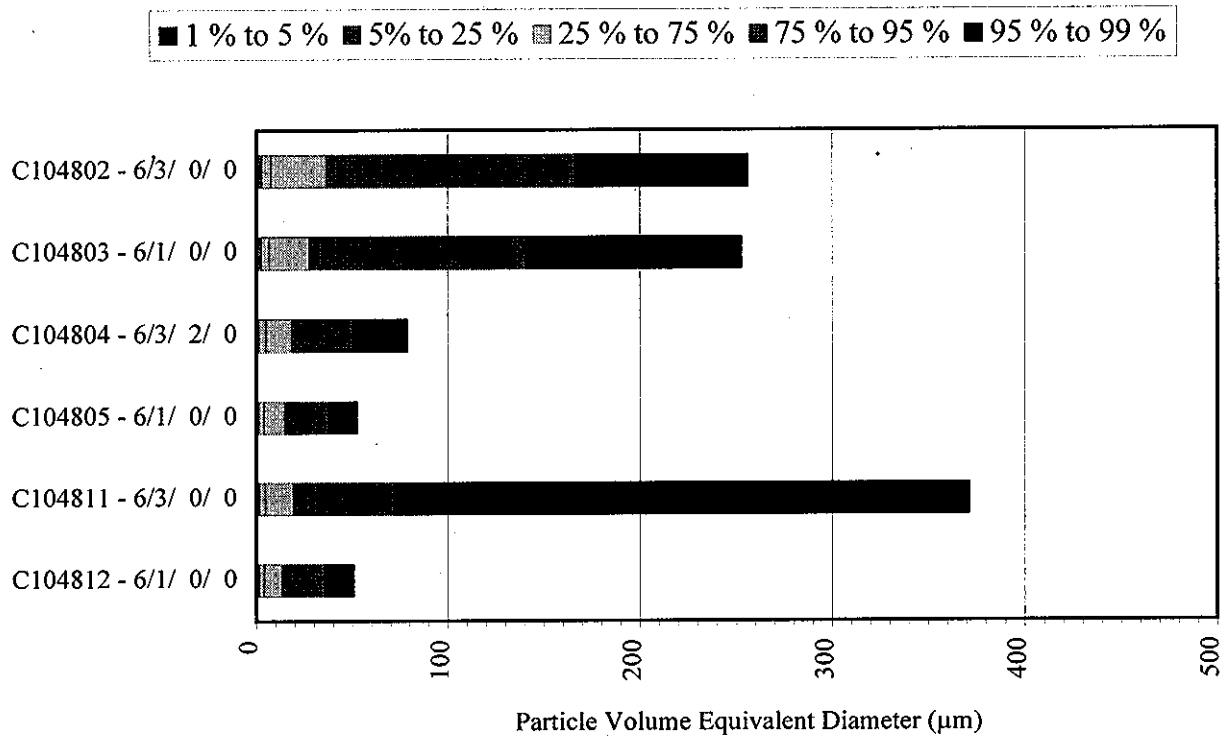


C-104 Composite: S01T001448

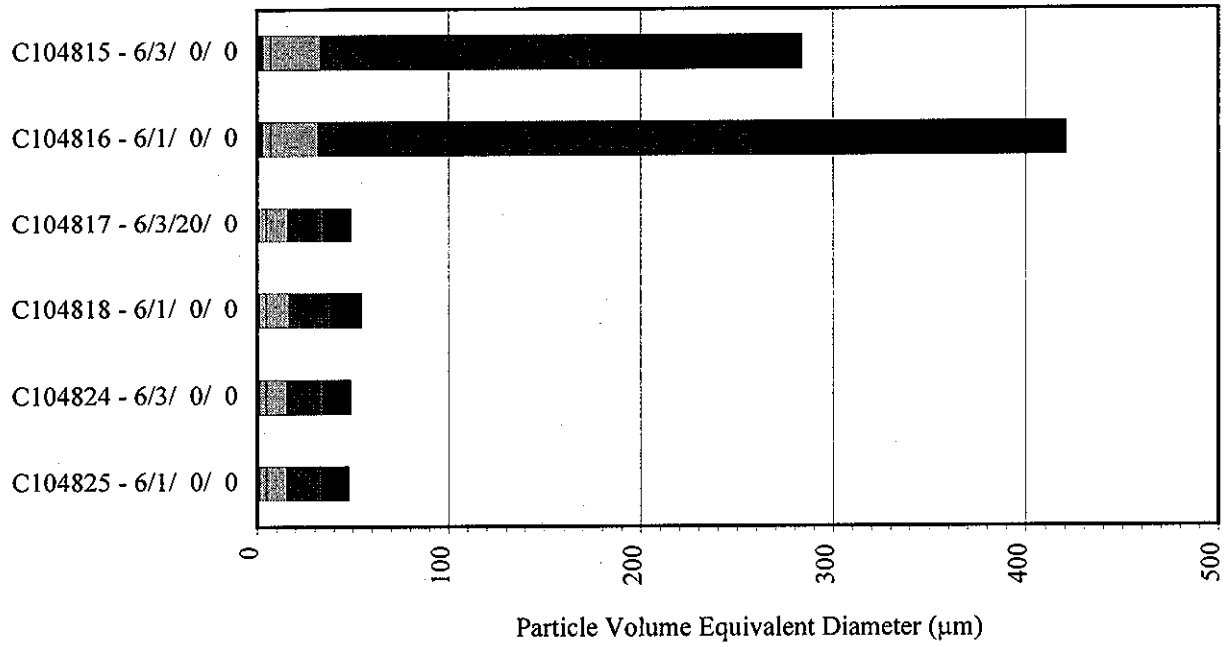


Continued:

C-104 Composite: S01T001449



C-104 Composite: S01T001451



4.3.3. Tank Waste Results at 325 Laboratory

All of the samples and their duplicates were polydispersed. Particles representing over 95% of the volume of the particles in the tank waste samples had diameters less than 100 μm in all analyses except for the initial sample for Tank AW-103 after 20 minutes of sonication. Based on the PSD of these samples, it appears that bubbles were produced in solution, and these bubbles were reported as particles with diameters at the upper end of the analysis (500 to 700 μm). These bubbles were not observed in the duplicate sample from Tank AW-103.

Representative plots of the PSDs from Tanks AW-103, AY-101, and C-104 are provided in Figures 37 through 39. These plots represent the PSDs measured on the samples at a flow rate of 40 mL/s after 2 minutes of sonication at 40 watts. The particle refractive index chosen for these analyses was 1.7. The results from PSD measurements at the other conditions are similar. Adequate PSD measurements were obtained for all tank waste samples at all three flow rates.

The larger "particles" in the distribution of these tank waste samples are not primary particles and are broken into smaller particles upon sonication and under flowing conditions. These smaller particles re-aggregate if left undisturbed as indicated by the measurements made 60 minutes after sonication was completed.

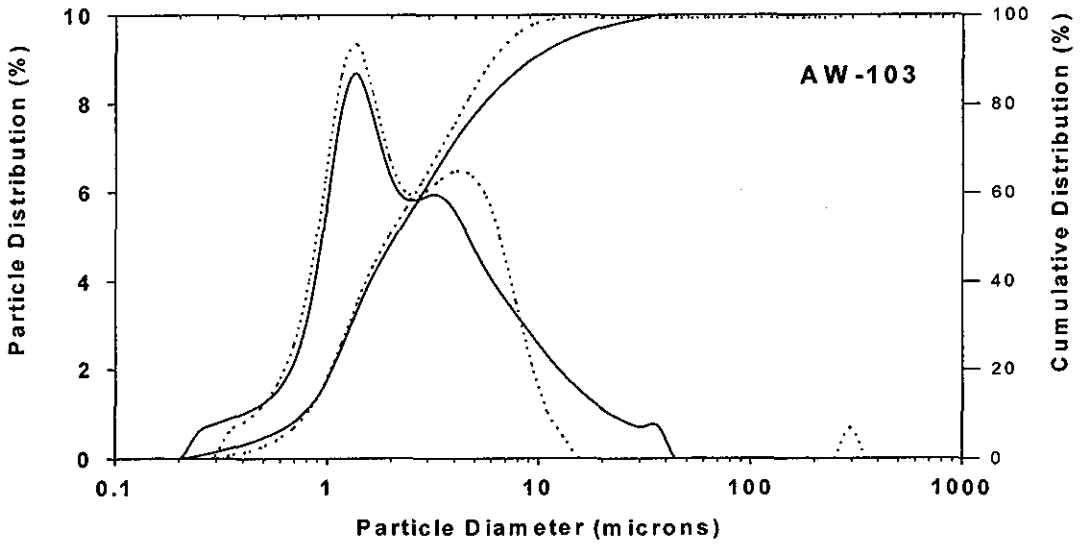


Figure 37. PSD of AW-103 Sample and Duplicate.
(40-mL/s flow rate
2 minutes pre-sonication at 40 W
Calculated using a particle refractive index of 1.7).

Tank AW-103. Two overlapping primary particle distributions with peaks between 0.25 and 3 μm and 3 and 100 μm based on volume were observed in all of the samples from Tank AW-103. The mean size based on volume distribution for these particle distributions were approximately 1 μm and 5 μm, respectively. A third distribution with much smaller relative volume percent was observed around 75 μm. Generally, this distribution could not be separated from the distribution centering around 5 μm. The mean diameter of the 5-μm distribution decreased with time and with sonication to approximately 3 μm. The relative volume percent of these distributions initially was 40 % for the smaller particles and 60% for the larger particles. This relative volume percent shifted to the smaller particles with circulation time and sonication. It appeared to reach a steady state at approximately 55% for the smaller particles and 45% for the larger particles were obtained prior to sonication. After sonication the volume percent of the smaller particles increased to approximately 62%.

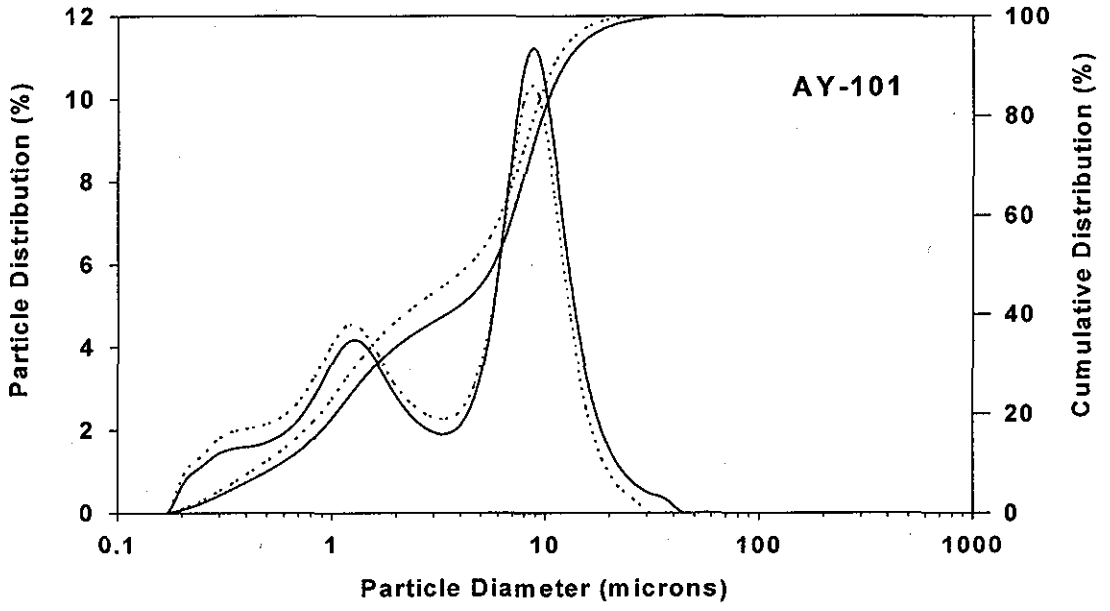


Figure 38. PSD of AY-101 Sample and Duplicate.
(40 mL/s flow rate
2 minutes pre-sonication at 40 W
Calculated using a particle refractive index of 1.7).

Tank AY-101. Two overlapping primary particle distributions with peaks between 0.25 and 4 μm and 1 and 25 μm based on volume were observed in the AY-101 samples. The mean size based on volume distribution for these particle distributions were approximately 1 μm and 8 μm,

respectively. The mean diameter of the 8-μm distribution decreased with time and with sonication to approximately 6 μm. The relative volume percent of these distributions initially was 35 % for the smaller particles and 65% for the larger particles. This relative volume percent shifted to the smaller particles with circulation time and sonication. It appeared to reach a steady state at approximately 55% for the smaller particles and 45% for the larger particles.

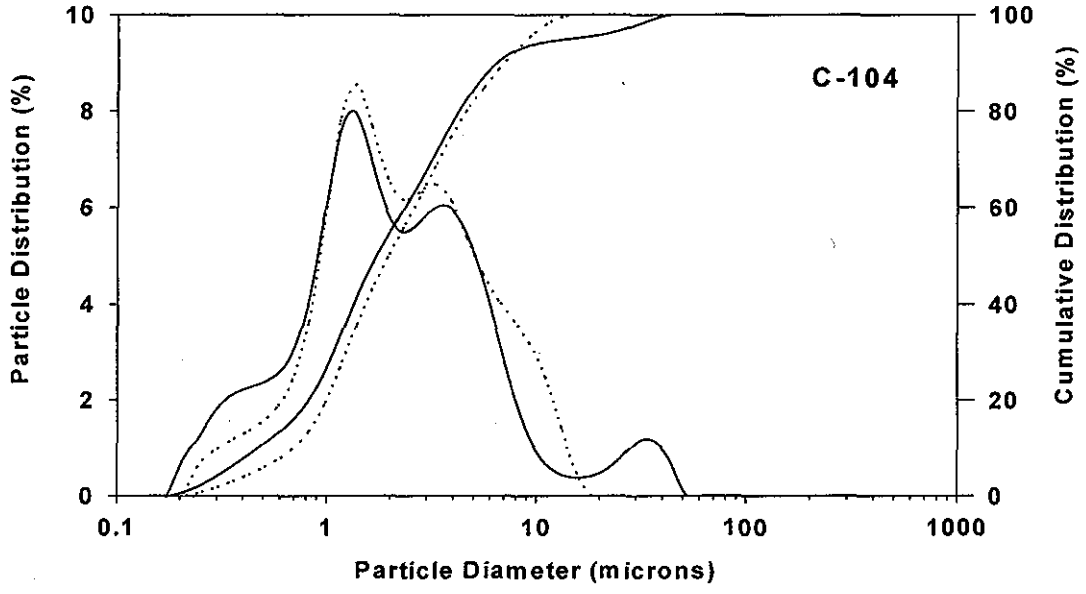


Figure 39. PSD of C-104 Sample and Duplicate.
(40 mL/s flow rate
2 minutes pre-sonication at 40 W
Calculated using a particle refractive index of 1.7).

Tank C-104. Three overlapping primary particle distributions with peaks between 0.25 and 3 μm, 1 and 10 μm, and 10 and 70 μm based on volume were observed in the samples from Tank C-104. The mean size based on volume distribution for these particle distributions were approximately 1 μm, 4 μm, and 30 μm, respectively. The mean diameter of this distribution decreased with time and with sonication. The relative volume percent of these distributions initially was approximately 22 % for the largest particles, 44% for the intermediate particles, and 34% for the smallest particles. This relative volume percent shifted to the intermediate and smallest particles with circulation time. It appeared to reach a steady state at approximately 12% for the largest particles, 48% for the intermediate particles, and 40% for the smallest particles prior to sonication. After sonication the largest particles disappeared, but after being left undisturbed for 60 minutes these large particles were again observed at relative volume percents similar to those initially measured.

4.4. Refractive Index Effects

The proprietary PSD calculation algorithms employed by the particle size analyzers at the two laboratories are both based on a combination of Fraunhofer diffraction and Mie scattering theories. Mie Scattering theory is particularly applicable to scattering by particles with diameters that are smaller than or of the same general magnitude as the wavelength of the interrogating light beam(s). The refractive index of both the sample solids and the dispersant liquid are required inputs in Mie theory calculations. Given the use of both the 632.8 nm and 450 nm light sources available in the Horiba LA-910, and the 780 nm source of the Microtrac X100, the refractive index values are expected to have significant impact on calculated PSDs only for samples with significant amounts of particles with diameters less than 10 μm.

Since samples of tank wastes are generally mixtures of unknown solid species, selecting an appropriate refractive index value for the particulates to use in the proprietary PSD calculation algorithms is generally problematic. In order to evaluate the magnitude of the impact the choice of refractive index input might have on calculation of PSDs, selected data sets were re-calculated using two to three significantly different refractive index values for the particulates.

4.4.1. Refractive Index Effects at 222-S Laboratory

The Horiba LA-910 software requires user selection of data files that contain refractive index calculation input for both light sources. The actual value selected is the "Relative Refractive Index" (RRI), which is the refractive index of the particulate solid phase divided by the refractive index of the liquid dispersant phase. The refractive index of the aqueous 1M NaOH and 1M $NaNO_3$ dispersant liquid was measured as $n_D = 1.352$ using an Abbe refractometer (Mark II Digital Refractometer, Reichert Scientific Instruments, Buffalo, NY). The refractive index of quartz is known to be $n_D = 1.544$. The RRI value selected for calculation of the PSDs was therefore 1.14 (1.544/1.352). A series of quality control measurements on a third quartz powder standard were made throughout the course of this study (Data in Appendix F). These measurements were made using deionized water, $n_D = 1.333$, for the dispersant liquid. The RRI value used in the calculation of those PSDs was therefore 1.16 (1.544/1.333).

Given no defensible criteria for assigning a refractive index value or values to the particulate solids of the tank waste samples, the same RRI value of 1.16, was used in the calculation of all PSDs for tank waste samples reported elsewhere in this report. It should be noted that, rigorously applied, Mie theory requires the input of both the real and imaginary components of the complex refractive index values. For the current study, however, only the real components of the indices were considered (i.e. the imaginary components were all set to 0.00i).

The light scattering data for selected measurements of the quartz powder standards and the AW-103, AY-101, and C-104 tank waste composites were recalculated at two additional values of RRI: 0.74 and 2.40. Given the refractive index value of $n_D = 1.352$ for the dispersant liquid, the RRI = 0.74 implies a refractive index of 1.00 for the sample particles. This value was selected as a lower limit of the range of RRI values which might apply in the aqueous NaOH and $NaNO_3$

system. The RRI value of 2.40, selected as the upper limit to the tested values, is the largest value of the RRI files currently available in the 222-S analyzer's software. At this RRI value, the implied refractive index of the sample solids is $n_D = 3.245$. For reference, the reported refractive indices of TiO_2 (rutile) and Fe_2O_3 are $n_D = 2.75$ and $n_D = 2.90$ respectively.

The data files selected for recalculation included single runs for each of the quartz powder standards since similar PSDs were observed for all run conditions. For each of the tank waste composites, the data files of a run before and after ultrasonic treatment were selected since the proportion of small and large particles is different for the two specimens.

Observations and Data. The recalculated PSDs and extracted particle size descriptors are presented in Tables 24 and 25 and Figures 40 through 48. The formats and content of these figures and tables were described in Sec. 4.2.1.

Generally, for samples with significant quantities of particulate material having diameters less than about 10 μm, the choice of RRI value is seen to have an observable effect. For the quartz powder standards, both the qualitative and quantitative impacts of selection of the RRI value were minimal. As expected, the observed effects were greatest for the BCR 67 standard with its smaller diameter particles. The most noticeable effect was the presence of an increased percentage of smaller particles in the PSDs calculated with the RRI values of 2.40.

For the tank waste composites, the RRI value used in the PSD calculations was also found to have an observable effect. Generally the impact of the choice of RRI was greatest for samples with broad distributions containing significant quantities of both large particles and particles <10 μm in diameter, i.e. the pre-ultrasonic treatment samples. For these specimens, PSDs calculated using the high and low RRI values (2.40 and 0.74) were qualitatively similar in shape. Compared to calculations using an RRI of 1.16, the PSDs calculated using the RRI value of 2.40 showed a small but observable shift of the <10 μm particle population to smaller diameters, while the populations reported for larger particles was unaffected. In the PSDs calculated using the baseline RRI value of 1.16, the particles are generally spread over a greater size range. In particular, the particles in the 1- to 10- μm diameter range appear to be redistributed to both higher and lower particle sizes relative to the PSDs calculated with RRI values of 0.74 and 2.40. This results in the clear enhancement (AY-101) or appearance (AW-103 and C-104) of the reported population of ≤1 μm particles in these PSDs. The percentages of the larger particles reported in the PSDs where RRI = 1.16 are also enhanced, though apparently without shifting the upper distribution boundaries to significantly higher diameter values. While not as qualitatively obvious, this redistribution causes the mean, median and higher %-undersize values for these PSDs to be larger relative to those for the PSDs calculated using RRI values of 0.74 and 2.40.

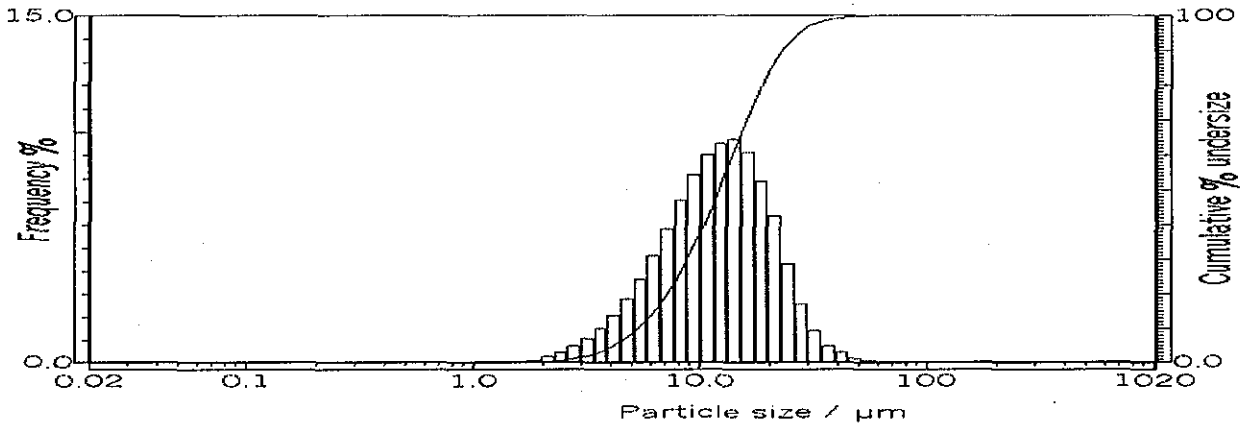
The same observations generally apply to the post-ultrasonic, tank composite specimens. Qualitatively the same trends are observed. However, since these distributions are initially both narrower (i.e. low populations of large particles) and more highly weighted in small diameter particles (i.e. <10 μm diameters) the quantitative effects on the distribution means, medians and larger %-undersize cut values are relatively insignificant.

Figure 40. Standard BCR 67: Volume-based PSDs calculated at three different values of Relative Refractive Index.

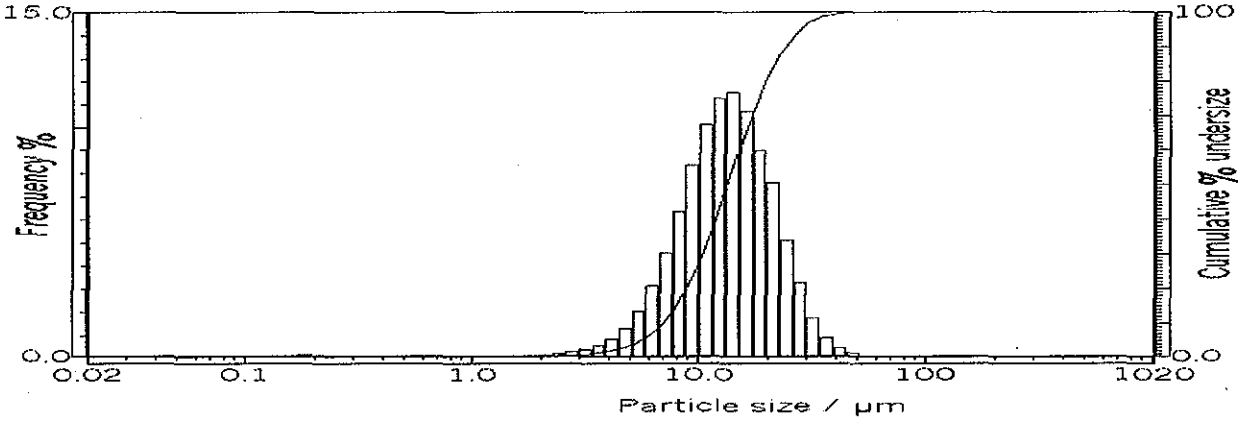
File Name: Cumulative times at run conditions

BC67671: P6 = 15 min; S1 = 9 min; S3 = 6 min; US = 2 min

Relative Refractive Index: 0.74 + 0.00i



Relative Refractive Index: 1.14 + 0.00i



Relative Refractive Index: 2.40 + 0.00i

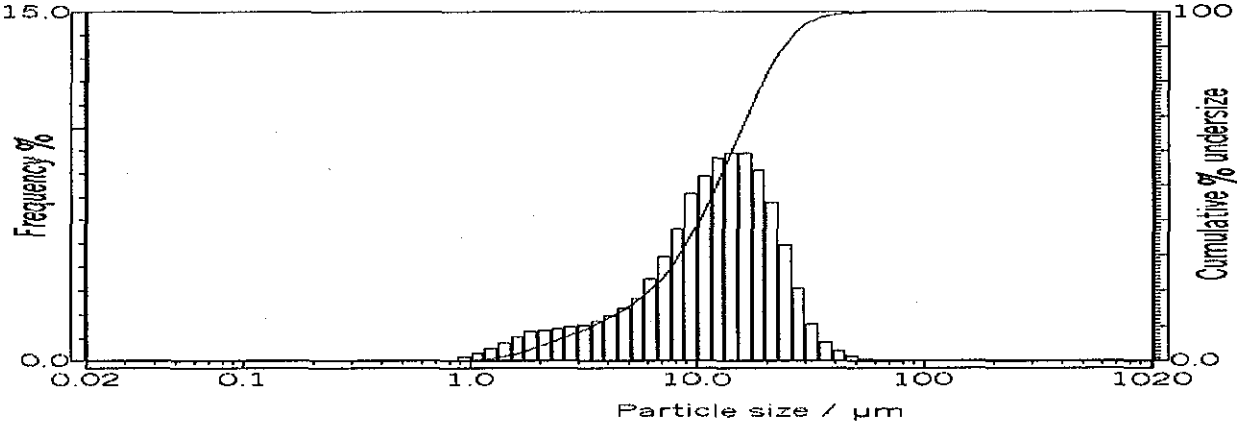
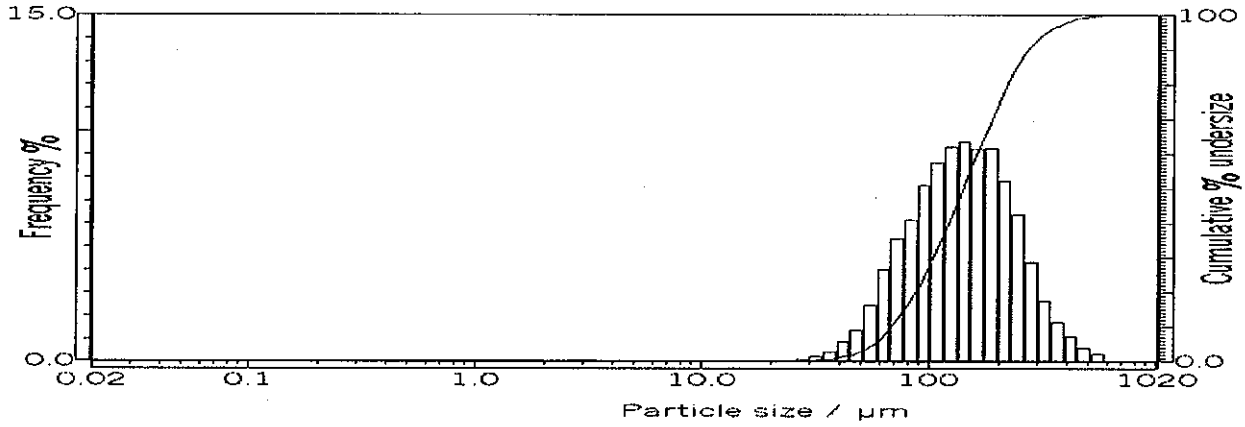


Figure 41. Standard BCR 130: Volume-based PSDs calculated at three different values of Relative Refractive Index.

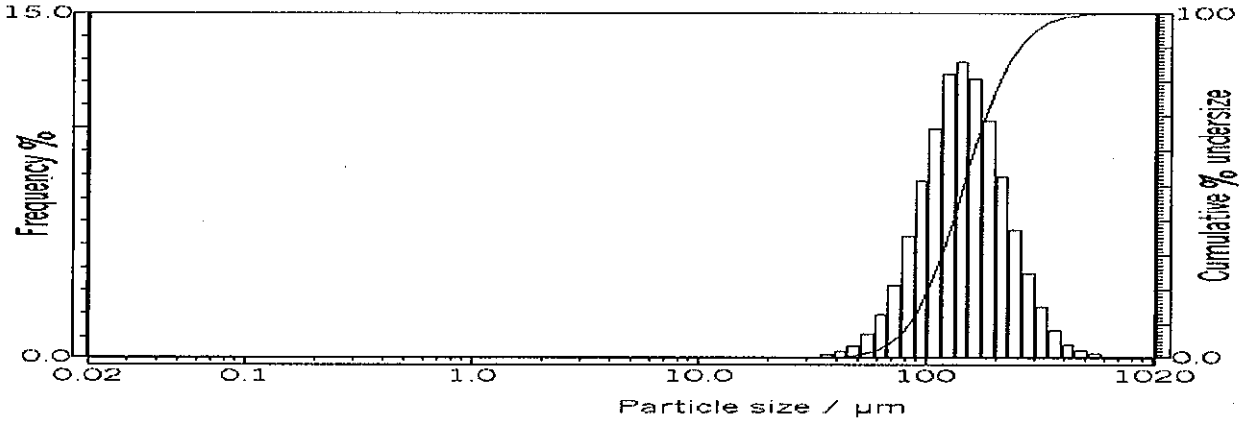
File Name: Cumulative times at run conditions

BC130680: P6 = 14 min; S1 = 8 min; S3 = 6 min; US = 2 min

Relative Refractive Index: 0.74 + 0.00i



Relative Refractive Index: 1.14 + 0.00i



Relative Refractive Index: 2.40 + 0.00i

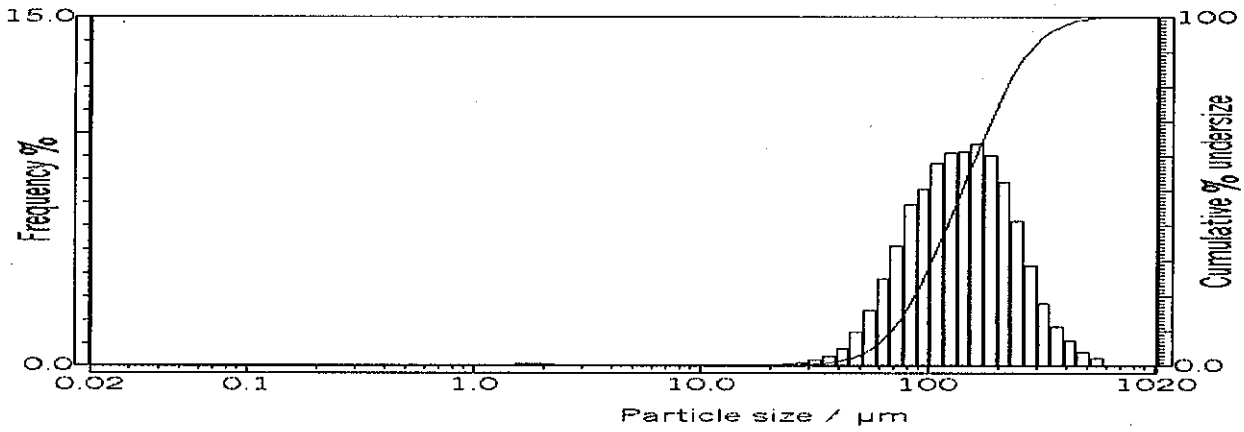
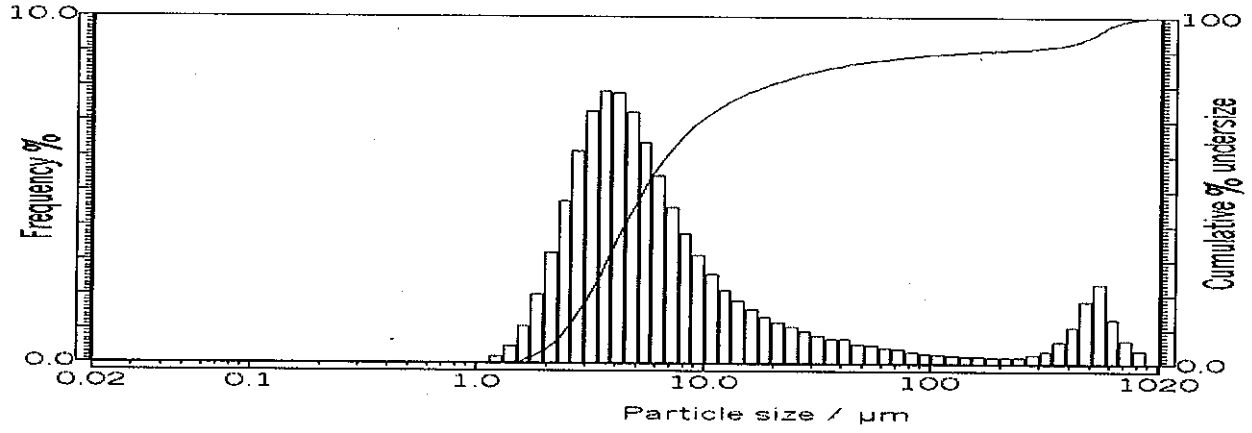


Figure 42. AW-103 Composite Before Sonication: Volume-based PSDs calculated at three different values of Relative Refractive Index.

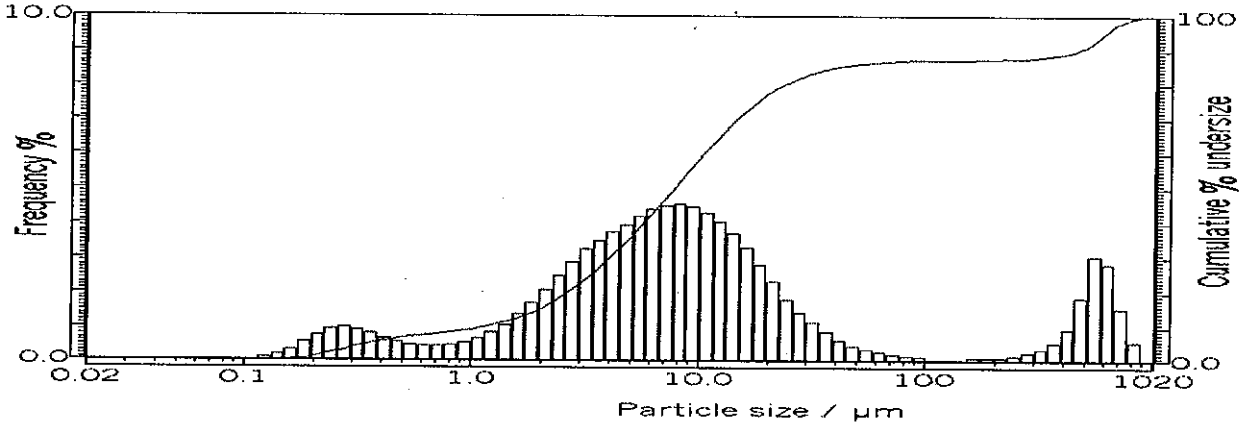
File Name: Cumulative times at run conditions

AW103740: P6 = 3 min; S1 = 3 min; S3 = 0 min; US = 0 min

Relative Refractive Index: 0.74 + 0.00i



Relative Refractive Index: 1.16 + 0.00i



Relative Refractive Index: 2.40 + 0.00i

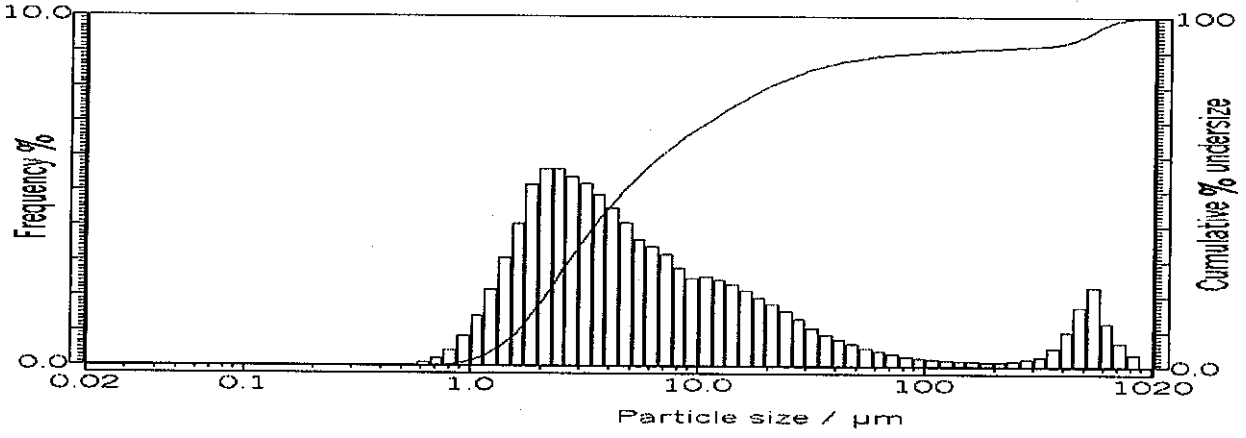
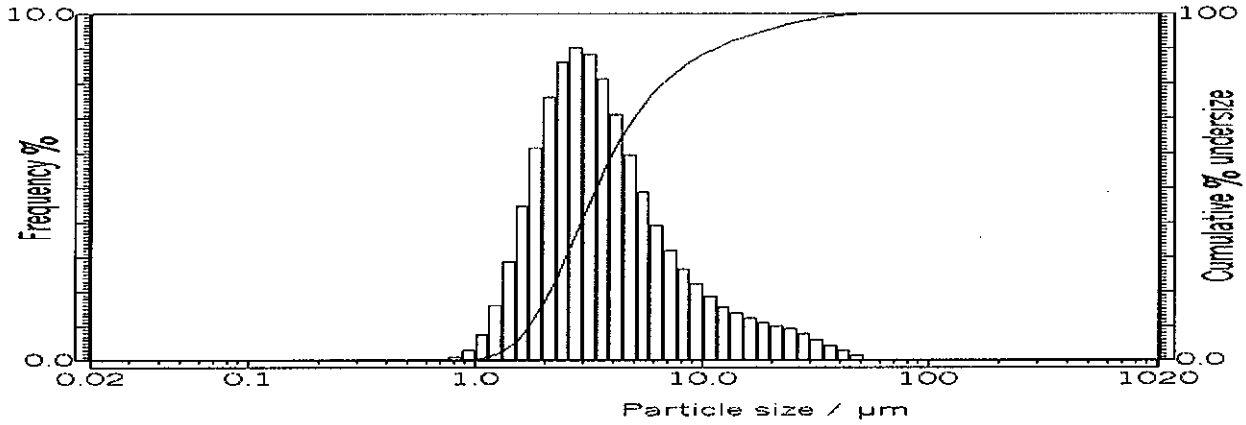


Figure 43. AW-103 Composite After Sonication: Volume-based PSDs calculated at three different values of Relative Refractive Index.

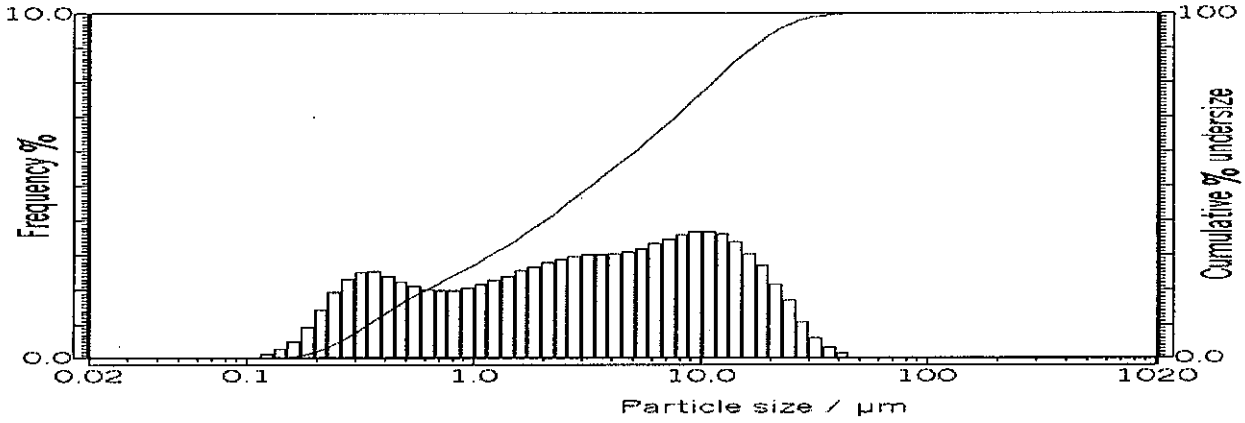
File Name: Cumulative times at run conditions

AW103743: P6 = 33 min; S1 = 27 min; S3 = 6 min; US = 20 min

Relative Refractive Index: 0.74 + 0.00i



Relative Refractive Index: 1.16 + 0.00i



Relative Refractive Index: 2.40 + 0.00i

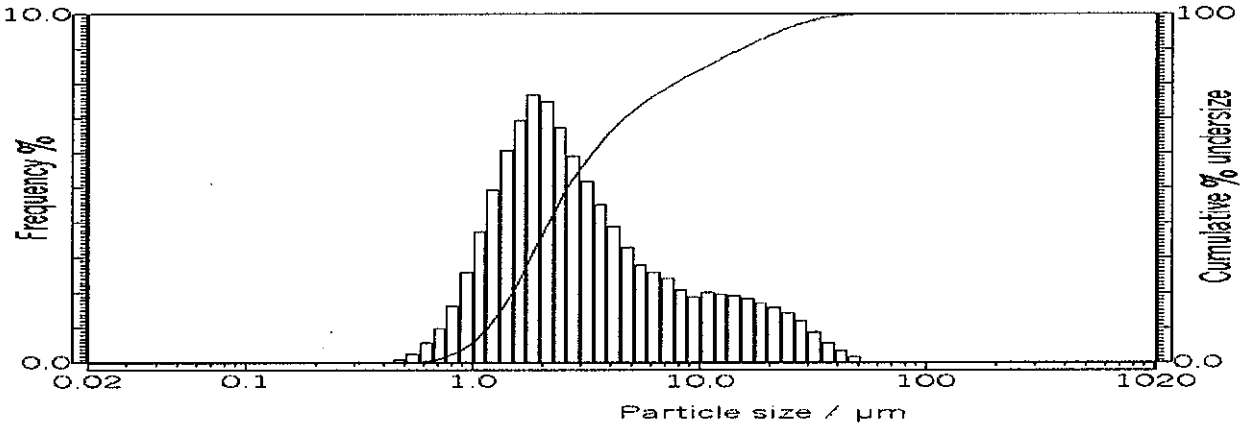
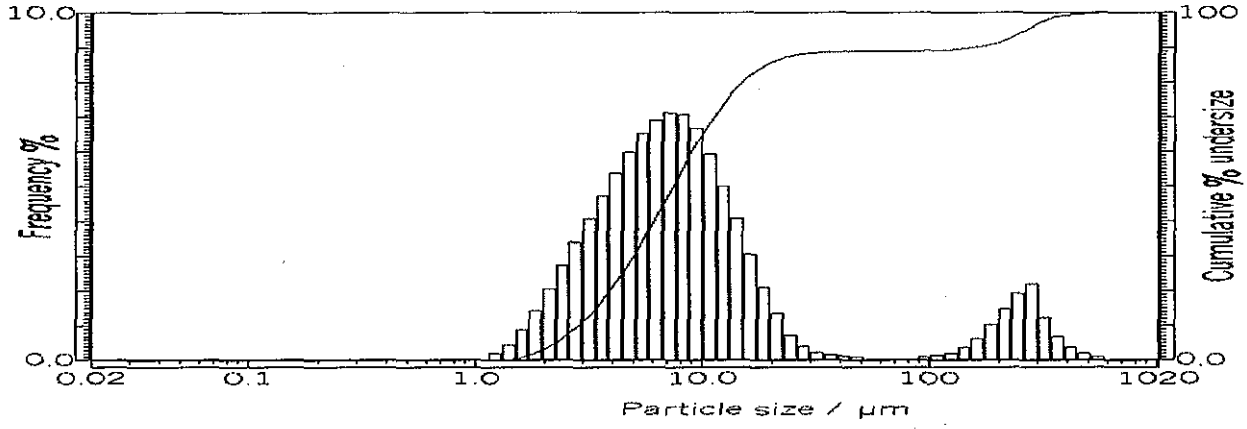


Figure 44. AY-101 Composite Before Sonication: Volume-based PSDs calculated at three different values of Relative Refractive Index.

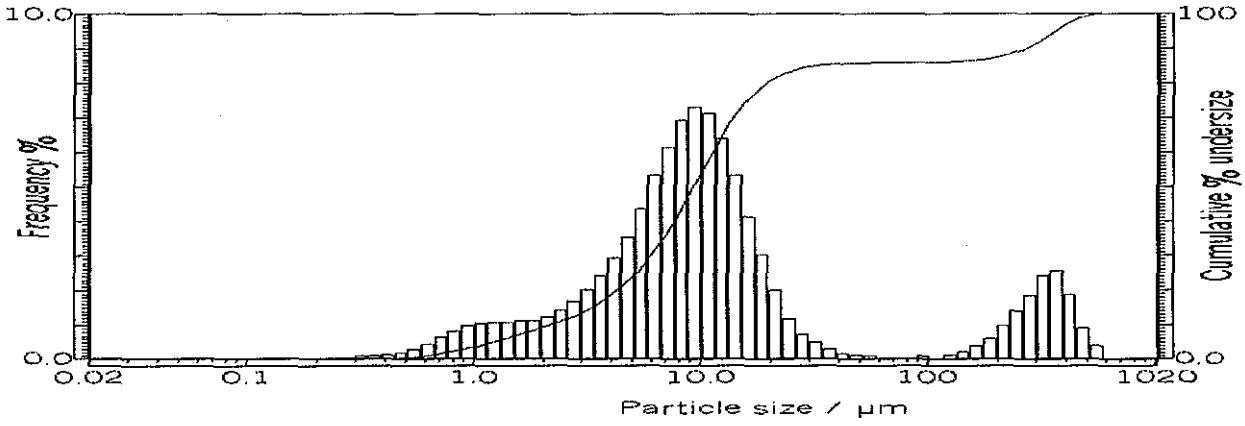
File Name: Cumulative times at run conditions

AY101840: P6 = 3 min; S1 = 3 min; S3 = 0 min; US = 0 min

Relative Refractive Index: 0.74 + 0.00i



Relative Refractive Index: 1.16 + 0.00i



Relative Refractive Index: 2.40 + 0.00i

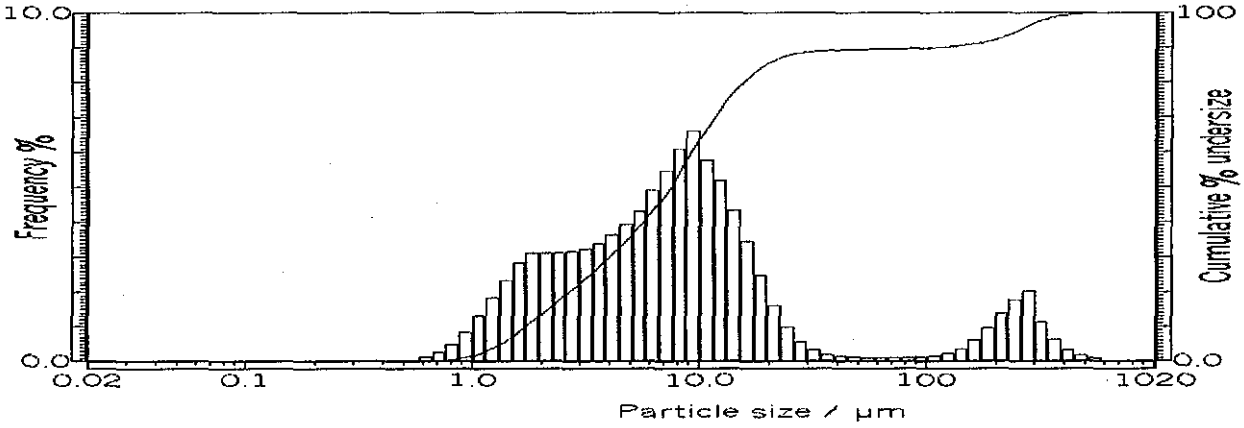
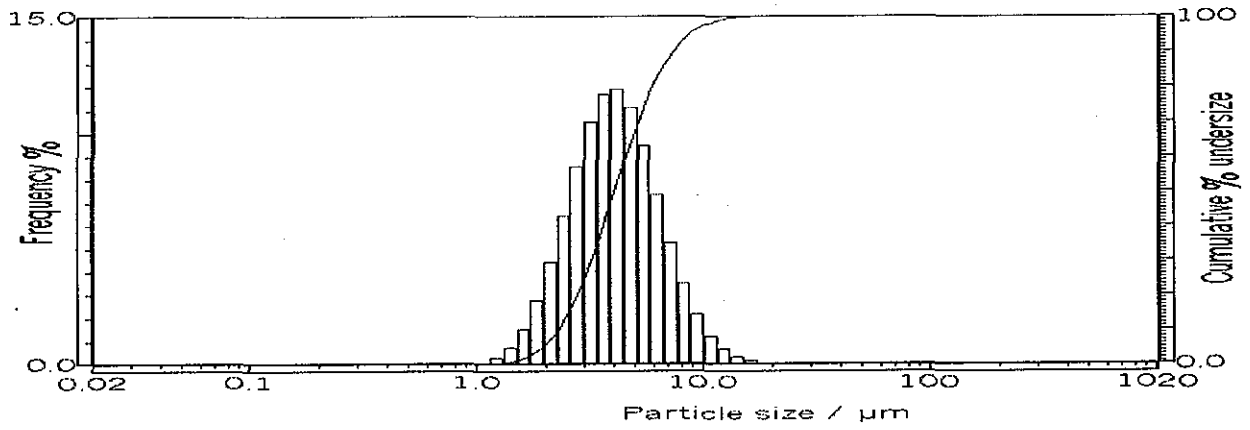


Figure 45. AY-101 Composite After Sonication: Volume-based PSDs calculated at three different values of Relative Refractive Index.

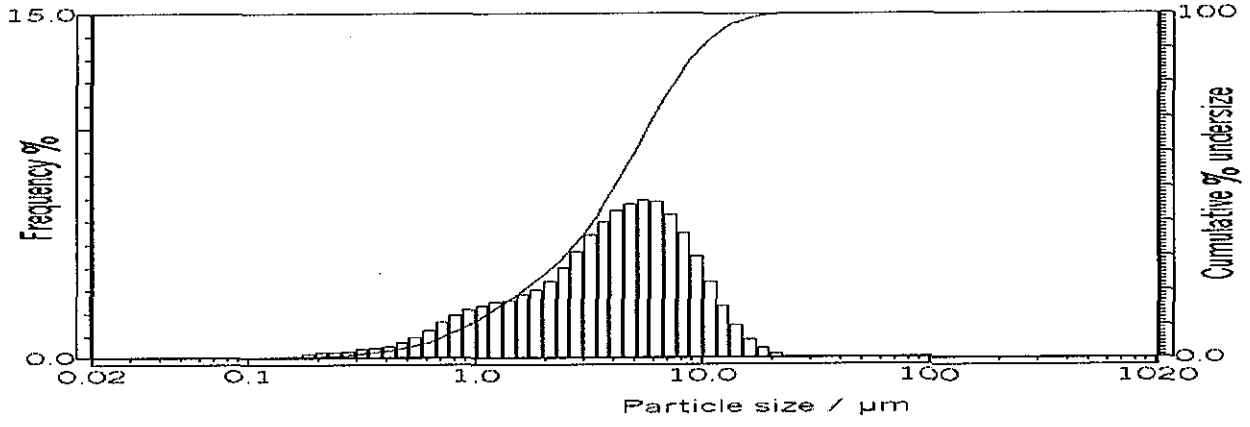
File Name: Cumulative times at run conditions

AY101843: P6 = 34 min; S1 = 27 min; S3 = 7 min; US = 20 min

Relative Refractive Index: 0.74 + 0.00i



Relative Refractive Index: 1.16 + 0.00i



Relative Refractive Index: 2.40 + 0.00i

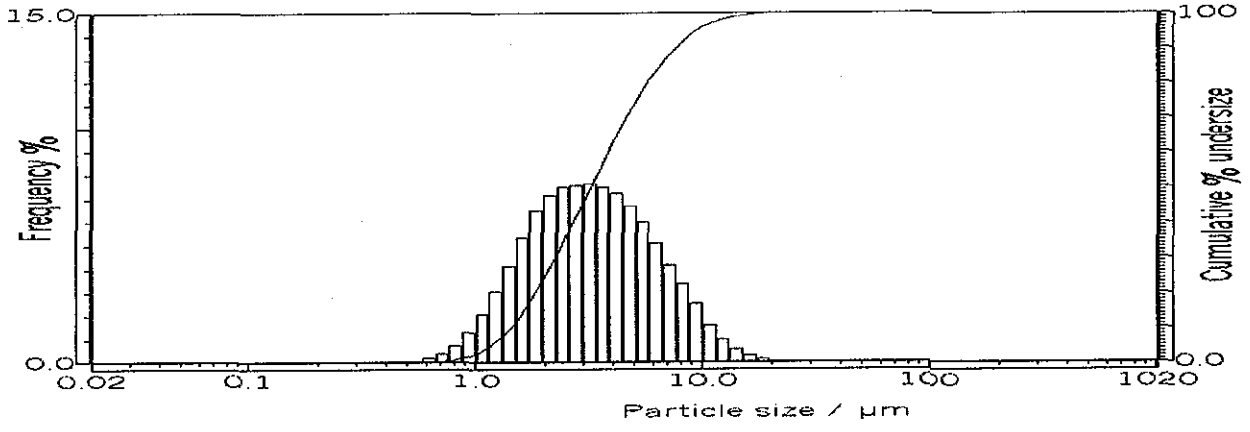
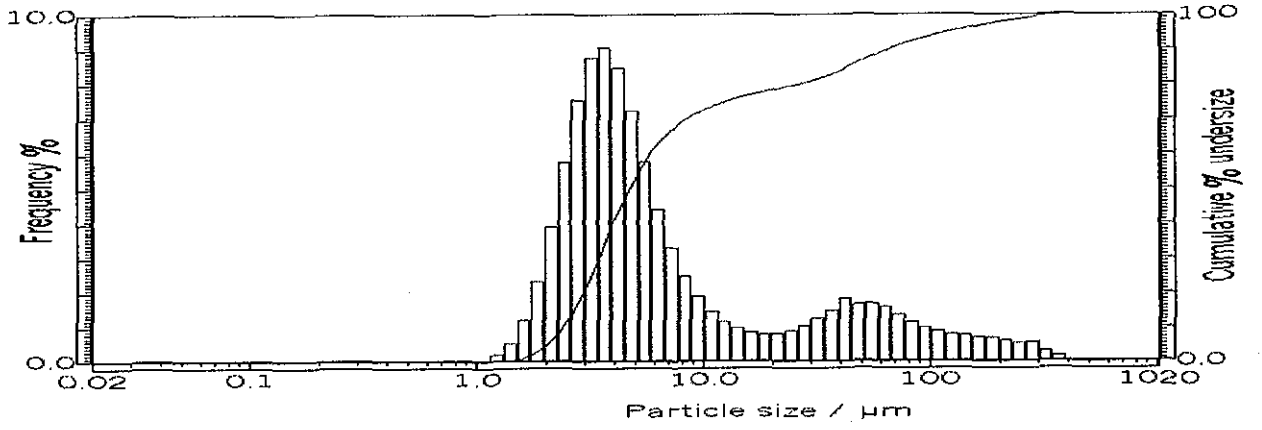


Figure 46. C-104 Composite Before Sonication: Volume-based PSDs calculated at three different values of Relative Refractive Index.

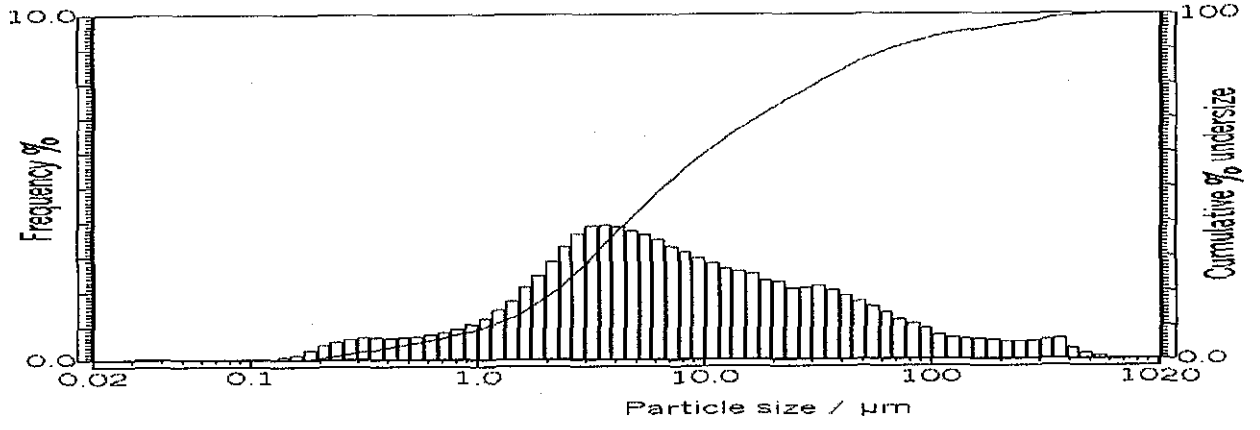
File Name: Cumulative times at run conditions

C104791: P6 = 4 min; S1 = 4 min; S3 = 0 min; US = 0 min

Relative Refractive Index: 0.74 + 0.00i



Relative Refractive Index: 1.16 + 0.00i



Relative Refractive Index: 2.40 + 0.00i

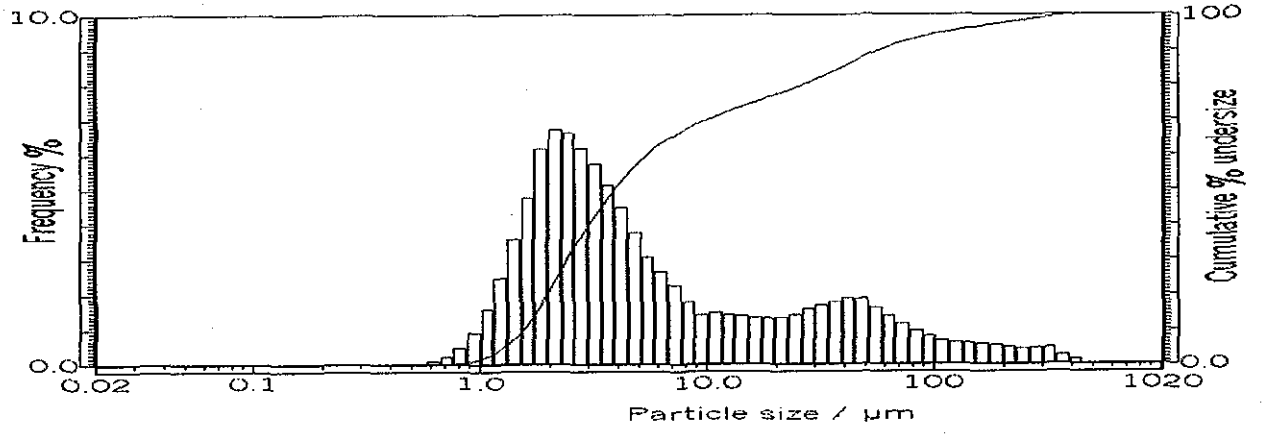
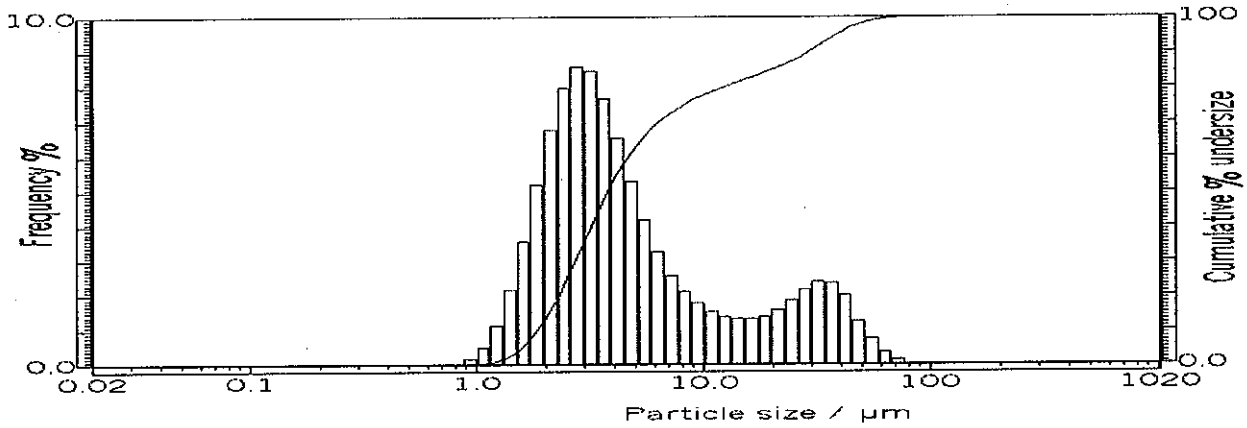


Figure 47. C-104 Composite After Sonication: Volume-based PSDs calculated at three different values of Relative Refractive Index.

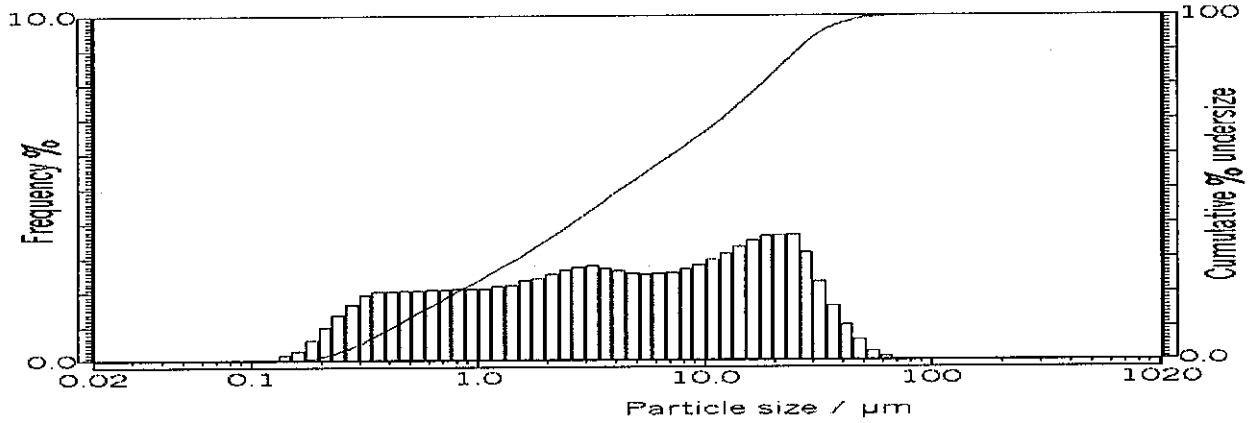
File Name: Cumulative times at run conditions

C104794: P6 = 35 min; S1 = 28 min; S3 = 7 min; US = 20 min

Relative Refractive Index: 0.74 + 0.00i



Relative Refractive Index: 1.16 + 0.00i



Relative Refractive Index: 2.40 + 0.00i

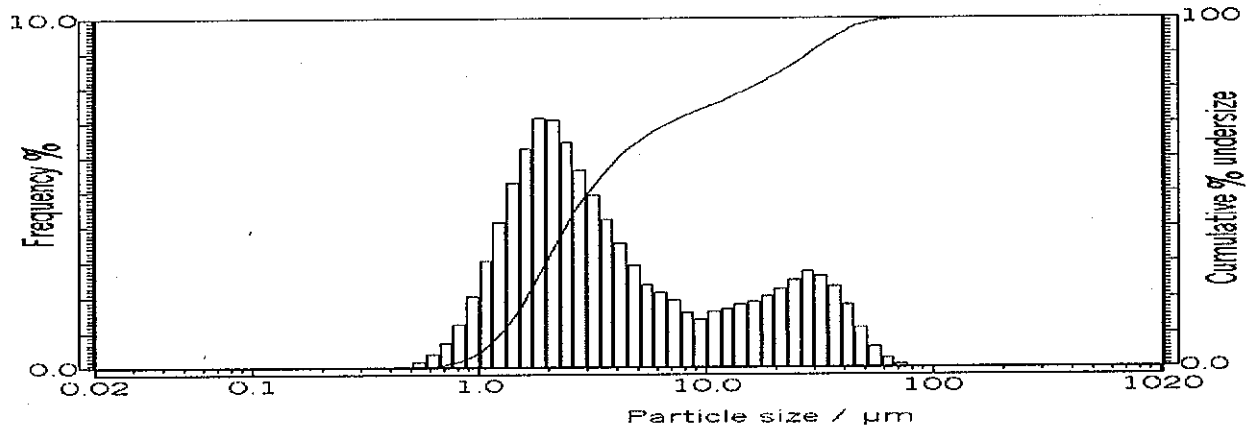


Table 19. Relative Refractive Index: Mean particle diameters of volume-based PSDs that have been calculated using three Relative Refractive Index (RRI) values.

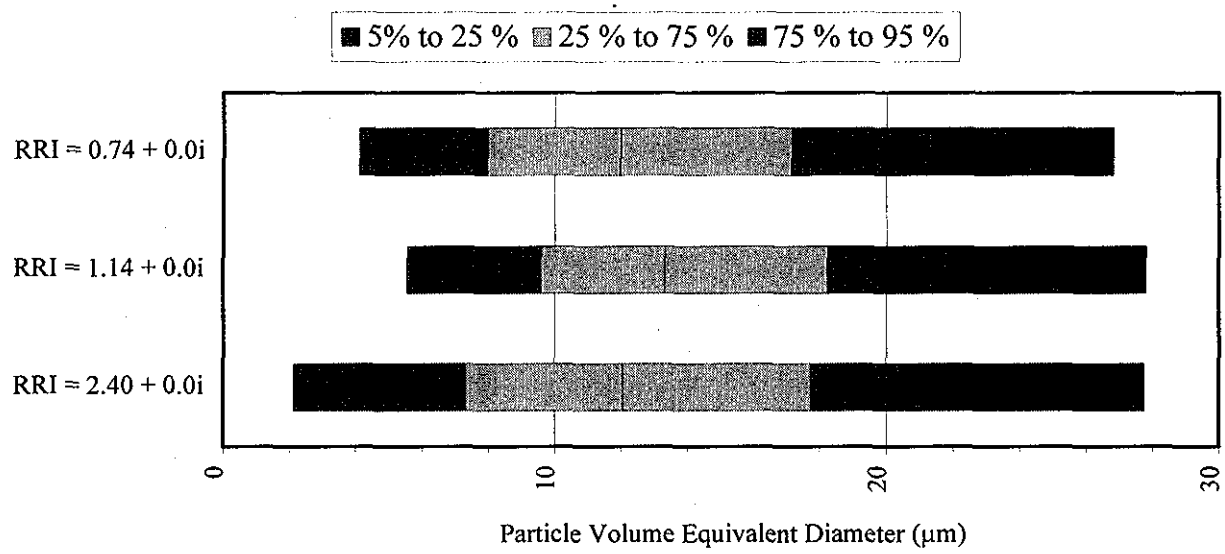
Sample	PSD Run File Name	RRI Value	Mean Diameter (μm)	Standard Deviation (μm)
BCR 67 After Sonication	BC67671	0.74+0.0i	13.3	7.4
		1.14+0.0i	14.5	7.0
		2.40+0.0i	13.2	8.1
BCR 130 After Sonication	BC130680	0.74+0.0i	157.4	85.8
		1.14+0.0i	158.5	72.8
		2.40+0.0i	156.9	86.1
AW-103 S01T001425 Before Sonication	AW103740	0.74+0.0i	58.5	155.0
		1.16+0.0i	77.4	186.5
		2.40+0.0i	55.5	152.0
AW-103 S01T001425 After Sonication	AW103743	0.74+0.0i	5.4	6.1
		1.16+0.0i	6.2	7.1
		2.40+0.0i	5.6	7.2
AY-101 S01T001492 Before Sonication	AY101840	0.74+0.0i	35.2	82.8
		1.16+0.0i	53.0	114.9
		2.40+0.0i	33.4	80.0
AY-101 S01T001492 After Sonication	AY101843	0.74+0.0i	4.5	2.1
		1.16+0.0i	4.8	3.6
		2.40+0.0i	4.0	2.7
C-104 S01T001448 Before Sonication	C104791	0.74+0.0i	23.1	48.8
		1.16+0.0i	28.6	64.4
		2.40+0.0i	22.6	51.5
C-104 S01T001448 After Sonication	C104794	0.74+0.0i	9.1	12.2
		1.16+0.0i	9.2	10.9
		2.40+0.0i	8.9	12.2

Table 20. Relative Refractive Index: Percentages of particles with diameters less than the indicated values in volume-based PSDs which have been calculated using three Relative Refractive Index (RRI) values.

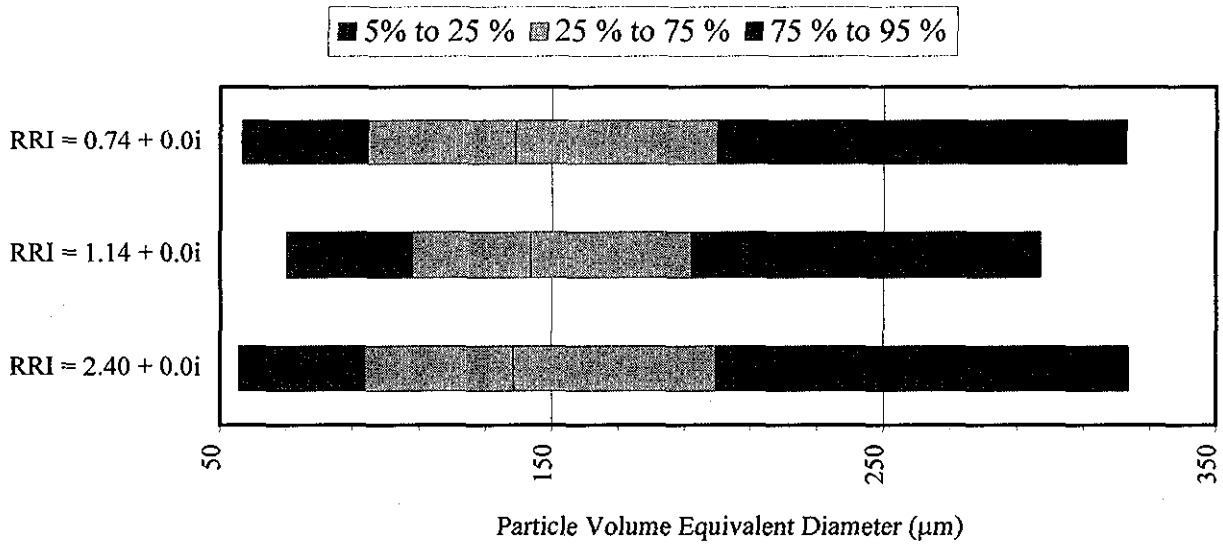
Sample	File Name - RRI	In Distributions Based on Total Particulate Volume				
		5 %	25 %	50 %	75 %	95 %
		Of the Particles Have Diameters Less Than (μm)				
BCR 67	BC67671 - 0.74	4.1	8.0	12.0	17.2	26.8
After Sonication	- 1.14	5.5	9.6	13.3	18.2	27.8
	- 2.40	2.1	7.3	12.1	17.7	27.8
BCR 130	BC130680 - 0.74	56.5	94.6	139.0	200.0	323.1
After Sonication	- 1.14	70.1	108.0	143.7	192.2	297.3
	- 2.40	55.7	93.7	138.4	199.6	323.8
AW-103	AW103740 - 0.74	2.1	3.4	5.3	12.3	508.5
S01T001425	- 1.16	0.3	3.3	7.6	17.6	591.7
Before Sonication	- 2.40	1.3	2.4	4.6	14.4	503.2
AW-103	AW103743 - 0.74	1.5	2.3	3.4	5.6	18.2
S01T001425	- 1.16	0.3	0.9	3.2	9.2	21.3
After Sonication	- 2.40	0.9	1.6	2.6	5.8	22.1
AY-101	AY101840 - 0.74	2.3	4.4	7.4	12.6	259.4
S01T001492	- 1.16	1.2	5.2	9.2	15.9	358.6
Before Sonication	- 2.40	1.3	3.3	7.4	13.2	251.8
AY-101	AY101843 - 0.74	2.0	3.0	4.4	5.5	8.6
S01T001492	- 1.16	0.6	2.0	4.1	6.7	11.8
After Sonication	- 2.40	1.2	2.0	3.2	5.1	9.4
C-104	C104791 - 0.74	2.0	3.1	4.7	12.4	119.4
S01T001448	- 1.16	0.5	2.6	6.5	22.4	139.9
Before Sonication	- 2.40	1.3	2.2	3.8	16.1	111.3
C-104	C104794 - 0.74	1.6	2.5	3.8	8.1	38.4
S01T001448	- 1.16	0.3	1.1	4.2	14.4	31.8
After Sonication	- 2.40	1.0	1.8	3.0	10.5	37.0

Figure 48. Relative Refractive Index: Diameters of particles (μm) within defined, volume-based, percentile ranges of PSDs which have been calculated using three Relative Refractive Index (RRI) values. (Four Pages)

Standard BCR 67: PSD Run BC67671: After Ultrasonic Treatment

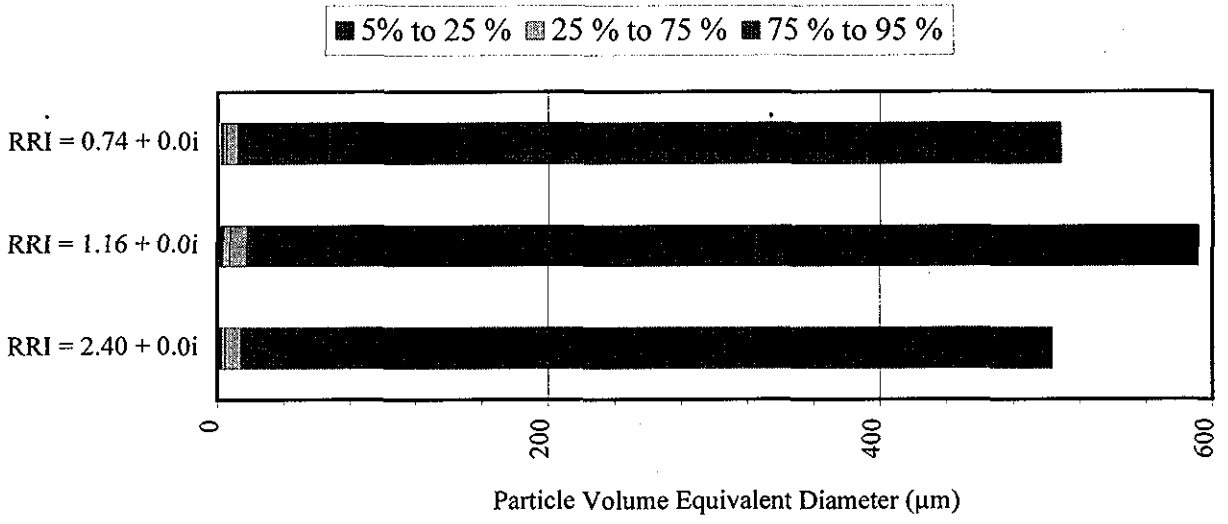


Standard BCR 130: PSD Run BC130680: After Ultrasonic Treatment

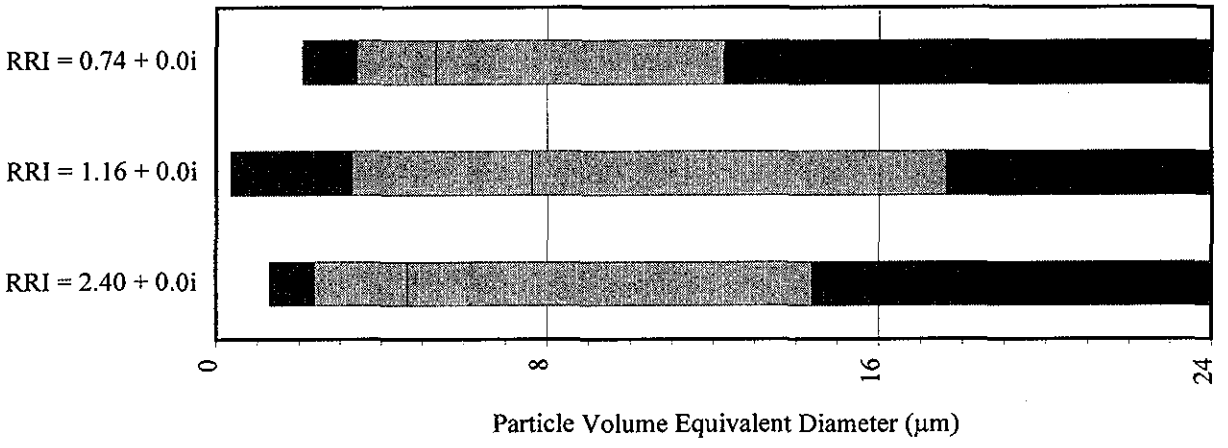


Continued:

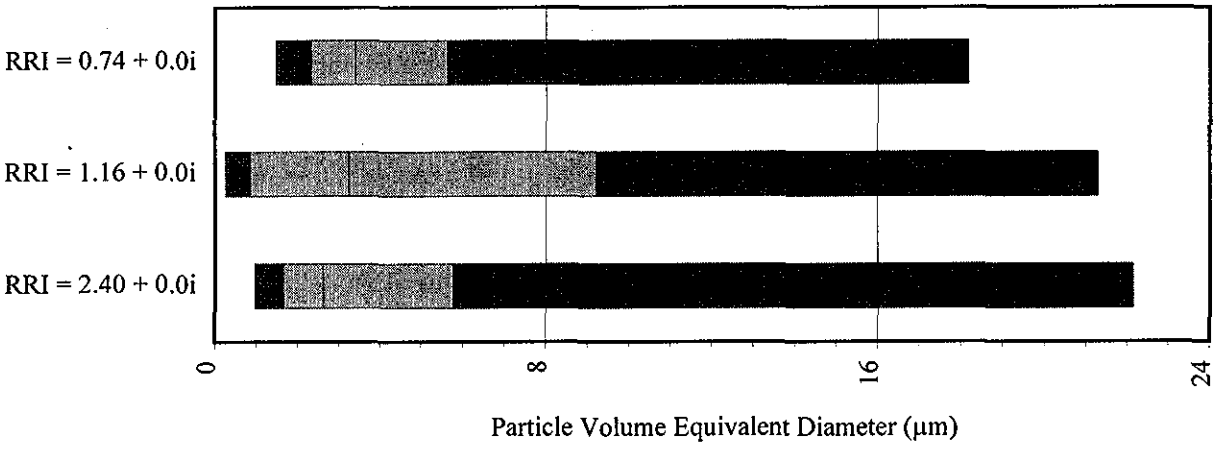
AW-103: PSD Run AW103740: Before Ultrasonic Treatment



AW-103: PSD Run AW103740: Before Ultrasonic Treatment – Re-scaled Plot

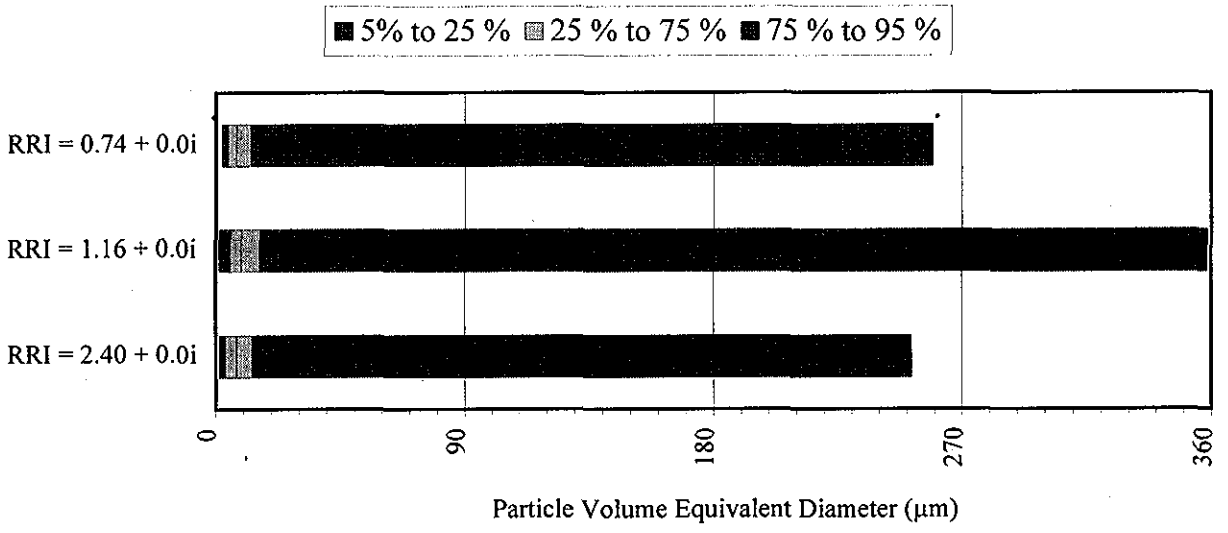


AW-103: PSD Run AW103743: After Ultrasonic Treatment

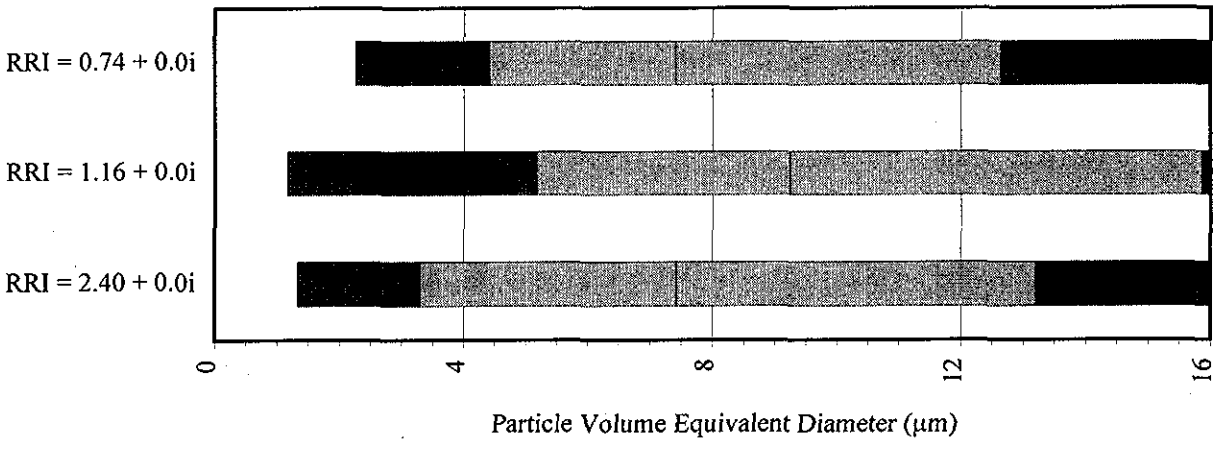


Continued:

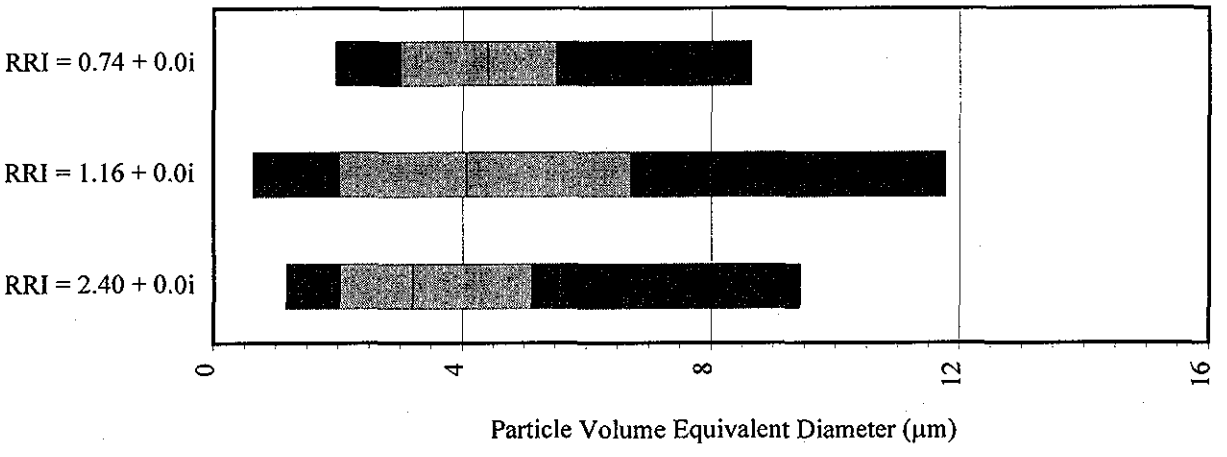
AY-101: PSD Run AY101840: Before Ultrasonic Treatment



AY-101: PSD Run AY101840: Before Ultrasonic Treatment – Re-scaled Plot

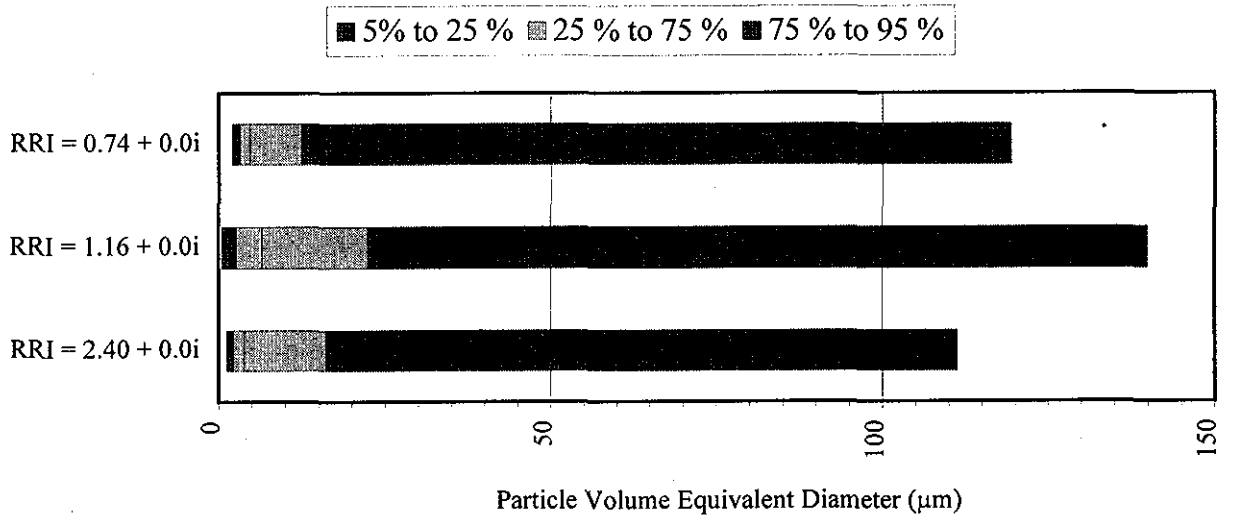


AY-101: PSD Run AY101843: After Ultrasonic Treatment

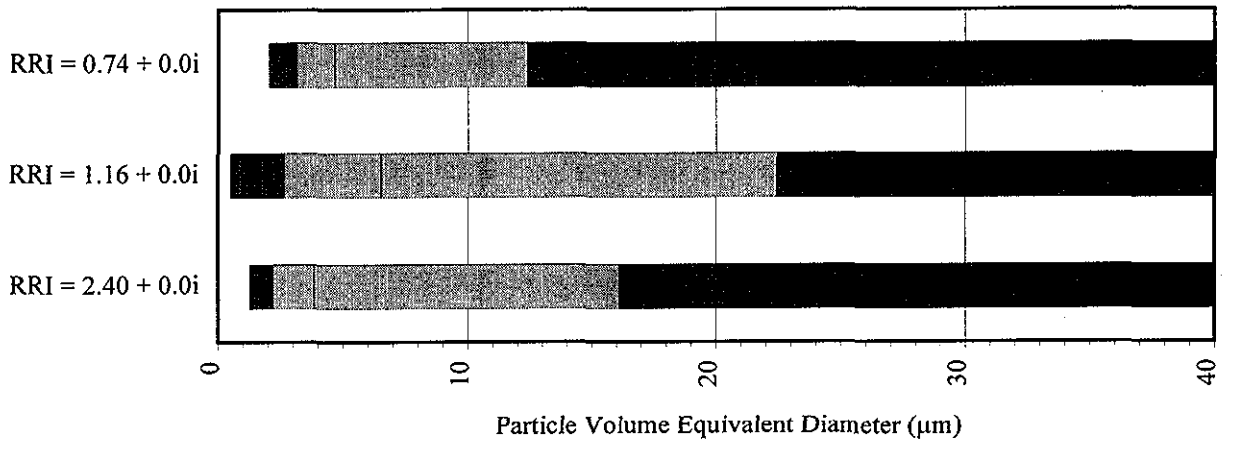


Continued:

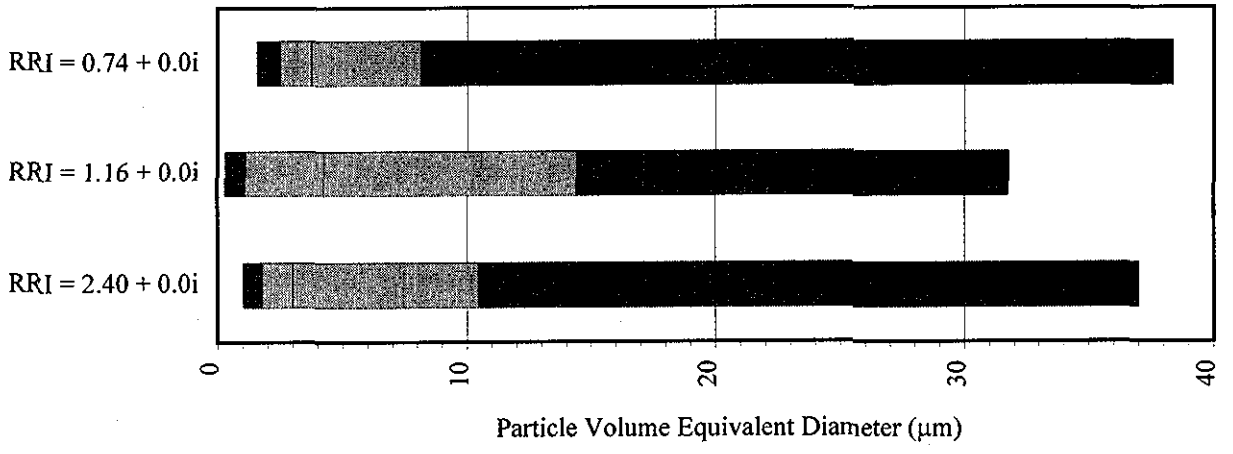
C-104: PSD Run C104791: Before Ultrasonic Treatment



C-104: PSD Run C104791: Before Ultrasonic Treatment – Re-scaled Plot



C-104: PSD Run C104794: After Ultrasonic Treatment



4.4.2. Refractive Index Effects at 325 Laboratory

At 325 Laboratory, when PSD results were recalculated for standards using absolute refractive index values varying from 1.5 to 2.0, some differences could be observed; however these differences were very small, paling in comparison to the changes observed with variation of the other instrument parameters, such as flow rate, duration of flow, and sonication. This may be verified by reviewing the PSDs shown in Appendix G.

To obtain some understanding of the effect of the refractive index value used in the proprietary Microtrac PSD calculation, particle refractive indices of 1.5, 1.7, and 2.0 were used to calculate the particle size distributions of the tank wastes. These refractive indices are representative of sodium aluminosilicates (1.5), aluminum oxides (1.7), and iron oxides (2.0). For the BCR standards, the refractive index of quartz, 1.54, was used. The PSD of the standards was also calculated with a particle refractive index of 2.0 to determine the impact on the results.

The index of refraction has an imaginary and a real component. The imaginary component of the index of refraction relates to the amount of light that is absorbed or reflected by the medium. The Microtrac PSD calculation incorporates this component into its calculations based on input from the operator. The operator selects whether the particles are transparent, non-transparent and light absorbing, or non-transparent and light reflecting. For the tank waste samples, the setting for non-transparent and light absorbing particles was selected.

4.5. PSD Results on AY-102, AZ-102, C-107, and SY-102 Composites

PSD Measurements. The dates the tank composites were subsampled in the hotcells, the sample numbers assigned to the subsamples, and the dates of PSD analyses are indicated In Table 26. All PSD measurement sets generated for analytical specimens are identified with the number of the analytical subsample or core composite from which the specimens were taken.

Table 21. PSD samples for tanks AY-102, AZ-102, C-107, and SY-102

Source Tank	Composite #	Subsampled	Sample #	PSD Analyses
AY-102	S01T001030	08/28/2001	S01T001654 S01T001655	09/26/2001
AZ-102	S01T001024	08/28/2001	S01T001651	08/29/2001
			S01T001652 S01T001653	09/26/2001
C-107	S01T001673	N/A	N/A	09/26/2001
SY-102	S01T001028	08/28/2001	S01T001648 S01T001649	08/29/2001

Data and Observations—AY-102. The measurement results summarized in Figures 49 through 53 and Tables 27 and 28 are presented in the format previously described in Sec. 4.2.1. Two

PSD measurement sets were collected for each of the AY-102 composite subsamples examined: S01T001654 and S01T001655. Separate analytical specimens were withdrawn from each subsample vial for each PSD measurement set.

All the PSDs measured on the AY-102 subsamples indicated that approximately half of the particulate volume was represented by a population of particles with diameters ranging from 0.5 μm to 2.5 μm and a mode around 1.2 μm. The remaining particulate volume was represented by particles with diameters ranging from 2.5 μm to 25 μm.

In the second PSD run (AY102895) of the first measurement set on subsample S01T001654 (Figure 49), the presence of a small population of larger particles, diameters ranging from 50 μm to 300 μm, is noted. The absence of these particles from the first P6/S1 run of the set may indicate that these particles/agglomerates are of sufficiently high density to require the more vigorous S3 stirring for efficient suspension in the specimen slurry. Two minutes of ultrasonic treatment completely removes these larger particles from the PSDs.

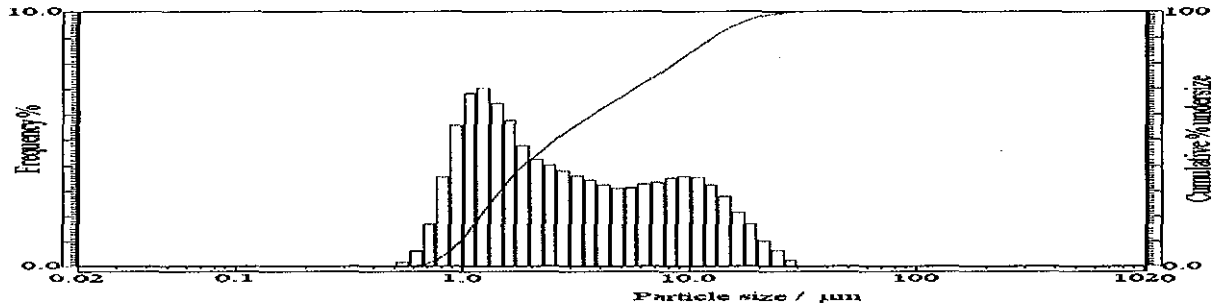
Otherwise, ultrasonic treatment, extended pumping, or stir rate changes have only minimal impact on the observed PSDs.

Figure 49. AY-102 Composite: Volume-based PSDs from first set of runs on sample S01T001654.

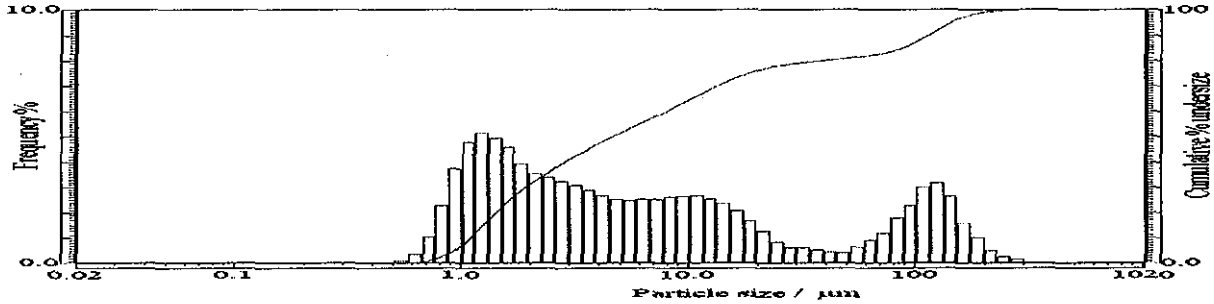
File Name: Cumulative times at run conditions with individual run settings highlighted.

[LOAD-IN]: P6 = ? min; S1 = ? min

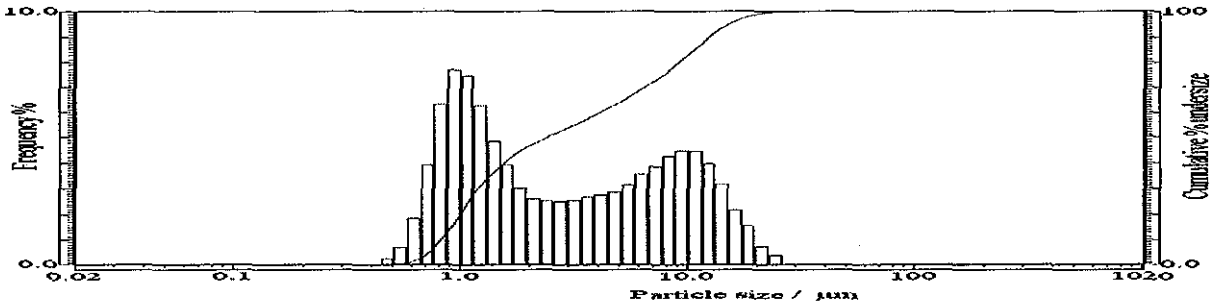
AY102894: P6 = 5 min; S1 = 5 min; S3 = 0 min; US = 0 min; DT = 0 min



AY102895: P6 = 9 min; S1 = 5 min; S3 = 4 min; US = 0 min; DT = 0 min



AY102896: P6 = 14 min; S1 = 5 min; S3 = 9 min; US = 2 min; DT = 0 min



AY102897: P6 = 17 min; S1 = 8 min; S3 = 9 min; US = 2 min; DT = 3 min

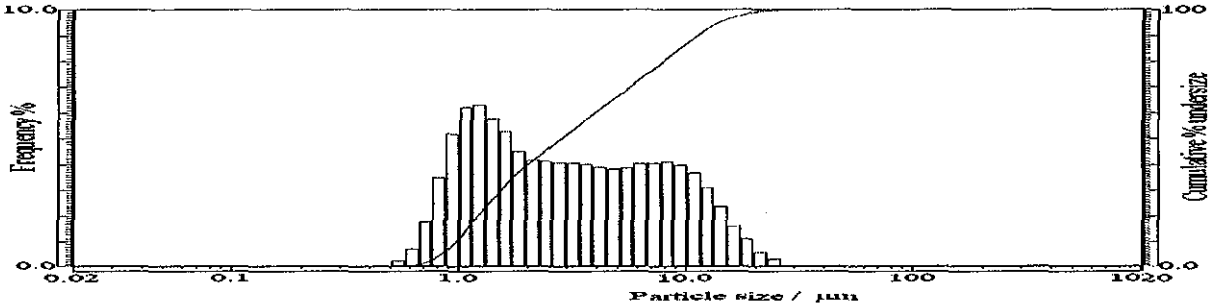
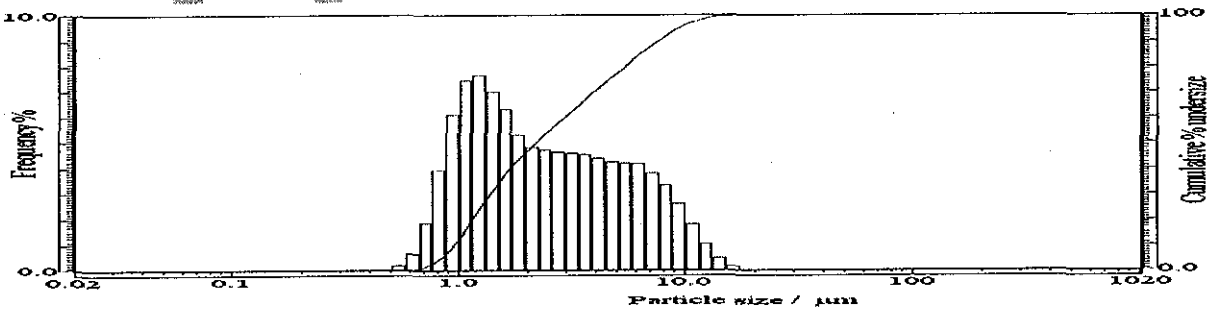


Figure 50: AY-102 Composite: Volume-based PSDs from second set of runs on sample S01T001654.

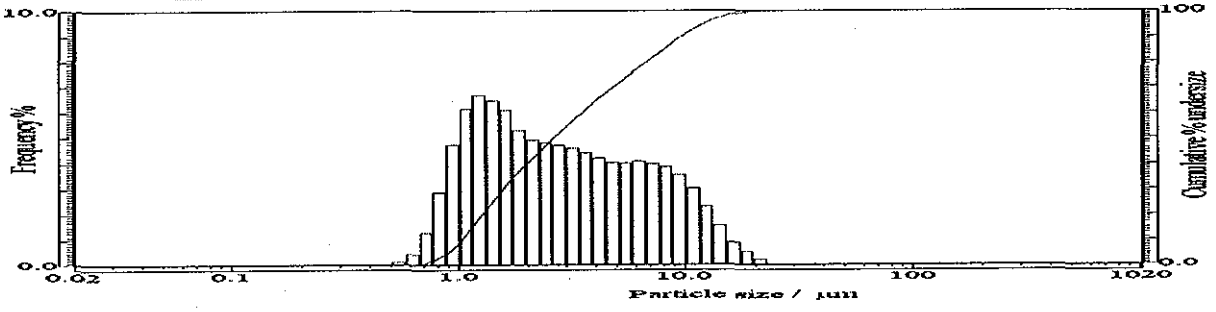
File Name: Cumulative times at run conditions with individual run settings highlighted.

[LOAD-IN]: P6 = ? min; S1 = ? min

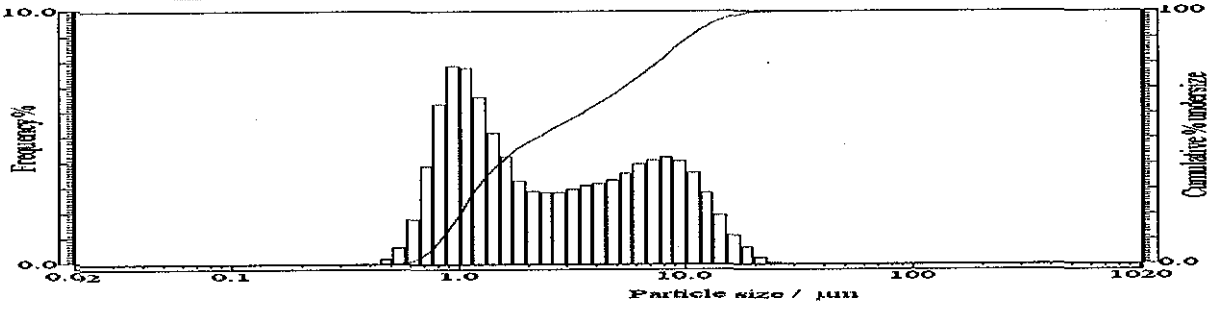
AY102898: P6 = 4 min; S1 = 4 min; S3 = 0 min; US = 0 min; DT = 0 min



AY102899: P6 = 7 min; S1 = 4 min; S3 = 3 min; US = 0 min; DT = 0 min



AY102900: P6 = 13 min; S1 = 4 min; S3 = 9 min; US = 2 min; DT = 0 min



AY102901: P6 = 16 min; S1 = 7 min; S3 = 9 min; US = 2 min; DT = 4 min

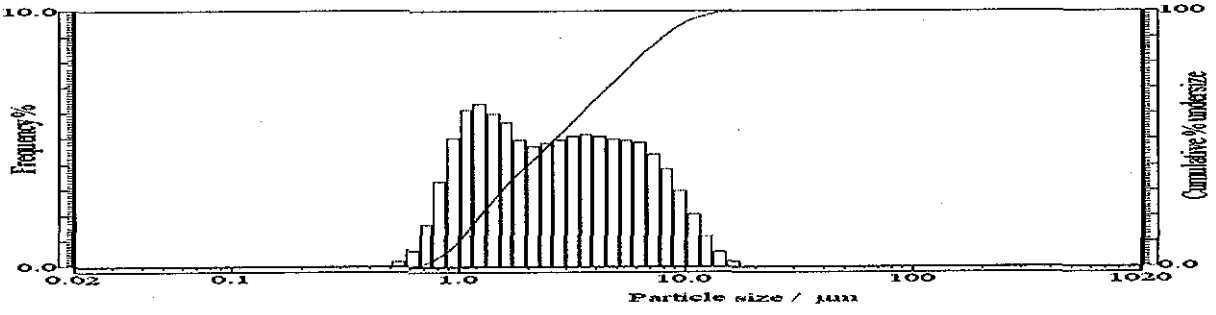
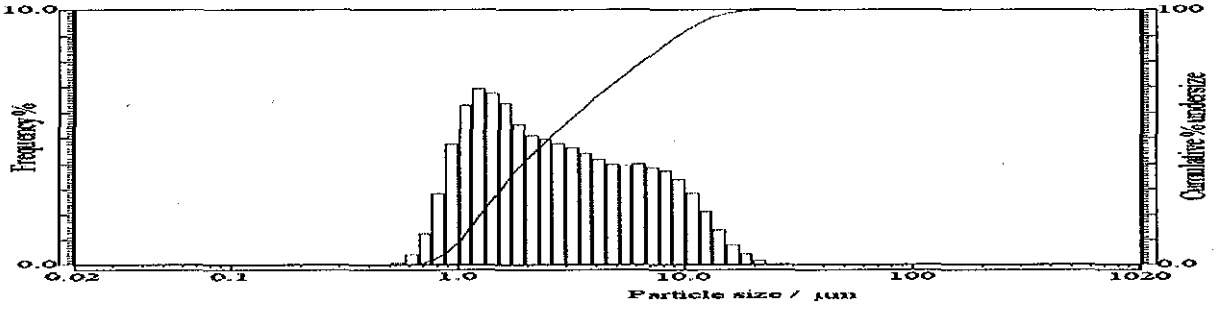


Figure 51. AY-102 Composite: Volume-based PSDs from first set of runs on sample S01T001655.

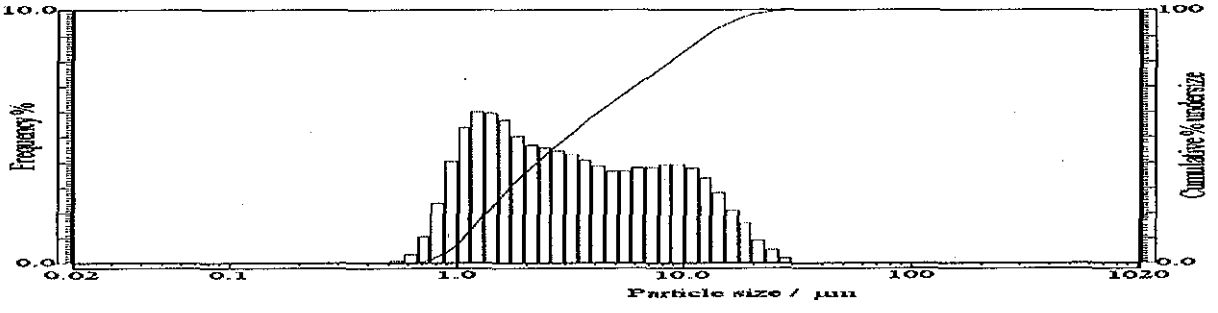
File Name: Cumulative times at run conditions with individual run settings **highlighted**.

[LOAD-IN]: **P6** = ? min; **S0** (Stirrer OFF)

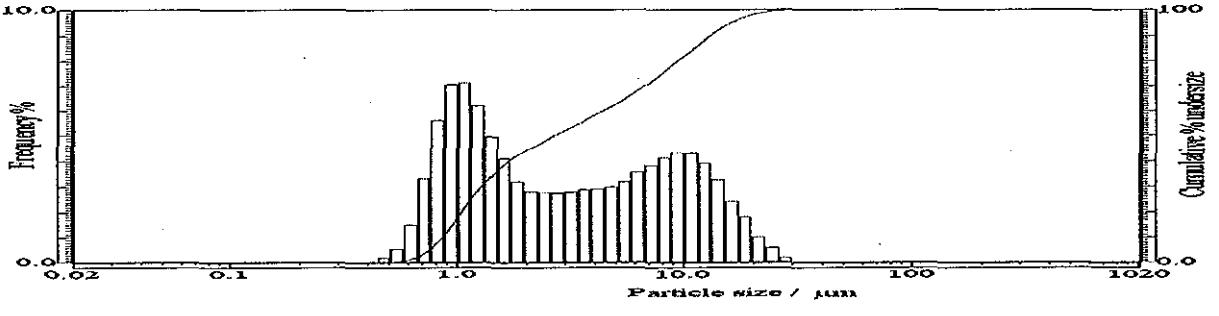
AY102902: **P6** = 4 min; **S0** ; *S3 = 0 min; US = 0 min; DT = 0 min*



AY102903: **P6** = 7 min; S1 = 0 min; **S3** = 3 min; US = 0 min; DT = 0 min



AY102904: **P6** = 14 min; S1 = 0 min; **S3** = 10 min; **US** = 2 min; **DT** = 0 min



AY102905: **P6** = 16 min; **S1** = 2 min; S3 = 10 min; US = 2 min; DT = 5 min

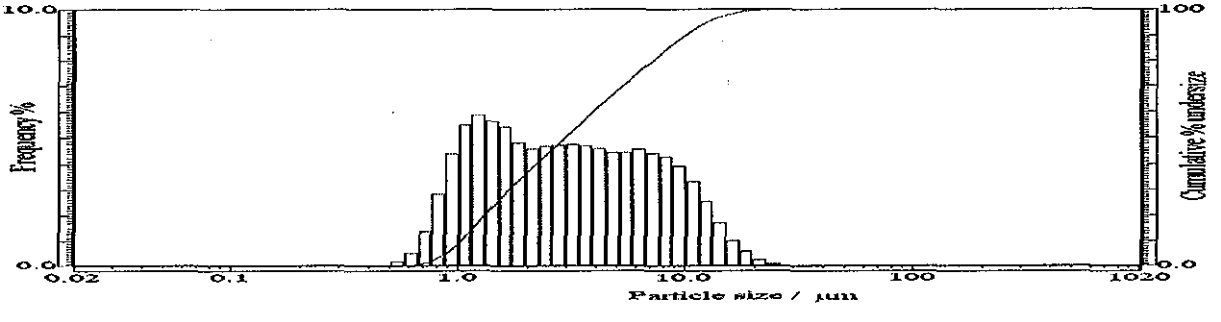
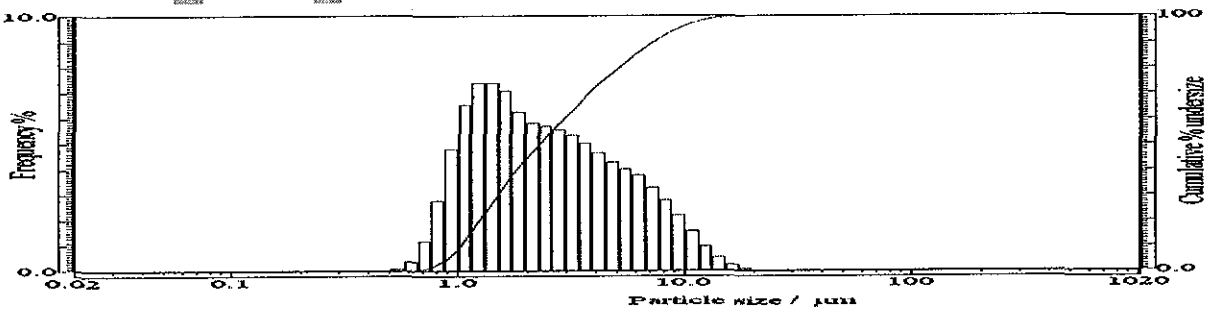


Figure 52: AY-102 Composite: Volume-based PSDs from second set of runs on sample S01T001655.

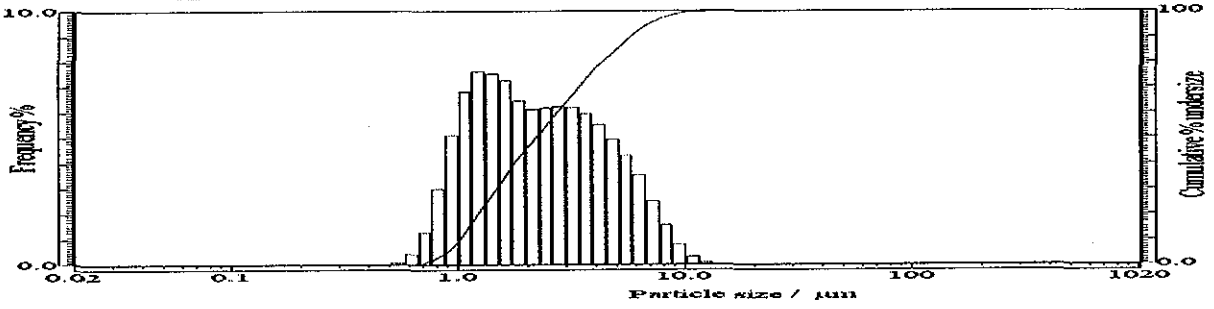
File Name: Cumulative times at run conditions with individual run settings highlighted.

[LOAD-IN]: P6 = ? min; S1 = ? min

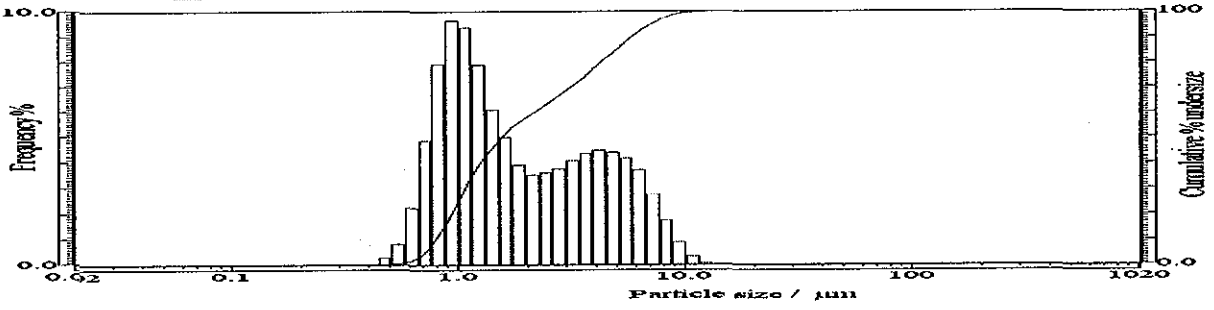
AY102906: P6 = 5 min; S1 = 5 min; S3 = 0 min; US = 0 min; DT = 0 min



AY102907: P6 = 8 min; S1 = 5 min; S3 = 3 min; US = 0 min; DT = 0 min



AY102908: P6 = 14 min; S1 = 5 min; S3 = 9 min; US = 2 min; DT = 0 min



AY102909: P6 = 16 min; S1 = 7 min; S3 = 11 min; US = 2 min; DT = 4 min

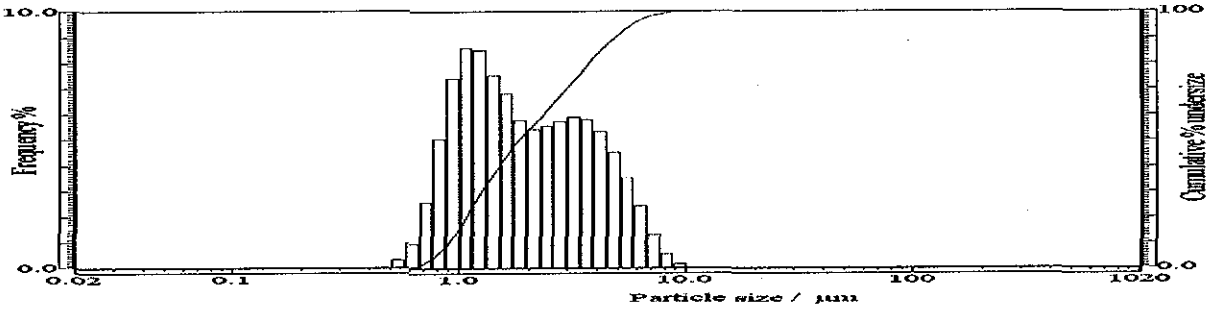


Table 22. AY-102 Composite: Mean particle diameters of volume-based PSDs.

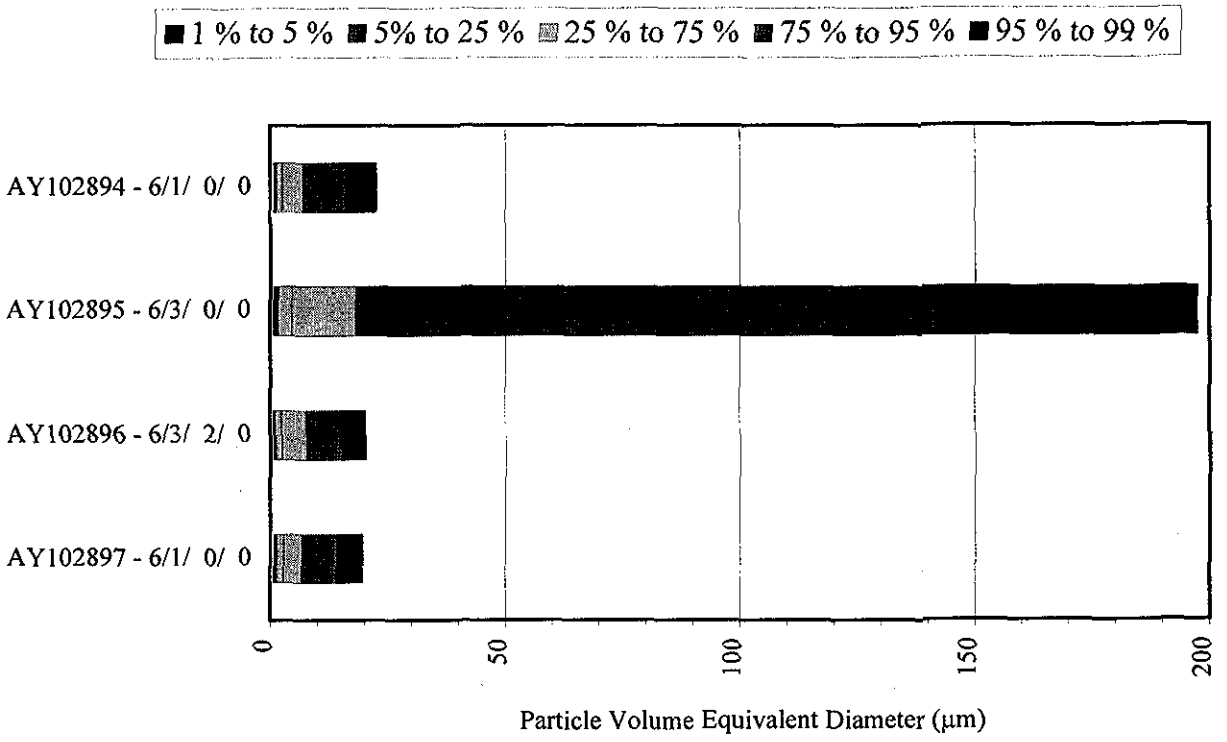
Sample	PSD Run File Name	Run Conditions				Mean Diameter (μm)	Standard Deviation (μm)
		P	S	US	DT		
S01T001654	AY102894	6	1	0	0	4.9	5.1
	AY102895	6	3	0	0	28.0	48.9
	AY102896	6	3	2	0	4.9	4.9
	AY102897	6	1	0	0	4.6	4.4
S01T001654	AY102898	6	1	0	0	3.3	2.8
	AY102899	6	3	0	0	4.1	3.7
	AY102900	6	3	2	0	4.2	4.1
	AY102901	6	1	0	0	3.6	2.9
S01T001655	AY102902	6	0	0	0	4.0	3.6
	AY102903	6	3	0	0	5.1	4.9
	AY102904	6	3	2	0	5.1	5.2
	AY102905	6	1	0	0	4.4	3.8
S01T001655	AY102906	6	1	0	0	3.3	2.8
	AY102907	6	3	0	0	2.8	2.0
	AY102908	6	3	2	0	2.5	2.1
	AY102909	6	1	0	0	2.4	1.6

Table 23. AY-102 Composite: Percentages of particles in volume-based PSDs with diameters less than the indicated values.

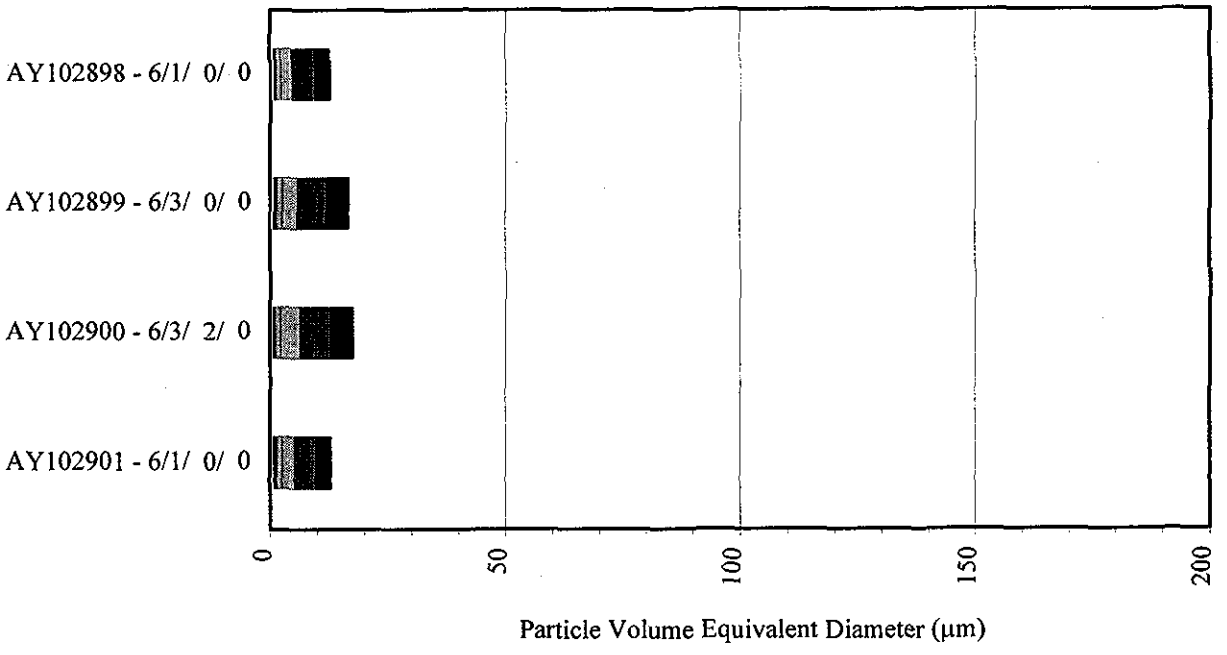
Sample	In Distributions Based on the Total Volume of Spherical Particles						
PSD Run	1 %	5 %	25 %	50 %	75 %	95 %	99 %
	Of the Particles Have Diameters Less Than (μm)						
S01T001654							
AY102894 - 6/1/ 0/ 0	0.68	0.85	1.31	2.54	6.9	16.0	22.5
AY102895 - 6/3/ 0/ 0	0.72	0.92	1.64	4.56	18.1	141.4	197.4
AY102896 - 6/3/ 2/ 0	0.59	0.72	1.09	2.43	7.7	15.0	20.3
AY102897 - 6/1/ 0/ 0	0.67	0.84	1.36	2.82	6.7	14.0	19.6
S01T001654							
AY102898 - 6/1/ 0/ 0	0.68	0.83	1.26	2.19	4.6	9.4	12.7
AY102899 - 6/3/ 0/ 0	0.70	0.88	1.40	2.60	5.7	12.0	16.8
AY102900 - 6/3/ 2/ 0	0.59	0.73	1.08	2.17	6.3	12.8	17.7
AY102901 - 6/1/ 0/ 0	0.68	0.85	1.37	2.63	5.1	9.7	13.0
S01T001655							
AY102902 - 6/0/ 0/ 0	0.70	0.89	1.39	2.51	5.4	11.5	16.3
AY102903 - 6/3/ 0/ 0	0.72	0.91	1.50	3.00	7.2	15.5	22.0
AY102904 - 6/3/ 2/ 0	0.60	0.75	1.14	2.70	7.9	16.1	22.2
AY102905 - 6/1/ 0/ 0	0.69	0.88	1.47	2.94	6.2	12.4	17.3
S01T001655							
AY102906 - 6/1/ 0/ 0	0.71	0.89	1.36	2.28	4.3	9.2	13.1
AY102907 - 6/3/ 0/ 0	0.70	0.88	1.33	2.18	3.8	6.8	9.2
AY102908 - 6/3/ 2/ 0	0.57	0.70	0.99	1.55	3.6	7.0	9.4
AY102909 - 6/1/ 0/ 0	0.64	0.79	1.15	1.82	3.3	5.8	7.5

Figure 53. AY-102 Composite: Diameters of particles within defined, volume-based, percentile ranges. (Two Pages)

AY-102 Composite: S00T001654: First Measurement Set

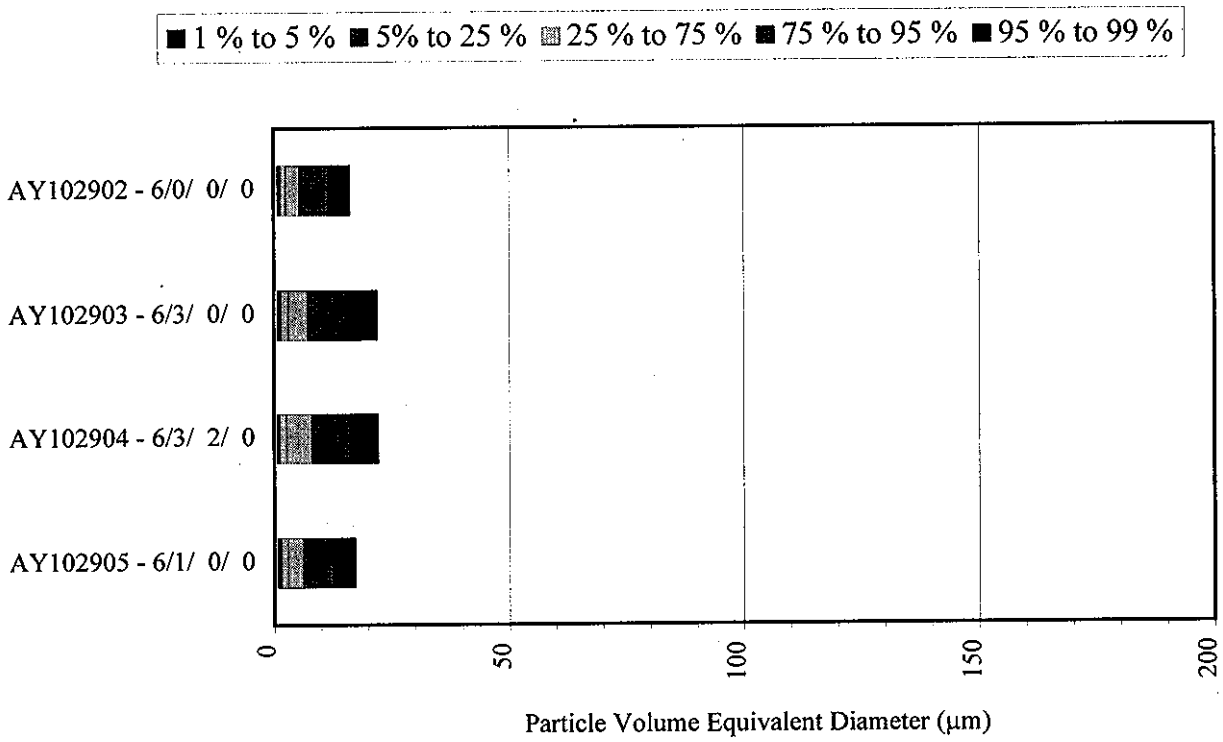


AY-102 Composite: S01T001654: Second Measurement Set

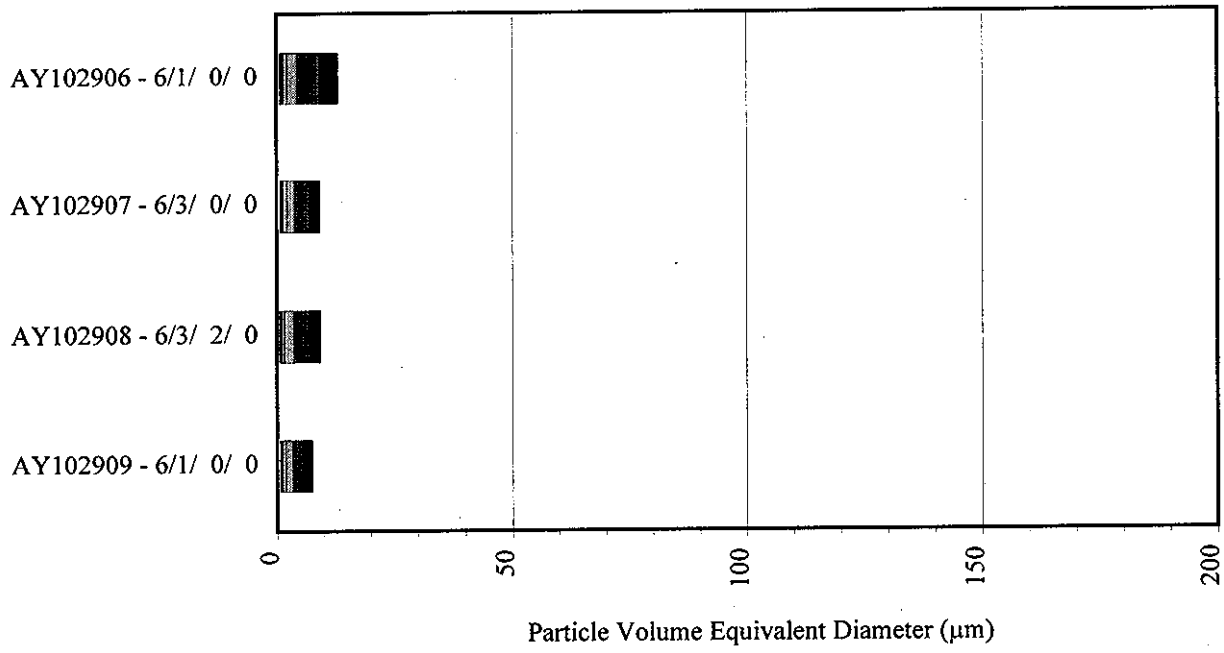


Continued:

AY-102 Composite: S00T001655: First Measurement Set



AY-102 Composite: S01T001655: Second Measurement Set



Data and Observations—AZ-102. The measurement results summarized in Figures 54 through 60 and Tables 29 and 30 are presented in the format previously described in Sec. 4.2.1. Three AZ-102 composite subsamples were examined. A single PSD measurement set was collected for subsample S01T001651. Three PSD measurement sets were collected for subsample S01T001652; two were collected for subsample S01T001653. Separate analytical specimens were withdrawn from the subsample vials for each measurement set.

A somewhat confusing picture is presented by the multiple measurement sets on the three subsamples. Generally, however, all the PSDs indicate the presence of a significant population of particles with diameters beginning around 1 μm and extending up to values between 30 μm and 100 μm. The modal values of these populations are in the range of 10 μm to 20 μm. This population of particles appears to be relatively unaffected by continuous pumping, stirring and sonication applied during the measurement sets.

The initial PSDs for the S01T001651 measurement set (Figure 54) and two of the three sets for subsample S01T001652 (Figures 55 and 57) also indicate the presence of significant populations of particles with diameters >100 μm. The appearance of these larger particles in the remaining S01T001652 measurement set (Figure 56) only after the ultrasonic treatment (Run AZ102916) is not understood and the results of this measurement set are suspect. The total absence of these larger particles from the PSDs of both measurement sets for subsample S01T001653 (Figures 58 and 59) is likewise not understood but could indicate poor precision in either the subsampling or specimen withdrawal steps.

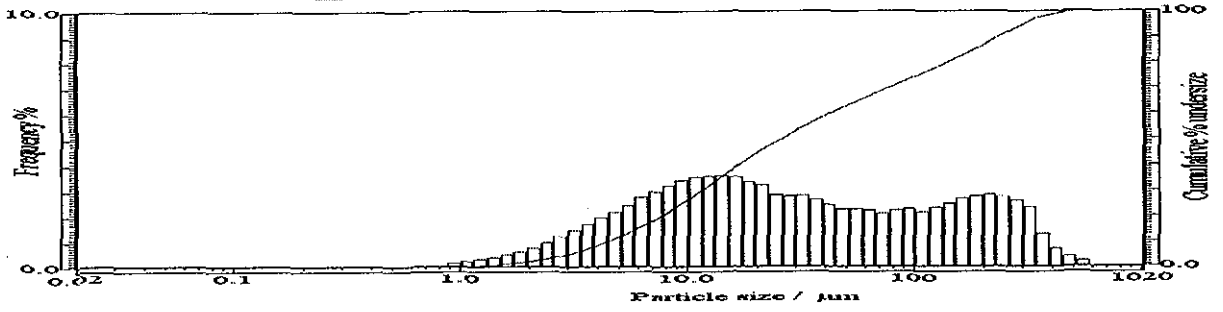
In the measurement sets where they do appear, the partial breakup of the >100 μm particles is initiated by pumping and stirring in the analyzer. This is clearly observed by comparing the first two PSD runs in Figures 54, 55, and 57 and the corresponding segments of Figure 60. The two minutes of ultrasonic treatment applied during the third PSD run in these sets was sufficient to complete the breakup of nearly all of the large particles/agglomerates. A minor remnant population of particles with diameters extending up to ≈ 250 μm is observed following the ultrasonic treatment.

Figure 54. AZ-102 Composite: Volume-based PSDs from set of runs on sample S01T001651.

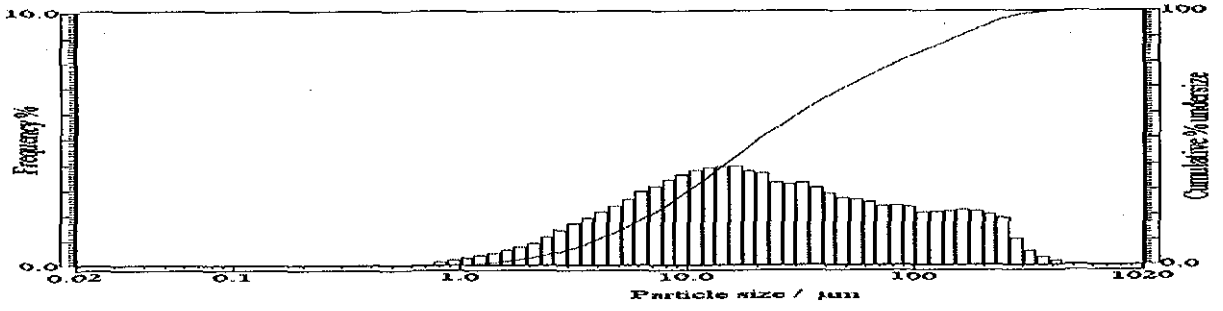
File Name: Cumulative times at run conditions with individual run settings highlighted.

[LOAD-IN]: P3 = 2 min; S3 = 2 min

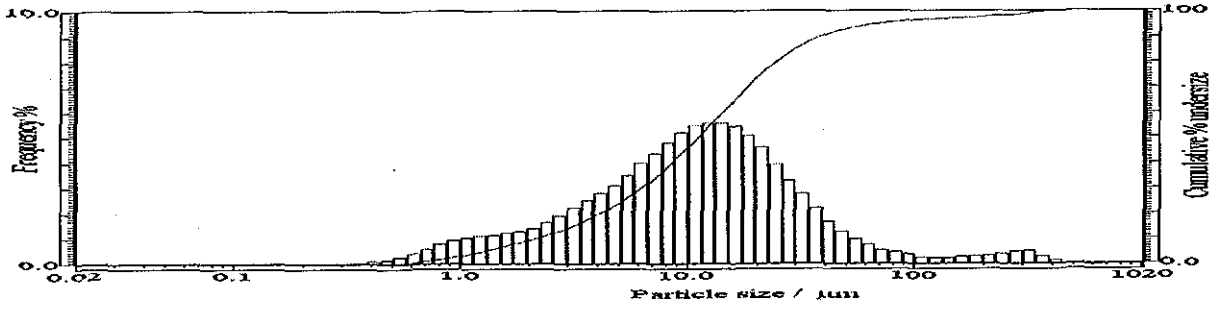
AZ102884: P3 = 2 min; P6 = 4 min; S1 = 4 min; S3 = 2 min; US = 0 min; DT = 0 min



AZ102885: P3 = 2 min; P6 = 7 min; S1 = 4 min; S3 = 6 min; US = 0 min; DT = 0 min



AZ102886: P3 = 2 min; P6 = 13 min; S1 = 4 min; S3 = 11 min; US = 2 min; DT = 0 min



AZ102887: P3 = 2 min; P6 = 16 min; S1 = 7 min; S3 = 11 min; US = 2 min; DT = 4 min

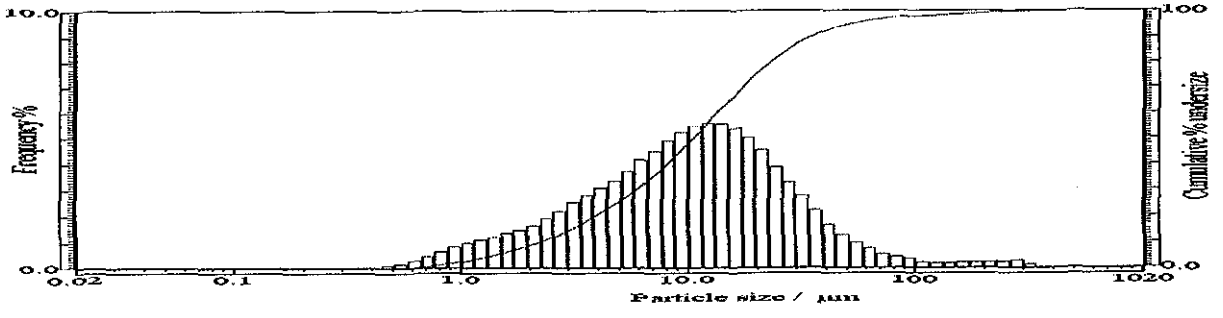
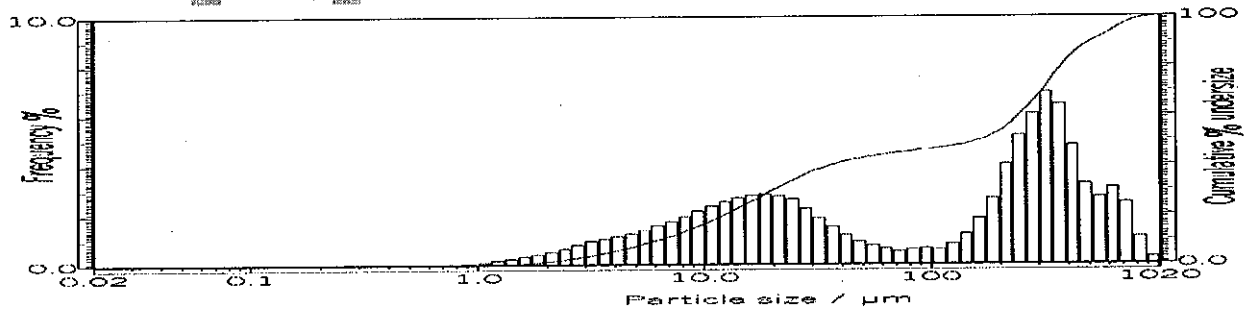


Figure 55. AZ-102 Composite: Volume-based PSDs from first set of runs on sample S01T001652.

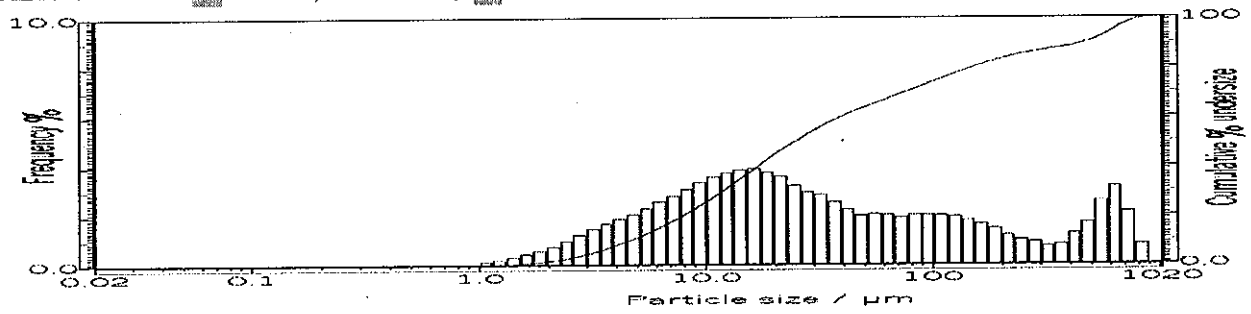
File Name: Cumulative times at run conditions with individual run settings **highlighted**.

[LOAD-IN]: **P6** = ? min; **S1** = ? min

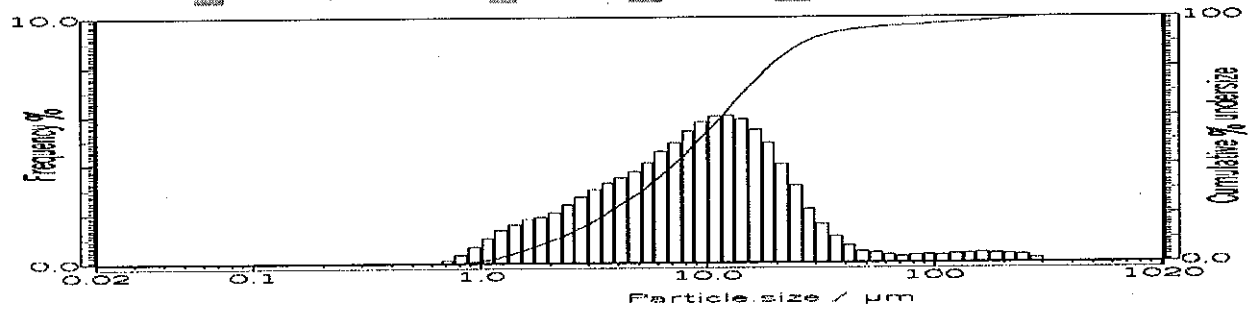
AZ102910: **P6** = 6 min; **S1** = 6 min; S3 = 0 min; US = 0 min; DT = 0 min



AZ102911: **P6** = 9 min; S1 = 6 min; **S3** = 3 min; US = 0 min; DT = 0 min



AZ102912: **P6** = 15 min; S1 = 6 min; **S3** = 9 min; **US** = 2 min; **DT** = 0 min



AZ102913: **P6** = 18 min; **S1** = 9 min; S3 = 9 min; US = 2 min; DT = 4 min

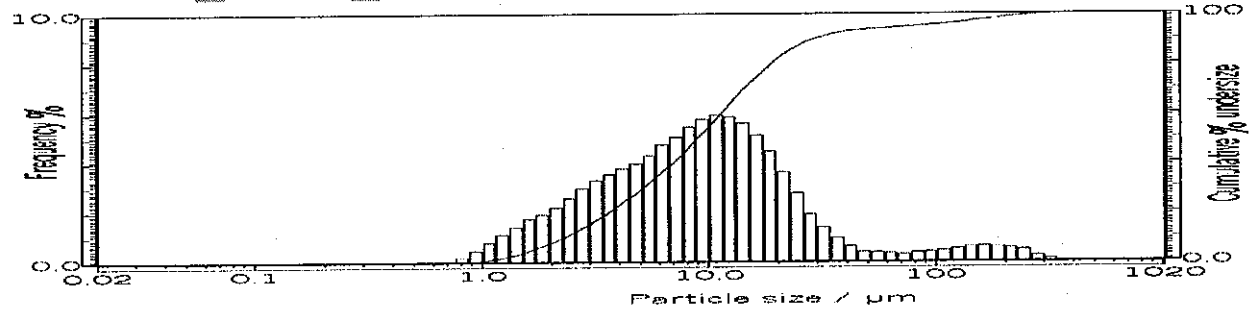
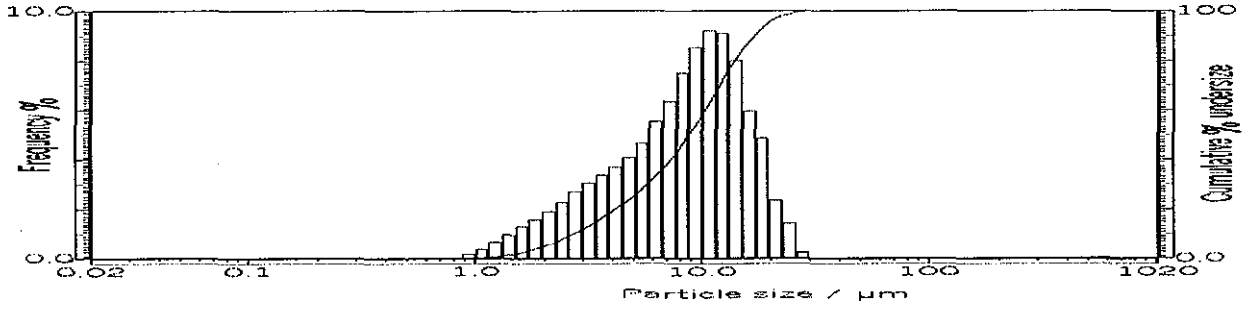


Figure 56. AZ-102 Composite: Volume-based PSDs from second set of runs on sample S01T001652.

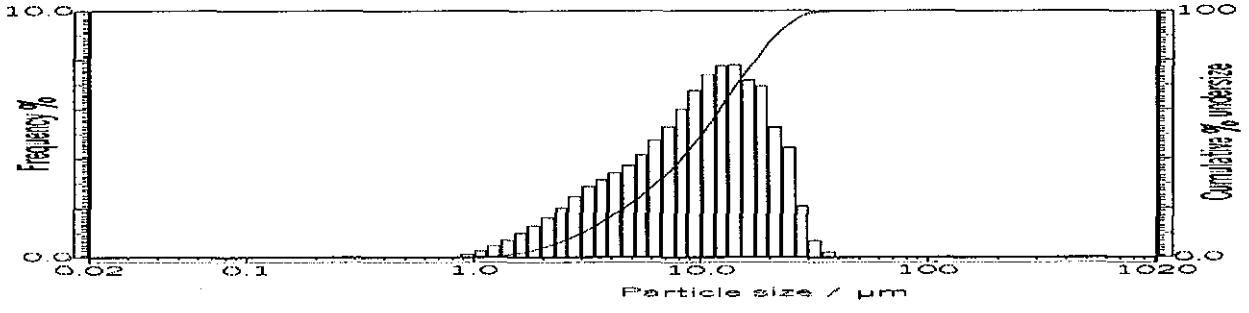
File Name: Cumulative times at run conditions with individual run settings **highlighted**.

[LOAD-IN]: **P6** = ? min; **S1** = ? min

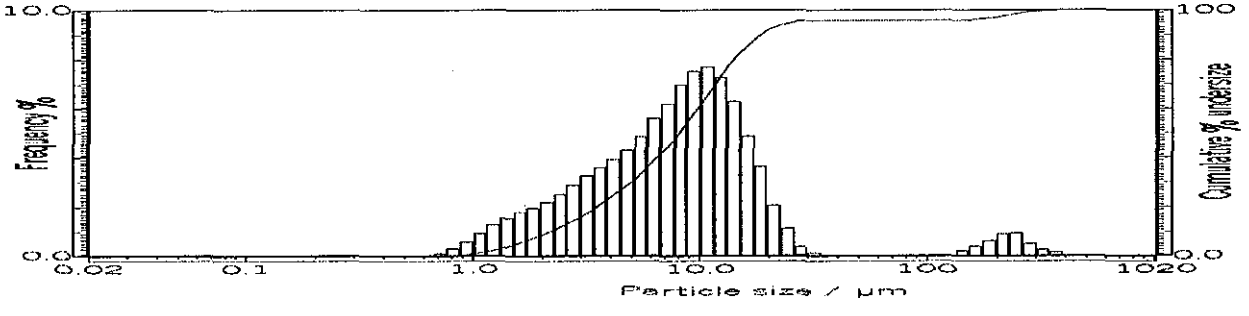
AZ102914: **P6** = 3 min; **S1** = 3 min; S3 = 0 min; US = 0 min; DT = 0 min



AZ102915: **P6** = 6 min; S1 = 3 min; **S3** = 3 min; US = 0 min; DT = 0 min



AZ102916: **P6** = 11 min; S1 = 3 min; **S3** = 8 min; **US** = 2 min; **DT** = 0 min



AZ102917: **P6** = 14 min; **S1** = 6 min; S3 = 8 min; US = 2 min; DT = 3 min

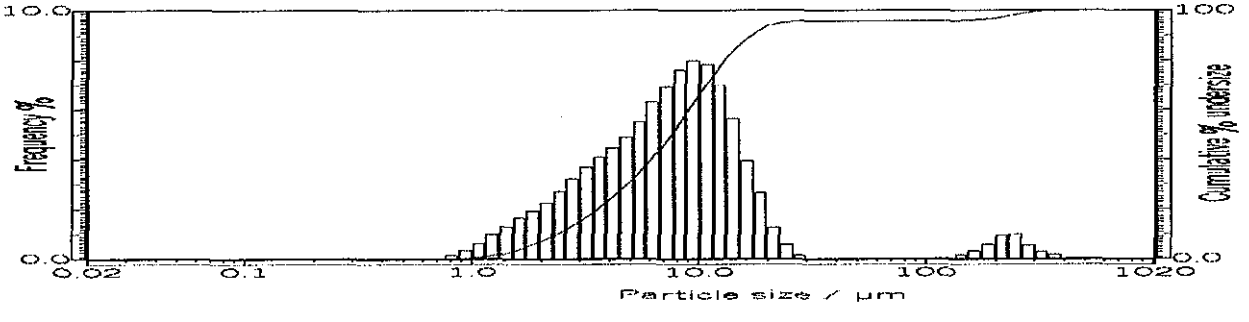
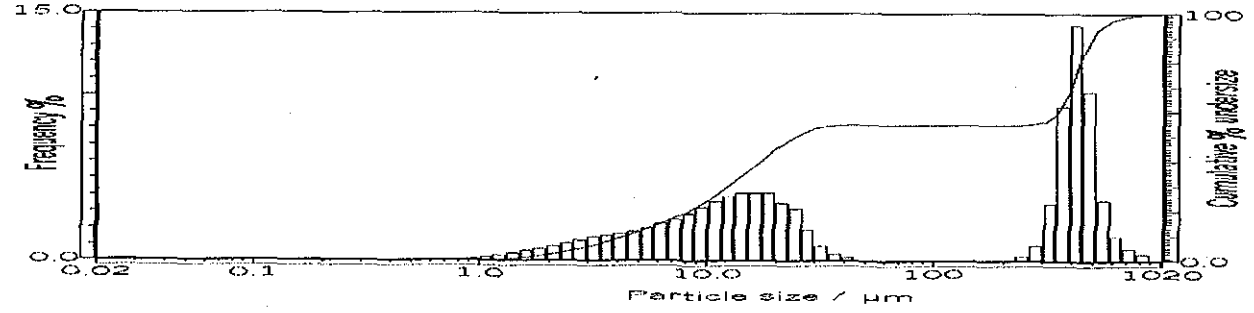


Figure 57. AZ-102 Composite: Volume-based PSDs from third set of runs on sample S01T001652.

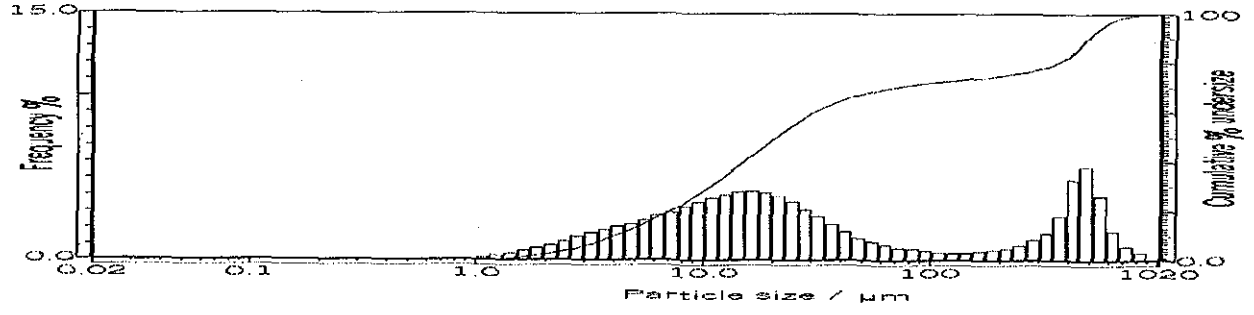
File Name: Cumulative times at run conditions with individual run settings **highlighted**.

[LOAD-IN]: **P6** = ? min; **S1** = ? min

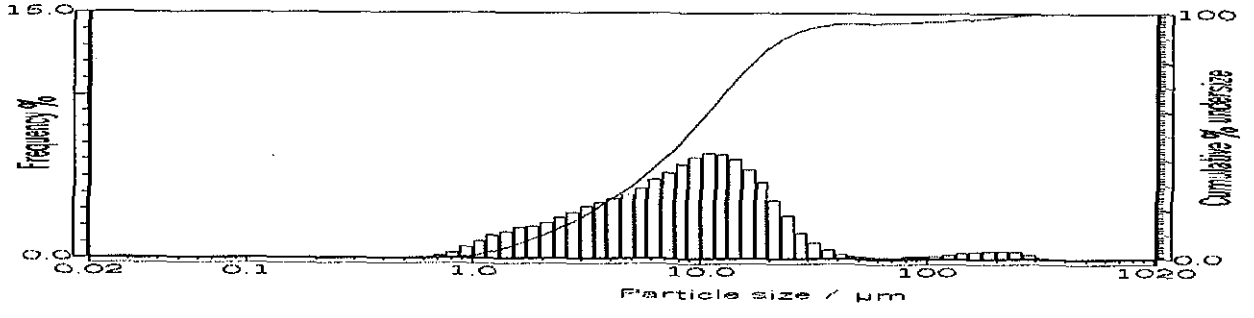
AZ102918: **P6** = 4 min; **S1** = 4 min; S3 = 0 min; US = 0 min; DT = 0 min



AZ102919: **P6** = 7 min; S1 = 4 min; **S3** = 3 min; US = 0 min; DT = 0 min



AZ102920: **P6** = 13 min; S1 = 4 min; **S3** = 9 min; **US** = 2 min; **DT** = 0 min



AZ102921: **P6** = 15 min; **S1** = 6 min; S3 = 9 min; US = 2 min; DT = 4 min

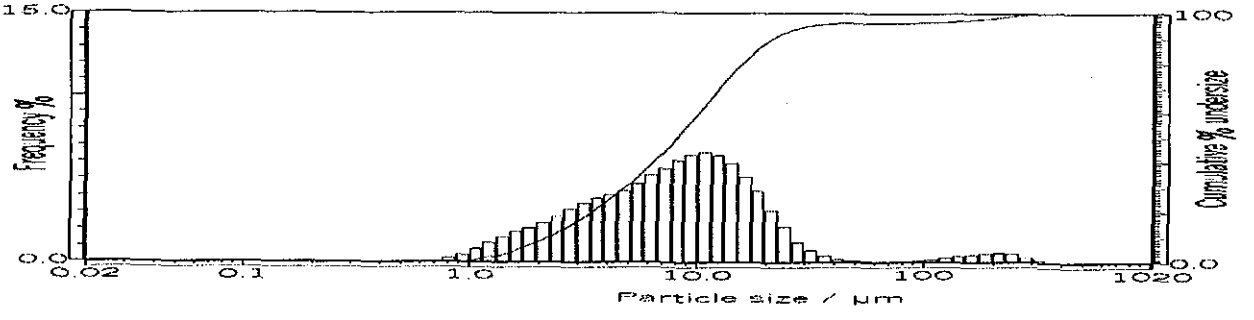
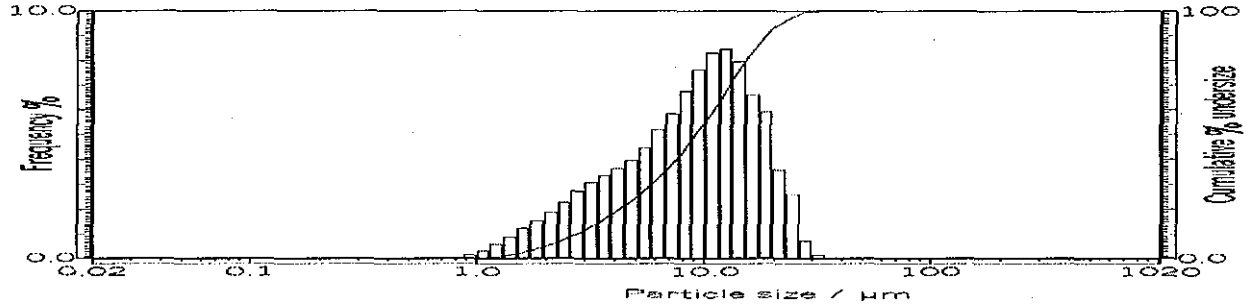


Figure 58: AZ-102 Composite: Volume-based PSDs from first set of runs on sample S01T001653.

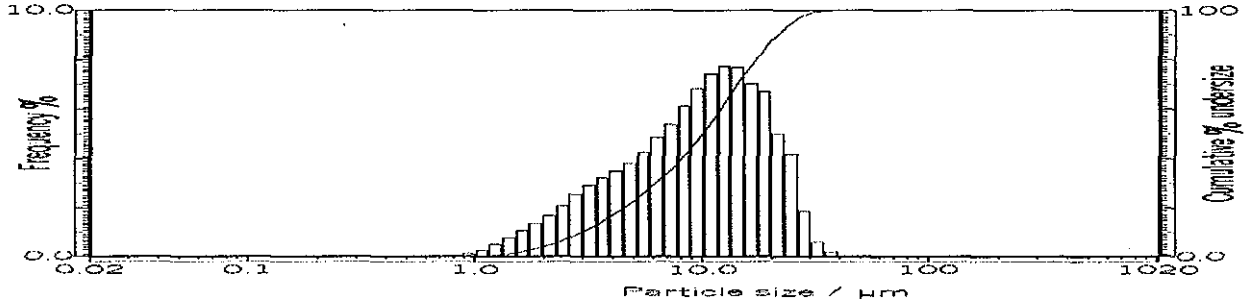
File Name: Cumulative times at run conditions with individual run settings highlighted.

[LOAD-IN]: P6 = ? min; S1 = ? min

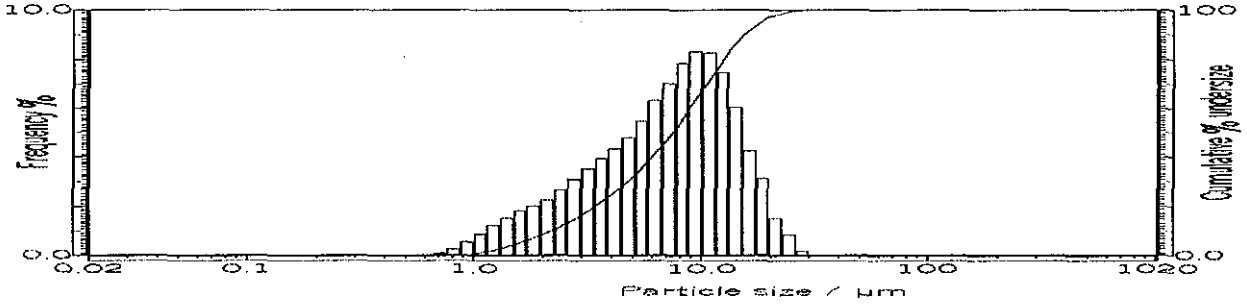
AZ102922: P6 = 4 min; S1 = 4 min; S3 = 0 min; US = 0 min; DT = 0 min



AZ102923: P6 = 7 min; S1 = 4 min; S3 = 3 min; US = 0 min; DT = 0 min



AZ102924: P6 = 13 min; S1 = 4 min; S3 = 9 min; US = 2 min; DT = 0 min



AZ102925: P6 = 15 min; S1 = 6 min; S3 = 9 min; US = 2 min; DT = 4 min

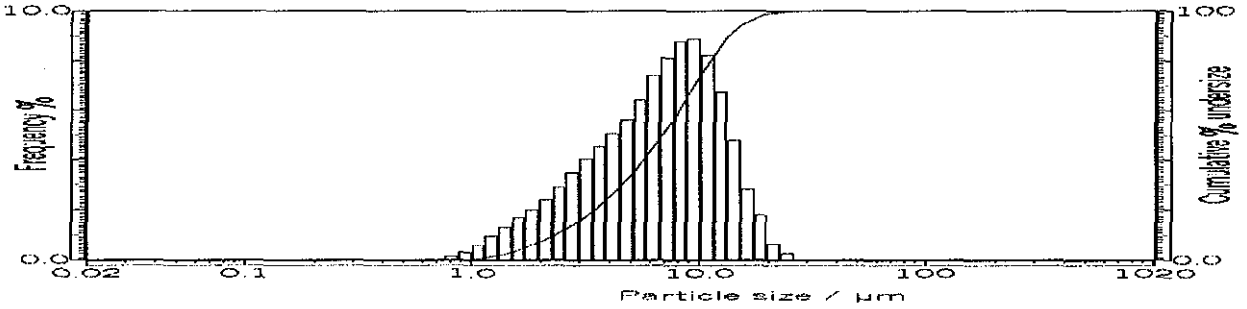
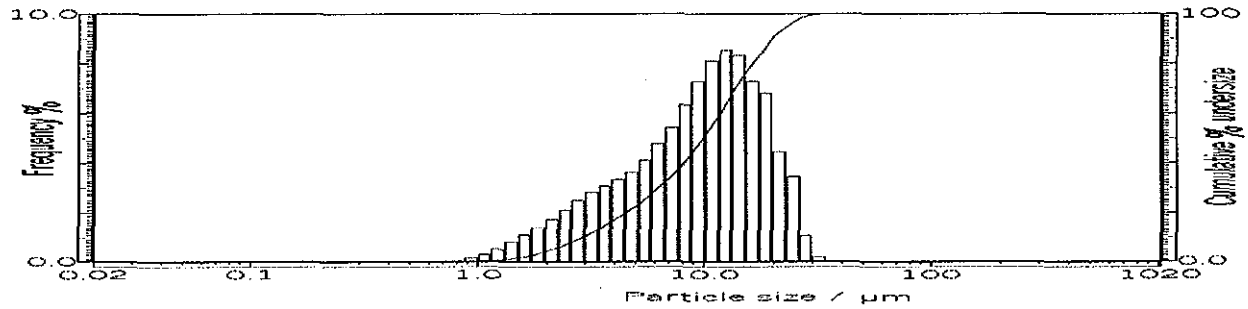


Figure 59: AZ-102 Composite: Volume-based PSDs from second set of runs on sample S01T001653.

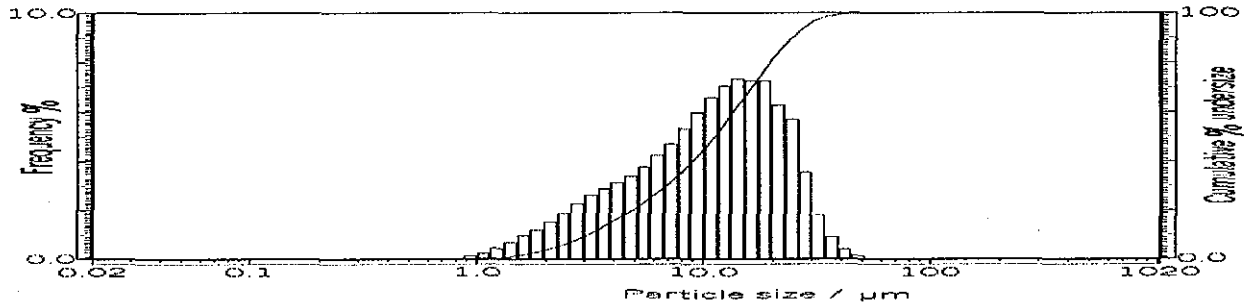
File Name: Cumulative times at run conditions with individual run settings **highlighted**.

[LOAD-IN]: **P6** = ? min; **S1** = ? min

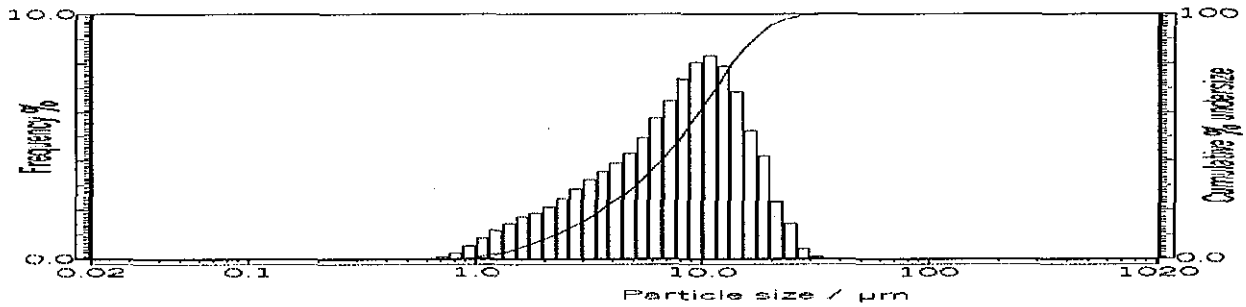
AZ102926: **P6** = 4 min; **S1** = 4 min; S3 = 0 min; US = 0 min; DT = 0 min



AZ102927: **P6** = 6 min; S1 = 4 min; **S3** = 2 min; US = 0 min; DT = 0 min



AZ102928: **P6** = 11 min; S1 = 4 min; **S3** = 7 min; **US** = 2 min; **DT** = 0 min



AZ102929: **P6** = 14 min; **S1** = 7 min; S3 = 7 min; US = 2 min; DT = 3 min

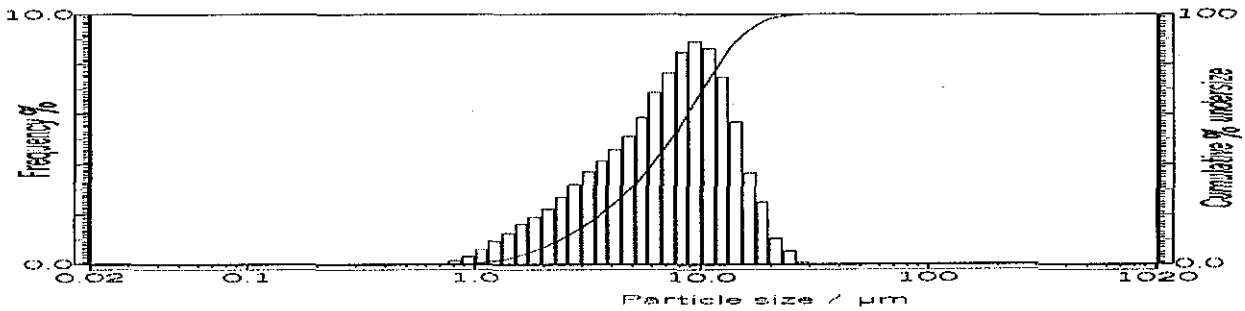


Table 24. AZ-102 Composite: Mean particle diameters of volume-based PSDs.

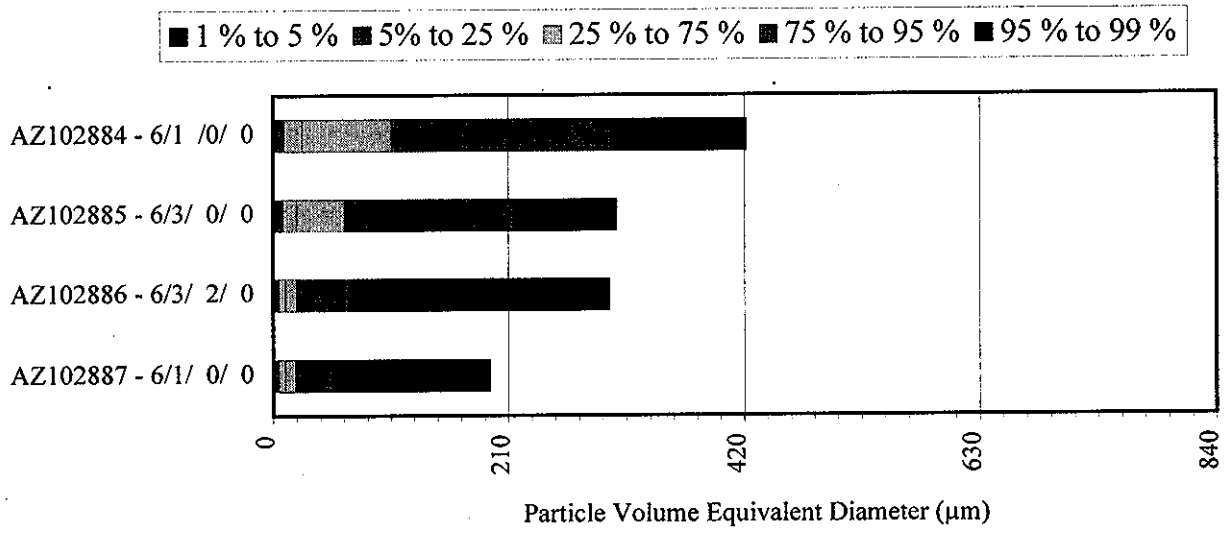
Sample	PSD Run File Name	Run Conditions				Mean Diameter (μm)	Standard Deviation (μm)
		P	S	US	DT		
S01T001651	AZ102884	6	1	0	0	75.2	100.5
	AZ102885	6	3	0	0	51.7	69.9
	AZ102886	6	3	2	0	22.7	47.1
	AZ102887	6	1	0	0	18.3	31.3
S01T001652	AZ102910	6	1	0	0	205.7	214.4
	AZ102911	6	3	0	0	114.9	194.2
	AZ102912	6	3	2	0	16.4	30.5
	AZ102913	6	1	0	0	19.0	38.3
S01T001652	AZ102914	6	1	0	0	9.4	5.4
	AZ102915	6	3	0	0	11.2	7.0
	AZ102916	6	3	2	0	17.6	45.5
	AZ102917	6	1	0	0	17.4	46.7
S01T001652	AZ102918	6	1	0	0	205.1	221.7
	AZ102919	6	3	0	0	132.6	201.3
	AZ102920	6	3	2	0	16.4	35.3
	AZ102921	6	1	0	0	16.3	37.1
S01T001653	AZ102922	6	1	0	0	10.0	6.0
	AZ102923	6	3	0	0	11.0	6.9
	AZ102924	6	3	2	0	8.2	5.1
	AZ102925	6	1	0	0	7.5	4.4
S01T001653	AZ102926	6	1	0	0	10.6	6.4
	AZ102927	6	3	0	0	12.6	8.3
	AZ102928	6	3	2	0	8.9	5.6
	AZ102929	6	1	0	0	8.0	4.7

Table 25. AZ-102 Composite: Percentages of particles in volume-based PSDs with diameters less than the indicated values.

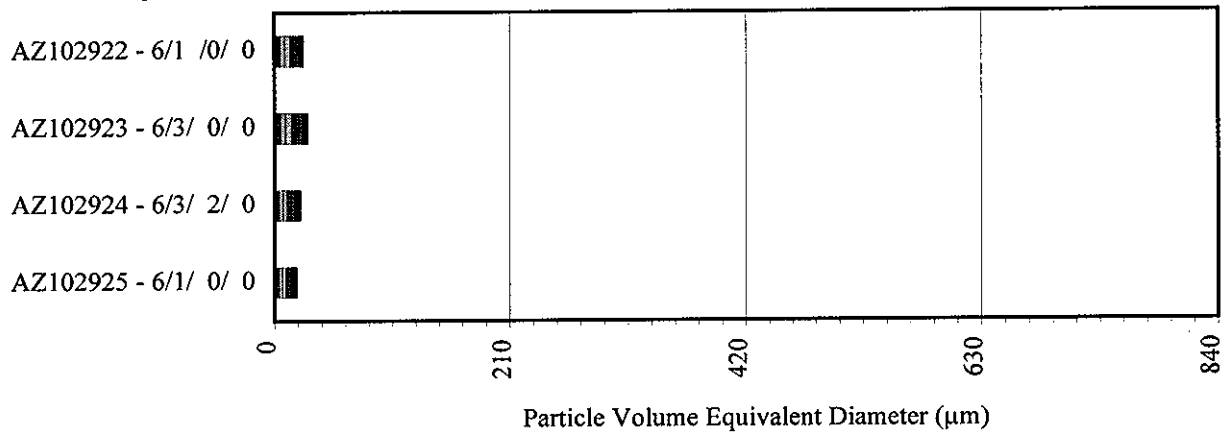
Sample	In Distributions Based on the Total Volume of Spherical Particles						
PSD Run	1 %	5 %	25 %	50 %	75 %	95 %	99 %
	Of the Particles Have Diameters Less Than (mm)						
S01T001651							
AZ102884 - 6/1 /0/ 0	1.48	2.96	9.37	25.6	105.3	300.1	421.4
AZ102885 - 6/3/ 0/ 0	1.29	2.62	8.37	20.6	63.4	214.7	306.6
AZ102886 - 6/3/ 2/ 0	0.67	1.25	5.19	11.0	20.8	66.9	299.8
AZ102887 - 6/1/ 0/ 0	0.75	1.38	4.94	10.5	19.7	52.7	193.9
S01T001652							
AZ102910 - 6/1 /0/ 0	1.78	3.72	15.74	163.07	338.9	648.1	820.6
AZ102911 - 6/3/ 0/ 0	1.66	3.06	9.71	24.36	105.5	624.8	769.5
AZ102912 - 6/3/ 2/ 0	0.97	1.49	4.35	9.18	16.4	43.8	191.3
AZ102913 - 6/1/ 0/ 0	1.07	1.64	4.33	8.95	16.2	81.0	223.8
S01T001652							
AZ102914 - 6/1 /0/ 0	1.26	1.97	4.93	8.78	12.9	19.4	24.4
AZ102915 - 6/3/ 0/ 0	1.34	2.15	5.44	10.06	15.7	24.6	29.8
AZ102916 - 6/3/ 2/ 0	1.00	1.53	4.19	8.04	12.7	25.0	261.2
AZ102917 - 6/1/ 0/ 0	1.11	1.71	4.15	7.53	11.7	22.6	266.2
S01T001652							
AZ102918 - 6/1 /0/ 0	1.47	2.78	10.12	24.58	418.1	545.6	703.9
AZ102919 - 6/3/ 0/ 0	1.53	2.74	8.72	20.51	208.6	558.0	721.4
AZ102920 - 6/3/ 2/ 0	0.97	1.47	4.17	8.62	14.8	35.0	222.9
AZ102921 - 6/1/ 0/ 0	1.06	1.60	4.09	8.17	13.9	31.8	231.2
S01T001653							
AZ102922 - 6/1 /0/ 0	1.29	2.01	5.00	9.15	13.9	21.6	25.9
AZ102923 - 6/3/ 0/ 0	1.33	2.12	5.29	9.82	15.4	24.3	29.6
AZ102924 - 6/3/ 2/ 0	1.02	1.56	4.04	7.43	11.3	18.0	23.1
AZ102925 - 6/1/ 0/ 0	1.13	1.72	3.97	6.85	10.2	15.6	19.9
S01T001653							
AZ102926 - 6/1 /0/ 0	1.31	2.08	5.36	9.81	14.8	22.6	27.2
AZ102927 - 6/3/ 0/ 0	1.35	2.21	5.81	11.07	17.8	28.1	36.9
AZ102928 - 6/3/ 2/ 0	1.02	1.58	4.30	8.05	12.3	19.5	25.1
AZ102929 - 6/1/ 0/ 0	1.13	1.74	4.17	7.32	10.9	16.9	21.8

Figure 60. AZ-102 Composite: Diameters of particles (μm) within defined, volume-based, percentile ranges. (Two Pages)

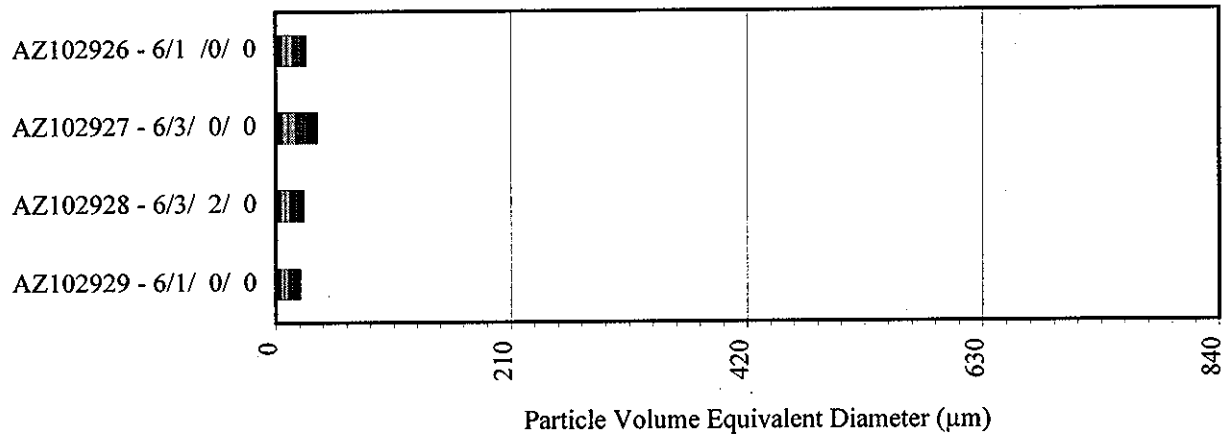
AZ-102 Composite: S01T001651



AZ-102 Composite: S01T001653: First Measurement Set

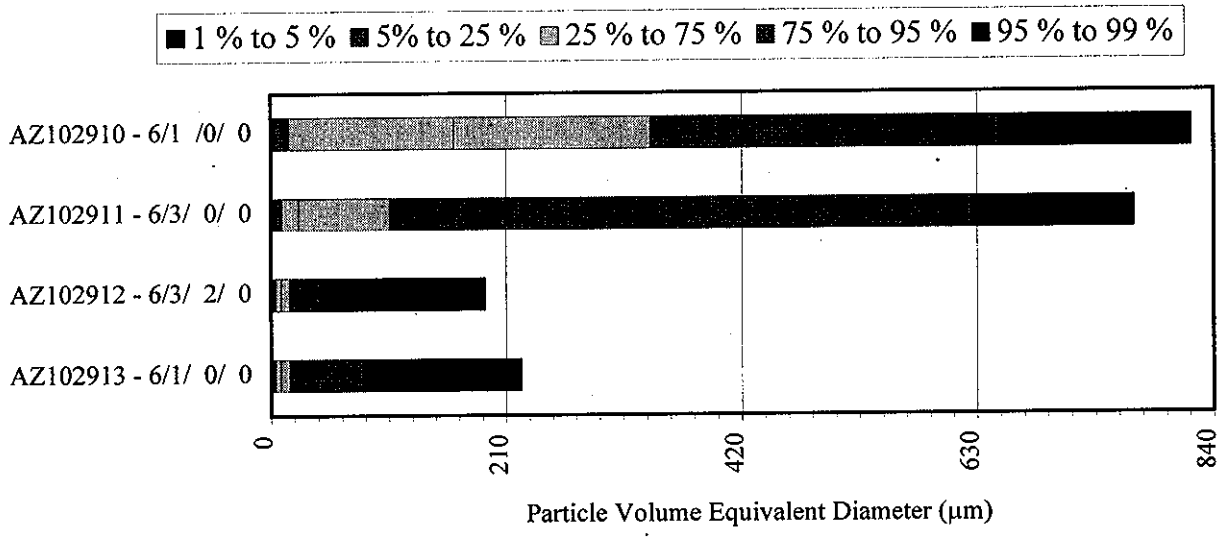


AZ-102 Composite: S01T001653: Second Measurement Set

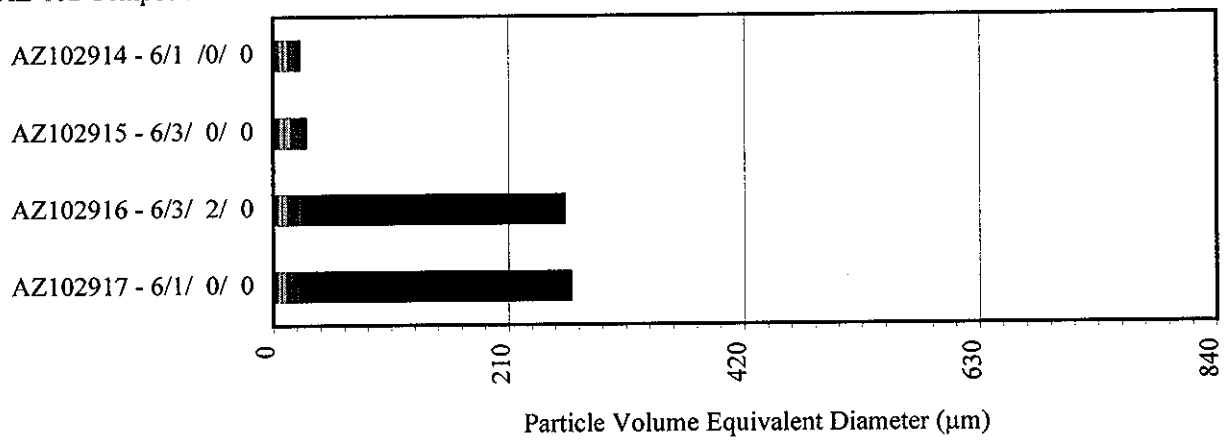


Continued:

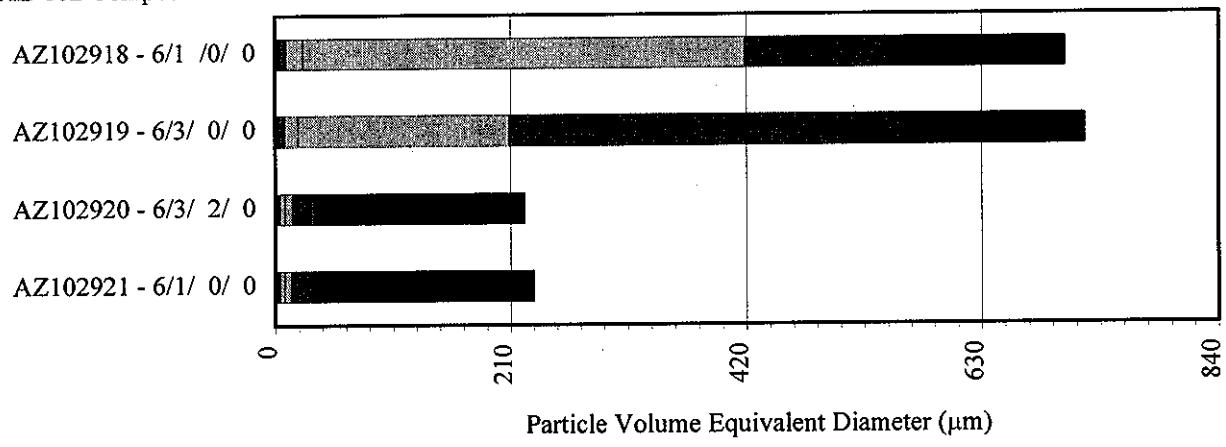
AZ-102 Composite: S01T001652: First Measurement Set



AZ-102 Composite: S01T001652: Second Measurement Set



AZ-102 Composite: S01T001652: Third Measurement Set



Data and Observations—C-107. The measurement results summarized in Figures 61 through 65 and Tables 31 and 32 are presented in the format previously described in Sec. 4.2.1. Four PSD measurement sets were collected on four separate analytical specimens withdrawn from C-107 composite sample S01T001673.

All four PSD measurement sets are very similar. The first two PSD runs in each set indicate the presence of a major population of particles with diameters ranging from around 3 μm to 20 μm (modes of 8 μm to 10 μm). A minor but significant population of smaller diameter particles, 0.6 μm to 3 μm, is also observed in each set. All the initial two PSD run sequences also indicate that the specimen particulates are largely unaffected by the pumping and stirring regimes of the analyzer.

Ultrasonic treatment for two minutes reduces the percentage of the population of 3 μm to 20 μm particles in the PSDs and shifts the mode of this population to slightly smaller diameter values. The original 0.6 μm to 3 μm population is enhanced by the breakup of the larger particles but does not shift appreciably in particle diameters.

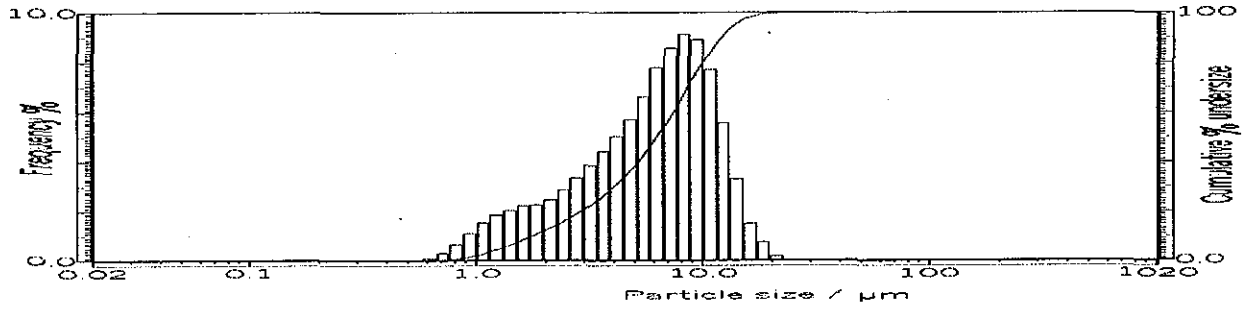
The shift of the population of larger particles to smaller diameters continues in the last PSD run of each set. Whether this indicates a continued breakup of particles weakened by the previous sonication or the inefficient suspension of the largest of the particles at the slower S1 stirring speeds of these runs is not clear.

Figure 61. C-107 Composite: Volume-based PSDs from first set of runs on composite S01T001673.

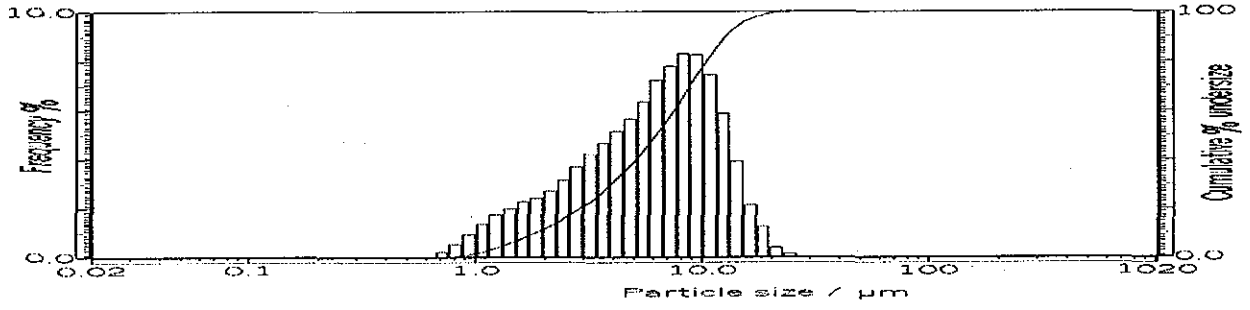
File Name: Cumulative times at run conditions with individual run settings highlighted.

[LOAD-IN]: P6 = ? min; S1 = ? min

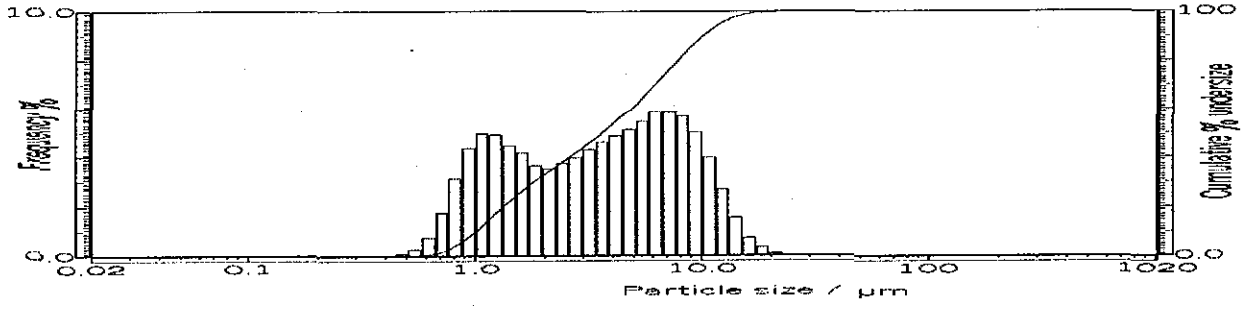
C107930: P6 = 5 min; S1 = 5 min; S3 = 0 min; US = 0 min; DT = 0 min



C107931: P6 = 8 min; S1 = 5 min; S3 = 3 min; US = 0 min; DT = 0 min



C107932: P6 = 13 min; S1 = 5 min; S3 = 8 min; US = 2 min; DT = 0 min



C107933: P6 = 17 min; S1 = 9 min; S3 = 8 min; US = 2 min; DT = 3 min

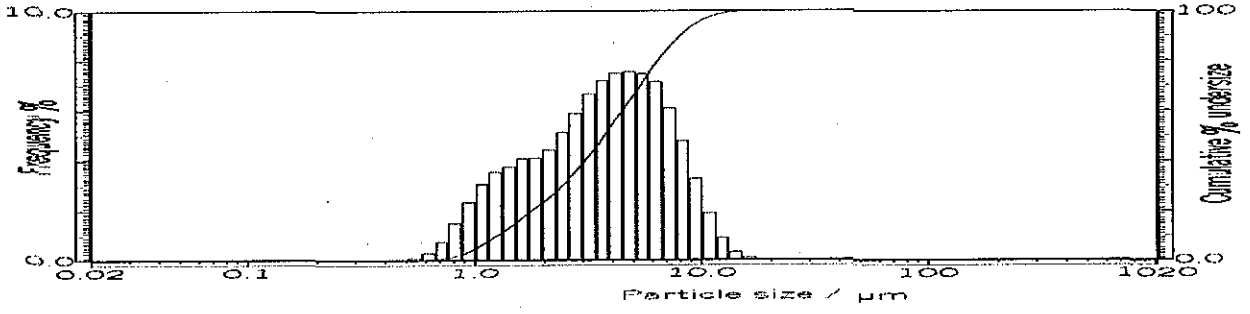
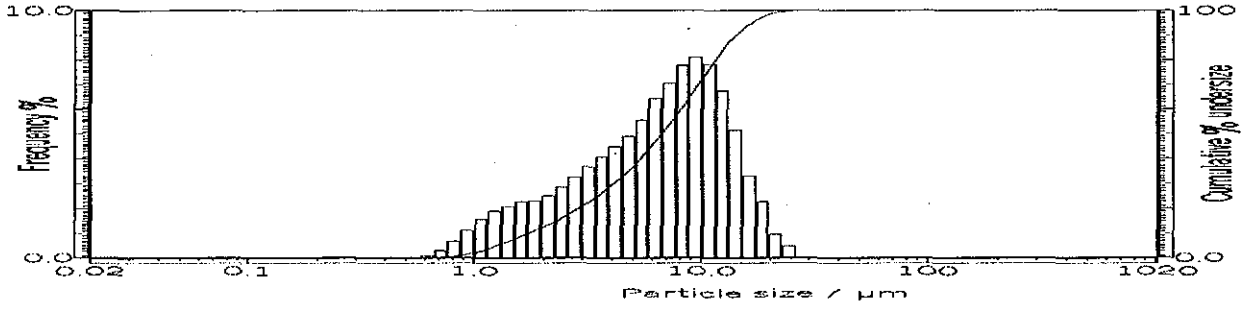


Figure 62. C-107 Composite: Volume-based PSDs from second set of runs on composite S01T001673.

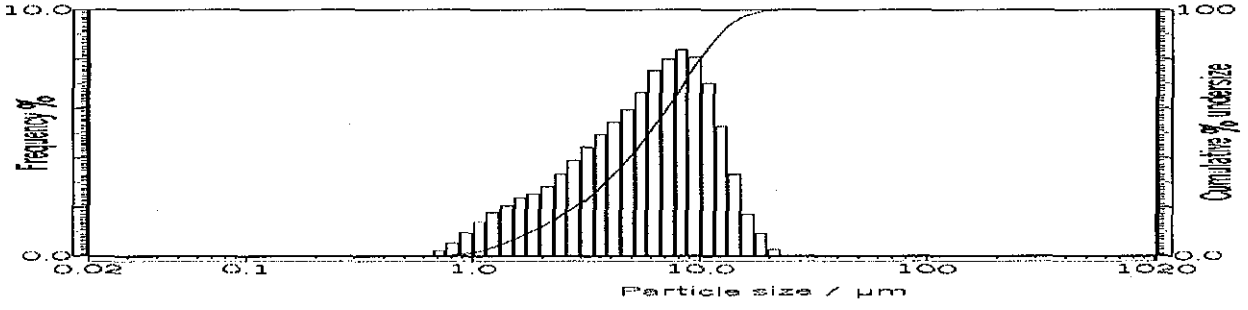
File Name: Cumulative times at run conditions with individual run settings **highlighted**.

[LOAD-IN]: **P6** = ? min; **S1** = ? min

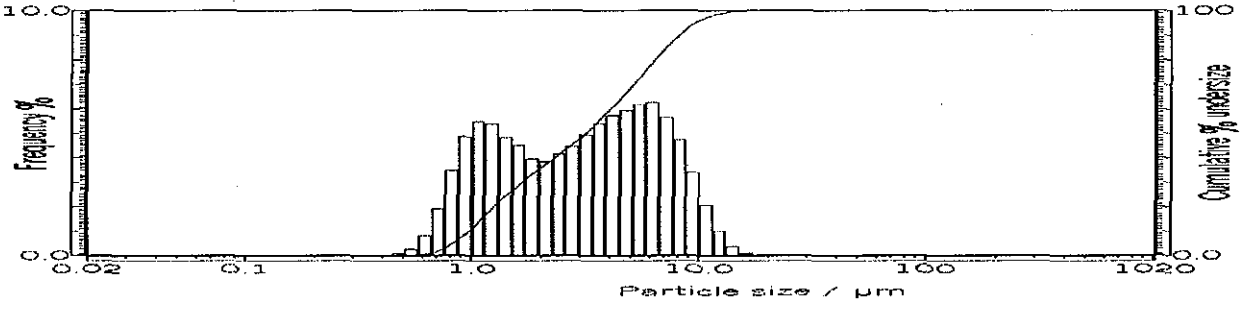
C107934: **P6** = 7 min; **S1** = 7 min; S3 = 0 min; US = 0 min; DT = 0 min



C107935: **P6** = 10 min; S1 = 7 min; **S3** = 3 min; US = 0 min; DT = 0 min



C107936: **P6** = 14 min; S1 = 7 min; **S3** = 7 min; **US** = 2 min; **DT** = 0 min



C107937: **P6** = 19 min; **S1** = 12 min; S3 = 7 min; US = 2 min; DT = 2 min

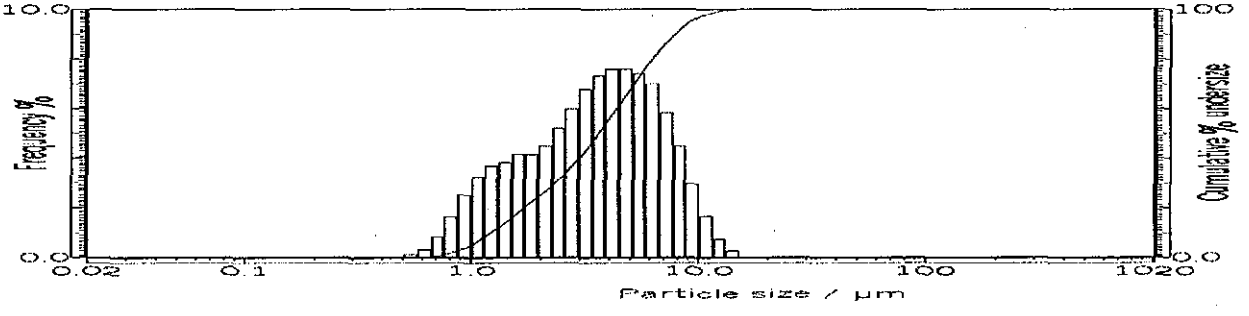
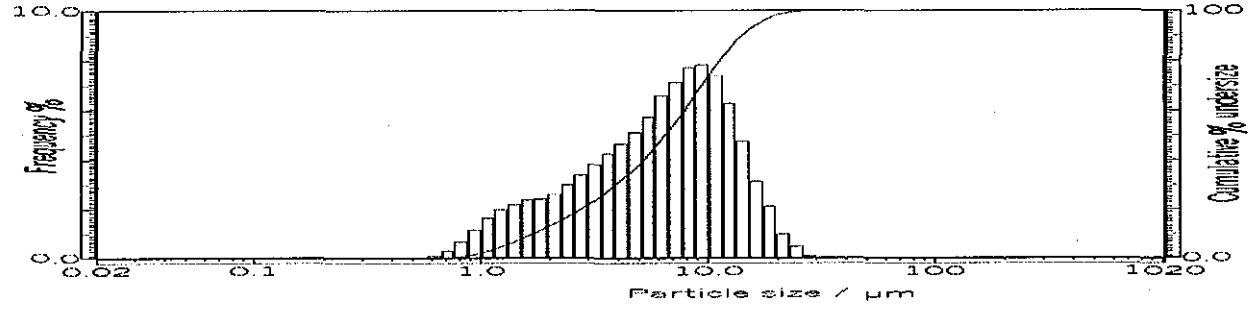


Figure 63. C-107 Composite: Volume-based PSDs from third set of runs on composite S01T001673.

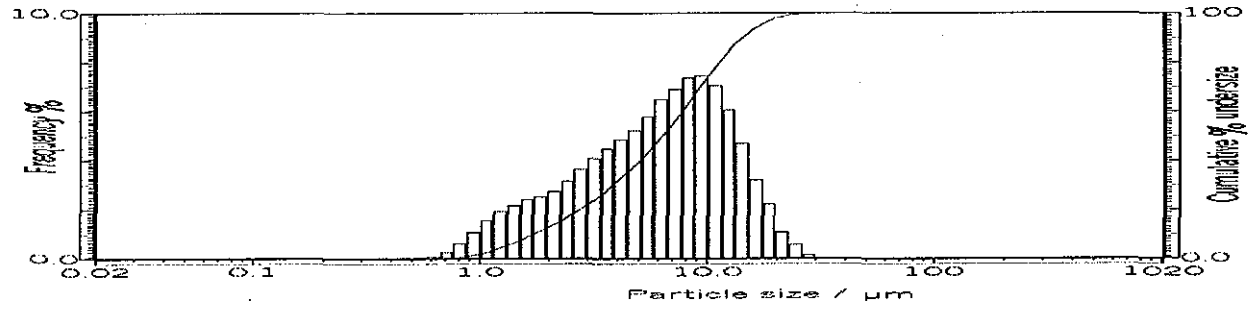
File Name: Cumulative times at run conditions with individual run settings highlighted.

[LOAD-IN]: P6 = ? min; S1 = ? min

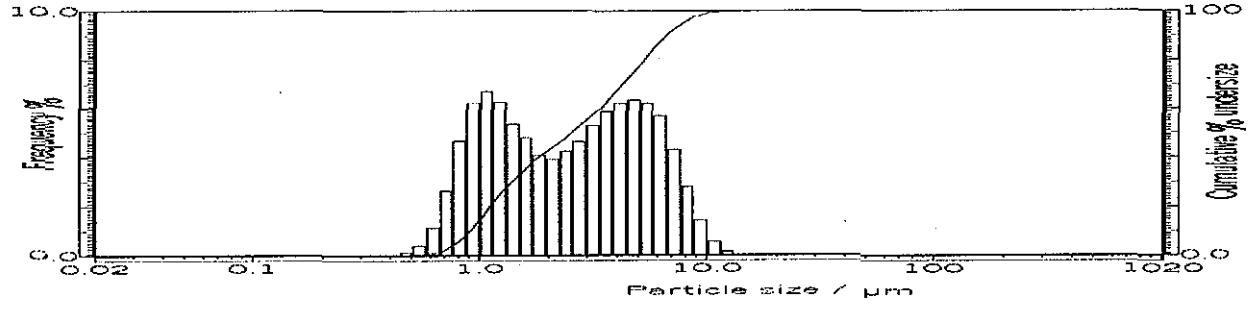
C107938: P6 = 4 min; S1 = 4 min; S3 = 0 min; US = 0 min; DT = 0 min



C107939: P6 = 8 min; S1 = 4 min; S3 = 4 min; US = 0 min; DT = 0 min



C107940: P6 = 14 min; S1 = 4 min; S3 = 10 min; US = 2 min; DT = 0 min



C107941: P6 = 16 min; S1 = 6 min; S3 = 10 min; US = 2 min; DT = 4 min

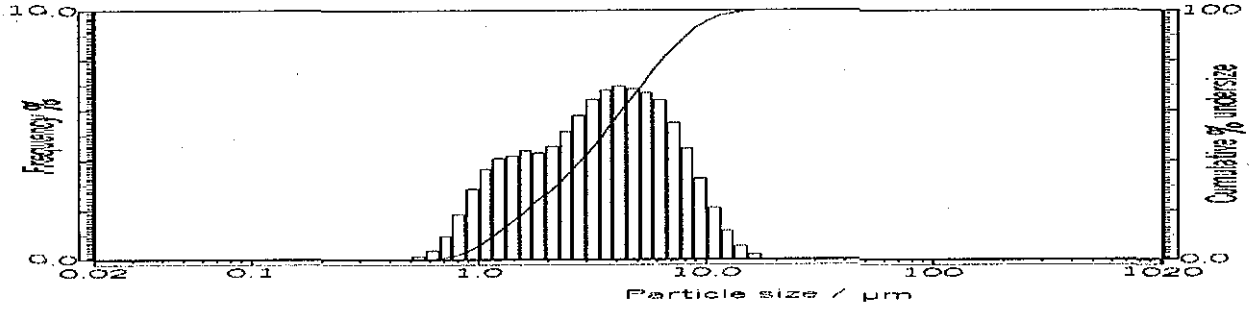
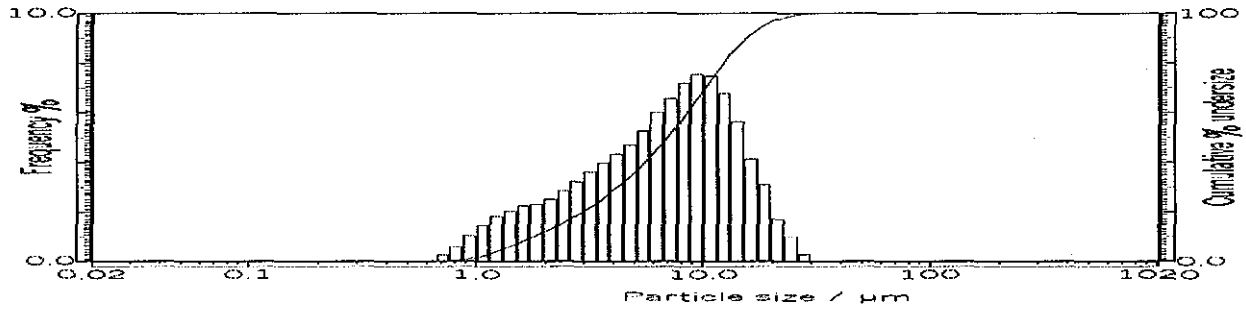


Figure 64. C-107 Composite: Volume-based PSDs from fourth set of runs on composite S01T001673.

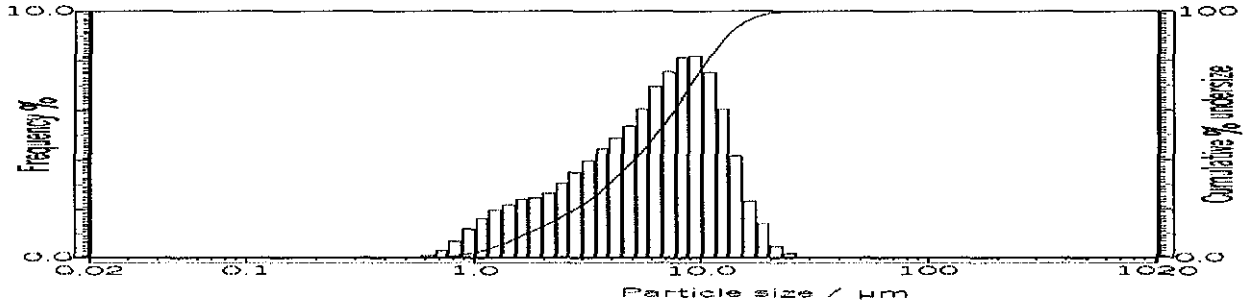
File Name: Cumulative times at run conditions with individual run settings highlighted.

[LOAD-IN]: P6 = ? min; S1 = ? min

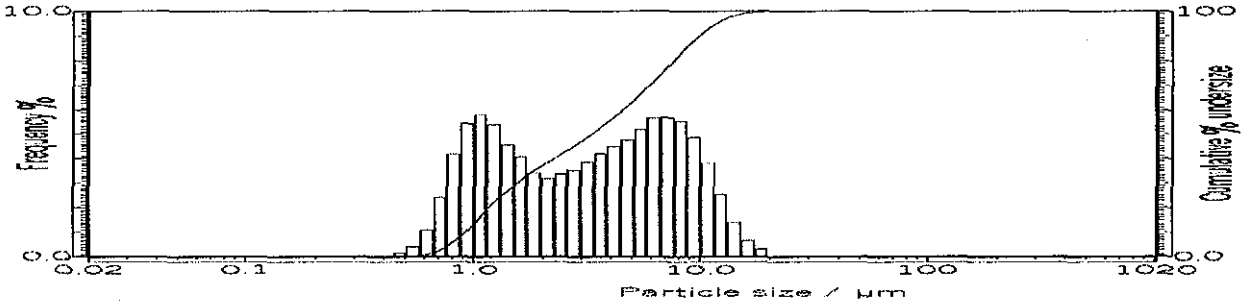
C107942: P6 = 4 min; S1 = 4 min; S3 = 0 min; US = 0 min; DT = 0 min



C107943: P6 = 7 min; S1 = 4 min; S3 = 3 min; US = 0 min; DT = 0 min



C107944: P6 = 13 min; S1 = 4 min; S3 = 9 min; US = 2 min; DT = 0 min



C107945: P6 = 15 min; S1 = 6 min; S3 = 9 min; US = 2 min; DT = 4 min

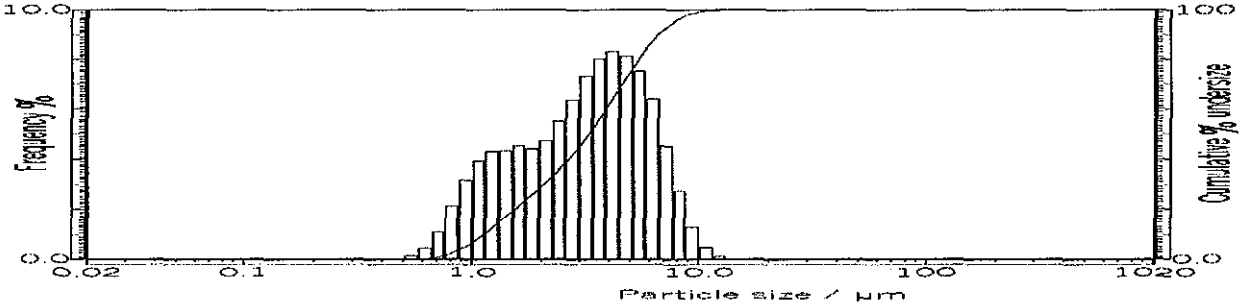


Table 26. C-107 Composite: Mean particle diameters of volume-based PSDs.

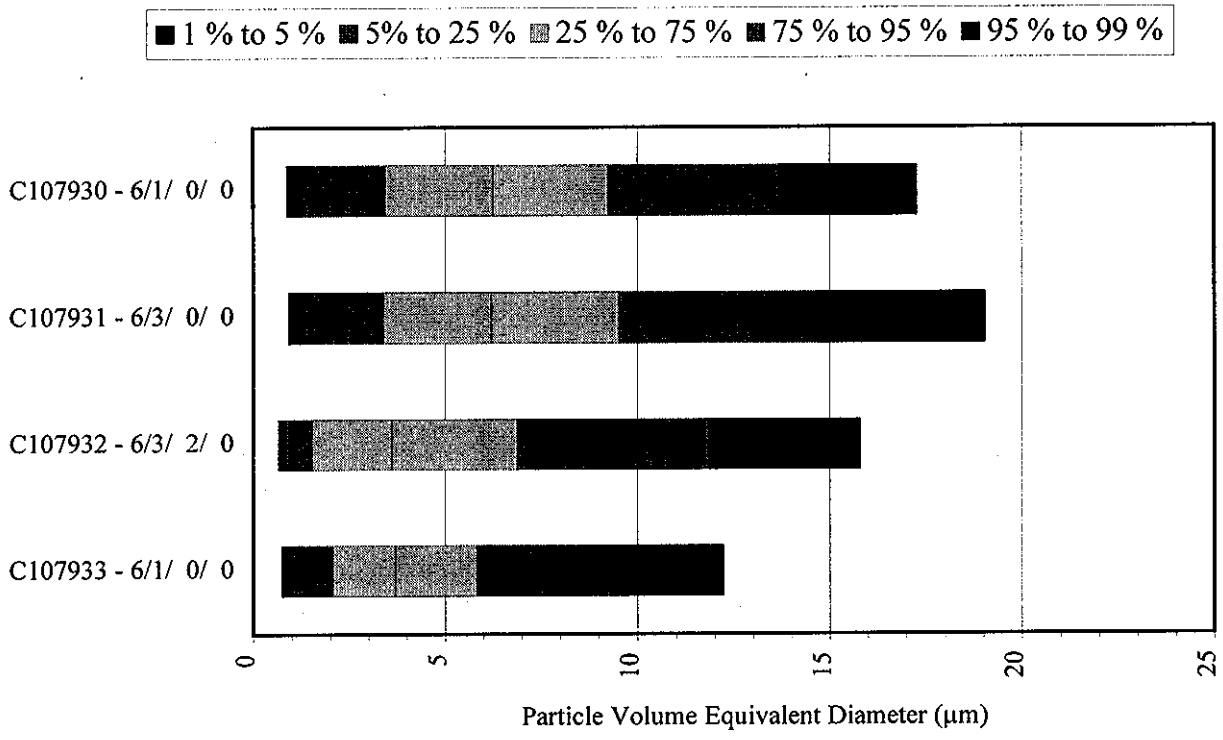
Sample	PSD Run File Name	Run Conditions				Mean Diameter (μm)	Standard Deviation (μm)
		P	S	US	DT		
S01T001673	C107930	6	1	0	0	6.6	3.9
	C107931	6	3	0	0	6.8	4.2
	C107932	6	3	2	0	4.7	3.7
	C107933	6	1	0	0	4.2	2.7
S01T001673	C107934	6	1	0	0	7.4	4.8
	C107935	6	3	0	0	6.5	4.0
	C107936	6	3	2	0	3.9	2.9
	C107937	6	1	0	0	4.1	2.6
S01T001673	C107938	6	1	0	0	7.2	4.8
	C107939	6	3	0	0	7.2	4.9
	C107940	6	3	2	0	3.2	2.3
	C107941	6	1	0	0	4.1	2.8
S01T001673	C107942	6	1	0	0	7.9	5.4
	C107943	6	3	0	0	6.9	4.4
	C107944	6	3	2	0	4.4	3.6
	C107945	6	1	0	0	3.6	2.2

Table 27. C-107 Composite: Percentages of particles in volume-based PSDs with diameters less than the indicated values.

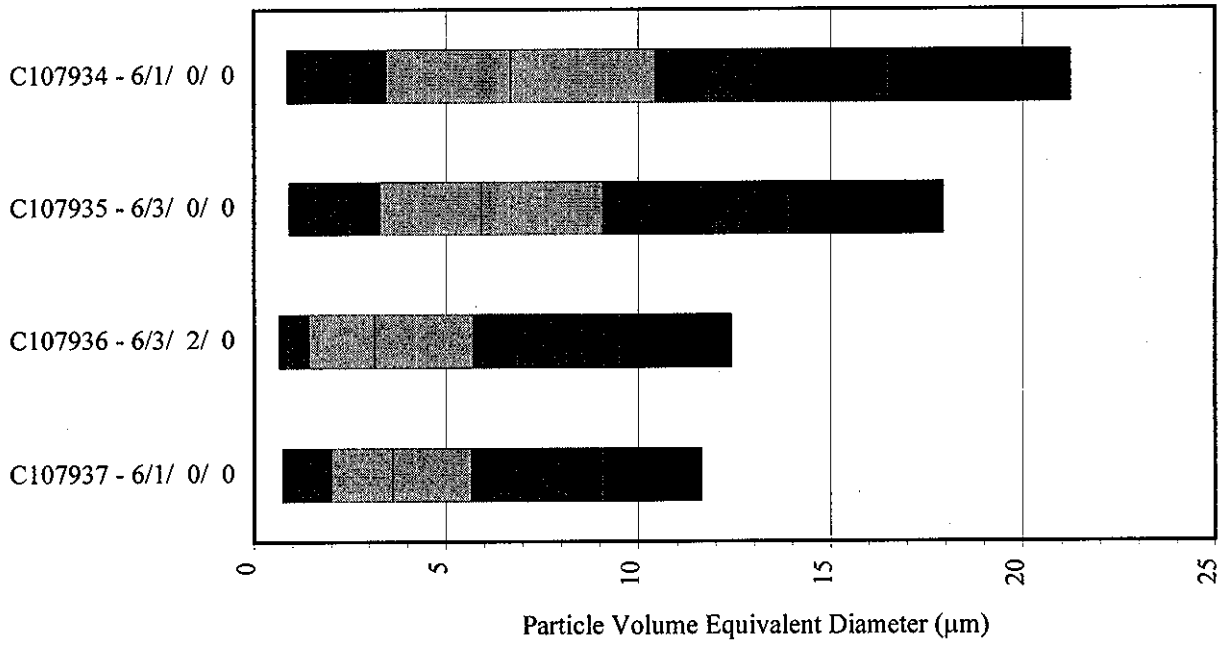
Sample	In Distributions Based on the Total Volume of Spherical Particles						
PSD Run	1 %	5 %	25 %	50 %	75 %	95 %	99 %
	Of the Particles Have Diameters Less Than (μm)						
S01T001673							
C107930 - 6/1/ 0/ 0	0.86	1.26	3.45	6.25	9.25	13.69	17.28
C107931 - 6/3/ 0/ 0	0.91	1.34	3.38	6.21	9.52	14.68	19.05
C107932 - 6/3/ 2/ 0	0.65	0.84	1.52	3.62	6.88	11.85	15.79
C107933 - 6/1/ 0/ 0	0.74	1.00	2.07	3.70	5.82	9.42	12.23
S01T001673							
C107934 - 6/1/ 0/ 0	0.86	1.25	3.44	6.69	10.43	16.53	21.24
C107935 - 6/3/ 0/ 0	0.91	1.33	3.27	5.93	9.08	13.97	17.94
C107936 - 6/3/ 2/ 0	0.65	0.83	1.42	3.15	5.71	9.57	12.42
C107937 - 6/1/ 0/ 0	0.73	0.98	2.01	3.61	5.67	9.11	11.65
S01T001673							
C107938 - 6/1/ 0/ 0	0.86	1.24	3.33	6.46	10.15	16.46	21.64
C107939 - 6/3/ 0/ 0	0.87	1.27	3.27	6.31	10.12	16.73	22.11
C107940 - 6/3/ 2/ 0	0.62	0.78	1.23	2.56	4.73	7.69	9.85
C107941 - 6/1/ 0/ 0	0.72	0.95	1.87	3.49	5.73	9.75	12.97
S01T001673							
C107942 - 6/1/ 0/ 0	0.89	1.29	3.52	6.95	11.12	18.30	23.86
C107943 - 6/3/ 0/ 0	0.86	1.24	3.28	6.24	9.65	14.90	19.32
C107944 - 6/3/ 2/ 0	0.62	0.79	1.32	3.31	6.69	11.53	15.11
C107945 - 6/1/ 0/ 0	0.70	0.92	1.78	3.26	4.97	7.63	9.73

Figure 65. C-107 Composite: Diameters of particles (μm) within defined, volume-based, percentile ranges. (Two Pages)

C-107 Composite: S01T001673: First Measurement Set

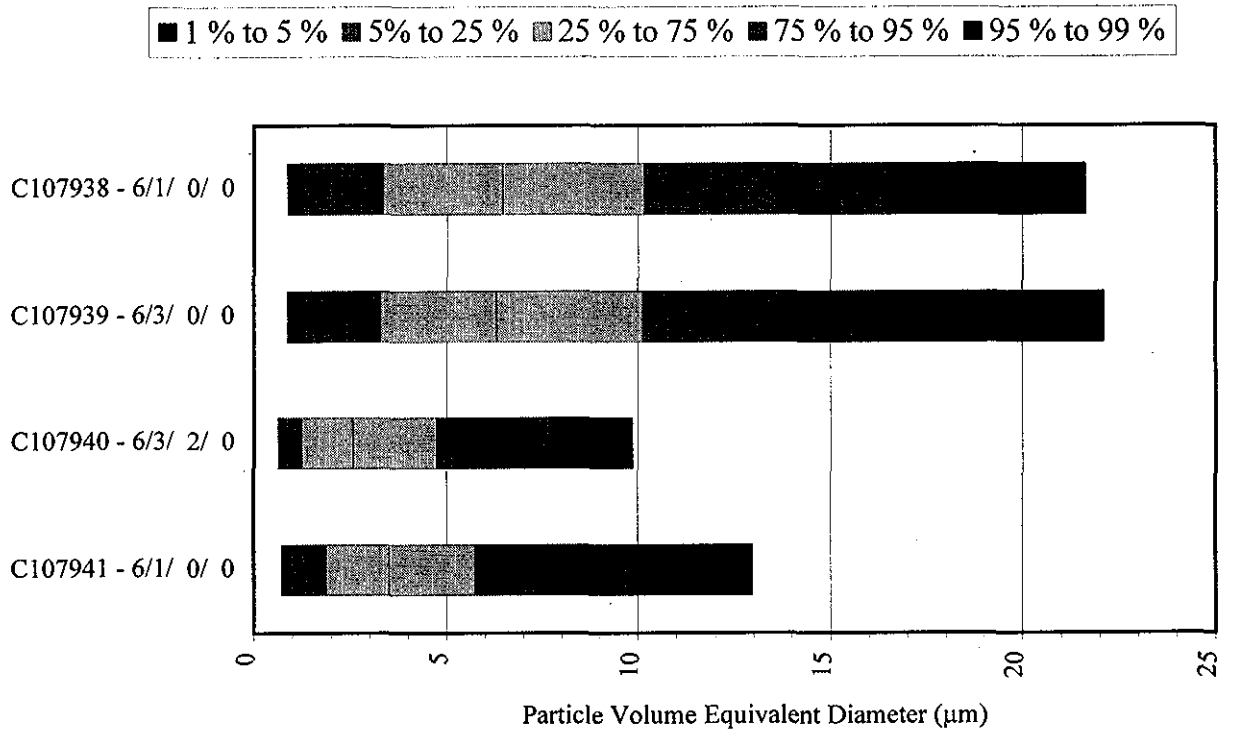


C-107 Composite: S01T001673: Second Measurement Set

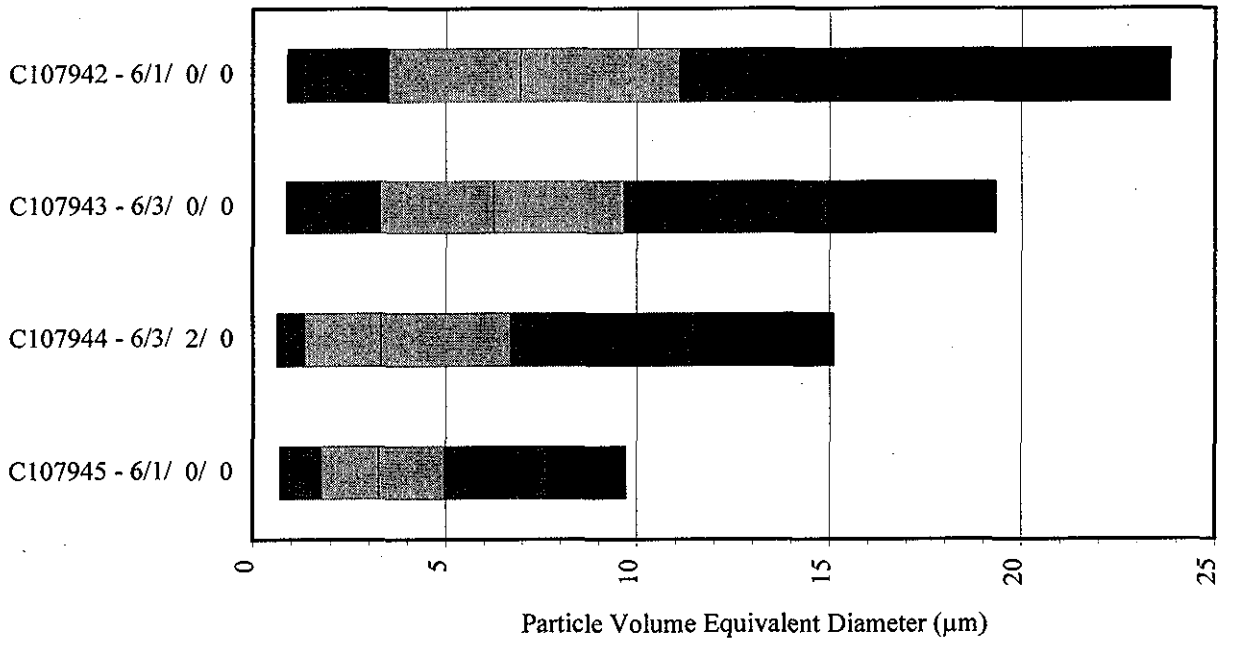


Continued:

C-107 Composite: S01T001673: Third Measurement Set



C-107 Composite: S01T001673: Fourth Measurement Set



Data and Observations—SY-102. The measurement results summarized in Figures 66 through 68 and Tables 33 and 34 are presented in the format previously described in Sec. 4.2.1. One PSD measurement set was collected for each of the two SY-102 composite subsamples examined: S01T001648 and S01T001649.

The initial PSDs in each of the SY-102 composite measurement sets are dominated by a population of particles with diameters ranging from 1 μm to 30 μm. A small but observable tailing of both PSDs to smaller particle diameters, 0.2 μm to 1 μm, is also noted. For sample S01T001649 (Figures 67 and 68), a small population of larger particles/agglomerates with diameters in the 80 μm to 400 μm range was also observed. Pumping and stirring in the analyzer was sufficient to break up these large diameter particles as they were not observed in the second PSD of the measurement set. This suggests that they were probably loosely bound agglomerates.

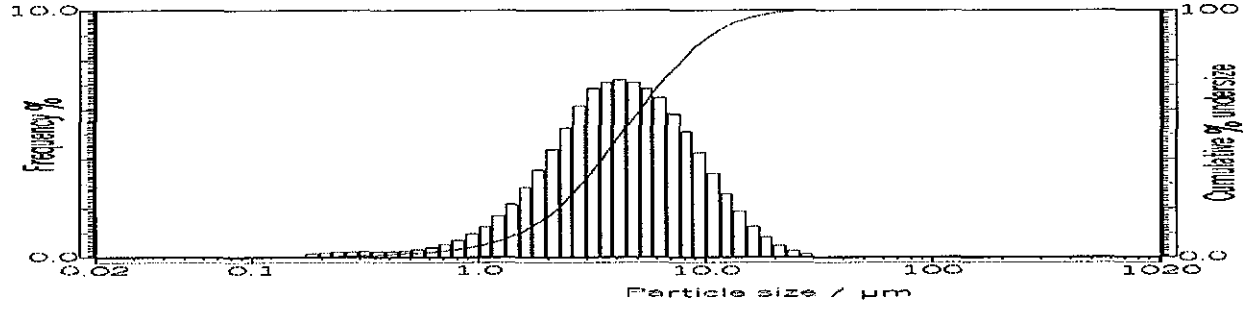
Sonication for two minutes was observed to reduce the percentage of particles in the original dominant populations (median particle diameters in the 3 μm to 4 μm range) and increase the percentage of <1 μm diameter particles in the PSDs. Stirring speed following the ultrasonic treatments had little effect on the observed PSDs.

Figure 66. SY-102 Composite: Volume-based PSDs from set of runs on sample S01T001648.

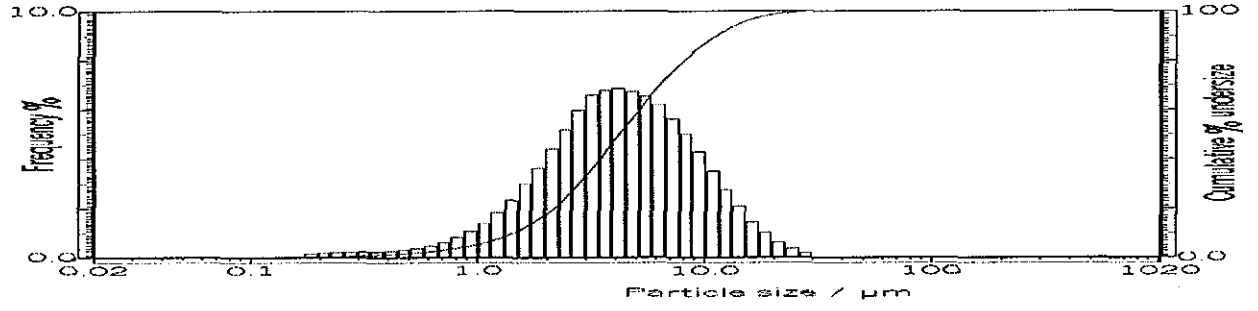
File Name: Cumulative times at run conditions with individual run settings **highlighted**.

[LOAD-IN]: **P3** = 3 min; **S3** = 3 min

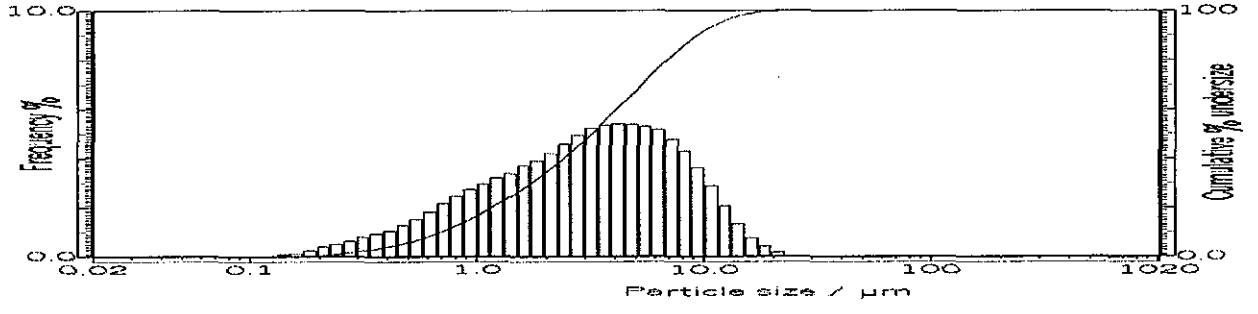
SY102876: P3 = 3 min; **P6** = 4 min; **S1** = 4 min; S3 = 3 min; *US = 0 min; DT = 0 min*



SY102877: P3 = 3 min; **P6** = 7 min; S1 = 4 min; **S3** = 6 min; US = 0 min; DT = 0 min



SY102878: P3 = 3 min; **P6** = 13 min; S1 = 4 min; **S3** = 12 min; **US** = 2 min; **DT** = 0 min



SY102879: P3 = 3 min; **P6** = 16 min; **S1** = 7 min; S3 = 12 min; US = 2 min; DT = 4 min

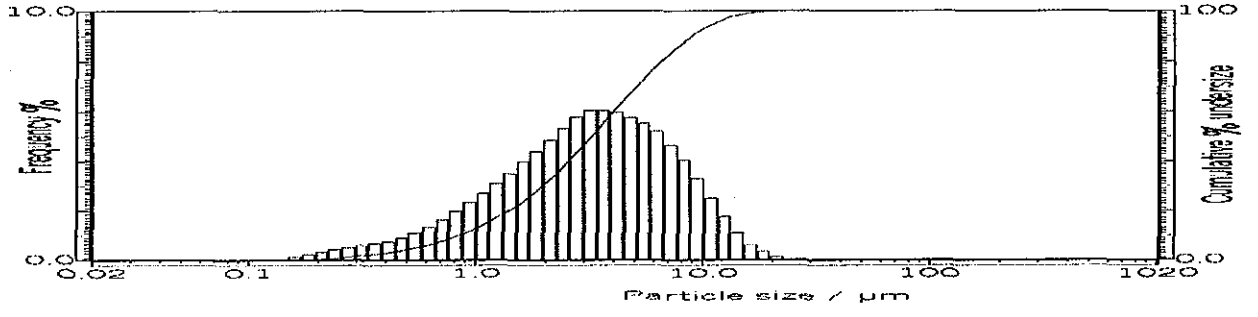
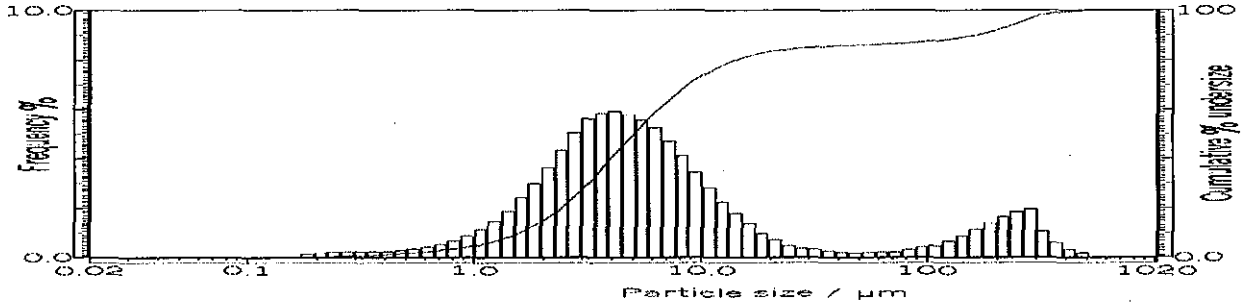


Figure 67. SY-102 Composite: Volume-based PSDs from set of runs on sample S01T001649.

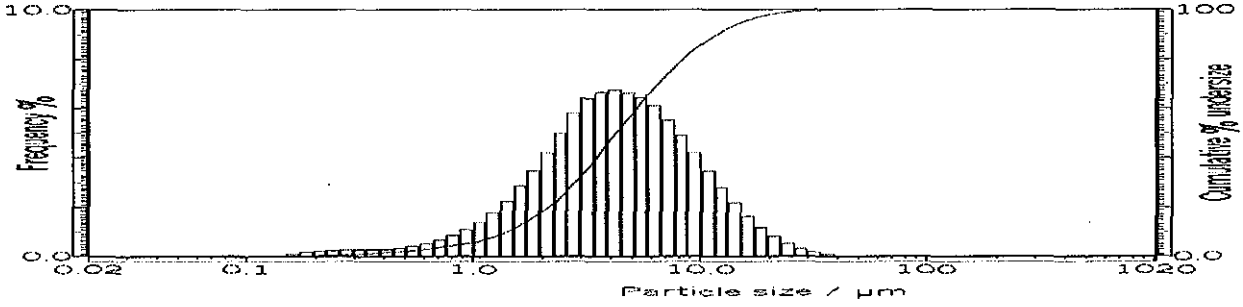
File Name: Cumulative times at run conditions with individual run settings highlighted.

[LOAD-IN]: P3 = 3 min; S3 = 3 min

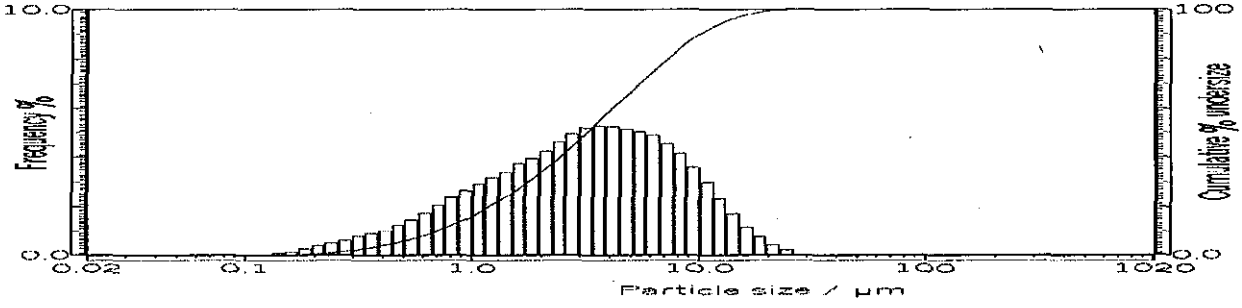
SY102880: P3 = 3 min; P6 = 3 min; S1 = 3 min; S3 = 3 min; US = 0 min; DT = 0 min



SY102881: P3 = 3 min; P6 = 7 min; S1 = 3 min; S3 = 6 min; US = 0 min; DT = 0 min



SY102882: P3 = 3 min; P6 = 12 min; S1 = 3 min; S3 = 12 min; US = 2 min; DT = 0 min



SY102883: P3 = 3 min; P6 = 15 min; S1 = 6 min; S3 = 12 min; US = 2 min; DT = 4 min

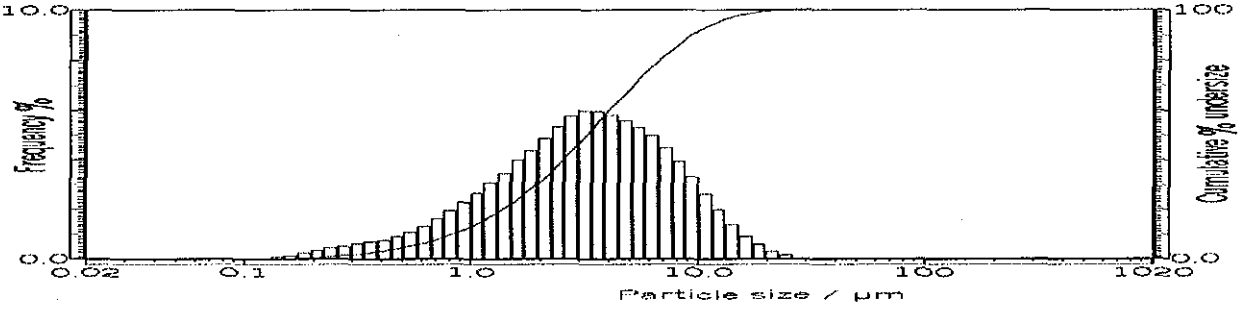


Table 28. SY-102 Composite: Mean particle diameters of volume-based PSDs.

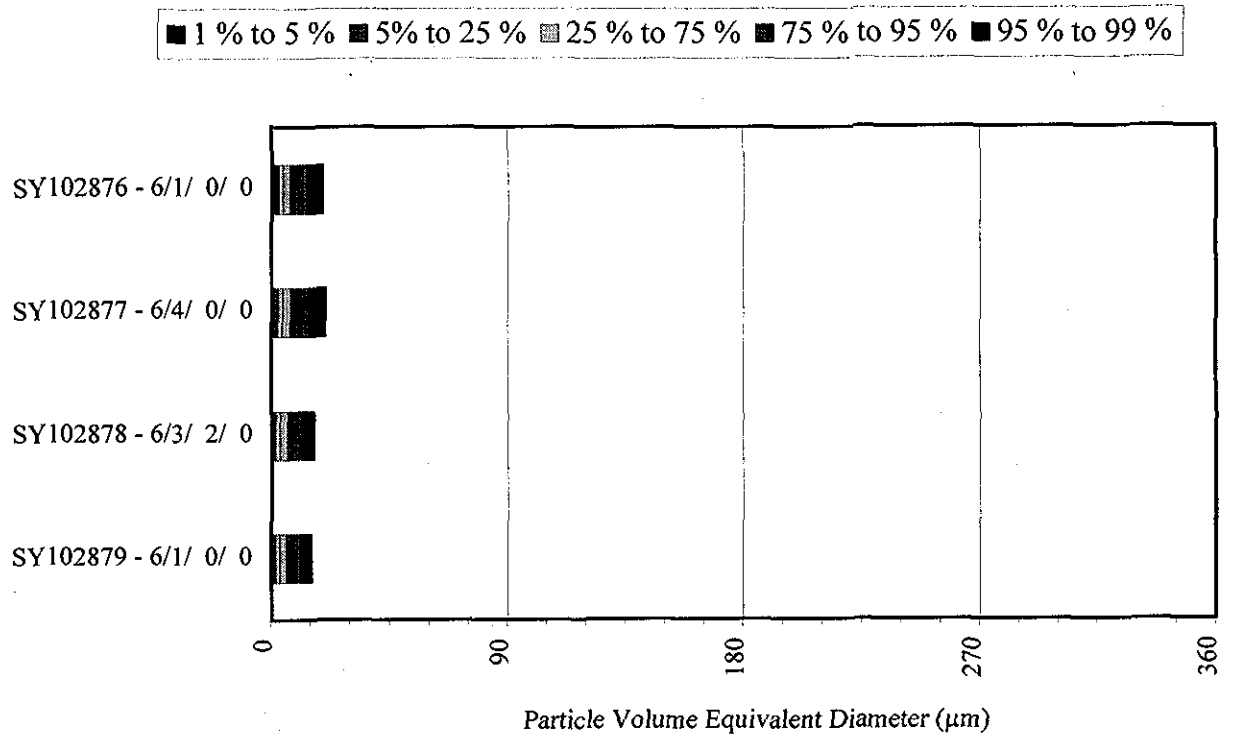
Sample	PSD Run File Name	Run Conditions				Mean Diameter (μm)	Standard Deviation (μm)
		P	S	US	DT		
S01T001648	SY102876	6	1	0	0	5.3	4.0
	SY102877	6	4	0	0	5.4	4.2
	SY102878	6	3	2	0	4.2	3.6
	SY102879	6	1	0	0	4.1	3.4
S01T001649	SY102880	6	1	0	0	35.2	80.6
	SY102881	6	3	0	0	5.6	4.8
	SY102882	6	3	2	0	4.4	4.0
	SY102883	6	1	0	0	4.3	3.7

Table 29. SY-102 Composite: Percentages of particles in volume-based PSDs with diameters less than the indicated values.

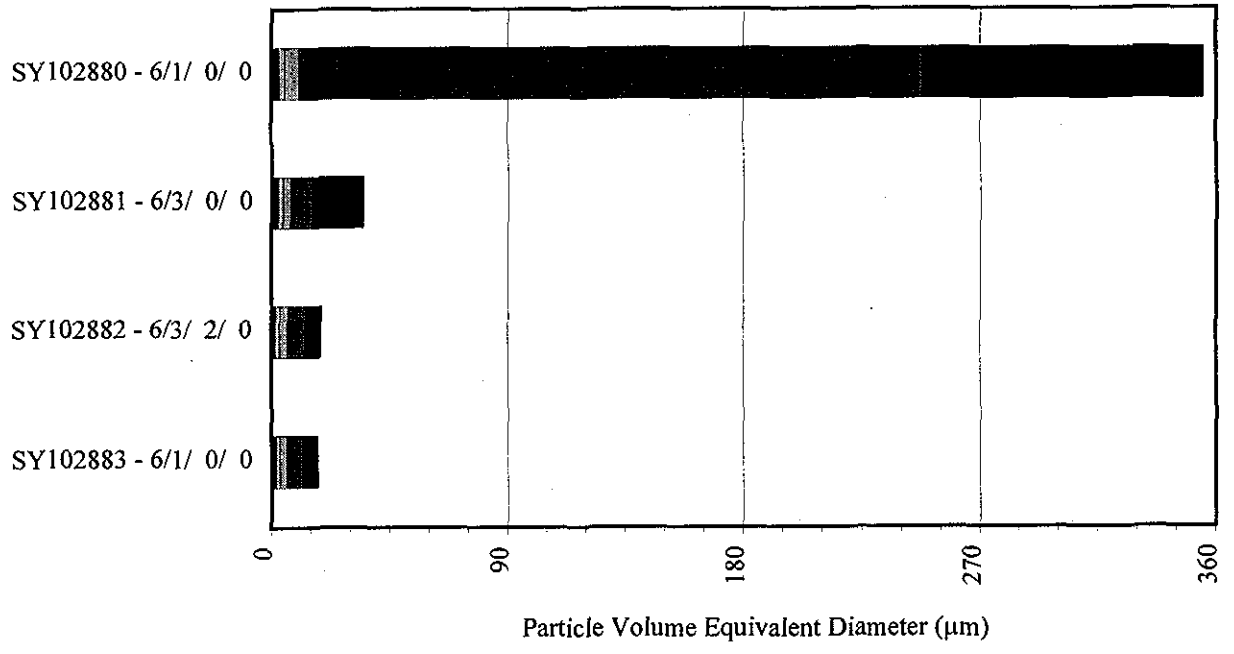
Sample	In Distributions Based on the Total Volume of Spherical Particles						
PSD Run	1 %	5 %	25 %	50 %	75 %	95 %	99 %
	Of the Particles Have Diameters Less Than (μm)						
S01T001648							
SY102876 - 6/1/ 0/ 0	0.32	1.02	2.5	4.2	6.9	13.2	19.6
SY102877 - 6/4/ 0/ 0	0.32	0.96	2.5	4.2	7.1	14.0	20.9
SY102878 - 6/3/ 2/ 0	0.23	0.45	1.4	3.2	6.0	11.5	16.3
SY102879 - 6/1/ 0/ 0	0.25	0.53	1.7	3.2	5.7	11.0	15.6
S01T001649							
SY102880 - 6/1/ 0/ 0	0.32	1.02	2.8	5.0	10.5	248.1	355.2
SY102881 - 6/3/ 0/ 0	0.29	0.89	2.5	4.2	7.3	15.1	34.9
SY102882 - 6/3/ 2/ 0	0.23	0.45	1.5	3.2	6.2	12.8	18.9
SY102883 - 6/1/ 0/ 0	0.24	0.52	1.7	3.2	5.8	11.9	17.6

Figure 68. SY-102 Composite: Diameters of particles (μm) within defined, volume-based, percentile ranges.

SY-102 Composite: S01T001648



SY-102 Composite: S01T001649



4.6. Sieve Test Results

Sieve testing was performed on four tank composites – those from Tanks AW-103, AY-101, C-104 and SY-102. The sieve data consist of the mass of wet sludge sieved, and the masses of sludge captured on each of the four sieves after wet sieving. The amount dissolved or passing through the finest sieve is termed eluate, and its mass is determined as the difference between the total mass sieved and the sum of the masses captured on the sieves. The eluates of all four sieve tests were observed to settle out into large volumes of solids in the rinse liquid, suggesting that dissolution played a relatively small role in passing the eluates. The data workup, including the fractions of mass retained on each sieve for each tank sample, is supplied as Appendix H. Table 35 summarizes the sieve results for the four tank composites in terms of the weight percent of wet, drained material retained.

Table 35 also includes relative sampling error estimates, where calculable, for each of the retained sieve fractions, as well as estimates of measurement error. The formula used to estimate sampling error is discussed in Sec. 5.8. It is being used somewhat beyond its range of validity for the sieve fractions, because their size class width ratios are greater than the square root of two. The formula is also only valid for relative fraction weights less than 50%, and this is why the eluate relative sampling error is not calculable. The sampling error estimates are therefore rather crude. The estimates of measurement error for each sieve fraction are based on the standard deviations of the several tare weights of each of the sieves and the mixing cone over all the tank experiments. The collected data and error estimates suggest that the sieve-based size distribution for these four tanks is at least believable, and that a semi-quantitative estimate of the large particle fractions is to be had on this scale of sample.

Comparing PSD data graphically with sieve test data requires the latter to be plotted as volume (or mass, assuming uniform particulate composition)-based bin plots and as cumulative-undersize plots, inclusive of all the data, including the smallest and largest size fractions. To include the lowest and highest sieve fractions in the bin plots, two assumptions about the lowest bound and the highest bound of the sieving had to be made. First, it was assumed that no particles existed below the smallest diameter observed in any PSD determination, about 0.1 μm. Thus, the eluate could be assumed to consist of particles between 0.1 μm and 53 μm in size. Secondly, it was assumed that the fraction captured on the largest mesh –500 μm—was smaller in diameter than the largest particle seen for any of the four tanks, about 5000 μm, as estimated from hot cell observations. These assumptions allow one to classify the sieve fraction data into five logarithmically delineated bins, and plot the data as volume probability density functions (i.e., fraction divided by interval) in Figures 69 through 72. This way, the comparison of these figures with PSD figures is direct, so long as one compares areas, not heights. The arbitrary selection of bounds for the sieve data does not really affect the result, because the area of the affected bins remains constant by changing the bin height as the terminal bounds are adjusted.

Table 30. Summary Sieve Test Results on Four Tank Composites; Wet, Drained Mass Basis.

SIEVE TEST SUMMARY	TOTAL SLUDGE (G)	ELUATE	53 MICRON SIEVE	106 MICRON SIEVE	212 MICRON SIEVE	500 MICRON SIEVE
TANK AW-103						
TOTAL SLUDGE (G)	20.236					
PERCENT RETAINED		70.9	4.3	4.8	3.4	16.7
CUM PERCENT RETAINED		70.9	75.2	80.0	83.3	100.0
REL.SAMPLING ERROR (%)		not calculable	2.5	6.7	28.8	20.6
REL. MEAS. ERROR (%)		3.7	26.1	19.8	28.0	32.1
TANK AY-101						
TOTAL SLUDGE (G)	35.38					
PERCENT RETAINED		85.4	2.3	1.5	2.1	8.7
CUM PERCENT RETAINED		85.4	87.7	89.2	91.3	100.0
REL.SAMPLING ERROR (%)		not calculable	2.6	9.5	27.8	24.0
REL. MEAS. ERROR (%)		1.8	25.4	24.2	25.5	32.4
TANK C-104						
TOTAL SLUDGE (G)	42.2					
PERCENT RETAINED		87.3	6.6	1.1	1.8	3.1
CUM PERCENT RETAINED		87.3	94.0	95.1	96.9	100.0
REL.SAMPLING ERROR (%)		not calculable	1.4	10.0	27.5	39.3
REL. MEAS. ERROR (%)		1.7	14.3	25.3	25.1	49.3
TANK SY-102						
TOTAL SLUDGE (G)	42.75					
PERCENT RETAINED		83.3	1.5	2.5	3.8	8.8
CUM PERCENT RETAINED		83.3	84.8	87.3	91.2	100.0
REL.SAMPLING ERROR (%)		not calculable	3.0	6.5	18.5	21.7
REL. MEAS. ERROR (%)		1.3	28.8	17.0	17.6	29.3

For all four tank composites material was captured on every sieve, including the 500 μm sieve. Most of the rest of the masses passed clear through the sieves to the eluate flask. The clear, plastic sieve bodies allowed one to observe the eluate passing through each sieve. This made it easy to determine when it was running clear, know that rinsing for that sieve was complete, and thereby dispense with the need to rinse the stack multiple times to demonstrate constant weight.

4.6.1. AW-103 Sieve Test Results

A 10.7 gram aliquot of wet sludge composite was poured and rinsed through the sieves, and the net weights of each sieve contents were determined. However, the 500 μm sieve contents were lost due to spillage before sending another aliquot (9.5 grams) through the sieves. Therefore, after the second aliquot was rinsed through, the new net weight of the 500 μm fraction was estimated by addition of a correction proportional to the ratio of the two aliquots multiplied by the first net weight. The other fractions were re-determined without the need for corrections.

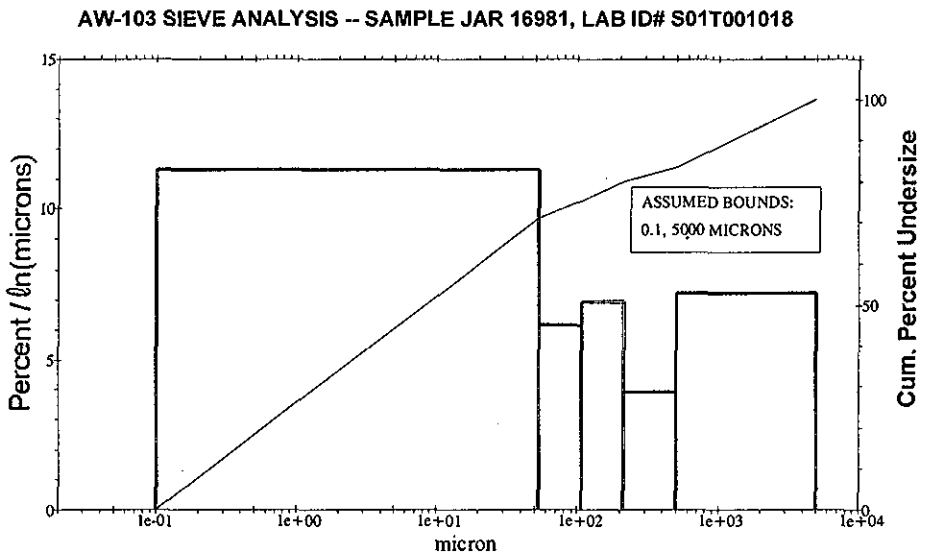


Figure 69. AW-103 Sieve Test Results.

The contents of the 106 μm sieve were lost to spillage after its final gross weight was taken. The other sieves were successfully sampled and the solids placed under wash liquid reagent in vials for subsequent analysis. Most of the net weight of the sample vials is due to cover liquid. All the sieve fractions appeared to be the same, light yellow, material.

4.6.2. AY-101 Sieve Test Results

The sieve testing of AY-101 composite went normally with one exception; the re-tare of the 500 μm sieve, 42.25 g, was anomalously high and was rejected. Instead, the tare of this sieve found for the AW-103 sieving, 39.95 grams, was used in sieve fraction calculations.

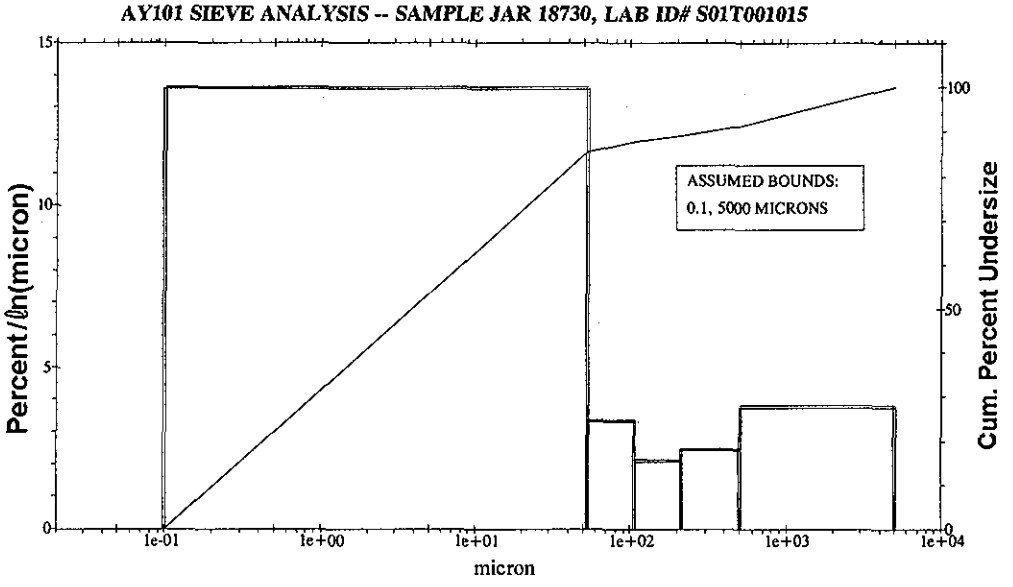


Figure 70. AY-101 Sieve Test Results.

The most striking observation of the AY-101 sieving was the fact that a few very large particles were found on the 500 μm sieve. The largest may have been as much as 5000 μm in diameter. They appeared to be non-porous. Their action on the sieve while rinsing suggested that a small amount of fines were being continually comminuted from them by the vibratory action of the shaker, so they were not rinsed further.

4.6.3. C-104 Sieve Test Results

The 500 μm sieve also retained some notably large particles in the C-104 test, as in the AY-101 test. The C-104 particles, however, looked variegated, and not uniform in composition, as had those from the other tank composites. Also unique to this test was the observation that the 500, 212, 106 and 53 μm retainates all seemed to cloud the wash liquid that was put in the sample vials to cover them. This suggests the particles were actually weak consolidates of finer material.

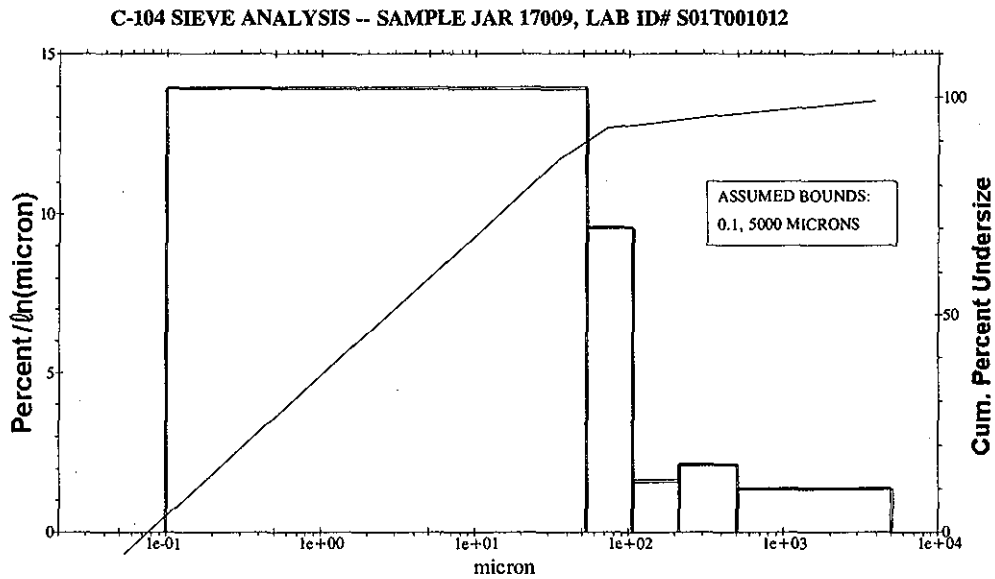


Figure 71. C-104 Sieve Test Results.

4.6.4. SY-102 Sieve Test Results

The SY-102 composite to be used had separated on storage to render approximately 2 to 3 mm of liquid over the sludge. This was easily remixed to a fairly fluid composite before drawing the sieve aliquot. After slurrying the very sizeable 42.75 g aliquot, the shaker was found to be inoperative -- the casualty of too much cleanup rinse water finding its way into the electrical components. Therefore the aliquot had to be sieved by shaking the stack manually.

Considerable rinsing was needed to get the large aliquot retainates to wash clear on each sieve to complete the sieving, including some intermediate rinses of individual sieves. Nonetheless, the task was completed, and samples of each retainate were packaged in vials under wash liquid as for the other samples.

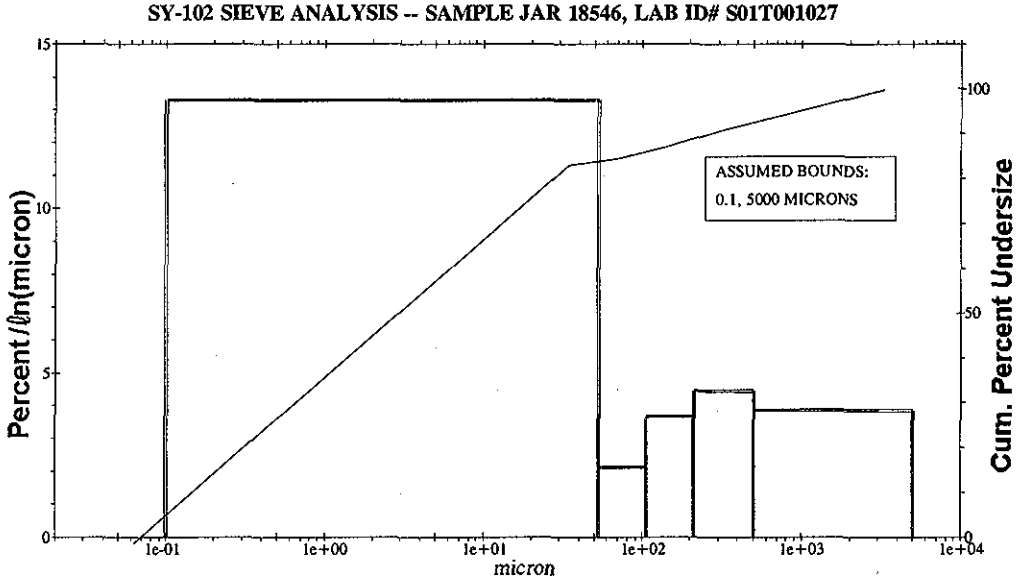


Figure 72. SY-102 Sieve Test Results.

4.6.5. Particle Size Results on Sieved Fractions

The sieve tests generated 15 samples of individual sieve fractions. Eight of these samples, two sieve fractions each from four tank composites, were subsequently subjected to PSD analysis to corroborate the PSD performance with the sieve test results and to look for possible evidence of particle re-agglomeration. A "<53 μm" sample represented the smaller sieve-size fraction for each of the four tank composites. A ">500 μm" sample represented the larger sieve-size fraction for Tanks AW-103, AY-101, and SY-102. Since the >500 μm sieve-size fraction for Tank C-104 was so small (Table 35), it was not analyzed for PSD. Instead, the larger "53 μm-106 μm" sieve fraction was analyzed. The four-run PSD measurement set implemented (Sec. 4.5) following completion of the run parameter studies was performed in duplicate on each of these sieve fractions.

Sampling. Before PSD measurement, the sieve fraction samples were stored for two months in 20 mL vials under 5 to 10 mL of $NaOH/NaNO_3$ wash solution.

Specimen Introduction. No additional liquid was added to the sieve fraction samples prior to withdrawal of the analytical specimens. Specimens for PLM and IA examination had been withdrawn from the samples before PSD measurements were begun. Moderately large particles, aggregates, or agglomerates were observed in several of the samples. Accordingly, plastic transfer pipettes used to withdraw PSD specimens from these samples were trimmed on a slight angle to produce a tip opening of ~4 mm internal diameter. One of these pipettes was used to gently stir and liquid-sparge a sample in its original vial. Sample material was then withdrawn from the vial with the pipette and the PSD specimen added, dropwise, into a charge of the $NaOH/NaNO_3$ test solution circulating in the analyzer. Rapid settling of sample solids in the pipette tips during specimen transfer was observed for several samples. In at least one case, the SY-102, >500 μm sieving cut (sample S01T001286), large sample particles were observed to have "wedged" in the transfer pipette even though the tip opening had been enlarged to 4 mm.

PSD Measurements. Two measurement sets were collected for each of the eight sieve fraction samples. Separate analytical specimens were withdrawn from the target sample vials for each set. The PSD measurement results generally agreed quite well for the two specimens from each sample. This can best be seen by comparison of the first (and second) PSDs of each measurement set for the replicate specimens (see Figures 73 through 91).

Observations and Data—Sieve Test Samples. The measurement results summarized in Figures 73 through 92 and Tables 36 through 43 are presented in the format previously described in Sec. 4.2.1. The resulting two-sieve-fraction data packages for all four tank composite samples are presented at the conclusion of these general observations in the sequence: AW-103, AY-101, C-104, and SY-102.

C-104--53 μm-106 μm. The PSD measurement results for the C-104 composite sieve fraction S01T001285 (Figures 83, 84, and 87) agree quite well with the reported 53 μm-106 μm sieve size cut. The initial PSD runs for both measurement sets for this sample display single populations of particles. Ninety-five percent of these particles have diameters exceeding 47 μm; only 5% have diameters exceeding 130 μm (Table 41 and Figure 87). These particles are

moderately robust and are not significantly affected by pumping and stirring. Sonication for two minutes creates a very small, but observable, tail of small particles extending down to diameters of around 2 μm to 3 μm.

Interestingly, the correlation of reported sieve size cut and PSD measurement data was not high for the remaining seven sieve test samples.

<53 μm Sieve Fractions. The correlation of the measured PSDs with the reported, <53 μm, sieve-fraction size is poor for all four tank composites. This is emphasized in the linear scale plots of Figures 77, 82, 87, and 92. The best correlation is observed for the initial PSDs of specimens from the <53 μm sieve fraction of the SY-102 composite where ≈ 45% of the particulate volume is attributed to particles with diameters <53 μm in diameter. For the other three tank composites, only 15% (C-104) to 30% (AY-101) of the particulate volume is attributed to particles with diameters <53 μm.

The PSD measurement sets for all the <53-μm sieve fractions share common characteristics. All displayed a small population of particles with diameters in the 1 μm to 10 μm range. With the exception of the AY-101 composite, S01T001299, (Figures 80 and 81), the particle diameter range of this population is essentially unaffected by pumping, circulation, and ultrasonic treatment. For the AY-101 composite, an enhancement of the part of this population consisting of particles with diameters around 1 μm is observed following sonication.

The major population observed in all the <53 μm sieve fractions consists of particles with diameters ranging from approximately 70 μm up to 400 μm with a general modal value of approximately 150 μm. The effects of pumping, stirring, and ultrasonic treatment on the particle diameter range covered by this population are minor. A clear shift of the mode of this population to a lower value of about 125 μm after ultrasonic treatment is observed only for the SY-102 composite specimens (Figures 90, 91, and 92).

An additional population of particles with diameters >500 μm is indicated in one of the PSD measurement sets for both the C-104 and SY-102 composites. These populations are observed in the second PSD runs, where the stirring speed is first increased to S3, of the C-104 measurement set in Figure 86 and the SY-102 measurement set in Figure 90. The presence of a similar population is also suggested in the same PSD run of the AY-101 measurement set in Figure 81. These large, possibly dense particles or agglomerates are moderately fragile and do not appear in the third, post-sonication PSDs in these measurement sets. While these large particle populations may represent moderately bound agglomerates, their actual physical nature is unknown. The appearance of a small population of >500 μm particles in the second SY-102 measurement set in Figure 91, only after ultrasonic treatment of the specimen, is very puzzling and regarded to be highly suspect.

>500 μm Sieve Fractions. The correlation of the PSD results with the reported >500 μm sieve fraction size range is poor. Only for the first two PSD runs of the first measurement set for the SY-102 sieve fraction did the percentage of particulate volume represented by particles with diameters >500 μm exceed 15% (20% for SY102001 and 15% for SY102002). For the second

measurement set on the SY-102 sieve fraction, these percentages dropped to ~3%. None of the PSDs for the AW-103 and AY-101 sieve fractions indicated the presence of a significant percentage of particles with diameters exceeding 500 μm.

The initial PSD runs for both measurement sets (Figures 73, 74, and 77) for the AW-103, >500 μm sieve fraction indicate the presence of broad distribution of particles with diameters ranging from 10 μm to 400 μm and a modal value of 50 μm to 70 μm. A small tailing of this population down to particle diameters around 2 μm is also observed. These PSDs do suggest a general upward trend of the observed particle diameters--the original major populations generally had particle diameters ranging from 1 μm to 10 μm (Sections 4.3.1 and 4.6). The effects of sonication on these specimens are small but observable: the populations of 1 μm to 10 μm diameter particles are slightly enhanced, the percentages of the PSDs representing particles with diameters >100 μm are reduced, and the modal values of the distributions decrease to approximately 25 μm to 30 μm.

The PSD runs for the AY-101, >500 μm sieve fraction specimens indicate the presence of a minor population of particles with diameters distributed around a mode of ≈ 15 μm, and a major population of larger particles with diameters distributed about a modal value of ≈ 170 μm and extending up to 400–500 μm. Again, a general upward trend in particle diameters relative to the PSDs of the unsieved composite (Sec. 4.3.1) is noted: no particles with diameters near 1 μm are observed and the relative magnitudes of the 15 μm and 170 μm modes are reversed. The effect of sonication on these specimens is again small but observable. The percentage of smaller diameter particles is enhanced relative to the moderately robust larger particles; and the mode of the population of smaller particles decreases to 7 to 8 μm.

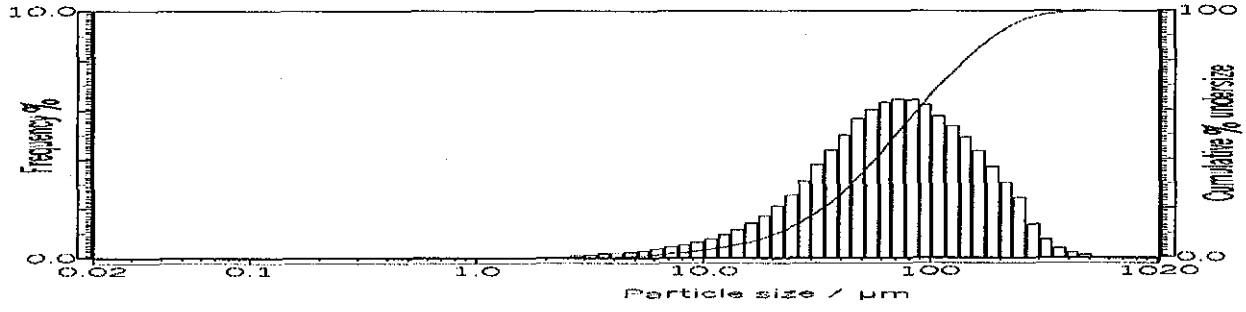
The PSD runs for the SY-102, >500 μm sieve fraction specimens, similar to those for AY-101 above, indicate the presence of minor population of particles with diameters ranging from 1 μm to 50 μm with a mode around 15 μm and a major population of particles with diameters >100 μm. This population of larger particles extends to include diameters of up to 850 μm and has a modal value of ~400 μm. The upward trend of particle diameters relative to the unsieved SY-102 composites (Sec. 4.5) is quite significant. The PSDs of the unsieved composite were dominated by a population of particles with diameters extending from 0.2 μm to 20 μm; only a small and inconsistent contribution from particles with diameters >100 μm was observed. The effects of ultrasonic treatment on these specimens are the most dramatic of all the sieve fraction samples. The percentages of particles in the PSDs with diameters >100 μm are significantly reduced resulting in a shift of the modal values of the overall distributions to values near 20 μm. This process appears to continue in the final run of each set at stirring speed S1. This observation (as noted for previous samples) may indicate either a continuing, pumping-induced breakup of the larger particles; or the presence of large, dense particles that are not efficiently suspended in the specimen slurry at the slow S1 stirring speed; or both.

Figure 73. AW-103 Sieve Tests: Volume-based PSDs from first set of runs on test sample S01T001291: >500 μm fraction.

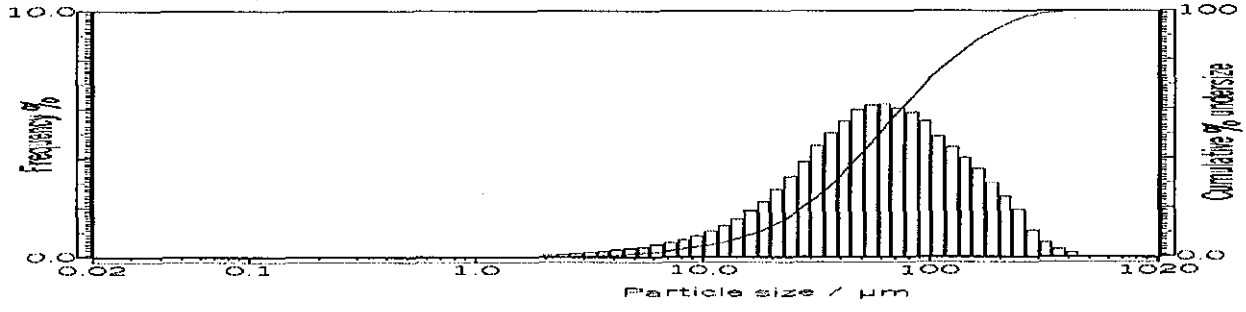
File Name: Cumulative times at run conditions with individual run settings **highlighted**.

[LOAD-IN]: **P6** = ? min; **S1** = ? min

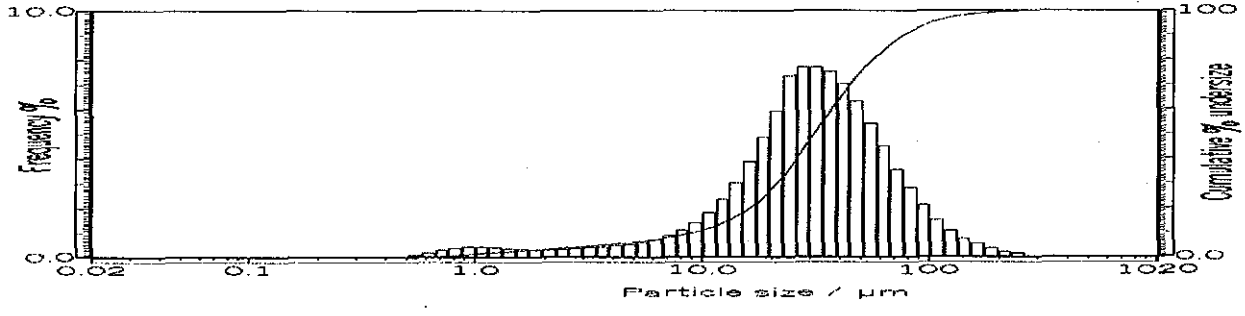
AW103017: **P6** = 9 min; **S1** = 9 min; S3 = 0 min; US = 0 min; DT = 0 min



AW103018: **P6** = 12 min; S1 = 9 min; **S3** = 3 min; US = 0 min; DT = 0 min



AW103019: **P6** = 17 min; S1 = 9 min; **S3** = 8 min; **US** = 2 min; **DT** = 0 min



AW10319A: **P6** = 19 min; **S1** = 11 min; S3 = 8 min; US = 2 min; DT = 3 min

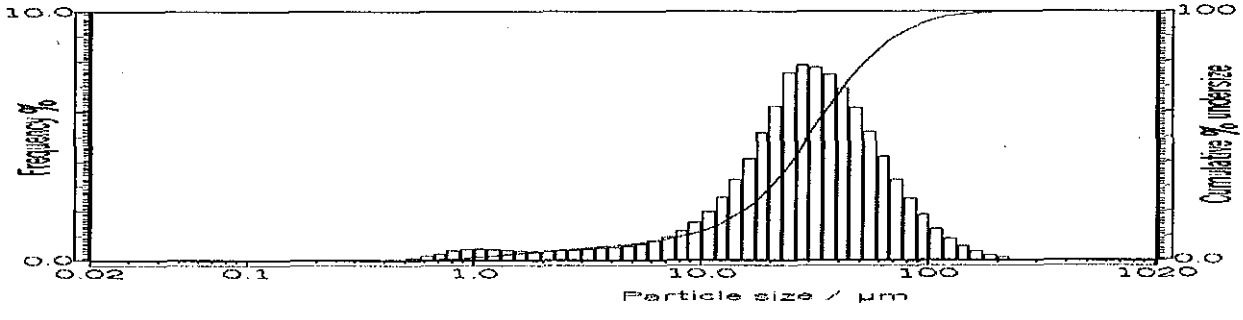
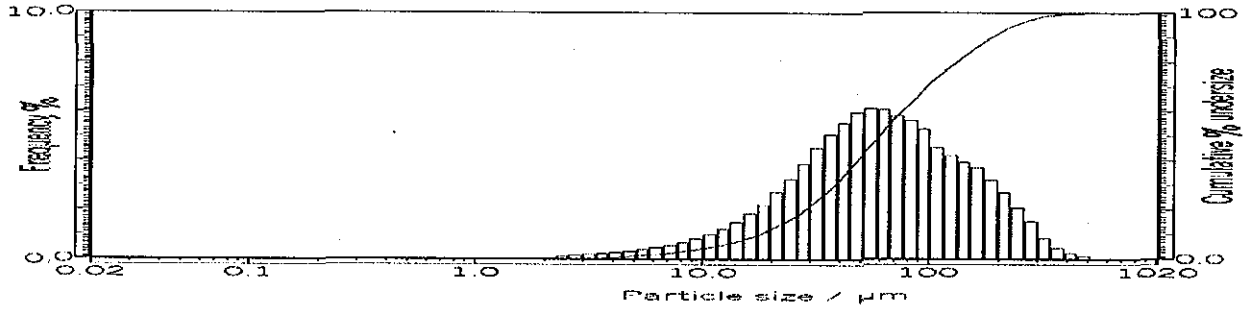


Figure 74. AW-103 Sieve Tests: Volume-based PSDs from second set of runs on test sample S01T001291: >500 μm fraction.

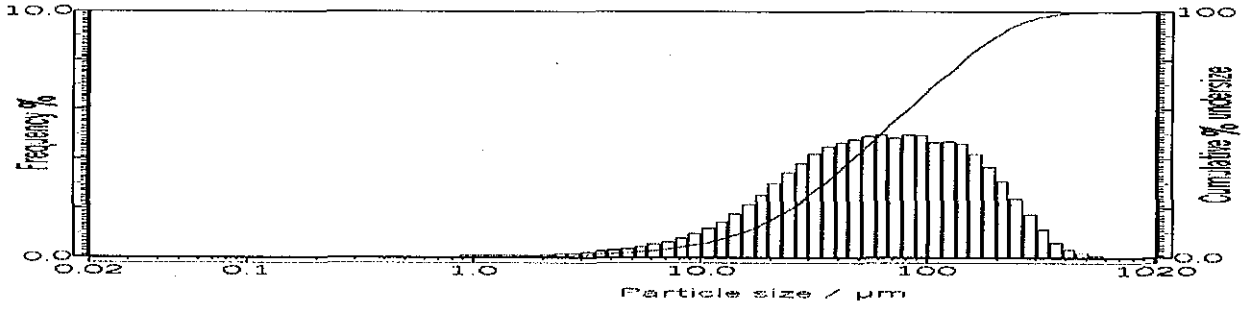
File Name: Cumulative times at run conditions with individual run settings highlighted.

[LOAD-IN]: P6 = ? min; S1 = ? min

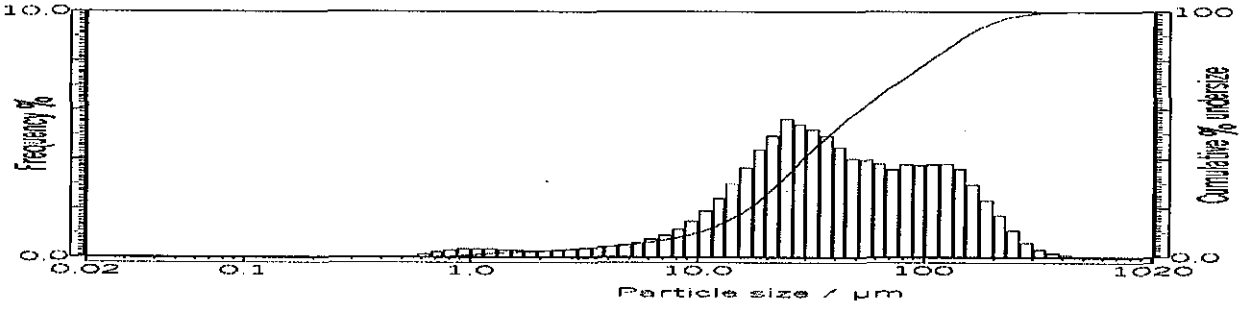
AW103020: P6 = 9 min; S1 = 9 min; S3 = 0 min; US = 0 min; DT = 0 min



AW103021: P6 = 14 min; S1 = 9 min; S3 = 5 min; US = 0 min; DT = 0 min



AW103022: P6 = 20 min; S1 = 9 min; S3 = 11 min; US = 2 min; DT = 0 min



AW103023: P6 = 22 min; S1 = 11 min; S3 = 11 min; US = 2 min; DT = 4 min

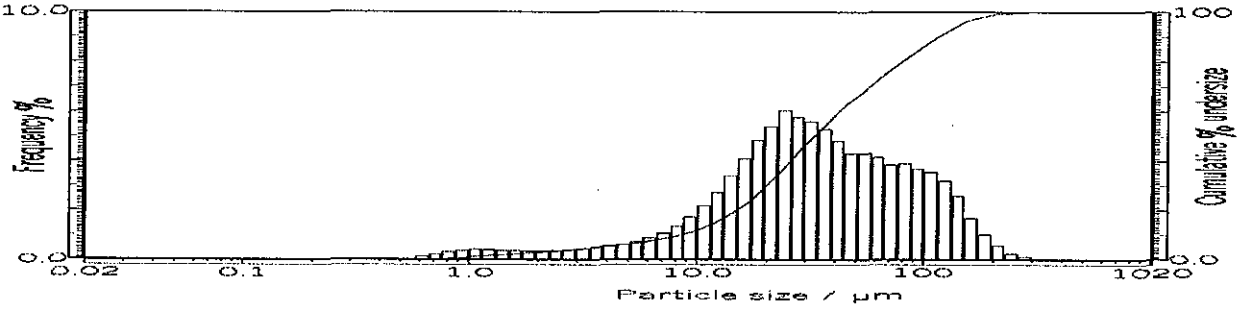
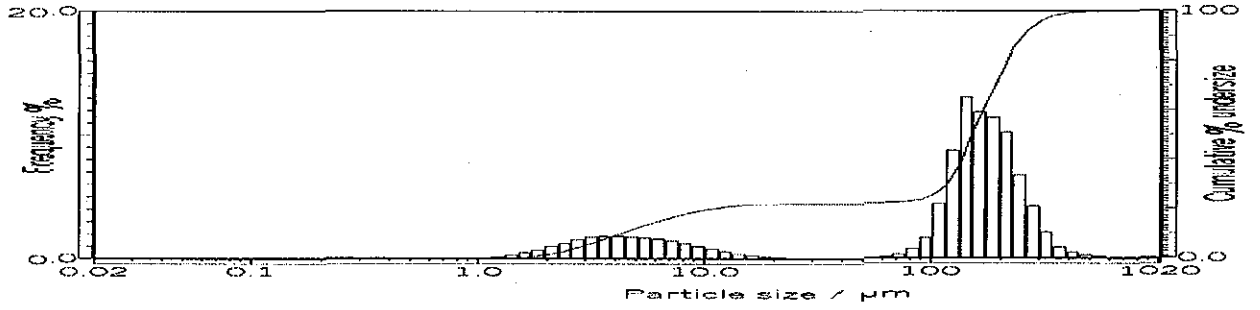


Figure 75. AW-103 Sieve Tests: Volume-based PSDs from first set of runs on test sample S01T001294: <53 μm fraction.

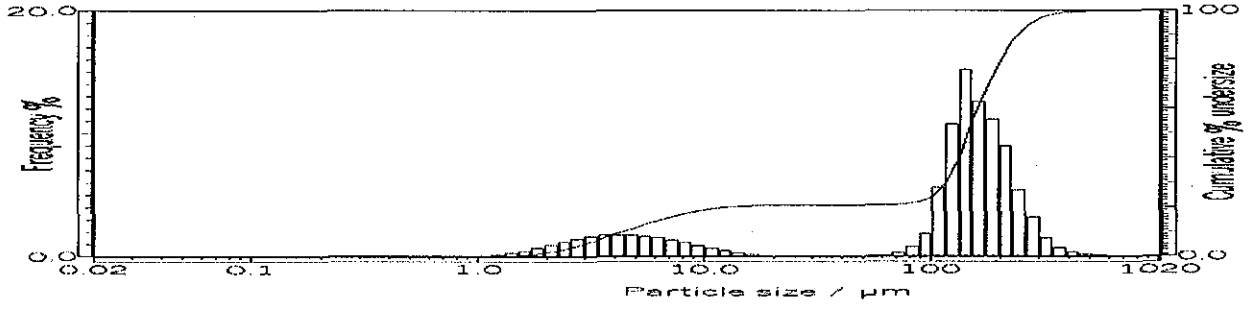
File Name: Cumulative times at run conditions with individual run settings **highlighted**.

[LOAD-IN]: **P6** = ? min; **S1** = ? min

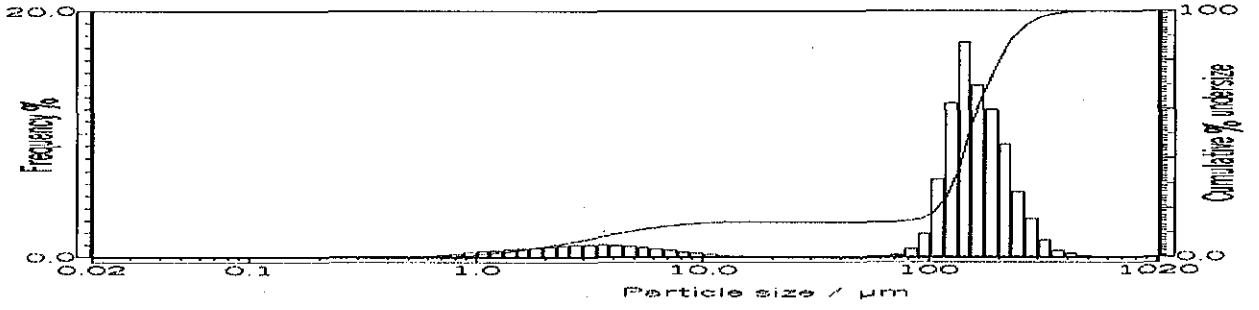
AW103024: **P6** = 5 min; **S1** = 5 min; S3 = 0 min; US = 0 min; DT = 0 min



AW103025: **P6** = 9 min; S1 = 5 min; **S3** = 4 min; US = 0 min; DT = 0 min



AW103026: **P6** = 15 min; S1 = 5 min; **S3** = 10 min; **US** = 2 min; **DT** = 0 min



AW103027: **P6** = 17 min; **S1** = 7 min; S3 = 10 min; US = 2 min; DT = 4 min

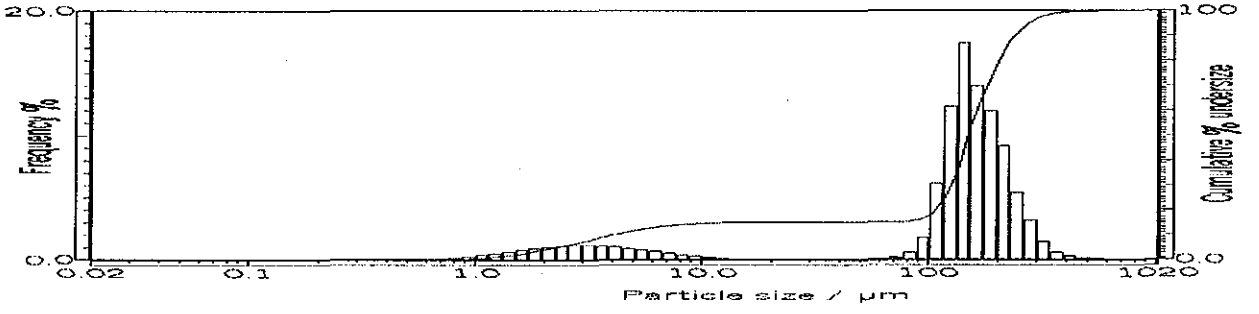
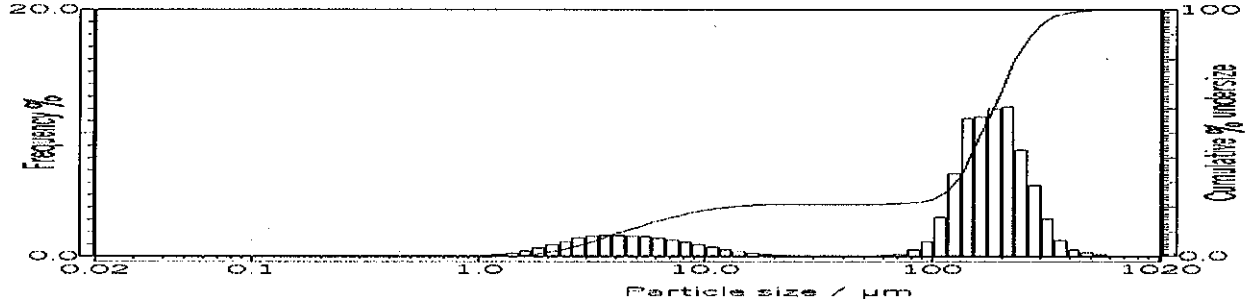


Figure 76. AW-103 Sieve Tests: Volume-based PSDs from second set of runs on test sample S01T001294: <53 μm fraction.

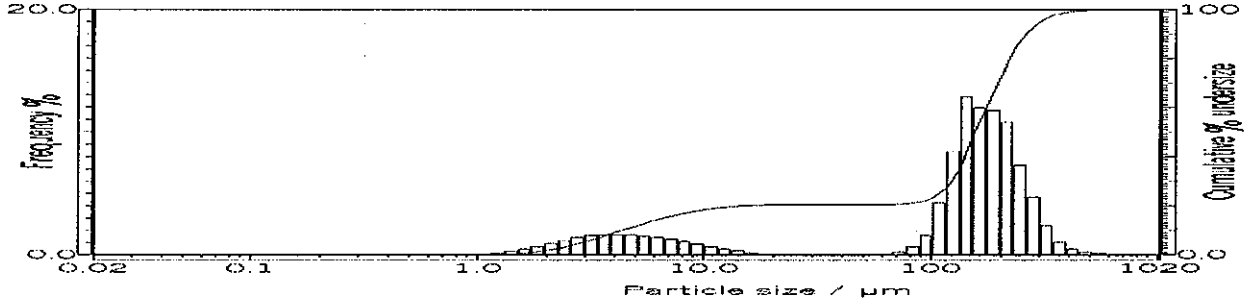
File Name: Cumulative times at run conditions with individual run settings **highlighted**.

[LOAD-IN]: **P6** = ? min; **S1** = ? min

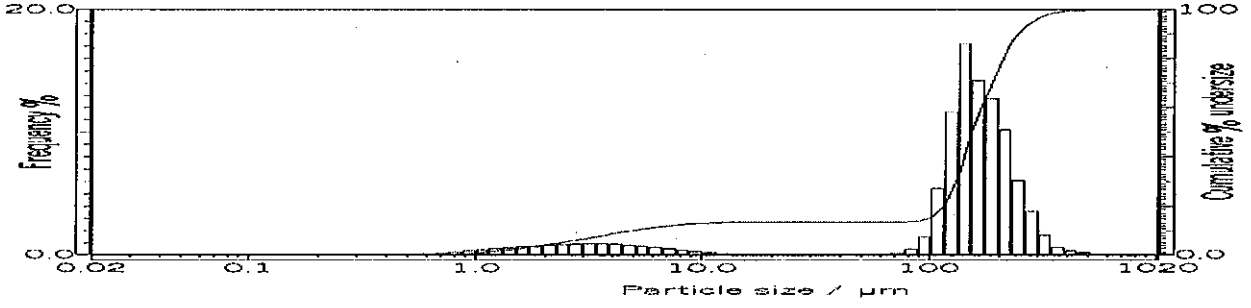
AW103028: **P6** = 4 min; **S1** = 4 min; S3 = 0 min; US = 0 min; DT = 0 min



AW103029: **P6** = 7 min; S1 = 4 min; **S3** = 3 min; US = 0 min; DT = 0 min



AW103030: **P6** = 14 min; S1 = 4 min; **S3** = 10 min; **US** = 2 min; **DT** = 0 min



AW103031: **P6** = 16 min; **S1** = 6 min; S3 = 10 min; US = 2 min; DT = 5 min

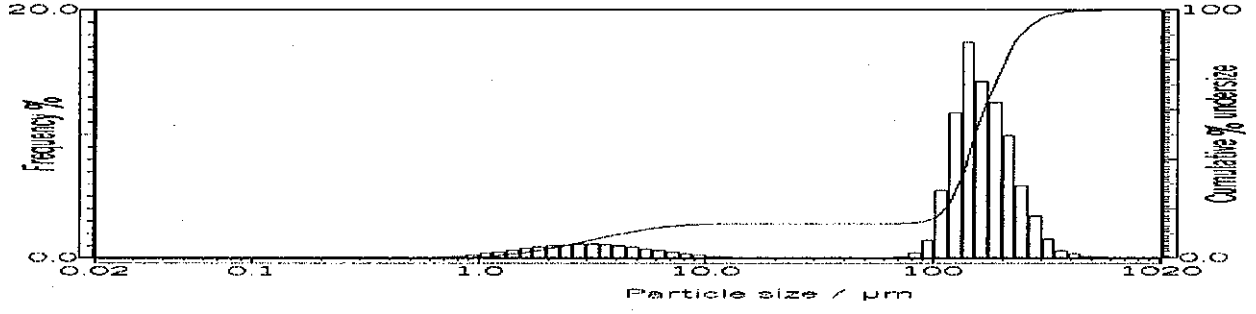


Table 31. AW-103 Sieve Tests: Mean particle diameters of volume-based PSDs.

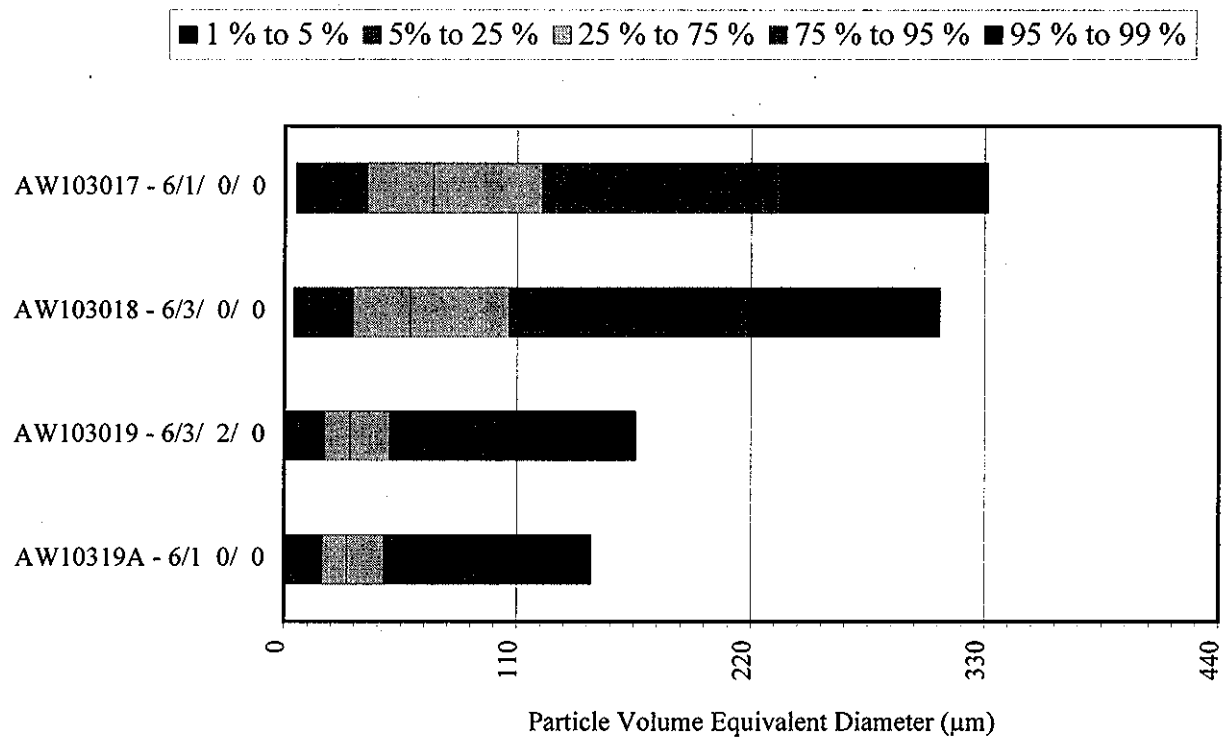
Sample Sieve Fraction	PSD Run File Name	Run Conditions				Mean Diameter (μm)	Standard Deviation (μm)
		P	S	US	DT		
S01T001291 >500 μm	AW103017	6	1	0	0	90	71
	AW103018	6	3	0	0	79	67
	AW103019	6	3	2	0	39	32
	AW10319A	6	1	0	0	36	29
S01T001291 >500 μm	AW103020	6	1	0	0	83	73
	AW103021	6	3	0	0	88	81
	AW103022	6	3	2	0	62	62
	AW103023	6	1	0	0	48	45
S01T001294 <53 μm	AW103024	6	1	0	0	144	94
	AW103025	6	3	0	0	139	88
	AW103026	6	3	2	0	146	79
	AW103027	6	1	0	0	147	80
S01T001294 <53 μm	AW103028	6	1	0	0	155	98
	AW103029	6	3	0	0	149	94
	AW103030	6	3	2	0	153	80
	AW103031	6	1	0	0	150	80

Table 32. AW-103 Sieve Tests: Percentages of particles in volume-based PSDs with diameters less than the indicated values.

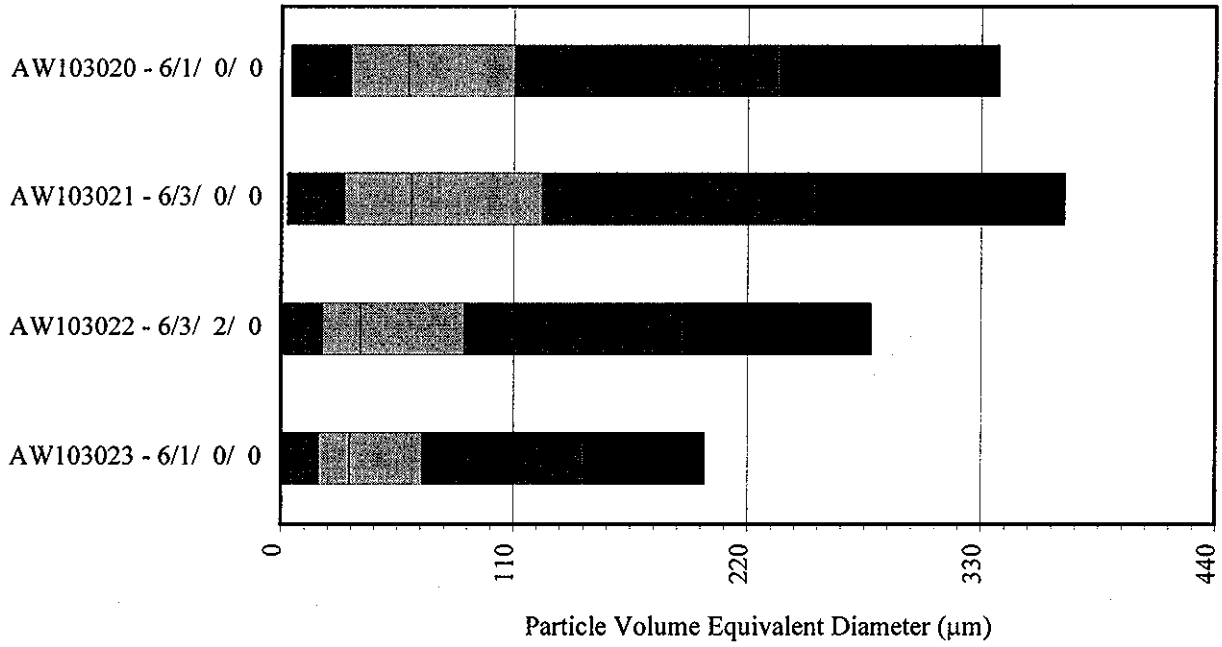
Sample	In Distributions Based on the Total Volume of Spherical Particles						
Sieve Fraction	1 %	5 %	25 %	50 %	75 %	95 %	99 %
PSD Run	Of the Particles Have Diameters Less Than (μm)						
S01T001291 >500 μm							
AW103017 - 6/1/ 0/ 0	5.28	13.16	38.9	70.1	121.8	234	332
AW103018 - 6/3/ 0/ 0	4.12	10.59	32.2	59.2	106.2	219	309
AW103019 - 6/3/ 2/ 0	0.87	3.61	18.8	31.0	49.7	100	166
AW10319A - 6/1 0/ 0	0.88	3.09	17.8	29.4	46.9	91	145
S01T001291 >500 μm							
AW103020 - 6/1/ 0/ 0	4.42	11.01	32.7	59.8	110.3	235	338
AW103021 - 6/3/ 0/ 0	2.68	9.01	29.6	61.5	123.3	252	369
AW103022 - 6/3/ 2/ 0	0.99	4.56	19.5	37.3	86.7	190	278
AW103023 - 6/1/ 0/ 0	0.97	3.65	17.6	32.4	66.6	143	200
S01T001294 <53 μm							
AW103024 - 6/1/ 0/ 0	1.73	2.84	99.5	150.2	200.5	291	391
AW103025 - 6/3/ 0/ 0	1.74	2.89	103.7	145.2	190.1	277	375
AW103026 - 6/3/ 2/ 0	0.99	2.20	117.7	148.1	189.8	271	354
AW103027 - 6/1/ 0/ 0	1.15	2.26	117.8	148.4	190.3	273	364
S01T001294 <53 μm							
AW103028 - 6/1/ 0/ 0	1.75	2.89	109.2	163.3	217.0	308	405
AW103029 - 6/3/ 0/ 0	1.67	2.84	107.2	154.4	206.2	296	393
AW103030 - 6/3/ 2/ 0	1.01	2.31	121.8	152.4	195.9	280	372
AW103031 - 6/1/ 0/ 0	1.15	2.30	120.7	151.3	194.1	276	367

Figure 77. AW-103 Sieve Tests: Diameters of particles within defined, volume-based, percentile ranges. (Two Pages)

AW-103 Sieve Test: >500 μm Fraction: S01T001291: First Measurement Set

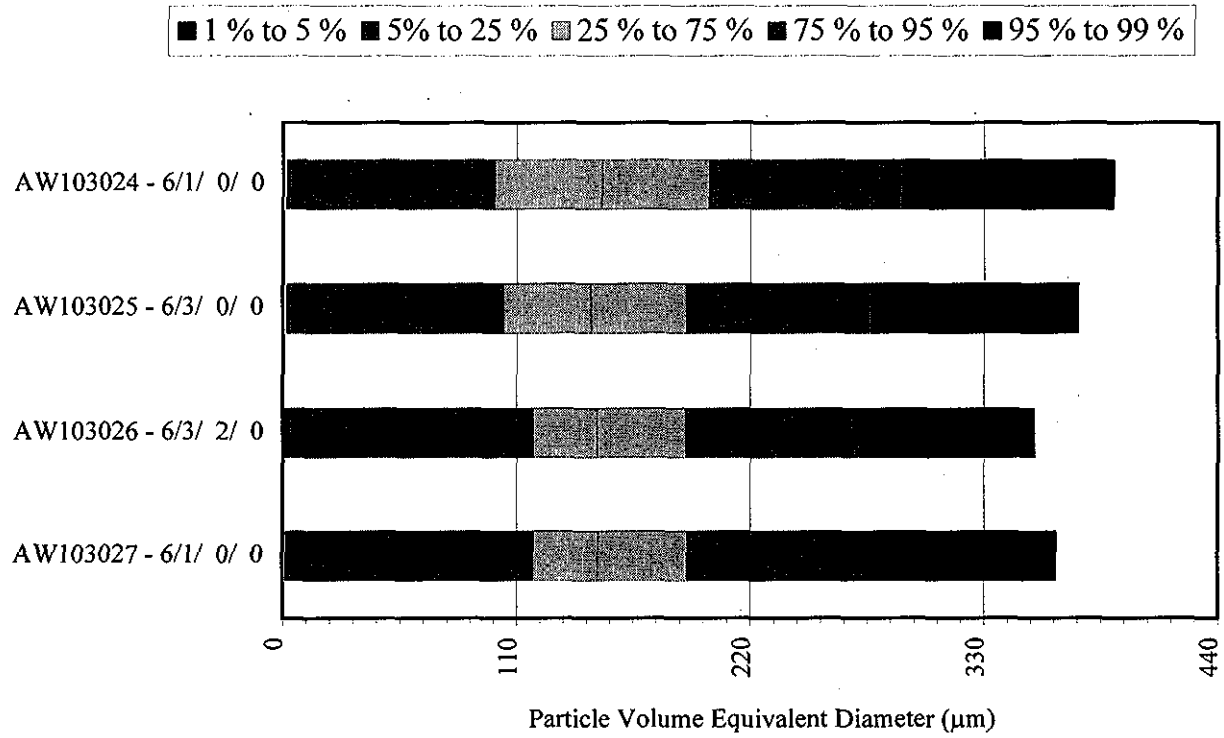


AW-103 Sieve Test: >500 μm Fraction: S01T001291: Second Measurement Set



Continued:

AW-103 Sieve Test: <53 μm Fraction: S01T001294: First Measurement Set



AW-103 Sieve Test: <53 μm Fraction: S01T001294: Second Measurement Set

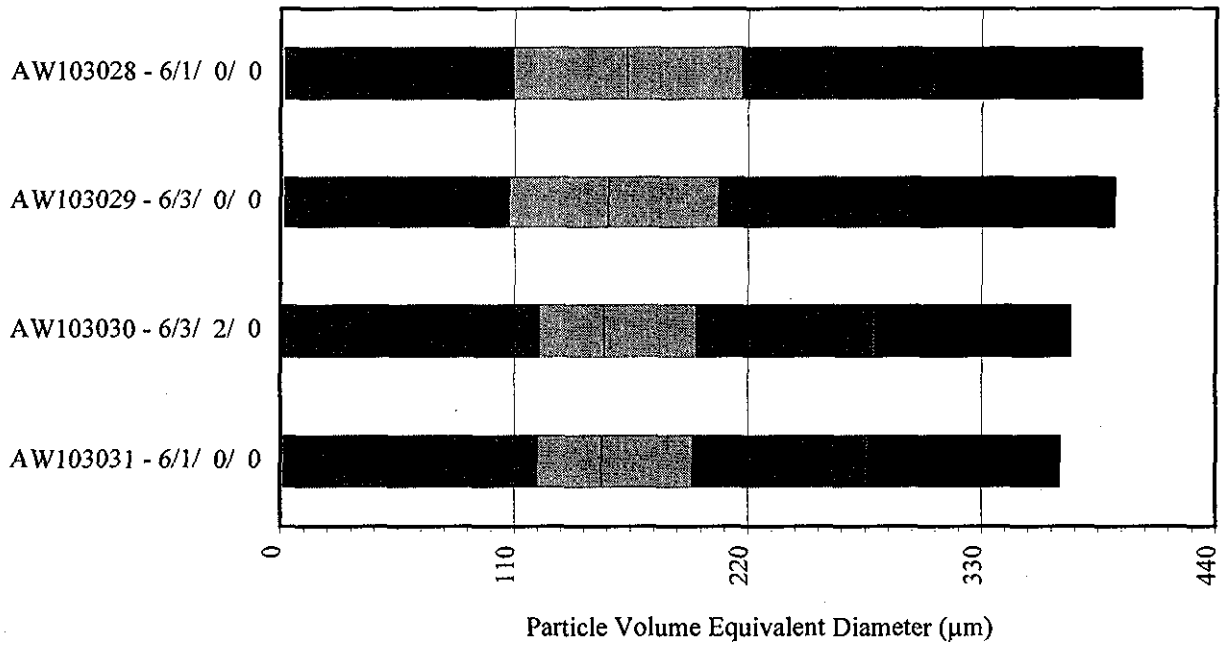
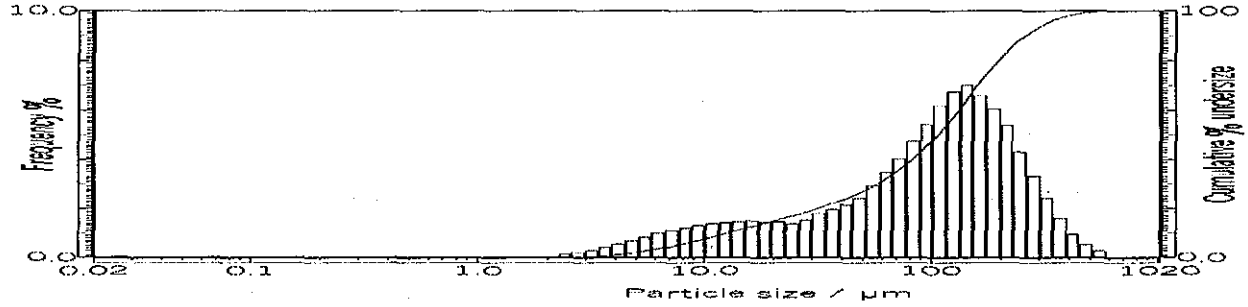


Figure 78. AY-101 Sieve Tests: Volume-based PSDs from first set of runs on test sample S01T001296: >500 μm fraction.

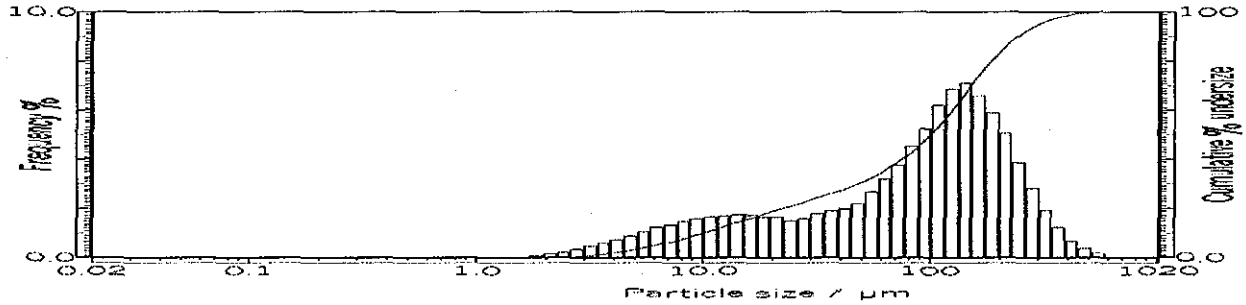
File Name: Cumulative times at run conditions with individual run settings highlighted.

[LOAD-IN]: P6 = ? min; S1 = ? min

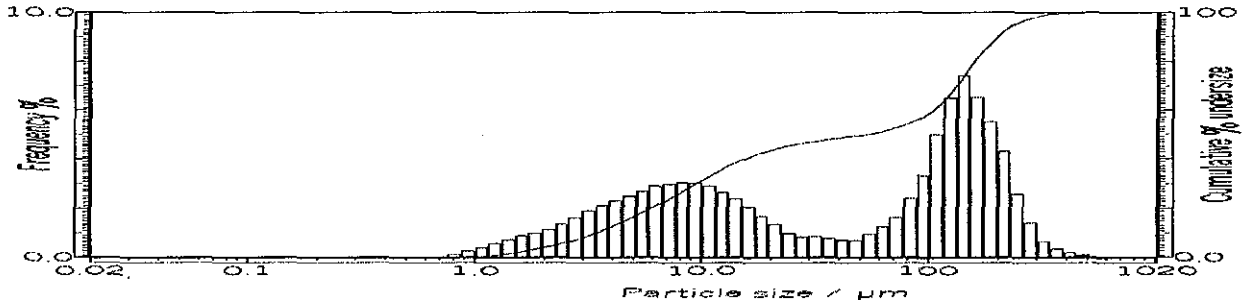
AY101048: P6 = 4 min; S1 = 4 min; S3 = 0 min; US = 0 min; DT = 0 min



AY101049: P6 = 8 min; S1 = 4 min; S3 = 4 min; US = 0 min; DT = 0 min



AY101050: P6 = 14 min; S1 = 4 min; S3 = 10 min; US = 2 min; DT = 0 min



AY101051: P6 = 16 min; S1 = 6 min; S3 = 10 min; US = 2 min; DT = 4 min

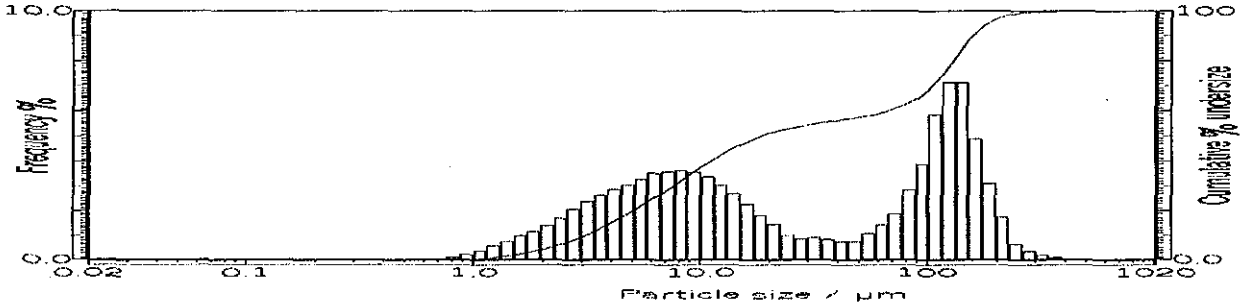
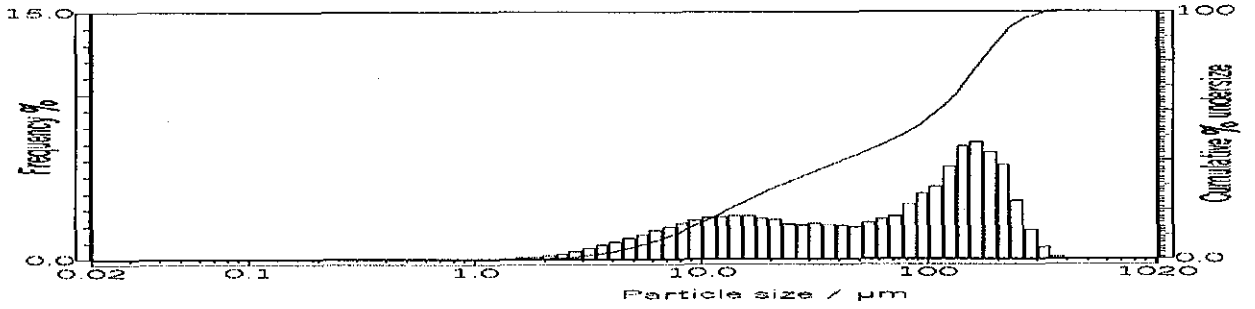


Figure 79. AY-101 Sieve Tests: Volume-based PSDs from second set of runs on test sample S01T001296: >500 μm fraction.

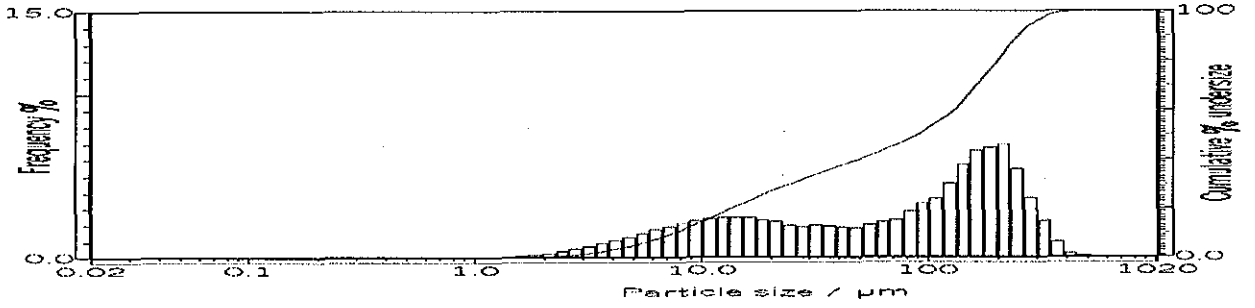
File Name: Cumulative times at run conditions with individual run settings **highlighted**.

[LOAD-IN]: **P6** = ? min; **S1** = ? min

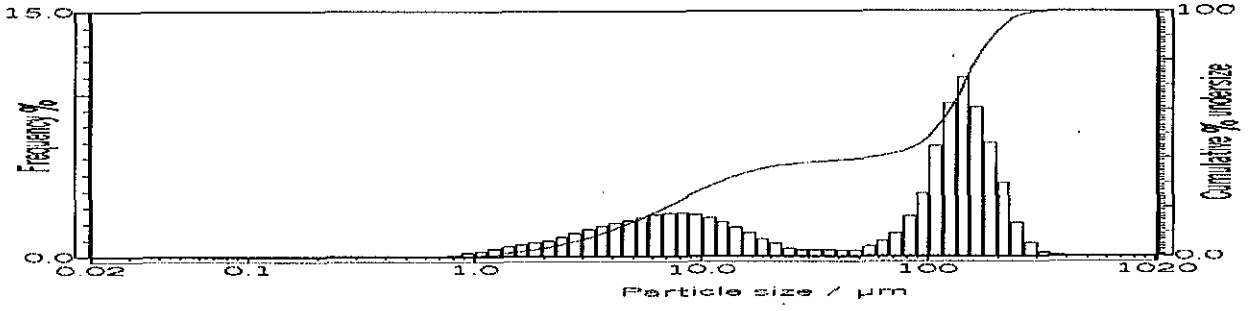
AY101052: **P6** = 4 min; **S1** = 4 min; S3 = 0 min; US = 0 min; DT = 0 min



AY101053: **P6** = 7 min; S1 = 4 min; **S3** = 3 min; US = 0 min; DT = 0 min



AY101054: **P6** = 12 min; S1 = 4 min; **S3** = 8 min; **US** = 2 min; **DT** = 0 min



AY101055: **P6** = 15 min; **S1** = 7 min; S3 = 8 min; US = 2 min; DT = 3 min

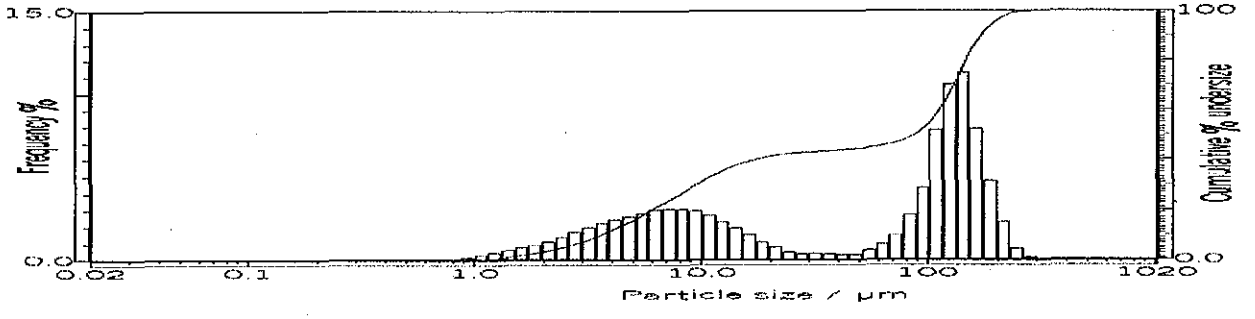
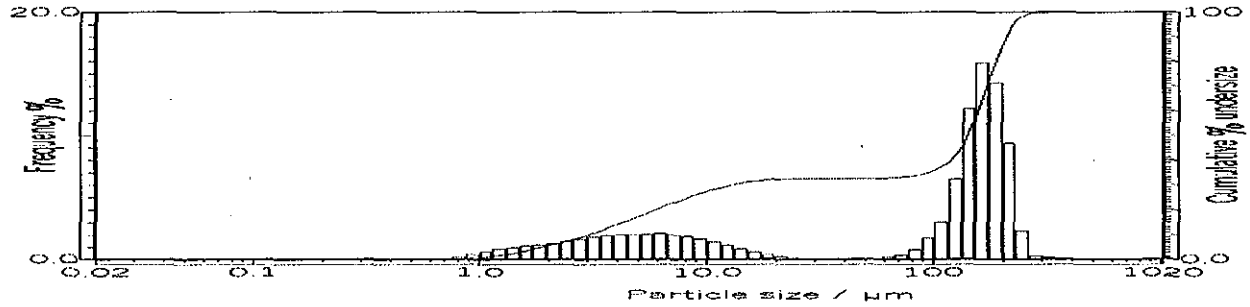


Figure 80. AY-101 Sieve Tests: Volume-based PSDs from first set of runs on test sample S01T001299: <53 μm fraction.

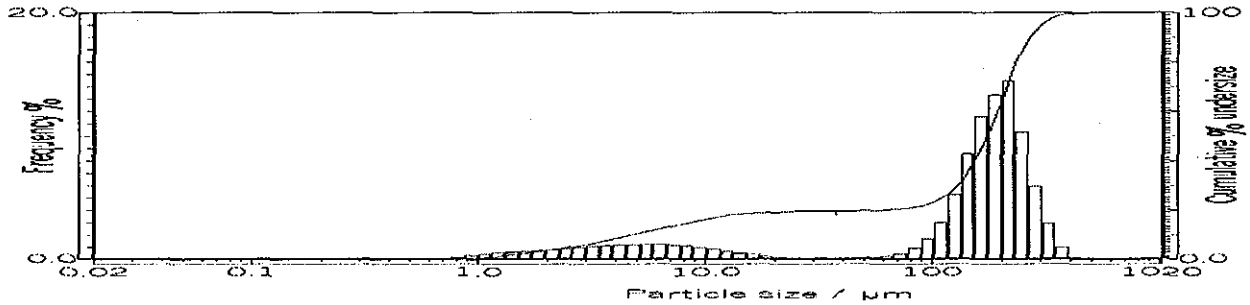
File Name: Cumulative times at run conditions with individual run settings highlighted.

[LOAD-IN]: P6 = ? min; S1 = ? min

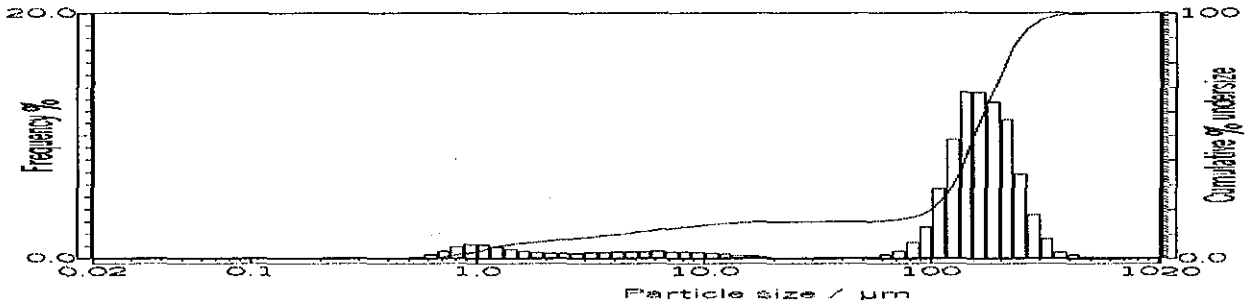
AY101056: P6 = 3 min; S1 = 3 min; S3 = 0 min; US = 0 min; DT = 0 min



AY101057: P6 = 7 min; S1 = 3 min; S3 = 4 min; US = 0 min; DT = 0 min



AY101058: P6 = 12 min; S1 = 3 min; S3 = 9 min; US = 2 min; DT = 0 min



AY101059: P6 = 15 min; S1 = 6 min; S3 = 9 min; US = 2 min; DT = 3 min

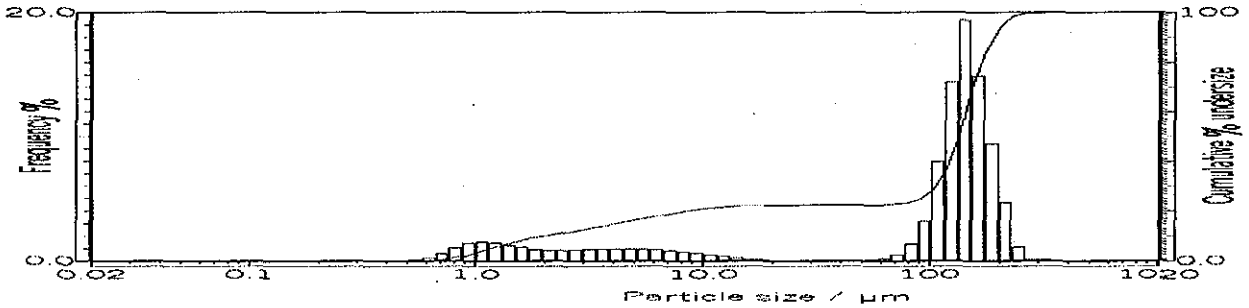
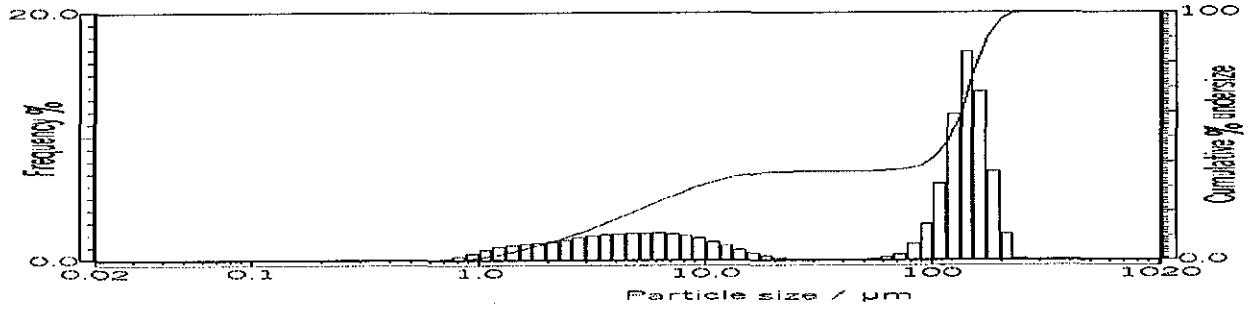


Figure 81. AY-101 Sieve Tests: Volume-based PSDs from second set of runs on test sample S01T001299: <53 μm fraction.

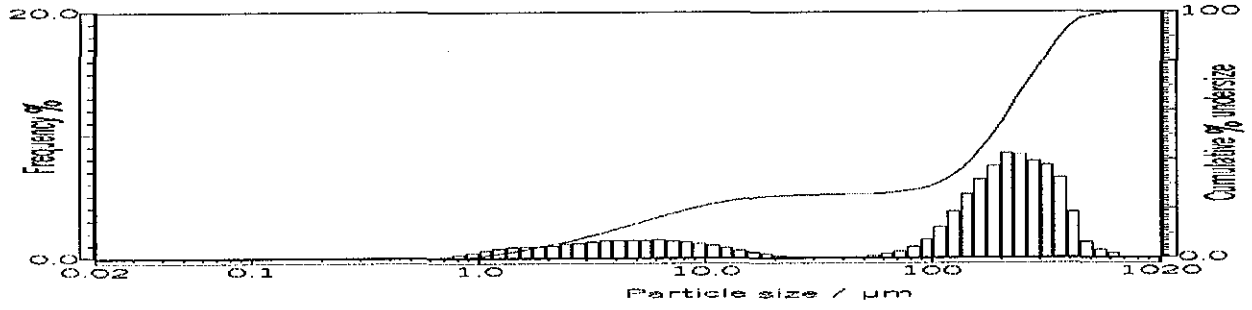
File Name: Cumulative times at run conditions with individual run settings highlighted.

[LOAD-IN]: P6 = ? min; S1 = ? min

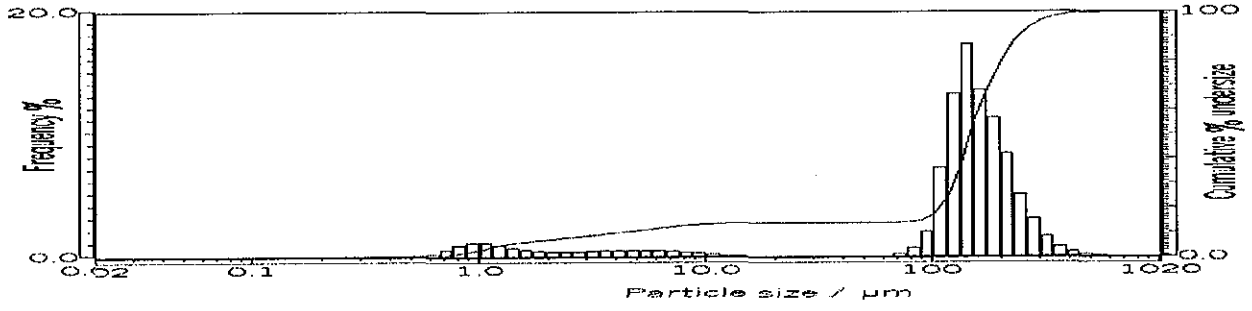
AY101060: P6 = 5 min; S1 = 5 min; S3 = 0 min; US = 0 min; DT = 0 min



AY101061: P6 = 10 min; S1 = 5 min; S3 = 5 min; US = 0 min; DT = 0 min



AY101062: P6 = 15 min; S1 = 5 min; S3 = 10 min; US = 2 min; DT = 0 min



AY101063: P6 = 19 min; S1 = 9 min; S3 = 10 min; US = 2 min; DT = 3 min

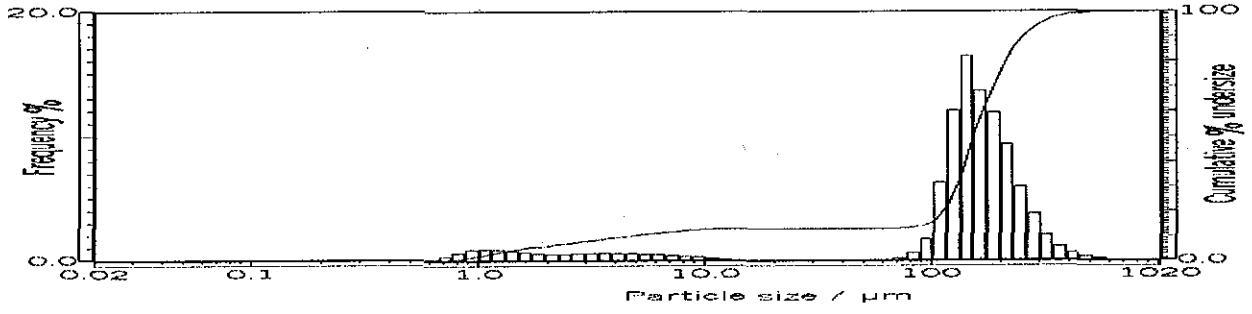


Table 33. AY-101 Sieve Tests: Mean particle diameters of volume-based PSDs.

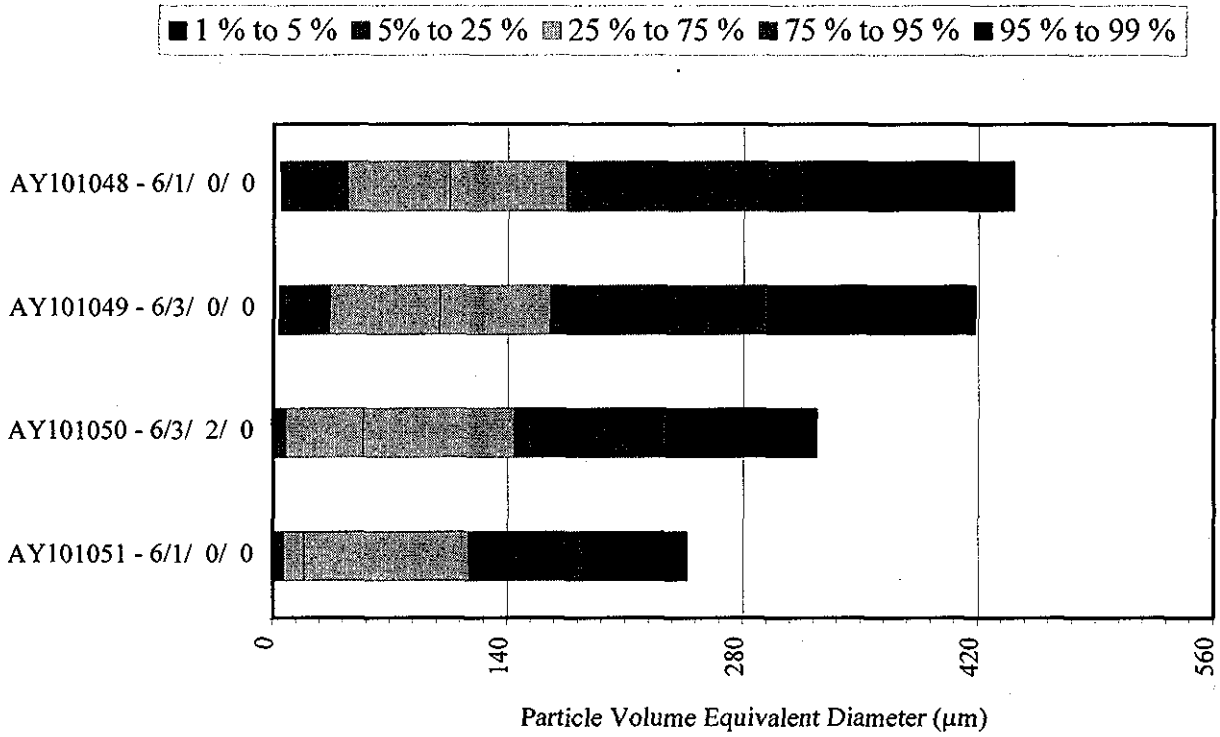
Sample Sieve Fraction	PSD Run File Name	Run Conditions				Mean Diameter (μm)	Standard Deviation (μm)
		P	S	US	DT		
S01T001296 >500 μm	AY101048	6	1	0	0	123	99
	AY101049	6	3	0	0	114	94
	AY101050	6	3	2	0	82	85
	AY101051	6	1	0	0	61	67
S01T001296 >500 μm	AY101052	6	1	0	0	93	81
	AY101053	6	3	0	0	108	96
	AY101054	6	3	2	0	92	77
	AY101055	6	1	0	0	79	69
S01T001299 <53 μm	AY101056	6	1	0	0	113	81
	AY101057	6	3	0	0	157	93
	AY101058	6	3	2	0	149	82
	AY101059	6	1	0	0	115	67
S01T001299 <53 μm	AY101060	6	1	0	0	93	71
	AY101061	6	3	0	0	181	137
	AY101062	6	3	2	0	148	82
	AY101063	6	1	0	0	155	86

Table 34. AY-101 Sieve Tests: Percentages of particles in volume-based PSDs with diameters less than the indicated values.

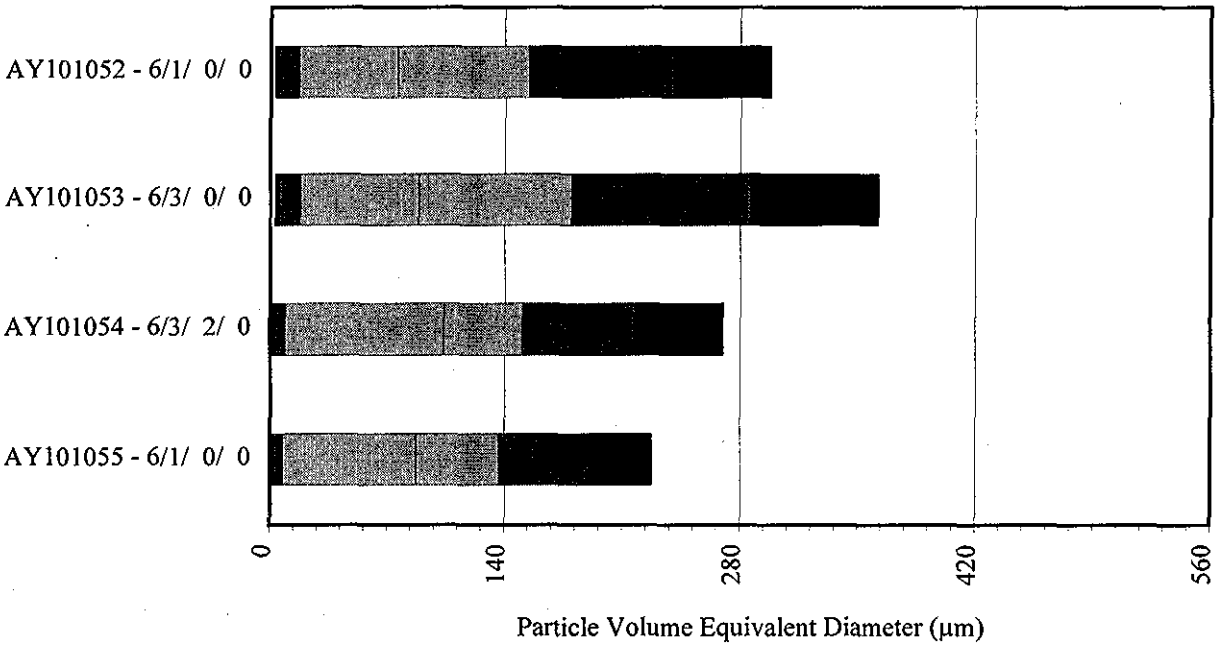
Sample	In Distributions Based on the Total Volume of Spherical Particles						
Sieve Fraction	1 %	5 %	25 %	50 %	75 %	95 %	99 %
PSD Run	Of the Particles Have Diameters Less Than (μm)						
S01T001296 >500 μm							
AY101048 - 6/1/ 0/ 0	3.76	7.45	43.92	105.1	174	315	441
AY101049 - 6/3/ 0/ 0	3.09	6.11	33.46	99.2	165	293	418
AY101050 - 6/3/ 2/ 0	1.19	2.23	7.50	53.6	144	234	324
AY101051 - 6/1/ 0/ 0	1.23	2.14	6.22	18.5	117	184	247
S01T001296 >500 μm							
AY101052 - 6/1/ 0/ 0	2.69	4.96	16.91	76.1	154	240	298
AY101053 - 6/3/ 0/ 0	2.64	4.91	17.72	88.6	179	286	362
AY101054 - 6/3/ 2/ 0	1.24	2.44	8.85	103.6	150	218	270
AY101055 - 6/1/ 0/ 0	1.33	2.41	7.50	87.3	137	190	227
S01T001299 <53 μm							
AY101056 - 6/1/ 0/ 0	1.08	1.87	8.21	140.2	177	222	254
AY101057 - 6/3/ 0/ 0	1.16	2.52	109.71	171.3	220	295	358
AY101058 - 6/3/ 2/ 0	0.75	1.26	113.95	153.8	199	275	346
AY101059 - 6/1/ 0/ 0	0.77	1.14	90.17	132.9	161	207	241
S01T001299 <53 μm							
AY101060 - 6/1/ 0/ 0	1.00	1.62	6.60	119.2	151	191	218
AY101061 - 6/3/ 0/ 0	1.04	1.91	19.08	182.8	277	411	522
AY101062 - 6/3/ 2/ 0	0.76	1.26	117.17	146.9	189	282	390
AY101063 - 6/1/ 0/ 0	0.84	1.54	120.13	151.6	197	296	414

Figure 82. AY-101 Sieve Tests: Diameters of particles (μm) within defined, volume-based, percentile ranges. (Two Pages)

AY-101 Sieve Tests: >500 μm Fraction: S01T001296: First Measurement Set

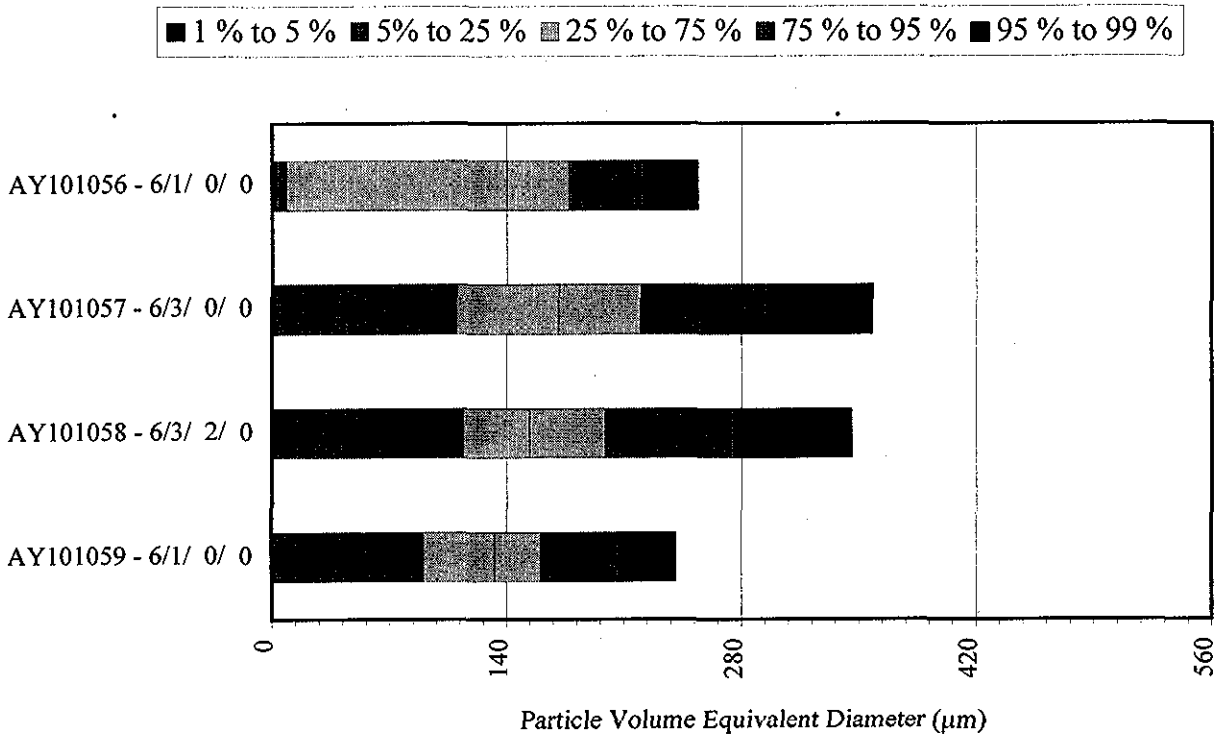


AY-101 Sieve Tests: >500 μm Fraction: S01T001296: Second Measurement Set



Continued:

AY-101 Sieve Tests: <53 μm Fraction: S01T001299: First Measurement Set



AY-101 Sieve Tests: <53 μm Fraction: S01T001299: Second Measurement Set

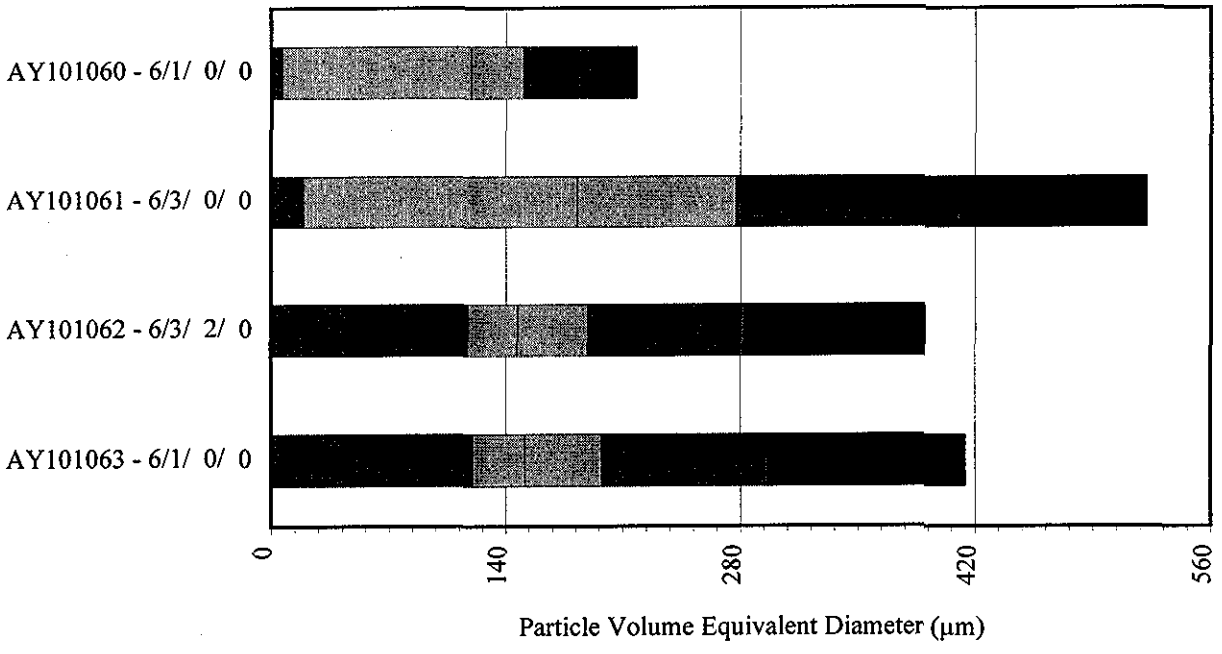
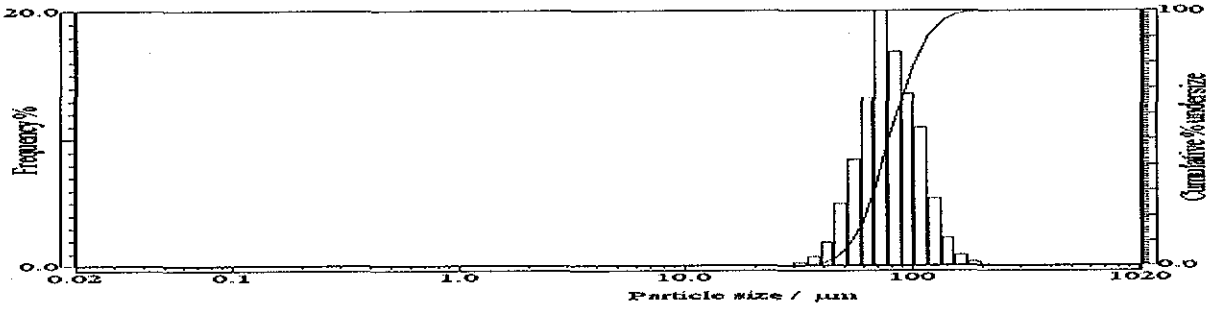


Figure 83. C-104 Sieve Tests: Volume-based PSDs from first set of runs on test sample S01T001285: 53 μm-106 μm fraction.

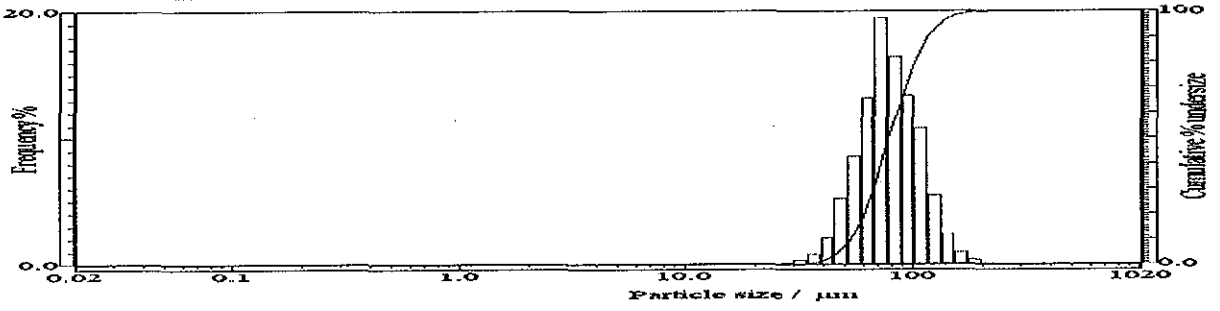
File Name: Cumulative times at run conditions with individual run settings highlighted.

[LOAD-IN]: P6 = ? min; S1 = ? min

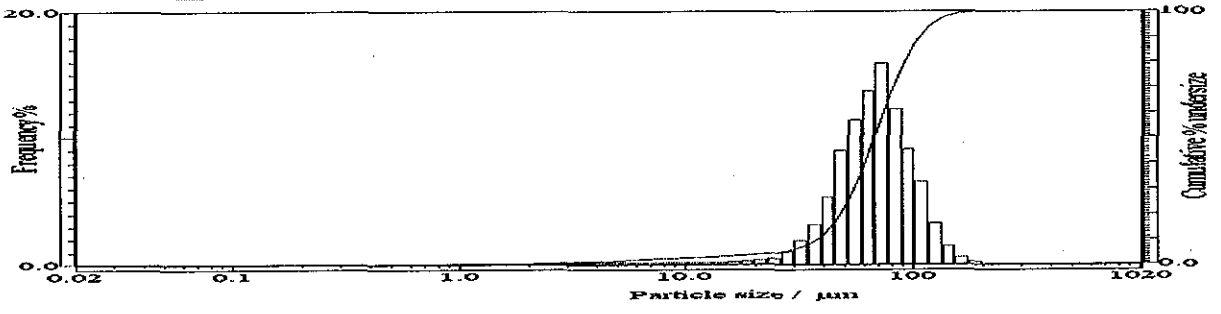
C104040: P6 = 5 min; S1 = 5 min; S3 = 0 min; US = 0 min; DT = 0 min



C104041: P6 = 7 min; S1 = 5 min; S3 = 2 min; US = 0 min; DT = 0 min



C104042: P6 = 13 min; S1 = 5 min; S3 = 8 min; US = 2 min; DT = 0 min



C104043: P6 = 16 min; S1 = 8 min; S3 = 8 min; US = 2 min; DT = 4 min

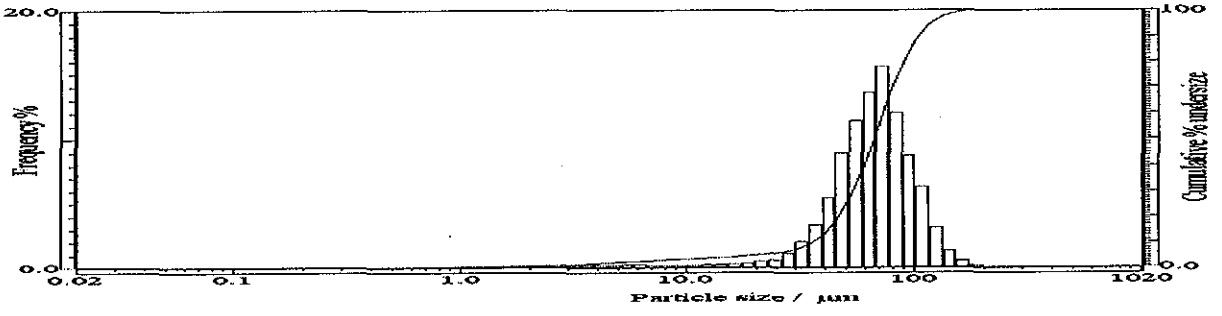
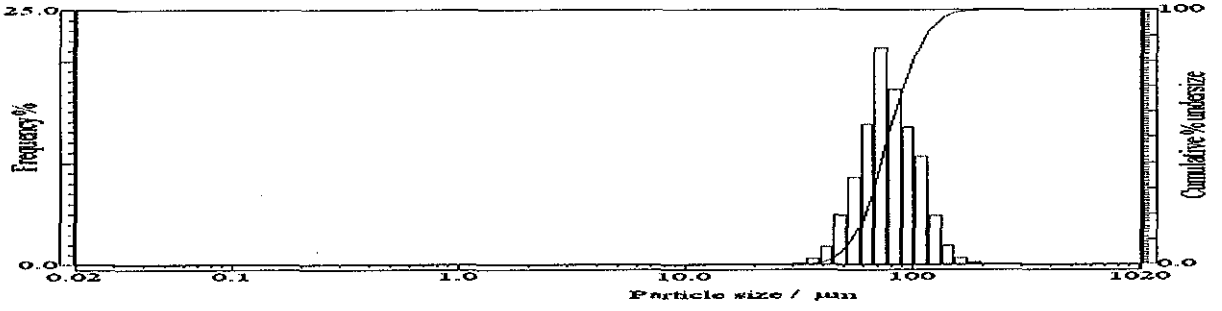


Figure 84: C-104 Sieve Tests: Volume-based PSDs from second set of runs on test sample S01T001285: 53 μm-106 μm fraction.

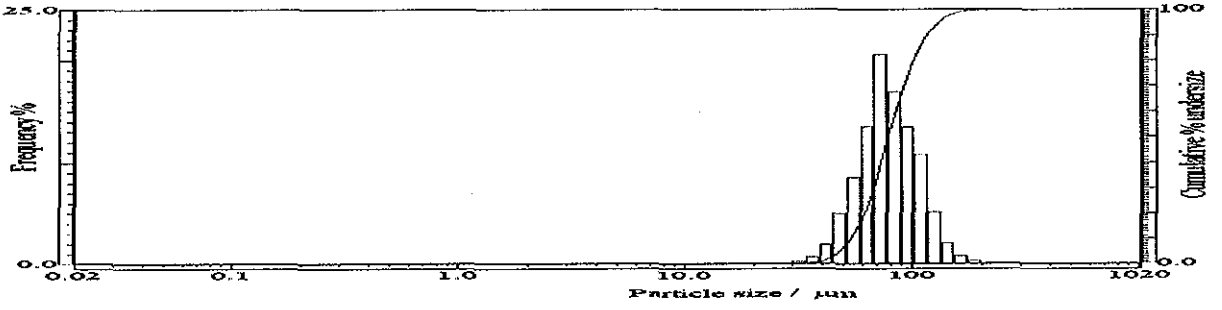
File Name: Cumulative times at run conditions with individual run settings highlighted.

[LOAD-IN]: P6 = ? min; S1 = ? min

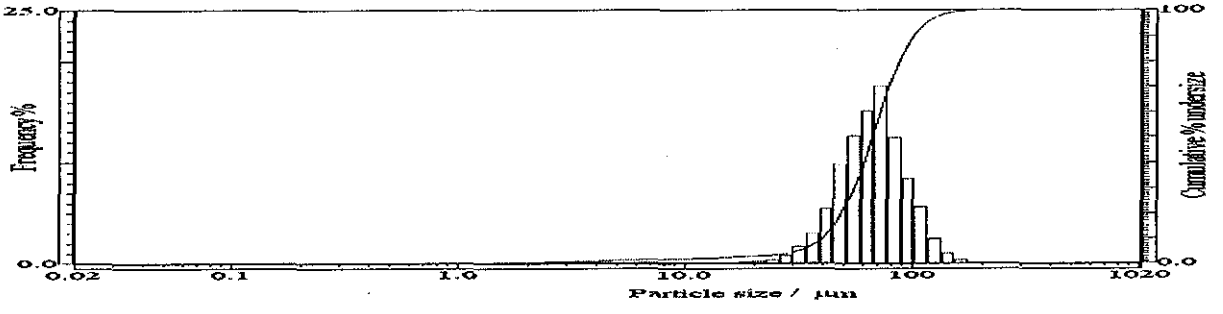
C104044: P6 = 4 min; S1 = 4 min; S3 = 0 min; US = 0 min; DT = 0 min



C104045: P6 = 6 min; S1 = 4 min; S3 = 2 min; US = 0 min; DT = 0 min



C104046: P6 = 12 min; S1 = 4 min; S3 = 8 min; US = 2 min; DT = 0 min



C104047: P6 = 14 min; S1 = 6 min; S3 = 8 min; US = 2 min; DT = 4 min

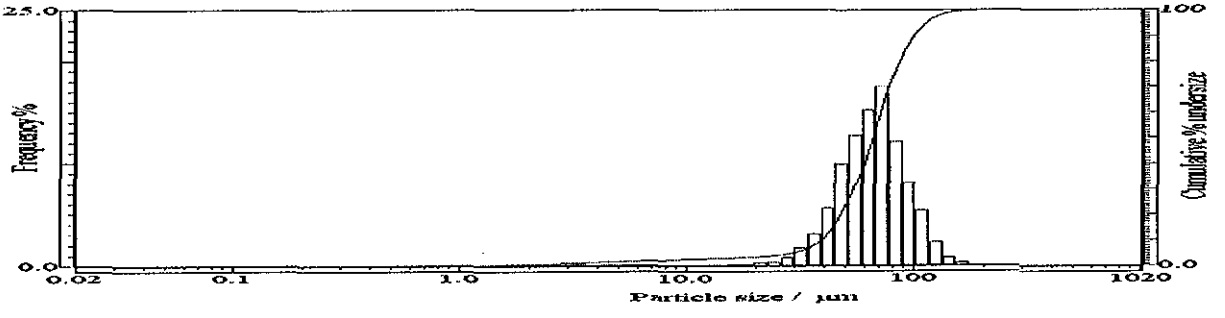
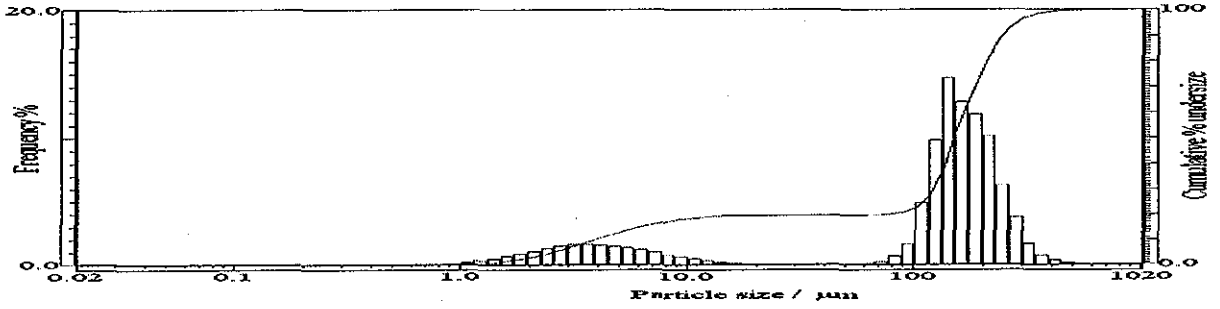


Figure 85. C-104 Sieve Tests: Volume-based PSDs from first set of runs on test sample S01T001284: <53 μm fraction.

File Name: Cumulative times at run conditions with individual run settings highlighted.

[LOAD-IN]: P6 = ? min; S1 = ? min

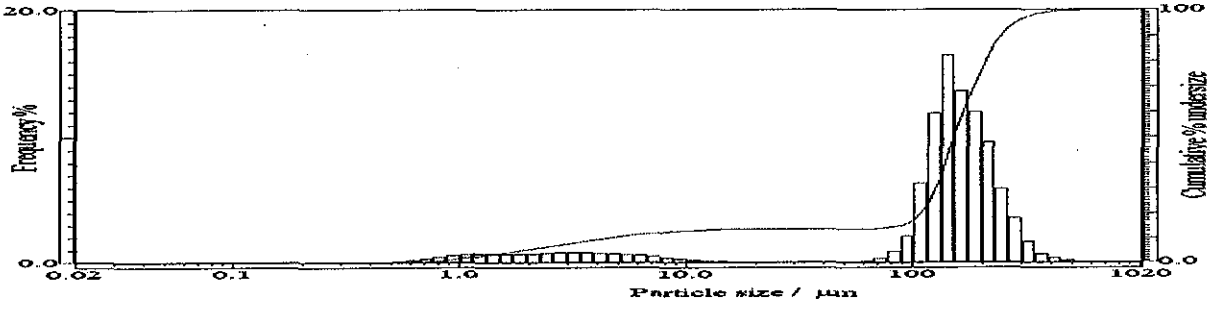
C104032: P6 = 5 min; S1 = 5 min; S3 = 0 min; US = 0 min; DT = 0 min



C104033: P6 = 11 min; S1 = 5 min; S3 = 6 min; US = 0 min; DT = 0 min

(DATA LOST FOR THIS RUN)

C104034: P6 = 18 min; S1 = 5 min; S3 = 13 min; US = 2 min; DT = 0 min



C104035: P6 = 20 min; S1 = 7 min; S3 = 13 min; US = 2 min; DT = 5 min

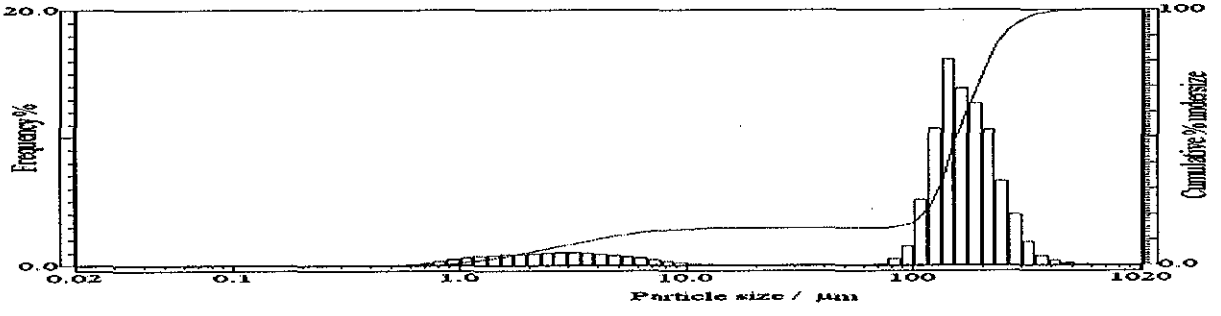
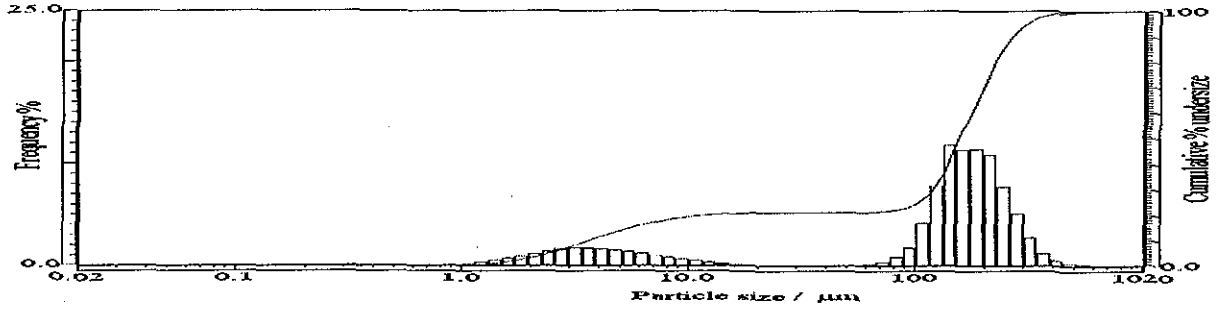


Figure 86. C-104 Sieve Tests: Volume-based PSDs from second set of runs on test sample S01T001284: <53 μm fraction.

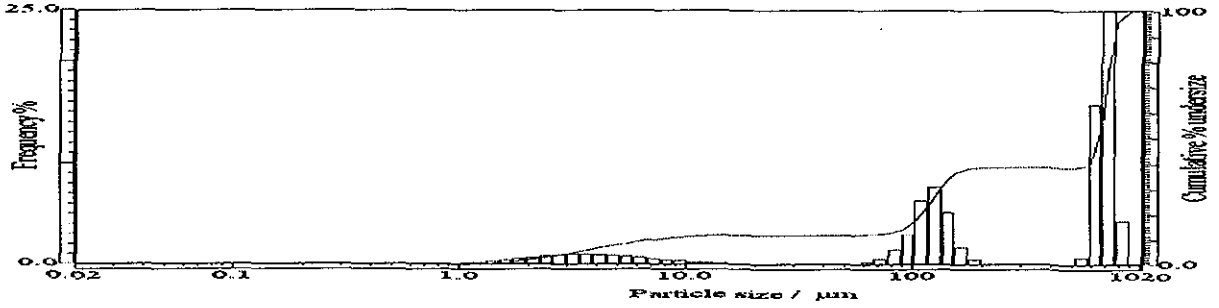
File Name: Cumulative times at run conditions with individual run settings highlighted.

[LOAD-IN]: P6 = ? min; S1 = ? min

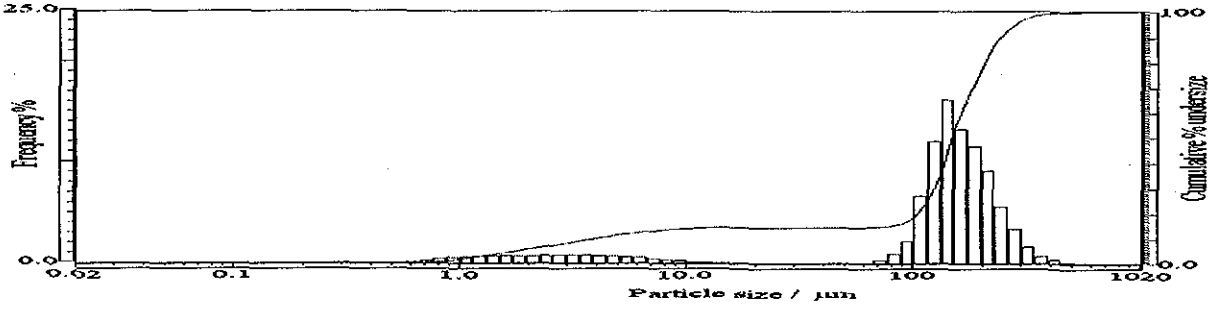
C104036: P6 = 4 min; S1 = 4 min; S3 = 0 min; US = 0 min; DT = 0 min



C104037: P6 = 7 min; S1 = 4 min; S3 = 3 min; US = 0 min; DT = 0 min



C104038: P6 = 13 min; S1 = 4 min; S3 = 9 min; US = 2 min; DT = 0 min



C104039: P6 = 16 min; S1 = 7 min; S3 = 9 min; US = 2 min; DT = 4 min

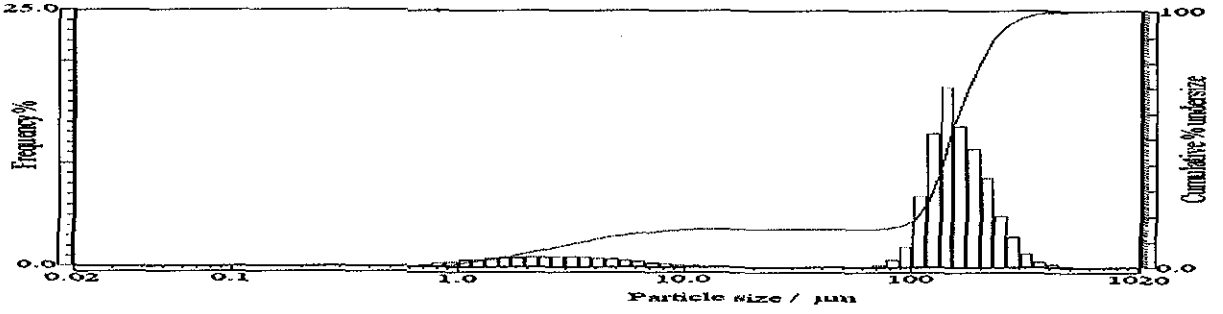


Table 35. C-104 Sieve Tests: Mean particle diameters of volume-based PSDs.

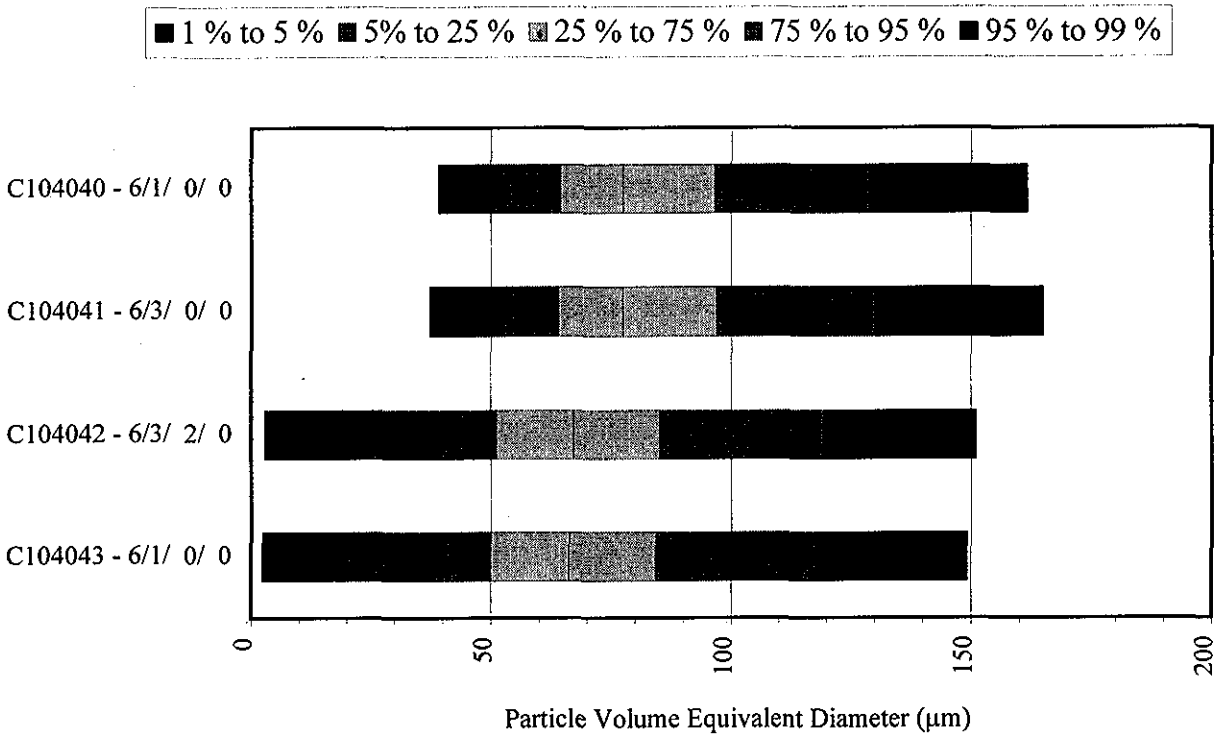
Sample Sieve Fraction	PSD Run File Name	Run Conditions				Mean Diameter (μm)	Standard Deviation (μm)
		P	S	US	DT		
S01T001285 53 - 106 μm	C104040	6	1	0	0	82	25
	C104041	6	3	0	0	82	26
	C104042	6	3	2	0	69	29
	C104043	6	1	0	0	68	29
S01T001285 53-106 μm	C104044	6	1	0	0	81	24
	C104045	6	3	0	0	82	25
	C104046	6	3	2	0	68	26
	C104047	6	1	0	0	67	26
S01T001284 <53 μm	C104032	6	1	0	0	144	88
		6	3	0	0		
	C104034	6	3	2	0	151	81
	C104035	6	1	0	0	153	84
S01T001284 <53 μm	C104036	6	1	0	0	150	97
	C104037	6	3	0	0	468	308
	C104038	6	3	2	0	148	83
	C104039	6	1	0	0	144	80

Table 36. C-104 Sieve Tests: Percentages of particles in volume-based PSDs with diameters less than the indicated values.

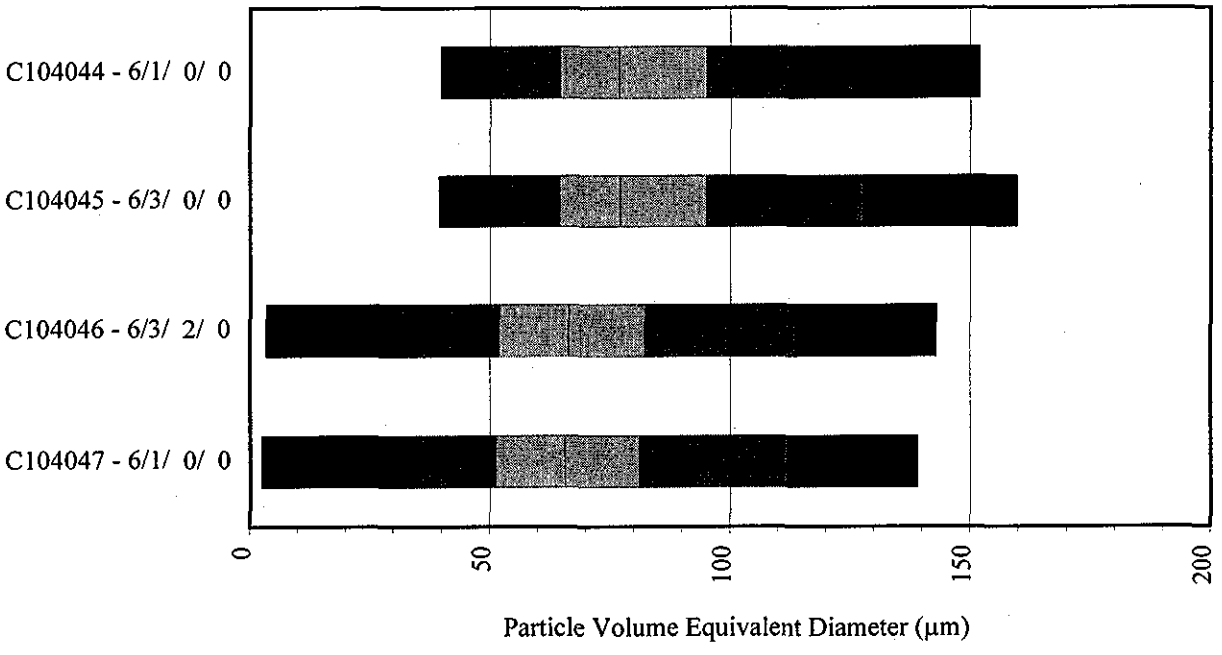
Sample	In Distributions Based on the Total Volume of Spherical Particles						
Sieve Fraction	1 %	5 %	25 %	50 %	75 %	95 %	99 %
PSD Run	Of the Particles Have Diameters Less Than (μm)						
S01T001285 53-106 μm							
C104040 - 6/1/ 0/ 0	39.12	47.64	64.5	78	97	129	162
C104041 - 6/3/ 0/ 0	37.22	46.84	64.0	77	97	130	165
C104042 - 6/3/ 2/ 0	2.78	25.71	51.1	67	85	120	151
C104043 - 6/1/ 0/ 0	2.27	19.90	49.9	66	84	118	149
S01T001285 53-106 μm							
C104044 - 6/1/ 0/ 0	39.67	48.06	64.5	77	95	125	152
C104045 - 6/3/ 0/ 0	39.32	47.75	64.4	77	95	128	160
C104046 - 6/3/ 2/ 0	3.31	31.42	51.9	66	82	114	143
C104047 - 6/1/ 0/ 0	2.29	29.60	51.2	66	81	112	139
S01T001284 <53 μm							
C104032 - 6/1/ 0/ 0	1.42	2.53	109.2	150	197	282	378
- 6/3/ 0/ 0							
C104034 - 6/3/ 2/ 0	0.85	1.90	118.3	150	195	281	376
C104035 - 6/1/ 0/ 0	0.96	1.94	121.0	154	199	286	381
S01T001284 <53 μm							
C104036 - 6/1/ 0/ 0	1.40	2.45	103.7	156	210	303	405
C104037 - 6/3/ 0/ 0	1.65	3.34	119.7	651	727	776	864
C104038 - 6/3/ 2/ 0	0.84	1.78	116.2	148	193	282	382
C104039 - 6/1/ 0/ 0	0.94	1.86	116.2	146	187	269	363

Figure 87. C-104 Sieve Tests: Diameters of particles (μm) within defined, volume-based, percentile ranges. (Two Pages)

C-104 Sieve Tests: 53 μm-106 μm Fraction: S01T001285: First Measurement Set

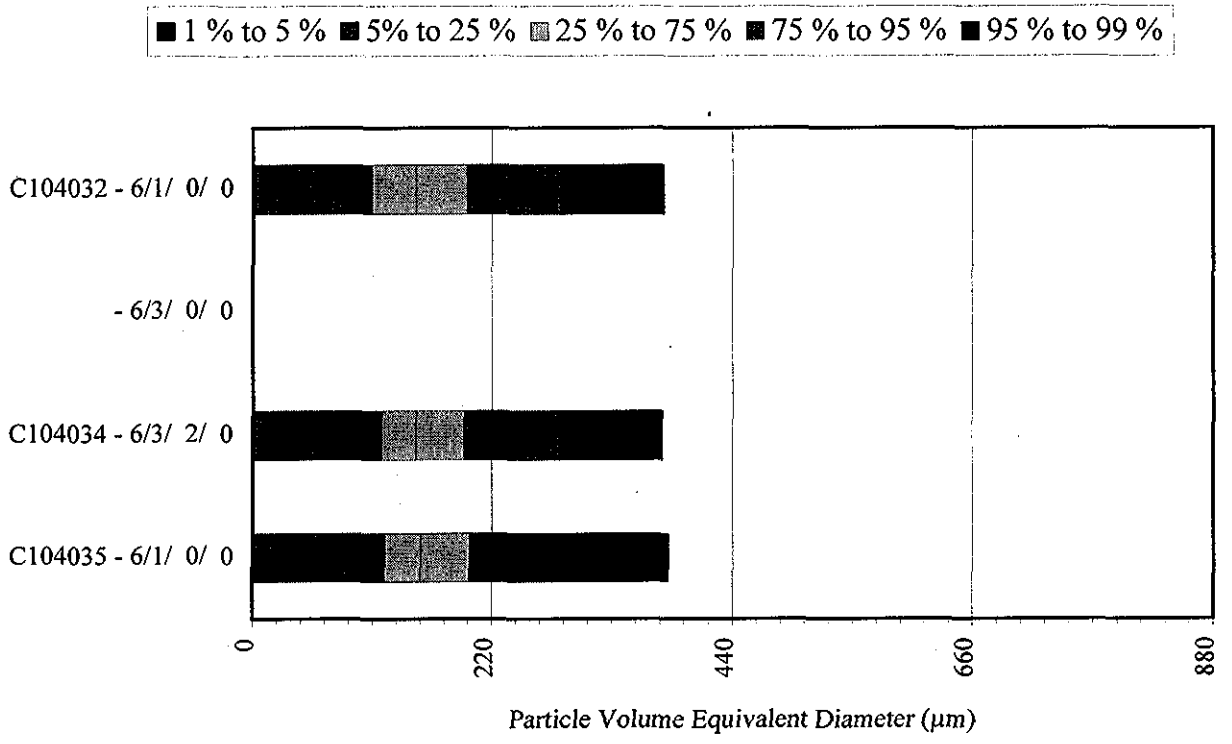


C-104 Sieve Tests: 53 μm-106 μm Fraction: S01T001285: Second Measurement Set



Continued:

C-104 Sieve Tests: <53 μm Fraction: S01T001284: First Measurement Set



C-104 Sieve Tests: <53 μm Fraction: S01T001284: Second Measurement Set

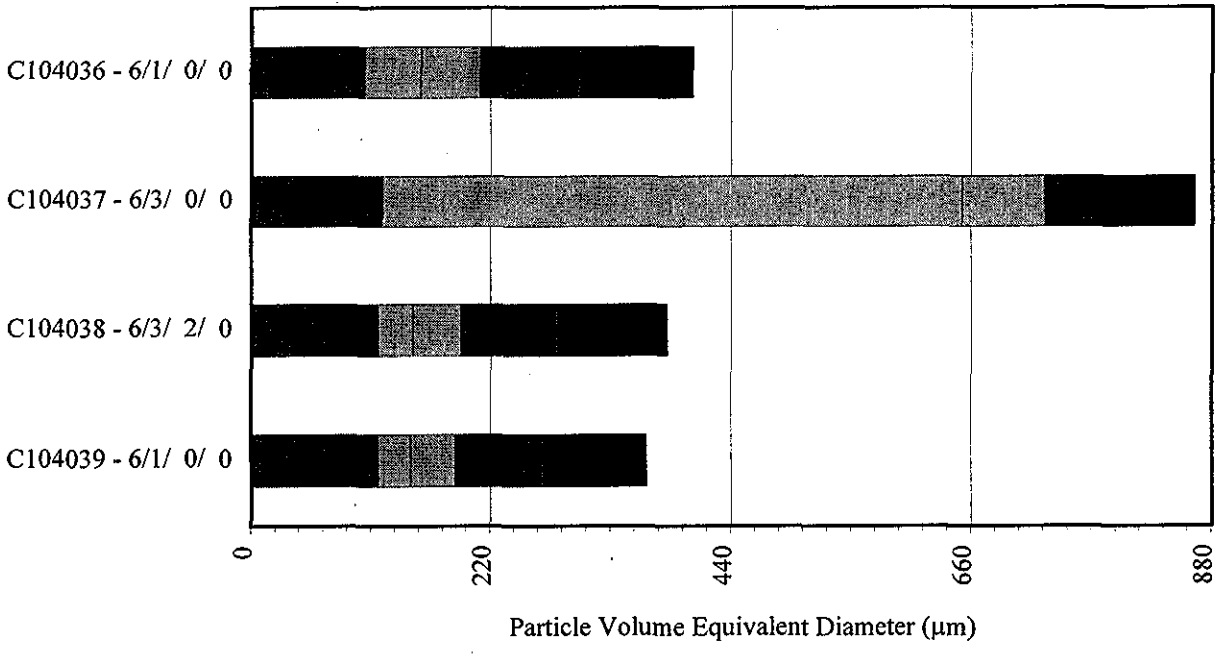
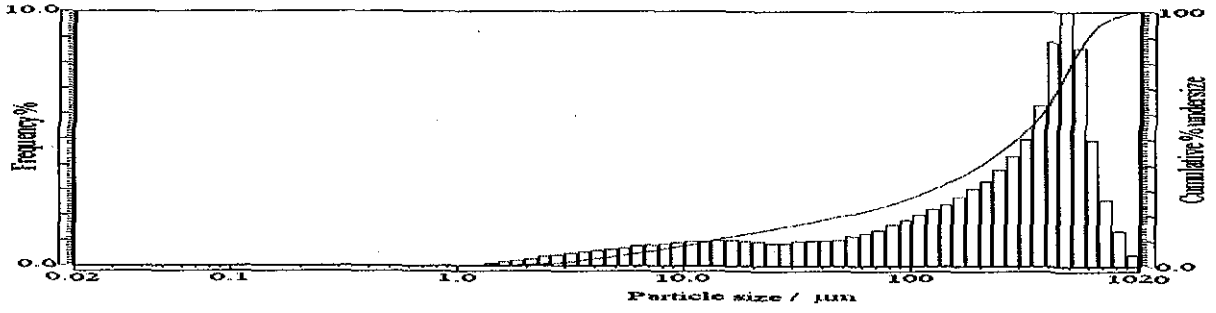


Figure 88. SY-102 Sieve Tests: Volume-based PSDs from first set of runs on test sample S01T001286: >500 μm fraction.

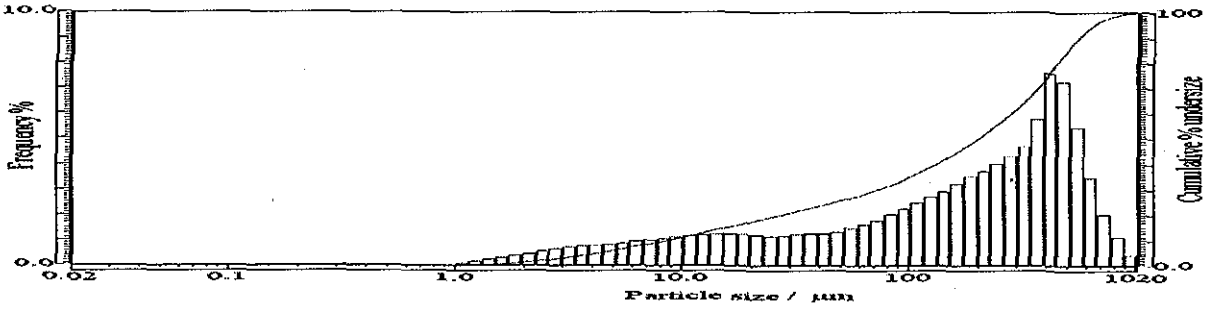
File Name: Cumulative times at run conditions with individual run settings highlighted.

[LOAD-IN]: P6 = ? min; S1 = ? min

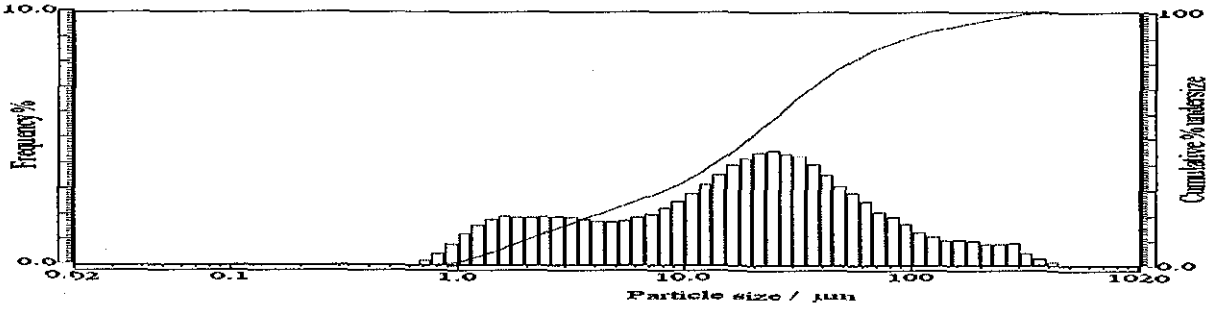
SY102001: P6 = 5 min; S1 = 5 min; S3 = 0 min; US = 0 min; DT = 0 min



SY102002: P6 = 8 min; S1 = 5 min; S3 = 3 min; US = 0 min; DT = 0 min



SY102003: P6 = 13 min; S1 = 5 min; S3 = 8 min; US = 2 min; DT = 0 min



SY102004: P6 = 15 min; S1 = 7 min; S3 = 8 min; US = 2 min; DT = 3 min

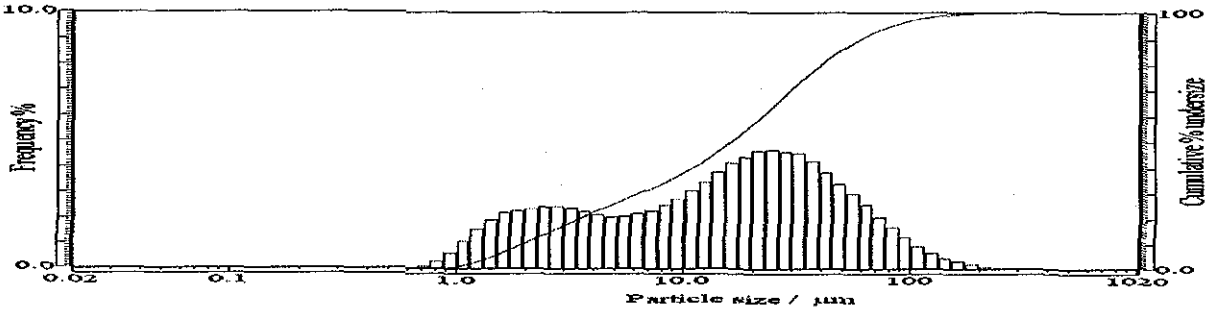
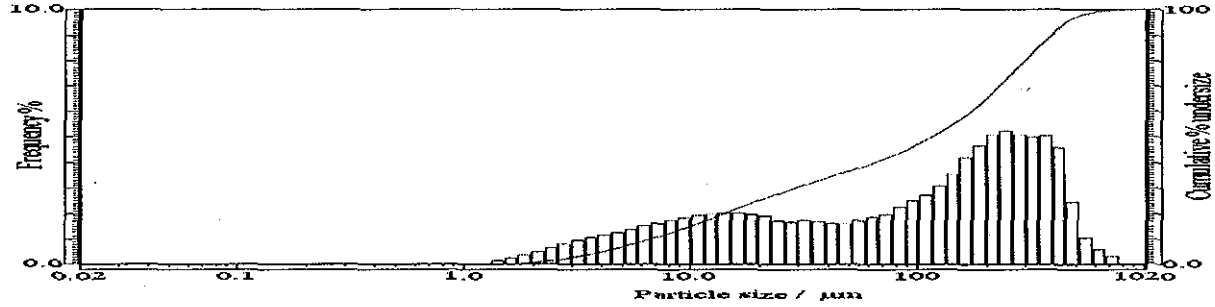


Figure 89. SY-102 Sieve Tests: Volume-based PSDs from second set of runs on test sample S01T001286: >500 μm fraction.

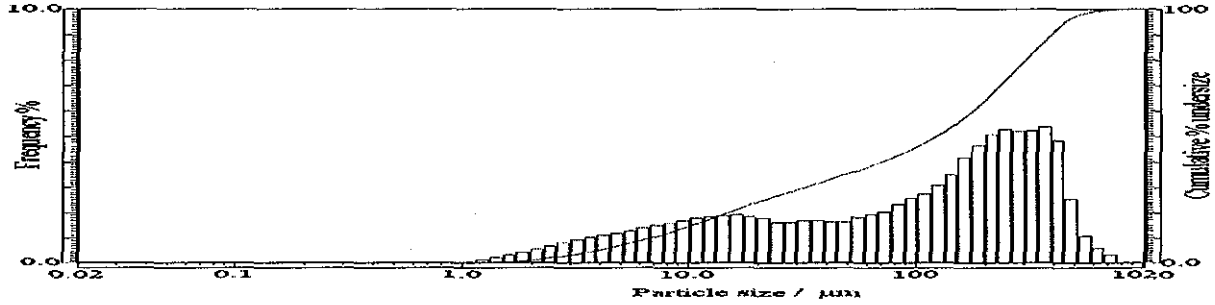
File Name: Cumulative times at run conditions with individual run settings highlighted.

[LOAD-IN]: P6 = ? *min*; S1 = ? *min*

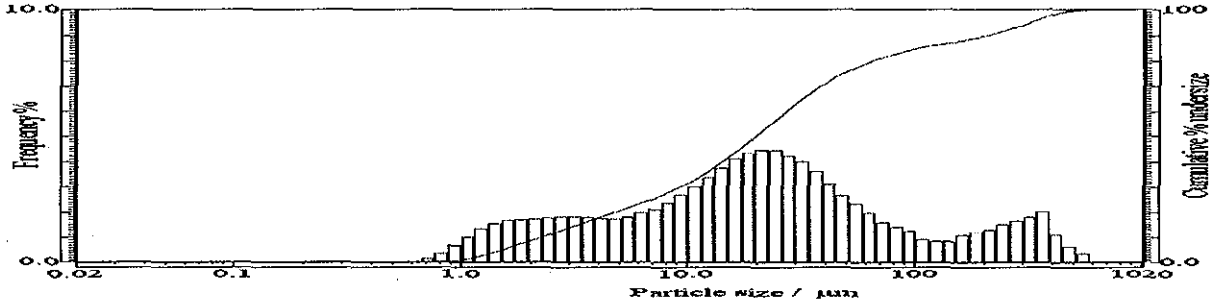
SY102005: P6 = 2 min; S1 = 2 min; S3 = 0 min; US = 0 min; DT = 0 min



SY102006: P6 = 5 min; S1 = 2 min; S3 = 3 min; US = 0 min; DT = 0 min



SY102007: P6 = 10 min; S1 = 2 min; S3 = 8 min; US = 2 min; DT = 0 min



SY102008: P6 = 13 min; S1 = 5 min; S3 = 8 min; US = 2 min; DT = 3 min

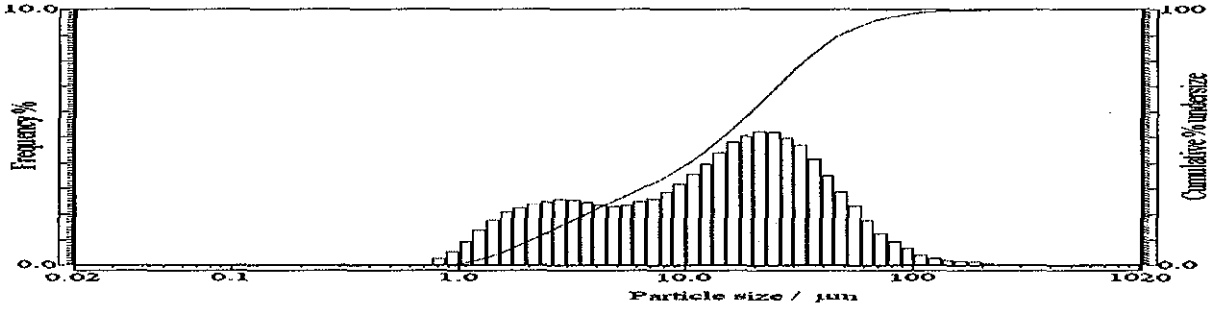
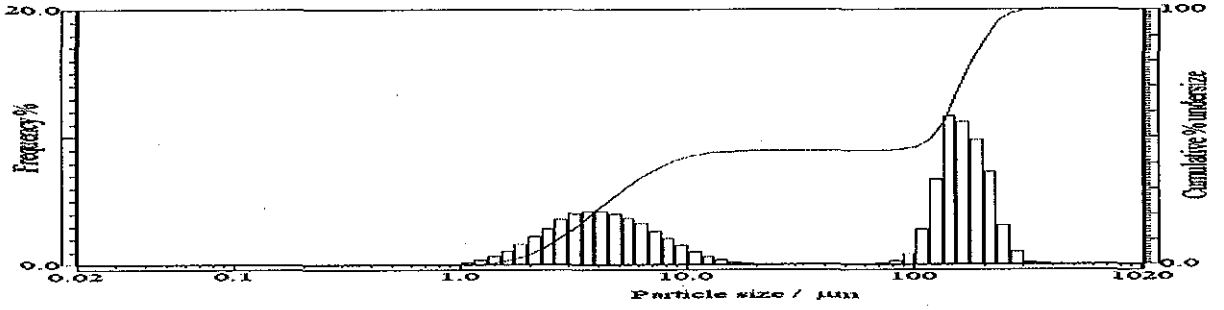


Figure 90. SY-102 Sieve Tests: Volume-based PSDs from first set of runs on test sample S01T001289: <53 μm fraction.

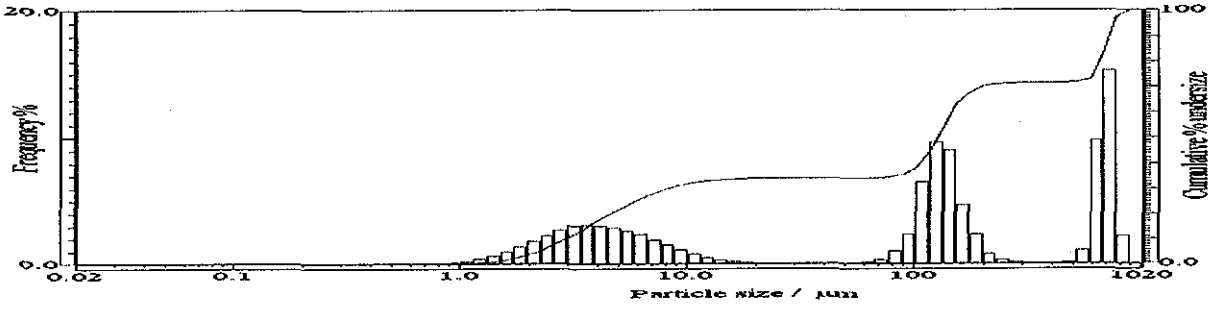
File Name: Cumulative times at run conditions with individual run settings highlighted.

[LOAD-IN]: P6 = ? min; S1 = ? min

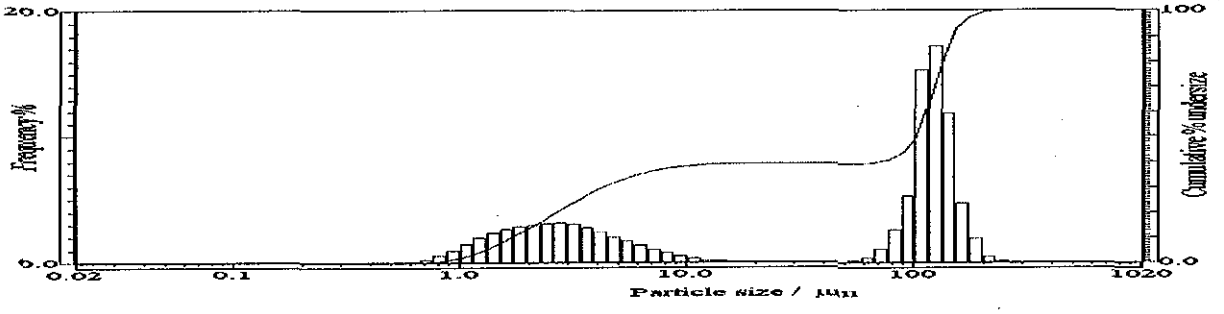
SY102009: P6 = 3 min; S1 = 3 min; S3 = 0 min; US = 0 min; DT = 0 min



SY102010: P6 = 7 min; S1 = 3 min; S3 = 4 min; US = 0 min; DT = 0 min



SY102011: P6 = 12 min; S1 = 3 min; S3 = 9 min; US = 2 min; DT = 0 min



SY102012: P6 = 14 min; S1 = 5 min; S3 = 9 min; US = 2 min; DT = 3 min

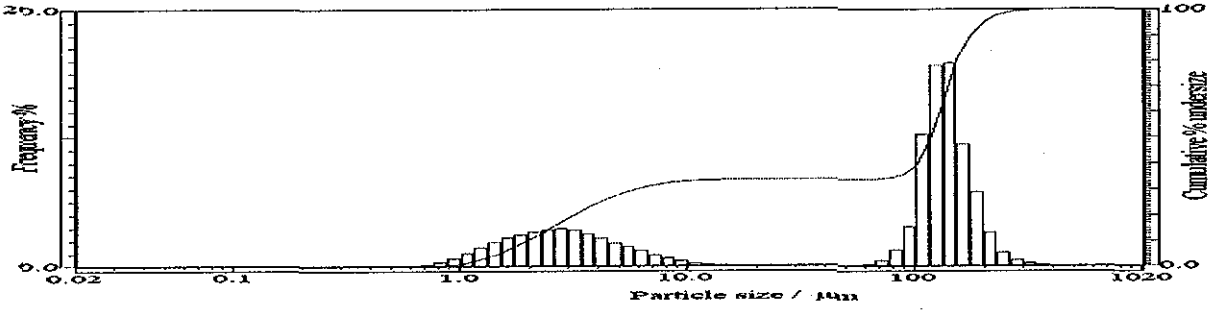
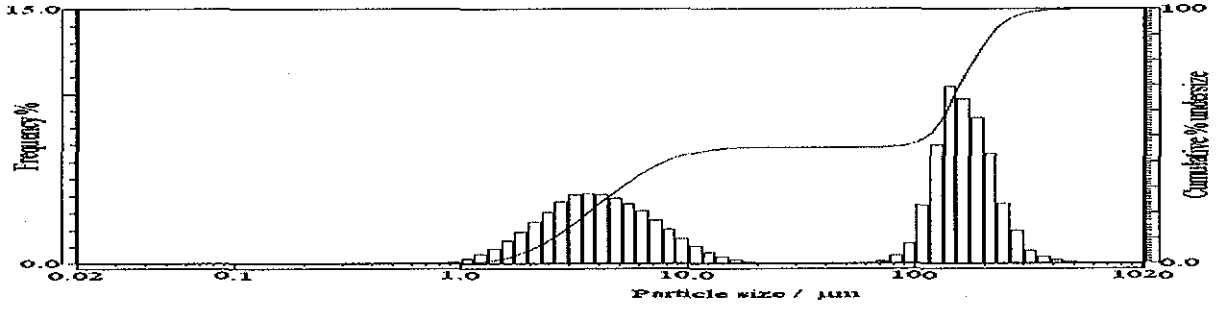


Figure 91. SY-102 Sieve Tests: Volume-based PSDs from second set of runs on test sample S01T001289: <53 μm fraction.

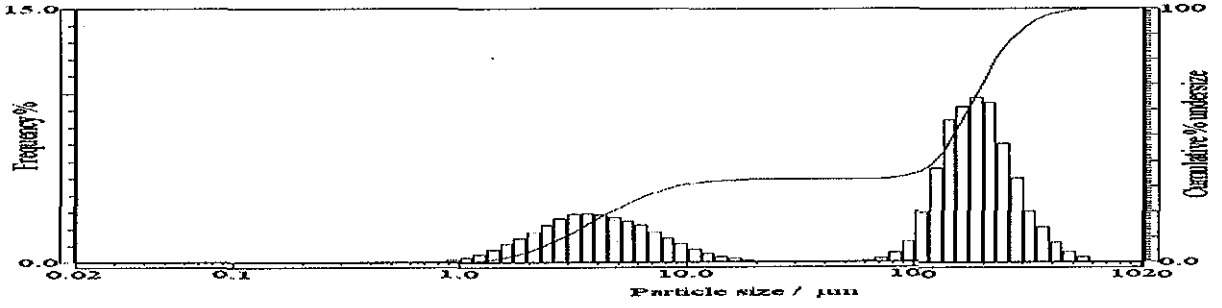
File Name: Cumulative times at run conditions with individual run settings highlighted.

[LOAD-IN]: P6 = ? min; S1 = ? min

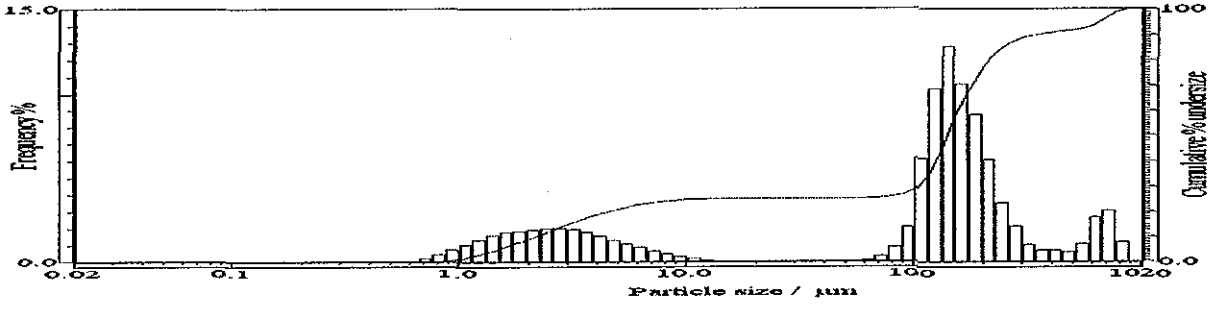
SY102013: P6 = 4 min; S1 = 4 min; S3 = 0 min; US = 0 min; DT = 0 min



SY102014: P6 = 6 min; S1 = 4 min; S3 = 2 min; US = 0 min; DT = 0 min



SY102015: P6 = 12 min; S1 = 4 min; S3 = 8 min; US = 2 min; DT = 0 min



SY102016: P6 = 15 min; S1 = 7 min; S3 = 8 min; US = 2 min; DT = 4 min

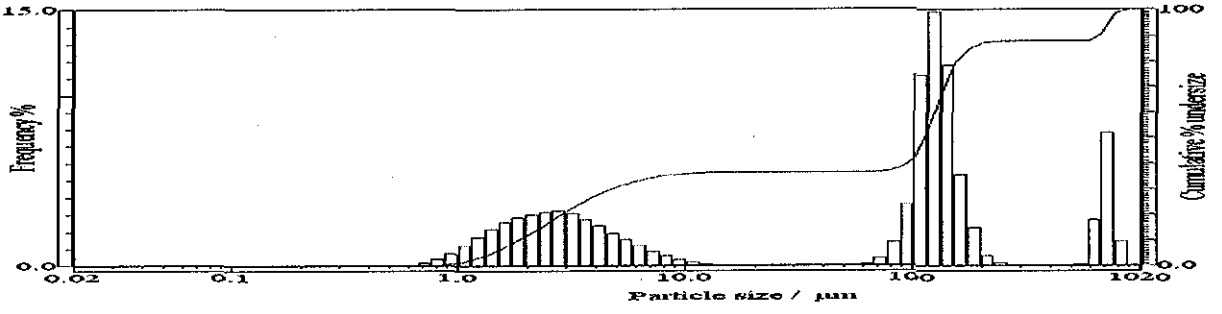


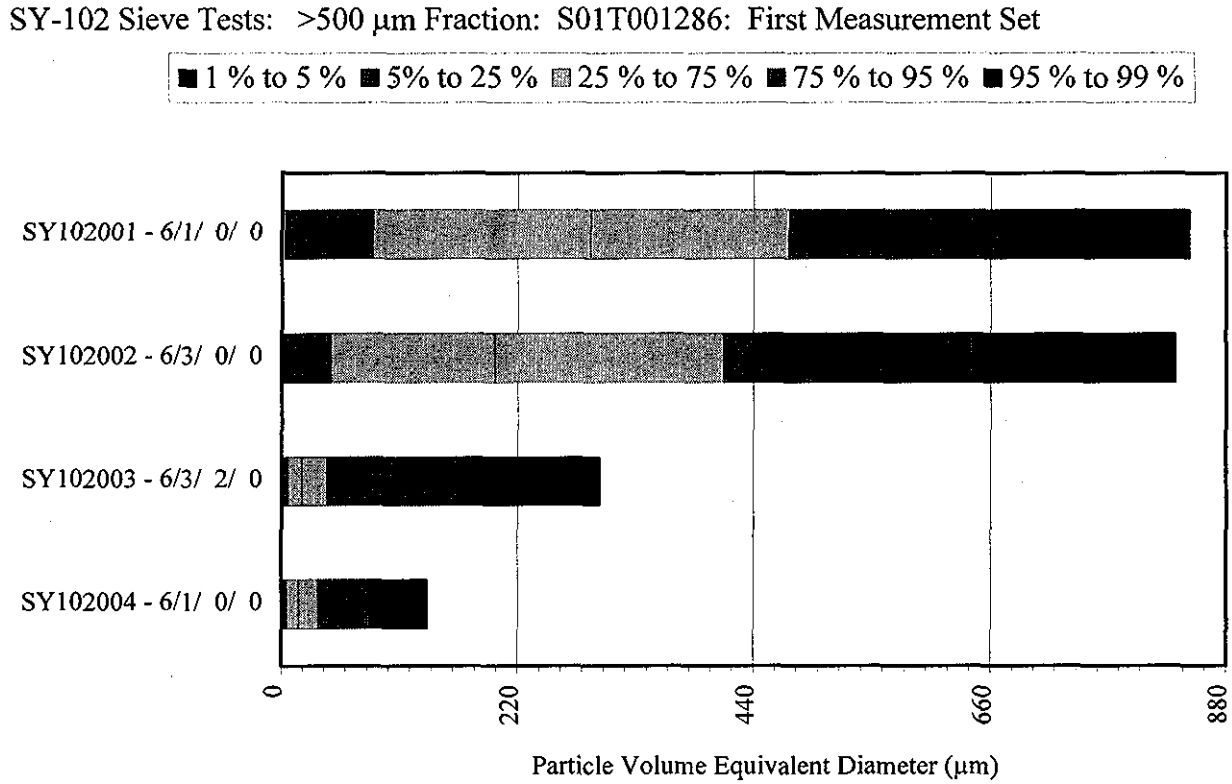
Table 37. SY-102 Sieve Tests: Mean particle diameters of volume-based PSDs.

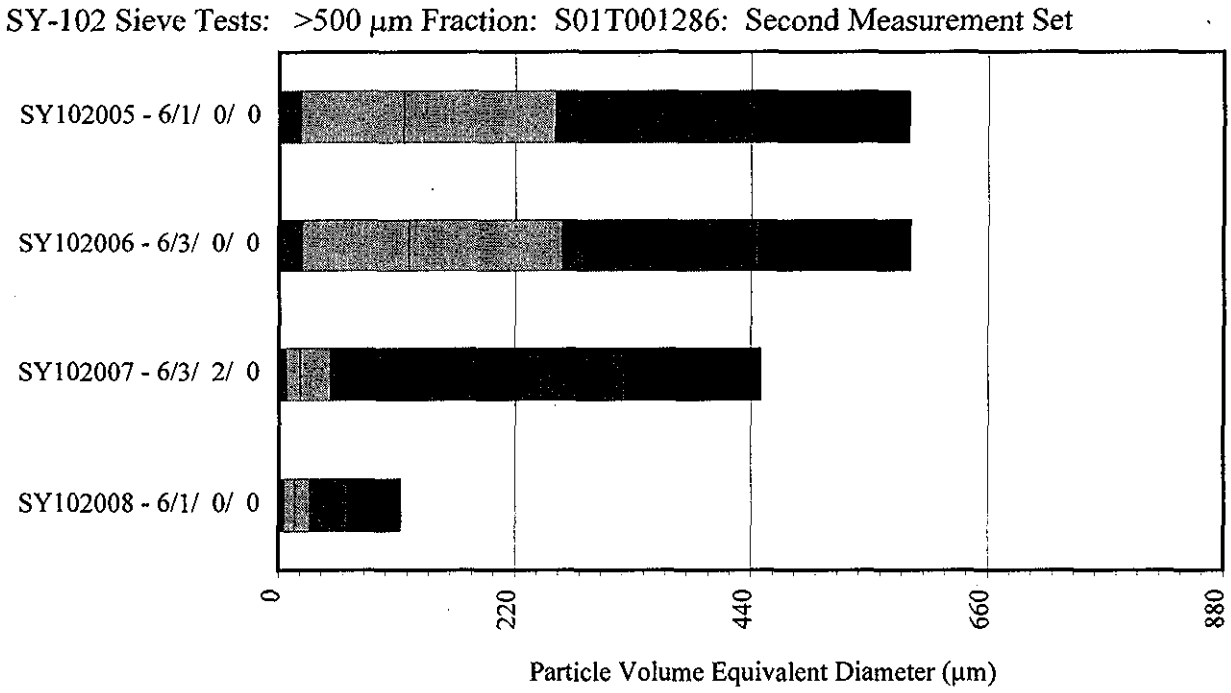
Sample Sieve Fraction	PSD Run File Name	Run Conditions				Mean Diameter (μm)	Standard Deviation (μm)
		P	S	US	DT		
S01T001286 >500 μm	SY102001	6	1	0	0	297	223
	SY102002	6	3	0	0	247	216
	SY102003	6	3	2	0	39	58
	SY102004	6	1	0	0	25	28
S01T001286 >500 μm	SY102005	6	1	0	0	157	152
	SY102006	6	3	0	0	161	153
	SY102007	6	3	2	0	59	101
	SY102008	6	1	0	0	21	23
S01T001289 <53 μm	SY102009	6	1	0	0	95	87
	SY102010	6	3	0	0	250	289
	SY102011	6	3	2	0	77	62
	SY102012	6	1	0	0	96	73
S01T001289 <53 μm	SY102013	6	1	0	0	97	93
	SY102014	6	3	0	0	138	115
	SY102015	6	3	2	0	170	179
	SY102016	6	1	0	0	155	218

Table 38. SY-102 Sieve Tests: Percentages of particles in volume-based PSDs with diameters less than the indicated values.

Sample	In Distributions Based on the Total Volume of Spherical Particles						
Sieve Fraction	1 %	5 %	25 %	50 %	75 %	95 %	99 %
PSD Run	Of the Particles Have Diameters Less Than (μm)						
S01T001286 >500 μm							
SY102001 - 6/1/ 0/ 0	2.44	6.14	84.82	287.7	473.1	669.6	846
SY102002 - 6/3/ 0/ 0	1.81	4.24	46.23	199.0	412.1	643.5	833
SY102003 - 6/3/ 2/ 0	0.93	1.38	5.94	19.1	42.3	164.4	297
SY102004 - 6/1/ 0/ 0	0.99	1.44	4.70	16.0	33.8	81.3	136
S01T001286 >500 μm							
SY102005 - 6/1/ 0/ 0	2.10	4.02	19.69	115.8	256.9	444.7	587
SY102006 - 6/3/ 0/ 0	1.93	3.87	21.47	121.3	264.0	446.4	588
SY102007 - 6/3/ 2/ 0	0.97	1.51	6.98	19.9	47.9	321.5	450
SY102008 - 6/1/ 0/ 0	1.04	1.53	4.81	14.6	28.7	63.6	114
S01T001289 <53 μm							
SY102009 - 6/1/ 0/ 0	1.43	2.11	4.45	119.0	167.8	227.1	278
SY102010 - 6/3/ 0/ 0	1.40	2.18	5.83	125.8	612.2	759.4	840
SY102011 - 6/3/ 2/ 0	0.88	1.28	3.35	103.1	127.4	163.2	195
SY102012 - 6/1/ 0/ 0	0.97	1.45	4.11	117.5	146.1	198.3	260
S01T001289 <53 μm							
SY102013 - 6/1/ 0/ 0	1.32	1.96	4.25	112.7	167.9	248.3	333
SY102014 - 6/3/ 0/ 0	1.33	2.10	6.05	147.2	211.6	333.8	453
SY102015 - 6/3/ 2/ 0	0.94	1.47	11.61	140.6	193.7	655.3	795
SY102016 - 6/1/ 0/ 0	0.95	1.38	3.56	112.4	145.0	732.3	812

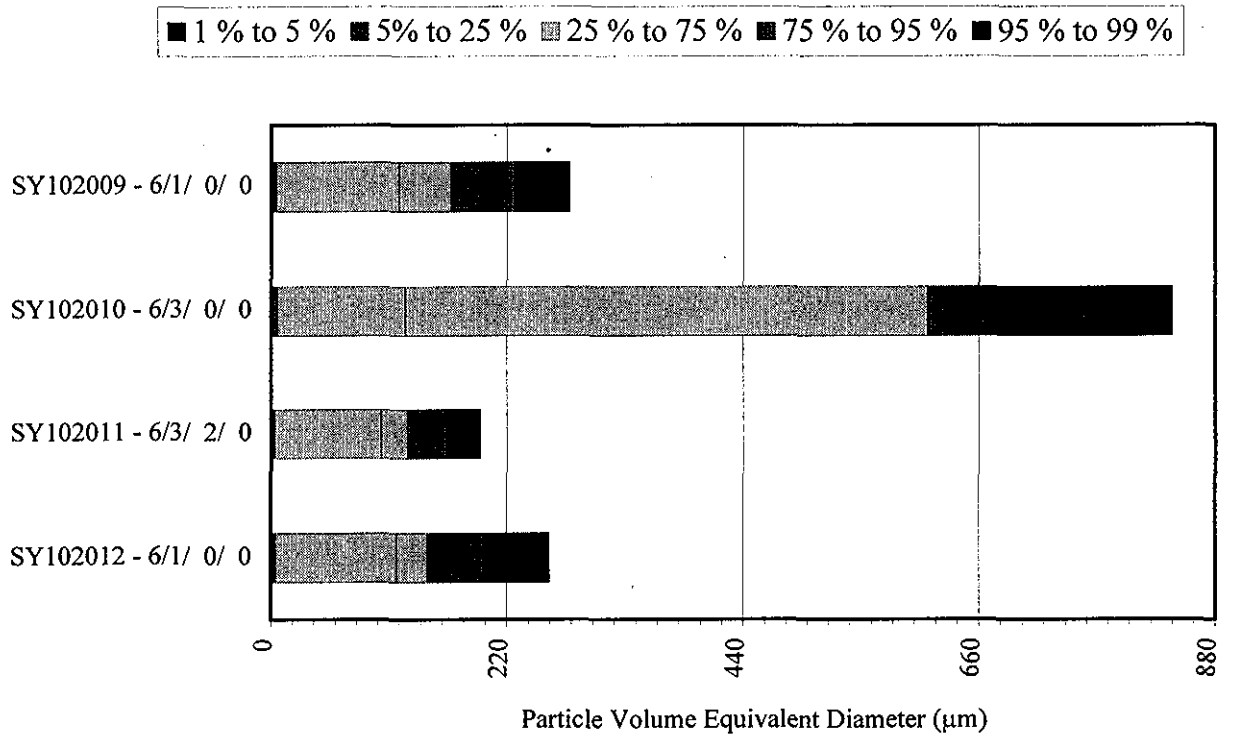
Figure 92. SY-102 Sieve Tests: Diameters of particles (μm) within defined, volume-based, percentile ranges. (Two Pages)



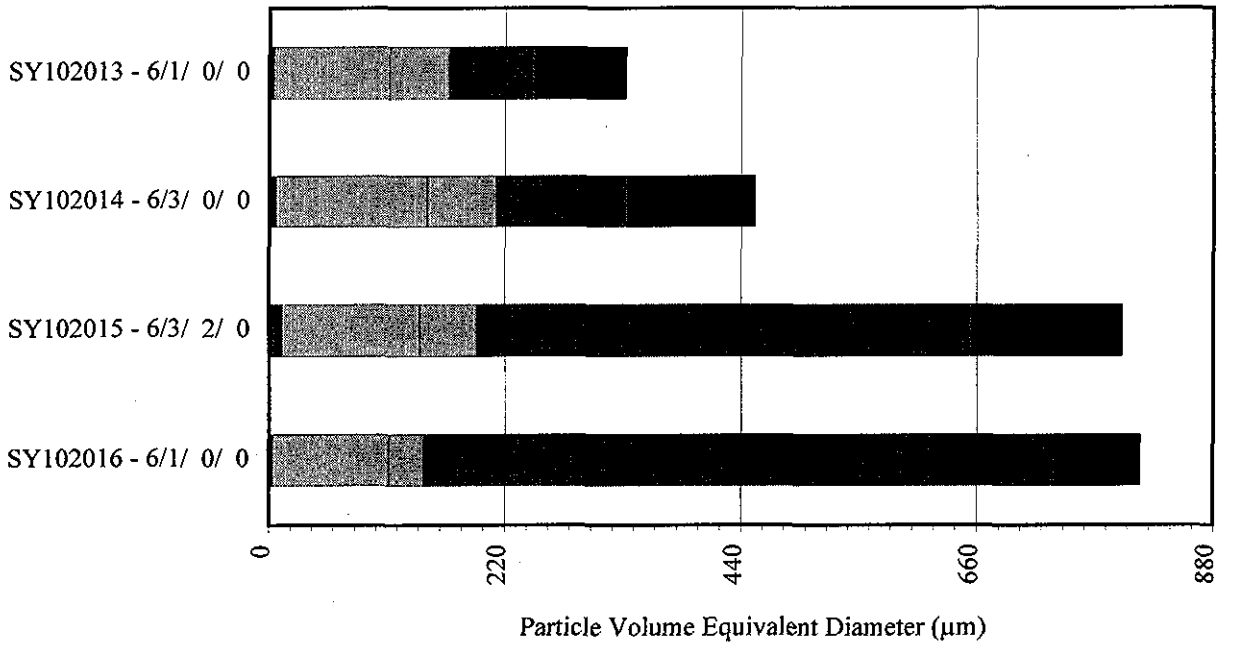


Continued:

SY-102 Sieve Tests: <53 μm Fraction: S01T001289: First Measurement Set



SY-102 Sieve Tests: <53 μm Fraction: S01T001289: Second Measurement Set



4.6.6. Sieve Test Samples Observations After Extended Storage

On 11/14/01, three and one half months after sampling the last sieve fractions into vials and covering them with wash liquid, those samples not subjected to subsequent particle sizing were observed for signs of particle degradation. They had sat largely undisturbed in the hot cell (~27°C) during that time. All vials still contained excess clear liquid above the settled particulates. Each vial was observed undisturbed, then its contents were shaken to look for the appearance of suspendible fines. Table 44 describes what was seen.

Table 39. Observations of Sieve Fraction Samples After Extended Storage.

TANK	SIEVE SIZE	VIAL NUMBER	DESCRIPTION
AW-103	53 μm	1295	White, slightly yellow particles settled under clear, slightly yellowed liquid. Shaking produces some fines, but still mostly discrete particles.
	212 μm	1293	White, slightly yellow particles under slightly yellow clear liquid. Shaking produces partially opaque suspension and particles.
AY-101	53 μm	1300	Dark fines under clear liquid and some particles. Shaking produces opaque but fast-settling suspension.
	106 μm	1297	Dark particles under clear liquid. Shaking produces some settleable suspension plus particles.
	212 μm	1298	Dark particles under clear liquid. Shaking produces opaque suspension plus particles.
C-104	106 μm	1282	Dark brown particles under clear liquid. Shaking produces opaque suspension and settled solids; suspension settling discernable
	212 μm	1283	Variegated light and dark particles under clear liquid. Shaking produces particles and opaque suspension.
	500 μm	1281	Dark brown particles and chunks under liquid clouded with fines. Shaking produces opaque suspension, some large particles are still visible.
SY-102	53 μm	1290	Dark fines under slightly yellow tinted clear liquid. Shaking produces opaque suspension.
	106 μm	1287	Very dark settled fines under slightly yellow tinted clear liquid. Shaking produces opaque suspension.
	212 μm	1288	Dark particles under slightly yellow tinted clear liquid. Shaking produces opaque suspension, settling discernable.

The significance of the observations is the evidence of particle breakup into suspended fines in the samples of larger particulate, even in vials that were largely undisturbed. Also noted is the suggestion that a yellow component is dissolving away from those sludge solids that have a yellow color, imparting the same tint to the liquid. The level of tint together with the amount of solids indicates that very little is actually dissolving, though this may be enough to loosen aggregates that are loosely bound by some sort of solute. If any large amount of solubilization

occurred to the sludges at all, it would have to have been when the sludges were first exposed to wash liquid during testing, which of course was assumed to model of the planned retrieval process that would produce sludges to be pumped. None of the original tests, however, produced any indication of large-scale solubilization of the composites.

4.7. Settling Test Results

Settling tests described in Sec. 3.4 were done for two aliquots each of tanks AY-101, C-104, AW-103, and SY-102. For the selected settling velocity criterion selected, 0.0865 cm/s, and every aliquot of every tank yielded less than 10 vol% of settled sludge. Since the other settling velocity criteria of interest (see Appendix D) were even greater, and would therefore result in even less settled solids, no further tests were required or performed. The tests performed at a settling speed of 0.0865 cm/s are listed in Table 45 in the order of performance over a two-week period.

Table 40. Weights and Settled Solids Volumes for Settling Tests at 0.0865 cm/s.

Test	Initial Sample (Pre-Test)			Remaining Solids		Mix Strokes
	Wt, g	Vol, mL	Vol_{coarse}, mL	Vol %	$f_{coarse,rem}$	
AY-101#1	8.08	7.6[a]	Not obs.	7[a]		11
AY-101#2	6.15	5.8	Not obs.	9		11
C-104#1	5.83	8.0	0.8	4	0.4	11
C-104#2	5.92	8.2	1.8	9	0.4	10
AW-103#1	6.06	7.0	1.8	4	0.2	10
AW-103#2	6.35	9.0	0.4	4	1.0	4
SY-102#1	5.85	8.3	1.1	6	0.5	4
SY-102#2	5.92	13.5	1.0	4	0.5	4

[a]Volume estimated from sample #2 volume in proportion to weights.

In the first test (AY-101#1), a departure from the procedure (Appendix D) was made to determine the initial volume because the initial solids were observed to settle very slowly in the Imhoff cone, with dark-colored fine particles keeping the slurry opaque after tens of minutes of settling. Rather than just waiting for a long period of time, attempts were made to speed the settling. First, the slurry in the cone was diluted to about 350 mL. It remained opaque for a period of five minutes or so, at which time the upper 200 mL was removed via pipette. Three more partial washes followed where the Imhoff cone was filled to about 250 mL and then pipetted down to about 100 mL after five minutes or so. The delay time was a little longer than the chosen settling time for the sedimentation pipette, and the height of the column of liquid removed from the Imhoff cone (about 7 cm) was shorter than the fall distance in the sedimentation pipette. Thus, the solids removed from the Imhoff cone settled more slowly than about 0.024 cm/s, and would have been removed by the actual settling test anyway. The slurry was then washed into the sedimentation pipette, where the planned eight settlings were performed. The initial volume of settled solids for this test was then estimated by proportion, using the weights of the two samples of AY-101 and the measured settled volume for the second sample. All other aliquots were treated according to the procedure.

4.7.1. Particle Size Results on Settled Fractions

The fractional settling tests of four tank composite samples yielded four samples of solids settled at a critical settling speed of ~0.0865 cm/s in the wash liquid at a hot cell ambient temperature of approximately 27°C. Each of these samples was subjected to PSD analysis to determine the diameters of particles settling at this speed, in order to estimate the effective settling densities of the particles.

The four-run PSD measurement set developed and implemented following completion of the run parameter studies (Sec. 4.5) was used for all reported measurements.

Sampling. All PSD measurements were made on samples as received from the fractional settling tests, i.e. 20 mL vials containing various amounts of sample solids covered by 5 to 10 mL of the $NaOH/NaNO_3$ test solution.

Specimen Introduction. No additional liquid was added to the fractional settling samples prior to withdrawal of the analytical specimens. PSD specimens were withdrawn from these samples using the same technique described for the sieve test samples. Moderately large particles, aggregates, or agglomerates were also observed in several of the as-received, fractional settling samples. The amounts of solids present in these samples were also much less than that received in the other materials submitted for PSD analysis. Withdrawal of representative specimens for PSD analysis was, therefore, particularly challenging.

PSD Measurements. Specimens for PLM and IA examination were withdrawn from the samples (Sec. 3.5) before PSD measurements were begun. PSD measurements were made 5 to 7 weeks after the settling tests. Two measurement sets were collected for each of the four fractional settling samples. Separate analytical specimens were withdrawn from the target sample vials for each set.

Observations and Data—Fractional Settling Samples. The measurement results summarized in Figures 93 through 104 and Tables 46 through 53 are presented in the format previously described in Sec. 4.2.1. The PSD measurement results generally agreed quite well for the two specimens from each sample. This can best be seen by comparison of the first (and second) PSDs of each measurement set for the replicate specimens (see combined histogram and %-undersize tabular figures at conclusion of this section.

The initial PSDs for the AW-103 fractional settling specimens (Figures 93, 94, and 95) display a broad population of particles with a diameter modal value of 83 μm. This population of particles extends to include particles with diameters as large as 370 μm and tails off below about 20 μm to include particles with diameters down to 2 μm in diameter. Ultrasonic treatment significantly reduces percentage of >100 μm particles in the PSDs, shifting the overall distribution modal values to 37 μm. Particles >100 μm are nearly completely absent in the final PSD runs, at stirring rate S1. As previously noted, this may indicate continued particle breakup and/or moderate density for the larger diameter particles. Finally, it may be noted that the PSDs and particulate behavior noted for the fractional settling sample specimens is similar to that previously observed for the >500 μm sieve fraction specimens (Sec. 4.7)

The PSDs measured for the AY-101 fractional settling samples and for the >500 μm fraction from the AY-101 sieving test (Sec. 4.7) were especially similar. The initial measurements obtain for these samples always contained two modes, a large one in the 140 – 170 μm range and a smaller one in the 10 – 15 μm range. The effects of sonication on these samples are also extremely similar.

Each of the initial PSD runs for the C-104 fractional settling specimens (Figures 99, 100, and 101) is dominated by a population of particles with diameters ranging from about 30 μm to 300 μm and a modal diameter of 73 μm. A low frequency distribution of particles on the small diameter side of the dominant population extends the range of particle diameters observed in the PSDs down to ≈ 2 μm. Ultrasonic treatment does not change the modal value of the major distribution; however the diameters of the largest particles observed in the PSDs decrease (note the 95% undersize data in Table 51 and Figure 101) and a significant population of particles with diameters ranging from 0.5 μm to 2 μm appears.

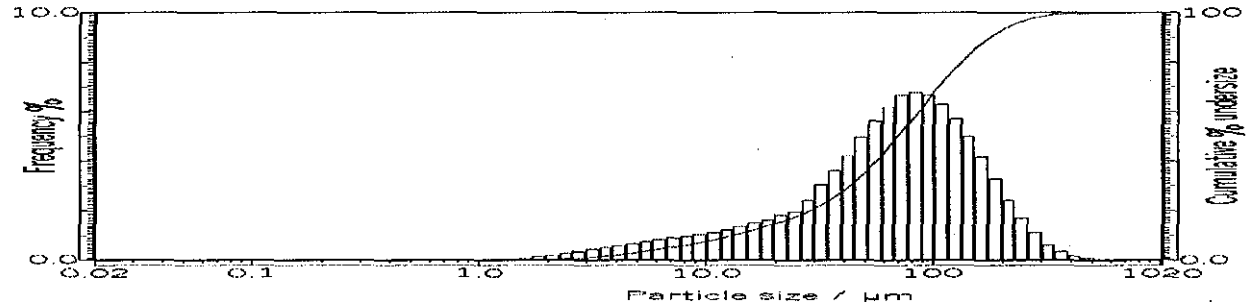
Each of the initial PSDs for the SY-102 fractional settling specimens (Figures 102, 103 and 104) depict broad distributions with particle diameters extending from 2 μm up to 550 μm. The initial modal value is 215 μm. Breakup of the largest particles is initiated when the stirring speed is increased to S3 in the second PSD run of each set (note median and 95% undersize data in Table 53 and Figure 104). Two minutes of ultrasonic treatment results in a major reduction in the observed percentages of particles with diameters >100 μm with a concomitant build up of the percentages observed in the 1 μm to 10 μm and 10 μm to 100 μm ranges. The distribution diameter mode after sonication is ≈ 16 μm. A further reduction in the diameters of the largest particles observed in the PSDs occurs in the final, stirring speed S1, runs. The multiple possible causes of this reduction have been previously enumerated. Finally, as noted for the AW-103 and AY-101 specimens, the measured PSDs and observed particulate behavior for the SY-102, >500 μm sieve-fraction and fractional settling samples are quite similar.

Figure 93. AW-103 Fractional Settling: Volume-based PSDs from first set of runs on test sample S01T001344.

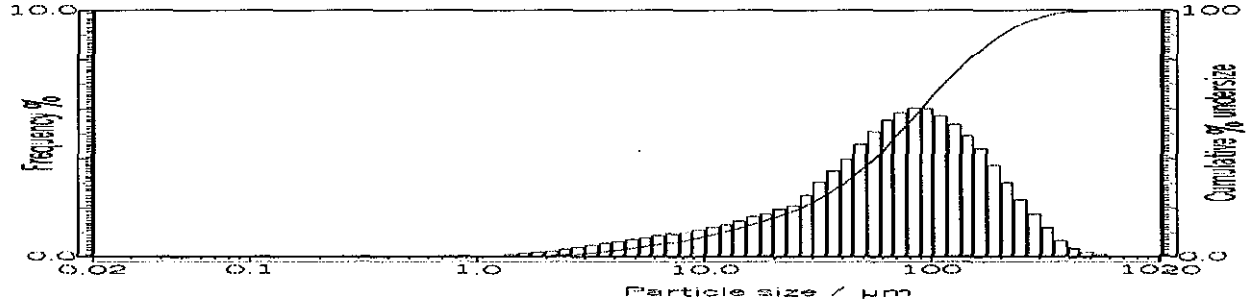
File Name: Cumulative times at run conditions with settings of individual runs highlighted.

[LOAD-IN]: P6 = ? min; S1 = ? min

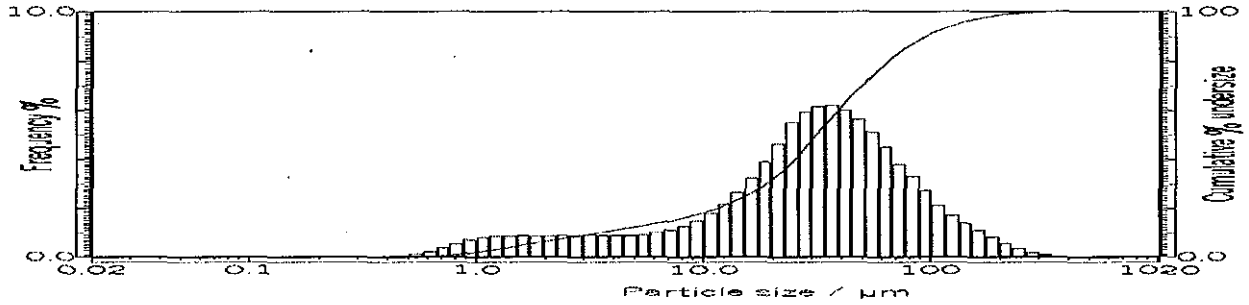
AW103972: P6 = 4 min; S1 = 4 min; S3 = 0 min; US = 0 min; DT = 0 min



AW103973: P6 = 7 min; S1 = 4 min; S3 = 3 min; US = 0 min; DT = 0 min



AW103974: P6 = 12 min; S1 = 4 min; S3 = 8 min; US = 2 min; DT = 0 min



AW103975: P6 = 14 min; S1 = 6 min; S3 = 8 min; US = 2 min; DT = 3 min

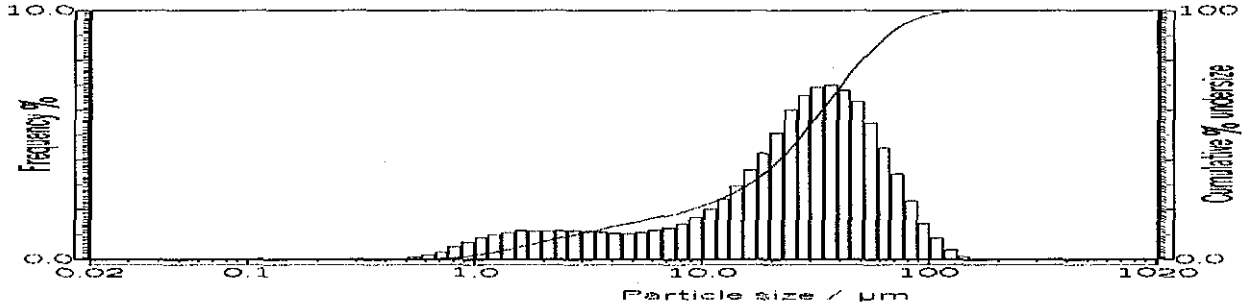
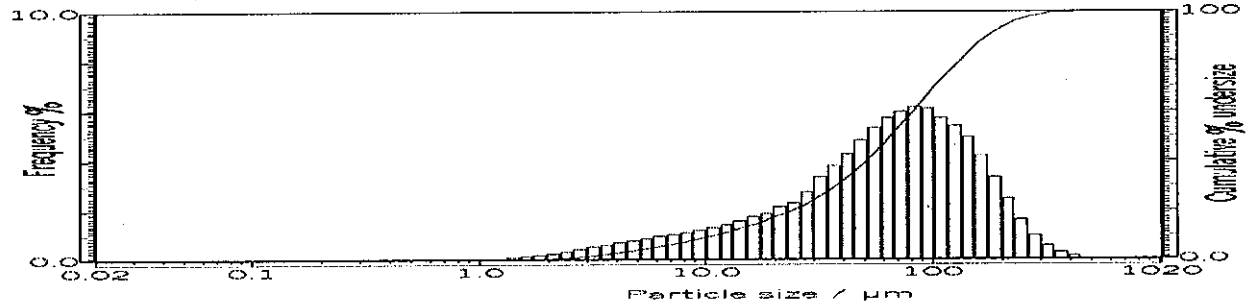


Figure 94. AW-103 Fractional Settling: Volume-based PSDs from second set of runs on test sample S01T001344.

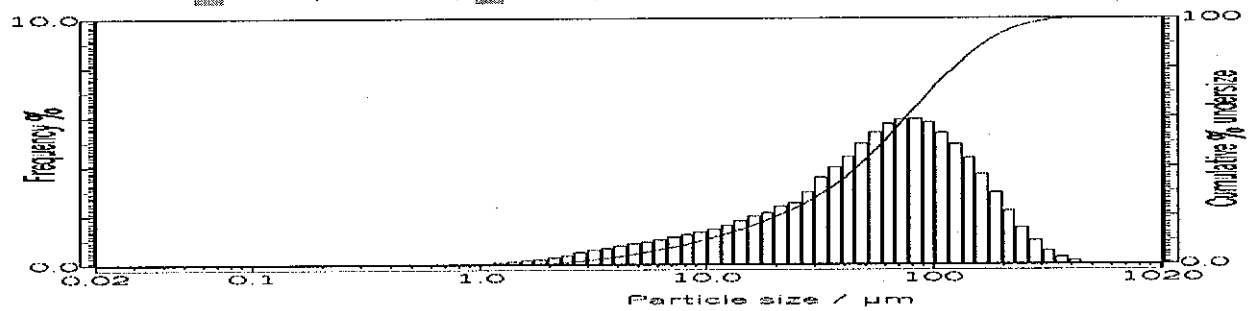
File Name: Cumulative times at run conditions with settings of individual runs **highlighted**.

[LOAD-IN]: **P6** = ? min; **S1** = ? min

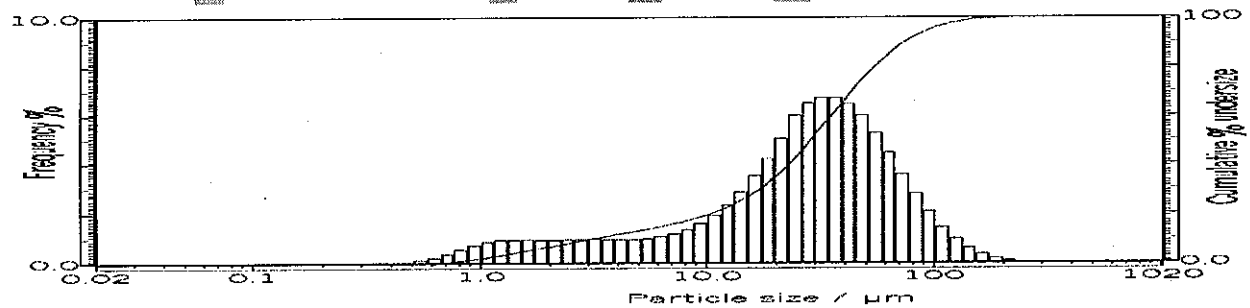
AW103976: **P6** = 5 min; **S1** = 5 min; S3 = 0 min; US = 0 min; DT = 0 min



AW103977: **P6** = 8 min; S1 = 5 min; **S3** = 3 min; US = 0 min; DT = 0 min



AW103978: **P6** = 13 min; S1 = 5 min; **S3** = 8 min; **US** = 2 min; **DT** = 0 min



AW103979: **P6** = 17 min; **S1** = 9 min; S3 = 8 min; US = 2 min; DT = 3 min

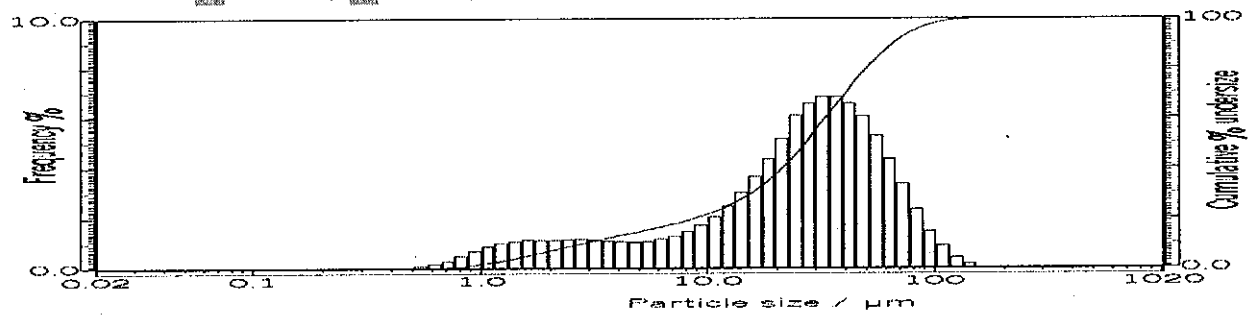


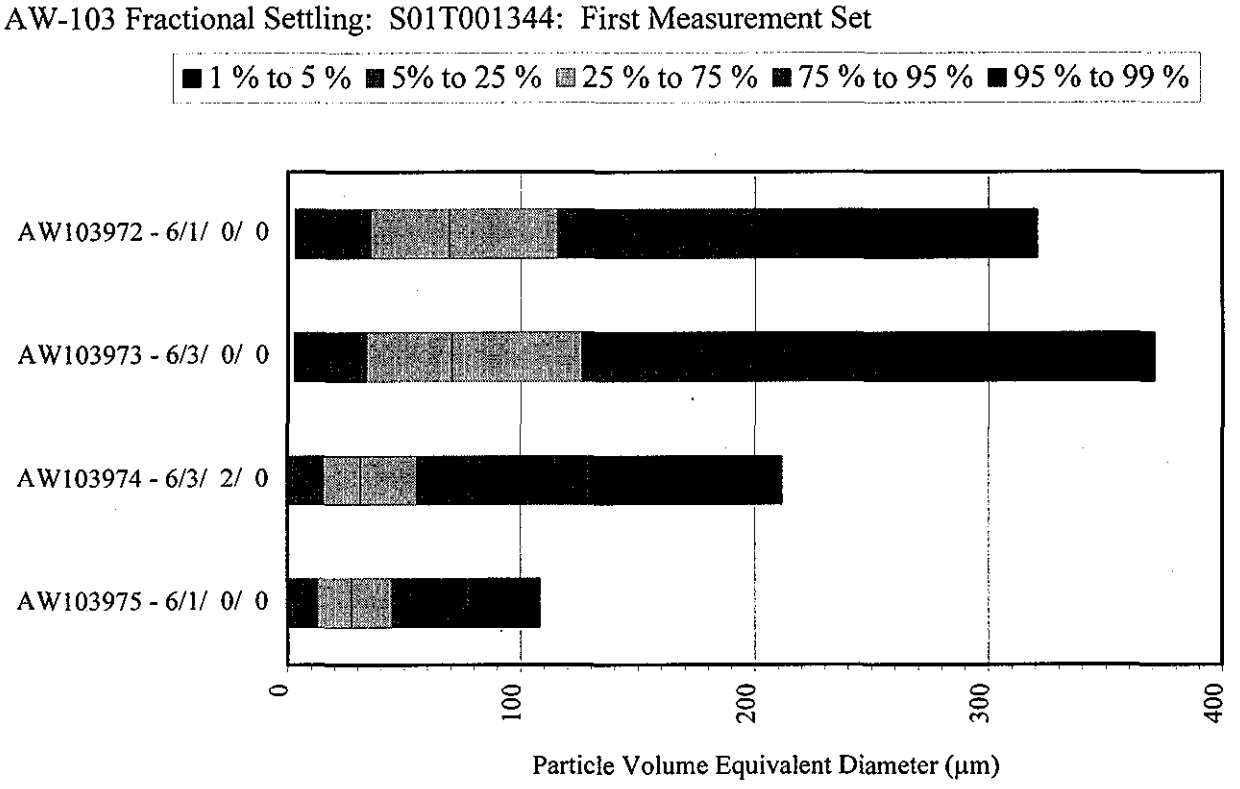
Table 41. AW-103 Fractional Settling: Mean particle diameters of volume-based PSDs.

Sample	PSD Run File Name	Run Conditions				Mean Diameter (μm)	Standard Deviation (μm)
		P	S	US	DT		
S01T001344	AW103972	6	1	0	0	84.7	68.5
	AW103973	6	3	0	0	91.2	80.0
	AW103974	6	3	2	0	42.8	42.7
	AW103975	6	1	0	0	31.5	24.4
S01T001344	AW103976	6	1	0	0	80.8	67.1
	AW103977	6	3	0	0	76.4	66.4
	AW103978	6	3	2	0	35.2	30.1
	AW103979	6	1	0	0	31.3	24.7

Table 42. AW-103 Fractional Settling: Percentages of particles in volume-based PSDs with diameters less than the indicated values.

Sample PSD Run	In Distributions Based on the Total Volume of Spherical Particles						
	1 %	5 %	25 %	50 %	75 %	95 %	99 %
	Of the Particles Have Diameters Less Than (μm)						
S01T001344							
AW103972 - 6/1/ 0/ 0	2.85	6.70	35.4	69.3	115.6	219.1	321
AW103973 - 6/3/ 0/ 0	2.56	6.24	33.5	70.4	125.9	252.1	371
AW103974 - 6/3/ 2/ 0	0.82	1.62	15.2	31.2	55.6	128.9	212
AW103975 - 6/1/ 0/ 0	0.85	1.54	12.6	27.4	44.9	78.1	108
S01T001344							
AW103976 - 6/1/ 0/ 0	2.58	5.89	30.6	64.7	113.9	213.5	303
AW103977 - 6/3/ 0/ 0	2.28	5.25	26.9	59.5	106.9	209.6	303
AW103978 - 6/3/ 2/ 0	0.81	1.55	13.9	28.7	48.2	93.9	144
AW103979 - 6/1/ 0/ 0	0.85	1.54	12.3	26.9	44.5	79.2	110

Figure 95. AW-103 Fractional Settling: Diameters of particles (μm) within defined, volume-based, percentile ranges.



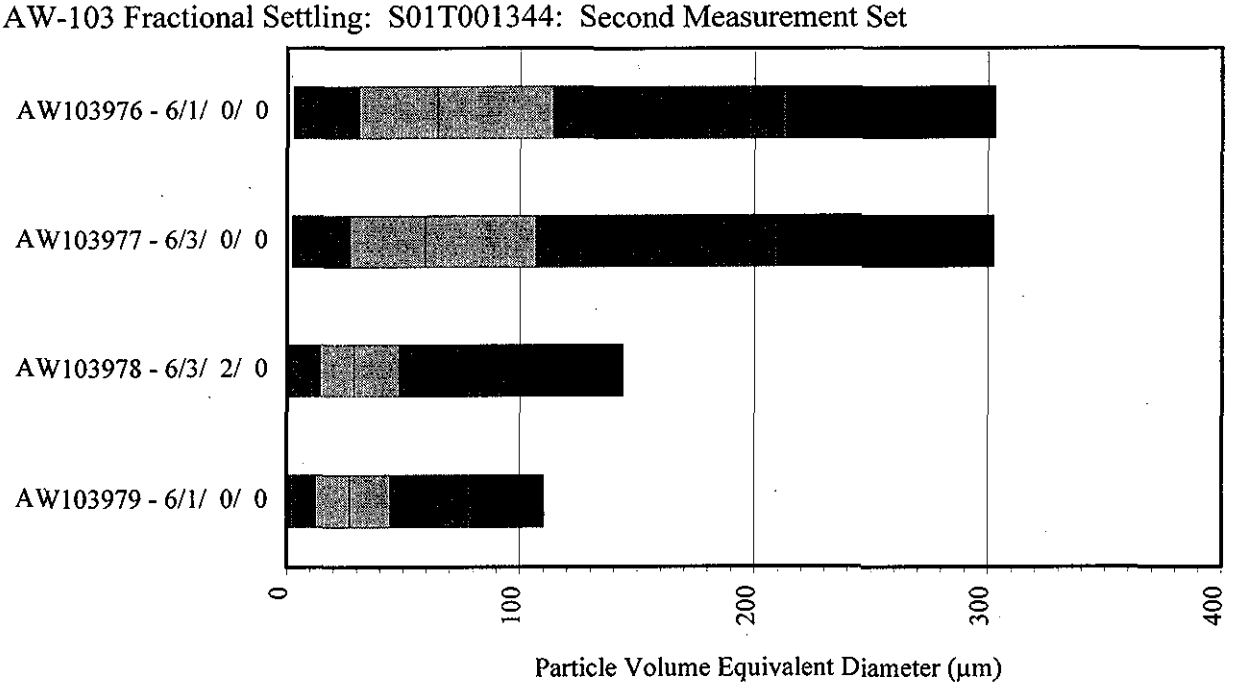
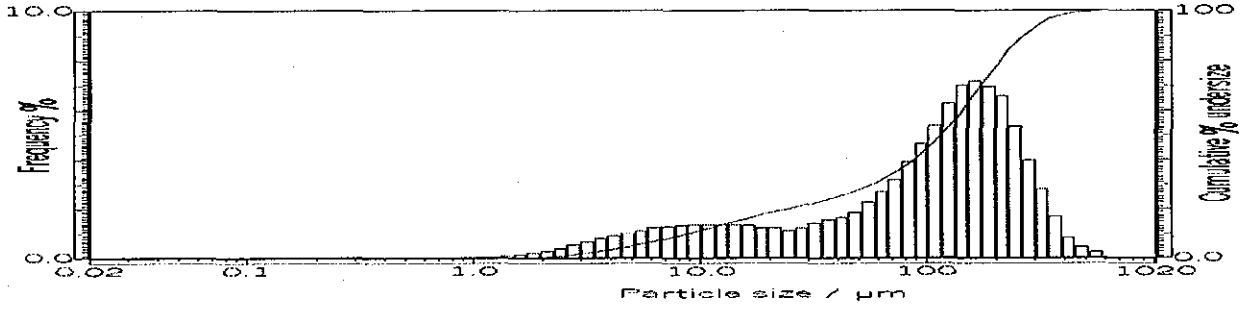


Figure 96. AY-101 Fractional Settling: Volume-based PSDs from first set of runs on test sample S01T001326.

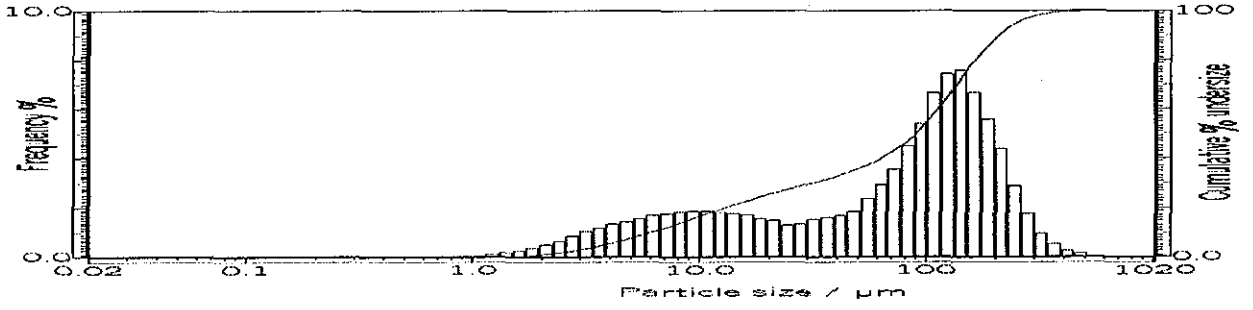
File Name: Cumulative times at run conditions with settings of individual runs highlighted.

[LOAD-IN]: P6 = ? min; S1 = ? min

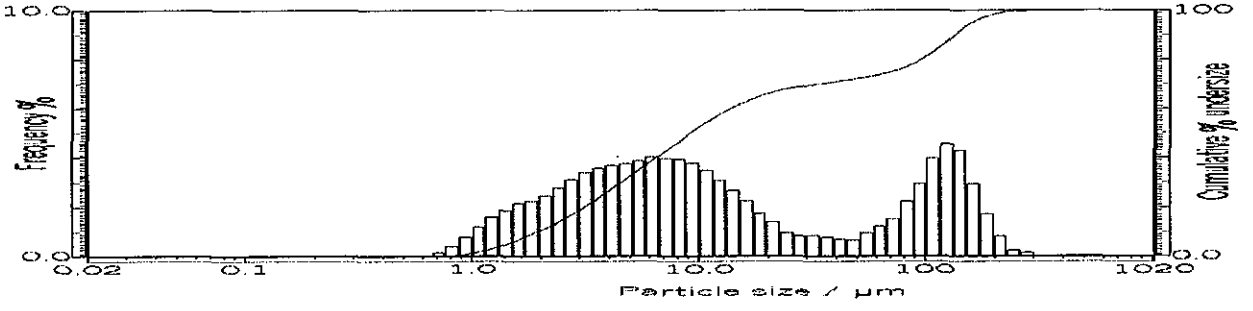
AY101988: P6 = 4 min; S1 = 4 min; S3 = 0 min; US = 0 min; DT = 0 min



AY101989: P6 = 7 min; S1 = 4 min; S3 = 3 min; US = 0 min; DT = 0 min



AY101990: P6 = 13 min; S1 = 4 min; S3 = 9 min; US = 2 min; DT = 0 min



AY101991: P6 = 15 min; S1 = 6 min; S3 = 9 min; US = 2 min; DT = 4 min

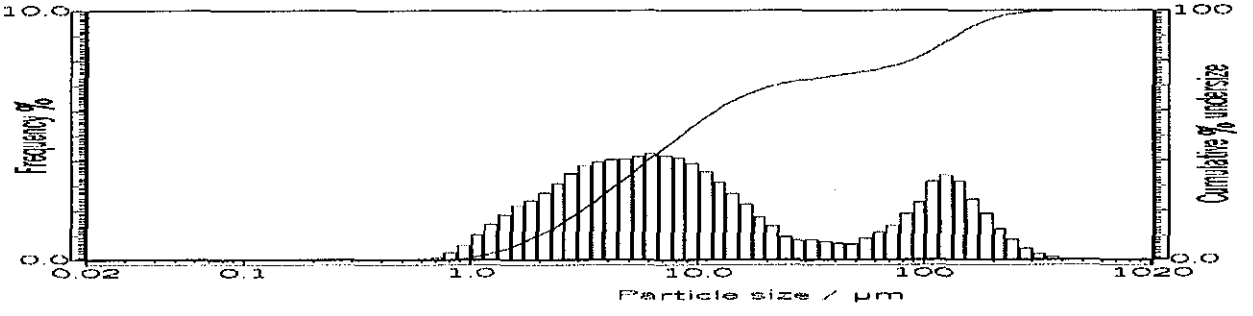
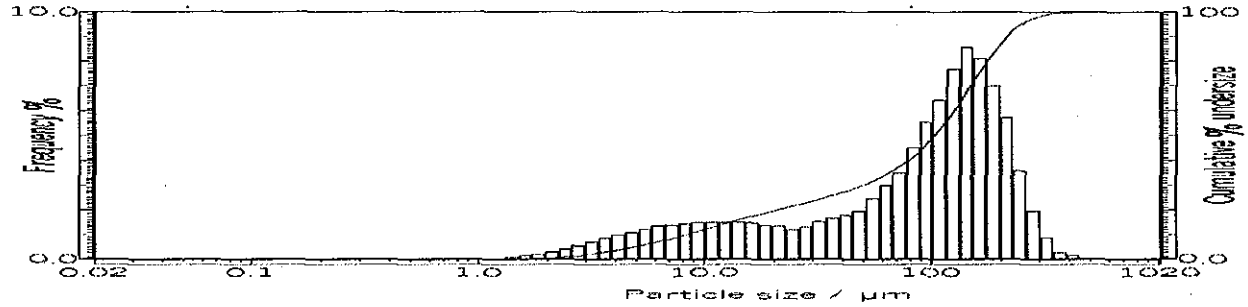


Figure 97. AY-101 Fractional Settling: Volume-based PSDs from second set of runs on test sample S01T001326.

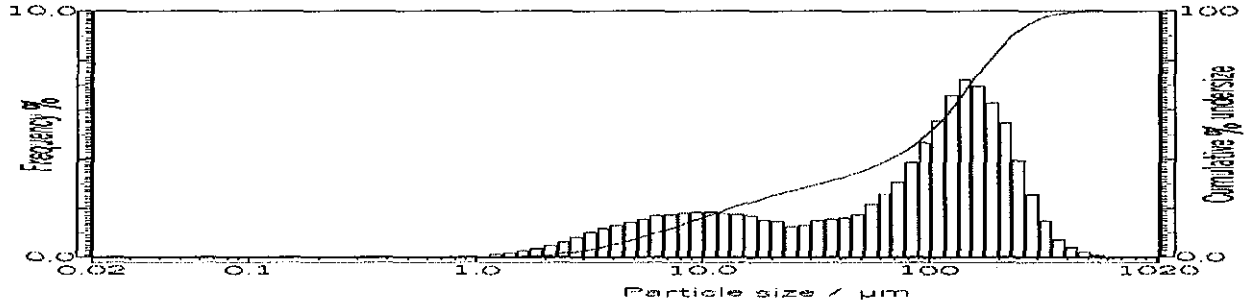
File Name: Cumulative times at run conditions with settings of individual runs **highlighted**.

[LOAD-IN]: **P6** = ? min; **S1** = ? min

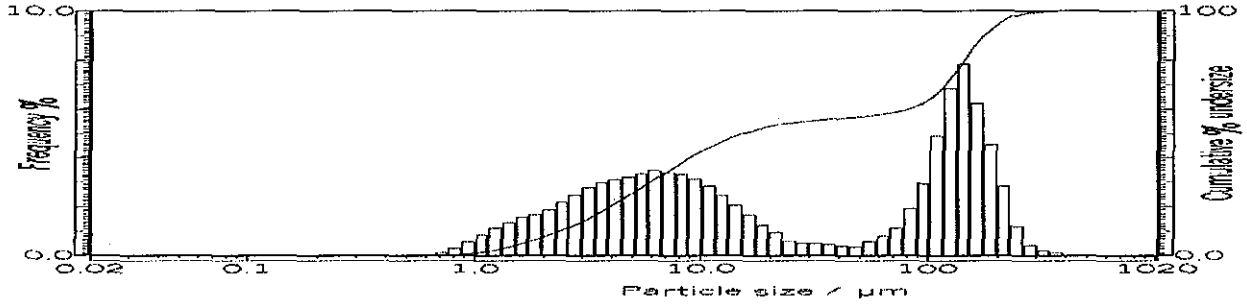
AY101992: **P6** = 8 min; **S1** = 8 min; S3 = 0 min; US = 0 min; DT = 0 min



AY101993: **P6** = 12 min; S1 = 8 min; **S3** = 4 min; US = 0 min; DT = 0 min



AY101994: **P6** = 18 min; S1 = 8 min; **S3** = 10 min; **US** = 2 min; **DT** = 0 min



AY101995: **P6** = 20 min; **S1** = 10 min; S3 = 10 min; US = 2 min; DT = 4 min

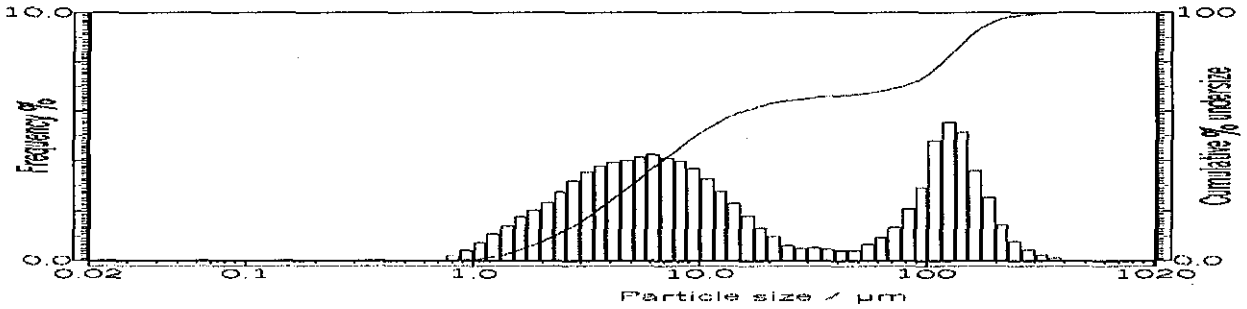


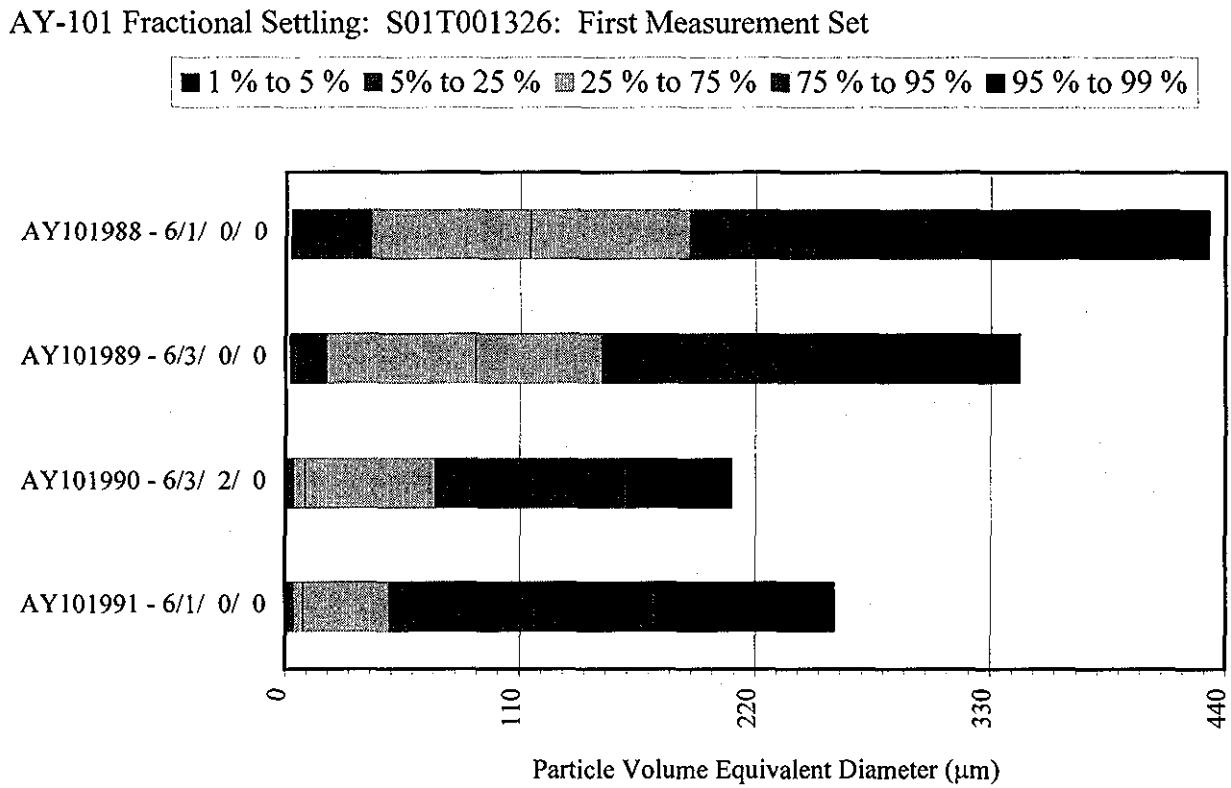
Table 43. AY-101 Fractional Settling: Mean particle diameters of volume-based PSDs.

Sample	PSD Run File Name	Run Conditions				Mean Diameter (μm)	Standard Deviation (μm)
		P	S	US	DT		
S01T001326	AY101988	6	1	0	0	127	101
	AY101989	6	3	0	0	98	82
	AY101990	6	3	2	0	40	56
	AY101991	6	1	0	0	39	62
S01T001326	AY101992	6	1	0	0	106	79
	AY101993	6	3	0	0	106	91
	AY101994	6	3	2	0	66	74
	AY101995	6	1	0	0	50	67

Table 44. AY-101 Fractional Settling: Percentages of particles in volume-based PSDs with diameters less than the indicated values.

Sample PSD Run	In Distributions Based on the Total Volume of Spherical Particles						
	1 %	5 %	25 %	50 %	75 %	95 %	99 %
	Of the Particles Have Diameters Less Than (μm)						
S01T001326							
AY101988 - 6/1/ 0/ 0	2.40	4.96	39.8	114.8	189.1	317	432
AY101989 - 6/3/ 0/ 0	1.96	3.77	19.1	89.4	148.0	248	344
AY101990 - 6/3/ 2/ 0	0.94	1.40	3.8	9.1	70.4	160	209
AY101991 - 6/1/ 0/ 0	1.00	1.47	3.6	8.3	48.8	173	257
S01T001326							
AY101992 - 6/1/ 0/ 0	2.43	4.87	33.8	102.4	159.9	247	317
AY101993 - 6/3/ 0/ 0	2.00	3.84	19.4	95.1	162.8	271	377
AY101994 - 6/3/ 2/ 0	1.00	1.59	4.9	14.8	129.5	199	258
AY101995 - 6/1/ 0/ 0	1.07	1.64	4.1	9.6	100.7	181	256

Figure 98. AY-101 Fractional Settling: Diameters of particles (μm) within defined, volume-based, percentile ranges.



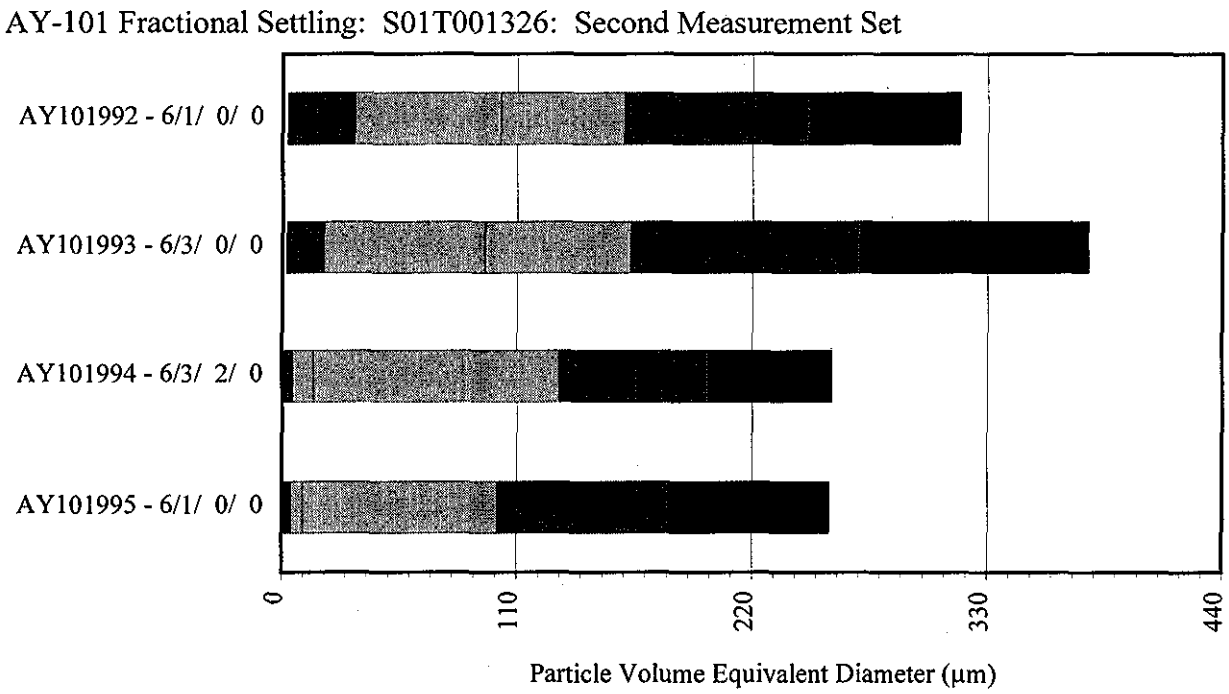
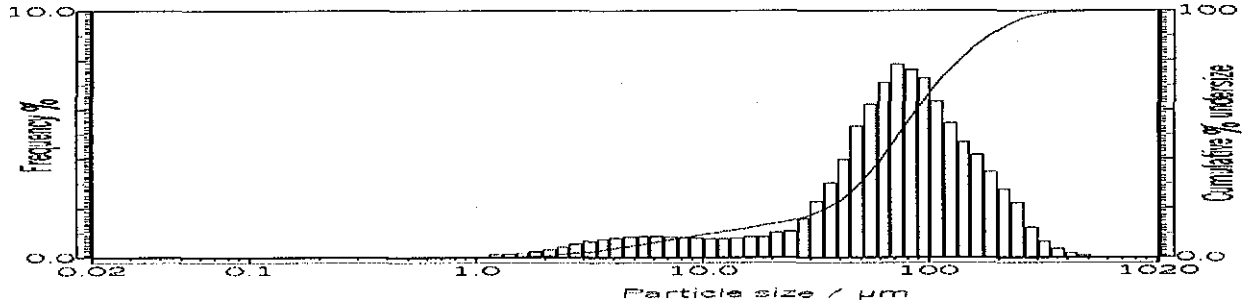


Figure 99. C-104 Fractional Settling: Volume-based PSDs from first set of runs on test sample S01T001332.

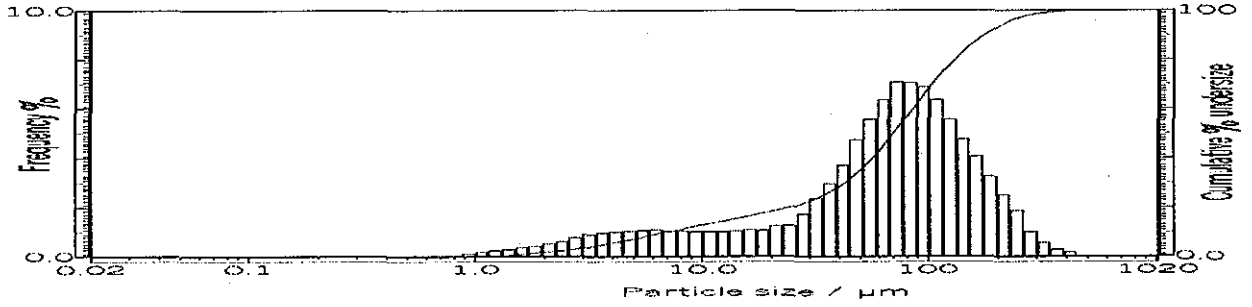
File Name: Cumulative times at run conditions with settings of individual runs highlighted.

[LOAD-IN]: P6 = ? min; S1 = ? min

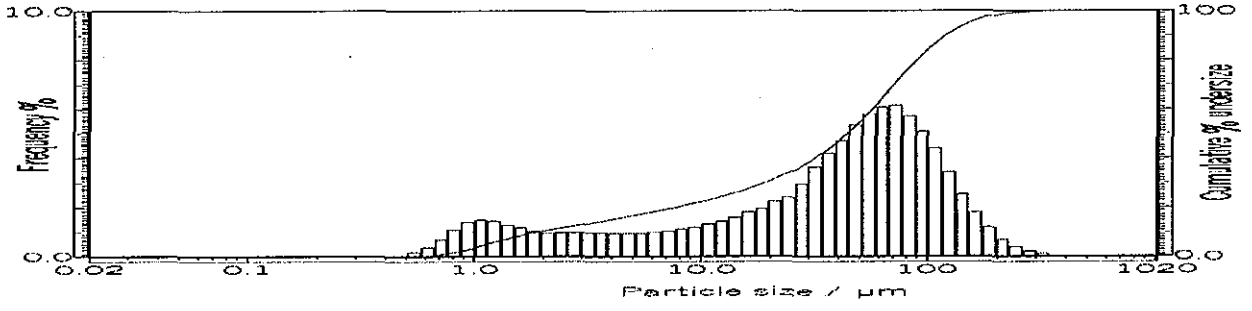
C104980: P6 = 5 min; S1 = 5 min; S3 = 0 min; US = 0 min; DT = 0 min



C104981: P6 = 8 min; S1 = 5 min; S3 = 3 min; US = 0 min; DT = 0 min



C104982: P6 = 14 min; S1 = 5 min; S3 = 9 min; US = 2 min; DT = 0 min



C104983: P6 = 17 min; S1 = 8 min; S3 = 9 min; US = 2 min; DT = 4 min

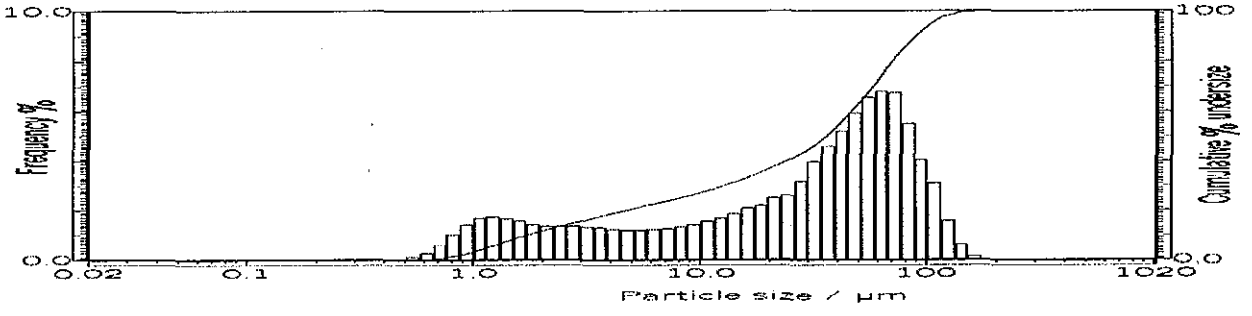
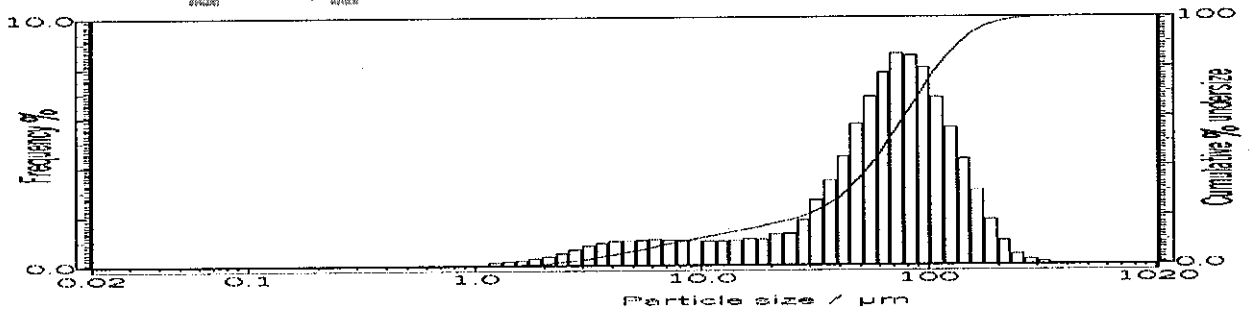


Figure 100. C-104 Fractional Settling: Volume-based PSDs from second set of runs on test sample S01T001332.

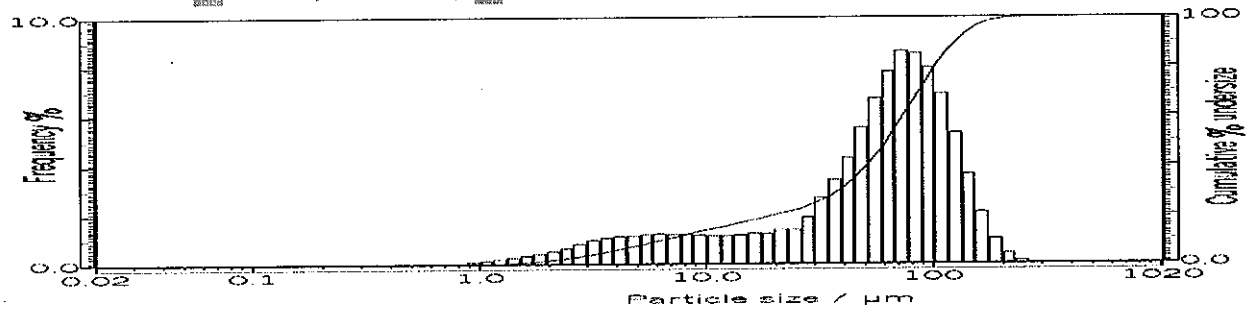
File Name: Cumulative times at run conditions with settings of individual runs highlighted.

[LOAD-IN]: P6 = ? min; S1 = ? min

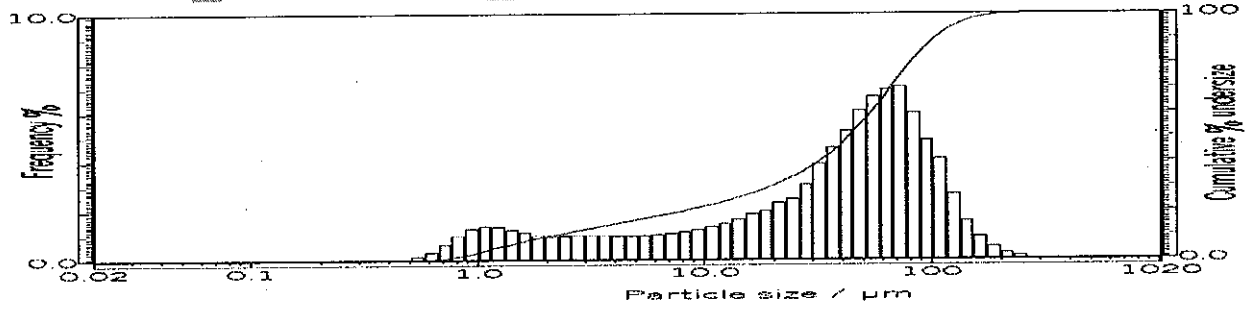
C104984: P6 = 4 min; S1 = 4 min; S3 = 0 min; US = 0 min; DT = 0 min



C104985: P6 = 7 min; S1 = 4 min; S3 = 3 min; US = 0 min; DT = 0 min



C104986: P6 = 14 min; S1 = 4 min; S3 = 10 min; US = 2 min; DT = 0 min



C104987: P6 = 16 min; S1 = 6 min; S3 = 10 min; US = 2 min; DT = 5 min

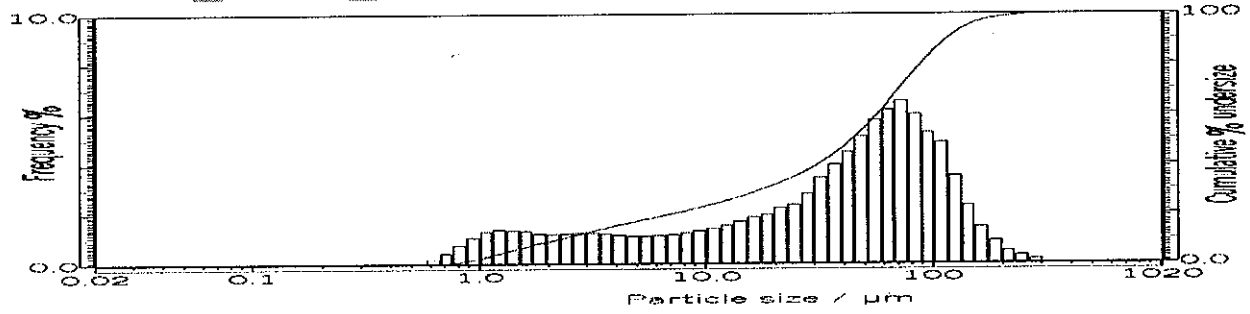


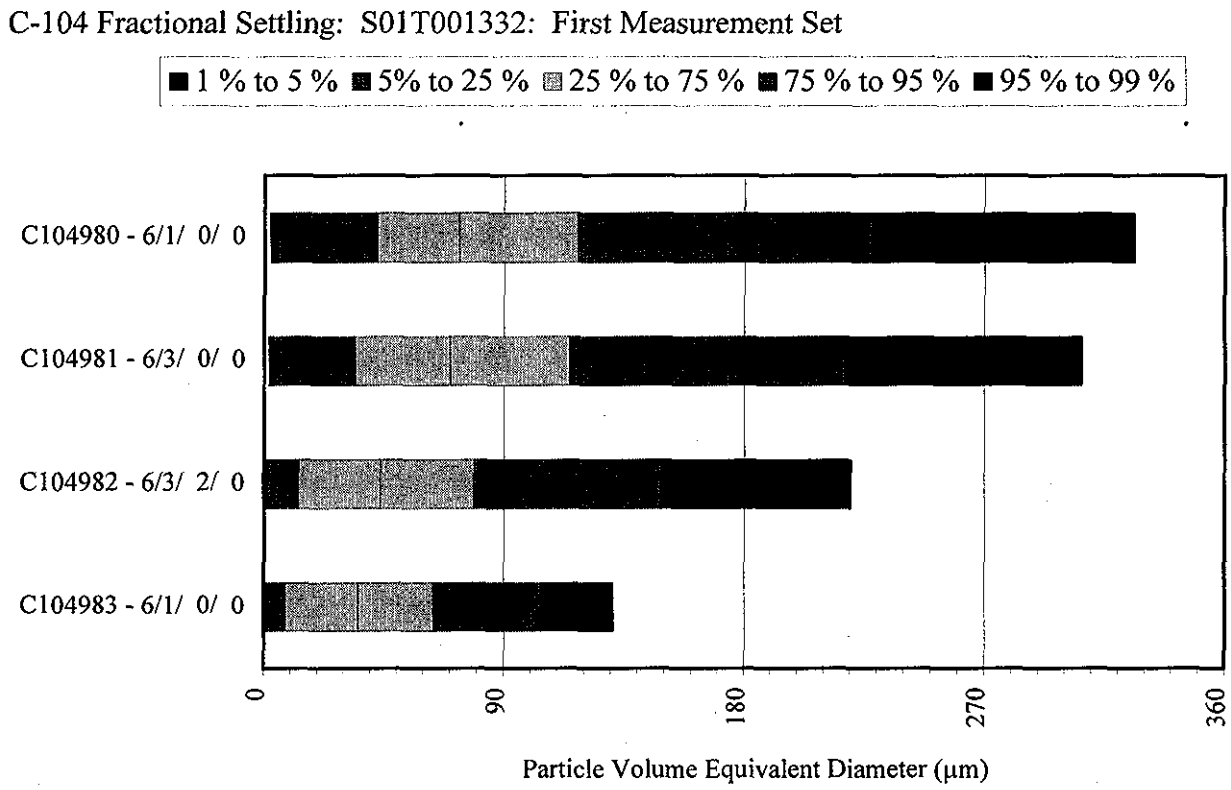
Table 45. C-104 Fractional Settling: Mean particle diameters of volume-based PSDs.

Sample	PSD Run File Name	Run Conditions				Mean Diameter (μm)	Standard Deviation (μm)
		P	S	US	DT		
S01T001332	C104980	6	1	0	0	88.7	69.7
	C104981	6	3	0	0	82.8	67.6
	C104982	6	3	2	0	53.6	49.5
	C104983	6	1	0	0	40.2	33.9
S01T001332	C104984	6	1	0	0	71.7	49.9
	C104985	6	3	0	0	64.8	44.5
	C104986	6	3	2	0	48.4	40.7
	C104987	6	1	0	0	52.1	46.6

Table 46. C-104 Fractional Settling: Percentages of particles in volume-based PSDs with diameters less than the indicated values.

Sample	In Distributions Based on the Total Volume of Spherical Particles						
PSD Run	1 %	5 %	25 %	50 %	75 %	95 %	99 %
	Of the Particles Have Diameters Less Than (μm)						
S01T001332							
C104980 - 6/1/ 0/ 0	2.16	4.94	42.5	73.3	117.6	228	326
C104981 - 6/3/ 0/ 0	1.55	3.59	34.2	69.7	114.3	217	307
C104982 - 6/3/ 2/ 0	0.73	1.12	12.9	43.8	78.7	149	220
C104983 - 6/1/ 0/ 0	0.76	1.13	8.1	35.3	63.6	104	131
S01T001332							
C104984 - 6/1/ 0/ 0	2.08	4.39	36.4	65.7	98.8	165	224
C104985 - 6/3/ 0/ 0	1.66	3.60	30.3	61.7	92.7	146	189
C104986 - 6/3/ 2/ 0	0.74	1.17	13.4	42.7	72.0	124	174
C104987 - 6/1/ 0/ 0	0.82	1.30	11.9	43.6	78.0	139	201

Figure 101. C-104 Fractional Settling: Diameters of particles (μm) within defined, volume-based, percentile ranges.



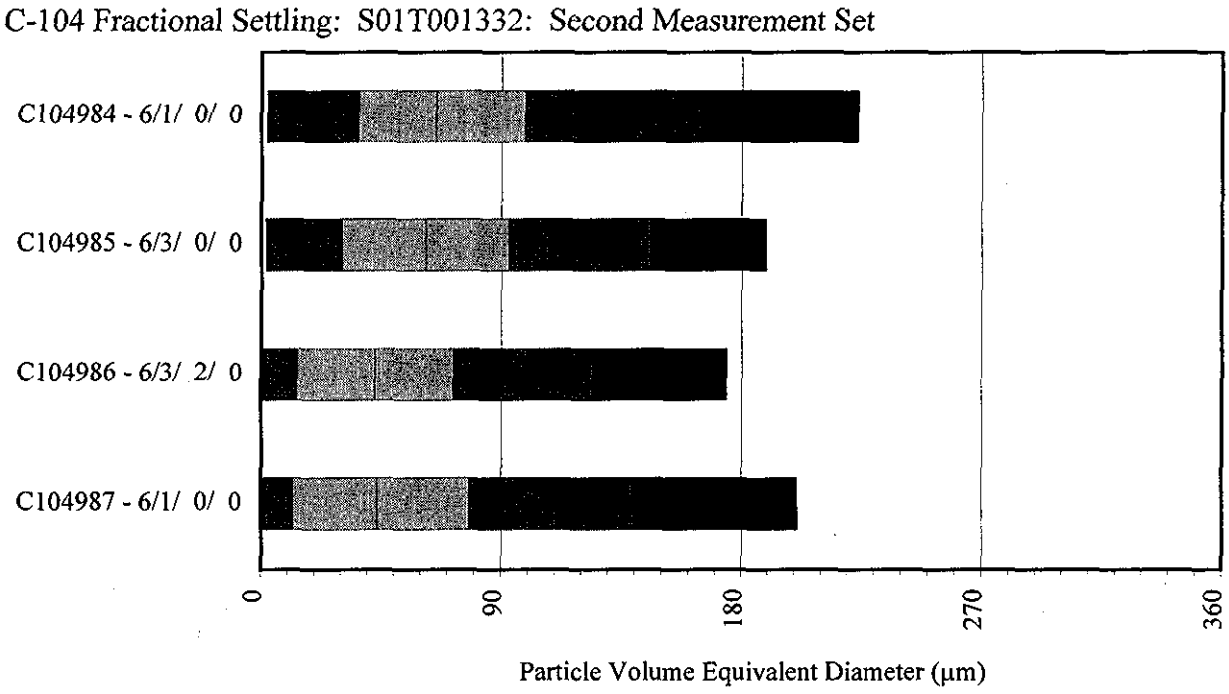
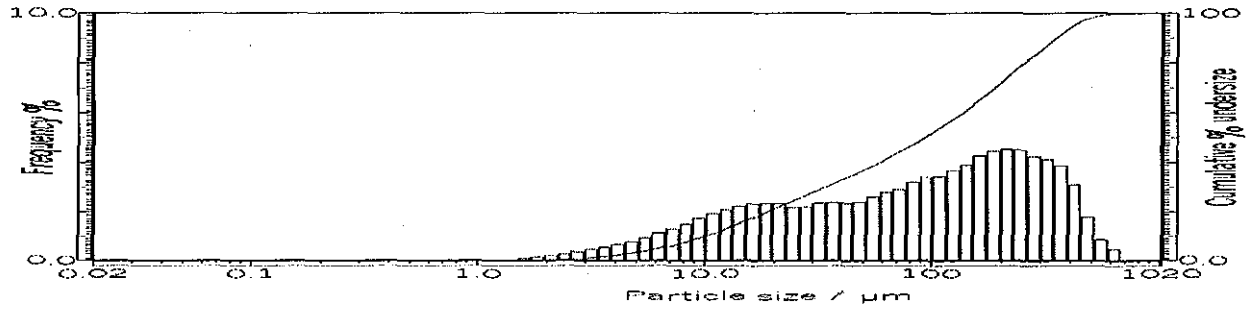


Figure 102. SY-102 Fractional Settling: Volume-based PSDs from first set of runs on test sample S01T001338.

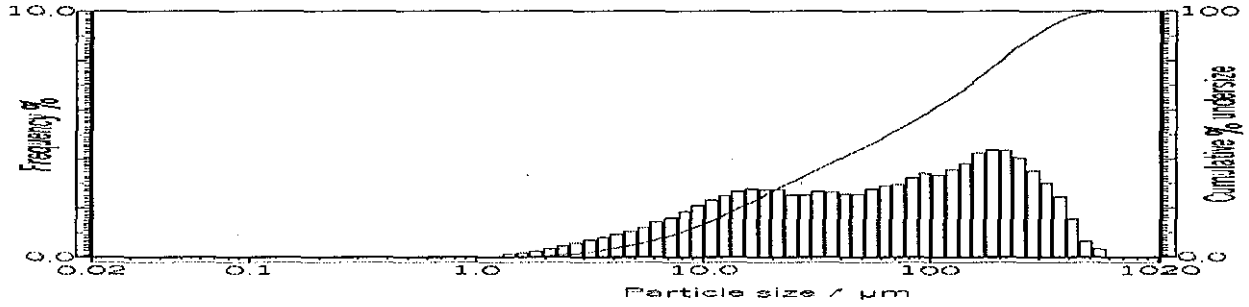
File Name: Cumulative times at run conditions with settings of individual runs highlighted.

[LOAD-IN]: P6 = ? min; S1 = ? min

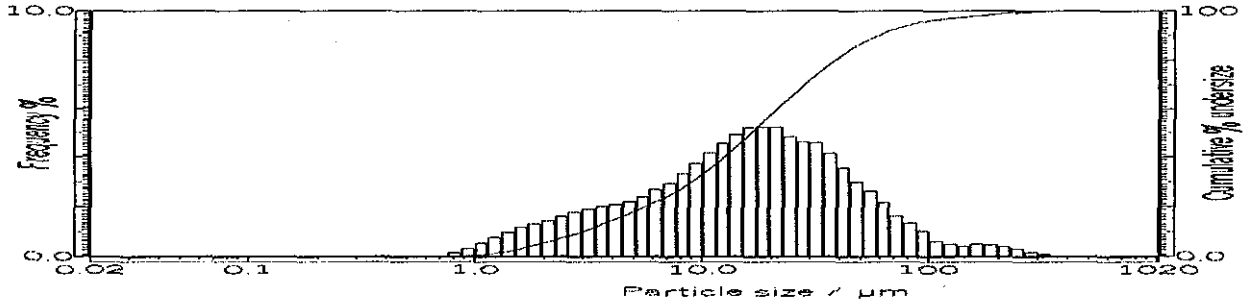
SY102964: P6 = 4 min; S1 = 4 min; S3 = 0 min; US = 0 min; DT = 0 min



SY102965: P6 = 7 min; S1 = 4 min; S3 = 3 min; US = 0 min; DT = 0 min



SY102966: P6 = 13 min; S1 = 4 min; S3 = 9 min; US = 2 min; DT = 0 min



SY102967: P6 = 15 min; S1 = 6 min; S3 = 9 min; US = 2 min; DT = 4 min

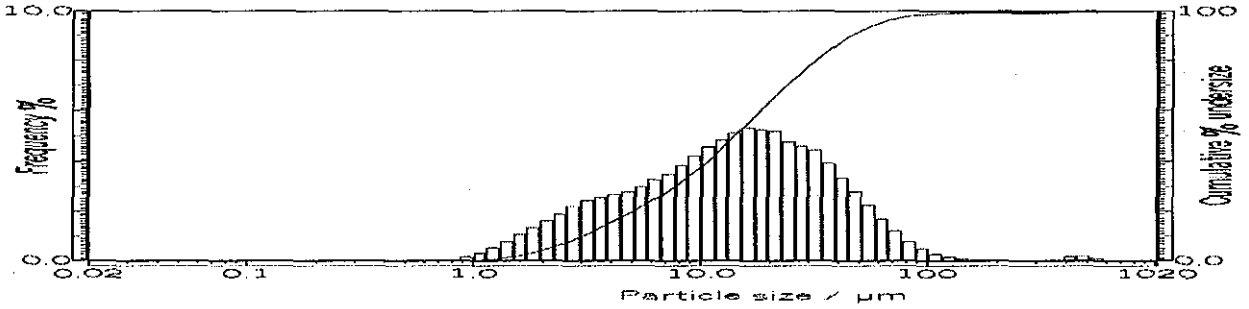
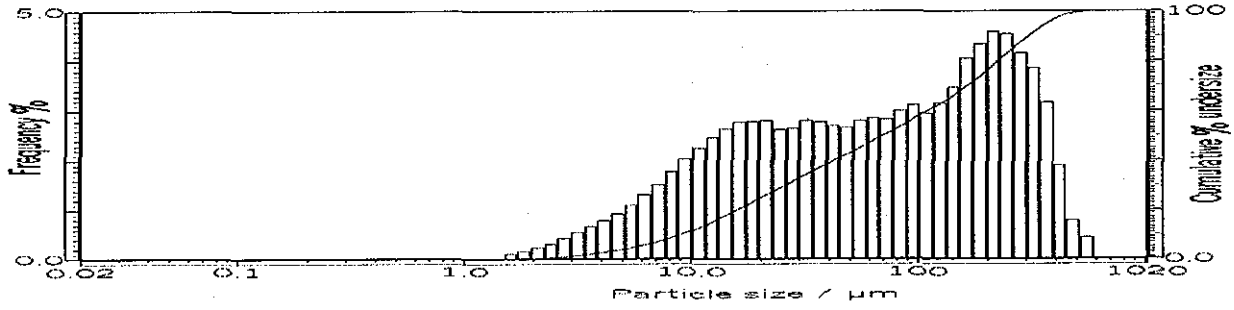


Figure 103. SY-102 Fractional Settling: Volume-based PSDs from second set of runs on test sample S01T001338.

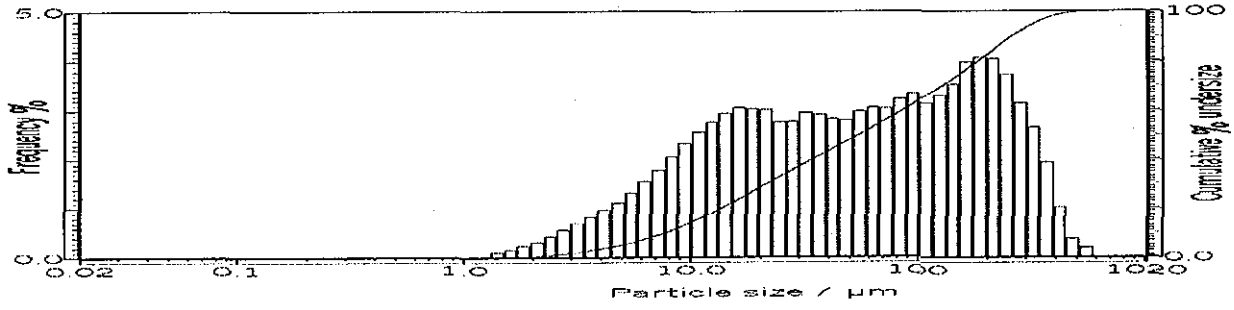
File Name: Cumulative times at run conditions with settings of individual runs **highlighted**.

[LOAD-IN]: **P6** = ? min; **S1** = ? min

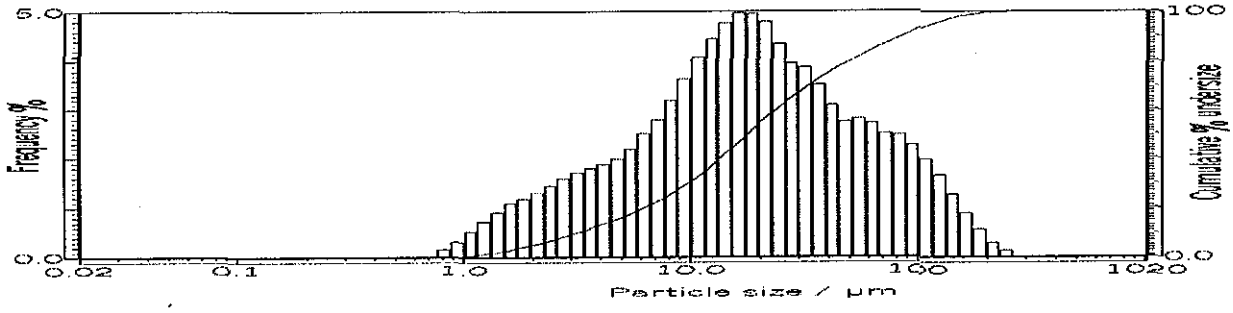
SY102968: **P6** = 3 min; **S1** = 3 min; S3 = 0 min; US = 0 min; DT = 0 min



SY102969: **P6** = 7 min; S1 = 3 min; **S3** = 4 min; US = 0 min; DT = 0 min



SY102970: **P6** = 13 min; S1 = 3 min; **S3** = 10 min; **US** = 2 min; **DT** = 0 min



SY102971: **P6** = 15 min; **S1** = 5 min; S3 = 10 min; US = 2 min; DT = 4 min

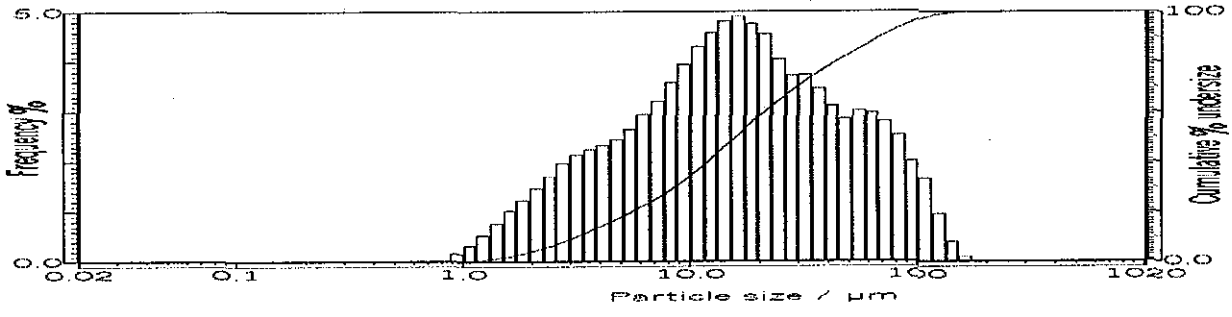


Table 47. SY-102 Fractional Settling: Mean particle diameters of volume-based PSDs.

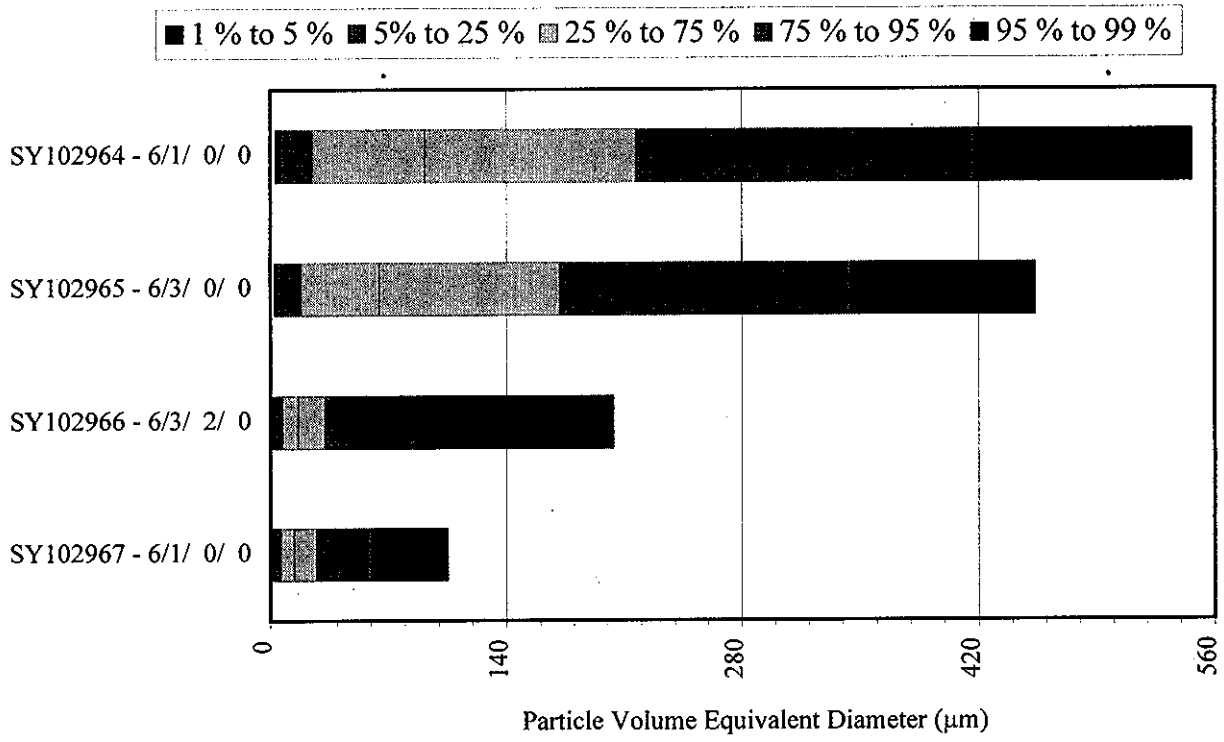
Sample	PSD Run File Name	Run Conditions				Mean Diameter (μm)	Standard Deviation (μm)
		P	S	US	DT		
S01T001338	SY102964	6	1	0	0	138	136
	SY102965	6	3	0	0	109	113
	SY102966	6	3	2	0	27	36
	SY102967	6	1	0	0	22	38
S01T001338	SY102968	6	1	0	0	118	120
	SY102969	6	3	0	0	98	105
	SY102970	6	3	2	0	32	38
	SY102971	6	1	0	0	27	28

Table 48. SY-102 Fractional Settling: Percentages of particles in volume-based PSDs with diameters less than the indicated values.

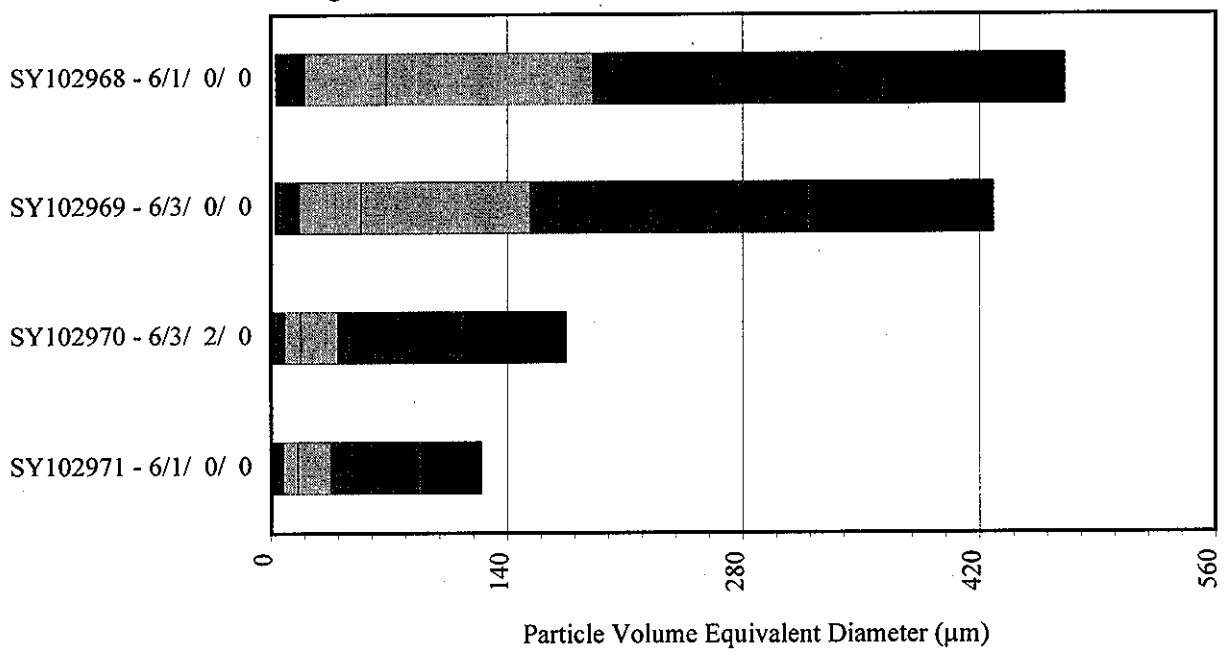
Sample PSD Run	In Distributions Based on the Total Volume of Spherical Particles						
	1 %	5 %	25 %	50 %	75 %	95 %	99 %
	Of the Particles Have Diameters Less Than (μm)						
S01T001338							
SY102964 - 6/1/ 0/ 0	2.8	6.1	24.9	91.8	216.6	417.1	547
SY102965 - 6/3/ 0/ 0	2.3	4.8	18.2	64.9	171.5	344.8	454
SY102966 - 6/3/ 2/ 0	1.1	1.9	7.2	16.4	32.5	86.0	204
SY102967 - 6/1/ 0/ 0	1.3	2.1	6.3	14.1	27.5	60.4	106
S01T001338							
SY102968 - 6/1/ 0/ 0	2.7	5.6	20.0	68.8	190.9	364.8	470
SY102969 - 6/3/ 0/ 0	2.4	4.8	16.7	53.6	153.5	320.2	428
SY102970 - 6/3/ 2/ 0	1.1	2.0	8.0	17.8	39.9	114.8	175
SY102971 - 6/1/ 0/ 0	1.3	2.2	7.0	15.9	35.6	89.5	125

Figure 104. SY-102 Fractional Settling: Diameters of particles (μm) within defined, volume-based, percentile ranges.

SY-102 Fractional Settling: S01T001338: First Measurement Set



SY-102 Fractional Settling: S01T001338: Second Measurement Set



4.8. Polarized Light Microscopy Tests Results

Certified standards BCR 67 and BCR 130 and samples from Tanks C-104, SY-102, AW-103, and AY-101 were subjected to particle characterization by PLM and IA. Some of the waste samples had been sieved or settled from the original composites prior to PLM analysis. Table 54 describes the tank samples that were analyzed by PLM and IA.

Table 49. PLM Results on Tank Wastes.

Tank	Origin	Vial
AW-103	Undisturbed composite	1670
	Sieved, >53 μm	1294
	Sieved, >500 μm	1291
	Settled	1344
AY-101	Undisturbed composite	1493
	Sieved, >53 μm	1299
	Sieved, >500 μm	1296
	Settled	1326
C-104	Undisturbed composite	1450
	Sieved, >53 μm	1284
	Sieved, 53-106 μm	1285
	Settled	1332
SY-102	Undisturbed composite	1650
	Sieved, >53 μm	1289
	Sieved, >500 μm	1286
	Settled	1338

The notes taken during the preparation and examination of the PLM samples, along with the images acquired, are compiled in Appendix I. The images for the two particle size standards are designated as "BCR 67" and "BCR 130," respectively, with a lower-case letter indicating the particular field of view. The tank sample images are identified by the prefix "WPPA" followed by the vial number (from Table 54) and a lower-case letter indicating the particular field of view. Generally, two microscope mounts were made for each sample; these are indicated in Appendix I as "Slide #1" and Slide #2.

For samples that had been sieved, the particles observed in the PLM are significantly finer than the corresponding sieve size fraction. Samples that passed through the 53 μm sieve rarely contained particles with maximum dimensions greater than 20 μm. Of the seven to nine images obtained for the <53 μm fractions from each of the four tanks, only one image (WPPA1299d, for Tank AY-101) contained any particles greater than 20 μm. On this one image, five particles have longest dimensions greater than 20 μm, with the largest being 43 μm.

In contrast to the above, two particle size standards, prepared in the same fashion, show maximum particle sizes consistent with the expected result. Sample BCR 67 (with 99.1% of its particle mass less than 32 μm) has largest particles of 18 to 42 on six images. Five images of sample BCR 69 (with 96.6% of its particle mass less than 90 μm) contain largest particles of 46 to 83 μm. Though this standard was not included in the PSD studies, it did serve to show that PLM could detect particles greater than 50 μm.

The trend toward smaller particle size continued through the PLM results for the other samples. The 53 to 106 μm sieve sample, WPPA1285 (Tank C-104) contains largest particles ranging from 12 to 31 μm. The samples retained on the 500 μm screen (WPPA1286, WPPA1291, WPPA1296) yield PLM images with largest particles ranging from only 9 to 90 μm.

For the >500 μm fractions, the AW-103 sample was "clumpy and hard to disperse," but none of the eight images obtained for this sample exhibit any particle larger than the 50-μm size bar. The seven images for the SY-101 sample also contained only particles smaller than 50 μm. The AY-101 sample was described as "clumpy but easy to disperse"; it yielded images with several particles on the order of 50 μm, the largest having a maximum dimension of about 100 μm. This sample also included one large (small pea sized) unbreakable chunk. From the descriptions, one is led to believe that the large particles were mostly smashed in the sample mounting process. The samples from the settling tests show the coarsest particulate, with some of the particles ranging up to 400 μm in size.

Finally, the undisturbed (pre-test) composite samples contain considerable fine particulate. The coarsest particulate in the PLM slides from these samples range up to 49 μm, although the Tank C-104 sample contained some granular material on the bottom of the vial that was not sampled. The Tank AY-101 sample is particularly fine-grained, with the largest particles being about 3 μm in size. In addition, the slide from this sample includes 10-to-30-μm oval objects. Due to their slightly irregular margins and comparatively thin edges, they are probably not gas bubbles. They appear to be areas of immiscible liquid.

4.9. Image Analysis Test Results

Image analysis confirms and extends the PLM observations. Appendix J shows the PLM images processed as described in Sec. 3.6. The diameters (major, minor and mean), aspect ratio, sphericity, and area were calculated for each particle in each image. Each particle area was multiplied by its mean diameter to produce an estimated volume. These data were used to produce the log-normal plot of cumulative particle volume (mass) versus mean particle size shown in Appendix J. The appendix also shows the "largest particle" (maximum of the mean diameters) and the "median mass particle diameter" (mean particle size at the 50th percentile of a volume-based distribution). The false colors applied to the detected particles represent size classifications, but these colors were not actually used in the size analysis.

These median particle diameters are fairly consistent with the known values for the standard BCR 69. However, they are systematically higher for the standard BCR 67. This may be due to the presence of too many touching particles in the sample preparation from BCR 67. It may also result from an incorrect assumption in calculating the particle volumes.

The PLM overestimation of the median particle size for standard BCR 67 is contrary to PLM observation of the waste samples. For the waste samples, the PLM size estimates are consistently smaller than expected from PSD determinations and sieving. This topic is discussed further in Sec. 5.6.

5. DISCUSSION

5.1. Sample Condition

Many archives were dry and some were consolidated masses. They seemed to reconstitute nicely with water after breaking up the big pieces, but un-broken crumbs could easily have been overlooked in the opaque slurry when stirring them in a hot cell. The sieve tests unequivocally isolated some large particles greater than 500 μm in size – some a few millimeters in diameter. A question crucial to applying the results of the entire WPPA project is then: To what extent were these large particles originally extant in the tank from which the archive sample was originally taken, and not merely an artifact of partial reconstitution?

The largest particles on the sieves were actually visible, and they generally looked like the same material as the invisibly small particles from the same aliquot. The large AY-101 particles gave some indication that the vibration from the sieve shaker was wearing small particles from these visible crumbs. On that basis they could indeed be a consolidation of small particles that resulted from dry-out in the archive. On the other hand, these larger particles did survive the reconstitution, did survive the continuous exposure to wash liquid during wet sieving, did survive continuous exposure to wash liquid during settling tests, did survive approximately six weeks of continuous exposure to wash liquid before follow-up PSD analysis, and finally, at least some of them did survive the gentle initial agitation sequences in the particle size analyzer to be detected before being broken up. This argues that they could easily have originally come from their respective tank, because it is hard to imagine simple short-term dry-out causing particles to form so resistant to softening by re-immersion. The good news is that particles greater than 500 μm in diameter represented less than 17% of the mass of any sieved aliquot.

5.2. PSD Comparison of Standards

The statistics of Sec. 4.2.3 indicate that both laboratories differed from the certified cumulative size distributions of the BCR 67 and BCR 130 standards by statistically significant amounts. These differences might be explained by the different methodologies being compared: the BCR 67 certification is based on sedimentation rate, and the BCR 130, on sieving. These different methodologies are not necessarily comparable, especially for measurement of non-spherical particles. However, methodology differences do not explain why the two laboratories deviated from the standard values in opposite directions.

Nevertheless, the figures in Sections 4.2.1 and 4.2.2 suggest, that both labs were reasonably close to the probability density distribution curve of the standard. By "reasonably" it is meant that the much larger inter-laboratory differences observed subsequently in studies of tank waste composites cannot blamed on individual laboratory calibrations; rather, other explanations must be found. The statistics of the variations in instrumental analytical parameters suggest that for the quartz standards, parameter values other than those that ensure an adequate stirring rate have no significant effect on results at either laboratory. Of course, quartz is a hard material, whose particles are not terribly prone to breakage from shear or ultrasound.

It should also be understood that the certified standard values were obtained by means other than laser-light scattering; each method has its own built-in bias for non-spherical particles

5.3. PSD Comparison on Tanks AW-103, AY-101, and C-104

Sec. 4.3 reports the PSD results from both 222-S and 325 Laboratories for the composites of these three tanks. A clear difference between the two labs emerged in that the 222-S Laboratory generally found larger particles than the 325 Laboratory at low cumulative agitations of the samples. The 222-S Laboratory showed that increased stirring speed and/or sonication resulted in the destruction of the larger particles to produce more of the smaller ones. At the same time, the 222-S Laboratory showed wide variability among aliquots and samples for the larger particles. The 325 Laboratory results were generally more reproducible and indicated smaller particles.

The simplest explanation for the difference between laboratories lies partly in the fragility of the very largest particles seen in the sieve and settling tests. The results of sieve tests mention the appearance of smaller particles at the expense of large ones, and that the large particles are not monolithic, but are instead consolidates of finer material. It is possible they are in reality the remnants of the dried up archives that had to be broken up to be sampled for the tank composites. This is in keeping with the origins of Hanford tank sludges. The sludges are mostly derived from the rapid precipitation of very poorly soluble metal oxides, hydroxides, phosphates, carbonates and fluorides. They are so poorly soluble that they do not Ostwald ripen to larger sizes at sub-boiling temperatures. This is in contrast to the much more soluble tank saltcake wastes, wherein sizable single crystals can be found.

The other contributor to the differences between laboratories lies in the faster stirring rates of the instrument used in the 325 Laboratory. The lowest circulation rate at the 325 Laboratory (produced by a centrifugal pump) is roughly equal to the highest circulation rate employed at the 222-S Laboratory (produced by a peristaltic pump always set to maximum). The tank agitation at 325 Laboratory could only be increased by changes to the circulation pump speed, because the particle size analyzer had no stirrer in its tank. The 222-S Laboratory analyzer had a propeller stirrer in its tank in addition to the circulating pump. This stirrer was what was varied, allowing a gentler means to maintain the particulate suspensions. The net result was that the 325 Laboratory analyzer probably destroyed all large, fragile particles before they had a chance to be seen, and likewise reduced the sizes of the remaining particles. The 222-S Laboratory analyzer could effect an agitation regime where the largest particles could be detected before they were destroyed, and then it could increase the state of agitation to the point where most of them would be broken up.

The irreproducibility between tank samples within 222-S Laboratory is illustrated by the results of Sec. 4.3. Here, a second subsampling from the subsample of Tank AW-103 composite produced two samples whose PSD results disagreed considerably. One sample apparently contained some very large particles that were relatively resistant to increased stirring and ultrasound. Their size or density, in one case, resulted in their not being detected by the 222-S particle size analyzer until the stirring rate was increased. However, the other sample appeared to be devoid of especially large particles. In hindsight, insufficient sample size and/or homogenization of the composite were probably the culprits. Sample size is discussed further in

Sec. 5.8. The small size of the samples from the composite mother jar probably resulted in an uneven representation of large particles, even though the second subsampling was meant to improve on the technique used in the first subsampling campaign for this tank.

5.4. PSD of AY-102, AZ-102, C-107 and SY-102

There are general trends to be observed for the PSD studies of these four tanks. More stirring and /or sonication and reduce the distribution mode diameters. Within a tank, the observance of large particles can vary considerably from aliquot to aliquot or sample to sample

A Notable exception to the first trend is offered by Tank AZ-102. In this tank, there is indication that some large particles are relatively resistant to breakup by stirring or sonication. Also, Tank AY-102 may have had some particularly dense large particles, for they don't appear until the increased stirring rate has been applied to the particular aliquot.

Tank C-107 is noticeable in that its composite was not drawn from dry archives, but rather from fresher samples that had not yet had the chance to dry out. Results for that tank revealed no large particles at all. Since all other tank composites revealed large particles at one time or another, this may mean that the very large particles found in this study had more to do with the crumbs generated by breaking up the dried archives than they did from the native tank contents. The idea of poorly reconstituted crumbs fits in nicely with the observations from sieve tests and settling tests that the very large particles are consolidates and that they do release smaller particles over time or mild agitation.

5.5. Statistical Analysis of the Effect of Sonication

Casual observation of the PSD data from 222-S Laboratory indicates often the larger particle sizes are diminished after sonication. To quantify this difference and to test the generality of this statement, the means of measurements obtained before sonication were compared with those obtained after sonication. This comparison was made at seven different percentiles in the PSDs for each tank. In each case, a 95% confidence interval on the difference between the two means was computed. The PSDs from the 325 Laboratory were not used in the comparison because the particle sizes obtained before sonication were generally much lower than those obtained at 222-S Laboratory. This fact is thought to be due to the more destructive turbulence of the higher circulation flows used at the 325 Laboratory.

Snedecor (1980, p. 97) give the equations for the confidence interval on the difference and the method used to determine the degrees of freedom for Student's t distribution. If the confidence interval spans zero, then the "Before Sonication" and "After Sonication" means <u>are not significantly different from each other</u>. These cases are denoted by a "No" in Table 55. If zero is not contained in the confidence interval, then the "Before Sonication" and "After Sonication" means <u>are significantly different from each other</u> (at the 0.05% level of significance). These cases are denoted by a "Yes" in Table 55.

In all but 13 out of the 49 cases in Table 55, there are significant changes in the diameters of the particles due to sonication. In many of the other cases, there were large particles in the higher

percentiles. These large particles had a large influence on the magnitude of the mean diameter and variance of the mean in these percentiles.

Table 50. The Percentiles Having Significant Differences Between the Means, Before and After Sonication.

Tank	Percentile						
	1.0 %	5.0 %	25.0%	50.0 %	75.0 %	95.0 %	99.0 %
AW-103	Yes	Yes	Yes	No	No	No	No
AY-101	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AY-102	Yes	Yes	Yes	No	No	No	No
AZ-102	Yes	Yes	Yes	No	Yes	Yes	No
C-104	Yes	Yes	Yes	Yes	Yes	Yes	Yes
C-107	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SY-102	Yes	Yes	Yes	Yes	No	No	No

The overwhelming result is that yes, sonication can in general reduce the size of the tank sludge particles. Only the large variability of the appearance of large particles in tank wastes at 222-S Laboratory prevents a positive statistical statement.

5.6. Reconciling PSD with Sieving, Settling, PLM and IA

The size distributions of the sludges from three HLW tanks -- AW-103, AY-101, and C-104 -- have now been tested by five methods: PSD at 222-S Laboratory, PSD at 325 Laboratory, sieving, settling, and PLM/IA. An additional sludge from Tank SY-102 has been characterized by four of them, lacking only the 325 Laboratory particle sizing.

PSD vs. Sieving. For the four tanks subjected to sieving, settling, and IA tests, there are some general comments common to them all. The sieve fractions of the waste samples were qualitatively consistent with the particle size results for the least-agitated composite samples, except that the particle size analyzer was poor at finding the largest size classes above 500 μm in size.

When individual sieved fractions were subsequently particle sized, only the C-104 fraction retained on the 53 μm sieve (passing the 106 μm sieve) yielded a result consistent with its sieved size range. The most striking findings were the particle sizing of the finest sieve fractions – those passing all sieves. Although these fractions had passed through a 53 μm sieve, their PSDs contained a major mode in the vicinity of 100-150 μm, and only a minor mode near 10 μm. These PSDs were generally resistant to sonication. These observations support the concept that the particle agglomeration is in a dynamic equilibrium, with the PSD being affected by the competition between van der Waals attractions and the dispersive effects of hydrodynamic shear and electrostatic particle charges. The resistance to sonication may be related to the removal of larger particles by sieving; the remaining particles have higher surface area, therefore greater van der Waals forces.

All the sieve fractions retained on the 500 μm sieve were subsequently found to be mostly weighted below that size in the particle size analyzer. This result is likely due to incomplete de-agglomeration of the solids during sieving. These clumps of waste either softened up during the approximately six weeks of storage under wash liquid while awaiting PSD analysis, or the action of suspending the solids for PSD analysis was more aggressive than the wet sieving process in breaking up the solids.

The occasional PSD result showing particles greater than 500 μm in diameter suggests that the PSD analyzer can detect them if they are there. However, in hindsight, the samples finding their way to the particle size analyzer were too small to adequately represent the large particles, and the pipetting technique used to administer an even smaller portion to the analyzer may not have picked them up. Particle sizing and sieving results taken together suggest that the interim sample storage, pipetting technique and particle size analyzer conditions tended to miss or destroy the particles greater than 500 μm in size, even before the first PSD result is taken. On the other hand, it appears these same conditions allow agglomeration of smaller particles up to approximately 150 μm to occur. Hence, if a PSD result did indicate the presence of large particles above 200 μm, they were probably real, and the only question remaining is how representatively they were sampled or were suspended so that they could be detected.

PSD vs. Settling. PSDs of settling test settled fractions failed to find very many of the very large particles, despite their being visible during the settling tests from the outside of a hot cell window. Again, the interim storage and initial particle size analyzer conditions must have contributed to the breakup of large particles before they could be detected. This is supported by the observations of the sieve fractions not submitted for PSD analysis that were stored in a like state for two months. These samples gave ample evidence of slow softening and breakup of the very largest particles even under zero shear conditions.

PLM and IA vs. PSD and Sieving. The PLM and IA size estimates for the waste samples are consistently smaller than expected from PSD determinations and sieving. Several sample preparation factors may contribute to this discrepancy. First, the sampling method (gentle stirring with a pipette) probably did not provide a reproducible hydrodynamic environment; thus, the degree of agglomeration was not well defined in the sample when the microscope specimen was removed. Image WPPA1326g in Appendix I is instructive as an example of this problem: On the one hand, large clumps, which may represent the condition of the solids in a stagnant system are present; on the other hand, there are also very tiny particles of just a few microns, which are probably more representative of solids in a flowing stream. The view shows very clearly a bimodal distribution of particle sizes.

Another factor that probably biases IA results toward smaller sizes is pressing the cover slip into place. This is a standard technique for spreading the sample out to separate the particles on from the other. However, pressing the cover slip can crush particles into smaller pieces or disperse aggregates. It was also noted sometimes that coarser particles were pushed out toward the rim of the cover slip; the particles near the rim were not observed because of gross crowding.

Third, there was a concern that IA should be performed on microscope views in which the particles were clearly separated. This strategy could easily bias the analysis against large, loose

aggregates of particles. Selection of the field of view is critical to IA analysis, as may be seen by visually comparing, for instance, the various views (a through f) shown for PLM sample 1299, slide #1 in Appendix I. Some of these views, e.g., c and f, do not contain a single particle greater than 10 μm; others, e.g. view d, have clumps (or fragments) as large as 50 μm.

5.6.1. AW-103

The PSDs of AW-103 composite sludge exhibited wide variability. However, a PSD selected for good representation of the largest particles can be compared with the sieve test results in Figure 105. The acts of two serial subsamplings and an aliquotting combined with the minimal agitation have already reduced the highest particle sizes found on the 500 μm sieve.

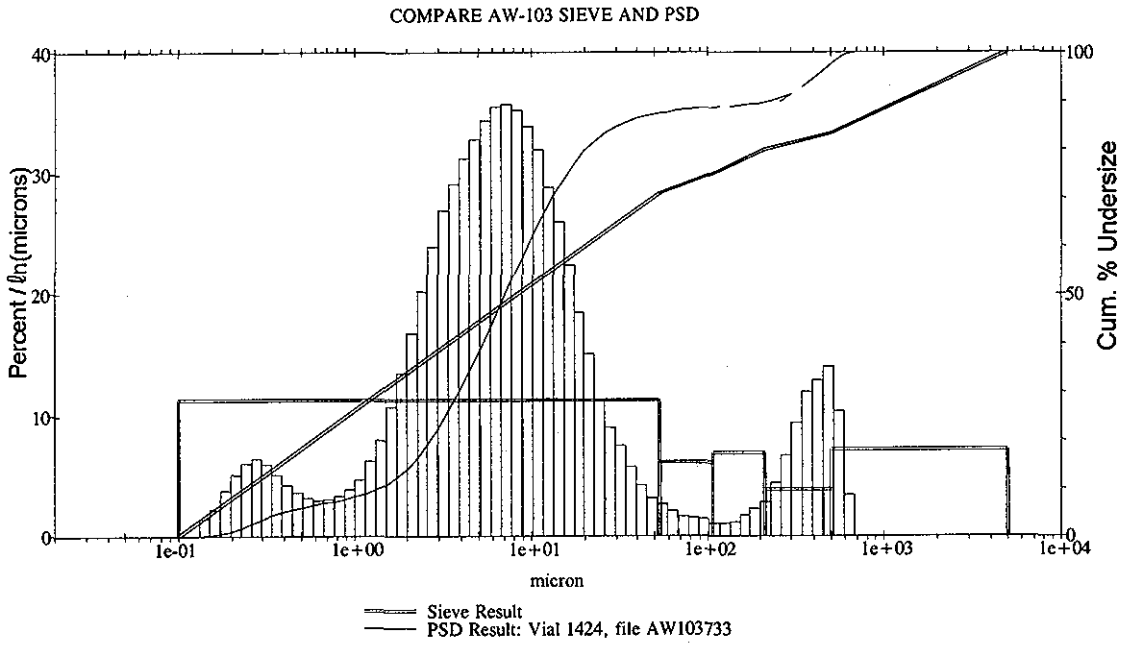


Figure 105. Compare PSD and Sieve Test results of AW-103 Sludge.

Given that the very largest particles in AW-103 sieve fractions existed at least when the sieving was performed, we must somehow include them in our assessment of the "true and complete" size distribution of AW-103 sludge. To do this, we decide to discount the PSD results above 106 μm in diameter, substituting instead the sieve test results for sizes greater than 106 μm, and splice the two distributions together after appropriate weighting by volume/mass. Figure 106 then, indicates the best information we have on the "true" size distribution of AW-103 sludge.

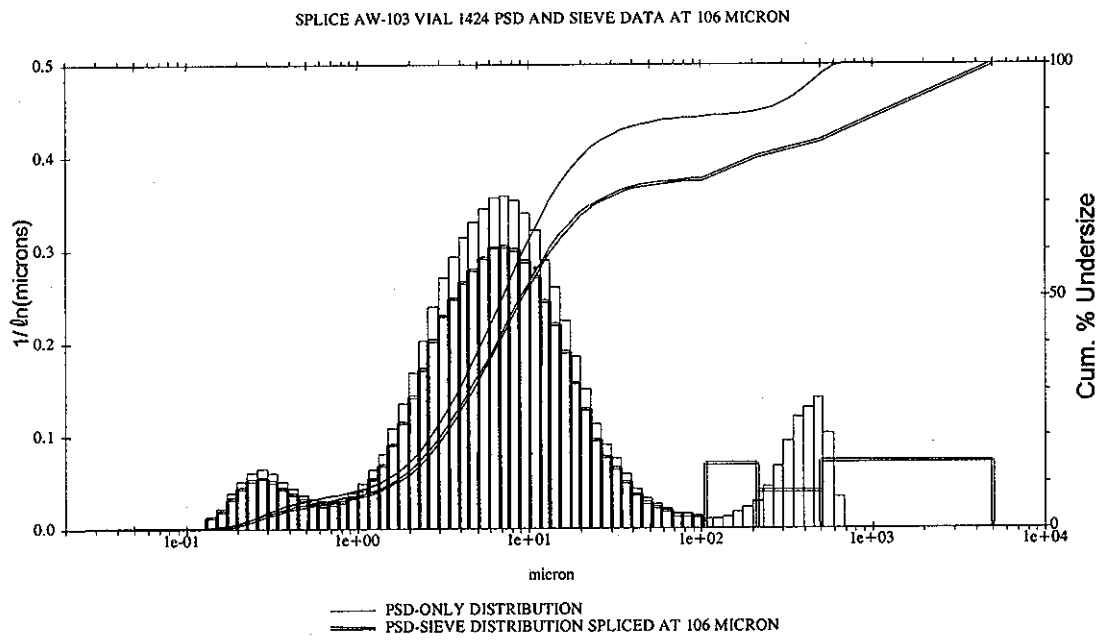


Figure 106. Spliced Particle Size Distribution of AW-103 Sludge.

5.6.2. AY-101

Figure 107 compares representative PSD result at low cumulative agitation to the Sieve Test result for the Tank AY-101 composite to show the general correspondence at particle diameters below 106 μm. Like the AW-103 comparison, it is evident the sampling, aliquotting and initial agitation techniques have already reduced the sizes of the largest fraction found on the sieves.

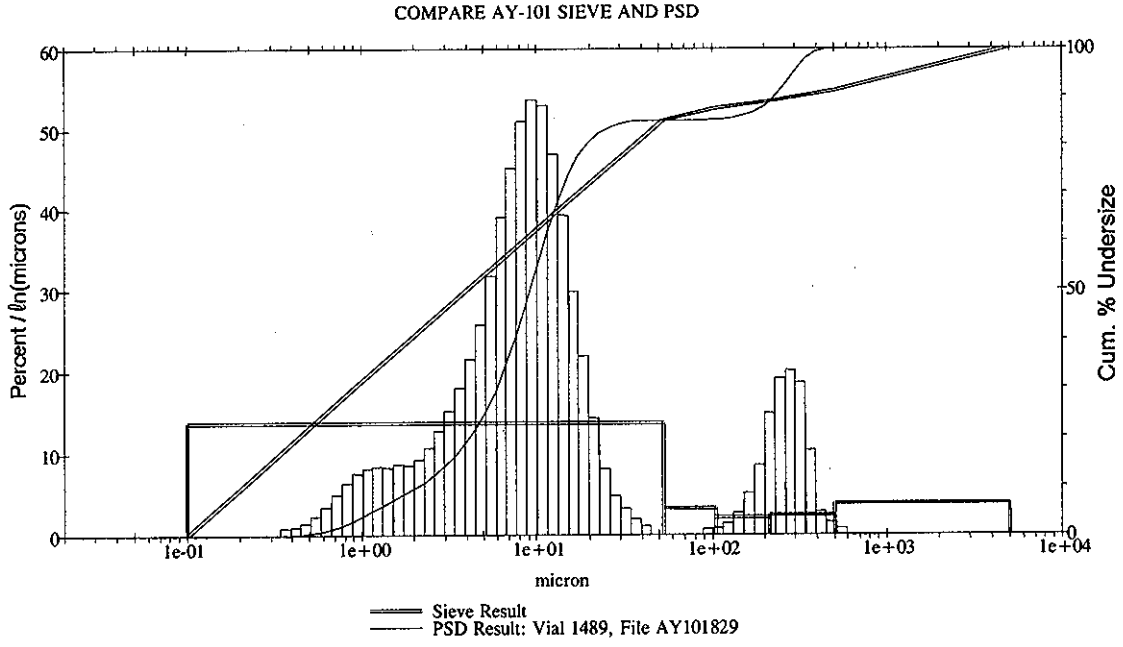


Figure 107. Compare PSD and Sieve Test results of AW-101 Sludge.

Consequently, to arrive at the best estimate of the "true" particle size of Tank AY-101 sludge, we splice the sieve result and the PSD result at 106 μm with proper weighting to produce Figure 108.

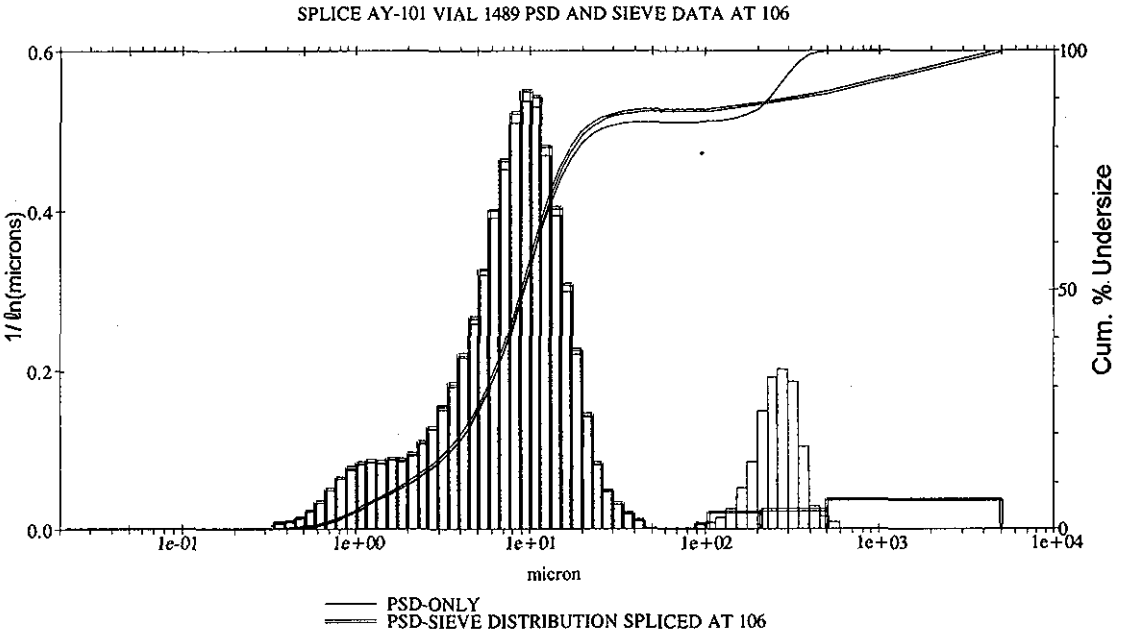


Figure 108. Spliced Particle Size Distribution of AY-101 Sludge.

5.6.3. C-104

Figure 109 compares a PSD result and the Sieve Test result for the C-104 composite. The comparison is like those for AW-103 and AY-101—the correspondence is good at lower particle sizes, but suffers at the high end, purportedly due to some combination of particle fragility, poor sample representation or initial agitation conditions.

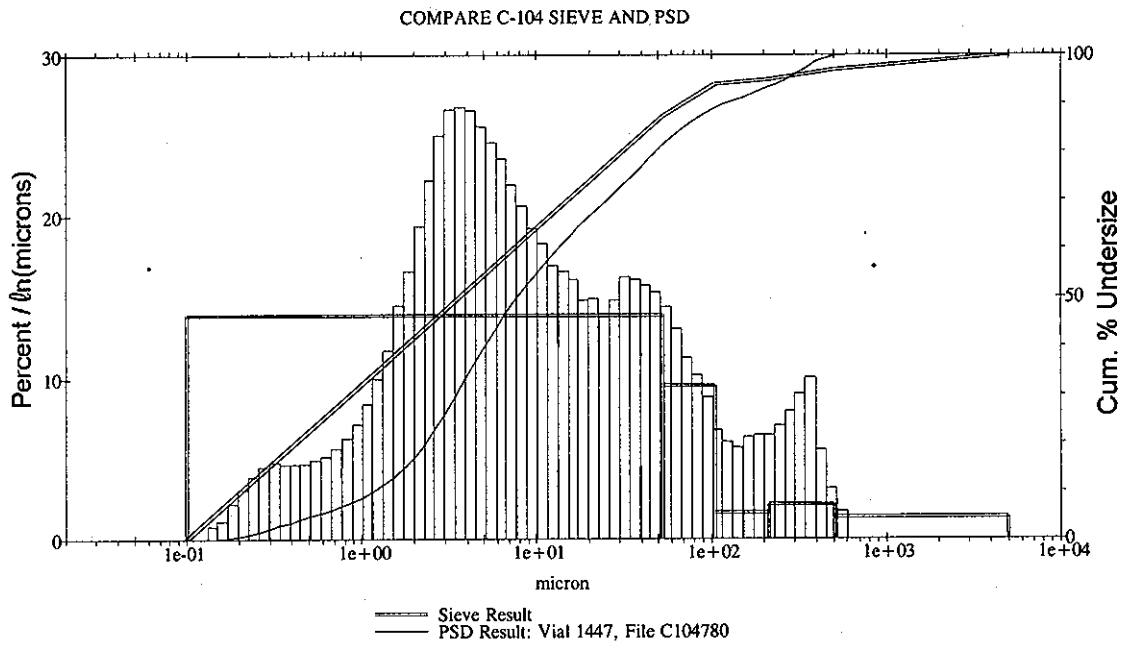


Figure 109. Compare PSD and Sieve Test results of C-104 Sludge.

Therefore the best estimate of the "true" size distribution of C-104 sludge is one spliced from the PSD below 106 μm weighted to match the sieve result above 106 μm., and presented in Figure 110.

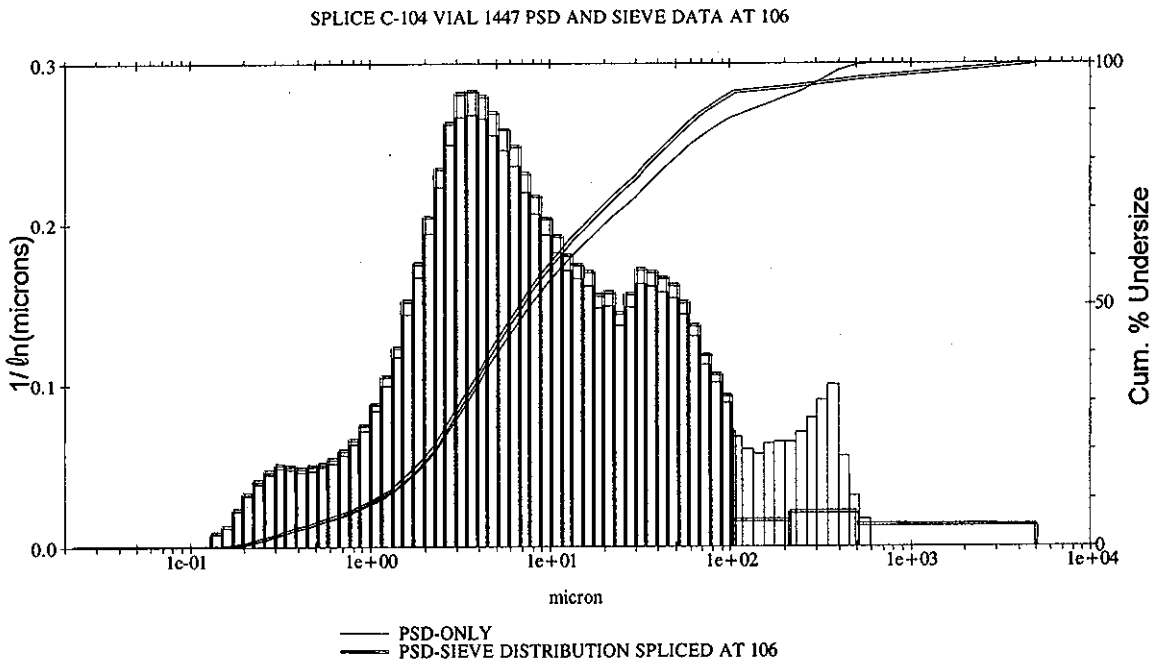


Figure 110. Spliced Particle Size Distribution of C-104 Sludge.

5.6.4. SY-102

Figure 111 compares an SY-102 PSD result with the sieve test result for composite sludge, showing the reduction of the largest particle sizes in the PSD result brought about by some combination of large particle fragility, under representation in aliquots, and initial agitation conditions.

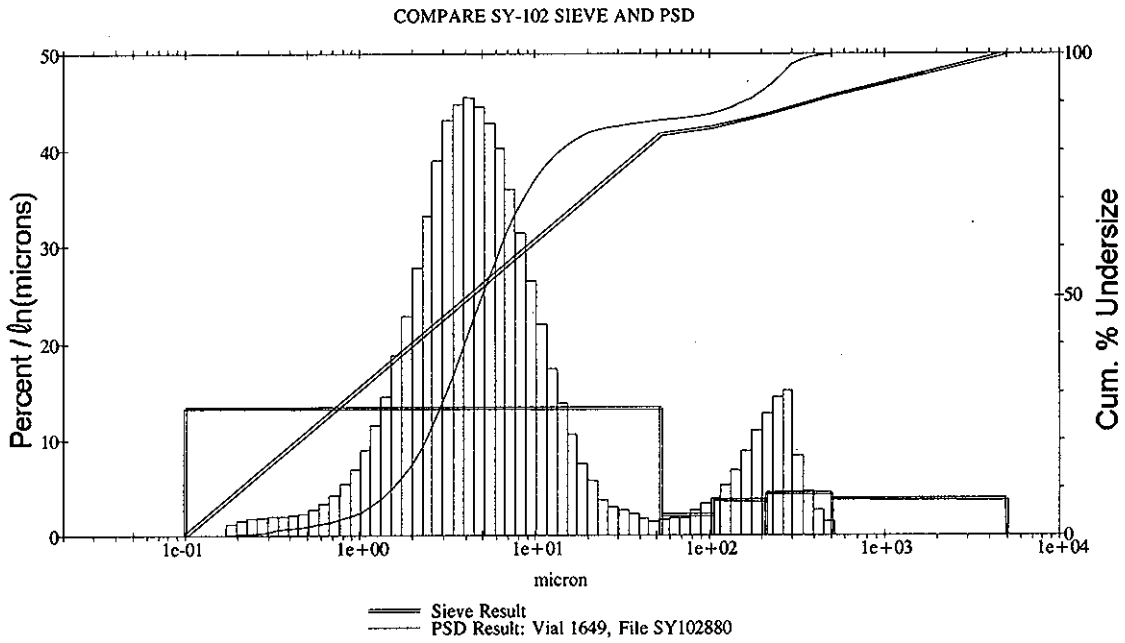


Figure 111. Compare PSD and Sieve Test results of C-104 Sludge.

Figure 112 indicates the best information we have on the "true" size distribution of SY-102 sludge. It was produced by splicing the sieve result above 106 μm to the weighted PSD result below 106 μm.

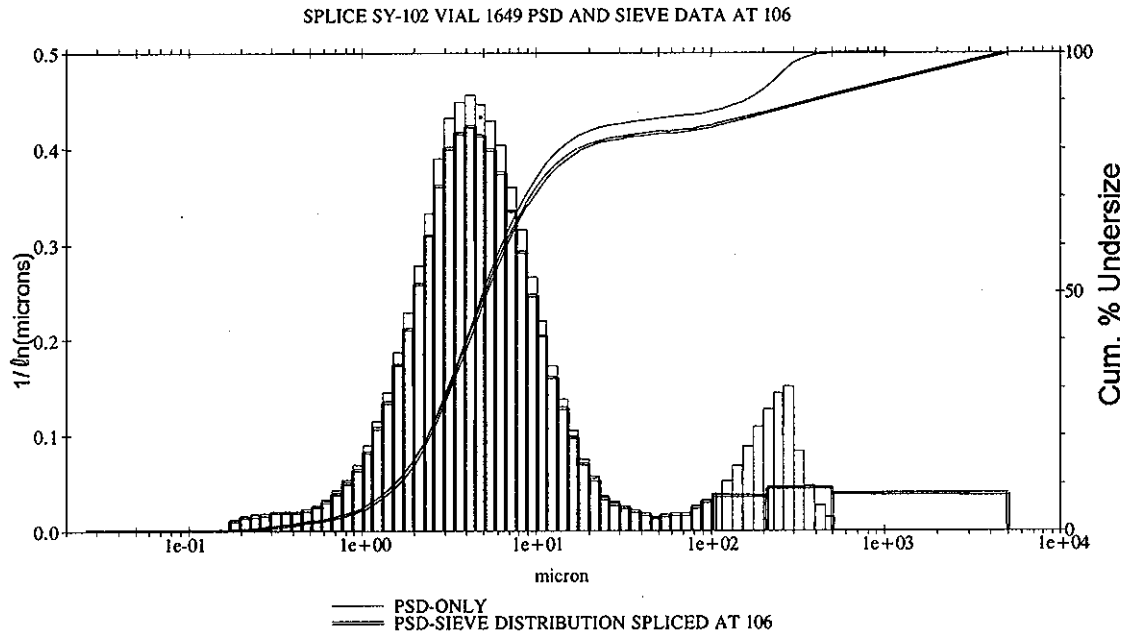


Figure 112. Spliced Particle Size Distribution of SY-102 Sludge.

5.7. Estimating Effective Particle Density from Settling Tests

The piping design for transporting the HLW sludges is being based on correlations requiring particle sizes and densities as inputs. The unhindered settling behavior of individual particles in dilute suspension can be used to provide estimates of particle densities, if the particle sizes are known. Particle agglomeration is not modeled, so the true solid-phase density of a particle can not be used to calculate its unhindered settling rate if the particle happens to be a loose agglomerate containing liquid-filled voids. Rather, an effective density derived from the actual observed settling rate is more desirable. We can determine this effective density if we can derive the effect of a perfectly conducted settling procedure upon the PSD of a sample.

5.7.1. Derivation of the Fractionation Function F_{dn}

The derivation of the fraction of particles of a certain diameter remaining after a settling test found in Allen (1990) is specific to Stokes Law. Though the same strategy can be used here, it has to be generalized beyond the Stokes settling regime because we have encountered some large, fast-settling particles liable to be in a locally turbulent flow regime.

Consider a dilute suspension of particles settling quiescently and unhindered through a medium of density ρ and viscosity η in the pipette depicted in Figure 113.

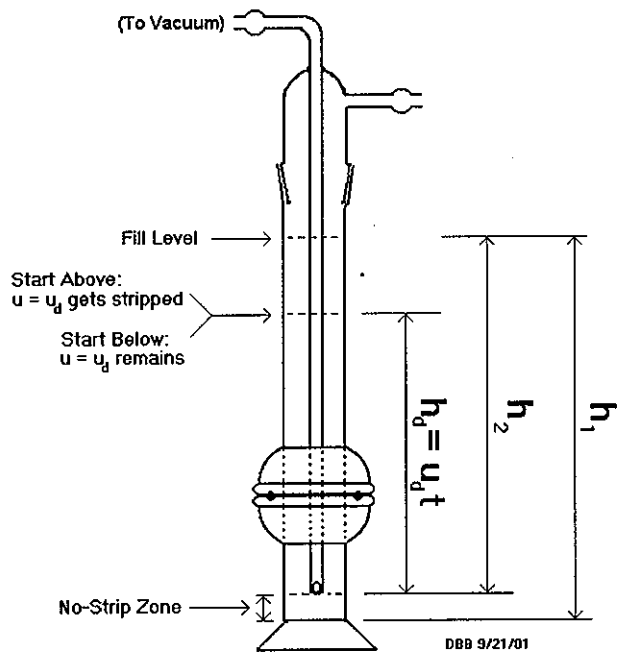


Figure 113. Settling Test Geometry.

All the particles are spherical and have the same particle density ρ_p, however there is a distribution of diameters $\Phi(d)$, and consequently of terminal settling speeds u_d.

The terminal settling speed of each particle balances the force of gravity against the resistance of drag in the medium. The local Reynolds number N_{Re}.

$$N_{\mathrm{Re}} = \frac{\rho u_d d}{\eta} \tag{5.7-1}$$

describes the flow regime that defines the coefficient of drag for spheres C_{sph} (Julyk 2001)

$$C_{sph} = \left[\sqrt{\frac{24}{N_{\mathrm{Re}}}} + 0.34035\left(N_{\mathrm{Re}}^{0.06071} + \frac{1}{1.72013 + 0.018N_{\mathrm{Re}}}\right)\right]^2 \tag{5.7-2}$$

that in turn leads to the terminal settling speed (Perry 1984)

$$u_d = \sqrt{\frac{4gd(\rho_p - \rho)}{3\rho C_{sph}}} \tag{5.7-3}$$

where g is the gravitational acceleration.

Inspection of these equations shows that u_d appears implicitly in equation 5.7-3. This is not a problem, because all three equations can be solved iteratively by direct substitution, given d, ρ_p, ρ, and η.

The perfectly conducted settling test begins by stirring the pipette to homogenize the suspension, distributing all the particles uniformly over the column of liquid of height h_1. Then, the particles are allowed to settle freely for a fixed time t, during which each particle covers a distance h_d

$$h_d = u_d t \leq h_1 \tag{5.7-4}$$

At time t, all the particles still residing in the portion h_2 bounded by the fill mark and the bottom of the dip tube ports are stripped away, leaving only those that managed to pass the dip tube and settle into the no-strip zone. Some of the remaining particles did so because $u_d > h_2/t$. For these, the fraction remaining is always unity. For other particles where $u_d < h_2/t$, only those that started settling within distance h_d of the dip tube managed to avoid being stripped away. The rest of them were removed through the dip tube. We denote the fraction removed of these slow-moving particles by F_{sd}, and we see by Figure 113 that

$$F_{sd} = \frac{h_2 - h_d}{h_1} = \frac{h_2 - u_d t}{h_1} \tag{5.7-5}$$

The fraction of particles of a certain speed <u>remaining</u> after the first settling and stripping operation, F_{d1}, is just the complement of F_{sd}.

$$F_{d1} = 1 - F_{sd} = 1 - \frac{h_2 - h_d}{h_1} = 1 - \frac{h_2}{h_1} + \frac{u_d t}{h_1} \tag{5.7-6}$$

When the addition of fresh medium, re-homogenization of the remaining fractions in the medium, and re-stripping at time t, is performed again, the new portion of particles removed, F_{sd2}, becomes

$$F_{sd2} = F_{sd} F_{d1} \tag{5.7-7}$$

and the <u>cumulative</u> fraction of particles of size d removed, ΣF_{sd2}, becomes

$$\Sigma F_{sd2} = F_{sd} + F_{sd2} = F_{sd} + F_{sd} F_{d1} = F_{sd} + F_{sd}\left[1 - F_{sd}\right] \tag{5.7-8}$$

and the new remaining fraction is

$$F_{d2} = 1 - \Sigma F_{sd2} = 1 - F_{sd} - F_{sd}\left[1 - F_{sd}\right] = \left[1 - F_{sd}\right]^2 \tag{5.7-9}$$

Repeating the process a third time gives

$$F_{sd3} = F_{sd} F_{d2} = F_{sd}\left[1 - F_{sd}\right]^2 \tag{5.7-10}$$

$$\Sigma F_{sd3} = F_{sd} + F_{sd2} + F_{sd3} = F_{sd} + F_{sd}\left[1 - F_{sd}\right] + F_{sd}\left[1 - F_{sd}\right]^2 \tag{5.7-11}$$

$$\begin{aligned} F_{d3} &= 1 - \Sigma F_{sd3} = 1 - F_{sd} - F_{sd}\left[1 - F_{sd}\right] - F_{sd}\left[1 - F_{sd}\right]^2 \\ &= \left[1 - F_{sd}\right]^3 \end{aligned} \tag{5.7-12}$$

By induction then, we are led to the fraction of particles of size d remaining after n stripping operations

$$F_{dn} = \left[1 - F_{sd}\right]^n = \left[1 - \frac{h_2}{h_1} + \frac{u_d t}{h_1}\right]^n \tag{5.7-13}$$

We can substitute equation 5.7-3 into 5.7-13 to express the fraction remaining of particles of a given diameter after n operations of settling and stripping.

$$F_{dn} = \begin{cases} \left[1 - \frac{h_2}{h_1} + \frac{t\sqrt{\frac{4gd(\rho_p - \rho)}{3\rho C_{sph}}}}{h_1}\right]^n & , u_d \le \frac{h_2}{t} \\ 1 \quad , & u_d \succ \frac{h_2}{t} \end{cases} \tag{5.7-14}$$

To compute F_{dn}, we select relevant values for h_1, h_2, t, ρ, ρ_p, η, d, and n, then calculate u_d, N_{Re} and C_{sph} implicitly, and then compute F_{dn}. If the value becomes greater than unity, we reset it to unity, because all particles faster than h_2/t are too quick to be caught in the dip tube and are never removed.

5.7.2. Methods

To use F_{dn} to find ρ_p, we note that the effect of the perfectly conducted settling test on the particle size distribution $\Phi(d)$ is merely to convert it into the (renormalized) product of Φ and F_{dn}.

$$\Phi(d)_{after} = \frac{\Phi(d) \cdot F_n(d)}{\int_0^\infty \Phi(x) \cdot F_n(x) dx} \tag{5.7-15}$$

The functional form of F_{dn} with respect to d consists of a smooth rise from zero to one, the latter value reached at $d = f^{-1}(u_d = h_2 t)$, whereupon the curve remains at unity for all succeeding d. The

rise would get sharper if we performed more stripping operations, instead of just 8. In fact, if n were infinite, then F_{dn} would amount to a step change from 0 to 1 at $d = f^{-1}(u_d = h_2 t)$. Regardless, the sharp change in slope should propagate to, and be evident in, the PSD of the post-settled fraction, when compared with the distribution of the original sample. Figure 114 simulates an unnormalized log-normal PSD both before the particles are subjected to a settling test, and after the fractionation.

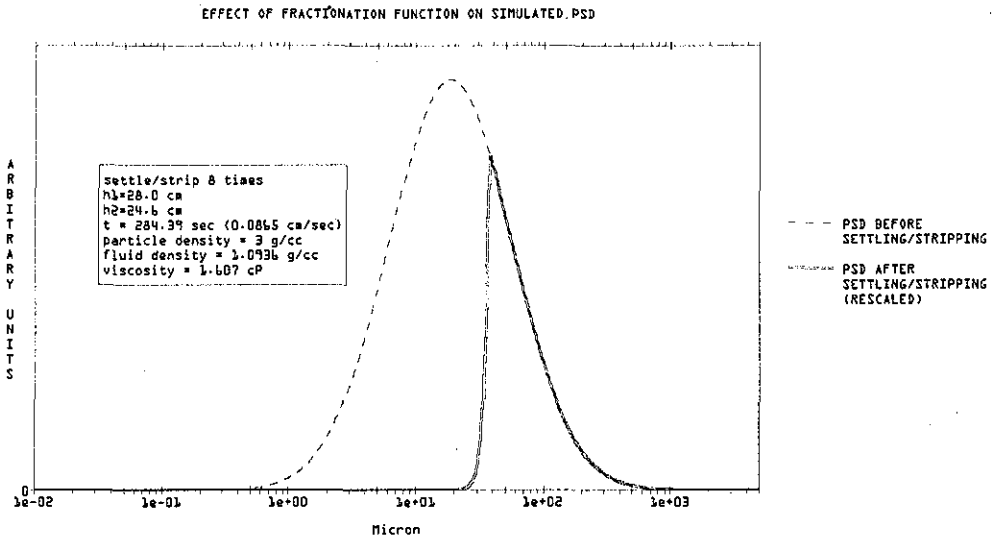


Figure 114. Settling Test Simulation.

The sharp break is the key feature—it identifies the exact diameter having the speed h_2/t. Inserting this diameter into equations 5.7-1 to 5.7-3, we then numerically back-calculate the sought-after value of ρ_p that produces this speed. All we have to do, then, is to compare the PSDs of the sample before and after settling, identify the sharp break, pick off its diameter, and back-calculate ρ_p using parameters appropriate to the test.

If the visual comparison of PSDs before and after settling does not lead to a very satisfying result, another straightforward alternative exists that utilizes the measured volume fractions remaining after the settling operations. Each remaining volume fraction should represent the denominator of equation 5.7-15. So, we can select a representative PSD analysis of the sludge, apply the factor F_{dn} appropriate to the bin midpoint and interval of each tabulated particle size datum, and accumulate the results to compare with the measured volume fraction. (The tabular PSD data is equally spaced on a logarithmic scale, so it is best to work in logarithmic interval values). By trial and error, one can arrive at a value of ρ_p to use in F_{dn} that produces a match between numerical and measured volume fractions.

The sieve test results of Sec. 4.6 also represent tabular particle size data. Consisting of only five sizing bins, these data offer very low resolution compared to the PSD data, but they are the most faithful representation of the actual large-sized particle distributions due to the large, representative, and gently treated samples of the sieve tests. The sieve test data can be processed by the factor F_{dn} too, and the result compared with the settled volume fraction to arrive at an

estimate for ρ_p. The major difficulty with using sieve data comes when the settled volume fraction happens to be less than the >500μm sieve fraction. In that case, the highest bin midpoint of 2750 μm inputted to the F_{dn} function causes it to apply wholly to that highest bin, and the result is an artificially low estimate of ρ_p.

The most sophisticated method to find ρ_p would be to fit the product of the settled distribution and F_{nd} to the native distribution through least squares adjustment of the particle density parameter. However, this demands a higher degree of perfection than has been demonstrated in the settling experiments, the PSD measurements, and the stability of the size distributions themselves towards fragmentation. It will become clear why this technique was not employed.

5.7.3. Results

The known parameters for the settling tests are:

$$\begin{aligned} n &= 8 \\ h_1 &= 0.280\,(m) \\ h_2 &= 0.246\,(m) \\ t &= 284\,(s) \\ \rho &= 1093.6\left(\frac{kg}{m^3}\right) \\ \eta &= 0.001607\,(Pa \cdot s) \end{aligned} \tag{5.7-16}$$

The latter two have been measured at 25°C for the wash liquid reagent (Tingey 2002). The hot cell temperature where the settling tests were conducted is usually in the range 27 ±0.5°C.

Table 56 summarizes the PSDs that were examined and compared, along with the range of critical diameters selected from them for the visual comparison method. There were multiple runs made of multiple aliquots of native (unsettled) PSD determinations for each tank. Each tank's settled fraction sample was run in duplicate to produce two PSDs for comparison. The PSDs are identified by vial number and filename in Appendix F.

Only Tanks AY-101 and C-104 produced settled volume fractions that were larger than their 500 μm sieve retainate mass fractions. Tank C-104 produced two settled volume determinations, and Tank AY-101 produced one meeting this criterion. Settled volume-to-sieve fraction comparisons were used for these to derive estimates of particle densities, and the results are also listed in Table 56.

Table 51. Particle Density Results from Settling Tests.

TANK	PSD ID NUMBERS OF ORIGINAL WASTE	PSD ID NUMBERS OF SETTLED WASTE	d (μm) by VISUAL COMPARISON	ρ_P (g/cm^3) by VISUAL COMPARISON	SETTLED VOLUME FRACTION	ρ_P (g/cm^3) BY VOLUME FRACTION
AW-103	Vial 1424, File AW103733. Vial 1425, File AW103740. Vial 1427, File AW103752. Vial 1670, File AW103956. Vial 1670, File AW103961.	Vial 1344, File AW103972. Vial 1344, File AW103976.	from 25 to 80	from 5.27 to 1.51		
	Vial 1424, File AW103733.				4% average	1.106
	Vial 1670, File AW103961.				4% average	1.112
	Vial 1426, File AW103746. Vial 1669, File AW103946. Vial 1669, File AW103950.	Not credible progenitors of settling results				
AY-101	Vial 1489, File AY101829. Vial 1490, File AY101851. Vial 1491, File AY101862. Vial 1492, File AY101840.	Vial 1326, File AY101988. Vial 1326, File AY101992.	from 30 to 150	from 4.00 to 1.21		
	Vial 1489, File AY101829.				8% average	1.130
	Sieve Test Result				9%	1.110
C-104	Vial 1447, File C104780. Vial 1448, File C104791. Vial 1449, File C104802. Vial 1451, C104815.	Vial 1332, File C104980. Vial 1332, File C104984.	from 25 to 72.6	from 5.27 to 1.60		
	Vial 1447, File C104780.				6.5% average	1.146
	Sieve Test Result				4%	1.114
	Sieve Test Result				9%	1.468
SY-102	Vial 1648 File SY102876	Not a credible progenitor of settling result				
	Vial 1649 File SY102880	Vial 1338 File SY102964 Vial 1338 File SY102968	from 20 to 214	from 7.60 to 1.15	5%	1.133

The general problems with the visual comparison method began with the wide variability in PSD results of the unsettled waste for each tank. Some results could not be credibly viewed as

progenitors of the settled fraction, because they did not indicate the existence of the large particles shown in the settled fraction results. This is probably a result of the observed shifts in size distributions in the particle size analyzers mentioned in previous discussions.

The problems continued with the settled fraction results themselves. Though more reproducible than the results for the original material, they did not in general appear like the crisply cut, high-diameter tails of the legitimate progenitors, as suggested by the theoretical simulation in Figure 114. Instead, the settled results gave evidence of small particle production during the PSD measurement, which naturally must come from the destruction of large particles. It is also possible that the settling process itself reduced the larger sizes, since some evidence was noted during the settling tests that the plunge stirring of the suspensions might have resulted in some size reductions. Other possible reasons for the lack of fidelity in the settled fraction PSDs include imperfections in carrying out the settling timings, the slow damping of stirring currents relative to the settling times, turbulence generated during the fast withdrawals, shape irregularities in the particles and variable particle densities.

Another contributor to the difficulties for three of the tanks was the plain bad luck in choosing a settling velocity that placed the cutoff in the low-population region between population modes. C-104 is less problematical than the others in this regard. If the fall speed had been selected to split the major population mode, for example, the contrast brought about by the fractionation would probably have been far easier to see. However, the main mode consists of small particles, and the main point of this exercise was to estimate the densities of the larger particles, i.e., the ones most difficult to keep suspended.

As a result of these problems, the visual comparison method was unable to pinpoint the critical settling diameters, and could only estimate lower and upper bounds to them. The credible original and settled PSDs were viewed for each tank and a choice was made of the lowest diameter that could reasonably be viewed as the critical settling diameter. The mode of the settled PSD served as the upper bound. Calculations of the range of densities appearing in Table 56 were based on these guesses. The lower bound estimates are probably quite excessive, and they result in excessively high particle density estimates. The particle size analyzer would not even detect even modestly sized particles with densities like these, because it would not reliably suspend them in the dispersant.

Table 56 also includes the results of the volume fraction method of calculating densities using the PSDs for the original waste samples and sieve test results. The representative PSD run or runs are listed for each tank along with the settled fraction runs, the average of two volume fractions listed in Table 45, and the resulting estimate of particle density. The method of settled volume fractions suffers from its own potential problems. It places a premium on accurate PSD results for the largest size classes – usually the most difficult to count. It also demands high stability of the particles towards breakup. Finally, the measurement of volume fraction requires estimating small volumes after a sediment transfer, several rinses and a settling in the Imhoff cone. The determination is probably vulnerable to mechanical losses. It is also not quite proportional to mass due to the smaller particles that were present in the original settled volume having now been stripped away, leaving the larger, less-close-packing, coarse particles to measure. Utilizing the pre-test PSD data and the volume fractions of settled solids resulted in

quite low particle density estimates. The afore-mentioned possibilities of mechanical loss and poor representation of larger particles would contribute to low estimates of density.

Taking the size distributions from the sieve test results instead of the PSDs for comparing the settled volume fractions provides better accuracy for the largest sizes at the expense of resolution. The result is that only three settled volume fractions actually exceeded the sieve mass fraction at the highest bin for any tank, and hence only three useful estimates could be made. Tank C-104 was the best in this regard, since its major sieve fractions were concentrated in the lower bins.

Comparing the small, 0.0865 cm/s settled volume fractions in the settling tests with the larger sieve test mass fractions at high diameters at least qualitatively supports the idea that effective densities are low. Given that the particles in all four tank wastes are expected to be mineral-based with densities of at least 2 g/cm^3 or more, then the low, settling-based particle densities being found suggest that the fast-settling particles are agglomerates in the non-turbulent, free settling state. This seems to be confirmed by the apparent ability of the particle size analyzer to destroy the higher modes of the distributions by increased agitation or circulation, demonstrating that very little shear is required to break them up.

5.8. Sampling and Sizing Large Particles

It is intuitive that to determine the existence of large particles, one requires a large sample size in order to get enough of them to count. The simple formula for estimating the sample size is, (Allen 1997),

$$M_s = \frac{10^3}{2}\frac{\rho}{\sigma^2}\left(\frac{1}{w_l} - 2\right)\left(\frac{d_h^3 + d_l^3}{2}\right) \tag{5.8-1}$$

where M_s (grams) is the mass of sample required, ρ (grams/cm^3) is the sample bulk density, σ is the desired fractional error in determination of the largest size class, w_l is the fractional weight of the largest size class, and d_h and d_l (cm) are the highest and lowest diameters of the largest size class, with the restriction that d_h/d_l be less than 1.414. (We presume the author meant to use a plus sign to compute the mean of the cubes of the diameters in its calculation examples, and not the minus sign shown and actually used in the reference). For a typical tank sludge bulk density of 1.8, a desired error of 0.5, and an estimated fractional weight of 0.05 in the size class 0.05 to 0.0707 cm, one would need to interrogate a 16-gram sample.

Sixteen grams has always been far more than the particle size analyzer can handle, mechanically or radiologically, at 222-S Laboratory. This means that the large particles we now truly believe exist have never been given a decent, reliable chance to be detected on the basis of aliquot size alone. In fact, the only sampling or sizing technique employed in this program that actually came close to meeting the sample size criterion was the sieve tests. Particle size aliquotting had generally been limited by radiological and instrument loading requirements to less than one gram, taken with the use of a pipette having a 2-to-4 mm bore. The PLM (and IA) techniques employed a 2mm-bore pipette to stir and withdraw a drop of dispersant containing solids, and the settling tests used aliquots generally less than 9 grams in order to lessen the effects of hindered

settling. Aliquot size may therefore be a contributor to the variability of replicate particle sizings of the AW-103 composite, for example.

Assuming that information about both small and large particle sizes is still desired for future particle sizing studies, a reasonable, practical compromise to the situation would be to employ the strategy illustrated in Figures 106, 108, 110, and 112 to splice a sieve measurement and a PSD measurement together. It will depend on the assumption that the sludge sample is insoluble in the dispersant or wash liquid to be used, and that adequate amounts of sample and wash liquid are available.

- First, decide on the highest diameter, D, that the particle size analyzer could reasonably be expected to correctly measure, based on its range, ability to suspend the particles properly, and the aliquot size limitations discussed above.

- Second, wet sieve a 16-gram sample with a single sieve (or multiple stack, if the extra resolution was felt necessary) having mesh size D.

- Third, analyze the eluate with the particle size analyzer over the instrument's entire range.

- Fourth, ignore PSD results above D, and weight its results below D by the factor

$$\frac{1-F_{sh}}{F_{pl}} \tag{5.8-2}$$

where F_{sh} is the sieve retained fraction above mesh size D, and F_{pl} is the PSD cumulative undersize fraction below size D.

- Join these rescaled results to the single sieve result (ignoring the PSD results above D) to obtain the correct relative representation of all particles, albeit with reduced resolution above D. The upper bound of the size class above D would have to be fixed by an observation of the very largest particle on the sieve.

For a choice of D in the neighborhood of 100 μm, the above procedure would permit the sizing to be done with adequate amounts of sample (~15 grams) for the largest particles in the hot cell, and reduce the requirement to a practical amount (~1 gram or less) for analysis of the smaller particles.

5.9. Agglomeration Effects

Observations of the sieving tests and later examination of unused sieve fraction samples suggested that most of the largest particles were consolidates of smaller units that could soften and disaggregate on protracted exposure to wash liquid. Although none of the test procedures produced any observations of large-scale solubility of sludge composites when exposed to wash liquid, there was indication in the sieve test samples after protracted storage that minor amounts

of slow solubilization may have been available to help disaggregate the largest particles. On the other hand, the PLM images show some amounts of small particle agglomeration of the tank wastes in the 1M $NaNO_3$, 1M NaOH dispersant, when the samples were analyzed approximately six weeks after sieving. A strong suggestion that small particle agglomeration can occur also comes from the PSD results for sieved fractions less than 53 μm in size. Those PSD results indicate the small particles that passed through the mesh can – given the four-to-six weeks' time between sieving and PSD analysis – reassemble to produce modes approximately 140-200μm in size that are stable even in the strongest agitation used in the 222-S particle size analyzer. This is in spite of the observations that the largest sieved particles are broken down to sizes smaller than 100 μm in the particle size analyzer, while (for C-104, at least), particles that began life between 53 and 106 μm in size remained so.

Time and concentration may indeed provide the explanation for some of these disparate results. The PSD analysis of necessity employs very dilute suspensions of particles, and rates of agglomeration are always depressed in dilute suspensions, because the individual particles don't often encounter each other. Hence, one cannot expect the typical PSD experiment in this program to produce agglomeration *in situ* unless a great deal of time is offered to the dispersion at very gentle shear. On the other hand, a set of samples having been allowed to settle to a compact, concentrated mass in wash liquid and then sit that way for six weeks may very well have engendered agglomerates of the individual particles, but of a size that is still amenable to transport, since the settling test results at qualitatively indicate low effective settling densities.

All this leads one to speculate that recently retrieved, slurried sludge should not be prone to rapid, large-scale agglomeration until well after it has been pumped to its destination, i.e., agglomeration of small particles to large, fast settling ones should not present a pumping problem on, say, a month's time scale.

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6. CONCLUSIONS

The particle size analyzers at 222-S and 325 Laboratories agree sufficiently well with stable, certified wide-dispersion quartz standards certified by sedimentation and sieving methods and with each other to permit conclusions regarding the much larger differences between them for tank waste sludges. The two laboratories measured distribution medians within 27% of the certified median value and within 33% of each other for one standard. For the other standard, they were within 20% of the certified median and within 8% of each other. Some of the variability from the standards lies in the fact that both instruments employ the laser light scattering principle, while the standards were certified using more traditional sieving or free settling methods.

The differences between PSD results for Tank sludges at 222-S and 325 Laboratories can be explained in terms of particle fragility and the levels of agitation at each laboratory to which the sludges are subjected.

Large particles greater than 200 μm in diameter do exist in sludge composites from HLW Tanks AW-103, AY-101, C-104 and SY-102, made from archived core samples. The large-particle washed mass fractions have been measured by sieve techniques, and qualitatively corroborate the PSD results. Mass fractions representing sizes greater than 212 μm were 20% for AW-103 sludge, 10.8% for AY-101 sludge, 4.9% for C-104 sludge and 12.7% for SY-102 sludge. To argue that large particles don't exist in the tanks requires the assumption that these large particles were formed when the archive samples were dried and then broken up for sampling.

The 222-S particle size analyzer with the recirculating tank/cell sample holder can detect and report large particles greater than 200 μm in a sample known to contain them, utilizing sample agitation parameters developed in this work. That the instrument occasionally doesn't detect them must mean that either they were not represented in the sample aliquot or they are too fragile to withstand the necessary agitation. The analyzer has demonstrated that it breaks up large particles while they are being analyzed. Hence, if the analyzer does report large particles, they are actually present.

The techniques of PLM and IA were not useful in corroborating PSD results for the broadly dispersed sludge samples in the present work, in part because the techniques for microscopy sample preparation discriminate against fragile particles larger than 50 μm, and partly because the IA interpretation routines have difficulty distinguishing particles that are touching each other in an image. Techniques more amenable to finding and characterizing large particles could be developed.

Results of this work indicate that the sample sizes and aliquotting techniques presently and previously used at 222-S Laboratory have been inadequate to represent particles greater than 500 μm that have now been found in typical tank archived sludge distributions. The laboratory's sampling and sizing method could be improved by a combination of large-particle wet sieving and small-particle sizing, so long as sufficient quantities of sample and a suitable wash liquid could be found.

As developed for the present work, fast-settling particulate measurement techniques were able to produce semi-quantitative results on fractions of sludges having a designated free-settling speed. The measurements require more development and validation to produce better than qualitative effective particle density estimates.

Sludge sample composites from four HLW tanks possessed particles that freely settle at speeds greater than 0.0865 cm/s. The volume fractions of these particles have been measured. The amounts ranged from 4 to 9 volume percent of washed and settled fraction as compared to the initial washed and settled sludge. The particles' effective settling densities are less than 8 g/cm^3 and greater than 1.11 g/cm^3.

Particle sizing of sludge composites from HLW Tank AZ-102 indicate the existence of significant amounts of particles larger than 200 μm. Three out of four determinations on two out of three aliquots indicated volume percentages of particles larger than 200μm at 13, 46 and 45%.

Particle sizing of sludge composites from HLW Tank AY-102 indicated that they do not contain significant amounts of particles larger than 200 μm. One determination out of four on two separate aliquots gave indicated less than 1 volume percent.

Particle sizing of a sludge composite from HLW Tank C-107, made from core samples that had never been allowed to dry, did not indicate the presence of particles larger than 200 μm.

7. ACKNOWLEDGEMENTS

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A. L. Barnes and the Hot Cells staff kept track of sample generation, usage and load outs.

L. A. Guerra performed hot cell operations to mix and subsample composites.

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J. R. Smith performed hot cell sieve testing, cold testing of settling test apparatus, and hot cell settling tests.

J. K. Watts performed PSD tests.

W. I. Winters provided essential resource allocation planning functions.

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8. REFERENCES

Allen, T., (1990), *Particle Size Measurement*, page 362, Chapman and Hall, New York, New York

Allen, T., (1997), *Particle Size Measurement, Volume 1, Powder Sampling and Particle Size Measurement*, Chapman & Hall, New York, New York, pg. 38-39.

Bechtold, D. B., (2001a), *Composite Samples Required for Waste Particle Properties Analysis*, HNF-8274, Revision 0, Fluor Hanford, Inc., Richland Washington.

Bechtold, D. B., (2001b), *Laboratory Test Plan for WPPA Sieving and Settling Testing of Tank Waste*, HNF-8170, Revision 0, Fluor Hanford Inc., Richland, Washington.

Bell, K. E., (2000), *Final Report For Tank 241-AY-101, Push Mode Core Samples 275, 276, 277, and 278*, HNF-1710, Revision 0, Fluor Hanford Inc., Richland, Washington.

Bunker, B. C., (2000), J. Liu, D. R. Rector, G. L. Graff, P. A. Smith, P. J. Bruinsma, L. Song, X. S. Li, J. D. Virden, N. G. Colton, J. R. Phillips, K. D. Keefer, and J. M. Tingey, *Fractal Colloidal Agglomerates in Nuclear Tank Wastes: Impact on Waste Properties and Processing*, Radioactive Waste Management and Environmental Restoration, Vol. 22, pp. 97-133, Overseas Publishers Association, N.V.

DOE (2001), *River Protection Project - Project Management Plan*, DOE/ORP-2000-06, Revision 2, U. S. Department of Energy, Richland, Washington.

Duncan, J. B., (2001a), Laboratory Notebook WHC-N-313-10, pg. 88 ff.

Duncan, J. B., (2001b), and J. M. Tingey, *Laboratory Test Plan for WPPA Particle Size Testing of Tank Waste*, HNF-7431, Revision 1, Fluor Hanford Inc., Richland, WA.

Fritts, L. L., (1997), *Tank 241-C-104, Cores 162 and 165 Analytical Results for the Final Report*, WHC-SD-WM-DP-211, Revision 1, Rust Federal Services of Hanford, Inc., Richland, Washington.

Herndan, G., (1953) and M. L. Smith, *Small Particle Statistics*, page 471, Elsevier Publishing Company, New York, New York

J. R. Jewett, (2000), and L. Jensen, *Assessment of Available Particle Size Data to Support an Analysis of the Waste Feed Delivery Transfer System*, RPP-6427, Revision.0, CH2M-Hill Hanford Group, Richland, Washington.

Julyk, L. J., (2001), T. C. Oten, and W. L. Willis, *Waste Feed Delivery Transfer System Analysis*, RPP-5346, Revision 1, CH2M Hill Hanford Group, Inc., Richland, Washington.

McKinney, S. G., (2001), and R. Bushaw, *Tank 241-C-107 Cores 287 and 288 Analytical Results for the Final Report*, HNF-7438, Revision 0, Fluor Hanford, Inc., Richland, Washington.

Orme, R. M. (2001), D. J. Geniesse, G. T. MacLean, *Generalized Feed Delivery Descriptions & Tank Specific Flowsheets*, RPP-8218, Revision 0, CH2M Hill Hanford Group, Inc., Richland, Washington.

Perry, R. H, (1984), D. W. Green and J. O. Maloney, Editors, *Perry's Chemical Engineers' Handbook, 6th Edition*, page 5-63, McGraw-Hill Book Company, New York, New York.

Snedecor, G. W., (1980), and W. G. Cochran, *Statistical Methods, 7th edition*, Iowa State University Press, Ames, Iowa.

Steen, F. H., (1998), *Tank 241-SY-102, Cores 211and& 213 Analytical Results for the Final Report*, HNF-SD-WM-267, Revision 0, Waste Management of Hanford, Inc., Richland, Washington.

Steen, F. H., (2000a), *Tank 241-AW-103 Cores 265 and 267 Analytical Results for the Final Report*, HNF-1691, Revision 0, Fluor Hanford, Inc., Richland, Washington.

Steen, F. H., (2000b), *Tank 241-AZ-102, Cores 254, 261, 262 and 268 Analytical Results For The Final Report*, HNF-1697, Revision 0, Fluor Hanford, Inc., Richland, Washington.

Steen, F. H., (2001), *Final Analytical Results For Tank 241-AY-102 Grab and Core Samples*, Letter FH-0100790 (reissued) to J. G. Field, February 15, 2001, Fluor Hanford, Inc., Richland, Washington.

Tingey, J. M., (2002), Letter to J. R. Jewett, "Physical Properties of 1M NaOH/1M $NaNO_3$ Solution," February 28, 2002, Pacific Northwest National Laboratory, Richland, Washington.

Wilson, R., (1980), K. Leschonski, W. Alex, T. Allen, B. Koglin, B. Scarlett, *BCR Information: Certification report on reference materials of defined particle size. Quartz. (BCR No 66, 67, 68, 69, 70)*, EUR 6825 EN, Commission of the European Communities, Luxembourg.

Wilson, R., (1985), and D. Gould, *BCR Information: Reference Materials of Defined Particle Size. Quartz. BCR No. 130-131*, EUR 9769 EN, Commission of the European Communities, Community Bureau of Reference, Luxembourg.

This document was too large to scan as a single document. It has been divided into smaller sections.

Section 2 of

Document Information			
Document #	**HNF-8862**	**Revision**	**0**
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APPENDIX A
COMPOSITE MIXING AND SPLITTING PROCEDURES

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TEST PROCEDURE: MIXING AND SPLITTING REMAINING WPPA COMPOSITE SAMPLES for 222-S LAB

D. B. Bechtold 6/5/01

This constitutes a test procedure instruction to mix and sample the WPPA composites that have been generated under HNF-8274, "Composite Samples Required for Waste Particle Properties Analysis", and to be used by test plans HNF-7431 and HNF-8170.

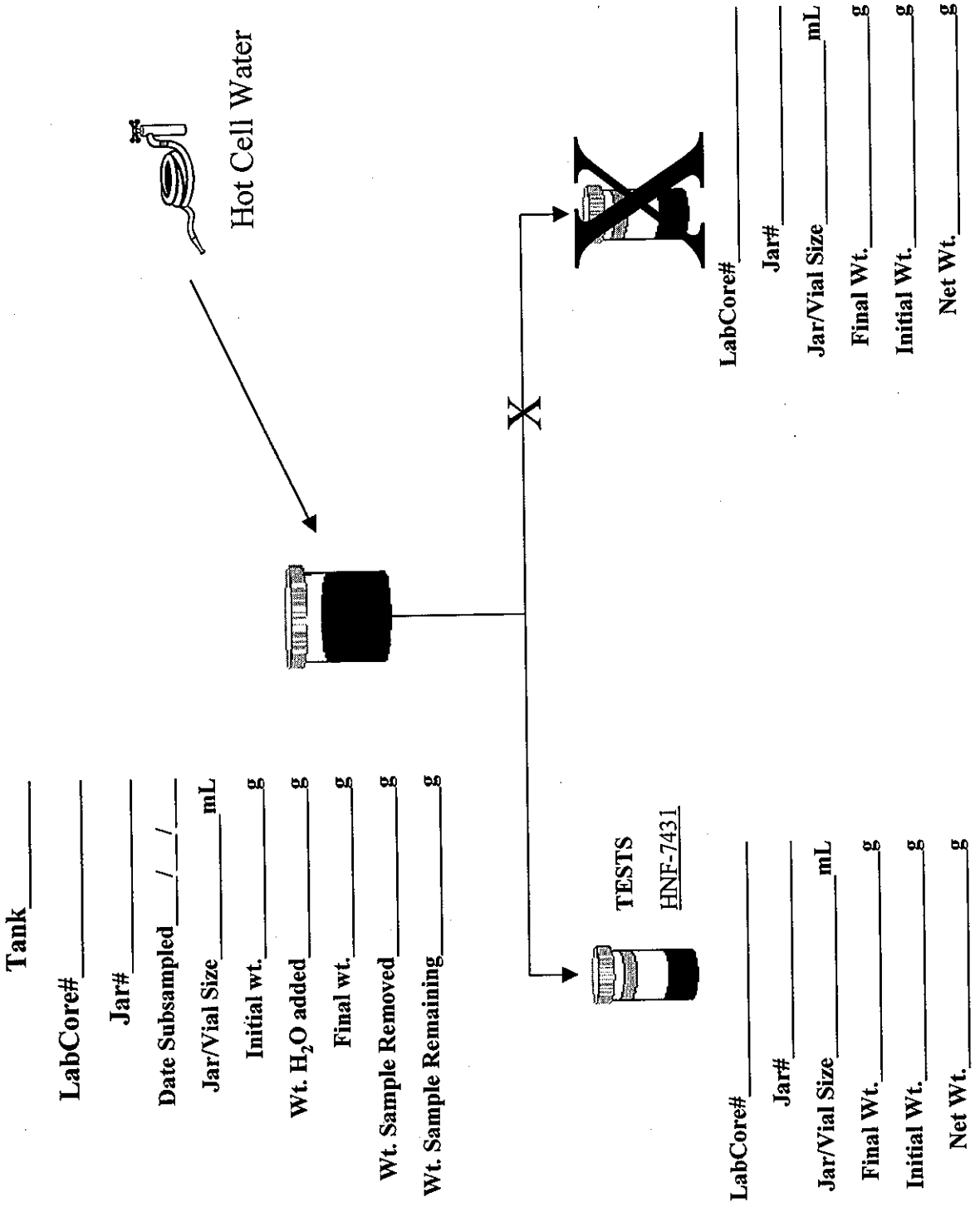
There are no unusual radiological or other safety hazards associated with this procedure. RAD screening will be necessary only if the samples to be removed from 11A hot cells possess a radiation field greater than 50 mRem/hr at 30 cm. Nor are there any unusual waste disposal issues.

Approved: _____

L. L. Lockrem, ~~manager~~Manager, TPM

1. The remaining five composite jars are identified in the table below and are documented in HNF-N-211-1, pg 63, ff.
2. These jars are to be thoroughly mixed with spatulas (no mixers or tissue homogenizer) until smooth and homogeneous--like cake batter--but without compromising the particle size distributions.
3. Weigh in and record just enough water, if needed, to make a smooth mixture. A mixture that separates has too much water.
4. Two samples of net 25 grams each are taken from each mixture into a numbered vial, to be loaded out for 222-S lab.
5. Use the attached subsample worksheet to record the pertinent data and identifications for each composite.
6. Use hot cell loadout sheets to designate the five samples to be loaded out to 222-S for HNF-7431 tests.
7. The remaining composite materials will be used for HNF-8170 tests.

COMPOSITE IDENTIFICATION		
Jar	**Tank**	**LABCORE Number**
18706	AZ-101	S01T001025
18546	SY-102	S01T001027
17184	AZ-102	S01T001023
18545	AY-102	S01T001029
16996	C-107	S01T001021


Tank
LabCore#
Jar#
Date Subsampled / /
Jar/Vial Size mL
Initial wt. g
Wt. H_2O added g
Final wt. g
Wt. Sample Removed g
Wt. Sample Remaining g
Hot Cell Water
TESTS
HNF-7431
LabCore#
Jar#
Jar/Vial Size mL
Final Wt. g
Initial Wt. g
Net Wt. g
LabCore#
Jar#
Jar/Vial Size mL
Final Wt. g
Initial Wt. g
Net Wt. g

TEST PROCEDURE: MIXING AND SPLITTING WPPA COMPOSITE SAMPLES for 222-S AND 325 LABS

D. B. Bechtold 5/30/01

This constitutes a test procedure instruction to mix and sample the WPPA composites that have been generated under HNF-8274, "Composite Samples Required for Waste Particle Properties Analysis", and to be used by test plans HNF-7431 and HNF-8170.

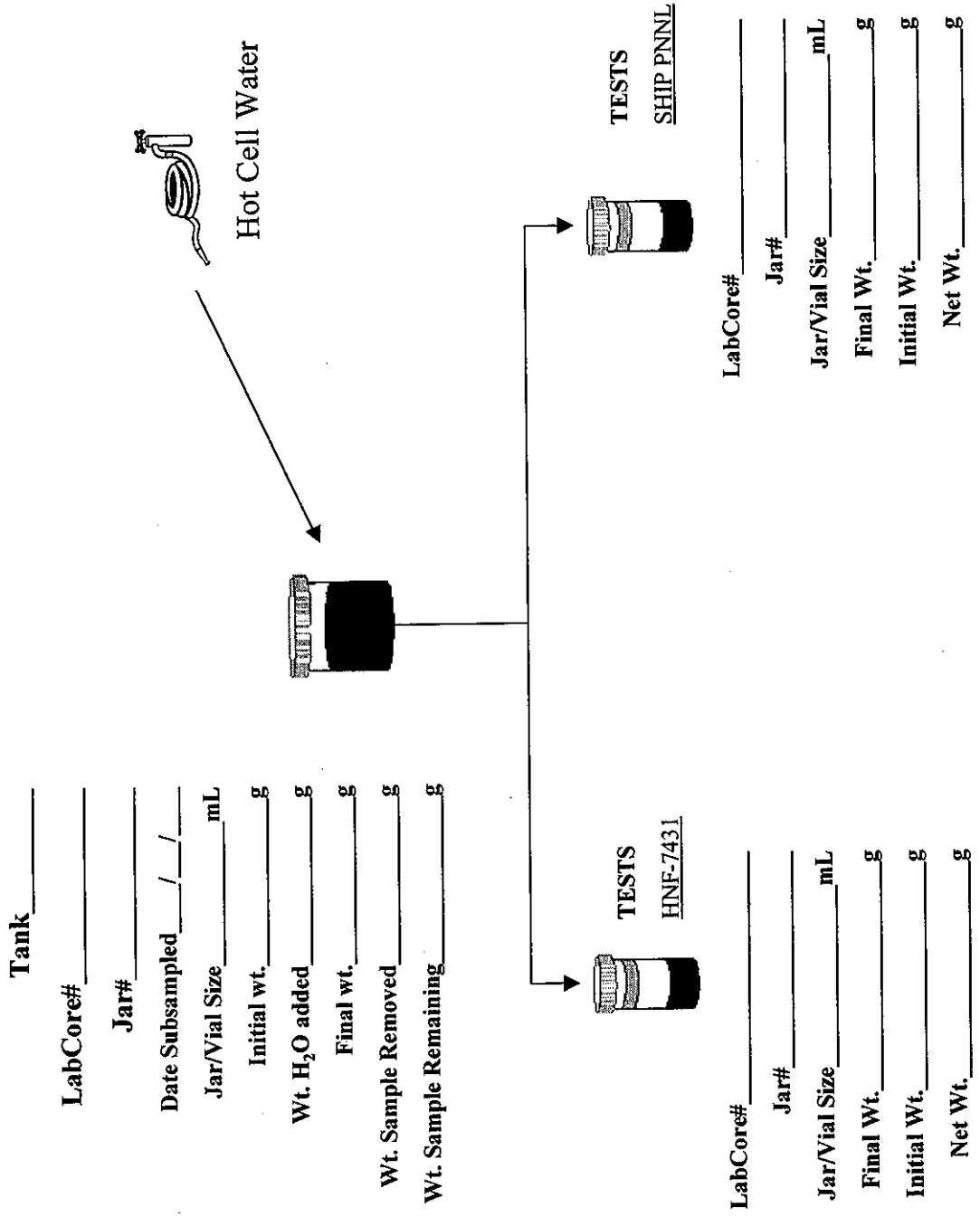
There are no unusual radiological or other safety hazards associated with this procedure. RAD screening will be necessary only if the samples to be removed from 11A hot cells possess a radiation field greater than 50 mRem/hr at 30 cm. Nor are there any unusual waste disposal issues.

Approved: _____

L. L. Lockrem, manager, TPM

8. The three composite jars are identified in the table below and are documented in HNF-N-211-1, pg 63, ff.
9. These jars are to be thoroughly mixed with spatulas (no mixers or tissue homogenizer) until smooth and homogeneous--like cake batter--but without compromising the particle size distributions.
10. Weigh in and record just enough water, if needed, to make a smooth mixture. A mixture that separates has too much water.
11. Two samples of net 25 grams each are taken from each mixture into numbered vials, one for 222-S labs and one to be shipped to PNNL.
12. Use the attached subsample worksheet to record the pertinent data and identifications for each composite.
13. Use hot cell loadout sheets to designate the three samples to be shipped to PNNL and the three samples to be loaded out to 222-S for HNF-7431 tests.
14. The remaining composite materials will be used for HNF-8170 tests.

COMPOSITE IDENTIFICATION		
Jar	**Tank**	**LABCORE Number**
18730	AY-101	
17009	C-104	
16981	AW-103	


Tank
LabCore#
Jar#
Date Subsampled / /
Jar/Vial Size mL
Initial wt. g
Wt. H_2O added g
Final wt. g
Wt. Sample Removed g
Wt. Sample Remaining g
Hot Cell Water
TESTS
HNF-7431
LabCore#
Jar#
Jar/Vial Size mL
Final Wt. g
Initial Wt. g
Net Wt. g
TESTS
SHIP PNNL
LabCore#
Jar#
Jar/Vial Size mL
Final Wt. g
Initial Wt. g
Net Wt. g

APPENDIX B

222-S PARTICLE SIZE DISTRIBUTION MEASUREMENT METHOD AND TEST PROCEDURE

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INSTRUMENTATION

Basics

The Horiba Instruments Inc. (Irvine, CA) LA-910 Laser Scattering Particle Size Distribution Analyzer located in Hood 2 of Room 1F of the 222-S Laboratory was used for all particle size distribution (PSD) measurements reported.

The basic operation of the LA-910 is as follows. A dilute suspension of sample solids (≈ 0.1% by volume solids or less) in a liquid dispersant is prepared and caused to flow through a sample cell fabricated from optical grade glass. Two collimated beams of light (about 1 mm in diameter) are sequentially directed through the sample cell. The first light source, a 1 mW helium-neon laser, produces a beam with a wavelength of 632.8 nm. The second light beam, provided by the filtered and collimated output of a 50 W tungsten-halogen lamp, has an effective wavelength of 450 nm. The angular dispersion and intensity of the scattering pattern created as each light beam interacts with the ensemble of sample particles is recorded by a set of 21 detector elements. These detectors are arrayed so as to measure forward scattering, high-angle forward scattering, side scattering, and back scattering of the incident light beams. Fraunhofer Diffraction and Mie Scattering Theory are then applied to calculate the distribution of diameters of an ensemble of spherical scattering centers that could generate the observed scattering patterns. The recombination of the scattering pattern information from the dual light sources and the calculation of the reported particle size distributions (PSDs) are performed using proprietary vendor algorithms.

Light scattering based particle size measurement devices produce measurement results that are based on the volumes of the particles in the particulate fraction of the measured specimen. All particle diameter representations associated with results presented in this report should be interpreted as the calculated diameters of spherical particles whose volume-related light scattering properties have been measured. The wavelengths of the dual light sources and the spatial arrangement of the detector elements enable the LA-910 to calculate size distributions of sample ensembles containing particles with volume equivalent diameters extending from 0.02 μm to 1020 μm. It should be emphasized that light scattering PSD measurements are an ensemble method; i.e., no specific measurement result should be taken to imply that an actual particle of the reported volume has actually been directly detected and measured.

Instrument Description

A basic description of the components of the flow cell system of the LA-910 analyzer that was used in all reported measurements follows.

Sample Tank. Sample and dispersant liquid are introduced into the analyzer by addition to a stainless steel sample tank with a volume of ≈300 mL. The bottom of the sample tank slopes slightly. The exit port whereby the specimen suspension enters the measurement flow loop is located on the bottom circumference of the tank at its lowest point. The specimen return port is located on the wall of the tank ≈2 cm above the bottom of the tank.

Mechanical Stirrer. A mechanical stirrer is mounted in the sample tank to assist in dispersion and mixing of the sample solids in the specimen suspension. The motor shaft is fitted with a three-bladed stirrer that rotates in a horizontal plane near the bottom of the sample tank. The stirrer speed is adjustable in seven steps, 1 through 7, up to a nominal speed of 1000 rpm. All measurements presented in this report were made with a specimen suspension volume of 160 – 170 mL. At this volume, the maximum speed of the stirrer is limited to a setting of '3' to avoid the excessive sample spattering and potential bubble formation which occurs when the suspension vortex reaches the depth of the spinning stirrer blade.

Ultrasonic Generator. A 40 W, 39 kHz ultrasonic generator is integrated with the sample tank. The power of the ultrasonic treatment is not adjustable. The length of time that the ultrasonic generator is on, whether the ultrasonic generator is on while PSD measurement is active, and, if not, the length of delay between turning the generator off and initiating the PSD measurement are all user selectable parameters.

Circulation Pump. Circulation of the specimen suspension in the LA-910 measurement flow loop is maintained with a peristaltic pump. The pump used during these measurements has three rollers that pinch the pump tubing completely shut at the contact points. The pump speed is adjustable in seven steps, 1 through 7, up to a discharge volume of 17.2 mL/s (with distilled water). Discharge rates at the various pump speed settings were measured and are shown below.

Pump Speed Setting	Circulation Rate mL/s	Turnover Time (s) 170 mL Suspension Volume
1	2.10	81
2	4.35	39
3	7.10	24
4	9.40	18
5	10.60	16
6	14.40	12
7	17.20	10

Flow Cell and Tubing. The LA-910 flow cell is a precision fabricated, rectangular cylinder of Tempax™ glass that is open on the top and bottom ends. The external cell surfaces through which the interrogating light beams pass are highly polished and have an anti-reflection coating. Stainless steel fittings introduce the flowing specimen suspension into the bottom of the cell and

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provide an exit port at the top of the cell. The path length of the analyzer light beams directly through the internal specimen chamber of the cell (i.e. normal to the cell faces) is 3.5 mm. The total internal cell volume is ≈15 mL.

All connections of the flow loop components were made with Tygon® tubing. The tubing segment connected to the sample tank exit port and passing through the peristaltic pump has an internal diameter of 4.9 mm. The tubing segments used for all other connections have an internal diameter of 5.5 mm.

PSD Run Conditions

The PSD measurements for the WPPA study were divided into three general groups: PSD measurements on quartz powder standards to determine appropriate run conditions; PSD measurements on three tank composites (AW-103, AY-101, and C-104) to further evaluate appropriate run conditions; and PSD measurements on additional tank composites (AY-102, AZ-102, SY-102, and C-107) and WPPA test samples with a fixed set of run conditions. The test matrix of run conditions for the first two groups was specified in the project test plan (Duncan 2001) and is presented in the first two of the following three test matrix diagrams.

Each PSD measurement made under a specified set of flow/dispersion conditions is identified as a PSD "Run." A series of PSD runs at different flow/dispersion conditions were made on each analytical specimen. These series of PSD runs are collected into measurement "Sets" for each specimen. In the following test matrix diagrams, each row represents an individual PSD run (or activity such as a "Sample Introduction" or "Sample Drain"). Shading in row cells identifies the flow/dispersion conditions used in each specific PSD run. Within each measurement set, the PSD runs are listed in the exact order in which they were made.

QUARTZ POWDER STANDARDS – RUN CONDITIONS TESTING										
Set	Pump Speed Setting		Stirrer Speed Setting			Ultrasonic Time (min)			Delay Time (min)	
	0	6	0	1	3	0	2	20	0	60
1	SAMPLE INTRODUCTION									
		■		■		■			■	
		■			■	■			■	
		■		■			■		■	
		■			■	■			■	
	SAMPLE DRAIN									

® Tygon is a registered trademark of Norton Company, Worcester, Massachusetts.

AW-103, AY-101, AND C-104 COMPOSITES—RUN CONDITIONS TESTING										
Set	Pump Speed Setting		Stirrer Speed Setting			Ultrasonic Time (min)			Delay Time (min)	
	0	6	0	1	3	0	2	20	0	60
1	SAMPLE INTRODUCTION									
		■		■		■			■	
		■			■	■			■	
		■		■			■		■	
		■			■	■			■	
	■		■			■				■
		■		■		■			■	
		■			■	■			■	
	SAMPLE DRAIN									
2	SAMPLE INTRODUCTION									
		■		■		■			■	
		■			■	■			■	
		■		■				■	■	
		■			■	■			■	
	■		■			■				■
		■		■		■			■	
		■			■	■			■	
	SAMPLE DRAIN									
3	SAMPLE INTRODUCTION									
		■			■	■			■	
		■		■		■			■	
		■			■		■		■	
		■		■		■			■	
	■		■			■				■
		■			■	■			■	
		■		■		■			■	
	SAMPLE DRAIN									
4	SAMPLE INTRODUCTION									
		■			■	■			■	
		■		■		■			■	
		■			■			■	■	
		■		■		■			■	
	■		■			■				■
		■			■	■			■	
		■		■		■			■	
	SAMPLE DRAIN									

PSD measurement results were presented to WPPA clients for evaluation after completion of measurements on the quartz powder standards and again after completion of measurements on the first set of tank waste composites (AW-103, AY-101, and C-104). Based on these evaluations, it was determined that all subsequent measurements on tank waste composites and other WPPA test samples would be made using a fixed measurement set of four PSD runs. The selected flow/dispersion conditions for each of the four runs are shown in the last test matrix diagram.

AY-102, AZ-102, SY-102, AND C-107 COMPOSITES AND WPPA TEST SAMPLES										
Set	Pump Speed Setting		Stirrer Speed Setting			Ultrasonic Time (min)			Delay Time (min)	
	0	6	0	1	3	0	2	20	0	60
1	SAMPLE INTRODUCTION									
		■		■		■			■	
		■			■	■			■	
		■			■		■		■	
		■		■		■			■	
	SAMPLE DRAIN									

All PSD measurements on WPPA test samples were made using 160 to 170 mL of dispersant liquid. The dispersant liquid was an aqueous solution 1M in both NaOH and $NaNO_3$. The dispersant liquid was filtered through 0.45 μm filters prior to use in PSD measurements.

Basic Operational Sequence

The basic sequence of operations followed in performing all PSD measurements presented in this report follow.

1. The value of the Relative Refractive Index file selected within the analyzer software was checked and changed if necessary.

2. A 160 to 170 mL volume of the 1M NaOH/1M $NaNO_3$ solution was added to the sample tank and the peristaltic pump and mechanical stirrer were turned on at settings of 6 and 3 respectively.

3. The alignment of the helium-neon laser beam relative to the forward-scattering detector array was verified and adjusted if necessary.

4. The light scattering pattern of the clean dispersant liquid was observed. If any scattering above the normal background readings was observed, the tank and flow loop were drained and refilled with clean dispersant liquid. This process was repeated until no scattering above background levels was observed.

5. A "Blank" measurement of the background light scattering was made. The LA-910 software automatically subtracts the most recently measured blank scattering pattern from scattering data collected in subsequent PSD measurements.

6. The Pump Speed and Stirrer Speed were adjusted to the settings specified for sample load-in or for the first PSD run.

7. Sample material was added to the sample tank while monitoring the "%-Transmission" of the laser and filtered halogen lamp beams through the flow cell. The %-Transmission values of both sources are set to 100% during the Blank measurement. Sufficient sample solids were added to bring the %-Transmission values within a target range of 70% to 95%.

8. The first PSD run in the measurement set was initiated.

9. After the first PSD run was complete, the data file was named and saved.

10. The PSD Run Conditions (i.e., Pump Speed, Stirrer Speed, and Ultrasonic Time) required for the second PSD run in the measurement set were selected and the second PSD run was initiated.

11. After the second PSD run in the measurement set was complete, the data file was named and saved.

12. The previous two steps were repeated until all required PSD runs in the measurement set had been completed.

13. The LA-910 sample tank and flow loop were drained and then refilled with deionized water. After circulation through the measurement flow loop, the water rinse was drained.

14. The previous water-rinse step was repeated until the light scattering observed had returned to blank levels.

The LA-910 was preset to interrogate the scattered light detectors for 100 cycles during each measurement run. The resulting measurement time for each run was about two minutes plus any time required for ultrasonic treatment. The sample solids were also subjected to the selected flow and dispersion conditions during the time required to name and save data files and set up and initiate the individual runs.

All ultrasonic treatment of the samples was made using the ultrasonic unit integrated with the LA-910 sample tank. The flow and stirring conditions specified in the PSD run listing were maintained for the entire duration of the ultrasonic treatment. The PSD data collection for all PSD runs incorporating ultrasonic treatment was initiated immediately after the treatment had been completed and the generator turned off. The (post-ultrasonic) delay time indicated for all individual PSD runs is, therefore, always "0 minutes."

The test matrix for the Run Conditions Testing on the tank waste composites required a quiescent delay period of 60 minutes duration after the ultrasonic treatment portion of the test

matrix had been completed. This delay period was controlled manually. The sample tank stirrer was turned off during this "Delay Time." The peristaltic pump was operated at its minimum speed (Setting 1) during the delay periods required during the PSD measurements on the initial tank waste composite, AW-103. The pump was turned off during the delay periods in the measurement sets for the remaining two tank composites, AY-101 and C-104, where the delay periods were required.

The post-ultrasonic-treatment delay times accumulated in measurement sets due to the 60-minute quiescent delay periods and/or PSD runs following a run incorporating ultrasonic treatment are captured in the run condition tables preceding the PSD measurement results in Appendix F. The cumulative delay times are also captured in the run conditions headers that precede each PSD histogram in the figures within the body of this report.

REFERENCES

Duncan, J. B., (2001), and J. M. Tingey, *Laboratory Test Plan for WPPA Particle Size Testing of Tank Waste*, HNF-7431, Revision 1, Fluor Hanford Inc., Richland, WA.

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APPENDIX C
SIEVE TEST PROCEDURE

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TEST PROCEDURE: PERFORM WPPA COMPOSITE SIEVE TESTS
D. B. Bechtold 7/16/01

This constitutes a test procedure instruction to perform the WPPA sieve tests on composites that have been generated under HNF-8274, "Composite Samples Required for Waste Particle Properties Analysis", and to be used by test plans HNF-7431 and HNF-8170. The sieve tests are planned in HNF-8170, " Laboratory Test Plan for WPPA Sieving and Settling Testing of Tank Waste", as directed by J. R. Jewett, CHG, 7990-36 Revised SOW "Statement of Work, Waste Physical Properties Analysis", Revision 2.1, July 9, 2001. The approved procedure will reside in controlled laboratory notebook HNF-N-211-1, on or about page 93.

The procedure is conducted entirely in the 11A hot cells, therefore there are no unusual radiological or other safety hazards associated with this procedure. RAD screening will be necessary only if the samples to be removed from 11A hot cells possess a radiation field greater than 50 mRem/hr at 30 cm.

A waste stream consisting of HLW tank solids dispersed in a solution 1M NaOH and 1M $NaNO_3$ will be generated and disposed of down the hot cell drains to the 219-S disposal system. The signatures appearing on the attached waste stream fact sheet indicate concurrence with this test.

Approved: _____ 7/16/01
L. L. Lockrem, manager, TPM

1. SIEVE TESTS

The largest particles are captured on sieves and characterized by microscopic sizing, shaping and appearance of agglomeration before and after sieving.

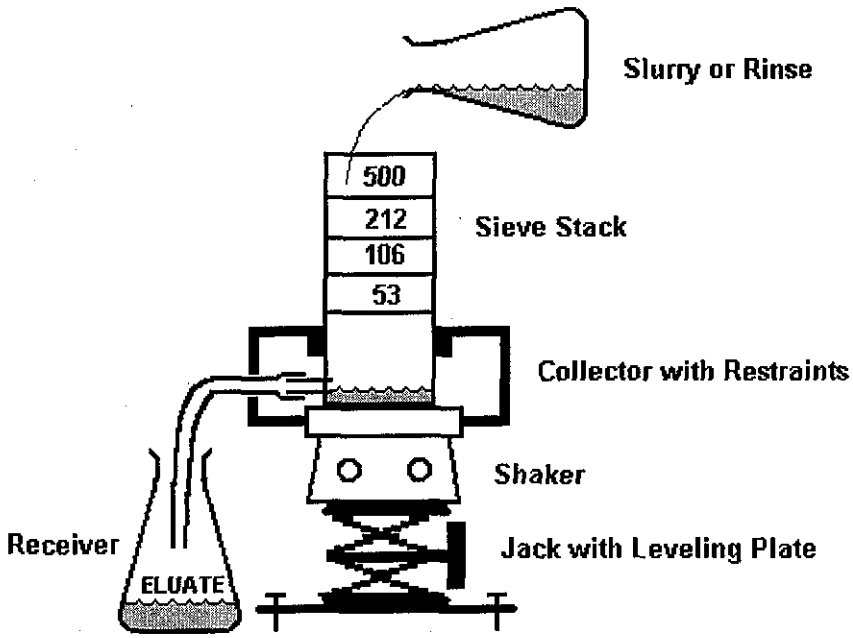
1.1. Procure Sieves --Three-inch diameter.
- 1.1.1. 500 micron #35 Tyler 32.
- 1.1.2. 210 micron #70 Tyler 65.
- 1.1.3. 105 micron #140 Tyler 150.
- 1.1.4. 53 micron #270 Tyler 270.

1.2. *Obtain 5 pre-numbered 20mL vials for each tank composite to be sieved.*

1.3. Record all work on data sheets to be attached to controlled laboratory notebook HNF-N-211-1.

1.4. Get the identity of the composite sample to be sieved from the cognizant scientist. It will be one in which the pre-sieved PSD, PLM and Image Analysis (IA) analyses are or will be available.

1.5. Perform Sieve Tests on a wet-but-drained weight basis.
- 1.5.1. In the hot cell, tare and record each of the 4 sieves wetted and shaken free of excess wash liquid.
- 1.5.2. Stack the sieves in increasing order of size, largest on top, over the collector on the shaker (see drawing) and apply the restraints.
- 1.5.3. Arrange the receiver, labeled "ELUATE", and tube to capture the eluate collected from the sieve stack.
- 1.5.4. Weigh and record a suitable portion of settled sludge into a dilution/mixing jar, flask



or bottle.

- 1.5.5. Stir in enough wash liquid (an aqueous solution 1M in $NaNO_3$ and 1M in NaOH) to dissolve and dilute the sludge to render the remaining solids easily passable through the sieve stack.

1.5.6. Turn on the shaker.

1.5.7. Rinse the remaining solids onto the sieve stack with wash liquid.

1.5.8. Wash the solids with agitation through the stack and into the receiver. BE CAREFUL not to add liquid so fast that a sieve will overflow--this will lose slurry before it passes through the lower sieves.

1.5.9. Repeat the steps 1.5.3 through 1.5.7 above from weighing to washing until an adequate amount of washed solids has built up on the sieves to demonstrate where at least 95% of the solids are fractionating and have enough of those fractions to weigh and sample for PLM, IA and PSD.

1.5.10. Turn off the shaker.

1.5.11. Allow to drain and shake loose the excess wash liquid from each sieve.

1.5.12. Reweigh and record each sieve to determine the fraction of total net initial sludge weights retained on the sieves, and by difference, the fraction dissolved or not otherwise retained.

1.5.13. Repeat washing and reweighing until reasonably constant sieve weights are achieved.

1.5.14. For each fraction (including the unretained fraction)>5% of the original sample, collect the retained solids into a numbered vial for PSD, PLM and IA. The unretained fraction may need to settled and decanted in order to obtain an adequate sample of solids.

1.5.15. Record the vial number and sieve size or receiver origin of each retained solids sample.

1.5.16. Record any pertinent observations on each sieve fraction.

1.5.17. Clean up the sieves collector and tubing with water.

1.5.18. Transfer the remaining receiver contents to drain immediately to prepare for the next tank sample.

Compatibility Review

Compatibility, in this case, means that two or more substances can be mixed with no adverse effects occurring over an extended period. Incompatibility means contact of two or more substances could result in an explosion, an unexpected rapid evolution of gases or the emission of substances that are highly toxic and/or flammable.

PROCEDURE NUMBER: HNF-8170, Test Procedure HNF-N-214-1 (93)

CHEMICALS OF CONCERN IN ANALYSIS/WASTE STREAM (WHERE REACTIVITY/CONCENTRATION POSE A POTENTIAL COMPATIBILITY ISSUE)

	MAXIMUM CONCENTRATION
NaOH	1M aqueous
$NaNO_3$	1M aqueous

COMPATIBILITY HAZARDS, INCLUDING SPECIAL STORAGE REQUIREMENTS, POSSIBLE REACTIONS, AND RESULTS OF MIXING INCOMPATIBLE WASTE STREAMS:

Solution is alkaline (pH>12) and corrosive. Mixture with strong acids may cause boiling or bumping.

RECOMMENDED WASTE STREAMS:

1 aqueous, alkaline waste

CONTAINER(S) MATERIAL: Plastic or glass

REFERENCE DOCUMENTS USED IN COMPATIBILITY STUDY:

Sax, et al, Dangerous Properties of Industrial Materials, 7th ed.

[signature] 7/17/01 Preparer/Date

[signature] 7/17/01 Reviewer/Date

222-S LABORATORY
DEVELOPMENTAL METHOD WASTE STREAM FACT SHEET

CONSTITUENTS OF WASTE GENERATED	CAS NUMBER OR MSDS NUMBER	APPROXIMATE WEIGHT %
Reagent Water	7732-18-5	88%
1M Sodium Nitrate	7757-79-1	8%
1M Sodium Hydroxide	1310-73-2	4%
Waste Codes: D002 A 7-17-01	Waste Class: Corrosive, A 7-17-01 pH 7-12	
Disposal: Cubicle Drain to 219-S	Waste Container: None	
Comments: No waste Stream Label Required. Waste generated from this test will ~~be disposed~~ trmkted down cubicle Hot Cell drains		
Intended Use: Test Plan HNF-8170, Tests HNF-N-211-1 (93)		
Approvals - print name, sign, and date		
Authored By D. B. Bechtold	[signature] 7/16/01	
Environmental Compliance Officer (or delegate) Lucinda Borneman	Lucinda Borneman 7/17/01	

Waste Stream Labeling Requirements: (Waste Stream type, container type, waste codes, and disposal criteria are required.) Waste class is optional. The label is considered to be an example label, but contains the required information for waste stream identification. Other hazardous waste labeling requirements may apply.

DEVELOPMENTAL METHOD WASTE STREAM LABEL

Waste Stream Type: Label not needed. Disposal is direct to Hot Cell drain
Waste Container:
Waste Codes:
Waste Class:
Disposal Criteria: Immediately upon test completion.

☐ **Mark if waste has NOT been in contact with Tank Farm waste.**

Procedure No.	Rev-Mod	Developmental Method No.	Waste Stream Type	Waste Stream No.	Page No.
HNF-8170	0	HNF-N-211-1 (93)	aqueous	1 of 1	1 of 1

222-S LABORATORY
DEVELOPMENTAL METHOD WASTE STREAM FACT SHEET

NAME CONSTITUENTS OF WASTE PRODUCED	CAS NUMBER OR MSDS NUMBER	APPROXIMATE WEIGHT %
Reagent Water	7732-18-5	88%
1M Sodium Nitrate	7757-79-1	8%
1M Sodium Hydroxide	1310-73-2	4%

Waste Codes: D002, F001-F005	Waste Class: Corrosive, pH 7/12.5
Disposal: Cubicle Drain to 219-S	Waste Container: None

Comments: No waste Stream Label Required. Waste generated from this test will be disposed, through down cubicle Hot Cell drains

Intended Use: Test Plan HNF-8170, Tests HNF-N-211-1 (93)

	Approval, print name, sign, and date
Authored By O. B. Bechtold	7/16/01
Environmental Compliance Officer (or delegate)	G. Jay Warwick 7/27/01

3/28/01

Waste Stream Labeling Requirements: (Waste Stream type, container type, waste codes, and disposal criteria are required.) Waste class is optional. The label is considered to be an example label, but contains the required information for waste stream identification. Other hazardous waste labeling requirements may apply.

DEVELOPMENTAL METHOD WASTE STREAM LABEL

Waste Stream Type: Label not
Waste Container: needed. Disposal
Waste Codes: is direct to Hot
Waste Class: Cell drain
Disposal Criteria: Immediately upon test completion.

☐ **Mark if waste has NOT been in contact with Tank Farm waste.**

Procedure No.	Rev-Mod	Developmental Method No.	Waste Stream Type	Waste Stream No.	Page No.
HNF-8170	0	HNF-N-211-1 (93)	aqueous	1 of 1	1 of 1

APPENDIX D
SETTLING TEST PROCEDURE

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TEST PROCEDURE: PERFORM WPPA COMPOSITE SETTLING TESTS

D. B. Bechtold 7/26/01

This constitutes a test procedure instruction to perform the WPPA settling tests on composites that have been generated under HNF-8274, "Composite Samples Required for Waste Particle Properties Analysis", and to be used by test plans HNF-7431 and HNF-8170. The settling tests are planned as "Fractional Extraction Sedimentation (FES) tests" in HNF-8170, " Laboratory Test Plan for WPPA Sieving and Settling Testing of Tank Waste", as directed by J. R. Jewett, CHG, 7990-36 Revised SOW "Statement of Work, Waste Physical Properties Analysis", Revision 2.1, July 9, 2001. The approved procedure will reside in controlled laboratory notebook HNF-N-211-1, on or after page 100.

The procedure is conducted entirely in the 11A hot cells, therefore there are no unusual radiological or other safety hazards associated with this procedure. RAD screening will be necessary only if the samples to be removed from 11A hot cells possess a radiation field greater than 50 mRem/hr at 30 cm.

A waste stream consisting of HLW tank solids dispersed in a solution 1M NaOH and 1M $NaNO_3$ will be generated and disposed of down the hot cell drains to the 219-S disposal system. The signatures appearing on the attached waste stream fact sheet indicate concurrence with this test.

Approved: _____

L. L. Lockrem, manager, TPM

1. FRACTIONAL EXTRACTION SEDIMENTATION (FES) TESTS

An aliquot of solids is stirred up in wash liquid to approximately 1 volume % and stripped of it's slower-settling particles to leave its faster-settling particles by first, timed settling over a known distance; then decanting, remixing and repeating until most of the slower-settling particles are removed. This is done for three settling times corresponding to three settling rates.

1.1. Procure and prepare a sedimentation pipet (Allen, 1990, and *loc. cit.*, see Figure 1 this plan) and ancillary equipment. Essential features are:

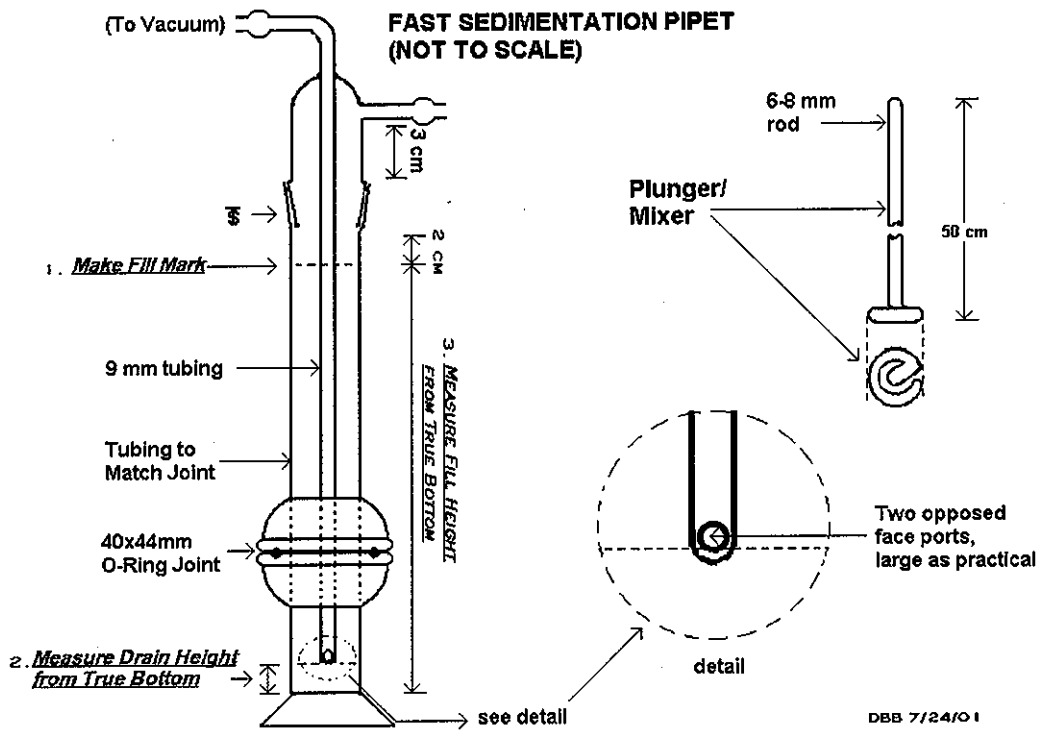

Figure 1 Fast Sedimentation Pipet

1.1.1. an internal diameter of ~40mm.uniform cylindrical container with a fill level gradation mark at a known height above the inside pipet bottom,

1.1.2. an integral decantation siphon that can remove all but the bottom 10% of the internal volume, at a known drain height from the inside pipet bottom.

1.1.3. a separate plunger/mixer.

1.1.4. a vacuum flask, pump and stopcock to rapidly apply siphoning vacuum.

1.1.5. the capability to be operated in a hot cell.

1.2. Determine, record and mark the relevant geometries of the pipet:

1.2.1. At a place 2 cm below the bottom edge of the ground glass joint, place an indelible circumferential fill mark around the outside of the vessel. Use plastic tape, the upper edge of which will represent the fill mark

1.2.2. Measure and record the drain height as the distance from the true bottom of the inside of the pipet to the lower edge of the siphon ports (see Figure 1). This will require a narrow ruler with a flush-zero scale that can fit and stand inside the pipet. Write the drain height indelibly on a label on the pipet base.

1.2.3. Measure and record the ~~fill height~~ of the pipet as the distance from the inside bottom of the pipet to the fill mark. This will require a narrow ruler with a flush-zero scale that can fit and stand inside the pipet. Write the drain height indelibly on the fill mark tape.

1.2.4. Calculate and record the ~~settle distance~~ as (fill height)-(drain height).

1.2.5. Calculate and record the ~~fill volume~~ of the pipet as $(4.1)^2\pi/4$x(fill height) in cubic centimeters. The sample aliquot volume will be approximately 1% of this fill volume.

1.3. Perform the following three-test series at least twice (on as many separate aliquots of sample). Each series can be repeated more times if needed to generate two sufficient sample amounts for post-test analyses. However post-settling analyses are unnecessary if the settled volume fraction is less than 15% of the initial settled volume of the aliquot.

1.4. Perform the following settling tests at up to three settling rates of interest according to the following sequence, using up to three aliquots of material. The post-settling tests may be omitted if the settled fraction is less than 15% of the original (Imhoff cone) settled aliquot volume.

1.4.1. Settle and fractionally decant an aliquot timed to remove particles falling more slowly than 0.0865 cm/sec.

1.4.2. If <15% settled, no more settling tests are necessary.

1.4.3. If >15% settled, then retain the sediment for analysis and continue.

1.4.4. Settle and fractionally decant another aliquot timed to remove particles falling more slowly than 0.375 cm/sec.

1.4.5. If <15% settled, then settle and fractionally decant another aliquot timed to remove particles falling more slowly than 0.25 cm/sec and retain the sediment for analysis.

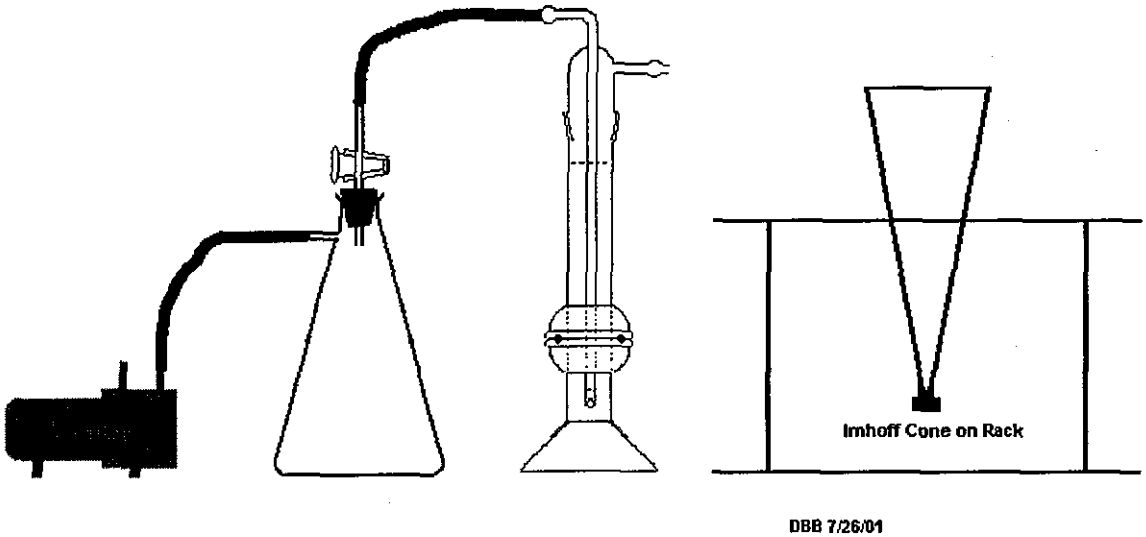

Figure 2 Siphon Vacuum Arrangement and Imhoff Cone.

1.5. Calculate and record the target settling time of interest as (Settle Height)/(Settling Rate).

1.6. Slurry approximately 1 volume % of the fill volume of sample in wash liquid, in a suitable slurry flask or vessel.

1.7. Rinse the slurry with wash liquid into an Imhoff cone to measure the initial settled volume of the sample. Record the observation of layers, if any appear. Add additional slurry if necessary to make 1%. *(Some solids may dissolve).*

1.8. Rinse the slurry into the pipet.

1.9. Set the pipet plumb upright.

1.10. Add wash liquid to the fill mark.

1.11. Do not insert the siphon yet. Rather, attach the siphon to the vacuum stopcock, flask and pump.

1.12. Close the vacuum stopcock.

1.13. Turn on the pump to apply and maintain full vacuum to the vacuum flask.

1.14. Thoroughly mix the contents of the pipet to homogenize the slurry, using the plunger mixer.

1.15. Immediately start timing the settling soon as the plunger is removed.

1.16. Immediately insert the siphon all the way so the ground glass joint seats.

1.17. At the predetermined settling time calculated to represent the settling rate of interest, immediately apply vacuum to the siphon by opening the vacuum stopcock to rapidly pipet away the top fraction of fluid volume to the vacuum flask.

1.18. Turn off the vacuum.

1.19. Discard the fraction collected in the vacuum flask

1.20. Remove the siphon from the pipet.

1.21. Refill the pipet to the fill mark with clean wash liquid.

1.22. Repeat the mixing, timed settling, pipetting and refilling six more times.

1.23. Repeat the mixing, timed settling and pipetting one last time.

1.24. When the 8-fold settlings and decantations are complete, disassemble the pipet at the o-ring joint to access the sediment at the bottom.

1.25. Rinse the remaining slurry at the bottom of the sedimentation vessel into the Imhoff cone for measurement of volume and calculation of volume fraction =100% x [volume]/[initial volume].

1.26. If the volume fraction is greater than 15%, then rinse the fraction into a numbered vial per the worksheet to loadout and transport for PSD, PLM and Image Analysis (IA) tests.

1.27. Record any pertinent observations of the properties of the sediment sampled.

1.28. Proceed with the next series as applicable.

Compatibility Review

Compatibility, in this case, means that two or more substances can be mixed with no adverse effects occurring over an extended period. Incompatibility means contact of two or more substances could result in an explosion, an unexpected rapid evolution of gases or the emission of substances that are highly toxic and/or flammable.

PROCEDURE NUMBER: HNF-8170, Test Procedure HNF-N-211-1 (100)

CHEMICALS OF CONCERN IN ANALYSIS/WASTE STREAM (WHERE REACTIVITY/CONCENTRATION POSE A POTENTIAL COMPATIBILITY ISSUE) — **MAXIMUM CONCENTRATION**

NaOH	1 M aqueous
$NaNO_3$	1 M aqueous

COMPATIBILITY HAZARDS, INCLUDING SPECIAL STORAGE REQUIREMENTS, POSSIBLE REACTIONS, AND RESULTS OF MIXING INCOMPATIBLE WASTE STREAMS:

Solution is alkaline (pH > 12) and corrosive. Mixture with strong acids may cause boiling or bumping.

RECOMMENDED WASTE STREAMS:

1 aqueous, alkaline waste.

CONTAINER(S) MATERIAL: Plastic or glass.

REFERENCE DOCUMENTS USED IN COMPATIBILITY STUDY:

Sax, et al., Dangerous Properties of Industrial Materials, 7th ed.

[signature] 7/25/01 Preparer/Date

JC Perm 7/25/01 Reviewer/Date

222-S LABORATORY
DEVELOPMENTAL METHOD WASTE STREAM FACT SHEET

CONSTITUENTS OF WASTE GENERATED	CAS NUMBER OR MSDS NUMBER	APPROXIMATE WEIGHT %
Reagent water	7732-18-5	88%
1M Sodium Nitrate	7757-79-1	8%
1M Sodium Hydroxide	1310-73-2	4%
Foxl-Foos		

Waste Codes: D002 AH 7-26-01	Waste Class: Corrosive, pH >12.5 AH 7-26-01
Disposal: Cubicle Drain to 219-S	Waste Container: None
Comments: No waste stream label required. Waste generated from this test will be transferred down the Hot Cell cubicle drains.	
Intended Use: Test Plan HNF-8170, Tests HNF-N-211-1 (100)	
Approvals - print name, sign, and date	
Authored By D.B. Bechtold	7/25/01
Environmental Compliance Officer (or delegate)	

7/26/01

Waste Stream Labeling Requirements: (Waste Stream type, container type, waste codes, and disposal criteria are required.) Waste class is optional. *The label is considered to be an example label, but contains the required information for waste stream identification.* Other hazardous waste labeling requirements may apply.

DEVELOPMENTAL METHOD WASTE STREAM LABEL

Waste Stream Type: Label not
Waste Container: needed, Disposal
Waste Codes: is direct to Hot
Waste Class: cell drain immediately
Disposal Criteria: upon test completion.

See Comments AH 7-26-01

☐ **Mark if waste has NOT been in contact with Tank Farm waste.**

Procedure No.	Rev-Mod	Developmental Method No.	Waste Stream Type	Waste Stream No.	Page No.
HNF-8170	0	HNF-N-211-1 (100)	aqueous	1 of 1	1 of 1

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APPENDIX E
SAMPLE COMPOSITE DATA

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TANK AW-103 COMPOSITE DATA 1
TANK AY-101 COMPOSITE DATA 2
TANK AY-102 COMPOSITE DATA 3
TANK AZ-102 COMPOSITE DATA 4
TANK C-104 COMPOSITE DATA 5
TANK C-107 COMPOSITE DATA 6
TANK SY-102 COMPOSITE DATA 7

EXPLANATION OF TABLES

In this appendix is a table for each of the high level waste tank composites that were actually used to develop the results in HNF-8862. The tank composites actually used are from:

AW-103 – The composite was made from six archived samples.

AY-101 – The composite was made from six archived samples.

AY-102 – The composite was made from three archived samples.

AZ-102 – The composite was made from two archived samples.

C-104 –The composite was made from five archived samples.

C-107 – The composite was made from ten current samples less than 6 months old.

SY-102 – The composite was made from four archived samples.

The tables are all organized in the same way. The upper half of each table lists the data taken as each tank composite was assembled from its respective sample jars, while the bottom half is devoted to data taken on the resulting composite itself. A blank table cell indicates that the particular datum was unavailable or did not exist.

TABLE COLUMNS

The first column of each table identifies the particular sample or compsite datum. The subsequent columns are each devoted to a specific sample jar in the upper table half, or the composite itself in the lower table half.

TABLE ROWS

The row headings are explained as follows.

sample group id – The LABCORE group identification number of the tank archives.

sample id -- The LABCORE archive or sample identification number assigned to the archive component jar, generated when the archive was first made.

recomposite id -- The additional LABCORE sample identification number assigned to the archive or sample component jar, generated to track the sample's present usage.

core number -- The tank sample core number, if applicable, whence the archive or sample came (The AZ-101 archives used were from grab samples, not core samples).

segment number -- The tank sample core segment number, if applicable, whence the archive or sample came (The AZ-101 archives used were from grab samples, not core samples).

sample jar number -- The identification number on the archive or sample jar.

sample jar size -- The volume. (mL) and or type of the archive or sample jar.

sample contents description -- The observations of the archive or sample jar contents.

sample initial grams -- The gross weight (grams) of the archive or sample jar before anything is removed.

sample final grams -- The re-gross weight (grams) of the archive or sample jar after the component quantity was transferred out to the composite. Emptied jars are not weighed and are indicated by "depleted".

net grams out of sample -- The net weight (grams) of material, determined by subtraction, taken from the archive or sample jar to use in building the composite. If unavailable, the term "#VALUE" is displayed.

grams to composite -- The net weight (grams) gained by the composite jar when the material removed from the archive or sample jar was placed in the composite jar.

composite group id – The LABCORE group identification number of the composite.

composite id – The LABCORE sample number assigned to the composite.

composite jar number – The identification number on the composite jar.

composite jar size (mL) – The volume (mL) and type of the composite jar.

composite final grams – The final gross weight (grams) of the composite jar after all archive or sample component materials have been transferred into it.

composite initial grams – The tare weight (grams) of the empty composite jar.

composite net grams – The net weight (grams) of material in the composite jar, determined by subtraction.

check net grams – The sum of the **grams to composite** net weights (grams) transferred to the composite jar from the various archive or sample component jars. The difference between this and the **composite net grams** value represents the variability of weighing in the hot cell and/or small amounts of mechanical losses.

grams before H_2O addition – The re-gross weight (grams) of the composite jar before water is added to or removed from the contents for rehydration and homogenization.

grams after H_2O addition – The re-gross weight (grams) of the composite jar after water is added to or removed from the contents for rehydration and homogenization.

net grams H_2O added – The net weight (grams) of water added to the composite from several addition and mixing operations to achieve a desired consistency. this may represent evaporative and mechanical losses.

composite net grams with H_2O – The final net weight (grams) of wetted, mixed composite after several water addition and mixing operations. It may represent evaporation and mechanical losses due to mixing.

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TANK AW-103 COMPOSITE DATA

AW-103 COMPOSITE ASSEMBLY DATA						
	1st Archive Jar	2nd Archive Jar	3rd Archive Jar	4th Archive Jar	5th Archive Jar	6th Archive Jar
archive group id						
archive id	S99T001491	S99T001492	S99T001494	S99T001495	S99T001493	S99T001496
recomposite id	S01T001306	S01T001307	S01T001308	S01T001309	S01T001310	S01T001311
core number	265	265	265	265	265	265
segment number	5	6	8	9	7	10
archive jar number	14922	15487	15490	15496	15497	17060
archive jar size (mL)	125	125	125	125	125	60
archive contents description	white, chalky, hard, crumbly, break up with screwdriver	white, sl. sticky, almost gooey, stir with spatula	dirty white, stiff, cream, stir with spatula	dirty white, stirs up to very wet cream	yellow-white, stirs up stiff, sticky	dark brown with white crumbs, stirs up wet
archive initial grams	169.455	201.818	276.387	252.820	218.785	138.732
archive final grams	144.120	173.980	248.500	225.457	192.107	112.886
net grams out of archive	25.335	27.838	27.887	27.363	26.678	25.846
grams to composite	25.077	25.073	25.047	25.059	25.169	25.116
AW-103 COMPOSITE RESULTS DATA						
composite group id	20010163					
composite id	S01T001018					
composite jar number	16981					
composite jar size (mL)	250					
composite final grams	368.278					
composite initial grams	217.768					
composite net grams	150.510					
check net grams	150.541					
grams before H2O addition	367.875					
grams after H2O addition	375.904					
net grams H2O added	16.237					
composite net grams with H2O	158.136					

TANK AY-101 COMPOSITE DATA

AY-101 COMPOSITE ASSEMBLY DATA						
	1st Archive Jar	2nd Archive Jar	3rd Archive Jar	4th Archive Jar	5th Archive Jar	6th Archive Jar
archive group id	20000024	20000024	20000024	20000024	20000024	20000024
archive id	S00T000581	S00T000585	S00T000590	S00T000668	S00T000673	S00T000678
recomposite id	*S01T001236*	*S01T001237*	*S01T001239*	S01T001240	S01T001240	S01T001241
core number	275	275	275	277	277	277
segment number	2UH	2LH	3UH	2UH	2LH	3WS
archive jar number	18303	16992	17013	15946	15951	15952
archive jar size (mL)						
archive contents description	dried, cracked *break up with* screwdriver, pestle	dry, cracked, but sticky	dark brown, *crumbly,* breakup with screwdriver	*dark, sticky,* wet, stir with spatula	dark, gooey, stiff, mix with *spatula,* some gelatinous behavior	*dark brown, dry,* breaks up into powder
archive initial grams	152.282	318.832	414.803	324.544	374.476	346.093
archive final grams	depleted	283.363	344.397	286.260	337.952	275.626
net grams out of archive	#VALUE!	35.469	70.406	38.284	36.524	70.467
grams to composite	31.175	35.038	70.042	35.193	34.931	70.017
AY-101 COMPOSITE RESULTS DATA						
composite group id	20010162					
composite id	S01T001015					
composite jar number	18730					
composite jar size (mL)	tall 500					
composite final grams	566.408					
composite initial grams	290.194					
composite net grams	276.214					
check net grams	276.396					
grams before H2O addition	566.372					
grams after H2O addition	619.211					
net grams H2O added	53.233					
composite net grams with H2O	329.017					

TANK AY-102 COMPOSITE DATA

AY-102 COMPOSITE ASSEMBLY DATA			
	1st Archive Jar	Second Archive Jar	Third Archive Jar
archive group id			
archive id	S01T000151	S01T000152	S01T000154
recomposite id	S01T001248	S01T001249	S01T001250
core number	281	281	281
segment number	10	11	12
archive jar number	18683	18685	18687
archive jar size (mL)	tall 125	tall 125	tall 125
archive contents description	dark, dry sticky crumbs; a small, narrow white piece; break up with screwdriver	dark, sticky crumbs; chop up with spatula	dark, sticky crumbs; break up with screwdriver
archive initial grams	174.681	162.025	198.358
archive final grams	122.676	124.281	135.312
net grams out of archive	52.005	37.744	63.046
grams to composite	50.061	37.960	62.138
AY-102 COMPOSITE RESULTS DATA			
composite group id	20010168		
composite id	S01T001029		
composite jar number	18545		
composite jar size (mL)	250		
composite final grams	374.125		
composite initial grams	224.002		
composite net grams	150.123		
check net grams	150.159		
grams before H2O addition	374.015		
grams after H2O addition	407.382		
net grams H2O added	37.165		
composite net grams with H2O	183.380		

TANK AZ-102 COMPOSITE DATA

AZ-102 COMPOSITE ASSEMBLY DATA		
	1st Archive Jar	2nd Archive Jar
archive group id		
archive id	S98T003166	S98T003165
recomposite id	S01T001234	S01T001235
core number	254	254
segment number	16	17
archive jar number	15430	15610
archive jar size (mL)	500	60
archive contents description	dark, dry chunks, break up with pestle	dark, dry crumbs
archive initial grams	324.258	93.079
archive final grams	313.669	89.405
net grams out of archive	10.589	3.674
grams to composite	10.154	3.597
AZ-102 COMPOSITE RESULTS DATA		
composite group id	20010165	
composite id	S01T001023	
composite jar number	17184	
composite jar size (mL)	60	
composite final grams	100.214	
composite initial grams	86.427	
composite net grams	13.787	
check net grams	13.751	
grams before H2O addition	100.367	
grams after H2O addition	112.218	
net grams H2O added	12.316	
composite net grams with H2O	25.791	

TANK C-104 COMPOSITE DATA

C-104 COMPOSITE ASSEMBLY DATA					
	1st Archive Jar	2nd Archive Jar	3rd Archive Jar	4th Archive Jar	5th Archive Jar
archive group id					
archive id	S96T004844	S96T004372	S96T004882	S96T004849	S96T004887
recomposite id	S01T001255	S01T001256	S01T001303	S01T001304	S01T001305
core number	162	165	165	162	165
segment number	1	2	3	4	6
archive jar number	11350	10968	11357	11356	11366
archive jar size (mL)	*60*	*60*	*60*	*60*	*60*
archive contents description	dark, semisoft, stirred mat'l is gooey	Dry, breakup to crumbs with screwdriver	lt. brown paste, easy to stir, wet, white and brown components	light, dry, crummy, breakup to powder with screwdriver	lt. brown, wet, creamy, stirs with spatula
archive initial grams	128.471	113.857	139.380	140.333	151.617
archive final grams	104.115	depleted	101.882	109.613	119.988
net grams out of archive	24.356	#VALUE!	37.498	30.720	31.629
grams to composite	30.016	24.309	36.112	30.030	30.064
C-104 COMPOSITE RESULTS DATA					
composite group id	20010160				
composite id	S01T001012				
composite jar number	17009				
composite jar size *(mL)*	*250*				
composite final grams	368.320				
composite initial grams	218.017				
composite net grams	150.303				
check net grams	150.531				
grams before H2O addition	367.904				
grams after H2O addition	390.130				
net grams H2O added	27.799				
composite net grams with H2O	172.113				

TANK C-107 COMPOSITE DATA

C-107 COMPOSITE ASSEMBLY DATA										
	1st Sample Vial	2nd Sample Vial	3rd Sample Vial	4th Sample Vial	5th Sample Vial	6th Sample Vial	7th Sample Vial	8th Sample Vial	9th Sample Vial	10th Sample Vial
sample group id										
sample id	S01T000336	S01T000350	S01T000351	S01T000353	S01T000355	S01T000375	S01T000376	S01T000458	S01T000456	S01T000459
recomposite id										
core number	287	287	287	287	287	288	288	288	288	288
segment number	1, upper half	2, upper half	3, upper half	4 repeat, upper half	5 repeat, upper half	1, upper half	2, upper half	3; 2nd repeat, upper half	4, 2nd repeat, upper half	5, repeat, upper half
sample jar number										
sample jar size (mL)										
sample contents description	wet	wet	wet	wet	wet	wet	wet	wet	wet	wet
sample initial grams										
sample final grams										
net grams out of sample										
grams to composite										
C-107 COMPOSITE RESULTS DATA										
composite group id										
composite id	S01T001673									
composite jar number										
composite jar size (mL)										
composite final grams										
composite initial grams										
composite net grams										
check net grams										
grams before H2O addition										
grams after H2O addition										
net grams H2O added										
composite net grams with H2O										

TANK SY-102 COMPOSITE DATA

SY-102 COMPOSITE ASSEMBLY DATA				
	1st Archive Jar	2nd Archive Jar	3rd Archive Jar	4th Archive Jar
archive group id				
archive id	S97T001914	S97T001915	S97T001926	S97T001931
recomposite id	S01T001251	S01T001252	S01T001253	S01T001254
core number	211	211	211	211
segment number	11RL	11RU	12L	12U
archive jar number	13081	13082	13083	13084
archive jar size (mL)	60	60	60	60
archive contents description	dark, dry crumbs	dark liquid, stirred to runny liquid	dark, wet paste	dark liquid with goop on bottom, stirs to uniform
archive initial grams	95.699	136.015	160.699	190.199
archive final grams	depleted	90.663	110.462	139.513
net grams out of archive	7.735	45.352	50.237	50.686
grams to composite	7.201	44.543	49.394	49.156
SY-102 COMPOSITE RESULTS DATA				
composite group id	20010167			
composite id	S01T001027			
composite jar number	18546			
composite jar size (mL)	250			
composite final grams	381.584			
composite initial grams	231.321			
composite net grams	150.263			
check net grams	150.294			
grams before H2O addition	381.522			
grams after H2O addition	381.261			
net grams H2O added	0.000			
composite net grams with H2O	149.940			

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APPENDIX F

222-S PARTICLE SIZE DISTRIBUTION MEASUREMENT RESULTS

Consisting of 662 pages including this cover page

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APPENDIX F-1

PSD PARAMETRIC STUDY: QUARTZ POWDER STANDARD BCR-67

Consisting of 21 pages including this cover page

HNF-8862, Rev. 0

COMMISSION OF THE EUROPEAN COMMUNITIES

COMMUNITY BUREAU OF REFERENCE - BCR -

CERTIFIED REFERENCE MATERIAL

CERTIFICATE OF MEASUREMENT

BCR No 67 N°. 1448

QUARTZ

Certified Cumulative Particle Size Distribution, Q_3

Stokes diameter (1) x_{st} µm	Mass fraction of particles undersize (2) Q_3 g/100 g	Uncertainty (2) $S_R(Q_3)$ g/100 g	Number of data points (2) N
2.40	1.2	0.7	19
3.40	2.5	1.0	33
4.00	2.9	1.7	25
5.70	12.2	3.9	40
8.00	30.8	5.0	39
11.30	57.2	4.3	40
16.00	84.2	2.1	40
22.60	97.5	1.6	40
32.00	99.1	1.2	40

(1) *The Stokes diameter, x_{st}, is defined by the equation*

$$x_{st} = \left(\frac{18\,\eta\,h}{(\rho_s - \rho_f)\,g\,t} \right)^{1/2}$$

in which h is the vertical distance through which the particles fall in time t and g is the standard acceleration of free fall. The equation is fully described in Appendix 2 of the Certification Report. If SI base units are used on the right hand side of this equation, x_{st} is given in metres. For sedimentation data obtained at 20 °C on a 0,1 mass per cent aqueous solution of tetra sodium pyrophosphate decahydrate ($Na_4P_2O_7.10H_2O$), values of 999 kg.m^{-3} were used for the density, ρ_f, and 0.1005 x 10^{-2}N.s.m^{-2} for the viscosity, η, of the sedimentation fluid. A value of 2646 kg.m^{-3} was used for the density, ρ_s, of this sample of quartz, and a value of 9,807 m.s^{-2} was used for g.

(2) *The mass fraction of particles undersize, Q_3, and the associated overall uncertainty, $S_R(Q_3)$, were calculated as described in section 6.2 of the Certification Report for N data points from five laboratories. $S_R(Q_3)$ is indicative of the precision of the measurements at the five participating laboratories and the homogeneity of material with respect to particle size distribution.*

Brussels, November 6th, 1979

BCR
for certified true copy

F-6

DESCRIPTION OF THE SAMPLE

Each sample consists of approximately 10 g of quartz powder obtained by subdividing a bulk quantity of the material with the aid of a rotating riffle.

Results of chemical analyses are summarised below. In each case, relative mass loss is expressed in terms of $mg.g^{-1}$ of the material as received without pretreatment by the analyst. The « relative mass loss in hydrofluoric acid » was determined after successive treatment until the constant quoted value was obtained.

Relative mass loss after 24 hours at			Relative mass loss in HF	Relative mass of			
100 °C $mg.g^{-1}$	500 °C $mg.g^{-1}$	1000 °C $mg.g^{-1}$	$mg.g^{-1}$	Fe $mg.g^{-1}$	Ti $mg.g^{-1}$	Na $mg.g^{-1}$	Ca $mg.g^{-1}$
0	1.1	2.5	996	0.6	0.28	0.08	0.7

INSTRUCTIONS FOR USE

Detailed recommendations on the use of this RM are given in the Certification Report (Section 7).
If compatible with the measurement technique, the total sample should be used. If further subdivision is necessary, a rotating riffle is recommended for the abstraction of sub-samples down to ca 1 g from the supplied 10 g samples. For the abstraction of even smaller sub-samples the 1 g representative sub-sample should be made into a paste by adding a dispersant solution consisting of 0.1 mass per cent of tetra sodium pyrophosphate decahydrate in distilled water. The paste should be mixed well but gently before abstracting the required quantity.

Reproduction of the certified results is most likely if the detailed methodology used for certification described in Appendix 2 of the Certification Report is closely adhered to; deviations from these results are possible if other methods are used. However BCR No 67 may be used to check and/or calibrate apparatuses that measure Stokes diameter in the range covered by this reference material.

PARTICIPATING LABORATORIES

— The University of Bradford, Bradford (United Kingdom).
— Technische Universität Clausthal, Clausthal-Zellerfeld (Federal Republic of Germany).
— Universität Karlsruhe, Karlsruhe (Federal Republic of Germany).
— The University of Technology, Loughborough (United Kingdom).
— The National Physical Laboratory, Teddington (United Kingdom).

METHOD USED

The sample is certified with respect to the cumulative distribution by mass of the Stokes diameters of the particles as measured by sedimentation analysis in the gravity field (Pipette Method). Full details are given in the Certification Report (Appendix 2).

LEGAL NOTICE

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CERTIFICATION REPORT

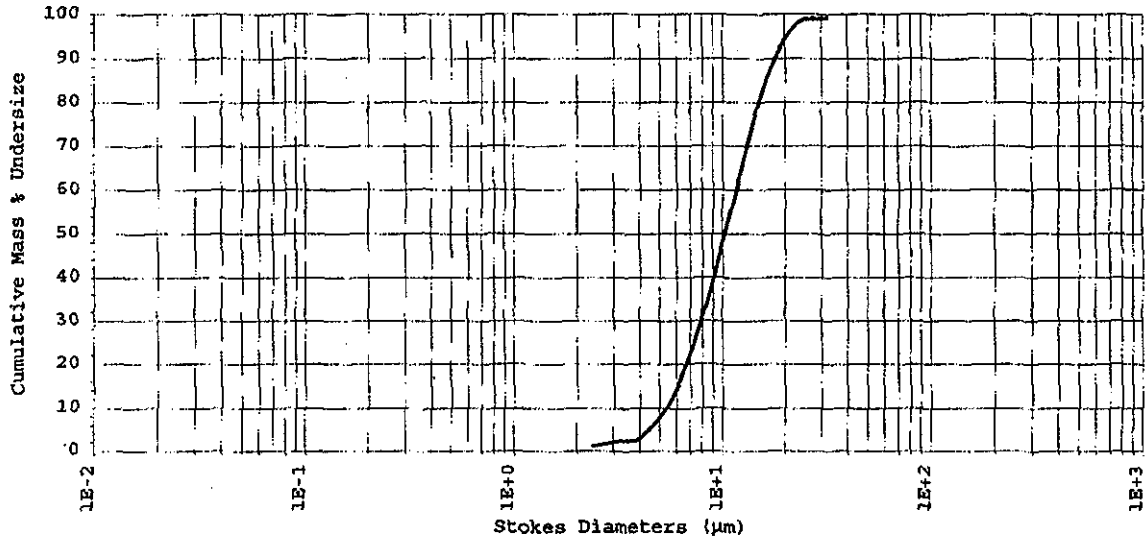
A Certification Report giving details of the certification procedures, of the methodology and of the data has been published (EUR 6825, 1980) and is available from the Community Bureau of Reference.

Rue de la Loi 200, B-1049 Brussels — Telephone 735 00 40/735 80 40 ext. 5014 — Telegraphic address « COMEUR Brussels » — Telex : 21 877 COMEU B »

CERTIFIED REFERENCE MATERIAL

Sample:	**BCR No 67**
Material:	Quartz Powder - Nominal Size Range 3 - 20 µm
Source:	Commission of the European Communities: Community Bureau of Reference - BCR -
Lot:	Bottle # 1448

Estimated -	Distribution Mean:	16.97	µm
	Standard Deviation:	7.42	µm
	Distribution Median:	10.3	µm



Certified Cumulative Particle Size Distribution

Stokes Diameter µm	Mass Fraction Undersize g/100g	Uncertainty g/100g
2.40	1.20	0.7
3.40	2.50	1.0
4.00	2.90	1.7
5.70	12.20	3.9
8.00	30.80	5.0
11.30	57.20	4.3
16.00	84.20	2.1
22.60	97.50	1.6
32.00	99.10	1.2

TABLE F-1. Sample identification and PSD run conditions. 3 - 20 μm quartz powder standard, BCR-67, Set 1 and Set 2.

Conditions Key: P = Pump Speed Setting; P6 = 14.4 mL/s
S = Stirrer Speed Setting (1-7); S1 = Stirrer Speed 1; S3 = Stirrer Speed 3
US = Ultrasonic ON Time (min.); DT = Delay Time (min) between end of ultrasonic treatment and PSD measurement.

Sample	PSD Run File Name	Run Conditions				Run Initiated At	Cumulative Time (min) At Conditions				
		P	S	US	DT		P6	S1	S3	US	DT
SET 1	[LOAD-IN]	6	1	0	0		?	?			
	BC67668	6	1	0	0	13:42	4	4			
	BC67669	6	3	0	0	13:46	7	4	3		
	BC67670	6	1	2	0	13:49	12	9	3	2	0
	BC67671	6	3	0	0	13:54	15	9	6	2	3
						13:57					
SET 2	[LOAD-IN]	6	1	0	0		?	?			
	BC67673	6	1	0	0	14:50	3	3			
	BC67674	6	3	0	0	14:53	7	3	4		
	BC67675	6	1	2	0	14:57	12	8	4	2	0
	BC67676	6	3	0	0	15:02	14	8	6	2	3
						15:04					

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for Windows(TM) Ver.1.20j Aug/01/'01 07:58

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010731-668 13:45
Filename : BC67668
Sample : BCR 67

Material : 3-20 um Quartz
Source : CEC/BCR
Lot Numbe : Bottle 1448 / Jar 67-3

Condition
T%(He-Ne): 61.3% Dist.Form: Std. Sampling times : 100
(LAMP): 72.0% R.R.Index: 1.14-0.001 ( )

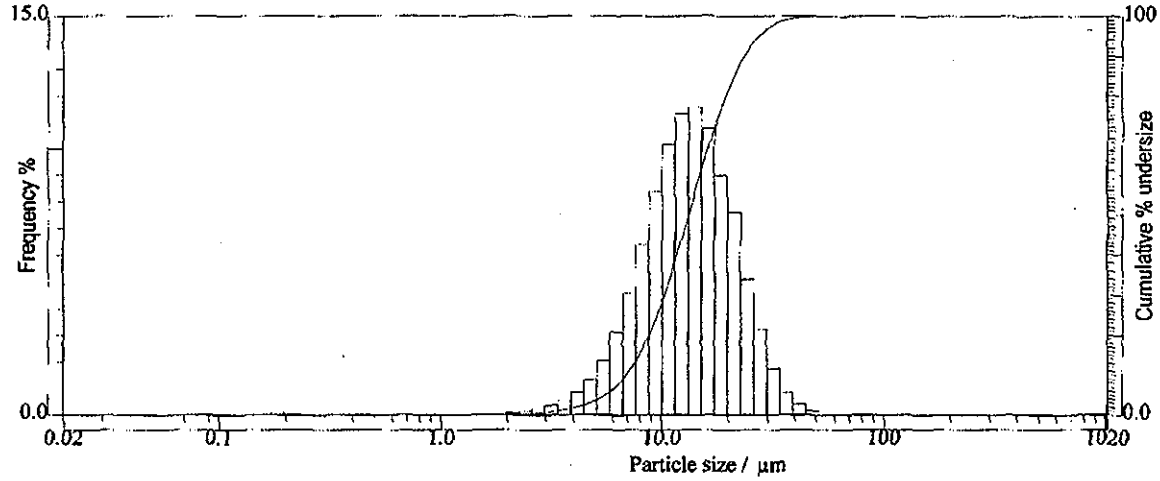
Agitation : 1 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 13.301μm SP.Area : 5562cm²/cm³ S.D. : 6.898μm
Mode : 14.129μm Mean : 14.520μm
C.V. : 47.50%

Span : (D 10.0-D 90.0) / D50 = 1.260

Dia. on %(5.0%) : 5.580μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 9.585μm % on Dia.(1.000μm) : 0.1%
Dia. on %(50.0%) : 13.301μm % on Dia.(10.000μm) : 27.6%
Dia. on %(75.0%) : 18.193μm % on Dia.(100.000μm) : 100.0%
Dia. on %(95.0%) : 27.663μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	5.09	93.62	0.669	0.00	0.10
890.1	0.00	100.00	22.80	7.59	88.53	0.584	0.00	0.10
777.1	0.00	100.00	19.90	8.98	80.94	0.510	0.00	0.10
678.5	0.00	100.00	17.38	10.74	71.97	0.445	0.00	0.10
592.4	0.00	100.00	15.17	11.58	61.23	0.389	0.00	0.10
517.2	0.00	100.00	13.25	11.31	49.65	0.339	0.00	0.10
451.6	0.00	100.00	11.56	10.14	38.34	0.296	0.00	0.10
394.2	0.00	100.00	10.10	8.37	28.21	0.259	0.00	0.10
344.2	0.00	100.00	8.816	6.37	19.83	0.226	0.00	0.10
300.5	0.00	100.00	7.697	4.57	13.46	0.197	0.10	0.10
262.4	0.00	100.00	6.720	3.14	8.89	0.172	0.00	0.00
229.1	0.00	100.00	5.867	2.04	5.75	0.150	0.00	0.00
200.0	0.00	100.00	5.122	1.31	3.71	0.131	0.00	0.00
174.6	0.00	100.00	4.472	0.85	2.40	0.115	0.00	0.00
152.5	0.00	100.00	3.905	0.56	1.55	0.100	0.00	0.00
133.1	0.00	100.00	3.409	0.37	0.99	0.087	0.00	0.00
116.2	0.00	100.00	2.976	0.25	0.62	0.076	0.00	0.00
101.5	0.00	100.00	2.599	0.16	0.38	0.067	0.00	0.00
88.58	0.00	100.00	2.269	0.11	0.21	0.058	0.00	0.00
77.34	0.00	100.00	1.981	0.00	0.10	0.051	0.00	0.00
67.52	0.00	100.00	1.729	0.00	0.10	0.044	0.00	0.00
58.95	0.00	100.00	1.510	0.00	0.10	0.039	0.00	0.00
51.47	0.18	100.00	1.318	0.00	0.10	0.034	0.00	0.00
44.94	0.40	99.82	1.151	0.00	0.10	0.029	0.00	0.00
39.23	0.84	99.43	1.005	0.00	0.10	0.026	0.00	0.00
34.25	1.72	98.59	0.877	0.00	0.10	0.022	0.00	0.00
29.91	3.25	96.87	0.766	0.00	0.10			

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PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/01/01
File Name: BC67668.DAT Sample Name: BCR 67 ID No: 01/07/31-668
Dist. Form: STANDARD R.R. Index: 114-000
Dist. Mode: VOLUME Laser: 61.323 % Lamp: 72.036 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: 3-20 um Quartz Source: CEC/BCR
Lot No: Bottle 1448 / Jar 67-3 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.196	0.10	0.10	(15)	14.136	5.00	55.00
(2)	3.417	0.90	1.00	(16)	14.967	5.00	60.00
(3)	4.406	1.30	2.30	(17)	15.946	5.00	65.00
(4)	5.592	2.70	5.00	(18)	16.973	5.00	70.00
(5)	6.956	5.00	10.00	(19)	18.231	5.00	75.00
(6)	7.967	5.00	15.00	(20)	19.638	5.00	80.00
(7)	8.107	0.80	15.80	(21)	21.145	4.20	84.20
(8)	8.841	4.20	20.00	(22)	21.451	0.80	85.00
(9)	9.606	5.00	25.00	(23)	23.754	5.00	90.00
(10)	10.357	5.00	30.00	(24)	27.726	5.00	95.00
(11)	11.081	5.00	35.00	(25)	32.009	2.70	97.70
(12)	11.811	5.00	40.00	(26)	36.696	1.30	99.00
(13)	12.555	5.00	45.00	(27)	47.741	0.90	99.90
(14)	13.304	5.00	50.00				

Median : 13.301 (μm) Mean: 14.520 (μm) Mode: 14.176 (μm)
Std. Dev.: 6.898 (μm) Span: 0.712
Coef. Var: 47.50% Spec. Area: 5562 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Aug/01/'01 07:59

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010731-669 13:49
Filename : BC67669
Sample : BCR 67

Material : 3-20 um Quartz
Source : CEC/BCR
Lot Numbe : Bottle 1448 / Jar 67-3

Condition
T%(He-Ne): 61.4% Dist.Form: Std. Sampling times : 100
(LAMP): 72.1% R.R.Index: 1.14-0.001 ( )

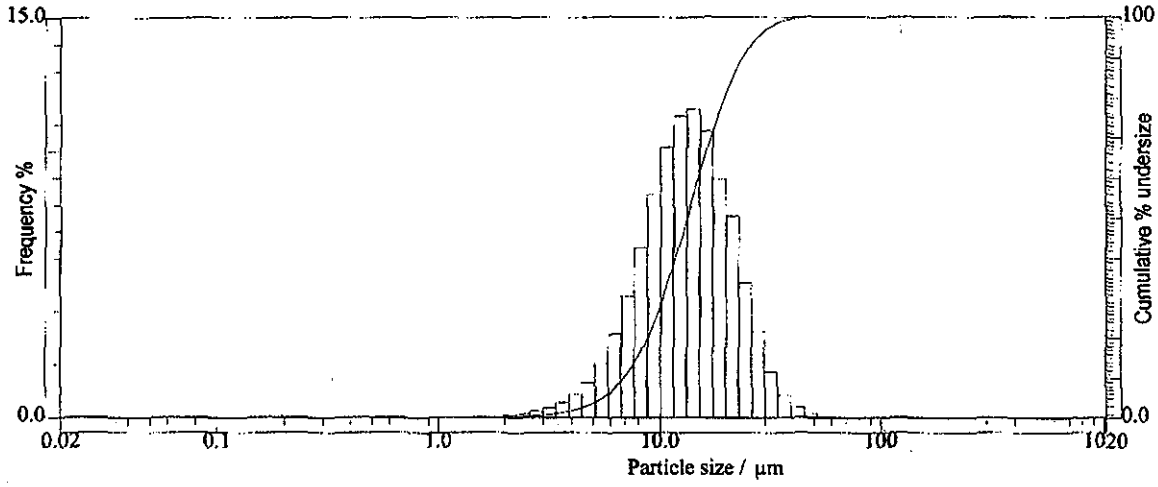
Agitation : 3 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 13.293µm SP.Area : 5587cm²/cm³ S.D. : 6.899µm
Mode : 14.128µm Mean : 14.513µm
C.V. : 47.53%

Span : (D 10.0-D 90.0) / D50 = 1.261

Dia. on %(5.0%) : 5.574µm % on Dia.(0.100µm) : 0.0%
Dia. on %(25.0%) : 9.579µm % on Dia.(1.000µm) : 0.1%
Dia. on %(50.0%) : 13.293µm % on Dia.(10.000µm) : 27.7%
Dia. on %(75.0%) : 18.184µm % on Dia.(100.000µm) : 100.0%
Dia. on %(95.0%) : 27.658µm % on Dia.(1000.000µm) : 100.0%



Size(µm)	Freq(%)	Und(%)	Size(µm)	Freq(%)	Und(%)	Size(µm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	5.08	93.62	0.669	0.00	0.11
890.1	0.00	100.00	22.80	7.58	88.55	0.584	0.00	0.11
777.1	0.00	100.00	19.90	8.97	80.97	0.510	0.00	0.11
678.5	0.00	100.00	17.38	10.73	72.00	0.445	0.00	0.11
592.4	0.00	100.00	15.17	11.57	61.27	0.389	0.00	0.11
517.2	0.00	100.00	13.25	11.31	49.70	0.339	0.00	0.11
451.6	0.00	100.00	11.56	10.14	38.39	0.296	0.00	0.11
394.2	0.00	100.00	10.10	8.38	28.25	0.259	0.00	0.11
344.2	0.00	100.00	8.816	6.38	19.87	0.226	0.00	0.11
300.5	0.00	100.00	7.697	4.57	13.49	0.197	0.11	0.11
262.4	0.00	100.00	6.720	3.15	8.92	0.172	0.00	0.00
229.1	0.00	100.00	5.867	2.05	5.77	0.150	0.00	0.00
200.0	0.00	100.00	5.122	1.32	3.73	0.131	0.00	0.00
174.6	0.00	100.00	4.472	0.85	2.41	0.115	0.00	0.00
152.5	0.00	100.00	3.905	0.56	1.56	0.100	0.00	0.00
133.1	0.00	100.00	3.409	0.37	1.00	0.087	0.00	0.00
116.2	0.00	100.00	2.976	0.25	0.63	0.076	0.00	0.00
101.5	0.00	100.00	2.599	0.16	0.38	0.067	0.00	0.00
88.58	0.00	100.00	2.269	0.11	0.22	0.058	0.00	0.00
77.34	0.00	100.00	1.981	0.00	0.11	0.051	0.00	0.00
67.52	0.00	100.00	1.729	0.00	0.11	0.044	0.00	0.00
58.95	0.00	100.00	1.510	0.00	0.11	0.039	0.00	0.00
51.47	0.18	100.00	1.318	0.00	0.11	0.034	0.00	0.00
44.94	0.40	99.82	1.151	0.00	0.11	0.029	0.00	0.00
39.23	0.84	99.43	1.005	0.00	0.11	0.026	0.00	0.00
34.25	1.72	98.59	0.877	0.00	0.11	0.022	0.00	0.00
29.91	3.25	96.87	0.766	0.00	0.11			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/01/01
File Name: BC67669.DAT Sample Name: BCR 67 ID No: 01/07/31-669
Dist. Form: STANDARD R.R. Index: 114-000
Dist. Mode: VOLUME Laser: 61.359 % Lamp: 72.053 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: 3-20 um Quartz Source: CEC/BCR
Lot No: Bottle 1448 / Jar 67-3 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.195	0.10	0.10	(15)	14.128	5.00	55.00
(2)	3.409	0.90	1.00	(16)	14.960	5.00	60.00
(3)	4.399	1.30	2.30	(17)	15.938	5.00	65.00
(4)	5.586	2.70	5.00	(18)	16.966	5.00	70.00
(5)	6.951	5.00	10.00	(19)	18.222	5.00	75.00
(6)	7.961	5.00	15.00	(20)	19.631	5.00	80.00
(7)	8.102	0.80	15.80	(21)	21.137	4.20	84.20
(8)	8.835	4.20	20.00	(22)	21.443	0.80	85.00
(9)	9.600	5.00	25.00	(23)	23.746	5.00	90.00
(10)	10.350	5.00	30.00	(24)	27.720	5.00	95.00
(11)	11.074	5.00	35.00	(25)	32.008	2.70	97.70
(12)	11.804	5.00	40.00	(26)	36.700	1.30	99.00
(13)	12.547	5.00	45.00	(27)	47.751	0.90	99.90
(14)	13.296	5.00	50.00				

Median : 13.293 (μm) Mean: 14.513 (μm) Mode: 14.176 (μm)
Std. Dev.: 6.899 (μm) Span: 0.713
Coef. Var: 47.53% Spec. Area: 5587 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20J Aug/01/'01 08:05

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010731-670 13:54
Filename : BC67670
Sample : BCR 67

Material : 3-20 um Quartz
Source : CEC/BCR
Lot Numbe : Bottle 1448 / Jar 67-3

Condition
T%(He-Ne): 61.4% Dist.Form: Std. Sampling times : 100
(LAMP): 71.9% R.R.Index: 1.14-0.00i ( )

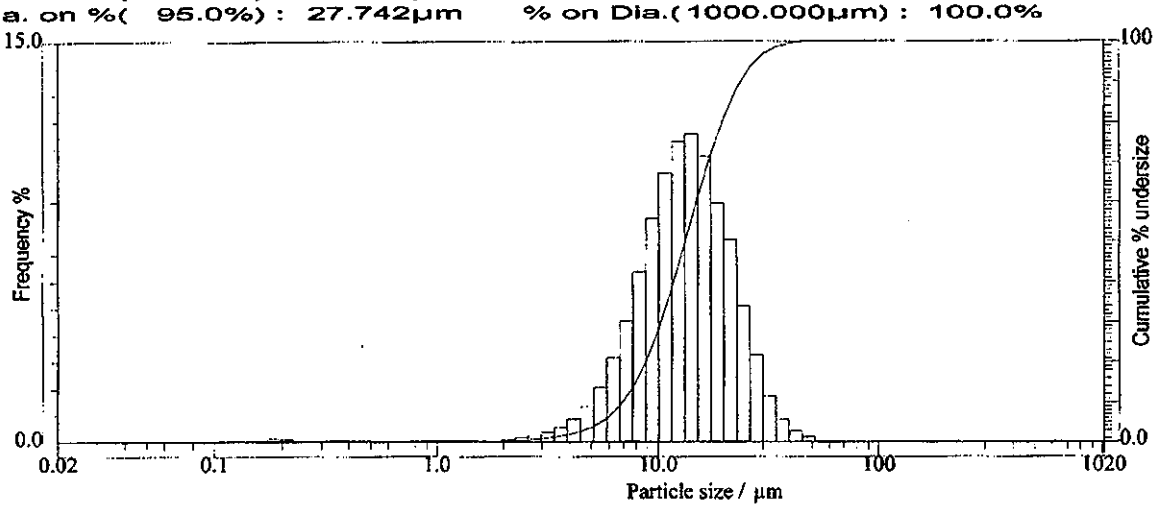
Agitation : 1 Circuitn : 6 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 13.293μm SP.Area : 5919cm²/cm³ S.D. : 6.944μm
Mode : 14.129μm Mean : 14.517μm
C.V. : 47.83%

Span : (D 10.0-D 90.0) / D50 = 1.267

Dia. on %(5.0%) : 5.525μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 9.565μm % on Dia.(1.000μm) : 0.2%
Dia. on %(50.0%) : 13.293μm % on Dia.(10.000μm) : 27.7%
Dia. on %(75.0%) : 18.206μm % on Dia.(100.000μm) : 100.0%
Dia. on %(95.0%) : 27.742μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	5.09	93.54	0.669	0.00	0.23
890.1	0.00	100.00	22.80	7.57	88.45	0.584	0.00	0.23
777.1	0.00	100.00	19.90	8.95	80.88	0.510	0.00	0.23
678.5	0.00	100.00	17.38	10.70	71.93	0.445	0.00	0.23
592.4	0.00	100.00	15.17	11.53	61.23	0.389	0.00	0.23
517.2	0.00	100.00	13.25	11.26	49.70	0.339	0.00	0.23
451.6	0.00	100.00	11.56	10.10	38.44	0.296	0.00	0.23
394.2	0.00	100.00	10.10	8.35	28.34	0.259	0.00	0.23
344.2	0.00	100.00	8.816	6.37	19.98	0.226	0.11	0.23
300.5	0.00	100.00	7.697	4.57	13.61	0.197	0.12	0.12
262.4	0.00	100.00	6.720	3.14	9.05	0.172	0.00	0.00
229.1	0.00	100.00	5.867	2.05	5.91	0.150	0.00	0.00
200.0	0.00	100.00	5.122	1.32	3.86	0.131	0.00	0.00
174.6	0.00	100.00	4.472	0.86	2.54	0.115	0.00	0.00
152.5	0.00	100.00	3.905	0.56	1.68	0.100	0.00	0.00
133.1	0.00	100.00	3.409	0.37	1.13	0.087	0.00	0.00
116.2	0.00	100.00	2.976	0.25	0.75	0.076	0.00	0.00
101.5	0.00	100.00	2.599	0.16	0.51	0.067	0.00	0.00
88.58	0.00	100.00	2.269	0.11	0.34	0.058	0.00	0.00
77.34	0.00	100.00	1.981	0.00	0.23	0.051	0.00	0.00
67.52	0.00	100.00	1.729	0.00	0.23	0.044	0.00	0.00
58.95	0.00	100.00	1.510	0.00	0.23	0.039	0.00	0.00
51.47	0.18	100.00	1.318	0.00	0.23	0.034	0.00	0.00
44.94	0.41	99.82	1.151	0.00	0.23	0.029	0.00	0.00
39.23	0.86	99.41	1.005	0.00	0.23	0.026	0.00	0.00
34.25	1.74	98.55	0.877	0.00	0.23	0.022	0.00	0.00
29.91	3.26	96.81	0.766	0.00	0.23			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/01/01
File Name: BC67670.DAT Sample Name: BCR 67 ID No: 01/07/31-670
Dist. Form: STANDARD R.R. Index: 114-000
Dist. Mode: VOLUME Laser: 61.393 % Lamp: 71.939 %
Circulation: 6 Agitation: 1 U.Sonic ** (min)
Material: 3-20 um Quartz Source: CEC/BCR
Lot No: Bottle 1448 / Jar 67-3 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.193	0.10	0.10	(15)	14.131	5.00	55.00
(2)	3.263	0.90	1.00	(16)	14.966	5.00	60.00
(3)	4.313	1.30	2.30	(17)	15.949	5.00	65.00
(4)	5.538	2.70	5.00	(18)	16.980	5.00	70.00
(5)	6.923	5.00	10.00	(19)	18.244	5.00	75.00
(6)	7.940	5.00	15.00	(20)	19.655	5.00	80.00
(7)	8.081	0.80	15.80	(21)	21.172	4.20	84.20
(8)	8.818	4.20	20.00	(22)	21.478	0.80	85.00
(9)	9.585	5.00	25.00	(23)	23.805	5.00	90.00
(10)	10.339	5.00	30.00	(24)	27.805	5.00	95.00
(11)	11.065	5.00	35.00	(25)	32.138	2.70	97.70
(12)	11.798	5.00	40.00	(26)	36.883	1.30	99.00
(13)	12.545	5.00	45.00	(27)	47.914	0.90	99.90
(14)	13.296	5.00	50.00				

Median : 13.293 (μm) Mean: 14.517 (μm) Mode: 14.176 (μm)
Std. Dev.: 6.944 (μm) Span: 0.717
Coef. Var: 47.83% Spec. Area: 5919 (cm2/cm3)

HNF-8862, Rev.0

HORIBA LA-910

for Windows(TM) Ver.1.20j Aug/01/01 08:06

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010731-671 13:57
Filename : BC67671
Sample : BCR 67

Material : 3-20 um Quartz
Source : CEC/BCR
Lot Numbe : Bottle 1448 / Jar 67-3

Condition
T%(He-Ne): 61.4% Dist.Form: Std. Sampling times : 100
(LAMP): 72.0% R.R.Index: 1.14-0.001 ( )

Agitation : 3 Circultn : 6 U.sonic : ~~ON~~ OFF (120)

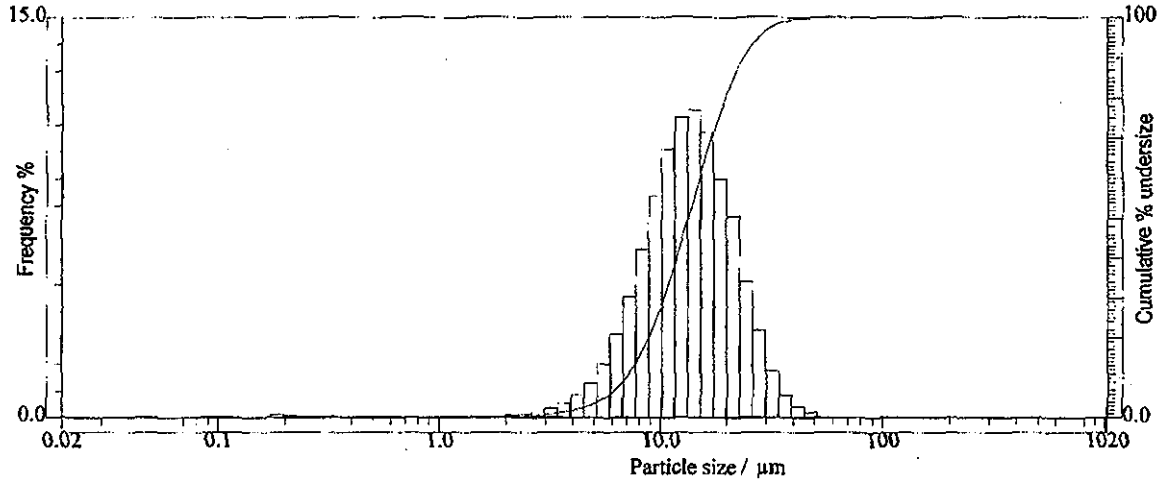
WS Calloway 8/4/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 13.317µm SP.Area : 5902cm²/cm³ S.D. : 6.965µm
Mode : 14.131µm Mean : 14.547µm
C.V. : 47.88%

Span : (D 10.0-D 90.0) / D50 = 1.267

Dia. on %(5.0%) :	5.540µm	% on Dia.(0.100µm) :	0.0%
Dia. on %(25.0%) :	9.585µm	% on Dia.(1.000µm) :	0.2%
Dia. on %(50.0%) :	13.317µm	% on Dia.(10.000µm) :	27.6%
Dia. on %(75.0%) :	18.238µm	% on Dia.(100.000µm) :	100.0%
Dia. on %(95.0%) :	27.810µm	% on Dia.(1000.000µm) :	100.0%



Size(µm)	Freq(%)	Und(%)	Size(µm)	Freq(%)	Und(%)	Size(µm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	5.11	93.48	0.669	0.00	0.23
890.1	0.00	100.00	22.80	7.59	88.37	0.584	0.00	0.23
777.1	0.00	100.00	19.90	8.98	80.78	0.510	0.00	0.23
678.5	0.00	100.00	17.38	10.72	71.80	0.445	0.00	0.23
592.4	0.00	100.00	15.17	11.54	61.09	0.389	0.00	0.23
517.2	0.00	100.00	13.25	11.26	49.54	0.339	0.00	0.23
451.6	0.00	100.00	11.56	10.09	38.28	0.296	0.00	0.23
394.2	0.00	100.00	10.10	8.33	28.19	0.259	0.00	0.23
344.2	0.00	100.00	8.816	6.34	19.86	0.226	0.11	0.23
300.5	0.00	100.00	7.697	4.54	13.52	0.197	0.12	0.12
262.4	0.00	100.00	6.720	3.12	8.98	0.172	0.00	0.00
229.1	0.00	100.00	5.867	2.03	5.86	0.150	0.00	0.00
200.0	0.00	100.00	5.122	1.31	3.83	0.131	0.00	0.00
174.6	0.00	100.00	4.472	0.85	2.52	0.115	0.00	0.00
152.5	0.00	100.00	3.905	0.55	1.67	0.100	0.00	0.00
133.1	0.00	100.00	3.409	0.37	1.12	0.087	0.00	0.00
116.2	0.00	100.00	2.976	0.25	0.75	0.076	0.00	0.00
101.5	0.00	100.00	2.599	0.16	0.50	0.067	0.00	0.00
88.58	0.00	100.00	2.269	0.11	0.34	0.058	0.00	0.00
77.34	0.00	100.00	1.981	0.00	0.23	0.051	0.00	0.00
67.52	0.00	100.00	1.729	0.00	0.23	0.044	0.00	0.00
58.95	0.00	100.00	1.510	0.00	0.23	0.039	0.00	0.00
51.47	0.19	100.00	1.318	0.00	0.23	0.034	0.00	0.00
44.94	0.43	99.81	1.151	0.00	0.23	0.029	0.00	0.00
39.23	0.88	99.38	1.005	0.00	0.23	0.026	0.00	0.00
34.25	1.75	98.51	0.877	0.00	0.23	0.022	0.00	0.00
29.91	3.28	96.75	0.766	0.00	0.23			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/01/01
File Name: BC67671.DAT Sample Name: BCR 67 ID No: 01/07/31-671
Dist. Form: STANDARD R.R. Index: 114-000
Dist. Mode: VOLUME Laser: 61.428 % Lamp: 72.027 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: 3-20 um Quartz Source: CEC/BCR
Lot No: Bottle 1448 / Jar 67-3 Test No:

JSC 8/4/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.193	0.10	0.10	(15)	14.156	5.00	55.00
(2)	3.272	0.90	1.00	(16)	14.990	5.00	60.00
(3)	4.325	1.30	2.30	(17)	15.977	5.00	65.00
(4)	5.552	2.70	5.00	(18)	17.006	5.00	70.00
(5)	6.939	5.00	10.00	(19)	18.277	5.00	75.00
(6)	7.957	5.00	15.00	(20)	19.684	5.00	80.00
(7)	8.098	0.80	15.80	(21)	21.207	4.20	84.20
(8)	8.837	4.20	20.00	(22)	21.512	0.80	85.00
(9)	9.606	5.00	25.00	(23)	23.854	5.00	90.00
(10)	10.360	5.00	30.00	(24)	27.874	5.00	95.00
(11)	11.087	5.00	35.00	(25)	32.254	2.70	97.70
(12)	11.821	5.00	40.00	(26)	37.063	1.30	99.00
(13)	12.568	5.00	45.00	(27)	48.082	0.90	99.90
(14)	13.322	5.00	50.00				

Median : 13.317 (μm) Mean: 14.547 (μm) Mode: 14.176 (μm)
Std. Dev.: 6.965 (μm) Span: 0.719
Coef. Var: 47.88% Spec. Area: 5902 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Aug/01/'01 08:08

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010731-673 14:53
Filename : BC67673
Sample : BCR 67

Material : 3-20 um Quartz
Source : CEC/BCR
Lot Numbe : Bottle 1448 / Jar 67-4

Condition
T%(He-Ne): 64.2% Dist.Form: Std. Sampling times : 100
(LAMP): 74.1% R.R.Index: 1.14-0.00i ( )

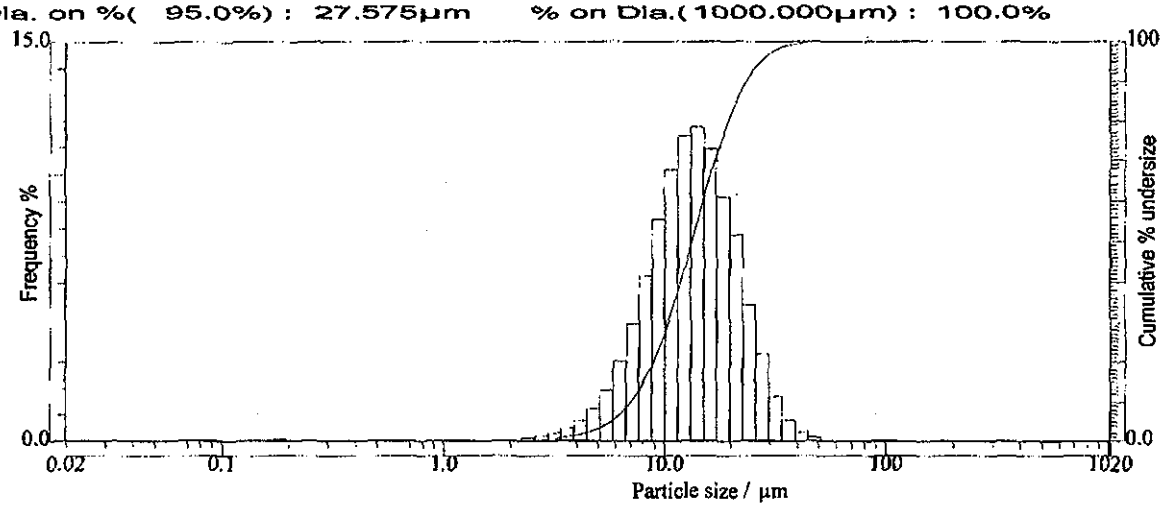
Agitation : 1 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 13.410μm SP.Area : 5492cm²/cm³ S.D. : 6.817μm
Mode : 14.137μm Mean : 14.602μm
C.V. : 46.68%

Span : (D 10.0-D 90.0) / D50 = 1.240

Dia. on %(5.0%) : 5.746μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 9.714μm % on Dia.(1.000μm) : 0.1%
Dia. on %(50.0%) : 13.410μm % on Dia.(10.000μm) : 26.8%
Dia. on %(75.0%) : 18.273μm % on Dia.(100.000μm) : 100.0%
Dia. on %(95.0%) : 27.575μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	5.17	93.68	0.669	0.00	0.11
890.1	0.00	100.00	22.80	7.76	88.51	0.584	0.00	0.11
777.1	0.00	100.00	19.90	9.14	80.76	0.510	0.00	0.11
678.5	0.00	100.00	17.38	10.93	71.62	0.445	0.00	0.11
592.4	0.00	100.00	15.17	11.75	60.69	0.389	0.00	0.11
517.2	0.00	100.00	13.25	11.41	48.94	0.339	0.00	0.11
451.6	0.00	100.00	11.56	10.16	37.53	0.296	0.00	0.11
394.2	0.00	100.00	10.10	8.32	27.37	0.259	0.00	0.11
344.2	0.00	100.00	8.816	6.27	19.05	0.226	0.00	0.11
300.5	0.00	100.00	7.697	4.45	12.78	0.197	0.11	0.11
262.4	0.00	100.00	6.720	3.03	8.33	0.172	0.00	0.00
229.1	0.00	100.00	5.867	1.95	5.30	0.150	0.00	0.00
200.0	0.00	100.00	5.122	1.24	3.35	0.131	0.00	0.00
174.6	0.00	100.00	4.472	0.79	2.11	0.115	0.00	0.00
152.5	0.00	100.00	3.905	0.51	1.32	0.100	0.00	0.00
133.1	0.00	100.00	3.409	0.34	0.81	0.087	0.00	0.00
116.2	0.00	100.00	2.976	0.22	0.47	0.076	0.00	0.00
101.5	0.00	100.00	2.599	0.14	0.25	0.067	0.00	0.00
88.58	0.00	100.00	2.269	0.00	0.11	0.058	0.00	0.00
77.34	0.00	100.00	1.981	0.00	0.11	0.051	0.00	0.00
67.52	0.00	100.00	1.729	0.00	0.11	0.044	0.00	0.00
58.95	0.00	100.00	1.510	0.00	0.11	0.039	0.00	0.00
51.47	0.16	100.00	1.318	0.00	0.11	0.034	0.00	0.00
44.94	0.37	99.84	1.151	0.00	0.11	0.029	0.00	0.00
39.23	0.80	99.47	1.005	0.00	0.11	0.026	0.00	0.00
34.25	1.71	98.67	0.877	0.00	0.11	0.022	0.00	0.00
29.91	3.28	96.96	0.766	0.00	0.11			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/01/01
File Name: BC67673.DAT Sample Name: BCR 67 ID No: 01/07/31-673
Dist. Form: STANDARD R.R. Index: 114-000
Dist. Mode: VOLUME Laser: 64.210 % Lamp: 74.137 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: 3-20 um Quartz Source: CEC/BCR
Lot No: Bottle 1448 / Jar 67-4 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.195	0.10	0.10	(15)	14.240	5.00	55.00
(2)	3.596	0.90	1.00	(16)	15.059	5.00	60.00
(3)	4.571	1.30	2.30	(17)	16.042	5.00	65.00
(4)	5.753	2.70	5.00	(18)	17.051	5.00	70.00
(5)	7.087	5.00	10.00	(19)	18.313	5.00	75.00
(6)	8.093	5.00	15.00	(20)	19.695	5.00	80.00
(7)	8.236	0.80	15.80	(21)	21.188	4.20	84.20
(8)	8.962	4.20	20.00	(22)	21.486	0.80	85.00
(9)	9.732	5.00	25.00	(23)	23.750	5.00	90.00
(10)	10.477	5.00	30.00	(24)	27.636	5.00	95.00
(11)	11.200	5.00	35.00	(25)	31.784	2.70	97.70
(12)	11.929	5.00	40.00	(26)	36.295	1.30	99.00
(13)	12.666	5.00	45.00	(27)	47.310	0.90	99.90
(14)	13.420	5.00	50.00				

Median : 13.410 (μm) Mean: 14.602 (μm) Mode: 14.176 (μm)
Std. Dev.: 6.817 (μm) Span: 0.694
Coef. Var: 46.68% Spec. Area: 5492 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Aug/01/01 08:09

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010731-674 14:56
Filename : BC67674
Sample : BCR 67

Material : 3-20 um Quartz
Source : CEC/BCR
Lot Numbe : Bottle 1448 / Jar 67-4

Condition
T%(He-Ne): 64.2% Dist.Form: Std. Sampling times : 100
(LAMP): 74.1% R.R.index: 1.14-0.001 ( )

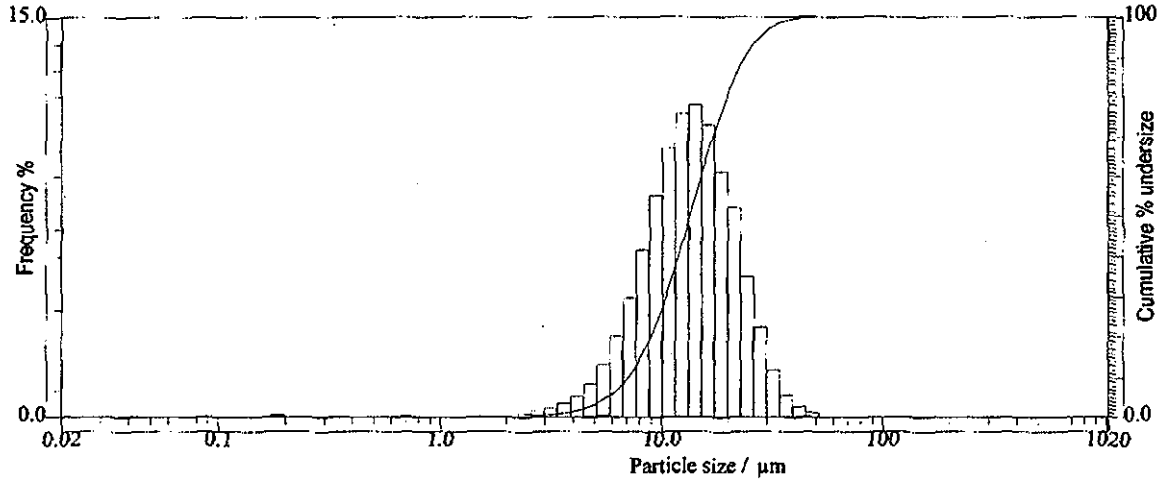
Agitation : 3 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 13.457μm SP.Area : 5487cm²/cm³ S.D. : 6.887μm
Mode : 14.141μm Mean : 14.672μm
C.V. : 46.94%

Span : (D 10.0-D 90.0) / D50 = 1.249

Dia. on %(5.0%) : 5.745μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 9.733μm % on Dia.(1.000μm) : 0.1%
Dia. on %(50.0%) : 13.457μm % on Dia.(10.000μm) : 26.6%
Dia. on %(75.0%) : 18.376μm % on Dia.(100.000μm) : 100.0%
Dia. on %(95.0%) : 27.801μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	5.25	93.45	0.669	0.00	0.11
890.1	0.00	100.00	22.80	7.81	88.20	0.584	0.00	0.11
777.1	0.00	100.00	19.90	9.16	80.39	0.510	0.00	0.11
678.5	0.00	100.00	17.38	10.90	71.23	0.445	0.00	0.11
592.4	0.00	100.00	15.17	11.68	60.32	0.389	0.00	0.11
517.2	0.00	100.00	13.25	11.33	48.64	0.339	0.00	0.11
451.6	0.00	100.00	11.56	10.08	37.31	0.296	0.00	0.11
394.2	0.00	100.00	10.10	8.26	27.23	0.259	0.00	0.11
344.2	0.00	100.00	8.816	6.23	18.98	0.226	0.00	0.11
300.5	0.00	100.00	7.697	4.43	12.74	0.197	0.11	0.11
262.4	0.00	100.00	6.720	3.02	8.32	0.172	0.00	0.00
229.1	0.00	100.00	5.867	1.94	5.30	0.150	0.00	0.00
200.0	0.00	100.00	5.122	1.24	3.36	0.131	0.00	0.00
174.6	0.00	100.00	4.472	0.79	2.12	0.115	0.00	0.00
152.5	0.00	100.00	3.905	0.51	1.33	0.100	0.00	0.00
133.1	0.00	100.00	3.409	0.34	0.81	0.087	0.00	0.00
116.2	0.00	100.00	2.976	0.22	0.48	0.076	0.00	0.00
101.5	0.00	100.00	2.599	0.14	0.25	0.067	0.00	0.00
88.58	0.00	100.00	2.269	0.00	0.11	0.058	0.00	0.00
77.34	0.00	100.00	1.981	0.00	0.11	0.051	0.00	0.00
67.52	0.00	100.00	1.729	0.00	0.11	0.044	0.00	0.00
58.95	0.00	100.00	1.510	0.00	0.11	0.039	0.00	0.00
51.47	0.17	100.00	1.318	0.00	0.11	0.034	0.00	0.00
44.94	0.40	99.83	1.151	0.00	0.11	0.029	0.00	0.00
39.23	0.85	99.43	1.005	0.00	0.11	0.026	0.00	0.00
34.25	1.78	98.59	0.877	0.00	0.11	0.022	0.00	0.00
29.91	3.36	96.81	0.766	0.00	0.11			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/01/01
File Name: BC67674.DAT Sample Name: BCR 67 ID No: 01/07/31-674
Dist. Form: STANDARD R.R. Index: 114-000
Dist. Mode: VOLUME Laser: 64.206 % Lamp: 74.148 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: 3-20 um Quartz Source: CEC/BCR
Lot No: Bottle 1448 / Jar 67-4 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.195	0.10	0.10	(15)	14.294	5.00	55.00
(2)	3.590	0.90	1.00	(16)	15.118	5.00	60.00
(3)	4.567	1.30	2.30	(17)	16.118	5.00	65.00
(4)	5.752	2.70	5.00	(18)	17.129	5.00	70.00
(5)	7.091	5.00	10.00	(19)	18.418	5.00	75.00
(6)	8.102	5.00	15.00	(20)	19.796	5.00	80.00
(7)	8.246	0.80	15.80	(21)	21.315	4.20	84.20
(8)	8.975	4.20	20.00	(22)	21.612	0.80	85.00
(9)	9.750	5.00	25.00	(23)	23.935	5.00	90.00
(10)	10.500	5.00	30.00	(24)	27.865	5.00	95.00
(11)	11.228	5.00	35.00	(25)	32.087	2.70	97.70
(12)	11.964	5.00	40.00	(26)	36.688	1.30	99.00
(13)	12.706	5.00	45.00	(27)	47.649	0.90	99.90
(14)	13.470	5.00	50.00				

Median : 13.457 (μm) Mean: 14.672 (μm) Mode: 14.176 (μm)
Std. Dev.: 6.887 (μm) Span: 0.700
Coef. Var: 46.94% Spec. Area: 5487 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20J Aug/01/'01 08:11

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010731-675 15:01
Filename : BC67675
Sample : BCR 67

Material : 3-20 um Quartz
Source : CEC/BCR
Lot Numbe : Bottle 1448 / Jar 67-4

Condition
T%(He-Ne): 64.3% Dist.Form: Std. Sampling times : 100
(LAMP): 74.1% R.R.Index: 1.14-0.00i ( )

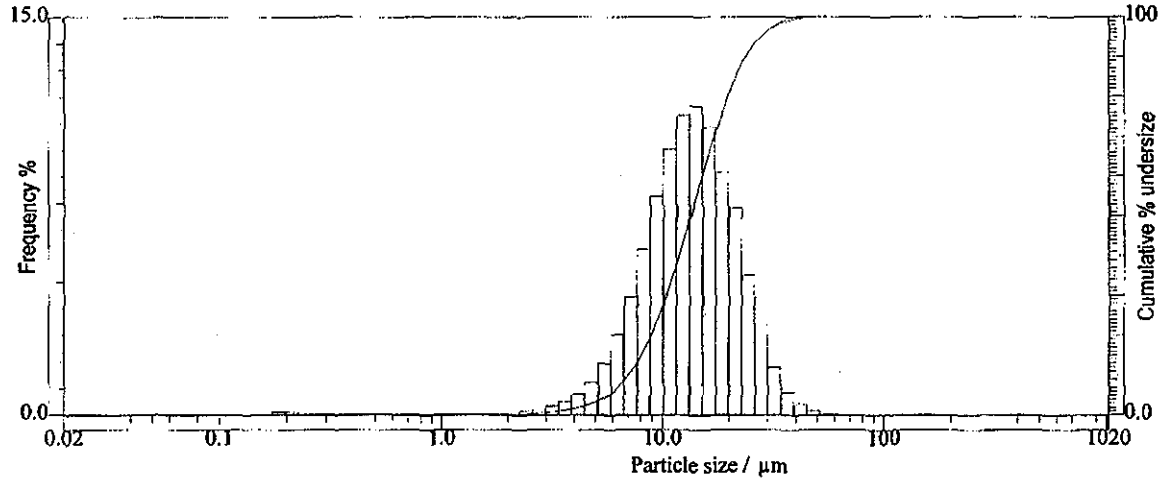
Agitation : 1 Circultn : 6 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 13.452μm SP.Area : 5833cm²/cm³ S.D. : 6.932μm
Mode : 14.142μm Mean : 14.670μm
C.V. : 47.25%

Span : (D 10.0-D 90.0) / D50 = 1.256

Dia. on %(5.0%) : 5.686μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 9.711μm % on Dia.(1.000μm) : 0.2%
Dia. on %(50.0%) : 13.452μm % on Dia.(10.000μm) : 26.8%
Dia. on %(75.0%) : 18.396μm % on Dia.(100.000μm) : 100.0%
Dia. on %(95.0%) : 27.881μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	5.26	93.36	0.669	0.00	0.23
890.1	0.00	100.00	22.80	7.80	88.10	0.584	0.00	0.23
777.1	0.00	100.00	19.90	9.14	80.30	0.510	0.00	0.23
678.5	0.00	100.00	17.38	10.86	71.17	0.445	0.00	0.23
592.4	0.00	100.00	15.17	11.63	60.31	0.389	0.00	0.23
517.2	0.00	100.00	13.25	11.28	48.68	0.339	0.00	0.23
451.6	0.00	100.00	11.56	10.04	37.41	0.296	0.00	0.23
394.2	0.00	100.00	10.10	8.24	27.37	0.259	0.00	0.23
344.2	0.00	100.00	8.816	6.23	19.13	0.226	0.11	0.23
300.5	0.00	100.00	7.697	4.43	12.90	0.197	0.12	0.12
262.4	0.00	100.00	6.720	3.02	8.47	0.172	0.00	0.00
229.1	0.00	100.00	5.867	1.95	5.45	0.150	0.00	0.00
200.0	0.00	100.00	5.122	1.24	3.50	0.131	0.00	0.00
174.6	0.00	100.00	4.472	0.80	2.26	0.115	0.00	0.00
152.5	0.00	100.00	3.905	0.52	1.46	0.100	0.00	0.00
133.1	0.00	100.00	3.409	0.34	0.94	0.087	0.00	0.00
116.2	0.00	100.00	2.976	0.22	0.60	0.076	0.00	0.00
101.5	0.00	100.00	2.599	0.15	0.38	0.067	0.00	0.00
88.58	0.00	100.00	2.269	0.00	0.23	0.058	0.00	0.00
77.34	0.00	100.00	1.981	0.00	0.23	0.051	0.00	0.00
67.52	0.00	100.00	1.729	0.00	0.23	0.044	0.00	0.00
58.95	0.00	100.00	1.510	0.00	0.23	0.039	0.00	0.00
51.47	0.18	100.00	1.318	0.00	0.23	0.034	0.00	0.00
44.94	0.41	99.82	1.151	0.00	0.23	0.029	0.00	0.00
39.23	0.87	99.42	1.005	0.00	0.23	0.026	0.00	0.00
34.25	1.80	98.55	0.877	0.00	0.23	0.022	0.00	0.00
29.91	3.39	96.75	0.766	0.00	0.23			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/01/01
File Name: BC67675.DAT Sample Name: BCR 67 ID No: 01/07/31-675
Dist. Form: STANDARD R.R. Index: 114-000
Dist. Mode: VOLUME Laser: 64.300 % Lamp: 74.105 %
Circulation: 6 Agitation: 1 U.Sonic ** (min)
Material: 3-20 um Quartz Source: CEC/BCR
Lot No: Bottle 1448 / Jar 67-4 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.193	0.10	0.10	(15)	14.293	5.00	55.00
(2)	3.465	0.90	1.00	(16)	15.121	5.00	60.00
(3)	4.495	1.30	2.30	(17)	16.125	5.00	65.00
(4)	5.695	2.70	5.00	(18)	17.140	5.00	70.00
(5)	7.057	5.00	10.00	(19)	18.437	5.00	75.00
(6)	8.074	5.00	15.00	(20)	19.820	5.00	80.00
(7)	8.218	0.80	15.80	(21)	21.349	4.20	84.20
(8)	8.951	4.20	20.00	(22)	21.646	0.80	85.00
(9)	9.729	5.00	25.00	(23)	23.992	5.00	90.00
(10)	10.482	5.00	30.00	(24)	27.945	5.00	95.00
(11)	11.213	5.00	35.00	(25)	32.199	2.70	97.70
(12)	11.952	5.00	40.00	(26)	36.837	1.30	99.00
(13)	12.697	5.00	45.00	(27)	47.778	0.90	99.90
(14)	13.465	5.00	50.00				

Median : 13.452 (μm) Mean: 14.670 (μm) Mode: 14.176 (μm)
Std. Dev.: 6.932 (μm) Span: 0.705
Coef. Var: 47.25% Spec. Area: 5833 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20] Aug/01/'01 08:12

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010731-676 15:04
Filename : BC67676
Sample : BCR 67

Material : 3-20 um Quartz
Source : CEC/BCR
Lot Numbe : Bottle 1448 / Jar 67-4

Condition
T%(He-Ne): 64.4% Dist.Form: Std. Sampling times : 100
(LAMP): 74.1% R.R.Index: 1.14-0.00i ( )

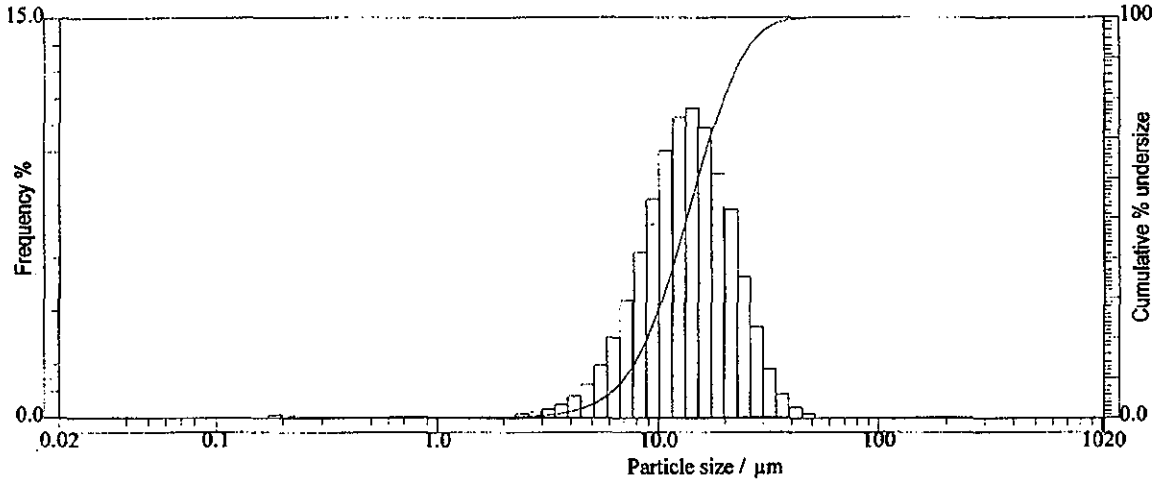
Agitation : 3 Circultn : 6 U.sonic : ~~On~~ (120)
OFF JS Calloway 8/4/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 13.473µm SP.Area : 5813cm²/cm³ S.D. : 6.942µm
Mode : 14.144µm Mean : 14.691µm
C.V. : 47.25%

Span : (D 10.0-D 90.0) / D50 = 1.257

Dia. on %(5.0%) :	5.692µm	% on Dia.(0.100µm) :	0.0%
Dia. on %(25.0%) :	9.726µm	% on Dia.(1.000µm) :	0.2%
Dia. on %(50.0%) :	13.473µm	% on Dia.(10.000µm) :	26.7%
Dia. on %(75.0%) :	18.426µm	% on Dia.(100.000µm) :	100.0%
Dia. on %(95.0%) :	27.919µm	% on Dia.(1000.000µm) :	100.0%



Size(µm)	Freq(%)	Und(%)	Size(µm)	Freq(%)	Und(%)	Size(µm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	5.29	93.32	0.669	0.00	0.23
890.1	0.00	100.00	22.80	7.83	88.03	0.584	0.00	0.23
777.1	0.00	100.00	19.90	9.16	80.20	0.510	0.00	0.23
678.5	0.00	100.00	17.38	10.87	71.05	0.445	0.00	0.23
592.4	0.00	100.00	15.17	11.63	60.18	0.389	0.00	0.23
517.2	0.00	100.00	13.25	11.26	48.55	0.339	0.00	0.23
451.6	0.00	100.00	11.56	10.02	37.29	0.296	0.00	0.23
394.2	0.00	100.00	10.10	8.21	27.27	0.259	0.00	0.23
344.2	0.00	100.00	8.816	6.20	19.06	0.226	0.11	0.23
300.5	0.00	100.00	7.697	4.41	12.85	0.197	0.12	0.12
262.4	0.00	100.00	6.720	3.01	8.44	0.172	0.00	0.00
229.1	0.00	100.00	5.867	1.94	5.43	0.150	0.00	0.00
200.0	0.00	100.00	5.122	1.24	3.49	0.131	0.00	0.00
174.6	0.00	100.00	4.472	0.80	2.25	0.115	0.00	0.00
152.5	0.00	100.00	3.905	0.52	1.45	0.100	0.00	0.00
133.1	0.00	100.00	3.409	0.34	0.94	0.087	0.00	0.00
116.2	0.00	100.00	2.976	0.22	0.60	0.076	0.00	0.00
101.5	0.00	100.00	2.599	0.15	0.37	0.067	0.00	0.00
88.58	0.00	100.00	2.269	0.00	0.23	0.058	0.00	0.00
77.34	0.00	100.00	1.981	0.00	0.23	0.051	0.00	0.00
67.52	0.00	100.00	1.729	0.00	0.23	0.044	0.00	0.00
58.95	0.00	100.00	1.510	0.00	0.23	0.039	0.00	0.00
51.47	0.18	100.00	1.318	0.00	0.23	0.034	0.00	0.00
44.94	0.41	99.82	1.151	0.00	0.23	0.029	0.00	0.00
39.23	0.87	99.41	1.005	0.00	0.23	0.026	0.00	0.00
34.25	1.81	98.54	0.877	0.00	0.23	0.022	0.00	0.00
29.91	3.41	96.73	0.766	0.00	0.23			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/01/01
File Name: BC67676.DAT Sample Name: BCR 67 ID No: 01/07/31-676
Dist. Form: STANDARD R.R. Index: 114-000
Dist. Mode: VOLUME Laser: 64.360 % Lamp: 74.096 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: 3-20 um Quartz Source: CEC/BCR
Lot No: Bottle 1448 / Jar 67-4 Test No:

wse 8/4/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.193	0.10	0.10	(15)	14.315	5.00	55.00
(2)	3.468	0.90	1.00	(16)	15.143	5.00	60.00
(3)	4.498	1.30	2.30	(17)	16.151	5.00	65.00
(4)	5.701	2.70	5.00	(18)	17.165	5.00	70.00
(5)	7.065	5.00	10.00	(19)	18.468	5.00	75.00
(6)	8.084	5.00	15.00	(20)	19.847	5.00	80.00
(7)	8.228	0.80	15.80	(21)	21.380	4.20	84.20
(8)	8.963	4.20	20.00	(22)	21.676	0.80	85.00
(9)	9.743	5.00	25.00	(23)	24.030	5.00	90.00
(10)	10.497	5.00	30.00	(24)	27.984	5.00	95.00
(11)	11.230	5.00	35.00	(25)	32.242	2.70	97.70
(12)	11.970	5.00	40.00	(26)	36.886	1.30	99.00
(13)	12.717	5.00	45.00	(27)	47.814	0.90	99.90
(14)	13.487	5.00	50.00				

Median : 13.473 (μm) Mean: 14.691 (μm) Mode: 14.176 (μm)
Std. Dev.: 6.942 (μm) Span: 0.705
Coef. Var: 47.25% Spec. Area: 5813 (cm2/cm3)

APPENDIX F-2

PSD PARAMETRIC STUDY: QUARTZ POWDER STANDARD BCR-130

Consisting of 23 pages including this cover page

COMMISSION OF THE EUROPEAN COMMUNITIES

COMMUNITY BUREAU OF REFERENCE - BCR

CERTIFIED REFERENCE MATERIAL

CERTIFICATE OF MEASUREMENT

BCR No 130 N°. 618

QUARTZ
(50 - 220 µm)

Brussels, November 1984

BCR
for certified true copy

CERTIFIED CUMULATIVE PARTICLE SIZE DISTRIBUTION (1)

Mass fraction of particles undersize Q_3 cg/g	Equivalent volume diameter (2) x_v µm	95% confidence interval (2) for x_v (±) µm	Mass fraction of particles undersize Q_3 cg/g	Equivalent volume diameter (2) x_v µm	95% confidence interval (2) for x_v (±) µm
1	46.4	0.4	51	125.8	1.4
2	48.5	0.4	52	127.5	1.4
3	50.1	0.4	53	129.3	1.4
4	51.5	0.4	54	131.2	1.4
5	52.7	0.5	55	133.0	1.5
6	53.9	0.5	56	135.0	1.5
7	55.0	0.5	57	136.4	1.4
8	56.1	0.5	58	138.1	1.5
9	57.2	0.5	59	140.9	1.9
10	58.3	0.6	60	143.0	1.9
11	59.4	0.6	61	145.1	1.9
12	60.6	0.6	62	147.3	2.0
13	61.8	0.6	63	149.4	2.0
14	63.0	0.6	64	151.5	2.0
15	64.4	0.7	65	153.6	2.0
16	65.8	0.8	66	155.6	2.1
17	67.7	0.6	67	157.7	2.1
18	70.1	0.8	68	159.7	2.1
19	71.3	0.7	69	161.7	2.2
20	72.8	0.7	70	163.6	2.2
21	74.3	0.6	71	163.9	2.1
22	75.9	0.7	72	165.8	2.1
23	77.5	0.7	73	168.0	2.1
24	78.8	0.7	74	169.0	2.5
25	80.3	0.7	75	170.7	2.5
26	82.1	0.7	76	172.4	2.6
27	83.9	0.7	77	174.2	2.5
28	85.3	0.7	78	176.8	2.5
29	87.5	0.7	79	178.5	2.6
30	89.1	0.7	80	180.2	2.6
31	90.7	0.7	81	182.0	2.7
32	92.3	0.8	82	183.8	2.7
33	94.0	0.8	83	185.7	2.8
34	95.4	0.7	84	187.6	2.9
35	97.5	0.8	85	189.5	2.9
36	99.0	0.8	86	191.6	3.0
37	99.7	0.8	87	193.7	3.1
38	102.6	0.8	88	195.9	3.1
39	104.3	0.8	89	198.2	3.2
40	106.0	0.9	90	200.6	3.3
41	107.7	0.9	91	203.2	3.4
42	109.3	0.9	92	206.0	3.5
43	111.3	1.0	93	209.1	3.6
44	113.0	1.1	94	212.5	3.7
45	115.1	1.2	95	216.3	3.8
46	116.8	1.2	96	220.8	4.0
47	118.5	1.3	97	226.3	4.2
48	120.6	1.3	98	232.2	2.5
49	122.3	1.3	99	244.6	4.9
50	124.0	1.3			

(1) *The cumulative particle size distribution in terms of mass fraction of particles undersize versus equivalent volume diameter was certified using sieves which had been calibrated using the counting/weighing procedure described in Appendix 1 of the Certification Report. Briefly, this involved the counting of z particles of total mass m which only just passed through the sieve. The equivalent volume diameter is then given by the equation*

$$x_v = \left(\frac{6\,m}{\rho_s\,\pi z} \right)^{1/3}$$

A value of 2642 kg m^{-3} was used for the density, ρ_s, of the quartz material.

(2) *Results from 15 sieves with mean measured Q_3 values on each side of the data point under consideration were used in the calculations of x_v and the 95% confidence interval. If there was an insufficient number of sieves on any one side a compensating number of sieves on the other were used to bring the total number up to 30.*

DESCRIPTION OF THE SAMPLE

Each sample consists of 41 to 57 g of quartz powder obtained by subdividing a bulk quantity of the material with the aid of a rotating riffle.

INSTRUCTIONS FOR USE

Detailed recommendations on the use of this RM are given in section 6 of the Certification Report. If compatible with the measurement technique, the total sample should be used. If further subdivision is necessary, a rotating riffle is recommended for the abstraction of sub-samples down to about 20 g.

A stack of sieves, or a single sieve, with nominal mesh dimensions in the range 50 to 200 µm, may be calibrated using BCR No 130 by sieving the whole of a single sample and weighing the various sieve fractions. The mass fractions of the particles passed by the individual sieves are then calculated and the process is repeated a number of times m to give mean values of Q_3 together with the associated standard deviations s_{Q_3}. The equivalent volume diameters of the cut sizes of the individual sieves are then obtained from the mean Q_3's by referring to the certified results contained in this certificate; linear interpolation between adjacent tabulated values of Q_3 will usually be necessary. It should be appreciated that these sieve calibrations are only strictly applicable when the sieves are used on materials consisting of particles with the same shape factors as the constituent particles of BCR No 130.

The 95% confidence interval of x_v for a calibration is the linear sum of the uncertainty indicated in the table of certified values and that due to the uncertainty in the value of Q_3. To calculate the latter contribution the range of values of x_v corresponding to $\overline{Q}_3 \pm \frac{t}{\sqrt{m}} \cdot s_{Q_3}$ must be determined from the certified values where t is Student's factor at the 5% significance level taken from table for (m-1) degrees of freedom.

PARTICIPATING LABORATORIES

— Bayer AG, Leverkusen (F.R. Germany)
— Bureau de Recherches Géologiques et Minières, Orléans (France)
— National Physical Laboratory, Teddington (United Kingdom)
— Technische Universität Clausthal, Clausthal-Zellerfeld (F.R. Germany)
— Technische Hogeschool, Delft (the Netherlands)
— University of Bradford, Bradford (United Kingdom)
— Universität Karlsruhe, Karlsruhe (F.R. Germany)
— University of Technology, Loughborough (United Kingdom)

METHOD USED

The sample is certified with respect to cumulative distribution by mass of the equivalent volume diameter of the particles measured by sieves calibrated as described in the Certification Report. Full details are given in Appendix 1 of the Certification Report.

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NOTE

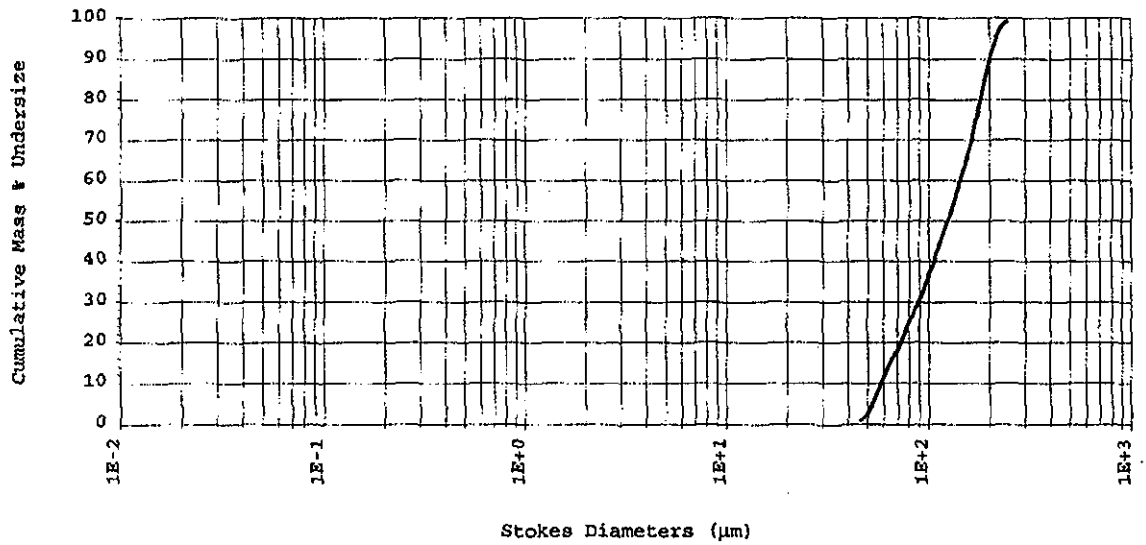
A certification report giving details of the certification procedure is delivered with the samples.

Rue de la Loi 200, B 1049 Brussels - - Telephone 235 50 14 - - Telegraphic address «COMEUR Brussels» - -
Telex: «21 877 COMEU B»

CERTIFIED REFERENCE MATERIAL

Sample:	**BCR No 130**
Material:	Quartz Powder - Nominal Size Range 50 - 220 µm
Source:	Commission of the European Communities: Community Bureau of Reference - BCR -
Lot:	Bottle # 618

Estimated-	Distribution Mean:	156.2	µm
	Standard Deviation:	45.1	µm
	Distribution Median:	124.0	µm



Certified Cumulative Particle Size Distribution

Mass Fraction Undersize cg/g	Equivalent Volume Diameter µm	95% Confidence Interval ± µm
1	46.4	0.4
2	48.5	0.4
3	50.1	0.4
4	51.5	0.4
5	52.7	0.5
6	53.9	0.5
7	55.0	0.5
8	56.1	0.5
9	57.2	0.5
10	58.3	0.6
11	59.4	0.6
12	60.6	0.6
13	61.8	0.6

BCR 130: Certified Cumulative Particle Size Distribution

Mass Fraction Undersize cg/g	Equivalent Volume Diameter µm	95% Confidence Interval ± µm	Mass Fraction Undersize cg/g	Equivalent Volume Diameter µm	95% Confidence Interval ± µm
14	63.0	0.6	59	140.9	1.9
15	64.4	0.7	60	143.0	1.9
16	65.8	0.8	61	145.1	1.9
17	67.7	0.6	62	147.3	2.0
18	70.1	0.8	63	149.4	2.0
19	71.3	0.7	64	151.5	2.0
20	72.8	0.7	65	153.6	2.0
21	74.3	0.6	66	155.6	2.1
22	75.9	0.7	67	157.7	2.1
23	77.5	0.7	68	159.7	2.1
24	78.8	0.7	69	161.7	2.2
25	80.3	0.7	70	163.6	2.2
26	82.1	0.7	71	163.9	2.1
27	83.9	0.7	72	165.8	2.1
28	85.3	0.7	73	168.0	2.1
29	87.5	0.7	74	169.0	2.5
30	89.1	0.7	75	170.7	2.5
31	90.7	0.7	76	172.4	2.6
32	92.3	0.8	77	174.2	2.5
33	94.0	0.8	78	176.8	2.5
34	95.4	0.7	79	178.5	2.6
35	97.5	0.8	80	180.2	2.6
36	99.0	0.8	81	182.0	2.7
37	99.7	0.8	82	183.8	2.7
38	102.6	0.8	83	185.7	2.8
39	104.3	0.8	84	187.6	2.9
40	106.0	0.9	85	189.5	2.9
41	107.7	0.9	86	191.6	3.0
42	109.3	0.9	87	193.7	3.1
43	111.3	1.0	88	195.9	3.1
44	113.0	1.1	89	198.2	3.2
45	115.1	1.2	90	200.6	3.3
46	116.8	1.2	91	203.2	3.4
47	118.5	1.3	92	206.0	3.5
48	120.6	1.3	93	209.1	3.6
49	122.3	1.3	94	212.5	3.7
50	124.0	1.3	95	216.3	3.8
51	125.8	1.4	96	220.8	4.0
52	127.5	1.4	97	226.3	4.2
53	129.3	1.4	98	232.2	2.5
54	131.2	1.4	99	244.6	4.9
55	133.0	1.5			
56	135.0	1.5			
57	136.4	1.4			
58	138.1	1.5			

TABLE F-2. Sample identification and PSD run conditions. 50 - 220 μm quartz powder standard, BCR-130, Set 1 and Set 2.

Conditions Key: P = Pump Speed Setting; P6 = 14.4 mL/s
S = Stirrer Speed Setting (1-7); S1 = Stirrer Speed 1; S3 = Stirrer Speed 3
US = Ultrasonic ON Time (min.); DT = Delay Time (min) between end of ultrasonic treatment and PSD measurement.

Sample	PSD Run File Name	Run Conditions				Run Initiated At	Cumulative Time (min) At Conditions				
		P	S	US	DT		P6	S1	S3	US	DT
SET 1	[LOAD-IN]	6	1	0	0		?	?			
	BC130677	6	1	0	0	15:27	3	3			
	BC130678	6	3	0	0	15:30	6	3	3		
	BC130679	6	1	2	0	15:33	11	8	3	2	0
	BC130680	6	3	0	0	15:38	14	8	6	2	3
						15:41					
SET 2	[LOAD-IN]	6	1	0	0		?	?			
		6	0	0	0	16:00	5	?			
	BC130682	6	1	0	0	16:05	8	3			
	BC130683	6	3	0	0	16:08	11	3	3		
	BC130684	6	1	2	0	16:11	16	8	3	2	0
	BC130685	6	3	0	0	16:16	18	8	5	2	3
						16:18					

HORIBA LA-910

for Windows(TM) Ver.1.20j Aug/01/'01 08:14

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010731-677 15:30
Filename : BC130677
Sample : BCR 130

Material : 50-220 um Quartz
Source : CEC/BCR
Lot Numbe : Bottle 618 / Jar 130-5

Condition
T%(He-Ne): 83.3% Dist.Form: Std. Sampling times : 100
(LAMP): 91.2% R.R.Index: 1.14-0.00i ( )

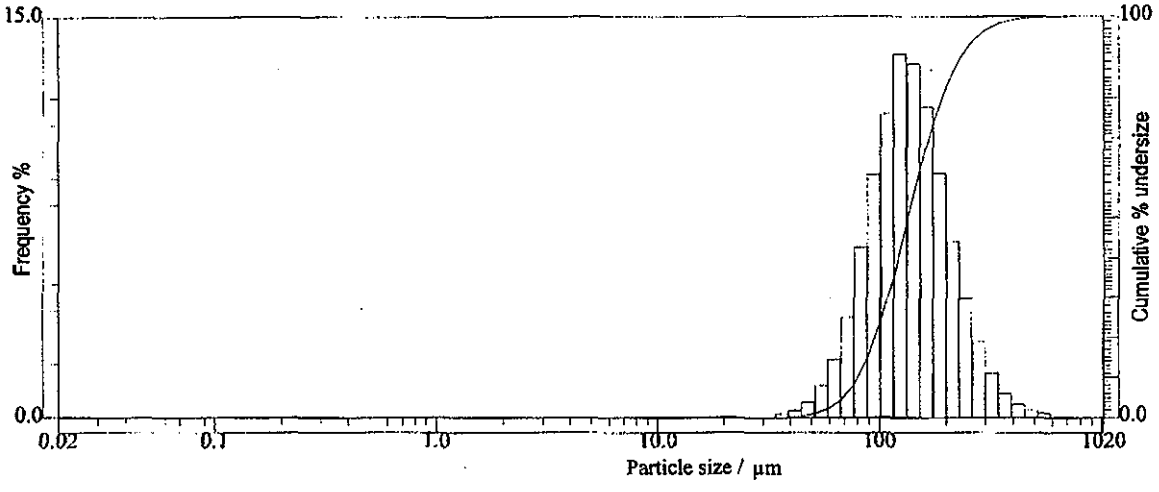
Agitation : 1 Circuitn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 135.042μm SP.Area : 480cm²/cm³ S.D. : 67.678μm
Mode : 125.537μm Mean : 149.209μm
C.V. : 45.36%

Span : (D 10.0-D 90.0) / D50 = 1.138

Dia. on %(5.0%) :	69.184μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	103.177μm	% on Dia.(1.000μm) :	0.0%
Dia. on %(50.0%) :	135.042μm	% on Dia.(10.000μm) :	0.0%
Dia. on %(75.0%) :	178.602μm	% on Dia.(100.000μm) :	22.6%
Dia. on %(95.0%) :	278.946μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	0.00	0.669	0.00	0.00
890.1	0.00	100.00	22.80	0.00	0.00	0.584	0.00	0.00
777.1	0.00	100.00	19.90	0.00	0.00	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.00	0.00	0.445	0.00	0.00
592.4	0.15	100.00	15.17	0.00	0.00	0.389	0.00	0.00
517.2	0.27	99.85	13.25	0.00	0.00	0.339	0.00	0.00
451.6	0.49	99.58	11.56	0.00	0.00	0.296	0.00	0.00
394.2	0.88	99.09	10.10	0.00	0.00	0.259	0.00	0.00
344.2	1.65	98.21	8.816	0.00	0.00	0.226	0.00	0.00
300.5	2.84	96.56	7.697	0.00	0.00	0.197	0.00	0.00
262.4	4.44	93.72	6.720	0.00	0.00	0.172	0.00	0.00
229.1	6.62	89.28	5.867	0.00	0.00	0.150	0.00	0.00
200.0	9.19	82.66	5.122	0.00	0.00	0.131	0.00	0.00
174.6	11.63	73.47	4.472	0.00	0.00	0.115	0.00	0.00
152.5	13.25	61.84	3.905	0.00	0.00	0.100	0.00	0.00
133.1	13.61	48.59	3.409	0.00	0.00	0.087	0.00	0.00
116.2	11.38	34.97	2.976	0.00	0.00	0.076	0.00	0.00
101.5	9.15	23.59	2.599	0.00	0.00	0.067	0.00	0.00
88.58	6.38	14.45	2.269	0.00	0.00	0.058	0.00	0.00
77.34	3.74	8.07	1.981	0.00	0.00	0.051	0.00	0.00
67.52	2.16	4.33	1.729	0.00	0.00	0.044	0.00	0.00
58.95	1.20	2.17	1.510	0.00	0.00	0.039	0.00	0.00
51.47	0.57	0.97	1.318	0.00	0.00	0.034	0.00	0.00
44.94	0.27	0.40	1.151	0.00	0.00	0.029	0.00	0.00
39.23	0.13	0.13	1.005	0.00	0.00	0.026	0.00	0.00
34.25	0.00	0.00	0.877	0.00	0.00	0.022	0.00	0.00
29.91	0.00	0.00	0.766	0.00	0.00			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/01/01
File Name: BC130677.DAT Sample Name: BCR 130 ID No: 01/07/31-677
Dist. Form: STANDARD R.R. Index: 114-000
Dist. Mode: VOLUME Laser: 83.318 % Lamp: 91.167 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: 50-220 um Quartz Source: CEC/BCR
Lot No: Bottle 618 / Jar 130-5 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	38.129	0.10	0.10	(15)	142.464	5.00	55.00
(2)	51.637	0.90	1.00	(16)	149.763	5.00	60.00
(3)	59.469	1.30	2.30	(17)	158.470	5.00	65.00
(4)	69.281	2.70	5.00	(18)	167.999	5.00	70.00
(5)	80.746	5.00	10.00	(19)	178.837	5.00	75.00
(6)	89.361	5.00	15.00	(20)	192.652	5.00	80.00
(7)	90.488	0.80	15.80	(21)	206.769	4.20	84.20
(8)	96.401	4.20	20.00	(22)	210.285	0.80	85.00
(9)	103.283	5.00	25.00	(23)	234.506	5.00	90.00
(10)	109.763	5.00	30.00	(24)	279.586	5.00	95.00
(11)	116.241	5.00	35.00	(25)	330.649	2.70	97.70
(12)	122.446	5.00	40.00	(26)	389.069	1.30	99.00
(13)	128.651	5.00	45.00	(27)	542.435	0.90	99.90
(14)	135.165	5.00	50.00				

Median : 135.042 (μm) Mean: 149.209 (μm) Mode: 124.370 (μm)
Std. Dev.: 67.678 (μm) Span: 0.743
Coef. Var: 45.36% Spec. Area: 480 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Aug/01/'01 08:14

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010731-678 15:33
Filename : BC130678
Sample : BCR 130

Material : 50-220 um Quartz
Source : CEC/BCR
Lot Numbe : Bottle 618 / Jar 130-5

Condition
T%(He-Ne): 78.2% Dist.Form: Std. Sampling times : 100
(LAMP): 86.6% R.R.Index: 1.14-0.00i ( )

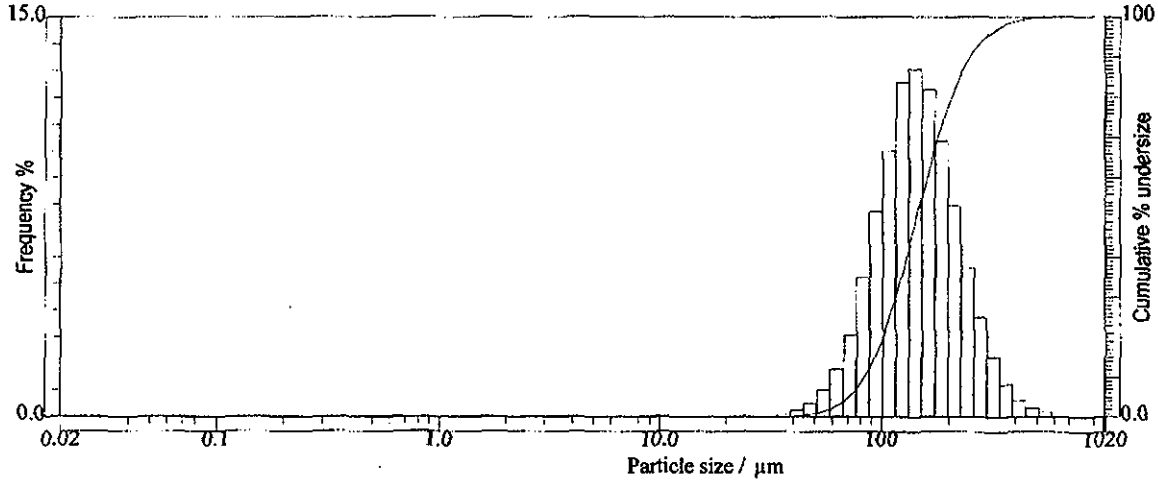
Agitation : 3 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 144.183μm SP.Area : 454cm²/cm³ S.D. : 72.238μm
Mode : 142.254μm Mean : 159.004μm
C.V. : 45.43%

Span : (D 10.0-D 90.0) / D50 = 1.168

Dia. on %(5.0%) : 71.566μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 108.949μm % on Dia.(1.000μm) : 0.0%
Dia. on %(50.0%) : 144.183μm % on Dia.(10.000μm) : 0.0%
Dia. on %(75.0%) : 192.234μm % on Dia.(100.000μm) : 18.9%
Dia. on %(95.0%) : 296.877μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	0.00	0.669	0.00	0.00
890.1	0.00	100.00	22.80	0.00	0.00	0.584	0.00	0.00
777.1	0.00	100.00	19.90	0.00	0.00	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.00	0.00	0.445	0.00	0.00
592.4	0.19	100.00	15.17	0.00	0.00	0.389	0.00	0.00
517.2	0.35	99.81	13.25	0.00	0.00	0.339	0.00	0.00
451.6	0.63	99.46	11.56	0.00	0.00	0.296	0.00	0.00
394.2	1.23	98.83	10.10	0.00	0.00	0.259	0.00	0.00
344.2	2.27	97.60	8.816	0.00	0.00	0.226	0.00	0.00
300.5	3.73	95.34	7.697	0.00	0.00	0.197	0.00	0.00
262.4	5.62	91.60	6.720	0.00	0.00	0.172	0.00	0.00
229.1	7.95	85.98	5.867	0.00	0.00	0.150	0.00	0.00
200.0	10.38	78.03	5.122	0.00	0.00	0.131	0.00	0.00
174.6	12.28	67.65	4.472	0.00	0.00	0.115	0.00	0.00
152.5	13.06	55.37	3.905	0.00	0.00	0.100	0.00	0.00
133.1	12.55	42.31	3.409	0.00	0.00	0.087	0.00	0.00
116.2	10.01	29.76	2.976	0.00	0.00	0.076	0.00	0.00
101.5	7.73	19.75	2.599	0.00	0.00	0.067	0.00	0.00
88.58	5.25	12.02	2.269	0.00	0.00	0.058	0.00	0.00
77.34	3.09	6.77	1.981	0.00	0.00	0.051	0.00	0.00
67.52	1.80	3.68	1.729	0.00	0.00	0.044	0.00	0.00
58.95	1.00	1.88	1.510	0.00	0.00	0.039	0.00	0.00
51.47	0.50	0.88	1.318	0.00	0.00	0.034	0.00	0.00
44.94	0.25	0.37	1.151	0.00	0.00	0.029	0.00	0.00
39.23	0.12	0.12	1.005	0.00	0.00	0.026	0.00	0.00
34.25	0.00	0.00	0.877	0.00	0.00	0.022	0.00	0.00
29.91	0.00	0.00	0.766	0.00	0.00			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/01/01
File Name: BC130678.DAT Sample Name: BCR 130 *ID No: 01/07/31-678*
Dist. Form: STANDARD R.R. Index: 114-000
Dist. Mode: VOLUME Laser: 78.191 % Lamp: 86.560 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: 50-220 um Quartz Source: CEC/BCR
Lot No: Bottle 618 / Jar 130-5 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	38.266	0.10	0.10	(15)	151.909	5.00	55.00
(2)	52.391	0.90	1.00	(16)	160.813	5.00	60.00
(3)	60.958	1.30	2.30	(17)	169.836	5.00	65.00
(4)	71.729	2.70	5.00	(18)	180.366	5.00	70.00
(5)	84.261	5.00	10.00	(19)	192.593	5.00	75.00
(6)	93.550	5.00	15.00	(20)	207.206	5.00	80.00
(7)	94.883	0.80	15.80	(21)	222.559	4.20	84.20
(8)	101.833	4.20	20.00	(22)	225.483	0.80	85.00
(9)	109.199	5.00	25.00	(23)	252.881	5.00	90.00
(10)	116.534	5.00	30.00	(24)	297.092	5.00	95.00
(11)	123.267	5.00	35.00	(25)	348.170	2.70	97.70
(12)	129.999	5.00	40.00	(26)	409.575	1.30	99.00
(13)	137.095	5.00	45.00	(27)	553.495	0.90	99.90
(14)	144.502	5.00	50.00				

Median : 144.183 (μm) Mean: 159.004 (μm) Mode: 142.450 (μm)
Std. Dev.: 72.238 (μm) Span: 0.726
Coef. Var: 45.43% Spec. Area: 454 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Aug/01/'01 08:15

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010731-679 15:38
Filename : BC130679
Sample : BCR 130

Material : 50-220 um Quartz
Source : CEC/BCR
Lot Numbe : Bottle 618 / Jar 130-5

Condition
T%(He-Ne): 82.8% Dist.Form: Std. Sampling times : 100
(LAMP): 89.1% R.R.Index: 1.14-0.00i ( )

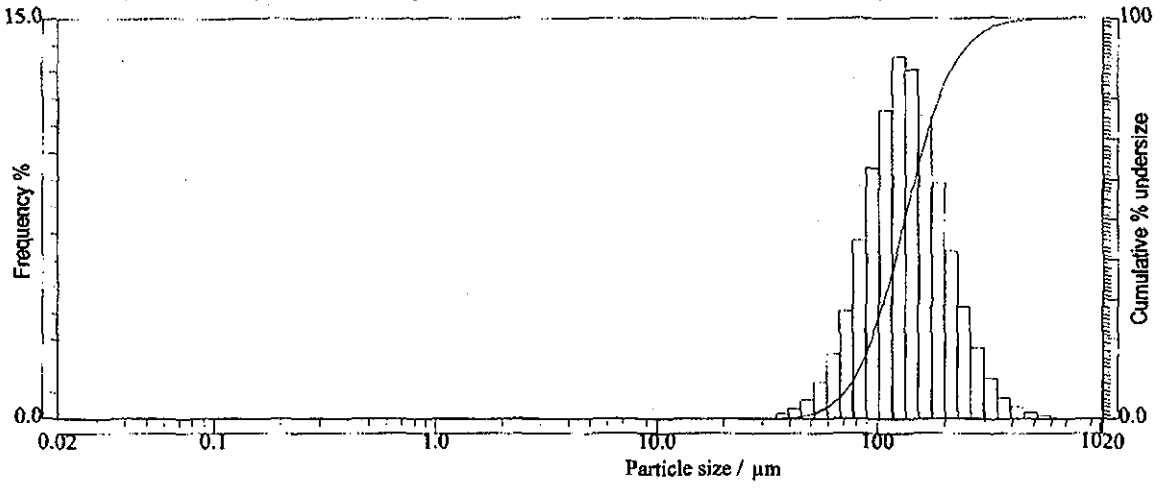
Agitation : 1 Circultn : 6 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 132.556μm SP.Area : 491cm²/cm³ S.D. : 66.909μm
Mode : 125.320μm Mean : 146.366μm
C.V. : 45.71%

Span : (D 10.0-D 90.0) / D50 = 1.138

Dia. on %(5.0%) : 67.001μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 100.956μm % on Dia.(1.000μm) : 0.0%
Dia. on %(50.0%) : 132.556μm % on Dia.(10.000μm) : 0.0%
Dia. on %(75.0%) : 175.227μm % on Dia.(100.000μm) : 24.3%
Dia. on %(95.0%) : 273.853μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	0.00	0.669	0.00	0.00
890.1	0.00	100.00	22.80	0.00	0.00	0.584	0.00	0.00
777.1	0.00	100.00	19.90	0.00	0.00	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.00	0.00	0.445	0.00	0.00
592.4	0.14	100.00	15.17	0.00	0.00	0.389	0.00	0.00
517.2	0.25	99.86	13.25	0.00	0.00	0.339	0.00	0.00
451.6	0.45	99.61	11.56	0.00	0.00	0.296	0.00	0.00
394.2	0.81	99.17	10.10	0.00	0.00	0.259	0.00	0.00
344.2	1.53	98.36	8.816	0.00	0.00	0.226	0.00	0.00
300.5	2.67	96.83	7.697	0.00	0.00	0.197	0.00	0.00
262.4	4.20	94.16	6.720	0.00	0.00	0.172	0.00	0.00
229.1	6.32	89.95	5.867	0.00	0.00	0.150	0.00	0.00
200.0	8.86	83.63	5.122	0.00	0.00	0.131	0.00	0.00
174.6	11.32	74.77	4.472	0.00	0.00	0.115	0.00	0.00
152.5	13.04	63.45	3.905	0.00	0.00	0.100	0.00	0.00
133.1	13.54	50.41	3.409	0.00	0.00	0.087	0.00	0.00
116.2	11.52	36.87	2.976	0.00	0.00	0.076	0.00	0.00
101.5	9.42	25.35	2.599	0.00	0.00	0.067	0.00	0.00
88.58	6.72	15.93	2.269	0.00	0.00	0.058	0.00	0.00
77.34	4.07	9.21	1.981	0.00	0.00	0.051	0.00	0.00
67.52	2.44	5.14	1.729	0.00	0.00	0.044	0.00	0.00
58.95	1.40	2.70	1.510	0.00	0.00	0.039	0.00	0.00
51.47	0.72	1.30	1.318	0.00	0.00	0.034	0.00	0.00
44.94	0.38	0.57	1.151	0.00	0.00	0.029	0.00	0.00
39.23	0.20	0.20	1.005	0.00	0.00	0.026	0.00	0.00
34.25	0.00	0.00	0.877	0.00	0.00	0.022	0.00	0.00
29.91	0.00	0.00	0.766	0.00	0.00			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/01/01
File Name: BC130679.DAT Sample Name: BCR 130 ID No: 01/07/31-679
Dist. Form: STANDARD R.R. Index: 114-000
Dist. Mode: VOLUME Laser: 82.809 % Lamp: 89.097 %
Circulation: 6 Agitation: 1 U.Sonic ** (min)
Material: 50-220 um Quartz Source: CEC/BCR
Lot No: Bottle 618 / Jar 130-5 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	36.779	0.10	0.10	(15)	139.913	5.00	55.00
(2)	48.798	0.90	1.00	(16)	147.332	5.00	60.00
(3)	56.833	1.30	2.30	(17)	155.486	5.00	65.00
(4)	67.033	2.70	5.00	(18)	165.274	5.00	70.00
(5)	78.662	5.00	10.00	(19)	175.269	5.00	75.00
(6)	87.033	5.00	15.00	(20)	189.592	5.00	80.00
(7)	88.372	0.80	15.80	(21)	202.607	4.20	84.20
(8)	94.152	4.20	20.00	(22)	206.287	0.80	85.00
(9)	100.987	5.00	25.00	(23)	229.435	5.00	90.00
(10)	107.419	5.00	30.00	(24)	274.407	5.00	95.00
(11)	113.821	5.00	35.00	(25)	325.413	2.70	97.70
(12)	120.118	5.00	40.00	(26)	383.954	1.30	99.00
(13)	126.354	5.00	45.00	(27)	537.957	0.90	99.90
(14)	132.590	5.00	50.00				

Median : 132.556 (μm) Mean: 146.366 (μm) Mode: 124.370 (μm)
Std. Dev.: 66.909 (μm) Span: 0.744
Coef. Var: 45.71% Spec. Area: 491 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20J Aug/01/'01 08:17

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010731-680 15:41
Filename : BC130680
Sample : BCR 130

Material : 50-220 um Quartz
Source : CEC/BCR
Lot Numbe : Bottle 618 / Jar 130-5

Condition
T%(He-Ne): 76.8% Dist.Form: Std. Sampling times : 100
(LAMP): 84.5% R.R.Index: 1.14-0.001 ( )

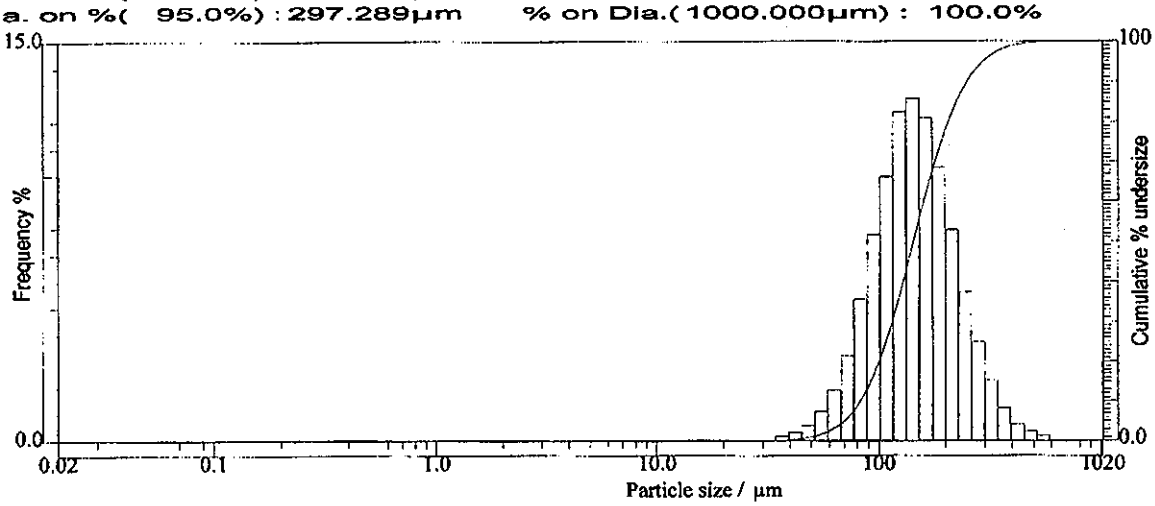
Agitation : 3 Circultn : 6 U.sonic : ~~ON~~(120) OFF WJC 8/4/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 143.725μm SP.Area : 458cm²/cm³ S.D. : 72.783μm
Mode : 142.276μm Mean : 158.521μm
C.V. : 45.91%

Span : (D 10.0-D 90.0) / D50 = 1.183

Dia. on %(5.0%) : 70.077μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 108.018μm % on Dia.(1.000μm) : 0.0%
Dia. on %(50.0%) : 143.725μm % on Dia.(10.000μm) : 0.0%
Dia. on %(75.0%) : 192.202μm % on Dia.(100.000μm) : 19.6%
Dia. on %(95.0%) : 297.289μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	0.00	0.669	0.00	0.00
890.1	0.00	100.00	22.80	0.00	0.00	0.584	0.00	0.00
777.1	0.00	100.00	19.90	0.00	0.00	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.00	0.00	0.445	0.00	0.00
592.4	0.19	100.00	15.17	0.00	0.00	0.389	0.00	0.00
517.2	0.35	99.81	13.25	0.00	0.00	0.339	0.00	0.00
451.6	0.63	99.45	11.56	0.00	0.00	0.296	0.00	0.00
394.2	1.24	98.82	10.10	0.00	0.00	0.259	0.00	0.00
344.2	2.28	97.58	8.816	0.00	0.00	0.226	0.00	0.00
300.5	3.74	95.30	7.697	0.00	0.00	0.197	0.00	0.00
262.4	5.62	91.55	6.720	0.00	0.00	0.172	0.00	0.00
229.1	7.92	85.94	5.867	0.00	0.00	0.150	0.00	0.00
200.0	10.29	78.02	5.122	0.00	0.00	0.131	0.00	0.00
174.6	12.13	67.72	4.472	0.00	0.00	0.115	0.00	0.00
152.5	12.88	55.59	3.905	0.00	0.00	0.100	0.00	0.00
133.1	12.36	42.72	3.409	0.00	0.00	0.087	0.00	0.00
116.2	9.94	30.35	2.976	0.00	0.00	0.076	0.00	0.00
101.5	7.74	20.41	2.599	0.00	0.00	0.067	0.00	0.00
88.58	5.33	12.68	2.269	0.00	0.00	0.058	0.00	0.00
77.34	3.22	7.34	1.981	0.00	0.00	0.051	0.00	0.00
67.52	1.93	4.12	1.729	0.00	0.00	0.044	0.00	0.00
58.95	1.11	2.19	1.510	0.00	0.00	0.039	0.00	0.00
51.47	0.59	1.08	1.318	0.00	0.00	0.034	0.00	0.00
44.94	0.32	0.49	1.151	0.00	0.00	0.029	0.00	0.00
39.23	0.17	0.17	1.005	0.00	0.00	0.026	0.00	0.00
34.25	0.00	0.00	0.877	0.00	0.00	0.022	0.00	0.00
29.91	0.00	0.00	0.766	0.00	0.00			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/01/01
File Name: BC130680.DAT Sample Name: BCR 130 ID No: 01/07/31-680
Dist. Form: STANDARD R.R. Index: 114-000
Dist. Mode: VOLUME Laser: 76.830 % Lamp: 84.497 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: 50-220 um Quartz Source: CEC/BCR
Lot No: Bottle 618 / Jar 130-5 Test No:

JSC 8/4/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	37.176	0.10	0.10	(15)	151.562	5.00	55.00
(2)	50.618	0.90	1.00	(16)	160.504	5.00	60.00
(3)	59.454	1.30	2.30	(17)	169.639	5.00	65.00
(4)	70.208	2.70	5.00	(18)	180.229	5.00	70.00
(5)	82.941	5.00	10.00	(19)	192.562	5.00	75.00
(6)	92.449	5.00	15.00	(20)	207.285	5.00	80.00
(7)	93.781	0.80	15.80	(21)	222.705	4.20	84.20
(8)	100.772	4.20	20.00	(22)	225.642	0.80	85.00
(9)	108.266	5.00	25.00	(23)	253.168	5.00	90.00
(10)	115.685	5.00	30.00	(24)	297.482	5.00	95.00
(11)	122.559	5.00	35.00	(25)	348.962	2.70	97.70
(12)	129.391	5.00	40.00	(26)	410.283	1.30	99.00
(13)	136.535	5.00	45.00	(27)	553.793	0.90	99.90
(14)	144.048	5.00	50.00				

Median : 143.725 (μm) Mean: 158.521 (μm) Mode: 142.450 (μm)
Std. Dev.: 72.783 (μm) Span: 0.731
Coef. Var: 45.91% Spec. Area: 458 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Aug/01/'01 08:18

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010731-682 16:07
Filename : BC130682
Sample : BCR 130

Material : 50-220 um Quartz
Source : CEC/BCR
Lot Numbe : Bottle 618 / Jar 130-6

Condition
T%(He-Ne): 84.3% Dist.Form: Std. Sampling times : 100
(LAMP): 91.4% R.R.Index: 1.14-0.00i ( )

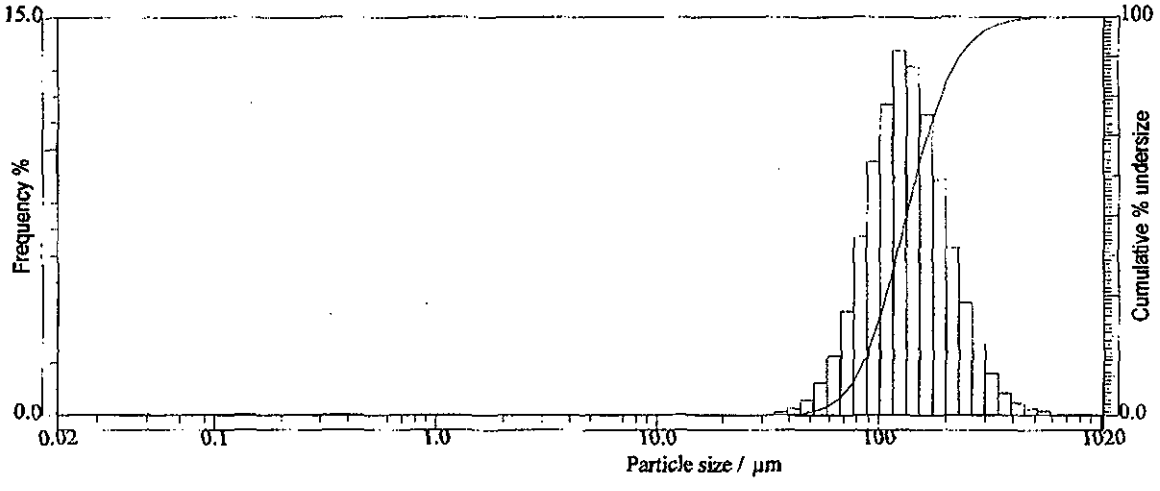
Agitation : 1 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 132.977μm SP.Area : 486cm²/cm³ S.D. : 67.389μm
Mode : 125.255μm Mean : 147.424μm
C.V. : 45.71%

Span : (D 10.0-D 90.0) / D50 = 1.140

Dia. on %(5.0%) : 68.627μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 101.816μm % on Dia.(1.000μm) : 0.0%
Dia. on %(50.0%) : 132.977μm % on Dia.(10.000μm) : 0.0%
Dia. on %(75.0%) : 175.901μm % on Dia.(100.000μm) : 23.7%
Dia. on %(95.0%) : 276.881μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	0.00	0.669	0.00	0.00
890.1	0.00	100.00	22.80	0.00	0.00	0.584	0.00	0.00
777.1	0.00	100.00	19.90	0.00	0.00	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.00	0.00	0.445	0.00	0.00
592.4	0.15	100.00	15.17	0.00	0.00	0.389	0.00	0.00
517.2	0.27	99.85	13.25	0.00	0.00	0.339	0.00	0.00
451.6	0.48	99.59	11.56	0.00	0.00	0.296	0.00	0.00
394.2	0.86	99.11	10.10	0.00	0.00	0.259	0.00	0.00
344.2	1.60	98.24	8.816	0.00	0.00	0.226	0.00	0.00
300.5	2.72	96.64	7.697	0.00	0.00	0.197	0.00	0.00
262.4	4.24	93.92	6.720	0.00	0.00	0.172	0.00	0.00
229.1	6.32	89.68	5.867	0.00	0.00	0.150	0.00	0.00
200.0	8.84	83.36	5.122	0.00	0.00	0.131	0.00	0.00
174.6	11.32	74.52	4.472	0.00	0.00	0.115	0.00	0.00
152.5	13.11	63.20	3.905	0.00	0.00	0.100	0.00	0.00
133.1	13.72	50.10	3.409	0.00	0.00	0.087	0.00	0.00
116.2	11.67	36.37	2.976	0.00	0.00	0.076	0.00	0.00
101.5	9.52	24.70	2.599	0.00	0.00	0.067	0.00	0.00
88.58	6.71	15.18	2.269	0.00	0.00	0.058	0.00	0.00
77.34	3.93	8.46	1.981	0.00	0.00	0.051	0.00	0.00
67.52	2.27	4.53	1.729	0.00	0.00	0.044	0.00	0.00
58.95	1.26	2.25	1.510	0.00	0.00	0.039	0.00	0.00
51.47	0.59	1.00	1.318	0.00	0.00	0.034	0.00	0.00
44.94	0.28	0.40	1.151	0.00	0.00	0.029	0.00	0.00
39.23	0.13	0.13	1.005	0.00	0.00	0.026	0.00	0.00
34.25	0.00	0.00	0.877	0.00	0.00	0.022	0.00	0.00
29.91	0.00	0.00	0.766	0.00	0.00			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/01/01
File Name: BC130682.DAT Sample Name: BCR 130 ID No: 01/07/31-682
Dist. Form: STANDARD R.R. Index: 114-000
Dist. Mode: VOLUME Laser: 84.294 % Lamp: 91.424 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: 50-220 um Quartz Source: CEC/BCR
Lot No: Bottle 618 / Jar 130-6 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	38.148	0.10	0.10	(15)	140.343	5.00	55.00
(2)	51.491	0.90	1.00	(16)	147.723	5.00	60.00
(3)	59.123	1.30	2.30	(17)	155.969	5.00	65.00
(4)	68.696	2.70	5.00	(18)	165.760	5.00	70.00
(5)	79.912	5.00	10.00	(19)	175.987	5.00	75.00
(6)	88.284	5.00	15.00	(20)	190.347	5.00	80.00
(7)	89.424	0.80	15.80	(21)	203.859	4.20	84.20
(8)	95.104	4.20	20.00	(22)	207.539	0.80	85.00
(9)	101.840	5.00	25.00	(23)	231.576	5.00	90.00
(10)	108.157	5.00	30.00	(24)	277.497	5.00	95.00
(11)	114.475	5.00	35.00	(25)	329.390	2.70	97.70
(12)	120.674	5.00	40.00	(26)	388.137	1.30	99.00
(13)	126.830	5.00	45.00	(27)	541.625	0.90	99.90
(14)	132.986	5.00	50.00				

Median : 132.977 (μm) Mean: 147.424 (μm) Mode: 124.370 (μm)
Std. Dev.: 67.389 (μm) Span: 0.759
Coef. Var: 45.71% Spec. Area: 486 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Aug/01/'01 08:19

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010731-683 16:10
Filename : BC130683
Sample : BCR 130

Material : 50-220 um Quartz
Source : CEC/BCR
Lot Numbe : Bottle 618 / Jar 130-6

Condition
T%(He-Ne): 77.9%
(LAMP): 86.9%
Dist.Form: Std.
R.R.Index: 1.14-0.00i
Sampling times : 100
( )

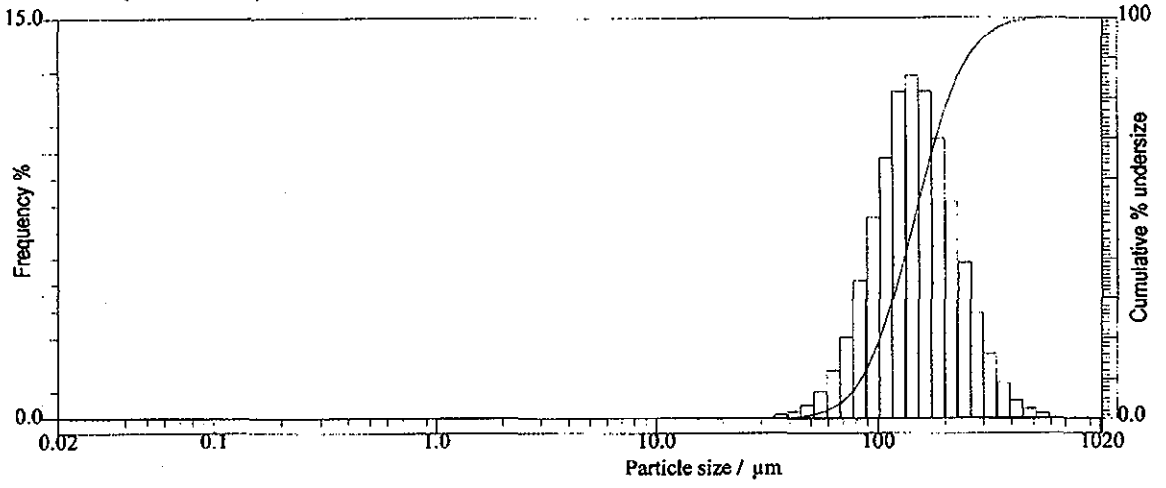
Agitation : 3
Circultn : 6
U.sonic : OFF(120)

Format
Dist.base : Volume
Scaling : Auto
Axis : LogX - LinearY

Data
Median : 145.667μm
SP.Area : 450cm²/cm³
S.D. : 73.599μm
Mode : 142.440μm
Mean : 160.828μm
C.V. : 45.76%

Span : (D 10.0-D 90.0) / D50 = 1.180

Dia. on %(5.0%) :	71.630μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	109.600μm	% on Dia.(1.000μm) :	0.0%
Dia. on %(50.0%) :	145.667μm	% on Dia.(10.000μm) :	0.0%
Dia. on %(75.0%) :	194.831μm	% on Dia.(100.000μm) :	18.6%
Dia. on %(95.0%) :	300.874μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	0.00	0.669	0.00	0.00
890.1	0.00	100.00	22.80	0.00	0.00	0.584	0.00	0.00
777.1	0.00	100.00	19.90	0.00	0.00	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.00	0.00	0.445	0.00	0.00
592.4	0.21	100.00	15.17	0.00	0.00	0.389	0.00	0.00
517.2	0.37	99.79	13.25	0.00	0.00	0.339	0.00	0.00
451.6	0.67	99.42	11.56	0.00	0.00	0.296	0.00	0.00
394.2	1.33	98.74	10.10	0.00	0.00	0.259	0.00	0.00
344.2	2.43	97.41	8.816	0.00	0.00	0.226	0.00	0.00
300.5	3.94	94.98	7.697	0.00	0.00	0.197	0.00	0.00
262.4	5.85	91.04	6.720	0.00	0.00	0.172	0.00	0.00
229.1	8.16	85.19	5.867	0.00	0.00	0.150	0.00	0.00
200.0	10.49	77.02	5.122	0.00	0.00	0.131	0.00	0.00
174.6	12.23	66.54	4.472	0.00	0.00	0.115	0.00	0.00
152.5	12.85	54.31	3.905	0.00	0.00	0.100	0.00	0.00
133.1	12.24	41.46	3.409	0.00	0.00	0.087	0.00	0.00
116.2	9.79	29.22	2.976	0.00	0.00	0.076	0.00	0.00
101.5	7.55	19.44	2.599	0.00	0.00	0.067	0.00	0.00
88.58	5.16	11.88	2.269	0.00	0.00	0.058	0.00	0.00
77.34	3.05	6.73	1.981	0.00	0.00	0.051	0.00	0.00
67.52	1.79	3.67	1.729	0.00	0.00	0.044	0.00	0.00
58.95	1.00	1.88	1.510	0.00	0.00	0.039	0.00	0.00
51.47	0.50	0.88	1.318	0.00	0.00	0.034	0.00	0.00
44.94	0.25	0.38	1.151	0.00	0.00	0.029	0.00	0.00
39.23	0.12	0.12	1.005	0.00	0.00	0.026	0.00	0.00
34.25	0.00	0.00	0.877	0.00	0.00	0.022	0.00	0.00
29.91	0.00	0.00	0.766	0.00	0.00			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/01/01
File Name: BC130683.DAT Sample Name: BCR 130 ID No: 01/07/31-683
Dist. Form: STANDARD R.R. Index: 114-000
Dist. Mode: VOLUME Laser: 77.933 % Lamp: 86.925 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: 50-220 um Quartz Source: CEC/BCR
Lot No: Bottle 618 / Jar 130-6 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	38.261	0.10	0.10	(15)	153.704	5.00	55.00
(2)	52.364	0.90	1.00	(16)	162.767	5.00	60.00
(3)	60.945	1.30	2.30	(17)	171.830	5.00	65.00
(4)	71.794	2.70	5.00	(18)	182.999	5.00	70.00
(5)	84.479	5.00	10.00	(19)	195.103	5.00	75.00
(6)	93.897	5.00	15.00	(20)	210.605	5.00	80.00
(7)	95.261	0.80	15.80	(21)	225.566	4.20	84.20
(8)	102.309	4.20	20.00	(22)	228.416	0.80	85.00
(9)	109.846	5.00	25.00	(23)	256.464	5.00	90.00
(10)	117.284	5.00	30.00	(24)	300.899	5.00	95.00
(11)	124.184	5.00	35.00	(25)	355.040	2.70	97.70
(12)	131.085	5.00	40.00	(26)	416.080	1.30	99.00
(13)	138.431	5.00	45.00	(27)	556.256	0.90	99.90
(14)	145.962	5.00	50.00				

Median : 145.667 (μm) Mean: 160.828 (μm) Mode: 142.450 (μm)
Std. Dev.: 73.599 (μm) Span: 0.728
Coef. Var: 45.76% Spec. Area: 450 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Aug/01/'01 08:21

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010731-684 16:15
Filename : BC130684
Sample : BCR 130

Material : 50-220 um Quartz
Source : CEC/BCR
Lot Numbe : Bottle 618 / Jar 130-6

Condition
T%(He-Ne): 82.3%
(LAMP): 90.0%
Dist.Form: Std.
R.R.Index: 1.14-0.00i
Sampling times : 100
( )

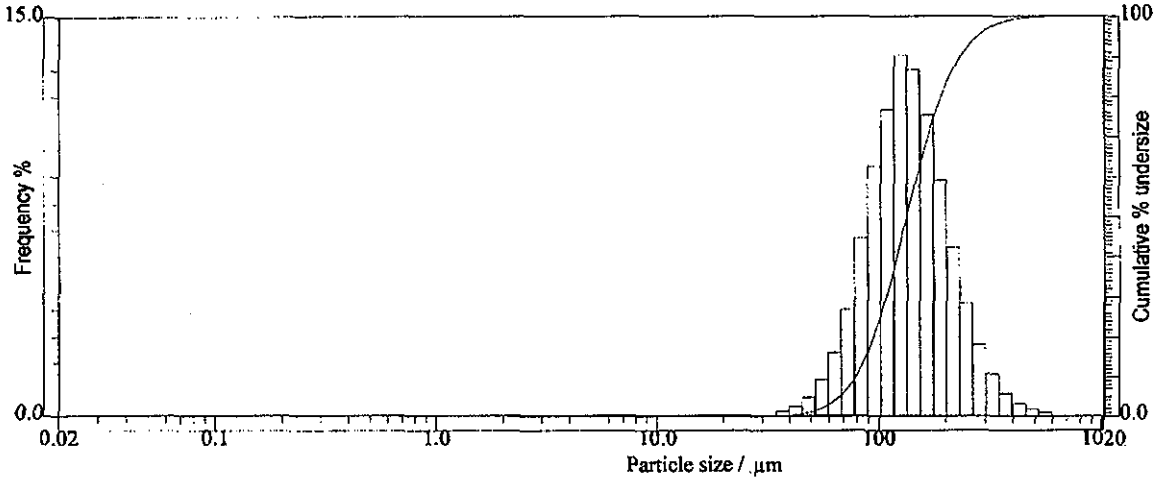
Agitation : 1 Circultn : 6 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 132.823μm SP.Area : 490cm²/cm³ S.D. : 67.521μm
Mode : 125.315μm Mean : 146.964μm
C.V. : 45.94%

Span : (D 10.0-D 90.0) / D50 = 1.147

Dia. on %(5.0%)	67.394μm	% on Dia.(0.100μm)	0.0%
Dia. on %(25.0%)	101.206μm	% on Dia.(1.000μm)	0.0%
Dia. on %(50.0%)	132.823μm	% on Dia.(10.000μm)	0.0%
Dia. on %(75.0%)	175.899μm	% on Dia.(100.000μm)	24.2%
Dia. on %(95.0%)	276.243μm	% on Dia.(1000.000μm)	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	0.00	0.669	0.00	0.00
890.1	0.00	100.00	22.80	0.00	0.00	0.584	0.00	0.00
777.1	0.00	100.00	19.90	0.00	0.00	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.00	0.00	0.445	0.00	0.00
592.4	0.15	100.00	15.17	0.00	0.00	0.389	0.00	0.00
517.2	0.26	99.85	13.25	0.00	0.00	0.339	0.00	0.00
451.6	0.47	99.59	11.56	0.00	0.00	0.296	0.00	0.00
394.2	0.85	99.12	10.10	0.00	0.00	0.259	0.00	0.00
344.2	1.59	98.28	8.816	0.00	0.00	0.226	0.00	0.00
300.5	2.72	96.69	7.697	0.00	0.00	0.197	0.00	0.00
262.4	4.25	93.97	6.720	0.00	0.00	0.172	0.00	0.00
229.1	6.34	89.72	5.867	0.00	0.00	0.150	0.00	0.00
200.0	8.85	83.38	5.122	0.00	0.00	0.131	0.00	0.00
174.6	11.30	74.52	4.472	0.00	0.00	0.115	0.00	0.00
152.5	13.01	63.22	3.905	0.00	0.00	0.100	0.00	0.00
133.1	13.53	50.21	3.409	0.00	0.00	0.087	0.00	0.00
116.2	11.51	36.68	2.976	0.00	0.00	0.076	0.00	0.00
101.5	9.41	25.17	2.599	0.00	0.00	0.067	0.00	0.00
88.58	6.70	15.77	2.269	0.00	0.00	0.058	0.00	0.00
77.34	4.04	9.07	1.981	0.00	0.00	0.051	0.00	0.00
67.52	2.41	5.03	1.729	0.00	0.00	0.044	0.00	0.00
58.95	1.38	2.62	1.510	0.00	0.00	0.039	0.00	0.00
51.47	0.70	1.25	1.318	0.00	0.00	0.034	0.00	0.00
44.94	0.36	0.54	1.151	0.00	0.00	0.029	0.00	0.00
39.23	0.19	0.19	1.005	0.00	0.00	0.026	0.00	0.00
34.25	0.00	0.00	0.877	0.00	0.00	0.022	0.00	0.00
29.91	0.00	0.00	0.766	0.00	0.00			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/01/01
File Name: BC130684.DAT Sample Name: BCR 130 ID No: 01/07/31-684
Dist. Form: STANDARD R.R. Index: 114-000
Dist. Mode: VOLUME Laser: 82.262 % Lamp: 89.957 %
Circulation: 6 Agitation: 1 U.Sonic ** (min)
Material: 50-220 um Quartz Source: CEC/BCR
Lot No: Bottle 618 / Jar 130-6 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	36.944	0.10	0.10	(15)	140.224	5.00	55.00
(2)	49.185	0.90	1.00	(16)	147.658	5.00	60.00
(3)	57.201	1.30	2.30	(17)	155.935	5.00	65.00
(4)	67.403	2.70	5.00	(18)	165.744	5.00	70.00
(5)	78.897	5.00	10.00	(19)	175.985	5.00	75.00
(6)	87.292	5.00	15.00	(20)	190.321	5.00	80.00
(7)	88.626	0.80	15.80	(21)	203.779	4.20	84.20
(8)	94.376	4.20	20.00	(22)	207.447	0.80	85.00
(9)	101.222	5.00	25.00	(23)	231.289	5.00	90.00
(10)	107.648	5.00	30.00	(24)	276.849	5.00	95.00
(11)	114.058	5.00	35.00	(25)	328.353	2.70	97.70
(12)	120.356	5.00	40.00	(26)	387.004	1.30	99.00
(13)	126.598	5.00	45.00	(27)	540.634	0.90	99.90
(14)	132.841	5.00	50.00				

Median : 132.823 (μm) Mean: 146.964 (μm) Mode: 124.370 (μm)
Std. Dev.: 67.521 (μm) Span: 0.755
Coef. Var: 45.94% Spec. Area: 490 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Aug/01/'01 08:22

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010731-685 16:18
Filename : BC130685
Sample : BCR 130

Material : 50-220 um Quartz
Source : CEC/BCR
Lot Numbe : Bottle 618 / Jar 130-6

Condition
T%(He-Ne): 76.9% Dist.Form: Std. Sampling times : 100
(LAMP): 85.0% R.R.Index: 1.14-0.001 ( )

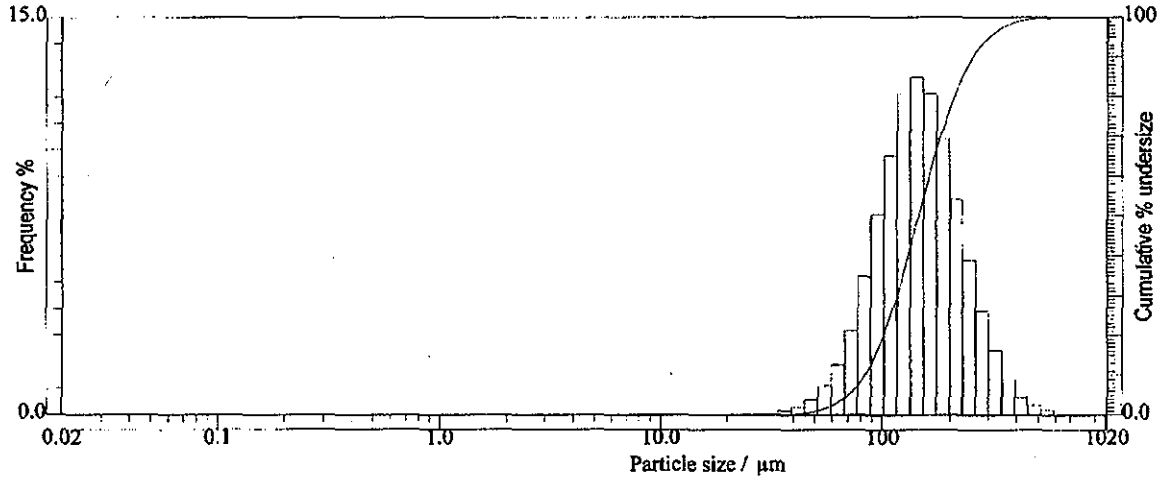
Agitation : 3 Circultn : 6 U.sonic : ~~ON~~(120) OFF WJC 8/9/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 145.203μm SP.Area : 454cm²/cm³ S.D. : 73.933μm
Mode : 142.447μm Mean : 160.301μm
C.V. : 46.12%

Span : (D 10.0-D 90.0) / D50 = 1.190

Dia. on %(5.0%)	70.395μm	% on Dia.(0.100μm)	0.0%
Dia. on %(25.0%)	108.820μm	% on Dia.(1.000μm)	0.0%
Dia. on %(50.0%)	145.203μm	% on Dia.(10.000μm)	0.0%
Dia. on %(75.0%)	194.593μm	% on Dia.(100.000μm)	19.2%
Dia. on %(95.0%)	300.871μm	% on Dia.(1000.000μm)	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	0.00	0.669	0.00	0.00
890.1	0.00	100.00	22.80	0.00	0.00	0.584	0.00	0.00
777.1	0.00	100.00	19.90	0.00	0.00	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.00	0.00	0.445	0.00	0.00
592.4	0.21	100.00	15.17	0.00	0.00	0.389	0.00	0.00
517.2	0.38	99.79	13.25	0.00	0.00	0.339	0.00	0.00
451.6	0.68	99.42	11.56	0.00	0.00	0.296	0.00	0.00
394.2	1.33	98.74	10.10	0.00	0.00	0.259	0.00	0.00
344.2	2.43	97.41	8.816	0.00	0.00	0.226	0.00	0.00
300.5	3.93	94.98	7.697	0.00	0.00	0.197	0.00	0.00
262.4	5.83	91.05	6.720	0.00	0.00	0.172	0.00	0.00
229.1	8.12	85.22	5.867	0.00	0.00	0.150	0.00	0.00
200.0	10.41	77.10	5.122	0.00	0.00	0.131	0.00	0.00
174.6	12.12	66.69	4.472	0.00	0.00	0.115	0.00	0.00
152.5	12.73	54.57	3.905	0.00	0.00	0.100	0.00	0.00
133.1	12.13	41.84	3.409	0.00	0.00	0.087	0.00	0.00
116.2	9.74	29.71	2.976	0.00	0.00	0.076	0.00	0.00
101.5	7.57	19.98	2.599	0.00	0.00	0.067	0.00	0.00
88.58	5.22	12.41	2.269	0.00	0.00	0.058	0.00	0.00
77.34	3.16	7.19	1.981	0.00	0.00	0.051	0.00	0.00
67.52	1.89	4.03	1.729	0.00	0.00	0.044	0.00	0.00
58.95	1.09	2.14	1.510	0.00	0.00	0.039	0.00	0.00
51.47	0.58	1.05	1.318	0.00	0.00	0.034	0.00	0.00
44.94	0.31	0.47	1.151	0.00	0.00	0.029	0.00	0.00
39.23	0.16	0.16	1.005	0.00	0.00	0.026	0.00	0.00
34.25	0.00	0.00	0.877	0.00	0.00	0.022	0.00	0.00
29.91	0.00	0.00	0.766	0.00	0.00			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/01/01
File Name: BC130685.DAT Sample Name: BCR 130 ID No: 01/07/31-685
Dist. Form: STANDARD R.R. Index: 114-000
Dist. Mode: VOLUME Laser: 76.900 % Lamp: 85.008 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: 50-220 um Quartz Source: CEC/BCR
Lot No: Bottle 618 / Jar 130-6 Test No:

JSC 8/9/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	37.303	0.10	0.10	(15)	153.241	5.00	55.00
(2)	50.941	0.90	1.00	(16)	162.382	5.00	60.00
(3)	59.691	1.30	2.30	(17)	171.524	5.00	65.00
(4)	70.536	2.70	5.00	(18)	182.683	5.00	70.00
(5)	83.393	5.00	10.00	(19)	194.874	5.00	75.00
(6)	92.992	5.00	15.00	(20)	210.379	5.00	80.00
(7)	94.353	0.80	15.80	(21)	225.422	4.20	84.20
(8)	101.497	4.20	20.00	(22)	228.287	0.80	85.00
(9)	109.070	5.00	25.00	(23)	256.374	5.00	90.00
(10)	116.608	5.00	30.00	(24)	300.896	5.00	95.00
(11)	123.573	5.00	35.00	(25)	355.180	2.70	97.70
(12)	130.539	5.00	40.00	(26)	416.319	1.30	99.00
(13)	137.906	5.00	45.00	(27)	556.358	0.90	99.90
(14)	145.507	5.00	50.00				

Median : 145.203 (μm) Mean: 160.301 (μm) Mode: 142.450 (μm)
Std. Dev.: 73.933 (μm) Span: 0.732
Coef. Var: 46.12% Spec. Area: 454 (cm2/cm3)

APPENDIX F-3

PSD PARAMETRIC STUDY: TANK AW-103 COMPOSITE

Consisting of 51 pages including this cover page

TABLE F-3. Sample identification and PSD run conditions. AW-103 composite subsamples S01T001424 and S01T001425.

Conditions Key: P = Pump Speed Setting; P6 = 14.4 mL/s
S = Stirrer Speed Setting (1-7); S1 = Stirrer Speed 1; S3 = Stirrer Speed 3
US = Ultrasonic ON Time (min); DT = Delay Time (min) between end of ultrasonic treatment and PSD measurement.

Sample	PSD Run File Name	Run Conditions				Run Initiated At	Cumulative Time (min) At Conditions				
		P	S	US	DT		P6	S1	S3	US	DT
S01T001424	[LOAD-IN]	6	1	0	0		?	?			
	AW103733	6	1	0	0	10:22	7	7			
	AW103734	6	3	0	0	10:29	11	7	4		
	AW103735	6	1	2	0	10:33	16	12	4	2	0
	AW103736	6	3	0	0	10:38	19	12	7	2	3
	[DELAY]	1	0	0	60	10:41					6
	AW103738	6	1	0	0	11:41	22	15	7	2	66
	AW103739	6	3	0	0	11:44	25	15	10	2	69
						11:47					
S01T001425	[LOAD-IN]						?	?			
	AW103740	6	1	0	0	12:06	3	3			
	AW103741	6	3	0	0	12:09	6	3	3		
	AW103742	6	1	20	0	12:12	30	27	3	20	0
	AW103743	6	3	0	0	12:36	33	27	6	20	4
	[DELAY]	1	0	0	60	12:39					7
	AW103744	6	1	0	0	13:39	35	29	6	20	67
	AW103745	6	3	0	0	13:41	37	29	8	20	69
						13:43					

TABLE F-3 (continued). Sample identification and PSD run conditions. AW-103 composite subsamples S01T001426 and S01T001427.

Conditions Key: P = Pump Speed Setting; P6 = 14.4 mL/s
S = Stirrer Speed Setting (1-7); S1 = Stirrer Speed 1; S3 = Stirrer Speed 3
US = Ultrasonic ON Time (min); DT = Delay Time (min) between end of ultrasonic treatment and PSD measurement.

Sample	PSD Run File Name	Run Conditions				Run Initiated At	Cumulative Time (min) At Conditions				
		P	S	US	DT		P6	S1	S3	US	DT
S01T001426	[LOAD-IN]	6	3	0	0		?		?		
	AW103746	6	3	0	0	14:08	3		3		
	AW103747	6	1	0	0	14:11	7	4	3		
	AW103748	6	3	2	0	14:15	12	4	8	2	0
	AW103749	6	1	0	0	14:20	15	7	8	2	3
	[DELAY]	1	0	0	60	14:23					6
	AW103750	6	3	0	0	15:23	18	7	11	2	66
	AW103751	6	1	0	0	15:26	21	10	11	2	69
						15:29					
S01T001427	[LOAD-IN]	6	3	0	0		?		?		
	AW103752	6	3	0	0	10:09	3		3		
	AW103753	6	1	0	0	10:12	6	3	3		
	AW103754	6	3	20	0	10:15	30	3	27	20	0
	AW103755	6	1	0	0	10:39	33	6	27	20	4
	[DELAY]	1	0	0	60	10:42					7
	AW103756	6	3	0	0	11:42	36	6	30	20	67
	AW103757	6	1	0	0	11:45	39	9	30	20	70
						11:48					

HORIBA LA-910

for Windows(TM) Ver.1.20j Aug/13/'01 16:15

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010810-733 10:25
Filename : AW103733
Sample : S01T001424

Material : AW-103 Solids
Source : S01T001020
Lot Numbe : S01T001424

Condition
T%(He-Ne): 79.6%
(LAMP): 69.1%

Dist.Form: Std.
R.R.Index: 1.16-0.001

Sampling times : 100
( )

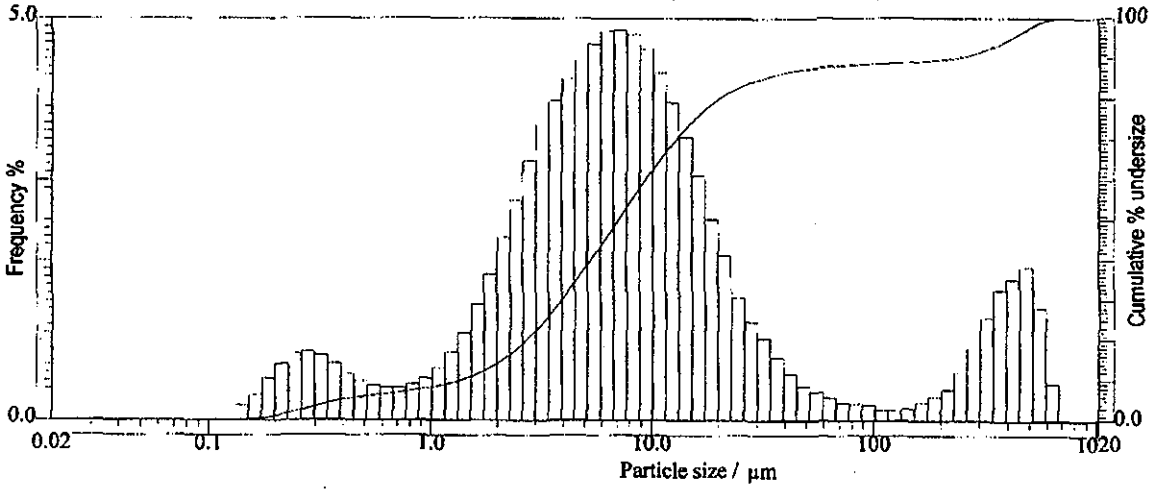
Agitation : 1
Circultn : 6
U.sonic : ~~ON~~ (120) OFF WSC 8/15/01

Format
Dist.base : Volume
Scaling : Auto
Axis : LogX - LinearY

Data
Median : 7.073μm
SP.Area : 25448cm²/cm³
S.D. : 127.526μm
Mode : 7.188μm
Mean : 52.124μm
C.V. : 244.66%

Span : (D 10.0-D 90.0) / D50 = 31.860

Dia. on %(5.0%) :	0.398μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	3.285μm	% on Dia.(1.000μm) :	8.2%
Dia. on %(50.0%) :	7.073μm	% on Dia.(10.000μm) :	62.1%
Dia. on %(75.0%) :	15.716μm	% on Dia.(100.000μm) :	88.6%
Dia. on %(95.0%) :	410.953μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.53	83.36	0.669	0.40	6.81
890.1	0.00	100.00	22.80	2.06	81.83	0.584	0.43	6.40
777.1	0.00	100.00	19.90	2.51	79.77	0.510	0.49	5.97
678.5	0.46	100.00	17.38	3.05	77.26	0.445	0.58	5.48
592.4	1.40	99.54	15.17	3.52	74.21	0.389	0.70	4.90
517.2	1.91	98.14	13.25	3.94	70.69	0.339	0.81	4.20
451.6	1.76	96.22	11.56	4.32	66.74	0.296	0.86	3.40
394.2	1.63	94.46	10.10	4.61	62.42	0.259	0.83	2.54
344.2	1.28	92.83	8.816	4.79	57.81	0.226	0.70	1.71
300.5	0.91	91.54	7.697	4.85	53.02	0.197	0.52	1.02
262.4	0.61	90.63	6.720	4.83	48.17	0.172	0.30	0.49
229.1	0.39	90.03	5.867	4.67	43.34	0.150	0.19	0.19
200.0	0.31	89.64	5.122	4.46	38.67	0.131	0.00	0.00
174.6	0.23	89.34	4.472	4.24	34.21	0.115	0.00	0.00
152.5	0.16	89.11	3.905	3.96	29.96	0.100	0.00	0.00
133.1	0.14	88.95	3.409	3.67	26.00	0.087	0.00	0.00
116.2	0.14	88.81	2.976	3.24	22.32	0.076	0.00	0.00
101.5	0.19	88.67	2.599	2.75	19.09	0.067	0.00	0.00
88.58	0.21	88.48	2.269	2.28	16.34	0.058	0.00	0.00
77.34	0.22	88.26	1.981	1.83	14.06	0.051	0.00	0.00
67.52	0.29	88.05	1.729	1.45	12.23	0.044	0.00	0.00
58.95	0.36	87.76	1.510	1.09	10.79	0.039	0.00	0.00
51.47	0.43	87.40	1.318	0.85	9.70	0.034	0.00	0.00
44.94	0.58	86.97	1.151	0.65	8.85	0.029	0.00	0.00
39.23	0.79	86.39	1.005	0.53	8.20	0.026	0.00	0.00
34.25	1.02	85.61	0.877	0.45	7.67	0.022	0.00	0.00
29.91	1.23	84.59	0.766	0.41	7.22			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/15/01
File Name: AW103733.DAT Sample Name: ~~BCR-69~~ S01T001424 ID No: 01/08/10-733
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 79.615 % Lamp: 69.077 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: ~~13-90 um Quartz~~ AW-103 Solids Source: ~~CEC/BCR~~ S01T001020
Lot No: ~~Bottle 1749 / Jar 69-3~~ Test No:

WJC 8/15/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.141	0.10	0.10	(15)	8.160	5.00	55.00
(2)	0.196	0.90	1.00	(16)	9.424	5.00	60.00
(3)	0.249	1.30	2.30	(17)	10.973	5.00	65.00
(4)	0.398	2.70	5.00	(18)	12.953	5.00	70.00
(5)	1.372	5.00	10.00	(19)	15.744	5.00	75.00
(6)	2.099	5.00	15.00	(20)	20.230	5.00	80.00
(7)	2.200	0.80	15.80	(21)	28.715	4.20	84.20
(8)	2.705	4.20	20.00	(22)	31.668	0.80	85.00
(9)	3.291	5.00	25.00	(23)	226.858	5.00	90.00
(10)	3.909	5.00	30.00	(24)	411.771	5.00	95.00
(11)	4.588	5.00	35.00	(25)	502.154	2.70	97.70
(12)	5.334	5.00	40.00	(26)	563.414	1.30	99.00
(13)	6.160	5.00	45.00	(27)	659.781	0.90	99.90
(14)	7.089	5.00	50.00				

Median : 7.073 (μm) Mean: 52.124 (μm) Mode: 7.192 (μm)
Std. Dev.: 127.526 (μm) Span: 55.879
Coef. Var: 244.66% Spec. Area: 25448 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Aug/13/'01 16:25

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010810-734 10:32
Filename : AW103734
Sample : S01T001424

Material : AW103 Solids
Source : S01T001020
Lot Numbe : S01T001424

Condition
T%(He-Ne): 79.7%
(LAMP): 68.7%

Dist.Form: Std.
R.R.Index: 1.16-0.001

Sampling times : 100
( )

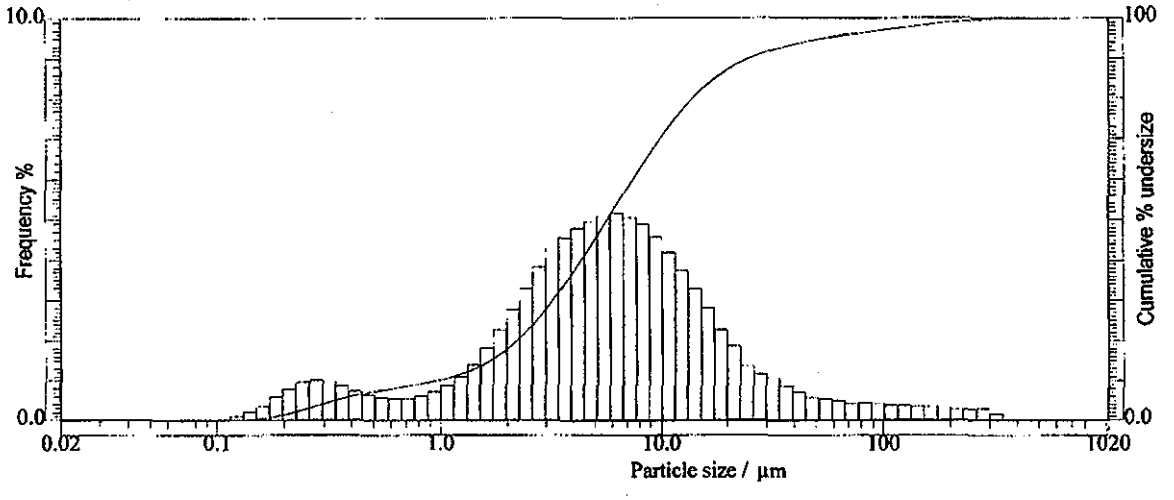
Agitation : 3
Circultn : 6
U.sonic : ~~ON~~(120)
OFF WSC 8/15/01

Format
Dist.base : Volume
Scaling : Auto
Axis : LogX - LinearY

Data
Median : 5.690μm
SP.Area : 30367cm²/cm³
S.D. : 33.781μm
Mode : 6.276μm
Mean : 14.528μm
C.V. : 232.52%

Span : (D 10.0-D 90.0) / D50 = 4.252

Dia. on %(5.0%) :	0.341μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	2.723μm	% on Dia.(1.000μm) :	10.1%
Dia. on %(50.0%) :	5.690μm	% on Dia.(10.000μm) :	70.5%
Dia. on %(75.0%) :	11.561μm	% on Dia.(100.000μm) :	97.1%
Dia. on %(95.0%) :	54.670μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.38	90.37	0.669	0.54	8.31
890.1	0.00	100.00	22.80	1.87	88.99	0.584	0.57	7.77
777.1	0.00	100.00	19.90	2.27	87.12	0.510	0.64	7.20
678.5	0.00	100.00	17.38	2.81	84.85	0.445	0.73	6.56
592.4	0.00	100.00	15.17	3.28	82.04	0.389	0.87	5.83
517.2	0.00	100.00	13.25	3.74	78.75	0.339	0.97	4.97
451.6	0.00	100.00	11.56	4.19	75.01	0.296	1.01	3.99
394.2	0.00	100.00	10.10	4.58	70.81	0.259	0.96	2.98
344.2	0.16	100.00	8.816	4.88	66.23	0.226	0.79	2.03
300.5	0.30	99.84	7.697	5.05	61.35	0.197	0.58	1.24
262.4	0.28	99.54	6.720	5.15	56.30	0.172	0.34	0.65
229.1	0.29	99.26	5.867	5.09	51.15	0.150	0.21	0.32
200.0	0.34	98.97	5.122	4.95	46.06	0.131	0.11	0.11
174.6	0.36	98.63	4.472	4.79	41.11	0.115	0.00	0.00
152.5	0.37	98.26	3.905	4.54	36.32	0.100	0.00	0.00
133.1	0.38	97.90	3.409	4.27	31.78	0.087	0.00	0.00
116.2	0.38	97.52	2.976	3.82	27.51	0.076	0.00	0.00
101.5	0.44	97.14	2.599	3.29	23.69	0.067	0.00	0.00
88.58	0.45	96.70	2.269	2.77	20.40	0.058	0.00	0.00
77.34	0.44	96.25	1.981	2.26	17.63	0.051	0.00	0.00
67.52	0.50	95.81	1.729	1.83	15.37	0.044	0.00	0.00
58.95	0.55	95.31	1.510	1.40	13.54	0.039	0.00	0.00
51.47	0.58	94.76	1.318	1.10	12.14	0.034	0.00	0.00
44.94	0.70	94.18	1.151	0.87	11.04	0.029	0.00	0.00
39.23	0.87	93.47	1.005	0.70	10.17	0.026	0.00	0.00
34.25	1.06	92.60	0.877	0.60	9.47	0.022	0.00	0.00
29.91	1.17	91.54	0.766	0.55	8.86			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/15/01
File Name: AW103734.DAT Sample Name: S01T001424 ID No: 01/08/10-734
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 79.700 % Lamp: 68.675 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: AW103 Solids Source: S01T001020
Lot No: S01T001424 Test No:

WSC
8/15/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.130	0.10	0.10	(15)	6.505	5.00	55.00
(2)	0.187	0.90	1.00	(16)	7.436	5.00	60.00
(3)	0.235	1.30	2.30	(17)	8.533	5.00	65.00
(4)	0.341	2.70	5.00	(18)	9.869	5.00	70.00
(5)	0.974	5.00	10.00	(19)	11.562	5.00	75.00
(6)	1.685	5.00	15.00	(20)	13.977	5.00	80.00
(7)	1.778	0.80	15.80	(21)	16.868	4.20	84.20
(8)	2.227	4.20	20.00	(22)	17.544	0.80	85.00
(9)	2.728	5.00	25.00	(23)	25.212	5.00	90.00
(10)	3.229	5.00	30.00	(24)	54.795	5.00	95.00
(11)	3.760	5.00	35.00	(25)	124.249	2.70	97.70
(12)	4.341	5.00	40.00	(26)	203.152	1.30	99.00
(13)	4.983	5.00	45.00	(27)	317.556	0.90	99.90
(14)	5.699	5.00	50.00				

Median : 5.690 (μm) Mean: 14.528 (μm) Mode: 6.279 (μm)
Std. Dev.: 33.781 (μm) Span: 7.576
Coef. Var: 232.52% Spec. Area: 30367 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Aug/14/'01 11:53

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010810-735 10:37
Filename : AW103735
Sample : S01T001424

Material : AW103 Solids
Source : S01T001020
Lot Numbe : S01T001424

Condition
T%(He-Ne): 82.1% Dist.Form: Std. Sampling times : 100
(LAMP): 69.6% R.R.Index: 1.16-0.001 ( )

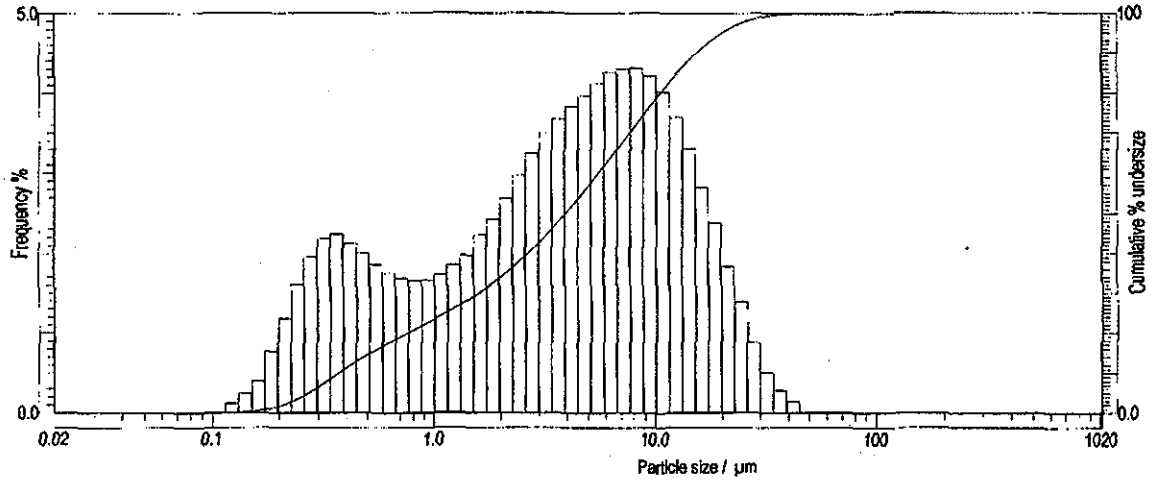
Agitation : 1 Circultn : 6 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 3.941μm SP.Area : 49461cm²/cm³ S.D. : 6.666μm
Mode : 8.225μm Mean : 6.197μm
C.V. : 107.58%

Span : (D 10.0-D 90.0) / D50 = 3.803

Dia. on %(5.0%) : 0.271μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 1.136μm % on Dia.(1.000μm) : 23.4%
Dia. on %(50.0%) : 3.941μm % on Dia.(10.000μm) : 78.4%
Dia. on %(75.0%) : 8.956μm % on Dia.(100.000μm) : 100.0%
Dia. on %(95.0%) : 19.970μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.38	98.18	0.669	1.75	18.44
890.1	0.00	100.00	22.80	1.84	96.79	0.584	1.87	16.68
777.1	0.00	100.00	19.90	2.38	94.95	0.510	2.01	14.82
678.5	0.00	100.00	17.38	2.83	92.57	0.445	2.13	12.81
592.4	0.00	100.00	15.17	3.31	89.74	0.389	2.24	10.68
517.2	0.00	100.00	13.25	3.70	86.43	0.339	2.18	8.44
451.6	0.00	100.00	11.56	4.01	82.73	0.296	1.96	6.26
394.2	0.00	100.00	10.10	4.21	78.72	0.259	1.61	4.30
344.2	0.00	100.00	8.816	4.30	74.51	0.226	1.18	2.69
300.5	0.00	100.00	7.697	4.30	70.21	0.197	0.77	1.51
262.4	0.00	100.00	6.720	4.26	65.91	0.172	0.39	0.75
229.1	0.00	100.00	5.867	4.12	61.65	0.150	0.24	0.35
200.0	0.00	100.00	5.122	3.96	57.53	0.131	0.11	0.11
174.6	0.00	100.00	4.472	3.83	53.57	0.115	0.00	0.00
152.5	0.00	100.00	3.905	3.67	49.74	0.100	0.00	0.00
133.1	0.00	100.00	3.409	3.50	46.07	0.087	0.00	0.00
116.2	0.00	100.00	2.976	3.25	42.56	0.076	0.00	0.00
101.5	0.00	100.00	2.599	2.97	39.32	0.067	0.00	0.00
88.58	0.00	100.00	2.269	2.68	36.34	0.058	0.00	0.00
77.34	0.00	100.00	1.981	2.43	33.66	0.051	0.00	0.00
67.52	0.00	100.00	1.729	2.23	31.23	0.044	0.00	0.00
58.95	0.00	100.00	1.510	1.98	29.00	0.039	0.00	0.00
51.47	0.00	100.00	1.318	1.85	27.02	0.034	0.00	0.00
44.94	0.14	100.00	1.151	1.73	25.17	0.029	0.00	0.00
39.23	0.28	99.86	1.005	1.66	23.44	0.026	0.00	0.00
34.25	0.51	99.57	0.877	1.65	21.77	0.022	0.00	0.00
29.91	0.89	99.06	0.766	1.68	20.12			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/15/01
File Name: AW103735.DAT Sample Name: S01T001424 ID No: 01/08/10-735
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 82.109 % Lamp: 69.609 %
Circulation: 6 Agitation: 1 U.Sonic ** (min)
Material: AW103 Solids Source: S01T001020
Lot No: S01T001424 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.129	0.10	0.10	(15)	4.706	5.00	55.00
(2)	0.180	0.90	1.00	(16)	5.568	5.00	60.00
(3)	0.216	1.30	2.30	(17)	6.538	5.00	65.00
(4)	0.272	2.70	5.00	(18)	7.650	5.00	70.00
(5)	0.374	5.00	10.00	(19)	8.965	5.00	75.00
(6)	0.517	5.00	15.00	(20)	10.566	5.00	80.00
(7)	0.549	0.80	15.80	(21)	12.232	4.20	84.20
(8)	0.759	4.20	20.00	(22)	12.596	0.80	85.00
(9)	1.137	5.00	25.00	(23)	15.371	5.00	90.00
(10)	1.608	5.00	30.00	(24)	19.975	5.00	95.00
(11)	2.124	5.00	35.00	(25)	24.968	2.70	97.70
(12)	2.678	5.00	40.00	(26)	29.637	1.30	99.00
(13)	3.277	5.00	45.00	(27)	41.002	0.90	99.90
(14)	3.943	5.00	50.00				

Median : 3.941 (μm) Mean: 6.197 (μm) Mode: 8.237 (μm)
Std. Dev.: 6.666 (μm) Span: 2.795
Coef. Var: 107.58% Spec. Area: 49461 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Aug/13/'01 16:28

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010810-736 10:40
Filename : AW103736
Sample : S01T001424

Material : AW103 Solids
Source : S01T001020
Lot Numbe : S01T001424

Condition
T%(He-Ne): 81.2%
(LAMP): 68.6%

Dist.Form: Std.
R.R.Index: 1.16-0.001

Sampling times : 100
( )

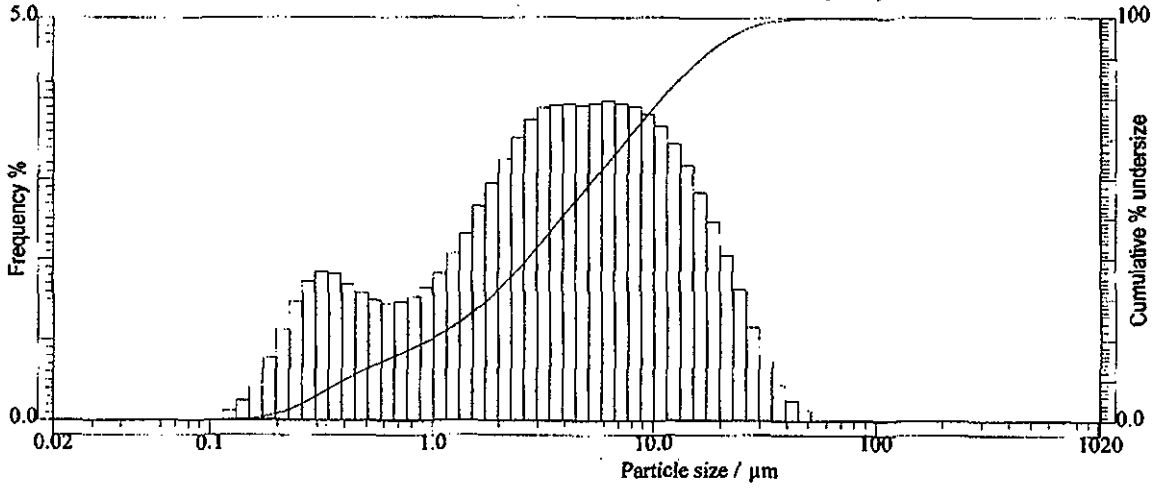
Agitation : 3
Circultn : 6
U.sonic : ~~ON~~(120)
OFF WJC 8/15/01

Format
Dist.base : Volume
Scaling : Auto
Axis : LogX - LinearY

Data
Median : 3.833μm
SP.Area : 46134cm²/cm³
S.D. : 7.296μm
Mode : 6.278μm
Mean : 6.508μm
C.V. : 112.10%

Span : (D 10.0-D 90.0) / D50 = 4.197

Dia. on %(5.0%) :	0.277μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	1.375μm	% on Dia.(1.000μm) :	20.3%
Dia. on %(50.0%) :	3.833μm	% on Dia.(10.000μm) :	77.7%
Dia. on %(75.0%) :	9.090μm	% on Dia.(100.000μm) :	100.0%
Dia. on %(95.0%) :	21.870μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.64	97.27	0.669	1.45	15.75
890.1	0.00	100.00	22.80	2.05	95.63	0.584	1.49	14.30
777.1	0.00	100.00	19.90	2.48	93.58	0.510	1.59	12.81
678.5	0.00	100.00	17.38	2.84	91.09	0.445	1.69	11.22
592.4	0.00	100.00	15.17	3.18	88.26	0.389	1.82	9.54
517.2	0.00	100.00	13.25	3.45	85.07	0.339	1.84	7.71
451.6	0.00	100.00	11.56	3.67	81.62	0.296	1.72	5.87
394.2	0.00	100.00	10.10	3.81	77.95	0.259	1.48	4.15
344.2	0.00	100.00	8.816	3.90	74.14	0.226	1.13	2.67
300.5	0.00	100.00	7.697	3.94	70.23	0.197	0.76	1.54
262.4	0.00	100.00	6.720	3.97	66.29	0.172	0.41	0.78
229.1	0.00	100.00	5.867	3.94	62.32	0.150	0.25	0.37
200.0	0.00	100.00	5.122	3.92	58.38	0.131	0.12	0.12
174.6	0.00	100.00	4.472	3.93	54.46	0.115	0.00	0.00
152.5	0.00	100.00	3.905	3.92	50.53	0.100	0.00	0.00
133.1	0.00	100.00	3.409	3.89	46.61	0.087	0.00	0.00
116.2	0.00	100.00	2.976	3.74	42.72	0.076	0.00	0.00
101.5	0.00	100.00	2.599	3.52	38.98	0.067	0.00	0.00
88.58	0.00	100.00	2.269	3.25	35.46	0.058	0.00	0.00
77.34	0.00	100.00	1.981	2.95	32.21	0.051	0.00	0.00
67.52	0.00	100.00	1.729	2.67	29.26	0.044	0.00	0.00
58.95	0.00	100.00	1.510	2.31	26.60	0.039	0.00	0.00
51.47	0.13	100.00	1.318	2.07	24.28	0.034	0.00	0.00
44.94	0.25	99.87	1.151	1.83	22.22	0.029	0.00	0.00
39.23	0.45	99.61	1.005	1.65	20.39	0.026	0.00	0.00
34.25	0.74	99.17	0.877	1.53	18.75	0.022	0.00	0.00
29.91	1.16	98.43	0.766	1.46	17.22			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/15/01
File Name: AW103736.DAT Sample Name: S01T001424 ID No: 01/08/10-736
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 81.189 % Lamp: 68.635 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: AW103 Solids Source: S01T001020
Lot No: S01T001424 Test No:

WSC 8/15/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.128	0.10	0.10	(15)	4.562	5.00	55.00
(2)	0.179	0.90	1.00	(16)	5.428	5.00	60.00
(3)	0.216	1.30	2.30	(17)	6.442	5.00	65.00
(4)	0.277	2.70	5.00	(18)	7.639	5.00	70.00
(5)	0.404	5.00	10.00	(19)	9.105	5.00	75.00
(6)	0.625	5.00	15.00	(20)	10.918	5.00	80.00
(7)	0.672	0.80	15.80	(21)	12.822	4.20	84.20
(8)	0.974	4.20	20.00	(22)	13.212	0.80	85.00
(9)	1.378	5.00	25.00	(23)	16.528	5.00	90.00
(10)	1.792	5.00	30.00	(24)	21.912	5.00	95.00
(11)	2.228	5.00	35.00	(25)	27.518	2.70	97.70
(12)	2.702	5.00	40.00	(26)	33.266	1.30	99.00
(13)	3.230	5.00	45.00	(27)	46.579	0.90	99.90
(14)	3.837	5.00	50.00				

Median : 3.833 (μm) Mean: 6.508 (μm) Mode: 6.279 (μm)
Std. Dev.: 7.296 (μm) Span: 3.334
Coef. Var: 112.10% Spec. Area: 46134 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Aug/14/'01 12:49

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010810-738 11:43
Filename : AW103738
Sample : S01T001424

Material : AW103 Solids
Source : S01T001020
Lot Numbe : S01T001424

Condition
T%(He-Ne): 81.7% Dist.Form: Std. Sampling times : 100
(LAMP): 70.0% R.R.Index: 1.16-0.001 ( )

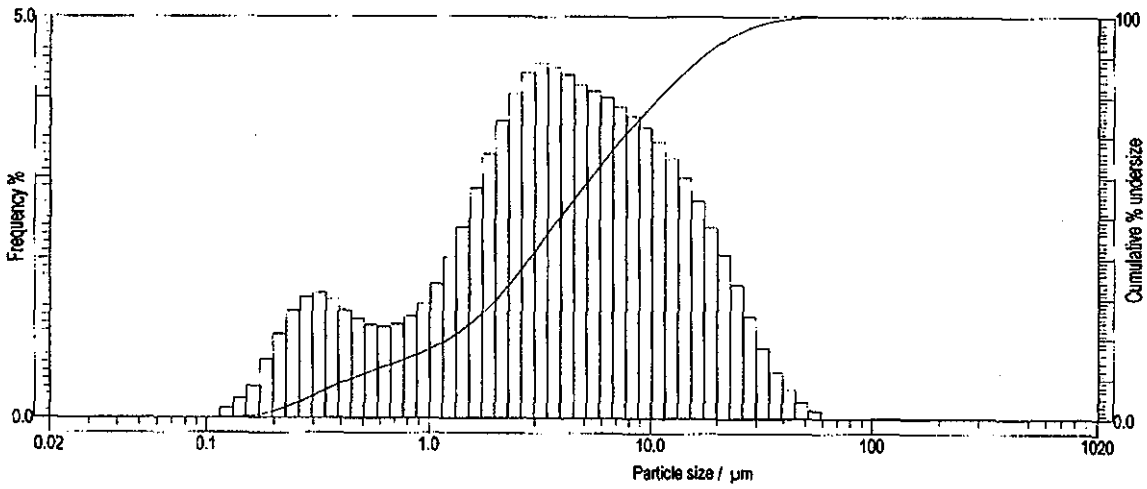
Agitation : 1 Circultn : 6 U.sonic : ~~on~~ (120)
OFF WSC 8/15/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 3.865µm SP.Area : 42465cm²/cm³ S.D. : 7.740µm
Mode : 3.188µm Mean : 6.729µm
C.V. : 115.03%

Span : (D 10.0-D 90.0) / D50 = 4.270

Dia. on %(5.0%) :	0.286µm	% on Dia.(0.100µm) :	0.0%
Dia. on %(25.0%) :	1.635µm	% on Dia.(1.000µm) :	17.2%
Dia. on %(50.0%) :	3.865µm	% on Dia.(10.000µm) :	77.8%
Dia. on %(75.0%) :	8.989µm	% on Dia.(100.000µm) :	100.0%
Dia. on %(95.0%) :	22.955µm	% on Dia.(1000.000µm) :	100.0%



Size(µm)	Freq(%)	Und(%)	Size(µm)	Freq(%)	Und(%)	Size(µm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.67	96.58	0.669	1.14	13.35
890.1	0.00	100.00	22.80	2.04	94.91	0.584	1.16	12.21
777.1	0.00	100.00	19.90	2.39	92.87	0.510	1.24	11.05
678.5	0.00	100.00	17.38	2.71	90.49	0.445	1.34	9.81
592.4	0.00	100.00	15.17	3.00	87.78	0.389	1.49	8.46
517.2	0.00	100.00	13.25	3.24	84.78	0.339	1.56	6.97
451.6	0.00	100.00	11.56	3.44	81.54	0.296	1.51	5.41
394.2	0.00	100.00	10.10	3.62	78.10	0.259	1.34	3.90
344.2	0.00	100.00	8.816	3.76	74.48	0.226	1.05	2.55
300.5	0.00	100.00	7.697	3.87	70.72	0.197	0.73	1.50
262.4	0.00	100.00	6.720	4.00	66.84	0.172	0.40	0.77
229.1	0.00	100.00	5.867	4.08	62.85	0.150	0.24	0.37
200.0	0.00	100.00	5.122	4.16	58.77	0.131	0.12	0.12
174.6	0.00	100.00	4.472	4.28	54.61	0.115	0.00	0.00
152.5	0.00	100.00	3.905	4.37	50.33	0.100	0.00	0.00
133.1	0.00	100.00	3.409	4.43	45.96	0.087	0.00	0.00
116.2	0.00	100.00	2.976	4.31	41.53	0.076	0.00	0.00
101.5	0.00	100.00	2.599	4.04	37.22	0.067	0.00	0.00
88.58	0.00	100.00	2.269	3.70	33.18	0.058	0.00	0.00
77.34	0.00	100.00	1.981	3.29	29.47	0.051	0.00	0.00
67.52	0.00	100.00	1.729	2.87	26.19	0.044	0.00	0.00
58.95	0.11	100.00	1.510	2.38	23.31	0.039	0.00	0.00
51.47	0.21	99.89	1.318	2.02	20.93	0.034	0.00	0.00
44.94	0.36	99.69	1.151	1.68	18.92	0.029	0.00	0.00
39.23	0.58	99.33	1.005	1.44	17.23	0.026	0.00	0.00
34.25	0.88	98.75	0.877	1.27	15.80	0.022	0.00	0.00
29.91	1.28	97.86	0.766	1.17	14.52			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/15/01
File Name: AW103738.DAT Sample Name: S01T001424 ID No: 01/08/10-738
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 81.689 % Lamp: 70.045 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: AW103 Solids Source: S01T001020
Lot No: S01T001424 Test No:

WSC
8/15/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.128	0.10	0.10	(15)	4.533	5.00	55.00
(2)	0.180	0.90	1.00	(16)	5.347	5.00	60.00
(3)	0.219	1.30	2.30	(17)	6.326	5.00	65.00
(4)	0.286	2.70	5.00	(18)	7.516	5.00	70.00
(5)	0.455	5.00	10.00	(19)	9.000	5.00	75.00
(6)	0.808	5.00	15.00	(20)	10.908	5.00	80.00
(7)	0.878	0.80	15.80	(21)	12.946	4.20	84.20
(8)	1.241	4.20	20.00	(22)	13.389	0.80	85.00
(9)	1.639	5.00	25.00	(23)	16.980	5.00	90.00
(10)	2.022	5.00	30.00	(24)	22.966	5.00	95.00
(11)	2.417	5.00	35.00	(25)	29.430	2.70	97.70
(12)	2.842	5.00	40.00	(26)	36.439	1.30	99.00
(13)	3.315	5.00	45.00	(27)	51.837	0.90	99.90
(14)	3.867	5.00	50.00				

Median : 3.865 (μm) Mean: 6.729 (μm) Mode: 3.185 (μm)
Std. Dev.: 7.740 (μm) Span: 3.614
Coef. Var: 115.03% Spec. Area: 42465 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Aug/14/'01 12:49

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010810-739 11:47
Filename : AW103739
Sample : S01T001424

Material : AW103 Solids
Source : S01T001020
Lot Numbe : S01T001424

Condition
T%(He-Ne): 81.9% Dist.Form: Std. Sampling times : 100
(LAMP): 70.1% R.R.Index: 1.16-0.00i ( )

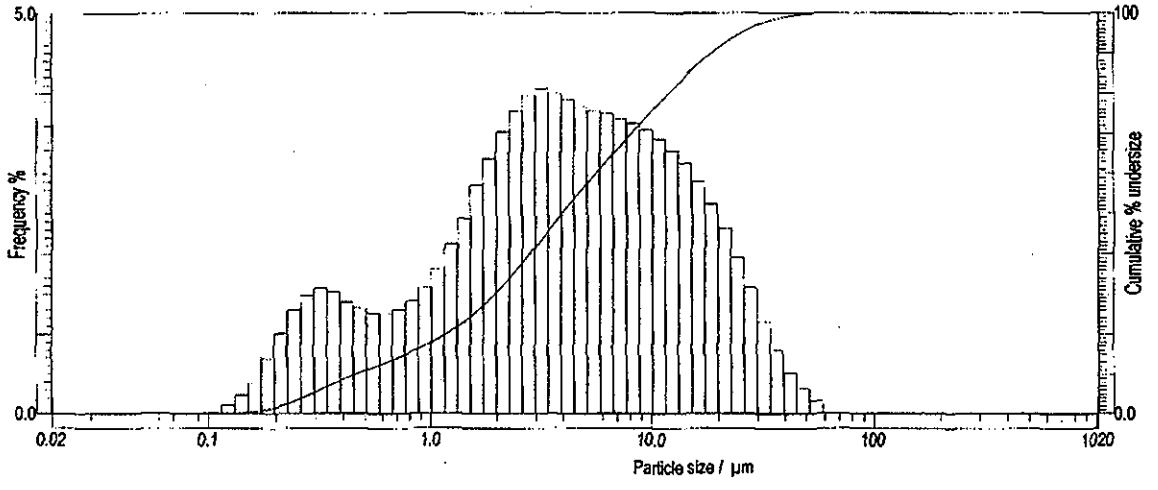
Agitation : 3 Circultn : 6 U.sonic : ~~ON~~(120) OFF WSC 8/15/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 3.947µm SP.Area : 42447cm²/cm³ S.D. : 8.488µm
Mode : 3.186µm Mean : 7.226µm
C.V. : 117.46%

Span : (D 10.0-D 90.0) / D50 = 4.623

Dia. on %(5.0%) :	0.290µm	% on Dia.(0.100µm) :	0.0%
Dia. on %(25.0%) :	1.563µm	% on Dia.(1.000µm) :	17.8%
Dia. on %(50.0%) :	3.947µm	% on Dia.(10.000µm) :	75.6%
Dia. on %(75.0%) :	9.785µm	% on Dia.(100.000µm) :	100.0%
Dia. on %(95.0%) :	25.274µm	% on Dia.(1000.000µm) :	100.0%



Size(µm)	Freq(%)	Und(%)	Size(µm)	Freq(%)	Und(%)	Size(µm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.95	95.47	0.669	1.26	13.59
890.1	0.00	100.00	22.80	2.32	93.51	0.584	1.26	12.33
777.1	0.00	100.00	19.90	2.62	91.20	0.510	1.33	11.07
678.5	0.00	100.00	17.38	2.90	88.58	0.445	1.40	9.74
592.4	0.00	100.00	15.17	3.13	85.68	0.389	1.52	8.34
517.2	0.00	100.00	13.25	3.30	82.55	0.339	1.57	6.81
451.6	0.00	100.00	11.56	3.44	79.26	0.296	1.49	5.24
394.2	0.00	100.00	10.10	3.55	75.82	0.259	1.31	3.76
344.2	0.00	100.00	8.816	3.63	72.27	0.226	1.01	2.45
300.5	0.00	100.00	7.697	3.68	68.65	0.197	0.70	1.44
262.4	0.00	100.00	6.720	3.75	64.97	0.172	0.39	0.74
229.1	0.00	100.00	5.867	3.78	61.22	0.150	0.23	0.35
200.0	0.00	100.00	5.122	3.83	57.44	0.131	0.12	0.12
174.6	0.00	100.00	4.472	3.92	53.61	0.115	0.00	0.00
152.5	0.00	100.00	3.905	4.00	49.69	0.100	0.00	0.00
133.1	0.00	100.00	3.409	4.06	45.69	0.087	0.00	0.00
116.2	0.00	100.00	2.976	3.98	41.63	0.076	0.00	0.00
101.5	0.00	100.00	2.599	3.79	37.65	0.067	0.00	0.00
88.58	0.00	100.00	2.269	3.53	33.86	0.058	0.00	0.00
77.34	0.00	100.00	1.981	3.20	30.34	0.051	0.00	0.00
67.52	0.00	100.00	1.729	2.86	27.14	0.044	0.00	0.00
58.95	0.17	100.00	1.510	2.44	24.27	0.039	0.00	0.00
51.47	0.32	99.83	1.318	2.13	21.83	0.034	0.00	0.00
44.94	0.52	99.52	1.151	1.82	19.70	0.029	0.00	0.00
39.23	0.80	99.00	1.005	1.58	17.89	0.026	0.00	0.00
34.25	1.15	98.20	0.877	1.41	16.31	0.022	0.00	0.00
29.91	1.58	97.05	0.766	1.31	14.89			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/15/01
File Name: AW103739.DAT . Sample Name: S01T001424 ID No: 01/08/10-739
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 81.909 % Lamp: 70.132 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: AW103 Solids Source: S01T001020
Lot No: S01T001424 Test No:

WJC 8/15/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.129	0.10	0.10	(15)	4.709	5.00	55.00
(2)	0.182	0.90	1.00	(16)	5.627	5.00	60.00
(3)	0.221	1.30	2.30	(17)	6.729	5.00	65.00
(4)	0.290	2.70	5.00	(18)	8.114	5.00	70.00
(5)	0.458	5.00	10.00	(19)	9.801	5.00	75.00
(6)	0.774	5.00	15.00	(20)	11.944	5.00	80.00
(7)	0.837	0.80	15.80	(21)	14.261	4.20	84.20
(8)	1.174	4.20	20.00	(22)	14.753	0.80	85.00
(9)	1.566	5.00	25.00	(23)	18.749	5.00	90.00
(10)	1.954	5.00	30.00	(24)	25.315	5.00	95.00
(11)	2.368	5.00	35.00	(25)	32.371	2.70	97.70
(12)	2.822	5.00	40.00	(26)	39.283	1.30	99.00
(13)	3.336	5.00	45.00	(27)	54.443	0.90	99.90
(14)	3.950	5.00	50.00				

Median : 3.947 (μm) Mean: 7.226 (μm) Mode: 3.185 (μm)
Std. Dev.: 8.488 (μm) Span: 3.924
Coef. Var: 117.46% Spec. Area: 42447 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/25/'01 12:06

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010810.740 12:08
Filename : AW103740
Sample : S01T001424 25

Material : AW103 Solids
Source : S01T001020
Lot Numbe : S01T001424 25

WSC 8/15/01

Condition
T%(He-Ne): 73.6% Dist.Form: Std. Sampling times : 100
(LAMP): 60.5% R.R.Index: 1.16-0.00i ( )

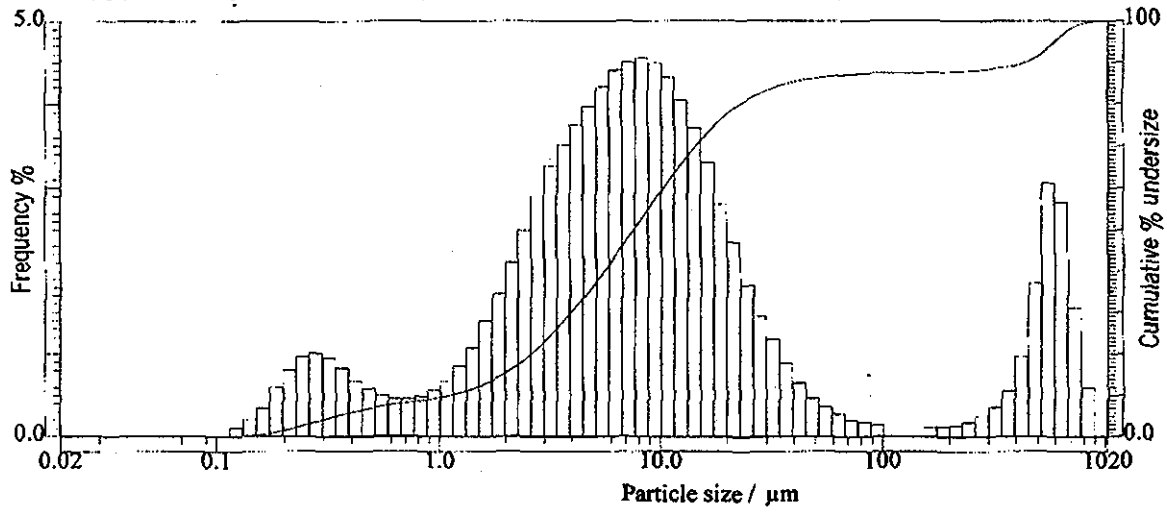
Agitation : 1 Circultn : 6 U.sonic : ~~ON~~ OFF (120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 7.631μm SP.Area : 27633cm²/cm³ S.D. : 186.482μm
Mode : 8.236μm Mean : 77.435μm
C.V. : 240.83%

Span : (D 10.0-D 90.0) / D50 = 58.029

Dia. on %(5.0%) :	0.342μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	3.279μm	% on Dia.(1.000μm) :	9.5%
Dia. on %(50.0%) :	7.631μm	% on Dia.(10.000μm) :	59.0%
Dia. on %(75.0%) :	17.610μm	% on Dia.(100.000μm) :	87.5%
Dia. on %(95.0%) :	591.653μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.82	81.70	0.669	0.46	7.98
890.1	0.59	100.00	22.80	2.35	79.88	0.584	0.50	7.52
777.1	1.56	99.41	19.90	2.81	77.53	0.510	0.58	7.02
678.5	2.83	97.86	17.38	3.30	74.72	0.445	0.68	6.45
592.4	3.05	95.03	15.17	3.72	71.42	0.389	0.83	5.77
517.2	1.85	91.97	13.25	4.06	67.71	0.339	0.94	4.95
451.6	0.97	90.12	11.56	4.32	63.65	0.296	1.00	4.00
394.2	0.55	89.15	10.10	4.49	59.33	0.259	0.96	3.00
344.2	0.35	88.60	8.816	4.55	54.83	0.226	0.80	2.04
300.5	0.25	88.25	7.697	4.50	50.28	0.197	0.59	1.24
262.4	0.17	88.00	6.720	4.40	45.78	0.172	0.34	0.65
229.1	0.12	87.82	5.867	4.20	41.38	0.150	0.21	0.31
200.0	0.12	87.70	5.122	3.97	37.18	0.131	0.10	0.10
174.6	0.10	87.58	4.472	3.76	33.21	0.115	0.00	0.00
152.5	0.00	87.48	3.905	3.51	29.44	0.100	0.00	0.00
133.1	0.00	87.48	3.409	3.26	25.93	0.087	0.00	0.00
116.2	0.00	87.48	2.976	2.90	22.67	0.076	0.00	0.00
101.5	0.14	87.48	2.599	2.49	19.77	0.067	0.00	0.00
88.58	0.17	87.33	2.269	2.10	17.28	0.058	0.00	0.00
77.34	0.20	87.16	1.981	1.72	15.18	0.051	0.00	0.00
67.52	0.28	86.96	1.729	1.39	13.46	0.044	0.00	0.00
58.95	0.37	86.67	1.510	1.07	12.07	0.039	0.00	0.00
51.47	0.47	86.31	1.318	0.85	11.01	0.034	0.00	0.00
44.94	0.64	85.84	1.151	0.68	10.15	0.029	0.00	0.00
39.23	0.89	85.20	1.005	0.56	9.48	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/15/01
File Name: AW103740.DAT Sample Name: S01T001425 ID No: 01/08/10-740
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 73.573 % Lamp: 60.523 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: AW103 Solids Source: S01T001020
Lot No: S01T001425 Test No:

WJC 8/15/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.130	0.10	0.10	(15)	8.863	5.00	55.00
(2)	0.187	0.90	1.00	(16)	10.326	5.00	60.00
(3)	0.235	1.30	2.30	(17)	12.125	5.00	65.00
(4)	0.342	2.70	5.00	(18)	14.435	5.00	70.00
(5)	1.117	5.00	10.00	(19)	17.625	5.00	75.00
(6)	1.954	5.00	15.00	(20)	23.012	5.00	80.00
(7)	2.066	0.80	15.80	(21)	33.844	4.20	84.20
(8)	2.628	4.20	20.00	(22)	38.134	0.80	85.00
(9)	3.285	5.00	25.00	(23)	444.382	5.00	90.00
(10)	3.988	5.00	30.00	(24)	591.700	5.00	95.00
(11)	4.766	5.00	35.00	(25)	673.688	2.70	97.70
(12)	5.622	5.00	40.00	(26)	750.889	1.30	99.00
(13)	6.568	5.00	45.00	(27)	870.838	0.90	99.90
(14)	7.635	5.00	50.00				

Median : 7.631 (μm) Mean: 77.435 (μm) Mode: 8.237 (μm)
Std. Dev.: 186.482 (μm) Span: 75.223
Coef. Var: 240.83% Spec. Area: 27633 (cm2/cm3)

HNF-8862, Rev.0

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/25/'01 12:06

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010810-741 12:11
Filename : AW103741
Sample : S01T001424 25

Material : AW103 Solids
Source : S01T001020
Lot Numbe : S01T001424 25

WSC 8/15/01

Condition
T%(He-Ne): 73.3% Dist.Form: Std. Sampling times : 100
(LAMP): 60.0% R.R.Index: 1.16-0.00i ( )

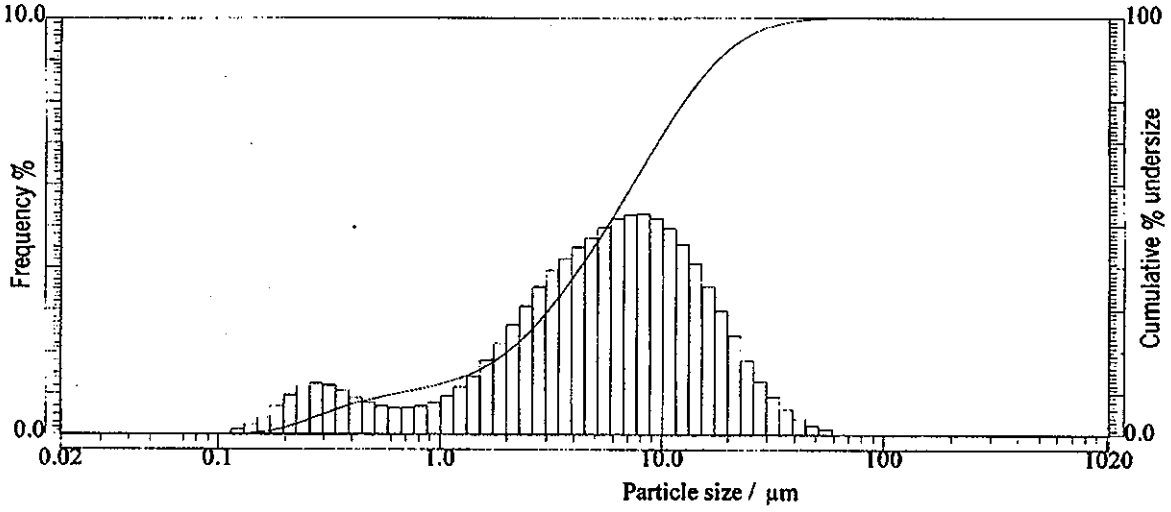
Agitation : 3 Circultn : 6 U.sonic : ~~ON~~ OFF (120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 5.679μm SP.Area : 34081cm²/cm³ S.D. : 7.811μm
Mode : 8.228μm Mean : 7.978μm
C.V. : 97.91%

Span : (D 10.0-D 90.0) / D50 = 3.051

Dia. on %(5.0%) : 0.303μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 2.559μm % on Dia.(1.000μm) : 12.1%
Dia. on %(50.0%) : 5.679μm % on Dia.(10.000μm) : 71.7%
Dia. on %(75.0%) : 10.935μm % on Dia.(100.000μm) : 100.0%
Dia. on %(95.0%) : 23.501μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.79	96.39	0.669	0.64	10.05
890.1	0.00	100.00	22.80	2.38	94.60	0.584	0.68	9.41
777.1	0.00	100.00	19.90	2.97	92.22	0.510	0.78	8.73
678.5	0.00	100.00	17.38	3.55	89.24	0.445	0.89	7.95
592.4	0.00	100.00	15.17	4.10	85.69	0.389	1.06	7.05
517.2	0.00	100.00	13.25	4.56	81.59	0.339	1.19	5.99
451.6	0.00	100.00	11.56	4.93	77.03	0.296	1.23	4.80
394.2	0.00	100.00	10.10	5.18	72.10	0.259	1.16	3.57
344.2	0.00	100.00	8.816	5.29	66.92	0.226	0.95	2.41
300.5	0.00	100.00	7.697	5.27	61.63	0.197	0.69	1.46
262.4	0.00	100.00	6.720	5.18	56.37	0.172	0.40	0.76
229.1	0.00	100.00	5.867	4.96	51.19	0.150	0.24	0.36
200.0	0.00	100.00	5.122	4.71	46.23	0.131	0.12	0.12
174.6	0.00	100.00	4.472	4.48	41.52	0.115	0.00	0.00
152.5	0.00	100.00	3.905	4.21	37.03	0.100	0.00	0.00
133.1	0.00	100.00	3.409	3.94	32.82	0.087	0.00	0.00
116.2	0.00	100.00	2.976	3.53	28.88	0.076	0.00	0.00
101.5	0.00	100.00	2.599	3.08	25.35	0.067	0.00	0.00
88.58	0.00	100.00	2.269	2.63	22.27	0.058	0.00	0.00
77.34	0.00	100.00	1.981	2.18	19.64	0.051	0.00	0.00
67.52	0.00	100.00	1.729	1.80	17.46	0.044	0.00	0.00
58.95	0.14	100.00	1.510	1.42	15.66	0.039	0.00	0.00
51.47	0.24	99.86	1.318	1.15	14.24	0.034	0.00	0.00
44.94	0.39	99.62	1.151	0.93	13.09	0.029	0.00	0.00
39.23	0.61	99.24	1.005	0.78	12.16	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/15/01

File Name: AW103741.DAT Sample Name: S01T001~~24~~ 25 ID No: 01/08/10-741

Dist. Form: STANDARD R.R. Index: 116-000

Dist. Mode: VOLUME Laser: 73.281 % Lamp: 59.953 %

Circulation: 6 Agitation: 3 U.Sonic OFF (min)

Material: AW103 Solids Source: S01T001020

Lot No: S01T0014~~24~~ 25 Test No:

WSC 8/15/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.128	0.10	0.10	(15)	6.494	5.00	55.00
(2)	0.181	0.90	1.00	(16)	7.393	5.00	60.00
(3)	0.223	1.30	2.30	(17)	8.408	5.00	65.00
(4)	0.303	2.70	5.00	(18)	9.577	5.00	70.00
(5)	0.662	5.00	10.00	(19)	10.959	5.00	75.00
(6)	1.421	5.00	15.00	(20)	12.658	5.00	80.00
(7)	1.527	0.80	15.80	(21)	14.470	4.20	84.20
(8)	2.020	4.20	20.00	(22)	14.846	0.80	85.00
(9)	2.561	5.00	25.00	(23)	18.021	5.00	90.00
(10)	3.099	5.00	30.00	(24)	23.540	5.00	95.00
(11)	3.665	5.00	35.00	(25)	29.923	2.70	97.70
(12)	4.280	5.00	40.00	(26)	37.322	1.30	99.00
(13)	4.953	5.00	45.00	(27)	53.671	0.90	99.90
(14)	5.688	5.00	50.00				

Median : 5.679 (μm) Mean: 7.978 (μm) Mode: 8.237 (μm)

Std. Dev.: 7.811 (μm) Span: 2.213

Coef. Var: 97.91% Spec. Area: 34081 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/25/'01 12:05

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010810-742 12:35
Filename : AW103742
Sample : S01T001424 25

Material : AW103 Solids
Source : S01T001020
Lot Numbe : S01T001424 25

WSC 8/15/01

Condition
T%(He-Ne): 76.8% Dist.Form: Std. Sampling times : 100
(LAMP): 60.0% R.R.Index: 1.16-0.00i ( )

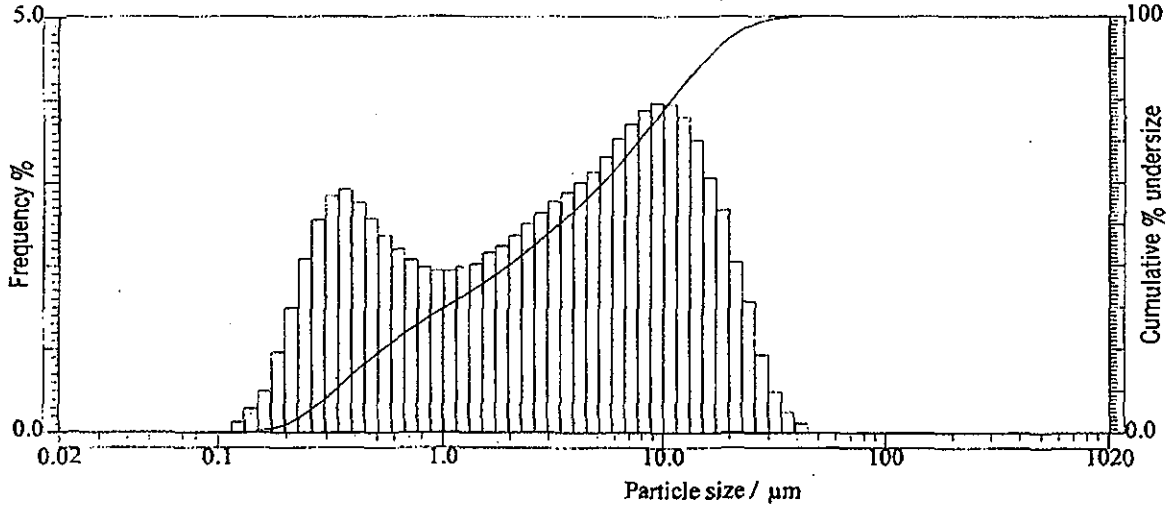
Agitation : 1 Circultn : 6 U.sonic : ON(1200)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 3.369μm SP.Area : 58896cm²/cm³ S.D. : 6.890μm
Mode : 9.448μm Mean : 6.065μm
C.V. : 113.60%

Span : (D 10.0-D 90.0) / D50 = 4.640

Dia. on %(5.0%) : 0.251μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 0.730μm % on Dia.(1.000μm) : 29.6%
Dia. on %(50.0%) : 3.369μm % on Dia.(10.000μm) : 77.3%
Dia. on %(75.0%) : 9.231μm % on Dia.(100.000μm) : 100.0%
Dia. on %(95.0%) : 20.445μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.57	98.21	0.669	2.20	23.66
890.1	0.00	100.00	22.80	2.05	96.64	0.584	2.37	21.47
777.1	0.00	100.00	19.90	2.67	94.60	0.510	2.57	19.10
678.5	0.00	100.00	17.38	3.06	91.92	0.445	2.76	16.53
592.4	0.00	100.00	15.17	3.51	88.86	0.389	2.92	13.77
517.2	0.00	100.00	13.25	3.80	85.35	0.339	2.84	10.85
451.6	0.00	100.00	11.56	3.94	81.55	0.296	2.55	8.00
394.2	0.00	100.00	10.10	3.95	77.61	0.259	2.08	5.45
344.2	0.00	100.00	8.816	3.86	73.66	0.226	1.50	3.37
300.5	0.00	100.00	7.697	3.70	69.80	0.197	0.96	1.88
262.4	0.00	100.00	6.720	3.53	66.10	0.172	0.49	0.91
229.1	0.00	100.00	5.867	3.32	62.57	0.150	0.29	0.42
200.0	0.00	100.00	5.122	3.13	59.26	0.131	0.13	0.13
174.6	0.00	100.00	4.472	3.00	56.13	0.115	0.00	0.00
152.5	0.00	100.00	3.905	2.88	53.12	0.100	0.00	0.00
133.1	0.00	100.00	3.409	2.77	50.24	0.087	0.00	0.00
116.2	0.00	100.00	2.976	2.63	47.47	0.076	0.00	0.00
101.5	0.00	100.00	2.599	2.50	44.83	0.067	0.00	0.00
88.58	0.00	100.00	2.269	2.35	42.33	0.058	0.00	0.00
77.34	0.00	100.00	1.981	2.23	39.97	0.051	0.00	0.00
67.52	0.00	100.00	1.729	2.15	37.74	0.044	0.00	0.00
58.95	0.00	100.00	1.510	2.02	35.59	0.039	0.00	0.00
51.47	0.00	100.00	1.318	1.98	33.57	0.034	0.00	0.00
44.94	0.12	100.00	1.151	1.94	31.59	0.029	0.00	0.00
39.23	0.25	99.88	1.005	1.94	29.65	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/15/01
File Name: AW103742.DAT Sample Name: S01T001425 ID No: 01/08/10-742
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 76.796 % Lamp: 59.991 %
Circulation: 6 Agitation: 1 U.Sonic ** (min)
Material: AW103 Solids Source: S01T001020
Lot No: S01T001425 Test No:

WSC 8/15/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.127	0.10	0.10	(15)	4.259	5.00	55.00
(2)	0.174	0.90	1.00	(16)	5.289	5.00	60.00
(3)	0.205	1.30	2.30	(17)	6.454	5.00	65.00
(4)	0.251	2.70	5.00	(18)	7.756	5.00	70.00
(5)	0.326	5.00	10.00	(19)	9.251	5.00	75.00
(6)	0.414	5.00	15.00	(20)	10.987	5.00	80.00
(7)	0.430	0.80	15.80	(21)	12.737	4.20	84.20
(8)	0.538	4.20	20.00	(22)	13.091	0.80	85.00
(9)	0.732	5.00	25.00	(23)	15.994	5.00	90.00
(10)	1.031	5.00	30.00	(24)	20.475	5.00	95.00
(11)	1.454	5.00	35.00	(25)	25.033	2.70	97.70
(12)	1.984	5.00	40.00	(26)	29.332	1.30	99.00
(13)	2.622	5.00	45.00	(27)	40.120	0.90	99.90
(14)	3.372	5.00	50.00				

Median : 3.369 (μm) Mean: 6.065 (μm) Mode: 9.435 (μm)
Std. Dev.: 6.890 (μm) Span: 3.328
Coef. Var: 113.60% Spec. Area: 58896 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/25/'01 12:05

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010810-743 12:38
Filename : AW103743
Sample : S01T001424 25

Material : AW103 Solids
Source : S01T001020
Lot Numbe : S01T001424 25

WDSC 8/15/01

Condition
T%(He-Ne): 75.7% Dist.Form: Std. Sampling times : 100
(LAMP): 59.0% R.R.Index: 1.16-0.00i ( )

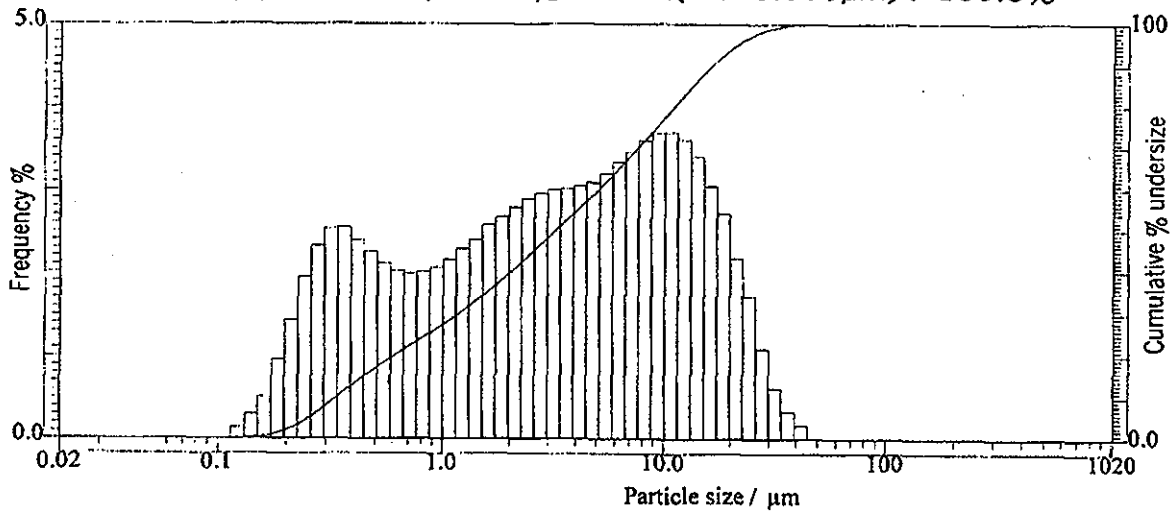
Agitation : 3 Circultn : 6 U.sonic : ~~ON~~ OFF (1200)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 3.246μm SP.Area : 56203cm²/cm³ S.D. : 7.131μm
Mode : 10.792μm Mean : 6.169μm
C.V. : 115.60%

Span : (D 10.0-D 90.0) / D50 = 4.968

Dia. on %(5.0%) :	0.254μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	0.857μm	% on Dia.(1.000μm) :	27.3%
Dia. on %(50.0%) :	3.246μm	% on Dia.(10.000μm) :	77.2%
Dia. on %(75.0%) :	9.216μm	% on Dia.(100.000μm) :	100.0%
Dia. on %(95.0%) :	21.297μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.71	97.80	0.669	2.02	21.37
890.1	0.00	100.00	22.80	2.16	96.08	0.584	2.10	19.35
777.1	0.00	100.00	19.90	2.71	93.92	0.510	2.24	17.25
678.5	0.00	100.00	17.38	3.04	91.21	0.445	2.38	15.01
592.4	0.00	100.00	15.17	3.40	88.17	0.389	2.54	12.63
517.2	0.00	100.00	13.25	3.60	84.77	0.339	2.52	10.09
451.6	0.00	100.00	11.56	3.69	81.17	0.296	2.31	7.56
394.2	0.00	100.00	10.10	3.68	77.47	0.259	1.94	5.25
344.2	0.00	100.00	8.816	3.59	73.80	0.226	1.43	3.32
300.5	0.00	100.00	7.697	3.45	70.21	0.197	0.95	1.89
262.4	0.00	100.00	6.720	3.33	66.75	0.172	0.50	0.94
229.1	0.00	100.00	5.867	3.19	63.42	0.150	0.29	0.43
200.0	0.00	100.00	5.122	3.08	60.23	0.131	0.14	0.14
174.6	0.00	100.00	4.472	3.04	57.15	0.115	0.00	0.00
152.5	0.00	100.00	3.905	3.02	54.10	0.100	0.00	0.00
133.1	0.00	100.00	3.409	3.01	51.09	0.087	0.00	0.00
116.2	0.00	100.00	2.976	2.95	48.08	0.076	0.00	0.00
101.5	0.00	100.00	2.599	2.89	45.13	0.067	0.00	0.00
88.58	0.00	100.00	2.269	2.78	42.24	0.058	0.00	0.00
77.34	0.00	100.00	1.981	2.67	39.46	0.051	0.00	0.00
67.52	0.00	100.00	1.729	2.57	36.79	0.044	0.00	0.00
58.95	0.00	100.00	1.510	2.38	34.22	0.039	0.00	0.00
51.47	0.00	100.00	1.318	2.28	31.84	0.034	0.00	0.00
44.94	0.17	100.00	1.151	2.15	29.56	0.029	0.00	0.00
39.23	0.34	99.83	1.005	2.05	27.41	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/15/01
File Name: AW103743.DAT Sample Name: S01T001425 ID No: 01/08/10-743
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 75.706 % Lamp: 59.021 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: AW103 Solids Source: S01T001020
Lot No: S01T001425 Test No:

WSC 8/15/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.127	0.10	0.10	(15)	4.072	5.00	55.00
(2)	0.174	0.90	1.00	(16)	5.073	5.00	60.00
(3)	0.205	1.30	2.30	(17)	6.271	5.00	65.00
(4)	0.254	2.70	5.00	(18)	7.638	5.00	70.00
(5)	0.338	5.00	10.00	(19)	9.235	5.00	75.00
(6)	0.445	5.00	15.00	(20)	11.100	5.00	80.00
(7)	0.468	0.80	15.80	(21)	12.979	4.20	84.20
(8)	0.611	4.20	20.00	(22)	13.375	0.80	85.00
(9)	0.858	5.00	25.00	(23)	16.499	5.00	90.00
(10)	1.183	5.00	30.00	(24)	21.346	5.00	95.00
(11)	1.576	5.00	35.00	(25)	25.926	2.70	97.70
(12)	2.037	5.00	40.00	(26)	30.762	1.30	99.00
(13)	2.584	5.00	45.00	(27)	41.599	0.90	99.90
(14)	3.253	5.00	50.00				

Median : 3.246 (μm) Mean: 6.169 (μm) Mode: 10.806 (μm)
Std. Dev.: 7.131 (μm) Span: 3.722
Coef. Var: 115.60% Spec. Area: 56203 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/25/'01 12:05

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010810-744 13:40
Filename : AW103744
Sample : S01T001425

Material : AW103 Solids
Source : S01T001020
Lot Numbe : S01T001425

Condition
T%(He-Ne): 75.6% Dist.Form: Std. Sampling times : 100
(LAMP): 60.1% R.R.Index: 1.16-0.00i ( )

Agitation : 1 Circultn : 6 U.sonic : ~~ON~~ OFF (1200)

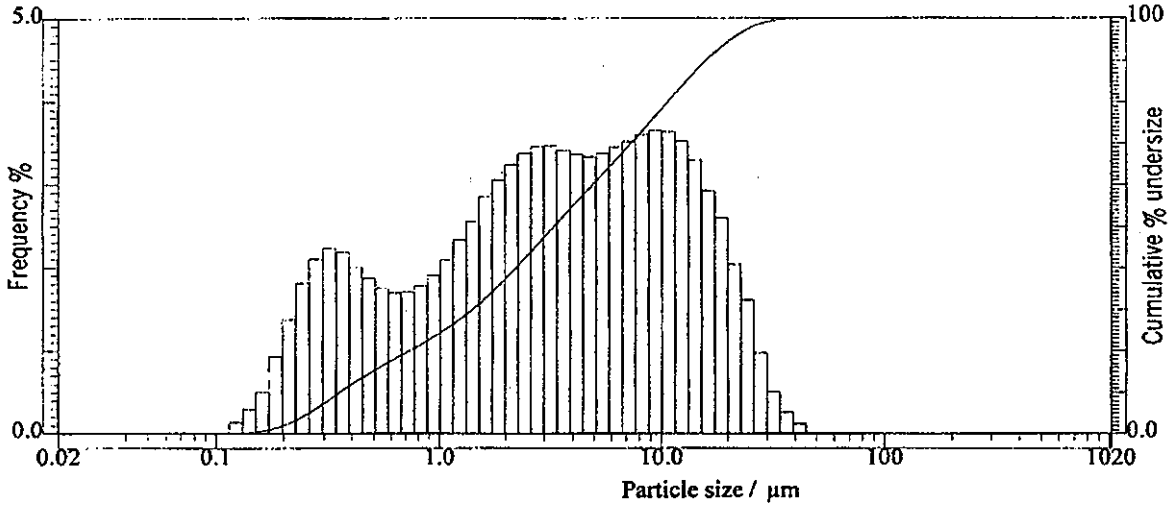
WSC 8/15/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 3.313μm SP.Area : 52781cm²/cm³ S.D. : 6.840μm
Mode : 9.440μm Mean : 6.052μm
C.V. : 113.02%

Span : (D 10.0-D 90.0) / D50 = 4.699

Dia. on %(5.0%) :	0.258μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	1.054μm	% on Dia.(1.000μm) :	24.2%
Dia. on %(50.0%) :	3.313μm	% on Dia.(10.000μm) :	78.2%
Dia. on %(75.0%) :	8.872μm	% on Dia.(100.000μm) :	100.0%
Dia. on %(95.0%) :	20.600μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.61	98.13	0.669	1.69	18.88
890.1	0.00	100.00	22.80	2.04	96.52	0.584	1.75	17.19
777.1	0.00	100.00	19.90	2.60	94.48	0.510	1.87	15.44
678.5	0.00	100.00	17.38	2.93	91.89	0.445	2.00	13.58
592.4	0.00	100.00	15.17	3.30	88.96	0.389	2.18	11.57
517.2	0.00	100.00	13.25	3.53	85.66	0.339	2.23	9.39
451.6	0.00	100.00	11.56	3.64	82.13	0.296	2.10	7.16
394.2	0.00	100.00	10.10	3.66	78.49	0.259	1.81	5.05
344.2	0.00	100.00	8.816	3.61	74.83	0.226	1.37	3.24
300.5	0.00	100.00	7.697	3.52	71.22	0.197	0.93	1.87
262.4	0.00	100.00	6.720	3.46	67.69	0.172	0.50	0.94
229.1	0.00	100.00	5.867	3.38	64.23	0.150	0.29	0.43
200.0	0.00	100.00	5.122	3.34	60.85	0.131	0.14	0.14
174.6	0.00	100.00	4.472	3.37	57.51	0.115	0.00	0.00
152.5	0.00	100.00	3.905	3.42	54.14	0.100	0.00	0.00
133.1	0.00	100.00	3.409	3.47	50.73	0.087	0.00	0.00
116.2	0.00	100.00	2.976	3.45	47.25	0.076	0.00	0.00
101.5	0.00	100.00	2.599	3.38	43.80	0.067	0.00	0.00
88.58	0.00	100.00	2.269	3.25	40.42	0.058	0.00	0.00
77.34	0.00	100.00	1.981	3.06	37.17	0.051	0.00	0.00
67.52	0.00	100.00	1.729	2.86	34.11	0.044	0.00	0.00
58.95	0.00	100.00	1.510	2.55	31.25	0.039	0.00	0.00
51.47	0.00	100.00	1.318	2.33	28.70	0.034	0.00	0.00
44.94	0.12	100.00	1.151	2.10	26.37	0.029	0.00	0.00
39.23	0.26	99.88	1.005	1.91	24.27	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/15/01
File Name: AW103744.DAT Sample Name: S01T001425 ID No: 01/08/10-744
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 75.590 % Lamp: 60.119 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: AW103 Solids Source: S01T001020
Lot No: S01T001425 Test No:

WSC
8/15/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.126	0.10	0.10	(15)	4.049	5.00	55.00
(2)	0.174	0.90	1.00	(16)	4.956	5.00	60.00
(3)	0.206	1.30	2.30	(17)	6.056	5.00	65.00
(4)	0.258	2.70	5.00	(18)	7.359	5.00	70.00
(5)	0.353	5.00	10.00	(19)	8.876	5.00	75.00
(6)	0.494	5.00	15.00	(20)	10.707	5.00	80.00
(7)	0.525	0.80	15.80	(21)	12.552	4.20	84.20
(8)	0.733	4.20	20.00	(22)	12.933	0.80	85.00
(9)	1.056	5.00	25.00	(23)	15.957	5.00	90.00
(10)	1.416	5.00	30.00	(24)	20.636	5.00	95.00
(11)	1.802	5.00	35.00	(25)	25.224	2.70	97.70
(12)	2.232	5.00	40.00	(26)	29.511	1.30	99.00
(13)	2.730	5.00	45.00	(27)	40.369	0.90	99.90
(14)	3.318	5.00	50.00				

Median : 3.313 (μm) Mean: 6.052 (μm) Mode: 9.435 (μm)
Std. Dev.: 6.840 (μm) Span: 3.539
Coef. Var: 113.02% Spec. Area: 52781 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/25/'01 12:01

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010810-745 13:43
Filename : AW103745
Sample : S01T001425

Material : AW103 Solids
Source : S01T001020
Lot Numbe : S01T001425

Condition
T%(He-Ne): 76.0% Dist.Form: Std. Sampling times : 100
(LAMP): 60.3% R.R.Index: 1.16-0.00i ( )

Agitation : 3 Circultn : 6 U.sonic : ~~ON~~(1200) OFF

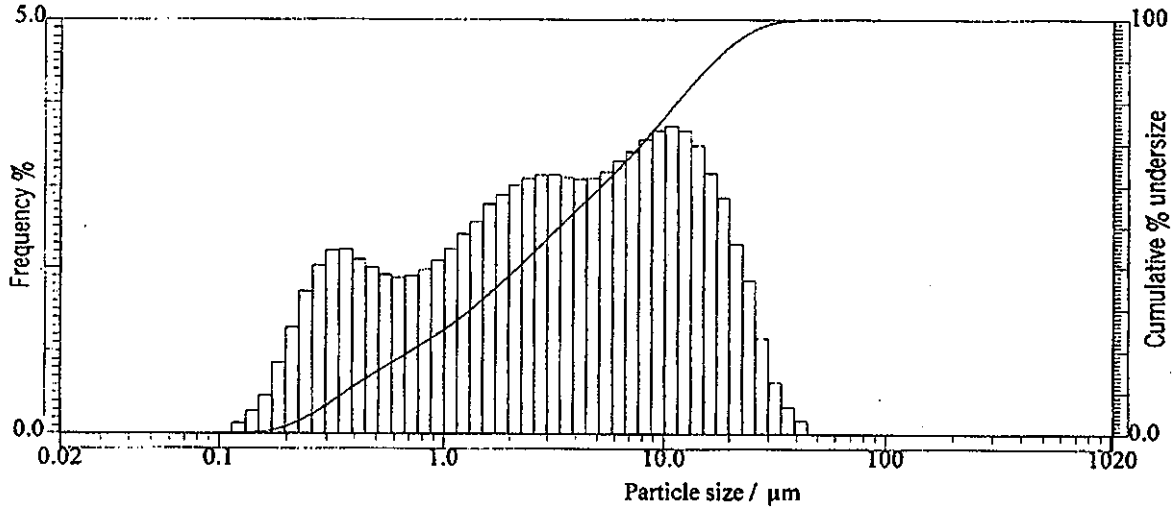
Format
Dist.base : Volume Scaling : Auto Axis : LogX · LinearY

WSC 8/15/01

Data
Median : 3.368μm SP.Area : 52327cm²/cm³ S.D. : 7.193μm
Mode : 10.805μm Mean : 6.337μm
C.V. : 113.49%

Span : (D 10.0-D 90.0) / D50 = 4.891

Dia. on %(5.0%) :	0.264μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	1.003μm	% on Dia.(1.000μm) :	25.0%
Dia. on %(50.0%) :	3.368μm	% on Dia.(10.000μm) :	76.4%
Dia. on %(75.0%) :	9.484μm	% on Dia.(100.000μm) :	100.0%
Dia. on %(95.0%) :	21.636μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.85	97.73	0.669	1.88	19.07
890.1	0.00	100.00	22.80	2.29	95.88	0.584	1.92	17.18
777.1	0.00	100.00	19.90	2.86	93.59	0.510	2.00	15.27
678.5	0.00	100.00	17.38	3.16	90.73	0.445	2.10	13.26
592.4	0.00	100.00	15.17	3.49	87.58	0.389	2.22	11.17
517.2	0.00	100.00	13.25	3.67	84.08	0.339	2.21	8.95
451.6	0.00	100.00	11.56	3.72	80.42	0.296	2.02	6.74
394.2	0.00	100.00	10.10	3.67	76.70	0.259	1.71	4.71
344.2	0.00	100.00	8.816	3.56	73.02	0.226	1.28	3.00
300.5	0.00	100.00	7.697	3.42	69.46	0.197	0.86	1.73
262.4	0.00	100.00	6.720	3.30	66.04	0.172	0.46	0.87
229.1	0.00	100.00	5.867	3.18	62.74	0.150	0.27	0.40
200.0	0.00	100.00	5.122	3.09	59.56	0.131	0.13	0.13
174.6	0.00	100.00	4.472	3.09	56.47	0.115	0.00	0.00
152.5	0.00	100.00	3.905	3.10	53.38	0.100	0.00	0.00
133.1	0.00	100.00	3.409	3.14	50.28	0.087	0.00	0.00
116.2	0.00	100.00	2.976	3.13	47.14	0.076	0.00	0.00
101.5	0.00	100.00	2.599	3.09	44.01	0.067	0.00	0.00
88.58	0.00	100.00	2.269	3.01	40.92	0.058	0.00	0.00
77.34	0.00	100.00	1.981	2.90	37.91	0.051	0.00	0.00
67.52	0.00	100.00	1.729	2.78	35.01	0.044	0.00	0.00
58.95	0.00	100.00	1.510	2.56	32.23	0.039	0.00	0.00
51.47	0.00	100.00	1.318	2.41	29.67	0.034	0.00	0.00
44.94	0.16	100.00	1.151	2.23	27.26	0.029	0.00	0.00
39.23	0.33	99.84	1.005	2.08	25.03	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/15/01
File Name: AW103745.DAT Sample Name: S01T001425 ID No: 01/08/10-745
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 76.027 % Lamp: 60.323 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: AW103 Solids Source: S01T001020
Lot No: S01T001425 Test No:

WSC 8/15/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.127	0.10	0.10	(15)	4.202	5.00	55.00
(2)	0.176	0.90	1.00	(16)	5.225	5.00	60.00
(3)	0.210	1.30	2.30	(17)	6.451	5.00	65.00
(4)	0.264	2.70	5.00	(18)	7.866	5.00	70.00
(5)	0.363	5.00	10.00	(19)	9.505	5.00	75.00
(6)	0.501	5.00	15.00	(20)	11.400	5.00	80.00
(7)	0.530	0.80	15.80	(21)	13.310	4.20	84.20
(8)	0.716	4.20	20.00	(22)	13.751	0.80	85.00
(9)	1.003	5.00	25.00	(23)	16.865	5.00	90.00
(10)	1.343	5.00	30.00	(24)	21.683	5.00	95.00
(11)	1.728	5.00	35.00	(25)	26.055	2.70	97.70
(12)	2.181	5.00	40.00	(26)	30.733	1.30	99.00
(13)	2.718	5.00	45.00	(27)	41.422	0.90	99.90
(14)	3.371	5.00	50.00				

Median : 3.368 (μm) Mean: 6.337 (μm) Mode: 10.806 (μm)
Std. Dev.: 7.193 (μm) Span: 3.608
Coef. Var: 113.49% Spec. Area: 52327 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20} Aug/14/'01 13:16

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010810-746 14:10
Filename : AW103746
Sample : S01T001426

Material : AW103 Solids
Source : S01T001020
Lot Numbe : S01T001426

Condition
T%(He-Ne): 81.1% Dist.Form: Std. Sampling times : 100
(LAMP): 71.7% R.R.Index: 1.16-0.00i ( )

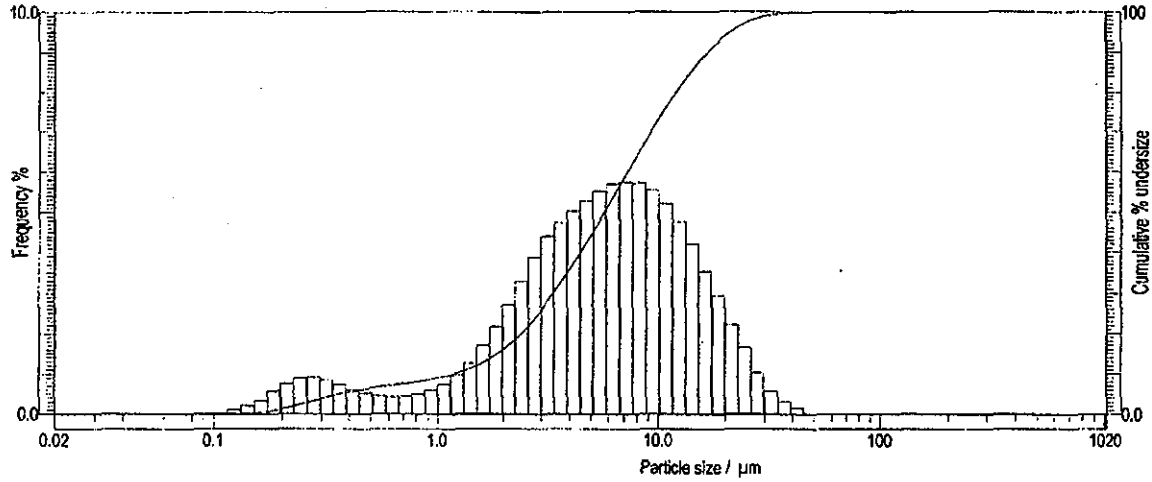
Agitation : 3 Circultn : 6 U.sonic : OFF(1200)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 5.770μm SP.Area : 28930cm²/cm³ S.D. : 6.596μm
Mode : 7.193μm Mean : 7.629μm
C.V. : 86.46%

Span : (D 10.0-D 90.0) / D50 = 2.677

Dia. on %(5.0%) :	0.363μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	2.903μm	% on Dia.(1.000μm) :	8.9%
Dia. on %(50.0%) :	5.770μm	% on Dia.(10.000μm) :	73.0%
Dia. on %(75.0%) :	10.528μm	% on Dia.(100.000μm) :	100.0%
Dia. on %(95.0%) :	21.086μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.65	97.93	0.669	0.44	7.40
890.1	0.00	100.00	22.80	2.23	96.28	0.584	0.46	6.97
777.1	0.00	100.00	19.90	2.94	94.05	0.510	0.52	6.50
678.5	0.00	100.00	17.38	3.53	91.12	0.445	0.61	5.98
592.4	0.00	100.00	15.17	4.20	87.58	0.389	0.74	5.37
517.2	0.00	100.00	13.25	4.76	83.38	0.339	0.85	4.63
451.6	0.00	100.00	11.56	5.22	78.62	0.296	0.91	3.78
394.2	0.00	100.00	10.10	5.54	73.39	0.259	0.89	2.86
344.2	0.00	100.00	8.816	5.72	67.85	0.226	0.75	1.98
300.5	0.00	100.00	7.697	5.75	62.13	0.197	0.57	1.22
262.4	0.00	100.00	6.720	5.71	56.38	0.172	0.33	0.65
229.1	0.00	100.00	5.867	5.52	50.68	0.150	0.21	0.32
200.0	0.00	100.00	5.122	5.28	45.16	0.131	0.11	0.11
174.6	0.00	100.00	4.472	5.04	39.88	0.115	0.00	0.00
152.5	0.00	100.00	3.905	4.73	34.84	0.100	0.00	0.00
133.1	0.00	100.00	3.409	4.40	30.12	0.087	0.00	0.00
116.2	0.00	100.00	2.976	3.88	25.72	0.076	0.00	0.00
101.5	0.00	100.00	2.599	3.30	21.83	0.067	0.00	0.00
88.58	0.00	100.00	2.269	2.72	18.54	0.058	0.00	0.00
77.34	0.00	100.00	1.981	2.18	15.81	0.051	0.00	0.00
67.52	0.00	100.00	1.729	1.71	13.64	0.044	0.00	0.00
58.95	0.00	100.00	1.510	1.27	11.93	0.039	0.00	0.00
51.47	0.00	100.00	1.318	0.98	10.66	0.034	0.00	0.00
44.94	0.15	100.00	1.151	0.74	9.68	0.029	0.00	0.00
39.23	0.31	99.85	1.005	0.59	8.94	0.026	0.00	0.00
34.25	0.58	99.54	0.877	0.50	8.35	0.022	0.00	0.00
29.91	1.03	98.96	0.766	0.45	7.85			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/15/01
File Name: AW103746.DAT Sample Name: S01T001426 ID No: 01/08/10-746
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 81.106 % Lamp: 71.708 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: AW103 Solids Source: S01T001020
Lot No: S01T001426 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.130	0.10	0.10	(15)	6.513	5.00	55.00
(2)	0.187	0.90	1.00	(16)	7.334	5.00	60.00
(3)	0.238	1.30	2.30	(17)	8.258	5.00	65.00
(4)	0.364	2.70	5.00	(18)	9.312	5.00	70.00
(5)	1.206	5.00	10.00	(19)	10.549	5.00	75.00
(6)	1.887	5.00	15.00	(20)	12.054	5.00	80.00
(7)	1.979	0.80	15.80	(21)	13.623	4.20	84.20
(8)	2.415	4.20	20.00	(22)	13.989	0.80	85.00
(9)	2.907	5.00	25.00	(23)	16.681	5.00	90.00
(10)	3.397	5.00	30.00	(24)	21.134	5.00	95.00
(11)	3.922	5.00	35.00	(25)	25.645	2.70	97.70
(12)	4.487	5.00	40.00	(26)	30.181	1.30	99.00
(13)	5.103	5.00	45.00	(27)	41.226	0.90	99.90
(14)	5.776	5.00	50.00				

Median : 5.770 (μm) Mean: 7.629 (μm) Mode: 7.192 (μm)
Std. Dev.: 6.596 (μm) Span: 1.830
Coef. Var: 86.46% Spec. Area: 28930 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Aug/14/'01 13:16

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010810-747 14:14
Filename : AW103747
Sample : S01T001426

Material : AW103 Solids
Source : S01T001020
Lot Numbe : S01T001426

Condition
T%(He-Ne): 81.2% Dist.Form: Std. Sampling times : 100
(LAMP): 71.7% R.R.Index: 1.16-0.00i ( )

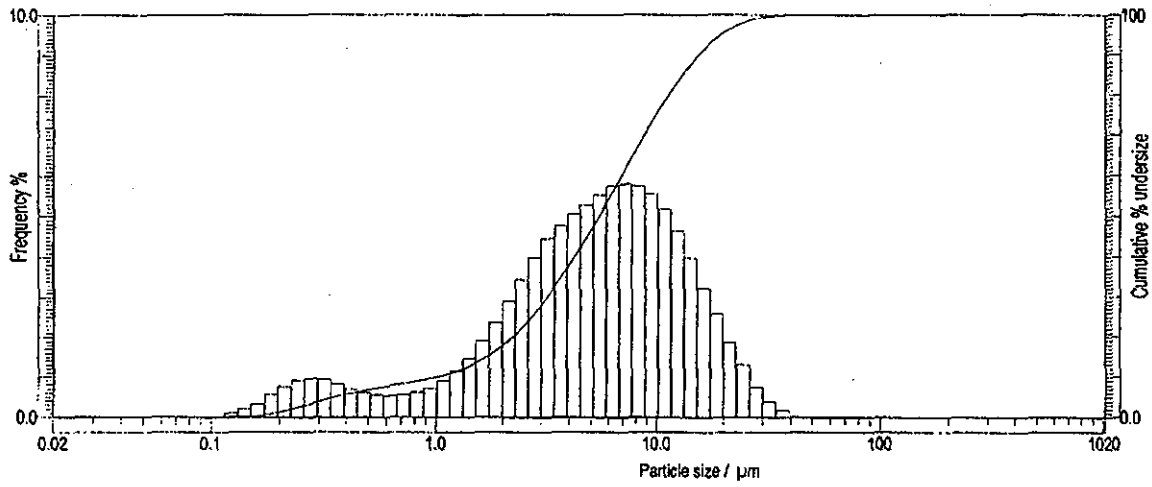
Agitation : 1 Circultn : 6 U.sonic : OFF(1200)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 5.442μm SP.Area : 30513cm²/cm³ S.D. : 6.049μm
Mode : 7.193μm Mean : 7.091μm
C.V. : 85.31%

Span : (D 10.0-D 90.0) / D50 = 2.634

Dia. on %(5.0%) :	0.352μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	2.687μm	% on Dia.(1.000μm) :	9.9%
Dia. on %(50.0%) :	5.442μm	% on Dia.(10.000μm) :	75.5%
Dia. on %(75.0%) :	9.871μm	% on Dia.(100.000μm) :	100.0%
Dia. on %(95.0%) :	19.364μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.30	98.68	0.669	0.54	8.01
890.1	0.00	100.00	22.80	1.85	97.38	0.584	0.56	7.47
777.1	0.00	100.00	19.90	2.59	95.52	0.510	0.62	6.91
678.5	0.00	100.00	17.38	3.22	92.93	0.445	0.70	6.30
592.4	0.00	100.00	15.17	3.98	89.71	0.389	0.82	5.60
517.2	0.00	100.00	13.25	4.63	85.74	0.339	0.92	4.77
451.6	0.00	100.00	11.56	5.18	81.10	0.296	0.96	3.85
394.2	0.00	100.00	10.10	5.56	75.93	0.259	0.91	2.89
344.2	0.00	100.00	8.816	5.76	70.37	0.226	0.76	1.98
300.5	0.00	100.00	7.697	5.79	64.61	0.197	0.57	1.21
262.4	0.00	100.00	6.720	5.74	58.81	0.172	0.33	0.64
229.1	0.00	100.00	5.867	5.54	53.07	0.150	0.21	0.32
200.0	0.00	100.00	5.122	5.29	47.53	0.131	0.11	0.11
174.6	0.00	100.00	4.472	5.05	42.25	0.115	0.00	0.00
152.5	0.00	100.00	3.905	4.75	37.20	0.100	0.00	0.00
133.1	0.00	100.00	3.409	4.45	32.45	0.087	0.00	0.00
116.2	0.00	100.00	2.976	3.98	27.99	0.076	0.00	0.00
101.5	0.00	100.00	2.599	3.43	24.01	0.067	0.00	0.00
88.58	0.00	100.00	2.269	2.90	20.58	0.058	0.00	0.00
77.34	0.00	100.00	1.981	2.37	17.68	0.051	0.00	0.00
67.52	0.00	100.00	1.729	1.91	15.32	0.044	0.00	0.00
58.95	0.00	100.00	1.510	1.46	13.40	0.039	0.00	0.00
51.47	0.00	100.00	1.318	1.15	11.94	0.034	0.00	0.00
44.94	0.00	100.00	1.151	0.90	10.79	0.029	0.00	0.00
39.23	0.19	100.00	1.005	0.72	9.90	0.026	0.00	0.00
34.25	0.38	99.81	0.877	0.61	9.17	0.022	0.00	0.00
29.91	0.75	99.43	0.766	0.55	8.56			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/15/01
File Name: AW103747.DAT Sample Name: S01T001426 ID No: 01/08/10-747
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 81.223 % Lamp: 71.657 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: AW103 Solids Source: S01T001020
Lot No: S01T001426 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.130	0.10	0.10	(15)	6.153	5.00	55.00
(2)	0.188	0.90	1.00	(16)	6.920	5.00	60.00
(3)	0.237	1.30	2.30	(17)	7.773	5.00	65.00
(4)	0.353	2.70	5.00	(18)	8.743	5.00	70.00
(5)	1.022	5.00	10.00	(19)	9.883	5.00	75.00
(6)	1.693	5.00	15.00	(20)	11.252	5.00	80.00
(7)	1.781	0.80	15.80	(21)	12.689	4.20	84.20
(8)	2.211	4.20	20.00	(22)	12.979	0.80	85.00
(9)	2.692	5.00	25.00	(23)	15.368	5.00	90.00
(10)	3.171	5.00	30.00	(24)	19.392	5.00	95.00
(11)	3.675	5.00	35.00	(25)	23.619	2.70	97.70
(12)	4.219	5.00	40.00	(26)	27.740	1.30	99.00
(13)	4.811	5.00	45.00	(27)	36.610	0.90	99.90
(14)	5.454	5.00	50.00				

Median : 5.442 (μm) Mean: 7.091 (μm) Mode: 7.192 (μm)
Std. Dev.: 6.049 (μm) Span: 1.745
Coef. Var: 85.31% Spec. Area: 30513 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20J Aug/14/'01 13:17

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010810-748 14:19
Filename : AW103748
Sample : S01T001426

Material : AW103 Solids
Source : S01T001020
Lot Numbe : S01T001426

Condition
T%(He-Ne): 83.2%
(LAMP): 71.8%

Dist.Form: Std.
R.R.Index: 1.16-0.00i

Sampling times : 100
( )

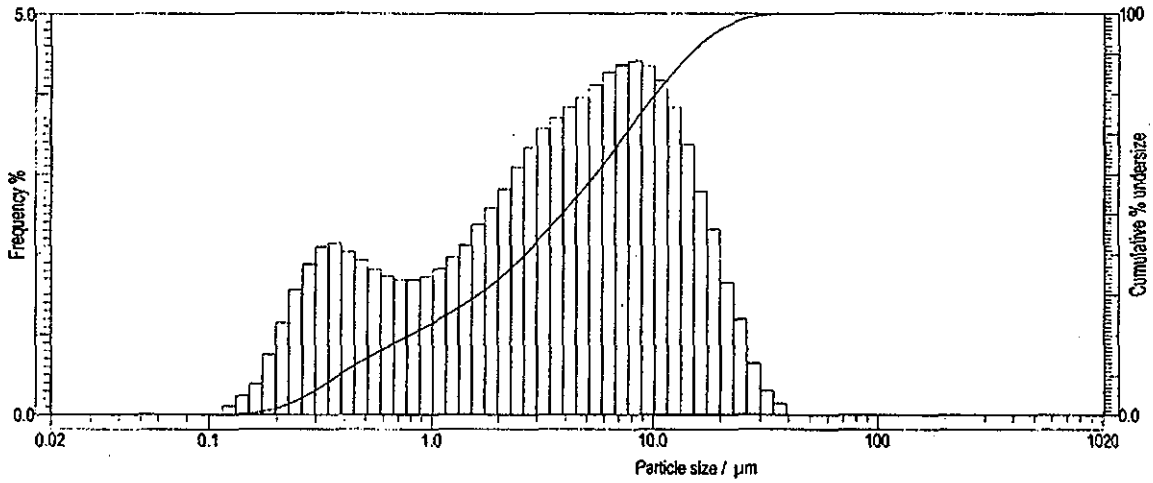
Agitation : 3
Circultn : 6
U.sonic : ON(120)

Format
Dist.base : Volume
Scaling : Auto
Axis : LogX - LinearY

Data
Median : 3.866μm
SP.Area : 48854cm²/cm³
S.D. : 6.142μm
Mode : 8.236μm
Mean : 5.937μm
C.V. : 103.44%

Span : (D 10.0-D 90.0) / D50 = 3.679

Dia. on %(5.0%) :	0.274μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	1.171μm	% on Dia.(1.000μm) :	22.9%
Dia. on %(50.0%) :	3.866μm	% on Dia.(10.000μm) :	79.3%
Dia. on %(75.0%) :	8.755μm	% on Dia.(100.000μm) :	100.0%
Dia. on %(95.0%) :	18.714μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.20	98.90	0.669	1.73	17.83
890.1	0.00	100.00	22.80	1.66	97.71	0.584	1.81	16.10
777.1	0.00	100.00	19.90	2.31	96.05	0.510	1.93	14.29
678.5	0.00	100.00	17.38	2.79	93.74	0.445	2.03	12.36
592.4	0.00	100.00	15.17	3.37	90.95	0.389	2.14	10.33
517.2	0.00	100.00	13.25	3.83	87.57	0.339	2.09	8.19
451.6	0.00	100.00	11.56	4.17	83.74	0.296	1.88	6.10
394.2	0.00	100.00	10.10	4.35	79.57	0.259	1.56	4.22
344.2	0.00	100.00	8.816	4.41	75.23	0.226	1.16	2.66
300.5	0.00	100.00	7.697	4.36	70.82	0.197	0.76	1.50
262.4	0.00	100.00	6.720	4.28	66.46	0.172	0.39	0.74
229.1	0.00	100.00	5.867	4.12	62.18	0.150	0.24	0.35
200.0	0.00	100.00	5.122	3.96	58.06	0.131	0.11	0.11
174.6	0.00	100.00	4.472	3.84	54.10	0.115	0.00	0.00
152.5	0.00	100.00	3.905	3.70	50.27	0.100	0.00	0.00
133.1	0.00	100.00	3.409	3.56	46.57	0.087	0.00	0.00
116.2	0.00	100.00	2.976	3.34	43.01	0.076	0.00	0.00
101.5	0.00	100.00	2.599	3.09	39.67	0.067	0.00	0.00
88.58	0.00	100.00	2.269	2.82	36.58	0.058	0.00	0.00
77.34	0.00	100.00	1.981	2.57	33.76	0.051	0.00	0.00
67.52	0.00	100.00	1.729	2.37	31.19	0.044	0.00	0.00
58.95	0.00	100.00	1.510	2.11	28.82	0.039	0.00	0.00
51.47	0.00	100.00	1.318	1.96	26.71	0.034	0.00	0.00
44.94	0.00	100.00	1.151	1.82	24.75	0.029	0.00	0.00
39.23	0.14	100.00	1.005	1.73	22.93	0.026	0.00	0.00
34.25	0.31	99.86	0.877	1.69	21.21	0.022	0.00	0.00
29.91	0.65	99.55	0.766	1.69	19.52			

HORIBA LA-910
PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/15/01
File Name: AW103748.DAT Sample Name: S01T001426 ID No: 01/08/10-748
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 83.212 % Lamp: 71.774 %
Circulation: 6 Agitation: 3 U.Sonic ** (min)
Material: AW103 Solids Source: S01T001020
Lot No: S01T001426 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.129	0.10	0.10	(15)	4.619	5.00	55.00
(2)	0.181	0.90	1.00	(16)	5.473	5.00	60.00
(3)	0.217	1.30	2.30	(17)	6.430	5.00	65.00
(4)	0.274	2.70	5.00	(18)	7.514	5.00	70.00
(5)	0.381	5.00	10.00	(19)	8.758	5.00	75.00
(6)	0.539	5.00	15.00	(20)	10.247	5.00	80.00
(7)	0.572	0.80	15.80	(21)	11.766	4.20	84.20
(8)	0.798	4.20	20.00	(22)	12.117	0.80	85.00
(9)	1.172	5.00	25.00	(23)	14.631	5.00	90.00
(10)	1.619	5.00	30.00	(24)	18.756	5.00	95.00
(11)	2.107	5.00	35.00	(25)	22.787	2.70	97.70
(12)	2.636	5.00	40.00	(26)	26.689	1.30	99.00
(13)	3.219	5.00	45.00	(27)	35.744	0.90	99.90
(14)	3.869	5.00	50.00				

Median : 3.866 (μm) Mean: 5.937 (μm) Mode: 8.237 (μm)
Std. Dev.: 6.142 (μm) Span: 2.576
Coef. Var: 103.44% Spec. Area: 48854 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/25/'01 12:00

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010810-749 14:22
Filename : AW103749
Sample : S01T001426

Material : AW103 Solids
Source : S01T001020
Lot Numbe : S01T001426

Condition
T%(He-Ne): 82.6% Dist.Form: Std. Sampling times : 100
(LAMP): 71.3% R.R.Index: 1.16-0.00i ( )

Agitation : 1 Circultn : 6 U.sonic : ~~ON~~ OFF (120)

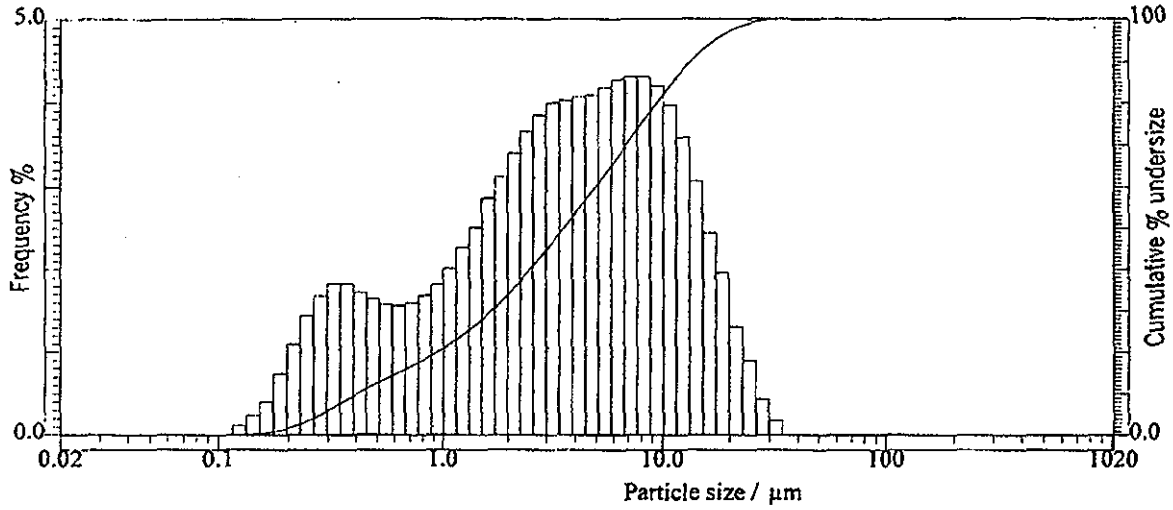
WSC 8/15/02

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 3.569μm SP.Area : 46945cm²/cm³ S.D. : 5.583μm
Mode : 8.224μm Mean : 5.506μm
C.V. : 101.40%

Span : (D 10.0-D 90.0) / D50 = 3.644

Dia. on %(5.0%) :	0.280μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	1.300μm	% on Dia.(1.000μm) :	20.9%
Dia. on %(50.0%) :	3.569μm	% on Dia.(10.000μm) :	81.8%
Dia. on %(75.0%) :	8.038μm	% on Dia.(100.000μm) :	100.0%
Dia. on %(95.0%) :	17.163μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.90	99.39	0.669	1.56	15.86
890.1	0.00	100.00	22.80	1.31	98.49	0.584	1.58	14.30
777.1	0.00	100.00	19.90	1.96	97.18	0.510	1.65	12.72
678.5	0.00	100.00	17.38	2.44	95.22	0.445	1.72	11.07
592.4	0.00	100.00	15.17	3.07	92.78	0.389	1.83	9.35
517.2	0.00	100.00	13.25	3.59	89.71	0.339	1.83	7.53
451.6	0.00	100.00	11.56	3.98	86.12	0.296	1.68	5.70
394.2	0.00	100.00	10.10	4.21	82.15	0.259	1.44	4.02
344.2	0.00	100.00	8.816	4.32	77.94	0.226	1.09	2.59
300.5	0.00	100.00	7.697	4.31	73.62	0.197	0.74	1.50
262.4	0.00	100.00	6.720	4.28	69.30	0.172	0.40	0.76
229.1	0.00	100.00	5.867	4.19	65.02	0.150	0.24	0.36
200.0	0.00	100.00	5.122	4.10	60.83	0.131	0.12	0.12
174.6	0.00	100.00	4.472	4.07	56.74	0.115	0.00	0.00
152.5	0.00	100.00	3.905	4.03	52.67	0.100	0.00	0.00
133.1	0.00	100.00	3.409	3.99	48.63	0.087	0.00	0.00
116.2	0.00	100.00	2.976	3.85	44.64	0.076	0.00	0.00
101.5	0.00	100.00	2.599	3.65	40.79	0.067	0.00	0.00
88.58	0.00	100.00	2.269	3.40	37.13	0.058	0.00	0.00
77.34	0.00	100.00	1.981	3.12	33.73	0.051	0.00	0.00
67.52	0.00	100.00	1.729	2.86	30.61	0.044	0.00	0.00
58.95	0.00	100.00	1.510	2.51	27.75	0.039	0.00	0.00
51.47	0.00	100.00	1.318	2.26	25.24	0.034	0.00	0.00
44.94	0.00	100.00	1.151	2.01	22.97	0.029	0.00	0.00
39.23	0.00	100.00	1.005	1.82	20.96	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/15/01
File Name: AW103749.DAT Sample Name: S01T001426 ID No: 01/08/10-749
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 82.595 % Lamp: 71.271 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: AW103 Solids Source: S01T001020
Lot No: S01T001426 Test No:

WSC 8/15/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.129	0.10	0.10	(15)	4.230	5.00	55.00
(2)	0.180	0.90	1.00	(16)	4.990	5.00	60.00
(3)	0.218	1.30	2.30	(17)	5.863	5.00	65.00
(4)	0.280	2.70	5.00	(18)	6.877	5.00	70.00
(5)	0.410	5.00	10.00	(19)	8.055	5.00	75.00
(6)	0.622	5.00	15.00	(20)	9.444	5.00	80.00
(7)	0.665	0.80	15.80	(21)	10.855	4.20	84.20
(8)	0.938	4.20	20.00	(22)	11.150	0.80	85.00
(9)	1.301	5.00	25.00	(23)	13.426	5.00	90.00
(10)	1.683	5.00	30.00	(24)	17.175	5.00	95.00
(11)	2.088	5.00	35.00	(25)	21.053	2.70	97.70
(12)	2.528	5.00	40.00	(26)	24.681	1.30	99.00
(13)	3.015	5.00	45.00	(27)	31.853	0.90	99.90
(14)	3.577	5.00	50.00				

Median : 3.569 (μm) Mean: 5.506 (μm) Mode: 8.237 (μm)
Std. Dev.: 5.583 (μm) Span: 2.556
Coef. Var: 101.40% Spec. Area: 46945 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/25/'01 12:00

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010810-750 15:26
Filename : AW103750
Sample : S01T001426

Material : AW103 Solids
Source : S01T001020
Lot Numbe : S01T001426

Condition
T%(He-Ne): 82.6% Dist.Form: Std. Sampling times : 100
(LAMP): 71.8% R.R.Index: 1.16-0.00i ( )

Agitation : 3 Circultn : 6 U.sonic : ON(120) OFF

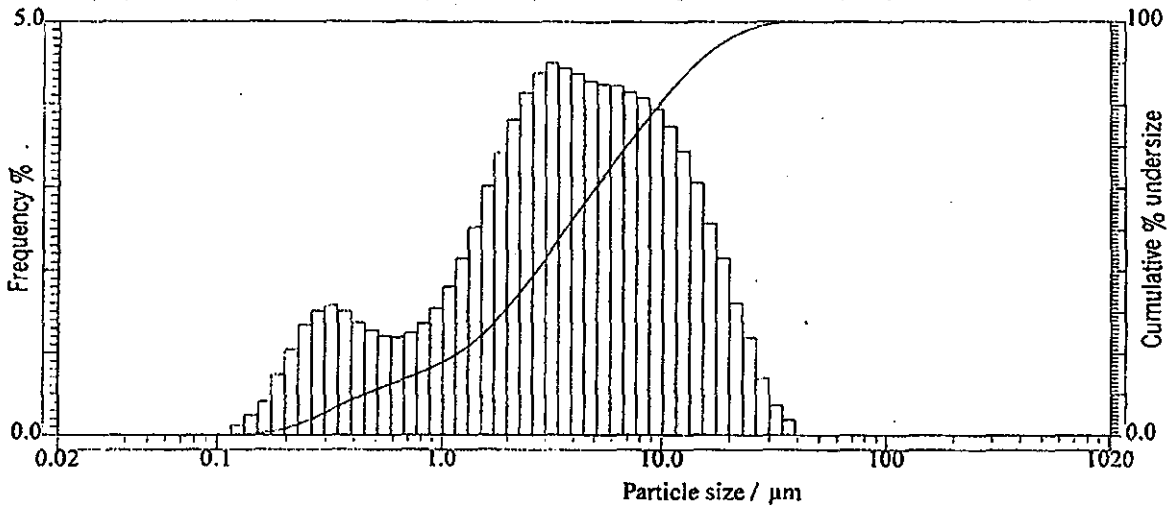
8/15/01 WSC

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 3.696μm SP.Area : 43273cm²/cm³ S.D. : 6.060μm
Mode : 3.188μm Mean : 5.856μm
C.V. : 103.49%

Span : (D 10.0-D 90.0) / D50 = 3.756

Dia. on %(5.0%) : 0.286μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 1.573μm % on Dia.(1.000μm) : 17.6%
Dia. on %(50.0%) : 3.696μm % on Dia.(10.000μm) : 80.8%
Dia. on %(75.0%) : 8.218μm % on Dia.(100.000μm) : 100.0%
Dia. on %(95.0%) : 18.702μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.19	98.77	0.669	1.19	13.51
890.1	0.00	100.00	22.80	1.60	97.58	0.584	1.20	12.31
777.1	0.00	100.00	19.90	2.15	95.98	0.510	1.28	11.11
678.5	0.00	100.00	17.38	2.57	93.84	0.445	1.36	9.83
592.4	0.00	100.00	15.17	3.05	91.27	0.389	1.50	8.47
517.2	0.00	100.00	13.25	3.44	88.22	0.339	1.57	6.97
451.6	0.00	100.00	11.56	3.74	84.79	0.296	1.51	5.40
394.2	0.00	100.00	10.10	3.94	81.05	0.259	1.34	3.89
344.2	0.00	100.00	8.816	4.08	77.11	0.226	1.05	2.55
300.5	0.00	100.00	7.697	4.14	73.03	0.197	0.73	1.50
262.4	0.00	100.00	6.720	4.22	68.89	0.172	0.40	0.77
229.1	0.00	100.00	5.867	4.24	64.67	0.150	0.25	0.37
200.0	0.00	100.00	5.122	4.28	60.43	0.131	0.12	0.12
174.6	0.00	100.00	4.472	4.37	56.16	0.115	0.00	0.00
152.5	0.00	100.00	3.905	4.44	51.79	0.100	0.00	0.00
133.1	0.00	100.00	3.409	4.50	47.35	0.087	0.00	0.00
116.2	0.00	100.00	2.976	4.38	42.86	0.076	0.00	0.00
101.5	0.00	100.00	2.599	4.14	38.47	0.067	0.00	0.00
88.58	0.00	100.00	2.269	3.82	34.33	0.058	0.00	0.00
77.34	0.00	100.00	1.981	3.42	30.51	0.051	0.00	0.00
67.52	0.00	100.00	1.729	3.01	27.09	0.044	0.00	0.00
58.95	0.00	100.00	1.510	2.51	24.09	0.039	0.00	0.00
51.47	0.00	100.00	1.318	2.14	21.57	0.034	0.00	0.00
44.94	0.00	100.00	1.151	1.80	19.43	0.029	0.00	0.00
39.23	0.18	100.00	1.005	1.53	17.63	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/15/01
File Name: AW103750.DAT Sample Name: S01T001426 ID No: 01/08/10-750
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 82.636 % Lamp: 71.842 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: AW103 Solids Source: S01T001020
Lot No: S01T001426 Test No:

WJC 8/15/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.128	0.10	0.10	(15)	4.322	5.00	55.00
(2)	0.180	0.90	1.00	(16)	5.056	5.00	60.00
(3)	0.219	1.30	2.30	(17)	5.933	5.00	65.00
(4)	0.286	2.70	5.00	(18)	6.982	5.00	70.00
(5)	0.454	5.00	10.00	(19)	8.237	5.00	75.00
(6)	0.787	5.00	15.00	(20)	9.756	5.00	80.00
(7)	0.853	0.80	15.80	(21)	11.334	4.20	84.20
(8)	1.196	4.20	20.00	(22)	11.669	0.80	85.00
(9)	1.577	5.00	25.00	(23)	14.369	5.00	90.00
(10)	1.943	5.00	30.00	(24)	18.744	5.00	95.00
(11)	2.322	5.00	35.00	(25)	23.126	2.70	97.70
(12)	2.730	5.00	40.00	(26)	27.384	1.30	99.00
(13)	3.183	5.00	45.00	(27)	36.484	0.90	99.90
(14)	3.705	5.00	50.00				

Median : 3.696 (μm) Mean: 5.856 (μm) Mode: 3.185 (μm)
Std. Dev.: 6.060 (μm) Span: 2.836
Coef. Var: 103.49% Spec. Area: 43273 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/25/'01 11:58

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010810-751 15:29
Filename : AW103751
Sample : S01T001426

Material : AW103 Solids
Source : S01T001020
Lot Numbe : S01T001426

Condition
T%(He-Ne): 82.9% Dist.Form: Std. Sampling times : 100
(LAMP): 72.2% R.R.Index: 1.16-0.00i ( )

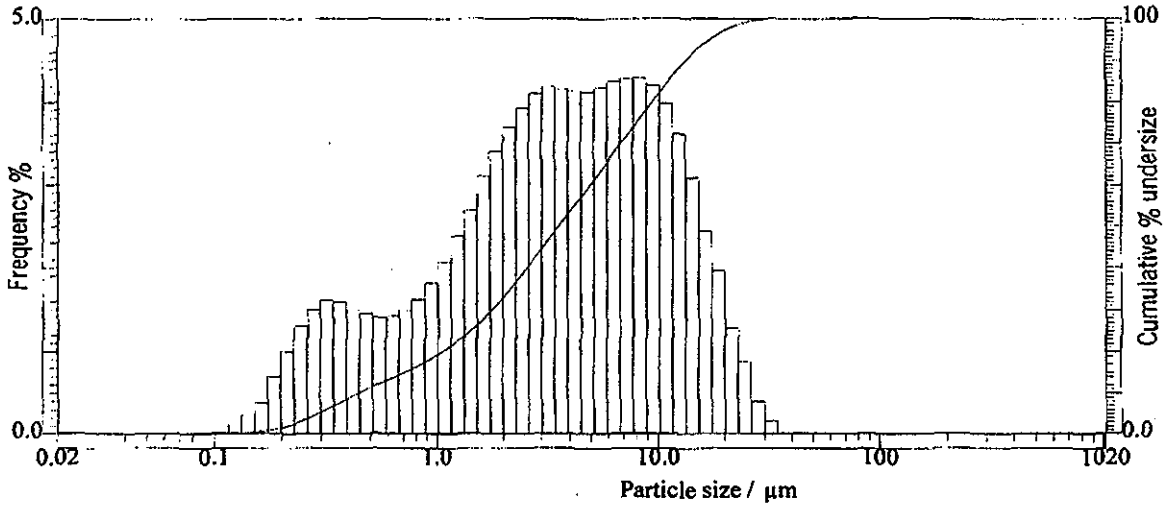
Agitation : 1 Circultn : 6 U.sonic : ~~ON~~ OFF (120) WSC 8/15/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 3.564μm SP.Area : 44447cm²/cm³ S.D. : 5.519μm
Mode : 8.227μm Mean : 5.512μm
C.V. : 100.13%

Span : (D 10.0-D 90.0) / D50 = 3.623

Dia. on %(5.0%) :	0.291μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	1.418μm	% on Dia.(1.000μm) :	19.1%
Dia. on %(50.0%) :	3.564μm	% on Dia.(10.000μm) :	81.9%
Dia. on %(75.0%) :	8.011μm	% on Dia.(100.000μm) :	100.0%
Dia. on %(95.0%) :	17.060μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.87	99.44	0.669	1.42	14.19
890.1	0.00	100.00	22.80	1.28	98.57	0.584	1.41	12.77
777.1	0.00	100.00	19.90	1.95	97.28	0.510	1.45	11.36
678.5	0.00	100.00	17.38	2.44	95.33	0.445	1.50	9.92
592.4	0.00	100.00	15.17	3.08	92.89	0.389	1.59	8.42
517.2	0.00	100.00	13.25	3.60	89.81	0.339	1.61	6.82
451.6	0.00	100.00	11.56	3.98	86.20	0.296	1.49	5.21
394.2	0.00	100.00	10.10	4.20	82.22	0.259	1.30	3.72
344.2	0.00	100.00	8.816	4.29	78.02	0.226	1.00	2.42
300.5	0.00	100.00	7.697	4.27	73.74	0.197	0.69	1.42
262.4	0.00	100.00	6.720	4.25	69.46	0.172	0.38	0.73
229.1	0.00	100.00	5.867	4.17	65.22	0.150	0.23	0.35
200.0	0.00	100.00	5.122	4.12	61.05	0.131	0.12	0.12
174.6	0.00	100.00	4.472	4.13	56.93	0.115	0.00	0.00
152.5	0.00	100.00	3.905	4.16	52.80	0.100	0.00	0.00
133.1	0.00	100.00	3.409	4.18	48.64	0.087	0.00	0.00
116.2	0.00	100.00	2.976	4.10	44.46	0.076	0.00	0.00
101.5	0.00	100.00	2.599	3.93	40.36	0.067	0.00	0.00
88.58	0.00	100.00	2.269	3.69	36.43	0.058	0.00	0.00
77.34	0.00	100.00	1.981	3.40	32.74	0.051	0.00	0.00
67.52	0.00	100.00	1.729	3.10	29.34	0.044	0.00	0.00
58.95	0.00	100.00	1.510	2.69	26.24	0.039	0.00	0.00
51.47	0.00	100.00	1.318	2.38	23.56	0.034	0.00	0.00
44.94	0.00	100.00	1.151	2.06	21.18	0.029	0.00	0.00
39.23	0.00	100.00	1.005	1.81	19.12	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/15/01
File Name: AW103751.DAT Sample Name: S01T001426 ID No: 01/08/10-751
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 82.869 % Lamp: 72.162 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: AW103 Solids Source: S01T001020
Lot No: S01T001426 Test No:

WSC 8/15/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.129	0.10	0.10	(15)	4.207	5.00	55.00
(2)	0.182	0.90	1.00	(16)	4.957	5.00	60.00
(3)	0.222	1.30	2.30	(17)	5.828	5.00	65.00
(4)	0.291	2.70	5.00	(18)	6.843	5.00	70.00
(5)	0.449	5.00	10.00	(19)	8.026	5.00	75.00
(6)	0.721	5.00	15.00	(20)	9.419	5.00	80.00
(7)	0.774	0.80	15.80	(21)	10.826	4.20	84.20
(8)	1.067	4.20	20.00	(22)	11.121	0.80	85.00
(9)	1.421	5.00	25.00	(23)	13.366	5.00	90.00
(10)	1.778	5.00	30.00	(24)	17.078	5.00	95.00
(11)	2.157	5.00	35.00	(25)	20.841	2.70	97.70
(12)	2.568	5.00	40.00	(26)	24.437	1.30	99.00
(13)	3.032	5.00	45.00	(27)	31.525	0.90	99.90
(14)	3.571	5.00	50.00				

Median : 3.564 (μm) Mean: 5.512 (μm) Mode: 8.237 (μm)
Std. Dev.: 5.519 (μm) Span: 2.539
Coef. Var: 100.14% Spec. Area: 44447 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Aug/14/'01 13:18

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010813-752 10:11
Filename : AW103752
Sample : S01T001427

Material : AW103 Solids
Source : S01T001020
Lot Numbe : S01T001427

Condition
T%(He-Ne): 83.1% Dist.Form: Std. Sampling times : 100
(LAMP): 74.4% R.R.Index: 1.16-0.00i ( )

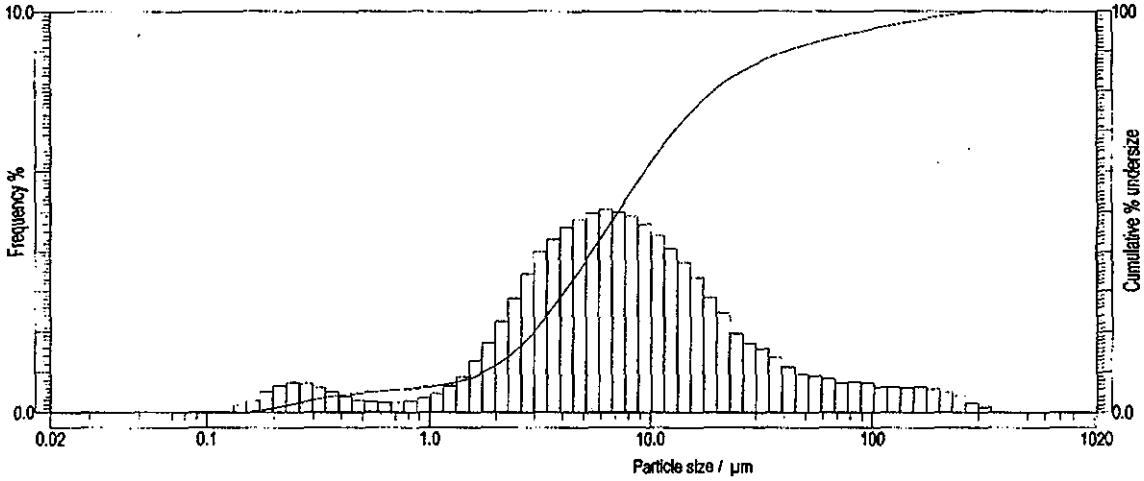
Agitation : 3 Circultn : 6 U.sonic : OFF(1200)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 7.167μm SP.Area : 23007cm²/cm³ S.D. : 38.533μm
Mode : 6.282μm Mean : 19.300μm
C.V. : 199.66%

Span : (D 10.0-D 90.0) / D50 = 5.451

Dia. on %(5.0%) :	0.523μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	3.529μm	% on Dia.(1.000μm) :	6.3%
Dia. on %(50.0%) :	7.167μm	% on Dia.(10.000μm) :	61.9%
Dia. on %(75.0%) :	15.544μm	% on Dia.(100.000μm) :	95.6%
Dia. on %(95.0%) :	90.231μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.95	85.01	0.669	0.25	5.47
890.1	0.00	100.00	22.80	2.47	83.06	0.584	0.27	5.22
777.1	0.00	100.00	19.90	2.84	80.59	0.510	0.32	4.95
678.5	0.00	100.00	17.38	3.34	77.74	0.445	0.39	4.63
592.4	0.00	100.00	15.17	3.72	74.40	0.389	0.51	4.24
517.2	0.00	100.00	13.25	4.07	70.68	0.339	0.63	3.73
451.6	0.00	100.00	11.56	4.40	66.61	0.296	0.71	3.10
394.2	0.00	100.00	10.10	4.69	62.21	0.259	0.73	2.39
344.2	0.13	100.00	8.816	4.90	57.52	0.226	0.65	1.66
300.5	0.23	99.87	7.697	5.00	52.62	0.197	0.51	1.01
262.4	0.42	99.64	6.720	5.05	47.62	0.172	0.31	0.50
229.1	0.51	99.21	5.867	4.96	42.57	0.150	0.19	0.19
200.0	0.60	98.70	5.122	4.80	37.61	0.131	0.00	0.00
174.6	0.64	98.11	4.472	4.60	32.81	0.115	0.00	0.00
152.5	0.61	97.47	3.905	4.31	28.21	0.100	0.00	0.00
133.1	0.61	96.86	3.409	3.98	23.90	0.087	0.00	0.00
116.2	0.61	96.24	2.976	3.44	19.92	0.076	0.00	0.00
101.5	0.73	95.63	2.599	2.83	16.47	0.067	0.00	0.00
88.58	0.75	94.90	2.269	2.26	13.64	0.058	0.00	0.00
77.34	0.72	94.15	1.981	1.72	11.38	0.051	0.00	0.00
67.52	0.83	93.43	1.729	1.28	9.66	0.044	0.00	0.00
58.95	0.89	92.61	1.510	0.90	8.38	0.039	0.00	0.00
51.47	0.93	91.71	1.318	0.65	7.48	0.034	0.00	0.00
44.94	1.12	90.79	1.151	0.47	6.83	0.029	0.00	0.00
39.23	1.35	89.67	1.005	0.35	6.36	0.026	0.00	0.00
34.25	1.59	88.31	0.877	0.29	6.01	0.022	0.00	0.00
29.91	1.72	86.73	0.766	0.25	5.72			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/15/01
File Name: AW103752.DAT Sample Name: S01T001427 ID No: 01/08/13-752
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 83.141 % Lamp: 74.446 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: AW103 Solids Source: S01T001020
Lot No: S01T001427 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.141	0.10	0.10	(15)	8.240	5.00	55.00
(2)	0.197	0.90	1.00	(16)	9.493	5.00	60.00
(3)	0.255	1.30	2.30	(17)	11.027	5.00	65.00
(4)	0.524	2.70	5.00	(18)	12.964	5.00	70.00
(5)	1.779	5.00	10.00	(19)	15.565	5.00	75.00
(6)	2.427	5.00	15.00	(20)	19.383	5.00	80.00
(7)	2.520	0.80	15.80	(21)	24.732	4.20	84.20
(8)	2.985	4.20	20.00	(22)	26.089	0.80	85.00
(9)	3.536	5.00	25.00	(23)	40.929	5.00	90.00
(10)	4.126	5.00	30.00	(24)	90.332	5.00	95.00
(11)	4.769	5.00	35.00	(25)	160.473	2.70	97.70
(12)	5.481	5.00	40.00	(26)	216.937	1.30	99.00
(13)	6.277	5.00	45.00	(27)	310.655	0.90	99.90
(14)	7.184	5.00	50.00				

Median : 7.167 (μm) Mean: 19.300 (μm) Mode: 6.279 (μm)
Std. Dev.: 38.533 (μm) Span: 10.420
Coef. Var: 199.66% Spec. Area: 23007 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Aug/14/'01 13:19

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010813-753 10:15
Filename : AW103753
Sample : S01T001427

Material : AW103 Solids
Source : S01T001020
Lot Numbe : S01T001427

Condition
T%(He-Ne): 83.1%
(LAMP): 74.2%

Dist.Form: Std.
R.R.Index: 1.16-0.001

Sampling times : 100
( )

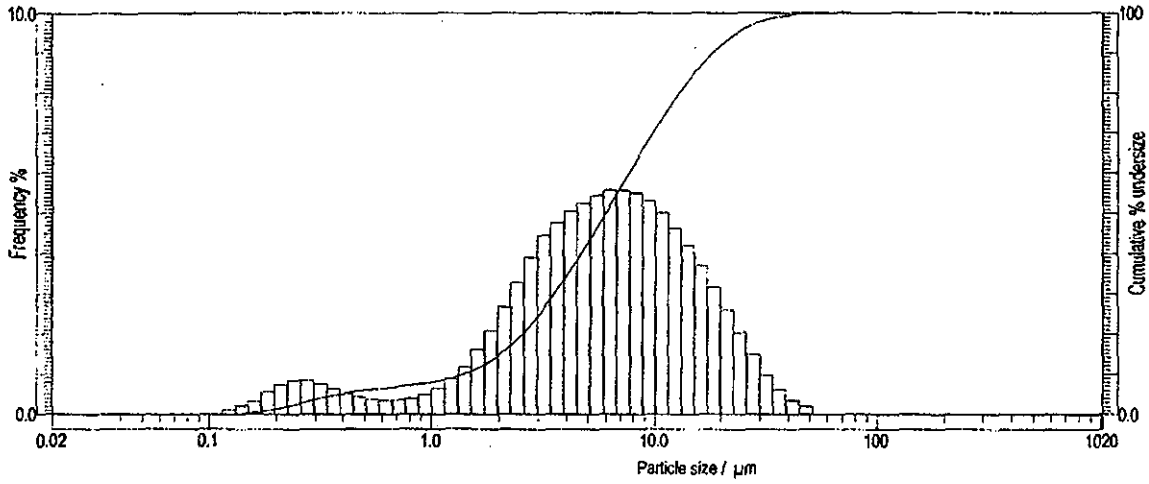
Agitation : 1 Circultn : 6 U.sonic : OFF(1200)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 6.001μm SP.Area : 27169cm²/cm³ S.D. : 7.535μm
Mode : 6.288μm Mean : 8.300μm
C.V. : 90.78%

Span : (D 10.0-D 90.0) / D50 = 2.840

Dia. on %(5.0%) :	0.392μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	3.059μm	% on Dia.(1.000μm) :	7.9%
Dia. on %(50.0%) :	6.001μm	% on Dia.(10.000μm) :	70.6%
Dia. on %(75.0%) :	11.244μm	% on Dia.(100.000μm) :	100.0%
Dia. on %(95.0%) :	23.813μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	2.04	96.38	0.669	0.35	6.62
890.1	0.00	100.00	22.80	2.60	94.35	0.584	0.37	6.27
777.1	0.00	100.00	19.90	3.16	91.75	0.510	0.43	5.90
678.5	0.00	100.00	17.38	3.69	88.59	0.445	0.51	5.48
592.4	0.00	100.00	15.17	4.21	84.90	0.389	0.63	4.97
517.2	0.00	100.00	13.25	4.65	80.69	0.339	0.75	4.34
451.6	0.00	100.00	11.56	5.02	76.04	0.296	0.83	3.58
394.2	0.00	100.00	10.10	5.31	71.02	0.259	0.83	2.75
344.2	0.00	100.00	8.816	5.50	65.71	0.226	0.72	1.92
300.5	0.00	100.00	7.697	5.56	60.21	0.197	0.56	1.20
262.4	0.00	100.00	6.720	5.58	54.65	0.172	0.33	0.64
229.1	0.00	100.00	5.867	5.45	49.07	0.150	0.21	0.32
200.0	0.00	100.00	5.122	5.26	43.62	0.131	0.11	0.11
174.6	0.00	100.00	4.472	5.05	38.37	0.115	0.00	0.00
152.5	0.00	100.00	3.905	4.76	33.31	0.100	0.00	0.00
133.1	0.00	100.00	3.409	4.44	28.55	0.087	0.00	0.00
116.2	0.00	100.00	2.976	3.91	24.11	0.076	0.00	0.00
101.5	0.00	100.00	2.599	3.28	20.20	0.067	0.00	0.00
88.58	0.00	100.00	2.269	2.67	16.92	0.058	0.00	0.00
77.34	0.00	100.00	1.981	2.09	14.25	0.051	0.00	0.00
67.52	0.00	100.00	1.729	1.61	12.15	0.044	0.00	0.00
58.95	0.00	100.00	1.510	1.16	10.55	0.039	0.00	0.00
51.47	0.20	100.00	1.318	0.87	9.39	0.034	0.00	0.00
44.94	0.36	99.80	1.151	0.64	8.52	0.029	0.00	0.00
39.23	0.61	99.45	1.005	0.49	7.88	0.026	0.00	0.00
34.25	0.97	98.84	0.877	0.41	7.39	0.022	0.00	0.00
29.91	1.49	97.87	0.766	0.36	6.98			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/15/01
File Name: AW103753.DAT Sample Name: S01T001427 ID No: 01/08/13-753
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 83.069 % Lamp: 74.164 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: AW103 Solids Source: S01T001020
Lot No: S01T001427 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.130	0.10	0.10	(15)	6.781	5.00	55.00
(2)	0.188	0.90	1.00	(16)	7.659	5.00	60.00
(3)	0.241	1.30	2.30	(17)	8.671	5.00	65.00
(4)	0.392	2.70	5.00	(18)	9.851	5.00	70.00
(5)	1.420	5.00	10.00	(19)	11.260	5.00	75.00
(6)	2.062	5.00	15.00	(20)	12.997	5.00	80.00
(7)	2.148	0.80	15.80	(21)	14.852	4.20	84.20
(8)	2.578	4.20	20.00	(22)	15.232	0.80	85.00
(9)	3.063	5.00	25.00	(23)	18.504	5.00	90.00
(10)	3.560	5.00	30.00	(24)	23.862	5.00	95.00
(11)	4.094	5.00	35.00	(25)	29.481	2.70	97.70
(12)	4.674	5.00	40.00	(26)	35.554	1.30	99.00
(13)	5.310	5.00	45.00	(27)	48.134	0.90	99.90
(14)	6.009	5.00	50.00				

Median : 6.001 (μm) Mean: 8.300 (μm) Mode: 6.279 (μm)
Std. Dev.: 7.535 (μm) Span: 2.095
Coef. Var: 90.79% Spec. Area: 27170 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Aug/14/'01 13:19

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010813-754 10:39
Filename : AW103754
Sample : S01T001427

Material : AW103 Solids
Source : S01T001020
Lot Numbe : S01T001427

Condition
T%(He-Ne): 85.3% Dist.Form: Std. Sampling times : 100
(LAMP): 73.7% R.R.Index: 1.16-0.00i ( )

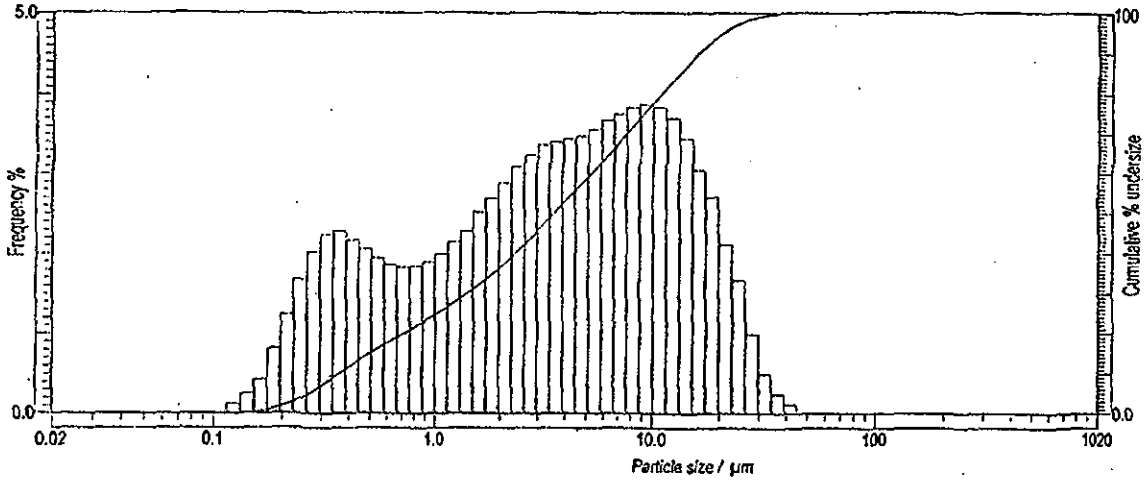
Agitation : 3 Circultn : 6 U.sonic : ON(1200)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 3.586μm SP.Area : 51331cm²/cm³ S.D. : 6.846μm
Mode : 9.435μm Mean : 6.205μm
C.V. : 110.32%

Span : (D 10.0-D 90.0) / D50 = 4.390

Dia. on %(5.0%) :	0.267μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	1.034μm	% on Dia.(1.000μm) :	24.5%
Dia. on %(50.0%) :	3.586μm	% on Dia.(10.000μm) :	77.4%
Dia. on %(75.0%) :	9.187μm	% on Dia.(100.000μm) :	100.0%
Dia. on %(95.0%) :	20.693μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.67	98.17	0.669	1.86	19.03
890.1	0.00	100.00	22.80	2.10	96.50	0.584	1.94	17.18
777.1	0.00	100.00	19.90	2.70	94.40	0.510	2.05	15.24
678.5	0.00	100.00	17.38	3.04	91.70	0.445	2.16	13.19
592.4	0.00	100.00	15.17	3.44	88.66	0.389	2.28	11.03
517.2	0.00	100.00	13.25	3.69	85.22	0.339	2.23	8.75
451.6	0.00	100.00	11.56	3.83	81.53	0.296	2.01	6.52
394.2	0.00	100.00	10.10	3.87	77.69	0.259	1.68	4.51
344.2	0.00	100.00	8.816	3.83	73.83	0.226	1.23	2.83
300.5	0.00	100.00	7.697	3.74	70.00	0.197	0.81	1.60
262.4	0.00	100.00	6.720	3.67	66.25	0.172	0.42	0.79
229.1	0.00	100.00	5.867	3.55	62.59	0.150	0.25	0.37
200.0	0.00	100.00	5.122	3.47	59.03	0.131	0.12	0.12
174.6	0.00	100.00	4.472	3.43	55.57	0.115	0.00	0.00
152.5	0.00	100.00	3.905	3.40	52.13	0.100	0.00	0.00
133.1	0.00	100.00	3.409	3.36	48.74	0.087	0.00	0.00
116.2	0.00	100.00	2.976	3.24	45.38	0.076	0.00	0.00
101.5	0.00	100.00	2.599	3.08	42.14	0.067	0.00	0.00
88.58	0.00	100.00	2.269	2.88	39.06	0.058	0.00	0.00
77.34	0.00	100.00	1.981	2.68	36.18	0.051	0.00	0.00
67.52	0.00	100.00	1.729	2.52	33.50	0.044	0.00	0.00
58.95	0.00	100.00	1.510	2.27	30.98	0.039	0.00	0.00
51.47	0.00	100.00	1.318	2.13	28.71	0.034	0.00	0.00
44.94	0.11	100.00	1.151	1.99	26.57	0.029	0.00	0.00
39.23	0.24	99.89	1.005	1.89	24.58	0.026	0.00	0.00
34.25	0.49	99.65	0.877	1.84	22.70	0.022	0.00	0.00
29.91	0.99	99.16	0.766	1.83	20.86			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/15/01
File Name: AW103754.DAT Sample Name: S01T001427 ID No: 01/08/13-754
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 85.298 % Lamp: 73.658 %
Circulation: 6 Agitation: 3 U.Sonic ** (min)
Material: AW103 Solids Source: S01T001020
Lot No: S01T001427 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.129	0.10	0.10	(15)	4.378	5.00	55.00
(2)	0.179	0.90	1.00	(16)	5.325	5.00	60.00
(3)	0.213	1.30	2.30	(17)	6.428	5.00	65.00
(4)	0.268	2.70	5.00	(18)	7.698	5.00	70.00
(5)	0.366	5.00	10.00	(19)	9.205	5.00	75.00
(6)	0.502	5.00	15.00	(20)	10.981	5.00	80.00
(7)	0.531	0.80	15.80	(21)	12.782	4.20	84.20
(8)	0.720	4.20	20.00	(22)	13.146	0.80	85.00
(9)	1.035	5.00	25.00	(23)	16.143	5.00	90.00
(10)	1.427	5.00	30.00	(24)	20.732	5.00	95.00
(11)	1.870	5.00	35.00	(25)	25.178	2.70	97.70
(12)	2.369	5.00	40.00	(26)	29.310	1.30	99.00
(13)	2.932	5.00	45.00	(27)	39.731	0.90	99.90
(14)	3.593	5.00	50.00				

Median : 3.586 (μm) Mean: 6.205 (μm) Mode: 9.435 (μm)
Std. Dev.: 6.846 (μm) Span: 3.209
Coef. Var: 110.32% Spec. Area: 51331 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/25/'01 11:56

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010813-755 10:42
Filename : AW103755
Sample : S01T001427

Material : AW103 Solids
Source : S01T001020
Lot Numbe : S01T001427

Condition
T%(He-Ne): 84.6% Dist.Form: Std. Sampling times : 100
(LAMP): 73.3% R.R.Index: 1.16-0.00i ( )

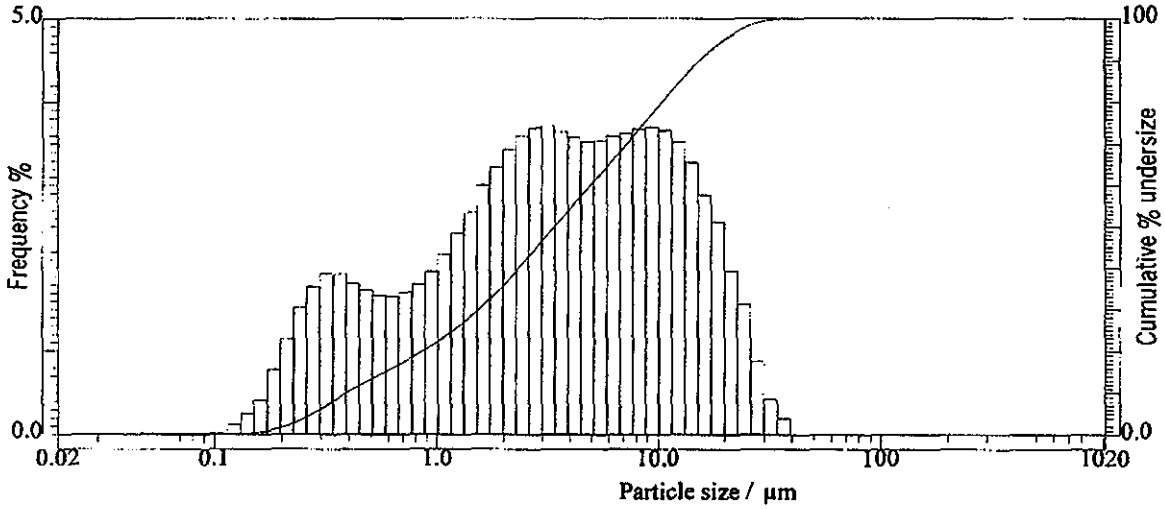
Agitation : 1 Circultn : 6 U.sonic : ~~ON~~ OFF (1200) 3/15/01 WSL

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 3.391μm SP.Area : 48697cm²/cm³ S.D. : 6.534μm
Mode : 3.183μm Mean : 5.969μm
C.V. : 109.47%

Span : (D 10.0-D 90.0) / D50 = 4.459

Dia. on %(5.0%) :	0.274μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	1.191μm	% on Dia.(1.000μm) :	22.2%
Dia. on %(50.0%) :	3.391μm	% on Dia.(10.000μm) :	78.8%
Dia. on %(75.0%) :	8.701μm	% on Dia.(100.000μm) :	100.0%
Dia. on %(95.0%) :	19.947μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.56	98.49	0.669	1.66	16.75
890.1	0.00	100.00	22.80	1.97	96.93	0.584	1.67	15.09
777.1	0.00	100.00	19.90	2.56	94.97	0.510	1.74	13.42
678.5	0.00	100.00	17.38	2.88	92.41	0.445	1.81	11.68
592.4	0.00	100.00	15.17	3.28	89.53	0.389	1.92	9.87
517.2	0.00	100.00	13.25	3.53	86.25	0.339	1.93	7.94
451.6	0.00	100.00	11.56	3.66	82.72	0.296	1.78	6.01
394.2	0.00	100.00	10.10	3.70	79.06	0.259	1.52	4.24
344.2	0.00	100.00	8.816	3.68	75.35	0.226	1.15	2.72
300.5	0.00	100.00	7.697	3.63	71.67	0.197	0.78	1.57
262.4	0.00	100.00	6.720	3.59	68.04	0.172	0.42	0.79
229.1	0.00	100.00	5.867	3.54	64.45	0.150	0.25	0.37
200.0	0.00	100.00	5.122	3.53	60.91	0.131	0.12	0.12
174.6	0.00	100.00	4.472	3.58	57.38	0.115	0.00	0.00
152.5	0.00	100.00	3.905	3.65	53.79	0.100	0.00	0.00
133.1	0.00	100.00	3.409	3.71	50.14	0.087	0.00	0.00
116.2	0.00	100.00	2.976	3.69	46.43	0.076	0.00	0.00
101.5	0.00	100.00	2.599	3.59	42.74	0.067	0.00	0.00
88.58	0.00	100.00	2.269	3.43	39.15	0.058	0.00	0.00
77.34	0.00	100.00	1.981	3.22	35.71	0.051	0.00	0.00
67.52	0.00	100.00	1.729	3.00	32.49	0.044	0.00	0.00
58.95	0.00	100.00	1.510	2.67	29.49	0.039	0.00	0.00
51.47	0.00	100.00	1.318	2.43	26.82	0.034	0.00	0.00
44.94	0.00	100.00	1.151	2.17	24.39	0.029	0.00	0.00
39.23	0.20	100.00	1.005	1.96	22.22	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/15/01
File Name: AW103755.DAT Sample Name: S01T001427 ID No: 01/08/13-755
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 84.571 % Lamp: 73.252 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: AW103 Solids Source: S01T001020
Lot No: S01T001427 Test No:

WSC
8/15/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.128	0.10	0.10	(15)	4.096	5.00	55.00
(2)	0.179	0.90	1.00	(16)	4.955	5.00	60.00
(3)	0.215	1.30	2.30	(17)	5.998	5.00	65.00
(4)	0.275	2.70	5.00	(18)	7.247	5.00	70.00
(5)	0.393	5.00	10.00	(19)	8.708	5.00	75.00
(6)	0.580	5.00	15.00	(20)	10.475	5.00	80.00
(7)	0.620	0.80	15.80	(21)	12.270	4.20	84.20
(8)	0.861	4.20	20.00	(22)	12.651	0.80	85.00
(9)	1.193	5.00	25.00	(23)	15.534	5.00	90.00
(10)	1.547	5.00	30.00	(24)	19.950	5.00	95.00
(11)	1.925	5.00	35.00	(25)	24.424	2.70	97.70
(12)	2.347	5.00	40.00	(26)	28.291	1.30	99.00
(13)	2.830	5.00	45.00	(27)	36.760	0.90	99.90
(14)	3.392	5.00	50.00				

Median : 3.391 (μm) Mean: 5.969 (μm) Mode: 3.185 (μm)
Std. Dev.: 6.534 (μm) Span: 3.316
Coef. Var: 109.47% Spec. Area: 48697 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/25/'01 11:54

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010813.756 11:44
Filename : AW103756
Sample : S01T001424 27

Material : AW103 Solids
Source : S01T001020
Lot Numbe : S01T001424 27

Condition
T%(He-Ne): 84.6%
(LAMP): 73.7%

Dist.Form: Std.
R.R.Index: 1.16-0.00i

Sampling times : 100
( )

WSC 8/15/01

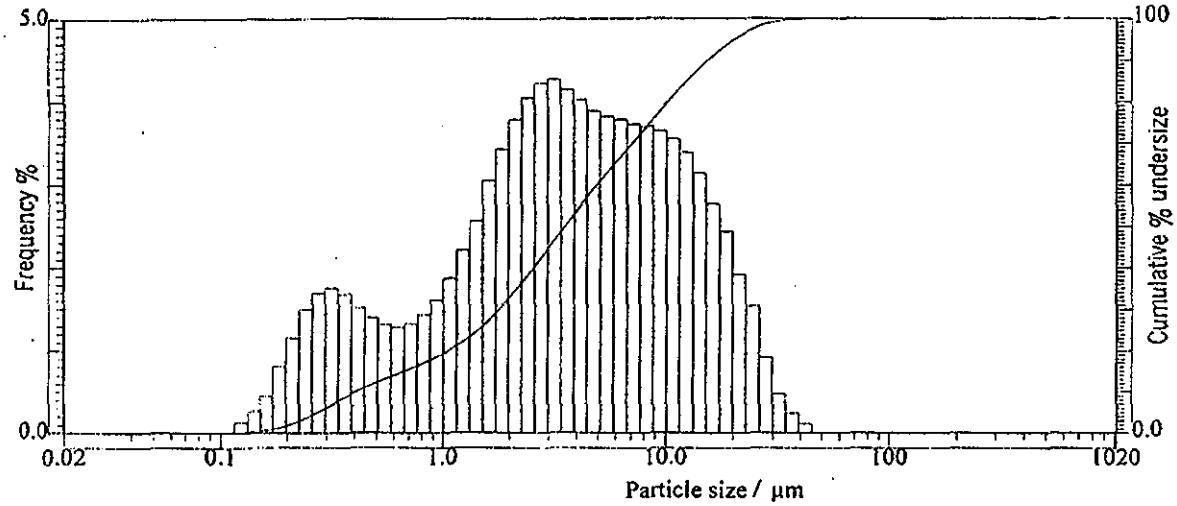
Agitation : 3 Circultn : 6 U.sonic : ~~ON(120)~~ OFF

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 3.550μm SP.Area : 45993cm²/cm³ S.D. : 6.602μm
Mode : 3.181μm Mean : 6.065μm
C.V. : 108.87%

Span : (D 10.0-D 90.0) / D50 = 4.244

Dia. on %(5.0%) :	0.274μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	1.436μm	% on Dia.(1.000μm) :	19.2%
Dia. on %(50.0%) :	3.550μm	% on Dia.(10.000μm) :	79.3%
Dia. on %(75.0%) :	8.538μm	% on Dia.(100.000μm) :	100.0%
Dia. on %(95.0%) :	20.179μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.53	98.26	0.669	1.28	14.93
890.1	0.00	100.00	22.80	1.92	96.73	0.584	1.31	13.65
777.1	0.00	100.00	19.90	2.44	94.81	0.510	1.41	12.33
678.5	0.00	100.00	17.38	2.77	92.36	0.445	1.52	10.93
592.4	0.00	100.00	15.17	3.14	89.60	0.389	1.68	9.41
517.2	0.00	100.00	13.25	3.39	86.46	0.339	1.75	7.73
451.6	0.00	100.00	11.56	3.55	83.08	0.296	1.69	5.98
394.2	0.00	100.00	10.10	3.65	79.52	0.259	1.49	4.29
344.2	0.00	100.00	8.816	3.71	75.87	0.226	1.16	2.80
300.5	0.00	100.00	7.697	3.73	72.17	0.197	0.80	1.64
262.4	0.00	100.00	6.720	3.79	68.44	0.172	0.44	0.83
229.1	0.00	100.00	5.867	3.82	64.65	0.150	0.26	0.39
200.0	0.00	100.00	5.122	3.89	60.83	0.131	0.13	0.13
174.6	0.00	100.00	4.472	4.03	56.93	0.115	0.00	0.00
152.5	0.00	100.00	3.905	4.15	52.91	0.100	0.00	0.00
133.1	0.00	100.00	3.409	4.27	48.76	0.087	0.00	0.00
116.2	0.00	100.00	2.976	4.23	44.49	0.076	0.00	0.00
101.5	0.00	100.00	2.599	4.05	40.27	0.067	0.00	0.00
88.58	0.00	100.00	2.269	3.79	36.22	0.058	0.00	0.00
77.34	0.00	100.00	1.981	3.43	32.43	0.051	0.00	0.00
67.52	0.00	100.00	1.729	3.05	29.00	0.044	0.00	0.00
58.95	0.00	100.00	1.510	2.57	25.95	0.039	0.00	0.00
51.47	0.00	100.00	1.318	2.21	23.37	0.034	0.00	0.00
44.94	0.11	100.00	1.151	1.87	21.16	0.029	0.00	0.00
39.23	0.24	99.89	1.005	1.61	19.29	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/15/01
File Name: AW103756.DAT Sample Name: S01T001427 ID No: 01/08/13-756
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 84.598 % Lamp: 73.691 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: AW103 Solids Source: S01T001020
Lot No: S01T001427 Test No:

WSC
8/15/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.128	0.10	0.10	(15)	4.199	5.00	55.00
(2)	0.177	0.90	1.00	(16)	4.984	5.00	60.00
(3)	0.213	1.30	2.30	(17)	5.946	5.00	65.00
(4)	0.274	2.70	5.00	(18)	7.129	5.00	70.00
(5)	0.410	5.00	10.00	(19)	8.552	5.00	75.00
(6)	0.674	5.00	15.00	(20)	10.294	5.00	80.00
(7)	0.733	0.80	15.80	(21)	12.123	4.20	84.20
(8)	1.060	4.20	20.00	(22)	12.520	0.80	85.00
(9)	1.439	5.00	25.00	(23)	15.493	5.00	90.00
(10)	1.803	5.00	30.00	(24)	20.197	5.00	95.00
(11)	2.176	5.00	35.00	(25)	24.902	2.70	97.70
(12)	2.577	5.00	40.00	(26)	29.158	1.30	99.00
(13)	3.028	5.00	45.00	(27)	39.738	0.90	99.90
(14)	3.557	5.00	50.00				

Median : 3.550 (μm) Mean: 6.065 (μm) Mode: 3.185 (μm)
Std. Dev.: 6.602 (μm) Span: 3.279
Coef. Var: 108.87% Spec. Area: 45993 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/25/'01 11:51

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010813-757 11:48
Filename : AW103757
Sample : S01T001427

Material : AW103 Solids
Source : S01T001020
Lot Numbe : S01T001427

Condition
T%(He-Ne): 85.1% Dist.Form: Std. Sampling times : 100
(LAMP): 74.2% R.R.Index: 1.16-0.00i ( )

Agitation : 1 Circultn : 6 U.sonic : ~~ON~~ OFF (120)

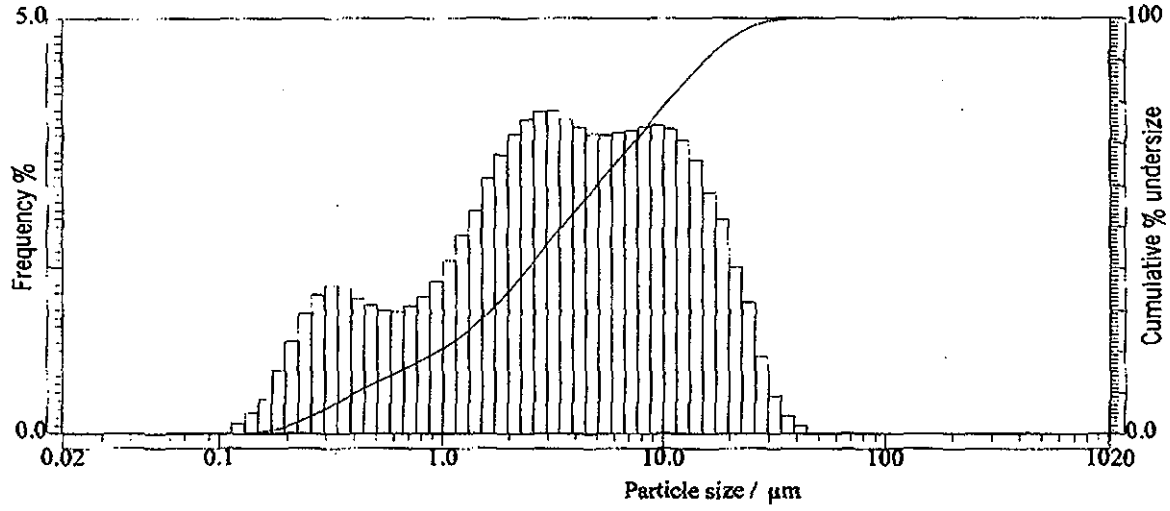
WSC 3/15/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 3.495μm SP.Area : 46721cm²/cm³ S.D. : 6.675μm
Mode : 3.180μm Mean : 6.109μm
C.V. : 109.26%

Span : (D 10.0-D 90.0) / D50 = 4.387

Dia. on %(5.0%) :	0.277μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	1.318μm	% on Dia.(1.000μm) :	20.5%
Dia. on %(50.0%) :	3.495μm	% on Dia.(10.000μm) :	78.4%
Dia. on %(75.0%) :	8.821μm	% on Dia.(100.000μm) :	100.0%
Dia. on %(95.0%) :	20.316μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.59	98.29	0.669	1.48	15.50
890.1	0.00	100.00	22.80	2.00	96.70	0.584	1.49	14.03
777.1	0.00	100.00	19.90	2.58	94.70	0.510	1.55	12.54
678.5	0.00	100.00	17.38	2.91	92.12	0.445	1.63	10.99
592.4	0.00	100.00	15.17	3.30	89.21	0.389	1.76	9.36
517.2	0.00	100.00	13.25	3.54	85.91	0.339	1.79	7.60
451.6	0.00	100.00	11.56	3.67	82.37	0.296	1.68	5.81
394.2	0.00	100.00	10.10	3.71	78.70	0.259	1.46	4.14
344.2	0.00	100.00	8.816	3.70	74.98	0.226	1.12	2.68
300.5	0.00	100.00	7.697	3.65	71.28	0.197	0.77	1.56
262.4	0.00	100.00	6.720	3.63	67.63	0.172	0.42	0.80
229.1	0.00	100.00	5.867	3.60	64.00	0.150	0.25	0.38
200.0	0.00	100.00	5.122	3.61	60.40	0.131	0.12	0.12
174.6	0.00	100.00	4.472	3.69	56.79	0.115	0.00	0.00
152.5	0.00	100.00	3.905	3.79	53.09	0.100	0.00	0.00
133.1	0.00	100.00	3.409	3.89	49.30	0.087	0.00	0.00
116.2	0.00	100.00	2.976	3.88	45.41	0.076	0.00	0.00
101.5	0.00	100.00	2.599	3.79	41.53	0.067	0.00	0.00
88.58	0.00	100.00	2.269	3.61	37.74	0.058	0.00	0.00
77.34	0.00	100.00	1.981	3.36	34.13	0.051	0.00	0.00
67.52	0.00	100.00	1.729	3.08	30.77	0.044	0.00	0.00
58.95	0.00	100.00	1.510	2.69	27.69	0.039	0.00	0.00
51.47	0.00	100.00	1.318	2.39	25.00	0.034	0.00	0.00
44.94	0.10	100.00	1.151	2.08	22.61	0.029	0.00	0.00
39.23	0.23	99.90	1.005	1.83	20.53	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/15/01
File Name: AW103757.DAT Sample Name: S01T001427 ID No: 01/08/13-757
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 85.066 % Lamp: 74.165 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: AW103 Solids Source: S01T001020
Lot No: S01T001427 Test No:

WSC 8/15/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.128	0.10	0.10	(15)	4.198	5.00	55.00
(2)	0.179	0.90	1.00	(16)	5.051	5.00	60.00
(3)	0.216	1.30	2.30	(17)	6.102	5.00	65.00
(4)	0.278	2.70	5.00	(18)	7.354	5.00	70.00
(5)	0.411	5.00	10.00	(19)	8.822	5.00	75.00
(6)	0.640	5.00	15.00	(20)	10.618	5.00	80.00
(7)	0.687	0.80	15.80	(21)	12.434	4.20	84.20
(8)	0.968	4.20	20.00	(22)	12.814	0.80	85.00
(9)	1.318	5.00	25.00	(23)	15.772	5.00	90.00
(10)	1.674	5.00	30.00	(24)	20.341	5.00	95.00
(11)	2.050	5.00	35.00	(25)	24.885	2.70	97.70
(12)	2.465	5.00	40.00	(26)	29.033	1.30	99.00
(13)	2.936	5.00	45.00	(27)	39.306	0.90	99.90
(14)	3.500	5.00	50.00				

Median : 3.495 (μm) Mean: 6.109 (μm) Mode: 3.185 (μm)
Std. Dev.: 6.675 (μm) Span: 3.289
Coef. Var: 109.26% Spec. Area: 46721 (cm2/cm3)

APPENDIX F-4

PSD PARAMETRIC STUDY: TANK AY-101 COMPOSITE

Consisting of 51 pages including this cover page

TABLE F-4. Sample identification and PSD run conditions. AY-101 composite subsamples S01T001489 and S01T001492.

Conditions Key: P = Pump Speed Setting; P6 = 14.4 mL/s
S = Stirrer Speed Setting (1-7); S1 = Stirrer Speed 1; S3 = Stirrer Speed 3
US = Ultrasonic ON Time (min); DT = Delay Time (min) between end of ultrasonic treatment and PSD measurement.

Sample	File ID	Run Conditions				Run Initiated At	Cumulative Time (min) At Conditions				
		P	S	US	DT		P6	S1	S3	US	DT
S01T001489	[LOAD-IN]	6	1	0	0		?	?			
	AY101829	6	1	0	0	08:39	4	4			
	AY101830	6	3	0	0	08:43	7	4	3		
	AY101831	6	1	2	0	08:46	12	9	3	2	0
	AY101832	6	3	0	0	08:51	16	9	7	2	3
	[DELAY]	0	0	0	60	08:55					7
	AY101838	6	1	0	0	09:55	19	12	7	2	67
	AY101839	6	3	0	0	09:58	23	12	11	2	70
						10:02					
S01T001492	[LOAD-IN]	6	1	0	0		?	?			
	AY101840	6	1	0	0	10:22	3	3			
	AY101841	6	3	0	0	10:25	7	3	4		
	AY101842	6	1	20	0	10:29	31	27	4	20	0
	AY101843	6	3	0	0	10:53	34	27	7	20	4
	[DELAY]	0	0	0	60	10:56					7
	AY101849	6	1	0	0	11:56	38	31	7	20	67
	AY101850	6	3	0	0	12:00	40	31	9	20	71
						12:02					

TABLE F-4 (continued). Sample identification and PSD run conditions. AY-101 composite subsamples S01T001490 and S01T001491.

Conditions Key: P = Pump Speed Setting; P6 = 14.4 mL/sec
S = Stirrer Speed Setting (1-7); S1 = Stirrer Speed 1; S3 = Stirrer Speed 3
US = Ultrasonic ON Time (min); DT = Delay Time (min) between end of ultrasonic treatment and PSD measurement.

Sample	File ID	Run Conditions				Run Initiated At	Cumulative Time (min) At Conditions				
		P	S	US	DT		P6	S1	S3	US	DT
S01T001490	[LOAD-IN]	6	3	0	0		?		?		
	AY101851	6	3	0	0	12:25	3		3		
	AY101852	6	1	0	0	12:28	6	3	3		
	AY101853	6	3	2	0	12:31	11	3	8	2	0
	AY101854	6	1	0	0	12:36	14	6	8	2	3
	[DELAY]	0	0	0	60	12:39					6
	AY101860	6	3	0	0	13:39	17	6	11	2	66
	AY101861	6	1	0	0	13:42	20	9	11	2	69
						13:45					
S01T001491	[LOAD-IN]	6	3	0	0		?		?		
	AY101862	6	3	0	0	14:03	3		3		
	AY101863	6	1	0	0	14:06	6	3	3		
	AY101864	6	3	20	0	14:09	30	3	27	20	0
	AY101865	6	1	0	0	14:33	33	6	27	20	4
	[DELAY]	0	0	0	60	14:36					7
	AY101871	6	3	0	0	15:36	37	6	31	20	67
	AY101872	6	1	0	0	15:40	39	8	31	20	71
						15:42					

HORIBA LA-910

for Windows(TM) Ver.1.20J Aug/20/'01 15:59

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010817-829 08:41
Filename : AY101829
Sample : S01T001489

Material : AY-101 Solids
Source : S00T001017
Lot Numbe : S01T001489

Condition
T%(He-Ne): 82.3% Dist.Form: Std. Sampling times : 100
(LAMP): 80.8% R.R.Index: 1.16-0.00i ( )

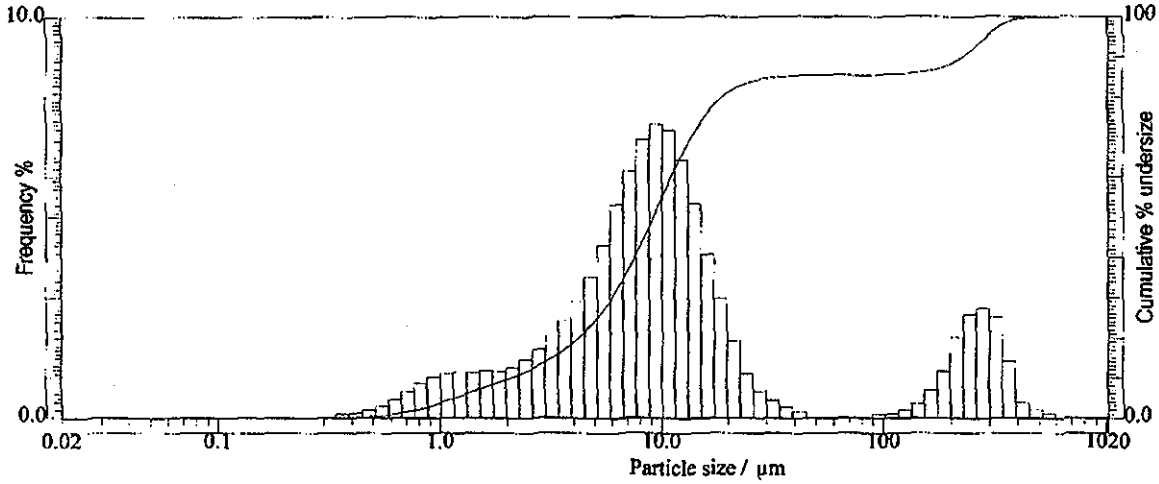
Agitation : 1 Circuitn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 9.223μm SP.Area : 12252cm²/cm³ S.D. : 96.584μm
Mode : 9.454μm Mean : 46.900μm
C.V. : 205.94%

Span : (D 10.0-D 90.0) / D50 = 24.557

Dia. on %(5.0%) : 1.167μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 5.145μm % on Dia.(1.000μm) : 3.7%
Dia. on %(50.0%) : 9.223μm % on Dia.(10.000μm) : 54.4%
Dia. on %(75.0%) : 15.805μm % on Dia.(100.000μm) : 85.5%
Dia. on %(95.0%) : 295.336μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.11	83.86	0.669	0.46	1.21
890.1	0.00	100.00	22.80	1.93	82.75	0.584	0.30	0.75
777.1	0.00	100.00	19.90	2.98	80.82	0.510	0.20	0.44
678.5	0.00	100.00	17.38	4.07	77.85	0.445	0.13	0.24
592.4	0.12	100.00	15.17	5.33	73.77	0.389	0.11	0.11
517.2	0.21	99.88	13.25	6.41	68.45	0.339	0.00	0.00
451.6	0.39	99.67	11.56	7.16	62.03	0.296	0.00	0.00
394.2	1.41	99.28	10.10	7.31	54.87	0.259	0.00	0.00
344.2	2.52	97.87	8.816	6.93	47.56	0.226	0.00	0.00
300.5	2.73	95.35	7.697	6.14	40.63	0.197	0.00	0.00
262.4	2.59	92.62	6.720	5.31	34.49	0.172	0.00	0.00
229.1	2.02	90.03	5.867	4.32	29.18	0.150	0.00	0.00
200.0	1.17	88.01	5.122	3.51	24.86	0.131	0.00	0.00
174.6	0.70	86.84	4.472	2.92	21.35	0.115	0.00	0.00
152.5	0.36	86.14	3.905	2.44	18.43	0.100	0.00	0.00
133.1	0.19	85.78	3.409	2.05	15.99	0.087	0.00	0.00
116.2	0.11	85.59	2.976	1.71	13.94	0.076	0.00	0.00
101.5	0.10	85.48	2.599	1.46	12.23	0.067	0.00	0.00
88.58	0.00	85.38	2.269	1.26	10.77	0.058	0.00	0.00
77.34	0.00	85.38	1.981	1.17	9.51	0.051	0.00	0.00
67.52	0.00	85.38	1.729	1.18	8.34	0.044	0.00	0.00
58.95	0.00	85.38	1.510	1.13	7.15	0.039	0.00	0.00
51.47	0.00	85.38	1.318	1.14	6.03	0.034	0.00	0.00
44.94	0.16	85.38	1.151	1.11	4.88	0.029	0.00	0.00
39.23	0.27	85.22	1.005	1.03	3.77	0.026	0.00	0.00
34.25	0.44	84.95	0.877	0.87	2.75	0.022	0.00	0.00
29.91	0.66	84.52	0.766	0.67	1.87			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/25/01
File Name: AY101829.DAT Sample Name: S01T001489 ID No: 01/08/17-829
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 82.324 % Lamp: 80.826 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: AY-101 Solids Source: S00T001017
Lot No: S01T001489 Test No: Run 1

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.384	0.10	0.10	(15)	10.123	5.00	55.00
(2)	0.631	0.90	1.00	(16)	11.148	5.00	60.00
(3)	0.820	1.30	2.30	(17)	12.343	5.00	65.00
(4)	1.168	2.70	5.00	(18)	13.808	5.00	70.00
(5)	2.093	5.00	10.00	(19)	15.836	5.00	75.00
(6)	3.200	5.00	15.00	(20)	19.204	5.00	80.00
(7)	3.370	0.80	15.80	(21)	28.074	4.20	84.20
(8)	4.210	4.20	20.00	(22)	35.103	0.80	85.00
(9)	5.146	5.00	25.00	(23)	228.623	5.00	90.00
(10)	5.999	5.00	30.00	(24)	295.630	5.00	95.00
(11)	6.801	5.00	35.00	(25)	341.257	2.70	97.70
(12)	7.596	5.00	40.00	(26)	384.277	1.30	99.00
(13)	8.402	5.00	45.00	(27)	529.221	0.90	99.90
(14)	9.243	5.00	50.00				

Median : 9.223 (μm) Mean: 46.900 (μm) Mode: 9.435 (μm)
Std. Dev.: 96.584 (μm) Span: 30.306
Coef. Var: 205.94% Spec. Area: 12252 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20J Aug/20/'01 15:59

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010817-830 08:45
Filename : AY101830
Sample : S01T001489

Material : AY-101 Solids
Source : S00T001017
Lot Numbe : S01T001489

Condition
T%(He-Ne): 82.1%
(LAMP): 80.7%

Dist.Form: Std.
R.R.Index: 1.16-0.00i

Sampling times : 100
( )

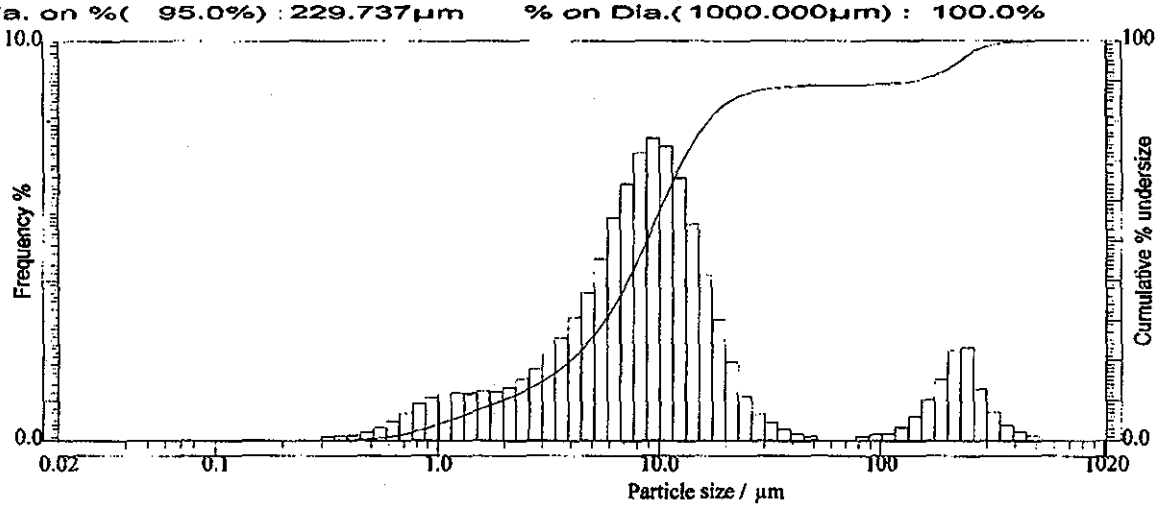
Agitation : 3 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 8.829μm SP.Area : 12980cm²/cm³ S.D. : 73.391μm
Mode : 9.448μm Mean : 33.493μm
C.V. : 219.12%

Span : (D 10.0-D 90.0) / D50 = 16.416

Dia. on %(5.0%) :	1.122μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	4.912μm	% on Dia.(1.000μm) :	4.0%
Dia. on %(50.0%) :	8.829μm	% on Dia.(10.000μm) :	56.9%
Dia. on %(75.0%) :	14.477μm	% on Dia.(100.000μm) :	89.0%
Dia. on %(95.0%) :	229.737μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.11	87.09	0.669	0.48	1.37
890.1	0.00	100.00	22.80	1.95	85.98	0.584	0.32	0.88
777.1	0.00	100.00	19.90	3.01	84.03	0.510	0.21	0.57
678.5	0.00	100.00	17.38	4.15	81.02	0.445	0.14	0.36
592.4	0.00	100.00	15.17	5.44	76.88	0.389	0.11	0.22
517.2	0.12	100.00	13.25	6.58	71.44	0.339	0.10	0.10
451.6	0.22	99.88	11.56	7.38	64.86	0.296	0.00	0.00
394.2	0.40	99.66	10.10	7.57	57.49	0.259	0.00	0.00
344.2	0.71	99.26	8.816	7.22	49.91	0.226	0.00	0.00
300.5	1.28	98.55	7.697	6.43	42.69	0.197	0.00	0.00
262.4	2.31	97.26	6.720	5.58	36.27	0.172	0.00	0.00
229.1	2.23	94.95	5.867	4.55	30.69	0.150	0.00	0.00
200.0	1.52	92.72	5.122	3.70	26.15	0.131	0.00	0.00
174.6	1.03	91.20	4.472	3.08	22.44	0.115	0.00	0.00
152.5	0.60	90.16	3.905	2.57	19.37	0.100	0.00	0.00
133.1	0.32	89.56	3.409	2.15	16.80	0.087	0.00	0.00
116.2	0.18	89.24	2.976	1.79	14.65	0.076	0.00	0.00
101.5	0.16	89.06	2.599	1.53	12.86	0.067	0.00	0.00
88.58	0.12	88.90	2.269	1.31	11.34	0.058	0.00	0.00
77.34	0.00	88.78	1.981	1.22	10.03	0.051	0.00	0.00
67.52	0.00	88.78	1.729	1.23	8.81	0.044	0.00	0.00
58.95	0.00	88.78	1.510	1.17	7.58	0.039	0.00	0.00
51.47	0.11	88.78	1.318	1.19	6.41	0.034	0.00	0.00
44.94	0.17	88.67	1.151	1.16	5.22	0.029	0.00	0.00
39.23	0.29	88.50	1.005	1.07	4.06	0.026	0.00	0.00
34.25	0.46	88.22	0.877	0.92	2.99	0.022	0.00	0.00
29.91	0.67	87.76	0.766	0.70	2.07			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/25/01
File Name: AY101830.DAT Sample Name: S01T001489 ID No: 01/08/17-830
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 82.135 % Lamp: 80.673 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: AY-101 Solids Source: S00T001017
Lot No: S01T001489 Test No: Run 1

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.338	0.10	0.10	(15)	9.676	5.00	55.00
(2)	0.604	0.90	1.00	(16)	10.597	5.00	60.00
(3)	0.794	1.30	2.30	(17)	11.600	5.00	65.00
(4)	1.123	2.70	5.00	(18)	12.878	5.00	70.00
(5)	1.976	5.00	10.00	(19)	14.507	5.00	75.00
(6)	3.046	5.00	15.00	(20)	16.833	5.00	80.00
(7)	3.208	0.80	15.80	(21)	20.151	4.20	84.20
(8)	4.022	4.20	20.00	(22)	21.338	0.80	85.00
(9)	4.921	5.00	25.00	(23)	147.177	5.00	90.00
(10)	5.754	5.00	30.00	(24)	229.783	5.00	95.00
(11)	6.526	5.00	35.00	(25)	275.356	2.70	97.70
(12)	7.287	5.00	40.00	(26)	328.229	1.30	99.00
(13)	8.054	5.00	45.00	(27)	463.546	0.90	99.90
(14)	8.830	5.00	50.00				

Median : 8.829 (μm) Mean: 33.493 (μm) Mode: 9.435 (μm)
Std. Dev.: 73.391 (μm) Span: 24.380
Coef. Var: 219.12% Spec. Area: 12980 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Aug/20/'01 15:59

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010817-831 08:51
Filename : AY101831
Sample : S01T001489

Material : AY-101 Solids
Source : S00T001017
Lot Numbe : S01T001489

Condition
T%(He-Ne): 79.6% Dist.Form: Std. Sampling times : 100
(LAMP): 75.3% R.R.Index: 1.16-0.00i ( )

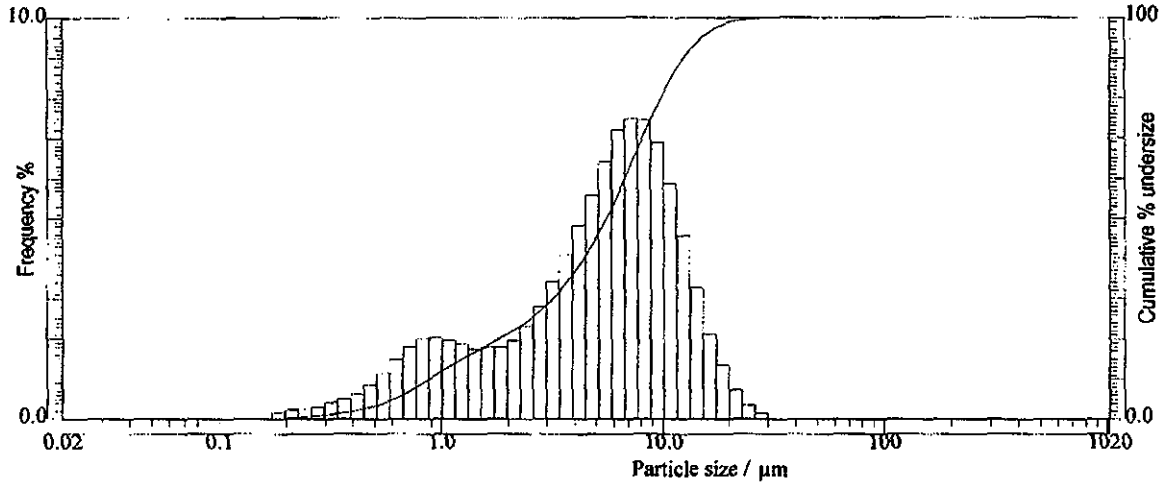
Agitation : 1 Circultn : 6 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 5.563μm SP.Area : 25528cm²/cm³ S.D. : 4.655μm
Mode : 7.209μm Mean : 6.264μm
C.V. : 74.32%

Span : (D 10.0-D 90.0) / D50 = 2.084

Dia. on %(5.0%) : 0.607μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 2.537μm % on Dia.(1.000μm) : 11.8%
Dia. on %(50.0%) : 5.563μm % on Dia.(10.000μm) : 81.1%
Dia. on %(75.0%) : 8.871μm % on Dia.(100.000μm) : 100.0%
Dia. on %(95.0%) : 14.999μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.36	99.85	0.669	1.48	6.06
890.1	0.00	100.00	22.80	0.73	99.48	0.584	1.14	4.58
777.1	0.00	100.00	19.90	1.36	98.76	0.510	0.86	3.43
678.5	0.00	100.00	17.38	2.12	97.40	0.445	0.63	2.57
592.4	0.00	100.00	15.17	3.26	95.28	0.389	0.51	1.94
517.2	0.00	100.00	13.25	4.56	92.01	0.339	0.43	1.43
451.6	0.00	100.00	11.56	5.88	87.45	0.296	0.31	1.00
394.2	0.00	100.00	10.10	6.89	81.58	0.259	0.27	0.69
344.2	0.00	100.00	8.816	7.47	74.68	0.226	0.24	0.42
300.5	0.00	100.00	7.697	7.49	67.22	0.197	0.18	0.18
262.4	0.00	100.00	6.720	7.21	59.73	0.172	0.00	0.00
229.1	0.00	100.00	5.867	6.41	52.52	0.150	0.00	0.00
200.0	0.00	100.00	5.122	5.58	46.10	0.131	0.00	0.00
174.6	0.00	100.00	4.472	4.82	40.53	0.115	0.00	0.00
152.5	0.00	100.00	3.905	4.09	35.71	0.100	0.00	0.00
133.1	0.00	100.00	3.409	3.41	31.62	0.087	0.00	0.00
116.2	0.00	100.00	2.976	2.79	28.20	0.076	0.00	0.00
101.5	0.00	100.00	2.599	2.33	25.41	0.067	0.00	0.00
88.58	0.00	100.00	2.269	1.96	23.07	0.058	0.00	0.00
77.34	0.00	100.00	1.981	1.79	21.11	0.051	0.00	0.00
67.52	0.00	100.00	1.729	1.81	19.32	0.044	0.00	0.00
58.95	0.00	100.00	1.510	1.76	17.51	0.039	0.00	0.00
51.47	0.00	100.00	1.318	1.88	15.76	0.034	0.00	0.00
44.94	0.00	100.00	1.151	1.97	13.88	0.029	0.00	0.00
39.23	0.00	100.00	1.005	2.04	11.91	0.026	0.00	0.00
34.25	0.00	100.00	0.877	2.01	9.87	0.022	0.00	0.00
29.91	0.15	100.00	0.766	1.81	7.87			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/20/01
File Name: AY101831.DAT Sample Name: S01T001489 ID No: 01/08/17-831
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 79.553 % Lamp: 75.310 %
Circulation: 6 Agitation: 1 U.Sonic ** (min)
Material: AY-101 Solids Source: S00T001017
Lot No: S01T001489 Test No: Run 1

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.186	0.10	0.10	(15)	6.161	5.00	55.00
(2)	0.296	0.90	1.00	(16)	6.756	5.00	60.00
(3)	0.420	1.30	2.30	(17)	7.408	5.00	65.00
(4)	0.608	2.70	5.00	(18)	8.114	5.00	70.00
(5)	0.885	5.00	10.00	(19)	8.874	5.00	75.00
(6)	1.251	5.00	15.00	(20)	9.804	5.00	80.00
(7)	1.323	0.80	15.80	(21)	10.753	4.20	84.20
(8)	1.825	4.20	20.00	(22)	10.953	0.80	85.00
(9)	2.541	5.00	25.00	(23)	12.504	5.00	90.00
(10)	3.204	5.00	30.00	(24)	15.009	5.00	95.00
(11)	3.819	5.00	35.00	(25)	17.940	2.70	97.70
(12)	4.410	5.00	40.00	(26)	20.877	1.30	99.00
(13)	4.994	5.00	45.00	(27)	27.452	0.90	99.90
(14)	5.575	5.00	50.00				

Median : 5.563 (μm) Mean: 6.264 (μm) Mode: 7.192 (μm)
Std. Dev.: 4.655 (μm) Span: 1.102
Coef. Var: 74.32% Spec. Area: 25528 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Aug/20/'01 15:59

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010817-832 08:54
Filename : AY101832
Sample : S01T001489

Material : AY-101 Solids
Source : S00T001017
Lot Numbe : S01T001489

Condition
T%(He-Ne): 79.4% Dist.Form: Std. Sampling times : 100
(LAMP): 75.6% R.R.Index: 1.16-0.00i ( )

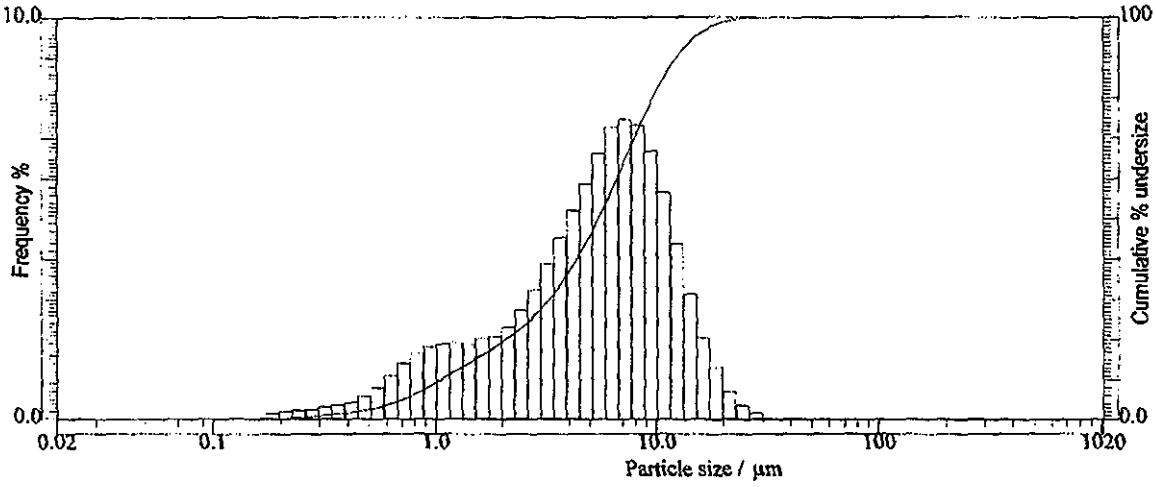
Agitation : 3 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 5.457μm SP.Area : 23240cm²/cm³ S.D. : 4.553μm
Mode : 7.194μm Mean : 6.236μm
C.V. : 73.01%

Span : (D 10.0-D 90.0) / D50 = 2.065

Dia. on %(5.0%) : 0.708μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 2.693μm % on Dia.(1.000μm) : 9.2%
Dia. on %(50.0%) : 5.457μm % on Dia.(10.000μm) : 81.8%
Dia. on %(75.0%) : 8.718μm % on Dia.(100.000μm) : 100.0%
Dia. on %(95.0%) : 14.874μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.35	99.85	0.669	1.08	4.41
890.1	0.00	100.00	22.80	0.70	99.50	0.584	0.80	3.33
777.1	0.00	100.00	19.90	1.30	98.80	0.510	0.59	2.53
678.5	0.00	100.00	17.38	2.04	97.49	0.445	0.43	1.93
592.4	0.00	100.00	15.17	3.13	95.46	0.389	0.36	1.50
517.2	0.00	100.00	13.25	4.38	92.33	0.339	0.32	1.14
451.6	0.00	100.00	11.56	5.66	87.95	0.296	0.24	0.82
394.2	0.00	100.00	10.10	6.69	82.29	0.259	0.22	0.58
344.2	0.00	100.00	8.816	7.33	75.60	0.226	0.21	0.36
300.5	0.00	100.00	7.697	7.45	68.27	0.197	0.16	0.16
262.4	0.00	100.00	6.720	7.29	60.82	0.172	0.00	0.00
229.1	0.00	100.00	5.867	6.62	53.53	0.150	0.00	0.00
200.0	0.00	100.00	5.122	5.89	46.91	0.131	0.00	0.00
174.6	0.00	100.00	4.472	5.22	41.02	0.115	0.00	0.00
152.5	0.00	100.00	3.905	4.53	35.80	0.100	0.00	0.00
133.1	0.00	100.00	3.409	3.88	31.27	0.087	0.00	0.00
116.2	0.00	100.00	2.976	3.24	27.39	0.076	0.00	0.00
101.5	0.00	100.00	2.599	2.73	24.15	0.067	0.00	0.00
88.58	0.00	100.00	2.269	2.30	21.42	0.058	0.00	0.00
77.34	0.00	100.00	1.981	2.07	19.12	0.051	0.00	0.00
67.52	0.00	100.00	1.729	2.03	17.05	0.044	0.00	0.00
58.95	0.00	100.00	1.510	1.90	15.02	0.039	0.00	0.00
51.47	0.00	100.00	1.318	1.92	13.12	0.034	0.00	0.00
44.94	0.00	100.00	1.151	1.89	11.20	0.029	0.00	0.00
39.23	0.00	100.00	1.005	1.82	9.30	0.026	0.00	0.00
34.25	0.00	100.00	0.877	1.67	7.48	0.022	0.00	0.00
29.91	0.15	100.00	0.766	1.40	5.81			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/20/01
File Name: AY101832.DAT Sample Name: S01T001489 ID No: 01/08/17-832
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 79.447 % Lamp: 75.589 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: AY-101 Solids Source: S00T001017
Lot No: S01T001489 Test No: Run 1

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.188	0.10	0.10	(15)	6.039	5.00	55.00
(2)	0.320	0.90	1.00	(16)	6.624	5.00	60.00
(3)	0.485	1.30	2.30	(17)	7.268	5.00	65.00
(4)	0.710	2.70	5.00	(18)	7.960	5.00	70.00
(5)	1.059	5.00	10.00	(19)	8.724	5.00	75.00
(6)	1.508	5.00	15.00	(20)	9.659	5.00	80.00
(7)	1.594	0.80	15.80	(21)	10.592	4.20	84.20
(8)	2.090	4.20	20.00	(22)	10.800	0.80	85.00
(9)	2.697	5.00	25.00	(23)	12.352	5.00	90.00
(10)	3.267	5.00	30.00	(24)	14.890	5.00	95.00
(11)	3.817	5.00	35.00	(25)	17.780	2.70	97.70
(12)	4.361	5.00	40.00	(26)	20.748	1.30	99.00
(13)	4.912	5.00	45.00	(27)	27.396	0.90	99.90
(14)	5.470	5.00	50.00				

Median : 5.457 (μm) Mean: 6.236 (μm) Mode: 7.192 (μm)
Std. Dev.: 4.553 (μm) Span: 1.128
Coef. Var: 73.01% Spec. Area: 23240 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Aug/20/'01 16:01

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010817-838 09:58
Filename : AY101838
Sample : S01T001489

Material : AY-101 Solids
Source : S00T001017
Lot Numbe : S01T001489

Condition
T%(He-Ne): 80.9% Dist.Form: Std. Sampling times : 100
(LAMP): 76.4% R.R.Index: 1.16-0.00i ( )

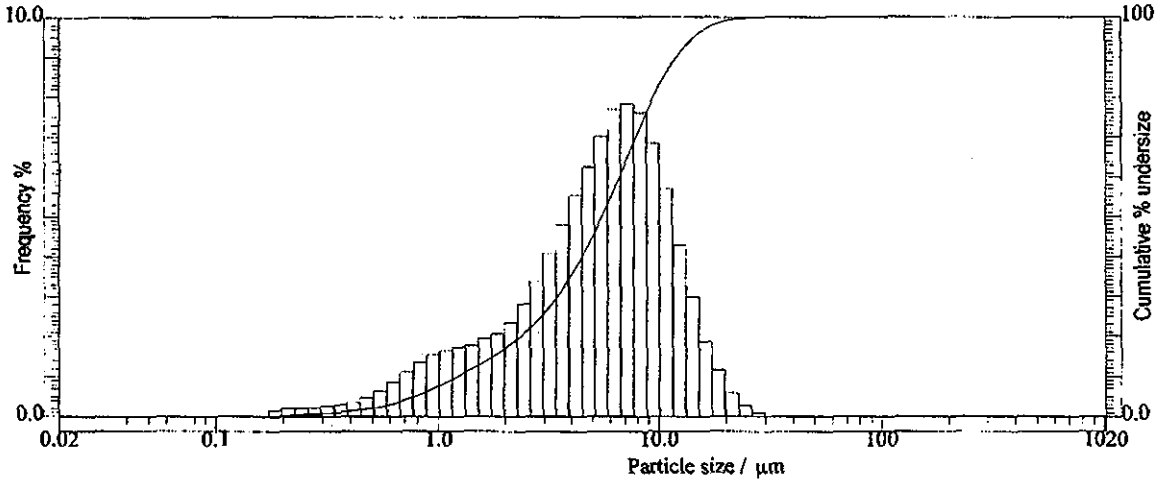
Agitation : 1 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 5.536μm SP.Area : 21552cm²/cm³ S.D. : 4.356μm
Mode : 7.186μm Mean : 6.251μm
C.V. : 69.69%

Span : (D 10.0-D 90.0) / D50 = 1.955

Dia. on %(5.0%) :	0.785μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	2.941μm	% on Dia.(1.000μm) :	7.6%
Dia. on %(50.0%) :	5.536μm	% on Dia.(10.000μm) :	82.5%
Dia. on %(75.0%) :	8.636μm	% on Dia.(100.000μm) :	100.0%
Dia. on %(95.0%) :	14.497μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.28	99.89	0.669	0.86	3.63
890.1	0.00	100.00	22.80	0.59	99.61	0.584	0.63	2.77
777.1	0.00	100.00	19.90	1.15	99.02	0.510	0.47	2.13
678.5	0.00	100.00	17.38	1.87	97.87	0.445	0.35	1.66
592.4	0.00	100.00	15.17	2.98	96.00	0.389	0.30	1.31
517.2	0.00	100.00	13.25	4.30	93.02	0.339	0.27	1.01
451.6	0.00	100.00	11.56	5.70	88.72	0.296	0.21	0.74
394.2	0.00	100.00	10.10	6.86	83.02	0.259	0.20	0.53
344.2	0.00	100.00	8.816	7.62	76.16	0.226	0.19	0.33
300.5	0.00	100.00	7.697	7.82	68.54	0.197	0.15	0.15
262.4	0.00	100.00	6.720	7.71	60.72	0.172	0.00	0.00
229.1	0.00	100.00	5.867	7.03	53.01	0.150	0.00	0.00
200.0	0.00	100.00	5.122	6.26	45.98	0.131	0.00	0.00
174.6	0.00	100.00	4.472	5.54	39.72	0.115	0.00	0.00
152.5	0.00	100.00	3.905	4.80	34.19	0.100	0.00	0.00
133.1	0.00	100.00	3.409	4.09	29.39	0.087	0.00	0.00
116.2	0.00	100.00	2.976	3.38	25.30	0.076	0.00	0.00
101.5	0.00	100.00	2.599	2.81	21.92	0.067	0.00	0.00
88.58	0.00	100.00	2.269	2.33	19.11	0.058	0.00	0.00
77.34	0.00	100.00	1.981	2.05	16.78	0.051	0.00	0.00
67.52	0.00	100.00	1.729	1.95	14.72	0.044	0.00	0.00
58.95	0.00	100.00	1.510	1.77	12.77	0.039	0.00	0.00
51.47	0.00	100.00	1.318	1.73	11.01	0.034	0.00	0.00
44.94	0.00	100.00	1.151	1.64	9.28	0.029	0.00	0.00
39.23	0.00	100.00	1.005	1.53	7.64	0.026	0.00	0.00
34.25	0.00	100.00	0.877	1.36	6.11	0.022	0.00	0.00
29.91	0.11	100.00	0.766	1.12	4.75			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/20/01
File Name: AY101838.DAT Sample Name: S01T001489 ID No: 01/08/17-838
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 80.874 % Lamp: 76.409 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: AY-101 Solids Source: S00T001017
Lot No: S01T001489 Test No: Run 1

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.189	0.10	0.10	(15)	6.087	5.00	55.00
(2)	0.337	0.90	1.00	(16)	6.641	5.00	60.00
(3)	0.529	1.30	2.30	(17)	7.255	5.00	65.00
(4)	0.787	2.70	5.00	(18)	7.911	5.00	70.00
(5)	1.221	5.00	10.00	(19)	8.646	5.00	75.00
(6)	1.763	5.00	15.00	(20)	9.533	5.00	80.00
(7)	1.861	0.80	15.80	(21)	10.401	4.20	84.20
(8)	2.373	4.20	20.00	(22)	10.607	0.80	85.00
(9)	2.943	5.00	25.00	(23)	12.066	5.00	90.00
(10)	3.472	5.00	30.00	(24)	14.526	5.00	95.00
(11)	3.988	5.00	35.00	(25)	17.180	2.70	97.70
(12)	4.501	5.00	40.00	(26)	19.858	1.30	99.00
(13)	5.020	5.00	45.00	(27)	26.496	0.90	99.90
(14)	5.548	5.00	50.00				

Median : 5.536 (μm) Mean: 6.251 (μm) Mode: 7.192 (μm)
Std. Dev.: 4.356 (μm) Span: 1.059
Coef. Var: 69.69% Spec. Area: 21552 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20J Aug/20/'01 16:01

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010817-839 10:02
Filename : AY101839
Sample : S01T001489

Material : AY-101 Solids
Source : S00T001017
Lot Numbe : S01T001489

Condition
T%(He-Ne): 80.8% Dist.Form: Std. Sampling times : 100
(LAMP): 76.5% R.R.Index: 1.16-0.00i ( )

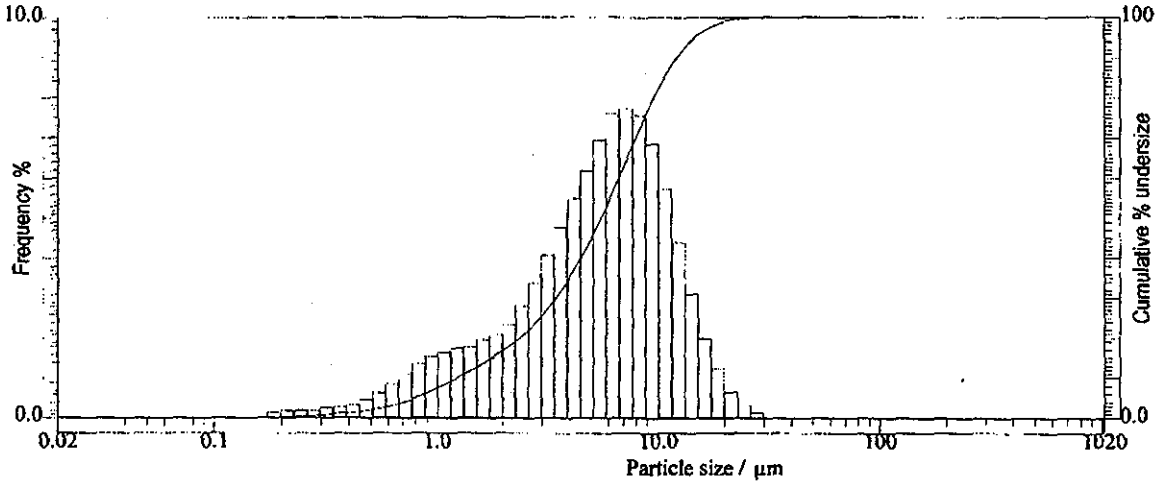
Agitation : 3 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 5.562μm SP.Area : 21367cm²/cm³ S.D. : 4.440μm
Mode : 7.188μm Mean : 6.316μm
C.V. : 70.30%

Span : (D 10.0-D 90.0) / D50 = 1.979

Dia. on %(5.0%) : 0.795μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 2.943μm % on Dia.(1.000μm) : 7.5%
Dia. on %(50.0%) : 5.562μm % on Dia.(10.000μm) : 82.0%
Dia. on %(75.0%) : 8.718μm % on Dia.(100.000μm) : 100.0%
Dia. on %(95.0%) : 14.740μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.32	99.86	0.669	0.84	3.52
890.1	0.00	100.00	22.80	0.66	99.54	0.584	0.62	2.67
777.1	0.00	100.00	19.90	1.25	98.88	0.510	0.46	2.06
678.5	0.00	100.00	17.38	1.98	97.64	0.445	0.34	1.60
592.4	0.00	100.00	15.17	3.09	95.66	0.389	0.29	1.26
517.2	0.00	100.00	13.25	4.38	92.57	0.339	0.26	0.97
451.6	0.00	100.00	11.56	5.73	88.19	0.296	0.20	0.72
394.2	0.00	100.00	10.10	6.84	82.46	0.259	0.19	0.51
344.2	0.00	100.00	8.816	7.55	75.62	0.226	0.18	0.32
300.5	0.00	100.00	7.697	7.73	68.07	0.197	0.14	0.14
262.4	0.00	100.00	6.720	7.61	60.34	0.172	0.00	0.00
229.1	0.00	100.00	5.867	6.94	52.73	0.150	0.00	0.00
200.0	0.00	100.00	5.122	6.19	45.79	0.131	0.00	0.00
174.6	0.00	100.00	4.472	5.49	39.61	0.115	0.00	0.00
152.5	0.00	100.00	3.905	4.76	34.12	0.100	0.00	0.00
133.1	0.00	100.00	3.409	4.08	29.36	0.087	0.00	0.00
116.2	0.00	100.00	2.976	3.38	25.28	0.076	0.00	0.00
101.5	0.00	100.00	2.599	2.82	21.90	0.067	0.00	0.00
88.58	0.00	100.00	2.269	2.34	19.08	0.058	0.00	0.00
77.34	0.00	100.00	1.981	2.07	16.74	0.051	0.00	0.00
67.52	0.00	100.00	1.729	1.97	14.67	0.044	0.00	0.00
58.95	0.00	100.00	1.510	1.78	12.70	0.039	0.00	0.00
51.47	0.00	100.00	1.318	1.74	10.92	0.034	0.00	0.00
44.94	0.00	100.00	1.151	1.65	9.18	0.029	0.00	0.00
39.23	0.00	100.00	1.005	1.54	7.52	0.026	0.00	0.00
34.25	0.00	100.00	0.877	1.36	5.99	0.022	0.00	0.00
29.91	0.14	100.00	0.766	1.11	4.63			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/20/01
File Name: AY101839.DAT Sample Name: S01T001489 ID No: 01/08/17-839
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 80.774 % Lamp: 76.496 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: AY-101 Solids Source: S00T001017
Lot No: S01T001489 Test No: Run 1

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.190	0.10	0.10	(15)	6.122	5.00	55.00
(2)	0.344	0.90	1.00	(16)	6.682	5.00	60.00
(3)	0.539	1.30	2.30	(17)	7.309	5.00	65.00
(4)	0.796	2.70	5.00	(18)	7.983	5.00	70.00
(5)	1.230	5.00	10.00	(19)	8.724	5.00	75.00
(6)	1.769	5.00	15.00	(20)	9.637	5.00	80.00
(7)	1.867	0.80	15.80	(21)	10.544	4.20	84.20
(8)	2.376	4.20	20.00	(22)	10.749	0.80	85.00
(9)	2.945	5.00	25.00	(23)	12.261	5.00	90.00
(10)	3.476	5.00	30.00	(24)	14.762	5.00	95.00
(11)	3.996	5.00	35.00	(25)	17.507	2.70	97.70
(12)	4.514	5.00	40.00	(26)	20.416	1.30	99.00
(13)	5.039	5.00	45.00	(27)	27.098	0.90	99.90
(14)	5.574	5.00	50.00				

Median : 5.562 (μm) Mean: 6.316 (μm) Mode: 7.192 (μm)
Std. Dev.: 4.440 (μm) Span: 1.083
Coef. Var: 70.30% Spec. Area: 21367 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Aug/20/'01 16:03

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010817-840 10:25
Filename : AY101840
Sample : S01T001492

Material : AY-101 Solids
Source : S00T001017
Lot Numbe : S01T001492

Condition
T%(He-Ne): 83.4% Dist.Form: Std. Sampling times : 100
(LAMP): 81.2% R.R.Index: 1.16-0.00i ( )

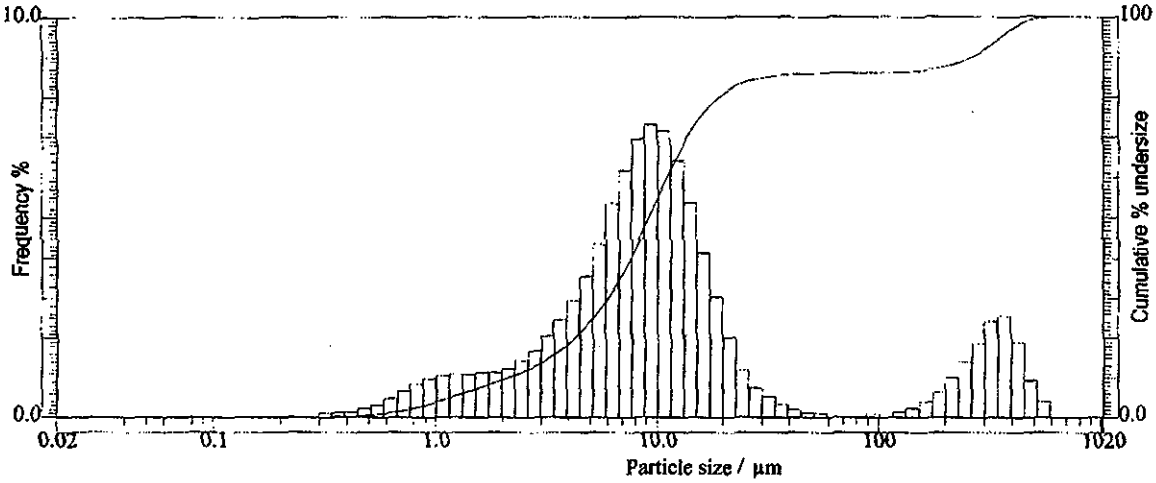
Agitation : 1 Circultn : 6 U.sonic : OFF(1200)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 9.241μm SP.Area : 12349cm²/cm³ S.D. : 114.949μm
Mode : 9.452μm Mean : 53.046μm
C.V. : 216.70%

Span : (D 10.0-D 90.0) / D50 = 28.302

Dia. on %(5.0%) :	1.166μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	5.178μm	% on Dia.(1.000μm) :	3.8%
Dia. on %(50.0%) :	9.241μm	% on Dia.(10.000μm) :	54.2%
Dia. on %(75.0%) :	15.853μm	% on Dia.(100.000μm) :	86.1%
Dia. on %(95.0%) :	358.551μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.18	84.03	0.669	0.46	1.35
890.1	0.00	100.00	22.80	2.02	82.85	0.584	0.31	0.89
777.1	0.00	100.00	19.90	3.04	80.83	0.510	0.21	0.58
678.5	0.00	100.00	17.38	4.13	77.80	0.445	0.14	0.37
592.4	0.41	100.00	15.17	5.35	73.66	0.389	0.12	0.23
517.2	0.92	99.59	13.25	6.41	68.31	0.339	0.11	0.11
451.6	1.89	98.67	11.56	7.14	61.91	0.296	0.00	0.00
394.2	2.55	96.78	10.10	7.30	54.77	0.259	0.00	0.00
344.2	2.43	94.23	8.816	6.94	47.46	0.226	0.00	0.00
300.5	1.87	91.80	7.697	6.17	40.52	0.197	0.00	0.00
262.4	1.41	89.93	6.720	5.35	34.35	0.172	0.00	0.00
229.1	0.99	88.52	5.867	4.35	29.01	0.150	0.00	0.00
200.0	0.62	87.53	5.122	3.54	24.65	0.131	0.00	0.00
174.6	0.40	86.92	4.472	2.94	21.11	0.115	0.00	0.00
152.5	0.24	86.51	3.905	2.44	18.17	0.100	0.00	0.00
133.1	0.15	86.28	3.409	2.04	15.73	0.087	0.00	0.00
116.2	0.00	86.13	2.976	1.69	13.69	0.076	0.00	0.00
101.5	0.10	86.13	2.599	1.44	12.00	0.067	0.00	0.00
88.58	0.00	86.03	2.269	1.23	10.56	0.058	0.00	0.00
77.34	0.00	86.03	1.981	1.13	9.33	0.051	0.00	0.00
67.52	0.00	86.03	1.729	1.14	8.20	0.044	0.00	0.00
58.95	0.11	86.03	1.510	1.08	7.06	0.039	0.00	0.00
51.47	0.13	85.92	1.318	1.09	5.98	0.034	0.00	0.00
44.94	0.20	85.79	1.151	1.06	4.89	0.029	0.00	0.00
39.23	0.32	85.60	1.005	0.98	3.83	0.026	0.00	0.00
34.25	0.51	85.27	0.877	0.85	2.85	0.022	0.00	0.00
29.91	0.74	84.76	0.766	0.65	2.00			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/20/01
File Name: AY101840.DAT Sample Name: S01T001492 ID No: 01/08/17-840
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 83.388 % Lamp: 81.236 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: AY-101 Solids Source: S00T001017
Lot No: S01T001492 Test No: Run 2

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.336	0.10	0.10	(15)	10.145	5.00	55.00
(2)	0.604	0.90	1.00	(16)	11.173	5.00	60.00
(3)	0.805	1.30	2.30	(17)	12.377	5.00	65.00
(4)	1.167	2.70	5.00	(18)	13.853	5.00	70.00
(5)	2.137	5.00	10.00	(19)	15.885	5.00	75.00
(6)	3.254	5.00	15.00	(20)	19.211	5.00	80.00
(7)	3.424	0.80	15.80	(21)	27.014	4.20	84.20
(8)	4.258	4.20	20.00	(22)	31.941	0.80	85.00
(9)	5.182	5.00	25.00	(23)	263.759	5.00	90.00
(10)	6.025	5.00	30.00	(24)	359.259	5.00	95.00
(11)	6.822	5.00	35.00	(25)	422.086	2.70	97.70
(12)	7.614	5.00	40.00	(26)	475.080	1.30	99.00
(13)	8.418	5.00	45.00	(27)	573.985	0.90	99.90
(14)	9.261	5.00	50.00				

Median : 9.241 (μm) Mean: 53.046 (μm) Mode: 9.435 (μm)
Std. Dev.: 114.949 (μm) Span: 37.085
Coef. Var: 216.70% Spec. Area: 12349 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20J Aug/20/'01 16:03

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010817-841 10:28
Filename : AY101841
Sample : S01T001492

Material : AY-101 Solids
Source : S00T001017
Lot Numbe : S01T001492

Condition
T%(He-Ne): 83.1%
(LAMP): 80.9%
Dist.Form: Std.
R.R.Index: 1.16-0.001
Sampling times : 100
( )

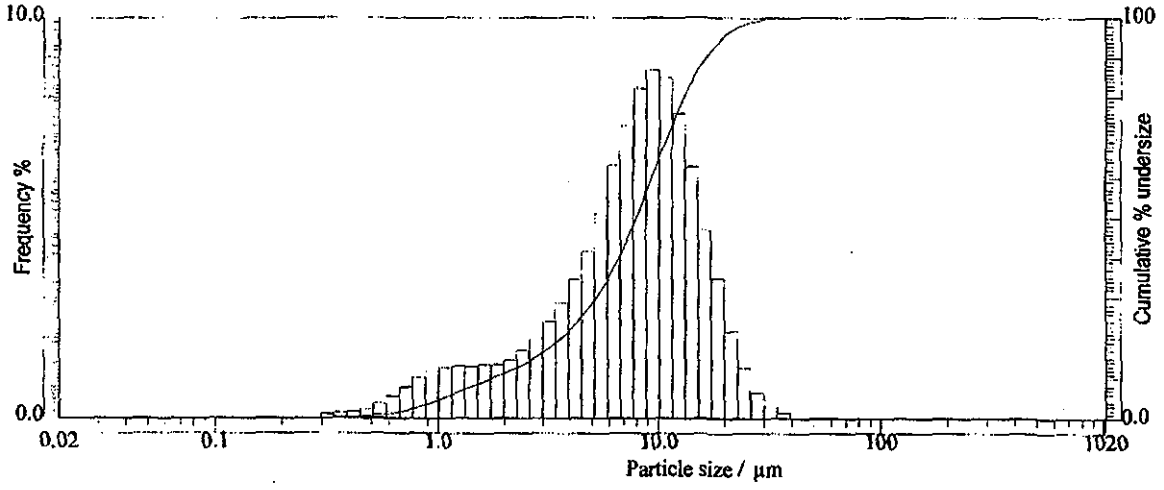
Agitation : 3 Circultn : 6 U.sonic : OFF(1200)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 7.964µm SP.Area : 14601cm²/cm³ S.D. : 5.785µm
Mode : 9.455µm Mean : 8.749µm
C.V. : 66.12%

Span : (D 10.0-D 90.0) / D50 = 1.841

Dia. on %(5.0%) : 1.048µm % on Dia.(0.100µm) : 0.0%
Dia. on %(25.0%) : 4.461µm % on Dia.(1.000µm) : 4.6%
Dia. on %(50.0%) : 7.964µm % on Dia.(10.000µm) : 64.2%
Dia. on %(75.0%) : 11.906µm % on Dia.(100.000µm) : 100.0%
Dia. on %(95.0%) : 19.547µm % on Dia.(1000.000µm) : 100.0%



Size(µm)	Freq(%)	Und(%)	Size(µm)	Freq(%)	Und(%)	Size(µm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.26	98.90	0.669	0.55	1.60
890.1	0.00	100.00	22.80	2.18	97.64	0.584	0.37	1.04
777.1	0.00	100.00	19.90	3.49	95.46	0.510	0.25	0.68
678.5	0.00	100.00	17.38	4.71	91.97	0.445	0.17	0.43
592.4	0.00	100.00	15.17	6.27	87.26	0.389	0.14	0.26
517.2	0.00	100.00	13.25	7.61	80.98	0.339	0.12	0.12
451.6	0.00	100.00	11.56	8.51	73.37	0.296	0.00	0.00
394.2	0.00	100.00	10.10	8.69	64.86	0.259	0.00	0.00
344.2	0.00	100.00	8.816	8.24	56.17	0.226	0.00	0.00
300.5	0.00	100.00	7.697	7.29	47.93	0.197	0.00	0.00
262.4	0.00	100.00	6.720	6.30	40.64	0.172	0.00	0.00
229.1	0.00	100.00	5.867	5.12	34.34	0.150	0.00	0.00
200.0	0.00	100.00	5.122	4.16	29.22	0.131	0.00	0.00
174.6	0.00	100.00	4.472	3.45	25.06	0.115	0.00	0.00
152.5	0.00	100.00	3.905	2.87	21.61	0.100	0.00	0.00
133.1	0.00	100.00	3.409	2.40	18.73	0.087	0.00	0.00
116.2	0.00	100.00	2.976	1.99	16.33	0.076	0.00	0.00
101.5	0.00	100.00	2.599	1.70	14.34	0.067	0.00	0.00
88.58	0.00	100.00	2.269	1.46	12.64	0.058	0.00	0.00
77.34	0.00	100.00	1.981	1.35	11.18	0.051	0.00	0.00
67.52	0.00	100.00	1.729	1.35	9.83	0.044	0.00	0.00
58.95	0.00	100.00	1.510	1.29	8.48	0.039	0.00	0.00
51.47	0.00	100.00	1.318	1.31	7.19	0.034	0.00	0.00
44.94	0.00	100.00	1.151	1.28	5.88	0.029	0.00	0.00
39.23	0.14	100.00	1.005	1.19	4.60	0.026	0.00	0.00
34.25	0.31	99.86	0.877	1.02	3.41	0.022	0.00	0.00
29.91	0.65	99.55	0.766	0.79	2.39			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/20/01
File Name: AY101841.DAT Sample Name: S01T001492 ID No: 01/08/17-841
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 83.086 % Lamp: 80.877 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: AY-101 Solids Source: S00T001017
Lot No: S01T001492 Test No: Run 2

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.331	0.10	0.10	(15)	8.657	5.00	55.00
(2)	0.575	0.90	1.00	(16)	9.381	5.00	60.00
(3)	0.755	1.30	2.30	(17)	10.121	5.00	65.00
(4)	1.050	2.70	5.00	(18)	10.984	5.00	70.00
(5)	1.760	5.00	10.00	(19)	11.925	5.00	75.00
(6)	2.724	5.00	15.00	(20)	13.029	5.00	80.00
(7)	2.875	0.80	15.80	(21)	14.233	4.20	84.20
(8)	3.627	4.20	20.00	(22)	14.479	0.80	85.00
(9)	4.462	5.00	25.00	(23)	16.455	5.00	90.00
(10)	5.235	5.00	30.00	(24)	19.568	5.00	95.00
(11)	5.956	5.00	35.00	(25)	22.953	2.70	97.70
(12)	6.633	5.00	40.00	(26)	26.680	1.30	99.00
(13)	7.304	5.00	45.00	(27)	35.676	0.90	99.90
(14)	7.978	5.00	50.00				

Median : 7.964 (μm) Mean: 8.749 (μm) Mode: 9.435 (μm)
Std. Dev.: 5.785 (μm) Span: 0.960
Coef. Var: 66.12% Spec. Area: 14601 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Aug/20/'01 16:03

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010817-842 10:52
Filename : AY101842
Sample : S01T001492

Material : AY-101 Solids
Source : S00T001017
Lot Numbe : S01T001492

Condition
T%(He-Ne): 78.8% Dist.Form: Std. Sampling times : 100
(LAMP): 72.5% R.R.Index: 1.16-0.00i ( )

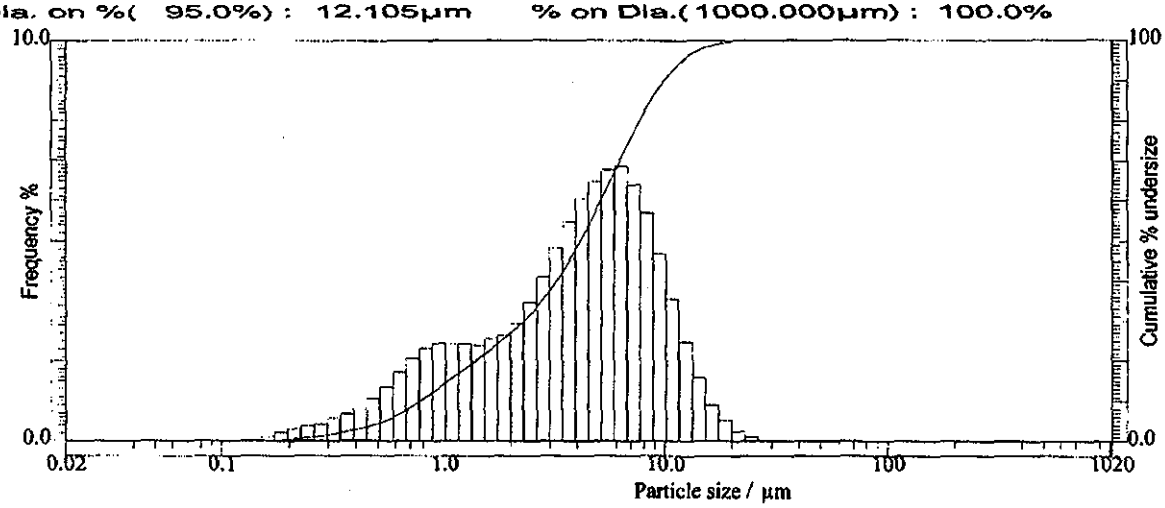
Agitation : 1 Circultn : 6 U.sonic : ON(1200)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 4.109µm SP.Area : 31211cm²/cm³ S.D. : 3.781µm
Mode : 6.255µm Mean : 4.855µm
C.V. : 77.88%

Span : (D 10.0-D 90.0) / D50 = 2.224

Dia. on %(5.0%) : 0.534µm % on Dia.(0.100µm) : 0.0%
Dia. on %(25.0%) : 1.797µm % on Dia.(1.000µm) : 14.3%
Dia. on %(50.0%) : 4.109µm % on Dia.(10.000µm) : 90.3%
Dia. on %(75.0%) : 6.885µm % on Dia.(100.000µm) : 100.0%
Dia. on %(95.0%) : 12.105µm % on Dia.(1000.000µm) : 100.0%



Size(µm)	Freq(%)	Und(%)	Size(µm)	Freq(%)	Und(%)	Size(µm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.11	100.00	0.669	1.71	7.61
890.1	0.00	100.00	22.80	0.24	99.89	0.584	1.35	5.89
777.1	0.00	100.00	19.90	0.52	99.65	0.510	1.05	4.55
678.5	0.00	100.00	17.38	0.91	99.13	0.445	0.80	3.50
592.4	0.00	100.00	15.17	1.58	98.22	0.389	0.67	2.70
517.2	0.00	100.00	13.25	2.47	96.64	0.339	0.57	2.03
451.6	0.00	100.00	11.56	3.56	94.17	0.296	0.43	1.46
394.2	0.00	100.00	10.10	4.68	90.61	0.259	0.37	1.03
344.2	0.00	100.00	8.816	5.68	85.93	0.226	0.32	0.66
300.5	0.00	100.00	7.697	6.39	80.25	0.197	0.22	0.34
262.4	0.00	100.00	6.720	6.85	73.86	0.172	0.12	0.12
229.1	0.00	100.00	5.867	6.77	67.01	0.150	0.00	0.00
200.0	0.00	100.00	5.122	6.46	60.24	0.131	0.00	0.00
174.6	0.00	100.00	4.472	6.05	53.78	0.115	0.00	0.00
152.5	0.00	100.00	3.905	5.48	47.73	0.100	0.00	0.00
133.1	0.00	100.00	3.409	4.84	42.24	0.087	0.00	0.00
116.2	0.00	100.00	2.976	4.10	37.40	0.076	0.00	0.00
101.5	0.00	100.00	2.599	3.47	33.30	0.067	0.00	0.00
88.58	0.00	100.00	2.269	2.94	29.83	0.058	0.00	0.00
77.34	0.00	100.00	1.981	2.63	26.89	0.051	0.00	0.00
67.52	0.00	100.00	1.729	2.56	24.25	0.044	0.00	0.00
58.95	0.00	100.00	1.510	2.40	21.69	0.039	0.00	0.00
51.47	0.00	100.00	1.318	2.44	19.30	0.034	0.00	0.00
44.94	0.00	100.00	1.151	2.44	16.86	0.029	0.00	0.00
39.23	0.00	100.00	1.005	2.43	14.42	0.026	0.00	0.00
34.25	0.00	100.00	0.877	2.32	11.99	0.022	0.00	0.00
29.91	0.00	100.00	0.766	2.07	9.67			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/20/01
File Name: AY101842.DAT Sample Name: S01T001492 ID No: 01/08/17-842
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 78.794 % Lamp: 72.495 %
Circulation: 6 Agitation: 1 U.Sonic ** (min)
Material: AY-101 Solids Source: S00T001017
Lot No: S01T001492 Test No: Run 2

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.169	0.10	0.10	(15)	4.595	5.00	55.00
(2)	0.256	0.90	1.00	(16)	5.098	5.00	60.00
(3)	0.359	1.30	2.30	(17)	5.646	5.00	65.00
(4)	0.535	2.70	5.00	(18)	6.240	5.00	70.00
(5)	0.782	5.00	10.00	(19)	6.894	5.00	75.00
(6)	1.040	5.00	15.00	(20)	7.659	5.00	80.00
(7)	1.087	0.80	15.80	(21)	8.475	4.20	84.20
(8)	1.374	4.20	20.00	(22)	8.632	0.80	85.00
(9)	1.800	5.00	25.00	(23)	9.930	5.00	90.00
(10)	2.285	5.00	30.00	(24)	12.130	5.00	95.00
(11)	2.755	5.00	35.00	(25)	14.541	2.70	97.70
(12)	3.208	5.00	40.00	(26)	17.065	1.30	99.00
(13)	3.658	5.00	45.00	(27)	23.052	0.90	99.90
(14)	4.118	5.00	50.00				

Median : 4.109 (μm) Mean: 4.855 (μm) Mode: 6.279 (μm)
Std. Dev.: 3.781 (μm) Span: 1.270
Coef. Var: 77.87% Spec. Area: 31211 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Aug/20/'01 16:04

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010817-843 10:55
Filename : AY101843
Sample : S01T001492

Material : AY-101 Solids
Source : S00T001017
Lot Numbe : S01T001492

Condition
T%(He-Ne): 78.5% Dist.Form: Std. Sampling times : 100
(LAMP): 72.8% R.R.Index: 1.16-0.00i ( )

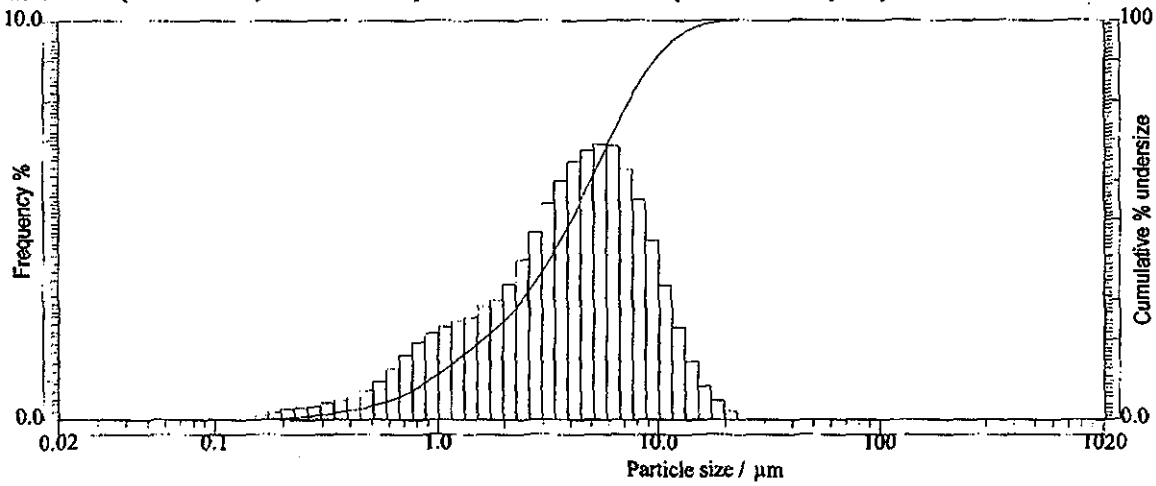
Agitation : 3 Circultn : 6 U.sonic : OFF(1200)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 4.064μm SP.Area : 28448cm²/cm³ S.D. : 3.597μm
Mode : 5.488μm Mean : 4.814μm
C.V. : 74.72%

Span : (D 10.0-D 90.0) / D50 = 2.160

Dia. on %(5.0%) : 0.625μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 2.011μm % on Dia.(1.000μm) : 11.3%
Dia. on %(50.0%) : 4.064μm % on Dia.(10.000μm) : 91.0%
Dia. on %(75.0%) : 6.713μm % on Dia.(100.000μm) : 100.0%
Dia. on %(95.0%) : 11.776μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	100.00	0.669	1.27	5.63
890.1	0.00	100.00	22.80	0.22	100.00	0.584	0.96	4.36
777.1	0.00	100.00	19.90	0.47	99.78	0.510	0.74	3.40
678.5	0.00	100.00	17.38	0.84	99.31	0.445	0.56	2.66
592.4	0.00	100.00	15.17	1.46	98.47	0.389	0.48	2.10
517.2	0.00	100.00	13.25	2.32	97.01	0.339	0.43	1.63
451.6	0.00	100.00	11.56	3.37	94.69	0.296	0.33	1.20
394.2	0.00	100.00	10.10	4.48	91.32	0.259	0.30	0.87
344.2	0.00	100.00	8.816	5.51	86.85	0.226	0.27	0.57
300.5	0.00	100.00	7.697	6.28	81.34	0.197	0.20	0.30
262.4	0.00	100.00	6.720	6.86	75.05	0.172	0.11	0.11
229.1	0.00	100.00	5.867	6.91	68.20	0.150	0.00	0.00
200.0	0.00	100.00	5.122	6.74	61.29	0.131	0.00	0.00
174.6	0.00	100.00	4.472	6.46	54.56	0.115	0.00	0.00
152.5	0.00	100.00	3.905	5.99	48.10	0.100	0.00	0.00
133.1	0.00	100.00	3.409	5.42	42.11	0.087	0.00	0.00
116.2	0.00	100.00	2.976	4.68	36.69	0.076	0.00	0.00
101.5	0.00	100.00	2.599	3.99	32.01	0.067	0.00	0.00
88.58	0.00	100.00	2.269	3.39	28.01	0.058	0.00	0.00
77.34	0.00	100.00	1.981	3.01	24.62	0.051	0.00	0.00
67.52	0.00	100.00	1.729	2.85	21.62	0.044	0.00	0.00
58.95	0.00	100.00	1.510	2.57	18.77	0.039	0.00	0.00
51.47	0.00	100.00	1.318	2.48	16.20	0.034	0.00	0.00
44.94	0.00	100.00	1.151	2.34	13.72	0.029	0.00	0.00
39.23	0.00	100.00	1.005	2.18	11.38	0.026	0.00	0.00
34.25	0.00	100.00	0.877	1.94	9.20	0.022	0.00	0.00
29.91	0.00	100.00	0.766	1.62	7.26			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/20/01
File Name: AY101843.DAT Sample Name: S01T001492 ID No: 01/08/17-843
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 78.513 % Lamp: 72.806 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: AY-101 Solids Source: S00T001017
Lot No: S01T001492 Test No: Run 2

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.171	0.10	0.10	(15)	4.515	5.00	55.00
(2)	0.274	0.90	1.00	(16)	4.997	5.00	60.00
(3)	0.408	1.30	2.30	(17)	5.522	5.00	65.00
(4)	0.626	2.70	5.00	(18)	6.091	5.00	70.00
(5)	0.924	5.00	10.00	(19)	6.713	5.00	75.00
(6)	1.237	5.00	15.00	(20)	7.489	5.00	80.00
(7)	1.291	0.80	15.80	(21)	8.278	4.20	84.20
(8)	1.605	4.20	20.00	(22)	8.441	0.80	85.00
(9)	2.013	5.00	25.00	(23)	9.718	5.00	90.00
(10)	2.433	5.00	30.00	(24)	11.788	5.00	95.00
(11)	2.840	5.00	35.00	(25)	14.157	2.70	97.70
(12)	3.241	5.00	40.00	(26)	16.563	1.30	99.00
(13)	3.648	5.00	45.00	(27)	21.469	0.90	99.90
(14)	4.072	5.00	50.00				

Median : 4.064 (μm) Mean: 4.814 (μm) Mode: 5.482 (μm)
Std. Dev.: 3.597 (μm) Span: 1.246
Coef. Var: 74.72% Spec. Area: 28448 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20J Aug/20/'01 16:05

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010817-849 11:59
Filename : AY101849
Sample : S01T001492

Material : AY-101 Solids
Source : S00T001017
Lot Numbe : S01T001492

Condition
T%(He-Ne): 80.5% Dist.Form: Std. Sampling times : 100
(LAMP): 74.2% R.R.Index: 1.16-0.00i ( )

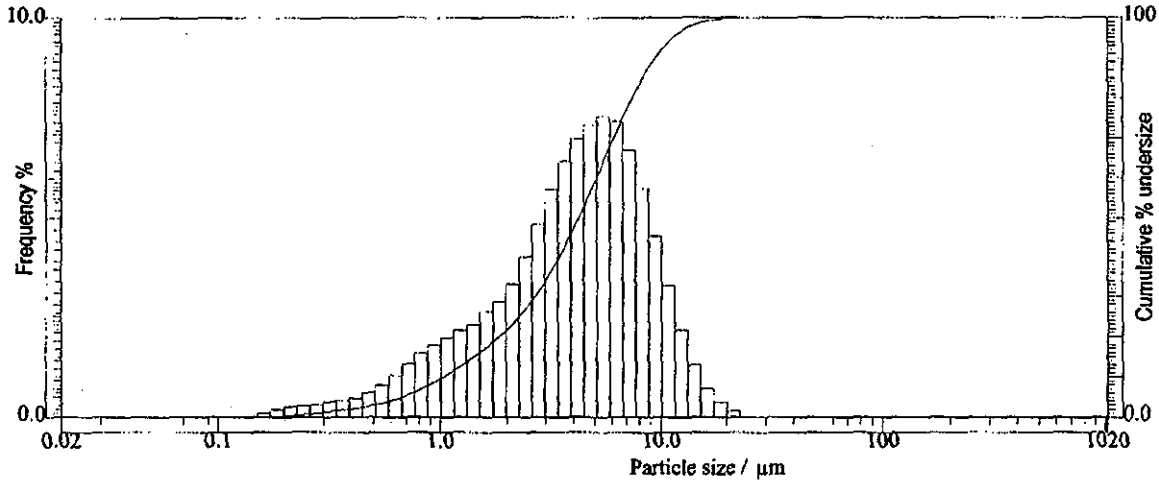
Agitation : 1 Circultn : 6 U.sonic : OFF(1200)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 4.240μm SP.Area : 26511cm²/cm³ S.D. : 3.433μm
Mode : 5.486μm Mean : 4.883μm
C.V. : 70.31%

Span : (D 10.0-D 90.0) / D50 = 1.997

Dia. on %(5.0%) :	0.679μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	2.285μm	% on Dia.(1.000μm) :	9.5%
Dia. on %(50.0%) :	4.240μm	% on Dia.(10.000μm) :	91.7%
Dia. on %(75.0%) :	6.714μm	% on Dia.(100.000μm) :	100.0%
Dia. on %(95.0%) :	11.423μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	100.00	0.669	1.03	4.85
890.1	0.00	100.00	22.80	0.16	100.00	0.584	0.79	3.82
777.1	0.00	100.00	19.90	0.38	99.84	0.510	0.61	3.03
678.5	0.00	100.00	17.38	0.71	99.46	0.445	0.47	2.42
592.4	0.00	100.00	15.17	1.30	98.75	0.389	0.42	1.95
517.2	0.00	100.00	13.25	2.16	97.46	0.339	0.38	1.53
451.6	0.00	100.00	11.56	3.28	95.30	0.296	0.31	1.15
394.2	0.00	100.00	10.10	4.53	92.02	0.259	0.28	0.84
344.2	0.00	100.00	8.816	5.74	87.49	0.226	0.26	0.56
300.5	0.00	100.00	7.697	6.70	81.75	0.197	0.19	0.30
262.4	0.00	100.00	6.720	7.42	75.05	0.172	0.11	0.11
229.1	0.00	100.00	5.867	7.53	67.63	0.150	0.00	0.00
200.0	0.00	100.00	5.122	7.34	60.09	0.131	0.00	0.00
174.6	0.00	100.00	4.472	6.99	52.75	0.115	0.00	0.00
152.5	0.00	100.00	3.905	6.41	45.76	0.100	0.00	0.00
133.1	0.00	100.00	3.409	5.71	39.35	0.087	0.00	0.00
116.2	0.00	100.00	2.976	4.83	33.64	0.076	0.00	0.00
101.5	0.00	100.00	2.599	4.02	28.81	0.067	0.00	0.00
88.58	0.00	100.00	2.269	3.32	24.79	0.058	0.00	0.00
77.34	0.00	100.00	1.981	2.86	21.47	0.051	0.00	0.00
67.52	0.00	100.00	1.729	2.63	18.61	0.044	0.00	0.00
58.95	0.00	100.00	1.510	2.30	15.99	0.039	0.00	0.00
51.47	0.00	100.00	1.318	2.16	13.69	0.034	0.00	0.00
44.94	0.00	100.00	1.151	1.98	11.54	0.029	0.00	0.00
39.23	0.00	100.00	1.005	1.80	9.55	0.026	0.00	0.00
34.25	0.00	100.00	0.877	1.59	7.75	0.022	0.00	0.00
29.91	0.00	100.00	0.766	1.32	6.17			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/25/01
File Name: AY101849.DAT Sample Name: S01T001492 ID No: 01/08/17-849
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 80.504 % Lamp: 74.249 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: AY-101 Solids Source: S00T001017
Lot No: S01T001492 Test No: Run 2

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.171	0.10	0.10	(15)	4.671	5.00	55.00
(2)	0.278	0.90	1.00	(16)	5.114	5.00	60.00
(3)	0.431	1.30	2.30	(17)	5.607	5.00	65.00
(4)	0.680	2.70	5.00	(18)	6.140	5.00	70.00
(5)	1.038	5.00	10.00	(19)	6.714	5.00	75.00
(6)	1.427	5.00	15.00	(20)	7.442	5.00	80.00
(7)	1.494	0.80	15.80	(21)	8.174	4.20	84.20
(8)	1.851	4.20	20.00	(22)	8.330	0.80	85.00
(9)	2.286	5.00	25.00	(23)	9.525	5.00	90.00
(10)	2.692	5.00	30.00	(24)	11.431	5.00	95.00
(11)	3.079	5.00	35.00	(25)	13.607	2.70	97.70
(12)	3.459	5.00	40.00	(26)	15.938	1.30	99.00
(13)	3.846	5.00	45.00	(27)	21.033	0.90	99.90
(14)	4.249	5.00	50.00				

Median : 4.240 (μm) Mean: 4.883 (μm) Mode: 5.482 (μm)
Std. Dev.: 3.433 (μm) Span: 1.111
Coef. Var: 70.31% Spec. Area: 26511 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20J Aug/20/'01 16:05

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010817-850 12:02
Filename : AY101850
Sample : S01T001492

Material : AY-101 Solids
Source : S00T001017
Lot Numbe : S01T001492

Condition
T%(He-Ne): 80.5% Dist.Form: Std. Sampling times : 100
(LAMP): 74.3% R.R.Index: 1.16-0.00i ( )

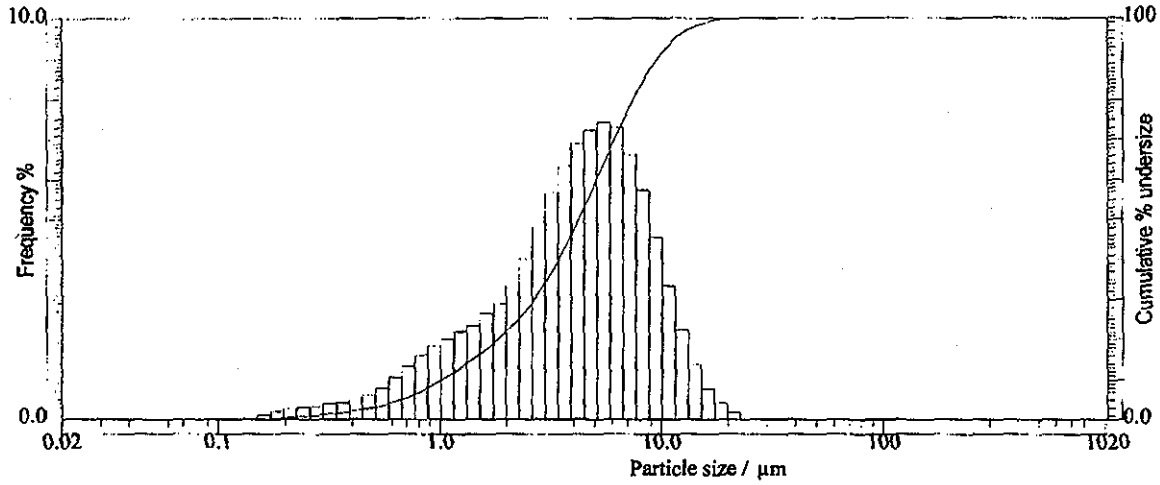
Agitation : 3 Circultn : 6 U.sonic : OFF(1200)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 4.233μm SP.Area : 26694cm²/cm³ S.D. : 3.493μm
Mode : 5.486μm Mean : 4.908μm
C.V. : 71.17%

Span : (D 10.0-D 90.0) / D50 = 2.027

Dia. on %(5.0%) : 0.674μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 2.265μm % on Dia.(1.000μm) : 9.6%
Dia. on %(50.0%) : 4.233μm % on Dia.(10.000μm) : 91.3%
Dia. on %(75.0%) : 6.751μm % on Dia.(100.000μm) : 100.0%
Dia. on %(95.0%) : 11.565μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	100.00	0.669	1.04	4.93
890.1	0.00	100.00	22.80	0.19	100.00	0.584	0.79	3.89
777.1	0.00	100.00	19.90	0.42	99.81	0.510	0.62	3.10
678.5	0.00	100.00	17.38	0.77	99.39	0.445	0.48	2.48
592.4	0.00	100.00	15.17	1.38	98.61	0.389	0.43	2.00
517.2	0.00	100.00	13.25	2.24	97.24	0.339	0.39	1.57
451.6	0.00	100.00	11.56	3.34	95.00	0.296	0.31	1.18
394.2	0.00	100.00	10.10	4.55	91.66	0.259	0.29	0.87
344.2	0.00	100.00	8.816	5.71	87.12	0.226	0.27	0.58
300.5	0.00	100.00	7.697	6.63	81.40	0.197	0.20	0.31
262.4	0.00	100.00	6.720	7.32	74.77	0.172	0.11	0.11
229.1	0.00	100.00	5.867	7.42	67.45	0.150	0.00	0.00
200.0	0.00	100.00	5.122	7.24	60.03	0.131	0.00	0.00
174.6	0.00	100.00	4.472	6.91	52.80	0.115	0.00	0.00
152.5	0.00	100.00	3.905	6.34	45.89	0.100	0.00	0.00
133.1	0.00	100.00	3.409	5.67	39.55	0.087	0.00	0.00
116.2	0.00	100.00	2.976	4.81	33.87	0.076	0.00	0.00
101.5	0.00	100.00	2.599	4.02	29.06	0.067	0.00	0.00
88.58	0.00	100.00	2.269	3.33	25.05	0.058	0.00	0.00
77.34	0.00	100.00	1.981	2.88	21.71	0.051	0.00	0.00
67.52	0.00	100.00	1.729	2.65	18.83	0.044	0.00	0.00
58.95	0.00	100.00	1.510	2.32	16.18	0.039	0.00	0.00
51.47	0.00	100.00	1.318	2.18	13.86	0.034	0.00	0.00
44.94	0.00	100.00	1.151	2.00	11.68	0.029	0.00	0.00
39.23	0.00	100.00	1.005	1.82	9.68	0.026	0.00	0.00
34.25	0.00	100.00	0.877	1.60	7.85	0.022	0.00	0.00
29.91	0.00	100.00	0.766	1.33	6.25			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/20/01
File Name: AY101850.DAT Sample Name: S01T001492 ID No: 01/08/17-850
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 80.479 % Lamp: 74.346 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: AY-101 Solids Source: S00T001017
Lot No: S01T001492 Test No: Run 2

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.170	0.10	0.10	(15)	4.670	5.00	55.00
(2)	0.274	0.90	1.00	(16)	5.119	5.00	60.00
(3)	0.424	1.30	2.30	(17)	5.621	5.00	65.00
(4)	0.674	2.70	5.00	(18)	6.164	5.00	70.00
(5)	1.028	5.00	10.00	(19)	6.753	5.00	75.00
(6)	1.412	5.00	15.00	(20)	7.490	5.00	80.00
(7)	1.478	0.80	15.80	(21)	8.244	4.20	84.20
(8)	1.831	4.20	20.00	(22)	8.401	0.80	85.00
(9)	2.265	5.00	25.00	(23)	9.628	5.00	90.00
(10)	2.672	5.00	30.00	(24)	11.565	5.00	95.00
(11)	3.062	5.00	35.00	(25)	13.895	2.70	97.70
(12)	3.444	5.00	40.00	(26)	16.277	1.30	99.00
(13)	3.835	5.00	45.00	(27)	21.297	0.90	99.90
(14)	4.242	5.00	50.00				

Median : 4.233 (μm) Mean: 4.908 (μm) Mode: 5.482 (μm)
Std. Dev.: 3.493 (μm) Span: 1.137
Coef. Var: 71.17% Spec. Area: 26694 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Aug/20/'01 16:08

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010817-851 12:27
Filename : AY101851
Sample : S01T001490

Material : AY-101 Solids
Source : S00T001017
Lot Numbe : S01T001490

Condition
T%(He-Ne): 76.5% Dist.Form: Std. Sampling times : 100
(LAMP): 73.8% R.R.Index: 1.16-0.00i ( )

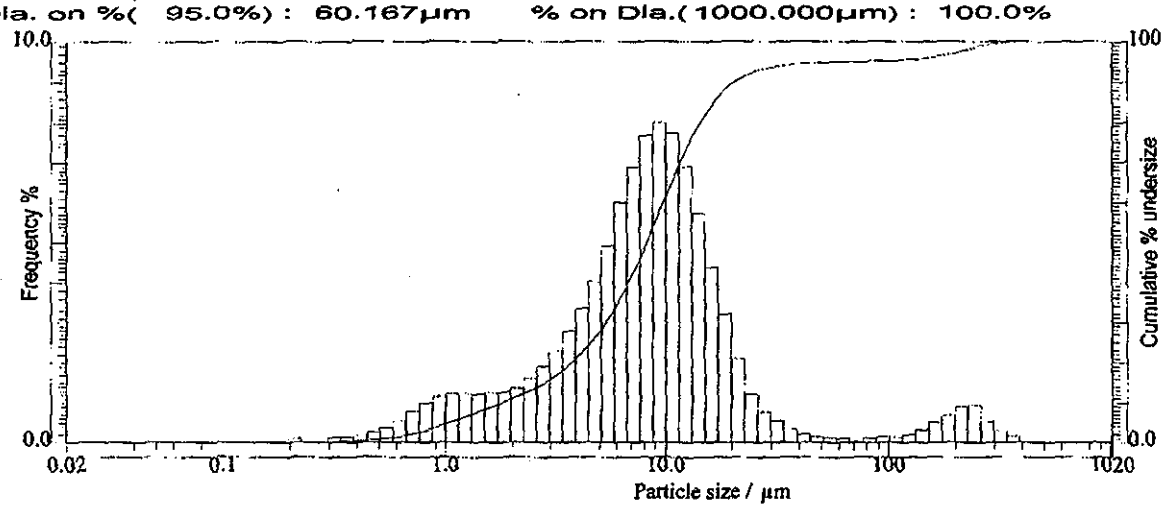
Agitation : 3 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 8.277μm SP.Area : 14250cm²/cm³ S.D. : 46.632μm
Mode : 9.441μm Mean : 19.040μm
C.V. : 244.91%

Span : (D 10.0-D 90.0) / D50 = 2.262

Dia. on %(5.0%) :	1.051μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	4.613μm	% on Dia.(1.000μm) :	4.6%
Dia. on %(50.0%) :	8.277μm	% on Dia.(10.000μm) :	61.0%
Dia. on %(75.0%) :	12.935μm	% on Dia.(100.000μm) :	95.3%
Dia. on %(95.0%) :	60.167μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.23	92.85	0.669	0.54	1.69
890.1	0.00	100.00	22.80	2.12	91.63	0.584	0.36	1.14
777.1	0.00	100.00	19.90	3.21	89.51	0.510	0.25	0.78
678.5	0.00	100.00	17.38	4.38	86.30	0.445	0.17	0.53
592.4	0.00	100.00	15.17	5.71	81.92	0.389	0.14	0.37
517.2	0.00	100.00	13.25	6.90	76.21	0.339	0.13	0.23
451.6	0.00	100.00	11.56	7.75	69.31	0.296	0.00	0.10
394.2	0.16	100.00	10.10	8.00	61.56	0.259	0.00	0.10
344.2	0.29	99.84	8.816	7.67	53.56	0.226	0.10	0.10
300.5	0.52	99.55	7.697	6.87	45.89	0.197	0.00	0.00
262.4	0.94	99.02	6.720	6.00	39.02	0.172	0.00	0.00
229.1	0.89	98.08	5.867	4.92	33.02	0.150	0.00	0.00
200.0	0.68	97.19	5.122	4.02	28.10	0.131	0.00	0.00
174.6	0.50	96.51	4.472	3.34	24.08	0.115	0.00	0.00
152.5	0.32	96.01	3.905	2.77	20.75	0.100	0.00	0.00
133.1	0.20	95.69	3.409	2.31	17.97	0.087	0.00	0.00
116.2	0.14	95.49	2.976	1.90	15.67	0.076	0.00	0.00
101.5	0.14	95.35	2.599	1.61	13.77	0.067	0.00	0.00
88.58	0.12	95.21	2.269	1.37	12.16	0.058	0.00	0.00
77.34	0.00	95.09	1.981	1.26	10.79	0.051	0.00	0.00
67.52	0.11	95.09	1.729	1.27	9.53	0.044	0.00	0.00
58.95	0.13	94.98	1.510	1.21	8.26	0.039	0.00	0.00
51.47	0.14	94.86	1.318	1.24	7.05	0.034	0.00	0.00
44.94	0.21	94.72	1.151	1.22	5.81	0.029	0.00	0.00
39.23	0.35	94.50	1.005	1.14	4.60	0.026	0.00	0.00
34.25	0.54	94.16	0.877	0.99	3.46	0.022	0.00	0.00
29.91	0.76	93.62	0.766	0.77	2.46			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/20/01
File Name: AY101851.DAT Sample Name: S01T001490 ID No: 01/08/17-851
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 76.509 % Lamp: 73.813 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: AY-101 Solids Source: S00T001017
Lot No: S01T001490 Test No: Run 3

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.225	0.10	0.10	(15)	9.046	5.00	55.00
(2)	0.555	0.90	1.00	(16)	9.848	5.00	60.00
(3)	0.745	1.30	2.30	(17)	10.749	5.00	65.00
(4)	1.053	2.70	5.00	(18)	11.733	5.00	70.00
(5)	1.824	5.00	10.00	(19)	12.952	5.00	75.00
(6)	2.844	5.00	15.00	(20)	14.524	5.00	80.00
(7)	3.001	0.80	15.80	(21)	16.319	4.20	84.20
(8)	3.771	4.20	20.00	(22)	16.721	0.80	85.00
(9)	4.621	5.00	25.00	(23)	20.574	5.00	90.00
(10)	5.410	5.00	30.00	(24)	60.241	5.00	95.00
(11)	6.149	5.00	35.00	(25)	216.734	2.70	97.70
(12)	6.859	5.00	40.00	(26)	261.569	1.30	99.00
(13)	7.570	5.00	45.00	(27)	363.312	0.90	99.90
(14)	8.296	5.00	50.00				

Median : 8.277 (μm) Mean: 19.040 (μm) Mode: 9.435 (μm)
Std. Dev.: 46.632 (μm) Span: 5.706
Coef. Var: 244.91% Spec. Area: 14250 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Aug/20/'01 16:08

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010817-852 12:30
Filename : AY101852
Sample : S01T001490

Material : AY-101 Solids
Source : S00T001017
Lot Numbe : S01T001490

Condition
T%(He-Ne): 76.4%
(LAMP): 73.6%

Dist.Form: Std.
R.R.Index: 1.16-0.001

Sampling times : 100
( )

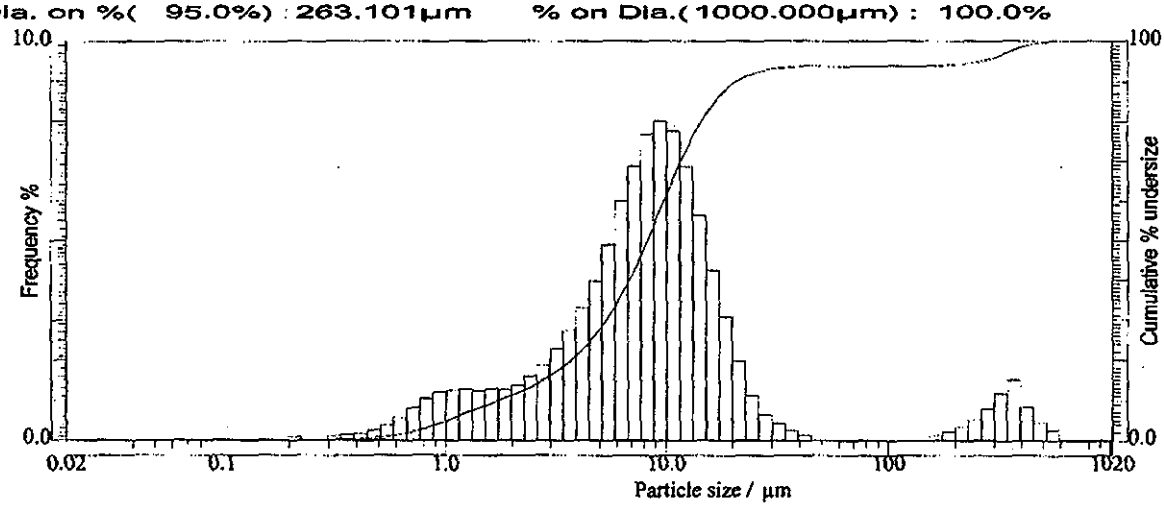
Agitation : 1 Circuitn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 8.261μm SP.Area : 14436cm²/cm³ S.D. : 83.956μm
Mode : 9.440μm Mean : 29.501μm
C.V. : 284.59%

Span : (D 10.0-D 90.0) / D50 = 2.329

Dia. on %(5.0%) :	1.024μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	4.584μm	% on Dia.(1.000μm) :	4.8%
Dia. on %(50.0%) :	8.261μm	% on Dia.(10.000μm) :	61.1%
Dia. on %(75.0%) :	12.917μm	% on Dia.(100.000μm) :	93.8%
Dia. on %(95.0%) :	263.101μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.12	92.31	0.669	0.58	1.78
890.1	0.00	100.00	22.80	1.97	91.19	0.584	0.38	1.20
777.1	0.00	100.00	19.90	3.07	89.22	0.510	0.26	0.82
678.5	0.00	100.00	17.38	4.25	86.15	0.445	0.18	0.55
592.4	0.26	100.00	15.17	5.63	81.90	0.389	0.14	0.38
517.2	0.46	99.74	13.25	6.86	76.27	0.339	0.13	0.23
451.6	0.84	99.28	11.56	7.74	69.42	0.296	0.00	0.10
394.2	1.51	98.44	10.10	8.00	61.67	0.259	0.00	0.10
344.2	1.17	96.93	8.816	7.67	53.67	0.226	0.10	0.10
300.5	0.78	95.77	7.697	6.87	46.00	0.197	0.00	0.00
262.4	0.52	94.98	6.720	5.98	39.14	0.172	0.00	0.00
229.1	0.34	94.46	5.867	4.89	33.15	0.150	0.00	0.00
200.0	0.21	94.12	5.122	3.98	28.26	0.131	0.00	0.00
174.6	0.13	93.91	4.472	3.31	24.28	0.115	0.00	0.00
152.5	0.00	93.78	3.905	2.74	20.97	0.100	0.00	0.00
133.1	0.00	93.78	3.409	2.28	18.23	0.087	0.00	0.00
116.2	0.00	93.78	2.976	1.88	15.95	0.076	0.00	0.00
101.5	0.00	93.78	2.599	1.60	14.07	0.067	0.00	0.00
88.58	0.00	93.78	2.269	1.36	12.48	0.058	0.00	0.00
77.34	0.00	93.78	1.981	1.26	11.11	0.051	0.00	0.00
67.52	0.00	93.78	1.729	1.28	9.85	0.044	0.00	0.00
58.95	0.00	93.78	1.510	1.23	8.57	0.039	0.00	0.00
51.47	0.00	93.78	1.318	1.27	7.35	0.034	0.00	0.00
44.94	0.14	93.78	1.151	1.26	6.08	0.029	0.00	0.00
39.23	0.25	93.64	1.005	1.19	4.82	0.026	0.00	0.00
34.25	0.42	93.39	0.877	1.04	3.63	0.022	0.00	0.00
29.91	0.65	92.97	0.766	0.82	2.59			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/20/01
File Name: AY101852.DAT Sample Name: S01T001490 ID No: 01/08/17-852
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 76.418 % Lamp: 73.567 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: AY-101 Solids Source: S00T001017
Lot No: S01T001490 Test No: Run 3

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.225	0.10	0.10	(15)	9.028	5.00	55.00
(2)	0.545	0.90	1.00	(16)	9.829	5.00	60.00
(3)	0.731	1.30	2.30	(17)	10.728	5.00	65.00
(4)	1.025	2.70	5.00	(18)	11.708	5.00	70.00
(5)	1.759	5.00	10.00	(19)	12.934	5.00	75.00
(6)	2.785	5.00	15.00	(20)	14.522	5.00	80.00
(7)	2.946	0.80	15.80	(21)	16.366	4.20	84.20
(8)	3.729	4.20	20.00	(22)	16.781	0.80	85.00
(9)	4.590	5.00	25.00	(23)	21.047	5.00	90.00
(10)	5.387	5.00	30.00	(24)	263.151	5.00	95.00
(11)	6.130	5.00	35.00	(25)	369.648	2.70	97.70
(12)	6.843	5.00	40.00	(26)	432.585	1.30	99.00
(13)	7.554	5.00	45.00	(27)	563.270	0.90	99.90
(14)	8.280	5.00	50.00				

Median : 8.261 (μm) Mean: 29.501 (μm) Mode: 9.435 (μm)
Std. Dev.: 83.956 (μm) Span: 30.285
Coef. Var: 284.59% Spec. Area: 14436 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20J Aug/20/'01 16:08

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010817-853 12:36
Filename : AY101853
Sample : S01T001490

Material : AY-101 Solids
Source : S00T001017
Lot Numbe : S01T001490

Condition
T%(He-Ne): 72.6% Dist.Form: Std. Sampling times : 100
(LAMP): 66.8% R.R.Index: 1.16-0.00i ( )

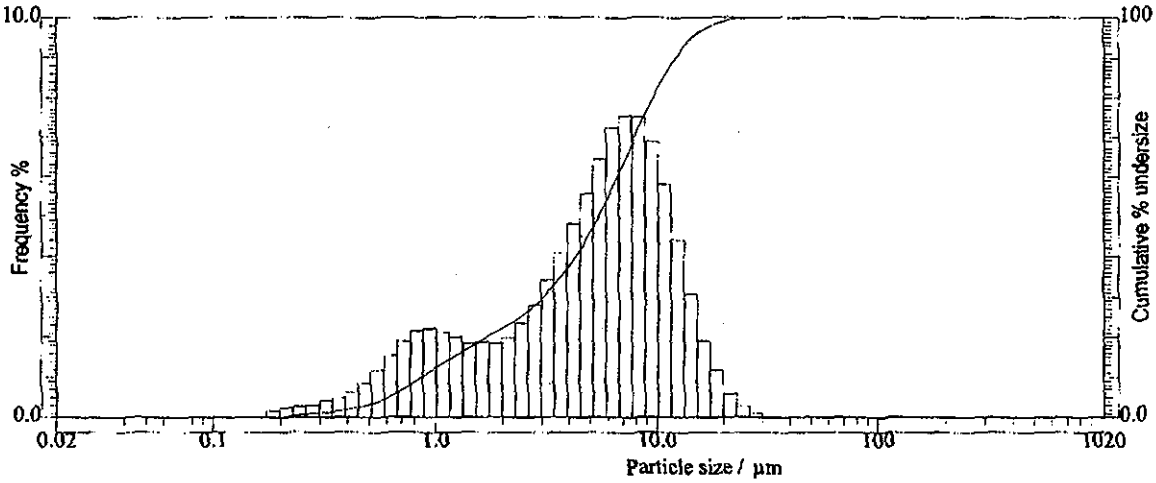
Agitation : 3 Circultn : 6 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 5.445μm SP.Area : 26044cm²/cm³ S.D. : 4.520μm
Mode : 7.208μm Mean : 6.094μm
C.V. : 74.16%

Span : (D 10.0-D 90.0) / D50 = 2.067

Dia. on %(5.0%) : 0.608μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 2.390μm % on Dia.(1.000μm) : 12.3%
Dia. on %(50.0%) : 5.445μm % on Dia.(10.000μm) : 82.2%
Dia. on %(75.0%) : 8.689μm % on Dia.(100.000μm) : 100.0%
Dia. on %(95.0%) : 14.558μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.28	99.89	0.669	1.54	6.09
890.1	0.00	100.00	22.80	0.59	99.61	0.584	1.16	4.55
777.1	0.00	100.00	19.90	1.18	99.02	0.510	0.86	3.38
678.5	0.00	100.00	17.38	1.91	97.84	0.445	0.62	2.53
592.4	0.00	100.00	15.17	3.06	95.93	0.389	0.50	1.91
517.2	0.00	100.00	13.25	4.41	92.87	0.339	0.42	1.41
451.6	0.00	100.00	11.56	5.79	88.46	0.296	0.30	0.99
394.2	0.00	100.00	10.10	6.88	82.67	0.259	0.27	0.69
344.2	0.00	100.00	8.816	7.50	75.80	0.226	0.24	0.42
300.5	0.00	100.00	7.697	7.53	68.30	0.197	0.18	0.18
262.4	0.00	100.00	6.720	7.24	60.77	0.172	0.00	0.00
229.1	0.00	100.00	5.867	6.42	53.53	0.150	0.00	0.00
200.0	0.00	100.00	5.122	5.57	47.10	0.131	0.00	0.00
174.6	0.00	100.00	4.472	4.81	41.54	0.115	0.00	0.00
152.5	0.00	100.00	3.905	4.07	36.73	0.100	0.00	0.00
133.1	0.00	100.00	3.409	3.41	32.66	0.087	0.00	0.00
116.2	0.00	100.00	2.976	2.80	29.25	0.076	0.00	0.00
101.5	0.00	100.00	2.599	2.36	26.45	0.067	0.00	0.00
88.58	0.00	100.00	2.269	2.00	24.10	0.058	0.00	0.00
77.34	0.00	100.00	1.981	1.85	22.10	0.051	0.00	0.00
67.52	0.00	100.00	1.729	1.89	20.25	0.044	0.00	0.00
58.95	0.00	100.00	1.510	1.86	18.36	0.039	0.00	0.00
51.47	0.00	100.00	1.318	2.01	16.50	0.034	0.00	0.00
44.94	0.00	100.00	1.151	2.13	14.49	0.029	0.00	0.00
39.23	0.00	100.00	1.005	2.20	12.37	0.026	0.00	0.00
34.25	0.00	100.00	0.877	2.16	10.16	0.022	0.00	0.00
29.91	0.11	100.00	0.766	1.92	8.01			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/20/01
File Name: AY101853.DAT Sample Name: S01T001490 ID No: 01/08/17-853
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 72.554 % Lamp: 66.802 %
Circulation: 6 Agitation: 3 U.Sonic ** (min)
Material: AY-101 Solids Source: S00T001017
Lot No: S01T001490 Test No: Run 3

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.186	0.10	0.10	(15)	6.040	5.00	55.00
(2)	0.297	0.90	1.00	(16)	6.629	5.00	60.00
(3)	0.424	1.30	2.30	(17)	7.268	5.00	65.00
(4)	0.609	2.70	5.00	(18)	7.950	5.00	70.00
(5)	0.869	5.00	10.00	(19)	8.697	5.00	75.00
(6)	1.193	5.00	15.00	(20)	9.599	5.00	80.00
(7)	1.260	0.80	15.80	(21)	10.484	4.20	84.20
(8)	1.700	4.20	20.00	(22)	10.687	0.80	85.00
(9)	2.395	5.00	25.00	(23)	12.151	5.00	90.00
(10)	3.071	5.00	30.00	(24)	14.586	5.00	95.00
(11)	3.694	5.00	35.00	(25)	17.214	2.70	97.70
(12)	4.291	5.00	40.00	(26)	19.856	1.30	99.00
(13)	4.876	5.00	45.00	(27)	26.363	0.90	99.90
(14)	5.458	5.00	50.00				

Median : 5.445 (μm) Mean: 6.094 (μm) Mode: 7.192 (μm)
Std. Dev.: 4.520 (μm) Span: 1.078
Coef. Var: 74.16% Spec. Area: 26044 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Aug/20/'01 16:08

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010817-854 12:39
Filename : AY101854
Sample : S01T001490

Material : AY-101 Solids
Source : S00T001017
Lot Numbe : S01T001490

Condition
T%(He-Ne): 72.5% Dist.Form: Std. Sampling times : 100
(LAMP): 67.1% R.R.index: 1.16-0.00i ( )

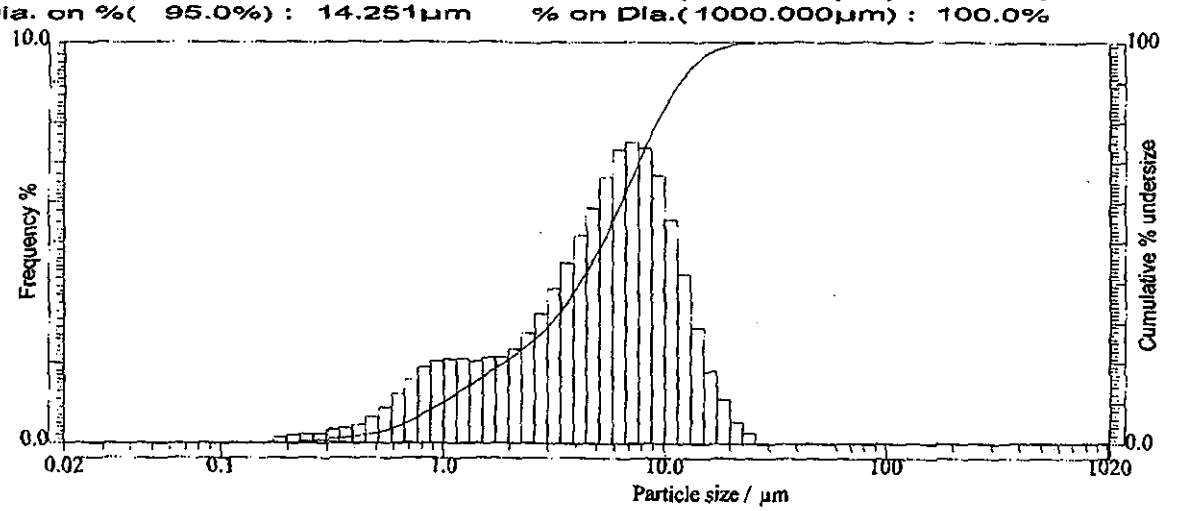
Agitation : 1 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 5.305μm SP.Area : 24201cm²/cm³ S.D. : 4.343μm
Mode : 7.194μm Mean : 5.996μm
C.V. : 72.43%

Span : (D 10.0-D 90.0) / D50 = 2.046

Dia. on %(5.0%) : 0.687μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 2.506μm % on Dia.(1.000μm) : 10.1%
Dia. on %(50.0%) : 5.305μm % on Dia.(10.000μm) : 83.2%
Dia. on %(75.0%) : 8.488μm % on Dia.(100.000μm) : 100.0%
Dia. on %(95.0%) : 14.251μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.25	100.00	0.669	1.21	4.68
890.1	0.00	100.00	22.80	0.54	99.75	0.584	0.88	3.48
777.1	0.00	100.00	19.90	1.09	99.20	0.510	0.64	2.60
678.5	0.00	100.00	17.38	1.78	98.11	0.445	0.45	1.96
592.4	0.00	100.00	15.17	2.88	96.33	0.389	0.37	1.51
517.2	0.00	100.00	13.25	4.19	93.45	0.339	0.32	1.13
451.6	0.00	100.00	11.56	5.55	89.26	0.296	0.24	0.81
394.2	0.00	100.00	10.10	6.66	83.71	0.259	0.22	0.57
344.2	0.00	100.00	8.816	7.35	77.05	0.226	0.20	0.36
300.5	0.00	100.00	7.697	7.49	69.70	0.197	0.15	0.15
262.4	0.00	100.00	6.720	7.31	62.22	0.172	0.00	0.00
229.1	0.00	100.00	5.867	6.61	54.90	0.150	0.00	0.00
200.0	0.00	100.00	5.122	5.85	48.29	0.131	0.00	0.00
174.6	0.00	100.00	4.472	5.17	42.44	0.115	0.00	0.00
152.5	0.00	100.00	3.905	4.48	37.27	0.100	0.00	0.00
133.1	0.00	100.00	3.409	3.84	32.79	0.087	0.00	0.00
116.2	0.00	100.00	2.976	3.22	28.95	0.076	0.00	0.00
101.5	0.00	100.00	2.599	2.74	25.73	0.067	0.00	0.00
88.58	0.00	100.00	2.269	2.33	22.99	0.058	0.00	0.00
77.34	0.00	100.00	1.981	2.14	20.66	0.051	0.00	0.00
67.52	0.00	100.00	1.729	2.13	18.52	0.044	0.00	0.00
58.95	0.00	100.00	1.510	2.03	16.39	0.039	0.00	0.00
51.47	0.00	100.00	1.318	2.09	14.36	0.034	0.00	0.00
44.94	0.00	100.00	1.151	2.09	12.26	0.029	0.00	0.00
39.23	0.00	100.00	1.005	2.04	10.17	0.026	0.00	0.00
34.25	0.00	100.00	0.877	1.87	8.13	0.022	0.00	0.00
29.91	0.00	100.00	0.766	1.57	6.26			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/20/01
File Name: AY101854.DAT Sample Name: S01T001490 ID No: 01/08/17-854
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 72.516 % Lamp: 67.067 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: AY-101 Solids Source: S00T001017
Lot No: S01T001490 Test No: Run 3

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.188	0.10	0.10	(15)	5.878	5.00	55.00
(2)	0.321	0.90	1.00	(16)	6.461	5.00	60.00
(3)	0.479	1.30	2.30	(17)	7.083	5.00	65.00
(4)	0.688	2.70	5.00	(18)	7.742	5.00	70.00
(5)	0.994	5.00	10.00	(19)	8.503	5.00	75.00
(6)	1.379	5.00	15.00	(20)	9.383	5.00	80.00
(7)	1.454	0.80	15.80	(21)	10.226	4.20	84.20
(8)	1.904	4.20	20.00	(22)	10.438	0.80	85.00
(9)	2.511	5.00	25.00	(23)	11.861	5.00	90.00
(10)	3.095	5.00	30.00	(24)	14.283	5.00	95.00
(11)	3.653	5.00	35.00	(25)	16.867	2.70	97.70
(12)	4.204	5.00	40.00	(26)	19.430	1.30	99.00
(13)	4.756	5.00	45.00	(27)	24.807	0.90	99.90
(14)	5.315	5.00	50.00				

Median : 5.305 (μm) Mean: 5.996 (μm) Mode: 7.192 (μm)
Std. Dev.: 4.343 (μm) Span: 1.086
Coef. Var: 72.43% Spec. Area: 24201 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Aug/20/'01 16:10

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010817-860 13:41
Filename : AY101860
Sample : S01T001490

Material : AY-101 Solids
Source : S00T001017
Lot Numbe : S01T001490

Condition
T%(He-Ne): 73.7%
(LAMP): 67.9%

Dist.Form: Std.
R.R.Index: 1.16-0.00i

Sampling times : 100
( )

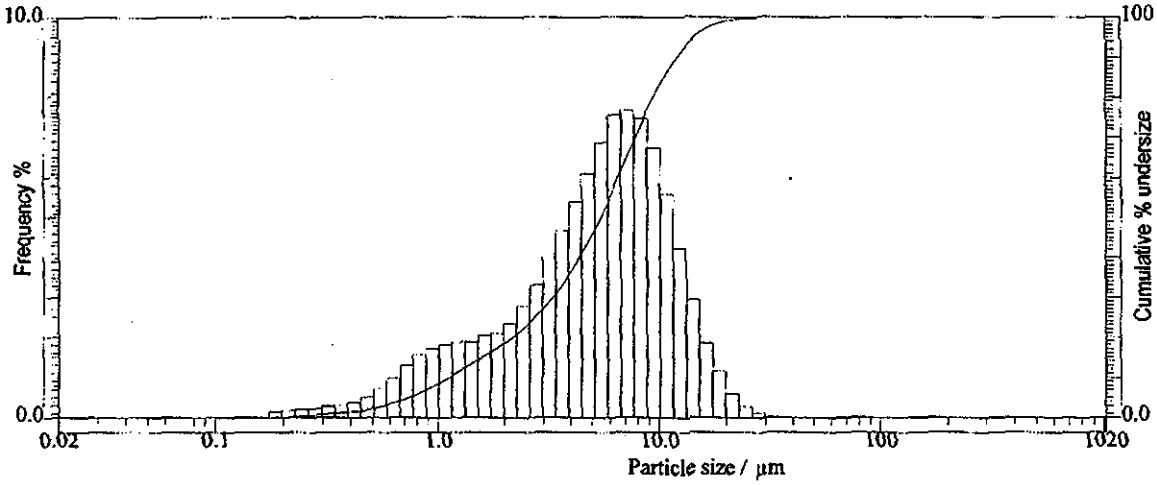
Agitation : 3 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 5.443μm SP.Area : 22590cm²/cm³ S.D. : 4.394μm
Mode : 7.187μm Mean : 6.166μm
C.V. : 71.26%

Span : (D 10.0-D 90.0) / D50 = 2.001

Dia. on %(5.0%) :	0.742μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	2.774μm	% on Dia.(1.000μm) :	8.5%
Dia. on %(50.0%) :	5.443μm	% on Dia.(10.000μm) :	82.8%
Dia. on %(75.0%) :	8.579μm	% on Dia.(100.000μm) :	100.0%
Dia. on %(95.0%) :	14.485μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.29	99.88	0.669	0.98	4.02
890.1	0.00	100.00	22.80	0.59	99.60	0.584	0.72	3.04
777.1	0.00	100.00	19.90	1.15	99.00	0.510	0.53	2.32
678.5	0.00	100.00	17.38	1.85	97.86	0.445	0.39	1.79
592.4	0.00	100.00	15.17	2.94	96.00	0.389	0.33	1.40
517.2	0.00	100.00	13.25	4.23	93.06	0.339	0.29	1.08
451.6	0.00	100.00	11.56	5.60	88.83	0.296	0.22	0.79
394.2	0.00	100.00	10.10	6.74	83.23	0.259	0.21	0.56
344.2	0.00	100.00	8.816	7.47	76.50	0.226	0.20	0.35
300.5	0.00	100.00	7.697	7.67	69.02	0.197	0.15	0.15
262.4	0.00	100.00	6.720	7.55	61.35	0.172	0.00	0.00
229.1	0.00	100.00	5.867	6.87	53.80	0.150	0.00	0.00
200.0	0.00	100.00	5.122	6.11	46.92	0.131	0.00	0.00
174.6	0.00	100.00	4.472	5.40	40.81	0.115	0.00	0.00
152.5	0.00	100.00	3.905	4.68	35.41	0.100	0.00	0.00
133.1	0.00	100.00	3.409	4.00	30.73	0.087	0.00	0.00
116.2	0.00	100.00	2.976	3.32	26.73	0.076	0.00	0.00
101.5	0.00	100.00	2.599	2.78	23.40	0.067	0.00	0.00
88.58	0.00	100.00	2.269	2.34	20.62	0.058	0.00	0.00
77.34	0.00	100.00	1.981	2.09	18.28	0.051	0.00	0.00
67.52	0.00	100.00	1.729	2.03	16.19	0.044	0.00	0.00
58.95	0.00	100.00	1.510	1.88	14.16	0.039	0.00	0.00
51.47	0.00	100.00	1.318	1.88	12.28	0.034	0.00	0.00
44.94	0.00	100.00	1.151	1.82	10.41	0.029	0.00	0.00
39.23	0.00	100.00	1.005	1.73	8.59	0.026	0.00	0.00
34.25	0.00	100.00	0.877	1.55	6.86	0.022	0.00	0.00
29.91	0.12	100.00	0.766	1.29	5.31			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/20/01
File Name: AY101860.DAT Sample Name: S01T001490 ID No: 01/08/17-860
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 73.671 % Lamp: 67.892 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: AY-101 Solids Source: S00T001017
Lot No: S01T001490 Test No: Run 3

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.188	0.10	0.10	(15)	6.003	5.00	55.00
(2)	0.328	0.90	1.00	(16)	6.567	5.00	60.00
(3)	0.507	1.30	2.30	(17)	7.184	5.00	65.00
(4)	0.743	2.70	5.00	(18)	7.843	5.00	70.00
(5)	1.118	5.00	10.00	(19)	8.591	5.00	75.00
(6)	1.600	5.00	15.00	(20)	9.482	5.00	80.00
(7)	1.687	0.80	15.80	(21)	10.350	4.20	84.20
(8)	2.192	4.20	20.00	(22)	10.560	0.80	85.00
(9)	2.780	5.00	25.00	(23)	12.029	5.00	90.00
(10)	3.330	5.00	30.00	(24)	14.515	5.00	95.00
(11)	3.861	5.00	35.00	(25)	17.191	2.70	97.70
(12)	4.387	5.00	40.00	(26)	19.893	1.30	99.00
(13)	4.918	5.00	45.00	(27)	26.665	0.90	99.90
(14)	5.455	5.00	50.00				

Median : 5.443 (μm) Mean: 6.166 (μm) Mode: 7.192 (μm)
Std. Dev.: 4.394 (μm) Span: 1.085
Coef. Var: 71.26% Spec. Area: 22590 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Aug/20/'01 16:11

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010817-861 13:45
Filename : AY101861
Sample : S01T001490

Material : AY-101 Solids
Source : S00T001017
Lot Numbe : S01T001490

Condition
T%(He-Ne): 73.8%
(LAMP): 68.0%
Dist.Form: Std.
R.R.Index: 1.16-0.00i
Sampling times : 100
( )

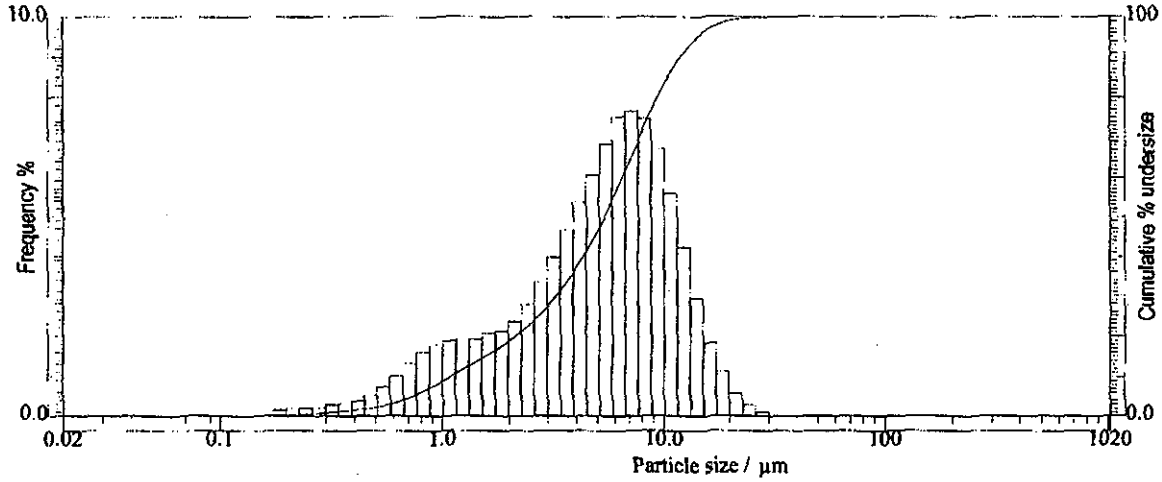
Agitation : 1
Circultn : 6
U.sonic : OFF(120)

Format
Dist.base : Volume
Scaling : Auto
Axis : LogX - LinearY

Data
Median : 5.421μm
SP.Area : 22732cm²/cm³
S.D. : 4.389μm
Mode : 7.188μm
Mean : 6.140μm
C.V. : 71.47%

Span : (D 10.0-D 90.0) / D50 = 2.007

Dia. on %(5.0%) :	0.738μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	2.733μm	% on Dia.(1.000μm) :	8.7%
Dia. on %(50.0%) :	5.421μm	% on Dia.(10.000μm) :	82.8%
Dia. on %(75.0%) :	8.564μm	% on Dia.(100.000μm) :	100.0%
Dia. on %(95.0%) :	14.446μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.28	99.89	0.669	1.01	4.05
890.1	0.00	100.00	22.80	0.58	99.61	0.584	0.73	3.04
777.1	0.00	100.00	19.90	1.13	99.03	0.510	0.54	2.31
678.5	0.00	100.00	17.38	1.84	97.89	0.445	0.39	1.77
592.4	0.00	100.00	15.17	2.93	96.06	0.389	0.33	1.38
517.2	0.00	100.00	13.25	4.22	93.13	0.339	0.29	1.05
451.6	0.00	100.00	11.56	5.59	88.91	0.296	0.22	0.77
394.2	0.00	100.00	10.10	6.73	83.32	0.259	0.20	0.55
344.2	0.00	100.00	8.816	7.46	76.59	0.226	0.19	0.34
300.5	0.00	100.00	7.697	7.64	69.13	0.197	0.15	0.15
262.4	0.00	100.00	6.720	7.51	61.49	0.172	0.00	0.00
229.1	0.00	100.00	5.867	6.83	53.98	0.150	0.00	0.00
200.0	0.00	100.00	5.122	6.07	47.15	0.131	0.00	0.00
174.6	0.00	100.00	4.472	5.36	41.08	0.115	0.00	0.00
152.5	0.00	100.00	3.905	4.65	35.72	0.100	0.00	0.00
133.1	0.00	100.00	3.409	3.98	31.07	0.087	0.00	0.00
116.2	0.00	100.00	2.976	3.32	27.09	0.076	0.00	0.00
101.5	0.00	100.00	2.599	2.79	23.77	0.067	0.00	0.00
88.58	0.00	100.00	2.269	2.35	20.98	0.058	0.00	0.00
77.34	0.00	100.00	1.981	2.11	18.63	0.051	0.00	0.00
67.52	0.00	100.00	1.729	2.06	16.52	0.044	0.00	0.00
58.95	0.00	100.00	1.510	1.92	14.46	0.039	0.00	0.00
51.47	0.00	100.00	1.318	1.92	12.54	0.034	0.00	0.00
44.94	0.00	100.00	1.151	1.87	10.62	0.029	0.00	0.00
39.23	0.00	100.00	1.005	1.78	8.75	0.026	0.00	0.00
34.25	0.00	100.00	0.877	1.60	6.97	0.022	0.00	0.00
29.91	0.11	100.00	0.766	1.32	5.37			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/20/01
File Name: AY101861.DAT Sample Name: S01T001490 ID No: 01/08/17-861
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 73.808 % Lamp: 67.970 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: AY-101 Solids Source: S00T001017
Lot No: S01T001490 Test No: Run 3

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.189	0.10	0.10	(15)	5.983	5.00	55.00
(2)	0.331	0.90	1.00	(16)	6.551	5.00	60.00
(3)	0.509	1.30	2.30	(17)	7.169	5.00	65.00
(4)	0.739	2.70	5.00	(18)	7.827	5.00	70.00
(5)	1.103	5.00	10.00	(19)	8.577	5.00	75.00
(6)	1.568	5.00	15.00	(20)	9.465	5.00	80.00
(7)	1.653	0.80	15.80	(21)	10.329	4.20	84.20
(8)	2.149	4.20	20.00	(22)	10.539	0.80	85.00
(9)	2.739	5.00	25.00	(23)	12.000	5.00	90.00
(10)	3.293	5.00	30.00	(24)	14.477	5.00	95.00
(11)	3.828	5.00	35.00	(25)	17.145	2.70	97.70
(12)	4.358	5.00	40.00	(26)	19.840	1.30	99.00
(13)	4.892	5.00	45.00	(27)	26.527	0.90	99.90
(14)	5.433	5.00	50.00				

Median : 5.421 (μm) Mean: 6.140 (μm) Mode: 7.192 (μm)
Std. Dev.: 4.389 (μm) Span: 1.085
Coef. Var: 71.47% Spec. Area: 22732 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20) Aug/20/'01 16:12

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010817-862 14:05 Material : AY-101 Solids
Filename : AY101862 Source : S00T001017
Sample : S01T001491 Lot Numbe : S01T001491

Condition
T%(He-Ne): 81.8% Dist.Form: Std. Sampling times : 100
(LAMP): 80.2% R.R.Index: 1.16-0.00i ( )

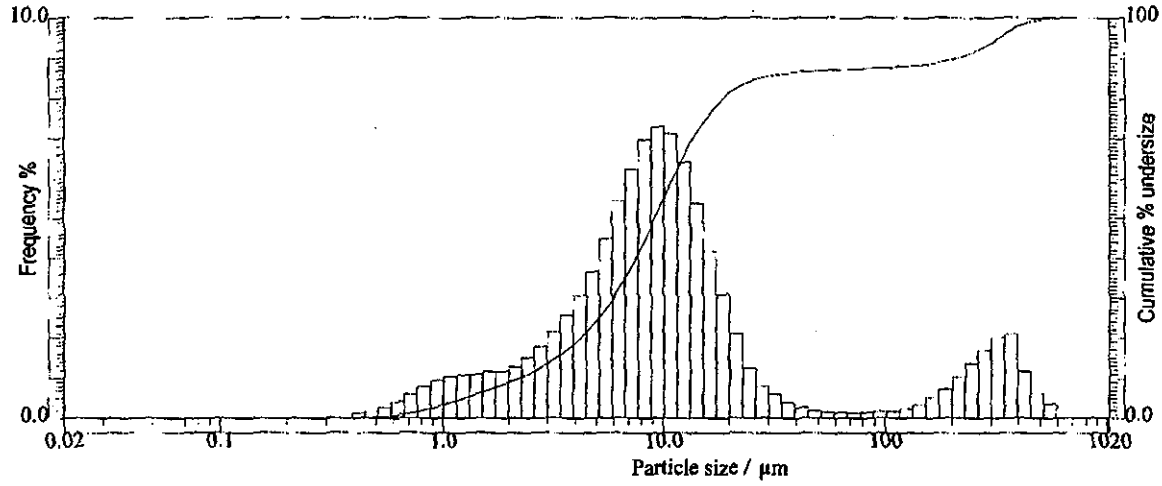
Agitation : 3 Circultn : 6 U.sonic : OFF(1200)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 9.166μm SP.Area : 11857cm²/cm³ S.D. : 103.551μm
Mode : 9.448μm Mean : 46.132μm
C.V. : 224.47%

Span : (D 10.0-D 90.0) / D50 = 22.517

Dia. on %(5.0%) : 1.246μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 5.153μm % on Dia.(1.000μm) : 3.3%
Dia. on %(50.0%) : 9.166μm % on Dia.(10.000μm) : 54.7%
Dia. on %(75.0%) : 15.631μm % on Dia.(100.000μm) : 87.7%
Dia. on %(95.0%) : 327.076μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.24	84.68	0.669	0.42	1.00
890.1	0.00	100.00	22.80	2.09	83.44	0.584	0.28	0.58
777.1	0.00	100.00	19.90	3.09	81.35	0.510	0.18	0.31
678.5	0.00	100.00	17.38	4.18	78.26	0.445	0.12	0.12
592.4	0.36	100.00	15.17	5.36	74.08	0.389	0.00	0.00
517.2	0.64	99.64	13.25	6.40	68.72	0.339	0.00	0.00
451.6	1.16	99.00	11.56	7.12	62.32	0.296	0.00	0.00
394.2	2.08	97.84	10.10	7.30	55.20	0.259	0.00	0.00
344.2	2.01	95.76	8.816	6.97	47.90	0.226	0.00	0.00
300.5	1.69	93.75	7.697	6.23	40.93	0.197	0.00	0.00
262.4	1.36	92.06	6.720	5.44	34.71	0.172	0.00	0.00
229.1	1.02	90.70	5.867	4.46	29.27	0.150	0.00	0.00
200.0	0.73	89.68	5.122	3.66	24.81	0.131	0.00	0.00
174.6	0.51	88.96	4.472	3.05	21.15	0.115	0.00	0.00
152.5	0.32	88.45	3.905	2.55	18.09	0.100	0.00	0.00
133.1	0.23	88.12	3.409	2.14	15.54	0.087	0.00	0.00
116.2	0.17	87.89	2.976	1.77	13.40	0.076	0.00	0.00
101.5	0.18	87.72	2.599	1.50	11.63	0.067	0.00	0.00
88.58	0.15	87.55	2.269	1.28	10.13	0.058	0.00	0.00
77.34	0.13	87.39	1.981	1.17	8.85	0.051	0.00	0.00
67.52	0.15	87.26	1.729	1.16	7.68	0.044	0.00	0.00
58.95	0.17	87.11	1.510	1.08	6.53	0.039	0.00	0.00
51.47	0.18	86.94	1.318	1.08	5.45	0.034	0.00	0.00
44.94	0.27	86.76	1.151	1.03	4.37	0.029	0.00	0.00
39.23	0.40	86.49	1.005	0.94	3.34	0.026	0.00	0.00
34.25	0.60	86.09	0.877	0.80	2.40	0.022	0.00	0.00
29.91	0.81	85.48	0.766	0.61	1.61			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/20/01
File Name: AY101862.DAT Sample Name: S01T001491 ID No: 01/08/17-862
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 81.819 % Lamp: 80.196 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: AY-101 Solids Source: S00T001017
Lot No: S01T001491 Test No: Run 4

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.434	0.10	0.10	(15)	10.062	5.00	55.00
(2)	0.668	0.90	1.00	(16)	11.086	5.00	60.00
(3)	0.863	1.30	2.30	(17)	12.269	5.00	65.00
(4)	1.248	2.70	5.00	(18)	13.706	5.00	70.00
(5)	2.240	5.00	10.00	(19)	15.656	5.00	75.00
(6)	3.300	5.00	15.00	(20)	18.798	5.00	80.00
(7)	3.460	0.80	15.80	(21)	24.828	4.20	84.20
(8)	4.259	4.20	20.00	(22)	27.624	0.80	85.00
(9)	5.155	5.00	25.00	(23)	209.052	5.00	90.00
(10)	5.982	5.00	30.00	(24)	327.775	5.00	95.00
(11)	6.766	5.00	35.00	(25)	390.869	2.70	97.70
(12)	7.550	5.00	40.00	(26)	451.662	1.30	99.00
(13)	8.349	5.00	45.00	(27)	571.360	0.90	99.90
(14)	9.184	5.00	50.00				

Median : 9.166 (μm) Mean: 46.132 (μm) Mode: 9.435 (μm)
Std. Dev.: 103.551 (μm) Span: 33.977
Coef. Var: 224.47% Spec. Area: 11857 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Aug/20/'01 16:12

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010817-863 14:08
Filename : AY101863
Sample : S01T001491

Material : AY-101 Solids
Source : S00T001017
Lot Numbe : S01T001491

Condition
T%(He-Ne): 81.5% Dist.Form: Std. Sampling times : 100
(LAMP): 79.8% R.R.Index: 1.16-0.00i ( )

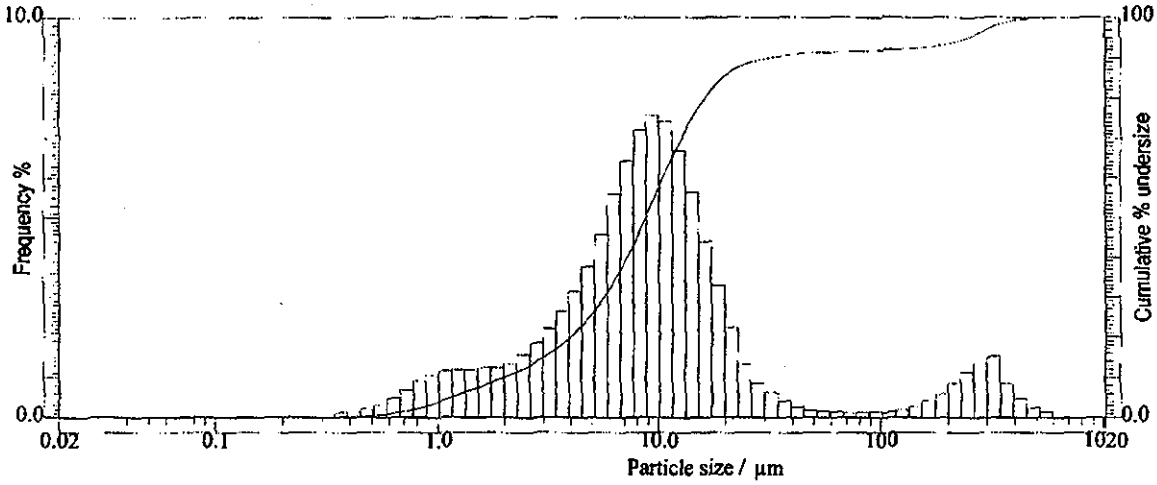
Agitation : 1 Circultn : 6 U.sonic : OFF(1200)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 8.776μm SP.Area : 12893cm²/cm³ S.D. : 79.177μm
Mode : 9.453μm Mean : 31.822μm
C.V. : 248.81%

Span : (D 10.0-D 90.0) / D50 = 3.441

Dia. on %(5.0%) : 1.142μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 4.868μm % on Dia.(1.000μm) : 3.9%
Dia. on %(50.0%) : 8.776μm % on Dia.(10.000μm) : 57.3%
Dia. on %(75.0%) : 14.261μm % on Dia.(100.000μm) : 91.8%
Dia. on %(95.0%) : 249.172μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.32	88.80	0.669	0.48	1.26
890.1	0.00	100.00	22.80	2.22	87.48	0.584	0.31	0.78
777.1	0.00	100.00	19.90	3.28	85.26	0.510	0.21	0.46
678.5	0.00	100.00	17.38	4.41	81.98	0.445	0.14	0.25
592.4	0.14	100.00	15.17	5.63	77.57	0.389	0.11	0.11
517.2	0.26	99.86	13.25	6.69	71.94	0.339	0.00	0.00
451.6	0.47	99.60	11.56	7.42	65.24	0.296	0.00	0.00
394.2	0.84	99.13	10.10	7.58	57.82	0.259	0.00	0.00
344.2	1.51	98.29	8.816	7.21	50.24	0.226	0.00	0.00
300.5	1.36	96.78	7.697	6.43	43.03	0.197	0.00	0.00
262.4	1.12	95.42	6.720	5.60	36.60	0.172	0.00	0.00
229.1	0.84	94.31	5.867	4.59	31.00	0.150	0.00	0.00
200.0	0.60	93.47	5.122	3.76	26.41	0.131	0.00	0.00
174.6	0.42	92.86	4.472	3.14	22.65	0.115	0.00	0.00
152.5	0.26	92.44	3.905	2.63	19.51	0.100	0.00	0.00
133.1	0.18	92.18	3.409	2.21	16.88	0.087	0.00	0.00
116.2	0.14	92.00	2.976	1.84	14.67	0.076	0.00	0.00
101.5	0.15	91.86	2.599	1.57	12.83	0.067	0.00	0.00
88.58	0.14	91.71	2.269	1.34	11.27	0.058	0.00	0.00
77.34	0.12	91.57	1.981	1.24	9.92	0.051	0.00	0.00
67.52	0.14	91.46	1.729	1.24	8.68	0.044	0.00	0.00
58.95	0.16	91.32	1.510	1.18	7.44	0.039	0.00	0.00
51.47	0.18	91.15	1.318	1.19	6.26	0.034	0.00	0.00
44.94	0.27	90.97	1.151	1.15	5.07	0.029	0.00	0.00
39.23	0.42	90.70	1.005	1.06	3.92	0.026	0.00	0.00
34.25	0.63	90.29	0.877	0.91	2.86	0.022	0.00	0.00
29.91	0.85	89.66	0.766	0.69	1.95			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/20/01
File Name: AY101863.DAT Sample Name: S01T001491 ID No: 01/08/17-863
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 81.508 % Lamp: 79.838 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: AY-101 Solids Source: S00T001017
Lot No: S01T001491 Test No: Run 4

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.383	0.10	0.10	(15)	9.621	5.00	55.00
(2)	0.623	0.90	1.00	(16)	10.529	5.00	60.00
(3)	0.809	1.30	2.30	(17)	11.517	5.00	65.00
(4)	1.142	2.70	5.00	(18)	12.760	5.00	70.00
(5)	1.998	5.00	10.00	(19)	14.294	5.00	75.00
(6)	3.040	5.00	15.00	(20)	16.388	5.00	80.00
(7)	3.197	0.80	15.80	(21)	19.088	4.20	84.20
(8)	3.993	4.20	20.00	(22)	19.704	0.80	85.00
(9)	4.878	5.00	25.00	(23)	32.267	5.00	90.00
(10)	5.705	5.00	30.00	(24)	249.707	5.00	95.00
(11)	6.476	5.00	35.00	(25)	327.056	2.70	97.70
(12)	7.236	5.00	40.00	(26)	386.407	1.30	99.00
(13)	8.002	5.00	45.00	(27)	540.100	0.90	99.90
(14)	8.778	5.00	50.00				

Median : 8.776 (μm) Mean: 31.822 (μm) Mode: 9.435 (μm)
Std. Dev.: 79.177 (μm) Span: 26.768
Coef. Var: 248.81% Spec. Area: 12893 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Aug/20/'01 16:12

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010817-864 14:33
Filename : AY101864
Sample : S01T001491

Material : AY-101 Solids
Source : S00T001017
Lot Numbe : S01T001491

Condition
T%(He-Ne): 77.7% Dist.Form: Std. Sampling times : 100
(LAMP): 71.0% R.R.Index: 1.16-0.00i ( )

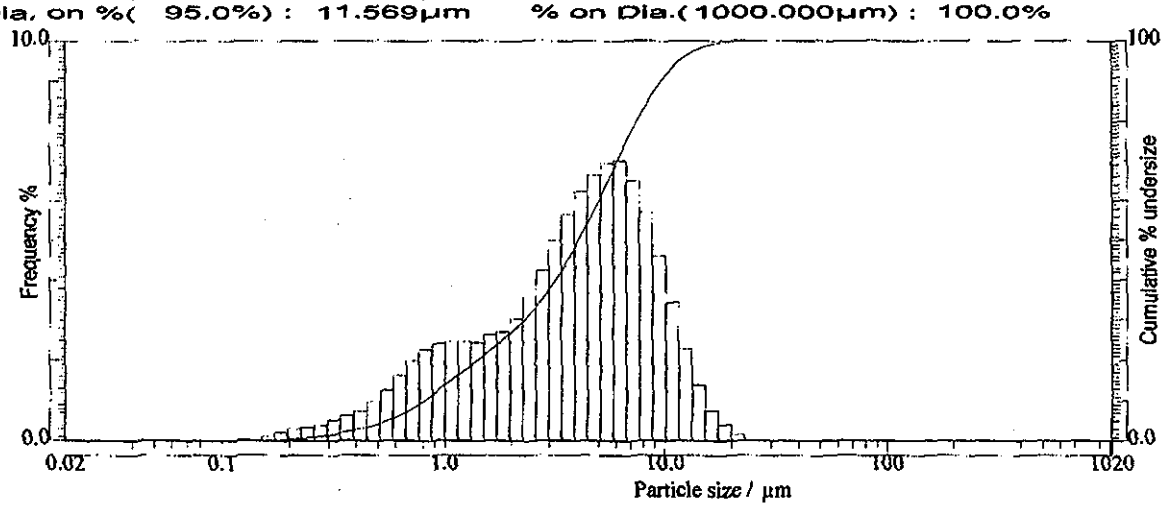
Agitation : 3 Circultn : 6 U.sonic : ON(1200)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 4.084µm SP.Area : 30573cm²/cm³ S.D. : 3.586µm
Mode : 6.251µm Mean : 4.760µm
C.V. : 75.34%

Span : (D 10.0-D 90.0) / D50 = 2.163

Dia. on %(5.0%) : 0.555µm % on Dia.(0.100µm) : 0.0%
Dia. on %(25.0%) : 1.843µm % on Dia.(1.000µm) : 13.7%
Dia. on %(50.0%) : 4.084µm % on Dia.(10.000µm) : 91.2%
Dia. on %(75.0%) : 6.753µm % on Dia.(100.000µm) : 100.0%
Dia. on %(95.0%) : 11.569µm % on Dia.(1000.000µm) : 100.0%



Size(µm)	Freq(%)	Und(%)	Size(µm)	Freq(%)	Und(%)	Size(µm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	100.00	0.669	1.63	7.10
890.1	0.00	100.00	22.80	0.17	100.00	0.584	1.26	5.47
777.1	0.00	100.00	19.90	0.40	99.83	0.510	0.97	4.21
678.5	0.00	100.00	17.38	0.75	99.43	0.445	0.73	3.24
592.4	0.00	100.00	15.17	1.39	98.67	0.389	0.61	2.50
517.2	0.00	100.00	13.25	2.29	97.28	0.339	0.53	1.89
451.6	0.00	100.00	11.56	3.42	94.99	0.296	0.39	1.36
394.2	0.00	100.00	10.10	4.62	91.57	0.259	0.34	0.97
344.2	0.00	100.00	8.816	5.71	86.96	0.226	0.30	0.62
300.5	0.00	100.00	7.697	6.49	81.25	0.197	0.21	0.32
262.4	0.00	100.00	6.720	7.00	74.77	0.172	0.11	0.11
229.1	0.00	100.00	5.867	6.94	67.76	0.150	0.00	0.00
200.0	0.00	100.00	5.122	6.64	60.82	0.131	0.00	0.00
174.6	0.00	100.00	4.472	6.23	54.17	0.115	0.00	0.00
152.5	0.00	100.00	3.905	5.65	47.94	0.100	0.00	0.00
133.1	0.00	100.00	3.409	5.00	42.29	0.087	0.00	0.00
116.2	0.00	100.00	2.976	4.24	37.29	0.076	0.00	0.00
101.5	0.00	100.00	2.599	3.59	33.05	0.067	0.00	0.00
88.58	0.00	100.00	2.269	3.03	29.46	0.058	0.00	0.00
77.34	0.00	100.00	1.981	2.71	26.44	0.051	0.00	0.00
67.52	0.00	100.00	1.729	2.62	23.73	0.044	0.00	0.00
58.95	0.00	100.00	1.510	2.44	21.11	0.039	0.00	0.00
51.47	0.00	100.00	1.318	2.46	18.67	0.034	0.00	0.00
44.94	0.00	100.00	1.151	2.45	16.21	0.029	0.00	0.00
39.23	0.00	100.00	1.005	2.40	13.76	0.026	0.00	0.00
34.25	0.00	100.00	0.877	2.27	11.36	0.022	0.00	0.00
29.91	0.00	100.00	0.766	1.99	9.09			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/20/01
File Name: AY101864.DAT Sample Name: S01T001491 ID No: 01/08/17-864
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 77.661 % Lamp: 70.984 %
Circulation: 6 Agitation: 3 U.Sonic ** (min)
Material: AY-101 Solids Source: S00T001017
Lot No: S01T001491 Test No: Run 4

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.170	0.10	0.10	(15)	4.553	5.00	55.00
(2)	0.262	0.90	1.00	(16)	5.042	5.00	60.00
(3)	0.372	1.30	2.30	(17)	5.571	5.00	65.00
(4)	0.556	2.70	5.00	(18)	6.139	5.00	70.00
(5)	0.811	5.00	10.00	(19)	6.755	5.00	75.00
(6)	1.079	5.00	15.00	(20)	7.508	5.00	80.00
(7)	1.127	0.80	15.80	(21)	8.275	4.20	84.20
(8)	1.423	4.20	20.00	(22)	8.432	0.80	85.00
(9)	1.847	5.00	25.00	(23)	9.660	5.00	90.00
(10)	2.318	5.00	30.00	(24)	11.569	5.00	95.00
(11)	2.772	5.00	35.00	(25)	13.824	2.70	97.70
(12)	3.211	5.00	40.00	(26)	16.132	1.30	99.00
(13)	3.647	5.00	45.00	(27)	21.102	0.90	99.90
(14)	4.092	5.00	50.00				

Median : 4.084 (μm) Mean: 4.760 (μm) Mode: 6.279 (μm)
Std. Dev.: 3.586 (μm) Span: 1.179
Coef. Var: 75.34% Spec. Area: 30573 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Aug/20/'01 16:12

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010817-865 14:36
Filename : AY101865
Sample : S01T001491

Material : AY-101 Solids
Source : S00T001017
Lot Numbe : S01T001491

Condition
T%(He-Ne): 77.3% Dist.Form: Std. Sampling times : 100
(LAMP): 71.2% R.R.Index: 1.16-0.00i ( )

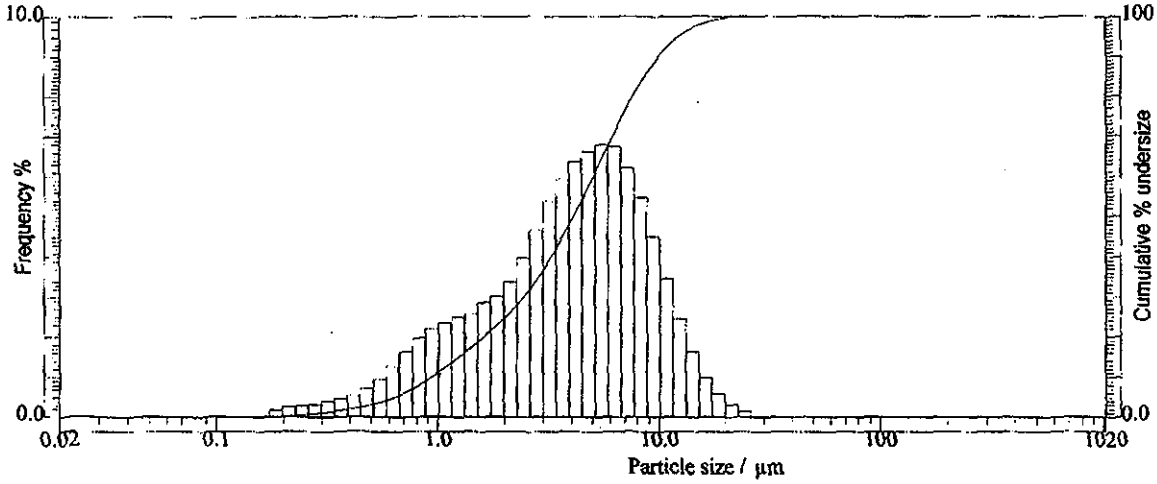
Agitation : 1 Circultn : 6 U.sonic : OFF(1200)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 4.096μm SP.Area : 27754cm²/cm³ S.D. : 3.786μm
Mode : 5.488μm Mean : 4.928μm
C.V. : 76.82%

Span : (D 10.0-D 90.0) / D50 = 2.205

Dia. on %(5.0%) : 0.641μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 2.024μm % on Dia.(1.000μm) : 11.1%
Dia. on %(50.0%) : 4.096μm % on Dia.(10.000μm) : 90.1%
Dia. on %(75.0%) : 6.829μm % on Dia.(100.000μm) : 100.0%
Dia. on %(95.0%) : 12.294μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.14	100.00	0.669	1.27	5.39
890.1	0.00	100.00	22.80	0.30	99.86	0.584	0.96	4.12
777.1	0.00	100.00	19.90	0.59	99.55	0.510	0.73	3.16
678.5	0.00	100.00	17.38	0.99	98.97	0.445	0.54	2.44
592.4	0.00	100.00	15.17	1.62	97.97	0.389	0.46	1.89
517.2	0.00	100.00	13.25	2.46	96.35	0.339	0.41	1.43
451.6	0.00	100.00	11.56	3.46	93.89	0.296	0.31	1.03
394.2	0.00	100.00	10.10	4.50	90.44	0.259	0.28	0.71
344.2	0.00	100.00	8.816	5.47	85.93	0.226	0.25	0.43
300.5	0.00	100.00	7.697	6.20	80.46	0.197	0.18	0.18
262.4	0.00	100.00	6.720	6.74	74.27	0.172	0.00	0.00
229.1	0.00	100.00	5.867	6.78	67.53	0.150	0.00	0.00
200.0	0.00	100.00	5.122	6.62	60.75	0.131	0.00	0.00
174.6	0.00	100.00	4.472	6.36	54.12	0.115	0.00	0.00
152.5	0.00	100.00	3.905	5.92	47.76	0.100	0.00	0.00
133.1	0.00	100.00	3.409	5.37	41.84	0.087	0.00	0.00
116.2	0.00	100.00	2.976	4.65	36.47	0.076	0.00	0.00
101.5	0.00	100.00	2.599	3.98	31.82	0.067	0.00	0.00
88.58	0.00	100.00	2.269	3.38	27.84	0.058	0.00	0.00
77.34	0.00	100.00	1.981	3.01	24.46	0.051	0.00	0.00
67.52	0.00	100.00	1.729	2.85	21.45	0.044	0.00	0.00
58.95	0.00	100.00	1.510	2.58	18.60	0.039	0.00	0.00
51.47	0.00	100.00	1.318	2.50	16.02	0.034	0.00	0.00
44.94	0.00	100.00	1.151	2.36	13.53	0.029	0.00	0.00
39.23	0.00	100.00	1.005	2.19	11.17	0.026	0.00	0.00
34.25	0.00	100.00	0.877	1.96	8.98	0.022	0.00	0.00
29.91	0.00	100.00	0.766	1.63	7.02			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/20/01
File Name: AY101865.DAT Sample Name: S01T001491 ID No: 01/08/17-865
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 77.312 % Lamp: 71.234 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: AY-101 Solids Source: S00T001017
Lot No: S01T001491 Test No: Run 4

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.186	0.10	0.10	(15)	4.558	5.00	55.00
(2)	0.293	0.90	1.00	(16)	5.049	5.00	60.00
(3)	0.431	1.30	2.30	(17)	5.589	5.00	65.00
(4)	0.643	2.70	5.00	(18)	6.180	5.00	70.00
(5)	0.937	5.00	10.00	(19)	6.835	5.00	75.00
(6)	1.250	5.00	15.00	(20)	7.624	5.00	80.00
(7)	1.303	0.80	15.80	(21)	8.461	4.20	84.20
(8)	1.617	4.20	20.00	(22)	8.625	0.80	85.00
(9)	2.027	5.00	25.00	(23)	9.973	5.00	90.00
(10)	2.447	5.00	30.00	(24)	12.322	5.00	95.00
(11)	2.857	5.00	35.00	(25)	14.847	2.70	97.70
(12)	3.261	5.00	40.00	(26)	17.525	1.30	99.00
(13)	3.673	5.00	45.00	(27)	23.819	0.90	99.90
(14)	4.104	5.00	50.00				

Median : 4.096 (μm) Mean: 4.928 (μm) Mode: 5.482 (μm)
Std. Dev.: 3.786 (μm) Span: 1.334
Coef. Var: 76.82% Spec. Area: 27754 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Aug/20/'01 16:14

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010817-871 15:39
Filename : AY101871
Sample : S01T001491

Material : AY-101 Solids
Source : S00T001017
Lot Numbe : S01T001491

Condition
T%(He-Ne): 78.1% Dist.Form: Std. Sampling times : 100
(LAMP): 72.5% R.R.Index: 1.16-0.001 ( )

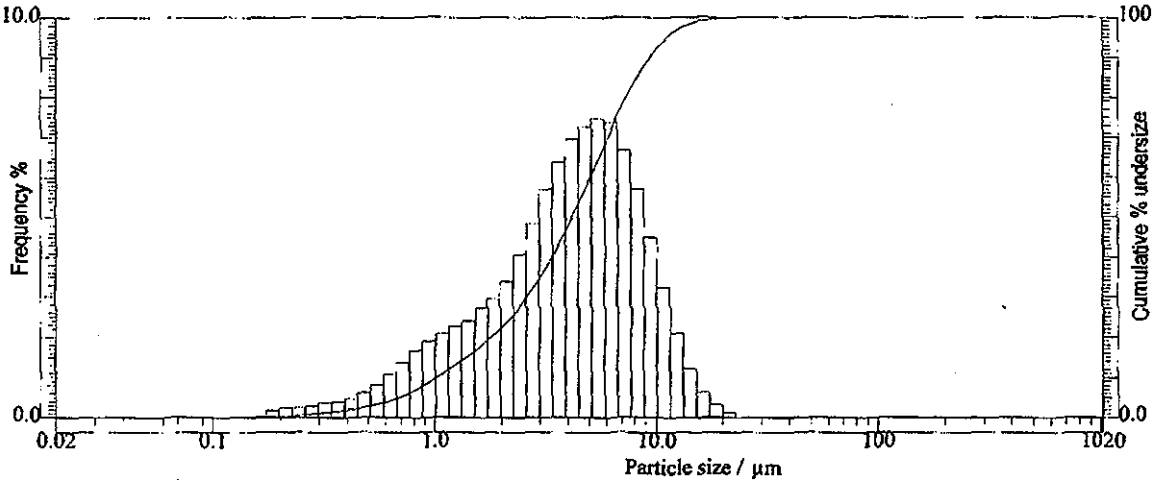
Agitation : 3 Circultn : 6 U.sonic : OFF(1200)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 4.189μm SP.Area : 26330cm²/cm³ S.D. : 3.384μm
Mode : 5.487μm Mean : 4.822μm
C.V. : 70.17%

Span : (D 10.0-D 90.0) / D50 = 1.998

Dia. on %(5.0%) :	0.688μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	2.232μm	% on Dia.(1.000μm) :	9.6%
Dia. on %(50.0%) :	4.189μm	% on Dia.(10.000μm) :	92.1%
Dia. on %(75.0%) :	6.659μm	% on Dia.(100.000μm) :	100.0%
Dia. on %(95.0%) :	11.277μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	100.00	0.669	1.07	4.72
890.1	0.00	100.00	22.80	0.13	100.00	0.584	0.81	3.65
777.1	0.00	100.00	19.90	0.33	99.87	0.510	0.62	2.84
678.5	0.00	100.00	17.38	0.64	99.54	0.445	0.47	2.23
592.4	0.00	100.00	15.17	1.22	98.90	0.389	0.41	1.76
517.2	0.00	100.00	13.25	2.08	97.68	0.339	0.37	1.35
451.6	0.00	100.00	11.56	3.22	95.60	0.296	0.29	0.98
394.2	0.00	100.00	10.10	4.49	92.38	0.259	0.27	0.69
344.2	0.00	100.00	8.816	5.72	87.89	0.226	0.24	0.43
300.5	0.00	100.00	7.697	6.67	82.17	0.197	0.18	0.18
262.4	0.00	100.00	6.720	7.38	75.50	0.172	0.00	0.00
229.1	0.00	100.00	5.867	7.48	68.12	0.150	0.00	0.00
200.0	0.00	100.00	5.122	7.29	60.64	0.131	0.00	0.00
174.6	0.00	100.00	4.472	6.95	53.35	0.115	0.00	0.00
152.5	0.00	100.00	3.905	6.38	46.41	0.100	0.00	0.00
133.1	0.00	100.00	3.409	5.71	40.02	0.087	0.00	0.00
116.2	0.00	100.00	2.976	4.85	34.32	0.076	0.00	0.00
101.5	0.00	100.00	2.599	4.06	29.47	0.067	0.00	0.00
88.58	0.00	100.00	2.269	3.38	25.41	0.058	0.00	0.00
77.34	0.00	100.00	1.981	2.93	22.03	0.051	0.00	0.00
67.52	0.00	100.00	1.729	2.71	19.10	0.044	0.00	0.00
58.95	0.00	100.00	1.510	2.39	16.39	0.039	0.00	0.00
51.47	0.00	100.00	1.318	2.26	14.00	0.034	0.00	0.00
44.94	0.00	100.00	1.151	2.08	11.74	0.029	0.00	0.00
39.23	0.00	100.00	1.005	1.90	9.66	0.026	0.00	0.00
34.25	0.00	100.00	0.877	1.67	7.76	0.022	0.00	0.00
29.91	0.00	100.00	0.766	1.38	6.10			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/20/01
File Name: AY101871.DAT Sample Name: S01T001491 ID No: 01/08/17-871
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 78.073 % Lamp: 72.495 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: AY-101 Solids Source: S00T001017
Lot No: S01T001491 Test No: Run 4

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.186	0.10	0.10	(15)	4.619	5.00	55.00
(2)	0.298	0.90	1.00	(16)	5.065	5.00	60.00
(3)	0.453	1.30	2.30	(17)	5.556	5.00	65.00
(4)	0.689	2.70	5.00	(18)	6.084	5.00	70.00
(5)	1.029	5.00	10.00	(19)	6.662	5.00	75.00
(6)	1.399	5.00	15.00	(20)	7.379	5.00	80.00
(7)	1.463	0.80	15.80	(21)	8.094	4.20	84.20
(8)	1.807	4.20	20.00	(22)	8.250	0.80	85.00
(9)	2.234	5.00	25.00	(23)	9.419	5.00	90.00
(10)	2.640	5.00	30.00	(24)	11.292	5.00	95.00
(11)	3.028	5.00	35.00	(25)	13.272	2.70	97.70
(12)	3.407	5.00	40.00	(26)	15.507	1.30	99.00
(13)	3.795	5.00	45.00	(27)	20.618	0.90	99.90
(14)	4.198	5.00	50.00				

Median : 4.189 (μm) Mean: 4.822 (μm) Mode: 5.482 (μm)
Std. Dev.: 3.384 (μm) Span: 1.103
Coef. Var: 70.17% Spec. Area: 26330 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Aug/20/'01 16:14

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010817-872 15:42
Filename : AY101872
Sample : S01T001491

Material : AY-101 Solids
Source : S00T001017
Lot Numbe : S01T001491

Condition
T%(He-Ne): 78.2% Dist.Form: Std. Sampling times : 100
(LAMP): 72.7% R.R.Index: 1.16-0.00i ( )

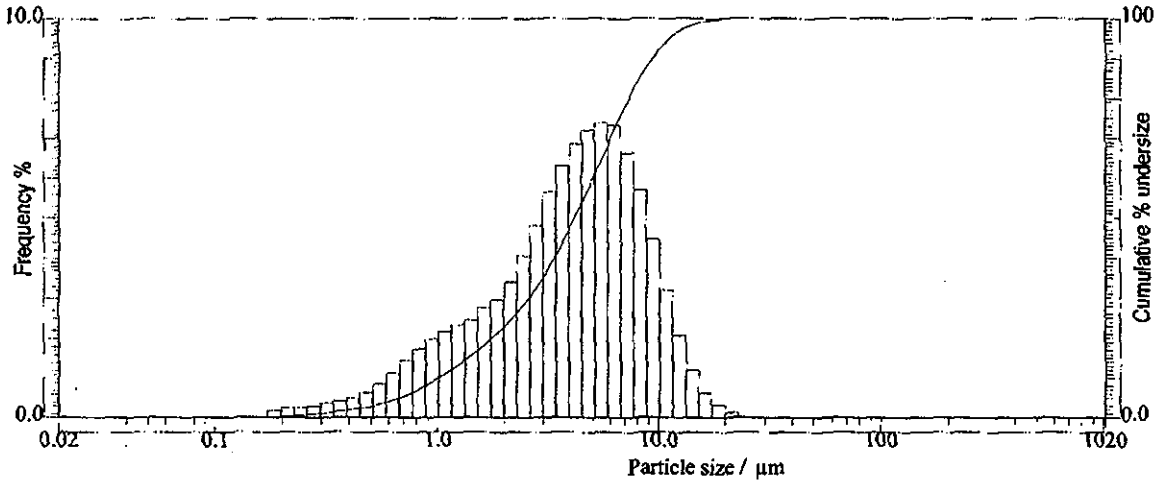
Agitation : 1 Circultn : 6 U.sonic : OFF(1200)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 4.155μm SP.Area : 26697cm²/cm³ S.D. : 3.381μm
Mode : 5.488μm Mean : 4.789μm
C.V. : 70.60%

Span : (D 10.0-D 90.0) / D50 = 2.014

Dia. on %(5.0%) : 0.678μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 2.174μm % on Dia.(1.000μm) : 9.9%
Dia. on %(50.0%) : 4.155μm % on Dia.(10.000μm) : 92.1%
Dia. on %(75.0%) : 6.639μm % on Dia.(100.000μm) : 100.0%
Dia. on %(95.0%) : 11.241μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	100.00	0.669	1.12	4.85
890.1	0.00	100.00	22.80	0.12	100.00	0.584	0.84	3.73
777.1	0.00	100.00	19.90	0.32	99.88	0.510	0.64	2.89
678.5	0.00	100.00	17.38	0.62	99.56	0.445	0.48	2.25
592.4	0.00	100.00	15.17	1.20	98.94	0.389	0.42	1.77
517.2	0.00	100.00	13.25	2.07	97.74	0.339	0.37	1.35
451.6	0.00	100.00	11.56	3.21	95.67	0.296	0.29	0.98
394.2	0.00	100.00	10.10	4.48	92.46	0.259	0.27	0.69
344.2	0.00	100.00	8.816	5.70	87.98	0.226	0.24	0.42
300.5	0.00	100.00	7.697	6.64	82.29	0.197	0.18	0.18
262.4	0.00	100.00	6.720	7.32	75.65	0.172	0.00	0.00
229.1	0.00	100.00	5.867	7.40	68.33	0.150	0.00	0.00
200.0	0.00	100.00	5.122	7.20	60.93	0.131	0.00	0.00
174.6	0.00	100.00	4.472	6.86	53.72	0.115	0.00	0.00
152.5	0.00	100.00	3.905	6.30	46.86	0.100	0.00	0.00
133.1	0.00	100.00	3.409	5.64	40.56	0.087	0.00	0.00
116.2	0.00	100.00	2.976	4.81	34.92	0.076	0.00	0.00
101.5	0.00	100.00	2.599	4.05	30.11	0.067	0.00	0.00
88.58	0.00	100.00	2.269	3.39	26.06	0.058	0.00	0.00
77.34	0.00	100.00	1.981	2.96	22.68	0.051	0.00	0.00
67.52	0.00	100.00	1.729	2.76	19.72	0.044	0.00	0.00
58.95	0.00	100.00	1.510	2.45	16.96	0.039	0.00	0.00
51.47	0.00	100.00	1.318	2.33	14.51	0.034	0.00	0.00
44.94	0.00	100.00	1.151	2.16	12.18	0.029	0.00	0.00
39.23	0.00	100.00	1.005	1.98	10.02	0.026	0.00	0.00
34.25	0.00	100.00	0.877	1.74	8.04	0.022	0.00	0.00
29.91	0.00	100.00	0.766	1.44	6.29			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/20/01
File Name: AY101872.DAT Sample Name: S01T001491 ID No: 01/08/17-872
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 78.189 % Lamp: 72.656 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: AY-101 Solids Source: S00T001017
Lot No: S01T001491 Test No: Run 4

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.186	0.10	0.10	(15)	4.587	5.00	55.00
(2)	0.298	0.90	1.00	(16)	5.039	5.00	60.00
(3)	0.450	1.30	2.30	(17)	5.532	5.00	65.00
(4)	0.679	2.70	5.00	(18)	6.062	5.00	70.00
(5)	1.004	5.00	10.00	(19)	6.644	5.00	75.00
(6)	1.357	5.00	15.00	(20)	7.360	5.00	80.00
(7)	1.419	0.80	15.80	(21)	8.072	4.20	84.20
(8)	1.753	4.20	20.00	(22)	8.229	0.80	85.00
(9)	2.178	5.00	25.00	(23)	9.392	5.00	90.00
(10)	2.590	5.00	30.00	(24)	11.257	5.00	95.00
(11)	2.982	5.00	35.00	(25)	13.214	2.70	97.70
(12)	3.366	5.00	40.00	(26)	15.384	1.30	99.00
(13)	3.758	5.00	45.00	(27)	20.482	0.90	99.90
(14)	4.164	5.00	50.00				

Median : 4.155 (μm) Mean: 4.789 (μm) Mode: 5.482 (μm)
Std. Dev.: 3.381 (μm) Span: 1.108
Coef. Var: 70.60% Spec. Area: 26697 (cm2/cm3)

APPENDIX F-5

PSD PARAMETRIC STUDY: TANK C-104 COMPOSITE

Consisting of 51 pages including this cover page

TABLE F-5. Sample identification and PSD run conditions. C-104 composite subsamples S01T001447 and S01T001448.

Conditions Key: P = Pump Speed Setting; P6 = 14.4 mL/s
S = Stirrer Speed Setting (1-7); S1 = Stirrer Speed 1; S3 = Stirrer Speed 3
US = Ultrasonic ON Time (min); DT = Delay Time (min) between end of ultrasonic treatment and PSD measurement.

Sample	PSD Run File Name	Run Conditions				Run Initiated At	Cumulative Time (min) At Conditions				
		P	S	US	DT		P6	S1	S3	US	DT
S01T001447	[LOAD-IN]	6	1	0	0		?	?			
	C104780	6	1	0	0	07:59	4	4			
	C104781	6	3	0	0	08:03	8	4	4		
	C104782	6	1	2	0	08:07	13	9	4	2	0
	C104783	6	3	0	0	08:12	17	9	8	2	3
	[DELAY]	0	0	0	60	08:16					7
	C104789	6	1	0	0	09:16	20	12	8	2	67
	C104790	6	3	0	0	09:19	23	12	11	2	70
						09:22					
S01T001448	[LOAD-IN]	6	1	0	0		?	?			
	C104791	6	1	0	0	10:24	4	4			
	C104792	6	3	0	0	10:28	8	4	4		
	C104793	6	1	20	0	10:32	32	28	4	20	0
	C104794	6	3	0	0	10:56	35	28	7	20	4
	[DELAY]	0	0	0	60	10:59					7
	C104800	6	1	0	0	11:59	39	32	7	20	67
	C104801	6	3	0	0	12:03	41	32	9	20	71
						12:05					

TABLE F-5 (continued). Sample identification and PSD run conditions. C-104 composite subsamples S01T001449 and S01T001451.

Conditions Key: P = Pump Speed Setting; P6 = 14.4 mL/s
S = Stirrer Speed Setting (1-7); S1 = Stirrer Speed 1; S3 = Stirrer Speed 3
US = Ultrasonic ON Time (min); DT = Delay Time (min) between end of ultrasonic treatment and PSD measurement.

Sample	PSD Run File Name	Run Conditions				Run Initiated At	Cumulative Time (min) At Conditions				
		P	S	US	DT		P6	S1	S3	US	DT
S01T001449	[LOAD-IN]	6	3	0	0		?		?		
	C104802	6	3	0	0	12:29	4		4		
	C104803	6	1	0	0	12:33	7	3	4		
	C104804	6	3	2	0	12:36	12	3	9	2	0
	C104805	6	1	0	0	12:41	16	7	9	2	3
	[DELAY]	0	0	0	60	12:45					7
	C104811	6	3	0	0	13:45	20	7	13	2	67
	C104812	6	1	0	0	13:49	22	9	13	2	71
						13:51					
S01T001451	[LOAD-IN]	6	3	0	0		?		?		
	C104815	6	3	0	0	14:19	3		3		
	C104816	6	1	0	0	14:22	8	5	3		
	C104817	6	3	20	0	14:27	34	5	29	20	0
	C104818	6	1	0	0	14:53	37	8	29	20	6
	[DELAY]	0	0	0	60	14:56					9
	C104824	6	3	0	0	15:56	42	8	34	20	69
	C104825	6	1	0	0	16:01	44	10	34	20	74
						16:03					

HORIBA LA-910

for Windows(TM) Ver.1.20J Aug/20/'01 07:48

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010816-780 08:01
Filename : C104780
Sample : S01T001447

Material : C-104 Solids
Source : S01T001014
Lot Numbe : S01T001447

Condition
T%(He-Ne): 86.8% Dist.Form: Std. Sampling times : 100
(LAMP): 78.5% R.R.Index: 1.16-0.00i ( )

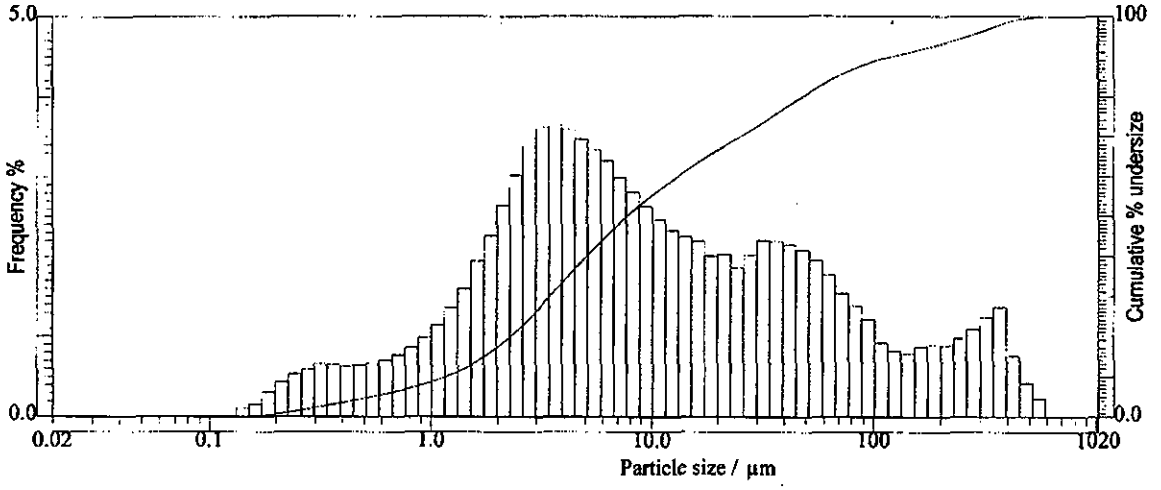
Agitation : 1 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 7.763μm SP.Area : 23228cm²/cm³ S.D. : 87.729μm
Mode : 3.647μm Mean : 43.005μm
C.V. : 204.00%

Span : (D 10.0-D 90.0) / D50 = 15.500

Dia. on %(5.0%) : 0.543μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 2.863μm % on Dia.(1.000μm) : 8.6%
Dia. on %(50.0%) : 7.763μm % on Dia.(10.000μm) : 55.1%
Dia. on %(75.0%) : 35.165μm % on Dia.(100.000μm) : 88.7%
Dia. on %(95.0%) : 265.044μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.86	70.36	0.669	0.70	6.05
890.1	0.00	100.00	22.80	2.03	68.51	0.584	0.66	5.35
777.1	0.00	100.00	19.90	2.00	66.48	0.510	0.64	4.70
678.5	0.00	100.00	17.38	2.19	64.47	0.445	0.62	4.06
592.4	0.23	100.00	15.17	2.24	62.28	0.389	0.65	3.43
517.2	0.42	99.77	13.25	2.33	60.04	0.339	0.65	2.79
451.6	0.76	99.35	11.56	2.46	57.71	0.296	0.59	2.13
394.2	1.36	98.59	10.10	2.62	55.25	0.259	0.53	1.54
344.2	1.23	97.23	8.816	2.80	52.63	0.226	0.43	1.01
300.5	1.08	96.00	7.697	2.98	49.82	0.197	0.30	0.57
262.4	0.96	94.92	6.720	3.20	46.84	0.172	0.16	0.27
229.1	0.88	93.96	5.867	3.34	43.64	0.150	0.11	0.11
200.0	0.88	93.08	5.122	3.47	40.30	0.131	0.00	0.00
174.6	0.86	92.19	4.472	3.60	36.83	0.115	0.00	0.00
152.5	0.78	91.33	3.905	3.64	33.23	0.100	0.00	0.00
133.1	0.82	90.55	3.409	3.62	29.58	0.087	0.00	0.00
116.2	0.91	89.73	2.976	3.38	25.97	0.076	0.00	0.00
101.5	1.21	88.82	2.599	3.02	22.59	0.067	0.00	0.00
88.58	1.38	87.61	2.269	2.63	19.57	0.058	0.00	0.00
77.34	1.53	86.24	1.981	2.26	16.93	0.051	0.00	0.00
67.52	1.77	84.70	1.729	1.95	14.67	0.044	0.00	0.00
58.95	1.95	82.93	1.510	1.59	12.72	0.039	0.00	0.00
51.47	2.08	80.98	1.318	1.35	11.13	0.034	0.00	0.00
44.94	2.14	78.91	1.151	1.14	9.78	0.029	0.00	0.00
39.23	2.19	76.77	1.005	0.97	8.64	0.026	0.00	0.00
34.25	2.20	74.58	0.877	0.85	7.67	0.022	0.00	0.00
29.91	2.02	72.38	0.766	0.76	6.81			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/20/01
File Name: C104780.DAT Sample Name: S01T001447 ID No: 01/08/16-780
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 86.782 % Lamp: 78.528 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: C-104 Solids Source: S01T001014
Lot No: S01T001447 Test No: 1

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.149	0.10	0.10	(15)	9.975	5.00	55.00
(2)	0.225	0.90	1.00	(16)	13.218	5.00	60.00
(3)	0.307	1.30	2.30	(17)	18.042	5.00	65.00
(4)	0.544	2.70	5.00	(18)	25.466	5.00	70.00
(5)	1.178	5.00	10.00	(19)	35.216	5.00	75.00
(6)	1.766	5.00	15.00	(20)	48.375	5.00	80.00
(7)	1.855	0.80	15.80	(21)	65.087	4.20	84.20
(8)	2.316	4.20	20.00	(22)	69.419	0.80	85.00
(9)	2.868	5.00	25.00	(23)	121.760	5.00	90.00
(10)	3.466	5.00	30.00	(24)	265.219	5.00	95.00
(11)	4.184	5.00	35.00	(25)	361.471	2.70	97.70
(12)	5.066	5.00	40.00	(26)	425.257	1.30	99.00
(13)	6.230	5.00	45.00	(27)	560.161	0.90	99.90
(14)	7.768	5.00	50.00				

Median : 7.763 (μm) Mean: 43.005 (μm) Mode: 3.648 (μm)
Std. Dev.: 87.729 (μm) Span: 29.611
Coef. Var: 204.00% Spec. Area: 23229 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20J Aug/20/'01 07:49

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010816-781 08:06
Filename : C104781
Sample : S01T001447

Material : C-104 Solids
Source : S01T001014
Lot Numbe : S01T001447

Condition
T%(He-Ne): 86.5% Dist.Form: Std. Sampling times : 100
(LAMP): 78.2% R.R.Index: 1.16-0.00i ( )

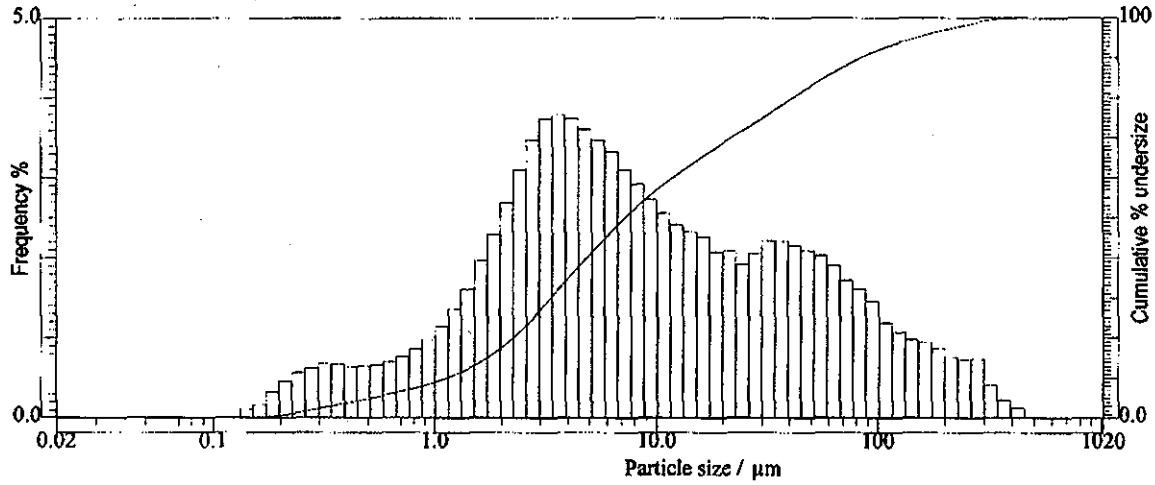
Agitation : 3 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 7.280μm SP.Area : 23989cm²/cm³ S.D. : 56.097μm
Mode : 3.648μm Mean : 30.297μm
C.V. : 185.16%

Span : (D 10.0-D 90.0) / D50 = 11.499

Dia. on %(5.0%) :	0.520μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	2.806μm	% on Dia.(1.000μm) :	8.8%
Dia. on %(50.0%) :	7.280μm	% on Dia.(10.000μm) :	56.7%
Dia. on %(75.0%) :	30.675μm	% on Dia.(100.000μm) :	91.8%
Dia. on %(95.0%) :	148.413μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.91	72.53	0.669	0.70	6.27
890.1	0.00	100.00	22.80	2.09	70.62	0.584	0.66	5.57
777.1	0.00	100.00	19.90	2.07	68.53	0.510	0.65	4.90
678.5	0.00	100.00	17.38	2.26	66.46	0.445	0.64	4.25
592.4	0.00	100.00	15.17	2.32	64.20	0.389	0.67	3.61
517.2	0.00	100.00	13.25	2.41	61.87	0.339	0.68	2.94
451.6	0.13	100.00	11.56	2.55	59.46	0.296	0.63	2.26
394.2	0.23	99.87	10.10	2.72	56.91	0.259	0.57	1.64
344.2	0.41	99.65	8.816	2.91	54.19	0.226	0.46	1.07
300.5	0.74	99.24	7.697	3.10	51.27	0.197	0.32	0.61
262.4	0.73	98.50	6.720	3.32	48.17	0.172	0.17	0.28
229.1	0.76	97.77	5.867	3.47	44.85	0.150	0.11	0.11
200.0	0.87	97.00	5.122	3.61	41.37	0.131	0.00	0.00
174.6	0.94	96.14	4.472	3.74	37.77	0.115	0.00	0.00
152.5	0.98	95.19	3.905	3.78	34.03	0.100	0.00	0.00
133.1	1.07	94.22	3.409	3.74	30.25	0.087	0.00	0.00
116.2	1.19	93.15	2.976	3.48	26.51	0.076	0.00	0.00
101.5	1.45	91.96	2.599	3.10	23.03	0.067	0.00	0.00
88.58	1.61	90.51	2.269	2.69	19.94	0.058	0.00	0.00
77.34	1.71	88.90	1.981	2.29	17.25	0.051	0.00	0.00
67.52	1.91	87.19	1.729	1.97	14.96	0.044	0.00	0.00
58.95	2.03	85.28	1.510	1.60	12.99	0.039	0.00	0.00
51.47	2.09	83.25	1.318	1.36	11.39	0.034	0.00	0.00
44.94	2.15	81.16	1.151	1.14	10.03	0.029	0.00	0.00
39.23	2.21	79.01	1.005	0.98	8.88	0.026	0.00	0.00
34.25	2.22	76.80	0.877	0.86	7.90	0.022	0.00	0.00
29.91	2.05	74.59	0.766	0.77	7.04			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/20/01
File Name: C104781.DAT Sample Name: S01T001447 ID No: 01/08/16-781
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 86.471 % Lamp: 78.233 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: C-104 Solids Source: S01T001014
Lot No: S01T001447 Test No: 1

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.148	0.10	0.10	(15)	9.199	5.00	55.00
(2)	0.221	0.90	1.00	(16)	11.941	5.00	60.00
(3)	0.299	1.30	2.30	(17)	15.956	5.00	65.00
(4)	0.521	2.70	5.00	(18)	21.937	5.00	70.00
(5)	1.148	5.00	10.00	(19)	30.719	5.00	75.00
(6)	1.734	5.00	15.00	(20)	41.857	5.00	80.00
(7)	1.821	0.80	15.80	(21)	54.968	4.20	84.20
(8)	2.275	4.20	20.00	(22)	57.921	0.80	85.00
(9)	2.812	5.00	25.00	(23)	85.026	5.00	90.00
(10)	3.380	5.00	30.00	(24)	148.624	5.00	95.00
(11)	4.052	5.00	35.00	(25)	226.513	2.70	97.70
(12)	4.875	5.00	40.00	(26)	288.246	1.30	99.00
(13)	5.906	5.00	45.00	(27)	406.183	0.90	99.90
(14)	7.296	5.00	50.00				

Median : 7.280 (μm) Mean: 30.297 (μm) Mode: 3.648 (μm)
Std. Dev.: 56.097 (μm) Span: 16.174
Coef. Var: 185.16% Spec. Area: 23989 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Aug/20/'01 07:51

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010816-782 08:11
Filename : C104782
Sample : S01T001447

Material : C-104 Solids
Source : S01T001014
Lot Numbe : S01T001447

Condition
T%(He-Ne): 87.0% Dist.Form: Std. Sampling times : 100
(LAMP): 77.5% R.R.Index: 1.16-0.00i ( )

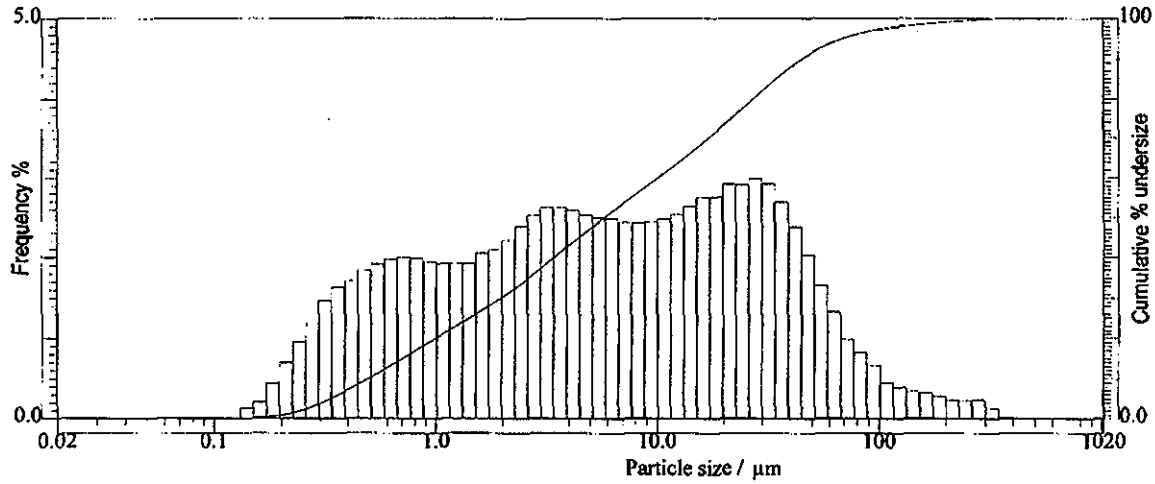
Agitation : 1 Circultn : 6 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 5.840μm SP.Area : 38135cm²/cm³ S.D. : 33.750μm
Mode : 27.955μm Mean : 18.237μm
C.V. : 185.06%

Span : (D 10.0-D 90.0) / D50 = 7.689

Dia. on %(5.0%) :	0.336μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	1.413μm	% on Dia.(1.000μm) :	20.1%
Dia. on %(50.0%) :	5.840μm	% on Dia.(10.000μm) :	59.7%
Dia. on %(75.0%) :	21.809μm	% on Dia.(100.000μm) :	97.3%
Dia. on %(95.0%) :	68.802μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	2.91	78.86	0.669	1.98	14.21
890.1	0.00	100.00	22.80	2.92	75.95	0.584	1.92	12.23
777.1	0.00	100.00	19.90	2.76	73.04	0.510	1.85	10.31
678.5	0.00	100.00	17.38	2.76	70.28	0.445	1.72	8.47
592.4	0.00	100.00	15.17	2.64	67.52	0.389	1.64	6.74
517.2	0.00	100.00	13.25	2.53	64.88	0.339	1.47	5.11
451.6	0.00	100.00	11.56	2.48	62.35	0.296	1.19	3.63
394.2	0.00	100.00	10.10	2.44	59.87	0.259	0.96	2.44
344.2	0.14	100.00	8.816	2.43	57.43	0.226	0.70	1.48
300.5	0.24	99.86	7.697	2.43	55.00	0.197	0.44	0.78
262.4	0.23	99.62	6.720	2.48	52.57	0.172	0.21	0.34
229.1	0.24	99.39	5.867	2.49	50.09	0.150	0.14	0.14
200.0	0.29	99.15	5.122	2.53	47.59	0.131	0.00	0.00
174.6	0.32	98.86	4.472	2.59	45.06	0.115	0.00	0.00
152.5	0.34	98.54	3.905	2.63	42.47	0.100	0.00	0.00
133.1	0.39	98.19	3.409	2.62	39.84	0.087	0.00	0.00
116.2	0.45	97.80	2.976	2.53	37.22	0.076	0.00	0.00
101.5	0.67	97.35	2.599	2.39	34.69	0.067	0.00	0.00
88.58	0.83	96.68	2.269	2.22	32.30	0.058	0.00	0.00
77.34	0.99	95.85	1.981	2.09	30.09	0.051	0.00	0.00
67.52	1.33	94.86	1.729	2.05	27.99	0.044	0.00	0.00
58.95	1.66	93.54	1.510	1.93	25.94	0.039	0.00	0.00
51.47	2.03	91.88	1.318	1.93	24.01	0.034	0.00	0.00
44.94	2.38	89.85	1.151	1.93	22.08	0.029	0.00	0.00
39.23	2.69	87.47	1.005	1.95	20.15	0.026	0.00	0.00
34.25	2.92	84.77	0.877	1.99	18.20	0.022	0.00	0.00
29.91	2.99	81.85	0.766	2.00	16.21			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/20/01
File Name: C104782.DAT Sample Name: S01T001447 ID No: 01/08/16-782
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 86.985 % Lamp: 77.499 %
Circulation: 6 Agitation: 1 U.Sonic ** (min)
Material: C-104 Solids Source: S01T001014
Lot No: S01T001447 Test No: 1

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.145	0.10	0.10	(15)	7.696	5.00	55.00
(2)	0.206	0.90	1.00	(16)	10.172	5.00	60.00
(3)	0.254	1.30	2.30	(17)	13.332	5.00	65.00
(4)	0.336	2.70	5.00	(18)	17.157	5.00	70.00
(5)	0.499	5.00	10.00	(19)	21.852	5.00	75.00
(6)	0.707	5.00	15.00	(20)	27.559	5.00	80.00
(7)	0.746	0.80	15.80	(21)	33.402	4.20	84.20
(8)	0.995	4.20	20.00	(22)	34.673	0.80	85.00
(9)	1.416	5.00	25.00	(23)	45.431	5.00	90.00
(10)	1.971	5.00	30.00	(24)	68.880	5.00	95.00
(11)	2.645	5.00	35.00	(25)	112.810	2.70	97.70
(12)	3.439	5.00	40.00	(26)	187.111	1.30	99.00
(13)	4.459	5.00	45.00	(27)	312.030	0.90	99.90
(14)	5.841	5.00	50.00				

Median : 5.840 (μm) Mean: 18.237 (μm) Mode: 27.945 (μm)
Std. Dev.: 33.750 (μm) Span: 8.047
Coef. Var: 185.06% Spec. Area: 38135 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Aug/20/'01 07:52

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010816-783 08:15
Filename : C104783
Sample : S01T001447

Material : C-104 Solids
Source : S01T001014
Lot Numbe : S01T001447

Condition
T%(He-Ne): 86.4%
(LAMP): 77.0%

Dist.Form: Std.
R.R.Index: 1.16-0.00i

Sampling times : 100
( )

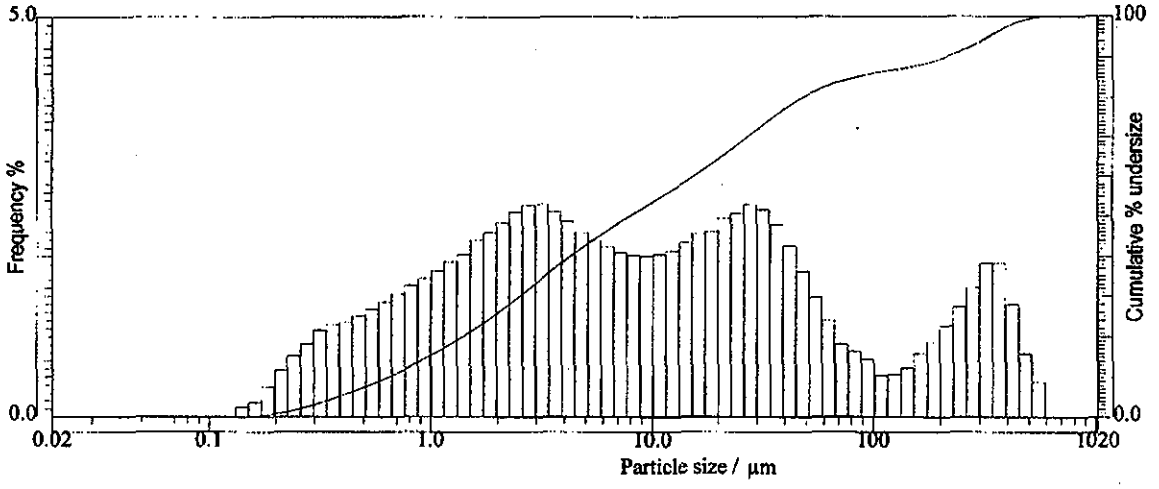
Agitation : 3 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 7.991μm SP.Area : 31212cm²/cm³ S.D. : 106.516μm
Mode : 3.178μm Mean : 52.887μm
C.V. : 201.40%

Span : (D 10.0-D 90.0) / D50 = 26.676

Dia. on %(5.0%) : 0.381μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 1.918μm % on Dia.(1.000μm) : 15.2%
Dia. on %(50.0%) : 7.991μm % on Dia.(10.000μm) : 53.3%
Dia. on %(75.0%) : 35.159μm % on Dia.(100.000μm) : 86.0%
Dia. on %(95.0%) : 333.046μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	2.53	69.33	0.669	1.43	10.38
890.1	0.00	100.00	22.80	2.48	66.79	0.584	1.34	8.95
777.1	0.00	100.00	19.90	2.31	64.31	0.510	1.26	7.61
678.5	0.00	100.00	17.38	2.29	62.00	0.445	1.18	6.35
592.4	0.44	100.00	15.17	2.17	59.71	0.389	1.15	5.17
517.2	0.79	99.56	13.25	2.07	57.54	0.339	1.08	4.02
451.6	1.39	98.77	11.56	2.02	55.47	0.296	0.91	2.94
394.2	1.91	97.38	10.10	2.00	53.45	0.259	0.76	2.03
344.2	1.91	95.46	8.816	2.01	51.45	0.226	0.58	1.27
300.5	1.61	93.55	7.697	2.04	49.44	0.197	0.38	0.69
262.4	1.37	91.95	6.720	2.13	47.40	0.172	0.19	0.31
229.1	1.14	90.58	5.867	2.19	45.28	0.150	0.12	0.12
200.0	0.94	89.44	5.122	2.29	43.08	0.131	0.00	0.00
174.6	0.79	88.50	4.472	2.43	40.79	0.115	0.00	0.00
152.5	0.61	87.71	3.905	2.56	38.36	0.100	0.00	0.00
133.1	0.54	87.10	3.409	2.65	35.80	0.087	0.00	0.00
116.2	0.52	86.56	2.976	2.64	33.15	0.076	0.00	0.00
101.5	0.73	86.04	2.599	2.55	30.51	0.067	0.00	0.00
88.58	0.83	85.31	2.269	2.42	27.96	0.058	0.00	0.00
77.34	0.91	84.49	1.981	2.29	25.54	0.051	0.00	0.00
67.52	1.21	83.58	1.729	2.20	23.25	0.044	0.00	0.00
58.95	1.49	82.37	1.510	2.02	21.05	0.039	0.00	0.00
51.47	1.82	80.88	1.318	1.93	19.02	0.034	0.00	0.00
44.94	2.13	79.06	1.151	1.82	17.09	0.029	0.00	0.00
39.23	2.39	76.93	1.005	1.72	15.27	0.026	0.00	0.00
34.25	2.58	74.54	0.877	1.63	13.55	0.022	0.00	0.00
29.91	2.64	71.96	0.766	1.54	11.92			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/20/01
File Name: C104783.DAT Sample Name: S01T001447 ID No: 01/08/16-783
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 86.406 % Lamp: 76.962 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: C-104 Solids Source: S01T001014
Lot No: S01T001447 Test No: 1

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.147	0.10	0.10	(15)	11.221	5.00	55.00
(2)	0.213	0.90	1.00	(16)	15.452	5.00	60.00
(3)	0.270	1.30	2.30	(17)	20.708	5.00	65.00
(4)	0.381	2.70	5.00	(18)	27.081	5.00	70.00
(5)	0.646	5.00	10.00	(19)	35.211	5.00	75.00
(6)	0.985	5.00	15.00	(20)	48.319	5.00	80.00
(7)	1.047	0.80	15.80	(21)	74.232	4.20	84.20
(8)	1.411	4.20	20.00	(22)	84.308	0.80	85.00
(9)	1.921	5.00	25.00	(23)	214.307	5.00	90.00
(10)	2.532	5.00	30.00	(24)	333.597	5.00	95.00
(11)	3.278	5.00	35.00	(25)	407.501	2.70	97.70
(12)	4.287	5.00	40.00	(26)	470.750	1.30	99.00
(13)	5.773	5.00	45.00	(27)	575.295	0.90	99.90
(14)	8.006	5.00	50.00				

Median : 7.991 (μm) Mean: 52.887 (μm) Mode: 3.185 (μm)
Std. Dev.: 106.516 (μm) Span: 37.278
Coef. Var: 201.40% Spec. Area: 31212 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Aug/20/'01 07:56

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010816-789 09:19
Filename : C104789
Sample : S01T001447

Material : C-104 Solids
Source : S01T001014
Lot Numbe : S01T001447

Condition
T%(He-Ne): 87.4% Dist.Form: Std. Sampling times : 100
(LAMP): 77.1% R.R.Index: 1.16-0.00i ( )

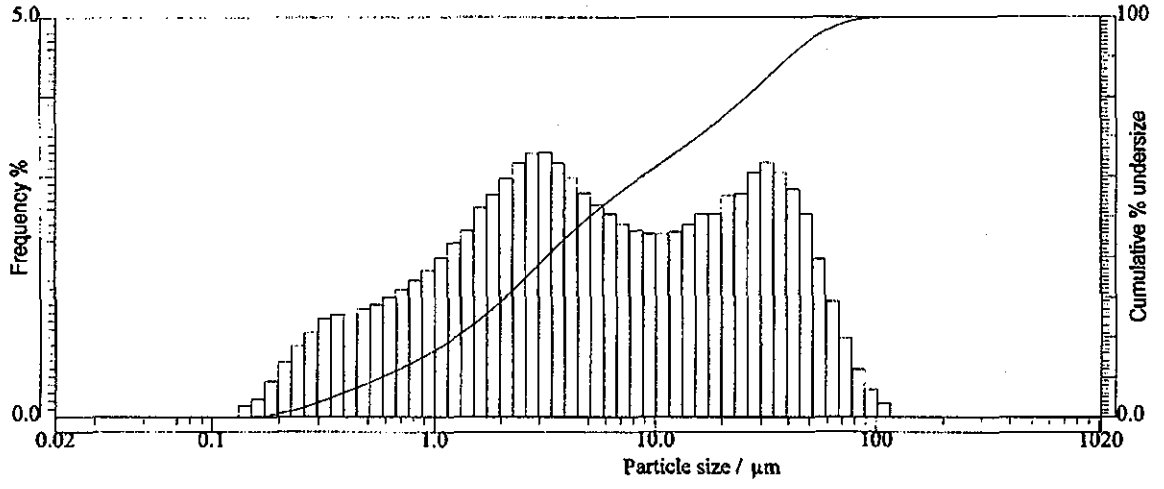
Agitation : 1 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 5.100μm SP.Area : 35332cm²/cm³ S.D. : 18.328μm
Mode : 3.177μm Mean : 13.980μm
C.V. : 131.11%

Span : (D 10.0-D 90.0) / D50 = 7.908

Dia. on %(5.0%) : 0.352μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 1.668μm % on Dia.(1.000μm) : 16.5%
Dia. on %(50.0%) : 5.100μm % on Dia.(10.000μm) : 62.1%
Dia. on %(75.0%) : 20.587μm % on Dia.(100.000μm) : 99.8%
Dia. on %(95.0%) : 53.299μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	2.78	79.85	0.669	1.49	11.47
890.1	0.00	100.00	22.80	2.75	77.07	0.584	1.40	9.98
777.1	0.00	100.00	19.90	2.53	74.32	0.510	1.35	8.58
678.5	0.00	100.00	17.38	2.53	71.78	0.445	1.28	7.23
592.4	0.00	100.00	15.17	2.40	69.25	0.389	1.28	5.94
517.2	0.00	100.00	13.25	2.31	66.86	0.339	1.22	4.66
451.6	0.00	100.00	11.56	2.28	64.55	0.296	1.05	3.44
394.2	0.00	100.00	10.10	2.28	62.27	0.259	0.89	2.39
344.2	0.00	100.00	8.816	2.33	59.99	0.226	0.68	1.50
300.5	0.00	100.00	7.697	2.40	57.66	0.197	0.45	0.82
262.4	0.00	100.00	6.720	2.53	55.26	0.172	0.22	0.37
229.1	0.00	100.00	5.867	2.64	52.73	0.150	0.14	0.14
200.0	0.00	100.00	5.122	2.79	50.09	0.131	0.00	0.00
174.6	0.00	100.00	4.472	2.98	47.30	0.115	0.00	0.00
152.5	0.00	100.00	3.905	3.16	44.32	0.100	0.00	0.00
133.1	0.00	100.00	3.409	3.29	41.16	0.087	0.00	0.00
116.2	0.17	100.00	2.976	3.28	37.87	0.076	0.00	0.00
101.5	0.34	99.83	2.599	3.16	34.58	0.067	0.00	0.00
88.58	0.60	99.49	2.269	2.97	31.43	0.058	0.00	0.00
77.34	0.99	98.89	1.981	2.76	28.46	0.051	0.00	0.00
67.52	1.44	97.90	1.729	2.60	25.69	0.044	0.00	0.00
58.95	1.97	96.46	1.510	2.33	23.09	0.039	0.00	0.00
51.47	2.54	94.49	1.318	2.17	20.76	0.034	0.00	0.00
44.94	2.83	91.96	1.151	1.98	18.59	0.029	0.00	0.00
39.23	3.05	89.12	1.005	1.83	16.61	0.026	0.00	0.00
34.25	3.17	86.07	0.877	1.71	14.78	0.022	0.00	0.00
29.91	3.05	82.90	0.766	1.60	13.07			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/20/01
File Name: C104789.DAT Sample Name: S01T001447 ID No: 01/08/16-789
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 87.400 % Lamp: 77.108 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: C-104 Solids Source: S01T001014
Lot No: S01T001447 Test No: 1

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.144	0.10	0.10	(15)	6.632	5.00	55.00
(2)	0.205	0.90	1.00	(16)	8.821	5.00	60.00
(3)	0.255	1.30	2.30	(17)	11.893	5.00	65.00
(4)	0.352	2.70	5.00	(18)	15.822	5.00	70.00
(5)	0.585	5.00	10.00	(19)	20.624	5.00	75.00
(6)	0.893	5.00	15.00	(20)	26.297	5.00	80.00
(7)	0.949	0.80	15.80	(21)	31.691	4.20	84.20
(8)	1.260	4.20	20.00	(22)	32.789	0.80	85.00
(9)	1.671	5.00	25.00	(23)	40.999	5.00	90.00
(10)	2.130	5.00	30.00	(24)	53.395	5.00	95.00
(11)	2.646	5.00	35.00	(25)	66.327	2.70	97.70
(12)	3.257	5.00	40.00	(26)	79.403	1.30	99.00
(13)	4.035	5.00	45.00	(27)	107.590	0.90	99.90
(14)	5.101	5.00	50.00				

Median : 5.100 (μm) Mean: 13.980 (μm) Mode: 3.185 (μm)
Std. Dev.: 18.328 (μm) Span: 6.414
Coef. Var: 131.11% Spec. Area: 35332 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20J Aug/20/'01 07:56

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010816-790 09:22
Filename : C104790
Sample : S01T001447

Material : C-104 Solids
Source : S01T001014
Lot Numbe : S01T001447

Condition
T%(He-Ne): 87.3%
(LAMP): 77.1%
Dist.Form: Std.
R.R.Index: 1.16-0.001
Sampling times : 100
( )

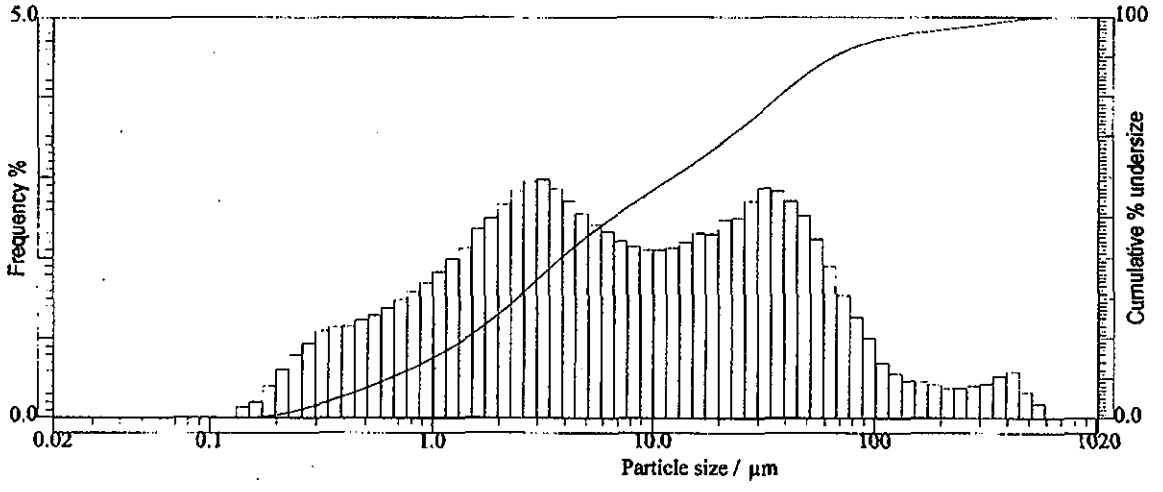
Agitation : 3 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 6.640μm SP.Area : 32039cm²/cm³ S.D. : 67.310μm
Mode : 3.178μm Mean : 29.923μm
C.V. : 224.94%

Span : (D 10.0-D 90.0) / D50 = 9.798

Dia. on %(5.0%) :	0.375μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	1.883μm	% on Dia.(1.000μm) :	15.1%
Dia. on %(50.0%) :	6.640μm	% on Dia.(10.000μm) :	56.5%
Dia. on %(75.0%) :	29.414μm	% on Dia.(100.000μm) :	94.1%
Dia. on %(95.0%) :	119.641μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	2.49	72.62	0.669	1.37	10.36
890.1	0.00	100.00	22.80	2.47	70.14	0.584	1.29	8.99
777.1	0.00	100.00	19.90	2.29	67.67	0.510	1.23	7.70
678.5	0.00	100.00	17.38	2.30	65.38	0.445	1.16	6.47
592.4	0.18	100.00	15.17	2.19	63.08	0.389	1.15	5.31
517.2	0.33	99.82	13.25	2.12	60.88	0.339	1.09	4.16
451.6	0.59	99.49	11.56	2.10	58.76	0.296	0.94	3.07
394.2	0.52	98.91	10.10	2.11	56.67	0.259	0.79	2.13
344.2	0.44	98.38	8.816	2.15	54.56	0.226	0.61	1.34
300.5	0.41	97.95	7.697	2.21	52.41	0.197	0.40	0.73
262.4	0.37	97.54	6.720	2.32	50.20	0.172	0.20	0.33
229.1	0.37	97.17	5.867	2.42	47.88	0.150	0.13	0.13
200.0	0.43	96.80	5.122	2.54	45.47	0.131	0.00	0.00
174.6	0.46	96.37	4.472	2.71	42.93	0.115	0.00	0.00
152.5	0.47	95.91	3.905	2.85	40.22	0.100	0.00	0.00
133.1	0.56	95.44	3.409	2.97	37.36	0.087	0.00	0.00
116.2	0.70	94.88	2.976	2.95	34.39	0.076	0.00	0.00
101.5	1.00	94.18	2.599	2.84	31.44	0.067	0.00	0.00
88.58	1.26	93.18	2.269	2.67	28.60	0.058	0.00	0.00
77.34	1.54	91.92	1.981	2.50	25.93	0.051	0.00	0.00
67.52	1.90	90.38	1.729	2.36	23.44	0.044	0.00	0.00
58.95	2.23	88.48	1.510	2.13	21.07	0.039	0.00	0.00
51.47	2.52	86.25	1.318	1.99	18.94	0.034	0.00	0.00
44.94	2.70	83.73	1.151	1.83	16.95	0.029	0.00	0.00
39.23	2.83	81.02	1.005	1.70	15.12	0.026	0.00	0.00
34.25	2.86	78.19	0.877	1.59	13.42	0.022	0.00	0.00
29.91	2.71	75.33	0.766	1.48	11.84			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/20/01
File Name: C104790.DAT Sample Name: S01T001447 ID No: 01/08/16-790
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 87.302 % Lamp: 77.102 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: C-104 Solids Source: S01T001014
Lot No: S01T001447 Test No: 1

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.146	0.10	0.10	(15)	9.083	5.00	55.00
(2)	0.210	0.90	1.00	(16)	12.545	5.00	60.00
(3)	0.265	1.30	2.30	(17)	17.015	5.00	65.00
(4)	0.375	2.70	5.00	(18)	22.637	5.00	70.00
(5)	0.647	5.00	10.00	(19)	29.442	5.00	75.00
(6)	0.996	5.00	15.00	(20)	37.435	5.00	80.00
(7)	1.059	0.80	15.80	(21)	46.167	4.20	84.20
(8)	1.413	4.20	20.00	(22)	48.238	0.80	85.00
(9)	1.887	5.00	25.00	(23)	65.798	5.00	90.00
(10)	2.431	5.00	30.00	(24)	119.831	5.00	95.00
(11)	3.065	5.00	35.00	(25)	277.471	2.70	97.70
(12)	3.867	5.00	40.00	(26)	403.332	1.30	99.00
(13)	5.003	5.00	45.00	(27)	550.832	0.90	99.90
(14)	6.645	5.00	50.00				

Median : 6.640 (μm) Mean: 29.923 (μm) Mode: 3.185 (μm)
Std. Dev.: 67.310 (μm) Span: 13.589
Coef. Var: 224.95% Spec. Area: 32039 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Aug/20/'01 07:57

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010816-791 10:27
Filename : C104791
Sample : S01T001448

Material : C-104 Solids
Source : S01T001014
Lot Numbe : S01T001448

Condition
T%(He-Ne): 87.9% Dist.Form: Std. Sampling times : 100
(LAMP): 80.6% R.R.index: 1.16-0.001 ( )

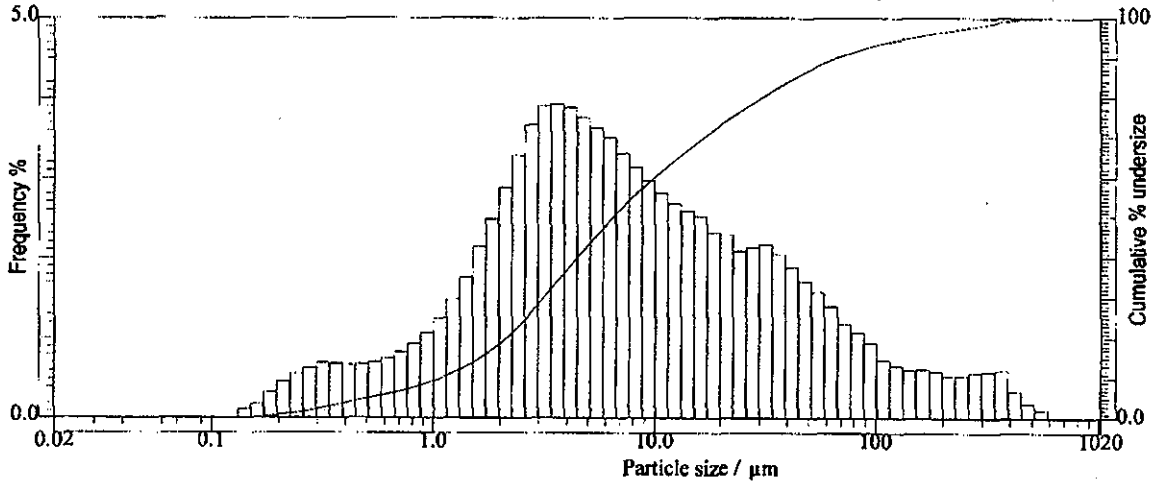
Agitation : 1 Circuitn : 6 U.sonic : OFF(1200)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 6.534μm SP.Area : 24968cm²/cm³ S.D. : 64.383μm
Mode : 3.647μm Mean : 28.588μm
C.V. : 225.21%

Span : (D 10.0-D 90.0) / D50 = 9.964

Dia. on %(5.0%) : 0.512μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 2.647μm % on Dia.(1.000μm) : 9.2%
Dia. on %(50.0%) : 6.534μm % on Dia.(10.000μm) : 59.9%
Dia. on %(75.0%) : 22.446μm % on Dia.(100.000μm) : 93.3%
Dia. on %(95.0%) : 139.936μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	2.08	77.34	0.669	0.75	6.43
890.1	0.00	100.00	22.80	2.28	75.26	0.584	0.70	5.68
777.1	0.00	100.00	19.90	2.31	72.98	0.510	0.68	4.98
678.5	0.00	100.00	17.38	2.51	70.67	0.445	0.66	4.30
592.4	0.10	100.00	15.17	2.58	68.16	0.389	0.69	3.64
517.2	0.19	99.90	13.25	2.67	65.58	0.339	0.69	2.95
451.6	0.33	99.71	11.56	2.80	62.91	0.296	0.63	2.26
394.2	0.60	99.38	10.10	2.96	60.10	0.259	0.56	1.63
344.2	0.58	98.78	8.816	3.13	57.15	0.226	0.46	1.07
300.5	0.57	98.20	7.697	3.30	54.02	0.197	0.32	0.61
262.4	0.53	97.63	6.720	3.50	50.72	0.172	0.17	0.29
229.1	0.53	97.10	5.867	3.63	47.22	0.150	0.12	0.12
200.0	0.58	96.57	5.122	3.75	43.60	0.131	0.00	0.00
174.6	0.61	95.99	4.472	3.87	39.85	0.115	0.00	0.00
152.5	0.60	95.38	3.905	3.92	35.98	0.100	0.00	0.00
133.1	0.65	94.78	3.409	3.90	32.06	0.087	0.00	0.00
116.2	0.73	94.12	2.976	3.66	28.16	0.076	0.00	0.00
101.5	0.94	93.40	2.599	3.28	24.50	0.067	0.00	0.00
88.58	1.07	92.45	2.269	2.87	21.22	0.058	0.00	0.00
77.34	1.18	91.38	1.981	2.47	18.35	0.051	0.00	0.00
67.52	1.39	90.20	1.729	2.14	15.88	0.044	0.00	0.00
58.95	1.57	88.81	1.510	1.75	13.74	0.039	0.00	0.00
51.47	1.71	87.25	1.318	1.49	11.99	0.034	0.00	0.00
44.94	1.88	85.54	1.151	1.25	10.50	0.029	0.00	0.00
39.23	2.04	83.66	1.005	1.07	9.25	0.026	0.00	0.00
34.25	2.16	81.62	0.877	0.93	8.19	0.022	0.00	0.00
29.91	2.12	79.46	0.766	0.83	7.26			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/20/01
File Name: C104791.DAT Sample Name: S01T001448 ID No: 01/08/16-791
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 87.944 % Lamp: 80.609 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: C-104 Solids Source: S01T001014
Lot No: S01T001448 Test No: 2

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.148	0.10	0.10	(15)	8.048	5.00	55.00
(2)	0.221	0.90	1.00	(16)	10.052	5.00	60.00
(3)	0.299	1.30	2.30	(17)	12.880	5.00	65.00
(4)	0.512	2.70	5.00	(18)	16.787	5.00	70.00
(5)	1.092	5.00	10.00	(19)	22.466	5.00	75.00
(6)	1.639	5.00	15.00	(20)	30.999	5.00	80.00
(7)	1.721	0.80	15.80	(21)	40.872	4.20	84.20
(8)	2.146	4.20	20.00	(22)	43.304	0.80	85.00
(9)	2.650	5.00	25.00	(23)	66.270	5.00	90.00
(10)	3.181	5.00	30.00	(24)	140.240	5.00	95.00
(11)	3.781	5.00	35.00	(25)	266.924	2.70	97.70
(12)	4.498	5.00	40.00	(26)	362.764	1.30	99.00
(13)	5.410	5.00	45.00	(27)	519.404	0.90	99.90
(14)	6.544	5.00	50.00				

Median : 6.534 (μm) Mean: 28.588 (μm) Mode: 3.648 (μm)
Std. Dev.: 64.383 (μm) Span: 17.980
Coef. Var: 225.21% Spec. Area: 24968 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20J Aug/20/'01 11:21

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010816-792 10:31
Filename : C104792
Sample : S01T001448

Material : C-104 Solids
Source : S01T001014
Lot Numbe : S01T001448

Condition
T%(He-Ne): 87.7% Dist.Form: Std. Sampling times : 100
(LAMP): 80.4% R.R.Index: 1.16-0.00i ( )

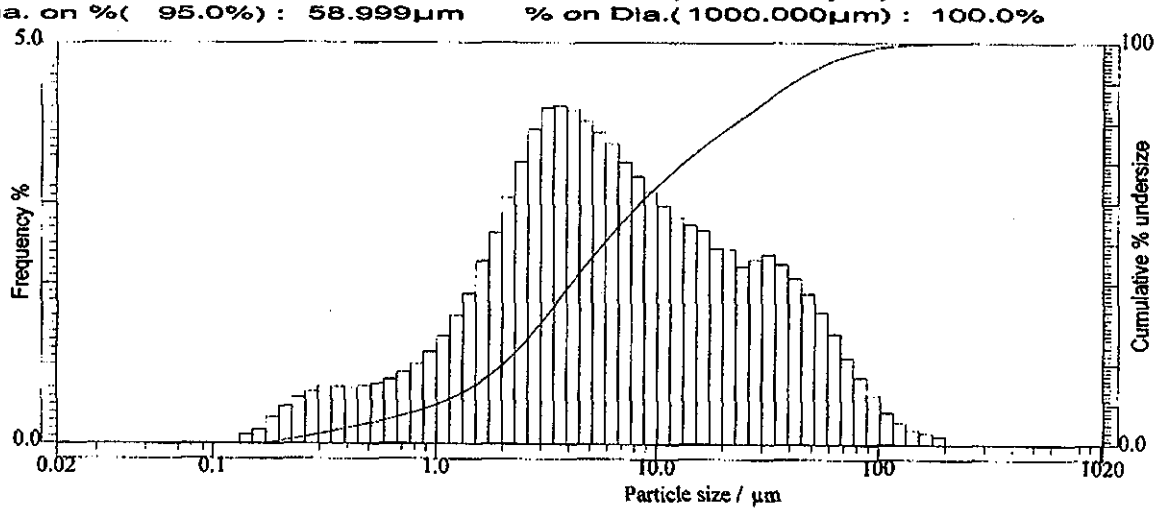
Agitation : 3 Circultn : 6 U.sonic : OFF(1200)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 5.770μm SP.Area : 26326cm²/cm³ S.D. : 21.871μm
Mode : 3.647μm Mean : 14.673μm
C.V. : 149.05%

Span : (D 10.0-D 90.0) / D50 = 6.889

Dia. on %(5.0%) : 0.495μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 2.494μm % on Dia.(1.000μm) : 9.7%
Dia. on %(50.0%) : 5.770μm % on Dia.(10.000μm) : 64.0%
Dia. on %(75.0%) : 17.029μm % on Dia.(100.000μm) : 98.8%
Dia. on %(95.0%) : 58.999μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	2.21	82.49	0.669	0.81	6.71
890.1	0.00	100.00	22.80	2.44	80.28	0.584	0.75	5.91
777.1	0.00	100.00	19.90	2.45	77.84	0.510	0.72	5.16
678.5	0.00	100.00	17.38	2.66	75.40	0.445	0.69	4.44
592.4	0.00	100.00	15.17	2.73	72.74	0.389	0.71	3.74
517.2	0.00	100.00	13.25	2.83	70.00	0.339	0.71	3.03
451.6	0.00	100.00	11.56	2.97	67.18	0.296	0.64	2.32
394.2	0.00	100.00	10.10	3.14	64.21	0.259	0.58	1.67
344.2	0.00	100.00	8.816	3.33	61.07	0.226	0.47	1.09
300.5	0.00	100.00	7.697	3.52	57.74	0.197	0.33	0.62
262.4	0.00	100.00	6.720	3.74	54.22	0.172	0.17	0.29
229.1	0.00	100.00	5.867	3.89	50.48	0.150	0.12	0.12
200.0	0.11	100.00	5.122	4.02	46.59	0.131	0.00	0.00
174.6	0.14	99.89	4.472	4.17	42.57	0.115	0.00	0.00
152.5	0.18	99.75	3.905	4.22	38.40	0.100	0.00	0.00
133.1	0.27	99.57	3.409	4.19	34.18	0.087	0.00	0.00
116.2	0.40	99.29	2.976	3.93	29.99	0.076	0.00	0.00
101.5	0.62	98.89	2.599	3.52	26.06	0.067	0.00	0.00
88.58	0.84	98.27	2.269	3.07	22.55	0.058	0.00	0.00
77.34	1.08	97.44	1.981	2.64	19.48	0.051	0.00	0.00
67.52	1.37	96.36	1.729	2.28	16.84	0.044	0.00	0.00
58.95	1.64	94.99	1.510	1.87	14.56	0.039	0.00	0.00
51.47	1.88	93.36	1.318	1.59	12.69	0.034	0.00	0.00
44.94	2.07	91.48	1.151	1.34	11.10	0.029	0.00	0.00
39.23	2.25	89.41	1.005	1.15	9.76	0.026	0.00	0.00
34.25	2.37	87.17	0.877	1.00	8.61	0.022	0.00	0.00
29.91	2.30	84.80	0.766	0.89	7.61			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/20/01
File Name: C104792.DAT Sample Name: S01T001448 ID No: 01/08/16-792
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 87.708 % Lamp: 80.391 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: C-104 Solids Source: S01T001014
Lot No: S01T001448 Test No: 2

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.147	0.10	0.10	(15)	6.936	5.00	55.00
(2)	0.220	0.90	1.00	(16)	8.457	5.00	60.00
(3)	0.295	1.30	2.30	(17)	10.488	5.00	65.00
(4)	0.495	2.70	5.00	(18)	13.243	5.00	70.00
(5)	1.031	5.00	10.00	(19)	17.049	5.00	75.00
(6)	1.552	5.00	15.00	(20)	22.465	5.00	80.00
(7)	1.629	0.80	15.80	(21)	28.924	4.20	84.20
(8)	2.030	4.20	20.00	(22)	30.280	0.80	85.00
(9)	2.499	5.00	25.00	(23)	40.854	5.00	90.00
(10)	2.978	5.00	30.00	(24)	59.002	5.00	95.00
(11)	3.505	5.00	35.00	(25)	80.873	2.70	97.70
(12)	4.122	5.00	40.00	(26)	105.497	1.30	99.00
(13)	4.865	5.00	45.00	(27)	175.927	0.90	99.90
(14)	5.775	5.00	50.00				

Median : 5.770 (μm) Mean: 14.673 (μm) Mode: 3.648 (μm)
Std. Dev.: 21.871 (μm) Span: 7.274
Coef. Var: 149.05% Spec. Area: 26326 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Aug/20/'01 11:21

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010816-793 10:55
Filename : C104793
Sample : S01T001448

Material : C-104 Solids
Source : S01T001014
Lot Numbe : S01T001448

Condition
T%(He-Ne): 89.8%
(LAMP): 80.0%

Dist.Form: Std.
R.R.Index: 1.16-0.00i

Sampling times : 100
( )

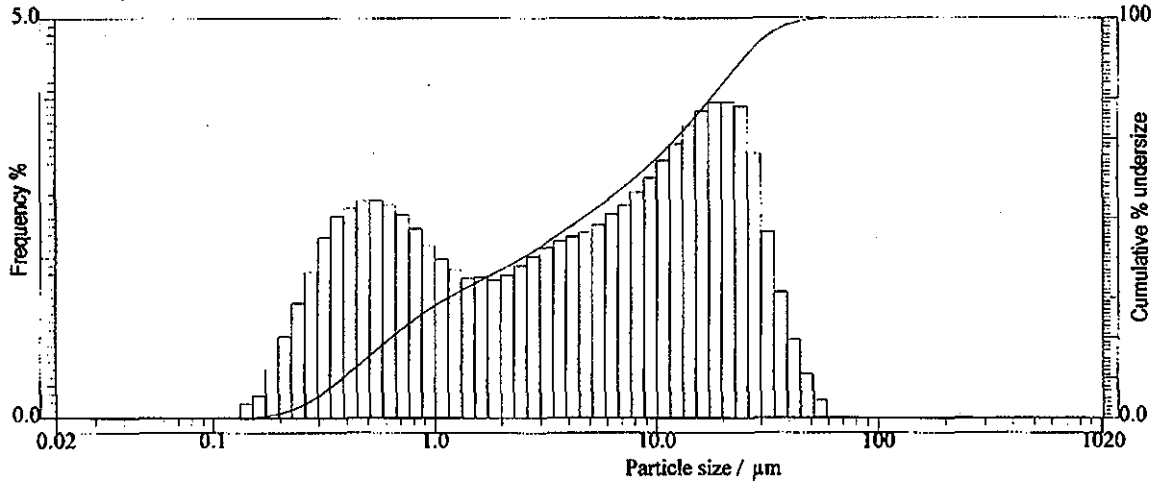
Agitation : 1 Circultn : 6 U.sonic : ON(1200)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 4.663μm SP.Area : 49664cm²/cm³ S.D. : 10.629μm
Mode : 21.283μm Mean : 9.253μm
C.V. : 114.86%

Span : (D 10.0-D 90.0) / D50 = 5.317

Dia. on %(5.0%) :	0.289μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	0.840μm	% on Dia.(1.000μm) :	27.8%
Dia. on %(50.0%) :	4.663μm	% on Dia.(10.000μm) :	64.9%
Dia. on %(75.0%) :	14.944μm	% on Dia.(100.000μm) :	100.0%
Dia. on %(95.0%) :	31.053μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	3.90	91.05	0.669	2.67	20.86
890.1	0.00	100.00	22.80	3.95	87.15	0.584	2.73	18.19
777.1	0.00	100.00	19.90	3.95	83.19	0.510	2.72	15.47
678.5	0.00	100.00	17.38	3.84	79.25	0.445	2.63	12.74
592.4	0.00	100.00	15.17	3.66	75.41	0.389	2.53	10.12
517.2	0.00	100.00	13.25	3.44	71.75	0.339	2.26	7.59
451.6	0.00	100.00	11.56	3.23	68.31	0.296	1.82	5.33
394.2	0.00	100.00	10.10	3.02	65.08	0.259	1.42	3.51
344.2	0.00	100.00	8.816	2.83	62.06	0.226	1.01	2.09
300.5	0.00	100.00	7.697	2.66	59.23	0.197	0.61	1.07
262.4	0.00	100.00	6.720	2.55	56.57	0.172	0.28	0.46
229.1	0.00	100.00	5.867	2.41	54.02	0.150	0.18	0.18
200.0	0.00	100.00	5.122	2.32	51.60	0.131	0.00	0.00
174.6	0.00	100.00	4.472	2.27	49.29	0.115	0.00	0.00
152.5	0.00	100.00	3.905	2.21	47.02	0.100	0.00	0.00
133.1	0.00	100.00	3.409	2.13	44.82	0.087	0.00	0.00
116.2	0.00	100.00	2.976	2.01	42.69	0.076	0.00	0.00
101.5	0.00	100.00	2.599	1.90	40.67	0.067	0.00	0.00
88.58	0.00	100.00	2.269	1.78	38.77	0.058	0.00	0.00
77.34	0.00	100.00	1.981	1.72	36.99	0.051	0.00	0.00
67.52	0.00	100.00	1.729	1.76	35.26	0.044	0.00	0.00
58.95	0.22	100.00	1.510	1.74	33.50	0.039	0.00	0.00
51.47	0.55	99.78	1.318	1.86	31.76	0.034	0.00	0.00
44.94	0.98	99.23	1.151	1.98	29.91	0.029	0.00	0.00
39.23	1.56	98.25	1.005	2.16	27.92	0.026	0.00	0.00
34.25	2.33	96.68	0.877	2.36	25.76	0.022	0.00	0.00
29.91	3.31	94.36	0.766	2.54	23.40			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/20/01
File Name: C104793.DAT Sample Name: S01T001448 ID No: 01/08/16-793
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 89.774 % Lamp: 79.981 %
Circulation: 6 Agitation: 1 U.Sonic ** (min)
Material: C-104 Solids Source: S01T001014
Lot No: S01T001448 Test No: 2

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.142	0.10	0.10	(15)	6.195	5.00	55.00
(2)	0.194	0.90	1.00	(16)	8.000	5.00	60.00
(3)	0.231	1.30	2.30	(17)	10.063	5.00	65.00
(4)	0.289	2.70	5.00	(18)	12.393	5.00	70.00
(5)	0.386	5.00	10.00	(19)	14.957	5.00	75.00
(6)	0.499	5.00	15.00	(20)	17.860	5.00	80.00
(7)	0.519	0.80	15.80	(21)	20.640	4.20	84.20
(8)	0.641	4.20	20.00	(22)	21.225	0.80	85.00
(9)	0.841	5.00	25.00	(23)	25.222	5.00	90.00
(10)	1.159	5.00	30.00	(24)	31.111	5.00	95.00
(11)	1.697	5.00	35.00	(25)	37.494	2.70	97.70
(12)	2.482	5.00	40.00	(26)	43.626	1.30	99.00
(13)	3.450	5.00	45.00	(27)	55.627	0.90	99.90
(14)	4.672	5.00	50.00				

Median : 4.663 (μm) Mean: 9.253 (μm) Mode: 21.301 (μm)
Std. Dev.: 10.629 (μm) Span: 3.455
Coef. Var: 114.86% Spec. Area: 49664 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20J Aug/20/'01 11:21

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010816-794 10:58
Filename : C104794
Sample : S01T001448

Material : C-104 Solids
Source : S01T001014
Lot Numbe : S01T001448

Condition
T%(He-Ne): 88.8% Dist.Form: Std. Sampling times : 100
(LAMP): 79.4% R.R.Index: 1.16-0.00i ( )

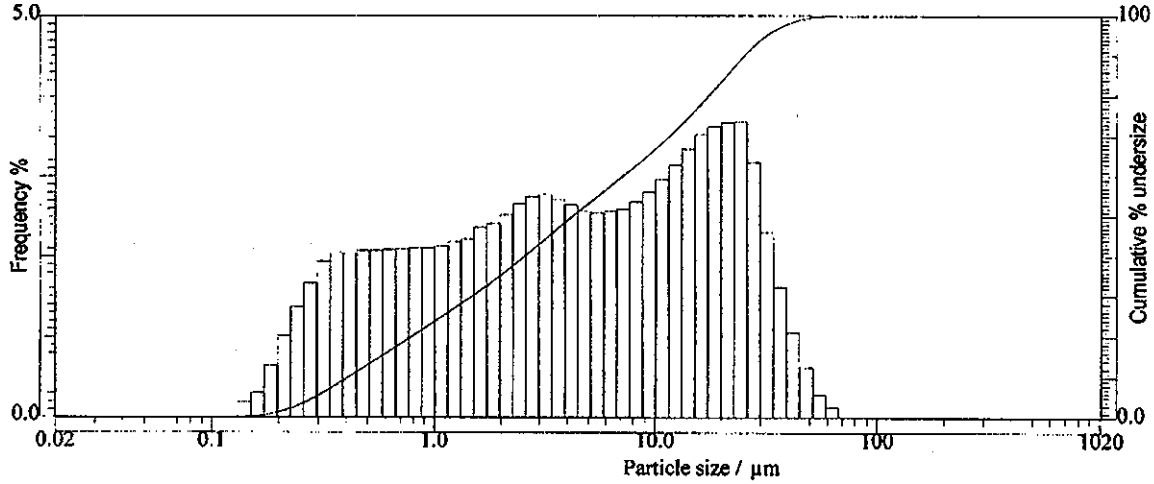
Agitation : 3 Circultn : 6 U.sonic : OFF(1200)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 4.230μm SP.Area : 46124cm²/cm³ S.D. : 10.863μm
Mode : 24.172μm Mean : 9.184μm
C.V. : 118.29%

Span : (D 10.0-D 90.0) / D50 = 5.894

Dia. on %(5.0%) : 0.291μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 1.090μm % on Dia.(1.000μm) : 23.6%
Dia. on %(50.0%) : 4.230μm % on Dia.(10.000μm) : 66.7%
Dia. on %(75.0%) : 14.390μm % on Dia.(100.000μm) : 100.0%
Dia. on %(95.0%) : 31.755μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	3.68	90.81	0.669	2.08	17.42
890.1	0.00	100.00	22.80	3.67	87.13	0.584	2.07	15.34
777.1	0.00	100.00	19.90	3.63	83.45	0.510	2.07	13.27
678.5	0.00	100.00	17.38	3.52	79.82	0.445	2.03	11.21
592.4	0.00	100.00	15.17	3.35	76.30	0.389	2.04	9.18
517.2	0.00	100.00	13.25	3.14	72.96	0.339	1.94	7.13
451.6	0.00	100.00	11.56	2.96	69.82	0.296	1.66	5.20
394.2	0.00	100.00	10.10	2.81	66.85	0.259	1.37	3.54
344.2	0.00	100.00	8.816	2.69	64.05	0.226	1.02	2.16
300.5	0.00	100.00	7.697	2.59	61.36	0.197	0.65	1.15
262.4	0.00	100.00	6.720	2.57	58.76	0.172	0.31	0.50
229.1	0.00	100.00	5.867	2.54	56.19	0.150	0.19	0.19
200.0	0.00	100.00	5.122	2.56	53.65	0.131	0.00	0.00
174.6	0.00	100.00	4.472	2.64	51.08	0.115	0.00	0.00
152.5	0.00	100.00	3.905	2.72	48.44	0.100	0.00	0.00
133.1	0.00	100.00	3.409	2.78	45.72	0.087	0.00	0.00
116.2	0.00	100.00	2.976	2.74	42.94	0.076	0.00	0.00
101.5	0.00	100.00	2.599	2.66	40.20	0.067	0.00	0.00
88.58	0.00	100.00	2.269	2.53	37.54	0.058	0.00	0.00
77.34	0.00	100.00	1.981	2.41	35.02	0.051	0.00	0.00
67.52	0.13	100.00	1.729	2.36	32.60	0.044	0.00	0.00
58.95	0.29	99.87	1.510	2.21	30.24	0.039	0.00	0.00
51.47	0.63	99.58	1.318	2.18	28.02	0.034	0.00	0.00
44.94	1.06	98.96	1.151	2.12	25.85	0.029	0.00	0.00
39.23	1.62	97.90	1.005	2.10	23.72	0.026	0.00	0.00
34.25	2.31	96.29	0.877	2.10	21.62	0.022	0.00	0.00
29.91	3.17	93.98	0.766	2.10	19.52			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/20/01
File Name: C104794.DAT Sample Name: S01T001448 ID No: 01/08/16-794
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 88.758 % Lamp: 79.424 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: C-104 Solids Source: S01T001014
Lot No: S01T001448 Test No: 2

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.141	0.10	0.10	(15)	5.518	5.00	55.00
(2)	0.191	0.90	1.00	(16)	7.185	5.00	60.00
(3)	0.229	1.30	2.30	(17)	9.252	5.00	65.00
(4)	0.292	2.70	5.00	(18)	11.664	5.00	70.00
(5)	0.411	5.00	10.00	(19)	14.421	5.00	75.00
(6)	0.572	5.00	15.00	(20)	17.499	5.00	80.00
(7)	0.603	0.80	15.80	(21)	20.490	4.20	84.20
(8)	0.791	4.20	20.00	(22)	21.120	0.80	85.00
(9)	1.093	5.00	25.00	(23)	25.381	5.00	90.00
(10)	1.489	5.00	30.00	(24)	31.828	5.00	95.00
(11)	1.979	5.00	35.00	(25)	38.606	2.70	97.70
(12)	2.574	5.00	40.00	(26)	45.363	1.30	99.00
(13)	3.297	5.00	45.00	(27)	60.790	0.90	99.90
(14)	4.240	5.00	50.00				

Median : 4.230 (μm) Mean: 9.184 (μm) Mode: 24.398 (μm)
Std. Dev.: 10.863 (μm) Span: 4.105
Coef. Var: 118.29% Spec. Area: 46124 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Aug/20/'01 11:28

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010816-800 12:02 Material : C-104 Solids
Filename : C104800 Source : S01T001014
Sample : S01T001448 Lot Numbe : S01T001448

Condition
T%(He-Ne): 89.5% Dist.Form: Std. Sampling times : 100
(LAMP): 80.2% R.R.Index: 1.16-0.00i ( )

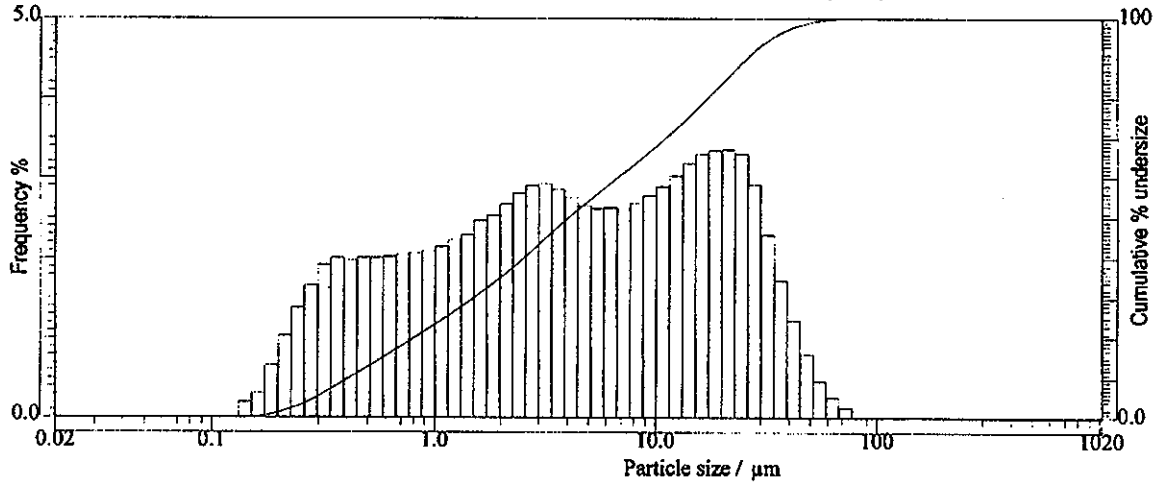
Agitation : 1 Circultn : 6 U.sonic : OFF(1200)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 4.073μm SP.Area : 46045cm²/cm³ S.D. : 11.546μm
Mode : 21.283μm Mean : 9.303μm
C.V. : 124.10%

Span : (D 10.0-D 90.0) / D50 = 6.253

Dia. on %(5.0%) : 0.291μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 1.115μm % on Dia.(1.000μm) : 23.3%
Dia. on %(50.0%) : 4.073μm % on Dia.(10.000μm) : 67.7%
Dia. on %(75.0%) : 13.966μm % on Dia.(100.000μm) : 100.0%
Dia. on %(95.0%) : 33.436μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	3.29	90.21	0.669	2.02	17.15
890.1	0.00	100.00	22.80	3.35	86.92	0.584	2.00	15.13
777.1	0.00	100.00	19.90	3.33	83.57	0.510	2.01	13.13
678.5	0.00	100.00	17.38	3.30	80.23	0.445	1.98	11.12
592.4	0.00	100.00	15.17	3.17	76.94	0.389	2.00	9.15
517.2	0.00	100.00	13.25	3.02	73.76	0.339	1.92	7.14
451.6	0.00	100.00	11.56	2.89	70.74	0.296	1.66	5.22
394.2	0.00	100.00	10.10	2.77	67.85	0.259	1.38	3.57
344.2	0.00	100.00	8.816	2.68	65.08	0.226	1.03	2.19
300.5	0.00	100.00	7.697	2.62	62.40	0.197	0.66	1.16
262.4	0.00	100.00	6.720	2.62	59.78	0.172	0.31	0.51
229.1	0.00	100.00	5.867	2.61	57.16	0.150	0.19	0.19
200.0	0.00	100.00	5.122	2.65	54.55	0.131	0.00	0.00
174.6	0.00	100.00	4.472	2.75	51.89	0.115	0.00	0.00
152.5	0.00	100.00	3.905	2.85	49.14	0.100	0.00	0.00
133.1	0.00	100.00	3.409	2.92	46.30	0.087	0.00	0.00
116.2	0.00	100.00	2.976	2.90	43.37	0.076	0.00	0.00
101.5	0.00	100.00	2.599	2.81	40.48	0.067	0.00	0.00
88.58	0.00	100.00	2.269	2.67	37.67	0.058	0.00	0.00
77.34	0.13	100.00	1.981	2.54	35.01	0.051	0.00	0.00
67.52	0.26	99.87	1.729	2.46	32.47	0.044	0.00	0.00
58.95	0.46	99.61	1.510	2.29	30.01	0.039	0.00	0.00
51.47	0.80	99.15	1.318	2.22	27.72	0.034	0.00	0.00
44.94	1.22	98.35	1.151	2.14	25.50	0.029	0.00	0.00
39.23	1.72	97.13	1.005	2.09	23.36	0.026	0.00	0.00
34.25	2.28	95.41	0.877	2.07	21.27	0.022	0.00	0.00
29.91	2.91	93.12	0.766	2.05	19.20			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/20/01
File Name: C104800.DAT Sample Name: S01T001448 ID No: 01/08/16-800
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 89.509 % Lamp: 80.153 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: C-104 Solids Source: S01T001014
Lot No: S01T001448 Test No: 2

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.141	0.10	0.10	(15)	5.252	5.00	55.00
(2)	0.191	0.90	1.00	(16)	6.802	5.00	60.00
(3)	0.228	1.30	2.30	(17)	8.782	5.00	65.00
(4)	0.291	2.70	5.00	(18)	11.188	5.00	70.00
(5)	0.413	5.00	10.00	(19)	13.997	5.00	75.00
(6)	0.579	5.00	15.00	(20)	17.222	5.00	80.00
(7)	0.612	0.80	15.80	(21)	20.449	4.20	84.20
(8)	0.809	4.20	20.00	(22)	21.140	0.80	85.00
(9)	1.117	5.00	25.00	(23)	25.898	5.00	90.00
(10)	1.509	5.00	30.00	(24)	33.480	5.00	95.00
(11)	1.980	5.00	35.00	(25)	41.913	2.70	97.70
(12)	2.542	5.00	40.00	(26)	50.245	1.30	99.00
(13)	3.217	5.00	45.00	(27)	69.757	0.90	99.90
(14)	4.082	5.00	50.00				

Median : 4.073 (μm) Mean: 9.303 (μm) Mode: 21.301 (μm)
Std. Dev.: 11.546 (μm) Span: 4.780
Coef. Var: 124.10% Spec. Area: 46045 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Aug/20/'01 11:23

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010816-801 12:05
Filename : C104801
Sample : S01T001448

Material : C-104 Solids
Source : S01T001014
Lot Numbe : S01T001448

Condition
T%(He-Ne): 89.6%
(LAMP): 80.5%

Dist.Form: Std.
R.R.Index: 1.16-0.00i

Sampling times : 100
( )

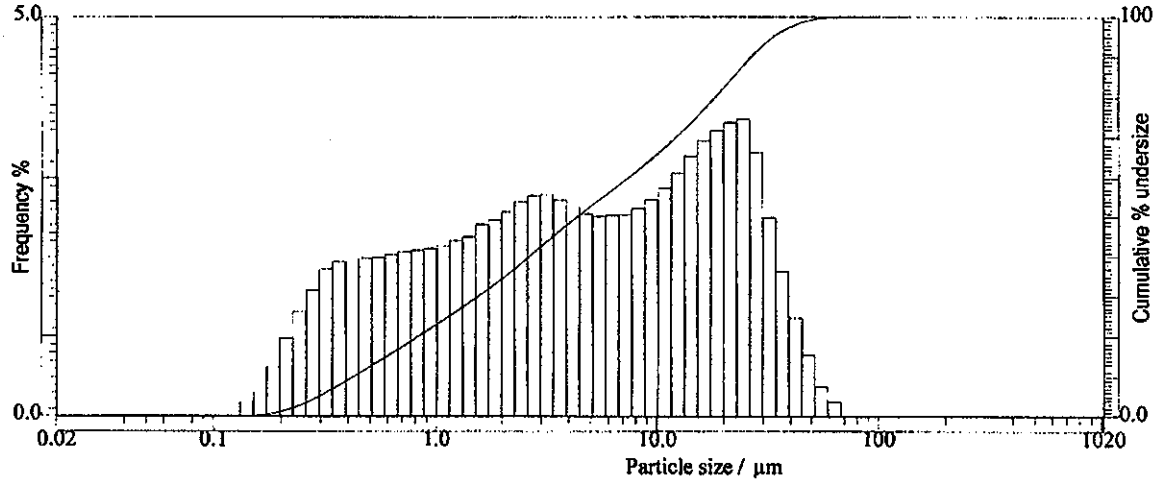
Agitation : 3
Circultn : 6
U.sonic : OFF(1200)

Format
Dist.base : Volume
Scaling : Auto
Axis : LogX - LinearY

Data
Median : 4.335μm
SP.Area : 44835cm²/cm³
S.D. : 11.335μm
Mode : 24.234μm
Mean : 9.554μm
C.V. : 118.65%

Span : (D 10.0-D 90.0) / D50 = 5.981

Dia. on %(5.0%) :	0.297μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	1.146μm	% on Dia.(1.000μm) :	22.8%
Dia. on %(50.0%) :	4.335μm	% on Dia.(10.000μm) :	65.9%
Dia. on %(75.0%) :	14.993μm	% on Dia.(100.000μm) :	100.0%
Dia. on %(95.0%) :	33.159μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	3.74	89.78	0.669	2.02	16.68
890.1	0.00	100.00	22.80	3.69	86.04	0.584	1.99	14.65
777.1	0.00	100.00	19.90	3.59	82.35	0.510	1.98	12.66
678.5	0.00	100.00	17.38	3.47	78.76	0.445	1.93	10.68
592.4	0.00	100.00	15.17	3.28	75.29	0.389	1.94	8.75
517.2	0.00	100.00	13.25	3.06	72.01	0.339	1.84	6.81
451.6	0.00	100.00	11.56	2.88	68.95	0.296	1.58	4.97
394.2	0.00	100.00	10.10	2.73	66.07	0.259	1.31	3.39
344.2	0.00	100.00	8.816	2.62	63.33	0.226	0.98	2.08
300.5	0.00	100.00	7.697	2.54	60.72	0.197	0.62	1.11
262.4	0.00	100.00	6.720	2.53	58.18	0.172	0.30	0.48
229.1	0.00	100.00	5.867	2.51	55.65	0.150	0.19	0.19
200.0	0.00	100.00	5.122	2.54	53.14	0.131	0.00	0.00
174.6	0.00	100.00	4.472	2.63	50.60	0.115	0.00	0.00
152.5	0.00	100.00	3.905	2.72	47.97	0.100	0.00	0.00
133.1	0.00	100.00	3.409	2.80	45.25	0.087	0.00	0.00
116.2	0.00	100.00	2.976	2.78	42.45	0.076	0.00	0.00
101.5	0.00	100.00	2.599	2.70	39.67	0.067	0.00	0.00
88.58	0.00	100.00	2.269	2.57	36.97	0.058	0.00	0.00
77.34	0.00	100.00	1.981	2.46	34.40	0.051	0.00	0.00
67.52	0.19	100.00	1.729	2.41	31.94	0.044	0.00	0.00
58.95	0.39	99.81	1.510	2.25	29.53	0.039	0.00	0.00
51.47	0.77	99.43	1.318	2.21	27.27	0.034	0.00	0.00
44.94	1.24	98.66	1.151	2.14	25.07	0.029	0.00	0.00
39.23	1.82	97.42	1.005	2.10	22.92	0.026	0.00	0.00
34.25	2.50	95.60	0.877	2.08	20.82	0.022	0.00	0.00
29.91	3.32	93.10	0.766	2.06	18.74			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/20/01
File Name: C104801.DAT Sample Name: S01T001448 ID No: 01/08/16-801
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 89.592 % Lamp: 80.470 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: C-104 Solids Source: S01T001014
Lot No: S01T001448 Test No: 2

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.141	0.10	0.10	(15)	5.673	5.00	55.00
(2)	0.193	0.90	1.00	(16)	7.421	5.00	60.00
(3)	0.231	1.30	2.30	(17)	9.597	5.00	65.00
(4)	0.297	2.70	5.00	(18)	12.142	5.00	70.00
(5)	0.425	5.00	10.00	(19)	15.003	5.00	75.00
(6)	0.598	5.00	15.00	(20)	18.253	5.00	80.00
(7)	0.632	0.80	15.80	(21)	21.356	4.20	84.20
(8)	0.833	4.20	20.00	(22)	21.983	0.80	85.00
(9)	1.146	5.00	25.00	(23)	26.368	5.00	90.00
(10)	1.553	5.00	30.00	(24)	33.213	5.00	95.00
(11)	2.048	5.00	35.00	(25)	40.521	2.70	97.70
(12)	2.643	5.00	40.00	(26)	47.833	1.30	99.00
(13)	3.371	5.00	45.00	(27)	62.926	0.90	99.90
(14)	4.342	5.00	50.00				

Median : 4.335 (μm) Mean: 9.554 (μm) Mode: 24.398 (μm)
Std. Dev.: 11.335 (μm) Span: 4.190
Coef. Var: 118.65% Spec. Area: 44835 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Aug/20/'01 11:31

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010816-802 12:32 Material : C-104 Solids
Filename : C104802 Source : S01T001014
Sample : S01T001449 Lot Numbe : S01T001449

Condition
T%(He-Ne): 81.5% Dist.Form: Std. Sampling times : 100
(LAMP): 70.9% R.R.Index: 1.16-0.00i ( )

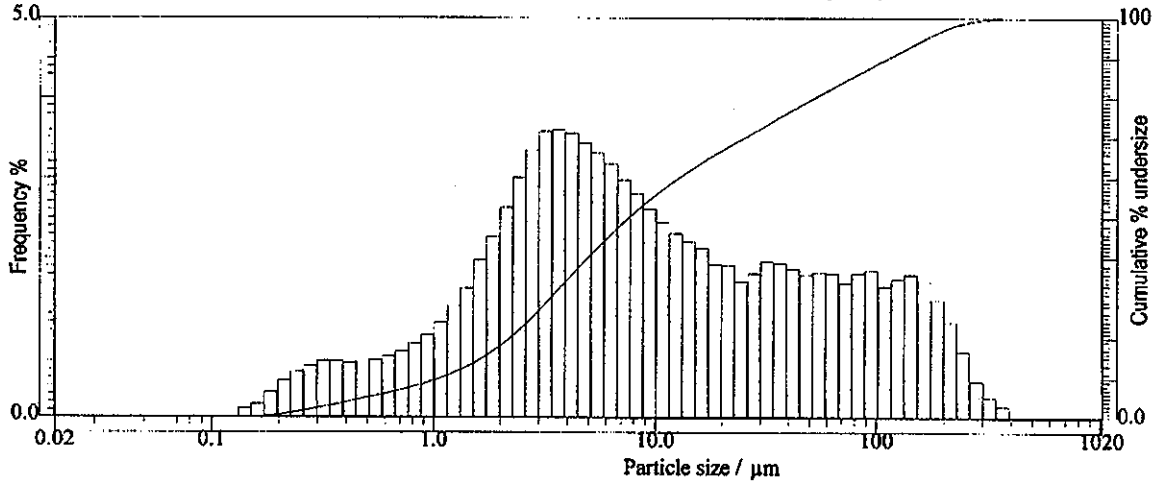
Agitation : 3 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 7.563μm SP.Area : 24198cm²/cm³ S.D. : 56.602μm
Mode : 3.647μm Mean : 33.756μm
C.V. : 167.68%

Span : (D 10.0-D 90.0) / D50 = 14.698

Dia. on %(5.0%) : 0.505μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 2.772μm % on Dia.(1.000μm) : 9.3%
Dia. on %(50.0%) : 7.563μm % on Dia.(10.000μm) : 55.6%
Dia. on %(75.0%) : 36.256μm % on Dia.(100.000μm) : 88.6%
Dia. on %(95.0%) : 165.725μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.71	70.42	0.669	0.76	6.53
890.1	0.00	100.00	22.80	1.91	68.71	0.584	0.72	5.77
777.1	0.00	100.00	19.90	1.93	66.80	0.510	0.70	5.05
678.5	0.00	100.00	17.38	2.13	64.87	0.445	0.68	4.35
592.4	0.00	100.00	15.17	2.20	62.74	0.389	0.71	3.67
517.2	0.00	100.00	13.25	2.30	60.54	0.339	0.70	2.96
451.6	0.00	100.00	11.56	2.45	58.24	0.296	0.64	2.26
394.2	0.14	100.00	10.10	2.61	55.79	0.259	0.57	1.62
344.2	0.25	99.86	8.816	2.80	53.18	0.226	0.46	1.05
300.5	0.46	99.61	7.697	2.97	50.38	0.197	0.32	0.59
262.4	0.82	99.15	6.720	3.18	47.41	0.172	0.16	0.28
229.1	1.20	98.33	5.867	3.31	44.23	0.150	0.11	0.11
200.0	1.47	97.13	5.122	3.44	40.92	0.131	0.00	0.00
174.6	1.71	95.66	4.472	3.56	37.48	0.115	0.00	0.00
152.5	1.79	93.95	3.905	3.60	33.93	0.100	0.00	0.00
133.1	1.73	92.16	3.409	3.58	30.33	0.087	0.00	0.00
116.2	1.65	90.42	2.976	3.35	26.75	0.076	0.00	0.00
101.5	1.84	88.78	2.599	3.00	23.40	0.067	0.00	0.00
88.58	1.82	86.93	2.269	2.63	20.40	0.058	0.00	0.00
77.34	1.69	85.12	1.981	2.27	17.78	0.051	0.00	0.00
67.52	1.81	83.42	1.729	1.97	15.51	0.044	0.00	0.00
58.95	1.83	81.62	1.510	1.63	13.54	0.039	0.00	0.00
51.47	1.80	79.79	1.318	1.40	11.91	0.034	0.00	0.00
44.94	1.86	77.99	1.151	1.19	10.51	0.029	0.00	0.00
39.23	1.94	76.13	1.005	1.04	9.32	0.026	0.00	0.00
34.25	1.96	74.19	0.877	0.92	8.28	0.022	0.00	0.00
29.91	1.81	72.23	0.766	0.83	7.36			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/20/01
File Name: C104802.DAT Sample Name: S01T001449 ID No: 01/08/16-802
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 81.542 % Lamp: 70.921 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: C-104 Solids Source: S01T001014
Lot No: S01T001449 Test No: 3

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.148	0.10	0.10	(15)	9.707	5.00	55.00
(2)	0.223	0.90	1.00	(16)	12.849	5.00	60.00
(3)	0.299	1.30	2.30	(17)	17.547	5.00	65.00
(4)	0.505	2.70	5.00	(18)	25.298	5.00	70.00
(5)	1.089	5.00	10.00	(19)	36.338	5.00	75.00
(6)	1.672	5.00	15.00	(20)	52.342	5.00	80.00
(7)	1.761	0.80	15.80	(21)	72.023	4.20	84.20
(8)	2.224	4.20	20.00	(22)	76.666	0.80	85.00
(9)	2.779	5.00	25.00	(23)	112.434	5.00	90.00
(10)	3.370	5.00	30.00	(24)	166.083	5.00	95.00
(11)	4.076	5.00	35.00	(25)	213.792	2.70	97.70
(12)	4.948	5.00	40.00	(26)	256.237	1.30	99.00
(13)	6.073	5.00	45.00	(27)	358.646	0.90	99.90
(14)	7.570	5.00	50.00				

Median : 7.563 (μm) Mean: 33.756 (μm) Mode: 3.648 (μm)
Std. Dev.: 56.602 (μm) Span: 17.120
Coef. Var: 167.68% Spec. Area: 24199 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Aug/20/'01 11:31

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010816-803 12:35
Filename : C104803
Sample : S01T001449

Material : C-104 Solids
Source : S01T001014
Lot Numbe : S01T001449

Condition
T%(He-Ne): 81.2% Dist.Form: Std. Sampling times : 100
(LAMP): 70.7% R.R.Index: 1.16-0.00i ( )

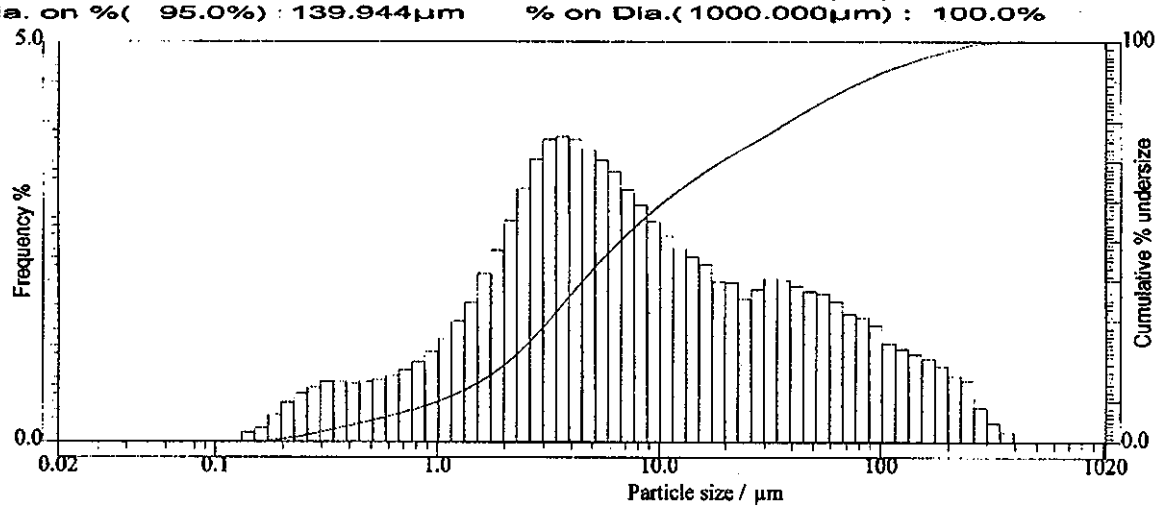
Agitation : 1 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 6.643μm SP.Area : 25610cm²/cm³ S.D. : 50.808μm
Mode : 3.648μm Mean : 27.897μm
C.V. : 182.13%

Span : (D 10.0-D 90.0) / D50 = 12.300

Dia. on %(5.0%) : 0.479μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 2.616μm % on Dia.(1.000μm) : 9.9%
Dia. on %(50.0%) : 6.643μm % on Dia.(10.000μm) : 58.9%
Dia. on %(75.0%) : 27.369μm % on Dia.(100.000μm) : 92.1%
Dia. on %(95.0%) : 139.944μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.77	74.35	0.669	0.82	6.92
890.1	0.00	100.00	22.80	1.98	72.57	0.584	0.77	6.11
777.1	0.00	100.00	19.90	1.99	70.60	0.510	0.75	5.34
678.5	0.00	100.00	17.38	2.21	68.61	0.445	0.72	4.59
592.4	0.00	100.00	15.17	2.29	66.40	0.389	0.75	3.87
517.2	0.00	100.00	13.25	2.40	64.11	0.339	0.74	3.12
451.6	0.00	100.00	11.56	2.57	61.70	0.296	0.67	2.38
394.2	0.13	100.00	10.10	2.75	59.14	0.259	0.60	1.71
344.2	0.23	99.87	8.816	2.95	56.39	0.226	0.48	1.11
300.5	0.42	99.64	7.697	3.15	53.43	0.197	0.34	0.63
262.4	0.76	99.22	6.720	3.38	50.28	0.172	0.17	0.29
229.1	0.82	98.46	5.867	3.52	46.91	0.150	0.12	0.12
200.0	0.93	97.64	5.122	3.65	43.39	0.131	0.00	0.00
174.6	1.03	96.71	4.472	3.78	39.73	0.115	0.00	0.00
152.5	1.08	95.68	3.905	3.82	35.95	0.100	0.00	0.00
133.1	1.15	94.60	3.409	3.78	32.14	0.087	0.00	0.00
116.2	1.22	93.45	2.976	3.53	28.36	0.076	0.00	0.00
101.5	1.45	92.23	2.599	3.16	24.82	0.067	0.00	0.00
88.58	1.55	90.78	2.269	2.77	21.66	0.058	0.00	0.00
77.34	1.59	89.23	1.981	2.39	18.89	0.051	0.00	0.00
67.52	1.75	87.64	1.729	2.09	16.50	0.044	0.00	0.00
58.95	1.83	85.90	1.510	1.73	14.42	0.039	0.00	0.00
51.47	1.87	84.07	1.318	1.49	12.69	0.034	0.00	0.00
44.94	1.93	82.20	1.151	1.28	11.19	0.029	0.00	0.00
39.23	2.00	80.26	1.005	1.11	9.92	0.026	0.00	0.00
34.25	2.03	78.26	0.877	0.99	8.81	0.022	0.00	0.00
29.91	1.89	76.23	0.766	0.89	7.82			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/20/01
File Name: C104803.DAT Sample Name: S01T001449 ID No: 01/08/16-803
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 81.223 % Lamp: 70.671 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: C-104 Solids Source: S01T001014
Lot No: S01T001449 Test No: 3

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.147	0.10	0.10	(15)	8.290	5.00	55.00
(2)	0.219	0.90	1.00	(16)	10.590	5.00	60.00
(3)	0.292	1.30	2.30	(17)	13.995	5.00	65.00
(4)	0.480	2.70	5.00	(18)	19.146	5.00	70.00
(5)	1.014	5.00	10.00	(19)	27.427	5.00	75.00
(6)	1.571	5.00	15.00	(20)	38.579	5.00	80.00
(7)	1.655	0.80	15.80	(21)	52.019	4.20	84.20
(8)	2.096	4.20	20.00	(22)	55.287	0.80	85.00
(9)	2.617	5.00	25.00	(23)	82.920	5.00	90.00
(10)	3.164	5.00	30.00	(24)	140.247	5.00	95.00
(11)	3.781	5.00	35.00	(25)	202.123	2.70	97.70
(12)	4.520	5.00	40.00	(26)	252.926	1.30	99.00
(13)	5.464	5.00	45.00	(27)	355.737	0.90	99.90
(14)	6.648	5.00	50.00				

Median : 6.643 (μm) Mean: 27.897 (μm) Mode: 3.648 (μm)
Std. Dev.: 50.808 (μm) Span: 16.945
Coef. Var: 182.13% Spec. Area: 25610 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20J Aug/20/'01 11:31

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010816-804 12:40
Filename : C104804
Sample : S01T001449

Material : C-104 Solids
Source : S01T001014
Lot Numbe : S01T001449

Condition
T%(He-Ne): 81.2%
(LAMP): 69.0%

Dist.Form: Std.
R.R.Index: 1.16-0.00i

Sampling times : 100
( )

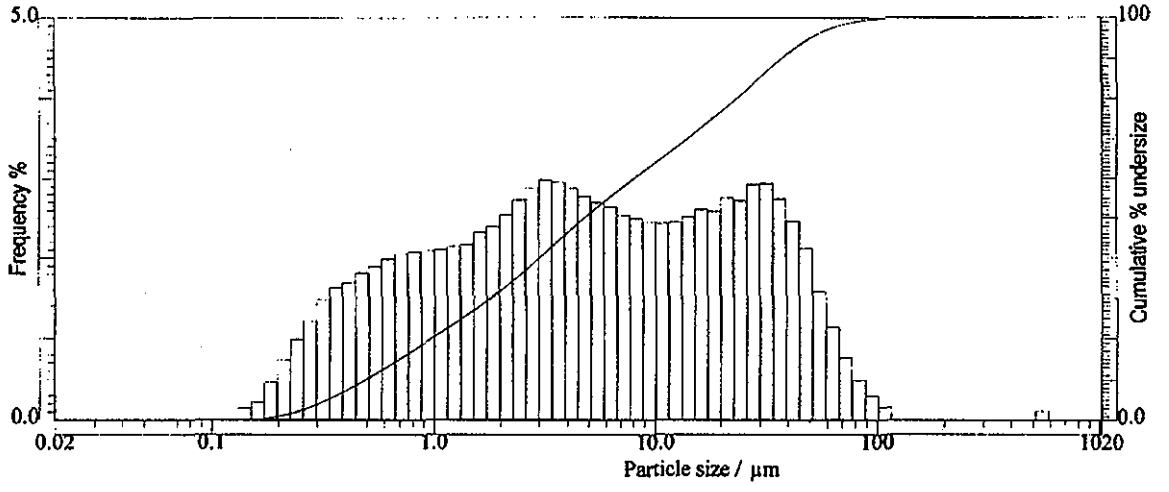
Agitation : 3
Circultn : 6
U.sonic : ON(120)

Format
Dist.base : Volume
Scaling : Auto
Axis : LogX - LinearY

Data
Median : 4.810μm
SP.Area : 39560cm²/cm³
S.D. : 25.583μm
Mode : 3.190μm
Mean : 13.462μm
C.V. : 190.04%

Span : (D 10.0-D 90.0) / D50 = 7.728

Dia. on %(5.0%) :	0.331μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	1.344μm	% on Dia.(1.000μm) :	20.4%
Dia. on %(50.0%) :	4.810μm	% on Dia.(10.000μm) :	63.9%
Dia. on %(75.0%) :	18.186μm	% on Dia.(100.000μm) :	99.7%
Dia. on %(95.0%) :	50.092μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	2.73	82.20	0.669	1.98	14.27
890.1	0.00	100.00	22.80	2.76	79.48	0.584	1.90	12.29
777.1	0.00	100.00	19.90	2.59	76.72	0.510	1.81	10.39
678.5	0.00	100.00	17.38	2.62	74.13	0.445	1.69	8.58
592.4	0.12	100.00	15.17	2.52	71.51	0.389	1.62	6.89
517.2	0.00	99.88	13.25	2.45	68.99	0.339	1.48	5.26
451.6	0.00	99.88	11.56	2.44	66.54	0.296	1.22	3.78
394.2	0.00	99.88	10.10	2.45	64.10	0.259	0.99	2.56
344.2	0.00	99.88	8.816	2.49	61.65	0.226	0.74	1.57
300.5	0.00	99.88	7.697	2.54	59.16	0.197	0.47	0.83
262.4	0.00	99.88	6.720	2.64	56.62	0.172	0.22	0.37
229.1	0.00	99.88	5.867	2.70	53.98	0.150	0.15	0.15
200.0	0.00	99.88	5.122	2.77	51.29	0.131	0.00	0.00
174.6	0.00	99.88	4.472	2.88	48.51	0.115	0.00	0.00
152.5	0.00	99.88	3.905	2.95	45.63	0.100	0.00	0.00
133.1	0.00	99.88	3.409	2.98	42.68	0.087	0.00	0.00
116.2	0.15	99.88	2.976	2.88	39.71	0.076	0.00	0.00
101.5	0.30	99.72	2.599	2.73	36.83	0.067	0.00	0.00
88.58	0.49	99.42	2.269	2.54	34.10	0.058	0.00	0.00
77.34	0.76	98.93	1.981	2.39	31.56	0.051	0.00	0.00
67.52	1.14	98.16	1.729	2.32	29.17	0.044	0.00	0.00
58.95	1.59	97.02	1.510	2.16	26.86	0.039	0.00	0.00
51.47	2.13	95.43	1.318	2.14	24.69	0.034	0.00	0.00
44.94	2.47	93.29	1.151	2.09	22.56	0.029	0.00	0.00
39.23	2.75	90.83	1.005	2.08	20.46	0.026	0.00	0.00
34.25	2.94	88.08	0.877	2.07	18.39	0.022	0.00	0.00
29.91	2.93	85.13	0.766	2.04	16.31			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/20/01
File Name: C104804.DAT Sample Name: S01T001449 ID No: 01/08/16-804
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 81.201 % Lamp: 68.964 %
Circulation: 6 Agitation: 3 U.Sonic ** (min)
Material: C-104 Solids Source: S01T001014
Lot No: S01T001449 Test No: 3

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.144	0.10	0.10	(15)	6.196	5.00	55.00
(2)	0.204	0.90	1.00	(16)	8.073	5.00	60.00
(3)	0.250	1.30	2.30	(17)	10.638	5.00	65.00
(4)	0.332	2.70	5.00	(18)	14.015	5.00	70.00
(5)	0.496	5.00	10.00	(19)	18.224	5.00	75.00
(6)	0.703	5.00	15.00	(20)	23.432	5.00	80.00
(7)	0.742	0.80	15.80	(21)	28.698	4.20	84.20
(8)	0.976	4.20	20.00	(22)	29.734	0.80	85.00
(9)	1.346	5.00	25.00	(23)	37.737	5.00	90.00
(10)	1.816	5.00	30.00	(24)	50.163	5.00	95.00
(11)	2.378	5.00	35.00	(25)	64.049	2.70	97.70
(12)	3.019	5.00	40.00	(26)	78.970	1.30	99.00
(13)	3.798	5.00	45.00	(27)	530.785	0.90	99.90
(14)	4.821	5.00	50.00				

Median : 4.810 (μm) Mean: 13.462 (μm) Mode: 3.185 (μm)
Std. Dev.: 25.583 (μm) Span: 6.634
Coef. Var: 190.05% Spec. Area: 39560 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Aug/20/'01 11:31

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010816-805 12:44
Filename : C104805
Sample : S01T001449

Material : C-104 Solids
Source : S01T001014
Lot Numbe : S01T001449

Condition
T%(He-Ne): 80.6%
(LAMP): 68.7%

Dist.Form: Std.
R.R.Index: 1.16-0.00i

Sampling times : 100
( )

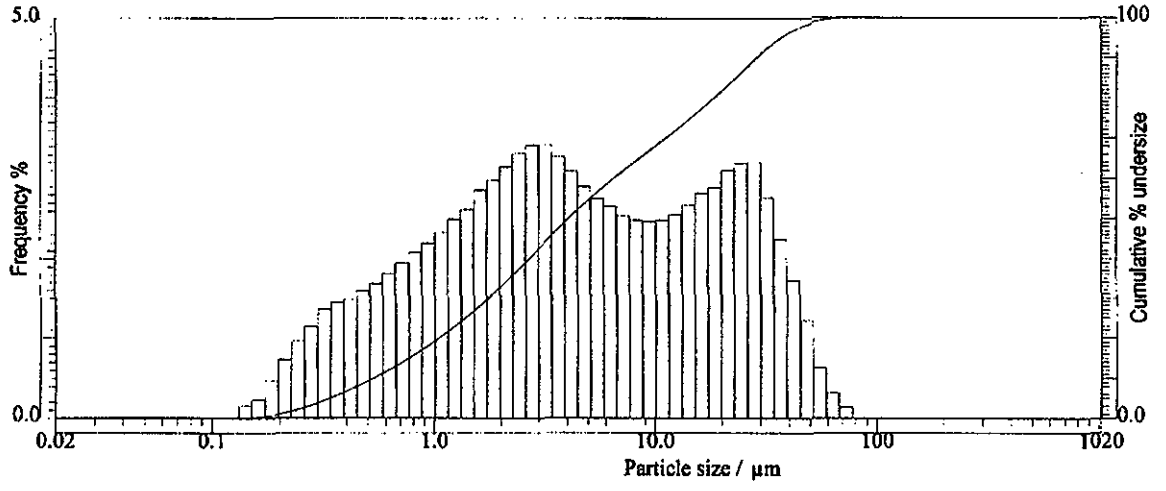
Agitation : 1 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 4.051μm SP.Area : 39418cm²/cm³ S.D. : 12.460μm
Mode : 3.176μm Mean : 9.934μm
C.V. : 125.43%

Span : (D 10.0-D 90.0) / D50 = 6.957

Dia. on %(5.0%) :	0.337μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	1.380μm	% on Dia.(1.000μm) :	19.2%
Dia. on %(50.0%) :	4.051μm	% on Dia.(10.000μm) :	67.9%
Dia. on %(75.0%) :	14.600μm	% on Dia.(100.000μm) :	100.0%
Dia. on %(95.0%) :	37.010μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	3.19	87.76	0.669	1.81	13.07
890.1	0.00	100.00	22.80	3.10	84.57	0.584	1.69	11.26
777.1	0.00	100.00	19.90	2.89	81.47	0.510	1.59	9.57
678.5	0.00	100.00	17.38	2.82	78.58	0.445	1.48	7.98
592.4	0.00	100.00	15.17	2.67	75.76	0.389	1.45	6.50
517.2	0.00	100.00	13.25	2.55	73.08	0.339	1.36	5.05
451.6	0.00	100.00	11.56	2.49	70.54	0.296	1.14	3.70
394.2	0.00	100.00	10.10	2.46	68.05	0.259	0.96	2.55
344.2	0.00	100.00	8.816	2.49	65.59	0.226	0.73	1.59
300.5	0.00	100.00	7.697	2.54	63.10	0.197	0.48	0.86
262.4	0.00	100.00	6.720	2.65	60.57	0.172	0.23	0.39
229.1	0.00	100.00	5.867	2.76	57.91	0.150	0.15	0.15
200.0	0.00	100.00	5.122	2.90	55.15	0.131	0.00	0.00
174.6	0.00	100.00	4.472	3.10	52.25	0.115	0.00	0.00
152.5	0.00	100.00	3.905	3.28	49.16	0.100	0.00	0.00
133.1	0.00	100.00	3.409	3.42	45.88	0.087	0.00	0.00
116.2	0.00	100.00	2.976	3.42	42.46	0.076	0.00	0.00
101.5	0.00	100.00	2.599	3.31	39.04	0.067	0.00	0.00
88.58	0.00	100.00	2.269	3.15	35.72	0.058	0.00	0.00
77.34	0.14	100.00	1.981	2.98	32.58	0.051	0.00	0.00
67.52	0.32	99.86	1.729	2.86	29.60	0.044	0.00	0.00
58.95	0.64	99.54	1.510	2.62	26.74	0.039	0.00	0.00
51.47	1.22	98.91	1.318	2.49	24.12	0.034	0.00	0.00
44.94	1.72	97.69	1.151	2.33	21.63	0.029	0.00	0.00
39.23	2.24	95.96	1.005	2.20	19.29	0.026	0.00	0.00
34.25	2.76	93.72	0.877	2.08	17.09	0.022	0.00	0.00
29.91	3.20	90.96	0.766	1.95	15.02			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/20/01
File Name: C104805.DAT Sample Name: S01T001449 ID No: 01/08/16-805
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 80.631 % Lamp: 68.678 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: C-104 Solids Source: S01T001014
Lot No: S01T001449 Test No: 3

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.144	0.10	0.10	(15)	5.088	5.00	55.00
(2)	0.202	0.90	1.00	(16)	6.538	5.00	60.00
(3)	0.250	1.30	2.30	(17)	8.551	5.00	65.00
(4)	0.338	2.70	5.00	(18)	11.248	5.00	70.00
(5)	0.528	5.00	10.00	(19)	14.627	5.00	75.00
(6)	0.765	5.00	15.00	(20)	18.618	5.00	80.00
(7)	0.808	0.80	15.80	(21)	22.452	4.20	84.20
(8)	1.049	4.20	20.00	(22)	23.244	0.80	85.00
(9)	1.383	5.00	25.00	(23)	28.769	5.00	90.00
(10)	1.763	5.00	30.00	(24)	37.093	5.00	95.00
(11)	2.202	5.00	35.00	(25)	45.002	2.70	97.70
(12)	2.705	5.00	40.00	(26)	52.551	1.30	99.00
(13)	3.298	5.00	45.00	(27)	70.371	0.90	99.90
(14)	4.059	5.00	50.00				

Median : 4.051 (μm) Mean: 9.934 (μm) Mode: 3.185 (μm)
Std. Dev.: 12.460 (μm) Span: 5.531
Coef. Var: 125.43% Spec. Area: 39418 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Aug/20/'01 11:34

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010816-811 13:48
Filename : C104811
Sample : S01T001449

Material : C-104 Solids
Source : S01T001014
Lot Numbe : S01T001449

Condition
T%(He-Ne): 81.2% Dist.Form: Std. Sampling times : 100
(LAMP): 69.2% R.R.Index: 1.16-0.001 ( )

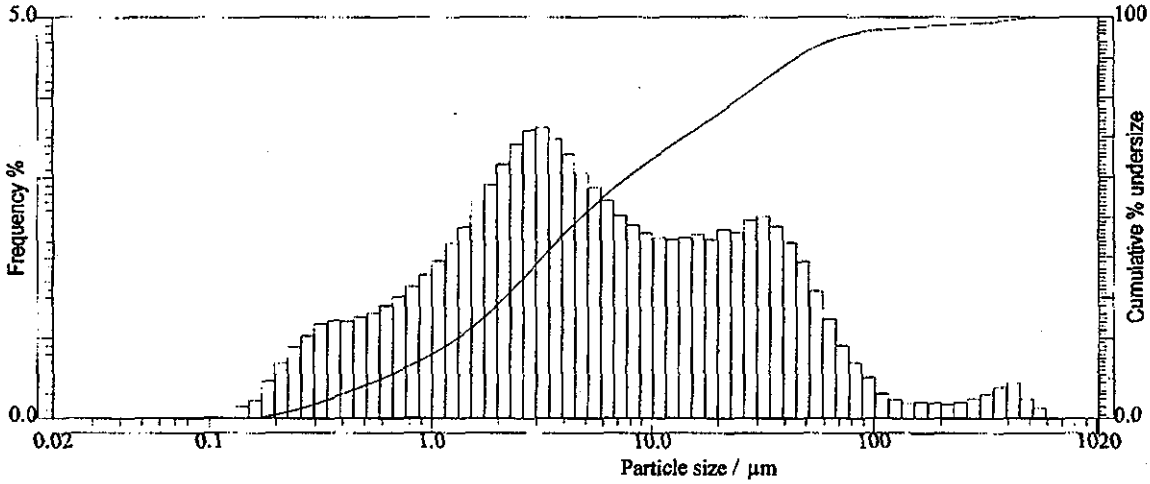
Agitation : 3 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 4.766μm SP.Area : 35003cm²/cm³ S.D. : 56.811μm
Mode : 3.179μm Mean : 21.555μm
C.V. : 263.56%

Span : (D 10.0-D 90.0) / D50 = 9.379

Dia. on %(5.0%) : 0.354μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 1.718μm % on Dia.(1.000μm) : 15.9%
Dia. on %(50.0%) : 4.766μm % on Dia.(10.000μm) : 64.3%
Dia. on %(75.0%) : 19.104μm % on Dia.(100.000μm) : 96.7%
Dia. on %(95.0%) : 71.369μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	2.30	80.32	0.669	1.39	11.00
890.1	0.00	100.00	22.80	2.35	78.02	0.584	1.31	9.60
777.1	0.00	100.00	19.90	2.23	75.67	0.510	1.26	8.29
678.5	0.00	100.00	17.38	2.29	73.45	0.445	1.20	7.04
592.4	0.14	100.00	15.17	2.24	71.15	0.389	1.21	5.83
517.2	0.25	99.86	13.25	2.22	68.91	0.339	1.18	4.62
451.6	0.44	99.62	11.56	2.25	66.70	0.296	1.03	3.45
394.2	0.39	99.18	10.10	2.31	64.45	0.259	0.89	2.42
344.2	0.30	98.79	8.816	2.41	62.14	0.226	0.69	1.53
300.5	0.24	98.49	7.697	2.53	59.73	0.197	0.46	0.84
262.4	0.20	98.25	6.720	2.71	57.20	0.172	0.23	0.38
229.1	0.17	98.06	5.867	2.87	54.49	0.150	0.15	0.15
200.0	0.20	97.88	5.122	3.05	51.62	0.131	0.00	0.00
174.6	0.21	97.68	4.472	3.28	48.57	0.115	0.00	0.00
152.5	0.20	97.48	3.905	3.48	45.28	0.100	0.00	0.00
133.1	0.24	97.28	3.409	3.62	41.81	0.087	0.00	0.00
116.2	0.31	97.05	2.976	3.58	38.19	0.076	0.00	0.00
101.5	0.51	96.74	2.599	3.41	34.61	0.067	0.00	0.00
88.58	0.69	96.23	2.269	3.17	31.20	0.058	0.00	0.00
77.34	0.90	95.53	1.981	2.91	28.04	0.051	0.00	0.00
67.52	1.23	94.63	1.729	2.70	25.13	0.044	0.00	0.00
58.95	1.57	93.40	1.510	2.38	22.43	0.039	0.00	0.00
51.47	1.94	91.83	1.318	2.17	20.05	0.034	0.00	0.00
44.94	2.19	89.88	1.151	1.96	17.88	0.029	0.00	0.00
39.23	2.39	87.69	1.005	1.78	15.92	0.026	0.00	0.00
34.25	2.52	85.30	0.877	1.64	14.14	0.022	0.00	0.00
29.91	2.46	82.78	0.766	1.51	12.50			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/20/01
File Name: C104811.DAT Sample Name: S01T001449 ID No: 01/08/16-811
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 81.173 % Lamp: 69.238 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: C-104 Solids Source: S01T001014
Lot No: S01T001449 Test No: 3

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.144	0.10	0.10	(15)	6.027	5.00	55.00
(2)	0.204	0.90	1.00	(16)	7.820	5.00	60.00
(3)	0.254	1.30	2.30	(17)	10.455	5.00	65.00
(4)	0.355	2.70	5.00	(18)	14.181	5.00	70.00
(5)	0.608	5.00	10.00	(19)	19.140	5.00	75.00
(6)	0.939	5.00	15.00	(20)	25.649	5.00	80.00
(7)	0.996	0.80	15.80	(21)	32.351	4.20	84.20
(8)	1.314	4.20	20.00	(22)	33.732	0.80	85.00
(9)	1.719	5.00	25.00	(23)	45.333	5.00	90.00
(10)	2.159	5.00	30.00	(24)	71.529	5.00	95.00
(11)	2.640	5.00	35.00	(25)	176.582	2.70	97.70
(12)	3.193	5.00	40.00	(26)	371.585	1.30	99.00
(13)	3.864	5.00	45.00	(27)	537.260	0.90	99.90
(14)	4.777	5.00	50.00				

Median : 4.766 (μm) Mean: 21.555 (μm) Mode: 3.185 (μm)
Std. Dev.: 56.811 (μm) Span: 10.966
Coef. Var: 263.56% Spec. Area: 35003 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20] Aug/20/'01 11:34

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010816-812 13:51
Filename : C104812
Sample : S01T001449

Material : C-104 Solids
Source : S01T001014
Lot Numbe : S01T001449

Condition
T%(He-Ne): 81.4%
(LAMP): 69.4%

Dist.Form: Std.
R.R.Index: 1.16-0.00i

Sampling times : 100
( )

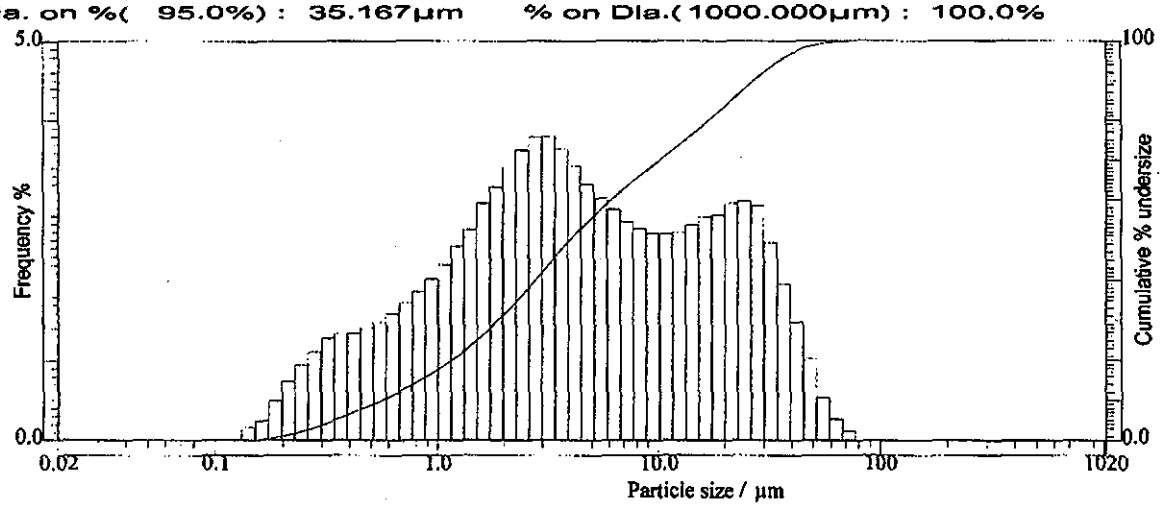
Agitation : 1 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 4.004μm SP.Area : 38272cm²/cm³ S.D. : 11.829μm
Mode : 3.177μm Mean : 9.407μm
C.V. : 125.75%

Span : (D 10.0-D 90.0) / D50 = 6.621

Dia. on %(5.0%) :	0.340μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	1.510μm	% on Dia.(1.000μm) :	17.7%
Dia. on %(50.0%) :	4.004μm	% on Dia.(10.000μm) :	69.7%
Dia. on %(75.0%) :	13.237μm	% on Dia.(100.000μm) :	100.0%
Dia. on %(95.0%) :	35.167μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	2.98	89.23	0.669	1.59	12.12
890.1	0.00	100.00	22.80	2.95	86.24	0.584	1.48	10.54
777.1	0.00	100.00	19.90	2.81	83.29	0.510	1.41	9.05
678.5	0.00	100.00	17.38	2.79	80.48	0.445	1.34	7.64
592.4	0.00	100.00	15.17	2.68	77.70	0.389	1.34	6.30
517.2	0.00	100.00	13.25	2.60	75.01	0.339	1.28	4.97
451.6	0.00	100.00	11.56	2.57	72.41	0.296	1.11	3.68
394.2	0.00	100.00	10.10	2.58	69.84	0.259	0.95	2.57
344.2	0.00	100.00	8.816	2.64	67.26	0.226	0.74	1.62
300.5	0.00	100.00	7.697	2.73	64.62	0.197	0.49	0.89
262.4	0.00	100.00	6.720	2.88	61.89	0.172	0.24	0.40
229.1	0.00	100.00	5.867	3.02	59.01	0.150	0.16	0.16
200.0	0.00	100.00	5.122	3.20	55.99	0.131	0.00	0.00
174.6	0.00	100.00	4.472	3.43	52.80	0.115	0.00	0.00
152.5	0.00	100.00	3.905	3.64	49.37	0.100	0.00	0.00
133.1	0.00	100.00	3.409	3.80	45.73	0.087	0.00	0.00
116.2	0.00	100.00	2.976	3.78	41.93	0.076	0.00	0.00
101.5	0.00	100.00	2.599	3.63	38.15	0.067	0.00	0.00
88.58	0.00	100.00	2.269	3.40	34.52	0.058	0.00	0.00
77.34	0.12	100.00	1.981	3.16	31.12	0.051	0.00	0.00
67.52	0.26	99.88	1.729	2.96	27.96	0.044	0.00	0.00
58.95	0.53	99.62	1.510	2.63	25.00	0.039	0.00	0.00
51.47	1.03	99.09	1.318	2.43	22.37	0.034	0.00	0.00
44.94	1.48	98.06	1.151	2.21	19.94	0.029	0.00	0.00
39.23	1.96	96.58	1.005	2.02	17.73	0.026	0.00	0.00
34.25	2.47	94.62	0.877	1.86	15.71	0.022	0.00	0.00
29.91	2.93	92.15	0.766	1.72	13.84			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/20/01
File Name: C104812.DAT Sample Name: S01T001449 ID No: 01/08/16-812
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 81.350 % Lamp: 69.391 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: C-104 Solids Source: S01T001014
Lot No: S01T001449 Test No: 3

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.143	0.10	0.10	(15)	4.921	5.00	55.00
(2)	0.201	0.90	1.00	(16)	6.160	5.00	60.00
(3)	0.249	1.30	2.30	(17)	7.859	5.00	65.00
(4)	0.341	2.70	5.00	(18)	10.187	5.00	70.00
(5)	0.557	5.00	10.00	(19)	13.237	5.00	75.00
(6)	0.835	5.00	15.00	(20)	16.994	5.00	80.00
(7)	0.883	0.80	15.80	(21)	20.794	4.20	84.20
(8)	1.155	4.20	20.00	(22)	21.578	0.80	85.00
(9)	1.510	5.00	25.00	(23)	27.114	5.00	90.00
(10)	1.892	5.00	30.00	(24)	35.219	5.00	95.00
(11)	2.312	5.00	35.00	(25)	43.542	2.70	97.70
(12)	2.783	5.00	40.00	(26)	50.918	1.30	99.00
(13)	3.326	5.00	45.00	(27)	68.980	0.90	99.90
(14)	4.010	5.00	50.00				

Median : 4.004 (μm) Mean: 9.407 (μm) Mode: 3.185 (μm)
Std. Dev.: 11.829 (μm) Span: 5.477
Coef. Var: 125.75% Spec. Area: 38272 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20J Aug/20/'01 11:41

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010816-815 14:21
Filename : C104815
Sample : S01T001451

Material : C-104 Solids
Source : S01T001014
Lot Numbe : S01T001451

Condition
T%(He-Ne): 83.7% Dist.Form: Std. Sampling times : 100
(LAMP): 75.0% R.R.Index: 1.16-0.00i ( )

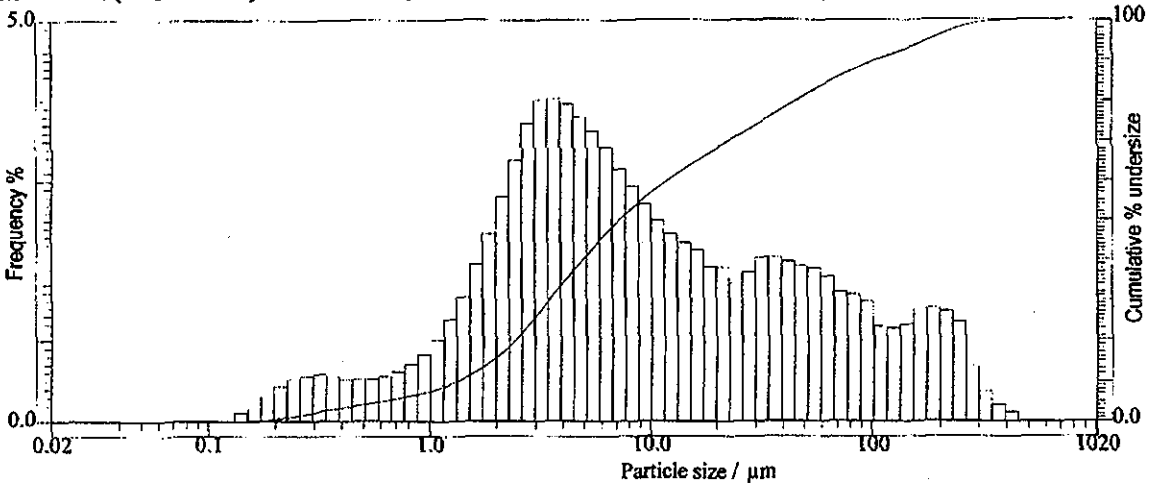
Agitation : 3 Circultn : 6 U.sonic : OFF(1200)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 7.260μm SP.Area : 22387cm²/cm³ S.D. : 60.688μm
Mode : 3.646μm Mean : 33.713μm
C.V. : 180.01%

Span : (D 10.0-D 90.0) / D50 = 14.138

Dia. on %(5.0%) : 0.610μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 2.935μm % on Dia.(1.000μm) : 7.5%
Dia. on %(50.0%) : 7.260μm % on Dia.(10.000μm) : 56.8%
Dia. on %(75.0%) : 33.045μm % on Dia.(100.000μm) : 89.6%
Dia. on %(95.0%) : 180.469μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.71	71.66	0.669	0.56	5.37
890.1	0.00	100.00	22.80	1.91	69.95	0.584	0.52	4.82
777.1	0.00	100.00	19.90	1.91	68.04	0.510	0.52	4.30
678.5	0.00	100.00	17.38	2.13	66.12	0.445	0.52	3.78
592.4	0.00	100.00	15.17	2.21	64.00	0.389	0.56	3.26
517.2	0.00	100.00	13.25	2.32	61.79	0.339	0.59	2.70
451.6	0.12	100.00	11.56	2.49	59.47	0.296	0.56	2.12
394.2	0.21	99.88	10.10	2.69	56.98	0.259	0.52	1.56
344.2	0.38	99.67	8.816	2.92	54.28	0.226	0.44	1.04
300.5	0.68	99.30	7.697	3.15	51.36	0.197	0.32	0.60
262.4	1.22	98.62	6.720	3.42	48.20	0.172	0.17	0.28
229.1	1.35	97.40	5.867	3.62	44.78	0.150	0.11	0.11
200.0	1.39	96.05	5.122	3.79	41.16	0.131	0.00	0.00
174.6	1.38	94.66	4.472	3.96	37.37	0.115	0.00	0.00
152.5	1.19	93.29	3.905	4.02	33.41	0.100	0.00	0.00
133.1	1.14	92.10	3.409	4.00	29.39	0.087	0.00	0.00
116.2	1.16	90.95	2.976	3.71	25.39	0.076	0.00	0.00
101.5	1.47	89.79	2.599	3.27	21.67	0.067	0.00	0.00
88.58	1.56	88.32	2.269	2.80	18.40	0.058	0.00	0.00
77.34	1.60	86.75	1.981	2.34	15.60	0.051	0.00	0.00
67.52	1.79	85.15	1.729	1.95	13.27	0.044	0.00	0.00
58.95	1.89	83.36	1.510	1.53	11.32	0.039	0.00	0.00
51.47	1.92	81.47	1.318	1.25	9.79	0.034	0.00	0.00
44.94	1.98	79.55	1.151	1.01	8.53	0.029	0.00	0.00
39.23	2.03	77.57	1.005	0.83	7.53	0.026	0.00	0.00
34.25	2.03	75.54	0.877	0.71	6.70	0.022	0.00	0.00
29.91	1.85	73.51	0.766	0.62	5.99			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/20/01
File Name: C104815.DAT Sample Name: S01T001451 ID No: 01/08/16-815
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 83.657 % Lamp: 75.023 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: C-104 Solids Source: S01T001014
Lot No: S01T001451 Test No: 4

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.148	0.10	0.10	(15)	9.158	5.00	55.00
(2)	0.223	0.90	1.00	(16)	11.950	5.00	60.00
(3)	0.310	1.30	2.30	(17)	16.211	5.00	65.00
(4)	0.611	2.70	5.00	(18)	22.895	5.00	70.00
(5)	1.345	5.00	10.00	(19)	33.103	5.00	75.00
(6)	1.916	5.00	15.00	(20)	46.484	5.00	80.00
(7)	2.001	0.80	15.80	(21)	62.974	4.20	84.20
(8)	2.430	4.20	20.00	(22)	66.799	0.80	85.00
(9)	2.937	5.00	25.00	(23)	104.139	5.00	90.00
(10)	3.484	5.00	30.00	(24)	180.782	5.00	95.00
(11)	4.132	5.00	35.00	(25)	237.220	2.70	97.70
(12)	4.923	5.00	40.00	(26)	283.713	1.30	99.00
(13)	5.922	5.00	45.00	(27)	402.216	0.90	99.90
(14)	7.277	5.00	50.00				

Median : 7.260 (μm) Mean: 33.713 (μm) Mode: 3.648 (μm)
Std. Dev.: 60.688 (μm) Span: 20.305
Coef. Var: 180.01% Spec. Area: 22387 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Aug/20/'01 11:41

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010816-816 14:25
Filename : C104816
Sample : S01T001451

Material : C-104 Solids
Source : S01T001014
Lot Numbe : S01T001451

Condition
T%(He-Ne): 83.4% Dist.Form: Std. Sampling times : 100
(LAMP): 74.8% R.R.Index: 1.16-0.00i ( )

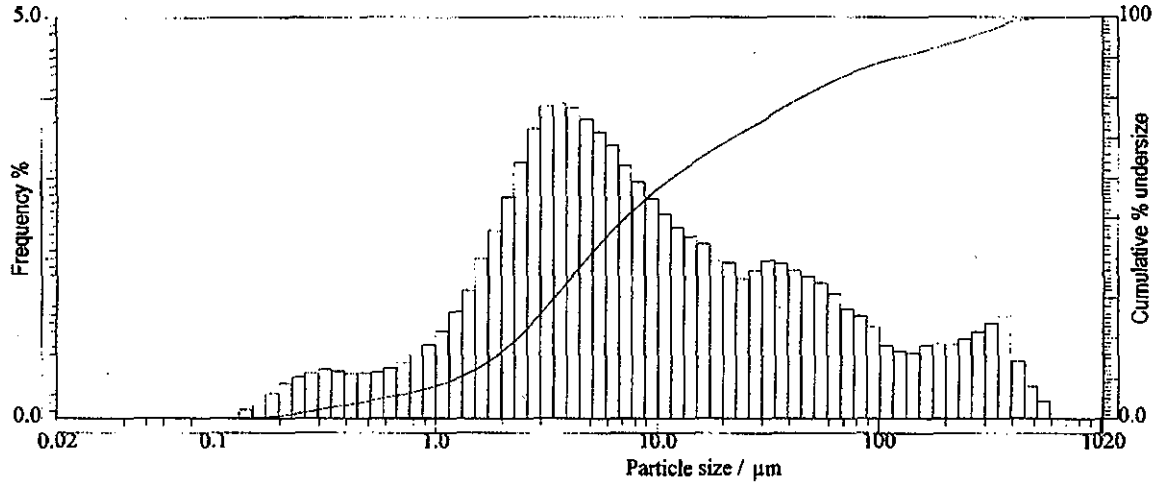
Agitation : 1 Circultn : 6 U.sonic : OFF(1200)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 7.184μm SP.Area : 22937cm²/cm³ S.D. : 86.732μm
Mode : 3.647μm Mean : 41.780μm
C.V. : 207.59%

Span : (D 10.0-D 90.0) / D50 = 16.869

Dia. on %(5.0%) : 0.581μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 2.865μm % on Dia.(1.000μm) : 8.0%
Dia. on %(50.0%) : 7.184μm % on Dia.(10.000μm) : 57.1%
Dia. on %(75.0%) : 31.659μm % on Dia.(100.000μm) : 88.6%
Dia. on %(95.0%) : 258.666μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.75	72.32	0.669	0.63	5.64
890.1	0.00	100.00	22.80	1.95	70.57	0.584	0.58	5.02
777.1	0.00	100.00	19.90	1.96	68.63	0.510	0.57	4.44
678.5	0.00	100.00	17.38	2.18	66.66	0.445	0.56	3.87
592.4	0.22	100.00	15.17	2.26	64.48	0.389	0.59	3.31
517.2	0.40	99.78	13.25	2.38	62.22	0.339	0.61	2.72
451.6	0.71	99.38	11.56	2.54	59.84	0.296	0.57	2.12
394.2	1.29	98.67	10.10	2.74	57.30	0.259	0.52	1.55
344.2	1.19	97.38	8.816	2.95	54.56	0.226	0.44	1.03
300.5	1.09	96.19	7.697	3.16	51.61	0.197	0.31	0.59
262.4	0.99	95.10	6.720	3.41	48.44	0.172	0.16	0.28
229.1	0.93	94.11	5.867	3.58	45.03	0.150	0.11	0.11
200.0	0.93	93.18	5.122	3.73	41.45	0.131	0.00	0.00
174.6	0.91	92.25	4.472	3.88	37.72	0.115	0.00	0.00
152.5	0.82	91.34	3.905	3.93	33.84	0.100	0.00	0.00
133.1	0.84	90.52	3.409	3.89	29.91	0.087	0.00	0.00
116.2	0.91	89.68	2.976	3.62	26.02	0.076	0.00	0.00
101.5	1.15	88.77	2.599	3.21	22.40	0.067	0.00	0.00
88.58	1.28	87.61	2.269	2.77	19.19	0.058	0.00	0.00
77.34	1.37	86.34	1.981	2.34	16.42	0.051	0.00	0.00
67.52	1.56	84.96	1.729	1.99	14.08	0.044	0.00	0.00
58.95	1.69	83.40	1.510	1.60	12.09	0.039	0.00	0.00
51.47	1.77	81.71	1.318	1.34	10.49	0.034	0.00	0.00
44.94	1.86	79.94	1.151	1.10	9.16	0.029	0.00	0.00
39.23	1.94	78.08	1.005	0.92	8.06	0.026	0.00	0.00
34.25	1.97	76.15	0.877	0.79	7.13	0.022	0.00	0.00
29.91	1.85	74.17	0.766	0.70	6.34			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/20/01
File Name: C104816.DAT Sample Name: S01T001451 ID No: 01/08/16-816
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 83.383 % Lamp: 74.782 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: C-104 Solids Source: S01T001014
Lot No: S01T001451 Test No: 4

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.148	0.10	0.10	(15)	9.022	5.00	55.00
(2)	0.224	0.90	1.00	(16)	11.677	5.00	60.00
(3)	0.309	1.30	2.30	(17)	15.693	5.00	65.00
(4)	0.581	2.70	5.00	(18)	21.945	5.00	70.00
(5)	1.257	5.00	10.00	(19)	31.731	5.00	75.00
(6)	1.828	5.00	15.00	(20)	45.163	5.00	80.00
(7)	1.914	0.80	15.80	(21)	63.330	4.20	84.20
(8)	2.352	4.20	20.00	(22)	67.779	0.80	85.00
(9)	2.870	5.00	25.00	(23)	122.711	5.00	90.00
(10)	3.420	5.00	30.00	(24)	258.882	5.00	95.00
(11)	4.075	5.00	35.00	(25)	356.553	2.70	97.70
(12)	4.870	5.00	40.00	(26)	420.847	1.30	99.00
(13)	5.861	5.00	45.00	(27)	558.276	0.90	99.90
(14)	7.201	5.00	50.00				

Median : 7.184 (μm) Mean: 41.780 (μm) Mode: 3.648 (μm)
Std. Dev.: 86.732 (μm) Span: 31.598
Coef. Var: 207.59% Spec. Area: 22937 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Aug/20/'01 11:42

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010816-817 14:50
Filename : C104817
Sample : S01T001451

Material : C-104 Solids
Source : S01T001014
Lot Numbe : S01T001451

Condition
T%(He-Ne): 84.2%
(LAMP): 72.7%

Dist.Form: Std.
R.R.Index: 1.16-0.00i

Sampling times : 100
( )

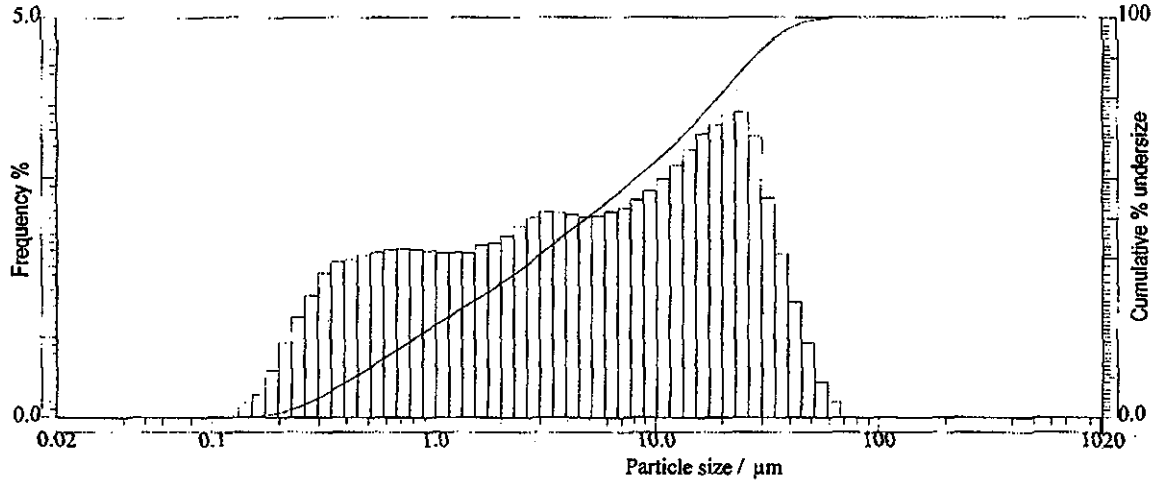
Agitation : 3
Circultn : 6
U.sonic : ON(1200)

Format
Dist.base : Volume
Scaling : Auto
Axis : LogX - LinearY

Data
Median : 4.842μm
SP.Area : 44047cm²/cm³
S.D. : 11.710μm
Mode : 24.279μm
Mean : 10.053μm
C.V. : 116.49%

Span : (D 10.0-D 90.0) / D50 = 5.586

Dia. on %(5.0%) :	0.301μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	1.141μm	% on Dia.(1.000μm) :	23.0%
Dia. on %(50.0%) :	4.842μm	% on Dia.(10.000μm) :	64.1%
Dia. on %(75.0%) :	15.854μm	% on Dia.(100.000μm) :	100.0%
Dia. on %(95.0%) :	34.381μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	3.82	88.68	0.669	2.11	16.74
890.1	0.00	100.00	22.80	3.79	84.86	0.584	2.07	14.63
777.1	0.00	100.00	19.90	3.67	81.07	0.510	2.04	12.56
678.5	0.00	100.00	17.38	3.55	77.40	0.445	1.97	10.52
592.4	0.00	100.00	15.17	3.36	73.85	0.389	1.95	8.55
517.2	0.00	100.00	13.25	3.16	70.49	0.339	1.82	6.60
451.6	0.00	100.00	11.56	2.99	67.33	0.296	1.53	4.77
394.2	0.00	100.00	10.10	2.84	64.34	0.259	1.26	3.24
344.2	0.00	100.00	8.816	2.72	61.51	0.226	0.93	1.98
300.5	0.00	100.00	7.697	2.62	58.78	0.197	0.59	1.05
262.4	0.00	100.00	6.720	2.59	56.16	0.172	0.28	0.46
229.1	0.00	100.00	5.867	2.53	53.57	0.150	0.18	0.18
200.0	0.00	100.00	5.122	2.51	51.04	0.131	0.00	0.00
174.6	0.00	100.00	4.472	2.55	48.53	0.115	0.00	0.00
152.5	0.00	100.00	3.905	2.57	45.98	0.100	0.00	0.00
133.1	0.00	100.00	3.409	2.58	43.40	0.087	0.00	0.00
116.2	0.00	100.00	2.976	2.51	40.82	0.076	0.00	0.00
101.5	0.00	100.00	2.599	2.41	38.31	0.067	0.00	0.00
88.58	0.00	100.00	2.269	2.28	35.90	0.058	0.00	0.00
77.34	0.00	100.00	1.981	2.19	33.62	0.051	0.00	0.00
67.52	0.20	100.00	1.729	2.17	31.43	0.044	0.00	0.00
58.95	0.44	99.80	1.510	2.06	29.26	0.039	0.00	0.00
51.47	0.93	99.36	1.318	2.07	27.20	0.034	0.00	0.00
44.94	1.44	98.44	1.151	2.07	25.13	0.029	0.00	0.00
39.23	2.05	97.00	1.005	2.09	23.06	0.026	0.00	0.00
34.25	2.75	94.94	0.877	2.11	20.98	0.022	0.00	0.00
29.91	3.52	92.19	0.766	2.12	18.86			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/20/01
File Name: C104817.DAT Sample Name: S01T001451 ID No: 01/08/16-817
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 84.194 % Lamp: 72.660 %
Circulation: 6 Agitation: 3 U.Sonic ** (min)
Material: C-104 Solids Source: S01T001014
Lot No: S01T001451 Test No: 4

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.142	0.10	0.10	(15)	6.338	5.00	55.00
(2)	0.195	0.90	1.00	(16)	8.197	5.00	60.00
(3)	0.234	1.30	2.30	(17)	10.419	5.00	65.00
(4)	0.302	2.70	5.00	(18)	12.985	5.00	70.00
(5)	0.430	5.00	10.00	(19)	15.886	5.00	75.00
(6)	0.599	5.00	15.00	(20)	19.169	5.00	80.00
(7)	0.631	0.80	15.80	(21)	22.295	4.20	84.20
(8)	0.826	4.20	20.00	(22)	22.921	0.80	85.00
(9)	1.142	5.00	25.00	(23)	27.541	5.00	90.00
(10)	1.584	5.00	30.00	(24)	34.390	5.00	95.00
(11)	2.155	5.00	35.00	(25)	42.021	2.70	97.70
(12)	2.852	5.00	40.00	(26)	48.914	1.30	99.00
(13)	3.716	5.00	45.00	(27)	63.209	0.90	99.90
(14)	4.853	5.00	50.00				

Median : 4.842 (μm) Mean: 10.053 (μm) Mode: 24.398 (μm)
Std. Dev.: 11.710 (μm) Span: 3.826
Coef. Var: 116.49% Spec. Area: 44047 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Aug/20/'01 11:42

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010816-818 14:54
Filename : C104818
Sample : S01T001451

Material : C-104 Solids
Source : S01T001014
Lot Numbe : S01T001451

Condition
T%(He-Ne): 83.9% Dist.Form: Std. Sampling times : 100
(LAMP): 72.5% R.R.Index: 1.16-0.00i ( )

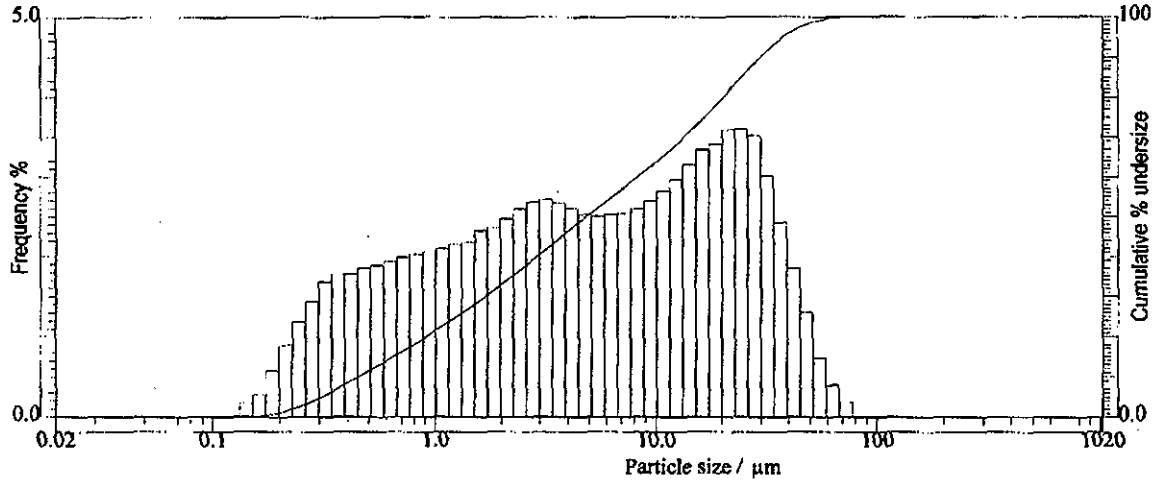
Agitation : 1 Circultn : 6 U.sonic : OFF(1200)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 4.885μm SP.Area : 42125cm²/cm³ S.D. : 12.922μm
Mode : 24.363μm Mean : 10.775μm
C.V. : 119.93%

Span : (D 10.0-D 90.0) / D50 = 6.003

Dia. on %(5.0%) : 0.308μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 1.257μm % on Dia.(1.000μm) : 21.4%
Dia. on %(50.0%) : 4.885μm % on Dia.(10.000μm) : 63.6%
Dia. on %(75.0%) : 16.682μm % on Dia.(100.000μm) : 100.0%
Dia. on %(95.0%) : 38.059μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	3.60	86.60	0.669	1.94	15.44
890.1	0.00	100.00	22.80	3.59	83.01	0.584	1.89	13.50
777.1	0.00	100.00	19.90	3.41	79.42	0.510	1.85	11.61
678.5	0.00	100.00	17.38	3.34	76.00	0.445	1.79	9.76
592.4	0.00	100.00	15.17	3.15	72.67	0.389	1.78	7.98
517.2	0.00	100.00	13.25	2.96	69.52	0.339	1.68	6.20
451.6	0.00	100.00	11.56	2.81	66.56	0.296	1.43	4.52
394.2	0.00	100.00	10.10	2.69	63.75	0.259	1.19	3.09
344.2	0.00	100.00	8.816	2.60	61.05	0.226	0.89	1.91
300.5	0.00	100.00	7.697	2.54	58.45	0.197	0.57	1.02
262.4	0.00	100.00	6.720	2.53	55.92	0.172	0.27	0.45
229.1	0.00	100.00	5.867	2.51	53.39	0.150	0.17	0.17
200.0	0.00	100.00	5.122	2.52	50.88	0.131	0.00	0.00
174.6	0.00	100.00	4.472	2.60	48.36	0.115	0.00	0.00
152.5	0.00	100.00	3.905	2.67	45.76	0.100	0.00	0.00
133.1	0.00	100.00	3.409	2.71	43.10	0.087	0.00	0.00
116.2	0.00	100.00	2.976	2.68	40.38	0.076	0.00	0.00
101.5	0.00	100.00	2.599	2.60	37.70	0.067	0.00	0.00
88.58	0.00	100.00	2.269	2.47	35.11	0.058	0.00	0.00
77.34	0.19	100.00	1.981	2.37	32.63	0.051	0.00	0.00
67.52	0.39	99.81	1.729	2.32	30.27	0.044	0.00	0.00
58.95	0.73	99.42	1.510	2.18	27.94	0.039	0.00	0.00
51.47	1.31	98.69	1.318	2.15	25.76	0.034	0.00	0.00
44.94	1.85	97.39	1.151	2.09	23.61	0.029	0.00	0.00
39.23	2.42	95.54	1.005	2.06	21.51	0.026	0.00	0.00
34.25	3.01	93.12	0.877	2.03	19.46	0.022	0.00	0.00
29.91	3.51	90.11	0.766	1.99	17.43			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/20/01
File Name: C104818.DAT Sample Name: S01T001451 ID No: 01/08/16-818
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 83.896 % Lamp: 72.480 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: C-104 Solids Source: S01T001014
Lot No: S01T001451 Test No: 4

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.142	0.10	0.10	(15)	6.411	5.00	55.00
(2)	0.196	0.90	1.00	(16)	8.362	5.00	60.00
(3)	0.237	1.30	2.30	(17)	10.751	5.00	65.00
(4)	0.308	2.70	5.00	(18)	13.540	5.00	70.00
(5)	0.453	5.00	10.00	(19)	16.713	5.00	75.00
(6)	0.650	5.00	15.00	(20)	20.373	5.00	80.00
(7)	0.686	0.80	15.80	(21)	23.897	4.20	84.20
(8)	0.911	4.20	20.00	(22)	24.635	0.80	85.00
(9)	1.259	5.00	25.00	(23)	29.785	5.00	90.00
(10)	1.704	5.00	30.00	(24)	38.118	5.00	95.00
(11)	2.256	5.00	35.00	(25)	46.496	2.70	97.70
(12)	2.923	5.00	40.00	(26)	54.613	1.30	99.00
(13)	3.763	5.00	45.00	(27)	72.157	0.90	99.90
(14)	4.895	5.00	50.00				

Median : 4.885 (μm) Mean: 10.775 (μm) Mode: 24.398 (μm)
Std. Dev.: 12.922 (μm) Span: 4.376
Coef. Var: 119.93% Spec. Area: 42125 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Aug/20/'01 11:43

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010816-824 15:59
Filename : C104824
Sample : S01T001451

Material : C-104 Solids
Source : S01T001014
Lot Numbe : S01T001451

Condition
T%(He-Ne): 85.0% Dist.Form: Std. Sampling times : 100
(LAMP): 72.9% R.R.Index: 1.16-0.00i ( )

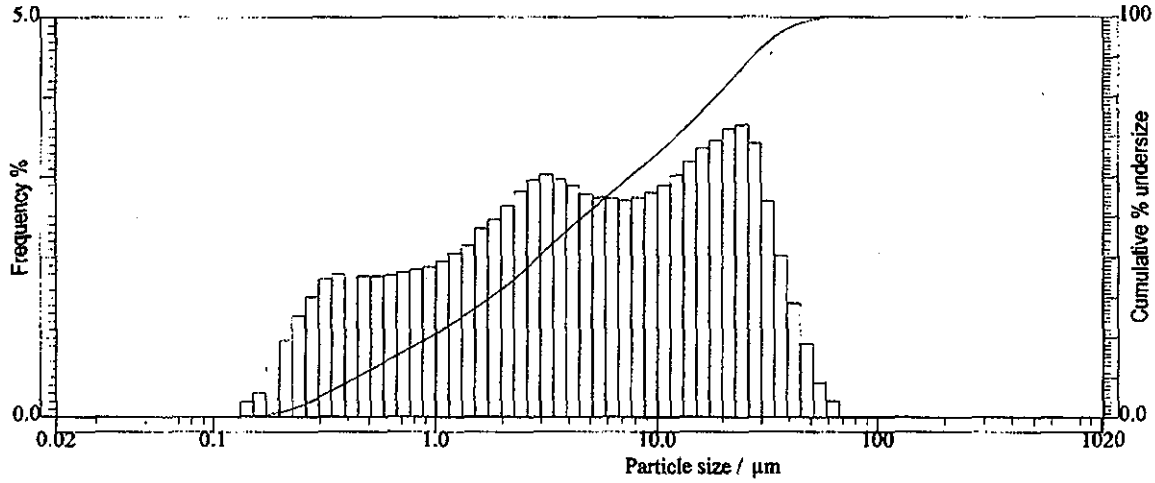
Agitation : 3 Circultn : 6 U.sonic : OFF(1200)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 4.646μm SP.Area : 42573cm²/cm³ S.D. : 11.617μm
Mode : 24.318μm Mean : 9.888μm
C.V. : 117.49%

Span : (D 10.0-D 90.0) / D50 = 5.783

Dia. on %(5.0%) : 0.300μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 1.322μm % on Dia.(1.000μm) : 20.9%
Dia. on %(50.0%) : 4.646μm % on Dia.(10.000μm) : 65.5%
Dia. on %(75.0%) : 15.277μm % on Dia.(100.000μm) : 100.0%
Dia. on %(95.0%) : 34.292μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	3.64	88.87	0.669	1.78	15.41
890.1	0.00	100.00	22.80	3.60	85.23	0.584	1.76	13.63
777.1	0.00	100.00	19.90	3.45	81.63	0.510	1.77	11.87
678.5	0.00	100.00	17.38	3.36	78.19	0.445	1.75	10.10
592.4	0.00	100.00	15.17	3.19	74.83	0.389	1.79	8.35
517.2	0.00	100.00	13.25	3.02	71.64	0.339	1.73	6.57
451.6	0.00	100.00	11.56	2.90	68.62	0.296	1.51	4.84
394.2	0.00	100.00	10.10	2.80	65.72	0.259	1.27	3.33
344.2	0.00	100.00	8.816	2.74	62.92	0.226	0.96	2.07
300.5	0.00	100.00	7.697	2.70	60.18	0.197	0.62	1.11
262.4	0.00	100.00	6.720	2.73	57.48	0.172	0.30	0.49
229.1	0.00	100.00	5.867	2.74	54.75	0.150	0.19	0.19
200.0	0.00	100.00	5.122	2.79	52.00	0.131	0.00	0.00
174.6	0.00	100.00	4.472	2.89	49.22	0.115	0.00	0.00
152.5	0.00	100.00	3.905	2.97	46.33	0.100	0.00	0.00
133.1	0.00	100.00	3.409	3.03	43.35	0.087	0.00	0.00
116.2	0.00	100.00	2.976	2.96	40.33	0.076	0.00	0.00
101.5	0.00	100.00	2.599	2.82	37.37	0.067	0.00	0.00
88.58	0.00	100.00	2.269	2.64	34.55	0.058	0.00	0.00
77.34	0.00	100.00	1.981	2.46	31.91	0.051	0.00	0.00
67.52	0.20	100.00	1.729	2.35	29.45	0.044	0.00	0.00
58.95	0.44	99.80	1.510	2.14	27.10	0.039	0.00	0.00
51.47	0.92	99.37	1.318	2.05	24.96	0.034	0.00	0.00
44.94	1.43	98.44	1.151	1.95	22.90	0.029	0.00	0.00
39.23	2.03	97.01	1.005	1.88	20.95	0.026	0.00	0.00
34.25	2.69	94.98	0.877	1.84	19.07	0.022	0.00	0.00
29.91	3.42	92.29	0.766	1.81	17.23			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/20/01
File Name: C104824.DAT Sample Name: S01T001451 ID No: 01/08/16-824
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 84.954 % Lamp: 72.902 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: C-104 Solids Source: S01T001014
Lot No: S01T001451 Test No: 4

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.141	0.10	0.10	(15)	5.946	5.00	55.00
(2)	0.193	0.90	1.00	(16)	7.631	5.00	60.00
(3)	0.232	1.30	2.30	(17)	9.766	5.00	65.00
(4)	0.300	2.70	5.00	(18)	12.333	5.00	70.00
(5)	0.442	5.00	10.00	(19)	15.284	5.00	75.00
(6)	0.649	5.00	15.00	(20)	18.707	5.00	80.00
(7)	0.689	0.80	15.80	(21)	21.969	4.20	84.20
(8)	0.940	4.20	20.00	(22)	22.613	0.80	85.00
(9)	1.322	5.00	25.00	(23)	27.365	5.00	90.00
(10)	1.786	5.00	30.00	(24)	34.294	5.00	95.00
(11)	2.322	5.00	35.00	(25)	41.977	2.70	97.70
(12)	2.934	5.00	40.00	(26)	48.869	1.30	99.00
(13)	3.683	5.00	45.00	(27)	63.150	0.90	99.90
(14)	4.655	5.00	50.00				

Median : 4.646 (μm) Mean: 9.888 (μm) Mode: 24.398 (μm)
Std. Dev.: 11.617 (μm) Span: 4.093
Coef. Var: 117.49% Spec. Area: 42573 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Aug/20/'01 11:44

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010816-825 16:03
Filename : C104825
Sample : S01T001451

Material : C-104 Solids
Source : S01T001014
Lot Numbe : S01T001451

Condition
T%(He-Ne): 85.2%
(LAMP): 73.3%

Dist.Form: Std.
R.R.index: 1.16-0.00i

Sampling times : 100
( )

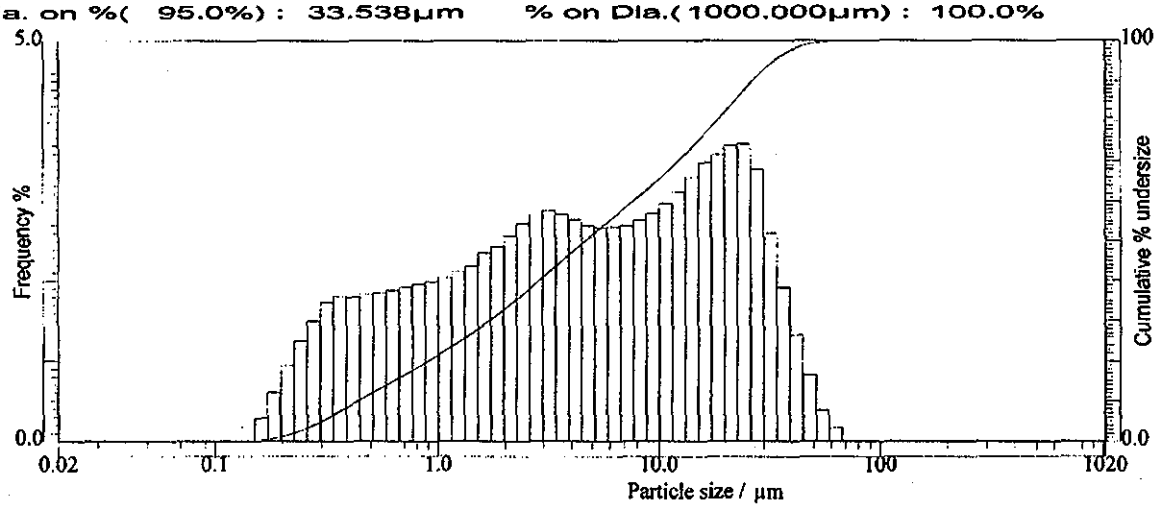
Agitation : 1
Circultn : 6
U.sonic : OFF(1200)

Format
Dist.base : Volume
Scaling : Auto
Axis : LogX - LinearY

Data
Median : 4.649μm
SP.Area : 42917cm²/cm³
S.D. : 11.384μm
Mode : 24.269μm
Mean : 9.756μm
C.V. : 116.69%

Span : (D 10.0-D 90.0) / D50 = 5.658

Dia. on %(5.0%) :	0.302μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	1.263μm	% on Dia.(1.000μm) :	21.4%
Dia. on %(50.0%) :	4.649μm	% on Dia.(10.000μm) :	65.4%
Dia. on %(75.0%) :	15.205μm	% on Dia.(100.000μm) :	100.0%
Dia. on %(95.0%) :	33.538μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	3.72	89.40	0.669	1.88	15.66
890.1	0.00	100.00	22.80	3.69	85.68	0.584	1.85	13.78
777.1	0.00	100.00	19.90	3.58	81.99	0.510	1.83	11.94
678.5	0.00	100.00	17.38	3.47	78.42	0.445	1.80	10.10
592.4	0.00	100.00	15.17	3.30	74.94	0.389	1.81	8.31
517.2	0.00	100.00	13.25	3.12	71.64	0.339	1.73	6.50
451.6	0.00	100.00	11.56	2.97	68.52	0.296	1.50	4.76
394.2	0.00	100.00	10.10	2.84	65.55	0.259	1.25	3.27
344.2	0.00	100.00	8.816	2.75	62.71	0.226	0.94	2.02
300.5	0.00	100.00	7.697	2.69	59.95	0.197	0.61	1.08
262.4	0.00	100.00	6.720	2.68	57.27	0.172	0.29	0.47
229.1	0.00	100.00	5.867	2.66	54.58	0.150	0.18	0.18
200.0	0.00	100.00	5.122	2.69	51.92	0.131	0.00	0.00
174.6	0.00	100.00	4.472	2.77	49.23	0.115	0.00	0.00
152.5	0.00	100.00	3.905	2.84	46.47	0.100	0.00	0.00
133.1	0.00	100.00	3.409	2.88	43.63	0.087	0.00	0.00
116.2	0.00	100.00	2.976	2.83	40.75	0.076	0.00	0.00
101.5	0.00	100.00	2.599	2.72	37.92	0.067	0.00	0.00
88.58	0.00	100.00	2.269	2.57	35.20	0.058	0.00	0.00
77.34	0.00	100.00	1.981	2.43	32.63	0.051	0.00	0.00
67.52	0.17	100.00	1.729	2.35	30.20	0.044	0.00	0.00
58.95	0.38	99.83	1.510	2.18	27.85	0.039	0.00	0.00
51.47	0.82	99.45	1.318	2.12	25.67	0.034	0.00	0.00
44.94	1.31	98.63	1.151	2.04	23.55	0.029	0.00	0.00
39.23	1.91	97.32	1.005	1.98	21.52	0.026	0.00	0.00
34.25	2.60	95.41	0.877	1.95	19.53	0.022	0.00	0.00
29.91	3.40	92.80	0.766	1.92	17.58			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/20/01
File Name: C104825.DAT Sample Name: S01T001451 ID No: 01/08/16-825
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 85.167 % Lamp: 73.330 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: C-104 Solids Source: S01T001014
Lot No: S01T001451 Test No: 4

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.142	0.10	0.10	(15)	5.999	5.00	55.00
(2)	0.194	0.90	1.00	(16)	7.715	5.00	60.00
(3)	0.233	1.30	2.30	(17)	9.848	5.00	65.00
(4)	0.302	2.70	5.00	(18)	12.361	5.00	70.00
(5)	0.442	5.00	10.00	(19)	15.207	5.00	75.00
(6)	0.639	5.00	15.00	(20)	18.496	5.00	80.00
(7)	0.676	0.80	15.80	(21)	21.634	4.20	84.20
(8)	0.907	4.20	20.00	(22)	22.261	0.80	85.00
(9)	1.265	5.00	25.00	(23)	26.779	5.00	90.00
(10)	1.710	5.00	30.00	(24)	33.578	5.00	95.00
(11)	2.246	5.00	35.00	(25)	40.903	2.70	97.70
(12)	2.876	5.00	40.00	(26)	47.873	1.30	99.00
(13)	3.648	5.00	45.00	(27)	62.386	0.90	99.90
(14)	4.658	5.00	50.00				

Median : 4.649 (μm) Mean: 9.756 (μm) Mode: 24.398 (μm)
Std. Dev.: 11.384 (μm) Span: 3.944
Coef. Var: 116.69% Spec. Area: 42917 (cm2/cm3)

This document was too large to scan as a single document. It has been divided into smaller sections.

Section 3 of

Document Information			
Document #	**HNF-8862**	**Revision**	**0**
Title	PARTICLE PROPERTY ANALYSES OF HLW TANK SLUDGES		
Date	**0/3/04/2002**		
Originator	**DB BECHTOLD** **L JENSEN** **JB DUNCAN** **JR JEWETT** **JM TINGEY**	**Originator Co.**	**FH** **CHG** **OTHER** **NHC** **PNL**
Recipient		**Recipient Co.**	
References	**EDT-628492**		
Keywords	Composite, Sieve Test		
Projects	**Tank Farms**		
Other Information	TANK 241AW103 241AY102 241AZ102 241C107 241SY102 241AW103 241AY101 App F, 222S PSD measurement Results Con'd (Pages F-202 → F-440) F6, F7, F8, F9, F10, F11, F12		

APPENDIX F-6

TANK AW-103 COMPOSITE: PSD MEASUREMENT RESULTS

Consisting of 34 pages including this cover page

TABLE F-6. Sample identification and PSD run conditions. AW-103 composite subsamples S01T001669 and S01T001670.

Conditions Key: P = Pump Speed Setting; P6 = 14.4 mL/s
S = Stirrer Speed Setting (1-7); S1 = Stirrer Speed 1; S3 = Stirrer Speed 3
US = Ultrasonic ON Time (min); DT = Delay Time (min) between end of ultrasonic treatment and PSD measurement.
Time = Clock time at beginning of measurement.

Sample	PSD Run File Name	Run Conditions				Time	Cumulative Time (min) At Conditions				
		P	S	US	DT		P6	S1	S3	US	DT
S01T001669	[LOAD-IN]	6	1	0	0	?	?	?			
	AW103946	6	1	0	0	21:06	4	4			
	AW103947	6	3	0	0	21:10	8	4	4		
	AW103948	6	3	2	0	21:14	14	4	10	2	0
	AW103949	6	1	0	0	21:20	17	7	10	2	4
						21:23					
S01T001669	[LOAD-IN]	6	1	0	0	?	?	?			
	AW103950	6	1	0	0	21:29	3	3			
	AW103951	6	3	0	0	21:32	7	3	4		
	AW103952	6	3	2	0	21:36	13	3	10	2	0
	AW103953	6	1	0	0	21:42	15	5	10	2	4
						21:44					
S01T001670	[LOAD-IN]	6	1	0	0	?	?	?			
	AW103956	6	1	0	0	10:43	7	7			
	AW103957	6	3	0	0	10:50	10	7	3		
	AW103958	6	3	2	0	10:53	16	7	9	2	0
	AW103959	6	1	0	0	10:59	18	9	9	2	4
						11:01					
S01T001670	[LOAD-IN]	6	3	0	0	?	?		?		
	AW103961	6	3	0	0	11:17	5		5		
	AW103960	6	1	0	0	11:22	13	8	5		
	AW103962	6	3	2	0	11:30	19	8	11	2	0
	AW103963	6	1	0	0	11:36	22	11	14	2	4
						11:39					

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/27/'01 16:23

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926-013 21:08
Filename : AW103946
Sample : aw103

Material :
Source :
Lot Numbe : 1669

Condition
T%(He-Ne): 83.0%
(LAMP): 77.0%
Dist.Form: Std.
R.R.Index: 1.16-0.00i
Sampling times : 100
( )

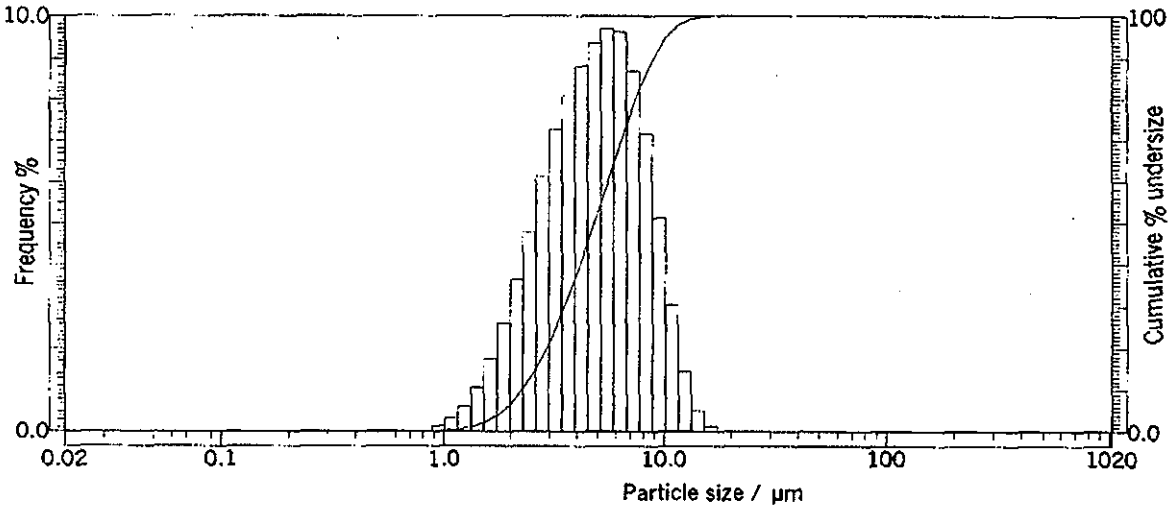
Agitation : 1
Circultn : 6
U.sonic : ~~ON~~ OFF (120) WSC 10/1/01

Format
Dist.base : Volume
Scaling : Auto
Axis : LogX - LinearY

Data
Median : 4.796μm
SP.Area : 15002cm²/cm³
S.D. : 2.615μm
Mode : 5.493μm
Mean : 5.248μm
C.V. : 49.83%

Span : (D 10.0-D 90.0) / D50 = 1.380

Dia. on %(5.0%) :	1.832μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	3.206μm	% on Dia.(1.000μm) :	0.1%
Dia. on %(50.0%) :	4.796μm	% on Dia.(10.000μm) :	94.5%
Dia. on %(75.0%) :	6.838μm	% on Dia.(100.000μm) :	100.0%
Dia. on %(95.0%) :	10.160μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	100.00	0.669	0.00	0.00
890.1	0.00	100.00	22.80	0.00	100.00	0.584	0.00	0.00
777.1	0.00	100.00	19.90	0.00	100.00	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.14	100.00	0.445	0.00	0.00
592.4	0.00	100.00	15.17	0.52	99.86	0.389	0.00	0.00
517.2	0.00	100.00	13.25	1.44	99.34	0.339	0.00	0.00
451.6	0.00	100.00	11.56	3.04	97.90	0.296	0.00	0.00
394.2	0.00	100.00	10.10	5.12	94.86	0.259	0.00	0.00
344.2	0.00	100.00	8.816	7.17	89.74	0.226	0.00	0.00
300.5	0.00	100.00	7.697	8.70	82.58	0.197	0.00	0.00
262.4	0.00	100.00	6.720	9.64	73.88	0.172	0.00	0.00
229.1	0.00	100.00	5.867	9.71	64.24	0.150	0.00	0.00
200.0	0.00	100.00	5.122	9.36	54.54	0.131	0.00	0.00
174.6	0.00	100.00	4.472	8.81	45.18	0.115	0.00	0.00
152.5	0.00	100.00	3.905	8.08	36.37	0.100	0.00	0.00
133.1	0.00	100.00	3.409	7.27	28.29	0.087	0.00	0.00
116.2	0.00	100.00	2.976	6.12	21.02	0.076	0.00	0.00
101.5	0.00	100.00	2.599	4.78	14.90	0.067	0.00	0.00
88.58	0.00	100.00	2.269	3.63	10.12	0.058	0.00	0.00
77.34	0.00	100.00	1.981	2.60	6.49	0.051	0.00	0.00
67.52	0.00	100.00	1.729	1.76	3.89	0.044	0.00	0.00
58.95	0.00	100.00	1.510	1.07	2.14	0.039	0.00	0.00
51.47	0.00	100.00	1.318	0.61	1.07	0.034	0.00	0.00
44.94	0.00	100.00	1.151	0.31	0.46	0.029	0.00	0.00
39.23	0.00	100.00	1.005	0.15	0.15	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/27/01
File Name: AW103946.DAT Sample Name: aw103 ID No: 01/09/26-013
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 82.966 % Lamp: 77.032 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Lot No: 1669 Test No:

WSC 10/1/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.962	0.10	0.10	(15)	5.158	5.00	55.00
(2)	1.299	0.90	1.00	(16)	5.541	5.00	60.00
(3)	1.530	1.30	2.30	(17)	5.934	5.00	65.00
(4)	1.836	2.70	5.00	(18)	6.376	5.00	70.00
(5)	2.259	5.00	10.00	(19)	6.845	5.00	75.00
(6)	2.604	5.00	15.00	(20)	7.407	5.00	80.00
(7)	2.654	0.80	15.80	(21)	7.950	4.20	84.20
(8)	2.913	4.20	20.00	(22)	8.075	0.80	85.00
(9)	3.213	5.00	25.00	(23)	8.880	5.00	90.00
(10)	3.514	5.00	30.00	(24)	10.164	5.00	95.00
(11)	3.821	5.00	35.00	(25)	11.467	2.70	97.70
(12)	4.138	5.00	40.00	(26)	12.845	1.30	99.00
(13)	4.461	5.00	45.00	(27)	15.755	0.90	99.90
(14)	4.807	5.00	50.00				

Median : 4.796 (μm) Mean: 5.248 (μm) Mode: 5.482 (μm)
Std. Dev.: 2.615 (μm) Span: 0.693
Coef. Var: 49.83% Spec. Area: 15002 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/27/'01 16:23

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926-014 21:14 Material :
Filename : AW103947 Source :
Sample : aw103 Lot Numbe : 1669

Condition
T%(He-Ne): 82.4% Dist.Form: Std. Sampling times : 100
(LAMP): 76.6% R.R.Index: 1.16-0.00i ( )

Agitation : 3 Circultn : 6 U.sonic : ~~ON~~ OFF (120)

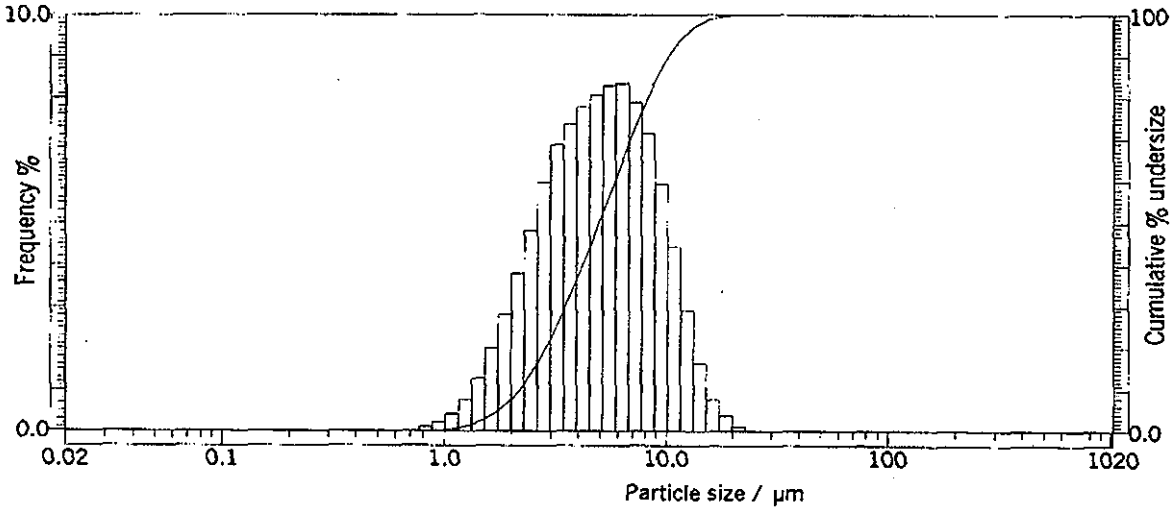
WSC 10/1/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 4.937μm SP.Area : 14941cm²/cm³ S.D. : 3.266μm
Mode : 6.258μm Mean : 5.661μm
C.V. : 57.69%

Span : (D 10.0-D 90.0) / D50 = 1.622

Dia. on %(5.0%) :	1.751μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	3.150μm	% on Dia.(1.000μm) :	0.3%
Dia. on %(50.0%) :	4.937μm	% on Dia.(10.000μm) :	89.4%
Dia. on %(75.0%) :	7.472μm	% on Dia.(100.000μm) :	100.0%
Dia. on %(95.0%) :	12.006μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	100.00	0.669	0.00	0.00
890.1	0.00	100.00	22.80	0.11	100.00	0.584	0.00	0.00
777.1	0.00	100.00	19.90	0.37	99.89	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.77	99.51	0.445	0.00	0.00
592.4	0.00	100.00	15.17	1.64	98.74	0.389	0.00	0.00
517.2	0.00	100.00	13.25	2.91	97.10	0.339	0.00	0.00
451.6	0.00	100.00	11.56	4.43	94.20	0.296	0.00	0.00
394.2	0.00	100.00	10.10	5.92	89.77	0.259	0.00	0.00
344.2	0.00	100.00	8.816	7.13	83.85	0.226	0.00	0.00
300.5	0.00	100.00	7.697	7.89	76.73	0.197	0.00	0.00
262.4	0.00	100.00	6.720	8.35	68.84	0.172	0.00	0.00
229.1	0.00	100.00	5.867	8.29	60.49	0.150	0.00	0.00
200.0	0.00	100.00	5.122	8.06	52.19	0.131	0.00	0.00
174.6	0.00	100.00	4.472	7.78	44.13	0.115	0.00	0.00
152.5	0.00	100.00	3.905	7.36	36.35	0.100	0.00	0.00
133.1	0.00	100.00	3.409	6.86	28.99	0.087	0.00	0.00
116.2	0.00	100.00	2.976	5.97	22.14	0.076	0.00	0.00
101.5	0.00	100.00	2.599	4.82	16.16	0.067	0.00	0.00
88.58	0.00	100.00	2.269	3.79	11.34	0.058	0.00	0.00
77.34	0.00	100.00	1.981	2.81	7.55	0.051	0.00	0.00
67.52	0.00	100.00	1.729	1.98	4.74	0.044	0.00	0.00
58.95	0.00	100.00	1.510	1.27	2.76	0.039	0.00	0.00
51.47	0.00	100.00	1.318	0.76	1.49	0.034	0.00	0.00
44.94	0.00	100.00	1.151	0.42	0.73	0.029	0.00	0.00
39.23	0.00	100.00	1.005	0.21	0.31	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/27/01

File Name: AW103947.DAT Sample Name: aw103 ID No: 01/09/26-014

Dist. Form: STANDARD R.R. Index: 116-000

Dist. Mode: VOLUME Laser: 82.414 % Lamp: 76.644 %

Circulation: 6 Agitation: 3 U.Sonic OFF (min)

Lot No: 1669 Test No:

WSC 10/1/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.875	0.10	0.10	(15)	5.374	5.00	55.00
(2)	1.210	0.90	1.00	(16)	5.823	5.00	60.00
(3)	1.440	1.30	2.30	(17)	6.328	5.00	65.00
(4)	1.752	2.70	5.00	(18)	6.864	5.00	70.00
(5)	2.167	5.00	10.00	(19)	7.483	5.00	75.00
(6)	2.519	5.00	15.00	(20)	8.211	5.00	80.00
(7)	2.574	0.80	15.80	(21)	8.891	4.20	84.20
(8)	2.841	4.20	20.00	(22)	9.064	0.80	85.00
(9)	3.157	5.00	25.00	(23)	10.172	5.00	90.00
(10)	3.477	5.00	30.00	(24)	12.028	5.00	95.00
(11)	3.814	5.00	35.00	(25)	13.945	2.70	97.70
(12)	4.171	5.00	40.00	(26)	15.907	1.30	99.00
(13)	4.542	5.00	45.00	(27)	20.239	0.90	99.90
(14)	4.945	5.00	50.00				

Median : 4.937 (μm) Mean: 5.661 (μm) Mode: 6.279 (μm)

Std. Dev.: 3.266 (μm) Span: 0.919

Coef. Var: 57.69% Spec. Area: 14941 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/27/'01 16:23

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926-015 21:19
Filename : AW103948
Sample : aw103

Material :
Source :
Lot Numbe : 1669

Condition
T%(He-Ne): 84.7%
(LAMP): 77.4%
Dist.Form: Std.
R.R.Index: 1.16-0.00i
Sampling times : 100
( )

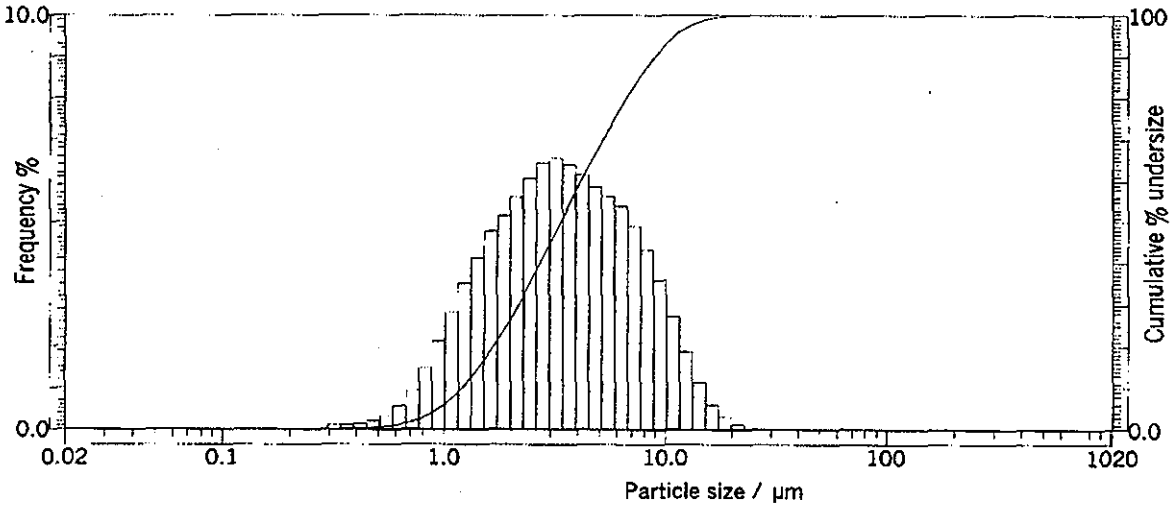
Agitation : 3 Circultn : 6 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 3.337μm SP.Area : 24256cm²/cm³ S.D. : 3.282μm
Mode : 3.184μm Mean : 4.336μm
C.V. : 75.69%

Span : (D 10.0-D 90.0) / D50 = 2.316

Dia. on %(5.0%) : 0.941μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 1.910μm % on Dia.(1.000μm) : 5.9%
Dia. on %(50.0%) : 3.337μm % on Dia.(10.000μm) : 93.0%
Dia. on %(75.0%) : 5.859μm % on Dia.(100.000μm) : 100.0%
Dia. on %(95.0%) : 11.028μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	100.00	0.669	0.57	1.48
890.1	0.00	100.00	22.80	0.12	100.00	0.584	0.34	0.92
777.1	0.00	100.00	19.90	0.32	99.88	0.510	0.22	0.58
678.5	0.00	100.00	17.38	0.60	99.56	0.445	0.14	0.36
592.4	0.00	100.00	15.17	1.14	98.96	0.389	0.12	0.22
517.2	0.00	100.00	13.25	1.87	97.82	0.339	0.10	0.10
451.6	0.00	100.00	11.56	2.72	95.95	0.296	0.00	0.00
394.2	0.00	100.00	10.10	3.58	93.23	0.259	0.00	0.00
344.2	0.00	100.00	8.816	4.32	89.65	0.226	0.00	0.00
300.5	0.00	100.00	7.697	4.89	85.33	0.197	0.00	0.00
262.4	0.00	100.00	6.720	5.38	80.44	0.172	0.00	0.00
229.1	0.00	100.00	5.867	5.63	75.06	0.150	0.00	0.00
200.0	0.00	100.00	5.122	5.86	69.43	0.131	0.00	0.00
174.6	0.00	100.00	4.472	6.15	63.57	0.115	0.00	0.00
152.5	0.00	100.00	3.905	6.39	57.42	0.100	0.00	0.00
133.1	0.00	100.00	3.409	6.55	51.03	0.087	0.00	0.00
116.2	0.00	100.00	2.976	6.43	44.47	0.076	0.00	0.00
101.5	0.00	100.00	2.599	6.06	38.05	0.067	0.00	0.00
88.58	0.00	100.00	2.269	5.61	31.99	0.058	0.00	0.00
77.34	0.00	100.00	1.981	5.16	26.38	0.051	0.00	0.00
67.52	0.00	100.00	1.729	4.78	21.22	0.044	0.00	0.00
58.95	0.00	100.00	1.510	4.11	16.44	0.039	0.00	0.00
51.47	0.00	100.00	1.318	3.51	12.33	0.034	0.00	0.00
44.94	0.00	100.00	1.151	2.81	8.82	0.029	0.00	0.00
39.23	0.00	100.00	1.005	2.11	6.02	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/27/01
File Name: AW103948.DAT Sample Name: aw103 ID No: 01/09/26-015
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 84.690 % Lamp: 77.351 %
Circulation: 6 Agitation: 3 U.Sonic ** (min)
Lot No: 1669 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.337	0.10	0.10	(15)	3.717	5.00	55.00
(2)	0.596	0.90	1.00	(16)	4.142	5.00	60.00
(3)	0.753	1.30	2.30	(17)	4.630	5.00	65.00
(4)	0.943	2.70	5.00	(18)	5.198	5.00	70.00
(5)	1.207	5.00	10.00	(19)	5.859	5.00	75.00
(6)	1.443	5.00	15.00	(20)	6.650	5.00	80.00
(7)	1.480	0.80	15.80	(21)	7.471	4.20	84.20
(8)	1.673	4.20	20.00	(22)	7.630	0.80	85.00
(9)	1.914	5.00	25.00	(23)	8.940	5.00	90.00
(10)	2.167	5.00	30.00	(24)	11.051	5.00	95.00
(11)	2.433	5.00	35.00	(25)	13.138	2.70	97.70
(12)	2.713	5.00	40.00	(26)	15.323	1.30	99.00
(13)	3.011	5.00	45.00	(27)	20.403	0.90	99.90
(14)	3.341	5.00	50.00				

Median : 3.337 (μm) Mean: 4.336 (μm) Mode: 3.185 (μm)
Std. Dev.: 3.282 (μm) Span: 1.549
Coef. Var: 75.68% Spec. Area: 24256 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/27/'01 16:24

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926-016 21:23
Filename : AW103949
Sample : aw103

Material :
Source :
Lot Numbe : 1669

Condition
T%(He-Ne): 84.1% Dist.Form: Std. Sampling times : 100
(LAMP): 77.1% R.R.Index: 1.16-0.00i ( )

Agitation : 1 Circultn : 6 U.sonic : ~~ON~~ OFF (120)

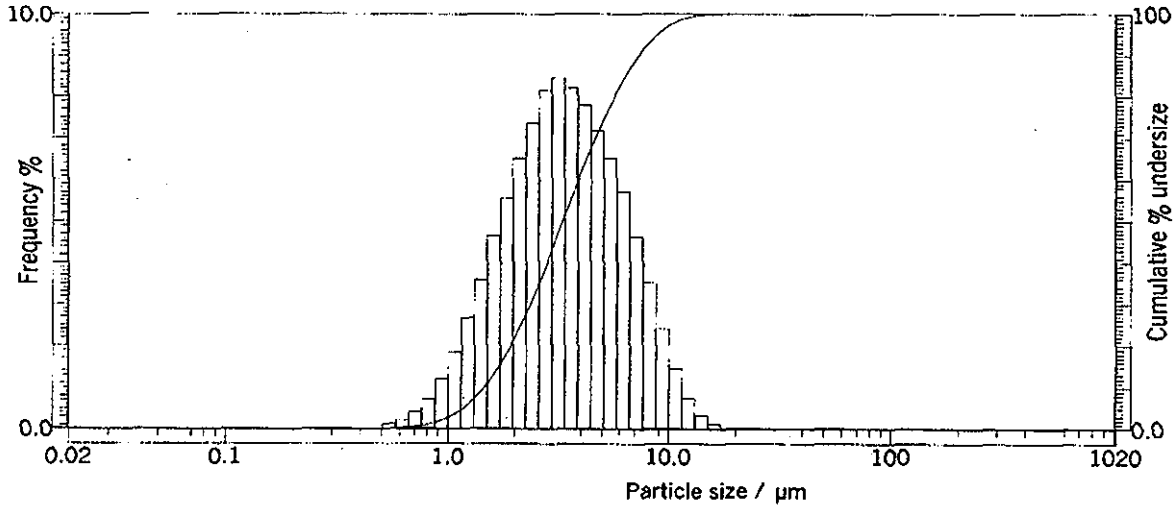
WJC 10/1/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 3.332μm SP.Area : 21928cm²/cm³ S.D. : 2.454μm
Mode : 3.187μm Mean : 3.965μm
C.V. : 61.89%

Span : (D 10.0-D 90.0) / D50 = 1.775

Dia. on %(5.0%) :	1.179μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	2.155μm	% on Dia.(1.000μm) :	2.6%
Dia. on %(50.0%) :	3.332μm	% on Dia.(10.000μm) :	97.2%
Dia. on %(75.0%) :	5.168μm	% on Dia.(100.000μm) :	100.0%
Dia. on %(95.0%) :	8.848μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	100.00	0.669	0.22	0.35
890.1	0.00	100.00	22.80	0.00	100.00	0.584	0.12	0.12
777.1	0.00	100.00	19.90	0.00	100.00	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.12	100.00	0.445	0.00	0.00
592.4	0.00	100.00	15.17	0.33	99.88	0.389	0.00	0.00
517.2	0.00	100.00	13.25	0.76	99.54	0.339	0.00	0.00
451.6	0.00	100.00	11.56	1.45	98.79	0.296	0.00	0.00
394.2	0.00	100.00	10.10	2.40	97.34	0.259	0.00	0.00
344.2	0.00	100.00	8.816	3.51	94.94	0.226	0.00	0.00
300.5	0.00	100.00	7.697	4.63	91.43	0.197	0.00	0.00
262.4	0.00	100.00	6.720	5.72	86.80	0.172	0.00	0.00
229.1	0.00	100.00	5.867	6.51	81.08	0.150	0.00	0.00
200.0	0.00	100.00	5.122	7.18	74.57	0.131	0.00	0.00
174.6	0.00	100.00	4.472	7.78	67.40	0.115	0.00	0.00
152.5	0.00	100.00	3.905	8.20	59.61	0.100	0.00	0.00
133.1	0.00	100.00	3.409	8.45	51.41	0.087	0.00	0.00
116.2	0.00	100.00	2.976	8.14	42.97	0.076	0.00	0.00
101.5	0.00	100.00	2.599	7.36	34.83	0.067	0.00	0.00
88.58	0.00	100.00	2.269	6.50	27.47	0.058	0.00	0.00
77.34	0.00	100.00	1.981	5.55	20.97	0.051	0.00	0.00
67.52	0.00	100.00	1.729	4.65	15.42	0.044	0.00	0.00
58.95	0.00	100.00	1.510	3.57	10.77	0.039	0.00	0.00
51.47	0.00	100.00	1.318	2.66	7.20	0.034	0.00	0.00
44.94	0.00	100.00	1.151	1.85	4.53	0.029	0.00	0.00
39.23	0.00	100.00	1.005	1.20	2.69	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/27/01
File Name: AW103949.DAT Sample Name: aw103 ID No: 01/09/26-016
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 84.145 % Lamp: 77.056 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Lot No: 1669 Test No:

WJC 10/1/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.570	0.10	0.10	(15)	3.626	5.00	55.00
(2)	0.803	0.90	1.00	(16)	3.933	5.00	60.00
(3)	0.964	1.30	2.30	(17)	4.297	5.00	65.00
(4)	1.180	2.70	5.00	(18)	4.708	5.00	70.00
(5)	1.469	5.00	10.00	(19)	5.171	5.00	75.00
(6)	1.710	5.00	15.00	(20)	5.743	5.00	80.00
(7)	1.747	0.80	15.80	(21)	6.332	4.20	84.20
(8)	1.937	4.20	20.00	(22)	6.451	0.80	85.00
(9)	2.159	5.00	25.00	(23)	7.396	5.00	90.00
(10)	2.382	5.00	30.00	(24)	8.850	5.00	95.00
(11)	2.606	5.00	35.00	(25)	10.464	2.70	97.70
(12)	2.839	5.00	40.00	(26)	12.037	1.30	99.00
(13)	3.080	5.00	45.00	(27)	15.584	0.90	99.90
(14)	3.337	5.00	50.00				

Median : 3.332 (μm) Mean: 3.965 (μm) Mode: 3.185 (μm)
Std. Dev.: 2.454 (μm) Span: 1.104
Coef. Var: 61.89% Spec. Area: 21928 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/27/'01 16:24

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926-017 21:31
Filename : AW103950
Sample : aw103

Material :
Source :
Lot Numbe : 1669

Condition
T%(He-Ne): 86.1%
(LAMP): 81.7%

Dist.Form: Std.
R.R.Index: 1.16-0.00i ( )

Sampling times : 100

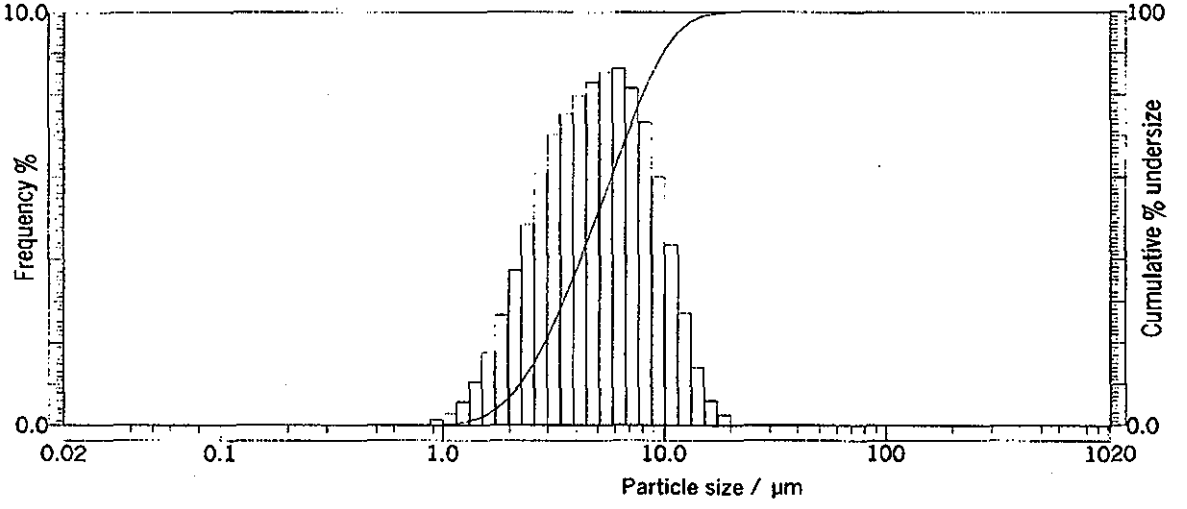
Agitation : 1 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 4.956μm SP.Area : 14630cm²/cm³ S.D. : 3.096μm
Mode : 6.259μm Mean : 5.618μm
C.V. : 55.11%

Span : (D 10.0-D 90.0) / D50 = 1.552

Dia. on %(5.0%) : 1.837μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 3.206μm % on Dia.(1.000μm) : 0.1%
Dia. on %(50.0%) : 4.956μm % on Dia.(10.000μm) : 90.2%
Dia. on %(75.0%) : 7.401μm % on Dia.(100.000μm) : 100.0%
Dia. on %(95.0%) : 11.558μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	100.00	0.669	0.00	0.00
890.1	0.00	100.00	22.80	0.00	100.00	0.584	0.00	0.00
777.1	0.00	100.00	19.90	0.26	100.00	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.59	99.74	0.445	0.00	0.00
592.4	0.00	100.00	15.17	1.41	99.15	0.389	0.00	0.00
517.2	0.00	100.00	13.25	2.72	97.74	0.339	0.00	0.00
451.6	0.00	100.00	11.56	4.35	95.02	0.296	0.00	0.00
394.2	0.00	100.00	10.10	6.00	90.67	0.259	0.00	0.00
344.2	0.00	100.00	8.816	7.32	84.67	0.226	0.00	0.00
300.5	0.00	100.00	7.697	8.15	77.35	0.197	0.00	0.00
262.4	0.00	100.00	6.720	8.63	69.20	0.172	0.00	0.00
229.1	0.00	100.00	5.867	8.56	60.57	0.150	0.00	0.00
200.0	0.00	100.00	5.122	8.30	52.01	0.131	0.00	0.00
174.6	0.00	100.00	4.472	7.99	43.71	0.115	0.00	0.00
152.5	0.00	100.00	3.905	7.54	35.72	0.100	0.00	0.00
133.1	0.00	100.00	3.409	7.02	28.18	0.087	0.00	0.00
116.2	0.00	100.00	2.976	6.09	21.15	0.076	0.00	0.00
101.5	0.00	100.00	2.599	4.85	15.06	0.067	0.00	0.00
88.58	0.00	100.00	2.269	3.74	10.21	0.058	0.00	0.00
77.34	0.00	100.00	1.981	2.67	6.48	0.051	0.00	0.00
67.52	0.00	100.00	1.729	1.77	3.81	0.044	0.00	0.00
58.95	0.00	100.00	1.510	1.05	2.04	0.039	0.00	0.00
51.47	0.00	100.00	1.318	0.57	0.98	0.034	0.00	0.00
44.94	0.00	100.00	1.151	0.28	0.41	0.029	0.00	0.00
39.23	0.00	100.00	1.005	0.13	0.13	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/27/01
File Name: AW103950.DAT Sample Name: aw103 ID No: 01/09/26-017
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 86.111 % Lamp: 81.735 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Lot No: 1669 Test No: dup

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.978	0.10	0.10	(15)	5.382	5.00	55.00
(2)	1.321	0.90	1.00	(16)	5.817	5.00	60.00
(3)	1.542	1.30	2.30	(17)	6.305	5.00	65.00
(4)	1.842	2.70	5.00	(18)	6.816	5.00	70.00
(5)	2.252	5.00	10.00	(19)	7.415	5.00	75.00
(6)	2.595	5.00	15.00	(20)	8.101	5.00	80.00
(7)	2.644	0.80	15.80	(21)	8.743	4.20	84.20
(8)	2.905	4.20	20.00	(22)	8.885	0.80	85.00
(9)	3.213	5.00	25.00	(23)	9.954	5.00	90.00
(10)	3.529	5.00	30.00	(24)	11.558	5.00	95.00
(11)	3.857	5.00	35.00	(25)	13.224	2.70	97.70
(12)	4.209	5.00	40.00	(26)	14.966	1.30	99.00
(13)	4.573	5.00	45.00	(27)	18.930	0.90	99.90
(14)	4.965	5.00	50.00				

Median : 4.956 (μm) Mean: 5.618 (μm) Mode: 6.279 (μm)
Std. Dev.: 3.096 (μm) Span: 0.839
Coef. Var: 55.11% Spec. Area: 14630 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/27/'01 16:24

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926-018 21:35
Filename : AW103951
Sample : aw103

Material :
Source :
Lot Numbe : 1669

Condition
T%(He-Ne): 86.0%
(LAMP): 81.6%
Dist.Form: Std.
R.R.index: 1.16-0.00i
Sampling times : 100
( )

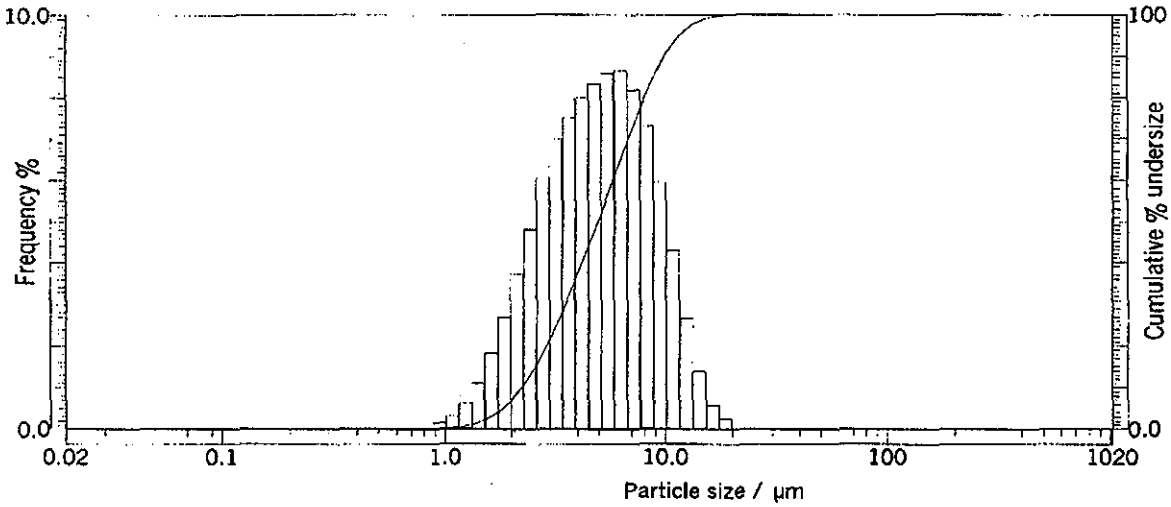
Agitation : 3 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 4.949μm SP.Area : 14699cm²/cm³ S.D. : 3.086μm
Mode : 6.258μm Mean : 5.600μm
C.V. : 55.10%

Span : (D 10.0-D 90.0) / D50 = 1.551

Dia. on %(5.0%) : 1.819μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 3.199μm % on Dia.(1.000μm) : 0.1%
Dia. on %(50.0%) : 4.949μm % on Dia.(10.000μm) : 90.4%
Dia. on %(75.0%) : 7.378μm % on Dia.(100.000μm) : 100.0%
Dia. on %(95.0%) : 11.523μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	100.00	0.669	0.00	0.00
890.1	0.00	100.00	22.80	0.00	100.00	0.584	0.00	0.00
777.1	0.00	100.00	19.90	0.25	100.00	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.58	99.75	0.445	0.00	0.00
592.4	0.00	100.00	15.17	1.38	99.17	0.389	0.00	0.00
517.2	0.00	100.00	13.25	2.67	97.79	0.339	0.00	0.00
451.6	0.00	100.00	11.56	4.30	95.12	0.296	0.00	0.00
394.2	0.00	100.00	10.10	5.96	90.82	0.259	0.00	0.00
344.2	0.00	100.00	8.816	7.31	84.86	0.226	0.00	0.00
300.5	0.00	100.00	7.697	8.17	77.55	0.197	0.00	0.00
262.4	0.00	100.00	6.720	8.67	69.37	0.172	0.00	0.00
229.1	0.00	100.00	5.867	8.60	60.71	0.150	0.00	0.00
200.0	0.00	100.00	5.122	8.33	52.11	0.131	0.00	0.00
174.6	0.00	100.00	4.472	7.99	43.78	0.115	0.00	0.00
152.5	0.00	100.00	3.905	7.52	35.79	0.100	0.00	0.00
133.1	0.00	100.00	3.409	6.98	28.26	0.087	0.00	0.00
116.2	0.00	100.00	2.976	6.05	21.28	0.076	0.00	0.00
101.5	0.00	100.00	2.599	4.82	15.24	0.067	0.00	0.00
88.58	0.00	100.00	2.269	3.73	10.42	0.058	0.00	0.00
77.34	0.00	100.00	1.981	2.69	6.69	0.051	0.00	0.00
67.52	0.00	100.00	1.729	1.82	4.00	0.044	0.00	0.00
58.95	0.00	100.00	1.510	1.10	2.18	0.039	0.00	0.00
51.47	0.00	100.00	1.318	0.62	1.08	0.034	0.00	0.00
44.94	0.00	100.00	1.151	0.31	0.46	0.029	0.00	0.00
39.23	0.00	100.00	1.005	0.15	0.15	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/27/01
File Name: AW103951.DAT Sample Name: aw103 ID No: 01/09/26-018
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 85.977 % Lamp: 81.641 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Lot No: 1669 Test No: dup

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.965	0.10	0.10	(15)	5.372	5.00	55.00
(2)	1.298	0.90	1.00	(16)	5.806	5.00	60.00
(3)	1.524	1.30	2.30	(17)	6.289	5.00	65.00
(4)	1.823	2.70	5.00	(18)	6.795	5.00	70.00
(5)	2.236	5.00	10.00	(19)	7.392	5.00	75.00
(6)	2.582	5.00	15.00	(20)	8.072	5.00	80.00
(7)	2.634	0.80	15.80	(21)	8.714	4.20	84.20
(8)	2.896	4.20	20.00	(22)	8.845	0.80	85.00
(9)	3.207	5.00	25.00	(23)	9.921	5.00	90.00
(10)	3.523	5.00	30.00	(24)	11.525	5.00	95.00
(11)	3.853	5.00	35.00	(25)	13.192	2.70	97.70
(12)	4.204	5.00	40.00	(26)	14.935	1.30	99.00
(13)	4.567	5.00	45.00	(27)	18.904	0.90	99.90
(14)	4.958	5.00	50.00				

Median : 4.949 (μm) Mean: 5.600 (μm) Mode: 6.279 (μm)
Std. Dev.: 3.086 (μm) Span: 0.837
Coef. Var: 55.10% Spec. Area: 14699 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/27/'01 16:24

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926-019 21:40
Filename : AW103952
Sample : aw103

Material :
Source :
Lot Numbe : 1669

Condition
T%(He-Ne): 87.9% Dist.Form: Std. Sampling times : 100
(LAMP): 82.5% R.R.Index: 1.16-0.00i ( )

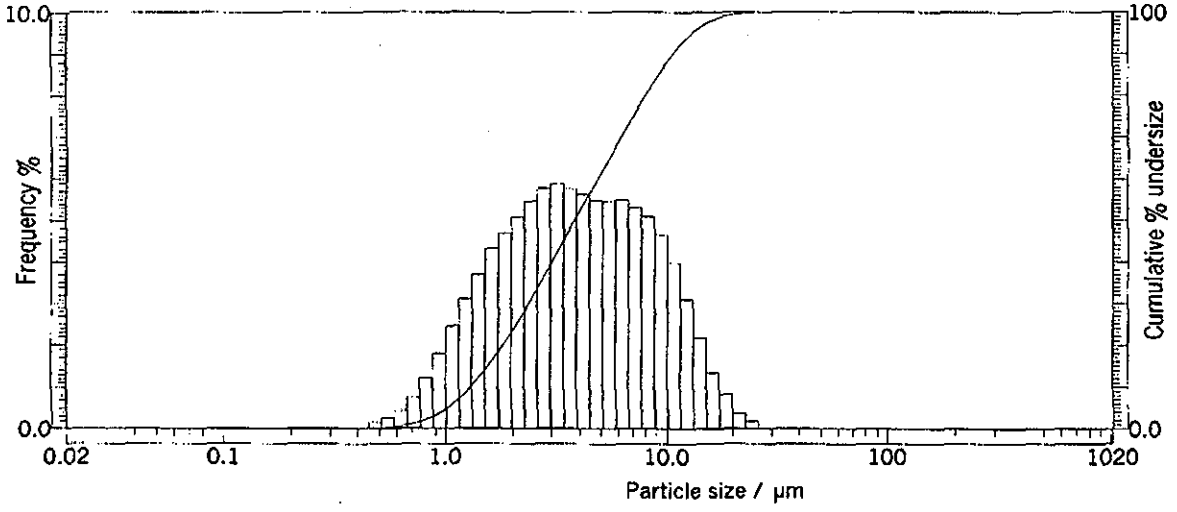
Agitation : 3 Circultn : 6 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 3.823μm SP.Area : 21541cm²/cm³ S.D. : 4.001μm
Mode : 3.185μm Mean : 5.109μm
C.V. : 78.32%

Span : (D 10.0-D 90.0) / D50 = 2.483

Dia. on %(5.0%) :	1.026μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	2.095μm	% on Dia.(1.000μm) :	4.6%
Dia. on %(50.0%) :	3.823μm	% on Dia.(10.000μm) :	87.7%
Dia. on %(75.0%) :	7.079μm	% on Dia.(100.000μm) :	100.0%
Dia. on %(95.0%) :	13.184μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.17	100.00	0.669	0.44	0.85
890.1	0.00	100.00	22.80	0.37	99.83	0.584	0.25	0.41
777.1	0.00	100.00	19.90	0.83	99.45	0.510	0.16	0.16
678.5	0.00	100.00	17.38	1.34	98.62	0.445	0.00	0.00
592.4	0.00	100.00	15.17	2.17	97.28	0.389	0.00	0.00
517.2	0.00	100.00	13.25	3.10	95.11	0.339	0.00	0.00
451.6	0.00	100.00	11.56	3.98	92.01	0.296	0.00	0.00
394.2	0.00	100.00	10.10	4.66	88.03	0.259	0.00	0.00
344.2	0.00	100.00	8.816	5.10	83.38	0.226	0.00	0.00
300.5	0.00	100.00	7.697	5.32	78.28	0.197	0.00	0.00
262.4	0.00	100.00	6.720	5.49	72.96	0.172	0.00	0.00
229.1	0.00	100.00	5.867	5.46	67.47	0.150	0.00	0.00
200.0	0.00	100.00	5.122	5.48	62.01	0.131	0.00	0.00
174.6	0.00	100.00	4.472	5.63	56.53	0.115	0.00	0.00
152.5	0.00	100.00	3.905	5.77	50.90	0.100	0.00	0.00
133.1	0.00	100.00	3.409	5.88	45.13	0.087	0.00	0.00
116.2	0.00	100.00	2.976	5.78	39.24	0.076	0.00	0.00
101.5	0.00	100.00	2.599	5.47	33.46	0.067	0.00	0.00
88.58	0.00	100.00	2.269	5.09	27.99	0.058	0.00	0.00
77.34	0.00	100.00	1.981	4.69	22.91	0.051	0.00	0.00
67.52	0.00	100.00	1.729	4.32	18.22	0.044	0.00	0.00
58.95	0.00	100.00	1.510	3.70	13.89	0.039	0.00	0.00
51.47	0.00	100.00	1.318	3.11	10.19	0.034	0.00	0.00
44.94	0.00	100.00	1.151	2.45	7.08	0.029	0.00	0.00
39.23	0.00	100.00	1.005	1.80	4.63	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/27/01
File Name: AW103952.DAT Sample Name: aw103 ID No: 01/09/26-019
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 87.910 % Lamp: 82.536 %
Circulation: 6 Agitation: 3 U.Sonic ** (min)
Lot No: 1669 Test No: dup

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.487	0.10	0.10	(15)	4.318	5.00	55.00
(2)	0.688	0.90	1.00	(16)	4.884	5.00	60.00
(3)	0.829	1.30	2.30	(17)	5.530	5.00	65.00
(4)	1.027	2.70	5.00	(18)	6.260	5.00	70.00
(5)	1.308	5.00	10.00	(19)	7.095	5.00	75.00
(6)	1.566	5.00	15.00	(20)	8.075	5.00	80.00
(7)	1.607	0.80	15.80	(21)	9.042	4.20	84.20
(8)	1.825	4.20	20.00	(22)	9.262	0.80	85.00
(9)	2.099	5.00	25.00	(23)	10.823	5.00	90.00
(10)	2.390	5.00	30.00	(24)	13.188	5.00	95.00
(11)	2.699	5.00	35.00	(25)	15.860	2.70	97.70
(12)	3.032	5.00	40.00	(26)	18.529	1.30	99.00
(13)	3.400	5.00	45.00	(27)	24.210	0.90	99.90
(14)	3.827	5.00	50.00				

Median : 3.823 (μm) Mean: 5.109 (μm) Mode: 3.185 (μm)
Std. Dev.: 4.001 (μm) Span: 1.597
Coef. Var: 78.32% Spec. Area: 21541 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/27/'01 16:24

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926-020 21:44
Filename : AW103953
Sample : aw103

Material :
Source :
Lot Numbe : 1669

Condition
T%(He-Ne): 87.3%
(LAMP): 82.1%

Dist.Form: Std.
R.R.Index: 1.16-0.00i

Sampling times : 100
( )

Agitation : 1 Circultn : 6 U.sonic : ON(120) OFF

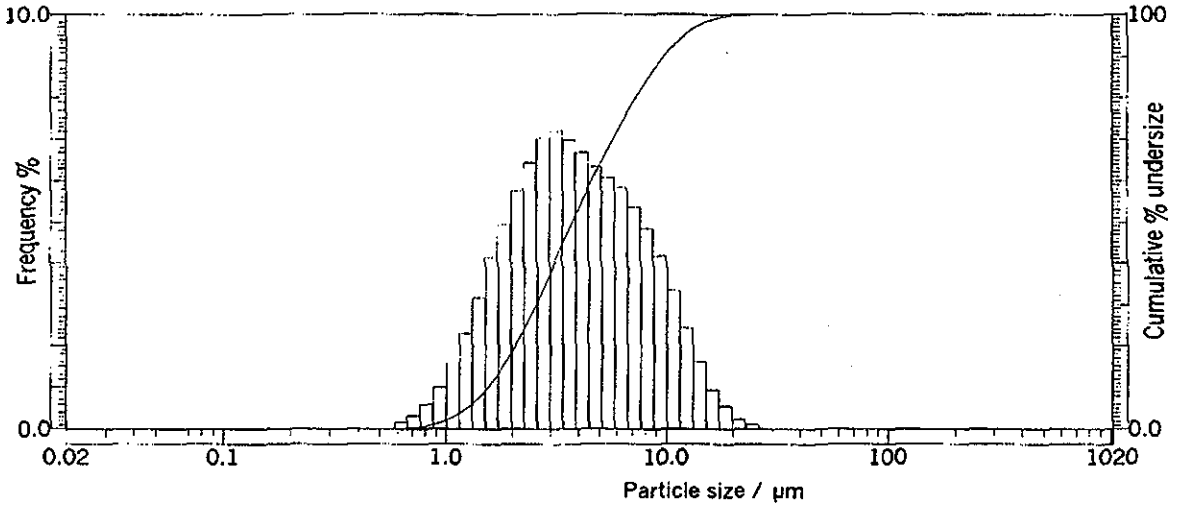
WSC 10/1/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 3.789μm SP.Area : 19663cm²/cm³ S.D. : 3.553μm
Mode : 3.184μm Mean : 4.897μm
C.V. : 72.55%

Span : (D 10.0-D 90.0) / D50 = 2.184

Dia. on %(5.0%) :	1.249μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	2.322μm	% on Dia.(1.000μm) :	2.0%
Dia. on %(50.0%) :	3.789μm	% on Dia.(10.000μm) :	90.5%
Dia. on %(75.0%) :	6.498μm	% on Dia.(100.000μm) :	100.0%
Dia. on %(95.0%) :	12.131μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.10	100.00	0.669	0.17	0.17
890.1	0.00	100.00	22.80	0.23	99.90	0.584	0.00	0.00
777.1	0.00	100.00	19.90	0.54	99.67	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.93	99.12	0.445	0.00	0.00
592.4	0.00	100.00	15.17	1.61	98.19	0.389	0.00	0.00
517.2	0.00	100.00	13.25	2.44	96.58	0.339	0.00	0.00
451.6	0.00	100.00	11.56	3.33	94.14	0.296	0.00	0.00
394.2	0.00	100.00	10.10	4.16	90.81	0.259	0.00	0.00
344.2	0.00	100.00	8.816	4.85	86.65	0.226	0.00	0.00
300.5	0.00	100.00	7.697	5.36	81.80	0.197	0.00	0.00
262.4	0.00	100.00	6.720	5.82	76.44	0.172	0.00	0.00
229.1	0.00	100.00	5.867	6.07	70.62	0.150	0.00	0.00
200.0	0.00	100.00	5.122	6.33	64.55	0.131	0.00	0.00
174.6	0.00	100.00	4.472	6.68	58.22	0.115	0.00	0.00
152.5	0.00	100.00	3.905	6.98	51.54	0.100	0.00	0.00
133.1	0.00	100.00	3.409	7.20	44.56	0.087	0.00	0.00
116.2	0.00	100.00	2.976	7.03	37.36	0.076	0.00	0.00
101.5	0.00	100.00	2.599	6.44	30.33	0.067	0.00	0.00
88.58	0.00	100.00	2.269	5.76	23.89	0.058	0.00	0.00
77.34	0.00	100.00	1.981	4.94	18.14	0.051	0.00	0.00
67.52	0.00	100.00	1.729	4.12	13.19	0.044	0.00	0.00
58.95	0.00	100.00	1.510	3.15	9.07	0.039	0.00	0.00
51.47	0.00	100.00	1.318	2.31	5.92	0.034	0.00	0.00
44.94	0.00	100.00	1.151	1.56	3.62	0.029	0.00	0.00
39.23	0.00	100.00	1.005	0.99	2.05	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/27/01
File Name: AW103953.DAT Sample Name: aw103 ID No: 01/09/26-020
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 87.250 % Lamp: 82.077 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min) WSC 10/1/01
Lot No: 1669 Test No: dup

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.635	0.10	0.10	(15)	4.199	5.00	55.00
(2)	0.865	0.90	1.00	(16)	4.655	5.00	60.00
(3)	1.028	1.30	2.30	(17)	5.177	5.00	65.00
(4)	1.251	2.70	5.00	(18)	5.791	5.00	70.00
(5)	1.559	5.00	10.00	(19)	6.508	5.00	75.00
(6)	1.821	5.00	15.00	(20)	7.368	5.00	80.00
(7)	1.862	0.80	15.80	(21)	8.250	4.20	84.20
(8)	2.074	4.20	20.00	(22)	8.435	0.80	85.00
(9)	2.325	5.00	25.00	(23)	9.848	5.00	90.00
(10)	2.581	5.00	30.00	(24)	12.157	5.00	95.00
(11)	2.849	5.00	35.00	(25)	14.587	2.70	97.70
(12)	3.135	5.00	40.00	(26)	17.086	1.30	99.00
(13)	3.440	5.00	45.00	(27)	22.846	0.90	99.90
(14)	3.795	5.00	50.00				

Median : 3.789 (μm) Mean: 4.897 (μm) Mode: 3.185 (μm)
Std. Dev.: 3.553 (μm) Span: 1.487
Coef. Var: 72.55% Spec. Area: 19663 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/01/'01 16:23

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010927-023 10:45
Filename : AW103956
Sample : Aw103

Material :
Source :
Lot Numbe : 1670

Condition
T%(He-Ne): 86.2% Dist.Form: Std. Sampling times : 100
(LAMP): 79.2% R.R.Index: 1.16-0.00i ( )

Agitation : 1 Circultn : 6 U.sonic : ~~ON~~ OFF (120)

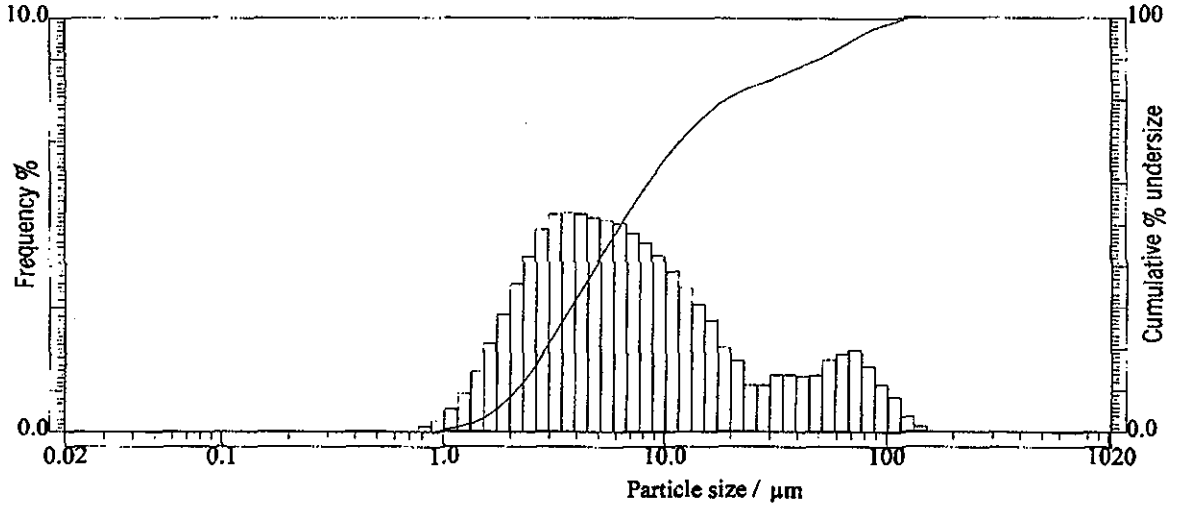
w)SC 10/1/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 6.334μm SP.Area : 12731cm²/cm³ S.D. : 23.108μm
Mode : 3.649μm Mean : 15.690μm
C.V. : 147.28%

Span : (D 10.0-D 90.0) / D50 = 7.473

Dia. on %(5.0%) :	1.680μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	3.299μm	% on Dia.(1.000μm) :	0.4%
Dia. on %(50.0%) :	6.334μm	% on Dia.(10.000μm) :	65.5%
Dia. on %(75.0%) :	14.341μm	% on Dia.(100.000μm) :	98.5%
Dia. on %(95.0%) :	72.405μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.14	83.82	0.669	0.00	0.00
890.1	0.00	100.00	22.80	1.71	82.68	0.584	0.00	0.00
777.1	0.00	100.00	19.90	2.02	80.97	0.510	0.00	0.00
678.5	0.00	100.00	17.38	2.68	78.95	0.445	0.00	0.00
592.4	0.00	100.00	15.17	3.07	76.27	0.389	0.00	0.00
517.2	0.00	100.00	13.25	3.47	73.20	0.339	0.00	0.00
451.6	0.00	100.00	11.56	3.89	69.73	0.296	0.00	0.00
394.2	0.00	100.00	10.10	4.26	65.84	0.259	0.00	0.00
344.2	0.00	100.00	8.816	4.58	61.58	0.226	0.00	0.00
300.5	0.00	100.00	7.697	4.81	57.00	0.197	0.00	0.00
262.4	0.00	100.00	6.720	5.04	52.20	0.172	0.00	0.00
229.1	0.00	100.00	5.867	5.12	47.15	0.150	0.00	0.00
200.0	0.00	100.00	5.122	5.19	42.04	0.131	0.00	0.00
174.6	0.00	100.00	4.472	5.28	36.85	0.115	0.00	0.00
152.5	0.13	100.00	3.905	5.30	31.58	0.100	0.00	0.00
133.1	0.37	99.87	3.409	5.26	26.27	0.087	0.00	0.00
116.2	0.84	99.49	2.976	4.91	21.01	0.076	0.00	0.00
101.5	1.14	98.66	2.599	4.24	16.10	0.067	0.00	0.00
88.58	1.57	97.52	2.269	3.57	11.86	0.058	0.00	0.00
77.34	1.96	95.95	1.981	2.83	8.28	0.051	0.00	0.00
67.52	1.87	93.99	1.729	2.13	5.45	0.044	0.00	0.00
58.95	1.72	92.12	1.510	1.45	3.32	0.039	0.00	0.00
51.47	1.35	90.40	1.318	0.92	1.87	0.034	0.00	0.00
44.94	1.33	89.05	1.151	0.53	0.95	0.029	0.00	0.00
39.23	1.38	87.71	1.005	0.28	0.42	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/01/01
File Name: AW103956.DAT Sample Name: Aw103 ID No: 01/09/27-023
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 86.241 % Lamp: 79.176 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Lot No: 1670 Test No:

WSC 10/1/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.846	0.10	0.10	(15)	7.289	5.00	55.00
(2)	1.160	0.90	1.00	(16)	8.429	5.00	60.00
(3)	1.375	1.30	2.30	(17)	9.843	5.00	65.00
(4)	1.683	2.70	5.00	(18)	11.696	5.00	70.00
(5)	2.119	5.00	10.00	(19)	14.373	5.00	75.00
(6)	2.513	5.00	15.00	(20)	18.688	5.00	80.00
(7)	2.575	0.80	15.80	(21)	27.375	4.20	84.20
(8)	2.898	4.20	20.00	(22)	30.045	0.80	85.00
(9)	3.304	5.00	25.00	(23)	49.542	5.00	90.00
(10)	3.757	5.00	30.00	(24)	72.572	5.00	95.00
(11)	4.273	5.00	35.00	(25)	90.587	2.70	97.70
(12)	4.867	5.00	40.00	(26)	107.477	1.30	99.00
(13)	5.553	5.00	45.00	(27)	138.114	0.90	99.90
(14)	6.348	5.00	50.00				

Median : 6.334 (μm) Mean: 15.690 (μm) Mode: 3.648 (μm)
Std. Dev.: 23.108 (μm) Span: 9.167
Coef. Var: 147.28% Spec. Area: 12731 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/01/'01 16:23

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010927-024 10:52 Material :
Filename : AW103957 Source :
Sample : Aw103 Lot Numbe : 1670

Condition
T%(He-Ne): 86.1% Dist.Form: Std. Sampling times : 100
(LAMP): 79.0% R.R.Index: 1.16-0.00i ( )

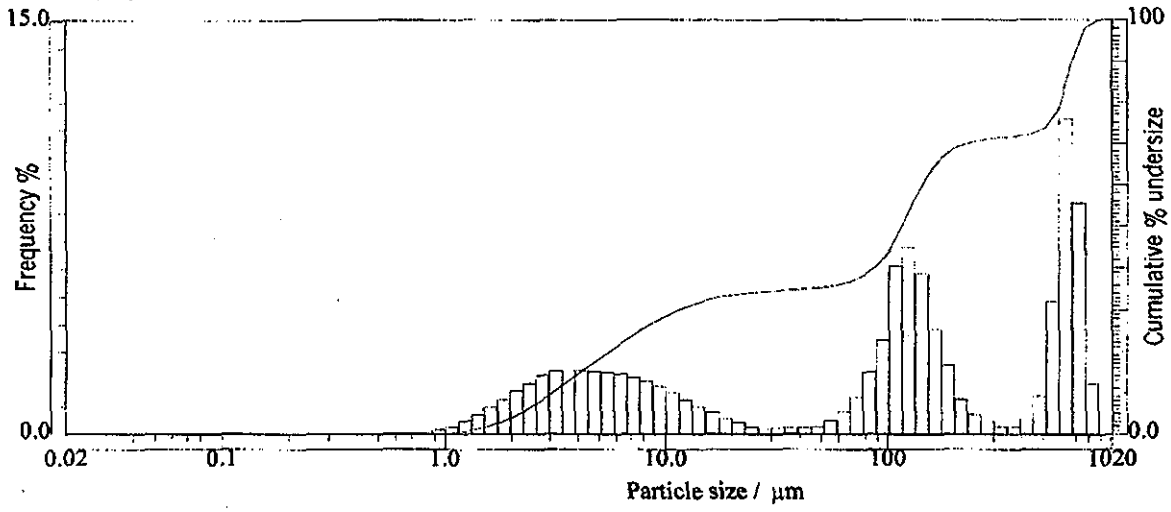
Agitation : 3 Circultn : 6 U.sonic : ~~ON~~ OFF (120) WSC 10/1/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 116.573μm SP.Area : 5665cm²/cm³ S.D. : 271.392μm
Mode : 647.496μm Mean : 234.763μm
C.V. : 115.60%

Span : (D 10.0-D 90.0) / D50 = 5.809

Dia. on %(5.0%) :	2.197μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	7.733μm	% on Dia.(1.000μm) :	0.2%
Dia. on %(50.0%) :	116.573μm	% on Dia.(10.000μm) :	28.4%
Dia. on %(75.0%) :	537.503μm	% on Dia.(100.000μm) :	43.4%
Dia. on %(95.0%) :	737.888μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.26	34.28	0.669	0.00	0.00
890.1	1.81	100.00	22.80	0.42	34.03	0.584	0.00	0.00
777.1	8.35	98.19	19.90	0.56	33.61	0.510	0.00	0.00
678.5	11.40	89.84	17.38	0.79	33.05	0.445	0.00	0.00
592.4	4.81	78.44	15.17	1.01	32.26	0.389	0.00	0.00
517.2	1.36	73.64	13.25	1.24	31.25	0.339	0.00	0.00
451.6	0.59	72.28	11.56	1.48	30.02	0.296	0.00	0.00
394.2	0.27	71.69	10.10	1.71	28.54	0.259	0.00	0.00
344.2	0.26	71.42	8.816	1.90	26.83	0.226	0.00	0.00
300.5	0.48	71.16	7.697	2.04	24.93	0.197	0.00	0.00
262.4	0.71	70.68	6.720	2.18	22.89	0.172	0.00	0.00
229.1	1.27	69.97	5.867	2.23	20.71	0.150	0.00	0.00
200.0	2.49	68.70	5.122	2.26	18.49	0.131	0.00	0.00
174.6	3.81	66.21	4.472	2.30	16.22	0.115	0.00	0.00
152.5	5.80	62.40	3.905	2.31	13.92	0.100	0.00	0.00
133.1	6.75	56.60	3.409	2.28	11.61	0.087	0.00	0.00
116.2	6.06	49.85	2.976	2.12	9.33	0.076	0.00	0.00
101.5	3.39	43.78	2.599	1.84	7.21	0.067	0.00	0.00
88.58	2.25	40.39	2.269	1.56	5.37	0.058	0.00	0.00
77.34	1.35	38.14	1.981	1.26	3.81	0.051	0.00	0.00
67.52	0.81	36.78	1.729	0.97	2.56	0.044	0.00	0.00
58.95	0.49	35.97	1.510	0.69	1.58	0.039	0.00	0.00
51.47	0.27	35.49	1.318	0.46	0.90	0.034	0.00	0.00
44.94	0.24	35.22	1.151	0.28	0.44	0.029	0.00	0.00
39.23	0.24	34.98	1.005	0.16	0.16	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/01/01
File Name: AW103957.DAT Sample Name: Aw103 ID No: 01/09/27-024
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 86.074 % Lamp: 78.950 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Lot No: 1670 Test No:

WSC 10/1/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.958	0.10	0.10	(15)	129.108	5.00	55.00
(2)	1.347	0.90	1.00	(16)	144.455	5.00	60.00
(3)	1.672	1.30	2.30	(17)	167.576	5.00	65.00
(4)	2.201	2.70	5.00	(18)	230.445	5.00	70.00
(5)	3.104	5.00	10.00	(19)	538.530	5.00	75.00
(6)	4.171	5.00	15.00	(20)	604.158	5.00	80.00
(7)	4.369	0.80	15.80	(21)	635.890	4.20	84.20
(8)	5.629	4.20	20.00	(22)	641.934	0.80	85.00
(9)	7.736	5.00	25.00	(23)	680.390	5.00	90.00
(10)	11.548	5.00	30.00	(24)	739.476	5.00	95.00
(11)	39.691	5.00	35.00	(25)	771.382	2.70	97.70
(12)	86.641	5.00	40.00	(26)	827.789	1.30	99.00
(13)	104.425	5.00	45.00	(27)	883.883	0.90	99.90
(14)	116.598	5.00	50.00				

Median : 116.573 (μm) Mean: 234.763 (μm) Mode: 633.985 (μm)
Std. Dev.: 271.392 (μm) Span: 1.719
Coef. Var: 115.60% Spec. Area: 5665 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/01/'01 16:23

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010927-025 10:57
Filename : AW103958
Sample : Aw103

Material :
Source :
Lot Numbe : 1670

Condition
T%(He-Ne): 87.8%
(LAMP): 79.9%

Dist.Form: Std.
R.R.Index: 1.16-0.00i

Sampling times : 100
( )

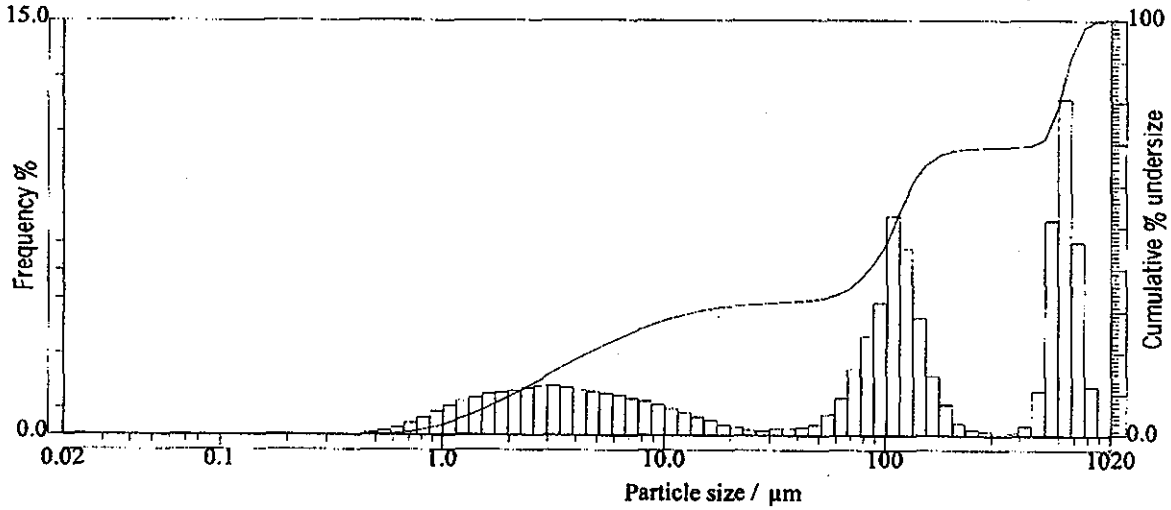
Agitation : 3 Circultn : 6 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 108.394μm SP.Area : 8165cm²/cm³ S.D. : 273.134μm
Mode : 631.318μm Mean : 238.625μm
C.V. : 114.46%

Span : (D 10.0-D 90.0) / D50 = 6.155

Dia. on %(5.0%) :	1.342μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	7.296μm	% on Dia.(1.000μm) :	2.4%
Dia. on %(50.0%) :	108.394μm	% on Dia.(10.000μm) :	27.8%
Dia. on %(75.0%) :	551.587μm	% on Dia.(100.000μm) :	45.6%
Dia. on %(95.0%) :	730.088μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.19	31.84	0.669	0.27	0.53
890.1	1.78	100.00	22.80	0.30	31.64	0.584	0.16	0.26
777.1	6.99	98.22	19.90	0.39	31.34	0.510	0.10	0.10
678.5	12.15	91.22	17.38	0.55	30.95	0.445	0.00	0.00
592.4	7.75	79.07	15.17	0.68	30.40	0.389	0.00	0.00
517.2	1.63	71.32	13.25	0.83	29.72	0.339	0.00	0.00
451.6	0.35	69.70	11.56	0.98	28.89	0.296	0.00	0.00
394.2	0.10	69.35	10.10	1.12	27.91	0.259	0.00	0.00
344.2	0.00	69.25	8.816	1.25	26.79	0.226	0.00	0.00
300.5	0.16	69.25	7.697	1.36	25.53	0.197	0.00	0.00
262.4	0.23	69.09	6.720	1.46	24.18	0.172	0.00	0.00
229.1	0.44	68.86	5.867	1.52	22.72	0.150	0.00	0.00
200.0	1.14	68.43	5.122	1.58	21.20	0.131	0.00	0.00
174.6	2.17	67.29	4.472	1.67	19.61	0.115	0.00	0.00
152.5	4.28	65.12	3.905	1.74	17.94	0.100	0.00	0.00
133.1	6.77	60.84	3.409	1.80	16.20	0.087	0.00	0.00
116.2	7.93	54.07	2.976	1.78	14.41	0.076	0.00	0.00
101.5	4.80	46.14	2.599	1.72	12.62	0.067	0.00	0.00
88.58	3.59	41.33	2.269	1.63	10.91	0.058	0.00	0.00
77.34	2.42	37.74	1.981	1.56	9.28	0.051	0.00	0.00
67.52	1.35	35.32	1.729	1.52	7.72	0.044	0.00	0.00
58.95	0.77	33.97	1.510	1.38	6.20	0.039	0.00	0.00
51.47	0.39	33.20	1.318	1.26	4.81	0.034	0.00	0.00
44.94	0.30	32.81	1.151	1.08	3.55	0.029	0.00	0.00
39.23	0.26	32.51	1.005	0.87	2.47	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/01/01
File Name: AW103958.DAT Sample Name: Aw103 ID No: 01/09/27-025
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 87.817 % Lamp: 79.915 %
Circulation: 6 Agitation: 3 U.Sonic ** (min)
Lot No: 1670 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.509	0.10	0.10	(15)	118.534	5.00	55.00
(2)	0.773	0.90	1.00	(16)	131.013	5.00	60.00
(3)	0.980	1.30	2.30	(17)	151.904	5.00	65.00
(4)	1.344	2.70	5.00	(18)	463.809	5.00	70.00
(5)	2.109	5.00	10.00	(19)	552.857	5.00	75.00
(6)	3.120	5.00	15.00	(20)	598.949	5.00	80.00
(7)	3.312	0.80	15.80	(21)	628.719	4.20	84.20
(8)	4.631	4.20	20.00	(22)	634.389	0.80	85.00
(9)	7.312	5.00	25.00	(23)	669.829	5.00	90.00
(10)	14.052	5.00	30.00	(24)	731.753	5.00	95.00
(11)	65.493	5.00	35.00	(25)	769.827	2.70	97.70
(12)	84.414	5.00	40.00	(26)	826.695	1.30	99.00
(13)	98.412	5.00	45.00	(27)	883.774	0.90	99.90
(14)	108.643	5.00	50.00				

Median : 108.394 (μm) Mean: 238.625 (μm) Mode: 633.985 (μm)
Std. Dev.: 273.134 (μm) Span: 1.647
Coef. Var: 114.46% Spec. Area: 8165 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/01/'01 16:23

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010927-026 11:01
Filename : AW103959
Sample : Aw103

Material :
Source :
Lot Numbe : 1670

Condition
T%(He-Ne): 87.4% Dist.Form: Std. Sampling times : 100
(LAMP): 79.5% R.R.index: 1.16-0.00i ( )

Agitation : 1 Circultn : 6 U.sonic : ~~ON~~ OFF (120)

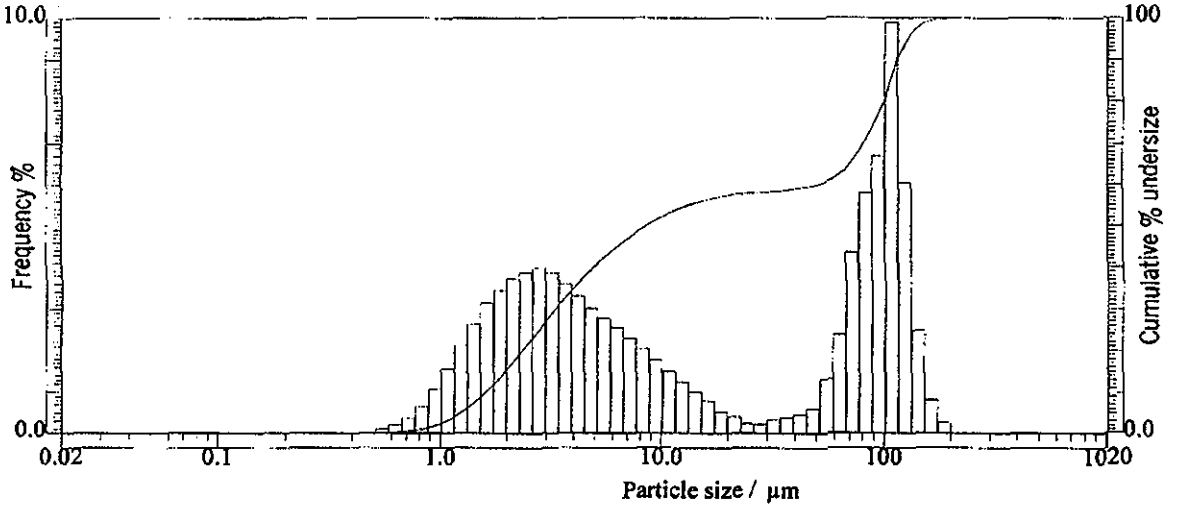
WJC 10/1/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 8.583μm SP.Area : 13708cm²/cm³ S.D. : 49.251μm
Mode : 108.096μm Mean : 43.618μm
C.V. : 112.91%

Span : (D 10.0-D 90.0) / D50 = 13.280

Dia. on %(5.0%) :	1.227μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	2.786μm	% on Dia.(1.000μm) :	2.4%
Dia. on %(50.0%) :	8.583μm	% on Dia.(10.000μm) :	52.1%
Dia. on %(75.0%) :	90.737μm	% on Dia.(100.000μm) :	79.8%
Dia. on %(95.0%) :	128.865μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.23	57.93	0.669	0.20	0.31
890.1	0.00	100.00	22.80	0.41	57.70	0.584	0.11	0.11
777.1	0.00	100.00	19.90	0.53	57.29	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.80	56.76	0.445	0.00	0.00
592.4	0.00	100.00	15.17	1.01	55.96	0.389	0.00	0.00
517.2	0.00	100.00	13.25	1.25	54.95	0.339	0.00	0.00
451.6	0.00	100.00	11.56	1.52	53.71	0.296	0.00	0.00
394.2	0.00	100.00	10.10	1.79	52.19	0.259	0.00	0.00
344.2	0.00	100.00	8.816	2.05	50.41	0.226	0.00	0.00
300.5	0.00	100.00	7.697	2.30	48.35	0.197	0.00	0.00
262.4	0.00	100.00	6.720	2.56	46.06	0.172	0.00	0.00
229.1	0.00	100.00	5.867	2.77	43.49	0.150	0.00	0.00
200.0	0.26	100.00	5.122	3.01	40.72	0.131	0.00	0.00
174.6	0.81	99.74	4.472	3.30	37.72	0.115	0.00	0.00
152.5	2.49	98.93	3.905	3.60	34.41	0.100	0.00	0.00
133.1	6.04	96.44	3.409	3.87	30.82	0.087	0.00	0.00
116.2	9.89	90.40	2.976	3.99	26.94	0.076	0.00	0.00
101.5	6.69	80.51	2.599	3.89	22.96	0.067	0.00	0.00
88.58	5.79	73.81	2.269	3.72	19.07	0.058	0.00	0.00
77.34	4.36	68.02	1.981	3.45	15.35	0.051	0.00	0.00
67.52	2.39	63.66	1.729	3.14	11.90	0.044	0.00	0.00
58.95	1.32	61.27	1.510	2.64	8.76	0.039	0.00	0.00
51.47	0.61	59.94	1.318	2.12	6.12	0.034	0.00	0.00
44.94	0.45	59.33	1.151	1.57	4.00	0.029	0.00	0.00
39.23	0.39	58.88	1.005	1.07	2.43	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/01/01
File Name: AW103959.DAT Sample Name: Aw103 ID No: 01/09/27-026
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 87.411 % Lamp: 79.471 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min) WSC 10/1/01
Lot No: 1670 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.578	0.10	0.10	(15)	13.334	5.00	55.00
(2)	0.818	0.90	1.00	(16)	51.786	5.00	60.00
(3)	0.990	1.30	2.30	(17)	70.541	5.00	65.00
(4)	1.230	2.70	5.00	(18)	81.181	5.00	70.00
(5)	1.597	5.00	10.00	(19)	90.862	5.00	75.00
(6)	1.955	5.00	15.00	(20)	100.480	5.00	80.00
(7)	2.015	0.80	15.80	(21)	106.963	4.20	84.20
(8)	2.348	4.20	20.00	(22)	108.155	0.80	85.00
(9)	2.792	5.00	25.00	(23)	115.611	5.00	90.00
(10)	3.318	5.00	30.00	(24)	129.075	5.00	95.00
(11)	4.005	5.00	35.00	(25)	142.891	2.70	97.70
(12)	4.966	5.00	40.00	(26)	154.329	1.30	99.00
(13)	6.369	5.00	45.00	(27)	190.164	0.90	99.90
(14)	8.595	5.00	50.00				

Median : 8.583 (μm) Mean: 43.618 (μm) Mode: 108.585 (μm)
Std. Dev.: 49.251 (μm) Span: 4.443
Coef. Var: 112.91% Spec. Area: 13708 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/01/'01 16:23

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010927-028 11:24
Filename : AW103961
Sample : Aw103

Material :
Source :
Lot Numbe : 1670

Condition
T%(He-Ne): 87.6%
(LAMP): 81.3%
Dist.Form: Std.
R.R.Index: 1.16-0.00i
Sampling times : 100 ( )

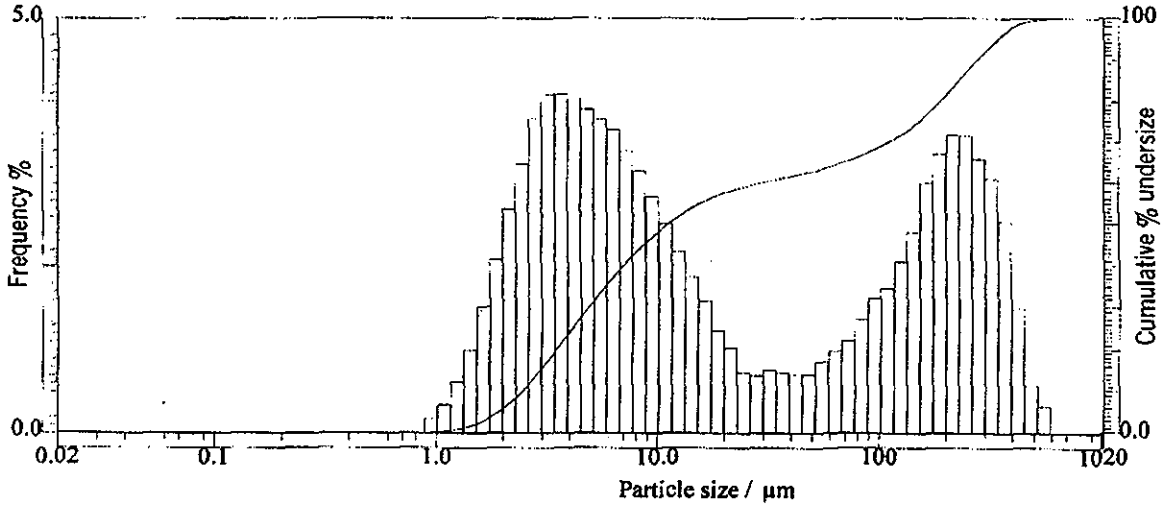
Agitation : 3 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 11.024μm SP.Area : 9269cm²/cm³ S.D. : 119.451μm
Mode : 3.645μm Mean : 84.515μm
C.V. : 141.34%

Span : (D 10.0-D 90.0) / D50 = 24.864

Dia. on %(5.0%) :	1.891μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	4.093μm	% on Dia.(1.000μm) :	0.2%
Dia. on %(50.0%) :	11.024μm	% on Dia.(10.000μm) :	48.2%
Dia. on %(75.0%) :	150.795μm	% on Dia.(100.000μm) :	68.8%
Dia. on %(95.0%) :	342.995μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.73	59.50	0.669	0.00	0.00
890.1	0.00	100.00	22.80	1.02	58.77	0.584	0.00	0.00
777.1	0.00	100.00	19.90	1.23	57.74	0.510	0.00	0.00
678.5	0.00	100.00	17.38	1.58	56.52	0.445	0.00	0.00
592.4	0.32	100.00	15.17	1.87	54.93	0.389	0.00	0.00
517.2	0.58	99.68	13.25	2.18	53.07	0.339	0.00	0.00
451.6	1.49	99.10	11.56	2.51	50.89	0.296	0.00	0.00
394.2	2.54	97.62	10.10	2.85	48.37	0.259	0.00	0.00
344.2	3.06	95.08	8.816	3.15	45.53	0.226	0.00	0.00
300.5	3.30	92.02	7.697	3.40	42.38	0.197	0.00	0.00
262.4	3.59	88.72	6.720	3.65	38.98	0.172	0.00	0.00
229.1	3.59	85.14	5.867	3.79	35.33	0.150	0.00	0.00
200.0	3.36	81.55	5.122	3.91	31.54	0.131	0.00	0.00
174.6	3.00	78.20	4.472	4.03	27.63	0.115	0.00	0.00
152.5	2.41	75.19	3.905	4.09	23.60	0.100	0.00	0.00
133.1	2.04	72.78	3.409	4.08	19.51	0.087	0.00	0.00
116.2	1.73	70.74	2.976	3.80	15.43	0.076	0.00	0.00
101.5	1.61	69.01	2.599	3.24	11.63	0.067	0.00	0.00
88.58	1.36	67.40	2.269	2.69	8.40	0.058	0.00	0.00
77.34	1.10	66.03	1.981	2.08	5.71	0.051	0.00	0.00
67.52	0.99	64.93	1.729	1.52	3.63	0.044	0.00	0.00
58.95	0.86	63.94	1.510	1.00	2.11	0.039	0.00	0.00
51.47	0.70	63.08	1.318	0.61	1.12	0.034	0.00	0.00
44.94	0.70	62.37	1.151	0.34	0.51	0.029	0.00	0.00
39.23	0.73	61.68	1.005	0.17	0.17	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/01/01
File Name: AW103961.DAT Sample Name: Aw103 ID No: 01/09/27-028
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 87.564 % Lamp: 81.317 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Lot No: 1670 Test No: Dup

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.952	0.10	0.10	(15)	15.265	5.00	55.00
(2)	1.287	0.90	1.00	(16)	28.867	5.00	60.00
(3)	1.537	1.30	2.30	(17)	68.176	5.00	65.00
(4)	1.895	2.70	5.00	(18)	109.910	5.00	70.00
(5)	2.432	5.00	10.00	(19)	150.895	5.00	75.00
(6)	2.933	5.00	15.00	(20)	188.266	5.00	80.00
(7)	3.016	0.80	15.80	(21)	221.474	4.20	84.20
(8)	3.468	4.20	20.00	(22)	227.959	0.80	85.00
(9)	4.101	5.00	25.00	(23)	277.139	5.00	90.00
(10)	4.866	5.00	30.00	(24)	343.072	5.00	95.00
(11)	5.803	5.00	35.00	(25)	397.435	2.70	97.70
(12)	7.013	5.00	40.00	(26)	447.541	1.30	99.00
(13)	8.628	5.00	45.00	(27)	568.884	0.90	99.90
(14)	11.047	5.00	50.00				

Median : 11.024 (μm) Mean: 84.515 (μm) Mode: 3.648 (μm)
Std. Dev.: 119.451 (μm) Span: 17.435
Coef. Var: 141.34% Spec. Area: 9269 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/01/'01 16:23

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010927-029 11:29
Filename : AW103960
Sample : Aw103

Material :
Source :
Lot Numbe : 1670

Condition
T%(He-Ne): 87.8% Dist.Form: Std. Sampling times : 100
(LAMP): 81.6% R.R.Index: 1.16-0.00i ( )

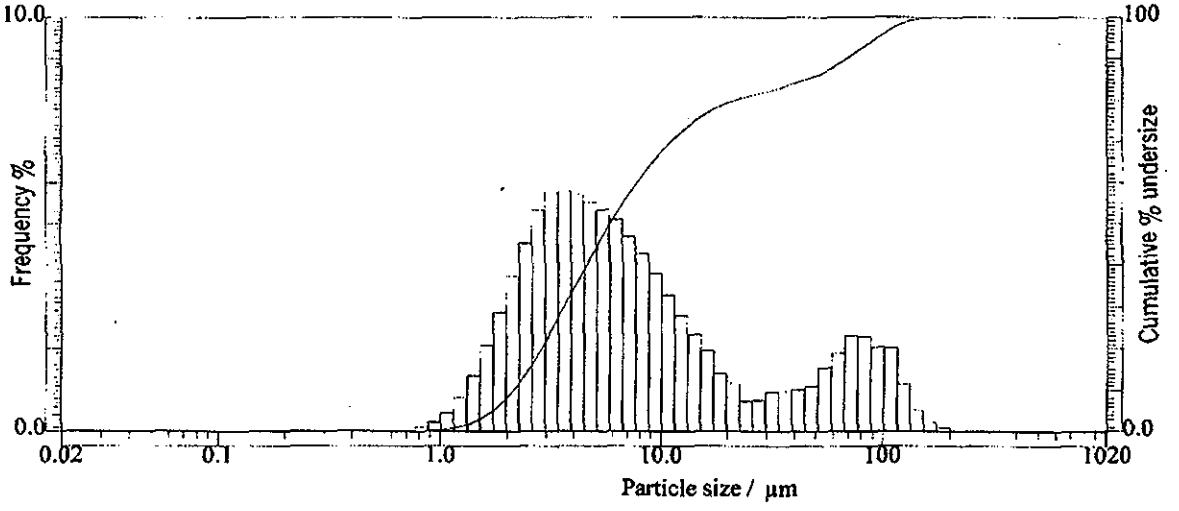
Agitation : 1 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 5.931μm SP.Area : 12799cm²/cm³ S.D. : 30.837μm
Mode : 3.646μm Mean : 19.385μm
C.V. : 159.08%

Span : (D 10.0-D 90.0) / D50 = 11.485

Dia. on %(5.0%) : 1.727μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 3.232μm % on Dia.(1.000μm) : 0.3%
Dia. on %(50.0%) : 5.931μm % on Dia.(10.000μm) : 67.1%
Dia. on %(75.0%) : 14.479μm % on Dia.(100.000μm) : 95.7%
Dia. on %(95.0%) : 95.172μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.74	81.06	0.669	0.00	0.00
890.1	0.00	100.00	22.80	1.16	80.31	0.584	0.00	0.00
777.1	0.00	100.00	19.90	1.40	79.15	0.510	0.00	0.00
678.5	0.00	100.00	17.38	1.95	77.75	0.445	0.00	0.00
592.4	0.00	100.00	15.17	2.34	75.80	0.389	0.00	0.00
517.2	0.00	100.00	13.25	2.78	73.47	0.339	0.00	0.00
451.6	0.00	100.00	11.56	3.28	70.69	0.296	0.00	0.00
394.2	0.00	100.00	10.10	3.78	67.42	0.259	0.00	0.00
344.2	0.00	100.00	8.816	4.27	63.63	0.226	0.00	0.00
300.5	0.00	100.00	7.697	4.68	59.36	0.197	0.00	0.00
262.4	0.00	100.00	6.720	5.09	54.69	0.172	0.00	0.00
229.1	0.00	100.00	5.867	5.32	49.59	0.150	0.00	0.00
200.0	0.10	100.00	5.122	5.52	44.27	0.131	0.00	0.00
174.6	0.24	99.90	4.472	5.70	38.75	0.115	0.00	0.00
152.5	0.52	99.66	3.905	5.78	33.05	0.100	0.00	0.00
133.1	1.15	99.14	3.409	5.76	27.27	0.087	0.00	0.00
116.2	2.02	97.98	2.976	5.34	21.51	0.076	0.00	0.00
101.5	2.04	95.96	2.599	4.53	16.17	0.067	0.00	0.00
88.58	2.29	93.92	2.269	3.74	11.64	0.058	0.00	0.00
77.34	2.30	91.63	1.981	2.88	7.90	0.051	0.00	0.00
67.52	1.90	89.33	1.729	2.08	5.02	0.044	0.00	0.00
58.95	1.54	87.42	1.510	1.36	2.94	0.039	0.00	0.00
51.47	1.10	85.88	1.318	0.82	1.59	0.034	0.00	0.00
44.94	1.01	84.79	1.151	0.45	0.77	0.029	0.00	0.00
39.23	0.99	83.77	1.005	0.22	0.33	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/01/01
File Name: AW103960.DAT Sample Name: Aw103 ID No: 01/09/27-029
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 87.781 % Lamp: 81.565 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Lot No: 1670 Test No: Dup

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.874	0.10	0.10	(15)	6.785	5.00	55.00
(2)	1.197	0.90	1.00	(16)	7.863	5.00	60.00
(3)	1.419	1.30	2.30	(17)	9.279	5.00	65.00
(4)	1.727	2.70	5.00	(18)	11.255	5.00	70.00
(5)	2.143	5.00	10.00	(19)	14.509	5.00	75.00
(6)	2.513	5.00	15.00	(20)	22.016	5.00	80.00
(7)	2.572	0.80	15.80	(21)	41.643	4.20	84.20
(8)	2.870	4.20	20.00	(22)	46.217	0.80	85.00
(9)	3.239	5.00	25.00	(23)	70.386	5.00	90.00
(10)	3.643	5.00	30.00	(24)	95.390	5.00	95.00
(11)	4.099	5.00	35.00	(25)	114.138	2.70	97.70
(12)	4.619	5.00	40.00	(26)	131.084	1.30	99.00
(13)	5.224	5.00	45.00	(27)	174.835	0.90	99.90
(14)	5.935	5.00	50.00				

Median : 5.931 (μm) Mean: 19.385 (μm) Mode: 3.648 (μm)
Std. Dev.: 30.837 (μm) Span: 13.606
Coef. Var: 159.08% Spec. Area: 12799 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/01/'01 16:24

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010927-030 11:35
Filename : AW103962
Sample : Aw103

Material :
Source :
Lot Numbe : 1670

Condition
T%(He-Ne): 89.5% Dist.Form: Std. Sampling times : 100
(LAMP): 82.5% R.R.Index: 1.16-0.00i ( )

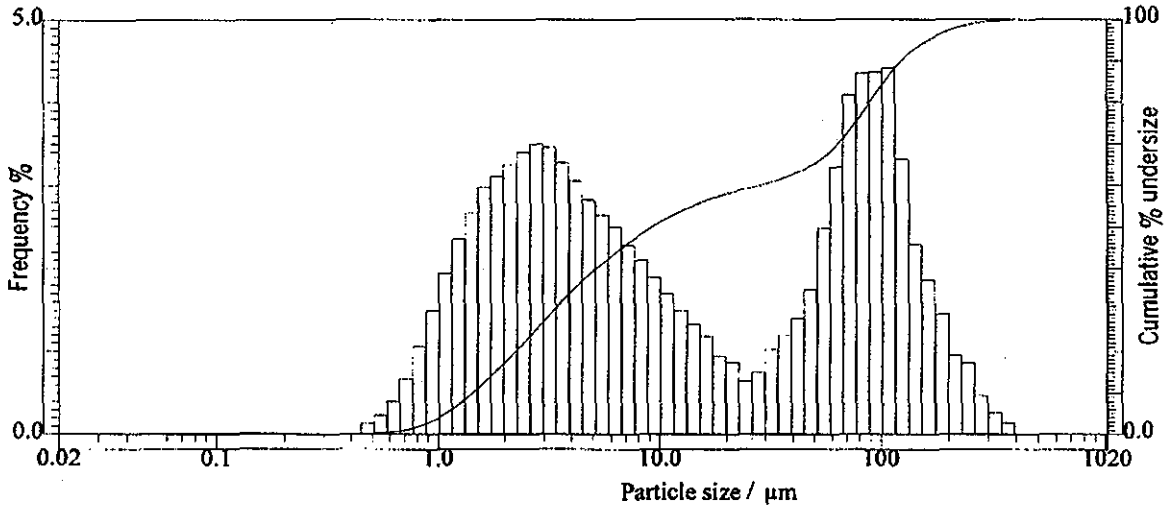
Agitation : 3 Circultn : 6 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 9.271μm SP.Area : 14723cm²/cm³ S.D. : 59.748μm
Mode : 106.866μm Mean : 44.337μm
C.V. : 134.76%

Span : (D 10.0-D 90.0) / D50 = 13.240

Dia. on %(5.0%) : 1.078μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 2.734μm % on Dia.(1.000μm) : 3.9%
Dia. on %(50.0%) : 9.271μm % on Dia.(10.000μm) : 51.1%
Dia. on %(75.0%) : 76.675μm % on Dia.(100.000μm) : 83.5%
Dia. on %(95.0%) : 164.142μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.65	59.36	0.669	0.40	0.77
890.1	0.00	100.00	22.80	0.87	58.72	0.584	0.23	0.37
777.1	0.00	100.00	19.90	0.94	57.85	0.510	0.14	0.14
678.5	0.00	100.00	17.38	1.19	56.90	0.445	0.00	0.00
592.4	0.00	100.00	15.17	1.33	55.72	0.389	0.00	0.00
517.2	0.00	100.00	13.25	1.50	54.39	0.339	0.00	0.00
451.6	0.00	100.00	11.56	1.70	52.89	0.296	0.00	0.00
394.2	0.15	100.00	10.10	1.90	51.19	0.259	0.00	0.00
344.2	0.26	99.85	8.816	2.10	49.30	0.226	0.00	0.00
300.5	0.48	99.59	7.697	2.28	47.20	0.197	0.00	0.00
262.4	0.86	99.11	6.720	2.49	44.92	0.172	0.00	0.00
229.1	0.95	98.25	5.867	2.64	42.42	0.150	0.00	0.00
200.0	1.46	97.30	5.122	2.82	39.78	0.131	0.00	0.00
174.6	1.86	95.85	4.472	3.05	36.96	0.115	0.00	0.00
152.5	2.29	93.99	3.905	3.27	33.91	0.100	0.00	0.00
133.1	3.32	91.70	3.409	3.45	30.64	0.087	0.00	0.00
116.2	4.41	88.38	2.976	3.50	27.18	0.076	0.00	0.00
101.5	4.36	83.97	2.599	3.40	23.69	0.067	0.00	0.00
88.58	4.35	79.61	2.269	3.25	20.29	0.058	0.00	0.00
77.34	4.08	75.26	1.981	3.10	17.03	0.051	0.00	0.00
67.52	3.22	71.18	1.729	2.98	13.93	0.044	0.00	0.00
58.95	2.48	67.96	1.510	2.66	10.95	0.039	0.00	0.00
51.47	1.75	65.48	1.318	2.35	8.29	0.034	0.00	0.00
44.94	1.40	63.73	1.151	1.94	5.94	0.029	0.00	0.00
39.23	1.20	62.33	1.005	1.49	4.00	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/01/01
File Name: AW103962.DAT Sample Name: Aw103 ID No: 01/09/27-030
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 89.539 % Lamp: 82.532 %
Circulation: 6 Agitation: 3 U.Sonic ** (min)
Lot No: 1670 Test No: Dup

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.491	0.10	0.10	(15)	14.130	5.00	55.00
(2)	0.701	0.90	1.00	(16)	29.354	5.00	60.00
(3)	0.856	1.30	2.30	(17)	49.679	5.00	65.00
(4)	1.080	2.70	5.00	(18)	64.383	5.00	70.00
(5)	1.441	5.00	10.00	(19)	76.715	5.00	75.00
(6)	1.816	5.00	15.00	(20)	89.738	5.00	80.00
(7)	1.881	0.80	15.80	(21)	102.240	4.20	84.20
(8)	2.243	4.20	20.00	(22)	104.916	0.80	85.00
(9)	2.740	5.00	25.00	(23)	124.468	5.00	90.00
(10)	3.329	5.00	30.00	(24)	164.516	5.00	95.00
(11)	4.107	5.00	35.00	(25)	212.135	2.70	97.70
(12)	5.184	5.00	40.00	(26)	258.020	1.30	99.00
(13)	6.754	5.00	45.00	(27)	360.199	0.90	99.90
(14)	9.291	5.00	50.00				

Median : 9.271 (μm) Mean: 44.337 (μm) Mode: 108.585 (μm)
Std. Dev.: 59.748 (μm) Span: 9.435
Coef. Var: 134.76% Spec. Area: 14723 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/01/'01 16:24

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010927-031 11:39
Filename : AW103963
Sample : Aw103

Material :
Source :
Lot Numbe : 1670

Condition
T%(He-Ne): 89.0%
(LAMP): 82.1%
Dist.Form: Std.
R.R.Index: 1.16-0.00i
Sampling times : 100
( )

Agitation : 1
Circultn : 6
U.sonic : ~~ON~~ OFF (120)

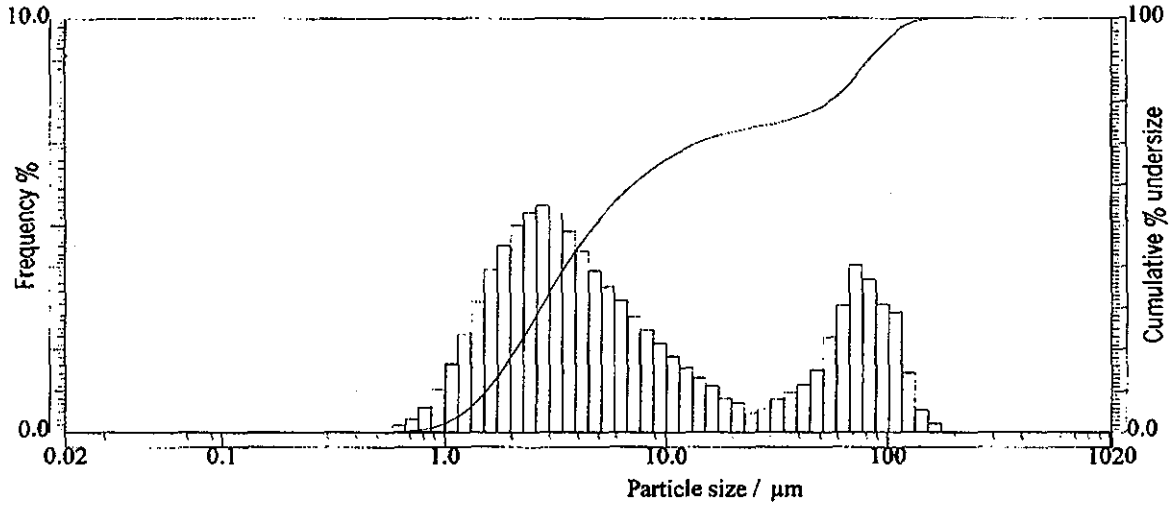
WSC 10/1/01

Format
Dist.base : Volume
Scaling : Auto
Axis : LogX - LinearY

Data
Median : 4.781μm
SP.Area : 16509cm²/cm³
S.D. : 34.807μm
Mode : 2.781μm
Mean : 23.581μm
C.V. : 147.60%

Span : (D 10.0-D 90.0) / D50 = 16.969

Dia. on %(5.0%) :	1.233μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	2.402μm	% on Dia.(1.000μm) :	2.1%
Dia. on %(50.0%) :	4.781μm	% on Dia.(10.000μm) :	65.9%
Dia. on %(75.0%) :	33.136μm	% on Dia.(100.000μm) :	94.6%
Dia. on %(95.0%) :	101.694μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.48	73.84	0.669	0.16	0.16
890.1	0.00	100.00	22.80	0.71	73.36	0.584	0.00	0.00
777.1	0.00	100.00	19.90	0.82	72.65	0.510	0.00	0.00
678.5	0.00	100.00	17.38	1.11	71.83	0.445	0.00	0.00
592.4	0.00	100.00	15.17	1.30	70.72	0.389	0.00	0.00
517.2	0.00	100.00	13.25	1.54	69.41	0.339	0.00	0.00
451.6	0.00	100.00	11.56	1.82	67.87	0.296	0.00	0.00
394.2	0.00	100.00	10.10	2.13	66.05	0.259	0.00	0.00
344.2	0.00	100.00	8.816	2.46	63.91	0.226	0.00	0.00
300.5	0.00	100.00	7.697	2.79	61.45	0.197	0.00	0.00
262.4	0.00	100.00	6.720	3.18	58.66	0.172	0.00	0.00
229.1	0.00	100.00	5.867	3.51	55.49	0.150	0.00	0.00
200.0	0.00	100.00	5.122	3.90	51.98	0.131	0.00	0.00
174.6	0.22	100.00	4.472	4.37	48.08	0.115	0.00	0.00
152.5	0.54	99.78	3.905	4.85	43.71	0.100	0.00	0.00
133.1	1.41	99.24	3.409	5.31	38.86	0.087	0.00	0.00
116.2	2.88	97.83	2.976	5.48	33.55	0.076	0.00	0.00
101.5	3.08	94.95	2.599	5.30	28.07	0.067	0.00	0.00
88.58	3.69	91.87	2.269	5.00	22.77	0.058	0.00	0.00
77.34	4.04	88.19	1.981	4.52	17.77	0.051	0.00	0.00
67.52	3.06	84.15	1.729	3.94	13.25	0.044	0.00	0.00
58.95	2.29	81.09	1.510	3.15	9.31	0.039	0.00	0.00
51.47	1.49	78.80	1.318	2.38	6.16	0.034	0.00	0.00
44.94	1.15	77.30	1.151	1.65	3.79	0.029	0.00	0.00
39.23	0.96	76.16	1.005	1.05	2.14	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/01/01
File Name: AW103963.DAT Sample Name: Aw103 ID No: 01/09/27-031
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 89.033 % Lamp: 82:070 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Lot No: 1670 Test No: Dup

WSC 10/1/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.636	0.10	0.10	(15)	5.764	5.00	55.00
(2)	0.860	0.90	1.00	(16)	7.188	5.00	60.00
(3)	1.019	1.30	2.30	(17)	9.468	5.00	65.00
(4)	1.236	2.70	5.00	(18)	14.113	5.00	70.00
(5)	1.548	5.00	10.00	(19)	33.191	5.00	75.00
(6)	1.827	5.00	15.00	(20)	55.395	5.00	80.00
(7)	1.871	0.80	15.80	(21)	67.653	4.20	84.20
(8)	2.109	4.20	20.00	(22)	69.597	0.80	85.00
(9)	2.408	5.00	25.00	(23)	82.872	5.00	90.00
(10)	2.732	5.00	30.00	(24)	101.710	5.00	95.00
(11)	3.094	5.00	35.00	(25)	115.549	2.70	97.70
(12)	3.526	5.00	40.00	(26)	130.234	1.30	99.00
(13)	4.072	5.00	45.00	(27)	164.332	0.90	99.90
(14)	4.792	5.00	50.00				

Median : 4.781 (μm) Mean: 23.581 (μm) Mode: 2.781 (μm)
Std. Dev.: 34.807 (μm) Span: 14.338
Coef. Var: 147.60% Spec. Area: 16509 (cm2/cm3)

APPENDIX F-7

TANK AY-102 COMPOSITE: PSD MEASUREMENT RESULTS

Consisting of 34 pages including this cover page

TABLE F-7. Sample identification and PSD run conditions. AY-102 composite subsamples S01T001654 and S01T001655.

Conditions Key: P = Pump Speed Setting; P6 = 14.4 mL/s
S = Stirrer Speed Setting (1-7); S1 = Stirrer Speed 1; S3 = Stirrer Speed 3
US = Ultrasonic ON Time (min); DT = Delay Time (min) between end of ultrasonic treatment and PSD measurement.
Time = Clock time at beginning of measurement.

Sample	PSD Run File Name	Run Conditions				Time	Cumulative Time (min) At Conditions				
		P	S	US	DT		P6	S1	S3	US	DT
S01T001654	[LOAD-IN]	6	1	0	0	?	?	?			
	AY102894	6	1	0	0	12:21	5	5			
	AY102895	6	3	0	0	12:26	9	5	4		
	AY102896	6	3	2	0	12:30	14	5	9	2	0
	AY102897	6	1	0	0	12:35	17	8	9	2	3
						12:38					
S01T001654	[LOAD-IN]	6	1	0	0	?	?	?			
	AY102898	6	1	0	0	12:47	4	4			
	AY102899	6	3	0	0	12:51	7	4	3		
	AY102900	6	3	2	0	12:54	13	4	9	2	0
	AY102901	6	1	0	0	13:00	16	7	9	2	4
						13:03					
S01T001655	[LOAD-IN]	6	0	0	0	?	?				
	AY102902	6	1	0	0	14:30	4				
	AY102903	6	3	0	0	14:34	7		3		
	AY102904	6	3	2	0	14:37	14		10	2	0
	AY102905	6	1	0	0	14:44	16	2	10	2	5
						14:46					
S01T001655	[LOAD-IN]	6	1	0	0	?	?	?			
	AY102906	6	1	0	0	14:58	5	5			
	AY102907	6	3	0	0	15:03	8	5	3		
	AY102908	6	3	2	0	15:06	14	5	9	2	0
	AY102909	6	1	0	0	15:12	16	7	11	2	4
						15:14					

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/27/'01 16:28

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926-961 12:23
Filename : AY102894
Sample : ay102

Material :
Source :
Lot Numbe : 1654

Condition
T%(He-Ne): 87.8%
(LAMP): 84.4%
Dist.Form: Std.
R.R.Index: 1.16-0.00i
Sampling times : 100
( )

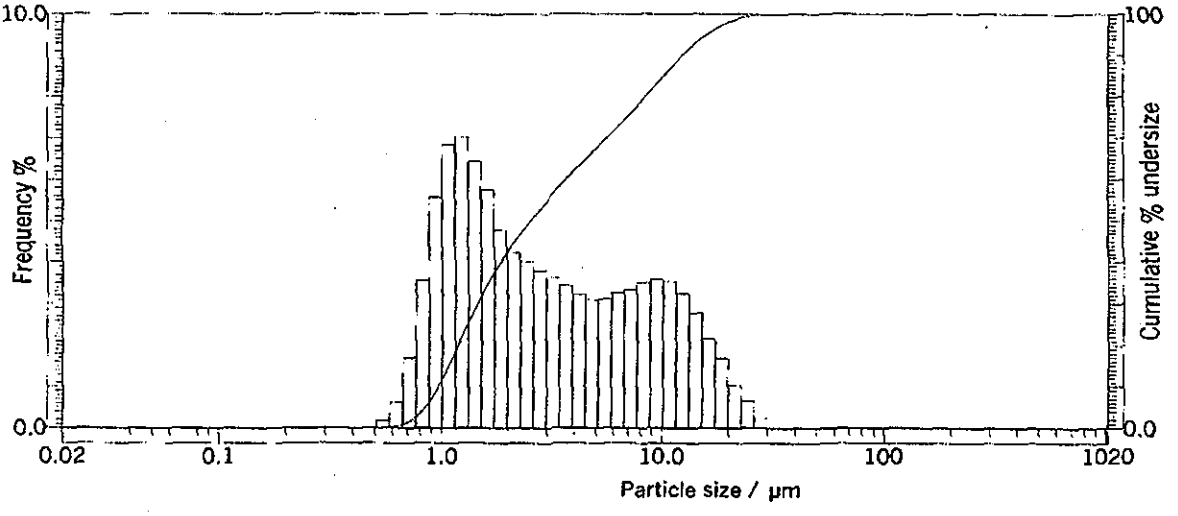
Agitation : 1 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 2.538μm SP.Area : 29202cm²/cm³ S.D. : 5.098μm
Mode : 1.227μm Mean : 4.881μm
C.V. : 104.45%

Span : (D 10.0-D 90.0) / D50 = 4.535

Dia. on %(5.0%) : 0.843μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 1.306μm % on Dia.(1.000μm) : 11.4%
Dia. on %(50.0%) : 2.538μm % on Dia.(10.000μm) : 84.4%
Dia. on %(75.0%) : 6.932μm % on Dia.(100.000μm) : 100.0%
Dia. on %(95.0%) : 15.938μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.65	99.74	0.669	0.61	0.79
890.1	0.00	100.00	22.80	1.03	99.09	0.584	0.18	0.18
777.1	0.00	100.00	19.90	1.69	98.06	0.510	0.00	0.00
678.5	0.00	100.00	17.38	2.16	96.37	0.445	0.00	0.00
592.4	0.00	100.00	15.17	2.78	94.22	0.389	0.00	0.00
517.2	0.00	100.00	13.25	3.25	91.43	0.339	0.00	0.00
451.6	0.00	100.00	11.56	3.53	88.18	0.296	0.00	0.00
394.2	0.00	100.00	10.10	3.58	84.65	0.259	0.00	0.00
344.2	0.00	100.00	8.816	3.50	81.07	0.226	0.00	0.00
300.5	0.00	100.00	7.697	3.34	77.57	0.197	0.00	0.00
262.4	0.00	100.00	6.720	3.26	74.24	0.172	0.00	0.00
229.1	0.00	100.00	5.867	3.11	70.97	0.150	0.00	0.00
200.0	0.00	100.00	5.122	3.09	67.86	0.131	0.00	0.00
174.6	0.00	100.00	4.472	3.23	64.77	0.115	0.00	0.00
152.5	0.00	100.00	3.905	3.43	61.54	0.100	0.00	0.00
133.1	0.00	100.00	3.409	3.61	58.11	0.087	0.00	0.00
116.2	0.00	100.00	2.976	3.80	54.50	0.076	0.00	0.00
101.5	0.00	100.00	2.599	4.02	50.70	0.067	0.00	0.00
88.58	0.00	100.00	2.269	4.24	46.68	0.058	0.00	0.00
77.34	0.00	100.00	1.981	4.78	42.45	0.051	0.00	0.00
67.52	0.00	100.00	1.729	5.75	37.67	0.044	0.00	0.00
58.95	0.00	100.00	1.510	6.44	31.91	0.039	0.00	0.00
51.47	0.00	100.00	1.318	7.03	25.48	0.034	0.00	0.00
44.94	0.00	100.00	1.151	6.84	18.44	0.029	0.00	0.00
39.23	0.00	100.00	1.005	5.57	11.60	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/27/01
File Name: AY102894.DAT Sample Name: ay102 ID No: 01/09/26-961
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 87.810 % Lamp: 84.358 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Lot No: 1654 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.551	0.10	0.10	(15)	3.036	5.00	55.00
(2)	0.681	0.90	1.00	(16)	3.682	5.00	60.00
(3)	0.756	1.30	2.30	(17)	4.520	5.00	65.00
(4)	0.845	2.70	5.00	(18)	5.634	5.00	70.00
(5)	0.968	5.00	10.00	(19)	6.944	5.00	75.00
(6)	1.077	5.00	15.00	(20)	8.473	5.00	80.00
(7)	1.094	0.80	15.80	(21)	9.935	4.20	84.20
(8)	1.188	4.20	20.00	(22)	10.241	0.80	85.00
(9)	1.307	5.00	25.00	(23)	12.504	5.00	90.00
(10)	1.453	5.00	30.00	(24)	15.973	5.00	95.00
(11)	1.628	5.00	35.00	(25)	19.359	2.70	97.70
(12)	1.852	5.00	40.00	(26)	22.537	1.30	99.00
(13)	2.154	5.00	45.00	(27)	28.438	0.90	99.90
(14)	2.541	5.00	50.00				

Median : 2.538 (μm) Mean: 4.881 (μm) Mode: 1.232 (μm)
Std. Dev.: 5.098 (μm) Span: 3.549
Coef. Var: 104.45% Spec. Area: 29202 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/27/'01 16:28

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926-962 12:28
Filename : AY102895
Sample : ay102

Material :
Source :
Lot Numbe : 1654

Condition
T%(He-Ne): 87.7%
(LAMP): 84.6%

Dist.Form: Std.
R.R.Index: 1.16-0.00i

Sampling times : 100
( )

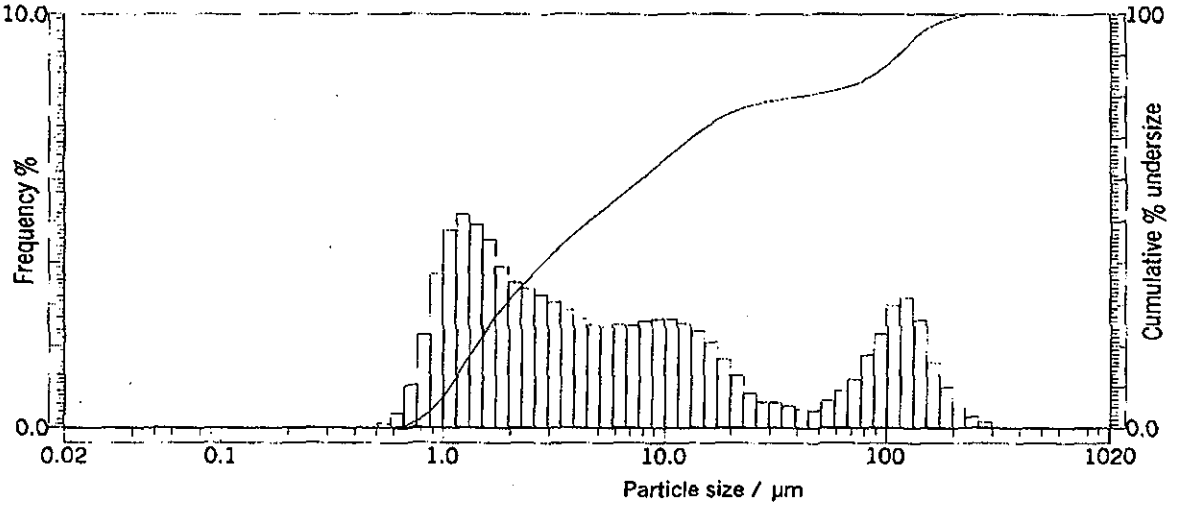
Agitation : 3 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 4.559μm SP.Area : 21692cm²/cm³ S.D. : 48.896μm
Mode : 1.234μm Mean : 27.951μm
C.V. : 174.94%

Span : (D 10.0-D 90.0) / D50 = 24.449

Dia. on %(5.0%) : 0.918μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 1.632μm % on Dia.(1.000μm) : 7.4%
Dia. on %(50.0%) : 4.559μm % on Dia.(10.000μm) : 64.7%
Dia. on %(75.0%) : 18.090μm % on Dia.(100.000μm) : 87.5%
Dia. on %(95.0%) : 141.057μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.85	78.30	0.669	0.36	0.46
890.1	0.00	100.00	22.80	1.28	77.45	0.584	0.10	0.10
777.1	0.00	100.00	19.90	1.66	76.17	0.510	0.00	0.00
678.5	0.00	100.00	17.38	2.08	74.51	0.445	0.00	0.00
592.4	0.00	100.00	15.17	2.36	72.43	0.389	0.00	0.00
517.2	0.00	100.00	13.25	2.54	70.07	0.339	0.00	0.00
451.6	0.00	100.00	11.56	2.65	67.53	0.296	0.00	0.00
394.2	0.00	100.00	10.10	2.64	64.88	0.259	0.00	0.00
344.2	0.00	100.00	8.816	2.60	62.24	0.226	0.00	0.00
300.5	0.15	100.00	7.697	2.52	59.64	0.197	0.00	0.00
262.4	0.26	99.85	6.720	2.52	57.12	0.172	0.00	0.00
229.1	0.49	99.59	5.867	2.46	54.61	0.150	0.00	0.00
200.0	1.00	99.10	5.122	2.50	52.15	0.131	0.00	0.00
174.6	1.60	98.10	4.472	2.67	49.64	0.115	0.00	0.00
152.5	2.63	96.51	3.905	2.88	46.98	0.100	0.00	0.00
133.1	3.17	93.87	3.409	3.07	44.10	0.087	0.00	0.00
116.2	2.99	90.71	2.976	3.24	41.03	0.076	0.00	0.00
101.5	2.28	87.71	2.599	3.40	37.79	0.067	0.00	0.00
88.58	1.77	85.44	2.269	3.54	34.40	0.058	0.00	0.00
77.34	1.19	83.66	1.981	3.91	30.86	0.051	0.00	0.00
67.52	0.90	82.48	1.729	4.57	26.95	0.044	0.00	0.00
58.95	0.65	81.58	1.510	4.93	22.38	0.039	0.00	0.00
51.47	0.41	80.92	1.318	5.16	17.45	0.034	0.00	0.00
44.94	0.45	80.51	1.151	4.80	12.29	0.029	0.00	0.00
39.23	0.53	80.07	1.005	3.72	7.49	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/27/01
File Name: AY102895.DAT Sample Name: ay102 ID No: 01/09/26-962
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 87.737 % Lamp: 84.641 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Lot No: 1654 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.581	0.10	0.10	(15)	6.000	5.00	55.00
(2)	0.719	0.90	1.00	(16)	7.852	5.00	60.00
(3)	0.805	1.30	2.30	(17)	10.163	5.00	65.00
(4)	0.920	2.70	5.00	(18)	13.200	5.00	70.00
(5)	1.081	5.00	10.00	(19)	18.125	5.00	75.00
(6)	1.239	5.00	15.00	(20)	38.611	5.00	80.00
(7)	1.265	0.80	15.80	(21)	80.746	4.20	84.20
(8)	1.417	4.20	20.00	(22)	85.816	0.80	85.00
(9)	1.636	5.00	25.00	(23)	112.731	5.00	90.00
(10)	1.926	5.00	30.00	(24)	141.377	5.00	95.00
(11)	2.327	5.00	35.00	(25)	169.023	2.70	97.70
(12)	2.856	5.00	40.00	(26)	197.437	1.30	99.00
(13)	3.565	5.00	45.00	(27)	274.568	0.90	99.90
(14)	4.564	5.00	50.00				

Median : 4.559 (μm) Mean: 27.951 (μm) Mode: 1.232 (μm)
Std. Dev.: 48.896 (μm) Span: 26.971
Coef. Var: 174.94% Spec. Area: 21692 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/27/'01 16:29

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926-963 12:34
Filename : AY102896
Sample : ay102

Material :
Source :
Lot Numbe : 1654

Condition

T%(He-Ne): 88.6% Dist.Form: Std. Sampling times : 100
(LAMP): 83.7% R.R.Index: 1.16-0.00i ( )

Agitation : 3 Circultn : 6 U.sonic : ON(120)

Format

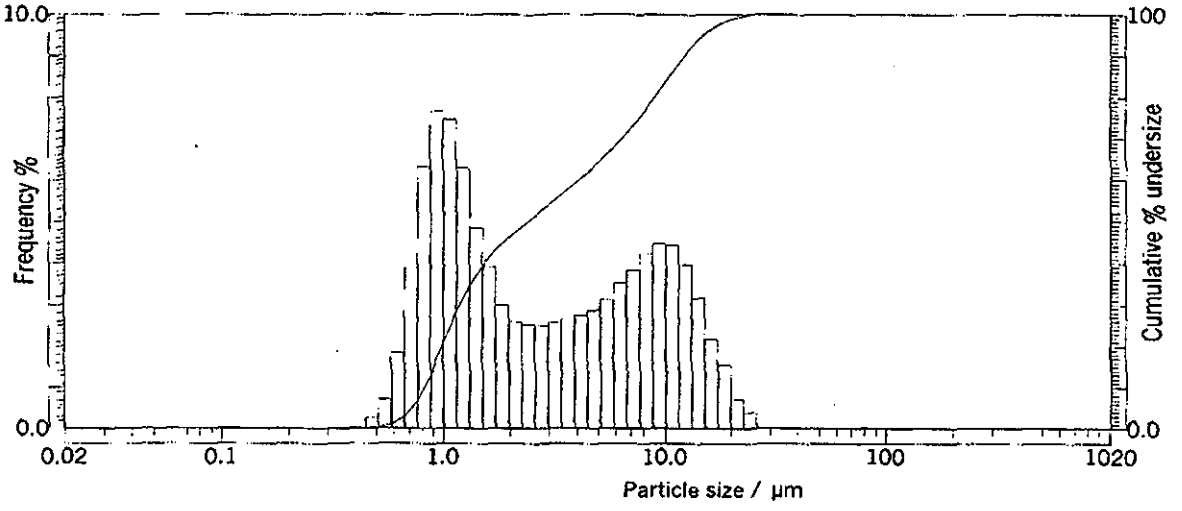
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data

Median : 2.426μm SP.Area : 33226cm²/cm³ S.D. : 4.946μm
Mode : 0.949μm Mean : 4.859μm
C.V. : 101.80%

Span : (D 10.0-D 90.0) / D50 = 4.749

Dia. on %(5.0%) :	0.722μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	1.087μm	% on Dia.(1.000μm) :	20.4%
Dia. on %(50.0%) :	2.426μm	% on Dia.(10.000μm) :	83.4%
Dia. on %(75.0%) :	7.700μm	% on Dia.(100.000μm) :	100.0%
Dia. on %(95.0%) :	15.040μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.38	100.00	0.669	1.83	2.78
890.1	0.00	100.00	22.80	0.72	99.62	0.584	0.70	0.96
777.1	0.00	100.00	19.90	1.54	98.90	0.510	0.25	0.25
678.5	0.00	100.00	17.38	2.15	97.35	0.445	0.00	0.00
592.4	0.00	100.00	15.17	3.15	95.20	0.389	0.00	0.00
517.2	0.00	100.00	13.25	3.96	92.05	0.339	0.00	0.00
451.6	0.00	100.00	11.56	4.43	88.10	0.296	0.00	0.00
394.2	0.00	100.00	10.10	4.46	83.67	0.259	0.00	0.00
344.2	0.00	100.00	8.816	4.23	79.21	0.226	0.00	0.00
300.5	0.00	100.00	7.697	3.83	74.99	0.197	0.00	0.00
262.4	0.00	100.00	6.720	3.52	71.16	0.172	0.00	0.00
229.1	0.00	100.00	5.867	3.11	67.64	0.150	0.00	0.00
200.0	0.00	100.00	5.122	2.84	64.53	0.131	0.00	0.00
174.6	0.00	100.00	4.472	2.73	61.69	0.115	0.00	0.00
152.5	0.00	100.00	3.905	2.65	58.96	0.100	0.00	0.00
133.1	0.00	100.00	3.409	2.54	56.30	0.087	0.00	0.00
116.2	0.00	100.00	2.976	2.48	53.76	0.076	0.00	0.00
101.5	0.00	100.00	2.599	2.52	51.28	0.067	0.00	0.00
88.58	0.00	100.00	2.269	2.58	48.75	0.058	0.00	0.00
77.34	0.00	100.00	1.981	2.99	46.17	0.051	0.00	0.00
67.52	0.00	100.00	1.729	3.90	43.18	0.044	0.00	0.00
58.95	0.00	100.00	1.510	4.85	39.28	0.039	0.00	0.00
51.47	0.00	100.00	1.318	6.28	34.43	0.034	0.00	0.00
44.94	0.00	100.00	1.151	7.47	28.15	0.029	0.00	0.00
39.23	0.00	100.00	1.005	7.67	20.68	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/27/01
File Name: AY102896.DAT Sample Name: ay102 ID No: 01/09/26-963
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 88.557 % Lamp: 83.740 %
Circulation: 6 Agitation: 3 U.Sonic ** (min)
Lot No: 1654 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.471	0.10	0.10	(15)	3.187	5.00	55.00
(2)	0.586	0.90	1.00	(16)	4.122	5.00	60.00
(3)	0.646	1.30	2.30	(17)	5.235	5.00	65.00
(4)	0.724	2.70	5.00	(18)	6.439	5.00	70.00
(5)	0.824	5.00	10.00	(19)	7.700	5.00	75.00
(6)	0.910	5.00	15.00	(20)	9.042	5.00	80.00
(7)	0.924	0.80	15.80	(21)	10.272	4.20	84.20
(8)	0.994	4.20	20.00	(22)	10.538	0.80	85.00
(9)	1.089	5.00	25.00	(23)	12.373	5.00	90.00
(10)	1.200	5.00	30.00	(24)	15.048	5.00	95.00
(11)	1.341	5.00	35.00	(25)	17.947	2.70	97.70
(12)	1.550	5.00	40.00	(26)	20.321	1.30	99.00
(13)	1.882	5.00	45.00	(27)	25.246	0.90	99.90
(14)	2.432	5.00	50.00				

Median : 2.426 (μm) Mean: 4.859 (μm) Mode: 0.939 (μm)
Std. Dev.: 4.946 (μm) Span: 3.026
Coef. Var: 101.80% Spec. Area: 33226 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/27/'01 16:29

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926-964 12:38
Filename : AY102897
Sample : ay102

Material :
Source :
Lot Numbe : 1654

Condition

T%(He-Ne): 88.7%
(LAMP): 84.4%

Dist.Form: Std.
R.R.Index: 1.16-0.00i

Sampling times : 100
( )

Agitation : 1
Circultn : 6
U.sonic : ~~ON~~ OFF (120)

WSC 10/3/01

Format

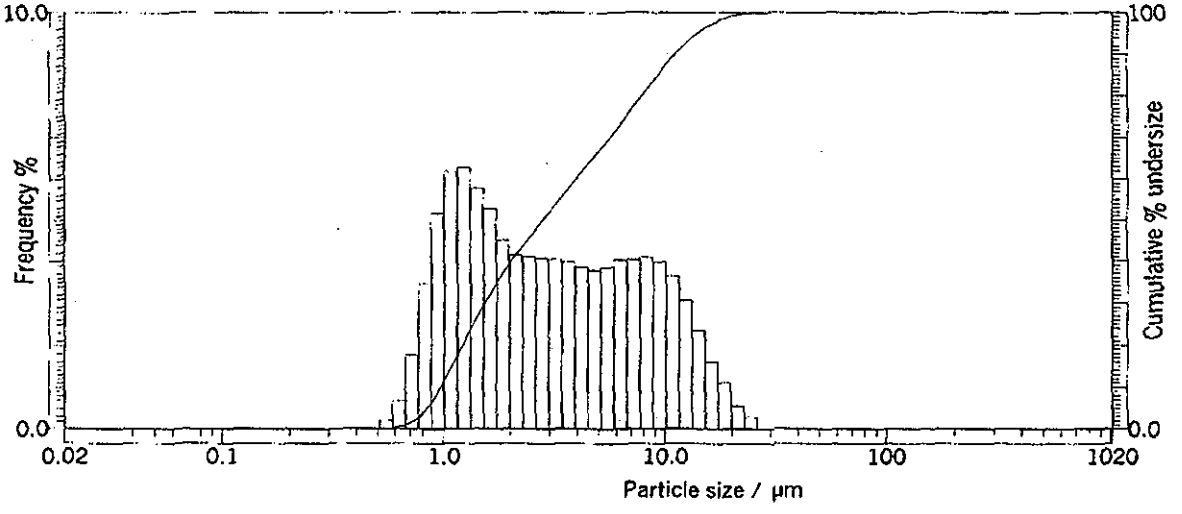
Dist.base : Volume
Scaling : Auto
Axis : LogX - LinearY

Data

Median : 2.812μm
SP.Area : 28401cm²/cm³
S.D. : 4.420μm
Mode : 1.226μm
Mean : 4.638μm
C.V. : 95.30%

Span : (D 10.0-D 90.0) / D50 = 3.613

Dia. on %(5.0%) :	0.840μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	1.356μm	% on Dia.(1.000μm) :	11.1%
Dia. on %(50.0%) :	2.812μm	% on Dia.(10.000μm) :	87.1%
Dia. on %(75.0%) :	6.659μm	% on Dia.(100.000μm) :	100.0%
Dia. on %(95.0%) :	13.959μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.30	100.00	0.669	0.68	0.91
890.1	0.00	100.00	22.80	0.56	99.70	0.584	0.22	0.22
777.1	0.00	100.00	19.90	1.10	99.14	0.510	0.00	0.00
678.5	0.00	100.00	17.38	1.60	98.04	0.445	0.00	0.00
592.4	0.00	100.00	15.17	2.35	96.44	0.389	0.00	0.00
517.2	0.00	100.00	13.25	3.07	94.09	0.339	0.00	0.00
451.6	0.00	100.00	11.56	3.65	91.02	0.296	0.00	0.00
394.2	0.00	100.00	10.10	3.97	87.37	0.259	0.00	0.00
344.2	0.00	100.00	8.816	4.09	83.40	0.226	0.00	0.00
300.5	0.00	100.00	7.697	4.04	79.31	0.197	0.00	0.00
262.4	0.00	100.00	6.720	4.03	75.27	0.172	0.00	0.00
229.1	0.00	100.00	5.867	3.85	71.24	0.150	0.00	0.00
200.0	0.00	100.00	5.122	3.79	67.39	0.131	0.00	0.00
174.6	0.00	100.00	4.472	3.87	63.60	0.115	0.00	0.00
152.5	0.00	100.00	3.905	3.99	59.73	0.100	0.00	0.00
133.1	0.00	100.00	3.409	4.04	55.74	0.087	0.00	0.00
116.2	0.00	100.00	2.976	4.07	51.70	0.076	0.00	0.00
101.5	0.00	100.00	2.599	4.11	47.63	0.067	0.00	0.00
88.58	0.00	100.00	2.269	4.15	43.52	0.058	0.00	0.00
77.34	0.00	100.00	1.981	4.51	39.37	0.051	0.00	0.00
67.52	0.00	100.00	1.729	5.29	34.86	0.044	0.00	0.00
58.95	0.00	100.00	1.510	5.78	29.57	0.039	0.00	0.00
51.47	0.00	100.00	1.318	6.30	23.80	0.034	0.00	0.00
44.94	0.00	100.00	1.151	6.19	17.49	0.029	0.00	0.00
39.23	0.00	100.00	1.005	5.18	11.30	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/27/01
File Name: AY102897.DAT Sample Name: ay102 ID No: 01/09/26-964
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 88.744 % Lamp: 84.428 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Lot No: 1654 Test No:

WSC
10/3/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.543	0.10	0.10	(15)	3.330	5.00	55.00
(2)	0.674	0.90	1.00	(16)	3.944	5.00	60.00
(3)	0.746	1.30	2.30	(17)	4.712	5.00	65.00
(4)	0.841	2.70	5.00	(18)	5.627	5.00	70.00
(5)	0.973	5.00	10.00	(19)	6.663	5.00	75.00
(6)	1.092	5.00	15.00	(20)	7.886	5.00	80.00
(7)	1.111	0.80	15.80	(21)	9.074	4.20	84.20
(8)	1.217	4.20	20.00	(22)	9.332	0.80	85.00
(9)	1.358	5.00	25.00	(23)	11.154	5.00	90.00
(10)	1.528	5.00	30.00	(24)	13.990	5.00	95.00
(11)	1.737	5.00	35.00	(25)	16.903	2.70	97.70
(12)	2.025	5.00	40.00	(26)	19.574	1.30	99.00
(13)	2.388	5.00	45.00	(27)	24.992	0.90	99.90
(14)	2.819	5.00	50.00				

Median : 2.812 (μm) Mean: 4.638 (μm) Mode: 1.232 (μm)
Std. Dev.: 4.420 (μm) Span: 2.596
Coef. Var: 95.30% Spec. Area: 28401 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/27/'01 16:29

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926-965 12:50
Filename : AY102898
Sample : ay102

Material :
Source :
Lot Numbe : 1654

Condition
T%(He-Ne): 86.3% Dist.Form: Std. Sampling times : 100
(LAMP): 81.9% R.R.Index: 1.16-0.00i ( )

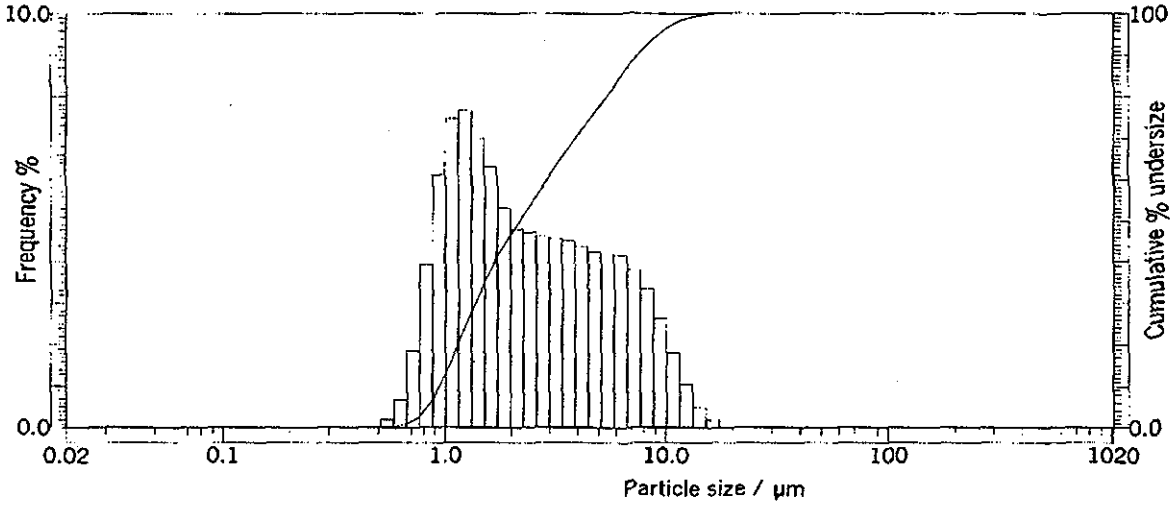
Agitation : 1 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 2.186μm SP.Area : 32187cm²/cm³ S.D. : 2.826μm
Mode : 1.227μm Mean : 3.335μm
C.V. : 84.73%

Span : (D 10.0-D 90.0) / D50 = 3.025

Dia. on %(5.0%) : 0.828μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 1.253μm % on Dia.(1.000μm) : 12.5%
Dia. on %(50.0%) : 2.186μm % on Dia.(10.000μm) : 96.3%
Dia. on %(75.0%) : 4.600μm % on Dia.(100.000μm) : 100.0%
Dia. on %(95.0%) : 9.362μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	100.00	0.669	0.67	0.87
890.1	0.00	100.00	22.80	0.00	100.00	0.584	0.20	0.20
777.1	0.00	100.00	19.90	0.00	100.00	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.19	100.00	0.445	0.00	0.00
592.4	0.00	100.00	15.17	0.50	99.81	0.389	0.00	0.00
517.2	0.00	100.00	13.25	1.04	99.31	0.339	0.00	0.00
451.6	0.00	100.00	11.56	1.81	98.27	0.296	0.00	0.00
394.2	0.00	100.00	10.10	2.62	96.46	0.259	0.00	0.00
344.2	0.00	100.00	8.816	3.33	93.84	0.226	0.00	0.00
300.5	0.00	100.00	7.697	3.80	90.51	0.197	0.00	0.00
262.4	0.00	100.00	6.720	4.16	86.71	0.172	0.00	0.00
229.1	0.00	100.00	5.867	4.19	82.55	0.150	0.00	0.00
200.0	0.00	100.00	5.122	4.24	78.36	0.131	0.00	0.00
174.6	0.00	100.00	4.472	4.38	74.12	0.115	0.00	0.00
152.5	0.00	100.00	3.905	4.52	69.74	0.100	0.00	0.00
133.1	0.00	100.00	3.409	4.58	65.22	0.087	0.00	0.00
116.2	0.00	100.00	2.976	4.62	60.65	0.076	0.00	0.00
101.5	0.00	100.00	2.599	4.71	56.03	0.067	0.00	0.00
88.58	0.00	100.00	2.269	4.81	51.32	0.058	0.00	0.00
77.34	0.00	100.00	1.981	5.31	46.51	0.051	0.00	0.00
67.52	0.00	100.00	1.729	6.32	41.20	0.044	0.00	0.00
58.95	0.00	100.00	1.510	7.00	34.88	0.039	0.00	0.00
51.47	0.00	100.00	1.318	7.66	27.88	0.034	0.00	0.00
44.94	0.00	100.00	1.151	7.46	20.23	0.029	0.00	0.00
39.23	0.00	100.00	1.005	6.11	12.77	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/27/01
File Name: AY102898.DAT Sample Name: ay102 ID No: 01/09/26-965
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 86.320 % Lamp: 81.935 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Lot No: 1654 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.547	0.10	0.10	(15)	2.527	5.00	55.00
(2)	0.675	0.90	1.00	(16)	2.923	5.00	60.00
(3)	0.743	1.30	2.30	(17)	3.388	5.00	65.00
(4)	0.830	2.70	5.00	(18)	3.938	5.00	70.00
(5)	0.947	5.00	10.00	(19)	4.608	5.00	75.00
(6)	1.049	5.00	15.00	(20)	5.414	5.00	80.00
(7)	1.064	0.80	15.80	(21)	6.205	4.20	84.20
(8)	1.146	4.20	20.00	(22)	6.370	0.80	85.00
(9)	1.255	5.00	25.00	(23)	7.566	5.00	90.00
(10)	1.376	5.00	30.00	(24)	9.384	5.00	95.00
(11)	1.514	5.00	35.00	(25)	11.105	2.70	97.70
(12)	1.688	5.00	40.00	(26)	12.745	1.30	99.00
(13)	1.909	5.00	45.00	(27)	16.223	0.90	99.90
(14)	2.190	5.00	50.00				

Median : 2.186 (μm) Mean: 3.335 (μm) Mode: 1.232 (μm)
Std. Dev.: 2.826 (μm) Span: 2.178
Coef. Var: 84.73% Spec. Area: 32187 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/27/'01 16:29

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926-966 12:54
Filename : AY102899
Sample : ay102

Material :
Source :
Lot Numbe : 1654

Condition
T%(He-Ne): 86.1% Dist.Form: Std. Sampling times : 100
(LAMP): 82.2% R.R.index: 1.16-0.00i ( )

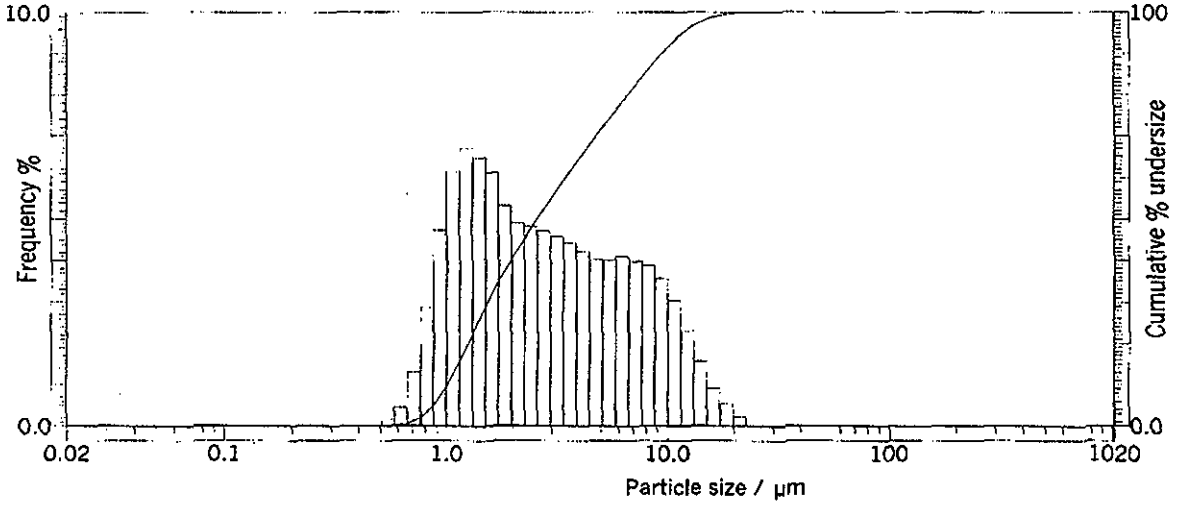
Agitation : 3 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 2.604μm SP.Area : 28595cm²/cm³ S.D. : 3.701μm
Mode : 1.236μm Mean : 4.095μm
C.V. : 90.38%

Span : (D 10.0-D 90.0) / D50 = 3.282

Dia. on %(5.0%) : 0.883μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 1.394μm % on Dia.(1.000μm) : 9.3%
Dia. on %(50.0%) : 2.604μm % on Dia.(10.000μm) : 91.2%
Dia. on %(75.0%) : 5.686μm % on Dia.(100.000μm) : 100.0%
Dia. on %(95.0%) : 11.943μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	100.00	0.669	0.45	0.58
890.1	0.00	100.00	22.80	0.22	100.00	0.584	0.13	0.13
777.1	0.00	100.00	19.90	0.54	99.78	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.91	99.24	0.445	0.00	0.00
592.4	0.00	100.00	15.17	1.56	98.33	0.389	0.00	0.00
517.2	0.00	100.00	13.25	2.31	96.76	0.339	0.00	0.00
451.6	0.00	100.00	11.56	3.03	94.45	0.296	0.00	0.00
394.2	0.00	100.00	10.10	3.55	91.42	0.259	0.00	0.00
344.2	0.00	100.00	8.816	3.87	87.87	0.226	0.00	0.00
300.5	0.00	100.00	7.697	3.98	84.00	0.197	0.00	0.00
262.4	0.00	100.00	6.720	4.10	80.02	0.172	0.00	0.00
229.1	0.00	100.00	5.867	4.01	75.92	0.150	0.00	0.00
200.0	0.00	100.00	5.122	4.04	71.91	0.131	0.00	0.00
174.6	0.00	100.00	4.472	4.21	67.87	0.115	0.00	0.00
152.5	0.00	100.00	3.905	4.43	63.66	0.100	0.00	0.00
133.1	0.00	100.00	3.409	4.59	59.23	0.087	0.00	0.00
116.2	0.00	100.00	2.976	4.71	54.64	0.076	0.00	0.00
101.5	0.00	100.00	2.599	4.82	49.93	0.067	0.00	0.00
88.58	0.00	100.00	2.269	4.91	45.11	0.058	0.00	0.00
77.34	0.00	100.00	1.981	5.31	40.20	0.051	0.00	0.00
67.52	0.00	100.00	1.729	6.10	34.89	0.044	0.00	0.00
58.95	0.00	100.00	1.510	6.47	28.79	0.039	0.00	0.00
51.47	0.00	100.00	1.318	6.69	22.33	0.034	0.00	0.00
44.94	0.00	100.00	1.151	6.15	15.63	0.029	0.00	0.00
39.23	0.00	100.00	1.005	4.73	9.49	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/27/01
File Name: AY102899.DAT Sample Name: ay102 ID No: 01/09/26-966
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 86.143 % Lamp: 82.161 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Lot No: 1654 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.566	0.10	0.10	(15)	3.010	5.00	55.00
(2)	0.700	0.90	1.00	(16)	3.495	5.00	60.00
(3)	0.782	1.30	2.30	(17)	4.085	5.00	65.00
(4)	0.884	2.70	5.00	(18)	4.815	5.00	70.00
(5)	1.017	5.00	10.00	(19)	5.696	5.00	75.00
(6)	1.136	5.00	15.00	(20)	6.716	5.00	80.00
(7)	1.155	0.80	15.80	(21)	7.754	4.20	84.20
(8)	1.260	4.20	20.00	(22)	7.985	0.80	85.00
(9)	1.397	5.00	25.00	(23)	9.583	5.00	90.00
(10)	1.553	5.00	30.00	(24)	11.964	5.00	95.00
(11)	1.735	5.00	35.00	(25)	14.402	2.70	97.70
(12)	1.971	5.00	40.00	(26)	16.799	1.30	99.00
(13)	2.262	5.00	45.00	(27)	21.488	0.90	99.90
(14)	2.604	5.00	50.00				

Median : 2.604 (μm) Mean: 4.095 (μm) Mode: 1.232 .(μm)
Std. Dev.: 3.701 (μm) Span: 2.403
Coef. Var: 90.38% Spec. Area: 28595 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/27/'01 16:29

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926-967 12:59
Filename : AY102900
Sample : ay102

Material :
Source :
Lot Numbe : 1654

Condition
T%(He-Ne): 86.8% Dist.Form: Std. Sampling times : 100
(LAMP): 81.1% R.R.index: 1.16-0.00i ( )

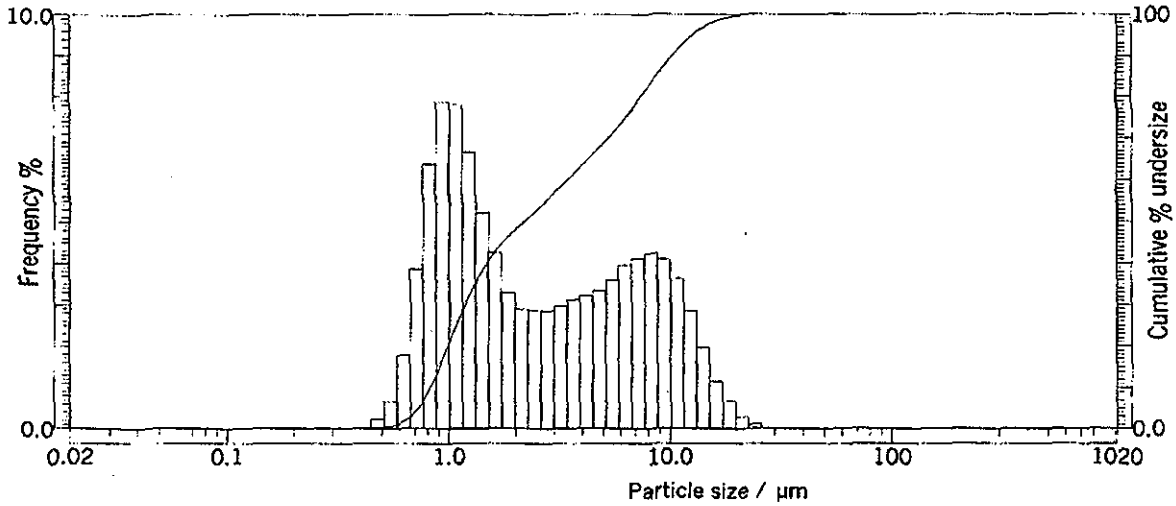
Agitation : 3 Circultn : 6 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 2.169μm SP.Area : 34440cm²/cm³ S.D. : 4.142μm
Mode : 0.951μm Mean : 4.155μm
C.V. : 99.69%

Span : (D 10.0-D 90.0) / D50 = 4.393

Dia. on %(5.0%) : 0.725μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 1.081μm % on Dia.(1.000μm) : 20.5%
Dia. on %(50.0%) : 2.169μm % on Dia.(10.000μm) : 89.0%
Dia. on %(75.0%) : 6.302μm % on Dia.(100.000μm) : 100.0%
Dia. on %(95.0%) : 12.745μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.12	100.00	0.669	1.78	2.68
890.1	0.00	100.00	22.80	0.28	99.88	0.584	0.67	0.91
777.1	0.00	100.00	19.90	0.69	99.61	0.510	0.24	0.24
678.5	0.00	100.00	17.38	1.15	98.92	0.445	0.00	0.00
592.4	0.00	100.00	15.17	1.96	97.77	0.389	0.00	0.00
517.2	0.00	100.00	13.25	2.85	95.81	0.339	0.00	0.00
451.6	0.00	100.00	11.56	3.63	92.96	0.296	0.00	0.00
394.2	0.00	100.00	10.10	4.09	89.33	0.259	0.00	0.00
344.2	0.00	100.00	8.816	4.24	85.24	0.226	0.00	0.00
300.5	0.00	100.00	7.697	4.12	80.99	0.197	0.00	0.00
262.4	0.00	100.00	6.720	3.97	76.88	0.172	0.00	0.00
229.1	0.00	100.00	5.867	3.60	72.91	0.150	0.00	0.00
200.0	0.00	100.00	5.122	3.34	69.31	0.131	0.00	0.00
174.6	0.00	100.00	4.472	3.22	65.96	0.115	0.00	0.00
152.5	0.00	100.00	3.905	3.11	62.75	0.100	0.00	0.00
133.1	0.00	100.00	3.409	2.96	59.64	0.087	0.00	0.00
116.2	0.00	100.00	2.976	2.85	56.67	0.076	0.00	0.00
101.5	0.00	100.00	2.599	2.86	53.82	0.067	0.00	0.00
88.58	0.00	100.00	2.269	2.89	50.96	0.058	0.00	0.00
77.34	0.00	100.00	1.981	3.30	48.06	0.051	0.00	0.00
67.52	0.00	100.00	1.729	4.26	44.76	0.044	0.00	0.00
58.95	0.00	100.00	1.510	5.22	40.50	0.039	0.00	0.00
51.47	0.00	100.00	1.318	6.67	35.29	0.034	0.00	0.00
44.94	0.00	100.00	1.151	7.81	28.62	0.029	0.00	0.00
39.23	0.00	100.00	1.005	7.89	20.82	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/27/01
File Name: AY102900.DAT Sample Name: ay102 ID No: 01/09/26-967
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 86.792 % Lamp: 81.117 %
Circulation: 6 Agitation: 3 U.Sonic ** (min)
Lot No: 1654 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.472	0.10	0.10	(15)	2.755	5.00	55.00
(2)	0.588	0.90	1.00	(16)	3.467	5.00	60.00
(3)	0.651	1.30	2.30	(17)	4.302	5.00	65.00
(4)	0.727	2.70	5.00	(18)	5.265	5.00	70.00
(5)	0.826	5.00	10.00	(19)	6.316	5.00	75.00
(6)	0.911	5.00	15.00	(20)	7.461	5.00	80.00
(7)	0.924	0.80	15.80	(21)	8.542	4.20	84.20
(8)	0.992	4.20	20.00	(22)	8.753	0.80	85.00
(9)	1.083	5.00	25.00	(23)	10.367	5.00	90.00
(10)	1.186	5.00	30.00	(24)	12.768	5.00	95.00
(11)	1.311	5.00	35.00	(25)	15.106	2.70	97.70
(12)	1.491	5.00	40.00	(26)	17.674	1.30	99.00
(13)	1.748	5.00	45.00	(27)	23.265	0.90	99.90
(14)	2.173	5.00	50.00				

Median : 2.169 (μm) Mean: 4.155 (μm) Mode: 0.939 (μm)
Std. Dev.: 4.142 (μm) Span: 2.970
Coef. Var: 99.69% Spec. Area: 34440 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/27/'01 16:30

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926.968 13:03 Material :
Filename : AY102901 Source :
Sample : ay102 Lot Numbe : 1654

Condition
T%(He-Ne): 86.8% Dist.Form: Std. Sampling times : 100
(LAMP): 81.8% R.R.Index: 1.16-0.00i ( )

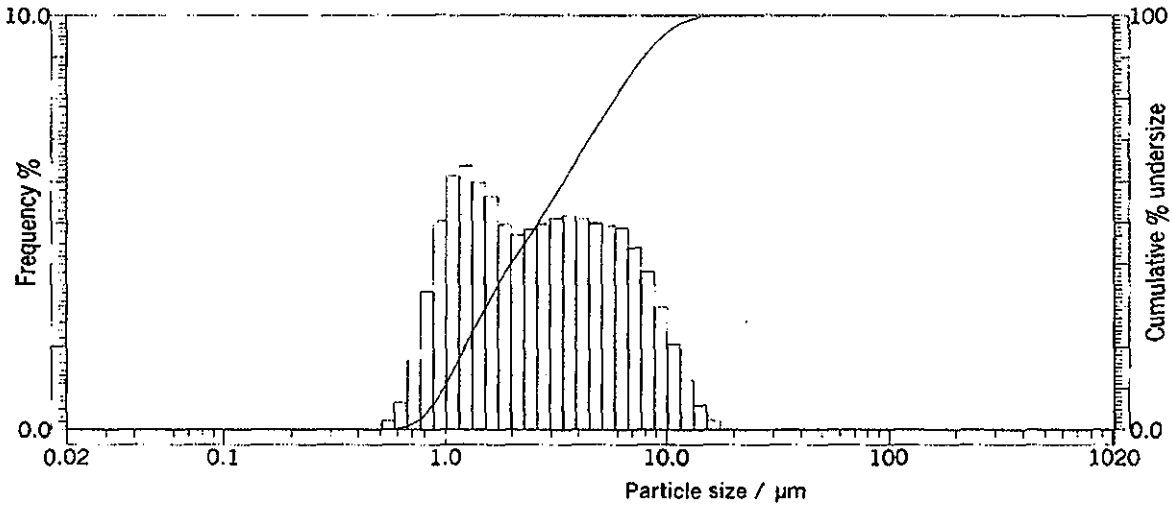
Agitation : 1 Circultn : 6 U.sonic : ~~ON~~ OFF (120) WJC 10/3/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 2.631μm SP.Area : 29509cm²/cm³ S.D. : 2.913μm
Mode : 1.230μm Mean : 3.645μm
C.V. : 79.93%

Span : (D 10.0-D 90.0) / D50 = 2.646

Dia. on %(5.0%) :	0.847μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	1.367μm	% on Dia.(1.000μm) :	10.7%
Dia. on %(50.0%) :	2.631μm	% on Dia.(10.000μm) :	95.7%
Dia. on %(75.0%) :	5.136μm	% on Dia.(100.000μm) :	100.0%
Dia. on %(95.0%) :	9.682μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	100.00	0.669	0.65	0.86
890.1	0.00	100.00	22.80	0.00	100.00	0.584	0.21	0.21
777.1	0.00	100.00	19.90	0.00	100.00	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.23	100.00	0.445	0.00	0.00
592.4	0.00	100.00	15.17	0.59	99.77	0.389	0.00	0.00
517.2	0.00	100.00	13.25	1.20	99.18	0.339	0.00	0.00
451.6	0.00	100.00	11.56	2.06	97.98	0.296	0.00	0.00
394.2	0.00	100.00	10.10	2.99	95.92	0.259	0.00	0.00
344.2	0.00	100.00	8.816	3.82	92.94	0.226	0.00	0.00
300.5	0.00	100.00	7.697	4.41	89.12	0.197	0.00	0.00
262.4	0.00	100.00	6.720	4.87	84.71	0.172	0.00	0.00
229.1	0.00	100.00	5.867	4.94	79.84	0.150	0.00	0.00
200.0	0.00	100.00	5.122	4.99	74.90	0.131	0.00	0.00
174.6	0.00	100.00	4.472	5.11	69.91	0.115	0.00	0.00
152.5	0.00	100.00	3.905	5.17	64.80	0.100	0.00	0.00
133.1	0.00	100.00	3.409	5.11	59.63	0.087	0.00	0.00
116.2	0.00	100.00	2.976	4.97	54.52	0.076	0.00	0.00
101.5	0.00	100.00	2.599	4.85	49.55	0.067	0.00	0.00
88.58	0.00	100.00	2.269	4.71	44.70	0.058	0.00	0.00
77.34	0.00	100.00	1.981	4.96	39.99	0.051	0.00	0.00
67.52	0.00	100.00	1.729	5.64	35.03	0.044	0.00	0.00
58.95	0.00	100.00	1.510	5.98	29.39	0.039	0.00	0.00
51.47	0.00	100.00	1.318	6.38	23.40	0.034	0.00	0.00
44.94	0.00	100.00	1.151	6.13	17.03	0.029	0.00	0.00
39.23	0.00	100.00	1.005	5.04	10.90	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/27/01
File Name: AY102901.DAT Sample Name: ay102 ID No: 01/09/26-968
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 86.835 % Lamp: 81.827 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Lot No: 1654 Test No:

WSC 10/3/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.545	0.10	0.10	(15)	3.017	5.00	55.00
(2)	0.677	0.90	1.00	(16)	3.444	5.00	60.00
(3)	0.753	1.30	2.30	(17)	3.926	5.00	65.00
(4)	0.849	2.70	5.00	(18)	4.484	5.00	70.00
(5)	0.982	5.00	10.00	(19)	5.137	5.00	75.00
(6)	1.103	5.00	15.00	(20)	5.895	5.00	80.00
(7)	1.122	0.80	15.80	(21)	6.630	4.20	84.20
(8)	1.229	4.20	20.00	(22)	6.784	0.80	85.00
(9)	1.369	5.00	25.00	(23)	7.955	5.00	90.00
(10)	1.534	5.00	30.00	(24)	9.701	5.00	95.00
(11)	1.728	5.00	35.00	(25)	11.364	2.70	97.70
(12)	1.982	5.00	40.00	(26)	12.993	1.30	99.00
(13)	2.289	5.00	45.00	(27)	16.433	0.90	99.90
(14)	2.633	5.00	50.00				

Median : 2.631 (μm) Mean: 3.645 (μm) Mode: 1.232 (μm)
Std. Dev.: 2.913 (μm) Span: 1.728
Coef. Var: 79.93% Spec. Area: 29509 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/27/'01 16:30

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926-969 14:32
Filename : AY102902
Sample : ay102

Material :
Source :
Lot Numbe : 1655

Condition
T%(He-Ne): 81.7%
(LAMP): 76.9%
Dist.Form: Std.
R.R.Index: 1.16-0.00i
Sampling times : 100
( )

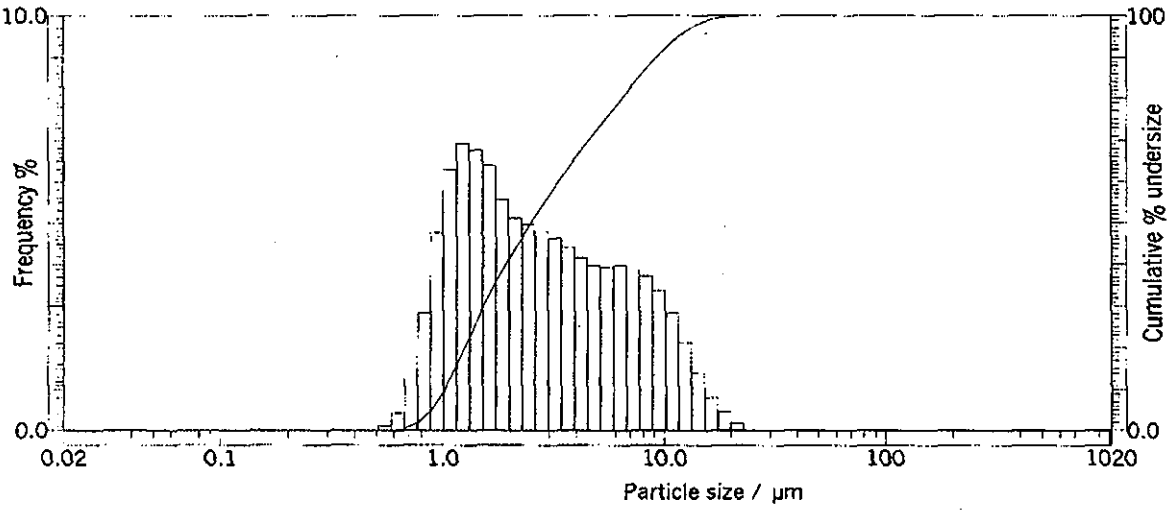
Agitation : 0 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 2.503μm SP.Area : 29019cm²/cm³ S.D. : 3.577μm
Mode : 1.237μm Mean : 3.956μm
C.V. : 90.42%

Span : (D 10.0-D 90.0) / D50 = 3.285

Dia. on %(5.0%) : 0.887μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 1.383μm % on Dia.(1.000μm) : 9.2%
Dia. on %(50.0%) : 2.503μm % on Dia.(10.000μm) : 92.0%
Dia. on %(75.0%) : 5.424μm % on Dia.(100.000μm) : 100.0%
Dia. on %(95.0%) : 11.537μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	100.00	0.669	0.42	0.54
890.1	0.00	100.00	22.80	0.18	100.00	0.584	0.12	0.12
777.1	0.00	100.00	19.90	0.45	99.82	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.80	99.37	0.445	0.00	0.00
592.4	0.00	100.00	15.17	1.40	98.58	0.389	0.00	0.00
517.2	0.00	100.00	13.25	2.13	97.18	0.339	0.00	0.00
451.6	0.00	100.00	11.56	2.84	95.05	0.296	0.00	0.00
394.2	0.00	100.00	10.10	3.38	92.21	0.259	0.00	0.00
344.2	0.00	100.00	8.816	3.72	88.83	0.226	0.00	0.00
300.5	0.00	100.00	7.697	3.86	85.11	0.197	0.00	0.00
262.4	0.00	100.00	6.720	3.98	81.25	0.172	0.00	0.00
229.1	0.00	100.00	5.867	3.92	77.27	0.150	0.00	0.00
200.0	0.00	100.00	5.122	3.97	73.35	0.131	0.00	0.00
174.6	0.00	100.00	4.472	4.16	69.38	0.115	0.00	0.00
152.5	0.00	100.00	3.905	4.42	65.22	0.100	0.00	0.00
133.1	0.00	100.00	3.409	4.63	60.80	0.087	0.00	0.00
116.2	0.00	100.00	2.976	4.80	56.17	0.076	0.00	0.00
101.5	0.00	100.00	2.599	4.96	51.37	0.067	0.00	0.00
88.58	0.00	100.00	2.269	5.11	46.40	0.058	0.00	0.00
77.34	0.00	100.00	1.981	5.56	41.30	0.051	0.00	0.00
67.52	0.00	100.00	1.729	6.38	35.74	0.044	0.00	0.00
58.95	0.00	100.00	1.510	6.76	29.36	0.039	0.00	0.00
51.47	0.00	100.00	1.318	6.93	22.61	0.034	0.00	0.00
44.94	0.00	100.00	1.151	6.29	15.68	0.029	0.00	0.00
39.23	0.00	100.00	1.005	4.76	9.39	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/27/01
File Name: AY102902.DAT Sample Name: ay102 ID No: 01/09/26-969
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 81.718 % Lamp: 76.865 %
Circulation: 6 Agitation: OFF U.Sonic OFF (min)
Lot No: 1655 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.571	0.10	0.10	(15)	2.884	5.00	55.00
(2)	0.704	0.90	1.00	(16)	3.334	5.00	60.00
(3)	0.786	1.30	2.30	(17)	3.880	5.00	65.00
(4)	0.887	2.70	5.00	(18)	4.574	5.00	70.00
(5)	1.019	5.00	10.00	(19)	5.436	5.00	75.00
(6)	1.135	5.00	15.00	(20)	6.452	5.00	80.00
(7)	1.154	0.80	15.80	(21)	7.467	4.20	84.20
(8)	1.255	4.20	20.00	(22)	7.669	0.80	85.00
(9)	1.386	5.00	25.00	(23)	9.260	5.00	90.00
(10)	1.532	5.00	30.00	(24)	11.539	5.00	95.00
(11)	1.704	5.00	35.00	(25)	13.966	2.70	97.70
(12)	1.922	5.00	40.00	(26)	16.341	1.30	99.00
(13)	2.189	5.00	45.00	(27)	21.158	0.90	99.90
(14)	2.508	5.00	50.00				

Median : 2.503 (μm) Mean: 3.956 (μm) Mode: 1.232 (μm)
Std. Dev.: 3.577 (μm) Span: 2.442
Coef. Var: 90.42% Spec. Area: 29019 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/27/'01 16:30

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926-970 14:36
Filename : AY102903
Sample : ay102

Material :
Source :
Lot Numbe : 1655

Condition
T%(He-Ne): 81.4%
(LAMP): 76.8%
Dist.Form: Std.
R.R.Index: 1.16-0.001
Sampling times : 100
( )

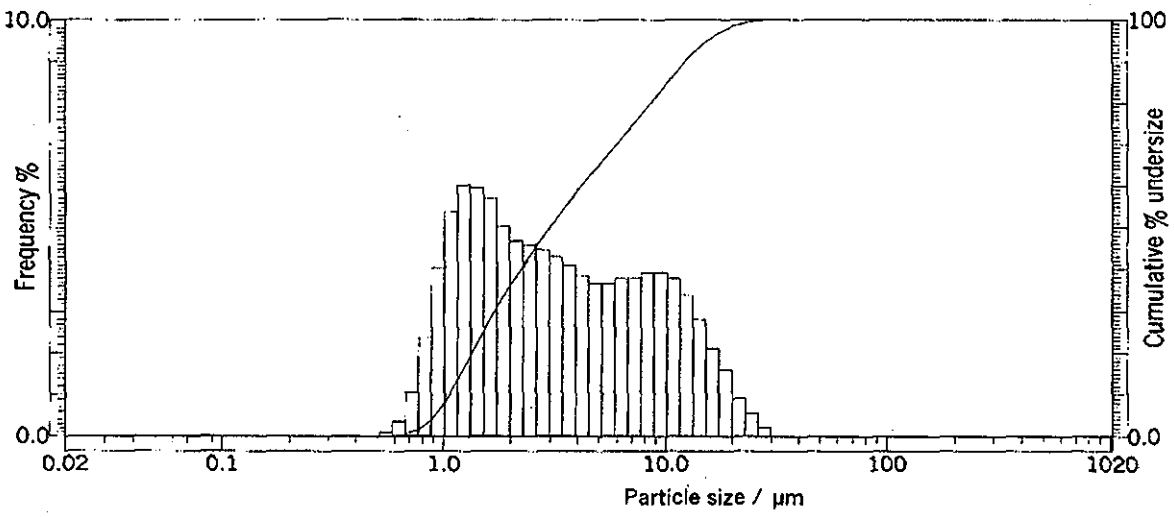
Agitation : 3 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 3.000μm SP.Area : 26061cm²/cm³ S.D. : 4.918μm
Mode : 1.240μm Mean : 5.074μm
C.V. : 96.92%

Span : (D 10.0-D 90.0) / D50 = 3.749

Dia. on %(5.0%) : 0.911μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 1.500μm % on Dia.(1.000μm) : 7.8%
Dia. on %(50.0%) : 3.000μm % on Dia.(10.000μm) : 84.4%
Dia. on %(75.0%) : 7.204μm % on Dia.(100.000μm) : 100.0%
Dia. on %(95.0%) : 15.525μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.55	99.80	0.669	0.35	0.46
890.1	0.00	100.00	22.80	0.92	99.25	0.584	0.10	0.10
777.1	0.00	100.00	19.90	1.58	98.33	0.510	0.00	0.00
678.5	0.00	100.00	17.38	2.10	96.75	0.445	0.00	0.00
592.4	0.00	100.00	15.17	2.81	94.64	0.389	0.00	0.00
517.2	0.00	100.00	13.25	3.38	91.83	0.339	0.00	0.00
451.6	0.00	100.00	11.56	3.77	88.45	0.296	0.00	0.00
394.2	0.00	100.00	10.10	3.92	84.68	0.259	0.00	0.00
344.2	0.00	100.00	8.816	3.91	80.76	0.226	0.00	0.00
300.5	0.00	100.00	7.697	3.80	76.85	0.197	0.00	0.00
262.4	0.00	100.00	6.720	3.77	73.05	0.172	0.00	0.00
229.1	0.00	100.00	5.867	3.64	69.28	0.150	0.00	0.00
200.0	0.00	100.00	5.122	3.66	65.64	0.131	0.00	0.00
174.6	0.00	100.00	4.472	3.84	61.98	0.115	0.00	0.00
152.5	0.00	100.00	3.905	4.09	58.13	0.100	0.00	0.00
133.1	0.00	100.00	3.409	4.30	54.04	0.087	0.00	0.00
116.2	0.00	100.00	2.976	4.46	49.74	0.076	0.00	0.00
101.5	0.00	100.00	2.599	4.59	45.28	0.067	0.00	0.00
88.58	0.00	100.00	2.269	4.68	40.69	0.058	0.00	0.00
77.34	0.00	100.00	1.981	5.03	36.01	0.051	0.00	0.00
67.52	0.00	100.00	1.729	5.70	30.98	0.044	0.00	0.00
58.95	0.00	100.00	1.510	5.95	25.28	0.039	0.00	0.00
51.47	0.00	100.00	1.318	6.01	19.33	0.034	0.00	0.00
44.94	0.00	100.00	1.151	5.39	13.31	0.029	0.00	0.00
39.23	0.00	100.00	1.005	4.04	7.93	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/27/01
File Name: AY102903.DAT Sample Name: ay102 ID No: 01/09/26-970
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 81.362 % Lamp: 76.844 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Lot No: 1655 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.583	0.10	0.10	(15)	3.525	5.00	55.00
(2)	0.719	0.90	1.00	(16)	4.180	5.00	60.00
(3)	0.803	1.30	2.30	(17)	5.009	5.00	65.00
(4)	0.912	2.70	5.00	(18)	6.030	5.00	70.00
(5)	1.061	5.00	10.00	(19)	7.221	5.00	75.00
(6)	1.198	5.00	15.00	(20)	8.598	5.00	80.00
(7)	1.220	0.80	15.80	(21)	9.941	4.20	84.20
(8)	1.340	4.20	20.00	(22)	10.222	0.80	85.00
(9)	1.501	5.00	25.00	(23)	12.335	5.00	90.00
(10)	1.692	5.00	30.00	(24)	15.546	5.00	95.00
(11)	1.930	5.00	35.00	(25)	18.896	2.70	97.70
(12)	2.226	5.00	40.00	(26)	22.016	1.30	99.00
(13)	2.578	5.00	45.00	(27)	28.039	0.90	99.90
(14)	3.002	5.00	50.00				

Median : 3.000 (μm) Mean: 5.074 (μm) Mode: 1.232 (μm)
Std. Dev.: 4.918 (μm) Span: 2.773
Coef. Var: 96.92% Spec. Area: 26061 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/27/'01 16:30

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926-971 14:42
Filename : AY102904
Sample : ay102

Material :
Source :
Lot Numbe : 1655

Condition
T%(He-Ne): 81.5% Dist.Form: Std. Sampling times : 100
(LAMP): 74.6% R.R.Index: 1.16-0.00i ( )

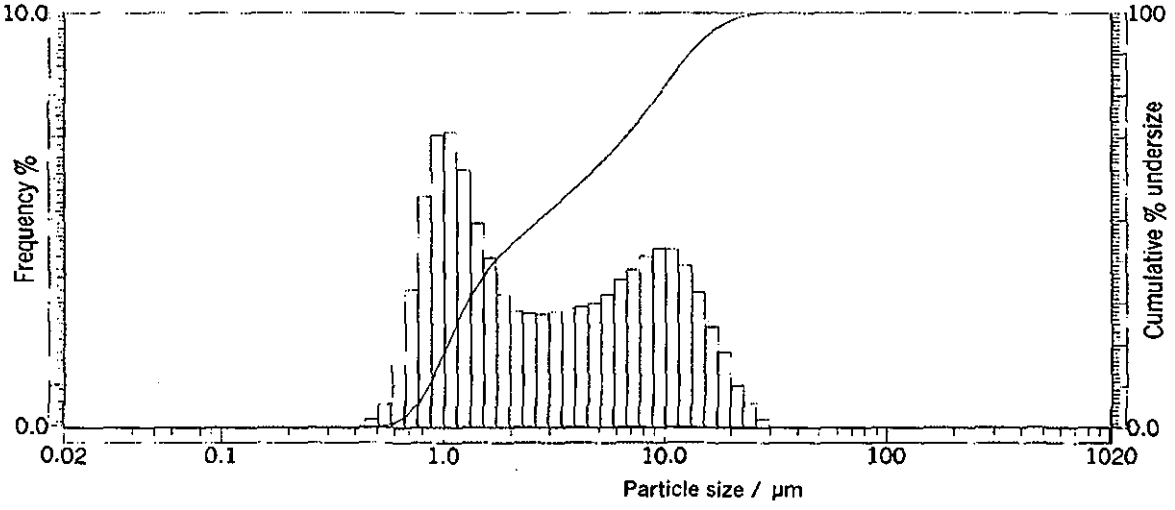
Agitation : 3 Circultn : 6 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 2.690μm SP.Area : 31509cm²/cm³ S.D. : 5.241μm
Mode : 1.067μm Mean : 5.124μm
C.V. : 102.28%

Span : (D 10.0-D 90.0) / D50 = 4.488

Dia. on %(5.0%) : 0.748μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 1.144μm % on Dia.(1.000μm) : 18.0%
Dia. on %(50.0%) : 2.690μm % on Dia.(10.000μm) : 82.2%
Dia. on %(75.0%) : 7.927μm % on Dia.(100.000μm) : 100.0%
Dia. on %(95.0%) : 16.076μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.59	99.80	0.669	1.50	2.25
890.1	0.00	100.00	22.80	1.01	99.21	0.584	0.55	0.75
777.1	0.00	100.00	19.90	1.82	98.21	0.510	0.19	0.19
678.5	0.00	100.00	17.38	2.42	96.39	0.445	0.00	0.00
592.4	0.00	100.00	15.17	3.26	93.97	0.389	0.00	0.00
517.2	0.00	100.00	13.25	3.91	90.71	0.339	0.00	0.00
451.6	0.00	100.00	11.56	4.28	86.80	0.296	0.00	0.00
394.2	0.00	100.00	10.10	4.30	82.52	0.259	0.00	0.00
344.2	0.00	100.00	8.816	4.11	78.22	0.226	0.00	0.00
300.5	0.00	100.00	7.697	3.79	74.11	0.197	0.00	0.00
262.4	0.00	100.00	6.720	3.55	70.32	0.172	0.00	0.00
229.1	0.00	100.00	5.867	3.20	66.77	0.150	0.00	0.00
200.0	0.00	100.00	5.122	2.98	63.57	0.131	0.00	0.00
174.6	0.00	100.00	4.472	2.91	60.59	0.115	0.00	0.00
152.5	0.00	100.00	3.905	2.87	57.68	0.100	0.00	0.00
133.1	0.00	100.00	3.409	2.78	54.81	0.087	0.00	0.00
116.2	0.00	100.00	2.976	2.72	52.03	0.076	0.00	0.00
101.5	0.00	100.00	2.599	2.76	49.31	0.067	0.00	0.00
88.58	0.00	100.00	2.269	2.80	46.55	0.058	0.00	0.00
77.34	0.00	100.00	1.981	3.19	43.75	0.051	0.00	0.00
67.52	0.00	100.00	1.729	4.08	40.55	0.044	0.00	0.00
58.95	0.00	100.00	1.510	4.94	36.47	0.039	0.00	0.00
51.47	0.00	100.00	1.318	6.20	31.53	0.034	0.00	0.00
44.94	0.00	100.00	1.151	7.12	25.33	0.029	0.00	0.00
39.23	0.00	100.00	1.005	7.05	18.21	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/27/01
File Name: AY102904.DAT Sample Name: ay102 ID No: 01/09/26-971
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 81.503 % Lamp: 74.555 %
Circulation: 6 Agitation: 3 U.Sonic ** (min)
Lot No: 1655 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.478	0.10	0.10	(15)	3.441	5.00	55.00
(2)	0.598	0.90	1.00	(16)	4.357	5.00	60.00
(3)	0.670	1.30	2.30	(17)	5.455	5.00	65.00
(4)	0.749	2.70	5.00	(18)	6.643	5.00	70.00
(5)	0.854	5.00	10.00	(19)	7.939	5.00	75.00
(6)	0.947	5.00	15.00	(20)	9.345	5.00	80.00
(7)	0.961	0.80	15.80	(21)	10.672	4.20	84.20
(8)	1.042	4.20	20.00	(22)	10.947	0.80	85.00
(9)	1.144	5.00	25.00	(23)	12.941	5.00	90.00
(10)	1.277	5.00	30.00	(24)	16.112	5.00	95.00
(11)	1.453	5.00	35.00	(25)	19.200	2.70	97.70
(12)	1.700	5.00	40.00	(26)	22.180	1.30	99.00
(13)	2.110	5.00	45.00	(27)	27.986	0.90	99.90
(14)	2.695	5.00	50.00				

Median : 2.690 (μm) Mean: 5.124 (μm) Mode: 1.075 (μm)
Std. Dev.: 5.241 (μm) Span: 3.030
Coef. Var: 102.28% Spec. Area: 31509 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/27/'01 16:30

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926-972 14:46
Filename : AY102905
Sample : ay102

Material :
Source :
Lot Numbe : 1655

Condition
T%(He-Ne): 81.4%
(LAMP): 75.3%

Dist.Form: Std.
R.R.Index: 1.16-0.00i

Sampling times : 100
( )

Agitation : 1
Circultn : 6
U.sonic : ~~ON~~ OFF (120)

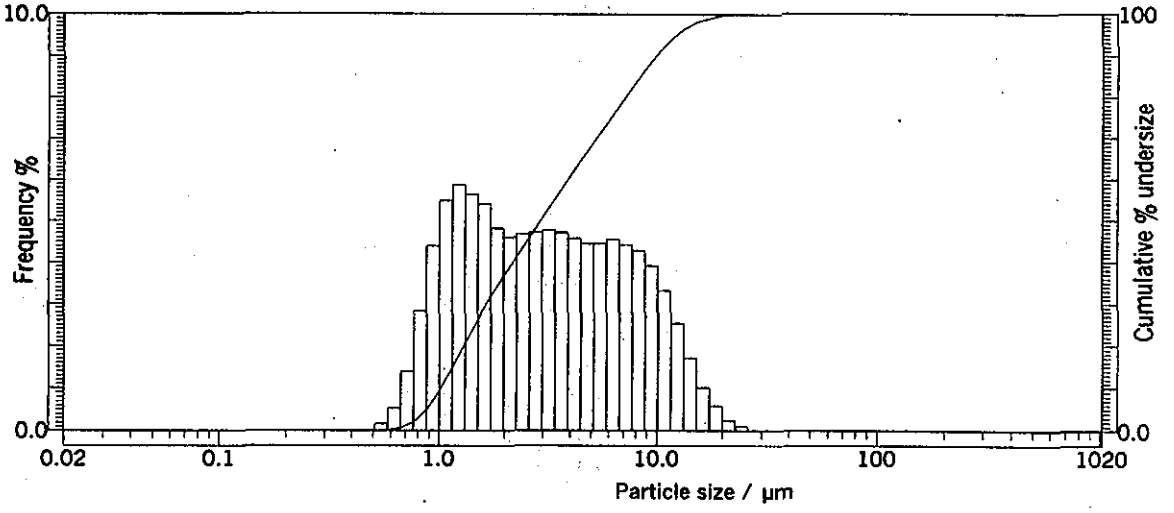
WSC 10/3/01

Format
Dist.base : Volume
Scaling : Auto
Axis : LogX - LinearY

Data
Median : 2.935μm
SP.Area : 27253cm²/cm³
S.D. : 3.842μm
Mode : 1.234μm
Mean : 4.364μm
C.V. : 88.04%

Span : (D 10.0-D 90.0) / D50 = 3.033

Dia. on %(5.0%) :	0.880μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	1.464μm	% on Dia.(1.000μm) :	9.1%
Dia. on %(50.0%) :	2.935μm	% on Dia.(10.000μm) :	90.2%
Dia. on %(75.0%) :	6.159μm	% on Dia.(100.000μm) :	100.0%
Dia. on %(95.0%) :	12.328μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.10	100.00	0.669	0.53	0.70
890.1	0.00	100.00	22.80	0.25	99.90	0.584	0.17	0.17
777.1	0.00	100.00	19.90	0.59	99.65	0.510	0.00	0.00
678.5	0.00	100.00	17.38	1.01	99.06	0.445	0.00	0.00
592.4	0.00	100.00	15.17	1.71	98.05	0.389	0.00	0.00
517.2	0.00	100.00	13.25	2.52	96.34	0.339	0.00	0.00
451.6	0.00	100.00	11.56	3.31	93.81	0.296	0.00	0.00
394.2	0.00	100.00	10.10	3.90	90.50	0.259	0.00	0.00
344.2	0.00	100.00	8.816	4.27	86.60	0.226	0.00	0.00
300.5	0.00	100.00	7.697	4.41	82.33	0.197	0.00	0.00
262.4	0.00	100.00	6.720	4.54	77.92	0.172	0.00	0.00
229.1	0.00	100.00	5.867	4.44	73.38	0.150	0.00	0.00
200.0	0.00	100.00	5.122	4.43	68.93	0.131	0.00	0.00
174.6	0.00	100.00	4.472	4.56	64.50	0.115	0.00	0.00
152.5	0.00	100.00	3.905	4.70	59.94	0.100	0.00	0.00
133.1	0.00	100.00	3.409	4.75	55.24	0.087	0.00	0.00
116.2	0.00	100.00	2.976	4.72	50.49	0.076	0.00	0.00
101.5	0.00	100.00	2.599	4.67	45.77	0.067	0.00	0.00
88.58	0.00	100.00	2.269	4.59	41.10	0.058	0.00	0.00
77.34	0.00	100.00	1.981	4.81	36.52	0.051	0.00	0.00
67.52	0.00	100.00	1.729	5.41	31.70	0.044	0.00	0.00
58.95	0.00	100.00	1.510	5.65	26.29	0.039	0.00	0.00
51.47	0.00	100.00	1.318	5.87	20.64	0.034	0.00	0.00
44.94	0.00	100.00	1.151	5.49	14.77	0.029	0.00	0.00
39.23	0.00	100.00	1.005	4.39	9.29	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/27/01
File Name: AY102905.DAT Sample Name: ay102 ID No: 01/09/26-972
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 81.436 % Lamp: 75.279 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Lot No: 1655 Test No:

WSC 10/3/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.553	0.10	0.10	(15)	3.387	5.00	55.00
(2)	0.690	0.90	1.00	(16)	3.912	5.00	60.00
(3)	0.775	1.30	2.30	(17)	4.545	5.00	65.00
(4)	0.880	2.70	5.00	(18)	5.301	5.00	70.00
(5)	1.024	5.00	10.00	(19)	6.172	5.00	75.00
(6)	1.157	5.00	15.00	(20)	7.181	5.00	80.00
(7)	1.180	0.80	15.80	(21)	8.188	4.20	84.20
(8)	1.300	4.20	20.00	(22)	8.397	0.80	85.00
(9)	1.466	5.00	25.00	(23)	9.934	5.00	90.00
(10)	1.660	5.00	30.00	(24)	12.356	5.00	95.00
(11)	1.902	5.00	35.00	(25)	14.779	2.70	97.70
(12)	2.200	5.00	40.00	(26)	17.253	1.30	99.00
(13)	2.544	5.00	45.00	(27)	22.947	0.90	99.90
(14)	2.937	5.00	50.00				

Median : 2.935 (μm) Mean: 4.364 (μm) Mode: 1.232 (μm)
Std. Dev.: 3.842 (μm) Span: 2.102
Coef. Var: 88.04% Spec. Area: 27253 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/27/'01 16:30

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926-973 15:01
Filename : AY102906
Sample : ay102

Material :
Source : Dup
Lot Numbe : 1655

Condition
T%(He-Ne): 86.5% Dist.Form: Std. Sampling times : 100
(LAMP): 83.0% R.R.Index: 1.16-0.00i ( )

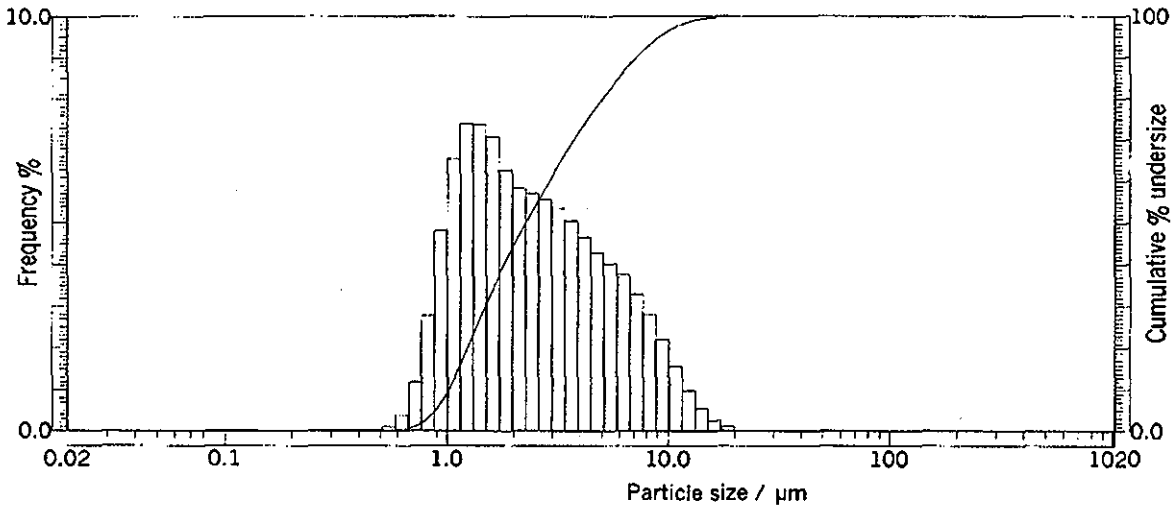
Agitation : 1 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 2.279μm SP.Area : 30563cm²/cm³ S.D. : 2.768μm
Mode : 1.241μm Mean : 3.313μm
C.V. : 83.53%

Span : (D 10.0-D 90.0) / D50 = 2.726

Dia. on %(5.0%) : 0.891μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 1.362μm % on Dia.(1.000μm) : 9.1%
Dia. on %(50.0%) : 2.279μm % on Dia.(10.000μm) : 96.4%
Dia. on %(75.0%) : 4.324μm % on Dia.(100.000μm) : 100.0%
Dia. on %(95.0%) : 9.193μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	100.00	0.669	0.39	0.49
890.1	0.00	100.00	22.80	0.00	100.00	0.584	0.11	0.11
777.1	0.00	100.00	19.90	0.12	100.00	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.26	99.88	0.445	0.00	0.00
592.4	0.00	100.00	15.17	0.54	99.62	0.389	0.00	0.00
517.2	0.00	100.00	13.25	0.99	99.08	0.339	0.00	0.00
451.6	0.00	100.00	11.56	1.57	98.09	0.296	0.00	0.00
394.2	0.00	100.00	10.10	2.20	96.52	0.259	0.00	0.00
344.2	0.00	100.00	8.816	2.81	94.32	0.226	0.00	0.00
300.5	0.00	100.00	7.697	3.30	91.51	0.197	0.00	0.00
262.4	0.00	100.00	6.720	3.77	88.21	0.172	0.00	0.00
229.1	0.00	100.00	5.867	4.01	84.45	0.150	0.00	0.00
200.0	0.00	100.00	5.122	4.28	80.44	0.131	0.00	0.00
174.6	0.00	100.00	4.472	4.66	76.16	0.115	0.00	0.00
152.5	0.00	100.00	3.905	5.05	71.50	0.100	0.00	0.00
133.1	0.00	100.00	3.409	5.36	66.45	0.087	0.00	0.00
116.2	0.00	100.00	2.976	5.57	61.10	0.076	0.00	0.00
101.5	0.00	100.00	2.599	5.71	55.53	0.067	0.00	0.00
88.58	0.00	100.00	2.269	5.84	49.82	0.058	0.00	0.00
77.34	0.00	100.00	1.981	6.28	43.98	0.051	0.00	0.00
67.52	0.00	100.00	1.729	7.09	37.70	0.044	0.00	0.00
58.95	0.00	100.00	1.510	7.38	30.61	0.039	0.00	0.00
51.47	0.00	100.00	1.318	7.40	23.23	0.034	0.00	0.00
44.94	0.00	100.00	1.151	6.55	15.82	0.029	0.00	0.00
39.23	0.00	100.00	1.005	4.82	9.28	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/27/01
File Name: AY102906.DAT Sample Name: ay102 ID No: 01/09/26-973
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 86.533 % Lamp: 83.011 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: Source: Dup
Lot No: 1655 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.579	0.10	0.10	(15)	2.568	5.00	55.00
(2)	0.710	0.90	1.00	(16)	2.902	5.00	60.00
(3)	0.791	1.30	2.30	(17)	3.292	5.00	65.00
(4)	0.892	2.70	5.00	(18)	3.757	5.00	70.00
(5)	1.021	5.00	10.00	(19)	4.331	5.00	75.00
(6)	1.133	5.00	15.00	(20)	5.056	5.00	80.00
(7)	1.150	0.80	15.80	(21)	5.821	4.20	84.20
(8)	1.245	4.20	20.00	(22)	5.992	0.80	85.00
(9)	1.364	5.00	25.00	(23)	7.249	5.00	90.00
(10)	1.494	5.00	30.00	(24)	9.211	5.00	95.00
(11)	1.646	5.00	35.00	(25)	11.198	2.70	97.70
(12)	1.821	5.00	40.00	(26)	13.114	1.30	99.00
(13)	2.031	5.00	45.00	(27)	17.787	0.90	99.90
(14)	2.279	5.00	50.00				

Median : 2.279 (μm) Mean: 3.313 (μm) Mode: 1.232 (μm)
Std. Dev.: 2.768 (μm) Span: 2.137
Coef. Var: 83.54% Spec. Area: 30563 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/27/'01 16:31

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926-974 15:05
Filename : AY102907
Sample : ay102

Material :
Source : Dup
Lot Numbe : 1655

Condition
T%(He-Ne): 86.4% Dist.Form: Std. Sampling times : 100
(LAMP): 83.1% R.R.Index: 1.16-0.00i ( )

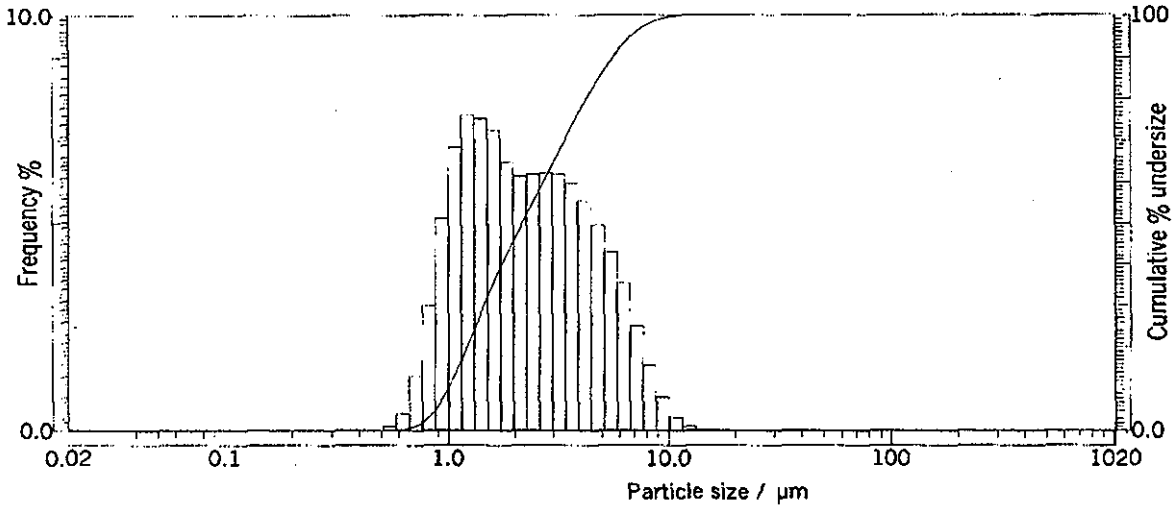
Agitation : 3 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 2.180μm SP.Area : 31987cm²/cm³ S.D. : 1.952μm
Mode : 1.239μm Mean : 2.824μm
C.V. : 69.11%

Span : (D 10.0-D 90.0) / D50 = 2.135

Dia. on %(5.0%) : 0.881μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 1.332μm % on Dia.(1.000μm) : 9.8%
Dia. on %(50.0%) : 2.180μm % on Dia.(10.000μm) : 99.5%
Dia. on %(75.0%) : 3.785μm % on Dia.(100.000μm) : 100.0%
Dia. on %(95.0%) : 6.837μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	100.00	0.669	0.43	0.55
890.1	0.00	100.00	22.80	0.00	100.00	0.584	0.12	0.12
777.1	0.00	100.00	19.90	0.00	100.00	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.00	100.00	0.445	0.00	0.00
592.4	0.00	100.00	15.17	0.00	100.00	0.389	0.00	0.00
517.2	0.00	100.00	13.25	0.10	100.00	0.339	0.00	0.00
451.6	0.00	100.00	11.56	0.33	99.90	0.296	0.00	0.00
394.2	0.00	100.00	10.10	0.81	99.57	0.259	0.00	0.00
344.2	0.00	100.00	8.816	1.57	98.76	0.226	0.00	0.00
300.5	0.00	100.00	7.697	2.51	97.19	0.197	0.00	0.00
262.4	0.00	100.00	6.720	3.54	94.68	0.172	0.00	0.00
229.1	0.00	100.00	5.867	4.30	91.14	0.150	0.00	0.00
200.0	0.00	100.00	5.122	4.94	86.84	0.131	0.00	0.00
174.6	0.00	100.00	4.472	5.53	81.90	0.115	0.00	0.00
152.5	0.00	100.00	3.905	5.97	76.37	0.100	0.00	0.00
133.1	0.00	100.00	3.409	6.19	70.40	0.087	0.00	0.00
116.2	0.00	100.00	2.976	6.22	64.21	0.076	0.00	0.00
101.5	0.00	100.00	2.599	6.19	57.99	0.067	0.00	0.00
88.58	0.00	100.00	2.269	6.13	51.80	0.058	0.00	0.00
77.34	0.00	100.00	1.981	6.47	45.67	0.051	0.00	0.00
67.52	0.00	100.00	1.729	7.26	39.20	0.044	0.00	0.00
58.95	0.00	100.00	1.510	7.53	31.93	0.039	0.00	0.00
51.47	0.00	100.00	1.318	7.62	24.41	0.034	0.00	0.00
44.94	0.00	100.00	1.151	6.83	16.78	0.029	0.00	0.00
39.23	0.00	100.00	1.005	5.11	9.95	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/27/01
File Name: AY102907.DAT Sample Name: ay102 ID No: 01/09/26-974
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 86.367 % Lamp: 83.092 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: Source: Dup
Lot No: 1655 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.571	0.10	0.10	(15)	2.439	5.00	55.00
(2)	0.702	0.90	1.00	(16)	2.721	5.00	60.00
(3)	0.783	1.30	2.30	(17)	3.032	5.00	65.00
(4)	0.881	2.70	5.00	(18)	3.381	5.00	70.00
(5)	1.006	5.00	10.00	(19)	3.791	5.00	75.00
(6)	1.113	5.00	15.00	(20)	4.278	5.00	80.00
(7)	1.130	0.80	15.80	(21)	4.775	4.20	84.20
(8)	1.222	4.20	20.00	(22)	4.880	0.80	85.00
(9)	1.333	5.00	25.00	(23)	5.669	5.00	90.00
(10)	1.461	5.00	30.00	(24)	6.844	5.00	95.00
(11)	1.603	5.00	35.00	(25)	8.060	2.70	97.70
(12)	1.761	5.00	40.00	(26)	9.197	1.30	99.00
(13)	1.955	5.00	45.00	(27)	11.598	0.90	99.90
(14)	2.184	5.00	50.00				

Median : 2.180 (μm) Mean: 2.824 (μm) Mode: 1.232 (μm)
Std. Dev.: 1.952 (μm) Span: 1.400
Coef. Var: 69.11% Spec. Area: 31987 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/27/'01 16:31

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926-975 15:11
Filename : AY102908
Sample : ay102

Material :
Source : Dup
Lot Numbe : 1655

Condition
T%(He-Ne): 87.1% Dist.Form: Std. Sampling times : 100
(LAMP): 81.9% R.R.Index: 1.16-0.00i ( )

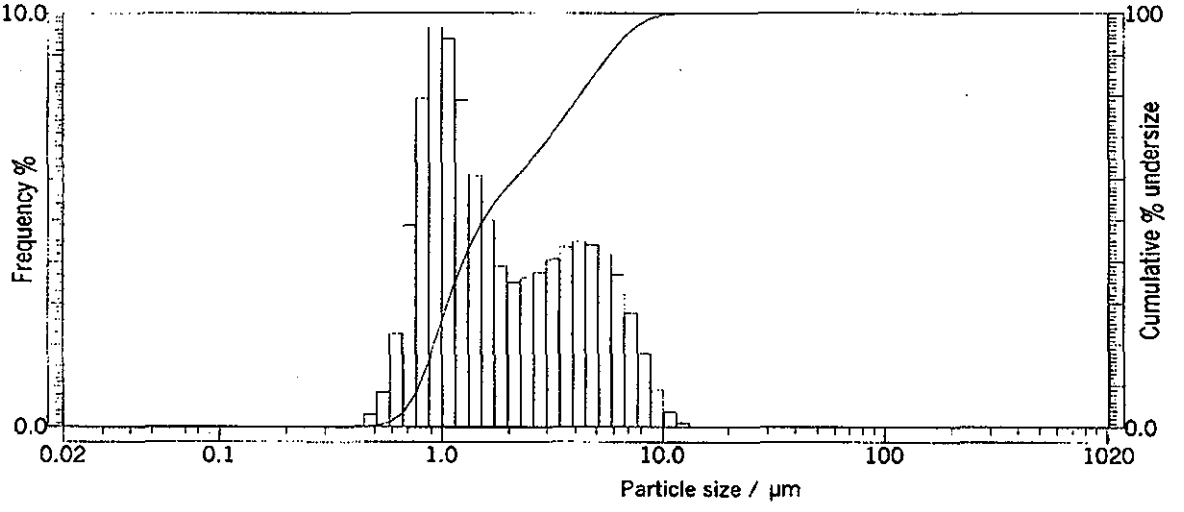
Agitation : 3 Circultn : 6 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 1.543μm SP.Area : 40906cm²/cm³ S.D. : 2.121μm
Mode : 0.949μm Mean : 2.542μm
C.V. : 83.45%

Span : (D 10.0-D 90.0) / D50 = 3.239

Dia. on %(5.0%) : 0.700μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 0.993μm % on Dia.(1.000μm) : 25.5%
Dia. on %(50.0%) : 1.543μm % on Dia.(10.000μm) : 99.5%
Dia. on %(75.0%) : 3.627μm % on Dia.(100.000μm) : 100.0%
Dia. on %(95.0%) : 7.025μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	100.00	0.669	2.24	3.38
890.1	0.00	100.00	22.80	0.00	100.00	0.584	0.84	1.14
777.1	0.00	100.00	19.90	0.00	100.00	0.510	0.29	0.29
678.5	0.00	100.00	17.38	0.00	100.00	0.445	0.00	0.00
592.4	0.00	100.00	15.17	0.00	100.00	0.389	0.00	0.00
517.2	0.00	100.00	13.25	0.11	100.00	0.339	0.00	0.00
451.6	0.00	100.00	11.56	0.36	99.89	0.296	0.00	0.00
394.2	0.00	100.00	10.10	0.91	99.53	0.259	0.00	0.00
344.2	0.00	100.00	8.816	1.77	98.62	0.226	0.00	0.00
300.5	0.00	100.00	7.697	2.75	96.85	0.197	0.00	0.00
262.4	0.00	100.00	6.720	3.69	94.10	0.172	0.00	0.00
229.1	0.00	100.00	5.867	4.17	90.41	0.150	0.00	0.00
200.0	0.00	100.00	5.122	4.40	86.24	0.131	0.00	0.00
174.6	0.00	100.00	4.472	4.48	81.84	0.115	0.00	0.00
152.5	0.00	100.00	3.905	4.36	77.37	0.100	0.00	0.00
133.1	0.00	100.00	3.409	4.06	73.00	0.087	0.00	0.00
116.2	0.00	100.00	2.976	3.75	68.95	0.076	0.00	0.00
101.5	0.00	100.00	2.599	3.60	65.20	0.067	0.00	0.00
88.58	0.00	100.00	2.269	3.50	61.59	0.058	0.00	0.00
77.34	0.00	100.00	1.981	3.90	58.09	0.051	0.00	0.00
67.52	0.00	100.00	1.729	4.99	54.18	0.044	0.00	0.00
58.95	0.00	100.00	1.510	6.09	49.19	0.039	0.00	0.00
51.47	0.00	100.00	1.318	7.89	43.10	0.034	0.00	0.00
44.94	0.00	100.00	1.151	9.38	35.20	0.029	0.00	0.00
39.23	0.00	100.00	1.005	9.65	25.82	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/27/01
File Name: AY102908.DAT Sample Name: ay102 ID No: 01/09/26-975
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 87.069 % Lamp: 81.891 %
Circulation: 6 Agitation: 3 U.Sonic ** (min)
Material: Source: Dup
Lot No: 1655 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.467	0.10	0.10	(15)	1.782	5.00	55.00
(2)	0.572	0.90	1.00	(16)	2.138	5.00	60.00
(3)	0.628	1.30	2.30	(17)	2.580	5.00	65.00
(4)	0.701	2.70	5.00	(18)	3.089	5.00	70.00
(5)	0.791	5.00	10.00	(19)	3.636	5.00	75.00
(6)	0.861	5.00	15.00	(20)	4.239	5.00	80.00
(7)	0.872	0.80	15.80	(21)	4.821	4.20	84.20
(8)	0.928	4.20	20.00	(22)	4.939	0.80	85.00
(9)	0.994	5.00	25.00	(23)	5.793	5.00	90.00
(10)	1.070	5.00	30.00	(24)	7.039	5.00	95.00
(11)	1.148	5.00	35.00	(25)	8.235	2.70	97.70
(12)	1.253	5.00	40.00	(26)	9.353	1.30	99.00
(13)	1.378	5.00	45.00	(27)	11.658	0.90	99.90
(14)	1.545	5.00	50.00				

Median : 1.543 (μm) Mean: 2.542 (μm) Mode: 0.939 (μm)
Std. Dev.: 2.121 (μm) Span: 2.201
Coef. Var: 83.45% Spec. Area: 40906 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/27/'01 16:31

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926-976 15:14
Filename : AY102909
Sample : ay102

Material :
Source : Dup
Lot Numbe : 1655

Condition

T%(He-Ne): 87.1%
(LAMP): 82.4%

Dist.Form: Std.
R.R.Index: 1.16-0.00i

Sampling times : 100
( )

Agitation : 1 Circultn : 6 U.sonic : ~~ON~~ OFF (120)

WSC 10/3/01

Format

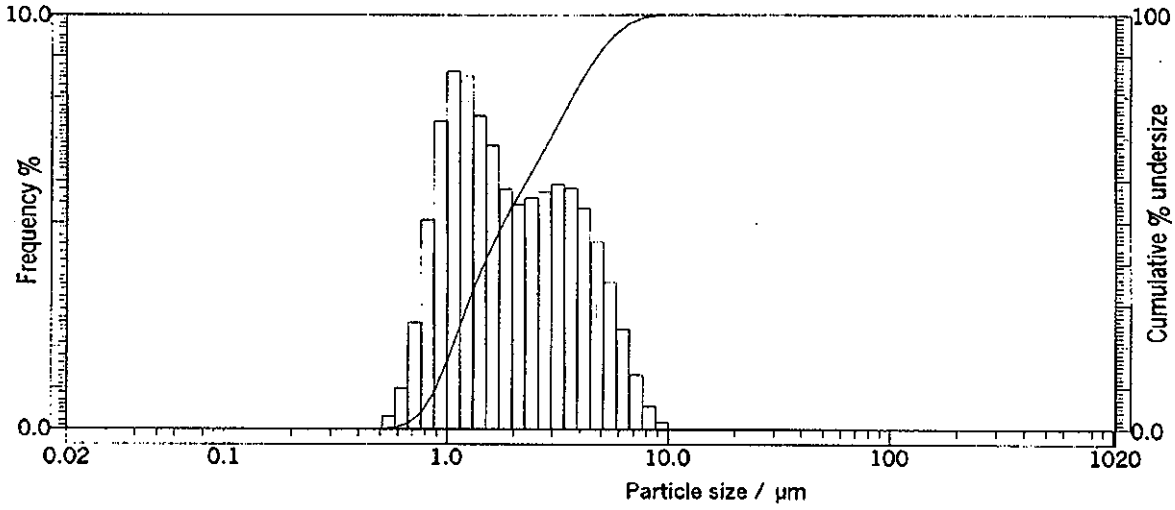
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data

Median : 1.818μm SP.Area : 36819cm²/cm³ S.D. : 1.628μm
Mode : 1.085μm Mean : 2.413μm
C.V. : 67.47%

Span : (D 10.0-D 90.0) / D50 = 2.164

Dia. on %(5.0%) :	0.789μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	1.151μm	% on Dia.(1.000μm) :	16.1%
Dia. on %(50.0%) :	1.818μm	% on Dia.(10.000μm) :	100.0%
Dia. on %(75.0%) :	3.309μm	% on Dia.(100.000μm) :	100.0%
Dia. on %(95.0%) :	5.752μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	100.00	0.669	0.99	1.31
890.1	0.00	100.00	22.80	0.00	100.00	0.584	0.32	0.32
777.1	0.00	100.00	19.90	0.00	100.00	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.00	100.00	0.445	0.00	0.00
592.4	0.00	100.00	15.17	0.00	100.00	0.389	0.00	0.00
517.2	0.00	100.00	13.25	0.00	100.00	0.339	0.00	0.00
451.6	0.00	100.00	11.56	0.00	100.00	0.296	0.00	0.00
394.2	0.00	100.00	10.10	0.18	100.00	0.259	0.00	0.00
344.2	0.00	100.00	8.816	0.56	99.82	0.226	0.00	0.00
300.5	0.00	100.00	7.697	1.31	99.26	0.197	0.00	0.00
262.4	0.00	100.00	6.720	2.43	97.94	0.172	0.00	0.00
229.1	0.00	100.00	5.867	3.54	95.51	0.150	0.00	0.00
200.0	0.00	100.00	5.122	4.53	91.98	0.131	0.00	0.00
174.6	0.00	100.00	4.472	5.34	87.45	0.115	0.00	0.00
152.5	0.00	100.00	3.905	5.81	82.10	0.100	0.00	0.00
133.1	0.00	100.00	3.409	5.91	76.30	0.087	0.00	0.00
116.2	0.00	100.00	2.976	5.73	70.39	0.076	0.00	0.00
101.5	0.00	100.00	2.599	5.58	64.66	0.067	0.00	0.00
88.58	0.00	100.00	2.269	5.42	59.08	0.058	0.00	0.00
77.34	0.00	100.00	1.981	5.79	53.66	0.051	0.00	0.00
67.52	0.00	100.00	1.729	6.83	47.87	0.044	0.00	0.00
58.95	0.00	100.00	1.510	7.54	41.04	0.039	0.00	0.00
51.47	0.00	100.00	1.318	8.50	33.49	0.034	0.00	0.00
44.94	0.00	100.00	1.151	8.61	25.00	0.029	0.00	0.00
39.23	0.00	100.00	1.005	7.43	16.38	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/27/01

File Name: AY102909.DAT Sample Name: ay102 ID No: 01/09/26-976

Dist. Form: STANDARD R.R. Index: 116-000

Dist. Mode: VOLUME Laser: 87.070 % Lamp: 82.415 %

Circulation: 6 Agitation: 1 U.Sonic OFF (min)

Material: Source: Dup

Lot No: 1655 Test No:

WSC 10/3/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.533	0.10	0.10	(15)	2.052	5.00	55.00
(2)	0.642	0.90	1.00	(16)	2.323	5.00	60.00
(3)	0.706	1.30	2.30	(17)	2.621	5.00	65.00
(4)	0.790	2.70	5.00	(18)	2.951	5.00	70.00
(5)	0.895	5.00	10.00	(19)	3.314	5.00	75.00
(6)	0.981	5.00	15.00	(20)	3.725	5.00	80.00
(7)	0.995	0.80	15.80	(21)	4.127	4.20	84.20
(8)	1.066	4.20	20.00	(22)	4.212	0.80	85.00
(9)	1.151	5.00	25.00	(23)	4.839	5.00	90.00
(10)	1.249	5.00	30.00	(24)	5.759	5.00	95.00
(11)	1.356	5.00	35.00	(25)	6.635	2.70	97.70
(12)	1.484	5.00	40.00	(26)	7.506	1.30	99.00
(13)	1.637	5.00	45.00	(27)	9.377	0.90	99.90
(14)	1.822	5.00	50.00				

Median : 1.818 (μm) Mean: 2.413 (μm) Mode: 1.075 (μm)

Std. Dev.: 1.628 (μm) Span: 1.344

Coef. Var: 67.47% Spec. Area: 36819 (cm2/cm3)

APPENDIX F-8

TANK AZ-102 COMPOSITE: PSD MEASUREMENT RESULTS

Consisting of 51 pages including this cover page

TABLE F-8. Sample identification and PSD run conditions. AZ-102 composite subsamples S01T001651 measured on August 29, 2001, and S01T001652 and S01T001653 measured on September 26, 2001.

Conditions Key: P = Pump Speed Setting; P3 = 7.1 mL/s; P6 = 14.4 mL/s
S = Stirrer Speed Setting (1-7); S1 = Stirrer Speed 1; S3 = Stirrer Speed 3
US = Ultrasonic ON Time (min); DT = Delay Time (min) between end of ultrasonic treatment and PSD measurement.
Run Time = Elapsed time (min) at beginning of measurement.
Time = Clock time at beginning of measurement.

Sample	PSD Run File Name	Run Conditions				Run Time	Cumulative Time (min) At Conditions					
		P	S	US	DT	(min)	P3	P6	S1	S3	US	DT
S01T001651	[LOAD-IN]	3	3	0	0	0.0	2			2		
	AZ102884	6	1	0	0	2.2	2	4	4	2		
	AZ102885	6	3	0	0	6.1	2	7	4	6		
	AZ102886	6	3	2	0	9.5	2	13	4	11	2	0
	AZ102887	6	1	0	0	15.0	2	16	7	11	2	4
						17.8						

TABLE F-8 (continued). AZ-102 composite subsamples S01T001652 and S01T001653.

Sample	PSD Run File Name	Run Conditions				Time	Cumulative Time (min) At Conditions					
		P	S	US	DT		P3	P6	S1	S3	US	DT
S01T001652	[LOAD-IN]	6	1	0	0	?		?	?			
	AZ102910	6	1	0	0	15:40		6	6			
	AZ102911	6	3	0	0	15:46		9	6	3		
	AZ102912	6	3	2	0	15:49		15	6	9	2	0
	AZ102913	6	1	0	0	15:55		18	9	9	2	4
						15:58						
S01T001652	[LOAD-IN]	6	1	0	0	?		?	?			
	AZ102914	6	1	0	0	16:07		3	3			
	AZ102915	6	3	0	0	16:10		6	3	3		
	AZ102916	6	3	2	0	16:13		11	3	8	2	0
	AZ102917	6	1	0	0	16:18		14	6	8	2	3
						16:21						
S01T001652	[LOAD-IN]	6	1	0	0	?		?	?			
	AZ102918	6	1	0	0	16:29		4	4			
	AZ102919	6	3	0	0	16:33		7	4	3		
	AZ102920	6	3	2	0	16:36		(13)	4	(9)	2	0
	AZ102921	6	1	0	0	?		15	(6)	(9)	2	(4)
						16:44						
S01T001653	[LOAD-IN]	6	1	0	0	?		?	?			
	AZ102922	6	1	0	0	17:02		4	4			
	AZ102923	6	3	0	0	17:06		7	4	3		
	AZ102924	6	3	2	0	17:09		13	4	9	2	0
	AZ102925	6	1	0	0	17:15		15	6	9	2	4
						17:17						
S01T001653	[LOAD-IN]	6	1	0	0	?		?	?			
	AZ102926	6	1	0	0	17:24		4	4			
	AZ102927	6	3	0	0	17:28		6	4	2		
	AZ102928	6	3	2	0	17:30		11	4	7	2	0
	AZ102929	6	1	0	0	17:35		14	7	7	2	3
						17:38						

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/26/'01 06:31

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010829-884 15:44
Filename : AZ102884
Sample : S01T001651

Material : AZ-102 Solids
Source : S01T001024
Lot Numbe : Aliquot 1

Condition
T%(He-Ne): 85.9% Dist.Form: Std. Sampling times : 100
(LAMP): 84.0% R.R.Index: 1.16-0.00i ( )

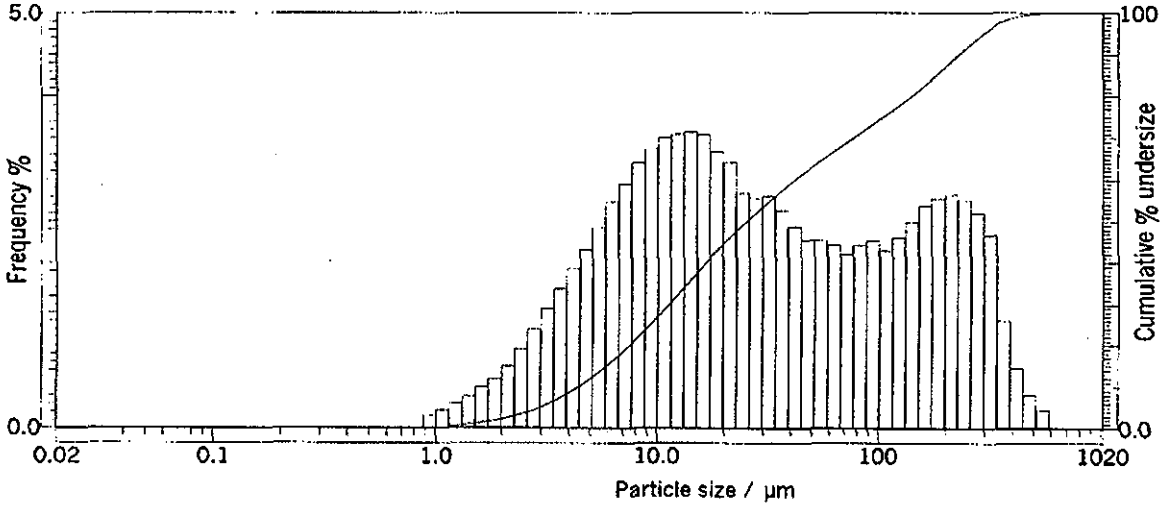
Agitation : 1 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 25.545μm SP.Area : 5241cm²/cm³ S.D. : 100.492μm
Mode : 14.172μm Mean : 75.189μm
C.V. : 133.65%

Span : (D 10.0-D 90.0) / D50 = 8.941

Dia. on %(5.0%) : 2.961μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 9.344μm % on Dia.(1.000μm) : 0.2%
Dia. on %(50.0%) : 25.545μm % on Dia.(10.000μm) : 26.7%
Dia. on %(75.0%) : 105.118μm % on Dia.(100.000μm) : 74.2%
Dia. on %(95.0%) : 300.026μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	2.84	50.46	0.669	0.00	0.00
890.1	0.00	100.00	22.80	3.21	47.62	0.584	0.00	0.00
777.1	0.00	100.00	19.90	3.33	44.41	0.510	0.00	0.00
678.5	0.00	100.00	17.38	3.53	41.09	0.445	0.00	0.00
592.4	0.22	100.00	15.17	3.57	37.55	0.389	0.00	0.00
517.2	0.40	99.78	13.25	3.55	33.98	0.339	0.00	0.00
451.6	0.72	99.38	11.56	3.50	30.43	0.296	0.00	0.00
394.2	1.30	98.66	10.10	3.38	26.93	0.259	0.00	0.00
344.2	2.33	97.36	8.816	3.19	23.55	0.226	0.00	0.00
300.5	2.60	95.03	7.697	2.95	20.36	0.197	0.00	0.00
262.4	2.76	92.43	6.720	2.73	17.41	0.172	0.00	0.00
229.1	2.82	89.67	5.867	2.42	14.68	0.150	0.00	0.00
200.0	2.78	86.84	5.122	2.15	12.26	0.131	0.00	0.00
174.6	2.69	84.07	4.472	1.92	10.11	0.115	0.00	0.00
152.5	2.49	81.38	3.905	1.69	8.18	0.100	0.00	0.00
133.1	2.31	78.89	3.409	1.45	6.50	0.087	0.00	0.00
116.2	2.14	76.58	2.976	1.19	5.05	0.076	0.00	0.00
101.5	2.27	74.44	2.599	0.95	3.85	0.067	0.00	0.00
88.58	2.22	72.18	2.269	0.74	2.91	0.058	0.00	0.00
77.34	2.09	69.96	1.981	0.60	2.16	0.051	0.00	0.00
67.52	2.22	67.87	1.729	0.50	1.56	0.044	0.00	0.00
58.95	2.27	65.65	1.510	0.38	1.07	0.039	0.00	0.00
51.47	2.28	63.38	1.318	0.30	0.69	0.034	0.00	0.00
44.94	2.43	61.10	1.151	0.23	0.38	0.029	0.00	0.00
39.23	2.64	58.67	1.005	0.16	0.16	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/26/01
File Name: AZ102884.DAT Sample Name: S01T001651 ID No: 01/08/29-884
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 85.940 % Lamp: 83.951 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: AZ-102 Solids Source: S01T001024
Lot No: Aliquot 1 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.957	0.10	0.10	(15)	32.648	5.00	55.00
(2)	1.475	0.90	1.00	(16)	42.353	5.00	60.00
(3)	2.034	1.30	2.30	(17)	56.820	5.00	65.00
(4)	2.962	2.70	5.00	(18)	77.545	5.00	70.00
(5)	4.441	5.00	10.00	(19)	105.309	5.00	75.00
(6)	5.966	5.00	15.00	(20)	141.732	5.00	80.00
(7)	6.216	0.80	15.80	(21)	175.832	4.20	84.20
(8)	7.577	4.20	20.00	(22)	183.143	0.80	85.00
(9)	9.365	5.00	25.00	(23)	233.074	5.00	90.00
(10)	11.385	5.00	30.00	(24)	300.057	5.00	95.00
(11)	13.796	5.00	35.00	(25)	357.220	2.70	97.70
(12)	16.700	5.00	40.00	(26)	421.445	1.30	99.00
(13)	20.433	5.00	45.00	(27)	558.534	0.90	99.90
(14)	25.576	5.00	50.00				

Median : 25.545 (μm) Mean: 75.189 (μm) Mode: 14.176 (μm)
Std. Dev.: 100.492 (μm) Span: 7.630
Coef. Var: 133.65% Spec. Area: 5241 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/26/'01 06:32

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010829-885 15:47
Filename : AZ102885
Sample : S01T001651

Material : AZ-102 Solids
Source : S01T001024
Lot Numbe : Aliquot 1

Condition

T%(He-Ne): 84.9% Dist.Form: Std. Sampling times : 100
(LAMP): 82.9% R.R.Index: 1.16-0.00i ( )

Agitation : 3 Circultn : 6 U.sonic : OFF(120)

Format

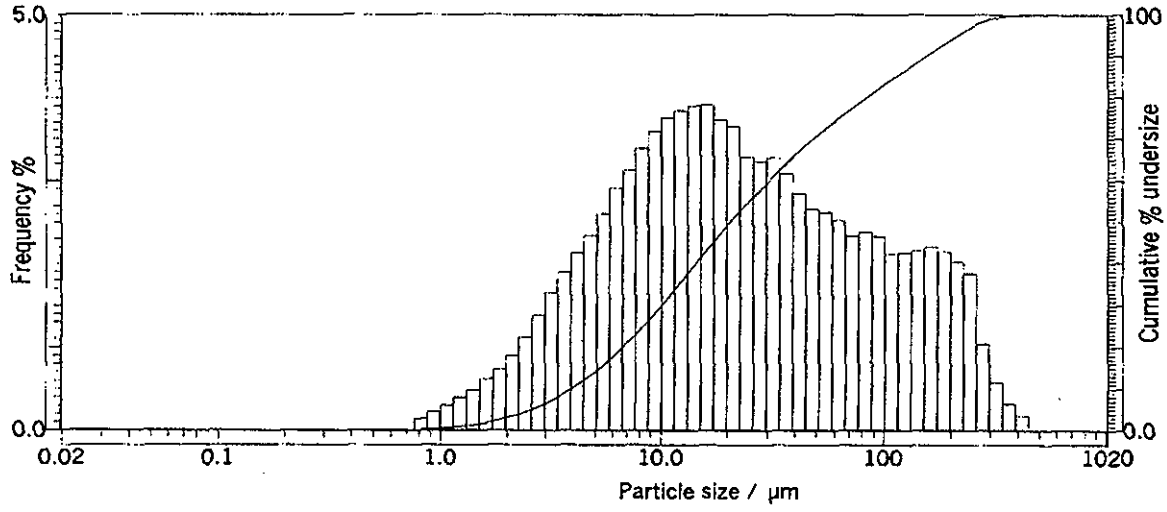
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data

Median : 20.612μm SP.Area : 6059cm²/cm³ S.D. : 69.895μm
Mode : 16.188μm Mean : 51.660μm
C.V. : 135.30%

Span : (D 10.0-D 90.0) / D50 = 7.372

Dia. on %(5.0%) :	2.619μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	8.353μm	% on Dia.(1.000μm) :	0.4%
Dia. on %(50.0%) :	20.612μm	% on Dia.(10.000μm) :	29.7%
Dia. on %(75.0%) :	63.275μm	% on Dia.(100.000μm) :	83.0%
Dia. on %(95.0%) :	214.231μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	3.28	55.98	0.669	0.00	0.00
890.1	0.00	100.00	22.80	3.64	52.70	0.584	0.00	0.00
777.1	0.00	100.00	19.90	3.73	49.06	0.510	0.00	0.00
678.5	0.00	100.00	17.38	3.91	45.33	0.445	0.00	0.00
592.4	0.00	100.00	15.17	3.90	41.42	0.389	0.00	0.00
517.2	0.00	100.00	13.25	3.84	37.52	0.339	0.00	0.00
451.6	0.18	100.00	11.56	3.75	33.69	0.296	0.00	0.00
394.2	0.32	99.82	10.10	3.59	29.94	0.259	0.00	0.00
344.2	0.58	99.50	8.816	3.39	26.34	0.226	0.00	0.00
300.5	1.04	98.92	7.697	3.13	22.96	0.197	0.00	0.00
262.4	1.88	97.87	6.720	2.91	19.83	0.172	0.00	0.00
229.1	2.02	96.00	5.867	2.61	16.92	0.150	0.00	0.00
200.0	2.14	93.98	5.122	2.34	14.31	0.131	0.00	0.00
174.6	2.20	91.84	4.472	2.12	11.97	0.115	0.00	0.00
152.5	2.15	89.64	3.905	1.89	9.86	0.100	0.00	0.00
133.1	2.13	87.49	3.409	1.66	7.96	0.087	0.00	0.00
116.2	2.11	85.36	2.976	1.39	6.31	0.076	0.00	0.00
101.5	2.33	83.25	2.599	1.12	4.92	0.067	0.00	0.00
88.58	2.38	80.92	2.269	0.90	3.80	0.058	0.00	0.00
77.34	2.33	78.54	1.981	0.73	2.90	0.051	0.00	0.00
67.52	2.52	76.21	1.729	0.62	2.17	0.044	0.00	0.00
58.95	2.62	73.69	1.510	0.49	1.55	0.039	0.00	0.00
51.47	2.66	71.07	1.318	0.39	1.06	0.034	0.00	0.00
44.94	2.85	68.40	1.151	0.30	0.67	0.029	0.00	0.00
39.23	3.08	65.56	1.005	0.22	0.36	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/26/01
File Name: AZ102885.DAT Sample Name: S01T001651 ID No: 01/08/29-885
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 84.913 % Lamp: 82.877 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: AZ-102 Solids Source: S01T001024
Lot No: Aliquot 1 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.842	0.10	0.10	(15)	25.119	5.00	55.00
(2)	1.292	0.90	1.00	(16)	30.962	5.00	60.00
(3)	1.774	1.30	2.30	(17)	38.336	5.00	65.00
(4)	2.620	2.70	5.00	(18)	48.855	5.00	70.00
(5)	3.943	5.00	10.00	(19)	63.420	5.00	75.00
(6)	5.319	5.00	15.00	(20)	84.244	5.00	80.00
(7)	5.547	0.80	15.80	(21)	108.124	4.20	84.20
(8)	6.772	4.20	20.00	(22)	113.712	0.80	85.00
(9)	8.371	5.00	25.00	(23)	156.084	5.00	90.00
(10)	10.122	5.00	30.00	(24)	214.724	5.00	95.00
(11)	12.141	5.00	35.00	(25)	259.276	2.70	97.70
(12)	14.469	5.00	40.00	(26)	306.631	1.30	99.00
(13)	17.189	5.00	45.00	(27)	419.540	0.90	99.90
(14)	20.649	5.00	50.00				

Median : 20.612 (μm) Mean: 51.660 (μm) Mode: 16.237 (μm)
Std. Dev.: 69.895 (μm) Span: 7.324
Coef. Var: 135.30% Spec. Area: 6059 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/26/'01 06:32

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010829-886 15:53
Filename : AZ102886
Sample : S01T001651

Material : AZ-102 Solids
Source : S01T001024
Lot Numbe : Aliquot 1

Condition
T%(He-Ne): 80.2% Dist.Form: Std. Sampling times : 100
(LAMP): 75.8% R.R.Index: 1.16-0.00i ( )

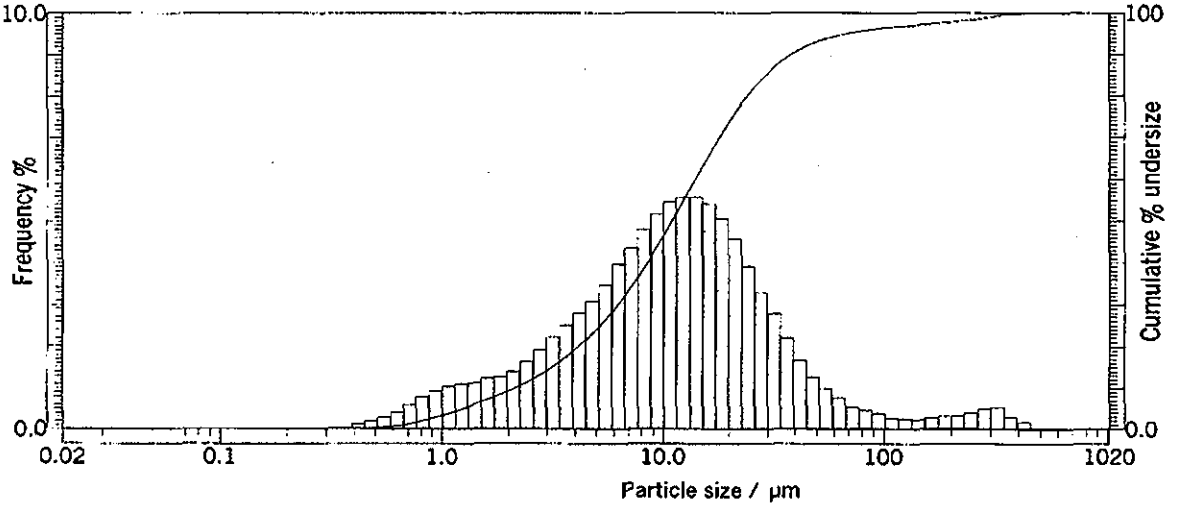
Agitation : 3 Circultn : 6 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 11.022μm SP.Area : 11542cm²/cm³ S.D. : 47.062μm
Mode : 14.148μm Mean : 22.730μm
C.V. : 207.04%

Span : (D 10.0-D 90.0) / D50 = 3.285

Dia. on %(5.0%) : 1.244μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 5.187μm % on Dia.(1.000μm) : 3.3%
Dia. on %(50.0%) : 11.022μm % on Dia.(10.000μm) : 46.1%
Dia. on %(75.0%) : 20.761μm % on Dia.(100.000μm) : 96.4%
Dia. on %(95.0%) : 66.816μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	3.91	82.08	0.669	0.42	1.01
890.1	0.00	100.00	22.80	4.60	78.17	0.584	0.28	0.59
777.1	0.00	100.00	19.90	5.07	73.57	0.510	0.19	0.31
678.5	0.00	100.00	17.38	5.41	68.51	0.445	0.13	0.13
592.4	0.00	100.00	15.17	5.58	63.09	0.389	0.00	0.00
517.2	0.00	100.00	13.25	5.58	57.51	0.339	0.00	0.00
451.6	0.16	100.00	11.56	5.46	51.93	0.296	0.00	0.00
394.2	0.30	99.84	10.10	5.18	46.47	0.259	0.00	0.00
344.2	0.53	99.54	8.816	4.81	41.29	0.226	0.00	0.00
300.5	0.49	99.01	7.697	4.35	36.49	0.197	0.00	0.00
262.4	0.40	98.52	6.720	3.97	32.14	0.172	0.00	0.00
229.1	0.33	98.12	5.867	3.49	28.17	0.150	0.00	0.00
200.0	0.31	97.80	5.122	3.09	24.68	0.131	0.00	0.00
174.6	0.28	97.48	4.472	2.79	21.58	0.115	0.00	0.00
152.5	0.23	97.20	3.905	2.51	18.79	0.100	0.00	0.00
133.1	0.24	96.97	3.409	2.22	16.29	0.087	0.00	0.00
116.2	0.26	96.73	2.976	1.91	14.07	0.076	0.00	0.00
101.5	0.39	96.47	2.599	1.64	12.15	0.067	0.00	0.00
88.58	0.47	96.08	2.269	1.41	10.51	0.058	0.00	0.00
77.34	0.55	95.61	1.981	1.27	9.10	0.051	0.00	0.00
67.52	0.76	95.06	1.729	1.23	7.83	0.044	0.00	0.00
58.95	0.99	94.30	1.510	1.13	6.60	0.039	0.00	0.00
51.47	1.26	93.30	1.318	1.10	5.47	0.034	0.00	0.00
44.94	1.68	92.04	1.151	1.04	4.37	0.029	0.00	0.00
39.23	2.20	90.36	1.005	0.94	3.33	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/26/01
File Name: AZ102886.DAT Sample Name: S01T001651 ID No: 01/08/29-886
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 80.181 % Lamp: 75.757 %
Circulation: 6 Agitation: 3 U.Sonic ** (min)
Material: AZ-102 Solids Source: S01T001024
Lot No: Aliquot 1 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.433	0.10	0.10	(15)	12.489	5.00	55.00
(2)	0.667	0.90	1.00	(16)	14.105	5.00	60.00
(3)	0.864	1.30	2.30	(17)	15.949	5.00	65.00
(4)	1.247	2.70	5.00	(18)	18.122	5.00	70.00
(5)	2.165	5.00	10.00	(19)	20.802	5.00	75.00
(6)	3.158	5.00	15.00	(20)	24.350	5.00	80.00
(7)	3.314	0.80	15.80	(21)	28.554	4.20	84.20
(8)	4.150	4.20	20.00	(22)	29.474	0.80	85.00
(9)	5.191	5.00	25.00	(23)	38.417	5.00	90.00
(10)	6.261	5.00	30.00	(24)	66.858	5.00	95.00
(11)	7.362	5.00	35.00	(25)	192.162	2.70	97.70
(12)	8.514	5.00	40.00	(26)	299.797	1.30	99.00
(13)	9.733	5.00	45.00	(27)	416.621	0.90	99.90
(14)	11.045	5.00	50.00				

Median : 11.022 (μm) Mean: 22.730 (μm) Mode: 14.176 (μm)
Std. Dev.: 47.062 (μm) Span: 4.178
Coef. Var: 207.04% **Spec. Area: 11542 (cm2/cm3)**

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/26/'01 06:32

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010829-887 15:56
Filename : AZ102887
Sample : S01T001651

Material : AZ-102 Solids
Source : S01T001024
Lot Numbe : Aliquot 1

Condition
T%(He-Ne): 80.1% Dist.Form: Std. Sampling times : 100
(LAMP): 75.9% R.R.index: 1.16-0.00i ( )

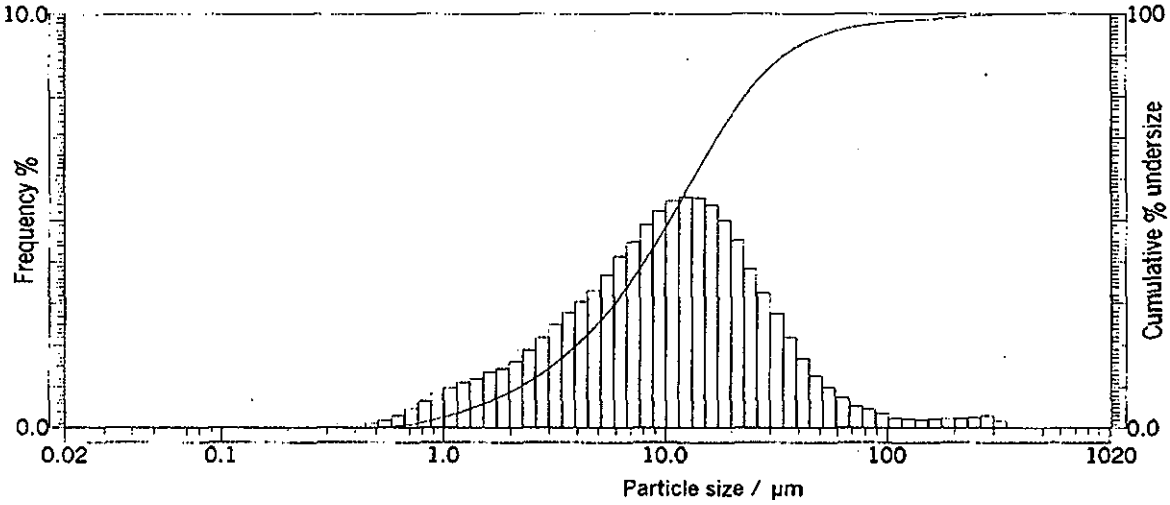
Agitation : 1 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 10.516μm SP.Area : 11262cm²/cm³ S.D. : 31.285μm
Mode : 12.387μm Mean : 18.292μm
C.V. : 171.03%

Span : (D 10.0-D 90.0) / D50 = 3.104

Dia. on %(5.0%) : 1.373μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 4.932μm % on Dia.(1.000μm) : 2.5%
Dia. on %(50.0%) : 10.516μm % on Dia.(10.000μm) : 48.0%
Dia. on %(75.0%) : 19.733μm % on Dia.(100.000μm) : 97.9%
Dia. on %(95.0%) : 52.630μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	3.85	83.70	0.669	0.30	0.61
890.1	0.00	100.00	22.80	4.53	79.85	0.584	0.19	0.31
777.1	0.00	100.00	19.90	5.00	75.32	0.510	0.12	0.12
678.5	0.00	100.00	17.38	5.37	70.32	0.445	0.00	0.00
592.4	0.00	100.00	15.17	5.55	64.95	0.389	0.00	0.00
517.2	0.00	100.00	13.25	5.57	59.40	0.339	0.00	0.00
451.6	0.00	100.00	11.56	5.48	53.84	0.296	0.00	0.00
394.2	0.00	100.00	10.10	5.23	48.36	0.259	0.00	0.00
344.2	0.16	100.00	8.816	4.90	43.12	0.226	0.00	0.00
300.5	0.29	99.84	7.697	4.48	38.23	0.197	0.00	0.00
262.4	0.26	99.54	6.720	4.14	33.75	0.172	0.00	0.00
229.1	0.23	99.28	5.867	3.68	29.61	0.150	0.00	0.00
200.0	0.23	99.06	5.122	3.32	25.93	0.131	0.00	0.00
174.6	0.22	98.82	4.472	3.04	22.61	0.115	0.00	0.00
152.5	0.19	98.60	3.905	2.77	19.57	0.100	0.00	0.00
133.1	0.21	98.41	3.409	2.50	16.79	0.087	0.00	0.00
116.2	0.24	98.20	2.976	2.18	14.29	0.076	0.00	0.00
101.5	0.37	97.95	2.599	1.88	12.11	0.067	0.00	0.00
88.58	0.46	97.59	2.269	1.61	10.23	0.058	0.00	0.00
77.34	0.54	97.13	1.981	1.43	8.62	0.051	0.00	0.00
67.52	0.76	96.59	1.729	1.35	7.19	0.044	0.00	0.00
58.95	0.99	95.83	1.510	1.19	5.84	0.039	0.00	0.00
51.47	1.26	94.84	1.318	1.11	4.64	0.034	0.00	0.00
44.94	1.67	93.57	1.151	0.98	3.54	0.029	0.00	0.00
39.23	2.19	91.90	1.005	0.83	2.56	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/26/01
File Name: AZ102887.DAT Sample Name: S01T001651 ID No: 01/08/29-887
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 80.074 % Lamp: 75.865 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: AZ-102 Solids Source: S01T001024
Lot No: Aliquot 1 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.498	0.10	0.10	(15)	11.916	5.00	55.00
(2)	0.750	0.90	1.00	(16)	13.453	5.00	60.00
(3)	0.965	1.30	2.30	(17)	15.192	5.00	65.00
(4)	1.376	2.70	5.00	(18)	17.247	5.00	70.00
(5)	2.228	5.00	10.00	(19)	19.744	5.00	75.00
(6)	3.099	5.00	15.00	(20)	22.926	5.00	80.00
(7)	3.237	0.80	15.80	(21)	26.699	4.20	84.20
(8)	3.985	4.20	20.00	(22)	27.631	0.80	85.00
(9)	4.941	5.00	25.00	(23)	34.908	5.00	90.00
(10)	5.947	5.00	30.00	(24)	52.699	5.00	95.00
(11)	6.993	5.00	35.00	(25)	92.550	2.70	97.70
(12)	8.102	5.00	40.00	(26)	193.885	1.30	99.00
(13)	9.275	5.00	45.00	(27)	317.498	0.90	99.90
(14)	10.537	5.00	50.00				

Median : 10.516 (μm) Mean: 18.292 (μm) Mode: 12.377 (μm)
Std. Dev.: 31.285 (μm) Span: 3.128
Coef. Var: 171.03% Spec. Area: 11262 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/27/'01 10:36

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926-977 15:42
Filename : AZ102910
Sample : az102

Material :
Source :
Lot Numbe : 1652

Condition
T%(He-Ne): 85.7%
(LAMP): 84.6%
Dist.Form: Std.
R.R.Index: 1.16-0.00i
Sampling times : 100
( )

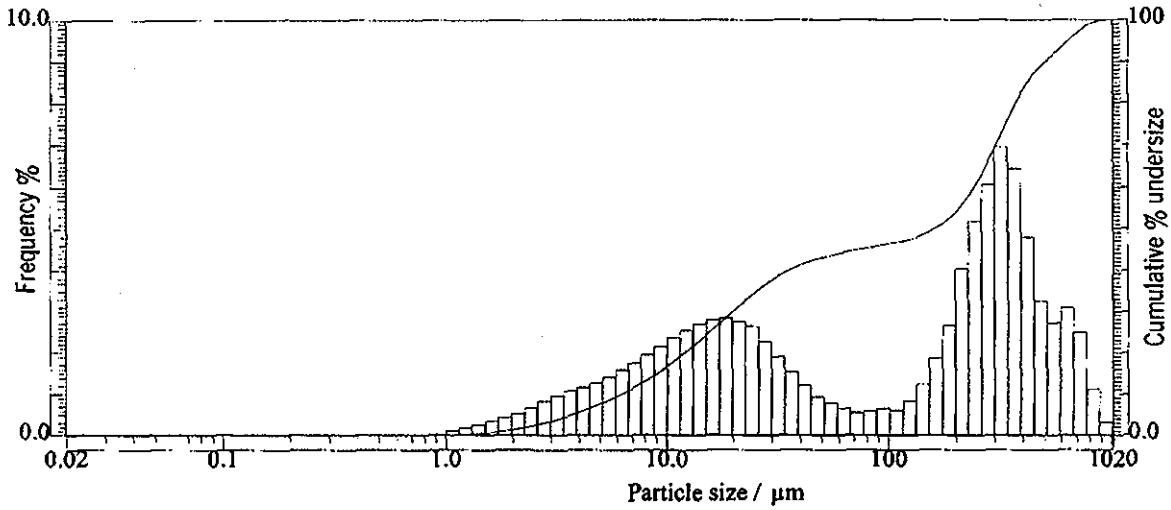
Agitation : 1 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 162.698μm SP.Area : 3424cm²/cm³ S.D. : 214.415μm
Mode : 322.797μm Mean : 205.747μm
C.V. : 104.21%

Span : (D 10.0-D 90.0) / D50 = 3.102

Dia. on %(5.0%) :	3.707μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	15.714μm	% on Dia.(1.000μm) :	0.0%
Dia. on %(50.0%) :	162.698μm	% on Dia.(10.000μm) :	16.5%
Dia. on %(75.0%) :	338.608μm	% on Dia.(100.000μm) :	46.3%
Dia. on %(95.0%) :	646.784μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.31	100.00	26.11	2.64	35.30	0.669	0.00	0.00
890.1	1.12	99.69	22.80	2.75	32.66	0.584	0.00	0.00
777.1	2.48	98.57	19.90	2.83	29.91	0.510	0.00	0.00
678.5	3.09	96.09	17.38	2.80	27.07	0.445	0.00	0.00
592.4	2.71	93.00	15.17	2.70	24.28	0.389	0.00	0.00
517.2	3.24	90.29	13.25	2.54	21.58	0.339	0.00	0.00
451.6	4.78	87.05	11.56	2.36	19.04	0.296	0.00	0.00
394.2	6.43	82.27	10.10	2.15	16.68	0.259	0.00	0.00
344.2	6.95	75.84	8.816	1.94	14.53	0.226	0.00	0.00
300.5	6.05	68.89	7.697	1.74	12.59	0.197	0.00	0.00
262.4	5.18	62.84	6.720	1.59	10.85	0.172	0.00	0.00
229.1	4.03	57.66	5.867	1.41	9.26	0.150	0.00	0.00
200.0	2.66	53.63	5.122	1.27	7.85	0.131	0.00	0.00
174.6	1.87	50.97	4.472	1.17	6.58	0.115	0.00	0.00
152.5	1.24	49.10	3.905	1.07	5.41	0.100	0.00	0.00
133.1	0.84	47.86	3.409	0.96	4.34	0.087	0.00	0.00
116.2	0.61	47.02	2.976	0.82	3.38	0.076	0.00	0.00
101.5	0.65	46.41	2.599	0.67	2.55	0.067	0.00	0.00
88.58	0.60	45.76	2.269	0.54	1.88	0.058	0.00	0.00
77.34	0.54	45.16	1.981	0.43	1.34	0.051	0.00	0.00
67.52	0.67	44.61	1.729	0.35	0.91	0.044	0.00	0.00
58.95	0.79	43.94	1.510	0.26	0.55	0.039	0.00	0.00
51.47	0.93	43.15	1.318	0.18	0.29	0.034	0.00	0.00
44.94	1.21	42.22	1.151	0.11	0.11	0.029	0.00	0.00
39.23	1.55	41.01	1.005	0.00	0.00	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/27/01
File Name: AZ102910.DAT Sample Name: az102 ID No: 01/09/26-977
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 85.744 % Lamp: 84.559 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Lot No: 1652 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	1.135	0.10	0.10	(15)	209.865	5.00	55.00
(2)	1.783	0.90	1.00	(16)	244.123	5.00	60.00
(3)	2.475	1.30	2.30	(17)	275.998	5.00	65.00
(4)	3.715	2.70	5.00	(18)	307.487	5.00	70.00
(5)	6.264	5.00	10.00	(19)	338.928	5.00	75.00
(6)	9.095	5.00	15.00	(20)	376.598	5.00	80.00
(7)	9.572	0.80	15.80	(21)	417.401	4.20	84.20
(8)	12.201	4.20	20.00	(22)	426.984	0.80	85.00
(9)	15.742	5.00	25.00	(23)	511.257	5.00	90.00
(10)	20.001	5.00	30.00	(24)	648.127	5.00	95.00
(11)	25.729	5.00	35.00	(25)	742.541	2.70	97.70
(12)	35.981	5.00	40.00	(26)	820.569	1.30	99.00
(13)	74.494	5.00	45.00	(27)	978.122	0.90	99.90
(14)	163.073	5.00	50.00				

Median : 162.698 (μm) Mean: 205.747 (μm) Mode: 321.621 (μm)
Std. Dev.: 214.415 (μm) Span: 1.894
Coef. Var: 104.21% Spec. Area: 3425 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/27/'01 10:37

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926-978 15:48
Filename : AZ102911
Sample : az102

Material :
Source :
Lot Numbe : 1652

Condition
T%(He-Ne): 81.1% Dist.Form: Std. Sampling times : 100
(LAMP): 80.5% R.R.index: 1.16-0.00i ( )

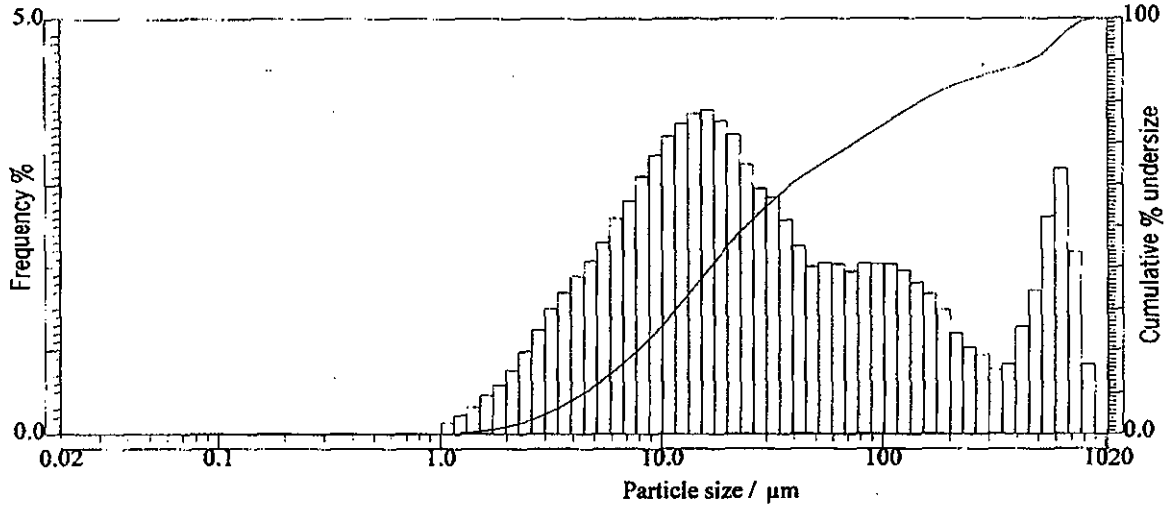
Agitation : 3 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 24.301μm SP.Area : 5026cm²/cm³ S.D. : 194.163μm
Mode : 16.208μm Mean : 114.934μm
C.V. : 168.93%

Span : (D 10.0-D 90.0) / D50 = 19.194

Dia. on %(5.0%) : 3.055μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 9.694μm % on Dia.(1.000μm) : 0.0%
Dia. on %(50.0%) : 24.301μm % on Dia.(10.000μm) : 25.8%
Dia. on %(75.0%) : 105.272μm % on Dia.(100.000μm) : 74.2%
Dia. on %(95.0%) : 623.405μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	3.24	51.72	0.669	0.00	0.00
890.1	0.83	100.00	22.80	3.61	48.47	0.584	0.00	0.00
777.1	2.17	99.17	19.90	3.76	44.87	0.510	0.00	0.00
678.5	3.20	96.99	17.38	3.91	41.10	0.445	0.00	0.00
592.4	2.62	93.80	15.17	3.87	37.19	0.389	0.00	0.00
517.2	1.71	91.18	13.25	3.74	33.33	0.339	0.00	0.00
451.6	1.28	89.47	11.56	3.58	29.59	0.296	0.00	0.00
394.2	0.83	88.19	10.10	3.35	26.01	0.259	0.00	0.00
344.2	0.77	87.35	8.816	3.10	22.65	0.226	0.00	0.00
300.5	0.94	86.58	7.697	2.81	19.56	0.197	0.00	0.00
262.4	1.03	85.64	6.720	2.60	16.75	0.172	0.00	0.00
229.1	1.20	84.60	5.867	2.30	14.16	0.150	0.00	0.00
200.0	1.49	83.40	5.122	2.07	11.85	0.131	0.00	0.00
174.6	1.67	81.91	4.472	1.88	9.79	0.115	0.00	0.00
152.5	1.81	80.23	3.905	1.70	7.90	0.100	0.00	0.00
133.1	1.95	78.43	3.409	1.49	6.21	0.087	0.00	0.00
116.2	2.02	76.47	2.976	1.24	4.71	0.076	0.00	0.00
101.5	2.03	74.45	2.599	0.98	3.47	0.067	0.00	0.00
88.58	2.04	72.42	2.269	0.76	2.49	0.058	0.00	0.00
77.34	1.94	70.38	1.981	0.59	1.73	0.051	0.00	0.00
67.52	2.03	68.43	1.729	0.46	1.14	0.044	0.00	0.00
58.95	2.05	66.41	1.510	0.33	0.68	0.039	0.00	0.00
51.47	2.00	64.36	1.318	0.22	0.35	0.034	0.00	0.00
44.94	2.25	62.35	1.151	0.13	0.13	0.029	0.00	0.00
39.23	2.57	60.10	1.005	0.00	0.00	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/27/01
File Name: AZ102911.DAT Sample Name: az102 ID No: 01/09/26-978
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 81.075 % Lamp: 80.450 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Lot No: 1652 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	1.115	0.10	0.10	(15)	30.403	5.00	55.00
(2)	1.661	0.90	1.00	(16)	39.043	5.00	60.00
(3)	2.196	1.30	2.30	(17)	53.818	5.00	65.00
(4)	3.060	2.70	5.00	(18)	75.442	5.00	70.00
(5)	4.539	5.00	10.00	(19)	105.467	5.00	75.00
(6)	6.144	5.00	15.00	(20)	149.939	5.00	80.00
(7)	6.407	0.80	15.80	(21)	219.311	4.20	84.20
(8)	7.857	4.20	20.00	(22)	241.831	0.80	85.00
(9)	9.712	5.00	25.00	(23)	471.914	5.00	90.00
(10)	11.750	5.00	30.00	(24)	624.767	5.00	95.00
(11)	14.079	5.00	35.00	(25)	710.537	2.70	97.70
(12)	16.755	5.00	40.00	(26)	769.527	1.30	99.00
(13)	20.011	5.00	45.00	(27)	876.543	0.90	99.90
(14)	24.357	5.00	50.00				

Median : 24.301 (μm) Mean: 114.934 (μm) Mode: 16.237 (μm)
Std. Dev.: 194.163 (μm) Span: 21.321
Coef. Var: 168.93% Spec. Area: 5026 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/27/'01 10:37

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926-979 15:54
Filename : AZ102912
Sample : az102

Material :
Source :
Lot Numbe : 1652

Condition
T%(He-Ne): 70.5% Dist.Form: Std. Sampling times : 100
(LAMP): 66.3% R.R.Index: 1.16-0.00i ( )

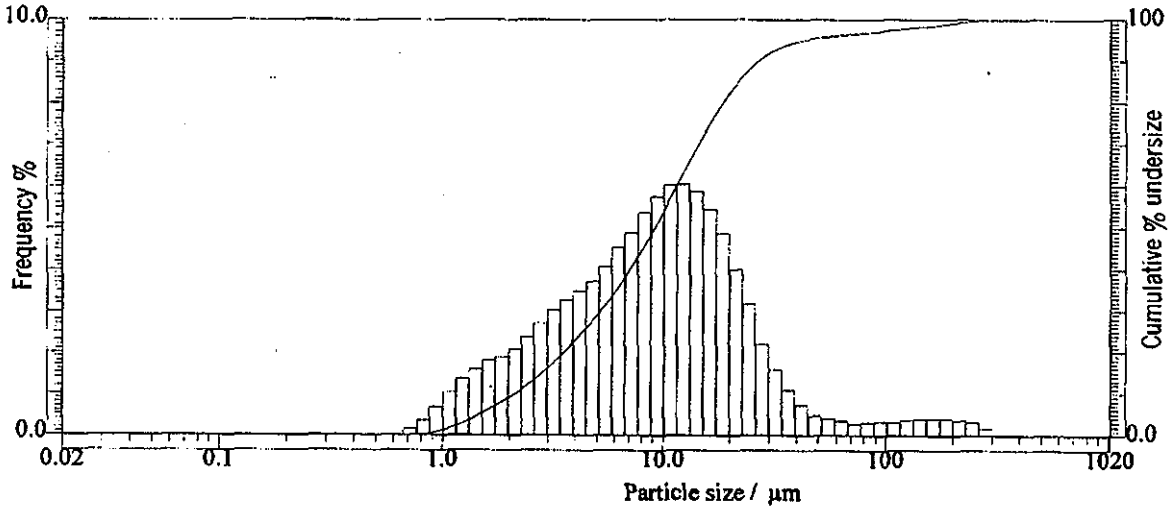
Agitation : 3 Circultn : 6 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 9.164μm SP.Area : 11444cm²/cm³ S.D. : 30.452μm
Mode : 12.357μm Mean : 16.404μm
C.V. : 185.64%

Span : (D 10.0-D 90.0) / D50 = 2.695

Dia. on %(5.0%) :	1.491μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	4.338μm	% on Dia.(1.000μm) :	1.2%
Dia. on %(50.0%) :	9.164μm	% on Dia.(10.000μm) :	53.7%
Dia. on %(75.0%) :	16.325μm	% on Dia.(100.000μm) :	97.2%
Dia. on %(95.0%) :	43.708μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	3.16	89.56	0.669	0.00	0.00
890.1	0.00	100.00	22.80	4.01	86.40	0.584	0.00	0.00
777.1	0.00	100.00	19.90	4.88	82.39	0.510	0.00	0.00
678.5	0.00	100.00	17.38	5.45	77.51	0.445	0.00	0.00
592.4	0.00	100.00	15.17	5.88	72.06	0.389	0.00	0.00
517.2	0.00	100.00	13.25	6.04	66.18	0.339	0.00	0.00
451.6	0.00	100.00	11.56	6.02	60.13	0.296	0.00	0.00
394.2	0.00	100.00	10.10	5.76	54.11	0.259	0.00	0.00
344.2	0.00	100.00	8.816	5.37	48.36	0.226	0.00	0.00
300.5	0.18	100.00	7.697	4.89	42.99	0.197	0.00	0.00
262.4	0.33	99.82	6.720	4.55	38.10	0.172	0.00	0.00
229.1	0.36	99.49	5.867	4.06	33.55	0.150	0.00	0.00
200.0	0.40	99.14	5.122	3.71	29.49	0.131	0.00	0.00
174.6	0.40	98.74	4.472	3.49	25.78	0.115	0.00	0.00
152.5	0.39	98.34	3.905	3.27	22.29	0.100	0.00	0.00
133.1	0.36	97.94	3.409	3.02	19.02	0.087	0.00	0.00
116.2	0.31	97.58	2.976	2.71	16.00	0.076	0.00	0.00
101.5	0.33	97.27	2.599	2.38	13.29	0.067	0.00	0.00
88.58	0.31	96.94	2.269	2.07	10.91	0.058	0.00	0.00
77.34	0.27	96.63	1.981	1.89	8.84	0.051	0.00	0.00
67.52	0.34	96.35	1.729	1.80	6.95	0.044	0.00	0.00
58.95	0.40	96.01	1.510	1.58	5.15	0.039	0.00	0.00
51.47	0.46	95.61	1.318	1.35	3.57	0.034	0.00	0.00
44.94	0.71	95.15	1.151	1.04	2.22	0.029	0.00	0.00
39.23	1.09	94.43	1.005	0.68	1.18	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/27/01
File Name: AZ102912.DAT Sample Name: az102 ID No: 01/09/26-979
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 70.535 % Lamp: 66.304 %
Circulation: 6 Agitation: 3 U.Sonic ** (min)
Lot No: 1652 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.735	0.10	0.10	(15)	10.314	5.00	55.00
(2)	0.970	0.90	1.00	(16)	11.532	5.00	60.00
(3)	1.161	1.30	2.30	(17)	12.918	5.00	65.00
(4)	1.492	2.70	5.00	(18)	14.497	5.00	70.00
(5)	2.142	5.00	10.00	(19)	16.362	5.00	75.00
(6)	2.837	5.00	15.00	(20)	18.668	5.00	80.00
(7)	2.949	0.80	15.80	(21)	21.213	4.20	84.20
(8)	3.557	4.20	20.00	(22)	21.790	0.80	85.00
(9)	4.345	5.00	25.00	(23)	26.872	5.00	90.00
(10)	5.216	5.00	30.00	(24)	43.772	5.00	95.00
(11)	6.139	5.00	35.00	(25)	121.660	2.70	97.70
(12)	7.100	5.00	40.00	(26)	191.303	1.30	99.00
(13)	8.116	5.00	45.00	(27)	279.457	0.90	99.90
(14)	9.182	5.00	50.00				

Median : 9.164 (μm) Mean: 16.404 (μm) Mode: 12.377 (μm)
Std. Dev.: 30.452 (μm) Span: 2.988
Coef. Var: 185.64% Spec. Area: 11445 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/27/'01 10:37

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926-980 15:58
Filename : AZ102913
Sample : az102

Material :
Source :
Lot Numbe : 1652

Condition
T%(He-Ne): 70.3% Dist.Form: Std. Sampling times : 100
(LAMP): 66.5% R.R.Index: 1.16-0.001 ( )

Agitation : 1 Circultn : 6 U.sonic : ~~ON~~ OFF (120)

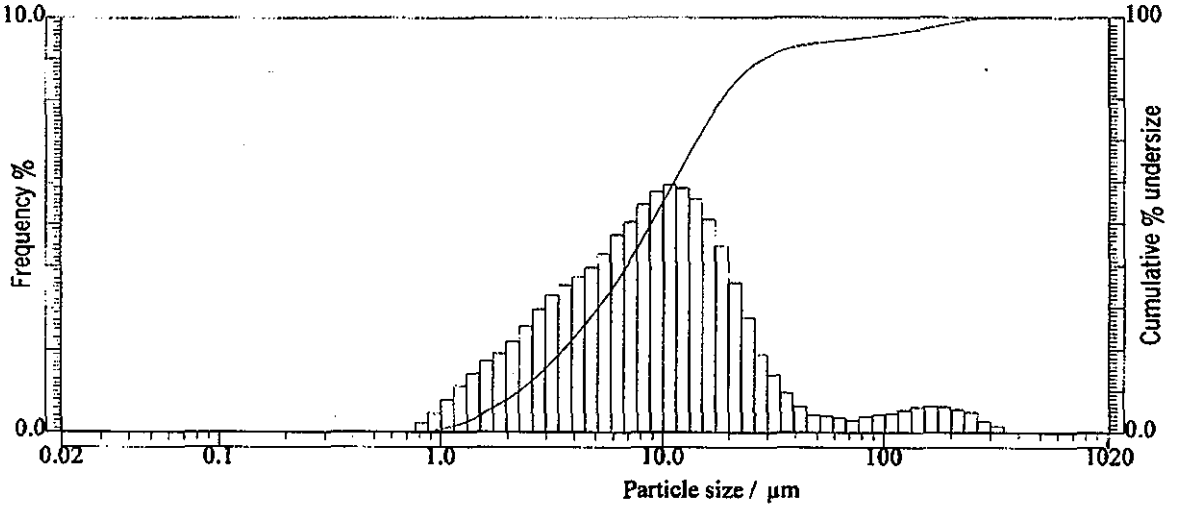
WSC. 10/3/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 8.942μm SP.Area : 11010cm²/cm³ S.D. : 38.336μm
Mode : 10.818μm Mean : 19.049μm
C.V. : 201.25%

Span : (D 10.0-D 90.0) / D50 = 2.990

Dia. on %(5.0%) :	1.635μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	4.326μm	% on Dia.(1.000μm) :	0.7%
Dia. on %(50.0%) :	8.942μm	% on Dia.(10.000μm) :	54.7%
Dia. on %(75.0%) :	16.185μm	% on Dia.(100.000μm) :	95.6%
Dia. on %(95.0%) :	80.818μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	2.77	88.52	0.669	0.00	0.00
890.1	0.00	100.00	22.80	3.60	85.75	0.584	0.00	0.00
777.1	0.00	100.00	19.90	4.47	82.14	0.510	0.00	0.00
678.5	0.00	100.00	17.38	5.10	77.67	0.445	0.00	0.00
592.4	0.00	100.00	15.17	5.61	72.57	0.389	0.00	0.00
517.2	0.00	100.00	13.25	5.86	66.96	0.339	0.00	0.00
451.6	0.00	100.00	11.56	5.94	61.10	0.296	0.00	0.00
394.2	0.00	100.00	10.10	5.77	55.16	0.259	0.00	0.00
344.2	0.15	100.00	8.816	5.46	49.39	0.226	0.00	0.00
300.5	0.27	99.85	7.697	5.04	43.94	0.197	0.00	0.00
262.4	0.48	99.58	6.720	4.74	38.90	0.172	0.00	0.00
229.1	0.55	99.10	5.867	4.28	34.16	0.150	0.00	0.00
200.0	0.62	98.55	5.122	3.96	29.87	0.131	0.00	0.00
174.6	0.63	97.93	4.472	3.75	25.92	0.115	0.00	0.00
152.5	0.62	97.29	3.905	3.54	22.17	0.100	0.00	0.00
133.1	0.55	96.67	3.409	3.30	18.62	0.087	0.00	0.00
116.2	0.45	96.13	2.976	2.95	15.32	0.076	0.00	0.00
101.5	0.42	95.68	2.599	2.56	12.37	0.067	0.00	0.00
88.58	0.38	95.25	2.269	2.19	9.81	0.058	0.00	0.00
77.34	0.30	94.88	1.981	1.92	7.63	0.051	0.00	0.00
67.52	0.35	94.57	1.729	1.73	5.71	0.044	0.00	0.00
58.95	0.39	94.22	1.510	1.41	3.98	0.039	0.00	0.00
51.47	0.42	93.83	1.318	1.11	2.57	0.034	0.00	0.00
44.94	0.64	93.41	1.151	0.78	1.46	0.029	0.00	0.00
39.23	0.96	92.77	1.005	0.46	0.68	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/27/01
File Name: AZ102913.DAT Sample Name: az102 ID No: 01/09/26-980
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 70.310 % Lamp: 66.480 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Lot No: 1652 Test No:

WSC
10/3/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.817	0.10	0.10	(15)	10.062	5.00	55.00
(2)	1.065	0.90	1.00	(16)	11.294	5.00	60.00
(3)	1.277	1.30	2.30	(17)	12.684	5.00	65.00
(4)	1.639	2.70	5.00	(18)	14.289	5.00	70.00
(5)	2.293	5.00	10.00	(19)	16.222	5.00	75.00
(6)	2.935	5.00	15.00	(20)	18.692	5.00	80.00
(7)	3.039	0.80	15.80	(21)	21.554	4.20	84.20
(8)	3.601	4.20	20.00	(22)	22.197	0.80	85.00
(9)	4.333	5.00	25.00	(23)	29.073	5.00	90.00
(10)	5.144	5.00	30.00	(24)	80.984	5.00	95.00
(11)	6.018	5.00	35.00	(25)	166.649	2.70	97.70
(12)	6.933	5.00	40.00	(26)	223.762	1.30	99.00
(13)	7.915	5.00	45.00	(27)	314.840	0.90	99.90
(14)	8.950	5.00	50.00				

Median : 8.942 (μm) Mean: 19.049 (μm) Mode: 10.806 (μm)
Std. Dev.: 38.336 (μm) Span: 7.228
Coef. Var: 201.25% Spec. Area: 11010 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/27/'01 10:37

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926-981 16:09
Filename : AZ102914
Sample : az102

Material :
Source :
Lot Numbe : 1652

Condition
T%(He-Ne): 85.4% Dist.Form: Std. Sampling times : 100
(LAMP): 84.9% R.R.Index: 1.16-0.00i ( )

Agitation : 1 Circultn : 6 U.sonic : ~~ON~~ OFF (120)

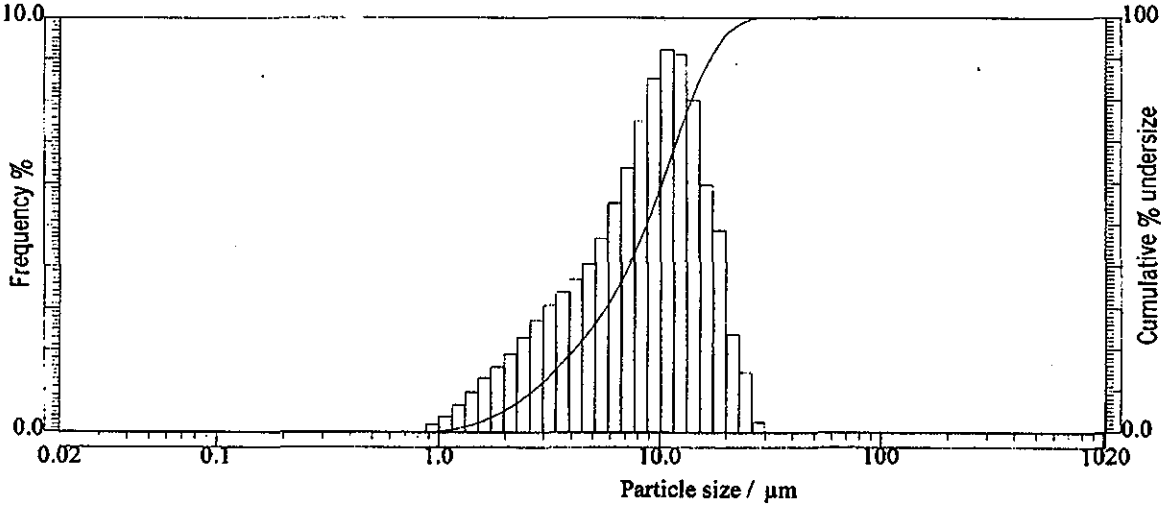
WJC 10/3/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 8.776μm SP.Area : 10363cm²/cm³ S.D. : 5.428μm
Mode : 10.851μm Mean : 9.359μm
C.V. : 57.99%

Span : (D 10.0-D 90.0) / D50 = 1.625

Dia. on %(5.0%) :	1.967μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	4.924μm	% on Dia.(1.000μm) :	0.2%
Dia. on %(50.0%) :	8.776μm	% on Dia.(10.000μm) :	58.2%
Dia. on %(75.0%) :	12.836μm	% on Dia.(100.000μm) :	100.0%
Dia. on %(95.0%) :	19.383μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.44	99.75	0.669	0.00	0.00
890.1	0.00	100.00	22.80	2.36	98.31	0.584	0.00	0.00
777.1	0.00	100.00	19.90	4.87	95.95	0.510	0.00	0.00
678.5	0.00	100.00	17.38	5.96	91.08	0.445	0.00	0.00
592.4	0.00	100.00	15.17	8.01	85.12	0.389	0.00	0.00
517.2	0.00	100.00	13.25	9.10	77.11	0.339	0.00	0.00
451.6	0.00	100.00	11.56	9.22	68.01	0.296	0.00	0.00
394.2	0.00	100.00	10.10	8.54	58.79	0.259	0.00	0.00
344.2	0.00	100.00	8.816	7.50	50.25	0.226	0.00	0.00
300.5	0.00	100.00	7.697	6.37	42.75	0.197	0.00	0.00
262.4	0.00	100.00	6.720	5.53	36.38	0.172	0.00	0.00
229.1	0.00	100.00	5.867	4.67	30.85	0.150	0.00	0.00
200.0	0.00	100.00	5.122	4.07	26.18	0.131	0.00	0.00
174.6	0.00	100.00	4.472	3.68	22.11	0.115	0.00	0.00
152.5	0.00	100.00	3.905	3.37	18.43	0.100	0.00	0.00
133.1	0.00	100.00	3.409	3.07	15.05	0.087	0.00	0.00
116.2	0.00	100.00	2.976	2.71	11.98	0.076	0.00	0.00
101.5	0.00	100.00	2.599	2.29	9.27	0.067	0.00	0.00
88.58	0.00	100.00	2.269	1.90	6.98	0.058	0.00	0.00
77.34	0.00	100.00	1.981	1.58	5.08	0.051	0.00	0.00
67.52	0.00	100.00	1.729	1.30	3.50	0.044	0.00	0.00
58.95	0.00	100.00	1.510	0.96	2.20	0.039	0.00	0.00
51.47	0.00	100.00	1.318	0.66	1.24	0.034	0.00	0.00
44.94	0.00	100.00	1.151	0.39	0.58	0.029	0.00	0.00
39.23	0.00	100.00	1.005	0.19	0.19	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/27/01
File Name: AZ102914.DAT Sample Name: az102 ID No: 01/09/26-981
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 85.355 % Lamp: 84.907 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Lot No: 1652 Test No: dup

WSC 10/3/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.944	0.10	0.10	(15)	9.529	5.00	55.00
(2)	1.257	0.90	1.00	(16)	10.290	5.00	60.00
(3)	1.526	1.30	2.30	(17)	11.086	5.00	65.00
(4)	1.968	2.70	5.00	(18)	11.933	5.00	70.00
(5)	2.700	5.00	10.00	(19)	12.857	5.00	75.00
(6)	3.401	5.00	15.00	(20)	13.941	5.00	80.00
(7)	3.518	0.80	15.80	(21)	14.950	4.20	84.20
(8)	4.147	4.20	20.00	(22)	15.143	0.80	85.00
(9)	4.933	5.00	25.00	(23)	16.977	5.00	90.00
(10)	5.732	5.00	30.00	(24)	19.411	5.00	95.00
(11)	6.507	5.00	35.00	(25)	22.049	2.70	97.70
(12)	7.275	5.00	40.00	(26)	24.388	1.30	99.00
(13)	8.032	5.00	45.00	(27)	28.403	0.90	99.90
(14)	8.778	5.00	50.00				

Median : 8.776 (μm) Mean: 9.359 (μm) Mode: 10.806 (μm)
Std. Dev.: 5.428 (μm) Span: 0.746
Coef. Var: 57.99% Spec. Area: 10363 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/27/'01 10:38

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926-982 16:12
Filename : AZ102915
Sample : az102

Material :
Source :
Lot Numbe : 1652

Condition

T%(He-Ne): 84.6% Dist.Form: Std. Sampling times : 100
(LAMP): 84.4% R.R.Index: 1.16-0.001 ( )

Agitation : 3 Circultn : 6 U.sonic : ~~ON~~ OFF (120)

WSC 10/3/01

Format

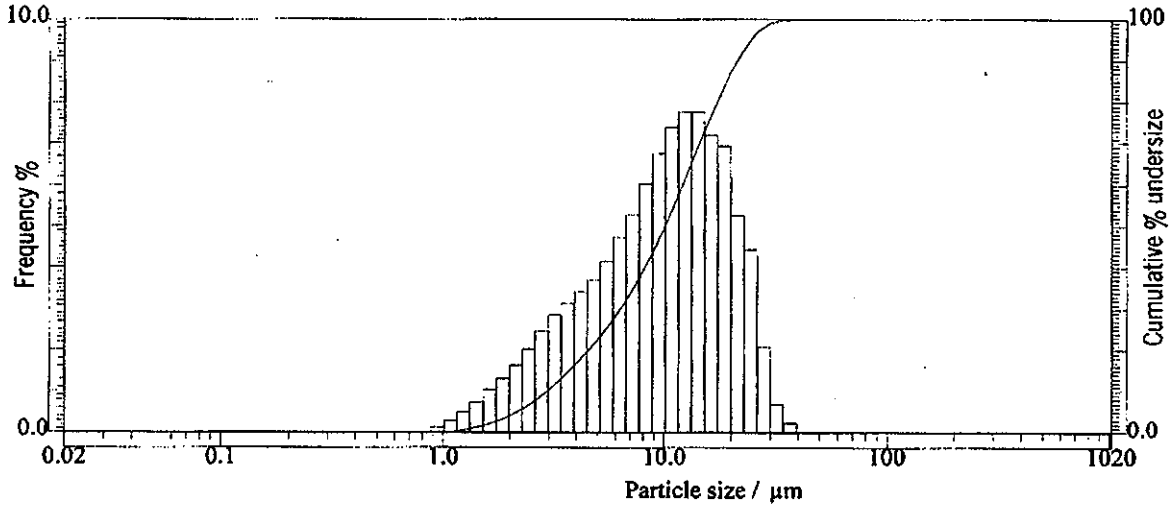
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data

Median : 10.057μm SP.Area : 9269cm²/cm³ S.D. : 7.019μm
Mode : 14.106μm Mean : 11.196μm
C.V. : 62.69%

Span : (D 10.0-D 90.0) / D50 = 1.829

Dia. on %(5.0%) :	2.147μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	5.423μm	% on Dia.(1.000μm) :	0.1%
Dia. on %(50.0%) :	10.057μm	% on Dia.(10.000μm) :	49.7%
Dia. on %(75.0%) :	15.710μm	% on Dia.(100.000μm) :	100.0%
Dia. on %(95.0%) :	24.566μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	4.44	96.99	0.669	0.00	0.00
890.1	0.00	100.00	22.80	5.27	92.56	0.584	0.00	0.00
777.1	0.00	100.00	19.90	6.94	87.28	0.510	0.00	0.00
678.5	0.00	100.00	17.38	7.20	80.35	0.445	0.00	0.00
592.4	0.00	100.00	15.17	7.78	73.15	0.389	0.00	0.00
517.2	0.00	100.00	13.25	7.77	65.37	0.339	0.00	0.00
451.6	0.00	100.00	11.56	7.40	57.60	0.296	0.00	0.00
394.2	0.00	100.00	10.10	6.76	50.20	0.259	0.00	0.00
344.2	0.00	100.00	8.816	6.02	43.44	0.226	0.00	0.00
300.5	0.00	100.00	7.697	5.28	37.42	0.197	0.00	0.00
262.4	0.00	100.00	6.720	4.74	32.14	0.172	0.00	0.00
229.1	0.00	100.00	5.867	4.14	27.40	0.150	0.00	0.00
200.0	0.00	100.00	5.122	3.70	23.26	0.131	0.00	0.00
174.6	0.00	100.00	4.472	3.41	19.56	0.115	0.00	0.00
152.5	0.00	100.00	3.905	3.14	16.15	0.100	0.00	0.00
133.1	0.00	100.00	3.409	2.85	13.01	0.087	0.00	0.00
116.2	0.00	100.00	2.976	2.47	10.16	0.076	0.00	0.00
101.5	0.00	100.00	2.599	2.02	7.69	0.067	0.00	0.00
88.58	0.00	100.00	2.269	1.63	5.66	0.058	0.00	0.00
77.34	0.00	100.00	1.981	1.31	4.03	0.051	0.00	0.00
67.52	0.00	100.00	1.729	1.04	2.72	0.044	0.00	0.00
58.95	0.00	100.00	1.510	0.75	1.68	0.039	0.00	0.00
51.47	0.00	100.00	1.318	0.50	0.93	0.034	0.00	0.00
44.94	0.00	100.00	1.151	0.29	0.43	0.029	0.00	0.00
39.23	0.24	100.00	1.005	0.14	0.14	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/27/01

File Name: AZ102915.DAT Sample Name: az102 ID No: 01/09/26-982

Dist. Form: STANDARD R.R. Index: 116-000

Dist. Mode: VOLUME Laser: 84.615 % Lamp: 84.434 %

Circulation: 6 Agitation: 3 U.Sonic OFF (min)

Lot No: 1652 Test No: dup

WSC 10/3/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.967	0.10	0.10	(15)	11.049	5.00	55.00
(2)	1.336	0.90	1.00	(16)	12.084	5.00	60.00
(3)	1.640	1.30	2.30	(17)	13.166	5.00	65.00
(4)	2.152	2.70	5.00	(18)	14.392	5.00	70.00
(5)	2.952	5.00	10.00	(19)	15.738	5.00	75.00
(6)	3.723	5.00	15.00	(20)	17.270	5.00	80.00
(7)	3.850	0.80	15.80	(21)	18.780	4.20	84.20
(8)	4.550	4.20	20.00	(22)	19.071	0.80	85.00
(9)	5.435	5.00	25.00	(23)	21.394	5.00	90.00
(10)	6.335	5.00	30.00	(24)	24.622	5.00	95.00
(11)	7.249	5.00	35.00	(25)	27.410	2.70	97.70
(12)	8.176	5.00	40.00	(26)	29.802	1.30	99.00
(13)	9.111	5.00	45.00	(27)	37.185	0.90	99.90
(14)	10.060	5.00	50.00				

Median : 10.057 (μm) Mean: 11.196 (μm) Mode: 14.176 (μm)

Std. Dev.: 7.019 (μm) Span: 0.881

Coef. Var: 62.69% Spec. Area: 9269 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/27/'01 10:38

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926-983 16:17
Filename : AZ102916
Sample : az102

Material :
Source :
Lot Numbe : 1652

Condition
T%(He-Ne): 80.9%
(LAMP): 78.1%
Dist.Form: Std.
R.R.Index: 1.16-0.00i
Sampling times : 100 ( )

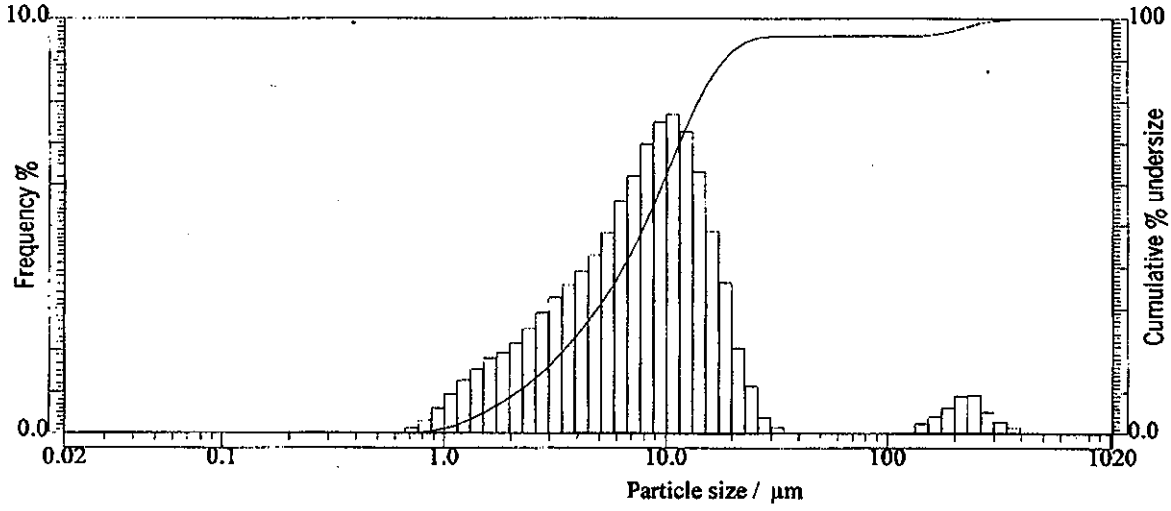
Agitation : 3 Circultn : 6 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 8.024μm SP.Area : 12023cm²/cm³ S.D. : 45.538μm
Mode : 10.783μm Mean : 17.647μm
C.V. : 258.05%

Span : (D 10.0-D 90.0) / D50 =- 2.017

Dia. on %(5.0%) : 1.531μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 4.181μm % on Dia.(1.000μm) : 1.0%
Dia. on %(50.0%) : 8.024μm % on Dia.(10.000μm) : 61.8%
Dia. on %(75.0%) : 12.677μm % on Dia.(100.000μm) : 95.9%
Dia. on %(95.0%) : 24.952μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.14	95.38	0.669	0.00	0.00
890.1	0.00	100.00	22.80	2.06	94.24	0.584	0.00	0.00
777.1	0.00	100.00	19.90	3.64	92.19	0.510	0.00	0.00
678.5	0.00	100.00	17.38	4.87	88.55	0.445	0.00	0.00
592.4	0.00	100.00	15.17	6.32	83.68	0.389	0.00	0.00
517.2	0.00	100.00	13.25	7.29	77.36	0.339	0.00	0.00
451.6	0.00	100.00	11.56	7.71	70.07	0.296	0.00	0.00
394.2	0.16	100.00	10.10	7.53	62.36	0.259	0.00	0.00
344.2	0.29	99.84	8.816	6.98	54.83	0.226	0.00	0.00
300.5	0.52	99.55	7.697	6.21	47.86	0.197	0.00	0.00
262.4	0.93	99.03	6.720	5.59	41.64	0.172	0.00	0.00
229.1	0.91	98.10	5.867	4.83	36.05	0.150	0.00	0.00
200.0	0.63	97.19	5.122	4.28	31.22	0.131	0.00	0.00
174.6	0.42	96.55	4.472	3.91	26.94	0.115	0.00	0.00
152.5	0.24	96.14	3.905	3.59	23.03	0.100	0.00	0.00
133.1	0.00	95.90	3.409	3.26	19.44	0.087	0.00	0.00
116.2	0.00	95.90	2.976	2.90	16.18	0.076	0.00	0.00
101.5	0.00	95.90	2.599	2.52	13.28	0.067	0.00	0.00
88.58	0.00	95.90	2.269	2.18	10.76	0.058	0.00	0.00
77.34	0.00	95.90	1.981	1.95	8.59	0.051	0.00	0.00
67.52	0.00	95.90	1.729	1.82	6.63	0.044	0.00	0.00
58.95	0.00	95.90	1.510	1.55	4.81	0.039	0.00	0.00
51.47	0.00	95.90	1.318	1.29	3.26	0.034	0.00	0.00
44.94	0.00	95.90	1.151	0.95	1.98	0.029	0.00	0.00
39.23	0.00	95.90	1.005	0.60	1.03	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/27/01
File Name: AZ102916.DAT Sample Name: az102 ID No: 01/09/26-983
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 80.916 % Lamp: 78.128 %
Circulation: 6 Agitation: 3 U.Sonic ** (min)
Lot No: 1652 Test No: dup

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.748	0.10	0.10	(15)	8.844	5.00	55.00
(2)	0.999	0.90	1.00	(16)	9.695	5.00	60.00
(3)	1.193	1.30	2.30	(17)	10.599	5.00	65.00
(4)	1.532	2.70	5.00	(18)	11.551	5.00	70.00
(5)	2.168	5.00	10.00	(19)	12.702	5.00	75.00
(6)	2.823	5.00	15.00	(20)	14.052	5.00	80.00
(7)	2.927	0.80	15.80	(21)	15.409	4.20	84.20
(8)	3.486	4.20	20.00	(22)	15.772	0.80	85.00
(9)	4.190	5.00	25.00	(23)	18.387	5.00	90.00
(10)	4.937	5.00	30.00	(24)	25.003	5.00	95.00
(11)	5.705	5.00	35.00	(25)	216.376	2.70	97.70
(12)	6.469	5.00	40.00	(26)	261.242	1.30	99.00
(13)	7.248	5.00	45.00	(27)	363.025	0.90	99.90
(14)	8.040	5.00	50.00				

Median : 8.024 (μm) Mean: 17.647 (μm) Mode: 10.806 (μm)
Std. Dev.: 45.538 (μm) Span: 1.530
Coef. Var: 258.05% Spec. Area: 12023 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/27/'01 10:38

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926-984 16:21
Filename : AZ102917
Sample : az102

Material :
Source :
Lot Numbe : 1652

Condition

T%(He-Ne): 80.8% Dist.Form: Std. Sampling times : 100
(LAMP): 78.4% R.R.Index: 1.16-0.00i ( )

Agitation : 1 Circultn : 6 U.sonic : ~~ON~~ OFF (120) WSC 10/3/01

Format

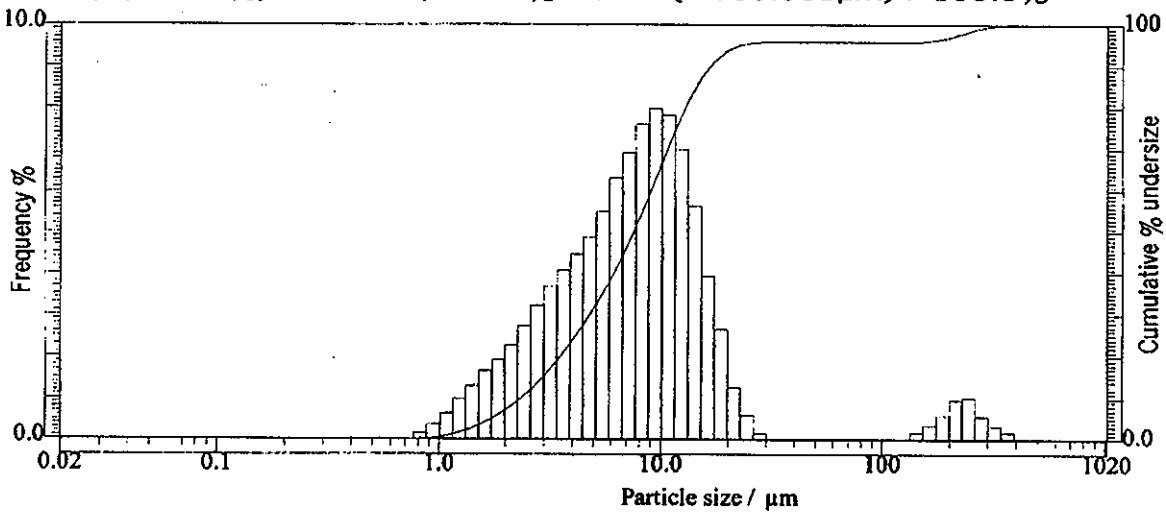
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data

Median : 7.524μm SP.Area : 11778cm²/cm³ S.D. : 46.694μm
Mode : 9.452μm Mean : 17.408μm
C.V. : 268.23%

Span : (D 10.0-D 90.0) / D50 = 1.906

Dia. on %(5.0%) :	1.711μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	4.144μm	% on Dia.(1.000μm) :	0.5%
Dia. on %(50.0%) :	7.524μm	% on Dia.(10.000μm) :	66.2%
Dia. on %(75.0%) :	11.656μm	% on Dia.(100.000μm) :	95.8%
Dia. on %(95.0%) :	22.547μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.59	95.70	0.669	0.00	0.00
890.1	0.00	100.00	22.80	1.27	95.10	0.584	0.00	0.00
777.1	0.00	100.00	19.90	2.65	93.83	0.510	0.00	0.00
678.5	0.00	100.00	17.38	3.94	91.18	0.445	0.00	0.00
592.4	0.00	100.00	15.17	5.64	87.24	0.389	0.00	0.00
517.2	0.00	100.00	13.25	7.00	81.60	0.339	0.00	0.00
451.6	0.00	100.00	11.56	7.84	74.59	0.296	0.00	0.00
394.2	0.18	100.00	10.10	7.98	66.76	0.259	0.00	0.00
344.2	0.32	99.82	8.816	7.62	58.78	0.226	0.00	0.00
300.5	0.57	99.51	7.697	6.93	51.16	0.197	0.00	0.00
262.4	1.02	98.94	6.720	6.32	44.23	0.172	0.00	0.00
229.1	0.96	97.92	5.867	5.51	37.91	0.150	0.00	0.00
200.0	0.59	96.96	5.122	4.89	32.40	0.131	0.00	0.00
174.6	0.35	96.37	4.472	4.47	27.51	0.115	0.00	0.00
152.5	0.18	96.02	3.905	4.08	23.04	0.100	0.00	0.00
133.1	0.00	95.85	3.409	3.69	18.96	0.087	0.00	0.00
116.2	0.00	95.85	2.976	3.22	15.27	0.076	0.00	0.00
101.5	0.00	95.85	2.599	2.72	12.05	0.067	0.00	0.00
88.58	0.00	95.85	2.269	2.27	9.33	0.058	0.00	0.00
77.34	0.00	95.85	1.981	1.93	7.06	0.051	0.00	0.00
67.52	0.00	95.85	1.729	1.67	5.13	0.044	0.00	0.00
58.95	0.00	95.85	1.510	1.31	3.46	0.039	0.00	0.00
51.47	0.00	95.85	1.318	0.98	2.15	0.034	0.00	0.00
44.94	0.00	95.85	1.151	0.65	1.17	0.029	0.00	0.00
39.23	0.00	95.85	1.005	0.36	0.53	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/27/01
File Name: AZ102917.DAT Sample Name: az102 ID No: 01/09/26-984
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 80.842 % Lamp: 78.351 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Lot No: 1652 Test No: dup

WJC 10/3/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.833	0.10	0.10	(15)	8.261	5.00	55.00
(2)	1.112	0.90	1.00	(16)	9.012	5.00	60.00
(3)	1.340	1.30	2.30	(17)	9.815	5.00	65.00
(4)	1.713	2.70	5.00	(18)	10.705	5.00	70.00
(5)	2.350	5.00	10.00	(19)	11.663	5.00	75.00
(6)	2.944	5.00	15.00	(20)	12.863	5.00	80.00
(7)	3.038	0.80	15.80	(21)	14.135	4.20	84.20
(8)	3.535	4.20	20.00	(22)	14.408	0.80	85.00
(9)	4.153	5.00	25.00	(23)	16.719	5.00	90.00
(10)	4.803	5.00	30.00	(24)	22.562	5.00	95.00
(11)	5.473	5.00	35.00	(25)	222.342	2.70	97.70
(12)	6.149	5.00	40.00	(26)	266.222	1.30	99.00
(13)	6.828	5.00	45.00	(27)	365.655	0.90	99.90
(14)	7.533	5.00	50.00				

Median : 7.524 (μm) Mean: 17.408 (μm) Mode: 9.435 (μm)
Std. Dev.: 46.694 (μm) Span: 1.447
Coef. Var: 268.23% Spec. Area: 11778 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/27/'01 10:38

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926-985 16:31 Material :
Filename : AZ102918 Source :
Sample : az102 Lot Numbe : 1652

Condition
T%(He-Ne): 85.6% Dist.Form: Std. Sampling times : 100
(LAMP): 84.4% R.R.index: 1.16-0.00i ( )

Agitation : 1 Circultn : 6 U.sonic : ~~ON~~ OFF (120)

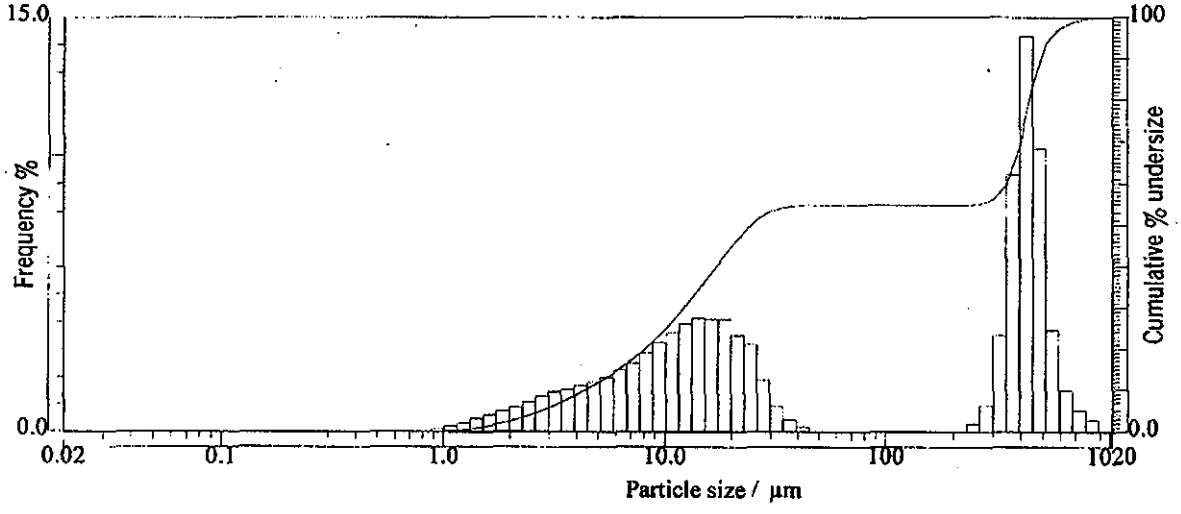
WSR 10/3/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 24.524μm SP.Area : 4991cm²/cm³ S.D. : 221.667μm
Mode : 423.748μm Mean : 205.131μm
C.V. : 108.06%

Span : (D 10.0-D 90.0) / D50 = 19.931

Dia. on %(5.0%) : 2.771μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 10.118μm % on Dia.(1.000μm) : 0.1%
Dia. on %(50.0%) : 24.524μm % on Dia.(10.000μm) : 24.7%
Dia. on %(75.0%) : 417.202μm % on Dia.(100.000μm) : 54.9%
Dia. on %(95.0%) : 544.429μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	3.18	51.47	0.669	0.00	0.00
890.1	0.43	100.00	22.80	3.51	48.29	0.584	0.00	0.00
777.1	0.77	99.57	19.90	4.10	44.79	0.510	0.00	0.00
678.5	1.50	98.80	17.38	4.10	40.69	0.445	0.00	0.00
592.4	3.70	97.30	15.17	4.12	36.59	0.389	0.00	0.00
517.2	10.26	93.60	13.25	3.92	32.47	0.339	0.00	0.00
451.6	14.32	83.35	11.56	3.61	28.55	0.296	0.00	0.00
394.2	9.35	69.03	10.10	3.23	24.94	0.259	0.00	0.00
344.2	3.51	59.68	8.816	2.85	21.71	0.226	0.00	0.00
300.5	0.97	56.17	7.697	2.49	18.86	0.197	0.00	0.00
262.4	0.31	55.20	6.720	2.25	16.37	0.172	0.00	0.00
229.1	0.00	54.89	5.867	1.98	14.12	0.150	0.00	0.00
200.0	0.00	54.89	5.122	1.79	12.14	0.131	0.00	0.00
174.6	0.00	54.89	4.472	1.67	10.34	0.115	0.00	0.00
152.5	0.00	54.89	3.905	1.56	8.67	0.100	0.00	0.00
133.1	0.00	54.89	3.409	1.44	7.11	0.087	0.00	0.00
116.2	0.00	54.89	2.976	1.27	5.67	0.076	0.00	0.00
101.5	0.00	54.89	2.599	1.07	4.40	0.067	0.00	0.00
88.58	0.00	54.89	2.269	0.89	3.33	0.058	0.00	0.00
77.34	0.00	54.89	1.981	0.74	2.44	0.051	0.00	0.00
67.52	0.00	54.89	1.729	0.61	1.70	0.044	0.00	0.00
58.95	0.00	54.89	1.510	0.46	1.09	0.039	0.00	0.00
51.47	0.00	54.89	1.318	0.32	0.63	0.034	0.00	0.00
44.94	0.19	54.89	1.151	0.20	0.30	0.029	0.00	0.00
39.23	0.44	54.70	1.005	0.10	0.10	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/27/01
File Name: AZ102918.DAT Sample Name: az102 ID No: 01/09/26-985
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 85.602 % Lamp: 84.368 % WSC 10/3/01
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Lot No: 1652 Test No: trip

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	1.001	0.10	0.10	(15)	240.637	5.00	55.00
(2)	1.474	0.90	1.00	(16)	345.910	5.00	60.00
(3)	1.934	1.30	2.30	(17)	372.672	5.00	65.00
(4)	2.777	2.70	5.00	(18)	398.126	5.00	70.00
(5)	4.356	5.00	10.00	(19)	418.144	5.00	75.00
(6)	6.202	5.00	15.00	(20)	438.162	5.00	80.00
(7)	6.505	0.80	15.80	(21)	457.024	4.20	84.20
(8)	8.143	4.20	20.00	(22)	462.144	0.80	85.00
(9)	10.120	5.00	25.00	(23)	494.144	5.00	90.00
(10)	12.186	5.00	30.00	(24)	545.621	5.00	95.00
(11)	14.428	5.00	35.00	(25)	615.348	2.70	97.70
(12)	17.007	5.00	40.00	(26)	703.887	1.30	99.00
(13)	20.080	5.00	45.00	(27)	863.717	0.90	99.90
(14)	24.580	5.00	50.00				

Median : 24.524 (μm) Mean: 205.131 (μm) Mode: 421.928 (μm)
Std. Dev.: 221.667 (μm) Span: 5.188
Coef. Var: 108.06% Spec. Area: 4991 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/27/'01 10:39

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926-986 16:35
Filename : AZ102919
Sample : az102

Material :
Source :
Lot Numbe : 1652

Condition

T%(He-Ne): 82.2%
(LAMP): 81.8%

Dist.Form: Std.
R.R.Index: 1.16-0.00i

Sampling times : 100
( )

Agitation : 3 Circultn : 6 U.sonic : ~~ON~~ OFF (120)

WSC 10/3/01

Format

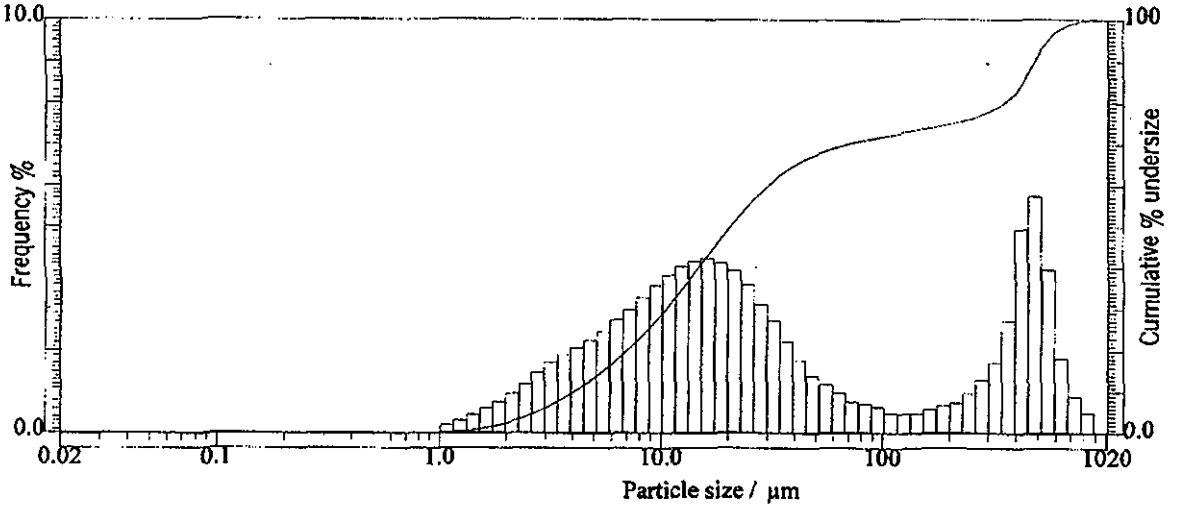
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data

Median : 20.478μm SP.Area : 5604cm²/cm³ S.D. : 201.293μm
Mode : 477.652μm Mean : 132.584μm
C.V. : 151.82%

Span : (D 10.0-D 90.0) / D50 = 23.406

Dia. on %(5.0%) :	2.735μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	8.712μm	% on Dia.(1.000μm) :	0.0%
Dia. on %(50.0%) :	20.478μm	% on Dia.(10.000μm) :	28.6%
Dia. on %(75.0%) :	208.161μm	% on Dia.(100.000μm) :	72.1%
Dia. on %(95.0%) :	556.732μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	3.58	56.68	0.669	0.00	0.00
890.1	0.50	100.00	22.80	3.93	53.10	0.584	0.00	0.00
777.1	0.89	99.50	19.90	4.12	49.18	0.510	0.00	0.00
678.5	1.81	98.61	17.38	4.22	45.05	0.445	0.00	0.00
592.4	3.95	96.80	15.17	4.17	40.83	0.389	0.00	0.00
517.2	5.73	92.86	13.25	4.01	36.66	0.339	0.00	0.00
451.6	4.93	87.13	11.56	3.81	32.65	0.296	0.00	0.00
394.2	2.71	82.20	10.10	3.55	28.84	0.259	0.00	0.00
344.2	1.70	79.48	8.816	3.27	25.29	0.226	0.00	0.00
300.5	1.29	77.78	7.697	2.96	22.02	0.197	0.00	0.00
262.4	0.97	76.49	6.720	2.75	19.06	0.172	0.00	0.00
229.1	0.74	75.52	5.867	2.46	16.31	0.150	0.00	0.00
200.0	0.66	74.78	5.122	2.24	13.85	0.131	0.00	0.00
174.6	0.57	74.12	4.472	2.07	11.61	0.115	0.00	0.00
152.5	0.46	73.55	3.905	1.91	9.54	0.100	0.00	0.00
133.1	0.46	73.09	3.409	1.72	7.63	0.087	0.00	0.00
116.2	0.49	72.63	2.976	1.47	5.92	0.076	0.00	0.00
101.5	0.63	72.14	2.599	1.19	4.45	0.067	0.00	0.00
88.58	0.71	71.51	2.269	0.95	3.26	0.058	0.00	0.00
77.34	0.77	70.80	1.981	0.76	2.31	0.051	0.00	0.00
67.52	0.98	70.03	1.729	0.61	1.55	0.044	0.00	0.00
58.95	1.18	69.04	1.510	0.44	0.94	0.039	0.00	0.00
51.47	1.39	67.86	1.318	0.31	0.49	0.034	0.00	0.00
44.94	1.77	66.48	1.151	0.19	0.19	0.029	0.00	0.00
39.23	2.23	64.71	1.005	0.00	0.00	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/27/01
File Name: AZ102919.DAT Sample Name: az102 ID No: 01/09/26-986
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 82.242 % Lamp: 81.775 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Lot No: 1652 Test No: trip

WSC
10/3/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	1.083	0.10	0.10	(15)	24.553	5.00	55.00
(2)	1.532	0.90	1.00	(16)	30.255	5.00	60.00
(3)	1.978	1.30	2.30	(17)	40.173	5.00	65.00
(4)	2.741	2.70	5.00	(18)	67.298	5.00	70.00
(5)	4.030	5.00	10.00	(19)	208.567	5.00	75.00
(6)	5.471	5.00	15.00	(20)	353.746	5.00	80.00
(7)	5.713	0.80	15.80	(21)	417.528	4.20	84.20
(8)	7.031	4.20	20.00	(22)	426.823	0.80	85.00
(9)	8.718	5.00	25.00	(23)	484.451	5.00	90.00
(10)	10.545	5.00	30.00	(24)	558.001	5.00	95.00
(11)	12.550	5.00	35.00	(25)	635.038	2.70	97.70
(12)	14.789	5.00	40.00	(26)	721.378	1.30	99.00
(13)	17.349	5.00	45.00	(27)	867.319	0.90	99.90
(14)	20.510	5.00	50.00				

Median : 20.478 (μm) Mean: 132.584 (μm) Mode: 483.265 (μm)
Std. Dev.: 201.293 (μm) Span: 17.022
Coef. Var: 151.82% Spec. Area: 5605 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/27/'01 10:39

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926-987 16:41
Filename : AZ102920
Sample : az102

Material :
Source :
Lot Numbe : 1652

Condition
T%(He-Ne): 74.1% Dist.Form: Std. Sampling times : 100
(LAMP): 70.2% R.R.Index: 1.16-0.00i ( )

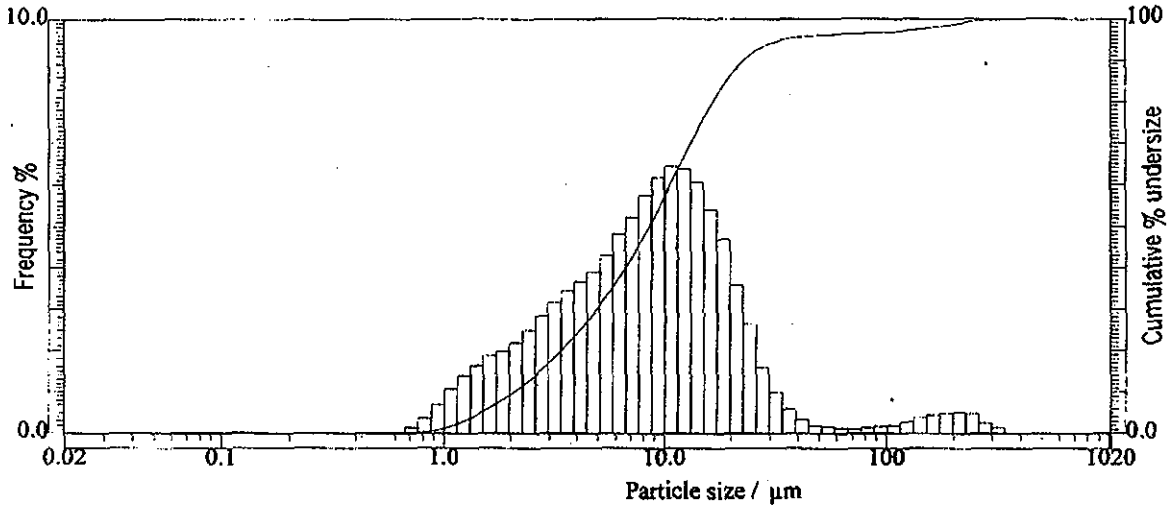
Agitation : 3 Circultn : 6 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 8.611μm SP.Area : 11886cm²/cm³ S.D. : 35.320μm
Mode : 10.829μm Mean : 16.386μm
C.V. : 215.54%

Span : (D 10.0-D 90.0) / D50 = 2.448

Dia. on %(5.0%) :	1.470μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	4.157μm	% on Dia.(1.000μm) :	1.2%
Dia. on %(50.0%) :	8.611μm	% on Dia.(10.000μm) :	56.7%
Dia. on %(75.0%) :	14.826μm	% on Dia.(100.000μm) :	96.8%
Dia. on %(95.0%) :	34.947μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	2.64	92.33	0.669	0.00	0.00
890.1	0.00	100.00	22.80	3.57	89.69	0.584	0.00	0.00
777.1	0.00	100.00	19.90	4.68	86.12	0.510	0.00	0.00
678.5	0.00	100.00	17.38	5.41	81.44	0.445	0.00	0.00
592.4	0.00	100.00	15.17	6.06	76.03	0.389	0.00	0.00
517.2	0.00	100.00	13.25	6.37	69.97	0.339	0.00	0.00
451.6	0.00	100.00	11.56	6.43	63.60	0.296	0.00	0.00
394.2	0.00	100.00	10.10	6.17	57.17	0.259	0.00	0.00
344.2	0.15	100.00	8.816	5.75	51.00	0.226	0.00	0.00
300.5	0.27	99.85	7.697	5.22	45.24	0.197	0.00	0.00
262.4	0.48	99.59	6.720	4.83	40.02	0.172	0.00	0.00
229.1	0.51	99.11	5.867	4.30	35.19	0.150	0.00	0.00
200.0	0.50	98.60	5.122	3.91	30.89	0.131	0.00	0.00
174.6	0.45	98.11	4.472	3.67	26.98	0.115	0.00	0.00
152.5	0.38	97.66	3.905	3.44	23.31	0.100	0.00	0.00
133.1	0.29	97.27	3.409	3.17	19.87	0.087	0.00	0.00
116.2	0.21	96.98	2.976	2.84	16.70	0.076	0.00	0.00
101.5	0.18	96.78	2.599	2.50	13.86	0.067	0.00	0.00
88.58	0.15	96.59	2.269	2.18	11.36	0.058	0.00	0.00
77.34	0.11	96.44	1.981	1.98	9.18	0.051	0.00	0.00
67.52	0.14	96.33	1.729	1.88	7.20	0.044	0.00	0.00
58.95	0.16	96.19	1.510	1.64	5.32	0.039	0.00	0.00
51.47	0.19	96.03	1.318	1.40	3.68	0.034	0.00	0.00
44.94	0.34	95.85	1.151	1.07	2.28	0.029	0.00	0.00
39.23	0.60	95.51	1.005	0.70	1.21	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/27/01
File Name: AZ102920.DAT Sample Name: az102 ID No: 01/09/26-987
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 74.051 % Lamp: 70.235 %
Circulation: 6 Agitation: 3 U.Sonic ** (min)
Lot No: 1652 Test No: trip

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.734	0.10	0.10	(15)	9.647	5.00	55.00
(2)	0.966	0.90	1.00	(16)	10.744	5.00	60.00
(3)	1.153	1.30	2.30	(17)	11.935	5.00	65.00
(4)	1.472	2.70	5.00	(18)	13.256	5.00	70.00
(5)	2.089	5.00	10.00	(19)	14.845	5.00	75.00
(6)	2.750	5.00	15.00	(20)	16.791	5.00	80.00
(7)	2.856	0.80	15.80	(21)	18.868	4.20	84.20
(8)	3.427	4.20	20.00	(22)	19.300	0.80	85.00
(9)	4.166	5.00	25.00	(23)	23.185	5.00	90.00
(10)	4.975	5.00	30.00	(24)	34.989	5.00	95.00
(11)	5.835	5.00	35.00	(25)	154.612	2.70	97.70
(12)	6.716	5.00	40.00	(26)	222.893	1.30	99.00
(13)	7.651	5.00	45.00	(27)	314.638	0.90	99.90
(14)	8.622	5.00	50.00				

Median : 8.611 (μm) Mean: 16.386 (μm) Mode: 10.806 (μm)
Std. Dev.: 35.320 (μm) Span: 2.337
Coef. Var: 215.54% Spec. Area: 11886 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20J Sep/27/'01 10:39

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926-988 16:44 Material :
Filename : AZ102921 Source :
Sample : az102 Lot Numbe : 1652

Condition
T%(He-Ne): 73.8% Dist.Form: Std. Sampling times : 100
(LAMP): 70.4% R.R.Index: 1.16-0.00i ( )

Agitation : 1 Circultn : 6 U.sonic : ~~ON~~ OFF (120)

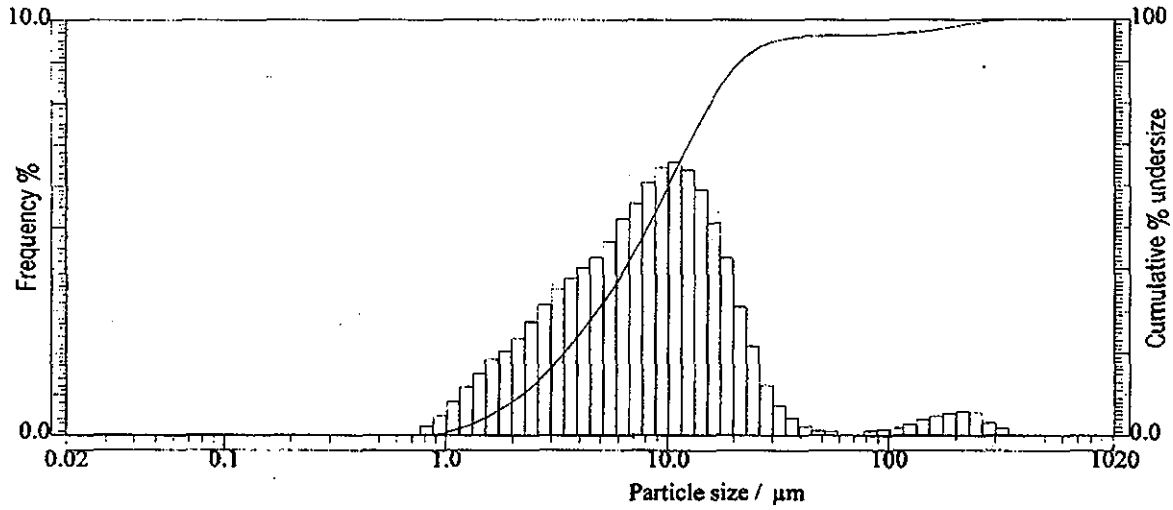
wsc 10/3/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 8.151μm SP.Area : 11708cm²/cm³ S.D. : 37.084μm
Mode : 10.801μm Mean : 16.269μm
C.V. : 227.94%

Span : (D 10.0-D 90.0) / D50 = 2.373

Dia. on %(5.0%) :	1.599μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	4.084μm	% on Dia.(1.000μm) :	0.7%
Dia. on %(50.0%) :	8.151μm	% on Dia.(10.000μm) :	59.5%
Dia. on %(75.0%) :	13.892μm	% on Dia.(100.000μm) :	96.5%
Dia. on %(95.0%) :	31.771μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	2.17	93.46	0.669	0.00	0.00
890.1	0.00	100.00	22.80	3.09	91.28	0.584	0.00	0.00
777.1	0.00	100.00	19.90	4.26	88.19	0.510	0.00	0.00
678.5	0.00	100.00	17.38	5.10	83.93	0.445	0.00	0.00
592.4	0.00	100.00	15.17	5.91	78.84	0.389	0.00	0.00
517.2	0.00	100.00	13.25	6.39	72.93	0.339	0.00	0.00
451.6	0.00	100.00	11.56	6.59	66.54	0.296	0.00	0.00
394.2	0.00	100.00	10.10	6.44	59.95	0.259	0.00	0.00
344.2	0.17	100.00	8.816	6.09	53.51	0.226	0.00	0.00
300.5	0.31	99.83	7.697	5.58	47.43	0.197	0.00	0.00
262.4	0.56	99.52	6.720	5.21	41.84	0.172	0.00	0.00
229.1	0.58	98.96	5.867	4.67	36.64	0.150	0.00	0.00
200.0	0.55	98.38	5.122	4.27	31.97	0.131	0.00	0.00
174.6	0.48	97.83	4.472	4.03	27.69	0.115	0.00	0.00
152.5	0.39	97.35	3.905	3.79	23.67	0.100	0.00	0.00
133.1	0.27	96.96	3.409	3.52	19.88	0.087	0.00	0.00
116.2	0.18	96.69	2.976	3.16	16.36	0.076	0.00	0.00
101.5	0.15	96.52	2.599	2.73	13.20	0.067	0.00	0.00
88.58	0.11	96.37	2.269	2.34	10.47	0.058	0.00	0.00
77.34	0.00	96.26	1.981	2.05	8.13	0.051	0.00	0.00
67.52	0.00	96.26	1.729	1.85	6.07	0.044	0.00	0.00
58.95	0.10	96.26	1.510	1.51	4.22	0.039	0.00	0.00
51.47	0.12	96.16	1.318	1.18	2.71	0.034	0.00	0.00
44.94	0.22	96.04	1.151	0.82	1.53	0.029	0.00	0.00
39.23	0.42	95.82	1.005	0.48	0.71	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/27/01
File Name: AZ102921.DAT Sample Name: az102 ID No: 01/09/26-988
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 73.844 % Lamp: 70.408 % WSC
Circulation: 6 Agitation: 1 U.Sonic OFF (min) 10/3/01
Lot No: 1652 Test No: trip

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.815	0.10	0.10	(15)	9.112	5.00	55.00
(2)	1.056	0.90	1.00	(16)	10.108	5.00	60.00
(3)	1.260	1.30	2.30	(17)	11.222	5.00	65.00
(4)	1.602	2.70	5.00	(18)	12.476	5.00	70.00
(5)	2.211	5.00	10.00	(19)	13.921	5.00	75.00
(6)	2.814	5.00	15.00	(20)	15.675	5.00	80.00
(7)	2.909	0.80	15.80	(21)	17.535	4.20	84.20
(8)	3.425	4.20	20.00	(22)	18.009	0.80	85.00
(9)	4.092	5.00	25.00	(23)	21.595	5.00	90.00
(10)	4.823	5.00	30.00	(24)	31.844	5.00	95.00
(11)	5.606	5.00	35.00	(25)	168.513	2.70	97.70
(12)	6.418	5.00	40.00	(26)	231.200	1.30	99.00
(13)	7.272	5.00	45.00	(27)	318.722	0.90	99.90
(14)	8.170	5.00	50.00				

Median : 8.151 (μm) Mean: 16.269 (μm) Mode: 10.806 (μm)
Std. Dev.: 37.084 (μm) Span: 2.193
Coef. Var: 227.94% Spec. Area: 11708 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/27/'01 10:39

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926-989 17:04
Filename : AZ102922
Sample : az102

Material :
Source :
Lot Numbe : 1653

Condition
T%(He-Ne): 87.5% Dist.Form: Std. Sampling times : 100
(LAMP): 87.7% R.R.Index: 1.16-0.00i ( )

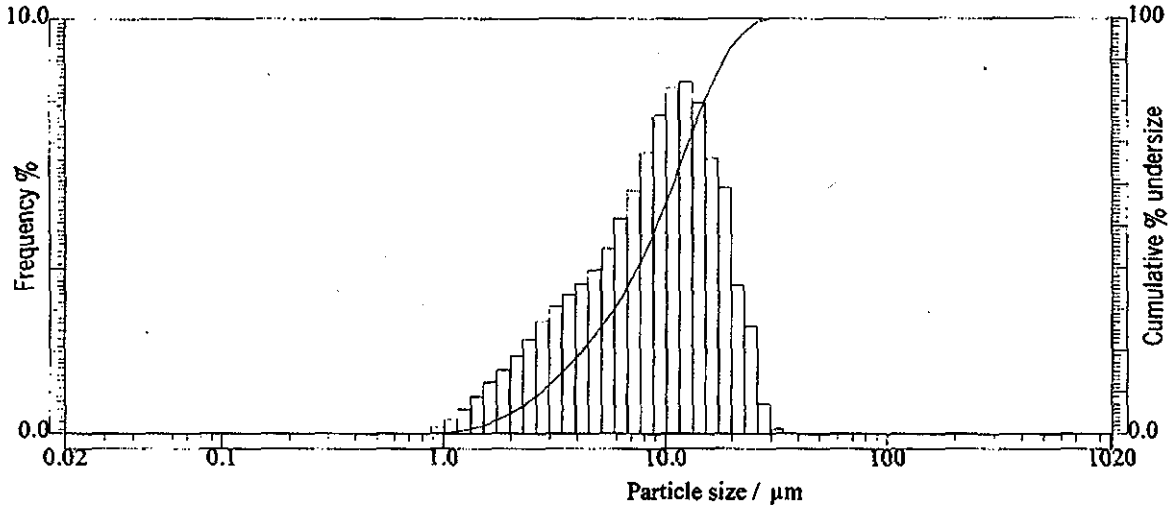
Agitation : 1 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 9.129μm SP.Area : 10058cm²/cm³ S.D. : 6.048μm
Mode : 12.343μm Mean : 9.972μm
C.V. : 60.65%

Span : (D 10.0-D 90.0) / D50 = 1.738

Dia. on %(5.0%) :	2.011μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	4.989μm	% on Dia.(1.000μm) :	0.2%
Dia. on %(50.0%) :	9.129μm	% on Dia.(10.000μm) :	55.1%
Dia. on %(75.0%) :	13.832μm	% on Dia.(100.000μm) :	100.0%
Dia. on %(95.0%) :	21.505μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	2.60	99.14	0.669	0.00	0.00
890.1	0.00	100.00	22.80	3.59	96.54	0.584	0.00	0.00
777.1	0.00	100.00	19.90	5.91	92.95	0.510	0.00	0.00
678.5	0.00	100.00	17.38	6.62	87.04	0.445	0.00	0.00
592.4	0.00	100.00	15.17	7.97	80.43	0.389	0.00	0.00
517.2	0.00	100.00	13.25	8.47	72.46	0.339	0.00	0.00
451.6	0.00	100.00	11.56	8.31	63.99	0.296	0.00	0.00
394.2	0.00	100.00	10.10	7.64	55.67	0.259	0.00	0.00
344.2	0.00	100.00	8.816	6.77	48.03	0.226	0.00	0.00
300.5	0.00	100.00	7.697	5.85	41.27	0.197	0.00	0.00
262.4	0.00	100.00	6.720	5.18	35.42	0.172	0.00	0.00
229.1	0.00	100.00	5.867	4.47	30.24	0.150	0.00	0.00
200.0	0.00	100.00	5.122	3.97	25.77	0.131	0.00	0.00
174.6	0.00	100.00	4.472	3.64	21.81	0.115	0.00	0.00
152.5	0.00	100.00	3.905	3.37	18.16	0.100	0.00	0.00
133.1	0.00	100.00	3.409	3.09	14.79	0.087	0.00	0.00
116.2	0.00	100.00	2.976	2.73	11.70	0.076	0.00	0.00
101.5	0.00	100.00	2.599	2.29	8.96	0.067	0.00	0.00
88.58	0.00	100.00	2.269	1.88	6.68	0.058	0.00	0.00
77.34	0.00	100.00	1.981	1.54	4.79	0.051	0.00	0.00
67.52	0.00	100.00	1.729	1.24	3.25	0.044	0.00	0.00
58.95	0.00	100.00	1.510	0.90	2.01	0.039	0.00	0.00
51.47	0.00	100.00	1.318	0.60	1.11	0.034	0.00	0.00
44.94	0.00	100.00	1.151	0.35	0.51	0.029	0.00	0.00
39.23	0.00	100.00	1.005	0.17	0.17	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/27/01
File Name: AZ102922.DAT Sample Name: az102 ID No: 01/09/26-989
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 87.451 % Lamp: 87.708 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Lot No: 1653 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.954	0.10	0.10	(15)	9.984	5.00	55.00
(2)	1.288	0.90	1.00	(16)	10.861	5.00	60.00
(3)	1.561	1.30	2.30	(17)	11.766	5.00	65.00
(4)	2.012	2.70	5.00	(18)	12.759	5.00	70.00
(5)	2.742	5.00	10.00	(19)	13.861	5.00	75.00
(6)	3.440	5.00	15.00	(20)	15.069	5.00	80.00
(7)	3.557	0.80	15.80	(21)	16.430	4.20	84.20
(8)	4.191	4.20	20.00	(22)	16.697	0.80	85.00
(9)	4.996	5.00	25.00	(23)	18.641	5.00	90.00
(10)	5.827	5.00	30.00	(24)	21.554	5.00	95.00
(11)	6.651	5.00	35.00	(25)	24.272	2.70	97.70
(12)	7.485	5.00	40.00	(26)	25.928	1.30	99.00
(13)	8.314	5.00	45.00	(27)	30.808	0.90	99.90
(14)	9.145	5.00	50.00				

Median : 9.129 (μm) Mean: 9.972 (μm) Mode: 12.377 (μm)
Std. Dev.: 6.048 (μm) Span: 0.841
Coef. Var: 60.65% Spec. Area: 10058 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/27/'01 10:40

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926-990 17:08
Filename : AZ102923
Sample : az102

Material :
Source :
Lot Numbe : 1653

Condition
T%(He-Ne): 87.2% Dist.Form: Std. Sampling times : 100
(LAMP): 87.5% R.R.index: 1.16-0.00i ( )

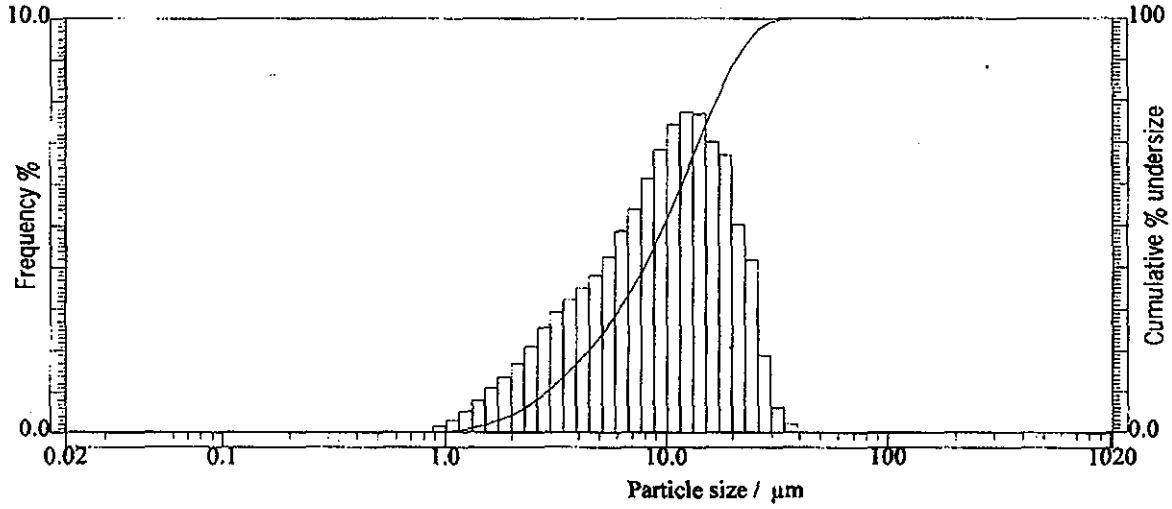
Agitation : 3 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 9.802μm SP.Area : 9454cm²/cm³ S.D. : 6.918μm
Mode : 12.403μm Mean : 10.968μm
C.V. : 63.07%

Span : (D 10.0-D 90.0) / D50 = 1.843

Dia. on %(5.0%) : 2.114μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 5.284μm % on Dia.(1.000μm) : 0.1%
Dia. on %(50.0%) : 9.802μm % on Dia.(10.000μm) : 51.0%
Dia. on %(75.0%) : 15.363μm % on Dia.(100.000μm) : 100.0%
Dia. on %(95.0%) : 24.242μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	4.18	97.29	0.669	0.00	0.00
890.1	0.00	100.00	22.80	5.02	93.11	0.584	0.00	0.00
777.1	0.00	100.00	19.90	6.71	88.09	0.510	0.00	0.00
678.5	0.00	100.00	17.38	7.03	81.38	0.445	0.00	0.00
592.4	0.00	100.00	15.17	7.68	74.35	0.389	0.00	0.00
517.2	0.00	100.00	13.25	7.74	66.67	0.339	0.00	0.00
451.6	0.00	100.00	11.56	7.44	58.93	0.296	0.00	0.00
394.2	0.00	100.00	10.10	6.83	51.49	0.259	0.00	0.00
344.2	0.00	100.00	8.816	6.13	44.66	0.226	0.00	0.00
300.5	0.00	100.00	7.697	5.39	38.53	0.197	0.00	0.00
262.4	0.00	100.00	6.720	4.86	33.14	0.172	0.00	0.00
229.1	0.00	100.00	5.867	4.25	28.28	0.150	0.00	0.00
200.0	0.00	100.00	5.122	3.81	24.03	0.131	0.00	0.00
174.6	0.00	100.00	4.472	3.51	20.22	0.115	0.00	0.00
152.5	0.00	100.00	3.905	3.23	16.71	0.100	0.00	0.00
133.1	0.00	100.00	3.409	2.94	13.48	0.087	0.00	0.00
116.2	0.00	100.00	2.976	2.55	10.54	0.076	0.00	0.00
101.5	0.00	100.00	2.599	2.10	7.98	0.067	0.00	0.00
88.58	0.00	100.00	2.269	1.70	5.89	0.058	0.00	0.00
77.34	0.00	100.00	1.981	1.36	4.19	0.051	0.00	0.00
67.52	0.00	100.00	1.729	1.09	2.83	0.044	0.00	0.00
58.95	0.00	100.00	1.510	0.78	1.74	0.039	0.00	0.00
51.47	0.00	100.00	1.318	0.52	0.96	0.034	0.00	0.00
44.94	0.00	100.00	1.151	0.30	0.44	0.029	0.00	0.00
39.23	0.21	100.00	1.005	0.15	0.15	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/27/01
File Name: AZ102923.DAT Sample Name: az102 ID No: 01/09/26-990
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 87.171 % Lamp: 87.495 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Lot No: 1653 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.965	0.10	0.10	(15)	10.789	5.00	55.00
(2)	1.328	0.90	1.00	(16)	11.797	5.00	60.00
(3)	1.623	1.30	2.30	(17)	12.883	5.00	65.00
(4)	2.118	2.70	5.00	(18)	14.081	5.00	70.00
(5)	2.897	5.00	10.00	(19)	15.376	5.00	75.00
(6)	3.642	5.00	15.00	(20)	16.945	5.00	80.00
(7)	3.765	0.80	15.80	(21)	18.440	4.20	84.20
(8)	4.437	4.20	20.00	(22)	18.742	0.80	85.00
(9)	5.293	5.00	25.00	(23)	21.007	5.00	90.00
(10)	6.169	5.00	30.00	(24)	24.298	5.00	95.00
(11)	7.057	5.00	35.00	(25)	26.940	2.70	97.70
(12)	7.965	5.00	40.00	(26)	29.551	1.30	99.00
(13)	8.879	5.00	45.00	(27)	36.817	0.90	99.90
(14)	9.817	5.00	50.00				

Median : 9.802 (μm) Mean: 10.968 (μm) Mode: 12.377 (μm)
Std. Dev.: 6.918 (μm) Span: 0.906
Coef. Var: 63.07% Spec. Area: 9454 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/27/'01 10:40

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926-991 17:13
Filename : AZ102924
Sample : az102

Material :
Source :
Lot Numbe : 1653

Condition
T%(He-Ne): 84.1% Dist.Form: Std. Sampling times : 100
(LAMP): 82.1% R.R.Index: 1.16-0.00i ( )

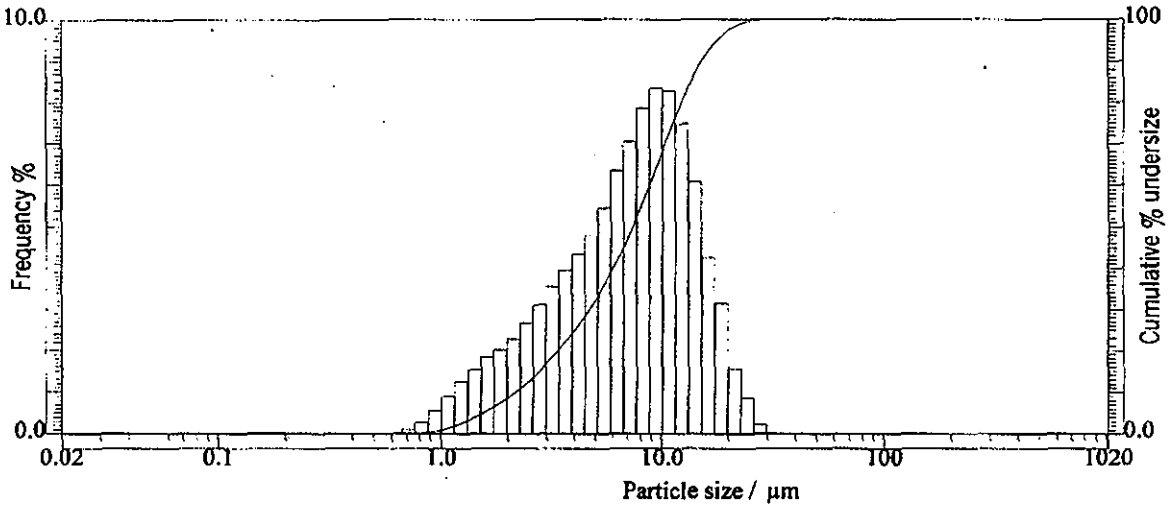
Agitation : 3 Circultn : 6 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 7.413μm SP.Area : 12548cm²/cm³ S.D. : 5.124μm
Mode : 9.468μm Mean : 8.182μm
C.V. : 62.62%

Span : (D 10.0-D 90.0) / D50 = 1.755

Dia. on %(5.0%) : 1.554μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 4.031μm % on Dia.(1.000μm) : 0.9%
Dia. on %(50.0%) : 7.413μm % on Dia.(10.000μm) : 67.6%
Dia. on %(75.0%) : 11.295μm % on Dia.(100.000μm) : 100.0%
Dia. on %(95.0%) : 17.961μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.86	99.78	0.669	0.00	0.00
890.1	0.00	100.00	22.80	1.55	98.92	0.584	0.00	0.00
777.1	0.00	100.00	19.90	3.13	97.37	0.510	0.00	0.00
678.5	0.00	100.00	17.38	4.25	94.24	0.445	0.00	0.00
592.4	0.00	100.00	15.17	6.06	89.98	0.389	0.00	0.00
517.2	0.00	100.00	13.25	7.48	83.92	0.339	0.00	0.00
451.6	0.00	100.00	11.56	8.29	76.44	0.296	0.00	0.00
394.2	0.00	100.00	10.10	8.34	68.15	0.259	0.00	0.00
344.2	0.00	100.00	8.816	7.86	59.81	0.226	0.00	0.00
300.5	0.00	100.00	7.697	7.05	51.95	0.197	0.00	0.00
262.4	0.00	100.00	6.720	6.34	44.90	0.172	0.00	0.00
229.1	0.00	100.00	5.867	5.45	38.56	0.150	0.00	0.00
200.0	0.00	100.00	5.122	4.79	33.10	0.131	0.00	0.00
174.6	0.00	100.00	4.472	4.33	28.32	0.115	0.00	0.00
152.5	0.00	100.00	3.905	3.94	23.98	0.100	0.00	0.00
133.1	0.00	100.00	3.409	3.54	20.05	0.087	0.00	0.00
116.2	0.00	100.00	2.976	3.11	16.50	0.076	0.00	0.00
101.5	0.00	100.00	2.599	2.67	13.39	0.067	0.00	0.00
88.58	0.00	100.00	2.269	2.27	10.72	0.058	0.00	0.00
77.34	0.00	100.00	1.981	2.01	8.45	0.051	0.00	0.00
67.52	0.00	100.00	1.729	1.84	6.44	0.044	0.00	0.00
58.95	0.00	100.00	1.510	1.53	4.61	0.039	0.00	0.00
51.47	0.00	100.00	1.318	1.24	3.08	0.034	0.00	0.00
44.94	0.00	100.00	1.151	0.90	1.83	0.029	0.00	0.00
39.23	0.00	100.00	1.005	0.55	0.94	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/27/01
File Name: AZ102924.DAT Sample Name: az102 ID No: 01/09/26-991
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 84.122 % Lamp: 82.121 %
Circulation: 6 Agitation: 3 U.Sonic ** (min)
Lot No: 1653 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.758	0.10	0.10	(15)	8.131	5.00	55.00
(2)	1.015	0.90	1.00	(16)	8.844	5.00	60.00
(3)	1.214	1.30	2.30	(17)	9.613	5.00	65.00
(4)	1.557	2.70	5.00	(18)	10.424	5.00	70.00
(5)	2.177	5.00	10.00	(19)	11.309	5.00	75.00
(6)	2.794	5.00	15.00	(20)	12.364	5.00	80.00
(7)	2.891	0.80	15.80	(21)	13.334	4.20	84.20
(8)	3.403	4.20	20.00	(22)	13.588	0.80	85.00
(9)	4.038	5.00	25.00	(23)	15.180	5.00	90.00
(10)	4.701	5.00	30.00	(24)	17.993	5.00	95.00
(11)	5.381	5.00	35.00	(25)	20.518	2.70	97.70
(12)	6.061	5.00	40.00	(26)	23.105	1.30	99.00
(13)	6.733	5.00	45.00	(27)	28.153	0.90	99.90
(14)	7.426	5.00	50.00				

Median : 7.413 (μm) Mean: 8.182 (μm) Mode: 9.435 (μm)
Std. Dev.: 5.124 (μm) Span: 0.899
Coef. Var: 62.62% Spec. Area: 12548 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/27/'01 10:40

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926-992 17:17
Filename : AZ102925
Sample : az102

Material :
Source :
Lot Numbe : 1653

Condition
T%(He-Ne): 84.1% Dist.Form: Std. Sampling times : 100
(LAMP): 82.3% R.R.Index: 1.16-0.00i ( )

Agitation : 1 Circultn : 6 U.sonic : ~~ON~~ OFF(120)

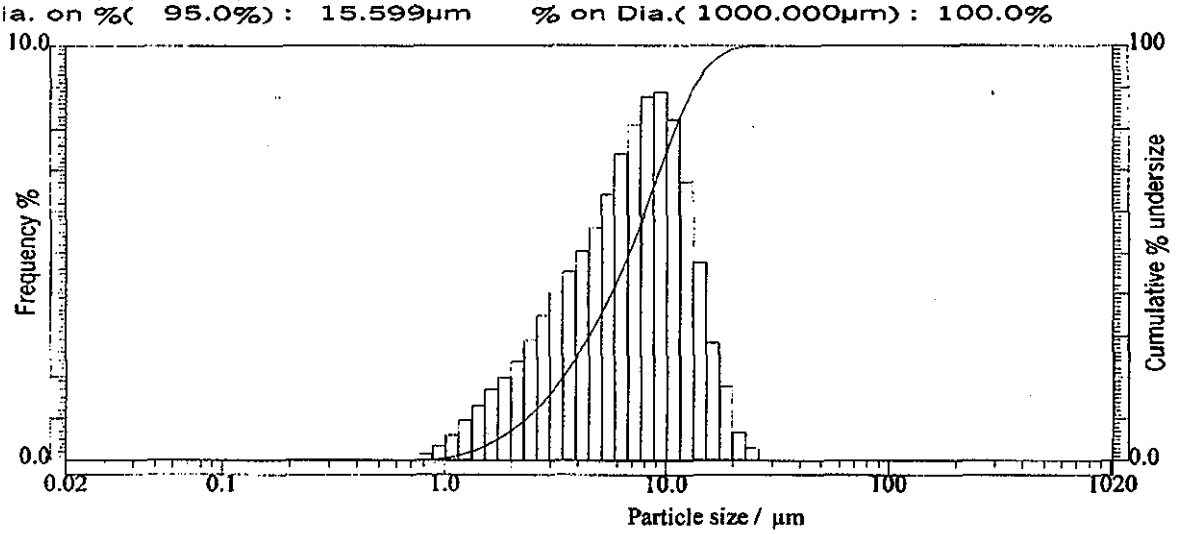
WSC 10/3/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 6.843μm SP.Area : 12518cm²/cm³ S.D. : 4.364μm
Mode : 9.395μm Mean : 7.465μm
C.V. : 58.45%

Span : (D 10.0-D 90.0) / D50 = 1.615

Dia. on %(5.0%) :	1.720μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	3.966μm	% on Dia.(1.000μm) :	0.5%
Dia. on %(50.0%) :	6.843μm	% on Dia.(10.000μm) :	74.1%
Dia. on %(75.0%) :	10.150μm	% on Dia.(100.000μm) :	100.0%
Dia. on %(95.0%) :	15.599μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.30	100.00	0.669	0.00	0.00
890.1	0.00	100.00	22.80	0.67	99.70	0.584	0.00	0.00
777.1	0.00	100.00	19.90	1.78	99.03	0.510	0.00	0.00
678.5	0.00	100.00	17.38	2.82	97.24	0.445	0.00	0.00
592.4	0.00	100.00	15.17	4.78	94.42	0.389	0.00	0.00
517.2	0.00	100.00	13.25	6.73	89.65	0.339	0.00	0.00
451.6	0.00	100.00	11.56	8.23	82.91	0.296	0.00	0.00
394.2	0.00	100.00	10.10	8.88	74.68	0.259	0.00	0.00
344.2	0.00	100.00	8.816	8.78	65.80	0.226	0.00	0.00
300.5	0.00	100.00	7.697	8.11	57.03	0.197	0.00	0.00
262.4	0.00	100.00	6.720	7.41	48.92	0.172	0.00	0.00
229.1	0.00	100.00	5.867	6.41	41.51	0.150	0.00	0.00
200.0	0.00	100.00	5.122	5.62	35.10	0.131	0.00	0.00
174.6	0.00	100.00	4.472	5.05	29.47	0.115	0.00	0.00
152.5	0.00	100.00	3.905	4.54	24.42	0.100	0.00	0.00
133.1	0.00	100.00	3.409	4.04	19.88	0.087	0.00	0.00
116.2	0.00	100.00	2.976	3.48	15.83	0.076	0.00	0.00
101.5	0.00	100.00	2.599	2.90	12.35	0.067	0.00	0.00
88.58	0.00	100.00	2.269	2.39	9.45	0.058	0.00	0.00
77.34	0.00	100.00	1.981	1.99	7.06	0.051	0.00	0.00
67.52	0.00	100.00	1.729	1.70	5.07	0.044	0.00	0.00
58.95	0.00	100.00	1.510	1.30	3.37	0.039	0.00	0.00
51.47	0.00	100.00	1.318	0.96	2.07	0.034	0.00	0.00
44.94	0.00	100.00	1.151	0.62	1.11	0.029	0.00	0.00
39.23	0.00	100.00	1.005	0.34	0.49	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/27/01

File Name: AZ102925.DAT Sample Name: az102 ID No: 01/09/26-992

Dist. Form: STANDARD R.R. Index: 116-000

Dist. Mode: VOLUME Laser: 84.144 % Lamp: 82.301 %

Circulation: 6 Agitation: 1 U.Sonic OFF (min)

Lot No: 1653 Test No:

WSC 10/3/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.839	0.10	0.10	(15)	7.453	5.00	55.00
(2)	1.125	0.90	1.00	(16)	8.076	5.00	60.00
(3)	1.352	1.30	2.30	(17)	8.713	5.00	65.00
(4)	1.720	2.70	5.00	(18)	9.421	5.00	70.00
(5)	2.331	5.00	10.00	(19)	10.153	5.00	75.00
(6)	2.886	5.00	15.00	(20)	11.045	5.00	80.00
(7)	2.973	0.80	15.80	(21)	11.886	4.20	84.20
(8)	3.423	4.20	20.00	(22)	12.086	0.80	85.00
(9)	3.970	5.00	25.00	(23)	13.389	5.00	90.00
(10)	4.533	5.00	30.00	(24)	15.623	5.00	95.00
(11)	5.111	5.00	35.00	(25)	18.024	2.70	97.70
(12)	5.692	5.00	40.00	(26)	19.867	1.30	99.00
(13)	6.269	5.00	45.00	(27)	25.003	0.90	99.90
(14)	6.850	5.00	50.00				

Median : 6.843 (μm) Mean: 7.465 (μm) Mode: 9.435 (μm)

Std. Dev.: 4.364 (μm) Span: 0.796

Coef. Var: 58.45% Spec. Area: 12518 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/27/'01 10:40

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926-993 17:27 Material :
Filename : AZ102926 Source :
Sample : az102 Lot Numbe : 1653

Condition
T%(He-Ne): 88.0% Dist.Form: Std. Sampling times : 100
(LAMP): 88.3% R.R.Index: 1.16-0.00i ( )

Agitation : 1 Circultn : 6 U.sonic : ~~ON~~ OFF (120)

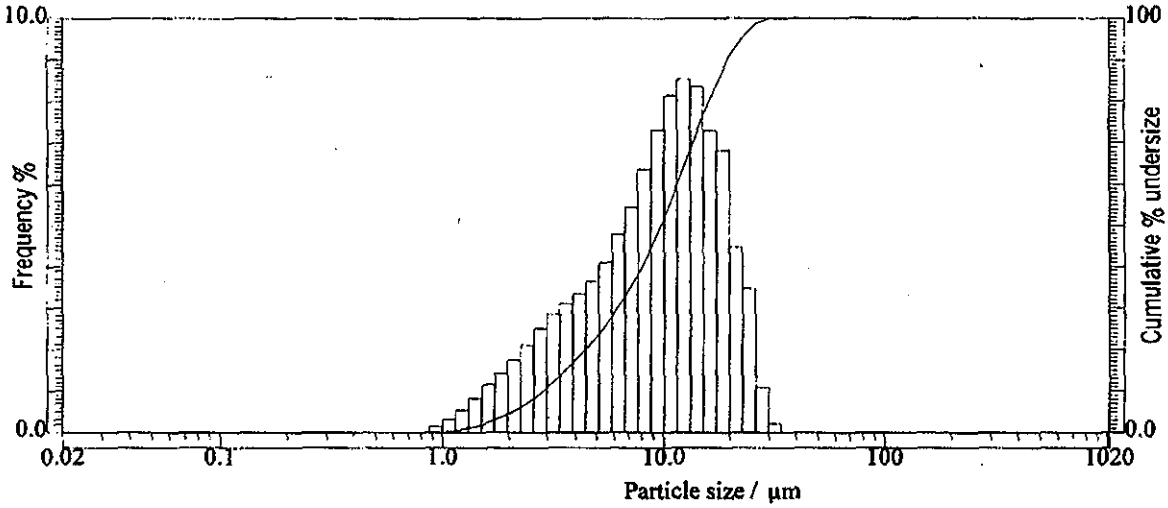
WSC 10/3/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 9.790μm SP.Area : 9541cm²/cm³ S.D. : 6.365μm
Mode : 12.399μm Mean : 10.610μm
C.V. : 59.99%

Span : (D 10.0-D 90.0) / D50 = 1.710

Dia. on %(5.0%) :	2.076μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	5.352μm	% on Dia.(1.000μm) :	0.1%
Dia. on %(50.0%) :	9.790μm	% on Dia.(10.000μm) :	51.1%
Dia. on %(75.0%) :	14.768μm	% on Dia.(100.000μm) :	100.0%
Dia. on %(95.0%) :	22.639μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	3.47	98.69	0.669	0.00	0.00
890.1	0.00	100.00	22.80	4.46	95.23	0.584	0.00	0.00
777.1	0.00	100.00	19.90	6.82	90.77	0.510	0.00	0.00
678.5	0.00	100.00	17.38	7.29	83.95	0.445	0.00	0.00
592.4	0.00	100.00	15.17	8.35	76.66	0.389	0.00	0.00
517.2	0.00	100.00	13.25	8.53	68.31	0.339	0.00	0.00
451.6	0.00	100.00	11.56	8.12	59.78	0.296	0.00	0.00
394.2	0.00	100.00	10.10	7.30	51.66	0.259	0.00	0.00
344.2	0.00	100.00	8.816	6.36	44.36	0.226	0.00	0.00
300.5	0.00	100.00	7.697	5.44	38.00	0.197	0.00	0.00
262.4	0.00	100.00	6.720	4.78	32.56	0.172	0.00	0.00
229.1	0.00	100.00	5.867	4.11	27.78	0.150	0.00	0.00
200.0	0.00	100.00	5.122	3.64	23.67	0.131	0.00	0.00
174.6	0.00	100.00	4.472	3.34	20.03	0.115	0.00	0.00
152.5	0.00	100.00	3.905	3.10	16.69	0.100	0.00	0.00
133.1	0.00	100.00	3.409	2.84	13.59	0.087	0.00	0.00
116.2	0.00	100.00	2.976	2.51	10.75	0.076	0.00	0.00
101.5	0.00	100.00	2.599	2.10	8.23	0.067	0.00	0.00
88.58	0.00	100.00	2.269	1.73	6.13	0.058	0.00	0.00
77.34	0.00	100.00	1.981	1.41	4.40	0.051	0.00	0.00
67.52	0.00	100.00	1.729	1.14	2.98	0.044	0.00	0.00
58.95	0.00	100.00	1.510	0.83	1.84	0.039	0.00	0.00
51.47	0.00	100.00	1.318	0.55	1.02	0.034	0.00	0.00
44.94	0.00	100.00	1.151	0.32	0.47	0.029	0.00	0.00
39.23	0.00	100.00	1.005	0.15	0.15	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/27/01
File Name: AZ102926.DAT Sample Name: az102 ID No: 01/09/26-993
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 88.025 % Lamp: 88.256 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Lot No: 1653 Test No: dup

WSC 10/3/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.962	0.10	0.10	(15)	10.701	5.00	55.00
(2)	1.314	0.90	1.00	(16)	11.608	5.00	60.00
(3)	1.598	1.30	2.30	(17)	12.593	5.00	65.00
(4)	2.081	2.70	5.00	(18)	13.635	5.00	70.00
(5)	2.864	5.00	10.00	(19)	14.789	5.00	75.00
(6)	3.634	5.00	15.00	(20)	16.183	5.00	80.00
(7)	3.762	0.80	15.80	(21)	17.471	4.20	84.20
(8)	4.467	4.20	20.00	(22)	17.768	0.80	85.00
(9)	5.363	5.00	25.00	(23)	19.620	5.00	90.00
(10)	6.263	5.00	30.00	(24)	22.649	5.00	95.00
(11)	7.158	5.00	35.00	(25)	25.161	2.70	97.70
(12)	8.049	5.00	40.00	(26)	27.175	1.30	99.00
(13)	8.928	5.00	45.00	(27)	32.220	0.90	99.90
(14)	9.806	5.00	50.00				

Median : 9.790 (μm) Mean: 10.610 (μm) Mode: 12.377 (μm)
Std. Dev.: 6.365 (μm) Span: 0.804
Coef. Var: 59.99% Spec. Area: 9541 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/27/'01 10:40

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926-994 17:30
Filename : AZ102927
Sample : az102

Material :
Source :
Lot Numbe : 1653

Condition
T%(He-Ne): 87.7% Dist.Form: Std. Sampling times : 100
(LAMP): 88.2% R.R.Index: 1.16-0.00i ( )

Agitation : 3 Circultn : 6 U.sonic : ~~ON~~ OFF (120)

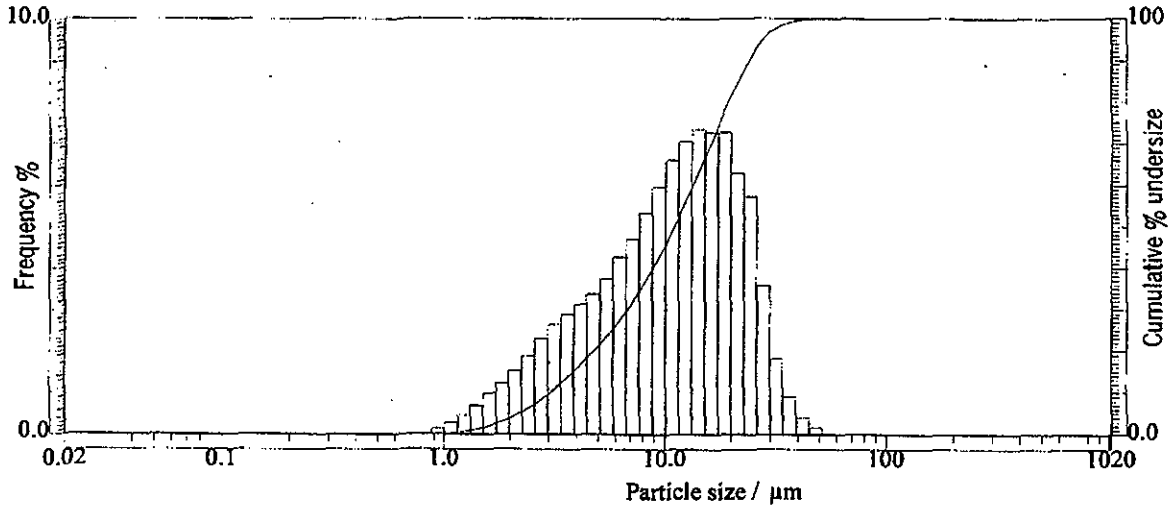
WJC 10/3/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 11.052μm SP.Area : 8721cm²/cm³ S.D. : 8.296μm
Mode : 14.204μm Mean : 12.554μm
C.V. : 66.09%

Span : (D 10.0-D 90.0) / D50 = 1.916

Dia. on %(5.0%) :	2.208μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	5.801μm	% on Dia.(1.000μm) :	0.1%
Dia. on %(50.0%) :	11.052μm	% on Dia.(10.000μm) :	45.2%
Dia. on %(75.0%) :	17.751μm	% on Dia.(100.000μm) :	100.0%
Dia. on %(95.0%) :	28.023μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	5.72	93.14	0.669	0.00	0.00
890.1	0.00	100.00	22.80	6.30	87.42	0.584	0.00	0.00
777.1	0.00	100.00	19.90	7.26	81.12	0.510	0.00	0.00
678.5	0.00	100.00	17.38	7.26	73.86	0.445	0.00	0.00
592.4	0.00	100.00	15.17	7.35	66.60	0.389	0.00	0.00
517.2	0.00	100.00	13.25	7.05	59.25	0.339	0.00	0.00
451.6	0.00	100.00	11.56	6.59	52.20	0.296	0.00	0.00
394.2	0.00	100.00	10.10	5.98	45.61	0.259	0.00	0.00
344.2	0.00	100.00	8.816	5.34	39.64	0.226	0.00	0.00
300.5	0.00	100.00	7.697	4.71	34.30	0.197	0.00	0.00
262.4	0.00	100.00	6.720	4.27	29.59	0.172	0.00	0.00
229.1	0.00	100.00	5.867	3.76	25.31	0.150	0.00	0.00
200.0	0.00	100.00	5.122	3.39	21.56	0.131	0.00	0.00
174.6	0.00	100.00	4.472	3.14	18.17	0.115	0.00	0.00
152.5	0.00	100.00	3.905	2.90	15.03	0.100	0.00	0.00
133.1	0.00	100.00	3.409	2.64	12.13	0.087	0.00	0.00
116.2	0.00	100.00	2.976	2.30	9.49	0.076	0.00	0.00
101.5	0.00	100.00	2.599	1.89	7.19	0.067	0.00	0.00
88.58	0.00	100.00	2.269	1.53	5.30	0.058	0.00	0.00
77.34	0.00	100.00	1.981	1.22	3.78	0.051	0.00	0.00
67.52	0.00	100.00	1.729	0.98	2.55	0.044	0.00	0.00
58.95	0.00	100.00	1.510	0.70	1.58	0.039	0.00	0.00
51.47	0.17	100.00	1.318	0.47	0.87	0.034	0.00	0.00
44.94	0.41	99.83	1.151	0.27	0.41	0.029	0.00	0.00
39.23	0.90	99.42	1.005	0.13	0.13	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/27/01
File Name: AZ102927.DAT Sample Name: az102 ID No: 01/09/26-994
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 87.699 % Lamp: 88.170 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min) WJC 10/3/01
Lot No: 1653 Test No: dup

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.973	0.10	0.10	(15)	12.232	5.00	55.00
(2)	1.353	0.90	1.00	(16)	13.442	5.00	60.00
(3)	1.673	1.30	2.30	(17)	14.752	5.00	65.00
(4)	2.212	2.70	5.00	(18)	16.205	5.00	70.00
(5)	3.060	5.00	10.00	(19)	17.774	5.00	75.00
(6)	3.900	5.00	15.00	(20)	19.513	5.00	80.00
(7)	4.044	0.80	15.80	(21)	21.318	4.20	84.20
(8)	4.824	4.20	20.00	(22)	21.686	0.80	85.00
(9)	5.805	5.00	25.00	(23)	24.292	5.00	90.00
(10)	6.806	5.00	30.00	(24)	28.087	5.00	95.00
(11)	7.844	5.00	35.00	(25)	32.286	2.70	97.70
(12)	8.893	5.00	40.00	(26)	36.919	1.30	99.00
(13)	9.966	5.00	45.00	(27)	47.549	0.90	99.90
(14)	11.074	5.00	50.00				

Median : 11.052 (μm) Mean: 12.554 (μm) Mode: 14.176 (μm)
Std. Dev.: 8.296 (μm) Span: 0.929
Coef. Var: 66.09% Spec. Area: 8721 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/27/'01 10:41

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926-995 17:35
Filename : AZ102928
Sample : az102

Material :
Source :
Lot Numbe : 1653

Condition
T%(He-Ne): 85.2% Dist.Form: Std. Sampling times : 100
(LAMP): 83.7% R.R.Index: 1.16-0.00i ( )

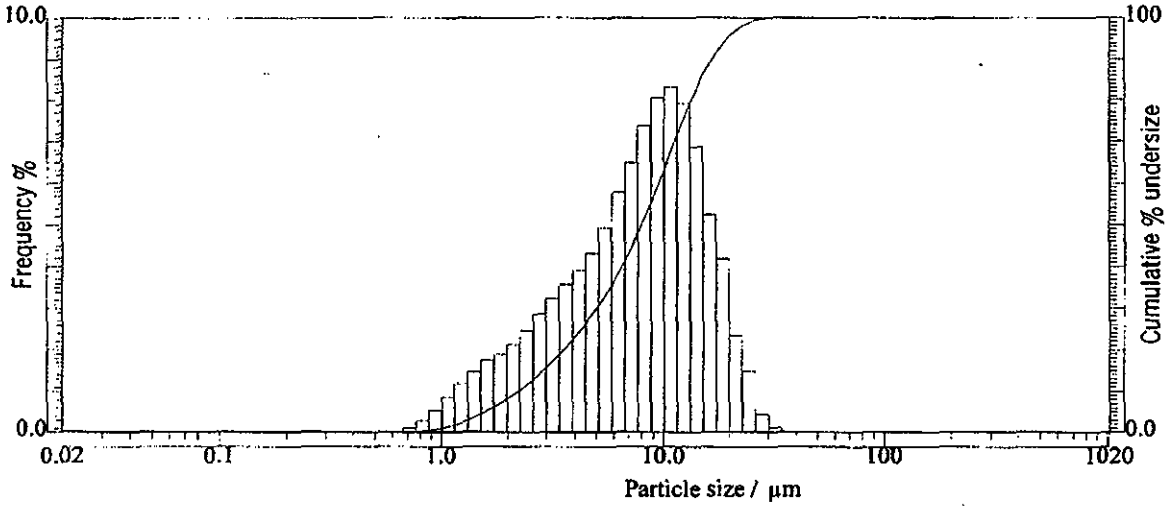
Agitation : 3 Circultn : 6 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 8.033μm SP.Area : 11947cm²/cm³ S.D. : 5.626μm
Mode : 10.794μm Mean : 8.865μm
C.V. : 63.47%

Span : (D 10.0-D 90.0) / D50 = 1.804

Dia. on %(5.0%) :	1.579μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	4.291μm	% on Dia.(1.000μm) :	0.9%
Dia. on %(50.0%) :	8.033μm	% on Dia.(10.000μm) :	62.5%
Dia. on %(75.0%) :	12.294μm	% on Dia.(100.000μm) :	100.0%
Dia. on %(95.0%) :	19.496μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.47	99.45	0.669	0.00	0.00
890.1	0.00	100.00	22.80	2.34	97.98	0.584	0.00	0.00
777.1	0.00	100.00	19.90	4.19	95.64	0.510	0.00	0.00
678.5	0.00	100.00	17.38	5.24	91.45	0.445	0.00	0.00
592.4	0.00	100.00	15.17	6.86	86.21	0.389	0.00	0.00
517.2	0.00	100.00	13.25	7.92	79.35	0.339	0.00	0.00
451.6	0.00	100.00	11.56	8.33	71.44	0.296	0.00	0.00
394.2	0.00	100.00	10.10	8.05	63.11	0.259	0.00	0.00
344.2	0.00	100.00	8.816	7.38	55.06	0.226	0.00	0.00
300.5	0.00	100.00	7.697	6.48	47.68	0.197	0.00	0.00
262.4	0.00	100.00	6.720	5.77	41.19	0.172	0.00	0.00
229.1	0.00	100.00	5.867	4.93	35.43	0.150	0.00	0.00
200.0	0.00	100.00	5.122	4.31	30.50	0.131	0.00	0.00
174.6	0.00	100.00	4.472	3.91	26.19	0.115	0.00	0.00
152.5	0.00	100.00	3.905	3.57	22.28	0.100	0.00	0.00
133.1	0.00	100.00	3.409	3.23	18.71	0.087	0.00	0.00
116.2	0.00	100.00	2.976	2.85	15.49	0.076	0.00	0.00
101.5	0.00	100.00	2.599	2.47	12.63	0.067	0.00	0.00
88.58	0.00	100.00	2.269	2.12	10.17	0.058	0.00	0.00
77.34	0.00	100.00	1.981	1.89	8.05	0.051	0.00	0.00
67.52	0.00	100.00	1.729	1.74	6.16	0.044	0.00	0.00
58.95	0.00	100.00	1.510	1.46	4.42	0.039	0.00	0.00
51.47	0.00	100.00	1.318	1.19	2.96	0.034	0.00	0.00
44.94	0.00	100.00	1.151	0.86	1.77	0.029	0.00	0.00
39.23	0.00	100.00	1.005	0.53	0.91	0.026	0.00	0.00

HORIBA LA-910
PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/27/01
File Name: AZ102928.DAT Sample Name: az102 ID No: 01/09/26-995
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 85.229 % Lamp: 83.660 %
Circulation: 6 Agitation: 3 U.Sonic ** (min)
Lot No: 1653 Test No: dup

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.761	0.10	0.10	(15)	8.807	5.00	55.00
(2)	1.020	0.90	1.00	(16)	9.602	5.00	60.00
(3)	1.225	1.30	2.30	(17)	10.430	5.00	65.00
(4)	1.583	2.70	5.00	(18)	11.312	5.00	70.00
(5)	2.246	5.00	10.00	(19)	12.322	5.00	75.00
(6)	2.912	5.00	15.00	(20)	13.428	5.00	80.00
(7)	3.018	0.80	15.80	(21)	14.607	4.20	84.20
(8)	3.588	4.20	20.00	(22)	14.831	0.80	85.00
(9)	4.300	5.00	25.00	(23)	16.766	5.00	90.00
(10)	5.046	5.00	30.00	(24)	19.518	5.00	95.00
(11)	5.802	5.00	35.00	(25)	22.449	2.70	97.70
(12)	6.543	5.00	40.00	(26)	25.094	1.30	99.00
(13)	7.293	5.00	45.00	(27)	30.183	0.90	99.90
(14)	8.049	5.00	50.00				

Median : 8.033 (μm) Mean: 8.865 (μm) Mode: 10.806 (μm)
Std. Dev.: 5.626 (μm) Span: 0.897
Coef. Var: 63.47% Spec. Area: 11947 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/27/'01 10:41

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926-996 17:38
Filename : AZ102929
Sample : az102

Material :
Source :
Lot Numbe : 1653

Condition
T%(He-Ne): 85.3% Dist.Form: Std. Sampling times : 100
(LAMP): 83.9% R.R.Index: 1.16-0.00i ( )

Agitation : 1 Circultn : 6 U.sonic : ~~ON~~ OFF (120)

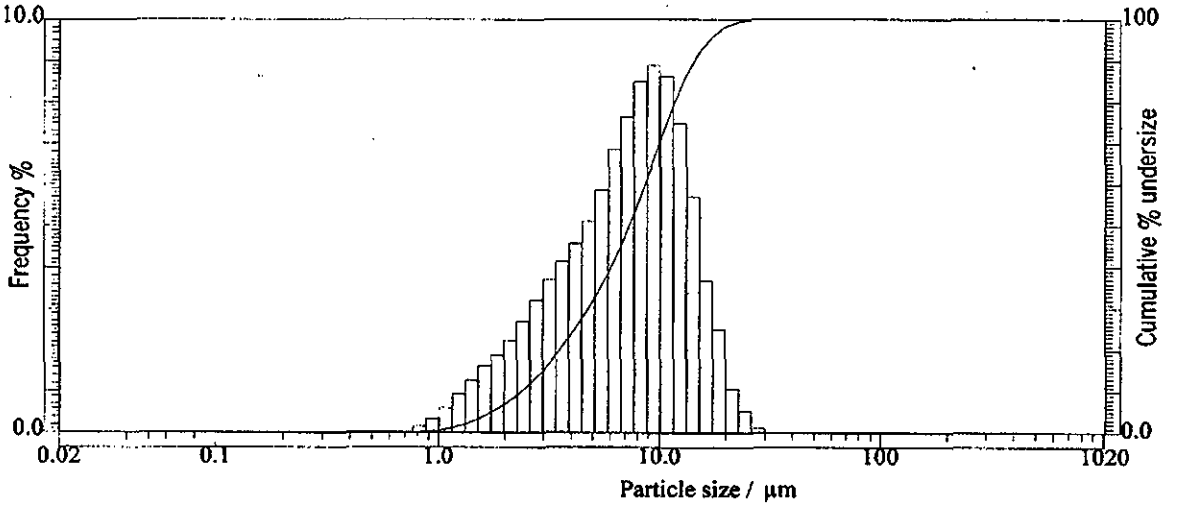
WSC 10/3/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 7.306μm SP.Area : 12032cm²/cm³ S.D. : 4.728μm
Mode : 9.444μm Mean : 7.963μm
C.V. : 59.38%

Span : (D 10.0-D 90.0) / D50 = 1.649

Dia. on %(5.0%) :	1.736μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	4.160μm	% on Dia.(1.000μm) :	0.5%
Dia. on %(50.0%) :	7.306μm	% on Dia.(10.000μm) :	69.7%
Dia. on %(75.0%) :	10.867μm	% on Dia.(100.000μm) :	100.0%
Dia. on %(95.0%) :	16.873μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.53	99.90	0.669	0.00	0.00
890.1	0.00	100.00	22.80	1.07	99.37	0.584	0.00	0.00
777.1	0.00	100.00	19.90	2.50	98.30	0.510	0.00	0.00
678.5	0.00	100.00	17.38	3.67	95.80	0.445	0.00	0.00
592.4	0.00	100.00	15.17	5.70	92.13	0.389	0.00	0.00
517.2	0.00	100.00	13.25	7.48	86.43	0.339	0.00	0.00
451.6	0.00	100.00	11.56	8.63	78.96	0.296	0.00	0.00
394.2	0.00	100.00	10.10	8.90	70.33	0.259	0.00	0.00
344.2	0.00	100.00	8.816	8.49	61.43	0.226	0.00	0.00
300.5	0.00	100.00	7.697	7.64	52.94	0.197	0.00	0.00
262.4	0.00	100.00	6.720	6.86	45.29	0.172	0.00	0.00
229.1	0.00	100.00	5.867	5.87	38.44	0.150	0.00	0.00
200.0	0.00	100.00	5.122	5.12	32.57	0.131	0.00	0.00
174.6	0.00	100.00	4.472	4.59	27.45	0.115	0.00	0.00
152.5	0.00	100.00	3.905	4.14	22.86	0.100	0.00	0.00
133.1	0.00	100.00	3.409	3.70	18.72	0.087	0.00	0.00
116.2	0.00	100.00	2.976	3.22	15.02	0.076	0.00	0.00
101.5	0.00	100.00	2.599	2.70	11.80	0.067	0.00	0.00
88.58	0.00	100.00	2.269	2.25	9.10	0.058	0.00	0.00
77.34	0.00	100.00	1.981	1.90	6.85	0.051	0.00	0.00
67.52	0.00	100.00	1.729	1.64	4.95	0.044	0.00	0.00
58.95	0.00	100.00	1.510	1.27	3.31	0.039	0.00	0.00
51.47	0.00	100.00	1.318	0.94	2.04	0.034	0.00	0.00
44.94	0.00	100.00	1.151	0.61	1.10	0.029	0.00	0.00
39.23	0.00	100.00	1.005	0.34	0.49	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/27/01
File Name: AZ102929.DAT Sample Name: az102 ID No: 01/09/26-996
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 85.301 % Lamp: 83.855 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Lot No: 1653 Test No: dup

WSC 10/3/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.840	0.10	0.10	(15)	7.969	5.00	55.00
(2)	1.127	0.90	1.00	(16)	8.627	5.00	60.00
(3)	1.357	1.30	2.30	(17)	9.330	5.00	65.00
(4)	1.736	2.70	5.00	(18)	10.050	5.00	70.00
(5)	2.379	5.00	10.00	(19)	10.892	5.00	75.00
(6)	2.974	5.00	15.00	(20)	11.799	5.00	80.00
(7)	3.068	0.80	15.80	(21)	12.744	4.20	84.20
(8)	3.562	4.20	20.00	(22)	12.924	0.80	85.00
(9)	4.170	5.00	25.00	(23)	14.452	5.00	90.00
(10)	4.796	5.00	30.00	(24)	16.899	5.00	95.00
(11)	5.431	5.00	35.00	(25)	19.298	2.70	97.70
(12)	6.061	5.00	40.00	(26)	21.797	1.30	99.00
(13)	6.683	5.00	45.00	(27)	26.218	0.90	99.90
(14)	7.321	5.00	50.00				

Median : 7.306 (μm) Mean: 7.963 (μm) Mode: 9.435 (μm)
Std. Dev.: 4.728 (μm) Span: 0.822
Coef. Var: 59.38% Spec. Area: 12032 (cm2/cm3)

APPENDIX F-9

TANK C-107 COMPOSITE: PSD MEASUREMENT RESULTS

Consisting of 34 pages including this cover page

TABLE F-9. Sample identification and PSD run conditions. PSD measurements on analytical specimens taken from C-107 composite S01T001673.

Conditions Key: P = Pump Speed Setting; P6 = 14.4 mL/s
S = Stirrer Speed Setting (1-7); S1 = Stirrer Speed 1; S3 = Stirrer Speed 3
US = Ultrasonic ON Time (min); DT = Delay Time (min) between end of ultrasonic treatment and PSD measurement.
Time = Clock time at beginning of measurement.

Sample	PSD Run File Name	Run Conditions				Time	Cumulative Time (min) At Conditions				
		P	S	US	DT		P6	S1	S3	US	DT
S01T001673	[LOAD-IN]	6	1	0	0	?	?	?			
	C107930	6	1	0	0	19:15	5	5			
	C107931	6	3	0	0	19:20	8	5	3		
	C107932	6	3	2	0	19:23	13	5	8	2	0
	C107933	6	1	0	0	19:28	17	9	8	2	3
						19:32					
S01T001673	[LOAD-IN]	6	1	0	0	?	?	?			
	C107934	6	1	0	0	19:36	7	7			
	C107935	6	3	0	0	19:43	10	7	3		
	C107936	6	3	2	0	19:46	14	7	7	2	0
	C107937	6	1	0	0	19:50	19	12	7	2	2
						19:55					
S01T001673	[LOAD-IN]	6	1	0	0	?	?	?			
	C107938	6	1	0	0	20:02	4	4			
	C107939	6	3	0	0	20:06	8	4	4		
	C107940	6	3	2	0	20:10	14	4	10	2	0
	C107941	6	1	0	0	20:16	16	6	10	2	4
						20:18					
S01T001673	[LOAD-IN]	6	1	0	0	?	?	?			
	C107942	6	1	0	0	20:25	4	4			
	C107943	6	3	0	0	20:29	7	4	3		
	C107944	6	3	2	0	20:32	13	4	9	2	0
	C107945	6	1	0	0	20:38	15	6	9	2	4
						20:40					

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/27/'01 16:09

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926-997 19:18
Filename : C107930
Sample : C107 comp

Material :
Source :
Lot Numbe : ~~1674~~ 1673

Condition
T%(He-Ne): 86.8% Dist.Form: Std. Sampling times : 100
(LAMP): 86.2% R.R.Index: 1.16-0.00i ( )

Agitation : 1 Circultn : 6 U.sonic : ~~ON~~ OFF (120)

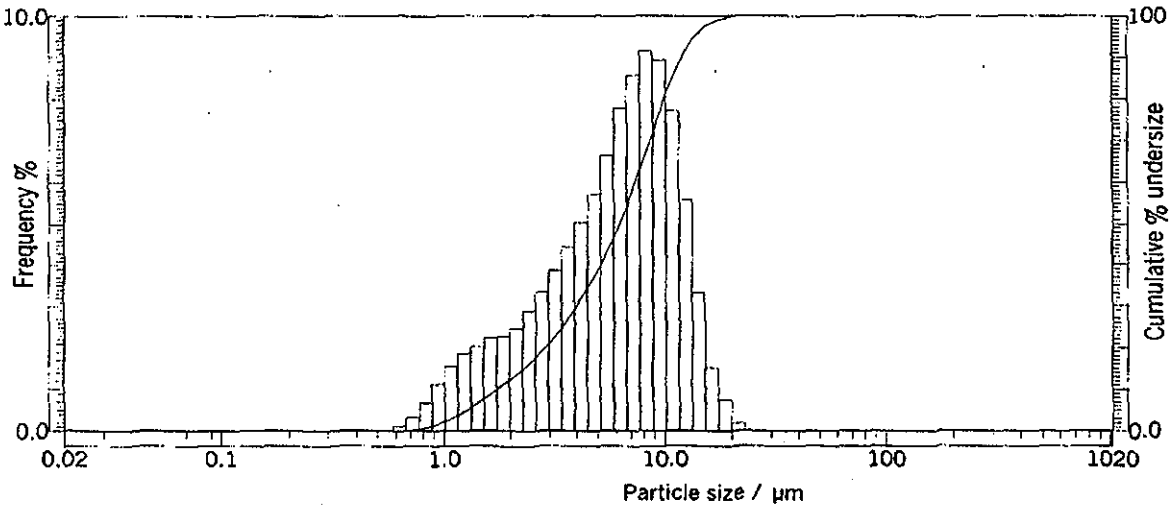
WSQ 10/4/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 6.234μm SP.Area : 15137cm²/cm³ S.D. : 3.905μm
Mode : 8.260μm Mean : 6.633μm
C.V. : 58.87%

Span : (D 10.0-D 90.0) / D50 = 1.638

Dia. on %(5.0%) :	1.260μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	3.443μm	% on Dia.(1.000μm) :	2.2%
Dia. on %(50.0%) :	6.234μm	% on Dia.(10.000μm) :	80.3%
Dia. on %(75.0%) :	9.226μm	% on Dia.(100.000μm) :	100.0%
Dia. on %(95.0%) :	13.667μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	100.00	0.669	0.12	0.12
890.1	0.00	100.00	22.80	0.18	100.00	0.584	0.00	0.00
777.1	0.00	100.00	19.90	0.75	99.82	0.510	0.00	0.00
678.5	0.00	100.00	17.38	1.52	99.06	0.445	0.00	0.00
592.4	0.00	100.00	15.17	3.31	97.55	0.389	0.00	0.00
517.2	0.00	100.00	13.25	5.60	94.24	0.339	0.00	0.00
451.6	0.00	100.00	11.56	7.71	88.64	0.296	0.00	0.00
394.2	0.00	100.00	10.10	8.92	80.93	0.259	0.00	0.00
344.2	0.00	100.00	8.816	9.15	72.01	0.226	0.00	0.00
300.5	0.00	100.00	7.697	8.56	62.86	0.197	0.00	0.00
262.4	0.00	100.00	6.720	7.79	54.31	0.172	0.00	0.00
229.1	0.00	100.00	5.867	6.65	46.51	0.150	0.00	0.00
200.0	0.00	100.00	5.122	5.72	39.87	0.131	0.00	0.00
174.6	0.00	100.00	4.472	5.04	34.15	0.115	0.00	0.00
152.5	0.00	100.00	3.905	4.44	29.11	0.100	0.00	0.00
133.1	0.00	100.00	3.409	3.86	24.67	0.087	0.00	0.00
116.2	0.00	100.00	2.976	3.33	20.81	0.076	0.00	0.00
101.5	0.00	100.00	2.599	2.87	17.48	0.067	0.00	0.00
88.58	0.00	100.00	2.269	2.47	14.61	0.058	0.00	0.00
77.34	0.00	100.00	1.981	2.27	12.14	0.051	0.00	0.00
67.52	0.00	100.00	1.729	2.23	9.87	0.044	0.00	0.00
58.95	0.00	100.00	1.510	2.03	7.64	0.039	0.00	0.00
51.47	0.00	100.00	1.318	1.86	5.61	0.034	0.00	0.00
44.94	0.00	100.00	1.151	1.54	3.76	0.029	0.00	0.00
39.23	0.00	100.00	1.005	1.12	2.22	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/27/01

File Name: C107930.DAT Sample Name: C107 comp ID No: 01/09/26-997

Dist. Form: STANDARD R.R. Index: 116-000

Dist. Mode: VOLUME Laser: 86.803 % Lamp: 86.169 %

Circulation: 6 Agitation: 1 U.Sonic OFF (min)

Lot No: ~~1674~~ 1673 Test No:

WJC 10/4/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.655	0.10	0.10	(15)	6.799	5.00	55.00
(2)	0.861	0.90	1.00	(16)	7.370	5.00	60.00
(3)	1.013	1.30	2.30	(17)	7.958	5.00	65.00
(4)	1.263	2.70	5.00	(18)	8.570	5.00	70.00
(5)	1.744	5.00	10.00	(19)	9.245	5.00	75.00
(6)	2.314	5.00	15.00	(20)	9.963	5.00	80.00
(7)	2.406	0.80	15.80	(21)	10.719	4.20	84.20
(8)	2.885	4.20	20.00	(22)	10.872	0.80	85.00
(9)	3.446	5.00	25.00	(23)	11.973	5.00	90.00
(10)	4.004	5.00	30.00	(24)	13.690	5.00	95.00
(11)	4.569	5.00	35.00	(25)	15.392	2.70	97.70
(12)	5.137	5.00	40.00	(26)	17.284	1.30	99.00
(13)	5.698	5.00	45.00	(27)	21.208	0.90	99.90
(14)	6.249	5.00	50.00				

Median : 6.234 (μm) Mean: 6.633 (μm) Mode: 8.237 (μm)

Std. Dev.: 3.905 (μm) Span: 0.712

Coef. Var: 58.87% Spec. Area: 15137 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/27/'01 16:10

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926-998 19:23
Filename : C107931
Sample : C107 comp

Material :
Source :
Lot Numbe : ~~1674~~ 1673

Condition
T%(He-Ne): 86.2%
(LAMP): 86.0%

Dist.Form: Std.
R.R.Index: 1.16-0.00i

Sampling times : 100
( )

Agitation : 3
Circultn : 6
U.sonic : ~~ON~~ OFF (120)

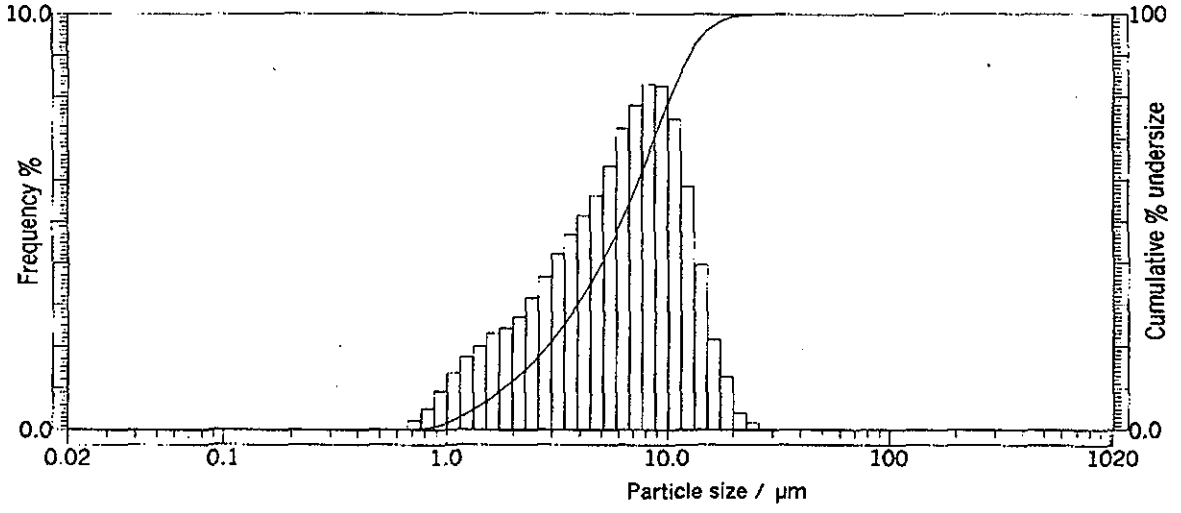
WSC. 10/4/01

Format
Dist.base : Volume
Scaling : Auto
Axis : LogX · LinearY

Data
Median : 6.194μm
SP.Area : 14789cm²/cm³
S.D. : 4.226μm
Mode : 8.268μm
Mean : 6.822μm
C.V. : 61.94%

Span : (D 10.0-D 90.0) / D50 = 1.745

Dia. on %(5.0%) :	1.338μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	3.382μm	% on Dia.(1.000μm) :	1.7%
Dia. on %(50.0%) :	6.194μm	% on Dia.(10.000μm) :	78.1%
Dia. on %(75.0%) :	9.500μm	% on Dia.(100.000μm) :	100.0%
Dia. on %(95.0%) :	14.651μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.16	100.00	0.669	0.00	0.00
890.1	0.00	100.00	22.80	0.41	99.84	0.584	0.00	0.00
777.1	0.00	100.00	19.90	1.26	99.43	0.510	0.00	0.00
678.5	0.00	100.00	17.38	2.15	98.17	0.445	0.00	0.00
592.4	0.00	100.00	15.17	3.95	96.02	0.389	0.00	0.00
517.2	0.00	100.00	13.25	5.88	92.07	0.339	0.00	0.00
451.6	0.00	100.00	11.56	7.47	86.18	0.296	0.00	0.00
394.2	0.00	100.00	10.10	8.26	78.71	0.259	0.00	0.00
344.2	0.00	100.00	8.816	8.31	70.45	0.226	0.00	0.00
300.5	0.00	100.00	7.697	7.80	62.14	0.197	0.00	0.00
262.4	0.00	100.00	6.720	7.24	54.34	0.172	0.00	0.00
229.1	0.00	100.00	5.867	6.35	47.10	0.150	0.00	0.00
200.0	0.00	100.00	5.122	5.65	40.75	0.131	0.00	0.00
174.6	0.00	100.00	4.472	5.16	35.10	0.115	0.00	0.00
152.5	0.00	100.00	3.905	4.70	29.94	0.100	0.00	0.00
133.1	0.00	100.00	3.409	4.21	25.25	0.087	0.00	0.00
116.2	0.00	100.00	2.976	3.68	21.04	0.076	0.00	0.00
101.5	0.00	100.00	2.599	3.17	17.36	0.067	0.00	0.00
88.58	0.00	100.00	2.269	2.70	14.19	0.058	0.00	0.00
77.34	0.00	100.00	1.981	2.42	11.49	0.051	0.00	0.00
67.52	0.00	100.00	1.729	2.29	9.07	0.044	0.00	0.00
58.95	0.00	100.00	1.510	2.00	6.77	0.039	0.00	0.00
51.47	0.00	100.00	1.318	1.73	4.78	0.034	0.00	0.00
44.94	0.00	100.00	1.151	1.36	3.05	0.029	0.00	0.00
39.23	0.00	100.00	1.005	0.93	1.69	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/27/01
File Name: C107931.DAT Sample Name: C107 comp ID No: 01/09/26-998
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 86.168 % Lamp: 85.994 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Lot No: ~~1674~~ 1673 Test No:

WSC. 10/4/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.710	0.10	0.10	(15)	6.802	5.00	55.00
(2)	0.910	0.90	1.00	(16)	7.429	5.00	60.00
(3)	1.071	1.30	2.30	(17)	8.082	5.00	65.00
(4)	1.339	2.70	5.00	(18)	8.755	5.00	70.00
(5)	1.826	5.00	10.00	(19)	9.521	5.00	75.00
(6)	2.353	5.00	15.00	(20)	10.350	5.00	80.00
(7)	2.436	0.80	15.80	(21)	11.175	4.20	84.20
(8)	2.869	4.20	20.00	(22)	11.332	0.80	85.00
(9)	3.383	5.00	25.00	(23)	12.655	5.00	90.00
(10)	3.911	5.00	30.00	(24)	14.676	5.00	95.00
(11)	4.461	5.00	35.00	(25)	16.900	2.70	97.70
(12)	5.036	5.00	40.00	(26)	19.046	1.30	99.00
(13)	5.620	5.00	45.00	(27)	24.062	0.90	99.90
(14)	6.208	5.00	50.00				

Median : 6.194 (μm) Mean: 6.822 (μm) Mode: 8.237 (μm)
Std. Dev.: 4.226 (μm) Span: 0.832
Coef. Var: 61.94% Spec. Area: 14789 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/27/'01 16:10

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926-999 19:28
Filename : C107932
Sample : C107 comp

Material :
Source :
Lot Numbe : ~~1674~~ 1473

WSR 10/4/01

Condition
T%(He-Ne): 86.2% Dist.Form: Std. Sampling times : 100
(LAMP): 83.5% R.R.Index: 1.16-0.00i ( )

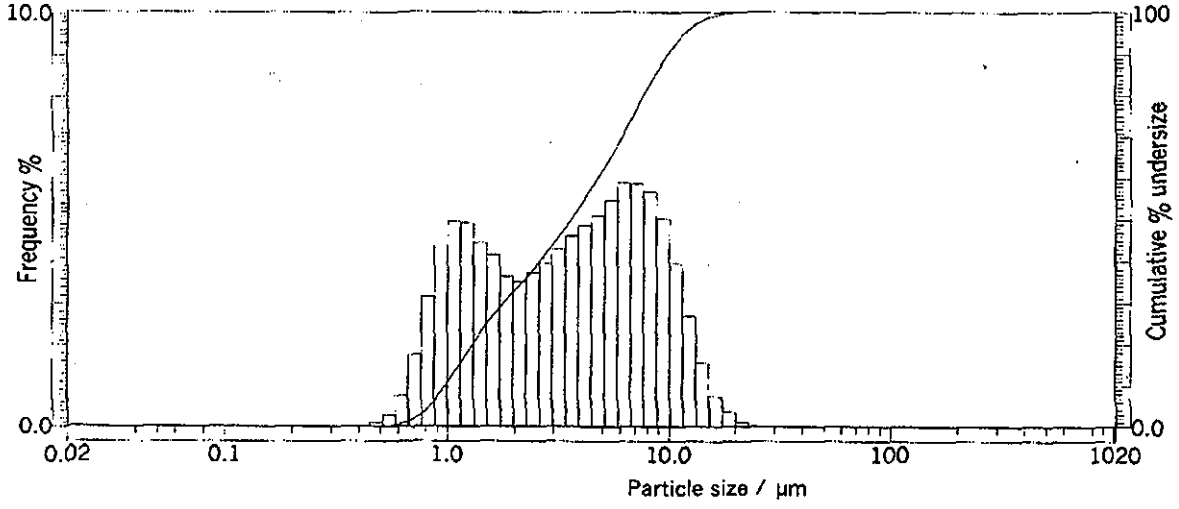
Agitation : 3 Circultn : 6 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 3.607μm SP.Area : 26055cm²/cm³ S.D. : 3.679μm
Mode : 6.308μm Mean : 4.650μm
C.V. : 79.11%

Span : (D 10.0-D 90.0) / D50 = 2.481

Dia. on %(5.0%) : 0.838μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 1.522μm % on Dia.(1.000μm) : 10.3%
Dia. on %(50.0%) : 3.607μm % on Dia.(10.000μm) : 90.2%
Dia. on %(75.0%) : 6.874μm % on Dia.(100.000μm) : 100.0%
Dia. on %(95.0%) : 11.831μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	100.00	0.669	0.77	1.16
890.1	0.00	100.00	22.80	0.11	100.00	0.584	0.29	0.39
777.1	0.00	100.00	19.90	0.36	99.89	0.510	0.11	0.11
678.5	0.00	100.00	17.38	0.74	99.53	0.445	0.00	0.00
592.4	0.00	100.00	15.17	1.55	98.79	0.389	0.00	0.00
517.2	0.00	100.00	13.25	2.69	97.24	0.339	0.00	0.00
451.6	0.00	100.00	11.56	3.97	94.55	0.296	0.00	0.00
394.2	0.00	100.00	10.10	5.02	90.58	0.259	0.00	0.00
344.2	0.00	100.00	8.816	5.68	85.57	0.226	0.00	0.00
300.5	0.00	100.00	7.697	5.87	79.88	0.197	0.00	0.00
262.4	0.00	100.00	6.720	5.89	74.02	0.172	0.00	0.00
229.1	0.00	100.00	5.867	5.47	68.13	0.150	0.00	0.00
200.0	0.00	100.00	5.122	5.10	62.66	0.131	0.00	0.00
174.6	0.00	100.00	4.472	4.86	57.56	0.115	0.00	0.00
152.5	0.00	100.00	3.905	4.61	52.70	0.100	0.00	0.00
133.1	0.00	100.00	3.409	4.30	48.08	0.087	0.00	0.00
116.2	0.00	100.00	2.976	3.97	43.78	0.076	0.00	0.00
101.5	0.00	100.00	2.599	3.73	39.81	0.067	0.00	0.00
88.58	0.00	100.00	2.269	3.52	36.08	0.058	0.00	0.00
77.34	0.00	100.00	1.981	3.64	32.56	0.051	0.00	0.00
67.52	0.00	100.00	1.729	4.16	28.92	0.044	0.00	0.00
58.95	0.00	100.00	1.510	4.45	24.76	0.039	0.00	0.00
51.47	0.00	100.00	1.318	4.92	20.31	0.034	0.00	0.00
44.94	0.00	100.00	1.151	4.96	15.39	0.029	0.00	0.00
39.23	0.00	100.00	1.005	4.37	10.43	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/27/01
File Name: C107932.DAT Sample Name: C107 comp ID No: 01/09/26-999
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 86.213 % Lamp: 83.500 %
Circulation: 6 Agitation: 3 U.Sonic ** (min)
Lot No: ~~1674~~ 1673 Test No:

WSR 10/4/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.506	0.10	0.10	(15)	4.173	5.00	55.00
(2)	0.651	0.90	1.00	(16)	4.783	5.00	60.00
(3)	0.732	1.30	2.30	(17)	5.441	5.00	65.00
(4)	0.840	2.70	5.00	(18)	6.138	5.00	70.00
(5)	0.992	5.00	10.00	(19)	6.884	5.00	75.00
(6)	1.139	5.00	15.00	(20)	7.719	5.00	80.00
(7)	1.165	0.80	15.80	(21)	8.546	4.20	84.20
(8)	1.308	4.20	20.00	(22)	8.704	0.80	85.00
(9)	1.523	5.00	25.00	(23)	9.948	5.00	90.00
(10)	1.804	5.00	30.00	(24)	11.847	5.00	95.00
(11)	2.180	5.00	35.00	(25)	13.819	2.70	97.70
(12)	2.616	5.00	40.00	(26)	15.794	1.30	99.00
(13)	3.099	5.00	45.00	(27)	20.144	0.90	99.90
(14)	3.615	5.00	50.00				

Median : 3.607 (μm) Mean: 4.650 (μm) Mode: 6.279 (μm)
Std. Dev.: 3.679 (μm) Span: 1.374
Coef. Var: 79.11% Spec. Area: 26055 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/27/'01 16:10

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926-000 19:32
Filename : C107933
Sample : C107 comp

Material :
Source :
Lot Numbe : ~~1674~~ 1673

Condition
T%(He-Ne): 86.3% Dist.Form: Std. Sampling times : 100
(LAMP): 83.8% R.R.Index: 1.16-0.00i ( )

Agitation : 1 Circultn : 6 U.sonic : ~~ON~~ OFF (120)

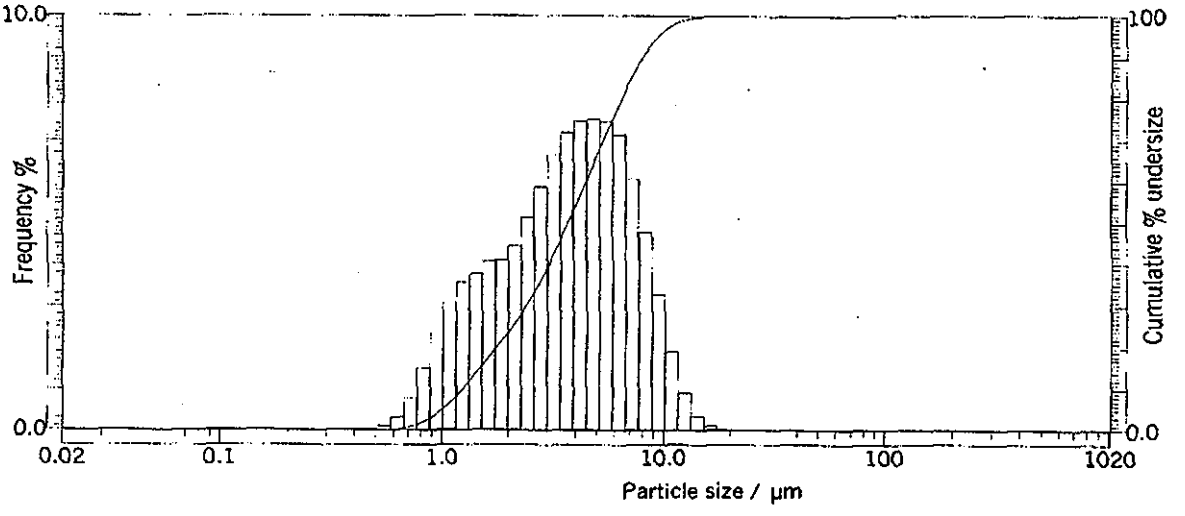
WJC 10/4/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 3.692μm SP.Area : 22565cm²/cm³ S.D. : 2.674μm
Mode : 4.785μm Mean : 4.227μm
C.V. : 63.26%

Span : (D 10.0-D 90.0) / D50 = 1.830

Dia. on %(5.0%) : 1.001μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 2.064μm % on Dia.(1.000μm) : 5.0%
Dia. on %(50.0%) : 3.692μm % on Dia.(10.000μm) : 96.5%
Dia. on %(75.0%) : 5.818μm % on Dia.(100.000μm) : 100.0%
Dia. on %(95.0%) : 9.397μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	100.00	0.669	0.32	0.43
890.1	0.00	100.00	22.80	0.00	100.00	0.584	0.12	0.12
777.1	0.00	100.00	19.90	0.00	100.00	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.10	100.00	0.445	0.00	0.00
592.4	0.00	100.00	15.17	0.35	99.90	0.389	0.00	0.00
517.2	0.00	100.00	13.25	0.91	99.55	0.339	0.00	0.00
451.6	0.00	100.00	11.56	1.91	98.64	0.296	0.00	0.00
394.2	0.00	100.00	10.10	3.28	96.74	0.259	0.00	0.00
344.2	0.00	100.00	8.816	4.78	93.46	0.226	0.00	0.00
300.5	0.00	100.00	7.697	6.08	88.67	0.197	0.00	0.00
262.4	0.00	100.00	6.720	7.14	82.60	0.172	0.00	0.00
229.1	0.00	100.00	5.867	7.46	75.46	0.150	0.00	0.00
200.0	0.00	100.00	5.122	7.53	67.99	0.131	0.00	0.00
174.6	0.00	100.00	4.472	7.49	60.46	0.115	0.00	0.00
152.5	0.00	100.00	3.905	7.19	52.97	0.100	0.00	0.00
133.1	0.00	100.00	3.409	6.66	45.78	0.087	0.00	0.00
116.2	0.00	100.00	2.976	5.89	39.12	0.076	0.00	0.00
101.5	0.00	100.00	2.599	5.14	33.23	0.067	0.00	0.00
88.58	0.00	100.00	2.269	4.45	28.09	0.058	0.00	0.00
77.34	0.00	100.00	1.981	4.10	23.64	0.051	0.00	0.00
67.52	0.00	100.00	1.729	4.08	19.54	0.044	0.00	0.00
58.95	0.00	100.00	1.510	3.76	15.46	0.039	0.00	0.00
51.47	0.00	100.00	1.318	3.56	11.69	0.034	0.00	0.00
44.94	0.00	100.00	1.151	3.08	8.14	0.029	0.00	0.00
39.23	0.00	100.00	1.005	2.35	5.06	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/27/01
File Name: C107933.DAT Sample Name: C107 comp ID No: 01/09/26-000
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 86.271 % Lamp: 83.751 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Lot No: ~~1674~~ 1673 Test No:

WSC 10/4/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.574	0.10	0.10	(15)	4.058	5.00	55.00
(2)	0.741	0.90	1.00	(16)	4.437	5.00	60.00
(3)	0.847	1.30	2.30	(17)	4.864	5.00	65.00
(4)	1.002	2.70	5.00	(18)	5.323	5.00	70.00
(5)	1.239	5.00	10.00	(19)	5.821	5.00	75.00
(6)	1.486	5.00	15.00	(20)	6.410	5.00	80.00
(7)	1.528	0.80	15.80	(21)	6.978	4.20	84.20
(8)	1.757	4.20	20.00	(22)	7.106	0.80	85.00
(9)	2.069	5.00	25.00	(23)	8.007	5.00	90.00
(10)	2.391	5.00	30.00	(24)	9.419	5.00	95.00
(11)	2.712	5.00	35.00	(25)	10.839	2.70	97.70
(12)	3.033	5.00	40.00	(26)	12.225	1.30	99.00
(13)	3.358	5.00	45.00	(27)	15.252	0.90	99.90
(14)	3.700	5.00	50.00				

Median : 3.692 (μm) Mean: 4.227 (μm) Mode: 4.786 (μm)
Std. Dev.: 2.674 (μm) Span: 0.969
Coef. Var: 63.26% Spec. Area: 22565 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/27/'01 16:10

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926-001 19:41
Filename : C107934
Sample : C107 comp

Material :
Source :
Lot Numbe : ~~1674~~ 1673

Condition
T%(He-Ne): 82.9% Dist.Form: Std. Sampling times : 100
(LAMP): 81.4% R.R.Index: 1.16-0.001i ( )

Agitation : 1 Circultn : 6 U.sonic : ~~ON~~ OFF (120)

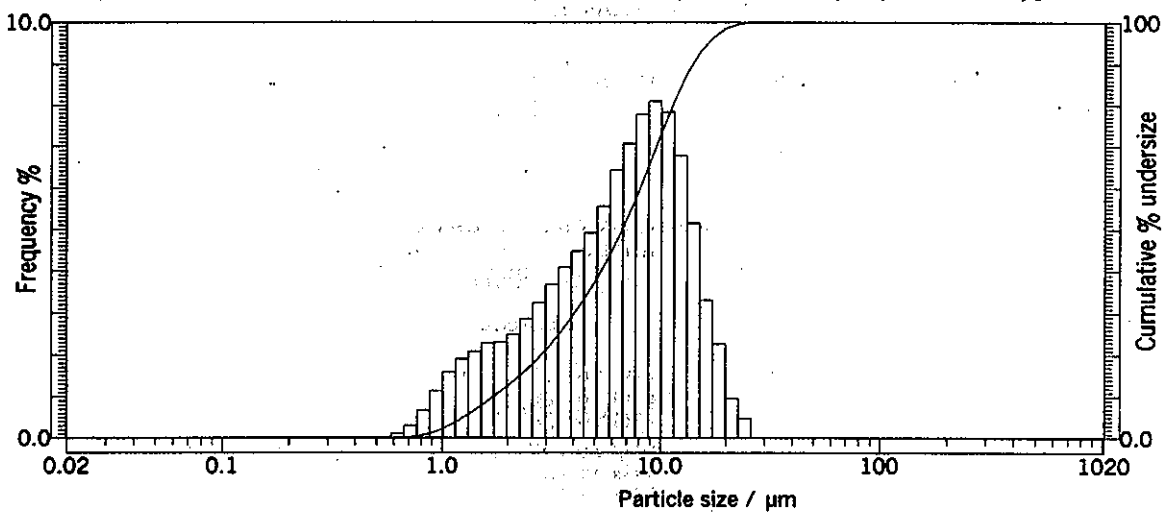
WJC 10/4/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 6.684μm SP.Area : 14774cm²/cm³ S.D. : 4.797μm
Mode : 9.439μm Mean : 7.393μm
C.V. : 64.89%

Span : (D 10.0-D 90.0) / D50 = 1.843

Dia. on %(5.0%) :	1.249μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	3.435μm	% on Dia.(1.000μm) :	2.2%
Dia. on %(50.0%) :	6.684μm	% on Dia.(10.000μm) :	72.6%
Dia. on %(75.0%) :	10.416μm	% on Dia.(100.000μm) :	100.0%
Dia. on %(95.0%) :	16.489μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.48	100.00	0.669	0.12	0.12
890.1	0.00	100.00	22.80	0.96	99.52	0.584	0.00	0.00
777.1	0.00	100.00	19.90	2.28	98.56	0.510	0.00	0.00
678.5	0.00	100.00	17.38	3.31	96.28	0.445	0.00	0.00
592.4	0.00	100.00	15.17	5.15	92.97	0.389	0.00	0.00
517.2	0.00	100.00	13.25	6.77	87.81	0.339	0.00	0.00
451.6	0.00	100.00	11.56	7.84	81.04	0.296	0.00	0.00
394.2	0.00	100.00	10.10	8.10	73.21	0.259	0.00	0.00
344.2	0.00	100.00	8.816	7.78	65.11	0.226	0.00	0.00
300.5	0.00	100.00	7.697	7.07	57.32	0.197	0.00	0.00
262.4	0.00	100.00	6.720	6.43	50.26	0.172	0.00	0.00
229.1	0.00	100.00	5.867	5.57	43.83	0.150	0.00	0.00
200.0	0.00	100.00	5.122	4.92	38.26	0.131	0.00	0.00
174.6	0.00	100.00	4.472	4.48	33.34	0.115	0.00	0.00
152.5	0.00	100.00	3.905	4.09	28.86	0.100	0.00	0.00
133.1	0.00	100.00	3.409	3.69	24.77	0.087	0.00	0.00
116.2	0.00	100.00	2.976	3.26	21.08	0.076	0.00	0.00
101.5	0.00	100.00	2.599	2.86	17.82	0.067	0.00	0.00
88.58	0.00	100.00	2.269	2.50	14.95	0.058	0.00	0.00
77.34	0.00	100.00	1.981	2.32	12.45	0.051	0.00	0.00
67.52	0.00	100.00	1.729	2.29	10.14	0.044	0.00	0.00
58.95	0.00	100.00	1.510	2.09	7.85	0.039	0.00	0.00
51.47	0.00	100.00	1.318	1.91	5.76	0.034	0.00	0.00
44.94	0.00	100.00	1.151	1.59	3.85	0.029	0.00	0.00
39.23	0.00	100.00	1.005	1.15	2.26	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/27/01
File Name: C107934.DAT Sample Name: C107 comp ID No: 01/09/26-001
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 82.937 % Lamp: 81.379 % WSC 10/4/01
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Lot No: ~~1674~~ 1673 Test No: ~~Dup~~

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.656	0.10	0.10	(15)	7.376	5.00	55.00
(2)	0.858	0.90	1.00	(16)	8.082	5.00	60.00
(3)	1.008	1.30	2.30	(17)	8.800	5.00	65.00
(4)	1.252	2.70	5.00	(18)	9.590	5.00	70.00
(5)	1.716	5.00	10.00	(19)	10.433	5.00	75.00
(6)	2.274	5.00	15.00	(20)	11.370	5.00	80.00
(7)	2.366	0.80	15.80	(21)	12.349	4.20	84.20
(8)	2.851	4.20	20.00	(22)	12.547	0.80	85.00
(9)	3.437	5.00	25.00	(23)	14.063	5.00	90.00
(10)	4.049	5.00	30.00	(24)	16.525	5.00	95.00
(11)	4.691	5.00	35.00	(25)	18.954	2.70	97.70
(12)	5.355	5.00	40.00	(26)	21.238	1.30	99.00
(13)	6.022	5.00	45.00	(27)	25.422	0.90	99.90
(14)	6.686	5.00	50.00				

Median : 6.684 (μm) Mean: 7.393 (μm) Mode: 9.435 (μm)
Std. Dev.: 4.797 (μm) Span: 0.909
Coef. Var: 64.89% Spec. Area: 14774 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/27/'01 16:10

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926-002 19:45
Filename : C107935
Sample : C107 comp

Material :
Source :
Lot Numbe : ~~1674~~ 1673

Condition
T%(He-Ne): 83.2% Dist.Form: Std. Sampling times : 100
(LAMP): 81.9% R.R.Index: 1.16-0.00i ( )

Agitation : 3 Circultn : 6 U.sonic : ~~ON~~ OFF(120)

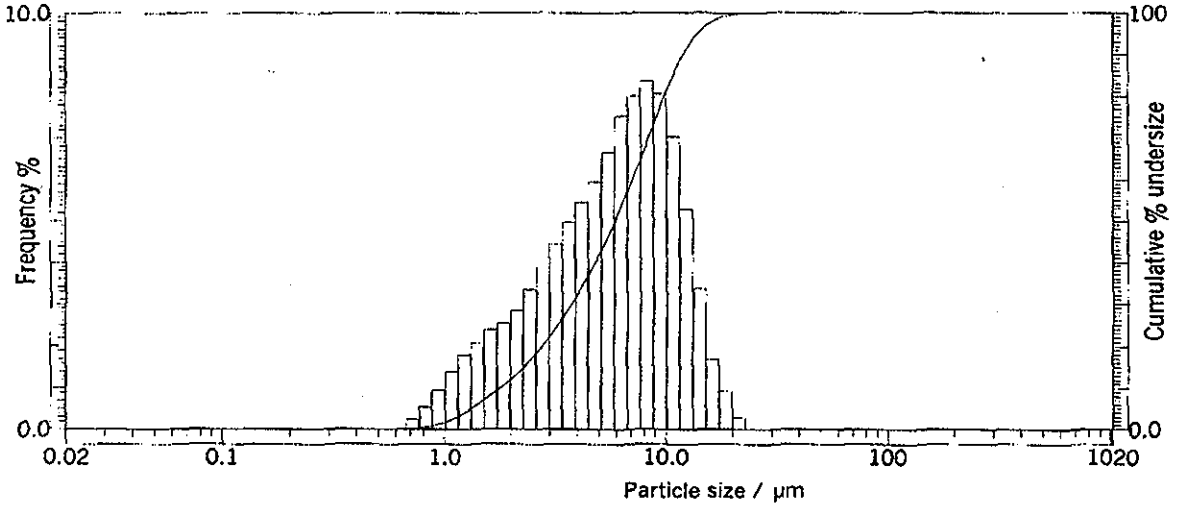
WSC 10/4/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX · LinearY

Data
Median : 5.925μm SP.Area : 15225cm²/cm³ S.D. : 3.982μm
Mode : 8.242μm Mean : 6.513μm
C.V. : 61.13%

Span : (D 10.0-D 90.0) / D50 = 1.730

Dia. on %(5.0%) :	1.324μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	3.266μm	% on Dia.(1.000μm) :	1.7%
Dia. on %(50.0%) :	5.925μm	% on Dia.(10.000μm) :	80.8%
Dia. on %(75.0%) :	9.064μm	% on Dia.(100.000μm) :	100.0%
Dia. on %(95.0%) :	13.941μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	100.00	0.669	0.00	0.00
890.1	0.00	100.00	22.80	0.28	100.00	0.584	0.00	0.00
777.1	0.00	100.00	19.90	0.93	99.72	0.510	0.00	0.00
678.5	0.00	100.00	17.38	1.70	98.79	0.445	0.00	0.00
592.4	0.00	100.00	15.17	3.35	97.09	0.389	0.00	0.00
517.2	0.00	100.00	13.25	5.28	93.74	0.339	0.00	0.00
451.6	0.00	100.00	11.56	7.03	88.46	0.296	0.00	0.00
394.2	0.00	100.00	10.10	8.07	81.42	0.259	0.00	0.00
344.2	0.00	100.00	8.816	8.36	73.35	0.226	0.00	0.00
300.5	0.00	100.00	7.697	8.00	64.99	0.197	0.00	0.00
262.4	0.00	100.00	6.720	7.53	56.99	0.172	0.00	0.00
229.1	0.00	100.00	5.867	6.67	49.46	0.150	0.00	0.00
200.0	0.00	100.00	5.122	5.96	42.79	0.131	0.00	0.00
174.6	0.00	100.00	4.472	5.45	36.83	0.115	0.00	0.00
152.5	0.00	100.00	3.905	4.97	31.38	0.100	0.00	0.00
133.1	0.00	100.00	3.409	4.45	26.41	0.087	0.00	0.00
116.2	0.00	100.00	2.976	3.88	21.96	0.076	0.00	0.00
101.5	0.00	100.00	2.599	3.33	18.08	0.067	0.00	0.00
88.58	0.00	100.00	2.269	2.83	14.76	0.058	0.00	0.00
77.34	0.00	100.00	1.981	2.53	11.93	0.051	0.00	0.00
67.52	0.00	100.00	1.729	2.39	9.40	0.044	0.00	0.00
58.95	0.00	100.00	1.510	2.07	7.01	0.039	0.00	0.00
51.47	0.00	100.00	1.318	1.80	4.93	0.034	0.00	0.00
44.94	0.00	100.00	1.151	1.40	3.13	0.029	0.00	0.00
39.23	0.00	100.00	1.005	0.96	1.73	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/27/01
File Name: C107935.DAT Sample Name: C107 comp ID No: 01/09/26-002
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 83.241 % Lamp: 81.918 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Lot No: ~~1674~~ 1673 Test No: ~~Dup~~

WSC 10/4/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.710	0.10	0.10	(15)	6.494	5.00	55.00
(2)	0.907	0.90	1.00	(16)	7.087	5.00	60.00
(3)	1.064	1.30	2.30	(17)	7.698	5.00	65.00
(4)	1.325	2.70	5.00	(18)	8.367	5.00	70.00
(5)	1.789	5.00	10.00	(19)	9.078	5.00	75.00
(6)	2.293	5.00	15.00	(20)	9.871	5.00	80.00
(7)	2.372	0.80	15.80	(21)	10.677	4.20	84.20
(8)	2.785	4.20	20.00	(22)	10.844	0.80	85.00
(9)	3.272	5.00	25.00	(23)	12.056	5.00	90.00
(10)	3.767	5.00	30.00	(24)	13.971	5.00	95.00
(11)	4.282	5.00	35.00	(25)	15.965	2.70	97.70
(12)	4.818	5.00	40.00	(26)	17.943	1.30	99.00
(13)	5.369	5.00	45.00	(27)	21.752	0.90	99.90
(14)	5.928	5.00	50.00				

Median : 5.925 (μm) Mean: 6.513 (μm) Mode: 8.237 (μm)
Std. Dev.: 3.982 (μm) Span: 0.823
Coef. Var: 61.13% Spec. Area: 15225 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/27/'01 16:11

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926-003 19:51
Filename : C107936
Sample : C107 comp

Material :
Source :
Lot Numbe : ~~1674~~ 1673

WSC 10/4/01

Condition
T%(He-Ne): 83.9% Dist.Form: Std. Sampling times : 100
(LAMP): 79.8% R.R.Index: 1.16-0.00i ( )

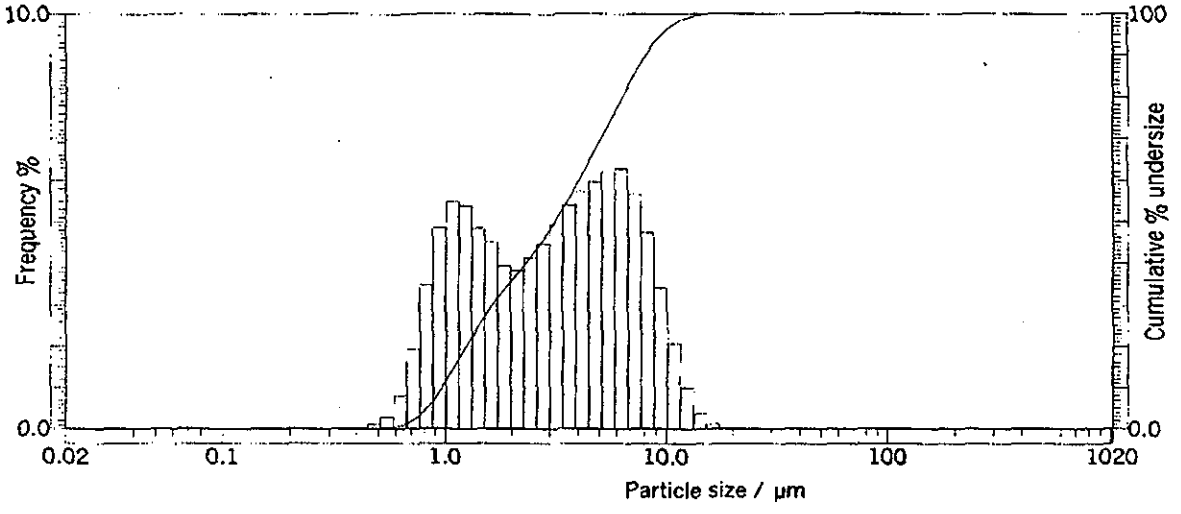
Agitation : 3 Circultn : 6 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 3.138μm SP.Area : 28160cm²/cm³ S.D. : 2.884μm
Mode : 6.243μm Mean : 3.897μm
C.V. : 74.00%

Span : (D 10.0-D 90.0) / D50 = 2.270

Dia. on %(	5.0%) :	0.823μm	% on Dia.(	0.100μm) :	0.0%
Dia. on %(	25.0%) :	1.420μm	% on Dia.(	1.000μm) :	11.3%
Dia. on %(	50.0%) :	3.138μm	% on Dia.(	10.000μm) :	96.2%
Dia. on %(	75.0%) :	5.701μm	% on Dia.(	100.000μm) :	100.0%
Dia. on %(	95.0%) :	9.546μm	% on Dia.(	1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	100.00	0.669	0.82	1.22
890.1	0.00	100.00	22.80	0.00	100.00	0.584	0.30	0.40
777.1	0.00	100.00	19.90	0.00	100.00	0.510	0.10	0.10
678.5	0.00	100.00	17.38	0.12	100.00	0.445	0.00	0.00
592.4	0.00	100.00	15.17	0.39	99.88	0.389	0.00	0.00
517.2	0.00	100.00	13.25	1.01	99.50	0.339	0.00	0.00
451.6	0.00	100.00	11.56	2.07	98.49	0.296	0.00	0.00
394.2	0.00	100.00	10.10	3.42	96.41	0.259	0.00	0.00
344.2	0.00	100.00	8.816	4.73	93.00	0.226	0.00	0.00
300.5	0.00	100.00	7.697	5.67	88.26	0.197	0.00	0.00
262.4	0.00	100.00	6.720	6.28	82.60	0.172	0.00	0.00
229.1	0.00	100.00	5.867	6.20	76.31	0.150	0.00	0.00
200.0	0.00	100.00	5.122	5.97	70.11	0.131	0.00	0.00
174.6	0.00	100.00	4.472	5.73	64.15	0.115	0.00	0.00
152.5	0.00	100.00	3.905	5.40	58.41	0.100	0.00	0.00
133.1	0.00	100.00	3.409	4.95	53.01	0.087	0.00	0.00
116.2	0.00	100.00	2.976	4.47	48.07	0.076	0.00	0.00
101.5	0.00	100.00	2.599	4.13	43.60	0.067	0.00	0.00
88.58	0.00	100.00	2.269	3.83	39.47	0.058	0.00	0.00
77.34	0.00	100.00	1.981	3.94	35.64	0.051	0.00	0.00
67.52	0.00	100.00	1.729	4.51	31.70	0.044	0.00	0.00
58.95	0.00	100.00	1.510	4.83	27.19	0.039	0.00	0.00
51.47	0.00	100.00	1.318	5.39	22.36	0.034	0.00	0.00
44.94	0.00	100.00	1.151	5.49	16.97	0.029	0.00	0.00
39.23	0.00	100.00	1.005	4.85	11.48	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/27/01
File Name: C107936.DAT Sample Name: C107 comp ID No: 01/09/26-003
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 83.860 % Lamp: 79.839 %
Circulation: 6 Agitation: 3 U.Sonic ** (min)
Lot No: ~~1674~~ 1673 Test No: ~~Dup~~

WSC
10/4/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.507	0.10	0.10	(15)	3.591	5.00	55.00
(2)	0.646	0.90	1.00	(16)	4.062	5.00	60.00
(3)	0.723	1.30	2.30	(17)	4.565	5.00	65.00
(4)	0.825	2.70	5.00	(18)	5.110	5.00	70.00
(5)	0.966	5.00	10.00	(19)	5.709	5.00	75.00
(6)	1.099	5.00	15.00	(20)	6.367	5.00	80.00
(7)	1.120	0.80	15.80	(21)	6.996	4.20	84.20
(8)	1.245	4.20	20.00	(22)	7.134	0.80	85.00
(9)	1.423	5.00	25.00	(23)	8.107	5.00	90.00
(10)	1.646	5.00	30.00	(24)	9.567	5.00	95.00
(11)	1.940	5.00	35.00	(25)	11.008	2.70	97.70
(12)	2.311	5.00	40.00	(26)	12.420	1.30	99.00
(13)	2.717	5.00	45.00	(27)	15.467	0.90	99.90
(14)	3.145	5.00	50.00				

Median : 3.138 (μm) Mean: 3.897 (μm) Mode: 6.279 (μm)
Std. Dev.: 2.884 (μm) Span: 1.225
Coef. Var: 74.00% Spec. Area: 28160 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/27/'01 16:11

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926-004 19:55
Filename : C107937
Sample : C107 comp

Material :
Source :
Lot Numbe : ~~1674~~ 1673

Condition
T%(He-Ne): 83.8% Dist.Form: Std. Sampling times : 100
(LAMP): 80.1% R.R.Index: 1.16-0.00i ( )

Agitation : 1 Circultn : 6 U.sonic : ~~ON~~ OFF (120)

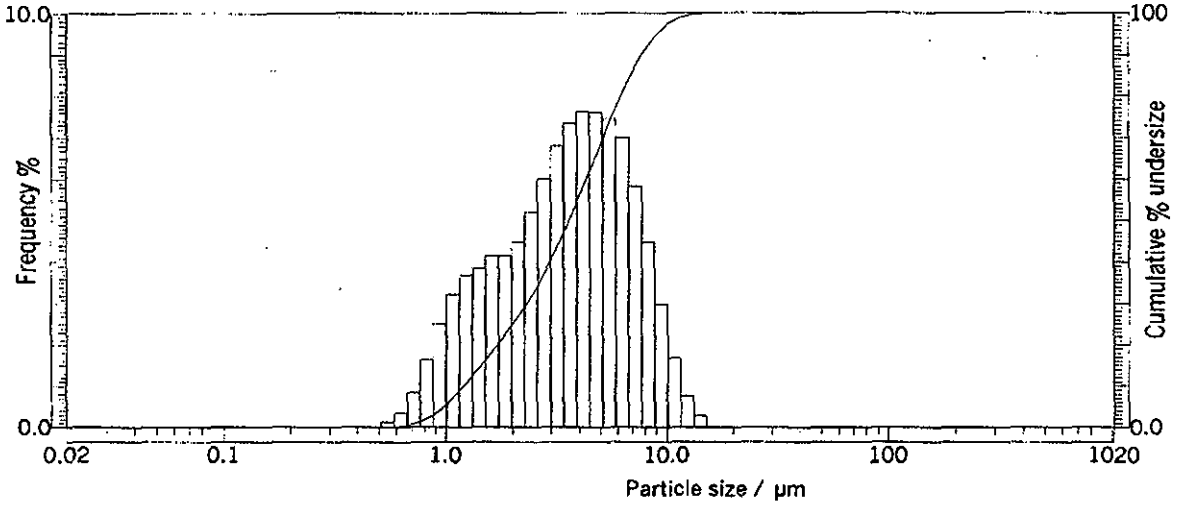
WSC 10/4/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 3.603μm SP.Area : 23110cm²/cm³ S.D. : 2.580μm
Mode : 4.189μm Mean : 4.109μm
C.V. : 62.78%

Span : (D 10.0-D 90.0) / D50 = 1.811

Dia. on %(5.0%) :	0.980μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	2.010μm	% on Dia.(1.000μm) :	5.4%
Dia. on %(50.0%) :	3.603μm	% on Dia.(10.000μm) :	97.1%
Dia. on %(75.0%) :	5.657μm	% on Dia.(100.000μm) :	100.0%
Dia. on %(95.0%) :	9.093μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	100.00	0.669	0.35	0.48
890.1	0.00	100.00	22.80	0.00	100.00	0.584	0.13	0.13
777.1	0.00	100.00	19.90	0.00	100.00	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.00	100.00	0.445	0.00	0.00
592.4	0.00	100.00	15.17	0.28	100.00	0.389	0.00	0.00
517.2	0.00	100.00	13.25	0.76	99.72	0.339	0.00	0.00
451.6	0.00	100.00	11.56	1.67	98.96	0.296	0.00	0.00
394.2	0.00	100.00	10.10	2.97	97.29	0.259	0.00	0.00
344.2	0.00	100.00	8.816	4.48	94.32	0.226	0.00	0.00
300.5	0.00	100.00	7.697	5.84	89.84	0.197	0.00	0.00
262.4	0.00	100.00	6.720	7.01	84.01	0.172	0.00	0.00
229.1	0.00	100.00	5.867	7.45	77.00	0.150	0.00	0.00
200.0	0.00	100.00	5.122	7.60	69.55	0.131	0.00	0.00
174.6	0.00	100.00	4.472	7.62	61.95	0.115	0.00	0.00
152.5	0.00	100.00	3.905	7.33	54.34	0.100	0.00	0.00
133.1	0.00	100.00	3.409	6.79	47.00	0.087	0.00	0.00
116.2	0.00	100.00	2.976	5.99	40.21	0.076	0.00	0.00
101.5	0.00	100.00	2.599	5.21	34.22	0.067	0.00	0.00
88.58	0.00	100.00	2.269	4.49	29.01	0.058	0.00	0.00
77.34	0.00	100.00	1.981	4.14	24.52	0.051	0.00	0.00
67.52	0.00	100.00	1.729	4.15	20.38	0.044	0.00	0.00
58.95	0.00	100.00	1.510	3.85	16.23	0.039	0.00	0.00
51.47	0.00	100.00	1.318	3.69	12.38	0.034	0.00	0.00
44.94	0.00	100.00	1.151	3.23	8.69	0.029	0.00	0.00
39.23	0.00	100.00	1.005	2.51	5.46	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/27/01
File Name: C107937.DAT Sample Name: C107 comp ID No: 01/09/26-004
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 83.784 % Lamp: 80.082 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Lot No: ~~1674~~ 1673 Test No: ~~Dup~~

WSC 10/4/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.568	0.10	0.10	(15)	3.954	5.00	55.00
(2)	0.729	0.90	1.00	(16)	4.327	5.00	60.00
(3)	0.833	1.30	2.30	(17)	4.733	5.00	65.00
(4)	0.982	2.70	5.00	(18)	5.167	5.00	70.00
(5)	1.210	5.00	10.00	(19)	5.667	5.00	75.00
(6)	1.449	5.00	15.00	(20)	6.232	5.00	80.00
(7)	1.489	0.80	15.80	(21)	6.752	4.20	84.20
(8)	1.709	4.20	20.00	(22)	6.886	0.80	85.00
(9)	2.011	5.00	25.00	(23)	7.736	5.00	90.00
(10)	2.331	5.00	30.00	(24)	9.108	5.00	95.00
(11)	2.648	5.00	35.00	(25)	10.455	2.70	97.70
(12)	2.963	5.00	40.00	(26)	11.649	1.30	99.00
(13)	3.281	5.00	45.00	(27)	14.479	0.90	99.90
(14)	3.612	5.00	50.00				

Median : 3.603 (μm) Mean: 4.109 (μm) Mode: 4.179 (μm)
Std. Dev.: 2.580 (μm) Span: 0.954
Coef. Var: 62.78% Spec. Area: 23110 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/27/'01 16:11

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926-005 20:05
Filename : C107938
Sample : C107 comp

Material :
Source :
Lot Numbe : ~~1675~~ 1673

WSC 10/4/01

Condition
T%(He-Ne): 87.2% Dist.Form: Std. Sampling times : 100
(LAMP): 86.6% R.R.Index: 1.16-0.00i ( )

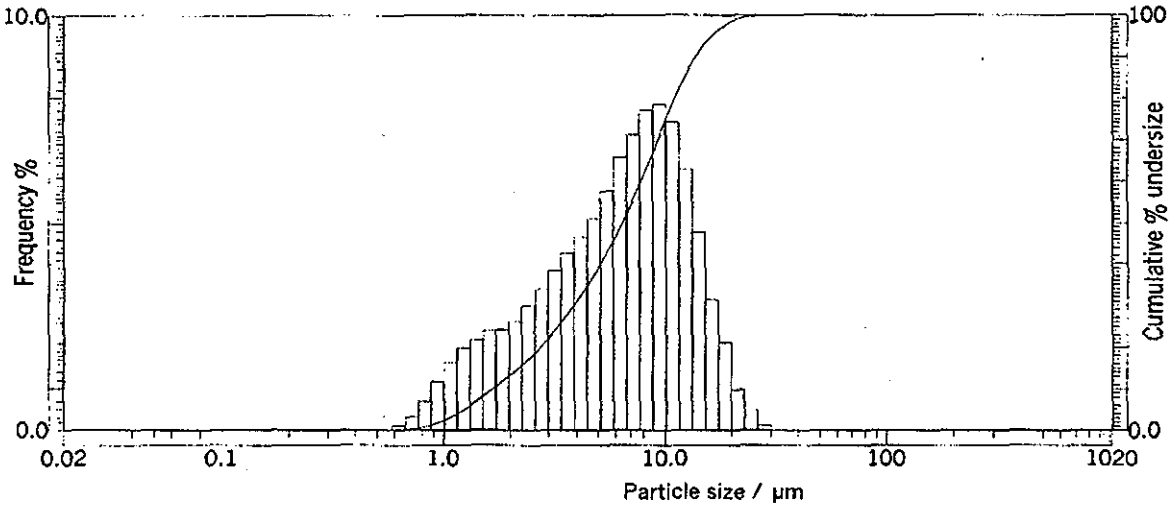
Agitation : 1 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 6.443μm SP.Area : 15086cm²/cm³ S.D. : 4.813μm
Mode : 9.410μm Mean : 7.245μm
C.V. : 66.44%

Span : (D 10.0-D 90.0) / D50 = 1.890

Dia. on %(5.0%) : 1.240μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 3.326μm % on Dia.(1.000μm) : 2.2%
Dia. on %(50.0%) : 6.443μm % on Dia.(10.000μm) : 74.2%
Dia. on %(75.0%) : 10.151μm % on Dia.(100.000μm) : 100.0%
Dia. on %(95.0%) : 16.420μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.48	99.88	0.669	0.11	0.11
890.1	0.00	100.00	22.80	0.98	99.39	0.584	0.00	0.00
777.1	0.00	100.00	19.90	2.11	98.42	0.510	0.00	0.00
678.5	0.00	100.00	17.38	3.13	96.31	0.445	0.00	0.00
592.4	0.00	100.00	15.17	4.77	93.18	0.389	0.00	0.00
517.2	0.00	100.00	13.25	6.29	88.41	0.339	0.00	0.00
451.6	0.00	100.00	11.56	7.41	82.12	0.296	0.00	0.00
394.2	0.00	100.00	10.10	7.83	74.71	0.259	0.00	0.00
344.2	0.00	100.00	8.816	7.70	66.88	0.226	0.00	0.00
300.5	0.00	100.00	7.697	7.13	59.17	0.197	0.00	0.00
262.4	0.00	100.00	6.720	6.58	52.04	0.172	0.00	0.00
229.1	0.00	100.00	5.867	5.75	45.46	0.150	0.00	0.00
200.0	0.00	100.00	5.122	5.10	39.71	0.131	0.00	0.00
174.6	0.00	100.00	4.472	4.66	34.61	0.115	0.00	0.00
152.5	0.00	100.00	3.905	4.25	29.95	0.100	0.00	0.00
133.1	0.00	100.00	3.409	3.83	25.70	0.087	0.00	0.00
116.2	0.00	100.00	2.976	3.39	21.87	0.076	0.00	0.00
101.5	0.00	100.00	2.599	2.98	18.48	0.067	0.00	0.00
88.58	0.00	100.00	2.269	2.61	15.50	0.058	0.00	0.00
77.34	0.00	100.00	1.981	2.42	12.89	0.051	0.00	0.00
67.52	0.00	100.00	1.729	2.39	10.47	0.044	0.00	0.00
58.95	0.00	100.00	1.510	2.18	8.08	0.039	0.00	0.00
51.47	0.00	100.00	1.318	1.99	5.90	0.034	0.00	0.00
44.94	0.00	100.00	1.151	1.64	3.91	0.029	0.00	0.00
39.23	0.00	100.00	1.005	1.17	2.27	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/27/01
File Name: C107938.DAT Sample Name: C107 comp ID No: 01/09/26-005
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 87.178 % Lamp: 86.553 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Lot No: ~~1675~~ 1473 Test No:

WSC-
10/4/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.660	0.10	0.10	(15)	7.125	5.00	55.00
(2)	0.861	0.90	1.00	(16)	7.817	5.00	60.00
(3)	1.008	1.30	2.30	(17)	8.543	5.00	65.00
(4)	1.243	2.70	5.00	(18)	9.327	5.00	70.00
(5)	1.686	5.00	10.00	(19)	10.154	5.00	75.00
(6)	2.213	5.00	15.00	(20)	11.145	5.00	80.00
(7)	2.302	0.80	15.80	(21)	12.122	4.20	84.20
(8)	2.768	4.20	20.00	(22)	12.335	0.80	85.00
(9)	3.330	5.00	25.00	(23)	13.889	5.00	90.00
(10)	3.911	5.00	30.00	(24)	16.456	5.00	95.00
(11)	4.522	5.00	35.00	(25)	19.046	2.70	97.70
(12)	5.160	5.00	40.00	(26)	21.635	1.30	99.00
(13)	5.807	5.00	45.00	(27)	26.852	0.90	99.90
(14)	6.455	5.00	50.00				

Median : 6.443 (μm) Mean: 7.245 (μm) Mode: 9.435 (μm)
Std. Dev.: 4.813 (μm) Span: 0.973
Coef. Var: 66.44% Spec. Area: 15086 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/27/'01 16:11

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926-006 20:09
Filename : C107939
Sample : C107 comp

Material :
Source :
Lot Numbe : ~~1675~~ 1673

WSR 10/4/01

Condition
T%(He-Ne): 87.3% Dist.Form: Std. Sampling times : 100
(LAMP): 86.9% R.R.Index: 1.16-0.00i ( )

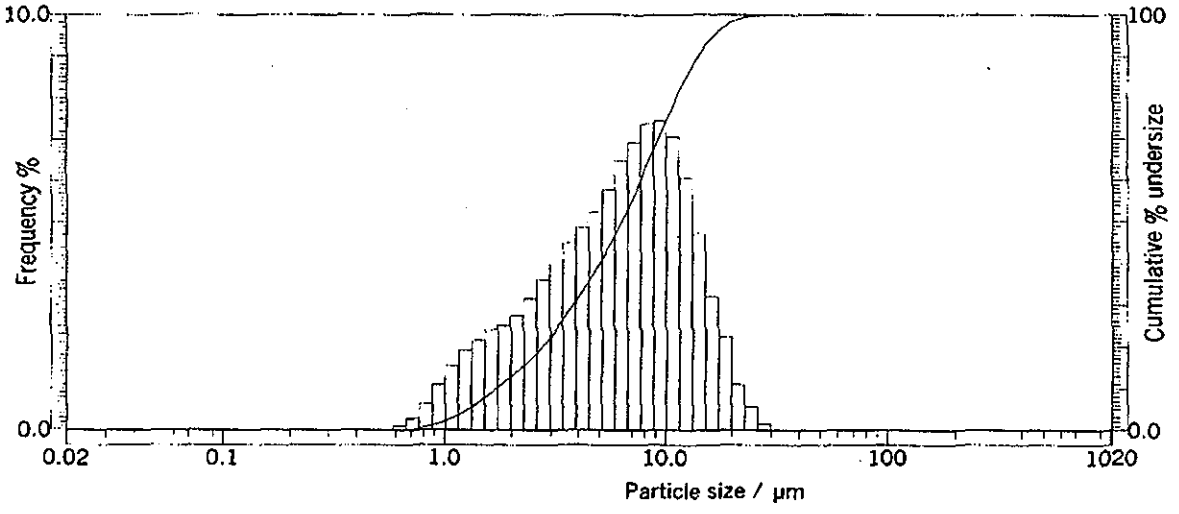
Agitation : 3 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 6.291μm SP.Area : 15096cm²/cm³ S.D. : 4.903μm
Mode : 9.408μm Mean : 7.227μm
C.V. : 67.85%

Span : (D 10.0-D 90.0) / D50 = 1.957

Dia. on %(5.0%) :	1.265μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	3.266μm	% on Dia.(1.000μm) :	2.1%
Dia. on %(50.0%) :	6.291μm	% on Dia.(10.000μm) :	74.4%
Dia. on %(75.0%) :	10.118μm	% on Dia.(100.000μm) :	100.0%
Dia. on %(95.0%) :	16.702μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.58	99.84	0.669	0.10	0.10
890.1	0.00	100.00	22.80	1.10	99.26	0.584	0.00	0.00
777.1	0.00	100.00	19.90	2.23	98.16	0.510	0.00	0.00
678.5	0.00	100.00	17.38	3.20	95.94	0.445	0.00	0.00
592.4	0.00	100.00	15.17	4.71	92.73	0.389	0.00	0.00
517.2	0.00	100.00	13.25	6.07	88.02	0.339	0.00	0.00
451.6	0.00	100.00	11.56	7.06	81.95	0.296	0.00	0.00
394.2	0.00	100.00	10.10	7.45	74.89	0.259	0.00	0.00
344.2	0.00	100.00	8.816	7.37	67.44	0.226	0.00	0.00
300.5	0.00	100.00	7.697	6.91	60.07	0.197	0.00	0.00
262.4	0.00	100.00	6.720	6.49	53.15	0.172	0.00	0.00
229.1	0.00	100.00	5.867	5.78	46.67	0.150	0.00	0.00
200.0	0.00	100.00	5.122	5.23	40.89	0.131	0.00	0.00
174.6	0.00	100.00	4.472	4.86	35.66	0.115	0.00	0.00
152.5	0.00	100.00	3.905	4.50	30.80	0.100	0.00	0.00
133.1	0.00	100.00	3.409	4.10	26.30	0.087	0.00	0.00
116.2	0.00	100.00	2.976	3.63	22.20	0.076	0.00	0.00
101.5	0.00	100.00	2.599	3.17	18.57	0.067	0.00	0.00
88.58	0.00	100.00	2.269	2.74	15.40	0.058	0.00	0.00
77.34	0.00	100.00	1.981	2.50	12.66	0.051	0.00	0.00
67.52	0.00	100.00	1.729	2.42	10.16	0.044	0.00	0.00
58.95	0.00	100.00	1.510	2.16	7.74	0.039	0.00	0.00
51.47	0.00	100.00	1.318	1.93	5.58	0.034	0.00	0.00
44.94	0.00	100.00	1.151	1.55	3.66	0.029	0.00	0.00
39.23	0.00	100.00	1.005	1.09	2.10	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/27/01
File Name: C107939.DAT Sample Name: C107 comp ID No: 01/09/26-006
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 87.276 % Lamp: 86.935 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Lot No: ~~1675~~ 1675 Test No:

WSC
10/4/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.666	0.10	0.10	(15)	6.981	5.00	55.00
(2)	0.874	0.90	1.00	(16)	7.687	5.00	60.00
(3)	1.023	1.30	2.30	(17)	8.446	5.00	65.00
(4)	1.268	2.70	5.00	(18)	9.256	5.00	70.00
(5)	1.715	5.00	10.00	(19)	10.120	5.00	75.00
(6)	2.226	5.00	15.00	(20)	11.159	5.00	80.00
(7)	2.310	0.80	15.80	(21)	12.188	4.20	84.20
(8)	2.747	4.20	20.00	(22)	12.410	0.80	85.00
(9)	3.272	5.00	25.00	(23)	14.056	5.00	90.00
(10)	3.817	5.00	30.00	(24)	16.734	5.00	95.00
(11)	4.395	5.00	35.00	(25)	19.379	2.70	97.70
(12)	5.012	5.00	40.00	(26)	22.113	1.30	99.00
(13)	5.652	5.00	45.00	(27)	27.587	0.90	99.90
(14)	6.305	5.00	50.00				

Median : 6.291 (μm) Mean: 7.227 (μm) Mode: 9.435 (μm)
Std. Dev.: 4.903 (μm) Span: 1.047
Coef. Var: 67.85% Spec. Area: 15096 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/27/'01 16:12

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926-007 20:14
Filename : C107940
Sample : C107 comp

Material :
Source :
Lot Numbe : ~~1675~~ 1673

WSC 10/4/01

Condition
T%(He-Ne): 88.1% Dist.Form: Std. Sampling times : 100
(LAMP): 85.8% R.R.Index: 1.16-0.00i ( )

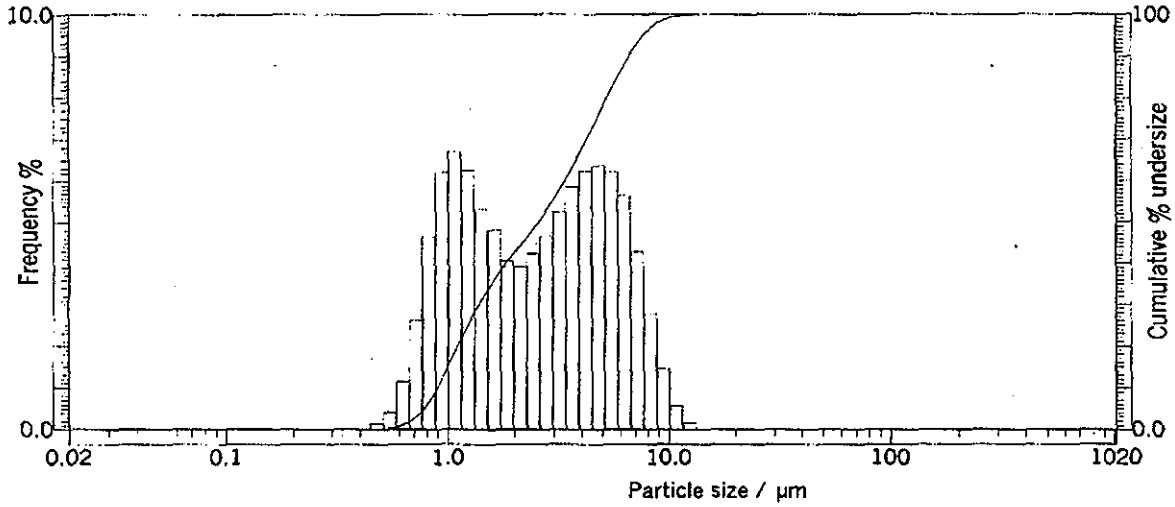
Agitation : 3 Circultn : 6 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 2.558μm SP.Area : 32186cm²/cm³ S.D. : 2.314μm
Mode : 1.076μm Mean : 3.216μm
C.V. : 71.94%

Span : (D 10.0-D 90.0) / D50 = 2.230

Dia. on %(5.0%) :	0.781μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	1.231μm	% on Dia.(1.000μm) :	15.0%
Dia. on %(50.0%) :	2.558μm	% on Dia.(10.000μm) :	99.2%
Dia. on %(75.0%) :	4.716μm	% on Dia.(100.000μm) :	100.0%
Dia. on %(95.0%) :	7.686μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	100.00	0.669	1.14	1.69
890.1	0.00	100.00	22.80	0.00	100.00	0.584	0.41	0.56
777.1	0.00	100.00	19.90	0.00	100.00	0.510	0.14	0.14
678.5	0.00	100.00	17.38	0.00	100.00	0.445	0.00	0.00
592.4	0.00	100.00	15.17	0.00	100.00	0.389	0.00	0.00
517.2	0.00	100.00	13.25	0.16	100.00	0.339	0.00	0.00
451.6	0.00	100.00	11.56	0.57	99.84	0.296	0.00	0.00
394.2	0.00	100.00	10.10	1.44	99.27	0.259	0.00	0.00
344.2	0.00	100.00	8.816	2.79	97.84	0.226	0.00	0.00
300.5	0.00	100.00	7.697	4.29	95.05	0.197	0.00	0.00
262.4	0.00	100.00	6.720	5.65	90.75	0.172	0.00	0.00
229.1	0.00	100.00	5.867	6.23	85.10	0.150	0.00	0.00
200.0	0.00	100.00	5.122	6.36	78.87	0.131	0.00	0.00
174.6	0.00	100.00	4.472	6.25	72.51	0.115	0.00	0.00
152.5	0.00	100.00	3.905	5.86	66.27	0.100	0.00	0.00
133.1	0.00	100.00	3.409	5.26	60.41	0.087	0.00	0.00
116.2	0.00	100.00	2.976	4.65	55.15	0.076	0.00	0.00
101.5	0.00	100.00	2.599	4.25	50.50	0.067	0.00	0.00
88.58	0.00	100.00	2.269	3.91	46.25	0.058	0.00	0.00
77.34	0.00	100.00	1.981	4.06	42.35	0.051	0.00	0.00
67.52	0.00	100.00	1.729	4.79	38.28	0.044	0.00	0.00
58.95	0.00	100.00	1.510	5.33	33.49	0.039	0.00	0.00
51.47	0.00	100.00	1.318	6.26	28.16	0.034	0.00	0.00
44.94	0.00	100.00	1.151	6.70	21.90	0.029	0.00	0.00
39.23	0.00	100.00	1.005	6.22	15.20	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/27/01
File Name: C107940.DAT Sample Name: C107 comp ID No: 01/09/26-007
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 88.077 % Lamp: 85.804 %
Circulation: 6 Agitation: 3 U.Sonic ** (min)
Lot No: ~~1675~~ 1673 Test No:

WSC
10/4/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.490	0.10	0.10	(15)	2.964	5.00	55.00
(2)	0.617	0.90	1.00	(16)	3.375	5.00	60.00
(3)	0.691	1.30	2.30	(17)	3.797	5.00	65.00
(4)	0.782	2.70	5.00	(18)	4.244	5.00	70.00
(5)	0.898	5.00	10.00	(19)	4.726	5.00	75.00
(6)	1.001	5.00	15.00	(20)	5.257	5.00	80.00
(7)	1.018	0.80	15.80	(21)	5.759	4.20	84.20
(8)	1.109	4.20	20.00	(22)	5.855	0.80	85.00
(9)	1.234	5.00	25.00	(23)	6.606	5.00	90.00
(10)	1.384	5.00	30.00	(24)	7.686	5.00	95.00
(11)	1.579	5.00	35.00	(25)	8.761	2.70	97.70
(12)	1.836	5.00	40.00	(26)	9.853	1.30	99.00
(13)	2.177	5.00	45.00	(27)	12.194	0.90	99.90
(14)	2.560	5.00	50.00				

Median : 2.558 (μm) Mean: 3.216 (μm) Mode: 1.075 (μm)
Std. Dev.: 2.314 (μm) Span: 1.161
Coef. Var: 71.94% Spec. Area: 32186 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/27/'01 16:12

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926-008 20:18
Filename : C107941
Sample : C107 comp

Material :
Source :
Lot Numbe : ~~1675~~ 1473

Condition
T%(He-Ne): 88.2% Dist.Form: Std. Sampling times : 100
(LAMP): 86.2% R.R.Index: 1.16-0.00i ( )

Agitation : 1 Circultn : 6 U.sonic : ~~ON~~ OFF (120)

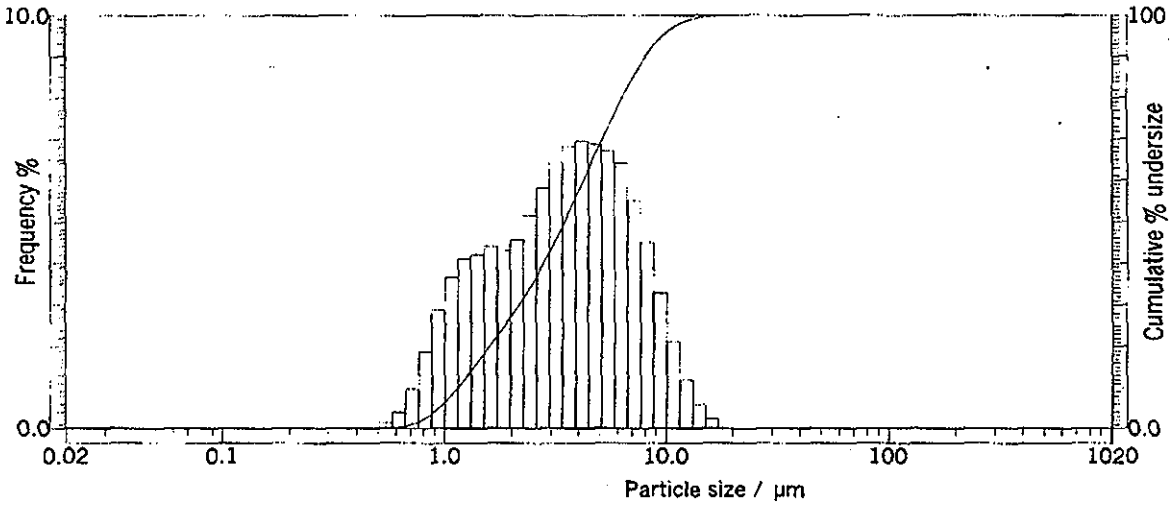
WSC 10/4/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 3.487μm SP.Area : 23956cm²/cm³ S.D. : 2.828μm
Mode : 4.181μm Mean : 4.149μm
C.V. : 68.18%

Span : (D 10.0-D 90.0) / D50 = 2.004

Dia. on %(5.0%) :	0.948μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	1.865μm	% on Dia.(1.000μm) :	6.1%
Dia. on %(50.0%) :	3.487μm	% on Dia.(10.000μm) :	95.7%
Dia. on %(75.0%) :	5.725μm	% on Dia.(100.000μm) :	100.0%
Dia. on %(95.0%) :	9.732μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	100.00	0.669	0.39	0.53
890.1	0.00	100.00	22.80	0.00	100.00	0.584	0.14	0.14
777.1	0.00	100.00	19.90	0.00	100.00	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.23	100.00	0.445	0.00	0.00
592.4	0.00	100.00	15.17	0.57	99.77	0.389	0.00	0.00
517.2	0.00	100.00	13.25	1.18	99.19	0.339	0.00	0.00
451.6	0.00	100.00	11.56	2.12	98.01	0.296	0.00	0.00
394.2	0.00	100.00	10.10	3.28	95.89	0.259	0.00	0.00
344.2	0.00	100.00	8.816	4.48	92.61	0.226	0.00	0.00
300.5	0.00	100.00	7.697	5.51	88.13	0.197	0.00	0.00
262.4	0.00	100.00	6.720	6.41	82.62	0.172	0.00	0.00
229.1	0.00	100.00	5.867	6.72	76.21	0.150	0.00	0.00
200.0	0.00	100.00	5.122	6.87	69.49	0.131	0.00	0.00
174.6	0.00	100.00	4.472	6.95	62.62	0.115	0.00	0.00
152.5	0.00	100.00	3.905	6.81	55.67	0.100	0.00	0.00
133.1	0.00	100.00	3.409	6.43	48.86	0.087	0.00	0.00
116.2	0.00	100.00	2.976	5.80	42.42	0.076	0.00	0.00
101.5	0.00	100.00	2.599	5.16	36.63	0.067	0.00	0.00
88.58	0.00	100.00	2.269	4.56	31.46	0.058	0.00	0.00
77.34	0.00	100.00	1.981	4.31	26.91	0.051	0.00	0.00
67.52	0.00	100.00	1.729	4.41	22.60	0.044	0.00	0.00
58.95	0.00	100.00	1.510	4.20	18.19	0.039	0.00	0.00
51.47	0.00	100.00	1.318	4.10	13.99	0.034	0.00	0.00
44.94	0.00	100.00	1.151	3.65	9.89	0.029	0.00	0.00
39.23	0.00	100.00	1.005	2.87	6.24	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/27/01

File Name: C107941.DAT Sample Name: C107 comp ID No: 01/09/26-008

Dist. Form: STANDARD R.R. Index: 116-000

Dist. Mode: VOLUME Laser: 88.188 % Lamp: 86.161 %

Circulation: 6 Agitation: 1 U.Sonic OFF (min)

Lot No: ~~1675~~ 1673 Test No:

WSC 10/4/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.562	0.10	0.10	(15)	3.856	5.00	55.00
(2)	0.716	0.90	1.00	(16)	4.258	5.00	60.00
(3)	0.814	1.30	2.30	(17)	4.697	5.00	65.00
(4)	0.950	2.70	5.00	(18)	5.179	5.00	70.00
(5)	1.155	5.00	10.00	(19)	5.733	5.00	75.00
(6)	1.364	5.00	15.00	(20)	6.371	5.00	80.00
(7)	1.401	0.80	15.80	(21)	7.000	4.20	84.20
(8)	1.600	4.20	20.00	(22)	7.142	0.80	85.00
(9)	1.869	5.00	25.00	(23)	8.163	5.00	90.00
(10)	2.176	5.00	30.00	(24)	9.749	5.00	95.00
(11)	2.495	5.00	35.00	(25)	11.350	2.70	97.70
(12)	2.818	5.00	40.00	(26)	12.970	1.30	99.00
(13)	3.149	5.00	45.00	(27)	16.435	0.90	99.90
(14)	3.492	5.00	50.00				

Median : 3.487 (μm) Mean: 4.149 (μm) Mode: 4.179 (μm)

Std. Dev.: 2.828 (μm) Span: 1.149

Coef. Var: 68.18% Spec. Area: 23956 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/27/'01 16:12

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926-009 20:27
Filename : C107942
Sample : C107 comp

Material :
Source :
Lot Numbe : ~~1675~~ /673

Condition
T%(He-Ne): 88.2% Dist.Form: Std. Sampling times : 100
(LAMP): 88.1% R.R.Index: 1.16-0.00i ( )

Agitation : 1 Circultn : 6 U.sonic : ~~ON~~ (120) OFF

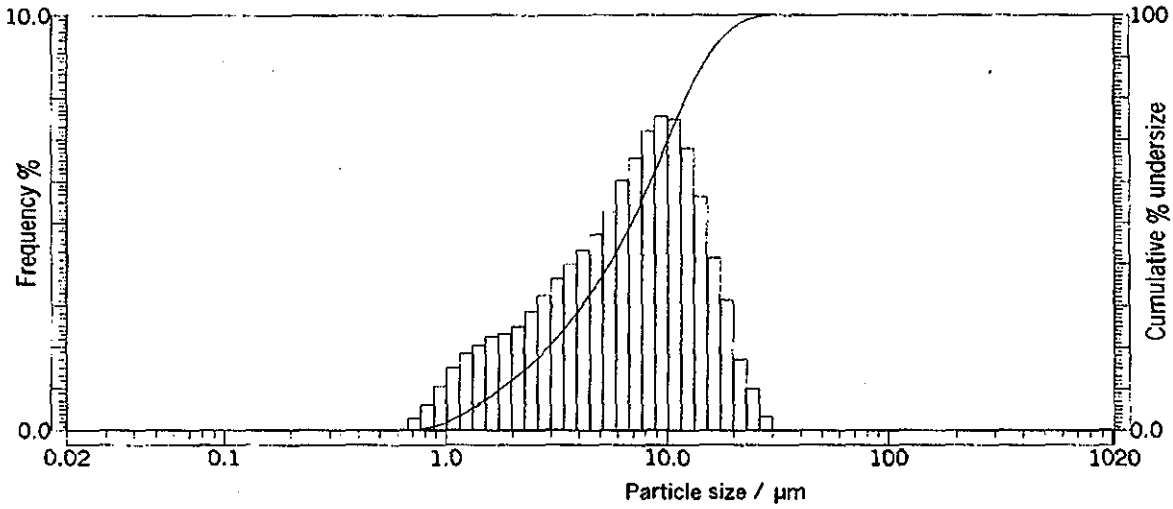
WSC 10/4/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 6.935μm SP.Area : 14239cm²/cm³ S.D. : 5.350μm
Mode : 9.458μm Mean : 7.887μm
C.V. : 67.83%

Span : (D 10.0-D 90.0) / D50 = 1.953

Dia. on %(5.0%) :	1.291μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	3.510μm	% on Dia.(1.000μm) :	1.9%
Dia. on %(50.0%) :	6.935μm	% on Dia.(10.000μm) :	69.3%
Dia. on %(75.0%) :	11.095μm	% on Dia.(100.000μm) :	100.0%
Dia. on %(95.0%) :	18.265μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.00	99.68	0.669	0.00	0.00
890.1	0.00	100.00	22.80	1.70	98.68	0.584	0.00	0.00
777.1	0.00	100.00	19.90	3.12	96.98	0.510	0.00	0.00
678.5	0.00	100.00	17.38	4.14	93.86	0.445	0.00	0.00
592.4	0.00	100.00	15.17	5.63	89.72	0.389	0.00	0.00
517.2	0.00	100.00	13.25	6.80	84.08	0.339	0.00	0.00
451.6	0.00	100.00	11.56	7.48	77.29	0.296	0.00	0.00
394.2	0.00	100.00	10.10	7.55	69.80	0.259	0.00	0.00
344.2	0.00	100.00	8.816	7.21	62.25	0.226	0.00	0.00
300.5	0.00	100.00	7.697	6.57	55.04	0.197	0.00	0.00
262.4	0.00	100.00	6.720	6.02	48.48	0.172	0.00	0.00
229.1	0.00	100.00	5.867	5.27	42.46	0.150	0.00	0.00
200.0	0.00	100.00	5.122	4.71	37.19	0.131	0.00	0.00
174.6	0.00	100.00	4.472	4.34	32.48	0.115	0.00	0.00
152.5	0.00	100.00	3.905	4.00	28.14	0.100	0.00	0.00
133.1	0.00	100.00	3.409	3.64	24.14	0.087	0.00	0.00
116.2	0.00	100.00	2.976	3.24	20.51	0.076	0.00	0.00
101.5	0.00	100.00	2.599	2.85	17.27	0.067	0.00	0.00
88.58	0.00	100.00	2.269	2.50	14.41	0.058	0.00	0.00
77.34	0.00	100.00	1.981	2.31	11.91	0.051	0.00	0.00
67.52	0.00	100.00	1.729	2.26	9.60	0.044	0.00	0.00
58.95	0.00	100.00	1.510	2.05	7.34	0.039	0.00	0.00
51.47	0.00	100.00	1.318	1.85	5.29	0.034	0.00	0.00
44.94	0.00	100.00	1.151	1.50	3.44	0.029	0.00	0.00
39.23	0.00	100.00	1.005	1.06	1.94	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/27/01
File Name: C107942.DAT Sample Name: C107 comp ID No: 01/09/26-009
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 88.171 % Lamp: 88.055 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Lot No: ~~1675~~ 1673 Test No: ~~Dup~~

WSC 10/4/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.704	0.10	0.10	(15)	7.690	5.00	55.00
(2)	0.891	0.90	1.00	(16)	8.466	5.00	60.00
(3)	1.040	1.30	2.30	(17)	9.282	5.00	65.00
(4)	1.292	2.70	5.00	(18)	10.136	5.00	70.00
(5)	1.773	5.00	10.00	(19)	11.116	5.00	75.00
(6)	2.336	5.00	15.00	(20)	12.236	5.00	80.00
(7)	2.429	0.80	15.80	(21)	13.286	4.20	84.20
(8)	2.917	4.20	20.00	(22)	13.560	0.80	85.00
(9)	3.515	5.00	25.00	(23)	15.322	5.00	90.00
(10)	4.148	5.00	30.00	(24)	18.304	5.00	95.00
(11)	4.820	5.00	35.00	(25)	21.134	2.70	97.70
(12)	5.520	5.00	40.00	(26)	23.859	1.30	99.00
(13)	6.227	5.00	45.00	(27)	28.722	0.90	99.90
(14)	6.946	5.00	50.00				

Median : 6.935 (μm) Mean: 7.887 (μm) Mode: 9.435 (μm)
Std. Dev.: 5.350 (μm) Span: 1.034
Coef. Var: 67.83% Spec. Area: 14239 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/27/'01 16:13

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926-010 20:31
Filename : C107943
Sample : C107 comp

Material :
Source :
Lot Numbe : ~~1675~~ 1673

Condition
T%(He-Ne): 88.0% Dist.Form: Std. Sampling times : 100
(LAMP): 88.2% R.R.Index: 1.16-0.00i ( )

Agitation : 3 Circultn : 6 U.sonic : ~~ON~~ OFF (120)

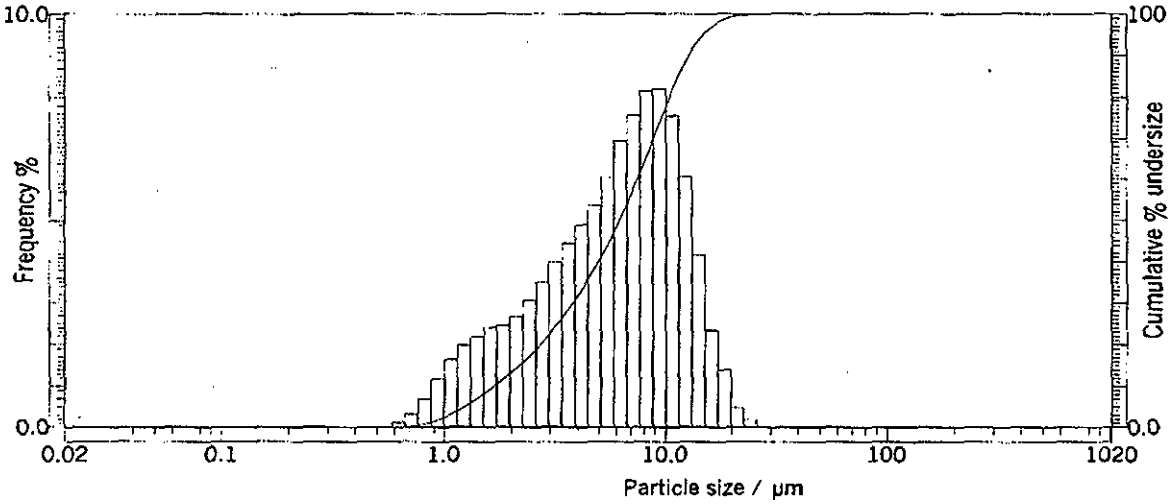
WSC 10/4/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 6.223μm SP.Area : 15389cm²/cm³ S.D. : 4.358μm
Mode : 9.387μm Mean : 6.857μm
C.V. : 63.56%

Span : (D 10.0-D 90.0) / D50 = 1.792

Dia. on %(5.0%) :	1.236μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	3.269μm	% on Dia.(1.000μm) :	2.3%
Dia. on %(50.0%) :	6.223μm	% on Dia.(10.000μm) :	77.2%
Dia. on %(75.0%) :	9.635μm	% on Dia.(100.000μm) :	100.0%
Dia. on %(95.0%) :	14.887μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.20	100.00	0.669	0.12	0.12
890.1	0.00	100.00	22.80	0.48	99.80	0.584	0.00	0.00
777.1	0.00	100.00	19.90	1.41	99.32	0.510	0.00	0.00
678.5	0.00	100.00	17.38	2.33	97.91	0.445	0.00	0.00
592.4	0.00	100.00	15.17	4.16	95.58	0.389	0.00	0.00
517.2	0.00	100.00	13.25	6.05	91.42	0.339	0.00	0.00
451.6	0.00	100.00	11.56	7.54	85.37	0.296	0.00	0.00
394.2	0.00	100.00	10.10	8.20	77.83	0.259	0.00	0.00
344.2	0.00	100.00	8.816	8.14	69.63	0.226	0.00	0.00
300.5	0.00	100.00	7.697	7.55	61.49	0.197	0.00	0.00
262.4	0.00	100.00	6.720	6.95	53.94	0.172	0.00	0.00
229.1	0.00	100.00	5.867	6.06	46.98	0.150	0.00	0.00
200.0	0.00	100.00	5.122	5.36	40.93	0.131	0.00	0.00
174.6	0.00	100.00	4.472	4.89	35.57	0.115	0.00	0.00
152.5	0.00	100.00	3.905	4.45	30.68	0.100	0.00	0.00
133.1	0.00	100.00	3.409	3.99	26.23	0.087	0.00	0.00
116.2	0.00	100.00	2.976	3.51	22.24	0.076	0.00	0.00
101.5	0.00	100.00	2.599	3.07	18.72	0.067	0.00	0.00
88.58	0.00	100.00	2.269	2.66	15.65	0.058	0.00	0.00
77.34	0.00	100.00	1.981	2.45	12.99	0.051	0.00	0.00
67.52	0.00	100.00	1.729	2.41	10.54	0.044	0.00	0.00
58.95	0.00	100.00	1.510	2.18	8.13	0.039	0.00	0.00
51.47	0.00	100.00	1.318	1.99	5.94	0.034	0.00	0.00
44.94	0.00	100.00	1.151	1.64	3.96	0.029	0.00	0.00
39.23	0.00	100.00	1.005	1.18	2.32	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/27/01
File Name: C107943.DAT Sample Name: C107 comp ID No: 01/09/26-010
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 87.975 % Lamp: 88.191 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Lot No: ~~1875~~ 1673 Test No: ~~Dup~~

WSC 10/4/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.654	0.10	0.10	(15)	6.857	5.00	55.00
(2)	0.855	0.90	1.00	(16)	7.504	5.00	60.00
(3)	1.003	1.30	2.30	(17)	8.179	5.00	65.00
(4)	1.239	2.70	5.00	(18)	8.873	5.00	70.00
(5)	1.681	5.00	10.00	(19)	9.654	5.00	75.00
(6)	2.198	5.00	15.00	(20)	10.519	5.00	80.00
(7)	2.284	0.80	15.80	(21)	11.337	4.20	84.20
(8)	2.736	4.20	20.00	(22)	11.493	0.80	85.00
(9)	3.276	5.00	25.00	(23)	12.851	5.00	90.00
(10)	3.829	5.00	30.00	(24)	14.903	5.00	95.00
(11)	4.406	5.00	35.00	(25)	17.176	2.70	97.70
(12)	5.010	5.00	40.00	(26)	19.324	1.30	99.00
(13)	5.623	5.00	45.00	(27)	24.428	0.90	99.90
(14)	6.237	5.00	50.00				

Median : 6.223 (μm) Mean: 6.857 (μm) Mode: 9.435 (μm)
Std. Dev.: 4.358 (μm) Span: 0.844
Coef. Var: 63.56% Spec. Area: 15389 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/27/'01 16:13

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926.011 20:37
Filename : C107944
Sample : C107 comp

Material :
Source :
Lot Numbe : ~~1675~~ 1673

WSL
10/4/01

Condition
T%(He-Ne): 88.6% Dist.Form: Std. Sampling times : 100
(LAMP): 86.7% R.R.index: 1.16-0.00i ( )

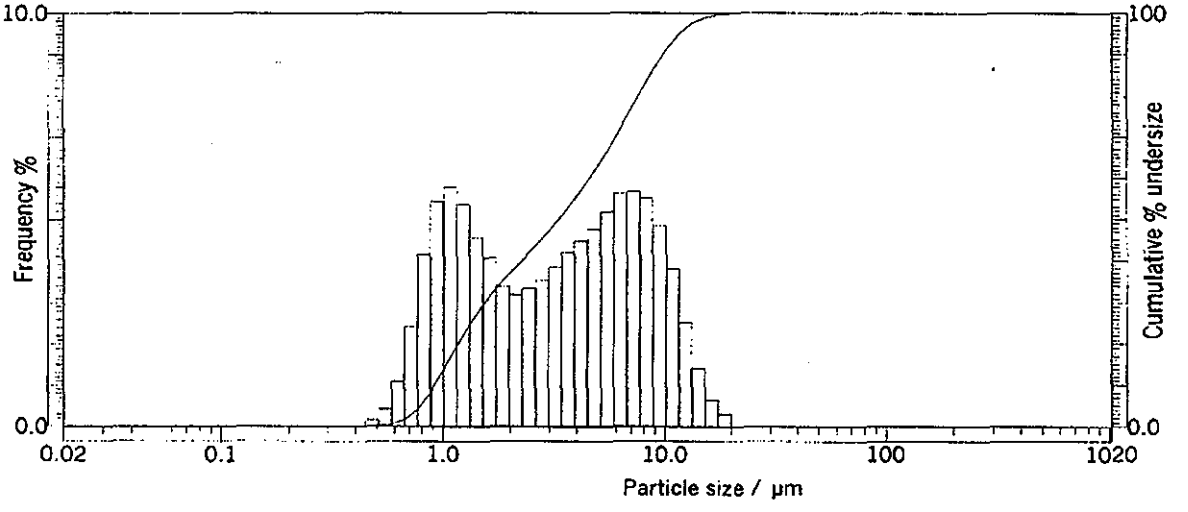
Agitation : 3 Circultn : 6 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 3.306μm SP.Area : 28564cm²/cm³ S.D. : 3.630μm
Mode : 1.075μm Mean : 4.428μm
C.V. : 81.98%

Span : (D 10.0-D 90.0) / D50 = 2.670

Dia. on %(5.0%) : 0.789μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 1.323μm % on Dia.(1.000μm) : 13.5%
Dia. on %(50.0%) : 3.306μm % on Dia.(10.000μm) : 90.9%
Dia. on %(75.0%) : 6.691μm % on Dia.(100.000μm) : 100.0%
Dia. on %(95.0%) : 11.529μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	100.00	0.669	1.10	1.67
890.1	0.00	100.00	22.80	0.00	100.00	0.584	0.42	0.58
777.1	0.00	100.00	19.90	0.30	100.00	0.510	0.16	0.16
678.5	0.00	100.00	17.38	0.65	99.70	0.445	0.00	0.00
592.4	0.00	100.00	15.17	1.42	99.04	0.389	0.00	0.00
517.2	0.00	100.00	13.25	2.53	97.62	0.339	0.00	0.00
451.6	0.00	100.00	11.56	3.81	95.09	0.296	0.00	0.00
394.2	0.00	100.00	10.10	4.87	91.28	0.259	0.00	0.00
344.2	0.00	100.00	8.816	5.53	86.41	0.226	0.00	0.00
300.5	0.00	100.00	7.697	5.69	80.87	0.197	0.00	0.00
262.4	0.00	100.00	6.720	5.66	75.18	0.172	0.00	0.00
229.1	0.00	100.00	5.867	5.19	69.52	0.150	0.00	0.00
200.0	0.00	100.00	5.122	4.77	64.33	0.131	0.00	0.00
174.6	0.00	100.00	4.472	4.49	59.55	0.115	0.00	0.00
152.5	0.00	100.00	3.905	4.20	55.07	0.100	0.00	0.00
133.1	0.00	100.00	3.409	3.85	50.87	0.087	0.00	0.00
116.2	0.00	100.00	2.976	3.54	47.01	0.076	0.00	0.00
101.5	0.00	100.00	2.599	3.35	43.47	0.067	0.00	0.00
88.58	0.00	100.00	2.269	3.19	40.12	0.058	0.00	0.00
77.34	0.00	100.00	1.981	3.40	36.93	0.051	0.00	0.00
67.52	0.00	100.00	1.729	4.07	33.52	0.044	0.00	0.00
58.95	0.00	100.00	1.510	4.57	29.46	0.039	0.00	0.00
51.47	0.00	100.00	1.318	5.38	24.88	0.034	0.00	0.00
44.94	0.00	100.00	1.151	5.80	19.50	0.029	0.00	0.00
39.23	0.00	100.00	1.005	5.45	13.70	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/27/01
File Name: C107944.DAT Sample Name: C107 comp ID No: 01/09/26-011
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 88.611 % Lamp: 86.712 %
Circulation: 6 Agitation: 3 U.Sonic ** (min)
Lot No: ~~1675~~ 1673 Test No: ~~Dup~~

WSC
10/4/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.487	0.10	0.10	(15)	3.897	5.00	55.00
(2)	0.617	0.90	1.00	(16)	4.533	5.00	60.00
(3)	0.694	1.30	2.30	(17)	5.219	5.00	65.00
(4)	0.790	2.70	5.00	(18)	5.939	5.00	70.00
(5)	0.918	5.00	10.00	(19)	6.693	5.00	75.00
(6)	1.038	5.00	15.00	(20)	7.547	5.00	80.00
(7)	1.058	0.80	15.80	(21)	8.369	4.20	84.20
(8)	1.166	4.20	20.00	(22)	8.531	0.80	85.00
(9)	1.323	5.00	25.00	(23)	9.761	5.00	90.00
(10)	1.539	5.00	30.00	(24)	11.531	5.00	95.00
(11)	1.838	5.00	35.00	(25)	13.353	2.70	97.70
(12)	2.258	5.00	40.00	(26)	15.114	1.30	99.00
(13)	2.761	5.00	45.00	(27)	19.072	0.90	99.90
(14)	3.312	5.00	50.00				

Median : 3.306 (μm) Mean: 4.428 (μm) Mode: 1.075 (μm)
Std. Dev.: 3.630 (μm) Span: 1.463
Coef. Var: 81.98% Spec. Area: 28565 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/27/'01 16:13

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926-012 20:40
Filename : C107945
Sample : C107 comp

Material :
Source :
Lot Numbe : ~~1675~~ 1673

Condition
T%(He-Ne): 88.9% Dist.Form: Std. Sampling times : 100
(LAMP): 87.2% R.R.Index: 1.16-0.00i ( )

Agitation : 1 Circultn : 6 U.sonic : ~~ON~~ OFF (120)

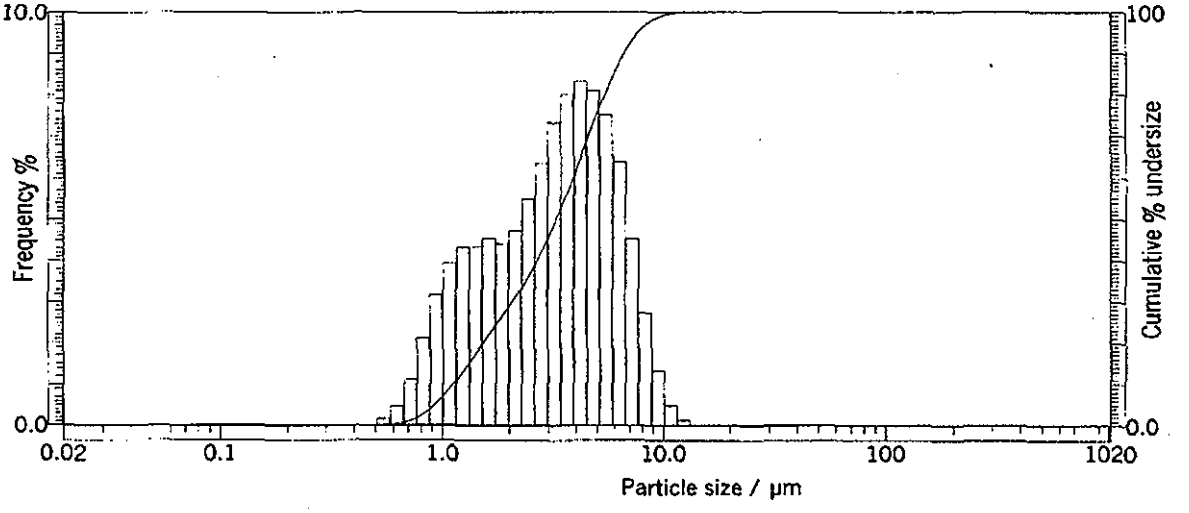
WSC 10/4/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 3.256μm SP.Area : 25492cm²/cm³ S.D. : 2.152μm
Mode : 4.182μm Mean : 3.599μm
C.V. : 59.79%

Span : (D 10.0-D 90.0) / D50 = 1.688

Dia. on %(5.0%) :	0.921μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	1.775μm	% on Dia.(1.000μm) :	6.9%
Dia. on %(50.0%) :	3.256μm	% on Dia.(10.000μm) :	99.3%
Dia. on %(75.0%) :	4.962μm	% on Dia.(100.000μm) :	100.0%
Dia. on %(95.0%) :	7.625μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	100.00	0.669	0.46	0.63
890.1	0.00	100.00	22.80	0.00	100.00	0.584	0.17	0.17
777.1	0.00	100.00	19.90	0.00	100.00	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.00	100.00	0.445	0.00	0.00
592.4	0.00	100.00	15.17	0.00	100.00	0.389	0.00	0.00
517.2	0.00	100.00	13.25	0.13	100.00	0.339	0.00	0.00
451.6	0.00	100.00	11.56	0.49	99.87	0.296	0.00	0.00
394.2	0.00	100.00	10.10	1.32	99.38	0.259	0.00	0.00
344.2	0.00	100.00	8.816	2.74	98.05	0.226	0.00	0.00
300.5	0.00	100.00	7.697	4.52	95.31	0.197	0.00	0.00
262.4	0.00	100.00	6.720	6.38	90.79	0.172	0.00	0.00
229.1	0.00	100.00	5.867	7.51	84.41	0.150	0.00	0.00
200.0	0.00	100.00	5.122	8.11	76.90	0.131	0.00	0.00
174.6	0.00	100.00	4.472	8.31	68.80	0.115	0.00	0.00
152.5	0.00	100.00	3.905	8.01	60.49	0.100	0.00	0.00
133.1	0.00	100.00	3.409	7.32	52.48	0.087	0.00	0.00
116.2	0.00	100.00	2.976	6.36	45.16	0.076	0.00	0.00
101.5	0.00	100.00	2.599	5.50	38.80	0.067	0.00	0.00
88.58	0.00	100.00	2.269	4.73	33.29	0.058	0.00	0.00
77.34	0.00	100.00	1.981	4.42	28.56	0.051	0.00	0.00
67.52	0.00	100.00	1.729	4.54	24.15	0.044	0.00	0.00
58.95	0.00	100.00	1.510	4.34	19.61	0.039	0.00	0.00
51.47	0.00	100.00	1.318	4.32	15.27	0.034	0.00	0.00
44.94	0.00	100.00	1.151	3.94	10.96	0.029	0.00	0.00
39.23	0.00	100.00	1.005	3.17	7.02	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/27/01

File Name: C107945.DAT Sample Name: C107 comp ID No: 01/09/26-012

Dist. Form: STANDARD R.R. Index: 116-000

Dist. Mode: VOLUME Laser: 88.882 % Lamp: 87.172 %

Circulation: 6 Agitation: 1 U.Sonic OFF (min)

Lot No: ~~1675~~ 1673 Test No: ~~Dup~~

WSC 10/4/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.554	0.10	0.10	(15)	3.565	5.00	55.00
(2)	0.701	0.90	1.00	(16)	3.874	5.00	60.00
(3)	0.795	1.30	2.30	(17)	4.213	5.00	65.00
(4)	0.923	2.70	5.00	(18)	4.569	5.00	70.00
(5)	1.115	5.00	10.00	(19)	4.970	5.00	75.00
(6)	1.308	5.00	15.00	(20)	5.429	5.00	80.00
(7)	1.341	0.80	15.80	(21)	5.846	4.20	84.20
(8)	1.529	4.20	20.00	(22)	5.946	0.80	85.00
(9)	1.778	5.00	25.00	(23)	6.614	5.00	90.00
(10)	2.068	5.00	30.00	(24)	7.629	5.00	95.00
(11)	2.371	5.00	35.00	(25)	8.672	2.70	97.70
(12)	2.670	5.00	40.00	(26)	9.732	1.30	99.00
(13)	2.967	5.00	45.00	(27)	11.974	0.90	99.90
(14)	3.262	5.00	50.00				

Median : 3.256 (μm) Mean: 3.599 (μm) Mode: 4.179 (μm)

Std. Dev.: 2.152 (μm) Span: 0.818

Coef. Var: 59.79% Spec. Area: 25493 (cm2/cm3)

APPENDIX F-10

TANK SY-102 COMPOSITE: PSD MEASUREMENT RESULTS

Consisting of 18 pages including this cover page

TABLE F-10. Sample identification and PSD run conditions. SY-102 composite subsamples S01T001648 and S01T001649.

Conditions Key: P = Pump Speed Setting; P3 = 7.1 mL/s; P6 = 14.4 mL/s
S = Stirrer Speed Setting (1-7); S1 = Stirrer Speed 1; S3 = Stirrer Speed 3
US = Ultrasonic ON Time (min); DT = Delay Time (min) between end of ultrasonic treatment and PSD measurement.
Run Time = Elapsed time (min) at beginning of measurement.

Sample	PSD Run File Name	Run Conditions				Run Time (min)	Cumulative Time (min) At Conditions					
		P	S	US	DT		P3	P6	S1	S3	US	DT
S01T001648	[LOAD-IN]	3	3	0	0	0.0	3			3		
	SY102876	6	1	0	0	3.0	3	4	4	3		
	SY102877	6	[redacted]	0	0	6.8	3	7	4	(6)		
	SY102878	6	3	2	0	10.2	3	13	4	(12)	2	0
	SY102879	6	1	0	0	15.9	3	16	7	(12)	2	4
						19.0						
S01T001649	[LOAD-IN]	3	3	0	0	0.0	3			3		
	SY102880	6	1	0	0	2.8	3	3	3	3		
	SY102881	6	3	0	0	6.2	3	7	3	6		
	SY102882	6	3	2	0	9.5	3	12	3	12	2	0
	SY102883	6	1	0	0	15.0	3	15	6	12	2	4
						17.6						

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/26/'01 06:29

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010829-876 13:51
Filename : SY102876
Sample : S01T001648

Material : SY-102 Solids
Source : S01T001028
Lot Numbe : Aliquot 1

Condition
T%(He-Ne): 88.4% Dist.Form: Std. Sampling times : 100
(LAMP): 83.1% R.R.Index: 1.16-0.00i ( )

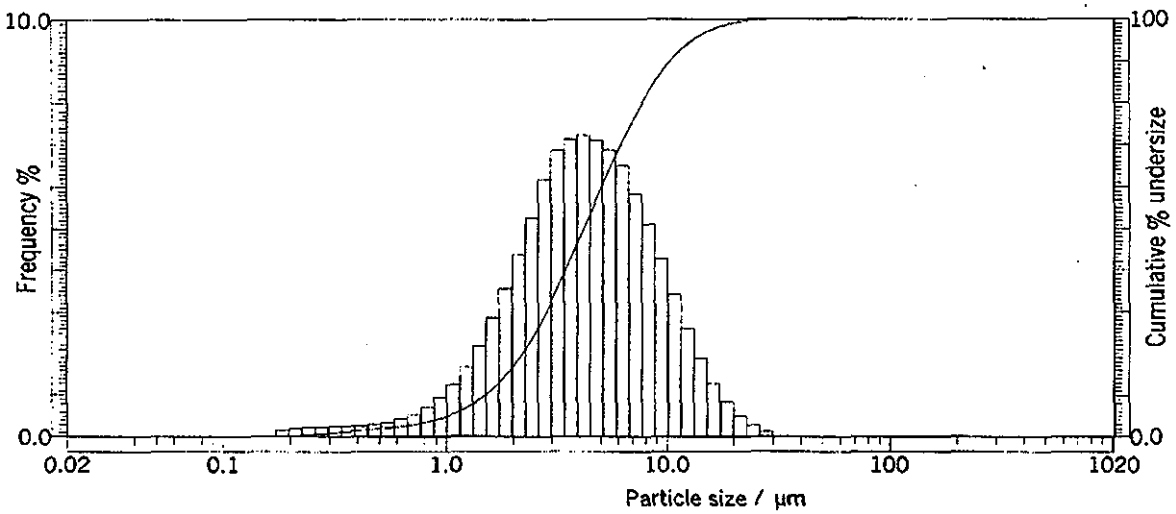
Agitation : 1 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 4.194μm SP.Area : 22152cm²/cm³ S.D. : 3.978μm
Mode : 4.178μm Mean : 5.275μm
C.V. : 75.41%

Span : (D 10.0-D 90.0) / D50 = 2.136

Dia. on %(5.0%) : 1.017μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 2.528μm % on Dia.(1.000μm) : 4.9%
Dia. on %(50.0%) : 4.194μm % on Dia.(10.000μm) : 88.8%
Dia. on %(75.0%) : 6.895μm % on Dia.(100.000μm) : 100.0%
Dia. on %(95.0%) : 13.173μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.28	99.87	0.669	0.42	2.67
890.1	0.00	100.00	22.80	0.49	99.59	0.584	0.34	2.24
777.1	0.00	100.00	19.90	0.85	99.10	0.510	0.29	1.90
678.5	0.00	100.00	17.38	1.27	98.25	0.445	0.26	1.61
592.4	0.00	100.00	15.17	1.88	96.98	0.389	0.26	1.35
517.2	0.00	100.00	13.25	2.60	95.11	0.339	0.26	1.10
451.6	0.00	100.00	11.56	3.41	92.51	0.296	0.24	0.84
394.2	0.00	100.00	10.10	4.27	89.09	0.259	0.23	0.60
344.2	0.00	100.00	8.816	5.10	84.83	0.226	0.21	0.37
300.5	0.00	100.00	7.697	5.83	79.72	0.197	0.16	0.16
262.4	0.00	100.00	6.720	6.50	73.89	0.172	0.00	0.00
229.1	0.00	100.00	5.867	6.87	67.40	0.150	0.00	0.00
200.0	0.00	100.00	5.122	7.10	60.52	0.131	0.00	0.00
174.6	0.00	100.00	4.472	7.22	53.42	0.115	0.00	0.00
152.5	0.00	100.00	3.905	7.12	46.20	0.100	0.00	0.00
133.1	0.00	100.00	3.409	6.85	39.08	0.087	0.00	0.00
116.2	0.00	100.00	2.976	6.17	32.23	0.076	0.00	0.00
101.5	0.00	100.00	2.599	5.26	26.06	0.067	0.00	0.00
88.58	0.00	100.00	2.269	4.38	20.80	0.058	0.00	0.00
77.34	0.00	100.00	1.981	3.55	16.42	0.051	0.00	0.00
67.52	0.00	100.00	1.729	2.86	12.87	0.044	0.00	0.00
58.95	0.00	100.00	1.510	2.17	10.00	0.039	0.00	0.00
51.47	0.00	100.00	1.318	1.68	7.83	0.034	0.00	0.00
44.94	0.00	100.00	1.151	1.26	6.15	0.029	0.00	0.00
39.23	0.00	100.00	1.005	0.95	4.88	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/26/01
File Name: SY102876.DAT Sample Name: S01T001648 ID No: 01/08/29-876
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 88.437 % Lamp: 83.065 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: SY-102 Solids Source: S01T001028
Lot No: Aliquot 1 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.187	0.10	0.10	(15)	4.617	5.00	55.00
(2)	0.323	0.90	1.00	(16)	5.074	5.00	60.00
(3)	0.595	1.30	2.30	(17)	5.607	5.00	65.00
(4)	1.018	2.70	5.00	(18)	6.209	5.00	70.00
(5)	1.510	5.00	10.00	(19)	6.905	5.00	75.00
(6)	1.880	5.00	15.00	(20)	7.757	5.00	80.00
(7)	1.937	0.80	15.80	(21)	8.678	4.20	84.20
(8)	2.216	4.20	20.00	(22)	8.868	0.80	85.00
(9)	2.532	5.00	25.00	(23)	10.486	5.00	90.00
(10)	2.840	5.00	30.00	(24)	13.178	5.00	95.00
(11)	3.151	5.00	35.00	(25)	16.422	2.70	97.70
(12)	3.473	5.00	40.00	(26)	19.617	1.30	99.00
(13)	3.821	5.00	45.00	(27)	26.947	0.90	99.90
(14)	4.203	5.00	50.00				

Median : 4.194 (μm) Mean: 5.275 (μm) Mode: 4.179 (μm)
Std. Dev.: 3.978 (μm) Span: 1.497
Coef. Var: 75.41% Spec. Area: 22152 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/26/'01 06:29

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010829-877 13:55
Filename : SY102877
Sample : S01T001648

Material : SY-102 Solids
Source : S01T001028
Lot Numbe : Aliquot 1

Condition
T%(He-Ne): 88.4%
(LAMP): 83.1%

Dist.Form: Std.
R.R.Index: 1.16-0.00i

Sampling times : 100
( )

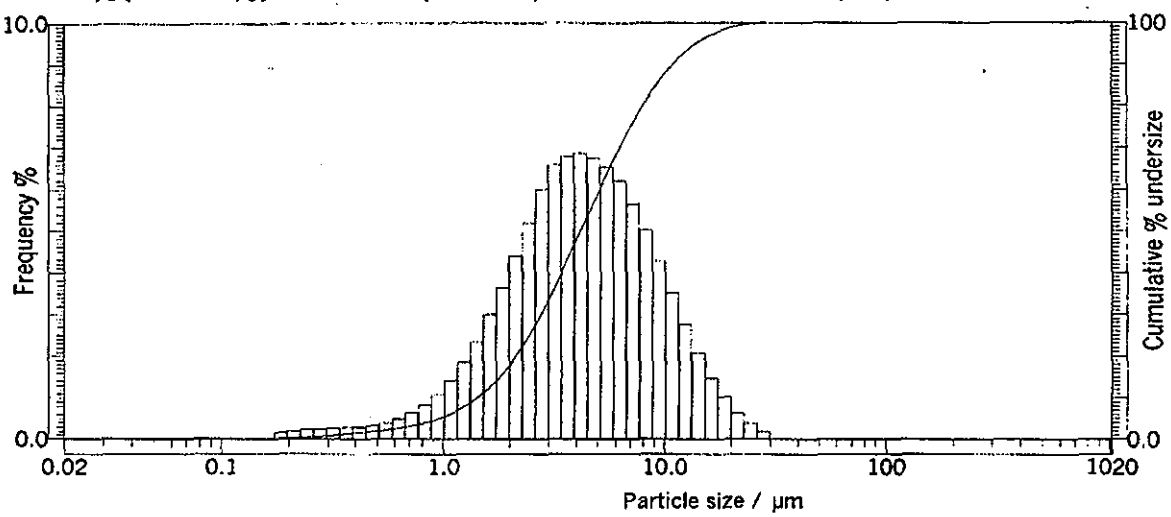
Agitation : 4 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 4.174μm SP.Area : 22670cm²/cm³ S.D. : 4.232μm
Mode : 4.176μm Mean : 5.377μm
C.V. : 78.70%

Span : (D 10.0-D 90.0) / D50 = 2.281

Dia. on %(5.0%) : 0.954μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 2.449μm % on Dia.(1.000μm) : 5.4%
Dia. on %(50.0%) : 4.174μm % on Dia.(10.000μm) : 87.6%
Dia. on %(75.0%) : 7.057μm % on Dia.(100.000μm) : 100.0%
Dia. on %(95.0%) : 13.955μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.39	99.81	0.669	0.49	2.87
890.1	0.00	100.00	22.80	0.64	99.42	0.584	0.39	2.39
777.1	0.00	100.00	19.90	1.03	98.78	0.510	0.33	2.00
678.5	0.00	100.00	17.38	1.47	97.75	0.445	0.28	1.67
592.4	0.00	100.00	15.17	2.08	96.28	0.389	0.27	1.39
517.2	0.00	100.00	13.25	2.77	94.20	0.339	0.27	1.12
451.6	0.00	100.00	11.56	3.52	91.44	0.296	0.24	0.84
394.2	0.00	100.00	10.10	4.29	87.91	0.259	0.23	0.60
344.2	0.00	100.00	8.816	5.02	83.63	0.226	0.21	0.37
300.5	0.00	100.00	7.697	5.64	78.61	0.197	0.16	0.16
262.4	0.00	100.00	6.720	6.22	72.97	0.172	0.00	0.00
229.1	0.00	100.00	5.867	6.53	66.75	0.150	0.00	0.00
200.0	0.00	100.00	5.122	6.73	60.22	0.131	0.00	0.00
174.6	0.00	100.00	4.472	6.86	53.48	0.115	0.00	0.00
152.5	0.00	100.00	3.905	6.79	46.63	0.100	0.00	0.00
133.1	0.00	100.00	3.409	6.58	39.84	0.087	0.00	0.00
116.2	0.00	100.00	2.976	6.00	33.26	0.076	0.00	0.00
101.5	0.00	100.00	2.599	5.19	27.26	0.067	0.00	0.00
88.58	0.00	100.00	2.269	4.40	22.07	0.058	0.00	0.00
77.34	0.00	100.00	1.981	3.65	17.66	0.051	0.00	0.00
67.52	0.00	100.00	1.729	3.00	14.02	0.044	0.00	0.00
58.95	0.00	100.00	1.510	2.34	11.01	0.039	0.00	0.00
51.47	0.00	100.00	1.318	1.84	8.68	0.034	0.00	0.00
44.94	0.00	100.00	1.151	1.42	6.83	0.029	0.00	0.00
39.23	0.00	100.00	1.005	1.08	5.42	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/26/01
File Name: SY102877.DAT Sample Name: S01T001648 ID No: 01/08/29-877
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 88.449 % Lamp: 83.053 %
Circulation: 6 Agitation: 4 U.Sonic OFF (min)
Material: SY-102 Solids Source: S01T001028
Lot No: Aliquot 1 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.188	0.10	0.10	(15)	4.619	5.00	55.00
(2)	0.321	0.90	1.00	(16)	5.101	5.00	60.00
(3)	0.567	1.30	2.30	(17)	5.667	5.00	65.00
(4)	0.956	2.70	5.00	(18)	6.313	5.00	70.00
(5)	1.427	5.00	10.00	(19)	7.072	5.00	75.00
(6)	1.797	5.00	15.00	(20)	8.007	5.00	80.00
(7)	1.852	0.80	15.80	(21)	8.987	4.20	84.20
(8)	2.134	4.20	20.00	(22)	9.226	0.80	85.00
(9)	2.455	5.00	25.00	(23)	10.967	5.00	90.00
(10)	2.771	5.00	30.00	(24)	13.985	5.00	95.00
(11)	3.091	5.00	35.00	(25)	17.296	2.70	97.70
(12)	3.421	5.00	40.00	(26)	20.885	1.30	99.00
(13)	3.786	5.00	45.00	(27)	27.912	0.90	99.90
(14)	4.184	5.00	50.00				

Median : 4.174 (μm) Mean: 5.377 (μm) Mode: 4.179 (μm)
Std. Dev.: 4.232 (μm) Span: 1.653
Coef. Var: 78.70% Spec. Area: 22671 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/26/'01 06:29

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010829-878 14:00
Filename : SY102878
Sample : S01T001648

Material : SY-102 Solids
Source : S01T001028
Lot Numbe : Aliquot 1

Condition
T%(He-Ne): 89.1%
(LAMP): 82.5%
Dist.Form: Std.
R.R.Index: 1.16-0.00i
Sampling times : 100
( )

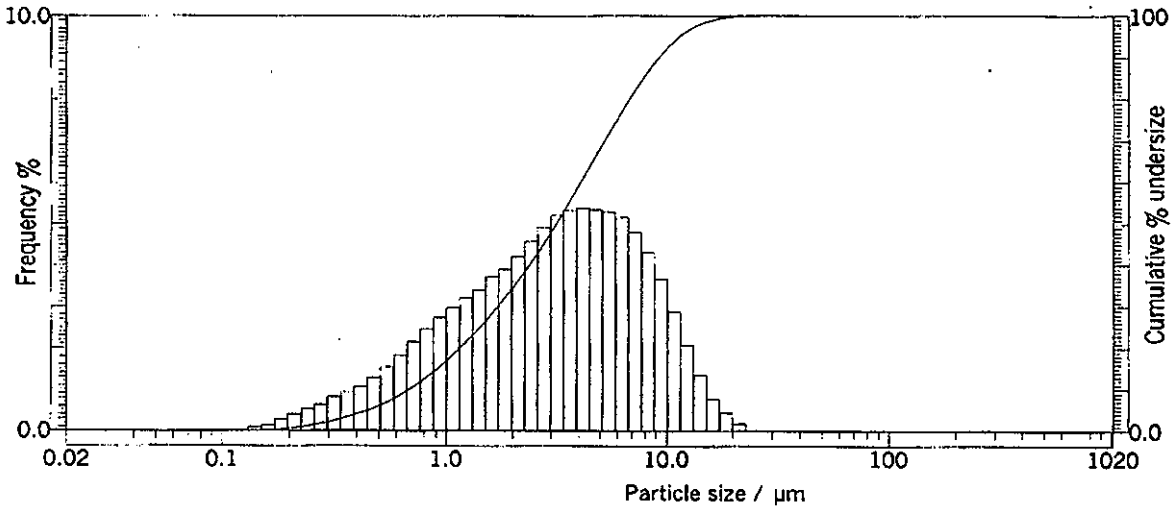
Agitation : 3 Circultn : 6 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 3.153μm SP.Area : 37120cm²/cm³ S.D. : 3.608μm
Mode : 4.179μm Mean : 4.199μm
C.V. : 85.93%

Span : (D 10.0-D 90.0) / D50 = 2.722

Dia. on %(5.0%) :	0.449μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	1.424μm	% on Dia.(1.000μm) :	16.8%
Dia. on %(50.0%) :	3.153μm	% on Dia.(10.000μm) :	92.0%
Dia. on %(75.0%) :	5.963μm	% on Dia.(100.000μm) :	100.0%
Dia. on %(95.0%) :	11.470μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	100.00	0.669	1.83	9.55
890.1	0.00	100.00	22.80	0.19	100.00	0.584	1.53	7.72
777.1	0.00	100.00	19.90	0.45	99.81	0.510	1.29	6.20
678.5	0.00	100.00	17.38	0.77	99.37	0.445	1.07	4.91
592.4	0.00	100.00	15.17	1.35	98.60	0.389	0.94	3.84
517.2	0.00	100.00	13.25	2.07	97.25	0.339	0.82	2.90
451.6	0.00	100.00	11.56	2.88	95.17	0.296	0.64	2.08
394.2	0.00	100.00	10.10	3.65	92.30	0.259	0.52	1.44
344.2	0.00	100.00	8.816	4.31	88.65	0.226	0.40	0.92
300.5	0.00	100.00	7.697	4.79	84.34	0.197	0.27	0.52
262.4	0.00	100.00	6.720	5.17	79.55	0.172	0.14	0.25
229.1	0.00	100.00	5.867	5.30	74.38	0.150	0.10	0.10
200.0	0.00	100.00	5.122	5.35	69.08	0.131	0.00	0.00
174.6	0.00	100.00	4.472	5.39	63.73	0.115	0.00	0.00
152.5	0.00	100.00	3.905	5.34	58.34	0.100	0.00	0.00
133.1	0.00	100.00	3.409	5.21	53.00	0.087	0.00	0.00
116.2	0.00	100.00	2.976	4.93	47.78	0.076	0.00	0.00
101.5	0.00	100.00	2.599	4.58	42.85	0.067	0.00	0.00
88.58	0.00	100.00	2.269	4.20	38.27	0.058	0.00	0.00
77.34	0.00	100.00	1.981	3.90	34.07	0.051	0.00	0.00
67.52	0.00	100.00	1.729	3.71	30.17	0.044	0.00	0.00
58.95	0.00	100.00	1.510	3.39	26.46	0.039	0.00	0.00
51.47	0.00	100.00	1.318	3.21	23.07	0.034	0.00	0.00
44.94	0.00	100.00	1.151	2.97	19.86	0.029	0.00	0.00
39.23	0.00	100.00	1.005	2.73	16.89	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/26/01
File Name: SY102878.DAT Sample Name: S01T001648 ID No: 01/08/29-878
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 89.144 % Lamp: 82.523 %
Circulation: 6 Agitation: 3 U.Sonic ** (min)
Material: SY-102 Solids Source: S01T001028
Lot No: Aliquot 1 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.149	0.10	0.10	(15)	3.595	5.00	55.00
(2)	0.231	0.90	1.00	(16)	4.080	5.00	60.00
(3)	0.308	1.30	2.30	(17)	4.627	5.00	65.00
(4)	0.450	2.70	5.00	(18)	5.252	5.00	70.00
(5)	0.689	5.00	10.00	(19)	5.970	5.00	75.00
(6)	0.916	5.00	15.00	(20)	6.812	5.00	80.00
(7)	0.954	0.80	15.80	(21)	7.668	4.20	84.20
(8)	1.158	4.20	20.00	(22)	7.868	0.80	85.00
(9)	1.427	5.00	25.00	(23)	9.291	5.00	90.00
(10)	1.719	5.00	30.00	(24)	11.476	5.00	95.00
(11)	2.044	5.00	35.00	(25)	13.890	2.70	97.70
(12)	2.393	5.00	40.00	(26)	16.329	1.30	99.00
(13)	2.763	5.00	45.00	(27)	21.249	0.90	99.90
(14)	3.160	5.00	50.00				

Median : 3.153 (μm) Mean: 4.199 (μm) Mode: 4.179 (μm)
Std. Dev.: 3.608 (μm) Span: 1.746
Coef. Var: 85.93% Spec. Area: 37120 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/26/'01 06:29

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010829-879 14:04
Filename : SY102879
Sample : S01T001648

Material : SY-102 Solids
Source : S01T001028
Lot Numbe : Aliquot 1

Condition
T%(He-Ne): 88.9% Dist.Form: Std. Sampling times : 100
(LAMP): 82.5% R.R.Index: 1.16-0.00i ( )

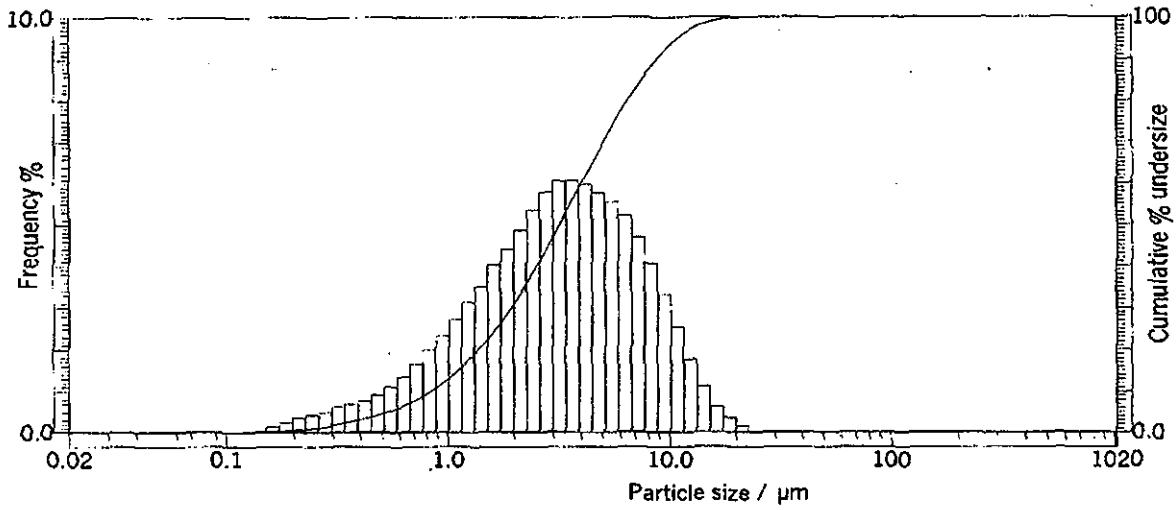
Agitation : 1 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 3.196μm SP.Area : 33244cm²/cm³ S.D. : 3.370μm
Mode : 3.645μm Mean : 4.138μm
C.V. : 81.44%

Span : (D 10.0-D 90.0) / D50 = 2.482

Dia. on %(5.0%) : 0.532μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 1.648μm % on Dia.(1.000μm) : 13.0%
Dia. on %(50.0%) : 3.196μm % on Dia.(10.000μm) : 93.2%
Dia. on %(75.0%) : 5.694μm % on Dia.(100.000μm) : 100.0%
Dia. on %(95.0%) : 10.960μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	100.00	0.669	1.35	7.10
890.1	0.00	100.00	22.80	0.15	100.00	0.584	1.10	5.75
777.1	0.00	100.00	19.90	0.35	99.85	0.510	0.92	4.65
678.5	0.00	100.00	17.38	0.62	99.50	0.445	0.77	3.73
592.4	0.00	100.00	15.17	1.12	98.88	0.389	0.69	2.96
517.2	0.00	100.00	13.25	1.76	97.76	0.339	0.62	2.27
451.6	0.00	100.00	11.56	2.52	96.00	0.296	0.50	1.65
394.2	0.00	100.00	10.10	3.31	93.47	0.259	0.43	1.14
344.2	0.00	100.00	8.816	4.05	90.16	0.226	0.34	0.72
300.5	0.00	100.00	7.697	4.67	86.11	0.197	0.24	0.37
262.4	0.00	100.00	6.720	5.22	81.44	0.172	0.13	0.13
229.1	0.00	100.00	5.867	5.54	76.22	0.150	0.00	0.00
200.0	0.00	100.00	5.122	5.77	70.68	0.131	0.00	0.00
174.6	0.00	100.00	4.472	5.98	64.91	0.115	0.00	0.00
152.5	0.00	100.00	3.905	6.07	58.94	0.100	0.00	0.00
133.1	0.00	100.00	3.409	6.05	52.87	0.087	0.00	0.00
116.2	0.00	100.00	2.976	5.78	46.82	0.076	0.00	0.00
101.5	0.00	100.00	2.599	5.34	41.04	0.067	0.00	0.00
88.58	0.00	100.00	2.269	4.86	35.69	0.058	0.00	0.00
77.34	0.00	100.00	1.981	4.40	30.83	0.051	0.00	0.00
67.52	0.00	100.00	1.729	4.02	26.43	0.044	0.00	0.00
58.95	0.00	100.00	1.510	3.51	22.41	0.039	0.00	0.00
51.47	0.00	100.00	1.318	3.12	18.90	0.034	0.00	0.00
44.94	0.00	100.00	1.151	2.71	15.78	0.029	0.00	0.00
39.23	0.00	100.00	1.005	2.34	13.07	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/26/01
File Name: SY102879.DAT Sample Name: S01T001648 ID No: 01/08/29-879
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 88.947 % Lamp: 82.485 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: SY-102 Solids Source: S01T001028
Lot No: Aliquot 1 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.167	0.10	0.10	(15)	3.583	5.00	55.00
(2)	0.248	0.90	1.00	(16)	4.005	5.00	60.00
(3)	0.342	1.30	2.30	(17)	4.482	5.00	65.00
(4)	0.533	2.70	5.00	(18)	5.045	5.00	70.00
(5)	0.836	5.00	10.00	(19)	5.703	5.00	75.00
(6)	1.109	5.00	15.00	(20)	6.485	5.00	80.00
(7)	1.152	0.80	15.80	(21)	7.297	4.20	84.20
(8)	1.378	4.20	20.00	(22)	7.464	0.80	85.00
(9)	1.651	5.00	25.00	(23)	8.770	5.00	90.00
(10)	1.933	5.00	30.00	(24)	10.984	5.00	95.00
(11)	2.228	5.00	35.00	(25)	13.186	2.70	97.70
(12)	2.534	5.00	40.00	(26)	15.601	1.30	99.00
(13)	2.858	5.00	45.00	(27)	20.817	0.90	99.90
(14)	3.204	5.00	50.00				

Median : 3.196 (μm) Mean: 4.138 (μm) Mode: 3.648 (μm)
Std. Dev.: 3.370 (μm) Span: 1.647
Coef. Var: 81.44% Spec. Area: 33244 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/26/'01 06:30

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010829-880 14:35
Filename : SY102880
Sample : S01T001649

Material : SY-102 Solids
Source : S01T001028
Lot Numbe : Aliquot 1

Condition
T%(He-Ne): 81.7% Dist.Form: Std. Sampling times : 100
(LAMP): 73.5% R.R.Index: 1.16-0.00i ( )

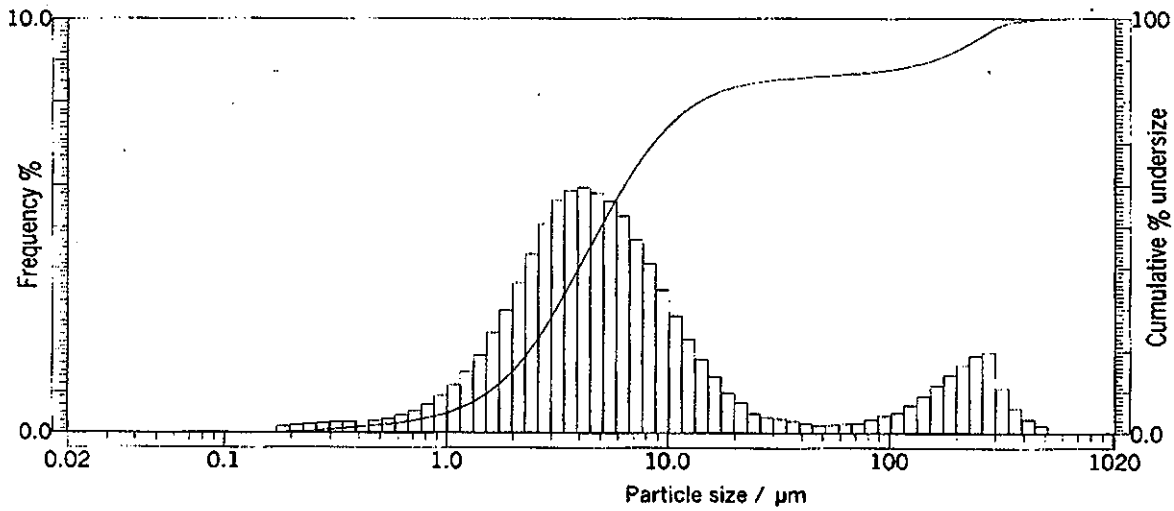
Agitation : 1 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 4.994μm SP.Area : 19645cm²/cm³ S.D. : 80.599μm
Mode : 4.177μm Mean : 35.188μm
C.V. : 229.05%

Span : (D 10.0-D 90.0) / D50 = 31.331

Dia. on %(5.0%) : 1.021μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 2.757μm % on Dia.(1.000μm) : 4.8%
Dia. on %(50.0%) : 4.994μm % on Dia.(10.000μm) : 74.0%
Dia. on %(75.0%) : 10.471μm % on Dia.(100.000μm) : 87.6%
Dia. on %(95.0%) : 247.580μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.48	84.73	0.669	0.43	2.72
890.1	0.00	100.00	22.80	0.74	84.25	0.584	0.35	2.29
777.1	0.00	100.00	19.90	0.98	83.51	0.510	0.30	1.94
678.5	0.00	100.00	17.38	1.38	82.53	0.445	0.27	1.63
592.4	0.00	100.00	15.17	1.79	81.15	0.389	0.27	1.36
517.2	0.19	100.00	13.25	2.27	79.36	0.339	0.27	1.10
451.6	0.34	99.81	11.56	2.85	77.09	0.296	0.24	0.83
394.2	0.61	99.47	10.10	3.47	74.24	0.259	0.23	0.59
344.2	1.09	98.87	8.816	4.11	70.76	0.226	0.20	0.36
300.5	1.97	97.77	7.697	4.70	66.65	0.197	0.16	0.16
262.4	1.87	95.80	6.720	5.26	61.94	0.172	0.00	0.00
229.1	1.66	93.93	5.867	5.60	56.68	0.150	0.00	0.00
200.0	1.42	92.26	5.122	5.81	51.08	0.131	0.00	0.00
174.6	1.15	90.85	4.472	5.93	45.27	0.115	0.00	0.00
152.5	0.89	89.69	3.905	5.85	39.34	0.100	0.00	0.00
133.1	0.68	88.80	3.409	5.63	33.49	0.087	0.00	0.00
116.2	0.50	88.13	2.976	5.07	27.86	0.076	0.00	0.00
101.5	0.43	87.63	2.599	4.34	22.79	0.067	0.00	0.00
88.58	0.34	87.20	2.269	3.63	18.45	0.058	0.00	0.00
77.34	0.24	86.87	1.981	2.98	14.82	0.051	0.00	0.00
67.52	0.24	86.62	1.729	2.44	11.84	0.044	0.00	0.00
58.95	0.22	86.39	1.510	1.89	9.40	0.039	0.00	0.00
51.47	0.19	86.17	1.318	1.50	7.52	0.034	0.00	0.00
44.94	0.23	85.98	1.151	1.16	6.02	0.029	0.00	0.00
39.23	0.29	85.75	1.005	0.90	4.86	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/26/01
File Name: SY102880.DAT Sample Name: S01T001649 ID No: 01/08/29-880
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 81.730 % Lamp: 73.459 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: SY-102 Solids Source: S01T001028
Lot No: Aliquot 1 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.188	0.10	0.10	(15)	5.643	5.00	55.00
(2)	0.324	0.90	1.00	(16)	6.405	5.00	60.00
(3)	0.586	1.30	2.30	(17)	7.354	5.00	65.00
(4)	1.022	2.70	5.00	(18)	8.608	5.00	70.00
(5)	1.563	5.00	10.00	(19)	10.490	5.00	75.00
(6)	1.995	5.00	15.00	(20)	13.936	5.00	80.00
(7)	2.058	0.80	15.80	(21)	22.609	4.20	84.20
(8)	2.386	4.20	20.00	(22)	28.804	0.80	85.00
(9)	2.763	5.00	25.00	(23)	158.326	5.00	90.00
(10)	3.141	5.00	30.00	(24)	248.134	5.00	95.00
(11)	3.537	5.00	35.00	(25)	299.133	2.70	97.70
(12)	3.968	5.00	40.00	(26)	355.208	1.30	99.00
(13)	4.446	5.00	45.00	(27)	482.224	0.90	99.90
(14)	5.001	5.00	50.00				

Median : 4.994 (μm) Mean: 35.188 (μm) Mode: 4.179 (μm)
Std. Dev.: 80.599 (μm) Span: 47.475
Coef. Var: 229.05% Spec. Area: 19645 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/26/'01 06:30

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010829-881 14:38
Filename : SY102881
Sample : S01T001649

Material : SY-102 Solids
Source : S01T001028
Lot Numbe : Aliquot 1

Condition
T%(He-Ne): 81.8% Dist.Form: Std. Sampling times : 100
(LAMP): 73.5% R.R.Index: 1.16-0.00i ( )

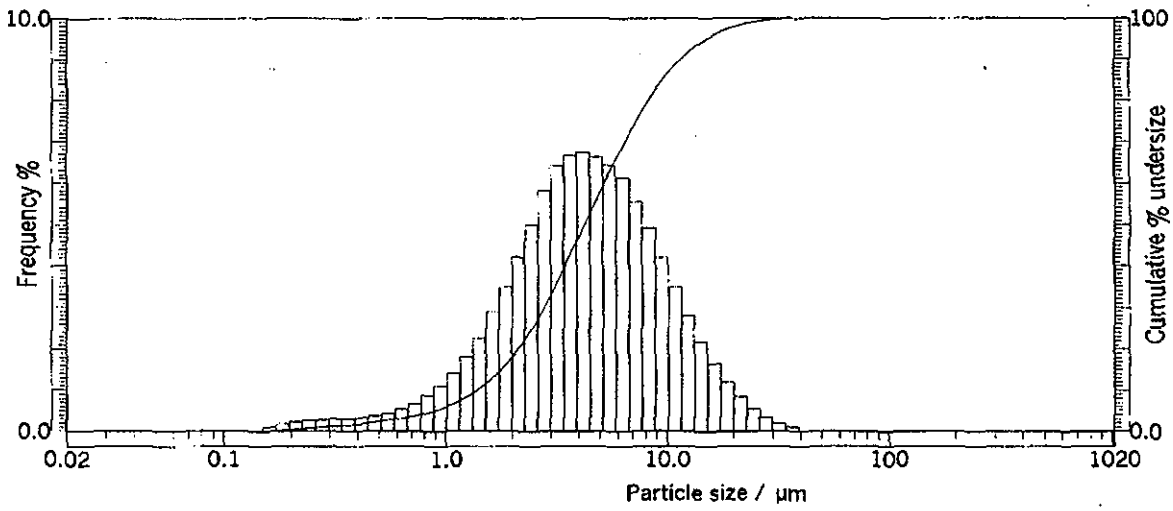
Agitation : 3 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 4.231μm SP.Area : 23454cm²/cm³ S.D. : 4.782μm
Mode : 4.178μm Mean : 5.612μm
C.V. : 85.20%

Span : (D 10.0-D 90.0) / D50 = 2.393

Dia. on %(5.0%) : 0.888μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 2.454μm % on Dia.(1.000μm) : 6.0%
Dia. on %(50.0%) : 4.231μm % on Dia.(10.000μm) : 86.3%
Dia. on %(75.0%) : 7.236μm % on Dia.(100.000μm) : 100.0%
Dia. on %(95.0%) : 15.056μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.54	99.33	0.669	0.53	3.36
890.1	0.00	100.00	22.80	0.83	98.79	0.584	0.43	2.83
777.1	0.00	100.00	19.90	1.19	97.96	0.510	0.37	2.39
678.5	0.00	100.00	17.38	1.64	96.77	0.445	0.32	2.02
592.4	0.00	100.00	15.17	2.19	95.12	0.389	0.32	1.70
517.2	0.00	100.00	13.25	2.80	92.94	0.339	0.32	1.38
451.6	0.00	100.00	11.56	3.49	90.14	0.296	0.28	1.07
394.2	0.00	100.00	10.10	4.21	86.65	0.259	0.27	0.78
344.2	0.00	100.00	8.816	4.92	82.43	0.226	0.23	0.52
300.5	0.00	100.00	7.697	5.54	77.52	0.197	0.18	0.28
262.4	0.00	100.00	6.720	6.12	71.98	0.172	0.11	0.11
229.1	0.00	100.00	5.867	6.45	65.85	0.150	0.00	0.00
200.0	0.00	100.00	5.122	6.65	59.41	0.131	0.00	0.00
174.6	0.00	100.00	4.472	6.76	52.76	0.115	0.00	0.00
152.5	0.00	100.00	3.905	6.66	46.00	0.100	0.00	0.00
133.1	0.00	100.00	3.409	6.42	39.34	0.087	0.00	0.00
116.2	0.00	100.00	2.976	5.81	32.92	0.076	0.00	0.00
101.5	0.00	100.00	2.599	5.00	27.11	0.067	0.00	0.00
88.58	0.00	100.00	2.269	4.22	22.11	0.058	0.00	0.00
77.34	0.00	100.00	1.981	3.49	17.89	0.051	0.00	0.00
67.52	0.00	100.00	1.729	2.89	14.40	0.044	0.00	0.00
58.95	0.00	100.00	1.510	2.26	11.51	0.039	0.00	0.00
51.47	0.00	100.00	1.318	1.81	9.24	0.034	0.00	0.00
44.94	0.00	100.00	1.151	1.42	7.43	0.029	0.00	0.00
39.23	0.12	100.00	1.005	1.11	6.01	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/26/01
File Name: SY102881.DAT Sample Name: S01T001649 ID No: 01/08/29-881
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 81.783 % Lamp: 73.455 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: SY-102 Solids Source: S01T001028
Lot No: Aliquot 1 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.171	0.10	0.10	(15)	4.691	5.00	55.00
(2)	0.287	0.90	1.00	(16)	5.191	5.00	60.00
(3)	0.493	1.30	2.30	(17)	5.768	5.00	65.00
(4)	0.888	2.70	5.00	(18)	6.445	5.00	70.00
(5)	1.382	5.00	10.00	(19)	7.253	5.00	75.00
(6)	1.773	5.00	15.00	(20)	8.262	5.00	80.00
(7)	1.830	0.80	15.80	(21)	9.353	4.20	84.20
(8)	2.125	4.20	20.00	(22)	9.596	0.80	85.00
(9)	2.459	5.00	25.00	(23)	11.507	5.00	90.00
(10)	2.787	5.00	30.00	(24)	15.063	5.00	95.00
(11)	3.117	5.00	35.00	(25)	19.351	2.70	97.70
(12)	3.458	5.00	40.00	(26)	24.065	1.30	99.00
(13)	3.830	5.00	45.00	(27)	34.942	0.90	99.90
(14)	4.240	5.00	50.00				

Median : 4.231 (μm) Mean: 5.612 (μm) Mode: 4.179 (μm)
Std. Dev.: 4.782 (μm) Span: 1.848
Coef. Var: 85.20% Spec. Area: 23454 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/26/'01 06:31

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010829-882 14:44
Filename : SY102882
Sample : S01T001649

Material : SY-102 Solids
Source : S01T001028
Lot Numbe : Aliquot 1

Condition
T%(He-Ne): 82.7% Dist.Form: Std. Sampling times : 100
(LAMP): 72.1% R.R.Index: 1.16-0.00i ( )

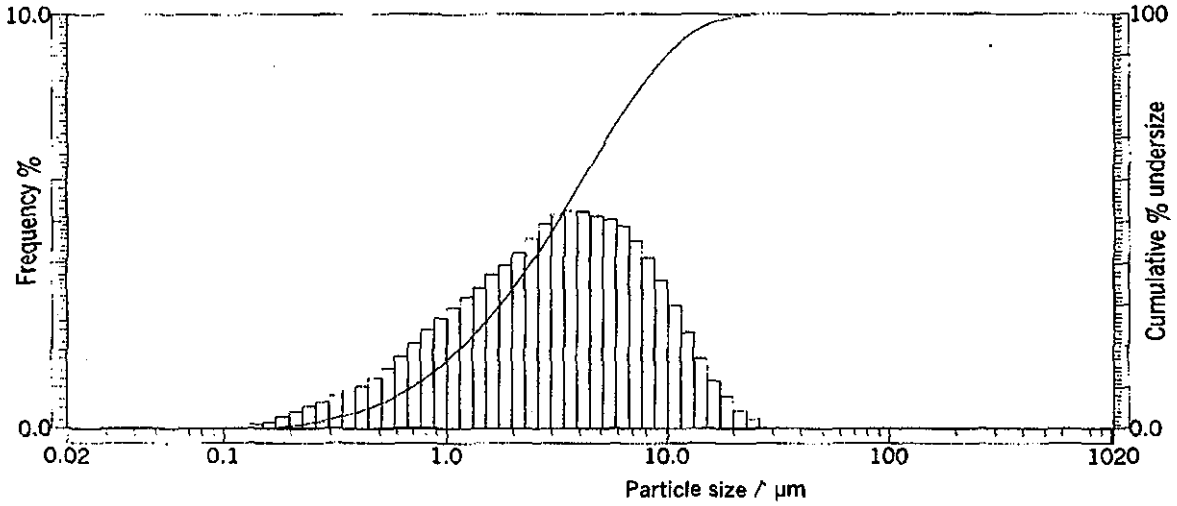
Agitation : 3 Circultn : 6 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 3.189μm SP.Area : 36545cm²/cm³ S.D. : 4.043μm
Mode : 3.651μm Mean : 4.437μm
C.V. : 91.11%

Span : (D 10.0-D 90.0) / D50 = 2.903

Dia. on %(5.0%) :	0.454μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	1.456μm	% on Dia.(1.000μm) :	16.3%
Dia. on %(50.0%) :	3.189μm	% on Dia.(10.000μm) :	90.1%
Dia. on %(75.0%) :	6.165μm	% on Dia.(100.000μm) :	100.0%
Dia. on %(95.0%) :	12.728μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.24	100.00	0.669	1.75	9.26
890.1	0.00	100.00	22.80	0.43	99.76	0.584	1.46	7.51
777.1	0.00	100.00	19.90	0.78	99.32	0.510	1.23	6.05
678.5	0.00	100.00	17.38	1.15	98.55	0.445	1.02	4.83
592.4	0.00	100.00	15.17	1.71	97.39	0.389	0.91	3.80
517.2	0.00	100.00	13.25	2.33	95.68	0.339	0.80	2.89
451.6	0.00	100.00	11.56	2.99	93.35	0.296	0.63	2.09
394.2	0.00	100.00	10.10	3.60	90.37	0.259	0.52	1.46
344.2	0.00	100.00	8.816	4.13	86.77	0.226	0.41	0.94
300.5	0.00	100.00	7.697	4.54	82.64	0.197	0.28	0.53
262.4	0.00	100.00	6.720	4.89	78.10	0.172	0.15	0.25
229.1	0.00	100.00	5.867	5.04	73.22	0.150	0.11	0.11
200.0	0.00	100.00	5.122	5.14	68.17	0.131	0.00	0.00
174.6	0.00	100.00	4.472	5.24	63.04	0.115	0.00	0.00
152.5	0.00	100.00	3.905	5.25	57.80	0.100	0.00	0.00
133.1	0.00	100.00	3.409	5.19	52.55	0.087	0.00	0.00
116.2	0.00	100.00	2.976	4.94	47.36	0.076	0.00	0.00
101.5	0.00	100.00	2.599	4.61	42.42	0.067	0.00	0.00
88.58	0.00	100.00	2.269	4.24	37.82	0.058	0.00	0.00
77.34	0.00	100.00	1.981	3.94	33.58	0.051	0.00	0.00
67.52	0.00	100.00	1.729	3.73	29.64	0.044	0.00	0.00
58.95	0.00	100.00	1.510	3.40	25.91	0.039	0.00	0.00
51.47	0.00	100.00	1.318	3.19	22.51	0.034	0.00	0.00
44.94	0.00	100.00	1.151	2.93	19.32	0.029	0.00	0.00
39.23	0.00	100.00	1.005	2.67	16.39	0.026	0.00	0.00

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PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/26/01
File Name: SY102882.DAT Sample Name: S01T001649 ID No: 01/08/29-882
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 82.671 % Lamp: 72.132 %
Circulation: 6 Agitation: 3 U.Sonic ** (min)
Material: SY-102 Solids *Source: S01T001028*
Lot No: Aliquot 1 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.149	0.10	0.10	(15)	3.640	5.00	55.00
(2)	0.230	0.90	1.00	(16)	4.143	5.00	60.00
(3)	0.307	1.30	2.30	(17)	4.721	5.00	65.00
(4)	0.454	2.70	5.00	(18)	5.392	5.00	70.00
(5)	0.704	5.00	10.00	(19)	6.178	5.00	75.00
(6)	0.939	5.00	15.00	(20)	7.128	5.00	80.00
(7)	0.977	0.80	15.80	(21)	8.119	4.20	84.20
(8)	1.187	4.20	20.00	(22)	8.336	0.80	85.00
(9)	1.459	5.00	25.00	(23)	9.966	5.00	90.00
(10)	1.752	5.00	30.00	(24)	12.752	5.00	95.00
(11)	2.077	5.00	35.00	(25)	15.758	2.70	97.70
(12)	2.425	5.00	40.00	(26)	18.850	1.30	99.00
(13)	2.796	5.00	45.00	(27)	24.741	0.90	99.90
(14)	3.196	5.00	50.00				

Median : 3.189 (μm) Mean: 4.437 (μm) Mode: 3.648 (μm)
Std. Dev.: 4.043 (μm) Span: 2.058
Coef. Var: 91.11% Spec. Area: 36545 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/26/'01 06:31

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010829.883 14:47
Filename : SY102883
Sample : S01T001649

Material : SY-102 Solids
Source : S01T001028
Lot Numbe : Aliquot 1

Condition
T%(He-Ne): 82.3% Dist.Form: Std. Sampling times : 100
(LAMP): 72.1% R.R.Index: 1.16-0.00i ( )

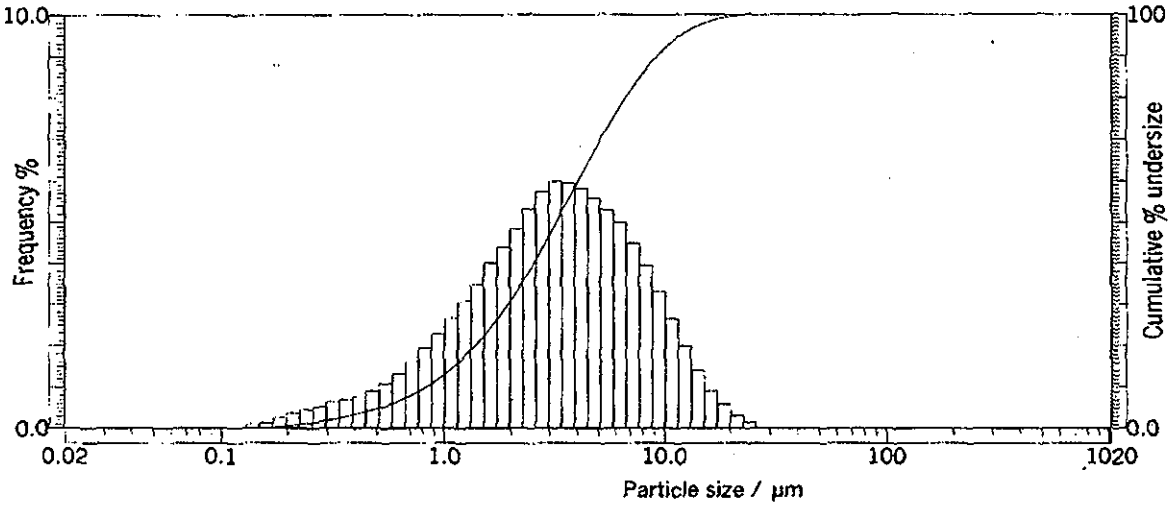
Agitation : 1 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 3.215μm SP.Area : 33599cm²/cm³ S.D. : 3.717μm
Mode : 3.193μm Mean : 4.309μm
C.V. : 86.26%

Span : (D 10.0-D 90.0) / D50 = 2.634

Dia. on %(5.0%) : 0.519μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 1.657μm % on Dia.(1.000μm) : 13.0%
Dia. on %(50.0%) : 3.215μm % on Dia.(10.000μm) : 91.8%
Dia. on %(75.0%) : 5.829μm % on Dia.(100.000μm) : 100.0%
Dia. on %(95.0%) : 11.842μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.16	100.00	0.669	1.31	7.24
890.1	0.00	100.00	22.80	0.31	99.84	0.584	1.08	5.93
777.1	0.00	100.00	19.90	0.58	99.53	0.510	0.91	4.85
678.5	0.00	100.00	17.38	0.91	98.94	0.445	0.77	3.94
592.4	0.00	100.00	15.17	1.40	98.04	0.389	0.70	3.18
517.2	0.00	100.00	13.25	1.99	96.64	0.339	0.64	2.48
451.6	0.00	100.00	11.56	2.65	94.65	0.296	0.52	1.84
394.2	0.00	100.00	10.10	3.31	92.01	0.259	0.45	1.31
344.2	0.00	100.00	8.816	3.95	88.69	0.226	0.36	0.86
300.5	0.00	100.00	7.697	4.49	84.74	0.197	0.26	0.50
262.4	0.00	100.00	6.720	5.00	80.25	0.172	0.14	0.24
229.1	0.00	100.00	5.867	5.32	75.25	0.150	0.10	0.10
200.0	0.00	100.00	5.122	5.58	69.94	0.131	0.00	0.00
174.6	0.00	100.00	4.472	5.82	64.36	0.115	0.00	0.00
152.5	0.00	100.00	3.905	5.96	58.54	0.100	0.00	0.00
133.1	0.00	100.00	3.409	5.99	52.59	0.087	0.00	0.00
116.2	0.00	100.00	2.976	5.75	46.60	0.076	0.00	0.00
101.5	0.00	100.00	2.599	5.33	40.85	0.067	0.00	0.00
88.58	0.00	100.00	2.269	4.86	35.51	0.058	0.00	0.00
77.34	0.00	100.00	1.981	4.39	30.66	0.051	0.00	0.00
67.52	0.00	100.00	1.729	4.00	26.26	0.044	0.00	0.00
58.95	0.00	100.00	1.510	3.47	22.26	0.039	0.00	0.00
51.47	0.00	100.00	1.318	3.08	18.78	0.034	0.00	0.00
44.94	0.00	100.00	1.151	2.66	15.70	0.029	0.00	0.00
39.23	0.00	100.00	1.005	2.28	13.04	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/26/01
File Name: SY102883.DAT Sample Name: S01T001649 ID No: 01/08/29-883
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 82.330 % Lamp: 72.084 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: SY-102 Solids Source: S01T001028
Lot No: Aliquot 1 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.150	0.10	0.10	(15)	3.610	5.00	55.00
(2)	0.236	0.90	1.00	(16)	4.047	5.00	60.00
(3)	0.327	1.30	2.30	(17)	4.546	5.00	65.00
(4)	0.520	2.70	5.00	(18)	5.131	5.00	70.00
(5)	0.833	5.00	10.00	(19)	5.831	5.00	75.00
(6)	1.112	5.00	15.00	(20)	6.677	5.00	80.00
(7)	1.156	0.80	15.80	(21)	7.578	4.20	84.20
(8)	1.385	4.20	20.00	(22)	7.769	0.80	85.00
(9)	1.660	5.00	25.00	(23)	9.322	5.00	90.00
(10)	1.943	5.00	30.00	(24)	11.858	5.00	95.00
(11)	2.238	5.00	35.00	(25)	14.705	2.70	97.70
(12)	2.546	5.00	40.00	(26)	17.621	1.30	99.00
(13)	2.871	5.00	45.00	(27)	24.096	0.90	99.90
(14)	3.222	5.00	50.00				

Median : 3.215 (μm) Mean: 4.309 (μm) Mode: 3.185 (μm)
Std. Dev.: 3.717 (μm) Span: 1.870
Coef. Var: 86.26% Spec. Area: 33599 (cm2/cm3)

APPENDIX F-11

AW-103 SIEVE TEST SAMPLES: PSD MEASUREMENT RESULTS

Consisting of 34 pages including this cover page

TABLE F-11. Sample identification and PSD run conditions. AW-103 composite, sieve test samples S01T001291 (> 500 μm) and S01T001294 (< 53 μm).

Conditions Key: P = Pump Speed Setting; P6 = 14.4 mL/s
S = Stirrer Speed Setting (1-7); S1 = Stirrer Speed 1; S3 = Stirrer Speed 3
US = Ultrasonic ON Time (min); DT = Delay Time (min) between end of ultrasonic treatment and PSD measurement.
Time = Clock time at beginning of measurement.

Sample Sieve Fraction	PSD Run File Name	Run Conditions				Time	Cumulative Time (min) At Conditions				
		P	S	US	DT		P6	S1	S3	US	DT
S01T001291	[LOAD-IN]	6	1	0	0	?	?	?			
> 500 μm	AW103017	6	1	0	0	09:45	9	9			
	AW103018	6	3	0	0	09:54	12	9	3		
	AW103019	6	3	2	0	09:57	17	9	8	2	0
	AW10319A	6	1	0	0	10:02	19	11	8	2	3
						10:04					
S01T001291	[LOAD-IN]	6	1	0	0	?	?	?			
> 500 μm	AW103020	6	1	0	0	10:14	9	9			
	AW103021	6	3	0	0	10:23	14	9	5		
	AW103022	6	3	2	0	10:28	20	9	11	2	0
	AW103023	6	1	0	0	10:34	22	11	11	2	4
						10:36					
S01T001294	[LOAD-IN]	6	1	0	0	?	?	?			
< 53 μm	AW103024	6	1	0	0	14:00	5	5			
	AW103025	6	3	0	0	14:05	9	5	4		
	AW103026	6	3	2	0	14:09	15	5	10	2	0
	AW103027	6	1	0	0	14:15	17	7	10	2	4
						14:17					
S01T001294	[LOAD-IN]	6	1	0	0	?	?	?			
< 53 μm	AW103028	6	1	0	0	14:28	4	4			
	AW103029	6	3	0	0	14:32	7	4	3		
	AW103030	6	3	2	0	14:35	14	4	10	2	0
	AW103031	6	1	0	0	14:42	16	6	10	2	5
						14:44					

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 07:10

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-082 09:51
Filename : AW103017
Sample : 1291

Material :
Source : Aw103
Lot Numbe :

Condition
T%(He-Ne): 90.6%
(LAMP): 91.7%
Dist.Form: Std.
R.R.index: 1.16-0.00i
Sampling times : 100
( )

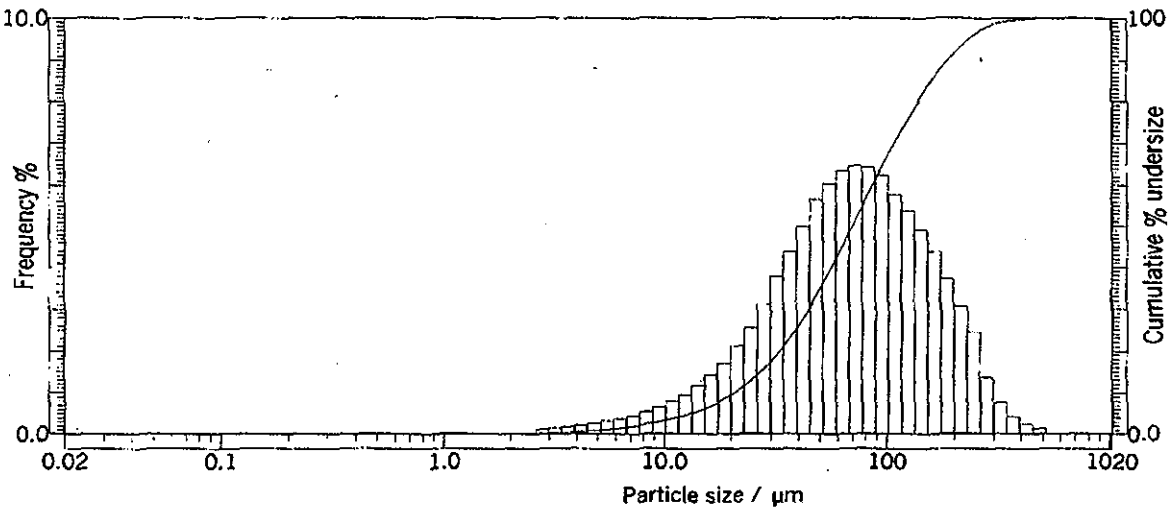
Agitation : 1 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 69.924μm SP.Area : 1453cm²/cm³ S.D. : 71.102μm
Mode : 72.329μm Mean : 89.930μm
C.V. : 79.06%

Span : (D 10.0-D 90.0) / D50 = 2.403

Dia. on %(5.0%) : 13.155μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 38.893μm % on Dia.(1.000μm) : 0.0%
Dia. on %(50.0%) : 69.924μm % on Dia.(10.000μm) : 3.3%
Dia. on %(75.0%) : 121.553μm % on Dia.(100.000μm) : 66.8%
Dia. on %(95.0%) : 233.517μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	2.54	14.01	0.669	0.00	0.00
890.1	0.00	100.00	22.80	2.11	11.47	0.584	0.00	0.00
777.1	0.00	100.00	19.90	1.70	9.36	0.510	0.00	0.00
678.5	0.00	100.00	17.38	1.44	7.65	0.445	0.00	0.00
592.4	0.00	100.00	15.17	1.17	6.22	0.389	0.00	0.00
517.2	0.13	100.00	13.25	0.95	5.05	0.339	0.00	0.00
451.6	0.23	99.87	11.56	0.79	4.09	0.296	0.00	0.00
394.2	0.42	99.64	10.10	0.66	3.30	0.259	0.00	0.00
344.2	0.76	99.22	8.816	0.55	2.65	0.226	0.00	0.00
300.5	1.36	98.46	7.697	0.46	2.10	0.197	0.00	0.00
262.4	2.45	97.10	6.720	0.39	1.64	0.172	0.00	0.00
229.1	3.07	94.65	5.867	0.32	1.25	0.150	0.00	0.00
200.0	3.72	91.58	5.122	0.27	0.93	0.131	0.00	0.00
174.6	4.36	87.86	4.472	0.22	0.67	0.115	0.00	0.00
152.5	4.91	83.50	3.905	0.18	0.44	0.100	0.00	0.00
133.1	5.37	78.59	3.409	0.15	0.26	0.087	0.00	0.00
116.2	5.76	73.22	2.976	0.11	0.11	0.076	0.00	0.00
101.5	6.23	67.46	2.599	0.00	0.00	0.067	0.00	0.00
88.58	6.43	61.23	2.269	0.00	0.00	0.058	0.00	0.00
77.34	6.46	54.80	1.981	0.00	0.00	0.051	0.00	0.00
67.52	6.35	48.34	1.729	0.00	0.00	0.044	0.00	0.00
58.95	6.05	41.99	1.510	0.00	0.00	0.039	0.00	0.00
51.47	5.66	35.94	1.318	0.00	0.00	0.034	0.00	0.00
44.94	5.00	30.28	1.151	0.00	0.00	0.029	0.00	0.00
39.23	4.38	25.28	1.005	0.00	0.00	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01
File Name: AW103017.DAT Sample Name: 1291 ID No: 01/09/28-082
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 90.585 % Lamp: 91.713 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: Source: Aw103

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	2.932	0.10	0.10	(15)	77.694	5.00	55.00
(2)	5.277	0.90	1.00	(16)	86.432	5.00	60.00
(3)	8.110	1.30	2.30	(17)	96.377	5.00	65.00
(4)	13.160	2.70	5.00	(18)	107.964	5.00	70.00
(5)	20.785	5.00	10.00	(19)	121.805	5.00	75.00
(6)	27.319	5.00	15.00	(20)	138.667	5.00	80.00
(7)	28.293	0.80	15.80	(21)	156.027	4.20	84.20
(8)	33.217	4.20	20.00	(22)	160.090	0.80	85.00
(9)	38.913	5.00	25.00	(23)	189.209	5.00	90.00
(10)	44.620	5.00	30.00	(24)	233.787	5.00	95.00
(11)	50.387	5.00	35.00	(25)	279.153	2.70	97.70
(12)	56.495	5.00	40.00	(26)	331.633	1.30	99.00
(13)	63.019	5.00	45.00	(27)	466.533	0.90	99.90
(14)	70.050	5.00	50.00				

Median : 69.924 (μm) Mean: 89.930 (μm) Mode: 72.265 (μm)
Std. Dev.: 71.102 (μm) Span: 1.601
Coef. Var: 79.06% Spec. Area: 1453 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 07:12

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-083 09:56
Filename : AW103018
Sample : 1291

Material :
Source : Aw103
Lot Numbe :

Condition

T%(He-Ne): 88.8% Dist.Form: Std. Sampling times : 100
(LAMP): 90.0% R.R.Index: 1.16-0.00i ( )

Agitation : 3 Circultn : 6 U.sonic : OFF(120)

Format

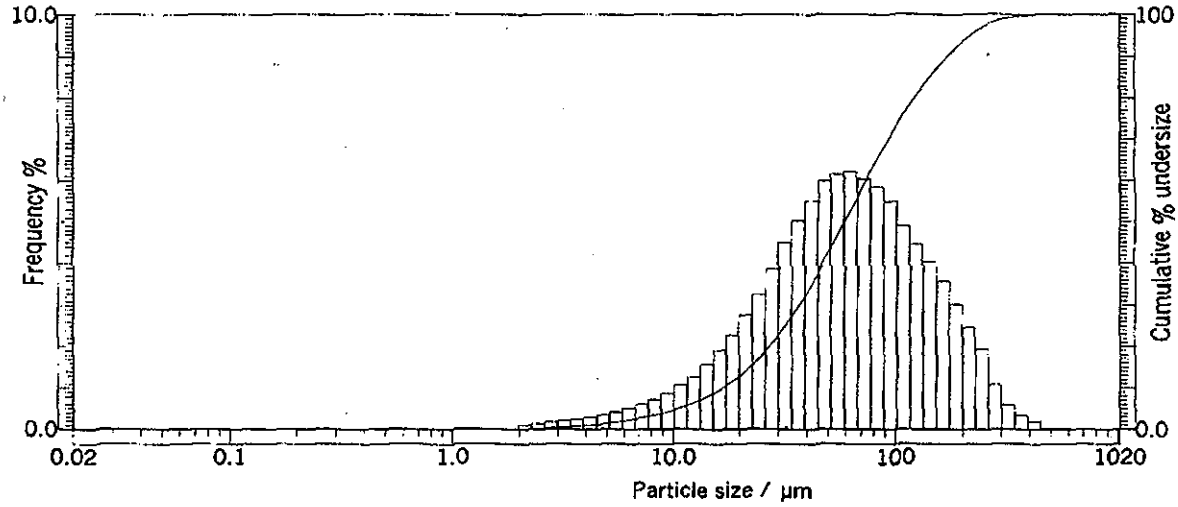
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data

Median : 59.190μm SP.Area : 1773cm²/cm³ S.D. : 66.542μm
Mode : 63.021μm Mean : 79.263μm
C.V. : 83.95%

Span : (D 10.0-D 90.0) / D50 = 2.623

Dia. on %(5.0%) :	10.570μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	32.127μm	% on Dia.(1.000μm) :	0.0%
Dia. on %(50.0%) :	59.190μm	% on Dia.(10.000μm) :	4.6%
Dia. on %(75.0%) :	105.999μm	% on Dia.(100.000μm) :	72.8%
Dia. on %(95.0%) :	218.342μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	3.27	18.75	0.669	0.00	0.00
890.1	0.00	100.00	22.80	2.76	15.48	0.584	0.00	0.00
777.1	0.00	100.00	19.90	2.27	12.72	0.510	0.00	0.00
678.5	0.00	100.00	17.38	1.91	10.45	0.445	0.00	0.00
592.4	0.00	100.00	15.17	1.56	8.54	0.389	0.00	0.00
517.2	0.00	100.00	13.25	1.28	6.98	0.339	0.00	0.00
451.6	0.18	100.00	11.56	1.06	5.70	0.296	0.00	0.00
394.2	0.33	99.82	10.10	0.87	4.64	0.259	0.00	0.00
344.2	0.60	99.48	8.816	0.72	3.78	0.226	0.00	0.00
300.5	1.08	98.88	7.697	0.59	3.06	0.197	0.00	0.00
262.4	1.94	97.81	6.720	0.51	2.46	0.172	0.00	0.00
229.1	2.46	95.87	5.867	0.42	1.96	0.150	0.00	0.00
200.0	3.02	93.41	5.122	0.35	1.54	0.131	0.00	0.00
174.6	3.58	90.39	4.472	0.30	1.19	0.115	0.00	0.00
152.5	4.03	86.81	3.905	0.25	0.89	0.100	0.00	0.00
133.1	4.47	82.78	3.409	0.21	0.63	0.087	0.00	0.00
116.2	4.89	78.31	2.976	0.17	0.42	0.076	0.00	0.00
101.5	5.50	73.42	2.599	0.14	0.25	0.067	0.00	0.00
88.58	5.86	67.92	2.269	0.11	0.11	0.058	0.00	0.00
77.34	6.05	62.07	1.981	0.00	0.00	0.051	0.00	0.00
67.52	6.20	56.02	1.729	0.00	0.00	0.044	0.00	0.00
58.95	6.15	49.82	1.510	0.00	0.00	0.039	0.00	0.00
51.47	5.98	43.67	1.318	0.00	0.00	0.034	0.00	0.00
44.94	5.52	37.68	1.151	0.00	0.00	0.029	0.00	0.00
39.23	5.04	32.17	1.005	0.00	0.00	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01
File Name: AW103018.DAT Sample Name: 1291 ID No: 01/09/28-083
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 88.787 % Lamp: 89.970 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: Source: Aw103

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	2.235	0.10	0.10	(15)	66.114	5.00	55.00
(2)	4.115	0.90	1.00	(16)	73.985	5.00	60.00
(3)	6.444	1.30	2.30	(17)	82.972	5.00	65.00
(4)	10.592	2.70	5.00	(18)	93.446	5.00	70.00
(5)	16.854	5.00	10.00	(19)	106.216	5.00	75.00
(6)	22.292	5.00	15.00	(20)	122.593	5.00	80.00
(7)	23.119	0.80	15.80	(21)	139.924	4.20	84.20
(8)	27.337	4.20	20.00	(22)	143.764	0.80	85.00
(9)	32.201	5.00	25.00	(23)	172.209	5.00	90.00
(10)	37.091	5.00	30.00	(24)	218.795	5.00	95.00
(11)	42.162	5.00	35.00	(25)	260.515	2.70	97.70
(12)	47.467	5.00	40.00	(26)	308.922	1.30	99.00
(13)	53.093	5.00	45.00	(27)	420.510	0.90	99.90
(14)	59.207	5.00	50.00				

Median : 59.190 (μm) Mean: 79.263 (μm) Mode: 63.093 (μm)
Std. Dev.: 66.542 (μm) Span: 1.898
Coef. Var: 83.95% Spec. Area: 1773 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 07:12

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-084 10:01
Filename : AW103019
Sample : 1291

Material :
Source : Aw103
Lot Numbe :

Condition
T%(He-Ne): 81.9% Dist.Form: Std. Sampling times : 100
(LAMP): 81.9% R.R.index: 1.16-0.00i ( )

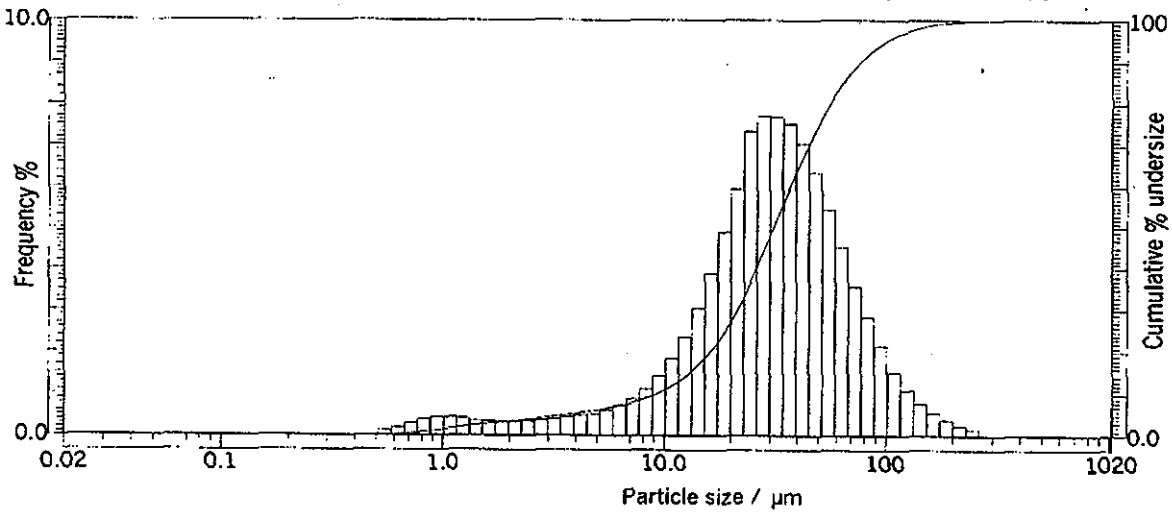
Agitation : 3 Circultn : 6 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 30.912μm SP.Area : 4726cm²/cm³ S.D. : 32.024μm
Mode : 28.031μm Mean : 38.888μm
C.V. : 82.35%

Span : (D 10.0-D 90.0) / D50 = 2.180

Dia. on %(5.0%) :	3.601μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	18.775μm	% on Dia.(1.000μm) :	1.5%
Dia. on %(50.0%) :	30.912μm	% on Dia.(10.000μm) :	11.0%
Dia. on %(75.0%) :	49.561μm	% on Dia.(100.000μm) :	95.0%
Dia. on %(95.0%) :	99.785μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	7.35	40.40	0.669	0.20	0.32
890.1	0.00	100.00	22.80	5.95	33.05	0.584	0.12	0.12
777.1	0.00	100.00	19.90	4.89	27.10	0.510	0.00	0.00
678.5	0.00	100.00	17.38	3.89	22.21	0.445	0.00	0.00
592.4	0.00	100.00	15.17	3.05	18.32	0.389	0.00	0.00
517.2	0.00	100.00	13.25	2.36	15.28	0.339	0.00	0.00
451.6	0.00	100.00	11.56	1.84	12.92	0.296	0.00	0.00
394.2	0.00	100.00	10.10	1.42	11.08	0.259	0.00	0.00
344.2	0.00	100.00	8.816	1.12	9.66	0.226	0.00	0.00
300.5	0.00	100.00	7.697	0.89	8.54	0.197	0.00	0.00
262.4	0.17	100.00	6.720	0.74	7.65	0.172	0.00	0.00
229.1	0.24	99.83	5.867	0.62	6.90	0.150	0.00	0.00
200.0	0.38	99.60	5.122	0.53	6.28	0.131	0.00	0.00
174.6	0.56	99.22	4.472	0.48	5.75	0.115	0.00	0.00
152.5	0.77	98.66	3.905	0.45	5.27	0.100	0.00	0.00
133.1	1.10	97.89	3.409	0.41	4.82	0.087	0.00	0.00
116.2	1.53	96.79	2.976	0.37	4.41	0.076	0.00	0.00
101.5	2.14	95.26	2.599	0.34	4.04	0.067	0.00	0.00
88.58	2.83	93.12	2.269	0.32	3.70	0.058	0.00	0.00
77.34	3.56	90.29	1.981	0.32	3.38	0.051	0.00	0.00
67.52	4.51	86.73	1.729	0.35	3.06	0.044	0.00	0.00
58.95	5.44	82.21	1.510	0.37	2.71	0.039	0.00	0.00
51.47	6.36	76.77	1.318	0.42	2.33	0.034	0.00	0.00
44.94	7.06	70.41	1.151	0.45	1.92	0.029	0.00	0.00
39.23	7.53	63.36	1.005	0.45	1.47	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01
File Name: AW103019.DAT Sample Name: 1291 ID No: 01/09/28-084
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 81.857 % Lamp: 81.885 %
Circulation: 6 Agitation: 3 U.Sonic ** (min)
Material: Source: Aw103

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.570	0.10	0.10	(15)	33.788	5.00	55.00
(2)	0.871	0.90	1.00	(16)	37.015	5.00	60.00
(3)	1.304	1.30	2.30	(17)	40.563	5.00	65.00
(4)	3.609	2.70	5.00	(18)	44.605	5.00	70.00
(5)	9.125	5.00	10.00	(19)	49.651	5.00	75.00
(6)	13.050	5.00	15.00	(20)	55.909	5.00	80.00
(7)	13.577	0.80	15.80	(21)	62.724	4.20	84.20
(8)	16.122	4.20	20.00	(22)	64.242	0.80	85.00
(9)	18.817	5.00	25.00	(23)	76.547	5.00	90.00
(10)	21.312	5.00	30.00	(24)	99.881	5.00	95.00
(11)	23.674	5.00	35.00	(25)	130.180	2.70	97.70
(12)	25.929	5.00	40.00	(26)	165.993	1.30	99.00
(13)	28.371	5.00	45.00	(27)	242.212	0.90	99.90
(14)	30.966	5.00	50.00				

Median : 30.912 (μm) Mean: 38.888 (μm) Mode: 27.945 (μm)
Std. Dev.: 32.024 (μm) Span: 1.625
Coef. Var: 82.35% Spec. Area: 4726 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 07:14

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-085 10:04
Filename : AW10319A
Sample : 1291

Material :
Source : Aw103
Lot Numbe :

Condition
T%(He-Ne): 81.8% Dist.Form: Std. Sampling times : 100
(LAMP): 81.5% R.R.Index: 1.16-0.00i ( )

Agitation : 1 Circultn : 6 U.sonic : ~~ON~~ OFF (120)

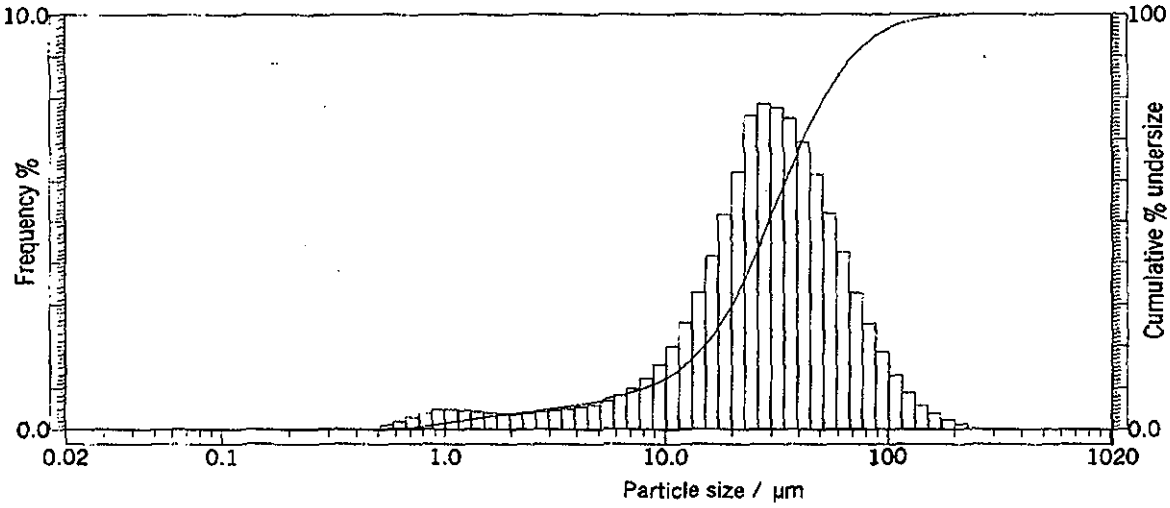
WSQ 10/4/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 29.389μm SP.Area : 4999cm²/cm³ S.D. : 28.568μm
Mode : 27.992μm Mean : 36.152μm
C.V. : 79.02%

Span : (D 10.0-D 90.0) / D50 = 2.137

Dia. on %(5.0%) :	3.082μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	17.744μm	% on Dia.(1.000μm) :	1.5%
Dia. on %(50.0%) :	29.389μm	% on Dia.(10.000μm) :	12.1%
Dia. on %(75.0%) :	46.762μm	% on Dia.(100.000μm) :	96.3%
Dia. on %(95.0%) :	91.075μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	7.57	43.16	0.669	0.19	0.30
890.1	0.00	100.00	22.80	6.22	35.59	0.584	0.11	0.11
777.1	0.00	100.00	19.90	5.17	29.38	0.510	0.00	0.00
678.5	0.00	100.00	17.38	4.15	24.20	0.445	0.00	0.00
592.4	0.00	100.00	15.17	3.28	20.06	0.389	0.00	0.00
517.2	0.00	100.00	13.25	2.55	16.78	0.339	0.00	0.00
451.6	0.00	100.00	11.56	1.99	14.23	0.296	0.00	0.00
394.2	0.00	100.00	10.10	1.55	12.23	0.259	0.00	0.00
344.2	0.00	100.00	8.816	1.22	10.68	0.226	0.00	0.00
300.5	0.00	100.00	7.697	0.97	9.46	0.197	0.00	0.00
262.4	0.00	100.00	6.720	0.82	8.48	0.172	0.00	0.00
229.1	0.14	100.00	5.867	0.68	7.67	0.150	0.00	0.00
200.0	0.25	99.86	5.122	0.59	6.99	0.131	0.00	0.00
174.6	0.39	99.61	4.472	0.54	6.39	0.115	0.00	0.00
152.5	0.58	99.22	3.905	0.50	5.85	0.100	0.00	0.00
133.1	0.88	98.64	3.409	0.47	5.35	0.087	0.00	0.00
116.2	1.28	97.76	2.976	0.43	4.88	0.076	0.00	0.00
101.5	1.86	96.48	2.599	0.40	4.45	0.067	0.00	0.00
88.58	2.54	94.62	2.269	0.38	4.05	0.058	0.00	0.00
77.34	3.28	92.08	1.981	0.38	3.67	0.051	0.00	0.00
67.52	4.24	88.80	1.729	0.42	3.29	0.044	0.00	0.00
58.95	5.20	84.55	1.510	0.43	2.87	0.039	0.00	0.00
51.47	6.15	79.35	1.318	0.47	2.44	0.034	0.00	0.00
44.94	6.93	73.20	1.151	0.49	1.96	0.029	0.00	0.00
39.23	7.50	66.27	1.005	0.47	1.47	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01

File Name: AW10319A.DAT Sample Name: 1291 ID No: 01/09/28-085

Dist. Form: STANDARD R.R. Index: 116-000

Dist. Mode: VOLUME Laser: 81.765 % Lamp: 81.546 %

Circulation: 6 Agitation: 1 U.Sonic OFF (min)

Material: Source: Aw103

WSC 10/4/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.576	0.10	0.10	(15)	32.141	5.00	55.00
(2)	0.878	0.90	1.00	(16)	35.069	5.00	60.00
(3)	1.270	1.30	2.30	(17)	38.390	5.00	65.00
(4)	3.088	2.70	5.00	(18)	42.305	5.00	70.00
(5)	8.192	5.00	10.00	(19)	46.853	5.00	75.00
(6)	12.074	5.00	15.00	(20)	52.408	5.00	80.00
(7)	12.601	0.80	15.80	(21)	58.448	4.20	84.20
(8)	15.138	4.20	20.00	(22)	59.860	0.80	85.00
(9)	17.766	5.00	25.00	(23)	71.129	5.00	90.00
(10)	20.194	5.00	30.00	(24)	91.216	5.00	95.00
(11)	22.520	5.00	35.00	(25)	115.473	2.70	97.70
(12)	24.727	5.00	40.00	(26)	145.024	1.30	99.00
(13)	27.001	5.00	45.00	(27)	207.934	0.90	99.90
(14)	29.418	5.00	50.00				

Median : 29.389 (μm) Mean: 36.152 (μm) Mode: 27.945 (μm)

Std. Dev.: 28.568 (μm) Span: 1.508

Coef. Var: 79.02% Spec. Area: 4999 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 07:12

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-086 10:17
Filename : AW103020
Sample : 1291

Material :
Source : Aw103
Lot Numbe :

Condition
T%(He-Ne): 92.4%
(LAMP): 93.2%
Dist.Form: Std.
R.R.Index: 1.16-0.00i
Sampling times : 100
( )

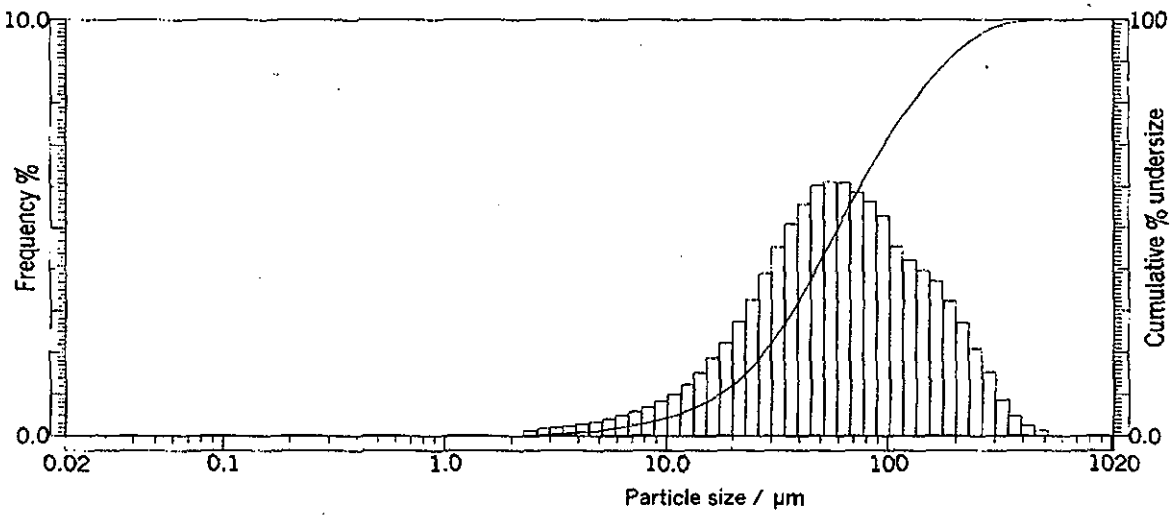
Agitation : 1 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 59.729μm SP.Area : 1708cm²/cm³ S.D. : 72.709μm
Mode : 55.137μm Mean : 83.050μm
C.V. : 87.55%

Span : (D 10.0-D 90.0) / D50 = 2.797

Dia. on %(5.0%) : 10.983μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 32.625μm % on Dia.(1.000μm) : 0.0%
Dia. on %(50.0%) : 59.729μm % on Dia.(10.000μm) : 4.3%
Dia. on %(75.0%) : 110.086μm % on Dia.(100.000μm) : 71.7%
Dia. on %(95.0%) : 234.681μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	3.26	18.21	0.669	0.00	0.00
890.1	0.00	100.00	22.80	2.73	14.95	0.584	0.00	0.00
777.1	0.00	100.00	19.90	2.22	12.22	0.510	0.00	0.00
678.5	0.00	100.00	17.38	1.86	10.00	0.445	0.00	0.00
592.4	0.00	100.00	15.17	1.52	8.13	0.389	0.00	0.00
517.2	0.15	100.00	13.25	1.23	6.62	0.339	0.00	0.00
451.6	0.26	99.85	11.56	1.02	5.39	0.296	0.00	0.00
394.2	0.47	99.59	10.10	0.84	4.37	0.259	0.00	0.00
344.2	0.85	99.12	8.816	0.69	3.53	0.226	0.00	0.00
300.5	1.54	98.26	7.697	0.57	2.84	0.197	0.00	0.00
262.4	2.10	96.72	6.720	0.49	2.26	0.172	0.00	0.00
229.1	2.70	94.63	5.867	0.41	1.77	0.150	0.00	0.00
200.0	3.22	91.92	5.122	0.34	1.37	0.131	0.00	0.00
174.6	3.72	88.70	4.472	0.29	1.02	0.115	0.00	0.00
152.5	3.95	84.98	3.905	0.24	0.73	0.100	0.00	0.00
133.1	4.22	81.04	3.409	0.20	0.49	0.087	0.00	0.00
116.2	4.54	76.81	2.976	0.16	0.29	0.076	0.00	0.00
101.5	5.28	72.27	2.599	0.13	0.13	0.067	0.00	0.00
88.58	5.63	66.99	2.269	0.00	0.00	0.058	0.00	0.00
77.34	5.84	61.35	1.981	0.00	0.00	0.051	0.00	0.00
67.52	6.10	55.51	1.729	0.00	0.00	0.044	0.00	0.00
58.95	6.12	49.41	1.510	0.00	0.00	0.039	0.00	0.00
51.47	6.01	43.29	1.318	0.00	0.00	0.034	0.00	0.00
44.94	5.56	37.28	1.151	0.00	0.00	0.029	0.00	0.00
39.23	5.08	31.72	1.005	0.00	0.00	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01
File Name: AW103020.DAT Sample Name: 1291 ID No: 01/09/28-086
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 92.408 % Lamp: 93.225 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: Source: Aw103
Lot No: Test No: Dup

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	2.527	0.10	0.10	(15)	66.806	5.00	55.00
(2)	4.424	0.90	1.00	(16)	75.066	5.00	60.00
(3)	6.784	1.30	2.30	(17)	84.619	5.00	65.00
(4)	11.006	2.70	5.00	(18)	95.931	5.00	70.00
(5)	17.380	5.00	10.00	(19)	110.327	5.00	75.00
(6)	22.853	5.00	15.00	(20)	128.961	5.00	80.00
(7)	23.666	0.80	15.80	(21)	148.611	4.20	84.20
(8)	27.864	4.20	20.00	(22)	152.548	0.80	85.00
(9)	32.693	5.00	25.00	(23)	184.852	5.00	90.00
(10)	37.554	5.00	30.00	(24)	235.007	5.00	95.00
(11)	42.601	5.00	35.00	(25)	286.582	2.70	97.70
(12)	47.893	5.00	40.00	(26)	338.292	1.30	99.00
(13)	53.557	5.00	45.00	(27)	472.373	0.90	99.90
(14)	59.779	5.00	50.00				

Median : 59.729 (μm) Mean: 83.050 (μm) Mode: 55.085 (μm)
Std. Dev.: 72.709 (μm) Span: 2.086
Coef. Var: 87.55% Spec. Area: 1709 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 07:12

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-088 10:25
Filename : AW103021
Sample : 1291

Material :
Source : Aw103
Lot Numbe :

Condition
T%(He-Ne): 90.5% Dist.Form: Std. Sampling times : 100
(LAMP): 91.5% R.R.index: 1.16-0.00i ( )

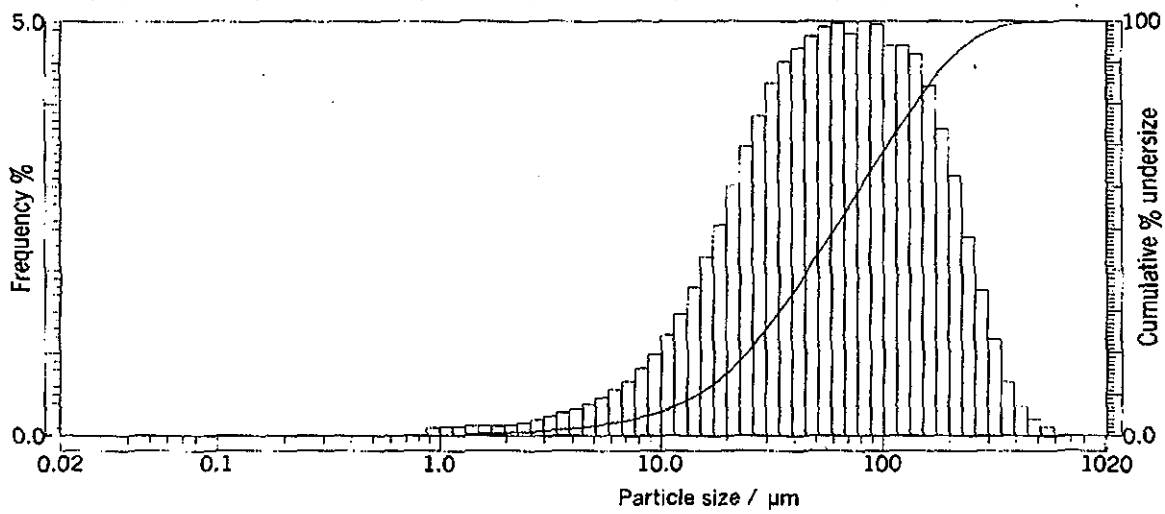
Agitation : 3 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 61.359μm SP.Area : 2128cm²/cm³ S.D. : 80.558μm
Mode : 82.891μm Mean : 87.837μm
C.V. : 91.71%

Span : (D 10.0-D 90.0) / D50 = 2.991

Dia. on %(5.0%) : 8.998μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 29.542μm % on Dia.(1.000μm) : 0.1%
Dia. on %(50.0%) : 61.359μm % on Dia.(10.000μm) : 5.8%
Dia. on %(75.0%) : 123.064μm % on Dia.(100.000μm) : 67.8%
Dia. on %(95.0%) : 251.449μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	3.47	21.50	0.669	0.00	0.00
890.1	0.00	100.00	22.80	3.00	18.02	0.584	0.00	0.00
777.1	0.00	100.00	19.90	2.55	15.02	0.510	0.00	0.00
678.5	0.00	100.00	17.38	2.17	12.47	0.445	0.00	0.00
592.4	0.11	100.00	15.17	1.79	10.31	0.389	0.00	0.00
517.2	0.20	99.89	13.25	1.47	8.51	0.339	0.00	0.00
451.6	0.36	99.69	11.56	1.21	7.05	0.296	0.00	0.00
394.2	0.65	99.33	10.10	0.99	5.84	0.259	0.00	0.00
344.2	1.17	98.68	8.816	0.81	4.85	0.226	0.00	0.00
300.5	1.75	97.51	7.697	0.66	4.04	0.197	0.00	0.00
262.4	2.40	95.75	6.720	0.56	3.39	0.172	0.00	0.00
229.1	3.12	93.35	5.867	0.46	2.83	0.150	0.00	0.00
200.0	3.69	90.23	5.122	0.38	2.37	0.131	0.00	0.00
174.6	4.22	86.54	4.472	0.33	1.99	0.115	0.00	0.00
152.5	4.60	82.32	3.905	0.28	1.66	0.100	0.00	0.00
133.1	4.70	77.72	3.409	0.23	1.38	0.087	0.00	0.00
116.2	4.70	73.01	2.976	0.19	1.15	0.076	0.00	0.00
101.5	4.96	68.32	2.599	0.16	0.96	0.067	0.00	0.00
88.58	4.99	63.36	2.269	0.13	0.80	0.058	0.00	0.00
77.34	4.85	58.36	1.981	0.12	0.67	0.051	0.00	0.00
67.52	4.98	53.51	1.729	0.12	0.55	0.044	0.00	0.00
58.95	4.94	48.53	1.510	0.11	0.44	0.039	0.00	0.00
51.47	4.82	43.59	1.318	0.11	0.33	0.034	0.00	0.00
44.94	4.68	38.78	1.151	0.11	0.21	0.029	0.00	0.00
39.23	4.51	34.10	1.005	0.10	0.10	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01
File Name: AW103021.DAT Sample Name: 1291 ID No: 01/09/28-088
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 90.545 % Lamp: 91.452 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: Source: Aw103
Lot No: Test No: Dup

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	1.000	0.10	0.10	(15)	70.534	5.00	55.00
(2)	2.682	0.90	1.00	(16)	81.023	5.00	60.00
(3)	4.997	1.30	2.30	(17)	92.849	5.00	65.00
(4)	9.009	2.70	5.00	(18)	106.747	5.00	70.00
(5)	14.843	5.00	10.00	(19)	123.343	5.00	75.00
(6)	19.883	5.00	15.00	(20)	142.693	5.00	80.00
(7)	20.655	0.80	15.80	(21)	162.318	4.20	84.20
(8)	24.682	4.20	20.00	(22)	166.522	0.80	85.00
(9)	29.564	5.00	25.00	(23)	198.433	5.00	90.00
(10)	34.708	5.00	30.00	(24)	251.939	5.00	95.00
(11)	40.334	5.00	35.00	(25)	307.725	2.70	97.70
(12)	46.596	5.00	40.00	(26)	369.078	1.30	99.00
(13)	53.600	5.00	45.00	(27)	524.910	0.90	99.90
(14)	61.479	5.00	50.00				

Median : 61.359 (μm) Mean: 87.837 (μm) Mode: 82.770 (μm)
Std. Dev.: 80.558 (μm) Span: 2.092
Coef. Var: 91.71% Spec. Area: 2128 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 07:12

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-089 10:33
Filename : AW103022
Sample : 1291

Material :
Source : Aw103
Lot Numbe :

Condition
T%(He-Ne): 85.8% Dist.Form: Std. Sampling times : 100
(LAMP): 86.0% R.R.Index: 1.16-0.00i ( )

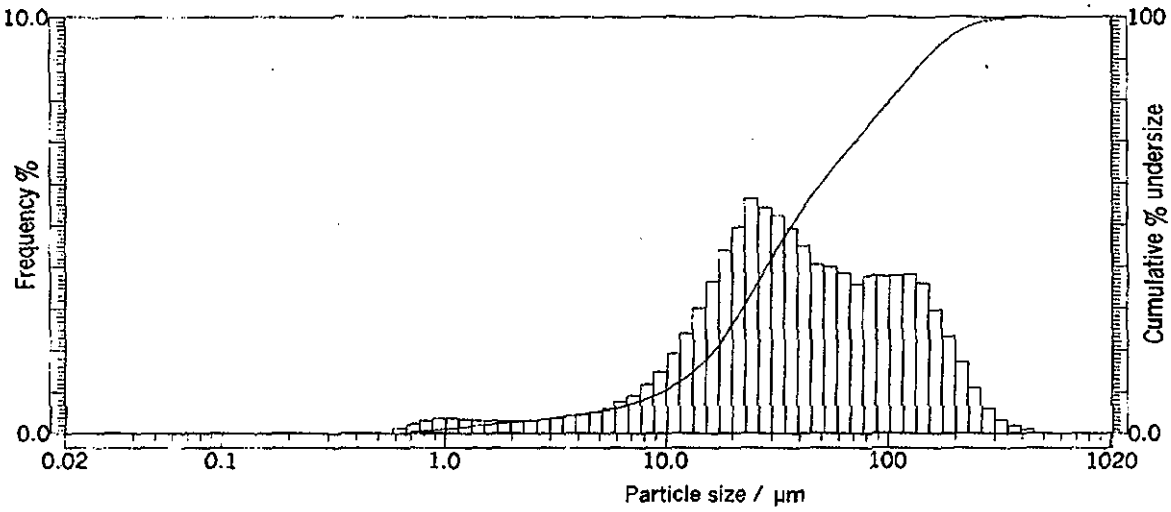
Agitation : 3 Circultn : 6 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 37.212μm SP.Area : 3982cm²/cm³ S.D. : 61.756μm
Mode : 24.537μm Mean : 61.582μm
C.V. : 100.28%

Span : (D 10.0-D 90.0) / D50 = 3.741

Dia. on %(5.0%) : 4.555μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 19.427μm % on Dia.(1.000μm) : 1.0%
Dia. on %(50.0%) : 37.212μm % on Dia.(10.000μm) : 10.3%
Dia. on %(75.0%) : 86.549μm % on Dia.(100.000μm) : 79.0%
Dia. on %(95.0%) : 189.733μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	5.64	36.36	0.669	0.15	0.15
890.1	0.00	100.00	22.80	4.94	30.72	0.584	0.00	0.00
777.1	0.00	100.00	19.90	4.39	25.78	0.510	0.00	0.00
678.5	0.00	100.00	17.38	3.65	21.40	0.445	0.00	0.00
592.4	0.00	100.00	15.17	3.00	17.75	0.389	0.00	0.00
517.2	0.00	100.00	13.25	2.41	14.74	0.339	0.00	0.00
451.6	0.11	100.00	11.56	1.91	12.34	0.296	0.00	0.00
394.2	0.19	99.89	10.10	1.49	10.43	0.259	0.00	0.00
344.2	0.34	99.70	8.816	1.17	8.94	0.226	0.00	0.00
300.5	0.62	99.36	7.697	0.92	7.76	0.197	0.00	0.00
262.4	1.11	98.74	6.720	0.76	6.84	0.172	0.00	0.00
229.1	1.72	97.63	5.867	0.62	6.08	0.150	0.00	0.00
200.0	2.33	95.90	5.122	0.53	5.46	0.131	0.00	0.00
174.6	2.95	93.57	4.472	0.47	4.93	0.115	0.00	0.00
152.5	3.61	90.62	3.905	0.42	4.46	0.100	0.00	0.00
133.1	3.81	87.01	3.409	0.38	4.03	0.087	0.00	0.00
116.2	3.78	83.20	2.976	0.35	3.65	0.076	0.00	0.00
101.5	3.77	79.42	2.599	0.32	3.30	0.067	0.00	0.00
88.58	3.79	75.65	2.269	0.29	2.99	0.058	0.00	0.00
77.34	3.58	71.86	1.981	0.29	2.70	0.051	0.00	0.00
67.52	3.84	68.29	1.729	0.31	2.41	0.044	0.00	0.00
58.95	3.98	64.44	1.510	0.32	2.09	0.039	0.00	0.00
51.47	4.04	60.46	1.318	0.36	1.77	0.034	0.00	0.00
44.94	4.50	56.42	1.151	0.37	1.41	0.029	0.00	0.00
39.23	4.94	51.92	1.005	0.36	1.04	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01
File Name: AW103022.DAT Sample Name: 1291 ID No: 01/09/28-089
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 85.833 % Lamp: 86.010 %
Circulation: 6 Agitation: 3 U.Sonic ** (min)
Material: Source: Aw103
Lot No: Test No: Dup

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.641	0.10	0.10	(15)	43.135	5.00	55.00
(2)	0.990	0.90	1.00	(16)	50.731	5.00	60.00
(3)	1.656	1.30	2.30	(17)	60.199	5.00	65.00
(4)	4.560	2.70	5.00	(18)	72.229	5.00	70.00
(5)	9.728	5.00	10.00	(19)	86.659	5.00	75.00
(6)	13.410	5.00	15.00	(20)	103.723	5.00	80.00
(7)	13.923	0.80	15.80	(21)	120.628	4.20	84.20
(8)	16.533	4.20	20.00	(22)	124.174	0.80	85.00
(9)	19.452	5.00	25.00	(23)	149.125	5.00	90.00
(10)	22.373	5.00	30.00	(24)	190.144	5.00	95.00
(11)	25.311	5.00	35.00	(25)	231.180	2.70	97.70
(12)	28.664	5.00	40.00	(26)	278.297	1.30	99.00
(13)	32.597	5.00	45.00	(27)	397.453	0.90	99.90
(14)	37.293	5.00	50.00				

Median : 37.212 (μm) Mean: 61.582 (μm) Mode: 24.398 (μm)
Std. Dev.: 61.756 (μm) Span: 2.773
Coef. Var: 100.28% Spec. Area: 3982 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 07:13

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-090 10:36
Filename : AW103023
Sample : 1291

Material :
Source : Aw103
Lot Numbe :

Condition

T%(He-Ne): 85.9% Dist.Form: Std. Sampling times : 100
(LAMP): 85.8% R.R.Index: 1.16-0.00i ( )

Agitation : 1 Circultn : 6 U.sonic : ~~ON~~ OFF(120)

WSC 10/4/01

Format

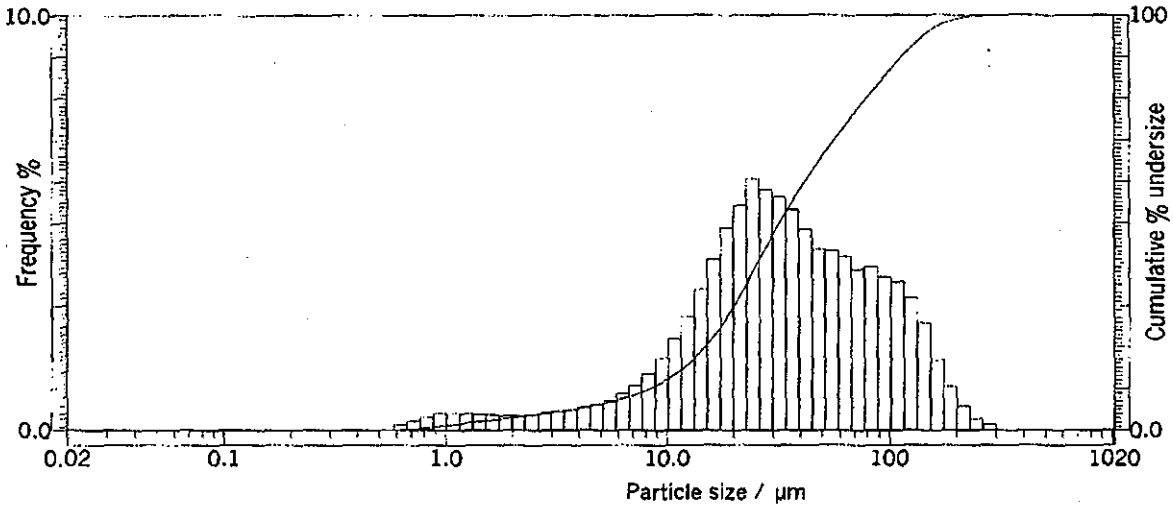
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data

Median : 32.295μm SP.Area : 4471cm²/cm³ S.D. : 44.883μm
Mode : 24.501μm Mean : 48.464μm
C.V. : 92.61%

Span : (D 10.0-D 90.0) / D50 = 3.272

Dia. on %(5.0%) :	3.644μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	17.540μm	% on Dia.(1.000μm) :	1.1%
Dia. on %(50.0%) :	32.295μm	% on Dia.(10.000μm) :	12.1%
Dia. on %(75.0%) :	66.543μm	% on Dia.(100.000μm) :	86.5%
Dia. on %(95.0%) :	142.589μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	6.07	41.02	0.669	0.15	0.15
890.1	0.00	100.00	22.80	5.42	34.96	0.584	0.00	0.00
777.1	0.00	100.00	19.90	4.87	29.54	0.510	0.00	0.00
678.5	0.00	100.00	17.38	4.10	24.67	0.445	0.00	0.00
592.4	0.00	100.00	15.17	3.40	20.57	0.389	0.00	0.00
517.2	0.00	100.00	13.25	2.75	17.16	0.339	0.00	0.00
451.6	0.00	100.00	11.56	2.20	14.41	0.296	0.00	0.00
394.2	0.00	100.00	10.10	1.73	12.22	0.259	0.00	0.00
344.2	0.00	100.00	8.816	1.36	10.49	0.226	0.00	0.00
300.5	0.15	100.00	7.697	1.08	9.13	0.197	0.00	0.00
262.4	0.27	99.85	6.720	0.89	8.05	0.172	0.00	0.00
229.1	0.58	99.58	5.867	0.73	7.17	0.150	0.00	0.00
200.0	1.04	99.01	5.122	0.62	6.44	0.131	0.00	0.00
174.6	1.69	97.96	4.472	0.56	5.82	0.115	0.00	0.00
152.5	2.58	96.27	3.905	0.51	5.26	0.100	0.00	0.00
133.1	3.20	93.69	3.409	0.46	4.75	0.087	0.00	0.00
116.2	3.57	90.49	2.976	0.42	4.29	0.076	0.00	0.00
101.5	3.69	86.92	2.599	0.39	3.86	0.067	0.00	0.00
88.58	3.92	83.22	2.269	0.36	3.47	0.058	0.00	0.00
77.34	3.86	79.31	1.981	0.36	3.11	0.051	0.00	0.00
67.52	4.17	75.45	1.729	0.39	2.74	0.044	0.00	0.00
58.95	4.33	71.28	1.510	0.40	2.36	0.039	0.00	0.00
51.47	4.35	66.95	1.318	0.42	1.96	0.034	0.00	0.00
44.94	4.84	62.60	1.151	0.43	1.54	0.029	0.00	0.00
39.23	5.32	57.76	1.005	0.40	1.11	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01
File Name: AW103023.DAT Sample Name: 1291 ID No: 01/09/28-090
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 85.897 % Lamp: 85.787 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: Source: Aw103
Lot No: Test No: Dup

WSC
10/4/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.641	0.10	0.10	(15)	36.650	5.00	55.00
(2)	0.969	0.90	1.00	(16)	41.871	5.00	60.00
(3)	1.483	1.30	2.30	(17)	48.537	5.00	65.00
(4)	3.653	2.70	5.00	(18)	56.737	5.00	70.00
(5)	8.413	5.00	10.00	(19)	66.600	5.00	75.00
(6)	11.924	5.00	15.00	(20)	79.332	5.00	80.00
(7)	12.413	0.80	15.80	(21)	91.982	4.20	84.20
(8)	14.852	4.20	20.00	(22)	94.770	0.80	85.00
(9)	17.551	5.00	25.00	(23)	114.192	5.00	90.00
(10)	20.152	5.00	30.00	(24)	142.917	5.00	95.00
(11)	22.821	5.00	35.00	(25)	171.189	2.70	97.70
(12)	25.553	5.00	40.00	(26)	199.875	1.30	99.00
(13)	28.717	5.00	45.00	(27)	274.945	0.90	99.90
(14)	32.368	5.00	50.00				

Median : 32.295 (μm) Mean: 48.464 (μm) Mode: 24.398 (μm)
Std. Dev.: 44.883 (μm) Span: 2.355
Coef. Var: 92.61% Spec. Area: 4471 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 07:13

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-107 14:02
Filename : AW103024
Sample : 1294

Material :
Source : Aw103
Lot Numbe :

Condition
T%(He-Ne): 88.5% Dist.Form: Std. Sampling times : 100
(LAMP): 80.9% R.R.Index: 1.16-0.00i ( )

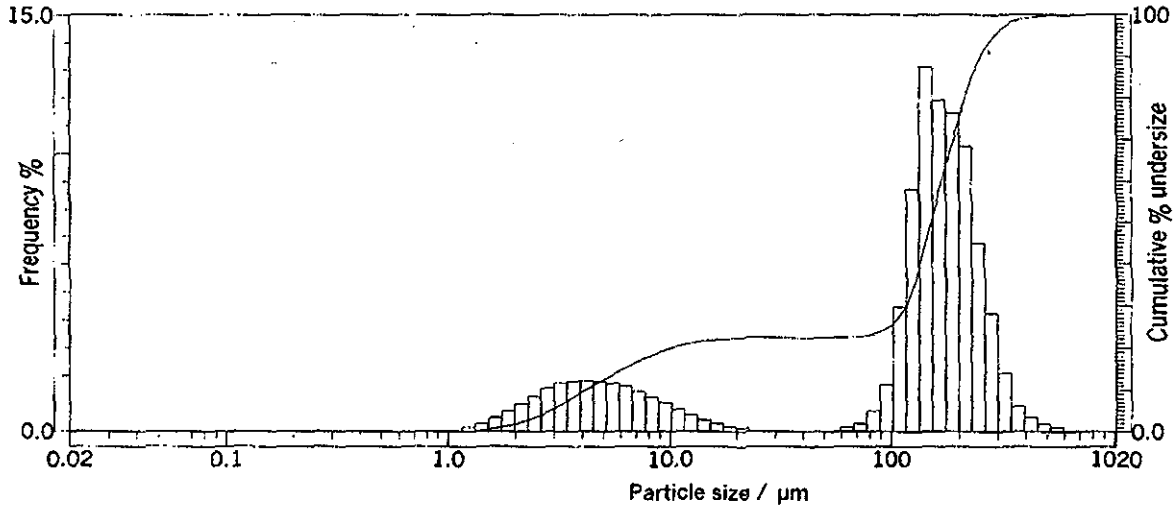
Agitation : 1 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 150.083μm SP.Area : 3719cm²/cm³ S.D. : 93.892μm
Mode : 144.819μm Mean : 143.693μm
C.V. : 65.34%

Span : (D 10.0-D 90.0) / D50 = 1.658

Dia. on %(5.0%) :	2.834μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	99.335μm	% on Dia.(1.000μm) :	0.0%
Dia. on %(50.0%) :	150.083μm	% on Dia.(10.000μm) :	19.8%
Dia. on %(75.0%) :	200.479μm	% on Dia.(100.000μm) :	25.1%
Dia. on %(95.0%) :	290.818μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	22.35	0.669	0.00	0.00
890.1	0.00	100.00	22.80	0.11	22.35	0.584	0.00	0.00
777.1	0.00	100.00	19.90	0.18	22.24	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.30	22.06	0.445	0.00	0.00
592.4	0.16	100.00	15.17	0.44	21.77	0.389	0.00	0.00
517.2	0.28	99.84	13.25	0.61	21.33	0.339	0.00	0.00
451.6	0.51	99.56	11.56	0.82	20.72	0.296	0.00	0.00
394.2	0.91	99.05	10.10	1.05	19.89	0.259	0.00	0.00
344.2	2.12	98.14	8.816	1.27	18.84	0.226	0.00	0.00
300.5	4.23	96.02	7.697	1.46	17.58	0.197	0.00	0.00
262.4	6.73	91.80	6.720	1.63	16.12	0.172	0.00	0.00
229.1	10.25	85.07	5.867	1.73	14.49	0.150	0.00	0.00
200.0	11.42	74.82	5.122	1.79	12.76	0.131	0.00	0.00
174.6	11.88	63.40	4.472	1.83	10.97	0.115	0.00	0.00
152.5	13.10	51.51	3.905	1.81	9.14	0.100	0.00	0.00
133.1	8.70	38.41	3.409	1.76	7.32	0.087	0.00	0.00
116.2	4.45	29.71	2.976	1.57	5.57	0.076	0.00	0.00
101.5	1.68	25.26	2.599	1.27	4.00	0.067	0.00	0.00
88.58	0.76	23.58	2.269	1.00	2.73	0.058	0.00	0.00
77.34	0.31	22.82	1.981	0.73	1.72	0.051	0.00	0.00
67.52	0.15	22.51	1.729	0.50	0.99	0.044	0.00	0.00
58.95	0.00	22.35	1.510	0.31	0.49	0.039	0.00	0.00
51.47	0.00	22.35	1.318	0.18	0.18	0.034	0.00	0.00
44.94	0.00	22.35	1.151	0.00	0.00	0.029	0.00	0.00
39.23	0.00	22.35	1.005	0.00	0.00	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01
File Name: AW103024.DAT Sample Name: 1294 ID No: 01/09/28-107
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 88.455 % Lamp: 80.877 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: Source: Aw103

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	1.244	0.10	0.10	(15)	158.958	5.00	55.00
(2)	1.732	0.90	1.00	(16)	168.282	5.00	60.00
(3)	2.146	1.30	2.30	(17)	178.180	5.00	65.00
(4)	2.840	2.70	5.00	(18)	189.291	5.00	70.00
(5)	4.172	5.00	10.00	(19)	200.513	5.00	75.00
(6)	6.134	5.00	15.00	(20)	214.700	5.00	80.00
(7)	6.553	0.80	15.80	(21)	226.617	4.20	84.20
(8)	10.289	4.20	20.00	(22)	228.887	0.80	85.00
(9)	99.452	5.00	25.00	(23)	253.487	5.00	90.00
(10)	116.769	5.00	30.00	(24)	291.297	5.00	95.00
(11)	126.476	5.00	35.00	(25)	335.162	2.70	97.70
(12)	135.447	5.00	40.00	(26)	391.357	1.30	99.00
(13)	142.833	5.00	45.00	(27)	544.446	0.90	99.90
(14)	150.219	5.00	50.00				

Median : 150.083 (μm) Mean: 143.693 (μm) Mode: 142.450 (μm)
Std. Dev.: 93.892 (μm) Span: 0.602
Coef. Var: 65.34% Spec. Area: 3719 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 07:13

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-108 14:08
Filename : AW103025
Sample : 1294

Material :
Source : Aw103
Lot Numbe :

Condition

T%(He-Ne): 88.6% Dist.Form: Std. Sampling times : 100
(LAMP): 81.0% R.R.Index: 1.16-0.00i ( )

Agitation : 3 Circultn : 6 U.sonic : OFF(120)

Format

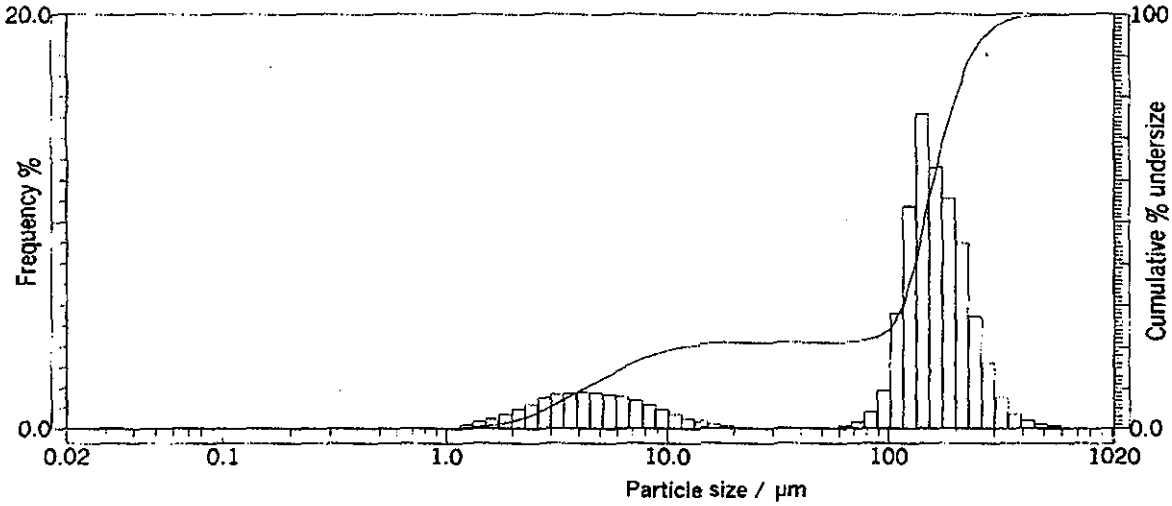
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data

Median : 144.908μm SP.Area : 3597cm²/cm³ S.D. : 87.614μm
Mode : 143.617μm Mean : 138.794μm
C.V. : 63.13%

Span : (D 10.0-D 90.0) / D50 = 1.618

Dia. on %(5.0%) :	2.886μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	103.561μm	% on Dia.(1.000μm) :	0.0%
Dia. on %(50.0%) :	144.908μm	% on Dia.(10.000μm) :	19.1%
Dia. on %(75.0%) :	189.645μm	% on Dia.(100.000μm) :	23.9%
Dia. on %(95.0%) :	275.996μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	21.03	0.669	0.00	0.00
890.1	0.00	100.00	22.80	0.00	21.03	0.584	0.00	0.00
777.1	0.00	100.00	19.90	0.12	21.03	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.21	20.91	0.445	0.00	0.00
592.4	0.12	100.00	15.17	0.33	20.69	0.389	0.00	0.00
517.2	0.22	99.88	13.25	0.50	20.36	0.339	0.00	0.00
451.6	0.39	99.66	11.56	0.71	19.86	0.296	0.00	0.00
394.2	0.70	99.27	10.10	0.94	19.15	0.259	0.00	0.00
344.2	1.54	98.57	8.816	1.18	18.21	0.226	0.00	0.00
300.5	3.25	97.04	7.697	1.40	17.02	0.197	0.00	0.00
262.4	5.45	93.79	6.720	1.59	15.63	0.172	0.00	0.00
229.1	8.98	88.34	5.867	1.70	14.04	0.150	0.00	0.00
200.0	11.13	79.36	5.122	1.76	12.34	0.131	0.00	0.00
174.6	12.56	68.23	4.472	1.79	10.58	0.115	0.00	0.00
152.5	15.15	55.67	3.905	1.76	8.79	0.100	0.00	0.00
133.1	10.74	40.51	3.409	1.69	7.03	0.087	0.00	0.00
116.2	5.62	29.77	2.976	1.49	5.34	0.076	0.00	0.00
101.5	1.89	24.15	2.599	1.21	3.85	0.067	0.00	0.00
88.58	0.80	22.26	2.269	0.95	2.64	0.058	0.00	0.00
77.34	0.30	21.46	1.981	0.70	1.69	0.051	0.00	0.00
67.52	0.13	21.16	1.729	0.49	0.98	0.044	0.00	0.00
58.95	0.00	21.03	1.510	0.31	0.49	0.039	0.00	0.00
51.47	0.00	21.03	1.318	0.18	0.18	0.034	0.00	0.00
44.94	0.00	21.03	1.151	0.00	0.00	0.029	0.00	0.00
39.23	0.00	21.03	1.005	0.00	0.00	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01
File Name: AW103025.DAT Sample Name: 1294 ID No: 01/09/28-108
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 88.581 % Lamp: 80.986 %
Circulation: 6 Agitation: 3 U,Sonic OFF (min)
Material: Source: Aw103

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	1.242	0.10	0.10	(15)	151.602	5.00	55.00
(2)	1.735	0.90	1.00	(16)	160.098	5.00	60.00
(3)	2.167	1.30	2.30	(17)	168.918	5.00	65.00
(4)	2.891	2.70	5.00	(18)	178.654	5.00	70.00
(5)	4.289	5.00	10.00	(19)	190.057	5.00	75.00
(6)	6.382	5.00	15.00	(20)	202.073	5.00	80.00
(7)	6.840	0.80	15.80	(21)	215.667	4.20	84.20
(8)	12.037	4.20	20.00	(22)	218.256	0.80	85.00
(9)	103.687	5.00	25.00	(23)	239.207	5.00	90.00
(10)	116.568	5.00	30.00	(24)	276.597	5.00	95.00
(11)	124.432	5.00	35.00	(25)	319.375	2.70	97.70
(12)	132.297	5.00	40.00	(26)	374.596	1.30	99.00
(13)	138.833	5.00	45.00	(27)	529.761	0.90	99.90
(14)	145.217	5.00	50.00				

Median : 144.908 (μm) Mean: 138.794 (μm) Mode: 142.450 (μm)
Std. Dev.: 87.614 (μm) Span: 0.596
Coef. Var: 63.13% Spec. Area: 3597 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 07:13

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-109 14:13
Filename : AW103026
Sample : 1294

Material :
Source : Aw103
Lot Numbe :

Condition
T%(He-Ne): 90.3% Dist.Form: Std. Sampling times : 100
(LAMP): 82.5% R.R.Index: 1.16-0.00i ( )

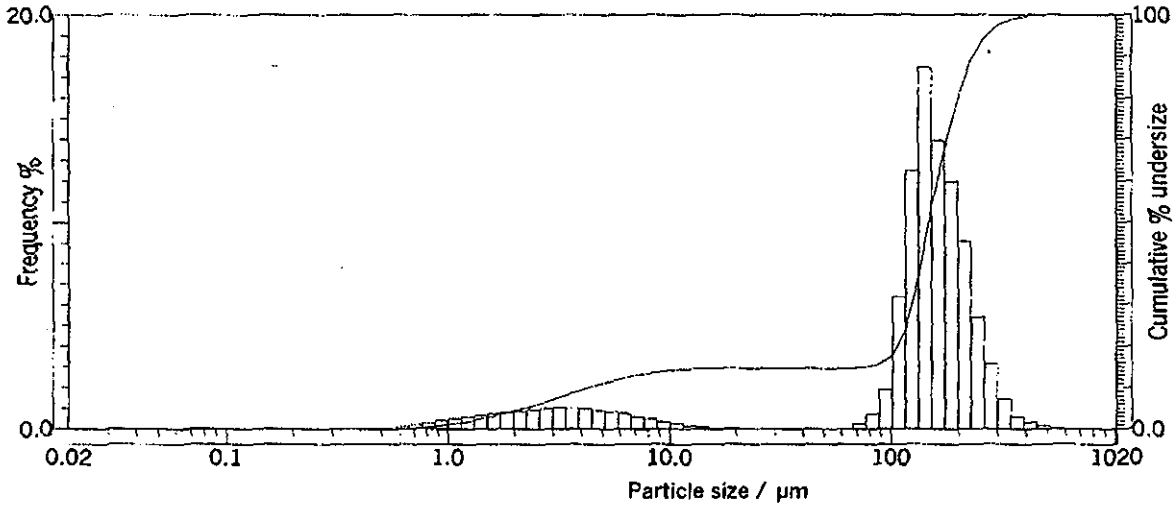
Agitation : 3 Circultn : 6 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 147.913μm SP.Area : 4090cm²/cm³ S.D. : 78.583μm
Mode : 143.253μm Mean : 146.304μm
C.V. : 53.71%

Span : (D 10.0-D 90.0) / D50 = 1.562

Dia. on %(5.0%) : 2.201μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 117.596μm % on Dia.(1.000μm) : 1.0%
Dia. on %(50.0%) : 147.913μm % on Dia.(10.000μm) : 14.1%
Dia. on %(75.0%) : 189.387μm % on Dia.(100.000μm) : 17.3%
Dia. on %(95.0%) : 270.581μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	14.65	0.669	0.13	0.13
890.1	0.00	100.00	22.80	0.00	14.65	0.584	0.00	0.00
777.1	0.00	100.00	19.90	0.00	14.65	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.00	14.65	0.445	0.00	0.00
592.4	0.00	100.00	15.17	0.11	14.65	0.389	0.00	0.00
517.2	0.18	100.00	13.25	0.17	14.55	0.339	0.00	0.00
451.6	0.33	99.82	11.56	0.26	14.37	0.296	0.00	0.00
394.2	0.60	99.48	10.10	0.37	14.11	0.259	0.00	0.00
344.2	1.45	98.88	8.816	0.50	13.73	0.226	0.00	0.00
300.5	3.15	97.44	7.697	0.62	13.24	0.197	0.00	0.00
262.4	5.37	94.28	6.720	0.74	12.62	0.172	0.00	0.00
229.1	9.11	88.91	5.867	0.83	11.88	0.150	0.00	0.00
200.0	11.95	79.80	5.122	0.90	11.05	0.131	0.00	0.00
174.6	13.95	67.85	4.472	0.97	10.15	0.115	0.00	0.00
152.5	17.48	53.89	3.905	1.02	9.18	0.100	0.00	0.00
133.1	12.51	36.41	3.409	1.03	8.16	0.087	0.00	0.00
116.2	6.36	23.91	2.976	1.00	7.13	0.076	0.00	0.00
101.5	1.92	17.54	2.599	0.93	6.12	0.067	0.00	0.00
88.58	0.73	15.62	2.269	0.86	5.19	0.058	0.00	0.00
77.34	0.24	14.90	1.981	0.79	4.33	0.051	0.00	0.00
67.52	0.00	14.65	1.729	0.75	3.54	0.044	0.00	0.00
58.95	0.00	14.65	1.510	0.66	2.79	0.039	0.00	0.00
51.47	0.00	14.65	1.318	0.59	2.13	0.034	0.00	0.00
44.94	0.00	14.65	1.151	0.50	1.54	0.029	0.00	0.00
39.23	0.00	14.65	1.005	0.40	1.04	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01
File Name: AW103026.DAT Sample Name: 1294 ID No: 01/09/28-109
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 90.312 % Lamp: 82.504 %
Circulation: 6 Agitation: 3 U.Sonic ** (min)
Material: Source: Aw103

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.649	0.10	0.10	(15)	154.210	5.00	55.00
(2)	0.993	0.90	1.00	(16)	162.152	5.00	60.00
(3)	1.367	1.30	2.30	(17)	170.093	5.00	65.00
(4)	2.204	2.70	5.00	(18)	179.186	5.00	70.00
(5)	4.386	5.00	10.00	(19)	189.803	5.00	75.00
(6)	78.957	5.00	15.00	(20)	200.631	5.00	80.00
(7)	89.771	0.80	15.80	(21)	214.035	4.20	84.20
(8)	107.153	4.20	20.00	(22)	216.589	0.80	85.00
(9)	117.685	5.00	25.00	(23)	235.817	5.00	90.00
(10)	124.439	5.00	30.00	(24)	271.030	5.00	95.00
(11)	131.193	5.00	35.00	(25)	308.465	2.70	97.70
(12)	137.073	5.00	40.00	(26)	353.835	1.30	99.00
(13)	142.608	5.00	45.00	(27)	481.650	0.90	99.90
(14)	148.143	5.00	50.00				

Median : 147.913 (μm) Mean: 146.304 (μm) Mode: 142.450 (μm)
Std. Dev.: 78.583 (μm) Span: 0.549
Coef. Var: 53.71% Spec. Area: 4090 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 07:13

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-110 14:17
Filename : AW103027
Sample : 1294

Material :
Source : Aw103
Lot Numbe :

Condition
T%(He-Ne): 89.8% Dist.Form: Std. Sampling times : 100
(LAMP): 82.0% R.R.Index: 1.16-0.00i ( )

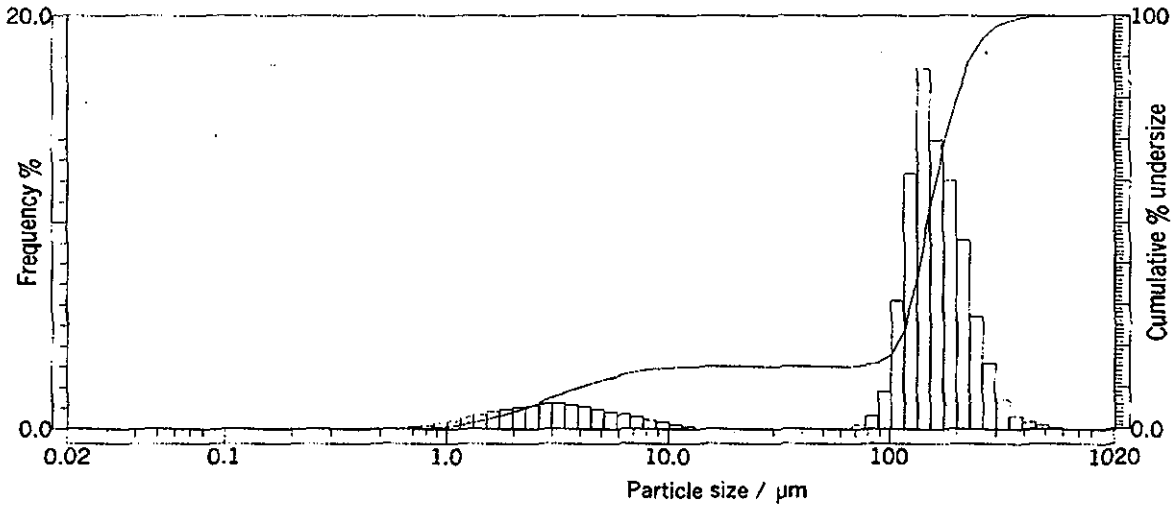
Agitation : 1 Circultn : 6 U.sonic : ~~ON~~ OFF (120) WJC 10/4/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 148.228μm SP.Area : 3947cm²/cm³ S.D. : 80.265μm
Mode : 143.344μm Mean : 146.625μm
C.V. : 54.74%

Span : (D 10.0-D 90.0) / D50 = 1.568

Dia. on %(5.0%) :	2.256μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	117.725μm	% on Dia.(1.000μm) :	0.6%
Dia. on %(50.0%) :	148.228μm	% on Dia.(10.000μm) :	14.6%
Dia. on %(75.0%) :	189.931μm	% on Dia.(100.000μm) :	17.5%
Dia. on %(95.0%) :	272.302μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	15.02	0.669	0.00	0.00
890.1	0.00	100.00	22.80	0.00	15.02	0.584	0.00	0.00
777.1	0.00	100.00	19.90	0.00	15.02	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.00	15.02	0.445	0.00	0.00
592.4	0.10	100.00	15.17	0.00	15.02	0.389	0.00	0.00
517.2	0.19	99.90	13.25	0.14	15.02	0.339	0.00	0.00
451.6	0.34	99.71	11.56	0.22	14.88	0.296	0.00	0.00
394.2	0.61	99.37	10.10	0.32	14.66	0.259	0.00	0.00
344.2	1.46	98.76	8.816	0.45	14.34	0.226	0.00	0.00
300.5	3.16	97.30	7.697	0.58	13.89	0.197	0.00	0.00
262.4	5.40	94.13	6.720	0.72	13.31	0.172	0.00	0.00
229.1	9.17	88.73	5.867	0.84	12.59	0.150	0.00	0.00
200.0	12.00	79.57	5.122	0.95	11.76	0.131	0.00	0.00
174.6	13.96	67.57	4.472	1.06	10.81	0.115	0.00	0.00
152.5	17.44	53.61	3.905	1.15	9.75	0.100	0.00	0.00
133.1	12.35	36.17	3.409	1.22	8.60	0.087	0.00	0.00
116.2	6.17	23.82	2.976	1.21	7.38	0.076	0.00	0.00
101.5	1.78	17.66	2.599	1.13	6.18	0.067	0.00	0.00
88.58	0.65	15.87	2.269	1.04	5.04	0.058	0.00	0.00
77.34	0.21	15.23	1.981	0.94	4.00	0.051	0.00	0.00
67.52	0.00	15.02	1.729	0.83	3.07	0.044	0.00	0.00
58.95	0.00	15.02	1.510	0.69	2.24	0.039	0.00	0.00
51.47	0.00	15.02	1.318	0.55	1.55	0.034	0.00	0.00
44.94	0.00	15.02	1.151	0.41	1.00	0.029	0.00	0.00
39.23	0.00	15.02	1.005	0.29	0.59	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01
File Name: AW103027.DAT Sample Name: 1294 ID No: 01/09/28-110
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 89.846 % Lamp: 82.034 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: Source: Aw103

WSC 10/4/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.755	0.10	0.10	(15)	154.658	5.00	55.00
(2)	1.151	0.90	1.00	(16)	162.599	5.00	60.00
(3)	1.527	1.30	2.30	(17)	170.539	5.00	65.00
(4)	2.257	2.70	5.00	(18)	179.762	5.00	70.00
(5)	4.039	5.00	10.00	(19)	190.339	5.00	75.00
(6)	13.022	5.00	15.00	(20)	201.374	5.00	80.00
(7)	87.301	0.80	15.80	(21)	214.695	4.20	84.20
(8)	107.068	4.20	20.00	(22)	217.232	0.80	85.00
(9)	117.822	5.00	25.00	(23)	236.882	5.00	90.00
(10)	124.662	5.00	30.00	(24)	272.811	5.00	95.00
(11)	131.503	5.00	35.00	(25)	312.520	2.70	97.70
(12)	137.352	5.00	40.00	(26)	363.979	1.30	99.00
(13)	142.900	5.00	45.00	(27)	520.452	0.90	99.90
(14)	148.447	5.00	50.00				

Median : 148.228 (μm) Mean: 146.625 (μm) Mode: 142.450 (μm)
Std. Dev.: 80.265 (μm) Span: 0.556
Coef. Var: 54.74% Spec. Area: 3947 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 07:13

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-111 14:30
Filename : AW103028
Sample : 1294

Material :
Source : Aw103
Lot Numbe :

Condition
T%(He-Ne): 88.9% Dist.Form: Std. Sampling times : 100
(LAMP): 81.5% R.R.index: 1.16-0.00i ( )

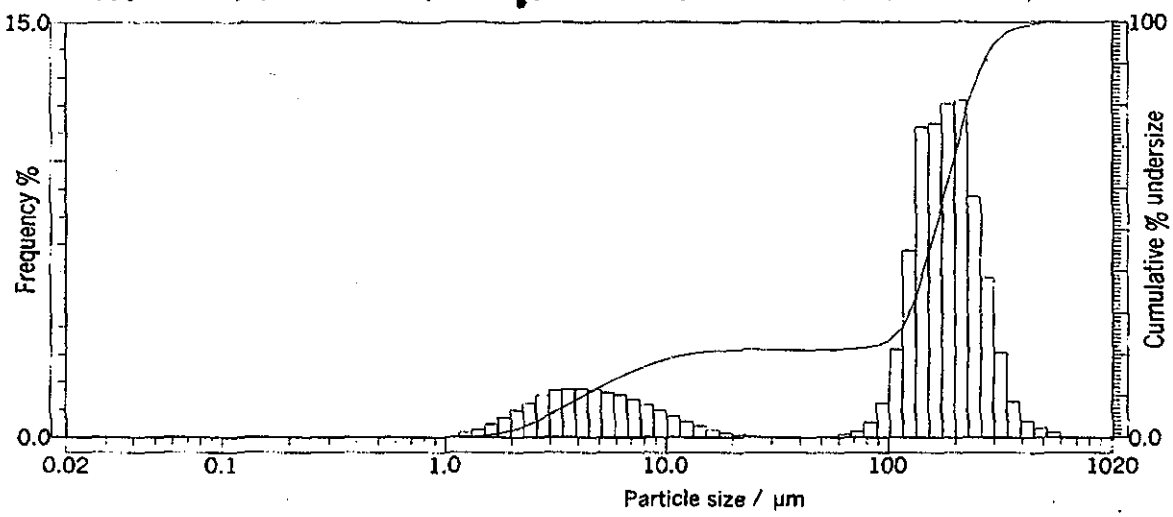
Agitation : 1 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 162.875μm SP.Area : 3546cm²/cm³ S.D. : 98.401μm
Mode : 210.083μm Mean : 155.319μm
C.V. : 63.35%

Span : (D 10.0-D 90.0) / D50 = 1.633

Dia. on %(5.0%) : 2.880μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 108.948μm % on Dia.(1.000μm) : 0.0%
Dia. on %(50.0%) : 162.875μm % on Dia.(10.000μm) : 18.8%
Dia. on %(75.0%) : 216.547μm % on Dia.(100.000μm) : 23.2%
Dia. on %(95.0%) : 307.148μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	21.18	0.669	0.00	0.00
890.1	0.00	100.00	22.80	0.10	21.18	0.584	0.00	0.00
777.1	0.00	100.00	19.90	0.17	21.08	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.28	20.91	0.445	0.00	0.00
592.4	0.18	100.00	15.17	0.41	20.63	0.389	0.00	0.00
517.2	0.33	99.82	13.25	0.57	20.23	0.339	0.00	0.00
451.6	0.60	99.48	11.56	0.77	19.65	0.296	0.00	0.00
394.2	1.30	98.88	10.10	0.98	18.88	0.259	0.00	0.00
344.2	3.07	97.58	8.816	1.18	17.90	0.226	0.00	0.00
300.5	5.77	94.51	7.697	1.36	16.72	0.197	0.00	0.00
262.4	8.69	88.74	6.720	1.53	15.36	0.172	0.00	0.00
229.1	12.18	80.05	5.867	1.63	13.83	0.150	0.00	0.00
200.0	12.05	67.87	5.122	1.69	12.20	0.131	0.00	0.00
174.6	11.35	55.82	4.472	1.73	10.51	0.115	0.00	0.00
152.5	11.21	44.47	3.905	1.73	8.77	0.100	0.00	0.00
133.1	6.74	33.26	3.409	1.68	7.05	0.087	0.00	0.00
116.2	3.20	26.52	2.976	1.51	5.37	0.076	0.00	0.00
101.5	1.24	23.32	2.599	1.23	3.86	0.067	0.00	0.00
88.58	0.56	22.08	2.269	0.97	2.63	0.058	0.00	0.00
77.34	0.23	21.53	1.981	0.71	1.66	0.051	0.00	0.00
67.52	0.12	21.30	1.729	0.48	0.95	0.044	0.00	0.00
58.95	0.00	21.18	1.510	0.30	0.47	0.039	0.00	0.00
51.47	0.00	21.18	1.318	0.17	0.17	0.034	0.00	0.00
44.94	0.00	21.18	1.151	0.00	0.00	0.029	0.00	0.00
39.23	0.00	21.18	1.005	0.00	0.00	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01
File Name: AW103028.DAT Sample Name: 1294 ID No: 01/09/28-111
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 88.939 % Lamp: 81.515 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: Source: Aw103
Lot No: Test No: Dup

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	1.249	0.10	0.10	(15)	173.009	5.00	55.00
(2)	1.747	0.90	1.00	(16)	183.417	5.00	60.00
(3)	2.171	1.30	2.30	(17)	193.953	5.00	65.00
(4)	2.885	2.70	5.00	(18)	205.087	5.00	70.00
(5)	4.306	5.00	10.00	(19)	217.027	5.00	75.00
(6)	6.521	5.00	15.00	(20)	228.967	5.00	80.00
(7)	7.038	0.80	15.80	(21)	244.987	4.20	84.20
(8)	12.586	4.20	20.00	(22)	248.051	0.80	85.00
(9)	109.197	5.00	25.00	(23)	270.710	5.00	90.00
(10)	124.928	5.00	30.00	(24)	307.542	5.00	95.00
(11)	136.103	5.00	35.00	(25)	348.812	2.70	97.70
(12)	144.737	5.00	40.00	(26)	405.285	1.30	99.00
(13)	153.490	5.00	45.00	(27)	551.669	0.90	99.90
(14)	163.250	5.00	50.00				

Median : 162.875 (μm) Mean: 155.319 (μm) Mode: 214.044 (μm)
Std. Dev.: 98.401 (μm) Span: 0.556
Coef. Var: 63.35% Spec. Area: 3546 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 07:14

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-112 14:34
Filename : AW103029
Sample : 1294

Material :
Source : Aw103
Lot Numbe :

Condition
T%(He-Ne): 89.0%
(LAMP): 81.6%
Dist.Form: Std.
R.R.Index: 1.16-0.00i
Sampling times : 100
( )

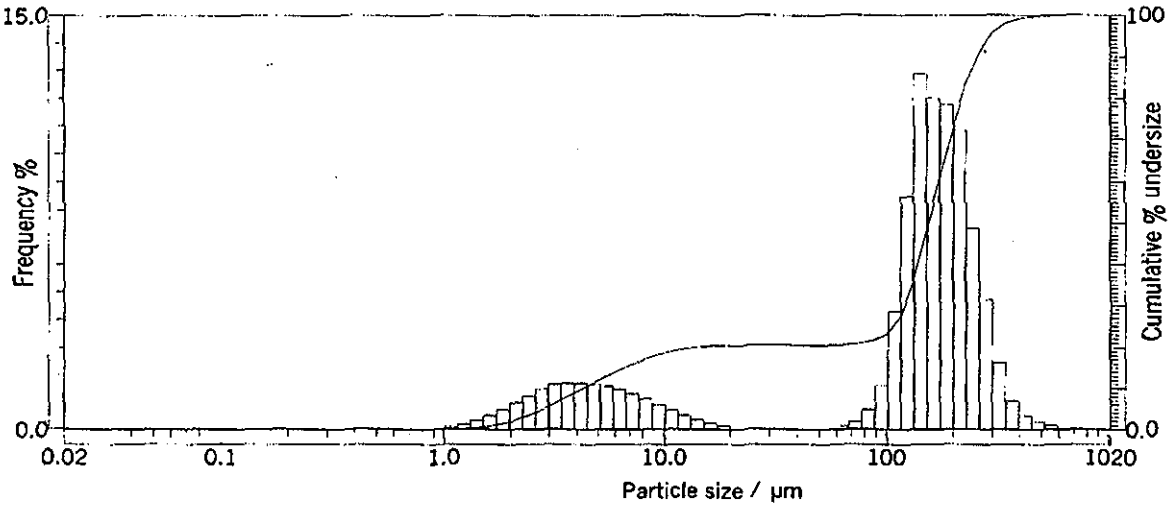
Agitation : 3 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 154.319μm SP.Area : 3593cm²/cm³ S.D. : 94.001μm
Mode : 145.139μm Mean : 149.093μm
C.V. : 63.05%

Span : (D 10.0-D 90.0) / D50 = 1.647

Dia. on %(5.0%) : 2.836μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 106.962μm % on Dia.(1.000μm) : 0.0%
Dia. on %(50.0%) : 154.319μm % on Dia.(10.000μm) : 18.6%
Dia. on %(75.0%) : 205.905μm % on Dia.(100.000μm) : 23.2%
Dia. on %(95.0%) : 295.952μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	20.58	0.669	0.00	0.00
890.1	0.00	100.00	22.80	0.00	20.58	0.584	0.00	0.00
777.1	0.00	100.00	19.90	0.14	20.58	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.23	20.44	0.445	0.00	0.00
592.4	0.16	100.00	15.17	0.35	20.21	0.389	0.00	0.00
517.2	0.29	99.84	13.25	0.51	19.86	0.339	0.00	0.00
451.6	0.52	99.55	11.56	0.70	19.35	0.296	0.00	0.00
394.2	1.06	99.04	10.10	0.91	18.65	0.259	0.00	0.00
344.2	2.44	97.97	8.816	1.13	17.73	0.226	0.00	0.00
300.5	4.71	95.53	7.697	1.32	16.61	0.197	0.00	0.00
262.4	7.32	90.82	6.720	1.49	15.29	0.172	0.00	0.00
229.1	10.82	83.50	5.867	1.59	13.80	0.150	0.00	0.00
200.0	11.77	72.68	5.122	1.66	12.21	0.131	0.00	0.00
174.6	11.99	60.91	4.472	1.70	10.55	0.115	0.00	0.00
152.5	12.87	48.93	3.905	1.69	8.85	0.100	0.00	0.00
133.1	8.44	36.05	3.409	1.64	7.16	0.087	0.00	0.00
116.2	4.28	27.61	2.976	1.47	5.52	0.076	0.00	0.00
101.5	1.61	23.34	2.599	1.21	4.05	0.067	0.00	0.00
88.58	0.72	21.73	2.269	0.97	2.84	0.058	0.00	0.00
77.34	0.29	21.01	1.981	0.73	1.87	0.051	0.00	0.00
67.52	0.14	20.72	1.729	0.51	1.14	0.044	0.00	0.00
58.95	0.00	20.58	1.510	0.33	0.63	0.039	0.00	0.00
51.47	0.00	20.58	1.318	0.20	0.30	0.034	0.00	0.00
44.94	0.00	20.58	1.151	0.11	0.11	0.029	0.00	0.00
39.23	0.00	20.58	1.005	0.00	0.00	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01
File Name: AW103029.DAT Sample Name: 1294 ID No: 01/09/28-112
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 89.037 % Lamp: 81.631 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: Source: Aw103
Lot No: Test No: Dup

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	1.141	0.10	0.10	(15)	163.683	5.00	55.00
(2)	1.668	0.90	1.00	(16)	172.928	5.00	60.00
(3)	2.109	1.30	2.30	(17)	183.432	5.00	65.00
(4)	2.842	2.70	5.00	(18)	194.219	5.00	70.00
(5)	4.289	5.00	10.00	(19)	206.233	5.00	75.00
(6)	6.554	5.00	15.00	(20)	219.666	5.00	80.00
(7)	7.099	0.80	15.80	(21)	232.248	4.20	84.20
(8)	14.032	4.20	20.00	(22)	235.888	0.80	85.00
(9)	107.198	5.00	25.00	(23)	258.634	5.00	90.00
(10)	120.986	5.00	30.00	(24)	296.216	5.00	95.00
(11)	130.994	5.00	35.00	(25)	339.292	2.70	97.70
(12)	139.035	5.00	40.00	(26)	392.589	1.30	99.00
(13)	146.552	5.00	45.00	(27)	545.320	0.90	99.90
(14)	154.439	5.00	50.00				

Median : 154.319 (μm) Mean: 149.093 (μm) Mode: 142.450 (μm)
Std. Dev.: 94.001 (μm) Span: 0.584
Coef. Var: 63.05% Spec. Area: 3593 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 07:14

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-113 14:40
Filename : AW103030
Sample : 1294

Material :
Source : Aw103
Lot Numbe :

Condition
T%(He-Ne): 90.7% Dist.Form: Std. Sampling times : 100
(LAMP): 83.2% R.R.Index: 1.16-0.00i ( )

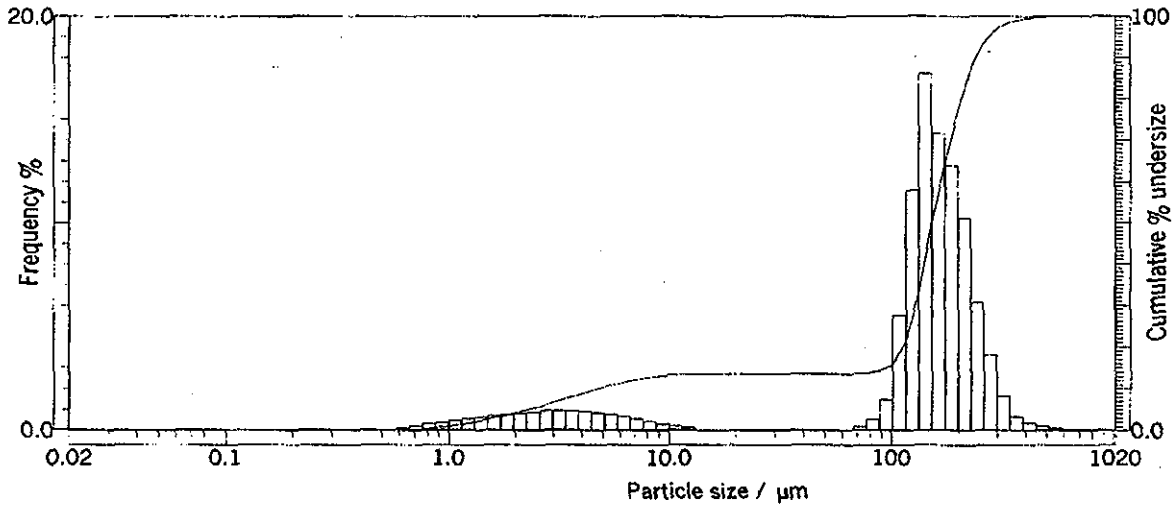
Agitation : 3 Circultn : 6 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 152.435μm SP.Area : 3856cm²/cm³ S.D. : 80.255μm
Mode : 143.963μm Mean : 152.518μm
C.V. : 52.62%

Span : (D 10.0-D 90.0) / D50 = 1.566

Dia. on %(5.0%) : 2.305μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 121.505μm % on Dia.(1.000μm) : 1.0%
Dia. on %(50.0%) : 152.435μm % on Dia.(10.000μm) : 13.1%
Dia. on %(75.0%) : 195.674μm % on Dia.(100.000μm) : 15.5%
Dia. on %(95.0%) : 278.996μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	13.51	0.669	0.12	0.12
890.1	0.00	100.00	22.80	0.00	13.51	0.584	0.00	0.00
777.1	0.00	100.00	19.90	0.00	13.51	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.00	13.51	0.445	0.00	0.00
592.4	0.12	100.00	15.17	0.00	13.51	0.389	0.00	0.00
517.2	0.21	99.88	13.25	0.13	13.51	0.339	0.00	0.00
451.6	0.38	99.68	11.56	0.21	13.38	0.296	0.00	0.00
394.2	0.68	99.30	10.10	0.31	13.17	0.259	0.00	0.00
344.2	1.65	98.62	8.816	0.43	12.86	0.226	0.00	0.00
300.5	3.60	96.97	7.697	0.55	12.43	0.197	0.00	0.00
262.4	6.11	93.37	6.720	0.68	11.88	0.172	0.00	0.00
229.1	10.20	87.26	5.867	0.77	11.20	0.150	0.00	0.00
200.0	12.75	77.05	5.122	0.85	10.43	0.131	0.00	0.00
174.6	14.29	64.30	4.472	0.92	9.58	0.115	0.00	0.00
152.5	17.22	50.02	3.905	0.96	8.66	0.100	0.00	0.00
133.1	11.61	32.80	3.409	0.98	7.70	0.087	0.00	0.00
116.2	5.50	21.19	2.976	0.95	6.72	0.076	0.00	0.00
101.5	1.50	15.69	2.599	0.88	5.78	0.067	0.00	0.00
88.58	0.52	14.19	2.269	0.81	4.90	0.058	0.00	0.00
77.34	0.16	13.66	1.981	0.75	4.09	0.051	0.00	0.00
67.52	0.00	13.51	1.729	0.70	3.34	0.044	0.00	0.00
58.95	0.00	13.51	1.510	0.63	2.64	0.039	0.00	0.00
51.47	0.00	13.51	1.318	0.56	2.02	0.034	0.00	0.00
44.94	0.00	13.51	1.151	0.47	1.46	0.029	0.00	0.00
39.23	0.00	13.51	1.005	0.38	0.98	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01
File Name: AW103030.DAT Sample Name: 1294 ID No: 01/09/28-113
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 90.687 % Lamp: 83.243 %
Circulation: 6 Agitation: 3 U.Sonic ** (min)
Material: Source: Aw103
Lot No: Test No: Dup

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.653	0.10	0.10	(15)	160.185	5.00	55.00
(2)	1.010	0.90	1.00	(16)	167.940	5.00	60.00
(3)	1.405	1.30	2.30	(17)	176.001	5.00	65.00
(4)	2.307	2.70	5.00	(18)	185.956	5.00	70.00
(5)	4.794	5.00	10.00	(19)	195.910	5.00	75.00
(6)	95.546	5.00	15.00	(20)	208.395	5.00	80.00
(7)	101.755	0.80	15.80	(21)	220.364	4.20	84.20
(8)	113.020	4.20	20.00	(22)	222.644	0.80	85.00
(9)	121.756	5.00	25.00	(23)	244.017	5.00	90.00
(10)	129.032	5.00	30.00	(24)	279.636	5.00	95.00
(11)	135.578	5.00	35.00	(25)	319.794	2.70	97.70
(12)	141.197	5.00	40.00	(26)	372.085	1.30	99.00
(13)	146.817	5.00	45.00	(27)	527.553	0.90	99.90
(14)	152.436	5.00	50.00				

Median : 152.435 (μm) Mean: 152.518 (μm) Mode: 142.450 (μm)
Std. Dev.: 80.255 (μm) Span: 0.547
Coef. Var: 52.62% Spec. Area: 3856 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 07:14

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-114 14:44
Filename : AW103031
Sample : 1294

Material :
Source : Aw103
Lot Numbe :

Condition
T%(He-Ne): 90.3% Dist.Form: Std. Sampling times : 100
(LAMP): 82.8% R.R.Index: 1.16-0.00i ( )

Agitation : 1 Circultn : 6 U.sonic : ~~ON~~(120) OFF

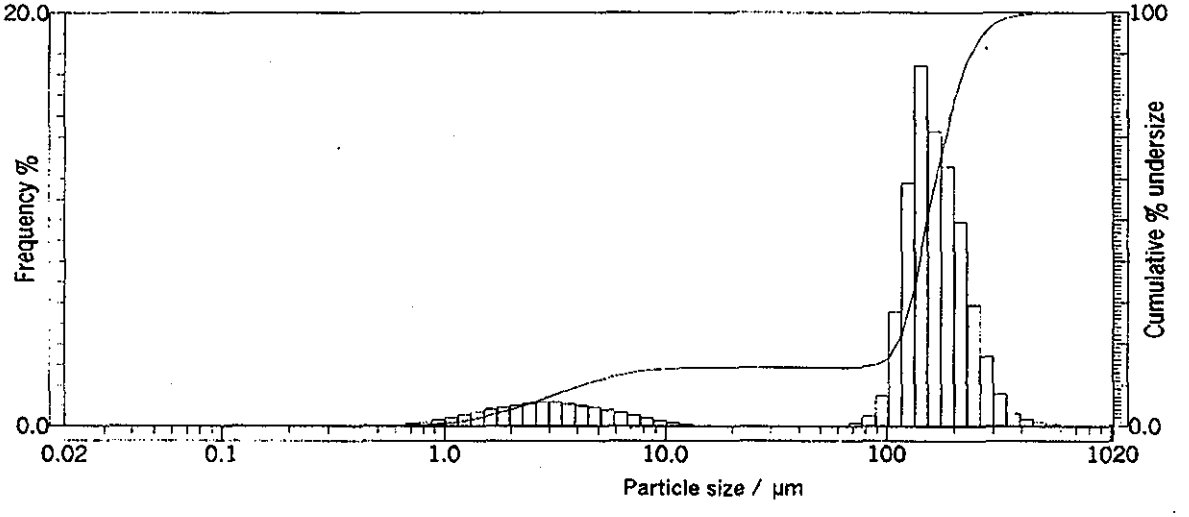
WSC 10/4/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 151.178μm SP.Area : 3814cm²/cm³ S.D. : 80.288μm
Mode : 143.840μm Mean : 150.300μm
C.V. : 53.42%

Span : (D 10.0-D 90.0) / D50 = 1.564

Dia. on %(5.0%) :	2.296μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	120.481μm	% on Dia.(1.000μm) :	0.6%
Dia. on %(50.0%) :	151.178μm	% on Dia.(10.000μm) :	13.9%
Dia. on %(75.0%) :	193.737μm	% on Dia.(100.000μm) :	16.2%
Dia. on %(95.0%) :	275.867μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	14.25	0.669	0.00	0.00
890.1	0.00	100.00	22.80	0.00	14.25	0.584	0.00	0.00
777.1	0.00	100.00	19.90	0.00	14.25	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.00	14.25	0.445	0.00	0.00
592.4	0.11	100.00	15.17	0.00	14.25	0.389	0.00	0.00
517.2	0.20	99.89	13.25	0.10	14.25	0.339	0.00	0.00
451.6	0.35	99.70	11.56	0.17	14.14	0.296	0.00	0.00
394.2	0.63	99.34	10.10	0.27	13.97	0.259	0.00	0.00
344.2	1.55	98.71	8.816	0.39	13.70	0.226	0.00	0.00
300.5	3.42	97.16	7.697	0.52	13.31	0.197	0.00	0.00
262.4	5.86	93.74	6.720	0.66	12.79	0.172	0.00	0.00
229.1	9.92	87.87	5.867	0.79	12.12	0.150	0.00	0.00
200.0	12.60	77.95	5.122	0.90	11.34	0.131	0.00	0.00
174.6	14.28	65.35	4.472	1.01	10.43	0.115	0.00	0.00
152.5	17.43	51.08	3.905	1.10	9.42	0.100	0.00	0.00
133.1	11.78	33.65	3.409	1.17	8.32	0.087	0.00	0.00
116.2	5.53	21.87	2.976	1.16	7.15	0.076	0.00	0.00
101.5	1.45	16.33	2.599	1.09	5.99	0.067	0.00	0.00
88.58	0.49	14.88	2.269	1.00	4.90	0.058	0.00	0.00
77.34	0.14	14.39	1.981	0.90	3.90	0.051	0.00	0.00
67.52	0.00	14.25	1.729	0.80	3.00	0.044	0.00	0.00
58.95	0.00	14.25	1.510	0.67	2.20	0.039	0.00	0.00
51.47	0.00	14.25	1.318	0.54	1.53	0.034	0.00	0.00
44.94	0.00	14.25	1.151	0.41	0.99	0.029	0.00	0.00
39.23	0.00	14.25	1.005	0.29	0.58	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01
File Name: AW103031.DAT Sample Name: 1294 ID No: 01/09/28-114
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 90.260 % Lamp: 82.772 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: Source: Aw103
Lot No: Test No: Dup

WSC 10/4/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.756	0.10	0.10	(15)	158.542	5.00	55.00
(2)	1.154	0.90	1.00	(16)	166.305	5.00	60.00
(3)	1.538	1.30	2.30	(17)	174.068	5.00	65.00
(4)	2.298	2.70	5.00	(18)	183.977	5.00	70.00
(5)	4.229	5.00	10.00	(19)	194.050	5.00	75.00
(6)	89.648	5.00	15.00	(20)	205.999	5.00	80.00
(7)	96.737	0.80	15.80	(21)	218.312	4.20	84.20
(8)	111.234	4.20	20.00	(22)	220.657	0.80	85.00
(9)	120.702	5.00	25.00	(23)	241.161	5.00	90.00
(10)	127.871	5.00	30.00	(24)	276.467	5.00	95.00
(11)	134.603	5.00	35.00	(25)	315.804	2.70	97.70
(12)	140.154	5.00	40.00	(26)	367.178	1.30	99.00
(13)	145.705	5.00	45.00	(27)	523.249	0.90	99.90
(14)	151.256	5.00	50.00				

Median : 151.178 (μm) Mean: 150.299 (μm) Mode: 142.450 (μm)
Std. Dev.: 80.288 (μm) Span: 0.543
Coef. Var: 53.42% Spec. Area: 3814 (cm2/cm3)

APPENDIX F-12

AY-101 SIEVE TEST SAMPLES: PSD MEASUREMENT RESULTS

Consisting of 34 pages including this cover page

TABLE F-12. Sample identification and PSD run conditions. AY-101 composite, sieve test samples S01T001296 (> 500 μm) and S01T001299 (< 53 μm).

Conditions Key: P = Pump Speed Setting; P6 = 14.4 mL/s
S = Stirrer Speed Setting (1-7); S1 = Stirrer Speed 1; S3 = Stirrer Speed 3
US = Ultrasonic ON Time (min); DT = Delay Time (min) between end of ultrasonic treatment and PSD measurement.
Time = Clock time at beginning of measurement.

Sample Sieve Fraction	PSD Run File Name	Run Conditions				Time	Cumulative Time (min) At Conditions				
		P	S	US	DT		P6	S1	S3	US	DT
S01T001296	[LOAD-IN]	6	1	0	0	?	?	?			
> 500 μm	AY101048	6	1	0	0	10:48	4	4			
	AY101049	6	3	0	0	10:52	8	4	4		
	AY101050	6	3	2	0	10:56	14	4	10	2	0
	AY101051	6	1	0	0	11:02	16	6	10	2	4
						11:04					
S01T001296	[LOAD-IN]	6	1	0	0	?	?	?			
> 500 μm	AY101052	6	1	0	0	11:11	4	4			
	AY101053	6	3	0	0	11:15	7	4	3		
	AY101054	6	3	2	0	11:18	12	4	8	2	0
	AY101055	6	1	0	0	11:23	15	7	8	2	3
						11:26					
S01T001299	[LOAD-IN]	6	1	0	0	?	?	?			
< 53 μm	AY101056	6	1	0	0	11:33	3	3			
	AY101057	6	3	0	0	11:36	7	3	4		
	AY101058	6	3	2	0	11:40	12	3	9	2	0
	AY101059	6	1	0	0	11:45	15	6	9	2	3
						11:48					
S01T001299	[LOAD-IN]	6	1	0	0	?	?	?			
< 53 μm	AY101060	6	1	0	0	13:10	5	5			
	AY101061	6	3	0	0	13:15	10	5	5		
	AY101062	6	3	2	0	13:20	15	5	10	2	0
	AY101063	6	1	0	0	13:25	19	9	10	2	3
						13:29					

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 07:35

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-091 10:50
Filename : AY101048
Sample : 1296

Material :
Source : AY101
Lot Numbe :

Condition
T%(He-Ne): 89.0%
(LAMP): 88.2%
Dist.Form: Std.
R.R.Index: 1.16-0.00i
Sampling times : 100
( )

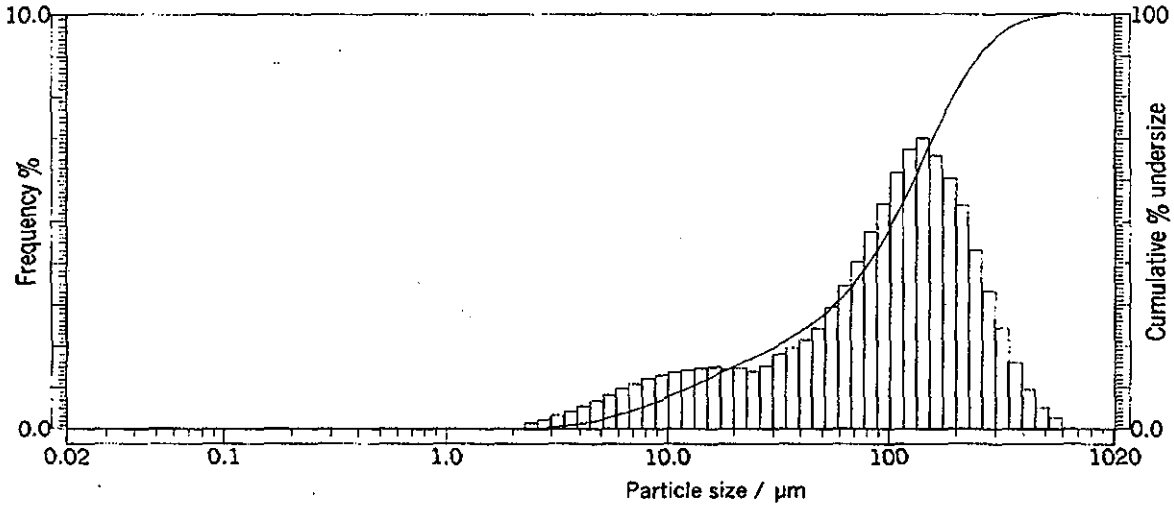
Agitation : 1 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 104.879μm SP.Area : 1728cm²/cm³ S.D. : 98.601μm
Mode : 142.246μm Mean : 122.512μm
C.V. : 80.48%

Span : (D 10.0-D 90.0) / D50 = 2.316

Dia. on %(5.0%) : 7.435μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 43.862μm % on Dia.(1.000μm) : 0.0%
Dia. on %(50.0%) : 104.879μm % on Dia.(10.000μm) : 7.7%
Dia. on %(75.0%) : 174.238μm % on Dia.(100.000μm) : 47.9%
Dia. on %(95.0%) : 314.456μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.39	17.93	0.669	0.00	0.00
890.1	0.00	100.00	22.80	1.49	16.54	0.584	0.00	0.00
777.1	0.00	100.00	19.90	1.46	15.05	0.510	0.00	0.00
678.5	0.00	100.00	17.38	1.50	13.60	0.445	0.00	0.00
592.4	0.29	100.00	15.17	1.47	12.10	0.389	0.00	0.00
517.2	0.53	99.71	13.25	1.43	10.63	0.339	0.00	0.00
451.6	0.95	99.18	11.56	1.38	9.20	0.296	0.00	0.00
394.2	1.61	98.22	10.10	1.32	7.82	0.259	0.00	0.00
344.2	2.43	96.62	8.816	1.22	6.50	0.226	0.00	0.00
300.5	3.33	94.19	7.697	1.10	5.28	0.197	0.00	0.00
262.4	4.32	90.86	6.720	0.99	4.18	0.172	0.00	0.00
229.1	5.38	86.54	5.867	0.83	3.19	0.150	0.00	0.00
200.0	6.05	81.16	5.122	0.68	2.36	0.131	0.00	0.00
174.6	6.62	75.11	4.472	0.55	1.68	0.115	0.00	0.00
152.5	7.03	68.48	3.905	0.43	1.12	0.100	0.00	0.00
133.1	6.77	61.46	3.409	0.32	0.69	0.087	0.00	0.00
116.2	6.20	54.69	2.976	0.22	0.37	0.076	0.00	0.00
101.5	5.44	48.49	2.599	0.15	0.15	0.067	0.00	0.00
88.58	4.76	43.05	2.269	0.00	0.00	0.058	0.00	0.00
77.34	4.05	38.29	1.981	0.00	0.00	0.051	0.00	0.00
67.52	3.48	34.24	1.729	0.00	0.00	0.044	0.00	0.00
58.95	2.94	30.77	1.510	0.00	0.00	0.039	0.00	0.00
51.47	2.44	27.82	1.318	0.00	0.00	0.034	0.00	0.00
44.94	2.15	25.38	1.151	0.00	0.00	0.029	0.00	0.00
39.23	1.97	23.23	1.005	0.00	0.00	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01
File Name: AY101048.DAT Sample Name: 1296 ID No: 01/09/28-091
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 88.969 % Lamp: 88.235 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: Source: AY101

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	2.496	0.10	0.10	(15)	116.988	5.00	55.00
(2)	3.764	0.90	1.00	(16)	129.465	5.00	60.00
(3)	5.064	1.30	2.30	(17)	142.857	5.00	65.00
(4)	7.448	2.70	5.00	(18)	157.526	5.00	70.00
(5)	12.505	5.00	10.00	(19)	174.263	5.00	75.00
(6)	19.813	5.00	15.00	(20)	195.138	5.00	80.00
(7)	21.358	0.80	15.80	(21)	216.430	4.20	84.20
(8)	31.213	4.20	20.00	(22)	220.754	0.80	85.00
(9)	43.919	5.00	25.00	(23)	255.732	5.00	90.00
(10)	57.009	5.00	30.00	(24)	315.111	5.00	95.00
(11)	69.364	5.00	35.00	(25)	377.915	2.70	97.70
(12)	81.381	5.00	40.00	(26)	440.924	1.30	99.00
(13)	93.204	5.00	45.00	(27)	566.816	0.90	99.90
(14)	105.062	5.00	50.00				

Median : 104.879 (μm) Mean: 122.512 (μm) Mode: 142.450 (μm)
Std. Dev.: 98.601 (μm) Span: 1.337
Coef. Var: 80.48% Spec. Area: 1728 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 07:36

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-092 10:55
Filename : AY101049
Sample : 1296

Material :
Source : AY101
Lot Numbe :

Condition
T%(He-Ne): 86.4% Dist.Form: Std. Sampling times : 100
(LAMP): 85.6% R.R.Index: 1.16-0.00i ( )

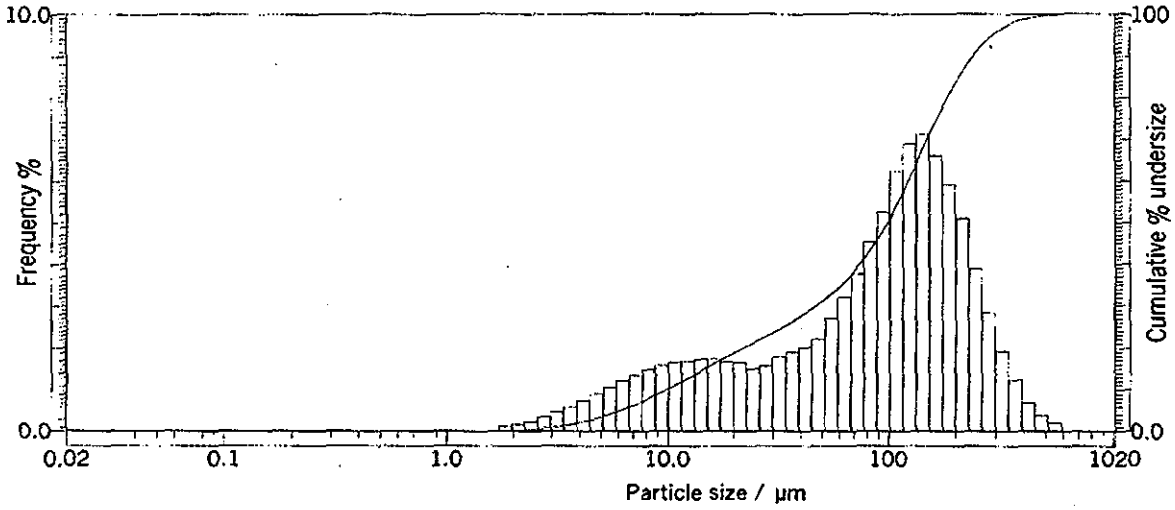
Agitation : 3 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 99.089μm SP.Area : 2123cm²/cm³ S.D. : 94.371μm
Mode : 142.078μm Mean : 113.701μm
C.V. : 83.00%

Span : (D 10.0-D 90.0) / D50 = 2.311

Dia. on %(5.0%) : 6.099μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 33.412μm % on Dia.(1.000μm) : 0.0%
Dia. on %(50.0%) : 99.089μm % on Dia.(10.000μm) : 10.2%
Dia. on %(75.0%) : 164.886μm % on Dia.(100.000μm) : 50.4%
Dia. on %(95.0%) : 292.981μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.50	21.95	0.669	0.00	0.00
890.1	0.00	100.00	22.80	1.65	20.45	0.584	0.00	0.00
777.1	0.00	100.00	19.90	1.66	18.80	0.510	0.00	0.00
678.5	0.00	100.00	17.38	1.74	17.13	0.445	0.00	0.00
592.4	0.21	100.00	15.17	1.73	15.39	0.389	0.00	0.00
517.2	0.39	99.79	13.25	1.70	13.66	0.339	0.00	0.00
451.6	0.69	99.40	11.56	1.66	11.96	0.296	0.00	0.00
394.2	1.25	98.71	10.10	1.59	10.30	0.259	0.00	0.00
344.2	1.93	97.46	8.816	1.49	8.71	0.226	0.00	0.00
300.5	2.84	95.53	7.697	1.35	7.23	0.197	0.00	0.00
262.4	3.89	92.69	6.720	1.23	5.88	0.172	0.00	0.00
229.1	5.10	88.81	5.867	1.05	4.65	0.150	0.00	0.00
200.0	5.92	83.71	5.122	0.89	3.60	0.131	0.00	0.00
174.6	6.61	77.79	4.472	0.75	2.71	0.115	0.00	0.00
152.5	7.13	71.18	3.905	0.61	1.96	0.100	0.00	0.00
133.1	6.88	64.05	3.409	0.48	1.35	0.087	0.00	0.00
116.2	6.25	57.17	2.976	0.35	0.87	0.076	0.00	0.00
101.5	5.26	50.92	2.599	0.24	0.52	0.067	0.00	0.00
88.58	4.53	45.66	2.269	0.17	0.28	0.058	0.00	0.00
77.34	3.76	41.12	1.981	0.11	0.11	0.051	0.00	0.00
67.52	3.21	37.36	1.729	0.00	0.00	0.044	0.00	0.00
58.95	2.70	34.15	1.510	0.00	0.00	0.039	0.00	0.00
51.47	2.21	31.46	1.318	0.00	0.00	0.034	0.00	0.00
44.94	2.01	29.25	1.151	0.00	0.00	0.029	0.00	0.00
39.23	1.91	27.24	1.005	0.00	0.00	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01
File Name: AY101049.DAT Sample Name: 1296 ID No: 01/09/28-092
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 86.427 % Lamp: 85.619 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: Source: AY101

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	1.948	0.10	0.10	(15)	111.097	5.00	55.00
(2)	3.091	0.90	1.00	(16)	123.163	5.00	60.00
(3)	4.163	1.30	2.30	(17)	135.677	5.00	65.00
(4)	6.110	2.70	5.00	(18)	149.246	5.00	70.00
(5)	9.854	5.00	10.00	(19)	165.255	5.00	75.00
(6)	14.736	5.00	15.00	(20)	184.086	5.00	80.00
(7)	15.689	0.80	15.80	(21)	202.794	4.20	84.20
(8)	22.009	4.20	20.00	(22)	207.359	0.80	85.00
(9)	33.457	5.00	25.00	(23)	239.305	5.00	90.00
(10)	47.160	5.00	30.00	(24)	293.381	5.00	95.00
(11)	61.214	5.00	35.00	(25)	353.880	2.70	97.70
(12)	74.408	5.00	40.00	(26)	418.452	1.30	99.00
(13)	86.957	5.00	45.00	(27)	557.267	0.90	99.90
(14)	99.216	5.00	50.00				

Median : 99.089 (μm) Mean: 113.701 (μm) Mode: 142.450 (μm)
Std. Dev.: 94.371 (μm) Span: 1.293
Coef. Var: 83.00% Spec. Area: 2123 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 07:36

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-093 11:00
Filename : AY101050
Sample : 1296

Material :
Source : AY101
Lot Numbe :

Condition
T%(He-Ne): 74.5% Dist.Form: Std. Sampling times : 100
(LAMP): 69.9% R.R.index: 1.16-0.00i ( )

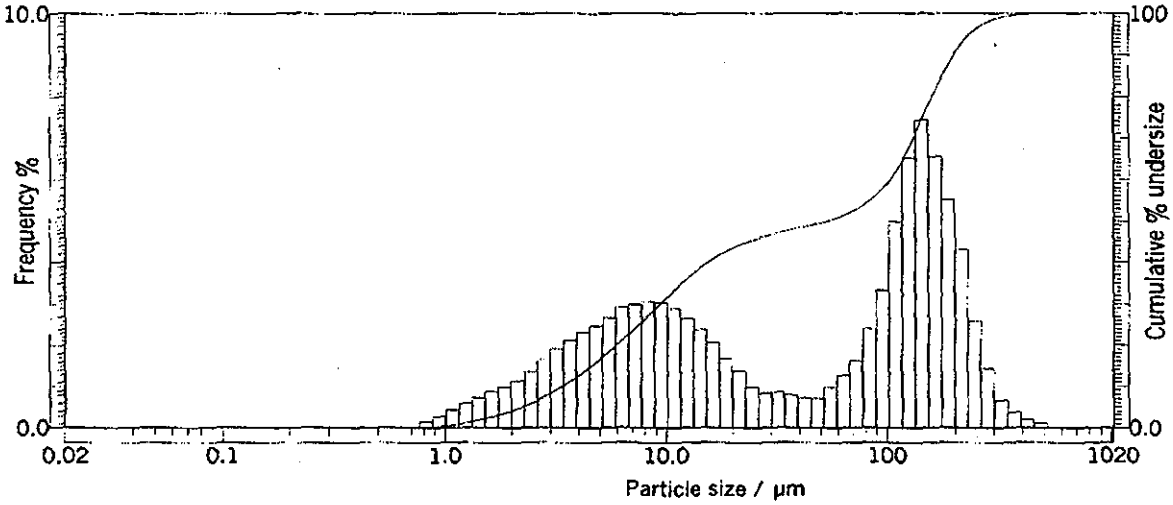
Agitation : 3 Circultn : 6 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 53.537μm SP.Area : 6257cm²/cm³ S.D. : 84.758μm
Mode : 142.487μm Mean : 82.488μm
C.V. : 102.75%

Span : (D 10.0-D 90.0) / D50 = 3.644

Dia. on %(5.0%) : 2.223μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 7.485μm % on Dia.(1.000μm) : 0.4%
Dia. on %(50.0%) : 53.537μm % on Dia.(10.000μm) : 31.5%
Dia. on %(75.0%) : 143.668μm % on Dia.(100.000μm) : 59.0%
Dia. on %(95.0%) : 233.753μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.98	45.78	0.669	0.00	0.00
890.1	0.00	100.00	22.80	1.37	44.80	0.584	0.00	0.00
777.1	0.00	100.00	19.90	1.68	43.43	0.510	0.00	0.00
678.5	0.00	100.00	17.38	2.07	41.75	0.445	0.00	0.00
592.4	0.00	100.00	15.17	2.39	39.68	0.389	0.00	0.00
517.2	0.11	100.00	13.25	2.66	37.29	0.339	0.00	0.00
451.6	0.21	99.89	11.56	2.91	34.63	0.296	0.00	0.00
394.2	0.37	99.68	10.10	3.04	31.72	0.259	0.00	0.00
344.2	0.66	99.31	8.816	3.07	28.69	0.226	0.00	0.00
300.5	1.44	98.65	7.697	2.99	25.61	0.197	0.00	0.00
262.4	2.59	97.21	6.720	2.92	22.62	0.172	0.00	0.00
229.1	4.30	94.61	5.867	2.69	19.70	0.150	0.00	0.00
200.0	5.51	90.31	5.122	2.48	17.01	0.131	0.00	0.00
174.6	6.54	84.80	4.472	2.31	14.53	0.115	0.00	0.00
152.5	7.44	78.25	3.905	2.12	12.22	0.100	0.00	0.00
133.1	6.52	70.81	3.409	1.91	10.09	0.087	0.00	0.00
116.2	4.99	64.30	2.976	1.64	8.18	0.076	0.00	0.00
101.5	3.33	59.31	2.599	1.37	6.54	0.067	0.00	0.00
88.58	2.41	55.98	2.269	1.14	5.17	0.058	0.00	0.00
77.34	1.63	53.58	1.981	0.98	4.03	0.051	0.00	0.00
67.52	1.26	51.95	1.729	0.88	3.06	0.044	0.00	0.00
58.95	0.97	50.69	1.510	0.73	2.18	0.039	0.00	0.00
51.47	0.71	49.72	1.318	0.59	1.45	0.034	0.00	0.00
44.94	0.73	49.00	1.151	0.43	0.86	0.029	0.00	0.00
39.23	0.79	48.28	1.005	0.28	0.43	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01
File Name: AY101050.DAT Sample Name: 1296 ID No: 01/09/28-093
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 74.532 % Lamp: 69.876 %
Circulation: 6 Agitation: 3 U.Sonic ** (min)
Material: Source: AY101

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.841	0.10	0.10	(15)	83.985	5.00	55.00
(2)	1.190	0.90	1.00	(16)	103.495	5.00	60.00
(3)	1.541	1.30	2.30	(17)	118.030	5.00	65.00
(4)	2.225	2.70	5.00	(18)	130.991	5.00	70.00
(5)	3.388	5.00	10.00	(19)	143.992	5.00	75.00
(6)	4.595	5.00	15.00	(20)	158.371	5.00	80.00
(7)	4.805	0.80	15.80	(21)	172.593	4.20	84.20
(8)	5.954	4.20	20.00	(22)	175.549	0.80	85.00
(9)	7.496	5.00	25.00	(23)	198.569	5.00	90.00
(10)	9.370	5.00	30.00	(24)	234.035	5.00	95.00
(11)	11.800	5.00	35.00	(25)	275.443	2.70	97.70
(12)	15.514	5.00	40.00	(26)	323.726	1.30	99.00
(13)	23.482	5.00	45.00	(27)	459.607	0.90	99.90
(14)	53.640	5.00	50.00				

Median : 53.537 (μm) Mean: 82.488 (μm) Mode: 142.450 (μm)
Std. Dev.: 84.758 (μm) Span: 1.683
Coef. Var: 102.75% Spec. Area: 6257 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 07:36

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-094 11:04
Filename : AY101051
Sample : 1296

Material :
Source : AY101
Lot Numbe :

Condition
T%(He-Ne): 74.7% Dist.Form: Std. Sampling times : 100
(LAMP): 70.1% R.R.Index: 1.16-0.00i ( )

Agitation : 1 Circultn : 6 U.sonic : ~~ON~~ OFF (120)

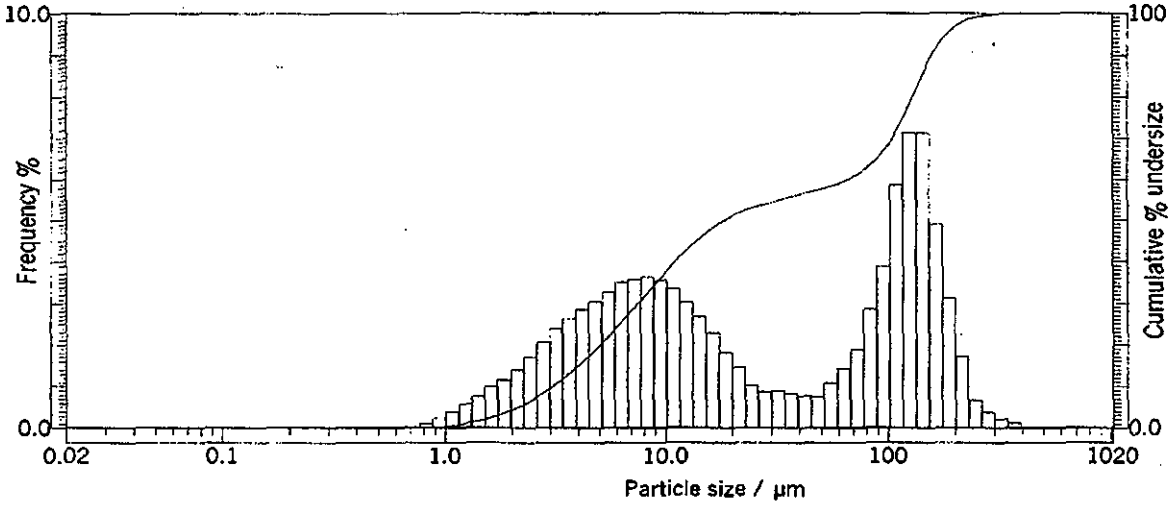
WSC 10/5/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 18.453μm SP.Area : 7162cm²/cm³ S.D. : 67.496μm
Mode : 125.869μm Mean : 61.396μm
C.V. : 109.93%

Span : (D 10.0-D 90.0) / D50 = 8.349

Dia. on %(5.0%) : 2.132μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 6.203μm % on Dia.(1.000μm) : 0.3%
Dia. on %(50.0%) : 18.453μm % on Dia.(10.000μm) : 37.6%
Dia. on %(75.0%) : 116.987μm % on Dia.(100.000μm) : 68.4%
Dia. on %(95.0%) : 183.977μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.02	53.50	0.669	0.00	0.00
890.1	0.00	100.00	22.80	1.46	52.48	0.584	0.00	0.00
777.1	0.00	100.00	19.90	1.82	51.01	0.510	0.00	0.00
678.5	0.00	100.00	17.38	2.29	49.20	0.445	0.00	0.00
592.4	0.00	100.00	15.17	2.68	46.90	0.389	0.00	0.00
517.2	0.00	100.00	13.25	3.03	44.22	0.339	0.00	0.00
451.6	0.00	100.00	11.56	3.35	41.19	0.296	0.00	0.00
394.2	0.11	100.00	10.10	3.55	37.83	0.259	0.00	0.00
344.2	0.21	99.89	8.816	3.63	34.28	0.226	0.00	0.00
300.5	0.37	99.68	7.697	3.58	30.65	0.197	0.00	0.00
262.4	0.67	99.31	6.720	3.52	27.07	0.172	0.00	0.00
229.1	1.73	98.65	5.867	3.27	23.56	0.150	0.00	0.00
200.0	3.12	96.92	5.122	3.04	20.29	0.131	0.00	0.00
174.6	4.89	93.80	4.472	2.85	17.25	0.115	0.00	0.00
152.5	7.13	88.91	3.905	2.63	14.40	0.100	0.00	0.00
133.1	7.13	81.78	3.409	2.38	11.77	0.087	0.00	0.00
116.2	5.87	74.65	2.976	2.05	9.38	0.076	0.00	0.00
101.5	3.89	68.78	2.599	1.70	7.33	0.067	0.00	0.00
88.58	2.85	64.89	2.269	1.39	5.63	0.058	0.00	0.00
77.34	1.89	62.05	1.981	1.16	4.24	0.051	0.00	0.00
67.52	1.44	60.15	1.729	0.99	3.09	0.044	0.00	0.00
58.95	1.08	58.72	1.510	0.77	2.09	0.039	0.00	0.00
51.47	0.76	57.64	1.318	0.58	1.32	0.034	0.00	0.00
44.94	0.77	56.88	1.151	0.39	0.74	0.029	0.00	0.00
39.23	0.84	56.11	1.005	0.23	0.34	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01
File Name: AY101051.DAT Sample Name: 1296 ID No: 01/09/28-094
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 74.687 % Lamp: 70.077 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: Source: AY101

WSC 10/5/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.866	0.10	0.10	(15)	32.946	5.00	55.00
(2)	1.226	0.90	1.00	(16)	66.608	5.00	60.00
(3)	1.556	1.30	2.30	(17)	88.936	5.00	65.00
(4)	2.137	2.70	5.00	(18)	104.521	5.00	70.00
(5)	3.088	5.00	10.00	(19)	117.040	5.00	75.00
(6)	4.024	5.00	15.00	(20)	128.885	5.00	80.00
(7)	4.183	0.80	15.80	(21)	139.672	4.20	84.20
(8)	5.060	4.20	20.00	(22)	141.844	0.80	85.00
(9)	6.217	5.00	25.00	(23)	157.404	5.00	90.00
(10)	7.519	5.00	30.00	(24)	184.383	5.00	95.00
(11)	9.074	5.00	35.00	(25)	213.151	2.70	97.70
(12)	11.045	5.00	40.00	(26)	246.813	1.30	99.00
(13)	13.805	5.00	45.00	(27)	350.381	0.90	99.90
(14)	18.495	5.00	50.00				

Median : 18.453 (μm) Mean: 61.396 (μm) Mode: 124.370 (μm)
Std. Dev.: 67.496 (μm) Span: 3.630
Coef. Var: 109.93% Spec. Area: 7162 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 07:36

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-095 11:13
Filename : AY101052
Sample : 1296

Material :
Source : AY101
Lot Numbe :

Condition
T%(He-Ne): 90.9% Dist.Form: Std. Sampling times : 100
(LAMP): 90.0% R.R.Index: 1.16-0.00i ( )

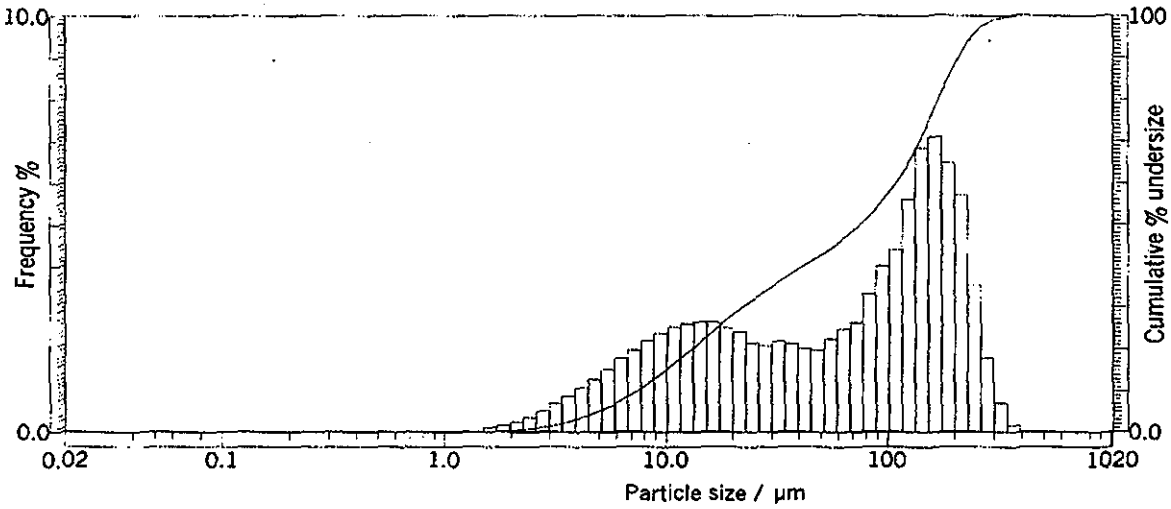
Agitation : 1 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 76.004μm SP.Area : 2893cm²/cm³ S.D. : 80.652μm
Mode : 162.596μm Mean : 92.937μm
C.V. : 86.78%

Span : (D 10.0-D 90.0) / D50 = 2.656

Dia. on %(5.0%) : 4.948μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 16.888μm % on Dia.(1.000μm) : 0.0%
Dia. on %(50.0%) : 76.004μm % on Dia.(10.000μm) : 15.0%
Dia. on %(75.0%) : 153.936μm % on Dia.(100.000μm) : 57.2%
Dia. on %(95.0%) : 239.877μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	2.14	32.62	0.669	0.00	0.00
890.1	0.00	100.00	22.80	2.41	30.47	0.584	0.00	0.00
777.1	0.00	100.00	19.90	2.50	28.06	0.510	0.00	0.00
678.5	0.00	100.00	17.38	2.63	25.55	0.445	0.00	0.00
592.4	0.00	100.00	15.17	2.64	22.92	0.389	0.00	0.00
517.2	0.00	100.00	13.25	2.59	20.28	0.339	0.00	0.00
451.6	0.00	100.00	11.56	2.51	17.70	0.296	0.00	0.00
394.2	0.17	100.00	10.10	2.38	15.18	0.259	0.00	0.00
344.2	0.71	99.83	8.816	2.20	12.80	0.226	0.00	0.00
300.5	1.79	99.12	7.697	1.98	10.60	0.197	0.00	0.00
262.4	3.53	97.33	6.720	1.78	8.62	0.172	0.00	0.00
229.1	5.71	93.80	5.867	1.52	6.84	0.150	0.00	0.00
200.0	6.49	88.09	5.122	1.28	5.33	0.131	0.00	0.00
174.6	7.10	81.60	4.472	1.08	4.04	0.115	0.00	0.00
152.5	6.85	74.49	3.905	0.88	2.97	0.100	0.00	0.00
133.1	5.60	67.64	3.409	0.70	2.09	0.087	0.00	0.00
116.2	4.40	62.04	2.976	0.52	1.39	0.076	0.00	0.00
101.5	3.99	57.64	2.599	0.36	0.88	0.067	0.00	0.00
88.58	3.32	53.65	2.269	0.24	0.52	0.058	0.00	0.00
77.34	2.60	50.33	1.981	0.16	0.28	0.051	0.00	0.00
67.52	2.47	47.73	1.729	0.11	0.11	0.044	0.00	0.00
58.95	2.24	45.26	1.510	0.00	0.00	0.039	0.00	0.00
51.47	1.98	43.03	1.318	0.00	0.00	0.034	0.00	0.00
44.94	2.03	41.05	1.151	0.00	0.00	0.029	0.00	0.00
39.23	2.13	39.02	1.005	0.00	0.00	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01
File Name: AY101052.DAT Sample Name: 1296 ID No: 01/09/28-095
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 90.929 % Lamp: 89.977 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: Source: AY101
Lot No: Test No: Dup

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	1.704	0.10	0.10	(15)	92.943	5.00	55.00
(2)	2.689	0.90	1.00	(16)	109.382	5.00	60.00
(3)	3.527	1.30	2.30	(17)	125.145	5.00	65.00
(4)	4.957	2.70	5.00	(18)	139.766	5.00	70.00
(5)	7.401	5.00	10.00	(19)	154.033	5.00	75.00
(6)	9.998	5.00	15.00	(20)	169.634	5.00	80.00
(7)	10.457	0.80	15.80	(21)	184.795	4.20	84.20
(8)	13.061	4.20	20.00	(22)	187.924	0.80	85.00
(9)	16.913	5.00	25.00	(23)	209.726	5.00	90.00
(10)	22.229	5.00	30.00	(24)	240.380	5.00	95.00
(11)	30.491	5.00	35.00	(25)	270.262	2.70	97.70
(12)	41.982	5.00	40.00	(26)	297.972	1.30	99.00
(13)	58.072	5.00	45.00	(27)	364.138	0.90	99.90
(14)	76.080	5.00	50.00				

Median : 76.004 (μm) Mean: 92.937 (μm) Mode: 163.159 (μm)
Std. Dev.: 80.652 (μm) Span: 1.131
Coef. Var: 86.78% Spec. Area: 2893 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 07:36

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-096 11:17
Filename : AY101053
Sample : 1296

Material :
Source : AY101
Lot Numbe :

Condition
T%(He-Ne): 90.5% Dist.Form: Std. Sampling times : 100
(LAMP): 89.3% R.R.Index: 1.16-0.00i ( )

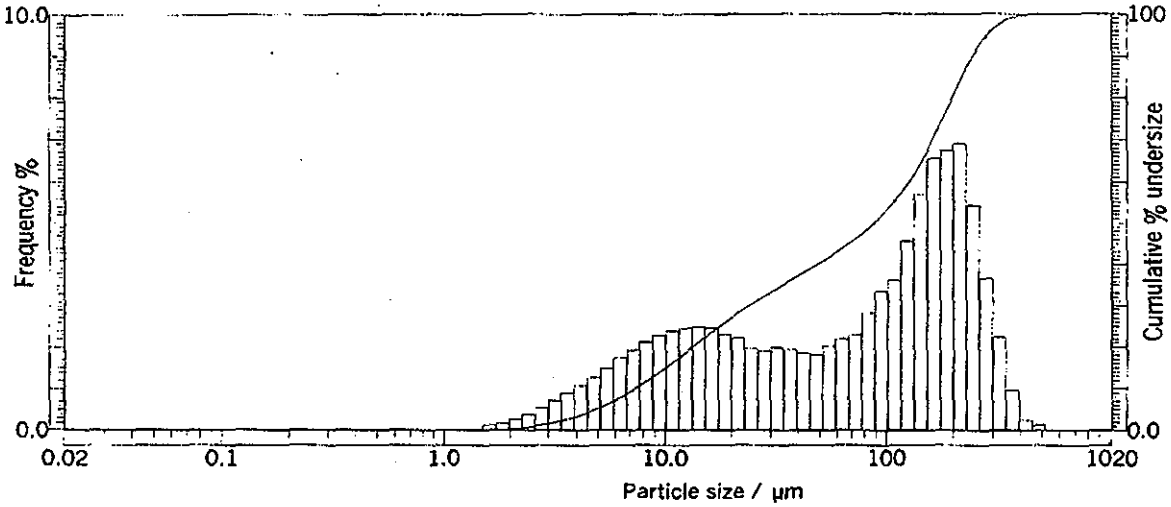
Agitation : 3 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 88.639μm SP.Area : 2820cm²/cm³ S.D. : 96.159μm
Mode : 211.284μm Mean : 108.474μm
C.V. : 88.65%

Span : (D 10.0-D 90.0) / D50 = 2.678

Dia. on %(5.0%) : 4.896μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 17.698μm % on Dia.(1.000μm) : 0.0%
Dia. on %(50.0%) : 88.639μm % on Dia.(10.000μm) : 14.8%
Dia. on %(75.0%) : 179.212μm % on Dia.(100.000μm) : 53.0%
Dia. on %(95.0%) : 285.069μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.96	31.18	0.669	0.00	0.00
890.1	0.00	100.00	22.80	2.22	29.22	0.584	0.00	0.00
777.1	0.00	100.00	19.90	2.31	27.00	0.510	0.00	0.00
678.5	0.00	100.00	17.38	2.45	24.69	0.445	0.00	0.00
592.4	0.00	100.00	15.17	2.47	22.24	0.389	0.00	0.00
517.2	0.14	100.00	13.25	2.44	19.77	0.339	0.00	0.00
451.6	0.26	99.86	11.56	2.39	17.33	0.296	0.00	0.00
394.2	0.96	99.60	10.10	2.27	14.95	0.259	0.00	0.00
344.2	2.23	98.65	8.816	2.12	12.67	0.226	0.00	0.00
300.5	3.65	96.42	7.697	1.91	10.56	0.197	0.00	0.00
262.4	5.42	92.77	6.720	1.73	8.64	0.172	0.00	0.00
229.1	6.90	87.35	5.867	1.49	6.91	0.150	0.00	0.00
200.0	6.74	80.45	5.122	1.27	5.42	0.131	0.00	0.00
174.6	6.53	73.71	4.472	1.07	4.16	0.115	0.00	0.00
152.5	5.70	67.18	3.905	0.89	3.08	0.100	0.00	0.00
133.1	4.56	61.48	3.409	0.71	2.19	0.087	0.00	0.00
116.2	3.61	56.93	2.976	0.53	1.48	0.076	0.00	0.00
101.5	3.33	53.32	2.599	0.38	0.95	0.067	0.00	0.00
88.58	2.82	49.98	2.269	0.26	0.57	0.058	0.00	0.00
77.34	2.29	47.16	1.981	0.18	0.31	0.051	0.00	0.00
67.52	2.19	44.87	1.729	0.13	0.13	0.044	0.00	0.00
58.95	2.01	42.68	1.510	0.00	0.00	0.039	0.00	0.00
51.47	1.81	40.66	1.318	0.00	0.00	0.034	0.00	0.00
44.94	1.85	38.86	1.151	0.00	0.00	0.029	0.00	0.00
39.23	1.93	37.01	1.005	0.00	0.00	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01
File Name: AY101053.DAT Sample Name: 1296 ID No: 01/09/28-096
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 90.511 % Lamp: 89.315 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: Source: AY101
Lot No: Test No: Dup

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	1.679	0.10	0.10	(15)	108.334	5.00	55.00
(2)	2.635	0.90	1.00	(16)	127.606	5.00	60.00
(3)	3.468	1.30	2.30	(17)	145.054	5.00	65.00
(4)	4.906	2.70	5.00	(18)	162.028	5.00	70.00
(5)	7.412	5.00	10.00	(19)	179.475	5.00	75.00
(6)	10.129	5.00	15.00	(20)	198.308	5.00	80.00
(7)	10.622	0.80	15.80	(21)	215.805	4.20	84.20
(8)	13.425	4.20	20.00	(22)	219.176	0.80	85.00
(9)	17.718	5.00	25.00	(23)	245.364	5.00	90.00
(10)	24.121	5.00	30.00	(24)	285.687	5.00	95.00
(11)	34.092	5.00	35.00	(25)	325.633	2.70	97.70
(12)	49.073	5.00	40.00	(26)	362.692	1.30	99.00
(13)	68.093	5.00	45.00	(27)	470.910	0.90	99.90
(14)	88.643	5.00	50.00				

Median : 88.639 (μm) Mean: 108.474 (μm) Mode: 214.044 (μm)
Std. Dev.: 96.159 (μm) Span: 1.194
Coef. Var: 88.65% Spec. Area: 2820 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 07:36

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-097 11:23
Filename : AY101054
Sample : 1296

Material :
Source : AY101
Lot Numbe :

Condition
T%(He-Ne): 85.8% Dist.Form: Std. Sampling times : 100
(LAMP): 82.1% R.R.Index: 1.16-0.00i ( )

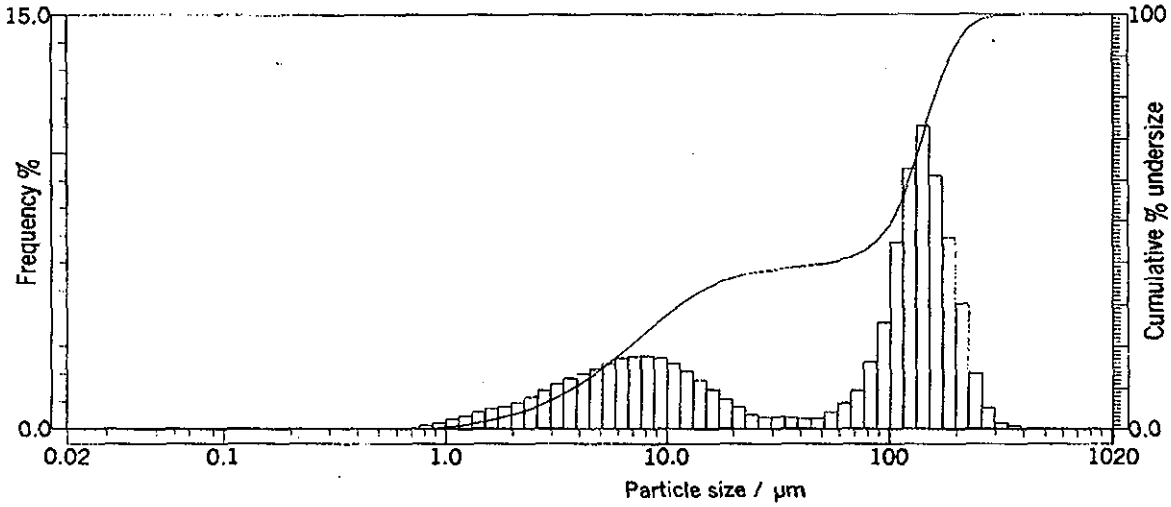
Agitation : 3 Circultn : 6 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 103.435μm SP.Area : 5378cm²/cm³ S.D. : 76.938μm
Mode : 142.210μm Mean : 92.053μm
C.V. : 83.58%

Span : (D 10.0-D 90.0) / D50 = 1.813

Dia. on %(5.0%) : 2.434μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 8.845μm % on Dia.(1.000μm) : 0.4%
Dia. on %(50.0%) : 103.435μm % on Dia.(10.000μm) : 27.3%
Dia. on %(75.0%) : 150.236μm % on Dia.(100.000μm) : 48.6%
Dia. on %(95.0%) : 217.069μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.52	37.68	0.669	0.00	0.00
890.1	0.00	100.00	22.80	0.82	37.16	0.584	0.00	0.00
777.1	0.00	100.00	19.90	1.09	36.34	0.510	0.00	0.00
678.5	0.00	100.00	17.38	1.46	35.26	0.445	0.00	0.00
592.4	0.00	100.00	15.17	1.78	33.80	0.389	0.00	0.00
517.2	0.00	100.00	13.25	2.10	32.01	0.339	0.00	0.00
451.6	0.00	100.00	11.56	2.39	29.91	0.296	0.00	0.00
394.2	0.13	100.00	10.10	2.58	27.52	0.259	0.00	0.00
344.2	0.23	99.87	8.816	2.67	24.94	0.226	0.00	0.00
300.5	0.80	99.64	7.697	2.63	22.27	0.197	0.00	0.00
262.4	2.04	98.84	6.720	2.58	19.64	0.172	0.00	0.00
229.1	4.53	96.80	5.867	2.38	17.07	0.150	0.00	0.00
200.0	6.92	92.26	5.122	2.19	14.69	0.131	0.00	0.00
174.6	9.16	85.35	4.472	2.03	12.50	0.115	0.00	0.00
152.5	10.98	76.19	3.905	1.85	10.48	0.100	0.00	0.00
133.1	9.43	65.21	3.409	1.65	8.63	0.087	0.00	0.00
116.2	6.73	55.77	2.976	1.41	6.98	0.076	0.00	0.00
101.5	3.86	49.04	2.599	1.18	5.57	0.067	0.00	0.00
88.58	2.45	45.19	2.269	0.97	4.39	0.058	0.00	0.00
77.34	1.42	42.74	1.981	0.83	3.42	0.051	0.00	0.00
67.52	0.95	41.32	1.729	0.74	2.59	0.044	0.00	0.00
58.95	0.63	40.37	1.510	0.61	1.84	0.039	0.00	0.00
51.47	0.39	39.73	1.318	0.50	1.23	0.034	0.00	0.00
44.94	0.38	39.34	1.151	0.37	0.73	0.029	0.00	0.00
39.23	0.41	38.96	1.005	0.24	0.37	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01
File Name: AY101054.DAT Sample Name: 1296 ID No: 01/09/28-097
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 85.750 % Lamp: 82.052 %
Circulation: 6 Agitation: 3 U.Sonic ** (min)
Material: Source: AY101
Lot No: Test No: Dup

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.853	0.10	0.10	(15)	114.518	5.00	55.00
(2)	1.241	0.90	1.00	(16)	123.781	5.00	60.00
(3)	1.645	1.30	2.30	(17)	132.734	5.00	65.00
(4)	2.440	2.70	5.00	(18)	141.552	5.00	70.00
(5)	3.776	5.00	10.00	(19)	150.364	5.00	75.00
(6)	5.219	5.00	15.00	(20)	161.682	5.00	80.00
(7)	5.470	0.80	15.80	(21)	171.842	4.20	84.20
(8)	6.853	4.20	20.00	(22)	173.777	0.80	85.00
(9)	8.847	5.00	25.00	(23)	191.689	5.00	90.00
(10)	11.636	5.00	30.00	(24)	217.543	5.00	95.00
(11)	16.991	5.00	35.00	(25)	243.800	2.70	97.70
(12)	54.604	5.00	40.00	(26)	270.107	1.30	99.00
(13)	87.729	5.00	45.00	(27)	355.626	0.90	99.90
(14)	103.555	5.00	50.00				

Median : 103.435 (μm) Mean: 92.053 (μm) Mode: 142.450 (μm)
Std. Dev.: 76.938 (μm) Span: 0.646
Coef. Var: 83.58% Spec. Area: 5378 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 07:37

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-098 11:26
Filename : AY101055
Sample : 1296

Material :
Source : AY101
Lot Numbe :

Condition
T%(He-Ne): 85.8% Dist.Form: Std. Sampling times : 100
(LAMP): 82.2% R.R.Index: 1.16-0.00i ( )

Agitation : 1 Circultn : 6 U.sonic : ~~ON~~ OFF (120)

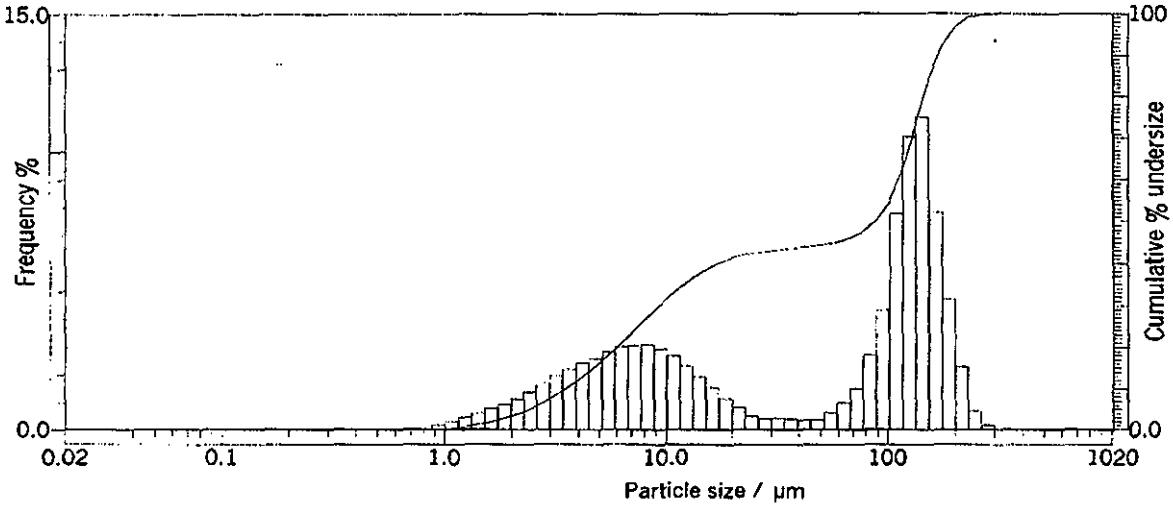
WSC 10/5/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 87.247μm SP.Area : 5843cm²/cm³ S.D. : 69.007μm
Mode : 140.146μm Mean : 78.751μm
C.V. : 87.63%

Span : (D 10.0-D 90.0) / D50 = 1.890

Dia. on %(5.0%) :	2.406μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	7.490μm	% on Dia.(1.000μm) :	0.2%
Dia. on %(50.0%) :	87.247μm	% on Dia.(10.000μm) :	31.4%
Dia. on %(75.0%) :	136.385μm	% on Dia.(100.000μm) :	54.2%
Dia. on %(95.0%) :	189.818μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.50	42.55	0.669	0.00	0.00
890.1	0.00	100.00	22.80	0.82	42.05	0.584	0.00	0.00
777.1	0.00	100.00	19.90	1.12	41.23	0.510	0.00	0.00
678.5	0.00	100.00	17.38	1.54	40.11	0.445	0.00	0.00
592.4	0.00	100.00	15.17	1.93	38.57	0.389	0.00	0.00
517.2	0.00	100.00	13.25	2.32	36.63	0.339	0.00	0.00
451.6	0.00	100.00	11.56	2.68	34.31	0.296	0.00	0.00
394.2	0.00	100.00	10.10	2.94	31.63	0.259	0.00	0.00
344.2	0.00	100.00	8.816	3.07	28.69	0.226	0.00	0.00
300.5	0.17	100.00	7.697	3.06	25.62	0.197	0.00	0.00
262.4	0.69	99.83	6.720	3.03	22.55	0.172	0.00	0.00
229.1	2.31	99.14	5.867	2.81	19.53	0.150	0.00	0.00
200.0	4.74	96.82	5.122	2.60	16.71	0.131	0.00	0.00
174.6	7.84	92.09	4.472	2.42	14.11	0.115	0.00	0.00
152.5	11.27	84.25	3.905	2.22	11.68	0.100	0.00	0.00
133.1	10.55	72.98	3.409	1.99	9.47	0.087	0.00	0.00
116.2	7.78	62.43	2.976	1.69	7.48	0.076	0.00	0.00
101.5	4.35	54.65	2.599	1.39	5.79	0.067	0.00	0.00
88.58	2.71	50.30	2.269	1.12	4.40	0.058	0.00	0.00
77.34	1.51	47.59	1.981	0.93	3.28	0.051	0.00	0.00
67.52	0.98	46.08	1.729	0.79	2.35	0.044	0.00	0.00
58.95	0.63	45.10	1.510	0.61	1.56	0.039	0.00	0.00
51.47	0.36	44.47	1.318	0.46	0.95	0.034	0.00	0.00
44.94	0.36	44.11	1.151	0.31	0.49	0.029	0.00	0.00
39.23	0.39	43.75	1.005	0.18	0.18	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01
File Name: AY101055.DAT Sample Name: 1296 ID No: 01/09/28-098
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 85.840 % Lamp: 82.173 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: Source: AY101
Lot No: Test No: Dup

WJC 10/5/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.947	0.10	0.10	(15)	102.119	5.00	55.00
(2)	1.333	0.90	1.00	(16)	111.599	5.00	60.00
(3)	1.716	1.30	2.30	(17)	120.324	5.00	65.00
(4)	2.411	2.70	5.00	(18)	128.333	5.00	70.00
(5)	3.528	5.00	10.00	(19)	136.575	5.00	75.00
(6)	4.694	5.00	15.00	(20)	145.160	5.00	80.00
(7)	4.894	0.80	15.80	(21)	152.371	4.20	84.20
(8)	6.000	4.20	20.00	(22)	154.580	0.80	85.00
(9)	7.500	5.00	25.00	(23)	168.719	5.00	90.00
(10)	9.388	5.00	30.00	(24)	190.228	5.00	95.00
(11)	12.064	5.00	35.00	(25)	211.013	2.70	97.70
(12)	17.218	5.00	40.00	(26)	227.361	1.30	99.00
(13)	57.793	5.00	45.00	(27)	278.236	0.90	99.90
(14)	87.324	5.00	50.00				

Median : 87.247 (μm) Mean: 78.751 (μm) Mode: 142.450 (μm)
Std. Dev.: 69.007 (μm) Span: 0.612
Coef. Var: 87.63% Spec. Area: 5843 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 07:37

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-099 11:35
Filename : AY101056
Sample : 1299

Material :
Source : AY101
Lot Numbe :

Condition
T%(He-Ne): 91.4%
(LAMP): 89.1%
Dist.Form: Std.
R.R.Index: 1.16-0.00i
Sampling times : 100
( )

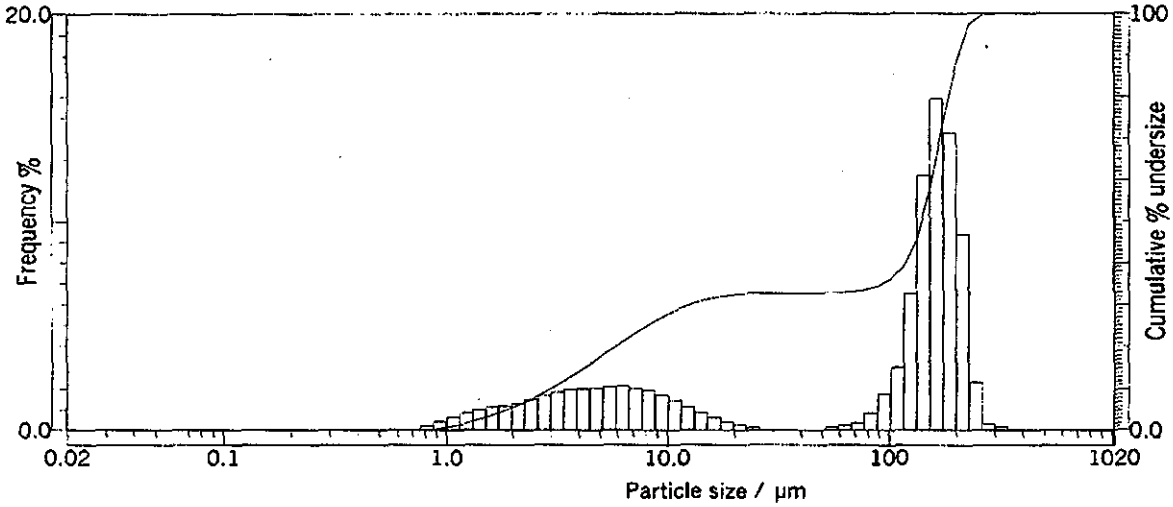
Agitation : 1 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 139.911μm SP.Area : 6117cm²/cm³ S.D. : 81.173μm
Mode : 164.606μm Mean : 113.063μm
C.V. : 71.79%

Span : (D 10.0-D 90.0) / D50 = 1.453

Dia. on %(5.0%) :	1.869μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	8.192μm	% on Dia.(1.000μm) :	0.6%
Dia. on %(50.0%) :	139.911μm	% on Dia.(10.000μm) :	27.6%
Dia. on %(75.0%) :	176.908μm	% on Dia.(100.000μm) :	35.8%
Dia. on %(95.0%) :	221.699μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.14	32.70	0.669	0.00	0.00
890.1	0.00	100.00	22.80	0.26	32.56	0.584	0.00	0.00
777.1	0.00	100.00	19.90	0.41	32.30	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.63	31.90	0.445	0.00	0.00
592.4	0.00	100.00	15.17	0.88	31.26	0.389	0.00	0.00
517.2	0.00	100.00	13.25	1.16	30.38	0.339	0.00	0.00
451.6	0.00	100.00	11.56	1.46	29.22	0.296	0.00	0.00
394.2	0.00	100.00	10.10	1.72	27.76	0.259	0.00	0.00
344.2	0.15	100.00	8.816	1.92	26.04	0.226	0.00	0.00
300.5	0.28	99.85	7.697	2.03	24.12	0.197	0.00	0.00
262.4	2.31	99.57	6.720	2.13	22.09	0.172	0.00	0.00
229.1	9.36	97.26	5.867	2.08	19.96	0.150	0.00	0.00
200.0	14.26	87.89	5.122	2.04	17.88	0.131	0.00	0.00
174.6	15.92	73.63	4.472	2.01	15.84	0.115	0.00	0.00
152.5	12.19	57.71	3.905	1.96	13.82	0.100	0.00	0.00
133.1	6.49	45.52	3.409	1.86	11.87	0.087	0.00	0.00
116.2	3.00	39.03	2.976	1.69	10.01	0.076	0.00	0.00
101.5	1.75	36.03	2.599	1.49	8.32	0.067	0.00	0.00
88.58	0.85	34.27	2.269	1.31	6.82	0.058	0.00	0.00
77.34	0.36	33.43	1.981	1.20	5.51	0.051	0.00	0.00
67.52	0.23	33.07	1.729	1.14	4.31	0.044	0.00	0.00
58.95	0.14	32.84	1.510	1.00	3.17	0.039	0.00	0.00
51.47	0.00	32.70	1.318	0.86	2.17	0.034	0.00	0.00
44.94	0.00	32.70	1.151	0.66	1.32	0.029	0.00	0.00
39.23	0.00	32.70	1.005	0.43	0.66	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01
File Name: AY101056.DAT Sample Name: 1299 ID No: 01/09/28-099
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 91.402 % Lamp: 89.093 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: Source: AY101

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.815	0.10	0.10	(15)	148.149	5.00	55.00
(2)	1.081	0.90	1.00	(16)	155.638	5.00	60.00
(3)	1.343	1.30	2.30	(17)	162.601	5.00	65.00
(4)	1.874	2.70	5.00	(18)	169.563	5.00	70.00
(5)	2.975	5.00	10.00	(19)	177.055	5.00	75.00
(6)	4.236	5.00	15.00	(20)	185.953	5.00	80.00
(7)	4.462	0.80	15.80	(21)	193.427	4.20	84.20
(8)	5.883	4.20	20.00	(22)	194.850	0.80	85.00
(9)	8.211	5.00	25.00	(23)	206.539	5.00	90.00
(10)	12.694	5.00	30.00	(24)	222.064	5.00	95.00
(11)	93.917	5.00	35.00	(25)	235.440	2.70	97.70
(12)	118.735	5.00	40.00	(26)	254.155	1.30	99.00
(13)	131.753	5.00	45.00	(27)	315.681	0.90	99.90
(14)	140.214	5.00	50.00				

Median : 139.911 (μm) Mean: 113.063 (μm) Mode: 163.159 (μm)
Std. Dev.: 81.173 (μm) Span: 0.320
Coef. Var: 71.80% Spec. Area: 6117 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 07:37

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-100 11:39
Filename : AY101057
Sample : 1299

Material :
Source : AY101
Lot Numbe :

Condition
T%(He-Ne): 91.5% Dist.Form: Std. Sampling times : 100
(LAMP): 89.0% R.R.Index: 1.16-0.00i ( )

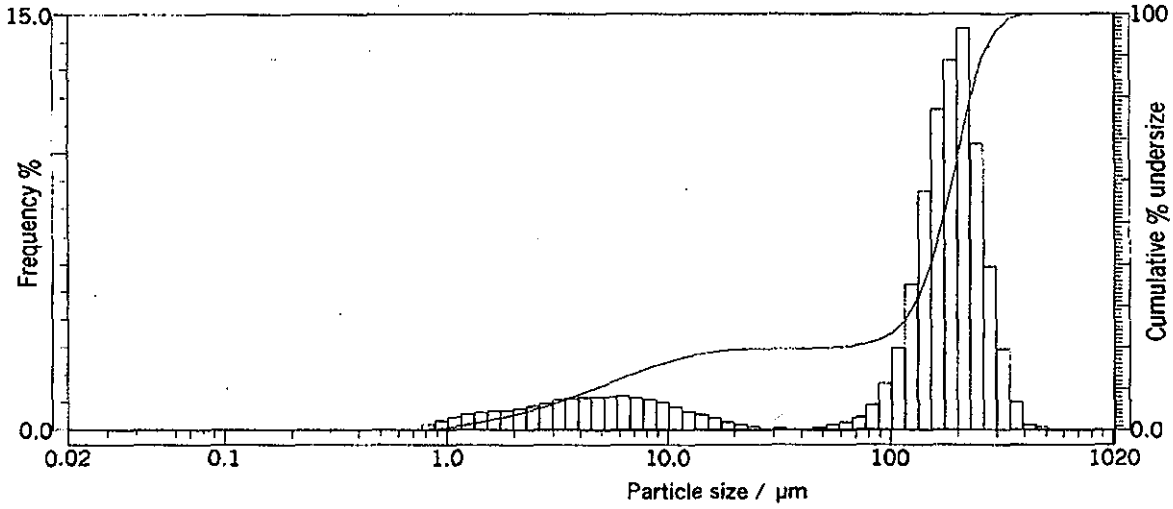
Agitation : 3 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 171.069μm SP.Area : 3896cm²/cm³ S.D. : 92.836μm
Mode : 211.064μm Mean : 157.293μm
C.V. : 59.02%

Span : (D 10.0-D 90.0) / D50 = 1.510

Dia. on %(5.0%) : 2.511μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 109.464μm % on Dia.(1.000μm) : 0.5%
Dia. on %(50.0%) : 171.069μm % on Dia.(10.000μm) : 16.4%
Dia. on %(75.0%) : 219.507μm % on Dia.(100.000μm) : 23.2%
Dia. on %(95.0%) : 295.001μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.11	19.56	0.669	0.00	0.00
890.1	0.00	100.00	22.80	0.20	19.44	0.584	0.00	0.00
777.1	0.00	100.00	19.90	0.28	19.25	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.41	18.97	0.445	0.00	0.00
592.4	0.00	100.00	15.17	0.54	18.56	0.389	0.00	0.00
517.2	0.10	100.00	13.25	0.69	18.02	0.339	0.00	0.00
451.6	0.19	99.90	11.56	0.85	17.33	0.296	0.00	0.00
394.2	0.99	99.71	10.10	0.99	16.48	0.259	0.00	0.00
344.2	2.91	98.72	8.816	1.11	15.48	0.226	0.00	0.00
300.5	5.93	95.81	7.697	1.17	14.38	0.197	0.00	0.00
262.4	10.33	89.88	6.720	1.23	13.21	0.172	0.00	0.00
229.1	14.48	79.55	5.867	1.21	11.97	0.150	0.00	0.00
200.0	13.32	65.07	5.122	1.19	10.76	0.131	0.00	0.00
174.6	11.56	51.75	4.472	1.17	9.58	0.115	0.00	0.00
152.5	8.60	40.19	3.905	1.14	8.40	0.100	0.00	0.00
133.1	5.29	31.59	3.409	1.07	7.27	0.087	0.00	0.00
116.2	2.97	26.31	2.976	0.97	6.19	0.076	0.00	0.00
101.5	1.68	23.34	2.599	0.86	5.22	0.067	0.00	0.00
88.58	0.93	21.66	2.269	0.76	4.35	0.058	0.00	0.00
77.34	0.48	20.73	1.981	0.71	3.59	0.051	0.00	0.00
67.52	0.30	20.26	1.729	0.70	2.88	0.044	0.00	0.00
58.95	0.19	19.96	1.510	0.63	2.19	0.039	0.00	0.00
51.47	0.11	19.77	1.318	0.57	1.55	0.034	0.00	0.00
44.94	0.00	19.66	1.151	0.47	0.98	0.029	0.00	0.00
39.23	0.00	19.66	1.005	0.33	0.51	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01
File Name: AY101057.DAT Sample Name: 1299 ID No: 01/09/28-100
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 91.479 % Lamp: 88.992 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: Source: AY101

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.826	0.10	0.10	(15)	180.814	5.00	55.00
(2)	1.156	0.90	1.00	(16)	190.341	5.00	60.00
(3)	1.545	1.30	2.30	(17)	199.869	5.00	65.00
(4)	2.515	2.70	5.00	(18)	209.899	5.00	70.00
(5)	4.704	5.00	10.00	(19)	219.936	5.00	75.00
(6)	8.328	5.00	15.00	(20)	230.517	5.00	80.00
(7)	9.226	0.80	15.80	(21)	244.058	4.20	84.20
(8)	60.220	4.20	20.00	(22)	246.638	0.80	85.00
(9)	109.712	5.00	25.00	(23)	263.140	5.00	90.00
(10)	128.011	5.00	30.00	(24)	295.311	5.00	95.00
(11)	140.771	5.00	35.00	(25)	328.922	2.70	97.70
(12)	152.026	5.00	40.00	(26)	358.467	1.30	99.00
(13)	161.677	5.00	45.00	(27)	453.993	0.90	99.90
(14)	171.265	5.00	50.00				

Median : 171.069 (μm) Mean: 157.293 (μm) Mode: 214.044 (μm)
Std. Dev.: 92.836 (μm) Span: 0.441
Coef. Var: 59.02% Spec. Area: 3896 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 07:37

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-101 11:44
Filename : AY101058
Sample : 1299

Material :
Source : AY101
Lot Numbe :

Condition
T%(He-Ne): 91.4%
(LAMP): 87.4%
Dist.Form: Std.
R.R.Index: 1.16-0.00i
Sampling times : 100
( )

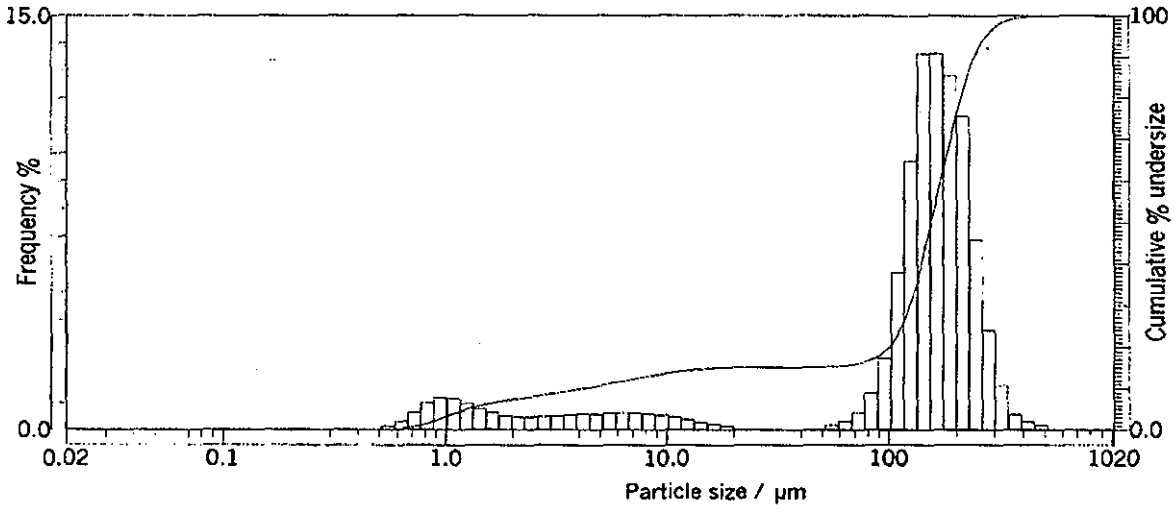
Agitation : 3 Circultn : 6 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 153.716μm SP.Area : 5601cm²/cm³ S.D. : 81.638μm
Mode : 162.491μm Mean : 149.089μm
C.V. : 54.76%

Span : (D 10.0-D 90.0) / D50 = 1.557

Dia. on %(5.0%) : 1.254μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 113.818μm % on Dia.(1.000μm) : 3.2%
Dia. on %(50.0%) : 153.716μm % on Dia.(10.000μm) : 13.7%
Dia. on %(75.0%) : 198.734μm % on Dia.(100.000μm) : 19.9%
Dia. on %(95.0%) : 274.845μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	15.18	0.669	0.31	0.44
890.1	0.00	100.00	22.80	0.00	15.18	0.584	0.13	0.13
777.1	0.00	100.00	19.90	0.14	15.18	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.22	15.03	0.445	0.00	0.00
592.4	0.00	100.00	15.17	0.29	14.81	0.389	0.00	0.00
517.2	0.17	100.00	13.25	0.37	14.52	0.339	0.00	0.00
451.6	0.30	99.83	11.56	0.46	14.15	0.296	0.00	0.00
394.2	0.55	99.53	10.10	0.52	13.70	0.259	0.00	0.00
344.2	1.62	98.98	8.816	0.57	13.17	0.226	0.00	0.00
300.5	3.60	97.37	7.697	0.59	12.60	0.197	0.00	0.00
262.4	6.85	93.77	6.720	0.61	12.01	0.172	0.00	0.00
229.1	11.32	86.92	5.867	0.59	11.40	0.150	0.00	0.00
200.0	12.80	75.60	5.122	0.57	10.81	0.131	0.00	0.00
174.6	13.63	62.80	4.472	0.55	10.24	0.115	0.00	0.00
152.5	13.62	49.17	3.905	0.54	9.69	0.100	0.00	0.00
133.1	9.68	35.55	3.409	0.51	9.15	0.087	0.00	0.00
116.2	5.68	25.87	2.976	0.48	8.64	0.076	0.00	0.00
101.5	2.59	20.19	2.599	0.46	8.16	0.067	0.00	0.00
88.58	1.32	17.60	2.269	0.45	7.70	0.058	0.00	0.00
77.34	0.62	16.28	1.981	0.50	7.25	0.051	0.00	0.00
67.52	0.32	15.66	1.729	0.63	6.74	0.044	0.00	0.00
58.95	0.17	15.34	1.510	0.76	6.11	0.039	0.00	0.00
51.47	0.00	15.18	1.318	0.97	5.35	0.034	0.00	0.00
44.94	0.00	15.18	1.151	1.14	4.39	0.029	0.00	0.00
39.23	0.00	15.18	1.005	1.18	3.25	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01
File Name: AY101058.DAT Sample Name: 1299 ID No: 01/09/28-101
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 91.416 % Lamp: 87.409 %
Circulation: 6 Agitation: 3 U.Sonic ** (min)
Material: Source: AY101

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.567	0.10	0.10	(15)	161.933	5.00	55.00
(2)	0.754	0.90	1.00	(16)	170.065	5.00	60.00
(3)	0.902	1.30	2.30	(17)	178.982	5.00	65.00
(4)	1.257	2.70	5.00	(18)	188.897	5.00	70.00
(5)	4.222	5.00	10.00	(19)	198.812	5.00	75.00
(6)	17.066	5.00	15.00	(20)	211.304	5.00	80.00
(7)	69.704	0.80	15.80	(21)	222.093	4.20	84.20
(8)	100.496	4.20	20.00	(22)	224.148	0.80	85.00
(9)	113.950	5.00	25.00	(23)	244.055	5.00	90.00
(10)	123.419	5.00	30.00	(24)	275.423	5.00	95.00
(11)	132.147	5.00	35.00	(25)	309.515	2.70	97.70
(12)	139.427	5.00	40.00	(26)	345.767	1.30	99.00
(13)	146.528	5.00	45.00	(27)	478.213	0.90	99.90
(14)	153.801	5.00	50.00				

Median : 153.716 (μm) Mean: 149.089 (μm) Mode: 163.159 (μm)
Std. Dev.: 81.638 (μm) Span: 0.495
Coef. Var: 54.76% Spec. Area: 5601 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 07:37

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-102 11:48
Filename : AY101059
Sample : 1299

Material :
Source : AY101
Lot Numbe :

Condition
T%(He-Ne): 91.8% Dist.Form: Std. Sampling times : 100
(LAMP): 87.7% R.R.Index: 1.16-0.00i ( )

Agitation : 1 Circultn : 6 U.sonic : ~~ON~~ OFF (120)

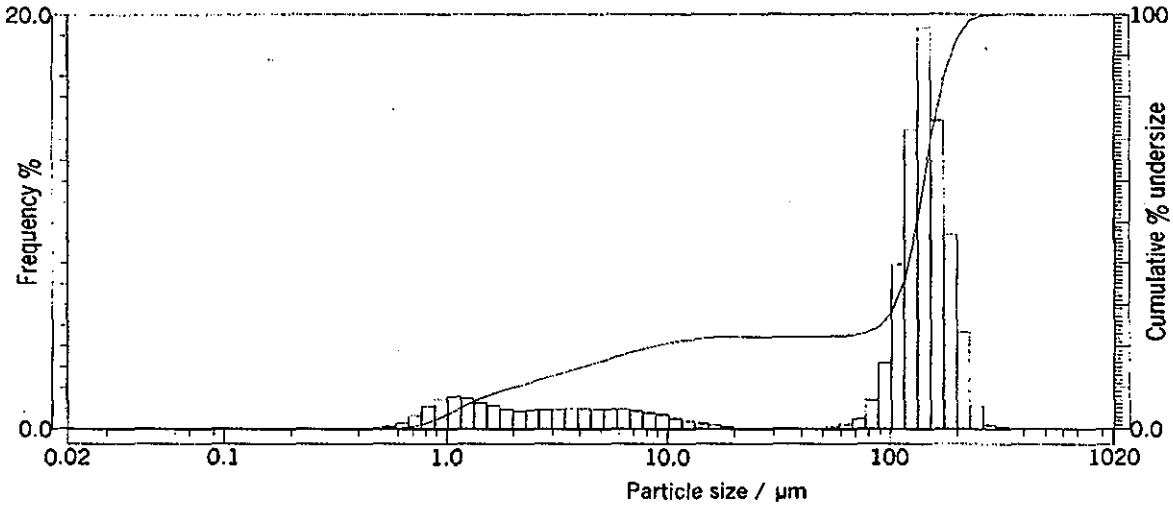
WSC 10/5/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 132.883μm SP.Area : 7550cm²/cm³ S.D. : 67.460μm
Mode : 142.684μm Mean : 115.401μm
C.V. : 58.46%

Span : (D 10.0-D 90.0) / D50 = 1.408

Dia. on %(5.0%) :	1.138μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	90.077μm	% on Dia.(1.000μm) :	3.5%
Dia. on %(50.0%) :	132.883μm	% on Dia.(10.000μm) :	20.7%
Dia. on %(75.0%) :	160.194μm	% on Dia.(100.000μm) :	27.5%
Dia. on %(95.0%) :	206.434μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	22.33	0.669	0.28	0.38
890.1	0.00	100.00	22.80	0.00	22.33	0.584	0.10	0.10
777.1	0.00	100.00	19.90	0.11	22.33	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.19	22.21	0.445	0.00	0.00
592.4	0.00	100.00	15.17	0.29	22.02	0.389	0.00	0.00
517.2	0.00	100.00	13.25	0.41	21.73	0.339	0.00	0.00
451.6	0.00	100.00	11.56	0.55	21.32	0.296	0.00	0.00
394.2	0.00	100.00	10.10	0.68	20.77	0.259	0.00	0.00
344.2	0.10	100.00	8.816	0.80	20.09	0.226	0.00	0.00
300.5	0.18	99.90	7.697	0.87	19.30	0.197	0.00	0.00
262.4	1.12	99.71	6.720	0.95	18.42	0.172	0.00	0.00
229.1	4.69	98.59	5.867	0.95	17.48	0.150	0.00	0.00
200.0	9.44	93.91	5.122	0.96	16.53	0.131	0.00	0.00
174.6	14.90	84.47	4.472	0.97	15.57	0.115	0.00	0.00
152.5	19.39	69.56	3.905	0.98	14.60	0.100	0.00	0.00
133.1	14.44	50.18	3.409	0.96	13.62	0.087	0.00	0.00
116.2	7.95	35.74	2.976	0.92	12.66	0.076	0.00	0.00
101.5	3.18	27.79	2.599	0.90	11.74	0.067	0.00	0.00
88.58	1.40	24.61	2.269	0.88	10.84	0.058	0.00	0.00
77.34	0.54	23.21	1.981	0.95	9.96	0.051	0.00	0.00
67.52	0.24	22.67	1.729	1.13	9.01	0.044	0.00	0.00
58.95	0.11	22.43	1.510	1.27	7.88	0.039	0.00	0.00
51.47	0.00	22.33	1.318	1.48	6.61	0.034	0.00	0.00
44.94	0.00	22.33	1.151	1.57	5.13	0.029	0.00	0.00
39.23	0.00	22.33	1.005	1.46	3.56	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01
File Name: AY101059.DAT Sample Name: 1299 ID No: 01/09/28-102
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 91.752 % Lamp: 87.739 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: Source: AY101

WJC 10/5/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.580	0.10	0.10	(15)	137.918	5.00	55.00
(2)	0.765	0.90	1.00	(16)	142.909	5.00	60.00
(3)	0.895	1.30	2.30	(17)	147.900	5.00	65.00
(4)	1.139	2.70	5.00	(18)	153.105	5.00	70.00
(5)	1.995	5.00	10.00	(19)	160.541	5.00	75.00
(6)	4.140	5.00	15.00	(20)	167.976	5.00	80.00
(7)	4.628	0.80	15.80	(21)	174.221	4.20	84.20
(8)	8.685	4.20	20.00	(22)	176.053	0.80	85.00
(9)	90.170	5.00	25.00	(23)	189.497	5.00	90.00
(10)	105.559	5.00	30.00	(24)	206.783	5.00	95.00
(11)	114.836	5.00	35.00	(25)	223.526	2.70	97.70
(12)	121.194	5.00	40.00	(26)	241.127	1.30	99.00
(13)	127.046	5.00	45.00	(27)	301.367	0.90	99.90
(14)	132.897	5.00	50.00				

Median : 132.883 (μm) Mean: 115.401 (μm) Mode: 142.450 (μm)
Std. Dev.: 67.460 (μm) Span: 0.348
Coef. Var: 58.46% Spec. Area: 7550 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 07:38

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-103 13:12
Filename : AY101060
Sample : 1299

Material :
Source : AY101
Lot Numbe :

Condition
T%(He-Ne): 90.6% Dist.Form: Std. Sampling times : 100
(LAMP): 88.3% R.R.Index: 1.16-0.00i ( )

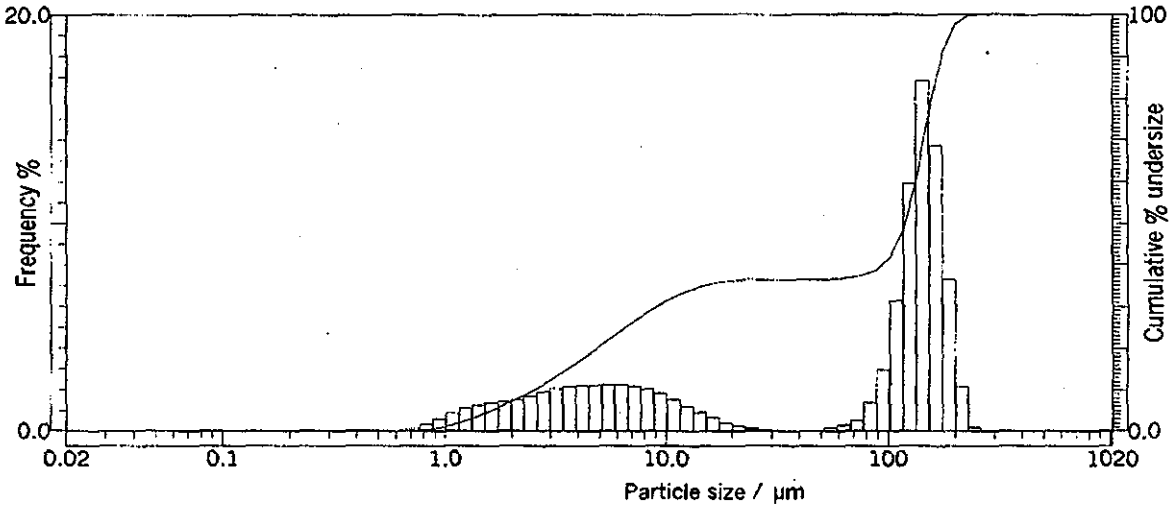
Agitation : 1 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 119.005μm SP.Area : 7263cm²/cm³ S.D. : 70.820μm
Mode : 143.481μm Mean : 93.262μm
C.V. : 75.94%

Span : (D 10.0-D 90.0) / D50 = 1.441

Dia. on %(5.0%) : 1.619μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 6.596μm % on Dia.(1.000μm) : 1.0%
Dia. on %(50.0%) : 119.005μm % on Dia.(10.000μm) : 31.2%
Dia. on %(75.0%) : 150.391μm % on Dia.(100.000μm) : 41.3%
Dia. on %(95.0%) : 190.383μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.12	36.36	0.669	0.00	0.00
890.1	0.00	100.00	22.80	0.24	36.25	0.584	0.00	0.00
777.1	0.00	100.00	19.90	0.39	36.01	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.63	35.62	0.445	0.00	0.00
592.4	0.00	100.00	15.17	0.89	34.99	0.389	0.00	0.00
517.2	0.00	100.00	13.25	1.20	34.10	0.339	0.00	0.00
451.6	0.00	100.00	11.56	1.54	32.90	0.296	0.00	0.00
394.2	0.00	100.00	10.10	1.83	31.36	0.259	0.00	0.00
344.2	0.00	100.00	8.816	2.05	29.54	0.226	0.00	0.00
300.5	0.00	100.00	7.697	2.18	27.49	0.197	0.00	0.00
262.4	0.19	100.00	6.720	2.28	25.31	0.172	0.00	0.00
229.1	2.18	99.81	5.867	2.24	23.03	0.150	0.00	0.00
200.0	7.26	97.64	5.122	2.20	20.78	0.131	0.00	0.00
174.6	13.68	90.37	4.472	2.19	18.58	0.115	0.00	0.00
152.5	16.89	76.69	3.905	2.14	16.39	0.100	0.00	0.00
133.1	11.89	59.80	3.409	2.05	14.25	0.087	0.00	0.00
116.2	6.26	47.92	2.976	1.89	12.20	0.076	0.00	0.00
101.5	2.99	41.66	2.599	1.70	10.32	0.067	0.00	0.00
88.58	1.36	38.67	2.269	1.52	8.62	0.058	0.00	0.00
77.34	0.52	37.31	1.981	1.42	7.10	0.051	0.00	0.00
67.52	0.28	36.79	1.729	1.40	5.68	0.044	0.00	0.00
58.95	0.15	36.51	1.510	1.26	4.28	0.039	0.00	0.00
51.47	0.00	36.36	1.318	1.11	3.02	0.034	0.00	0.00
44.94	0.00	36.36	1.151	0.88	1.91	0.029	0.00	0.00
39.23	0.00	36.36	1.005	0.59	1.03	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01
File Name: AY101060.DAT Sample Name: 1299 ID No: 01/09/28-103
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 90.607 % Lamp: 88.268 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: Source: AY101
Lot No: Test No: Dup

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.744	0.10	0.10	(15)	126.274	5.00	55.00
(2)	0.999	0.90	1.00	(16)	133.327	5.00	60.00
(3)	1.210	1.30	2.30	(17)	139.055	5.00	65.00
(4)	1.623	2.70	5.00	(18)	144.784	5.00	70.00
(5)	2.537	5.00	10.00	(19)	150.512	5.00	75.00
(6)	3.582	5.00	15.00	(20)	157.808	5.00	80.00
(7)	3.767	0.80	15.80	(21)	164.612	4.20	84.20
(8)	4.891	4.20	20.00	(22)	165.908	0.80	85.00
(9)	6.603	5.00	25.00	(23)	174.009	5.00	90.00
(10)	9.141	5.00	30.00	(24)	190.784	5.00	95.00
(11)	15.196	5.00	35.00	(25)	200.851	2.70	97.70
(12)	94.294	5.00	40.00	(26)	218.210	1.30	99.00
(13)	109.327	5.00	45.00	(27)	244.498	0.90	99.90
(14)	119.168	5.00	50.00				

Median : 119.005 (μm) Mean: 93.262 (μm) Mode: 142.450 (μm)
Std. Dev.: 70.820 (μm) Span: 0.336
Coef. Var: 75.94% Spec. Area: 7263 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 07:38

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-104 13:17
Filename : AY101061
Sample : 1299

Material :
Source : AY101
Lot Numbe :

Condition
T%(He-Ne): 90.9% Dist.Form: Std. Sampling times : 100
(LAMP): 88.2% R.R.Index: 1.16-0.00i ( )

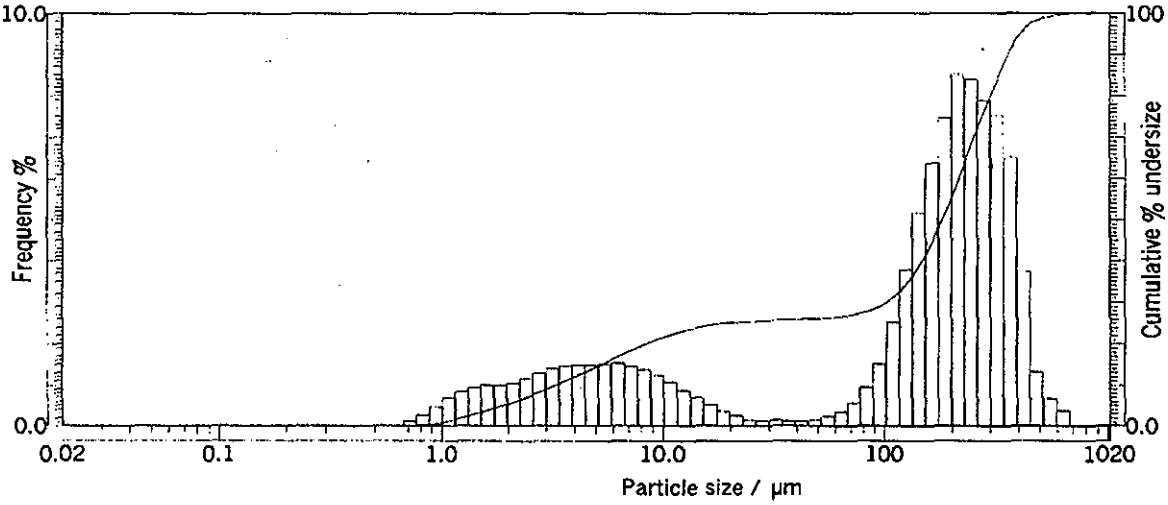
Agitation : 3 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 182.474μm SP.Area : 5228cm²/cm³ S.D. : 136.951μm
Mode : 215.651μm Mean : 181.248μm
C.V. : 75.56%

Span : (D 10.0-D 90.0) / D50 = 1.974

Dia. on %(5.0%) : 1.908μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 19.044μm % on Dia.(1.000μm) : 0.8%
Dia. on %(50.0%) : 182.474μm % on Dia.(10.000μm) : 21.6%
Dia. on %(75.0%) : 276.443μm % on Dia.(100.000μm) : 29.6%
Dia. on %(95.0%) : 410.365μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.14	25.51	0.669	0.00	0.00
890.1	0.00	100.00	22.80	0.25	25.36	0.584	0.00	0.00
777.1	0.00	100.00	19.90	0.35	25.11	0.510	0.00	0.00
678.5	0.37	100.00	17.38	0.52	24.76	0.445	0.00	0.00
592.4	0.67	99.63	15.17	0.68	24.25	0.389	0.00	0.00
517.2	1.32	98.96	13.25	0.87	23.57	0.339	0.00	0.00
451.6	3.74	97.64	11.56	1.06	22.70	0.296	0.00	0.00
394.2	6.52	93.89	10.10	1.23	21.64	0.259	0.00	0.00
344.2	7.52	87.37	8.816	1.37	20.41	0.226	0.00	0.00
300.5	7.88	79.85	7.697	1.44	19.04	0.197	0.00	0.00
262.4	8.40	71.97	6.720	1.52	17.60	0.172	0.00	0.00
229.1	8.52	63.56	5.867	1.50	16.08	0.150	0.00	0.00
200.0	7.46	55.04	5.122	1.48	14.58	0.131	0.00	0.00
174.6	6.37	47.58	4.472	1.48	13.09	0.115	0.00	0.00
152.5	5.18	41.21	3.905	1.45	11.61	0.100	0.00	0.00
133.1	3.78	36.03	3.409	1.39	10.16	0.087	0.00	0.00
116.2	2.53	32.25	2.976	1.29	8.77	0.076	0.00	0.00
101.5	1.51	29.73	2.599	1.16	7.48	0.067	0.00	0.00
88.58	0.94	28.21	2.269	1.05	6.32	0.058	0.00	0.00
77.34	0.55	27.27	1.981	0.99	5.27	0.051	0.00	0.00
67.52	0.35	26.72	1.729	1.00	4.28	0.044	0.00	0.00
58.95	0.23	26.37	1.510	0.92	3.28	0.039	0.00	0.00
51.47	0.14	26.14	1.318	0.84	2.36	0.034	0.00	0.00
44.94	0.12	26.00	1.151	0.68	1.52	0.029	0.00	0.00
39.23	0.12	25.88	1.005	0.47	0.84	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01
File Name: AY101061.DAT Sample Name: 1299 ID No: 01/09/28-104
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 90.859 % Lamp: 88.246 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: Source: AY101
Lot No: Test No: Dup

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.757	0.10	0.10	(15)	199.852	5.00	55.00
(2)	1.039	0.90	1.00	(16)	216.914	5.00	60.00
(3)	1.306	1.30	2.30	(17)	234.767	5.00	65.00
(4)	1.912	2.70	5.00	(18)	254.582	5.00	70.00
(5)	3.359	5.00	10.00	(19)	277.053	5.00	75.00
(6)	5.333	5.00	15.00	(20)	301.391	5.00	80.00
(7)	5.730	0.80	15.80	(21)	325.779	4.20	84.20
(8)	8.483	4.20	20.00	(22)	330.424	0.80	85.00
(9)	19.082	5.00	25.00	(23)	364.361	5.00	90.00
(10)	103.058	5.00	30.00	(24)	411.166	5.00	95.00
(11)	128.482	5.00	35.00	(25)	454.606	2.70	97.70
(12)	147.918	5.00	40.00	(26)	522.117	1.30	99.00
(13)	165.635	5.00	45.00	(27)	655.406	0.90	99.90
(14)	182.848	5.00	50.00				

Median : 182.474 (μm) Mean: 181.248 (μm) Mode: 214.044 (μm)
Std. Dev.: 136.951 (μm) Span: 0.734
Coef. Var: 75.56% Spec. Area: 5228 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 07:38

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-105 13:24
Filename : AY101062
Sample : 1299

Material :
Source : AY101
Lot Numbe :

Condition
T%(He-Ne): 90.7%
(LAMP): 86.6%

Dist.Form: Std.
R.R.Index: 1.16-0.00i

Sampling times : 100
( )

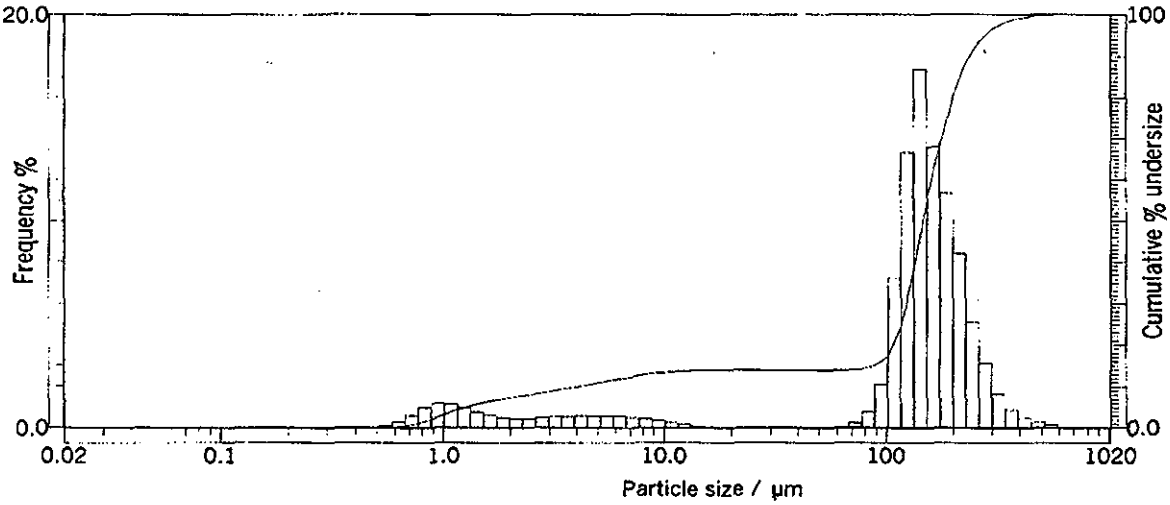
Agitation : 3 Circultn : 6 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 146.655μm SP.Area : 5530cm²/cm³ S.D. : 81.744μm
Mode : 142.596μm Mean : 147.949μm
C.V. : 55.25%

Span : (D 10.0-D 90.0) / D50 = 1.606

Dia. on %(5.0%) : 1.259μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 117.112μm % on Dia.(1.000μm) : 3.2%
Dia. on %(50.0%) : 146.655μm % on Dia.(10.000μm) : 13.3%
Dia. on %(75.0%) : 188.571μm % on Dia.(100.000μm) : 16.8%
Dia. on %(95.0%) : 281.306μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	13.91	0.669	0.29	0.41
890.1	0.00	100.00	22.80	0.00	13.91	0.584	0.12	0.12
777.1	0.00	100.00	19.90	0.00	13.91	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.00	13.91	0.445	0.00	0.00
592.4	0.15	100.00	15.17	0.10	13.91	0.389	0.00	0.00
517.2	0.28	99.85	13.25	0.17	13.80	0.339	0.00	0.00
451.6	0.50	99.57	11.56	0.26	13.63	0.296	0.00	0.00
394.2	0.89	99.08	10.10	0.35	13.37	0.259	0.00	0.00
344.2	1.66	98.19	8.816	0.44	13.02	0.226	0.00	0.00
300.5	3.13	96.53	7.697	0.51	12.57	0.197	0.00	0.00
262.4	5.08	93.39	6.720	0.57	12.06	0.172	0.00	0.00
229.1	8.40	88.32	5.867	0.58	11.49	0.150	0.00	0.00
200.0	11.35	79.92	5.122	0.58	10.91	0.131	0.00	0.00
174.6	13.61	68.57	4.472	0.58	10.33	0.115	0.00	0.00
152.5	17.38	54.96	3.905	0.56	9.76	0.100	0.00	0.00
133.1	13.35	37.59	3.409	0.53	9.20	0.087	0.00	0.00
116.2	7.21	24.24	2.976	0.49	8.67	0.076	0.00	0.00
101.5	2.09	17.03	2.599	0.47	8.18	0.067	0.00	0.00
88.58	0.78	14.94	2.269	0.46	7.70	0.058	0.00	0.00
77.34	0.26	14.16	1.981	0.51	7.24	0.051	0.00	0.00
67.52	0.00	13.91	1.729	0.64	6.74	0.044	0.00	0.00
58.95	0.00	13.91	1.510	0.77	6.10	0.039	0.00	0.00
51.47	0.00	13.91	1.318	0.98	5.33	0.034	0.00	0.00
44.94	0.00	13.91	1.151	1.15	4.35	0.029	0.00	0.00
39.23	0.00	13.91	1.005	1.19	3.20	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01
File Name: AY101062.DAT Sample Name: 1299 ID No: 01/09/28-105
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 90.728 % Lamp: 86.563 %
Circulation: 6 Agitation: 3 U.Sonic ** (min)
Material: Source: AY101
Lot No: Test No: Dup

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.573	0.10	0.10	(15)	152.512	5.00	55.00
(2)	0.762	0.90	1.00	(16)	160.655	5.00	60.00
(3)	0.908	1.30	2.30	(17)	168.798	5.00	65.00
(4)	1.262	2.70	5.00	(18)	177.810	5.00	70.00
(5)	4.146	5.00	10.00	(19)	188.995	5.00	75.00
(6)	88.956	5.00	15.00	(20)	200.279	5.00	80.00
(7)	93.894	0.80	15.80	(21)	214.824	4.20	84.20
(8)	107.541	4.20	20.00	(22)	217.594	0.80	85.00
(9)	117.172	5.00	25.00	(23)	240.128	5.00	90.00
(10)	123.501	5.00	30.00	(24)	281.952	5.00	95.00
(11)	129.830	5.00	35.00	(25)	331.422	2.70	97.70
(12)	135.791	5.00	40.00	(26)	389.925	1.30	99.00
(13)	141.358	5.00	45.00	(27)	543.189	0.90	99.90
(14)	146.926	5.00	50.00				

Median : 146.655 (μm) Mean: 147.949 (μm) Mode: 142.450 (μm)
Std. Dev.: 81.744 (μm) Span: 0.632
Coef. Var: 55.25% Spec. Area: 5530 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 07:39

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-106 13:29
Filename : AY101063
Sample : 1299

Material :
Source : AY101
Lot Numbe :

Condition

T%(He-Ne): 90.8% Dist.Form: Std. Sampling times : 100
(LAMP): 86.8% R.R.Index: 1.16-0.00i ( )

Agitation : 1 Circultn : 6 U.sonic : ~~ON~~ OFF (120)

WSC 10/5/01

Format

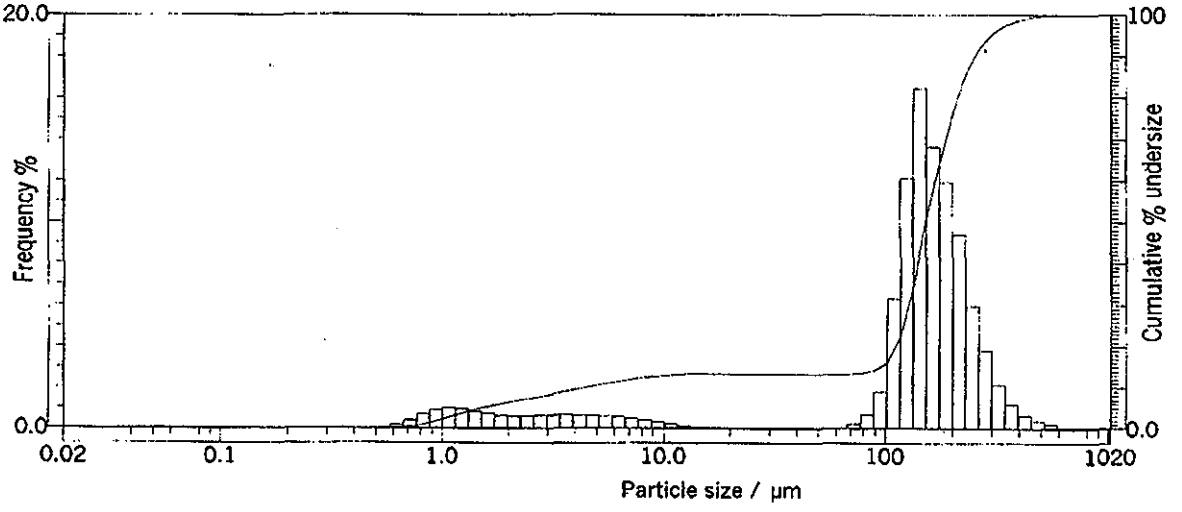
Dist.base : Volume Scaling : Auto Axis : LogX · LinearY

Data

Median : 151.565μm SP.Area : 4784cm²/cm³ S.D. : 85.501μm
Mode : 143.354μm Mean : 155.020μm
C.V. : 55.15%

Span : (D 10.0-D 90.0) / D50 = 1.638

Dia. on %(5.0%) : 1.537μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 119.929μm % on Dia.(1.000μm) : 2.1%
Dia. on %(50.0%) : 151.565μm % on Dia.(10.000μm) : 12.9%
Dia. on %(75.0%) : 197.166μm % on Dia.(100.000μm) : 15.7%
Dia. on %(95.0%) : 295.772μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	13.23	0.669	0.17	0.17
890.1	0.00	100.00	22.80	0.00	13.23	0.584	0.00	0.00
777.1	0.00	100.00	19.90	0.00	13.23	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.00	13.23	0.445	0.00	0.00
592.4	0.20	100.00	15.17	0.00	13.23	0.389	0.00	0.00
517.2	0.37	99.80	13.25	0.13	13.23	0.339	0.00	0.00
451.6	0.66	99.43	11.56	0.21	13.10	0.296	0.00	0.00
394.2	1.19	98.77	10.10	0.30	12.89	0.259	0.00	0.00
344.2	2.13	97.58	8.816	0.40	12.58	0.226	0.00	0.00
300.5	3.82	95.45	7.697	0.48	12.19	0.197	0.00	0.00
262.4	5.97	91.63	6.720	0.56	11.71	0.172	0.00	0.00
229.1	9.41	85.66	5.867	0.59	11.15	0.150	0.00	0.00
200.0	11.94	76.26	5.122	0.62	10.56	0.131	0.00	0.00
174.6	13.61	64.32	4.472	0.64	9.94	0.115	0.00	0.00
152.5	16.43	50.71	3.905	0.65	9.29	0.100	0.00	0.00
133.1	12.08	34.27	3.409	0.64	8.64	0.087	0.00	0.00
116.2	6.31	22.20	2.976	0.61	8.00	0.076	0.00	0.00
101.5	1.79	15.89	2.599	0.59	7.39	0.067	0.00	0.00
88.58	0.65	14.10	2.269	0.57	6.80	0.058	0.00	0.00
77.34	0.21	13.44	1.981	0.61	6.24	0.051	0.00	0.00
67.52	0.00	13.23	1.729	0.72	5.63	0.044	0.00	0.00
58.95	0.00	13.23	1.510	0.81	4.91	0.039	0.00	0.00
51.47	0.00	13.23	1.318	0.94	4.10	0.034	0.00	0.00
44.94	0.00	13.23	1.151	1.00	3.16	0.029	0.00	0.00
39.23	0.00	13.23	1.005	0.92	2.16	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C · 10/04/01
File Name: AY101063.DAT Sample Name: 1299 ID No: 01/09/28-106
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 90.837 % Lamp: 86.811 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: Source: AY101
Lot No: Test No: Dup

WSC
10/5/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.634	0.10	0.10	(15)	159.444	5.00	55.00
(2)	0.838	0.90	1.00	(16)	167.587	5.00	60.00
(3)	1.025	1.30	2.30	(17)	176.070	5.00	65.00
(4)	1.538	2.70	5.00	(18)	186.701	5.00	70.00
(5)	4.540	5.00	10.00	(19)	197.331	5.00	75.00
(6)	95.092	5.00	15.00	(20)	211.574	5.00	80.00
(7)	100.847	0.80	15.80	(21)	224.555	4.20	84.20
(8)	111.076	4.20	20.00	(22)	227.028	0.80	85.00
(9)	120.131	5.00	25.00	(23)	253.282	5.00	90.00
(10)	127.124	5.00	30.00	(24)	296.045	5.00	95.00
(11)	133.957	5.00	35.00	(25)	349.300	2.70	97.70
(12)	139.845	5.00	40.00	(26)	414.346	1.30	99.00
(13)	145.733	5.00	45.00	(27)	555.518	0.90	99.90
(14)	151.620	5.00	50.00				

Median : 151.565 (μm) Mean: 155.020 (μm) Mode: 142.450 (μm)
Std. Dev.: 85.501 (μm) Span: 0.651
Coef. Var: 55.16% Spec. Area: 4784 (cm2/cm3)

This document was too large to scan as a single document. It has been divided into smaller sections.

Section 4 of

Document Information			
Document #	**HNF-8862**	**Revision**	**0**
Title	PARTICLE PROPERTY ANALYSES OF HLW TANK SLUDGES		
Date	**0/3/04/2002**		
Originator	**DB BECHTOLD** **L JENSEN** **JB DUNCAN** **JR JEWETT** **JM TINGEY**	**Originator Co.**	**FH** **CHG** **OTHER** **NHC** **PNL**
Recipient		**Recipient Co.**	
References	**EDT-628492**		
Keywords	Effects of Relative Refractive Index, QC Data Sieve Test Samples, Fractional Settling		
Projects	**Tank Farms** 241C104, 241SY102, 241AW103, 241AY101		
Other Information	App F, 2225 PSD measurement Results Cont'd (Pages F-441 → F-662) F13, F14, F15, F16, F17, F18, F19, F20, F21 Monodisperse Polystyrene microspheres Quartz Powder Standard BCR-69 241C104		

APPENDIX F-13

C-104 SIEVE TEST SAMPLES: PSD MEASUREMENT RESULTS

Consisting of 32 pages including this cover page

TABLE F-13. Sample identification and PSD run conditions. C-104 composite, sieve test samples S01T001284 (< 53 μm) and S01T001285 (53 < < 106 μm).

Conditions Key: P = Pump Speed Setting; P6 = 14.4 mL/s
S = Stirrer Speed Setting (1-7); S1 = Stirrer Speed 1; S3 = Stirrer Speed 3
US = Ultrasonic ON Time (min); DT = Delay Time (min) between end of ultrasonic treatment and PSD measurement.
Time = Clock time at beginning of measurement.

Sample Sieve Fraction	PSD Run File Name	Run Conditions				Time	Cumulative Time (min) At Conditions				
		P	S	US	DT		P6	S1	S3	US	DT
S01T001284	[LOAD-IN]	6	1	0	0	?	?	?			
< 53 μm	C104032	6	1	0	0	15:05	5	5			
	(Not Saved)	6	3	0	0	15:10	11	5	6		
	C104034	6	3	2	0	15:16	18	5	13	2	0
	C104035	6	1	0	0	15:23	20	7	13	2	5
						15:25					
S01T001284	[LOAD-IN]	6	1	0	0	?	?	?			
< 53 μm	C104036	6	1	0	0	15:43	4	4			
	C104037	6	3	0	0	15:47	7	4	3		
	C104038	6	3	2	0	15:50	13	4	9	2	0
	C104039	6	1	0	0	15:56	16	7	9	2	4
						15:59					
S01T001285	[LOAD-IN]	6	1	0	0	?	?	?			
53 < < 106 μm	C104040	6	1	0	0	16:18	5	5			
	C104041	6	3	0	0	16:23	7	5	2		
	C104042	6	3	2	0	16:25	13	5	8	2	0
	C104043	6	1	0	0	16:31	16	8	8	2	4
						16:34					
S01T001285	[LOAD-IN]	6	1	0	0	?	?	?			
53 < < 106 μm	C104044	6	1	0	0	16:52	4	4			
	C104045	6	3	0	0	16:56	6	4	2		
	C104046	6	3	2	0	16:58	12	4	8	2	0
	C104047	6	1	0	0	17:04	14	6	8	2	4
						17:06					

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 09:29

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-115 15:07
Filename : C104032
Sample : 1284

Material :
Source : C104
Lot Numbe :

Condition
T%(He-Ne): 87.9%
(LAMP): 79.9%

Dist.Form: Std.
R.R.Index: 1.16-0.00i

Sampling times : 100
( )

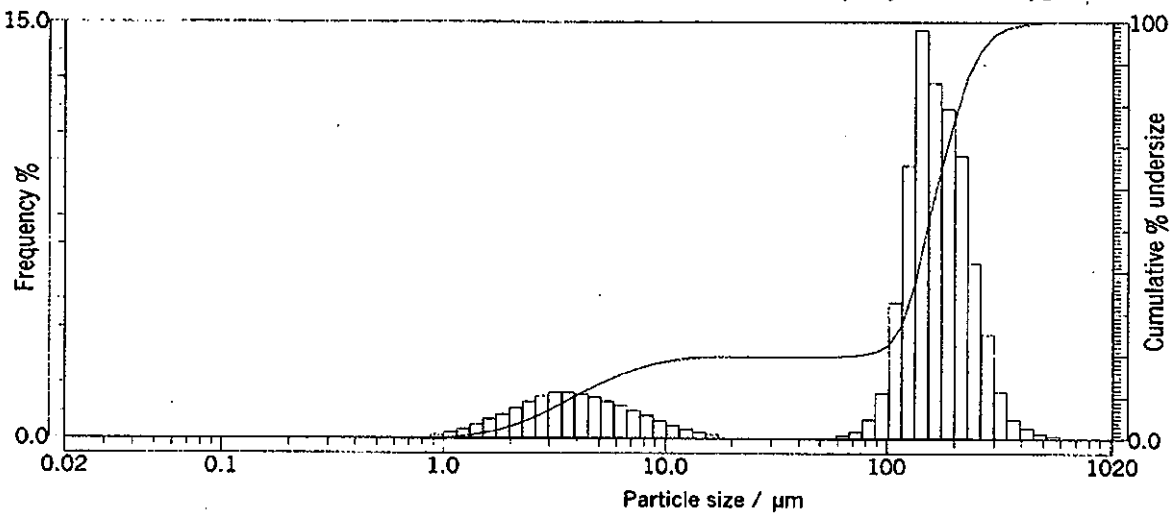
Agitation : 1 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 149.852μm SP.Area : 3959cm²/cm³ S.D. : 88.385μm
Mode : 144.424μm Mean : 144.471μm
C.V. : 61.18%

Span : (D 10.0-D 90.0) / D50 = 1.614

Dia. on %(5.0%) : 2.524μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 108.989μm % on Dia.(1.000μm) : 0.1%
Dia. on %(50.0%) : 149.852μm % on Dia.(10.000μm) : 18.3%
Dia. on %(75.0%) : 196.458μm % on Dia.(100.000μm) : 22.2%
Dia. on %(95.0%) : 281.671μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	19.64	0.669	0.00	0.00
890.1	0.00	100.00	22.80	0.00	19.64	0.584	0.00	0.00
777.1	0.00	100.00	19.90	0.00	19.64	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.16	19.64	0.445	0.00	0.00
592.4	0.13	100.00	15.17	0.24	19.48	0.389	0.00	0.00
517.2	0.23	99.87	13.25	0.35	19.24	0.339	0.00	0.00
451.6	0.41	99.65	11.56	0.50	18.89	0.296	0.00	0.00
394.2	0.73	99.24	10.10	0.67	18.39	0.259	0.00	0.00
344.2	1.72	98.51	8.816	0.85	17.73	0.226	0.00	0.00
300.5	3.75	96.79	7.697	1.03	16.88	0.197	0.00	0.00
262.4	6.30	93.04	6.720	1.23	15.84	0.172	0.00	0.00
229.1	10.18	86.74	5.867	1.37	14.62	0.150	0.00	0.00
200.0	11.88	76.56	5.122	1.49	13.25	0.131	0.00	0.00
174.6	12.82	64.68	4.472	1.60	11.76	0.115	0.00	0.00
152.5	14.70	51.86	3.905	1.66	10.16	0.100	0.00	0.00
133.1	9.84	37.16	3.409	1.67	8.50	0.087	0.00	0.00
116.2	4.92	27.33	2.976	1.55	6.83	0.076	0.00	0.00
101.5	1.66	22.40	2.599	1.33	5.28	0.067	0.00	0.00
88.58	0.71	20.74	2.269	1.11	3.96	0.058	0.00	0.00
77.34	0.27	20.03	1.981	0.90	2.85	0.051	0.00	0.00
67.52	0.12	19.76	1.729	0.71	1.95	0.044	0.00	0.00
58.95	0.00	19.64	1.510	0.51	1.24	0.039	0.00	0.00
51.47	0.00	19.64	1.318	0.36	0.72	0.034	0.00	0.00
44.94	0.00	19.64	1.151	0.23	0.36	0.029	0.00	0.00
39.23	0.00	19.64	1.005	0.14	0.14	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01
File Name: C104032.DAT Sample Name: 1284 ID No: 01/09/28-115
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 87.866 % Lamp: 79.928 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: Source: C104

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.972	0.10	0.10	(15)	157.876	5.00	55.00
(2)	1.421	0.90	1.00	(16)	166.521	5.00	60.00
(3)	1.828	1.30	2.30	(17)	175.296	5.00	65.00
(4)	2.528	2.70	5.00	(18)	185.977	5.00	70.00
(5)	3.857	5.00	10.00	(19)	196.659	5.00	75.00
(6)	6.134	5.00	15.00	(20)	209.816	5.00	80.00
(7)	6.690	0.80	15.80	(21)	221.814	4.20	84.20
(8)	76.113	4.20	20.00	(22)	224.100	0.80	85.00
(9)	109.239	5.00	25.00	(23)	246.309	5.00	90.00
(10)	120.803	5.00	30.00	(24)	282.317	5.00	95.00
(11)	129.390	5.00	35.00	(25)	323.618	2.70	97.70
(12)	136.839	5.00	40.00	(26)	377.696	1.30	99.00
(13)	143.419	5.00	45.00	(27)	532.471	0.90	99.90
(14)	150.000	5.00	50.00				

Median : 149.852 (μm) Mean: 144.471 (μm) Mode: 142.450 (μm)
Std. Dev.: 88.385 (μm) Span: 0.569
Coef. Var: 61.18% Spec. Area: 3959 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 09:29

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-117 15:18
Filename : C104034
Sample : 1284

Material :
Source : C104
Lot Numbe :

Condition
T%(He-Ne): 89.1% Dist.Form: Std. Sampling times : 100
(LAMP): 80.3% R.R.Index: 1.16-0.00i ( )

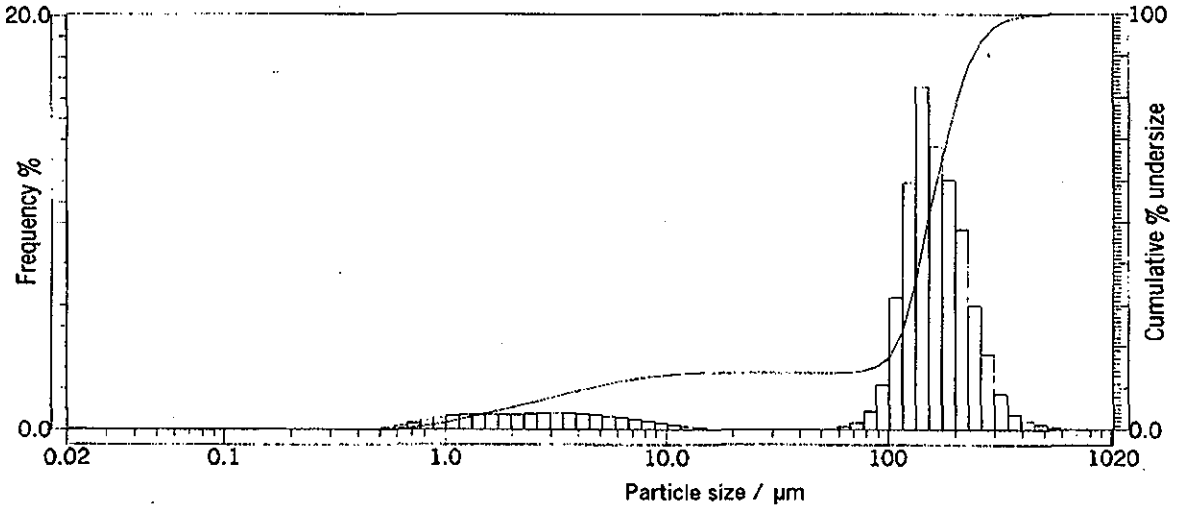
Agitation : 3 Circultn : 6 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 150.093μm SP.Area : 4470cm²/cm³ S.D. : 81.153μm
Mode : 143.478μm Mean : 150.625μm
C.V. : 53.88%

Span : (D 10.0-D 90.0) / D50 = 1.595

Dia. on %(5.0%) : 1.893μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 118.204μm % on Dia.(1.000μm) : 1.7%
Dia. on %(50.0%) : 150.093μm % on Dia.(10.000μm) : 13.1%
Dia. on %(75.0%) : 194.272μm % on Dia.(100.000μm) : 16.9%
Dia. on %(95.0%) : 280.661μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	13.60	0.669	0.20	0.32
890.1	0.00	100.00	22.80	0.00	13.60	0.584	0.12	0.12
777.1	0.00	100.00	19.90	0.00	13.60	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.00	13.60	0.445	0.00	0.00
592.4	0.12	100.00	15.17	0.11	13.60	0.389	0.00	0.00
517.2	0.22	99.88	13.25	0.17	13.49	0.339	0.00	0.00
451.6	0.40	99.66	11.56	0.24	13.32	0.296	0.00	0.00
394.2	0.72	99.26	10.10	0.32	13.08	0.259	0.00	0.00
344.2	1.72	98.54	8.816	0.41	12.75	0.226	0.00	0.00
300.5	3.62	96.82	7.697	0.50	12.34	0.197	0.00	0.00
262.4	5.97	93.20	6.720	0.59	11.84	0.172	0.00	0.00
229.1	9.66	87.24	5.867	0.65	11.25	0.150	0.00	0.00
200.0	12.03	77.58	5.122	0.71	10.60	0.131	0.00	0.00
174.6	13.65	65.54	4.472	0.76	9.89	0.115	0.00	0.00
152.5	16.49	51.89	3.905	0.80	9.13	0.100	0.00	0.00
133.1	11.90	35.41	3.409	0.82	8.33	0.087	0.00	0.00
116.2	6.36	23.51	2.976	0.80	7.51	0.076	0.00	0.00
101.5	2.16	17.15	2.599	0.76	6.71	0.067	0.00	0.00
88.58	0.91	14.99	2.269	0.72	5.95	0.058	0.00	0.00
77.34	0.34	14.08	1.981	0.70	5.23	0.051	0.00	0.00
67.52	0.14	13.74	1.729	0.72	4.53	0.044	0.00	0.00
58.95	0.00	13.60	1.510	0.71	3.81	0.039	0.00	0.00
51.47	0.00	13.60	1.318	0.71	3.10	0.034	0.00	0.00
44.94	0.00	13.60	1.151	0.67	2.39	0.029	0.00	0.00
39.23	0.00	13.60	1.005	0.60	1.72	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01
File Name: C104034.DAT Sample Name: 1284 ID No: 01/09/28-117
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 89.062 % Lamp: 80.256 %
Circulation: 6 Agitation: 3 U.Sonic ** (min)
Material: Source: C104

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.573	0.10	0.10	(15)	157.496	5.00	55.00
(2)	0.848	0.90	1.00	(16)	165.615	5.00	60.00
(3)	1.130	1.30	2.30	(17)	173.735	5.00	65.00
(4)	1.897	2.70	5.00	(18)	184.018	5.00	70.00
(5)	4.571	5.00	10.00	(19)	194.565	5.00	75.00
(6)	88.640	5.00	15.00	(20)	207.294	5.00	80.00
(7)	93.413	0.80	15.80	(21)	219.936	4.20	84.20
(8)	108.074	4.20	20.00	(22)	222.343	0.80	85.00
(9)	118.328	5.00	25.00	(23)	244.496	5.00	90.00
(10)	125.425	5.00	30.00	(24)	281.307	5.00	95.00
(11)	132.523	5.00	35.00	(25)	322.859	2.70	97.70
(12)	138.492	5.00	40.00	(26)	376.371	1.30	99.00
(13)	144.360	5.00	45.00	(27)	531.311	0.90	99.90
(14)	150.229	5.00	50.00				

Median : 150.093 (μm) Mean: 150.625 (μm) Mode: 142.450 (μm)
Std. Dev.: 81.153 (μm) Span: 0.576
Coef. Var: 53.88% Spec. Area: 4470 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 09:29

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-118 15:25
Filename : C104035
Sample : 1284

Material :
Source : C104
Lot Numbe :

Condition

T%(He-Ne): 88.8% Dist.Form: Std. Sampling times : 100
(LAMP): 80.0% R.R.Index: 1.16-0.00i ( )

Agitation : 1 Circultn : 6 U.sonic : ~~ON~~ OFF (120)

WSB 10/5/01

Format

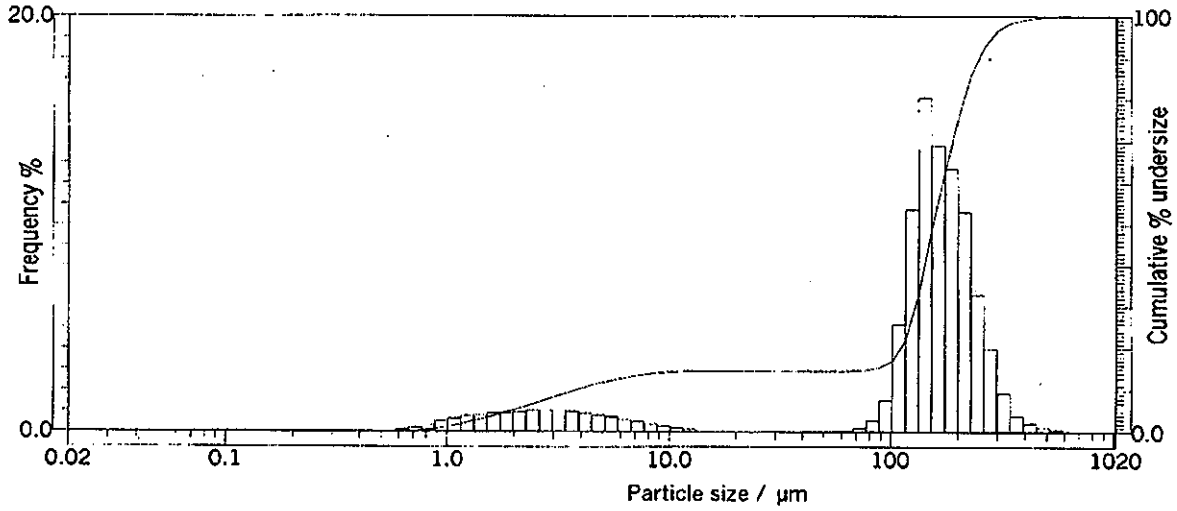
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data

Median : 154.253μm SP.Area : 4414cm²/cm³ S.D. : 83.698μm
Mode : 144.333μm Mean : 153.396μm
C.V. : 54.56%

Span : (D 10.0-D 90.0) / D50 = 1.589

Dia. on %(5.0%) :	1.937μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	120.769μm	% on Dia.(1.000μm) :	1.2%
Dia. on %(50.0%) :	154.253μm	% on Dia.(10.000μm) :	14.2%
Dia. on %(75.0%) :	199.224μm	% on Dia.(100.000μm) :	16.7%
Dia. on %(95.0%) :	285.114μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	14.57	0.669	0.12	0.12
890.1	0.00	100.00	22.80	0.00	14.57	0.584	0.00	0.00
777.1	0.00	100.00	19.90	0.00	14.57	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.00	14.57	0.445	0.00	0.00
592.4	0.13	100.00	15.17	0.00	14.57	0.389	0.00	0.00
517.2	0.24	99.87	13.25	0.12	14.57	0.339	0.00	0.00
451.6	0.43	99.63	11.56	0.19	14.44	0.296	0.00	0.00
394.2	0.77	99.20	10.10	0.28	14.25	0.259	0.00	0.00
344.2	1.88	98.42	8.816	0.38	13.97	0.226	0.00	0.00
300.5	3.98	96.54	7.697	0.48	13.59	0.197	0.00	0.00
262.4	6.59	92.56	6.720	0.60	13.11	0.172	0.00	0.00
229.1	10.61	85.97	5.867	0.69	12.51	0.150	0.00	0.00
200.0	12.72	75.36	5.122	0.79	11.81	0.131	0.00	0.00
174.6	13.84	62.65	4.472	0.89	11.02	0.115	0.00	0.00
152.5	16.12	48.80	3.905	0.97	10.14	0.100	0.00	0.00
133.1	10.72	32.68	3.409	1.03	9.16	0.087	0.00	0.00
116.2	5.14	21.96	2.976	1.04	8.13	0.076	0.00	0.00
101.5	1.51	16.82	2.599	1.00	7.10	0.067	0.00	0.00
88.58	0.56	15.31	2.269	0.95	6.10	0.058	0.00	0.00
77.34	0.18	14.75	1.981	0.91	5.15	0.051	0.00	0.00
67.52	0.00	14.57	1.729	0.89	4.24	0.044	0.00	0.00
58.95	0.00	14.57	1.510	0.81	3.36	0.039	0.00	0.00
51.47	0.00	14.57	1.318	0.74	2.54	0.034	0.00	0.00
44.94	0.00	14.57	1.151	0.63	1.80	0.029	0.00	0.00
39.23	0.00	14.57	1.005	0.49	1.17	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01
File Name: C104035.DAT Sample Name: 1284 ID No: 01/09/28-118
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 88.841 % Lamp: 80.009 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: Source: C104

WSC 10/5/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.655	0.10	0.10	(15)	162.375	5.00	55.00
(2)	0.960	0.90	1.00	(16)	170.380	5.00	60.00
(3)	1.263	1.30	2.30	(17)	179.315	5.00	65.00
(4)	1.939	2.70	5.00	(18)	189.294	5.00	70.00
(5)	3.835	5.00	10.00	(19)	199.273	5.00	75.00
(6)	82.343	5.00	15.00	(20)	212.706	5.00	80.00
(7)	92.758	0.80	15.80	(21)	224.218	4.20	84.20
(8)	110.585	4.20	20.00	(22)	226.410	0.80	85.00
(9)	121.000	5.00	25.00	(23)	249.429	5.00	90.00
(10)	128.877	5.00	30.00	(24)	285.731	5.00	95.00
(11)	135.885	5.00	35.00	(25)	327.401	2.70	97.70
(12)	141.886	5.00	40.00	(26)	381.480	1.30	99.00
(13)	147.888	5.00	45.00	(27)	535.797	0.90	99.90
(14)	154.370	5.00	50.00				

Median : 154.253 (μm) Mean: 153.396 (μm) Mode: 142.450 (μm)
Std. Dev.: 83.698 (μm) Span: 0.557
Coef. Var: 54.56% Spec. Area: 4414 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 09:29

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-119 15:45
Filename : C104036
Sample : 1284

Material :
Source : C104
Lot Numbe :

Condition
T%(He-Ne): 87.8% Dist.Form: Std. Sampling times : 100
(LAMP): 79.8% R.R.Index: 1.16-0.00i ( )

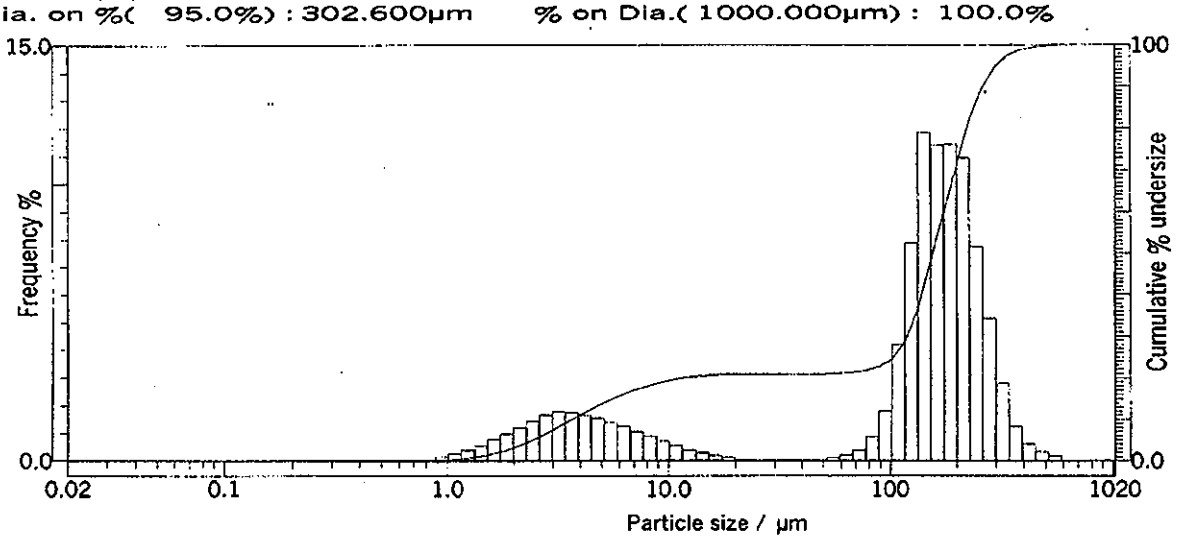
Agitation : 1 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 155.619μm SP.Area : 4169cm²/cm³ S.D. : 97.083μm
Mode : 145.344μm Mean : 150.477μm
C.V. : 64.52%

Span : (D 10.0-D 90.0) / D50 = 1.675

Dia. on %(5.0%) : 2.441μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 103.576μm % on Dia.(1.000μm) : 0.1%
Dia. on %(50.0%) : 155.619μm % on Dia.(10.000μm) : 19.3%
Dia. on %(75.0%) : 210.007μm % on Dia.(100.000μm) : 24.2%
Dia. on %(95.0%) : 302.600μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	20.95	0.669	0.00	0.00
890.1	0.00	100.00	22.80	0.00	20.95	0.584	0.00	0.00
777.1	0.00	100.00	19.90	0.14	20.95	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.21	20.82	0.445	0.00	0.00
592.4	0.18	100.00	15.17	0.30	20.61	0.389	0.00	0.00
517.2	0.33	99.82	13.25	0.41	20.31	0.339	0.00	0.00
451.6	0.60	99.48	11.56	0.55	19.90	0.296	0.00	0.00
394.2	1.24	98.88	10.10	0.71	19.35	0.259	0.00	0.00
344.2	2.79	97.65	8.816	0.89	18.64	0.226	0.00	0.00
300.5	5.15	94.86	7.697	1.06	17.76	0.197	0.00	0.00
262.4	7.72	89.71	6.720	1.26	16.69	0.172	0.00	0.00
229.1	10.91	81.99	5.867	1.40	15.44	0.150	0.00	0.00
200.0	11.42	71.07	5.122	1.54	14.03	0.131	0.00	0.00
174.6	11.38	59.66	4.472	1.67	12.49	0.115	0.00	0.00
152.5	11.84	48.28	3.905	1.74	10.82	0.100	0.00	0.00
133.1	7.87	36.43	3.409	1.77	9.08	0.087	0.00	0.00
116.2	4.20	28.56	2.976	1.65	7.31	0.076	0.00	0.00
101.5	1.79	24.36	2.599	1.42	5.66	0.067	0.00	0.00
88.58	0.88	22.57	2.269	1.20	4.23	0.058	0.00	0.00
77.34	0.40	21.68	1.981	0.97	3.04	0.051	0.00	0.00
67.52	0.21	21.29	1.729	0.76	2.07	0.044	0.00	0.00
58.95	0.12	21.07	1.510	0.55	1.31	0.039	0.00	0.00
51.47	0.00	20.95	1.318	0.38	0.76	0.034	0.00	0.00
44.94	0.00	20.95	1.151	0.24	0.38	0.029	0.00	0.00
39.23	0.00	20.95	1.005	0.14	0.14	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01
File Name: C104036.DAT Sample Name: 1284 ID No: 01/09/28-119
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 87.765 % Lamp: 79.751 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: Source: C104
Lot No: Test No: Dup

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.968	0.10	0.10	(15)	165.547	5.00	55.00
(2)	1.402	0.90	1.00	(16)	175.380	5.00	60.00
(3)	1.788	1.30	2.30	(17)	186.496	5.00	65.00
(4)	2.446	2.70	5.00	(18)	197.612	5.00	70.00
(5)	3.671	5.00	10.00	(19)	210.458	5.00	75.00
(6)	5.636	5.00	15.00	(20)	223.778	5.00	80.00
(7)	6.114	0.80	15.80	(21)	238.615	4.20	84.20
(8)	11.969	4.20	20.00	(22)	242.066	0.80	85.00
(9)	103.703	5.00	25.00	(23)	264.536	5.00	90.00
(10)	119.294	5.00	30.00	(24)	302.740	5.00	95.00
(11)	130.027	5.00	35.00	(25)	346.351	2.70	97.70
(12)	138.930	5.00	40.00	(26)	405.448	1.30	99.00
(13)	147.100	5.00	45.00	(27)	551.740	0.90	99.90
(14)	155.810	5.00	50.00				

Median : 155.619 (μm) Mean: 150.477 (μm) Mode: 142.450 (μm)
Std. Dev.: 97.083 (μm) Span: 0.595
Coef. Var: 64.52% Spec. Area: 4169 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 09:29

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-120 15:49
Filename : C104037
Sample : 1284

Material :
Source : C104
Lot Numbe :

Condition
T%(He-Ne): 87.8% Dist.Form: Std. Sampling times : 100
(LAMP): 79.7% R.R.Index: 1.16-0.00i ( )

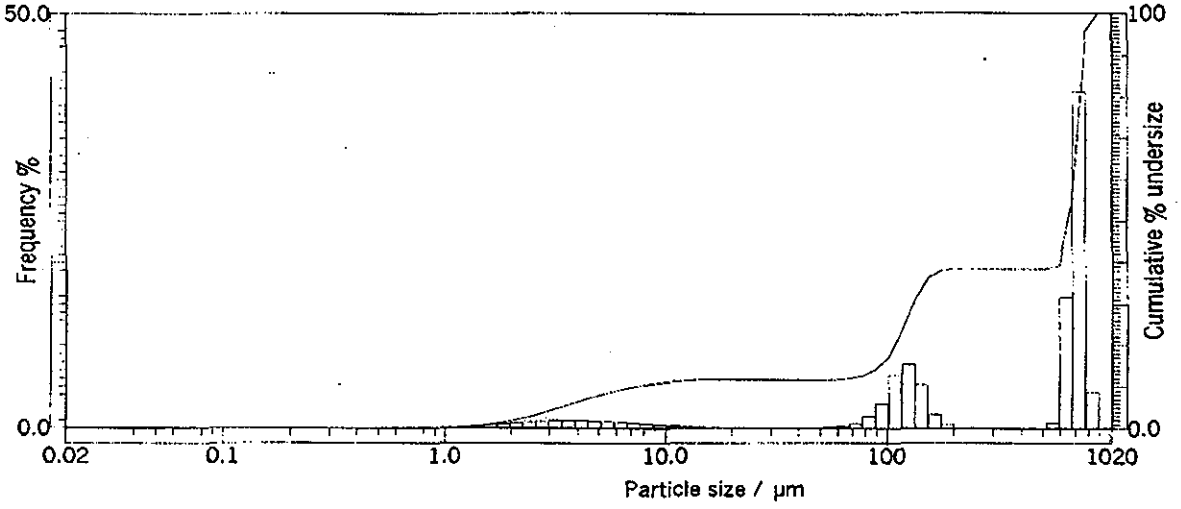
Agitation : 3 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 650.004μm SP.Area : 2371cm²/cm³ S.D. : 308.009μm
Mode : 712.375μm Mean : 468.190μm
C.V. : 65.79%

Span : (D 10.0-D 90.0) / D50 = 1.162

Dia. on %(5.0%) : 3.339μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 119.497μm % on Dia.(1.000μm) : 0.0%
Dia. on %(50.0%) : 650.004μm % on Dia.(10.000μm) : 10.9%
Dia. on %(75.0%) : 725.343μm % on Dia.(100.000μm) : 16.7%
Dia. on %(95.0%) : 775.410μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	11.58	0.669	0.00	0.00
890.1	4.33	100.00	22.80	0.00	11.58	0.584	0.00	0.00
777.1	40.67	95.67	19.90	0.00	11.58	0.510	0.00	0.00
678.5	15.81	55.00	17.38	0.00	11.58	0.445	0.00	0.00
592.4	0.67	39.19	15.17	0.14	11.58	0.389	0.00	0.00
517.2	0.00	38.51	13.25	0.20	11.43	0.339	0.00	0.00
451.6	0.00	38.51	11.56	0.28	11.23	0.296	0.00	0.00
394.2	0.00	38.51	10.10	0.38	10.94	0.259	0.00	0.00
344.2	0.00	38.51	8.816	0.48	10.56	0.226	0.00	0.00
300.5	0.00	38.51	7.697	0.59	10.08	0.197	0.00	0.00
262.4	0.00	38.51	6.720	0.71	9.49	0.172	0.00	0.00
229.1	0.00	38.51	5.867	0.80	8.78	0.150	0.00	0.00
200.0	0.51	38.51	5.122	0.88	7.98	0.131	0.00	0.00
174.6	1.73	38.01	4.472	0.95	7.10	0.115	0.00	0.00
152.5	5.20	36.28	3.905	0.99	6.15	0.100	0.00	0.00
133.1	7.65	31.08	3.409	1.00	5.15	0.087	0.00	0.00
116.2	6.37	23.43	2.976	0.94	4.15	0.076	0.00	0.00
101.5	3.00	17.06	2.599	0.81	3.22	0.067	0.00	0.00
88.58	1.50	14.06	2.269	0.68	2.41	0.058	0.00	0.00
77.34	0.60	12.56	1.981	0.56	1.73	0.051	0.00	0.00
67.52	0.27	11.96	1.729	0.45	1.17	0.044	0.00	0.00
58.95	0.11	11.69	1.510	0.33	0.72	0.039	0.00	0.00
51.47	0.00	11.58	1.318	0.24	0.39	0.034	0.00	0.00
44.94	0.00	11.58	1.151	0.16	0.16	0.029	0.00	0.00
39.23	0.00	11.58	1.005	0.00	0.00	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01
File Name: C104037.DAT Sample Name: 1284 ID No: 01/09/28-120
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 87.841 % Lamp: 79.708 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: Source: C104
Lot No: Test No: Dup

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	1.099	0.10	0.10	(15)	678.509	5.00	55.00
(2)	1.646	0.90	1.00	(16)	690.635	5.00	60.00
(3)	2.223	1.30	2.30	(17)	702.762	5.00	65.00
(4)	3.343	2.70	5.00	(18)	714.888	5.00	70.00
(5)	7.565	5.00	10.00	(19)	727.015	5.00	75.00
(6)	92.623	5.00	15.00	(20)	739.141	5.00	80.00
(7)	96.057	0.80	15.80	(21)	749.328	4.20	84.20
(8)	108.272	4.20	20.00	(22)	751.268	0.80	85.00
(9)	119.682	5.00	25.00	(23)	763.394	5.00	90.00
(10)	130.722	5.00	30.00	(24)	775.521	5.00	95.00
(11)	147.684	5.00	35.00	(25)	830.133	2.70	97.70
(12)	596.804	5.00	40.00	(26)	864.036	1.30	99.00
(13)	624.041	5.00	45.00	(27)	887.508	0.90	99.90
(14)	651.278	5.00	50.00				

Median : 650.004 (μm) Mean: 468.190 (μm) Mode: 726.150 (μm)
Std. Dev.: 308.009 (μm) Span: 0.077
Coef. Var: 65.79% Spec. Area: 2371 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 09:29

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-121 15:55
Filename : C104038
Sample : 1284

Material :
Source : C104
Lot Numbe :

Condition
T%(He-Ne): 89.0% Dist.Form: Std. Sampling times : 100
(LAMP): 80.2% R.R.Index: 1.16-0.00i ( )

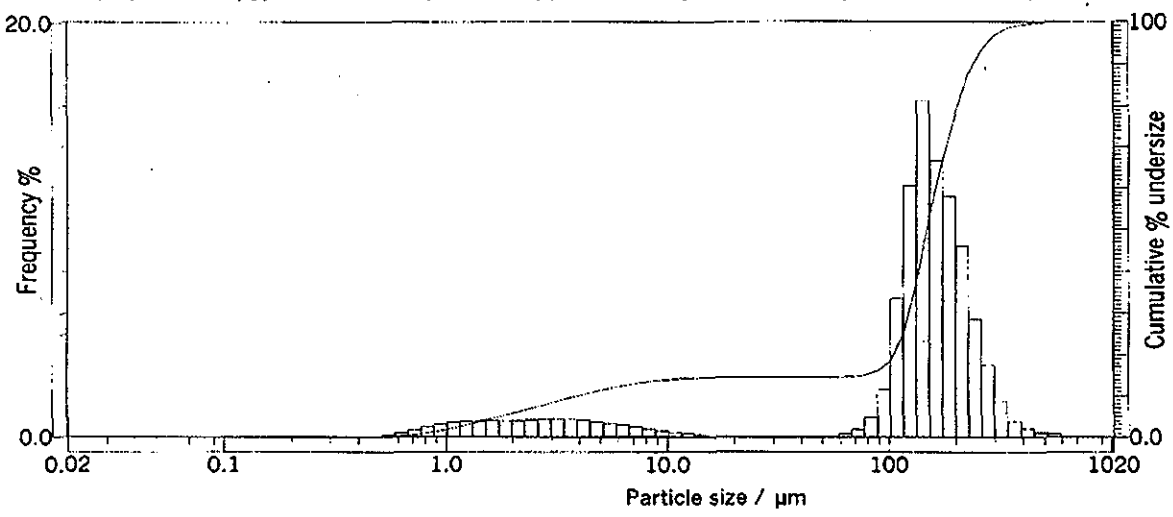
Agitation : 3 Circultn : 6 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 148.191μm SP.Area : 4750cm²/cm³ S.D. : 82.555μm
Mode : 143.166μm Mean : 148.399μm
C.V. : 55.63%

Span : (D 10.0-D 90.0) / D50 = 1.614

Dia. on %(5.0%) :	1.777μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	116.220μm	% on Dia.(1.000μm) :	1.8%
Dia. on %(50.0%) :	148.191μm	% on Dia.(10.000μm) :	13.9%
Dia. on %(75.0%) :	192.383μm	% on Dia.(100.000μm) :	18.1%
Dia. on %(95.0%) :	281.448μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	14.47	0.669	0.21	0.33
890.1	0.00	100.00	22.80	0.00	14.47	0.584	0.12	0.12
777.1	0.00	100.00	19.90	0.00	14.47	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.00	14.47	0.445	0.00	0.00
592.4	0.13	100.00	15.17	0.11	14.47	0.389	0.00	0.00
517.2	0.24	99.87	13.25	0.17	14.36	0.339	0.00	0.00
451.6	0.43	99.63	11.56	0.24	14.19	0.296	0.00	0.00
394.2	0.78	99.19	10.10	0.33	13.95	0.259	0.00	0.00
344.2	1.73	98.41	8.816	0.42	13.62	0.226	0.00	0.00
300.5	3.49	96.69	7.697	0.51	13.21	0.197	0.00	0.00
262.4	5.69	93.19	6.720	0.61	12.69	0.172	0.00	0.00
229.1	9.18	87.50	5.867	0.68	12.09	0.150	0.00	0.00
200.0	11.59	78.32	5.122	0.74	11.41	0.131	0.00	0.00
174.6	13.32	66.73	4.472	0.81	10.66	0.115	0.00	0.00
152.5	16.29	53.40	3.905	0.86	9.85	0.100	0.00	0.00
133.1	12.12	37.11	3.409	0.89	8.99	0.087	0.00	0.00
116.2	6.69	24.99	2.976	0.87	8.10	0.076	0.00	0.00
101.5	2.31	18.30	2.599	0.83	7.23	0.067	0.00	0.00
88.58	0.99	15.99	2.269	0.79	6.40	0.058	0.00	0.00
77.34	0.38	15.01	1.981	0.77	5.61	0.051	0.00	0.00
67.52	0.15	14.62	1.729	0.79	4.85	0.044	0.00	0.00
58.95	0.00	14.47	1.510	0.77	4.06	0.039	0.00	0.00
51.47	0.00	14.47	1.318	0.76	3.29	0.034	0.00	0.00
44.94	0.00	14.47	1.151	0.72	2.53	0.029	0.00	0.00
39.23	0.00	14.47	1.005	0.63	1.81	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01
File Name: C104038.DAT Sample Name: 1284 ID No: 01/09/28-121
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 88.990 % Lamp: 80.206 %
Circulation: 6 Agitation: 3 U.Sonic ** (min)
Material: Source: C104
Lot No: Test No: Dup

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.571	0.10	0.10	(15)	155.108	5.00	55.00
(2)	0.838	0.90	1.00	(16)	163.427	5.00	60.00
(3)	1.105	1.30	2.30	(17)	171.745	5.00	65.00
(4)	1.780	2.70	5.00	(18)	181.788	5.00	70.00
(5)	4.009	5.00	10.00	(19)	192.738	5.00	75.00
(6)	77.176	5.00	15.00	(20)	205.333	5.00	80.00
(7)	86.380	0.80	15.80	(21)	218.629	4.20	84.20
(8)	105.209	4.20	20.00	(22)	221.162	0.80	85.00
(9)	116.221	5.00	25.00	(23)	243.698	5.00	90.00
(10)	123.191	5.00	30.00	(24)	282.094	5.00	95.00
(11)	130.162	5.00	35.00	(25)	326.147	2.70	97.70
(12)	136.535	5.00	40.00	(26)	381.870	1.30	99.00
(13)	142.473	5.00	45.00	(27)	536.133	0.90	99.90
(14)	148.411	5.00	50.00				

Median : 148.191 (μm) Mean: 148.399 (μm) Mode: 142.450 (μm)
Std. Dev.: 82.555 (μm) Span: 0.601
Coef. Var: 55.63% Spec. Area: 4751 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 09:30

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-122 15:59
Filename : C104039
Sample : 1284

Material :
Source : C104
Lot Numbe :

Condition

T%(He-Ne): 88.7% Dist.Form: Std. Sampling times : 100
(LAMP): 80.0% R.R.Index: 1.16-0.00i ( )

Agitation : 1 Circultn : 6 U.sonic : ~~ON~~ OFF (120)

WSC 10/5/01

Format

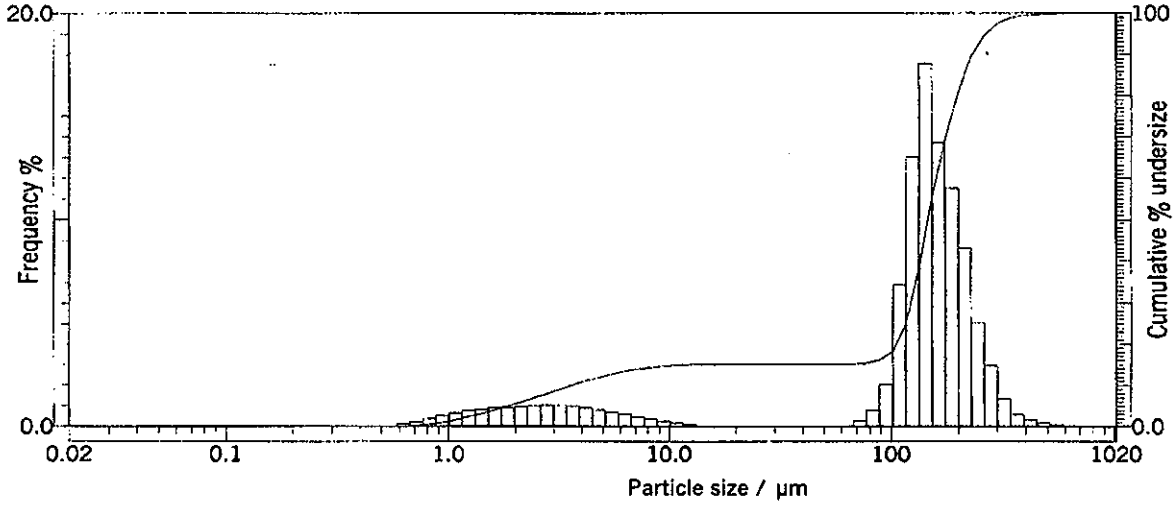
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data

Median : 146.026μm SP.Area : 4635cm²/cm³ S.D. : 79.541μm
Mode : 142.833μm Mean : 144.409μm
C.V. : 55.08%

Span : (D 10.0-D 90.0) / D50 = 1.567

Dia. on %(5.0%) :	1.853μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	116.229μm	% on Dia.(1.000μm) :	1.3%
Dia. on %(50.0%) :	146.026μm	% on Dia.(10.000μm) :	14.7%
Dia. on %(75.0%) :	186.761μm	% on Dia.(100.000μm) :	17.9%
Dia. on %(95.0%) :	268.692μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	15.00	0.669	0.13	0.13
890.1	0.00	100.00	22.80	0.00	15.00	0.584	0.00	0.00
777.1	0.00	100.00	19.90	0.00	15.00	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.00	15.00	0.445	0.00	0.00
592.4	0.10	100.00	15.17	0.00	15.00	0.389	0.00	0.00
517.2	0.19	99.90	13.25	0.12	15.00	0.339	0.00	0.00
451.6	0.33	99.71	11.56	0.19	14.88	0.296	0.00	0.00
394.2	0.60	99.38	10.10	0.27	14.70	0.259	0.00	0.00
344.2	1.35	98.77	8.816	0.37	14.43	0.226	0.00	0.00
300.5	2.94	97.42	7.697	0.48	14.06	0.197	0.00	0.00
262.4	5.03	94.49	6.720	0.60	13.58	0.172	0.00	0.00
229.1	8.64	89.45	5.867	0.70	12.98	0.150	0.00	0.00
200.0	11.52	80.81	5.122	0.80	12.28	0.131	0.00	0.00
174.6	13.72	69.30	4.472	0.90	11.49	0.115	0.00	0.00
152.5	17.56	55.57	3.905	0.99	10.58	0.100	0.00	0.00
133.1	13.03	38.01	3.409	1.06	9.59	0.087	0.00	0.00
116.2	6.88	24.98	2.976	1.07	8.53	0.076	0.00	0.00
101.5	2.05	18.10	2.599	1.03	7.46	0.067	0.00	0.00
88.58	0.79	16.06	2.269	0.98	6.43	0.058	0.00	0.00
77.34	0.27	15.27	1.981	0.94	5.46	0.051	0.00	0.00
67.52	0.00	15.00	1.729	0.92	4.52	0.044	0.00	0.00
58.95	0.00	15.00	1.510	0.85	3.60	0.039	0.00	0.00
51.47	0.00	15.00	1.318	0.78	2.75	0.034	0.00	0.00
44.94	0.00	15.00	1.151	0.67	1.97	0.029	0.00	0.00
39.23	0.00	15.00	1.005	0.54	1.29	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01
File Name: C104039.DAT Sample Name: 1284 ID No: 01/09/28-122
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 88.719 % Lamp: 79.968 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: Source: C104
Lot No: Test No: Dup

WSC
10/5/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.647	0.10	0.10	(15)	151.822	5.00	55.00
(2)	0.935	0.90	1.00	(16)	159.603	5.00	60.00
(3)	1.222	1.30	2.30	(17)	167.679	5.00	65.00
(4)	1.857	2.70	5.00	(18)	176.170	5.00	70.00
(5)	3.615	5.00	10.00	(19)	187.191	5.00	75.00
(6)	13.210	5.00	15.00	(20)	198.212	5.00	80.00
(7)	84.899	0.80	15.80	(21)	211.404	4.20	84.20
(8)	105.527	4.20	20.00	(22)	214.096	0.80	85.00
(9)	116.231	5.00	25.00	(23)	232.702	5.00	90.00
(10)	122.715	5.00	30.00	(24)	269.061	5.00	95.00
(11)	129.199	5.00	35.00	(25)	309.501	2.70	97.70
(12)	135.295	5.00	40.00	(26)	363.002	1.30	99.00
(13)	140.804	5.00	45.00	(27)	519.595	0.90	99.90
(14)	146.313	5.00	50.00				

Median : 146.026 (μm) Mean: 144.409 (μm) Mode: 142.450 (μm)
Std. Dev.: 79.541 (μm) Span: 0.561
Coef. Var: 55.08% Spec. Area: 4635 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 09:30

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-123 16:21
Filename : C104040
Sample : 1285

Material :
Source : C104
Lot Numbe :

Condition
T%(He-Ne): 88.4% Dist.Form: Std. Sampling times : 100
(LAMP): 92.4% R.R.index: 1.16-0.00i ( )

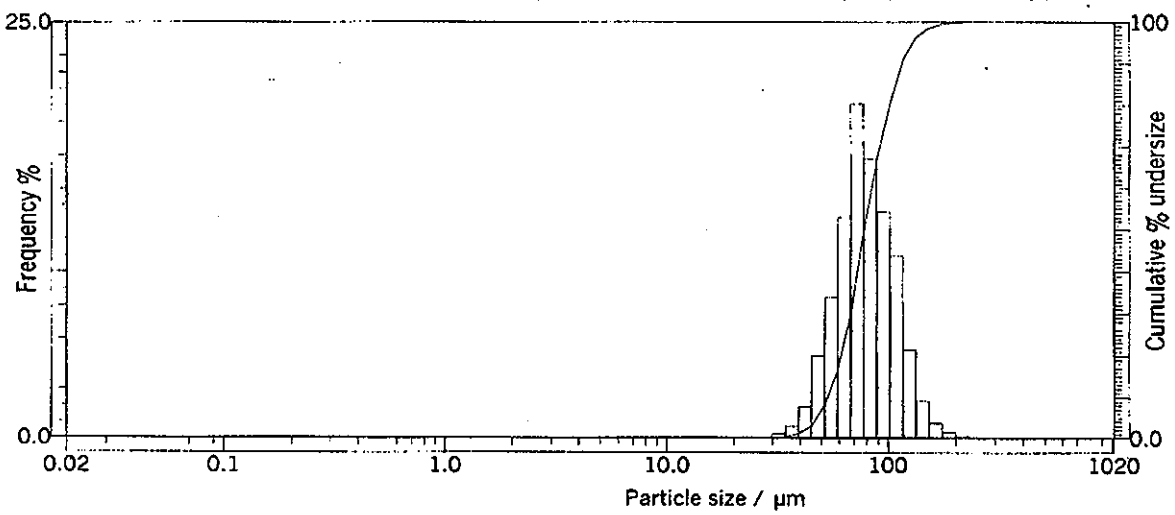
Agitation : 1 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 77.500μm SP.Area : 800cm²/cm³ S.D. : 25.205μm
Mode : 73.128μm Mean : 81.993μm
C.V. : 30.74%

Span : (D 10.0-D 90.0) / D50 = 0.794

Dia. on %(5.0%) : 47.531μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 64.393μm % on Dia.(1.000μm) : 0.0%
Dia. on %(50.0%) : 77.500μm % on Dia.(10.000μm) : 0.0%
Dia. on %(75.0%) : 96.416μm % on Dia.(100.000μm) : 78.6%
Dia. on %(95.0%) : 128.621μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	0.00	0.669	0.00	0.00
890.1	0.00	100.00	22.80	0.00	0.00	0.584	0.00	0.00
777.1	0.00	100.00	19.90	0.00	0.00	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.00	0.00	0.445	0.00	0.00
592.4	0.00	100.00	15.17	0.00	0.00	0.389	0.00	0.00
517.2	0.00	100.00	13.25	0.00	0.00	0.339	0.00	0.00
451.6	0.00	100.00	11.56	0.00	0.00	0.296	0.00	0.00
394.2	0.00	100.00	10.10	0.00	0.00	0.259	0.00	0.00
344.2	0.00	100.00	8.816	0.00	0.00	0.226	0.00	0.00
300.5	0.00	100.00	7.697	0.00	0.00	0.197	0.00	0.00
262.4	0.00	100.00	6.720	0.00	0.00	0.172	0.00	0.00
229.1	0.12	100.00	5.867	0.00	0.00	0.150	0.00	0.00
200.0	0.36	99.88	5.122	0.00	0.00	0.131	0.00	0.00
174.6	0.91	99.53	4.472	0.00	0.00	0.115	0.00	0.00
152.5	2.27	98.62	3.905	0.00	0.00	0.100	0.00	0.00
133.1	5.34	96.35	3.409	0.00	0.00	0.087	0.00	0.00
116.2	10.92	91.01	2.976	0.00	0.00	0.076	0.00	0.00
101.5	13.55	80.09	2.599	0.00	0.00	0.067	0.00	0.00
88.58	16.80	66.54	2.269	0.00	0.00	0.058	0.00	0.00
77.34	20.10	49.74	1.981	0.00	0.00	0.051	0.00	0.00
67.52	13.28	29.64	1.729	0.00	0.00	0.044	0.00	0.00
58.95	8.45	16.36	1.510	0.00	0.00	0.039	0.00	0.00
51.47	4.97	7.92	1.318	0.00	0.00	0.034	0.00	0.00
44.94	1.93	2.94	1.151	0.00	0.00	0.029	0.00	0.00
39.23	0.73	1.02	1.005	0.00	0.00	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01
File Name: C104040.DAT Sample Name: 1285 ID No: 01/09/28-123
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 88.409 % Lamp: 92.385 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: Source: C104

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	31.450	0.10	0.10	(15)	80.858	5.00	55.00
(2)	39.123	0.90	1.00	(16)	84.205	5.00	60.00
(3)	43.031	1.30	2.30	(17)	87.552	5.00	65.00
(4)	47.638	2.70	5.00	(18)	91.871	5.00	70.00
(5)	53.315	5.00	10.00	(19)	96.622	5.00	75.00
(6)	57.745	5.00	15.00	(20)	101.373	5.00	80.00
(7)	58.454	0.80	15.80	(21)	107.012	4.20	84.20
(8)	61.300	4.20	20.00	(22)	108.093	0.80	85.00
(9)	64.527	5.00	25.00	(23)	114.850	5.00	90.00
(10)	67.697	5.00	30.00	(24)	128.840	5.00	95.00
(11)	70.139	5.00	35.00	(25)	144.612	2.70	97.70
(12)	72.581	5.00	40.00	(26)	161.695	1.30	99.00
(13)	75.023	5.00	45.00	(27)	203.857	0.90	99.90
(14)	77.511	5.00	50.00				

Median : 77.500 (μm) Mean: 81.993 (μm) Mode: 72.265 (μm)
Std. Dev.: 25.205 (μm) Span: 0.416
Coef. Var: 30.74% Spec. Area: 800 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 09:30

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-124 16:25
Filename : C104041
Sample : 1285

Material :
Source : C104
Lot Numbe :

Condition

T%(He-Ne): 89.3% Dist.Form: Std. Sampling times : 100
(LAMP): 92.5% R.R.Index: 1.16-0.00i ( )

Agitation : 3 Circultn : 6 U.sonic : OFF(120)

Format

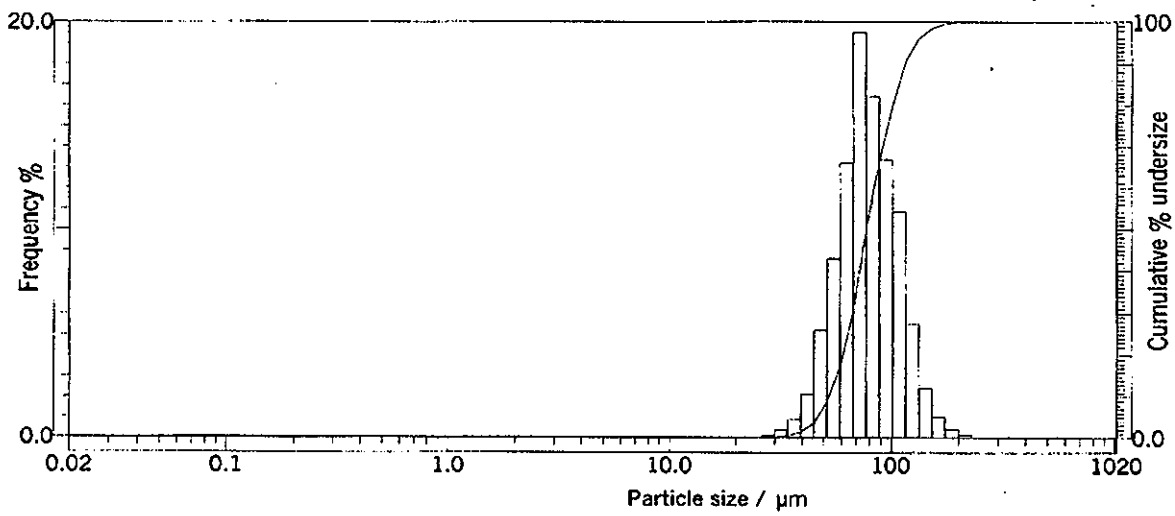
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data

Median : 77.384μm SP.Area : 805cm²/cm³ S.D. : 25.965μm
Mode : 73.087μm Mean : 81.981μm
C.V. : 31.67%

Span : (D 10.0-D 90.0) / D50 = 0.813

Dia. on %(5.0%) : 46.747μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 63.836μm % on Dia.(1.000μm) : 0.0%
Dia. on %(50.0%) : 77.384μm % on Dia.(10.000μm) : 0.0%
Dia. on %(75.0%) : 96.714μm % on Dia.(100.000μm) : 78.3%
Dia. on %(95.0%) : 129.802μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	0.00	0.669	0.00	0.00
890.1	0.00	100.00	22.80	0.00	0.00	0.584	0.00	0.00
777.1	0.00	100.00	19.90	0.00	0.00	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.00	0.00	0.445	0.00	0.00
592.4	0.00	100.00	15.17	0.00	0.00	0.389	0.00	0.00
517.2	0.00	100.00	13.25	0.00	0.00	0.339	0.00	0.00
451.6	0.00	100.00	11.56	0.00	0.00	0.296	0.00	0.00
394.2	0.00	100.00	10.10	0.00	0.00	0.259	0.00	0.00
344.2	0.00	100.00	8.816	0.00	0.00	0.226	0.00	0.00
300.5	0.00	100.00	7.697	0.00	0.00	0.197	0.00	0.00
262.4	0.00	100.00	6.720	0.00	0.00	0.172	0.00	0.00
229.1	0.14	100.00	5.867	0.00	0.00	0.150	0.00	0.00
200.0	0.41	99.86	5.122	0.00	0.00	0.131	0.00	0.00
174.6	1.01	99.44	4.472	0.00	0.00	0.115	0.00	0.00
152.5	2.42	98.43	3.905	0.00	0.00	0.100	0.00	0.00
133.1	5.47	96.01	3.409	0.00	0.00	0.087	0.00	0.00
116.2	10.82	90.54	2.976	0.00	0.00	0.076	0.00	0.00
101.5	13.37	79.72	2.599	0.00	0.00	0.067	0.00	0.00
88.58	16.42	66.35	2.269	0.00	0.00	0.058	0.00	0.00
77.34	19.48	49.93	1.981	0.00	0.00	0.051	0.00	0.00
67.52	13.17	30.45	1.729	0.00	0.00	0.044	0.00	0.00
58.95	8.59	17.28	1.510	0.00	0.00	0.039	0.00	0.00
51.47	5.20	8.69	1.318	0.00	0.00	0.034	0.00	0.00
44.94	2.14	3.49	1.151	0.00	0.00	0.029	0.00	0.00
39.23	0.87	1.35	1.005	0.00	0.00	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01
File Name: C104041.DAT Sample Name: 1285 ID No: 01/09/28-124
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 89.250 % Lamp: 92.521 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: Source: C104

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	29.167	0.10	0.10	(15)	80.811	5.00	55.00
(2)	37.218	0.90	1.00	(16)	84.234	5.00	60.00
(3)	41.766	1.30	2.30	(17)	87.657	5.00	65.00
(4)	46.838	2.70	5.00	(18)	92.098	5.00	70.00
(5)	52.614	5.00	10.00	(19)	96.915	5.00	75.00
(6)	56.970	5.00	15.00	(20)	101.845	5.00	80.00
(7)	57.667	0.80	15.80	(21)	107.569	4.20	84.20
(8)	60.725	4.20	20.00	(22)	108.659	0.80	85.00
(9)	63.978	5.00	25.00	(23)	115.474	5.00	90.00
(10)	67.230	5.00	30.00	(24)	129.977	5.00	95.00
(11)	69.816	5.00	35.00	(25)	146.584	2.70	97.70
(12)	72.335	5.00	40.00	(26)	164.857	1.30	99.00
(13)	74.855	5.00	45.00	(27)	208.554	0.90	99.90
(14)	77.387	5.00	50.00				

Median : 77.384 (μm) Mean: 81.981 (μm) Mode: 72.265 (μm)
Std. Dev.: 25.965 (μm) Span: 0.428
Coef. Var: 31.67% Spec. Area: 805 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 09:30

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-125 16:30
Filename : C104042
Sample : 1285

Material :
Source : C104
Lot Numbe :

Condition
T%(He-Ne): 84.0% Dist.Form: Std. Sampling times : 100
(LAMP): 83.2% R.R.Index: 1.16-0.00i ( )

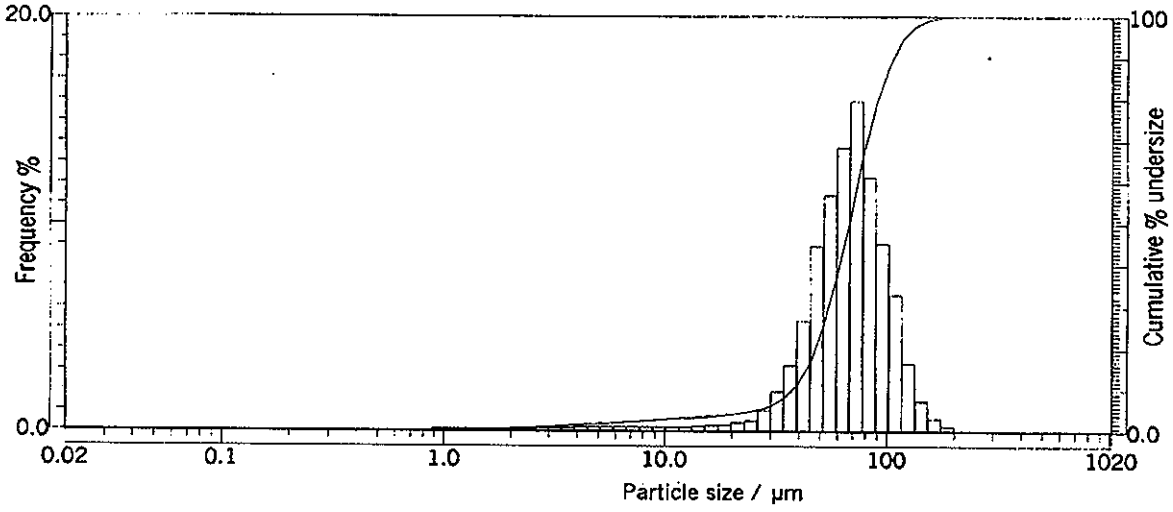
Agitation : 3 Circultn : 6 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 67.145μm SP.Area : 1589cm²/cm³ S.D. : 28.618μm
Mode : 71.825μm Mean : 69.114μm
C.V. : 41.41%

Span : (D 10.0-D 90.0) / D50 = 1.026

Dia. on %(5.0%) : 25.681μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 51.104μm % on Dia.(1.000μm) : 0.1%
Dia. on %(50.0%) : 67.145μm % on Dia.(10.000μm) : 2.8%
Dia. on %(75.0%) : 84.992μm % on Dia.(100.000μm) : 86.8%
Dia. on %(95.0%) : 119.392μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.53	5.06	0.669	0.00	0.00
890.1	0.00	100.00	22.80	0.44	4.53	0.584	0.00	0.00
777.1	0.00	100.00	19.90	0.31	4.10	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.28	3.79	0.445	0.00	0.00
592.4	0.00	100.00	15.17	0.24	3.51	0.389	0.00	0.00
517.2	0.00	100.00	13.25	0.21	3.27	0.339	0.00	0.00
451.6	0.00	100.00	11.56	0.20	3.06	0.296	0.00	0.00
394.2	0.00	100.00	10.10	0.20	2.86	0.259	0.00	0.00
344.2	0.00	100.00	8.816	0.20	2.66	0.226	0.00	0.00
300.5	0.00	100.00	7.697	0.20	2.45	0.197	0.00	0.00
262.4	0.00	100.00	6.720	0.21	2.25	0.172	0.00	0.00
229.1	0.00	100.00	5.867	0.21	2.04	0.150	0.00	0.00
200.0	0.27	100.00	5.122	0.20	1.83	0.131	0.00	0.00
174.6	0.63	99.73	4.472	0.20	1.63	0.115	0.00	0.00
152.5	1.47	99.11	3.905	0.19	1.44	0.100	0.00	0.00
133.1	3.30	97.64	3.409	0.17	1.25	0.087	0.00	0.00
116.2	6.55	94.34	2.976	0.15	1.08	0.076	0.00	0.00
101.5	9.05	87.79	2.599	0.13	0.93	0.067	0.00	0.00
88.58	12.27	78.74	2.269	0.12	0.79	0.058	0.00	0.00
77.34	15.90	66.47	1.981	0.11	0.68	0.051	0.00	0.00
67.52	13.70	50.57	1.729	0.11	0.57	0.044	0.00	0.00
58.95	11.39	36.87	1.510	0.11	0.45	0.039	0.00	0.00
51.47	8.93	25.47	1.318	0.12	0.34	0.034	0.00	0.00
44.94	5.34	16.54	1.151	0.12	0.23	0.029	0.00	0.00
39.23	3.20	11.20	1.005	0.11	0.11	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01
File Name: C104042.DAT Sample Name: 1285 ID No: 01/09/28-125
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 83.975 % Lamp: 83.201 %
Circulation: 6 Agitation: 3 U.Sonic ** (min)
Material: Source: C104

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.991	0.10	0.10	(15)	70.260	5.00	55.00
(2)	2.780	0.90	1.00	(16)	73.346	5.00	60.00
(3)	6.964	1.30	2.30	(17)	76.432	5.00	65.00
(4)	25.705	2.70	5.00	(18)	80.574	5.00	70.00
(5)	37.365	5.00	10.00	(19)	85.155	5.00	75.00
(6)	43.295	5.00	15.00	(20)	90.374	5.00	80.00
(7)	44.150	0.80	15.80	(21)	96.349	4.20	84.20
(8)	47.470	4.20	20.00	(22)	97.487	0.80	85.00
(9)	51.126	5.00	25.00	(23)	106.429	5.00	90.00
(10)	54.445	5.00	30.00	(24)	119.572	5.00	95.00
(11)	57.728	5.00	35.00	(25)	133.901	2.70	97.70
(12)	60.914	5.00	40.00	(26)	151.061	1.30	99.00
(13)	64.041	5.00	45.00	(27)	190.445	0.90	99.90
(14)	67.169	5.00	50.00				

Median : 67.145 (μm) Mean: 69.114 (μm) Mode: 72.265 (μm)
Std. Dev.: 28.618 (μm) Span: 0.512
Coef. Var: 41.41% Spec. Area: 1589 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 09:30

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-126 16:34
Filename : C104043
Sample : 1285

Material :
Source : C104
Lot Numbe :

Condition

T%(He-Ne): 84.5% Dist.Form: Std. Sampling times : 100
(LAMP): 83.3% R.R.Index: 1.16-0.00i ( )

Agitation : 1 Circultn : 6 U.sonic : ~~ON~~ OFF(120)

WSL 10/5/01

Format

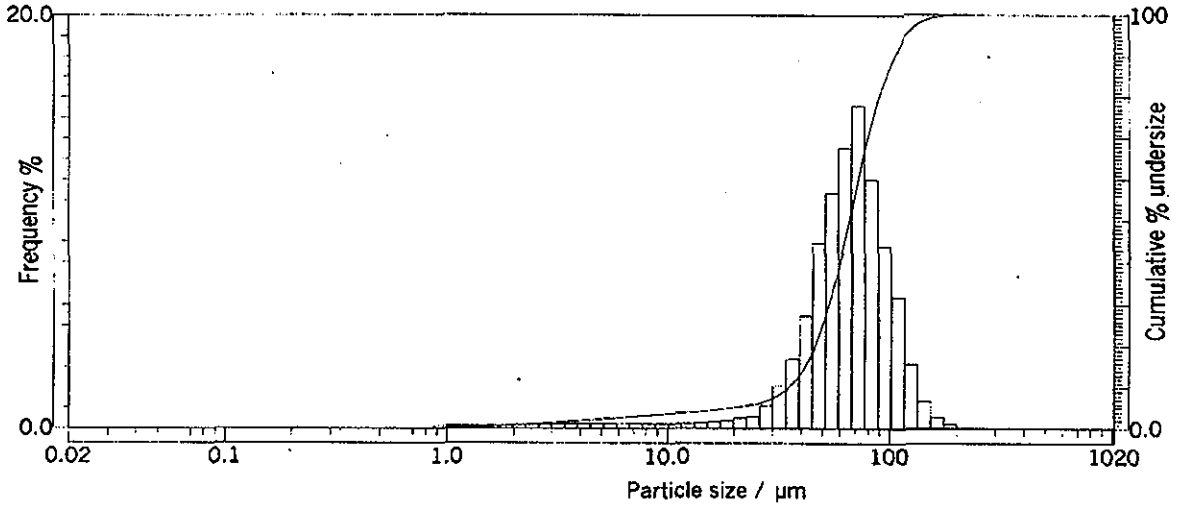
Dist.base : Volume Scaling : Auto Axis : LogX · LinearY

Data

Median : 66.182μm SP.Area : 1750cm²/cm³ S.D. : 28.860μm
Mode : 71.781μm Mean : 67.816μm
C.V. : 42.56%

Span : (D 10.0-D 90.0) / D50 = 1.054

Dia. on %(5.0%) :	19.900μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	49.866μm	% on Dia.(1.000μm) :	0.1%
Dia. on %(50.0%) :	66.182μm	% on Dia.(10.000μm) :	3.5%
Dia. on %(75.0%) :	84.084μm	% on Dia.(100.000μm) :	87.5%
Dia. on %(95.0%) :	117.536μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.60	6.11	0.669	0.00	0.00
890.1	0.00	100.00	22.80	0.50	5.50	0.584	0.00	0.00
777.1	0.00	100.00	19.90	0.36	5.00	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.33	4.64	0.445	0.00	0.00
592.4	0.00	100.00	15.17	0.28	4.31	0.389	0.00	0.00
517.2	0.00	100.00	13.25	0.25	4.03	0.339	0.00	0.00
451.6	0.00	100.00	11.56	0.24	3.78	0.296	0.00	0.00
394.2	0.00	100.00	10.10	0.24	3.54	0.259	0.00	0.00
344.2	0.00	100.00	8.816	0.24	3.30	0.226	0.00	0.00
300.5	0.00	100.00	7.697	0.24	3.06	0.197	0.00	0.00
262.4	0.00	100.00	6.720	0.25	2.82	0.172	0.00	0.00
229.1	0.00	100.00	5.867	0.24	2.57	0.150	0.00	0.00
200.0	0.22	100.00	5.122	0.24	2.33	0.131	0.00	0.00
174.6	0.55	99.78	4.472	0.24	2.09	0.115	0.00	0.00
152.5	1.35	99.23	3.905	0.24	1.85	0.100	0.00	0.00
133.1	3.14	97.87	3.409	0.22	1.61	0.087	0.00	0.00
116.2	6.34	94.74	2.976	0.20	1.39	0.076	0.00	0.00
101.5	8.78	88.39	2.599	0.18	1.18	0.067	0.00	0.00
88.58	12.01	79.61	2.269	0.16	1.00	0.058	0.00	0.00
77.34	15.60	67.61	1.981	0.15	0.84	0.051	0.00	0.00
67.52	13.55	52.00	1.729	0.15	0.69	0.044	0.00	0.00
58.95	11.36	38.45	1.510	0.14	0.53	0.039	0.00	0.00
51.47	8.96	27.09	1.318	0.14	0.39	0.034	0.00	0.00
44.94	5.48	18.13	1.151	0.13	0.25	0.029	0.00	0.00
39.23	3.36	12.65	1.005	0.12	0.12	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01
File Name: C104043.DAT Sample Name: 1285 ID No: 01/09/28-126
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 84.504 % Lamp: 83.291 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: Source: C104

WSC 10/5/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.987	0.10	0.10	(15)	69.409	5.00	55.00
(2)	2.268	0.90	1.00	(16)	72.555	5.00	60.00
(3)	5.039	1.30	2.30	(17)	75.701	5.00	65.00
(4)	19.901	2.70	5.00	(18)	79.582	5.00	70.00
(5)	35.304	5.00	10.00	(19)	84.265	5.00	75.00
(6)	41.682	5.00	15.00	(20)	89.154	5.00	80.00
(7)	42.514	0.80	15.80	(21)	95.312	4.20	84.20
(8)	46.303	4.20	20.00	(22)	96.485	0.80	85.00
(9)	49.946	5.00	25.00	(23)	105.194	5.00	90.00
(10)	53.386	5.00	30.00	(24)	117.622	5.00	95.00
(11)	56.679	5.00	35.00	(25)	132.170	2.70	97.70
(12)	59.932	5.00	40.00	(26)	149.229	1.30	99.00
(13)	63.094	5.00	45.00	(27)	188.584	0.90	99.90
(14)	66.256	5.00	50.00				

Median : 66.182 (μm) Mean: 67.816 (μm) Mode: 72.265 (μm)
Std. Dev.: 28.860 (μm) Span: 0.505
Coef. Var: 42.56% Spec. Area: 1750 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 09:30

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-127 16:54
Filename : C104044
Sample : 1285

Material :
Source : C104
Lot Numbe :

Condition
T%(He-Ne): 84.0%
(LAMP): 90.1%
Dist.Form: Std.
R.R.Index: 1.16-0.00i
Sampling times : 100
( )

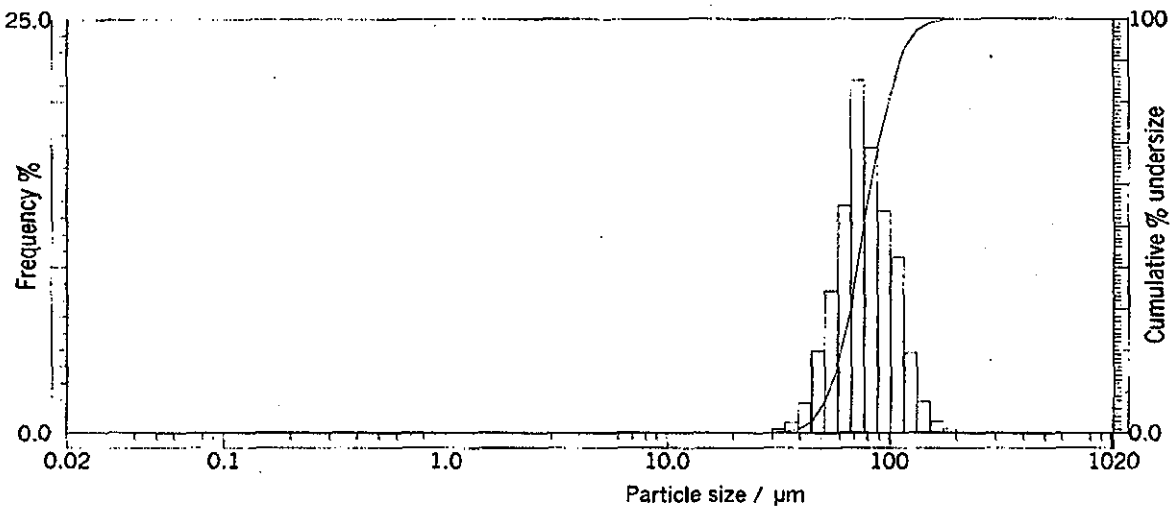
Agitation : 1 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 76.770μm SP.Area : 805cm²/cm³ S.D. : 23.658μm
Mode : 73.061μm Mean : 80.915μm
C.V. : 29.24%

Span : (D 10.0-D 90.0) / D50 = 0.772

Dia. on %(5.0%) : 47.947μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 64.354μm % on Dia.(1.000μm) : 0.0%
Dia. on %(50.0%) : 76.770μm % on Dia.(10.000μm) : 0.0%
Dia. on %(75.0%) : 94.755μm % on Dia.(100.000μm) : 80.3%
Dia. on %(95.0%) : 125.202μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	0.00	0.669	0.00	0.00
890.1	0.00	100.00	22.80	0.00	0.00	0.584	0.00	0.00
777.1	0.00	100.00	19.90	0.00	0.00	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.00	0.00	0.445	0.00	0.00
592.4	0.00	100.00	15.17	0.00	0.00	0.389	0.00	0.00
517.2	0.00	100.00	13.25	0.00	0.00	0.339	0.00	0.00
451.6	0.00	100.00	11.56	0.00	0.00	0.296	0.00	0.00
394.2	0.00	100.00	10.10	0.00	0.00	0.259	0.00	0.00
344.2	0.00	100.00	8.816	0.00	0.00	0.226	0.00	0.00
300.5	0.00	100.00	7.697	0.00	0.00	0.197	0.00	0.00
262.4	0.00	100.00	6.720	0.00	0.00	0.172	0.00	0.00
229.1	0.00	100.00	5.867	0.00	0.00	0.150	0.00	0.00
200.0	0.25	100.00	5.122	0.00	0.00	0.131	0.00	0.00
174.6	0.70	99.75	4.472	0.00	0.00	0.115	0.00	0.00
152.5	1.88	99.05	3.905	0.00	0.00	0.100	0.00	0.00
133.1	4.81	97.17	3.409	0.00	0.00	0.087	0.00	0.00
116.2	10.60	92.36	2.976	0.00	0.00	0.076	0.00	0.00
101.5	13.42	81.76	2.599	0.00	0.00	0.067	0.00	0.00
88.58	17.18	68.34	2.269	0.00	0.00	0.058	0.00	0.00
77.34	21.29	51.16	1.981	0.00	0.00	0.051	0.00	0.00
67.52	13.74	29.87	1.729	0.00	0.00	0.044	0.00	0.00
58.95	8.56	16.12	1.510	0.00	0.00	0.039	0.00	0.00
51.47	4.91	7.57	1.318	0.00	0.00	0.034	0.00	0.00
44.94	1.79	2.65	1.151	0.00	0.00	0.029	0.00	0.00
39.23	0.64	0.86	1.005	0.00	0.00	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01
File Name: C104044.DAT Sample Name: 1285 ID No: 01/09/28-127
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 83.986 % Lamp: 90.074 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: Source: C104
Lot No: Test No: Dup

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	31.814	0.10	0.10	(15)	79.854	5.00	55.00
(2)	39.665	0.90	1.00	(16)	83.126	5.00	60.00
(3)	43.807	1.30	2.30	(17)	86.398	5.00	65.00
(4)	48.057	2.70	5.00	(18)	90.177	5.00	70.00
(5)	53.598	5.00	10.00	(19)	94.974	5.00	75.00
(6)	57.970	5.00	15.00	(20)	99.770	5.00	80.00
(7)	58.670	0.80	15.80	(21)	104.854	4.20	84.20
(8)	61.370	4.20	20.00	(22)	105.967	0.80	85.00
(9)	64.488	5.00	25.00	(23)	112.926	5.00	90.00
(10)	67.584	5.00	30.00	(24)	125.487	5.00	95.00
(11)	69.890	5.00	35.00	(25)	138.570	2.70	97.70
(12)	72.195	5.00	40.00	(26)	151.931	1.30	99.00
(13)	74.500	5.00	45.00	(27)	189.827	0.90	99.90
(14)	76.805	5.00	50.00				

Median : 76.770 (μm) Mean: 80.915 (μm) Mode: 72.265 (μm)
Std. Dev.: 23.658 (μm) Span: 0.397
Coef. Var: 29.24% Spec. Area: 805 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 09:31

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-128 16:58
Filename : C104045
Sample : 1285

Material :
Source : C104
Lot Numbe :

Condition
T%(He-Ne): 83.9% Dist.Form: Std. Sampling times : 100
(LAMP): 89.6% R.R.Index: 1.16-0.00i ( )

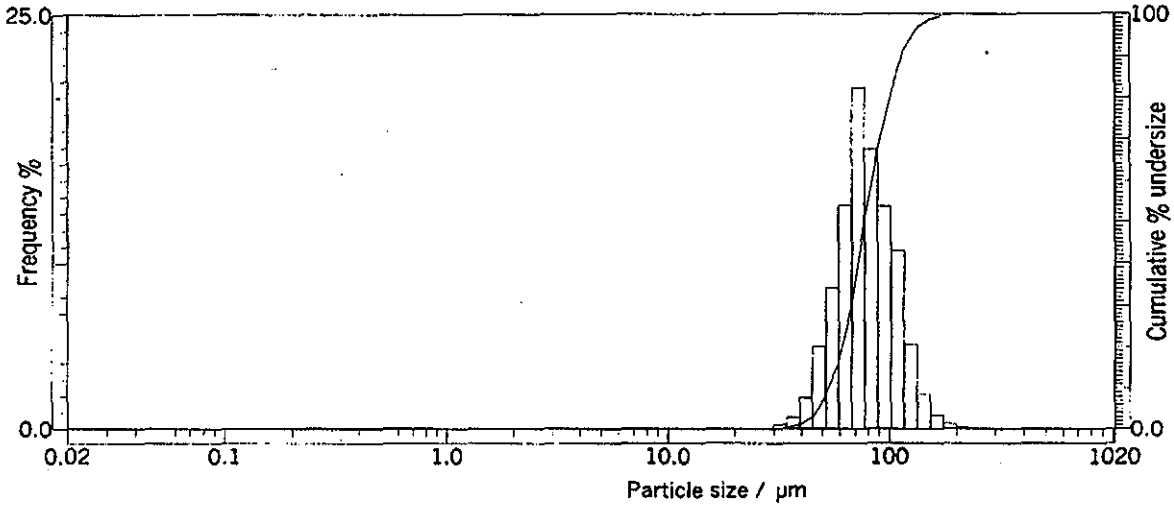
Agitation : 3 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 77.116μm SP.Area : 802cm²/cm³ S.D. : 24.794μm
Mode : 73.080μm Mean : 81.574μm
C.V. : 30.39%

Span : (D 10.0-D 90.0) / D50 = 0.788

Dia. on %(5.0%) : 47.638μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 64.315μm % on Dia.(1.000μm) : 0.0%
Dia. on %(50.0%) : 77.116μm % on Dia.(10.000μm) : 0.0%
Dia. on %(75.0%) : 95.728μm % on Dia.(100.000μm) : 79.3%
Dia. on %(95.0%) : 127.548μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	0.00	0.669	0.00	0.00
890.1	0.00	100.00	22.80	0.00	0.00	0.584	0.00	0.00
777.1	0.00	100.00	19.90	0.00	0.00	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.00	0.00	0.445	0.00	0.00
592.4	0.00	100.00	15.17	0.00	0.00	0.389	0.00	0.00
517.2	0.00	100.00	13.25	0.00	0.00	0.339	0.00	0.00
451.6	0.00	100.00	11.56	0.00	0.00	0.296	0.00	0.00
394.2	0.00	100.00	10.10	0.00	0.00	0.259	0.00	0.00
344.2	0.00	100.00	8.816	0.00	0.00	0.226	0.00	0.00
300.5	0.00	100.00	7.697	0.00	0.00	0.197	0.00	0.00
262.4	0.00	100.00	6.720	0.00	0.00	0.172	0.00	0.00
229.1	0.10	100.00	5.867	0.00	0.00	0.150	0.00	0.00
200.0	0.33	99.90	5.122	0.00	0.00	0.131	0.00	0.00
174.6	0.85	99.57	4.472	0.00	0.00	0.115	0.00	0.00
152.5	2.12	98.72	3.905	0.00	0.00	0.100	0.00	0.00
133.1	5.10	96.60	3.409	0.00	0.00	0.087	0.00	0.00
116.2	10.74	91.50	2.976	0.00	0.00	0.076	0.00	0.00
101.5	13.44	80.76	2.599	0.00	0.00	0.067	0.00	0.00
88.58	16.88	67.32	2.269	0.00	0.00	0.058	0.00	0.00
77.34	20.61	50.44	1.981	0.00	0.00	0.051	0.00	0.00
67.52	13.48	29.83	1.729	0.00	0.00	0.044	0.00	0.00
58.95	8.52	16.36	1.510	0.00	0.00	0.039	0.00	0.00
51.47	4.98	7.84	1.318	0.00	0.00	0.034	0.00	0.00
44.94	1.89	2.86	1.151	0.00	0.00	0.029	0.00	0.00
39.23	0.70	0.97	1.005	0.00	0.00	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01
File Name: C104045.DAT Sample Name: 1285 ID No: 01/09/28-128
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 83.870 % Lamp: 89.646 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: Source: C104
Lot No: Test No: Dup

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	31.546	0.10	0.10	(15)	80.377	5.00	55.00
(2)	39.324	0.90	1.00	(16)	83.707	5.00	60.00
(3)	43.249	1.30	2.30	(17)	87.037	5.00	65.00
(4)	47.747	2.70	5.00	(18)	91.150	5.00	70.00
(5)	53.369	5.00	10.00	(19)	95.943	5.00	75.00
(6)	57.761	5.00	15.00	(20)	100.735	5.00	80.00
(7)	58.464	0.80	15.80	(21)	106.188	4.20	84.20
(8)	61.270	4.20	20.00	(22)	107.287	0.80	85.00
(9)	64.449	5.00	25.00	(23)	114.151	5.00	90.00
(10)	67.602	5.00	30.00	(24)	127.797	5.00	95.00
(11)	69.984	5.00	35.00	(25)	143.121	2.70	97.70
(12)	72.366	5.00	40.00	(26)	159.716	1.30	99.00
(13)	74.748	5.00	45.00	(27)	200.916	0.90	99.90
(14)	77.130	5.00	50.00				

Median : 77.116 (μm) Mean: 81.574 (μm) Mode: 72.265 (μm)
Std. Dev.: 24.794 (μm) Span: 0.413
Coef. Var: 30.39% Spec. Area: 802 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 09:31

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-129 17:03
Filename : C104046
Sample : 1285

Material :
Source : C104
Lot Numbe :

Condition
T%(He-Ne): 75.5% Dist.Form: Std. Sampling times : 100
(LAMP): 76.1% R.R.Index: 1.16-0.00i ( )

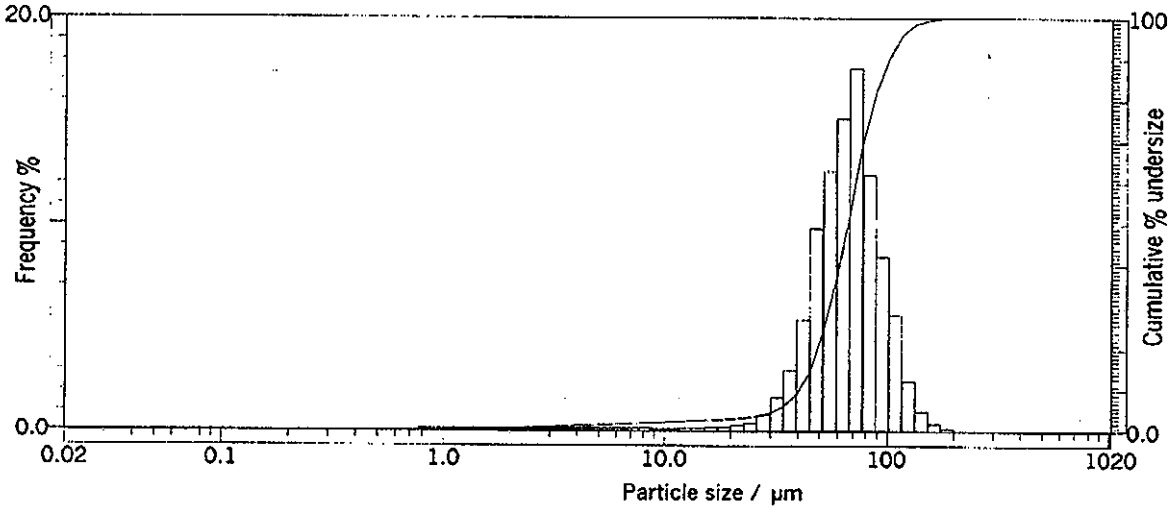
Agitation : 3 Circultn : 6 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 66.332μm SP.Area : 1524cm²/cm³ S.D. : 25.682μm
Mode : 71.505μm Mean : 68.103μm
C.V. : 37.71%

Span : (D 10.0-D 90.0) / D50 = 0.915

Dia. on %(5.0%) : 31.349μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 51.871μm % on Dia.(1.000μm) : 0.2%
Dia. on %(50.0%) : 66.332μm % on Dia.(10.000μm) : 2.1%
Dia. on %(75.0%) : 82.076μm % on Dia.(100.000μm) : 89.5%
Dia. on %(95.0%) : 113.397μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.38	3.62	0.669	0.00	0.00
890.1	0.00	100.00	22.80	0.30	3.24	0.584	0.00	0.00
777.1	0.00	100.00	19.90	0.20	2.94	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.18	2.74	0.445	0.00	0.00
592.4	0.00	100.00	15.17	0.15	2.56	0.389	0.00	0.00
517.2	0.00	100.00	13.25	0.13	2.41	0.339	0.00	0.00
451.6	0.00	100.00	11.56	0.13	2.28	0.296	0.00	0.00
394.2	0.00	100.00	10.10	0.13	2.15	0.259	0.00	0.00
344.2	0.00	100.00	8.816	0.13	2.02	0.226	0.00	0.00
300.5	0.00	100.00	7.697	0.14	1.89	0.197	0.00	0.00
262.4	0.00	100.00	6.720	0.14	1.75	0.172	0.00	0.00
229.1	0.00	100.00	5.867	0.14	1.61	0.150	0.00	0.00
200.0	0.14	100.00	5.122	0.15	1.46	0.131	0.00	0.00
174.6	0.38	99.86	4.472	0.15	1.32	0.115	0.00	0.00
152.5	0.98	99.47	3.905	0.14	1.17	0.100	0.00	0.00
133.1	2.48	98.50	3.409	0.13	1.03	0.087	0.00	0.00
116.2	5.63	96.02	2.976	0.12	0.89	0.076	0.00	0.00
101.5	8.42	90.38	2.599	0.11	0.77	0.067	0.00	0.00
88.58	12.39	81.97	2.269	0.00	0.66	0.058	0.00	0.00
77.34	17.59	69.57	1.981	0.00	0.66	0.051	0.00	0.00
67.52	15.13	51.99	1.729	0.10	0.66	0.044	0.00	0.00
58.95	12.57	36.86	1.510	0.10	0.56	0.039	0.00	0.00
51.47	9.81	24.28	1.318	0.11	0.46	0.034	0.00	0.00
44.94	5.41	14.48	1.151	0.12	0.34	0.029	0.00	0.00
39.23	2.98	9.06	1.005	0.12	0.22	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01
File Name: C104046.DAT Sample Name: 1285 ID No: 01/09/28-129
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 75.479 % Lamp: 76.078 %
Circulation: 6 Agitation: 3 U.Sonic ** (min)
Material: Source: C104
Lot No: Test No: Dup

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.871	0.10	0.10	(15)	69.206	5.00	55.00
(2)	3.314	0.90	1.00	(16)	71.997	5.00	60.00
(3)	11.825	1.30	2.30	(17)	74.787	5.00	65.00
(4)	31.415	2.70	5.00	(18)	77.727	5.00	70.00
(5)	40.221	5.00	10.00	(19)	82.263	5.00	75.00
(6)	45.287	5.00	15.00	(20)	86.800	5.00	80.00
(7)	45.820	0.80	15.80	(21)	92.001	4.20	84.20
(8)	48.618	4.20	20.00	(22)	93.225	0.80	85.00
(9)	51.898	5.00	25.00	(23)	100.874	5.00	90.00
(10)	54.873	5.00	30.00	(24)	113.547	5.00	95.00
(11)	57.849	5.00	35.00	(25)	127.676	2.70	97.70
(12)	60.735	5.00	40.00	(26)	143.090	1.30	99.00
(13)	63.567	5.00	45.00	(27)	182.430	0.90	99.90
(14)	66.399	5.00	50.00				

Median : 66.332 (μm) Mean: 68.103 (μm) Mode: 72.265 (μm)
Std. Dev.: 25.682 (μm) Span: 0.472
Coef. Var: 37.71% Spec. Area: 1524 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 09:31

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-130 17:06
Filename : C104047
Sample : 1285

Material :
Source : C104
Lot Numbe :

Condition
T%(He-Ne): 75.7% Dist.Form: Std. Sampling times : 100
(LAMP): 76.1% R.R.Index: 1.16-0.00i ( )

Agitation : 1 Circultn : 6 U.sonic : ~~ON~~ OFF (120)

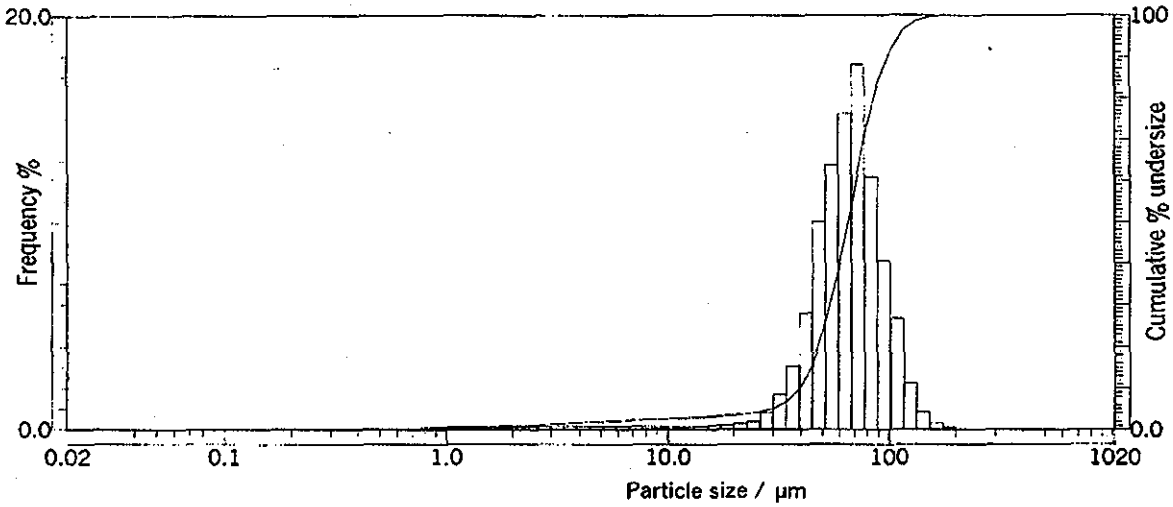
WSC 10/5/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 65.527μm SP.Area : 1674cm²/cm³ S.D. : 25.540μm
Mode : 71.411μm Mean : 66.959μm
C.V. : 38.14%

Span : (D 10.0-D 90.0) / D50 = 0.917

Dia. on %(5.0%) : 29.581μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 51.203μm % on Dia.(1.000μm) : 0.2%
Dia. on %(50.0%) : 65.527μm % on Dia.(10.000μm) : 2.7%
Dia. on %(75.0%) : 80.916μm % on Dia.(100.000μm) : 90.3%
Dia. on %(95.0%) : 111.863μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.39	4.23	0.669	0.00	0.00
890.1	0.00	100.00	22.80	0.31	3.83	0.584	0.00	0.00
777.1	0.00	100.00	19.90	0.21	3.52	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.19	3.31	0.445	0.00	0.00
592.4	0.00	100.00	15.17	0.16	3.11	0.389	0.00	0.00
517.2	0.00	100.00	13.25	0.14	2.95	0.339	0.00	0.00
451.6	0.00	100.00	11.56	0.14	2.81	0.296	0.00	0.00
394.2	0.00	100.00	10.10	0.14	2.67	0.259	0.00	0.00
344.2	0.00	100.00	8.816	0.14	2.53	0.226	0.00	0.00
300.5	0.00	100.00	7.697	0.15	2.39	0.197	0.00	0.00
262.4	0.00	100.00	6.720	0.16	2.25	0.172	0.00	0.00
229.1	0.00	100.00	5.867	0.16	2.09	0.150	0.00	0.00
200.0	0.11	100.00	5.122	0.16	1.93	0.131	0.00	0.00
174.6	0.31	99.89	4.472	0.17	1.77	0.115	0.00	0.00
152.5	0.84	99.58	3.905	0.17	1.60	0.100	0.00	0.00
133.1	2.25	98.74	3.409	0.16	1.44	0.087	0.00	0.00
116.2	5.31	96.49	2.976	0.15	1.28	0.076	0.00	0.00
101.5	8.07	91.18	2.599	0.14	1.13	0.067	0.00	0.00
88.58	12.15	83.11	2.269	0.12	0.99	0.058	0.00	0.00
77.34	17.59	70.95	1.981	0.12	0.87	0.051	0.00	0.00
67.52	15.23	53.37	1.729	0.13	0.75	0.044	0.00	0.00
58.95	12.75	38.13	1.510	0.13	0.62	0.039	0.00	0.00
51.47	9.99	25.38	1.318	0.13	0.50	0.034	0.00	0.00
44.94	5.54	15.39	1.151	0.13	0.36	0.029	0.00	0.00
39.23	3.07	9.85	1.005	0.13	0.23	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01
File Name: C104047.DAT Sample Name: 1285 ID No: 01/09/28-130
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 75.694 % Lamp: 76.065 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: Source: C104
Lot No: Test No: Dup

WSC 10/5/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.872	0.10	0.10	(15)	68.435	5.00	55.00
(2)	2.285	0.90	1.00	(16)	71.226	5.00	60.00
(3)	7.084	1.30	2.30	(17)	74.017	5.00	65.00
(4)	29.601	2.70	5.00	(18)	76.808	5.00	70.00
(5)	39.390	5.00	10.00	(19)	81.084	5.00	75.00
(6)	44.537	5.00	15.00	(20)	85.710	5.00	80.00
(7)	45.206	0.80	15.80	(21)	90.329	4.20	84.20
(8)	47.951	4.20	20.00	(22)	91.605	0.80	85.00
(9)	51.220	5.00	25.00	(23)	99.580	5.00	90.00
(10)	54.180	5.00	30.00	(24)	112.067	5.00	95.00
(11)	57.114	5.00	35.00	(25)	125.287	2.70	97.70
(12)	60.003	5.00	40.00	(26)	139.098	1.30	99.00
(13)	62.816	5.00	45.00	(27)	176.859	0.90	99.90
(14)	65.629	5.00	50.00				

Median : 65.527 (μm) Mean: 66.959 (μm) Mode: 72.265 (μm)
Std. Dev.: 25.540 (μm) Span: 0.472
Coef. Var: 38.14% Spec. Area: 1674 (cm2/cm3)

APPENDIX F-14

SY-102 SIEVE TEST SAMPLES: PSD MEASUREMENT RESULTS

Consisting of 34 pages including this cover page

TABLE F-14. Sample identification and PSD run conditions. SY-102 composite sieve test samples S01T001286 (> 500 μm) and S01T001289 (< 53 μm).

Conditions Key: P = Pump Speed Setting; P6 = 14.4 mL/s
S = Stirrer Speed Setting (1-7); S1 = Stirrer Speed 1; S3 = Stirrer Speed 3
US = Ultrasonic ON Time (min); DT = Delay Time (min) between end of ultrasonic treatment and PSD measurement.
Time = Clock time at beginning of measurement.

Sample Sieve Fraction	PSD Run File Name	Run Conditions				Time	Cumulative Time (min) At Conditions				
		P	S	US	DT		P6	S1	S3	US	DT
S01T001286	[LOAD-IN]	6	1	0	0	?	?	?			
> 500 μm	SY102001	6	1	0	0	08:11	5	5			
	SY102002	6	3	0	0	08:16	8	5	3		
	SY102003	6	3	2	0	08:19	13	5	8	2	0
	SY102004	6	1	0	0	08:24	15	7	8	2	3
						08:26					
S01T001286	[LOAD-IN]	6	1	0	0	?	?	?			
> 500 μm	SY102005	6	1	0	0	08:35	2	2			
	SY102006	6	3	0	0	08:37	5	2	3		
	SY102007	6	3	2	0	08:40	10	2	8	2	0
	SY102008	6	1	0	0	08:45	13	5	8	2	3
						08:48					
S01T001289	[LOAD-IN]	6	1	0	0	?	?	?			
< 53 μm	SY102009	6	1	0	0	08:55	3	3			
	SY102010	6	3	0	0	08:58	7	3	4		
	SY102011	6	3	2	0	09:02	12	3	9	2	0
	SY102012	6	1	0	0	09:07	14	5	9	2	3
						09:09					
S01T001289	[LOAD-IN]	6	1	0	0	?	?	?			
< 53 μm	SY102013	6	1	0	0	09:17	4	4			
	SY102014	6	3	0	0	09:21	6	4	2		
	SY102015	6	3	2	0	09:23	12	4	8	2	0
	SY102016	6	1	0	0	09:29	15	7	8	2	4
						09:32					

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 09:52

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928.066 08:13
Filename : SY102001
Sample : 1286

Material :
Source : SY 102
Lot Numbe :

Condition
T%(He-Ne): 86.8% Dist.Form: Std. Sampling times : 100
(LAMP): 82.1% R.R.Index: 1.16-0.00i ( )

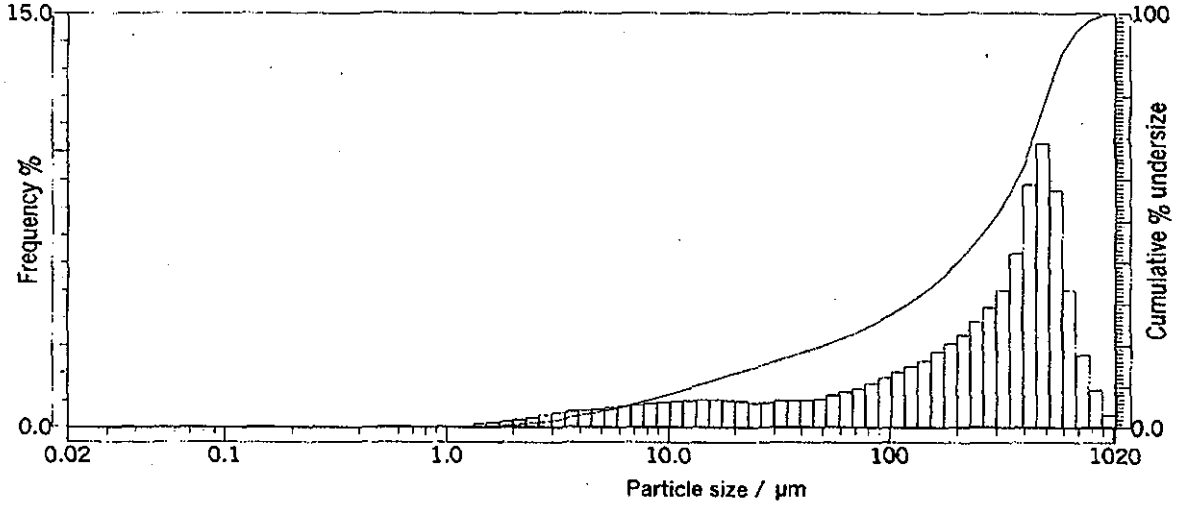
Agitation : 1 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 287.140μm SP.Area : 1724cm²/cm³ S.D. : 223.445μm
Mode : 482.606μm Mean : 297.323μm
C.V. : 75.15%

Span : (D 10.0-D 90.0) / D50 = 2.001

Dia. on %(5.0%) :	6.130μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	84.644μm	% on Dia.(1.000μm) :	0.0%
Dia. on %(50.0%) :	287.140μm	% on Dia.(10.000μm) :	8.1%
Dia. on %(75.0%) :	472.090μm	% on Dia.(100.000μm) :	27.2%
Dia. on %(95.0%) :	669.082μm	% on Dia.(1000.000μm) :	99.9%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.46	100.00	26.11	0.91	15.06	0.669	0.00	0.00
890.1	1.38	99.54	22.80	0.97	14.15	0.584	0.00	0.00
777.1	2.64	98.15	19.90	0.99	13.18	0.510	0.00	0.00
678.5	4.99	95.51	17.38	1.02	12.19	0.445	0.00	0.00
592.4	8.60	90.52	15.17	1.01	11.17	0.389	0.00	0.00
517.2	10.29	81.92	13.25	0.99	10.16	0.339	0.00	0.00
451.6	8.81	71.63	11.56	0.97	9.16	0.296	0.00	0.00
394.2	6.34	62.82	10.10	0.93	8.19	0.259	0.00	0.00
344.2	5.01	56.48	8.816	0.89	7.26	0.226	0.00	0.00
300.5	4.37	51.47	7.697	0.83	6.37	0.197	0.00	0.00
262.4	3.83	47.10	6.720	0.79	5.53	0.172	0.00	0.00
229.1	3.37	43.27	5.867	0.73	4.74	0.150	0.00	0.00
200.0	3.08	39.90	5.122	0.67	4.02	0.131	0.00	0.00
174.6	2.76	36.83	4.472	0.62	3.35	0.115	0.00	0.00
152.5	2.45	34.07	3.905	0.58	2.72	0.100	0.00	0.00
133.1	2.24	31.62	3.409	0.52	2.15	0.087	0.00	0.00
116.2	2.02	29.39	2.976	0.45	1.63	0.076	0.00	0.00
101.5	1.82	27.36	2.599	0.36	1.18	0.067	0.00	0.00
88.58	1.63	25.55	2.269	0.29	0.81	0.058	0.00	0.00
77.34	1.42	23.92	1.981	0.23	0.52	0.051	0.00	0.00
67.52	1.30	22.50	1.729	0.17	0.29	0.044	0.00	0.00
58.95	1.18	21.19	1.510	0.12	0.12	0.039	0.00	0.00
51.47	1.04	20.02	1.318	0.00	0.00	0.034	0.00	0.00
44.94	1.01	18.97	1.151	0.00	0.00	0.029	0.00	0.00
39.23	1.00	17.96	1.005	0.00	0.00	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01
File Name: SY102001.DAT Sample Name: 1286 ID No: 01/09/28-066
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 86.794 % Lamp: 82.096 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: Source: SY 102

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	1.477	0.10	0.10	(15)	331.316	5.00	55.00
(2)	2.439	0.90	1.00	(16)	372.001	5.00	60.00
(3)	3.539	1.30	2.30	(17)	408.441	5.00	65.00
(4)	6.143	2.70	5.00	(18)	440.964	5.00	70.00
(5)	12.982	5.00	10.00	(19)	473.063	5.00	75.00
(6)	25.899	5.00	15.00	(20)	504.957	5.00	80.00
(7)	29.180	0.80	15.80	(21)	537.130	4.20	84.20
(8)	51.364	4.20	20.00	(22)	544.120	0.80	85.00
(9)	84.815	5.00	25.00	(23)	587.812	5.00	90.00
(10)	120.847	5.00	30.00	(24)	669.631	5.00	95.00
(11)	159.924	5.00	35.00	(25)	760.235	2.70	97.70
(12)	200.826	5.00	40.00	(26)	846.329	1.30	99.00
(13)	244.120	5.00	45.00	(27)	991.589	0.90	99.90
(14)	287.721	5.00	50.00				

Median : 287.139 (μm) Mean: 297.323 (μm) Mode: 483.265 (μm)
Std. Dev.: 223.445 (μm) Span: 0.686
Coef. Var: 75.15% Spec. Area: 1724 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20J Oct/04/'01 09:53

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-067 08:18
Filename : SY102002
Sample : 1286

Material :
Source : SY 102
Lot Numbe :

Condition
T%(He-Ne): 80.0% Dist.Form: Std. Sampling times : 100
(LAMP): 75.9% R.R.Index: 1.16-0.00i ( )

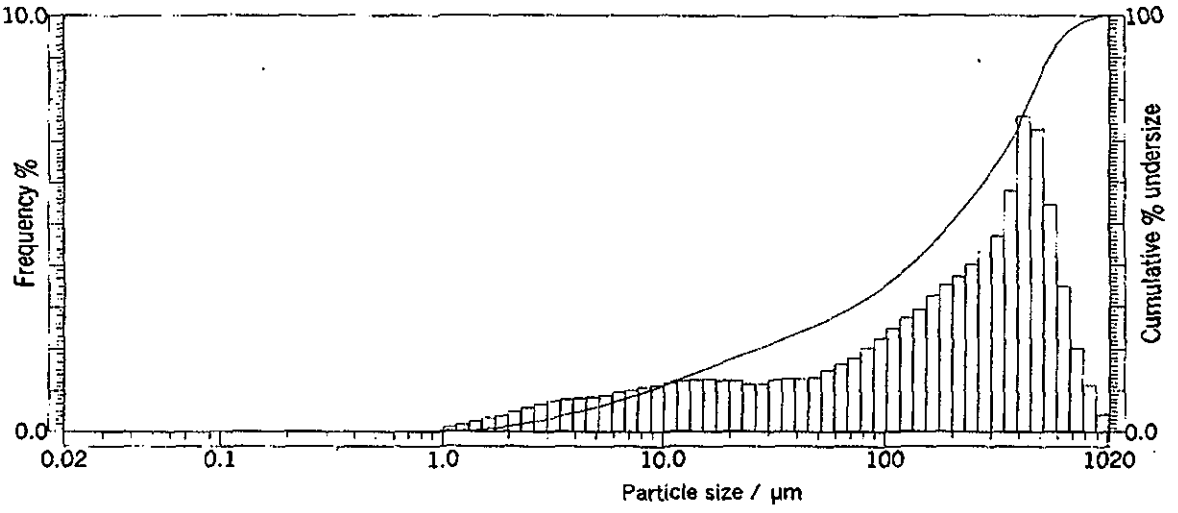
Agitation : 3 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 198.903μm SP.Area : 2492cm²/cm³ S.D. : 216.088μm
Mode : 427.630μm Mean : 247.193μm
C.V. : 87.42%

Span : (D 10.0-D 90.0) / D50 = 2.724

Dia. on %(5.0%) : 4.230μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 46.160μm % on Dia.(1.000μm) : 0.0%
Dia. on %(50.0%) : 198.903μm % on Dia.(10.000μm) : 11.1%
Dia. on %(75.0%) : 411.227μm % on Dia.(100.000μm) : 35.0%
Dia. on %(95.0%) : 642.096μm % on Dia.(1000.000μm) : 99.9%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.43	100.00	26.11	1.15	19.77	0.669	0.00	0.00
890.1	1.14	99.57	22.80	1.23	18.62	0.584	0.00	0.00
777.1	2.02	98.43	19.90	1.24	17.38	0.510	0.00	0.00
678.5	3.48	96.41	17.38	1.28	16.14	0.445	0.00	0.00
592.4	5.44	92.94	15.17	1.25	14.87	0.389	0.00	0.00
517.2	7.27	87.50	13.25	1.22	13.61	0.339	0.00	0.00
451.6	7.58	80.23	11.56	1.18	12.40	0.296	0.00	0.00
394.2	5.77	72.64	10.10	1.13	11.22	0.259	0.00	0.00
344.2	4.69	66.87	8.816	1.07	10.09	0.226	0.00	0.00
300.5	4.31	62.18	7.697	1.00	9.03	0.197	0.00	0.00
262.4	4.01	57.87	6.720	0.96	8.03	0.172	0.00	0.00
229.1	3.72	53.86	5.867	0.89	7.07	0.150	0.00	0.00
200.0	3.52	50.14	5.122	0.84	6.18	0.131	0.00	0.00
174.6	3.25	46.62	4.472	0.81	5.33	0.115	0.00	0.00
152.5	2.93	43.37	3.905	0.78	4.52	0.100	0.00	0.00
133.1	2.72	40.44	3.409	0.74	3.74	0.087	0.00	0.00
116.2	2.49	37.73	2.976	0.67	3.00	0.076	0.00	0.00
101.5	2.25	35.24	2.599	0.57	2.33	0.067	0.00	0.00
88.58	2.03	32.99	2.269	0.49	1.76	0.058	0.00	0.00
77.34	1.78	30.96	1.981	0.40	1.27	0.051	0.00	0.00
67.52	1.64	29.18	1.729	0.33	0.87	0.044	0.00	0.00
58.95	1.49	27.54	1.510	0.25	0.53	0.039	0.00	0.00
51.47	1.31	26.05	1.318	0.18	0.28	0.034	0.00	0.00
44.94	1.28	24.74	1.151	0.11	0.11	0.029	0.00	0.00
39.23	1.27	23.46	1.005	0.00	0.00	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01
File Name: SY102002.DAT Sample Name: 1286 ID No: 01/09/28-067
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 79.989 % Lamp: 75.857 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: Source: SY 102

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	1.139	0.10	0.10	(15)	238.560	5.00	55.00
(2)	1.812	0.90	1.00	(16)	281.256	5.00	60.00
(3)	2.581	1.30	2.30	(17)	326.781	5.00	65.00
(4)	4.240	2.70	5.00	(18)	371.321	5.00	70.00
(5)	8.718	5.00	10.00	(19)	412.053	5.00	75.00
(6)	15.403	5.00	15.00	(20)	449.853	5.00	80.00
(7)	16.786	0.80	15.80	(21)	487.438	4.20	84.20
(8)	26.865	4.20	20.00	(22)	494.660	0.80	85.00
(9)	46.229	5.00	25.00	(23)	551.796	5.00	90.00
(10)	72.044	5.00	30.00	(24)	643.511	5.00	95.00
(11)	100.095	5.00	35.00	(25)	741.338	2.70	97.70
(12)	130.346	5.00	40.00	(26)	833.308	1.30	99.00
(13)	163.577	5.00	45.00	(27)	989.233	0.90	99.90
(14)	198.972	5.00	50.00				

Median : 198.903 (μm) Mean: 247.193 (μm) Mode: 421.928 (μm)
Std. Dev.: 216.088 (μm) Span: 1.161
Coef. Var: 87.42% Spec. Area: 2492 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 09:53

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-068 08:23
Filename : SY102003
Sample : 1286

Material :
Source : SY 102
Lot Numbe :

Condition
T%(He-Ne): 63.7% Dist.Form: Std. Sampling times : 100
(LAMP): 53.8% R.R.Index: 1.16-0.00i ( )

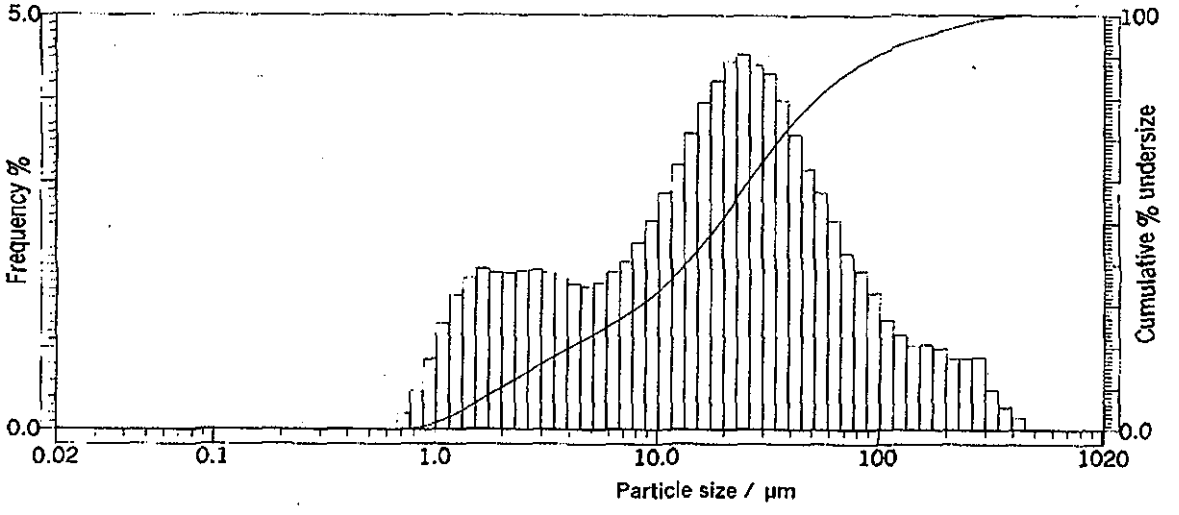
Agitation : 3 Circultn : 6 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 19.024μm SP.Area : 9546cm²/cm³ S.D. : 58.154μm
Mode : 24.383μm Mean : 38.576μm
C.V. : 150.75%

Span : (D 10.0-D 90.0) / D50 = 4.834

Dia. on %(5.0%) : 1.376μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 5.935μm % on Dia.(1.000μm) : 1.5%
Dia. on %(50.0%) : 19.024μm % on Dia.(10.000μm) : 33.4%
Dia. on %(75.0%) : 42.172μm % on Dia.(100.000μm) : 90.8%
Dia. on %(95.0%) : 163.991μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	4.53	60.39	0.669	0.00	0.00
890.1	0.00	100.00	22.80	4.45	55.86	0.584	0.00	0.00
777.1	0.00	100.00	19.90	4.22	51.41	0.510	0.00	0.00
678.5	0.00	100.00	17.38	3.96	47.19	0.445	0.00	0.00
592.4	0.00	100.00	15.17	3.59	43.22	0.389	0.00	0.00
517.2	0.00	100.00	13.25	3.21	39.63	0.339	0.00	0.00
451.6	0.15	100.00	11.56	2.86	36.43	0.296	0.00	0.00
394.2	0.27	99.85	10.10	2.53	33.57	0.259	0.00	0.00
344.2	0.49	99.58	8.816	2.26	31.03	0.226	0.00	0.00
300.5	0.88	99.08	7.697	2.03	28.77	0.197	0.00	0.00
262.4	0.87	98.20	6.720	1.91	26.74	0.172	0.00	0.00
229.1	0.87	97.33	5.867	1.77	24.84	0.150	0.00	0.00
200.0	0.99	96.46	5.122	1.73	23.06	0.131	0.00	0.00
174.6	1.03	95.48	4.472	1.76	21.34	0.115	0.00	0.00
152.5	1.02	94.44	3.905	1.83	19.57	0.100	0.00	0.00
133.1	1.15	93.43	3.409	1.90	17.74	0.087	0.00	0.00
116.2	1.33	92.28	2.976	1.93	15.84	0.076	0.00	0.00
101.5	1.66	90.94	2.599	1.92	13.91	0.067	0.00	0.00
88.58	1.92	89.28	2.269	1.89	11.99	0.058	0.00	0.00
77.34	2.13	87.36	1.981	1.90	10.10	0.051	0.00	0.00
67.52	2.53	85.23	1.729	1.95	8.19	0.044	0.00	0.00
58.95	2.87	82.69	1.510	1.83	6.25	0.039	0.00	0.00
51.47	3.15	79.82	1.318	1.63	4.42	0.034	0.00	0.00
44.94	3.57	76.67	1.151	1.28	2.79	0.029	0.00	0.00
39.23	3.99	73.10	1.005	0.85	1.51	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01
File Name: SY102003.DAT Sample Name: 1286 ID No: 01/09/28-068
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 63.709 % Lamp: 53.802 %
Circulation: 6 Agitation: 3 U.Sonic ** (min)
Material: Source: SY 102

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.718	0.10	0.10	(15)	22.239	5.00	55.00
(2)	0.928	0.90	1.00	(16)	25.824	5.00	60.00
(3)	1.095	1.30	2.30	(17)	30.102	5.00	65.00
(4)	1.379	2.70	5.00	(18)	35.363	5.00	70.00
(5)	1.968	5.00	10.00	(19)	42.268	5.00	75.00
(6)	2.812	5.00	15.00	(20)	51.937	5.00	80.00
(7)	2.968	0.80	15.80	(21)	64.051	4.20	84.20
(8)	4.042	4.20	20.00	(22)	66.759	0.80	85.00
(9)	5.939	5.00	25.00	(23)	94.142	5.00	90.00
(10)	8.304	5.00	30.00	(24)	164.366	5.00	95.00
(11)	10.832	5.00	35.00	(25)	243.179	2.70	97.70
(12)	13.443	5.00	40.00	(26)	296.881	1.30	99.00
(13)	16.161	5.00	45.00	(27)	413.749	0.90	99.90
(14)	19.062	5.00	50.00				

Median : 19.024 (μm) Mean: 38.576 (μm) Mode: 24.398 (μm)
Std. Dev.: 58.154 (μm) Span: 6.404
Coef. Var: 150.75% Spec. Area: 9546 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 09:53

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-069 08:26
Filename : SY102004
Sample : 1286

Material :
Source : SY 102
Lot Numbe :

Condition
T%(He-Ne): 63.2%
(LAMP): 53.8%

Dist.Form: Std.
R.R.index: 1.16-0.00i

Sampling times : 100
( )

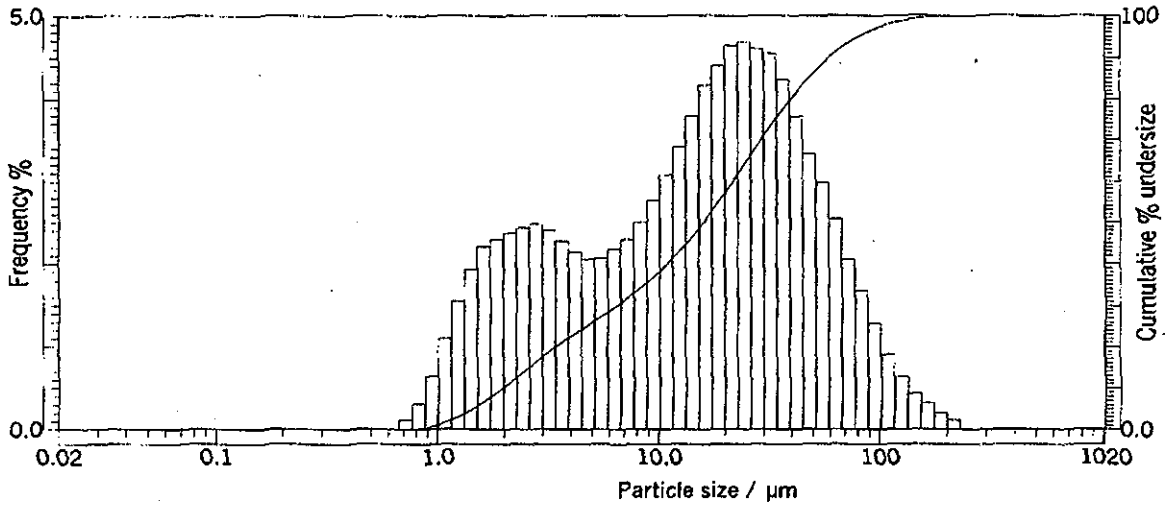
Agitation : 1 Circultn : 6 U.sonic : ~~ON~~ OFF (120) WSC 10/8/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 15.967μm SP.Area : 10175cm²/cm³ S.D. : 28.267μm
Mode : 24.385μm Mean : 24.853μm
C.V. : 113.74%

Span : (D 10.0-D 90.0) / D50 = 3.604

Dia. on %(5.0%) :	1.441μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	4.693μm	% on Dia.(1.000μm) :	1.1%
Dia. on %(50.0%) :	15.967μm	% on Dia.(10.000μm) :	37.9%
Dia. on %(75.0%) :	33.764μm	% on Dia.(100.000μm) :	97.2%
Dia. on %(95.0%) :	81.106μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	4.68	66.32	0.669	0.00	0.00
890.1	0.00	100.00	22.80	4.64	61.64	0.584	0.00	0.00
777.1	0.00	100.00	19.90	4.40	57.00	0.510	0.00	0.00
678.5	0.00	100.00	17.38	4.17	52.60	0.445	0.00	0.00
592.4	0.00	100.00	15.17	3.79	48.43	0.389	0.00	0.00
517.2	0.00	100.00	13.25	3.42	44.64	0.339	0.00	0.00
451.6	0.00	100.00	11.56	3.08	41.22	0.296	0.00	0.00
394.2	0.00	100.00	10.10	2.76	38.14	0.259	0.00	0.00
344.2	0.00	100.00	8.816	2.50	35.38	0.226	0.00	0.00
300.5	0.00	100.00	7.697	2.29	32.87	0.197	0.00	0.00
262.4	0.00	100.00	6.720	2.18	30.59	0.172	0.00	0.00
229.1	0.11	100.00	5.867	2.08	28.40	0.150	0.00	0.00
200.0	0.21	99.89	5.122	2.06	26.33	0.131	0.00	0.00
174.6	0.32	99.68	4.472	2.15	24.27	0.115	0.00	0.00
152.5	0.44	99.36	3.905	2.27	22.12	0.100	0.00	0.00
133.1	0.64	98.93	3.409	2.40	19.85	0.087	0.00	0.00
116.2	0.91	98.28	2.976	2.47	17.45	0.076	0.00	0.00
101.5	1.28	97.37	2.599	2.44	14.98	0.067	0.00	0.00
88.58	1.67	96.09	2.269	2.37	12.54	0.058	0.00	0.00
77.34	2.05	94.41	1.981	2.30	10.17	0.051	0.00	0.00
67.52	2.54	92.36	1.729	2.21	7.87	0.044	0.00	0.00
58.95	2.98	89.82	1.510	1.93	5.66	0.039	0.00	0.00
51.47	3.33	86.84	1.318	1.56	3.73	0.034	0.00	0.00
44.94	3.79	83.51	1.151	1.10	2.17	0.029	0.00	0.00
39.23	4.24	79.72	1.005	0.65	1.08	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01
File Name: SY102004.DAT Sample Name: 1286 ID No: 01/09/28-069
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 63.229 % Lamp: 53.847 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: Source: SY 102

WSC 10/8/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.752	0.10	0.10	(15)	18.755	5.00	55.00
(2)	0.990	0.90	1.00	(16)	21.773	5.00	60.00
(3)	1.164	1.30	2.30	(17)	25.174	5.00	65.00
(4)	1.444	2.70	5.00	(18)	29.141	5.00	70.00
(5)	1.962	5.00	10.00	(19)	33.793	5.00	75.00
(6)	2.602	5.00	15.00	(20)	39.657	5.00	80.00
(7)	2.724	0.80	15.80	(21)	46.294	4.20	84.20
(8)	3.442	4.20	20.00	(22)	47.863	0.80	85.00
(9)	4.703	5.00	25.00	(23)	59.548	5.00	90.00
(10)	6.490	5.00	30.00	(24)	81.278	5.00	95.00
(11)	8.647	5.00	35.00	(25)	106.815	2.70	97.70
(12)	10.983	5.00	40.00	(26)	136.380	1.30	99.00
(13)	13.430	5.00	45.00	(27)	203.378	0.90	99.90
(14)	16.002	5.00	50.00				

Median : 15.967 (μm) Mean: 24.853 (μm) Mode: 24.398 (μm)
Std. Dev.: 28.267 (μm) Span: 2.965
Coef. Var: 113.74% Spec. Area: 10175 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 09:53

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-070 08:36
Filename : SY102005
Sample : 1286

Material :
Source : SY 102
Lot Numbe :

Condition
T%(He-Ne): 82.6% Dist.Form: Std. Sampling times : 100
(LAMP): 79.3% R.R.Index: 1.16-0.00i ( )

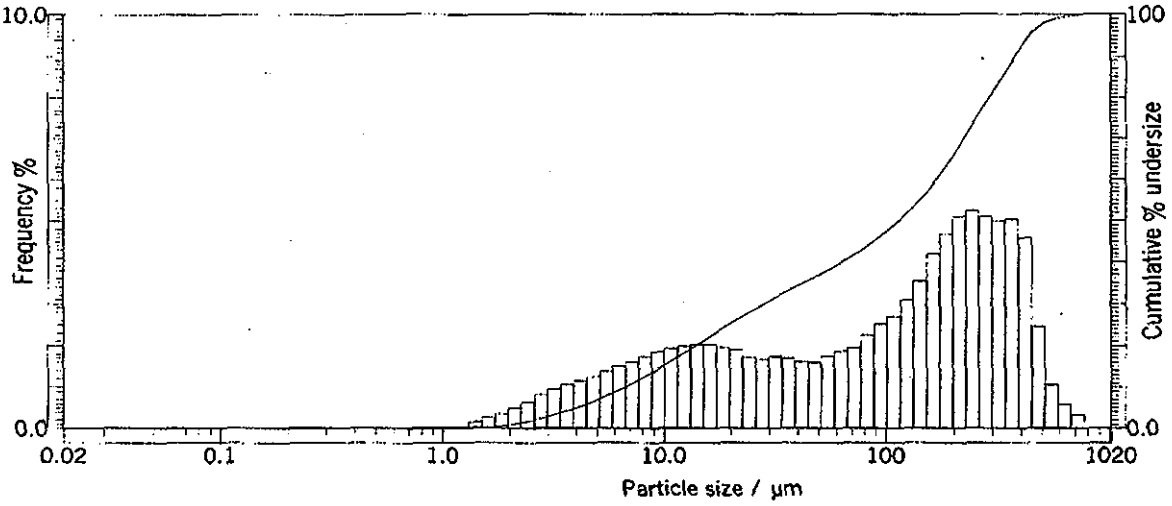
Agitation : 1 Circuitn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 115.780μm SP.Area : 2999cm²/cm³ S.D. : 151.957μm
Mode : 245.181μm Mean : 157.170μm
C.V. : 96.68%

Span : (D 10.0-D 90.0) / D50 = 3.259

Dia. on %(5.0%) : 4.013μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 19.678μm % on Dia.(1.000μm) : 0.0%
Dia. on %(50.0%) : 115.780μm % on Dia.(10.000μm) : 15.1%
Dia. on %(75.0%) : 256.600μm % on Dia.(100.000μm) : 47.1%
Dia. on %(95.0%) : 444.285μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.72	28.77	0.669	0.00	0.00
890.1	0.00	100.00	22.80	1.89	27.06	0.584	0.00	0.00
777.1	0.33	100.00	19.90	1.95	25.16	0.510	0.00	0.00
678.5	0.59	99.67	17.38	2.04	23.21	0.445	0.00	0.00
592.4	1.07	99.08	15.17	2.03	21.17	0.389	0.00	0.00
517.2	2.47	98.01	13.25	1.99	19.14	0.339	0.00	0.00
451.6	4.58	95.55	11.56	1.93	17.16	0.296	0.00	0.00
394.2	5.03	90.97	10.10	1.84	15.23	0.259	0.00	0.00
344.2	4.99	85.94	8.816	1.73	13.39	0.226	0.00	0.00
300.5	5.09	80.95	7.697	1.60	11.65	0.197	0.00	0.00
262.4	5.24	75.86	6.720	1.51	10.05	0.172	0.00	0.00
229.1	5.09	70.62	5.867	1.37	8.54	0.150	0.00	0.00
200.0	4.66	65.53	5.122	1.25	7.18	0.131	0.00	0.00
174.6	4.19	60.87	4.472	1.16	5.92	0.115	0.00	0.00
152.5	3.53	56.69	3.905	1.06	4.77	0.100	0.00	0.00
133.1	3.08	53.16	3.409	0.96	3.70	0.087	0.00	0.00
116.2	2.70	50.07	2.976	0.82	2.75	0.076	0.00	0.00
101.5	2.51	47.37	2.599	0.64	1.93	0.067	0.00	0.00
88.58	2.25	44.86	2.269	0.50	1.29	0.058	0.00	0.00
77.34	1.95	42.62	1.981	0.37	0.79	0.051	0.00	0.00
67.52	1.86	40.67	1.729	0.26	0.43	0.044	0.00	0.00
58.95	1.74	38.80	1.510	0.17	0.17	0.039	0.00	0.00
51.47	1.58	37.06	1.318	0.00	0.00	0.034	0.00	0.00
44.94	1.62	35.49	1.151	0.00	0.00	0.029	0.00	0.00
39.23	1.69	33.87	1.005	0.00	0.00	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01
File Name: SY102005.DAT Sample Name: 1286 ID No: 01/09/28-070
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 82.640 % Lamp: 79.265 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: Source: SY 102
Lot No: Test No: Duplicate

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	1.434	0.10	0.10	(15)	143.210	5.00	55.00
(2)	2.102	0.90	1.00	(16)	169.996	5.00	60.00
(3)	2.770	1.30	2.30	(17)	197.105	5.00	65.00
(4)	4.019	2.70	5.00	(18)	225.538	5.00	70.00
(5)	6.692	5.00	10.00	(19)	256.914	5.00	75.00
(6)	9.939	5.00	15.00	(20)	293.380	5.00	80.00
(7)	10.533	0.80	15.80	(21)	328.944	4.20	84.20
(8)	14.058	4.20	20.00	(22)	335.949	0.80	85.00
(9)	19.691	5.00	25.00	(23)	384.579	5.00	90.00
(10)	28.893	5.00	30.00	(24)	444.701	5.00	95.00
(11)	43.224	5.00	35.00	(25)	508.878	2.70	97.70
(12)	64.456	5.00	40.00	(26)	586.841	1.30	99.00
(13)	89.285	5.00	45.00	(27)	747.167	0.90	99.90
(14)	115.808	5.00	50.00				

Median : 115.780 (μm) Mean: 157.170 (μm) Mode: 245.161 (μm)
Std. Dev.: 151.957 (μm) Span: 1.621
Coef. Var: 96.68% Spec. Area: 2999 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 09:53

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-071 08:39
Filename : SY102006
Sample : 1286

Material :
Source : SY 102
Lot Numbe :

Condition
T%(He-Ne): 80.2% Dist.Form: Std. Sampling times : 100
(LAMP): 76.1% R.R.Index: 1.16-0.00i ( )

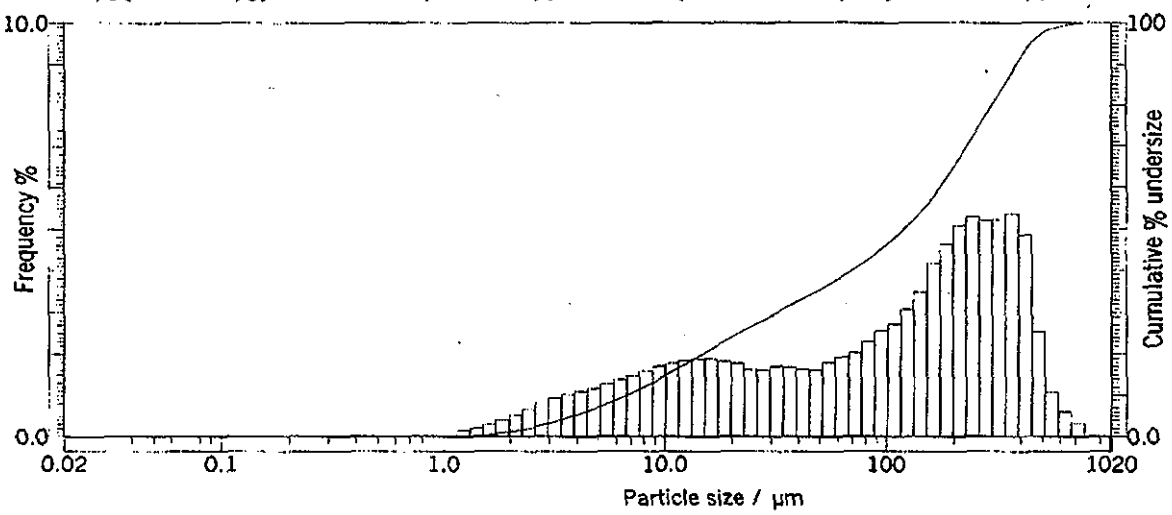
Agitation : 3 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 121.109μm SP.Area : 3036cm²/cm³ S.D. : 152.993μm
Mode : 366.615μm Mean : 161.257μm
C.V. : 94.88%

Span : (D 10.0-D 90.0) / D50 = 3.152

Dia. on %(5.0%) : 3.864μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 21.421μm % on Dia.(1.000μm) : 0.0%
Dia. on %(50.0%) : 121.109μm % on Dia.(10.000μm) : 14.7%
Dia. on %(75.0%) : 263.854μm % on Dia.(100.000μm) : 46.1%
Dia. on %(95.0%) : 446.066μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.62	27.44	0.669	0.00	0.00
890.1	0.00	100.00	22.80	1.78	25.82	0.584	0.00	0.00
777.1	0.34	100.00	19.90	1.82	24.03	0.510	0.00	0.00
678.5	0.61	99.66	17.38	1.90	22.21	0.445	0.00	0.00
592.4	1.09	99.06	15.17	1.88	20.31	0.389	0.00	0.00
517.2	2.53	97.97	13.25	1.84	18.43	0.339	0.00	0.00
451.6	4.85	95.44	11.56	1.78	16.59	0.296	0.00	0.00
394.2	5.37	90.59	10.10	1.70	14.81	0.259	0.00	0.00
344.2	5.22	85.22	8.816	1.60	13.11	0.226	0.00	0.00
300.5	5.21	79.99	7.697	1.48	11.51	0.197	0.00	0.00
262.4	5.29	74.78	6.720	1.40	10.03	0.172	0.00	0.00
229.1	5.08	69.50	5.867	1.28	8.63	0.150	0.00	0.00
200.0	4.64	64.42	5.122	1.18	7.36	0.131	0.00	0.00
174.6	4.16	59.78	4.472	1.10	6.18	0.115	0.00	0.00
152.5	3.49	55.62	3.905	1.03	5.08	0.100	0.00	0.00
133.1	3.07	52.13	3.409	0.94	4.05	0.087	0.00	0.00
116.2	2.72	49.07	2.976	0.82	3.11	0.076	0.00	0.00
101.5	2.57	46.35	2.599	0.67	2.29	0.067	0.00	0.00
88.58	2.32	43.78	2.269	0.53	1.63	0.058	0.00	0.00
77.34	2.03	41.46	1.981	0.42	1.09	0.051	0.00	0.00
67.52	1.94	39.43	1.729	0.32	0.68	0.044	0.00	0.00
58.95	1.80	37.49	1.510	0.22	0.36	0.039	0.00	0.00
51.47	1.63	35.69	1.318	0.14	0.14	0.034	0.00	0.00
44.94	1.64	34.07	1.151	0.00	0.00	0.029	0.00	0.00
39.23	1.68	32.43	1.005	0.00	0.00	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01
File Name: SY102006.DAT Sample Name: 1286 ID No: 01/09/28-071
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 80.249 % Lamp: 76.128 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: Source: SY 102
Lot No: Test No: Duplicate

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	1.270	0.10	0.10	(15)	149.011	5.00	55.00
(2)	1.925	0.90	1.00	(16)	175.831	5.00	60.00
(3)	2.602	1.30	2.30	(17)	203.338	5.00	65.00
(4)	3.867	2.70	5.00	(18)	232.252	5.00	70.00
(5)	6.700	5.00	10.00	(19)	263.954	5.00	75.00
(6)	10.253	5.00	15.00	(20)	300.580	5.00	80.00
(7)	10.912	0.80	15.80	(21)	335.698	4.20	84.20
(8)	14.853	4.20	20.00	(22)	342.388	0.80	85.00
(9)	21.470	5.00	25.00	(23)	388.737	5.00	90.00
(10)	32.334	5.00	30.00	(24)	446.391	5.00	95.00
(11)	48.693	5.00	35.00	(25)	510.211	2.70	97.70
(12)	70.287	5.00	40.00	(26)	588.328	1.30	99.00
(13)	94.710	5.00	45.00	(27)	747.798	0.90	99.90
(14)	121.349	5.00	50.00				

Median : 121.109 (μm) Mean: 161.257 (μm) Mode: 368.376 (μm)
Std. Dev.: 152.993 (μm) Span: 1.505
Coef. Var: 94.87% Spec. Area: 3036 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 09:54

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-072 08:44
Filename : SY102007
Sample : 1286

Material :
Source : SY 102
Lot Numbe :

Condition
T%(He-Ne): 64.8% Dist.Form: Std. Sampling times : 100
(LAMP): 54.7% R.R.Index: 1.16-0.00i ( )

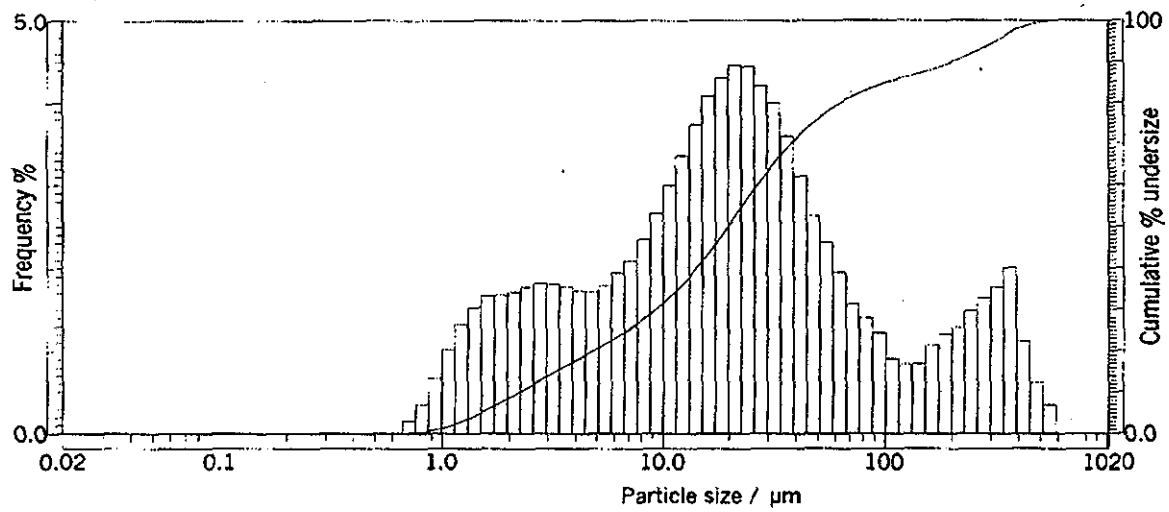
Agitation : 3 Circultn : 6 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 19.904μm SP.Area : 8565cm²/cm³ S.D. : 100.884μm
Mode : 21.344μm Mean : 59.303μm
C.V. : 170.12%

Span : (D 10.0-D 90.0) / D50 = 10.226

Dia. on %(5.0%) :	1.506μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	6.966μm	% on Dia.(1.000μm) :	1.1%
Dia. on %(50.0%) :	19.904μm	% on Dia.(10.000μm) :	31.3%
Dia. on %(75.0%) :	47.839μm	% on Dia.(100.000μm) :	84.7%
Dia. on %(95.0%) :	320.808μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	4.43	58.89	0.669	0.00	0.00
890.1	0.00	100.00	22.80	4.46	54.46	0.584	0.00	0.00
777.1	0.00	100.00	19.90	4.30	50.00	0.510	0.00	0.00
678.5	0.00	100.00	17.38	4.08	45.70	0.445	0.00	0.00
592.4	0.34	100.00	15.17	3.73	41.61	0.389	0.00	0.00
517.2	0.62	99.66	13.25	3.35	37.88	0.339	0.00	0.00
451.6	1.11	99.04	11.56	3.00	34.53	0.296	0.00	0.00
394.2	2.00	97.93	10.10	2.65	31.53	0.259	0.00	0.00
344.2	1.78	95.92	8.816	2.35	28.89	0.226	0.00	0.00
300.5	1.64	94.14	7.697	2.09	26.54	0.197	0.00	0.00
262.4	1.49	92.50	6.720	1.94	24.45	0.172	0.00	0.00
229.1	1.29	91.02	5.867	1.79	22.50	0.150	0.00	0.00
200.0	1.21	89.73	5.122	1.72	20.71	0.131	0.00	0.00
174.6	1.07	88.52	4.472	1.73	18.99	0.115	0.00	0.00
152.5	0.84	87.46	3.905	1.77	17.26	0.100	0.00	0.00
133.1	0.84	86.61	3.409	1.81	15.49	0.087	0.00	0.00
116.2	0.90	85.78	2.976	1.82	13.68	0.076	0.00	0.00
101.5	1.22	84.87	2.599	1.77	11.86	0.067	0.00	0.00
88.58	1.41	83.65	2.269	1.71	10.09	0.058	0.00	0.00
77.34	1.56	82.25	1.981	1.68	8.38	0.051	0.00	0.00
67.52	1.96	80.69	1.729	1.67	6.70	0.044	0.00	0.00
58.95	2.31	78.73	1.510	1.53	5.03	0.039	0.00	0.00
51.47	2.63	76.42	1.318	1.32	3.50	0.034	0.00	0.00
44.94	3.10	73.79	1.151	1.01	2.18	0.029	0.00	0.00
39.23	3.60	70.69	1.005	0.66	1.16	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01
File Name: SY102007.DAT Sample Name: 1286 ID No: 01/09/28-072
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 64.795 % Lamp: 54.711 %
Circulation: 6 Agitation: 3 U.Sonic ** (min)
Material: Source: SY 102
Lot No: Test No: Duplicate

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.734	0.10	0.10	(15)	23.204	5.00	55.00
(2)	0.973	0.90	1.00	(16)	27.115	5.00	60.00
(3)	1.166	1.30	2.30	(17)	31.982	5.00	65.00
(4)	1.507	2.70	5.00	(18)	38.282	5.00	70.00
(5)	2.253	5.00	10.00	(19)	47.949	5.00	75.00
(6)	3.292	5.00	15.00	(20)	64.518	5.00	80.00
(7)	3.496	0.80	15.80	(21)	94.349	4.20	84.20
(8)	4.853	4.20	20.00	(22)	103.542	0.80	85.00
(9)	6.979	5.00	25.00	(23)	206.111	5.00	90.00
(10)	9.355	5.00	30.00	(24)	321.547	5.00	95.00
(11)	11.802	5.00	35.00	(25)	388.619	2.70	97.70
(12)	14.339	5.00	40.00	(26)	449.590	1.30	99.00
(13)	17.001	5.00	45.00	(27)	570.497	0.90	99.90
(14)	19.904	5.00	50.00				

Median : 19.904 (μm) Mean: 59.303 (μm) Mode: 21.301 (μm)
Std. Dev.: 100.884 (μm) Span: 13.715
Coef. Var: 170.12% Spec. Area: 8565 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 09:54

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-073 08:48
Filename : SY102008
Sample : 1286

Material :
Source : SY 102
Lot Numbe :

Condition
T%(He-Ne): 64.4% Dist.Form: Std. Sampling times : 100
(LAMP): 54.7% R.R.Index: 1.16-0.00i ( )

Agitation : 1 Circultn : 6 U.sonic : ~~ON~~ OFF (120)

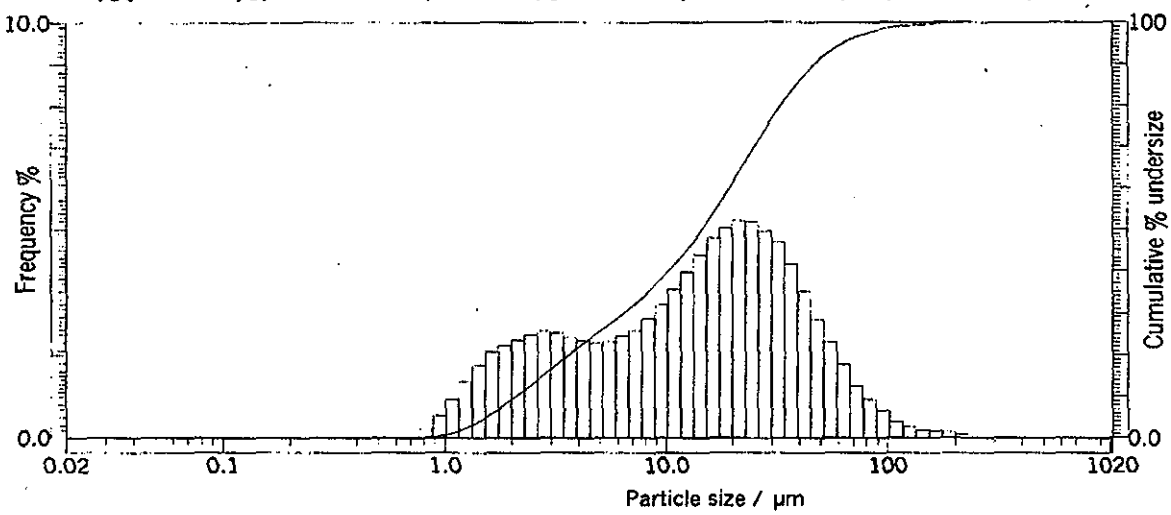
WSC 10/8/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 14.542μm SP.Area : 9992cm²/cm³ S.D. : 23.490μm
Mode : 21.348μm Mean : 21.115μm
C.V. : 111.25%

Span : (D 10.0-D 90.0) / D50 = 3.116

Dia. on %(5.0%) :	1.526μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	4.801μm	% on Dia.(1.000μm) :	0.8%
Dia. on %(50.0%) :	14.542μm	% on Dia.(10.000μm) :	39.3%
Dia. on %(75.0%) :	28.655μm	% on Dia.(100.000μm) :	98.6%
Dia. on %(95.0%) :	63.431μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	5.20	71.60	0.669	0.00	0.00
890.1	0.00	100.00	22.80	5.23	66.41	0.584	0.00	0.00
777.1	0.00	100.00	19.90	5.03	61.18	0.510	0.00	0.00
678.5	0.00	100.00	17.38	4.78	56.15	0.445	0.00	0.00
592.4	0.00	100.00	15.17	4.38	51.37	0.389	0.00	0.00
517.2	0.00	100.00	13.25	3.95	46.99	0.339	0.00	0.00
451.6	0.00	100.00	11.56	3.55	43.04	0.296	0.00	0.00
394.2	0.00	100.00	10.10	3.18	39.49	0.259	0.00	0.00
344.2	0.00	100.00	8.816	2.86	36.31	0.226	0.00	0.00
300.5	0.00	100.00	7.697	2.59	33.44	0.197	0.00	0.00
262.4	0.00	100.00	6.720	2.46	30.85	0.172	0.00	0.00
229.1	0.10	100.00	5.867	2.31	28.39	0.150	0.00	0.00
200.0	0.15	99.90	5.122	2.27	26.08	0.131	0.00	0.00
174.6	0.19	99.74	4.472	2.33	23.81	0.115	0.00	0.00
152.5	0.21	99.55	3.905	2.43	21.48	0.100	0.00	0.00
133.1	0.28	99.34	3.409	2.53	19.05	0.087	0.00	0.00
116.2	0.39	99.07	2.976	2.56	16.52	0.076	0.00	0.00
101.5	0.67	98.67	2.599	2.47	13.96	0.067	0.00	0.00
88.58	0.94	98.01	2.269	2.36	11.48	0.058	0.00	0.00
77.34	1.25	97.07	1.981	2.22	9.13	0.051	0.00	0.00
67.52	1.77	95.81	1.729	2.07	6.91	0.044	0.00	0.00
58.95	2.31	94.05	1.510	1.75	4.84	0.039	0.00	0.00
51.47	2.85	91.74	1.318	1.36	3.09	0.034	0.00	0.00
44.94	3.49	88.88	1.151	0.93	1.72	0.029	0.00	0.00
39.23	4.14	85.39	1.005	0.54	0.79	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01
File Name: SY102008.DAT Sample Name: 1286 ID No: 01/09/28-073
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 64.378 % Lamp: 54.722 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: Source: SY 102
Lot No: Test No: Duplicate

WSC 10/8/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.810	0.10	0.10	(15)	16.846	5.00	55.00
(2)	1.038	0.90	1.00	(16)	19.311	5.00	60.00
(3)	1.222	1.30	2.30	(17)	22.018	5.00	65.00
(4)	1.527	2.70	5.00	(18)	25.088	5.00	70.00
(5)	2.087	5.00	10.00	(19)	28.711	5.00	75.00
(6)	2.752	5.00	15.00	(20)	33.097	5.00	80.00
(7)	2.870	0.80	15.80	(21)	37.803	4.20	84.20
(8)	3.602	4.20	20.00	(22)	38.764	0.80	85.00
(9)	4.812	5.00	25.00	(23)	47.494	5.00	90.00
(10)	6.425	5.00	30.00	(24)	63.576	5.00	95.00
(11)	8.305	5.00	35.00	(25)	84.901	2.70	97.70
(12)	10.309	5.00	40.00	(26)	113.720	1.30	99.00
(13)	12.399	5.00	45.00	(27)	201.328	0.90	99.90
(14)	14.570	5.00	50.00				

Median : 14.542 (μm) Mean: 21.115 (μm) Mode: 21.301 (μm)
Std. Dev.: 23.490 (μm) Span: 2.391
Coef. Var: 111.25% Spec. Area: 9992 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 09:54

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-074 08:57
Filename : SY102009
Sample : 1289

Material :
Source : SY 102
Lot Numbe :

Condition
T%(He-Ne): 87.2% Dist.Form: Std. Sampling times : 100
(LAMP): 81.5% R.R.Index: 1.16-0.00i ( )

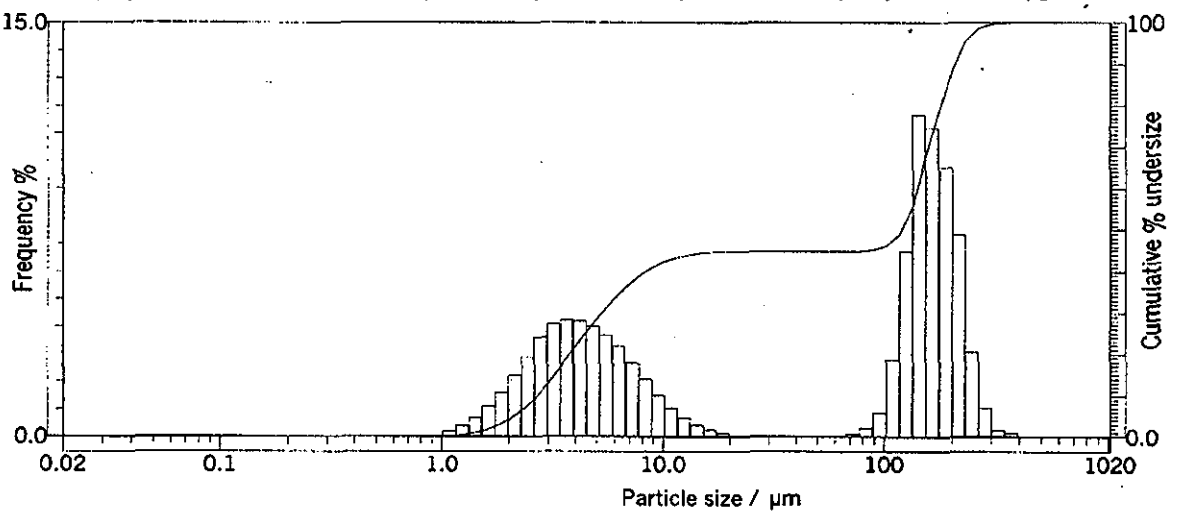
Agitation : 1 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 118.884μm SP.Area : 7715cm²/cm³ S.D. : 87.381μm
Mode : 146.205μm Mean : 95.232μm
C.V. : 91.76%

Span : (D 10.0-D 90.0) / D50 = 1.718

Dia. on %(5.0%) :	2.103μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	4.452μm	% on Dia.(1.000μm) :	0.0%
Dia. on %(50.0%) :	118.884μm	% on Dia.(10.000μm) :	42.2%
Dia. on %(75.0%) :	167.527μm	% on Dia.(100.000μm) :	46.0%
Dia. on %(95.0%) :	227.000μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	44.77	0.669	0.00	0.00
890.1	0.00	100.00	22.80	0.00	44.77	0.584	0.00	0.00
777.1	0.00	100.00	19.90	0.12	44.77	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.24	44.65	0.445	0.00	0.00
592.4	0.00	100.00	15.17	0.41	44.41	0.389	0.00	0.00
517.2	0.00	100.00	13.25	0.67	44.00	0.339	0.00	0.00
451.6	0.00	100.00	11.56	1.03	43.33	0.296	0.00	0.00
394.2	0.13	100.00	10.10	1.51	42.30	0.259	0.00	0.00
344.2	0.24	99.87	8.816	2.07	40.79	0.226	0.00	0.00
300.5	1.06	99.62	7.697	2.66	38.72	0.197	0.00	0.00
262.4	3.07	98.56	6.720	3.25	36.06	0.172	0.00	0.00
229.1	7.31	95.49	5.867	3.68	32.81	0.150	0.00	0.00
200.0	9.76	88.18	5.122	3.99	29.13	0.131	0.00	0.00
174.6	11.18	78.41	4.472	4.19	25.14	0.115	0.00	0.00
152.5	11.64	67.23	3.905	4.20	20.95	0.100	0.00	0.00
133.1	6.72	55.59	3.409	4.07	16.75	0.087	0.00	0.00
116.2	2.81	48.87	2.976	3.59	12.68	0.076	0.00	0.00
101.5	0.87	46.07	2.599	2.86	9.10	0.067	0.00	0.00
88.58	0.32	45.20	2.269	2.22	6.24	0.058	0.00	0.00
77.34	0.10	44.87	1.981	1.62	4.02	0.051	0.00	0.00
67.52	0.00	44.77	1.729	1.11	2.40	0.044	0.00	0.00
58.95	0.00	44.77	1.510	0.69	1.29	0.039	0.00	0.00
51.47	0.00	44.77	1.318	0.39	0.60	0.034	0.00	0.00
44.94	0.00	44.77	1.151	0.20	0.20	0.029	0.00	0.00
39.23	0.00	44.77	1.005	0.00	0.00	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01
File Name: SY102009.DAT Sample Name: 1289 ID No: 01/09/28-074
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 87.176 % Lamp: 81.550 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: Source: SY 102

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	1.077	0.10	0.10	(15)	131.614	5.00	55.00
(2)	1.430	0.90	1.00	(16)	140.430	5.00	60.00
(3)	1.709	1.30	2.30	(17)	148.742	5.00	65.00
(4)	2.108	2.70	5.00	(18)	157.938	5.00	70.00
(5)	2.694	5.00	10.00	(19)	167.849	5.00	75.00
(6)	3.223	5.00	15.00	(20)	178.739	5.00	80.00
(7)	3.308	0.80	15.80	(21)	189.660	4.20	84.20
(8)	3.792	4.20	20.00	(22)	191.740	0.80	85.00
(9)	4.453	5.00	25.00	(23)	207.248	5.00	90.00
(10)	5.298	5.00	30.00	(24)	227.126	5.00	95.00
(11)	6.442	5.00	35.00	(25)	253.021	2.70	97.70
(12)	8.390	5.00	40.00	(26)	278.100	1.30	99.00
(13)	81.757	5.00	45.00	(27)	357.124	0.90	99.90
(14)	119.042	5.00	50.00				

Median : 118.884 (μm) Mean: 95.232 (μm) Mode: 142.450 (μm)
Std. Dev.: 87.381 (μm) Span: 0.500
Coef. Var: 91.76% Spec. Area: 7715 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 09:54

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-075 09:01
Filename : SY102010
Sample : 1289

Material :
Source : SY 102
Lot Numbe :

Condition
T%(He-Ne): 87.4% Dist.Form: Std. Sampling times : 100
(LAMP): 81.5% R.R.Index: 1.16-0.00i ( )

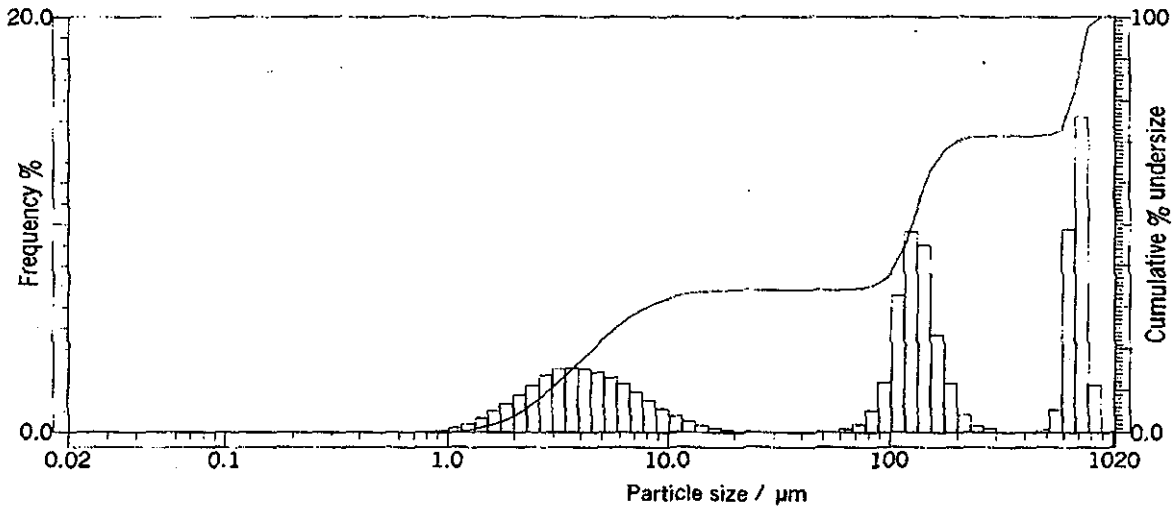
Agitation : 3 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 125.524μm SP.Area : 6154cm²/cm³ S.D. : 288.918μm
Mode : 702.155μm Mean : 250.113μm
C.V. : 115.52%

Span : (D 10.0-D 90.0) / D50 = 5.755

Dia. on %(5.0%) :	2.172μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	5.824μm	% on Dia.(1.000μm) :	0.1%
Dia. on %(50.0%) :	125.524μm	% on Dia.(10.000μm) :	32.0%
Dia. on %(75.0%) :	611.179μm	% on Dia.(100.000μm) :	37.7%
Dia. on %(95.0%) :	758.366μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	34.01	0.669	0.00	0.00
890.1	2.26	100.00	22.80	0.00	34.01	0.584	0.00	0.00
777.1	15.20	97.74	19.90	0.11	34.01	0.510	0.00	0.00
678.5	9.79	82.54	17.38	0.21	33.90	0.445	0.00	0.00
592.4	1.09	72.75	15.17	0.34	33.69	0.389	0.00	0.00
517.2	0.15	71.66	13.25	0.52	33.35	0.339	0.00	0.00
451.6	0.00	71.50	11.56	0.79	32.83	0.296	0.00	0.00
394.2	0.00	71.50	10.10	1.12	32.04	0.259	0.00	0.00
344.2	0.00	71.50	8.816	1.52	30.92	0.226	0.00	0.00
300.5	0.18	71.50	7.697	1.92	29.40	0.197	0.00	0.00
262.4	0.32	71.32	6.720	2.34	27.48	0.172	0.00	0.00
229.1	0.82	71.01	5.867	2.64	25.14	0.150	0.00	0.00
200.0	2.35	70.18	5.122	2.87	22.50	0.131	0.00	0.00
174.6	4.68	67.83	4.472	3.03	19.63	0.115	0.00	0.00
152.5	8.99	63.15	3.905	3.07	16.60	0.100	0.00	0.00
133.1	9.64	54.16	3.409	3.01	13.53	0.087	0.00	0.00
116.2	6.52	44.52	2.976	2.71	10.52	0.076	0.00	0.00
101.5	2.37	38.00	2.599	2.23	7.81	0.067	0.00	0.00
88.58	1.06	35.63	2.269	1.80	5.57	0.058	0.00	0.00
77.34	0.39	34.57	1.981	1.37	3.78	0.051	0.00	0.00
67.52	0.17	34.18	1.729	1.00	2.40	0.044	0.00	0.00
58.95	0.00	34.01	1.510	0.66	1.40	0.039	0.00	0.00
51.47	0.00	34.01	1.318	0.41	0.73	0.034	0.00	0.00
44.94	0.00	34.01	1.151	0.22	0.33	0.029	0.00	0.00
39.23	0.00	34.01	1.005	0.11	0.11	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01
File Name: SY102010.DAT Sample Name: 1289 ID No: 01/09/28-075
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 87.445 % Lamp: 81.472 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: Source: SY 102

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.996	0.10	0.10	(15)	134.903	5.00	55.00
(2)	1.395	0.90	1.00	(16)	145.668	5.00	60.00
(3)	1.707	1.30	2.30	(17)	161.215	5.00	65.00
(4)	2.177	2.70	5.00	(18)	198.046	5.00	70.00
(5)	2.904	5.00	10.00	(19)	612.201	5.00	75.00
(6)	3.646	5.00	15.00	(20)	656.191	5.00	80.00
(7)	3.775	0.80	15.80	(21)	689.299	4.20	84.20
(8)	4.555	4.20	20.00	(22)	694.489	0.80	85.00
(9)	5.827	5.00	25.00	(23)	726.929	5.00	90.00
(10)	8.137	5.00	30.00	(24)	759.368	5.00	95.00
(11)	81.924	5.00	35.00	(25)	776.886	2.70	97.70
(12)	105.982	5.00	40.00	(26)	840.142	1.30	99.00
(13)	117.046	5.00	45.00	(27)	885.119	0.90	99.90
(14)	125.807	5.00	50.00				

Median : 125.524 (μm) Mean: 250.113 (μm) Mode: 726.150 (μm)
Std. Dev.: 288.918 (μm) Span: 1.173
Coef. Var: 115.52% Spec. Area: 6154 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 10:05

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-076 09:06
Filename : SY102011
Sample : 1289

Material :
Source : SY 102
Lot Numbe :

Condition
T%(He-Ne): 88.2% Dist.Form: Std. Sampling times : 100
(LAMP): 80.7% R.R.Index: 1.16-0.00i ( )

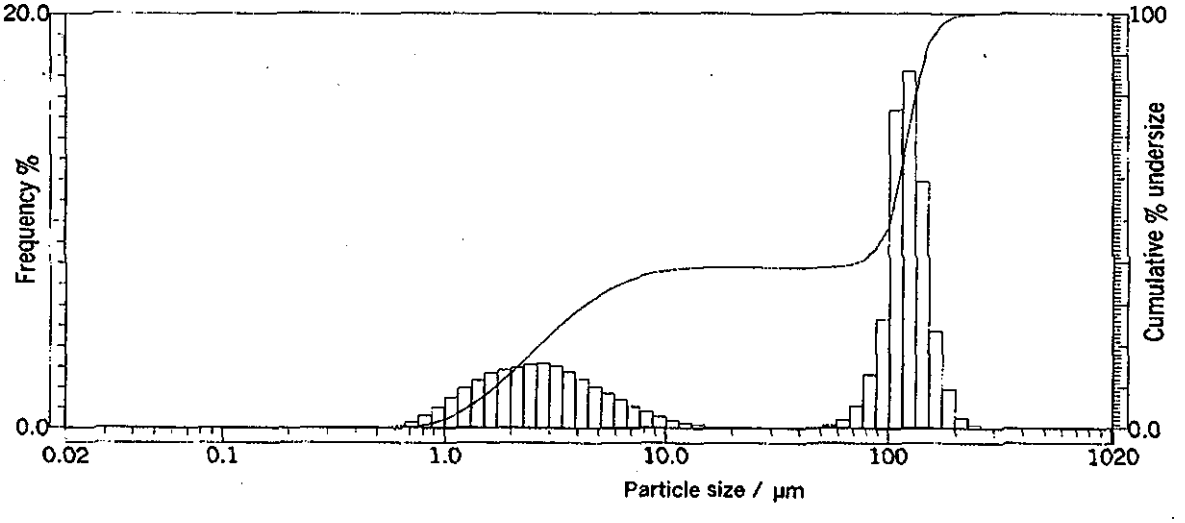
Agitation : 3 Circultn : 6 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 102.956μm SP.Area : 10844cm²/cm³ S.D. : 62.442μm
Mode : 122.695μm Mean : 77.151μm
C.V. : 80.93%

Span : (D 10.0-D 90.0) / D50 = 1.419

Dia. on %(5.0%) : 1.279μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 3.341μm % on Dia.(1.000μm) : 2.0%
Dia. on %(50.0%) : 102.956μm % on Dia.(10.000μm) : 38.1%
Dia. on %(75.0%) : 127.093μm % on Dia.(100.000μm) : 47.8%
Dia. on %(95.0%) : 162.788μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	38.86	0.669	0.12	0.12
890.1	0.00	100.00	22.80	0.00	38.86	0.584	0.00	0.00
777.1	0.00	100.00	19.90	0.00	38.86	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.00	38.86	0.445	0.00	0.00
592.4	0.00	100.00	15.17	0.15	38.86	0.389	0.00	0.00
517.2	0.00	100.00	13.25	0.24	38.71	0.339	0.00	0.00
451.6	0.00	100.00	11.56	0.37	38.47	0.296	0.00	0.00
394.2	0.00	100.00	10.10	0.55	38.10	0.259	0.00	0.00
344.2	0.00	100.00	8.816	0.78	37.55	0.226	0.00	0.00
300.5	0.00	100.00	7.697	1.06	36.76	0.197	0.00	0.00
262.4	0.15	100.00	6.720	1.39	35.71	0.172	0.00	0.00
229.1	0.51	99.85	5.867	1.70	34.32	0.150	0.00	0.00
200.0	1.91	99.34	5.122	2.03	32.62	0.131	0.00	0.00
174.6	4.71	97.43	4.472	2.40	30.58	0.115	0.00	0.00
152.5	11.87	92.72	3.905	2.74	28.19	0.100	0.00	0.00
133.1	17.20	80.86	3.409	3.02	25.45	0.087	0.00	0.00
116.2	15.31	63.65	2.976	3.14	22.43	0.076	0.00	0.00
101.5	5.28	48.35	2.599	3.07	19.29	0.067	0.00	0.00
88.58	2.59	43.07	2.269	2.96	16.22	0.058	0.00	0.00
77.34	1.08	40.48	1.981	2.82	13.25	0.051	0.00	0.00
67.52	0.39	39.40	1.729	2.67	10.44	0.044	0.00	0.00
58.95	0.15	39.01	1.510	2.34	7.77	0.039	0.00	0.00
51.47	0.00	38.86	1.318	1.95	5.43	0.034	0.00	0.00
44.94	0.00	38.86	1.151	1.48	3.48	0.029	0.00	0.00
39.23	0.00	38.86	1.005	1.00	2.00	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01
File Name: SY102011.DAT Sample Name: 1289 ID No: 01/09/28-076
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 88.208 % Lamp: 80.683 %
Circulation: 6 Agitation: 3 U.Sonic ** (min)
Material: Source: SY 102

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.652	0.10	0.10	(15)	107.869	5.00	55.00
(2)	0.878	0.90	1.00	(16)	112.688	5.00	60.00
(3)	1.035	1.30	2.30	(17)	117.531	5.00	65.00
(4)	1.281	2.70	5.00	(18)	122.442	5.00	70.00
(5)	1.693	5.00	10.00	(19)	127.352	5.00	75.00
(6)	2.151	5.00	15.00	(20)	132.263	5.00	80.00
(7)	2.228	0.80	15.80	(21)	138.555	4.20	84.20
(8)	2.684	4.20	20.00	(22)	139.859	0.80	85.00
(9)	3.345	5.00	25.00	(23)	148.011	5.00	90.00
(10)	4.334	5.00	30.00	(24)	163.164	5.00	95.00
(11)	6.286	5.00	35.00	(25)	178.171	2.70	97.70
(12)	73.008	5.00	40.00	(26)	195.459	1.30	99.00
(13)	93.296	5.00	45.00	(27)	239.945	0.90	99.90
(14)	103.050	5.00	50.00				

Median : 102.956 (μm) Mean: 77.151 (μm) Mode: 124.370 (μm)
Std. Dev.: 62.442 (μm) Span: 0.347
Coef. Var: 80.93% Spec. Area: 10844 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 09:56

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-077 09:09
Filename : SY102012
Sample : 1289

Material :
Source : SY 102
Lot Numbe :

Condition

T%(He-Ne): 88.1% Dist.Form: Std. Sampling times : 100
(LAMP): 80.6% R.R.Index: 1.16-0.00i ( )

Agitation : 1 Circultn : 6 U.sonic : ~~ON~~ OFF(120)

WSC 10/8/01

Format

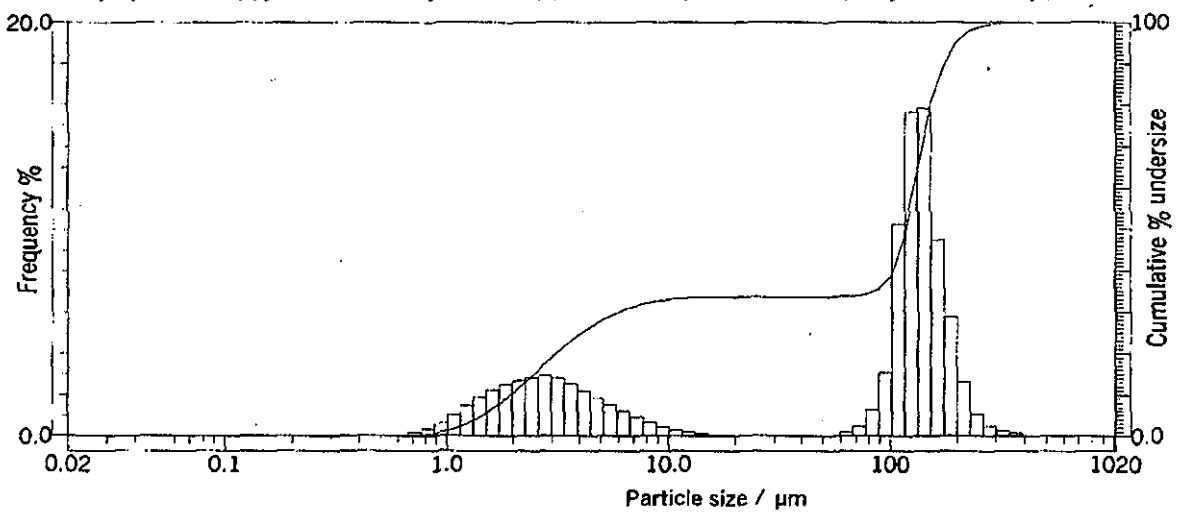
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data

Median : 117.465μm SP.Area : 8925cm²/cm³ S.D. : 72.793μm
Mode : 138.736μm Mean : 95.793μm
C.V. : 75.99%

Span : (D 10.0-D 90.0) / D50 = 1.483

Dia. on %(5.0%) :	1.450μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	4.103μm	% on Dia.(1.000μm) :	1.1%
Dia. on %(50.0%) :	117.465μm	% on Dia.(10.000μm) :	33.0%
Dia. on %(75.0%) :	145.831μm	% on Dia.(100.000μm) :	38.2%
Dia. on %(95.0%) :	198.227μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	33.56	0.669	0.00	0.00
890.1	0.00	100.00	22.80	0.00	33.56	0.584	0.00	0.00
777.1	0.00	100.00	19.90	0.00	33.56	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.00	33.56	0.445	0.00	0.00
592.4	0.00	100.00	15.17	0.11	33.56	0.389	0.00	0.00
517.2	0.00	100.00	13.25	0.18	33.46	0.339	0.00	0.00
451.6	0.00	100.00	11.56	0.29	33.28	0.296	0.00	0.00
394.2	0.15	100.00	10.10	0.45	32.98	0.259	0.00	0.00
344.2	0.27	99.85	8.816	0.66	32.54	0.226	0.00	0.00
300.5	0.49	99.58	7.697	0.91	31.88	0.197	0.00	0.00
262.4	1.08	99.09	6.720	1.22	30.97	0.172	0.00	0.00
229.1	2.64	98.02	5.867	1.52	29.76	0.150	0.00	0.00
200.0	5.75	95.38	5.122	1.84	28.24	0.131	0.00	0.00
174.6	9.46	89.63	4.472	2.20	26.39	0.115	0.00	0.00
152.5	15.79	80.17	3.905	2.53	24.20	0.100	0.00	0.00
133.1	15.61	64.37	3.409	2.82	21.66	0.087	0.00	0.00
116.2	10.23	48.76	2.976	2.94	18.84	0.076	0.00	0.00
101.5	3.08	38.53	2.599	2.85	15.90	0.067	0.00	0.00
88.58	1.27	35.45	2.269	2.71	13.06	0.058	0.00	0.00
77.34	0.46	34.18	1.981	2.51	10.34	0.051	0.00	0.00
67.52	0.16	33.72	1.729	2.27	7.84	0.044	0.00	0.00
58.95	0.00	33.56	1.510	1.89	5.57	0.039	0.00	0.00
51.47	0.00	33.56	1.318	1.48	3.67	0.034	0.00	0.00
44.94	0.00	33.56	1.151	1.04	2.20	0.029	0.00	0.00
39.23	0.00	33.56	1.005	0.65	1.15	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01
File Name: SY102012.DAT Sample Name: 1289 ID No: 01/09/28-077
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 88.136 % Lamp: 80.592 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: Source: SY 102

WSC 10/8/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.730	0.10	0.10	(15)	122.958	5.00	55.00
(2)	0.974	0.90	1.00	(16)	128.370	5.00	60.00
(3)	1.163	1.30	2.30	(17)	133.871	5.00	65.00
(4)	1.452	2.70	5.00	(18)	139.996	5.00	70.00
(5)	1.946	5.00	10.00	(19)	146.122	5.00	75.00
(6)	2.494	5.00	15.00	(20)	152.247	5.00	80.00
(7)	2.587	0.80	15.80	(21)	161.900	4.20	84.20
(8)	3.154	4.20	20.00	(22)	163.774	0.80	85.00
(9)	4.112	5.00	25.00	(23)	176.260	5.00	90.00
(10)	6.038	5.00	30.00	(24)	198.334	5.00	95.00
(11)	84.570	5.00	35.00	(25)	225.599	2.70	97.70
(12)	103.573	5.00	40.00	(26)	259.540	1.30	99.00
(13)	110.782	5.00	45.00	(27)	360.972	0.90	99.90
(14)	117.547	5.00	50.00				

Median : 117.465 (μm) Mean: 95.793 (μm) Mode: 142.450 (μm)
Std. Dev.: 72.793 (μm) Span: 0.446
Coef. Var: 75.99% Spec. Area: 8925 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 09:58

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-078 09:19
Filename : SY102013
Sample : 1289

Material :
Source : SY 102
Lot Numbe :

Condition
T%(He-Ne): 84.6% Dist.Form: Std. Sampling times : 100
(LAMP): 77.5% R.R.Index: 1.16-0.00i ( )

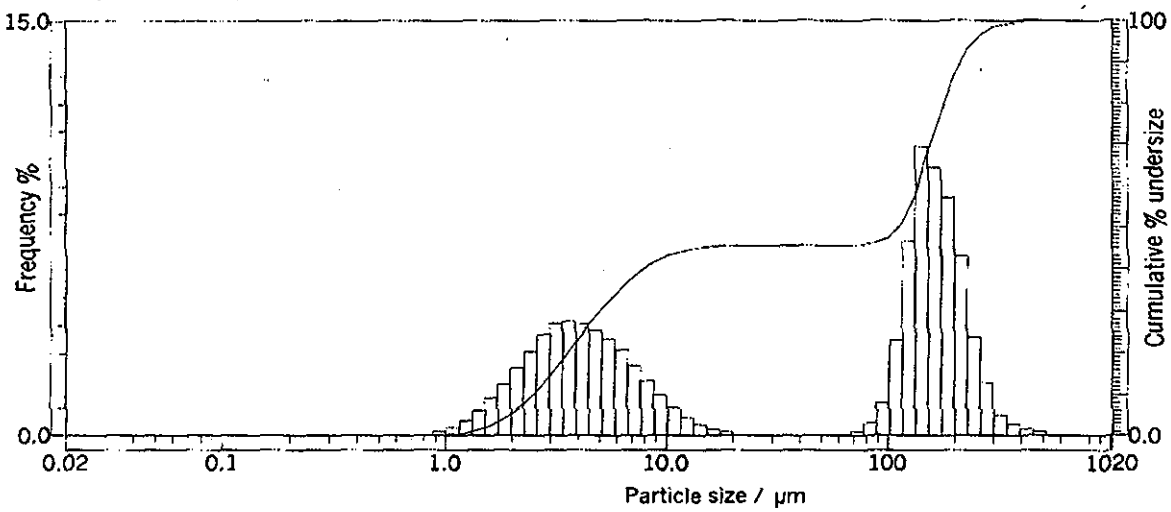
Agitation : 1 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 112.564μm SP.Area : 8240cm²/cm³ S.D. : 93.496μm
Mode : 144.971μm Mean : 96.540μm
C.V. : 96.85%

Span : (D 10.0-D 90.0) / D50 = 1.890

Dia. on %(5.0%) : 1.958μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 4.244μm % on Dia.(1.000μm) : 0.1%
Dia. on %(50.0%) : 112.564μm % on Dia.(10.000μm) : 43.0%
Dia. on %(75.0%) : 167.622μm % on Dia.(100.000μm) : 47.2%
Dia. on %(95.0%) : 247.726μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	45.53	0.669	0.00	0.00
890.1	0.00	100.00	22.80	0.00	45.53	0.584	0.00	0.00
777.1	0.00	100.00	19.90	0.12	45.53	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.24	45.41	0.445	0.00	0.00
592.4	0.00	100.00	15.17	0.41	45.16	0.389	0.00	0.00
517.2	0.13	100.00	13.25	0.67	44.75	0.339	0.00	0.00
451.6	0.24	99.87	11.56	1.02	44.09	0.296	0.00	0.00
394.2	0.43	99.63	10.10	1.48	43.06	0.259	0.00	0.00
344.2	0.77	99.20	8.816	2.01	41.58	0.226	0.00	0.00
300.5	1.93	98.44	7.697	2.55	39.57	0.197	0.00	0.00
262.4	3.55	96.50	6.720	3.11	37.02	0.172	0.00	0.00
229.1	6.46	92.95	5.867	3.51	33.90	0.150	0.00	0.00
200.0	8.57	86.49	5.122	3.83	30.39	0.131	0.00	0.00
174.6	9.69	77.92	4.472	4.05	26.56	0.115	0.00	0.00
152.5	10.43	68.23	3.905	4.12	22.51	0.100	0.00	0.00
133.1	6.99	57.80	3.409	4.06	18.39	0.087	0.00	0.00
116.2	3.45	50.81	2.976	3.67	14.33	0.076	0.00	0.00
101.5	1.18	47.36	2.599	3.04	10.66	0.067	0.00	0.00
88.58	0.48	46.18	2.269	2.46	7.62	0.058	0.00	0.00
77.34	0.17	45.70	1.981	1.88	5.16	0.051	0.00	0.00
67.52	0.00	45.53	1.729	1.37	3.28	0.044	0.00	0.00
58.95	0.00	45.53	1.510	0.91	1.91	0.039	0.00	0.00
51.47	0.00	45.53	1.318	0.55	1.00	0.034	0.00	0.00
44.94	0.00	45.53	1.151	0.30	0.45	0.029	0.00	0.00
39.23	0.00	45.53	1.005	0.15	0.15	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01
File Name: SY102013.DAT Sample Name: 1289 ID No: 01/09/28-078
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 84.620 % Lamp: 77.513 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: Source: SY 102
Lot No: Test No: Dup

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.965	0.10	0.10	(15)	126.337	5.00	55.00
(2)	1.318	0.90	1.00	(16)	137.185	5.00	60.00
(3)	1.572	1.30	2.30	(17)	146.459	5.00	65.00
(4)	1.959	2.70	5.00	(18)	156.500	5.00	70.00
(5)	2.527	5.00	10.00	(19)	167.942	5.00	75.00
(6)	3.047	5.00	15.00	(20)	180.784	5.00	80.00
(7)	3.133	0.80	15.80	(21)	193.218	4.20	84.20
(8)	3.603	4.20	20.00	(22)	195.587	0.80	85.00
(9)	4.253	5.00	25.00	(23)	215.787	5.00	90.00
(10)	5.056	5.00	30.00	(24)	248.279	5.00	95.00
(11)	6.168	5.00	35.00	(25)	286.007	2.70	97.70
(12)	7.935	5.00	40.00	(26)	332.607	1.30	99.00
(13)	14.408	5.00	45.00	(27)	467.389	0.90	99.90
(14)	112.746	5.00	50.00				

Median : 112.564 (μm) Mean: 96.540 (μm) Mode: 142.450 (μm)
Std. Dev.: 93.496 (μm) Span: 0.712
Coef. Var: 96.85% Spec. Area: 8240 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 09:58

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-079 09:23
Filename : SY102014
Sample : 1289

Material :
Source : SY 102
Lot Numbe :

Condition
T%(He-Ne): 84.8% Dist.Form: Std. Sampling times : 100
(LAMP): 77.4% R.R.Index: 1.16-0.00i ( )

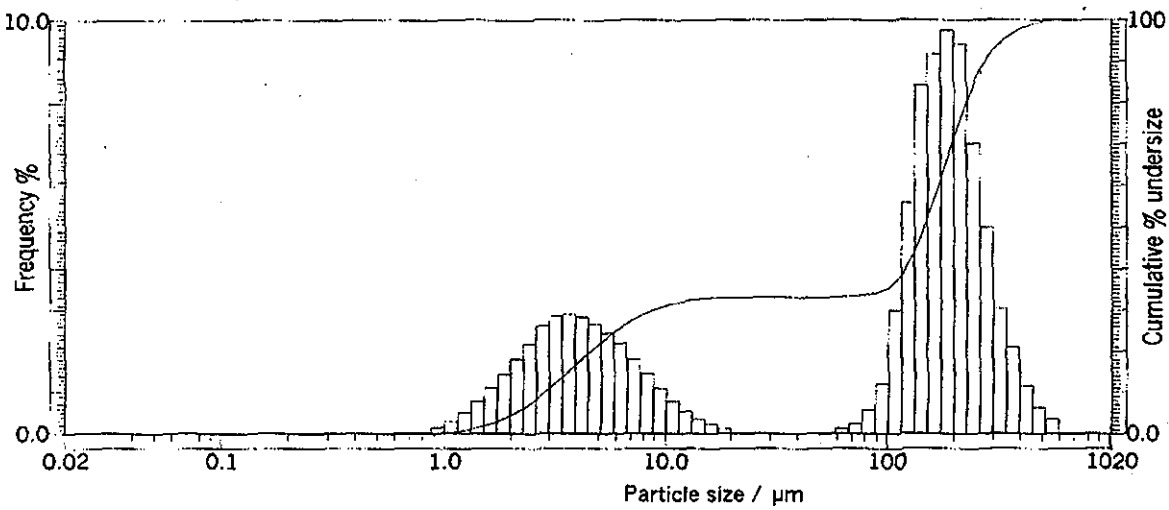
Agitation : 3 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 146.974μm SP.Area : 6210cm²/cm³ S.D. : 114.548μm
Mode : 187.191μm Mean : 137.902μm
C.V. : 83.06%

Span : (D 10.0-D 90.0) / D50 = 1.882

Dia. on %(5.0%) : 2.090μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 6.037μm % on Dia.(1.000μm) : 0.2%
Dia. on %(50.0%) : 146.974μm % on Dia.(10.000μm) : 31.0%
Dia. on %(75.0%) : 211.157μm % on Dia.(100.000μm) : 35.1%
Dia. on %(95.0%) : 333.301μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	33.11	0.669	0.00	0.00
890.1	0.00	100.00	22.80	0.00	33.11	0.584	0.00	0.00
777.1	0.00	100.00	19.90	0.13	33.11	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.23	32.98	0.445	0.00	0.00
592.4	0.36	100.00	15.17	0.35	32.75	0.389	0.00	0.00
517.2	0.65	99.64	13.25	0.54	32.40	0.339	0.00	0.00
451.6	1.17	98.99	11.56	0.79	31.86	0.296	0.00	0.00
394.2	2.10	97.82	10.10	1.10	31.08	0.259	0.00	0.00
344.2	3.04	95.72	8.816	1.45	29.98	0.226	0.00	0.00
300.5	5.00	92.68	7.697	1.81	28.54	0.197	0.00	0.00
262.4	7.02	87.68	6.720	2.18	26.73	0.172	0.00	0.00
229.1	9.44	80.66	5.867	2.45	24.54	0.150	0.00	0.00
200.0	9.75	71.23	5.122	2.66	22.09	0.131	0.00	0.00
174.6	9.20	61.47	4.472	2.82	19.43	0.115	0.00	0.00
152.5	8.44	52.28	3.905	2.88	16.61	0.100	0.00	0.00
133.1	5.58	43.84	3.409	2.84	13.73	0.087	0.00	0.00
116.2	3.00	38.26	2.976	2.60	10.88	0.076	0.00	0.00
101.5	1.21	35.26	2.599	2.19	8.29	0.067	0.00	0.00
88.58	0.57	34.05	2.269	1.81	6.09	0.058	0.00	0.00
77.34	0.25	33.48	1.981	1.44	4.28	0.051	0.00	0.00
67.52	0.13	33.23	1.729	1.11	2.85	0.044	0.00	0.00
58.95	0.00	33.11	1.510	0.78	1.74	0.039	0.00	0.00
51.47	0.00	33.11	1.318	0.51	0.96	0.034	0.00	0.00
44.94	0.00	33.11	1.151	0.30	0.46	0.029	0.00	0.00
39.23	0.00	33.11	1.005	0.16	0.16	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01
File Name: SY102014.DAT Sample Name: 1289 ID No: 01/09/28-079
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 84.799 % Lamp: 77.355 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: Source: SY 102
Lot No: Test No: Dup

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.959	0.10	0.10	(15)	159.020	5.00	55.00
(2)	1.327	0.90	1.00	(16)	171.070	5.00	60.00
(3)	1.621	1.30	2.30	(17)	183.799	5.00	65.00
(4)	2.095	2.70	5.00	(18)	196.811	5.00	70.00
(5)	2.848	5.00	10.00	(19)	211.628	5.00	75.00
(6)	3.628	5.00	15.00	(20)	227.032	5.00	80.00
(7)	3.766	0.80	15.80	(21)	245.851	4.20	84.20
(8)	4.612	4.20	20.00	(22)	249.645	0.80	85.00
(9)	6.046	5.00	25.00	(23)	280.043	5.00	90.00
(10)	8.834	5.00	30.00	(24)	333.844	5.00	95.00
(11)	98.675	5.00	35.00	(25)	391.328	2.70	97.70
(12)	121.479	5.00	40.00	(26)	452.511	1.30	99.00
(13)	135.767	5.00	45.00	(27)	571.534	0.90	99.90
(14)	147.235	5.00	50.00				

Median : 146.974 (μm) Mean: 137.902 (μm) Mode: 186.878 (μm)
Std. Dev.: 114.548 (μm) Span: 0.831
Coef. Var: 83.07% Spec. Area: 6210 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 09:58

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-080 09:28
Filename : SY102015
Sample : 1289

Material :
Source : SY 102
Lot Numbe :

Condition
T%(He-Ne): 85.7% Dist.Form: Std. Sampling times : 100
(LAMP): 76.5% R.R.Index: 1.16-0.00i ( )

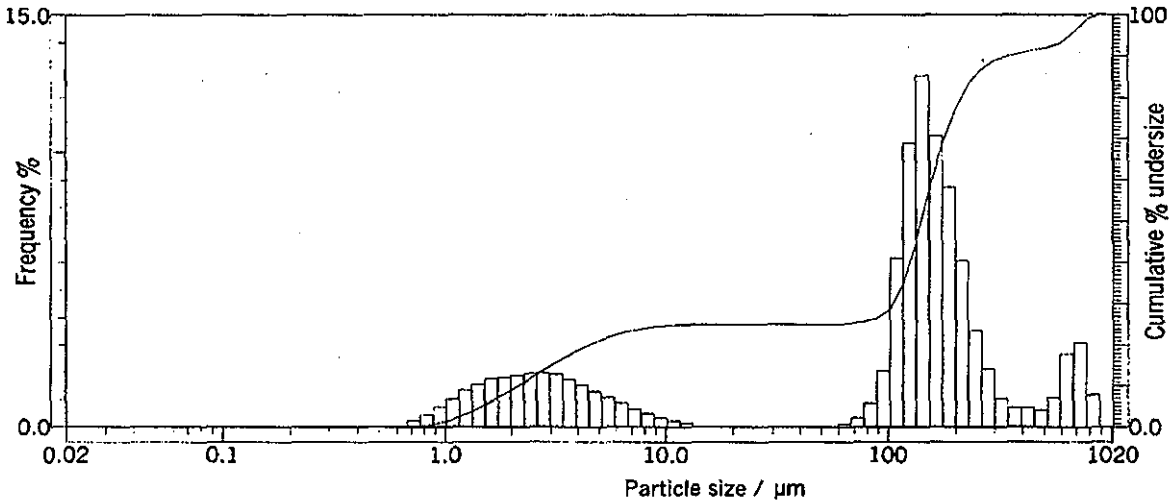
Agitation : 3 Circultn : 6 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 140.333μm SP.Area : 7225cm²/cm³ S.D. : 179.019μm
Mode : 142.660μm Mean : 169.983μm
C.V. : 105.32%

Span : (D 10.0-D 90.0) / D50 = 2.466

Dia. on %(5.0%) : 1.464μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 11.608μm % on Dia.(1.000μm) : 1.4%
Dia. on %(50.0%) : 140.333μm % on Dia.(10.000μm) : 24.8%
Dia. on %(75.0%) : 193.382μm % on Dia.(100.000μm) : 28.3%
Dia. on %(95.0%) : 654.116μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	25.14	0.669	0.00	0.00
890.1	1.19	100.00	22.80	0.00	25.14	0.584	0.00	0.00
777.1	3.09	98.81	19.90	0.00	25.14	0.510	0.00	0.00
678.5	2.68	95.72	17.38	0.00	25.14	0.445	0.00	0.00
592.4	1.06	93.04	15.17	0.00	25.14	0.389	0.00	0.00
517.2	0.61	91.98	13.25	0.14	25.14	0.339	0.00	0.00
451.6	0.72	91.37	11.56	0.22	25.00	0.296	0.00	0.00
394.2	0.71	90.65	10.10	0.33	24.78	0.259	0.00	0.00
344.2	1.05	89.94	8.816	0.48	24.44	0.226	0.00	0.00
300.5	2.13	88.89	7.697	0.66	23.96	0.197	0.00	0.00
262.4	3.53	86.76	6.720	0.88	23.30	0.172	0.00	0.00
229.1	6.06	83.23	5.867	1.08	22.42	0.150	0.00	0.00
200.0	8.75	77.17	5.122	1.30	21.34	0.131	0.00	0.00
174.6	10.61	68.42	4.472	1.53	20.04	0.115	0.00	0.00
152.5	12.80	57.81	3.905	1.75	18.51	0.100	0.00	0.00
133.1	10.33	45.01	3.409	1.93	16.76	0.087	0.00	0.00
116.2	6.14	34.68	2.976	2.01	14.82	0.076	0.00	0.00
101.5	2.07	28.54	2.599	1.97	12.82	0.067	0.00	0.00
88.58	0.88	26.47	2.269	1.90	10.85	0.058	0.00	0.00
77.34	0.34	25.60	1.981	1.83	8.94	0.051	0.00	0.00
67.52	0.13	25.26	1.729	1.76	7.12	0.044	0.00	0.00
58.95	0.00	25.14	1.510	1.57	5.36	0.039	0.00	0.00
51.47	0.00	25.14	1.318	1.35	3.79	0.034	0.00	0.00
44.94	0.00	25.14	1.151	1.05	2.44	0.029	0.00	0.00
39.23	0.00	25.14	1.005	0.73	1.39	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01
File Name: SY102015.DAT Sample Name: 1289 ID No: 01/09/28-080
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 85.664 % Lamp: 76.500 %
Circulation: 6 Agitation: 3 U.Sonic ** (min)
Material: Source: SY 102
Lot No: Test No: Dup

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.712	0.10	0.10	(15)	148.202	5.00	55.00
(2)	0.937	0.90	1.00	(16)	157.024	5.00	60.00
(3)	1.131	1.30	2.30	(17)	167.472	5.00	65.00
(4)	1.466	2.70	5.00	(18)	179.203	5.00	70.00
(5)	2.140	5.00	10.00	(19)	193.707	5.00	75.00
(6)	3.016	5.00	15.00	(20)	213.576	5.00	80.00
(7)	3.195	0.80	15.80	(21)	238.211	4.20	84.20
(8)	4.457	4.20	20.00	(22)	245.756	0.80	85.00
(9)	11.611	5.00	25.00	(23)	348.497	5.00	90.00
(10)	104.965	5.00	30.00	(24)	655.278	5.00	95.00
(11)	116.728	5.00	35.00	(25)	741.651	2.70	97.70
(12)	124.907	5.00	40.00	(26)	795.084	1.30	99.00
(13)	133.085	5.00	45.00	(27)	880.613	0.90	99.90
(14)	140.644	5.00	50.00				

Median : 140.333 (μm) Mean: 169.983 (μm) Mode: 142.450 (μm)
Std. Dev.: 179.019 (μm) Span: 3.283
Coef. Var: 105.32% Spec. Area: 7225 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/04/'01 09:58

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-081 09:32
Filename : SY102016
Sample : 1289

Material :
Source : SY 102
Lot Numbe :

Condition
T%(He-Ne): 85.7% Dist.Form: Std. Sampling times : 100
(LAMP): 76.6% R.R.Index: 1.16-0.00i ( )

Agitation : 1 Circultn : 6 U.sonic : ~~ON~~ OFF (120)

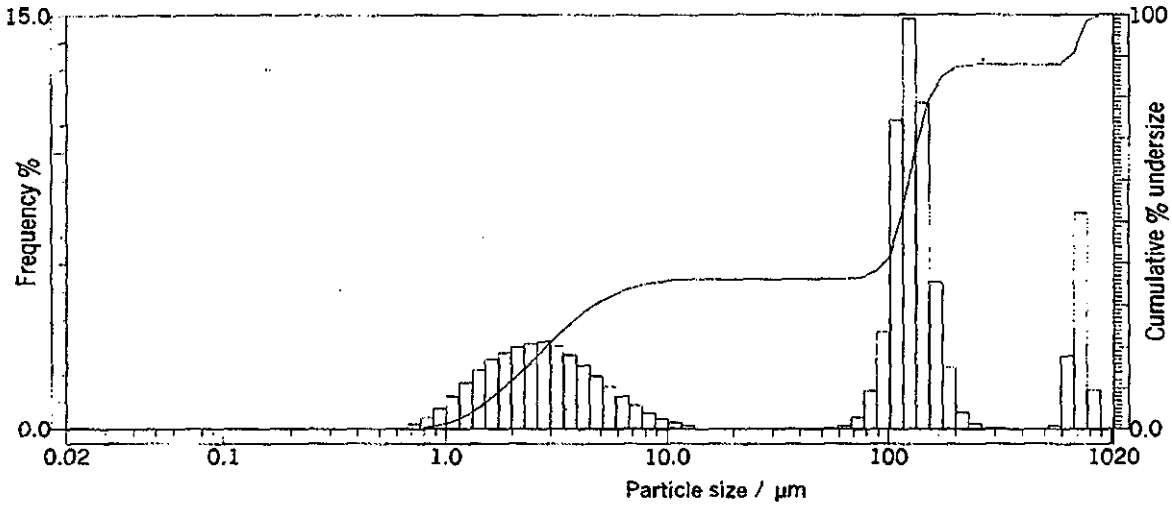
WSC 10/8/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 112.200μm SP.Area : 9845cm²/cm³ S.D. : 217.973μm
Mode : 124.713μm Mean : 154.626μm
C.V. : 140.97%

Span : (D 10.0-D 90.0) / D50 = 5.809

Dia. on %(5.0%) :	1.381μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	3.548μm	% on Dia.(1.000μm) :	1.3%
Dia. on %(50.0%) :	112.200μm	% on Dia.(10.000μm) :	35.8%
Dia. on %(75.0%) :	144.680μm	% on Dia.(100.000μm) :	41.3%
Dia. on %(95.0%) :	730.627μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	36.19	0.669	0.00	0.00
890.1	1.45	100.00	22.80	0.00	36.19	0.584	0.00	0.00
777.1	7.82	98.55	19.90	0.00	36.19	0.510	0.00	0.00
678.5	2.68	90.74	17.38	0.00	36.19	0.445	0.00	0.00
592.4	0.13	88.06	15.17	0.00	36.19	0.389	0.00	0.00
517.2	0.00	87.93	13.25	0.14	36.19	0.339	0.00	0.00
451.6	0.00	87.93	11.56	0.24	36.05	0.296	0.00	0.00
394.2	0.00	87.93	10.10	0.39	35.81	0.259	0.00	0.00
344.2	0.00	87.93	8.816	0.60	35.43	0.226	0.00	0.00
300.5	0.00	87.93	7.697	0.87	34.82	0.197	0.00	0.00
262.4	0.19	87.93	6.720	1.21	33.95	0.172	0.00	0.00
229.1	0.60	87.75	5.867	1.55	32.74	0.150	0.00	0.00
200.0	2.26	87.14	5.122	1.93	31.18	0.131	0.00	0.00
174.6	5.34	84.89	4.472	2.33	29.25	0.115	0.00	0.00
152.5	11.79	79.55	3.905	2.72	26.92	0.100	0.00	0.00
133.1	14.86	67.75	3.409	3.06	24.20	0.087	0.00	0.00
116.2	11.19	52.90	2.976	3.21	21.14	0.076	0.00	0.00
101.5	3.54	41.70	2.599	3.14	17.92	0.067	0.00	0.00
88.58	1.40	38.16	2.269	3.01	14.79	0.058	0.00	0.00
77.34	0.44	36.76	1.981	2.81	11.78	0.051	0.00	0.00
67.52	0.13	36.32	1.729	2.56	8.98	0.044	0.00	0.00
58.95	0.00	36.19	1.510	2.16	6.41	0.039	0.00	0.00
51.47	0.00	36.19	1.318	1.70	4.25	0.034	0.00	0.00
44.94	0.00	36.19	1.151	1.21	2.56	0.029	0.00	0.00
39.23	0.00	36.19	1.005	0.76	1.35	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/04/01
File Name: SY102016.DAT Sample Name: 1289 ID No: 01/09/28-081
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 85.731 % Lamp: 76.583 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: Source: SY 102
Lot No: Test No: Dup

WSC 10/8/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.721	0.10	0.10	(15)	118.603	5.00	55.00
(2)	0.946	0.90	1.00	(16)	124.288	5.00	60.00
(3)	1.120	1.30	2.30	(17)	129.973	5.00	65.00
(4)	1.384	2.70	5.00	(18)	136.790	5.00	70.00
(5)	1.821	5.00	10.00	(19)	144.993	5.00	75.00
(6)	2.291	5.00	15.00	(20)	154.333	5.00	80.00
(7)	2.375	0.80	15.80	(21)	171.759	4.20	84.20
(8)	2.843	4.20	20.00	(22)	175.870	0.80	85.00
(9)	3.555	5.00	25.00	(23)	654.772	5.00	90.00
(10)	4.724	5.00	30.00	(24)	732.289	5.00	95.00
(11)	8.027	5.00	35.00	(25)	766.360	2.70	97.70
(12)	95.269	5.00	40.00	(26)	811.967	1.30	99.00
(13)	105.804	5.00	45.00	(27)	882.302	0.90	99.90
(14)	112.394	5.00	50.00				

Median : 112.200 (μm) Mean: 154.626 (μm) Mode: 124.370 (μm)
Std. Dev.: 217.973 (μm) Span: 5.222
Coef. Var: 140.97% Spec. Area: 9845 (cm2/cm3)

APPENDIX F-15

AW-103 FRACTIONAL SETTLING SAMPLE: PSD MEASUREMENT RESULTS

Consisting of 18 pages including this cover page

TABLE F-15. Sample identification and PSD run conditions. Sample from fractional settling tests on AW-103 composite.

Conditions Key: P = Pump Speed Setting; P6 = 14.4 mL/s
S = Stirrer Speed Setting (1-7); S1 = Stirrer Speed 1; S3 = Stirrer Speed 3
US = Ultrasonic ON Time (min); DT = Delay Time (min) between end of ultrasonic treatment and PSD measurement.
Time = Clock time at beginning of measurement.

Sample	PSD Run File Name	Run Conditions				Time	Cumulative Time (min) At Conditions				
		P	S	US	DT		P6	S1	S3	US	DT
S01T001344	[LOAD-IN]	6	1	0	0	?	?	?			
	AW103972	6	1	0	0	16:17	4	4			
	AW103973	6	3	0	0	16:21	7	4	3		
	AW103974	6	3	2	0	16:24	12	4	8	2	0
	AW103975	6	1	0	0	16:29	14	6	8	2	3
						16:31					
S01T001344	[LOAD-IN]	6	1	0	0	?	?	?			
	AW103976	6	1	0	0	16:37	5	5			
	AW103977	6	3	0	0	16:42	8	5	3		
	AW103978	6	3	2	0	16:45	13	5	8	2	0
	AW103979	6	1	0	0	16:50	17	9	8	2	3
						16:54					

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/01/'01 15:30

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010927-040 16:19
Filename : AW103972
Sample : AW103

Material : Fractional Settling
Source :
Lot Numbe : 1344

Condition
T%(He-Ne): 87.7% Dist.Form: Std. Sampling times : 100
(LAMP): 87.1% R.R.Index: 1.16-0.00i ( )

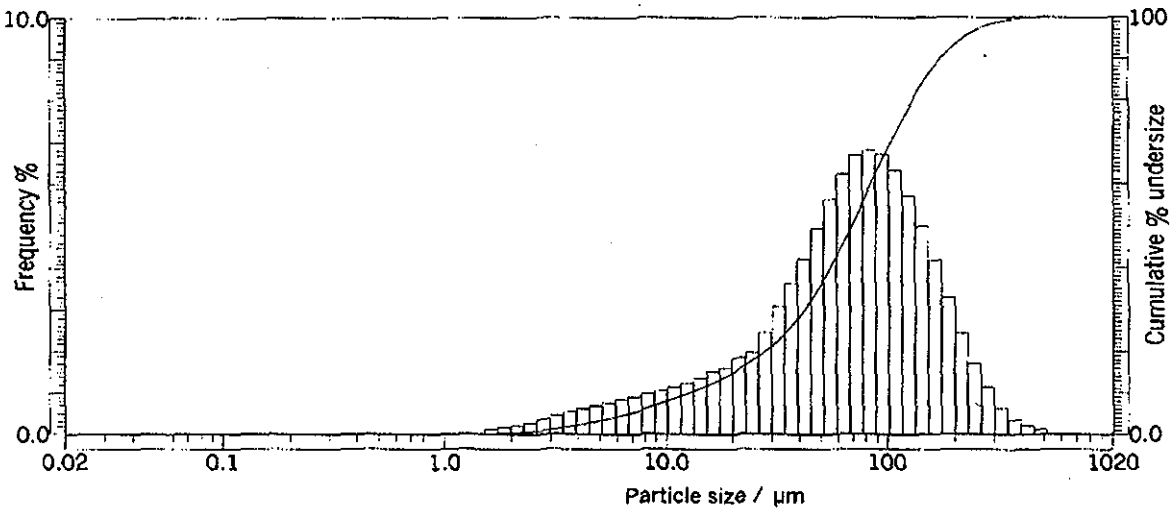
Agitation : 1 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 69.224μm SP.Area : 2100cm²/cm³ S.D. : 68.475μm
Mode : 82.782μm Mean : 84.665μm
C.V. : 80.88%

Span : (D 10.0-D 90.0) / D50 = 2.330

Dia. on %(5.0%) : 6.699μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 35.344μm % on Dia.(1.000μm) : 0.0%
Dia. on %(50.0%) : 69.224μm % on Dia.(10.000μm) : 7.9%
Dia. on %(75.0%) : 115.599μm % on Dia.(100.000μm) : 68.2%
Dia. on %(95.0%) : 218.604μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.97	18.66	0.669	0.00	0.00
890.1	0.00	100.00	22.80	1.85	16.69	0.584	0.00	0.00
777.1	0.00	100.00	19.90	1.61	14.84	0.510	0.00	0.00
678.5	0.00	100.00	17.38	1.52	13.24	0.445	0.00	0.00
592.4	0.00	100.00	15.17	1.37	11.72	0.389	0.00	0.00
517.2	0.11	100.00	13.25	1.24	10.35	0.339	0.00	0.00
451.6	0.20	99.89	11.56	1.15	9.11	0.296	0.00	0.00
394.2	0.35	99.69	10.10	1.06	7.97	0.259	0.00	0.00
344.2	0.64	99.34	8.816	0.98	6.91	0.226	0.00	0.00
300.5	1.15	98.70	7.697	0.90	5.92	0.197	0.00	0.00
262.4	1.71	97.56	6.720	0.85	5.02	0.172	0.00	0.00
229.1	2.44	95.84	5.867	0.76	4.17	0.150	0.00	0.00
200.0	3.29	93.40	5.122	0.68	3.41	0.131	0.00	0.00
174.6	4.18	90.11	4.472	0.61	2.73	0.115	0.00	0.00
152.5	4.98	85.93	3.905	0.54	2.12	0.100	0.00	0.00
133.1	5.71	80.95	3.409	0.46	1.58	0.087	0.00	0.00
116.2	6.31	75.25	2.976	0.36	1.12	0.076	0.00	0.00
101.5	6.69	68.93	2.599	0.28	0.76	0.067	0.00	0.00
88.58	6.79	62.24	2.269	0.21	0.48	0.058	0.00	0.00
77.34	6.68	55.45	1.981	0.16	0.28	0.051	0.00	0.00
67.52	6.22	48.78	1.729	0.12	0.12	0.044	0.00	0.00
58.95	5.63	42.56	1.510	0.00	0.00	0.039	0.00	0.00
51.47	4.95	36.93	1.318	0.00	0.00	0.034	0.00	0.00
44.94	4.21	31.98	1.151	0.00	0.00	0.029	0.00	0.00
39.23	3.61	27.78	1.005	0.00	0.00	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/01/01
File Name: AW103972.DAT Sample Name: AW103 ID No: 01/09/27-040
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 87.654 % Lamp: 87.130 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: Fractional Settling Source:
Lot No: 1344 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	1.690	0.10	0.10	(15)	76.674	5.00	55.00
(2)	2.848	0.90	1.00	(16)	84.867	5.00	60.00
(3)	4.073	1.30	2.30	(17)	93.886	5.00	65.00
(4)	6.700	2.70	5.00	(18)	103.951	5.00	70.00
(5)	12.769	5.00	10.00	(19)	115.637	5.00	75.00
(6)	20.149	5.00	15.00	(20)	130.285	5.00	80.00
(7)	21.402	0.80	15.80	(21)	145.731	4.20	84.20
(8)	28.192	4.20	20.00	(22)	148.841	0.80	85.00
(9)	35.403	5.00	25.00	(23)	174.054	5.00	90.00
(10)	42.250	5.00	30.00	(24)	219.053	5.00	95.00
(11)	48.918	5.00	35.00	(25)	267.160	2.70	97.70
(12)	55.548	5.00	40.00	(26)	320.883	1.30	99.00
(13)	62.317	5.00	45.00	(27)	457.115	0.90	99.90
(14)	69.322	5.00	50.00				

Median : 69.224 (μm) Mean: 84.665 (μm) Mode: 82.770 (μm)
Std. Dev.: 68.475 (μm) Span: 1.488
Coef. Var: 80.88% Spec. Area: 2101 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/01/'01 15:30

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010927-041 16:23
Filename : AW103973
Sample : AW103

Material : Fractional Settling
Source :
Lot Numbe : 1344

Condition
T%(He-Ne): 85.5% Dist.Form: Std. Sampling times : 100
(LAMP): 84.9% R.R.index: 1.16-0.00i ( )

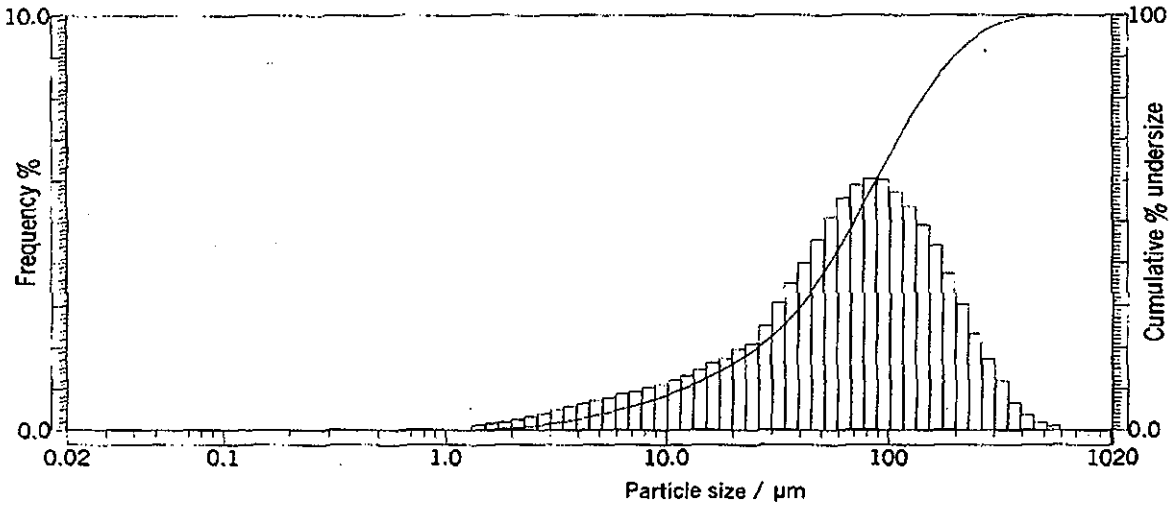
Agitation : 3 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 70.255μm SP.Area : 2234cm²/cm³ S.D. : 80.001μm
Mode : 82.900μm Mean : 91.234μm
C.V. : 87.69%

Span : (D 10.0-D 90.0) / D50 = 2.643

Dia. on %(5.0%) : 6.224μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 33.413μm % on Dia.(1.000μm) : 0.0%
Dia. on %(50.0%) : 70.255μm % on Dia.(10.000μm) : 8.5%
Dia. on %(75.0%) : 125.657μm % on Dia.(100.000μm) : 65.6%
Dia. on %(95.0%) : 251.651μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	2.09	19.98	0.669	0.00	0.00
890.1	0.00	100.00	22.80	1.97	17.89	0.584	0.00	0.00
777.1	0.00	100.00	19.90	1.73	15.92	0.510	0.00	0.00
678.5	0.00	100.00	17.38	1.63	14.19	0.445	0.00	0.00
592.4	0.11	100.00	15.17	1.46	12.56	0.389	0.00	0.00
517.2	0.21	99.89	13.25	1.32	11.09	0.339	0.00	0.00
451.6	0.37	99.68	11.56	1.21	9.77	0.296	0.00	0.00
394.2	0.67	99.31	10.10	1.11	8.56	0.259	0.00	0.00
344.2	1.20	98.64	8.816	1.02	7.44	0.226	0.00	0.00
300.5	1.73	97.45	7.697	0.93	6.42	0.197	0.00	0.00
262.4	2.34	95.72	6.720	0.87	5.49	0.172	0.00	0.00
229.1	3.03	93.38	5.867	0.78	4.62	0.150	0.00	0.00
200.0	3.75	90.35	5.122	0.70	3.85	0.131	0.00	0.00
174.6	4.42	86.60	4.472	0.64	3.14	0.115	0.00	0.00
152.5	4.91	82.18	3.905	0.57	2.51	0.100	0.00	0.00
133.1	5.36	77.27	3.409	0.49	1.94	0.087	0.00	0.00
116.2	5.71	71.91	2.976	0.40	1.45	0.076	0.00	0.00
101.5	6.01	66.20	2.599	0.32	1.04	0.067	0.00	0.00
88.58	6.03	60.19	2.269	0.25	0.72	0.058	0.00	0.00
77.34	5.87	54.16	1.981	0.19	0.48	0.051	0.00	0.00
67.52	5.55	48.28	1.729	0.16	0.28	0.044	0.00	0.00
58.95	5.10	42.73	1.510	0.12	0.12	0.039	0.00	0.00
51.47	4.56	37.64	1.318	0.00	0.00	0.034	0.00	0.00
44.94	3.99	33.07	1.151	0.00	0.00	0.029	0.00	0.00
39.23	3.52	29.08	1.005	0.00	0.00	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/01/01
File Name: AW103973.DAT Sample Name: AW103 ID No: 01/09/27-041
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 85.503 % Lamp: 84.851 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: Fractional Settling Source:
Lot No: 1344 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	1.476	0.10	0.10	(15)	78.910	5.00	55.00
(2)	2.555	0.90	1.00	(16)	88.229	5.00	60.00
(3)	3.724	1.30	2.30	(17)	98.885	5.00	65.00
(4)	6.238	2.70	5.00	(18)	111.267	5.00	70.00
(5)	11.857	5.00	10.00	(19)	125.938	5.00	75.00
(6)	18.563	5.00	15.00	(20)	143.851	5.00	80.00
(7)	19.731	0.80	15.80	(21)	162.575	4.20	84.20
(8)	26.139	4.20	20.00	(22)	166.589	0.80	85.00
(9)	33.458	5.00	25.00	(23)	197.648	5.00	90.00
(10)	40.547	5.00	30.00	(24)	252.137	5.00	95.00
(11)	47.698	5.00	35.00	(25)	309.789	2.70	97.70
(12)	54.941	5.00	40.00	(26)	370.929	1.30	99.00
(13)	62.453	5.00	45.00	(27)	526.544	0.90	99.90
(14)	70.391	5.00	50.00				

Median : 70.255 (μm) Mean: 91.234 (μm) Mode: 82.770 (μm)
Std. Dev.: 80.001 (μm) Span: 1.793
Coef. Var: 87.69% Spec. Area: 2234 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/01/'01 15:30

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010927-042 16:28
Filename : AW103974
Sample : AW103

Material : Fractional Settling
Source :
Lot Numbe : 1344

Condition
T%(He-Ne): 75.8% Dist.Form: Std. Sampling times : 100
(LAMP): 69.1% R.R.Index: 1.16-0.00i ( )

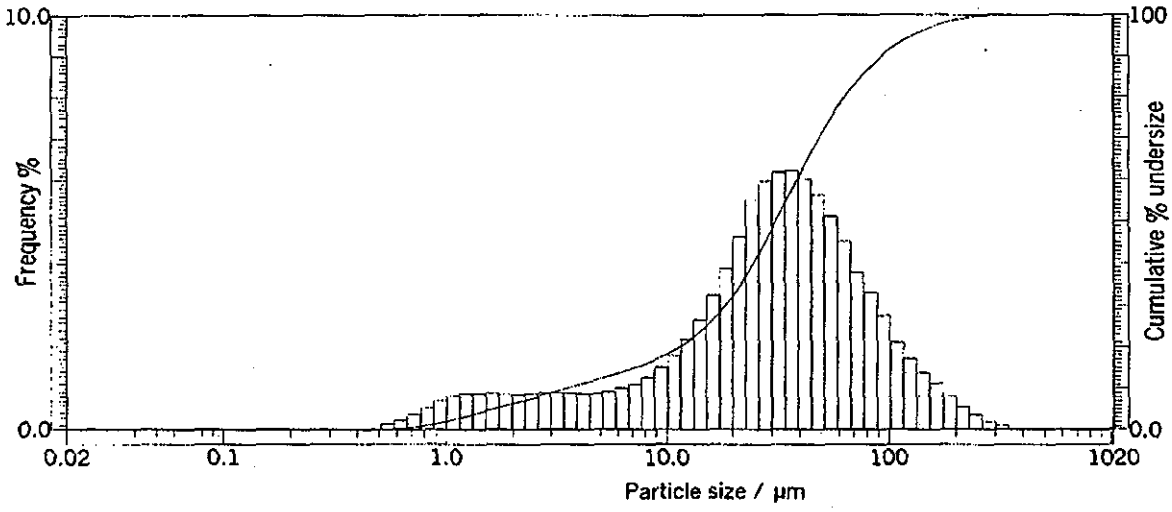
Agitation : 3 Circultn : 6 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 31.166μm SP.Area : 6621cm²/cm³ S.D. : 42.675μm
Mode : 36.596μm Mean : 42.795μm
C.V. : 99.72%

Span : (D 10.0-D 90.0) / D50 = 2.895

Dia. on %(5.0%) : 1.615μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 15.224μm % on Dia.(1.000μm) : 2.0%
Dia. on %(50.0%) : 31.166μm % on Dia.(10.000μm) : 18.2%
Dia. on %(75.0%) : 55.524μm % on Dia.(100.000μm) : 91.3%
Dia. on %(95.0%) : 128.634μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	5.51	42.18	0.669	0.23	0.37
890.1	0.00	100.00	22.80	4.63	36.67	0.584	0.14	0.14
777.1	0.00	100.00	19.90	3.88	32.04	0.510	0.00	0.00
678.5	0.00	100.00	17.38	3.25	28.16	0.445	0.00	0.00
592.4	0.00	100.00	15.17	2.66	24.92	0.389	0.00	0.00
517.2	0.00	100.00	13.25	2.17	22.26	0.339	0.00	0.00
451.6	0.00	100.00	11.56	1.80	20.09	0.296	0.00	0.00
394.2	0.00	100.00	10.10	1.50	18.29	0.259	0.00	0.00
344.2	0.11	100.00	8.816	1.27	16.79	0.226	0.00	0.00
300.5	0.20	99.89	7.697	1.11	15.52	0.197	0.00	0.00
262.4	0.36	99.69	6.720	1.01	14.41	0.172	0.00	0.00
229.1	0.56	99.33	5.867	0.92	13.40	0.150	0.00	0.00
200.0	0.83	98.77	5.122	0.88	12.48	0.131	0.00	0.00
174.6	1.12	97.94	4.472	0.88	11.60	0.115	0.00	0.00
152.5	1.39	96.82	3.905	0.89	10.72	0.100	0.00	0.00
133.1	1.72	95.43	3.409	0.90	9.83	0.087	0.00	0.00
116.2	2.11	93.71	2.976	0.90	8.93	0.076	0.00	0.00
101.5	2.75	91.61	2.599	0.88	8.03	0.067	0.00	0.00
88.58	3.30	88.86	2.269	0.85	7.16	0.058	0.00	0.00
77.34	3.78	85.56	1.981	0.85	6.30	0.051	0.00	0.00
67.52	4.52	81.78	1.729	0.89	5.45	0.044	0.00	0.00
58.95	5.12	77.26	1.510	0.87	4.56	0.039	0.00	0.00
51.47	5.63	72.14	1.318	0.87	3.69	0.034	0.00	0.00
44.94	6.01	66.52	1.151	0.81	2.82	0.029	0.00	0.00
39.23	6.21	60.51	1.005	0.70	2.00	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/01/01
File Name: AW103974.DAT Sample Name: AW103 ID No: 01/09/27-042
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 75.808 % Lamp: 69.057 %
Circulation: 6 Agitation: 3 U.Sonic ** (min)
Material: Fractional Settling Source:
Lot No: 1344 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.563	0.10	0.10	(15)	34.820	5.00	55.00
(2)	0.816	0.90	1.00	(16)	38.828	5.00	60.00
(3)	1.058	1.30	2.30	(17)	43.499	5.00	65.00
(4)	1.619	2.70	5.00	(18)	48.984	5.00	70.00
(5)	3.503	5.00	10.00	(19)	55.649	5.00	75.00
(6)	7.239	5.00	15.00	(20)	64.152	5.00	80.00
(7)	7.944	0.80	15.80	(21)	73.817	4.20	84.20
(8)	11.494	4.20	20.00	(22)	75.894	0.80	85.00
(9)	15.228	5.00	25.00	(23)	93.923	5.00	90.00
(10)	18.573	5.00	30.00	(24)	128.852	5.00	95.00
(11)	21.752	5.00	35.00	(25)	169.839	2.70	97.70
(12)	24.799	5.00	40.00	(26)	211.739	1.30	99.00
(13)	27.911	5.00	45.00	(27)	304.548	0.90	99.90
(14)	31.227	5.00	50.00				

Median : 31.166 (μm) Mean: 42.795 (μm) Mode: 36.660 (μm)
Std. Dev.: 42.675 (μm) Span: 2.346
Coef. Var: 99.72% Spec. Area: 6621 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/01/'01 15:31

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010927-043 16:31
Filename : AW103975
Sample : AW103

Material : Fractional Settling
Source :
Lot Numbe : 1344

Condition
T%(He-Ne): 75.2% Dist.Form: Std. Sampling times : 100
(LAMP): 68.6% R.R.Index: 1.16-0.00i ( )

Agitation : 1 Circultn : 6 U.sonic : ~~ON~~ OFF (120)

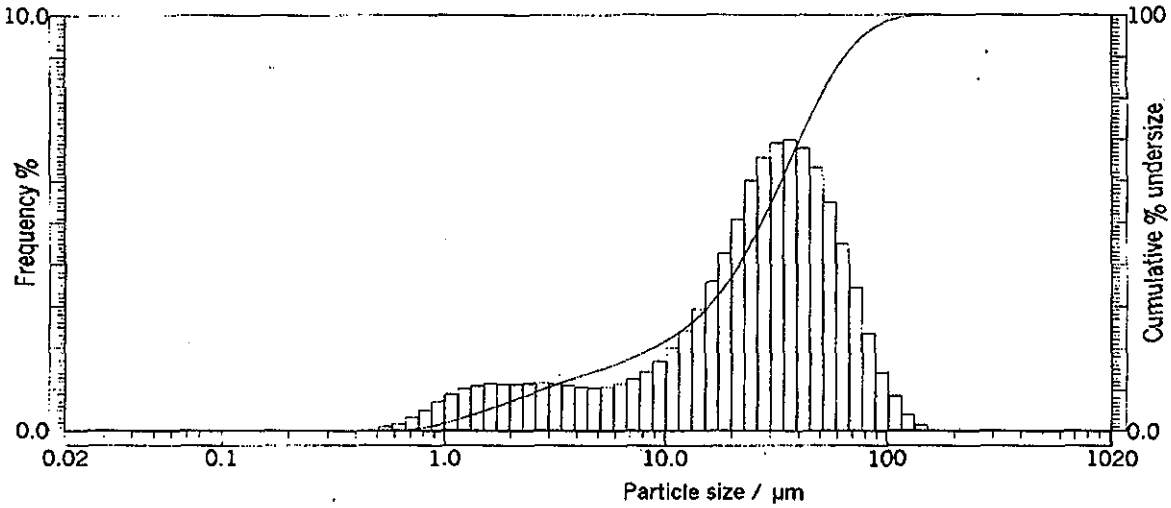
WSC 10/2/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 27.314μm SP.Area : 7370cm²/cm³ S.D. : 24.433μm
Mode : 36.613μm Mean : 31.463μm
C.V. : 77.66%

Span : (D 10.0-D 90.0) / D50 = 2.268

Dia. on %(5.0%) :	1.538μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	12.544μm	% on Dia.(1.000μm) :	1.8%
Dia. on %(50.0%) :	27.314μm	% on Dia.(10.000μm) :	21.4%
Dia. on %(75.0%) :	44.854μm	% on Dia.(100.000μm) :	98.5%
Dia. on %(95.0%) :	78.076μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	6.01	47.82	0.669	0.18	0.29
890.1	0.00	100.00	22.80	5.08	41.81	0.584	0.10	0.10
777.1	0.00	100.00	19.90	4.25	36.73	0.510	0.00	0.00
678.5	0.00	100.00	17.38	3.58	32.48	0.445	0.00	0.00
592.4	0.00	100.00	15.17	2.94	28.90	0.389	0.00	0.00
517.2	0.00	100.00	13.25	2.41	25.97	0.339	0.00	0.00
451.6	0.00	100.00	11.56	2.00	23.56	0.296	0.00	0.00
394.2	0.00	100.00	10.10	1.68	21.56	0.259	0.00	0.00
344.2	0.00	100.00	8.816	1.44	19.88	0.226	0.00	0.00
300.5	0.00	100.00	7.697	1.26	18.44	0.197	0.00	0.00
262.4	0.00	100.00	6.720	1.16	17.18	0.172	0.00	0.00
229.1	0.00	100.00	5.867	1.08	16.02	0.150	0.00	0.00
200.0	0.00	100.00	5.122	1.04	14.95	0.131	0.00	0.00
174.6	0.00	100.00	4.472	1.06	13.90	0.115	0.00	0.00
152.5	0.15	100.00	3.905	1.10	12.84	0.100	0.00	0.00
133.1	0.39	99.85	3.409	1.15	11.73	0.087	0.00	0.00
116.2	0.86	99.46	2.976	1.17	10.59	0.076	0.00	0.00
101.5	1.43	98.60	2.599	1.16	9.42	0.067	0.00	0.00
88.58	2.34	97.17	2.269	1.14	8.27	0.058	0.00	0.00
77.34	3.44	94.84	1.981	1.13	7.13	0.051	0.00	0.00
67.52	4.48	91.40	1.729	1.15	5.99	0.044	0.00	0.00
58.95	5.48	86.92	1.510	1.09	4.84	0.039	0.00	0.00
51.47	6.34	81.43	1.318	1.02	3.75	0.034	0.00	0.00
44.94	6.79	75.09	1.151	0.89	2.73	0.029	0.00	0.00
39.23	7.00	68.31	1.005	0.71	1.83	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/01/01
File Name: AW103975.DAT Sample Name: AW103 ID No: 01/09/27-043
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 75.220 % Lamp: 68.565 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: Fractional Settling Source:
Lot No: 1344 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.581	0.10	0.10	(15)	30.288	5.00	55.00
(2)	0.851	0.90	1.00	(16)	33.430	5.00	60.00
(3)	1.081	1.30	2.30	(17)	36.880	5.00	65.00
(4)	1.540	2.70	5.00	(18)	40.657	5.00	70.00
(5)	2.785	5.00	10.00	(19)	44.860	5.00	75.00
(6)	5.160	5.00	15.00	(20)	49.995	5.00	80.00
(7)	5.714	0.80	15.80	(21)	55.247	4.20	84.20
(8)	8.908	4.20	20.00	(22)	56.339	0.80	85.00
(9)	12.571	5.00	25.00	(23)	64.854	5.00	90.00
(10)	15.848	5.00	30.00	(24)	78.124	5.00	95.00
(11)	18.875	5.00	35.00	(25)	93.322	2.70	97.70
(12)	21.765	5.00	40.00	(26)	108.279	1.30	99.00
(13)	24.556	5.00	45.00	(27)	139.255	0.90	99.90
(14)	27.371	5.00	50.00				

Median : 27.314 (μm) Mean: 31.463 (μm) Mode: 36.660 (μm)
Std. Dev.: 24.433 (μm) Span: 1.216
Coef. Var: 77.66% Spec. Area: 7370 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/01/'01 15:31

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010927-044 16:40
Filename : AW103976
Sample : AW103

Material : Fractional Settling
Source :
Lot Numbe : 1344

Condition
T%(He-Ne): 86.5% Dist.Form: Std. Sampling times : 100
(LAMP): 85.8% R.R.Index: 1.16-0.00i ( )

Agitation : 1 Circultn : 6 U.sonic : ~~ON~~ OFF (120)

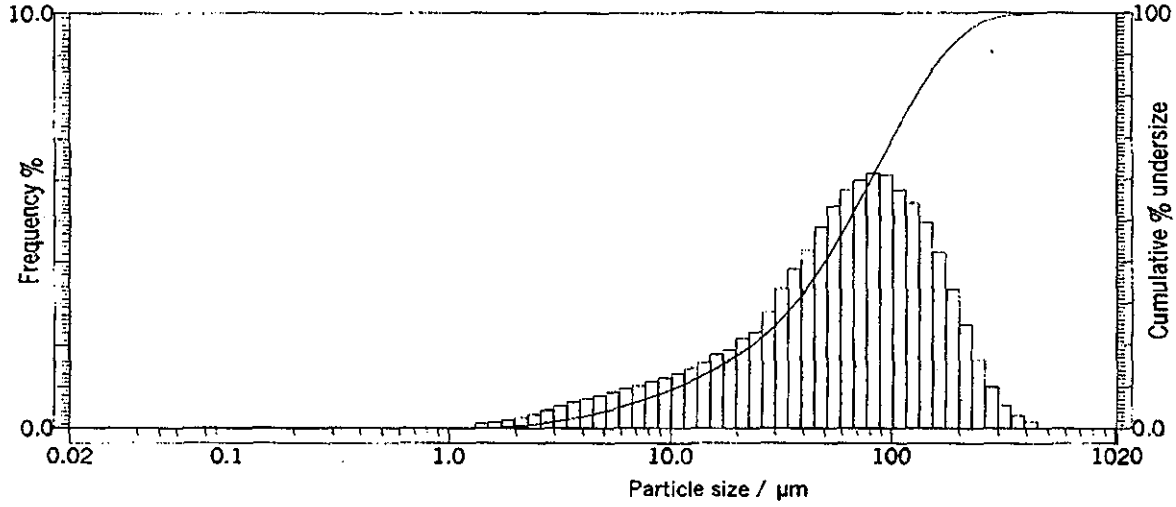
WJC 10/2/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 64.557μm SP.Area : 2366cm²/cm³ S.D. : 67.050μm
Mode : 82.903μm Mean : 80.847μm
C.V. : 82.93%

Span : (D 10.0-D 90.0) / D50 = 2.493

Dia. on %(5.0%) :	5.891μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	30.525μm	% on Dia.(1.000μm) :	0.0%
Dia. on %(50.0%) :	64.557μm	% on Dia.(10.000μm) :	9.2%
Dia. on %(75.0%) :	113.745μm	% on Dia.(100.000μm) :	69.5%
Dia. on %(95.0%) :	213.054μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	2.31	21.73	0.669	0.00	0.00
890.1	0.00	100.00	22.80	2.15	19.42	0.584	0.00	0.00
777.1	0.00	100.00	19.90	1.88	17.27	0.510	0.00	0.00
678.5	0.00	100.00	17.38	1.77	15.39	0.445	0.00	0.00
592.4	0.00	100.00	15.17	1.59	13.62	0.389	0.00	0.00
517.2	0.00	100.00	13.25	1.43	12.03	0.339	0.00	0.00
451.6	0.17	100.00	11.56	1.32	10.60	0.296	0.00	0.00
394.2	0.31	99.83	10.10	1.21	9.29	0.259	0.00	0.00
344.2	0.55	99.52	8.816	1.12	8.07	0.226	0.00	0.00
300.5	1.00	98.97	7.697	1.03	6.95	0.197	0.00	0.00
262.4	1.64	97.97	6.720	0.96	5.93	0.172	0.00	0.00
229.1	2.49	96.33	5.867	0.86	4.97	0.150	0.00	0.00
200.0	3.33	93.84	5.122	0.78	4.11	0.131	0.00	0.00
174.6	4.22	90.51	4.472	0.71	3.33	0.115	0.00	0.00
152.5	4.96	86.29	3.905	0.62	2.62	0.100	0.00	0.00
133.1	5.42	81.33	3.409	0.54	2.00	0.087	0.00	0.00
116.2	5.74	75.91	2.976	0.43	1.46	0.076	0.00	0.00
101.5	6.12	70.17	2.599	0.33	1.02	0.067	0.00	0.00
88.58	6.16	64.04	2.269	0.25	0.69	0.058	0.00	0.00
77.34	5.98	57.88	1.981	0.19	0.44	0.051	0.00	0.00
67.52	5.75	51.90	1.729	0.15	0.25	0.044	0.00	0.00
58.95	5.34	46.15	1.510	0.11	0.11	0.039	0.00	0.00
51.47	4.85	40.81	1.318	0.00	0.00	0.034	0.00	0.00
44.94	4.29	35.96	1.151	0.00	0.00	0.029	0.00	0.00
39.23	3.82	31.67	1.005	0.00	0.00	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/01/01
File Name: AW103976.DAT Sample Name: AW103 ID No: 01/09/27-044
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 86.531 % Lamp: 85.823 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: Fractional Settling Source:
Lot No: 1344 Test No: Dup

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	1.500	0.10	0.10	(15)	72.609	5.00	55.00
(2)	2.575	0.90	1.00	(16)	81.207	5.00	60.00
(3)	3.650	1.30	2.30	(17)	90.597	5.00	65.00
(4)	5.893	2.70	5.00	(18)	101.111	5.00	70.00
(5)	10.894	5.00	10.00	(19)	113.881	5.00	75.00
(6)	16.893	5.00	15.00	(20)	128.964	5.00	80.00
(7)	17.929	0.80	15.80	(21)	144.313	4.20	84.20
(8)	23.625	4.20	20.00	(22)	147.436	0.80	85.00
(9)	30.562	5.00	25.00	(23)	171.952	5.00	90.00
(10)	37.059	5.00	30.00	(24)	213.544	5.00	95.00
(11)	43.658	5.00	35.00	(25)	256.851	2.70	97.70
(12)	50.380	5.00	40.00	(26)	303.023	1.30	99.00
(13)	57.338	5.00	45.00	(27)	418.007	0.90	99.90
(14)	64.687	5.00	50.00				

Median : 64.557 (μm) Mean: 80.847 (μm) Mode: 82.770 (μm)
Std. Dev.: 67.050 (μm) Span: 1.538
Coef. Var: 82.93% Spec. Area: 2366 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/01/'01 15:31

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010927-045 16:44
Filename : AW103977
Sample : AW103

Material : Fractional Settling
Source :
Lot Numbe : 1344

Condition
T%(He-Ne): 84.4% Dist.Form: Std. Sampling times : 100
(LAMP): 83.6% R.R.Index: 1.16-0.00i ( )

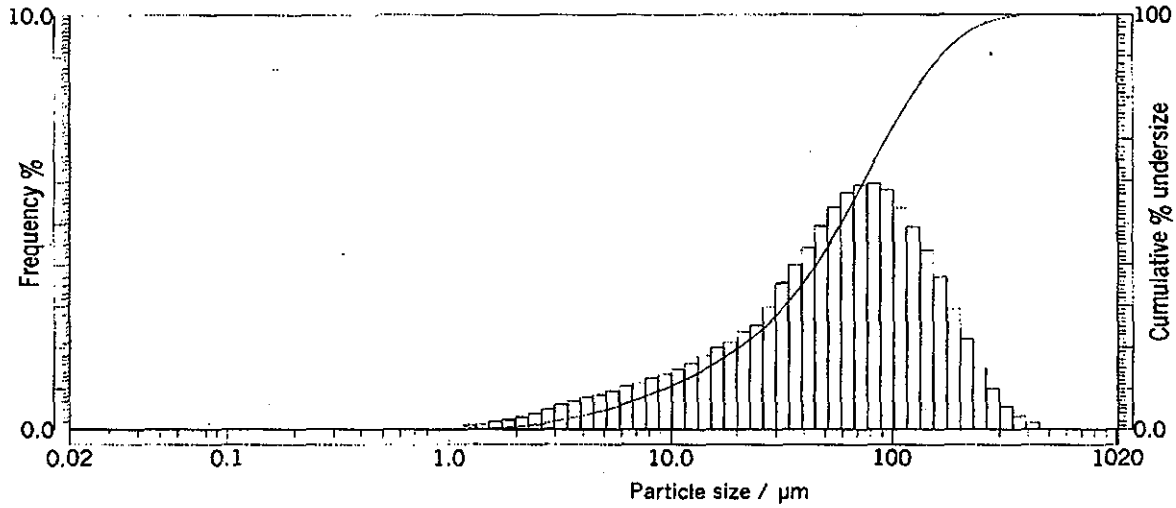
Agitation : 3 Circultn : 6 U.sonic : ~~ON~~ OFF (120) WSC 10/2/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 59.424μm SP.Area : 2656cm²/cm³ S.D. : 66.423μm
Mode : 82.659μm Mean : 76.383μm
C.V. : 86.96%

Span : (D 10.0-D 90.0) / D50 = 2.635

Dia. on %(5.0%) :	5.244μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	26.836μm	% on Dia.(1.000μm) :	0.0%
Dia. on %(50.0%) :	59.424μm	% on Dia.(10.000μm) :	10.4%
Dia. on %(75.0%) :	106.656μm	% on Dia.(100.000μm) :	72.4%
Dia. on %(95.0%) :	209.172μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	2.52	24.40	0.669	0.00	0.00
890.1	0.00	100.00	22.80	2.38	21.88	0.584	0.00	0.00
777.1	0.00	100.00	19.90	2.11	19.49	0.510	0.00	0.00
678.5	0.00	100.00	17.38	1.98	17.39	0.445	0.00	0.00
592.4	0.00	100.00	15.17	1.78	15.41	0.389	0.00	0.00
517.2	0.00	100.00	13.25	1.61	13.62	0.339	0.00	0.00
451.6	0.17	100.00	11.56	1.47	12.02	0.296	0.00	0.00
394.2	0.31	99.83	10.10	1.35	10.54	0.259	0.00	0.00
344.2	0.55	99.52	8.816	1.24	9.19	0.226	0.00	0.00
300.5	0.99	98.97	7.697	1.13	7.95	0.197	0.00	0.00
262.4	1.51	97.98	6.720	1.05	6.83	0.172	0.00	0.00
229.1	2.19	96.47	5.867	0.94	5.78	0.150	0.00	0.00
200.0	2.93	94.28	5.122	0.85	4.84	0.131	0.00	0.00
174.6	3.69	91.35	4.472	0.78	3.98	0.115	0.00	0.00
152.5	4.35	87.66	3.905	0.70	3.20	0.100	0.00	0.00
133.1	4.91	83.30	3.409	0.61	2.51	0.087	0.00	0.00
116.2	5.37	78.39	2.976	0.50	1.89	0.076	0.00	0.00
101.5	5.79	73.03	2.599	0.40	1.39	0.067	0.00	0.00
88.58	5.95	67.24	2.269	0.31	0.99	0.058	0.00	0.00
77.34	5.90	61.29	1.981	0.24	0.69	0.051	0.00	0.00
67.52	5.73	55.39	1.729	0.19	0.45	0.044	0.00	0.00
58.95	5.39	49.66	1.510	0.14	0.25	0.039	0.00	0.00
51.47	4.93	44.28	1.318	0.11	0.11	0.034	0.00	0.00
44.94	4.42	39.35	1.151	0.00	0.00	0.029	0.00	0.00
39.23	3.99	34.92	1.005	0.00	0.00	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/01/01
File Name: AW103977.DAT Sample Name: AW103 ID No: 01/09/27-045
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 84.420 % Lamp: 83.558 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: Fractional Settling Source:
Lot No: 1344 Test No: Dup

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	1.303	0.10	0.10	(15)	66.938	5.00	55.00
(2)	2.275	0.90	1.00	(16)	75.187	5.00	60.00
(3)	3.264	1.30	2.30	(17)	84.347	5.00	65.00
(4)	5.251	2.70	5.00	(18)	94.726	5.00	70.00
(5)	9.583	5.00	10.00	(19)	106.887	5.00	75.00
(6)	14.733	5.00	15.00	(20)	121.741	5.00	80.00
(7)	15.610	0.80	15.80	(21)	137.091	4.20	84.20
(8)	20.519	4.20	20.00	(22)	140.646	0.80	85.00
(9)	26.877	5.00	25.00	(23)	166.517	5.00	90.00
(10)	33.119	5.00	30.00	(24)	209.605	5.00	95.00
(11)	39.335	5.00	35.00	(25)	256.162	2.70	97.70
(12)	45.804	5.00	40.00	(26)	302.610	1.30	99.00
(13)	52.474	5.00	45.00	(27)	417.828	0.90	99.90
(14)	59.455	5.00	50.00				

Median : 59.424 (μm) Mean: 76.383 (μm) Mode: 82.770 (μm)
Std. Dev.: 66.423 (μm) Span: 1.725
Coef. Var: 86.96% Spec. Area: 2656 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/01/'01 15:33

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010927-046 16:50
Filename : AW103978
Sample : AW103

Material : Fractional Settling
Source :
Lot Numbe : 1344

Condition
T%(He-Ne): 75.1% Dist.Form: Std. Sampling times : 100
(LAMP): 68.5% R.R.Index: 1.16-0.00i ( )

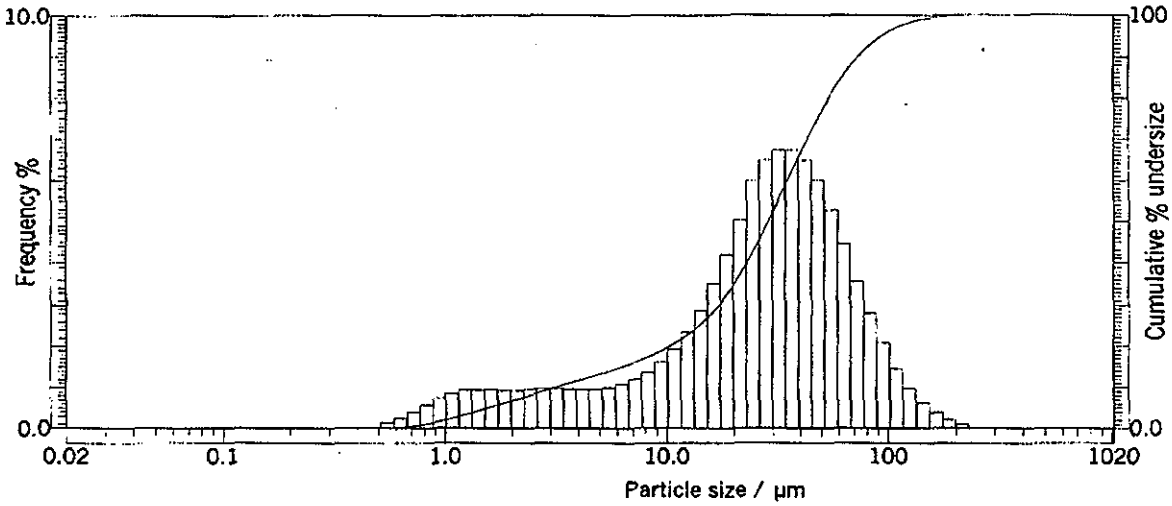
Agitation : 3 Circultn : 6 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 28.627μm SP.Area : 7051cm²/cm³ S.D. : 30.125μm
Mode : 36.569μm Mean : 35.179μm
C.V. : 85.63%

Span : (D 10.0-D 90.0) / D50 = 2.458

Dia. on %(5.0%) : 1.546μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 13.912μm % on Dia.(1.000μm) : 2.1%
Dia. on %(50.0%) : 28.627μm % on Dia.(10.000μm) : 19.6%
Dia. on %(75.0%) : 48.045μm % on Dia.(100.000μm) : 96.0%
Dia. on %(95.0%) : 93.718μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	6.01	45.59	0.669	0.24	0.38
890.1	0.00	100.00	22.80	5.04	39.59	0.584	0.14	0.14
777.1	0.00	100.00	19.90	4.21	34.55	0.510	0.00	0.00
678.5	0.00	100.00	17.38	3.51	30.34	0.445	0.00	0.00
592.4	0.00	100.00	15.17	2.87	26.83	0.389	0.00	0.00
517.2	0.00	100.00	13.25	2.34	23.96	0.339	0.00	0.00
451.6	0.00	100.00	11.56	1.94	21.62	0.296	0.00	0.00
394.2	0.00	100.00	10.10	1.61	19.69	0.259	0.00	0.00
344.2	0.00	100.00	8.816	1.37	18.07	0.226	0.00	0.00
300.5	0.00	100.00	7.697	1.19	16.70	0.197	0.00	0.00
262.4	0.00	100.00	6.720	1.09	15.51	0.172	0.00	0.00
229.1	0.11	100.00	5.867	0.99	14.42	0.150	0.00	0.00
200.0	0.22	99.89	5.122	0.95	13.43	0.131	0.00	0.00
174.6	0.39	99.68	4.472	0.95	12.48	0.115	0.00	0.00
152.5	0.63	99.28	3.905	0.97	11.52	0.100	0.00	0.00
133.1	0.98	98.65	3.409	0.98	10.56	0.087	0.00	0.00
116.2	1.45	97.67	2.976	0.97	9.58	0.076	0.00	0.00
101.5	2.08	96.21	2.599	0.95	8.61	0.067	0.00	0.00
88.58	2.80	94.14	2.269	0.93	7.65	0.058	0.00	0.00
77.34	3.56	91.33	1.981	0.93	6.72	0.051	0.00	0.00
67.52	4.45	87.77	1.729	0.97	5.80	0.044	0.00	0.00
58.95	5.27	83.32	1.510	0.94	4.83	0.039	0.00	0.00
51.47	6.01	78.05	1.318	0.93	3.89	0.034	0.00	0.00
44.94	6.48	72.04	1.151	0.87	2.96	0.029	0.00	0.00
39.23	6.74	65.56	1.005	0.74	2.09	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/01/01
File Name: AW103978.DAT Sample Name: AW103 ID No: 01/09/27-046
Dist. Form: STANDARD R.R..Index: 116-000
Dist. Mode: VOLUME Laser: 75.149 % Lamp: 68.497 %
Circulation: 6 Agitation: 3 U.Sonic ** (min)
Material: Fractional Settling Source:
Lot No: 1344 Test No: Dup

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.562	0.10	0.10	(15)	31.784	5.00	55.00
(2)	0.810	0.90	1.00	(16)	35.125	5.00	60.00
(3)	1.040	1.30	2.30	(17)	38.819	5.00	65.00
(4)	1.548	2.70	5.00	(18)	43.141	5.00	70.00
(5)	3.162	5.00	10.00	(19)	48.155	5.00	75.00
(6)	6.321	5.00	15.00	(20)	54.240	5.00	80.00
(7)	6.959	0.80	15.80	(21)	60.645	4.20	84.20
(8)	10.335	4.20	20.00	(22)	62.185	0.80	85.00
(9)	13.942	5.00	25.00	(23)	73.662	5.00	90.00
(10)	17.161	5.00	30.00	(24)	93.929	5.00	95.00
(11)	20.162	5.00	35.00	(25)	116.800	2.70	97.70
(12)	23.026	5.00	40.00	(26)	143.805	1.30	99.00
(13)	25.784	5.00	45.00	(27)	201.473	0.90	99.90
(14)	28.683	5.00	50.00				

Median : 28.627 (μm) Mean: 35.179 (μm) Mode: 36.660 (μm)
Std. Dev.: 30.125 (μm) Span: 1.595
Coef. Var: 85.63% Spec. Area: 7051 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/01/'01 15:31

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010927.047 16:54
Filename : AW103979
Sample : AW103

Material : Fractional Settling
Source :
Lot Numbe : 1344

Condition

T%(He-Ne): 74.3% Dist.Form: Std. Sampling times : 100
(LAMP): 67.8% R.R.Index: 1.16-0.00i ( )

Agitation : 1 Circultn : 6 U.sonic : ~~ON~~ OFF(120)

WSC 10/2/01

Format

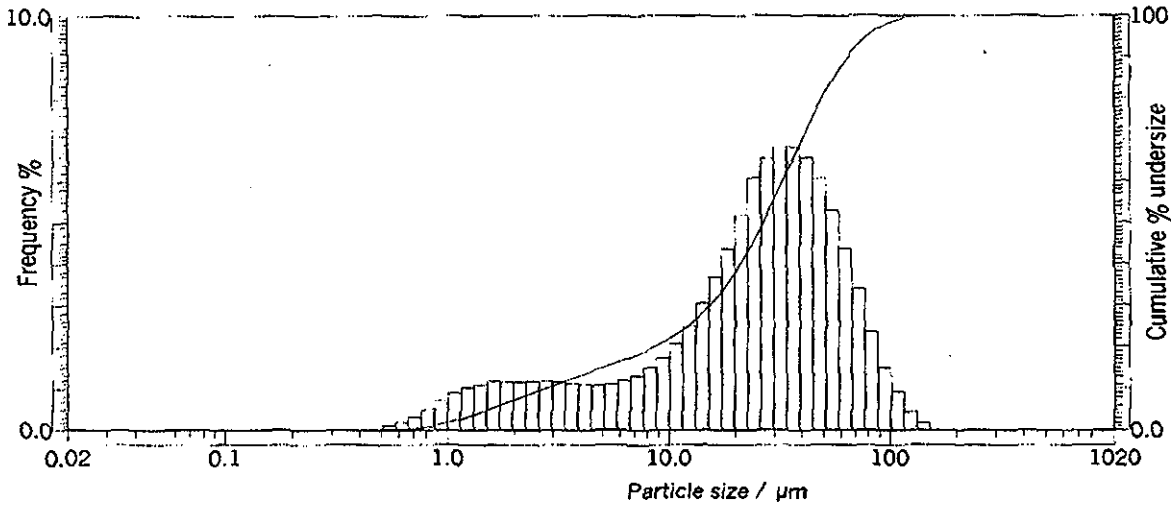
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data

Median : 26.814μm SP.Area : 7405cm²/cm³ S.D. : 24.730μm
Mode : 36.564μm Mean : 31.301μm
C.V. : 79.01%

Span : (D 10.0-D 90.0) / D50 = 2.320

Dia. on %(5.0%) :	1.541μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	12.270μm	% on Dia.(1.000μm) :	1.8%
Dia. on %(50.0%) :	26.814μm	% on Dia.(10.000μm) :	21.7%
Dia. on %(75.0%) :	44.462μm	% on Dia.(100.000μm) :	98.3%
Dia. on %(95.0%) :	79.133μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	6.08	48.72	0.669	0.18	0.28
890.1	0.00	100.00	22.80	5.17	42.63	0.584	0.10	0.10
777.1	0.00	100.00	19.90	4.36	37.46	0.510	0.00	0.00
678.5	0.00	100.00	17.38	3.67	33.10	0.445	0.00	0.00
592.4	0.00	100.00	15.17	3.03	29.43	0.389	0.00	0.00
517.2	0.00	100.00	13.25	2.49	26.40	0.339	0.00	0.00
451.6	0.00	100.00	11.56	2.07	23.92	0.296	0.00	0.00
394.2	0.00	100.00	10.10	1.73	21.85	0.259	0.00	0.00
344.2	0.00	100.00	8.816	1.48	20.11	0.226	0.00	0.00
300.5	0.00	100.00	7.697	1.30	18.63	0.197	0.00	0.00
262.4	0.00	100.00	6.720	1.19	17.33	0.172	0.00	0.00
229.1	0.00	100.00	5.867	1.10	16.14	0.150	0.00	0.00
200.0	0.00	100.00	5.122	1.06	15.04	0.131	0.00	0.00
174.6	0.00	100.00	4.472	1.08	13.98	0.115	0.00	0.00
152.5	0.18	100.00	3.905	1.12	12.90	0.100	0.00	0.00
133.1	0.45	99.82	3.409	1.16	11.78	0.087	0.00	0.00
116.2	0.92	99.37	2.976	1.18	10.62	0.076	0.00	0.00
101.5	1.49	98.45	2.599	1.17	9.44	0.067	0.00	0.00
88.58	2.36	96.96	2.269	1.15	8.27	0.058	0.00	0.00
77.34	3.37	94.60	1.981	1.14	7.13	0.051	0.00	0.00
67.52	4.35	91.23	1.729	1.16	5.98	0.044	0.00	0.00
58.95	5.29	86.88	1.510	1.09	4.83	0.039	0.00	0.00
51.47	6.07	81.59	1.318	1.02	3.73	0.034	0.00	0.00
44.94	6.57	75.52	1.151	0.89	2.71	0.029	0.00	0.00
39.23	6.84	68.95	1.005	0.71	1.82	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/01/01
File Name: AW103979.DAT Sample Name: AW103 ID No: 01/09/27-047
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 74.348 % Lamp: 67.783 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: Fractional Settling Source:
Lot No: 1344 Test No: Dup

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.583	0.10	0.10	(15)	29.745	5.00	55.00
(2)	0.853	0.90	1.00	(16)	32.912	5.00	60.00
(3)	1.084	1.30	2.30	(17)	36.359	5.00	65.00
(4)	1.543	2.70	5.00	(18)	40.147	5.00	70.00
(5)	2.778	5.00	10.00	(19)	44.490	5.00	75.00
(6)	5.095	5.00	15.00	(20)	49.762	5.00	80.00
(7)	5.634	0.80	15.80	(21)	55.165	4.20	84.20
(8)	8.730	4.20	20.00	(22)	56.296	0.80	85.00
(9)	12.298	5.00	25.00	(23)	65.099	5.00	90.00
(10)	15.515	5.00	30.00	(24)	79.239	5.00	95.00
(11)	18.477	5.00	35.00	(25)	95.005	2.70	97.70
(12)	21.323	5.00	40.00	(26)	110.315	1.30	99.00
(13)	24.086	5.00	45.00	(27)	141.769	0.90	99.90
(14)	26.854	5.00	50.00				

Median : 26.814 (μm) Mean: 31.301 (μm) Mode: 36.660 (μm)
Std. Dev.: 24.730 (μm) Span: 1.293
Coef. Var: 79.01% Spec. Area: 7405 (cm2/cm3)

APPENDIX F-16

AY-101 FRACTIONAL SETTLING SAMPLE: PSD MEASUREMENT RESULTS

Consisting of 18 pages including this cover page

TABLE F-16. Sample identification and PSD run conditions. Sample from fractional settling tests on AY-101 composite.

Conditions Key: P = Pump Speed Setting; P6 = 14.4 mL/s
S = Stirrer Speed Setting (1-7); S1 = Stirrer Speed 1; S3 = Stirrer Speed 3
US = Ultrasonic ON Time (min); DT = Delay Time (min) between end of ultrasonic treatment and PSD measurement.
Time = Clock time at beginning of measurement

Sample	PSD Run File Name	Run Conditions				Time	Cumulative Time (min) At Conditions				
		P	S	US	DT		P6	S1	S3	US	DT
S01T001326	[LOAD-IN]	6	1	0	0	?	?	?			
	AY101988	6	1	0	0	17:56	4	4			
	AY101989	6	3	0	0	18:00	7	4	3		
	AY101990	6	3	2	0	18:03	13	4	9	2	0
	AY101991	6	1	0	0	18:09	15	6	9	2	4
						18:11					
S01T001326	[LOAD-IN]	6	1	0	0	?	?	?			
	AY101992	6	1	0	0	18:22	8	8			
	AY101993	6	3	0	0	18:30	12	8	4		
	AY101994	6	3	2	0	18:34	18	8	10	2	0
	AY101995	6	1	0	0	18:40	20	10	10	2	4
						18:42					

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/01/'01 15:32

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010927-056 17:59
Filename : AY101988
Sample : AY 101

Material : Fractional Settling
Source :
Lot Numbe : 1326

Condition
T%(He-Ne): 84.9% Dist.Form: Std. Sampling times : 100
(LAMP): 82.0% R.R.index: 1.16-0.00i ( )

Agitation : 1 Circultn : 6 U.sonic : ~~ON~~ OFF (120)

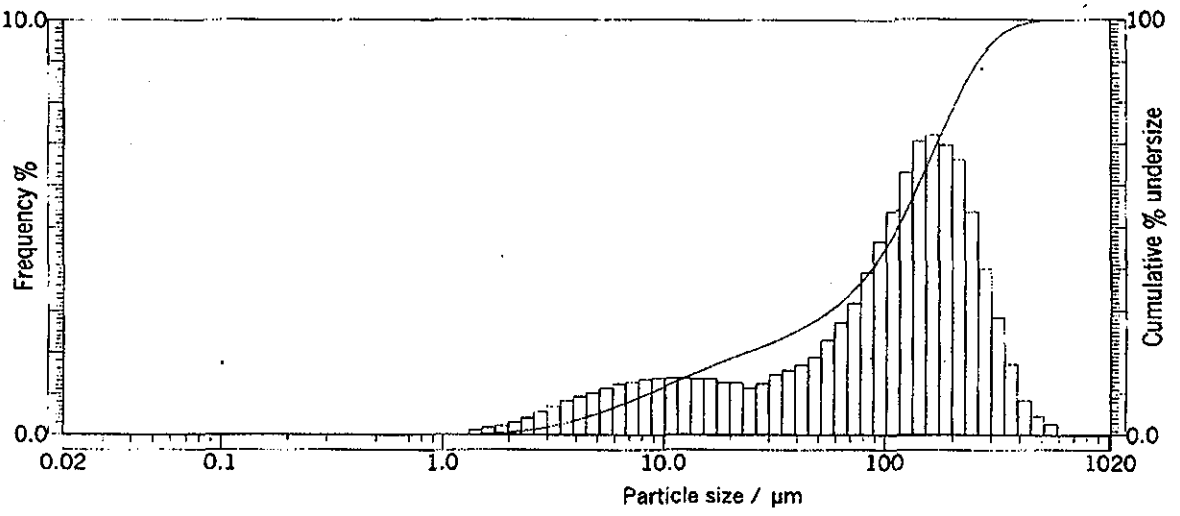
WSC 10/2/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 114.687μm SP.Area : 2357cm²/cm³ S.D. : 101.391μm
Mode : 163.039μm Mean : 127.415μm
C.V. : 79.58%

Span : (D 10.0-D 90.0) / D50 = 2.217

Dia. on %(5.0%) :	4.951μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	39.801μm	% on Dia.(1.000μm) :	0.0%
Dia. on %(50.0%) :	114.687μm	% on Dia.(10.000μm) :	11.5%
Dia. on %(75.0%) :	188.669μm	% on Dia.(100.000μm) :	44.6%
Dia. on %(95.0%) :	316.328μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.12	20.62	0.669	0.00	0.00
890.1	0.00	100.00	22.80	1.24	19.50	0.584	0.00	0.00
777.1	0.00	100.00	19.90	1.25	18.25	0.510	0.00	0.00
678.5	0.00	100.00	17.38	1.34	17.01	0.445	0.00	0.00
592.4	0.26	100.00	15.17	1.35	15.67	0.389	0.00	0.00
517.2	0.46	99.74	13.25	1.36	14.31	0.339	0.00	0.00
451.6	0.83	99.28	11.56	1.37	12.95	0.296	0.00	0.00
394.2	1.69	98.45	10.10	1.37	11.58	0.259	0.00	0.00
344.2	2.82	96.76	8.816	1.34	10.22	0.226	0.00	0.00
300.5	3.99	93.93	7.697	1.28	8.88	0.197	0.00	0.00
262.4	5.36	89.94	6.720	1.23	7.60	0.172	0.00	0.00
229.1	6.59	84.58	5.867	1.12	6.38	0.150	0.00	0.00
200.0	6.96	77.99	5.122	1.02	5.26	0.131	0.00	0.00
174.6	7.19	71.03	4.472	0.92	4.24	0.115	0.00	0.00
152.5	7.04	63.84	3.905	0.81	3.32	0.100	0.00	0.00
133.1	6.28	56.81	3.409	0.70	2.50	0.087	0.00	0.00
116.2	5.38	50.52	2.976	0.56	1.81	0.076	0.00	0.00
101.5	4.66	45.14	2.599	0.42	1.25	0.067	0.00	0.00
88.58	3.92	40.48	2.269	0.31	0.83	0.058	0.00	0.00
77.34	3.18	36.56	1.981	0.23	0.52	0.051	0.00	0.00
67.52	2.72	33.38	1.729	0.17	0.29	0.044	0.00	0.00
58.95	2.29	30.65	1.510	0.12	0.12	0.039	0.00	0.00
51.47	1.87	28.37	1.318	0.00	0.00	0.034	0.00	0.00
44.94	1.67	26.50	1.151	0.00	0.00	0.029	0.00	0.00
39.23	1.55	24.82	1.005	0.00	0.00	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/01/01
File Name: AY101988.DAT Sample Name: AY 101 ID No: 01/09/27-056
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 84.915 % Lamp: 81.952 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: Fractional Settling Source:
Lot No: 1326 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	1.480	0.10	0.10	(15)	128.248	5.00	55.00
(2)	2.402	0.90	1.00	(16)	141.888	5.00	60.00
(3)	3.283	1.30	2.30	(17)	156.023	5.00	65.00
(4)	4.959	2.70	5.00	(18)	171.436	5.00	70.00
(5)	8.635	5.00	10.00	(19)	189.092	5.00	75.00
(6)	14.222	5.00	15.00	(20)	208.868	5.00	80.00
(7)	15.391	0.80	15.80	(21)	227.400	4.20	84.20
(8)	24.277	4.20	20.00	(22)	231.686	0.80	85.00
(9)	39.837	5.00	25.00	(23)	262.939	5.00	90.00
(10)	56.817	5.00	30.00	(24)	317.021	5.00	95.00
(11)	72.529	5.00	35.00	(25)	372.171	2.70	97.70
(12)	87.210	5.00	40.00	(26)	432.344	1.30	99.00
(13)	101.069	5.00	45.00	(27)	563.169	0.90	99.90
(14)	114.776	5.00	50.00				

Median : 114.687 (μm) Mean: 127.415 (μm) Mode: 163.159 (μm)
Std. Dev.: 101.391 (μm) Span: 1.113
Coef. Var: 79.57% Spec. Area: 2357 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/01/'01 15:32

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010927-057 18:03
Filename : AY101989
Sample : AY 101

Material : Fractional Settling
Source :
Lot Numbe : 1326

Condition
T%(He-Ne): 79.6% Dist.Form: Std. Sampling times : 100
(LAMP): 77.2% R.R.Index: 1.16-0.00i ( )

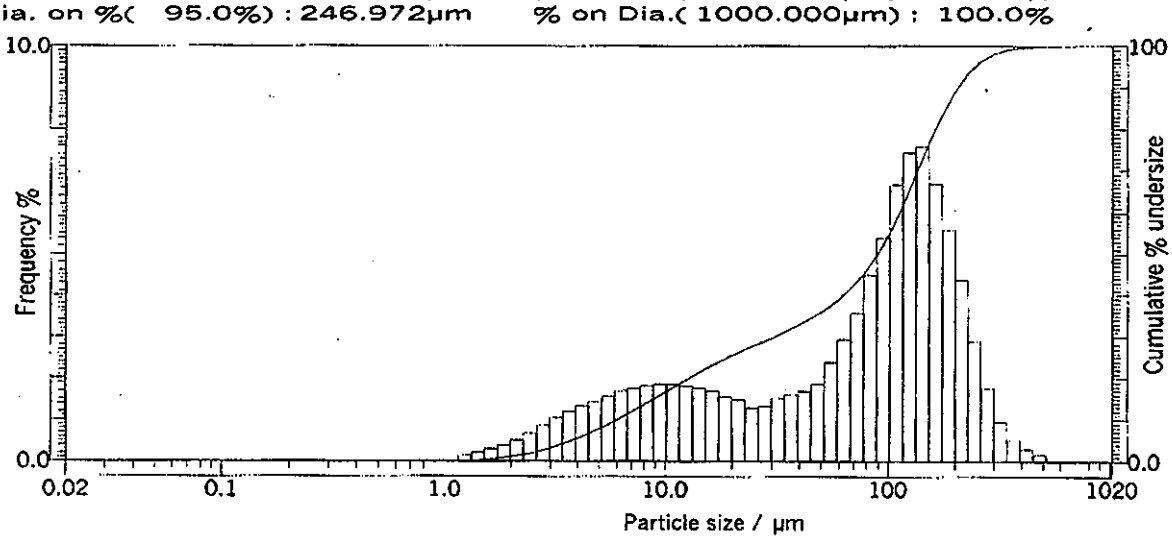
Agitation : 3 Circultn : 6 U.sonic : ~~ON~~ OFF(120) WSL 10/2/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 89.333μm SP.Area : 3295cm²/cm³ S.D. : 82.283μm
Mode : 141.514μm Mean : 97.538μm
C.V. : 84.36%

Span : (D 10.0-D 90.0) / D50 = 2.241

Dia. on %(5.0%) :	3.762μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	19.053μm	% on Dia.(1.000μm) :	0.0%
Dia. on %(50.0%) :	89.333μm	% on Dia.(10.000μm) :	16.7%
Dia. on %(75.0%) :	147.782μm	% on Dia.(100.000μm) :	54.5%
Dia. on %(95.0%) :	246.972μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.28	28.27	0.669	0.00	0.00
890.1	0.00	100.00	22.80	1.49	26.99	0.584	0.00	0.00
777.1	0.00	100.00	19.90	1.55	25.50	0.510	0.00	0.00
678.5	0.00	100.00	17.38	1.71	23.95	0.445	0.00	0.00
592.4	0.00	100.00	15.17	1.77	22.24	0.389	0.00	0.00
517.2	0.16	100.00	13.25	1.81	20.47	0.339	0.00	0.00
451.6	0.29	99.84	11.56	1.85	18.65	0.296	0.00	0.00
394.2	0.53	99.54	10.10	1.86	16.80	0.259	0.00	0.00
344.2	0.95	99.01	8.816	1.83	14.94	0.226	0.00	0.00
300.5	1.77	98.06	7.697	1.75	13.12	0.197	0.00	0.00
262.4	2.89	96.29	6.720	1.70	11.36	0.172	0.00	0.00
229.1	4.38	93.40	5.867	1.56	9.66	0.150	0.00	0.00
200.0	5.59	89.02	5.122	1.44	8.10	0.131	0.00	0.00
174.6	6.69	83.43	4.472	1.33	6.66	0.115	0.00	0.00
152.5	7.60	76.74	3.905	1.20	5.33	0.100	0.00	0.00
133.1	7.43	69.15	3.409	1.05	4.13	0.087	0.00	0.00
116.2	6.66	61.72	2.976	0.86	3.08	0.076	0.00	0.00
101.5	5.39	55.06	2.599	0.67	2.21	0.067	0.00	0.00
88.58	4.49	49.66	2.269	0.51	1.55	0.058	0.00	0.00
77.34	3.56	45.18	1.981	0.39	1.04	0.051	0.00	0.00
67.52	2.93	41.61	1.729	0.30	0.65	0.044	0.00	0.00
58.95	2.38	38.68	1.510	0.21	0.35	0.039	0.00	0.00
51.47	1.87	36.30	1.318	0.14	0.14	0.034	0.00	0.00
44.94	1.70	34.43	1.151	0.00	0.00	0.029	0.00	0.00
39.23	1.61	32.74	1.005	0.00	0.00	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/01/01
File Name: AY101989.DAT Sample Name: AY 101 ID No: 01/09/27-057
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 79.615 % Lamp: 77.245 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: Fractional Settling Source:
Lot No: 1326 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	1.269	0.10	0.10	(15)	101.319	5.00	55.00
(2)	1.956	0.90	1.00	(16)	112.402	5.00	60.00
(3)	2.636	1.30	2.30	(17)	123.672	5.00	65.00
(4)	3.769	2.70	5.00	(18)	135.279	5.00	70.00
(5)	6.036	5.00	10.00	(19)	148.017	5.00	75.00
(6)	8.854	5.00	15.00	(20)	163.250	5.00	80.00
(7)	9.406	0.80	15.80	(21)	178.114	4.20	84.20
(8)	12.814	4.20	20.00	(22)	181.748	0.80	85.00
(9)	19.091	5.00	25.00	(23)	206.525	5.00	90.00
(10)	31.060	5.00	30.00	(24)	247.532	5.00	95.00
(11)	46.923	5.00	35.00	(25)	292.749	2.70	97.70
(12)	62.811	5.00	40.00	(26)	343.591	1.30	99.00
(13)	76.857	5.00	45.00	(27)	477.013	0.90	99.90
(14)	89.383	5.00	50.00				

Median : 89.333 (μm) Mean: 97.538 (μm) Mode: 142.450 (μm)
Std. Dev.: 82.283 (μm) Span: 1.110
Coef. Var: 84.36% Spec. Area: 3295 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/01/'01 15:34

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010927-058 18:08
Filename : AY101990
Sample : AY 101

Material : Fractional Settling
Source :
Lot Numbe : 1326

Condition
T%(He-Ne): 62.8% Dist.Form: Std. Sampling times : 100
(LAMP): 55.7% R.R.Index: 1.16-0.00i ( )

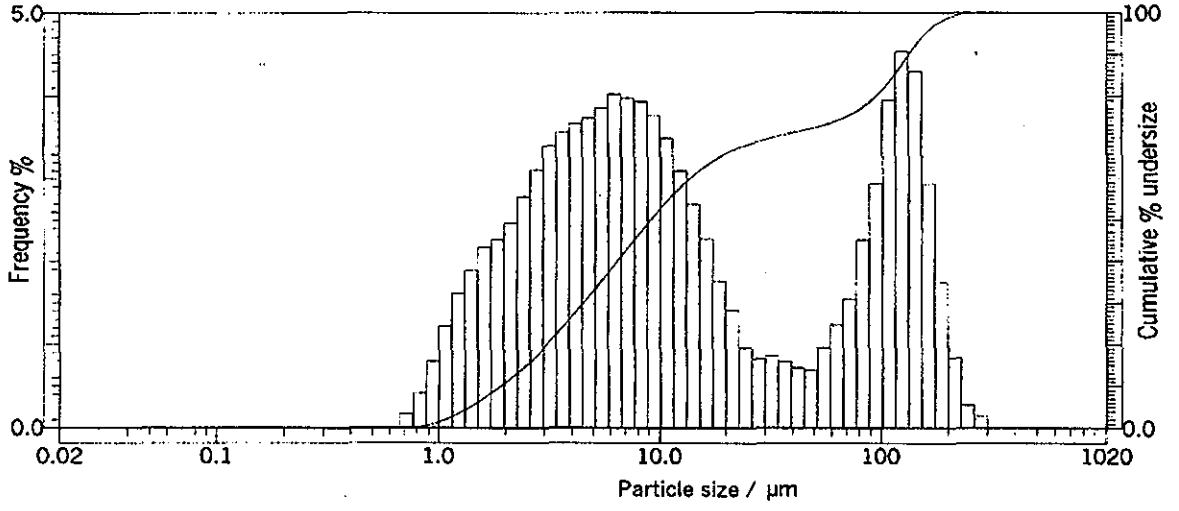
Agitation : 3 Circultn : 6 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 9.126μm SP.Area : 11588cm²/cm³ S.D. : 56.236μm
Mode : 125.013μm Mean : 40.195μm
C.V. : 139.91%

Span : (D 10.0-D 90.0) / D50 = 14.483

Dia. on %(5.0%) : 1.394μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 3.779μm % on Dia.(1.000μm) : 1.4%
Dia. on %(50.0%) : 9.126μm % on Dia.(10.000μm) : 52.5%
Dia. on %(75.0%) : 70.225μm % on Dia.(100.000μm) : 81.0%
Dia. on %(95.0%) : 159.200μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.96	68.48	0.669	0.00	0.00
890.1	0.00	100.00	22.80	1.41	67.52	0.584	0.00	0.00
777.1	0.00	100.00	19.90	1.76	66.11	0.510	0.00	0.00
678.5	0.00	100.00	17.38	2.27	64.35	0.445	0.00	0.00
592.4	0.00	100.00	15.17	2.69	62.08	0.389	0.00	0.00
517.2	0.00	100.00	13.25	3.10	59.39	0.339	0.00	0.00
451.6	0.00	100.00	11.56	3.49	56.29	0.296	0.00	0.00
394.2	0.00	100.00	10.10	3.76	52.80	0.259	0.00	0.00
344.2	0.00	100.00	8.816	3.94	49.04	0.226	0.00	0.00
300.5	0.15	100.00	7.697	3.97	45.11	0.197	0.00	0.00
262.4	0.27	99.85	6.720	4.02	41.14	0.172	0.00	0.00
229.1	0.84	99.58	5.867	3.86	37.11	0.150	0.00	0.00
200.0	1.74	98.74	5.122	3.73	33.26	0.131	0.00	0.00
174.6	2.93	97.00	4.472	3.67	29.52	0.115	0.00	0.00
152.5	4.30	94.06	3.905	3.56	25.86	0.100	0.00	0.00
133.1	4.53	89.77	3.409	3.40	22.29	0.087	0.00	0.00
116.2	3.95	85.23	2.976	3.12	18.90	0.076	0.00	0.00
101.5	2.94	81.28	2.599	2.78	15.78	0.067	0.00	0.00
88.58	2.25	78.35	2.269	2.46	13.00	0.058	0.00	0.00
77.34	1.54	76.10	1.981	2.26	10.54	0.051	0.00	0.00
67.52	1.23	74.55	1.729	2.16	8.28	0.044	0.00	0.00
58.95	0.96	73.32	1.510	1.89	6.12	0.039	0.00	0.00
51.47	0.69	72.37	1.318	1.61	4.23	0.034	0.00	0.00
44.94	0.71	71.68	1.151	1.22	2.61	0.029	0.00	0.00
39.23	0.79	70.96	1.005	0.80	1.39	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/01/01
File Name: AY101990.DAT Sample Name: AY 101 ID No: 01/09/27-058
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 62.761 % Lamp: 55.686 %
Circulation: 6 Agitation: 3 U.Sonic ** (min)
Material: Fractional Settling Source:
Lot No: 1326 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.725	0.10	0.10	(15)	11.022	5.00	55.00
(2)	0.943	0.90	1.00	(16)	13.686	5.00	60.00
(3)	1.114	1.30	2.30	(17)	18.309	5.00	65.00
(4)	1.397	2.70	5.00	(18)	33.397	5.00	70.00
(5)	1.921	5.00	10.00	(19)	70.361	5.00	75.00
(6)	2.506	5.00	15.00	(20)	95.838	5.00	80.00
(7)	2.601	0.80	15.80	(21)	112.351	4.20	84.20
(8)	3.117	4.20	20.00	(22)	115.337	0.80	85.00
(9)	3.785	5.00	25.00	(23)	134.148	5.00	90.00
(10)	4.555	5.00	30.00	(24)	159.525	5.00	95.00
(11)	5.459	5.00	35.00	(25)	184.852	2.70	97.70
(12)	6.479	5.00	40.00	(26)	209.046	1.30	99.00
(13)	7.671	5.00	45.00	(27)	275.322	0.90	99.90
(14)	9.142	5.00	50.00				

Median : 9.126 (μm) Mean: 40.195 (μm) Mode: 124.370 (μm)
Std. Dev.: 56.236 (μm) Span: 9.750
Coef. Var: 139.91% Spec. Area: 11588 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/01/'01 15:35

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010927-059 18:11
Filename : AY101991
Sample : AY 101

Material : Fractional Settling
Source :
Lot Numbe : 1326

Condition
T%(He-Ne): 62.5% Dist.Form: Std. Sampling times : 100
(LAMP): 55.8% R.R.Index: 1.16-0.00i ( )

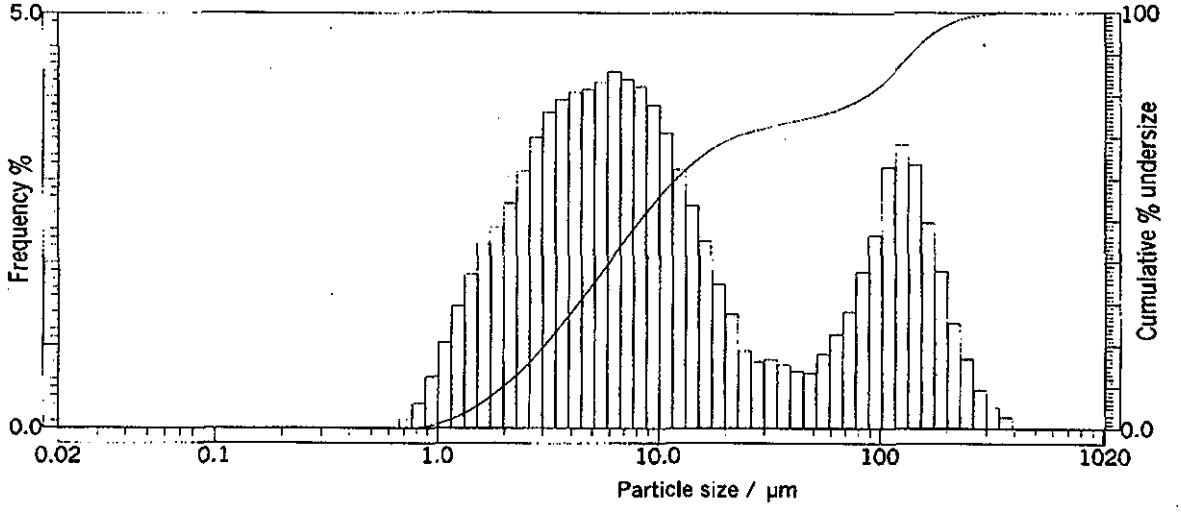
Agitation : 1 Circultn : 6 U.sonic : ~~ON~~ OFF (120) WSC 10/2/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 8.267μm SP.Area : 11758cm²/cm³ S.D. : 61.740μm
Mode : 6.282μm Mean : 39.445μm
C.V. : 156.52%

Span : (D 10.0-D 90.0) / D50 = 16.217

Dia. on %(5.0%) : 1.469μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 3.636μm % on Dia.(1.000μm) : 1.0%
Dia. on %(50.0%) : 8.267μm % on Dia.(10.000μm) : 55.6%
Dia. on %(75.0%) : 48.674μm % on Dia.(100.000μm) : 82.7%
Dia. on %(95.0%) : 173.325μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.93	71.52	0.669	0.00	0.00
890.1	0.00	100.00	22.80	1.38	70.58	0.584	0.00	0.00
777.1	0.00	100.00	19.90	1.73	69.21	0.510	0.00	0.00
678.5	0.00	100.00	17.38	2.26	67.47	0.445	0.00	0.00
592.4	0.00	100.00	15.17	2.69	65.22	0.389	0.00	0.00
517.2	0.00	100.00	13.25	3.13	62.52	0.339	0.00	0.00
451.6	0.00	100.00	11.56	3.56	59.39	0.296	0.00	0.00
394.2	0.14	100.00	10.10	3.89	55.83	0.259	0.00	0.00
344.2	0.26	99.86	8.816	4.11	51.95	0.226	0.00	0.00
300.5	0.47	99.60	7.697	4.19	47.84	0.197	0.00	0.00
262.4	0.84	99.13	6.720	4.29	43.64	0.172	0.00	0.00
229.1	1.27	98.29	5.867	4.17	39.35	0.150	0.00	0.00
200.0	1.89	97.03	5.122	4.07	35.18	0.131	0.00	0.00
174.6	2.47	95.14	4.472	4.04	31.11	0.115	0.00	0.00
152.5	3.18	92.67	3.905	3.96	27.07	0.100	0.00	0.00
133.1	3.42	89.49	3.409	3.80	23.12	0.087	0.00	0.00
116.2	3.16	86.07	2.976	3.50	19.31	0.076	0.00	0.00
101.5	2.33	82.92	2.599	3.10	15.82	0.067	0.00	0.00
88.58	1.88	80.59	2.269	2.71	12.72	0.058	0.00	0.00
77.34	1.40	78.71	1.981	2.42	10.01	0.051	0.00	0.00
67.52	1.13	77.30	1.729	2.21	7.59	0.044	0.00	0.00
58.95	0.90	76.18	1.510	1.84	5.38	0.039	0.00	0.00
51.47	0.67	75.28	1.318	1.47	3.54	0.034	0.00	0.00
44.94	0.69	74.60	1.151	1.03	2.07	0.029	0.00	0.00
39.23	0.76	73.91	1.005	0.62	1.03	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/01/02
File Name: AY101991.DAT Sample Name: AY 101 ID No: 01/09/27-059
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 62.535 % Lamp: 55.775 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: Fractional Settling Source:
Lot No: 1326 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.754	0.10	0.10	(15)	9.823	5.00	55.00
(2)	0.998	0.90	1.00	(16)	11.892	5.00	60.00
(3)	1.177	1.30	2.30	(17)	15.017	5.00	65.00
(4)	1.471	2.70	5.00	(18)	21.575	5.00	70.00
(5)	1.980	5.00	10.00	(19)	48.782	5.00	75.00
(6)	2.511	5.00	15.00	(20)	85.063	5.00	80.00
(7)	2.597	0.80	15.80	(21)	107.458	4.20	84.20
(8)	3.054	4.20	20.00	(22)	111.197	0.80	85.00
(9)	3.645	5.00	25.00	(23)	136.218	5.00	90.00
(10)	4.316	5.00	30.00	(24)	173.404	5.00	95.00
(11)	5.093	5.00	35.00	(25)	215.508	2.70	97.70
(12)	5.996	5.00	40.00	(26)	257.213	1.30	99.00
(13)	7.036	5.00	45.00	(27)	359.489	0.90	99.90
(14)	8.286	5.00	50.00				

Median : 8.267 (μm) Mean: 39.445 (μm) Mode: 6.279 (μm)
Std. Dev.: 61.740 (μm) Span: 15.079
Coef. Var: 156.52% Spec. Area: 11758 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/01/'01 15:35

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010927-060 18:25
Filename : AY101992
Sample : AY 101

Material : Fractional Settling
Source :
Lot Numbe : 1326

Condition
T%(He-Ne): 89.9% Dist.Form: Std. Sampling times : 100
(LAMP): 88.7% R.R.Index: 1.16-0.00i ( )

Agitation : 1 Circultn : 6 U.sonic : ~~ON~~ OFF (120)

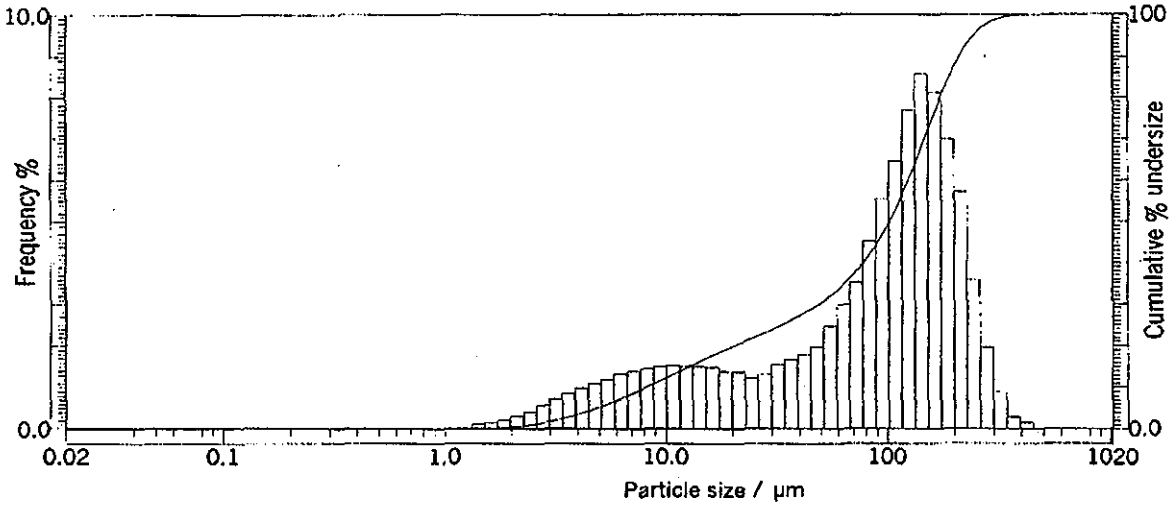
WSC 10/2/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 102.332μm SP.Area : 2489cm²/cm³ S.D. : 78.842μm
Mode : 142.924μm Mean : 106.492μm
C.V. : 74.04%

Span : (D 10.0-D 90.0) / D50 = 2.000

Dia. on %(5.0%) : 4.857μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 33.742μm % on Dia.(1.000μm) : 0.0%
Dia. on %(50.0%) : 102.332μm % on Dia.(10.000μm) : 12.2%
Dia. on %(75.0%) : 159.523μm % on Dia.(100.000μm) : 49.0%
Dia. on %(95.0%) : 246.092μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.22	22.32	0.669	0.00	0.00
890.1	0.00	100.00	22.80	1.37	21.10	0.584	0.00	0.00
777.1	0.00	100.00	19.90	1.38	19.73	0.510	0.00	0.00
678.5	0.00	100.00	17.38	1.48	18.35	0.445	0.00	0.00
592.4	0.00	100.00	15.17	1.50	16.87	0.389	0.00	0.00
517.2	0.00	100.00	13.25	1.51	15.37	0.339	0.00	0.00
451.6	0.16	100.00	11.56	1.52	13.86	0.296	0.00	0.00
394.2	0.29	99.84	10.10	1.51	12.33	0.259	0.00	0.00
344.2	0.89	99.55	8.816	1.47	10.83	0.226	0.00	0.00
300.5	1.96	98.66	7.697	1.39	9.36	0.197	0.00	0.00
262.4	3.59	96.70	6.720	1.33	7.97	0.172	0.00	0.00
229.1	5.71	93.10	5.867	1.21	6.63	0.150	0.00	0.00
200.0	6.99	87.39	5.122	1.09	5.43	0.131	0.00	0.00
174.6	8.11	80.40	4.472	0.98	4.34	0.115	0.00	0.00
152.5	8.56	72.29	3.905	0.85	3.36	0.100	0.00	0.00
133.1	7.69	63.73	3.409	0.72	2.51	0.087	0.00	0.00
116.2	6.45	56.04	2.976	0.57	1.78	0.076	0.00	0.00
101.5	5.53	49.59	2.599	0.42	1.21	0.067	0.00	0.00
88.58	4.52	44.07	2.269	0.31	0.79	0.058	0.00	0.00
77.34	3.52	39.54	1.981	0.22	0.48	0.051	0.00	0.00
67.52	2.99	36.03	1.729	0.16	0.26	0.044	0.00	0.00
58.95	2.46	33.04	1.510	0.11	0.11	0.039	0.00	0.00
51.47	1.97	30.58	1.318	0.00	0.00	0.034	0.00	0.00
44.94	1.78	28.61	1.151	0.00	0.00	0.029	0.00	0.00
39.23	1.66	26.83	1.005	0.00	0.00	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/01/01
File Name: AY101992.DAT Sample Name: AY 101 ID No: 01/09/27-060
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 89.913 % Lamp: 88.725 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: Fractional Settling Source:
Lot No: 1326 Test No: Duplicate

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	1.500	0.10	0.10	(15)	113.824	5.00	55.00
(2)	2.433	0.90	1.00	(16)	124.904	5.00	60.00
(3)	3.285	1.30	2.30	(17)	135.971	5.00	65.00
(4)	4.867	2.70	5.00	(18)	147.271	5.00	70.00
(5)	8.184	5.00	10.00	(19)	159.855	5.00	75.00
(6)	12.839	5.00	15.00	(20)	173.524	5.00	80.00
(7)	13.803	0.80	15.80	(21)	188.414	4.20	84.20
(8)	20.470	4.20	20.00	(22)	191.318	0.80	85.00
(9)	33.772	5.00	25.00	(23)	213.279	5.00	90.00
(10)	49.550	5.00	30.00	(24)	246.656	5.00	95.00
(11)	64.579	5.00	35.00	(25)	281.919	2.70	97.70
(12)	78.476	5.00	40.00	(26)	317.410	1.30	99.00
(13)	90.760	5.00	45.00	(27)	416.121	0.90	99.90
(14)	102.390	5.00	50.00				

Median : 102.332 (μm) Mean: 106.492 (μm) Mode: 142.450 (μm)
Std. Dev.: 78.842 (μm) Span: 0.846
Coef. Var: 74.04% Spec. Area: 2489 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/01/'01 15:35

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010927-061 18:33
Filename : AY101993
Sample : AY 101

Material : Fractional Settling
Source :
Lot Numbe : 1326

Condition
T%(He-Ne): 85.0% Dist.Form: Std. Sampling times : 100
(LAMP): 83.8% R.R.Index: 1.16-0.00i ( )

Agitation : 3 Circultn : 6 U.sonic : ~~ON~~ OFF (120)

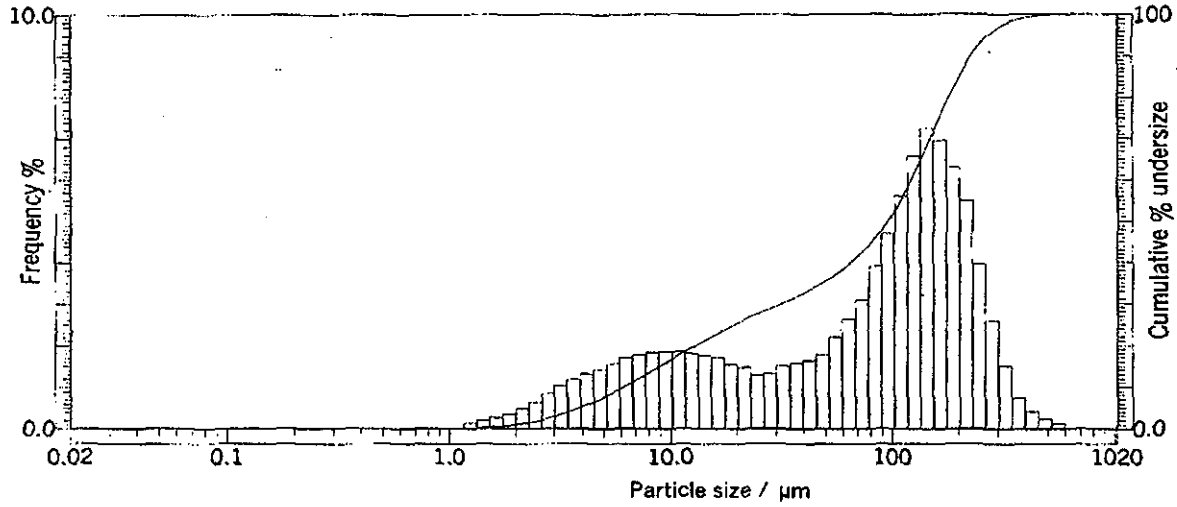
WSC 10/2/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 94.901μm SP.Area : 3222cm²/cm³ S.D. : 90.881μm
Mode : 142.951μm Mean : 105.886μm
C.V. : 85.83%

Span : (D 10.0-D 90.0) / D50 = 2.321

Dia. on %(5.0%) :	3.837μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	19.413μm	% on Dia.(1.000μm) :	0.0%
Dia. on %(50.0%) :	94.901μm	% on Dia.(10.000μm) :	16.5%
Dia. on %(75.0%) :	162.475μm	% on Dia.(100.000μm) :	51.8%
Dia. on %(95.0%) :	270.314μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.27	28.03	0.669	0.00	0.00
890.1	0.00	100.00	22.80	1.48	26.76	0.584	0.00	0.00
777.1	0.00	100.00	19.90	1.54	25.28	0.510	0.00	0.00
678.5	0.00	100.00	17.38	1.70	23.74	0.445	0.00	0.00
592.4	0.12	100.00	15.17	1.76	22.04	0.389	0.00	0.00
517.2	0.22	99.88	13.25	1.81	20.28	0.339	0.00	0.00
451.6	0.40	99.65	11.56	1.85	18.47	0.296	0.00	0.00
394.2	0.73	99.25	10.10	1.86	16.62	0.259	0.00	0.00
344.2	1.51	98.52	8.816	1.83	14.76	0.226	0.00	0.00
300.5	2.58	97.01	7.697	1.76	12.93	0.197	0.00	0.00
262.4	3.95	94.43	6.720	1.70	11.17	0.172	0.00	0.00
229.1	5.49	90.48	5.867	1.56	9.47	0.150	0.00	0.00
200.0	6.30	84.99	5.122	1.44	7.90	0.131	0.00	0.00
174.6	6.95	78.69	4.472	1.32	6.47	0.115	0.00	0.00
152.5	7.25	71.74	3.905	1.18	5.15	0.100	0.00	0.00
133.1	6.58	64.49	3.409	1.03	3.97	0.087	0.00	0.00
116.2	5.60	57.91	2.976	0.84	2.94	0.076	0.00	0.00
101.5	4.70	52.31	2.599	0.64	2.10	0.067	0.00	0.00
88.58	3.89	47.62	2.269	0.49	1.46	0.058	0.00	0.00
77.34	3.08	43.73	1.981	0.37	0.97	0.051	0.00	0.00
67.52	2.62	40.65	1.729	0.28	0.61	0.044	0.00	0.00
58.95	2.19	38.03	1.510	0.19	0.33	0.039	0.00	0.00
51.47	1.77	35.84	1.318	0.13	0.13	0.034	0.00	0.00
44.94	1.63	34.07	1.151	0.00	0.00	0.029	0.00	0.00
39.23	1.57	32.43	1.005	0.00	0.00	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/01/01
File Name: AY101993.DAT Sample Name: AY 101 ID No: 01/09/27-061
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 84.953 % Lamp: 83.823 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: Fractional Settling Source:
Lot No: 1326 Test No: Duplicate

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	1.279	0.10	0.10	(15)	108.541	5.00	55.00
(2)	1.997	0.90	1.00	(16)	121.576	5.00	60.00
(3)	2.687	1.30	2.30	(17)	134.468	5.00	65.00
(4)	3.841	2.70	5.00	(18)	147.813	5.00	70.00
(5)	6.133	5.00	10.00	(19)	162.849	5.00	75.00
(6)	8.979	5.00	15.00	(20)	179.888	5.00	80.00
(7)	9.531	0.80	15.80	(21)	196.819	4.20	84.20
(8)	12.987	4.20	20.00	(22)	200.057	0.80	85.00
(9)	19.439	5.00	25.00	(23)	226.530	5.00	90.00
(10)	31.768	5.00	30.00	(24)	270.752	5.00	95.00
(11)	48.373	5.00	35.00	(25)	320.485	2.70	97.70
(12)	65.402	5.00	40.00	(26)	377.286	1.30	99.00
(13)	81.018	5.00	45.00	(27)	532.110	0.90	99.90
(14)	95.120	5.00	50.00				

Median : 94.901 (μm) Mean: 105.886 (μm) Mode: 142.450 (μm)
Std. Dev.: 90.881 (μm) Span: 1.136
Coef. Var: 85.83% Spec. Area: 3222 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/01/'01 15:35

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010927-062 18:39
Filename : AY101994
Sample : AY 101

Material : Fractional Settling
Source :
Lot Numbe : 1326

Condition
T%(He-Ne): 74.5% Dist.Form: Std. Sampling times : 100
(LAMP): 68.8% R.R.Index: 1.16-0.00i ( )

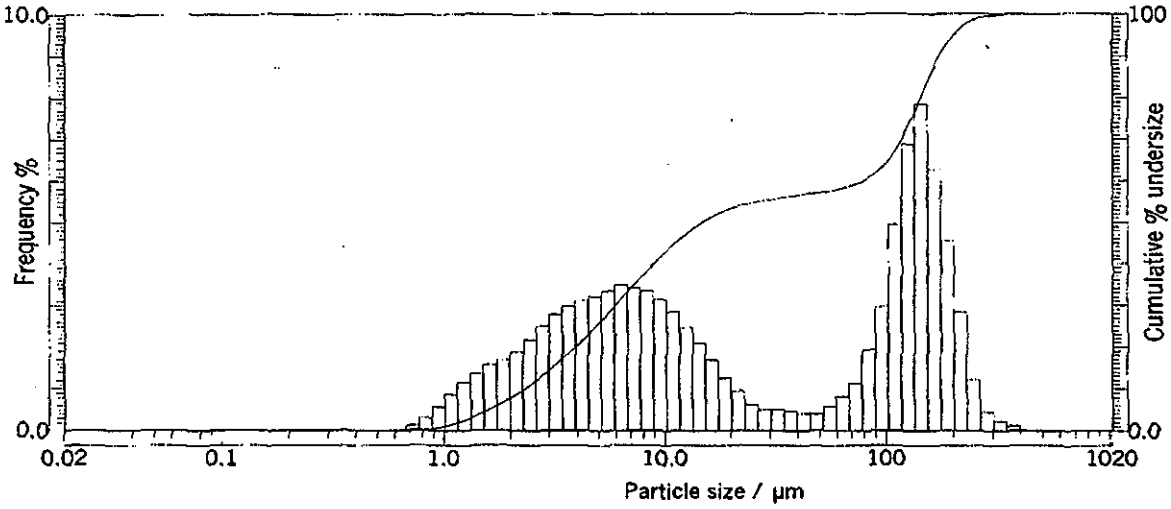
Agitation : 3 Circultn : 6 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 14.770μm SP.Area : 9110cm²/cm³ S.D. : 74.370μm
Mode : 141.708μm Mean : 66.071μm
C.V. : 112.56%

Span : (D 10.0-D 90.0) / D50 = 11.520

Dia. on %(5.0%) : 1.591μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 4.847μm % on Dia.(1.000μm) : 1.0%
Dia. on %(50.0%) : 14.770μm % on Dia.(10.000μm) : 42.8%
Dia. on %(75.0%) : 129.355μm % on Dia.(100.000μm) : 64.3%
Dia. on %(95.0%) : 199.253μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.62	54.92	0.669	0.00	0.00
890.1	0.00	100.00	22.80	0.95	54.30	0.584	0.00	0.00
777.1	0.00	100.00	19.90	1.25	53.35	0.510	0.00	0.00
678.5	0.00	100.00	17.38	1.68	52.09	0.445	0.00	0.00
592.4	0.00	100.00	15.17	2.07	50.41	0.389	0.00	0.00
517.2	0.00	100.00	13.25	2.46	48.34	0.339	0.00	0.00
451.6	0.00	100.00	11.56	2.85	45.88	0.296	0.00	0.00
394.2	0.14	100.00	10.10	3.15	43.03	0.259	0.00	0.00
344.2	0.25	99.86	8.816	3.35	39.88	0.226	0.00	0.00
300.5	0.44	99.62	7.697	3.42	36.54	0.197	0.00	0.00
262.4	1.21	99.18	6.720	3.48	33.12	0.172	0.00	0.00
229.1	2.84	97.97	5.867	3.34	29.64	0.150	0.00	0.00
200.0	4.56	95.13	5.122	3.21	26.31	0.131	0.00	0.00
174.6	6.27	90.57	4.472	3.11	23.10	0.115	0.00	0.00
152.5	7.85	84.30	3.905	2.98	19.98	0.100	0.00	0.00
133.1	6.87	76.45	3.409	2.78	17.01	0.087	0.00	0.00
116.2	4.94	69.57	2.976	2.50	14.23	0.076	0.00	0.00
101.5	2.97	64.63	2.599	2.18	11.73	0.067	0.00	0.00
88.58	1.94	61.66	2.269	1.89	9.55	0.058	0.00	0.00
77.34	1.14	59.73	1.981	1.69	7.67	0.051	0.00	0.00
67.52	0.82	58.59	1.729	1.58	5.98	0.044	0.00	0.00
58.95	0.58	57.77	1.510	1.36	4.39	0.039	0.00	0.00
51.47	0.39	57.18	1.318	1.15	3.03	0.034	0.00	0.00
44.94	0.41	56.79	1.151	0.87	1.88	0.029	0.00	0.00
39.23	0.46	56.39	1.005	0.57	1.01	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/01/01

File Name: AY101994.DAT Sample Name: AY 101 ID No: 01/09/27-062

Dist. Form: STANDARD R.R. Index: 116-000

Dist. Mode: VOLUME Laser: 74.464 % Lamp: 68.825 %

Circulation: 6 Agitation: 3 U.Sonic ** (min)

Material: Fractional Settling Source:

Lot No: 1326 Test No: Duplicate

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.743	0.10	0.10	(15)	26.740	5.00	55.00
(2)	1.002	0.90	1.00	(16)	78.934	5.00	60.00
(3)	1.212	1.30	2.30	(17)	102.557	5.00	65.00
(4)	1.594	2.70	5.00	(18)	117.261	5.00	70.00
(5)	2.337	5.00	10.00	(19)	129.548	5.00	75.00
(6)	3.097	5.00	15.00	(20)	141.861	5.00	80.00
(7)	3.221	0.80	15.80	(21)	152.213	4.20	84.20
(8)	3.907	4.20	20.00	(22)	154.936	0.80	85.00
(9)	4.858	5.00	25.00	(23)	172.610	5.00	90.00
(10)	5.954	5.00	30.00	(24)	199.301	5.00	95.00
(11)	7.257	5.00	35.00	(25)	226.351	2.70	97.70
(12)	8.863	5.00	40.00	(26)	257.502	1.30	99.00
(13)	11.113	5.00	45.00	(27)	357.506	0.90	99.90
(14)	14.791	5.00	50.00				

Median : 14.770 (μm) Mean: 66.071 (μm) Mode: 142.450 (μm)

Std. Dev.: 74.370 (μm) Span: 4.733

Coef. Var: 112.56% Spec. Area: 9110 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/01/'01 15:35

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010927-063 18:42
Filename : AY101995
Sample : AY 101

Material : Fractional Settling
Source :
Lot Numbe : 1326

Condition
T%(He-Ne): 74.4% Dist.Form: Std. Sampling times : 100
(LAMP): 69.1% R.R.Index: 1.16-0.00i ( )

Agitation : 1 Circultn : 6 U.sonic : ~~ON~~ OFF (120)

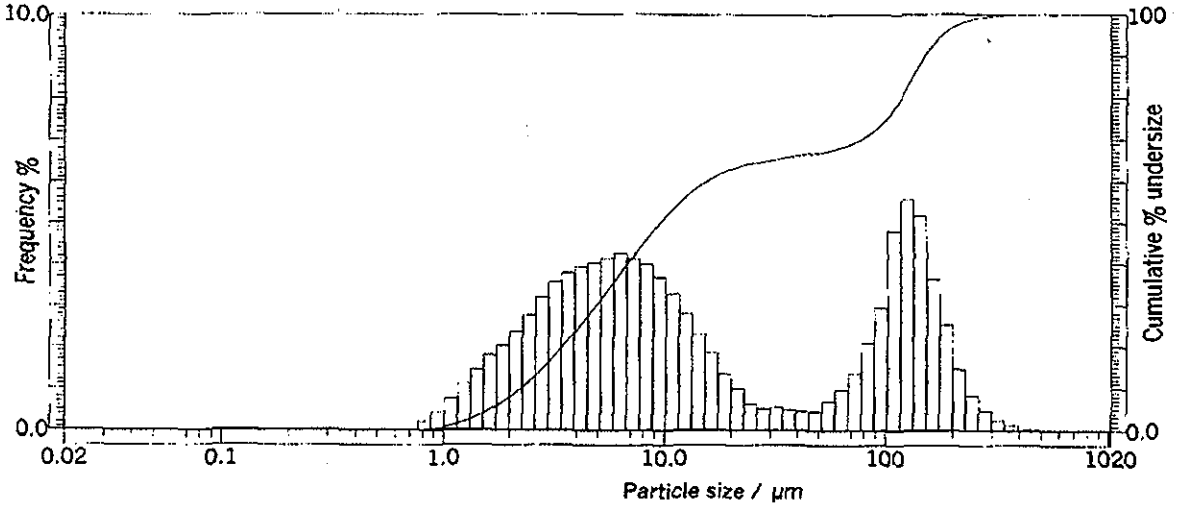
WSC 10/2/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 9.549μm SP.Area : 10220cm²/cm³ S.D. : 66.718μm
Mode : 124.888μm Mean : 49.597μm
C.V. : 134.52%

Span : (D 10.0-D 90.0) / D50 = 15.429

Dia. on %(5.0%) : 1.637μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 4.126μm % on Dia.(1.000μm) : 0.6%
Dia. on %(50.0%) : 9.549μm % on Dia.(10.000μm) : 51.3%
Dia. on %(75.0%) : 100.628μm % on Dia.(100.000μm) : 74.9%
Dia. on %(95.0%) : 180.873μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.63	64.70	0.669	0.00	0.00
890.1	0.00	100.00	22.80	1.00	64.07	0.584	0.00	0.00
777.1	0.00	100.00	19.90	1.34	63.06	0.510	0.00	0.00
678.5	0.00	100.00	17.38	1.85	61.73	0.445	0.00	0.00
592.4	0.00	100.00	15.17	2.30	59.88	0.389	0.00	0.00
517.2	0.00	100.00	13.25	2.79	57.58	0.339	0.00	0.00
451.6	0.00	100.00	11.56	3.28	54.79	0.296	0.00	0.00
394.2	0.14	100.00	10.10	3.68	51.51	0.259	0.00	0.00
344.2	0.25	99.86	8.816	3.98	47.83	0.226	0.00	0.00
300.5	0.45	99.61	7.697	4.12	43.85	0.197	0.00	0.00
262.4	0.82	99.15	6.720	4.25	39.73	0.172	0.00	0.00
229.1	1.47	98.34	5.867	4.13	35.48	0.150	0.00	0.00
200.0	2.53	96.87	5.122	4.01	31.35	0.131	0.00	0.00
174.6	3.62	94.34	4.472	3.93	27.33	0.115	0.00	0.00
152.5	5.16	90.72	3.905	3.78	23.41	0.100	0.00	0.00
133.1	5.56	85.56	3.409	3.57	19.62	0.087	0.00	0.00
116.2	4.82	80.00	2.976	3.20	16.06	0.076	0.00	0.00
101.5	2.94	75.18	2.599	2.76	12.85	0.067	0.00	0.00
88.58	2.10	72.24	2.269	2.35	10.10	0.058	0.00	0.00
77.34	1.36	70.14	1.981	2.03	7.75	0.051	0.00	0.00
67.52	0.96	68.78	1.729	1.79	5.72	0.044	0.00	0.00
58.95	0.68	67.83	1.510	1.43	3.93	0.039	0.00	0.00
51.47	0.44	67.15	1.318	1.10	2.50	0.034	0.00	0.00
44.94	0.45	66.70	1.151	0.75	1.40	0.029	0.00	0.00
39.23	0.50	66.26	1.005	0.44	0.65	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/01/01
File Name: AY101995.DAT Sample Name: AY 101 ID No: 01/09/27-063
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 74.411 % Lamp: 69.054 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: Fractional Settling Source:
Lot No: 1326 Test No: Duplicate

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.819	0.10	0.10	(15)	11.691	5.00	55.00
(2)	1.074	0.90	1.00	(16)	15.312	5.00	60.00
(3)	1.288	1.30	2.30	(17)	28.329	5.00	65.00
(4)	1.641	2.70	5.00	(18)	76.303	5.00	70.00
(5)	2.257	5.00	10.00	(19)	100.679	5.00	75.00
(6)	2.852	5.00	15.00	(20)	116.220	5.00	80.00
(7)	2.946	0.80	15.80	(21)	128.972	4.20	84.20
(8)	3.458	4.20	20.00	(22)	131.402	0.80	85.00
(9)	4.135	5.00	25.00	(23)	149.753	5.00	90.00
(10)	4.904	5.00	30.00	(24)	181.201	5.00	95.00
(11)	5.780	5.00	35.00	(25)	216.457	2.70	97.70
(12)	6.783	5.00	40.00	(26)	256.120	1.30	99.00
(13)	8.019	5.00	45.00	(27)	358.542	0.90	99.90
(14)	9.571	5.00	50.00				

Median : 9.549 (μm) Mean: 49.597 (μm) Mode: 124.370 (μm)
Std. Dev.: 66.718 (μm) Span: 8.403
Coef. Var: 134.52% Spec. Area: 10220 (cm2/cm3)

APPENDIX F-17

C-104 FRACTIONAL SETTLING SAMPLE: PSD MEASUREMENT RESULTS

Consisting of 18 pages including this cover page

TABLE F-17. Sample identification and PSD run conditions. Sample from fractional settling tests on C-104 composite.

Conditions Key: P = Pump Speed Setting; P6 = 14.4 mL/s
S = Stirrer Speed Setting (1-7); S1 = Stirrer Speed 1; S3 = Stirrer Speed 3
US = Ultrasonic ON Time (min); DT = Delay Time (min) between end of ultrasonic treatment and PSD measurement.
Time = Clock time at beginning of measurement

Sample	PSD Run File Name	Run Conditions				Time	Cumulative Time (min) At Conditions				
		P	S	US	DT		P6	S1	S3	US	DT
S01T001332	[LOAD-IN]	6	1	0	0	?	?	?			
	C104980	6	1	0	0	17:07	5	5			
	C104981	6	3	0	0	17:12	8	5	3		
	C104982	6	3	2	0	17:15	14	5	9	2	0
	C104983	6	1	0	0	17:21	17	8	9	2	4
						17:24					
S01T001332	[LOAD-IN]	6	1	0	0	?	?	?			
	C104984	6	1	0	0	17:31	4	4			
	C104985	6	3	0	0	17:35	7	4	3		
	C104986	6	3	2	0	17:38	14	4	10	2	0
	C104987	6	1	0	0	17:45	16	6	10	2	5
						17:47					

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/01/'01 15:36

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010927-048 17:09
Filename : C104980
Sample : C104

Material : Fractional Settling
Source :
Lot Numbe : 1332

Condition
T%(He-Ne): 84.5% Dist.Form: Std. Sampling times : 100
(LAMP): 82.0% R.R.Index: 1.16-0.00i ( )

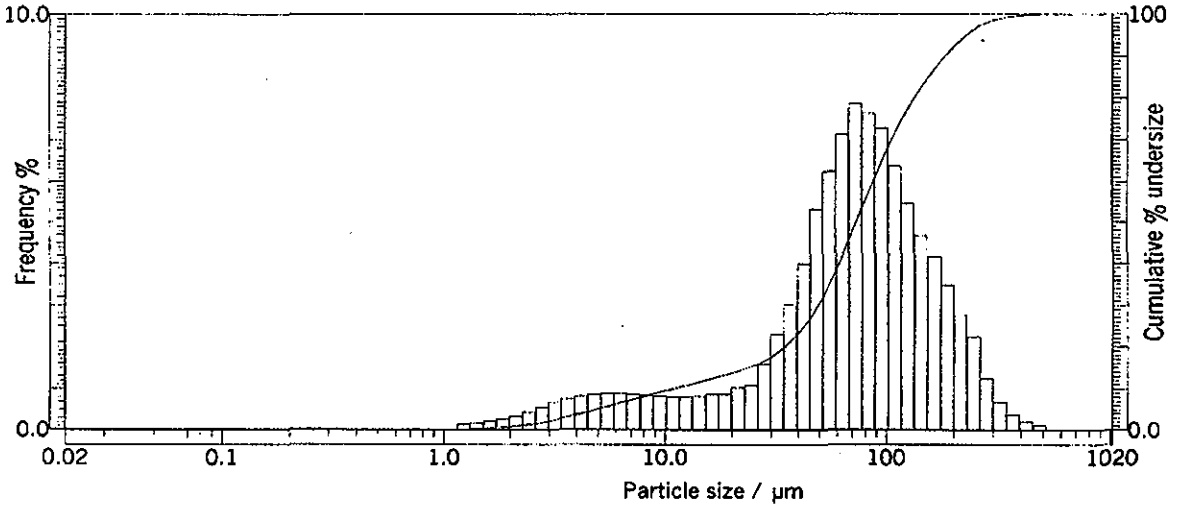
Agitation : 1 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 73.105μm SP.Area : 2386cm²/cm³ S.D. : 69.701μm
Mode : 72.586μm Mean : 88.650μm
C.V. : 78.62%

Span : (D 10.0-D 90.0) / D50 = 2.349

Dia. on %(5.0%) : 4.931μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 42.420μm % on Dia.(1.000μm) : 0.0%
Dia. on %(50.0%) : 73.105μm % on Dia.(10.000μm) : 9.5%
Dia. on %(75.0%) : 117.514μm % on Dia.(100.000μm) : 67.4%
Dia. on %(95.0%) : 227.899μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.09	15.80	0.669	0.00	0.00
890.1	0.00	100.00	22.80	1.03	14.71	0.584	0.00	0.00
777.1	0.00	100.00	19.90	0.87	13.68	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.87	12.81	0.445	0.00	0.00
592.4	0.00	100.00	15.17	0.81	11.94	0.389	0.00	0.00
517.2	0.12	100.00	13.25	0.79	11.13	0.339	0.00	0.00
451.6	0.21	99.88	11.56	0.80	10.34	0.296	0.00	0.00
394.2	0.38	99.67	10.10	0.82	9.54	0.259	0.00	0.00
344.2	0.69	99.28	8.816	0.84	8.72	0.226	0.00	0.00
300.5	1.25	98.59	7.697	0.86	7.88	0.197	0.00	0.00
262.4	2.24	97.35	6.720	0.90	7.02	0.172	0.00	0.00
229.1	2.78	95.11	5.867	0.88	6.12	0.150	0.00	0.00
200.0	3.48	92.33	5.122	0.86	5.24	0.131	0.00	0.00
174.6	4.16	88.85	4.472	0.82	4.38	0.115	0.00	0.00
152.5	4.68	84.69	3.905	0.76	3.56	0.100	0.00	0.00
133.1	5.46	80.01	3.409	0.68	2.80	0.087	0.00	0.00
116.2	6.36	74.55	2.976	0.56	2.12	0.076	0.00	0.00
101.5	7.28	68.19	2.599	0.44	1.56	0.067	0.00	0.00
88.58	7.64	60.90	2.269	0.34	1.12	0.058	0.00	0.00
77.34	7.87	53.27	1.981	0.26	0.79	0.051	0.00	0.00
67.52	7.12	45.39	1.729	0.22	0.52	0.044	0.00	0.00
58.95	6.25	38.27	1.510	0.17	0.30	0.039	0.00	0.00
51.47	5.33	32.02	1.318	0.13	0.13	0.034	0.00	0.00
44.94	3.99	26.69	1.151	0.00	0.00	0.029	0.00	0.00
39.23	3.03	22.71	1.005	0.00	0.00	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/01/01
File Name: C104980.DAT Sample Name: C104 ID No: 01/09/27-048
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 84.524 % Lamp: 82.016 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: Fractional Settling Source:
Lot No: 1332 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	1.276	0.10	0.10	(15)	79.892	5.00	55.00
(2)	2.163	0.90	1.00	(16)	87.251	5.00	60.00
(3)	3.092	1.30	2.30	(17)	95.825	5.00	65.00
(4)	4.940	2.70	5.00	(18)	105.663	5.00	70.00
(5)	10.942	5.00	10.00	(19)	117.599	5.00	75.00
(6)	23.683	5.00	15.00	(20)	133.062	5.00	80.00
(7)	26.117	0.80	15.80	(21)	150.427	4.20	84.20
(8)	34.786	4.20	20.00	(22)	154.106	0.80	85.00
(9)	42.515	5.00	25.00	(23)	182.996	5.00	90.00
(10)	48.992	5.00	30.00	(24)	227.973	5.00	95.00
(11)	55.039	5.00	35.00	(25)	273.201	2.70	97.70
(12)	61.037	5.00	40.00	(26)	326.298	1.30	99.00
(13)	67.051	5.00	45.00	(27)	461.859	0.90	99.90
(14)	73.267	5.00	50.00				

Median : 73.105 (μm) Mean: 88.650 (μm) Mode: 72.265 (μm)
Std. Dev.: 69.701 (μm) Span: 1.510
Coef. Var: 78.62% Spec. Area: 2386 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/01/'01 15:38

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010927-049 17:15
Filename : C104981
Sample : C104

Material : Fractional Settling
Source :
Lot Numbe : 1332

Condition
T%(He-Ne): 81.0% Dist.Form: Std. Sampling times : 100
(LAMP): 77.9% R.R.Index: 1.16-0.00i ( )

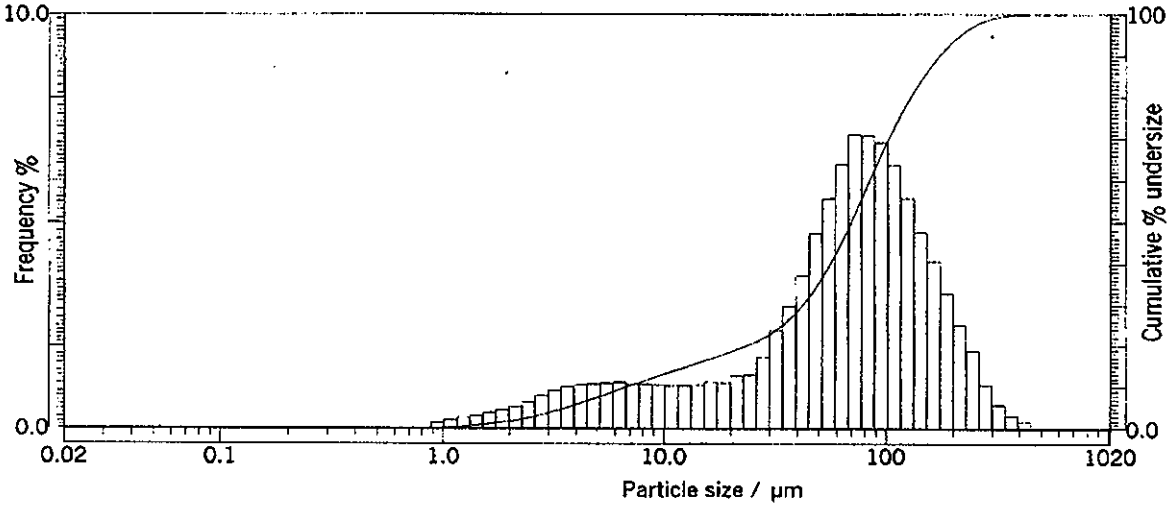
Agitation : 3 Circultn : 6 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 69.624μm SP.Area : 3247cm²/cm³ S.D. : 67.647μm
Mode : 72.754μm Mean : 82.812μm
C.V. : 81.69%

Span : (D 10.0-D 90.0) / D50 = 2.392

Dia. on %(5.0%) : 3.581μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 34.169μm % on Dia.(1.000μm) : 0.1%
Dia. on %(50.0%) : 69.624μm % on Dia.(10.000μm) : 13.0%
Dia. on %(75.0%) : 114.187μm % on Dia.(100.000μm) : 68.7%
Dia. on %(95.0%) : 216.972μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.28	20.95	0.669	0.00	0.00
890.1	0.00	100.00	22.80	1.26	19.67	0.584	0.00	0.00
777.1	0.00	100.00	19.90	1.10	18.41	0.510	0.00	0.00
678.5	0.00	100.00	17.38	1.11	17.32	0.445	0.00	0.00
592.4	0.00	100.00	15.17	1.05	16.20	0.389	0.00	0.00
517.2	0.00	100.00	13.25	1.03	15.15	0.339	0.00	0.00
451.6	0.18	100.00	11.56	1.03	14.12	0.296	0.00	0.00
394.2	0.32	99.82	10.10	1.04	13.09	0.259	0.00	0.00
344.2	0.58	99.50	8.816	1.06	12.05	0.226	0.00	0.00
300.5	1.04	98.92	7.697	1.07	10.99	0.197	0.00	0.00
262.4	1.88	97.88	6.720	1.10	9.91	0.172	0.00	0.00
229.1	2.50	96.00	5.867	1.08	8.81	0.150	0.00	0.00
200.0	3.27	93.50	5.122	1.06	7.73	0.131	0.00	0.00
174.6	4.06	90.22	4.472	1.04	6.67	0.115	0.00	0.00
152.5	4.76	86.16	3.905	0.99	5.63	0.100	0.00	0.00
133.1	5.57	81.39	3.409	0.91	4.64	0.087	0.00	0.00
116.2	6.36	75.82	2.976	0.79	3.73	0.076	0.00	0.00
101.5	6.90	69.46	2.599	0.65	2.94	0.067	0.00	0.00
88.58	7.07	62.56	2.269	0.53	2.29	0.058	0.00	0.00
77.34	7.09	55.49	1.981	0.44	1.76	0.051	0.00	0.00
67.52	6.37	48.40	1.729	0.39	1.32	0.044	0.00	0.00
58.95	5.57	42.03	1.510	0.32	0.93	0.039	0.00	0.00
51.47	4.73	36.46	1.318	0.26	0.61	0.034	0.00	0.00
44.94	3.71	31.72	1.151	0.20	0.35	0.029	0.00	0.00
39.23	2.97	28.01	1.005	0.14	0.14	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/01/01
File Name: C104981.DAT Sample Name: C104 ID No: 01/09/27-049
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 80.954 % Lamp: 77.945 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: Fractional Settling Source:
Lot No: 1332 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.965	0.10	0.10	(15)	76.664	5.00	55.00
(2)	1.549	0.90	1.00	(16)	84.510	5.00	60.00
(3)	2.274	1.30	2.30	(17)	93.134	5.00	65.00
(4)	3.589	2.70	5.00	(18)	102.715	5.00	70.00
(5)	6.798	5.00	10.00	(19)	114.302	5.00	75.00
(6)	13.000	5.00	15.00	(20)	128.876	5.00	80.00
(7)	14.434	0.80	15.80	(21)	144.498	4.20	84.20
(8)	23.652	4.20	20.00	(22)	147.747	0.80	85.00
(9)	34.175	5.00	25.00	(23)	173.397	5.00	90.00
(10)	42.290	5.00	30.00	(24)	217.447	5.00	95.00
(11)	49.461	5.00	35.00	(25)	259.225	2.70	97.70
(12)	56.228	5.00	40.00	(26)	306.538	1.30	99.00
(13)	62.949	5.00	45.00	(27)	419.498	0.90	99.90
(14)	69.739	5.00	50.00				

Median : 69.624 (μm) Mean: 82.812 (μm) Mode: 72.265 (μm)
Std. Dev.: 67.647 (μm) Span: 1.476
Coef. Var: 81.69% Spec. Area: 3247 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/01/'01 15:38

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010927-050 17:20
Filename : C104982
Sample : C104

Material : Fractional Settling
Source :
Lot Numbe : 1332

Condition
T%(He-Ne): 71.2% Dist.Form: Std. Sampling times : 100
(LAMP): 61.1% R.R.Index: 1.16-0.00i ( )

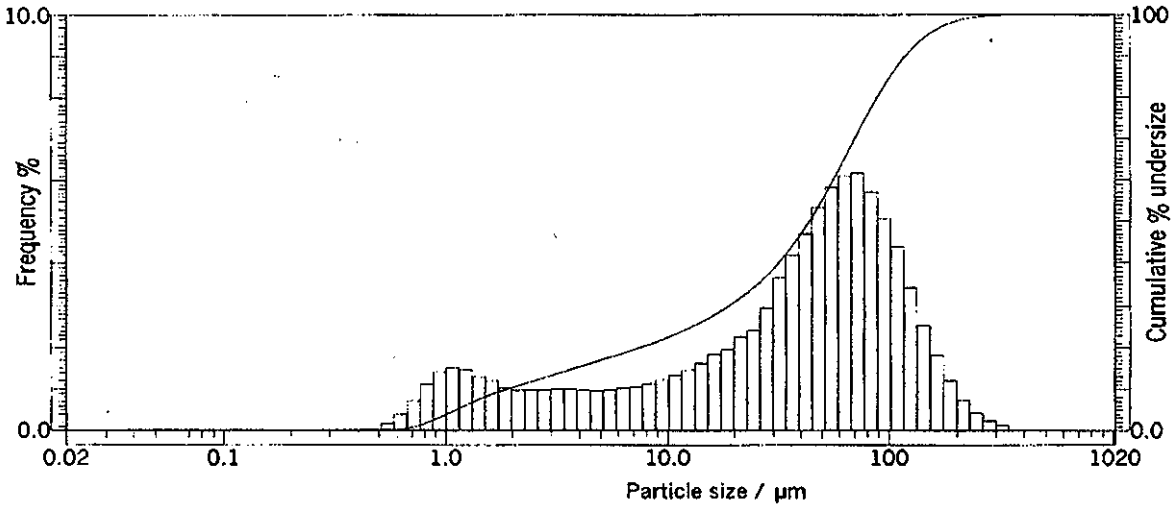
Agitation : 3 Circultn : 6 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 43.756μm SP.Area : 8668cm²/cm³ S.D. : 49.471μm
Mode : 71.972μm Mean : 53.649μm
C.V. : 92.21%

Span : (D 10.0-D 90.0) / D50 = 2.663

Dia. on %(5.0%) : 1.118μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 12.845μm % on Dia.(1.000μm) : 3.8%
Dia. on %(50.0%) : 43.756μm % on Dia.(10.000μm) : 22.5%
Dia. on %(75.0%) : 78.586μm % on Dia.(100.000μm) : 84.6%
Dia. on %(95.0%) : 148.565μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	2.42	35.43	0.669	0.38	0.56
890.1	0.00	100.00	22.80	2.27	33.01	0.584	0.18	0.18
777.1	0.00	100.00	19.90	1.96	30.75	0.510	0.00	0.00
678.5	0.00	100.00	17.38	1.83	28.79	0.445	0.00	0.00
592.4	0.00	100.00	15.17	1.62	26.95	0.389	0.00	0.00
517.2	0.00	100.00	13.25	1.46	25.33	0.339	0.00	0.00
451.6	0.00	100.00	11.56	1.33	23.87	0.296	0.00	0.00
394.2	0.00	100.00	10.10	1.22	22.54	0.259	0.00	0.00
344.2	0.13	100.00	8.816	1.13	21.32	0.226	0.00	0.00
300.5	0.23	99.87	7.697	1.05	20.19	0.197	0.00	0.00
262.4	0.42	99.64	6.720	1.02	19.14	0.172	0.00	0.00
229.1	0.72	99.22	5.867	0.97	18.12	0.150	0.00	0.00
200.0	1.21	98.50	5.122	0.95	17.15	0.131	0.00	0.00
174.6	1.81	97.29	4.472	0.97	16.19	0.115	0.00	0.00
152.5	2.53	95.48	3.905	0.99	15.22	0.100	0.00	0.00
133.1	3.43	92.95	3.409	1.00	14.23	0.087	0.00	0.00
116.2	4.40	89.52	2.976	0.99	13.23	0.076	0.00	0.00
101.5	5.08	85.12	2.599	0.98	12.24	0.067	0.00	0.00
88.58	5.71	80.04	2.269	0.97	11.26	0.058	0.00	0.00
77.34	6.16	74.33	1.981	1.03	10.29	0.051	0.00	0.00
67.52	6.08	68.17	1.729	1.19	9.26	0.044	0.00	0.00
58.95	5.81	62.09	1.510	1.30	8.07	0.039	0.00	0.00
51.47	5.35	56.27	1.318	1.45	6.77	0.034	0.00	0.00
44.94	4.71	50.93	1.151	1.52	5.32	0.029	0.00	0.00
39.23	4.18	46.21	1.005	1.41	3.80	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/01/01
File Name: C104982.DAT Sample Name: C104 ID No: 01/09/27-050
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 71.226 % Lamp: 61.117 %
Circulation: 6 Agitation: 3 U.Sonic ** (min)
Material: Fractional Settling Source:
Lot No: 1332 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.551	0.10	0.10	(15)	49.918	5.00	55.00
(2)	0.729	0.90	1.00	(16)	56.270	5.00	60.00
(3)	0.868	1.30	2.30	(17)	63.059	5.00	65.00
(4)	1.120	2.70	5.00	(18)	70.443	5.00	70.00
(5)	1.910	5.00	10.00	(19)	78.664	5.00	75.00
(6)	3.794	5.00	15.00	(20)	88.502	5.00	80.00
(7)	4.242	0.80	15.80	(21)	99.131	4.20	84.20
(8)	7.517	4.20	20.00	(22)	101.160	0.80	85.00
(9)	12.866	5.00	25.00	(23)	118.578	5.00	90.00
(10)	18.942	5.00	30.00	(24)	148.770	5.00	95.00
(11)	25.521	5.00	35.00	(25)	183.234	2.70	97.70
(12)	31.833	5.00	40.00	(26)	220.353	1.30	99.00
(13)	37.789	5.00	45.00	(27)	310.552	0.90	99.90
(14)	43.818	5.00	50.00				

Median : 43.756 (μm) Mean: 53.649 (μm) Mode: 72.265 (μm)
Std. Dev.: 49.471 (μm) Span: 1.599
Coef. Var: 92.21% Spec. Area: 8668 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/01/'01 15:38

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010927-051 17:24
Filename : C104983
Sample : C104

Material : Fractional Settling
Source :
Lot Numbe : 1332

Condition
T%(He-Ne): 71.0% Dist.Form: Std. Sampling times : 100
(LAMP): 61.1% R.R.Index: 1.16-0.00i ( )

Agitation : 1 Circultn : 6 U.sonic : ~~ON~~(120) OFF

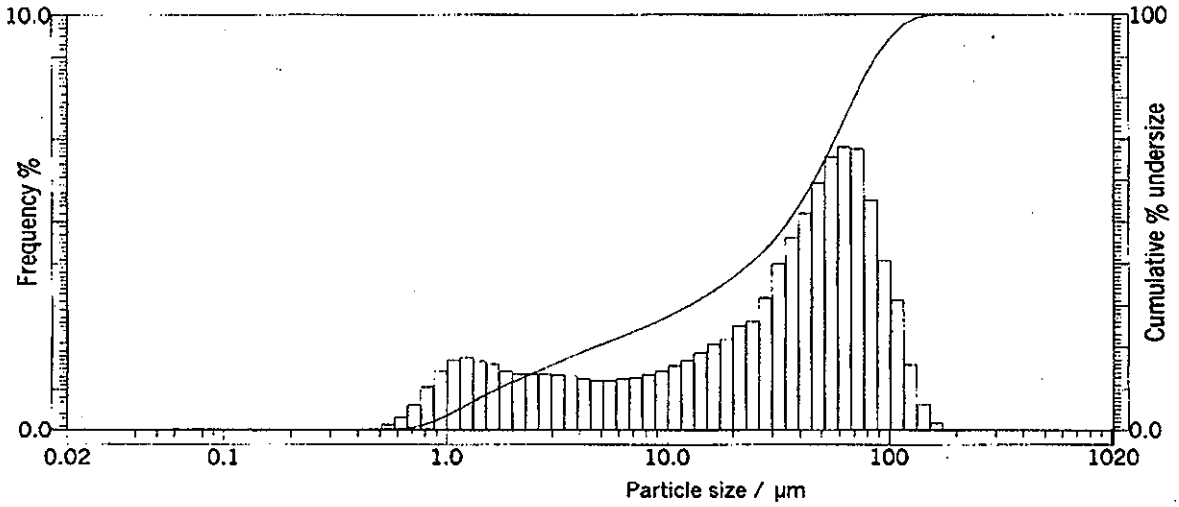
WSC 10/2/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 35.282μm SP.Area : 9722cm²/cm³ S.D. : 33.931μm
Mode : 63.215μm Mean : 40.152μm
C.V. : 84.51%

Span : (D 10.0-D 90.0) / D50 = 2.437

Dia. on %(5.0%) :	1.131μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	8.066μm	% on Dia.(1.000μm) :	3.5%
Dia. on %(50.0%) :	35.282μm	% on Dia.(10.000μm) :	27.2%
Dia. on %(75.0%) :	63.429μm	% on Dia.(100.000μm) :	94.1%
Dia. on %(95.0%) :	103.721μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	2.61	41.82	0.669	0.30	0.43
890.1	0.00	100.00	22.80	2.50	39.21	0.584	0.13	0.13
777.1	0.00	100.00	19.90	2.19	36.71	0.510	0.00	0.00
678.5	0.00	100.00	17.38	2.08	34.52	0.445	0.00	0.00
592.4	0.00	100.00	15.17	1.86	32.44	0.389	0.00	0.00
517.2	0.00	100.00	13.25	1.69	30.57	0.339	0.00	0.00
451.6	0.00	100.00	11.56	1.56	28.88	0.296	0.00	0.00
394.2	0.00	100.00	10.10	1.44	27.32	0.259	0.00	0.00
344.2	0.00	100.00	8.816	1.35	25.88	0.226	0.00	0.00
300.5	0.00	100.00	7.697	1.27	24.53	0.197	0.00	0.00
262.4	0.00	100.00	6.720	1.25	23.26	0.172	0.00	0.00
229.1	0.00	100.00	5.867	1.20	22.02	0.150	0.00	0.00
200.0	0.00	100.00	5.122	1.20	20.81	0.131	0.00	0.00
174.6	0.17	100.00	4.472	1.25	19.61	0.115	0.00	0.00
152.5	0.63	99.83	3.905	1.30	18.37	0.100	0.00	0.00
133.1	1.59	99.21	3.409	1.34	17.06	0.087	0.00	0.00
116.2	3.12	97.61	2.976	1.36	15.72	0.076	0.00	0.00
101.5	4.07	94.49	2.599	1.36	14.36	0.067	0.00	0.00
88.58	5.52	90.42	2.269	1.36	13.00	0.058	0.00	0.00
77.34	6.76	84.90	1.981	1.43	11.65	0.051	0.00	0.00
67.52	6.80	78.14	1.729	1.59	10.22	0.044	0.00	0.00
58.95	6.57	71.33	1.510	1.66	8.63	0.039	0.00	0.00
51.47	5.95	64.76	1.318	1.75	6.96	0.034	0.00	0.00
44.94	5.21	58.81	1.151	1.69	5.22	0.029	0.00	0.00
39.23	4.61	53.60	1.005	1.45	3.53	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/01/01

File Name: C104983.DAT Sample Name: C104 ID No: 01/09/27-051

Dist. Form: STANDARD R.R. Index: 116-000

Dist. Mode: VOLUME Laser: 70.964 % Lamp: 61.091 %

Circulation: 6 Agitation: 1 U.Sonic OFF (min)

Material: Fractional Settling Source:

Lot No: 1332 Test No:

WSC 10/2/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.567	0.10	0.10	(15)	40.762	5.00	55.00
(2)	0.760	0.90	1.00	(16)	46.240	5.00	60.00
(3)	0.897	1.30	2.30	(17)	51.742	5.00	65.00
(4)	1.132	2.70	5.00	(18)	57.436	5.00	70.00
(5)	1.699	5.00	10.00	(19)	63.573	5.00	75.00
(6)	2.776	5.00	15.00	(20)	70.228	5.00	80.00
(7)	3.002	0.80	15.80	(21)	76.323	4.20	84.20
(8)	4.682	4.20	20.00	(22)	77.542	0.80	85.00
(9)	8.083	5.00	25.00	(23)	87.724	5.00	90.00
(10)	12.676	5.00	30.00	(24)	103.855	5.00	95.00
(11)	17.932	5.00	35.00	(25)	117.118	2.70	97.70
(12)	23.796	5.00	40.00	(26)	130.899	1.30	99.00
(13)	29.907	5.00	45.00	(27)	161.203	0.90	99.90
(14)	35.339	5.00	50.00				

Median : 35.282 (μm) Mean: 40.152 (μm) Mode: 63.093 (μm)

Std. Dev.: 33.931 (μm) Span: 1.142

Coef. Var: 84.51% Spec. Area: 9722 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/01/'01 15:38

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010927-052 17:33
Filename : C104984
Sample : C104

Material : Fractional Settling
Source :
Lot Numbe : 1332

Condition
T%(He-Ne): 88.3% Dist.Form: Std. Sampling times : 100
(LAMP): 86.8% R.R.Index: 1.16-0.00i ( )

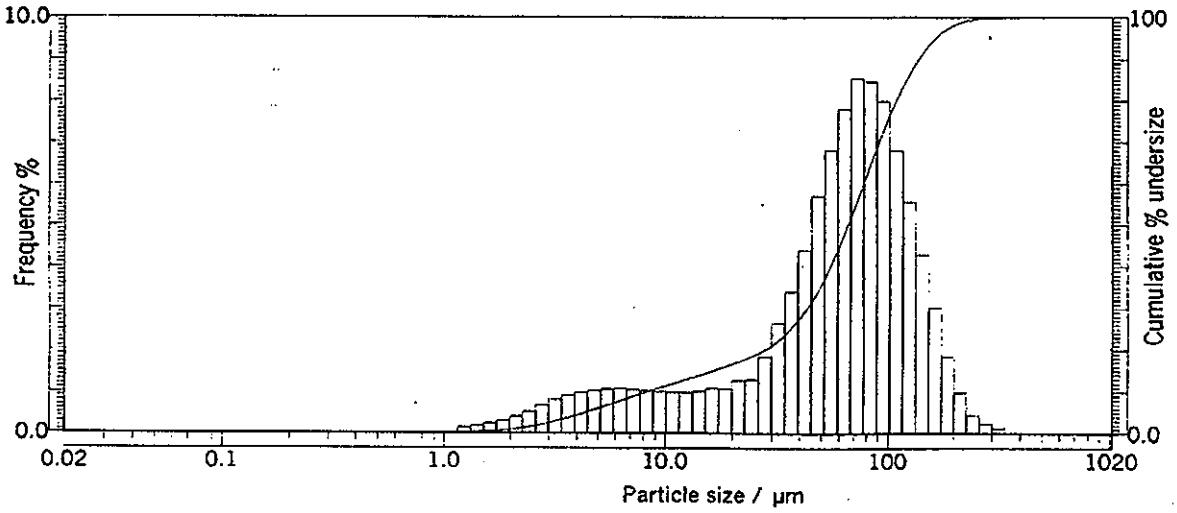
Agitation : 1 Circultn : 6 U.sonic : ~~ON~~ OFF (120) WJC 10/2/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 65.581μm SP.Area : 2733cm²/cm³ S.D. : 49.873μm
Mode : 72.644μm Mean : 71.663μm
C.V. : 69.59%

Span : (D 10.0-D 90.0) / D50 = 1.965

Dia. on %(5.0%) :	4.383μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	36.270μm	% on Dia.(1.000μm) :	0.0%
Dia. on %(50.0%) :	65.581μm	% on Dia.(10.000μm) :	11.3%
Dia. on %(75.0%) :	98.647μm	% on Dia.(100.000μm) :	75.8%
Dia. on %(95.0%) :	164.421μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.30	19.08	0.669	0.00	0.00
890.1	0.00	100.00	22.80	1.26	17.78	0.584	0.00	0.00
777.1	0.00	100.00	19.90	1.07	16.52	0.510	0.00	0.00
678.5	0.00	100.00	17.38	1.08	15.45	0.445	0.00	0.00
592.4	0.00	100.00	15.17	1.02	14.36	0.389	0.00	0.00
517.2	0.00	100.00	13.25	0.98	13.35	0.339	0.00	0.00
451.6	0.00	100.00	11.56	0.99	12.36	0.296	0.00	0.00
394.2	0.00	100.00	10.10	1.01	11.37	0.259	0.00	0.00
344.2	0.14	100.00	8.816	1.03	10.36	0.226	0.00	0.00
300.5	0.25	99.86	7.697	1.05	9.33	0.197	0.00	0.00
262.4	0.44	99.62	6.720	1.07	8.29	0.172	0.00	0.00
229.1	0.99	99.18	5.867	1.05	7.21	0.150	0.00	0.00
200.0	1.85	98.19	5.122	1.02	6.16	0.131	0.00	0.00
174.6	3.02	96.34	4.472	0.98	5.15	0.115	0.00	0.00
152.5	4.29	93.32	3.905	0.91	4.17	0.100	0.00	0.00
133.1	5.57	89.02	3.409	0.81	3.26	0.087	0.00	0.00
116.2	6.80	83.45	2.976	0.67	2.45	0.076	0.00	0.00
101.5	7.99	76.66	2.599	0.52	1.78	0.067	0.00	0.00
88.58	8.46	68.66	2.269	0.40	1.26	0.058	0.00	0.00
77.34	8.53	60.21	1.981	0.31	0.86	0.051	0.00	0.00
67.52	7.80	51.68	1.729	0.24	0.56	0.044	0.00	0.00
58.95	6.80	43.88	1.510	0.18	0.31	0.039	0.00	0.00
51.47	5.71	37.07	1.318	0.13	0.13	0.034	0.00	0.00
44.94	4.39	31.36	1.151	0.00	0.00	0.029	0.00	0.00
39.23	3.42	26.98	1.005	0.00	0.00	0.026	0.00	0.00

HORIBA·LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/01/01

File Name: C104984.DAT Sample Name: C104 ID No: 01/09/27-052

Dist. Form: STANDARD R.R. Index: 116-000

Dist. Mode: VOLUME Laser: 88.334 % Lamp: 86.783 %

Circulation: 6 Agitation: 1 U.Sonic OFF (min)

Material: Fractional Settling Source:

Lot No: 1332 Test No: Dup

WSC
10/2/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	1.275	0.10	0.10	(15)	71.348	5.00	55.00
(2)	2.079	0.90	1.00	(16)	77.101	5.00	60.00
(3)	2.892	1.30	2.30	(17)	83.713	5.00	65.00
(4)	4.388	2.70	5.00	(18)	90.737	5.00	70.00
(5)	8.420	5.00	10.00	(19)	98.792	5.00	75.00
(6)	16.464	5.00	15.00	(20)	108.716	5.00	80.00
(7)	18.202	0.80	15.80	(21)	118.474	4.20	84.20
(8)	28.003	4.20	20.00	(22)	120.901	0.80	85.00
(9)	36.352	5.00	25.00	(23)	137.505	5.00	90.00
(10)	43.164	5.00	30.00	(24)	164.793	5.00	95.00
(11)	49.097	5.00	35.00	(25)	193.311	2.70	97.70
(12)	54.688	5.00	40.00	(26)	223.909	1.30	99.00
(13)	60.185	5.00	45.00	(27)	312.194	0.90	99.90
(14)	65.681	5.00	50.00				

Median : 65.581 (μm) Mean: 71.663 (μm) Mode: 72.265 (μm)

Std. Dev.: 49.873 (μm) Span: 1.003

Coef. Var: 69.59% Spec. Area: 2733 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/01/'01 15:38

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010927-053 17:37
Filename : C104985
Sample : C104

Material : Fractional Settling
Source :
Lot Numbe : 1332

Condition
T%(He-Ne): 86.9% Dist.Form: Std. Sampling times : 100
(LAMP): 85.1% R.R.Index: 1.16-0.00i ( )

Agitation : 3 Circultn : 6 U.sonic : ~~ON~~ OFF (120)

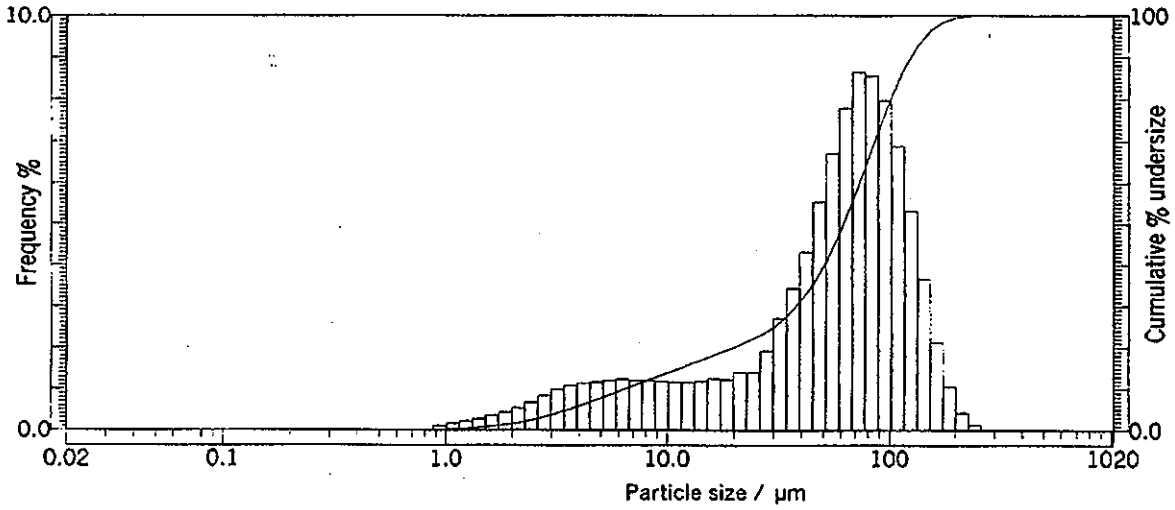
WSC 10/2/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 61.606μm SP.Area : 3371cm²/cm³ S.D. : 44.466μm
Mode : 72.698μm Mean : 64.788μm
C.V. : 68.63%

Span : (D 10.0-D 90.0) / D50 = 1.917

Dia. on %(5.0%) :	3.596μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	30.277μm	% on Dia.(1.000μm) :	0.1%
Dia. on %(50.0%) :	61.606μm	% on Dia.(10.000μm) :	13.9%
Dia. on %(75.0%) :	92.526μm	% on Dia.(100.000μm) :	79.6%
Dia. on %(95.0%) :	145.449μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.41	22.84	0.669	0.00	0.00
890.1	0.00	100.00	22.80	1.41	21.43	0.584	0.00	0.00
777.1	0.00	100.00	19.90	1.23	20.02	0.510	0.00	0.00
678.5	0.00	100.00	17.38	1.26	18.79	0.445	0.00	0.00
592.4	0.00	100.00	15.17	1.19	17.53	0.389	0.00	0.00
517.2	0.00	100.00	13.25	1.16	16.34	0.339	0.00	0.00
451.6	0.00	100.00	11.56	1.17	15.18	0.296	0.00	0.00
394.2	0.00	100.00	10.10	1.18	14.01	0.259	0.00	0.00
344.2	0.00	100.00	8.816	1.20	12.83	0.226	0.00	0.00
300.5	0.00	100.00	7.697	1.21	11.63	0.197	0.00	0.00
262.4	0.13	100.00	6.720	1.24	10.41	0.172	0.00	0.00
229.1	0.43	99.87	5.867	1.21	9.18	0.150	0.00	0.00
200.0	1.05	99.44	5.122	1.17	7.97	0.131	0.00	0.00
174.6	2.12	98.39	4.472	1.14	6.80	0.115	0.00	0.00
152.5	3.66	96.27	3.905	1.08	5.65	0.100	0.00	0.00
133.1	5.30	92.61	3.409	0.98	4.57	0.087	0.00	0.00
116.2	6.89	87.30	2.976	0.84	3.59	0.076	0.00	0.00
101.5	7.97	80.41	2.599	0.67	2.75	0.067	0.00	0.00
88.58	8.55	72.44	2.269	0.54	2.08	0.058	0.00	0.00
77.34	8.63	63.90	1.981	0.43	1.55	0.051	0.00	0.00
67.52	7.79	55.26	1.729	0.36	1.11	0.044	0.00	0.00
58.95	6.72	47.47	1.510	0.28	0.75	0.039	0.00	0.00
51.47	5.54	40.75	1.318	0.22	0.48	0.034	0.00	0.00
44.94	4.32	35.21	1.151	0.16	0.26	0.029	0.00	0.00
39.23	3.43	30.89	1.005	0.10	0.10	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/01/01
File Name: C104985.DAT Sample Name: C104 ID No: 01/09/27-053
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 86.884 % Lamp: 85.098 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: Fractional Settling Source:
Lot No: 1332 Test No: Dup

WJC
10/2/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	1.002	0.10	0.10	(15)	67.235	5.00	55.00
(2)	1.660	0.90	1.00	(16)	72.910	5.00	60.00
(3)	2.376	1.30	2.30	(17)	78.792	5.00	65.00
(4)	3.604	2.70	5.00	(18)	85.368	5.00	70.00
(5)	6.434	5.00	10.00	(19)	92.715	5.00	75.00
(6)	11.338	5.00	15.00	(20)	100.797	5.00	80.00
(7)	12.461	0.80	15.80	(21)	109.569	4.20	84.20
(8)	19.856	4.20	20.00	(22)	111.281	0.80	85.00
(9)	30.301	5.00	25.00	(23)	124.797	5.00	90.00
(10)	37.943	5.00	30.00	(24)	145.749	5.00	95.00
(11)	44.664	5.00	35.00	(25)	167.400	2.70	97.70
(12)	50.585	5.00	40.00	(26)	189.334	1.30	99.00
(13)	56.199	5.00	45.00	(27)	237.468	0.90	99.90
(14)	61.733	5.00	50.00				

Median : 61.606 (μm) Mean: 64.788 (μm) Mode: 72.265 (μm)
Std. Dev.: 44.466 (μm) Span: 0.859
Coef. Var: 68.63% Spec. Area: 3371 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/01/'01 15:39

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010927-054 17:43
Filename : C104986
Sample : C104

Material : Fractional Settling
Source :
Lot Numbe : 1332

Condition
T%(He-Ne): 80.6% Dist.Form: Std. Sampling times : 100
(LAMP): 73.2% R.R.Index: 1.16-0.00i ( )

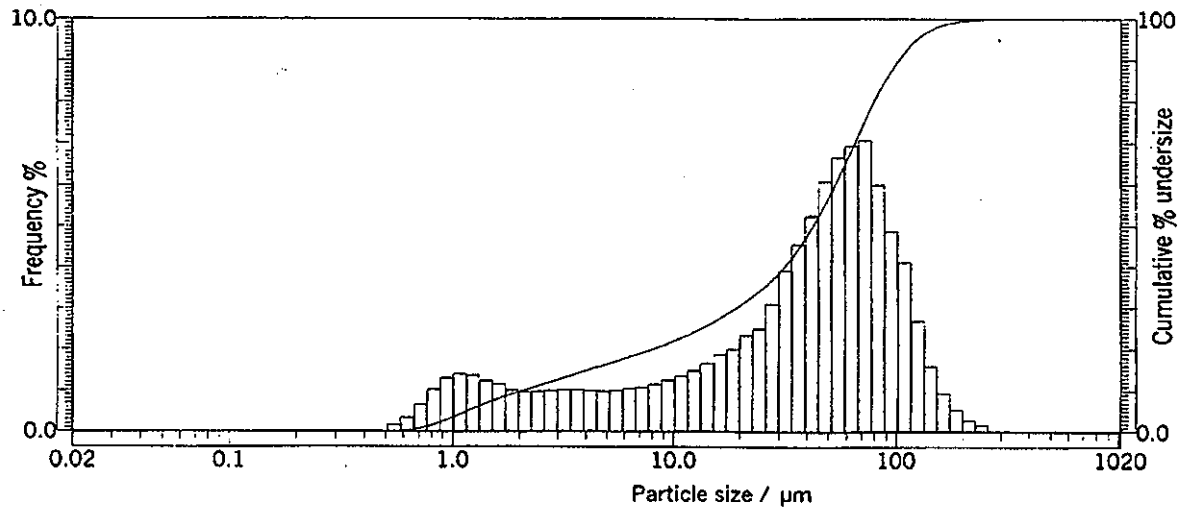
Agitation : 3 Circultn : 6 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 42.585μm SP.Area : 8319cm²/cm³ S.D. : 40.686μm
Mode : 71.620μm Mean : 48.375μm
C.V. : 84.11%

Span : (D 10.0-D 90.0) / D50 = 2.358

Dia. on %(5.0%) :	1.167μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	13.344μm	% on Dia.(1.000μm) :	3.4%
Dia. on %(50.0%) :	42.585μm	% on Dia.(10.000μm) :	22.0%
Dia. on %(75.0%) :	71.879μm	% on Dia.(100.000μm) :	89.2%
Dia. on %(95.0%) :	123.491μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	2.49	35.28	0.669	0.35	0.51
890.1	0.00	100.00	22.80	2.33	32.78	0.584	0.16	0.16
777.1	0.00	100.00	19.90	2.00	30.45	0.510	0.00	0.00
678.5	0.00	100.00	17.38	1.88	28.45	0.445	0.00	0.00
592.4	0.00	100.00	15.17	1.66	26.57	0.389	0.00	0.00
517.2	0.00	100.00	13.25	1.49	24.91	0.339	0.00	0.00
451.6	0.00	100.00	11.56	1.36	23.42	0.296	0.00	0.00
394.2	0.00	100.00	10.10	1.24	22.07	0.259	0.00	0.00
344.2	0.00	100.00	8.816	1.15	20.82	0.226	0.00	0.00
300.5	0.00	100.00	7.697	1.08	19.67	0.197	0.00	0.00
262.4	0.17	100.00	6.720	1.05	18.59	0.172	0.00	0.00
229.1	0.28	99.83	5.867	1.00	17.54	0.150	0.00	0.00
200.0	0.55	99.55	5.122	0.98	16.54	0.131	0.00	0.00
174.6	0.94	99.01	4.472	1.00	15.57	0.115	0.00	0.00
152.5	1.59	98.07	3.905	1.02	14.57	0.100	0.00	0.00
133.1	2.68	96.48	3.409	1.02	13.55	0.087	0.00	0.00
116.2	4.12	93.80	2.976	1.00	12.54	0.076	0.00	0.00
101.5	4.87	89.68	2.599	0.98	11.54	0.067	0.00	0.00
88.58	6.00	84.81	2.269	0.96	10.55	0.058	0.00	0.00
77.34	7.07	78.81	1.981	1.01	9.59	0.051	0.00	0.00
67.52	6.93	71.75	1.729	1.14	8.59	0.044	0.00	0.00
58.95	6.66	64.81	1.510	1.23	7.44	0.039	0.00	0.00
51.47	6.08	58.16	1.318	1.35	6.21	0.034	0.00	0.00
44.94	5.24	52.08	1.151	1.39	4.86	0.029	0.00	0.00
39.23	4.56	46.83	1.005	1.29	3.47	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/01/01
File Name: C104986.DAT Sample Name: C104 ID No: 01/09/27-054
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 80.587 % Lamp: 73.188 %
Circulation: 6 Agitation: 3 U.Sonic ** (min)
Material: Fractional Settling Source:
Lot No: 1332 Test No: Dup

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.555	0.10	0.10	(15)	48.078	5.00	55.00
(2)	0.741	0.90	1.00	(16)	53.542	5.00	60.00
(3)	0.889	1.30	2.30	(17)	59.184	5.00	65.00
(4)	1.168	2.70	5.00	(18)	65.366	5.00	70.00
(5)	2.103	5.00	10.00	(19)	72.044	5.00	75.00
(6)	4.150	5.00	15.00	(20)	79.566	5.00	80.00
(7)	4.628	0.80	15.80	(21)	87.439	4.20	84.20
(8)	8.021	4.20	20.00	(22)	89.084	0.80	85.00
(9)	13.350	5.00	25.00	(23)	102.595	5.00	90.00
(10)	19.335	5.00	30.00	(24)	123.773	5.00	95.00
(11)	25.744	5.00	35.00	(25)	147.957	2.70	97.70
(12)	31.721	5.00	40.00	(26)	174.489	1.30	99.00
(13)	37.230	5.00	45.00	(27)	243.116	0.90	99.90
(14)	42.678	5.00	50.00				

Median : 42.585 (μm) Mean: 48.375 (μm) Mode: 72.265 (μm)
Std. Dev.: 40.686 (μm) Span: 1.212
Coef. Var: 84.11% Spec. Area: 8319 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/01/'01 15:39

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010927.055 17:47
Filename : C104987
Sample : C104

Material : Fractional Settling
Source :
Lot Numbe : 1332

Condition
T%(He-Ne): 80.2% Dist.Form: Std. Sampling times : 100
(LAMP): 73.1% R.R.index: 1.16-0.001 ( )

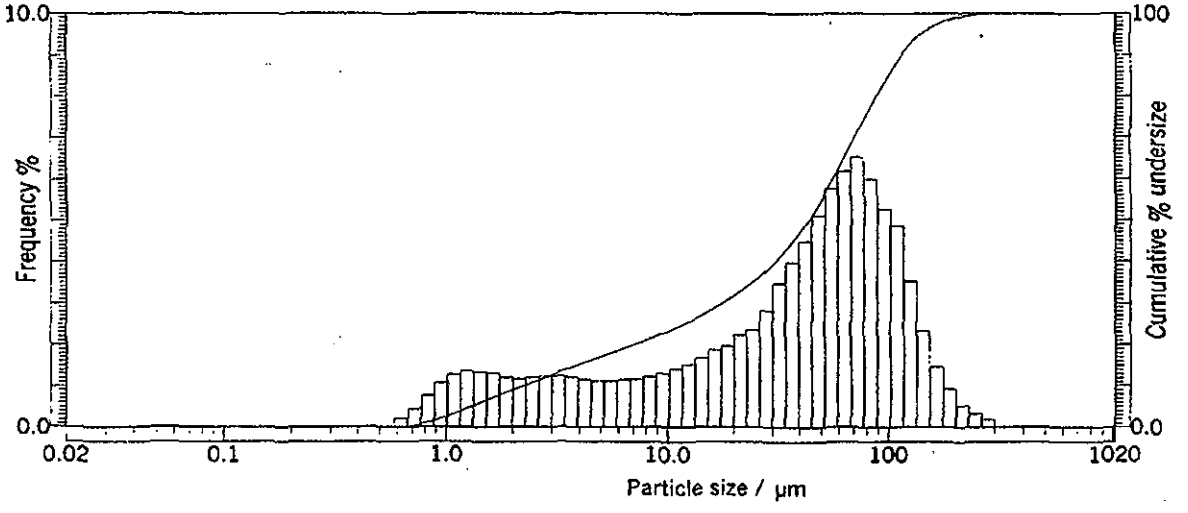
Agitation : 1 Circultn : 6 U.sonic : ~~ON~~ OFF (120) wsl 10/2/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 43.496μm SP.Area : 7889cm²/cm³ S.D. : 46.578μm
Mode : 72.121μm Mean : 52.052μm
C.V. : 89.48%

Span : (D 10.0-D 90.0) / D50 = 2.567

Dia. on %(5.0%) :	1.302μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	11.902μm	% on Dia.(1.000μm) :	2.5%
Dia. on %(50.0%) :	43.496μm	% on Dia.(10.000μm) :	23.2%
Dia. on %(75.0%) :	77.999μm	% on Dia.(100.000μm) :	85.3%
Dia. on %(95.0%) :	139.024μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	2.36	36.32	0.669	0.22	0.22
890.1	0.00	100.00	22.80	2.24	33.97	0.584	0.00	0.00
777.1	0.00	100.00	19.90	1.97	31.73	0.510	0.00	0.00
678.5	0.00	100.00	17.38	1.87	29.76	0.445	0.00	0.00
592.4	0.00	100.00	15.17	1.68	27.89	0.389	0.00	0.00
517.2	0.00	100.00	13.25	1.53	26.20	0.339	0.00	0.00
451.6	0.00	100.00	11.56	1.41	24.68	0.296	0.00	0.00
394.2	0.00	100.00	10.10	1.31	23.27	0.259	0.00	0.00
344.2	0.00	100.00	8.816	1.23	21.96	0.226	0.00	0.00
300.5	0.18	100.00	7.697	1.16	20.73	0.197	0.00	0.00
262.4	0.33	99.82	6.720	1.15	19.57	0.172	0.00	0.00
229.1	0.51	99.49	5.867	1.11	18.42	0.150	0.00	0.00
200.0	0.92	98.98	5.122	1.11	17.31	0.131	0.00	0.00
174.6	1.47	98.06	4.472	1.16	16.20	0.115	0.00	0.00
152.5	2.33	96.59	3.905	1.20	15.04	0.100	0.00	0.00
133.1	3.53	94.25	3.409	1.23	13.84	0.087	0.00	0.00
116.2	4.86	90.72	2.976	1.23	12.61	0.076	0.00	0.00
101.5	5.26	85.87	2.599	1.21	11.38	0.067	0.00	0.00
88.58	5.98	80.61	2.269	1.18	10.17	0.058	0.00	0.00
77.34	6.51	74.63	1.981	1.21	8.98	0.051	0.00	0.00
67.52	6.17	68.12	1.729	1.31	7.77	0.044	0.00	0.00
58.95	5.75	61.94	1.510	1.33	6.46	0.039	0.00	0.00
51.47	5.11	56.19	1.318	1.36	5.13	0.034	0.00	0.00
44.94	4.48	51.08	1.151	1.28	3.77	0.029	0.00	0.00
39.23	3.98	46.59	1.005	1.07	2.49	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/01/01
File Name: C104987.DAT Sample Name: C104 ID No: 01/09/27-055
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 80.190 % Lamp: 73.101 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: Fractional Settling Source:
Lot No: 1332 Test No: Dup

WSC
10/2/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.623	0.10	0.10	(15)	49.949	5.00	55.00
(2)	0.816	0.90	1.00	(16)	56.426	5.00	60.00
(3)	0.982	1.30	2.30	(17)	63.197	5.00	65.00
(4)	1.303	2.70	5.00	(18)	70.363	5.00	70.00
(5)	2.228	5.00	10.00	(19)	78.043	5.00	75.00
(6)	3.888	5.00	15.00	(20)	87.438	5.00	80.00
(7)	4.277	0.80	15.80	(21)	97.374	4.20	84.20
(8)	7.085	4.20	20.00	(22)	99.333	0.80	85.00
(9)	11.920	5.00	25.00	(23)	114.010	5.00	90.00
(10)	17.686	5.00	30.00	(24)	139.307	5.00	95.00
(11)	24.247	5.00	35.00	(25)	169.240	2.70	97.70
(12)	30.977	5.00	40.00	(26)	201.094	1.30	99.00
(13)	37.238	5.00	45.00	(27)	279.542	0.90	99.90
(14)	43.568	5.00	50.00				

Median : 43.496 (μm) Mean: 52.052 (μm) Mode: 72.265 (μm)
Std. Dev.: 46.578 (μm) Span: 1.403
Coef. Var: 89.48% Spec. Area: 7889 (cm2/cm3)

APPENDIX F-18

SY-102 FRACTIONAL SETTLING SAMPLE: PSD MEASUREMENT RESULTS

Consisting of 18 pages including this cover page

TABLE F-18. Sample identification and PSD run conditions. Sample from fractional settling tests on SY-102 composite.

Conditions Key: P = Pump Speed Setting; P6 = 14.4 mL/s
S = Stirrer Speed Setting (1-7); S1 = Stirrer Speed 1; S3 = Stirrer Speed 3
US = Ultrasonic ON Time (min); DT = Delay Time (min) between end of ultrasonic treatment and PSD measurement.
Time = Clock time at beginning of measurement

Sample	PSD Run File Name	Run Conditions				Time	Cumulative Time (min) At Conditions				
		P	S	US	DT		P6	S1	S3	US	DT
S01T001338	[LOAD-IN]	6	1	0	0	?	?	?			
	SY102964	6	1	0	0	15:17	4	4			
	SY102965	6	3	0	0	15:21	7	4	3		
	SY102966	6	3	2	0	15:24	13	4	9	2	0
	SY102967	6	1	0	0	15:30	15	6	9	2	4
						15:32					
S01T001338	[LOAD-IN]	6	1	0	0	?	?	?			
	SY102968	6	1	0	0	15:48	3	3			
	SY102969	6	3	0	0	15:51	7	3	4		
	SY102970	6	3	2	0	15:55	13	3	10	2	0
	SY102971	6	1	0	0	16:01	15	5	10	2	4
						16:03					

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/01/'01 15:41

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010927-032 15:19
Filename : SY102964
Sample : SY102

Material : Fractional Settling
Source :
Lot Numbe : 1338

Condition
T%(He-Ne): 85.8%
(LAMP): 84.7%

Dist.Form: Std.
R.R.index: 1.16-0.00i

Sampling times : 100
( )

Agitation : 1
Circultn : 6
U.sonic : ~~ON~~ OFF (120)

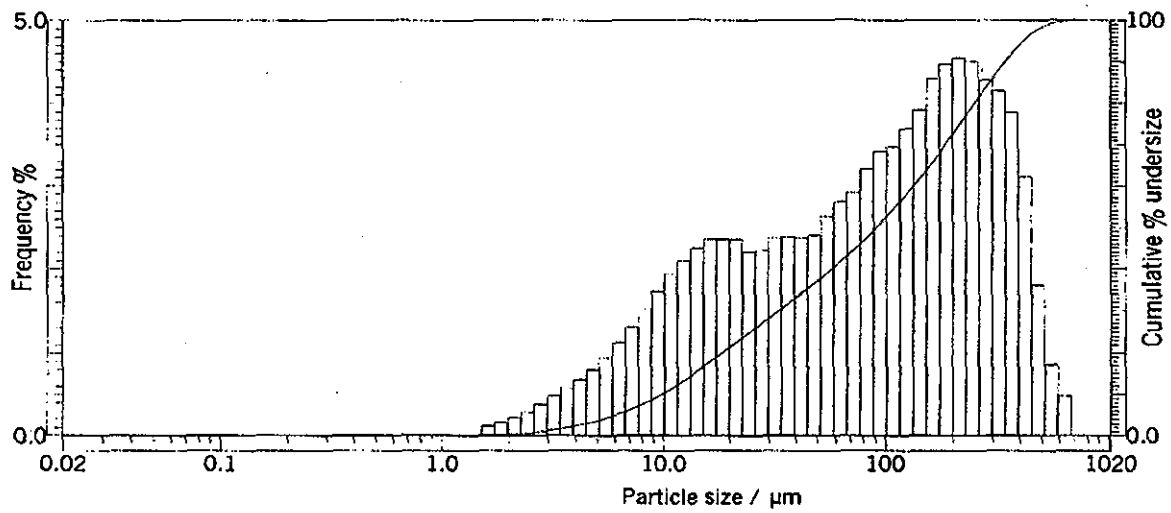
WSL 10/2/01

Format
Dist.base : Volume
Scaling : Auto
Axis : LogX - LinearY

Data
Median : 91.665μm
SP.Area : 2276cm²/cm³
S.D. : 135.923μm
Mode : 214.169μm
Mean : 138.211μm
C.V. : 98.34%

Span : (D 10.0-D 90.0) / D50 = 3.665

Dia. on %(5.0%) :	6.135μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	24.806μm	% on Dia.(1.000μm) :	0.0%
Dia. on %(50.0%) :	91.665μm	% on Dia.(10.000μm) :	10.2%
Dia. on %(75.0%) :	216.144μm	% on Dia.(100.000μm) :	52.2%
Dia. on %(95.0%) :	416.178μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	2.20	25.83	0.669	0.00	0.00
890.1	0.00	100.00	22.80	2.36	23.63	0.584	0.00	0.00
777.1	0.00	100.00	19.90	2.35	21.28	0.510	0.00	0.00
678.5	0.48	100.00	17.38	2.35	18.93	0.445	0.00	0.00
592.4	0.86	99.52	15.17	2.24	16.58	0.389	0.00	0.00
517.2	1.80	98.66	13.25	2.10	14.34	0.339	0.00	0.00
451.6	3.11	96.87	11.56	1.93	12.24	0.296	0.00	0.00
394.2	3.89	93.76	10.10	1.73	10.31	0.259	0.00	0.00
344.2	4.14	89.87	8.816	1.52	8.58	0.226	0.00	0.00
300.5	4.27	85.73	7.697	1.30	7.06	0.197	0.00	0.00
262.4	4.51	81.45	6.720	1.13	5.76	0.172	0.00	0.00
229.1	4.54	76.95	5.867	0.94	4.63	0.150	0.00	0.00
200.0	4.47	72.40	5.122	0.80	3.68	0.131	0.00	0.00
174.6	4.30	67.93	4.472	0.68	2.89	0.115	0.00	0.00
152.5	3.92	63.63	3.905	0.57	2.21	0.100	0.00	0.00
133.1	3.69	59.72	3.409	0.48	1.64	0.087	0.00	0.00
116.2	3.47	56.03	2.976	0.38	1.16	0.076	0.00	0.00
101.5	3.42	52.56	2.599	0.29	0.78	0.067	0.00	0.00
88.58	3.20	49.14	2.269	0.21	0.49	0.058	0.00	0.00
77.34	2.92	45.94	1.981	0.16	0.27	0.051	0.00	0.00
67.52	2.80	43.01	1.729	0.12	0.12	0.044	0.00	0.00
58.95	2.63	40.21	1.510	0.00	0.00	0.039	0.00	0.00
51.47	2.40	37.58	1.318	0.00	0.00	0.034	0.00	0.00
44.94	2.37	35.17	1.151	0.00	0.00	0.029	0.00	0.00
39.23	2.39	32.81	1.005	0.00	0.00	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/01/01
File Name: SY102964.DAT Sample Name: SY102 ID No: 01/09/27-032
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 85.772 % Lamp: 84.666 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: Fractional Settling Source:
Lot No: 1338 Test No:

WSC
10/2/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	1.699	0.10	0.10	(15)	111.848	5.00	55.00
(2)	2.819	0.90	1.00	(16)	134.502	5.00	60.00
(3)	3.979	1.30	2.30	(17)	159.492	5.00	65.00
(4)	6.147	2.70	5.00	(18)	186.360	5.00	70.00
(5)	9.867	5.00	10.00	(19)	216.629	5.00	75.00
(6)	13.817	5.00	15.00	(20)	251.646	5.00	80.00
(7)	14.503	0.80	15.80	(21)	286.900	4.20	84.20
(8)	18.532	4.20	20.00	(22)	294.040	0.80	85.00
(9)	24.859	5.00	25.00	(23)	345.882	5.00	90.00
(10)	33.481	5.00	30.00	(24)	417.106	5.00	95.00
(11)	44.519	5.00	35.00	(25)	482.002	2.70	97.70
(12)	58.363	5.00	40.00	(26)	546.647	1.30	99.00
(13)	74.197	5.00	45.00	(27)	660.461	0.90	99.90
(14)	91.828	5.00	50.00				

Median : 91.665 (μm) Mean: 138.211 (μm) Mode: 214.044 (μm)
Std. Dev.: 135.923 (μm) Span: 2.182
Coef. Var: 98.34% Spec. Area: 2276 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/01/'01 15:41

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010927-033 15:24
Filename : SY102965
Sample : SY102

Material : Fractional Settling
Source :
Lot Numbe : 1338

Condition
T%(He-Ne): 83.3% Dist.Form: Std. Sampling times : 100
(LAMP): 81.9% R.R.Index: 1.16-0.00i ( )

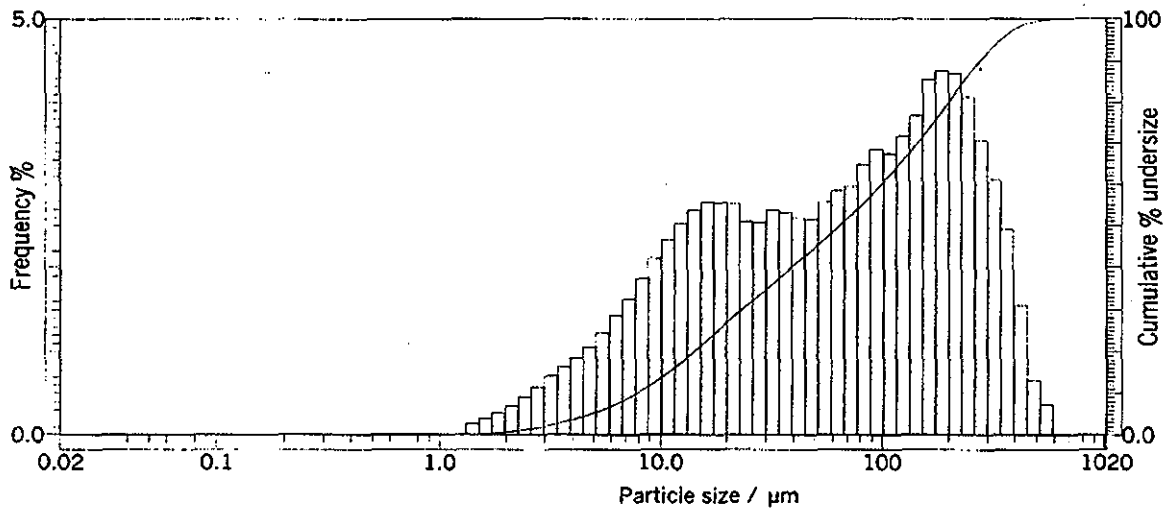
Agitation : 3 Circultn : 6 U.sonic : ~~ON~~ OFF (120) WSC 10/2/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 64.785μm SP.Area : 2932cm²/cm³ S.D. : 113.233μm
Mode : 187.106μm Mean : 108.775μm
C.V. : 104.10%

Span : (D 10.0-D 90.0) / D50 = 4.187

Dia. on %(5.0%) :	4.809μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	18.187μm	% on Dia.(1.000μm) :	0.0%
Dia. on %(50.0%) :	64.785μm	% on Dia.(10.000μm) :	13.6%
Dia. on %(75.0%) :	171.338μm	% on Dia.(100.000μm) :	60.2%
Dia. on %(95.0%) :	344.749μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	2.55	32.15	0.669	0.00	0.00
890.1	0.00	100.00	22.80	2.76	29.60	0.584	0.00	0.00
777.1	0.00	100.00	19.90	2.77	26.84	0.510	0.00	0.00
678.5	0.00	100.00	17.38	2.79	24.07	0.445	0.00	0.00
592.4	0.37	100.00	15.17	2.68	21.28	0.389	0.00	0.00
517.2	0.66	99.63	13.25	2.52	18.60	0.339	0.00	0.00
451.6	1.55	98.98	11.56	2.33	16.08	0.296	0.00	0.00
394.2	2.45	97.43	10.10	2.11	13.74	0.259	0.00	0.00
344.2	3.05	94.97	8.816	1.87	11.64	0.226	0.00	0.00
300.5	3.53	91.92	7.697	1.62	9.77	0.197	0.00	0.00
262.4	4.06	88.39	6.720	1.43	8.15	0.172	0.00	0.00
229.1	4.35	84.33	5.867	1.22	6.71	0.150	0.00	0.00
200.0	4.38	79.98	5.122	1.06	5.49	0.131	0.00	0.00
174.6	4.27	75.60	4.472	0.93	4.44	0.115	0.00	0.00
152.5	3.83	71.32	3.905	0.81	3.51	0.100	0.00	0.00
133.1	3.58	67.49	3.409	0.70	2.69	0.087	0.00	0.00
116.2	3.37	63.91	2.976	0.58	1.99	0.076	0.00	0.00
101.5	3.43	60.54	2.599	0.45	1.41	0.067	0.00	0.00
88.58	3.25	57.11	2.269	0.35	0.95	0.058	0.00	0.00
77.34	2.97	53.86	1.981	0.27	0.60	0.051	0.00	0.00
67.52	2.92	50.89	1.729	0.20	0.34	0.044	0.00	0.00
58.95	2.78	47.97	1.510	0.14	0.14	0.039	0.00	0.00
51.47	2.57	45.19	1.318	0.00	0.00	0.034	0.00	0.00
44.94	2.59	42.62	1.151	0.00	0.00	0.029	0.00	0.00
39.23	2.66	40.03	1.005	0.00	0.00	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/01/01
File Name: SY102965.DAT Sample Name: SY102 ID No: 01/09/27-033
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 83.278 % Lamp: 81.942 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: Fractional Settling Source:
Lot No: 1338 Test No:

WSC
10/2/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	1.459	0.10	0.10	(15)	81.276	5.00	55.00
(2)	2.303	0.90	1.00	(16)	99.444	5.00	60.00
(3)	3.167	1.30	2.30	(17)	121.356	5.00	65.00
(4)	4.820	2.70	5.00	(18)	145.775	5.00	70.00
(5)	7.835	5.00	10.00	(19)	171.521	5.00	75.00
(6)	10.888	5.00	15.00	(20)	200.134	5.00	80.00
(7)	11.391	0.80	15.80	(21)	228.181	4.20	84.20
(8)	14.255	4.20	20.00	(22)	234.539	0.80	85.00
(9)	18.225	5.00	25.00	(23)	279.741	5.00	90.00
(10)	23.315	5.00	30.00	(24)	344.787	5.00	95.00
(11)	30.419	5.00	35.00	(25)	404.398	2.70	97.70
(12)	39.175	5.00	40.00	(26)	453.883	1.30	99.00
(13)	50.997	5.00	45.00	(27)	571.814	0.90	99.90
(14)	64.909	5.00	50.00				

Median : 64.785 (μm) Mean: 108.775 (μm) Mode: 186.878 (μm)
Std. Dev.: 113.233 (μm) Span: 2.677
Coef. Var: 104.10% Spec. Area: 2932 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/01/'01 15:41

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010927-034 15:29
Filename : SY102966
Sample : SY102

Material : Fractional Settling
Source :
Lot Numbe : 1338

Condition
T%(He-Ne): 70.9% Dist.Form: Std. Sampling times : 100
(LAMP): 63.7% R.R.Index: 1.16-0.00i ( )

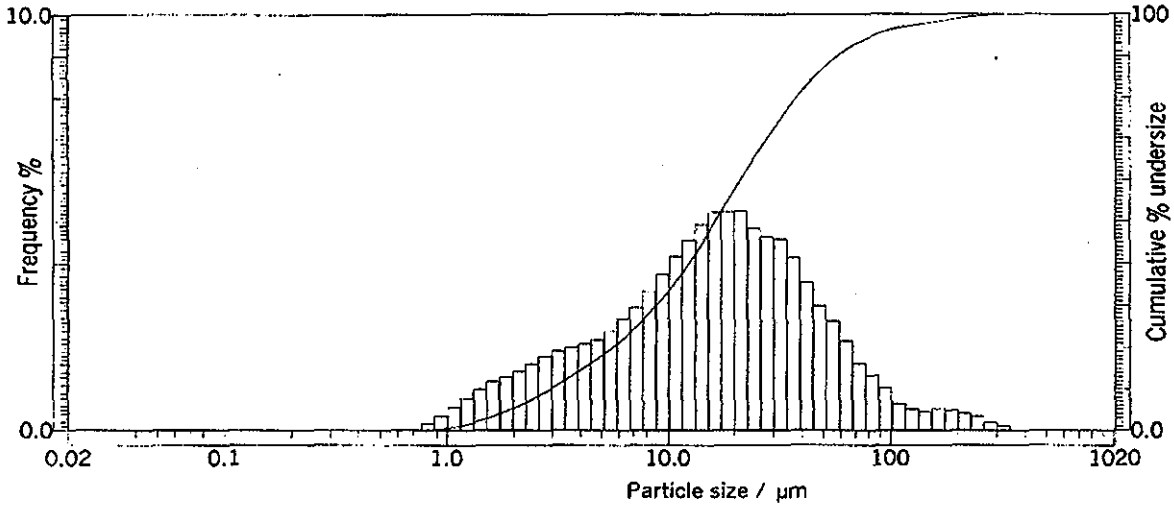
Agitation : 3 Circultn : 6 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 16.350μm SP.Area : 7748cm²/cm³ S.D. : 36.047μm
Mode : 21.192μm Mean : 27.114μm
C.V. : 132.95%

Span : (D 10.0-D 90.0) / D50 = 3.392

Dia. on %(5.0%) :	1.912μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	7.217μm	% on Dia.(1.000μm) :	0.5%
Dia. on %(50.0%) :	16.350μm	% on Dia.(10.000μm) :	33.2%
Dia. on %(75.0%) :	32.415μm	% on Dia.(100.000μm) :	96.2%
Dia. on %(95.0%) :	85.892μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	4.84	67.64	0.669	0.00	0.00
890.1	0.00	100.00	22.80	5.24	62.81	0.584	0.00	0.00
777.1	0.00	100.00	19.90	5.23	57.57	0.510	0.00	0.00
678.5	0.00	100.00	17.38	5.21	52.34	0.445	0.00	0.00
592.4	0.00	100.00	15.17	4.92	47.13	0.389	0.00	0.00
517.2	0.00	100.00	13.25	4.56	42.20	0.339	0.00	0.00
451.6	0.00	100.00	11.56	4.17	37.65	0.296	0.00	0.00
394.2	0.00	100.00	10.10	3.75	33.48	0.259	0.00	0.00
344.2	0.11	100.00	8.816	3.34	29.73	0.226	0.00	0.00
300.5	0.19	99.89	7.697	2.95	26.40	0.197	0.00	0.00
262.4	0.34	99.70	6.720	2.68	23.45	0.172	0.00	0.00
229.1	0.41	99.36	5.867	2.38	20.77	0.150	0.00	0.00
200.0	0.50	98.95	5.122	2.19	18.39	0.131	0.00	0.00
174.6	0.52	98.45	4.472	2.09	16.20	0.115	0.00	0.00
152.5	0.44	97.93	3.905	2.01	14.11	0.100	0.00	0.00
133.1	0.51	97.49	3.409	1.92	12.11	0.087	0.00	0.00
116.2	0.64	96.98	2.976	1.79	10.19	0.076	0.00	0.00
101.5	1.04	96.34	2.599	1.61	8.39	0.067	0.00	0.00
88.58	1.33	95.30	2.269	1.44	6.78	0.058	0.00	0.00
77.34	1.63	93.97	1.981	1.30	5.34	0.051	0.00	0.00
67.52	2.16	92.34	1.729	1.19	4.03	0.044	0.00	0.00
58.95	2.64	90.18	1.510	0.99	2.85	0.039	0.00	0.00
51.47	3.00	87.55	1.318	0.79	1.86	0.034	0.00	0.00
44.94	3.55	84.55	1.151	0.56	1.07	0.029	0.00	0.00
39.23	4.13	81.00	1.005	0.34	0.51	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/01/01
File Name: SY102966.DAT Sample Name: SY102 ID No: 01/09/27-034
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 70.926 % Lamp: 63.671 %
Circulation: 6 Agitation: 3 U.Sonic ** (min)
Material: Fractional Settling Source:
Lot No: 1338 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.831	0.10	0.10	(15)	18.663	5.00	55.00
(2)	1.133	0.90	1.00	(16)	21.246	5.00	60.00
(3)	1.404	1.30	2.30	(17)	24.300	5.00	65.00
(4)	1.916	2.70	5.00	(18)	28.040	5.00	70.00
(5)	2.937	5.00	10.00	(19)	32.486	5.00	75.00
(6)	4.146	5.00	15.00	(20)	38.032	5.00	80.00
(7)	4.364	0.80	15.80	(21)	44.376	4.20	84.20
(8)	5.626	4.20	20.00	(22)	45.919	0.80	85.00
(9)	7.234	5.00	25.00	(23)	58.433	5.00	90.00
(10)	8.907	5.00	30.00	(24)	86.028	5.00	95.00
(11)	10.633	5.00	35.00	(25)	142.399	2.70	97.70
(12)	12.433	5.00	40.00	(26)	203.611	1.30	99.00
(13)	14.339	5.00	45.00	(27)	303.173	0.90	99.90
(14)	16.388	5.00	50.00				

Median : 16.350 (μm) Mean: 27.114 (μm) Mode: 21.301 (μm)
Std. Dev.: 36.047 (μm) Span: 3.271
Coef. Var: 132.95% Spec. Area: 7748 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/01/'01 15:42

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010927-035 15:32
Filename : SY102967
Sample : SY102

Material : Fractional Settling
Source :
Lot Numbe : 1338

Condition

T%(He-Ne): 70.4% Dist.Form: Std. Sampling times : 100
(LAMP): 63.8% R.R.Index: 1.16-0.00i ( )

Agitation : 1 Circultn : 6 U.sonic : ~~ON~~ OFF (120)

WSC 10/2/01

Format

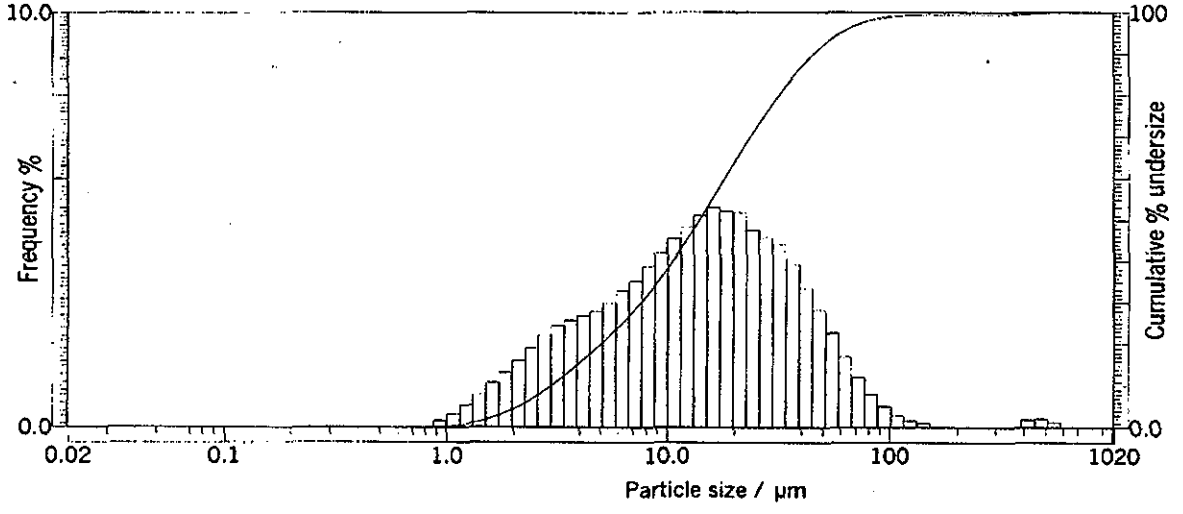
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data

Median : 14.066μm SP.Area : 7955cm²/cm³ S.D. : 38.189μm
Mode : 16.260μm Mean : 22.265μm
C.V. : 171.52%

Span : (D 10.0-D 90.0) / D50 = 3.038

Dia. on %(5.0%) :	2.112μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	6.256μm	% on Dia.(1.000μm) :	0.2%
Dia. on %(50.0%) :	14.066μm	% on Dia.(10.000μm) :	38.0%
Dia. on %(75.0%) :	27.425μm	% on Dia.(100.000μm) :	98.9%
Dia. on %(95.0%) :	60.304μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	4.77	73.34	0.669	0.00	0.00
890.1	0.00	100.00	22.80	5.19	68.58	0.584	0.00	0.00
777.1	0.00	100.00	19.90	5.23	63.39	0.510	0.00	0.00
678.5	0.00	100.00	17.38	5.31	58.16	0.445	0.00	0.00
592.4	0.12	100.00	15.17	5.12	52.85	0.389	0.00	0.00
517.2	0.21	99.88	13.25	4.84	47.74	0.339	0.00	0.00
451.6	0.19	99.67	11.56	4.55	42.89	0.296	0.00	0.00
394.2	0.00	99.48	10.10	4.21	38.34	0.259	0.00	0.00
344.2	0.00	99.48	8.816	3.87	34.13	0.226	0.00	0.00
300.5	0.00	99.48	7.697	3.52	30.26	0.197	0.00	0.00
262.4	0.00	99.48	6.720	3.29	26.73	0.172	0.00	0.00
229.1	0.00	99.48	5.867	3.00	23.44	0.150	0.00	0.00
200.0	0.00	99.48	5.122	2.80	20.45	0.131	0.00	0.00
174.6	0.00	99.48	4.472	2.68	17.65	0.115	0.00	0.00
152.5	0.11	99.48	3.905	2.57	14.97	0.100	0.00	0.00
133.1	0.17	99.37	3.409	2.44	12.40	0.087	0.00	0.00
116.2	0.29	99.20	2.976	2.22	9.96	0.076	0.00	0.00
101.5	0.51	98.92	2.599	1.90	7.75	0.067	0.00	0.00
88.58	0.80	98.41	2.269	1.60	5.85	0.058	0.00	0.00
77.34	1.20	97.61	1.981	1.33	4.24	0.051	0.00	0.00
67.52	1.70	96.41	1.729	1.08	2.92	0.044	0.00	0.00
58.95	2.26	94.72	1.510	0.79	1.84	0.039	0.00	0.00
51.47	2.82	92.46	1.318	0.54	1.04	0.034	0.00	0.00
44.94	3.36	89.64	1.151	0.33	0.50	0.029	0.00	0.00
39.23	3.93	86.28	1.005	0.17	0.17	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/01/01
File Name: SY102967.DAT Sample Name: SY102 ID No: 01/09/27-035
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 70.366 % Lamp: 63.778 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: Fractional Settling Source:
Lot No: 1338 Test No:

WSC
10/2/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.952	0.10	0.10	(15)	16.063	5.00	55.00
(2)	1.305	0.90	1.00	(16)	18.266	5.00	60.00
(3)	1.604	1.30	2.30	(17)	20.803	5.00	65.00
(4)	2.117	2.70	5.00	(18)	23.787	5.00	70.00
(5)	2.983	5.00	10.00	(19)	27.484	5.00	75.00
(6)	3.911	5.00	15.00	(20)	31.946	5.00	80.00
(7)	4.081	0.80	15.80	(21)	36.595	4.20	84.20
(8)	5.019	4.20	20.00	(22)	37.609	0.80	85.00
(9)	6.270	5.00	25.00	(23)	45.770	5.00	90.00
(10)	7.625	5.00	30.00	(24)	60.383	5.00	95.00
(11)	9.081	5.00	35.00	(25)	78.547	2.70	97.70
(12)	10.632	5.00	40.00	(26)	105.620	1.30	99.00
(13)	12.296	5.00	45.00	(27)	528.126	0.90	99.90
(14)	14.098	5.00	50.00				

Median : 14.066 (μm) Mean: 22.265 (μm) Mode: 16.237 (μm)
Std. Dev.: 38.189 (μm) Span: 2.337
Coef. Var: 171.52% Spec. Area: 7955 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/01/'01 15:42

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010927-036 15:51
Filename : SY102968
Sample : SY102

Material : Fractional Settling
Source :
Lot Numbe : 1338

Condition
T%(He-Ne): 85.7% Dist.Form: Std. Sampling times : 100
(LAMP): 84.3% R.R.Index: 1.16-0.00i ( )

Agitation : 1 Circultn : 6 U.sonic : ~~ON~~ OFF (120)

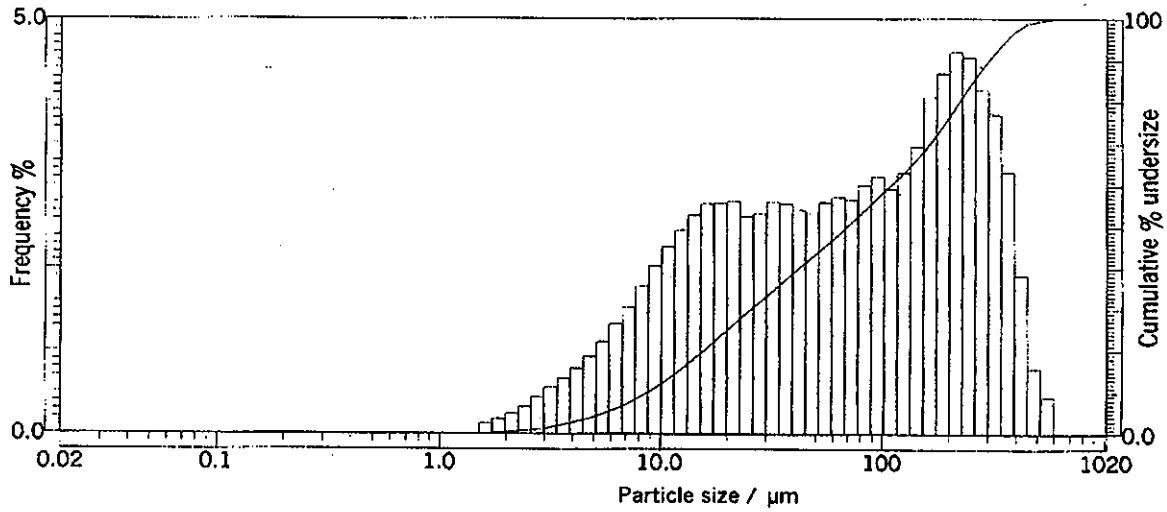
WSL 10/2/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 68.748μm SP.Area : 2586cm²/cm³ S.D. : 119.901μm
Mode : 214.662μm Mean : 117.567μm
C.V. : 101.99%

Span : (D 10.0-D 90.0) / D50 = 4.266

Dia. on %(5.0%) :	5.634μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	19.988μm	% on Dia.(1.000μm) :	0.0%
Dia. on %(50.0%) :	68.748μm	% on Dia.(10.000μm) :	11.8%
Dia. on %(75.0%) :	190.490μm	% on Dia.(100.000μm) :	58.2%
Dia. on %(95.0%) :	363.947μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	2.63	30.35	0.669	0.00	0.00
890.1	0.00	100.00	22.80	2.81	27.72	0.584	0.00	0.00
777.1	0.00	100.00	19.90	2.79	24.91	0.510	0.00	0.00
678.5	0.00	100.00	17.38	2.78	22.12	0.445	0.00	0.00
592.4	0.44	100.00	15.17	2.65	19.35	0.389	0.00	0.00
517.2	0.79	99.56	13.25	2.46	16.70	0.339	0.00	0.00
451.6	1.91	98.77	11.56	2.26	14.24	0.296	0.00	0.00
394.2	3.16	96.86	10.10	2.03	11.98	0.259	0.00	0.00
344.2	3.85	93.70	8.816	1.78	9.95	0.226	0.00	0.00
300.5	4.15	89.85	7.697	1.52	8.17	0.197	0.00	0.00
262.4	4.54	85.70	6.720	1.32	6.65	0.172	0.00	0.00
229.1	4.60	81.16	5.867	1.10	5.33	0.150	0.00	0.00
200.0	4.34	76.56	5.122	0.93	4.23	0.131	0.00	0.00
174.6	4.06	72.22	4.472	0.79	3.30	0.115	0.00	0.00
152.5	3.47	68.16	3.905	0.66	2.51	0.100	0.00	0.00
133.1	3.16	64.69	3.409	0.55	1.85	0.087	0.00	0.00
116.2	2.95	61.53	2.976	0.44	1.30	0.076	0.00	0.00
101.5	3.12	58.57	2.599	0.32	0.86	0.067	0.00	0.00
88.58	3.00	55.46	2.269	0.24	0.53	0.058	0.00	0.00
77.34	2.83	52.45	1.981	0.17	0.30	0.051	0.00	0.00
67.52	2.86	49.63	1.729	0.12	0.12	0.044	0.00	0.00
58.95	2.80	46.77	1.510	0.00	0.00	0.039	0.00	0.00
51.47	2.67	43.97	1.318	0.00	0.00	0.034	0.00	0.00
44.94	2.70	41.29	1.151	0.00	0.00	0.029	0.00	0.00
39.23	2.78	38.59	1.005	0.00	0.00	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/01/01
File Name: SY102968.DAT Sample Name: SY102 ID No: 01/09/27-036
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 85.732 % Lamp: 84.264 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: Fractional Settling Source:
Lot No: 1338 Test No: duplicate

WJC 10/2/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	1.688	0.10	0.10	(15)	86.875	5.00	55.00
(2)	2.720	0.90	1.00	(16)	108.593	5.00	60.00
(3)	3.747	1.30	2.30	(17)	134.856	5.00	65.00
(4)	5.645	2.70	5.00	(18)	162.510	5.00	70.00
(5)	8.847	5.00	10.00	(19)	190.889	5.00	75.00
(6)	12.085	5.00	15.00	(20)	221.756	5.00	80.00
(7)	12.631	0.80	15.80	(21)	251.401	4.20	84.20
(8)	15.691	4.20	20.00	(22)	257.272	0.80	85.00
(9)	19.994	5.00	25.00	(23)	302.241	5.00	90.00
(10)	25.670	5.00	30.00	(24)	364.765	5.00	95.00
(11)	33.001	5.00	35.00	(25)	419.320	2.70	97.70
(12)	42.215	5.00	40.00	(26)	470.362	1.30	99.00
(13)	54.235	5.00	45.00	(27)	575.211	0.90	99.90
(14)	68.823	5.00	50.00				

Median : 68.748 (μm) Mean: 117.567 (μm) Mode: 214.044 (μm)
Std. Dev.: 119.901 (μm) Span: 2.523
Coef. Var: 101.99% Spec. Area: 2586 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/01/'01 15:42

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010927-037 15:55
Filename : SY102969
Sample : SY102

Material : Fractional Settling
Source :
Lot Numbe : 1338

Condition
T%(He-Ne): 83.9% Dist.Form: Std. Sampling times : 100
(LAMP): 82.5% R.R.Index: 1.16-0.00i ( )

Agitation : 3 Circultn : 6 U.sonic : ~~ON~~ OFF (120)

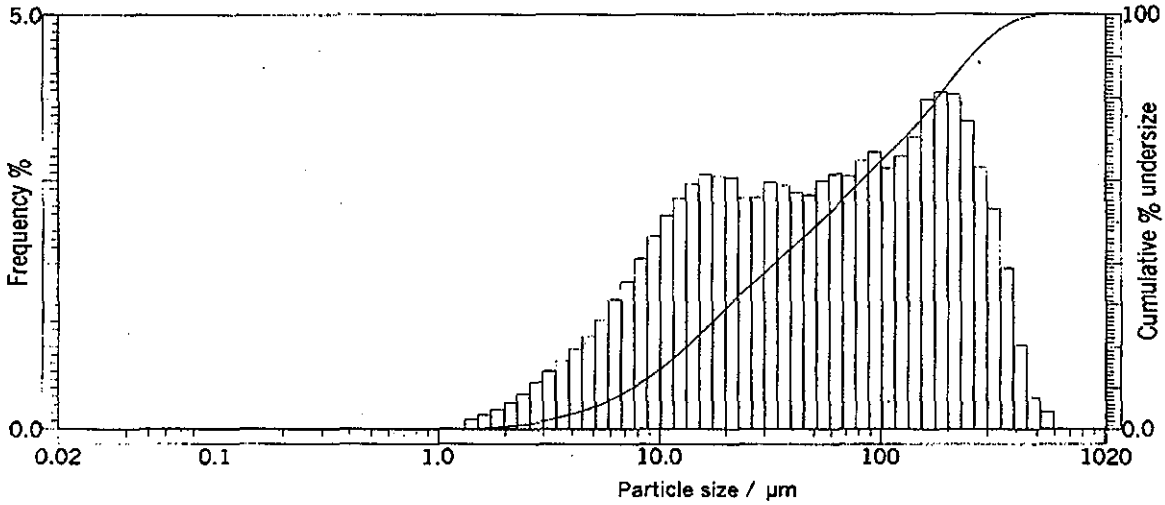
WSC 10/2/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 53.542μm SP.Area : 3054cm²/cm³ S.D. : 104.991μm
Mode : 187.082μm Mean : 97.604μm
C.V. : 107.57%

Span : (D 10.0-D 90.0) / D50 = 4.645

Dia. on %(5.0%) :	4.835μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	16.692μm	% on Dia.(1.000μm) :	0.0%
Dia. on %(50.0%) :	53.542μm	% on Dia.(10.000μm) :	14.4%
Dia. on %(75.0%) :	153.417μm	% on Dia.(100.000μm) :	64.5%
Dia. on %(95.0%) :	319.511μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	2.78	34.77	0.669	0.00	0.00
890.1	0.00	100.00	22.80	3.03	31.99	0.584	0.00	0.00
777.1	0.00	100.00	19.90	3.04	28.96	0.510	0.00	0.00
678.5	0.00	100.00	17.38	3.07	25.91	0.445	0.00	0.00
592.4	0.21	100.00	15.17	2.96	22.84	0.389	0.00	0.00
517.2	0.38	99.79	13.25	2.78	19.88	0.339	0.00	0.00
451.6	1.01	99.41	11.56	2.58	17.10	0.296	0.00	0.00
394.2	1.94	98.40	10.10	2.33	14.53	0.259	0.00	0.00
344.2	2.65	96.46	8.816	2.06	12.20	0.226	0.00	0.00
300.5	3.16	93.80	7.697	1.78	10.14	0.197	0.00	0.00
262.4	3.73	90.64	6.720	1.56	8.36	0.172	0.00	0.00
229.1	4.05	86.91	5.867	1.32	6.79	0.150	0.00	0.00
200.0	4.07	82.87	5.122	1.12	5.48	0.131	0.00	0.00
174.6	3.98	78.80	4.472	0.97	4.35	0.115	0.00	0.00
152.5	3.53	74.82	3.905	0.83	3.39	0.100	0.00	0.00
133.1	3.30	71.29	3.409	0.70	2.55	0.087	0.00	0.00
116.2	3.15	67.98	2.976	0.57	1.85	0.076	0.00	0.00
101.5	3.35	64.83	2.599	0.43	1.28	0.067	0.00	0.00
88.58	3.24	61.49	2.269	0.32	0.85	0.058	0.00	0.00
77.34	3.05	58.25	1.981	0.24	0.53	0.051	0.00	0.00
67.52	3.07	55.19	1.729	0.17	0.29	0.044	0.00	0.00
58.95	2.99	52.12	1.510	0.11	0.11	0.039	0.00	0.00
51.47	2.82	49.13	1.318	0.00	0.00	0.034	0.00	0.00
44.94	2.85	46.31	1.151	0.00	0.00	0.029	0.00	0.00
39.23	2.93	43.46	1.005	0.00	0.00	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/01/01
File Name: SY102969.DAT Sample Name: SY102 ID No: 01/09/27-037
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 83.866 % Lamp: 82.472 %
Circulation: 6 Agitation: 3 U.Sonic OFF (min)
Material: Fractional Settling Source:
Lot No: 1338 Test No: duplicate

WJC 10/2/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	1.486	0.10	0.10	(15)	66.981	5.00	55.00
(2)	2.384	0.90	1.00	(16)	83.423	5.00	60.00
(3)	3.253	1.30	2.30	(17)	102.240	5.00	65.00
(4)	4.846	2.70	5.00	(18)	126.523	5.00	70.00
(5)	7.621	5.00	10.00	(19)	153.483	5.00	75.00
(6)	10.368	5.00	15.00	(20)	182.119	5.00	80.00
(7)	10.823	0.80	15.80	(21)	209.573	4.20	84.20
(8)	13.323	4.20	20.00	(22)	215.320	0.80	85.00
(9)	16.724	5.00	25.00	(23)	256.656	5.00	90.00
(10)	20.901	5.00	30.00	(24)	320.243	5.00	95.00
(11)	26.427	5.00	35.00	(25)	376.275	2.70	97.70
(12)	33.482	5.00	40.00	(26)	428.300	1.30	99.00
(13)	42.314	5.00	45.00	(27)	556.593	0.90	99.90
(14)	53.646	5.00	50.00				

Median : 53.542 (μm) Mean: 97.604 (μm) Mode: 186.878 (μm)
Std. Dev.: 104.991 (μm) Span: 3.102
Coef. Var: 107.57% Spec. Area: 3054 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/01/'01 15:42

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010927-038 16:00
Filename : SY102970
Sample : SY102

Material : Fractional Settling
Source :
Lot Numbe : 1338

Condition
T%(He-Ne): 71.8% Dist.Form: Std. Sampling times : 100
(LAMP): 65.1% R.R.Index: 1.16-0.00i ( )

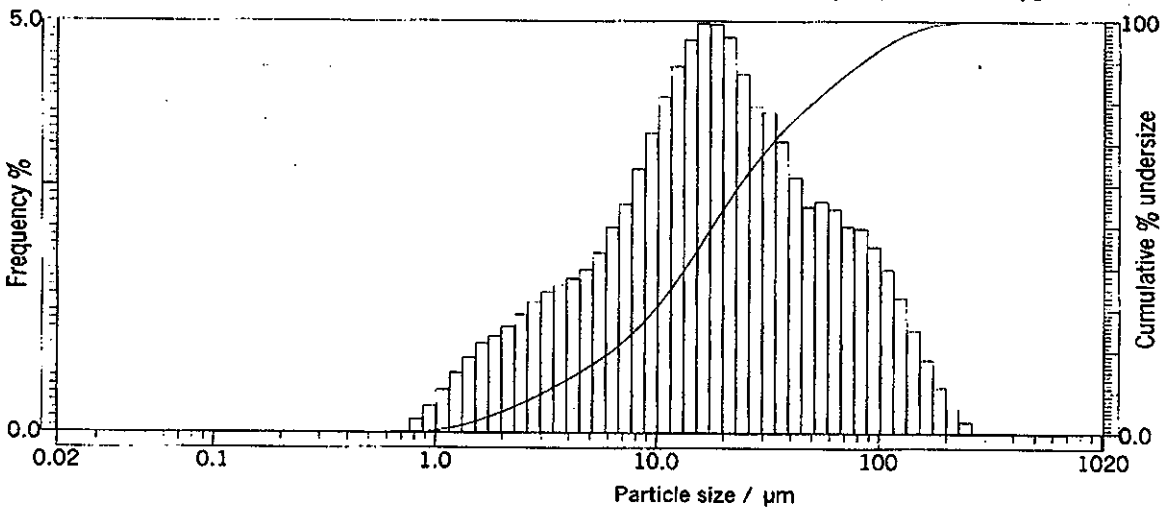
Agitation : 3 Circultn : 6 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 17.782μm SP.Area : 7197cm²/cm³ S.D. : 37.639μm
Mode : 16.279μm Mean : 32.041μm
C.V. : 117.47%

Span : (D 10.0-D 90.0) / D50 = 4.552

Dia. on %(5.0%) : 1.993μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 7.998μm % on Dia.(1.000μm) : 0.5%
Dia. on %(50.0%) : 17.782μm % on Dia.(10.000μm) : 30.7%
Dia. on %(75.0%) : 39.897μm % on Dia.(100.000μm) : 93.0%
Dia. on %(95.0%) : 114.730μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	4.34	63.26	0.669	0.00	0.00
890.1	0.00	100.00	22.80	4.80	58.92	0.584	0.00	0.00
777.1	0.00	100.00	19.90	4.96	54.12	0.510	0.00	0.00
678.5	0.00	100.00	17.38	4.97	49.16	0.445	0.00	0.00
592.4	0.00	100.00	15.17	4.77	44.19	0.389	0.00	0.00
517.2	0.00	100.00	13.25	4.44	39.43	0.339	0.00	0.00
451.6	0.00	100.00	11.56	4.07	34.98	0.296	0.00	0.00
394.2	0.00	100.00	10.10	3.63	30.92	0.259	0.00	0.00
344.2	0.00	100.00	8.816	3.19	27.29	0.226	0.00	0.00
300.5	0.00	100.00	7.697	2.78	24.10	0.197	0.00	0.00
262.4	0.14	100.00	6.720	2.49	21.32	0.172	0.00	0.00
229.1	0.30	99.86	5.867	2.19	18.83	0.150	0.00	0.00
200.0	0.56	99.56	5.122	1.98	16.64	0.131	0.00	0.00
174.6	0.89	99.00	4.472	1.87	14.66	0.115	0.00	0.00
152.5	1.26	98.10	3.905	1.79	12.78	0.100	0.00	0.00
133.1	1.65	96.84	3.409	1.71	10.99	0.087	0.00	0.00
116.2	1.98	95.19	2.976	1.60	9.28	0.076	0.00	0.00
101.5	2.26	93.20	2.599	1.45	7.69	0.067	0.00	0.00
88.58	2.47	90.95	2.269	1.30	6.24	0.058	0.00	0.00
77.34	2.50	88.47	1.981	1.18	4.94	0.051	0.00	0.00
67.52	2.71	85.97	1.729	1.09	3.76	0.044	0.00	0.00
58.95	2.81	83.26	1.510	0.92	2.67	0.039	0.00	0.00
51.47	2.74	80.45	1.318	0.74	1.75	0.034	0.00	0.00
44.94	3.09	77.71	1.151	0.53	1.02	0.029	0.00	0.00
39.23	3.52	74.62	1.005	0.32	0.49	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/01/01
File Name: SY102970.DAT Sample Name: SY102 ID No: 01/09/27-038
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 71.825 % Lamp: 65.135 %
Circulation: 6 Agitation: 3 U.Sonic ** (min)
Material: Fractional Settling Source:
Lot No: 1338 Test No: duplicate

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.833	0.10	0.10	(15)	20.437	5.00	55.00
(2)	1.147	0.90	1.00	(16)	23.624	5.00	60.00
(3)	1.433	1.30	2.30	(17)	27.778	5.00	65.00
(4)	1.994	2.70	5.00	(18)	33.024	5.00	70.00
(5)	3.158	5.00	10.00	(19)	39.939	5.00	75.00
(6)	4.585	5.00	15.00	(20)	50.389	5.00	80.00
(7)	4.847	0.80	15.80	(21)	61.918	4.20	84.20
(8)	6.269	4.20	20.00	(22)	64.446	0.80	85.00
(9)	8.013	5.00	25.00	(23)	84.278	5.00	90.00
(10)	9.773	5.00	30.00	(24)	114.817	5.00	95.00
(11)	11.571	5.00	35.00	(25)	146.274	2.70	97.70
(12)	13.478	5.00	40.00	(26)	174.769	1.30	99.00
(13)	15.529	5.00	45.00	(27)	238.932	0.90	99.90
(14)	17.806	5.00	50.00				

Median : 17.782 (μm) Mean: 32.041 (μm) Mode: 16.237 (μm)
Std. Dev.: 37.639 (μm) Span: 4.208
Coef. Var: 117.47% Spec. Area: 7197 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/01/'01 15:42

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010927-039 16:03
Filename : SY102971
Sample : SY102

Material : Fractional Settling
Source :
Lot Numbe : 1338

Condition
T%(He-Ne): 71.3% Dist.Form: Std. Sampling times : 100
(LAMP): 65.2% R.R.Index: 1.16-0.00i ( )

Agitation : 1 Circultn : 6 U.sonic : ~~ON~~ OFF (120)

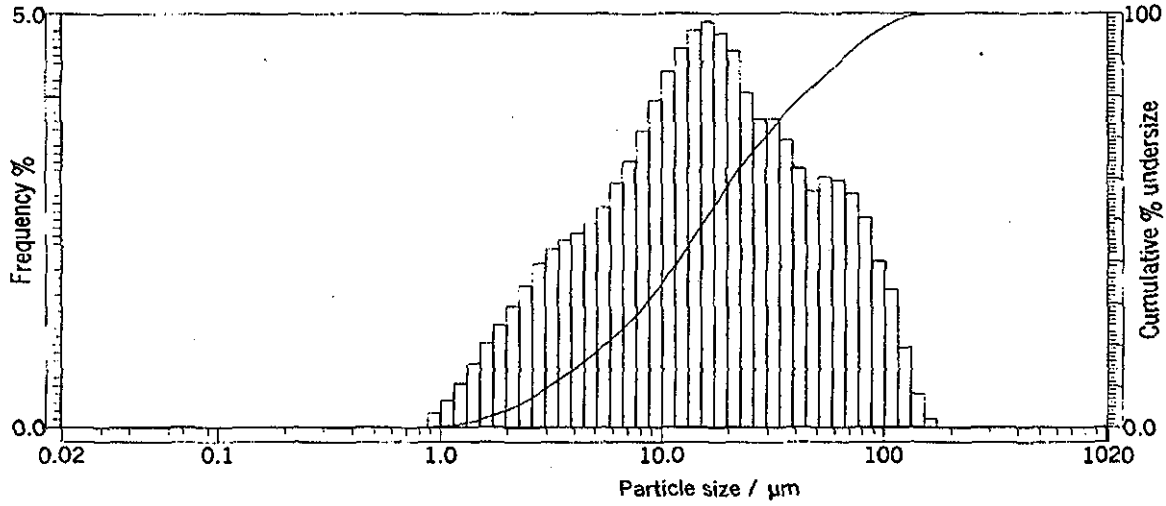
WSC 10/2/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 15.878μm SP.Area : 7325cm²/cm³ S.D. : 28.273μm
Mode : 16.228μm Mean : 26.651μm
C.V. : 106.09%

Span : (D 10.0-D 90.0) / D50 = 4.157

Dia. on %(5.0%) :	2.163μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	7.026μm	% on Dia.(1.000μm) :	0.2%
Dia. on %(50.0%) :	15.878μm	% on Dia.(10.000μm) :	34.4%
Dia. on %(75.0%) :	35.516μm	% on Dia.(100.000μm) :	96.6%
Dia. on %(95.0%) :	89.485μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	4.05	66.62	0.669	0.00	0.00
890.1	0.00	100.00	22.80	4.56	62.58	0.584	0.00	0.00
777.1	0.00	100.00	19.90	4.76	58.02	0.510	0.00	0.00
678.5	0.00	100.00	17.38	4.90	53.26	0.445	0.00	0.00
592.4	0.00	100.00	15.17	4.80	48.36	0.389	0.00	0.00
517.2	0.00	100.00	13.25	4.58	43.56	0.339	0.00	0.00
451.6	0.00	100.00	11.56	4.30	38.98	0.296	0.00	0.00
394.2	0.00	100.00	10.10	3.95	34.68	0.259	0.00	0.00
344.2	0.00	100.00	8.816	3.58	30.73	0.226	0.00	0.00
300.5	0.00	100.00	7.697	3.20	27.15	0.197	0.00	0.00
262.4	0.00	100.00	6.720	2.95	23.95	0.172	0.00	0.00
229.1	0.00	100.00	5.867	2.65	21.00	0.150	0.00	0.00
200.0	0.00	100.00	5.122	2.45	18.35	0.131	0.00	0.00
174.6	0.11	100.00	4.472	2.34	15.91	0.115	0.00	0.00
152.5	0.41	99.89	3.905	2.24	13.57	0.100	0.00	0.00
133.1	0.96	99.48	3.409	2.14	11.33	0.087	0.00	0.00
116.2	1.67	98.52	2.976	1.97	9.19	0.076	0.00	0.00
101.5	2.00	96.85	2.599	1.71	7.22	0.067	0.00	0.00
88.58	2.53	94.85	2.269	1.46	5.51	0.058	0.00	0.00
77.34	2.81	92.32	1.981	1.23	4.05	0.051	0.00	0.00
67.52	2.98	89.51	1.729	1.02	2.82	0.044	0.00	0.00
58.95	3.02	86.53	1.510	0.76	1.79	0.039	0.00	0.00
51.47	2.86	83.51	1.318	0.53	1.03	0.034	0.00	0.00
44.94	3.12	80.66	1.151	0.33	0.50	0.029	0.00	0.00
39.23	3.46	77.54	1.005	0.17	0.17	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/01/01
File Name: SY102971.DAT Sample Name: SY102 ID No: 01/09/27-039
Dist. Form: STANDARD *R.R. Index: 116-000*
Dist. Mode: VOLUME Laser: 71.256 % Lamp: 65.247 %
Circulation: 6 Agitation: 1 U.Sonic OFF (min)
Material: Fractional Settling Source:
Lot No: 1338 Test No: duplicate

WSC 10/2/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.952	0.10	0.10	(15)	18.301	5.00	55.00
(2)	1.309	0.90	1.00	(16)	21.160	5.00	60.00
(3)	1.619	1.30	2.30	(17)	24.781	5.00	65.00
(4)	2.168	2.70	5.00	(18)	29.552	5.00	70.00
(5)	3.141	5.00	10.00	(19)	35.581	5.00	75.00
(6)	4.252	5.00	15.00	(20)	43.739	5.00	80.00
(7)	4.446	0.80	15.80	(21)	53.176	4.20	84.20
(8)	5.585	4.20	20.00	(22)	55.156	0.80	85.00
(9)	7.040	5.00	25.00	(23)	69.225	5.00	90.00
(10)	8.587	5.00	30.00	(24)	89.544	5.00	95.00
(11)	10.207	5.00	35.00	(25)	108.955	2.70	97.70
(12)	11.941	5.00	40.00	(26)	124.632	1.30	99.00
(13)	13.825	5.00	45.00	(27)	154.258	0.90	99.90
(14)	15.911	5.00	50.00				

Median : 15.878 (μm) Mean: 26.651 (μm) Mode: 16.237 (μm)
Std. Dev.: 28.273 (μm) Span: 3.399
Coef. Var: 106.09% Spec. Area: 7325 (cm2/cm3)

APPENDIX F-19

EFFECTS OF RELATIVE REFRACTIVE INDEX ON PSD RESULTS

Consisting of 26 pages including this cover page

TABLE F-19. Sample identification and PSD run conditions. PSD runs for which particle size distributions were recalculated with varying values of Relative Refractive Index (RRI).

Conditions Key: P = Pump Speed Setting; P6 = 14.4 mL/s
S = Stirrer Speed Setting (1-7); S1 = Stirrer Speed 1; S3 = Stirrer Speed 3
US = Ultrasonic ON Time (min); DT = Delay Time (min) between end of ultrasonic treatment and PSD measurement.

Sample	PSD Run File Name	Run Conditions					Cumulative Time (min) At Conditions				
		P	S	US	DT		P6	S1	S3	US	DT
BCR-67	BC67671	6	3	0	0		15	9	6	2	3
BCR-130	BC130680	6	3	0	0		14	8	6	2	3
AW-103	AW103740	6	1	0	0		3	3	0	0	0
S01T001425	AW103743	6	3	0	0		33	27	6	20	4
AY-101	AY101840	6	1	0	0		3	3	0	0	0
S01T001492	AY101843	6	3	0	0		34	27	7	20	4
C-104	C104791	6	1	0	0		4	4	0	0	0
S01T001448	C104794	6	3	0	0		35	28	7	20	4

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/09/'01 10:47

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010731-671 13:57
Filename : BC67671
Sample : BCR 67

Material : 3-20 um Quartz
Source : CEC/BCR
Lot Numbe : Bottle 1448 / Jar 67-3

Condition
T%(He-Ne) : 61.4%
(LAMP) : 72.0%
Dist.Form: Std.
R.R.Index: 0.74-0.00i
Sampling times : 100 ( )

Agitation : 3 Circultn : 6 U.sonic : ~~ON~~ OFF (120)

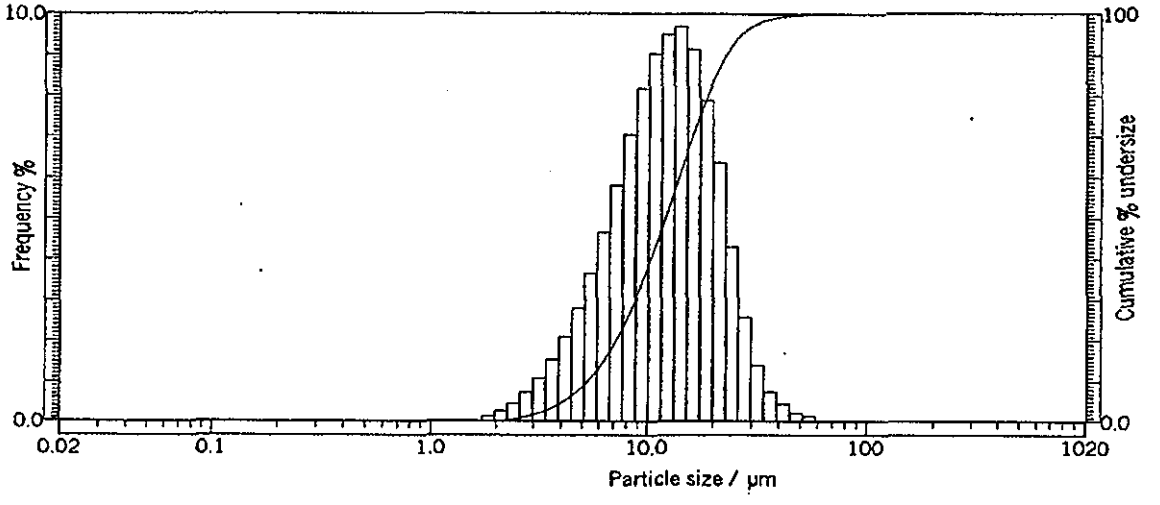
WJC 8/4/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 11.986μm SP.Area : 6226cm²/cm³ S.D. : 7.363μm
Mode : 14.140μm Mean : 13.322μm
C.V. : 55.27%

Span : (D 10.0-D 90.0) / D50 = 1.454

Dia. on %(5.0%) : 4.102μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 7.958μm % on Dia.(1.000μm) : 0.0%
Dia. on %(50.0%) : 11.986μm % on Dia.(10.000μm) : 37.9%
Dia. on %(75.0%) : 17.160μm % on Dia.(100.000μm) : 100.0%
Dia. on %(95.0%) : 26.836μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	4.33	94.48	0.669	0.00	0.00
890.1	0.00	100.00	22.80	6.39	90.15	0.584	0.00	0.00
777.1	0.00	100.00	19.90	7.91	83.76	0.510	0.00	0.00
678.5	0.00	100.00	17.38	9.15	75.85	0.445	0.00	0.00
592.4	0.00	100.00	15.17	9.69	66.70	0.389	0.00	0.00
517.2	0.00	100.00	13.25	9.52	57.01	0.339	0.00	0.00
451.6	0.00	100.00	11.56	9.01	47.49	0.296	0.00	0.00
394.2	0.00	100.00	10.10	8.16	38.48	0.259	0.00	0.00
344.2	0.00	100.00	8.816	7.05	30.32	0.226	0.00	0.00
300.5	0.00	100.00	7.697	5.82	23.27	0.197	0.00	0.00
262.4	0.00	100.00	6.720	4.66	17.45	0.172	0.00	0.00
229.1	0.00	100.00	5.867	3.66	12.79	0.150	0.00	0.00
200.0	0.00	100.00	5.122	2.80	9.13	0.131	0.00	0.00
174.6	0.00	100.00	4.472	2.09	6.33	0.115	0.00	0.00
152.5	0.00	100.00	3.905	1.53	4.24	0.100	0.00	0.00
133.1	0.00	100.00	3.409	1.09	2.70	0.087	0.00	0.00
116.2	0.00	100.00	2.976	0.73	1.62	0.076	0.00	0.00
101.5	0.00	100.00	2.599	0.47	0.89	0.067	0.00	0.00
88.58	0.00	100.00	2.269	0.27	0.42	0.058	0.00	0.00
77.34	0.00	100.00	1.981	0.14	0.14	0.051	0.00	0.00
67.52	0.00	100.00	1.729	0.00	0.00	0.044	0.00	0.00
58.95	0.13	100.00	1.510	0.00	0.00	0.039	0.00	0.00
51.47	0.21	99.87	1.318	0.00	0.00	0.034	0.00	0.00
44.94	0.45	99.65	1.151	0.00	0.00	0.029	0.00	0.00
39.23	0.74	99.20	1.005	0.00	0.00	0.026	0.00	0.00
34.25	1.39	98.45	0.877	0.00	0.00	0.022	0.00	0.00
29.91	2.58	97.06	0.766	0.00	0.00			

HORIBA LA-910

for Windows(TM) Ver.1.20] Oct/09/'01 10:47

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010731-671 13:57
Filename : BC67671
Sample : BCR 67

Material : 3-20 um Quartz
Source : CEC/BCR
Lot Numbe : Bottle 1448 / Jar 67-3

Condition
T%(He-Ne) : 61.4% Dist.Form: Std. Sampling times : 100
(LAMP) : 72.0% R.R.Index: 1.14-0.00i ( )

Agitation : 3 Circultn : 6 U.sonic : ~~ON~~ OFF (120)

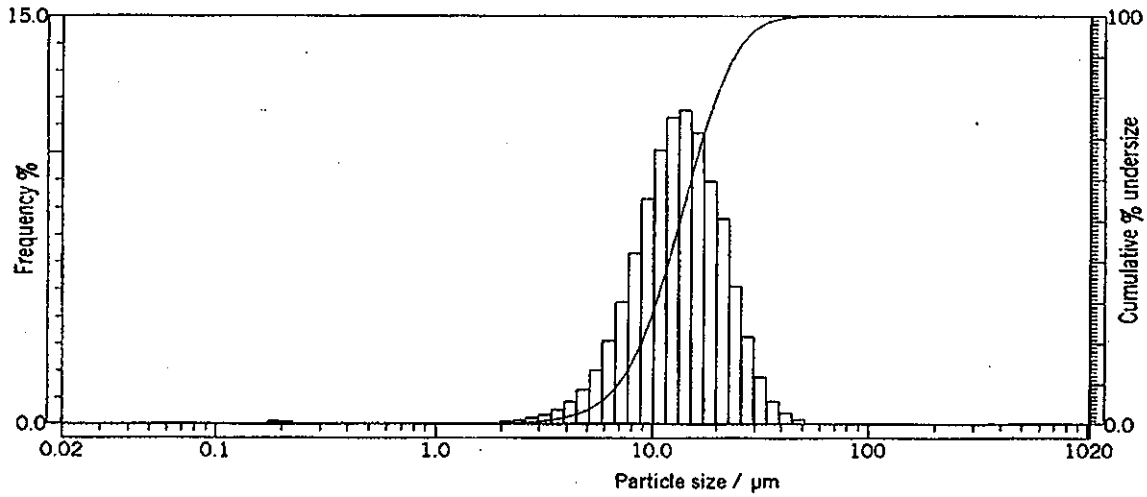
DSC 8/4/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 13.317μm SP.Area : 5902cm²/cm³ S.D. : 6.965μm
Mode : 14.131μm Mean : 14.547μm
C.V. : 47.88%

Span : (D 10.0-D 90.0) / D50 = 1.267

Dia. on %(5.0%) : 5.540μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 9.585μm % on Dia.(1.000μm) : 0.2%
Dia. on %(50.0%) : 13.317μm % on Dia.(10.000μm) : 27.6%
Dia. on %(75.0%) : 18.238μm % on Dia.(100.000μm) : 100.0%
Dia. on %(95.0%) : 27.810μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	5.11	93.48	0.669	0.00	0.23
890.1	0.00	100.00	22.80	7.59	88.37	0.584	0.00	0.23
777.1	0.00	100.00	19.90	8.98	80.78	0.510	0.00	0.23
678.5	0.00	100.00	17.38	10.72	71.80	0.445	0.00	0.23
592.4	0.00	100.00	15.17	11.54	61.09	0.389	0.00	0.23
517.2	0.00	100.00	13.25	11.26	49.54	0.339	0.00	0.23
451.6	0.00	100.00	11.56	10.09	38.28	0.296	0.00	0.23
394.2	0.00	100.00	10.10	8.33	28.19	0.259	0.00	0.23
344.2	0.00	100.00	8.816	6.34	19.86	0.226	0.11	0.23
300.5	0.00	100.00	7.697	4.54	13.52	0.197	0.12	0.12
262.4	0.00	100.00	6.720	3.12	8.98	0.172	0.00	0.00
229.1	0.00	100.00	5.867	2.03	5.86	0.150	0.00	0.00
200.0	0.00	100.00	5.122	1.31	3.83	0.131	0.00	0.00
174.6	0.00	100.00	4.472	0.85	2.52	0.115	0.00	0.00
152.5	0.00	100.00	3.905	0.55	1.67	0.100	0.00	0.00
133.1	0.00	100.00	3.409	0.37	1.12	0.087	0.00	0.00
116.2	0.00	100.00	2.976	0.25	0.75	0.076	0.00	0.00
101.5	0.00	100.00	2.599	0.16	0.50	0.067	0.00	0.00
88.58	0.00	100.00	2.269	0.11	0.34	0.058	0.00	0.00
77.34	0.00	100.00	1.981	0.00	0.23	0.051	0.00	0.00
67.52	0.00	100.00	1.729	0.00	0.23	0.044	0.00	0.00
58.95	0.00	100.00	1.510	0.00	0.23	0.039	0.00	0.00
51.47	0.19	100.00	1.318	0.00	0.23	0.034	0.00	0.00
44.94	0.43	99.81	1.151	0.00	0.23	0.029	0.00	0.00
39.23	0.88	99.38	1.005	0.00	0.23	0.026	0.00	0.00
34.25	1.75	98.51	0.877	0.00	0.23	0.022	0.00	0.00
29.91	3.28	96.75	0.766	0.00	0.23			

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/09/'01 10:48

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010731-671 13:57
Filename : BC67671
Sample : BCR 67

Material : 3-20 um Quartz
Source : CEC/BCR
Lot Numbe : Bottle 1448 / Jar 67-3

Condition
T%(He-Ne) : 61.4% Dist.Form : Std. Sampling times : 100
(LAMP) : 72.0% R.R.Index : 2.40-0.00i ( )

Agitation : 3 Circultn : 6 U.sonic : ~~ON~~ OFF (120)

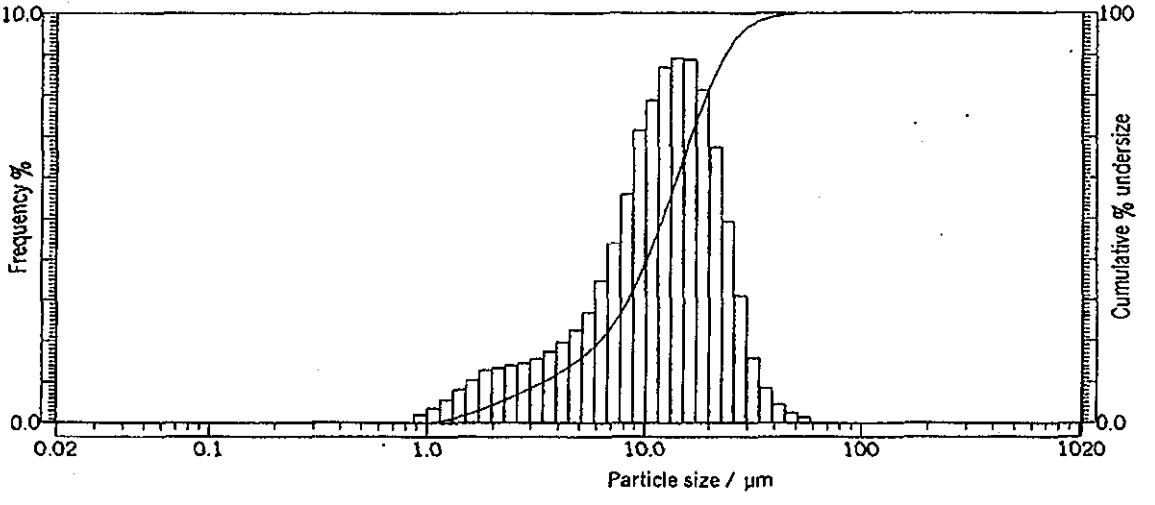
WJC 8/4/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 12.071μm SP.Area : 8064cm²/cm³ S.D. : 8.064μm
Mode : 14.197μm Mean : 13.167μm
C.V. : 61.25%

Span : (D 10.0-D 90.0) / D50 = 1.678

Dia. on %(5.0%) : 2.134μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 7.325μm % on Dia.(1.000μm) : 0.2%
Dia. on %(50.0%) : 12.071μm % on Dia.(10.000μm) : 38.9%
Dia. on %(75.0%) : 17.742μm % on Dia.(100.000μm) : 100.0%
Dia. on %(95.0%) : 27.754μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	4.95	93.61	0.669	0.00	0.00
890.1	0.00	100.00	22.80	6.76	88.66	0.584	0.00	0.00
777.1	0.00	100.00	19.90	8.15	81.90	0.510	0.00	0.00
678.5	0.00	100.00	17.38	8.89	73.75	0.445	0.00	0.00
592.4	0.00	100.00	15.17	8.91	64.87	0.389	0.00	0.00
517.2	0.00	100.00	13.25	8.70	55.96	0.339	0.00	0.00
451.6	0.00	100.00	11.56	7.89	47.26	0.296	0.00	0.00
394.2	0.00	100.00	10.10	7.16	39.36	0.259	0.00	0.00
344.2	0.00	100.00	8.816	5.59	32.20	0.226	0.00	0.00
300.5	0.00	100.00	7.697	4.41	26.61	0.197	0.00	0.00
262.4	0.00	100.00	6.720	3.47	22.20	0.172	0.00	0.00
229.1	0.00	100.00	5.867	2.69	18.73	0.150	0.00	0.00
200.0	0.00	100.00	5.122	2.28	16.03	0.131	0.00	0.00
174.6	0.00	100.00	4.472	1.97	13.76	0.115	0.00	0.00
152.5	0.00	100.00	3.905	1.74	11.78	0.100	0.00	0.00
133.1	0.00	100.00	3.409	1.57	10.04	0.087	0.00	0.00
116.2	0.00	100.00	2.976	1.47	8.47	0.076	0.00	0.00
101.5	0.00	100.00	2.599	1.40	7.00	0.067	0.00	0.00
88.58	0.00	100.00	2.269	1.34	5.60	0.058	0.00	0.00
77.34	0.00	100.00	1.981	1.28	4.26	0.051	0.00	0.00
67.52	0.00	100.00	1.729	1.05	2.98	0.044	0.00	0.00
58.95	0.14	100.00	1.510	0.81	1.93	0.039	0.00	0.00
51.47	0.24	99.86	1.318	0.57	1.12	0.034	0.00	0.00
44.94	0.46	99.62	1.151	0.36	0.56	0.029	0.00	0.00
39.23	0.85	99.16	1.005	0.20	0.20	0.026	0.00	0.00
34.25	1.60	98.31	0.877	0.00	0.00	0.022	0.00	0.00
29.91	3.10	96.71	0.766	0.00	0.00			

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/09/'01 10:45

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010731-680 15:41
Filename : BC130680
Sample : BCR 130

Material : 50-220 um Quartz
Source : CEC/BCR
Lot Numbe : Bottle 618 / Jar 130-5

Condition
T%(He-Ne) : 76.8% Dist.Form: Std. Sampling times : 100
(LAMP) : 84.5% R.R.Index: 0.74-0.00i ( )

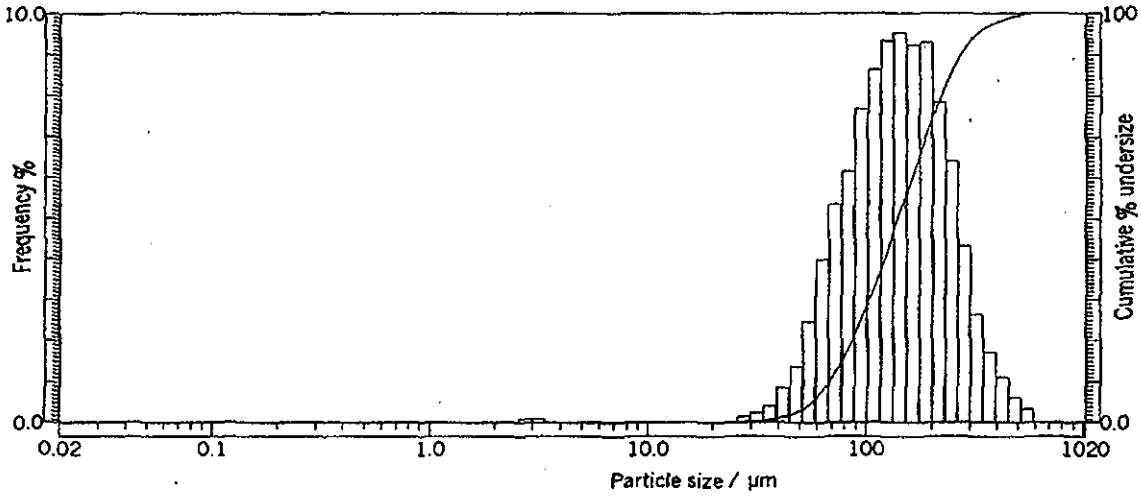
Agitation : 3 Circultn : 6 U.sonic : ~~ON~~ OFF (120) wsc 8/4/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 139.044μm SP.Area : 545cm²/cm³ S.D. : 85.760μm
Mode : 142.353μmMean : 157.443μm
C.V. : 54.47%

Span : (D 10.0-D 90.0) / D50 = 1.443

Dia. on %(5.0%) : 56.536μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 94.598μm % on Dia.(1.000μm) : 0.0%
Dia. on %(50.0%) :139.044μm % on Dia.(10.000μm) : 0.2%
Dia. on %(75.0%) :199.979μm % on Dia.(100.000μm) : 28.1%
Dia. on %(95.0%) :323.134μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	0.22	0.669	0.00	0.00
890.1	0.00	100.00	22.80	0.00	0.22	0.584	0.00	0.00
777.1	0.00	100.00	19.90	0.00	0.22	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.00	0.22	0.445	0.00	0.00
592.4	0.34	100.00	15.17	0.00	0.22	0.389	0.00	0.00
517.2	0.61	99.66	13.25	0.00	0.22	0.339	0.00	0.00
451.6	1.10	99.05	11.56	0.00	0.22	0.296	0.00	0.00
394.2	1.71	97.94	10.10	0.00	0.22	0.259	0.00	0.00
344.2	2.65	96.23	8.816	0.00	0.22	0.226	0.00	0.00
300.5	4.33	93.59	7.697	0.00	0.22	0.197	0.00	0.00
262.4	6.40	89.26	6.720	0.00	0.22	0.172	0.00	0.00
229.1	7.85	82.86	5.867	0.00	0.22	0.150	0.00	0.00
200.0	9.30	75.01	5.122	0.00	0.22	0.131	0.00	0.00
174.6	9.23	65.71	4.472	0.00	0.22	0.115	0.00	0.00
152.5	9.55	56.47	3.905	0.00	0.22	0.100	0.00	0.00
133.1	9.33	46.93	3.409	0.11	0.22	0.087	0.00	0.00
116.2	8.63	37.60	2.976	0.11	0.11	0.076	0.00	0.00
101.5	7.69	28.97	2.599	0.00	0.00	0.067	0.00	0.00
88.58	6.18	21.28	2.269	0.00	0.00	0.058	0.00	0.00
77.34	5.35	15.10	1.981	0.00	0.00	0.051	0.00	0.00
67.52	3.99	9.75	1.729	0.00	0.00	0.044	0.00	0.00
58.95	2.47	5.76	1.510	0.00	0.00	0.039	0.00	0.00
51.47	1.39	3.29	1.318	0.00	0.00	0.034	0.00	0.00
44.94	0.87	1.91	1.151	0.00	0.00	0.029	0.00	0.00
39.23	0.42	1.03	1.005	0.00	0.00	0.026	0.00	0.00
34.25	0.25	0.62	0.877	0.00	0.00	0.022	0.00	0.00
29.91	0.15	0.36	0.766	0.00	0.00			

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/09/'01 10:45

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010731-680 15:41
Filename : BC130680
Sample : BCR 130

Material : 50-220 um Quartz
Source : CEC/BCR
Lot Numbe : Bottle 618 / Jar 130-5

Condition
T%(He-Ne) : 76.8% Dist.Form: Std. Sampling times : 100
(LAMP) : 84.5% R.R.Index : 1.14-0.00i ( )

Agitation : 3 Circultn : 6 U.sonic : ~~ON~~ OFF (120)

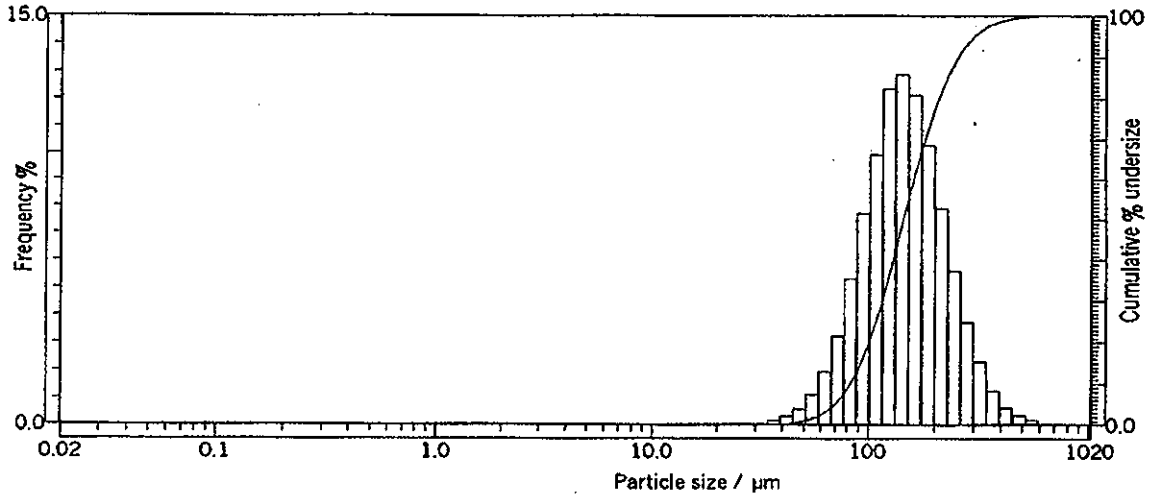
WSC 9/4/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 143.725μm SP.Area : 458cm²/cm³ S.D. : 72.783μm
Mode : 142.276μm Mean : 158.521μm
C.V. : 45.91%

Span : (D 10.0-D 90.0) / D50 = 1.183

Dia. on %(5.0%) : 70.077μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 108.018μm % on Dia.(1.000μm) : 0.0%
Dia. on %(50.0%) : 143.725μm % on Dia.(10.000μm) : 0.0%
Dia. on %(75.0%) : 192.202μm % on Dia.(100.000μm) : 19.6%
Dia. on %(95.0%) : 297.289μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	0.00	0.669	0.00	0.00
890.1	0.00	100.00	22.80	0.00	0.00	0.584	0.00	0.00
777.1	0.00	100.00	19.90	0.00	0.00	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.00	0.00	0.445	0.00	0.00
592.4	0.19	100.00	15.17	0.00	0.00	0.389	0.00	0.00
517.2	0.35	99.81	13.25	0.00	0.00	0.339	0.00	0.00
451.6	0.63	99.45	11.56	0.00	0.00	0.296	0.00	0.00
394.2	1.24	98.82	10.10	0.00	0.00	0.259	0.00	0.00
344.2	2.28	97.58	8.816	0.00	0.00	0.226	0.00	0.00
300.5	3.74	95.30	7.697	0.00	0.00	0.197	0.00	0.00
262.4	5.62	91.55	6.720	0.00	0.00	0.172	0.00	0.00
229.1	7.92	85.94	5.867	0.00	0.00	0.150	0.00	0.00
200.0	10.29	78.02	5.122	0.00	0.00	0.131	0.00	0.00
174.6	12.13	67.72	4.472	0.00	0.00	0.115	0.00	0.00
152.5	12.88	55.59	3.905	0.00	0.00	0.100	0.00	0.00
133.1	12.36	42.72	3.409	0.00	0.00	0.087	0.00	0.00
116.2	9.94	30.35	2.976	0.00	0.00	0.076	0.00	0.00
101.5	7.74	20.41	2.599	0.00	0.00	0.067	0.00	0.00
88.58	5.33	12.68	2.269	0.00	0.00	0.058	0.00	0.00
77.34	3.22	7.34	1.981	0.00	0.00	0.051	0.00	0.00
67.52	1.93	4.12	1.729	0.00	0.00	0.044	0.00	0.00
58.95	1.11	2.19	1.510	0.00	0.00	0.039	0.00	0.00
51.47	0.59	1.08	1.318	0.00	0.00	0.034	0.00	0.00
44.94	0.32	0.49	1.151	0.00	0.00	0.029	0.00	0.00
39.23	0.17	0.17	1.005	0.00	0.00	0.026	0.00	0.00
34.25	0.00	0.00	0.877	0.00	0.00	0.022	0.00	0.00
29.91	0.00	0.00	0.766	0.00	0.00			

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/09/'01 10:45

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010731-680 15:41
Filename : BC130680
Sample : BCR 130

Material : 50-220 um Quartz
Source : CEC/BCR
Lot Numbe : Bottle 618 / Jar 130-5

Condition

T%(He-Ne) : 76.8% Dist.Form: Std. Sampling times : 100
(LAMP) : 84.5% R.R.Index : 2.40-0.00i ( )

Agitation : 3 Circultn : 6 U.sonic : ~~ON~~ OFF (120)

WSC 8/4/01

Format

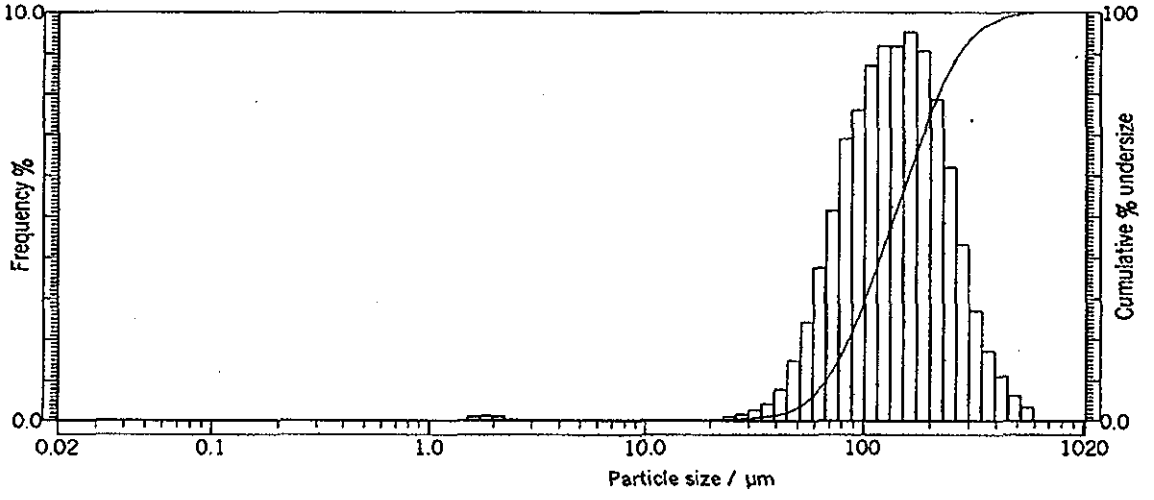
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data

Median : 138.448μm SP.Area : 618cm²/cm³ S.D. : 86.117μm
Mode : 163.014μmMean : 156.930μm
C.V. : 54.88%

Span : (D 10.0-D 90.0) / D50 = 1.454

Dia. on %(5.0%) : 55.672μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 93.743μm % on Dia.(1.000μm) : 0.0%
Dia. on %(50.0%) :138.448μm % on Dia.(10.000μm) : 0.3%
Dia. on %(75.0%) :199.647μm % on Dia.(100.000μm) : 28.6%
Dia. on %(95.0%) :323.780μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.11	0.46	0.669	0.00	0.00
890.1	0.00	100.00	22.80	0.00	0.35	0.584	0.00	0.00
777.1	0.00	100.00	19.90	0.00	0.35	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.00	0.35	0.445	0.00	0.00
592.4	0.34	100.00	15.17	0.00	0.35	0.389	0.00	0.00
517.2	0.61	99.66	13.25	0.00	0.35	0.339	0.00	0.00
451.6	1.10	99.05	11.56	0.00	0.35	0.296	0.00	0.00
394.2	1.72	97.94	10.10	0.00	0.35	0.259	0.00	0.00
344.2	2.71	96.22	8.816	0.00	0.35	0.226	0.00	0.00
300.5	4.32	93.51	7.697	0.00	0.35	0.197	0.00	0.00
262.4	6.19	89.19	6.720	0.00	0.35	0.172	0.00	0.00
229.1	7.88	82.99	5.867	0.00	0.35	0.150	0.00	0.00
200.0	9.07	75.12	5.122	0.00	0.35	0.131	0.00	0.00
174.6	9.53	66.05	4.472	0.00	0.35	0.115	0.00	0.00
152.5	9.19	56.53	3.905	0.00	0.35	0.100	0.00	0.00
133.1	9.19	47.33	3.409	0.00	0.35	0.087	0.00	0.00
116.2	8.72	38.15	2.976	0.00	0.35	0.076	0.00	0.00
101.5	7.61	29.43	2.599	0.00	0.35	0.067	0.00	0.00
88.58	6.90	21.83	2.269	0.11	0.35	0.058	0.00	0.00
77.34	5.14	14.93	1.981	0.13	0.24	0.051	0.00	0.00
67.52	3.76	9.79	1.729	0.12	0.12	0.044	0.00	0.00
58.95	2.43	6.03	1.510	0.00	0.00	0.039	0.00	0.00
51.47	1.49	3.59	1.318	0.00	0.00	0.034	0.00	0.00
44.94	0.79	2.11	1.151	0.00	0.00	0.029	0.00	0.00
39.23	0.43	1.32	1.005	0.00	0.00	0.026	0.00	0.00
34.25	0.26	0.89	0.877	0.00	0.00	0.022	0.00	0.00
29.91	0.17	0.63	0.766	0.00	0.00			

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/08/'01 15:42

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010810-740 12:08
Filename : AW103740
Sample : S01T00142~~45~~

Material : AW103 Solids
Source : S01T001020
Lot Numbe : S01T00142~~45~~

Condition
T%(He-Ne) : 73.6% Dist.Form: Std. Sampling times : 100
(LAMP) : 60.5% R.R.Index: 0.74-0.00i ( )

Agitation : 1 Circultn : 6 U.sonic : ~~ON~~ OFF(120)

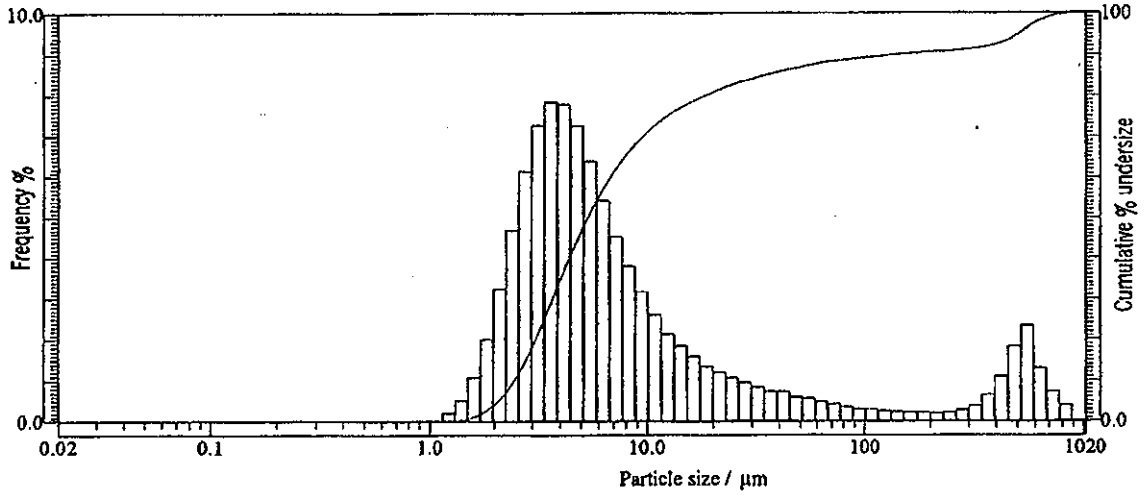
WSC 8/15/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 5.330μm SP.Area : 12148cm²/cm³ S.D. : 155.008μm
Mode : 3.665μm Mean : 58.534μm
C.V. : 264.82%

Span : (D 10.0-D 90.0) / D50 = 26.785

Dia. on %(5.0%) : 2.081μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 3.396μm % on Dia.(1.000μm) : 0.0%
Dia. on %(50.0%) : 5.330μm % on Dia.(10.000μm) : 71.2%
Dia. on %(75.0%) : 12.261μm % on Dia.(100.000μm) : 89.3%
Dia. on %(95.0%) :508.474μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.08	83.28	0.669	0.00	0.00
890.1	0.40	100.00	22.80	1.20	82.20	0.584	0.00	0.00
777.1	0.72	99.60	19.90	1.35	81.00	0.510	0.00	0.00
678.5	1.30	98.87	17.38	1.58	79.64	0.445	0.00	0.00
592.4	2.34	97.57	15.17	1.84	78.07	0.389	0.00	0.00
517.2	1.83	95.23	13.25	2.14	76.22	0.339	0.00	0.00
451.6	1.10	93.40	11.56	2.60	74.08	0.296	0.00	0.00
394.2	0.65	92.30	10.10	3.17	71.47	0.259	0.00	0.00
344.2	0.39	91.65	8.816	3.80	68.30	0.226	0.00	0.00
300.5	0.29	91.26	7.697	4.54	64.50	0.197	0.00	0.00
262.4	0.22	90.97	6.720	5.43	59.96	0.172	0.00	0.00
229.1	0.21	90.75	5.867	6.40	54.53	0.150	0.00	0.00
200.0	0.22	90.54	5.122	7.26	48.13	0.131	0.00	0.00
174.6	0.23	90.32	4.472	7.81	40.87	0.115	0.00	0.00
152.5	0.25	90.09	3.905	7.85	33.06	0.100	0.00	0.00
133.1	0.25	89.84	3.409	7.28	25.21	0.087	0.00	0.00
116.2	0.30	89.59	2.976	6.15	17.92	0.076	0.00	0.00
101.5	0.32	89.29	2.599	4.71	11.78	0.067	0.00	0.00
88.58	0.36	88.97	2.269	3.25	7.07	0.058	0.00	0.00
77.34	0.43	88.61	1.981	2.01	3.82	0.051	0.00	0.00
67.52	0.49	88.18	1.729	1.09	1.82	0.044	0.00	0.00
58.95	0.56	87.69	1.510	0.52	0.72	0.039	0.00	0.00
51.47	0.59	87.13	1.318	0.21	0.21	0.034	0.00	0.00
44.94	0.74	86.54	1.151	0.00	0.00	0.029	0.00	0.00
39.23	0.73	85.80	1.005	0.00	0.00	0.026	0.00	0.00
34.25	0.84	85.07	0.877	0.00	0.00	0.022	0.00	0.00
29.91	0.95	84.23	0.766	0.00	0.00			

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/08/'01 15:42

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010810-740 12:08
Filename : AW103740
Sample : S01T00142#5

Material : AW103 Solids
Source : S01T001020
Lot Numbe : S01T00142#5

Condition
T%(He-Ne) : 73.6%
(LAMP) : 60.5%
Dist.Form : Std.
R.R.Index : 1.16-0.00i
Sampling times : 100 ( )

Agitation : 1 Circultn : 6 U.sonic : ~~ON~~ OFF (120)

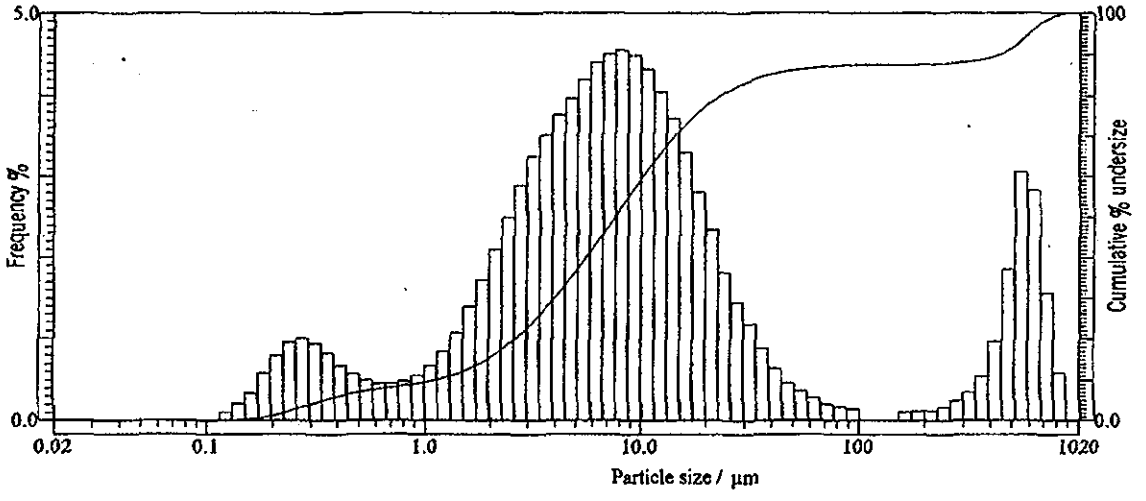
WJC 8/15/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 7.631μm SP.Area : 27633cm²/cm³ S.D. : 186.482μm
Mode : 8.236μm Mean : 77.435μm
C.V. : 240.83%

Span : (D 10.0-D 90.0) / D50 = 58.029

Dia. on %(5.0%) :	0.342μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	3.279μm	% on Dia.(1.000μm) :	9.5%
Dia. on %(50.0%) :	7.631μm	% on Dia.(10.000μm) :	59.0%
Dia. on %(75.0%) :	17.610μm	% on Dia.(100.000μm) :	87.5%
Dia. on %(95.0%) :	591.653μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.82	81.70	0.669	0.46	7.98
890.1	0.59	100.00	22.80	2.35	79.88	0.584	0.50	7.52
777.1	1.56	99.41	19.90	2.81	77.53	0.510	0.58	7.02
678.5	2.83	97.86	17.38	3.30	74.72	0.445	0.68	6.45
592.4	3.05	95.03	15.17	3.72	71.42	0.389	0.83	5.77
517.2	1.85	91.97	13.25	4.06	67.71	0.339	0.94	4.95
451.6	0.97	90.12	11.56	4.32	63.65	0.296	1.00	4.00
394.2	0.55	89.15	10.10	4.49	59.33	0.259	0.96	3.00
344.2	0.35	88.60	8.816	4.55	54.83	0.226	0.80	2.04
300.5	0.25	88.25	7.697	4.50	50.28	0.197	0.59	1.24
262.4	0.17	88.00	6.720	4.40	45.78	0.172	0.34	0.65
229.1	0.12	87.82	5.867	4.20	41.38	0.150	0.21	0.31
200.0	0.12	87.70	5.122	3.97	37.18	0.131	0.10	0.10
174.6	0.10	87.58	4.472	3.76	33.21	0.115	0.00	0.00
152.5	0.00	87.48	3.905	3.51	29.44	0.100	0.00	0.00
133.1	0.00	87.48	3.409	3.26	25.93	0.087	0.00	0.00
116.2	0.00	87.48	2.976	2.90	22.67	0.076	0.00	0.00
101.5	0.14	87.48	2.599	2.49	19.77	0.067	0.00	0.00
88.58	0.17	87.33	2.269	2.10	17.28	0.058	0.00	0.00
77.34	0.20	87.16	1.981	1.72	15.18	0.051	0.00	0.00
67.52	0.28	86.96	1.729	1.39	13.46	0.044	0.00	0.00
58.95	0.37	86.67	1.510	1.07	12.07	0.039	0.00	0.00
51.47	0.47	86.31	1.318	0.85	11.01	0.034	0.00	0.00
44.94	0.64	85.84	1.151	0.68	10.15	0.029	0.00	0.00
39.23	0.89	85.20	1.005	0.56	9.48	0.026	0.00	0.00
34.25	1.17	84.31	0.877	0.49	8.92	0.022	0.00	0.00
29.91	1.44	83.14	0.766	0.46	8.43			

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/08/'01 15:42

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010810-740 12:08
Filename : AW103740
Sample : S01T00142#5

Material : AW103 Solids
Source : S01T001020
Lot Numbe : S01T00142#5

Condition
T%(He-Ne) : 73.6%
(LAMP) : 60.5%
Dist.Form : Std.
R.R.Index : 2.40-0.00i
Sampling times : 100
( )

Agitation : 1 Circultn : 6 U.sonic : ~~ON~~ OFF (120)

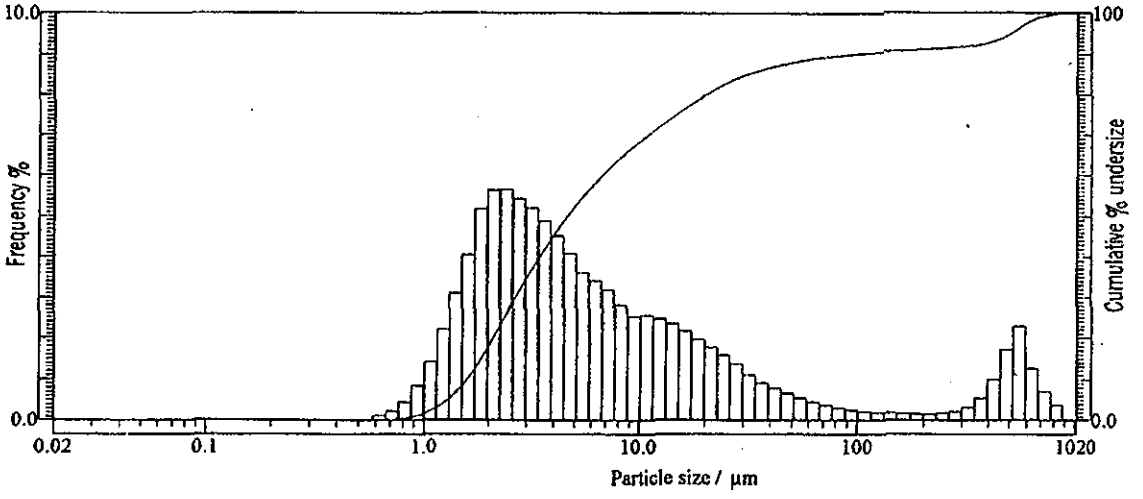
wsl 8/15/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 4.635μm SP.Area : 16724cm²/cm³ S.D. : 152.037μm
Mode : 2.422μm Mean : 55.474μm
C.V. : 274.07%

Span : (D 10.0-D 90.0) / D50 = 19.215

Dia. on %(5.0%) :	1.295μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	2.366μm	% on Dia.(1.000μm) :	1.6%
Dia. on %(50.0%) :	4.635μm	% on Dia.(10.000μm) :	68.4%
Dia. on %(75.0%) :	14.394μm	% on Dia.(100.000μm) :	90.2%
Dia. on %(95.0%) :	503.225μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.58	83.40	0.669	0.12	0.12
890.1	0.39	100.00	22.80	1.78	81.82	0.584	0.00	0.00
777.1	0.71	99.61	19.90	1.97	80.05	0.510	0.00	0.00
678.5	1.27	98.90	17.38	2.17	78.08	0.445	0.00	0.00
592.4	2.29	97.63	15.17	2.35	75.91	0.389	0.00	0.00
517.2	1.72	95.35	13.25	2.46	73.56	0.339	0.00	0.00
451.6	1.00	93.63	11.56	2.57	71.10	0.296	0.00	0.00
394.2	0.55	92.63	10.10	2.51	68.53	0.259	0.00	0.00
344.2	0.32	92.08	8.816	2.81	66.02	0.226	0.00	0.00
300.5	0.23	91.75	7.697	3.19	63.21	0.197	0.00	0.00
262.4	0.18	91.53	6.720	3.40	60.02	0.172	0.00	0.00
229.1	0.16	91.35	5.867	3.61	56.61	0.150	0.00	0.00
200.0	0.16	91.19	5.122	4.08	53.00	0.131	0.00	0.00
174.6	0.18	91.03	4.472	4.52	48.93	0.115	0.00	0.00
152.5	0.19	90.85	3.905	4.89	44.40	0.100	0.00	0.00
133.1	0.20	90.66	3.409	5.21	39.52	0.087	0.00	0.00
116.2	0.23	90.46	2.976	5.42	34.31	0.076	0.00	0.00
101.5	0.27	90.23	2.599	5.64	28.89	0.067	0.00	0.00
88.58	0.32	89.95	2.269	5.63	23.25	0.058	0.00	0.00
77.34	0.39	89.64	1.981	5.18	17.62	0.051	0.00	0.00
67.52	0.45	89.25	1.729	4.05	12.44	0.044	0.00	0.00
58.95	0.55	88.80	1.510	3.10	8.39	0.039	0.00	0.00
51.47	0.67	88.25	1.318	2.19	5.29	0.034	0.00	0.00
44.94	0.79	87.58	1.151	1.43	3.10	0.029	0.00	0.00
39.23	0.91	86.80	1.005	0.85	1.67	0.026	0.00	0.00
34.25	1.11	85.88	0.877	0.46	0.81	0.022	0.00	0.00
29.91	1.37	84.78	0.766	0.24	0.35			

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/08/'01 15:43

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010810-743 12:38
Filename : AW103743
Sample : S01T00142#5

Material : AW103 Solids
Source : S01T001020
Lot Numbe : S01T00142#5

Condition
T%(He-Ne) : 75.7%
(LAMP) : 59.0%
Dist.Form : Std.
R.R.Index : 0.74-0.00i
Sampling times : 100
( )

Agitation : 3 Circultn : 6 U.sonic : ~~ON~~ OFF (1200)

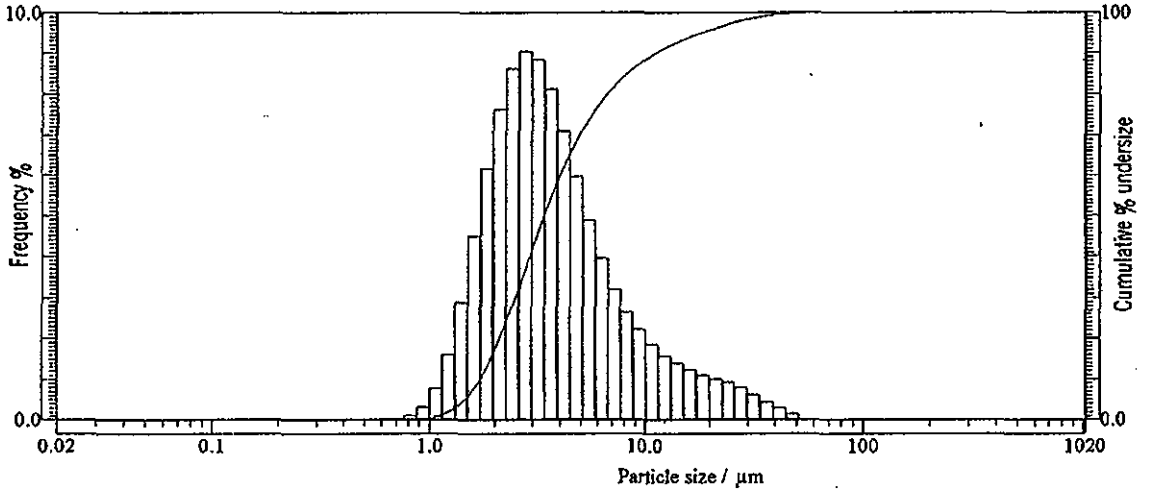
WJC 8/15/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 3.386μm SP.Area : 19311cm²/cm³ S.D. : 6.112μm
Mode : 2.786μm Mean : 5.444μm
C.V. : 112.27%

Span : (D 10.0-D 90.0) / D50 = 2.801

Dia. on %(5.0%) : 1.463μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 2.307μm % on Dia.(1.000μm) : 0.4%
Dia. on %(50.0%) : 3.386μm % on Dia.(10.000μm) : 88.4%
Dia. on %(75.0%) : 5.623μm % on Dia.(100.000μm) : 100.0%
Dia. on %(95.0%) : 18.174μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.93	97.69	0.669	0.00	0.00
890.1	0.00	100.00	22.80	1.02	96.76	0.584	0.00	0.00
777.1	0.00	100.00	19.90	1.11	95.74	0.510	0.00	0.00
678.5	0.00	100.00	17.38	1.24	94.63	0.445	0.00	0.00
592.4	0.00	100.00	15.17	1.39	93.40	0.389	0.00	0.00
517.2	0.00	100.00	13.25	1.57	92.00	0.339	0.00	0.00
451.6	0.00	100.00	11.56	1.86	90.43	0.296	0.00	0.00
394.2	0.00	100.00	10.10	2.23	88.57	0.259	0.00	0.00
344.2	0.00	100.00	8.816	2.65	86.34	0.226	0.00	0.00
300.5	0.00	100.00	7.697	3.21	83.68	0.197	0.00	0.00
262.4	0.00	100.00	6.720	3.95	80.47	0.172	0.00	0.00
229.1	0.00	100.00	5.867	4.89	76.53	0.150	0.00	0.00
200.0	0.00	100.00	5.122	5.97	71.64	0.131	0.00	0.00
174.6	0.00	100.00	4.472	7.11	65.67	0.115	0.00	0.00
152.5	0.00	100.00	3.905	8.13	58.56	0.100	0.00	0.00
133.1	0.00	100.00	3.409	8.84	50.43	0.087	0.00	0.00
116.2	0.00	100.00	2.976	9.03	41.59	0.076	0.00	0.00
101.5	0.00	100.00	2.599	8.62	32.56	0.067	0.00	0.00
88.58	0.00	100.00	2.269	7.62	23.95	0.058	0.00	0.00
77.34	0.00	100.00	1.981	6.17	16.32	0.051	0.00	0.00
67.52	0.00	100.00	1.729	4.49	10.15	0.044	0.00	0.00
58.95	0.00	100.00	1.510	2.88	5.67	0.039	0.00	0.00
51.47	0.16	100.00	1.318	1.60	2.79	0.034	0.00	0.00
44.94	0.30	99.84	1.151	0.76	1.18	0.029	0.00	0.00
39.23	0.43	99.54	1.005	0.31	0.42	0.026	0.00	0.00
34.25	0.62	99.11	0.877	0.11	0.11	0.022	0.00	0.00
29.91	0.80	98.49	0.766	0.00	0.00			

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/08/'01 15:43

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010810-743 12:38
Filename : AW103743
Sample : S01T00142~~4~~5

Material : AW103 Solids
Source : S01T001020
Lot Numbe : S01T00142~~4~~5

Condition
T%(He-Ne) : 75.7%
(LAMP) : 59.0%
Dist.Form : Std.
R.R.Index : 1.16-0.00i ( )
Sampling times : 100

Agitation : 3 Circultn : 6 U.sonic : ~~ON~~ OFF (1200)

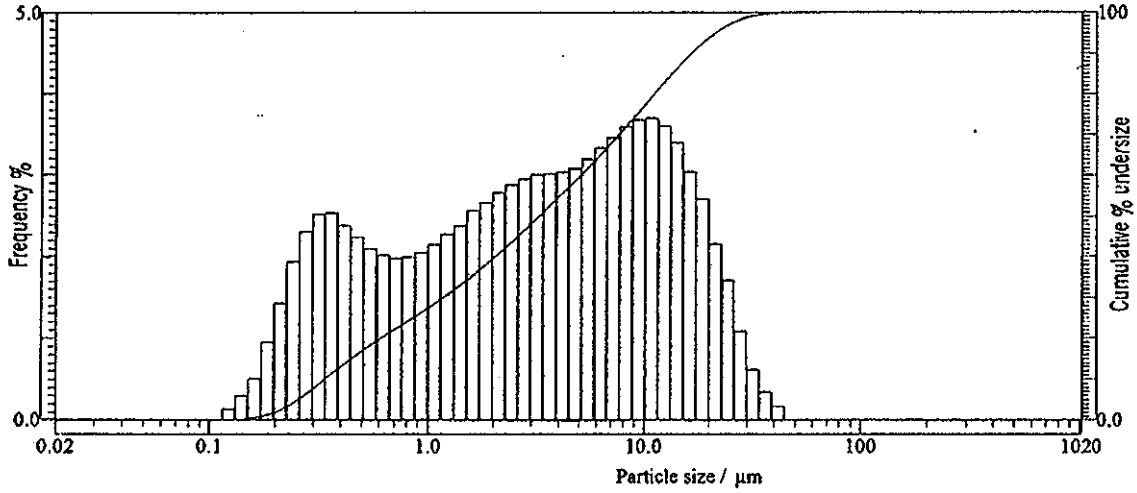
WSC 8/15/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 3.246μm SP.Area : 56203cm²/cm³ S.D. : 7.131μm
Mode : 10.792μm Mean : 6.169μm
C.V. : 115.60%

Span : (D 10.0-D 90.0) / D50 = 4.968

Dia. on %(5.0%) : 0.254μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 0.857μm % on Dia.(1.000μm) : 27.3%
Dia. on %(50.0%) : 3.246μm % on Dia.(10.000μm) : 77.2%
Dia. on %(75.0%) : 9.216μm % on Dia.(100.000μm) : 100.0%
Dia. on %(95.0%) : 21.297μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.71	97.80	0.669	2.02	21.37
890.1	0.00	100.00	22.80	2.16	96.08	0.584	2.10	19.35
777.1	0.00	100.00	19.90	2.71	93.92	0.510	2.24	17.25
678.5	0.00	100.00	17.38	3.04	91.21	0.445	2.38	15.01
592.4	0.00	100.00	15.17	3.40	88.17	0.389	2.54	12.63
517.2	0.00	100.00	13.25	3.60	84.77	0.339	2.52	10.09
451.6	0.00	100.00	11.56	3.69	81.17	0.296	2.31	7.56
394.2	0.00	100.00	10.10	3.68	77.47	0.259	1.94	5.25
344.2	0.00	100.00	8.816	3.59	73.80	0.226	1.43	3.32
300.5	0.00	100.00	7.697	3.45	70.21	0.197	0.95	1.89
262.4	0.00	100.00	6.720	3.33	66.75	0.172	0.50	0.94
229.1	0.00	100.00	5.867	3.19	63.42	0.150	0.29	0.43
200.0	0.00	100.00	5.122	3.08	60.23	0.131	0.14	0.14
174.6	0.00	100.00	4.472	3.04	57.15	0.115	0.00	0.00
152.5	0.00	100.00	3.905	3.02	54.10	0.100	0.00	0.00
133.1	0.00	100.00	3.409	3.01	51.09	0.087	0.00	0.00
116.2	0.00	100.00	2.976	2.95	48.08	0.076	0.00	0.00
101.5	0.00	100.00	2.599	2.89	45.13	0.067	0.00	0.00
88.58	0.00	100.00	2.269	2.78	42.24	0.058	0.00	0.00
77.34	0.00	100.00	1.981	2.67	39.46	0.051	0.00	0.00
67.52	0.00	100.00	1.729	2.57	36.79	0.044	0.00	0.00
58.95	0.00	100.00	1.510	2.38	34.22	0.039	0.00	0.00
51.47	0.00	100.00	1.318	2.28	31.84	0.034	0.00	0.00
44.94	0.17	100.00	1.151	2.15	29.56	0.029	0.00	0.00
39.23	0.34	99.83	1.005	2.05	27.41	0.026	0.00	0.00
34.25	0.61	99.49	0.877	2.00	25.35	0.022	0.00	0.00
29.91	1.08	98.88	0.766	1.98	23.35			

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/08/'01 15:43

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010810-743 12:38
Filename : AW103743
Sample : S01T00142#5

Material : AW103 Solids
Source : S01T001020
Lot Numbe : S01T00142#5

Condition
T%(He-Ne) : 75.7% Dist.Form : Std. Sampling times : 100
(LAMP) : 59.0% R.R.Index : 2.40-0.00i ( )

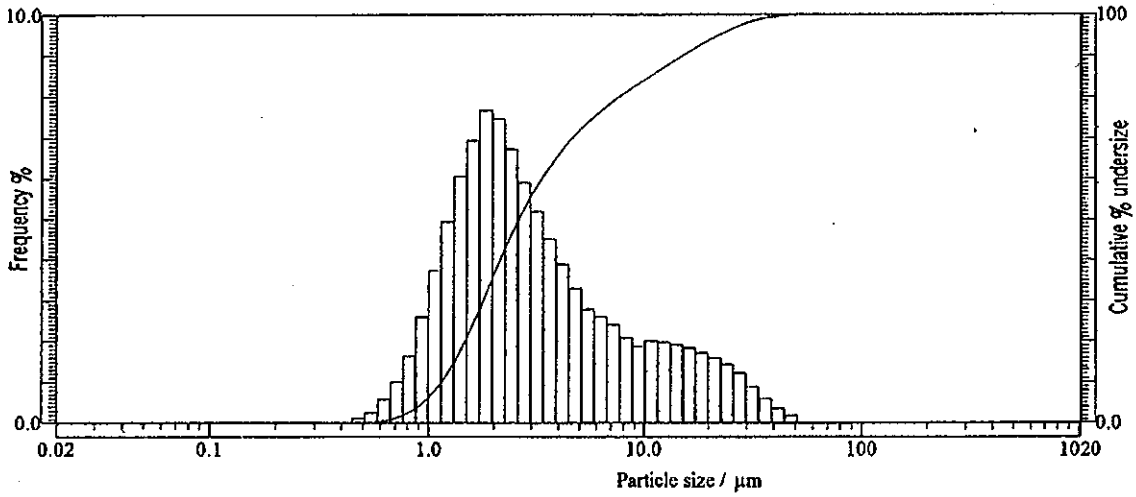
Agitation : 3 Circultn : 6 U.sonic : ~~ON~~ OFF (1200) WSC 8/15/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 2.612μm SP.Area : 26140cm²/cm³ S.D. : 7.225μm
Mode : 1.859μm Mean : 5.579μm
C.V. : 129.51%

Span : (D 10.0-D 90.0) / D50 = 5.284

Dia. on %(5.0%) : 0.945μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 1.635μm % on Dia.(1.000μm) : 6.1%
Dia. on %(50.0%) : 2.612μm % on Dia.(10.000μm) : 84.2%
Dia. on %(75.0%) : 5.771μm % on Dia.(100.000μm) : 100.0%
Dia. on %(95.0%) : 22.143μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.44	96.78	0.669	0.58	0.95
890.1	0.00	100.00	22.80	1.59	95.34	0.584	0.26	0.37
777.1	0.00	100.00	19.90	1.71	93.75	0.510	0.12	0.12
678.5	0.00	100.00	17.38	1.83	92.03	0.445	0.00	0.00
592.4	0.00	100.00	15.17	1.92	90.20	0.389	0.00	0.00
517.2	0.00	100.00	13.25	1.97	88.28	0.339	0.00	0.00
451.6	0.00	100.00	11.56	2.01	86.31	0.296	0.00	0.00
394.2	0.00	100.00	10.10	1.88	84.30	0.259	0.00	0.00
344.2	0.00	100.00	8.816	2.09	82.42	0.226	0.00	0.00
300.5	0.00	100.00	7.697	2.41	80.33	0.197	0.00	0.00
262.4	0.00	100.00	6.720	2.59	77.93	0.172	0.00	0.00
229.1	0.00	100.00	5.867	2.78	75.34	0.150	0.00	0.00
200.0	0.00	100.00	5.122	3.30	72.56	0.131	0.00	0.00
174.6	0.00	100.00	4.472	3.89	69.26	0.115	0.00	0.00
152.5	0.00	100.00	3.905	4.51	65.37	0.100	0.00	0.00
133.1	0.00	100.00	3.409	5.19	60.86	0.087	0.00	0.00
116.2	0.00	100.00	2.976	5.91	55.68	0.076	0.00	0.00
101.5	0.00	100.00	2.599	6.74	49.77	0.067	0.00	0.00
88.58	0.00	100.00	2.269	7.48	43.03	0.058	0.00	0.00
77.34	0.00	100.00	1.981	7.68	35.55	0.051	0.00	0.00
67.52	0.00	100.00	1.729	6.95	27.87	0.044	0.00	0.00
58.95	0.00	100.00	1.510	6.07	20.92	0.039	0.00	0.00
51.47	0.18	100.00	1.318	4.94	14.85	0.034	0.00	0.00
44.94	0.36	99.82	1.151	3.73	9.92	0.029	0.00	0.00
39.23	0.59	99.46	1.005	2.59	6.18	0.026	0.00	0.00
34.25	0.88	98.87	0.877	1.64	3.59	0.022	0.00	0.00
29.91	1.22	98.00	0.766	1.00	1.95			

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/09/'01 09:37

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010817-840 10:25
Filename : AY101840
Sample : S01T001492

Material : AY-101 Solids
Source : S00T001017
Lot Number : S01T001492

Condition
T%(He-Ne): 83.4% Dist.Form: Std. Sampling times : 100
(LAMP): 81.2% R.R.Index: 0.74-0.00i ( )

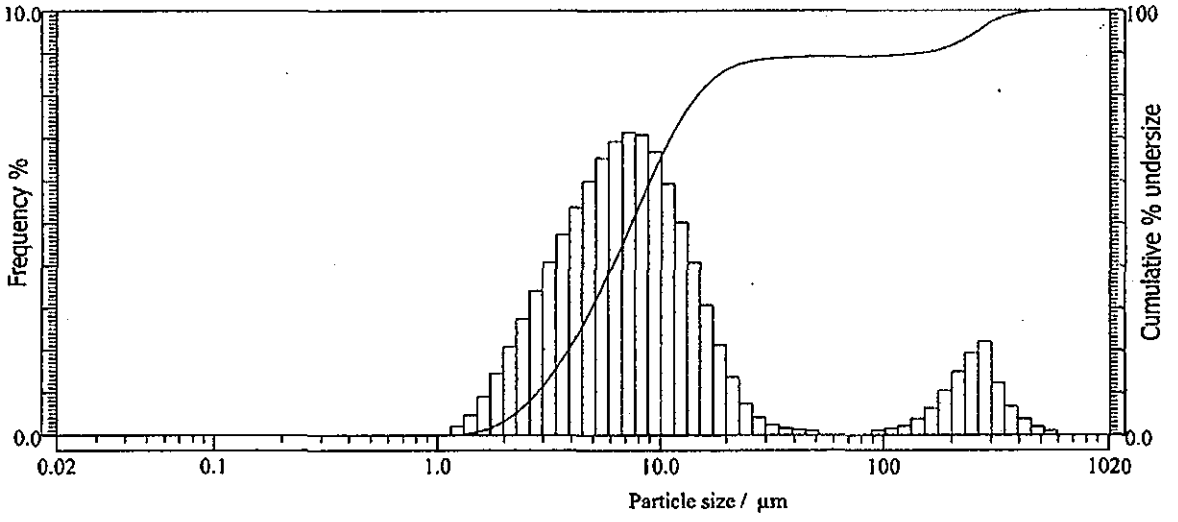
Agitation : 1 Circultn : 6 U.sonic : OFF(1200)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 7.408μm SP.Area : 10110cm²/cm³ S.D. : 82.763μm
Mode : 7.202μm Mean : 35.184μm
C.V. : 235.23%

Span : (D 10.0-D 90.0) / D50 = -19.858

Dia. on %(5.0%) :	2.257μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	4.424μm	% on Dia.(1.000μm) :	0.0%
Dia. on %(50.0%) :	7.408μm	% on Dia.(10.000μm) :	65.3%
Dia. on %(75.0%) :	12.646μm	% on Dia.(100.000μm) :	89.3%
Dia. on %(95.0%) :	259.411μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.75	88.10	0.669	0.00	0.00
890.1	0.00	100.00	22.80	1.36	87.36	0.584	0.00	0.00
777.1	0.00	100.00	19.90	2.12	86.00	0.510	0.00	0.00
678.5	0.00	100.00	17.38	3.07	83.87	0.445	0.00	0.00
592.4	0.12	100.00	15.17	4.09	80.80	0.389	0.00	0.00
517.2	0.21	99.88	13.25	5.01	76.71	0.339	0.00	0.00
451.6	0.38	99.67	11.56	5.94	71.70	0.296	0.00	0.00
394.2	0.68	99.29	10.10	6.68	65.76	0.259	0.00	0.00
344.2	1.23	98.61	8.816	7.08	59.08	0.226	0.00	0.00
300.5	2.22	97.38	7.697	7.13	52.01	0.197	0.00	0.00
262.4	1.94	95.16	6.720	6.92	44.88	0.172	0.00	0.00
229.1	1.49	93.22	5.867	6.53	37.95	0.150	0.00	0.00
200.0	1.05	91.73	5.122	5.99	31.42	0.131	0.00	0.00
174.6	0.64	90.68	4.472	5.38	25.43	0.115	0.00	0.00
152.5	0.38	90.05	3.905	4.74	20.05	0.100	0.00	0.00
133.1	0.22	89.67	3.409	4.09	15.31	0.087	0.00	0.00
116.2	0.17	89.44	2.976	3.41	11.22	0.076	0.00	0.00
101.5	0.12	89.28	2.599	2.74	7.81	0.067	0.00	0.00
88.58	0.00	89.15	2.269	2.07	5.08	0.058	0.00	0.00
77.34	0.00	89.15	1.981	1.44	3.00	0.051	0.00	0.00
67.52	0.00	89.15	1.729	0.89	1.56	0.044	0.00	0.00
58.95	0.00	89.15	1.510	0.47	0.67	0.039	0.00	0.00
51.47	0.11	89.15	1.318	0.20	0.20	0.034	0.00	0.00
44.94	0.13	89.05	1.151	0.00	0.00	0.029	0.00	0.00
39.23	0.16	88.91	1.005	0.00	0.00	0.026	0.00	0.00

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/09/'01 10:38

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010817-840 10:25
Filename : AY101840
Sample : S01T001492

Material : AY-101 Solids
Source : S00T001017
Lot Numbe : S01T001492

Condition
T%(He-Ne) : 83.4% Dist.Form: Std. Sampling times : 100
(LAMP) : 81.2% R.R.Index : 1.16-0.00i ( )

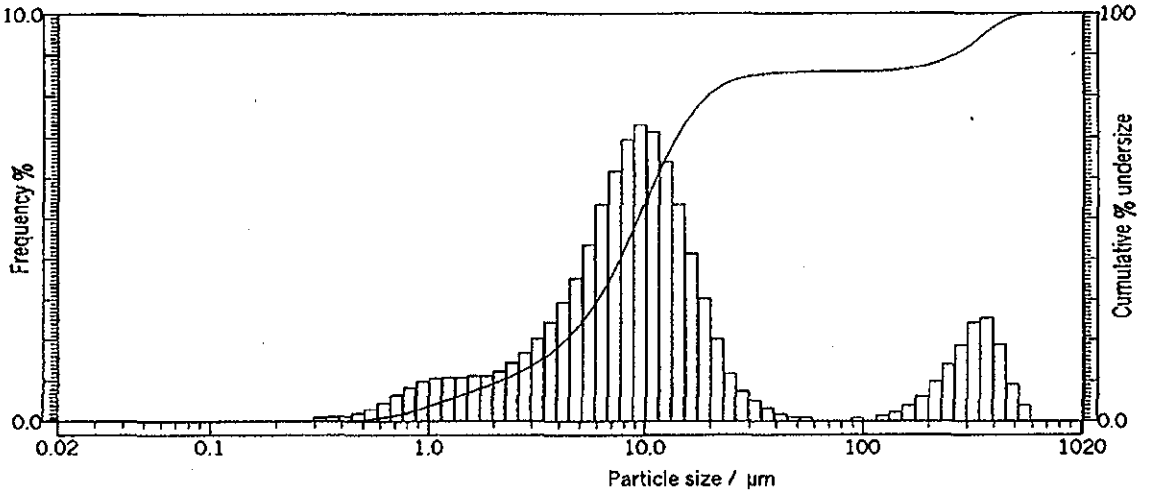
Agitation : 1 Circultn : 6 U.sonic : OFF(1200)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 9.241μm SP.Area : 12349cm²/cm³ S.D. : 114.949μm
Mode : 9.452μm Mean : 53.046μm
C.V. : 216.70%

Span : (D 10.0-D 90.0) / D50 = 28.302

Dia. on %(5.0%) : 1.166μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 5.178μm % on Dia.(1.000μm) : 3.8%
Dia. on %(50.0%) : 9.241μm % on Dia.(10.000μm) : 54.2%
Dia. on %(75.0%) : 15.853μm % on Dia.(100.000μm) : 86.1%
Dia. on %(95.0%) :358.551μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.18	84.03	0.669	0.46	1.35
890.1	0.00	100.00	22.80	2.02	82.85	0.584	0.31	0.89
777.1	0.00	100.00	19.90	3.04	80.83	0.510	0.21	0.58
678.5	0.00	100.00	17.38	4.13	77.80	0.445	0.14	0.37
592.4	0.41	100.00	15.17	5.35	73.66	0.389	0.12	0.23
517.2	0.92	99.59	13.25	6.41	68.31	0.339	0.11	0.11
451.6	1.89	98.67	11.56	7.14	61.91	0.296	0.00	0.00
394.2	2.55	96.78	10.10	7.30	54.77	0.259	0.00	0.00
344.2	2.43	94.23	8.816	6.94	47.46	0.226	0.00	0.00
300.5	1.87	91.80	7.697	6.17	40.52	0.197	0.00	0.00
262.4	1.41	89.93	6.720	5.35	34.35	0.172	0.00	0.00
229.1	0.99	88.52	5.867	4.35	29.01	0.150	0.00	0.00
200.0	0.62	87.53	5.122	3.54	24.65	0.131	0.00	0.00
174.6	0.40	86.92	4.472	2.94	21.11	0.115	0.00	0.00
152.5	0.24	86.51	3.905	2.44	18.17	0.100	0.00	0.00
133.1	0.15	86.28	3.409	2.04	15.73	0.087	0.00	0.00
116.2	0.00	86.13	2.976	1.69	13.69	0.076	0.00	0.00
101.5	0.10	86.13	2.599	1.44	12.00	0.067	0.00	0.00
88.58	0.00	86.03	2.269	1.23	10.56	0.058	0.00	0.00
77.34	0.00	86.03	1.981	1.13	9.33	0.051	0.00	0.00
67.52	0.00	86.03	1.729	1.14	8.20	0.044	0.00	0.00
58.95	0.11	86.03	1.510	1.08	7.06	0.039	0.00	0.00
51.47	0.13	85.92	1.318	1.09	5.98	0.034	0.00	0.00
44.94	0.20	85.79	1.151	1.06	4.89	0.029	0.00	0.00
39.23	0.32	85.60	1.005	0.98	3.83	0.026	0.00	0.00
34.25	0.51	85.27	0.877	0.85	2.85	0.022	0.00	0.00
29.91	0.74	84.76	0.766	0.65	2.00			

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/09/'01 09:39

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010817-840 10:25
Filename : AY101840
Sample : S01T001492

Material : AY-101 Solids
Source : S00T001017
Lot Number : S01T001492

Condition
T%(He-Ne): 83.4% Dist.Form: Std. Sampling times : 100
(LAMP): 81.2% R.R.Index: 2.40-0.001 ( )

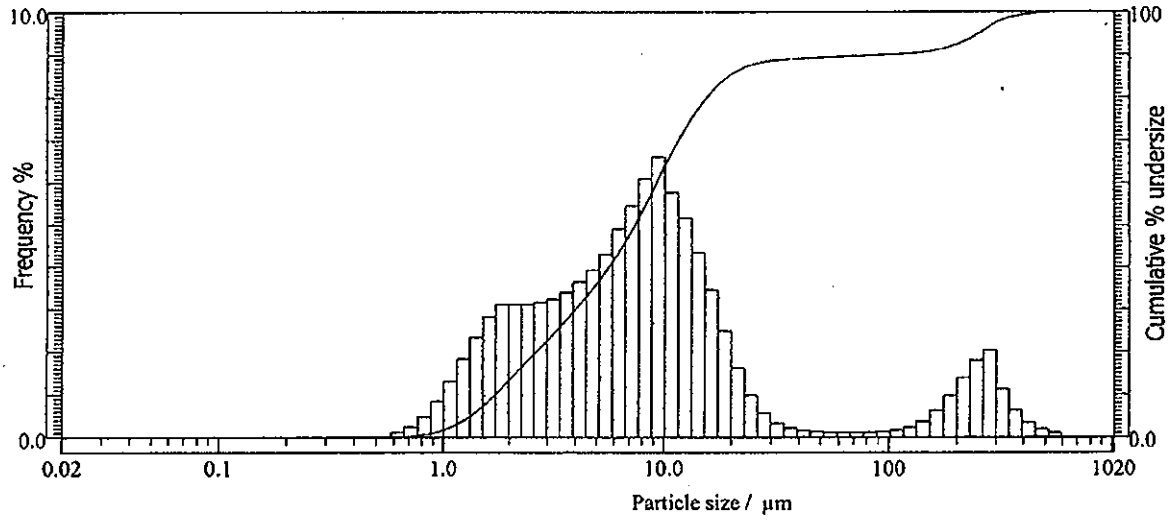
Agitation : 1 Circultn : 6 U.sonic : OFF(1200)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 7.424μm SP.Area : 13787cm²/cm³ S.D. : 80.047μm
Mode : 9.403μm Mean : 33.369μm
C.V. : 239.89%

Span : (D 10.0-D 90.0) / D50 = -13.521

Dia. on %(5.0%) : 1.329μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 3.298μm % on Dia.(1.000μm) : 1.7%
Dia. on %(50.0%) : 7.424μm % on Dia.(10.000μm) : 63.7%
Dia. on %(75.0%) : 13.204μm % on Dia.(100.000μm) : 90.0%
Dia. on %(95.0%) : 251.810μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.98	88.01	0.669	0.13	0.13
890.1	0.00	100.00	22.80	1.62	87.02	0.584	0.00	0.00
777.1	0.00	100.00	19.90	2.49	85.40	0.510	0.00	0.00
678.5	0.00	100.00	17.38	3.45	82.92	0.445	0.00	0.00
592.4	0.11	100.00	15.17	4.34	79.46	0.389	0.00	0.00
517.2	0.19	99.89	13.25	5.18	75.12	0.339	0.00	0.00
451.6	0.35	99.70	11.56	5.77	69.94	0.296	0.00	0.00
394.2	0.63	99.35	10.10	6.62	64.17	0.259	0.00	0.00
344.2	1.13	98.72	8.816	6.09	57.55	0.226	0.00	0.00
300.5	2.04	97.58	7.697	5.47	51.45	0.197	0.00	0.00
262.4	1.80	95.54	6.720	4.92	45.99	0.172	0.00	0.00
229.1	1.40	93.75	5.867	4.31	41.07	0.150	0.00	0.00
200.0	0.97	92.35	5.122	3.93	36.76	0.131	0.00	0.00
174.6	0.62	91.38	4.472	3.64	32.83	0.115	0.00	0.00
152.5	0.37	90.76	3.905	3.40	29.19	0.100	0.00	0.00
133.1	0.23	90.39	3.409	3.24	25.79	0.087	0.00	0.00
116.2	0.17	90.16	2.976	3.16	22.55	0.076	0.00	0.00
101.5	0.13	89.99	2.599	3.12	19.39	0.067	0.00	0.00
88.58	0.11	89.86	2.269	3.12	16.27	0.058	0.00	0.00
77.34	0.11	89.74	1.981	3.12	13.15	0.051	0.00	0.00
67.52	0.11	89.63	1.729	2.83	10.03	0.044	0.00	0.00
58.95	0.12	89.52	1.510	2.35	7.21	0.039	0.00	0.00
51.47	0.13	89.40	1.318	1.83	4.86	0.034	0.00	0.00
44.94	0.16	89.27	1.151	1.32	3.03	0.029	0.00	0.00
39.23	0.21	89.11	1.005	0.85	1.71	0.026	0.00	0.00

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/09/'01 09:41

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010817-843 10:55
Filename : AY101843
Sample : S01T001492

Material : AY-101 Solids
Source : S00T001017
Lot Number : S01T001492

Condition
T%(He-Ne): 78.5% Dist.Form: Std. Sampling times : 100
(LAMP): 72.8% R.R.Index: 0.74-0.00i ( )

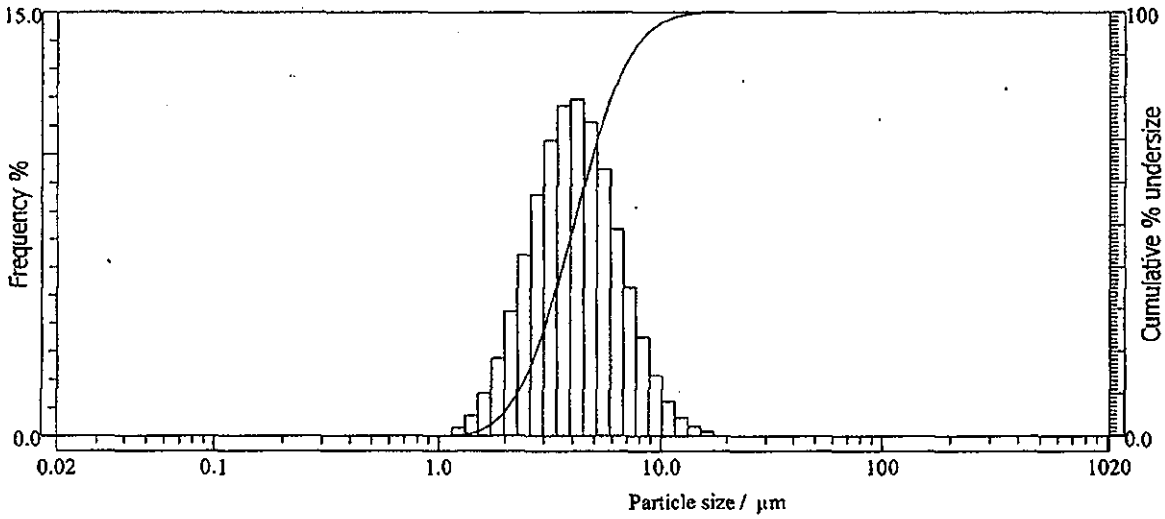
Agitation : 3 Circultn : 6 U.sonic : OFF(1200)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 4.045μm SP.Area : 16288cm²/cm³ S.D. : 2.147μm
Mode : 4.165μm Mean : 4.501μm
C.V. : 47.70%

Span : (D 10.0-D 90.0) / D50 = 1.242

Dia. on %(5.0%) :	1.953μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	2.987μm	% on Dia.(1.000μm) :	0.0%
Dia. on %(50.0%) :	4.045μm	% on Dia.(10.000μm) :	97.5%
Dia. on %(75.0%) :	5.509μm	% on Dia.(100.000μm) :	100.0%
Dia. on %(95.0%) :	8.642μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	100.00	0.669	0.00	0.00
890.1	0.00	100.00	22.80	0.00	100.00	0.584	0.00	0.00
777.1	0.00	100.00	19.90	0.00	100.00	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.15	100.00	0.445	0.00	0.00
592.4	0.00	100.00	15.17	0.33	99.85	0.389	0.00	0.00
517.2	0.00	100.00	13.25	0.65	99.52	0.339	0.00	0.00
451.6	0.00	100.00	11.56	1.22	98.87	0.296	0.00	0.00
394.2	0.00	100.00	10.10	2.14	97.65	0.259	0.00	0.00
344.2	0.00	100.00	8.816	3.49	95.51	0.226	0.00	0.00
300.5	0.00	100.00	7.697	5.27	92.02	0.197	0.00	0.00
262.4	0.00	100.00	6.720	7.36	86.74	0.172	0.00	0.00
229.1	0.00	100.00	5.867	9.46	79.39	0.150	0.00	0.00
200.0	0.00	100.00	5.122	11.12	69.93	0.131	0.00	0.00
174.6	0.00	100.00	4.472	11.91	58.81	0.115	0.00	0.00
152.5	0.00	100.00	3.905	11.69	46.89	0.100	0.00	0.00
133.1	0.00	100.00	3.409	10.48	35.20	0.087	0.00	0.00
116.2	0.00	100.00	2.976	8.58	24.72	0.076	0.00	0.00
101.5	0.00	100.00	2.599	6.43	16.14	0.067	0.00	0.00
88.58	0.00	100.00	2.269	4.42	9.71	0.058	0.00	0.00
77.34	0.00	100.00	1.981	2.75	5.29	0.051	0.00	0.00
67.52	0.00	100.00	1.729	1.52	2.54	0.044	0.00	0.00
58.95	0.00	100.00	1.510	0.73	1.02	0.039	0.00	0.00
51.47	0.00	100.00	1.318	0.29	0.29	0.034	0.00	0.00
44.94	0.00	100.00	1.151	0.00	0.00	0.029	0.00	0.00
39.23	0.00	100.00	1.005	0.00	0.00	0.026	0.00	0.00

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/09/'01 10:38

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010817-843 10:55
Filename : AY101843
Sample : S01T001492

Material : AY-101 Solids
Source : S00T001017
Lot Numbe : S01T001492

Condition
T%(He-Ne) : 78.5% Dist.Form: Std. Sampling times : 100
(LAMP) : 72.8% R.R.Index: 1.16-0.00i ( )

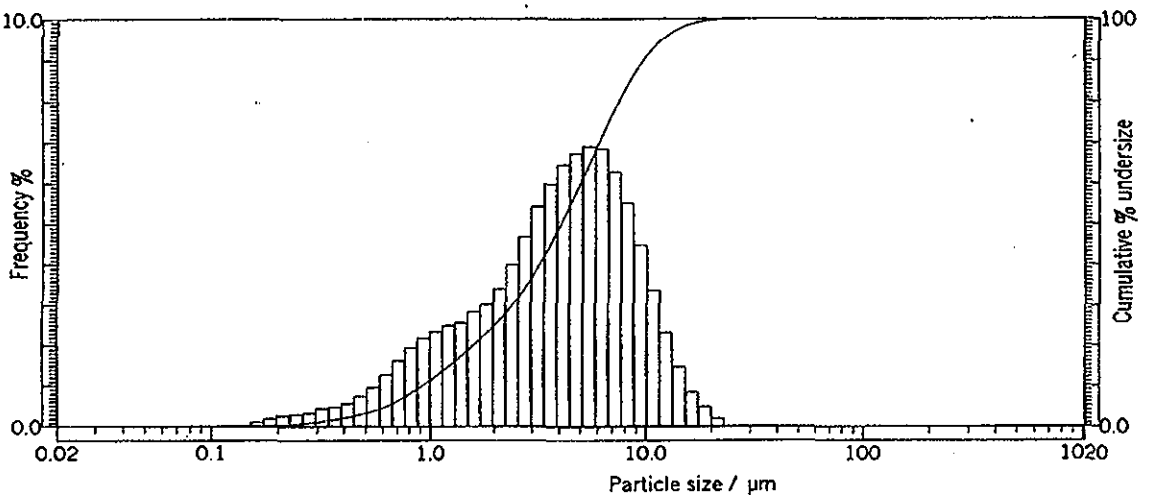
Agitation : 3 Circultn : 6 U.sonic : OFF(1200)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 4.064μm SP.Area : 28448cm²/cm³ S.D. : 3.597μm
Mode : 5.488μm Mean : 4.814μm
C.V. : 74.72%

Span : (D 10.0-D 90.0) / D50 = 2.160

Dia. on %(5.0%) : 0.625μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 2.011μm % on Dia.(1.000μm) : 11.3%
Dia. on %(50.0%) : 4.064μm % on Dia.(10.000μm) : 91.0%
Dia. on %(75.0%) : 6.713μm % on Dia.(100.000μm) : 100.0%
Dia. on %(95.0%) : 11.776μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	100.00	0.669	1.27	5.63
890.1	0.00	100.00	22.80	0.22	100.00	0.584	0.96	4.36
777.1	0.00	100.00	19.90	0.47	99.78	0.510	0.74	3.40
678.5	0.00	100.00	17.38	0.84	99.31	0.445	0.56	2.66
592.4	0.00	100.00	15.17	1.46	98.47	0.389	0.48	2.10
517.2	0.00	100.00	13.25	2.32	97.01	0.339	0.43	1.63
451.6	0.00	100.00	11.56	3.37	94.69	0.296	0.33	1.20
394.2	0.00	100.00	10.10	4.48	91.32	0.259	0.30	0.87
344.2	0.00	100.00	8.816	5.51	86.85	0.226	0.27	0.57
300.5	0.00	100.00	7.697	6.28	81.34	0.197	0.20	0.30
262.4	0.00	100.00	6.720	6.86	75.05	0.172	0.11	0.11
229.1	0.00	100.00	5.867	6.91	68.20	0.150	0.00	0.00
200.0	0.00	100.00	5.122	6.74	61.29	0.131	0.00	0.00
174.6	0.00	100.00	4.472	6.46	54.56	0.115	0.00	0.00
152.5	0.00	100.00	3.905	5.99	48.10	0.100	0.00	0.00
133.1	0.00	100.00	3.409	5.42	42.11	0.087	0.00	0.00
116.2	0.00	100.00	2.976	4.68	36.69	0.076	0.00	0.00
101.5	0.00	100.00	2.599	3.99	32.01	0.067	0.00	0.00
88.58	0.00	100.00	2.269	3.39	28.01	0.058	0.00	0.00
77.34	0.00	100.00	1.981	3.01	24.62	0.051	0.00	0.00
67.52	0.00	100.00	1.729	2.85	21.62	0.044	0.00	0.00
58.95	0.00	100.00	1.510	2.57	18.77	0.039	0.00	0.00
51.47	0.00	100.00	1.318	2.48	16.20	0.034	0.00	0.00
44.94	0.00	100.00	1.151	2.34	13.72	0.029	0.00	0.00
39.23	0.00	100.00	1.005	2.18	11.38	0.026	0.00	0.00
34.25	0.00	100.00	0.877	1.94	9.20	0.022	0.00	0.00
29.91	0.00	100.00	0.766	1.62	7.26			

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/09/'01 09:42

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010817-843 10:55
Filename : AY101843
Sample : S01T001492

Material : AY-101 Solids
Source : S00T001017
Lot Number : S01T001492

Condition
T%(He-Ne): 78.5% Dist.Form : Std. Sampling times : 100
(LAMP) : 72.8% R.R.Index: 2.40-0.00i ( )

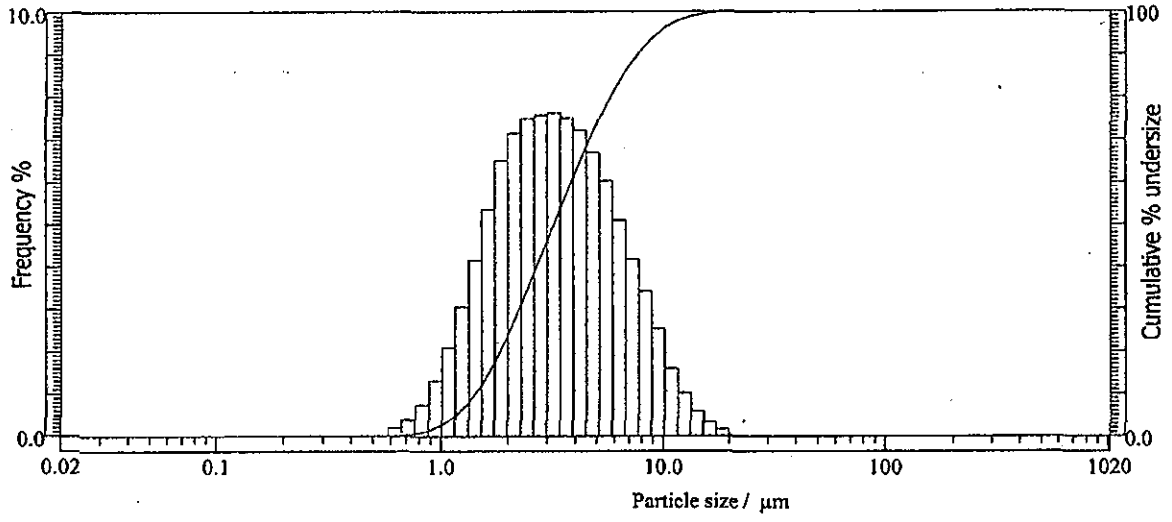
Agitation : 3 Circultn : 6 U.sonic : OFF(1200)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 3.197μm SP.Area : 22546cm²/cm³ S.D. : 2.708μm
Mode : 3.183μm Mean : 3.971μm
C.V. : 68.18%

Span : (D 10.0-D 90.0) / D50 = 1.937

Dia. on %(5.0%) :	1.165μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	2.027μm	% on Dia.(1.000μm) :	2.6%
Dia. on %(50.0%) :	3.197μm	% on Dia.(10.000μm) :	96.1%
Dia. on %(75.0%) :	5.120μm	% on Dia.(100.000μm) :	100.0%
Dia. on %(95.0%) :	9.424μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	100.00	0.669	0.20	0.20
890.1	0.00	100.00	22.80	0.00	100.00	0.584	0.00	0.00
777.1	0.00	100.00	19.90	0.17	100.00	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.34	99.83	0.445	0.00	0.00
592.4	0.00	100.00	15.17	0.60	99.49	0.389	0.00	0.00
517.2	0.00	100.00	13.25	1.01	98.89	0.339	0.00	0.00
451.6	0.00	100.00	11.56	1.59	97.88	0.296	0.00	0.00
394.2	0.00	100.00	10.10	2.53	96.29	0.259	0.00	0.00
344.2	0.00	100.00	8.816	3.41	93.75	0.226	0.00	0.00
300.5	0.00	100.00	7.697	4.18	90.35	0.197	0.00	0.00
262.4	0.00	100.00	6.720	5.11	86.17	0.172	0.00	0.00
229.1	0.00	100.00	5.867	6.03	81.06	0.150	0.00	0.00
200.0	0.00	100.00	5.122	6.70	75.02	0.131	0.00	0.00
174.6	0.00	100.00	4.472	7.23	68.32	0.115	0.00	0.00
152.5	0.00	100.00	3.905	7.50	61.09	0.100	0.00	0.00
133.1	0.00	100.00	3.409	7.62	53.60	0.087	0.00	0.00
116.2	0.00	100.00	2.976	7.56	45.97	0.076	0.00	0.00
101.5	0.00	100.00	2.599	7.49	38.41	0.067	0.00	0.00
88.58	0.00	100.00	2.269	7.15	30.93	0.058	0.00	0.00
77.34	0.00	100.00	1.981	6.51	23.78	0.051	0.00	0.00
67.52	0.00	100.00	1.729	5.36	17.27	0.044	0.00	0.00
58.95	0.00	100.00	1.510	4.14	11.91	0.039	0.00	0.00
51.47	0.00	100.00	1.318	3.04	7.76	0.034	0.00	0.00
44.94	0.00	100.00	1.151	2.08	4.73	0.029	0.00	0.00
39.23	0.00	100.00	1.005	1.31	2.65	0.026	0.00	0.00

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/09/'01 10:09

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010816-791 10:27
Filename : C104791
Sample : S01T001448

Material : C-104 Solids
Source : S01T001014
Lot Number : S01T001448

Condition
T%(He-Ne): 87.9% Dist.Form: Std. Sampling times : 100
(LAMP): 80.6% R.R.Index: 0.74-0.00i ( )

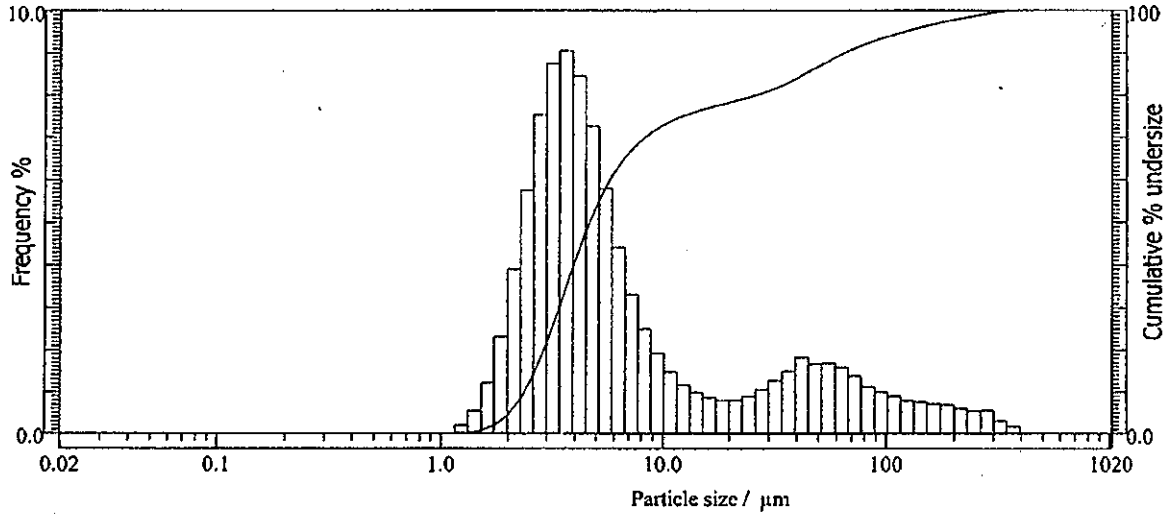
Agitation : 1 Circultn : 6 U.sonic : OFF(1200)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 4.666μm SP.Area : 13063cm²/cm³ S.D. : 48.751μm
Mode : 3.640μm Mean : 23.091μm
C.V. : 211.12%

Span : (D 10.0-D 90.0) / D50 = -13.414

Dia. on %(5.0%) : 2.031μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 3.144μm % on Dia.(1.000μm) : 0.0%
Dia. on %(50.0%) : 4.666μm % on Dia.(10.000μm) : 72.8%
Dia. on %(75.0%) : 12.406μm % on Dia.(100.000μm) : 93.8%
Dia. on %(95.0%) : 119.419μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.89	79.89	0.669	0.00	0.00
890.1	0.00	100.00	22.80	0.81	79.00	0.584	0.00	0.00
777.1	0.00	100.00	19.90	0.79	78.20	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.86	77.41	0.445	0.00	0.00
592.4	0.00	100.00	15.17	0.98	76.55	0.389	0.00	0.00
517.2	0.00	100.00	13.25	1.16	75.56	0.339	0.00	0.00
451.6	0.00	100.00	11.56	1.47	74.40	0.296	0.00	0.00
394.2	0.17	100.00	10.10	1.92	72.92	0.259	0.00	0.00
344.2	0.31	99.83	8.816	2.50	71.00	0.226	0.00	0.00
300.5	0.55	99.52	7.697	3.31	68.50	0.197	0.00	0.00
262.4	0.55	98.97	6.720	4.42	65.19	0.172	0.00	0.00
229.1	0.60	98.42	5.867	5.79	60.77	0.150	0.00	0.00
200.0	0.70	97.82	5.122	7.25	54.98	0.131	0.00	0.00
174.6	0.72	97.12	4.472	8.45	47.73	0.115	0.00	0.00
152.5	0.77	96.40	3.905	9.06	39.28	0.100	0.00	0.00
133.1	0.79	95.63	3.409	8.75	30.22	0.087	0.00	0.00
116.2	0.90	94.84	2.976	7.53	21.47	0.076	0.00	0.00
101.5	0.99	93.94	2.599	5.75	13.94	0.067	0.00	0.00
88.58	1.13	92.95	2.269	3.90	8.19	0.058	0.00	0.00
77.34	1.37	91.83	1.981	2.33	4.29	0.051	0.00	0.00
67.52	1.58	90.45	1.729	1.21	1.96	0.044	0.00	0.00
58.95	1.69	88.87	1.510	0.54	0.75	0.039	0.00	0.00
51.47	1.66	87.18	1.318	0.20	0.20	0.034	0.00	0.00
44.94	1.83	85.53	1.151	0.00	0.00	0.029	0.00	0.00
39.23	1.49	83.70	1.005	0.00	0.00	0.026	0.00	0.00

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/09/'01 10:42

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010816-791 10:27
Filename : C104791
Sample : S01T001448

Material : C-104 Solids
Source : S01T001014
Lot Numbe : S01T001448

Condition
T%(He-Ne) : 87.9% Dist.Form: Std. Sampling times : 100
(LAMP) : 80.6% R.R.Index : 1.16-0.00i ( )

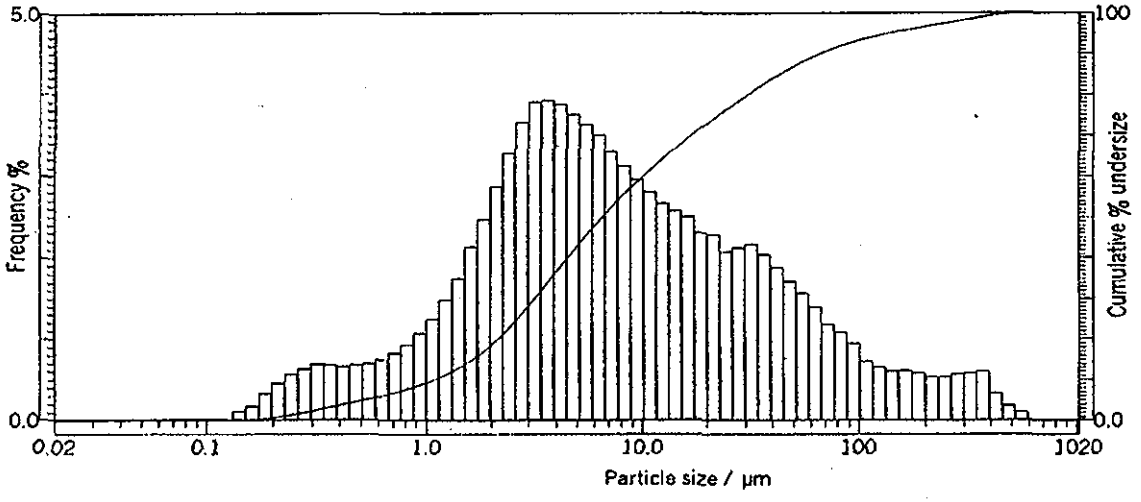
Agitation : 1 Circultn : 6 U.sonic : OFF(1200)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 6.534μm SP.Area : 24968cm²/cm³ S.D. : 64.383μm
Mode : 3.647μm Mean : 28.588μm
C.V. : 225.21%

Span : (D 10.0-D 90.0) / D50 = 9.964

Dia. on %(5.0%) : 0.512μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 2.647μm % on Dia.(1.000μm) : 9.2%
Dia. on %(50.0%) : 6.534μm % on Dia.(10.000μm) : 59.9%
Dia. on %(75.0%) : 22.446μm % on Dia.(100.000μm) : 93.3%
Dia. on %(95.0%) :139.936μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	2.08	77.34	0.669	0.75	6.43
890.1	0.00	100.00	22.80	2.28	75.26	0.584	0.70	5.68
777.1	0.00	100.00	19.90	2.31	72.98	0.510	0.68	4.98
678.5	0.00	100.00	17.38	2.51	70.67	0.445	0.66	4.30
592.4	0.10	100.00	15.17	2.58	68.16	0.389	0.69	3.64
517.2	0.19	99.90	13.25	2.67	65.58	0.339	0.69	2.95
451.6	0.33	99.71	11.56	2.80	62.91	0.296	0.63	2.26
394.2	0.60	99.38	10.10	2.96	60.10	0.259	0.56	1.63
344.2	0.58	98.78	8.816	3.13	57.15	0.226	0.46	1.07
300.5	0.57	98.20	7.697	3.30	54.02	0.197	0.32	0.61
262.4	0.53	97.63	6.720	3.50	50.72	0.172	0.17	0.29
229.1	0.53	97.10	5.867	3.63	47.22	0.150	0.12	0.12
200.0	0.58	96.57	5.122	3.75	43.60	0.131	0.00	0.00
174.6	0.61	95.99	4.472	3.87	39.85	0.115	0.00	0.00
152.5	0.60	95.38	3.905	3.92	35.98	0.100	0.00	0.00
133.1	0.65	94.78	3.409	3.90	32.06	0.087	0.00	0.00
116.2	0.73	94.12	2.976	3.66	28.16	0.076	0.00	0.00
101.5	0.94	93.40	2.599	3.28	24.50	0.067	0.00	0.00
88.58	1.07	92.45	2.269	2.87	21.22	0.058	0.00	0.00
77.34	1.18	91.38	1.981	2.47	18.35	0.051	0.00	0.00
67.52	1.39	90.20	1.729	2.14	15.88	0.044	0.00	0.00
58.95	1.57	88.81	1.510	1.75	13.74	0.039	0.00	0.00
51.47	1.71	87.25	1.318	1.49	11.99	0.034	0.00	0.00
44.94	1.88	85.54	1.151	1.25	10.50	0.029	0.00	0.00
39.23	2.04	83.66	1.005	1.07	9.25	0.026	0.00	0.00
34.25	2.16	81.62	0.877	0.93	8.19	0.022	0.00	0.00
29.91	2.12	79.46	0.766	0.83	7.26			

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/09/'01 10:09

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010816-791 10:27
Filename : C104791
Sample : S01T001448

Material : C-104 Solids
Source : S01T001014
Lot Number : S01T001448

Condition
T%(He-Ne): 87.9% Dist.Form: Std. Sampling times : 100
(LAMP): 80.6% R.R.Index: 2.40-0.001 ( )

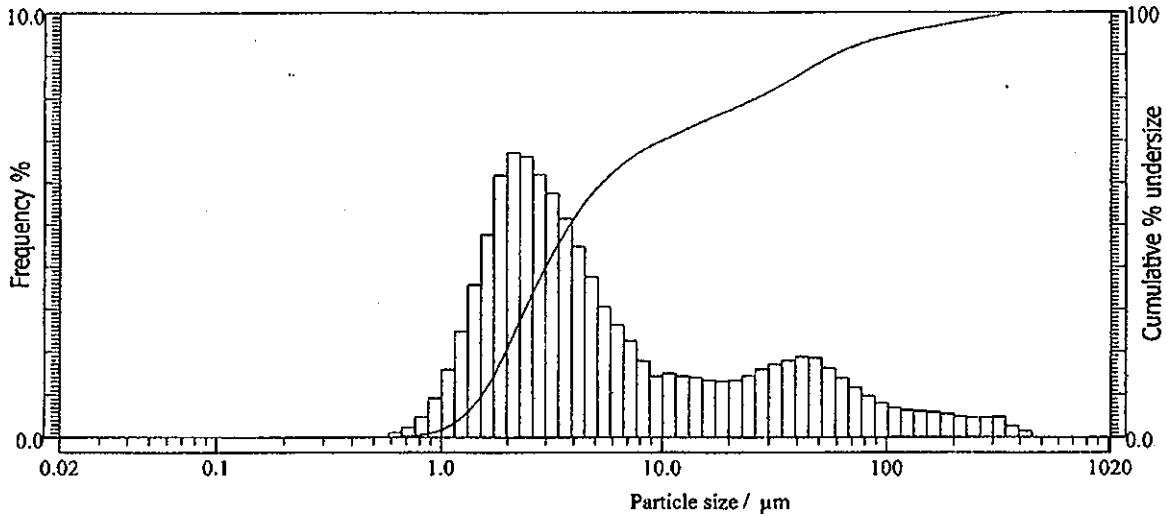
Agitation : 1 Circultn : 6 U.sonic : OFF(1200)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 3.832μm SP.Area : 18116cm²/cm³ S.D. : 51.517μm
Mode : 2.130μm Mean : 22.641μm
C.V. : 227.54%

Span : (D 10.0-D 90.0) / D50 = 14.722

Dia. on %(5.0%) : 1.262μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 2.179μm % on Dia.(1.000μm) : 1.7%
Dia. on %(50.0%) : 3.832μm % on Dia.(10.000μm) : 70.0%
Dia. on %(75.0%) : 16.119μm % on Dia.(100.000μm) : 94.4%
Dia. on %(95.0%) : 111.291μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.42	79.80	0.669	0.12	0.12
890.1	0.00	100.00	22.80	1.33	78.37	0.584	0.00	0.00
777.1	0.00	100.00	19.90	1.30	77.04	0.510	0.00	0.00
678.5	0.00	100.00	17.38	1.33	75.74	0.445	0.00	0.00
592.4	0.00	100.00	15.17	1.40	74.40	0.389	0.00	0.00
517.2	0.00	100.00	13.25	1.42	73.01	0.339	0.00	0.00
451.6	0.15	100.00	11.56	1.49	71.58	0.296	0.00	0.00
394.2	0.27	99.85	10.10	1.42	70.09	0.259	0.00	0.00
344.2	0.49	99.58	8.816	1.78	68.67	0.226	0.00	0.00
300.5	0.48	99.09	7.697	2.26	66.89	0.197	0.00	0.00
262.4	0.47	98.61	6.720	2.63	64.64	0.172	0.00	0.00
229.1	0.50	98.14	5.867	3.06	62.01	0.150	0.00	0.00
200.0	0.56	97.64	5.122	3.76	58.95	0.131	0.00	0.00
174.6	0.60	97.08	4.472	4.49	55.20	0.115	0.00	0.00
152.5	0.62	96.48	3.905	5.15	50.71	0.100	0.00	0.00
133.1	0.64	95.86	3.409	5.75	45.56	0.087	0.00	0.00
116.2	0.70	95.22	2.976	6.19	39.82	0.076	0.00	0.00
101.5	0.81	94.52	2.599	6.62	33.63	0.067	0.00	0.00
88.58	0.97	93.72	2.269	6.72	27.01	0.058	0.00	0.00
77.34	1.16	92.74	1.981	6.17	20.29	0.051	0.00	0.00
67.52	1.38	91.58	1.729	4.76	14.12	0.044	0.00	0.00
58.95	1.61	90.20	1.510	3.56	9.36	0.039	0.00	0.00
51.47	1.86	88.59	1.318	2.47	5.80	0.034	0.00	0.00
44.94	1.88	86.73	1.151	1.58	3.33	0.029	0.00	0.00
39.23	1.78	84.86	1.005	0.92	1.75	0.026	0.00	0.00

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/09/'01 10:13

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010816-794 10:58
Filename : C104794
Sample : S01T001448

Material : C-104 Solids
Source : S01T001014
Lot Number : S01T001448

Condition
T%(He-Ne): 88.8% Dist.Form: Std. Sampling times : 100
(LAMP): 79.4% R.R.Index: 0.74-0.00i ( )

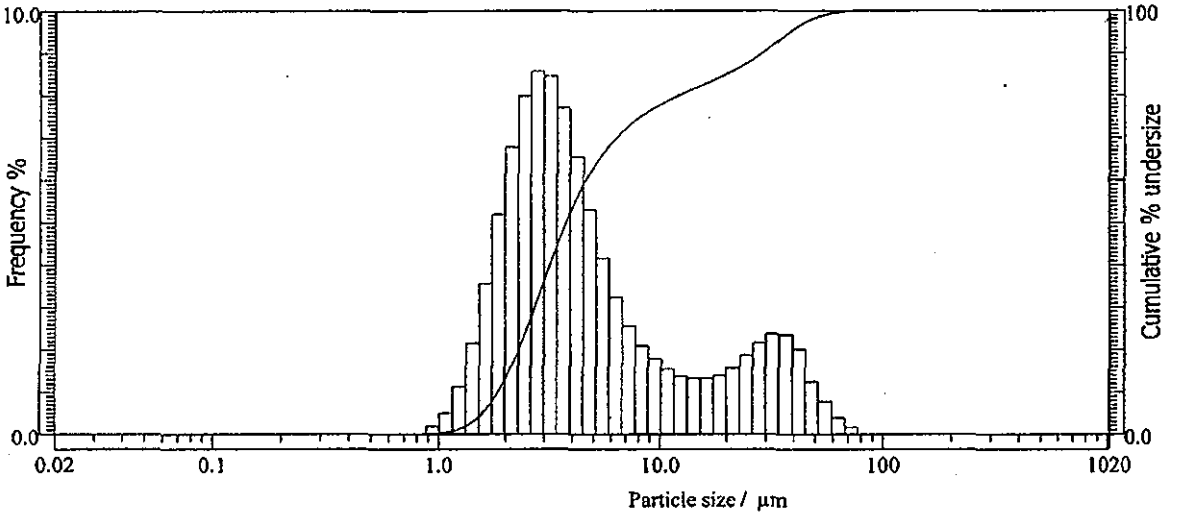
Agitation : 3 Circultn : 6 U.sonic : OFF(1200)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 3.751μm SP.Area : 16933cm²/cm³ S.D. : 12.213μm
Mode : 2.791μm Mean : 9.100μm
C.V. : 134.21%

Span : (D 10.0-D 90.0) / D50 = 7.167

Dia. on %(5.0%) : 1.569μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 2.489μm % on Dia.(1.000μm) : 0.2%
Dia. on %(50.0%) : 3.751μm % on Dia.(10.000μm) : 77.9%
Dia. on %(75.0%) : 8.128μm % on Dia.(100.000μm) : 100.0%
Dia. on %(95.0%) : 38.364μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.87	88.47	0.669	0.00	0.00
890.1	0.00	100.00	22.80	1.58	86.61	0.584	0.00	0.00
777.1	0.00	100.00	19.90	1.40	85.02	0.510	0.00	0.00
678.5	0.00	100.00	17.38	1.33	83.63	0.445	0.00	0.00
592.4	0.00	100.00	15.17	1.33	82.30	0.389	0.00	0.00
517.2	0.00	100.00	13.25	1.38	80.97	0.339	0.00	0.00
451.6	0.00	100.00	11.56	1.54	79.59	0.296	0.00	0.00
394.2	0.00	100.00	10.10	1.79	78.05	0.259	0.00	0.00
344.2	0.00	100.00	8.816	2.10	76.26	0.226	0.00	0.00
300.5	0.00	100.00	7.697	2.57	74.16	0.197	0.00	0.00
262.4	0.00	100.00	6.720	3.25	71.59	0.172	0.00	0.00
229.1	0.00	100.00	5.867	4.18	68.33	0.150	0.00	0.00
200.0	0.00	100.00	5.122	5.32	64.15	0.131	0.00	0.00
174.6	0.00	100.00	4.472	6.56	58.83	0.115	0.00	0.00
152.5	0.00	100.00	3.905	7.70	52.27	0.100	0.00	0.00
133.1	0.00	100.00	3.409	8.46	44.57	0.087	0.00	0.00
116.2	0.00	100.00	2.976	8.58	36.11	0.076	0.00	0.00
101.5	0.00	100.00	2.599	7.99	27.54	0.067	0.00	0.00
88.58	0.00	100.00	2.269	6.78	19.55	0.058	0.00	0.00
77.34	0.17	100.00	1.981	5.21	12.77	0.051	0.00	0.00
67.52	0.39	99.83	1.729	3.57	7.56	0.044	0.00	0.00
58.95	0.77	99.43	1.510	2.15	3.99	0.039	0.00	0.00
51.47	1.25	98.66	1.318	1.13	1.83	0.034	0.00	0.00
44.94	2.02	97.41	1.151	0.51	0.71	0.029	0.00	0.00
39.23	2.36	95.39	1.005	0.20	0.20	0.026	0.00	0.00

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/09/'01 10:42

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010816-794 10:58
Filename : C104794
Sample : S01T001448

Material : C-104 Solids
Source : S01T001014
Lot Numbe : S01T001448

Condition
T%(He-Ne) : 88.8% Dist.Form : Std. Sampling times : 100
(LAMP) : 79.4% R.R.Index : 1.16-0.00i ( )

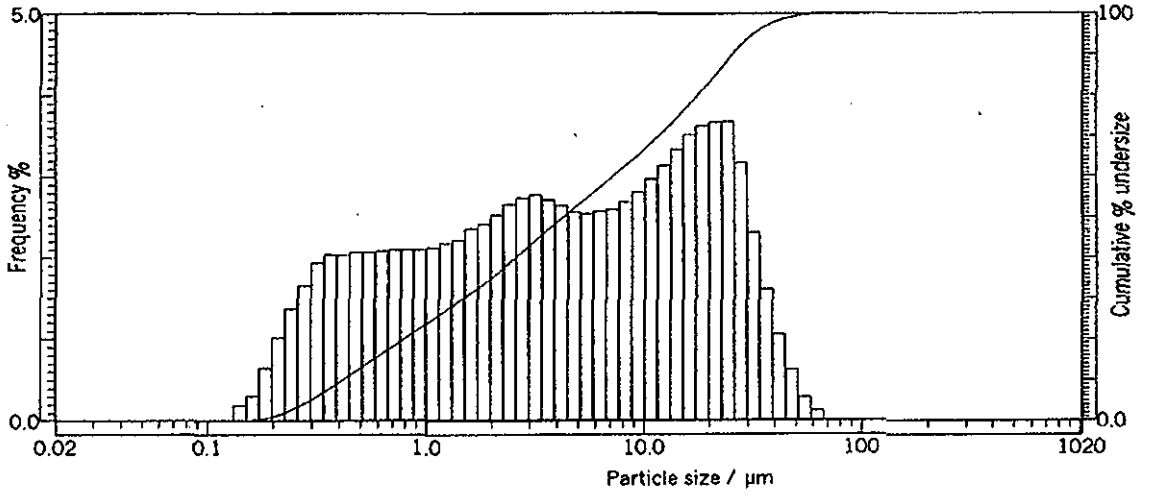
Agitation : 3 Circultn : 6 U.sonic : OFF(1200)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 4.230μm SP.Area : 46124cm²/cm³ S.D. : 10.863μm
Mode : 24.172μm Mean : 9.184μm
C.V. : 118.29%

Span : (D 10.0-D 90.0) / D50 = 5.894

Dia. on %(5.0%) : 0.291μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 1.090μm % on Dia.(1.000μm) : 23.6%
Dia. on %(50.0%) : 4.230μm % on Dia.(10.000μm) : 66.7%
Dia. on %(75.0%) : 14.390μm % on Dia.(100.000μm) : 100.0%
Dia. on %(95.0%) : 31.755μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	3.68	90.81	0.669	2.08	17.42
890.1	0.00	100.00	22.80	3.67	87.13	0.584	2.07	15.34
777.1	0.00	100.00	19.90	3.63	83.45	0.510	2.07	13.27
678.5	0.00	100.00	17.38	3.52	79.82	0.445	2.03	11.21
592.4	0.00	100.00	15.17	3.35	76.30	0.389	2.04	9.18
517.2	0.00	100.00	13.25	3.14	72.96	0.339	1.94	7.13
451.6	0.00	100.00	11.56	2.96	69.82	0.296	1.66	5.20
394.2	0.00	100.00	10.10	2.81	66.85	0.259	1.37	3.54
344.2	0.00	100.00	8.816	2.69	64.05	0.226	1.02	2.16
300.5	0.00	100.00	7.697	2.59	61.36	0.197	0.65	1.15
262.4	0.00	100.00	6.720	2.57	58.76	0.172	0.31	0.50
229.1	0.00	100.00	5.867	2.54	56.19	0.150	0.19	0.19
200.0	0.00	100.00	5.122	2.56	53.65	0.131	0.00	0.00
174.6	0.00	100.00	4.472	2.64	51.08	0.115	0.00	0.00
152.5	0.00	100.00	3.905	2.72	48.44	0.100	0.00	0.00
133.1	0.00	100.00	3.409	2.78	45.72	0.087	0.00	0.00
116.2	0.00	100.00	2.976	2.74	42.94	0.076	0.00	0.00
101.5	0.00	100.00	2.599	2.66	40.20	0.067	0.00	0.00
88.58	0.00	100.00	2.269	2.53	37.54	0.058	0.00	0.00
77.34	0.00	100.00	1.981	2.41	35.02	0.051	0.00	0.00
67.52	0.13	100.00	1.729	2.36	32.60	0.044	0.00	0.00
58.95	0.29	99.87	1.510	2.21	30.24	0.039	0.00	0.00
51.47	0.63	99.58	1.318	2.18	28.02	0.034	0.00	0.00
44.94	1.06	98.96	1.151	2.12	25.85	0.029	0.00	0.00
39.23	1.62	97.90	1.005	2.10	23.72	0.026	0.00	0.00
34.25	2.31	96.29	0.877	2.10	21.62	0.022	0.00	0.00
29.91	3.17	93.98	0.766	2.10	19.52			

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/09/'01 10:14

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010816-794 10:58
Filename : C104794
Sample : S01T001448

Material : C-104 Solids
Source : S01T001014
Lot Number : S01T001448

Condition
T%(He-Ne): 88.8% Dist.Form: Std. Sampling times : 100
(LAMP): 79.4% R.R.Index: 2.40-0.00i ( )

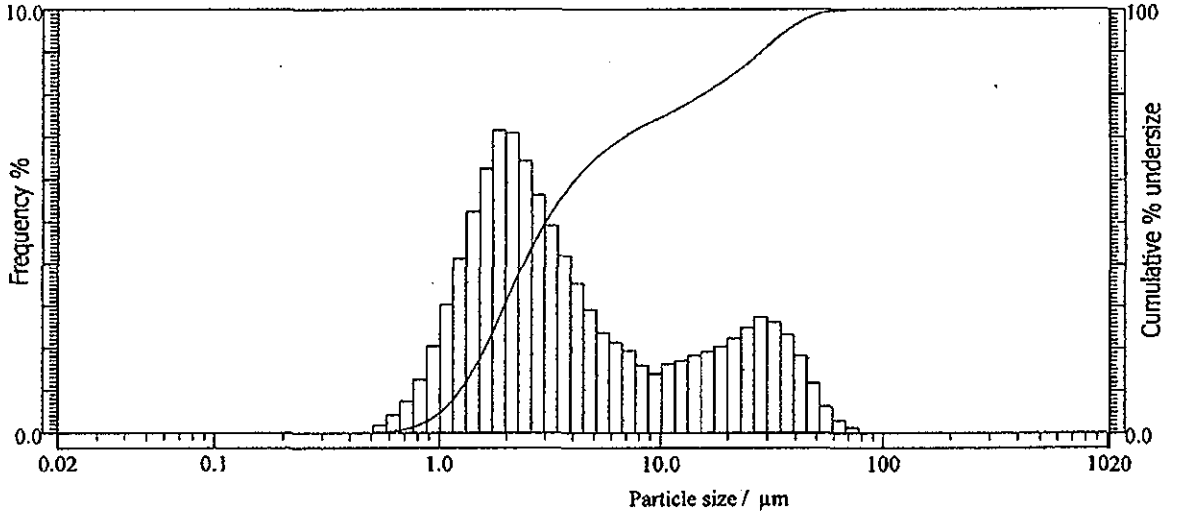
Agitation : 3 Circultn : 6 U.sonic : OFF(1200)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 3.007μm SP.Area : 22867cm²/cm³ S.D. : 12.201μm
Mode : 1.866μm Mean : 8.937μm
C.V. : 136.51%

Span : (D 10.0-D 90.0) / D50 = - 9.015

Dia. on %(5.0%) : 1.021μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 1.786μm % on Dia.(1.000μm) : 4.6%
Dia. on %(50.0%) : 3.007μm % on Dia.(10.000μm) : 74.5%
Dia. on %(75.0%) : 10.453μm % on Dia.(100:000μm) : 100.0%
Dia. on %(95.0%) : 37.015μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	2.48	88.34	0.669	0.42	0.61
890.1	0.00	100.00	22.80	2.23	85.86	0.584	0.19	0.19
777.1	0.00	100.00	19.90	2.03	83.64	0.510	0.00	0.00
678.5	0.00	100.00	17.38	1.90	81.61	0.445	0.00	0.00
592.4	0.00	100.00	15.17	1.81	79.71	0.389	0.00	0.00
517.2	0.00	100.00	13.25	1.70	77.90	0.339	0.00	0.00
451.6	0.00	100.00	11.56	1.62	76.21	0.296	0.00	0.00
394.2	0.00	100.00	10.10	1.38	74.59	0.259	0.00	0.00
344.2	0.00	100.00	8.816	1.59	73.21	0.226	0.00	0.00
300.5	0.00	100.00	7.697	1.93	71.62	0.197	0.00	0.00
262.4	0.00	100.00	6.720	2.13	69.69	0.172	0.00	0.00
229.1	0.00	100.00	5.867	2.36	67.56	0.150	0.00	0.00
200.0	0.00	100.00	5.122	2.91	65.20	0.131	0.00	0.00
174.6	0.00	100.00	4.472	3.54	62.29	0.115	0.00	0.00
152.5	0.00	100.00	3.905	4.21	58.75	0.100	0.00	0.00
133.1	0.00	100.00	3.409	4.92	54.54	0.087	0.00	0.00
116.2	0.00	100.00	2.976	5.63	49.62	0.076	0.00	0.00
101.5	0.00	100.00	2.599	6.44	43.99	0.067	0.00	0.00
88.58	0.00	100.00	2.269	7.09	37.55	0.058	0.00	0.00
77.34	0.12	100.00	1.981	7.15	30.46	0.051	0.00	0.00
67.52	0.29	99.88	1.729	6.25	23.31	0.044	0.00	0.00
58.95	0.62	99.58	1.510	5.25	17.06	0.039	0.00	0.00
51.47	1.16	98.97	1.318	4.14	11.81	0.034	0.00	0.00
44.94	1.81	97.81	1.151	3.03	7.67	0.029	0.00	0.00
39.23	2.31	95.99	1.005	2.04	4.64	0.026	0.00	0.00

APPENDIX F-20

QUALITY CONTROL DATA
MONODISPERSE POLYSTYRENE MICROSPHERES

Consisting of 29 pages including this cover page

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December 19, 1997

CERTIFIED NANOSPHERE™ SIZE STANDARDS
NIST Traceable Mean Diameter - Calibrated by TEM

Packaging Lot # 19756 Packaging Date: APR 28 1998

1. DESCRIPTION These certified particle size standards were prepared as calibrants for traceable methods of particle size analysis. They are part of the Nanosphere series of monodisperse polymer microspheres, and were calibrated with methodology traceable to the National Institute of Standards and Technology (NIST). Diameters from 20 to 900 nm (nanometers) are available as aqueous suspensions in dropper tipped vials, calibrated by transmission electron microscopy (TEM) or photon correlation spectroscopy (PCS). The aqueous medium has been prepared to promote dispersion and reduce clumping of the particles. The certified diameter is traceable to NIST. Other physical data is for information only and should not be used as calibration values.

VALUABLE CERTIFICATE - KEEP ON FILE

CERTIFICATE OF CALIBRATION AND TRACEABILITY

This certifies that the calibration value listed below was transferred by transmission electron microscopy (TEM) from National Institute of Standards and Technology (NIST) certified microspheres (Standard Reference Material 1963, 1691 or 1690.)

Catalog Number: 3200A, Nanosphere™ Size Standards
Nominal Diameter: 200nm (0.200μm) Certified Mean Diameter: 204nm
Material Batch: 3200-010 Uncertainty: ± 6nm
Certification Date: October 20, 1997

Stanley D. Duke

Stanley D. Duke, Laboratory Director
Duke Scientific Corporation

2. OTHER PHYSICAL DATA	Nanosphere™ Size Standard
Standard Deviation:	3.1nm
Coefficient of Variation:	1.5%
Hydrodynamic Diameter:	202-210nm (PCS)
Microsphere Composition:	Polystyrene
Polymer Density:	1.05g/ml
Index of Refraction:	1.59 @ 589nm
Approximate Concentration:	1% solids

– Over for more data

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May 23, 2001

NANOSPHERE™ SIZE STANDARDS
NIST Traceable Mean Diameter

1. DESCRIPTION. These particle size standards provide accurate and traceable size calibration for particle size analysis. They are part of a series of monodisperse polymer microspheres with calibrated mean diameters traceable to the Standard Meter through the National Institute of Standards and Technology (NIST). Diameters from 20 nanometers (nm) to 160 micrometers (µm) are available as aqueous suspensions in dropper-tipped vials, calibrated by photon correlation spectroscopy (PCS), transmission electron microscopy (TEM) or optical microscopy. The aqueous medium has been prepared to promote dispersion and reduce clumping of the particles. The approximate particle concentration in percent solids is given to facilitate dilution for the calibration and validation of particle analyzers. Diameters from 200µm to 1000µm are available as dry spheres, calibrated by optical microscopy. The certified mean diameter is traceable to NIST. Other values are for information only and should not be used as calibration values.

2. PHYSICAL DATA.	Catalog Number: 3200 and 3200A, Nominal 200nm (0.2µm)
Certified Mean Diameter:	199nm ± 6nm
Standard Deviation:	3.4nm
Coefficient of Variation:	1.7%
Hydrodynamic Diameter:	195-205nm (PCS)
Microsphere Composition:	Polystyrene
Polymer Density:	1.05g/cm³
Index of Refraction:	1.59 @ 589nm
Approximate Concentration:	1% solids

– Continued on page 2

VALUABLE CERTIFICATE - KEEP ON FILE

CERTIFICATE OF CALIBRATION AND TRACEABILITY

This certifies that the calibrated mean diameter dimension was transferred by transmission electron microscopy (TEM) from National Institute of Standards and Technology (NIST) certified microspheres (Standard Reference Material 1963, 1691 or 1690).

Catalog Number: 3200 and 3200A, Nanosphere™ Size Standards
Certified Mean Diameter: 199nm — Material Batch: 3200-014
Uncertainty: ± 6nm — Certification Date: February 12, 2001

Philip L. Warren, President
Duke Scientific Corporation

Void without seal

Packaging Lot # 23220 — Expiration Date: AUG '04

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January 15, 1998

CERTIFIED PARTICLE-SIZE STANDARDS
NIST/BCR Traceable Mean Diameter

1. DESCRIPTION. These certified particle-size standards were prepared in response to the need for traceable methods of particle-size analysis. They are part of the 4000 series of monodisperse polymer microspheres which have been calibrated with methodology traceable to the National Institute of Standards and Technology (NIST, formerly NBS) and Community Bureau of Reference (BCR). Diameters from 0.9 to 160 micrometers (µm) are available as aqueous suspensions in dropper tipped vials. The particle concentration is specified in percent solids to facilitate dilution for the calibration of particle analyzers. The aqueous medium has been prepared to promote dispersion and reduce clumping of the particles. The certified diameter is NIST traceable; other specifications are for information only and should not be used as calibration values.

— Over for more data

Valuable CERTIFICATE - Keep on File

CERTIFICATE OF CALIBRATION AND TRACEABILITY

This certifies that the calibration value listed below was transferred by optical microscopy from a stage micrometer calibrated by the National Institute of Standards and Technology (Calibration Report #5524). NIST and Community Bureau of Reference (BCR) materials were used to validate the accuracy and traceability of the calibration methods (NIST SRM #1690, 1692, 1960, and 1961, and BCR #165A, 166A, and 167A).

Catalog # 4009, 4009A, Particle Size Standards
Nominal Diameter: 1.0µm Certified Mean Diameter: 0.993µm
Material Batch: 4009-013 Uncertainty: ± 0.021µm
Certification Date: January 15, 1998

Ellen B. Layendecker, Laboratory Manager
Duke Scientific Corporation

Packaging Lot # 19782 Packaging Date: MAY 1 1 1998

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—continued from first page DUKE SCIENTIFIC CORPORATI

2. MEASUREMENT METHODOLOGY. The certified diameters of the product were transferred by optical microscopy from an NIST calibrated stage micrometer, a glass slide engraved with a two millimeter scale with 200 lines. The exact line spacing was calibrated by NIST in micrometers. The uncertainty is the sum of the calibration transfer uncertainty and the random error of the measurements. To validate the accuracy of our optical methods, NIST and BCR certified microsphere standards were measured by the same method. Size distributions (standard deviations) were obtained by optical microscopy, electron microscopy or electrical resistance analysis depending on the size of the particles. *Coefficient of Variation* is the standard deviation as a percentage of the mean diameter.

3. TECHNICAL SPECIFICATIONS.
Catalog Numbers: 4009, 4009A, Particle Size Standards
Certified Mean Diameter: 0.993µm ± 0.021µm
Standard Deviation: 0.010µm
Coefficient of Variation: 1.0%
Microsphere Composition: Polystyrene
Polymer Density: 1.05g/ml
Index of Refraction: 1.59 @ 589nm
Concentration: 1% solids

4. OPERATING INSTRUCTIONS. For ease of use, the microspheres are packaged in an aqueous suspension. They must be thoroughly dispersed in the bottle to assure statistically consistent samples. To disperse the particles, gently invert the bottle several times, then immerse in a low power ultrasonic bath (30 seconds). Do not shake the bottle, as the small bubbles formed may introduce statistical artifacts. Before using, be sure no solid material or clumps are visible inside the bottle. Dispense immediately after dispersion using the dropper tip, or remove the tip and use a micropipette. Clean all sampling implements before inserting in the bottle to prevent contamination of the contents during handling. The particle count is proportional to both the volume and the weight of the suspension.

5. SAFETY AND HANDLING PRECAUTIONS. Avoid aerosol production while handling these products, or wear a suitable filter respirator when necessary. Although there are no known ill effects, avoid inhalation or ingestion of the particles. These products should only be used by trained scientific personnel. A Material Safety Data Sheet is included with each package.

6. STORAGE AND DISPOSAL. Keep the bottle tightly sealed to avoid contamination, and store it upright to prevent clogging the tip with particles. Refrigeration is not required for storage. Do not freeze the particles. In case of spills, wash or wipe the area thoroughly. Dispose of as normal laboratory waste; there are no special disposal procedures.

7. LIMITED WARRANTY. These products are intended for laboratory research use by trained scientific personnel. Determination of their suitability for specific end-uses is solely the responsibility of the user, who assumes all liability for loss or damage arising out of the use of the product. *Rebottling or relabeling invalidates the certification and traceability of these products.* Except for the purpose of record keeping, this certificate may not be reproduced. Duke Scientific Corporation's warranty is limited to replacement of defective products if returned with our authorization within 60 days of the purchase date.

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September 15, 2000

PARTICLE SIZE STANDARDS
NIST Traceable Mean Diameter

1. DESCRIPTION. These particle size standards provide accurate and traceable size calibration for particle size analysis. They are part of a series of monodisperse polymer microspheres with calibrated mean diameters traceable to the Standard Meter through the National Institute of Standards and Technology (NIST). Diameters from 20 nanometers (nm) to 160 micrometers (µm) are available as aqueous suspensions in dropper-tipped vials, calibrated by photon correlation spectroscopy (PCS), transmission electron microscopy (TEM) or optical microscopy. The aqueous medium has been prepared to promote dispersion and reduce clumping of the particles. The approximate particle concentration in percent solids is given to facilitate dilution for the calibration and validation of particle analyzers. Diameters from 200µm to 1000µm are available as dry spheres, calibrated by optical microscopy. The certified mean diameter is traceable to NIST. Other values are for information only and should not be used as calibration values.

2. PHYSICAL DATA.

	Catalog Number: 4210 and 4210A, Nominal 10µm
Certified Mean Diameter:	10.15µm ± 0.06µm
Standard Deviation:	0.10µm
Coefficient of Variation:	1.0%
Microsphere Composition:	Polystyrene
Polymer Density:	1.05g/cm³
Index of Refraction:	1.59 @ 589nm
Approximate Concentration:	0.2% solids

– Continued on page 2

VALUABLE CERTIFICATE - KEEP ON FILE

CERTIFICATE OF CALIBRATION AND TRACEABILITY

This certifies that the calibrated mean diameter dimension of this product was transferred by optical microscopy from a stage micrometer calibrated by the National Institute of Standards and Technology (Calibration Report #5524). NIST Standard Reference Materials 1690, 1692, 1960, and 1961 were used to validate the accuracy and traceability of the calibration methods.

Catalog Number: 4210 and 4210A, Particle Size Standards

Certified Mean Diameter: 10.15µm — Material Batch: 4210-028

Uncertainty: ± 0.06µm — Certification Date: September 7, 2000

Philip L. Warren, President
Duke Scientific Corporation

Void without seal

Packaging Lot # 22294 — Expiration Date: SEP '03

RCVD. 10/20/00

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January 19, 2000

PARTICLE SIZE STANDARDS
NIST Traceable Mean Diameter

1. DESCRIPTION. These particle size standards provide accurate and traceable size calibration for particle size analysis. They are part of a series of monodisperse polymer microspheres with calibrated mean diameters traceable to the Standard Meter through the National Institute of Standards and Technology (NIST). Diameters from 20 nanometers (nm) to 160 micrometers (µm) are available as aqueous suspensions in dropper-tipped vials, calibrated by photon correlation spectroscopy (PCS), transmission electron microscopy (TEM) or optical microscopy. The aqueous medium has been prepared to promote dispersion and reduce clumping of the particles. The approximate particle concentration in percent solids is given to facilitate dilution for the calibration and validation of particle analyzers. Diameters from 200µm to 1000µm are available as dry spheres, calibrated by optical microscopy. The certified mean diameter is traceable to NIST. Other values are for information only and should not be used as calibration values.

2. PHYSICAL DATA.

	Catalog Number: 4250 and 4250A, Nominal 50µm
Certified Mean Diameter:	49.1µm ± 0.8µm
Standard Deviation:	0.7µm
Coefficient of Variation:	1.4%
Microsphere Composition:	Polystyrene
Polymer Density:	1.05g/cm³
Index of Refraction:	1.59 @ 589nm
Approximate Concentration:	1.3% solids

– Continued on page 2

VALUABLE CERTIFICATE - KEEP ON FILE

CERTIFICATE OF CALIBRATION AND TRACEABILITY

This certifies that the calibrated mean diameter dimension of this product was transferred by optical microscopy from a stage micrometer calibrated by the National Institute of Standards and Technology (Calibration Report #5524). NIST Standard Reference Materials 1690, 1692, 1960, and 1961 were used to validate the accuracy and traceability of the calibration methods.

Catalog Number: 4250 and 4250A, Particle Size Standards

Certified Mean Diameter: 49.1µm — Material Batch: 4250-011

Uncertainty: ± 0.8µm — Certification Date: January 19, 2000

Ellen B. Layendecker, Laboratory Manager
Duke Scientific Corporation

Void without seal

Rev. 10/20/03

Packaging Lot # 22237 — Expiration Date: SEP '03

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September 28, 2000

PARTICLE SIZE STANDARDS
NIST Traceable Mean Diameter

1. DESCRIPTION. These particle size standards provide accurate and traceable size calibration for particle size analysis. They are part of a series of monodisperse polymer microspheres with calibrated mean diameters traceable to the Standard Meter through the National Institute of Standards and Technology (NIST). Diameters from 20 nanometers (nm) to 160 micrometers (µm) are available as aqueous suspensions in dropper-tipped vials, calibrated by photon correlation spectroscopy (PCS), transmission electron microscopy (TEM) or optical microscopy. The aqueous medium has been prepared to promote dispersion and reduce clumping of the particles. The approximate particle concentration in percent solids is given to facilitate dilution for the calibration and validation of particle analyzers. Diameters from 200µm to 1000µm are available as dry spheres, calibrated by optical microscopy. The certified mean diameter is traceable to NIST. Other values are for information only and should not be used as calibration values.

2. PHYSICAL DATA.	Catalog Number: 4314A, Nominal 140µm
Certified Mean Diameter:	138µm ± 2.0µm
Standard Deviation:	2.2µm
Coefficient of Variation:	1.6%
Microsphere Composition:	Polystyrene
Polymer Density:	1.05g/cm³
Index of Refraction:	1.59 @ 589nm
Approximate Concentration:	4.0% solids

-- Continued on page 2

VALUABLE CERTIFICATE - KEEP ON FILE

CERTIFICATE OF CALIBRATION AND TRACEABILITY

This certifies that the calibrated mean diameter dimension of this product was transferred by optical microscopy from a stage micrometer calibrated by the National Institute of Standards and Technology (Calibration Report #5524). NIST Standard Reference Materials 1690, 1692, 1960, and 1961 were used to validate the accuracy and traceability of the calibration methods.

Catalog Number: 4314A, Particle Size Standards

Certified Mean Diameter: 138µm — Material Batch: 4314-006

Uncertainty: ± 2.0µm — Certification Date: September 27, 2000

Philip L. Warren, President
Duke Scientific Corporation

NIST TRACEABLE Duke Scientific Corporation STANDARD

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Rev0. 10/20/00

Packaging Lot # 22346 — Expiration Date: OCT '03

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F-20 A. Mean, volume equivalent, particle diameters of measured particle size distributions for monodisperse, polystyrene, microsphere standards (Duke Scientific Corp.). Measurement parameters: Dispersant - H_2O / Pump Speed - 4 (9.4 mL/s) / Stirrer Speed - 3 / Ultrasonic Time - 2 min / Delay Time - 10 seconds.

NOMINAL DIAMETER RUN DATE--RUN #	FILE ID	Mean Diameter (μm)	Standard Deviation (μm)
200 nm (Lot # 19756)	CERTIFIED	0.204	0.0031
07/31/2001--666	204NM666	0.196	0.023
(Lot # 23220)	CERTIFIED	0.199	0.0034
09/26/2001--021 [a]	200N954C	0.186	0.015
09/27/2001--064 [b]	200N996C	0.289	0.055
09/28/2001--132 [c]	200N998C	0.185	0.015
1 μm (Lot # 19782)	CERTIFIED	0.993	0.010
08/13/2001--778	1UM778	1.021	0.247
10 μm (Lot # 22294)	CERTIFIED	10.15	0.10
08/17/2001--826 [d]	10UM826	11.99	3.23
50 μm (Lot # 22237)	CERTIFIED	49.1	0.7
08/21/2001--874	50UM874	55.9	13.6
140 μm (Lot # 22346)	CERTIFIED	138	2.2
07/31/2001--686	140UM686	153	39.3

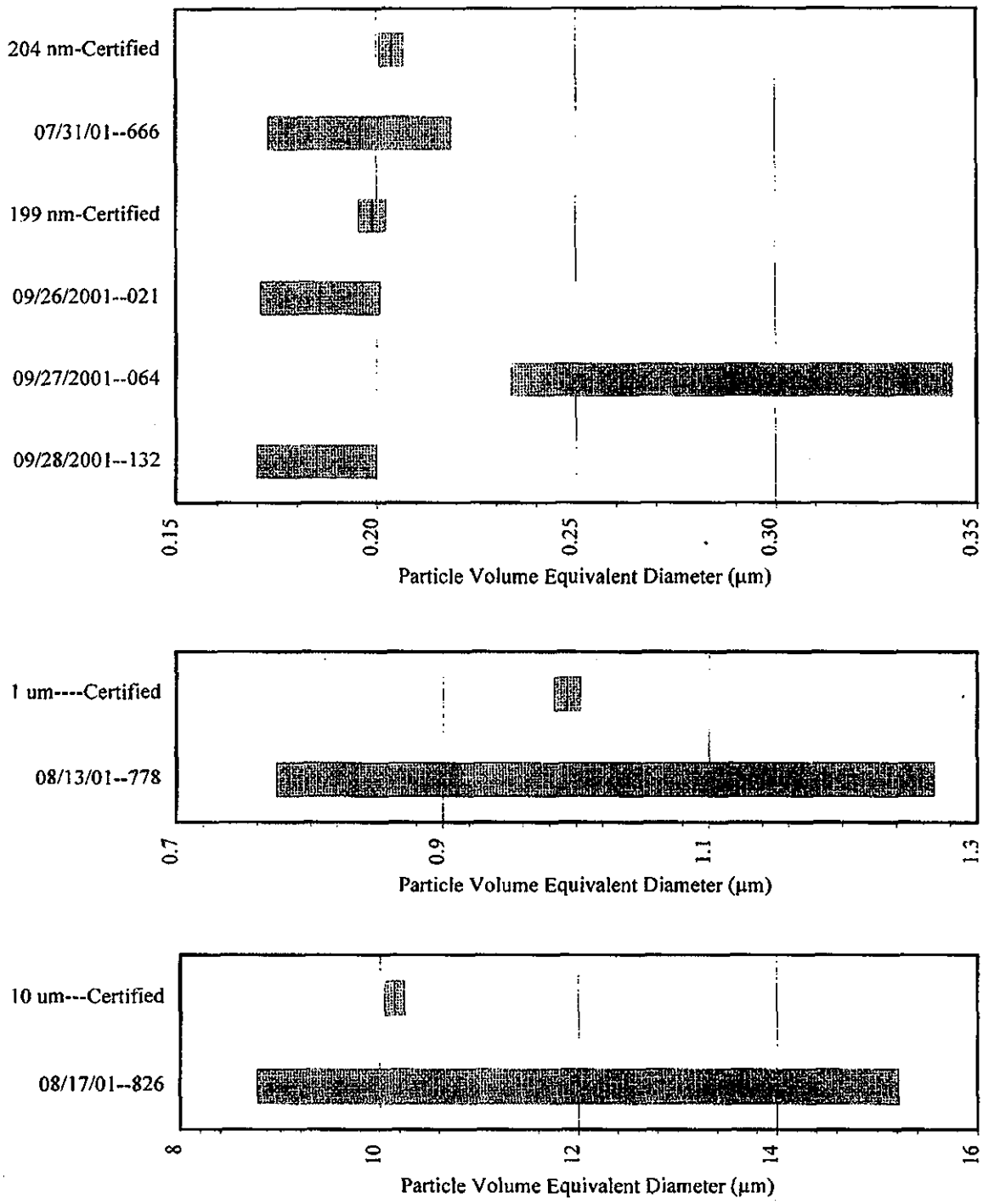
[a] 200 nm standard run of 09/26/2001 made with Pump Speed - 5 (10.6 mL/s) / Ultrasonic Time - 0 minutes.

[b] 200 nm standard run of 09/27/2001 made with Stirrer Speed - 1 / Ultrasonic Time - 0 min.

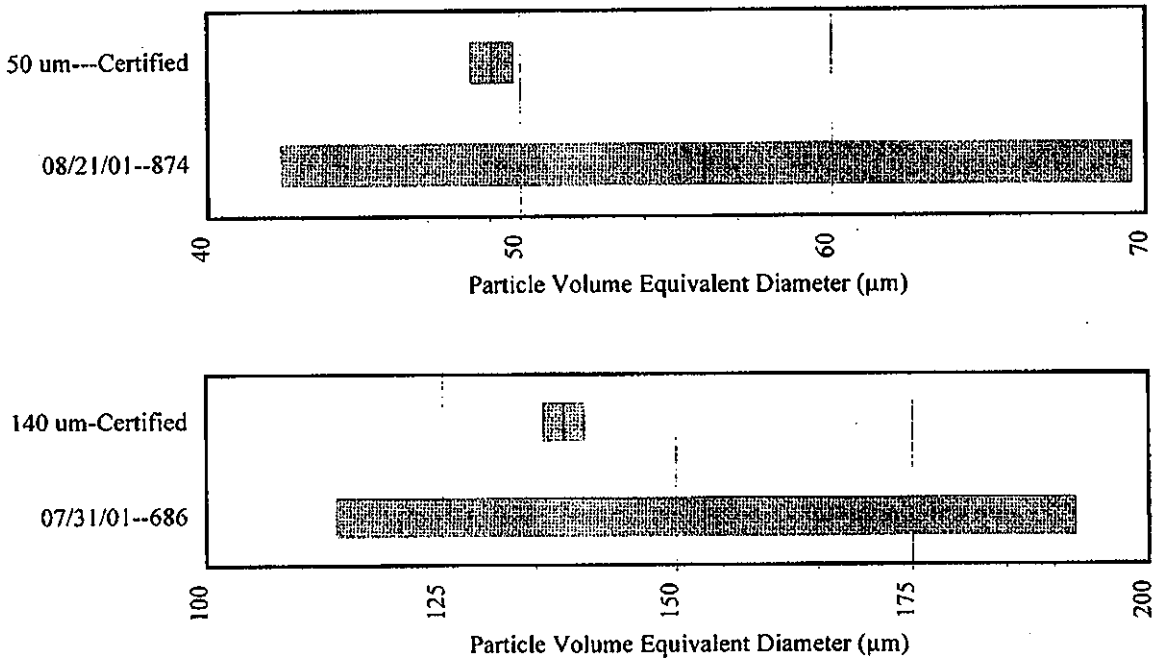
[c] 200 nm standard run of 09/28/2001 made with Stirrer Speed - 1 / Ultrasonic Time - 0 min.

[d] 10 μm standard run of 08/17/2001 exhausted standard Lot # 22294. Contamination of standard was indicated by presence of 200 - 800 μm particles in the measured distribution. This part of the distribution was excluded from the calculation of the reported values.

F-20 B. Mean particle diameters of volume-based particle size distributions of polystyrene, microsphere standards. Vertical lines within bars indicate the mean particle diameters (μm). Ba widths represent ± one standard deviation range.



F-20 B (continued). Mean particle diameters of volume-based particle size distributions of polystyrene, microsphere standards.

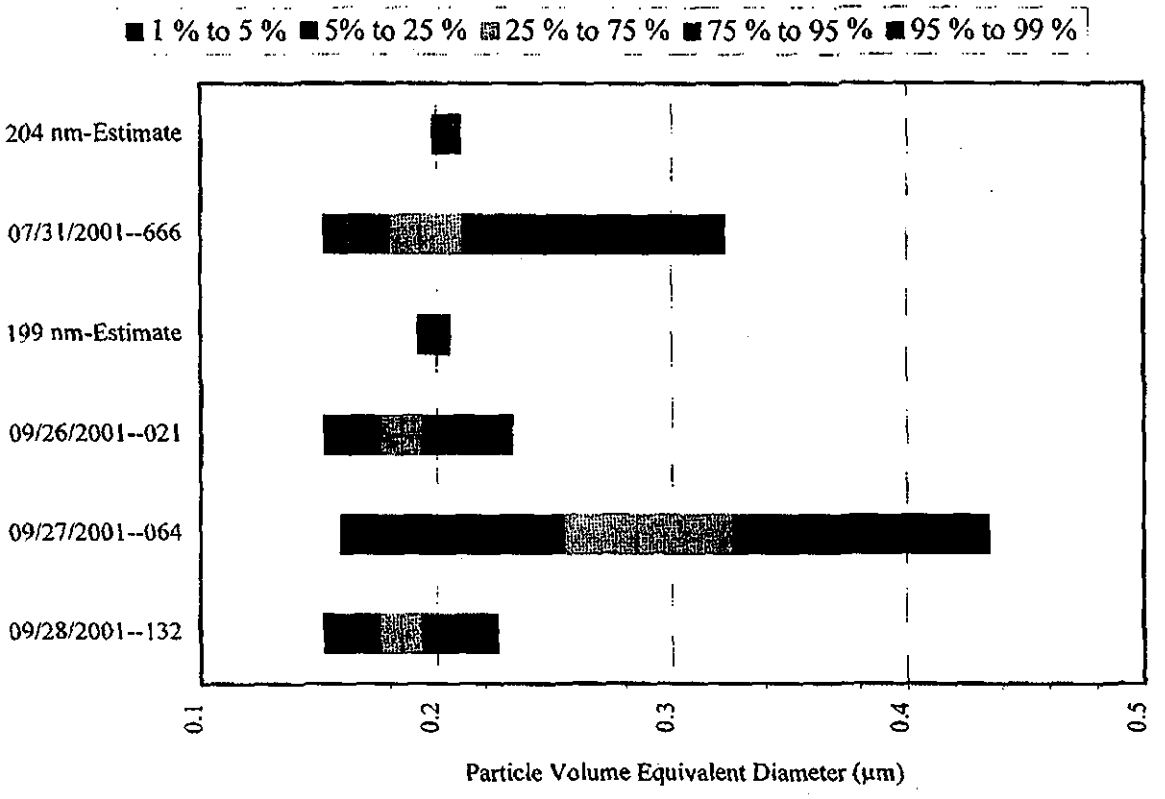


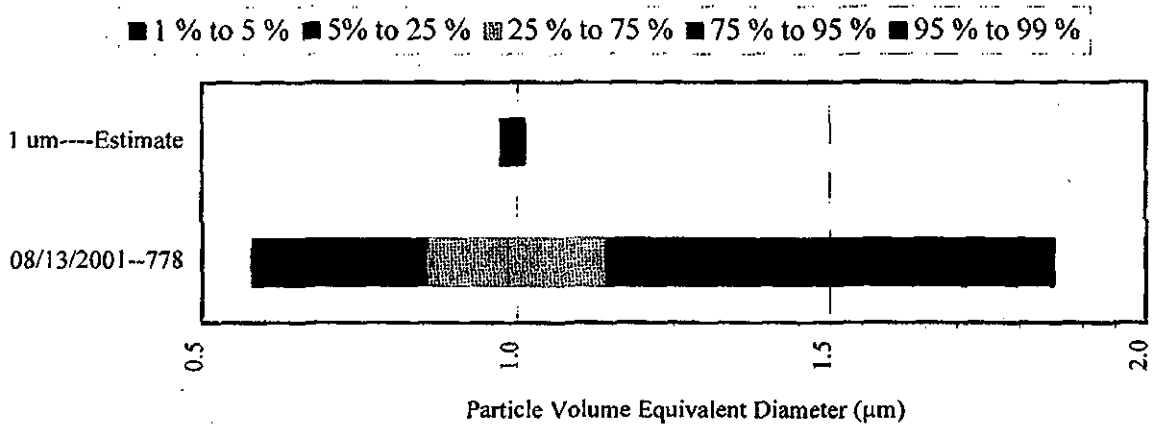
F-20 C. Percentages of particles in polystyrene, microsphere standards with diameters (μm) less than the indicated values. Derived from volume-based, cumulative, %-Undersize distributions.

Sample	In Distributions Based on the Total Volume of Spherical Particles						
	1 %	5 %	25 %	50 %	75 %	95 %	99 %
	Of the Particles Have Diameters Less Than (μm)						
204 nm - Estimate *		0.1978		0.204		0.2102	
07/31/2001--666	0.152	0.162	0.180	0.193	0.211	0.243	0.323
199 nm - Estimate		0.1922		0.199		0.2058	
09/26/2001--021	0.152	0.159	0.176	0.185	0.194	0.218	0.232
09/27/2001--064	0.159	0.201	0.254	0.285	0.326	0.385	0.435
09/28/2001--132	0.152	0.158	0.176	0.185	0.194	0.218	0.226
1 μm - Estimate		0.973		0.993		1.013	
08/13/2001--778	0.577	0.690	0.856	0.985	1.141	1.483	1.856
10 μm - Estimate		9.95		10.15		10.35	
08/17/2001--826			9.98	12.30	15.10		
50 μm - Estimate		47.7		49.1		50.5	
08/21/2001--874	33.7	38.2	46.6	53.9	63.1	82.4	100.7
140 μm - Estimate		133.6		138		142.4	
07/31/2001--686	91	107	128	145	169	226	297

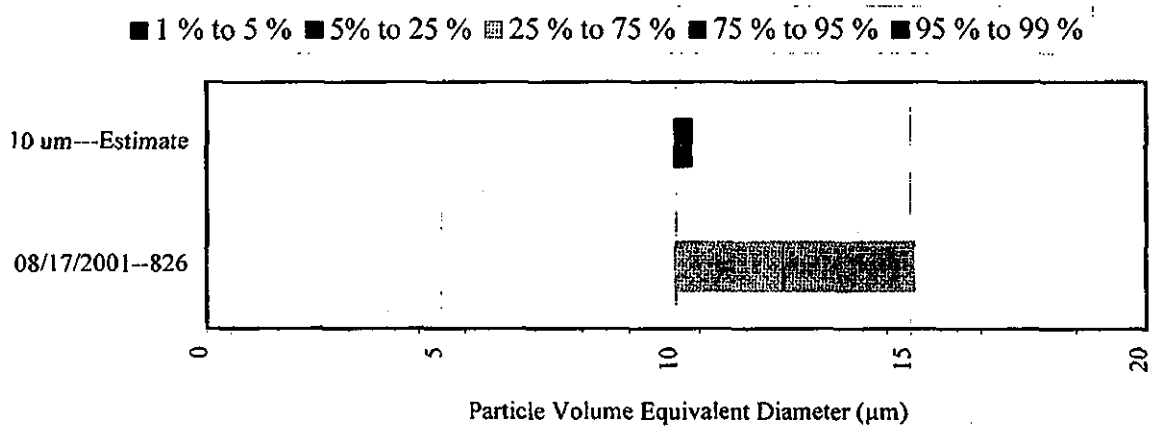
* Estimated values for the standards are (1) the certified mean diameter minus 2σ (5 %), (2) the certified mean diameter (50 %), and (3) the certified mean plus 2σ (95 %).

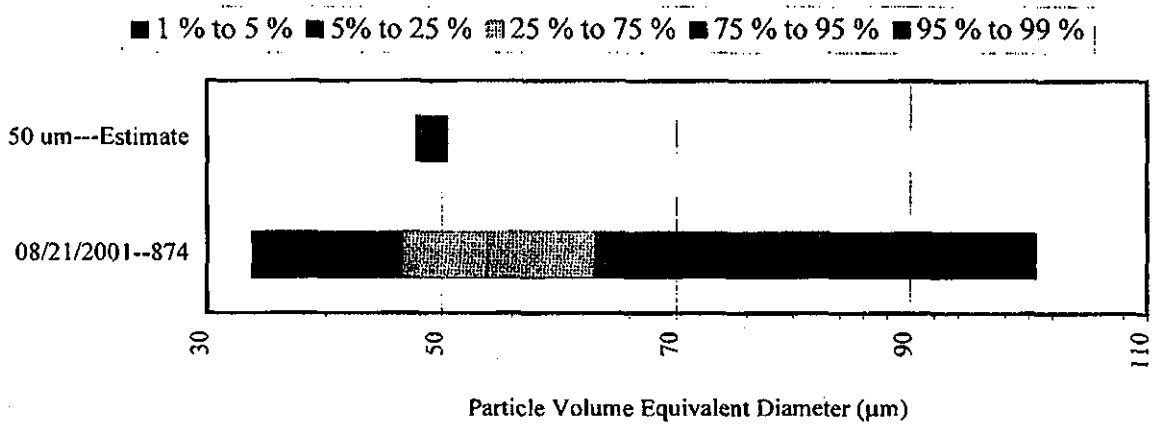
F-20 D. Diameters of particles (μm), in microsphere standards, within defined percentile ranges. Data derived from volume-based, %-Undersize distributions. Vertical lines within the middle, "25 % to 75 %" bars locate the median particle diameters.

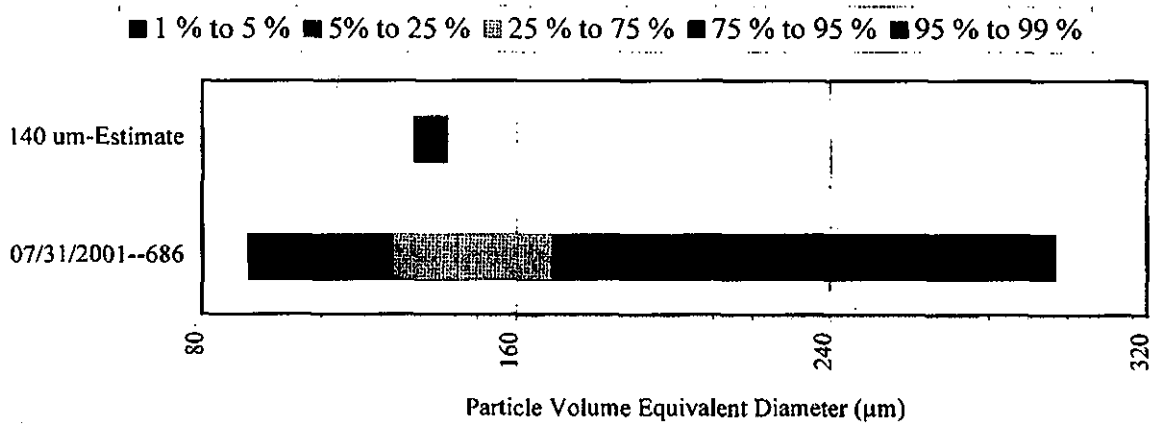




F-20 D (continued). Diameters of particles (μm), in microsphere standards, within defined, volume-based, percentile ranges.







HORIBA LA-910

for Windows(TM) Ver.1.20j Aug/01/'01 07:49

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010731-666 09:55
Filename : 204NM666
Sample : 3200A

Material : 204nm Polymer Beads
Source : Duke Scientific
Lot Numbe : 19756

Condition
T%(He-Ne): 90.7% Dist.Form: Std. Sampling times : 100
(LAMP): 68.0% R.R.Index: 1.19-0.00i ( )

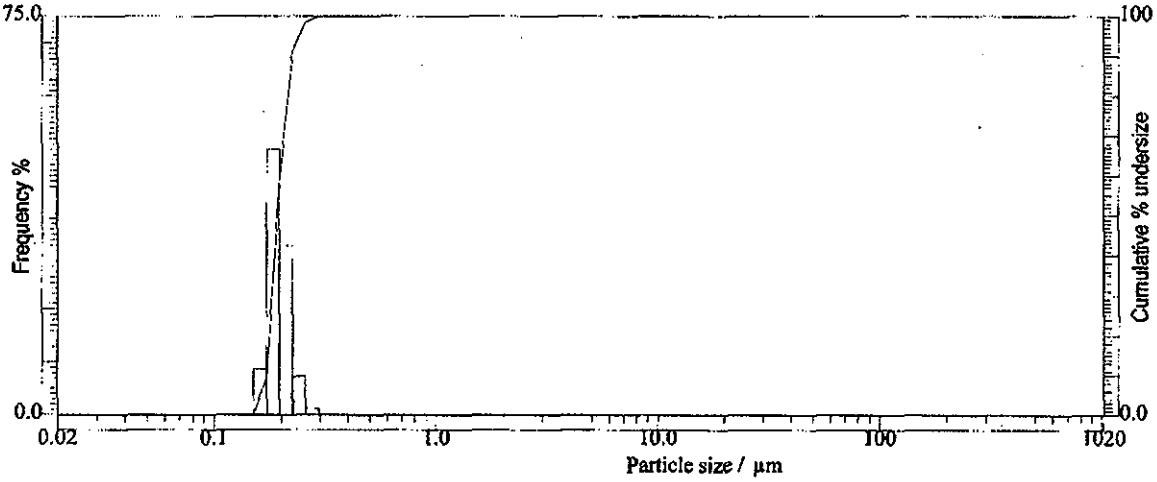
Agitation : 3 Circultn : 4 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 0.192μm SP.Area : 309422cm²/cm³ S.D. : 0.023μm
Mode : 0.190μm Mean : 0.196μm
C.V. : 11.74%

Span : (D 10.0-D 90.0) / D50 = 0.271

Dia. on %(5.0%) : 0.162μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 0.180μm % on Dia.(1.000μm) : 100.0%
Dia. on %(50.0%) : 0.192μm % on Dia.(10.000μm) : 100.0%
Dia. on %(75.0%) : 0.211μm % on Dia.(100.000μm) : 100.0%
Dia. on %(95.0%) : 0.243μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	100.00	0.669	0.00	100.00
890.1	0.00	100.00	22.80	0.00	100.00	0.584	0.00	100.00
777.1	0.00	100.00	19.90	0.00	100.00	0.510	0.00	100.00
678.5	0.00	100.00	17.38	0.00	100.00	0.445	0.00	100.00
592.4	0.00	100.00	15.17	0.00	100.00	0.389	0.00	100.00
517.2	0.00	100.00	13.25	0.00	100.00	0.339	0.26	100.00
451.6	0.00	100.00	11.56	0.00	100.00	0.296	1.30	99.74
394.2	0.00	100.00	10.10	0.00	100.00	0.259	7.32	98.44
344.2	0.00	100.00	8.816	0.00	100.00	0.226	32.00	91.12
300.5	0.00	100.00	7.697	0.00	100.00	0.197	50.11	59.12
262.4	0.00	100.00	6.720	0.00	100.00	0.172	8.85	9.00
229.1	0.00	100.00	5.867	0.00	100.00	0.150	0.15	0.15
200.0	0.00	100.00	5.122	0.00	100.00	0.131	0.00	0.00
174.6	0.00	100.00	4.472	0.00	100.00	0.115	0.00	0.00
152.5	0.00	100.00	3.905	0.00	100.00	0.100	0.00	0.00
133.1	0.00	100.00	3.409	0.00	100.00	0.087	0.00	0.00
116.2	0.00	100.00	2.976	0.00	100.00	0.076	0.00	0.00
101.5	0.00	100.00	2.599	0.00	100.00	0.067	0.00	0.00
88.58	0.00	100.00	2.269	0.00	100.00	0.058	0.00	0.00
77.34	0.00	100.00	1.981	0.00	100.00	0.051	0.00	0.00
67.52	0.00	100.00	1.729	0.00	100.00	0.044	0.00	0.00
58.95	0.00	100.00	1.510	0.00	100.00	0.039	0.00	0.00
51.47	0.00	100.00	1.318	0.00	100.00	0.034	0.00	0.00
44.94	0.00	100.00	1.151	0.00	100.00	0.029	0.00	0.00
39.23	0.00	100.00	1.005	0.00	100.00	0.026	0.00	0.00
34.25	0.00	100.00	0.877	0.00	100.00	0.022	0.00	0.00
29.91	0.00	100.00	0.766	0.00	100.00			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/01/01
File Name: 204NM666.DAT Sample Name: 3200A ID No: 01/07/31-666
Dist. Form: STANDARD R.R. Index: 119-000
Dist. Mode: VOLUME Laser: 90.729 % Lamp: 68.042 %
Circulation: 4 Agitation: 3 U.Sonic ** (min)
Material: 204nm Polymer Beads Source: Duke Scientific
Lot No: 19756 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.144	0.10	0.10	(15)	0.195	5.00	55.00
(2)	0.152	0.90	1.00	(16)	0.198	5.00	60.00
(3)	0.156	1.30	2.30	(17)	0.202	5.00	65.00
(4)	0.162	2.70	5.00	(18)	0.207	5.00	70.00
(5)	0.173	5.00	10.00	(19)	0.211	5.00	75.00
(6)	0.175	5.00	15.00	(20)	0.216	5.00	80.00
(7)	0.175	0.80	15.80	(21)	0.220	4.20	84.20
(8)	0.178	4.20	20.00	(22)	0.220	0.80	85.00
(9)	0.180	5.00	25.00	(23)	0.225	5.00	90.00
(10)	0.183	5.00	30.00	(24)	0.243	5.00	95.00
(11)	0.185	5.00	35.00	(25)	0.255	2.70	97.70
(12)	0.188	5.00	40.00	(26)	0.275	1.30	99.00
(13)	0.190	5.00	45.00	(27)	0.323	0.90	99.90
(14)	0.193	5.00	50.00				

Median : 0.192 (μm) Mean: 0.196 (μm) Mode: 0.184 (μm)
Std. Dev.: 0.023 (μm) Span: 0.165
Coef. Var: 11.74% Spec. Area: 309422 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Aug/01/'01 07:23

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010731-686 16:45
Filename : 140UM686
Sample : 4314A

Material : 140um Polymer Beads
Source : Duke Scientific
Lot Numbe : 22346

Condition
T%(He-Ne): 88.5% Dist.Form: Std. Sampling times : 100
(LAMP): 93.5% R.R.Index: 1.19-0.00i ( )

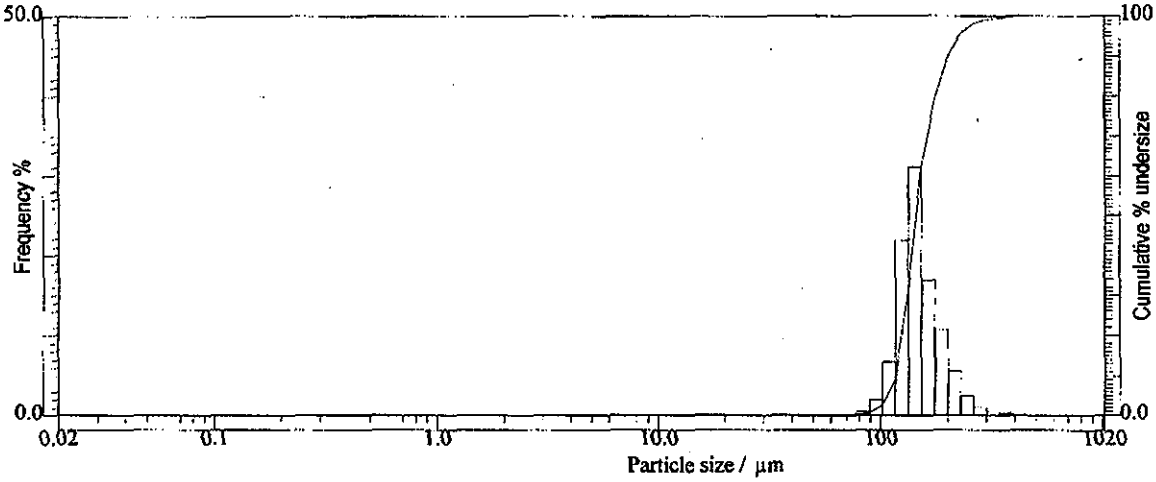
Agitation : 3 Circuitn : 4 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 144.501µm SP.Area : 413cm²/cm³ S.D. : 39.327µm
Mode : 140.901µm Mean : 153.128µm
C.V. : 25.68%

Span : (D 10.0-D 90.0) / D50 = 0.578

Dia. on %(5.0%)	: 106.638µm	% on Dia.(0.100µm) :	0.0%
Dia. on %(25.0%)	: 128.117µm	% on Dia.(1.000µm) :	0.0%
Dia. on %(50.0%)	: 144.501µm	% on Dia.(10.000µm) :	0.0%
Dia. on %(75.0%)	: 168.843µm	% on Dia.(100.000µm) :	2.3%
Dia. on %(95.0%)	: 226.144µm	% on Dia.(1000.000µm) :	100.0%



Size(µm)	Freq(%)	Und(%)	Size(µm)	Freq(%)	Und(%)	Size(µm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	0.00	0.669	0.00	0.00
890.1	0.00	100.00	22.80	0.00	0.00	0.584	0.00	0.00
777.1	0.00	100.00	19.90	0.00	0.00	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.00	0.00	0.445	0.00	0.00
592.4	0.00	100.00	15.17	0.00	0.00	0.389	0.00	0.00
517.2	0.00	100.00	13.25	0.00	0.00	0.339	0.00	0.00
451.6	0.15	100.00	11.56	0.00	0.00	0.296	0.00	0.00
394.2	0.27	99.85	10.10	0.00	0.00	0.259	0.00	0.00
344.2	0.48	99.58	8.816	0.00	0.00	0.226	0.00	0.00
300.5	1.03	99.10	7.697	0.00	0.00	0.197	0.00	0.00
262.4	2.54	98.07	6.720	0.00	0.00	0.172	0.00	0.00
229.1	5.58	95.53	5.867	0.00	0.00	0.150	0.00	0.00
200.0	10.76	89.95	5.122	0.00	0.00	0.131	0.00	0.00
174.6	16.91	79.19	4.472	0.00	0.00	0.115	0.00	0.00
152.5	31.12	62.28	3.905	0.00	0.00	0.100	0.00	0.00
133.1	21.92	31.17	3.409	0.00	0.00	0.087	0.00	0.00
116.2	6.71	9.25	2.976	0.00	0.00	0.076	0.00	0.00
101.5	1.97	2.54	2.599	0.00	0.00	0.067	0.00	0.00
88.58	0.47	0.57	2.269	0.00	0.00	0.058	0.00	0.00
77.34	0.11	0.11	1.981	0.00	0.00	0.051	0.00	0.00
67.52	0.00	0.00	1.729	0.00	0.00	0.044	0.00	0.00
58.95	0.00	0.00	1.510	0.00	0.00	0.039	0.00	0.00
51.47	0.00	0.00	1.318	0.00	0.00	0.034	0.00	0.00
44.94	0.00	0.00	1.151	0.00	0.00	0.029	0.00	0.00
39.23	0.00	0.00	1.005	0.00	0.00	0.026	0.00	0.00
34.25	0.00	0.00	0.877	0.00	0.00	0.022	0.00	0.00
29.91	0.00	0.00	0.766	0.00	0.00			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/01/01
File Name: 140UM686.DAT Sample Name: 4314A ID No: 01/07/31-686
Dist. Form: STANDARD R.R. Index: 119-000
Dist. Mode: VOLUME Laser: 88.506 % Lamp: 93.529 %
Circulation: 4 Agitation: 3 U.Sonic ** (min)
Material: 140um Polymer Beads Source: Duke Scientific
Lot No: 22346 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	76.774	0.10	0.10	(15)	147.925	5.00	55.00
(2)	91.385	0.90	1.00	(16)	151.035	5.00	60.00
(3)	99.889	1.30	2.30	(17)	156.018	5.00	65.00
(4)	106.869	2.70	5.00	(18)	162.572	5.00	70.00
(5)	116.790	5.00	10.00	(19)	169.127	5.00	75.00
(6)	120.644	5.00	15.00	(20)	176.532	5.00	80.00
(7)	121.260	0.80	15.80	(21)	186.436	4.20	84.20
(8)	124.497	4.20	20.00	(22)	188.322	0.80	85.00
(9)	128.351	5.00	25.00	(23)	200.249	5.00	90.00
(10)	132.205	5.00	30.00	(24)	226.316	5.00	95.00
(11)	135.488	5.00	35.00	(25)	257.568	2.70	97.70
(12)	138.597	5.00	40.00	(26)	296.951	1.30	99.00
(13)	141.706	5.00	45.00	(27)	413.250	0.90	99.90
(14)	144.816	5.00	50.00				

Median : 144.501 (μm) Mean: 153.128 (μm) Mode: 142.450 (μm)
Std. Dev.: 39.327 (μm) Span: 0.397
Coef. Var: 25.68% Spec. Area: 413 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Aug/13/'01 16:07

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010813-778 14:24
Filename : 1UM778
Sample : 4009A

Material : 1um Polymer Beads
Source : Duke Scientific
Lot Numbe : 19782

Condition
T%(He-Ne): 78.6% Dist.Form: Std. Sampling times : 100
(LAMP): 71.0% R.R.Index: 1.19-0.00i ( )

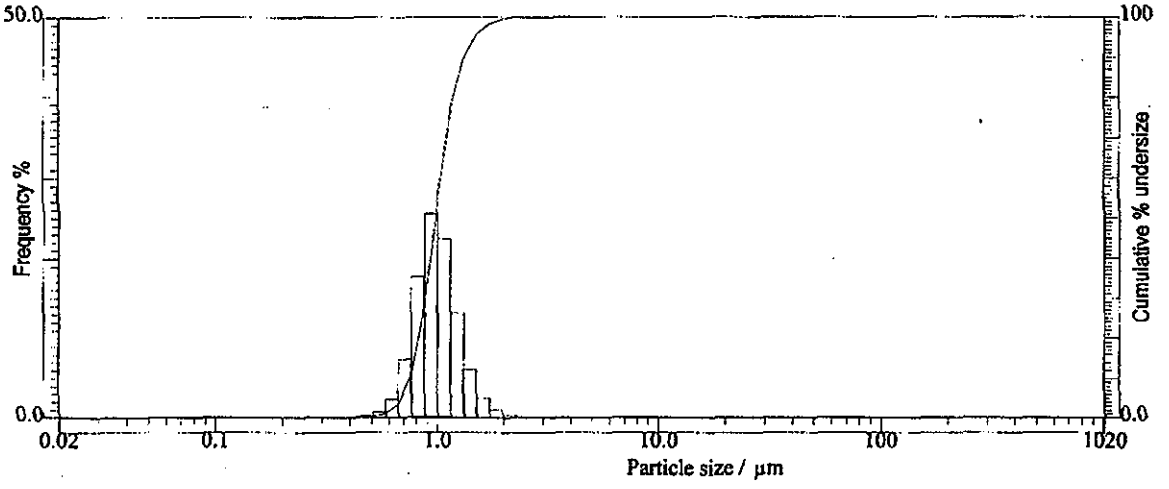
Agitation : 3 Circultn : 4 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 0.984µm SP.Area : 61976cm²/cm³ S.D. : 0.247µm
Mode : 0.951µm Mean : 1.021µm
C.V. : 24.23%

Span : (D 10.0-D 90.0) / D50 = 0.582

Dia. on %(5.0%) : 0.689µm % on Dia.(0.100µm) : 0.0%
Dia. on %(25.0%) : 0.855µm % on Dia.(1.000µm) : 53.1%
Dia. on %(50.0%) : 0.984µm % on Dia.(10.000µm) : 100.0%
Dia. on %(75.0%) : 1.141µm % on Dia.(100.000µm) : 100.0%
Dia. on %(95.0%) : 1.481µm % on Dia.(1000.000µm) : 100.0%



Size(µm)	Freq(%)	Und(%)	Size(µm)	Freq(%)	Und(%)	Size(µm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	100.00	0.669	2.32	3.38
890.1	0.00	100.00	22.80	0.00	100.00	0.584	0.69	1.06
777.1	0.00	100.00	19.90	0.00	100.00	0.510	0.26	0.37
678.5	0.00	100.00	17.38	0.00	100.00	0.445	0.11	0.11
592.4	0.00	100.00	15.17	0.00	100.00	0.389	0.00	0.00
517.2	0.00	100.00	13.25	0.00	100.00	0.339	0.00	0.00
451.6	0.00	100.00	11.56	0.00	100.00	0.296	0.00	0.00
394.2	0.00	100.00	10.10	0.00	100.00	0.259	0.00	0.00
344.2	0.00	100.00	8.816	0.00	100.00	0.226	0.00	0.00
300.5	0.00	100.00	7.697	0.00	100.00	0.197	0.00	0.00
262.4	0.00	100.00	6.720	0.00	100.00	0.172	0.00	0.00
229.1	0.00	100.00	5.867	0.00	100.00	0.150	0.00	0.00
200.0	0.00	100.00	5.122	0.00	100.00	0.131	0.00	0.00
174.6	0.00	100.00	4.472	0.00	100.00	0.115	0.00	0.00
152.5	0.00	100.00	3.905	0.00	100.00	0.100	0.00	0.00
133.1	0.00	100.00	3.409	0.00	100.00	0.087	0.00	0.00
116.2	0.00	100.00	2.976	0.00	100.00	0.076	0.00	0.00
101.5	0.00	100.00	2.599	0.12	100.00	0.067	0.00	0.00
88.58	0.00	100.00	2.269	0.37	99.88	0.058	0.00	0.00
77.34	0.00	100.00	1.981	1.03	99.51	0.051	0.00	0.00
67.52	0.00	100.00	1.729	2.62	98.48	0.044	0.00	0.00
58.95	0.00	100.00	1.510	6.19	95.87	0.039	0.00	0.00
51.47	0.00	100.00	1.318	13.17	89.68	0.034	0.00	0.00
44.94	0.00	100.00	1.151	22.52	76.51	0.029	0.00	0.00
39.23	0.00	100.00	1.005	25.56	53.99	0.026	0.00	0.00
34.25	0.00	100.00	0.877	17.67	28.43	0.022	0.00	0.00
29.91	0.00	100.00	0.766	7.37	10.76			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/15/01
File Name: 1UM778.DAT Sample Name: 4009A ID No: 01/08/13-778
Dist. Form: STANDARD R.R. Index: 119-000
Dist. Mode: VOLUME Laser: 78.610 % Lamp: 70.975 %
Circulation: 4 Agitation: 3 U.Sonic ** (min)
Material: 1um Polymer Beads Source: Duke Scientific
Lot No: 19782 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.439	0.10	0.10	(15)	1.011	5.00	55.00
(2)	0.577	0.90	1.00	(16)	1.044	5.00	60.00
(3)	0.629	1.30	2.30	(17)	1.076	5.00	65.00
(4)	0.690	2.70	5.00	(18)	1.109	5.00	70.00
(5)	0.756	5.00	10.00	(19)	1.141	5.00	75.00
(6)	0.793	5.00	15.00	(20)	1.195	5.00	80.00
(7)	0.798	0.80	15.80	(21)	1.249	4.20	84.20
(8)	0.824	4.20	20.00	(22)	1.259	0.80	85.00
(9)	0.856	5.00	25.00	(23)	1.328	5.00	90.00
(10)	0.885	5.00	30.00	(24)	1.483	5.00	95.00
(11)	0.910	5.00	35.00	(25)	1.664	2.70	97.70
(12)	0.935	5.00	40.00	(26)	1.856	1.30	99.00
(13)	0.960	5.00	45.00	(27)	2.327	0.90	99.90
(14)	0.985	5.00	50.00				

Median : 0.984 (μm) Mean: 1.021 (μm) Mode: 0.939 (μm)
Std. Dev.: 0.247 (μm) Span: 0.347
Coef. Var: 24.23% Spec. Area: 61976 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/26/'01 07:44

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010817.826 07:53
Filename : 10UM826
Sample : 4210A

Material : 10um Polymer Beads
Source : Duke Scientific
Lot Numbe : 22294

Condition
T%(He-Ne): 89.7% Dist.Form: Std. Sampling times : 100
(LAMP): 92.7% R.R.Index: 1.19-0.00i ( )

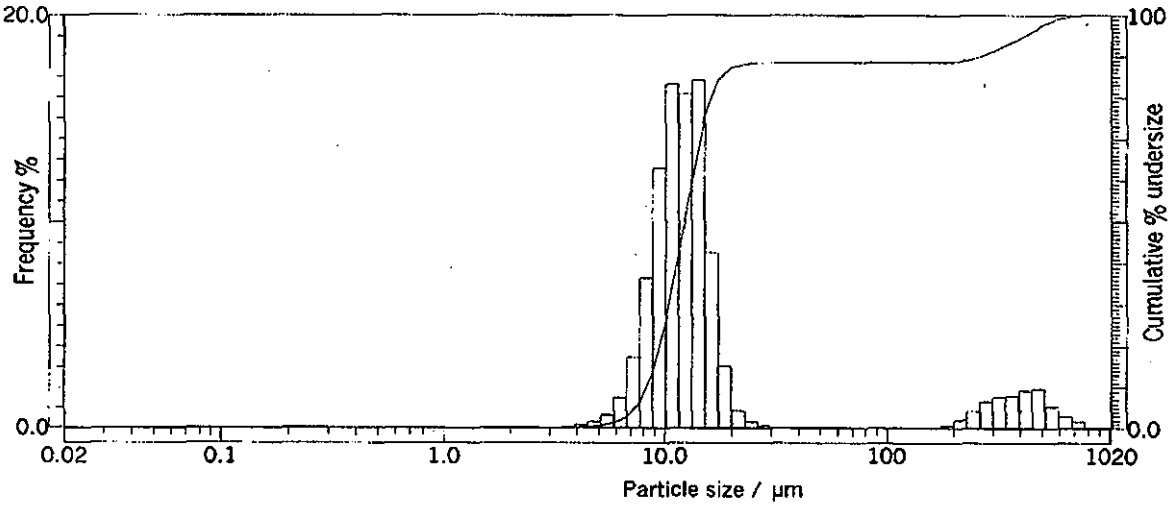
Agitation : 3 Circultn : 4 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 12.300μm SP.Area : 4797cm²/cm³ S.D. : 132.355μm
Mode : 13.748μm Mean : 57.272μm
C.V. : 231.10%

Span : (D 10.0-D 90.0) / D50 = 21.024

Dia. on %(5.0%) : 7.348μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 9.983μm % on Dia.(1.000μm) : 0.0%
Dia. on %(50.0%) : 12.300μm % on Dia.(10.000μm) : 25.2%
Dia. on %(75.0%) : 15.095μm % on Dia.(100.000μm) : 88.5%
Dia. on %(95.0%) : 417.053μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.32	88.37	0.669	0.00	0.00
890.1	0.00	100.00	22.80	0.86	88.05	0.584	0.00	0.00
777.1	0.33	100.00	19.90	3.03	87.18	0.510	0.00	0.00
678.5	0.60	99.67	17.38	8.53	84.16	0.445	0.00	0.00
592.4	1.07	99.07	15.17	16.82	75.63	0.389	0.00	0.00
517.2	1.93	98.00	13.25	16.13	58.81	0.339	0.00	0.00
451.6	1.83	96.07	11.56	16.63	42.68	0.296	0.00	0.00
394.2	1.58	94.24	10.10	12.57	26.05	0.259	0.00	0.00
344.2	1.51	92.66	8.816	7.30	13.48	0.226	0.00	0.00
300.5	1.31	91.14	7.697	3.46	6.18	0.197	0.00	0.00
262.4	0.84	89.84	6.720	1.48	2.72	0.172	0.00	0.00
229.1	0.39	89.00	5.867	0.65	1.24	0.150	0.00	0.00
200.0	0.13	88.61	5.122	0.31	0.60	0.131	0.00	0.00
174.6	0.00	88.48	4.472	0.17	0.29	0.115	0.00	0.00
152.5	0.00	88.48	3.905	0.11	0.11	0.100	0.00	0.00
133.1	0.00	88.48	3.409	0.00	0.00	0.087	0.00	0.00
116.2	0.00	88.48	2.976	0.00	0.00	0.076	0.00	0.00
101.5	0.00	88.48	2.599	0.00	0.00	0.067	0.00	0.00
88.58	0.00	88.48	2.269	0.00	0.00	0.058	0.00	0.00
77.34	0.00	88.48	1.981	0.00	0.00	0.051	0.00	0.00
67.52	0.00	88.48	1.729	0.00	0.00	0.044	0.00	0.00
58.95	0.00	88.48	1.510	0.00	0.00	0.039	0.00	0.00
51.47	0.00	88.48	1.318	0.00	0.00	0.034	0.00	0.00
44.94	0.00	88.48	1.151	0.00	0.00	0.029	0.00	0.00
39.23	0.00	88.48	1.005	0.00	0.00	0.026	0.00	0.00

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/26/'01 07:55

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010817-826 07:53
Filename : 10UM826
Sample : 4210A

Material : 10um Polymer Beads
Source : Duke Scientific
Lot Numbe : 22294

Condition
T%(He-Ne): 89.7% Dist.Form: Std. Sampling times : 100
(LAMP): 92.7% R.R.Index: 1.19-0.00i ( )

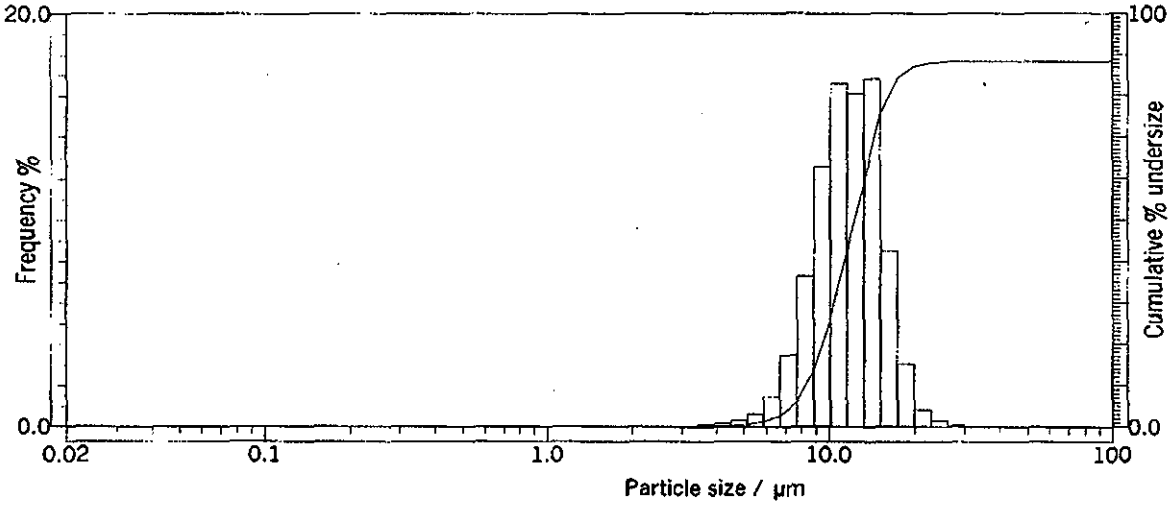
Agitation : 3 Circultn : 4 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 12.300μm SP.Area : 4779cm²/cm³ S.D. : 3.225μm
Mode : 13.748μm Mean : 11.991μm
C.V. : 26.89%

Span : (D 10.0-D 90.0) / D50 = 7.577

Dia. on %(5.0%) : 7.348μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 9.983μm % on Dia.(1.000μm) : 0.0%
Dia. on %(50.0%) : 12.300μm % on Dia.(10.000μm) : 25.2%
Dia. on %(75.0%) : 15.095μm % on Dia.(100.000μm) : 88.5%
Dia. on %(95.0%) : 101.460μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
101.5	0.00	88.48	2.599	0.00	0.00	0.067	0.00	0.00
88.58	0.00	88.48	2.269	0.00	0.00	0.058	0.00	0.00
77.34	0.00	88.48	1.981	0.00	0.00	0.051	0.00	0.00
67.52	0.00	88.48	1.729	0.00	0.00	0.044	0.00	0.00
58.95	0.00	88.48	1.510	0.00	0.00	0.039	0.00	0.00
51.47	0.00	88.48	1.318	0.00	0.00	0.034	0.00	0.00
44.94	0.00	88.48	1.151	0.00	0.00	0.029	0.00	0.00
39.23	0.00	88.48	1.005	0.00	0.00	0.026	0.00	0.00
34.25	0.00	88.48	0.877	0.00	0.00	0.022	0.00	0.00
29.91	0.12	88.48	0.766	0.00	0.00			
26.11	0.32	88.37	0.669	0.00	0.00			
22.80	0.86	88.05	0.584	0.00	0.00			
19.90	3.03	87.18	0.510	0.00	0.00			
17.38	8.53	84.16	0.445	0.00	0.00			
15.17	16.82	75.63	0.389	0.00	0.00			
13.25	16.13	58.81	0.339	0.00	0.00			
11.56	16.63	42.68	0.296	0.00	0.00			
10.10	12.57	26.05	0.259	0.00	0.00			
8.816	7.30	13.48	0.226	0.00	0.00			
7.697	3.46	6.18	0.197	0.00	0.00			
6.720	1.48	2.72	0.172	0.00	0.00			
5.867	0.65	1.24	0.150	0.00	0.00			
5.122	0.31	0.60	0.131	0.00	0.00			
4.472	0.17	0.29	0.115	0.00	0.00			
3.905	0.11	0.11	0.100	0.00	0.00			

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/26/'01 11:59

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010821.874 08:37
Filename : 50UM874
Sample : 4250A

Material : 50um Polymer Beads
Source : Duke Scientific
Lot Numbe : 22237

Condition
T%(He-Ne): 88.6% Dist.Form: Std. Sampling times : 100
(LAMP): 93.9% R.R.Index: 1.19-0.00i ( )

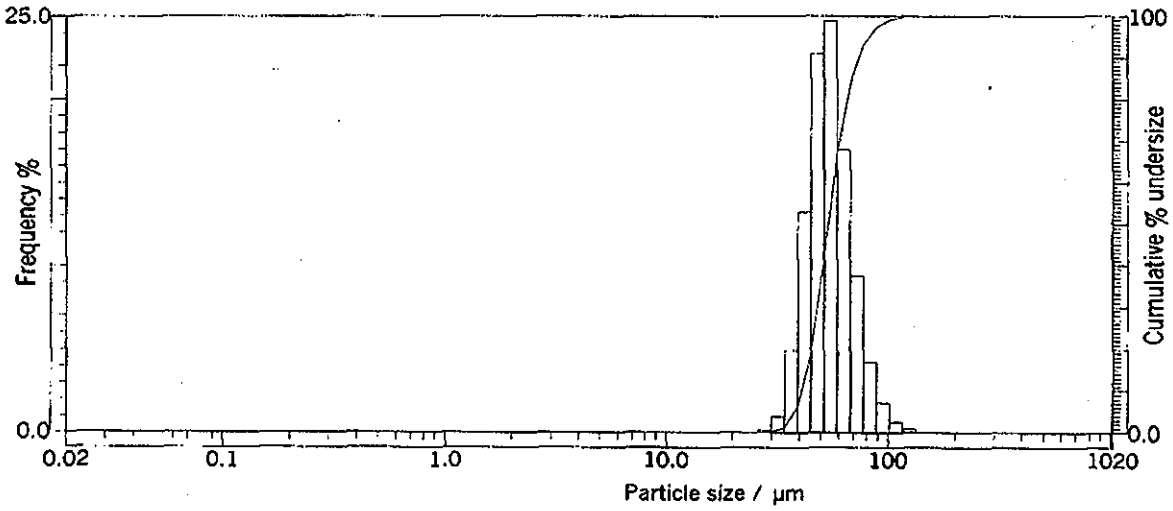
Agitation : 3 Circultn : 4 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 53.762μm SP.Area : 1130cm²/cm³ S.D. : 13.609μm
Mode : 54.217μm Mean : 55.941μm
C.V. : 24.33%

Span : (D 10.0-D 90.0) / D50 = 0.616

Dia. on %(5.0%) :	38.096μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	46.490μm	% on Dia.(1.000μm) :	0.0%
Dia. on %(50.0%) :	53.762μm	% on Dia.(10.000μm) :	0.0%
Dia. on %(75.0%) :	62.957μm	% on Dia.(100.000μm) :	98.9%
Dia. on %(95.0%) :	82.239μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	0.00	0.669	0.00	0.00
890.1	0.00	100.00	22.80	0.00	0.00	0.584	0.00	0.00
777.1	0.00	100.00	19.90	0.00	0.00	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.00	0.00	0.445	0.00	0.00
592.4	0.00	100.00	15.17	0.00	0.00	0.389	0.00	0.00
517.2	0.00	100.00	13.25	0.00	0.00	0.339	0.00	0.00
451.6	0.00	100.00	11.56	0.00	0.00	0.296	0.00	0.00
394.2	0.00	100.00	10.10	0.00	0.00	0.259	0.00	0.00
344.2	0.00	100.00	8.816	0.00	0.00	0.226	0.00	0.00
300.5	0.00	100.00	7.697	0.00	0.00	0.197	0.00	0.00
262.4	0.00	100.00	6.720	0.00	0.00	0.172	0.00	0.00
229.1	0.00	100.00	5.867	0.00	0.00	0.150	0.00	0.00
200.0	0.00	100.00	5.122	0.00	0.00	0.131	0.00	0.00
174.6	0.00	100.00	4.472	0.00	0.00	0.115	0.00	0.00
152.5	0.00	100.00	3.905	0.00	0.00	0.100	0.00	0.00
133.1	0.23	100.00	3.409	0.00	0.00	0.087	0.00	0.00
116.2	0.66	99.77	2.976	0.00	0.00	0.076	0.00	0.00
101.5	1.80	99.11	2.599	0.00	0.00	0.067	0.00	0.00
88.58	4.23	97.31	2.269	0.00	0.00	0.058	0.00	0.00
77.34	9.33	93.09	1.981	0.00	0.00	0.051	0.00	0.00
67.52	16.98	83.76	1.729	0.00	0.00	0.044	0.00	0.00
58.95	24.71	66.78	1.510	0.00	0.00	0.039	0.00	0.00
51.47	22.76	42.07	1.318	0.00	0.00	0.034	0.00	0.00
44.94	13.23	19.31	1.151	0.00	0.00	0.029	0.00	0.00
39.23	4.96	6.08	1.005	0.00	0.00	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/26/01
File Name: 50UM874.DAT Sample Name: 4250A ID No: 01/08/21-874
Dist. Form: STANDARD R.R. Index: 119-000
Dist. Mode: VOLUME Laser: 88.619 % Lamp: 93.891 %
Circulation: 4 Agitation: 3 U.Sonic ** (min)
Material: 50um Polymer Beads Source: Duke Scientific
Lot No: 22237 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	28.601	0.10	0.10	(15)	55.386	5.00	55.00
(2)	33.727	0.90	1.00	(16)	56.900	5.00	60.00
(3)	35.442	1.30	2.30	(17)	58.414	5.00	65.00
(4)	38.154	2.70	5.00	(18)	60.578	5.00	70.00
(5)	40.926	5.00	10.00	(19)	63.102	5.00	75.00
(6)	43.081	5.00	15.00	(20)	65.626	5.00	80.00
(7)	43.426	0.80	15.80	(21)	67.987	4.20	84.20
(8)	45.137	4.20	20.00	(22)	68.829	0.80	85.00
(9)	46.572	5.00	25.00	(23)	74.090	5.00	90.00
(10)	48.007	5.00	30.00	(24)	82.427	5.00	95.00
(11)	49.442	5.00	35.00	(25)	91.350	2.70	97.70
(12)	50.877	5.00	40.00	(26)	100.662	1.30	99.00
(13)	52.358	5.00	45.00	(27)	125.686	0.90	99.90
(14)	53.872	5.00	50.00				

Median : 53.762 (μm) Mean: 55.941 (μm) Mode: 55.085 (μm)
Std. Dev.: 13.609 (μm) Span: 0.359
Coef. Var: 24.33% Spec. Area: 1130 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/08/'01 18:02

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926-021 22:04
Filename : 200N954C
Sample : Duke 200 nm

Material :
Source :
Lot Numbe : 23220

Condition
T%(He-Ne): 90.4%
(LAMP): 68.0%

Dist.Form: Std.
R.R.Index: 1.19-0.00i

Sampling times : 100
( )

Agitation : 3 Circultn : 5 U.sonic : ~~ON~~ OFF (120)

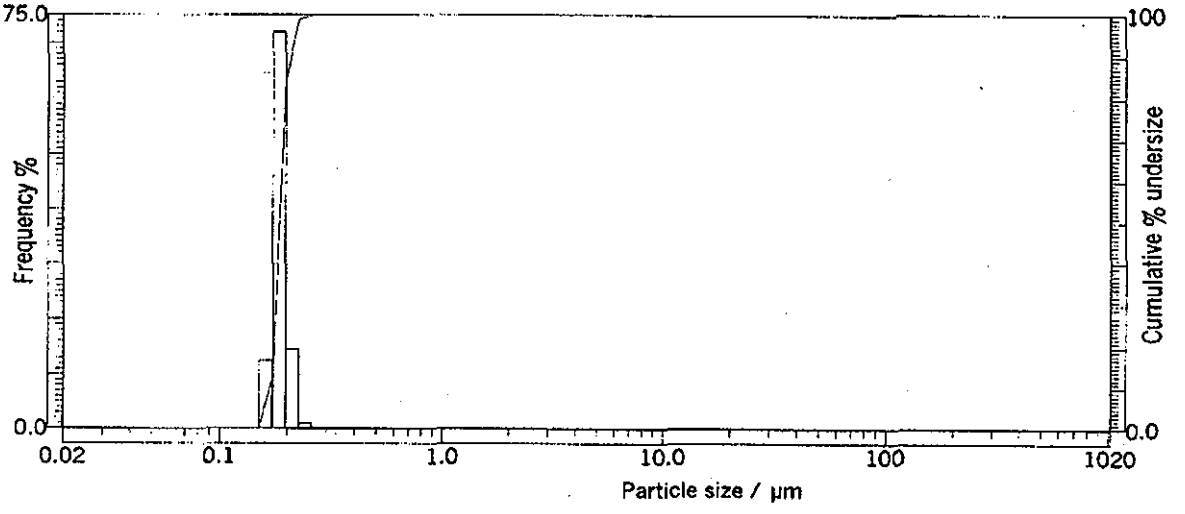
WSC 10/9/01

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 0.185μm SP.Area : 324661cm²/cm³ S.D. : 0.015μm
Mode : 0.185μm Mean : 0.186μm
C.V. : 8.21%

Span : (D 10.0-D 90.0) / D50 = 0.218

Dia. on %(5.0%) :	0.159μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	0.176μm	% on Dia.(1.000μm) :	100.0%
Dia. on %(50.0%) :	0.185μm	% on Dia.(10.000μm) :	100.0%
Dia. on %(75.0%) :	0.194μm	% on Dia.(100.000μm) :	100.0%
Dia. on %(95.0%) :	0.218μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	100.00	0.669	0.00	100.00
890.1	0.00	100.00	22.80	0.00	100.00	0.584	0.00	100.00
777.1	0.00	100.00	19.90	0.00	100.00	0.510	0.00	100.00
678.5	0.00	100.00	17.38	0.00	100.00	0.445	0.00	100.00
592.4	0.00	100.00	15.17	0.00	100.00	0.389	0.00	100.00
517.2	0.00	100.00	13.25	0.00	100.00	0.339	0.11	100.00
451.6	0.00	100.00	11.56	0.00	100.00	0.296	0.18	99.89
394.2	0.00	100.00	10.10	0.00	100.00	0.259	0.87	99.70
344.2	0.00	100.00	8.816	0.00	100.00	0.226	14.43	98.83
300.5	0.00	100.00	7.697	0.00	100.00	0.197	71.94	84.40
262.4	0.00	100.00	6.720	0.00	100.00	0.172	12.46	12.46
229.1	0.00	100.00	5.867	0.00	100.00	0.150	0.00	0.00
200.0	0.00	100.00	5.122	0.00	100.00	0.131	0.00	0.00
174.6	0.00	100.00	4.472	0.00	100.00	0.115	0.00	0.00
152.5	0.00	100.00	3.905	0.00	100.00	0.100	0.00	0.00
133.1	0.00	100.00	3.409	0.00	100.00	0.087	0.00	0.00
116.2	0.00	100.00	2.976	0.00	100.00	0.076	0.00	0.00
101.5	0.00	100.00	2.599	0.00	100.00	0.067	0.00	0.00
88.58	0.00	100.00	2.269	0.00	100.00	0.058	0.00	0.00
77.34	0.00	100.00	1.981	0.00	100.00	0.051	0.00	0.00
67.52	0.00	100.00	1.729	0.00	100.00	0.044	0.00	0.00
58.95	0.00	100.00	1.510	0.00	100.00	0.039	0.00	0.00
51.47	0.00	100.00	1.318	0.00	100.00	0.034	0.00	0.00
44.94	0.00	100.00	1.151	0.00	100.00	0.029	0.00	0.00
39.23	0.00	100.00	1.005	0.00	100.00	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/08/01
File Name: 200N954C.DAT Sample Name: Duke 200 nm ID No: 01/09/26-021
Dist. Form: STANDARD R.R. Index: 119-000
Dist. Mode: VOLUME Laser: 90.413 % Lamp: 67.961 %
Circulation: 5 Agitation: 3 U.Sonic OFF (min)
Lot No: 23220 Test No:

WSC 10/9/01

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.150	0.10	0.10	(15)	0.187	5.00	55.00
(2)	0.152	0.90	1.00	(16)	0.189	5.00	60.00
(3)	0.154	1.30	2.30	(17)	0.190	5.00	65.00
(4)	0.159	2.70	5.00	(18)	0.192	5.00	70.00
(5)	0.168	5.00	10.00	(19)	0.194	5.00	75.00
(6)	0.173	5.00	15.00	(20)	0.196	5.00	80.00
(7)	0.173	0.80	15.80	(21)	0.197	4.20	84.20
(8)	0.175	4.20	20.00	(22)	0.198	0.80	85.00
(9)	0.176	5.00	25.00	(23)	0.208	5.00	90.00
(10)	0.178	5.00	30.00	(24)	0.218	5.00	95.00
(11)	0.180	5.00	35.00	(25)	0.224	2.70	97.70
(12)	0.182	5.00	40.00	(26)	0.232	1.30	99.00
(13)	0.183	5.00	45.00	(27)	0.302	0.90	99.90
(14)	0.185	5.00	50.00				

Median : 0.185 (μm) Mean: 0.186 (μm) Mode: 0.184 (μm)
Std. Dev.: 0.015 (μm) Span: 0.131
Coef. Var: 8.21% Spec. Area: 324661 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/08/'01 18:03

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010927-064 18:51
Filename : 200N996C
Sample : ~~AY-101~~ 3200A

Material : ~~Fractional Settling~~ 200 nm Polymer Beads
Source :
Lot Numbe : ~~1326~~ 23220 Duke Scientific

WSC 10/9/01

Condition
T%(He-Ne): 92.3% Dist.Form: Std. Sampling times : 100
(LAMP): 74.2% R.R.Index: 1.19-0.00i ( )

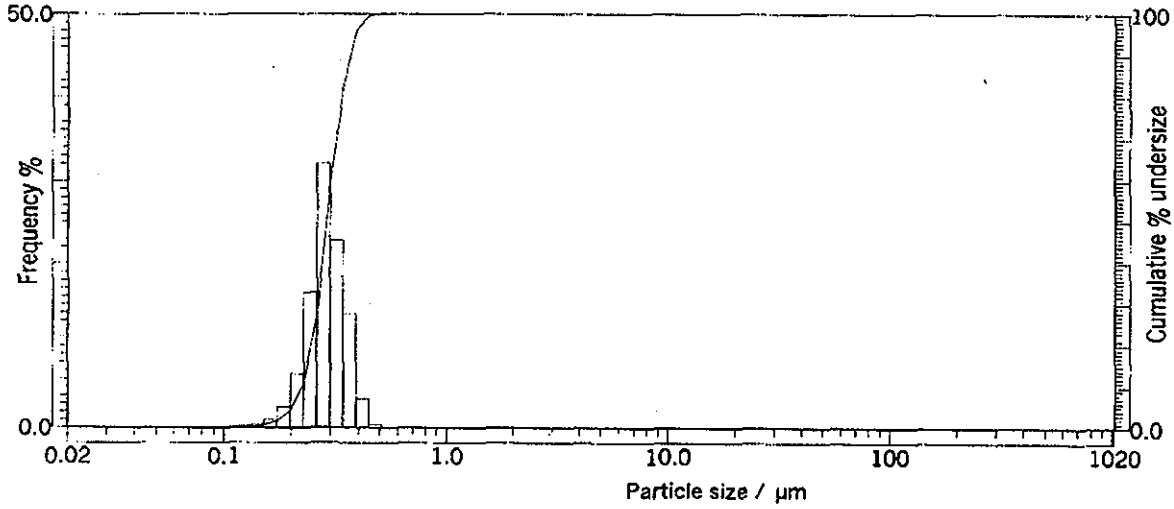
Agitation : 1 Circultn : 4 U.sonic : ~~ON~~ OFF (120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 0.285μm SP.Area : 215824cm²/cm³ S.D. : 0.055μm
Mode : 0.280μm Mean : 0.289μm
C.V. : 19.10%

Span : (D 10.0-D 90.0) / D50 = 0.505

Dia. on %(5.0%) :	0.201μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	0.254μm	% on Dia.(1.000μm) :	100.0%
Dia. on %(50.0%) :	0.285μm	% on Dia.(10.000μm) :	100.0%
Dia. on %(75.0%) :	0.325μm	% on Dia.(100.000μm) :	100.0%
Dia. on %(95.0%) :	0.385μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	100.00	0.669	0.00	100.00
890.1	0.00	100.00	22.80	0.00	100.00	0.584	0.00	100.00
777.1	0.00	100.00	19.90	0.00	100.00	0.510	0.40	100.00
678.5	0.00	100.00	17.38	0.00	100.00	0.445	3.53	99.60
592.4	0.00	100.00	15.17	0.00	100.00	0.389	13.81	96.07
517.2	0.00	100.00	13.25	0.00	100.00	0.339	22.83	82.25
451.6	0.00	100.00	11.56	0.00	100.00	0.296	32.16	59.43
394.2	0.00	100.00	10.10	0.00	100.00	0.259	16.54	27.27
344.2	0.00	100.00	8.816	0.00	100.00	0.226	6.61	10.73
300.5	0.00	100.00	7.697	0.00	100.00	0.197	2.54	4.12
262.4	0.00	100.00	6.720	0.00	100.00	0.172	0.99	1.58
229.1	0.00	100.00	5.867	0.00	100.00	0.150	0.40	0.59
200.0	0.00	100.00	5.122	0.00	100.00	0.131	0.19	0.19
174.6	0.00	100.00	4.472	0.00	100.00	0.115	0.00	0.00
152.5	0.00	100.00	3.905	0.00	100.00	0.100	0.00	0.00
133.1	0.00	100.00	3.409	0.00	100.00	0.087	0.00	0.00
116.2	0.00	100.00	2.976	0.00	100.00	0.076	0.00	0.00
101.5	0.00	100.00	2.599	0.00	100.00	0.067	0.00	0.00
88.58	0.00	100.00	2.269	0.00	100.00	0.058	0.00	0.00
77.34	0.00	100.00	1.981	0.00	100.00	0.051	0.00	0.00
67.52	0.00	100.00	1.729	0.00	100.00	0.044	0.00	0.00
58.95	0.00	100.00	1.510	0.00	100.00	0.039	0.00	0.00
51.47	0.00	100.00	1.318	0.00	100.00	0.034	0.00	0.00
44.94	0.00	100.00	1.151	0.00	100.00	0.029	0.00	0.00
39.23	0.00	100.00	1.005	0.00	100.00	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/08/01
File Name: 200N996C.DAT Sample Name: ~~AY-101~~ 3200A ID No: 01/09/27-064
Dist. Form: STANDARD R.R. Index: 119-000
Dist. Mode: VOLUME Laser: 92.349 % Lamp: 74.219 % WSC 10/9/01
Circulation: 4 Agitation: 1 U.Sonic OFF (min)
Material: ~~Fractional Settling~~ 200 nm Polymer Beads Source: Duke Scientific
Lot No: ~~1926~~ 23220 Test No: Duplicate

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.123	0.10	0.10	(15)	0.291	5.00	55.00
(2)	0.159	0.90	1.00	(16)	0.297	5.00	60.00
(3)	0.179	1.30	2.30	(17)	0.307	5.00	65.00
(4)	0.201	2.70	5.00	(18)	0.316	5.00	70.00
(5)	0.223	5.00	10.00	(19)	0.326	5.00	75.00
(6)	0.234	5.00	15.00	(20)	0.335	5.00	80.00
(7)	0.236	0.80	15.80	(21)	0.346	4.20	84.20
(8)	0.244	4.20	20.00	(22)	0.349	0.80	85.00
(9)	0.254	5.00	25.00	(23)	0.367	5.00	90.00
(10)	0.262	5.00	30.00	(24)	0.385	5.00	95.00
(11)	0.268	5.00	35.00	(25)	0.415	2.70	97.70
(12)	0.273	5.00	40.00	(26)	0.435	1.30	99.00
(13)	0.279	5.00	45.00	(27)	0.494	0.90	99.90
(14)	0.285	5.00	50.00				

Median : 0.285 (μm) Mean: 0.289 (μm) Mode: 0.277 (μm)
Std. Dev.: 0.055 (μm) Span: 0.209
Coef. Var: 19.10% Spec. Area: 215824 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/08/'01 18:05

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-132 19:29 Material : Standard
Filename : 200N998C Source : Duke
Sample : 200nm Polymer Beads Lot Numbe : 23220

Condition
T%(He-Ne): 89.5% Dist.Form: Std. Sampling times : 100
(LAMP): 63.4% R.R.Index: 1.19-0.00i ( )

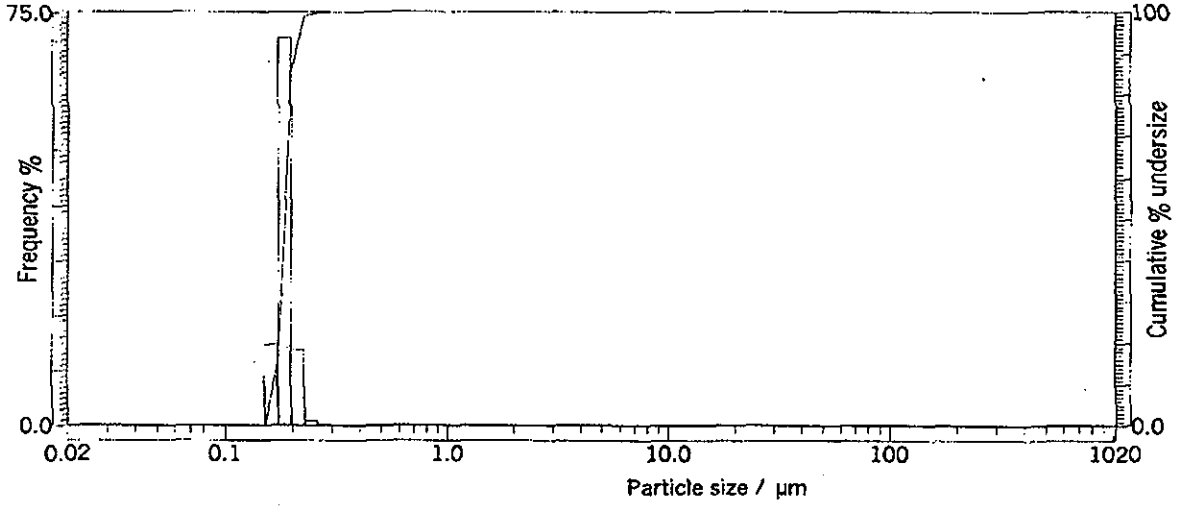
Agitation : 1 Circultn : 4 U.sonic : OFF(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 0.184μm SP.Area : 326172cm²/cm³ S.D. : 0.015μm
Mode : 0.184μm Mean : 0.185μm
C.V. : 8.04%

Span : (D 10.0-D 90.0) / D50 = 0.228

Dia. on %(5.0%) :	0.157μm	% on Dia.(	0.100μm) :	0.0%
Dia. on %(25.0%) :	0.176μm	% on Dia.(	1.000μm) :	100.0%
Dia. on %(50.0%) :	0.184μm	% on Dia.(	10.000μm) :	100.0%
Dia. on %(75.0%) :	0.193μm	% on Dia.(	100.000μm) :	100.0%
Dia. on %(95.0%) :	0.217μm	% on Dia.(	1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	0.00	100.00	0.669	0.00	100.00
890.1	0.00	100.00	22.80	0.00	100.00	0.584	0.00	100.00
777.1	0.00	100.00	19.90	0.00	100.00	0.510	0.00	100.00
678.5	0.00	100.00	17.38	0.00	100.00	0.445	0.00	100.00
592.4	0.00	100.00	15.17	0.00	100.00	0.389	0.00	100.00
517.2	0.00	100.00	13.25	0.00	100.00	0.339	0.00	100.00
451.6	0.00	100.00	11.56	0.00	100.00	0.296	0.17	100.00
394.2	0.00	100.00	10.10	0.00	100.00	0.259	0.84	99.83
344.2	0.00	100.00	8.816	0.00	100.00	0.226	13.86	98.99
300.5	0.00	100.00	7.697	0.00	100.00	0.197	70.38	85.13
262.4	0.00	100.00	6.720	0.00	100.00	0.172	14.75	14.75
229.1	0.00	100.00	5.867	0.00	100.00	0.150	0.00	0.00
200.0	0.00	100.00	5.122	0.00	100.00	0.131	0.00	0.00
174.6	0.00	100.00	4.472	0.00	100.00	0.115	0.00	0.00
152.5	0.00	100.00	3.905	0.00	100.00	0.100	0.00	0.00
133.1	0.00	100.00	3.409	0.00	100.00	0.087	0.00	0.00
116.2	0.00	100.00	2.976	0.00	100.00	0.076	0.00	0.00
101.5	0.00	100.00	2.599	0.00	100.00	0.067	0.00	0.00
88.58	0.00	100.00	2.269	0.00	100.00	0.058	0.00	0.00
77.34	0.00	100.00	1.981	0.00	100.00	0.051	0.00	0.00
67.52	0.00	100.00	1.729	0.00	100.00	0.044	0.00	0.00
58.95	0.00	100.00	1.510	0.00	100.00	0.039	0.00	0.00
51.47	0.00	100.00	1.318	0.00	100.00	0.034	0.00	0.00
44.94	0.00	100.00	1.151	0.00	100.00	0.029	0.00	0.00
39.23	0.00	100.00	1.005	0.00	100.00	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/08/01
File Name: 200N998C.DAT Sample Name: 200nm Polymer Beads ID No: 01/09/28-132
Dist. Form: STANDARD R.R. Index: 119-000
Dist. Mode: VOLUME Laser: 89.466 % Lamp: 63.440 %
Circulation: 4 Agitation: 1 U.Sonic OFF (min)
Material: Standard Source: Duke
Lot No: 23220 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	0.150	0.10	0.10	(15)	0.186	5.00	55.00
(2)	0.152	0.90	1.00	(16)	0.188	5.00	60.00
(3)	0.154	1.30	2.30	(17)	0.190	5.00	65.00
(4)	0.158	2.70	5.00	(18)	0.192	5.00	70.00
(5)	0.165	5.00	10.00	(19)	0.194	5.00	75.00
(6)	0.172	5.00	15.00	(20)	0.195	5.00	80.00
(7)	0.172	0.80	15.80	(21)	0.197	4.20	84.20
(8)	0.174	4.20	20.00	(22)	0.197	0.80	85.00
(9)	0.176	5.00	25.00	(23)	0.207	5.00	90.00
(10)	0.178	5.00	30.00	(24)	0.218	5.00	95.00
(11)	0.179	5.00	35.00	(25)	0.223	2.70	97.70
(12)	0.181	5.00	40.00	(26)	0.226	1.30	99.00
(13)	0.183	5.00	45.00	(27)	0.274	0.90	99.90
(14)	0.185	5.00	50.00				

Median : 0.184 (μm) Mean: 0.185 (μm) Mode: 0.184 (μm)
Std. Dev.: 0.015 (μm) Span: 0.129
Coef. Var: 8.04% Spec. Area: 326172 (cm2/cm3)

APPENDIX F-21

QUALITY CONTROL DATA
QUARTZ POWDER STANDARD BCR-69

Consisting of 28 pages including this cover page

COMMISSION OF THE EUROPEAN COMMUNITIES

COMMUNITY BUREAU OF REFERENCE - BCR -

CERTIFIED REFERENCE MATERIAL

CERTIFICATE OF MEASUREMENT

BCR No 69 N°. 1749

QUARTZ

Certified Cumulative Particle Size Distribution, Q_3

Stokes diameter (1) x_{st} µm	Mass fraction of particles undersize (2) Q_3 g/100 g	Uncertainty (2) $S_R(Q_3)$ g/100 g	Number of data points (2) N
14.0	2.8	1.2	53
16.0	4.9	1.5	43
23.0	19.9	2.6	43
32.0	38.8	2.7	43
45.0	63.5	3.6	21
64.0	83.3	3.7	36
90.0	96.6	2.0	41

(1) *The Stokes diameter, x_{st}, is defined by the equation*

$$x_{st} = \left(\frac{18\,\eta\,h}{(\rho_s - \rho_f)\,g\,t} \right)^{1/2}$$

in which h is the vertical distance through which the particles fall in time t and g is the standard acceleration of free fall. The equation is fully described in Appendix 2 of the Certification Report. If SI base units are used on the right hand side of this equation, x_{st} is given in metres. For sedimentation data obtained at 20 °C on a 0.1 mass per cent aqueous solution of tetra sodium pyrophosphate decahydrate ($Na_4P_2O_7.10H_2O$), values of 999 $kg.m^{-3}$ were used for the density, ρ_f, and 0.1005 x $10^{-3}N.s.m^{-2}$ for the viscosity, η, of the sedimentation fluid. A value of 2645 $kg.m^{-3}$ was used for the density, ρ_s, of this sample of quartz, and a value of 9.807 $m.s^{-2}$ was used for g.

(2) *The mass fraction of particles undersize, Q_3, and the associated overall uncertainty, $S_R(Q_3)$, were calculated as described in section 6.2 of the Certification Report for N data points from five laboratories. $S_R(Q_3)$ is indicative of the precision of the measurements at the five participating laboratories and the homogeneity of material with respect to particle size distribution.*

Brussels, November 6th, 1979

BCR
for certified true copy

DESCRIPTION OF THE SAMPLE

Each sample consists of approximately 10 g of quartz powder obtained by subdividing a bulk quantity of the material with the aid of a rotating riffle.

Results of chemical analyses are summarised below. In each case, relative mass loss is expressed in terms of $mg.g^{-1}$ of the material as received without pretreatment by the analyst. The « relative mass loss in hydrofluoric acid » was determined after successive treatment until the constant quoted value was obtained.

Relative mass loss after 24 hours at			Relative mass loss in HF	Relative mass of			
100 °C $mg.g^{-1}$	500 °C $mg.g^{-1}$	1000 °C $mg.g^{-1}$	$mg.g^{-1}$	Fe $mg.g^{-1}$	Ti $mg.g^{-1}$	Na $mg.g^{-1}$	Ca $mg.g^{-1}$
0	0.35	1.6	≥997	0.24	0.26	0.05	0.03

INSTRUCTIONS FOR USE

Detailed recommendations on the use of this RM are given in the Certification Report (Section 7).
If compatible with the measurement technique, the total sample should be used. If further subdivision is necessary, a rotating riffle is recommended for the abstraction of sub-samples down to ca 1 g from the supplied 10 g samples. For the abstraction of even smaller sub-samples the 1 g representative sub-sample should be made into a paste by adding a dispersant solution consisting of 0.1 mass per cent of tetra sodium pyrophosphate decahydrate in distilled water. The paste should be mixed well but gently before abstracting the required quantity.

Reproduction of the certified results is most likely if the detailed methodology used for certification described in Appendix 2 of the Certification Report is closely adhered to; deviations from these results are possible if other methods are used. However BCR No 69 may be used to check and/or calibrate apparatuses that measure Stokes diameter in the range covered by this reference material.

PARTICIPATING LABORATORIES

— The University of Bradford, Bradford (United Kingdom).
— Technische Universität Clausthal, Clausthal-Zellerfeld (Federal Republic of Germany).
— Universität Karlsruhe, Karlsruhe (Federal Republic of Germany).
— The University of Technology, Loughborough (United Kingdom).
— The National Physical Laboratory, Teddington (United Kingdom).

METHOD USED

The sample is certified with respect to the cumulative distribution by mass of the Stokes diameters of the particles as measured by sedimentation analysis in the gravity field (Pipette Method). Full details are given in the Certification Report (Appendix 2).

LEGAL NOTICE

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or assume any liability with respect to the use of, or for damages resulting from the use of any information, material, apparatus, methods or process disclosed in this document.

CERTIFICATION REPORT

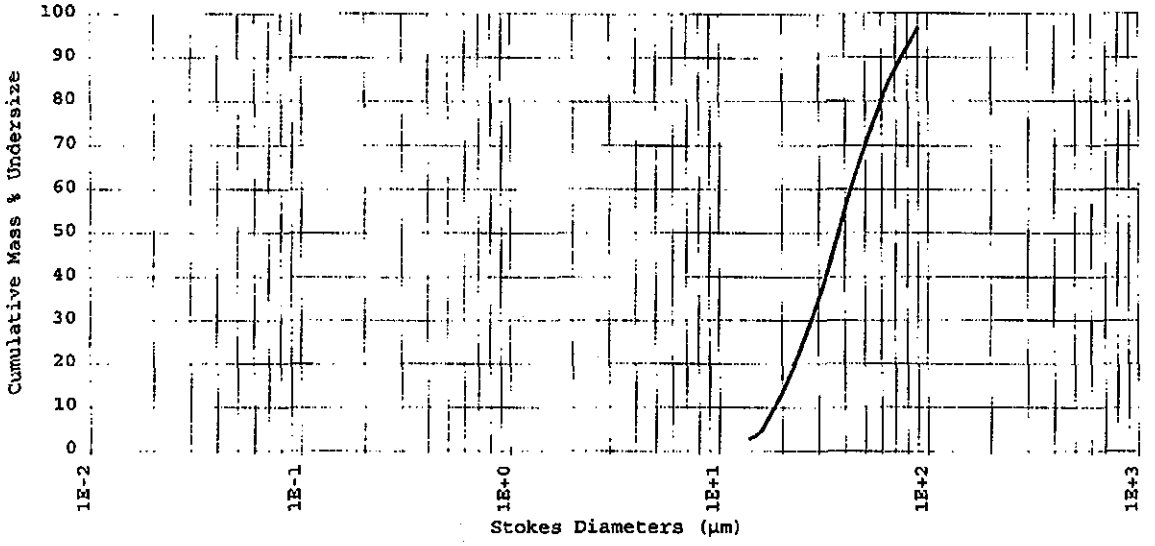
A Certification Report giving details of the certification procedures, of the methodology and of the data has been published (EUR 6825, 1980) and is available from the Community Bureau of Reference.

Rue de la Loi 200, B-1049 Brussels — Telephone 735 00 40/735 80 40 ext. 5014 — Telegraphic address « COMEUR Brussels » — Telex : 21 877 COMEU B »

CERTIFIED REFERENCE MATERIAL

Sample:	**BCR No 69**
Material:	Quartz Powder - Nominal Size Range 12 - 90 µm
Source:	Commission of the European Communities: Community Bureau of Reference - BCR -
Lot:	Bottle # 1749

Estimated -	Distribution Mean:	51.6	µm
	Standard Deviation:	20.4	µm
	Distribution Median:	37.5	µm

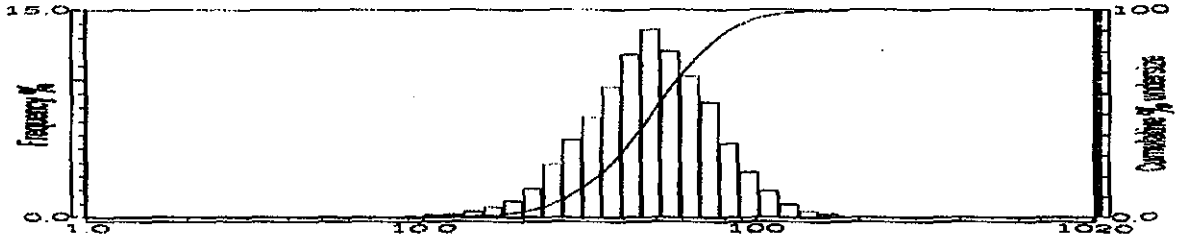


Certified Cumulative Particle Size Distribution

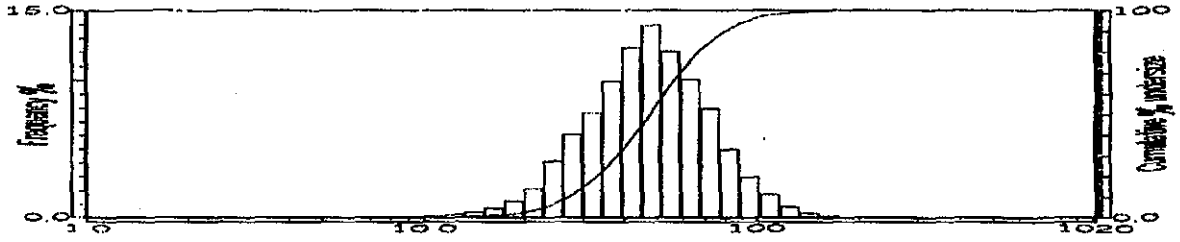
Stokes Diameter µm	Mass Fraction Undersize g/100g	Uncertainty g/100g
14.0	2.8	1.2
16.0	4.9	1.5
23.0	19.9	2.6
32.0	38.8	2.7
45.0	63.5	3.6
64.0	83.3	3.7
90.0	96.6	2.0

F-21 A. Volume-based PSDs for measurement runs on quartz powder standard BCR-69: 12 to 90 µm nominal particle diameters. Sample Key—Filename: Run Date; Run Conditions.

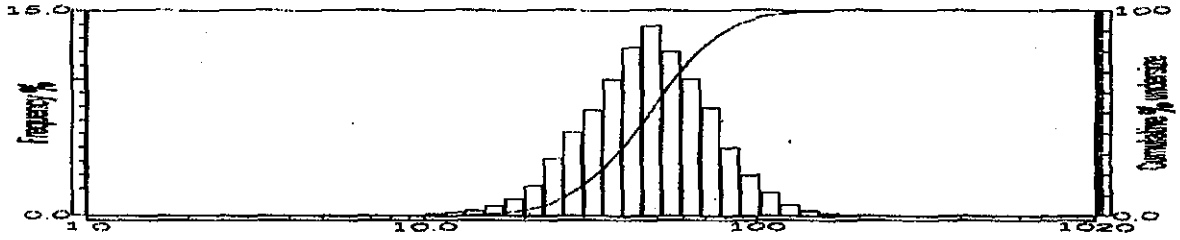
BC69672C: 07/31/2001; Dispersant = H2O; P5; S3; US = 2 min; DT = 10 s



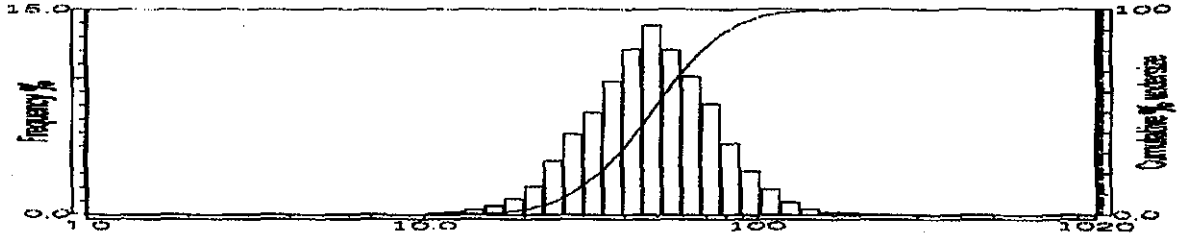
BC69687: 07/31/2001; Dispersant = H2O; P5; S3; US = 2 min; DT = 10 s



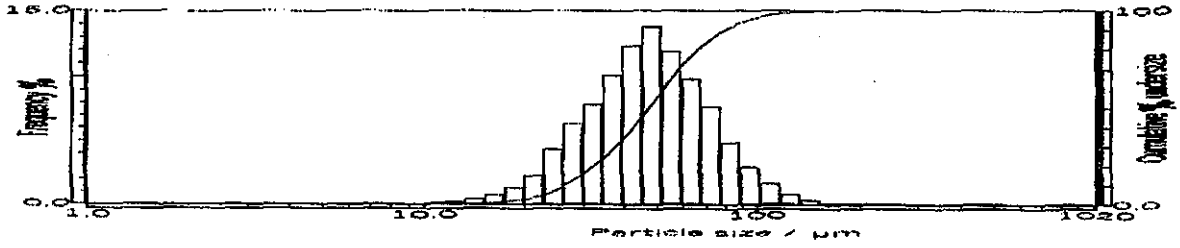
BC69732: 08/10/2001; Dispersant = H2O; P5; S3; US = 2 min; DT = 10 s



BC69779: 08/16/2001; Dispersant = H2O; P5; S3; US = 2 min; DT = 10 s

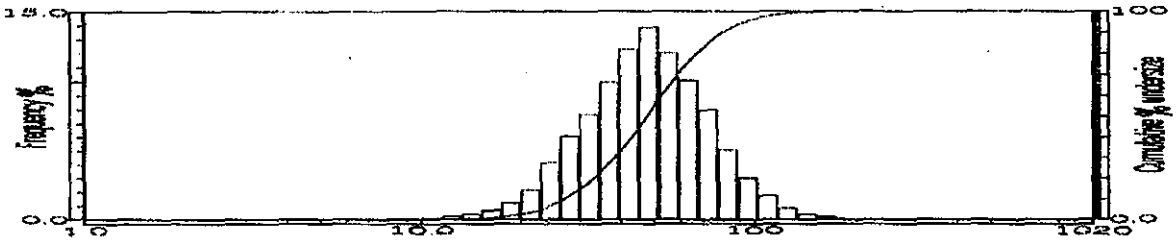


BC69873: 08/21/2001; Dispersant = H2O; P5; S3; US = 2 min; DT = 10 s

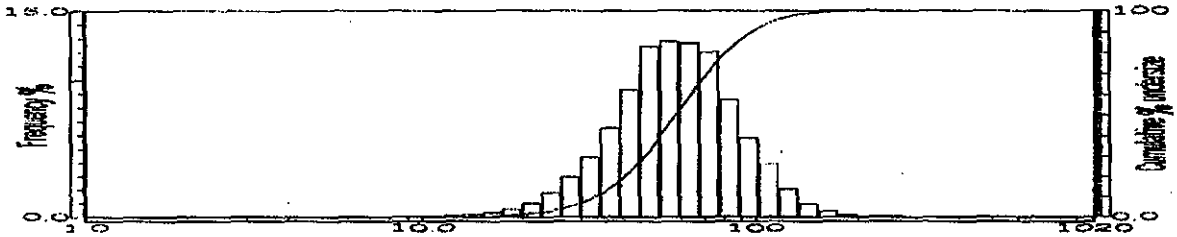


F-21 A (continued). Volume-based PSDs for measurement runs on quartz powder standard BCR-69: 12 to 90 μm nominal particle diameters.

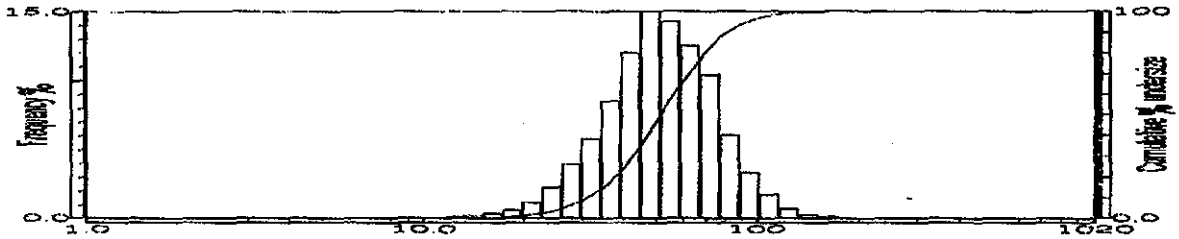
BC69875: 08/29/2001; Dispersant = H2O; P5; S3; US = 2 min; DT = 10 s



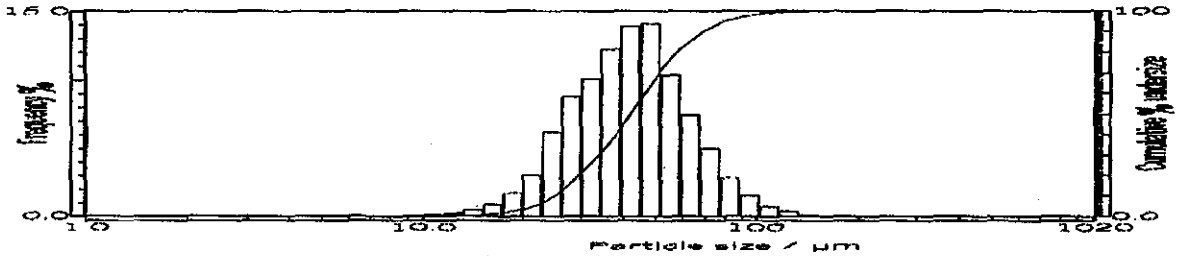
BC69893: 09/26/2001; Dispersant = H2O; P5; S3; US = 2 min; DT = 10 s



BCR69955: 09/27/2001; Dispersant = H2O; P5; S3; US = 2 min; DT = 10 s



BCR69997: 09/28/2001; Dispersant = H2O; P6; S3; US = 2 min; DT = 10 s

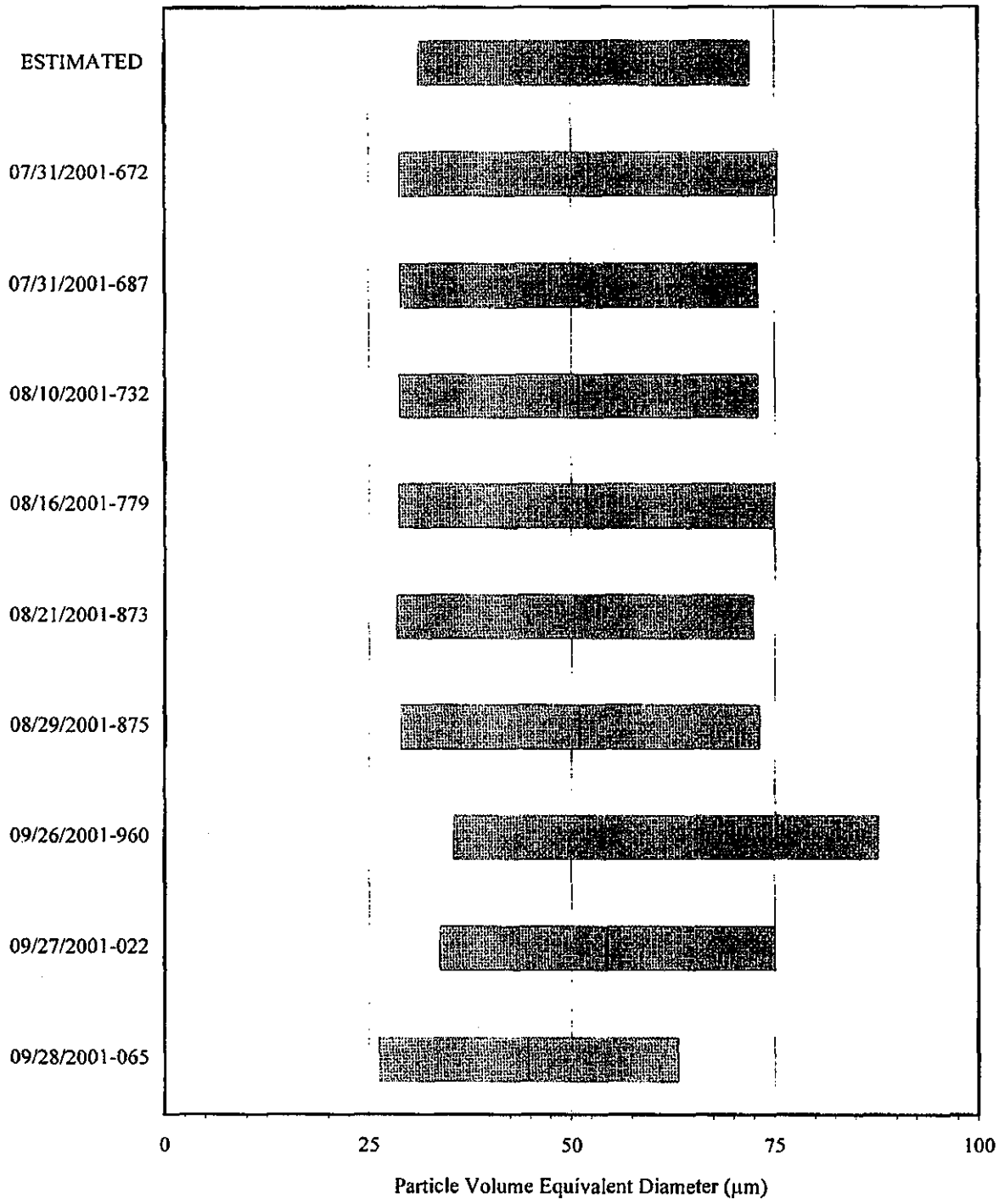


F-21 B. Mean, volume equivalent, particle diameters from PSD measurements of quartz powder standard BCR-69: 12 to 90 μm nominal diameters. PSD run date included in measurement identification. Measurement conditions: Dispersant - H_2O / Stirrer Speed - 3 / Pump Speed - 5 (10.6 mL/s) / Ultrasonic Time - 2 min / Delay Time - 10 seconds.

(RUN DATE-RUN #)	File ID	Mean Diameter (μm)	Standard Deviation (μm)
ESTIMATED		51.6	20.4
07/31/2001-672	BC69672C	52.1	23.3
07/31/2001-687	BC69687	50.9	22.0
08/10/2001-732	BC69732	50.9	22.1
08/16/2001-779	BC69779	51.9	23.1
08/21/2001-873	BC69873	50.4	22.0
08/29/2001-875	BC69875	51.0	22.1
09/26/2001-960	BC69893	61.6	26.2
09/27/2001-022	BCR69955	54.4	20.7
09/28/2001-065 *	BCR69997	44.7	18.5

* Pump Speed at setting "6" (14.4 mL/s) for this PSD run.

F-21 C. Mean particle diameters of volume-based particle size distributions for standard BCR-69. Vertical lines within bars indicate the mean particle diameters (μm). Bar widths represent ± one standard deviation range.

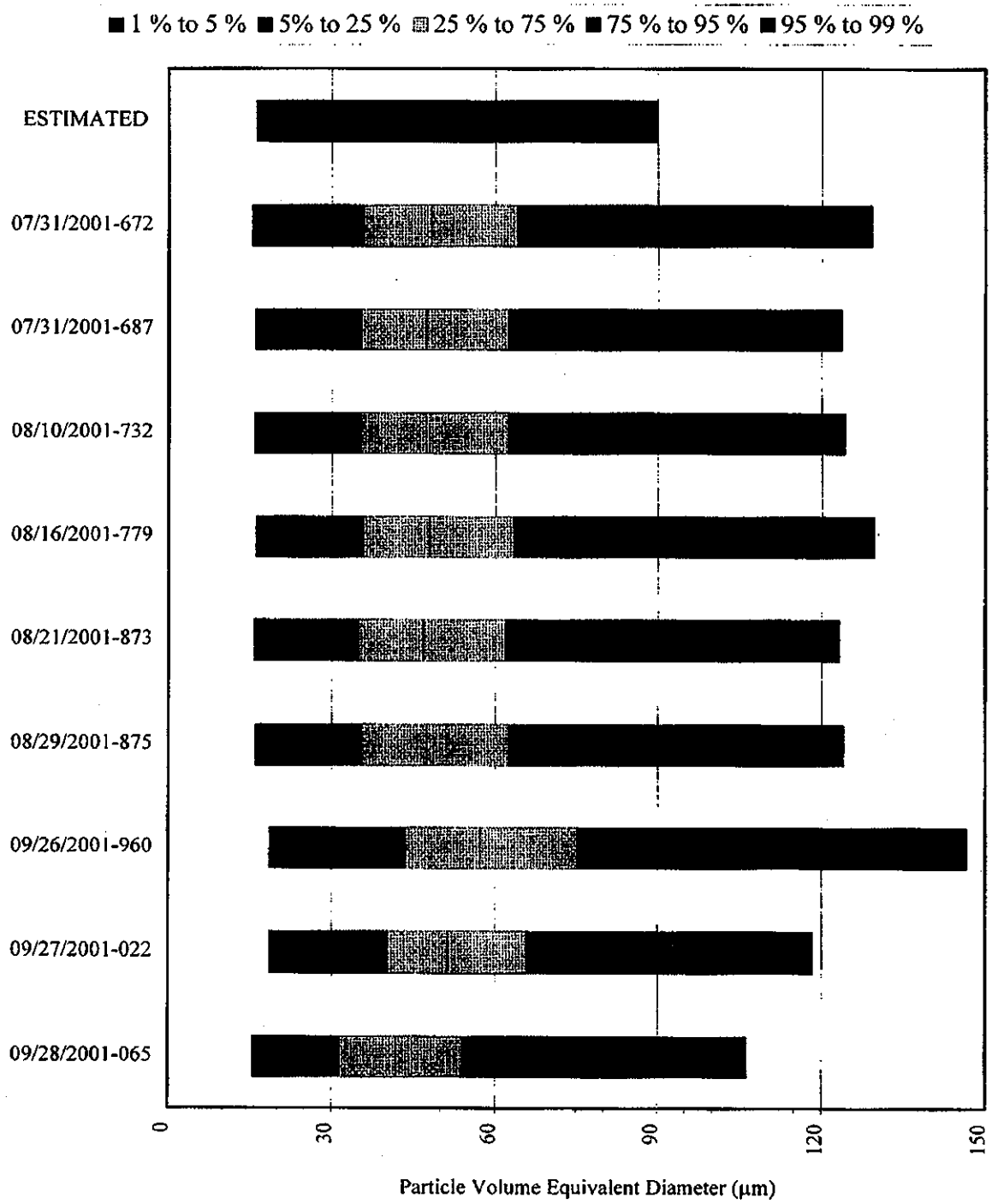


F-21 D. Percentages of quartz grains in standard BCR-69 with reported diameters (μm) less than the indicated values. Derived from volume-based, cumulative, %-Undersize, particle size distributions.

Sample	In Distributions Based on the Spherical Volume of Particles						
	1 %	5 %	25 %	50 %	75 %	95 %	99 %
	Of Particles Have Diameters Less Than (μm)						
ESTIMATED *		16.0		37.5		90.0	
07/31/2001-672	15.3	22.8	35.9	48.2	64.0	96.4	129.3
07/31/2001-687	15.9	22.9	35.4	47.3	62.4	93.0	123.7
08/10/2001-732	15.8	22.8	35.3	47.2	62.3	93.2	124.3
08/16/2001-779	16.0	23.1	35.8	47.8	63.4	95.8	129.7
08/21/2001-873	15.7	22.5	34.9	46.8	61.8	92.5	123.3
08/29/2001-875	15.9	22.9	35.4	47.3	62.5	93.4	124.1
09/26/2001-960	18.5	27.1	43.4	57.3	75.1	111.7	146.7
09/27/2001-022	18.5	26.3	40.2	51.2	65.9	93.2	118.4
09/28/2001-065	15.5	21.4	31.5	41.8	53.9	79.7	106.4

* The BCR-69 "Estimated" values include the following sedimentation measurement data: (1) the certified Stokes diameter (μm) at the 4.9% mass fraction undersize cut, (2) a graphically determined estimate of the median Stokes diameter, and (3) the certified Stokes diameter (μm) at the 96.6 % mass fraction undersize cut.

F-21 E. Diameters of quartz grains (μm), in standard BCR-69, within the indicated percentile ranges. Derived from volume-based, %-Undersize distributions. Vertical lines within the middl "25 % to 75 %" bars locate the median particle diameters.



HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/08/'01 17:17

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010731-672 14:21
Filename : BC69672C
Sample : BCR 69

Material : 12-90 um Quartz
Source : CEC/BCR
Lot Numbe : Bottle 1749 / Jar 69-3

Condition
T%(He-Ne): 68.4% Dist.Form: Std. Sampling times : 100
(LAMP): 80.4% R.R.Index: 1.16-0.00i ( )

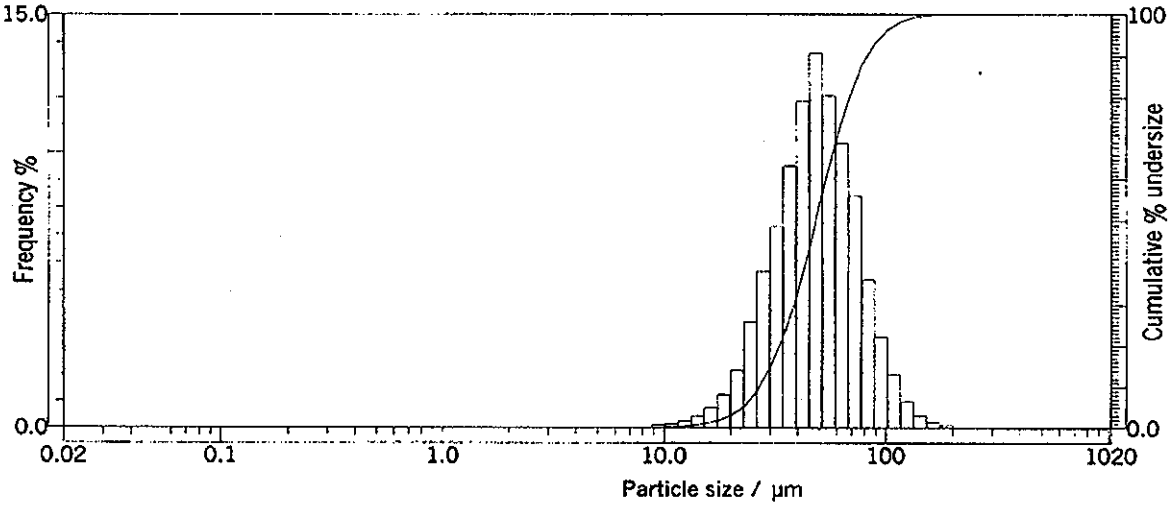
Agitation : 3 Circultn : 5 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX · LinearY

Data
Median : 48.090μm SP.Area : 1398cm²/cm³ S.D. : 23.307μm
Mode : 48.148μm Mean : 52.145μm
C.V. : 44.70%

Span : (D 10.0-D 90.0) / D50 = 1.152

Dia. on %(5.0%) : 22.762μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 35.821μm % on Dia.(1.000μm) : 0.0%
Dia. on %(50.0%) : 48.090μm % on Dia.(10.000μm) : 0.1%
Dia. on %(75.0%) : 63.904μm % on Dia.(100.000μm) : 95.9%
Dia. on %(95.0%) : 96.228μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	3.87	8.90	0.669	0.00	0.00
890.1	0.00	100.00	22.80	2.11	5.02	0.584	0.00	0.00
777.1	0.00	100.00	19.90	1.24	2.91	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.73	1.68	0.445	0.00	0.00
592.4	0.00	100.00	15.17	0.43	0.95	0.389	0.00	0.00
517.2	0.00	100.00	13.25	0.26	0.52	0.339	0.00	0.00
451.6	0.00	100.00	11.56	0.16	0.26	0.296	0.00	0.00
394.2	0.00	100.00	10.10	0.10	0.10	0.259	0.00	0.00
344.2	0.00	100.00	8.816	0.00	0.00	0.226	0.00	0.00
300.5	0.00	100.00	7.697	0.00	0.00	0.197	0.00	0.00
262.4	0.00	100.00	6.720	0.00	0.00	0.172	0.00	0.00
229.1	0.00	100.00	5.867	0.00	0.00	0.150	0.00	0.00
200.0	0.11	100.00	5.122	0.00	0.00	0.131	0.00	0.00
174.6	0.23	99.89	4.472	0.00	0.00	0.115	0.00	0.00
152.5	0.45	99.67	3.905	0.00	0.00	0.100	0.00	0.00
133.1	0.97	99.21	3.409	0.00	0.00	0.087	0.00	0.00
116.2	1.95	98.25	2.976	0.00	0.00	0.076	0.00	0.00
101.5	3.32	96.30	2.599	0.00	0.00	0.067	0.00	0.00
88.58	5.40	92.97	2.269	0.00	0.00	0.058	0.00	0.00
77.34	8.39	87.57	1.981	0.00	0.00	0.051	0.00	0.00
67.52	10.31	79.19	1.729	0.00	0.00	0.044	0.00	0.00
58.95	12.06	68.87	1.510	0.00	0.00	0.039	0.00	0.00
51.47	13.61	56.81	1.318	0.00	0.00	0.034	0.00	0.00
44.94	11.83	43.20	1.151	0.00	0.00	0.029	0.00	0.00
39.23	9.50	31.37	1.005	0.00	0.00	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/08/01
File Name: BC69672C.DAT Sample Name: BCR 69 ID No: 01/07/31-672
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 68.443 % Lamp: 80.437 %
Circulation: 5 Agitation: 3 U.Sonic ** (min)
Material: 12-90 um Quartz Source: CEC/BCR
Lot No: Bottle 1749 / Jar 69-3 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	10.045	0.10	0.10	(15)	50.601	5.00	55.00
(2)	15.325	0.90	1.00	(16)	53.448	5.00	60.00
(3)	18.648	1.30	2.30	(17)	56.550	5.00	65.00
(4)	22.765	2.70	5.00	(18)	59.889	5.00	70.00
(5)	26.847	5.00	10.00	(19)	64.045	5.00	75.00
(6)	30.153	5.00	15.00	(20)	68.477	5.00	80.00
(7)	30.631	0.80	15.80	(21)	73.391	4.20	84.20
(8)	33.138	4.20	20.00	(22)	74.327	0.80	85.00
(9)	35.895	5.00	25.00	(23)	82.391	5.00	90.00
(10)	38.516	5.00	30.00	(24)	96.437	5.00	95.00
(11)	40.984	5.00	35.00	(25)	112.061	2.70	97.70
(12)	43.393	5.00	40.00	(26)	129.344	1.30	99.00
(13)	45.800	5.00	45.00	(27)	176.052	0.90	99.90
(14)	48.200	5.00	50.00				

Median : 48.090 (μm) Mean: 52.145 (μm) Mode: 48.094 (μm)
Std. Dev.: 23.307 (μm) Span: 0.672
Coef. Var: 44.70% Spec. Area: 1398 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Aug/01/'01 07:54

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010731-687 17:05
Filename : BC69687
Sample : BCR 69

Material : 12-90 um Quartz
Source : CEC/BCR
Lot Numbe : Bottle 1749 / Jar 69-3

Condition
T%(He-Ne): 78.4% Dist.Form: Std. Sampling times : 100
(LAMP): 86.8% R.R.Index: 1.16-0.00i ( )

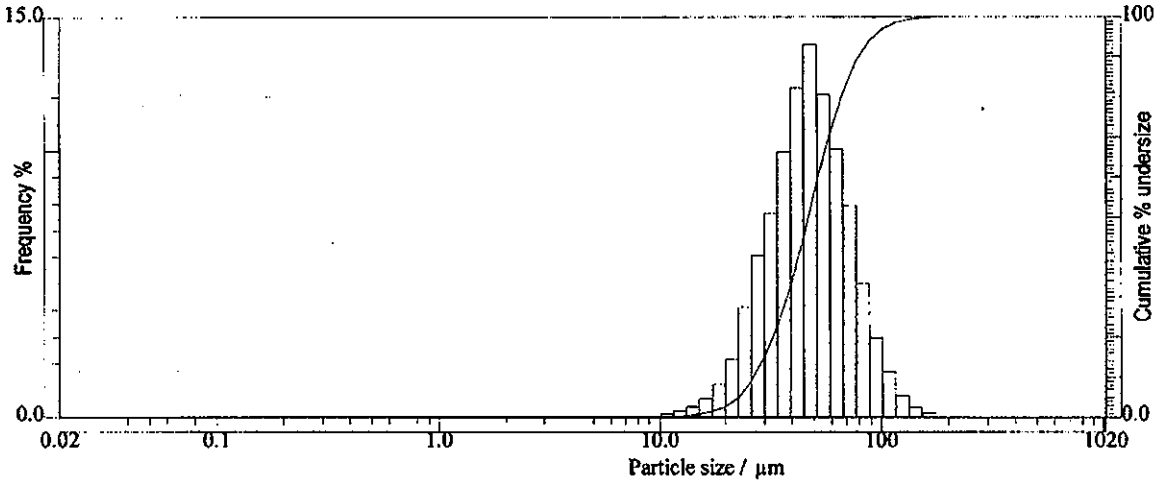
Agitation : 3 Circultn : 5 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 47.207μm SP.Area : 1413cm²/cm³ S.D. : 22.028μm
Mode : 48.034μm Mean : 50.944μm
C.V. : 43.24%

Span : (D 10.0-D 90.0) / D50 = 1.118

Dia. on %(5.0%) : 22.917μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 35.373μm % on Dia.(1.000μm) : 0.0%
Dia. on %(50.0%) : 47.207μm % on Dia.(10.000μm) : 0.0%
Dia. on %(75.0%) : 62.245μm % on Dia.(100.000μm) : 96.6%
Dia. on %(95.0%) : 92.847μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	4.10	8.94	0.669	0.00	0.00
890.1	0.00	100.00	22.80	2.15	4.84	0.584	0.00	0.00
777.1	0.00	100.00	19.90	1.22	2.69	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.70	1.47	0.445	0.00	0.00
592.4	0.00	100.00	15.17	0.40	0.77	0.389	0.00	0.00
517.2	0.00	100.00	13.25	0.23	0.37	0.339	0.00	0.00
451.6	0.00	100.00	11.56	0.14	0.14	0.296	0.00	0.00
394.2	0.00	100.00	10.10	0.00	0.00	0.259	0.00	0.00
344.2	0.00	100.00	8.816	0.00	0.00	0.226	0.00	0.00
300.5	0.00	100.00	7.697	0.00	0.00	0.197	0.00	0.00
262.4	0.00	100.00	6.720	0.00	0.00	0.172	0.00	0.00
229.1	0.00	100.00	5.867	0.00	0.00	0.150	0.00	0.00
200.0	0.00	100.00	5.122	0.00	0.00	0.131	0.00	0.00
174.6	0.18	100.00	4.472	0.00	0.00	0.115	0.00	0.00
152.5	0.37	99.82	3.905	0.00	0.00	0.100	0.00	0.00
133.1	0.81	99.45	3.409	0.00	0.00	0.087	0.00	0.00
116.2	1.69	98.64	2.976	0.00	0.00	0.076	0.00	0.00
101.5	2.98	96.95	2.599	0.00	0.00	0.067	0.00	0.00
88.58	4.98	93.97	2.269	0.00	0.00	0.058	0.00	0.00
77.34	7.96	88.99	1.981	0.00	0.00	0.051	0.00	0.00
67.52	10.06	81.03	1.729	0.00	0.00	0.044	0.00	0.00
58.95	12.07	70.97	1.510	0.00	0.00	0.039	0.00	0.00
51.47	13.97	58.90	1.318	0.00	0.00	0.034	0.00	0.00
44.94	12.33	44.93	1.151	0.00	0.00	0.029	0.00	0.00
39.23	9.96	32.60	1.005	0.00	0.00	0.026	0.00	0.00
34.25	7.66	22.64	0.877	0.00	0.00	0.022	0.00	0.00
29.91	6.04	14.99	0.766	0.00	0.00			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/01/01
File Name: BC69687.DAT Sample Name: BCR 69 ID No: 01/07/31-687
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 78.445 % Lamp: 86.792 %
Circulation: 5 Agitation: 3 U.Sonic ** (min)
Material: 12-90 um Quartz Source: CEC/BCR
Lot No: Bottle 1749 / Jar 69-3 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	11.143	0.10	0.10	(15)	49.647	5.00	55.00
(2)	15.893	0.90	1.00	(16)	52.153	5.00	60.00
(3)	19.090	1.30	2.30	(17)	55.251	5.00	65.00
(4)	22.925	2.70	5.00	(18)	58.350	5.00	70.00
(5)	26.775	5.00	10.00	(19)	62.384	5.00	75.00
(6)	29.915	5.00	15.00	(20)	66.643	5.00	80.00
(7)	30.369	0.80	15.80	(21)	71.430	4.20	84.20
(8)	32.754	4.20	20.00	(22)	72.417	0.80	85.00
(9)	35.433	5.00	25.00	(23)	79.620	5.00	90.00
(10)	37.933	5.00	30.00	(24)	93.043	5.00	95.00
(11)	40.344	5.00	35.00	(25)	108.036	2.70	97.70
(12)	42.657	5.00	40.00	(26)	123.733	1.30	99.00
(13)	44.970	5.00	45.00	(27)	162.217	0.90	99.90
(14)	47.308	5.00	50.00				

Median : 47.207 (μm) Mean: 50.944 (μm) Mode: 48.094 (μm)
Std. Dev.: 22.028 (μm) Span: 0.648
Coef. Var: 43.24% Spec. Area: 1413 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Aug/13/'01 16:10

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010810-732 09:54
Filename : BC69732
Sample : BCR 69

Material : 12-90 um Quartz
Source : CEC/BCR
Lot Numbe : Bottle 1749 / Jar 69-5

Condition
T%(He-Ne): 76.2% Dist.Form: Std. Sampling times : 100
(LAMP): 85.2% R.R.Index: 1.16-0.001 ( )

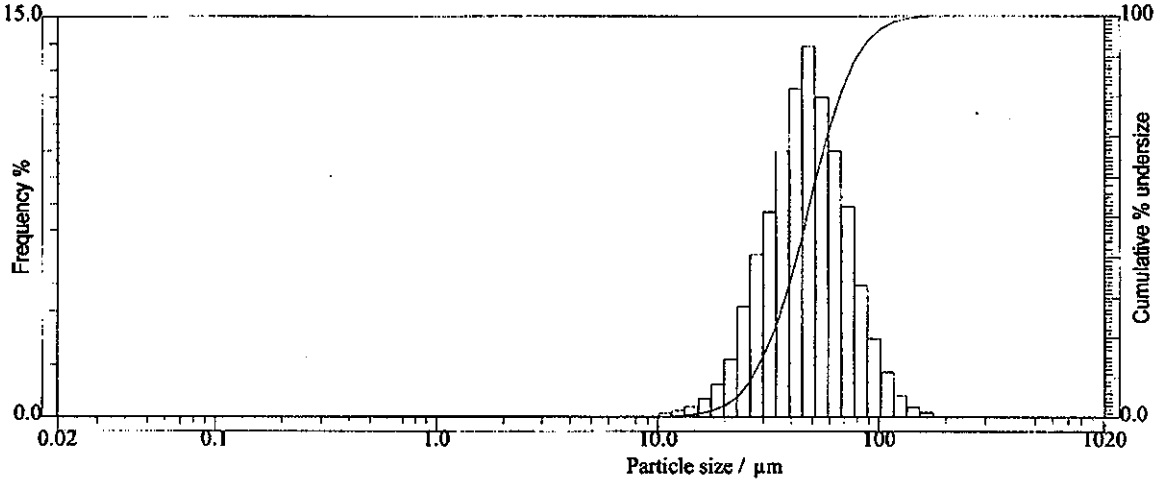
Agitation : 3 Circultn : 5 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 47.110µm SP.Area : 1417cm²/cm³ S.D. : 22.134µm
Mode : 48.023µm Mean : 50.885µm
C.V. : 43.50%

Span : (D 10.0-D 90.0) / D50 = 1.124

Dia. on %(5.0%) : 22.827µm % on Dia.(0.100µm) : 0.0%
Dia. on %(25.0%) : 35.248µm % on Dia.(1.000µm) : 0.0%
Dia. on %(50.0%) : 47.110µm % on Dia.(10.000µm) : 0.0%
Dia. on %(75.0%) : 62.191µm % on Dia.(100.000µm) : 96.6%
Dia. on %(95.0%) : 93.036µm % on Dia.(1000.000µm) : 100.0%



Size(µm)	Freq(%)	Und(%)	Size(µm)	Freq(%)	Und(%)	Size(µm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	4.15	9.11	0.669	0.00	0.00
890.1	0.00	100.00	22.80	2.19	4.96	0.584	0.00	0.00
777.1	0.00	100.00	19.90	1.26	2.77	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.72	1.51	0.445	0.00	0.00
592.4	0.00	100.00	15.17	0.41	0.80	0.389	0.00	0.00
517.2	0.00	100.00	13.25	0.24	0.38	0.339	0.00	0.00
451.6	0.00	100.00	11.56	0.14	0.14	0.296	0.00	0.00
394.2	0.00	100.00	10.10	0.00	0.00	0.259	0.00	0.00
344.2	0.00	100.00	8.816	0.00	0.00	0.226	0.00	0.00
300.5	0.00	100.00	7.697	0.00	0.00	0.197	0.00	0.00
262.4	0.00	100.00	6.720	0.00	0.00	0.172	0.00	0.00
229.1	0.00	100.00	5.867	0.00	0.00	0.150	0.00	0.00
200.0	0.00	100.00	5.122	0.00	0.00	0.131	0.00	0.00
174.6	0.19	100.00	4.472	0.00	0.00	0.115	0.00	0.00
152.5	0.38	99.81	3.905	0.00	0.00	0.100	0.00	0.00
133.1	0.82	99.43	3.409	0.00	0.00	0.087	0.00	0.00
116.2	1.70	98.61	2.976	0.00	0.00	0.076	0.00	0.00
101.5	2.98	96.90	2.599	0.00	0.00	0.067	0.00	0.00
88.58	4.96	93.92	2.269	0.00	0.00	0.058	0.00	0.00
77.34	7.90	88.96	1.981	0.00	0.00	0.051	0.00	0.00
67.52	9.99	81.06	1.729	0.00	0.00	0.044	0.00	0.00
58.95	12.00	71.06	1.510	0.00	0.00	0.039	0.00	0.00
51.47	13.90	59.06	1.318	0.00	0.00	0.034	0.00	0.00
44.94	12.30	45.17	1.151	0.00	0.00	0.029	0.00	0.00
39.23	9.97	32.87	1.005	0.00	0.00	0.026	0.00	0.00
34.25	7.70	22.90	0.877	0.00	0.00	0.022	0.00	0.00
29.91	6.09	15.21	0.766	0.00	0.00			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/15/01
File Name: BC69732.DAT Sample Name: BCR 69 ID No: 01/08/10-732
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 76.178 % Lamp: 85.221 %
Circulation: 5 Agitation: 3 U.Sonic ** (min)
Material: 12-90 um Quartz Source: CEC/BCR
Lot No: Bottle 1749 / Jar 69-5 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	11.110	0.10	0.10	(15)	49.560	5.00	55.00
(2)	15.797	0.90	1.00	(16)	52.054	5.00	60.00
(3)	18.958	1.30	2.30	(17)	55.172	5.00	65.00
(4)	22.830	2.70	5.00	(18)	58.290	5.00	70.00
(5)	26.664	5.00	10.00	(19)	62.330	5.00	75.00
(6)	29.779	5.00	15.00	(20)	66.618	5.00	80.00
(7)	30.243	0.80	15.80	(21)	71.429	4.20	84.20
(8)	32.616	4.20	20.00	(22)	72.423	0.80	85.00
(9)	35.303	5.00	25.00	(23)	79.701	5.00	90.00
(10)	37.800	5.00	30.00	(24)	93.237	5.00	95.00
(11)	40.222	5.00	35.00	(25)	108.358	2.70	97.70
(12)	42.541	5.00	40.00	(26)	124.297	1.30	99.00
(13)	44.860	5.00	45.00	(27)	162.823	0.90	99.90
(14)	47.209	5.00	50.00				

Median : 47.110 (μm) Mean: 50.885 (μm) Mode: 48.094 (μm)
Std. Dev.: 22.134 (μm) Span: 0.655
Coef. Var: 43.50% Spec. Area: 1417 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Aug/27/'01 11:53

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010816-779 07:17
Filename : BC69779
Sample : BCR 69

Material : 12-90 um Quartz
Source : CEC/BCR
Lot Numbe : Bottle 1749 Jar 69-5

Condition
T%(He-Ne): 78.9% Dist.Form: Std. Sampling times : 100
(LAMP): 87.3% R.R.Index: 1.16-0.001 ( )

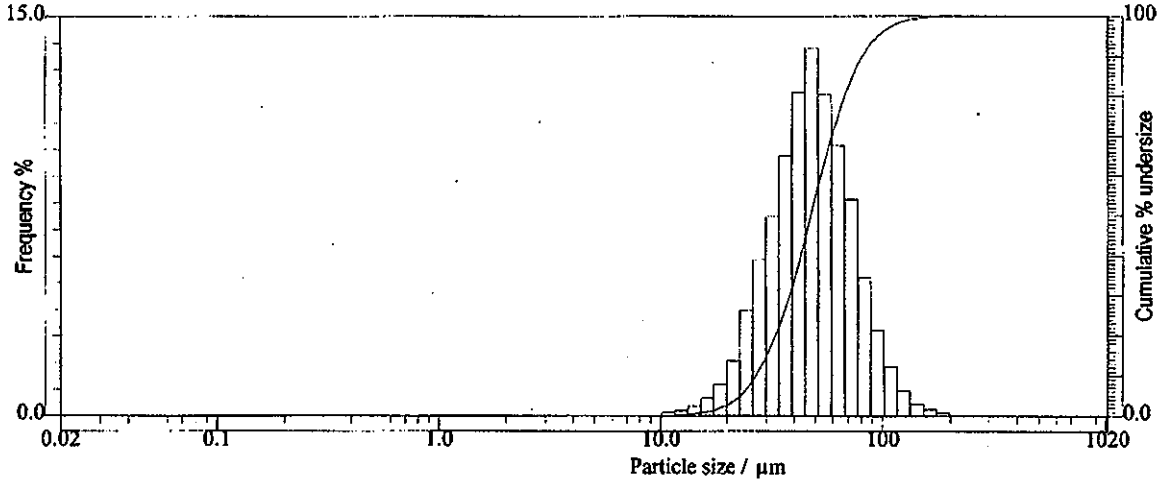
Agitation : 3 Circultn : 5 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 47.727µm SP.Area : 1396cm²/cm³ S.D. : 23.142µm
Mode : 48.074µm Mean : 51.861µm
C.V. : 44.62%

Span : (D 10.0-D 90.0) / D50 = 1.143

Dia. on %(5.0%) : 23.055µm % on Dia.(0.100µm) : 0.0%
Dia. on %(25.0%) : 35.722µm % on Dia.(1.000µm) : 0.0%
Dia. on %(50.0%) : 47.727µm % on Dia.(10.000µm) : 0.0%
Dia. on %(75.0%) : 63.257µm % on Dia.(100.000µm) : 96.1%
Dia. on %(95.0%) : 95.615µm % on Dia.(1000.000µm) : 100.0%



Size(µm)	Freq(%)	Und(%)	Size(µm)	Freq(%)	Und(%)	Size(µm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	3.97	8.64	0.669	0.00	0.00
890.1	0.00	100.00	22.80	2.08	4.67	0.584	0.00	0.00
777.1	0.00	100.00	19.90	1.18	2.59	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.67	1.41	0.445	0.00	0.00
592.4	0.00	100.00	15.17	0.38	0.74	0.389	0.00	0.00
517.2	0.00	100.00	13.25	0.22	0.36	0.339	0.00	0.00
451.6	0.00	100.00	11.56	0.13	0.13	0.296	0.00	0.00
394.2	0.00	100.00	10.10	0.00	0.00	0.259	0.00	0.00
344.2	0.00	100.00	8.816	0.00	0.00	0.226	0.00	0.00
300.5	0.00	100.00	7.697	0.00	0.00	0.197	0.00	0.00
262.4	0.00	100.00	6.720	0.00	0.00	0.172	0.00	0.00
229.1	0.00	100.00	5.867	0.00	0.00	0.150	0.00	0.00
200.0	0.12	100.00	5.122	0.00	0.00	0.131	0.00	0.00
174.6	0.24	99.88	4.472	0.00	0.00	0.115	0.00	0.00
152.5	0.45	99.64	3.905	0.00	0.00	0.100	0.00	0.00
133.1	0.93	99.19	3.409	0.00	0.00	0.087	0.00	0.00
116.2	1.86	98.25	2.976	0.00	0.00	0.076	0.00	0.00
101.5	3.20	96.40	2.599	0.00	0.00	0.067	0.00	0.00
88.58	5.20	93.20	2.269	0.00	0.00	0.058	0.00	0.00
77.34	8.12	88.00	1.981	0.00	0.00	0.051	0.00	0.00
67.52	10.15	79.88	1.729	0.00	0.00	0.044	0.00	0.00
58.95	12.05	69.73	1.510	0.00	0.00	0.039	0.00	0.00
51.47	13.82	57.69	1.318	0.00	0.00	0.034	0.00	0.00
44.94	12.13	43.87	1.151	0.00	0.00	0.029	0.00	0.00
39.23	9.75	31.74	1.005	0.00	0.00	0.026	0.00	0.00
34.25	7.47	21.98	0.877	0.00	0.00	0.022	0.00	0.00
29.91	5.87	14.52	0.766	0.00	0.00			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/27/01
File Name: BC69779.DAT Sample Name: BCR 69 ID No: 01/08/16-779
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 78.931 % Lamp: 87.259 %
Circulation: 5 Agitation: 3 U.Sonic ** (min)
Material: 12-90 um Quartz Source: CEC/BCR
Lot No: Bottle 1749 Jar 69-5 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	11.195	0.10	0.10	(15)	50.201	5.00	55.00
(2)	16.027	0.90	1.00	(16)	52.908	5.00	60.00
(3)	19.275	1.30	2.30	(17)	56.014	5.00	65.00
(4)	23.071	2.70	5.00	(18)	59.179	5.00	70.00
(5)	26.988	5.00	10.00	(19)	63.402	5.00	75.00
(6)	30.189	5.00	15.00	(20)	67.669	5.00	80.00
(7)	30.655	0.80	15.80	(21)	72.744	4.20	84.20
(8)	33.099	4.20	20.00	(22)	73.711	0.80	85.00
(9)	35.794	5.00	25.00	(23)	81.659	5.00	90.00
(10)	38.346	5.00	30.00	(24)	95.830	5.00	95.00
(11)	40.767	5.00	35.00	(25)	111.811	2.70	97.70
(12)	43.118	5.00	40.00	(26)	129.716	1.30	99.00
(13)	45.472	5.00	45.00	(27)	178.924	0.90	99.90
(14)	47.837	5.00	50.00				

Median : 47.727 (μm) Mean: 51.861 (μm) Mode: 48.094 (μm)
Std. Dev.: 23.142 (μm) Span: 0.678
Coef. Var: 44.62% Spec. Area: 1396 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Aug/27/'01 11:54

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010821-873 07:58
Filename : BC69873
Sample : BCR69

Material : 12-90 um Quartz
Source : CEC/BCR
Lot Numbe : Bottle 1749 / Jar 69-5

Condition
T%(He-Ne): 77.2%
(LAMP): 85.9%
Dist.Form: Std.
R.R.Index: 1.16-0.00i
Sampling times : 100
( )

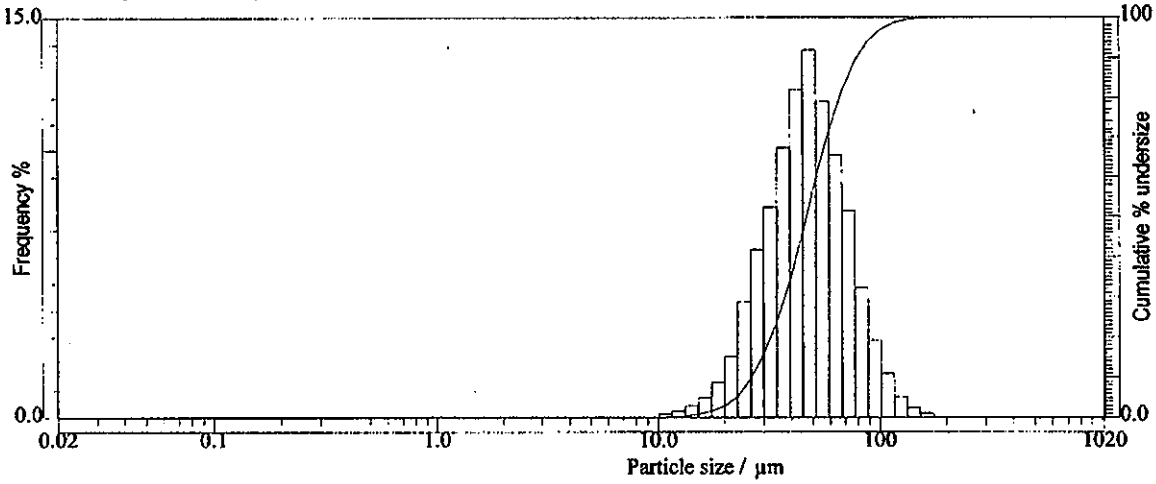
Agitation : 3
Circultn : 5
U.sonic : ON(120)

Format
Dist.base : Volume
Scaling : Auto
Axis : LogX - LinearY

Data
Median : 46.697µm
SP.Area : 1431cm²/cm³
S.D. : 22.025µm
Mode : 47.981µm
Mean : 50.442µm
C.V. : 43.66%

Span : (D 10.0-D 90.0) / D50 = 1.125

Dia. on %(5.0%) :	22.526µm	% on Dia.(0.100µm) :	0.0%
Dia. on %(25.0%) :	34.867µm	% on Dia.(1.000µm) :	0.0%
Dia. on %(50.0%) :	46.697µm	% on Dia.(10.000µm) :	0.0%
Dia. on %(75.0%) :	61.670µm	% on Dia.(100.000µm) :	96.7%
Dia. on %(95.0%) :	92.318µm	% on Dia.(1000.000µm) :	100.0%



Size(µm)	Freq(%)	Und(%)	Size(µm)	Freq(%)	Und(%)	Size(µm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	4.33	9.53	0.669	0.00	0.00
890.1	0.00	100.00	22.80	2.29	5.20	0.584	0.00	0.00
777.1	0.00	100.00	19.90	1.32	2.91	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.75	1.59	0.445	0.00	0.00
592.4	0.00	100.00	15.17	0.43	0.84	0.389	0.00	0.00
517.2	0.00	100.00	13.25	0.25	0.40	0.339	0.00	0.00
451.6	0.00	100.00	11.56	0.15	0.15	0.296	0.00	0.00
394.2	0.00	100.00	10.10	0.00	0.00	0.259	0.00	0.00
344.2	0.00	100.00	8.816	0.00	0.00	0.226	0.00	0.00
300.5	0.00	100.00	7.697	0.00	0.00	0.197	0.00	0.00
262.4	0.00	100.00	6.720	0.00	0.00	0.172	0.00	0.00
229.1	0.00	100.00	5.867	0.00	0.00	0.150	0.00	0.00
200.0	0.00	100.00	5.122	0.00	0.00	0.131	0.00	0.00
174.6	0.18	100.00	4.472	0.00	0.00	0.115	0.00	0.00
152.5	0.36	99.82	3.905	0.00	0.00	0.100	0.00	0.00
133.1	0.80	99.46	3.409	0.00	0.00	0.087	0.00	0.00
116.2	1.65	98.66	2.976	0.00	0.00	0.076	0.00	0.00
101.5	2.90	97.02	2.599	0.00	0.00	0.067	0.00	0.00
88.58	4.84	94.12	2.269	0.00	0.00	0.058	0.00	0.00
77.34	7.72	89.28	1.981	0.00	0.00	0.051	0.00	0.00
67.52	9.82	81.56	1.729	0.00	0.00	0.044	0.00	0.00
58.95	11.85	71.74	1.510	0.00	0.00	0.039	0.00	0.00
51.47	13.79	59.89	1.318	0.00	0.00	0.034	0.00	0.00
44.94	12.33	46.10	1.151	0.00	0.00	0.029	0.00	0.00
39.23	10.09	33.77	1.005	0.00	0.00	0.026	0.00	0.00
34.25	7.86	23.68	0.877	0.00	0.00	0.022	0.00	0.00
29.91	6.29	15.82	0.766	0.00	0.00			

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 08/27/01
File Name: BC69873.DAT Sample Name: BCR69 ID No: 01/08/21-873
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 77.177 % Lamp: 85.877 %
Circulation: 5 Agitation: 3 U.Sonic ** (min)
Material: 12-90 µm Quartz Source: CEC/BCR
Lot No: Bottle 1749 / Jar 69-5 Test No:

No.	SIZE(µm)	FREQ.%	U.SIZE%	No.	SIZE(µm)	FREQ.%	U.SIZE%
(1)	11.067	0.10	0.10	(15)	49.154	5.00	55.00
(2)	15.653	0.90	1.00	(16)	51.540	5.00	60.00
(3)	18.736	1.30	2.30	(17)	54.697	5.00	65.00
(4)	22.542	2.70	5.00	(18)	57.854	5.00	70.00
(5)	26.392	5.00	10.00	(19)	61.798	5.00	75.00
(6)	29.411	5.00	15.00	(20)	66.163	5.00	80.00
(7)	29.894	0.80	15.80	(21)	70.883	4.20	84.20
(8)	32.218	4.20	20.00	(22)	71.900	0.80	85.00
(9)	34.905	5.00	25.00	(23)	79.019	5.00	90.00
(10)	37.372	5.00	30.00	(24)	92.502	5.00	95.00
(11)	39.802	5.00	35.00	(25)	107.585	2.70	97.70
(12)	42.116	5.00	40.00	(26)	123.344	1.30	99.00
(13)	44.429	5.00	45.00	(27)	161.985	0.90	99.90
(14)	46.786	5.00	50.00				

Median : 46.697 (µm) Mean: 50.442 (µm) Mode: 48.094 (µm)
Std. Dev.: 22.025 (µm) Span: 0.656
Coef. Var: 43.66% Spec. Area: 1431 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/26/'01 06:27

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010829-875 13:02
Filename : BC69875
Sample : BCR69

Material : 12-90 um Quartz
Source : Duke Scientific
Lot Numbe : Bott. 1749 / Jar 69-6

Condition
T%(He-Ne): 79.1% Dist.Form: Std. Sampling times : 100
(LAMP): 87.8% R.R.Index: 1.16-0.00i ( )

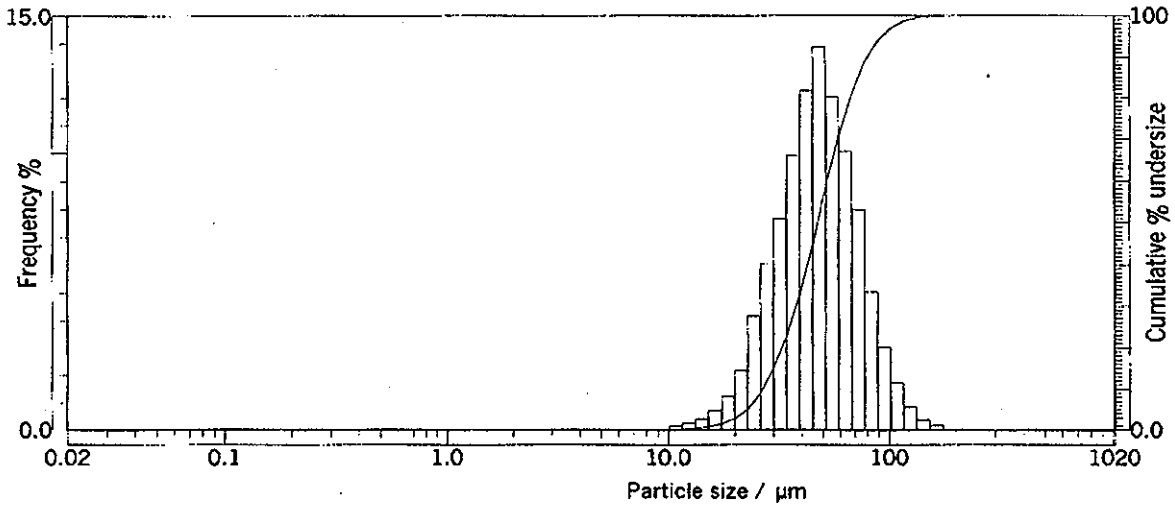
Agitation : 3 Circultn : 5 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 47.238μm SP.Area : 1412cm²/cm³ S.D. : 22.131μm
Mode : 48.038μm Mean : 51.021μm
C.V. : 43.38%

Span : (D 10.0-D 90.0) / D50 = 1.124

Dia. on %(5.0%) :	22.906μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	35.347μm	% on Dia.(1.000μm) :	0.0%
Dia. on %(50.0%) :	47.238μm	% on Dia.(10.000μm) :	0.0%
Dia. on %(75.0%) :	62.396μm	% on Dia.(100.000μm) :	96.6%
Dia. on %(95.0%) :	93.238μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	4.13	8.99	0.669	0.00	0.00
890.1	0.00	100.00	22.80	2.16	4.86	0.584	0.00	0.00
777.1	0.00	100.00	19.90	1.23	2.69	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.70	1.46	0.445	0.00	0.00
592.4	0.00	100.00	15.17	0.40	0.76	0.389	0.00	0.00
517.2	0.00	100.00	13.25	0.23	0.37	0.339	0.00	0.00
451.6	0.00	100.00	11.56	0.14	0.14	0.296	0.00	0.00
394.2	0.00	100.00	10.10	0.00	0.00	0.259	0.00	0.00
344.2	0.00	100.00	8.816	0.00	0.00	0.226	0.00	0.00
300.5	0.00	100.00	7.697	0.00	0.00	0.197	0.00	0.00
262.4	0.00	100.00	6.720	0.00	0.00	0.172	0.00	0.00
229.1	0.00	100.00	5.867	0.00	0.00	0.150	0.00	0.00
200.0	0.00	100.00	5.122	0.00	0.00	0.131	0.00	0.00
174.6	0.18	100.00	4.472	0.00	0.00	0.115	0.00	0.00
152.5	0.38	99.82	3.905	0.00	0.00	0.100	0.00	0.00
133.1	0.83	99.44	3.409	0.00	0.00	0.087	0.00	0.00
116.2	1.73	98.61	2.976	0.00	0.00	0.076	0.00	0.00
101.5	3.02	96.88	2.599	0.00	0.00	0.067	0.00	0.00
88.58	5.03	93.86	2.269	0.00	0.00	0.058	0.00	0.00
77.34	7.98	88.83	1.981	0.00	0.00	0.051	0.00	0.00
67.52	10.06	80.85	1.729	0.00	0.00	0.044	0.00	0.00
58.95	12.03	70.79	1.510	0.00	0.00	0.039	0.00	0.00
51.47	13.87	58.77	1.318	0.00	0.00	0.034	0.00	0.00
44.94	12.26	44.90	1.151	0.00	0.00	0.029	0.00	0.00
39.23	9.93	32.64	1.005	0.00	0.00	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/26/01

File Name: BC69875.DAT Sample Name: BCR69 ID No: 01/08/29-875

Dist. Form: STANDARD R.R. Index: 116-000

Dist. Mode: VOLUME Laser: 79.139 % Lamp: 87.783 %

Circulation: 5 Agitation: 3 U.Sonic ** (min)

Material: 12-90 um Quartz Source: Duke Scientific

Lot No: Bott. 1749 / Jar 69-6 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	11.169	0.10	0.10	(15)	49.697	5.00	55.00
(2)	15.921	0.90	1.00	(16)	52.238	5.00	60.00
(3)	19.096	1.30	2.30	(17)	55.349	5.00	65.00
(4)	22.913	2.70	5.00	(18)	58.459	5.00	70.00
(5)	26.745	5.00	10.00	(19)	62.537	5.00	75.00
(6)	29.877	5.00	15.00	(20)	66.797	5.00	80.00
(7)	30.334	0.80	15.80	(21)	71.642	4.20	84.20
(8)	32.720	4.20	20.00	(22)	72.626	0.80	85.00
(9)	35.407	5.00	25.00	(23)	79.951	5.00	90.00
(10)	37.913	5.00	30.00	(24)	93.443	5.00	95.00
(11)	40.334	5.00	35.00	(25)	108.448	2.70	97.70
(12)	42.659	5.00	40.00	(26)	124.089	1.30	99.00
(13)	44.985	5.00	45.00	(27)	162.129	0.90	99.90
(14)	47.341	5.00	50.00				

Median : 47.238 (μm) Mean: 51.021 (μm) Mode: 48.094 (μm)

Std. Dev.: 22.131 (μm) Span: 0.653

Coef. Var: 43.38% Spec. Area: 1412 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Sep/27/'01 16:09

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010926-960 11:40
Filename : BC69893
Sample : bcr 69

Material : poly disperse silica
Source : Duke Scientific
Lot Numbe : bcr69-6

Condition
T%(He-Ne): 79.6% Dist.Form: Std. Sampling times : 100
(LAMP): 89.1% R.R.Index: 1.16-0.00i ( )

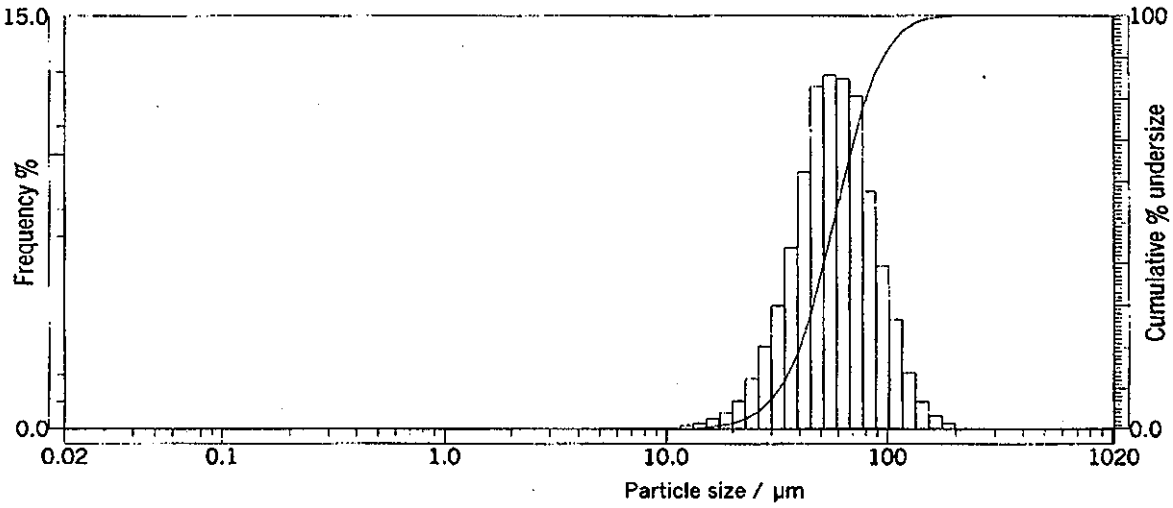
Agitation : 3 Circultn : 5 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 57.185μm SP.Area : 1168cm²/cm³ S.D. : 26.166μm
Mode : 55.162μm Mean : 61.596μm
C.V. : 42.48%

Span : (D 10.0-D 90.0) / D50 = 1.116

Dia. on %(5.0%) : 27.085μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 43.286μm % on Dia.(1.000μm) : 0.0%
Dia. on %(50.0%) : 57.185μm % on Dia.(10.000μm) : 0.0%
Dia. on %(75.0%) : 75.023μm % on Dia.(100.000μm) : 91.6%
Dia. on %(95.0%) : 111.484μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	1.84	4.18	0.669	0.00	0.00
890.1	0.00	100.00	22.80	1.02	2.35	0.584	0.00	0.00
777.1	0.00	100.00	19.90	0.59	1.32	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.37	0.73	0.445	0.00	0.00
592.4	0.00	100.00	15.17	0.22	0.36	0.389	0.00	0.00
517.2	0.00	100.00	13.25	0.14	0.14	0.339	0.00	0.00
451.6	0.00	100.00	11.56	0.00	0.00	0.296	0.00	0.00
394.2	0.00	100.00	10.10	0.00	0.00	0.259	0.00	0.00
344.2	0.00	100.00	8.816	0.00	0.00	0.226	0.00	0.00
300.5	0.00	100.00	7.697	0.00	0.00	0.197	0.00	0.00
262.4	0.00	100.00	6.720	0.00	0.00	0.172	0.00	0.00
229.1	0.00	100.00	5.867	0.00	0.00	0.150	0.00	0.00
200.0	0.22	100.00	5.122	0.00	0.00	0.131	0.00	0.00
174.6	0.48	99.78	4.472	0.00	0.00	0.115	0.00	0.00
152.5	1.00	99.30	3.905	0.00	0.00	0.100	0.00	0.00
133.1	2.08	98.30	3.409	0.00	0.00	0.087	0.00	0.00
116.2	3.98	96.22	2.976	0.00	0.00	0.076	0.00	0.00
101.5	5.89	92.23	2.599	0.00	0.00	0.067	0.00	0.00
88.58	8.63	86.34	2.269	0.00	0.00	0.058	0.00	0.00
77.34	12.10	77.71	1.981	0.00	0.00	0.051	0.00	0.00
67.52	12.73	65.61	1.729	0.00	0.00	0.044	0.00	0.00
58.95	12.85	52.88	1.510	0.00	0.00	0.039	0.00	0.00
51.47	12.46	40.04	1.318	0.00	0.00	0.034	0.00	0.00
44.94	9.33	27.57	1.151	0.00	0.00	0.029	0.00	0.00
39.23	6.56	18.24	1.005	0.00	0.00	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 09/27/01
File Name: BC69893.DAT Sample Name: bcr 69 ID No: 01/09/26-960
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 79.559 % Lamp: 89.147 %
Circulation: 5 Agitation: 3 U.Sonic ** (min)
Material: poly disperse silica Source: Duke Scientific
Lot No: bcr69-6 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	12.758	0.10	0.10	(15)	60.380	5.00	55.00
(2)	18.522	0.90	1.00	(16)	63.747	5.00	60.00
(3)	22.664	1.30	2.30	(17)	67.114	5.00	65.00
(4)	27.135	2.70	5.00	(18)	71.085	5.00	70.00
(5)	32.621	5.00	10.00	(19)	75.140	5.00	75.00
(6)	36.774	5.00	15.00	(20)	80.321	5.00	80.00
(7)	37.380	0.80	15.80	(21)	85.793	4.20	84.20
(8)	40.308	4.20	20.00	(22)	86.835	0.80	85.00
(9)	43.364	5.00	25.00	(23)	96.578	5.00	90.00
(10)	46.209	5.00	30.00	(24)	111.698	5.00	95.00
(11)	48.831	5.00	35.00	(25)	128.251	2.70	97.70
(12)	51.452	5.00	40.00	(26)	146.706	1.30	99.00
(13)	54.362	5.00	45.00	(27)	188.562	0.90	99.90
(14)	57.274	5.00	50.00				

Median : 57.185 (μm) Mean: 61.596 (μm) Mode: 55.085 (μm)
Std. Dev.: 26.166 (μm) Span: 0.638
Coef. Var: 42.48% Spec. Area: 1168 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/01/'01 16:24

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010927-022 10:25
Filename : BCR69955
Sample : BCR 69

Material : quartz polydispersed
Source :
Lot Numbe : bcr69-6

Condition
T%(He-Ne): 85.1% Dist.Form: Std. Sampling times : 100
(LAMP): 93.4% R.R.Index: 1.16-0.00i ( )

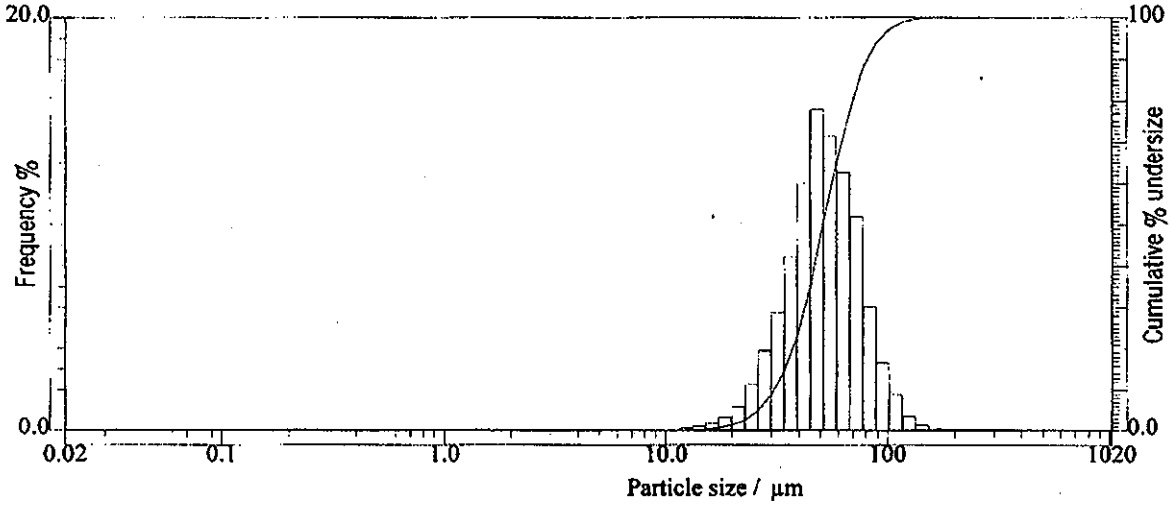
Agitation : 3 Circultn : 5 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 51.224μm SP.Area : 1276cm²/cm³ S.D. : 20.655μm
Mode : 48.580μm Mean : 54.427μm
C.V. : 37.95%

Span : (D 10.0-D 90.0) / D50 = 0.985

Dia. on %(5.0%) : 26.290μm % on Dia.(0.100μm) : 0.0%
Dia. on %(25.0%) : 40.152μm % on Dia.(1.000μm) : 0.0%
Dia. on %(50.0%) : 51.224μm % on Dia.(10.000μm) : 0.0%
Dia. on %(75.0%) : 65.797μm % on Dia.(100.000μm) : 96.8%
Dia. on %(95.0%) : 92.956μm % on Dia.(1000.000μm) : 100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	2.28	4.80	0.669	0.00	0.00
890.1	0.00	100.00	22.80	1.17	2.52	0.584	0.00	0.00
777.1	0.00	100.00	19.90	0.64	1.34	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.37	0.71	0.445	0.00	0.00
592.4	0.00	100.00	15.17	0.21	0.34	0.389	0.00	0.00
517.2	0.00	100.00	13.25	0.13	0.13	0.339	0.00	0.00
451.6	0.00	100.00	11.56	0.00	0.00	0.296	0.00	0.00
394.2	0.00	100.00	10.10	0.00	0.00	0.259	0.00	0.00
344.2	0.00	100.00	8.816	0.00	0.00	0.226	0.00	0.00
300.5	0.00	100.00	7.697	0.00	0.00	0.197	0.00	0.00
262.4	0.00	100.00	6.720	0.00	0.00	0.172	0.00	0.00
229.1	0.00	100.00	5.867	0.00	0.00	0.150	0.00	0.00
200.0	0.00	100.00	5.122	0.00	0.00	0.131	0.00	0.00
174.6	0.12	100.00	4.472	0.00	0.00	0.115	0.00	0.00
152.5	0.27	99.88	3.905	0.00	0.00	0.100	0.00	0.00
133.1	0.71	99.62	3.409	0.00	0.00	0.087	0.00	0.00
116.2	1.76	98.91	2.976	0.00	0.00	0.076	0.00	0.00
101.5	3.33	97.15	2.599	0.00	0.00	0.067	0.00	0.00
88.58	6.02	93.82	2.269	0.00	0.00	0.058	0.00	0.00
77.34	10.41	87.80	1.981	0.00	0.00	0.051	0.00	0.00
67.52	12.53	77.39	1.729	0.00	0.00	0.044	0.00	0.00
58.95	14.31	64.86	1.510	0.00	0.00	0.039	0.00	0.00
51.47	15.60	50.55	1.318	0.00	0.00	0.034	0.00	0.00
44.94	12.00	34.95	1.151	0.00	0.00	0.029	0.00	0.00
39.23	8.48	22.96	1.005	0.00	0.00	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/01/01
File Name: BCR69955.DAT Sample Name: BCR 69 ID No: 01/09/27-022
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 85.076 % Lamp: 93.436 %
Circulation: 5 Agitation: 3 U.Sonic ** (min)
Material: quartz polydispersed Source:
Lot No: bcr69-6 Test No:

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	12.899	0.10	0.10	(15)	53.796	5.00	55.00
(2)	18.536	0.90	1.00	(16)	56.410	5.00	60.00
(3)	22.257	1.30	2.30	(17)	59.046	5.00	65.00
(4)	26.302	2.70	5.00	(18)	62.467	5.00	70.00
(5)	30.876	5.00	10.00	(19)	65.888	5.00	75.00
(6)	34.563	5.00	15.00	(20)	69.985	5.00	80.00
(7)	35.033	0.80	15.80	(21)	73.947	4.20	84.20
(8)	37.499	4.20	20.00	(22)	74.701	0.80	85.00
(9)	40.206	5.00	25.00	(23)	81.454	5.00	90.00
(10)	42.583	5.00	30.00	(24)	93.154	5.00	95.00
(11)	44.957	5.00	35.00	(25)	106.076	2.70	97.70
(12)	47.051	5.00	40.00	(26)	118.407	1.30	99.00
(13)	49.145	5.00	45.00	(27)	155.379	0.90	99.90
(14)	51.239	5.00	50.00				

Median : 51.224 (μm) Mean: 54.427 (μm) Mode: 48.094 (μm)
Std. Dev.: 20.655 (μm) Span: 0.530
Coef. Var: 37.95% Spec. Area: 1276 (cm2/cm3)

HORIBA LA-910

for Windows(TM) Ver.1.20j Oct/08/'01 15:45

Laser scattering particle size distribution analyzer

PARTICLE SIZE MEASUREMENT DATA

ID# : 010928-065 07:46
Filename : BCR69997
Sample : BCR 69

Material : Quartz
Source : Jar 6
Lot Numbe :

Condition
T%(He-Ne): 74.6% Dist.Form: Std. Sampling times : 100
(LAMP): 85.8% R.R.Index: 1.16-0.00i ( )

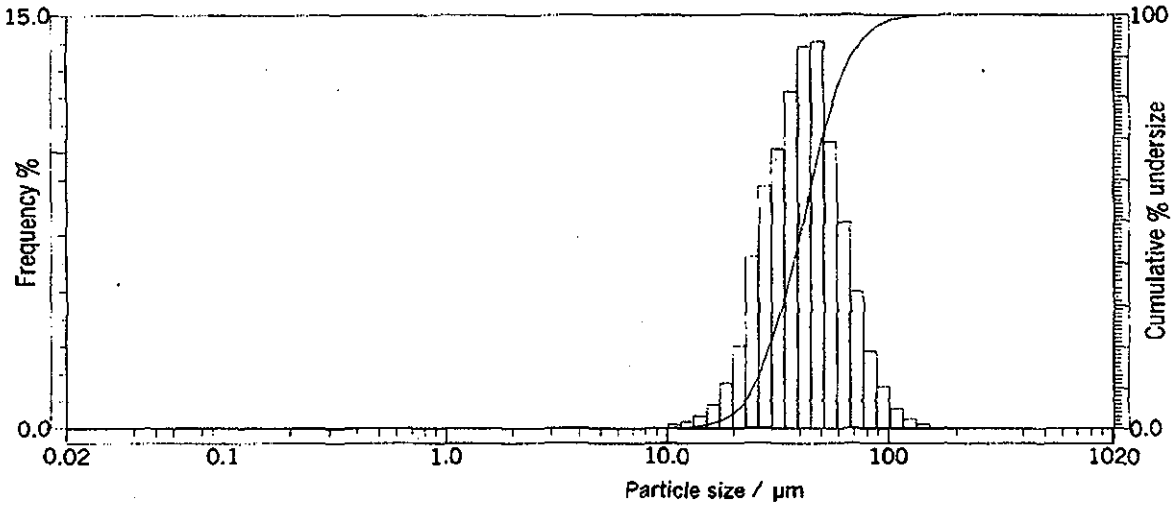
Agitation : 3 Circultn : 6 U.sonic : ON(120)

Format
Dist.base : Volume Scaling : Auto Axis : LogX - LinearY

Data
Median : 41.726μm SP.Area : 1576cm²/cm³ S.D. : 18.490μm
Mode : 47.286μm Mean : 44.709μm
C.V. : 41.36%

Span : (D 10.0-D 90.0) / D50 = 1.053

Dia. on %(5.0%) :	21.376μm	% on Dia.(0.100μm) :	0.0%
Dia. on %(25.0%) :	31.393μm	% on Dia.(1.000μm) :	0.0%
Dia. on %(50.0%) :	41.726μm	% on Dia.(10.000μm) :	0.0%
Dia. on %(75.0%) :	53.811μm	% on Dia.(100.000μm) :	98.6%
Dia. on %(95.0%) :	79.564μm	% on Dia.(1000.000μm) :	100.0%



Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)	Size(μm)	Freq(%)	Und(%)
1019.5	0.00	100.00	26.11	6.20	12.63	0.669	0.00	0.00
890.1	0.00	100.00	22.80	3.01	6.43	0.584	0.00	0.00
777.1	0.00	100.00	19.90	1.65	3.42	0.510	0.00	0.00
678.5	0.00	100.00	17.38	0.88	1.76	0.445	0.00	0.00
592.4	0.00	100.00	15.17	0.47	0.88	0.389	0.00	0.00
517.2	0.00	100.00	13.25	0.26	0.41	0.339	0.00	0.00
451.6	0.00	100.00	11.56	0.15	0.15	0.296	0.00	0.00
394.2	0.00	100.00	10.10	0.00	0.00	0.259	0.00	0.00
344.2	0.00	100.00	8.816	0.00	0.00	0.226	0.00	0.00
300.5	0.00	100.00	7.697	0.00	0.00	0.197	0.00	0.00
262.4	0.00	100.00	6.720	0.00	0.00	0.172	0.00	0.00
229.1	0.00	100.00	5.867	0.00	0.00	0.150	0.00	0.00
200.0	0.00	100.00	5.122	0.00	0.00	0.131	0.00	0.00
174.6	0.00	100.00	4.472	0.00	0.00	0.115	0.00	0.00
152.5	0.16	100.00	3.905	0.00	0.00	0.100	0.00	0.00
133.1	0.35	99.84	3.409	0.00	0.00	0.087	0.00	0.00
116.2	0.74	99.49	2.976	0.00	0.00	0.076	0.00	0.00
101.5	1.52	98.75	2.599	0.00	0.00	0.067	0.00	0.00
88.58	2.82	97.23	2.269	0.00	0.00	0.058	0.00	0.00
77.34	5.00	94.41	1.981	0.00	0.00	0.051	0.00	0.00
67.52	7.44	89.42	1.729	0.00	0.00	0.044	0.00	0.00
58.95	10.37	81.97	1.510	0.00	0.00	0.039	0.00	0.00
51.47	14.03	71.60	1.318	0.00	0.00	0.034	0.00	0.00
44.94	13.87	57.58	1.151	0.00	0.00	0.029	0.00	0.00
39.23	12.21	43.71	1.005	0.00	0.00	0.026	0.00	0.00

HORIBA LA-910

PARTICLE SIZE DISTRIBUTION DATA TABLE Custom - C 10/08/01
File Name: BCR69997.DAT Sample Name: BCR 69 ID No: 01/09/28-065
Dist. Form: STANDARD R.R. Index: 116-000
Dist. Mode: VOLUME Laser: 74.630 % Lamp: 85.795 %
Circulation: 6 Agitation: 3 U.Sonic ** (min)
Material: Quartz Source: Jar 6

No.	SIZE(μm)	FREQ.%	U.SIZE%	No.	SIZE(μm)	FREQ.%	U.SIZE%
(1)	11.093	0.10	0.10	(15)	43.878	5.00	55.00
(2)	15.472	0.90	1.00	(16)	46.067	5.00	60.00
(3)	18.201	1.30	2.30	(17)	48.395	5.00	65.00
(4)	21.425	2.70	5.00	(18)	50.724	5.00	70.00
(5)	24.705	5.00	10.00	(19)	53.922	5.00	75.00
(6)	27.138	5.00	15.00	(20)	57.531	5.00	80.00
(7)	27.484	0.80	15.80	(21)	61.520	4.20	84.20
(8)	29.305	4.20	20.00	(22)	62.441	0.80	85.00
(9)	31.460	5.00	25.00	(23)	68.672	5.00	90.00
(10)	33.611	5.00	30.00	(24)	79.688	5.00	95.00
(11)	35.683	5.00	35.00	(25)	92.566	2.70	97.70
(12)	37.722	5.00	40.00	(26)	106.410	1.30	99.00
(13)	39.765	5.00	45.00	(27)	140.721	0.90	99.90
(14)	41.821	5.00	50.00				

Median : 41.726 (μm) Mean: 44.709 (μm) Mode: 48.094 (μm)
Std. Dev.: 18.490 (μm) Span: 0.617
Coef. Var: 41.36% Spec. Area: 1576 (cm2/cm3)

APPENDIX F

222-S PARTICLE SIZE DISTRIBUTION MEASUREMENT RESULTS

END PAGE

This document was too large to scan as a single document. It has been divided into smaller sections.

Section 5 of

Document Information			
Document #	**HNF-8862**	**Revision**	**0**
Title	PARTICLE PROPERTY ANALYSES OF HLW TANK SLUDGES		
Date	**0/3/04/2002**		
Originator	**DB BECHTOLD** **L JENSEN** **JB DUNCAN** **JR JEWETT** **JM TINGEY**	**Originator Co.**	**FH** **CHG** **OTHER** **NHC** **PNL**
Recipient		**Recipient Co.**	
References	**EDT-628492**, BCR-67, BCR-130		
Keywords			
Projects	**Tank Farms** 241AW103, 241AY101		
Other Information	App G, Particle Size Results (PNNL) Pages G1 thru G243		

APPENDIX G

Particle Size Results

PNNL

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TABLE OF CONTENTS

(Sample changes are indicated by bold horizontal lines.)

Sample Material: BCR 67 Standard Dispersant: 1 M NaOH & 1 M $NaNO_3$

Replicate	Flow Rate (ml/sec)	Sonication Time (min.)	Sonication Delay (min.)	Particle Refractive Index	Page Number
Sample	17	0	0	1.54	G-11
Sample	17	0	0	2.00	G-12
Sample	17	2	0	1.54	G-13
Sample	17	2	0	2.00	G-14
Sample	40	0	0	1.54	G-15
Sample	40	0	0	2.00	G-16
Sample	40	2	0	1.54	G-17
Sample	40	2	0	2.00	G-18
Sample	60	0	0	1.54	G-19
Sample	60	0	0	2.00	G-20
Sample	60	2	0	1.54	G-21
Sample	60	2	0	2.00	G-22
Duplicate	17	0	0	1.54	G-23
Duplicate	17	0	0	2.00	G-24
Duplicate	17	2	0	1.54	G-25
Duplicate	17	2	0	2.00	G-26
Duplicate	40	0	0	1.54	G-27
Duplicate	40	0	0	2.00	G-28
Duplicate	40	2	0	1.54	G-29
Duplicate	40	2	0	2.00	G-30
Duplicate	60	0	0	1.54	G-31
Duplicate	60	0	0	2.00	G-32
Duplicate	60	0	0	2.00	G-33
Duplicate	60	2	0	1.54	G-34
Duplicate	60	2	0	2.00	G-35

Table of Contents (Continued)

Sample Material: BCR 130 Standard Dispersant: 1 M NaOH & 1 M $NaNO_3$

Replicate	Flow Rate (ml/sec)	Sonication Time (min.)	Sonication Delay (min.)	Particle Refractive Index	Page Number
Sample	17	0	0	1.54	G-36
Sample	17	0	0	2.00	G-37
Sample	17	2	0	1.54	G-38
Sample	17	2	0	2.00	G-39
Sample	40	0	0	1.54	G-40
Sample	40	0	0	2.00	G-41
Sample	40	2	0	1.54	G-42
Sample	40	2	0	2.00	G-43
Sample	60	0	0	1.54	G-44
Sample	60	0	0	2.00	G-45
Sample	60	2	0	1.54	G-46
Sample	60	2	0	2.00	G-47
Duplicate	17	0	0	1.54	G-48
Duplicate	17	0	0	2.00	G-49
Duplicate	17	0	0	1.54	G-50
Duplicate	17	0	0	2.00	G-51
Duplicate	17	2	0	1.54	G-52
Duplicate	17	2	0	2.00	G-53
Duplicate	17	2	0	1.54	G-54
Duplicate	17	2	0	2.00	G-55
Duplicate	40	0	0	1.54	G-56
Duplicate	40	0	0	2.00	G-57
Duplicate	40	2	0	1.54	G-58
Duplicate	40	2	0	2.00	G-59
Duplicate	60	0	0	1.54	G-60
Duplicate	60	0	0	2.00	G-61
Duplicate	60	2	0	1.54	G-62
Duplicate	60	2	0	2.00	G-63

Table of Contents (Continued)

Sample Material: Tank AW-103 Dispersant: 1 M NaOH & 1 M $NaNO_3$

Replicate	Flow Rate (ml/sec)	Sonication Time (min.)	Sonication Delay (min.)	Particle Refractive Index	Page Number
Sample	17	0	0	1.50	G-64
Sample	17	0	0	1.70	G-65
Sample	17	0	0	2.00	G-66
Sample	40	0	0	2.00	G-67
Sample	40	0	0	1.50	G-68
Sample	40	0	0	1.70	G-69
Sample	60	0	0	1.70	G-70
Sample	60	0	0	1.50	G-71
Sample	60	0	0	2.00	G-72
Sample	60	2	0	2.00	G-73
Sample	60	2	0	1.50	G-74
Sample	60	2	0	1.70	G-75
Sample	17	2	0	1.50	G-76
Sample	17	2	0	1.70	G-77
Sample	17	2	0	2.00	G-78
Sample	40	2	0	1.50	G-79
Sample	40	2	0	1.70	G-80
Sample	40	2	0	2.00	G-81
Sample	40	20	0	1.50	G-82
Sample	40	20	0	1.70	G-83
Sample	40	20	0	2.00	G-84
Sample	60	20	0	1.50	G-85
Sample	60	20	0	1.70	G-86
Sample	60	20	0	2.00	G-87
Sample	17	20	0	1.50	G-88
Sample	17	20	0	1.70	G-89
Sample	17	20	0	2.00	G-90
Sample	17	2	60	1.50	G-91
Sample	17	2	60	1.70	G-92
Sample	17	2	60	2.00	G-93
Sample	40	2	60	2.00	G-94
Sample	40	2	60	1.70	G-95
Sample	40	2	60	1.50	G-96
Sample	60	2	60	1.50	G-97
Sample	60	2	60	1.70	G-98
Sample	60	2	60	2.00	G-99
Sample	17	20	60	1.50	G-100
Sample	17	20	60	1.70	G-101
Sample	17	20	60	2.00	G-102
Sample	40	20	60	1.50	G-103
Sample	40	20	60	1.70	G-104
Sample	40	20	60	2.00	G-105
Sample	60	20	60	2.00	G-106
Sample	60	20	60	1.50	G-107
Sample	60	20	60	1.70	G-108

Table of Contents (Continued)

Sample Material: Tank AW-103 Dispersant: 1 M NaOH & 1 M $NaNO_3$
(continued from previous page)

Replicate	Flow Rate (ml/sec)	Sonication Time (min.)	Sonication Delay (min.)	Particle Refractive Index	Page Number
Duplicate	17	0	0	1.50	G-109
Duplicate	17	0	0	1.70	G-110
Duplicate	17	0	0	2.00	G-111
Duplicate	40	0	0	2.00	G-112
Duplicate	40	0	0	1.70	G-113
Duplicate	40	0	0	1.50	G-114
Duplicate	60	0	0	1.50	G-115
Duplicate	60	0	0	1.70	G-116
Duplicate	60	0	0	2.00	G-117
Duplicate	17	2	0	1.50	G-118
Duplicate	17	2	0	1.70	G-119
Duplicate	17	2	0	2.00	G-120
Duplicate	40	2	0	1.50	G-121
Duplicate	40	2	0	1.70	G-122
Duplicate	40	2	0	2.00	G-123
Duplicate	60	2	0	1.50	G-124
Duplicate	60	2	0	1.70	G-125
Duplicate	60	2	0	2.00	G-126
Duplicate	60	20	0	2.00	G-127
Duplicate	60	20	0	1.70	G-128
Duplicate	60	20	0	2.00	G-129
Duplicate	17	20	0	1.50	G-130
Duplicate	17	20	0	1.70	G-131
Duplicate	17	20	0	2.00	G-132
Duplicate	40	20	0	1.50	G-133
Duplicate	40	20	0	1.70	G-134
Duplicate	40	20	0	2.00	G-135
Duplicate	17	2	60	1.50	G-136
Duplicate	17	2	60	1.70	G-137
Duplicate	17	2	60	2.00	G-138
Duplicate	40	2	60	2.00	G-139
Duplicate	40	2	60	1.50	G-140
Duplicate	40	2	60	1.70	G-141
Duplicate	60	2	60	1.70	G-142
Duplicate	60	2	60	1.50	G-143
Duplicate	60	2	60	2.00	G-144
Duplicate	17	20	60	2.00	G-145
Duplicate	17	20	60	1.70	G-146
Duplicate	17	20	60	1.50	G-147
Duplicate	40	20	60	1.50	G-148
Duplicate	40	20	60	1.70	G-149
Duplicate	40	20	60	2.00	G-150
Duplicate	60	20	60	2.00	G-151
Duplicate	60	20	60	1.50	G-152
Duplicate	60	20	60	1.70	G-153

Table of Contents (Continued)

Sample Material: Tank AY-101 Dispersant: 1 M NaOH & 1 M $NaNO_3$

Replicate	Flow Rate (ml/sec)	Sonication Time (min.)	Sonication Delay (min.)	Particle Refractive Index	Page Number
Sample	17	0	0	1.50	G-154
Sample	17	0	0	1.70	G-155
Sample	17	0	0	2.00	G-156
Sample	40	0	0	2.00	G-157
Sample	40	0	0	1.70	G-158
Sample	40	0	0	1.50	G-159
Sample	60	0	0	1.50	G-160
Sample	60	0	0	2.00	G-161
Sample	60	0	0	1.70	G-162
Sample	17	2	0	1.70	G-163
Sample	17	2	0	1.50	G-164
Sample	17	2	0	2.00	G-165
Sample	40	2	0	2.00	G-166
Sample	40	2	0	1.70	G-167
Sample	40	2	0	1.50	G-168
Sample	60	2	0	1.50	G-169
Sample	60	2	0	1.70	G-170
Sample	60	2	0	2.00	G-171
Sample	17	20	0	1.50	G-172
Sample	17	20	0	1.70	G-173
Sample	17	20	0	2.00	G-174
Sample	40	20	0	2.00	G-175
Sample	40	20	0	1.50	G-176
Sample	40	20	0	1.70	G-177
Sample	60	20	0	1.70	G-178
Sample	60	20	0	1.50	G-179
Sample	60	20	0	2.00	G-180
Sample	60	2	60	2.00	G-181
Sample	60	2	60	1.50	G-182
Sample	60	2	60	1.70	G-183
Sample	17	2	60	1.70	G-184
Sample	17	2	60	1.50	G-185
Sample	17	2	60	2.00	G-186
Sample	40	2	60	2.00	G-187
Sample	40	2	60	1.70	G-188
Sample	40	2	60	1.50	G-189
Sample	60	20	60	1.50	G-190
Sample	60	20	60	1.70	G-191
Sample	60	20	60	2.00	G-192
Sample	17	20	60	2.00	G-193
Sample	17	20	60	1.50	G-194
Sample	17	20	60	1.70	G-195
Sample	40	20	60	1.70	G-196
Sample	40	20	60	1.50	G-197
Sample	40	20	60	2.00	G-198

Table of Contents (Continued)

Sample Material: Tank AY-101 Dispersant: 1 M NaOH & 1 M $NaNO_3$
(continued from previous page)

Replicate	Flow Rate (ml/sec)	Sonication Time (min.)	Sonication Delay (min.)	Particle Refractive Index	Page Number
Duplicate	17	0	0	1.50	G-199
Duplicate	17	0	0	1.70	G-200
Duplicate	17	0	0	2.00	G-201
Duplicate	40	0	0	1.50	G-202
Duplicate	40	0	0	1.70	G-203
Duplicate	40	0	0	2.00	G-204
Duplicate	60	0	0	1.50	G-205
Duplicate	60	0	0	1.70	G-206
Duplicate	60	0	0	2.00	G-207
Duplicate	17	2	0	1.50	G-208
Duplicate	17	2	0	1.70	G-209
Duplicate	17	2	0	2.00	G-210
Duplicate	40	2	0	1.50	G-211
Duplicate	40	2	0	1.70	G-212
Duplicate	40	2	0	2.00	G-213
Duplicate	60	2	0	1.50	G-214
Duplicate	60	2	0	1.70	G-215
Duplicate	60	2	0	2.00	G-216
Duplicate	17	20	0	1.50	G-217
Duplicate	17	20	0	1.70	G-218
Duplicate	17	20	0	2.00	G-219
Duplicate	40	20	0	1.50	G-220
Duplicate	40	20	0	1.70	G-221
Duplicate	40	20	0	2.00	G-222
Duplicate	60	20	0	1.50	G-223
Duplicate	60	20	0	1.70	G-224
Duplicate	60	20	0	2.00	G-225
Duplicate	40	2	60	1.50	G-226
Duplicate	40	2	60	1.70	G-227
Duplicate	40	2	60	2.00	G-228
Duplicate	17	2	60	2.00	G-229
Duplicate	17	2	60	1.50	G-230
Duplicate	17	2	60	1.70	G-231
Duplicate	60	2	60	1.70	G-232
Duplicate	60	2	60	2.00	G-233
Duplicate	60	2	60	1.50	G-234
Duplicate	17	20	60	1.50	G-235
Duplicate	17	20	60	1.70	G-236
Duplicate	17	20	60	2.00	G-237
Duplicate	40	20	60	2.00	G-238
Duplicate	40	20	60	1.50	G-239
Duplicate	40	20	60	1.70	G-240
Duplicate	60	20	60	1.70	G-241
Duplicate	60	20	60	2.00	G-242
Duplicate	60	20	60	1.50	G-243

Table of Contents (Continued)

Sample Material: Tank C-104 Dispersant: 1 M NaOH & 1 M $NaNO_3$

Replicate	Flow Rate (ml/sec)	Sonication Time (min.)	Sonication Delay (min.)	Particle Refractive Index	Page Number
Sample	17	0	0	1.50	G-244
Sample	17	0	0	1.70	G-245
Sample	17	0	0	2.00	G-246
Sample	40	0	0	1.50	G-247
Sample	40	0	0	1.70	G-248
Sample	40	0	0	2.00	G-249
Sample	60	0	0	1.50	G-250
Sample	60	0	0	1.70	G-251
Sample	60	0	0	2.00	G-252
Sample	17	2	0	1.50	G-253
Sample	17	2	0	1.70	G-254
Sample	17	2	0	2.00	G-255
Sample	40	2	0	1.50	G-256
Sample	40	2	0	1.70	G-257
Sample	40	2	0	2.00	G-258
Sample	60	2	0	2.00	G-259
Sample	60	2	0	1.50	G-260
Sample	60	2	0	1.70	G-261
Sample	17	20	0	1.50	G-262
Sample	17	20	0	1.70	G-263
Sample	17	20	0	2.00	G-264
Sample	40	20	0	2.00	G-265
Sample	40	20	0	1.50	G-266
Sample	40	20	0	1.70	G-267
Sample	60	20	0	1.70	G-268
Sample	60	20	0	1.50	G-269
Sample	60	20	0	2.00	G-270
Sample	17	2	60	1.50	G-271
Sample	17	2	60	1.70	G-272
Sample	17	2	60	2.00	G-273
Sample	40	2	60	2.00	G-274
Sample	40	2	60	1.50	G-275
Sample	40	2	60	1.70	G-276
Sample	60	2	60	1.70	G-277
Sample	60	2	60	1.50	G-278
Sample	60	2	60	2.00	G-279
Sample	60	20	60	2.00	G-280
Sample	60	20	60	1.50	G-281
Sample	60	20	60	1.70	G-282
Sample	17	20	60	1.70	G-283
Sample	17	20	60	1.50	G-284
Sample	17	20	60	2.00	G-285
Sample	40	20	60	2.00	G-286
Sample	40	20	60	1.50	G-287
Sample	40	20	60	1.70	G-288

Table of Contents (Continued)

Sample Material: Tank C-104 Dispersant: 1 M NaOH & 1 M $NaNO_3$
(continued from previous page)

Replicate	Flow Rate (ml/sec)	Sonication Time (min.)	Sonication Delay (min.)	Particle Refractive Index	Page Number
Duplicate	17	0	0	1.50	G-289
Duplicate	17	0	0	1.70	G-290
Duplicate	17	0	0	2.00	G-291
Duplicate	40	0	0	1.50	G-292
Duplicate	40	0	0	1.70	G-293
Duplicate	40	0	0	2.00	G-294
Duplicate	60	0	0	1.50	G-295
Duplicate	60	0	0	1.70	G-296
Duplicate	60	0	0	2.00	G-297
Duplicate	60	2	0	2.00	G-298
Duplicate	60	2	0	1.50	G-299
Duplicate	60	2	0	1.70	G-300
Duplicate	40	2	0	1.50	G-301
Duplicate	40	2	0	1.70	G-302
Duplicate	40	2	0	2.00	G-303
Duplicate	17	2	0	1.50	G-304
Duplicate	17	2	0	1.70	G-305
Duplicate	17	2	0	2.00	G-306
Duplicate	17	20	0	1.50	G-307
Duplicate	17	20	0	1.70	G-308
Duplicate	17	20	0	2.00	G-309
Duplicate	40	20	0	1.50	G-310
Duplicate	40	20	0	1.70	G-311
Duplicate	40	20	0	2.00	G-312
Duplicate	60	20	0	1.50	G-313
Duplicate	60	20	0	1.70	G-314
Duplicate	60	20	0	2.00	G-315
Duplicate	17	2	90	1.50	G-316
Duplicate	17	2	90	1.70	G-317
Duplicate	17	2	90	2.00	G-318
Duplicate	40	2	90	1.50	G-319
Duplicate	40	2	90	1.70	G-320
Duplicate	40	2	90	2.00	G-321
Duplicate	60	2	90	1.50	G-322
Duplicate	60	2	90	1.70	G-323
Duplicate	60	2	90	2.00	G-324
Duplicate	17	20	90	2.00	G-325
Duplicate	17	20	90	1.70	G-326
Duplicate	17	20	90	1.50	G-327
Duplicate	40	20	90	1.50	G-328
Duplicate	40	20	90	1.70	G-329
Duplicate	40	20	90	2.00	G-330
Duplicate	60	20	90	1.50	G-331
Duplicate	60	20	90	1.70	G-332
Duplicate	60	20	90	2.00	G-333

Table of Contents (Continued)

Sample Material: BCR Standards Dispersant: Water

Sample ID	Replicate	Flow Rate (ml/sec)	Sonication Time (min.)	Sonication Delay (min.)	Particle Refractive Index	Page Number
BCR 67	Sample	17	0	0	1.54	G-334
BCR 67	Sample	17	0	0	2.00	G-335
BCR 67	Sample	17	2	0	2.00	G-336
BCR 67	Sample	17	2	0	1.54	G-337
BCR 67	Sample	40	0	0	1.54	G-338
BCR 67	Sample	40	2	0	1.54	G-339
BCR 67	Sample	40	0	0	2.00	G-340
BCR 67	Sample	40	2	0	2.00	G-341
BCR 67	Sample	60	0	0	2.00	G-342
BCR 67	Sample	60	0	0	1.54	G-343
BCR 67	Sample	60	2	0	1.54	G-344
BCR 67	Sample	60	2	0	2.00	G-345
BCR 67	Duplicate	17	0	0	1.54	G-346
BCR 67	Duplicate	17	0	0	2.00	G-347
BCR 67	Duplicate	17	2	0	1.54	G-348
BCR 67	Duplicate	17	2	0	2.00	G-349
BCR 67	Duplicate	40	0	0	1.54	G-350
BCR 67	Duplicate	40	0	0	2.00	G-351
BCR 67	Duplicate	40	2	0	1.54	G-352
BCR 67	Duplicate	40	2	0	2.00	G-353
BCR 67	Duplicate	60	0	0	1.54	G-354
BCR 67	Duplicate	60	0	0	2.00	G-355
BCR 67	Duplicate	60	2	0	2.00	G-356
BCR 67	Duplicate	60	2	0	1.54	G-357
BCR130	Sample	17	0	0	1.54	G-358
BCR130	Sample	17	0	0	2.00	G-359
BCR130	Sample	17	2	0	1.54	G-360
BCR130	Sample	17	2	0	2.00	G-361
BCR130	Sample	40	0	0	1.54	G-362
BCR130	Sample	40	0	0	2.00	G-363
BCR130	Sample	40	2	0	1.54	G-364
BCR130	Sample	40	2	0	2.00	G-365

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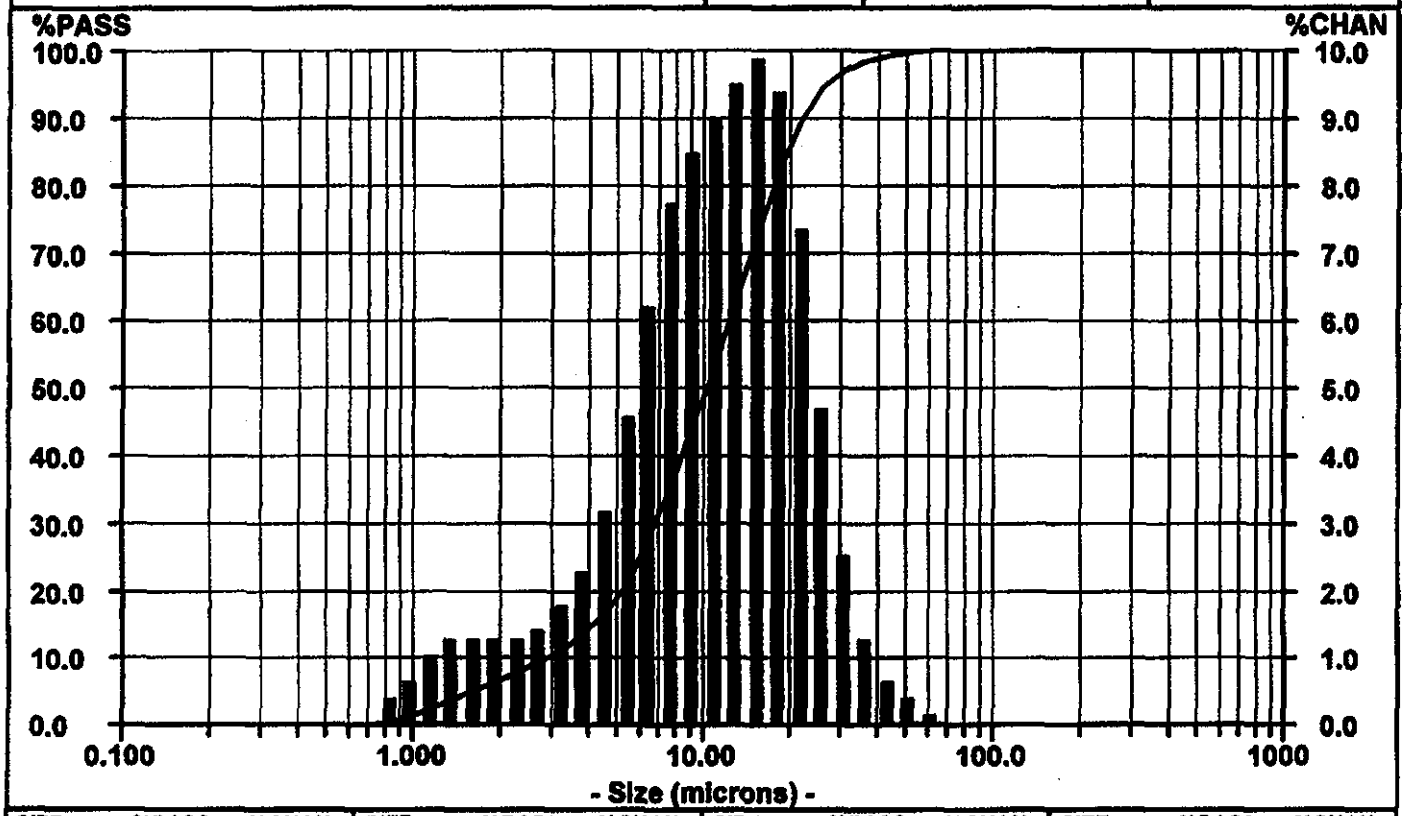
BCR 67 Sample

BCR67, riffled 7-18-01

Date: 10/19/91 Meas #: 00006
Time: 14:14 Pres #: 01

1M NaOH/1M NaNO3
Flow = 17 ml/sec
Refractive index of the medium = 1.33 and the particle = 1.54
File: BCR6725

Summary	Percentiles		Dia	Vol%	Width
mv = 11.91	10% = 2.935	60% = 12.41	10.82	95%	14.18
mn = 1.342	20% = 5.228	70% = 14.79	1.183	5%	0.591
ma = 6.099	30% = 6.872	80% = 17.66			
cs = 0.984	40% = 8.487	90% = 22.11			
sd = 7.340	50% = 10.31	95% = 26.76			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	44.37	8.65						
592.0	100.00	0.00	7.778	35.72	7.83						
497.8	100.00	0.00	6.541	27.89	6.36						
418.6	100.00	0.00	5.500	21.53	4.67						
352.0	100.00	0.00	4.625	16.86	3.29						
296.0	100.00	0.00	3.889	13.57	2.38						
248.9	100.00	0.00	3.270	11.19	1.83						
209.3	100.00	0.00	2.750	9.36	1.62						
176.0	100.00	0.00	2.312	7.84	1.38						
148.0	100.00	0.00	1.945	6.46	1.36						
124.5	100.00	0.00	1.635	5.10	1.39						
104.7	100.00	0.00	1.375	3.71	1.33						
88.00	100.00	0.00	1.156	2.38	1.11						
74.00	100.00	0.00	0.972	1.27	0.78						
62.23	100.00	0.21	0.818	0.49	0.49						
52.33	99.79	0.46	0.688	0.00	0.00						
44.00	99.33	0.76	0.578	0.00	0.00						
37.00	98.57	1.38	0.486	0.00	0.00						
31.11	97.19	2.61	0.409	0.00	0.00						
26.16	94.58	4.74	0.344	0.00	0.00						
22.00	89.84	7.43	0.289	0.00	0.00						
18.50	82.41	9.47	0.243	0.00	0.00						
15.56	72.94	9.96	0.204	0.00	0.00						
13.08	62.98	9.54	0.172	0.00	0.00						
11.00	53.44	9.07	0.145	0.00	0.00						

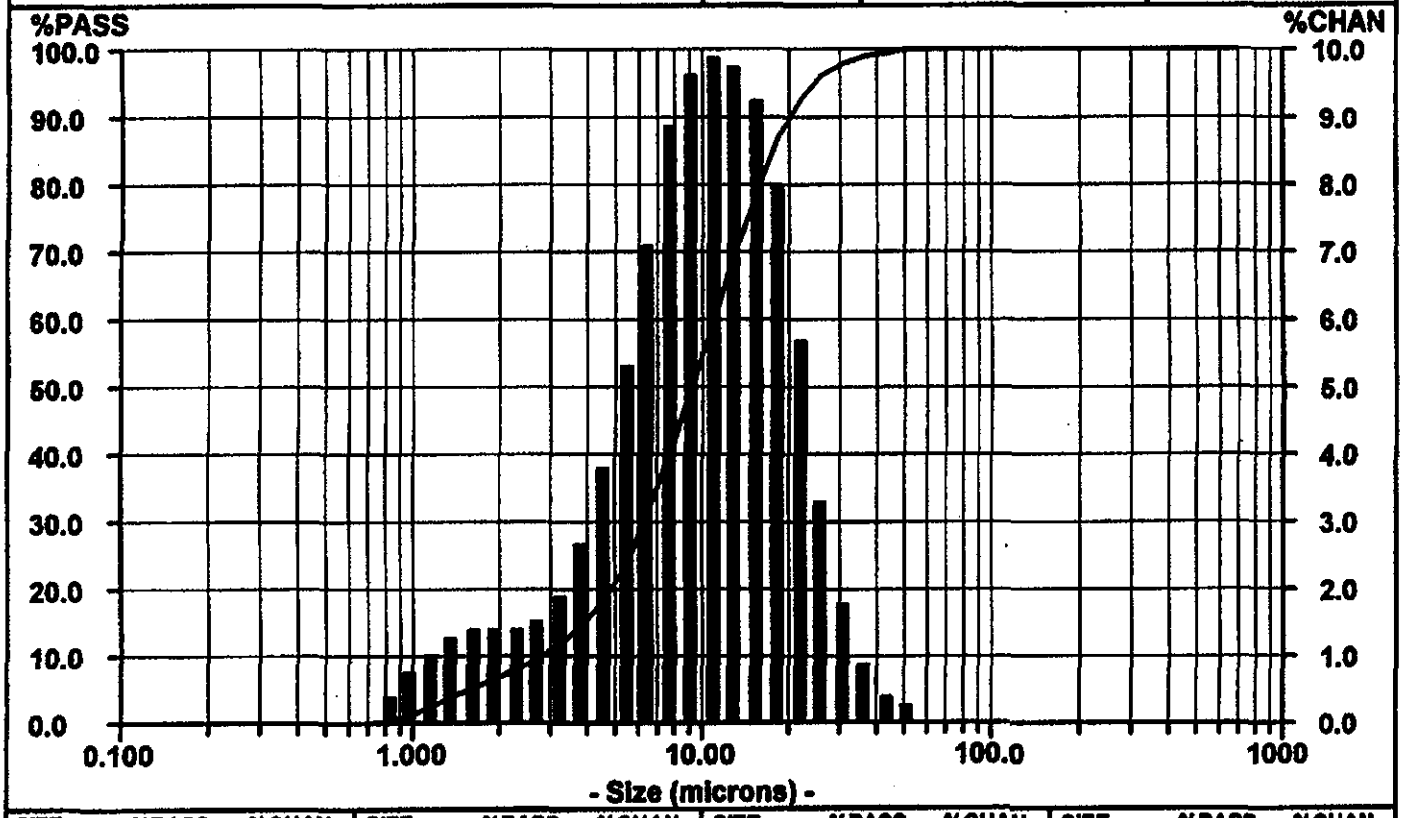
Particle Size Analysis

BCR67, riffled
7-18-01

Date: 07/19/91 Meas #: 00005
Time: 08:34 Pres #: 01

1M NaOH/1M NaNO3
Flow = 17 ml/sec
Refractive index of the medium = 1.33 and the particle = 2.00
File: BCR6726

Summary	Percentiles		Dia	Vol%	Width
mv = 10.79	10% = 2.802	60% = 11.05	9.716	95%	12.63
mn = 1.365	20% = 4.689	70% = 13.17	1.185	5%	0.587
ma = 5.763	30% = 6.378	80% = 15.88			
cs = 1.041	40% = 7.768	90% = 20.08			
sd = 6.544	50% = 9.280	95% = 24.40			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	49.82	9.75						
592.0	100.00	0.00	7.778	40.07	8.90						
497.8	100.00	0.00	6.541	31.17	7.30						
418.6	100.00	0.00	5.500	23.87	5.42						
352.0	100.00	0.00	4.625	18.45	3.84						
296.0	100.00	0.00	3.889	14.61	2.75						
248.9	100.00	0.00	3.270	11.86	2.08						
209.3	100.00	0.00	2.750	9.80	1.66						
176.0	100.00	0.00	2.312	8.14	1.46						
148.0	100.00	0.00	1.945	6.68	1.42						
124.5	100.00	0.00	1.635	5.26	1.44						
104.7	100.00	0.00	1.375	3.82	1.38						
88.00	100.00	0.00	1.156	2.44	1.15						
74.00	100.00	0.00	0.972	1.29	0.80						
62.23	100.00	0.00	0.818	0.49	0.49						
52.33	100.00	0.37	0.688	0.00	0.00						
44.00	99.63	0.58	0.578	0.00	0.00						
37.00	99.05	1.01	0.486	0.00	0.00						
31.11	98.04	1.87	0.409	0.00	0.00						
26.16	96.17	3.45	0.344	0.00	0.00						
22.00	92.72	5.72	0.289	0.00	0.00						
18.50	87.00	8.00	0.243	0.00	0.00						
15.56	79.00	9.37	0.204	0.00	0.00						
13.08	69.63	9.86	0.172	0.00	0.00						
11.00	59.77	9.95	0.145	0.00	0.00						

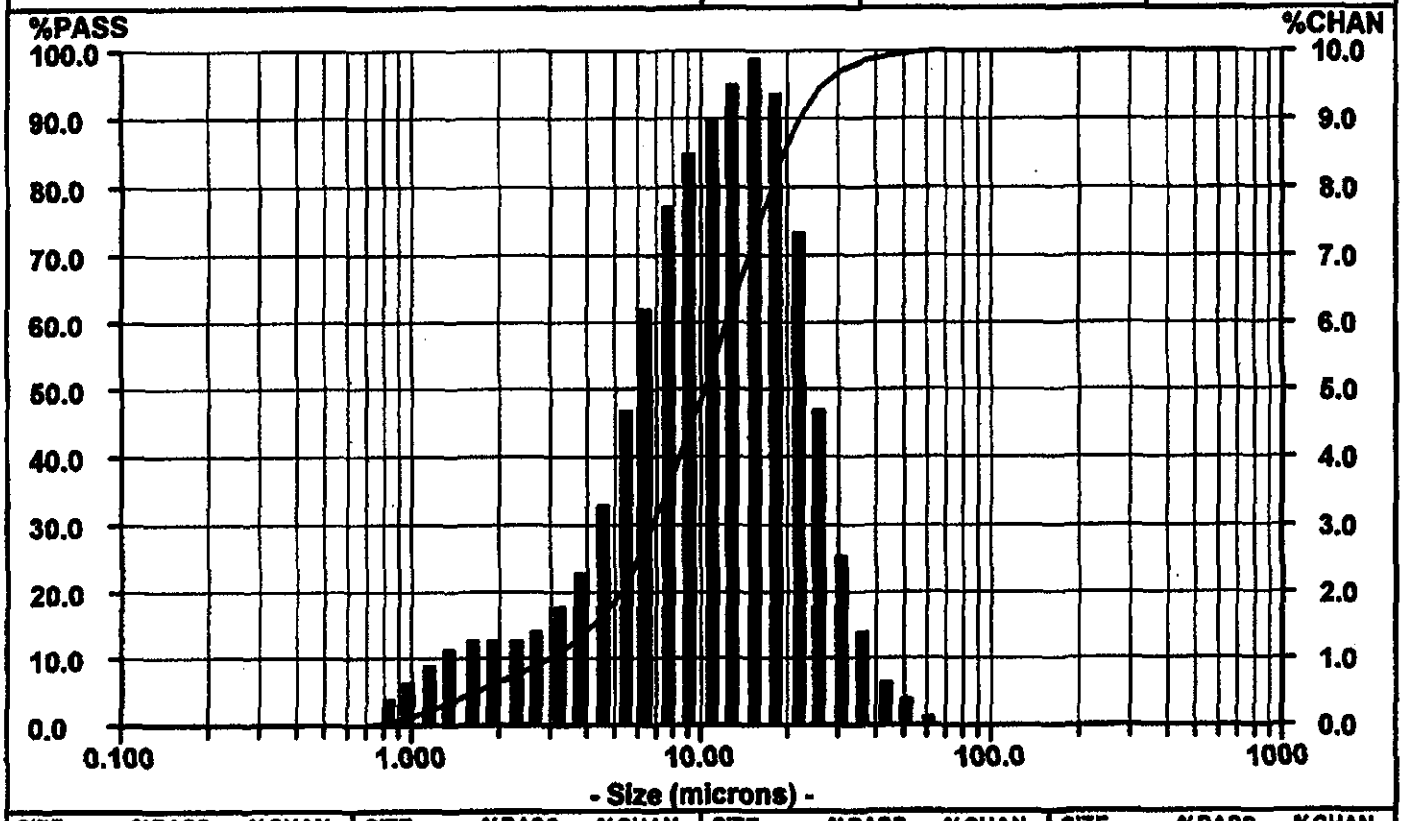
Particle Size Analysis

BCR67, riffled
7-19-01

Date: 07/20/01 Meas #: 00005
Time: 06:37 Pres #: 01

1M NaOH - 1M NaNO3
Flow = 17 ml/sec
RI of the medium = 1.33 and the particle = 1.54
Sonicate 2 min.
File: BCR6727

Summary		Percentiles		Dia	Vol%	Width
mv =	11.95	10% = 2.995	60% = 12.44	10.82	95%	14.23
mn =	1.364	20% = 5.267	70% = 14.83	1.185	5%	0.590
ma =	6.157	30% = 6.890	80% = 17.72			
cs =	0.974	40% = 8.502	90% = 22.19			
sd =	7.360	50% = 10.33	95% = 26.86			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	44.28	8.66						
592.0	100.00	0.00	7.778	35.62	7.85						
497.8	100.00	0.00	6.541	27.77	6.39						
418.6	100.00	0.00	5.500	21.38	4.70						
352.0	100.00	0.00	4.625	16.68	3.31						
296.0	100.00	0.00	3.889	13.37	2.39						
248.9	100.00	0.00	3.270	10.98	1.83						
209.3	100.00	0.00	2.750	9.15	1.52						
176.0	100.00	0.00	2.312	7.63	1.37						
148.0	100.00	0.00	1.945	6.26	1.33						
124.5	100.00	0.00	1.635	4.93	1.35						
104.7	100.00	0.00	1.375	3.58	1.29						
88.00	100.00	0.00	1.156	2.29	1.07						
74.00	100.00	0.00	0.972	1.22	0.75						
62.23	100.00	0.21	0.818	0.47	0.47						
52.33	99.79	0.47	0.688	0.00	0.00						
44.00	99.32	0.78	0.578	0.00	0.00						
37.00	98.54	1.40	0.486	0.00	0.00						
31.11	97.14	2.64	0.409	0.00	0.00						
26.16	94.50	4.78	0.344	0.00	0.00						
22.00	89.72	7.47	0.289	0.00	0.00						
18.50	82.25	9.49	0.243	0.00	0.00						
15.56	72.76	9.92	0.204	0.00	0.00						
13.08	62.84	9.51	0.172	0.00	0.00						
11.00	53.33	9.05	0.145	0.00	0.00						

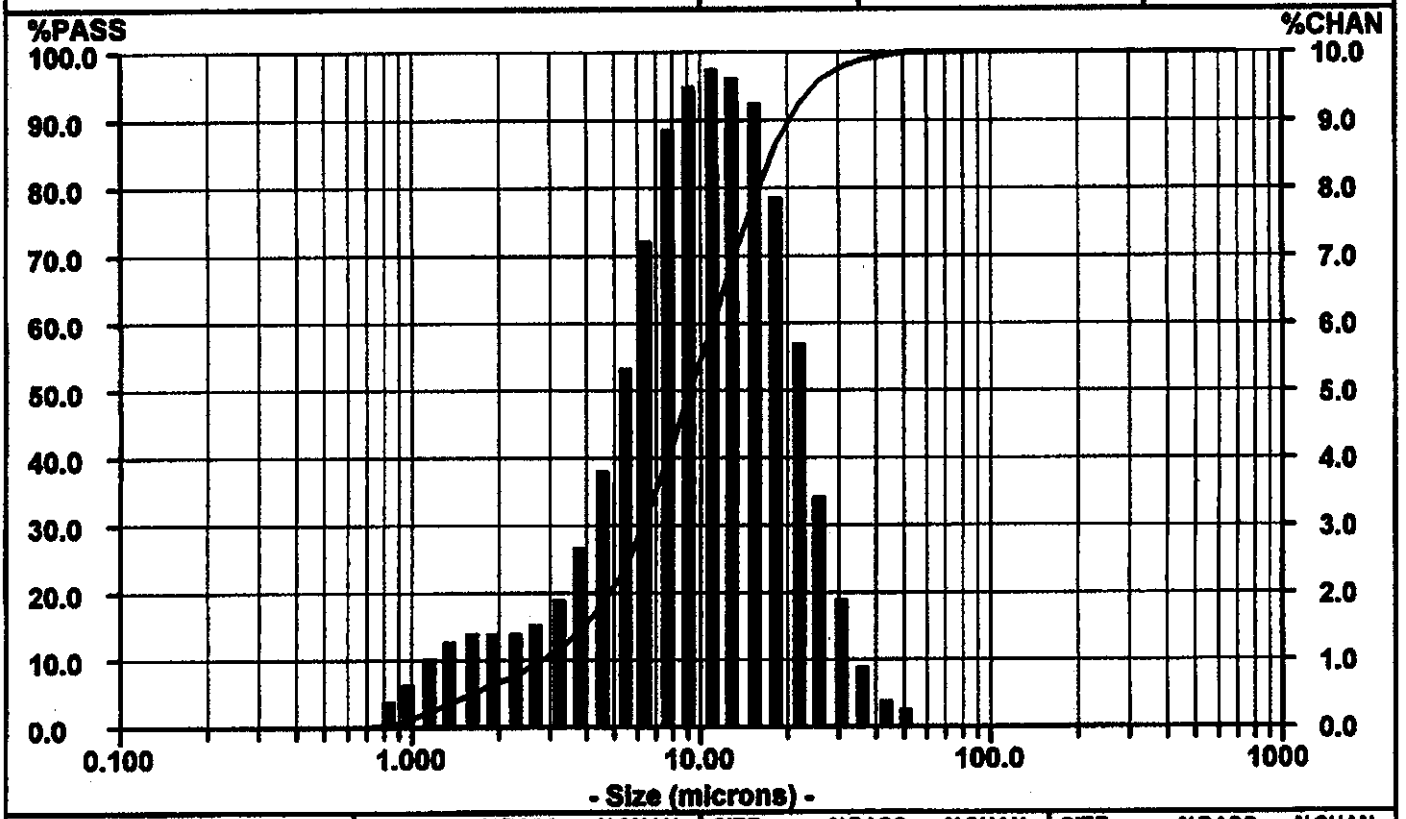
BCR 67 Sample

BCR67, riffled
7-19-01

Date: 07/20/91 Meas #: 00005
Time: 06:48 Pres #: 01

1M NaOH - 1M NaNO3
Flow = 17 ml/sec
RI of the medium = 1.33 and the particle = 2.00
Sonicate 2 min.
File: BCR6728

Summary		Percentiles		Dia	Vol%	Width
mv =	10.83	10% = 2.841	60% = 11.06	9.702	95%	12.72
mn =	1.373	20% = 4.890	70% = 13.20	1.186	5%	0.588
ma =	5.793	30% = 6.366	80% = 15.95			
cs =	1.036	40% = 7.754	90% = 20.20			
sd =	6.581	50% = 9.273	95% = 24.58			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	49.86	9.89						
592.0	100.00	0.00	7.778	40.17	8.91						
497.8	100.00	0.00	6.541	31.26	7.35						
418.6	100.00	0.00	5.500	23.91	5.49						
352.0	100.00	0.00	4.625	18.42	3.90						
296.0	100.00	0.00	3.889	14.52	2.79						
248.9	100.00	0.00	3.270	11.73	2.08						
209.3	100.00	0.00	2.750	9.65	1.66						
176.0	100.00	0.00	2.312	7.99	1.45						
148.0	100.00	0.00	1.945	6.54	1.40						
124.5	100.00	0.00	1.635	5.14	1.41						
104.7	100.00	0.00	1.375	3.73	1.35						
88.00	100.00	0.00	1.156	2.38	1.12						
74.00	100.00	0.00	0.972	1.26	0.78						
62.23	100.00	0.00	0.818	0.48	0.48						
52.33	100.00	0.38	0.688	0.00	0.00						
44.00	99.62	0.60	0.578	0.00	0.00						
37.00	99.02	1.04	0.486	0.00	0.00						
31.11	97.98	1.92	0.409	0.00	0.00						
26.16	96.06	3.51	0.344	0.00	0.00						
22.00	92.55	5.77	0.289	0.00	0.00						
18.50	86.78	7.99	0.243	0.00	0.00						
15.56	78.79	9.30	0.204	0.00	0.00						
13.08	69.49	9.76	0.172	0.00	0.00						
11.00	59.73	9.87	0.145	0.00	0.00						

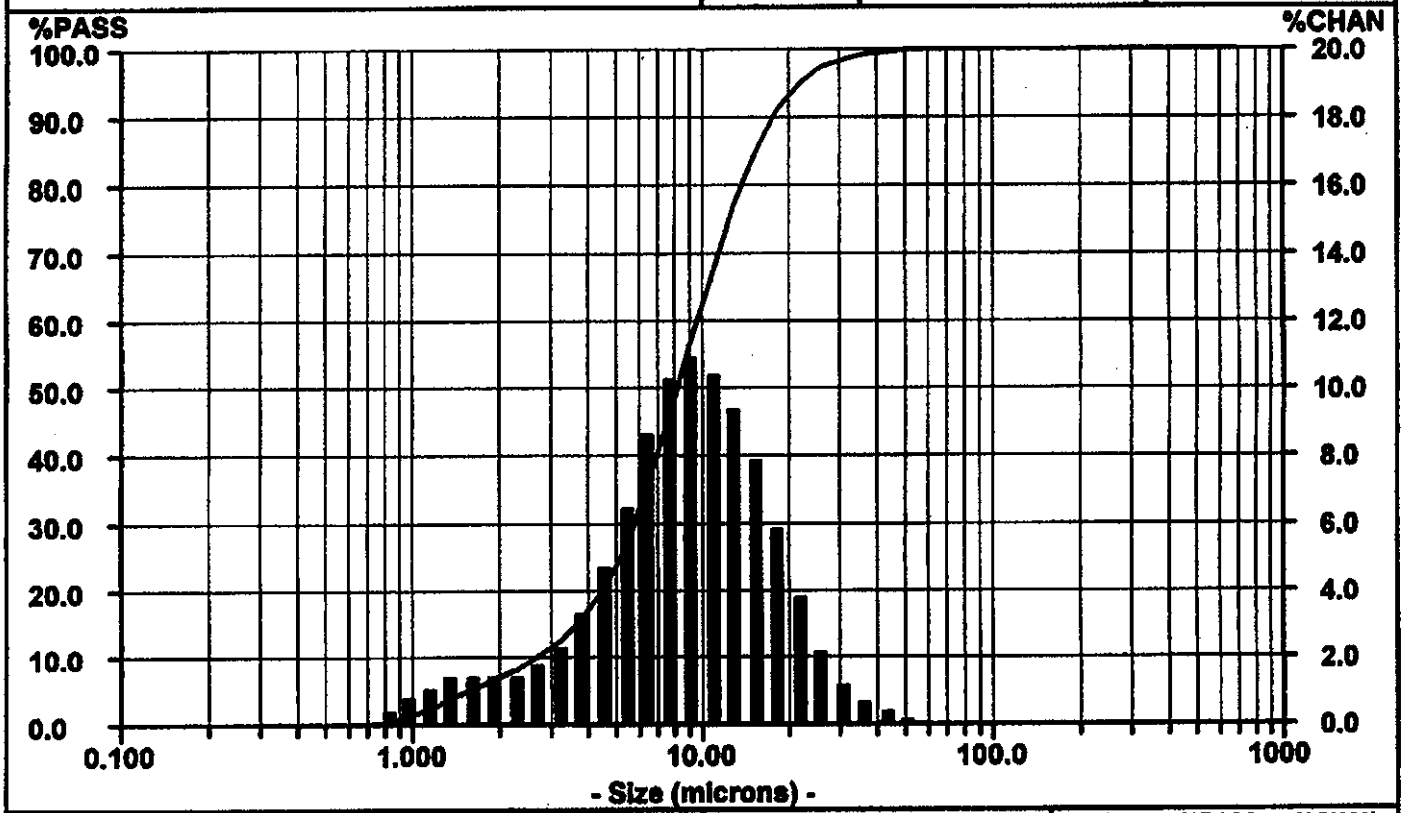
BCR 67 Sample

BCR67, riffled
7-19-01

Date: 07/20/91 Meas #: 00006
Time: 07:06 Pres #: 01

1M NaOH - 1M NaNO3
Flow = 40 ml/sec
RI of the medium = 1.33 and the particle = 1.54
File: BCR6729

Summary	Percentiles		Dia	Vol%	Width
mv = 9.623	10% = 2.701	60% = 9.659	8.604	95%	10.81
mn = 1.396	20% = 4.632	70% = 11.42	1.186	5%	0.587
ma = 5.406	30% = 5.840	80% = 13.82			
cs = 1.110	40% = 7.020	90% = 17.76			
sd = 5.602	50% = 8.249	95% = 21.84			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.260	57.29	10.99						
592.0	100.00	0.00	7.778	46.30	10.38						
497.8	100.00	0.00	6.541	35.92	8.71						
418.6	100.00	0.00	5.500	27.21	6.58						
352.0	100.00	0.00	4.625	20.63	4.70						
296.0	100.00	0.00	3.889	15.93	3.32						
248.9	100.00	0.00	3.270	12.61	2.40						
209.3	100.00	0.00	2.750	10.21	1.84						
176.0	100.00	0.00	2.312	8.37	1.55						
148.0	100.00	0.00	1.945	6.82	1.46						
124.5	100.00	0.00	1.635	5.36	1.47						
104.7	100.00	0.00	1.375	3.89	1.41						
88.00	100.00	0.00	1.156	2.48	1.17						
74.00	100.00	0.00	0.972	1.31	0.81						
62.23	100.00	0.00	0.818	0.50	0.50						
52.33	100.00	0.20	0.688	0.00	0.00						
44.00	99.80	0.44	0.578	0.00	0.00						
37.00	99.36	0.71	0.486	0.00	0.00						
31.11	98.65	1.24	0.409	0.00	0.00						
26.16	97.41	2.27	0.344	0.00	0.00						
22.00	95.14	3.91	0.289	0.00	0.00						
18.50	91.23	5.98	0.243	0.00	0.00						
15.56	85.25	7.93	0.204	0.00	0.00						
13.08	77.32	9.47	0.172	0.00	0.00						
11.00	67.85	10.56	0.145	0.00	0.00						

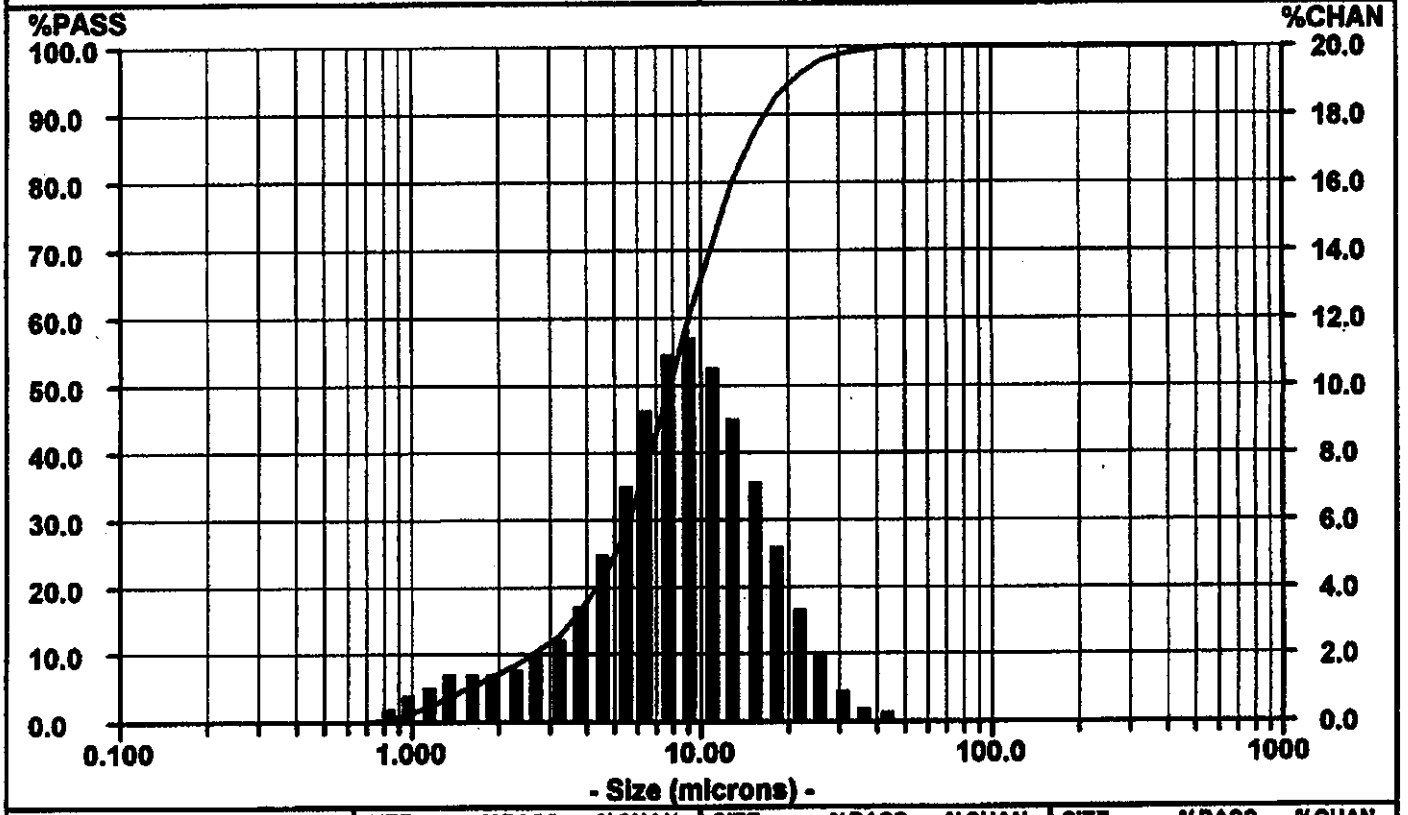
BCR 67 Sample

BCR67, rinsed 7-19-01

Date: 07/20/91 Meas #: 00005
Time: 07:14 Pres #: 01

1M NaOH - 1M NaNO3
Flow = 40 ml/sec
RI of the medium = 1.33 and the particle = 2.00
File: BCR6730

Summary	Percentiles		Dia	Vol%	Width
mv = 9.126	10% = 2.662	60% = 9.180	7.894	100%	10.41
mn = 1.408	20% = 4.408	70% = 10.78			
ma = 5.263	30% = 5.663	80% = 13.00			
cs = 1.140	40% = 6.761	90% = 16.74			
sd = 5.203	50% = 7.894	95% = 20.60			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	60.51	11.48						
592.0	100.00	0.00	7.778	49.03	11.04						
497.8	100.00	0.00	6.541	37.99	9.33						
418.6	100.00	0.00	5.500	28.66	7.08						
352.0	100.00	0.00	4.625	21.58	5.06						
296.0	100.00	0.00	3.889	16.53	3.55						
248.9	100.00	0.00	3.270	12.98	2.54						
209.3	100.00	0.00	2.750	10.44	1.93						
176.0	100.00	0.00	2.312	8.51	1.60						
148.0	100.00	0.00	1.945	6.91	1.49						
124.5	100.00	0.00	1.635	5.42	1.49						
104.7	100.00	0.00	1.375	3.93	1.43						
88.00	100.00	0.00	1.156	2.50	1.18						
74.00	100.00	0.00	0.972	1.32	0.82						
62.23	100.00	0.00	0.818	0.50	0.50						
52.33	100.00	0.00	0.688	0.00	0.00						
44.00	100.00	0.38	0.578	0.00	0.00						
37.00	99.62	0.60	0.486	0.00	0.00						
31.11	99.02	1.05	0.409	0.00	0.00						
26.16	97.97	1.90	0.344	0.00	0.00						
22.00	96.07	3.30	0.289	0.00	0.00						
18.50	92.77	5.21	0.243	0.00	0.00						
15.56	87.56	7.24	0.204	0.00	0.00						
13.08	80.32	9.13	0.172	0.00	0.00						
11.00	71.19	10.68	0.145	0.00	0.00						

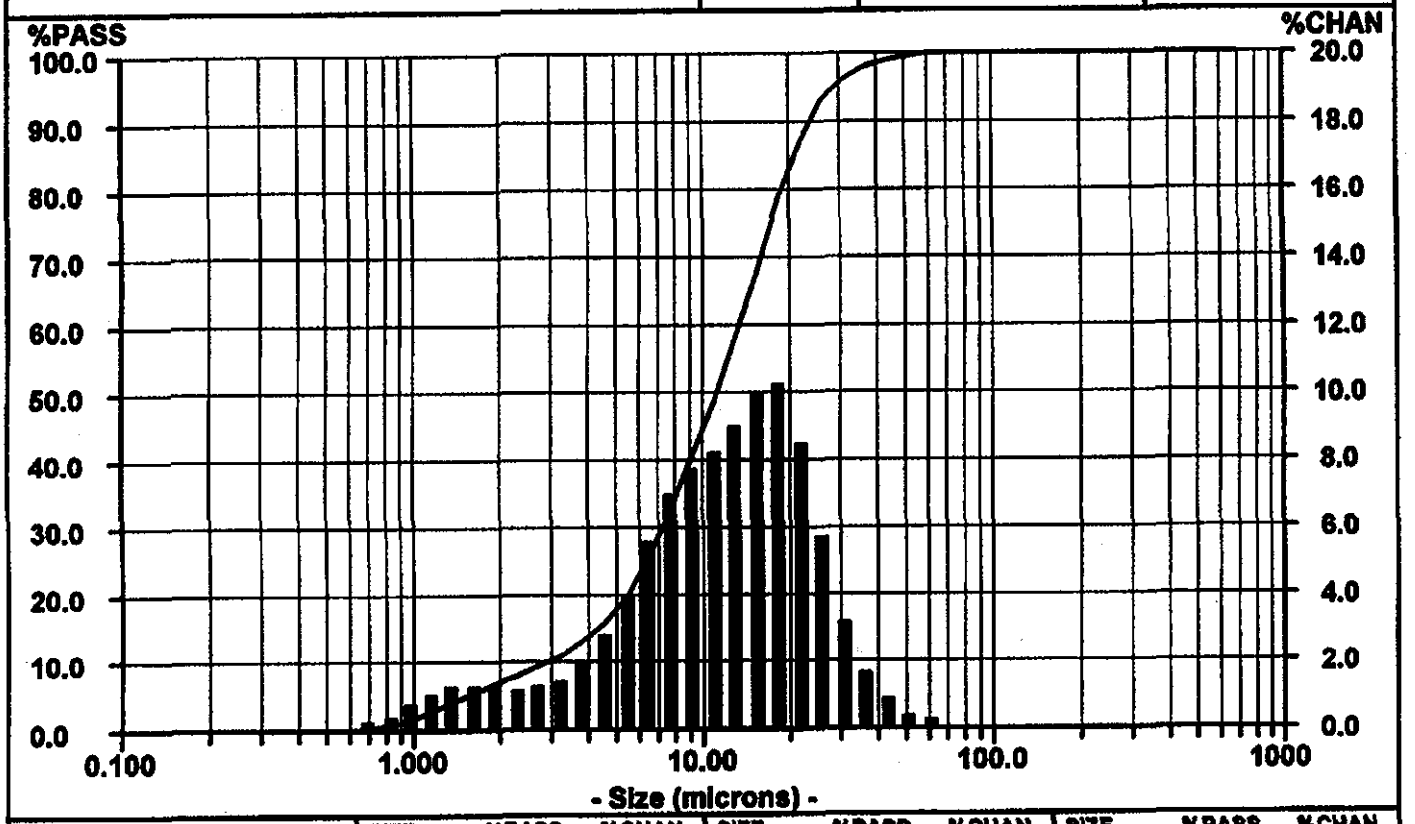
BCR 67 Sample

BCR67, riffled
7-19-01

Date: 07/20/91 Meas #: 00005
Time: 07:27 Pres #: 01

1M NaOH - 1M NaNO3
Flow = 40 ml/sec
RI of the medium = 1.33 and the particle = 1.54
Sonicate 2 min.
File: BCR6731

Summary	Percentiles		Dia	Vol%	Width
mv = 12.78	10% = 2.923	60% = 13.53	12.01	93%	15.13
mn = 1.173	20% = 5.494	70% = 16.03	1.255	7%	0.808
ma = 6.142	30% = 7.297	80% = 18.98			
cs = 0.977	40% = 9.139	90% = 23.63			
sd = 7.925	50% = 11.24	95% = 28.58			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	40.57	7.85						
592.0	100.00	0.00	7.778	32.72	7.04						
497.8	100.00	0.00	6.541	25.68	5.65						
418.6	100.00	0.00	5.500	20.03	4.09						
352.0	100.00	0.00	4.625	15.94	2.84						
296.0	100.00	0.00	3.889	13.10	2.04						
248.9	100.00	0.00	3.270	11.06	1.58						
209.3	100.00	0.00	2.750	9.48	1.34						
176.0	100.00	0.00	2.312	8.14	1.27						
148.0	100.00	0.00	1.945	6.87	1.31						
124.5	100.00	0.00	1.635	5.56	1.39						
104.7	100.00	0.00	1.375	4.17	1.37						
88.00	100.00	0.00	1.156	2.80	1.15						
74.00	100.00	0.00	0.972	1.65	0.82						
62.23	100.00	0.38	0.818	0.83	0.52						
52.33	99.62	0.57	0.688	0.31	0.31						
44.00	99.05	0.96	0.578	0.00	0.00						
37.00	98.09	1.74	0.486	0.00	0.00						
31.11	96.35	3.26	0.409	0.00	0.00						
26.16	93.09	5.80	0.344	0.00	0.00						
22.00	87.29	8.69	0.289	0.00	0.00						
18.50	78.60	10.38	0.243	0.00	0.00						
15.56	68.22	10.14	0.204	0.00	0.00						
13.08	58.08	9.14	0.172	0.00	0.00						
11.00	48.94	8.37	0.145	0.00	0.00						

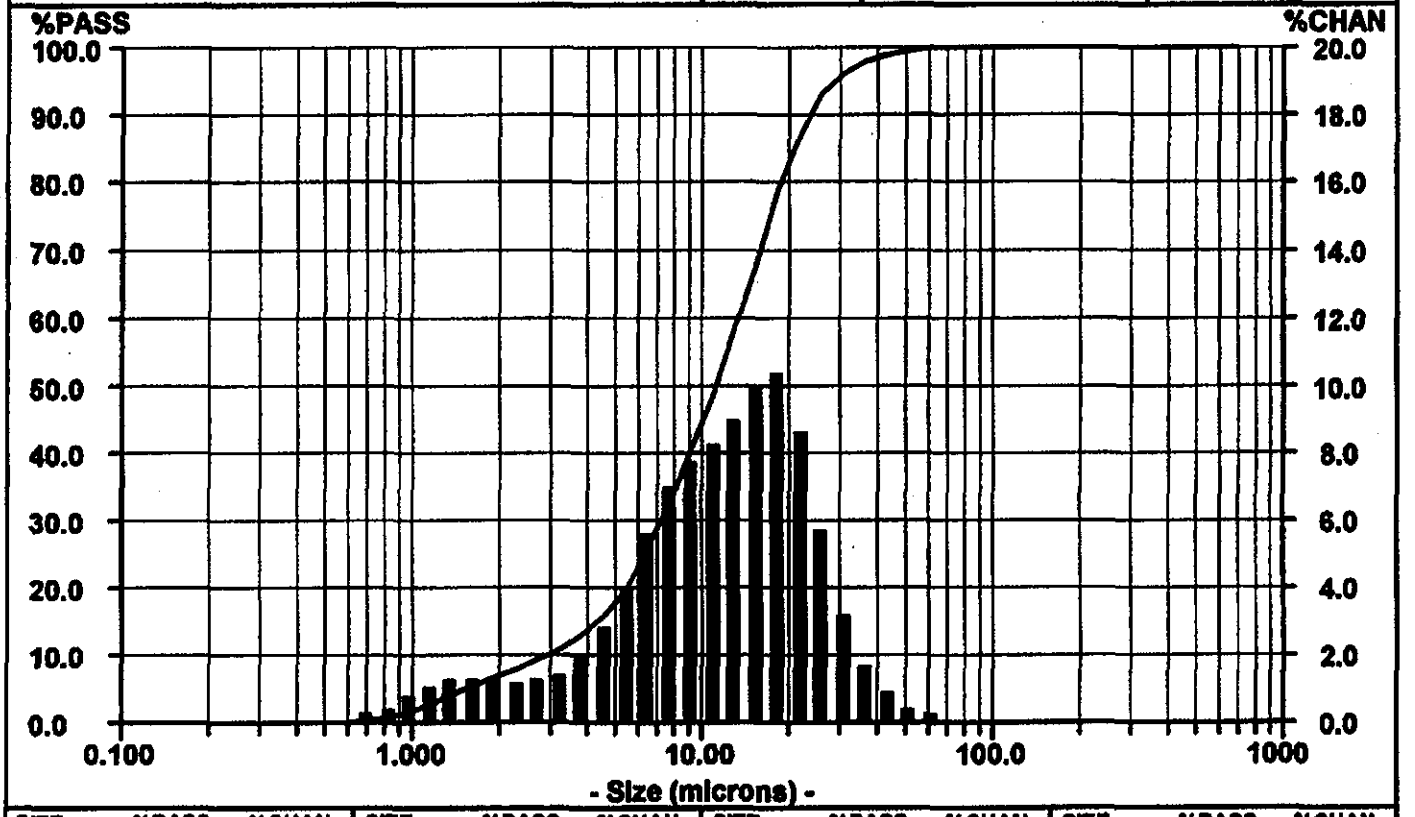
BCR 67 Sample

BCR67, riffled 7-19-01

Date: 07/20/01 Meas #: 00005
Time: 07:39 Pres #: 01

1M NaOH - 1M NaNO3
Flow = 40 ml/sec
RI of the medium = 1.33 and the particle = 2.00
Sonicate 2 min.
File: BCR6732

Summary	Percentiles		Dia	Vol%	Width
mv = 12.78	10% = 2.924	60% = 13.55	12.03	93%	15.12
mn = 1.173	20% = 5.504	70% = 16.04	1.255	7%	0.808
ma = 6.146	30% = 7.309	80% = 18.99			
cs = 0.978	40% = 9.153	90% = 23.63			
sd = 7.925	50% = 11.25	95% = 28.55			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	40.50	7.85						
592.0	100.00	0.00	7.778	32.65	7.03						
497.8	100.00	0.00	6.541	25.62	5.64						
418.6	100.00	0.00	5.500	19.98	4.07						
352.0	100.00	0.00	4.625	15.91	2.83						
296.0	100.00	0.00	3.889	13.08	2.03						
248.9	100.00	0.00	3.270	11.05	1.57						
209.3	100.00	0.00	2.750	9.48	1.34						
176.0	100.00	0.00	2.312	8.14	1.27						
148.0	100.00	0.00	1.945	6.87	1.31						
124.5	100.00	0.00	1.635	5.56	1.39						
104.7	100.00	0.00	1.375	4.17	1.37						
88.00	100.00	0.00	1.156	2.80	1.15						
74.00	100.00	0.00	0.972	1.65	0.82						
62.23	100.00	0.37	0.818	0.83	0.52						
52.33	99.63	0.57	0.688	0.31	0.31						
44.00	99.06	0.95	0.578	0.00	0.00						
37.00	98.11	1.74	0.486	0.00	0.00						
31.11	96.37	3.27	0.409	0.00	0.00						
26.16	93.10	5.82	0.344	0.00	0.00						
22.00	87.28	8.71	0.289	0.00	0.00						
18.50	78.57	10.40	0.243	0.00	0.00						
15.56	68.17	10.16	0.204	0.00	0.00						
13.08	58.01	9.14	0.172	0.00	0.00						
11.00	48.87	8.37	0.145	0.00	0.00						

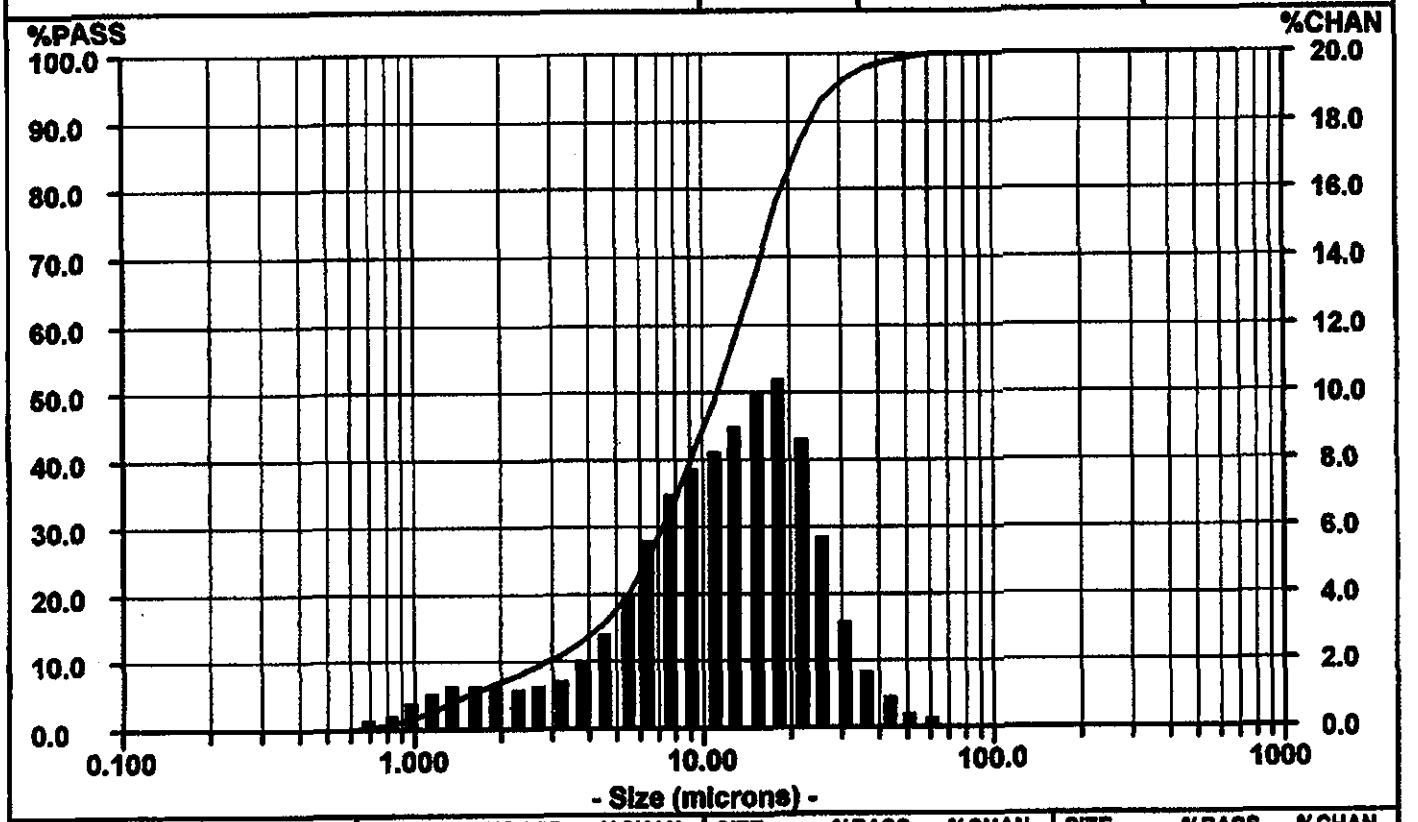
BCR 67 Sample

BCR67, riffled 7-19-01

Date: 07/20/91 Meas #: 00005
Time: 07:49 Pres #: 01

1M NaOH - 1M NaNO3
Flow = 60 ml/sec
RI of the medium = 1.33 and the particle = 1.54
File: BCR6733

Summary		Percentiles		Dia	Vol%	Width
mv	= 12.79	10% = 2.928	60% = 13.55	12.03	93%	15.11
mn	= 1.173	20% = 5.506	70% = 16.04	1.256	7%	0.808
ma	= 6.151	30% = 7.314	80% = 18.98			
cs	= 0.975	40% = 9.159	90% = 23.62			
sd	= 7.920	50% = 11.26	95% = 28.54			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	40.47	7.85						
592.0	100.00	0.00	7.778	32.62	7.02						
497.8	100.00	0.00	6.541	25.60	5.63						
418.6	100.00	0.00	5.500	19.97	4.07						
352.0	100.00	0.00	4.625	15.90	2.83						
296.0	100.00	0.00	3.888	13.07	2.03						
248.9	100.00	0.00	3.270	11.04	1.57						
209.3	100.00	0.00	2.750	9.47	1.34						
176.0	100.00	0.00	2.312	8.13	1.27						
148.0	100.00	0.00	1.945	6.86	1.31						
124.5	100.00	0.00	1.635	5.55	1.39						
104.7	100.00	0.00	1.375	4.16	1.37						
88.00	100.00	0.00	1.156	2.79	1.15						
74.00	100.00	0.00	0.972	1.64	0.81						
62.23	100.00	0.37	0.818	0.83	0.52						
52.33	99.63	0.57	0.688	0.31	0.31						
44.00	99.06	0.95	0.578	0.00	0.00						
37.00	98.11	1.74	0.486	0.00	0.00						
31.11	96.37	3.26	0.409	0.00	0.00						
26.16	93.11	5.81	0.344	0.00	0.00						
22.00	87.30	8.72	0.289	0.00	0.00						
18.50	78.58	10.42	0.243	0.00	0.00						
15.56	68.16	10.17	0.204	0.00	0.00						
13.08	57.99	9.15	0.172	0.00	0.00						
11.00	48.84	8.37	0.145	0.00	0.00						

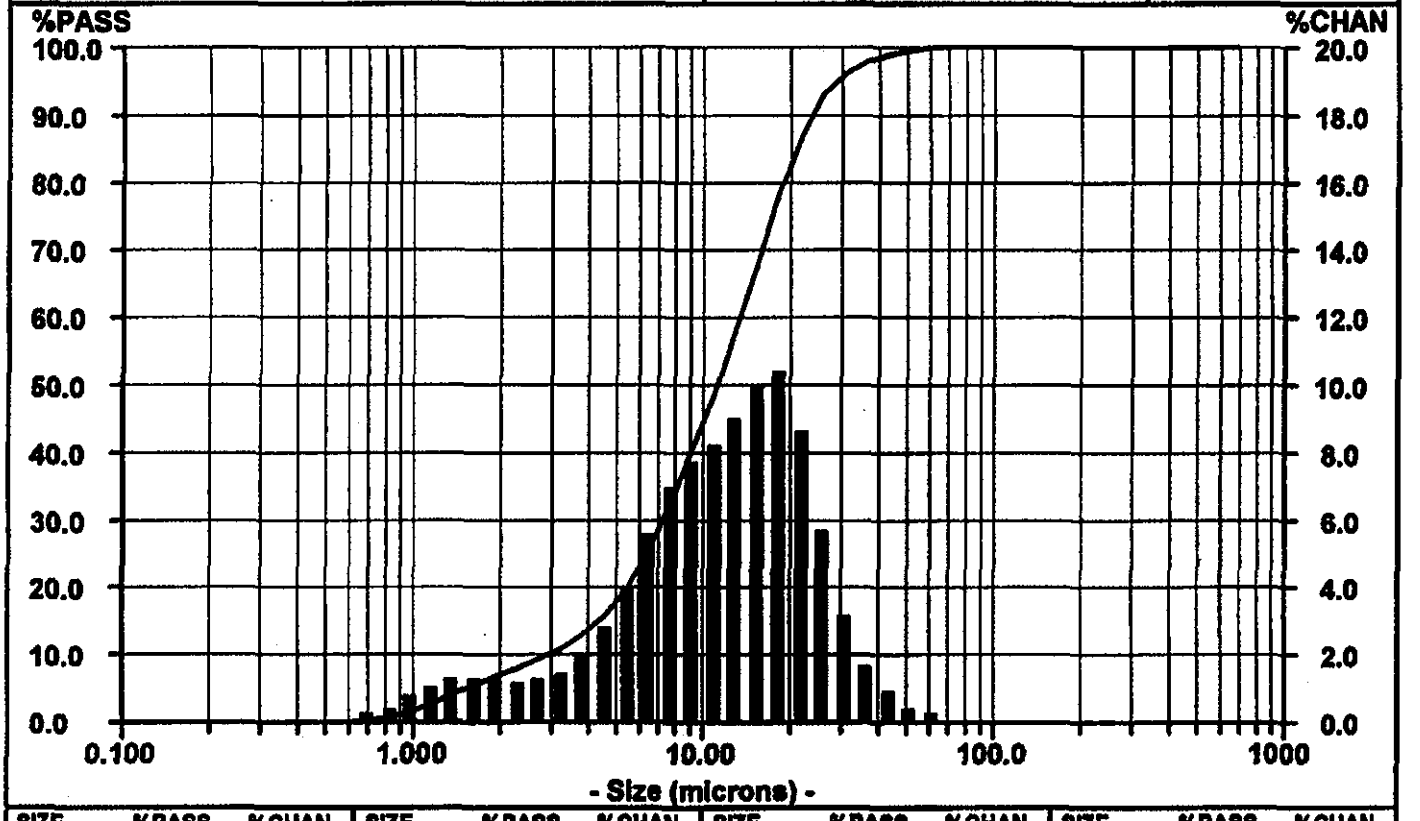
BCR 67 Sample

BCR67, riffed
7-19-01

Date: 07/20/91 Meas #: 00005
Time: 07:59 Pres #: 01

1M NaOH - 1M NaNO3
Flow = 60 ml/sec
RI of the medium = 1.33 and the particle = 2.00
File: BCR6734

Summary	Percentiles		Dia	Vol%	Width
mv = 12.78	10% = 2.928	60% = 13.55	12.03	93%	15.11
mn = 1.173	20% = 5.506	70% = 16.04	1.256	7%	0.808
ma = 6.151	30% = 7.314	80% = 18.98			
cs = 0.975	40% = 9.161	90% = 23.60			
sd = 7.917	50% = 11.26	95% = 28.50			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	40.48	7.84						
592.0	100.00	0.00	7.778	32.62	7.02						
497.8	100.00	0.00	6.541	25.60	5.63						
418.6	100.00	0.00	5.500	19.97	4.07						
352.0	100.00	0.00	4.625	15.90	2.83						
296.0	100.00	0.00	3.889	13.07	2.03						
248.9	100.00	0.00	3.270	11.04	1.57						
209.3	100.00	0.00	2.750	9.47	1.34						
176.0	100.00	0.00	2.312	8.13	1.27						
148.0	100.00	0.00	1.945	6.86	1.31						
124.5	100.00	0.00	1.635	5.55	1.39						
104.7	100.00	0.00	1.375	4.16	1.37						
88.00	100.00	0.00	1.156	2.79	1.15						
74.00	100.00	0.00	0.972	1.64	0.81						
62.23	100.00	0.37	0.818	0.83	0.52						
52.33	99.63	0.56	0.688	0.31	0.31						
44.00	99.07	0.94	0.578	0.00	0.00						
37.00	98.13	1.73	0.486	0.00	0.00						
31.11	96.40	3.26	0.409	0.00	0.00						
26.16	93.14	5.82	0.344	0.00	0.00						
22.00	87.32	8.73	0.289	0.00	0.00						
18.50	78.59	10.42	0.243	0.00	0.00						
15.56	68.17	10.18	0.204	0.00	0.00						
13.08	57.99	9.16	0.172	0.00	0.00						
11.00	48.83	8.37	0.145	0.00	0.00						

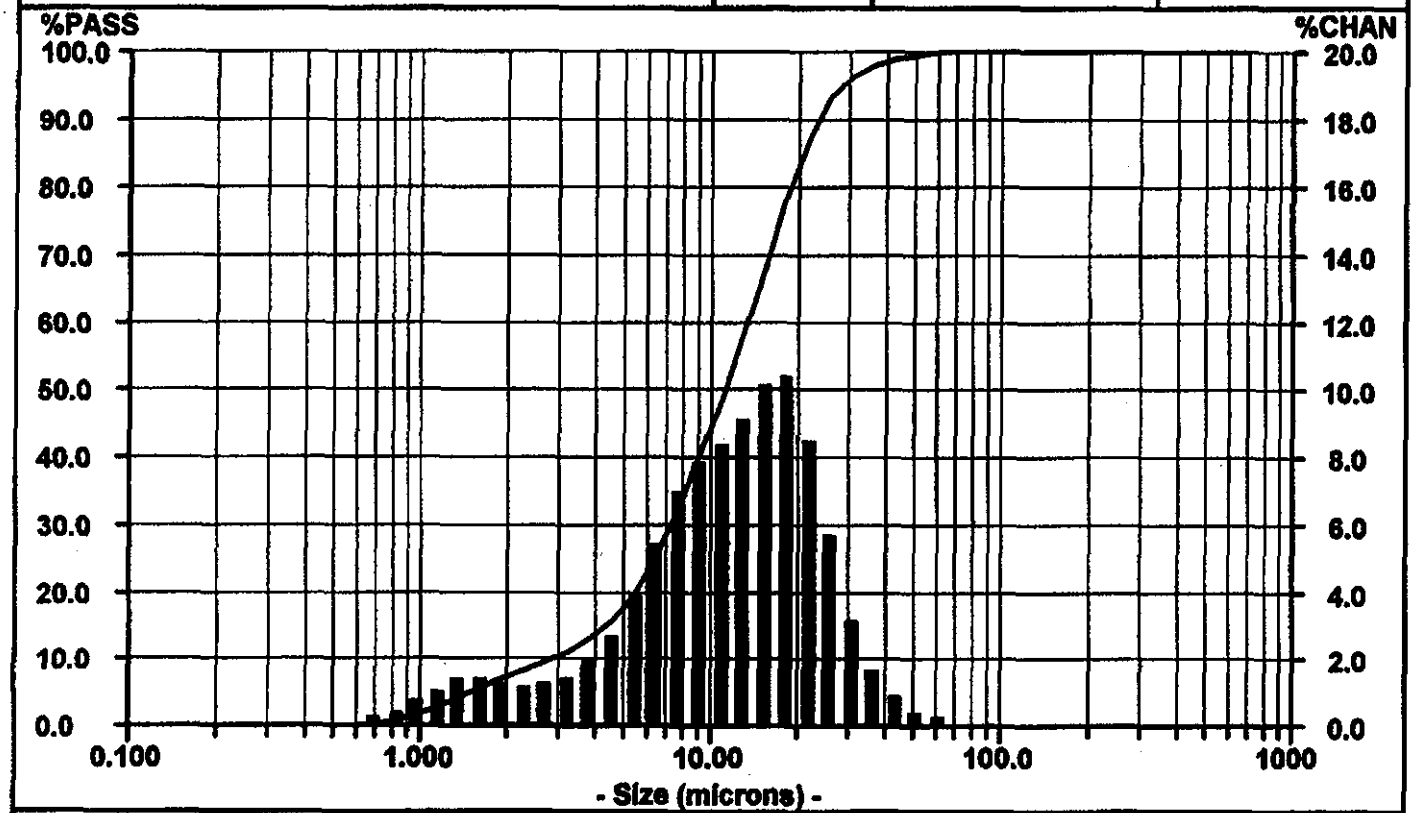
BCR 67 Sample

BCR67, riffled
7-19-01

Date: 07/20/91 Meas #: 00005
Time: 08:11 Pres #: 01

1M NaOH - 1M NaNO3
Flow = 60 ml/sec
RI of the medium = 1.33 and the particle = 1.54
Sonicate 2 min.
File: BCR6735

Summary	Percentiles		Dia	Vol%	Width
mv = 12.75	10% = 2.875	60% = 13.52	12.03	93%	15.00
mn = 1.157	20% = 5.516	70% = 15.98	1.251	7%	0.808
ma = 6.095	30% = 7.330	80% = 18.91			
cs = 0.984	40% = 9.167	90% = 23.52			
sd = 7.879	50% = 11.25	95% = 28.42			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	40.43	7.90						
592.0	100.00	0.00	7.778	32.53	7.02						
497.8	100.00	0.00	6.541	25.51	5.59						
418.6	100.00	0.00	5.500	19.92	4.02						
352.0	100.00	0.00	4.625	15.90	2.77						
296.0	100.00	0.00	3.889	13.13	1.97						
248.9	100.00	0.00	3.270	11.16	1.52						
209.3	100.00	0.00	2.750	9.64	1.31						
176.0	100.00	0.00	2.312	8.33	1.26						
148.0	100.00	0.00	1.945	7.07	1.32						
124.5	100.00	0.00	1.635	5.75	1.43						
104.7	100.00	0.00	1.375	4.32	1.41						
88.00	100.00	0.00	1.156	2.91	1.19						
74.00	100.00	0.00	0.972	1.72	0.84						
62.23	100.00	0.36	0.818	0.88	0.54						
52.33	99.64	0.56	0.688	0.34	0.34						
44.00	99.08	0.94	0.578	0.00	0.00						
37.00	98.14	1.71	0.486	0.00	0.00						
31.11	96.43	3.21	0.409	0.00	0.00						
26.16	93.22	5.75	0.344	0.00	0.00						
22.00	87.47	8.67	0.289	0.00	0.00						
18.50	78.80	10.42	0.243	0.00	0.00						
15.56	68.38	10.25	0.204	0.00	0.00						
13.08	58.13	9.25	0.172	0.00	0.00						
11.00	48.88	8.45	0.145	0.00	0.00						

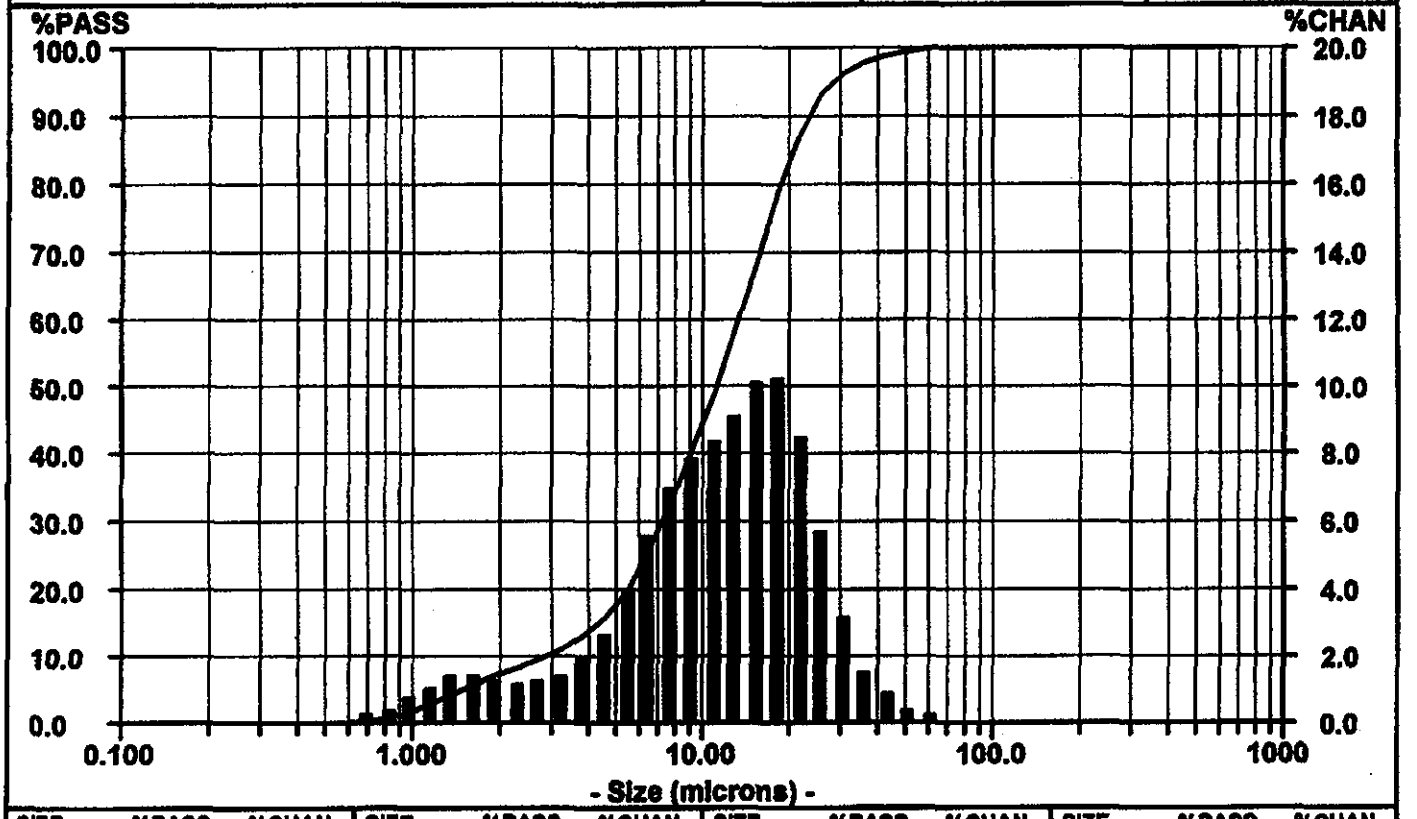
BCR 67 Sample

BCR67, riffled
7-19-01

Date: 07/20/91 Meas #: 00005
Time: 08:22 Pres #: 01

1M NaOH - 1M NaNO3
Flow = 60 ml/sec
RI of the medium = 1.33 and the particle = 2.00
Sonicate 2 min.
File: BCR6736

Summary	Percentiles		Dia	Vol%	Width
mv = 12.73	10% = 2.861	60% = 13.49	12.02	93%	14.99
mn = 1.157	20% = 5.508	70% = 15.96	1.250	7%	0.807
ma = 6.082	30% = 7.321	80% = 18.90			
cs = 0.987	40% = 9.154	90% = 23.49			
sd = 7.874	50% = 11.23	95% = 28.38			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	40.50	7.91						
592.0	100.00	0.00	7.778	32.59	7.03						
497.8	100.00	0.00	6.541	25.56	5.60						
418.6	100.00	0.00	5.500	19.96	4.02						
352.0	100.00	0.00	4.625	15.94	2.77						
296.0	100.00	0.00	3.889	13.17	1.97						
248.9	100.00	0.00	3.270	11.20	1.52						
209.3	100.00	0.00	2.750	9.68	1.31						
176.0	100.00	0.00	2.312	8.37	1.26						
148.0	100.00	0.00	1.945	7.11	1.33						
124.5	100.00	0.00	1.635	5.78	1.43						
104.7	100.00	0.00	1.375	4.35	1.42						
88.00	100.00	0.00	1.156	2.93	1.20						
74.00	100.00	0.00	0.972	1.73	0.88						
62.23	100.00	0.36	0.818	0.88	0.54						
52.33	99.64	0.55	0.688	0.34	0.34						
44.00	99.09	0.93	0.578	0.00	0.00						
37.00	98.16	1.70	0.486	0.00	0.00						
31.11	96.46	3.21	0.409	0.00	0.00						
26.16	93.25	5.74	0.344	0.00	0.00						
22.00	87.51	8.86	0.289	0.00	0.00						
18.50	78.85	10.37	0.243	0.00	0.00						
15.56	68.48	10.25	0.204	0.00	0.00						
13.08	58.23	9.26	0.172	0.00	0.00						
11.00	48.97	8.47	0.145	0.00	0.00						

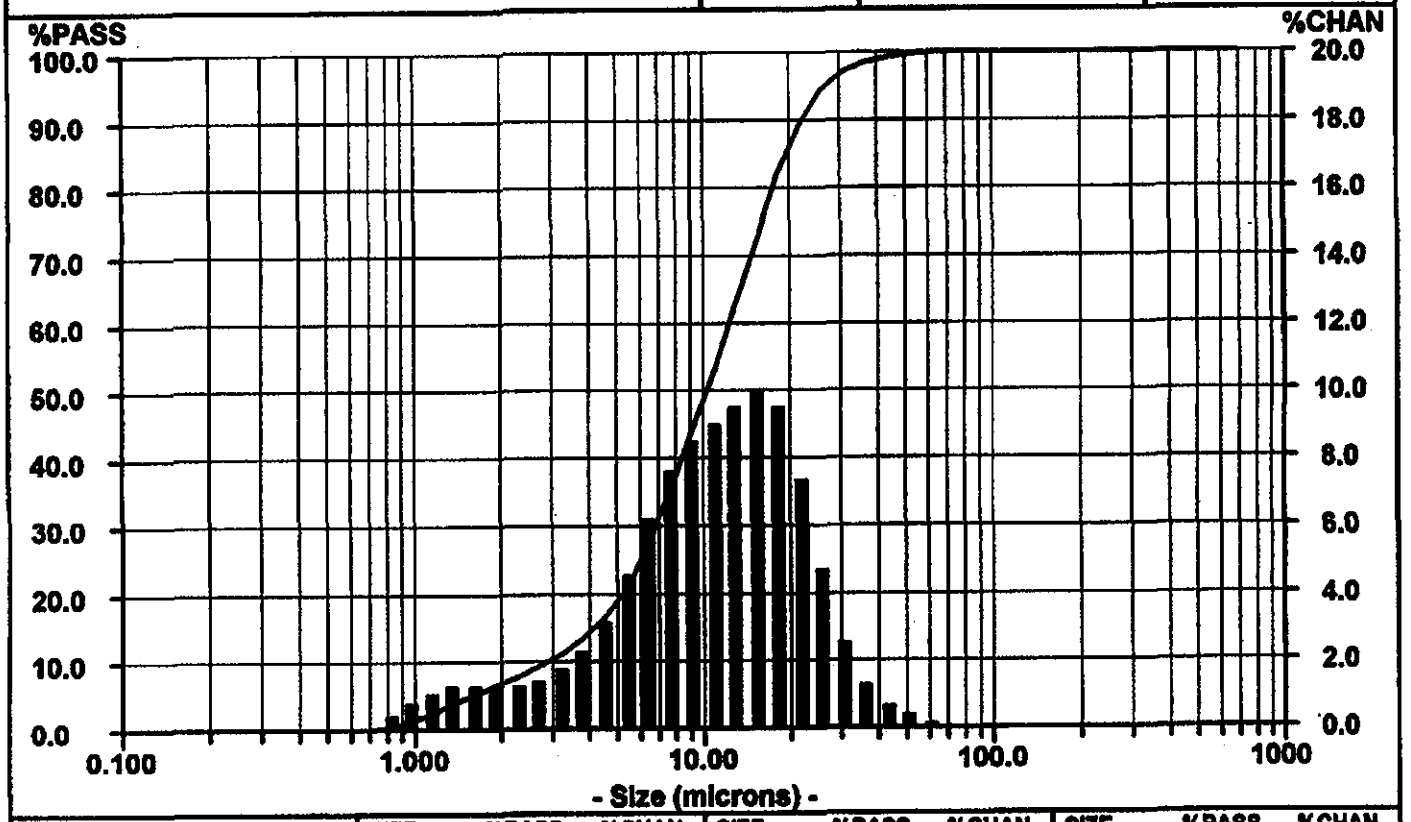
BCR 67 Duplicate

BCR67, riffled
7-19-01

Date: 07/20/91 Meas #: 00006
Time: 09:19 Pres #: 01

1M NaOH - 1M NaNO3
Flow = 17 ml/sec
RI of the medium = 1.33 and the particle = 1.54
File: BCR6737

Summary	Percentiles		Dia	Vol%	Width
mv = 11.94	10% = 2.916	60% = 12.46	10.87	95%	14.19
mn = 1.329	20% = 5.240	70% = 14.83	1.179	5%	0.590
ma = 6.079	30% = 6.895	80% = 17.70			
cs = 0.987	40% = 8.518	90% = 22.14			
sd = 7.353	50% = 10.35	95% = 28.78			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	44.18	8.63						
592.0	100.00	0.00	7.778	35.55	7.79						
497.8	100.00	0.00	6.541	27.76	6.31						
418.6	100.00	0.00	5.500	21.45	4.62						
352.0	100.00	0.00	4.625	16.83	3.25						
296.0	100.00	0.00	3.889	13.58	2.34						
248.9	100.00	0.00	3.270	11.24	1.80						
209.3	100.00	0.00	2.750	9.44	1.50						
176.0	100.00	0.00	2.312	7.94	1.37						
148.0	100.00	0.00	1.945	6.57	1.36						
124.5	100.00	0.00	1.635	5.21	1.39						
104.7	100.00	0.00	1.375	3.82	1.36						
88.00	100.00	0.00	1.156	2.46	1.14						
74.00	100.00	0.00	0.972	1.32	0.81						
62.23	100.00	0.21	0.818	0.51	0.51						
52.33	99.79	0.47	0.688	0.00	0.00						
44.00	99.32	0.77	0.578	0.00	0.00						
37.00	98.55	1.38	0.486	0.00	0.00						
31.11	97.17	2.61	0.409	0.00	0.00						
26.16	94.56	4.76	0.344	0.00	0.00						
22.00	89.80	7.48	0.289	0.00	0.00						
18.50	82.32	9.53	0.243	0.00	0.00						
15.56	72.79	10.01	0.204	0.00	0.00						
13.08	62.78	9.55	0.172	0.00	0.00						
11.00	53.23	9.05	0.145	0.00	0.00						

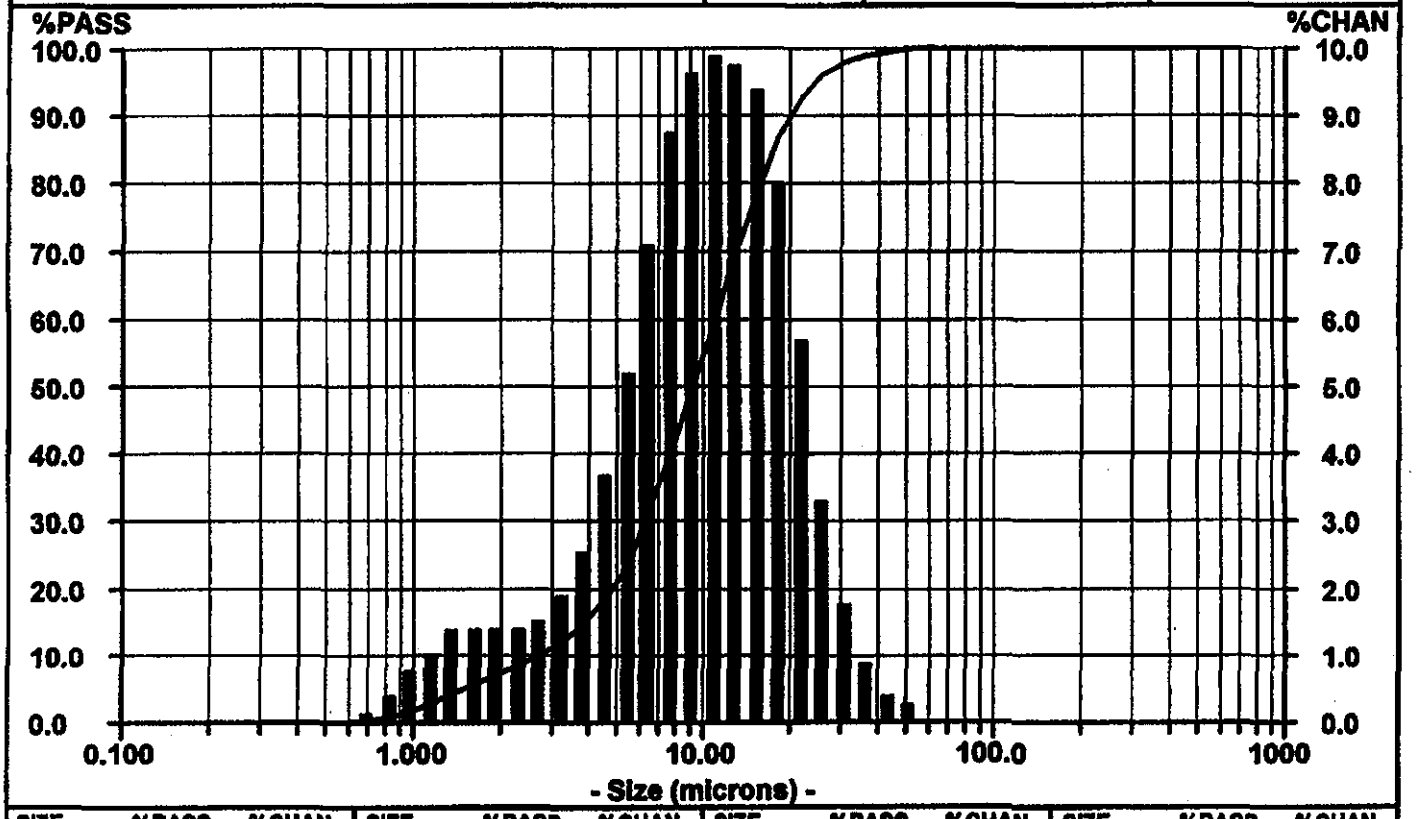
BCR 67 Duplicate

BCR67, riffled
7-19-01

Date: 07/20/91 Meas #: 00005
Time: 09:28 Pres #: 01

1M NaOH - 1M NaNO3
Flow = 17 ml/sec
RI of the medium = 1.33 and the particle = 2.00
File: BCR6738

Summary	Percentiles		Dia	Vol%	Width
mv = 10.79	10% = 2.707	60% = 11.07	9.765	94%	12.64
mn = 1.218	20% = 4.862	70% = 13.20	1.157	6%	0.630
ma = 6.607	30% = 6.371	80% = 15.90			
cs = 1.070	40% = 7.769	90% = 20.09			
sd = 6.579	50% = 9.290	95% = 24.39			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	49.76	9.70						
592.0	100.00	0.00	7.778	40.06	8.85						
497.8	100.00	0.00	6.541	31.21	7.23						
418.6	100.00	0.00	5.500	23.98	5.34						
352.0	100.00	0.00	4.625	18.64	3.77						
296.0	100.00	0.00	3.889	14.87	2.69						
248.9	100.00	0.00	3.270	12.18	2.02						
209.3	100.00	0.00	2.750	10.16	1.63						
176.0	100.00	0.00	2.312	8.53	1.45						
148.0	100.00	0.00	1.945	7.08	1.41						
124.5	100.00	0.00	1.635	5.67	1.44						
104.7	100.00	0.00	1.375	4.23	1.40						
88.00	100.00	0.00	1.156	2.83	1.18						
74.00	100.00	0.00	0.972	1.65	0.83						
62.23	100.00	0.00	0.818	0.82	0.82						
52.33	100.00	0.38	0.688	0.30	0.30						
44.00	99.62	0.58	0.578	0.00	0.00						
37.00	99.04	1.00	0.486	0.00	0.00						
31.11	98.04	1.86	0.409	0.00	0.00						
26.16	96.18	3.46	0.344	0.00	0.00						
22.00	92.72	5.76	0.289	0.00	0.00						
18.50	86.96	8.05	0.243	0.00	0.00						
15.56	78.91	9.40	0.204	0.00	0.00						
13.08	69.51	9.85	0.172	0.00	0.00						
11.00	59.66	9.90	0.145	0.00	0.00						

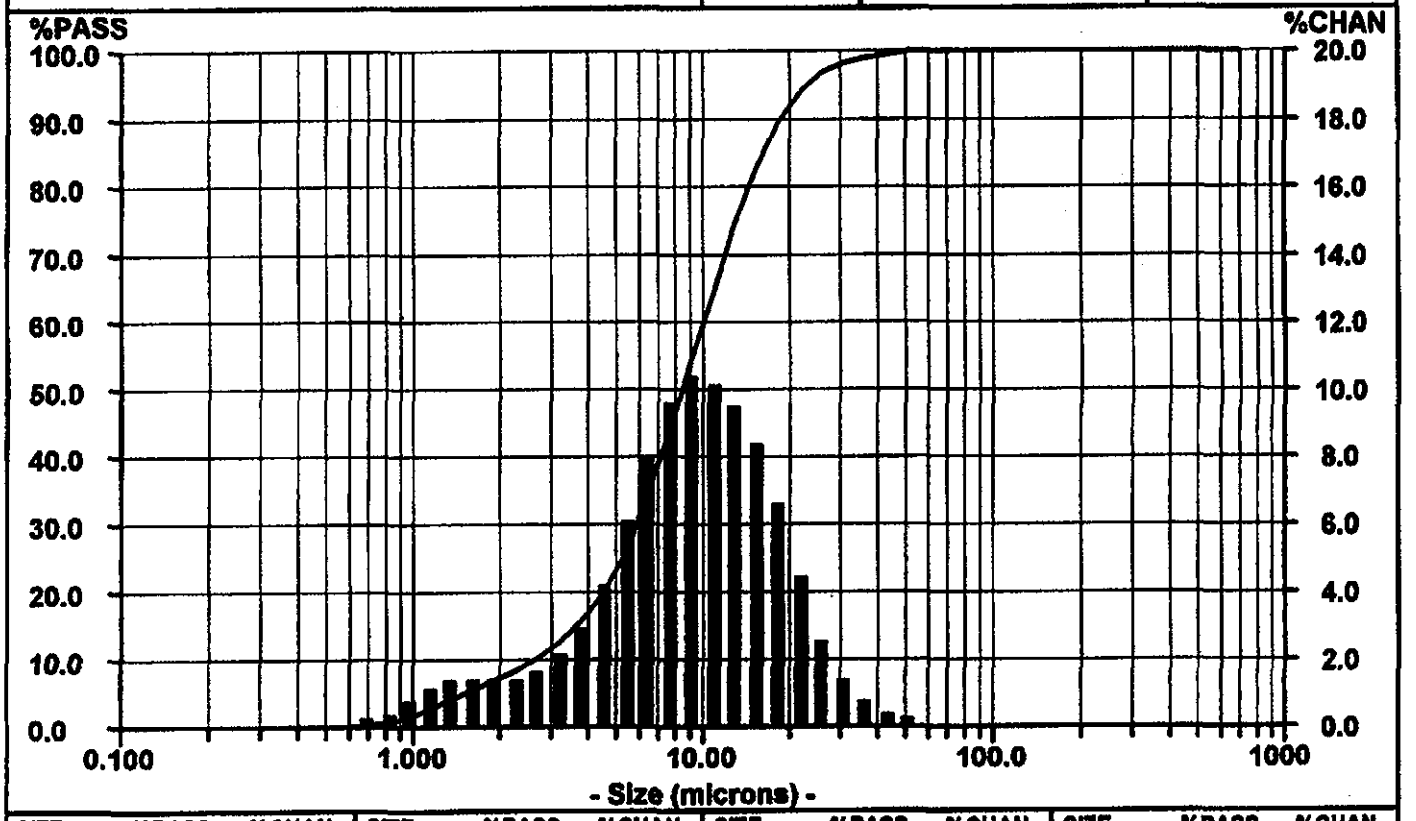
BCR 67 Duplicate

BCR67, riffed
7-19-01

Date: 07/20/91 Meas #: 00005
Time: 09:46 Pres #: 01

1M NaOH - 1M NaNO3
Flow = 17 ml/sec
RI of the medium = 1.33 and the particle = 1.54
Sonicate 2 min.
File: BCR6739

Summary	Percentiles		Dia	Vol%	Width
mv = 10.02	10% = 2.617	60% = 10.08	8.960	94%	11.53
mn = 1.232	20% = 4.582	70% = 12.01	1.157	6%	0.630
ma = 5.349	30% = 5.962	80% = 14.56			
cs = 1.122	40% = 7.214	90% = 18.65			
sd = 5.998	50% = 8.539	95% = 22.86			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	54.85	10.48						
592.0	100.00	0.00	7.778	44.40	9.79						
497.8	100.00	0.00	6.541	34.61	8.18						
418.6	100.00	0.00	5.500	26.43	6.16						
352.0	100.00	0.00	4.625	20.27	4.38						
296.0	100.00	0.00	3.889	15.89	3.09						
248.9	100.00	0.00	3.270	12.80	2.26						
209.3	100.00	0.00	2.750	10.54	1.76						
176.0	100.00	0.00	2.312	8.78	1.61						
148.0	100.00	0.00	1.945	7.27	1.45						
124.5	100.00	0.00	1.635	5.82	1.48						
104.7	100.00	0.00	1.375	4.34	1.44						
88.00	100.00	0.00	1.156	2.90	1.21						
74.00	100.00	0.00	0.972	1.69	0.85						
62.23	100.00	0.00	0.818	0.84	0.53						
52.33	100.00	0.34	0.688	0.31	0.31						
44.00	99.66	0.49	0.578	0.00	0.00						
37.00	99.17	0.80	0.486	0.00	0.00						
31.11	98.37	1.44	0.409	0.00	0.00						
26.16	96.93	2.65	0.344	0.00	0.00						
22.00	94.28	4.52	0.289	0.00	0.00						
18.50	89.76	6.69	0.243	0.00	0.00						
15.56	83.07	8.43	0.204	0.00	0.00						
13.08	74.64	9.55	0.172	0.00	0.00						
11.00	65.09	10.24	0.145	0.00	0.00						

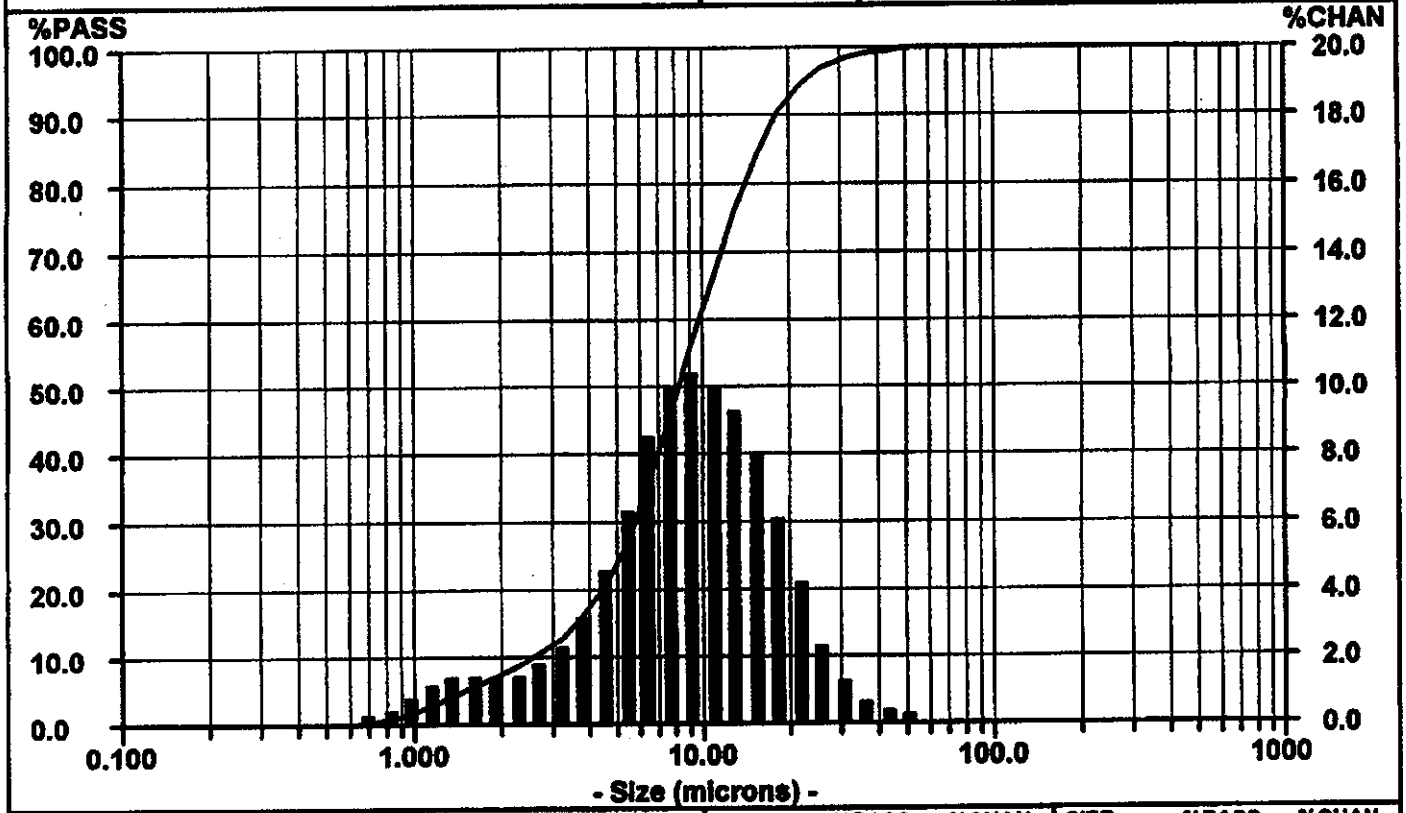
BCR 67 Duplicate

BCR67, rifled 7-19-01

Date: 07/20/91 Meas #: 00005
Time: 09:59 Pres #: 01

1M NaOH - 1M NaNO3
Flow = 17 ml/sec
RI of the medium = 1.33 and the particle = 2.00
sonicate 2 min.
File: BCR6740

Summary		Percentiles		Dia	Vol%	Width
mv =	9.796	10% = 2.599	60% = 9.799	8.716	94%	11.25
mn =	1.239	20% = 4.500	70% = 11.67	1.157	6%	0.629
ma =	5.276	30% = 5.831	80% = 14.19			
cs =	1.137	40% = 7.036	90% = 18.27			
sd =	5.836	50% = 8.310	95% = 22.49			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	56.56	10.58						
592.0	100.00	0.00	7.778	46.98	10.10						
497.8	100.00	0.00	6.541	36.88	8.56						
418.6	100.00	0.00	5.500	27.33	6.49						
352.0	100.00	0.00	4.626	20.84	4.62						
296.0	100.00	0.00	3.889	16.22	3.25						
248.9	100.00	0.00	3.270	12.97	2.34						
209.3	100.00	0.00	2.750	10.63	1.80						
176.0	100.00	0.00	2.312	8.83	1.53						
148.0	100.00	0.00	1.945	7.30	1.46						
124.5	100.00	0.00	1.635	5.84	1.46						
104.7	100.00	0.00	1.375	4.36	1.46						
88.00	100.00	0.00	1.156	2.91	1.22						
74.00	100.00	0.00	0.972	1.69	0.85						
62.23	100.00	0.00	0.818	0.84	0.53						
52.33	100.00	0.33	0.688	0.31	0.31						
44.00	99.67	0.47	0.578	0.00	0.00						
37.00	99.20	0.76	0.486	0.00	0.00						
31.11	98.44	1.35	0.409	0.00	0.00						
26.16	97.09	2.47	0.344	0.00	0.00						
22.00	94.62	4.22	0.289	0.00	0.00						
18.50	90.40	6.29	0.243	0.00	0.00						
15.56	84.11	8.05	0.204	0.00	0.00						
13.08	76.06	9.31	0.172	0.00	0.00						
11.00	66.75	10.19	0.145	0.00	0.00						

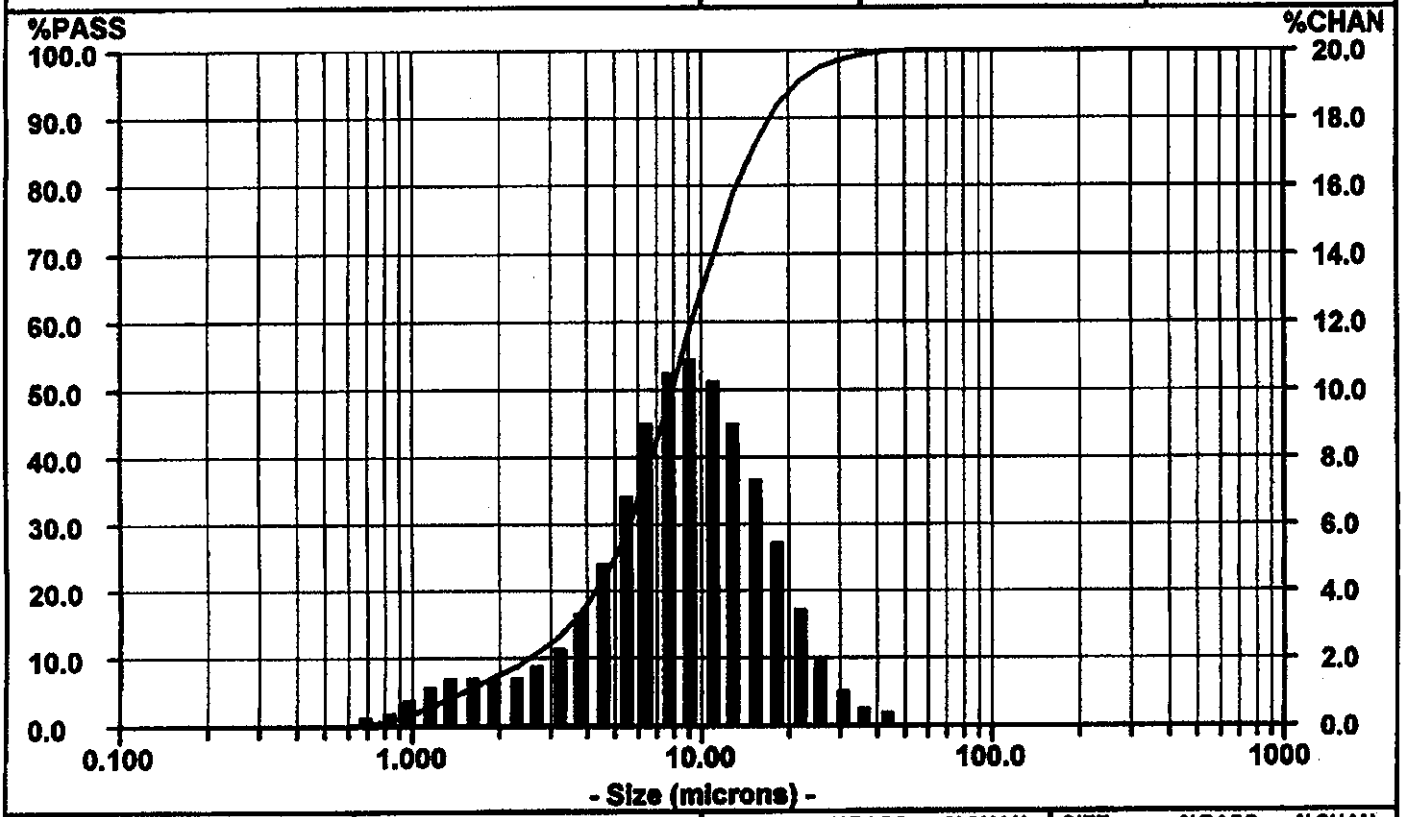
BCR 67 Duplicate

BCR67, riffled
7-19-01

Date: 07/20/91 Meas #: 00006
Time: 10:09 Pres #: 01

1M NaOH - 1M NaNO3
Flow = 40 ml/sec
RI of the medium = 1.33 and the particle 1.54
File: BCR6741

Summary	Percentiles		Dia	Vol%	Width
mv = 9.300	10% = 2.562	60% = 9.329	8.352	94%	10.44
mn = 1.250	20% = 4.383	70% = 11.03	1.158	6%	0.628
ma = 5.151	30% = 5.658	80% = 13.36			
cs = 1.165	40% = 6.798	90% = 17.23			
sd = 5.433	50% = 7.978	95% = 21.19			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	59.48	11.09						
592.0	100.00	0.00	7.778	48.39	10.66						
497.8	100.00	0.00	6.541	37.73	9.06						
418.6	100.00	0.00	5.500	28.65	6.93						
352.0	100.00	0.00	4.625	21.72	4.95						
296.0	100.00	0.00	3.889	16.77	3.47						
248.9	100.00	0.00	3.270	13.30	2.48						
209.3	100.00	0.00	2.750	10.82	1.88						
176.0	100.00	0.00	2.312	8.94	1.67						
148.0	100.00	0.00	1.945	7.37	1.48						
124.5	100.00	0.00	1.635	5.89	1.50						
104.7	100.00	0.00	1.375	4.39	1.46						
88.00	100.00	0.00	1.156	2.93	1.23						
74.00	100.00	0.00	0.972	1.70	0.86						
62.23	100.00	0.00	0.818	0.84	0.53						
52.33	100.00	0.10	0.688	0.31	0.31						
44.00	99.90	0.41	0.578	0.00	0.00						
37.00	99.49	0.65	0.486	0.00	0.00						
31.11	98.84	1.13	0.409	0.00	0.00						
26.16	97.71	2.07	0.344	0.00	0.00						
22.00	95.64	3.59	0.289	0.00	0.00						
18.50	92.05	5.56	0.243	0.00	0.00						
15.56	86.49	7.49	0.204	0.00	0.00						
13.08	79.00	9.13	0.172	0.00	0.00						
11.00	69.87	10.39	0.145	0.00	0.00						

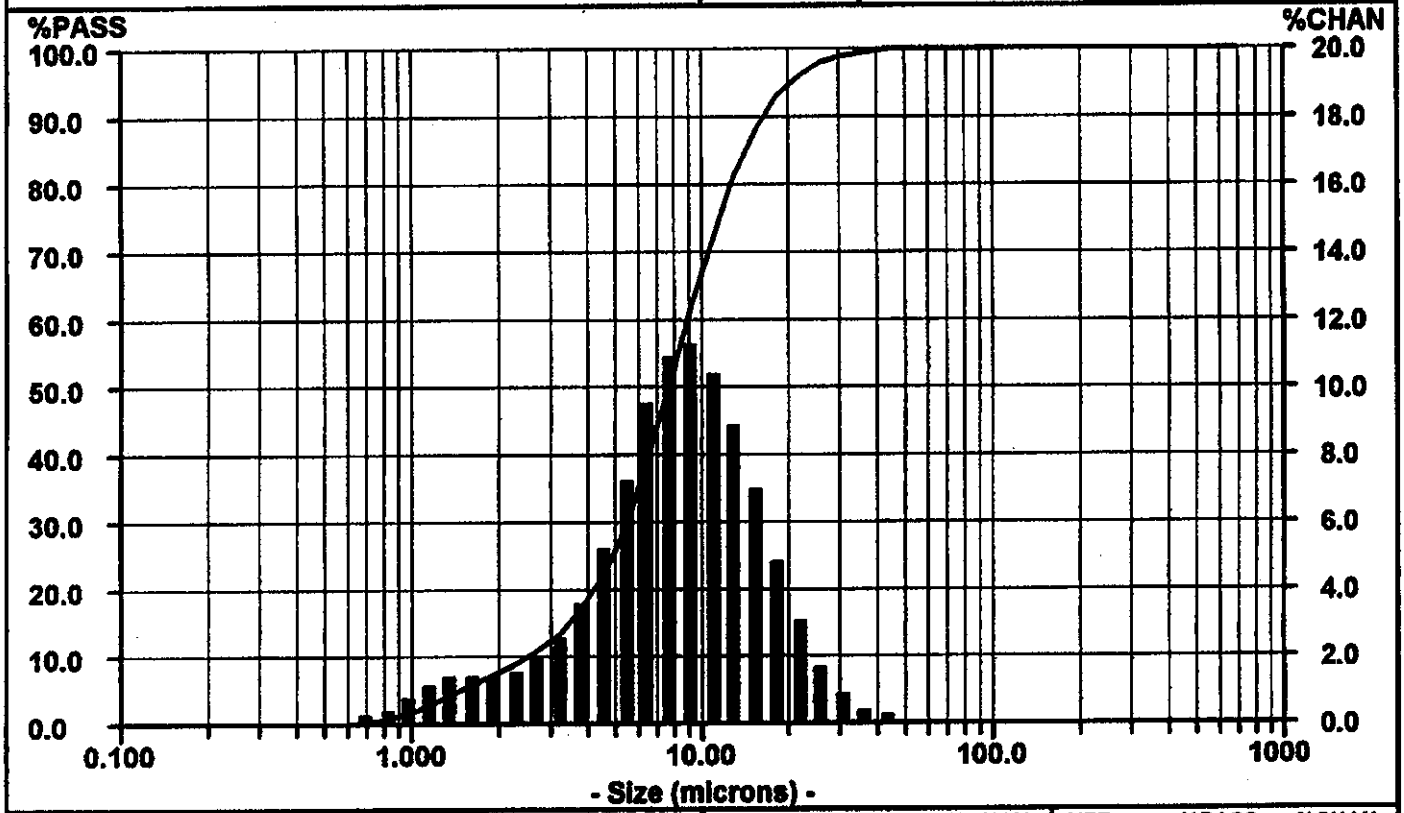
BCR 67 Duplicate

BCR67, riffed 7-19-01

Date: 07/20/91 Meas #: 00009
Time: 10:17 Pres #: 01

1M NaOH - 1M NaNO3
Flow = 40 ml/sec
RI of the medium = 1.33 and the particle = 2.00
File: BCR6742

Summary	Percentiles		Dia	Vol%	Width
mv = 8.947	10% = 2.535	60% = 9.001	8.087	94%	9.845
mn = 1.259	20% = 4.291	70% = 10.57	1.159	6%	0.627
ma = 5.056	30% = 5.522	80% = 12.76			
cs = 1.187	40% = 6.616	90% = 16.45			
sd = 5.130	50% = 7.733	95% = 20.24			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	61.78	11.39						
592.0	100.00	0.00	7.778	50.39	11.08						
497.8	100.00	0.00	6.541	39.31	9.51						
418.6	100.00	0.00	5.500	29.80	7.31						
352.0	100.00	0.00	4.625	22.49	5.25						
296.0	100.00	0.00	3.889	17.24	3.67						
248.9	100.00	0.00	3.270	13.57	2.60						
209.3	100.00	0.00	2.750	10.97	1.94						
176.0	100.00	0.00	2.312	9.03	1.61						
148.0	100.00	0.00	1.945	7.42	1.50						
124.5	100.00	0.00	1.635	5.92	1.51						
104.7	100.00	0.00	1.375	4.41	1.47						
88.00	100.00	0.00	1.156	2.94	1.24						
74.00	100.00	0.00	0.972	1.70	0.86						
62.23	100.00	0.00	0.818	0.84	0.53						
52.33	100.00	0.00	0.688	0.31	0.31						
44.00	100.00	0.37	0.578	0.00	0.00						
37.00	99.63	0.57	0.486	0.00	0.00						
31.11	99.06	0.98	0.409	0.00	0.00						
26.16	98.08	1.78	0.344	0.00	0.00						
22.00	96.30	3.12	0.289	0.00	0.00						
18.50	93.18	4.98	0.243	0.00	0.00						
15.56	88.20	7.01	0.204	0.00	0.00						
13.08	81.19	8.92	0.172	0.00	0.00						
11.00	72.27	10.49	0.145	0.00	0.00						

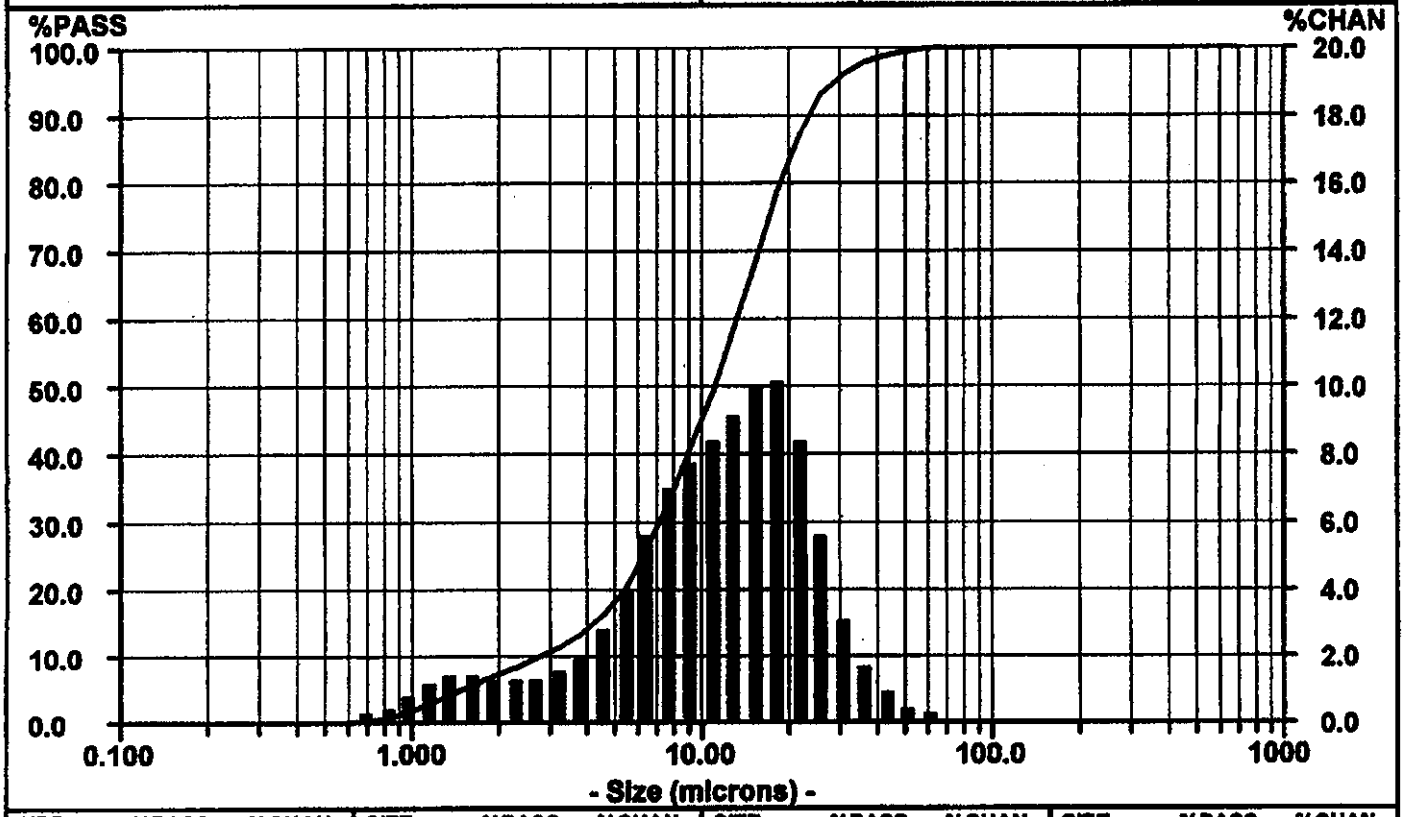
BCR 67 Duplicate

BCR67, riffled 7-19-01

Date: 07/20/91 Meas #: 00010
Time: 10:27 Pres #: 01

1M NaOH - 1M NaNO3
Flow = 40 ml/sec
RI of the medium = 1.33 and the particles = 1.54
sonicate 2 min.
File: BCR6742

Summary	Percentiles		Dia	Vol%	Width
mv = 12.67	10% = 2.806	60% = 13.39	11.92	93%	15.01
mn = 1.162	20% = 5.408	70% = 15.85	1.251	7%	0.808
ma = 6.028	30% = 7.227	80% = 18.80			
cs = 0.985	40% = 9.061	90% = 23.48			
sd = 7.885	50% = 11.12	95% = 28.49			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	40.98	7.87						
592.0	100.00	0.00	7.778	33.11	7.01						
497.8	100.00	0.00	6.541	26.10	5.64						
418.6	100.00	0.00	5.500	20.46	4.10						
352.0	100.00	0.00	4.625	16.36	2.87						
296.0	100.00	0.00	3.889	13.49	2.06						
248.9	100.00	0.00	3.270	11.43	1.60						
209.3	100.00	0.00	2.750	9.83	1.36						
176.0	100.00	0.00	2.312	8.47	1.30						
148.0	100.00	0.00	1.945	7.17	1.35						
124.5	100.00	0.00	1.635	5.82	1.44						
104.7	100.00	0.00	1.375	4.38	1.43						
88.00	100.00	0.00	1.156	2.95	1.21						
74.00	100.00	0.00	0.972	1.74	0.86						
62.23	100.00	0.38	0.818	0.88	0.55						
52.33	99.62	0.58	0.688	0.33	0.33						
44.00	99.04	0.96	0.578	0.00	0.00						
37.00	98.08	1.71	0.486	0.00	0.00						
31.11	96.37	3.17	0.409	0.00	0.00						
26.16	93.20	5.60	0.344	0.00	0.00						
22.00	87.60	8.46	0.289	0.00	0.00						
18.50	79.14	10.26	0.243	0.00	0.00						
15.56	68.88	10.19	0.204	0.00	0.00						
13.08	58.69	9.25	0.172	0.00	0.00						
11.00	49.44	8.46	0.145	0.00	0.00						

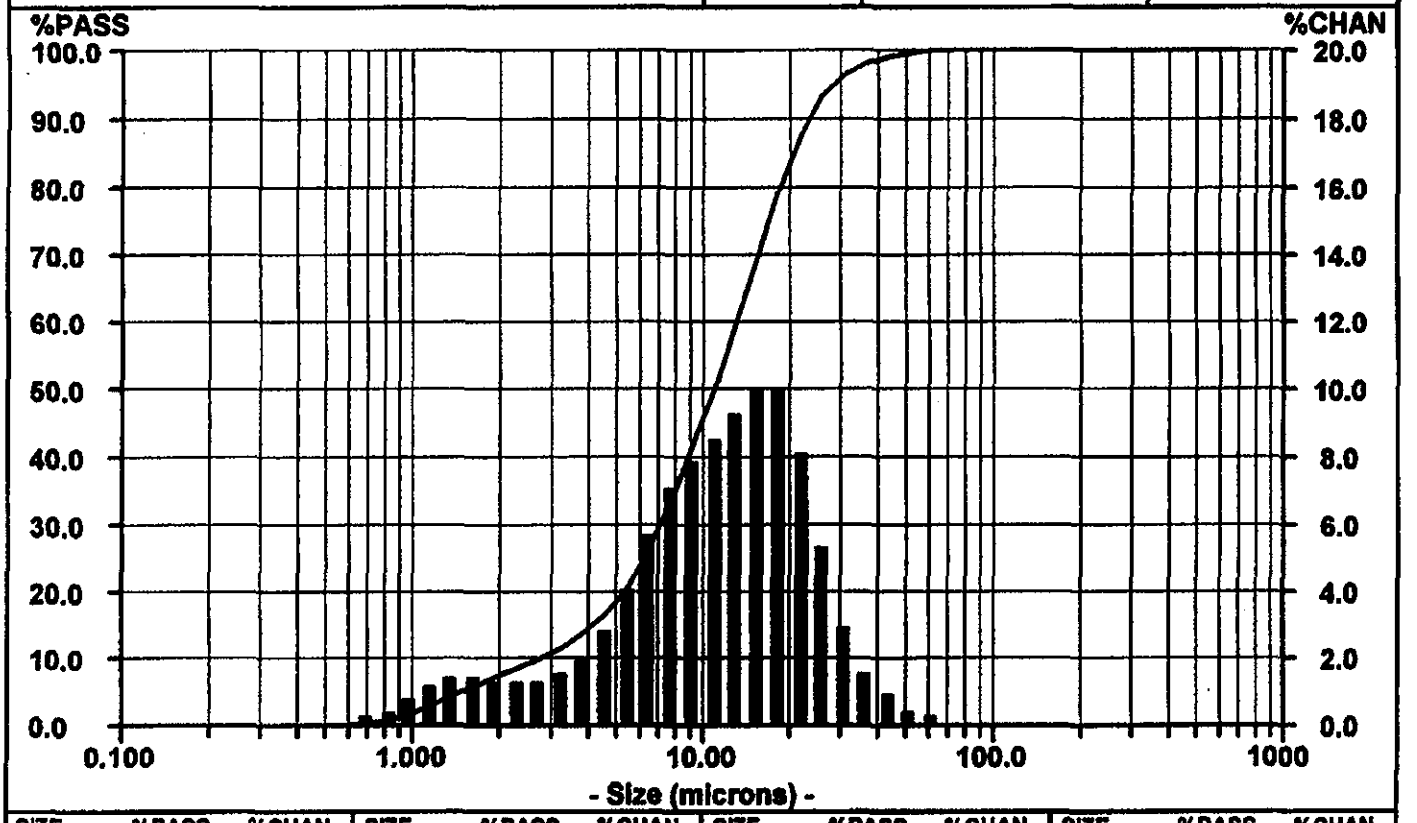
BCR 67 Duplicate

BCR67, riffled
7-19-01

Date: 07/20/91 Meas #: 00005
Time: 10:37 Pres #: 01

1M NaOH - 1M NaNO3
Flow = 40 ml/sec
RI of the medium 1.33 and of the particle 2.00
sonicate 2 min.
File: BCR6743

Summary	Percentiles		Dia	Vol%	Width
mv = 12.56	10% = 2.786	60% = 13.22	11.78	93%	14.89
mn = 1.163	20% = 5.366	70% = 15.68	1.251	7%	0.807
ma = 5.989	30% = 7.163	80% = 18.63			
cs = 1.002	40% = 8.962	90% = 23.30			
sd = 7.815	50% = 10.99	95% = 28.32			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	41.51	7.98						
592.0	100.00	0.00	7.778	33.53	7.12						
497.8	100.00	0.00	6.541	26.41	5.73						
418.6	100.00	0.00	5.500	20.68	4.17						
352.0	100.00	0.00	4.625	16.51	2.91						
296.0	100.00	0.00	3.889	13.60	2.09						
248.9	100.00	0.00	3.270	11.51	1.62						
209.3	100.00	0.00	2.750	9.89	1.37						
176.0	100.00	0.00	2.312	8.52	1.30						
148.0	100.00	0.00	1.945	7.22	1.36						
124.5	100.00	0.00	1.635	5.86	1.45						
104.7	100.00	0.00	1.375	4.41	1.44						
88.00	100.00	0.00	1.156	2.97	1.22						
74.00	100.00	0.00	0.972	1.75	0.87						
62.23	100.00	0.37	0.818	0.88	0.56						
52.33	99.63	0.57	0.688	0.33	0.33						
44.00	99.06	0.94	0.578	0.00	0.00						
37.00	98.12	1.67	0.486	0.00	0.00						
31.11	96.45	3.08	0.409	0.00	0.00						
26.16	93.37	5.46	0.344	0.00	0.00						
22.00	87.91	8.27	0.289	0.00	0.00						
18.50	79.64	10.11	0.243	0.00	0.00						
15.56	69.53	10.15	0.204	0.00	0.00						
13.08	59.38	9.31	0.172	0.00	0.00						
11.00	50.07	8.56	0.145	0.00	0.00						

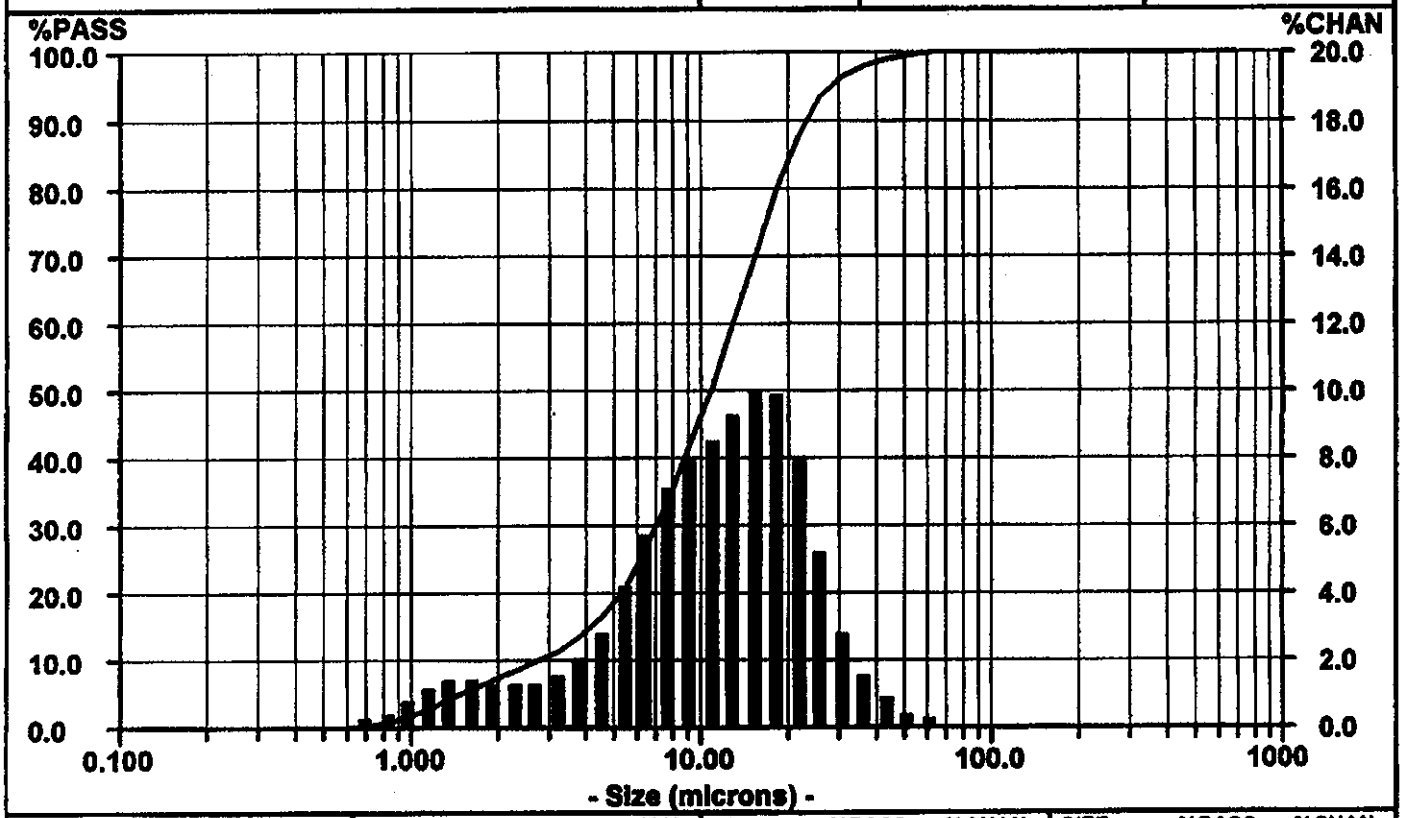
BCR 67 Duplicate

BCR67, riffled 7-19-01

Date: 07/20/91 Meas #: 00005
Time: 10:46 Pres #: 01

1M NaOH - 1M NaNO3
Flow = 60 ml/sec
RI of the medium = 1.33 and the particle = 1.54
File: BCR6744

Summary	Percentiles		Dia	Vol%	Width
mv = 12.44	10% = 2.773	60% = 13.06	11.63	93%	14.74
mn = 1.166	20% = 5.326	70% = 15.51	1.252	7%	0.807
ma = 5.957	30% = 7.098	80% = 18.44			
cs = 1.007	40% = 8.861	90% = 23.08			
sd = 7.741	50% = 10.85	95% = 28.08			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	42.07	8.10						
592.0	100.00	0.00	7.778	33.97	7.24						
497.8	100.00	0.00	6.541	26.73	5.83						
418.6	100.00	0.00	5.500	20.90	4.25						
352.0	100.00	0.00	4.625	16.65	2.97						
296.0	100.00	0.00	3.889	13.68	2.12						
248.9	100.00	0.00	3.270	11.56	1.63						
209.3	100.00	0.00	2.750	9.93	1.39						
176.0	100.00	0.00	2.312	8.54	1.31						
148.0	100.00	0.00	1.945	7.23	1.36						
124.5	100.00	0.00	1.635	5.87	1.46						
104.7	100.00	0.00	1.375	4.41	1.44						
88.00	100.00	0.00	1.156	2.97	1.22						
74.00	100.00	0.00	0.972	1.75	0.87						
62.23	100.00	0.36	0.818	0.88	0.55						
52.33	99.64	0.55	0.688	0.33	0.33						
44.00	99.09	0.91	0.578	0.00	0.00						
37.00	98.18	1.62	0.486	0.00	0.00						
31.11	96.56	2.99	0.409	0.00	0.00						
26.16	93.57	5.31	0.344	0.00	0.00						
22.00	88.26	8.09	0.289	0.00	0.00						
18.50	80.17	9.97	0.243	0.00	0.00						
15.56	70.20	10.13	0.204	0.00	0.00						
13.08	60.07	9.35	0.172	0.00	0.00						
11.00	50.72	8.65	0.145	0.00	0.00						

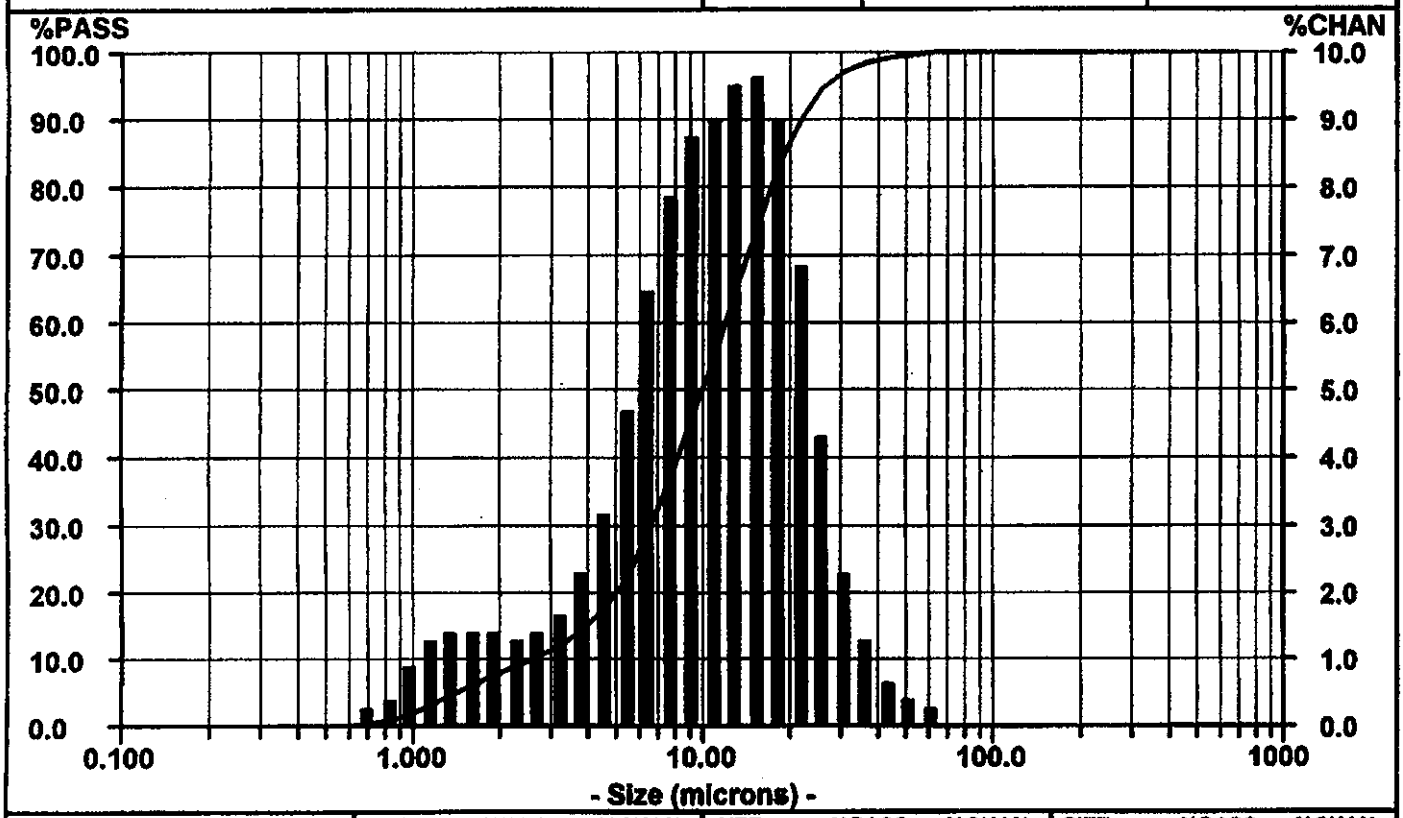
BCR 67 Duplicate

BCR67, riffled
7-19-01

Date: 07/20/91 Meas #: 00010
Time: 12:10 Pres #: 01

1M NaOH - 1M NaNO3
Flow = 60 ml/sec
RI of the medium = 1.33 and the particle = 2.00
File: BCR6745

Summary	Percentiles		Dia	Vol%	Width
mv = 11.69	10% = 2.619	60% = 12.07	10.77	92%	13.82
mn = 1.160	20% = 5.061	70% = 14.42	1.248	8%	0.804
ma = 5.674	30% = 6.696	80% = 17.32			
cs = 1.058	40% = 8.268	90% = 21.85			
sd = 7.270	50% = 10.03	95% = 26.68			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	45.78	8.81						
592.0	100.00	0.00	7.778	36.97	7.98						
497.8	100.00	0.00	6.541	28.99	6.50						
418.6	100.00	0.00	5.500	22.49	4.76						
352.0	100.00	0.00	4.625	17.73	3.29						
296.0	100.00	0.00	3.889	14.44	2.30						
248.9	100.00	0.00	3.270	12.14	1.72						
209.3	100.00	0.00	2.750	10.42	1.42						
176.0	100.00	0.00	2.312	9.00	1.34						
148.0	100.00	0.00	1.945	7.66	1.41						
124.5	100.00	0.00	1.635	6.25	1.54						
104.7	100.00	0.00	1.375	4.71	1.54						
88.00	100.00	0.00	1.156	3.17	1.30						
74.00	100.00	0.00	0.972	1.87	0.92						
62.23	100.00	0.31	0.818	0.95	0.58						
52.33	99.69	0.47	0.688	0.37	0.37						
44.00	99.22	0.76	0.578	0.00	0.00						
37.00	98.46	1.34	0.486	0.00	0.00						
31.11	97.12	2.46	0.409	0.00	0.00						
26.16	94.66	4.42	0.344	0.00	0.00						
22.00	90.24	6.96	0.289	0.00	0.00						
18.50	83.29	9.03	0.243	0.00	0.00						
15.56	74.26	9.74	0.204	0.00	0.00						
13.08	64.52	9.55	0.172	0.00	0.00						
11.00	54.97	9.19	0.145	0.00	0.00						

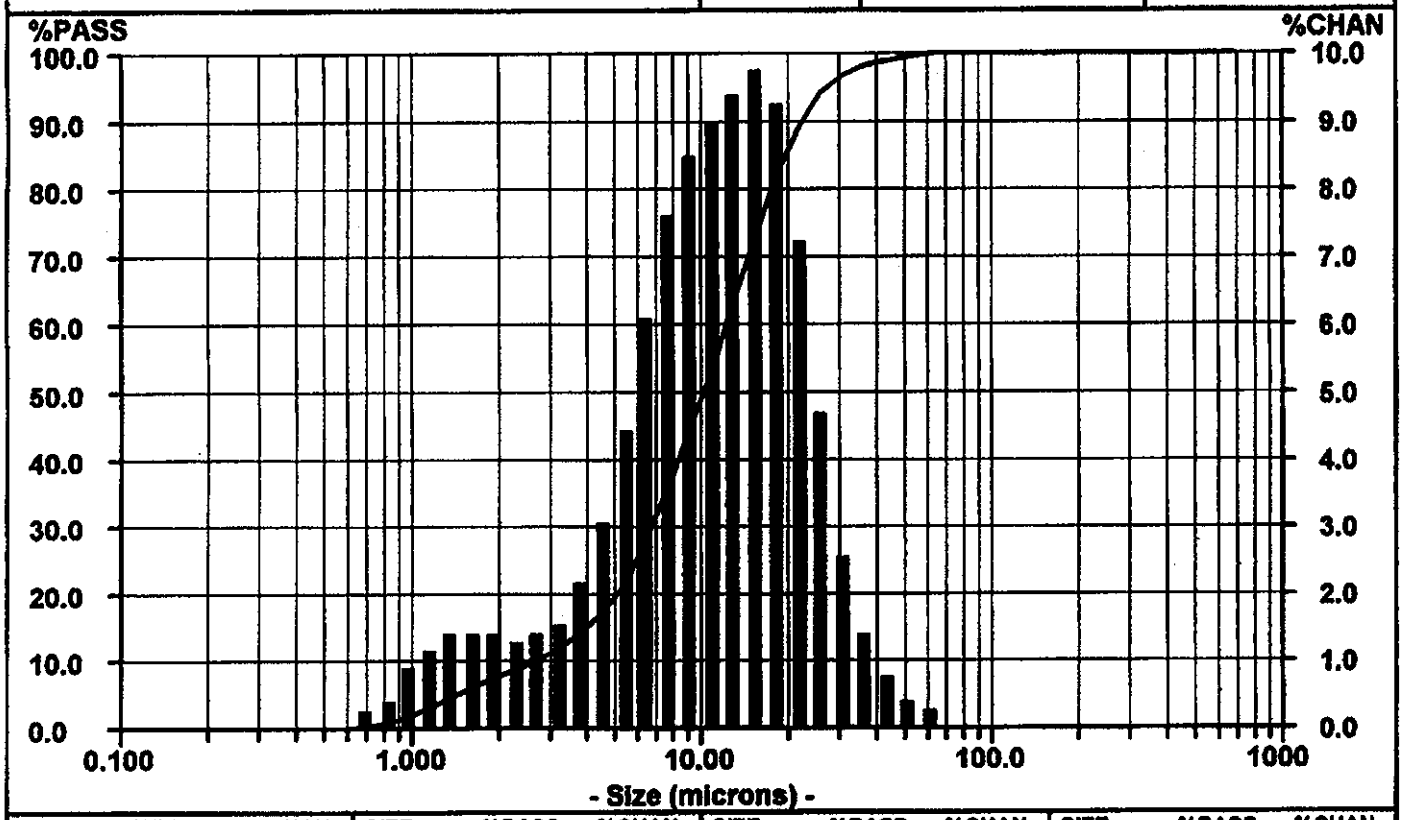
BCR 67 Duplicate

BCR67, riffled 7-19-01

Date: 07/20/91 Meas #: 00006
Time: 11:52 Pres #: 01

1M NaOH - 1M NaNO3
Flow = 60 ml/sec
RI of the medium = 1.33 and the particle = 2.00
Second Run
File: BCR6746

Summary	Percentiles		Dia	Vol%	Width
mv = 11.93	10% = 2.658	60% = 12.38	11.04	92%	14.14
mn = 1.160	20% = 5.142	70% = 14.77	1.249	8%	0.804
ma = 5.755	30% = 6.817	80% = 17.69			
cs = 1.043	40% = 8.443	90% = 22.28			
sd = 7.432	50% = 10.27	95% = 27.17			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	44.60	8.59						
592.0	100.00	0.00	7.778	36.01	7.75						
497.8	100.00	0.00	6.541	28.26	6.29						
418.6	100.00	0.00	5.500	21.97	4.59						
352.0	100.00	0.00	4.625	17.38	3.18						
296.0	100.00	0.00	3.889	14.20	2.23						
248.9	100.00	0.00	3.270	11.97	1.68						
209.3	100.00	0.00	2.750	10.29	1.40						
176.0	100.00	0.00	2.312	8.89	1.33						
148.0	100.00	0.00	1.945	7.56	1.40						
124.5	100.00	0.00	1.635	6.16	1.52						
104.7	100.00	0.00	1.375	4.64	1.52						
88.00	100.00	0.00	1.156	3.12	1.28						
74.00	100.00	0.00	0.972	1.84	0.91						
62.23	100.00	0.33	0.818	0.93	0.57						
52.33	99.67	0.50	0.688	0.36	0.36						
44.00	99.17	0.81	0.578	0.00	0.00						
37.00	98.36	1.44	0.486	0.00	0.00						
31.11	96.92	2.63	0.409	0.00	0.00						
26.16	94.29	4.70	0.344	0.00	0.00						
22.00	89.59	7.31	0.289	0.00	0.00						
18.50	82.28	9.32	0.243	0.00	0.00						
15.56	72.96	9.87	0.204	0.00	0.00						
13.08	63.09	9.48	0.172	0.00	0.00						
11.00	53.61	9.01	0.145	0.00	0.00						

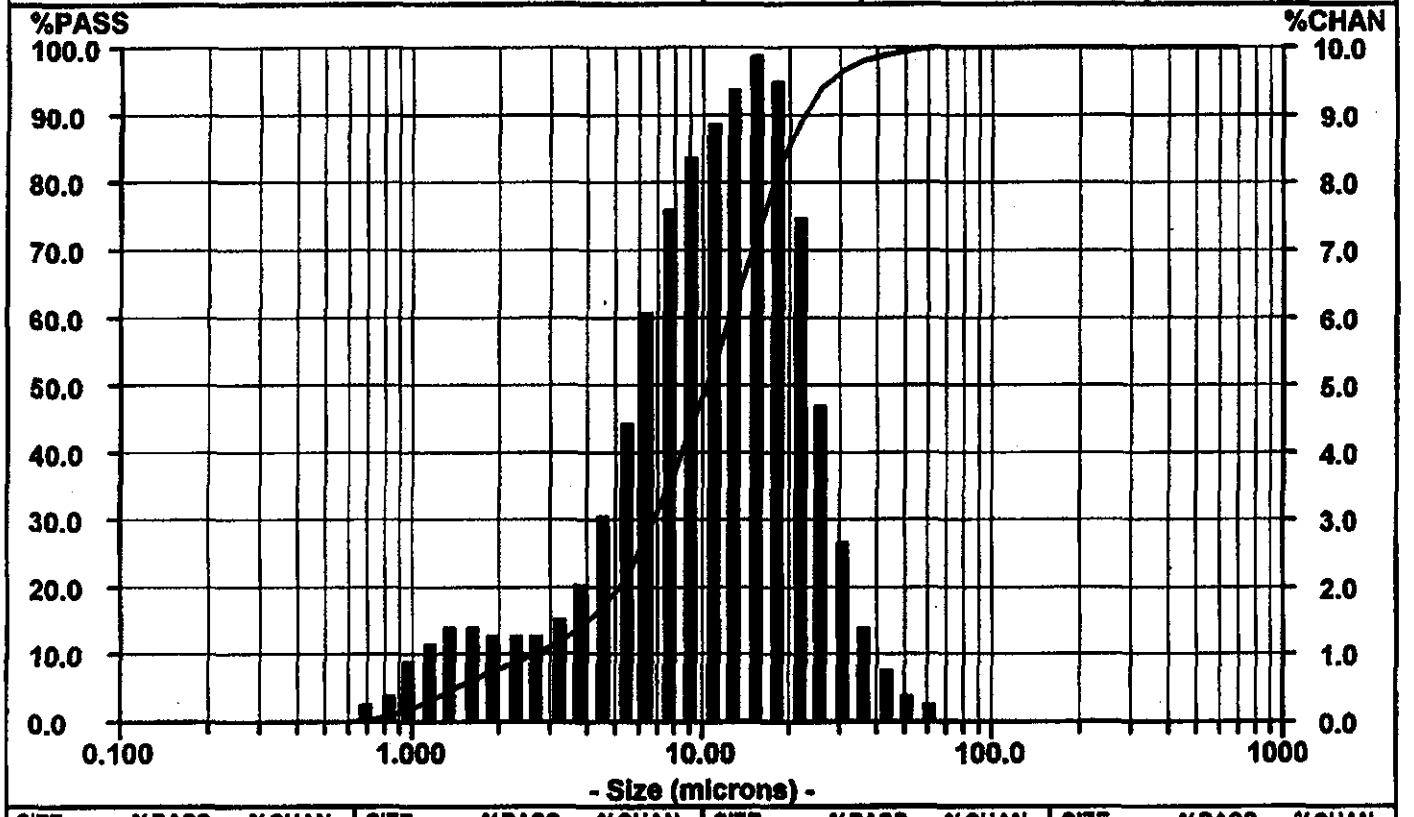
BCR 67 Duplicate

BCR67, riffed 7-19-01

Date: 07/20/91 Meas #: 00009
Time: 11:43 Pres #: 01

1M NaOH - 1M NaNO3
Flow = 60 ml/sec
RI of the medium = 1.33 and the particle = 1.64
sonicate 2 min.
File: BCR8745

Summary	Percentiles		Dia	Vol%	Width
mv = 12.08	10% = 2.676	60% = 12.56	11.20	92%	14.32
mn = 1.168	20% = 5.190	70% = 14.98	1.248	8%	0.804
ma = 5.797	30% = 6.886	80% = 17.91			
cs = 1.035	40% = 8.547	90% = 22.53			
sd = 7.524	50% = 10.42	95% = 27.48			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	43.93	8.45						
592.0	100.00	0.00	7.778	35.48	7.62						
497.8	100.00	0.00	6.541	27.86	6.18						
418.6	100.00	0.00	5.500	21.68	4.60						
352.0	100.00	0.00	4.625	17.18	3.11						
296.0	100.00	0.00	3.889	14.07	2.19						
248.9	100.00	0.00	3.270	11.88	1.65						
209.3	100.00	0.00	2.750	10.23	1.39						
176.0	100.00	0.00	2.312	8.84	1.32						
148.0	100.00	0.00	1.945	7.52	1.39						
124.5	100.00	0.00	1.635	6.13	1.51						
104.7	100.00	0.00	1.375	4.62	1.51						
88.00	100.00	0.00	1.156	3.11	1.28						
74.00	100.00	0.00	0.972	1.83	0.90						
62.23	100.00	0.35	0.818	0.93	0.57						
52.33	99.65	0.52	0.688	0.36	0.36						
44.00	99.13	0.85	0.578	0.00	0.00						
37.00	98.28	1.49	0.486	0.00	0.00						
31.11	96.79	2.73	0.409	0.00	0.00						
26.16	94.06	4.86	0.344	0.00	0.00						
22.00	89.20	7.51	0.289	0.00	0.00						
18.50	81.69	9.50	0.243	0.00	0.00						
15.56	72.19	9.91	0.204	0.00	0.00						
13.08	62.28	9.44	0.172	0.00	0.00						
11.00	52.84	8.91	0.145	0.00	0.00						

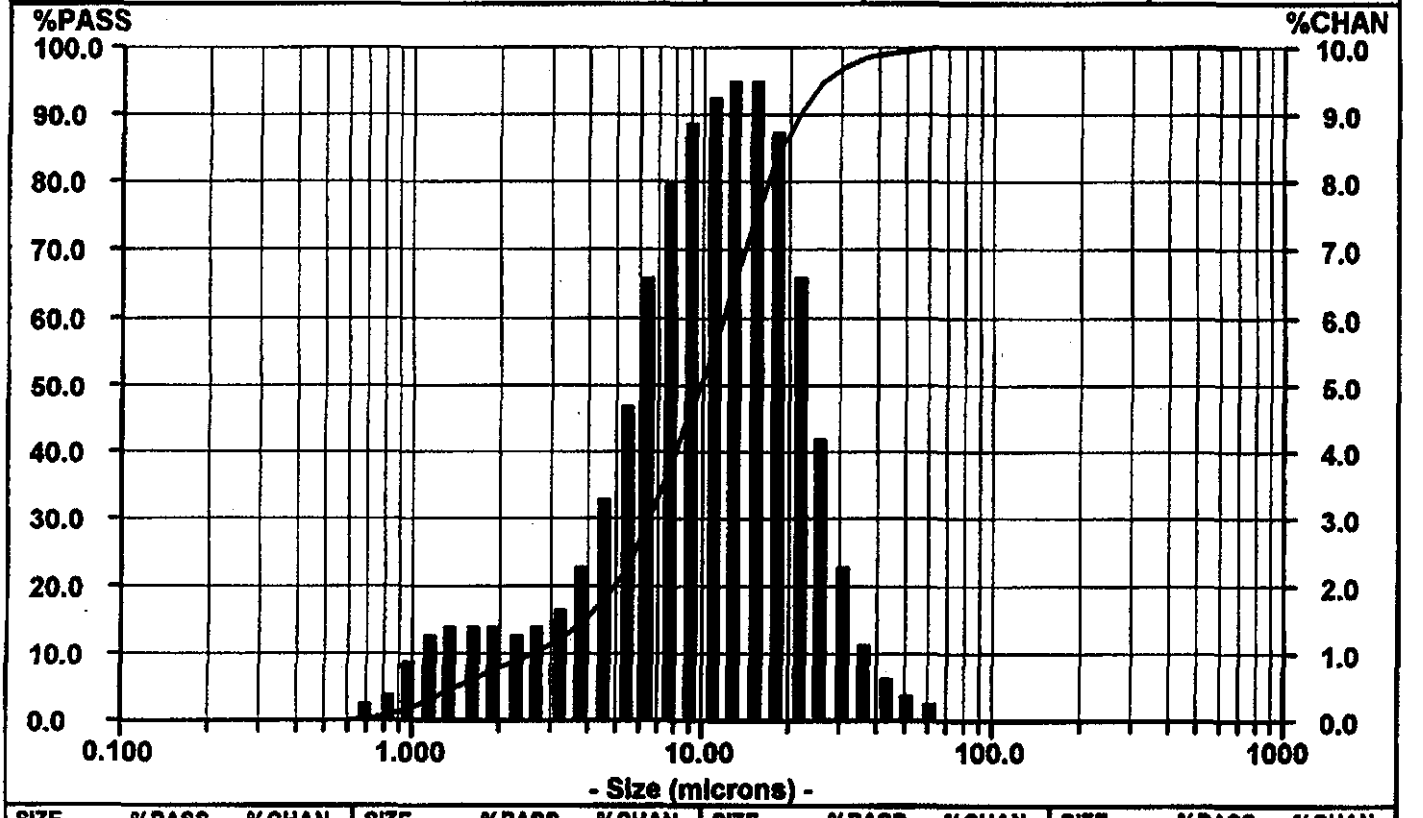
BCR 67 Duplicate

BCR67, riffled
7-19-01

Date: 07/20/91 Meas #: 00005
Time: 12:24 Pres #: 01

1M NaOH - 1M NaNO3
Flow = 60 ml/sec
RI of the medium = 1.33 and the particle = 2.00
Sonicate 2 min.
File: BCR6747

Summary	Percentiles		Dia	Vol%	Width
mv = 11.52	10% = 2.590	60% = 11.84	10.58	92%	13.60
mn = 1.163	20% = 5.000	70% = 14.16	1.248	8%	0.804
ma = 5.620	30% = 6.610	80% = 17.03			
cs = 1.068	40% = 8.143	90% = 21.55			
sd = 7.146	50% = 9.852	95% = 26.32			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	46.66	8.97						
592.0	100.00	0.00	7.778	37.69	8.15						
497.8	100.00	0.00	6.541	29.54	6.65						
418.6	100.00	0.00	5.500	22.89	4.88						
352.0	100.00	0.00	4.625	18.01	3.38						
296.0	100.00	0.00	3.889	14.63	2.36						
248.9	100.00	0.00	3.270	12.27	1.75						
209.3	100.00	0.00	2.750	10.52	1.44						
176.0	100.00	0.00	2.312	9.08	1.36						
148.0	100.00	0.00	1.945	7.72	1.43						
124.5	100.00	0.00	1.635	6.29	1.55						
104.7	100.00	0.00	1.375	4.74	1.55						
88.00	100.00	0.00	1.156	3.19	1.31						
74.00	100.00	0.00	0.972	1.88	0.93						
62.23	100.00	0.31	0.818	0.95	0.58						
52.33	99.69	0.45	0.688	0.37	0.37						
44.00	99.24	0.73	0.578	0.00	0.00						
37.00	98.51	1.27	0.486	0.00	0.00						
31.11	97.24	2.34	0.409	0.00	0.00						
26.16	94.90	4.21	0.344	0.00	0.00						
22.00	90.69	6.68	0.289	0.00	0.00						
18.50	84.01	8.80	0.243	0.00	0.00						
15.56	75.21	9.63	0.204	0.00	0.00						
13.08	65.58	9.60	0.172	0.00	0.00						
11.00	55.98	9.32	0.145	0.00	0.00						

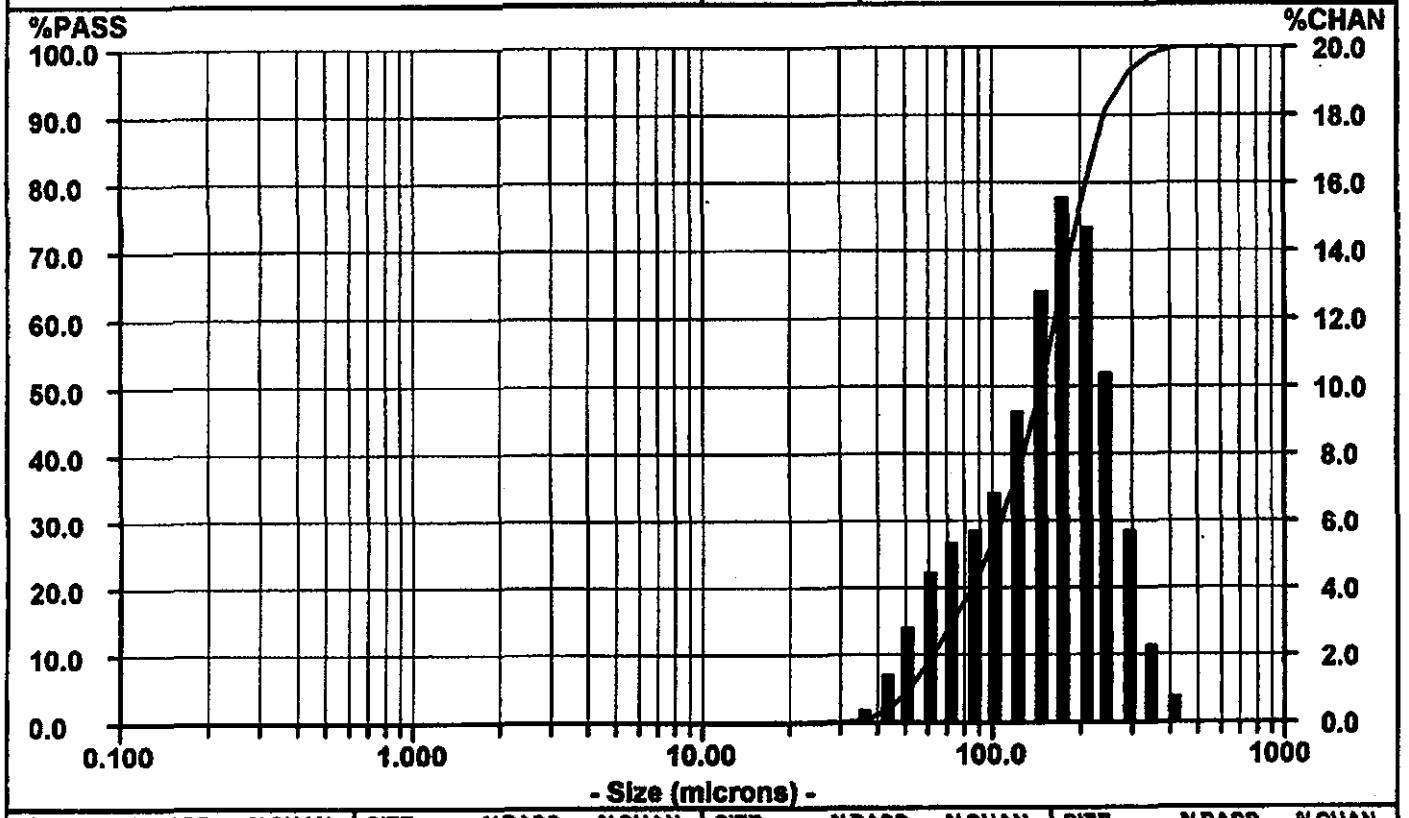
BCR 130 Sample

BCR130, riffled
7-20-01

Date: 10/19/91 Meas #: 00011
Time: 11:53 Pres #: 01

1M NaOH/1M NaNO3
Flow rate = 17 ml/sec
Refractive index of the medium = 1.33 and the particle = 1.54
File: BR13008 Measurment 11

Summary	Percentiles		Dia	Vol%	Width
mv = 152.3	10% = 63.46	60% = 166.6	148.0	100%	143.9
mn = 67.95	20% = 86.15	70% = 184.8			
ma = 118.4	30% = 109.8	80% = 208.4			
cs = 0.051	40% = 130.1	90% = 244.3			
sd = 71.93	50% = 148.0	95% = 276.9			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	0.00	0.00						
592.0	100.00	0.00	7.778	0.00	0.00						
497.8	100.00	0.00	6.541	0.00	0.00						
418.6	100.00	0.81	5.500	0.00	0.00						
352.0	99.19	2.41	4.625	0.00	0.00						
296.0	96.78	5.82	3.889	0.00	0.00						
248.9	90.96	10.60	3.270	0.00	0.00						
209.3	80.36	14.75	2.750	0.00	0.00						
176.0	65.61	15.62	2.312	0.00	0.00						
148.0	49.99	12.96	1.945	0.00	0.00						
124.5	37.03	9.33	1.635	0.00	0.00						
104.7	27.70	6.94	1.375	0.00	0.00						
88.00	20.76	5.89	1.156	0.00	0.00						
74.00	14.87	5.45	0.972	0.00	0.00						
62.23	9.42	4.53	0.818	0.00	0.00						
52.33	4.89	2.92	0.688	0.00	0.00						
44.00	1.97	1.41	0.578	0.00	0.00						
37.00	0.56	0.56	0.486	0.00	0.00						
31.11	0.00	0.00	0.409	0.00	0.00						
26.16	0.00	0.00	0.344	0.00	0.00						
22.00	0.00	0.00	0.289	0.00	0.00						
18.50	0.00	0.00	0.243	0.00	0.00						
15.56	0.00	0.00	0.204	0.00	0.00						
13.08	0.00	0.00	0.172	0.00	0.00						
11.00	0.00	0.00	0.145	0.00	0.00						

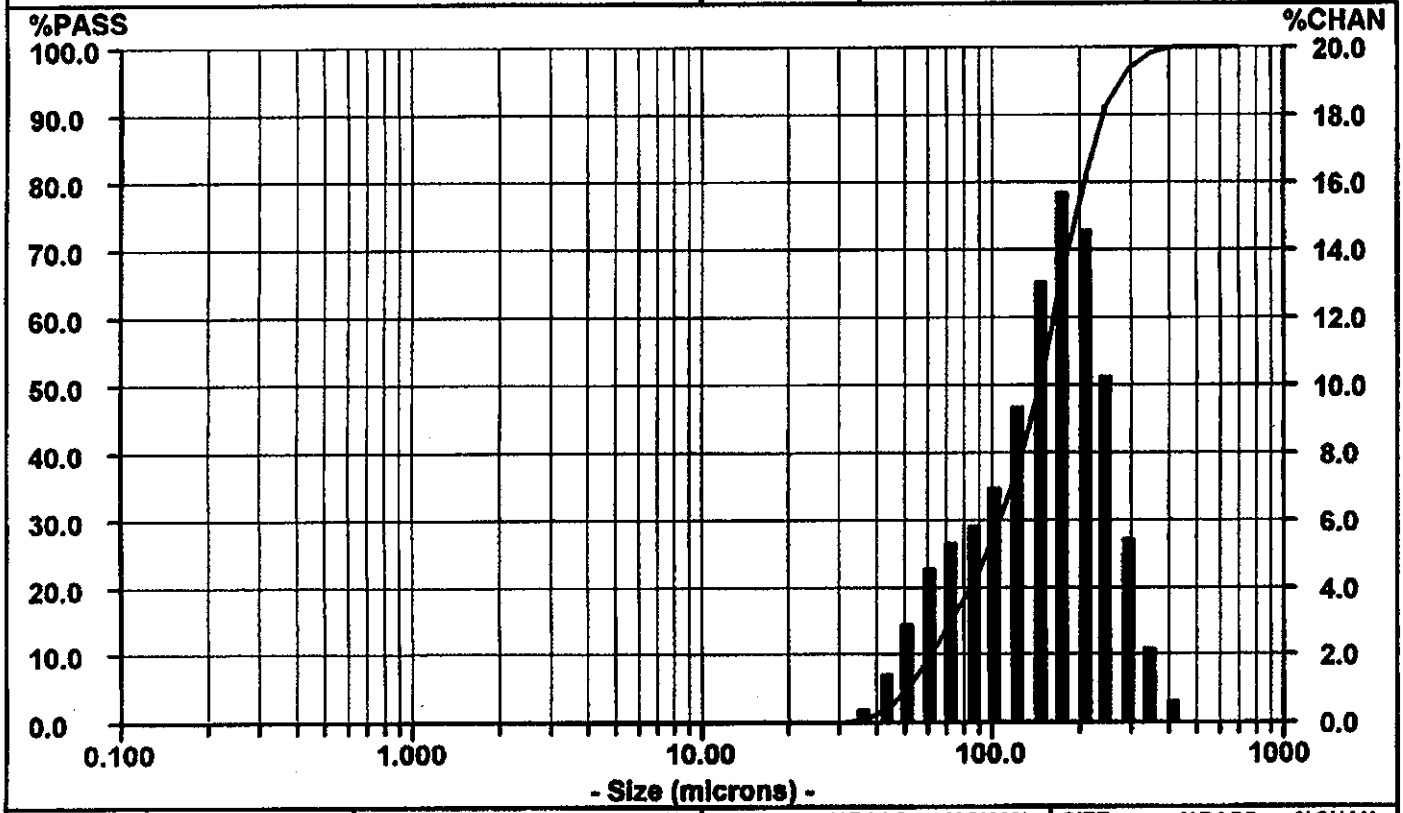
BCR 130 Sample

BCR130, rifted 7-20-01

Date: 07/25/91 Meas #: 00010
Time: 05:26 Pres #: 01

1M NaOH/1M NaNO3
Flow rate = 17 ml/sec
Refractive index of the medium = 1.33 and the particle = 2.00
File: BR13008 Measurment 10

Summary	Percentiles		Dia	Vol%	Width
mv = 151.0	10% = 62.92	60% = 164.1	146.7	100%	142.4
mn = 67.46	20% = 85.42	70% = 183.2			
ma = 117.4	30% = 108.9	80% = 206.5			
cs = 0.051	40% = 129.0	90% = 242.0			
sd = 71.20	50% = 146.7	95% = 274.2			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	0.00	0.00						
592.0	100.00	0.00	7.778	0.00	0.00						
497.8	100.00	0.00	6.541	0.00	0.00						
418.6	100.00	0.75	5.500	0.00	0.00						
352.0	99.25	2.27	4.625	0.00	0.00						
296.0	96.98	5.59	3.889	0.00	0.00						
248.9	91.39	10.35	3.270	0.00	0.00						
209.3	81.04	14.62	2.750	0.00	0.00						
176.0	66.42	15.70	2.312	0.00	0.00						
148.0	50.72	13.15	1.945	0.00	0.00						
124.5	37.57	9.48	1.635	0.00	0.00						
104.7	28.09	7.02	1.375	0.00	0.00						
88.00	21.07	5.92	1.156	0.00	0.00						
74.00	15.15	5.48	0.972	0.00	0.00						
62.23	9.67	4.60	0.818	0.00	0.00						
52.33	5.07	3.01	0.688	0.00	0.00						
44.00	2.06	1.46	0.578	0.00	0.00						
37.00	0.60	0.60	0.486	0.00	0.00						
31.11	0.00	0.00	0.409	0.00	0.00						
26.16	0.00	0.00	0.344	0.00	0.00						
22.00	0.00	0.00	0.289	0.00	0.00						
18.50	0.00	0.00	0.243	0.00	0.00						
15.56	0.00	0.00	0.204	0.00	0.00						
13.08	0.00	0.00	0.172	0.00	0.00						
11.00	0.00	0.00	0.145	0.00	0.00						

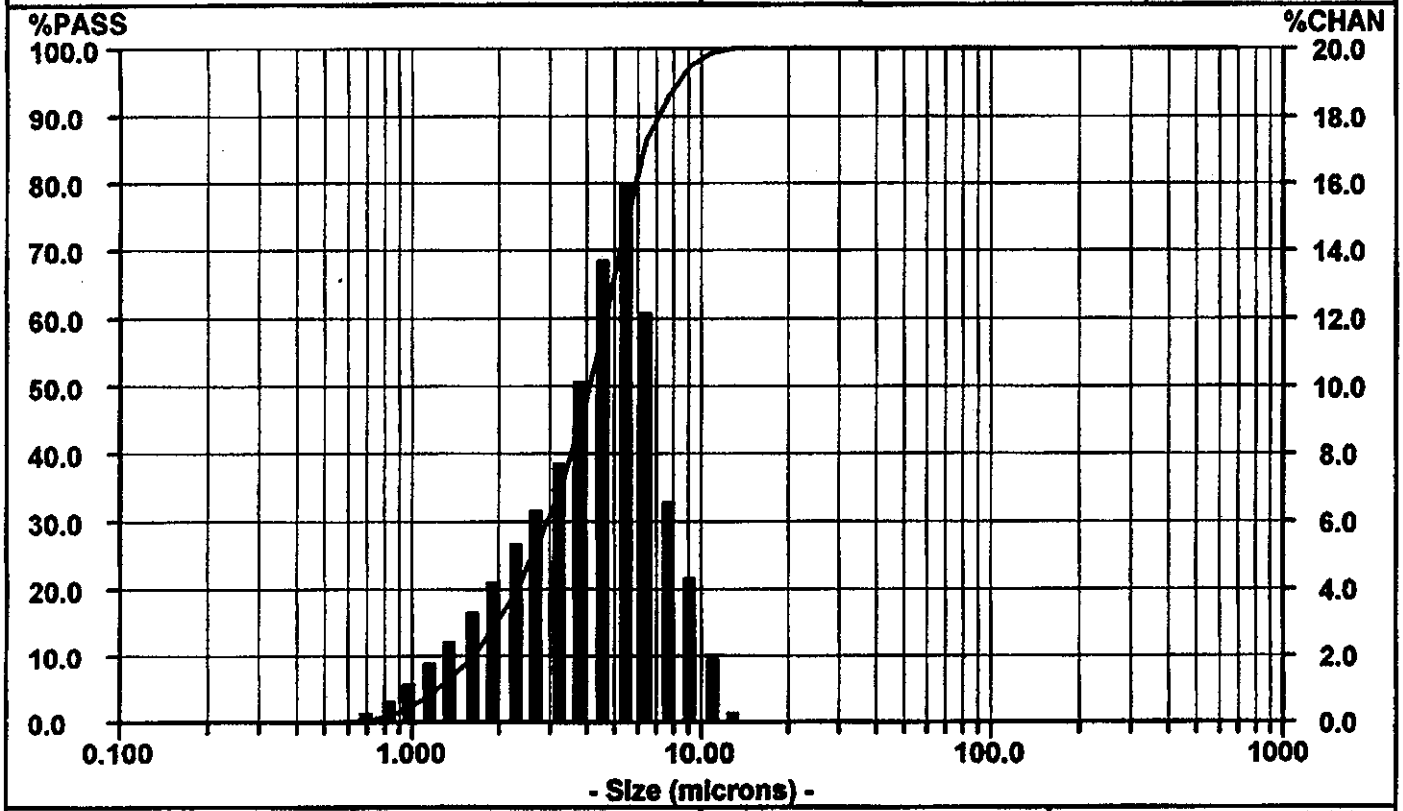
BCR 130 Sample

BCR130, riffled 7-20-01

Date: 10/19/91 Meas #: 00006
Time: 12:04 Pres #: 01

1M NaOH/1MNaNO3
Flow rate = 17 ml/sec
Refractive index of the medium = 1.33 and the particle = 1.54
Sonicate 2 min.
File: BR13009

Summary	Percentiles		Dia	Vol%	Width
mv = 4.309	10% = 1.635	60% = 4.722	4.198	100%	4.226
mn = 1.398	20% = 2.327	70% = 5.253			
ma = 3.122	30% = 3.002	80% = 5.927			
cs = 1.922	40% = 3.635	90% = 7.091			
sd = 2.113	50% = 4.198	95% = 8.287			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	97.58	4.43						
592.0	100.00	0.00	7.778	93.15	6.78						
497.8	100.00	0.00	6.541	86.37	12.26						
418.6	100.00	0.00	5.500	74.11	16.01						
352.0	100.00	0.00	4.625	58.10	13.75						
296.0	100.00	0.00	3.889	44.35	10.24						
248.9	100.00	0.00	3.270	34.11	7.86						
209.3	100.00	0.00	2.750	26.25	6.47						
176.0	100.00	0.00	2.312	19.78	5.42						
148.0	100.00	0.00	1.945	14.36	4.36						
124.5	100.00	0.00	1.635	10.00	3.34						
104.7	100.00	0.00	1.375	6.66	2.52						
88.00	100.00	0.00	1.156	4.14	1.84						
74.00	100.00	0.00	0.972	2.30	1.24						
62.23	100.00	0.00	0.818	1.06	0.75						
52.33	100.00	0.00	0.688	0.31	0.31						
44.00	100.00	0.00	0.578	0.00	0.00						
37.00	100.00	0.00	0.486	0.00	0.00						
31.11	100.00	0.00	0.409	0.00	0.00						
26.16	100.00	0.00	0.344	0.00	0.00						
22.00	100.00	0.00	0.289	0.00	0.00						
18.50	100.00	0.00	0.243	0.00	0.00						
15.56	100.00	0.00	0.204	0.00	0.00						
13.08	100.00	0.38	0.172	0.00	0.00						
11.00	99.62	2.04	0.145	0.00	0.00						

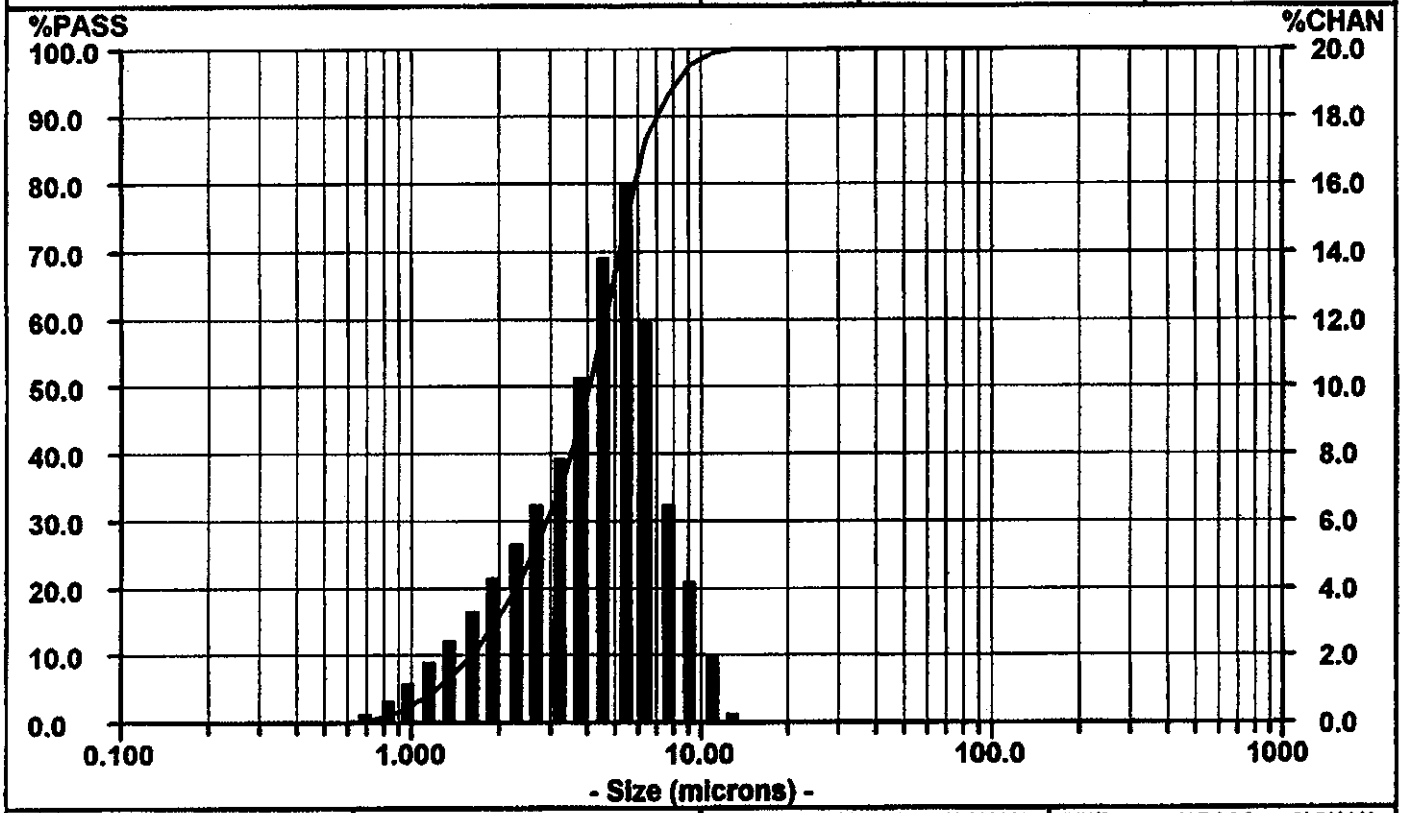
BCR 130 Sample

BCR130, riffled
7-20-01

Date: 07/25/91 Meas #: 00005
Time: 05:37 Pres #: 01

1M NaOH/1MNaNO3
Flow rate = 17 ml/sec
Refractive index of the medium = 1.33 and the particle = 2.00
Sonicate 2 min.
File: BR13009

Summary	Percentiles		Dia	Vol%	Width
mv = 4.270	10% = 1.620	60% = 4.682	4.161	100%	4.186
mn = 1.387	20% = 2.307	70% = 5.209			
ma = 3.094	30% = 2.976	80% = 5.872			
cs = 1.939	40% = 3.604	90% = 7.023			
sd = 2.093	50% = 4.161	95% = 8.216			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	97.76	4.34						
592.0	100.00	0.00	7.778	93.42	6.54						
497.8	100.00	0.00	6.541	86.88	11.98						
418.6	100.00	0.00	5.500	74.90	16.02						
352.0	100.00	0.00	4.625	58.88	13.93						
296.0	100.00	0.00	3.889	44.95	10.39						
248.9	100.00	0.00	3.270	34.56	7.95						
209.3	100.00	0.00	2.750	26.61	6.53						
176.0	100.00	0.00	2.312	20.08	5.47						
148.0	100.00	0.00	1.945	14.61	4.41						
124.5	100.00	0.00	1.635	10.20	3.39						
104.7	100.00	0.00	1.375	6.81	2.56						
88.00	100.00	0.00	1.156	4.25	1.87						
74.00	100.00	0.00	0.972	2.38	1.27						
62.23	100.00	0.00	0.818	1.11	0.77						
52.33	100.00	0.00	0.688	0.34	0.34						
44.00	100.00	0.00	0.578	0.00	0.00						
37.00	100.00	0.00	0.486	0.00	0.00						
31.11	100.00	0.00	0.409	0.00	0.00						
26.16	100.00	0.00	0.344	0.00	0.00						
22.00	100.00	0.00	0.289	0.00	0.00						
18.50	100.00	0.00	0.243	0.00	0.00						
15.56	100.00	0.00	0.204	0.00	0.00						
13.08	100.00	0.32	0.172	0.00	0.00						
11.00	99.68	1.92	0.145	0.00	0.00						

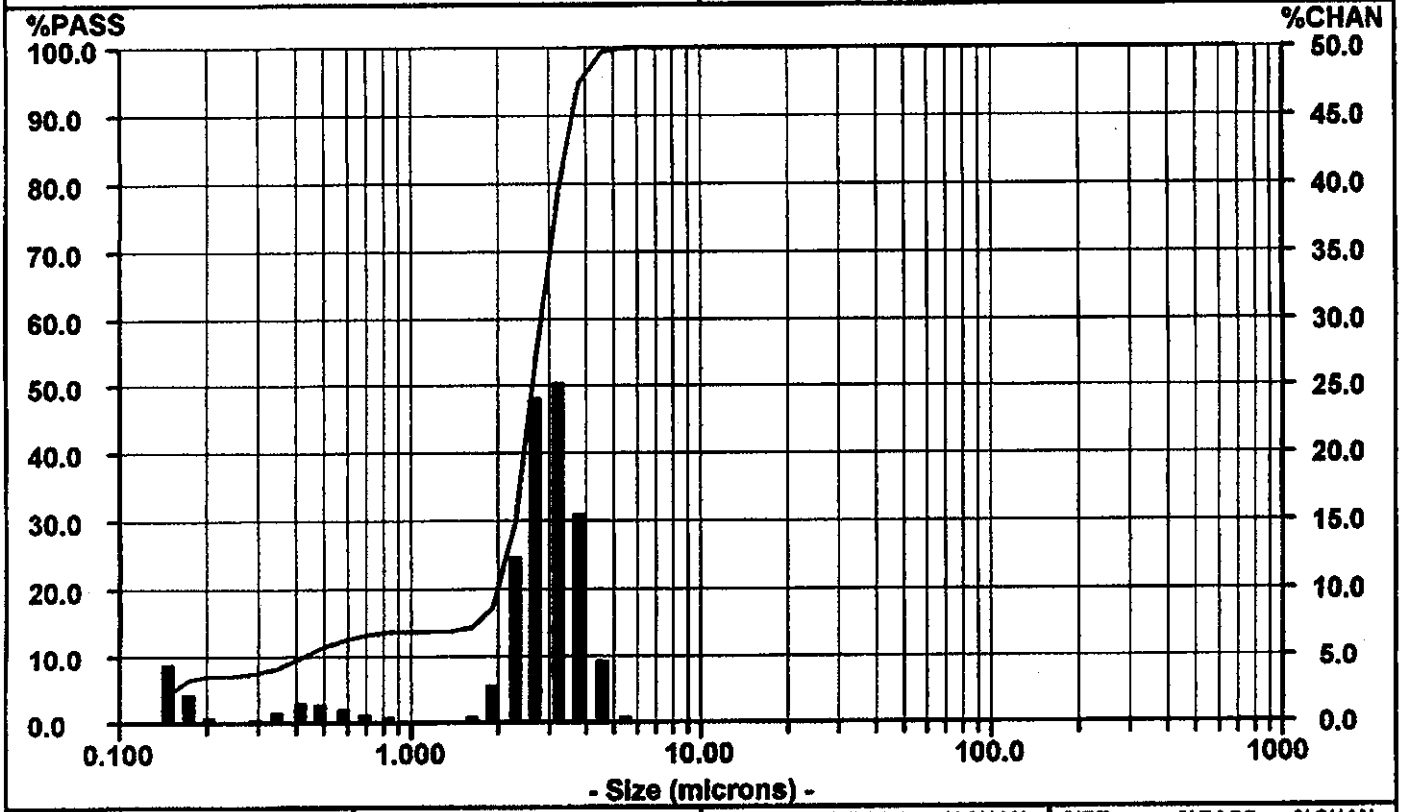
BCR 130 Sample

BCR130, riffled
7-20-01

Date: 07/25/91 Meas #: 00006
Time: 05:50 Pres #: 01

1M NaOH/1MNaNO3
Flow rate = 40 ml/sec
Refractive Index of the medium = 1.33 and the particle = 1.54
File: BR13010

Summary	Percentiles		Dia	Vol%	Width
mv = 2.510	10% = 0.411	60% = 2.860	2.805	86%	1.226
mn = 0.152	20% = 2.050	70% = 3.058	0.436	7%	0.263
ma = 1.022	30% = 2.315	80% = 3.294	0.142	7%	0.031
cs = 5.873	40% = 2.505	90% = 3.639			
sd = 0.781	50% = 2.680	95% = 3.916			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	100.00	0.00						
592.0	100.00	0.00	7.778	100.00	0.00						
497.8	100.00	0.00	6.541	100.00	0.00						
418.6	100.00	0.00	5.500	100.00	0.57						
352.0	100.00	0.00	4.625	99.43	4.73						
296.0	100.00	0.00	3.889	94.70	15.51						
248.9	100.00	0.00	3.270	79.19	25.22						
209.3	100.00	0.00	2.750	53.97	24.13						
176.0	100.00	0.00	2.312	29.84	12.45						
148.0	100.00	0.00	1.945	17.39	2.85						
124.5	100.00	0.00	1.635	14.54	0.59						
104.7	100.00	0.00	1.375	13.95	0.00						
88.00	100.00	0.00	1.156	13.95	0.00						
74.00	100.00	0.00	0.972	13.95	0.00						
62.23	100.00	0.00	0.818	13.95	0.53						
52.33	100.00	0.00	0.688	13.42	0.75						
44.00	100.00	0.00	0.578	12.67	1.14						
37.00	100.00	0.00	0.486	11.53	1.57						
31.11	100.00	0.00	0.409	9.96	1.60						
26.16	100.00	0.00	0.344	8.36	0.83						
22.00	100.00	0.00	0.289	7.53	0.34						
18.50	100.00	0.00	0.243	7.19	0.00						
15.56	100.00	0.00	0.204	7.19	0.48						
13.08	100.00	0.00	0.172	6.71	2.20						
11.00	100.00	0.00	0.145	4.51	4.51						

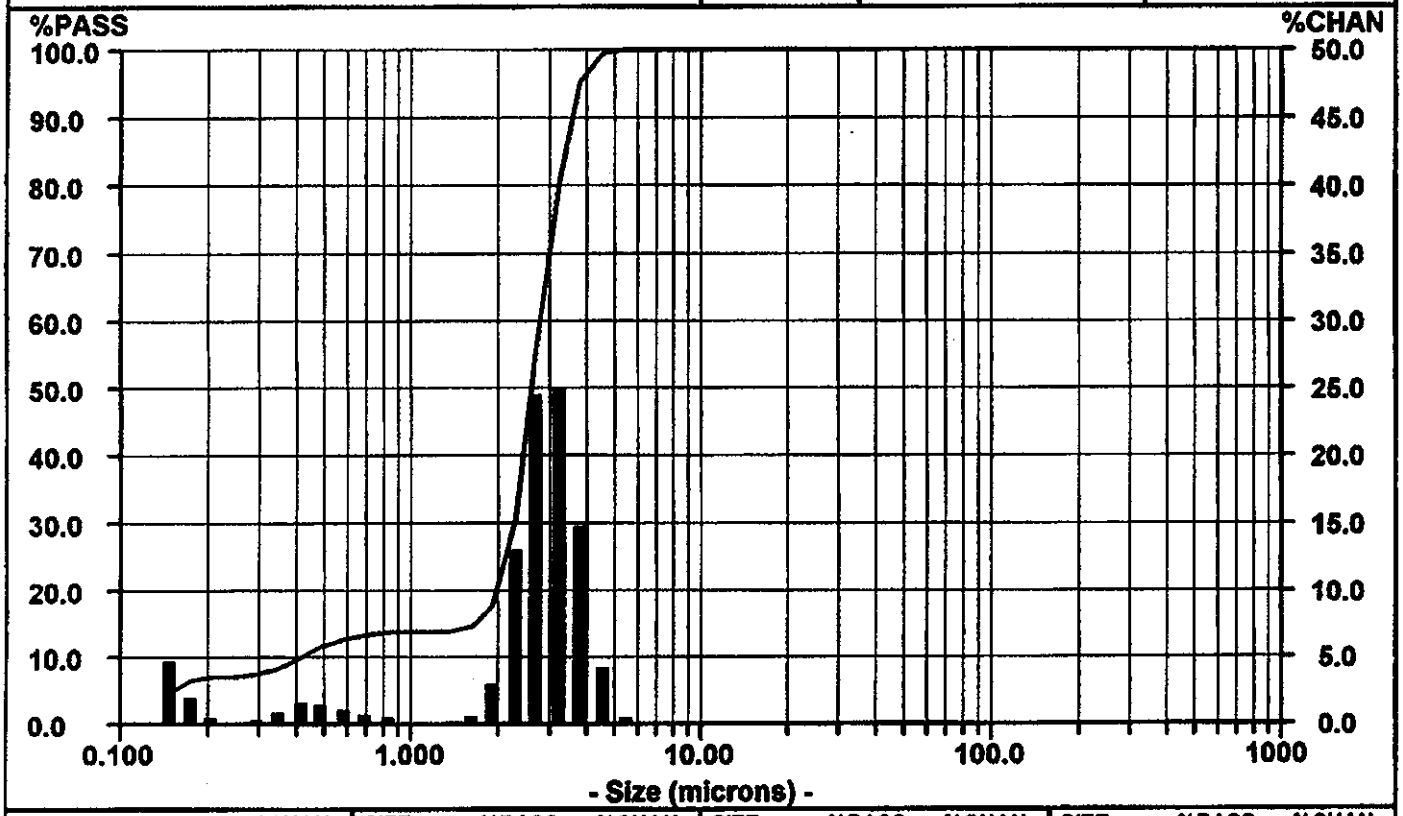
BCR 130 Sample

BCR130, riffled
7-20-01

Date: 07/26/91 Meas #: 00005
Time: 05:50 Pres #: 01

1M NaOH/1MNaNO3
Flow rate = 40 ml/sec
Refractive index of the medium = 1.33 and the particle = 2.00
File: BR13010

Summary	Percentiles		Dia	Vol%	Width
mv = 2.487	10% = 0.407	60% = 2.835	2.780	86%	1.210
mn = 0.161	20% = 2.036	70% = 3.030	0.432	7%	0.261
ma = 1.014	30% = 2.295	80% = 3.261	0.141	7%	0.029
cs = 5.919	40% = 2.484	90% = 3.602			
sd = 0.774	50% = 2.656	95% = 3.874			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	100.00	0.00						
592.0	100.00	0.00	7.778	100.00	0.00						
497.8	100.00	0.00	6.541	100.00	0.00						
418.6	100.00	0.00	5.500	100.00	0.47						
352.0	100.00	0.00	4.625	99.53	4.29						
296.0	100.00	0.00	3.889	95.24	14.89						
248.9	100.00	0.00	3.270	80.35	25.01						
209.3	100.00	0.00	2.750	55.34	24.59						
176.0	100.00	0.00	2.312	30.75	13.08						
148.0	100.00	0.00	1.945	17.67	3.07						
124.5	100.00	0.00	1.635	14.60	0.64						
104.7	100.00	0.00	1.375	13.96	0.00						
88.00	100.00	0.00	1.156	13.96	0.00						
74.00	100.00	0.00	0.972	13.96	0.00						
62.23	100.00	0.00	0.818	13.96	0.61						
52.33	100.00	0.00	0.688	13.45	0.73						
44.00	100.00	0.00	0.578	12.72	1.12						
37.00	100.00	0.00	0.486	11.60	1.55						
31.11	100.00	0.00	0.409	10.05	1.63						
26.16	100.00	0.00	0.344	8.42	0.86						
22.00	100.00	0.00	0.289	7.56	0.37						
18.50	100.00	0.00	0.243	7.19	0.00						
15.56	100.00	0.00	0.204	7.19	0.42						
13.08	100.00	0.00	0.172	6.77	2.03						
11.00	100.00	0.00	0.145	4.74	4.74						

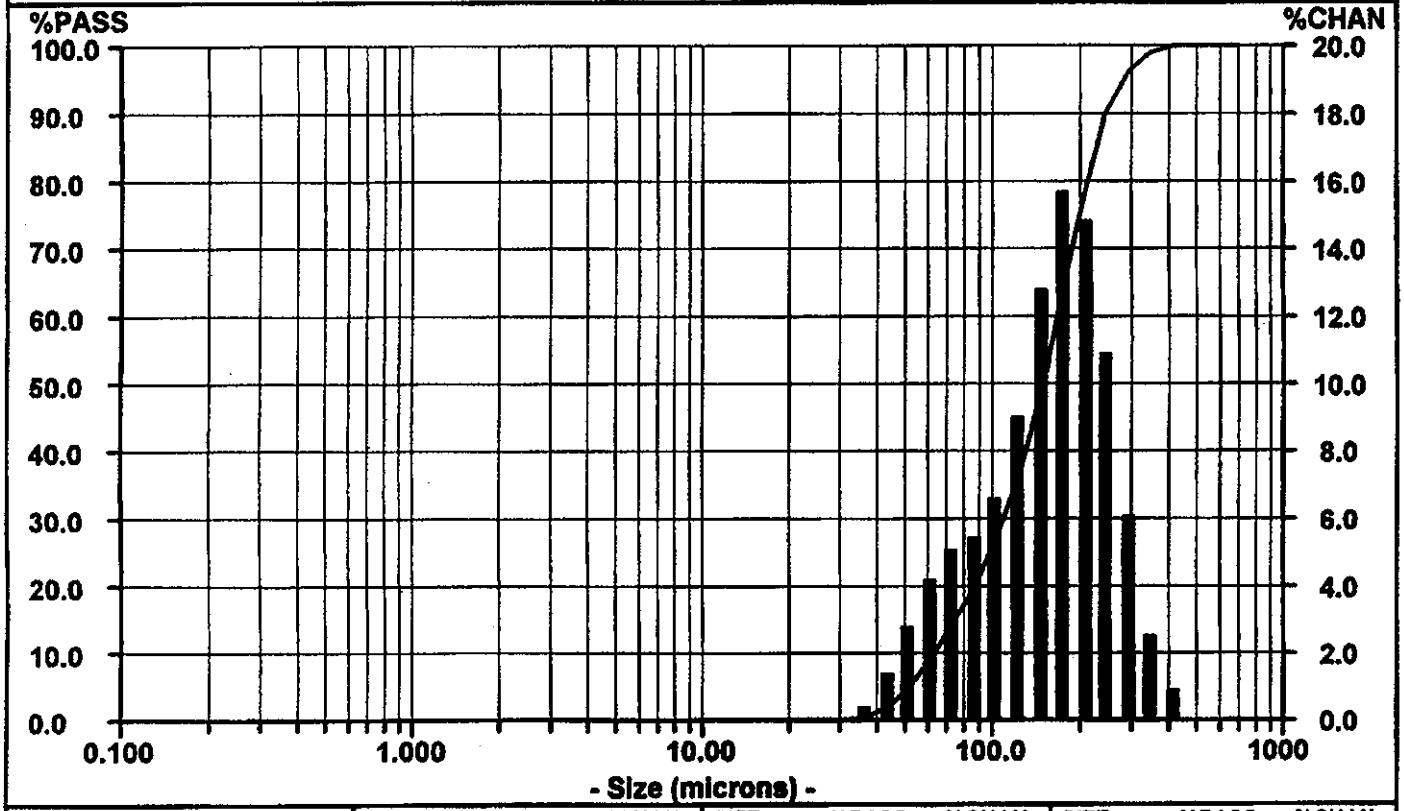
BCR 130 Sample

BCR130, riffled
7-23-01

Date: 10/19/91 Meas #: 00007
Time: 12:20 Pres #: 01

1M NaOH/1MNaNO3
Flow rate = 40 ml/sec
Refractive index of the medium = 1.33 and the particle = 1.54
Sonicate 2 min.
File: BR13011

Summary	Percentiles		Dia	Vol%	Width
mv = 154.7	10% = 64.03	60% = 168.0	150.5	100%	145.7
mn = 68.01	20% = 88.13	70% = 187.4			
ma = 120.1	30% = 112.5	80% = 211.4			
cs = 0.050	40% = 132.6	90% = 247.7			
sd = 72.83	50% = 150.5	95% = 280.8			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	0.00	0.00						
592.0	100.00	0.00	7.778	0.00	0.00						
497.8	100.00	0.00	6.541	0.00	0.00						
418.6	100.00	0.90	5.500	0.00	0.00						
352.0	99.10	2.64	4.625	0.00	0.00						
296.0	96.46	6.20	3.889	0.00	0.00						
248.9	90.26	10.97	3.270	0.00	0.00						
209.3	79.29	14.99	2.750	0.00	0.00						
176.0	64.30	15.73	2.312	0.00	0.00						
148.0	48.57	12.88	1.945	0.00	0.00						
124.5	35.69	9.09	1.635	0.00	0.00						
104.7	26.60	6.65	1.375	0.00	0.00						
88.00	19.95	5.59	1.156	0.00	0.00						
74.00	14.36	5.17	0.972	0.00	0.00						
62.23	9.19	4.35	0.818	0.00	0.00						
52.33	4.84	2.86	0.688	0.00	0.00						
44.00	1.98	1.42	0.578	0.00	0.00						
37.00	0.56	0.56	0.486	0.00	0.00						
31.11	0.00	0.00	0.409	0.00	0.00						
26.16	0.00	0.00	0.344	0.00	0.00						
22.00	0.00	0.00	0.289	0.00	0.00						
18.50	0.00	0.00	0.243	0.00	0.00						
15.56	0.00	0.00	0.204	0.00	0.00						
13.08	0.00	0.00	0.172	0.00	0.00						
11.00	0.00	0.00	0.145	0.00	0.00						

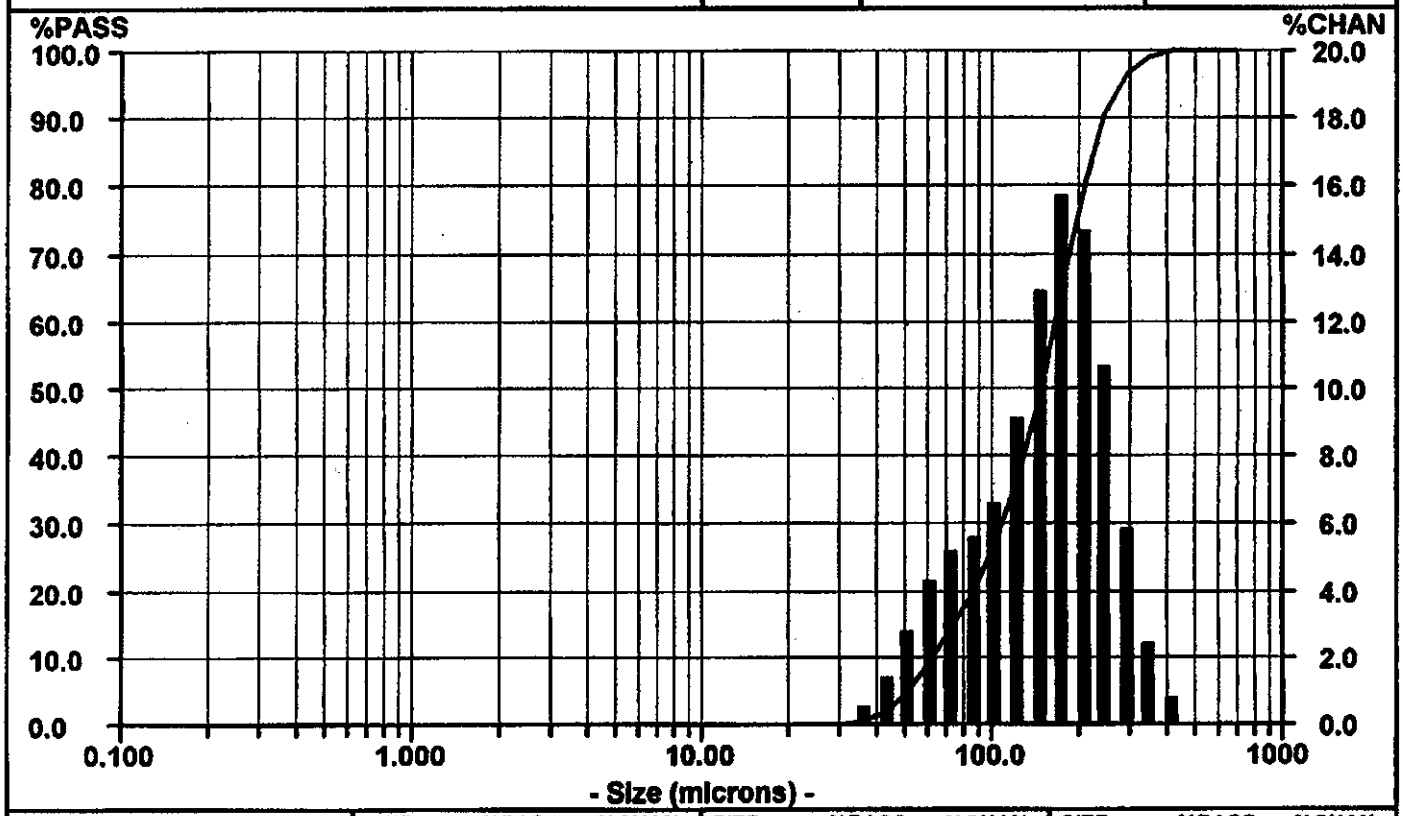
BCR 130 Sample

BCR130, rifled 7-23-01

Date: 07/26/91 Meas #: 00005
Time: 06:17 Pres #: 01

1M NaOH/1MNaNO3
Flow rate = 40 ml/sec
Refractive index of the medium = 1.33 and the particle = 2.0
Sonicate 2 min.
File: BR13011

Summary	Percentiles		Dia	Vol%	Width
mv = 153.4	10% = 63.46	60% = 166.6	149.2	100%	144.4
mn = 67.46	20% = 87.34	70% = 185.8			
ma = 119.0	30% = 111.5	80% = 209.4			
cs = 0.050	40% = 131.5	90% = 245.6			
sd = 72.18	50% = 149.2	95% = 278.5			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	0.00	0.00						
592.0	100.00	0.00	7.778	0.00	0.00						
497.8	100.00	0.00	6.541	0.00	0.00						
418.6	100.00	0.84	5.500	0.00	0.00						
352.0	99.16	2.50	4.625	0.00	0.00						
296.0	96.66	5.97	3.889	0.00	0.00						
248.9	90.69	10.72	3.270	0.00	0.00						
209.3	79.97	14.87	2.750	0.00	0.00						
176.0	65.10	15.78	2.312	0.00	0.00						
148.0	49.32	13.08	1.945	0.00	0.00						
124.5	36.24	9.25	1.635	0.00	0.00						
104.7	26.99	6.73	1.375	0.00	0.00						
88.00	20.26	5.62	1.156	0.00	0.00						
74.00	14.64	5.20	0.972	0.00	0.00						
62.23	9.44	4.42	0.818	0.00	0.00						
52.33	5.02	2.94	0.688	0.00	0.00						
44.00	2.08	1.47	0.578	0.00	0.00						
37.00	0.61	0.61	0.486	0.00	0.00						
31.11	0.00	0.00	0.409	0.00	0.00						
26.16	0.00	0.00	0.344	0.00	0.00						
22.00	0.00	0.00	0.289	0.00	0.00						
18.50	0.00	0.00	0.243	0.00	0.00						
15.56	0.00	0.00	0.204	0.00	0.00						
13.08	0.00	0.00	0.172	0.00	0.00						
11.00	0.00	0.00	0.145	0.00	0.00						

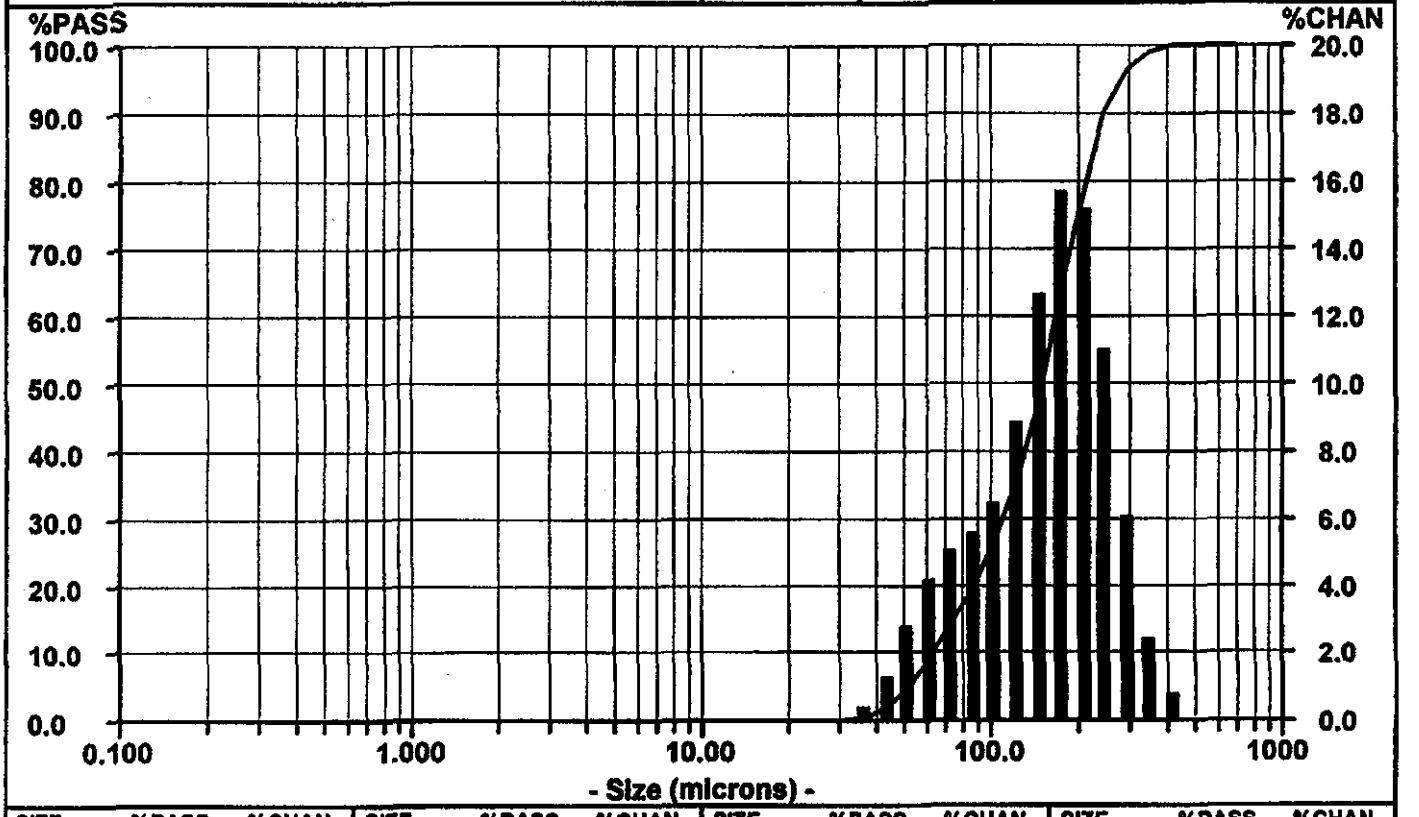
BCR 130 Sample

BCR130, riffled
7-23-01

Date: 07/25/91 Meas #: 00006
Time: 06:29 Pres #: 01

1M NaOH/1MNaNO3
Flow rate = 60 ml/sec
Refractive index of the medium = 1.33 and the particle = 1.54
File: BR13012

Summary	Percentiles		Dia	Vol%	Width
mv = 155.0	10% = 64.25	60% = 168.8	151.3	100%	145.7
mn = 68.26	20% = 88.28	70% = 188.2			
ma = 120.4	30% = 112.9	80% = 211.8			
cs = 0.050	40% = 133.3	90% = 247.4			
sd = 72.84	50% = 151.3	95% = 280.1			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.260	0.00	0.00						
592.0	100.00	0.00	7.778	0.00	0.00						
497.8	100.00	0.00	6.541	0.00	0.00						
418.6	100.00	0.87	5.500	0.00	0.00						
352.0	99.13	2.59	4.625	0.00	0.00						
296.0	96.54	6.22	3.889	0.00	0.00						
248.9	90.32	11.19	3.270	0.00	0.00						
209.3	79.13	15.26	2.750	0.00	0.00						
176.0	63.87	15.73	2.312	0.00	0.00						
148.0	48.14	12.72	1.945	0.00	0.00						
124.5	35.42	8.94	1.635	0.00	0.00						
104.7	26.48	6.59	1.375	0.00	0.00						
88.00	19.89	5.61	1.156	0.00	0.00						
74.00	14.28	5.19	0.972	0.00	0.00						
62.23	9.09	4.33	0.818	0.00	0.00						
52.33	4.76	2.83	0.688	0.00	0.00						
44.00	1.93	1.39	0.578	0.00	0.00						
37.00	0.54	0.54	0.486	0.00	0.00						
31.11	0.00	0.00	0.409	0.00	0.00						
26.16	0.00	0.00	0.344	0.00	0.00						
22.00	0.00	0.00	0.289	0.00	0.00						
18.50	0.00	0.00	0.243	0.00	0.00						
15.56	0.00	0.00	0.204	0.00	0.00						
13.08	0.00	0.00	0.172	0.00	0.00						
11.00	0.00	0.00	0.145	0.00	0.00						

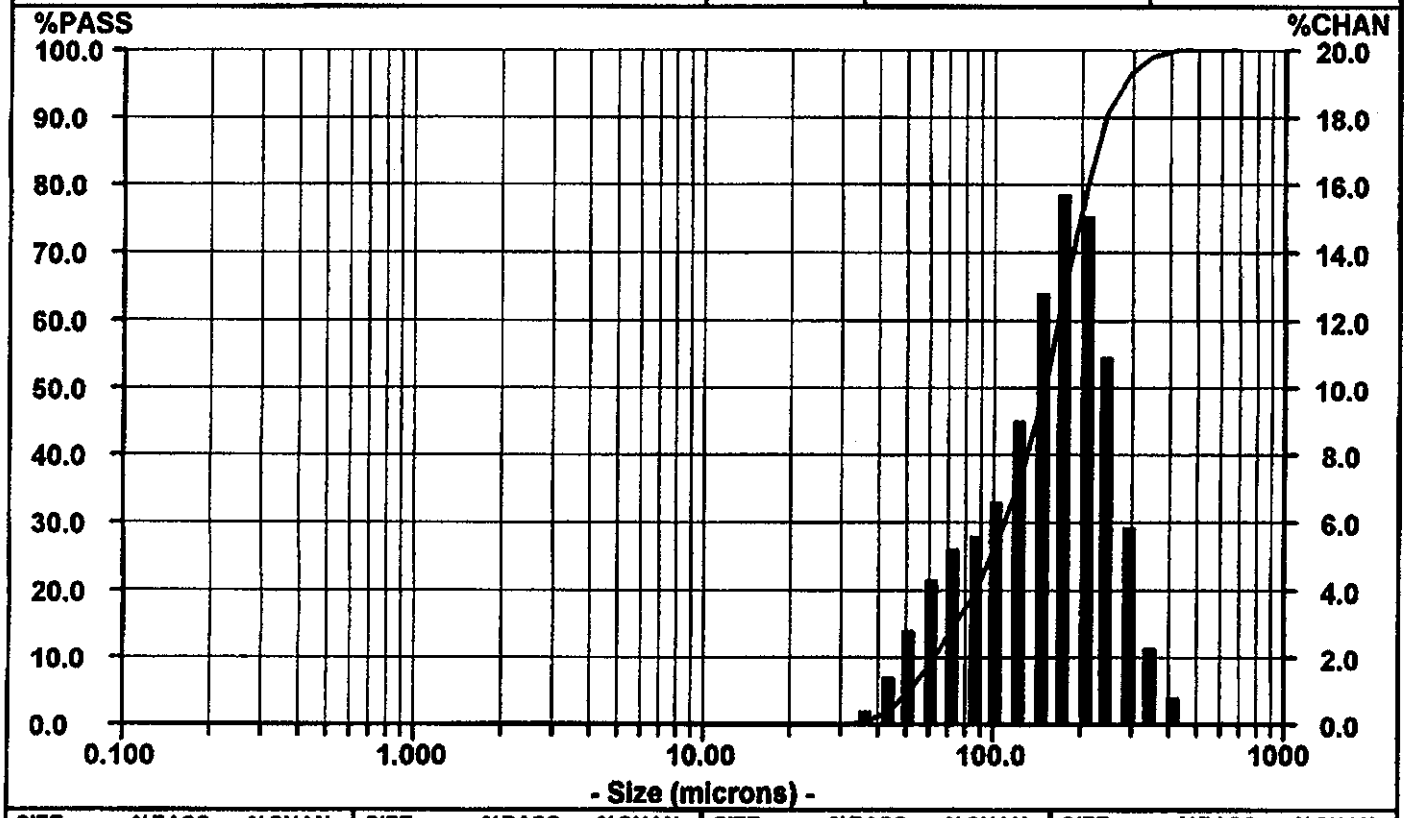
Particle Size Analysis

BCR130, riffled
7-23-01

Date: 07/25/91 Meas #: 00005
Time: 06:29 Pres #: 01

1M NaOH/1MNaNO3
Flow rate = 60 ml/sec
Refractive index of the medium 1.33 and the particle 2.00
File: BR13012

Summary	Percentiles		Dia	Vol%	Width
mv = 153.7	10% = 63.70	60% = 167.4	150.0	100%	144.3
mn = 67.76	20% = 87.54	70% = 186.5			
ma = 119.4	30% = 111.9	80% = 209.8			
cs = 0.050	40% = 132.2	90% = 245.3			
sd = 72.17	50% = 150.0	95% = 277.7			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	0.00	0.00						
592.0	100.00	0.00	7.778	0.00	0.00						
497.8	100.00	0.00	6.541	0.00	0.00						
418.6	100.00	0.81	5.500	0.00	0.00						
352.0	99.19	2.45	4.625	0.00	0.00						
296.0	96.74	5.98	3.889	0.00	0.00						
248.9	90.76	10.93	3.270	0.00	0.00						
209.3	79.83	15.14	2.750	0.00	0.00						
176.0	64.69	15.83	2.312	0.00	0.00						
148.0	48.86	12.92	1.945	0.00	0.00						
124.5	35.94	9.10	1.635	0.00	0.00						
104.7	26.84	6.66	1.375	0.00	0.00						
88.00	20.18	5.63	1.156	0.00	0.00						
74.00	14.55	5.22	0.972	0.00	0.00						
62.23	9.33	4.40	0.818	0.00	0.00						
52.33	4.93	2.91	0.688	0.00	0.00						
44.00	2.02	1.44	0.578	0.00	0.00						
37.00	0.58	0.58	0.486	0.00	0.00						
31.11	0.00	0.00	0.409	0.00	0.00						
26.16	0.00	0.00	0.344	0.00	0.00						
22.00	0.00	0.00	0.289	0.00	0.00						
18.50	0.00	0.00	0.243	0.00	0.00						
15.56	0.00	0.00	0.204	0.00	0.00						
13.08	0.00	0.00	0.172	0.00	0.00						
11.00	0.00	0.00	0.145	0.00	0.00						

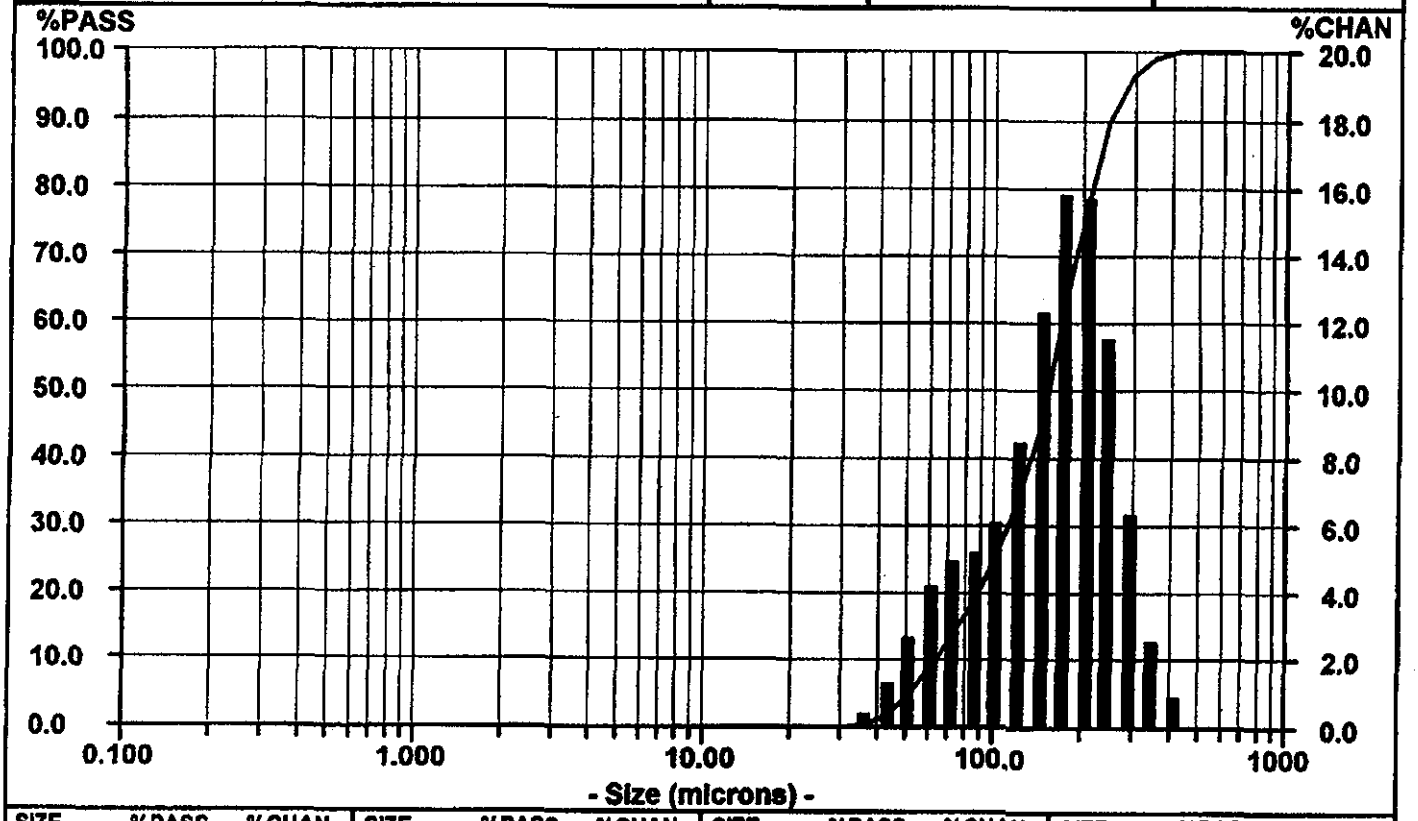
BCR 130 Sample

BCR130, riffled
7-23-01

Date: 07/25/91 Meas #: 00009
Time: 06:38 Pres #: 01

1M NaOH/1MNaNO3
Flow rate = 60 ml/sec
Refractive index of the medium = 1.33 and the particle = 1.54
Sonicate 2 min.
File: BR13013

Summary	Percentiles		Dia	Vol%	Width
mv = 157.0	10% = 64.74	60% = 171.5	154.0	100%	146.5
mn = 68.48	20% = 89.85	70% = 190.6			
ma = 122.0	30% = 115.4	80% = 213.9			
cs = 0.049	40% = 136.0	90% = 249.0			
sd = 73.26	50% = 154.0	95% = 281.4			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	0.00	0.00						
592.0	100.00	0.00	7.778	0.00	0.00						
497.8	100.00	0.00	6.541	0.00	0.00						
418.6	100.00	0.90	5.500	0.00	0.00						
352.0	99.10	2.67	4.625	0.00	0.00						
296.0	96.43	6.44	3.889	0.00	0.00						
248.9	89.99	11.67	3.270	0.00	0.00						
209.3	78.32	15.82	2.750	0.00	0.00						
176.0	62.50	15.93	2.312	0.00	0.00						
148.0	46.57	12.46	1.945	0.00	0.00						
124.5	34.11	8.54	1.635	0.00	0.00						
104.7	25.57	6.25	1.375	0.00	0.00						
88.00	19.32	5.37	1.156	0.00	0.00						
74.00	13.95	5.06	0.972	0.00	0.00						
62.23	8.89	4.25	0.818	0.00	0.00						
52.33	4.64	2.76	0.688	0.00	0.00						
44.00	1.88	1.35	0.578	0.00	0.00						
37.00	0.53	0.53	0.486	0.00	0.00						
31.11	0.00	0.00	0.409	0.00	0.00						
26.16	0.00	0.00	0.344	0.00	0.00						
22.00	0.00	0.00	0.289	0.00	0.00						
18.50	0.00	0.00	0.243	0.00	0.00						
15.56	0.00	0.00	0.204	0.00	0.00						
13.08	0.00	0.00	0.172	0.00	0.00						
11.00	0.00	0.00	0.146	0.00	0.00						

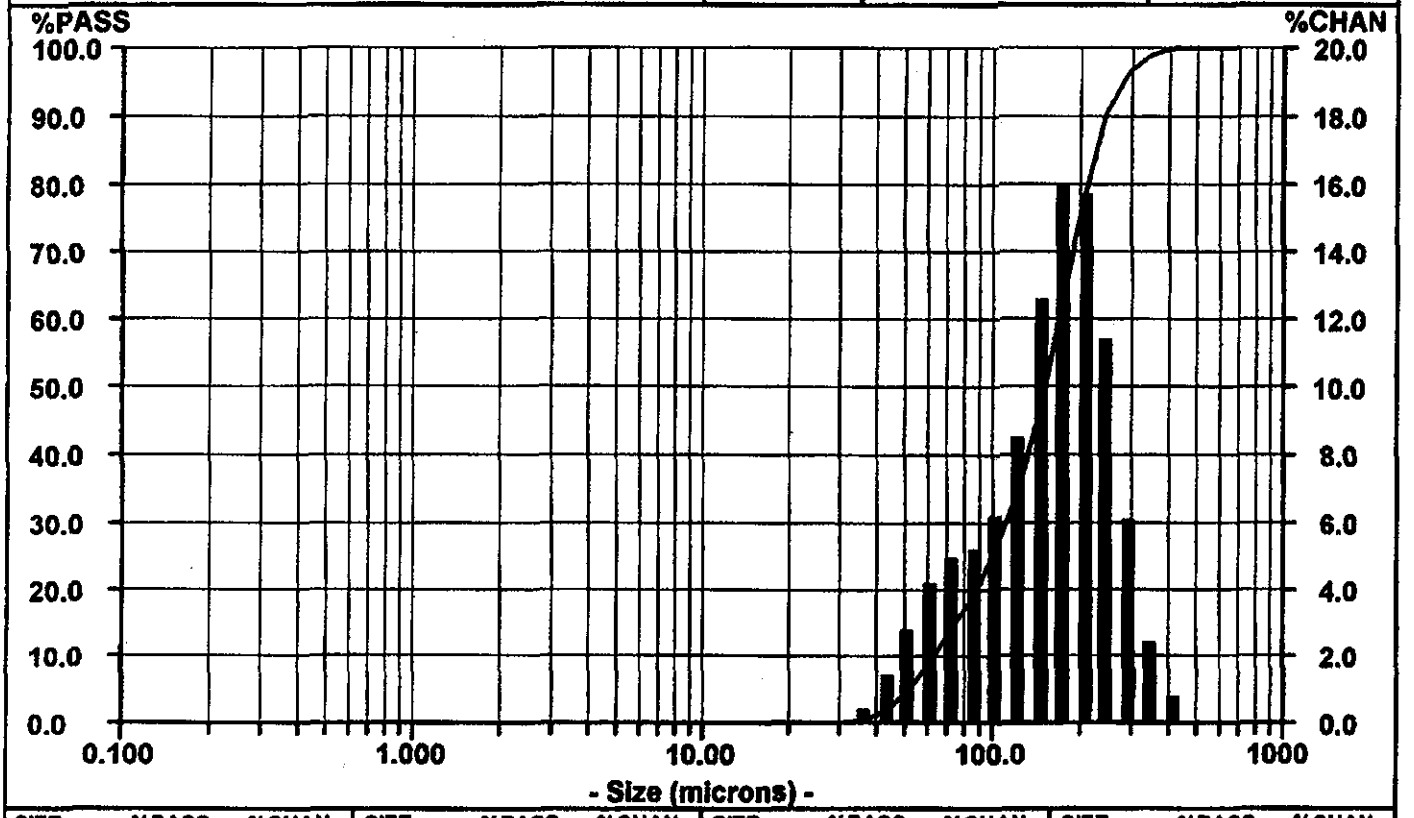
BCR 130 Sample

BCR130, riffled
7-23-01

Date: 07/25/91 Meas #: 00008
Time: 06:38 Pres #: 01

1M NaOH/1MNaNO3
Flow rate = 60 ml/sec
Refractive index of the medium = 1.33 and the particle = 2.0
Sonicate 2 min.
File: BR13013

Summary	Percentiles		Dia	Vol%	Width
mv = 155.7	10% = 64.19	60% = 170.0	152.7	100%	145.2
mn = 67.97	20% = 89.08	70% = 188.9			
ma = 121.0	30% = 114.4	80% = 212.0			
cs = 0.050	40% = 134.9	90% = 246.9			
sd = 72.62	50% = 152.7	95% = 279.0			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	0.00	0.00						
592.0	100.00	0.00	7.778	0.00	0.00						
497.8	100.00	0.00	6.541	0.00	0.00						
418.6	100.00	0.84	5.500	0.00	0.00						
352.0	99.16	2.52	4.625	0.00	0.00						
296.0	96.64	6.19	3.889	0.00	0.00						
248.9	90.45	11.40	3.270	0.00	0.00						
209.3	79.05	15.71	2.750	0.00	0.00						
176.0	63.34	16.06	2.312	0.00	0.00						
148.0	47.28	12.67	1.945	0.00	0.00						
124.5	34.61	8.69	1.635	0.00	0.00						
104.7	25.92	6.32	1.375	0.00	0.00						
88.00	19.60	5.39	1.156	0.00	0.00						
74.00	14.21	5.08	0.972	0.00	0.00						
62.23	9.13	4.32	0.818	0.00	0.00						
52.33	4.81	2.84	0.688	0.00	0.00						
44.00	1.97	1.40	0.578	0.00	0.00						
37.00	0.57	0.57	0.486	0.00	0.00						
31.11	0.00	0.00	0.409	0.00	0.00						
26.16	0.00	0.00	0.344	0.00	0.00						
22.00	0.00	0.00	0.289	0.00	0.00						
18.50	0.00	0.00	0.243	0.00	0.00						
15.56	0.00	0.00	0.204	0.00	0.00						
13.08	0.00	0.00	0.172	0.00	0.00						
11.00	0.00	0.00	0.145	0.00	0.00						

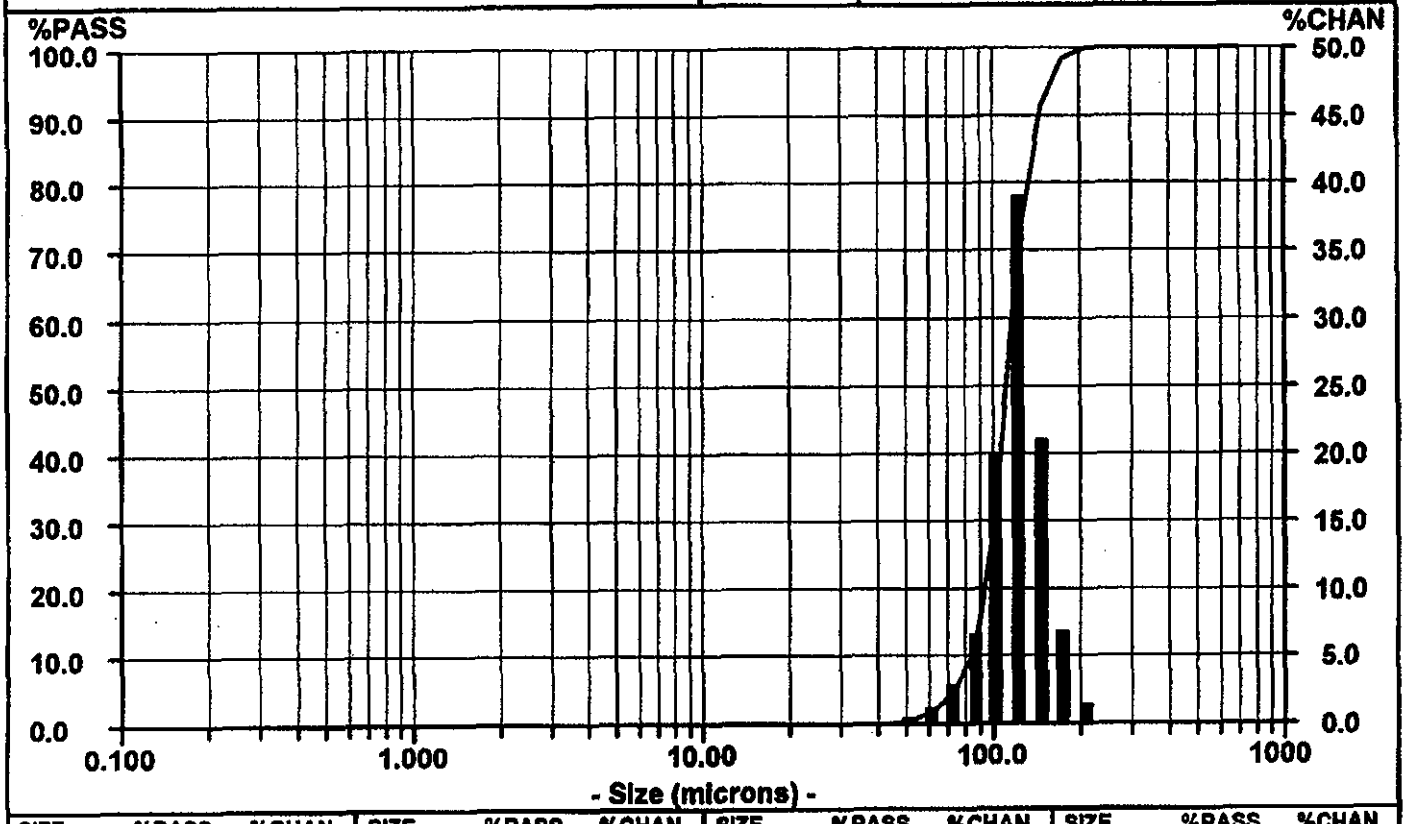
BCR 130 Duplicate

BCR130, riffled
7-25-01

Date: 07/26/91 Meas #: 00014
Time: 07:05 Pres #: 01

1M NaOH/1MNaNO3
Flow 17 ml/sec
Refractive index of the medium = 1.33 and the particle = 1.54
First pass
File: BR13014

Summary	Percentiles		Dia	Vol%	Width
mv = 114.8	10% = 86.21	60% = 116.6	113.7	100%	43.30
mn = 96.51	20% = 96.82	70% = 124.2			
ma = 109.4	30% = 103.8	80% = 132.4			
cs = 0.055	40% = 109.0	90% = 145.3			
sd = 21.65	50% = 113.7	95% = 157.2			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	0.00	0.00						
592.0	100.00	0.00	7.778	0.00	0.00						
497.8	100.00	0.00	6.541	0.00	0.00						
418.6	100.00	0.00	5.500	0.00	0.00						
352.0	100.00	0.00	4.625	0.00	0.00						
296.0	100.00	0.00	3.889	0.00	0.00						
248.9	100.00	0.00	3.270	0.00	0.00						
209.3	100.00	1.46	2.750	0.00	0.00						
176.0	98.54	6.96	2.312	0.00	0.00						
148.0	91.58	21.14	1.945	0.00	0.00						
124.5	70.44	39.12	1.635	0.00	0.00						
104.7	31.32	20.13	1.375	0.00	0.00						
88.00	11.19	6.60	1.156	0.00	0.00						
74.00	4.59	2.83	0.972	0.00	0.00						
62.23	1.76	1.23	0.818	0.00	0.00						
52.33	0.53	0.53	0.688	0.00	0.00						
44.00	0.00	0.00	0.578	0.00	0.00						
37.00	0.00	0.00	0.486	0.00	0.00						
31.11	0.00	0.00	0.409	0.00	0.00						
26.16	0.00	0.00	0.344	0.00	0.00						
22.00	0.00	0.00	0.289	0.00	0.00						
18.50	0.00	0.00	0.243	0.00	0.00						
15.56	0.00	0.00	0.204	0.00	0.00						
13.08	0.00	0.00	0.172	0.00	0.00						
11.00	0.00	0.00	0.145	0.00	0.00						

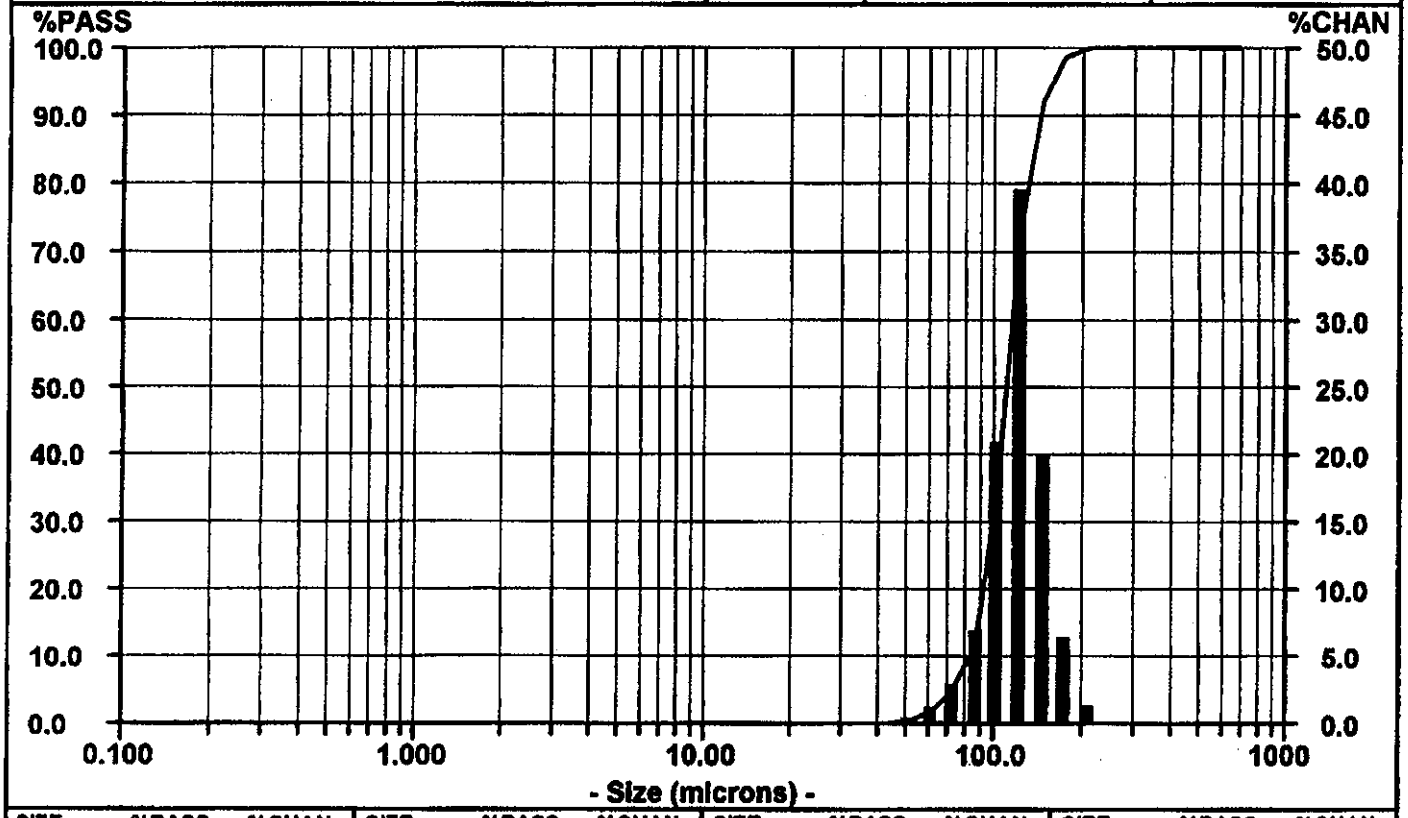
BCR 130 Duplicate

BCR130, riffled
7-25-01

Date: 07/26/91 Meas #: 00012
Time: 07:05 Pres #: 01

1M NaOH/1MNaNO3
Flow 17 ml/sec
Refractive index of the medium = 1.33 and the particle = 2.00
First pass
File: BR13014

Summary	Percentiles		Dia	Vol%	Width
mv = 113.8	10% = 86.53	60% = 117.7	112.9	100%	42.49
mn = 96.74	20% = 96.06	70% = 123.2			
ma = 108.5	30% = 102.9	80% = 130.8			
cs = 0.055	40% = 108.2	90% = 143.8			
sd = 21.24	50% = 112.9	95% = 155.6			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	0.00	0.00						
592.0	100.00	0.00	7.778	0.00	0.00						
497.8	100.00	0.00	6.541	0.00	0.00						
418.6	100.00	0.00	5.500	0.00	0.00						
352.0	100.00	0.00	4.625	0.00	0.00						
296.0	100.00	0.00	3.889	0.00	0.00						
248.9	100.00	0.00	3.270	0.00	0.00						
209.3	100.00	1.30	2.750	0.00	0.00						
176.0	98.70	6.45	2.312	0.00	0.00						
148.0	92.25	19.91	1.945	0.00	0.00						
124.5	72.34	39.64	1.635	0.00	0.00						
104.7	32.80	21.07	1.375	0.00	0.00						
88.00	11.73	6.94	1.156	0.00	0.00						
74.00	4.79	2.94	0.972	0.00	0.00						
62.23	1.85	1.28	0.818	0.00	0.00						
52.33	0.57	0.57	0.688	0.00	0.00						
44.00	0.00	0.00	0.578	0.00	0.00						
37.00	0.00	0.00	0.486	0.00	0.00						
31.11	0.00	0.00	0.409	0.00	0.00						
26.16	0.00	0.00	0.344	0.00	0.00						
22.00	0.00	0.00	0.289	0.00	0.00						
18.50	0.00	0.00	0.243	0.00	0.00						
15.56	0.00	0.00	0.204	0.00	0.00						
13.08	0.00	0.00	0.172	0.00	0.00						
11.00	0.00	0.00	0.145	0.00	0.00						

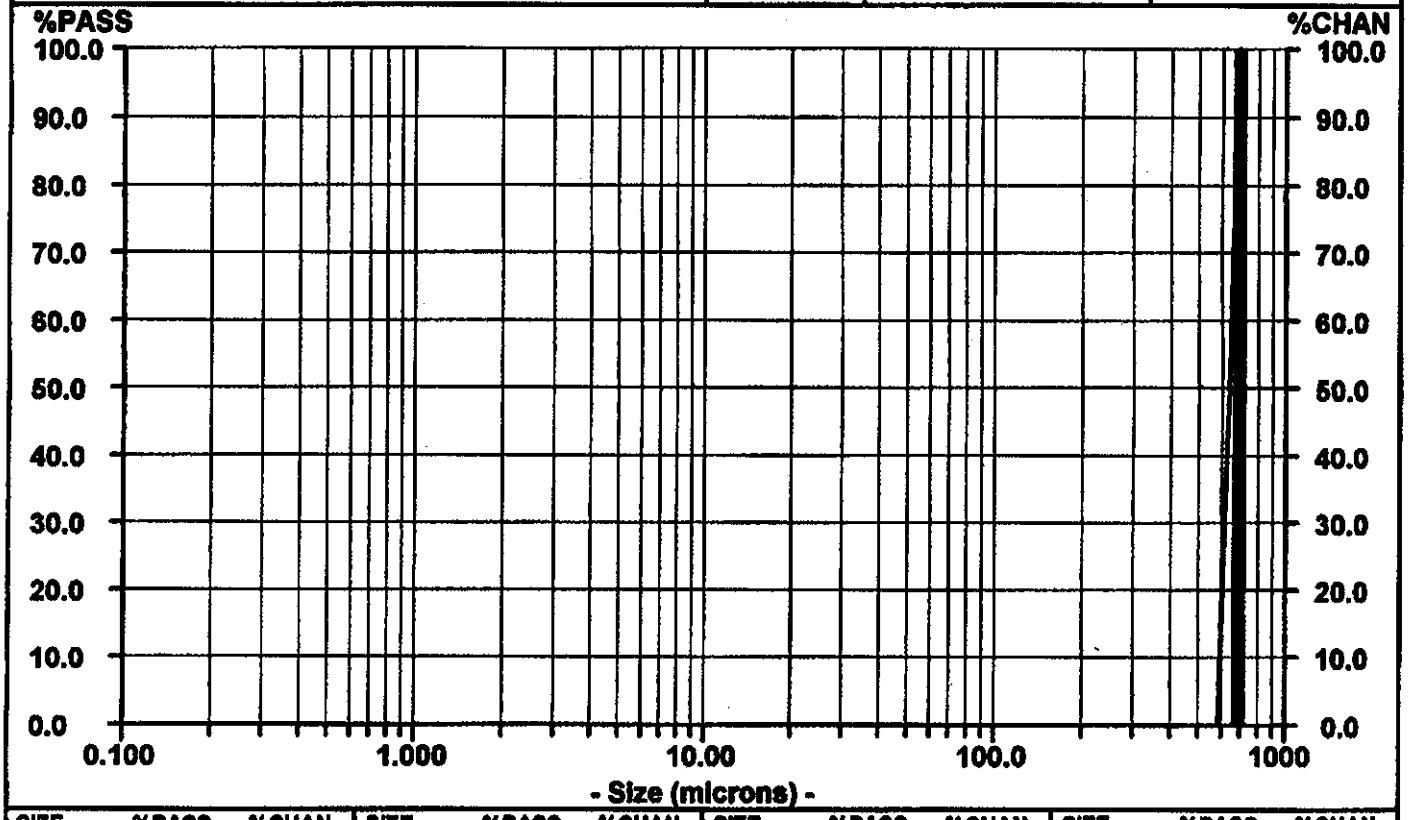
BCR 130 Duplicate

BCR130, riffled 7-25-01

Date: 07/26/91 Meas #: 00010
Time: 07:24 Pres #: 01

1M NaOH/1MNaNO3
Flow rate = 17 ml/sec
Refractive index of the medium = 1.33 and the particle = 1.54
Second pass.
File: BR13015

Summary	Percentiles		Dia	Vol%	Width
mv = 645.8	10% = 604.1	60% = 655.0	645.1	100%	69.47
mn = 641.8	20% = 616.2	70% = 664.9			
ma = 644.5	30% = 626.1	80% = 675.0			
cs = 0.009	40% = 635.6	90% = 689.5			
sd = 34.73	50% = 645.1	95% = 696.8			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	100.00	9.250	0.00	0.00						
592.0	0.00	0.00	7.778	0.00	0.00						
497.8	0.00	0.00	6.541	0.00	0.00						
418.6	0.00	0.00	5.500	0.00	0.00						
352.0	0.00	0.00	4.625	0.00	0.00						
296.0	0.00	0.00	3.889	0.00	0.00						
248.9	0.00	0.00	3.270	0.00	0.00						
209.3	0.00	0.00	2.750	0.00	0.00						
176.0	0.00	0.00	2.312	0.00	0.00						
148.0	0.00	0.00	1.945	0.00	0.00						
124.5	0.00	0.00	1.635	0.00	0.00						
104.7	0.00	0.00	1.375	0.00	0.00						
88.00	0.00	0.00	1.156	0.00	0.00						
74.00	0.00	0.00	0.972	0.00	0.00						
62.23	0.00	0.00	0.818	0.00	0.00						
52.33	0.00	0.00	0.688	0.00	0.00						
44.00	0.00	0.00	0.578	0.00	0.00						
37.00	0.00	0.00	0.486	0.00	0.00						
31.11	0.00	0.00	0.409	0.00	0.00						
26.16	0.00	0.00	0.344	0.00	0.00						
22.00	0.00	0.00	0.289	0.00	0.00						
18.50	0.00	0.00	0.243	0.00	0.00						
15.56	0.00	0.00	0.204	0.00	0.00						
13.08	0.00	0.00	0.172	0.00	0.00						
11.00	0.00	0.00	0.145	0.00	0.00						

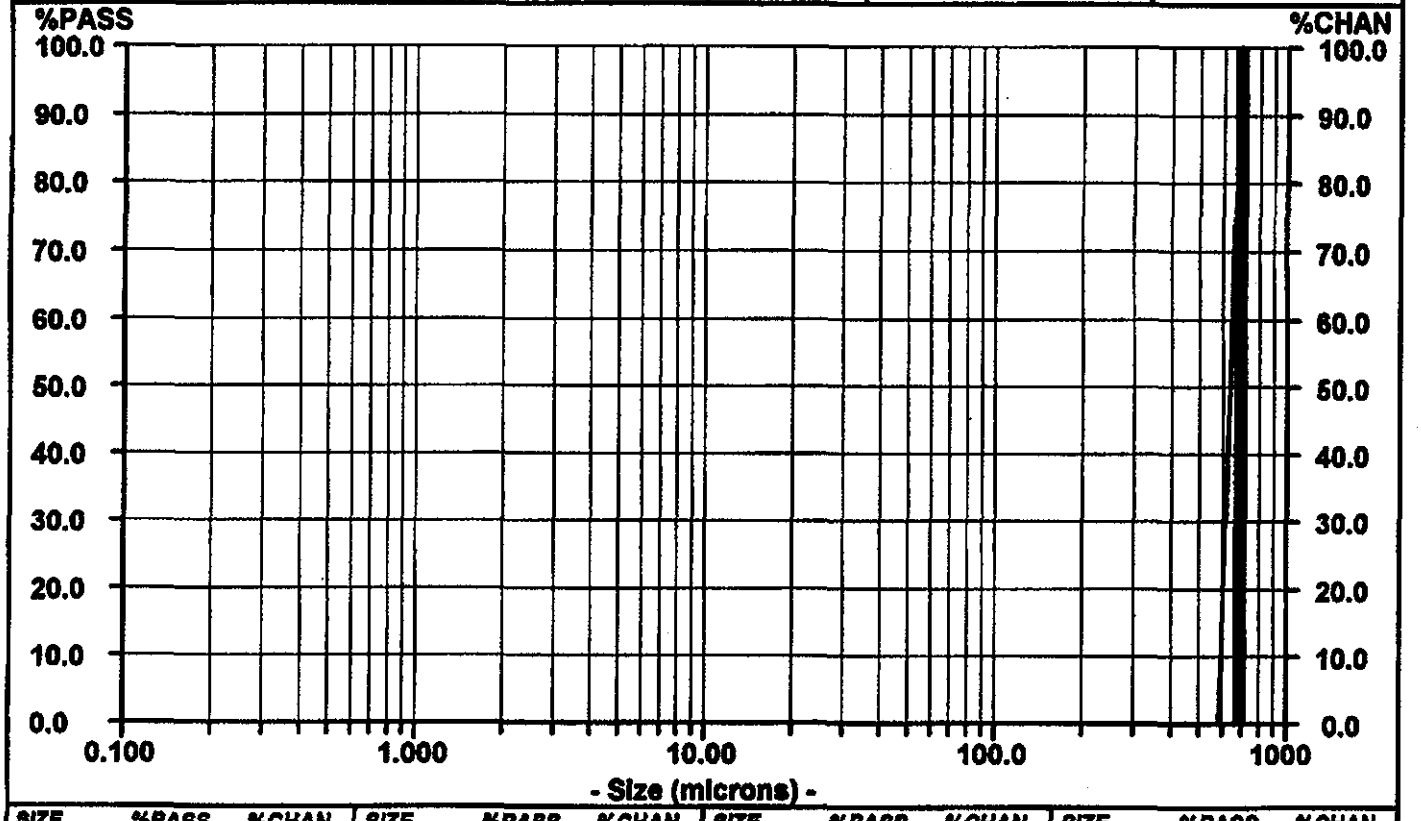
BCR 130 Duplicate

BCR130, rinsed 7-25-01

Date: 07/26/91 Meas #: 00009
Time: 07:24 Pres #: 01

1M NaOH/1MNaNO3
Flow rate = 17 ml/sec
Refractive index of the medium = 1.33 and the particle = 2.00
Second pass.
File: SR13015

Summary	Percentiles		Dia	Vol%	Width
mv = 645.8	10% = 604.1	60% = 655.0	645.1	100%	69.47
mn = 641.8	20% = 616.2	70% = 664.9			
ma = 644.5	30% = 626.1	80% = 675.0			
cs = 0.009	40% = 635.6	90% = 689.5			
sd = 34.73	50% = 645.1	95% = 696.8			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	100.00	9.250	0.00	0.00						
592.0	0.00	0.00	7.776	0.00	0.00						
497.8	0.00	0.00	6.541	0.00	0.00						
418.6	0.00	0.00	5.500	0.00	0.00						
352.0	0.00	0.00	4.625	0.00	0.00						
296.0	0.00	0.00	3.889	0.00	0.00						
248.9	0.00	0.00	3.270	0.00	0.00						
209.3	0.00	0.00	2.750	0.00	0.00						
176.0	0.00	0.00	2.312	0.00	0.00						
148.0	0.00	0.00	1.945	0.00	0.00						
124.5	0.00	0.00	1.635	0.00	0.00						
104.7	0.00	0.00	1.375	0.00	0.00						
88.00	0.00	0.00	1.156	0.00	0.00						
74.00	0.00	0.00	0.972	0.00	0.00						
62.23	0.00	0.00	0.818	0.00	0.00						
52.33	0.00	0.00	0.688	0.00	0.00						
44.00	0.00	0.00	0.578	0.00	0.00						
37.00	0.00	0.00	0.486	0.00	0.00						
31.11	0.00	0.00	0.409	0.00	0.00						
26.16	0.00	0.00	0.344	0.00	0.00						
22.00	0.00	0.00	0.289	0.00	0.00						
18.50	0.00	0.00	0.243	0.00	0.00						
15.56	0.00	0.00	0.204	0.00	0.00						
13.08	0.00	0.00	0.172	0.00	0.00						
11.00	0.00	0.00	0.145	0.00	0.00						

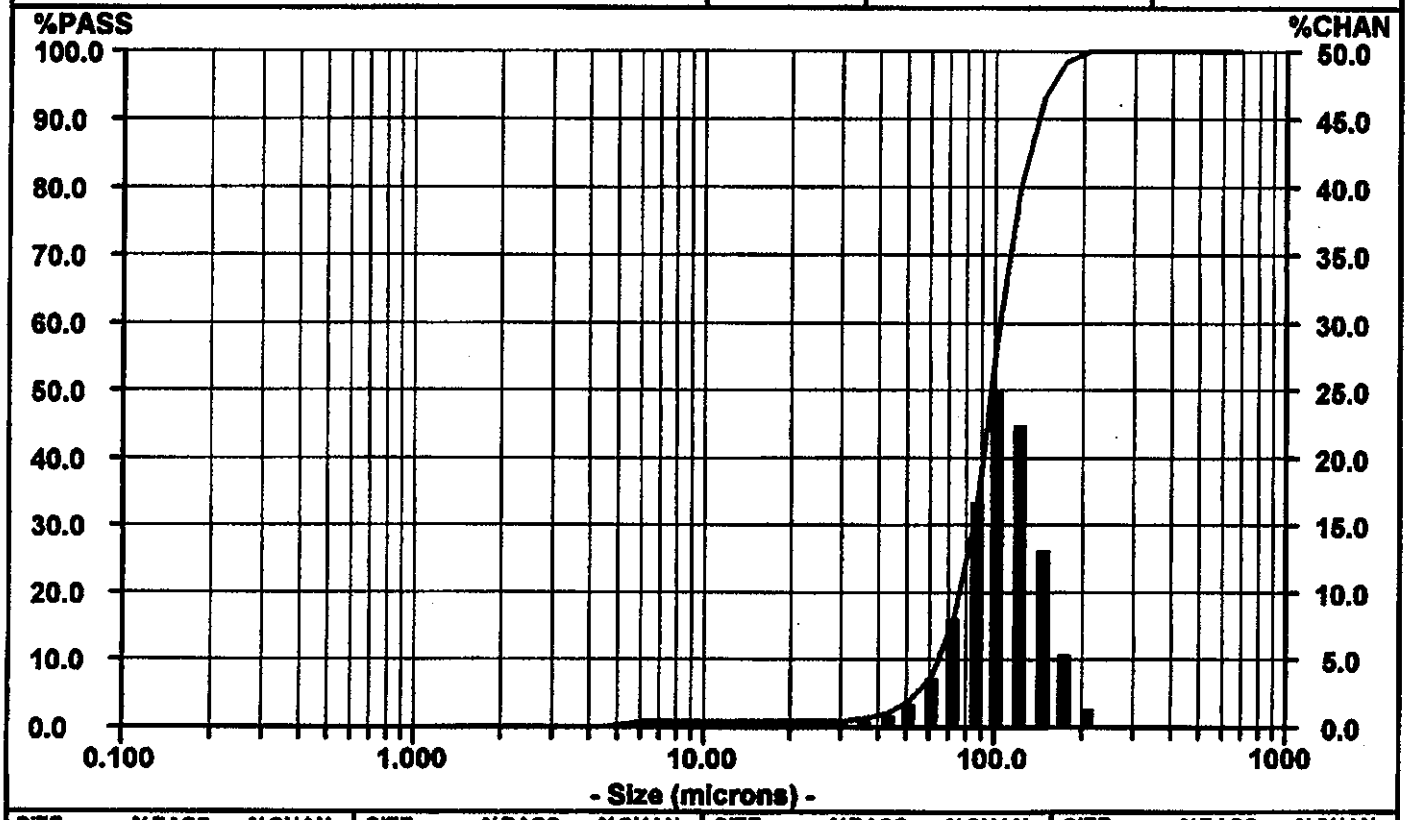
BCR 130 Duplicate

BCR130, riffled 7-25-01

Date: 07/26/91 Meas #: 00010
Time: 07:41 Pres #: 01

1M NaOH/1MNaNO3
Flow rate = 17 ml/sec
Refractive index of the medium = 1.33 and the particle = 1.54
Sonicate 2 min. after second pass
File: BR13016

Summary	Percentiles		Dia	Vol%	Width
mv = 101.4	10% = 66.49	60% = 106.6	99.51	100%	55.48
mn = 6.262	20% = 78.09	70% = 114.5			
ma = 80.41	30% = 86.12	80% = 124.5			
cs = 0.075	40% = 92.97	90% = 140.2			
sd = 27.74	50% = 99.51	95% = 154.1			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	0.94	0.00						
592.0	100.00	0.00	7.776	0.94	0.00						
497.8	100.00	0.00	6.541	0.94	0.32						
418.6	100.00	0.00	5.500	0.62	0.32						
352.0	100.00	0.00	4.626	0.30	0.30						
296.0	100.00	0.00	3.889	0.00	0.00						
248.9	100.00	0.00	3.270	0.00	0.00						
209.3	100.00	1.37	2.750	0.00	0.00						
176.0	98.63	5.42	2.312	0.00	0.00						
148.0	93.21	13.19	1.945	0.00	0.00						
124.5	80.02	22.54	1.635	0.00	0.00						
104.7	57.48	24.92	1.375	0.00	0.00						
88.00	32.56	16.81	1.156	0.00	0.00						
74.00	15.75	8.15	0.972	0.00	0.00						
62.23	7.60	3.64	0.818	0.00	0.00						
52.33	3.96	1.73	0.688	0.00	0.00						
44.00	2.23	0.88	0.578	0.00	0.00						
37.00	1.35	0.41	0.486	0.00	0.00						
31.11	0.94	0.00	0.409	0.00	0.00						
26.16	0.94	0.00	0.344	0.00	0.00						
22.00	0.94	0.00	0.289	0.00	0.00						
18.50	0.94	0.00	0.243	0.00	0.00						
15.56	0.94	0.00	0.204	0.00	0.00						
13.08	0.94	0.00	0.172	0.00	0.00						
11.00	0.94	0.00	0.145	0.00	0.00						

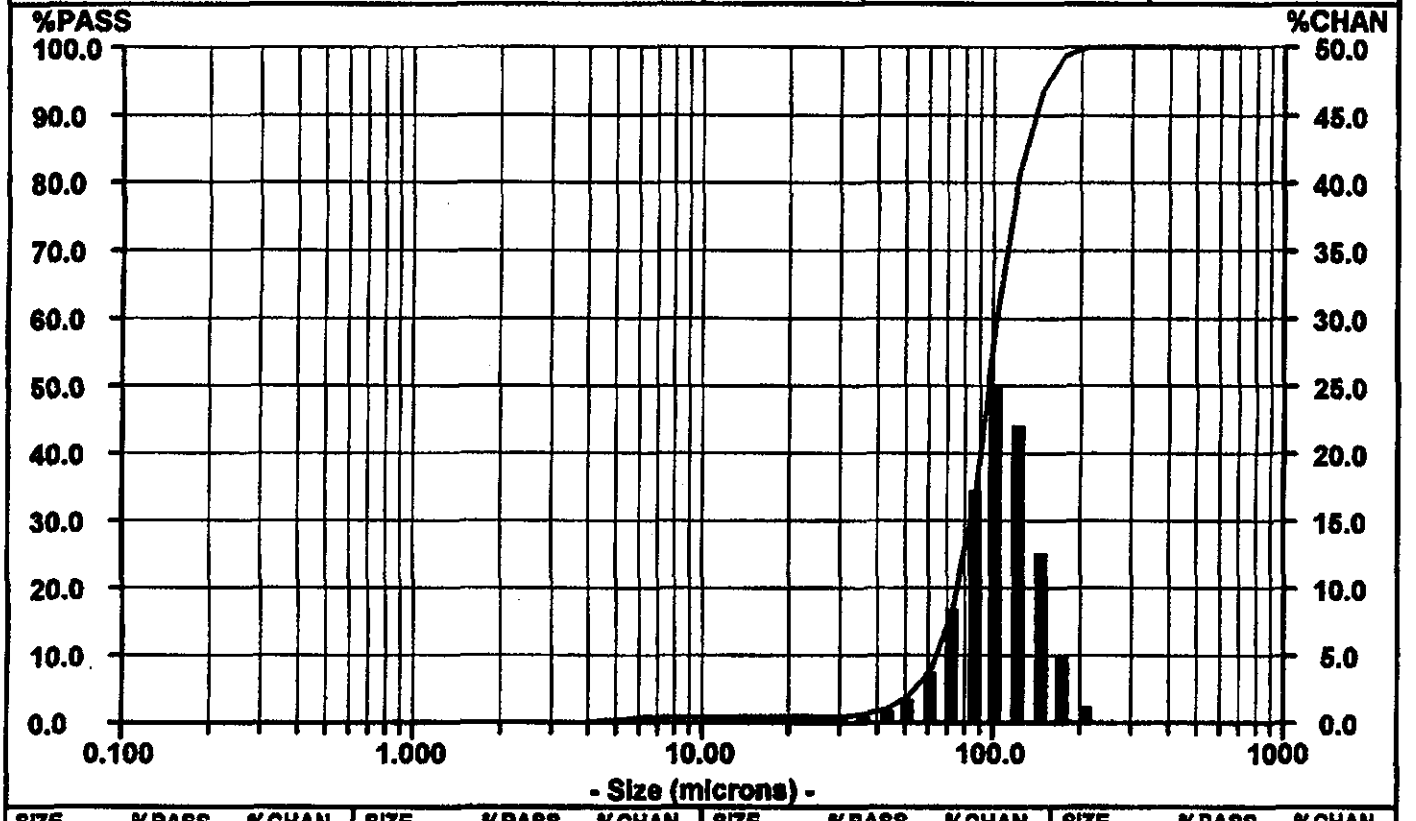
BCR 130 Duplicate

BCR130, riffled
7-25-01

Date: 07/26/91 Meas #: 00009
Time: 07:41 Pres #: 01

1M NaOH/1MNaNO3
Flow rate = 17 ml/sec
Refractive index of the medium = 1.33 and the particle = 2.00
Sonicate 2 min. after second pass
File: BR13016

Summary		Percentiles		Dia	Vol%	Width
mv =	100.6	10% = 66.92	60% = 105.6	98.66	100%	54.96
mn =	8.220	20% = 77.46	70% = 113.4			
ma =	79.63	30% = 85.39	80% = 123.4			
cs =	0.075	40% = 92.20	90% = 138.9			
sd =	27.48	50% = 98.66	95% = 152.8			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	0.95	0.00						
592.0	100.00	0.00	7.778	0.95	0.00						
497.8	100.00	0.00	6.541	0.95	0.31						
418.6	100.00	0.00	5.500	0.64	0.32						
352.0	100.00	0.00	4.625	0.32	0.32						
296.0	100.00	0.00	3.889	0.00	0.00						
248.9	100.00	0.00	3.270	0.00	0.00						
209.3	100.00	1.23	2.750	0.00	0.00						
176.0	98.77	5.10	2.312	0.00	0.00						
148.0	93.67	12.68	1.945	0.00	0.00						
124.5	80.99	22.19	1.635	0.00	0.00						
104.7	58.80	25.16	1.375	0.00	0.00						
88.00	33.64	17.30	1.156	0.00	0.00						
74.00	16.34	8.47	0.972	0.00	0.00						
62.23	7.87	3.78	0.818	0.00	0.00						
52.33	4.09	1.79	0.688	0.00	0.00						
44.00	2.30	0.91	0.578	0.00	0.00						
37.00	1.39	0.44	0.486	0.00	0.00						
31.11	0.95	0.00	0.409	0.00	0.00						
26.16	0.95	0.00	0.344	0.00	0.00						
22.00	0.95	0.00	0.289	0.00	0.00						
18.50	0.95	0.00	0.243	0.00	0.00						
15.56	0.95	0.00	0.204	0.00	0.00						
13.08	0.95	0.00	0.172	0.00	0.00						
11.00	0.95	0.00	0.145	0.00	0.00						

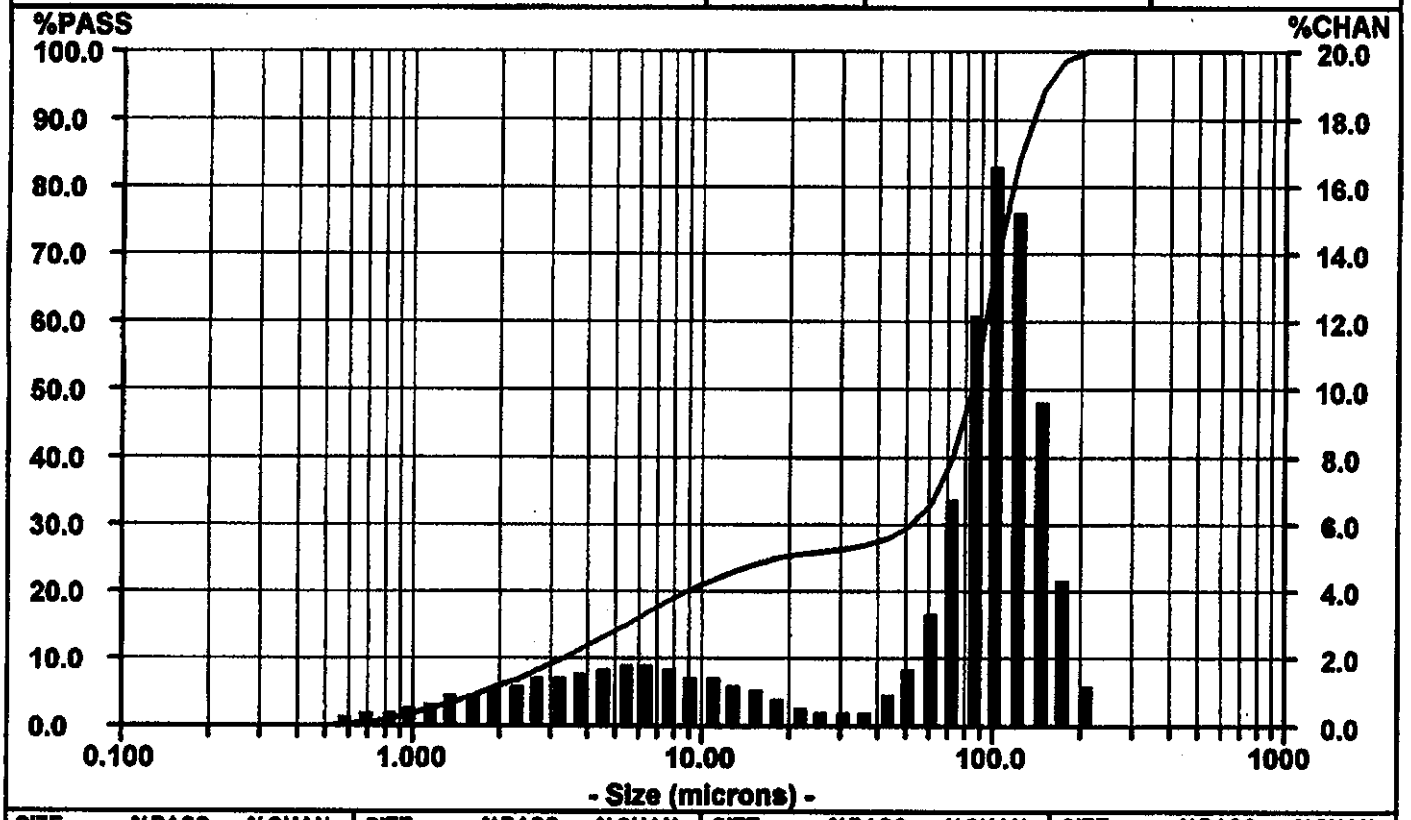
BCR 130 Duplicate

BCR130, riffled 7-25-01

Date: 07/26/91 Meas #: 00010
Time: 07:50 Pres #: 01

1M NaOH/1MNaNO3
Flow rate = 17 ml/sec
Refractive index of the medium = 1.33 and the particle = 1.54
Second sonication (2 min.) after second pass.
File: BR13017

Summary	Percentiles		Dia	Vol%	Width
mv = 76.13	10% = 3.310	60% = 95.45	98.43	74%	60.60
mn = 0.906	20% = 8.943	70% = 106.6	4.505	26%	9.725
ma = 9.740	30% = 53.15	80% = 117.7			
cs = 0.616	40% = 73.91	90% = 135.4			
sd = 58.89	50% = 85.56	95% = 151.1			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	20.30	1.59						
592.0	100.00	0.00	7.778	18.71	1.74						
497.8	100.00	0.00	6.541	16.97	1.82						
418.6	100.00	0.00	5.500	15.15	1.83						
352.0	100.00	0.00	4.625	13.32	1.77						
296.0	100.00	0.00	3.889	11.55	1.66						
248.9	100.00	0.00	3.270	9.89	1.53						
209.3	100.00	1.24	2.750	8.36	1.40						
176.0	98.76	4.48	2.312	6.96	1.26						
148.0	94.28	9.79	1.945	5.70	1.13						
124.5	84.49	15.34	1.635	4.57	1.01						
104.7	69.15	16.80	1.375	3.56	0.91						
88.00	52.35	12.29	1.156	2.65	0.79						
74.00	40.06	6.84	0.972	1.86	0.67						
62.23	33.22	3.45	0.818	1.19	0.48						
52.33	29.77	1.75	0.688	0.71	0.40						
44.00	28.02	0.96	0.578	0.31	0.31						
37.00	27.06	0.57	0.486	0.00	0.00						
31.11	26.49	0.40	0.409	0.00	0.00						
26.16	26.09	0.43	0.344	0.00	0.00						
22.00	25.66	0.64	0.289	0.00	0.00						
18.50	25.02	0.89	0.243	0.00	0.00						
15.56	24.13	1.11	0.204	0.00	0.00						
13.08	23.02	1.28	0.172	0.00	0.00						
11.00	21.74	1.44	0.145	0.00	0.00						

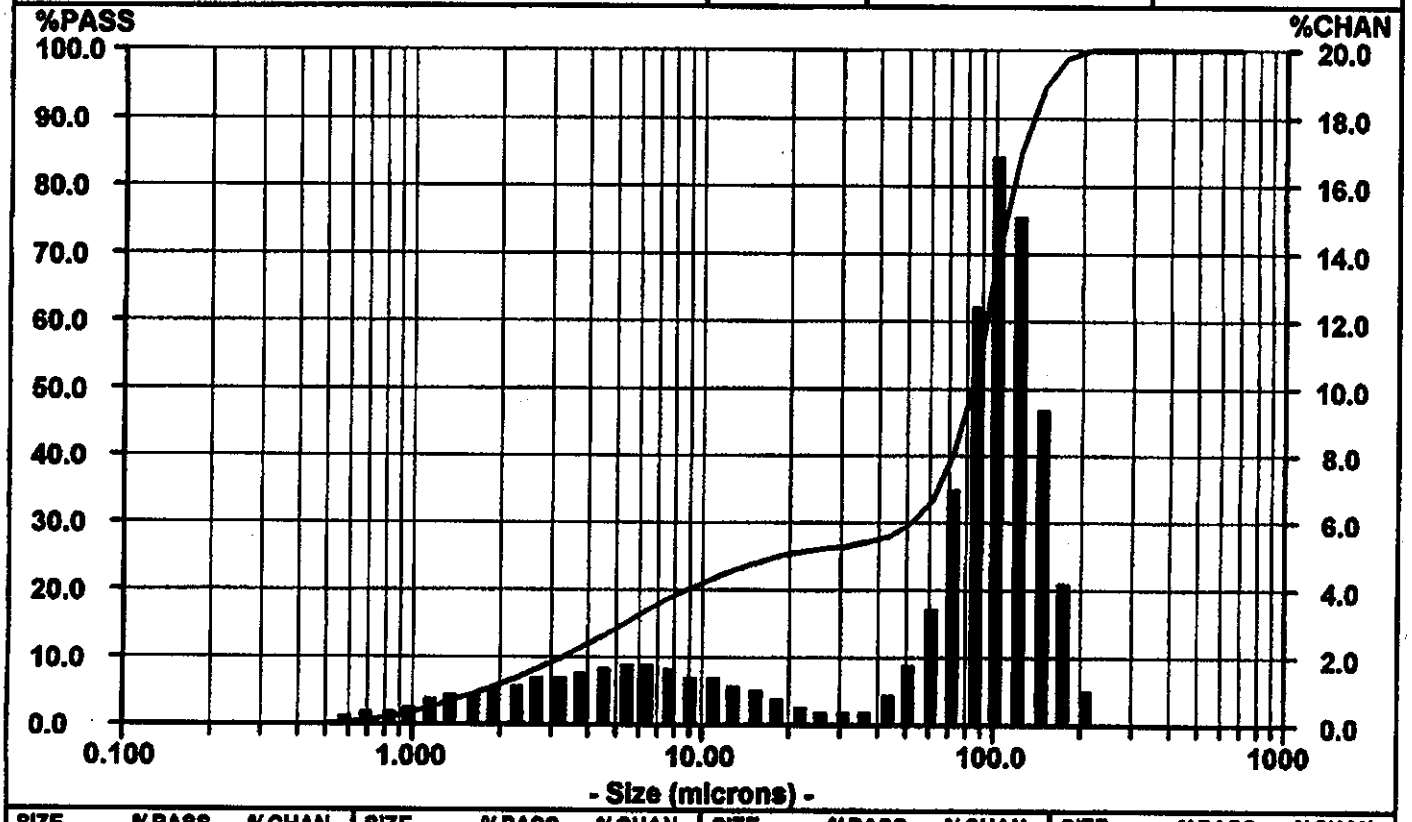
BCR 130 Duplicate

BCR130, riffled 7-25-01

Date: 07/26/91 Meas #: 00009
Time: 07:50 Pres #: 01

1M NaOH/1MNaNO3
Flow rate = 17 ml/sec
Refractive index of the medium = 1.33 and the particle = 2
Second sonication (2 min.) after second pass.
File: BR13017

Summary	Percentiles		Dia	Vol%	Width
mv = 75.45	10% = 3.270	60% = 94.64	97.60	74%	59.90
mn = 0.900	20% = 8.839	70% = 104.7	4.462	26%	9.660
ma = 9.640	30% = 52.67	80% = 116.7			
cs = 0.622	40% = 73.25	90% = 134.3			
sd = 58.38	50% = 84.83	95% = 149.6			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	20.40	1.68						
592.0	100.00	0.00	7.778	18.82	1.73						
497.8	100.00	0.00	6.541	17.09	1.82						
418.6	100.00	0.00	5.500	15.27	1.83						
352.0	100.00	0.00	4.625	13.44	1.77						
296.0	100.00	0.00	3.889	11.67	1.67						
248.9	100.00	0.00	3.270	10.00	1.54						
209.3	100.00	1.12	2.750	8.46	1.41						
176.0	98.88	4.24	2.312	7.05	1.27						
148.0	94.64	9.47	1.945	5.78	1.14						
124.5	85.17	15.14	1.636	4.64	1.02						
104.7	70.03	16.92	1.375	3.62	0.92						
88.00	53.11	12.58	1.156	2.70	0.80						
74.00	40.53	7.06	0.972	1.90	0.68						
62.23	33.47	3.57	0.818	1.22	0.49						
52.33	29.90	1.80	0.688	0.73	0.40						
44.00	28.10	0.99	0.578	0.33	0.33						
37.00	27.11	0.58	0.486	0.00	0.00						
31.11	26.53	0.40	0.409	0.00	0.00						
26.16	26.13	0.42	0.344	0.00	0.00						
22.00	25.71	0.63	0.289	0.00	0.00						
18.50	25.08	0.88	0.243	0.00	0.00						
15.56	24.20	1.10	0.204	0.00	0.00						
13.08	23.10	1.27	0.172	0.00	0.00						
11.00	21.83	1.43	0.145	0.00	0.00						

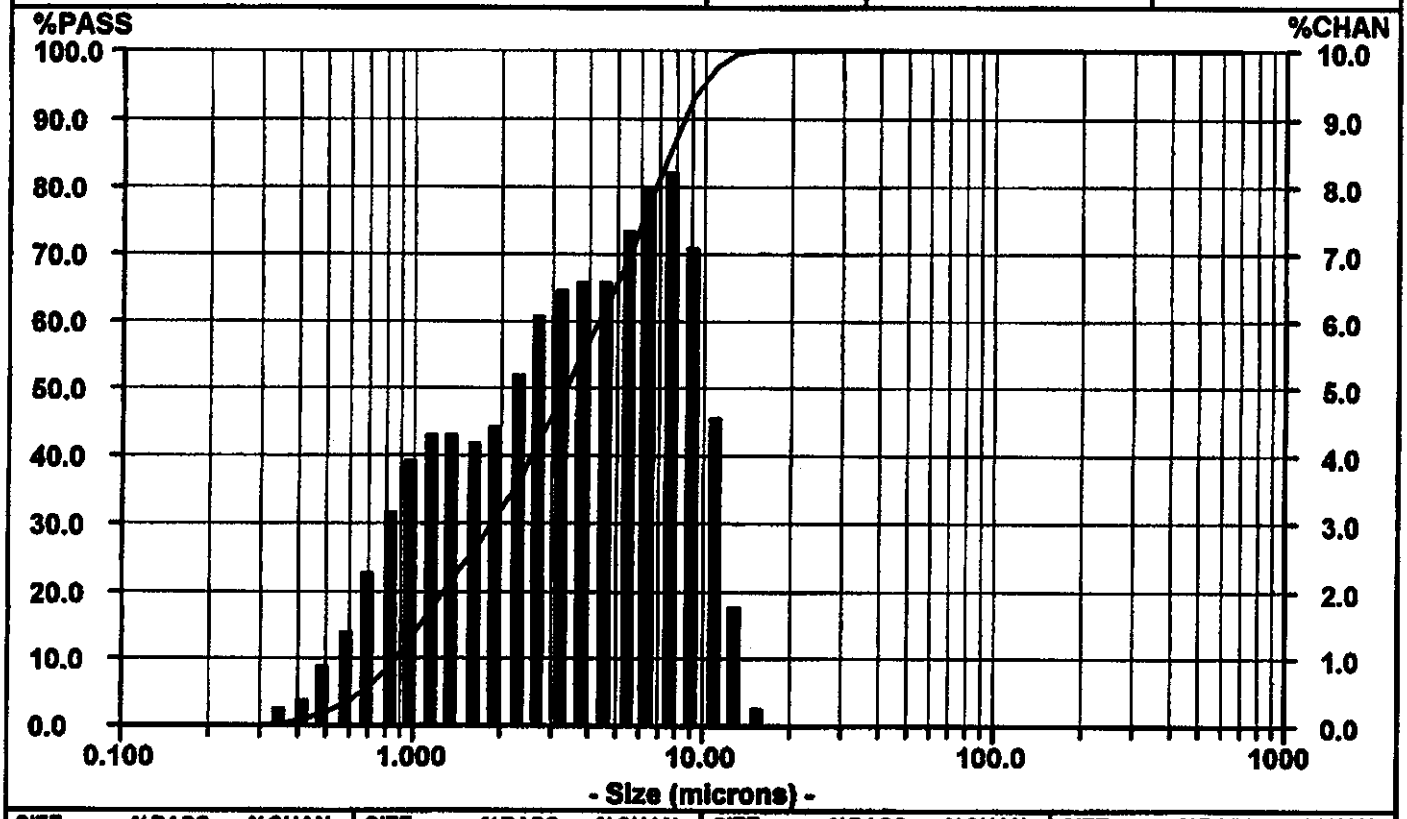
BCR 130 Duplicate

BCR130, riffled
7-25-01

Date: 07/26/91 Meas #: 00006
Time: 07:59 Pres #: 01

1M NaOH/1MNaNO3
Flow rate = 40 ml/sec
Refractive index of the medium = 1.33 and the particle = 1.54
File: BR13018

Summary	Percentiles		Dia	Vol%	Width
mv = 4.129	10% = 0.857	60% = 4.390	4.494	78%	5.854
mn = 0.667	20% = 1.276	70% = 5.562	0.893	22%	0.610
ma = 2.030	30% = 1.895	80% = 6.870			
cs = 2.956	40% = 2.594	90% = 8.527			
sd = 3.185	50% = 3.385	95% = 9.806			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	93.15	7.21						
592.0	100.00	0.00	7.778	85.94	8.32						
497.8	100.00	0.00	6.541	77.62	8.12						
418.6	100.00	0.00	5.500	69.50	7.40						
352.0	100.00	0.00	4.625	62.10	6.80						
296.0	100.00	0.00	3.889	55.30	6.61						
248.9	100.00	0.00	3.270	48.69	6.55						
209.3	100.00	0.00	2.750	42.14	6.12						
176.0	100.00	0.00	2.312	36.02	5.30						
148.0	100.00	0.00	1.945	30.72	4.55						
124.5	100.00	0.00	1.635	26.17	4.29						
104.7	100.00	0.00	1.375	21.88	4.40						
88.00	100.00	0.00	1.156	17.48	4.45						
74.00	100.00	0.00	0.972	13.03	4.08						
62.23	100.00	0.00	0.818	8.95	3.28						
52.33	100.00	0.00	0.688	5.67	2.34						
44.00	100.00	0.00	0.578	3.33	1.49						
37.00	100.00	0.00	0.486	1.84	0.91						
31.11	100.00	0.00	0.409	0.93	0.58						
26.16	100.00	0.00	0.344	0.35	0.35						
22.00	100.00	0.00	0.289	0.00	0.00						
18.50	100.00	0.00	0.243	0.00	0.00						
15.56	100.00	0.35	0.204	0.00	0.00						
13.08	99.65	1.87	0.172	0.00	0.00						
11.00	97.78	4.63	0.145	0.00	0.00						

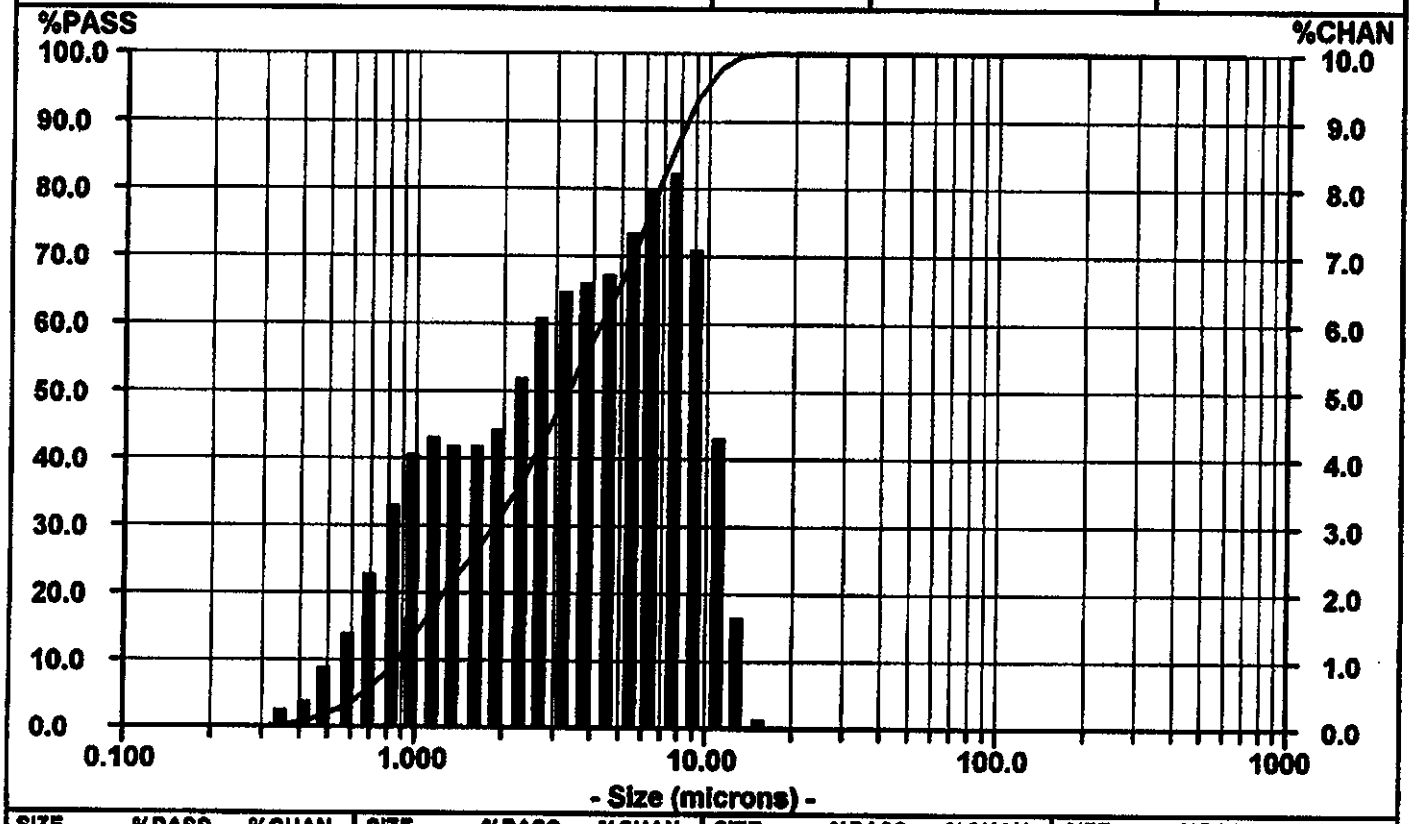
BCR 130 Duplicate

BCR130, riffled 7-25-01

Date: 07/26/91 Meas #: 00005
Time: 07:59 Pres #: 01

1M NaOH/1MNaNO3
Flow rate = 40 ml/sec
Refractive index of the medium = 1.33 and the particle = 2.00
File: BR13018

Summary	Percentiles		Dia	Vol%	Width
mv = 4.081	10% = 0.850	60% = 4.351	4.468	78%	5.796
mn = 0.652	20% = 1.264	70% = 5.512	0.889	22%	0.612
ma = 2.012	30% = 1.878	80% = 6.809			
cs = 2.983	40% = 2.571	90% = 8.451			
sd = 3.158	50% = 3.355	95% = 9.709			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	93.47	7.12						
592.0	100.00	0.00	7.776	86.35	8.30						
497.8	100.00	0.00	6.541	78.05	8.15						
418.6	100.00	0.00	5.500	69.90	7.44						
352.0	100.00	0.00	4.625	62.46	6.82						
296.0	100.00	0.00	3.889	55.64	6.61						
248.9	100.00	0.00	3.270	49.03	6.56						
209.3	100.00	0.00	2.750	42.47	6.16						
176.0	100.00	0.00	2.312	36.31	5.34						
148.0	100.00	0.00	1.945	30.97	4.57						
124.5	100.00	0.00	1.635	26.40	4.29						
104.7	100.00	0.00	1.375	22.11	4.39						
88.00	100.00	0.00	1.156	17.72	4.46						
74.00	100.00	0.00	0.972	13.26	4.11						
62.23	100.00	0.00	0.818	9.15	3.33						
52.33	100.00	0.00	0.688	5.82	2.39						
44.00	100.00	0.00	0.578	3.43	1.53						
37.00	100.00	0.00	0.486	1.90	0.93						
31.11	100.00	0.00	0.409	0.97	0.59						
26.16	100.00	0.00	0.344	0.38	0.38						
22.00	100.00	0.00	0.289	0.00	0.00						
18.50	100.00	0.00	0.243	0.00	0.00						
15.56	100.00	0.30	0.204	0.00	0.00						
13.08	99.70	1.75	0.172	0.00	0.00						
11.00	97.95	4.48	0.145	0.00	0.00						

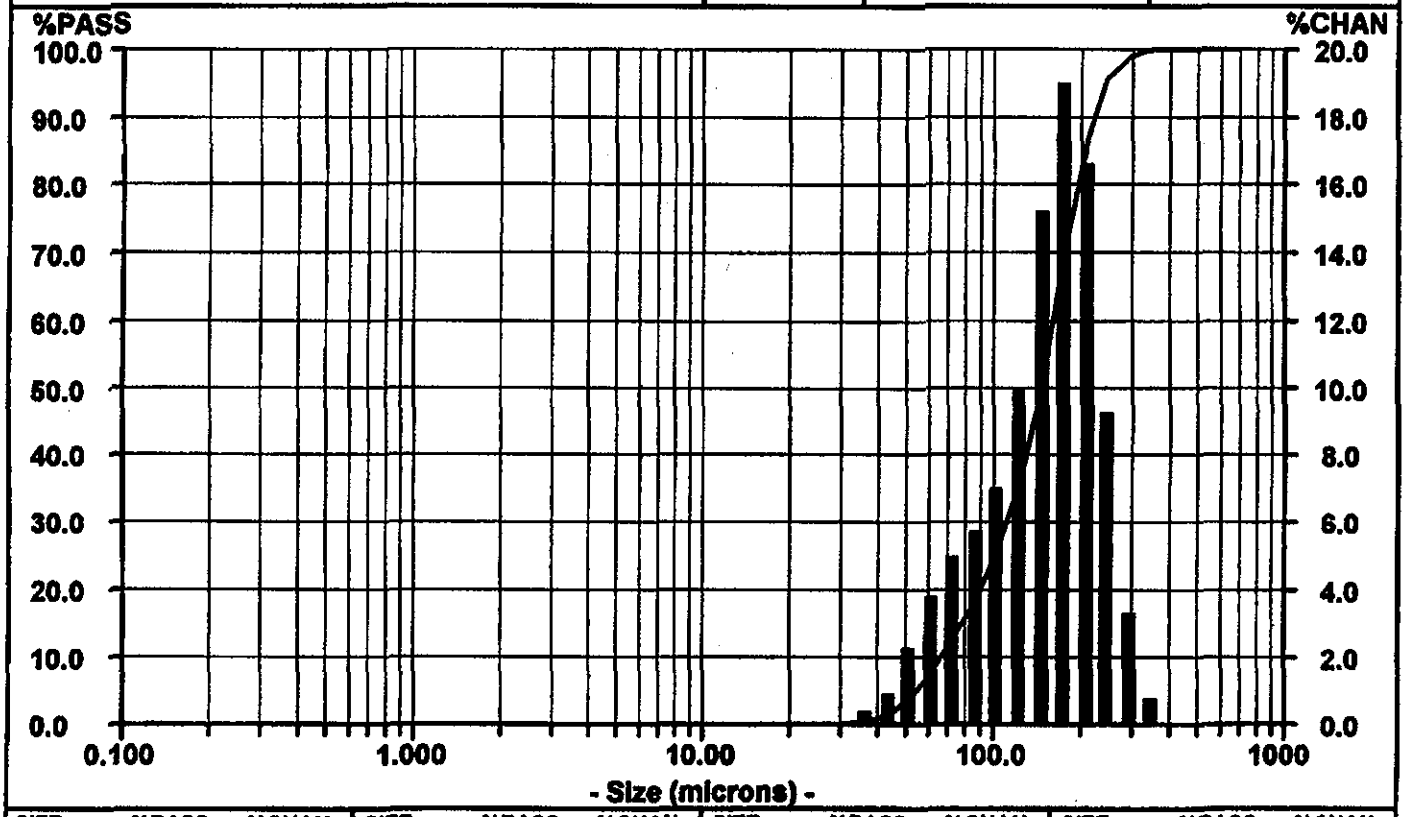
BCR 130 Duplicate

BCR130, riffled 7-26-01

Date: 07/26/91 Meas #: 00006
Time: 09:17 Pres #: 01

1M NaOH/1M NaNO3
Flow rate = 40 ml/sec
Refractive index of the medium = 1.33 and the particle = 1.54
Sonicate 2 min.
File: BR13019

Summary	Percentiles		Dia	Vol%	Width
mv = 146.6	10% = 67.58	60% = 161.2	147.0	100%	121.2
mn = 72.17	20% = 91.88	70% = 176.4			
ma = 119.9	30% = 114.2	80% = 194.4			
cs = 0.050	40% = 131.8	90% = 220.6			
sd = 60.62	50% = 147.0	95% = 243.9			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	0.00	0.00						
592.0	100.00	0.00	7.778	0.00	0.00						
497.8	100.00	0.00	6.541	0.00	0.00						
418.6	100.00	0.00	5.500	0.00	0.00						
352.0	100.00	0.84	4.625	0.00	0.00						
296.0	99.16	3.37	3.889	0.00	0.00						
248.9	95.79	9.34	3.270	0.00	0.00						
209.3	86.45	16.66	2.750	0.00	0.00						
176.0	69.79	19.08	2.312	0.00	0.00						
148.0	50.71	15.20	1.945	0.00	0.00						
124.5	35.51	10.06	1.635	0.00	0.00						
104.7	25.45	7.02	1.375	0.00	0.00						
88.00	18.43	5.70	1.156	0.00	0.00						
74.00	12.73	5.01	0.972	0.00	0.00						
62.23	7.72	3.88	0.818	0.00	0.00						
52.33	3.84	2.32	0.688	0.00	0.00						
44.00	1.52	1.09	0.578	0.00	0.00						
37.00	0.43	0.43	0.486	0.00	0.00						
31.11	0.00	0.00	0.409	0.00	0.00						
26.16	0.00	0.00	0.344	0.00	0.00						
22.00	0.00	0.00	0.289	0.00	0.00						
18.50	0.00	0.00	0.243	0.00	0.00						
15.56	0.00	0.00	0.204	0.00	0.00						
13.08	0.00	0.00	0.172	0.00	0.00						
11.00	0.00	0.00	0.145	0.00	0.00						

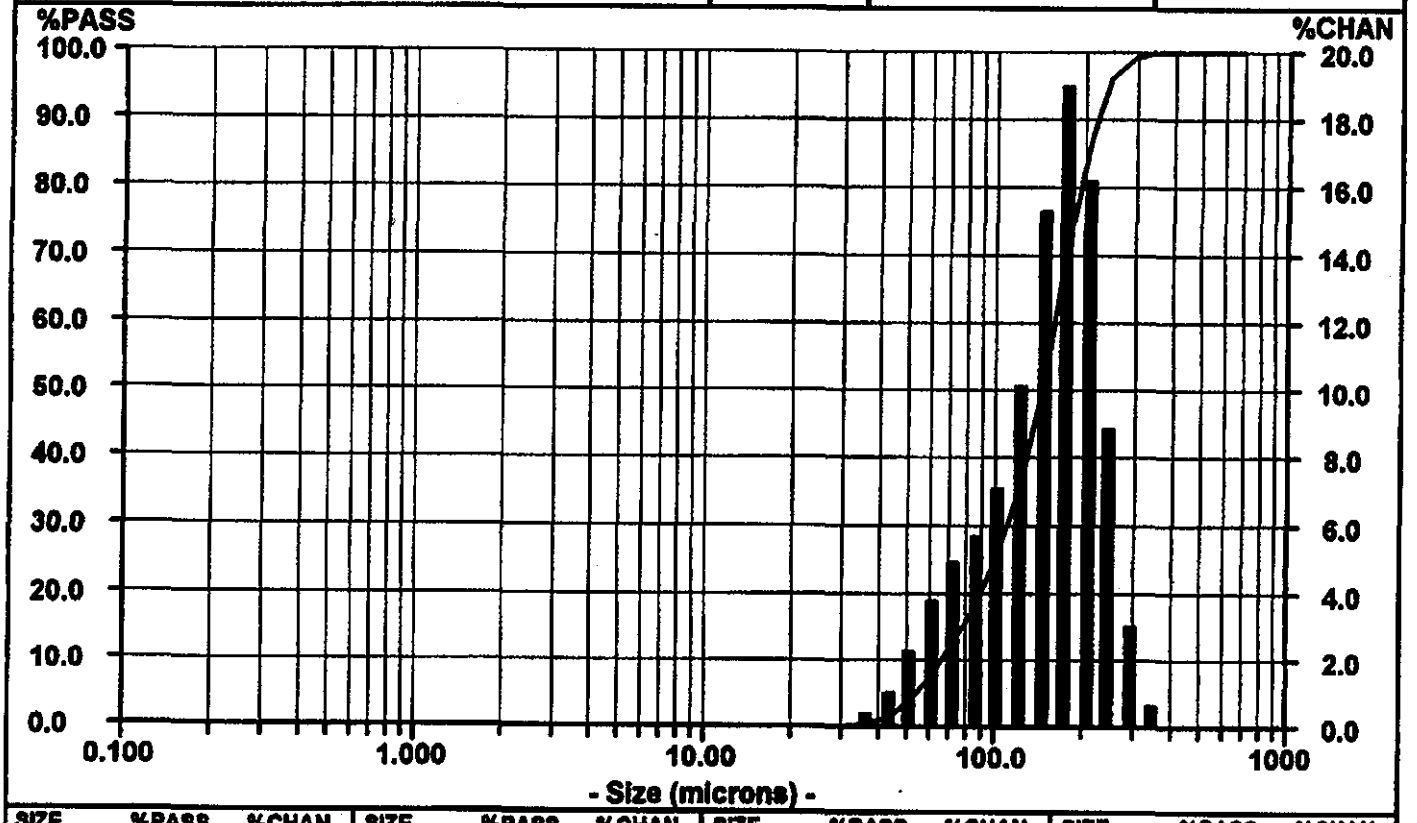
BCR 130 Duplicate

BCR130, riffled 7-25-01

Date: 07/26/91 Meas #: 00005
Time: 09:17 Pres #: 01

1M NaOH/1M NaNO3
Flow rate = 40 ml/sec
Refractive index of the medium = 1.33 and the particle =2.0
Sonicate 2 min.
File: BR13019

Summary	Percentiles		Dia	Vol%	Width
mv = 145.2	10% = 66.99	60% = 159.9	145.7	100%	120.0
mn = 71.64	20% = 91.08	70% = 174.8			
ma = 118.9	30% = 113.2	80% = 192.5			
cs = 0.050	40% = 130.7	90% = 218.3			
sd = 59.99	50% = 145.7	95% = 241.5			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	0.00	0.00						
592.0	100.00	0.00	7.778	0.00	0.00						
497.8	100.00	0.00	6.541	0.00	0.00						
418.6	100.00	0.00	5.500	0.00	0.00						
352.0	100.00	0.76	4.625	0.00	0.00						
296.0	99.24	3.13	3.889	0.00	0.00						
248.9	96.11	8.94	3.270	0.00	0.00						
209.3	87.17	16.39	2.750	0.00	0.00						
176.0	70.78	19.18	2.312	0.00	0.00						
148.0	51.60	15.47	1.945	0.00	0.00						
124.5	36.13	10.27	1.635	0.00	0.00						
104.7	25.86	7.12	1.375	0.00	0.00						
88.00	18.74	5.74	1.156	0.00	0.00						
74.00	13.00	5.05	0.972	0.00	0.00						
62.23	7.95	3.96	0.818	0.00	0.00						
52.33	3.99	2.40	0.688	0.00	0.00						
44.00	1.59	1.13	0.578	0.00	0.00						
37.00	0.46	0.46	0.486	0.00	0.00						
31.11	0.00	0.00	0.409	0.00	0.00						
26.16	0.00	0.00	0.344	0.00	0.00						
22.00	0.00	0.00	0.289	0.00	0.00						
18.50	0.00	0.00	0.243	0.00	0.00						
15.56	0.00	0.00	0.204	0.00	0.00						
13.08	0.00	0.00	0.172	0.00	0.00						
11.00	0.00	0.00	0.145	0.00	0.00						

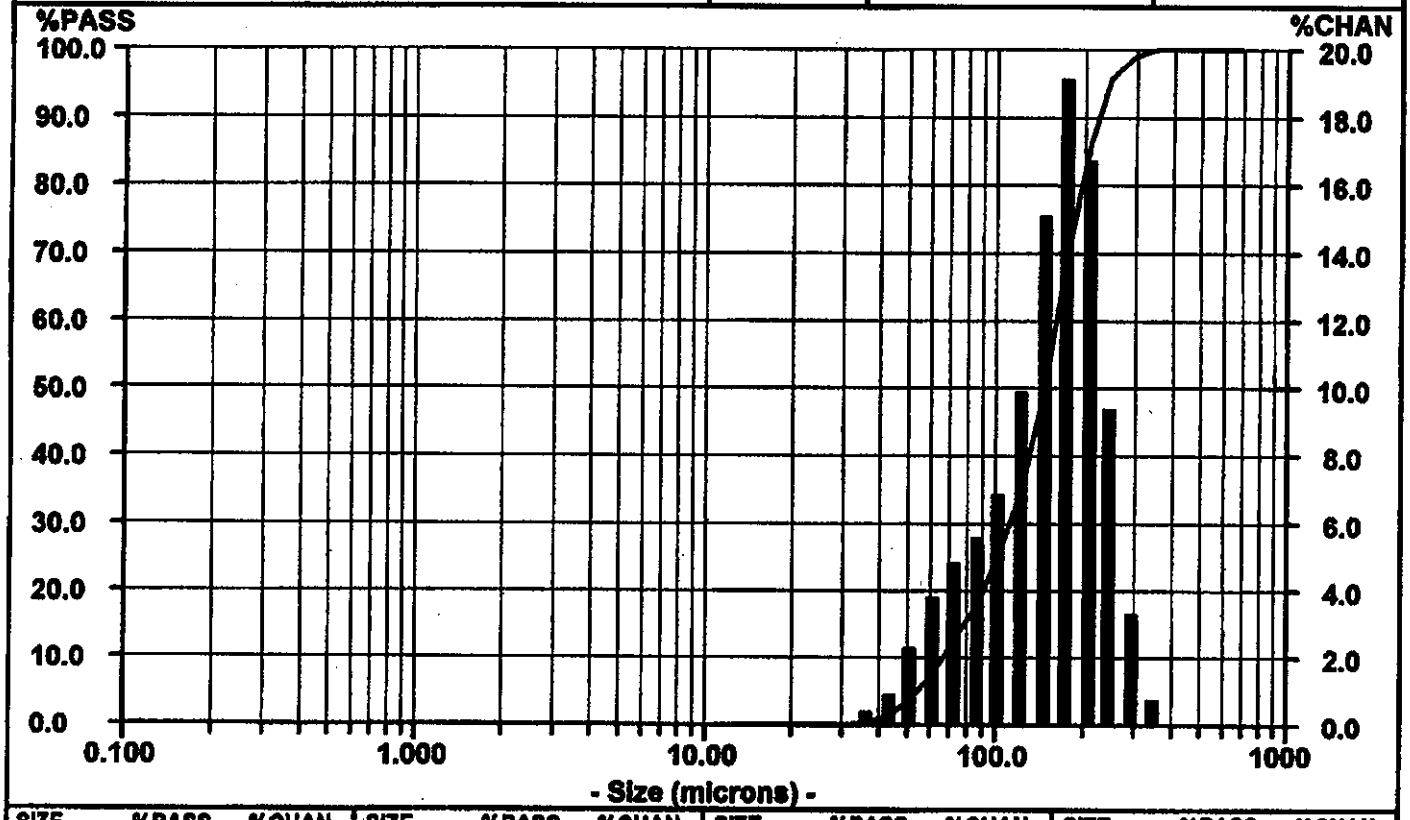
BCR 130 Duplicate

BCR130, rinsed 7-25-01

Date: 07/26/91 Meas #: 00006
Time: 09:26 Pres #: 01

1M NaOH/1M NaNO3
Flow rate = 60 ml/sec
Refractive index of the medium = 1.33 and the particle = 1.54
File: BR13020

Summary	Percentiles		Dia	Vol%	Width
mv = 147.0	10% = 67.74	60% = 161.8	147.6	100%	121.2
mn = 72.30	20% = 92.44	70% = 176.9			
ma = 120.4	30% = 114.9	80% = 194.8			
cs = 0.050	40% = 132.5	90% = 220.9			
sd = 60.61	50% = 147.6	95% = 244.2			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	0.00	0.00						
592.0	100.00	0.00	7.776	0.00	0.00						
497.8	100.00	0.00	6.541	0.00	0.00						
418.6	100.00	0.00	5.500	0.00	0.00						
352.0	100.00	0.84	4.625	0.00	0.00						
296.0	99.16	3.41	3.889	0.00	0.00						
248.9	95.75	9.43	3.270	0.00	0.00						
209.3	86.32	16.83	2.750	0.00	0.00						
176.0	69.49	19.21	2.312	0.00	0.00						
148.0	50.28	15.19	1.945	0.00	0.00						
124.5	35.09	9.96	1.635	0.00	0.00						
104.7	25.13	6.90	1.375	0.00	0.00						
88.00	18.23	5.61	1.156	0.00	0.00						
74.00	12.62	4.94	0.972	0.00	0.00						
62.23	7.68	3.86	0.818	0.00	0.00						
52.33	3.82	2.32	0.688	0.00	0.00						
44.00	1.50	1.08	0.578	0.00	0.00						
37.00	0.42	0.42	0.486	0.00	0.00						
31.11	0.00	0.00	0.409	0.00	0.00						
26.16	0.00	0.00	0.344	0.00	0.00						
22.00	0.00	0.00	0.289	0.00	0.00						
18.50	0.00	0.00	0.243	0.00	0.00						
15.56	0.00	0.00	0.204	0.00	0.00						
13.08	0.00	0.00	0.172	0.00	0.00						
11.00	0.00	0.00	0.145	0.00	0.00						

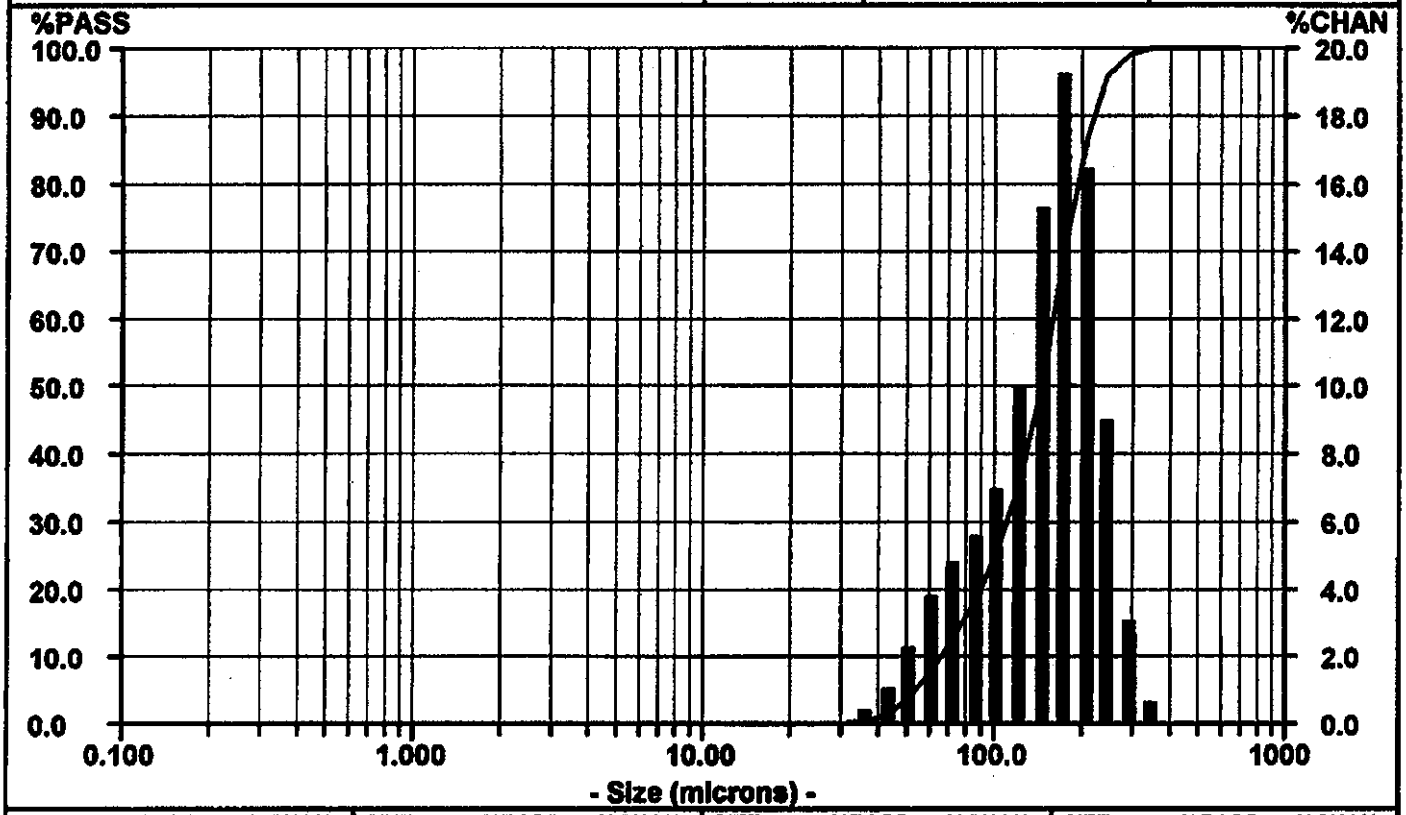
BCR 130 Duplicate

BCR130, riffed 7-25-01

Date: 07/26/91 Meas #: 00006
Time: 09:26 Pres #: 01

1M NaOH/1M NaNO3
Flow rate = 60 ml/sec
Refractive index of the medium = 1.33 and the particle =2.00
File: BR13020

Summary	Percentiles		Dia	Vol%	Width
mv = 145.7	10% = 67.20	60% = 160.4	146.3	100%	119.9
mn = 71.79	20% = 91.69	70% = 175.3			
ma = 119.4	30% = 114.0	80% = 193.0			
cs = 0.050	40% = 131.4	90% = 218.6			
sd = 59.97	50% = 146.3	95% = 241.9			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	0.00	0.00						
592.0	100.00	0.00	7.778	0.00	0.00						
497.8	100.00	0.00	6.541	0.00	0.00						
418.6	100.00	0.00	5.500	0.00	0.00						
352.0	100.00	0.76	4.625	0.00	0.00						
296.0	99.24	3.17	3.889	0.00	0.00						
248.9	96.07	9.03	3.270	0.00	0.00						
209.3	87.04	16.56	2.750	0.00	0.00						
176.0	70.48	19.32	2.312	0.00	0.00						
148.0	51.16	15.47	1.945	0.00	0.00						
124.5	35.69	10.17	1.635	0.00	0.00						
104.7	25.52	7.00	1.375	0.00	0.00						
88.00	18.52	5.65	1.156	0.00	0.00						
74.00	12.87	4.98	0.972	0.00	0.00						
62.23	7.89	3.93	0.818	0.00	0.00						
52.33	3.96	2.39	0.688	0.00	0.00						
44.00	1.57	1.12	0.578	0.00	0.00						
37.00	0.45	0.45	0.486	0.00	0.00						
31.11	0.00	0.00	0.409	0.00	0.00						
26.16	0.00	0.00	0.344	0.00	0.00						
22.00	0.00	0.00	0.289	0.00	0.00						
18.50	0.00	0.00	0.243	0.00	0.00						
15.56	0.00	0.00	0.204	0.00	0.00						
13.08	0.00	0.00	0.172	0.00	0.00						
11.00	0.00	0.00	0.145	0.00	0.00						

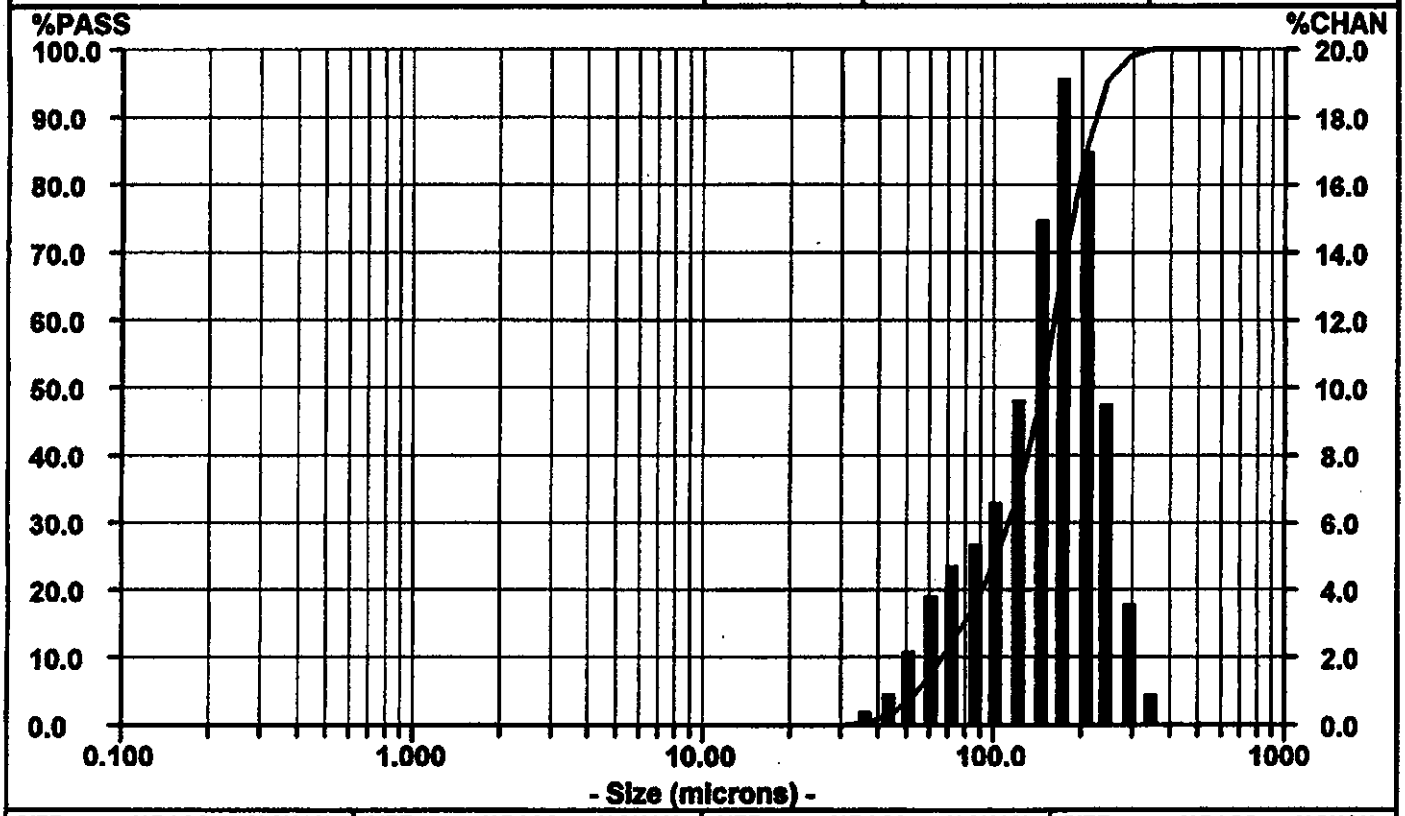
BCR 130 Duplicate

BCR130, riffled
7-25-01

Date: 07/26/91 Meas #: 00006
Time: 09:37 Pres #: 01

1M NaOH/1M NaNO3
Flow rate = 60 ml/sec
Refractive index of the medium = 1.33 and the particle = 1.54
Sonicate 2 min.
File: BR13021

Summary	Percentiles		Dia	Vol%	Width
mv = 148.2	10% = 68.08	60% = 162.9	148.7	100%	121.9
mn = 72.40	20% = 93.32	70% = 178.1			
ma = 121.2	30% = 116.0	80% = 196.1			
cs = 0.060	40% = 133.6	90% = 222.7			
sd = 60.97	50% = 148.7	95% = 246.4			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	0.00	0.00						
592.0	100.00	0.00	7.778	0.00	0.00						
497.8	100.00	0.00	6.541	0.00	0.00						
418.6	100.00	0.00	5.500	0.00	0.00						
352.0	100.00	0.98	4.625	0.00	0.00						
296.0	99.02	3.60	3.889	0.00	0.00						
248.9	95.42	9.64	3.270	0.00	0.00						
209.3	85.78	17.03	2.750	0.00	0.00						
176.0	68.75	19.23	2.312	0.00	0.00						
148.0	49.52	15.06	1.945	0.00	0.00						
124.5	34.46	9.78	1.635	0.00	0.00						
104.7	24.68	6.76	1.375	0.00	0.00						
88.00	17.92	5.49	1.156	0.00	0.00						
74.00	12.43	4.85	0.972	0.00	0.00						
62.23	7.58	3.80	0.818	0.00	0.00						
52.33	3.78	2.29	0.688	0.00	0.00						
44.00	1.49	1.07	0.578	0.00	0.00						
37.00	0.42	0.42	0.486	0.00	0.00						
31.11	0.00	0.00	0.409	0.00	0.00						
26.16	0.00	0.00	0.344	0.00	0.00						
22.00	0.00	0.00	0.289	0.00	0.00						
18.50	0.00	0.00	0.243	0.00	0.00						
15.56	0.00	0.00	0.204	0.00	0.00						
13.08	0.00	0.00	0.172	0.00	0.00						
11.00	0.00	0.00	0.145	0.00	0.00						

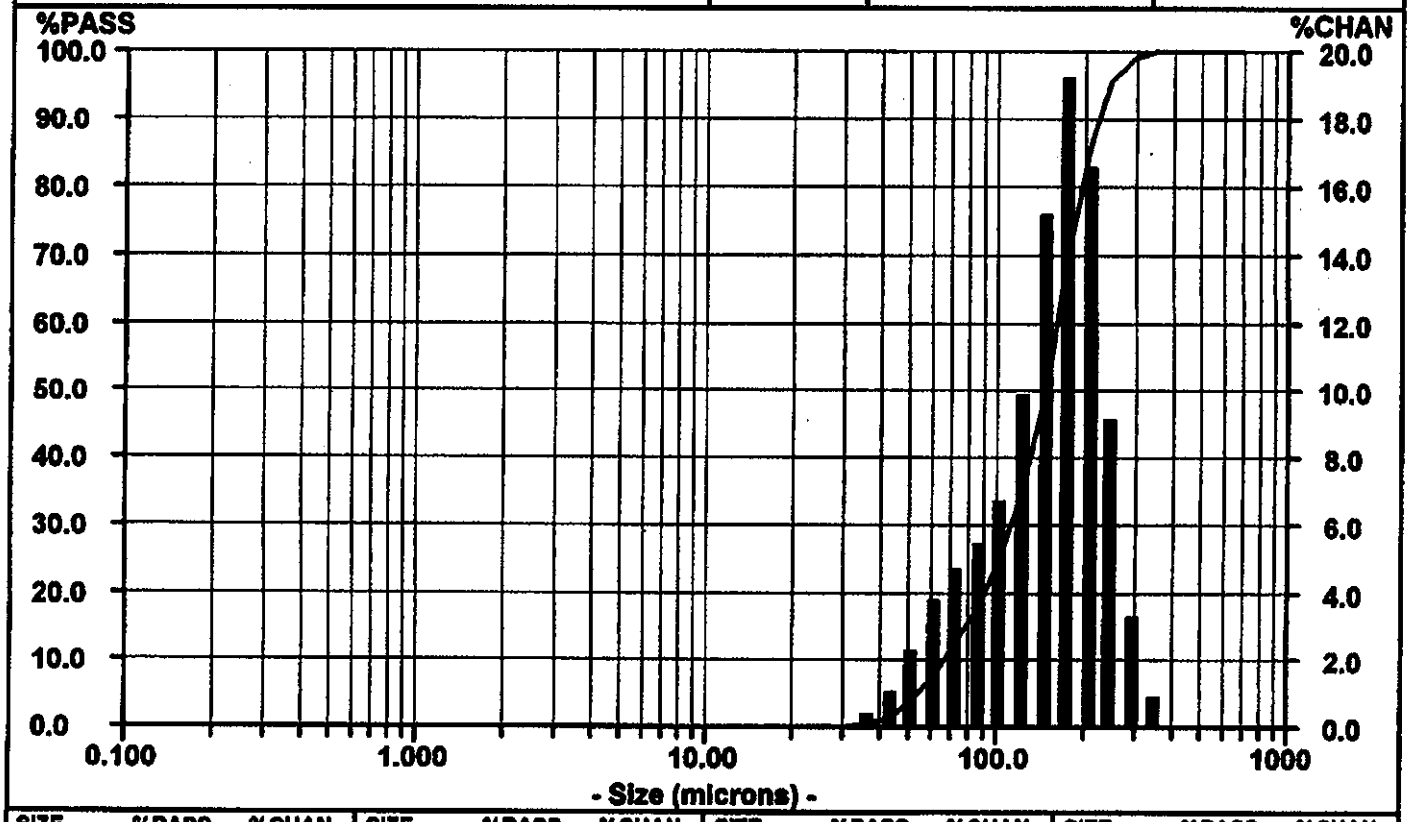
BCR 130 Duplicate

BCR130, riffled 7-25-01

Date: 07/26/91 Meas #: 00005
Time: 09:37 Pres #: 01

1M NaOH/1M NaNO3
Flow rate = 60 ml/sec
Refractive index of the medium = 1.33 and the particle = 2.00
Sonicate 2 min.
File: BR13021

Summary	Percentiles		Dia	Vol%	Width
mv = 146.9	10% = 67.52	60% = 161.5	147.4	100%	120.8
mn = 71.88	20% = 92.54	70% = 176.5			
ma = 120.2	30% = 115.1	80% = 194.3			
cs = 0.050	40% = 132.5	90% = 220.5			
sd = 60.38	50% = 147.4	95% = 244.2			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	0.00	0.00						
592.0	100.00	0.00	7.778	0.00	0.00						
497.8	100.00	0.00	6.541	0.00	0.00						
418.6	100.00	0.00	5.500	0.00	0.00						
352.0	100.00	0.90	4.625	0.00	0.00						
296.0	99.10	3.36	3.889	0.00	0.00						
248.9	95.74	9.24	3.270	0.00	0.00						
209.3	86.50	16.77	2.750	0.00	0.00						
176.0	69.73	19.34	2.312	0.00	0.00						
148.0	50.39	15.34	1.945	0.00	0.00						
124.5	35.05	9.99	1.635	0.00	0.00						
104.7	25.06	6.85	1.375	0.00	0.00						
88.00	18.21	5.53	1.156	0.00	0.00						
74.00	12.68	4.89	0.972	0.00	0.00						
62.23	7.79	3.87	0.818	0.00	0.00						
52.33	3.92	2.36	0.688	0.00	0.00						
44.00	1.56	1.11	0.578	0.00	0.00						
37.00	0.45	0.45	0.486	0.00	0.00						
31.11	0.00	0.00	0.409	0.00	0.00						
26.16	0.00	0.00	0.344	0.00	0.00						
22.00	0.00	0.00	0.289	0.00	0.00						
18.50	0.00	0.00	0.243	0.00	0.00						
15.56	0.00	0.00	0.204	0.00	0.00						
13.08	0.00	0.00	0.172	0.00	0.00						
11.00	0.00	0.00	0.145	0.00	0.00						

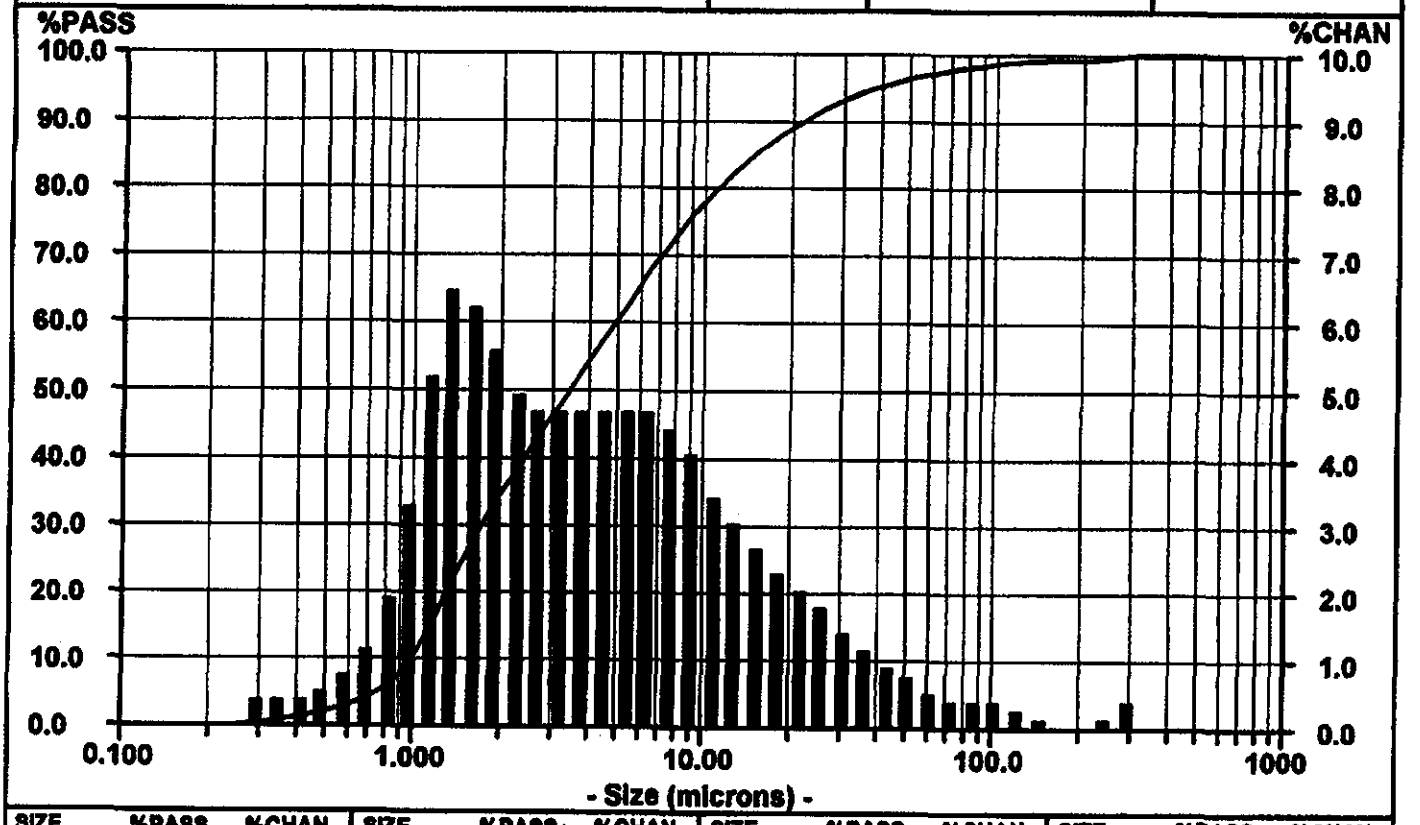
AW-103

1 M NaOH and 1 M NaNO3
Flow Rate = 17 ml/sec
Refractive Index = 1.50 Particle and 1.33 Medium
File: WPAA002

103AW
Sample

Date: 09/22/91 Meas #: 00004
Time: 12:34 Pres #: 01

Summary	Percentiles		Dia	Vol%	Width
mv = 10.29	10% = 0.983	60% = 4.965	6.960	61%	16.65
mn = 0.551	20% = 1.322	70% = 7.145	1.298	39%	1.061
ma = 2.149	30% = 1.739	80% = 11.07			
cs = 2.792	40% = 2.431	90% = 21.61			
sd = 6.372	50% = 3.474	95% = 38.30			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	76.30	4.11						
592.0	100.00	0.00	7.778	72.19	4.55						
497.8	100.00	0.00	6.541	67.64	4.78						
418.6	100.00	0.00	5.500	62.86	4.83						
352.0	100.00	0.00	4.625	58.03	4.85						
296.0	100.00	0.41	3.889	53.18	4.87						
248.9	99.59	0.22	3.270	48.31	4.86						
209.3	99.37	0.00	2.750	43.45	4.85						
176.0	99.37	0.00	2.312	38.60	5.05						
148.0	99.37	0.22	1.945	33.55	5.62						
124.5	99.15	0.35	1.635	27.93	6.39						
104.7	98.80	0.41	1.375	21.54	6.54						
88.00	98.39	0.48	1.156	15.00	5.31						
74.00	97.91	0.57	0.972	9.69	3.44						
62.23	97.34	0.69	0.818	6.25	2.00						
52.33	96.65	0.84	0.688	4.25	1.22						
44.00	95.81	1.03	0.578	3.03	0.84						
37.00	94.78	1.26	0.486	2.19	0.66						
31.11	93.52	1.51	0.409	1.53	0.56						
26.16	92.01	1.80	0.344	0.97	0.52						
22.00	90.21	2.10	0.289	0.45	0.45						
18.50	88.11	2.41	0.243	0.00	0.00						
15.56	85.70	2.72	0.204	0.00	0.00						
13.08	82.98	3.10	0.172	0.00	0.00						
11.00	79.88	3.58	0.145	0.00	0.00						

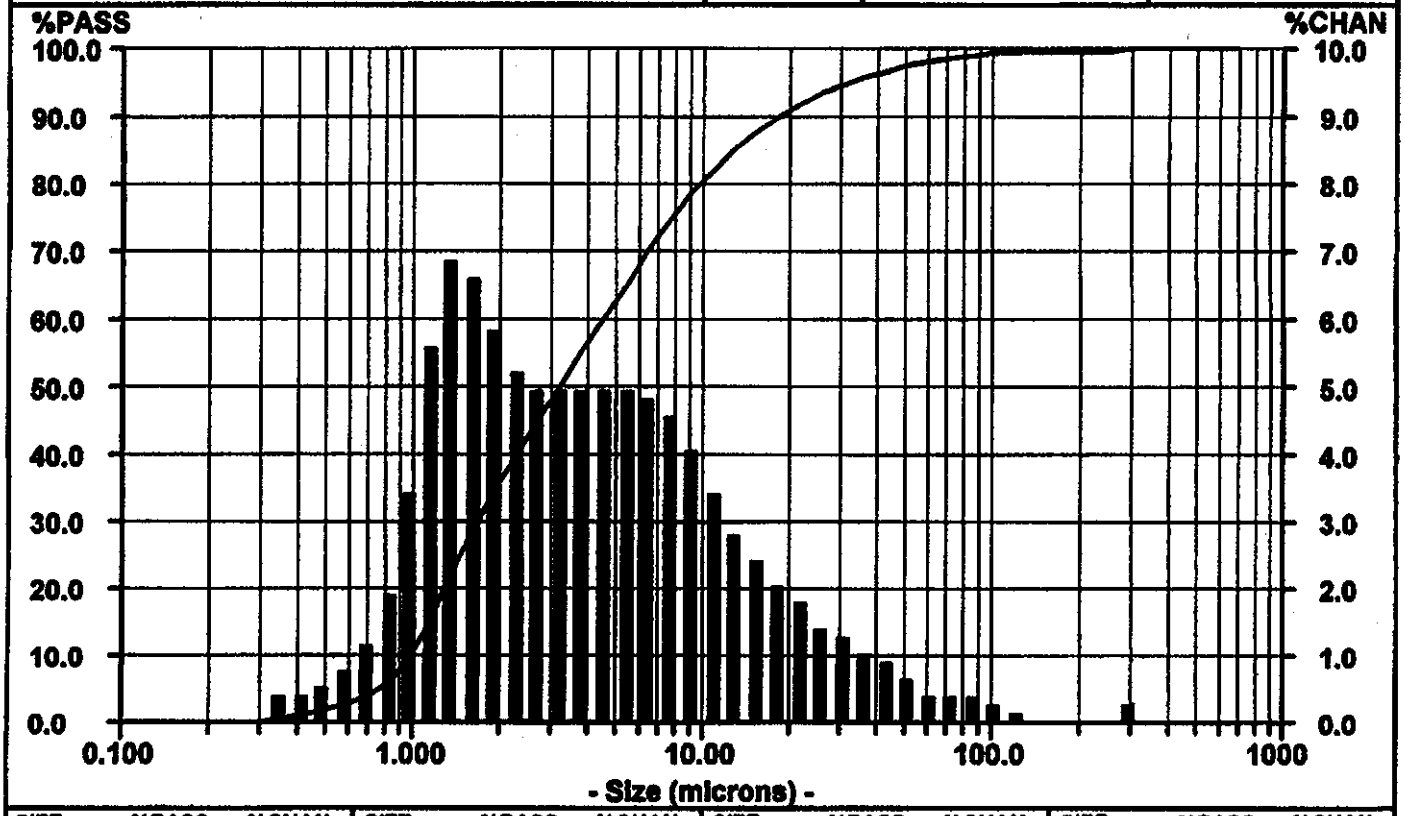
AW-103

103AW
Sample

Date: 09/22/91 Meas #: 00004
Time: 12:43 Pres #: 01

1 M NaOH and 1 M NaNO3
Flow Rate = 17 ml/sec
Refractive Index = 1.70 Particle and 1.33 Medium
File: WPAA003

Summary	Percentiles		Dia	Vol%	Width
mv = 8.566	10% = 0.986	60% = 4.574	6.487	60%	15.78
mn = 0.624	20% = 1.306	70% = 6.486	1.307	40%	1.041
ma = 2.129	30% = 1.686	80% = 9.697			
cs = 2.819	40% = 2.304	90% = 16.32			
sd = 5.401	50% = 3.246	95% = 31.63			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	78.99	4.12						
592.0	100.00	0.00	7.778	74.87	4.63						
497.8	100.00	0.00	6.541	70.24	4.91						
418.6	100.00	0.00	5.500	65.33	5.00						
352.0	100.00	0.00	4.625	60.33	5.04						
296.0	100.00	0.34	3.889	55.29	5.07						
248.9	99.66	0.00	3.270	50.22	5.06						
209.3	99.66	0.00	2.750	45.16	5.06						
176.0	99.66	0.00	2.312	40.10	5.28						
148.0	99.66	0.00	1.945	34.82	5.92						
124.5	99.66	0.20	1.635	28.90	6.77						
104.7	99.46	0.35	1.375	22.13	6.92						
88.00	99.11	0.41	1.156	15.21	5.60						
74.00	98.70	0.49	0.972	9.61	3.58						
62.23	98.21	0.59	0.818	6.03	2.06						
52.33	97.62	0.73	0.688	3.97	1.24						
44.00	96.89	0.90	0.578	2.73	0.85						
37.00	95.99	1.10	0.486	1.88	0.66						
31.11	94.89	1.32	0.409	1.22	0.67						
26.16	93.57	1.59	0.344	0.55	0.50						
22.00	91.98	1.86	0.289	0.15	0.15						
18.50	90.12	2.17	0.243	0.00	0.00						
15.56	87.95	2.51	0.204	0.00	0.00						
13.08	85.44	2.95	0.172	0.00	0.00						
11.00	82.49	3.50	0.145	0.00	0.00						

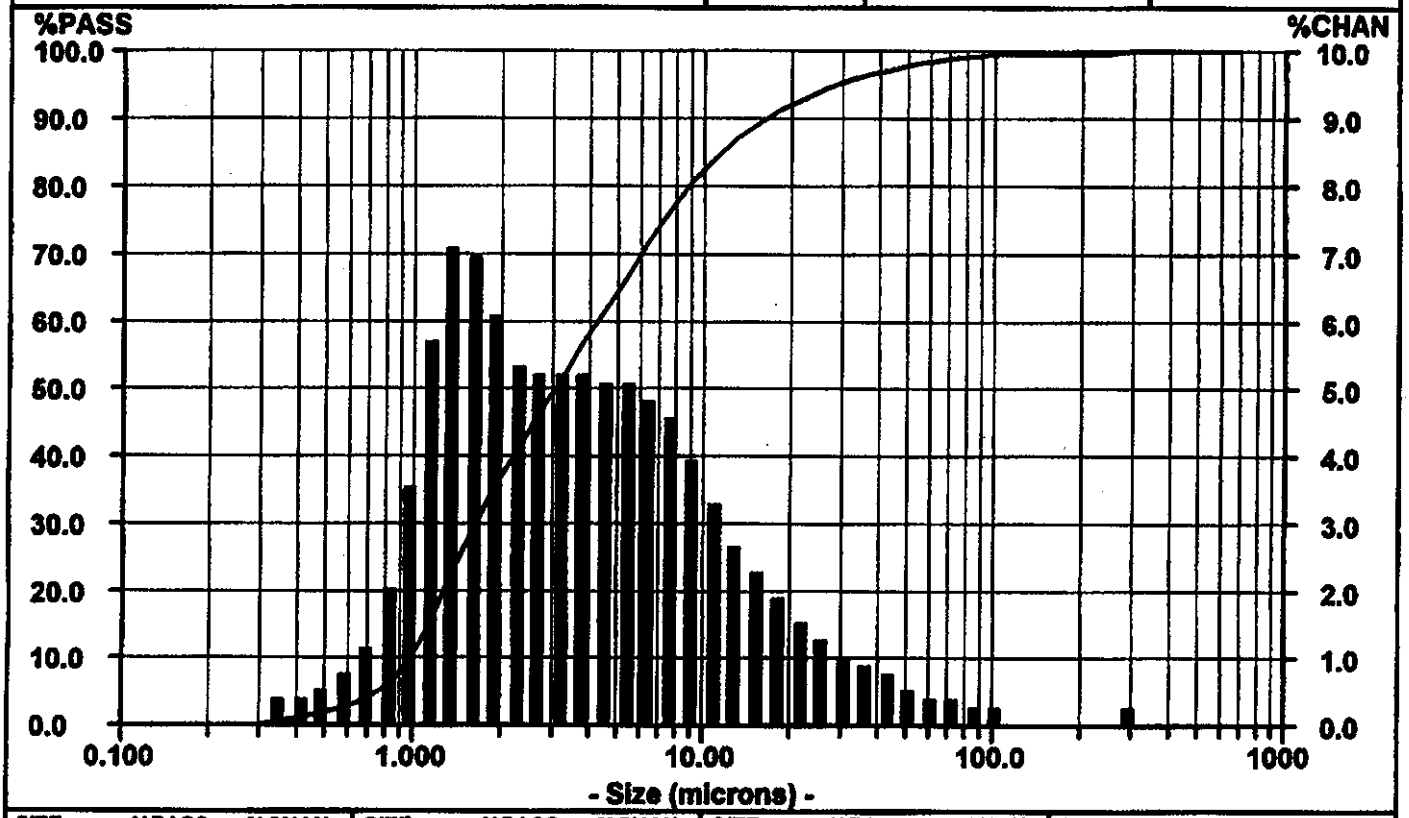
AW-103

103AW Sample

Date: 09/22/91 Time: 12:52 Meas #: 00004 Pres #: 01

1 M NaOH and 1 M NaNO3
Flow Rate = 17 ml/sec
Refractive Index = 2.00 Particle and 1.33 Medium
File: WPAA004

Summary	Percentiles		Dia	Vol%	Width
mv = 8.029	10% = 0.979	60% = 4.313	6.196	59%	14.17
mn = 0.628	20% = 1.289	70% = 6.059	1.309	41%	1.035
ma = 2.082	30% = 1.646	80% = 8.894			
cs = 2.882	40% = 2.217	90% = 16.43			
sd = 4.835	50% = 3.093	95% = 28.79			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	80.87	4.07						
592.0	100.00	0.00	7.778	76.80	4.63						
497.8	100.00	0.00	6.541	72.17	4.97						
418.6	100.00	0.00	5.500	67.20	5.11						
352.0	100.00	0.00	4.625	62.09	5.18						
296.0	100.00	0.38	3.889	56.91	5.22						
248.9	99.62	0.00	3.270	51.69	5.21						
209.3	99.62	0.00	2.750	46.48	5.20						
176.0	99.62	0.00	2.312	41.28	5.42						
148.0	99.62	0.00	1.945	35.86	6.11						
124.5	99.62	0.00	1.635	29.75	7.02						
104.7	99.62	0.33	1.375	22.73	7.15						
88.00	99.29	0.38	1.156	15.58	5.80						
74.00	98.91	0.44	0.972	9.78	3.68						
62.23	98.47	0.53	0.818	6.10	2.10						
52.33	97.94	0.66	0.688	4.00	1.25						
44.00	97.28	0.80	0.578	2.75	0.86						
37.00	96.48	0.96	0.486	1.89	0.67						
31.11	95.50	1.17	0.409	1.22	0.57						
26.16	94.33	1.39	0.344	0.65	0.50						
22.00	92.94	1.64	0.289	0.15	0.15						
18.50	91.30	1.94	0.243	0.00	0.00						
15.56	89.36	2.30	0.204	0.00	0.00						
13.08	87.06	2.79	0.172	0.00	0.00						
11.00	84.27	3.40	0.145	0.00	0.00						

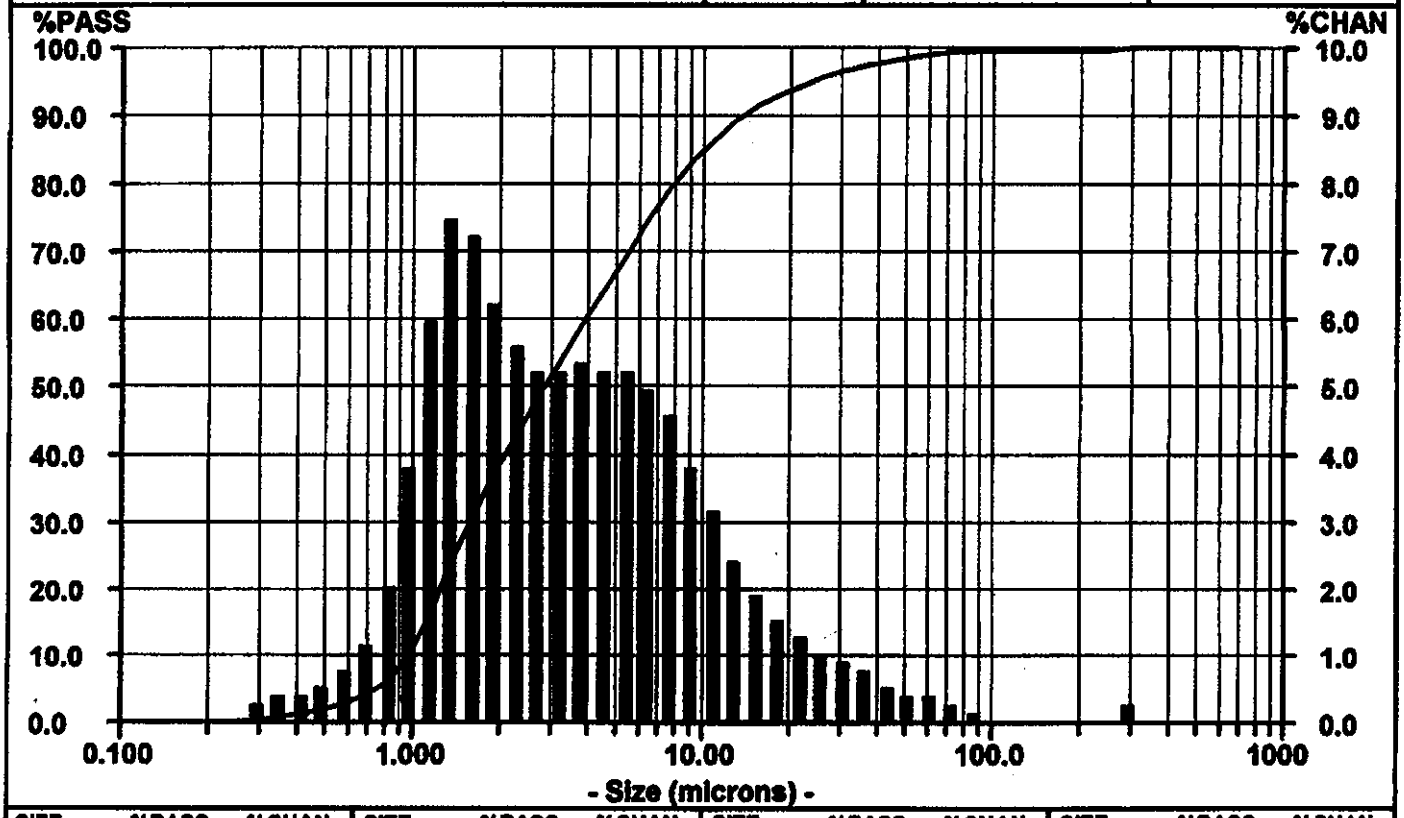
AW-103

103AW
Sample

Date: 09/22/91 Meas #: 00004
Time: 13:03 Pres #: 01

1 M NaOH and 1 M NaNO3
Flow Rate = 40 ml/sec
Refractive Index = 2.00 Particle and 1.33 Medium
File: WPAA005

Summary	Percentiles		Dia	Vol%	Width
mv = 5.983	10% = 0.967	60% = 3.992	5.824	57%	11.73
mn = 0.596	20% = 1.264	70% = 5.536	1.308	43%	1.031
ma = 1.999	30% = 1.694	80% = 7.937			
cs = 3.002	40% = 2.104	90% = 13.77			
sd = 4.166	50% = 2.898	95% = 23.69			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	83.50	3.99						
592.0	100.00	0.00	7.778	79.51	4.64						
497.8	100.00	0.00	6.541	74.87	5.06						
418.6	100.00	0.00	5.500	69.81	5.26						
352.0	100.00	0.00	4.625	64.55	5.36						
296.0	100.00	0.34	3.889	59.19	5.42						
248.9	99.66	0.00	3.270	53.77	5.39						
209.3	99.66	0.00	2.750	48.38	5.37						
176.0	99.66	0.00	2.312	43.01	5.61						
148.0	99.66	0.00	1.945	37.40	6.35						
124.5	99.66	0.00	1.635	31.05	7.33						
104.7	99.66	0.00	1.375	23.72	7.51						
88.00	99.66	0.22	1.156	16.21	6.06						
74.00	99.44	0.37	0.972	10.15	3.81						
62.23	99.07	0.44	0.818	6.34	2.14						
52.33	98.63	0.54	0.688	4.20	1.27						
44.00	98.09	0.67	0.578	2.93	0.87						
37.00	97.42	0.81	0.486	2.06	0.67						
31.11	96.61	0.97	0.409	1.39	0.57						
26.16	95.64	1.16	0.344	0.82	0.51						
22.00	94.48	1.39	0.289	0.31	0.31						
18.50	93.09	1.68	0.243	0.00	0.00						
15.56	91.41	2.07	0.204	0.00	0.00						
13.08	89.34	2.59	0.172	0.00	0.00						
11.00	86.75	3.25	0.145	0.00	0.00						

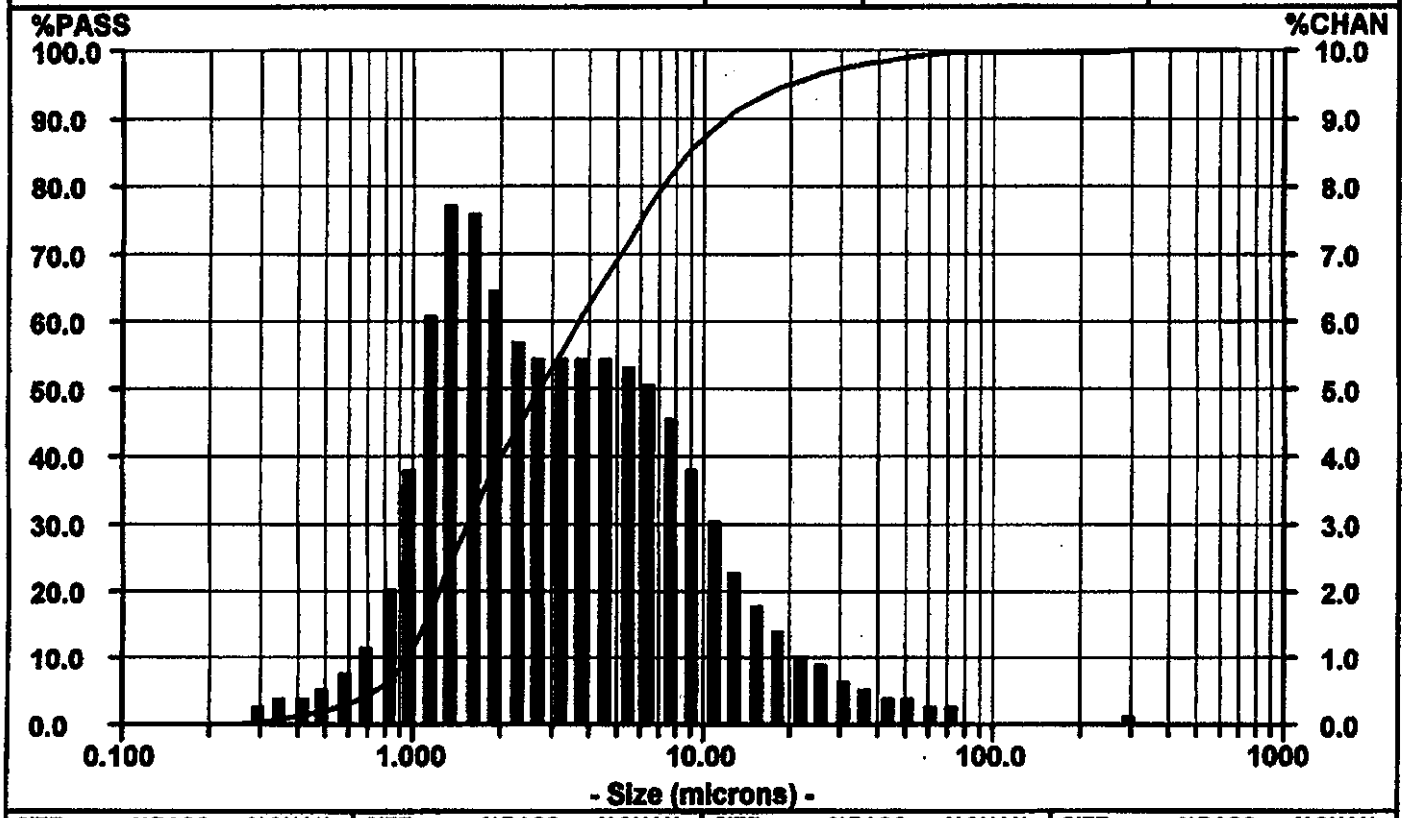
AW-103

103AW
Sample

Date: 09/22/91 Meas #: 00004
Time: 13:12 Pres #: 01

1 M NaOH and 1 M NaNO3
Flow Rate = 40 ml/sec
Refractive Index = 1.50 Particle and 1.33 Medium
File: WPAA006

Summary	Percentiles		Dia	Vol%	Width
mv = 6.085	10% = 0.959	60% = 3.759	5.537	56%	9.871
mn = 0.599	20% = 1.247	70% = 5.153	1.309	44%	1.026
ma = 1.948	30% = 1.556	80% = 7.247			
cs = 3.081	40% = 2.022	90% = 11.87			
sd = 3.691	50% = 2.753	95% = 19.84			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	85.77	3.93						
592.0	100.00	0.00	7.778	81.84	4.67						
497.8	100.00	0.00	6.541	77.17	5.15						
418.6	100.00	0.00	5.500	72.02	5.40						
352.0	100.00	0.00	4.625	66.62	5.52						
296.0	100.00	0.23	3.889	61.10	5.58						
248.9	99.77	0.00	3.270	55.52	5.55						
209.3	99.77	0.00	2.750	49.97	5.53						
176.0	99.77	0.00	2.312	44.44	5.78						
148.0	99.77	0.00	1.945	38.66	6.56						
124.5	99.77	0.00	1.635	32.10	7.61						
104.7	99.77	0.00	1.375	24.49	7.83						
88.00	99.77	0.00	1.156	16.66	6.28						
74.00	99.77	0.32	0.972	10.38	3.93						
62.23	99.45	0.38	0.818	6.45	2.19						
52.33	99.07	0.46	0.688	4.26	1.29						
44.00	98.61	0.55	0.578	2.97	0.88						
37.00	98.06	0.66	0.486	2.09	0.68						
31.11	97.40	0.79	0.409	1.41	0.58						
26.16	96.61	0.95	0.344	0.83	0.52						
22.00	95.66	1.15	0.289	0.31	0.31						
18.50	94.51	1.43	0.243	0.00	0.00						
15.56	93.08	1.82	0.204	0.00	0.00						
13.08	91.26	2.38	0.172	0.00	0.00						
11.00	88.88	3.11	0.145	0.00	0.00						

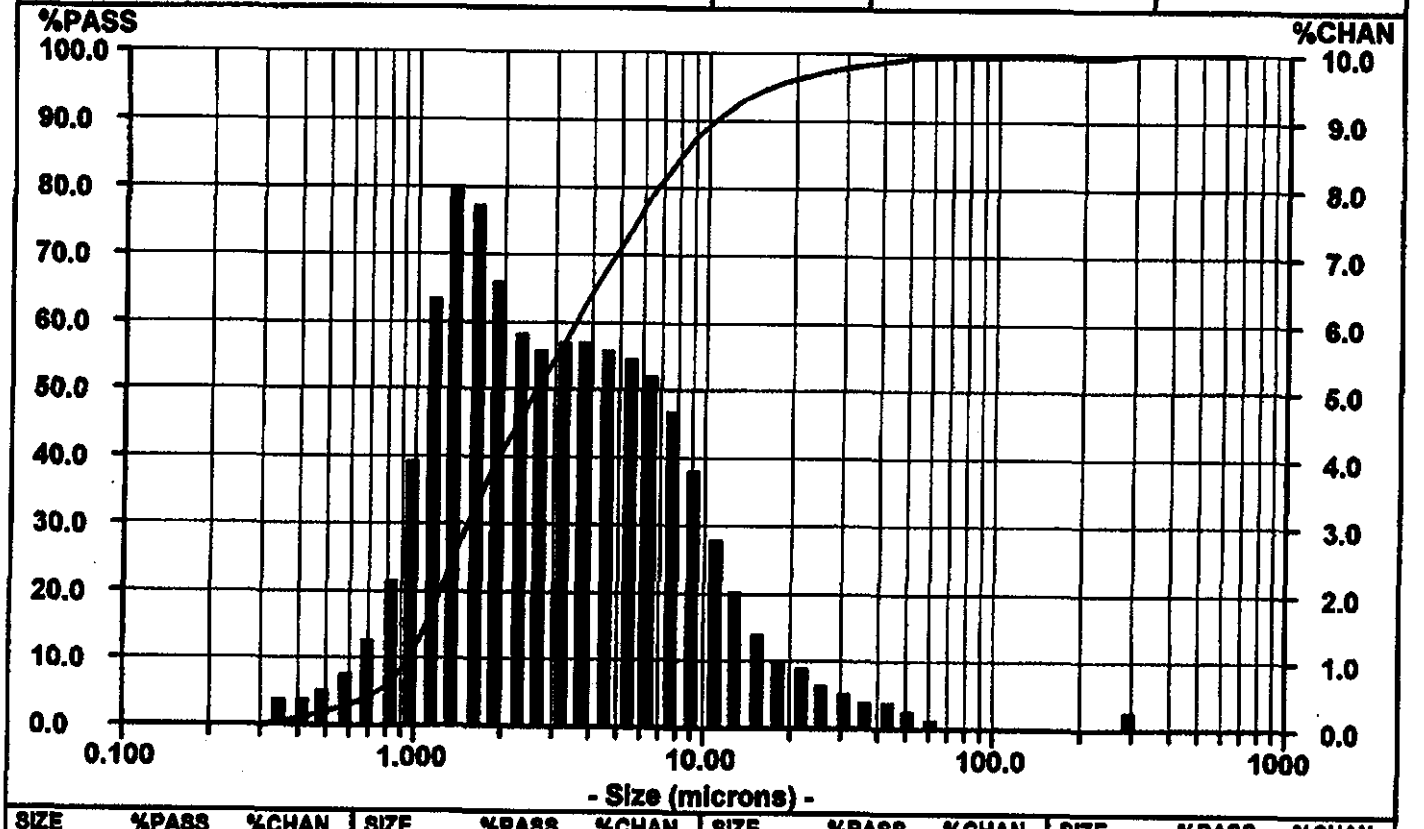
AW-103

103AW
Sample

Date: 09/22/91 Meas #: 00004
Time: 13:21 Pres #: 01

1 M NaOH and 1 M NaNO3
Flow Rate = 40 ml/sec
Refractive Index = 1.70 Particle and 1.33 Medium
File: WPAA007

Summary	Percentiles		Dia	Vol%	Width
mv = 5.781	10% = 0.958	60% = 3.576	5.300	54%	8.415
mn = 0.642	20% = 1.238	70% = 4.853	1.313	46%	1.017
ma = 1.925	30% = 1.531	80% = 6.716			
cs = 3.116	40% = 1.963	90% = 10.46			
sd = 3.331	50% = 2.640	95% = 16.57			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	87.82	3.87						
592.0	100.00	0.00	7.778	83.95	4.70						
497.8	100.00	0.00	6.541	79.25	5.26						
418.6	100.00	0.00	5.500	73.99	5.54						
352.0	100.00	0.00	4.625	68.45	5.67						
296.0	100.00	0.35	3.889	62.78	5.74						
248.9	99.65	0.00	3.270	57.04	5.71						
209.3	99.65	0.00	2.750	51.33	5.69						
176.0	99.65	0.00	2.312	45.64	5.96						
148.0	99.65	0.00	1.945	39.68	6.77						
124.5	99.65	0.00	1.635	32.91	7.88						
104.7	99.65	0.00	1.375	25.03	8.12						
88.00	99.65	0.00	1.156	16.91	6.49						
74.00	99.65	0.00	0.972	10.42	4.04						
62.23	99.65	0.21	0.818	6.38	2.24						
52.33	99.44	0.37	0.688	4.14	1.31						
44.00	99.07	0.45	0.578	2.83	0.89						
37.00	98.62	0.54	0.486	1.94	0.69						
31.11	98.08	0.64	0.409	1.25	0.59						
26.16	97.44	0.77	0.344	0.66	0.51						
22.00	96.67	0.94	0.289	0.15	0.15						
18.50	95.73	1.20	0.243	0.00	0.00						
15.56	94.53	1.59	0.204	0.00	0.00						
13.08	92.94	2.17	0.172	0.00	0.00						
11.00	90.77	2.95	0.145	0.00	0.00						

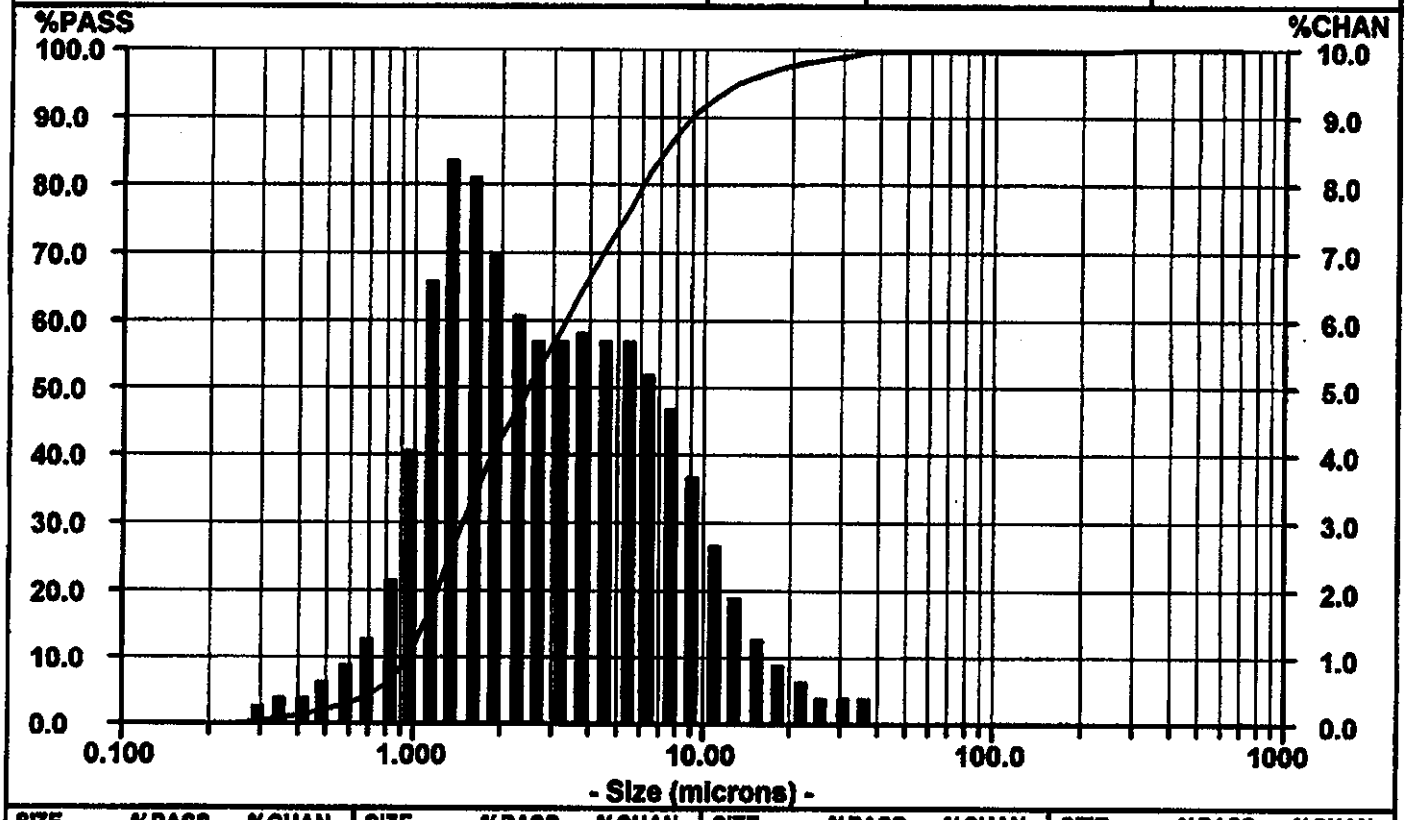
AW-103

103AW
Sample

Date: 09/22/91 Meas #: 00004
Time: 13:32 Pres #: 01

1 M NaOH and 1 M NaNO3
Flow Rate = 60 ml/sec
Refractive Index = 1.70 Particle and 1.33 Medium
File: WPAA008

Summary	Percentiles		Dia	Vol%	Width
mv = 4.617	10% = 0.947	60% = 3.366	5.038	53%	6.921
mn = 0.604	20% = 1.219	70% = 4.517	1.313	47%	1.014
ma = 1.853	30% = 1.494	80% = 6.145			
cs = 3.237	40% = 1.887	90% = 9.065			
sd = 2.963	50% = 2.506	95% = 12.99			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	90.40	3.78						
592.0	100.00	0.00	7.778	86.62	4.73						
497.8	100.00	0.00	6.541	81.89	5.38						
418.6	100.00	0.00	5.500	76.51	5.71						
352.0	100.00	0.00	4.625	70.80	5.86						
296.0	100.00	0.15	3.889	64.94	5.92						
248.9	99.85	0.00	3.270	59.02	5.88						
209.3	99.85	0.00	2.750	53.14	5.85						
176.0	99.85	0.00	2.312	47.29	6.13						
148.0	99.85	0.00	1.945	41.16	7.00						
124.5	99.85	0.00	1.635	34.16	8.21						
104.7	99.85	0.00	1.375	25.95	8.44						
88.00	99.85	0.00	1.156	17.51	6.74						
74.00	99.85	0.00	0.972	10.77	4.13						
62.23	99.85	0.00	0.818	6.64	2.26						
52.33	99.85	0.00	0.688	4.38	1.32						
44.00	99.85	0.11	0.578	3.06	0.90						
37.00	99.74	0.55	0.486	2.16	0.70						
31.11	99.19	0.55	0.409	1.46	0.60						
26.16	98.64	0.60	0.344	0.86	0.54						
22.00	98.04	0.72	0.289	0.32	0.32						
18.50	97.32	0.94	0.243	0.00	0.00						
15.56	96.38	1.31	0.204	0.00	0.00						
13.08	95.07	1.91	0.172	0.00	0.00						
11.00	93.16	2.76	0.145	0.00	0.00						

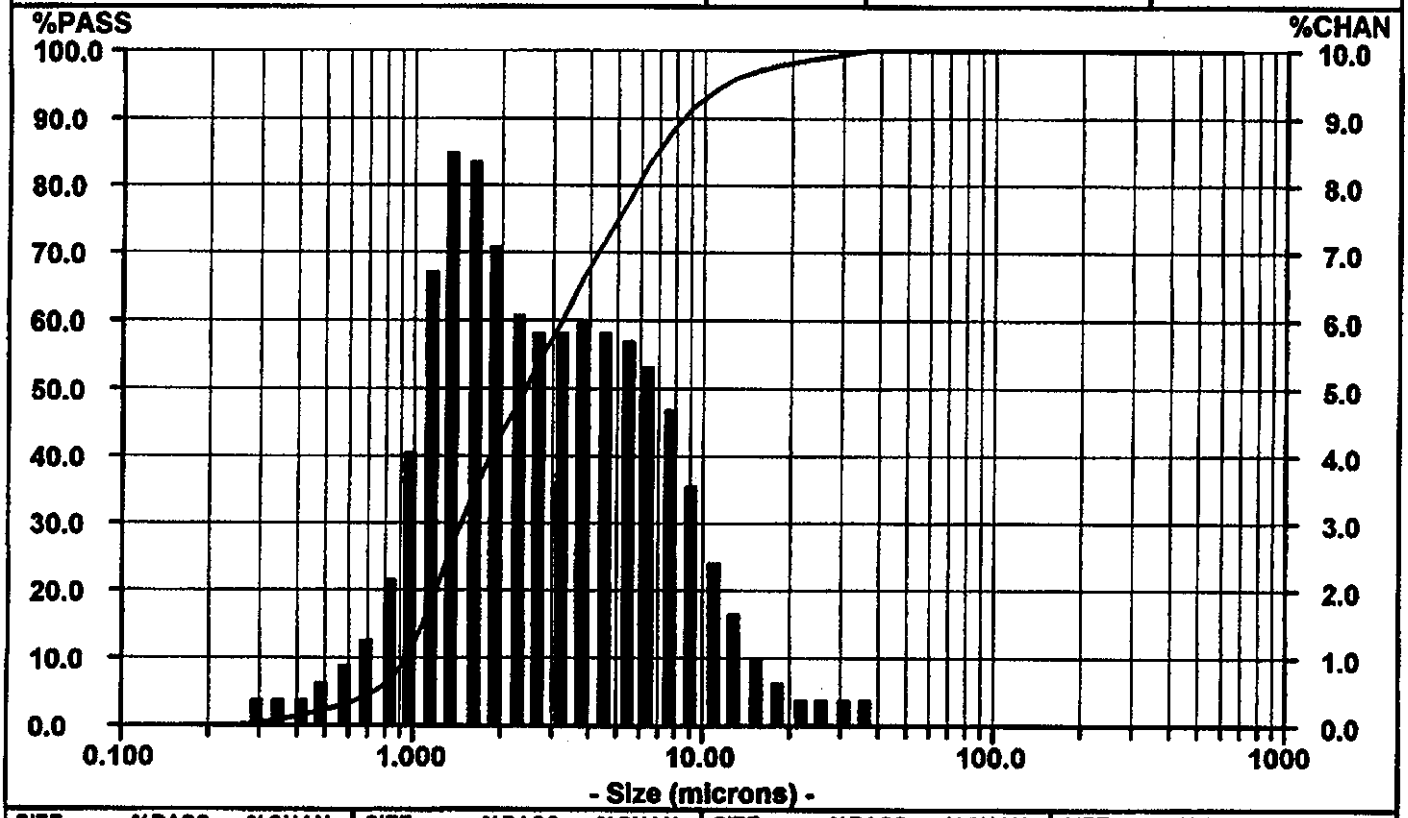
AW-103

103AW Sample

Date: 09/22/91 Time: 13:37 Meas #: 00001 Pres #: 01

1 M NaOH 1 M NaNO3
60 ml/sec
Refractive Index = 1.50 particle 1.33 medium
File: WPAA009

Summary	Percentiles		Dia	Vol%	Width
mv = 4.001	10% = 0.941	60% = 3.259	4.910	52%	6.293
mn = 0.577	20% = 1.209	70% = 4.350	1.312	48%	1.011
ma = 1.812	30% = 1.474	80% = 5.870			
cs = 3.311	40% = 1.846	90% = 8.468			
sd = 2.790	50% = 2.434	95% = 11.68			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	91.74	3.68						
592.0	100.00	0.00	7.778	88.06	4.71						
497.8	100.00	0.00	6.541	83.35	5.44						
418.6	100.00	0.00	5.500	77.91	5.80						
352.0	100.00	0.00	4.625	72.11	5.97						
296.0	100.00	0.00	3.889	66.14	6.02						
248.9	100.00	0.00	3.270	60.12	5.96						
209.3	100.00	0.00	2.750	54.16	5.91						
176.0	100.00	0.00	2.312	48.25	6.20						
148.0	100.00	0.00	1.945	42.05	7.12						
124.5	100.00	0.00	1.635	34.93	8.40						
104.7	100.00	0.00	1.375	26.53	8.69						
88.00	100.00	0.00	1.156	17.84	8.88						
74.00	100.00	0.00	0.972	10.96	4.17						
62.23	100.00	0.00	0.818	6.79	2.26						
52.33	100.00	0.00	0.688	4.53	1.31						
44.00	100.00	0.00	0.578	3.22	0.90						
37.00	100.00	0.49	0.486	2.32	0.70						
31.11	99.51	0.47	0.409	1.62	0.60						
26.16	99.04	0.50	0.344	1.02	0.55						
22.00	98.54	0.59	0.289	0.47	0.47						
18.50	97.95	0.78	0.243	0.00	0.00						
15.56	97.17	1.12	0.204	0.00	0.00						
13.08	96.05	1.72	0.172	0.00	0.00						
11.00	94.33	2.59	0.145	0.00	0.00						

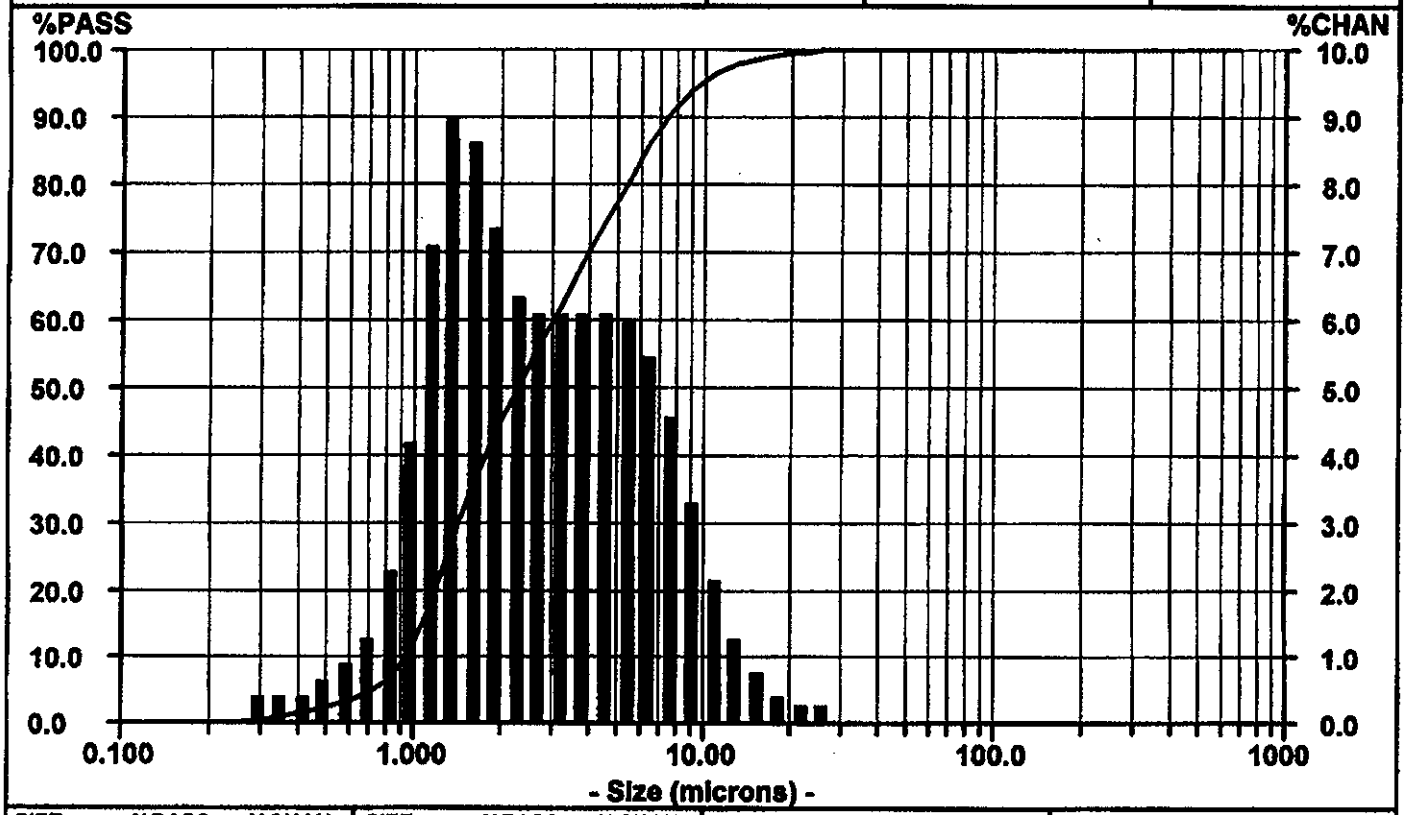
AW-103

1 M NaOH 1 M NaNO3
60 ml/sec
Refractive Index = 2.0 particle 1.33 medium
File: WPAA010

103AW
Sample

Date: 09/22/91 Meas #: 00001
Time: 13:50 Pres #: 01

Summary	Percentiles		Dia	Vol%	Width
mv = 3.494	10% = 0.937	60% = 3.070	4.673	50%	5.260
mn = 0.586	20% = 1.196	70% = 4.059	1.316	50%	1.004
ma = 1.767	30% = 1.446	80% = 5.394			
cs = 3.396	40% = 1.782	90% = 7.493			
sd = 2.493	50% = 2.311	95% = 9.631			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	94.38	3.46						
592.0	100.00	0.00	7.778	90.92	4.68						
497.8	100.00	0.00	6.541	86.24	5.57						
418.6	100.00	0.00	5.500	80.67	6.02						
352.0	100.00	0.00	4.625	74.65	6.18						
296.0	100.00	0.00	3.889	68.47	6.21						
248.9	100.00	0.00	3.270	62.26	6.14						
209.3	100.00	0.00	2.750	56.12	6.11						
176.0	100.00	0.00	2.312	50.01	6.43						
148.0	100.00	0.00	1.945	43.58	7.42						
124.5	100.00	0.00	1.635	36.16	8.78						
104.7	100.00	0.00	1.375	27.38	9.09						
88.00	100.00	0.00	1.156	18.29	7.15						
74.00	100.00	0.00	0.972	11.14	4.30						
62.23	100.00	0.00	0.818	6.84	2.31						
52.33	100.00	0.00	0.688	4.53	1.33						
44.00	100.00	0.00	0.578	3.20	0.90						
37.00	100.00	0.00	0.486	2.30	0.70						
31.11	100.00	0.00	0.408	1.60	0.60						
26.16	100.00	0.31	0.344	1.00	0.54						
22.00	99.69	0.37	0.289	0.46	0.46						
18.50	99.32	0.52	0.243	0.00	0.00						
15.56	98.80	0.81	0.204	0.00	0.00						
13.08	97.99	1.36	0.172	0.00	0.00						
11.00	96.63	2.25	0.145	0.00	0.00						

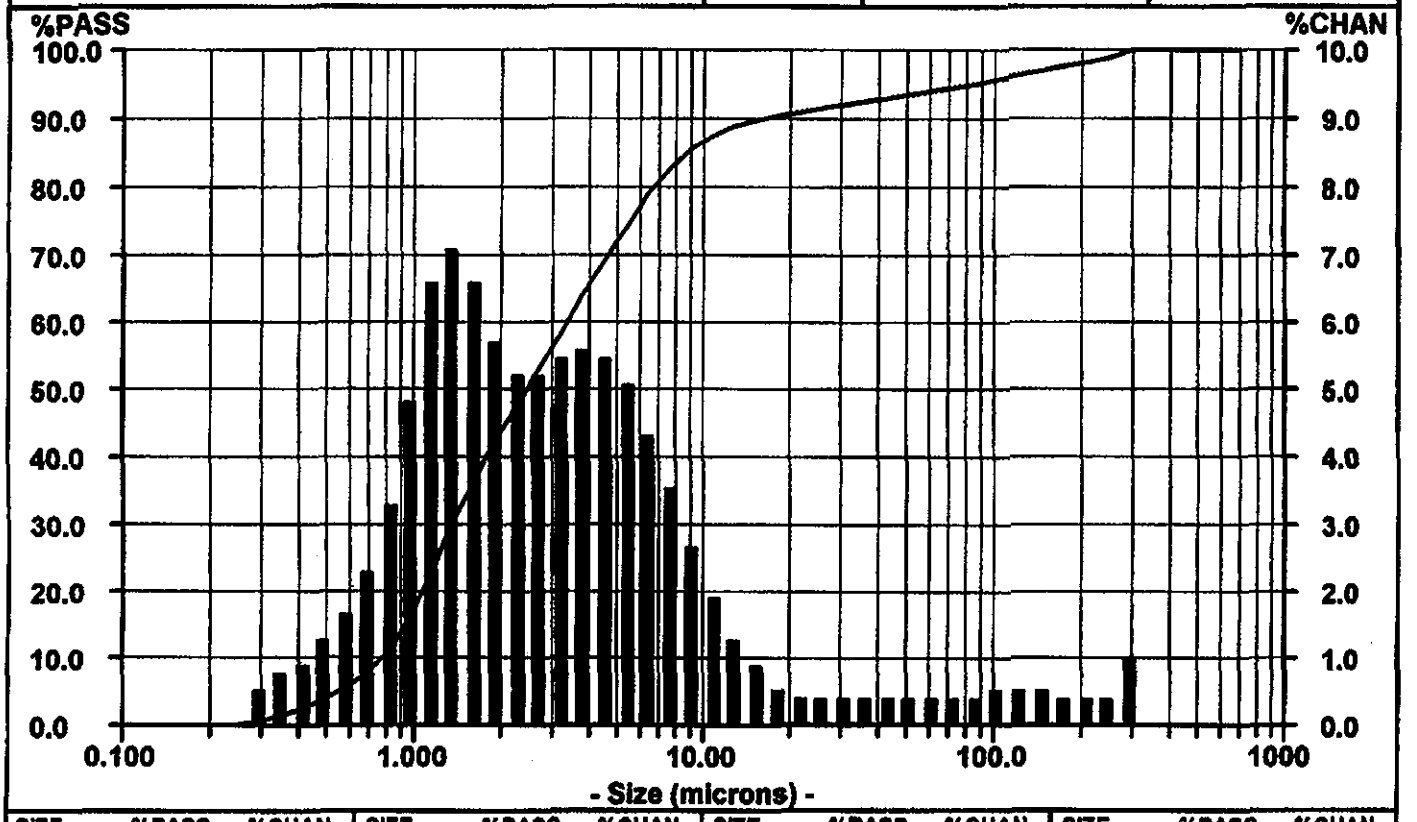
AW-103

103AW
Sample

Date: 09/22/91 Meas #: 00001
Time: 14:01 Pres #: 01

1 M NaOH 1 M NaNO3
50 ml/sec
2 min Sonication
Refractive Index = 2.0 particle 1.33 medium
File: WPAA011

Summary	Percentiles		Dia	Vol%	Width
mv = 13.77	10% = 0.768	60% = 3.413	249.4	2%	80.11
mn = 0.510	20% = 1.074	70% = 4.664	74.49	6%	96.54
ma = 1.662	30% = 1.369	80% = 6.729	4.249	49%	5.602
cs = 3.611	40% = 1.796	90% = 16.04	1.109	43%	0.954
sd = 3.636	50% = 2.487	95% = 83.14			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	85.75	2.74						
592.0	100.00	0.00	7.778	83.01	3.66						
497.8	100.00	0.00	6.541	79.35	4.49						
418.6	100.00	0.00	5.500	74.86	5.11						
352.0	100.00	0.00	4.625	69.75	5.50						
296.0	100.00	1.18	3.889	64.25	5.64						
248.9	98.82	0.60	3.270	58.61	5.62						
209.3	98.22	0.55	2.750	53.09	5.28						
176.0	97.67	0.59	2.312	47.81	5.26						
148.0	97.08	0.63	1.945	42.55	5.74						
124.5	96.45	0.64	1.635	36.81	6.64						
104.7	95.81	0.62	1.375	30.17	7.21						
88.00	95.19	0.56	1.156	22.96	6.61						
74.00	94.63	0.52	0.972	16.35	4.98						
62.23	94.11	0.50	0.818	11.37	3.39						
52.33	93.61	0.50	0.688	7.98	2.33						
44.00	93.11	0.50	0.578	5.65	1.71						
37.00	92.61	0.49	0.486	3.94	1.32						
31.11	92.12	0.49	0.408	2.62	1.05						
26.16	91.63	0.51	0.344	1.57	0.88						
22.00	91.12	0.56	0.289	0.69	0.69						
18.50	90.56	0.69	0.243	0.00	0.00						
15.56	89.87	0.91	0.204	0.00	0.00						
13.08	88.96	1.30	0.172	0.00	0.00						
11.00	87.66	1.91	0.145	0.00	0.00						

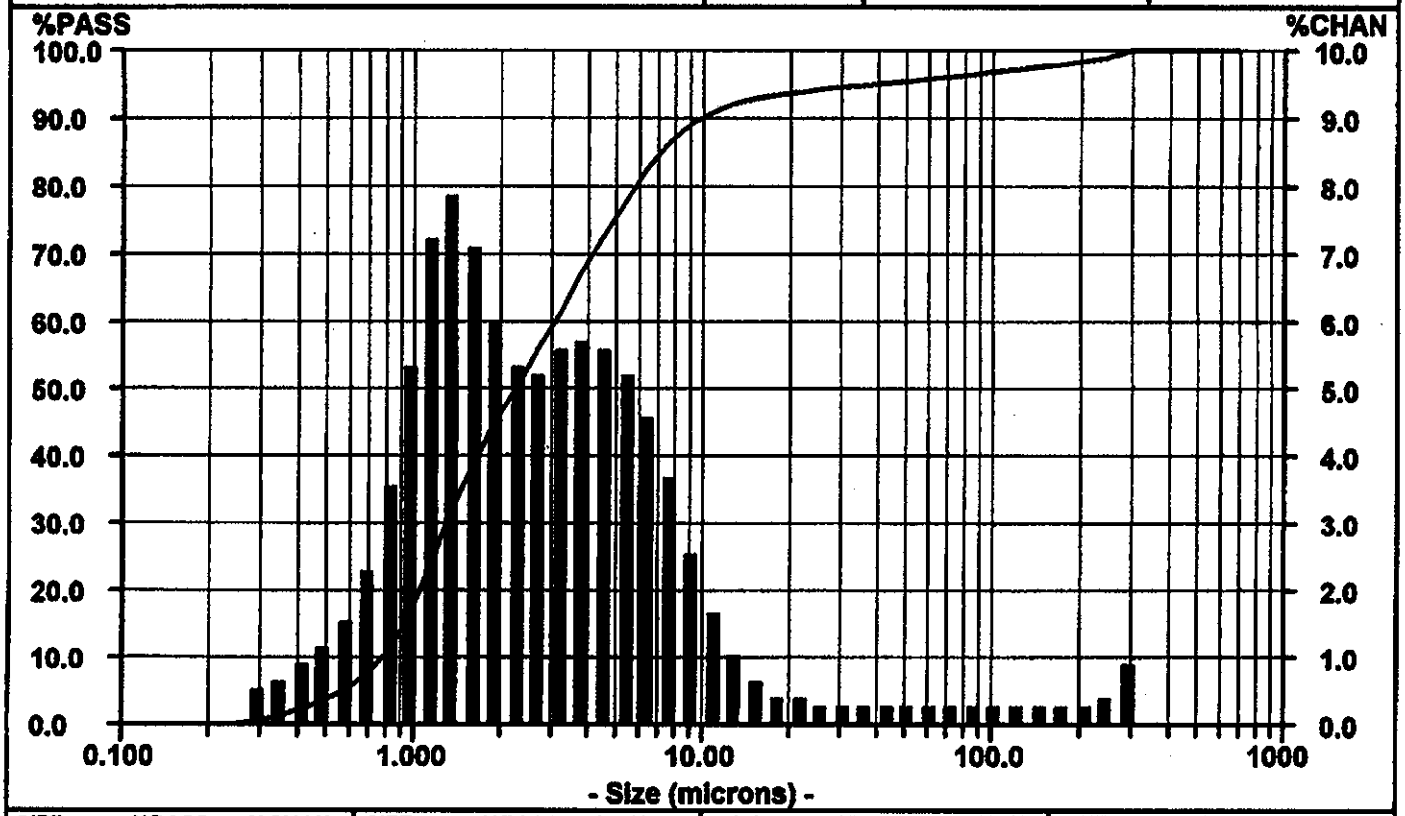
AW-103

103AW
Sample

Date: 09/22/91 Meas #: 00001
Time: 14:10 Pres #: 01

1 M NaOH and 1 M NaNO3
Sonicate for 2 minutes @ 40 W
Flow Rate = 60 ml/sec.
Refractive Index = 1.50 Particle/1.33 Medium
File: WPAA012

Summary	Percentiles		Dia	Vol%	Width
mv = 10.83	10% = 0.773	60% = 3.110	153.4	4%	185.9
mn = 0.533	20% = 1.052	70% = 4.205	4.632	45%	5.719
ma = 1.611	30% = 1.313	80% = 5.832	1.188	51%	1.090
cs = 3.724	40% = 1.670	90% = 9.764			
sd = 2.938	50% = 2.264	95% = 37.82			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	89.37	2.67						
592.0	100.00	0.00	7.778	86.70	3.71						
497.8	100.00	0.00	6.541	82.99	4.63						
418.6	100.00	0.00	5.500	78.36	5.28						
352.0	100.00	0.00	4.625	73.08	5.65						
296.0	100.00	1.04	3.889	67.43	5.77						
248.9	98.96	0.46	3.270	61.66	5.62						
209.3	98.50	0.39	2.750	56.04	5.39						
176.0	98.11	0.39	2.312	50.65	5.41						
148.0	97.72	0.39	1.945	45.24	6.01						
124.5	97.33	0.39	1.635	39.23	7.13						
104.7	96.94	0.37	1.375	32.10	7.95						
88.00	96.57	0.34	1.156	24.15	7.33						
74.00	96.23	0.32	0.972	16.82	5.46						
62.23	95.91	0.31	0.818	11.34	3.64						
52.33	95.60	0.32	0.688	7.70	2.41						
44.00	95.28	0.32	0.578	5.29	1.69						
37.00	94.96	0.32	0.486	3.60	1.25						
31.11	94.64	0.33	0.409	2.35	0.96						
26.16	94.31	0.36	0.344	1.39	0.78						
22.00	93.95	0.41	0.289	0.61	0.61						
18.50	93.54	0.53	0.243	0.00	0.00						
15.56	93.01	0.74	0.204	0.00	0.00						
13.08	92.27	1.13	0.172	0.00	0.00						
11.00	91.14	1.77	0.145	0.00	0.00						

AW-103

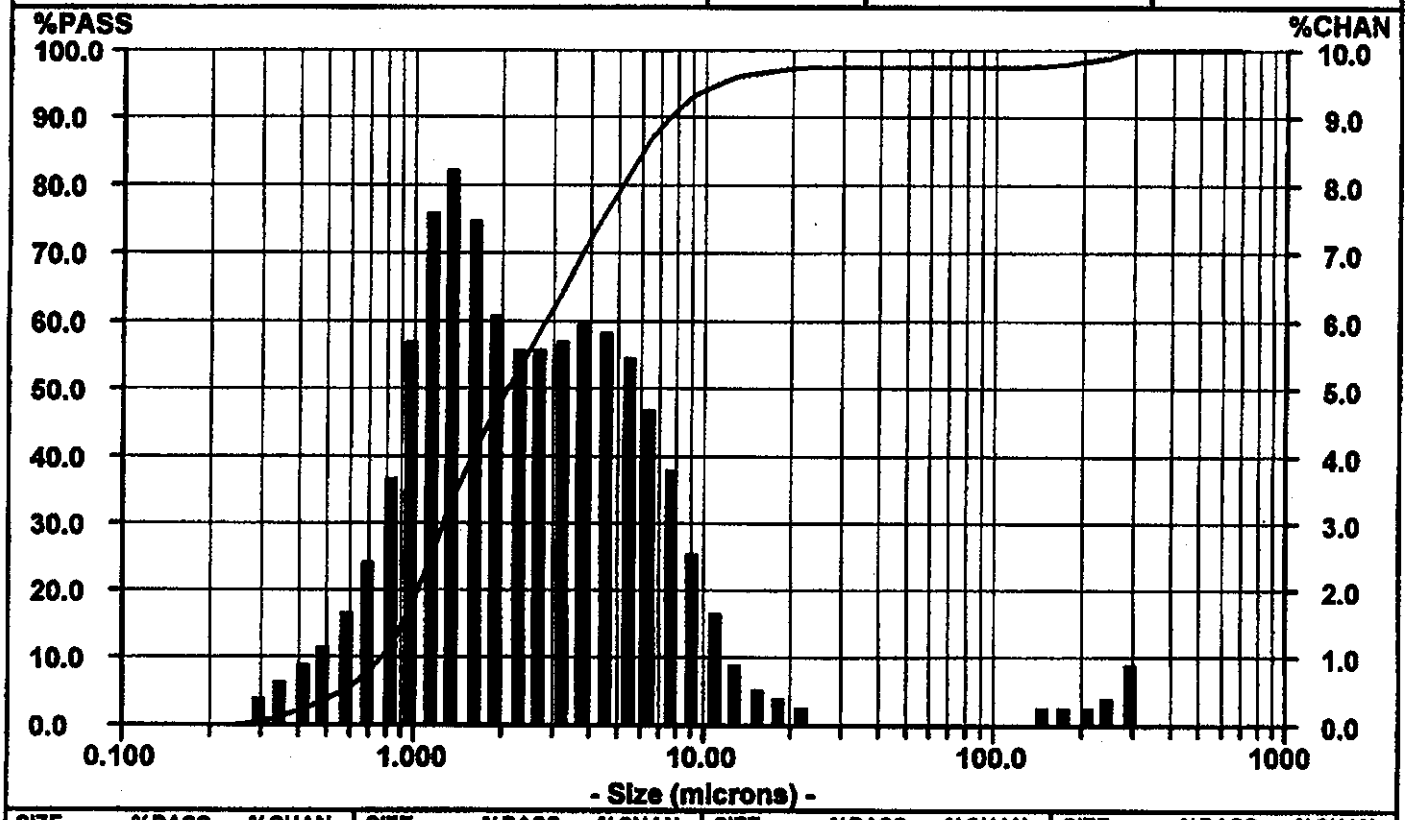
103AW Sample

Date: 09/22/91 Time: 14:14

Meas #: 00001 Pres #: 01

1 M NaOH 1 M NaNO3
60 ml/sec
2 min sonication
Refractive Index = 1.70 particle 1.33 medium
File: WPAA013

Summary	Percentiles		Dia	Vol%	Width
mv = 8.446	10% = 0.765	60% = 2.865	236.1	2%	120.9
mn = 0.542	20% = 1.034	70% = 3.831	4.469	45%	4.816
ma = 1.552	30% = 1.277	80% = 5.158	1.189	53%	1.080
cs = 3.866	40% = 1.592	90% = 7.526			
sd = 2.477	50% = 2.104	95% = 10.92			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	93.34	2.69						
592.0	100.00	0.00	7.778	90.65	3.82						
497.8	100.00	0.00	6.541	86.83	4.83						
418.6	100.00	0.00	5.500	82.00	5.54						
352.0	100.00	0.00	4.625	76.46	5.93						
296.0	100.00	1.04	3.889	70.53	6.03						
248.9	98.96	0.43	3.270	64.50	5.86						
209.3	98.53	0.34	2.750	58.64	5.60						
176.0	98.19	0.32	2.312	53.04	5.64						
148.0	97.87	0.31	1.945	47.40	6.30						
124.5	97.56	0.00	1.635	41.10	7.53						
104.7	97.56	0.00	1.375	33.57	8.39						
88.00	97.56	0.00	1.156	25.18	7.77						
74.00	97.56	0.00	0.972	17.41	5.77						
62.23	97.56	0.00	0.818	11.64	3.79						
52.33	97.56	0.00	0.688	7.85	2.50						
44.00	97.56	0.00	0.578	5.35	1.74						
37.00	97.56	0.00	0.486	3.61	1.27						
31.11	97.56	0.00	0.409	2.34	0.97						
26.16	97.56	0.00	0.344	1.37	0.78						
22.00	97.56	0.34	0.289	0.59	0.59						
18.50	97.22	0.45	0.243	0.00	0.00						
15.56	96.77	0.66	0.204	0.00	0.00						
13.08	96.11	1.05	0.172	0.00	0.00						
11.00	95.06	1.72	0.145	0.00	0.00						

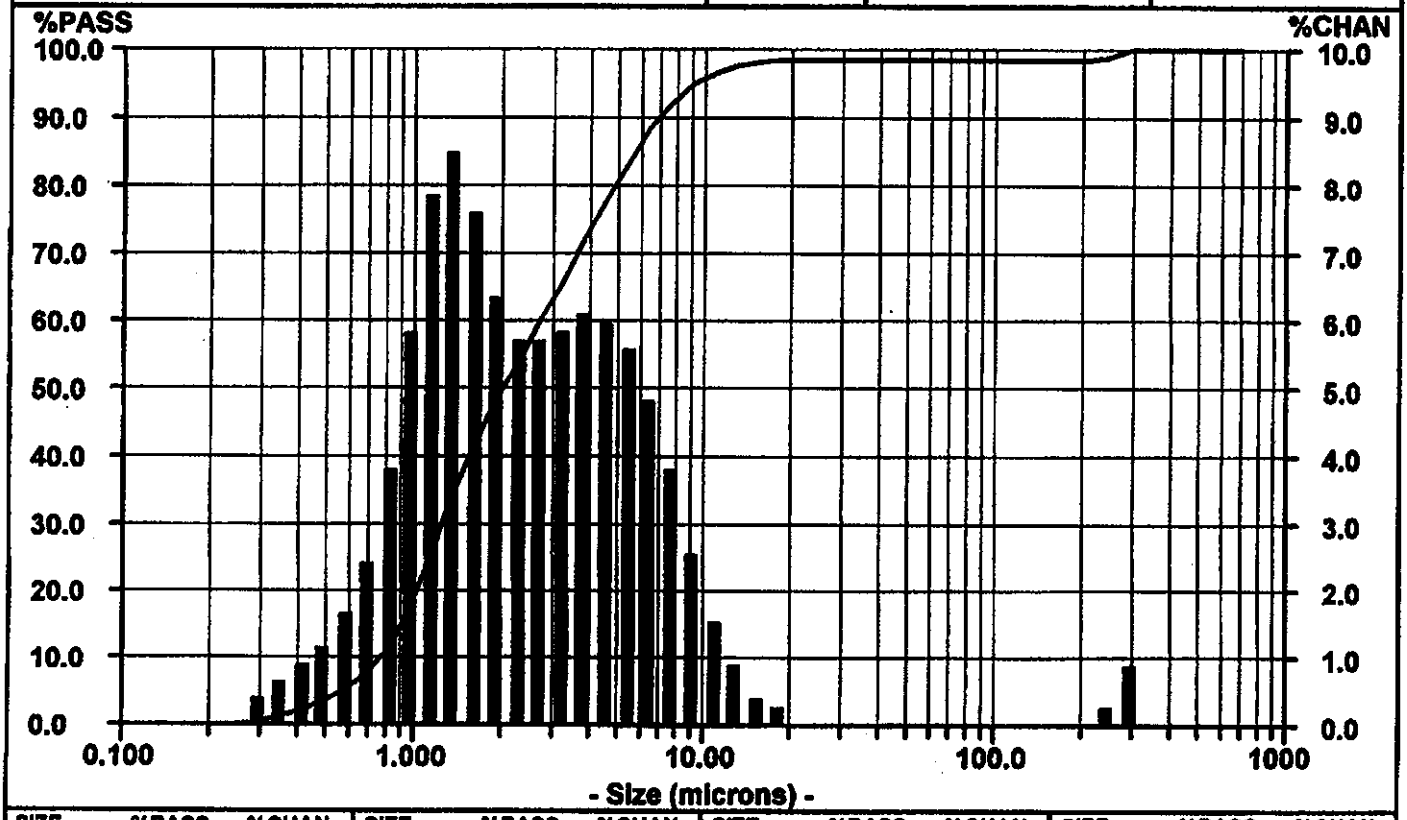
AW-103

103AW
Sample

Date: 09/22/91 Meas #: 00001
Time: 14:18 Pres #: 01

1 M NaOH 1 M NaNO3
17 ml/sec
2 min sonication
Refractive Index = 1.50 particle 1.33 medium
File: WPAA014

Summary		Percentiles		Dia	Vol%	Width
mv =	6.627	10% = 0.765	60% = 2.757	262.3	1%	44.51
mn =	0.549	20% = 1.028	70% = 3.675	4.405	44%	4.528
ma =	1.530	30% = 1.282	80% = 4.898	1.191	56%	1.072
cs =	3.921	40% = 1.559	90% = 6.913			
sd =	2.308	50% = 2.036	95% = 9.172			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	95.11	2.62						
592.0	100.00	0.00	7.778	92.49	3.83						
497.8	100.00	0.00	6.541	88.66	4.92						
418.6	100.00	0.00	5.500	83.74	5.66						
352.0	100.00	0.00	4.625	78.08	6.06						
296.0	100.00	1.02	3.889	72.02	6.14						
248.9	98.98	0.39	3.270	65.88	5.97						
209.3	98.59	0.00	2.750	59.91	5.71						
176.0	98.59	0.00	2.312	54.20	5.75						
148.0	98.59	0.00	1.945	48.45	6.45						
124.5	98.59	0.00	1.635	42.00	7.73						
104.7	98.59	0.00	1.375	34.27	8.68						
88.00	98.59	0.00	1.156	25.59	7.99						
74.00	98.59	0.00	0.972	17.60	5.92						
62.23	98.59	0.00	0.818	11.68	3.87						
52.33	98.59	0.00	0.688	7.81	2.53						
44.00	98.59	0.00	0.578	5.28	1.75						
37.00	98.59	0.00	0.486	3.53	1.26						
31.11	98.59	0.00	0.409	2.27	0.95						
26.16	98.59	0.00	0.344	1.32	0.75						
22.00	98.59	0.00	0.289	0.57	0.57						
18.50	98.59	0.37	0.243	0.00	0.00						
15.56	98.22	0.56	0.204	0.00	0.00						
13.08	97.66	0.94	0.172	0.00	0.00						
11.00	96.72	1.61	0.145	0.00	0.00						

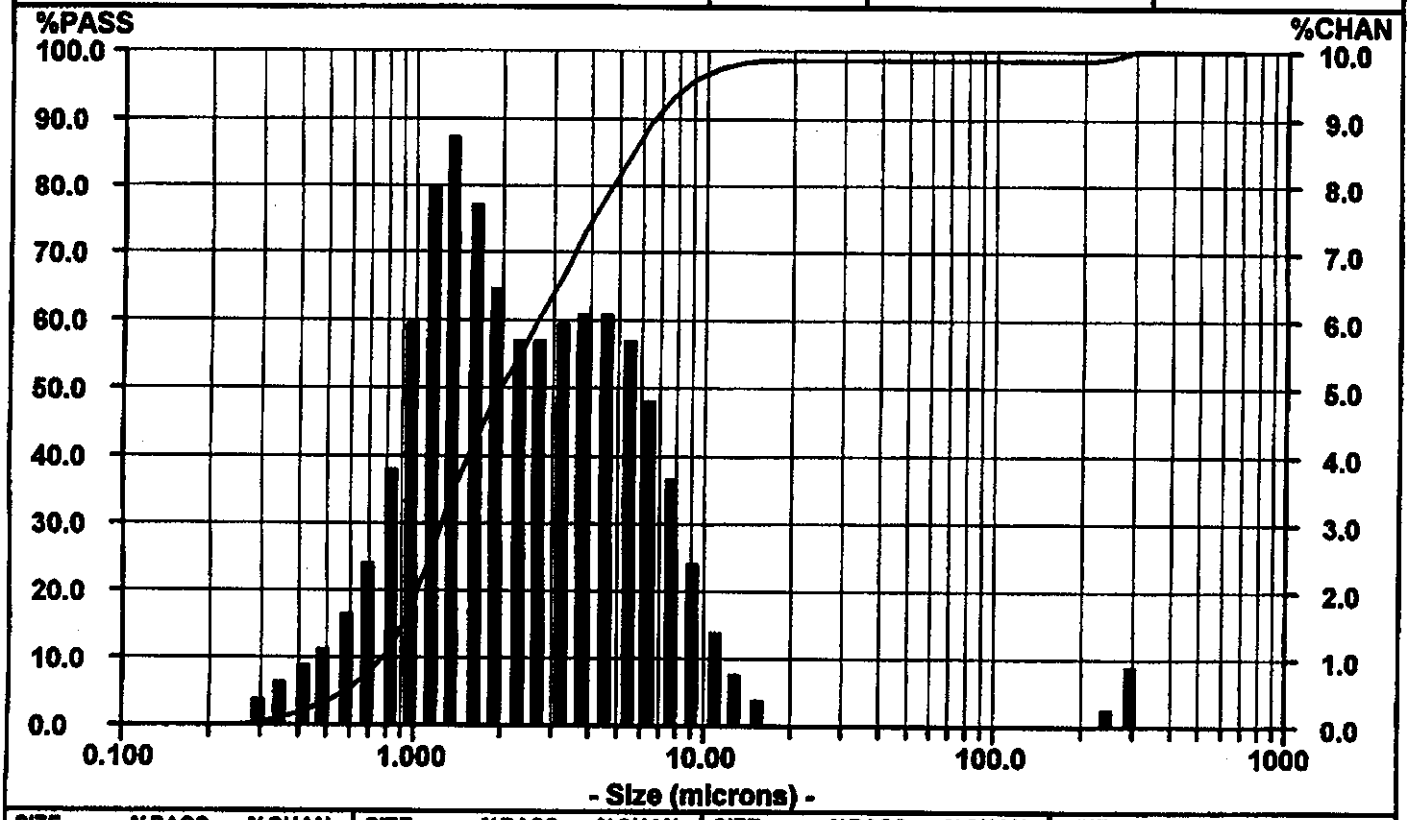
AW-103

103AW
Sample

Date: 09/22/91 Meas #: 00001
Time: 14:23 Pres #: 01

1 M NaOH 1 M NaNO3
17 ml/sec
2 min sonication
Refractive index = 1.70 particle 1.33 medium
File: WPAA015

Summary	Percentiles		Dia	Vol%	Width
mv = 6.189	10% = 0.768	60% = 2.704	263.4	1%	42.90
mn = 0.555	20% = 1.027	70% = 3.597	4.347	44%	4.291
ma = 1.523	30% = 1.257	80% = 4.770	1.195	55%	1.066
cs = 3.939	40% = 1.545	90% = 6.644			
sd = 2.225	50% = 2.003	95% = 8.602			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	95.93	2.53						
592.0	100.00	0.00	7.778	93.40	3.78						
497.8	100.00	0.00	6.541	89.62	4.94						
418.6	100.00	0.00	5.500	84.68	5.73						
352.0	100.00	0.00	4.625	78.95	6.14						
296.0	100.00	0.95	3.889	72.81	6.22						
248.9	99.05	0.32	3.270	66.59	6.02						
209.3	98.73	0.00	2.750	60.57	5.76						
176.0	98.73	0.00	2.312	54.81	5.82						
148.0	98.73	0.00	1.945	48.99	6.55						
124.5	98.73	0.00	1.635	42.44	7.87						
104.7	98.73	0.00	1.375	34.57	8.84						
88.00	98.73	0.00	1.156	25.73	8.13						
74.00	98.73	0.00	0.972	17.60	6.00						
62.23	98.73	0.00	0.818	11.60	3.90						
52.33	98.73	0.00	0.688	7.70	2.63						
44.00	98.73	0.00	0.578	5.17	1.73						
37.00	98.73	0.00	0.486	3.44	1.24						
31.11	98.73	0.00	0.409	2.20	0.92						
26.16	98.73	0.00	0.344	1.28	0.73						
22.00	98.73	0.00	0.289	0.55	0.55						
18.50	98.73	0.00	0.243	0.00	0.00						
15.56	98.73	0.47	0.204	0.00	0.00						
13.08	98.26	0.83	0.172	0.00	0.00						
11.00	97.43	1.50	0.145	0.00	0.00						

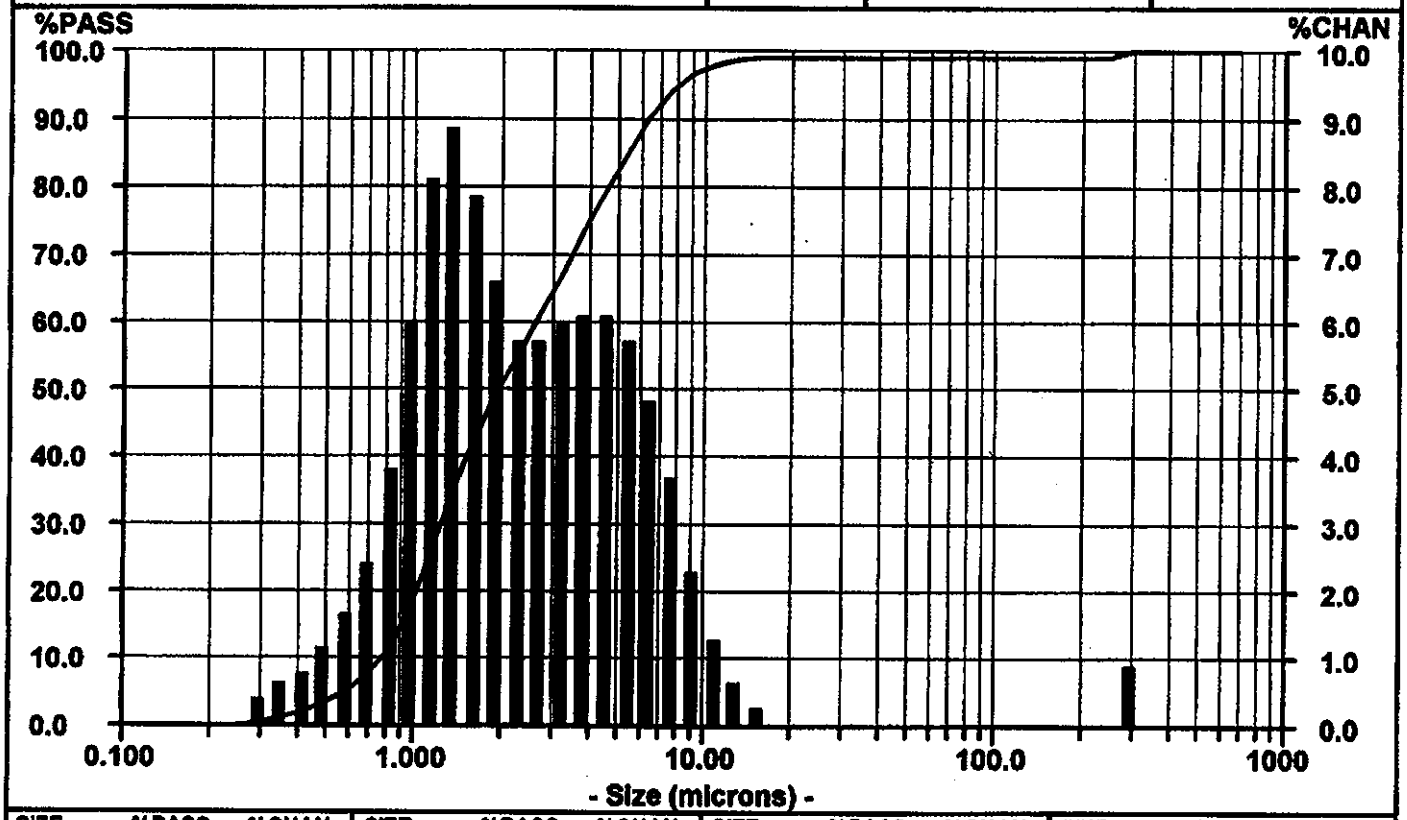
AW-103

103AW
Sample

Date: 09/22/91 Meas #: 00001
Time: 14:27 Pres #: 01

1 M NaOH 1 M NaNO3
17 ml/sec
2 min sonication
Refractive index = 2.00 particle 1.33 medium
File: WPAA016

Summary	Percentiles		Dia	Vol%	Width
mv = 5.308	10% = 0.772	60% = 2.658	4.361	45%	4.387
mn = 0.563	20% = 1.026	70% = 3.529	1.197	55%	1.059
ma = 1.518	30% = 1.252	80% = 4.659			
cs = 3.952	40% = 1.533	90% = 6.419			
sd = 2.164	50% = 1.976	95% = 8.145			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	96.65	2.41						
592.0	100.00	0.00	7.778	94.24	3.74						
497.8	100.00	0.00	6.541	90.50	4.96						
418.6	100.00	0.00	5.500	85.54	5.79						
352.0	100.00	0.00	4.625	79.75	6.21						
296.0	100.00	0.91	3.889	73.54	6.29						
248.9	99.09	0.00	3.270	67.25	6.09						
209.3	99.09	0.00	2.750	61.16	5.83						
176.0	99.09	0.00	2.312	55.33	5.88						
148.0	99.09	0.00	1.945	49.45	6.62						
124.5	99.09	0.00	1.635	42.83	7.98						
104.7	99.09	0.00	1.375	34.85	8.99						
88.00	99.09	0.00	1.156	25.86	8.27						
74.00	99.09	0.00	0.972	17.59	6.08						
62.23	99.09	0.00	0.818	11.51	3.93						
52.33	99.09	0.00	0.688	7.58	2.53						
44.00	99.09	0.00	0.578	5.05	1.72						
37.00	99.09	0.00	0.486	3.33	1.22						
31.11	99.09	0.00	0.409	2.11	0.89						
26.16	99.09	0.00	0.344	1.22	0.70						
22.00	99.09	0.00	0.289	0.52	0.52						
18.50	99.09	0.00	0.243	0.00	0.00						
15.56	99.09	0.38	0.204	0.00	0.00						
13.08	98.71	0.71	0.172	0.00	0.00						
11.00	98.00	1.35	0.145	0.00	0.00						

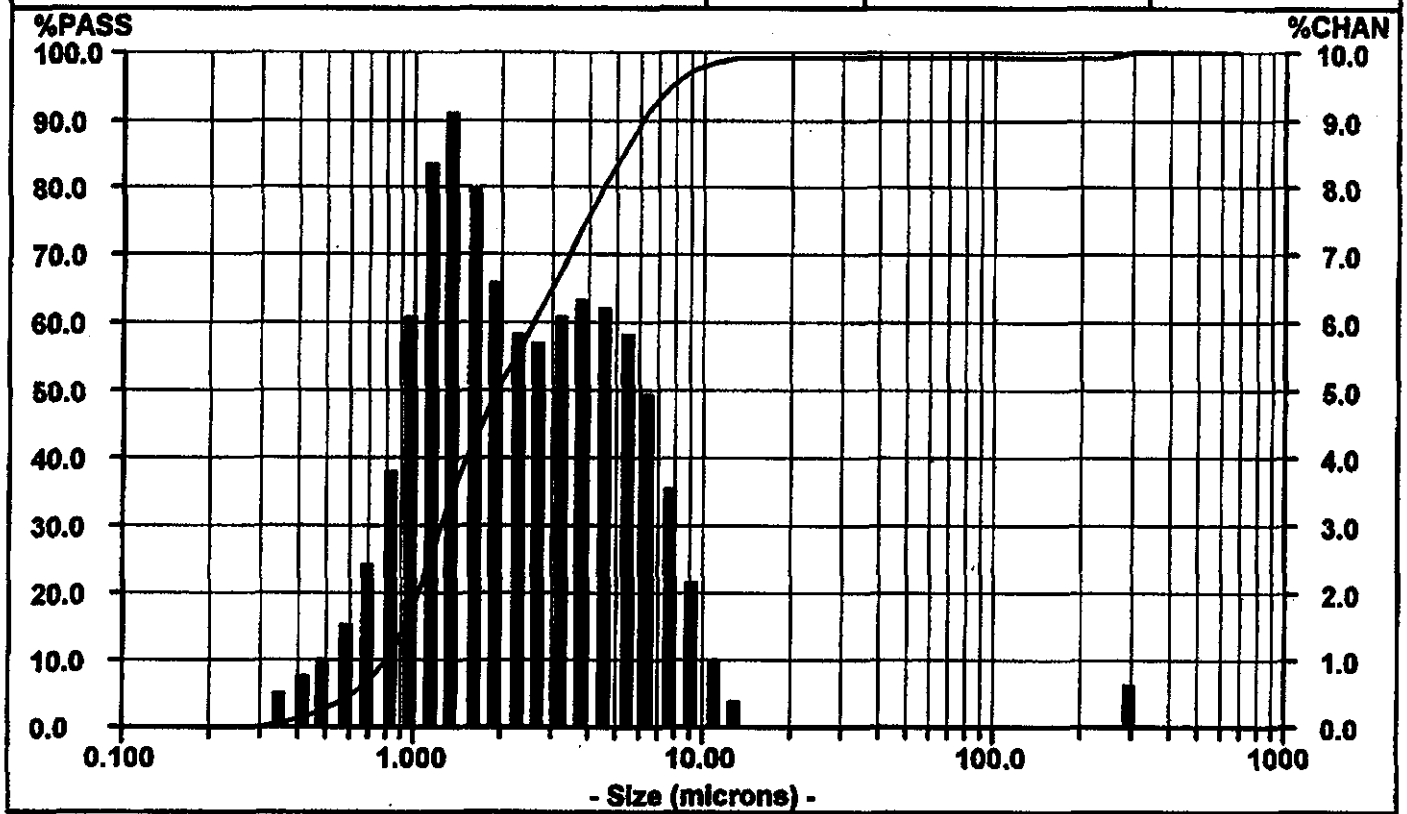
AW-103

103AW
Sample

Date: 09/22/91 Meas #: 00001
Time: 14:31 Pres #: 01

1 M NaOH 1 M NaNO3
40 ml/sec
2 min sonication
Refractive Index = 1.50 particle 1.33 medium
File: WPAA017

Summary	Percentiles		Dia	Vol%	Width
mv = 4.919	10% = 0.792	60% = 2.626	4.300	44%	4.096
mn = 0.652	20% = 1.037	70% = 3.479	1.207	56%	1.039
ma = 1.554	30% = 1.257	80% = 4.561			
cs = 3.861	40% = 1.532	90% = 6.186			
sd = 2.080	50% = 1.961	95% = 7.706			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	97.42	2.25						
592.0	100.00	0.00	7.778	95.17	3.67						
497.8	100.00	0.00	6.541	91.50	5.03						
418.6	100.00	0.00	5.500	86.47	5.96						
352.0	100.00	0.00	4.625	80.51	6.37						
296.0	100.00	0.79	3.889	74.14	6.40						
248.9	99.21	0.00	3.270	67.74	6.16						
209.3	99.21	0.00	2.750	61.58	5.89						
176.0	99.21	0.00	2.312	55.69	5.98						
148.0	99.21	0.00	1.945	49.71	6.77						
124.5	99.21	0.00	1.635	42.94	8.19						
104.7	99.21	0.00	1.375	34.75	9.23						
88.00	99.21	0.00	1.156	25.52	8.47						
74.00	99.21	0.00	0.972	17.05	6.19						
62.23	99.21	0.00	0.818	10.86	3.97						
52.33	99.21	0.00	0.688	6.89	2.53						
44.00	99.21	0.00	0.578	4.36	1.70						
37.00	99.21	0.00	0.486	2.66	1.18						
31.11	99.21	0.00	0.409	1.48	0.86						
26.16	99.21	0.00	0.344	0.62	0.62						
22.00	99.21	0.00	0.289	0.00	0.00						
18.50	99.21	0.00	0.243	0.00	0.00						
15.56	99.21	0.00	0.204	0.00	0.00						
13.08	99.21	0.59	0.172	0.00	0.00						
11.00	98.62	1.20	0.145	0.00	0.00						

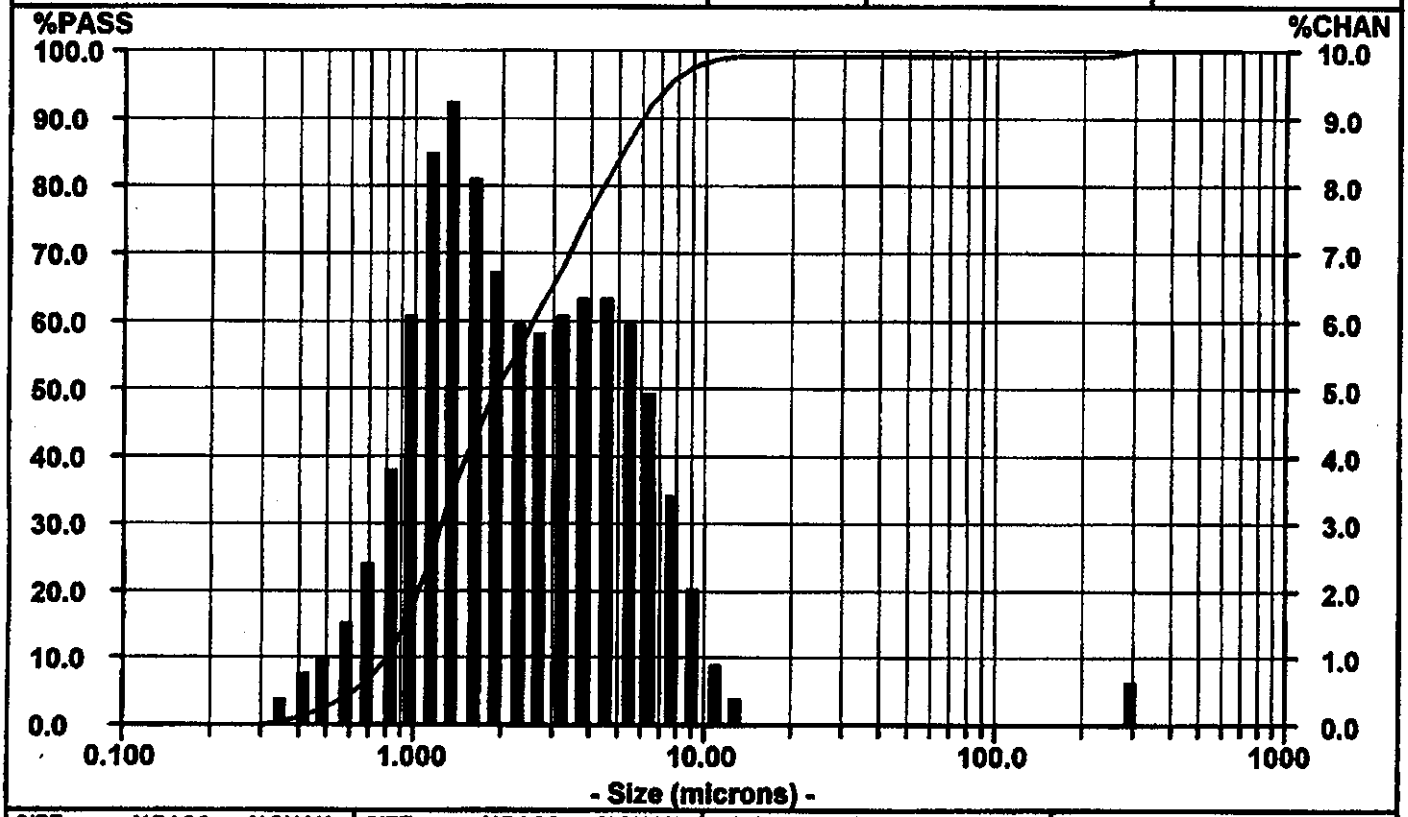
AW-103

103AW
Sample

Date: 09/22/91 Meas #: 00001
Time: 14:36 Pres #: 01

1 M NaOH 1 M NaNO3
40 ml/sec
2 min sonication
Refractive index = 1.70 particle 1.33 mdium
File: WPAA018

Summary	Percentiles		Dia	Vol%	Width
mv = 4.643	10% = 0.796	60% = 2.600	4.257	44%	3.952
mn = 0.669	20% = 1.037	70% = 3.437	1.209	56%	1.034
ma = 1.553	30% = 1.265	80% = 4.494			
cs = 3.866	40% = 1.525	90% = 6.058			
sd = 2.037	50% = 1.946	95% = 7.497			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	97.75	2.11						
592.0	100.00	0.00	7.778	95.64	3.57						
497.8	100.00	0.00	6.541	92.07	5.01						
418.6	100.00	0.00	5.500	87.06	6.00						
352.0	100.00	0.00	4.625	81.06	6.44						
296.0	100.00	0.70	3.889	74.62	6.46						
248.9	99.30	0.00	3.270	68.16	6.22						
209.3	99.30	0.00	2.750	61.94	5.94						
176.0	99.30	0.00	2.312	56.00	6.02						
148.0	99.30	0.00	1.945	49.98	6.82						
124.5	99.30	0.00	1.635	43.16	8.27						
104.7	99.30	0.00	1.375	34.89	9.33						
88.00	99.30	0.00	1.156	25.56	8.57						
74.00	99.30	0.00	0.972	16.99	6.25						
62.23	99.30	0.00	0.818	10.74	3.98						
52.33	99.30	0.00	0.688	6.76	2.52						
44.00	99.30	0.00	0.578	4.24	1.67						
37.00	99.30	0.00	0.486	2.57	1.15						
31.11	99.30	0.00	0.409	1.42	0.83						
26.16	99.30	0.00	0.344	0.59	0.59						
22.00	99.30	0.00	0.289	0.00	0.00						
18.50	99.30	0.00	0.243	0.00	0.00						
15.56	99.30	0.00	0.204	0.00	0.00						
13.08	99.30	0.49	0.172	0.00	0.00						
11.00	98.81	1.06	0.145	0.00	0.00						

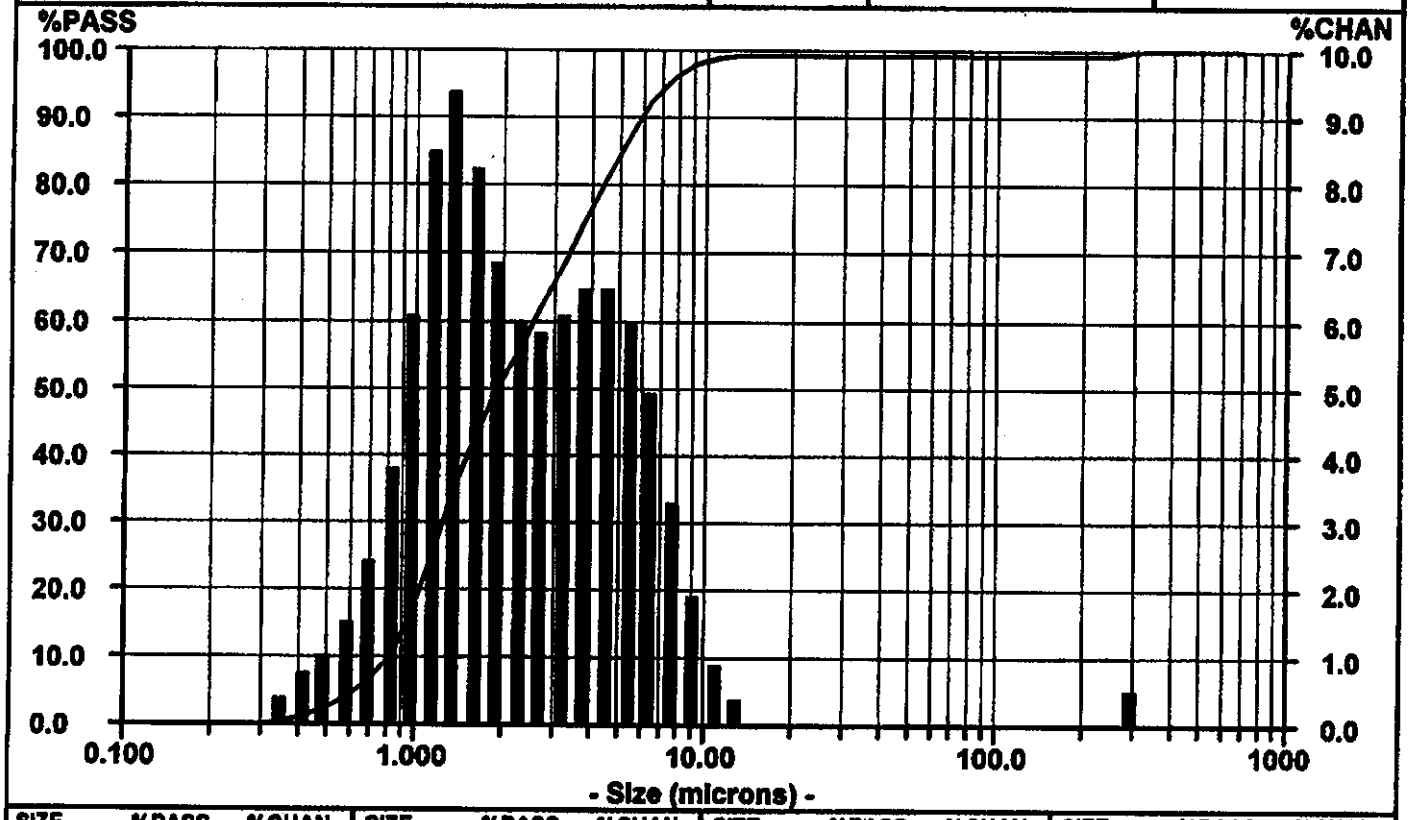
AW-103

103AW
Sample

Date: 09/22/91 Meas #: 00001
Time: 14:40 Pres #: 01

1 M NaOH 1 M NaNO3
40 ml/sec
2 min sonication
Refractive index = 2.00 particle 1.33 medium
File: WPAA019

Summary	Percentiles		Dia	Vol%	Width
mv = 4.504	10% = 0.800	60% = 2.577	4.226	44%	3.819
mn = 0.666	20% = 1.039	70% = 3.406	1.213	56%	1.029
ma = 1.552	30% = 1.255	80% = 4.439			
cs = 3.865	40% = 1.521	90% = 5.942			
sd = 2.000	50% = 1.932	95% = 7.310			



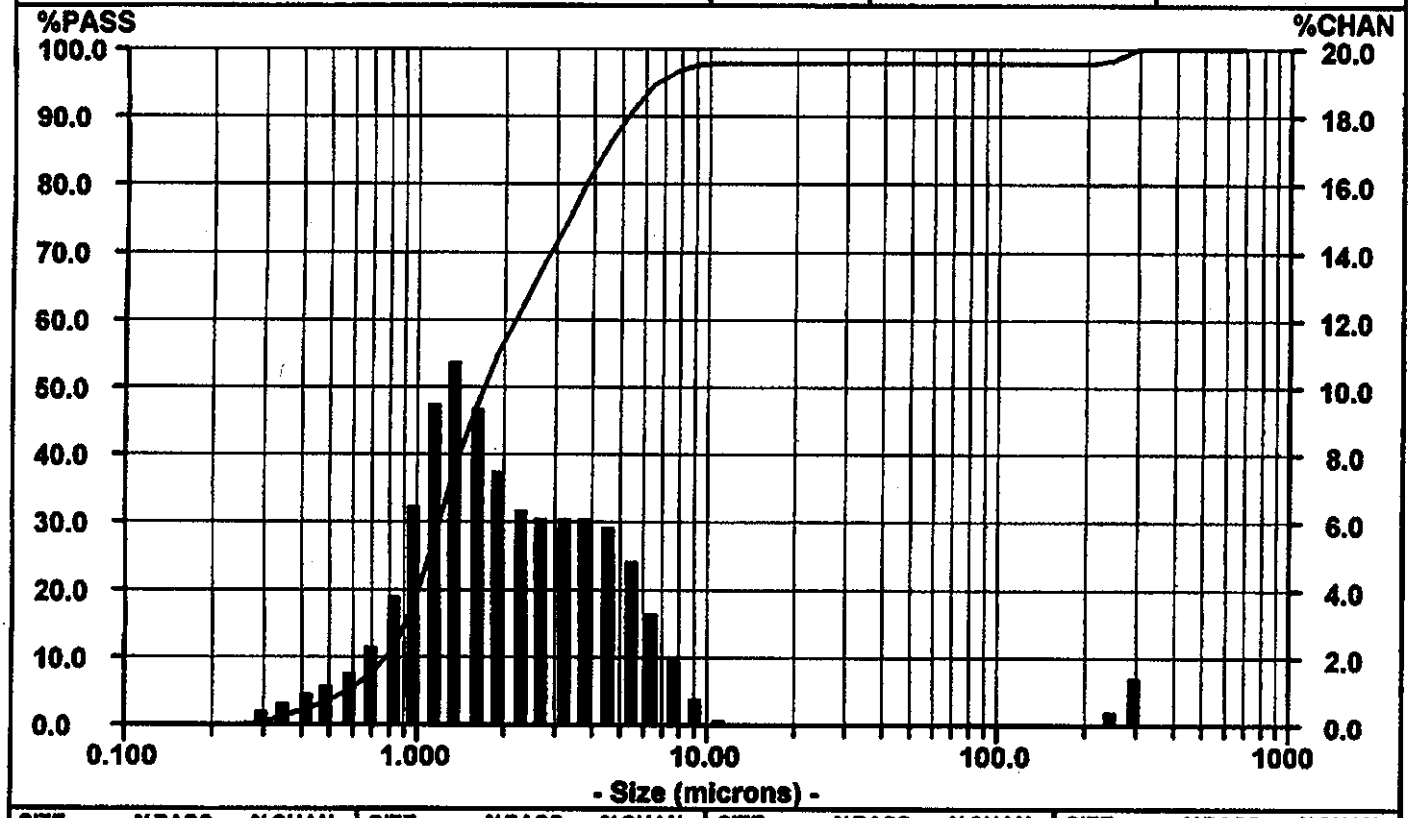
SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	98.02	1.95						
592.0	100.00	0.00	7.778	96.07	3.45						
497.8	100.00	0.00	6.541	92.62	5.01						
418.6	100.00	0.00	5.500	87.61	6.08						
352.0	100.00	0.00	4.625	81.53	6.53						
296.0	100.00	0.66	3.889	75.00	6.51						
248.9	99.34	0.00	3.270	68.49	6.23						
209.3	99.34	0.00	2.750	62.26	5.95						
176.0	99.34	0.00	2.312	56.31	6.06						
148.0	99.34	0.00	1.945	50.25	6.90						
124.5	99.34	0.00	1.635	43.35	8.39						
104.7	99.34	0.00	1.375	34.96	9.43						
88.00	99.34	0.00	1.156	25.53	8.65						
74.00	99.34	0.00	0.972	16.88	6.28						
62.23	99.34	0.00	0.818	10.60	3.98						
52.33	99.34	0.00	0.688	6.62	2.50						
44.00	99.34	0.00	0.578	4.12	1.64						
37.00	99.34	0.00	0.486	2.48	1.12						
31.11	99.34	0.00	0.409	1.36	0.80						
26.16	99.34	0.00	0.344	0.56	0.56						
22.00	99.34	0.00	0.289	0.00	0.00						
18.50	99.34	0.00	0.243	0.00	0.00						
15.56	99.34	0.00	0.204	0.00	0.00						
13.08	99.34	0.40	0.172	0.00	0.00						
11.00	98.94	0.92	0.145	0.00	0.00						

AW-103

103AW Sample	Date: 09/22/91 Meas #: 00001 Time: 15:04 Pres #: 01

1 M NaOH 1 M NaNO3
40 ml/sec
20 min sonication
Refractive index = 1.50 particle 1.33 medium
File: WPAA020

Summary	Percentiles		Dia	Vol%	Width
mv = 7.745	10% = 0.773	60% = 2.196	263.1	2%	43.30
mn = 0.561	20% = 1.012	70% = 2.912	3.827	36%	2.961
ma = 1.425	30% = 1.202	80% = 3.840	1.220	62%	1.018
cs = 4.211	40% = 1.414	90% = 5.221			
sd = 1.687	50% = 1.712	95% = 6.612			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	97.61	0.84						
592.0	100.00	0.00	7.778	96.77	1.92						
497.8	100.00	0.00	6.541	94.85	3.48						
418.6	100.00	0.00	5.500	91.37	4.98						
352.0	100.00	0.00	4.625	86.39	5.93						
296.0	100.00	1.56	3.889	80.46	6.27						
248.9	98.45	0.54	3.270	74.19	6.22						
209.3	97.91	0.00	2.750	67.97	6.12						
176.0	97.91	0.00	2.312	61.85	6.43						
148.0	97.91	0.00	1.945	55.42	7.57						
124.5	97.91	0.00	1.635	47.85	9.49						
104.7	97.91	0.00	1.375	38.36	10.80						
88.00	97.91	0.00	1.156	27.56	9.58						
74.00	97.91	0.00	0.972	17.98	6.51						
62.23	97.91	0.00	0.818	11.47	3.86						
52.33	97.91	0.00	0.688	7.61	2.38						
44.00	97.91	0.00	0.578	5.23	1.64						
37.00	97.91	0.00	0.486	3.59	1.24						
31.11	97.91	0.00	0.408	2.35	0.97						
26.16	97.91	0.00	0.344	1.38	0.79						
22.00	97.91	0.00	0.289	0.59	0.59						
18.50	97.91	0.00	0.243	0.00	0.00						
15.56	97.91	0.00	0.204	0.00	0.00						
13.08	97.91	0.00	0.172	0.00	0.00						
11.00	97.91	0.30	0.145	0.00	0.00						

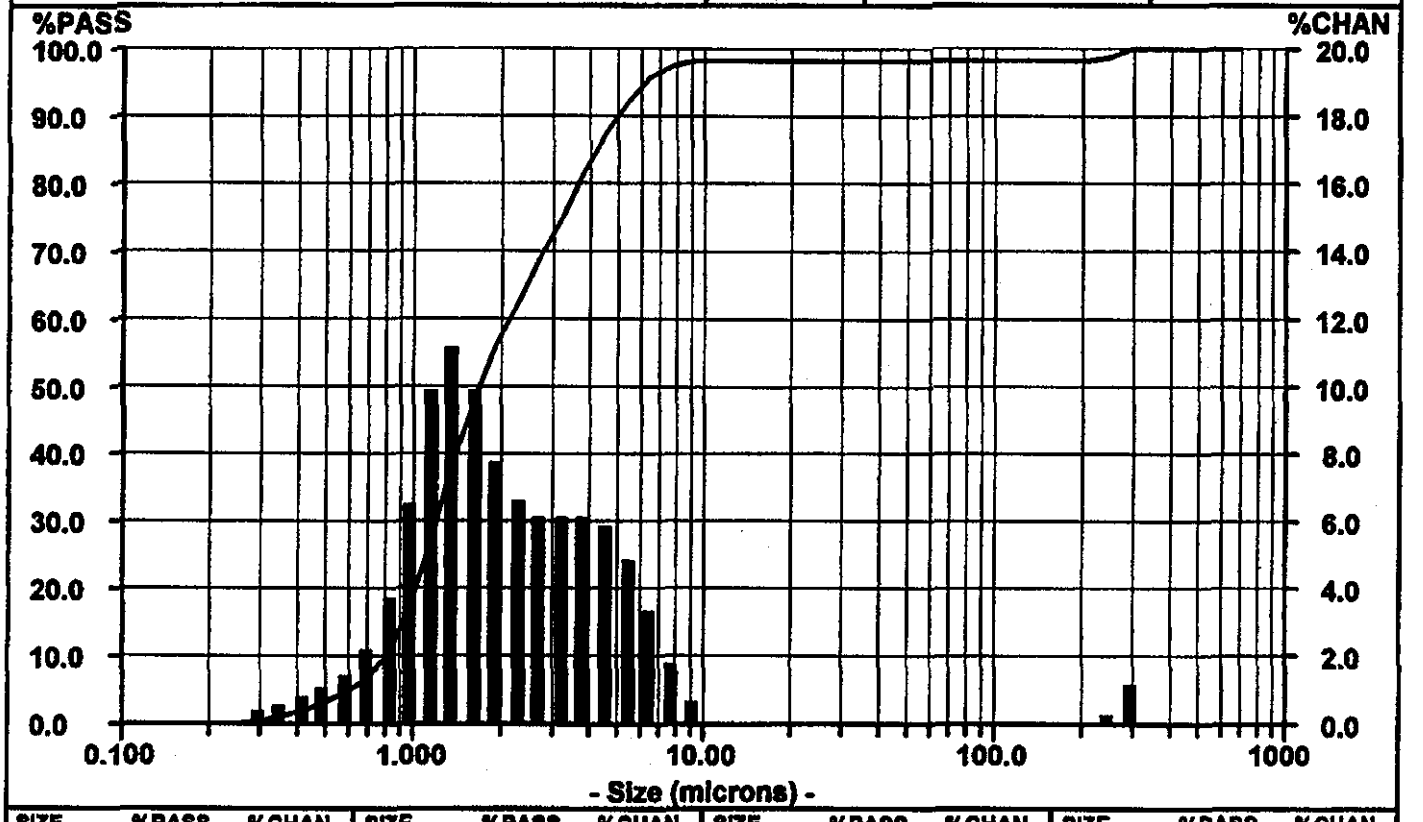
AW-103

1 M NaOH 1 M NaNO3
40 ml/sec
20 min sonication
Refractive index = 1.70 particle 1.33 medium
File: WPAA021

103AW
Sample

Date: 09/22/91 Meas #: 00001
Time: 15:08 Pres #: 01

Summary	Percentiles		Dia	Vol%	Width
mv = 6.618	10% = 0.798	60% = 2.146	264.5	2%	40.90
mn = 0.583	20% = 1.025	70% = 2.826	3.776	36%	2.846
ma = 1.436	30% = 1.208	80% = 3.717	1.234	62%	0.995
cs = 4.178	40% = 1.411	90% = 5.020			
sd = 1.608	50% = 1.692	95% = 6.229			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	98.34	0.75						
592.0	100.00	0.00	7.778	97.59	1.80						
497.8	100.00	0.00	6.541	95.79	3.36						
418.6	100.00	0.00	5.500	92.43	4.90						
352.0	100.00	0.00	4.625	87.53	5.90						
296.0	100.00	1.29	3.889	81.63	6.30						
248.9	98.71	0.37	3.270	75.33	6.30						
209.3	98.34	0.00	2.750	69.03	5.25						
176.0	98.34	0.00	2.312	62.78	6.61						
148.0	98.34	0.00	1.945	56.17	7.84						
124.5	98.34	0.00	1.635	48.33	9.90						
104.7	98.34	0.00	1.375	38.43	11.26						
88.00	98.34	0.00	1.156	27.17	9.93						
74.00	98.34	0.00	0.972	17.24	6.58						
62.23	98.34	0.00	0.818	10.66	3.77						
52.33	98.34	0.00	0.688	6.89	2.23						
44.00	98.34	0.00	0.578	4.66	1.49						
37.00	98.34	0.00	0.486	3.17	1.10						
31.11	98.34	0.00	0.409	2.07	0.86						
26.16	98.34	0.00	0.344	1.21	0.69						
22.00	98.34	0.00	0.289	0.52	0.52						
18.50	98.34	0.00	0.243	0.00	0.00						
15.56	98.34	0.00	0.204	0.00	0.00						
13.08	98.34	0.00	0.172	0.00	0.00						
11.00	98.34	0.00	0.145	0.00	0.00						

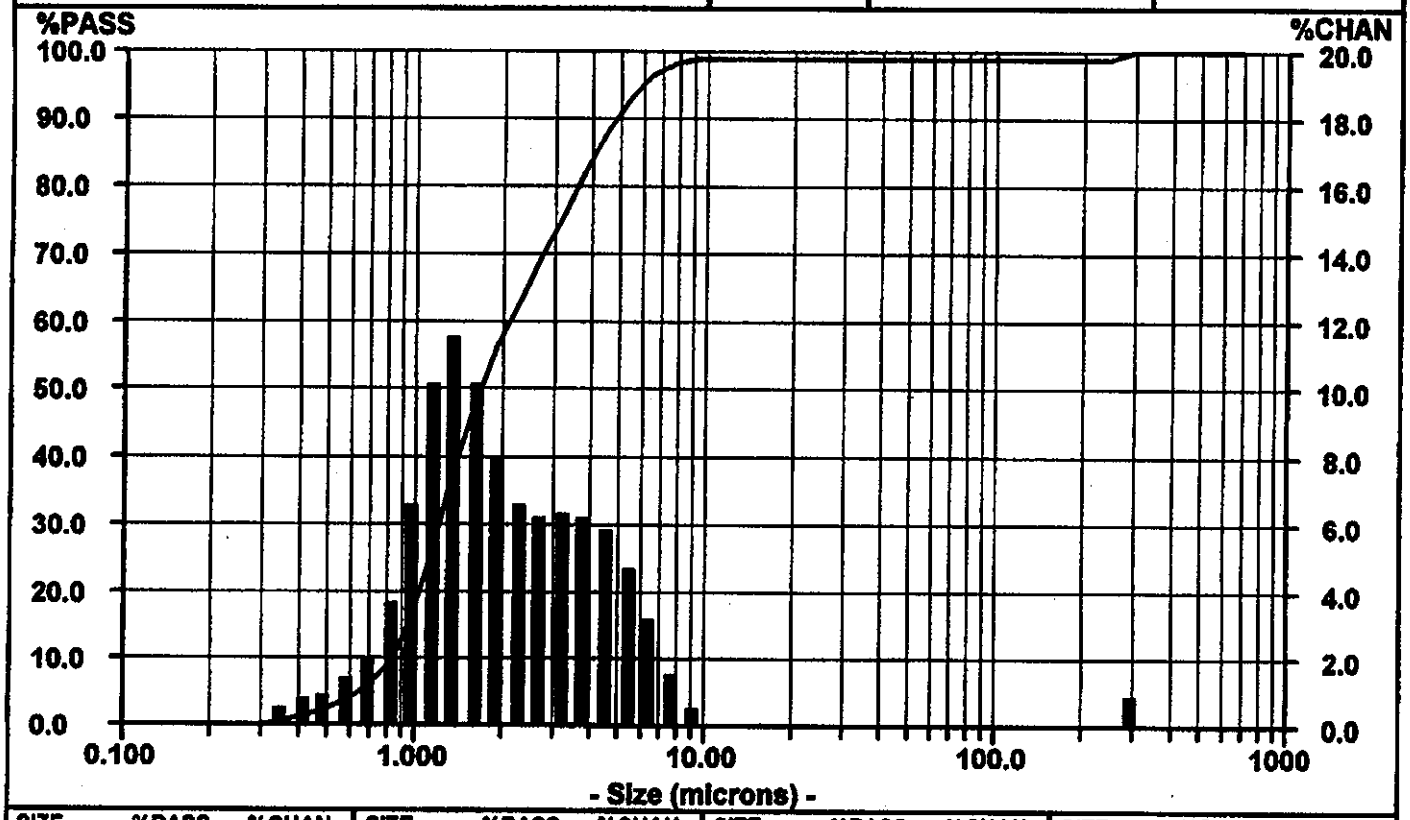
AW-103

103AW
Sample

Date: 09/22/91 Meas #: 00001
Time: 15:12 Pres #: 01

1 M NaOH 1 M NaNO3
40 ml/sec
20 min sonication
Refractive Index = 2.00 particle 1.33 medium
File: WPAA022

Summary	Percentiles		Dia	Vol%	Width
mv = 5.144	10% = 0.825	60% = 2.121	271.4	1%	29.48
mn = 0.684	20% = 1.039	70% = 2.774	3.745	36%	2.782
ma = 1.472	30% = 1.216	80% = 3.633	1.246	63%	0.973
cs = 4.076	40% = 1.414	90% = 4.866			
sd = 1.546	50% = 1.686	95% = 5.950			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	98.94	0.67						
592.0	100.00	0.00	7.778	98.27	1.68						
497.8	100.00	0.00	6.541	96.59	3.27						
418.6	100.00	0.00	5.500	93.32	4.88						
352.0	100.00	0.00	4.625	88.44	5.95						
296.0	100.00	1.06	3.889	82.49	6.39						
248.9	98.94	0.00	3.270	76.10	6.42						
209.3	98.94	0.00	2.750	69.68	6.39						
176.0	98.94	0.00	2.312	63.29	6.78						
148.0	98.94	0.00	1.945	56.51	8.05						
124.5	98.94	0.00	1.635	48.46	10.20						
104.7	98.94	0.00	1.375	38.26	11.67						
88.00	98.94	0.00	1.156	26.59	10.20						
74.00	98.94	0.00	0.972	16.39	6.66						
62.23	98.94	0.00	0.818	9.73	3.72						
52.33	98.94	0.00	0.688	6.01	2.15						
44.00	98.94	0.00	0.578	3.86	1.41						
37.00	98.94	0.00	0.486	2.45	1.03						
31.11	98.94	0.00	0.409	1.42	0.81						
26.16	98.94	0.00	0.344	0.61	0.61						
22.00	98.94	0.00	0.289	0.00	0.00						
18.50	98.94	0.00	0.243	0.00	0.00						
15.56	98.94	0.00	0.204	0.00	0.00						
13.08	98.94	0.00	0.172	0.00	0.00						
11.00	98.94	0.00	0.145	0.00	0.00						

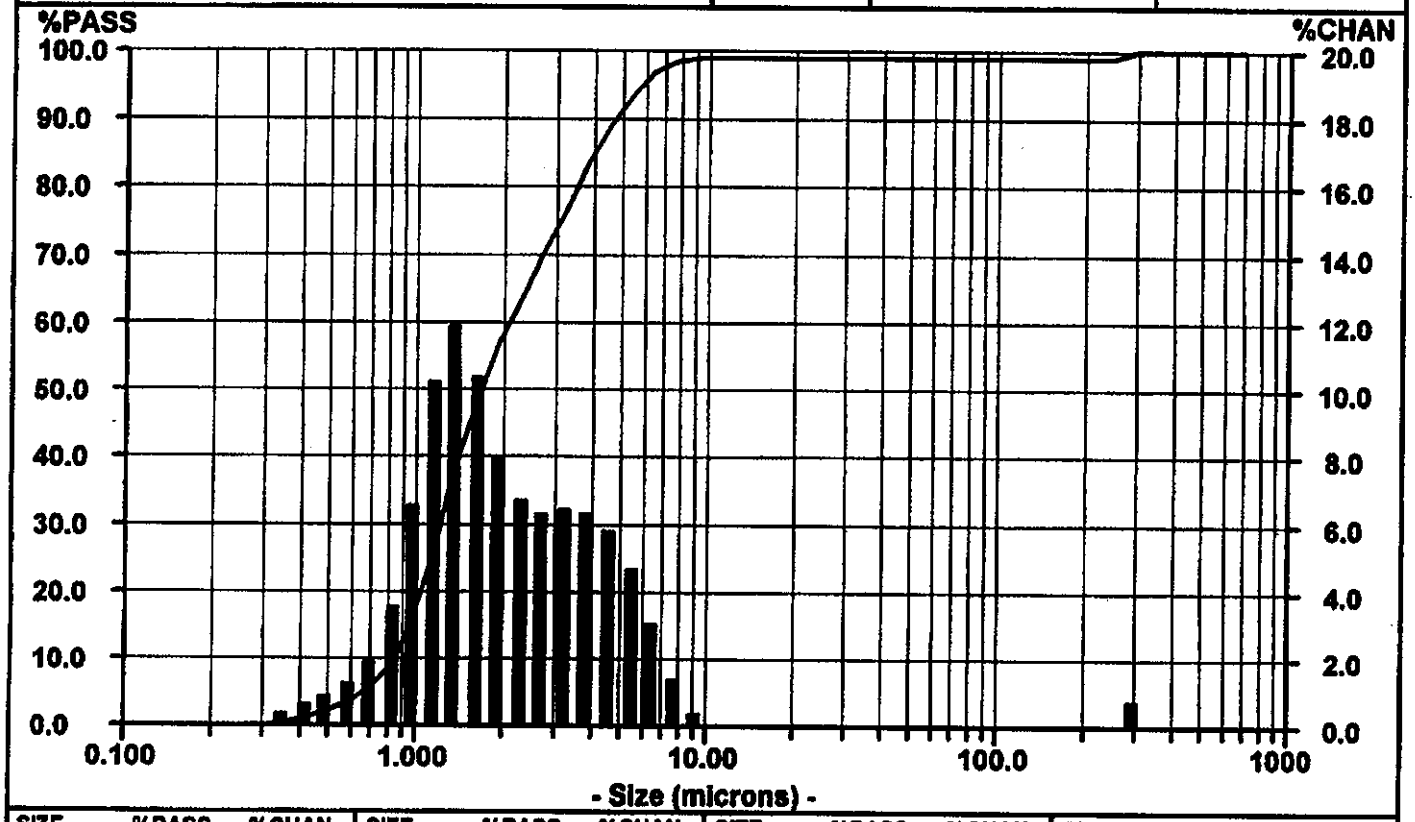
AW-103

103AW
Sample

Date: 09/22/91 Meas #: 00001
Time: 15:18 Pres #: 01

1 M NaOH 1 M NaNO3
80 ml/sec
20 min sonication
Refractive Index = 1.50 particle 1.33 medium
File: WPAA023

Summary	Percentiles		Dia	Vol%	Width
mv = 4.478	10% = 0.838	60% = 2.099	3.750	36%	2.853
mn = 0.701	20% = 1.047	70% = 2.735	1.254	64%	0.960
ma = 1.479	30% = 1.220	80% = 3.566			
cs = 4.067	40% = 1.413	90% = 4.748			
sd = 1.500	50% = 1.678	95% = 5.767			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	99.18	0.57						
592.0	100.00	0.00	7.778	98.61	1.52						
497.8	100.00	0.00	6.541	97.09	3.10						
418.6	100.00	0.00	5.500	93.99	4.79						
352.0	100.00	0.00	4.625	89.20	5.98						
296.0	100.00	0.82	3.889	83.22	6.49						
248.9	99.18	0.00	3.270	76.73	6.52						
209.3	99.18	0.00	2.750	70.21	6.47						
176.0	99.18	0.00	2.312	63.74	6.85						
148.0	99.18	0.00	1.945	56.89	8.20						
124.5	99.18	0.00	1.635	48.69	10.45						
104.7	99.18	0.00	1.375	38.24	11.95						
88.00	99.18	0.00	1.156	26.29	10.39						
74.00	99.18	0.00	0.972	15.90	6.66						
62.23	99.18	0.00	0.818	9.24	3.64						
52.33	99.18	0.00	0.688	5.60	2.05						
44.00	99.18	0.00	0.578	3.55	1.32						
37.00	99.18	0.00	0.486	2.23	0.95						
31.11	99.18	0.00	0.409	1.28	0.73						
26.16	99.18	0.00	0.344	0.55	0.55						
22.00	99.18	0.00	0.289	0.00	0.00						
18.50	99.18	0.00	0.243	0.00	0.00						
15.56	99.18	0.00	0.204	0.00	0.00						
13.08	99.18	0.00	0.172	0.00	0.00						
11.00	99.18	0.00	0.145	0.00	0.00						

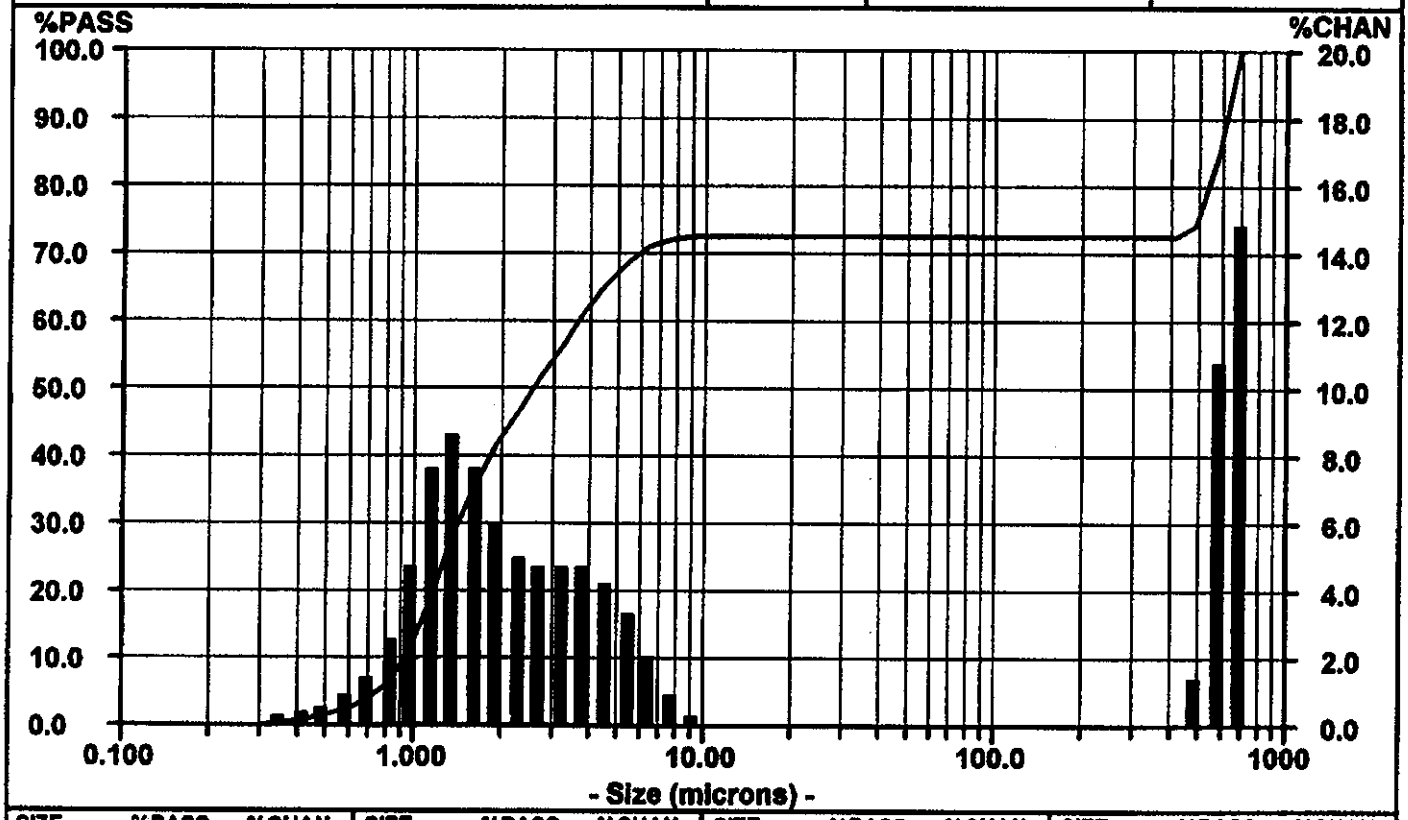
AW-103

103AW Sample

Date: 09/22/91 Meas #: 00001
Time: 15:22 Pres #: 01

1 M NaOH 1 M NaNO3
60 ml/sec
20 min sonication
Refractive Index = 1.70 particle 1.33 medium
File: WPAA024

Summary	Percentiles		Dia	Vol%	Width
mv = 164.5	10% = 0.929	60% = 3.714	599.6	27%	132.5
mn = 0.711	20% = 1.176	70% = 5.872	3.680	26%	2.647
ma = 2.022	30% = 1.436	80% = 554.2	1.258	47%	0.959
cs = 2.967	40% = 1.843	90% = 622.7			
sd = 291.5	50% = 2.591	95% = 656.2			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	14.90	9.250	72.64	0.39						
592.0	85.10	10.87	7.778	72.25	1.04						
497.8	74.23	1.59	6.541	71.21	2.16						
418.6	72.64	0.00	5.500	69.05	3.43						
352.0	72.64	0.00	4.625	65.62	4.37						
296.0	72.64	0.00	3.889	61.25	4.79						
248.9	72.64	0.00	3.270	56.46	4.82						
209.3	72.64	0.00	2.750	51.64	4.79						
176.0	72.64	0.00	2.312	46.85	5.09						
148.0	72.64	0.00	1.945	41.76	6.09						
124.5	72.64	0.00	1.635	35.67	7.73						
104.7	72.64	0.00	1.375	27.94	8.79						
88.00	72.64	0.00	1.156	19.15	7.61						
74.00	72.64	0.00	0.972	11.54	4.89						
62.23	72.64	0.00	0.818	6.65	2.67						
52.33	72.64	0.00	0.688	3.98	1.49						
44.00	72.64	0.00	0.578	2.49	0.94						
37.00	72.64	0.00	0.486	1.55	0.66						
31.11	72.64	0.00	0.409	0.89	0.51						
26.16	72.64	0.00	0.344	0.38	0.38						
22.00	72.64	0.00	0.289	0.00	0.00						
18.50	72.64	0.00	0.243	0.00	0.00						
15.56	72.64	0.00	0.204	0.00	0.00						
13.08	72.64	0.00	0.172	0.00	0.00						
11.00	72.64	0.00	0.145	0.00	0.00						

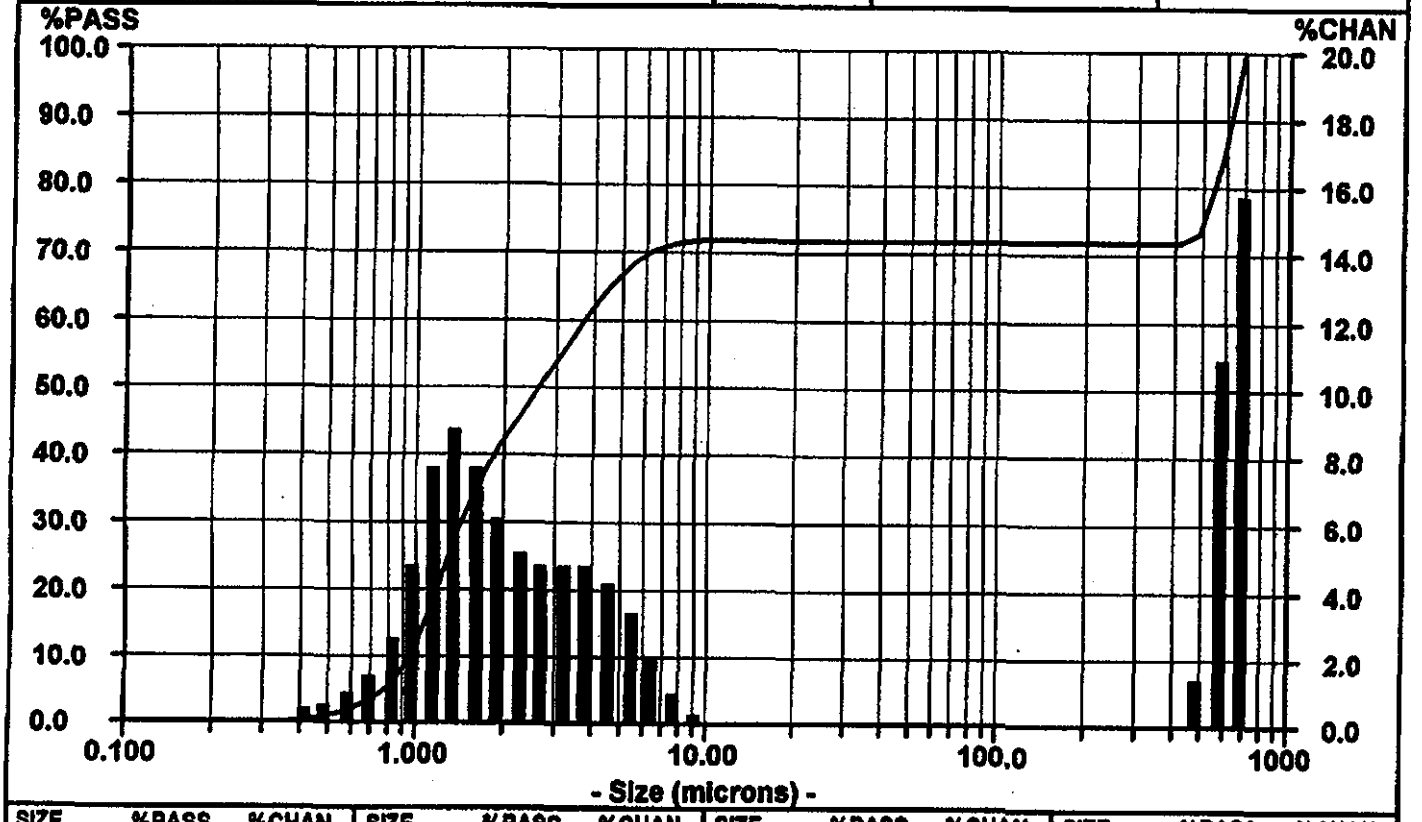
AW-103

1 M NaOH 1 M NaNO3
50 ml/sec
20 min sonication
Refractive Index = 2.00 particle 1.33 medium
File: WPAA025

103AW
Sample

Date: 09/22/91 Meas #: 00001
Time: 15:26 Pres #: 01

Summary	Percentiles		Dia	Vol%	Width
mv = 169.8	10% = 0.946	60% = 3.775	602.0	28%	130.8
mn = 0.805	20% = 1.189	70% = 6.165	3.654	25%	2.579
ma = 2.089	30% = 1.462	80% = 561.7	1.266	47%	0.946
cs = 2.873	40% = 1.870	90% = 626.4			
sd = 294.6	50% = 2.636	95% = 658.5			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	15.75	9.260	71.84	0.33						
592.0	84.25	10.96	7.778	71.51	0.94						
497.8	73.29	1.45	6.541	70.57	2.05						
418.6	71.84	0.00	5.500	68.52	3.36						
352.0	71.84	0.00	4.625	65.16	4.35						
296.0	71.84	0.00	3.889	60.81	4.80						
248.9	71.84	0.00	3.270	56.01	4.84						
209.3	71.84	0.00	2.750	51.17	4.80						
176.0	71.84	0.00	2.312	46.37	5.10						
148.0	71.84	0.00	1.945	41.27	6.11						
124.5	71.84	0.00	1.635	35.16	7.76						
104.7	71.84	0.00	1.375	27.40	8.83						
88.00	71.84	0.00	1.156	18.57	7.63						
74.00	71.84	0.00	0.972	10.94	4.87						
62.23	71.84	0.00	0.818	6.07	2.63						
52.33	71.84	0.00	0.688	3.44	1.45						
44.00	71.84	0.00	0.578	1.99	0.90						
37.00	71.84	0.00	0.486	1.09	0.64						
31.11	71.84	0.00	0.409	0.45	0.45						
26.16	71.84	0.00	0.344	0.00	0.00						
22.00	71.84	0.00	0.289	0.00	0.00						
18.50	71.84	0.00	0.243	0.00	0.00						
15.56	71.84	0.00	0.204	0.00	0.00						
13.08	71.84	0.00	0.172	0.00	0.00						
11.00	71.84	0.00	0.145	0.00	0.00						

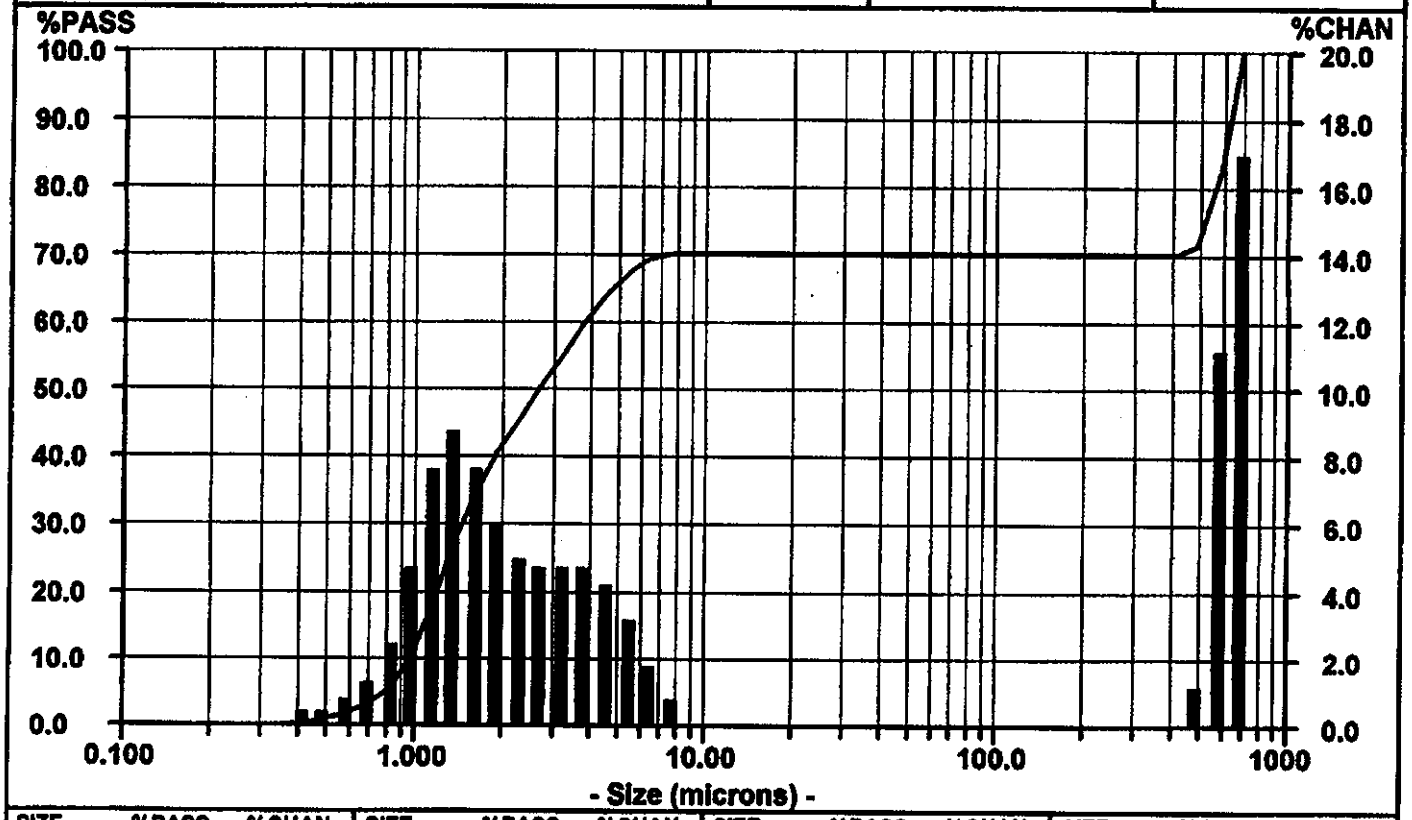
AW-103

1 M NaOH 1 M NaNO3
17 ml/sec
20 min sonication
Refractive index = 1.50 particle 1.33 medium
File: WPAA026

103AW
Sample

Date: 09/22/91 Meas #: 00001
Time: 15:31 Pres #: 01

Summary	Percentiles		Dia	Vol%	Width
mv = 179.1	10% = 0.957	60% = 3.862	604.5	30%	128.5
mn = 0.820	20% = 1.199	70% = 6.981	3.603	25%	2.431
ma = 2.130	30% = 1.466	80% = 572.2	1.269	45%	0.938
cs = 2.817	40% = 1.900	90% = 631.3			
sd = 298.4	50% = 2.696	95% = 661.4			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	17.05	9.250	70.40	0.00						
592.0	82.95	11.26	7.778	70.40	0.81						
497.8	71.69	1.29	6.541	69.59	1.87						
418.6	70.40	0.00	5.500	67.72	3.22						
352.0	70.40	0.00	4.625	64.50	4.31						
296.0	70.40	0.00	3.889	60.19	4.81						
248.9	70.40	0.00	3.270	55.38	4.83						
209.3	70.40	0.00	2.750	50.55	4.76						
176.0	70.40	0.00	2.312	45.79	5.04						
148.0	70.40	0.00	1.945	40.75	6.05						
124.5	70.40	0.00	1.635	34.70	7.73						
104.7	70.40	0.00	1.375	26.97	8.82						
88.00	70.40	0.00	1.156	18.15	7.60						
74.00	70.40	0.00	0.972	10.55	4.80						
62.23	70.40	0.00	0.818	5.75	2.55						
52.33	70.40	0.00	0.688	3.20	1.38						
44.00	70.40	0.00	0.578	1.82	0.84						
37.00	70.40	0.00	0.486	0.98	0.58						
31.11	70.40	0.00	0.409	0.40	0.40						
26.16	70.40	0.00	0.344	0.00	0.00						
22.00	70.40	0.00	0.289	0.00	0.00						
18.50	70.40	0.00	0.243	0.00	0.00						
15.56	70.40	0.00	0.204	0.00	0.00						
13.08	70.40	0.00	0.172	0.00	0.00						
11.00	70.40	0.00	0.145	0.00	0.00						

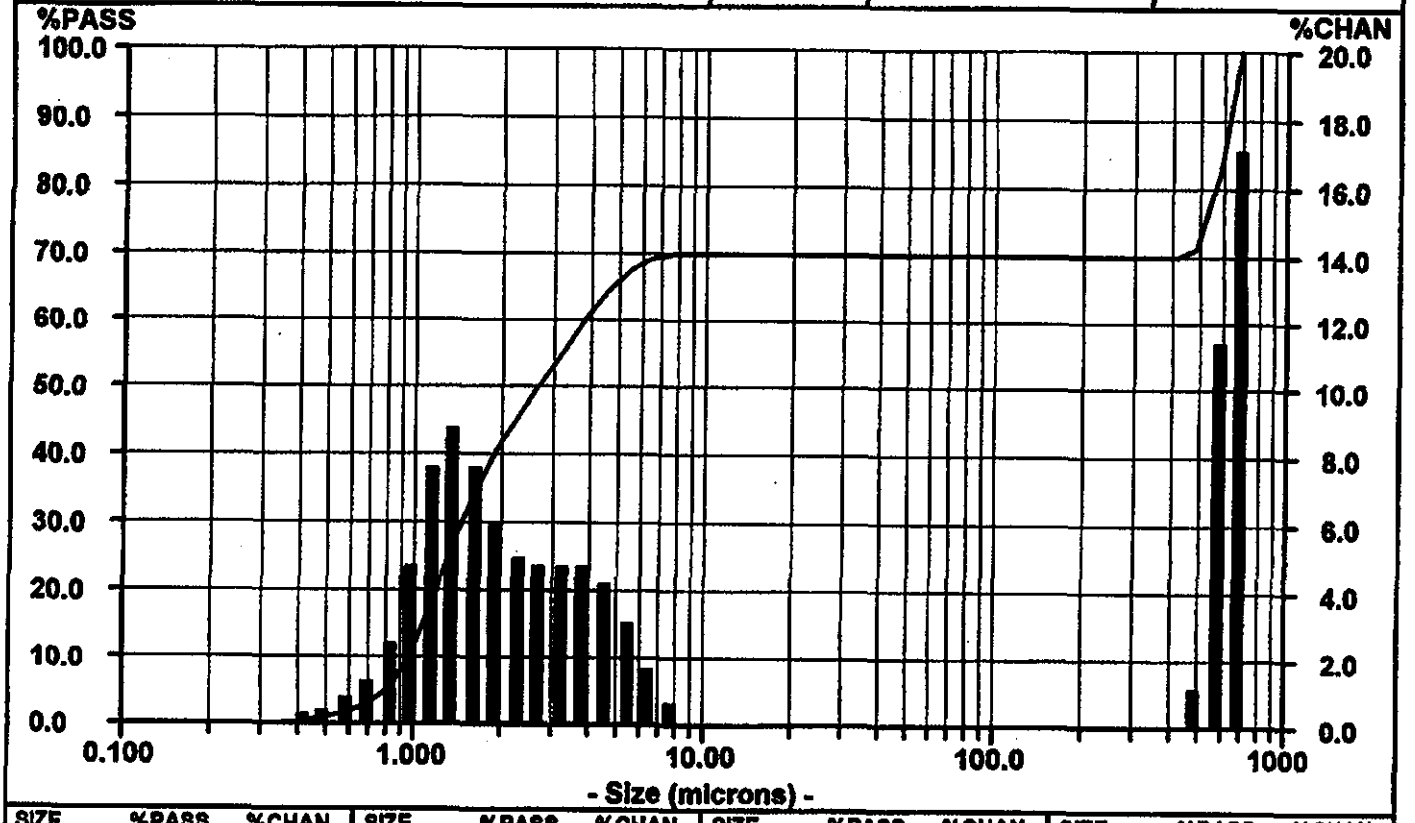
AW-103

103AW
Sample

Date: 09/22/91 Meas #: 00001
Time: 15:35 Pres #: 01

1 M NaOH 1 M NaNO3
17 ml/sec
20 min sonication
Refractive Index = 1.70 particle 1.33 medium
File: WPAA027

Summary	Percentiles		Dia	Vol%	Width
mv = 180.8	10% = 0.962	60% = 3.861	604.4	30%	128.3
mn = 0.828	20% = 1.203	70% = 7.422	3.580	24%	2.372
ma = 2.143	30% = 1.469	80% = 573.5	1.272	46%	0.932
cs = 2.800	40% = 1.904	90% = 631.7			
sd = 298.8	50% = 2.701	95% = 661.6			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	17.20	9.250	70.11	0.00						
592.0	82.80	11.43	7.778	70.11	0.72						
497.6	71.37	1.26	6.541	69.39	1.75						
418.6	70.11	0.00	5.500	67.64	3.14						
352.0	70.11	0.00	4.625	64.50	4.30						
296.0	70.11	0.00	3.889	60.20	4.84						
248.9	70.11	0.00	3.270	55.36	4.86						
209.3	70.11	0.00	2.750	50.50	4.77						
176.0	70.11	0.00	2.312	45.73	5.04						
148.0	70.11	0.00	1.945	40.69	6.06						
124.5	70.11	0.00	1.635	34.63	7.77						
104.7	70.11	0.00	1.375	26.86	8.88						
88.00	70.11	0.00	1.156	17.98	7.64						
74.00	70.11	0.00	0.972	10.34	4.78						
62.23	70.11	0.00	0.818	5.56	2.50						
52.33	70.11	0.00	0.688	3.06	1.33						
44.00	70.11	0.00	0.578	1.73	0.80						
37.00	70.11	0.00	0.486	0.93	0.55						
31.11	70.11	0.00	0.409	0.38	0.38						
26.16	70.11	0.00	0.344	0.00	0.00						
22.00	70.11	0.00	0.289	0.00	0.00						
18.50	70.11	0.00	0.243	0.00	0.00						
15.56	70.11	0.00	0.204	0.00	0.00						
13.08	70.11	0.00	0.172	0.00	0.00						
11.00	70.11	0.00	0.145	0.00	0.00						

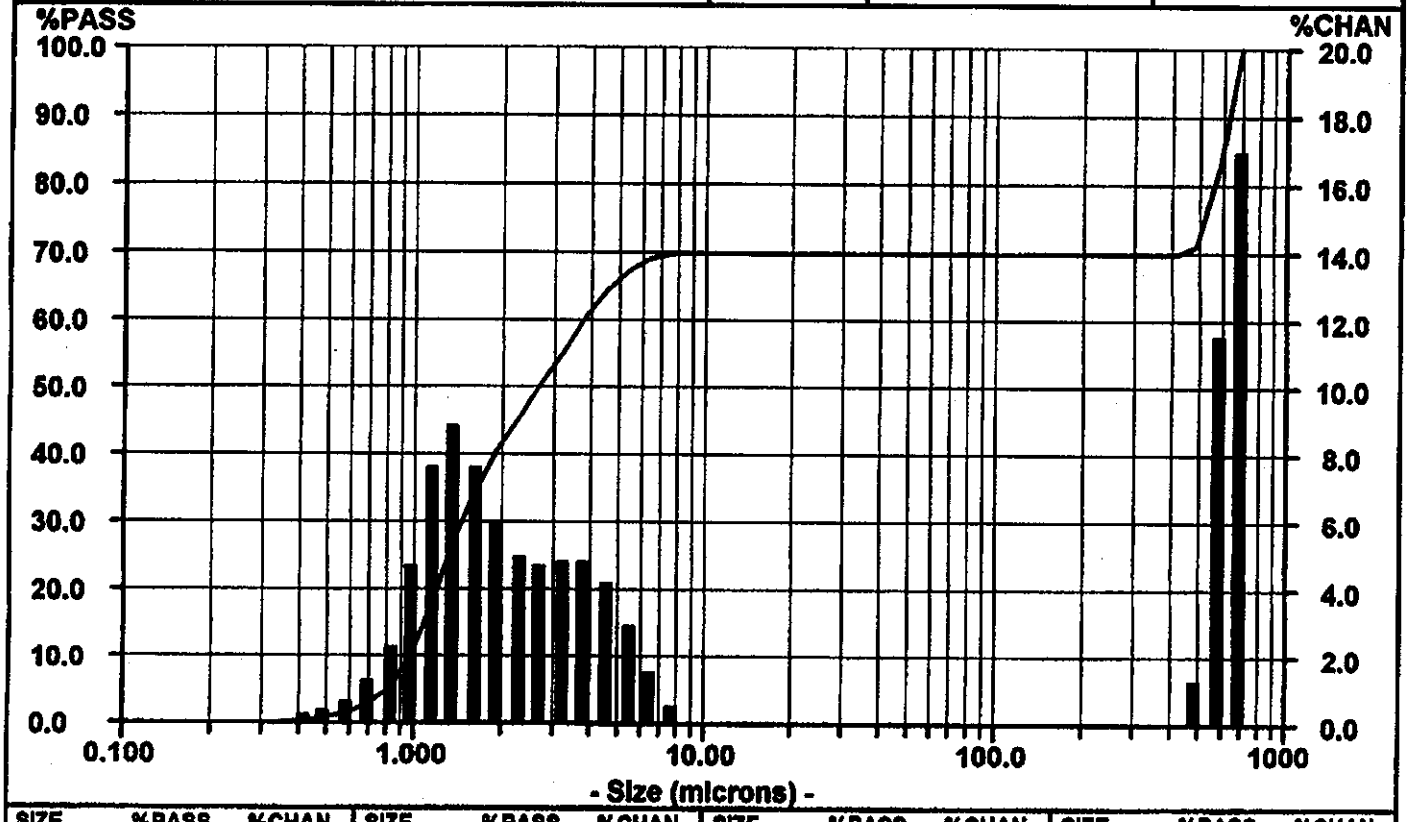
AW-103

103AW
Sample

Date: 09/22/91 Meas #: 00001
Time: 15:39 Pres #: 01

1 M NaOH 1 M NaNO3
17 ml/sec
20 min sonication
Refractive Index = 2.00 particle 1.33 medium
File WPAA028

Summary	Percentiles		Dia	Vol%	Width
mv = 181.6	10% = 0.966	60% = 3.845	603.2	30%	129.0
mn = 0.836	20% = 1.204	70% = 444.8	3.555	24%	2.313
ma = 2.150	30% = 1.470	80% = 572.8	1.273	46%	0.928
cs = 2.791	40% = 1.905	90% = 631.1			
sd = 298.4	50% = 2.701	95% = 661.2			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	17.06	9.250	69.93	0.00						
592.0	82.94	11.68	7.778	69.93	0.63						
497.8	71.26	1.33	6.541	69.30	1.63						
418.6	69.93	0.00	5.500	67.67	3.05						
352.0	69.93	0.00	4.625	64.62	4.30						
296.0	69.93	0.00	3.889	60.32	4.90						
248.9	69.93	0.00	3.270	55.42	4.92						
209.3	69.93	0.00	2.750	50.50	4.80						
176.0	69.93	0.00	2.312	45.70	5.04						
148.0	69.93	0.00	1.945	40.66	6.05						
124.5	69.93	0.00	1.635	34.61	7.78						
104.7	69.93	0.00	1.375	26.83	8.93						
88.00	69.93	0.00	1.156	17.90	7.68						
74.00	69.93	0.00	0.972	10.22	4.78						
62.23	69.93	0.00	0.818	5.44	2.48						
52.33	69.93	0.00	0.688	2.96	1.30						
44.00	69.93	0.00	0.578	1.66	0.78						
37.00	69.93	0.00	0.486	0.88	0.62						
31.11	69.93	0.00	0.409	0.36	0.36						
26.16	69.93	0.00	0.344	0.00	0.00						
22.00	69.93	0.00	0.289	0.00	0.00						
18.50	69.93	0.00	0.243	0.00	0.00						
15.56	69.93	0.00	0.204	0.00	0.00						
13.08	69.93	0.00	0.172	0.00	0.00						
11.00	69.93	0.00	0.145	0.00	0.00						

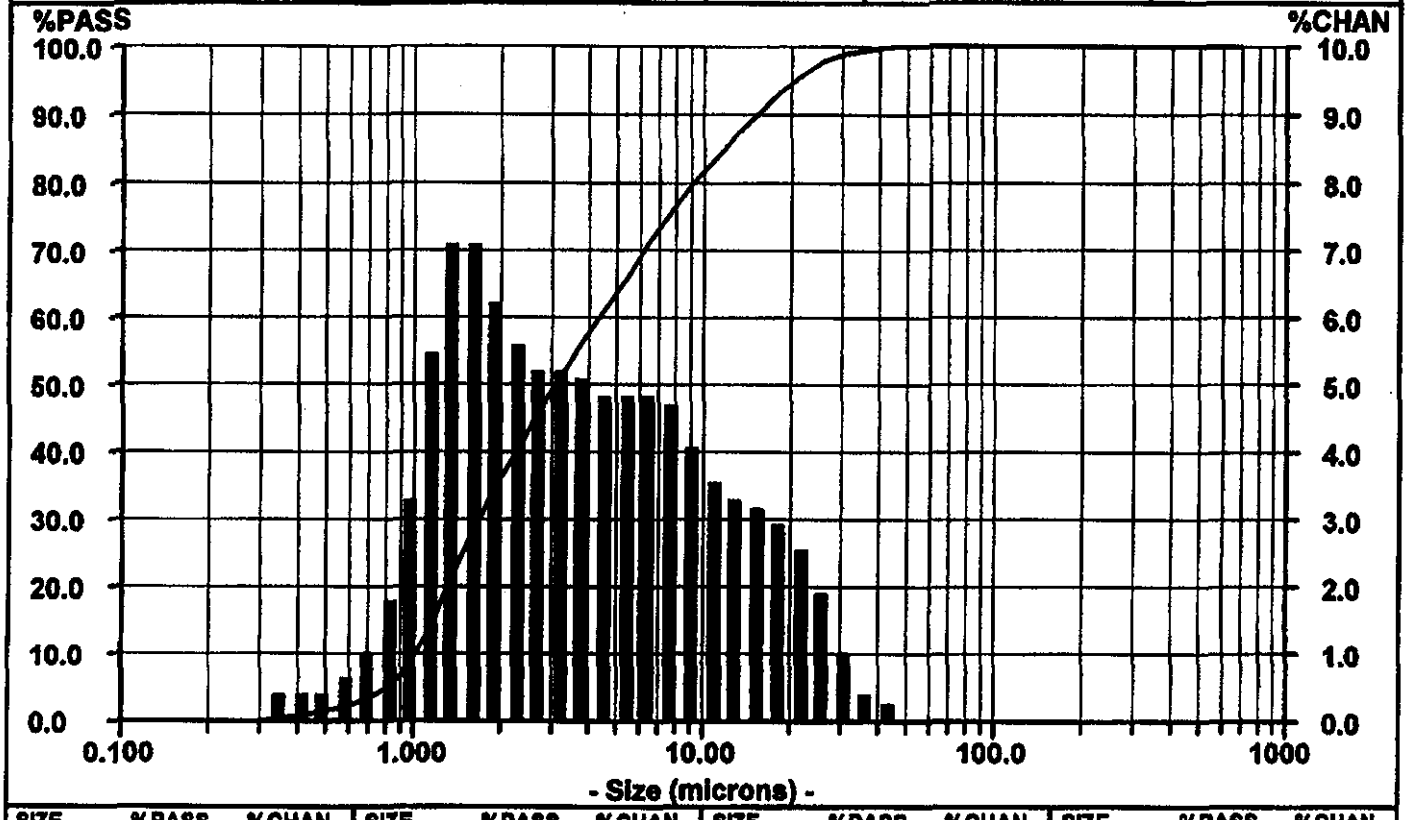
AW-103

AW-103
Duplicate

Date: 09/25/91 Meas #: 00001
Time: 12:49 Pres #: 01

1 M NaOH 1 M NaNO3
Sonicate 2 min. with a delay of 60 min.
External Sonication
Flow rate = 17 ml/sec.
Refractive index = 1.50 Particle 1.33 Medium
File: WPA007

Summary	Percentiles		Dia	Vol%	Width
mv = 5.869	10% = 1.019	60% = 4.412	3.134	100%	9.931
mn = 0.694	20% = 1.330	70% = 6.257			
ma = 2.163	30% = 1.696	80% = 9.199			
cs = 2.774	40% = 2.266	90% = 15.34			
sd = 4.965	50% = 3.134	95% = 20.50			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	80.13	4.18						
592.0	100.00	0.00	7.778	75.95	4.70						
497.8	100.00	0.00	6.541	71.25	4.94						
418.6	100.00	0.00	5.500	66.31	4.96						
352.0	100.00	0.00	4.625	61.35	4.97						
296.0	100.00	0.00	3.889	56.38	5.10						
248.9	100.00	0.00	3.270	51.28	5.25						
209.3	100.00	0.00	2.750	46.03	5.38						
176.0	100.00	0.00	2.312	40.65	5.68						
148.0	100.00	0.00	1.945	34.97	6.38						
124.5	100.00	0.00	1.635	28.61	7.19						
104.7	100.00	0.00	1.375	21.42	7.15						
88.00	100.00	0.00	1.156	14.27	5.59						
74.00	100.00	0.00	0.972	8.68	3.43						
62.23	100.00	0.00	0.818	5.25	1.89						
52.33	100.00	0.00	0.688	3.36	1.10						
44.00	100.00	0.32	0.578	2.26	0.76						
37.00	99.68	0.60	0.486	1.51	0.58						
31.11	99.08	1.14	0.409	0.93	0.50						
26.16	97.94	1.92	0.344	0.43	0.43						
22.00	96.02	2.67	0.289	0.00	0.00						
18.50	93.35	3.09	0.243	0.00	0.00						
15.56	90.26	3.20	0.204	0.00	0.00						
13.08	87.06	3.30	0.172	0.00	0.00						
11.00	83.76	3.63	0.145	0.00	0.00						

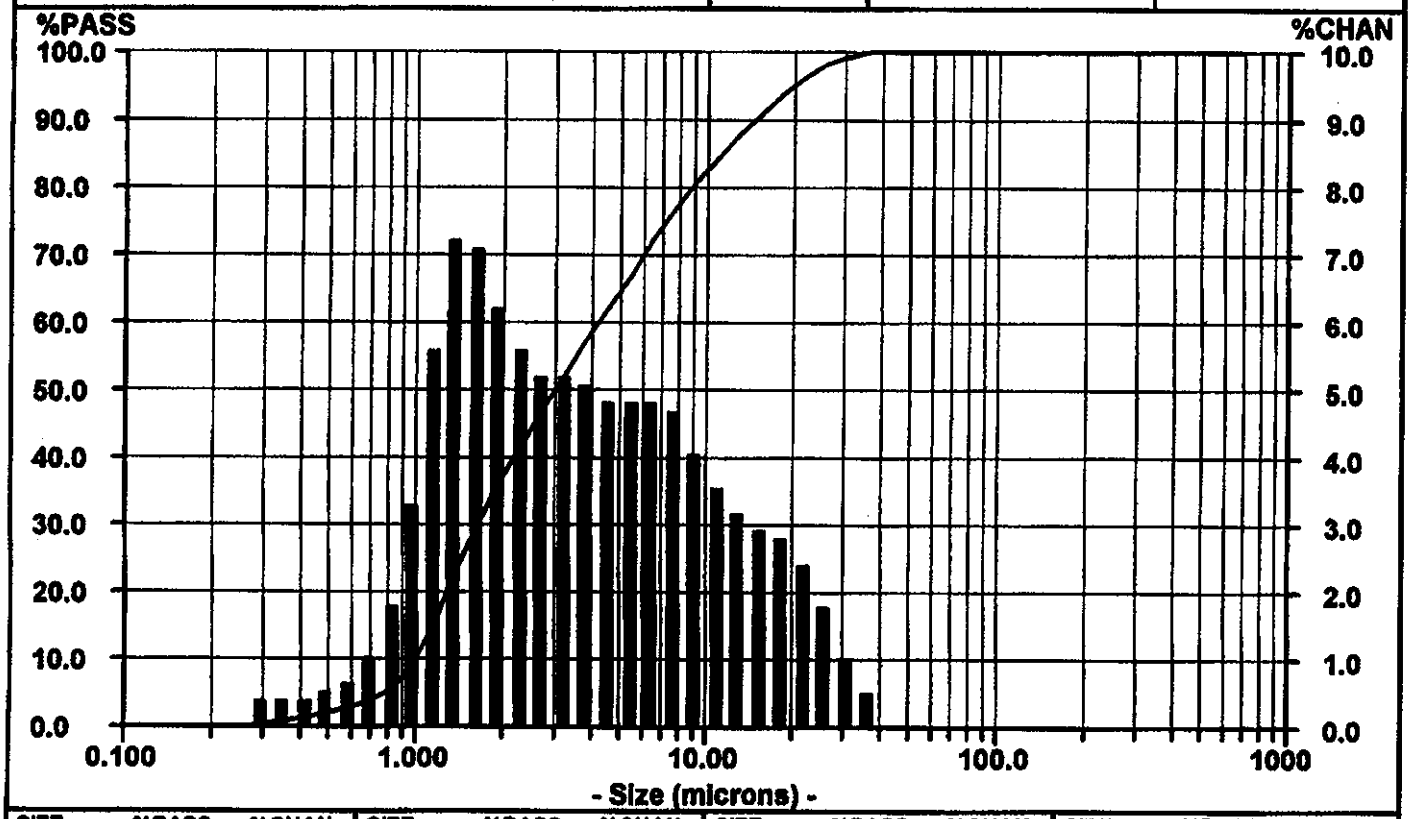
AW-103

AW-103
Duplicate

Date: 09/25/91 Meas #: 00001
Time: 12:53 Pres #: 01

1 M NaOH 1 M NaNO3
Sonicate for 2 min. with a delay of 60 min.
External Sonication
Flow rate = 17 ml/sec.
Refractive Index = 1.70 Particle 1.33 Medium
File: WPA008

Summary	Percentiles		Dia	Vol%	Width
mv = 5.642	10% = 0.997	60% = 4.263	3.036	100%	9.436
mn = 0.564	20% = 1.305	70% = 6.052			
ma = 2.057	30% = 1.653	80% = 8.825			
cs = 2.916	40% = 2.198	90% = 14.71			
sd = 4.718	50% = 3.036	95% = 19.88			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	81.08	4.18						
592.0	100.00	0.00	7.778	76.90	4.70						
497.8	100.00	0.00	6.541	72.20	4.93						
418.6	100.00	0.00	5.500	67.27	4.94						
352.0	100.00	0.00	4.625	62.33	4.97						
296.0	100.00	0.00	3.889	57.36	5.11						
248.9	100.00	0.00	3.270	52.25	5.26						
209.3	100.00	0.00	2.750	46.99	5.38						
176.0	100.00	0.00	2.312	41.61	5.66						
148.0	100.00	0.00	1.945	35.95	6.37						
124.5	100.00	0.00	1.635	29.58	7.28						
104.7	100.00	0.00	1.375	22.30	7.33						
88.00	100.00	0.00	1.156	14.97	5.69						
74.00	100.00	0.00	0.972	9.28	3.44						
62.23	100.00	0.00	0.818	5.84	1.87						
52.33	100.00	0.00	0.688	3.97	1.10						
44.00	100.00	0.00	0.578	2.87	0.76						
37.00	100.00	0.65	0.486	2.11	0.61						
31.11	99.35	1.13	0.408	1.50	0.54						
26.16	98.22	1.82	0.344	0.96	0.51						
22.00	96.40	2.50	0.289	0.45	0.45						
18.50	93.90	2.91	0.243	0.00	0.00						
15.56	90.99	3.07	0.204	0.00	0.00						
13.08	87.92	3.23	0.172	0.00	0.00						
11.00	84.69	3.61	0.145	0.00	0.00						

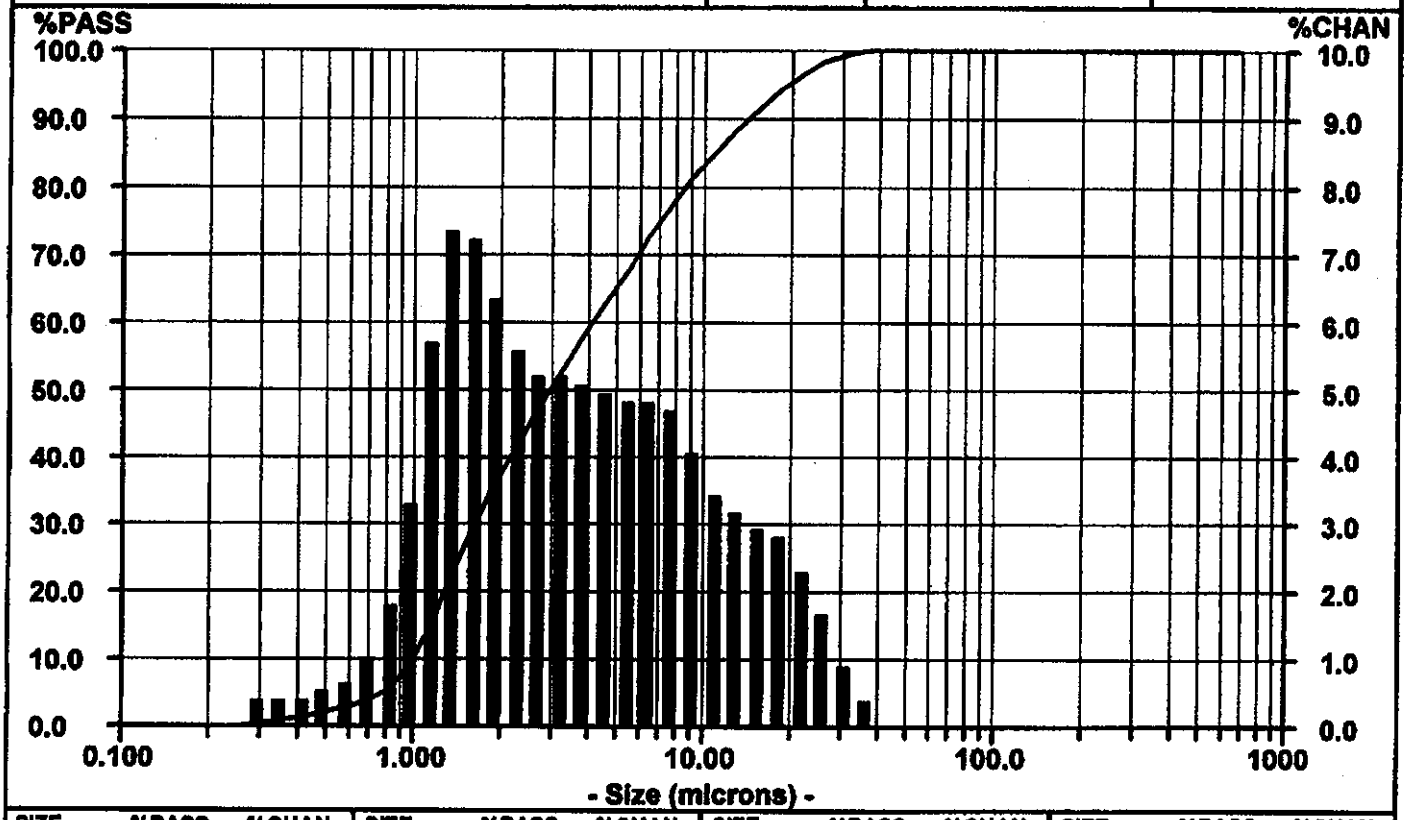
AW-103

AW-103
Sample

Date: 09/25/91 Meas #: 00001
Time: 12:57 Pres #: 01

1 M NaOH 1 M NaNO3
Sonicate for 2 min. with delay of 60 min.
External Sonication
Flow rate = 17 ml/sec.
Refractive Index = 2.00 Particle 1.33 Medium
File: WPA009

Summary	Percentiles		Dia	Vol%	Width
mv = 5.519	10% = 0.995	60% = 4.185	2.988	100%	9.159
mn = 0.566	20% = 1.297	70% = 5.930			
ma = 2.042	30% = 1.636	80% = 8.613			
cs = 2.939	40% = 2.168	90% = 14.30			
sd = 4.579	50% = 2.988	95% = 19.37			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	81.65	4.16						
592.0	100.00	0.00	7.778	77.49	4.70						
497.8	100.00	0.00	6.541	72.79	4.94						
418.6	100.00	0.00	5.500	67.85	4.97						
352.0	100.00	0.00	4.625	62.88	5.00						
296.0	100.00	0.00	3.888	57.88	5.14						
248.9	100.00	0.00	3.270	52.74	5.28						
209.3	100.00	0.00	2.750	47.46	5.39						
176.0	100.00	0.00	2.312	42.07	5.68						
148.0	100.00	0.00	1.945	36.39	6.42						
124.5	100.00	0.00	1.635	29.97	7.38						
104.7	100.00	0.00	1.375	22.59	7.46						
88.00	100.00	0.00	1.156	15.13	5.79						
74.00	100.00	0.00	0.972	9.34	3.48						
62.23	100.00	0.00	0.818	5.86	1.89						
52.33	100.00	0.00	0.688	3.97	1.10						
44.00	100.00	0.00	0.578	2.87	0.76						
37.00	100.00	0.55	0.486	2.11	0.61						
31.11	99.45	1.02	0.409	1.50	0.54						
26.16	98.43	1.71	0.344	0.96	0.51						
22.00	96.72	2.41	0.289	0.45	0.45						
18.50	94.31	2.85	0.243	0.00	0.00						
15.56	91.46	3.03	0.204	0.00	0.00						
13.08	88.43	3.20	0.172	0.00	0.00						
11.00	85.23	3.58	0.145	0.00	0.00						

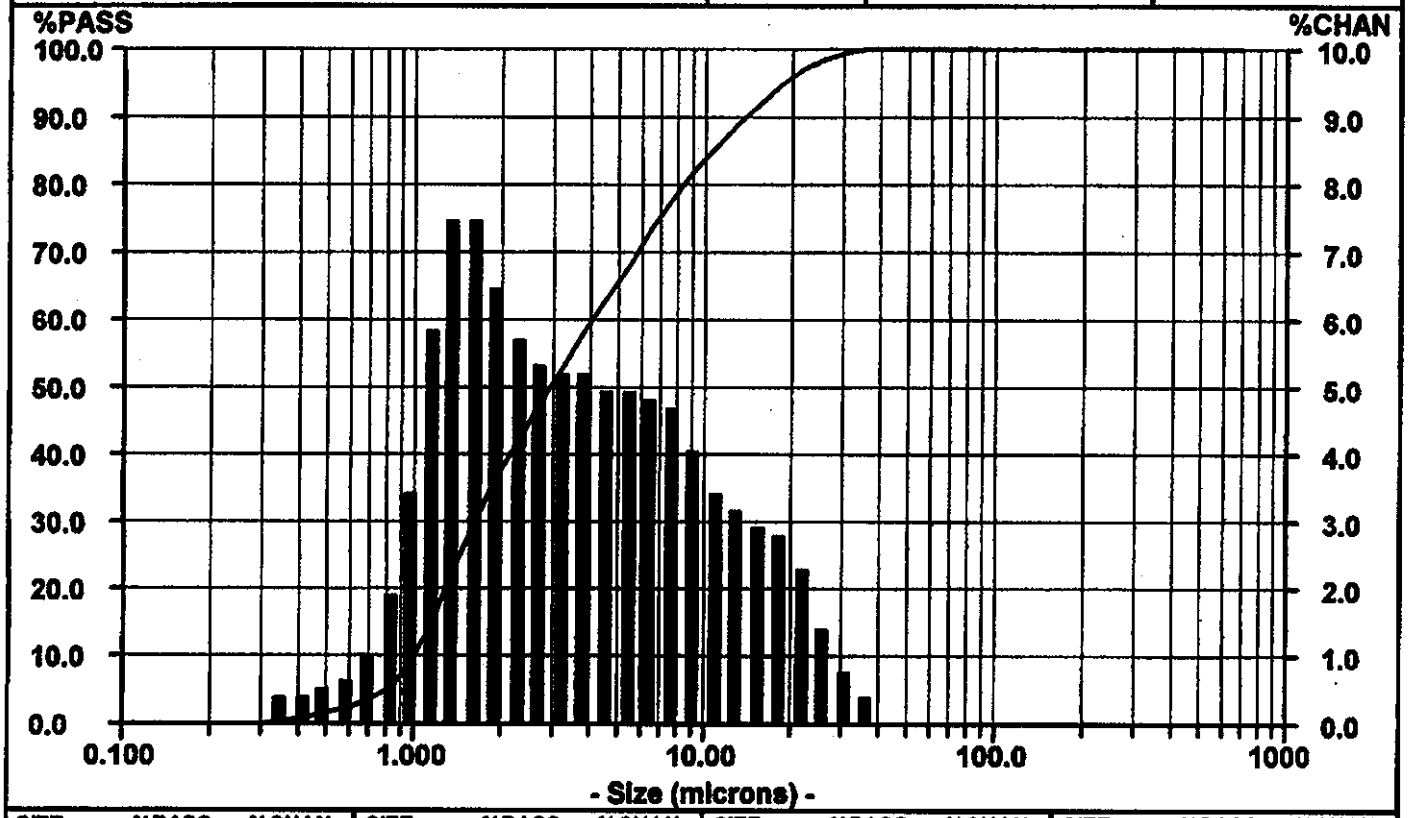
AW-103

AW-103
Sample

Date: 09/25/91 Meas #: 00001
Time: 13:02 Pres #: 01

1 M NaOH 1 M NaNO3
Sonicate for 2 min. with a delay of 60 min.
External Sonication
Flow rate = 40 ml/sec.
Refractive Index = 2.00 Particle 1.33 Medium
File: WPA010

Summary	Percentiles		Dia	Vol%	Width
mv = 5.403	10% = 1.007	60% = 4.127	2.961	100%	8.882
mn = 0.885	20% = 1.302	70% = 5.826			
ma = 2.092	30% = 1.635	80% = 8.419			
cs = 2.868	40% = 2.157	90% = 13.87			
sd = 4.441	50% = 2.961	95% = 18.77			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	82.19	4.16						
592.0	100.00	0.00	7.778	78.03	4.71						
497.8	100.00	0.00	6.541	73.32	4.98						
418.6	100.00	0.00	5.500	68.34	5.02						
352.0	100.00	0.00	4.625	63.32	5.06						
296.0	100.00	0.00	3.889	58.26	5.20						
248.9	100.00	0.00	3.270	53.06	5.35						
209.3	100.00	0.00	2.750	47.71	5.45						
176.0	100.00	0.00	2.312	42.26	5.75						
148.0	100.00	0.00	1.945	36.51	6.52						
124.5	100.00	0.00	1.635	29.99	7.51						
104.7	100.00	0.00	1.375	22.48	7.60						
88.00	100.00	0.00	1.156	14.88	5.91						
74.00	100.00	0.00	0.972	8.97	3.55						
62.23	100.00	0.00	0.818	5.42	1.91						
52.33	100.00	0.00	0.688	3.51	1.11						
44.00	100.00	0.00	0.578	2.40	0.77						
37.00	100.00	0.45	0.486	1.63	0.61						
31.11	99.55	0.88	0.409	1.02	0.54						
26.16	98.67	1.67	0.344	0.48	0.48						
22.00	97.10	2.31	0.289	0.00	0.00						
18.50	94.79	2.81	0.243	0.00	0.00						
15.56	91.98	3.01	0.204	0.00	0.00						
13.08	88.97	3.20	0.172	0.00	0.00						
11.00	85.77	3.58	0.145	0.00	0.00						

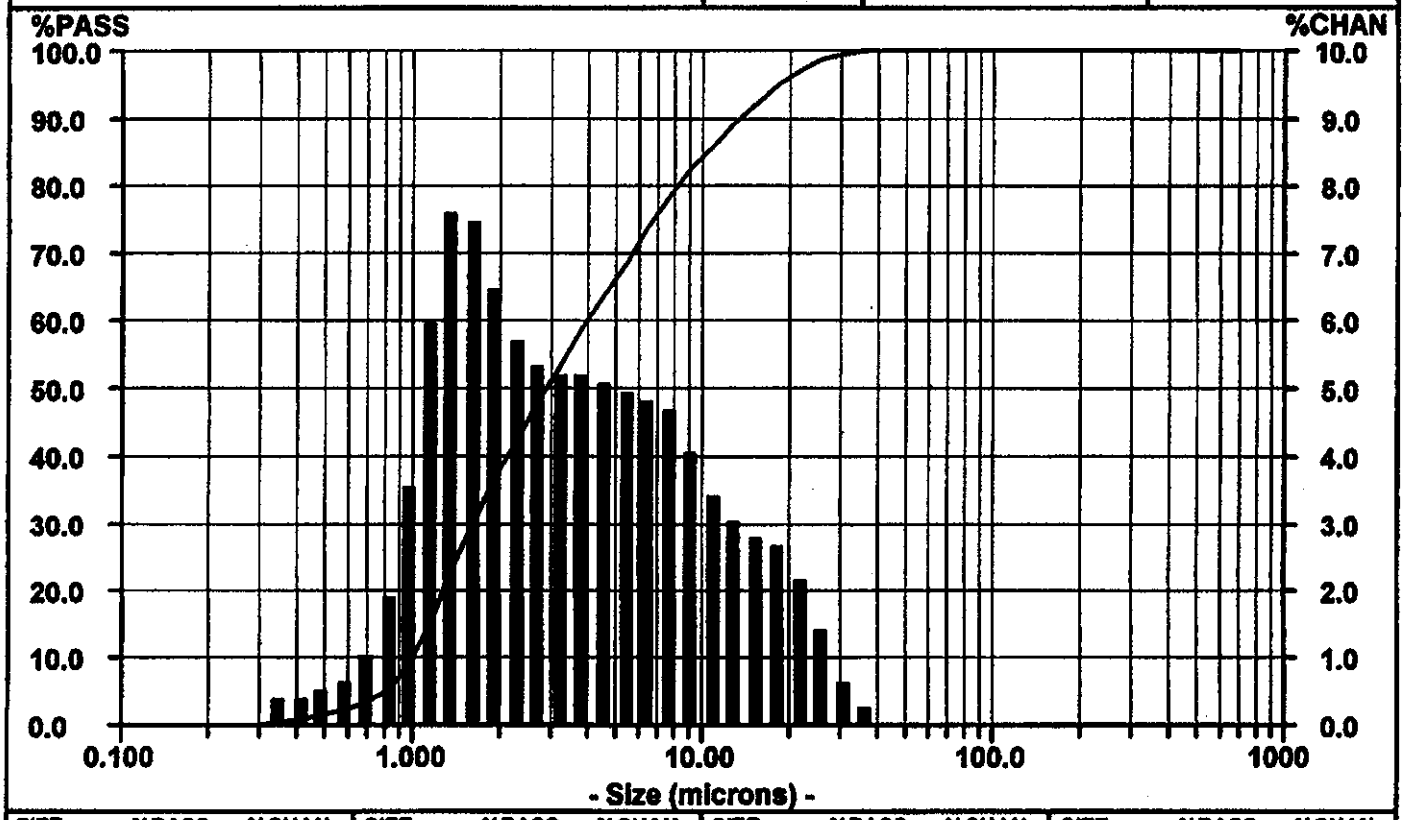
AW-103

AW-103
Sample

Date: 09/25/91 Meas #: 00001
Time: 13:07 Pres #: 01

1 M NaOH 1 M NaNO3
Sonicate for 2 min. with a delay of 60 min.
External Sonication
Flow rate = 40 ml/sec.
Refractive Index = 1.70 Particle 1.33 Medium
File: WPA011

Summary	Percentiles		Dia	Vol%	Width
mv = 5.292	10% = 1.004	60% = 4.053	2.920	100%	8.634
mn = 0.689	20% = 1.295	70% = 5.714			
ma = 2.078	30% = 1.622	80% = 8.234			
cs = 2.888	40% = 2.131	90% = 13.49			
sd = 4.317	50% = 2.920	95% = 18.31			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	82.73	4.15						
592.0	100.00	0.00	7.778	78.58	4.70						
497.8	100.00	0.00	6.541	73.88	4.98						
418.6	100.00	0.00	5.500	68.90	5.03						
352.0	100.00	0.00	4.625	63.87	5.10						
296.0	100.00	0.00	3.889	58.77	5.25						
248.9	100.00	0.00	3.270	53.52	5.38						
209.3	100.00	0.00	2.750	48.14	5.48						
176.0	100.00	0.00	2.312	42.66	5.77						
148.0	100.00	0.00	1.945	36.89	6.55						
124.5	100.00	0.00	1.635	30.34	7.69						
104.7	100.00	0.00	1.375	22.75	7.71						
88.00	100.00	0.00	1.156	15.04	6.01						
74.00	100.00	0.00	0.972	9.03	3.60						
62.23	100.00	0.00	0.818	5.43	1.93						
52.33	100.00	0.00	0.688	3.50	1.12						
44.00	100.00	0.00	0.578	2.38	0.76						
37.00	100.00	0.38	0.486	1.62	0.61						
31.11	99.62	0.79	0.409	1.01	0.54						
26.16	98.83	1.46	0.344	0.47	0.47						
22.00	97.37	2.21	0.289	0.00	0.00						
18.50	95.16	2.73	0.243	0.00	0.00						
15.56	92.43	2.97	0.204	0.00	0.00						
13.08	89.46	3.17	0.172	0.00	0.00						
11.00	86.29	3.56	0.145	0.00	0.00						

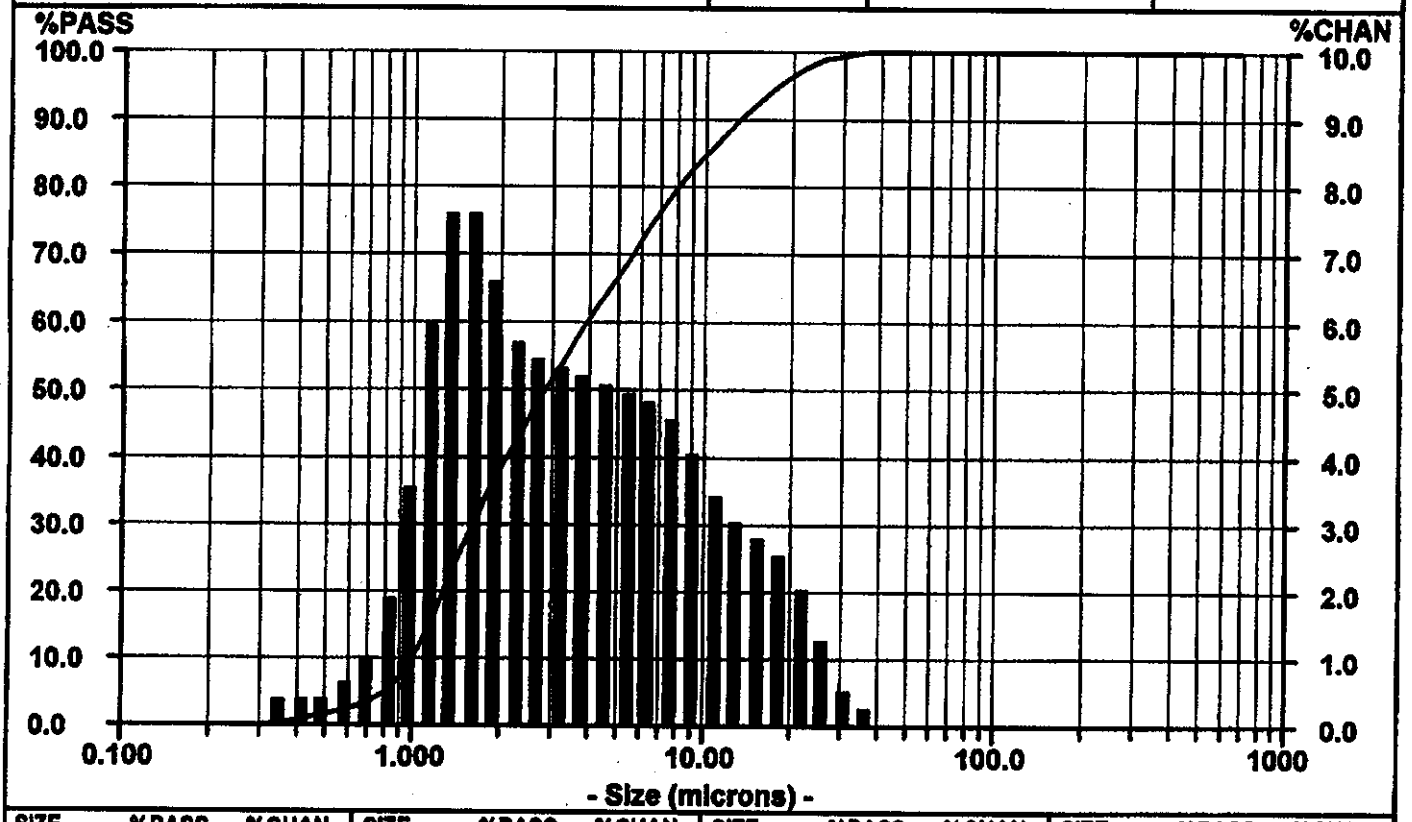
AW-103

AW-103
Sample

Date: 09/25/91 Meas #: 00001
Time: 13:11 Pres #: 01

1 M NaOH 1 M NaNO3
Sonicate for 2 min. with a delay of 60 min.
External Sonication
Flow Rate = 40 ml/sec.
Refractive Index = 1.50 Particle 1.33 Medium
File: WPA012

Summary	Percentiles		Dia	Vol%	Width
mv = 5.188	10% = 1.002	60% = 3.993	2.881	100%	8.422
mn = 0.691	20% = 1.290	70% = 5.616			
ma = 2.065	30% = 1.612	80% = 8.070			
cs = 2.905	40% = 2.110	90% = 13.16			
sd = 4.211	50% = 2.881	95% = 17.84			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	83.20	4.12						
592.0	100.00	0.00	7.778	79.08	4.69						
497.8	100.00	0.00	6.541	74.39	4.99						
418.6	100.00	0.00	5.500	69.40	5.06						
352.0	100.00	0.00	4.625	64.34	5.12						
296.0	100.00	0.00	3.889	59.22	5.27						
248.9	100.00	0.00	3.270	53.95	5.41						
209.3	100.00	0.00	2.750	48.54	5.52						
176.0	100.00	0.00	2.312	43.02	5.82						
148.0	100.00	0.00	1.945	37.20	6.60						
124.5	100.00	0.00	1.635	30.60	7.65						
104.7	100.00	0.00	1.375	22.95	7.77						
88.00	100.00	0.00	1.156	15.18	6.09						
74.00	100.00	0.00	0.972	9.09	3.65						
62.23	100.00	0.00	0.818	5.44	1.95						
52.33	100.00	0.00	0.688	3.49	1.12						
44.00	100.00	0.00	0.578	2.37	0.76						
37.00	100.00	0.31	0.486	1.61	0.60						
31.11	99.69	0.69	0.408	1.01	0.54						
26.16	99.00	1.35	0.344	0.47	0.47						
22.00	97.65	2.12	0.289	0.00	0.00						
18.50	95.53	2.69	0.243	0.00	0.00						
15.56	92.84	2.95	0.204	0.00	0.00						
13.08	89.89	3.15	0.172	0.00	0.00						
11.00	86.74	3.54	0.145	0.00	0.00						

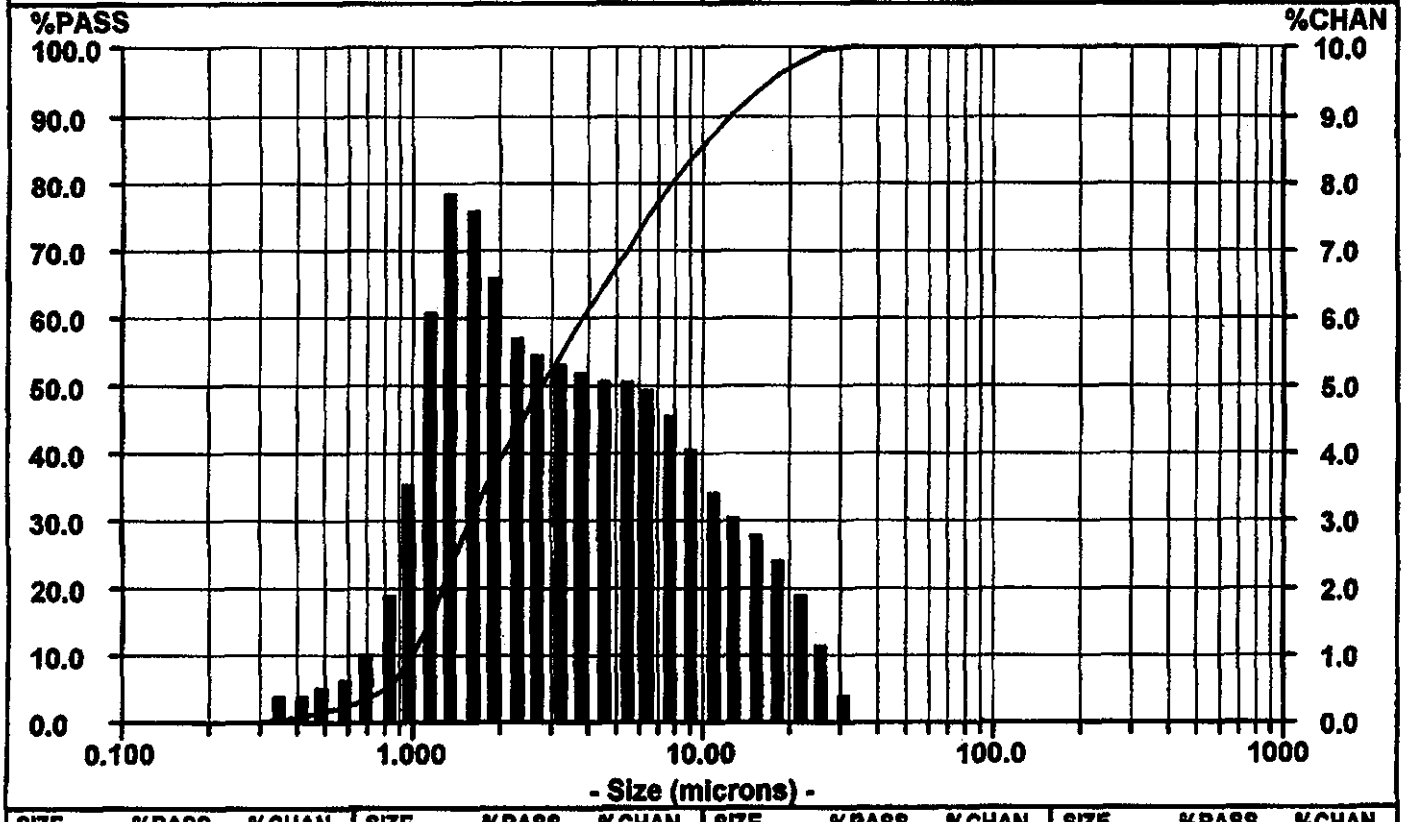
AW-103

AW-103
Sample

Date: 09/25/91 Meas #: 00001
Time: 13:16 Pres #: 01

1 M NaOH 1 M NaNO3
Sonicate for 2 min. with a delay of 60 min.
External Sonication
Flow rate = 60 ml/sec.
Refractive Index = 1.50 Particle 1.33 Medium
File: WPA013

Summary	Percentiles		Dia	Vol%	Width
mv = 4.986	10% = 0.999	60% = 3.882	2.823	100%	8.049
mn = 0.693	20% = 1.282	70% = 5.452			
ma = 2.043	30% = 1.595	80% = 7.791			
cs = 2.937	40% = 2.075	90% = 12.56			
sd = 4.024	50% = 2.823	95% = 17.01			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	84.07	4.11						
592.0	100.00	0.00	7.778	79.96	4.69						
497.8	100.00	0.00	6.541	75.27	5.01						
418.6	100.00	0.00	5.500	70.26	5.10						
352.0	100.00	0.00	4.625	65.16	5.18						
296.0	100.00	0.00	3.889	59.98	5.33						
248.9	100.00	0.00	3.270	54.65	5.47						
209.3	100.00	0.00	2.750	49.18	5.66						
176.0	100.00	0.00	2.312	43.52	5.87						
148.0	100.00	0.00	1.945	37.75	5.88						
124.5	100.00	0.00	1.635	31.07	7.77						
104.7	100.00	0.00	1.375	23.30	7.93						
88.00	100.00	0.00	1.156	15.37	6.19						
74.00	100.00	0.00	0.972	9.18	3.69						
62.23	100.00	0.00	0.818	5.49	1.97						
52.33	100.00	0.00	0.688	3.52	1.13						
44.00	100.00	0.00	0.578	2.39	0.77						
37.00	100.00	0.00	0.486	1.62	0.61						
31.11	100.00	0.59	0.409	1.01	0.54						
26.16	99.41	1.22	0.344	0.47	0.47						
22.00	98.19	1.99	0.289	0.00	0.00						
18.50	96.20	2.59	0.243	0.00	0.00						
15.56	93.61	2.89	0.204	0.00	0.00						
13.08	90.72	3.13	0.172	0.00	0.00						
11.00	87.59	3.62	0.145	0.00	0.00						

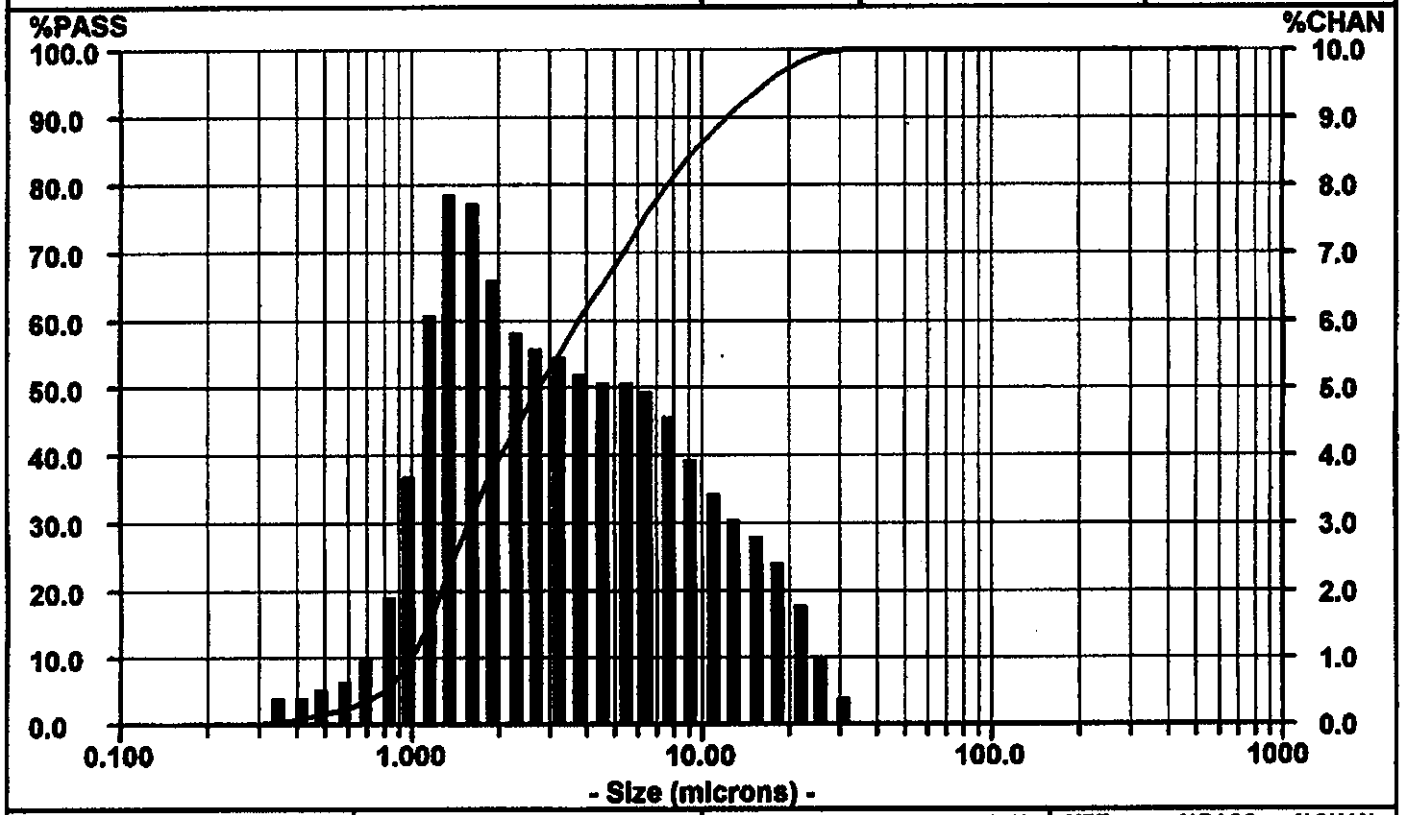
AW-103

AW-103
Sample

Date: 09/26/91 Meas #: 00001
Time: 13:20 Pres #: 01

1 M NaOH 1 M NaNO3
Sonicate for 2 min.with a delay of 60 min.
External Sonication
Flow rate = 60 ml/sec.
Refractive Index = 1.70 Particle 1.33 Medium
File: WPA014

Summary	Percentiles		Dia	Vol%	Width
mv = 4.906	10% = 0.997	60% = 3.839	2.790	100%	7.877
mn = 0.694	20% = 1.278	70% = 5.372			
ma = 2.032	30% = 1.687	80% = 7.861			
cs = 2.953	40% = 2.057	90% = 12.29			
sd = 3.939	50% = 2.790	95% = 16.66			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	84.50	4.10						
592.0	100.00	0.00	7.778	80.40	4.69						
497.8	100.00	0.00	6.541	75.71	5.01						
418.6	100.00	0.00	5.500	70.70	5.11						
352.0	100.00	0.00	4.625	65.59	5.19						
296.0	100.00	0.00	3.889	60.40	5.35						
248.9	100.00	0.00	3.270	55.05	5.50						
209.3	100.00	0.00	2.750	49.55	5.60						
176.0	100.00	0.00	2.312	43.95	5.91						
148.0	100.00	0.00	1.945	38.04	6.73						
124.5	100.00	0.00	1.635	31.31	7.84						
104.7	100.00	0.00	1.375	23.47	7.99						
88.00	100.00	0.00	1.156	15.48	6.25						
74.00	100.00	0.00	0.972	9.23	3.73						
62.23	100.00	0.00	0.818	5.50	1.98						
52.33	100.00	0.00	0.688	3.52	1.13						
44.00	100.00	0.00	0.578	2.39	0.77						
37.00	100.00	0.00	0.486	1.62	0.61						
31.11	100.00	0.52	0.409	1.01	0.54						
26.16	99.48	1.12	0.344	0.47	0.47						
22.00	98.36	1.89	0.289	0.00	0.00						
18.50	96.47	2.52	0.243	0.00	0.00						
15.56	93.95	2.85	0.204	0.00	0.00						
13.08	91.10	3.10	0.172	0.00	0.00						
11.00	88.00	3.50	0.145	0.00	0.00						

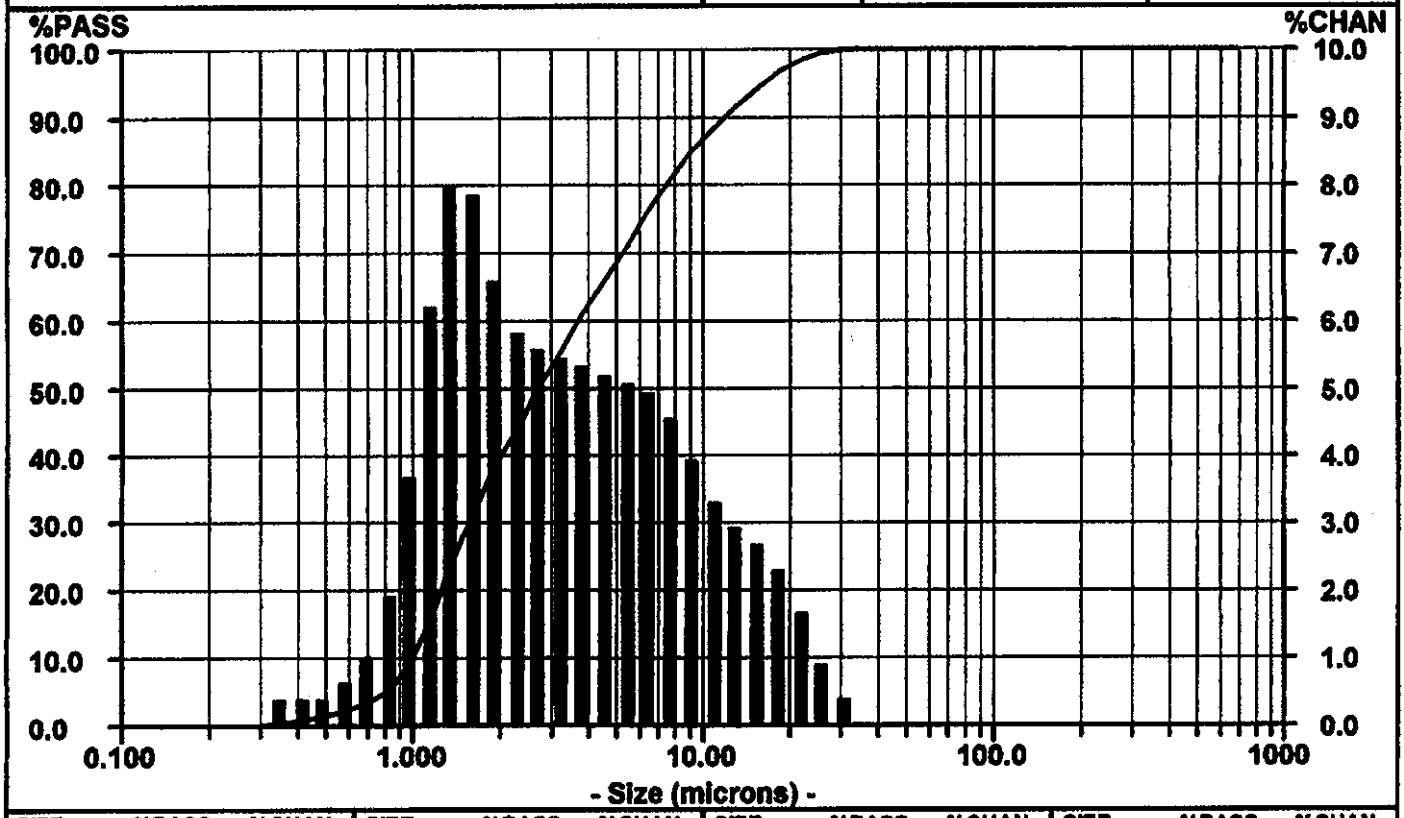
AW-103

AW-103
Sample

Date: 09/25/91 Meas #: 00001
Time: 13:26 Pres #: 01

1 M NaOH 1 M NaNO3
Sonicate for 2 min. with a delay of 60 min.
External Sonication
Flow rate = 60 ml/sec.
Refractive Index = 2.00 Particle/1.33 Medium
File: WPA015

Summary	Percentiles		Dia	Vol%	Width
mv = 4.792	10% = 0.995	60% = 3.763	2.745	100%	7.632
mn = 0.699	20% = 1.272	70% = 5.249			
ma = 2.017	30% = 1.573	80% = 7.468			
cs = 2.975	40% = 2.030	90% = 11.90			
sd = 3.816	50% = 2.745	95% = 16.18			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	85.12	4.07						
592.0	100.00	0.00	7.778	81.05	4.66						
497.8	100.00	0.00	6.541	76.39	5.01						
418.6	100.00	0.00	5.500	71.38	5.13						
352.0	100.00	0.00	4.625	66.25	5.23						
296.0	100.00	0.00	3.889	61.02	5.41						
248.9	100.00	0.00	3.270	55.61	5.55						
209.3	100.00	0.00	2.750	50.06	5.64						
176.0	100.00	0.00	2.312	44.42	5.95						
148.0	100.00	0.00	1.945	38.47	6.78						
124.5	100.00	0.00	1.635	31.69	7.92						
104.7	100.00	0.00	1.375	23.77	8.14						
88.00	100.00	0.00	1.156	15.63	6.35						
74.00	100.00	0.00	0.972	9.28	3.78						
62.23	100.00	0.00	0.818	5.50	2.00						
52.33	100.00	0.00	0.688	3.50	1.14						
44.00	100.00	0.00	0.578	2.36	0.77						
37.00	100.00	0.00	0.486	1.59	0.60						
31.11	100.00	0.43	0.409	0.99	0.53						
26.16	99.57	0.99	0.344	0.46	0.46						
22.00	98.58	1.75	0.289	0.00	0.00						
18.50	96.83	2.41	0.243	0.00	0.00						
15.56	94.42	2.78	0.204	0.00	0.00						
13.08	91.64	3.05	0.172	0.00	0.00						
11.00	88.59	3.47	0.145	0.00	0.00						

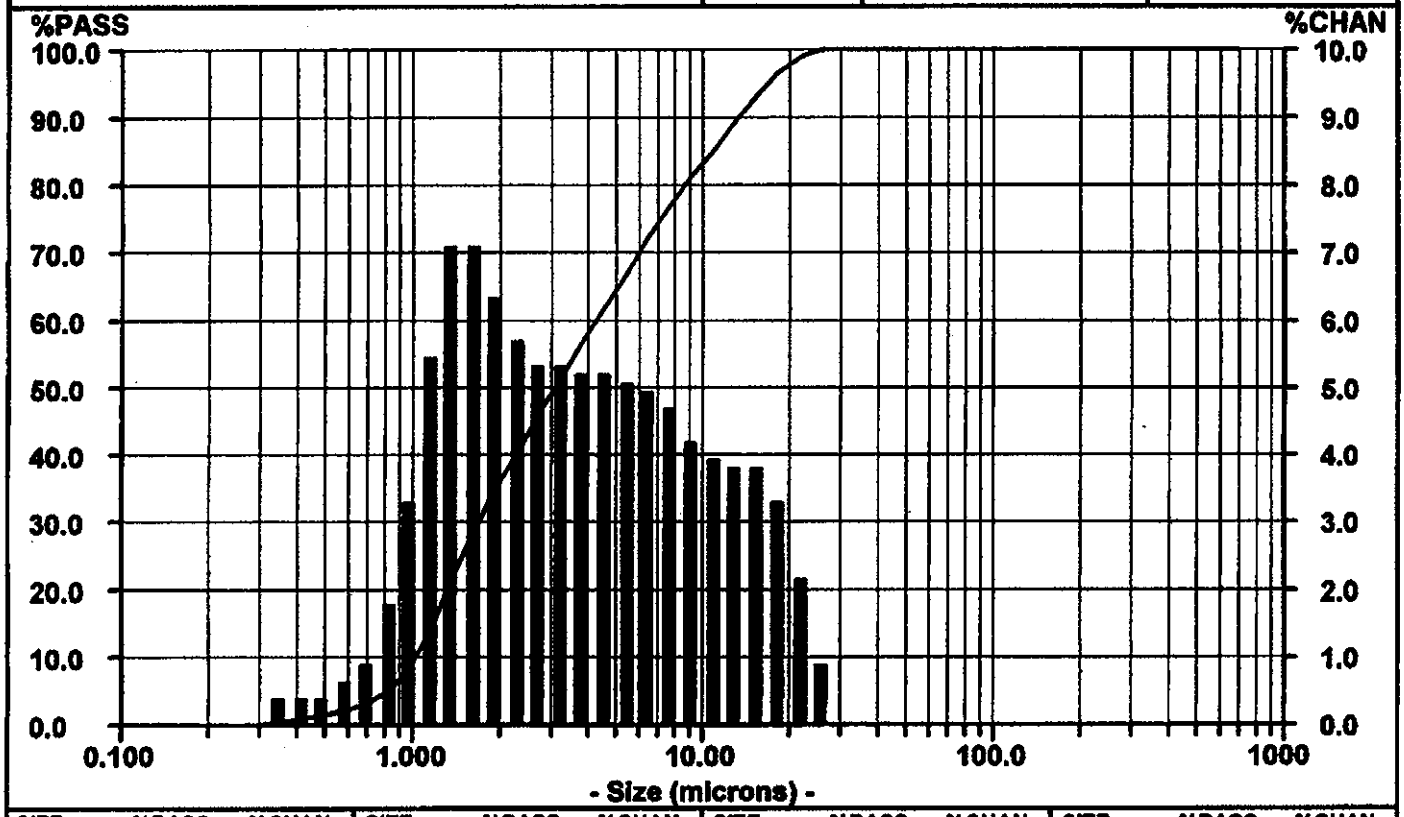
AW-103

AW-103
Sample

Date: 09/25/91 Meas #: 00001
Time: 15:01 Pres #: 01

1 M NaOH 1 M NaNO3
Sonicate for 20 min. with a delay of 60 min.
External Sonication
Flow rate = 17 ml/sec.
Refractive Index = 1.50 Particle 1.33 Medium
File: WPA016

Summary	Percentiles		Dia	Vol%	Width
mv = 5.262	10% = 1.026	60% = 4.330	3.125	100%	9.144
mn = 0.698	20% = 1.337	70% = 6.061			
ma = 2.158	30% = 1.702	80% = 8.753			
cs = 2.780	40% = 2.272	90% = 13.47			
sd = 4.672	50% = 3.125	95% = 16.89			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	81.35	4.34						
592.0	100.00	0.00	7.778	77.01	4.76						
497.8	100.00	0.00	6.541	72.25	5.06						
418.6	100.00	0.00	5.500	67.19	5.19						
352.0	100.00	0.00	4.625	62.00	5.25						
296.0	100.00	0.00	3.889	56.75	5.33						
248.9	100.00	0.00	3.270	51.42	5.40						
209.3	100.00	0.00	2.750	46.02	5.45						
176.0	100.00	0.00	2.312	40.57	5.72						
148.0	100.00	0.00	1.945	34.85	6.40						
124.5	100.00	0.00	1.635	28.45	7.24						
104.7	100.00	0.00	1.375	21.21	7.18						
88.00	100.00	0.00	1.156	14.03	5.54						
74.00	100.00	0.00	0.972	8.49	3.35						
62.23	100.00	0.00	0.818	5.14	1.84						
52.33	100.00	0.00	0.688	3.30	1.08						
44.00	100.00	0.00	0.578	2.22	0.74						
37.00	100.00	0.00	0.486	1.48	0.57						
31.11	100.00	0.00	0.409	0.91	0.49						
26.16	100.00	1.00	0.344	0.42	0.42						
22.00	99.00	2.29	0.289	0.00	0.00						
18.50	96.71	3.46	0.243	0.00	0.00						
15.56	93.25	3.92	0.204	0.00	0.00						
13.08	89.33	3.95	0.172	0.00	0.00						
11.00	85.38	4.03	0.145	0.00	0.00						

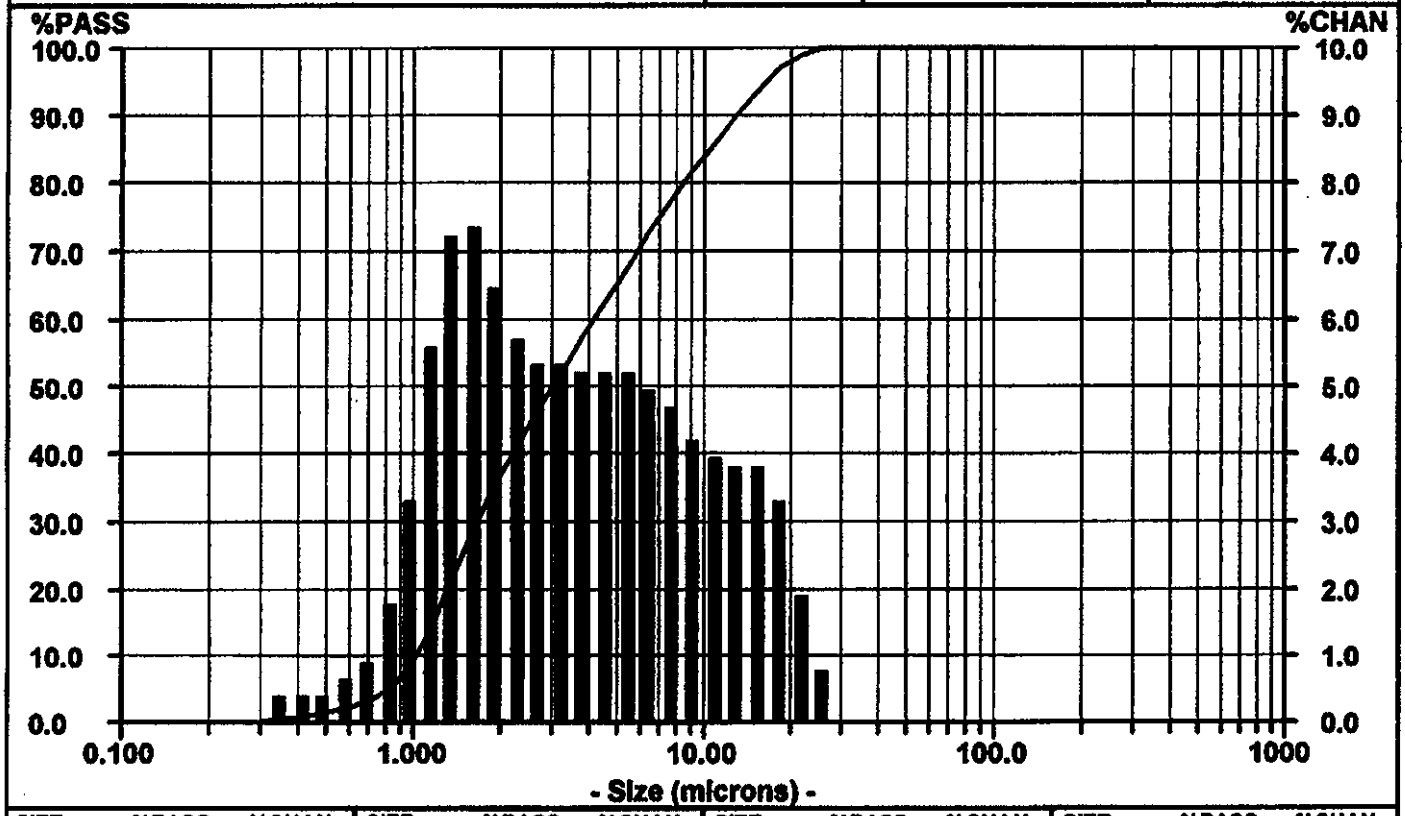
AW-103

AW-103
Sample

Date: 09/25/91 Meas #: 00001
Time: 15:05 Pres #: 01

1 M NaOH 1 M NaNO3
Sonicate for 20 min. followed by a delay of 60 min.
External Sonication
Flow rate = 17 ml/sec.
Refractive Index = 1.70 Particle 1.33 Medium
File: WPA017

Summary	Percentiles		Dia	Vol%	Width
mv = 5.140	10% = 1.026	60% = 4.223	3.058	100%	8.862
mn = 0.706	20% = 1.329	70% = 5.892			
ma = 2.141	30% = 1.679	80% = 8.510			
cs = 2.803	40% = 2.226	90% = 13.11			
sd = 4.431	50% = 3.058	95% = 16.48			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	82.02	4.29						
592.0	100.00	0.00	7.778	77.73	4.71						
497.8	100.00	0.00	6.541	73.02	5.04						
418.6	100.00	0.00	5.500	67.98	5.21						
352.0	100.00	0.00	4.625	62.77	5.30						
296.0	100.00	0.00	3.889	57.47	5.37						
248.9	100.00	0.00	3.270	52.10	5.41						
209.3	100.00	0.00	2.750	46.69	5.46						
176.0	100.00	0.00	2.312	41.23	5.76						
148.0	100.00	0.00	1.945	35.47	6.51						
124.5	100.00	0.00	1.635	28.96	7.44						
104.7	100.00	0.00	1.375	21.52	7.39						
88.00	100.00	0.00	1.156	14.13	5.68						
74.00	100.00	0.00	0.972	8.45	3.39						
62.23	100.00	0.00	0.818	5.06	1.83						
52.33	100.00	0.00	0.688	3.23	1.06						
44.00	100.00	0.00	0.578	2.17	0.72						
37.00	100.00	0.00	0.486	1.45	0.56						
31.11	100.00	0.00	0.409	0.89	0.48						
26.16	100.00	0.83	0.344	0.41	0.41						
22.00	99.17	2.06	0.289	0.00	0.00						
18.50	97.11	3.30	0.243	0.00	0.00						
15.56	93.81	3.86	0.204	0.00	0.00						
13.08	89.95	3.93	0.172	0.00	0.00						
11.00	86.02	4.00	0.145	0.00	0.00						

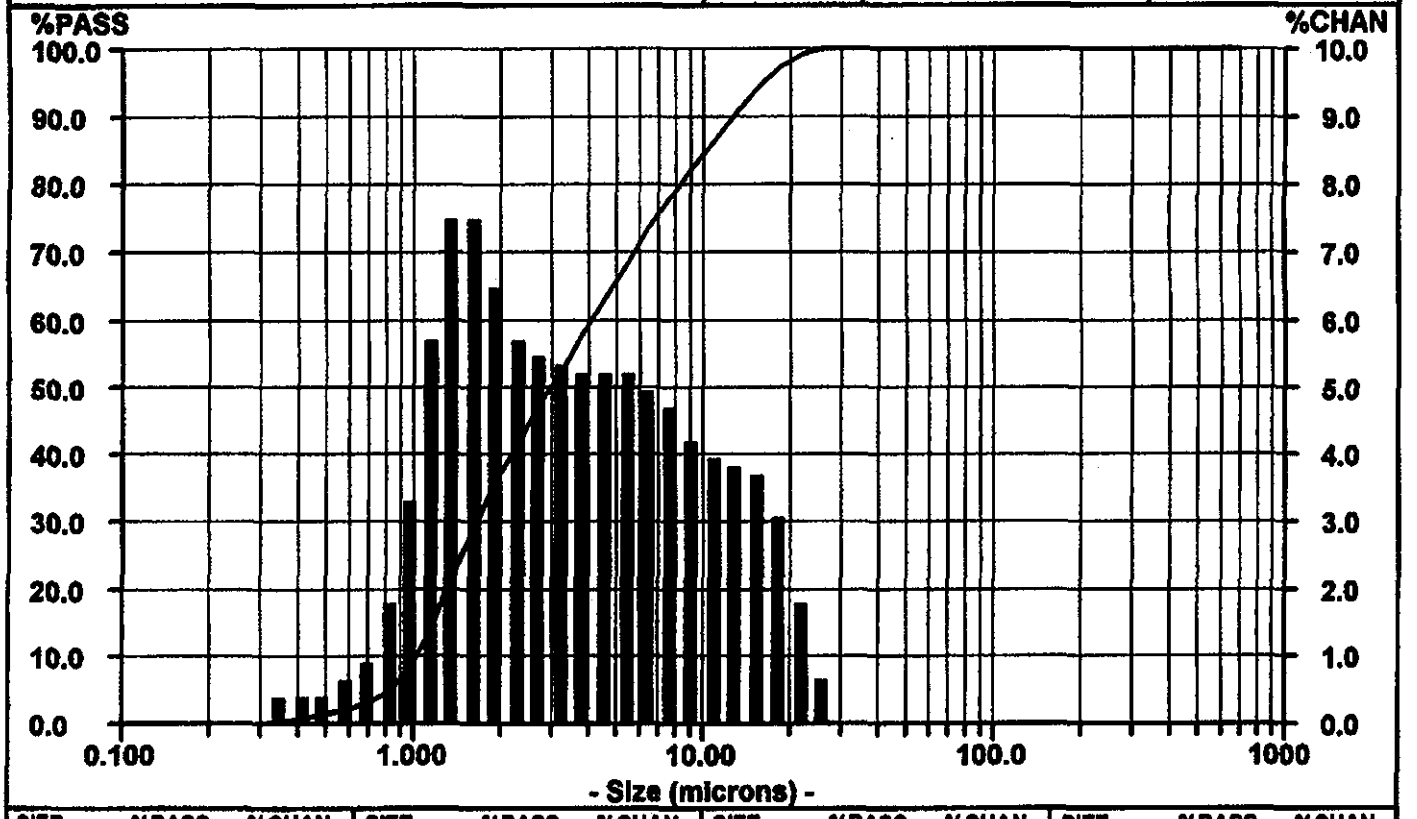
AW-103

AW-103 Sample

Date: 09/25/91 Meas #: 00001
Time: 15:09 Pres #: 01

1 M NaOH 1 M NaNO3
Sonicate for 20 min. followed by a delay of 60 min.
External Sonication
Flow rate = 17 ml/sec.
Refractive Index = 2.00 Particle 1.33 Medium
File: WPA018

Summary	Percentiles		Dia	Vol%	Width
mv = 5.053	10% = 1.027	60% = 4.153	3.010	100%	8.652
mn = 0.712	20% = 1.324	70% = 5.790			
ma = 2.131	30% = 1.666	80% = 8.348			
cs = 2.816	40% = 2.198	90% = 12.83			
sd = 4.326	50% = 3.010	95% = 16.17			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	82.51	4.29						
592.0	100.00	0.00	7.778	78.22	4.70						
497.8	100.00	0.00	6.541	73.52	5.03						
418.6	100.00	0.00	5.500	68.49	5.20						
352.0	100.00	0.00	4.625	63.29	5.30						
296.0	100.00	0.00	3.889	57.99	5.39						
248.9	100.00	0.00	3.270	52.60	5.44						
209.3	100.00	0.00	2.750	47.16	5.50						
176.0	100.00	0.00	2.312	41.66	5.81						
148.0	100.00	0.00	1.945	35.85	6.58						
124.5	100.00	0.00	1.635	29.27	7.56						
104.7	100.00	0.00	1.375	21.71	7.53						
88.00	100.00	0.00	1.156	14.18	5.77						
74.00	100.00	0.00	0.972	8.41	3.42						
62.23	100.00	0.00	0.818	4.99	1.83						
52.33	100.00	0.00	0.688	3.16	1.05						
44.00	100.00	0.00	0.578	2.11	0.70						
37.00	100.00	0.00	0.486	1.41	0.54						
31.11	100.00	0.00	0.409	0.87	0.47						
26.16	100.00	0.72	0.344	0.40	0.40						
22.00	99.28	1.89	0.289	0.00	0.00						
18.50	97.39	3.16	0.243	0.00	0.00						
15.56	94.23	3.79	0.204	0.00	0.00						
13.08	90.44	3.92	0.172	0.00	0.00						
11.00	86.52	4.01	0.145	0.00	0.00						

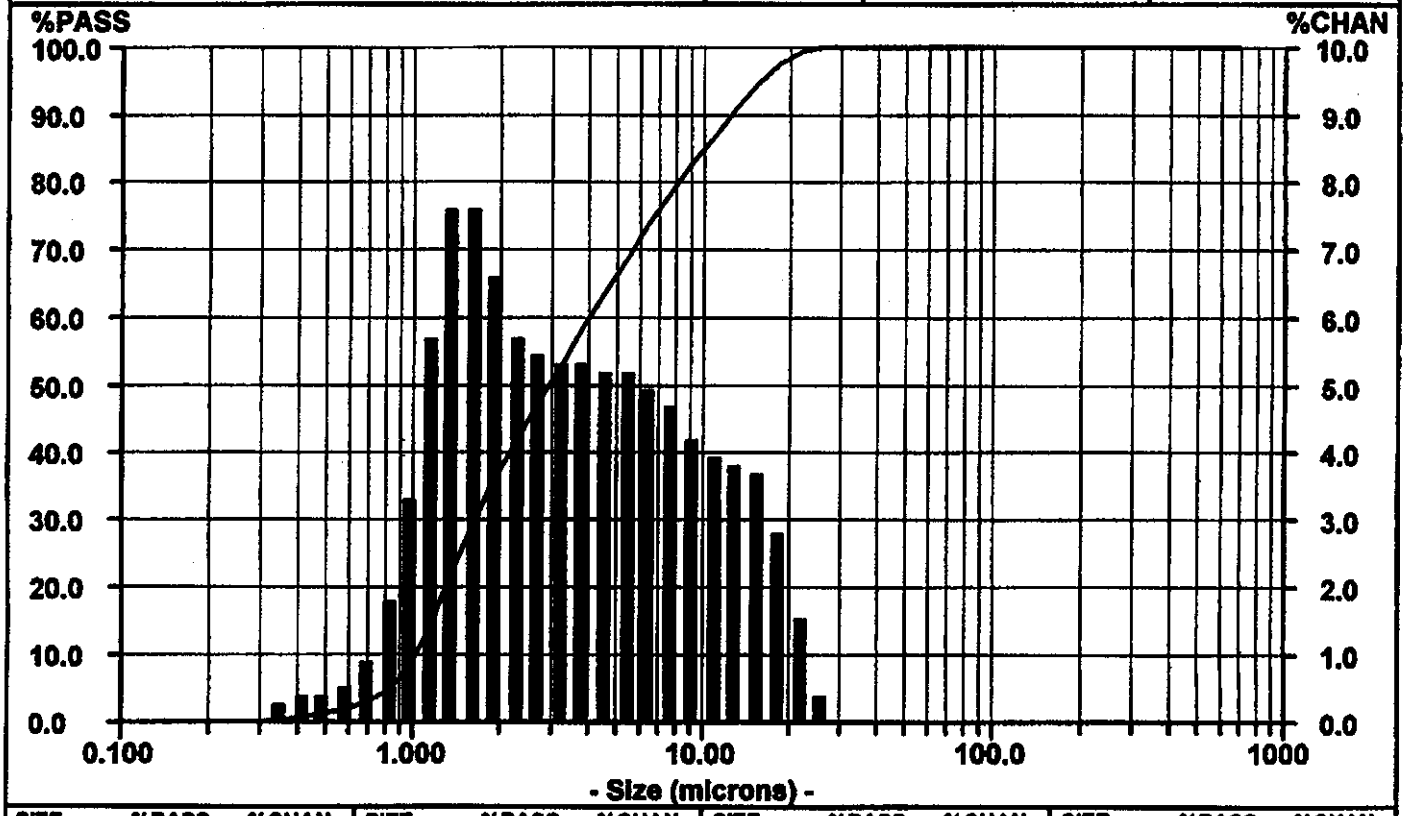
AW-103

AW-103
Sample

Date: 09/25/91 Meas #: 00001
Time: 15:14 Pres #: 01

1 M NaOH 1 M NaNO3
Sonicate for 20 min. followed by a delay of 60 min.
External Sonication
Flow rate = 40 ml/sec.
Refractive index = 1.50 Particle 1.33 Medium
File: WPA019

Summary	Percentiles		Dia	Vol%	Width
mv = 4.958	10% = 1.026	60% = 4.084	2.967	100%	8.423
mn = 0.718	20% = 1.320	70% = 5.687			
ma = 2.120	30% = 1.654	80% = 8.170			
cs = 2.630	40% = 2.173	90% = 12.61			
sd = 4.212	50% = 2.967	95% = 18.79			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	83.05	4.30						
592.0	100.00	0.00	7.778	78.75	4.70						
497.8	100.00	0.00	6.541	74.05	5.03						
418.6	100.00	0.00	5.500	69.02	5.21						
352.0	100.00	0.00	4.625	63.81	5.32						
296.0	100.00	0.00	3.889	58.49	5.42						
248.9	100.00	0.00	3.270	53.07	5.47						
209.3	100.00	0.00	2.750	47.60	5.54						
176.0	100.00	0.00	2.312	42.06	5.56						
148.0	100.00	0.00	1.945	36.20	5.86						
124.5	100.00	0.00	1.635	29.54	7.65						
104.7	100.00	0.00	1.375	21.89	7.64						
88.00	100.00	0.00	1.156	14.25	5.85						
74.00	100.00	0.00	0.972	8.40	3.46						
62.23	100.00	0.00	0.818	4.94	1.83						
52.33	100.00	0.00	0.688	3.11	1.04						
44.00	100.00	0.00	0.578	2.07	0.69						
37.00	100.00	0.00	0.486	1.38	0.53						
31.11	100.00	0.00	0.409	0.85	0.46						
26.16	100.00	0.60	0.344	0.39	0.39						
22.00	99.40	1.70	0.289	0.00	0.00						
18.50	97.70	2.98	0.243	0.00	0.00						
15.56	94.72	3.72	0.204	0.00	0.00						
13.08	91.00	3.92	0.172	0.00	0.00						
11.00	87.08	4.03	0.145	0.00	0.00						

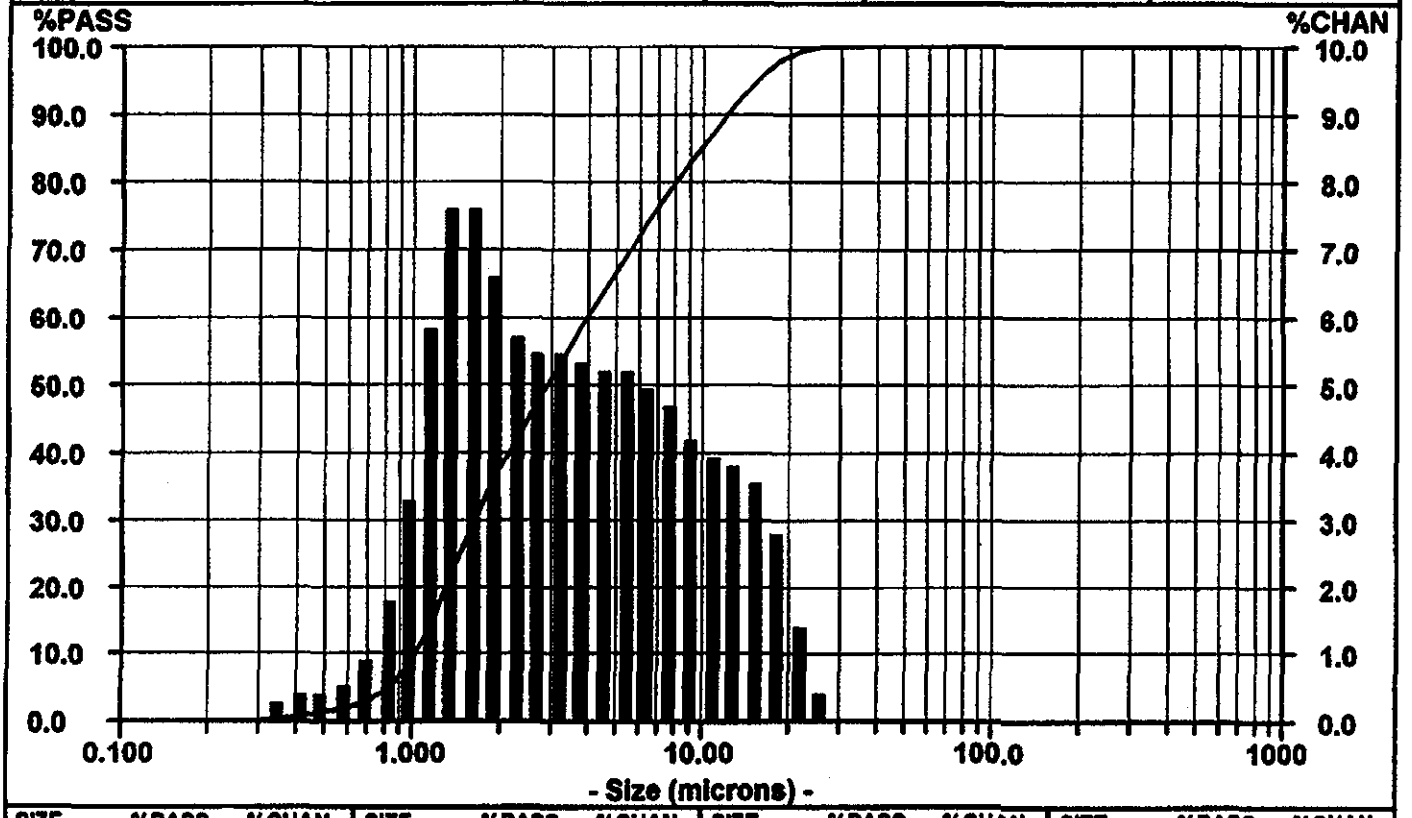
AW-103

AW-103
Sample

Date: 09/25/91 Meas #: 00001
Time: 15:18 Pres #: 01

1 M NaOH 1 M NaNO3
Sonicate for 20 min. with a delay of 60 min.
External Sonication
Flow rate = 40 ml/sec.
Refractive Index = 1.70 Particle 1.33 Medium
File: WPA020

Summary	Percentiles		Dia	Vol%	Width
mv = 4.888	10% = 1.025	60% = 4.033	2.937	100%	8.251
mn = 0.723	20% = 1.315	70% = 5.608			
ma = 2.111	30% = 1.645	80% = 8.032			
cs = 2.842	40% = 2.155	90% = 12.28			
sd = 4.125	50% = 2.937	95% = 16.51			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	83.49	4.31						
592.0	100.00	0.00	7.778	79.18	4.71						
497.8	100.00	0.00	6.541	74.47	5.04						
418.6	100.00	0.00	5.500	69.43	5.22						
352.0	100.00	0.00	4.625	64.21	5.34						
296.0	100.00	0.00	3.889	58.87	5.45						
248.9	100.00	0.00	3.270	53.42	5.50						
209.3	100.00	0.00	2.750	47.92	5.57						
176.0	100.00	0.00	2.312	42.35	5.89						
148.0	100.00	0.00	1.945	36.46	6.70						
124.5	100.00	0.00	1.635	29.76	7.71						
104.7	100.00	0.00	1.375	22.05	7.71						
88.00	100.00	0.00	1.156	14.34	5.92						
74.00	100.00	0.00	0.972	8.42	3.49						
62.23	100.00	0.00	0.816	4.93	1.84						
52.33	100.00	0.00	0.686	3.09	1.04						
44.00	100.00	0.00	0.576	2.05	0.69						
37.00	100.00	0.00	0.486	1.36	0.53						
31.11	100.00	0.00	0.409	0.83	0.45						
26.16	100.00	0.53	0.344	0.38	0.38						
22.00	99.47	1.56	0.289	0.00	0.00						
18.50	97.91	2.85	0.243	0.00	0.00						
15.56	95.06	3.64	0.204	0.00	0.00						
13.08	91.42	3.90	0.172	0.00	0.00						
11.00	87.52	4.03	0.145	0.00	0.00						

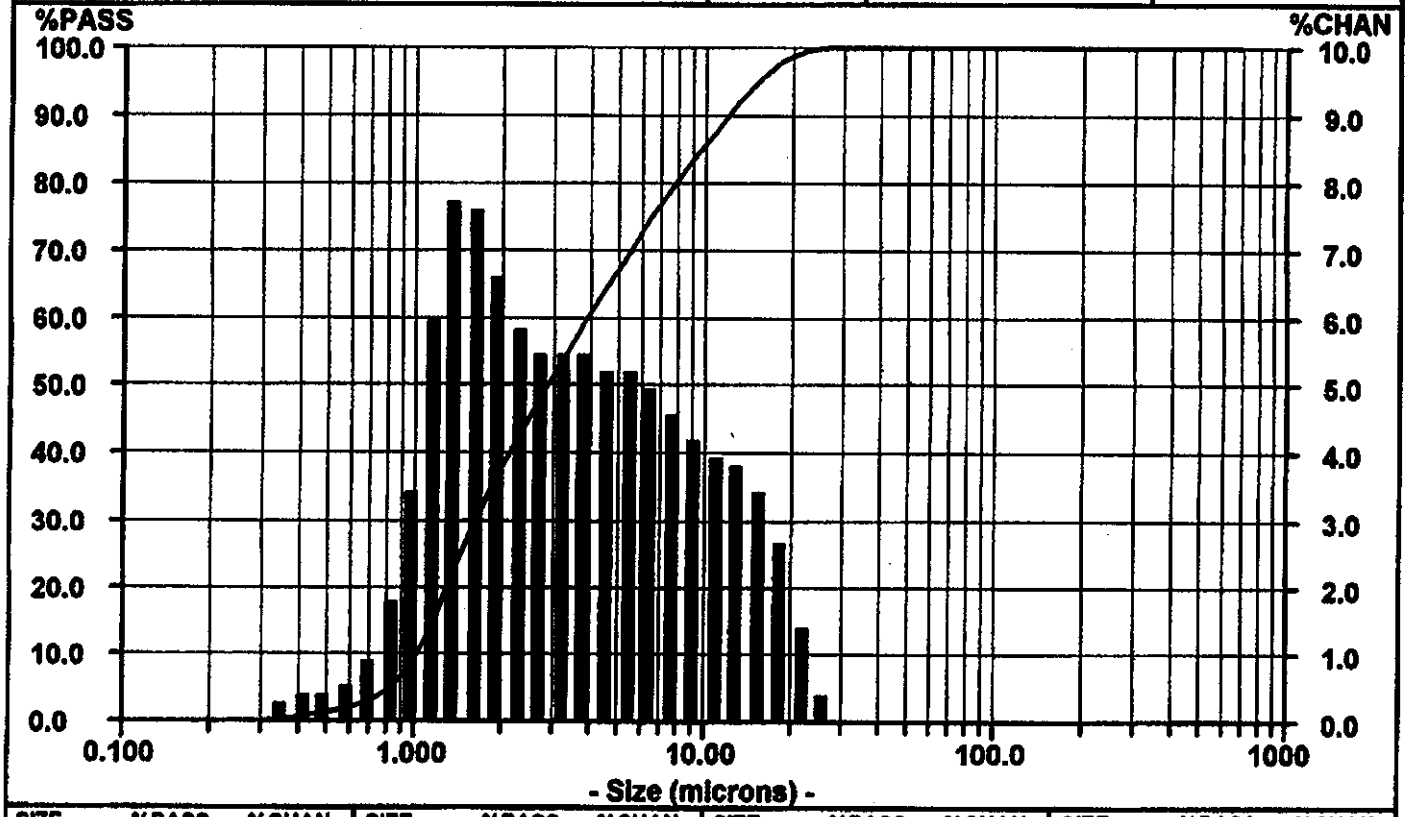
AW-103

AW-103
Sample

Date: 09/25/91 Meas #: 00001
Time: 15:22 Pres #: 01

1 M NaOH 1 M NaNO3
Sonicate for 20 min. with a delay of 60 min.
External Sonication
Flow rate = 40 ml/sec.
Refractive Index = 2.00 Particle 1.33 Medium
File: WPA021

Summary	Percentiles		Dia	Vol%	Width
mv = 4.811	10% = 1.024	60% = 3.976	2.904	100%	8.075
mn = 0.725	20% = 1.311	70% = 5.511			
ma = 2.100	30% = 1.634	80% = 7.690			
cs = 2.867	40% = 2.135	90% = 12.04			
sd = 4.037	50% = 2.904	95% = 15.23			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	83.94	4.30						
592.0	100.00	0.00	7.778	79.64	4.68						
497.8	100.00	0.00	6.541	74.96	5.02						
418.6	100.00	0.00	5.500	69.94	5.24						
352.0	100.00	0.00	4.625	64.70	5.39						
296.0	100.00	0.00	3.889	59.31	5.50						
248.9	100.00	0.00	3.270	53.81	5.55						
209.3	100.00	0.00	2.750	48.26	5.59						
176.0	100.00	0.00	2.312	42.67	5.91						
148.0	100.00	0.00	1.945	36.76	6.73						
124.5	100.00	0.00	1.635	30.03	7.78						
104.7	100.00	0.00	1.375	22.25	7.82						
88.00	100.00	0.00	1.156	14.43	6.00						
74.00	100.00	0.00	0.972	8.43	3.52						
62.23	100.00	0.00	0.818	4.91	1.84						
52.33	100.00	0.00	0.688	3.07	1.04						
44.00	100.00	0.00	0.578	2.03	0.68						
37.00	100.00	0.00	0.486	1.35	0.52						
31.11	100.00	0.00	0.409	0.83	0.45						
26.16	100.00	0.45	0.344	0.38	0.38						
22.00	99.55	1.42	0.289	0.00	0.00						
18.50	98.13	2.71	0.243	0.00	0.00						
15.56	95.42	3.57	0.204	0.00	0.00						
13.08	91.85	3.88	0.172	0.00	0.00						
11.00	87.97	4.03	0.145	0.00	0.00						

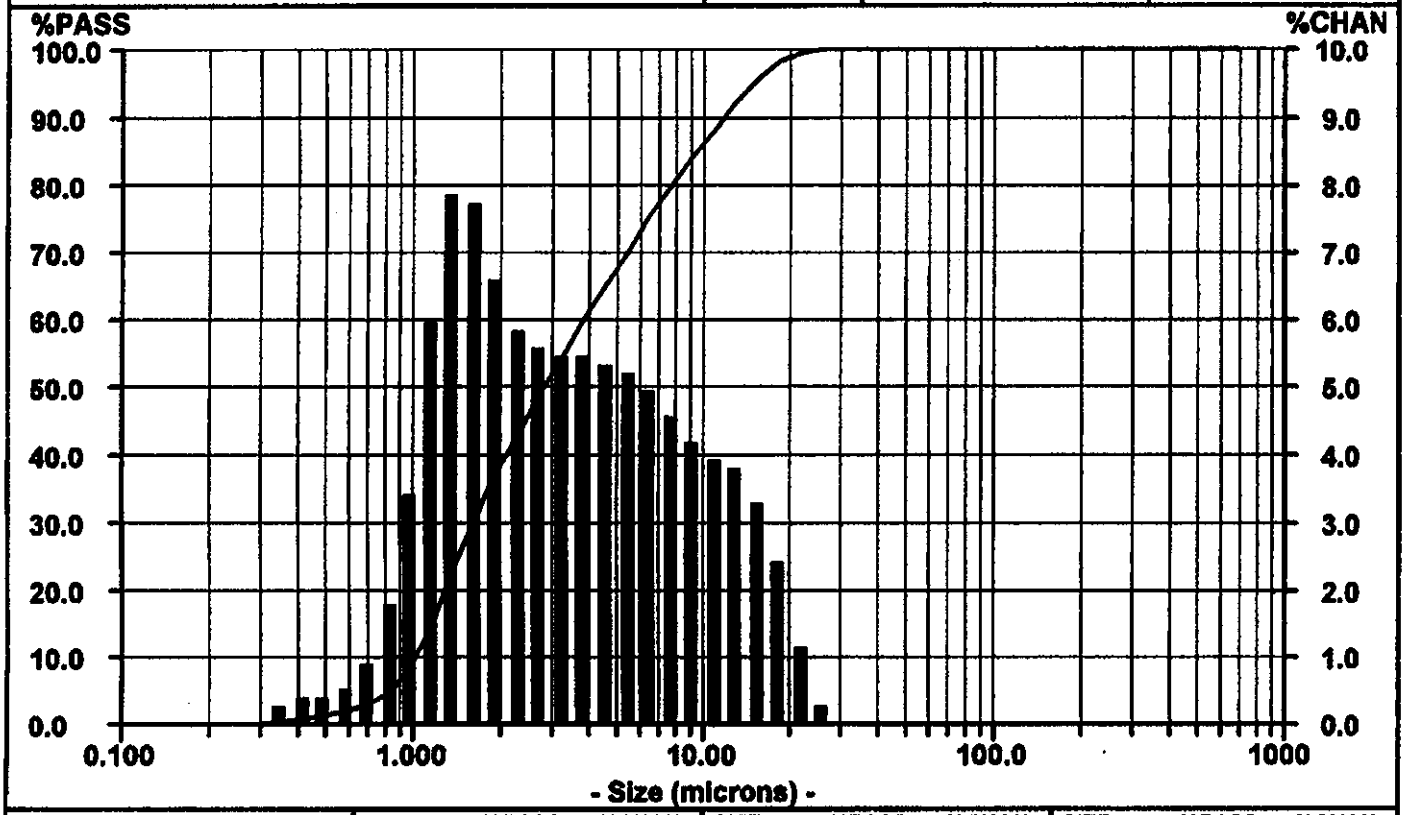
AW-103

AW-103
Sample

Date: 09/25/91 Meas #: 00001
Time: 15:26 Pres #: 01

1 M NaOH 1 M NaNO3
Sonicate for 20 min with a delay of 60 min.
External Sonication
Flow rate = 60 ml/sec.
Refractive Index = 2.00 Particle 1.33 Medium
File: WPA022

Summary	Percentiles		Dia	Vol%	Width
mv = 4.723	10% = 1.024	60% = 3.910	2.865	100%	7.885
mn = 0.732	20% = 1.306	70% = 5.408			
ma = 2.090	30% = 1.622	80% = 7.731			
cs = 2.871	40% = 2.111	90% = 11.76			
sd = 3.942	50% = 2.865	95% = 14.87			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	84.45	4.29						
592.0	100.00	0.00	7.778	80.16	4.65						
497.8	100.00	0.00	6.541	75.51	5.00						
418.6	100.00	0.00	5.500	70.51	5.25						
352.0	100.00	0.00	4.625	65.26	5.43						
296.0	100.00	0.00	3.889	59.83	5.56						
248.9	100.00	0.00	3.270	54.27	5.59						
209.3	100.00	0.00	2.750	48.68	5.62						
176.0	100.00	0.00	2.312	43.06	5.93						
148.0	100.00	0.00	1.945	37.13	6.78						
124.5	100.00	0.00	1.635	30.35	7.88						
104.7	100.00	0.00	1.375	22.47	7.97						
88.00	100.00	0.00	1.156	14.50	6.09						
74.00	100.00	0.00	0.972	8.41	3.55						
62.23	100.00	0.00	0.818	4.86	1.84						
52.33	100.00	0.00	0.688	3.02	1.03						
44.00	100.00	0.00	0.578	1.99	0.67						
37.00	100.00	0.00	0.486	1.32	0.51						
31.11	100.00	0.00	0.409	0.81	0.44						
26.16	100.00	0.36	0.344	0.37	0.37						
22.00	99.64	1.25	0.289	0.00	0.00						
18.50	98.39	2.54	0.243	0.00	0.00						
15.56	95.85	3.49	0.204	0.00	0.00						
13.08	92.36	3.87	0.172	0.00	0.00						
11.00	88.49	4.04	0.145	0.00	0.00						

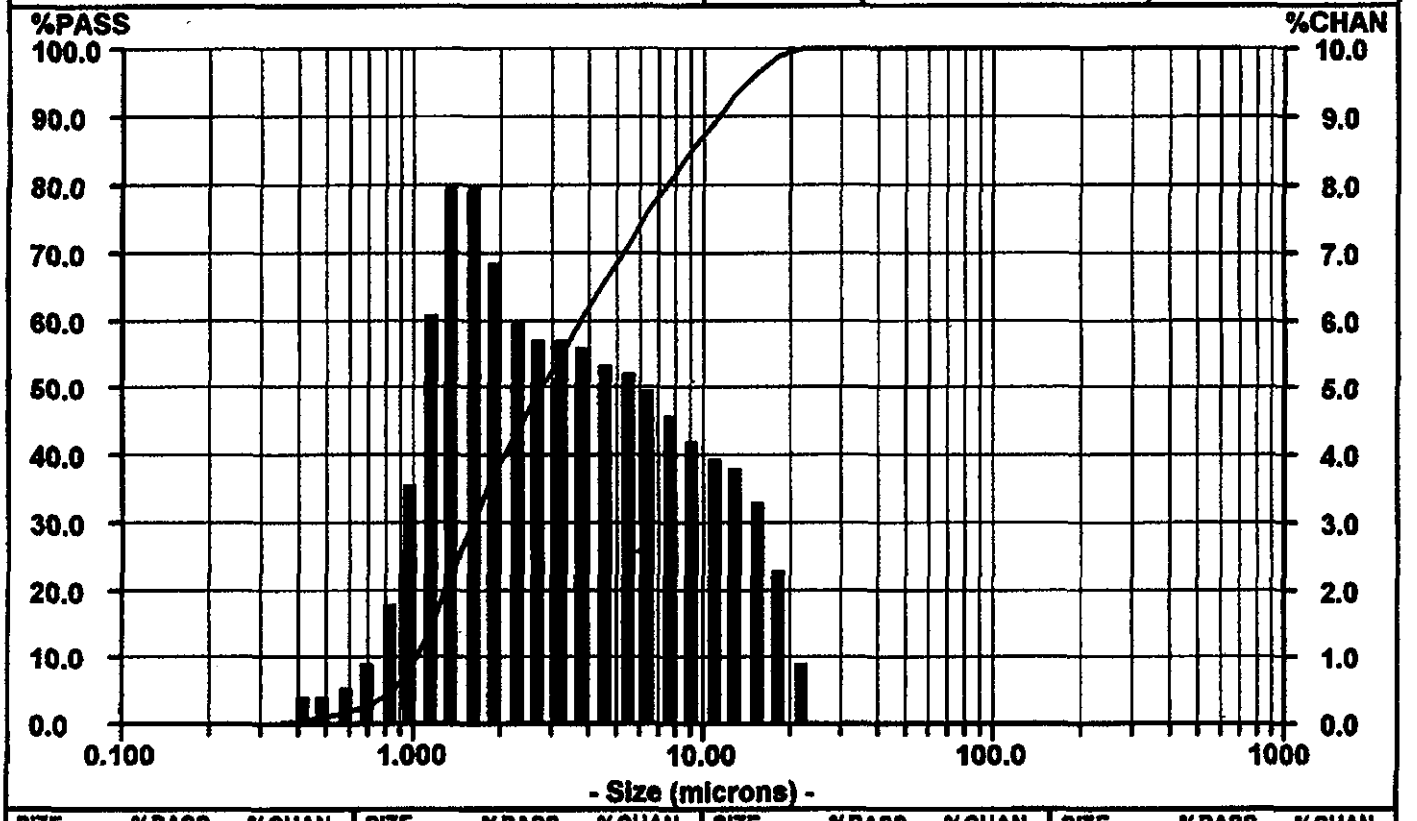
AW-103

AW-103 Sample

Date: 09/25/91 Meas #: 00001
Time: 15:33 Pres #: 01

1 M NaOH 1 M NaNO3
Sonicate for 20 min. with a delay of 60 min.
External Sonication
Flow rate = 60 ml/sec.
Refractive Index = 1.50 Particle 1.33 Medium
File: WPA023

Summary	Percentiles		Dia	Vol%	Width
mv = 4.677	10% = 1.031	60% = 3.828	2.821	100%	7.561
mn = 0.846	20% = 1.307	70% = 5.267			
ma = 2.113	30% = 1.617	80% = 7.484			
cs = 2.840	40% = 2.092	90% = 11.31			
sd = 3.780	50% = 2.821	95% = 14.27			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.260	85.33	4.32						
592.0	100.00	0.00	7.778	81.01	4.68						
497.8	100.00	0.00	6.541	76.33	5.03						
418.6	100.00	0.00	5.500	71.30	5.29						
352.0	100.00	0.00	4.625	66.01	5.49						
296.0	100.00	0.00	3.889	60.52	5.65						
248.9	100.00	0.00	3.270	54.87	5.70						
209.3	100.00	0.00	2.750	49.17	5.73						
176.0	100.00	0.00	2.312	43.44	6.03						
148.0	100.00	0.00	1.945	37.41	6.90						
124.5	100.00	0.00	1.635	30.51	8.03						
104.7	100.00	0.00	1.375	22.48	8.10						
88.00	100.00	0.00	1.156	14.38	8.23						
74.00	100.00	0.00	0.972	8.15	3.63						
62.23	100.00	0.00	0.818	4.52	1.87						
52.33	100.00	0.00	0.688	2.65	1.04						
44.00	100.00	0.00	0.578	1.61	0.68						
37.00	100.00	0.00	0.486	0.93	0.52						
31.11	100.00	0.00	0.409	0.41	0.41						
26.16	100.00	0.00	0.344	0.00	0.00						
22.00	100.00	1.07	0.289	0.00	0.00						
18.50	98.93	2.34	0.243	0.00	0.00						
15.56	96.59	3.37	0.204	0.00	0.00						
13.08	93.22	3.84	0.172	0.00	0.00						
11.00	89.38	4.05	0.145	0.00	0.00						

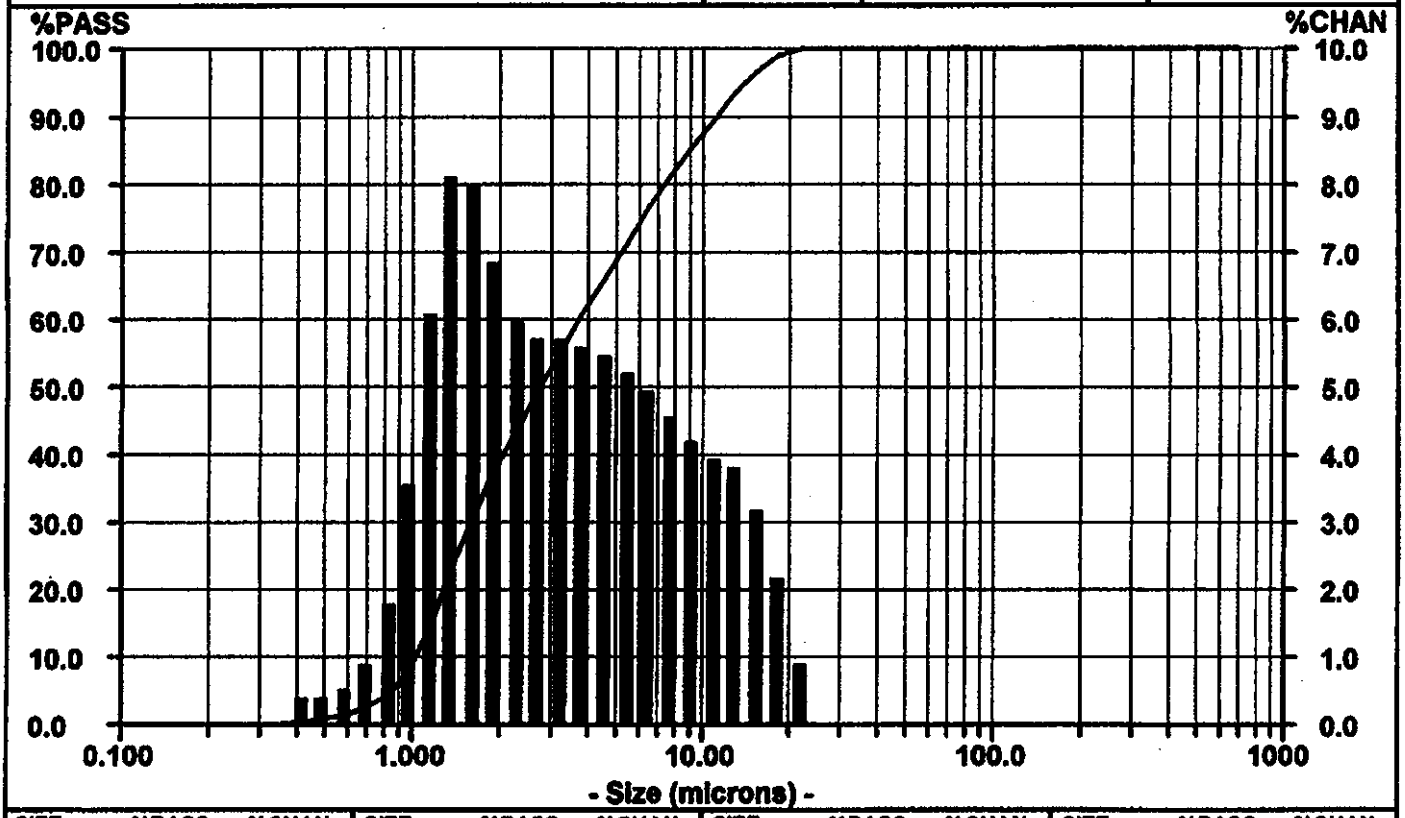
AW-103

AW-103
Sample

Date: 09/25/91 Meas #: 00001
Time: 15:37 Pres #: 01

1 M NaOH 1 M NaNO3
Sonicate for 20 min. followed with a delay of 60 min.
External Sonication
Flow rate = 60 ml/sec.
Refractive Index = 1.70 Particle 1.33 Medium
File: WPA024

Summary	Percentiles		Dia	Vol%	Width
mv = 4.625	10% = 1.032	60% = 3.787	2.793	100%	7.444
mn = 0.851	20% = 1.304	70% = 5.207			
ma = 2.106	30% = 1.609	80% = 7.393			
cs = 2.849	40% = 2.075	90% = 11.13			
sd = 3.722	50% = 2.793	95% = 14.07			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	85.67	4.33						
592.0	100.00	0.00	7.778	81.34	4.68						
497.8	100.00	0.00	6.541	76.66	5.01						
418.6	100.00	0.00	5.500	71.65	5.28						
352.0	100.00	0.00	4.625	66.37	5.50						
296.0	100.00	0.00	3.889	60.87	5.66						
248.9	100.00	0.00	3.270	55.21	5.71						
209.3	100.00	0.00	2.750	49.50	5.75						
176.0	100.00	0.00	2.312	43.75	6.07						
148.0	100.00	0.00	1.945	37.68	6.96						
124.5	100.00	0.00	1.635	30.72	8.11						
104.7	100.00	0.00	1.375	22.61	8.22						
88.00	100.00	0.00	1.156	14.39	8.27						
74.00	100.00	0.00	0.972	8.12	3.64						
62.23	100.00	0.00	0.818	4.48	1.87						
52.33	100.00	0.00	0.688	2.61	1.03						
44.00	100.00	0.00	0.578	1.58	0.67						
37.00	100.00	0.00	0.486	0.91	0.51						
31.11	100.00	0.00	0.409	0.40	0.40						
26.16	100.00	0.00	0.344	0.00	0.00						
22.00	100.00	0.97	0.289	0.00	0.00						
18.50	99.03	2.21	0.243	0.00	0.00						
15.56	96.82	3.28	0.204	0.00	0.00						
13.08	93.54	3.81	0.172	0.00	0.00						
11.00	89.73	4.06	0.145	0.00	0.00						

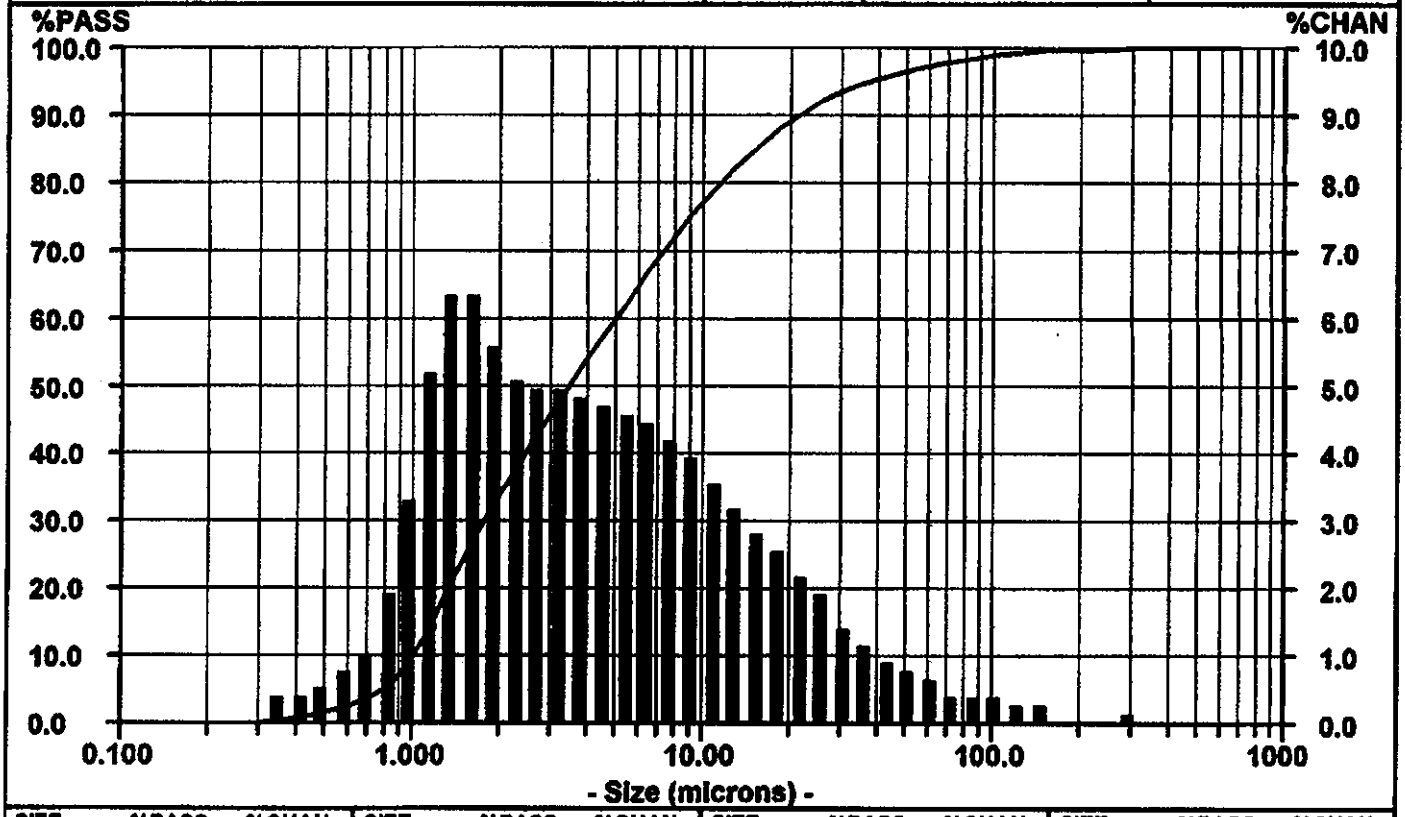
AW-103

103AW
Duplicate

Date: 09/25/91 Meas #: 00001
Time: 09:16 Pres #: 01

1 M NaOH 1 M NaNO3
17 ml/sec
Refractive Index = 1.50 Particle 1.33 Medium
File: WPAA029

Summary	Percentiles		Dia	Vol%	Width
mv = 9.835	10% = 1.013	60% = 5.028	7.069	62%	18.31
mn = 0.665	20% = 1.354	70% = 7.374	1.317	38%	1.048
ma = 2.254	30% = 1.787	80% = 11.52			
cs = 2.662	40% = 2.489	90% = 21.46			
sd = 6.563	50% = 3.508	95% = 37.31			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	75.42	4.09						
592.0	100.00	0.00	7.778	71.33	4.39						
497.8	100.00	0.00	6.541	66.94	4.55						
418.6	100.00	0.00	5.500	62.39	4.64						
352.0	100.00	0.00	4.625	57.75	4.80						
296.0	100.00	0.30	3.889	52.95	4.98						
248.9	99.70	0.00	3.270	47.97	5.06						
209.3	99.70	0.00	2.750	42.91	5.05						
176.0	99.70	0.00	2.312	37.86	5.18						
148.0	99.70	0.33	1.945	32.68	5.69						
124.5	99.37	0.37	1.635	26.99	6.40						
104.7	99.00	0.43	1.375	20.59	6.45						
88.00	98.57	0.60	1.156	14.14	5.22						
74.00	98.07	0.59	0.972	8.92	3.35						
62.23	97.48	0.70	0.818	5.57	1.94						
52.33	96.78	0.83	0.688	3.63	1.17						
44.00	95.95	1.00	0.578	2.46	0.81						
37.00	94.95	1.22	0.486	1.65	0.63						
31.11	93.73	1.52	0.409	1.02	0.55						
26.16	92.21	1.90	0.344	0.47	0.47						
22.00	90.31	2.29	0.289	0.00	0.00						
18.50	88.02	2.68	0.243	0.00	0.00						
15.56	85.36	2.97	0.204	0.00	0.00						
13.08	82.39	3.29	0.172	0.00	0.00						
11.00	79.10	3.68	0.145	0.00	0.00						

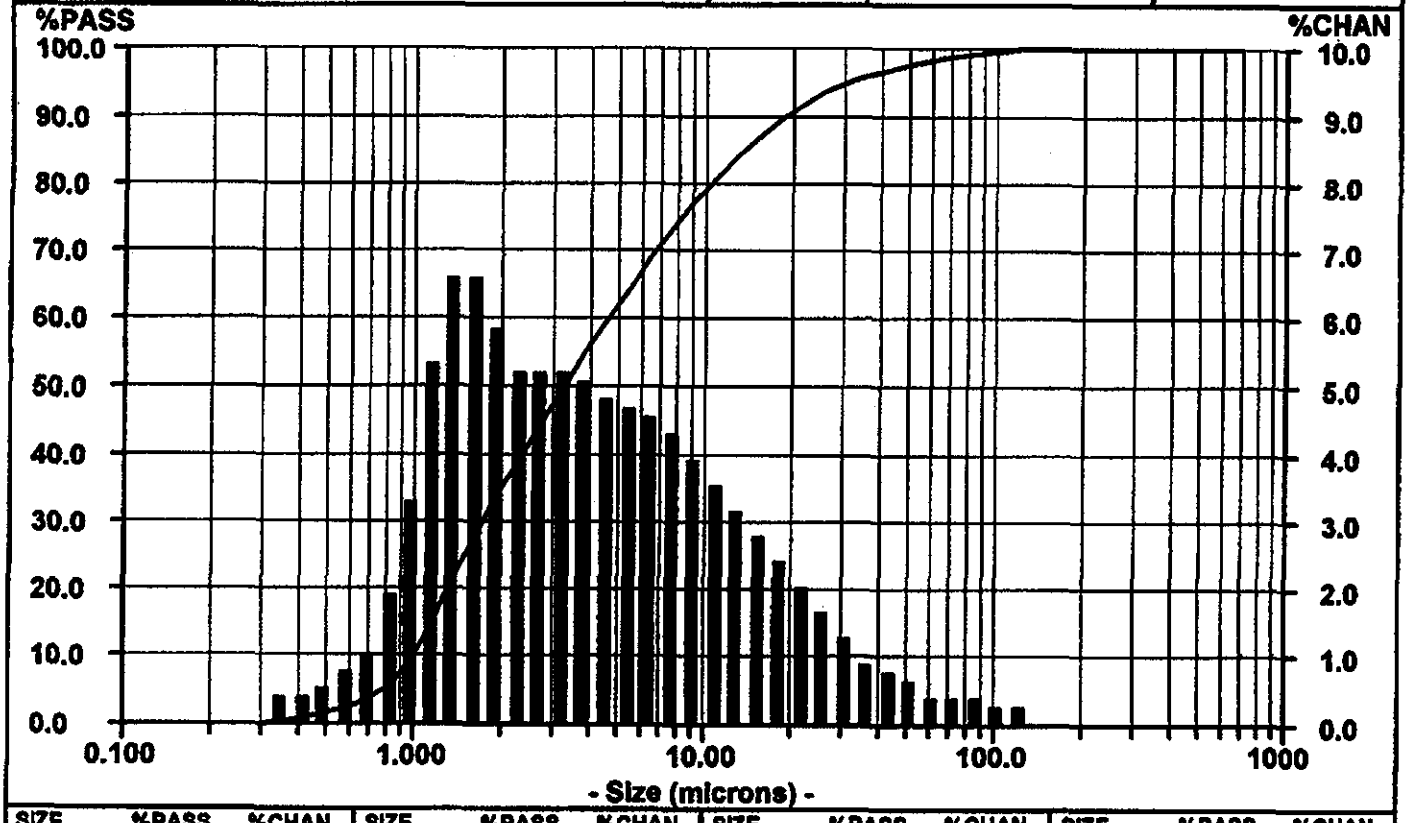
AW-103

103AW
Duplicate

Date: 09/25/91 Meas #: 00001
Time: 09:22 Pres #: 01

1 M NaOH 1 M NaNO3
17 ml/sec
Refractive Index = 1.70 Particle 1.33 Medium
File: WPAA030

Summary	Percentiles		Dia	Vol%	Width
mv = 8.002	10% = 1.006	60% = 4.668	6.676	61%	15.90
mn = 0.872	20% = 1.332	70% = 6.769	1.320	39%	1.038
ma = 2.195	30% = 1.731	80% = 10.34			
cs = 2.734	40% = 2.370	90% = 18.69			
sd = 5.768	50% = 3.305	95% = 30.65			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	77.60	4.08						
592.0	100.00	0.00	7.778	73.52	4.41						
497.8	100.00	0.00	6.541	69.11	4.61						
418.6	100.00	0.00	5.500	64.50	4.75						
352.0	100.00	0.00	4.625	59.75	4.93						
296.0	100.00	0.00	3.889	54.82	5.13						
248.9	100.00	0.00	3.270	49.69	5.22						
209.3	100.00	0.00	2.750	44.47	5.20						
176.0	100.00	0.00	2.312	39.27	5.36						
148.0	100.00	0.00	1.945	33.91	5.92						
124.5	100.00	0.31	1.635	27.99	6.70						
104.7	99.69	0.36	1.375	21.29	6.78						
88.00	99.33	0.42	1.156	14.51	5.45						
74.00	98.91	0.50	0.972	9.06	3.46						
62.23	98.41	0.60	0.818	5.60	1.97						
52.33	97.81	0.73	0.688	3.63	1.18						
44.00	97.08	0.88	0.578	2.45	0.81						
37.00	96.20	1.09	0.486	1.64	0.63						
31.11	95.11	1.37	0.409	1.01	0.54						
26.16	93.74	1.74	0.344	0.47	0.47						
22.00	92.00	2.13	0.289	0.00	0.00						
18.50	89.87	2.52	0.243	0.00	0.00						
15.56	87.35	2.87	0.204	0.00	0.00						
13.08	84.48	3.23	0.172	0.00	0.00						
11.00	81.25	3.65	0.145	0.00	0.00						

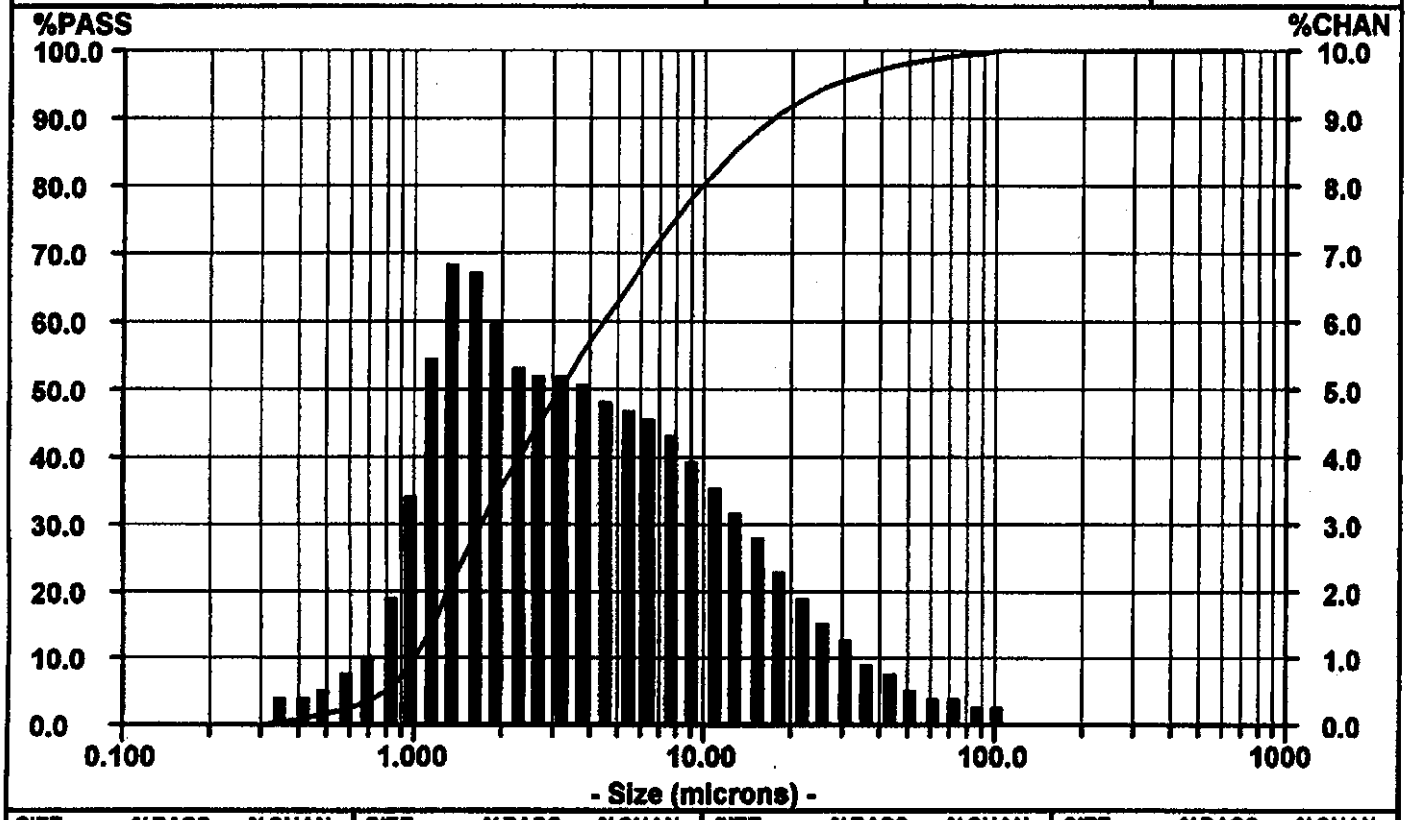
AW-103

103AW
Duplicate

Date: 09/25/91 Meas #: 00001
Time: 09:26 Pres #: 01

1 M NaOH 1 M NaNO3
17 ml/sec
Refractive Index = 2.00 Particle 1.33 Medium
File: WPAA031

Summary	Percentiles		Dia	Vol%	Width
mv = 7.367	10% = 1.004	60% = 4.524	6.511	60%	14.77
mn = 0.677	20% = 1.323	70% = 6.524	1.321	40%	1.033
ma = 2.171	30% = 1.707	80% = 9.867			
cs = 2.764	40% = 2.321	90% = 17.45			
sd = 5.425	50% = 3.222	95% = 27.69			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	78.62	4.10						
592.0	100.00	0.00	7.778	74.52	4.45						
497.8	100.00	0.00	6.541	70.07	4.65						
418.6	100.00	0.00	5.500	65.42	4.79						
352.0	100.00	0.00	4.625	60.63	4.98						
296.0	100.00	0.00	3.889	55.65	5.19						
248.9	100.00	0.00	3.270	50.46	5.29						
209.3	100.00	0.00	2.750	45.17	5.28						
176.0	100.00	0.00	2.312	39.89	5.44						
148.0	100.00	0.00	1.945	34.45	6.02						
124.5	100.00	0.00	1.635	28.43	6.83						
104.7	100.00	0.31	1.375	21.60	6.92						
88.00	99.69	0.37	1.156	14.68	5.57						
74.00	99.32	0.44	0.972	9.11	3.52						
62.23	98.88	0.54	0.818	5.59	1.99						
52.33	98.34	0.66	0.688	3.60	1.18						
44.00	97.68	0.82	0.578	2.42	0.80						
37.00	96.86	1.02	0.486	1.62	0.62						
31.11	95.84	1.30	0.409	1.00	0.54						
26.16	94.54	1.67	0.344	0.46	0.46						
22.00	92.87	2.07	0.289	0.00	0.00						
18.50	90.80	2.47	0.243	0.00	0.00						
15.56	88.33	2.84	0.204	0.00	0.00						
13.08	85.49	3.22	0.172	0.00	0.00						
11.00	82.27	3.65	0.145	0.00	0.00						

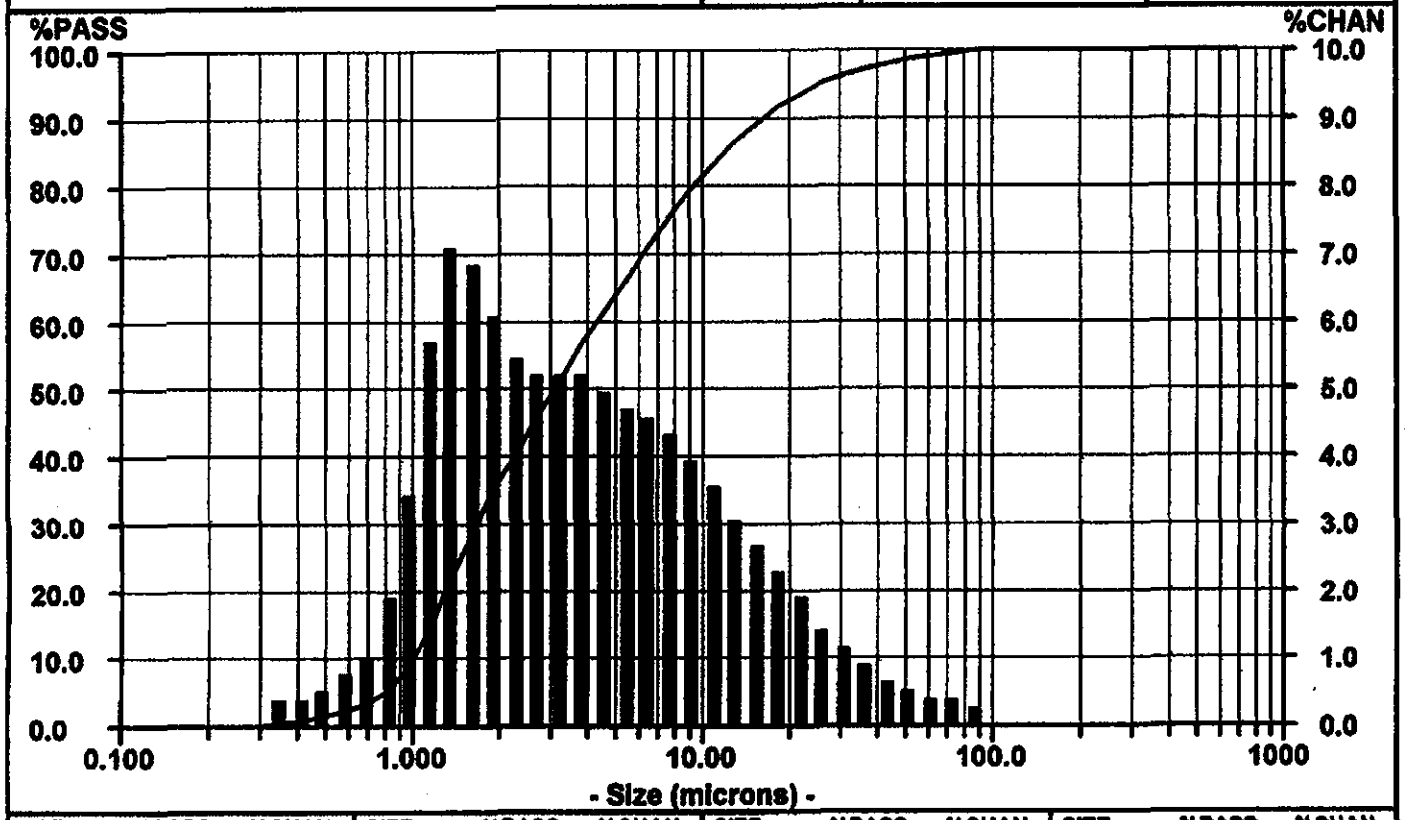
AW-103

103AW
Duplicate

Date: 09/25/91 Meas #: 00001
Time: 09:32 Pres #: 01

1 M NaOH 1 M NaNO3
40 ml/sec
Refractive Index = 2.00 Particle 1.33 Medium
File: WPAA032

Summary	Percentiles		Dia	Vol%	Width
mv = 6.847	10% = 1.001	60% = 4.366	6.334	59%	13.75
mn = 0.682	20% = 1.312	70% = 6.257	1.322	41%	1.026
ma = 2.142	30% = 1.681	80% = 9.366			
cs = 2.801	40% = 2.265	90% = 16.31			
sd = 5.093	50% = 3.131	95% = 25.41			

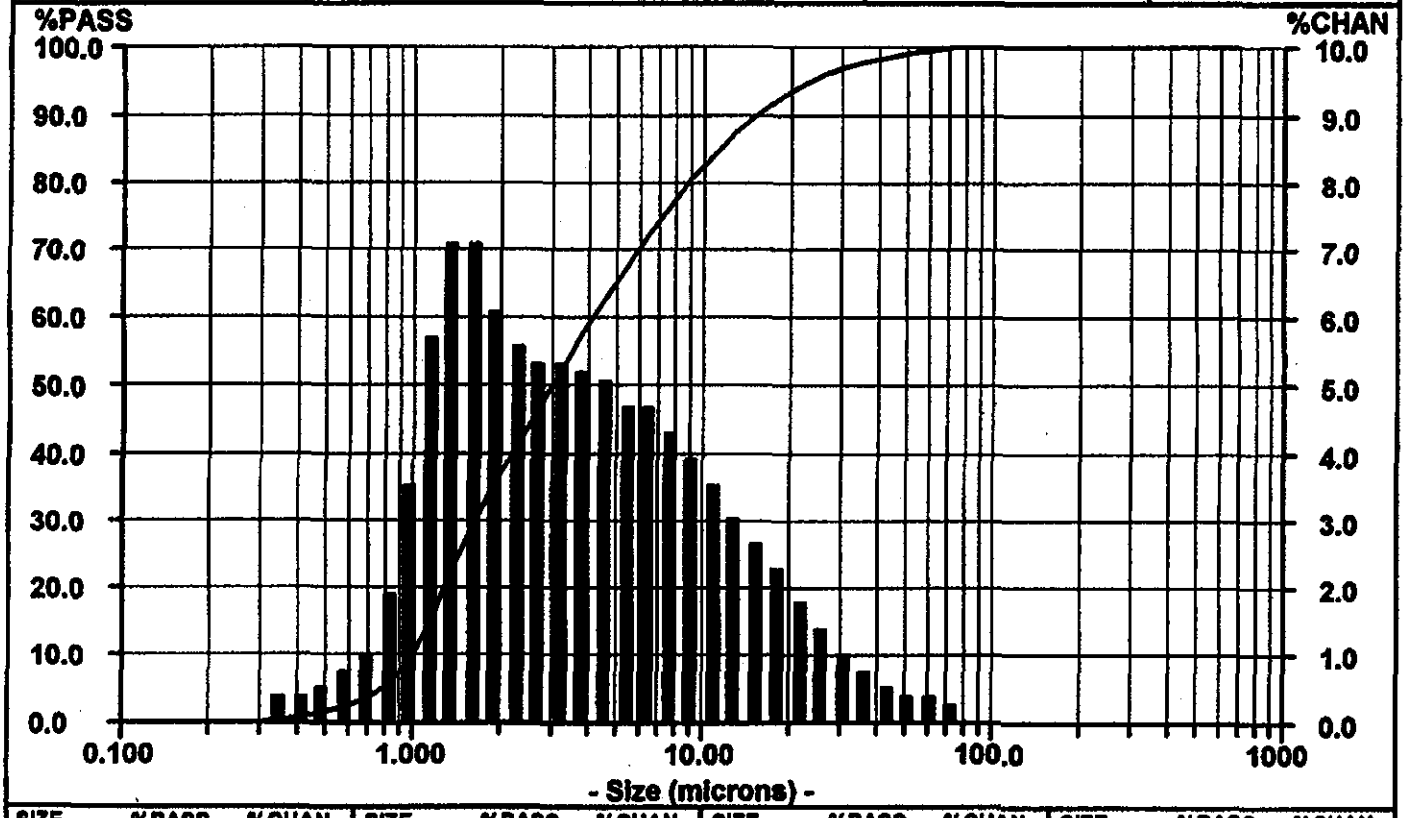


SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	79.73	4.09						
592.0	100.00	0.00	7.778	75.64	4.46						
497.8	100.00	0.00	6.541	71.18	4.68						
418.6	100.00	0.00	5.500	66.50	4.84						
352.0	100.00	0.00	4.625	61.66	5.05						
296.0	100.00	0.00	3.889	56.61	5.28						
248.9	100.00	0.00	3.270	51.35	5.36						
209.3	100.00	0.00	2.750	45.99	5.35						
176.0	100.00	0.00	2.312	40.64	5.52						
148.0	100.00	0.00	1.945	35.12	6.13						
124.5	100.00	0.00	1.635	28.99	6.99						
104.7	100.00	0.00	1.375	22.00	7.13						
88.00	100.00	0.34	1.156	14.87	5.70						
74.00	99.66	0.41	0.972	9.17	3.58						
62.23	99.25	0.50	0.818	5.59	2.00						
52.33	98.75	0.61	0.688	3.59	1.18						
44.00	98.14	0.75	0.578	2.41	0.80						
37.00	97.39	0.94	0.486	1.61	0.62						
31.11	96.45	1.21	0.409	0.99	0.53						
26.16	95.24	1.57	0.344	0.46	0.46						
22.00	93.67	1.97	0.289	0.00	0.00						
18.50	91.70	2.39	0.243	0.00	0.00						
15.56	89.31	2.77	0.204	0.00	0.00						
13.08	86.54	3.18	0.172	0.00	0.00						
11.00	83.36	3.63	0.145	0.00	0.00						

AW-103	103AW Duplicate	Date: 09/25/91 Meas #: 00001 Time: 09:38 Pres #: 01

1 M NaOH 1 M NaNO3
40 ml/sec
Refractive Index = 1.70 Particle 1.33 Medium
File: WPAA033

Summary	Percentiles		Dia	Vol%	Width
mv = 6.336	10% = 0.997	60% = 4.214	6.157	59%	12.70
mn = 0.884	20% = 1.301	70% = 6.000	1.322	41%	1.023
ma = 2.111	30% = 1.655	80% = 8.883			
cs = 2.842	40% = 2.212	90% = 15.16			
sd = 4.761	50% = 3.043	95% = 23.07			

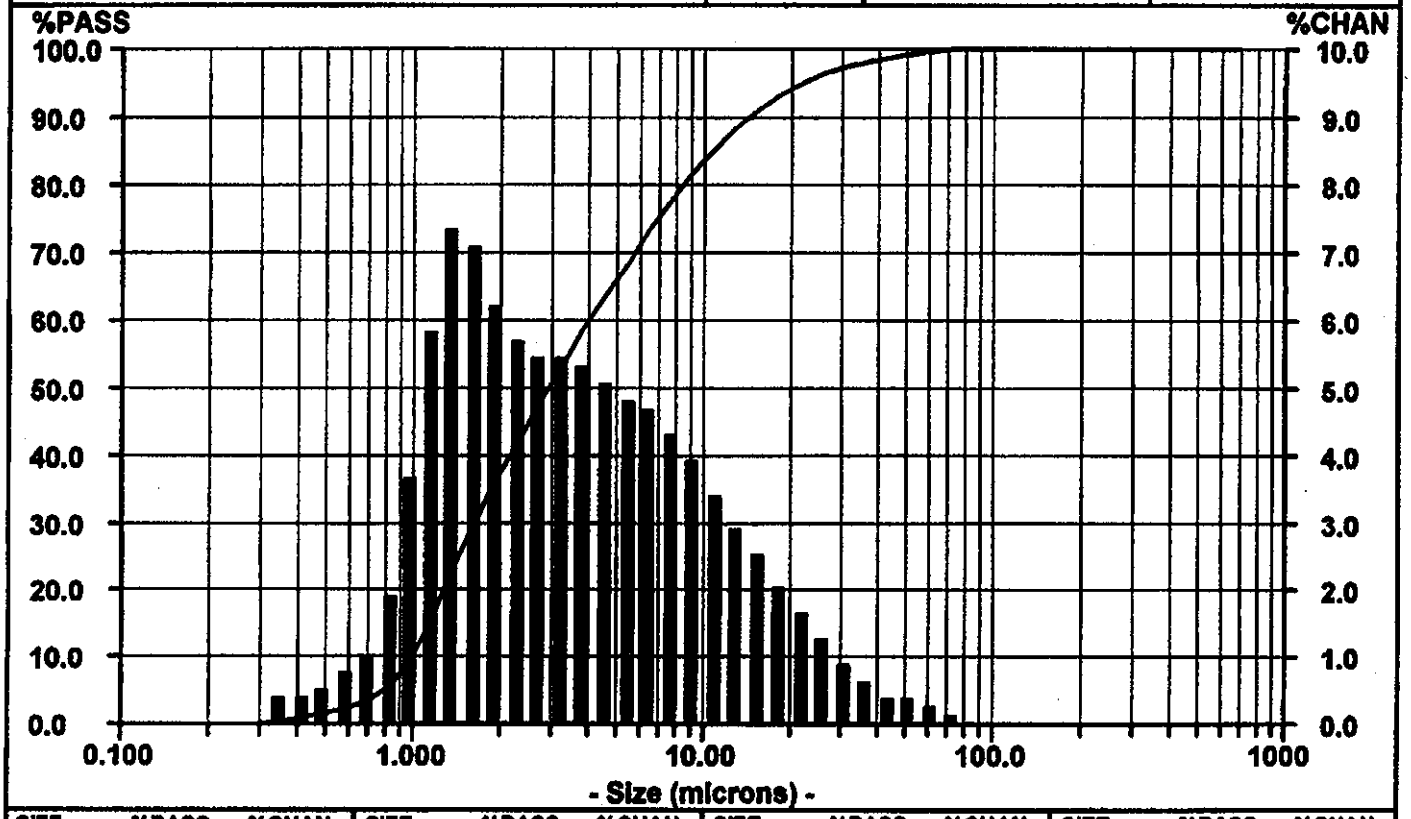


SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	80.92	4.10						
592.0	100.00	0.00	7.778	76.82	4.49						
497.8	100.00	0.00	6.541	72.33	4.72						
418.6	100.00	0.00	5.500	67.61	4.89						
352.0	100.00	0.00	4.625	62.72	5.11						
296.0	100.00	0.00	3.889	57.61	5.34						
248.9	100.00	0.00	3.270	52.27	5.44						
209.3	100.00	0.00	2.750	46.83	5.43						
176.0	100.00	0.00	2.312	41.40	5.61						
148.0	100.00	0.00	1.945	35.79	6.25						
124.5	100.00	0.00	1.635	29.54	7.14						
104.7	100.00	0.00	1.375	22.40	7.30						
88.00	100.00	0.00	1.156	15.10	5.82						
74.00	100.00	0.36	0.972	9.28	3.64						
62.23	99.64	0.44	0.818	5.64	2.03						
52.33	99.20	0.54	0.688	3.61	1.19						
44.00	98.66	0.67	0.578	2.42	0.80						
37.00	97.99	0.86	0.486	1.62	0.62						
31.11	97.13	1.11	0.409	1.00	0.54						
26.16	96.02	1.46	0.344	0.46	0.46						
22.00	94.56	1.87	0.289	0.00	0.00						
18.50	92.69	2.30	0.243	0.00	0.00						
15.56	90.39	2.71	0.204	0.00	0.00						
13.08	87.68	3.14	0.172	0.00	0.00						
11.00	84.54	3.62	0.145	0.00	0.00						

AW-103	103AW Duplicate	Date: 09/25/91 Meas #: 00001 Time: 09:45 Pres #: 01

1 M NaOH 1 M NaNO3
40 ml/sec
Refractive Index = 1.50 Particle 1.33 Medium
File: WPAA034

Summary	Percentiles		Dia	Vol%	Width
mv = 6.045	10% = 0.994	60% = 4.078	2.964	100%	8.995
mn = 0.686	20% = 1.293	70% = 5.770			
ma = 2.086	30% = 1.634	80% = 8.479			
cs = 2.876	40% = 2.169	90% = 14.27			
sd = 4.497	50% = 2.964	95% = 21.60			

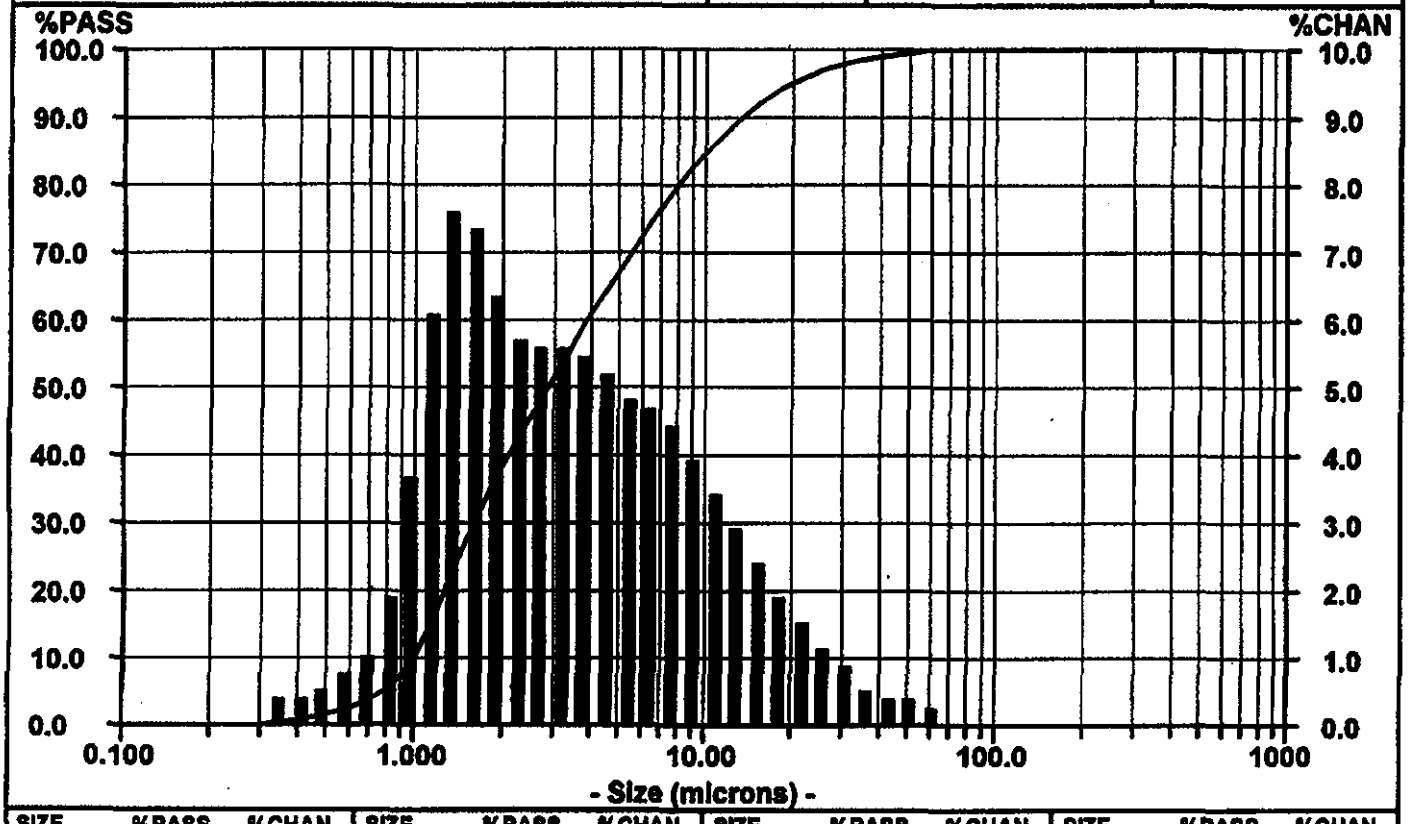


SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	81.99	4.08						
592.0	100.00	0.00	7.778	77.91	4.49						
497.8	100.00	0.00	6.541	73.42	4.75						
418.6	100.00	0.00	5.500	68.67	4.94						
352.0	100.00	0.00	4.625	63.73	5.17						
296.0	100.00	0.00	3.889	58.56	5.42						
248.9	100.00	0.00	3.270	53.14	5.53						
209.3	100.00	0.00	2.750	47.61	5.53						
176.0	100.00	0.00	2.312	42.08	5.70						
148.0	100.00	0.00	1.945	36.38	6.36						
124.5	100.00	0.00	1.635	30.02	7.29						
104.7	100.00	0.00	1.375	22.73	7.43						
88.00	100.00	0.00	1.156	15.30	5.96						
74.00	100.00	0.30	0.972	9.34	3.70						
62.23	99.70	0.37	0.818	5.64	2.04						
52.33	99.33	0.47	0.688	3.60	1.19						
44.00	98.86	0.59	0.578	2.41	0.80						
37.00	98.27	0.76	0.486	1.61	0.62						
31.11	97.51	1.00	0.409	0.99	0.53						
26.16	96.51	1.34	0.344	0.46	0.46						
22.00	95.17	1.74	0.289	0.00	0.00						
18.50	93.43	2.18	0.243	0.00	0.00						
15.56	91.25	2.62	0.204	0.00	0.00						
13.08	88.63	3.07	0.172	0.00	0.00						
11.00	85.56	3.57	0.145	0.00	0.00						

AW-103	103AW Duplicate	Date: 09/25/91 Meas #: 00001 Time: 09:52 Pres #: 01

1 M NaOH 1 M NaNO3
60 ml/sec
Refractive Index = 1.50 Particle 1.33 Medium
File: WPAA035

Summary	Percentiles		Dia	Vol%	Width
mv = 5.641	10% = 0.991	60% = 3.943	5.828	57%	11.07
mn = 0.690	20% = 1.283	70% = 5.538	1.324	43%	1.013
ma = 2.058	30% = 1.612	80% = 8.077			
cs = 2.918	40% = 2.121	90% = 13.36			
sd = 4.229	50% = 2.855	95% = 19.84			

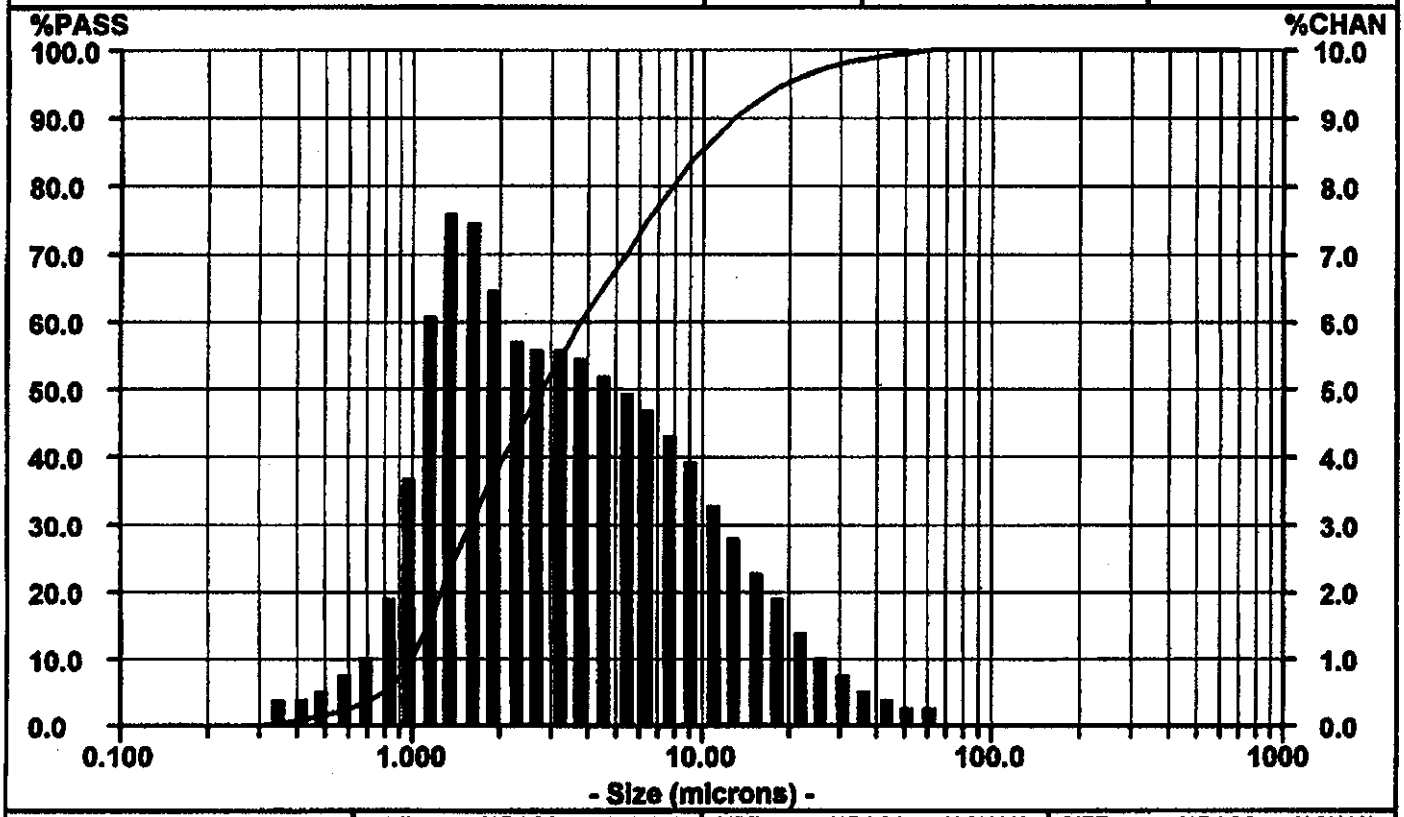


SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.260	83.14	4.06						
592.0	100.00	0.00	7.778	79.08	4.50						
497.8	100.00	0.00	6.541	74.58	4.77						
418.6	100.00	0.00	5.500	69.81	4.99						
352.0	100.00	0.00	4.625	64.82	5.24						
296.0	100.00	0.00	3.889	59.58	5.51						
248.9	100.00	0.00	3.270	54.07	5.62						
209.3	100.00	0.00	2.750	48.45	5.61						
176.0	100.00	0.00	2.312	42.84	5.78						
148.0	100.00	0.00	1.945	37.06	6.46						
124.5	100.00	0.00	1.635	30.60	7.45						
104.7	100.00	0.00	1.375	23.15	7.63						
88.00	100.00	0.00	1.156	15.52	6.10						
74.00	100.00	0.00	0.972	9.42	3.76						
62.23	100.00	0.33	0.818	5.66	2.05						
52.33	99.67	0.41	0.688	3.61	1.19						
44.00	99.26	0.51	0.578	2.42	0.80						
37.00	98.75	0.67	0.486	1.62	0.62						
31.11	98.08	0.91	0.409	1.00	0.54						
26.16	97.17	1.24	0.344	0.46	0.46						
22.00	95.93	1.64	0.289	0.00	0.00						
18.50	94.29	2.09	0.243	0.00	0.00						
15.56	92.20	2.53	0.204	0.00	0.00						
13.08	89.67	3.00	0.172	0.00	0.00						
11.00	86.67	3.53	0.145	0.00	0.00						

AW-103	103AW Duplicate	Date: 09/25/91 Meas #: 00001 Time: 09:58 Pres #: 01

1 M NaOH 1 M NaNO3
80 ml/sec
Refractive Index = 1.70 Particle 1.33 Medium
File: WPAA036

Summary	Percentiles		Dia	Vol%	Width
mv = 5.493	10% = 0.989	60% = 3.864	5.728	57%	10.65
mn = 0.692	20% = 1.277	70% = 5.402	1.324	43%	1.010
ma = 2.041	30% = 1.599	80% = 7.850			
cs = 2.939	40% = 2.093	90% = 12.90			
sd = 4.084	50% = 2.838	95% = 19.11			

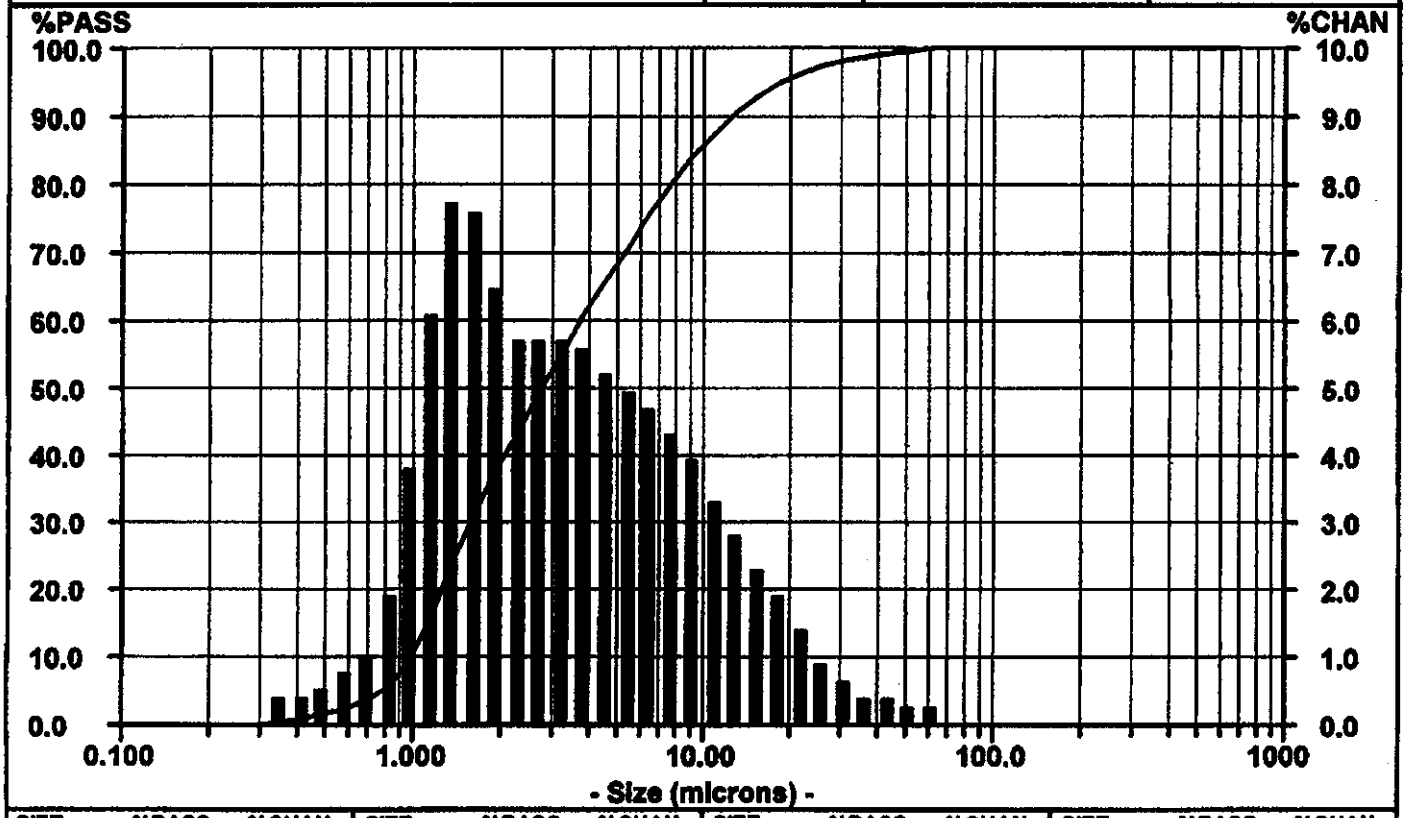


SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	83.81	4.03						
592.0	100.00	0.00	7.778	79.78	4.48						
497.8	100.00	0.00	6.541	75.30	4.78						
418.6	100.00	0.00	5.500	70.52	5.02						
352.0	100.00	0.00	4.625	65.50	5.29						
296.0	100.00	0.00	3.889	60.21	5.56						
248.9	100.00	0.00	3.270	54.65	5.67						
209.3	100.00	0.00	2.750	48.98	5.66						
176.0	100.00	0.00	2.312	43.32	5.84						
148.0	100.00	0.00	1.945	37.48	6.54						
124.5	100.00	0.00	1.635	30.94	7.55						
104.7	100.00	0.00	1.375	23.39	7.75						
88.00	100.00	0.00	1.156	15.64	6.18						
74.00	100.00	0.00	0.972	9.46	3.79						
62.23	100.00	0.31	0.818	5.67	2.06						
52.33	99.69	0.37	0.688	3.61	1.19						
44.00	99.32	0.47	0.578	2.42	0.80						
37.00	98.85	0.62	0.486	1.62	0.62						
31.11	98.23	0.84	0.409	1.00	0.54						
26.16	97.39	1.16	0.344	0.46	0.46						
22.00	96.23	1.55	0.289	0.00	0.00						
18.50	94.68	2.00	0.243	0.00	0.00						
15.56	92.68	2.45	0.204	0.00	0.00						
13.08	90.23	2.94	0.172	0.00	0.00						
11.00	87.29	3.48	0.145	0.00	0.00						

AW-103	103AW Duplicate	Date: 09/25/91 Meas #: 00001 Time: 10:02 Pres #: 01

1 M NaOH 1 M NaNO3
60 ml/sec
Refractive Index = 2.00 Particle 1.33 Medium
File: WPAA037

Summary	Percentiles		Dia	Vol%	Width
mv = 5.387	10% = 0.988	60% = 3.805	5.660	56%	10.33
mn = 0.694	20% = 1.273	70% = 5.304	1.324	44%	1.008
ma = 2.023	30% = 1.689	80% = 7.689			
cs = 2.957	40% = 2.073	90% = 12.53			
sd = 3.980	50% = 2.803	95% = 18.50			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	84.31	4.02						
592.0	100.00	0.00	7.778	80.29	4.47						
497.8	100.00	0.00	6.541	75.82	4.78						
418.6	100.00	0.00	5.500	71.04	5.03						
352.0	100.00	0.00	4.625	66.01	5.31						
296.0	100.00	0.00	3.889	60.70	5.60						
248.9	100.00	0.00	3.270	55.10	5.72						
209.3	100.00	0.00	2.750	49.38	5.70						
176.0	100.00	0.00	2.312	43.68	5.88						
148.0	100.00	0.00	1.945	37.80	6.58						
124.5	100.00	0.00	1.635	31.22	7.62						
104.7	100.00	0.00	1.375	23.60	7.85						
88.00	100.00	0.00	1.156	15.75	6.25						
74.00	100.00	0.00	0.972	9.50	3.82						
62.23	100.00	0.31	0.818	5.68	2.07						
52.33	99.69	0.36	0.688	3.61	1.19						
44.00	99.33	0.44	0.578	2.42	0.80						
37.00	98.89	0.57	0.486	1.62	0.62						
31.11	98.32	0.77	0.409	1.00	0.54						
26.16	97.55	1.08	0.344	0.46	0.46						
22.00	96.47	1.47	0.289	0.00	0.00						
18.50	95.00	1.93	0.243	0.00	0.00						
15.56	93.07	2.40	0.204	0.00	0.00						
13.08	90.67	2.90	0.172	0.00	0.00						
11.00	87.77	3.46	0.145	0.00	0.00						

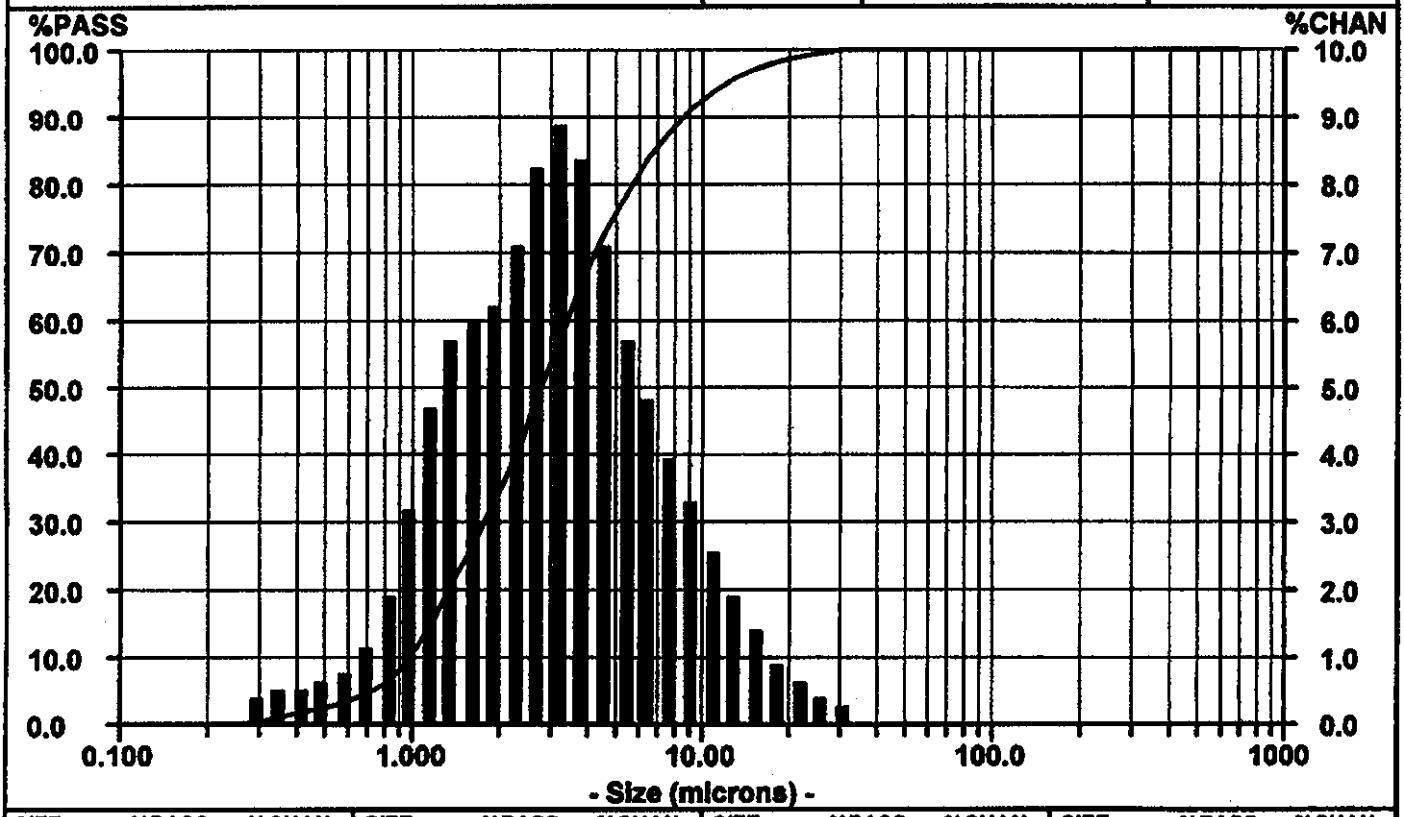
AW-103

103AW
Duplicate

Date: 09/25/91 Meas #: 00001
Time: 10:10 Pres #: 01

1 M NaOH 1 M NaNO3, sonicate 2 min.
17 ml/sec
Refractive Index = 1.50 Particle 1.33 Medium
File: WPAA038

Summary	Percentiles		Dia	Vol%	Width
mv = 4.061	10% = 0.975	60% = 3.438	2.831	100%	5.388
mn = 0.533	20% = 1.352	70% = 4.281			
ma = 1.943	30% = 1.793	80% = 5.701			
cs = 3.089	40% = 2.303	90% = 8.647			
sd = 2.694	50% = 2.831	95% = 12.13			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	91.21	3.31						
592.0	100.00	0.00	7.778	87.90	4.08						
497.8	100.00	0.00	6.541	83.82	4.90						
418.6	100.00	0.00	5.500	78.92	5.89						
352.0	100.00	0.00	4.625	73.03	7.14						
296.0	100.00	0.00	3.889	65.89	8.41						
248.9	100.00	0.00	3.270	57.48	8.96						
209.3	100.00	0.00	2.750	48.52	8.34						
176.0	100.00	0.00	2.312	40.18	7.15						
148.0	100.00	0.00	1.945	33.03	6.33						
124.5	100.00	0.00	1.635	26.70	6.09						
104.7	100.00	0.00	1.375	20.61	5.84						
88.00	100.00	0.00	1.156	14.77	4.84						
74.00	100.00	0.00	0.972	9.93	3.27						
62.23	100.00	0.00	0.818	6.66	1.97						
52.33	100.00	0.00	0.688	4.69	1.23						
44.00	100.00	0.00	0.578	3.46	0.89						
37.00	100.00	0.00	0.486	2.57	0.73						
31.11	100.00	0.35	0.409	1.84	0.66						
26.16	99.65	0.52	0.344	1.18	0.63						
22.00	99.13	0.75	0.289	0.55	0.55						
18.50	98.38	1.08	0.243	0.00	0.00						
15.56	97.30	1.49	0.204	0.00	0.00						
13.08	95.81	2.00	0.172	0.00	0.00						
11.00	93.81	2.60	0.145	0.00	0.00						

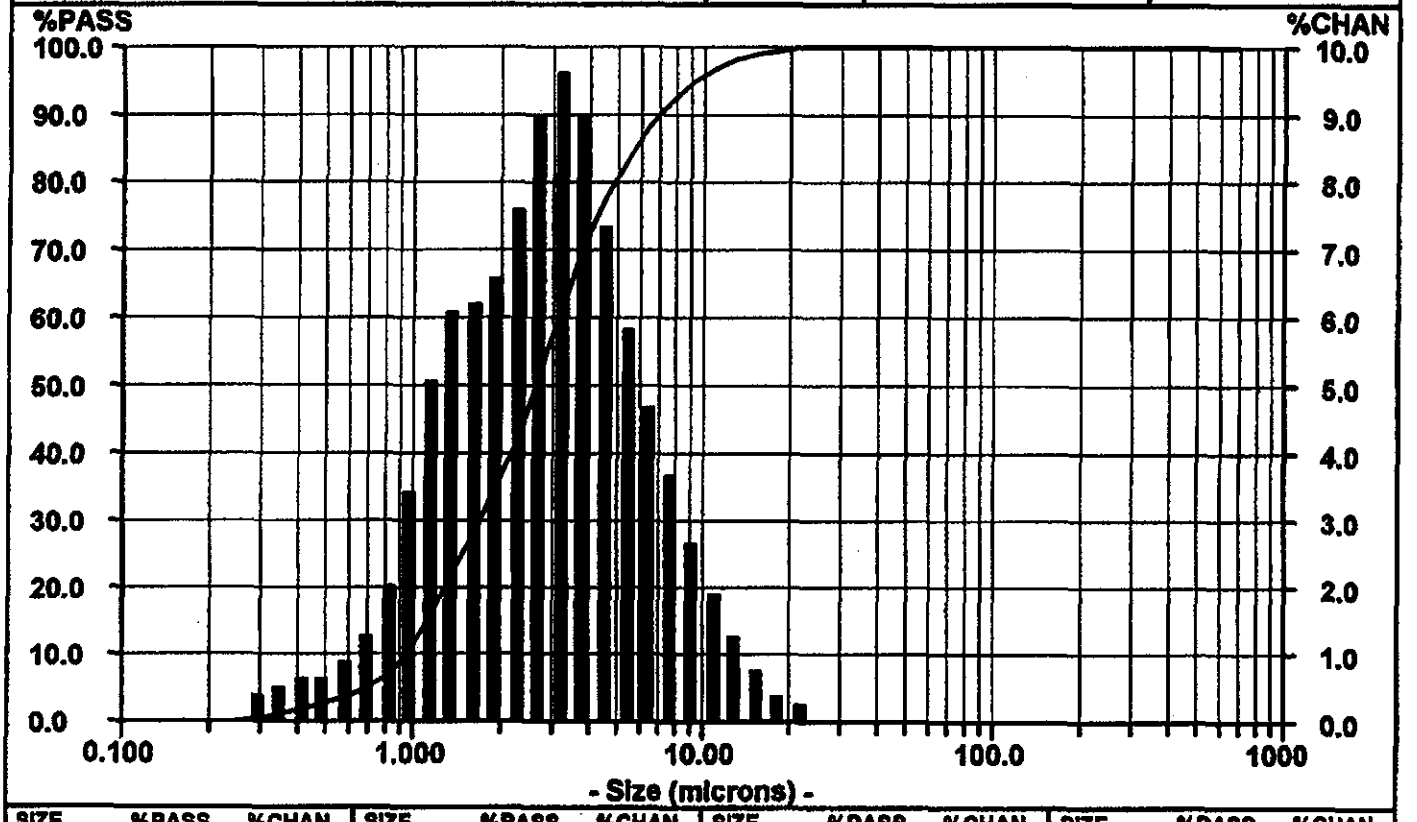
AW-103

103AW
Duplicate

Date: 09/25/91 Meas #: 00001
Time: 10:15 Pres #: 01

1 M NaOH 1 M NaNO3, sonicate 2 min.
17 ml/sec
Sonicate 2 min.
Refractive Index = 1.70 Particle 1.33 Medium
File: WPAA039

Summary	Percentiles		Dia	Vol%	Width
mv = 3.456	10% = 0.947	60% = 3.188	2.669	100%	4.382
mn = 0.533	20% = 1.304	70% = 3.854			
ma = 1.845	30% = 1.714	80% = 4.906			
cs = 3.252	40% = 2.190	90% = 6.993			
sd = 2.191	50% = 2.669	95% = 9.294			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.260	94.94	2.77						
592.0	100.00	0.00	7.778	92.17	3.70						
497.8	100.00	0.00	6.541	88.47	4.71						
418.6	100.00	0.00	5.500	83.76	5.90						
352.0	100.00	0.00	4.625	77.86	7.41						
296.0	100.00	0.00	3.889	70.45	9.01						
248.9	100.00	0.00	3.270	61.44	9.79						
209.3	100.00	0.00	2.750	51.66	9.11						
176.0	100.00	0.00	2.312	42.54	7.65						
148.0	100.00	0.00	1.945	34.89	6.63						
124.5	100.00	0.00	1.635	28.26	6.33						
104.7	100.00	0.00	1.375	21.93	6.14						
88.00	100.00	0.00	1.156	15.79	5.16						
74.00	100.00	0.00	0.972	10.63	3.51						
62.23	100.00	0.00	0.818	7.12	2.10						
52.33	100.00	0.00	0.688	5.02	1.32						
44.00	100.00	0.00	0.578	3.70	0.95						
37.00	100.00	0.00	0.486	2.75	0.79						
31.11	100.00	0.00	0.409	1.96	0.71						
26.16	100.00	0.00	0.344	1.25	0.67						
22.00	100.00	0.34	0.289	0.58	0.58						
18.50	99.66	0.55	0.243	0.00	0.00						
15.56	99.11	0.87	0.204	0.00	0.00						
13.08	98.24	1.33	0.172	0.00	0.00						
11.00	96.91	1.97	0.145	0.00	0.00						

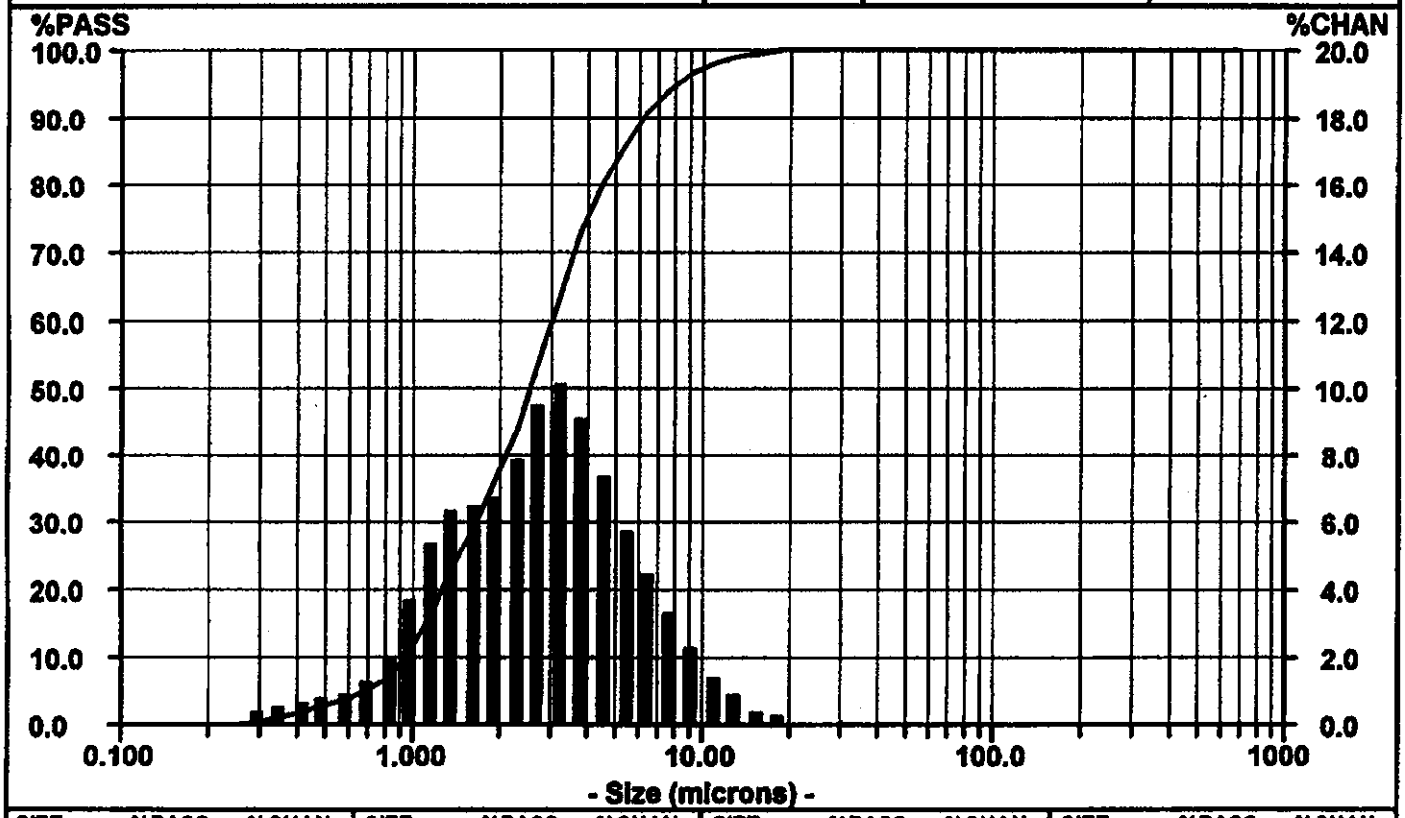
AW-103

103AW
Duplicate

Date: 09/25/91 Meas #: 00001
Time: 10:20 Pres #: 01

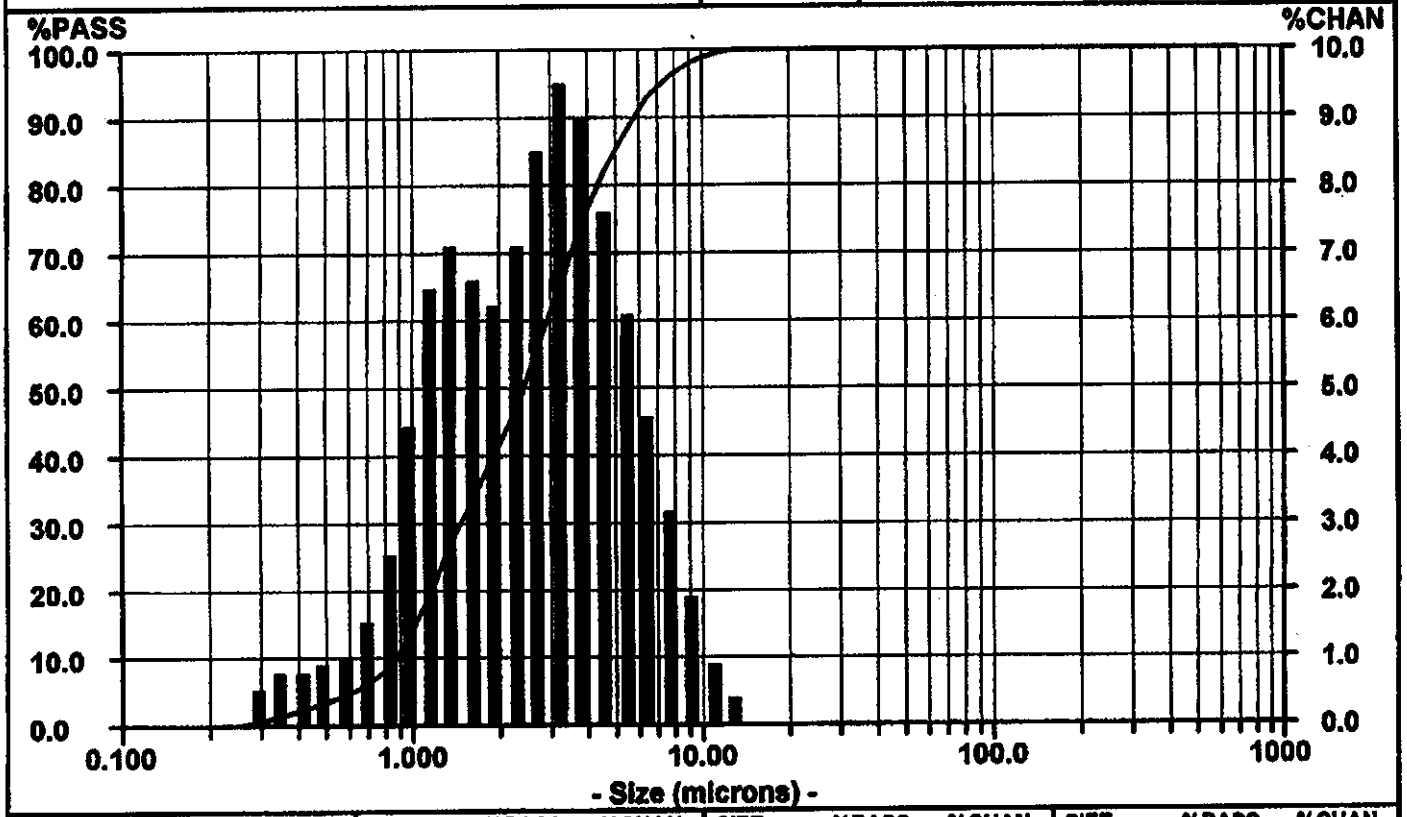
1 M NaOH 1 M NaNO3
17 ml/sec
sonicate 2 min.
Refractive Index = 2.00 Particle 1.33 Medium
File: WPAA040

Summary	Percentiles		Dia	Vol%	Width
mv = 3.184	10% = 0.933	60% = 3.059	2.578	100%	3.933
mn = 0.535	20% = 1.274	70% = 3.651			
ma = 1.792	30% = 1.662	80% = 4.543			
cs = 3.346	40% = 2.121	90% = 6.252			
sd = 1.966	50% = 2.578	95% = 8.082			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	96.73	2.32						
592.0	100.00	0.00	7.778	94.41	3.35						
497.8	100.00	0.00	6.541	91.06	4.51						
418.6	100.00	0.00	5.500	86.55	5.84						
352.0	100.00	0.00	4.625	80.71	7.49						
296.0	100.00	0.00	3.889	73.22	9.27						
248.9	100.00	0.00	3.270	63.95	10.24						
209.3	100.00	0.00	2.750	53.71	9.54						
176.0	100.00	0.00	2.312	44.17	7.96						
148.0	100.00	0.00	1.945	36.21	6.82						
124.5	100.00	0.00	1.635	29.39	6.62						
104.7	100.00	0.00	1.375	22.87	6.40						
88.00	100.00	0.00	1.156	16.47	5.44						
74.00	100.00	0.00	0.972	11.03	3.70						
62.23	100.00	0.00	0.818	7.33	2.19						
52.33	100.00	0.00	0.688	5.14	1.35						
44.00	100.00	0.00	0.578	3.79	0.97						
37.00	100.00	0.00	0.486	2.82	0.81						
31.11	100.00	0.00	0.409	2.01	0.73						
26.16	100.00	0.00	0.344	1.28	0.69						
22.00	100.00	0.00	0.289	0.59	0.59						
18.50	100.00	0.31	0.243	0.00	0.00						
15.56	99.69	0.54	0.204	0.00	0.00						
13.08	99.15	0.92	0.172	0.00	0.00						
11.00	98.23	1.60	0.145	0.00	0.00						

AW-103	103AW Duplicate	Date: 09/25/91 Time: 10:25	Meas #: 00001 Pres #: 01
1 M NaOH 1 M NaNO3 40 ml/sec Sonicate 2 min. Refractive Index = 1.50 Particle 1.33 Medium File: WPAA041 Measurement 1	Summary mv = 2.936 mn = 0.524 ma = 1.664 cs = 3.606 sd = 1.893	Percentiles 10% = 0.864 60% = 2.972 20% = 1.160 70% = 3.563 30% = 1.481 80% = 4.382 40% = 1.939 90% = 5.789 50% = 2.464 95% = 7.163	Dia Vol% Width 3.363 66% 3.509 1.073 34% 0.779



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	98.38	1.98						
592.0	100.00	0.00	7.778	96.40	3.24						
497.8	100.00	0.00	6.541	93.16	4.69						
418.6	100.00	0.00	5.500	88.47	6.20						
352.0	100.00	0.00	4.625	82.27	7.77						
296.0	100.00	0.00	3.889	74.50	9.16						
248.9	100.00	0.00	3.270	65.34	9.56						
209.3	100.00	0.00	2.750	55.78	8.56						
176.0	100.00	0.00	2.312	47.22	7.10						
148.0	100.00	0.00	1.945	40.12	6.38						
124.5	100.00	0.00	1.635	33.74	6.67						
104.7	100.00	0.00	1.375	27.07	7.21						
88.00	100.00	0.00	1.156	19.86	6.55						
74.00	100.00	0.00	0.972	13.31	4.53						
62.23	100.00	0.00	0.818	8.78	2.65						
52.33	100.00	0.00	0.688	6.13	1.61						
44.00	100.00	0.00	0.578	4.52	1.17						
37.00	100.00	0.00	0.486	3.35	0.98						
31.11	100.00	0.00	0.409	2.37	0.89						
26.16	100.00	0.00	0.344	1.48	0.81						
22.00	100.00	0.00	0.289	0.67	0.67						
18.50	100.00	0.00	0.243	0.00	0.00						
15.56	100.00	0.00	0.204	0.00	0.00						
13.08	100.00	0.54	0.172	0.00	0.00						
11.00	99.46	1.08	0.145	0.00	0.00						

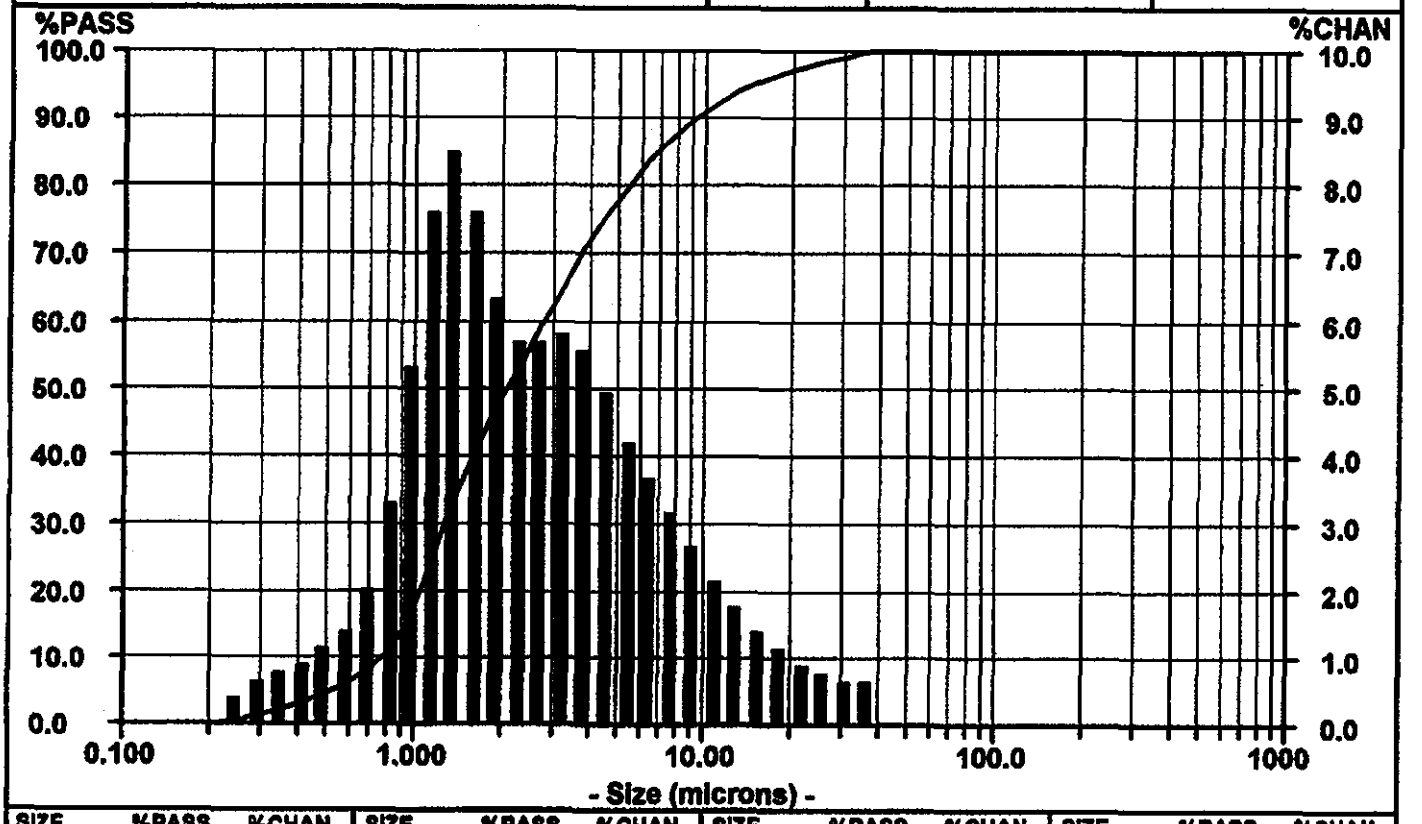
AW-103

103AW
Duplicate

Date: 09/26/91 Meas #: 00002
Time: 10:30 Pres #: 01

1 M NaOH 1 M NaNO3
40 ml/sec
Sonicate 2 min.
Refractive Index = 1.70 Particle 1.33 Medium
File: WPAA041 Measurement 2

Summary	Percentiles		Dia	Vol%	Width
mv = 4.022	10% = 0.768	60% = 2.821	4.302	53%	7.986
mn = 0.444	20% = 1.049	70% = 3.802	1.136	47%	0.927
ma = 1.515	30% = 1.289	80% = 5.482			
cs = 3.961	40% = 1.598	90% = 9.323			
sd = 2.820	50% = 2.097	95% = 14.52			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.260	89.89	2.77						
592.0	100.00	0.00	7.778	87.12	3.27						
497.8	100.00	0.00	6.541	83.85	3.77						
418.6	100.00	0.00	5.500	80.08	4.34						
352.0	100.00	0.00	4.625	75.74	5.02						
296.0	100.00	0.00	3.889	70.72	5.65						
248.9	100.00	0.00	3.270	65.07	5.94						
209.3	100.00	0.00	2.750	59.13	5.85						
176.0	100.00	0.00	2.312	53.28	5.85						
148.0	100.00	0.00	1.945	47.43	6.46						
124.5	100.00	0.00	1.635	40.97	7.73						
104.7	100.00	0.00	1.375	33.24	8.68						
88.00	100.00	0.00	1.156	24.56	7.77						
74.00	100.00	0.00	0.972	16.79	5.41						
62.23	100.00	0.00	0.818	11.38	3.32						
52.33	100.00	0.00	0.688	8.06	2.11						
44.00	100.00	0.00	0.578	5.95	1.52						
37.00	100.00	0.71	0.486	4.43	1.21						
31.11	99.29	0.71	0.409	3.22	1.02						
26.16	98.58	0.81	0.344	2.20	0.89						
22.00	97.77	0.98	0.289	1.31	0.76						
18.50	96.79	1.22	0.243	0.55	0.55						
15.56	95.57	1.52	0.204	0.00	0.00						
13.08	94.05	1.87	0.172	0.00	0.00						
11.00	92.18	2.29	0.146	0.00	0.00						

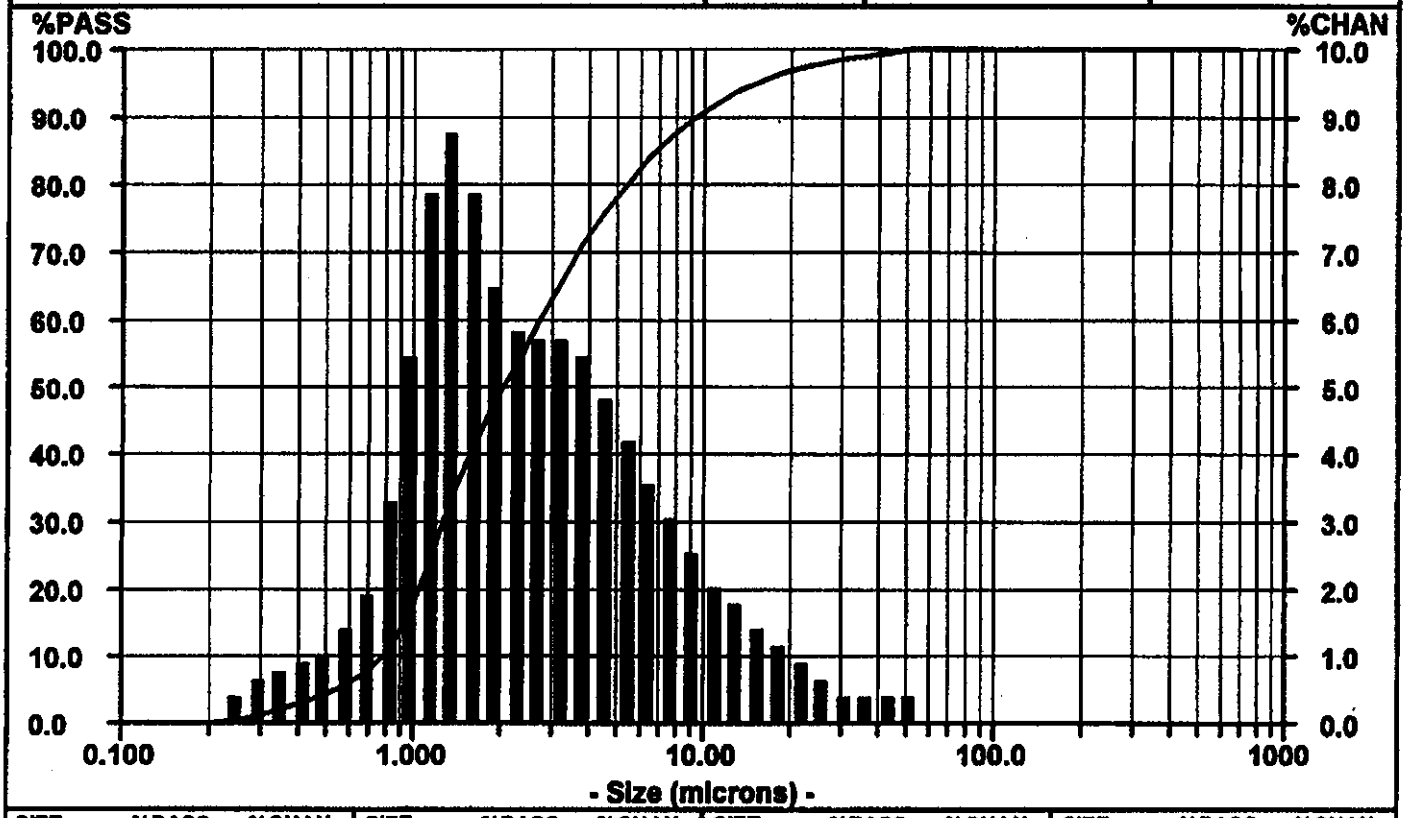
AW-103

103AW
Duplicate

Date: 09/25/91 Meas #: 00001
Time: 10:36 Pres #: 01

1 M NaOH 1 M NaNO3
40 ml/sec
Sonicate 2 min.
Refractive Index = 2.00 Particle 1.33 Medium
File: WPAA042

Summary	Percentiles		Dia	Vol%	Width
mv = 4.164	10% = 0.776	60% = 2.768	4.777	46%	8.774
mn = 0.448	20% = 1.050	70% = 3.740	1.209	54%	1.083
ma = 1.515	30% = 1.283	80% = 5.412			
cs = 3.962	40% = 1.561	90% = 9.376			
sd = 2.785	50% = 2.059	95% = 14.96			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	89.82	2.63						
592.0	100.00	0.00	7.778	87.19	3.14						
497.8	100.00	0.00	6.541	84.05	3.67						
418.6	100.00	0.00	5.500	80.38	4.25						
352.0	100.00	0.00	4.625	76.13	4.92						
296.0	100.00	0.00	3.889	71.21	5.55						
248.9	100.00	0.00	3.270	65.66	5.88						
209.3	100.00	0.00	2.750	59.78	5.85						
176.0	100.00	0.00	2.312	53.93	5.91						
148.0	100.00	0.00	1.945	48.02	6.57						
124.5	100.00	0.00	1.635	41.45	7.90						
104.7	100.00	0.00	1.375	33.55	8.89						
88.00	100.00	0.00	1.156	24.66	7.97						
74.00	100.00	0.00	0.972	16.69	5.51						
62.23	100.00	0.00	0.818	11.18	3.32						
52.33	100.00	0.41	0.688	7.86	2.08						
44.00	99.59	0.41	0.578	5.78	1.48						
37.00	99.18	0.45	0.486	4.30	1.17						
31.11	98.73	0.54	0.409	3.13	0.99						
26.16	98.19	0.71	0.344	2.14	0.86						
22.00	97.48	0.94	0.289	1.28	0.74						
18.50	96.54	1.22	0.243	0.54	0.54						
15.56	95.32	1.51	0.204	0.00	0.00						
13.08	93.81	1.81	0.172	0.00	0.00						
11.00	92.00	2.18	0.145	0.00	0.00						

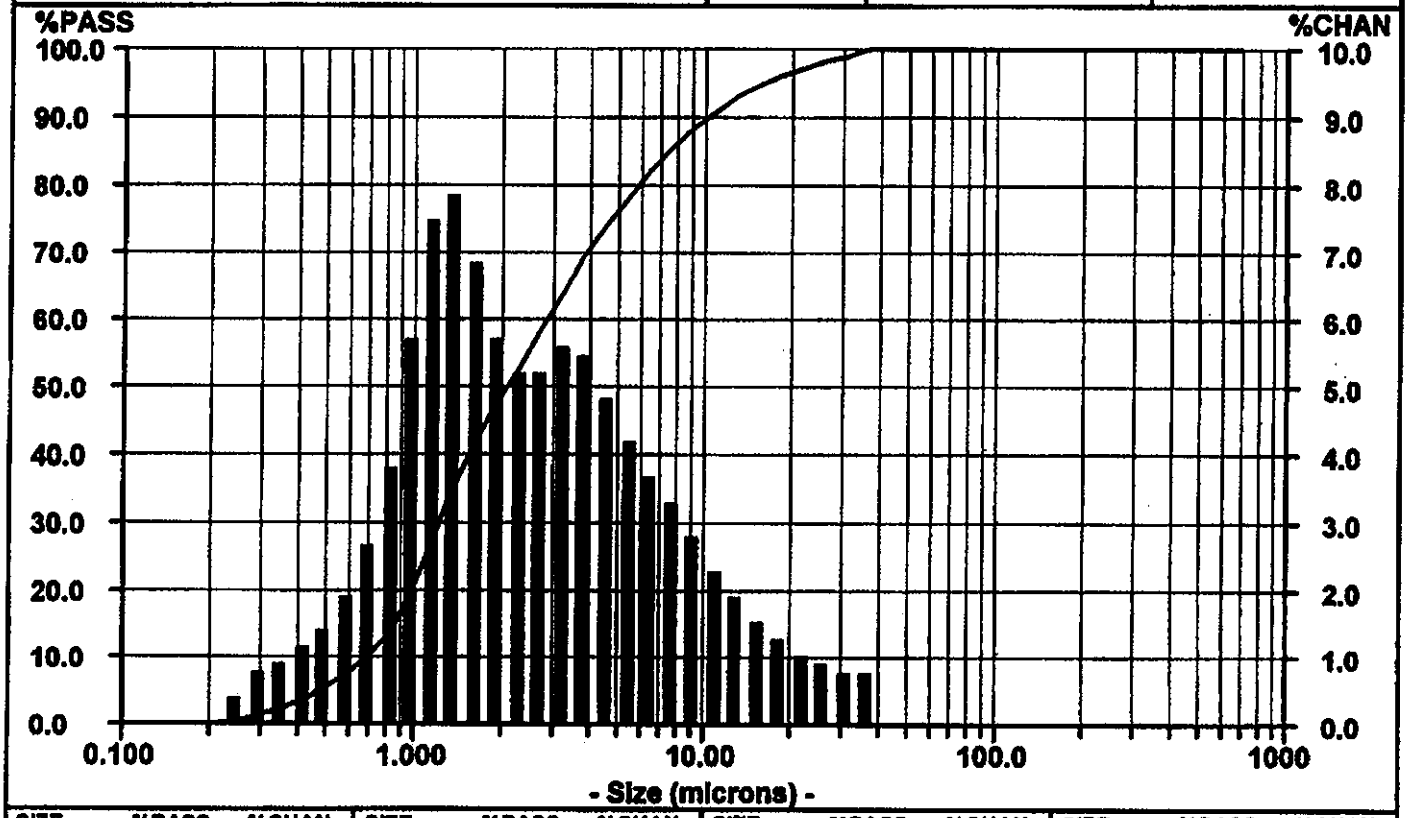
AW-103

103AW
Duplicate

Date: 09/25/91 Meas #: 00001
Time: 10:41 Pres #: 01

1 M NaOH 1 M NaNO3, s.
60 ml/sec
Sonicate 2 min.
Refractive Index = 1.5 Particle 1.33 Medium
File: WPAA043

Summary	Percentiles		Dia	Vol%	Width
mv = 4.208	10% = 0.688	60% = 2.899	4.541	52%	8.928
mn = 0.437	20% = 0.981	70% = 3.966	1.076	48%	0.962
ma = 1.450	30% = 1.230	80% = 5.834			
cs = 4.138	40% = 1.550	90% = 10.15			
sd = 3.103	50% = 2.094	95% = 15.87			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	88.63	2.89						
592.0	100.00	0.00	7.778	85.74	3.31						
497.8	100.00	0.00	6.641	82.43	3.76						
418.6	100.00	0.00	5.500	78.68	4.30						
352.0	100.00	0.00	4.625	74.38	4.96						
296.0	100.00	0.00	3.889	69.42	5.50						
248.9	100.00	0.00	3.270	63.92	5.60						
209.3	100.00	0.00	2.750	58.32	5.34						
176.0	100.00	0.00	2.312	52.98	5.23						
148.0	100.00	0.00	1.945	47.75	5.74						
124.5	100.00	0.00	1.635	42.01	6.92						
104.7	100.00	0.00	1.375	35.09	7.95						
88.00	100.00	0.00	1.156	27.14	7.51						
74.00	100.00	0.00	0.972	19.63	5.72						
62.23	100.00	0.00	0.818	13.91	3.90						
52.33	100.00	0.00	0.688	10.01	2.71						
44.00	100.00	0.00	0.578	7.30	2.02						
37.00	100.00	0.83	0.486	5.28	1.59						
31.11	99.17	0.85	0.409	3.69	1.27						
26.16	98.32	0.96	0.344	2.42	1.03						
22.00	97.36	1.14	0.289	1.39	0.82						
18.50	96.22	1.39	0.243	0.57	0.57						
15.56	94.83	1.69	0.204	0.00	0.00						
13.08	93.14	2.05	0.172	0.00	0.00						
11.00	91.09	2.46	0.145	0.00	0.00						

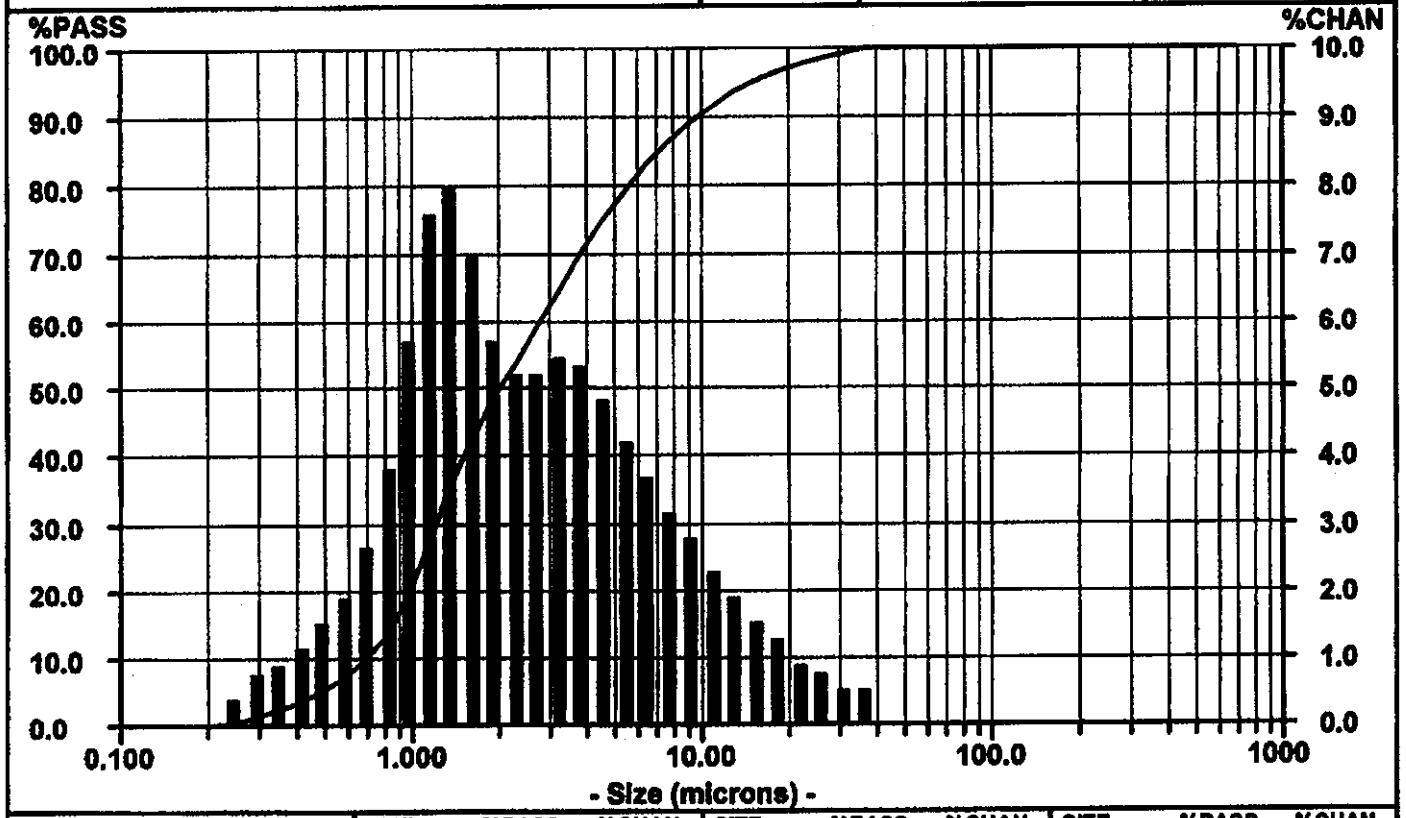
AW-103

103AW
Duplicate

Date: 09/25/91 Meas #: 00001
Time: 10:46 Pres #: 01

1 M NaOH 1 M NaNO3,
50 ml/sec
Sonicate 2 min.
Refractive Index = 1.70 Particle 1.33 Medium
File: WPAA044

Summary	Percentiles		Dia	Vol%	Width
mv = 4.032	10% = 0.682	60% = 2.823	4.476	51%	8.499
mn = 0.439	20% = 0.972	70% = 3.861	1.075	49%	0.959
ma = 1.432	30% = 1.215	80% = 5.619			
cs = 4.191	40% = 1.521	90% = 9.683			
sd = 2.960	50% = 2.036	95% = 14.88			

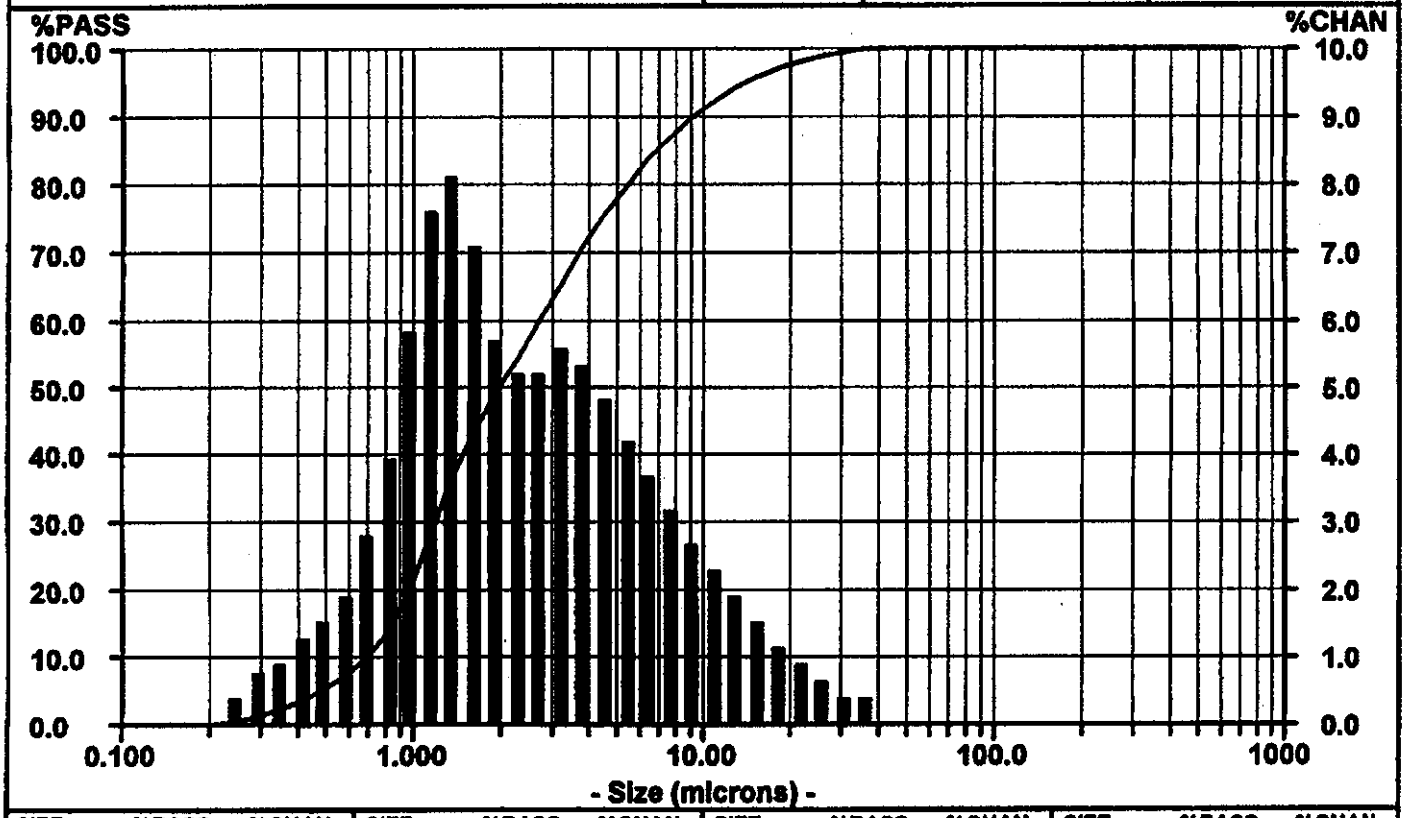


SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	89.33	2.81						
592.0	100.00	0.00	7.778	86.52	3.26						
497.8	100.00	0.00	6.541	83.26	3.74						
418.6	100.00	0.00	5.500	79.52	4.32						
352.0	100.00	0.00	4.625	75.20	4.97						
296.0	100.00	0.00	3.889	70.23	5.48						
248.9	100.00	0.00	3.270	64.75	5.58						
209.3	100.00	0.00	2.750	59.17	5.33						
176.0	100.00	0.00	2.312	53.84	5.25						
148.0	100.00	0.00	1.945	48.59	5.80						
124.5	100.00	0.00	1.635	42.79	7.03						
104.7	100.00	0.00	1.375	35.76	8.10						
88.00	100.00	0.00	1.156	27.66	7.67						
74.00	100.00	0.00	0.972	19.99	5.85						
62.23	100.00	0.00	0.818	14.14	3.98						
52.33	100.00	0.00	0.688	10.16	2.76						
44.00	100.00	0.00	0.578	7.40	2.06						
37.00	100.00	0.83	0.486	5.34	1.62						
31.11	99.37	0.69	0.409	3.72	1.29						
26.16	98.68	0.85	0.344	2.43	1.04						
22.00	97.83	1.07	0.289	1.39	0.83						
18.50	96.76	1.36	0.243	0.56	0.56						
15.56	95.40	1.67	0.204	0.00	0.00						
13.08	93.73	2.01	0.172	0.00	0.00						
11.00	91.72	2.39	0.145	0.00	0.00						

AW-103	103AW Duplicate	Date: 09/25/91 Meas #: 00001 Time: 10:51 Pres #: 01

1 M NaOH 1 M NaNO3
80 ml/sec
Sonicate 2 min.
Refractive Index = 2.00 Particle 1.33 Medium
File: WPAA045

Summary	Percentiles		Dia	Vol%	Width
mv = 3.877	10% = 0.677	60% = 2.752	4.401	51%	8.067
mn = 0.440	20% = 0.965	70% = 3.759	1.074	49%	0.957
ma = 1.416	30% = 1.203	80% = 5.434			
cs = 4.237	40% = 1.498	90% = 9.244			
sd = 2.837	50% = 1.991	95% = 14.04			

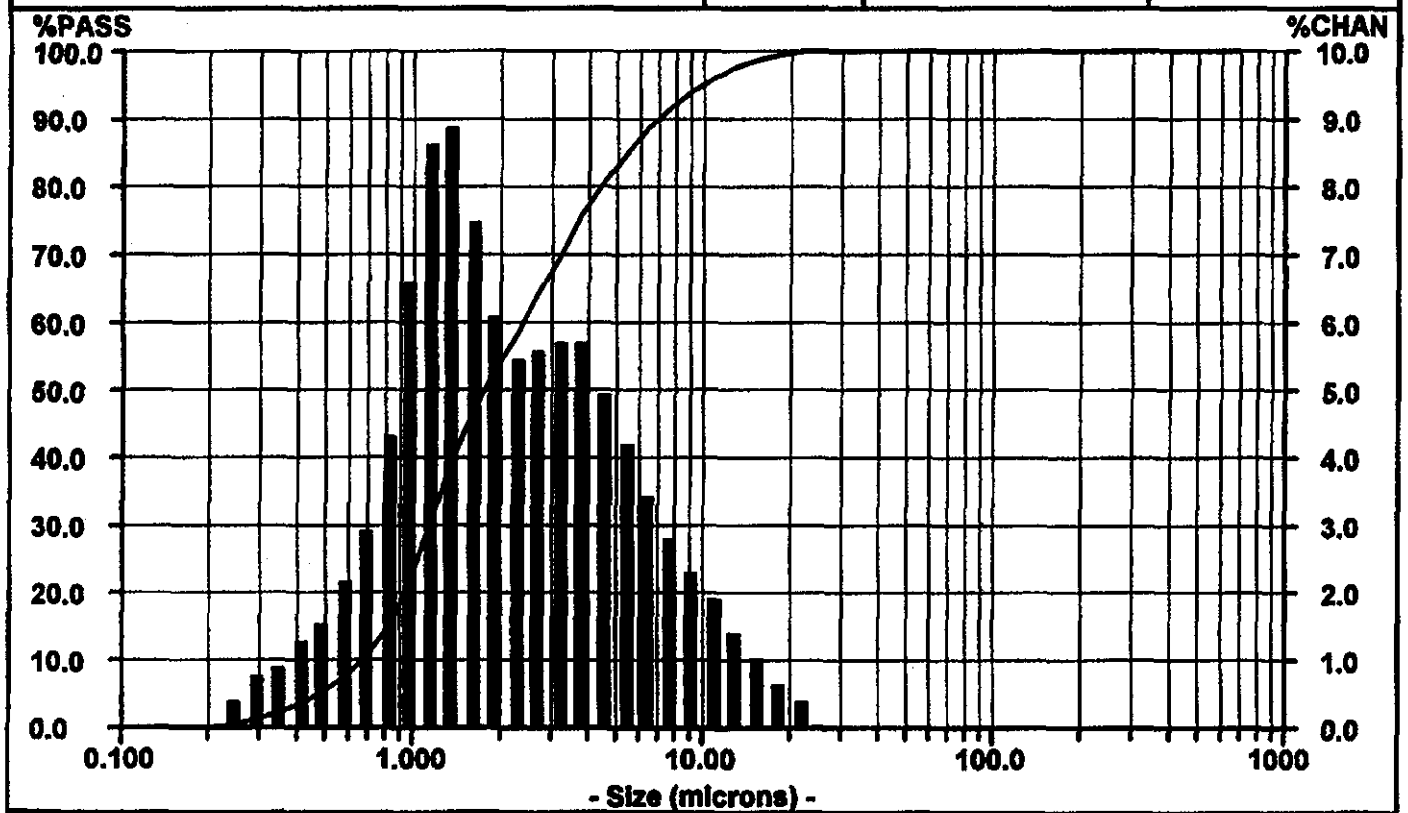


SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	90.01	2.77						
592.0	100.00	0.00	7.778	87.24	3.23						
497.8	100.00	0.00	6.541	84.01	3.72						
418.6	100.00	0.00	5.500	80.29	4.30						
352.0	100.00	0.00	4.625	75.99	4.94						
296.0	100.00	0.00	3.889	71.05	5.47						
248.9	100.00	0.00	3.270	65.58	5.60						
209.3	100.00	0.00	2.750	59.98	5.39						
176.0	100.00	0.00	2.312	54.59	5.32						
148.0	100.00	0.00	1.945	49.27	5.87						
124.5	100.00	0.00	1.635	43.40	7.10						
104.7	100.00	0.00	1.375	36.30	8.21						
88.00	100.00	0.00	1.156	28.09	7.79						
74.00	100.00	0.00	0.972	20.30	5.96						
62.23	100.00	0.00	0.818	14.34	4.06						
52.33	100.00	0.00	0.688	10.28	2.81						
44.00	100.00	0.00	0.578	7.47	2.09						
37.00	100.00	0.48	0.486	5.38	1.63						
31.11	99.52	0.57	0.409	3.75	1.30						
26.16	98.95	0.75	0.344	2.45	1.05						
22.00	98.20	0.99	0.289	1.40	0.83						
18.50	97.21	1.29	0.243	0.57	0.57						
15.56	95.92	1.61	0.204	0.00	0.00						
13.08	94.31	1.96	0.172	0.00	0.00						
11.00	92.35	2.34	0.145	0.00	0.00						

AW-103	103AW Duplicate	Date: 09/25/91 Meas #: 00001 Time: 11:32 Pres #: 01

1 M NaOH 1 M NaNO3,
80 ml/sec
Sonicate 20 min.
Refractive Index = 2.00 Particle 1.33 Medium
File: WPAA046

Summary	Percentiles		Dia	Vol%	Width
mv = 3.023	10% = 0.663	60% = 2.403	3.969	47%	5.742
mn = 0.449	20% = 0.931	70% = 3.244	1.071	53%	0.932
ma = 1.338	30% = 1.143	80% = 4.449			
cs = 4.484	40% = 1.388	90% = 6.989			
sd = 2.179	50% = 1.768	95% = 9.926			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	94.15	2.41						
592.0	100.00	0.00	7.778	91.74	2.91						
497.8	100.00	0.00	6.541	88.83	3.51						
418.6	100.00	0.00	5.500	85.32	4.25						
352.0	100.00	0.00	4.625	81.07	5.07						
296.0	100.00	0.00	3.889	76.00	5.72						
248.9	100.00	0.00	3.270	70.28	5.88						
209.3	100.00	0.00	2.750	64.40	5.63						
176.0	100.00	0.00	2.312	58.77	5.53						
148.0	100.00	0.00	1.945	53.24	6.12						
124.5	100.00	0.00	1.635	47.12	7.55						
104.7	100.00	0.00	1.375	39.57	8.95						
88.00	100.00	0.00	1.156	30.62	8.73						
74.00	100.00	0.00	0.972	21.89	6.69						
62.23	100.00	0.00	0.818	15.20	4.48						
52.33	100.00	0.00	0.688	10.72	3.03						
44.00	100.00	0.00	0.578	7.69	2.21						
37.00	100.00	0.00	0.486	5.48	1.70						
31.11	100.00	0.00	0.409	3.78	1.33						
26.16	100.00	0.00	0.344	2.45	1.06						
22.00	100.00	0.46	0.289	1.39	0.83						
18.50	99.54	0.74	0.243	0.56	0.56						
15.56	98.80	1.12	0.204	0.00	0.00						
13.08	97.68	1.55	0.172	0.00	0.00						
11.00	96.13	1.98	0.145	0.00	0.00						

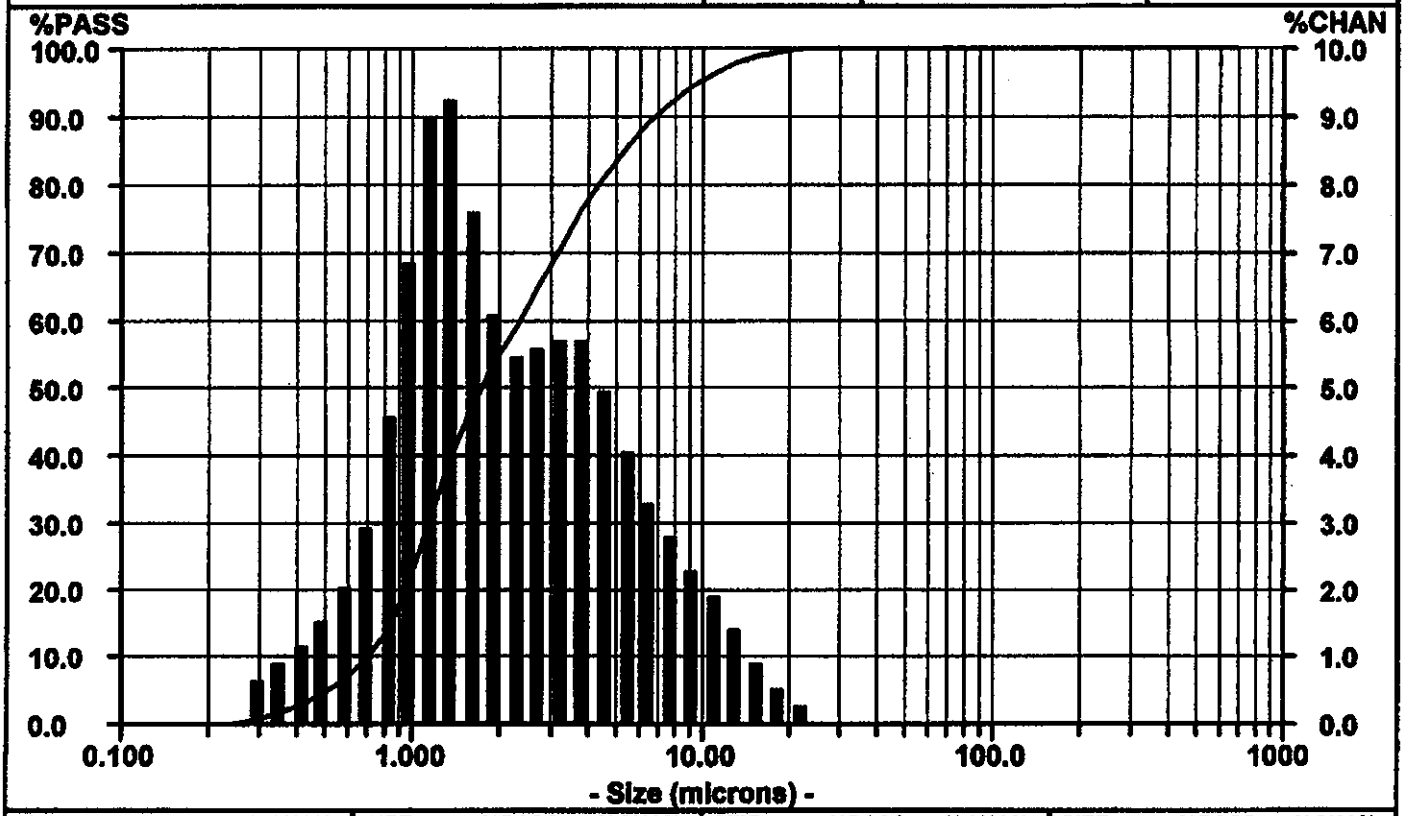
AW-103

103AW
Duplicate

Date: 09/26/91 Meas #: 00001
Time: 11:40 Pres #: 01

1 M NaOH 1 M NaNO3,
80 ml/sec
Sonicate 20 min.
Refractive Index = 1.70 Particle 1.33 Medium
File: WPAA047

Summary		Percentiles		Dia	Vol%	Width
mv = 2.972		10% = 0.697	60% = 2.361	3.929	46%	5.599
mn = 0.526		20% = 0.945	70% = 3.188	1.083	54%	0.895
ma = 1.382		30% = 1.147	80% = 4.366			
cs = 4.341		40% = 1.381	90% = 6.838			
sd = 2.118		50% = 1.745	95% = 9.626			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	94.81	2.41						
592.0	100.00	0.00	7.778	92.10	2.89						
497.8	100.00	0.00	6.541	89.21	3.45						
418.6	100.00	0.00	5.500	85.76	4.17						
352.0	100.00	0.00	4.625	81.59	5.01						
296.0	100.00	0.00	3.889	76.58	5.70						
248.9	100.00	0.00	3.270	70.88	5.89						
209.3	100.00	0.00	2.750	64.99	5.65						
176.0	100.00	0.00	2.312	59.34	5.57						
148.0	100.00	0.00	1.945	53.77	6.22						
124.5	100.00	0.00	1.635	47.55	7.76						
104.7	100.00	0.00	1.375	39.79	9.34						
88.00	100.00	0.00	1.156	30.45	9.15						
74.00	100.00	0.00	0.972	21.30	6.98						
62.23	100.00	0.00	0.818	14.32	4.60						
52.33	100.00	0.00	0.688	9.72	3.03						
44.00	100.00	0.00	0.578	6.69	2.14						
37.00	100.00	0.00	0.486	4.55	1.60						
31.11	100.00	0.00	0.409	2.95	1.24						
26.16	100.00	0.00	0.344	1.71	0.98						
22.00	100.00	0.39	0.289	0.73	0.73						
18.50	99.61	0.64	0.243	0.00	0.00						
15.56	98.97	1.02	0.204	0.00	0.00						
13.08	97.95	1.48	0.172	0.00	0.00						
11.00	96.47	1.96	0.145	0.00	0.00						

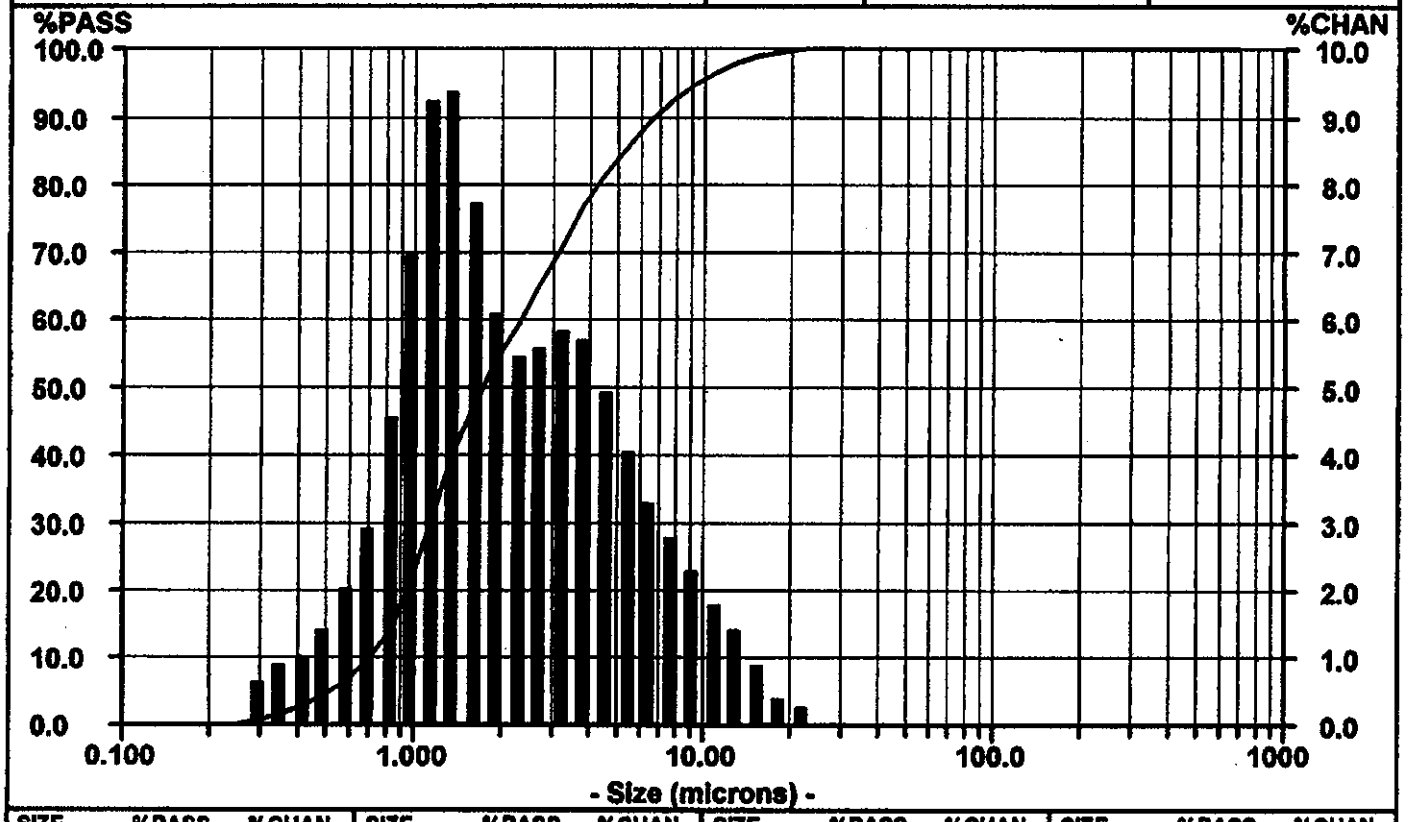
AW-103

103AW
Duplicate

Date: 09/25/91 Meas #: 00001
Time: 11:46 Pres #: 01

1 M NaOH and 1 M NaNO3
Sonicate for 20 min. @ 40 W
Flow Rate = 60 ml/sec.
Refractive Index = 1.50 Particle/1.33 Medium
File; WPAA048

Summary	Percentiles		Dia	Vol%	Width
mv = 2.924	10% = 0.703	60% = 2.336	3.894	46%	5.420
mn = 0.532	20% = 0.947	70% = 3.162	1.086	54%	0.885
ma = 1.383	30% = 1.145	80% = 4.294			
cs = 4.339	40% = 1.374	90% = 6.670			
sd = 2.066	50% = 1.728	95% = 9.369			

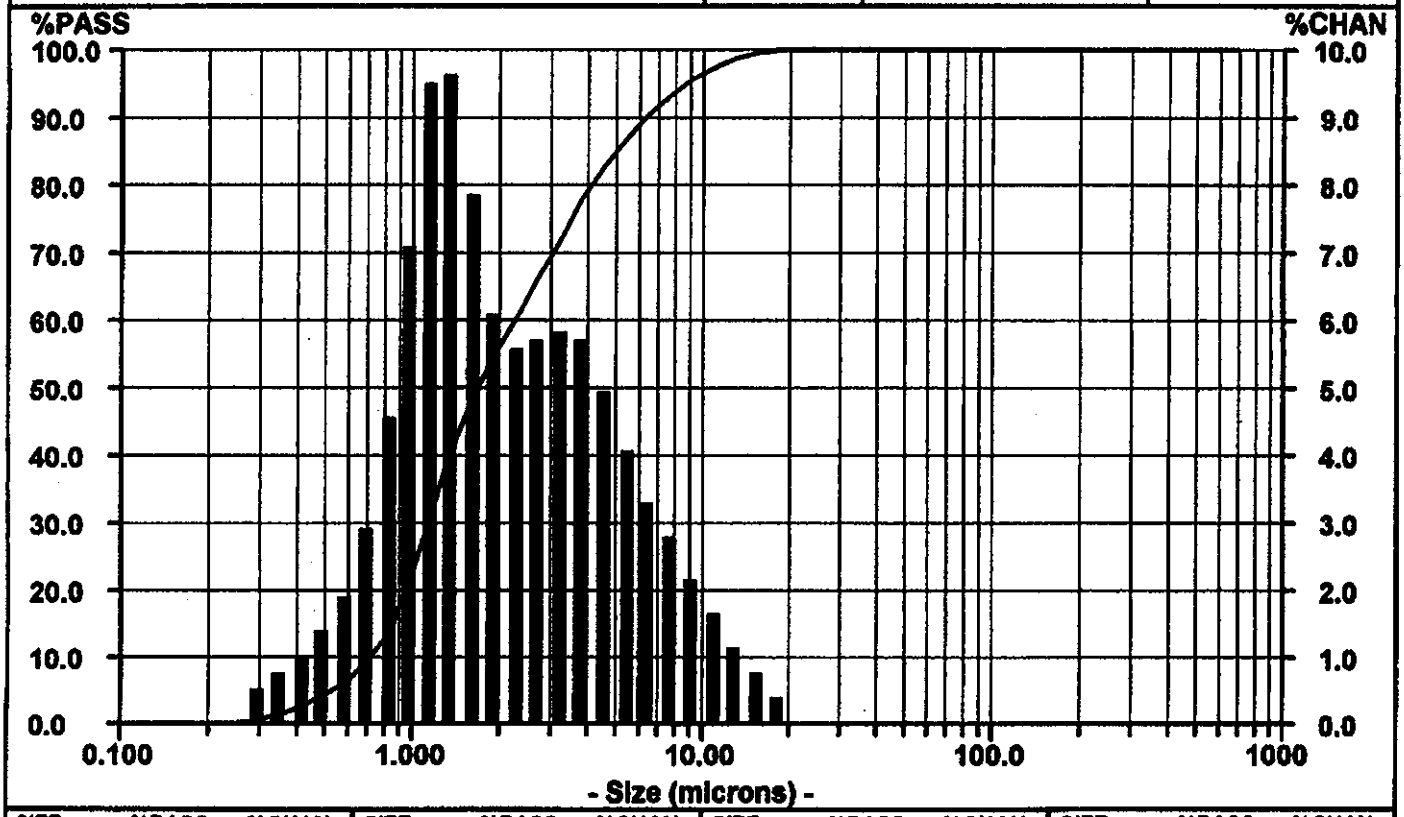


SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	94.85	2.35						
592.0	100.00	0.00	7.778	92.50	2.84						
497.8	100.00	0.00	6.541	89.66	3.42						
418.6	100.00	0.00	5.500	86.24	4.17						
352.0	100.00	0.00	4.625	82.07	5.05						
296.0	100.00	0.00	3.889	77.02	5.75						
248.9	100.00	0.00	3.270	71.27	5.93						
209.3	100.00	0.00	2.750	65.34	5.66						
176.0	100.00	0.00	2.312	59.68	5.56						
148.0	100.00	0.00	1.945	54.12	6.23						
124.5	100.00	0.00	1.635	47.89	7.84						
104.7	100.00	0.00	1.375	40.05	9.50						
88.00	100.00	0.00	1.156	30.55	9.32						
74.00	100.00	0.00	0.972	21.23	7.09						
62.23	100.00	0.00	0.818	14.14	4.63						
52.33	100.00	0.00	0.688	9.51	3.01						
44.00	100.00	0.00	0.578	6.50	2.10						
37.00	100.00	0.00	0.486	4.40	1.56						
31.11	100.00	0.00	0.408	2.84	1.19						
26.16	100.00	0.00	0.344	1.65	0.95						
22.00	100.00	0.35	0.289	0.70	0.70						
18.50	99.65	0.58	0.243	0.00	0.00						
15.56	99.07	0.94	0.204	0.00	0.00						
13.08	98.13	1.40	0.172	0.00	0.00						
11.00	96.73	1.88	0.145	0.00	0.00						

AW-103	103AW Duplicate	Date: 09/25/91 Meas #: 00001 Time: 11:59 Pres #: 01

1 M NaOH and 1 M NaNO3
Sonicate for 20 min. @ 40 W
Flow Rate = 17 ml/sec.
Refractive Index = 1.50 Particle/1.33 Medium
File: WPA001

Summary	Percentiles		Dia	Vol%	Width
mv = 2.803	10% = 0.709	60% = 2.283	3.833	45%	5.045
mn = 0.541	20% = 0.948	70% = 3.080	1.090	55%	0.874
ma = 1.379	30% = 1.141	80% = 4.168			
cs = 4.350	40% = 1.362	90% = 6.344			
sd = 1.975	50% = 1.699	95% = 8.779			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	95.64	2.28						
592.0	100.00	0.00	7.778	93.36	2.80						
497.8	100.00	0.00	6.541	90.56	3.41						
418.6	100.00	0.00	5.500	87.15	4.19						
352.0	100.00	0.00	4.625	82.96	5.08						
296.0	100.00	0.00	3.889	77.88	5.80						
248.9	100.00	0.00	3.270	72.08	5.97						
209.3	100.00	0.00	2.750	66.11	5.70						
176.0	100.00	0.00	2.312	60.41	5.60						
148.0	100.00	0.00	1.945	54.81	6.30						
124.5	100.00	0.00	1.635	48.51	7.99						
104.7	100.00	0.00	1.375	40.52	9.74						
88.00	100.00	0.00	1.156	30.78	9.56						
74.00	100.00	0.00	0.972	21.22	7.23						
62.23	100.00	0.00	0.818	13.99	4.68						
52.33	100.00	0.00	0.688	9.31	3.02						
44.00	100.00	0.00	0.578	6.29	2.08						
37.00	100.00	0.00	0.486	4.21	1.52						
31.11	100.00	0.00	0.409	2.69	1.14						
26.16	100.00	0.00	0.344	1.55	0.89						
22.00	100.00	0.00	0.289	0.66	0.66						
18.50	100.00	0.48	0.243	0.00	0.00						
15.56	99.52	0.82	0.204	0.00	0.00						
13.08	98.70	1.28	0.172	0.00	0.00						
11.00	97.42	1.78	0.145	0.00	0.00						

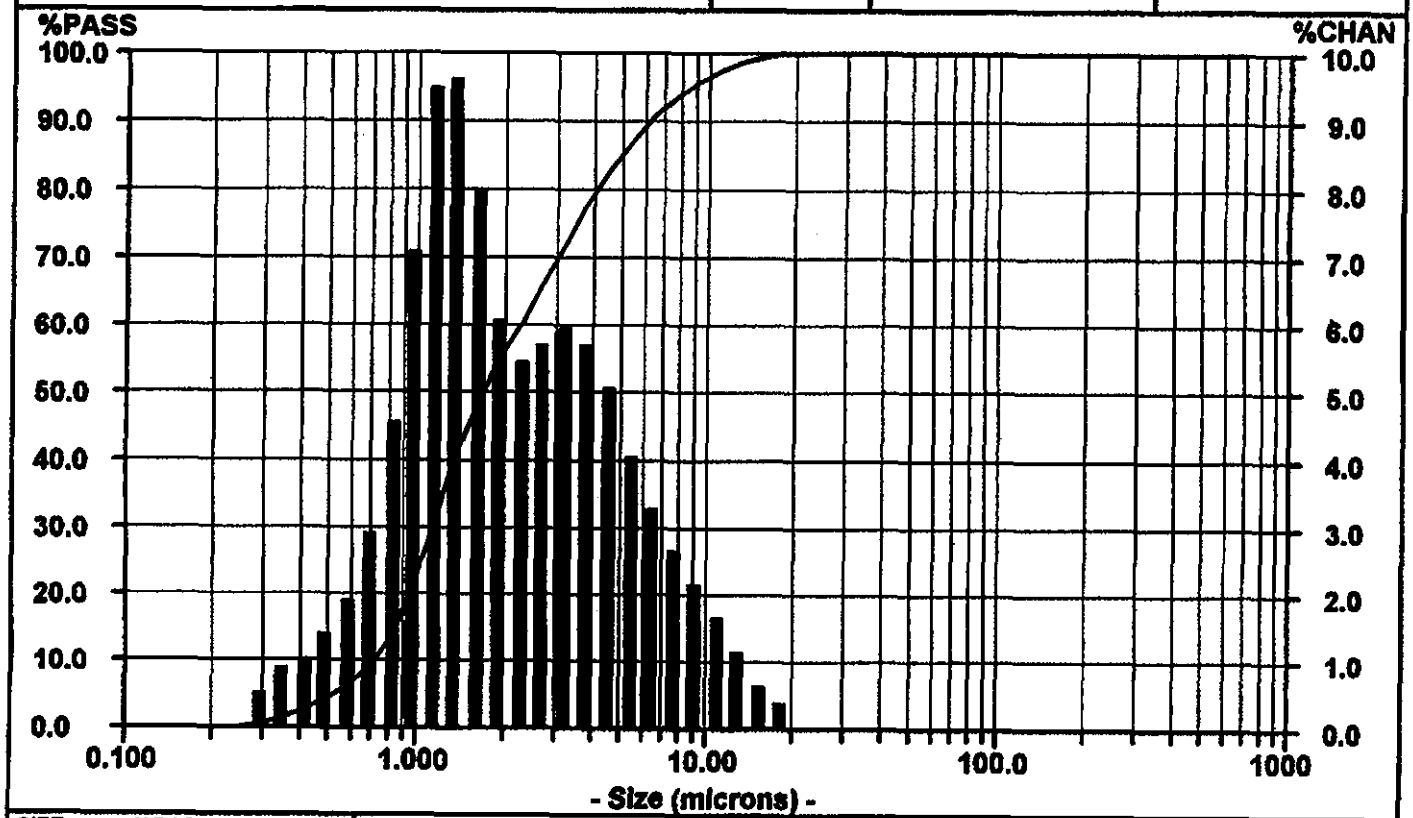
AW-103

103AW
Duplicate

Date: 09/25/91 Meas #: 00001
Time: 12:03 Pres #: 01

1 M NaOH 1 M NaNO3
17ml/sec
Sonicate 20 min.
Refractive Index = 1.70 Particle 1.33 Medium
File: WPA002 Measurement 1

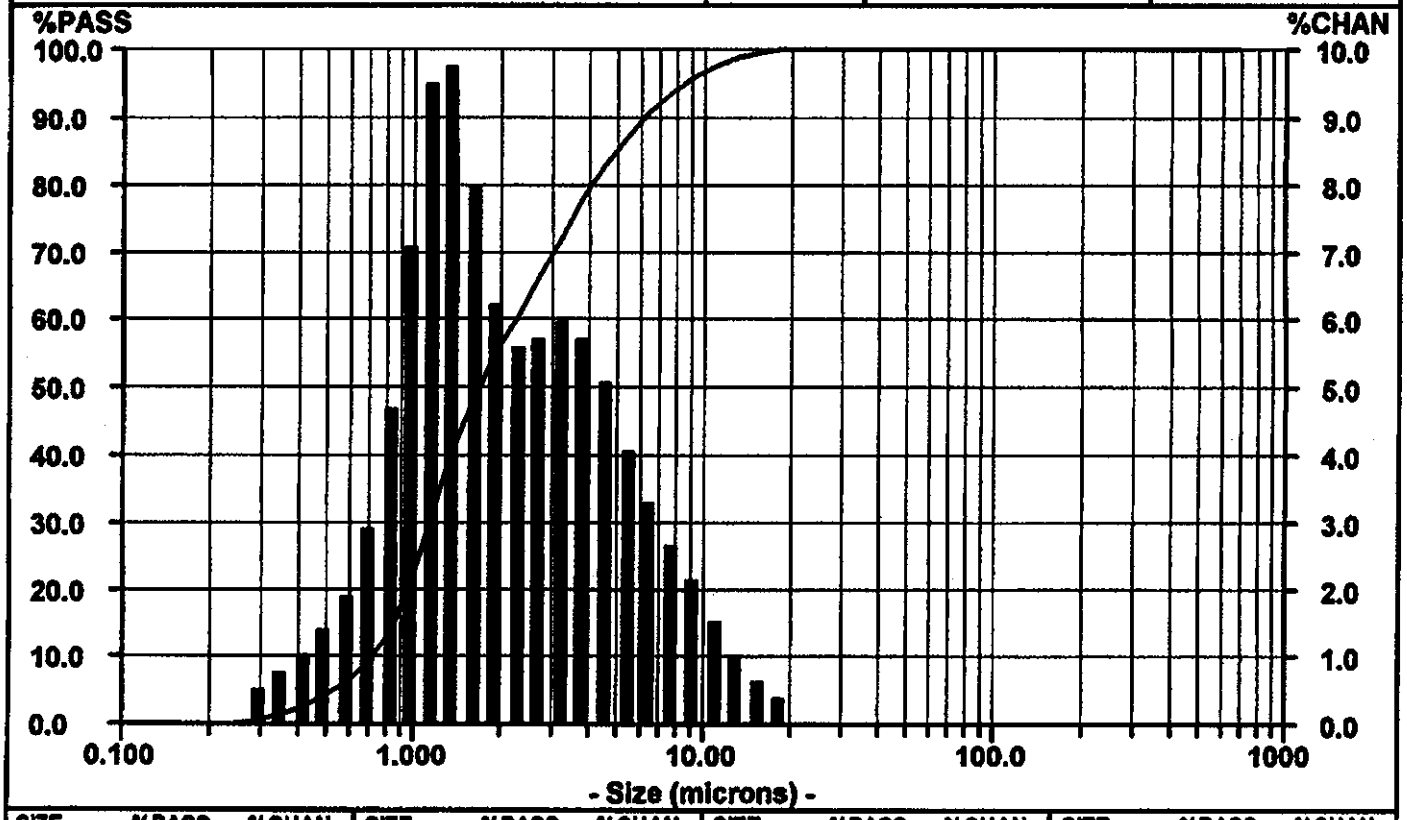
Summary	Percentiles		Dia	Vol%	Width
mv = 2.784	10% = 0.710	60% = 2.277	3.817	45%	4.959
mn = 0.541	20% = 0.948	70% = 3.069	1.090	55%	0.873
ma = 1.377	30% = 1.140	80% = 4.140			
cs = 4.358	40% = 1.360	90% = 6.269			
sd = 1.955	50% = 1.695	95% = 8.665			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	95.79	2.24						
592.0	100.00	0.00	7.778	93.55	2.78						
497.8	100.00	0.00	6.541	90.77	3.40						
418.6	100.00	0.00	5.500	87.37	4.19						
352.0	100.00	0.00	4.625	83.18	5.11						
296.0	100.00	0.00	3.889	78.07	5.85						
248.9	100.00	0.00	3.270	72.22	6.01						
209.3	100.00	0.00	2.750	66.21	5.71						
176.0	100.00	0.00	2.312	60.50	5.59						
148.0	100.00	0.00	1.945	54.91	6.30						
124.5	100.00	0.00	1.635	48.61	8.01						
104.7	100.00	0.00	1.375	40.60	9.76						
88.00	100.00	0.00	1.156	30.84	9.61						
74.00	100.00	0.00	0.972	21.23	7.26						
62.23	100.00	0.00	0.818	13.96	4.68						
52.33	100.00	0.00	0.688	9.30	3.00						
44.00	100.00	0.00	0.578	6.30	2.07						
37.00	100.00	0.00	0.486	4.23	1.52						
31.11	100.00	0.00	0.409	2.71	1.15						
26.16	100.00	0.00	0.344	1.56	0.90						
22.00	100.00	0.00	0.289	0.66	0.66						
18.50	100.00	0.46	0.243	0.00	0.00						
15.56	99.54	0.79	0.204	0.00	0.00						
13.08	98.75	1.23	0.172	0.00	0.00						
11.00	97.52	1.73	0.145	0.00	0.00						

AW-103	103AW Duplicate	Date: 09/25/91 Time: 12:07	Meas #: 00002 Pres #: 01
1 M NaOH 1 M NaNO3, 17ml/sec Sonicate 20 min. Refractive Index = 2.00 Particle 1.33 Medium File: WPA002 Measurement 2			

Summary	Percentiles		Dia	Vol%	Width
mv = 2.765	10% = 0.713	60% = 2.268	3.796	45%	4.893
mn = 0.646	20% = 0.949	70% = 3.054	1.091	55%	0.868
ma = 1.379	30% = 1.140	80% = 4.108			
cs = 4.351	40% = 1.359	90% = 6.208			
sd = 1.933	50% = 1.691	95% = 8.558			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	95.94	2.23						
592.0	100.00	0.00	7.778	93.71	2.76						
497.8	100.00	0.00	6.541	90.95	3.37						
418.6	100.00	0.00	5.500	87.58	4.17						
352.0	100.00	0.00	4.625	83.41	5.11						
296.0	100.00	0.00	3.889	78.30	5.88						
248.9	100.00	0.00	3.270	72.42	6.06						
209.3	100.00	0.00	2.750	66.36	5.74						
176.0	100.00	0.00	2.312	60.62	5.61						
148.0	100.00	0.00	1.945	55.01	6.31						
124.5	100.00	0.00	1.635	48.70	8.04						
104.7	100.00	0.00	1.375	40.66	9.81						
88.00	100.00	0.00	1.156	30.85	9.67						
74.00	100.00	0.00	0.972	21.18	7.30						
62.23	100.00	0.00	0.818	13.88	4.70						
52.33	100.00	0.00	0.688	9.18	3.00						
44.00	100.00	0.00	0.578	6.18	2.06						
37.00	100.00	0.00	0.486	4.12	1.49						
31.11	100.00	0.00	0.409	2.63	1.12						
26.16	100.00	0.00	0.344	1.51	0.87						
22.00	100.00	0.00	0.289	0.64	0.64						
18.50	100.00	0.43	0.243	0.00	0.00						
15.56	99.57	0.74	0.204	0.00	0.00						
13.08	98.83	1.19	0.172	0.00	0.00						
11.00	97.64	1.70	0.145	0.00	0.00						

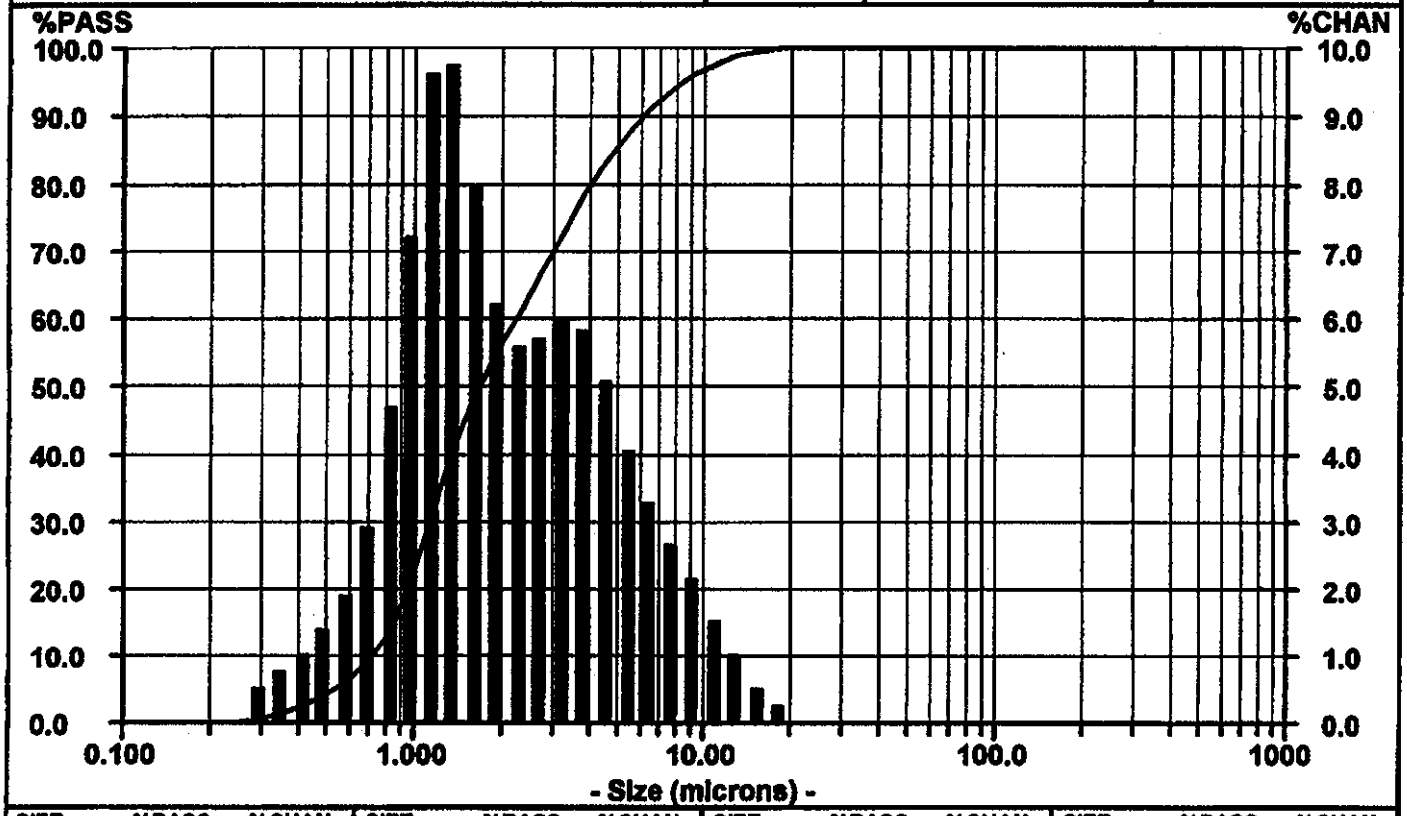
AW-103

103AW
Duplicate

Date: 09/25/91 Meas #: 00001
Time: 12:12 Pres #: 01

1 M NaOH 1 M NaNO3
40 ml/sec.
Sonicate 20 min.
Refractive Index = 1.50 Particle 1.33 Medium
File: WPA004

Summary	Percentiles		Dia	Vol%	Width
mv = 2.742	10% = 0.715	60% = 2.259	3.778	45%	4.802
mn = 0.548	20% = 0.949	70% = 3.038	1.092	55%	0.866
ma = 1.378	30% = 1.139	80% = 4.076			
cs = 4.353	40% = 1.357	90% = 6.132			
sd = 1.911	50% = 1.687	95% = 8.427			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	96.12	2.20						
592.0	100.00	0.00	7.778	93.92	2.74						
497.8	100.00	0.00	6.541	91.18	3.36						
418.6	100.00	0.00	5.500	87.82	4.17						
352.0	100.00	0.00	4.625	83.65	5.13						
296.0	100.00	0.00	3.889	78.52	5.91						
248.9	100.00	0.00	3.270	72.61	6.09						
209.3	100.00	0.00	2.750	66.52	5.77						
176.0	100.00	0.00	2.312	60.75	5.63						
148.0	100.00	0.00	1.945	55.12	6.33						
124.5	100.00	0.00	1.635	48.79	8.06						
104.7	100.00	0.00	1.375	40.73	9.84						
88.00	100.00	0.00	1.156	30.89	9.72						
74.00	100.00	0.00	0.972	21.17	7.33						
62.23	100.00	0.00	0.818	13.84	4.71						
52.33	100.00	0.00	0.688	9.13	3.00						
44.00	100.00	0.00	0.578	6.13	2.05						
37.00	100.00	0.00	0.486	4.08	1.48						
31.11	100.00	0.00	0.409	2.60	1.11						
26.16	100.00	0.00	0.344	1.49	0.86						
22.00	100.00	0.00	0.289	0.63	0.63						
18.50	100.00	0.39	0.243	0.00	0.00						
15.56	99.61	0.89	0.204	0.00	0.00						
13.08	98.92	1.14	0.172	0.00	0.00						
11.00	97.78	1.66	0.145	0.00	0.00						

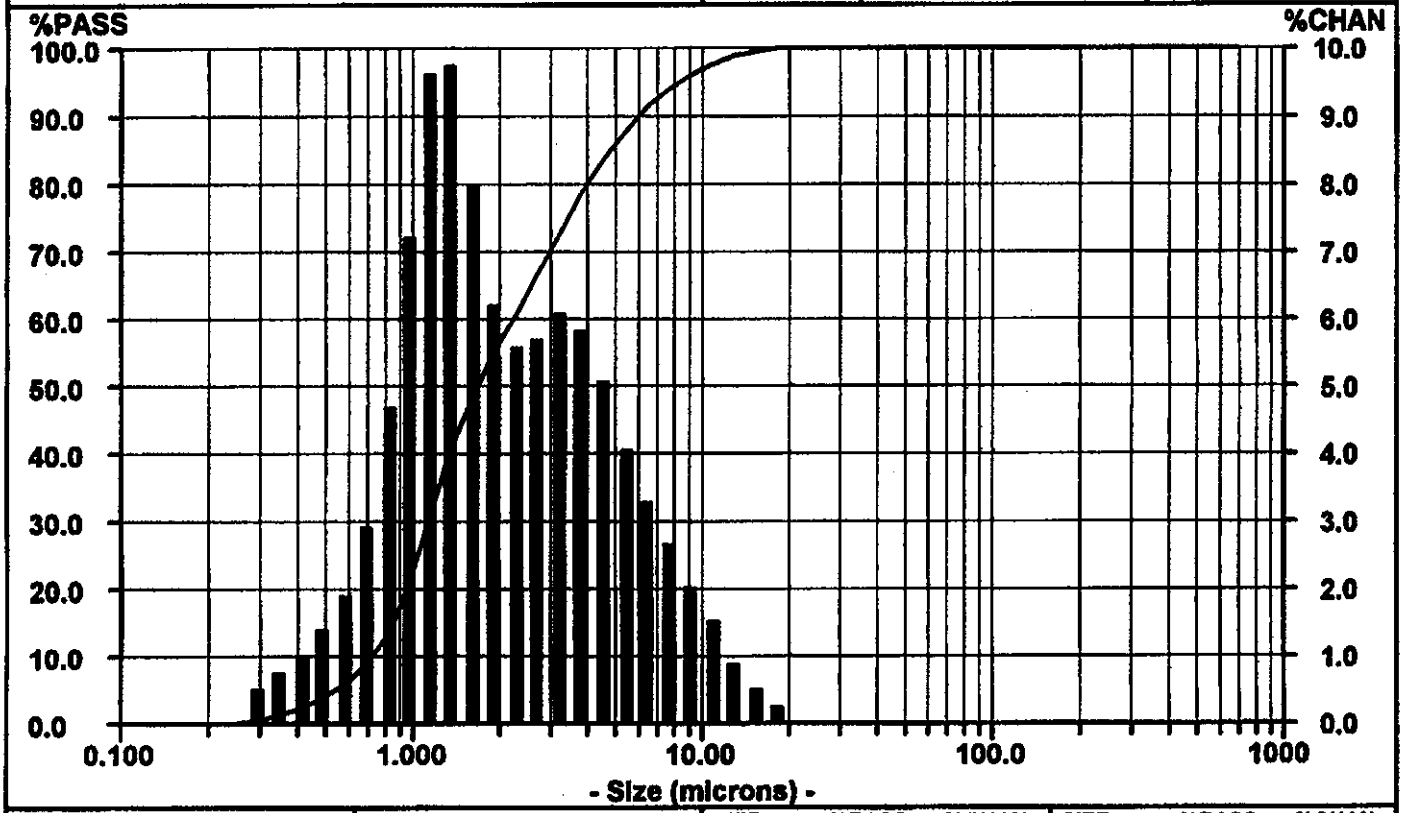
AW-103 Duplicate

103-AW
Duplicate

Date: 09/26/91 Meas #: 00001
Time: 12:16 Pres #: 01

1 M NaOH 1 M NaNO3
Flow Rate = 40 ml/sec
Sonicate 20 min.
Refractive Index = 1.70 Particle 1.33 Medium
File: WPA005

Summary	Percentiles		Dia	Vol%	Width
mv = 2.720	10% = 0.715	60% = 2.248	3.760	45%	4.711
mn = 0.550	20% = 0.949	70% = 3.021	1.093	55%	0.866
ma = 1.377	30% = 1.138	80% = 4.047			
cs = 4.356	40% = 1.356	90% = 6.067			
sd = 1.890	50% = 1.683	95% = 8.302			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	96.29	2.16						
592.0	100.00	0.00	7.778	94.13	2.72						
497.8	100.00	0.00	6.541	91.41	3.36						
418.6	100.00	0.00	5.500	88.05	4.17						
352.0	100.00	0.00	4.625	83.88	5.14						
296.0	100.00	0.00	3.889	78.74	5.92						
248.9	100.00	0.00	3.270	72.82	6.11						
209.3	100.00	0.00	2.750	66.71	5.79						
176.0	100.00	0.00	2.312	60.92	5.67						
148.0	100.00	0.00	1.945	55.25	6.37						
124.5	100.00	0.00	1.635	48.88	8.09						
104.7	100.00	0.00	1.375	40.79	9.87						
88.00	100.00	0.00	1.156	30.92	9.73						
74.00	100.00	0.00	0.972	21.19	7.35						
62.23	100.00	0.00	0.818	13.84	4.73						
52.33	100.00	0.00	0.688	9.11	3.01						
44.00	100.00	0.00	0.578	6.10	2.05						
37.00	100.00	0.00	0.486	4.05	1.48						
31.11	100.00	0.00	0.409	2.57	1.10						
26.16	100.00	0.00	0.344	1.47	0.85						
22.00	100.00	0.00	0.289	0.62	0.62						
18.50	100.00	0.36	0.243	0.00	0.00						
15.56	99.64	0.65	0.204	0.00	0.00						
13.08	98.99	1.09	0.172	0.00	0.00						
11.00	97.90	1.61	0.145	0.00	0.00						

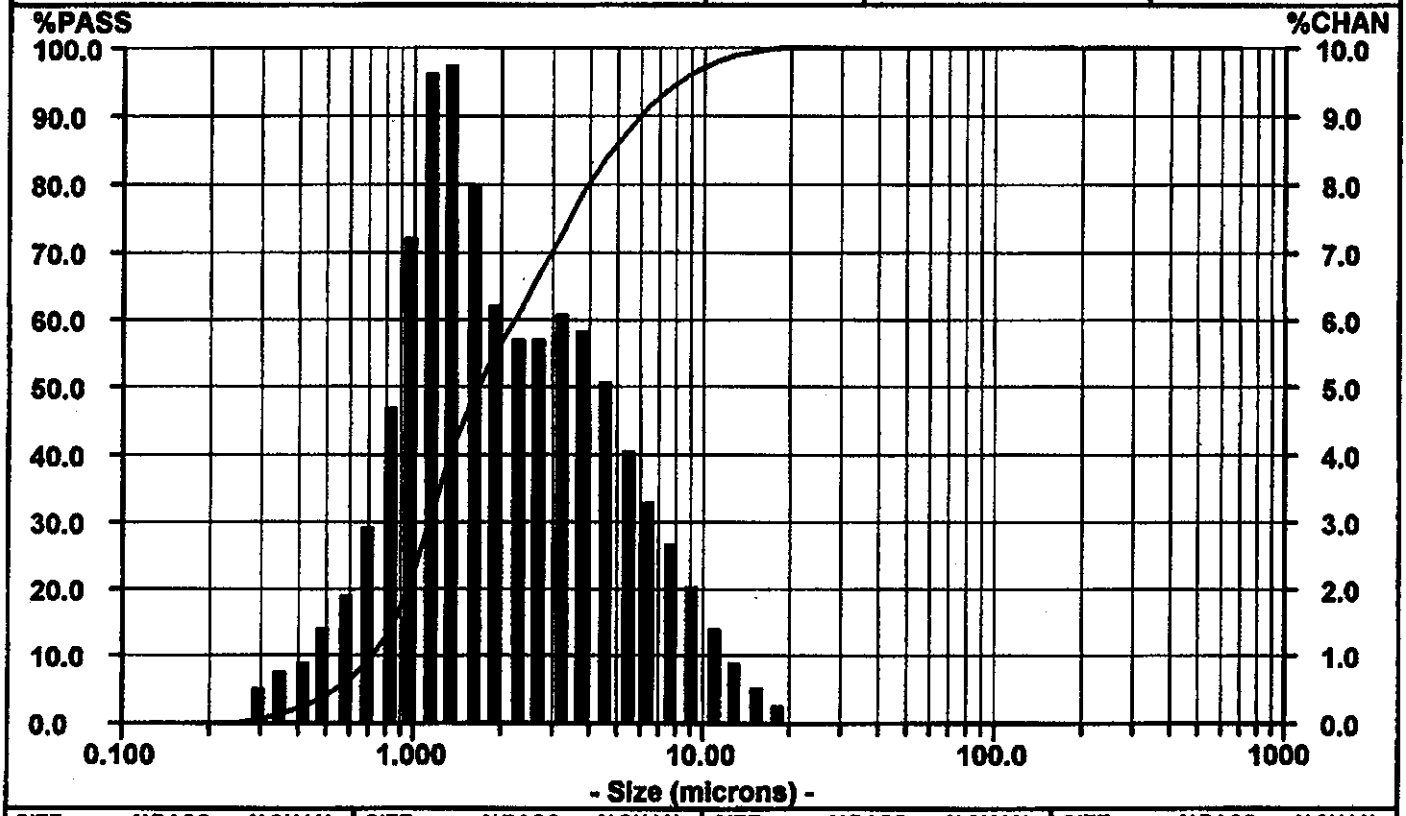
AW-103 Duplicate

AW-103 Duplicate

Date: 09/25/91 Meas #: 00001
Time: 12:20 Pres #: 01

1 M NaOH 1 M NaNO3
Flow rate = 40 ml/sec.
Sonicate 20 min.
Refractive Index = 2.00 Particle 1.33 Medium
File: WPA006

Summary	Percentiles		Dia	Vol%	Width
mv = 2.699	10% = 0.717	60% = 2.239	3.740	45%	4.632
mn = 0.551	20% = 0.949	70% = 3.004	1.093	55%	0.864
ma = 1.377	30% = 1.138	80% = 4.020			
cs = 4.356	40% = 1.354	90% = 5.989			
sd = 1.872	50% = 1.679	95% = 8.178			



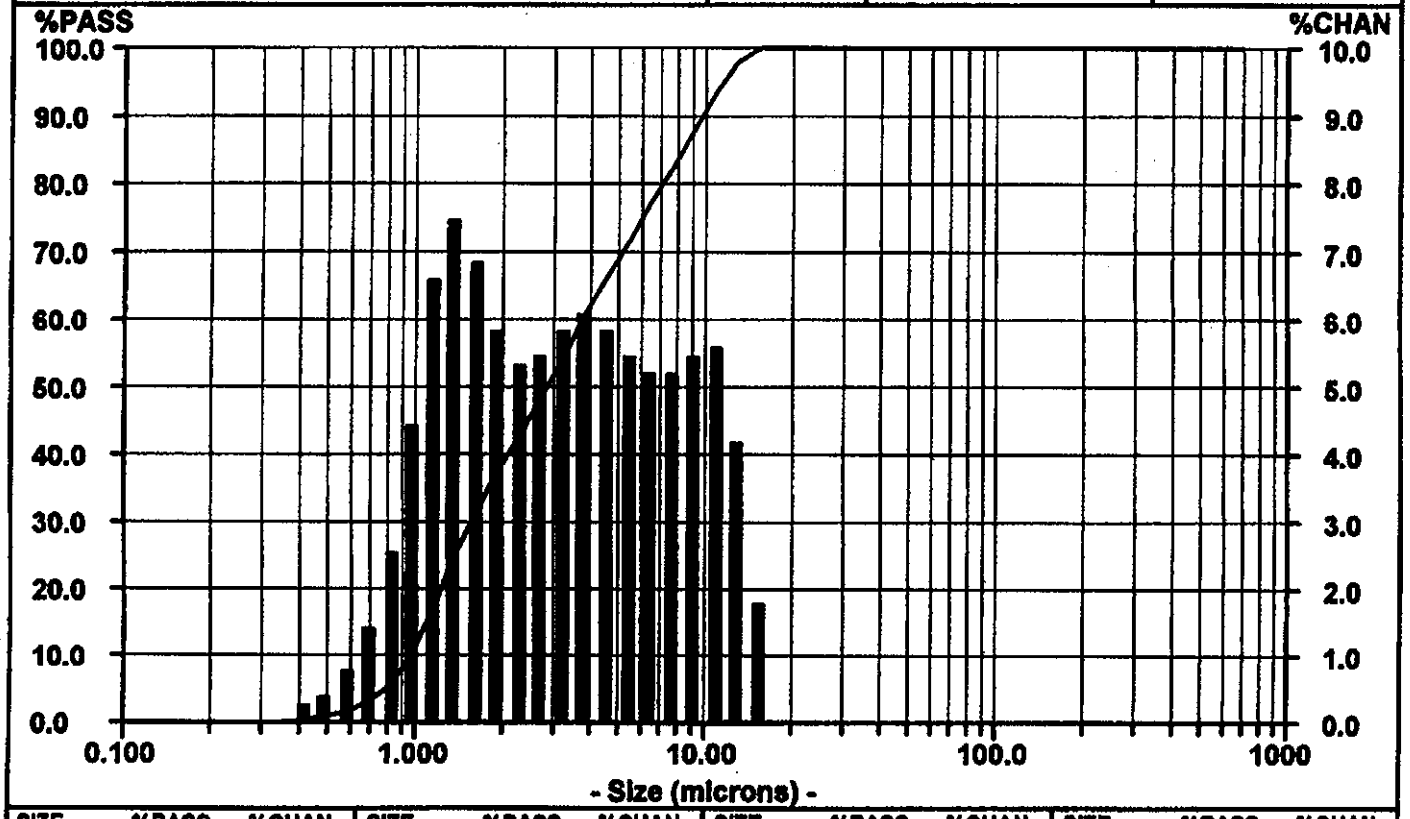
SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	96.46	2.13						
592.0	100.00	0.00	7.778	94.33	2.71						
497.8	100.00	0.00	6.541	91.62	3.36						
418.6	100.00	0.00	5.500	88.26	4.17						
352.0	100.00	0.00	4.625	84.09	5.13						
296.0	100.00	0.00	3.889	78.96	5.93						
248.9	100.00	0.00	3.270	73.03	6.14						
209.3	100.00	0.00	2.750	66.89	5.84						
176.0	100.00	0.00	2.312	61.05	5.70						
148.0	100.00	0.00	1.945	55.35	6.39						
124.5	100.00	0.00	1.635	48.96	8.11						
104.7	100.00	0.00	1.375	40.85	9.90						
88.00	100.00	0.00	1.156	30.95	9.77						
74.00	100.00	0.00	0.972	21.18	7.38						
62.23	100.00	0.00	0.818	13.80	4.74						
52.33	100.00	0.00	0.688	9.06	3.01						
44.00	100.00	0.00	0.578	6.05	2.04						
37.00	100.00	0.00	0.486	4.01	1.46						
31.11	100.00	0.00	0.409	2.55	1.09						
26.16	100.00	0.00	0.344	1.46	0.84						
22.00	100.00	0.00	0.289	0.62	0.62						
18.50	100.00	0.33	0.243	0.00	0.00						
15.56	99.67	0.61	0.204	0.00	0.00						
13.08	99.06	1.03	0.172	0.00	0.00						
11.00	98.03	1.57	0.145	0.00	0.00						

AW-103 Duplicate

AW-103 Duplicate
Date: 09/28/91 Meas #: 00001
Time: 08:22 Pres #: 01

in 1M NaNO3-1M NaOH
Sonicate for 2 min. with a 60 min. delay
External Sonication
Flow rate = 17 ml/sec.
Refractive index = 1.50 Particle 1.33 Medium
File: 103AWD01

Summary	Percentiles		Dia	Vol%	Width
mv = 4.153	10% = 0.961	60% = 3.833	8.657	28%	5.317
mn = 0.826	20% = 1.240	70% = 5.154	3.308	35%	2.309
ma = 2.033	30% = 1.572	80% = 7.139	1.204	37%	0.810
cs = 2.951	40% = 2.109	90% = 9.770			
sd = 3.497	50% = 2.885	95% = 11.46			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	88.19	5.55						
592.0	100.00	0.00	7.778	82.64	5.29						
497.8	100.00	0.00	6.541	77.35	5.29						
418.6	100.00	0.00	5.500	72.06	5.57						
352.0	100.00	0.00	4.625	66.49	5.97						
296.0	100.00	0.00	3.889	60.52	6.17						
248.9	100.00	0.00	3.270	54.35	5.95						
209.3	100.00	0.00	2.750	48.40	5.53						
176.0	100.00	0.00	2.312	42.87	5.42						
148.0	100.00	0.00	1.945	37.45	5.94						
124.5	100.00	0.00	1.635	31.51	6.97						
104.7	100.00	0.00	1.375	24.54	7.57						
88.00	100.00	0.00	1.156	16.97	6.61						
74.00	100.00	0.00	0.972	10.36	4.50						
62.23	100.00	0.00	0.818	5.86	2.60						
52.33	100.00	0.00	0.688	3.26	1.46						
44.00	100.00	0.00	0.578	1.80	0.87						
37.00	100.00	0.00	0.486	0.93	0.56						
31.11	100.00	0.00	0.409	0.37	0.37						
26.16	100.00	0.00	0.344	0.00	0.00						
22.00	100.00	0.00	0.289	0.00	0.00						
18.50	100.00	0.00	0.243	0.00	0.00						
15.56	100.00	1.82	0.204	0.00	0.00						
13.08	98.18	4.37	0.172	0.00	0.00						
11.00	93.81	5.62	0.145	0.00	0.00						

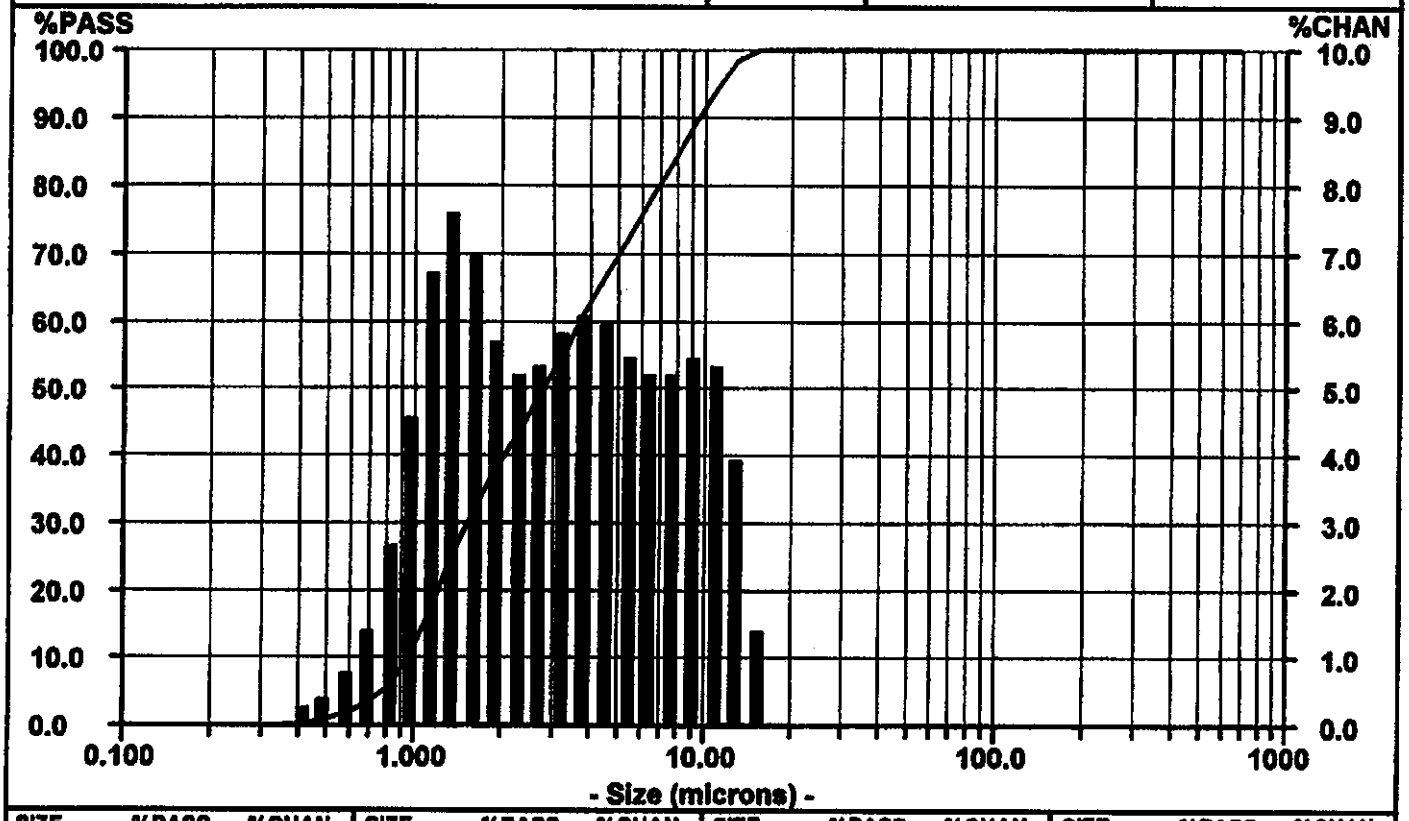
AW-103 Duplicate

AW-103 Duplicate

Date: 09/26/91 Meas #: 00001
Time: 08:26 Pres #: 01

1M NaNO3--1M NaOH
Sonicate for 2 min. followed by a 60 min. delay
External sonication
Flow rate = 17 ml/sec.
Refractive index of the particle = 1.70 and the medium = 1.33
File: 103AWD02

Summary		Percentiles		Dia	Vol%	Width
mv =	4.067	10% = 0.950	60% = 3.756	8.558	27%	5.162
mn =	0.826	20% = 1.221	70% = 5.027	3.318	35%	2.304
ma =	2.002	30% = 1.540	80% = 6.963	1.197	38%	0.805
cs =	2.887	40% = 2.060	90% = 9.555			
sd =	3.408	50% = 2.830	95% = 11.24			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	88.94	5.54						
592.0	100.00	0.00	7.778	83.40	5.28						
497.8	100.00	0.00	6.541	78.12	5.27						
418.6	100.00	0.00	5.500	72.85	5.58						
352.0	100.00	0.00	4.625	67.27	6.02						
296.0	100.00	0.00	3.889	61.25	6.23						
248.9	100.00	0.00	3.270	55.02	5.97						
209.3	100.00	0.00	2.750	49.05	5.49						
176.0	100.00	0.00	2.312	43.56	5.35						
148.0	100.00	0.00	1.945	38.21	5.89						
124.5	100.00	0.00	1.635	32.32	7.01						
104.7	100.00	0.00	1.375	25.31	7.74						
88.00	100.00	0.00	1.156	17.57	6.84						
74.00	100.00	0.00	0.972	10.73	4.68						
62.23	100.00	0.00	0.818	6.05	2.71						
52.33	100.00	0.00	0.688	3.34	1.51						
44.00	100.00	0.00	0.578	1.83	0.89						
37.00	100.00	0.00	0.486	0.94	0.57						
31.11	100.00	0.00	0.409	0.37	0.37						
26.16	100.00	0.00	0.344	0.00	0.00						
22.00	100.00	0.00	0.289	0.00	0.00						
18.50	100.00	0.00	0.243	0.00	0.00						
15.56	100.00	1.54	0.204	0.00	0.00						
13.08	98.46	4.04	0.172	0.00	0.00						
11.00	94.42	5.48	0.145	0.00	0.00						

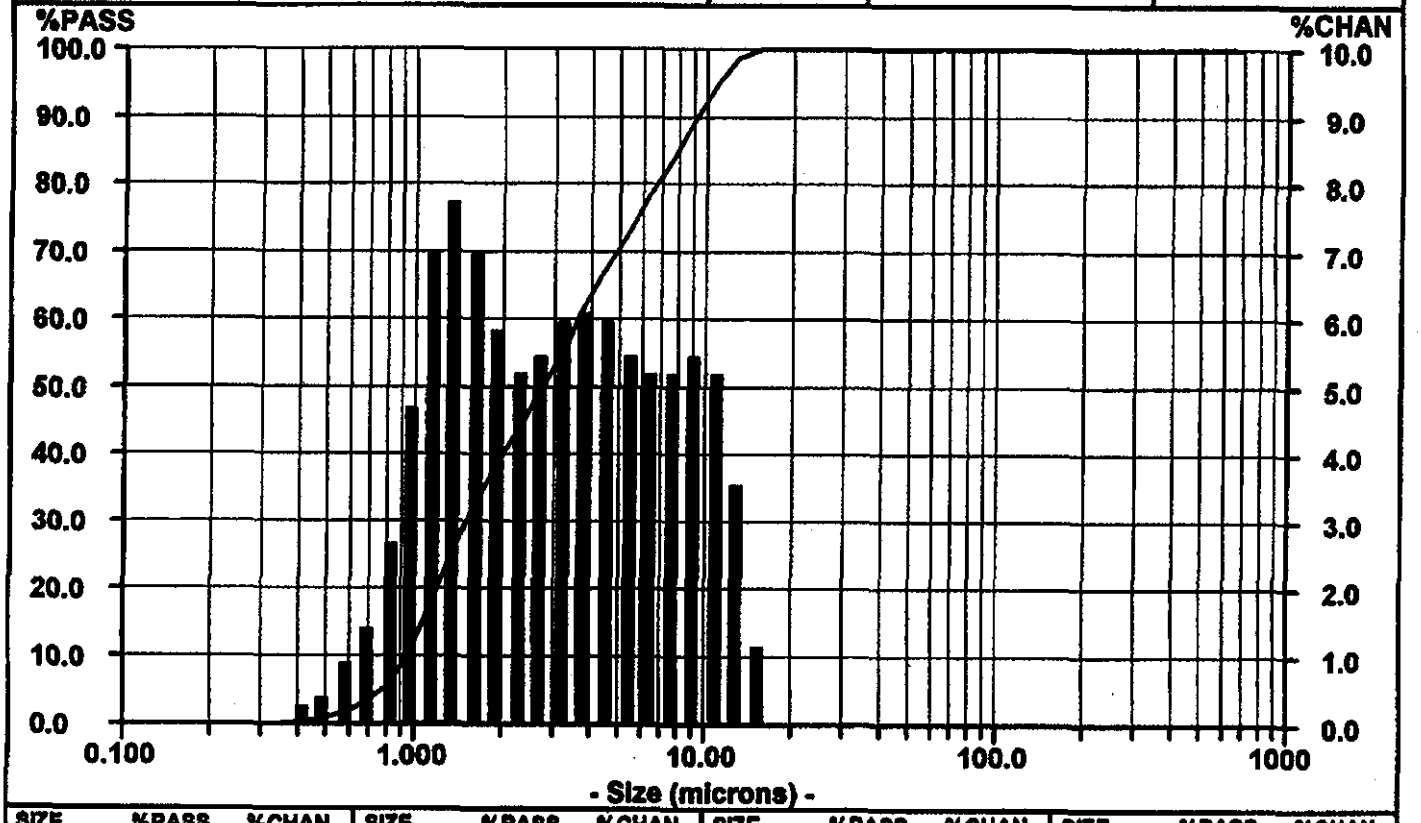
AW-103 Duplicate

AW-103 Duplicate

Date: 09/28/91 Meas #: 00001
Time: 08:31 Pres #: 01

1M NaNO3–1M NaOH
Sonicate for 2 min. followed by a 60 min. delay
External sonication
Flow rate = 17 ml/sec.
Refractive index of the particle = 2.00 and the medium = 1.33
File: 103AWD03

Summary	Percentiles		Dia	Vol%	Width
mv = 3.981	10% = 0.945	60% = 3.686	8.437	26%	4.955
mn = 0.827	20% = 1.210	70% = 4.916	3.318	35%	2.298
ma = 1.981	30% = 1.519	80% = 6.791	1.194	39%	0.802
cs = 3.029	40% = 2.023	90% = 9.313			
sd = 3.313	50% = 2.780	95% = 10.94			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	89.76	5.59						
592.0	100.00	0.00	7.778	84.19	5.33						
497.8	100.00	0.00	6.541	78.86	5.28						
418.6	100.00	0.00	5.500	73.58	5.58						
352.0	100.00	0.00	4.625	68.00	6.05						
296.0	100.00	0.00	3.889	61.95	6.29						
248.9	100.00	0.00	3.270	55.66	6.02						
209.3	100.00	0.00	2.750	49.64	5.52						
176.0	100.00	0.00	2.312	44.12	5.35						
148.0	100.00	0.00	1.945	38.77	5.90						
124.5	100.00	0.00	1.635	32.87	7.07						
104.7	100.00	0.00	1.375	25.80	7.88						
88.00	100.00	0.00	1.156	17.92	7.00						
74.00	100.00	0.00	0.972	10.92	4.79						
62.23	100.00	0.00	0.818	6.13	2.76						
52.33	100.00	0.00	0.688	3.37	1.54						
44.00	100.00	0.00	0.578	1.83	0.90						
37.00	100.00	0.00	0.486	0.93	0.57						
31.11	100.00	0.00	0.409	0.36	0.36						
26.16	100.00	0.00	0.344	0.00	0.00						
22.00	100.00	0.00	0.289	0.00	0.00						
18.50	100.00	0.00	0.243	0.00	0.00						
15.56	100.00	1.21	0.204	0.00	0.00						
13.08	98.79	3.64	0.172	0.00	0.00						
11.00	95.15	5.37	0.145	0.00	0.00						

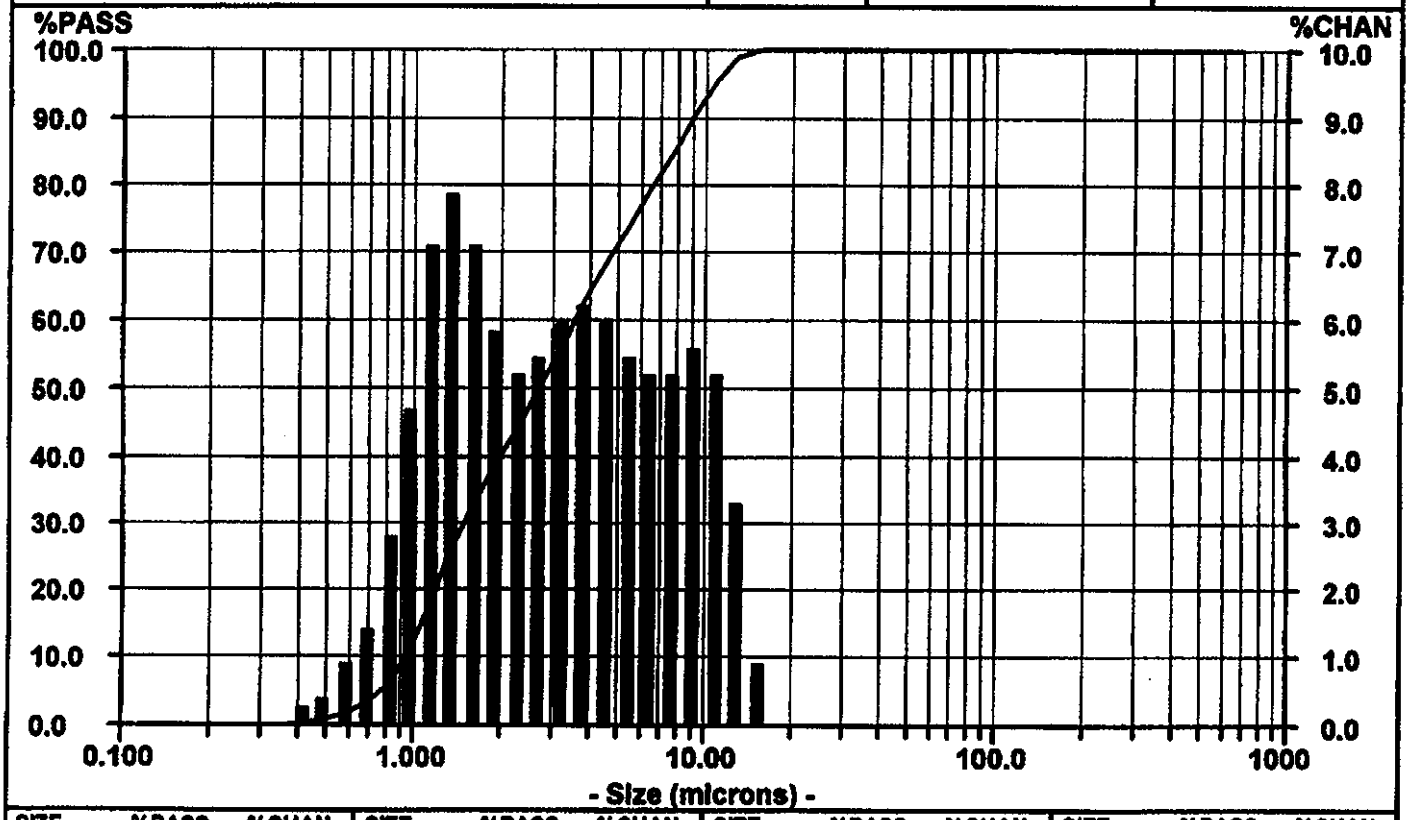
AW-103 Duplicate

AW-103
Duplicate

Date: 09/28/91 Meas #: 00001
Time: 08:35 Pres #: 01

1M NaNO3--1M NaOH
Sonicate for 2 min. followed by a 60 min. delay
External sonication
Flow rate = 40 ml/sec.
Refractive index of the particle = 2.00 and the medium = 1.33
File: 103AWD04

Summary	Percentiles		Dia	Vol%	Width
mv = 3.912	10% = 0.940	60% = 3.630	8.333	26%	4.784
mn = 0.828	20% = 1.202	70% = 4.828	3.314	35%	2.294
ma = 1.963	30% = 1.503	80% = 6.656	1.191	39%	0.800
cs = 3.066	40% = 1.995	90% = 9.116			
sd = 3.236	50% = 2.739	95% = 10.72			



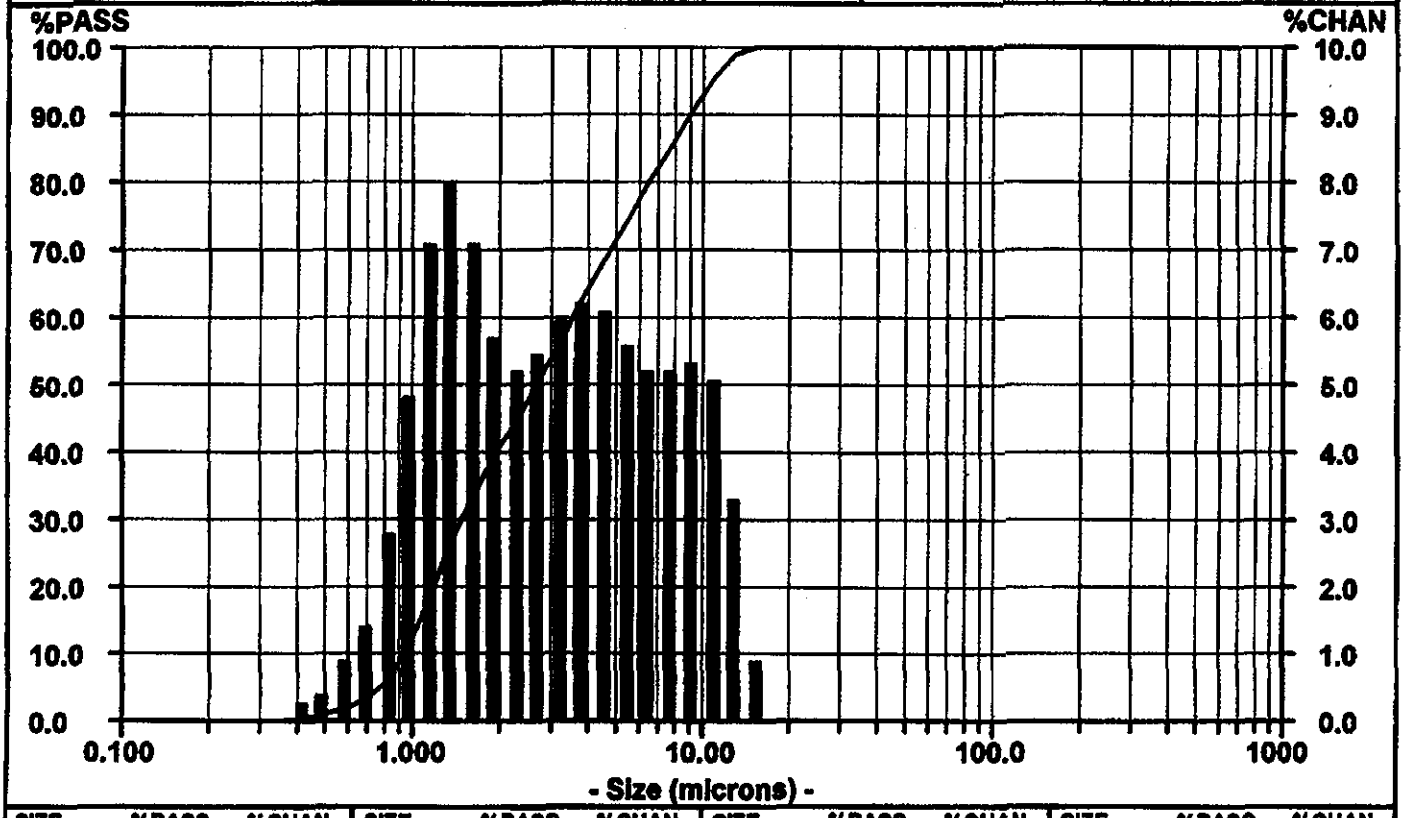
SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	90.48	5.62						
592.0	100.00	0.00	7.778	84.86	6.39						
497.8	100.00	0.00	6.541	79.47	5.31						
418.6	100.00	0.00	5.500	74.16	5.58						
352.0	100.00	0.00	4.625	68.58	6.06						
296.0	100.00	0.00	3.889	62.52	6.32						
248.9	100.00	0.00	3.270	56.20	6.07						
209.3	100.00	0.00	2.750	50.13	5.56						
176.0	100.00	0.00	2.312	44.57	5.37						
148.0	100.00	0.00	1.945	39.20	5.91						
124.5	100.00	0.00	1.635	33.29	7.10						
104.7	100.00	0.00	1.375	26.19	7.96						
88.00	100.00	0.00	1.156	18.23	7.11						
74.00	100.00	0.00	0.972	11.12	4.89						
62.23	100.00	0.00	0.818	6.23	2.82						
52.33	100.00	0.00	0.688	3.41	1.57						
44.00	100.00	0.00	0.578	1.84	0.91						
37.00	100.00	0.00	0.486	0.93	0.57						
31.11	100.00	0.00	0.409	0.36	0.36						
26.16	100.00	0.00	0.344	0.00	0.00						
22.00	100.00	0.00	0.289	0.00	0.00						
18.50	100.00	0.00	0.243	0.00	0.00						
15.56	100.00	1.00	0.204	0.00	0.00						
13.08	99.00	3.30	0.172	0.00	0.00						
11.00	95.70	5.22	0.145	0.00	0.00						

AW-103 Duplicate

AW-103 Duplicate
Date: 09/28/91 Meas #: 00001
Time: 08:39 Pres #: 01

In 1M NaNO3--1M NaOH
Sonicate for 2 min. with a 60 min. delay
External sonication
Flow rate = 40 ml/sec.
Refractive index of the particle = 1.50 and the medium = 1.33
File: 103AWD05

Summary	Percentiles		Dia	Vol%	Width
mv = 3.890	10% = 0.936	60% = 3.606	9.062	20%	4.257
mn = 0.825	20% = 1.195	70% = 4.783	3.573	40%	2.907
ma = 1.951	30% = 1.491	80% = 6.583	1.188	40%	0.799
cs = 3.076	40% = 1.976	90% = 9.089			
sd = 3.207	50% = 2.720	95% = 10.73			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.260	90.56	5.46						
592.0	100.00	0.00	7.778	85.10	5.29						
497.8	100.00	0.00	6.541	79.81	5.30						
418.6	100.00	0.00	5.500	74.51	5.63						
352.0	100.00	0.00	4.625	68.88	6.11						
296.0	100.00	0.00	3.889	62.77	6.35						
248.9	100.00	0.00	3.270	56.42	6.06						
209.3	100.00	0.00	2.750	50.36	5.52						
176.0	100.00	0.00	2.312	44.84	5.33						
148.0	100.00	0.00	1.945	39.51	5.88						
124.5	100.00	0.00	1.635	33.63	7.11						
104.7	100.00	0.00	1.375	26.52	8.04						
88.00	100.00	0.00	1.156	18.48	7.21						
74.00	100.00	0.00	0.972	11.27	4.95						
62.23	100.00	0.00	0.818	6.32	2.85						
52.33	100.00	0.00	0.688	3.47	1.59						
44.00	100.00	0.00	0.578	1.88	0.93						
37.00	100.00	0.00	0.486	0.95	0.58						
31.11	100.00	0.00	0.409	0.37	0.37						
26.16	100.00	0.00	0.344	0.00	0.00						
22.00	100.00	0.00	0.289	0.00	0.00						
18.50	100.00	0.00	0.243	0.00	0.00						
15.56	100.00	1.03	0.204	0.00	0.00						
13.08	98.97	3.31	0.172	0.00	0.00						
11.00	95.66	5.10	0.145	0.00	0.00						

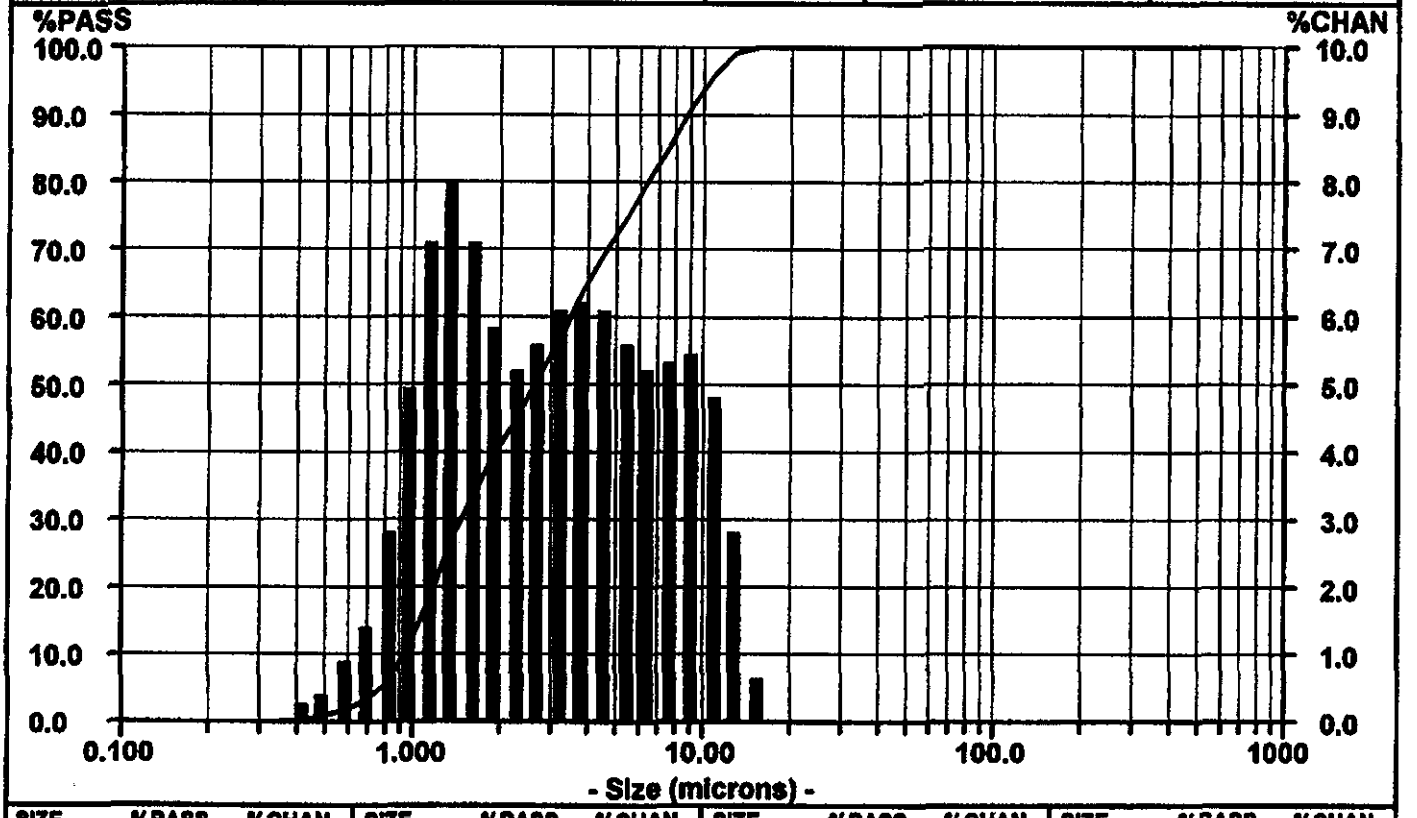
AW-103 Duplicate

AW-103
Duplicate

Date: 09/28/91 Meas #: 00001
Time: 08:43 Pres #: 01

In 1M NaNO3--1M NaOH
Sonicate for 2 min. followed by a 60 min. delay
External Sonifier
Flow rate = 40 ml/sec.
Refractive index of the particle = 1.70 and the medium = 1.33
File: 103AWD06

Summary	Percentiles		Dia	Vol%	Width
mv = 3.818	10% = 0.935	60% = 3.552	8.203	25%	4.584
mn = 0.829	20% = 1.191	70% = 4.704	3.313	35%	2.291
ma = 1.940	30% = 1.483	80% = 6.460	1.189	40%	0.797
cs = 3.093	40% = 1.956	90% = 8.853			
sd = 3.128	50% = 2.684	95% = 10.43			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	91.40	5.59						
592.0	100.00	0.00	7.778	85.81	5.42						
497.8	100.00	0.00	6.541	80.39	5.34						
418.6	100.00	0.00	5.500	75.05	5.61						
352.0	100.00	0.00	4.625	69.44	6.10						
296.0	100.00	0.00	3.889	63.34	6.38						
248.9	100.00	0.00	3.270	56.96	6.14						
209.3	100.00	0.00	2.750	50.82	5.61						
176.0	100.00	0.00	2.312	45.21	5.39						
148.0	100.00	0.00	1.945	39.82	5.94						
124.5	100.00	0.00	1.635	33.88	7.17						
104.7	100.00	0.00	1.375	26.71	8.09						
88.00	100.00	0.00	1.156	18.62	7.29						
74.00	100.00	0.00	0.972	11.33	5.01						
62.23	100.00	0.00	0.818	6.32	2.88						
52.33	100.00	0.00	0.688	3.44	1.59						
44.00	100.00	0.00	0.578	1.85	0.92						
37.00	100.00	0.00	0.486	0.93	0.57						
31.11	100.00	0.00	0.409	0.36	0.36						
26.16	100.00	0.00	0.344	0.00	0.00						
22.00	100.00	0.00	0.289	0.00	0.00						
18.50	100.00	0.00	0.243	0.00	0.00						
15.56	100.00	0.76	0.204	0.00	0.00						
13.08	99.24	2.87	0.172	0.00	0.00						
11.00	96.37	4.97	0.145	0.00	0.00						

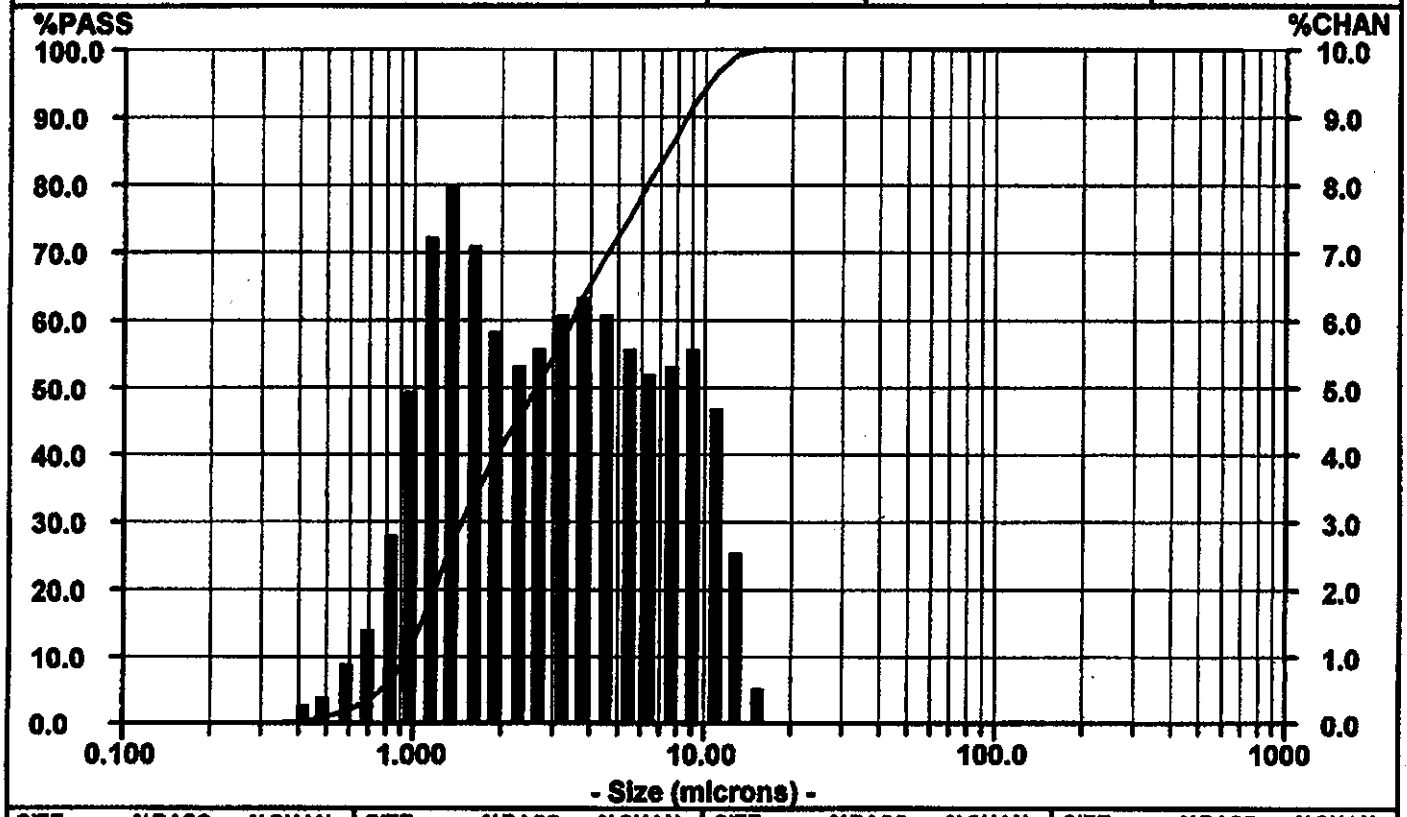
AW-103 Duplicate

AW-103 Duplicate

Date: 09/28/91 Meas #: 00001
Time: 08:48 Pres #: 01

In 1M NaNO3-1M NaOH
Sonicate for 2 min. followed by a 60 min. delay
External Sonifier
Flow rate = 60 ml/sec.
Refractive index of the particle = 1.70 and the medium = 1.33
File: 103AWD07

Summary		Percentiles		Dia	Vol%	Width
mv	= 3.769	10% = 0.934	60% = 3.514	8.126	25%	4.433
mn	= 0.832	20% = 1.187	70% = 4.646	3.310	35%	2.289
ma	= 1.931	30% = 1.475	80% = 6.371	1.188	40%	0.795
cs	= 3.108	40% = 1.939	90% = 8.711			
sd	= 3.076	50% = 2.657	95% = 10.25			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	91.93	5.63						
592.0	100.00	0.00	7.776	86.30	5.48						
497.8	100.00	0.00	6.541	80.82	5.36						
418.6	100.00	0.00	5.500	75.46	5.61						
352.0	100.00	0.00	4.625	69.85	6.10						
296.0	100.00	0.00	3.889	63.75	6.41						
248.9	100.00	0.00	3.270	57.34	6.18						
209.3	100.00	0.00	2.750	51.16	5.64						
176.0	100.00	0.00	2.312	45.52	5.42						
148.0	100.00	0.00	1.945	40.10	5.96						
124.5	100.00	0.00	1.635	34.14	7.22						
104.7	100.00	0.00	1.375	26.92	8.16						
88.00	100.00	0.00	1.156	18.76	7.38						
74.00	100.00	0.00	0.972	11.38	5.06						
62.23	100.00	0.00	0.818	6.32	2.90						
52.33	100.00	0.00	0.688	3.42	1.59						
44.00	100.00	0.00	0.578	1.83	0.92						
37.00	100.00	0.00	0.486	0.91	0.56						
31.11	100.00	0.00	0.409	0.35	0.35						
26.16	100.00	0.00	0.344	0.00	0.00						
22.00	100.00	0.00	0.289	0.00	0.00						
18.50	100.00	0.00	0.243	0.00	0.00						
15.56	100.00	0.61	0.204	0.00	0.00						
13.08	99.39	2.60	0.172	0.00	0.00						
11.00	96.79	4.86	0.145	0.00	0.00						

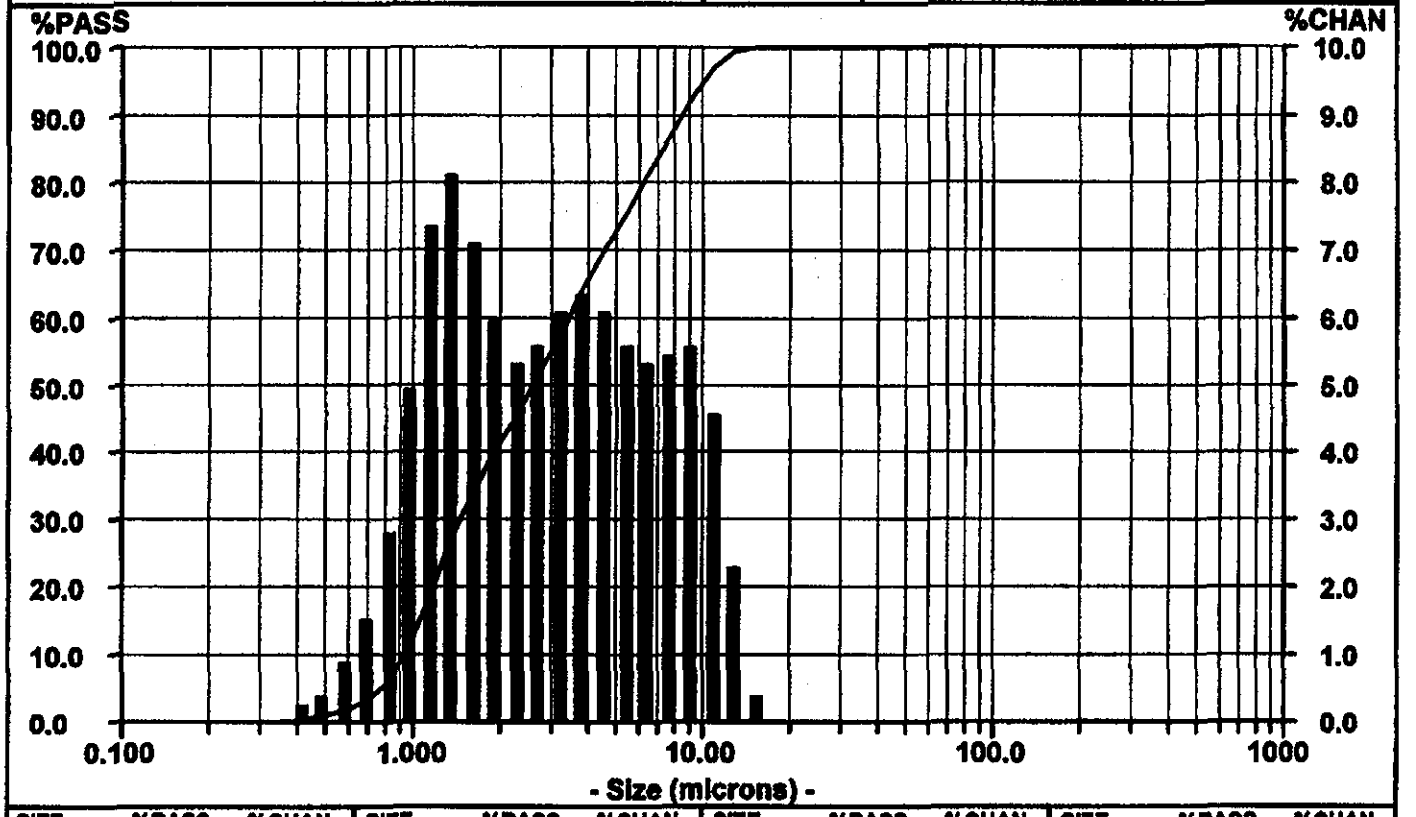
AW-103 Duplicate

AW-103 Duplicate

Date: 09/28/91 Meas #: 00001
Time: 08:52 Pres #: 01

in 1M NaNO3-1M NaOH
Sonicate for 2 min. followed by a 60 min. delay
External Sonifier
Flow rate = 60 ml/sec.
Refractive index of the particle = 1.50 and the medium = 1.33
File: 103AWD08

Summary		Percentiles		Dia	Vol%	Width
mv =	3.724	10% = 0.932	60% = 3.463	8.040	24%	4.283
mn =	0.832	20% = 1.184	70% = 4.601	3.307	35%	2.292
ma =	1.921	30% = 1.469	80% = 6.286	1.188	41%	0.795
cs =	3.123	40% = 1.925	90% = 8.565			
sd =	3.023	50% = 2.631	95% = 10.08			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	92.47	5.65						
592.0	100.00	0.00	7.778	86.82	5.57						
497.8	100.00	0.00	6.541	81.25	5.43						
418.6	100.00	0.00	5.500	75.82	5.64						
352.0	100.00	0.00	4.625	70.18	6.10						
296.0	100.00	0.00	3.889	64.08	6.40						
248.9	100.00	0.00	3.270	57.68	6.19						
209.3	100.00	0.00	2.750	51.49	5.68						
176.0	100.00	0.00	2.312	45.81	5.46						
148.0	100.00	0.00	1.945	40.35	6.00						
124.5	100.00	0.00	1.635	34.35	7.28						
104.7	100.00	0.00	1.375	27.09	8.22						
88.00	100.00	0.00	1.156	18.87	7.41						
74.00	100.00	0.00	0.972	11.46	5.09						
62.23	100.00	0.00	0.818	6.37	2.92						
52.33	100.00	0.00	0.688	3.45	1.61						
44.00	100.00	0.00	0.578	1.84	0.92						
37.00	100.00	0.00	0.486	0.92	0.57						
31.11	100.00	0.00	0.409	0.35	0.35						
26.16	100.00	0.00	0.344	0.00	0.00						
22.00	100.00	0.00	0.289	0.00	0.00						
18.50	100.00	0.00	0.243	0.00	0.00						
15.56	100.00	0.51	0.204	0.00	0.00						
13.08	99.49	2.34	0.172	0.00	0.00						
11.00	97.15	4.68	0.145	0.00	0.00						

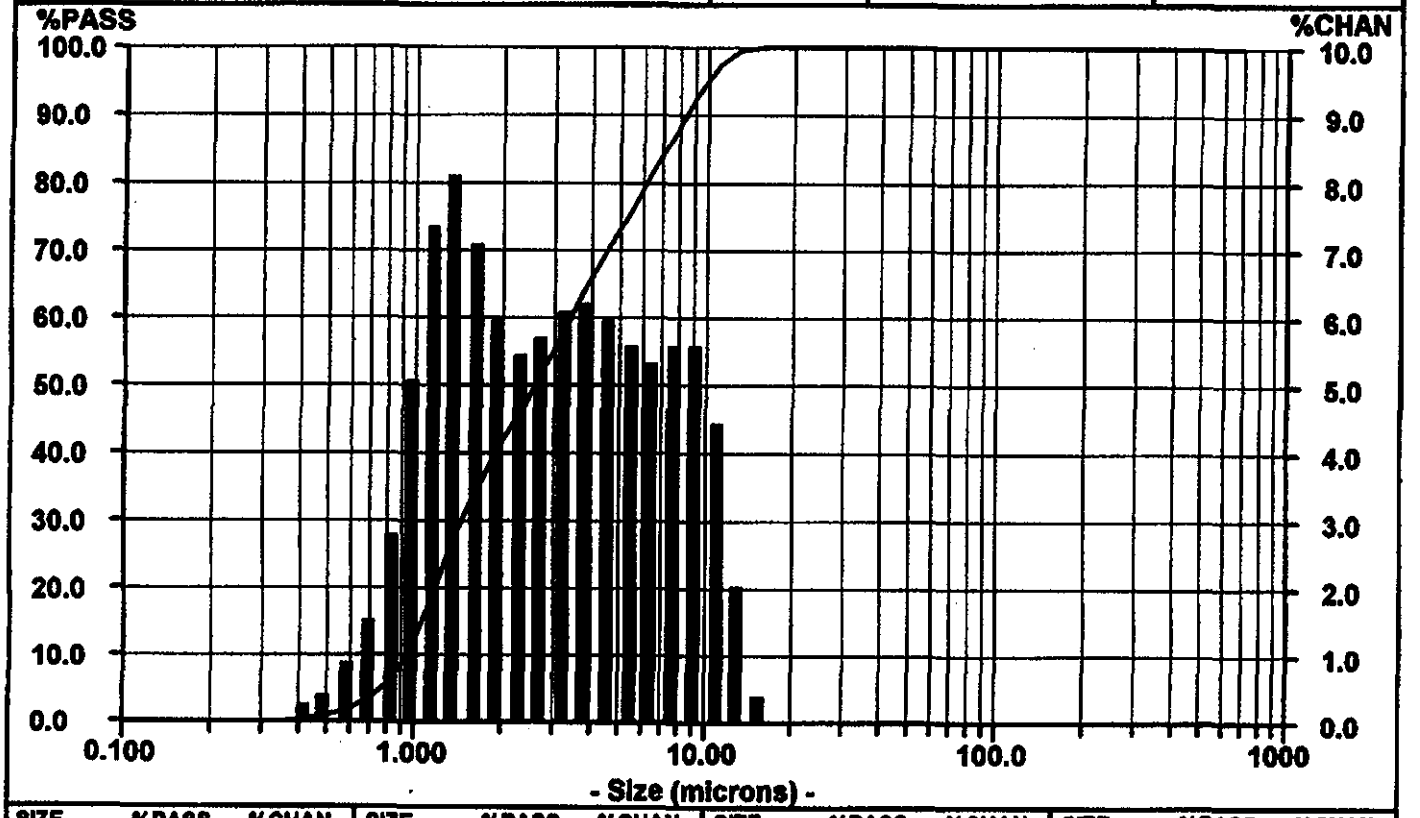
AW-103 Duplicate

AW-103 Duplicate

Date: 09/28/91 Meas #: 00001
Time: 08:56 Pres #: 01

in 1M NaNO3-1M NaOH
Sonicate for 2 min. followed by a 60 min. delay
External Sonifier
Flow rate = 60 ml/sec.
Refractive index of the particle = 2.00 and the medium = 1.33
File: 103AWD09

Summary	Percentiles		Dia	Vol%	Width
mv = 3.685	10% = 0.930	60% = 3.451	7.971	24%	4.191
mn = 0.832	20% = 1.181	70% = 4.560	3.301	36%	2.294
ma = 1.913	30% = 1.464	80% = 6.216	1.188	40%	0.796
cs = 3.137	40% = 1.911	90% = 8.445			
sd = 2.980	50% = 2.607	95% = 9.939			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	92.92	5.66						
592.0	100.00	0.00	7.778	87.26	5.64						
497.8	100.00	0.00	6.541	81.62	5.48						
418.6	100.00	0.00	5.500	76.14	5.65						
352.0	100.00	0.00	4.625	70.49	6.08						
296.0	100.00	0.00	3.889	64.41	6.39						
248.9	100.00	0.00	3.270	58.02	6.21						
209.3	100.00	0.00	2.750	51.81	5.72						
176.0	100.00	0.00	2.312	46.09	5.51						
148.0	100.00	0.00	1.945	40.58	6.05						
124.5	100.00	0.00	1.635	34.53	7.30						
104.7	100.00	0.00	1.375	27.23	8.25						
88.00	100.00	0.00	1.156	18.98	7.45						
74.00	100.00	0.00	0.972	11.53	5.12						
62.23	100.00	0.00	0.818	6.41	2.94						
52.33	100.00	0.00	0.688	3.47	1.62						
44.00	100.00	0.00	0.578	1.85	0.93						
37.00	100.00	0.00	0.486	0.92	0.57						
31.11	100.00	0.00	0.409	0.35	0.35						
26.16	100.00	0.00	0.344	0.00	0.00						
22.00	100.00	0.00	0.289	0.00	0.00						
18.50	100.00	0.00	0.243	0.00	0.00						
15.56	100.00	0.43	0.204	0.00	0.00						
13.08	99.57	2.13	0.172	0.00	0.00						
11.00	97.44	4.52	0.145	0.00	0.00						

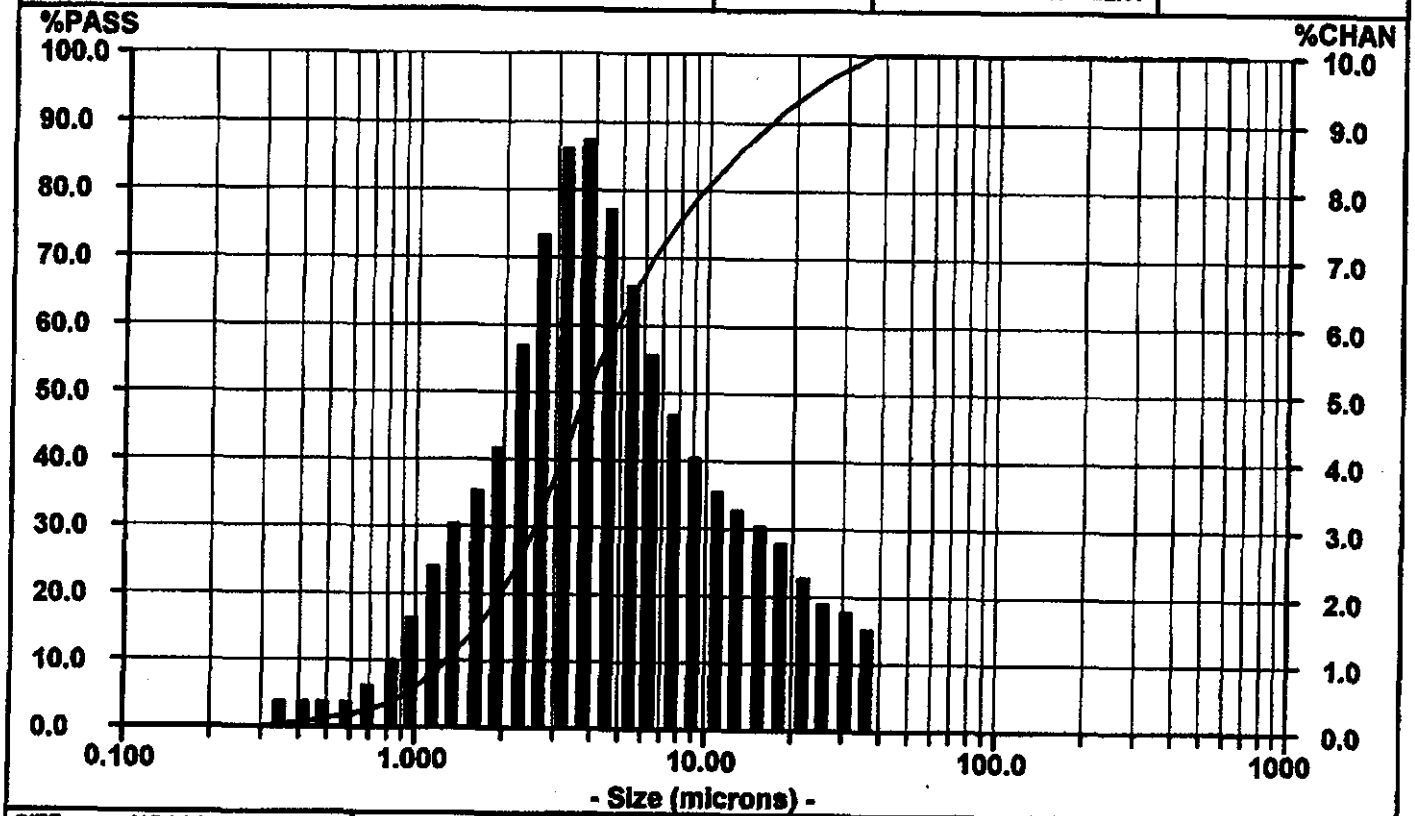
AW-103 Duplicate

AW-103
Duplicate

Date: 09/28/91 Meas #: 00001
Time: 09:13 Pres #: 01

in 1M NaNO3-1M NaOH
Sonicate for 20 min. followed by a 60 min. delay
External Sonifier
Flow rate = 17 ml/sec.
Refractive index of the particle = 2.00 and the medium = 1.33
File: 103AWD10

Summary	Percentiles		Dia	Vol%	Width
mv = 6.577	10% = 1.286	60% = 4.868	3.682	100%	10.00
mn = 0.658	20% = 1.992	70% = 6.507			
ma = 2.721	30% = 2.607	80% = 9.643			
cs = 2.205	40% = 3.193	90% = 16.30			
sd = 5.001	50% = 3.882	95% = 22.97			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	79.08	4.14						
592.0	100.00	0.00	7.778	74.94	4.78						
497.8	100.00	0.00	6.541	70.16	5.60						
418.6	100.00	0.00	5.500	64.56	6.63						
352.0	100.00	0.00	4.625	57.93	7.84						
296.0	100.00	0.00	3.889	50.09	8.83						
248.9	100.00	0.00	3.270	41.26	8.79						
209.3	100.00	0.00	2.750	32.47	7.47						
176.0	100.00	0.00	2.312	25.00	5.70						
148.0	100.00	0.00	1.945	19.30	4.38						
124.5	100.00	0.00	1.635	14.92	3.64						
104.7	100.00	0.00	1.375	11.28	3.14						
88.00	100.00	0.00	1.156	8.14	2.53						
74.00	100.00	0.00	0.972	5.61	1.79						
62.23	100.00	0.00	0.818	3.82	1.16						
52.33	100.00	0.00	0.688	2.66	0.77						
44.00	100.00	0.00	0.578	1.89	0.57						
37.00	100.00	1.67	0.486	1.32	0.48						
31.11	98.33	1.80	0.409	0.84	0.44						
26.16	96.53	2.08	0.344	0.40	0.40						
22.00	94.45	2.43	0.289	0.00	0.00						
18.50	92.02	2.80	0.243	0.00	0.00						
15.56	89.22	3.10	0.204	0.00	0.00						
13.08	86.12	3.36	0.172	0.00	0.00						
11.00	82.76	3.68	0.145	0.00	0.00						

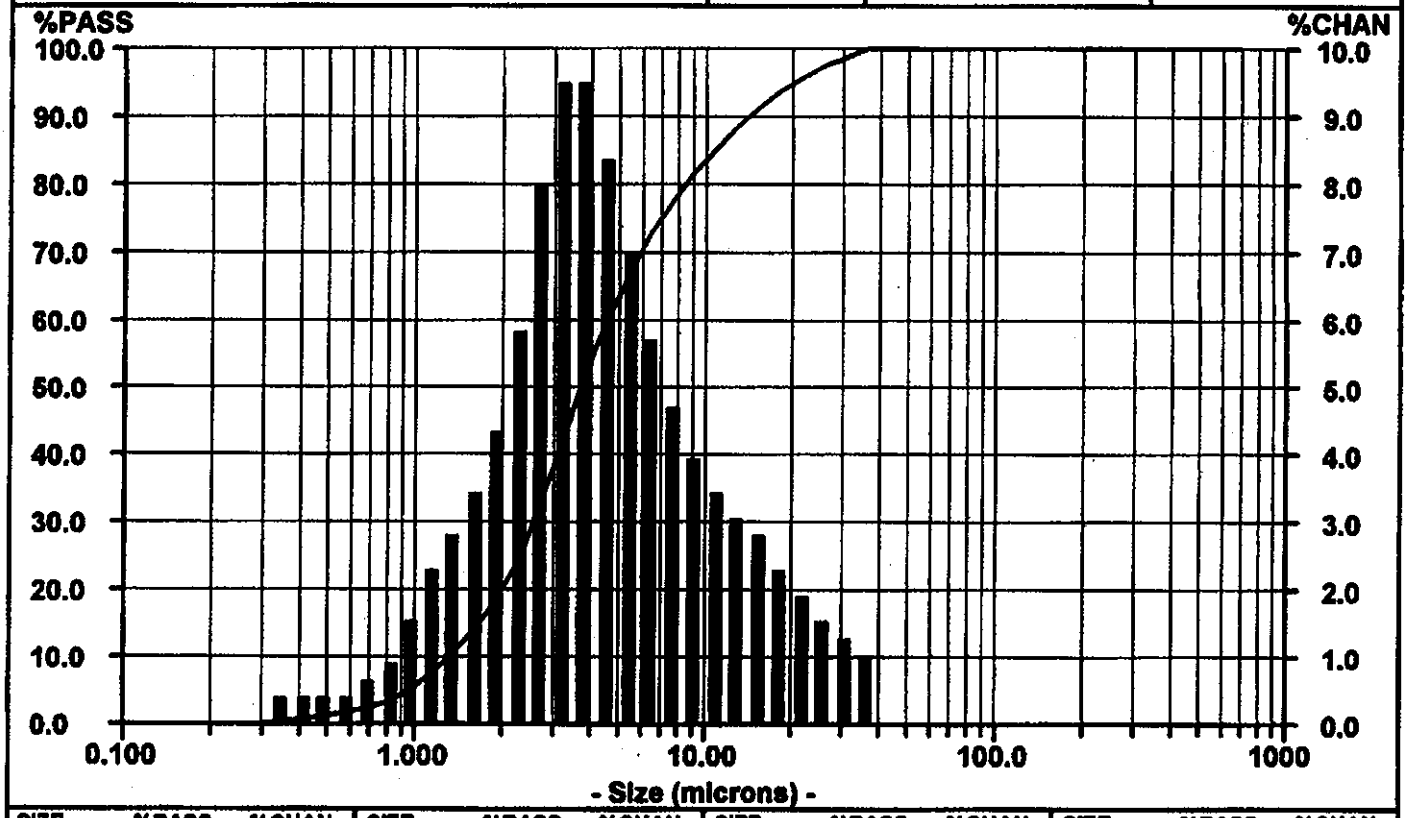
AW-103 Duplicate

AW-103 Duplicate

Date: 09/28/91 Meas #: 00001
Time: 09:18 Pres #: 01

in 1M NaNO3-1M NaOH
Sonicate for 20 min. followed by a 60 min. delay
External Sonifier
Flow rate = 17 ml/sec.
Refractive index of the particle = 1.70 and the medium = 1.33
File: 103AWD11

Summary	Percentiles		Dia	Vol%	Width
mv = 6.034	10% = 1.326	60% = 4.593	3.758	100%	8.419
mn = 0.663	20% = 2.034	70% = 5.940			
ma = 2.705	30% = 2.609	80% = 8.478			
cs = 2.218	40% = 3.145	90% = 14.15			
sd = 4.210	50% = 3.758	95% = 20.20			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	81.98	4.09						
592.0	100.00	0.00	7.778	77.89	4.81						
497.8	100.00	0.00	6.541	73.08	5.76						
418.6	100.00	0.00	5.500	67.32	7.00						
352.0	100.00	0.00	4.625	60.32	8.47						
296.0	100.00	0.00	3.889	51.85	9.62						
248.9	100.00	0.00	3.270	42.23	9.60						
209.3	100.00	0.00	2.750	32.63	8.03						
176.0	100.00	0.00	2.312	24.60	5.96						
148.0	100.00	0.00	1.945	18.64	4.42						
124.5	100.00	0.00	1.635	14.22	3.55						
104.7	100.00	0.00	1.375	10.67	2.98						
88.00	100.00	0.00	1.156	7.69	2.36						
74.00	100.00	0.00	0.972	5.33	1.67						
62.23	100.00	0.00	0.818	3.66	1.09						
52.33	100.00	0.00	0.688	2.57	0.73						
44.00	100.00	0.00	0.578	1.84	0.55						
37.00	100.00	1.12	0.486	1.29	0.46						
31.11	98.88	1.31	0.409	0.83	0.43						
26.16	97.57	1.63	0.344	0.40	0.40						
22.00	95.94	2.01	0.289	0.00	0.00						
18.50	93.93	2.43	0.243	0.00	0.00						
15.56	91.50	2.80	0.204	0.00	0.00						
13.08	88.70	3.16	0.172	0.00	0.00						
11.00	85.54	3.56	0.145	0.00	0.00						

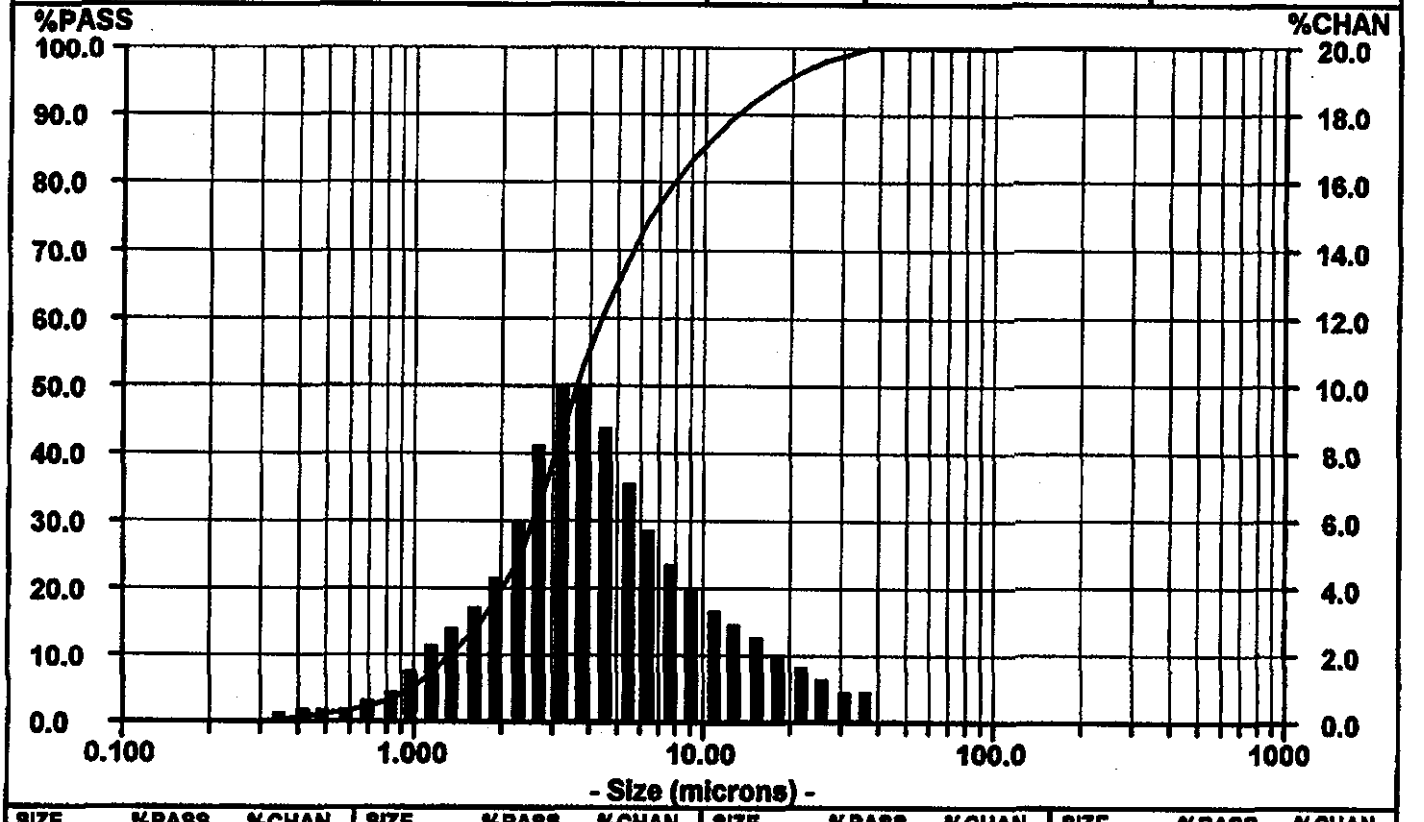
AW-103 Duplicate

AW-103 Duplicate

Date: 09/28/91 Meas #: 00001
Time: 09:23 Pres #: 01

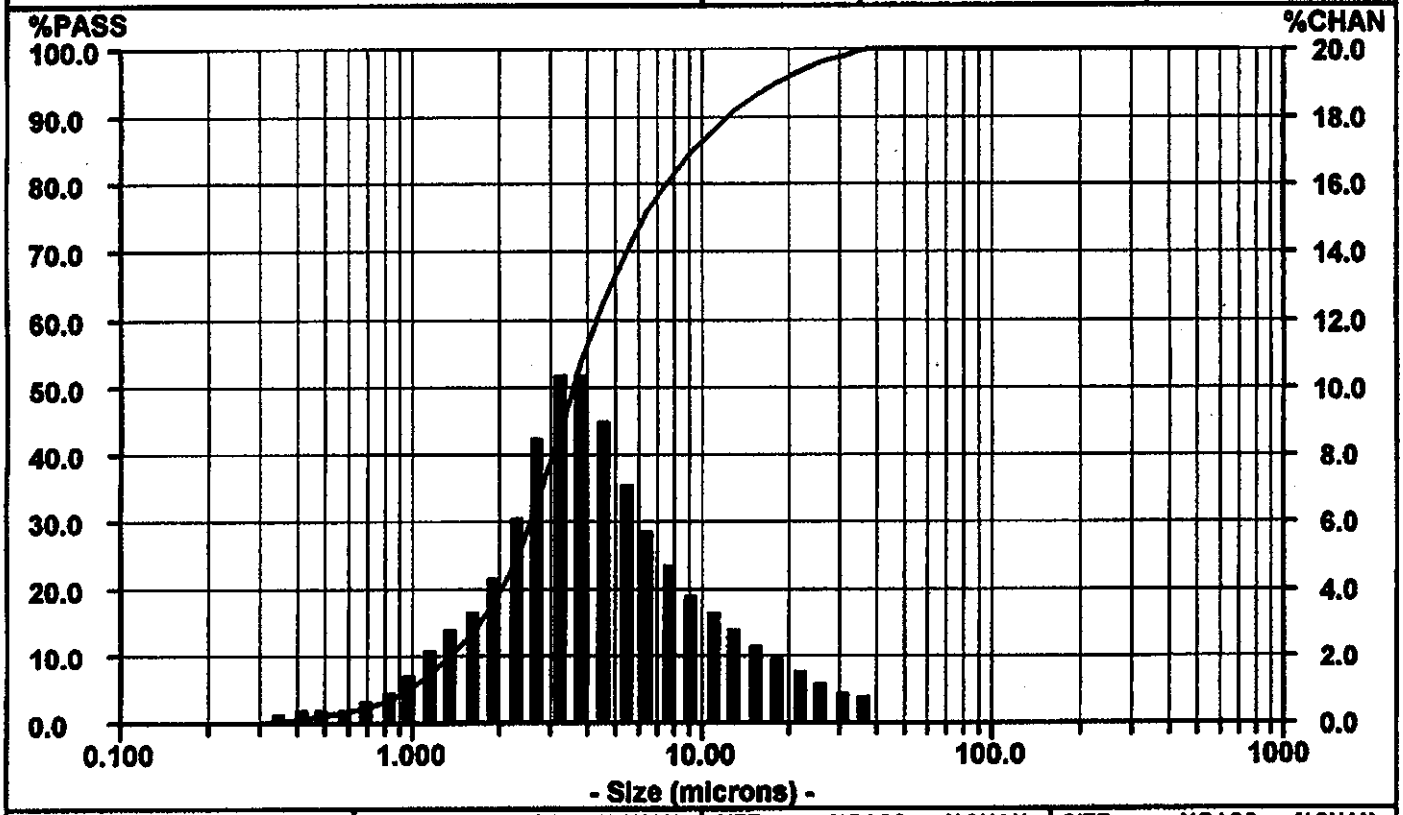
In 1M NaNO3-1M NaOH
Sonicate for 20 min. followed by a 60 min. delay
External Sonifier
Flow rate = 17 ml/sec.
Refractive Index of the particle = 1.50 and the medium = 1.33
File: 103AWD12

Summary	Percentiles		Dia	Vol%	Width
mv = 5.747	10% = 1.348	60% = 4.445	3.689	100%	7.634
mn = 0.669	20% = 2.052	70% = 5.645			
ma = 2.695	30% = 2.609	80% = 7.904			
cs = 2.226	40% = 3.119	90% = 13.01			
sd = 3.817	50% = 3.689	95% = 18.72			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	83.62	4.01						
592.0	100.00	0.00	7.778	79.61	4.76						
497.8	100.00	0.00	6.541	74.85	5.78						
418.6	100.00	0.00	5.500	69.07	7.18						
352.0	100.00	0.00	4.625	61.89	8.86						
296.0	100.00	0.00	3.889	53.03	10.18						
248.9	100.00	0.00	3.270	42.85	10.10						
209.3	100.00	0.00	2.750	32.75	8.34						
176.0	100.00	0.00	2.312	24.41	6.09						
148.0	100.00	0.00	1.945	18.32	4.44						
124.5	100.00	0.00	1.635	13.88	3.51						
104.7	100.00	0.00	1.375	10.37	2.91						
88.00	100.00	0.00	1.156	7.46	2.30						
74.00	100.00	0.00	0.972	5.16	1.61						
62.23	100.00	0.00	0.818	3.55	1.05						
52.33	100.00	0.00	0.688	2.50	0.71						
44.00	100.00	0.00	0.578	1.79	0.53						
37.00	100.00	0.91	0.486	1.26	0.45						
31.11	99.09	1.09	0.409	0.81	0.42						
26.16	98.00	1.38	0.344	0.39	0.39						
22.00	96.62	1.75	0.289	0.00	0.00						
18.50	94.87	2.18	0.243	0.00	0.00						
15.56	92.69	2.60	0.204	0.00	0.00						
13.08	90.09	3.01	0.172	0.00	0.00						
11.00	87.08	3.46	0.145	0.00	0.00						

AW-103	AW-103 Duplicate	Date: 09/28/91 Time: 09:27	Meas #: 00001 Pres #: 01
In 1M NaNO3-1M NaOH Sonicate for 20 min. followed by a 60 min. delay External Sonifier Flow rate = 40 ml/sec. Refractive index of the particle = 1.50 and the medium = 1.33 File: 103AWD13	Summary mv = 5.578 mn = 0.676 ma = 2.688 cs = 2.232 sd = 3.571	Percentiles 10% = 1.361 60% = 4.357 20% = 2.063 70% = 5.469 30% = 2.605 80% = 7.544 40% = 3.099 90% = 12.36 50% = 3.643 95% = 17.91	Dia Vol% Width 3.643 100% 7.142



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.260	84.72	3.94						
592.0	100.00	0.00	7.778	80.78	4.74						
497.8	100.00	0.00	6.541	76.04	5.82						
418.6	100.00	0.00	5.500	70.22	7.28						
352.0	100.00	0.00	4.625	62.94	9.06						
296.0	100.00	0.00	3.889	53.89	10.54						
248.9	100.00	0.00	3.270	43.35	10.44						
209.3	100.00	0.00	2.750	32.91	8.59						
176.0	100.00	0.00	2.312	24.32	6.20						
148.0	100.00	0.00	1.945	18.12	4.46						
124.5	100.00	0.00	1.635	13.66	3.48						
104.7	100.00	0.00	1.375	10.18	2.87						
88.00	100.00	0.00	1.156	7.31	2.25						
74.00	100.00	0.00	0.972	5.06	1.58						
62.23	100.00	0.00	0.818	3.48	1.03						
52.33	100.00	0.00	0.688	2.45	0.70						
44.00	100.00	0.00	0.578	1.75	0.52						
37.00	100.00	0.82	0.486	1.23	0.44						
31.11	99.18	0.96	0.409	0.79	0.41						
26.16	98.20	1.25	0.344	0.38	0.38						
22.00	96.95	1.60	0.289	0.00	0.00						
18.50	95.35	2.02	0.243	0.00	0.00						
15.56	93.33	2.43	0.204	0.00	0.00						
13.08	90.90	2.85	0.172	0.00	0.00						
11.00	88.05	3.33	0.145	0.00	0.00						

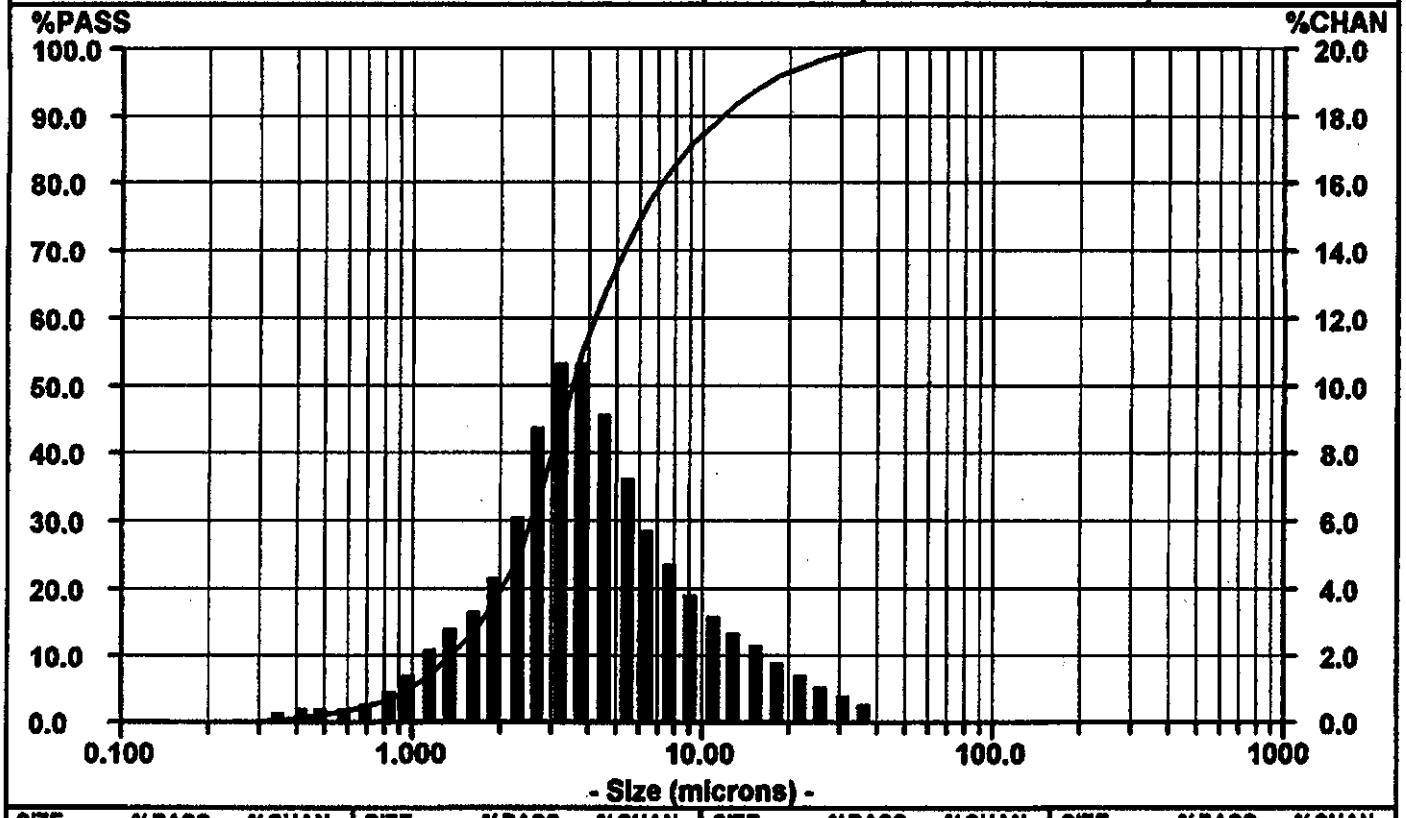
AW-103 Duplicate

AW-103 Duplicate

Date: 09/28/91 Meas #: 00001
Time: 09:32 Pres #: 01

in 1M NaNO3-1M NaOH
Sonicate for 20 min. followed by a 60 min. delay
External Sonifier
Flow rate = 40 ml/sec.
Refractive index of the particle = 1.70 and the medium = 1.33
File: 103AWD14

Summary		Percentiles		Dia	Vol%	Width
mv =	5.401	10% = 1.366	60% = 4.280	3.598	100%	6.724
mn =	0.684	20% = 2.066	70% = 5.324			
ma =	2.679	30% = 2.597	80% = 7.239			
cs =	2.240	40% = 3.075	90% = 11.72			
sd =	3.362	50% = 3.598	95% = 16.93			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	85.72	3.87						
592.0	100.00	0.00	7.778	81.85	4.72						
497.8	100.00	0.00	6.541	77.13	5.86						
418.6	100.00	0.00	5.500	71.27	7.36						
352.0	100.00	0.00	4.625	63.91	9.20						
296.0	100.00	0.00	3.889	54.71	10.75						
248.9	100.00	0.00	3.270	43.96	10.79						
209.3	100.00	0.00	2.750	33.17	8.83						
176.0	100.00	0.00	2.312	24.34	6.29						
148.0	100.00	0.00	1.945	18.05	4.46						
124.5	100.00	0.00	1.635	13.59	3.47						
104.7	100.00	0.00	1.375	10.12	2.88						
88.00	100.00	0.00	1.156	7.24	2.27						
74.00	100.00	0.00	0.972	4.97	1.59						
62.23	100.00	0.00	0.818	3.38	1.02						
52.33	100.00	0.00	0.688	2.36	0.67						
44.00	100.00	0.00	0.578	1.69	0.50						
37.00	100.00	0.69	0.486	1.19	0.42						
31.11	99.31	0.84	0.409	0.77	0.40						
26.16	98.47	1.10	0.344	0.37	0.37						
22.00	97.37	1.46	0.289	0.00	0.00						
18.50	95.91	1.89	0.243	0.00	0.00						
15.56	94.02	2.32	0.204	0.00	0.00						
13.08	91.70	2.75	0.172	0.00	0.00						
11.00	88.95	3.23	0.145	0.00	0.00						

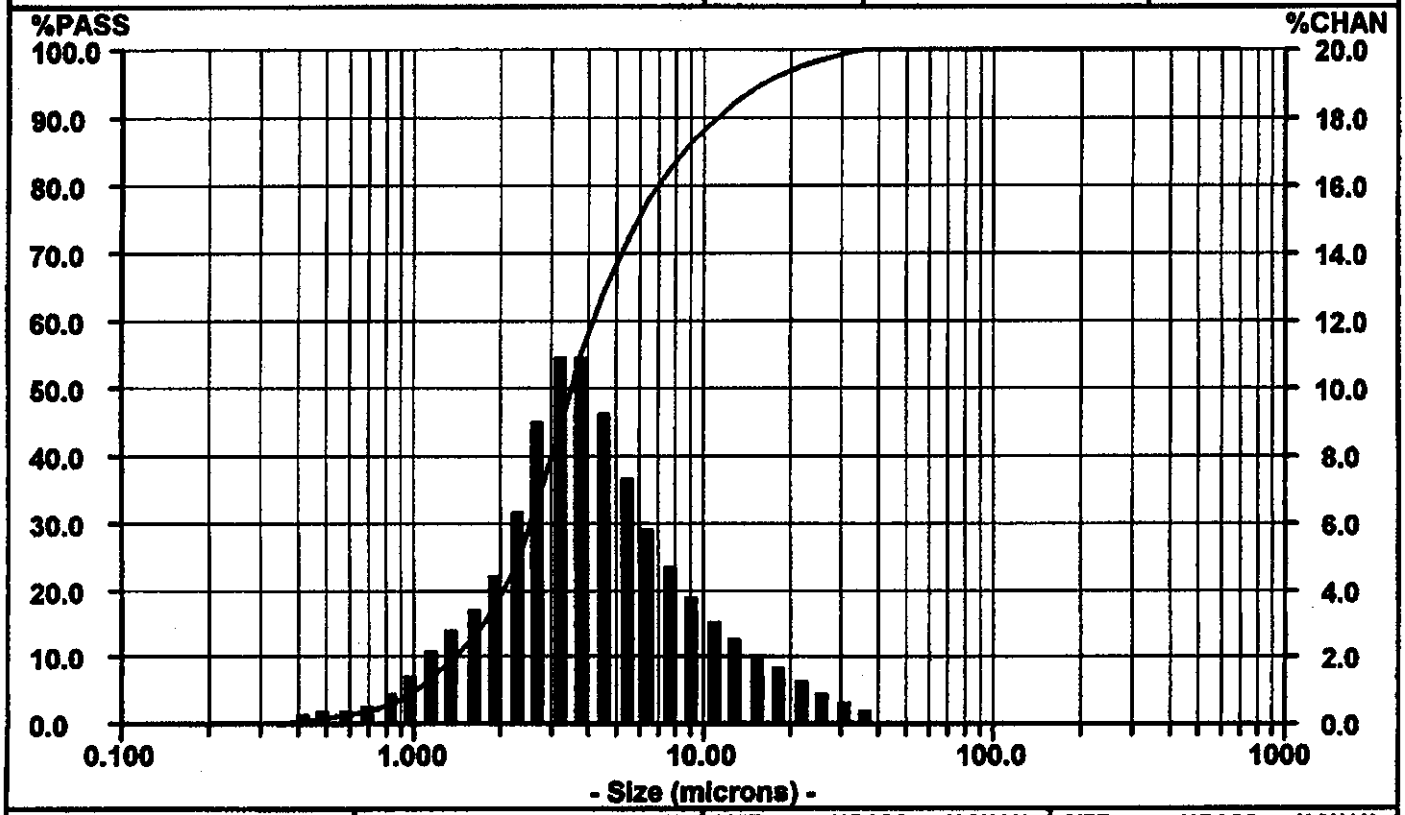
AW-103 Duplicate

AW-103
Duplicate

Date: 09/28/91 Meas #: 00001
Time: 09:36 Pres #: 01

in 1M NaNO3-1M NaOH
Sonicate for 20 min. followed by a 60 min. delay
External Sonifier
Flow rate = 40 ml/sec.
Refractive index of the particle = 2.00 and the medium = 1.33
File: 103AWD15

Summary	Percentiles		Dia	Vol%	Width
mv = 5.258	10% = 1.398	60% = 4.219	3.567	100%	6.335
mn = 0.839	20% = 2.081	70% = 5.205			
ma = 2.740	30% = 2.595	80% = 6.980			
cs = 2.190	40% = 3.060	90% = 11.13			
sd = 3.167	50% = 3.567	95% = 16.14			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	86.68	3.83						
592.0	100.00	0.00	7.778	82.85	4.73						
497.8	100.00	0.00	6.541	78.12	5.91						
418.6	100.00	0.00	5.500	72.21	7.47						
352.0	100.00	0.00	4.625	64.74	9.38						
296.0	100.00	0.00	3.889	55.36	11.00						
248.9	100.00	0.00	3.270	44.36	11.06						
209.3	100.00	0.00	2.750	33.30	9.09						
176.0	100.00	0.00	2.312	24.21	6.47						
148.0	100.00	0.00	1.945	17.74	4.55						
124.5	100.00	0.00	1.635	13.19	3.50						
104.7	100.00	0.00	1.375	9.69	2.87						
88.00	100.00	0.00	1.156	6.82	2.25						
74.00	100.00	0.00	0.972	4.57	1.57						
62.23	100.00	0.00	0.818	3.00	1.02						
52.33	100.00	0.00	0.688	1.98	0.68						
44.00	100.00	0.00	0.578	1.30	0.50						
37.00	100.00	0.60	0.486	0.80	0.43						
31.11	99.40	0.74	0.409	0.37	0.37						
26.16	98.66	0.99	0.344	0.00	0.00						
22.00	97.67	1.33	0.289	0.00	0.00						
18.50	96.34	1.74	0.243	0.00	0.00						
15.56	94.60	2.17	0.204	0.00	0.00						
13.08	92.43	2.61	0.172	0.00	0.00						
11.00	89.82	3.14	0.145	0.00	0.00						

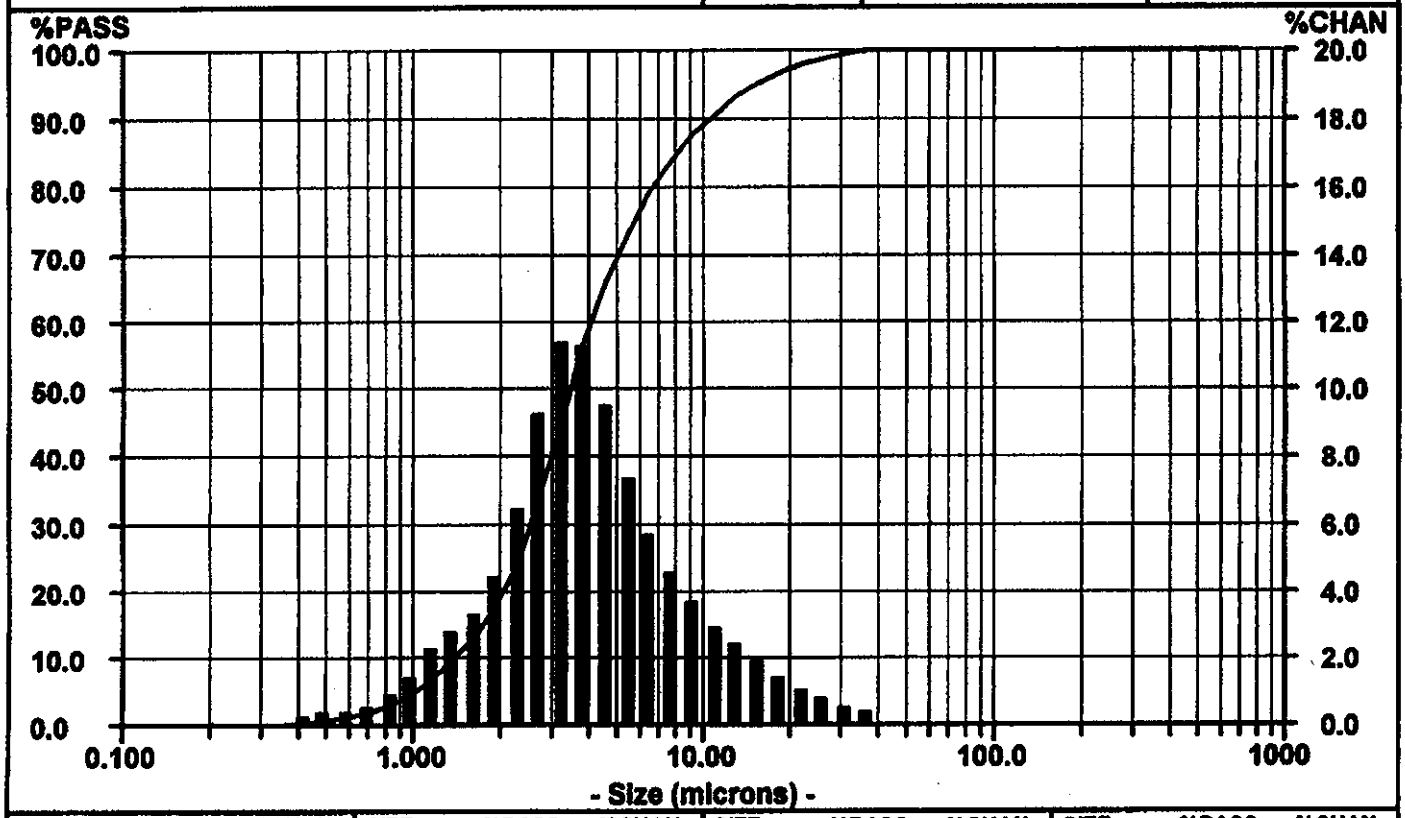
AW-103 Duplicate

AW-103 Duplicate

Date: 09/28/91 Meas #: 00001
Time: 09:40 Pres #: 01

in 1M NaNO3-1M NaOH
Sonicate for 20 min. followed by a 60 min. delay
External Sonifier
Flow rate = 60 ml/sec.
Refractive index of the particle = 2.00 and the medium = 1.33
File: 103AWD16

Summary	Percentiles		Dia	Vol%	Width
mv = 5.083	10% = 1.397	60% = 4.136	3.519	100%	5.994
mn = 0.851	20% = 2.081	70% = 5.058			
ma = 2.724	30% = 2.587	80% = 6.720			
cs = 2.203	40% = 3.035	90% = 10.55			
sd = 2.997	50% = 3.519	95% = 15.15			



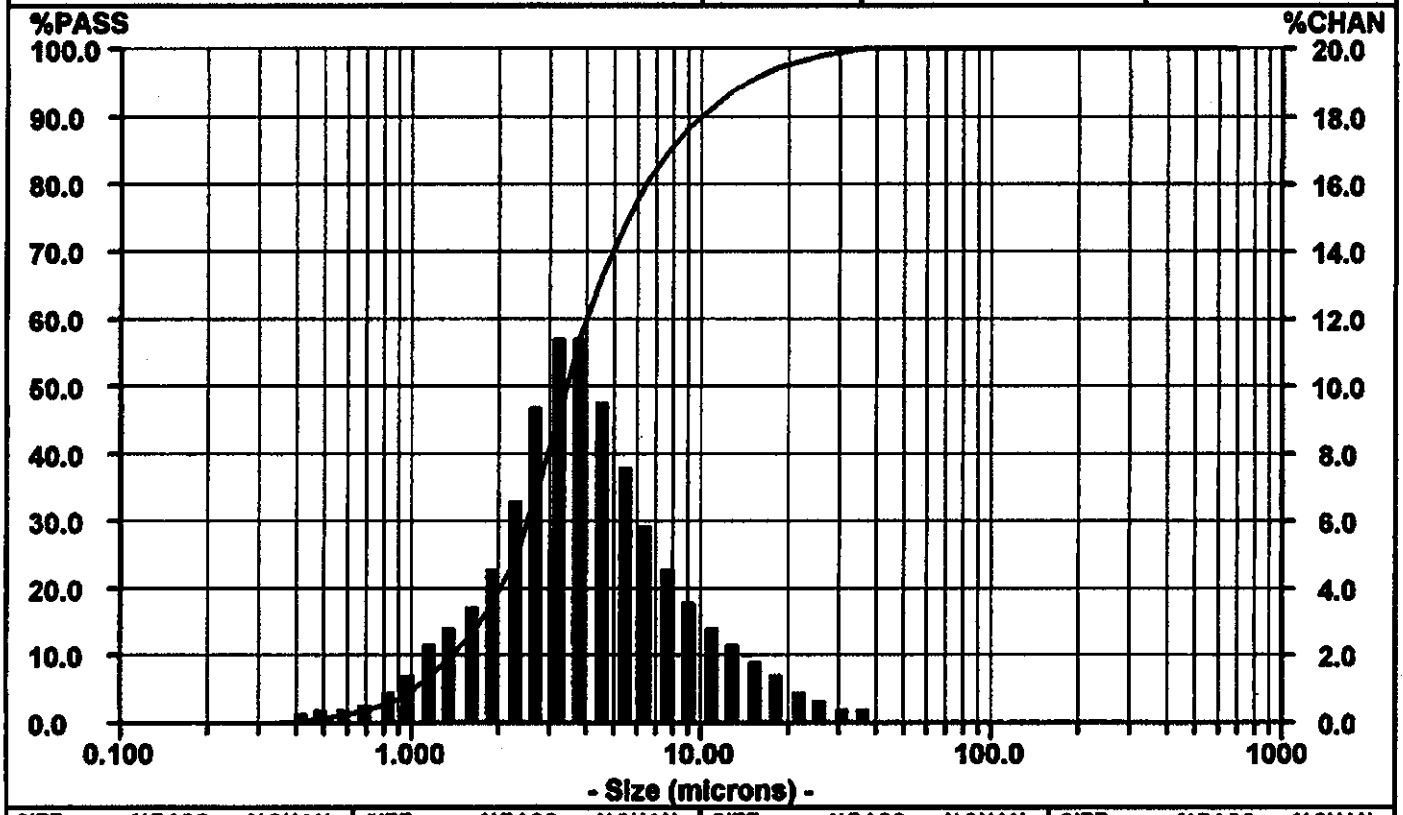
SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	87.61	3.75						
592.0	100.00	0.00	7.778	83.86	4.64						
497.8	100.00	0.00	6.541	79.22	5.84						
418.6	100.00	0.00	5.500	73.38	7.46						
352.0	100.00	0.00	4.625	65.92	9.51						
296.0	100.00	0.00	3.889	56.41	11.32						
248.9	100.00	0.00	3.270	45.09	11.49						
209.3	100.00	0.00	2.750	33.60	9.34						
176.0	100.00	0.00	2.312	24.26	6.53						
148.0	100.00	0.00	1.945	17.73	4.53						
124.5	100.00	0.00	1.635	13.20	3.49						
104.7	100.00	0.00	1.375	9.71	2.91						
88.00	100.00	0.00	1.156	6.80	2.31						
74.00	100.00	0.00	0.972	4.49	1.59						
62.23	100.00	0.00	0.818	2.90	1.00						
52.33	100.00	0.00	0.688	1.90	0.65						
44.00	100.00	0.00	0.578	1.25	0.48						
37.00	100.00	0.50	0.486	0.77	0.41						
31.11	99.50	0.62	0.409	0.36	0.38						
26.16	98.88	0.84	0.344	0.00	0.00						
22.00	98.04	1.16	0.289	0.00	0.00						
18.50	96.88	1.59	0.243	0.00	0.00						
15.56	95.29	2.06	0.204	0.00	0.00						
13.08	93.23	2.54	0.172	0.00	0.00						
11.00	90.69	3.08	0.145	0.00	0.00						

AW-103 Duplicate

AW-103 Duplicate
Date: 09/28/91 Meas #: 00001
Time: 09:45 Pres #: 01

in 1M NaNO3-1M NaOH
Sonicate for 20 min. followed by a 60 min. delay
External Sonifier
Flow rate = 60 ml/sec.
Refractive index of the particle = 1.50 and the medium = 1.33
File: 103AWD17

Summary		Percentiles		Dia	Vol%	Width
mv	= 4.947	10% = 1.396	60% = 4.086	3.490	100%	5.661
mn	= 0.852	20% = 2.069	70% = 4.960			
ma	= 2.701	30% = 2.568	80% = 6.479			
cs	= 2.221	40% = 3.012	90% = 10.02			
sd	= 2.831	50% = 3.490	95% = 14.47			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	88.59	3.65						
592.0	100.00	0.00	7.778	84.94	4.64						
497.8	100.00	0.00	6.541	80.30	5.95						
418.6	100.00	0.00	5.500	74.35	7.63						
352.0	100.00	0.00	4.625	66.72	9.67						
296.0	100.00	0.00	3.889	57.05	11.43						
248.9	100.00	0.00	3.270	45.62	11.57						
209.3	100.00	0.00	2.750	34.05	9.48						
176.0	100.00	0.00	2.312	24.57	6.97						
148.0	100.00	0.00	1.945	17.90	4.63						
124.5	100.00	0.00	1.635	13.27	3.55						
104.7	100.00	0.00	1.375	9.72	2.92						
88.00	100.00	0.00	1.156	6.80	2.30						
74.00	100.00	0.00	0.972	4.50	1.59						
62.23	100.00	0.00	0.818	2.91	1.00						
52.33	100.00	0.00	0.688	1.91	0.65						
44.00	100.00	0.00	0.578	1.26	0.48						
37.00	100.00	0.45	0.486	0.78	0.42						
31.11	99.55	0.56	0.409	0.36	0.36						
26.16	98.99	0.76	0.344	0.00	0.00						
22.00	98.23	1.05	0.289	0.00	0.00						
18.50	97.18	1.44	0.243	0.00	0.00						
15.56	95.74	1.88	0.204	0.00	0.00						
13.08	93.86	2.35	0.172	0.00	0.00						
11.00	91.51	2.92	0.145	0.00	0.00						

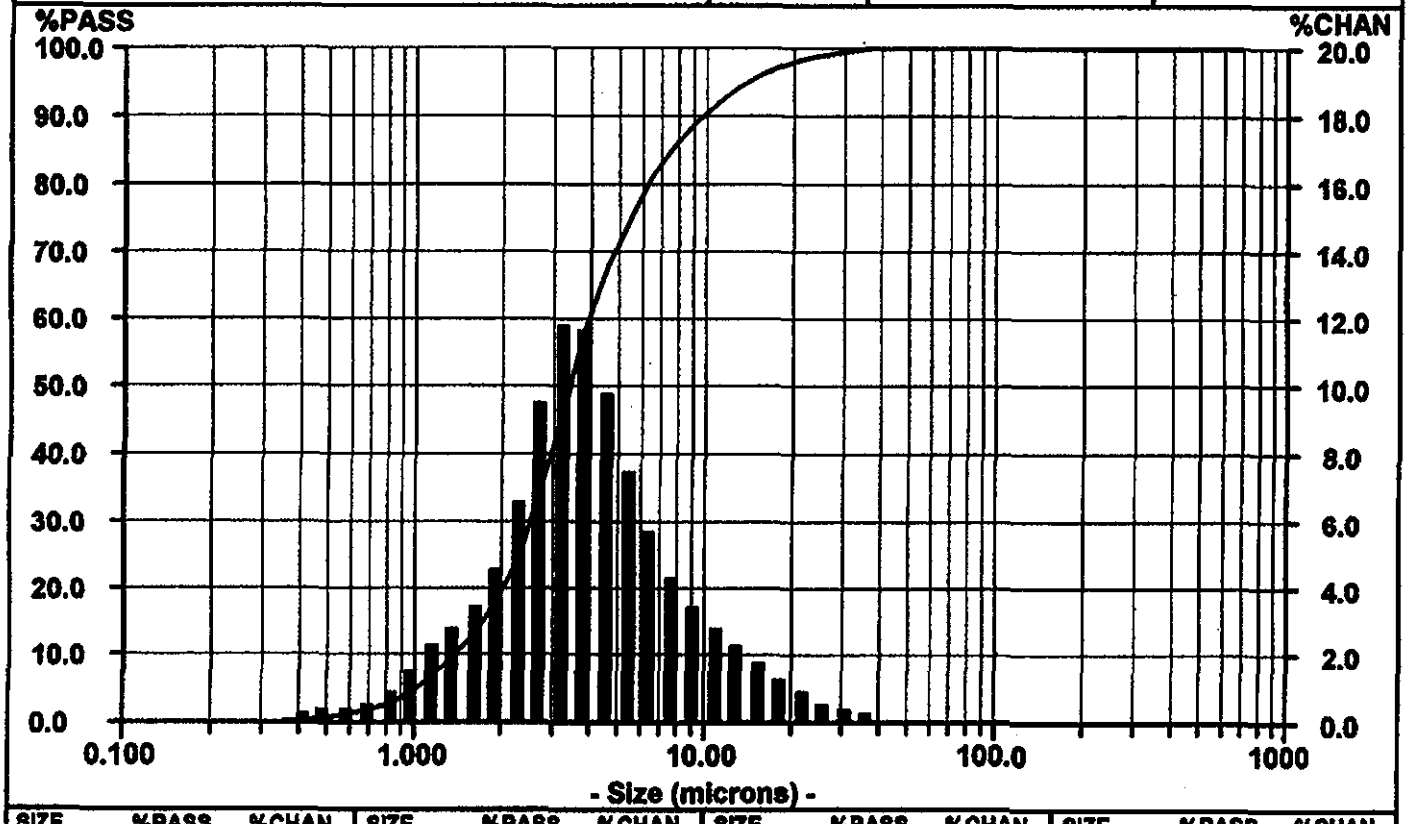
AW-103 Duplicate

AW-103 Duplicate

Date: 09/28/91 Meas #: 00001
Time: 09:49 Pres #: 01

in 1M NaNO3-1M NaOH
Sonicate for 20 min. followed by a 60 min. delay
External Sonifier
Flow rate = 60 ml/sec.
Refractive index of the particle = 1.70 and the medium = 1.33
File: 103AWD18

Summary	Percentiles		Dia	Vol%	Width
mv = 4.824	10% = 1.390	60% = 4.022	3.455	100%	5.455
mn = 0.862	20% = 2.065	70% = 4.845			
ma = 2.686	30% = 2.562	80% = 6.299			
cs = 2.234	40% = 2.996	90% = 9.699			
sd = 2.728	50% = 3.455	95% = 13.88			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	89.16	3.54						
592.0	100.00	0.00	7.778	85.62	4.48						
497.8	100.00	0.00	6.541	81.14	5.79						
418.6	100.00	0.00	5.500	75.35	7.58						
352.0	100.00	0.00	4.625	67.77	9.83						
296.0	100.00	0.00	3.889	57.94	11.78						
248.9	100.00	0.00	3.270	46.16	11.89						
209.3	100.00	0.00	2.750	34.27	9.63						
176.0	100.00	0.00	2.312	24.64	6.67						
148.0	100.00	0.00	1.945	17.97	4.61						
124.5	100.00	0.00	1.635	13.36	3.56						
104.7	100.00	0.00	1.375	9.80	2.98						
88.00	100.00	0.00	1.156	6.82	2.35						
74.00	100.00	0.00	0.972	4.47	1.61						
62.23	100.00	0.00	0.818	2.86	1.00						
52.33	100.00	0.00	0.688	1.86	0.64						
44.00	100.00	0.00	0.578	1.22	0.47						
37.00	100.00	0.36	0.486	0.75	0.40						
31.11	99.64	0.47	0.409	0.35	0.35						
26.16	99.17	0.67	0.344	0.00	0.00						
22.00	98.50	0.97	0.289	0.00	0.00						
18.50	97.53	1.37	0.243	0.00	0.00						
15.56	96.16	1.83	0.204	0.00	0.00						
13.08	94.33	2.31	0.172	0.00	0.00						
11.00	92.02	2.86	0.145	0.00	0.00						

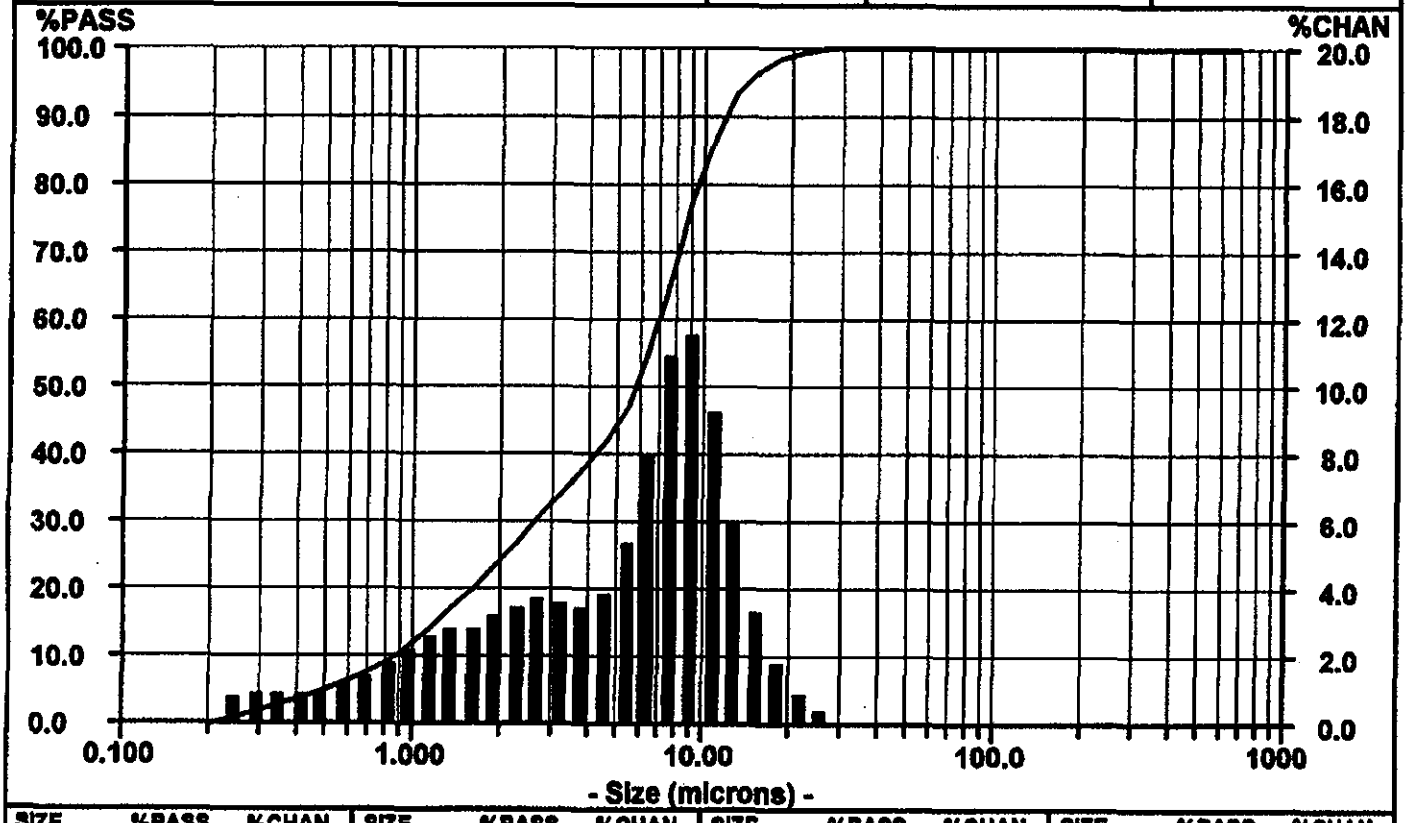
AY-101

AY-101 Sample

Date: 09/27/91 Meas #: 00001
Time: 08:04 Pres #: 01

1 M NaOH and 1 M NaNO3
Flow Rate = 17 ml/sec.
Refractive Index = 1.50 Particle/1.33 Medium
File: 101AY001

Summary	Percentiles		Dia	Vol%	Width
mv = 6.101	10% = 0.855	60% = 7.068	7.879	66%	6.496
mn = 0.354	20% = 1.619	70% = 8.212	1.373	34%	2.000
ma = 2.107	30% = 2.663	80% = 9.572			
cs = 2.848	40% = 4.282	90% = 11.78			
sd = 4.503	50% = 5.872	95% = 14.09			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	77.94	11.64						
592.0	100.00	0.00	7.778	66.30	10.94						
497.8	100.00	0.00	6.541	55.36	8.07						
418.6	100.00	0.00	5.500	47.29	5.41						
352.0	100.00	0.00	4.625	41.88	3.99						
296.0	100.00	0.00	3.889	37.89	3.56						
248.9	100.00	0.00	3.270	34.33	3.64						
209.3	100.00	0.00	2.750	30.69	3.73						
176.0	100.00	0.00	2.312	26.96	3.55						
148.0	100.00	0.00	1.945	23.41	3.23						
124.5	100.00	0.00	1.635	20.18	2.99						
104.7	100.00	0.00	1.375	17.19	2.84						
88.00	100.00	0.00	1.156	14.35	2.63						
74.00	100.00	0.00	0.972	11.72	2.25						
62.23	100.00	0.00	0.818	9.47	1.81						
52.33	100.00	0.00	0.688	7.66	1.45						
44.00	100.00	0.00	0.578	6.21	1.22						
37.00	100.00	0.00	0.486	4.99	1.09						
31.11	100.00	0.00	0.409	3.90	1.05						
26.16	100.00	0.51	0.344	2.85	1.04						
22.00	99.49	0.96	0.289	1.81	1.01						
18.50	98.53	1.82	0.243	0.80	0.80						
15.56	96.71	3.41	0.204	0.00	0.00						
13.08	93.30	6.02	0.172	0.00	0.00						
11.00	87.28	9.34	0.145	0.00	0.00						

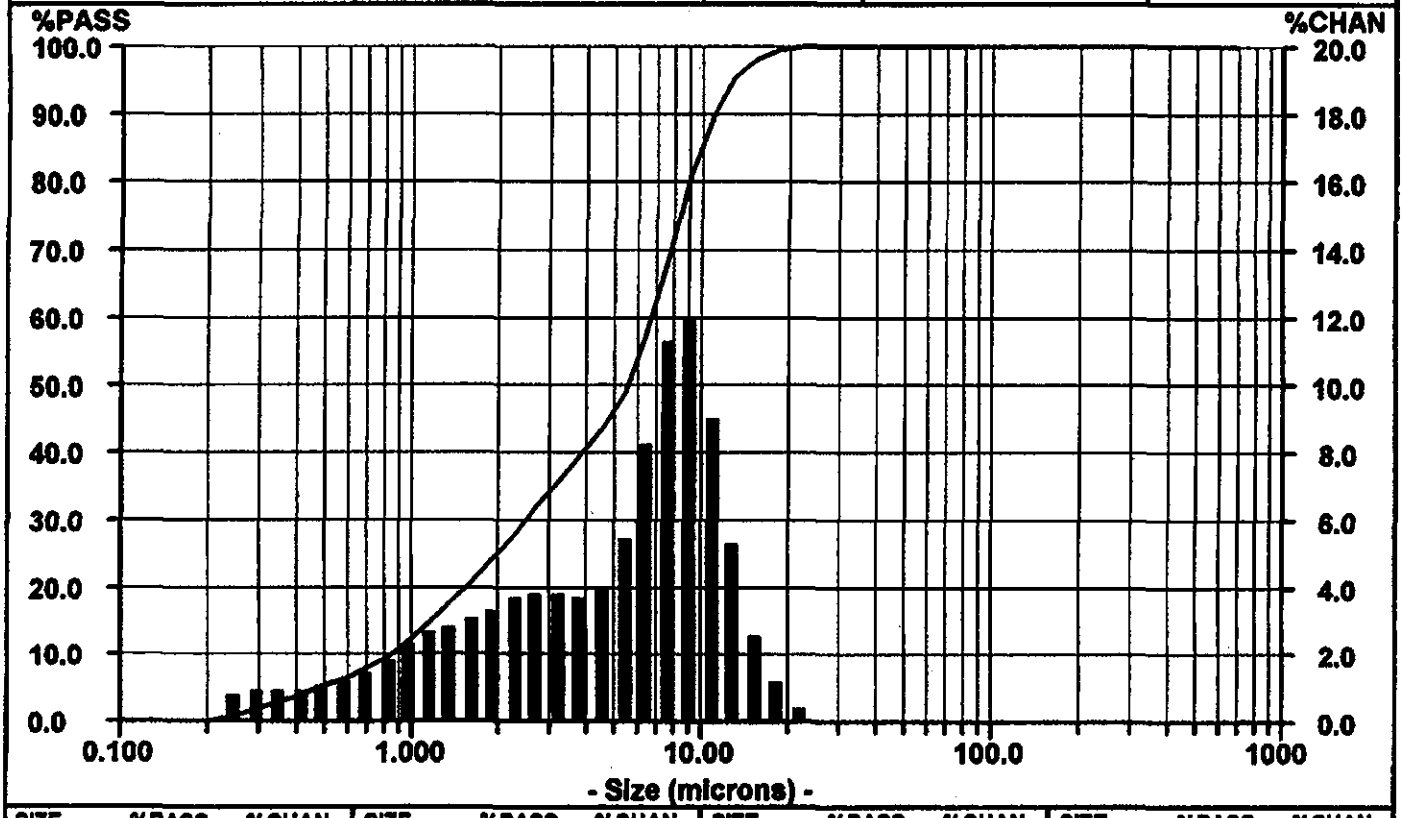
AY-101

AY-101 Sample

Date: 09/27/91 Meas #: 00001
Time: 08:08 Pres #: 01

1 M NaOH and 1 M NaNO3
Flow Rate = 17 ml/sec.
Refractive Index = 1.70 Particle/1.33 Medium
File: 101AY002

Summary	Percentiles		Dia	Vol%	Width
mv = 5.722	10% = 0.835	60% = 6.810	7.673	64%	5.872
mn = 0.355	20% = 1.556	70% = 7.896	1.391	36%	2.002
ma = 2.043	30% = 2.509	80% = 9.122			
cs = 2.937	40% = 3.949	90% = 10.97			
sd = 4.248	50% = 5.601	95% = 12.80			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	80.93	11.98						
592.0	100.00	0.00	7.778	68.95	11.39						
497.8	100.00	0.00	6.541	57.56	8.30						
418.6	100.00	0.00	5.500	49.26	5.51						
352.0	100.00	0.00	4.625	43.75	4.08						
296.0	100.00	0.00	3.889	39.67	3.70						
248.9	100.00	0.00	3.270	35.97	3.85						
209.3	100.00	0.00	2.750	32.12	3.99						
176.0	100.00	0.00	2.312	28.13	3.79						
148.0	100.00	0.00	1.945	24.34	3.42						
124.5	100.00	0.00	1.635	20.92	3.14						
104.7	100.00	0.00	1.375	17.78	2.97						
88.00	100.00	0.00	1.156	14.81	2.73						
74.00	100.00	0.00	0.972	12.08	2.33						
62.23	100.00	0.00	0.818	9.75	1.86						
52.33	100.00	0.00	0.688	7.89	1.49						
44.00	100.00	0.00	0.578	6.40	1.25						
37.00	100.00	0.00	0.486	5.15	1.13						
31.11	100.00	0.00	0.409	4.02	1.08						
26.16	100.00	0.00	0.344	2.94	1.08						
22.00	100.00	0.55	0.289	1.86	1.04						
18.50	99.45	1.23	0.243	0.82	0.82						
15.56	98.22	2.69	0.204	0.00	0.00						
13.08	95.53	5.41	0.172	0.00	0.00						
11.00	90.12	9.19	0.145	0.00	0.00						

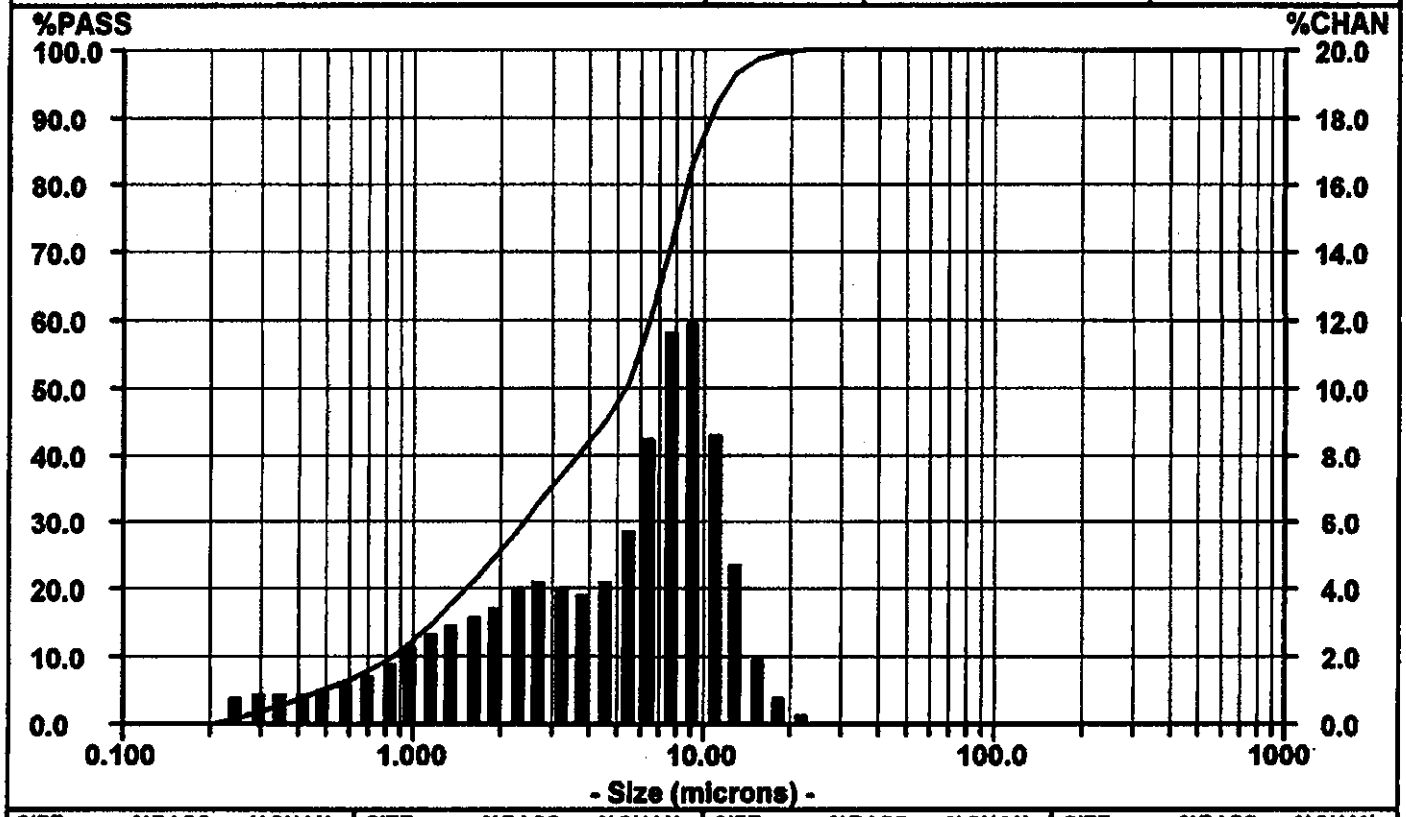
AY-101

AY-101 Sample

Date: 09/27/91 Meas #: 00001
Time: 08:13 Pres #: 01

1 M NaOH and 1 M NaNO3
Flow Rate = 17 ml/sec.
Refractive Index = 2.00 Particle/1.33 Medium
File: 101AY003

Summary	Percentiles		Dia	Vol%	Width
mv = 5.483	10% = 0.831	60% = 6.677	7.475	63%	5.520
mn = 0.357	20% = 1.633	70% = 7.630	1.418	37%	2.000
ma = 2.015	30% = 2.425	80% = 8.787			
cs = 2.978	40% = 3.726	90% = 10.47			
sd = 4.062	50% = 5.362	95% = 12.08			



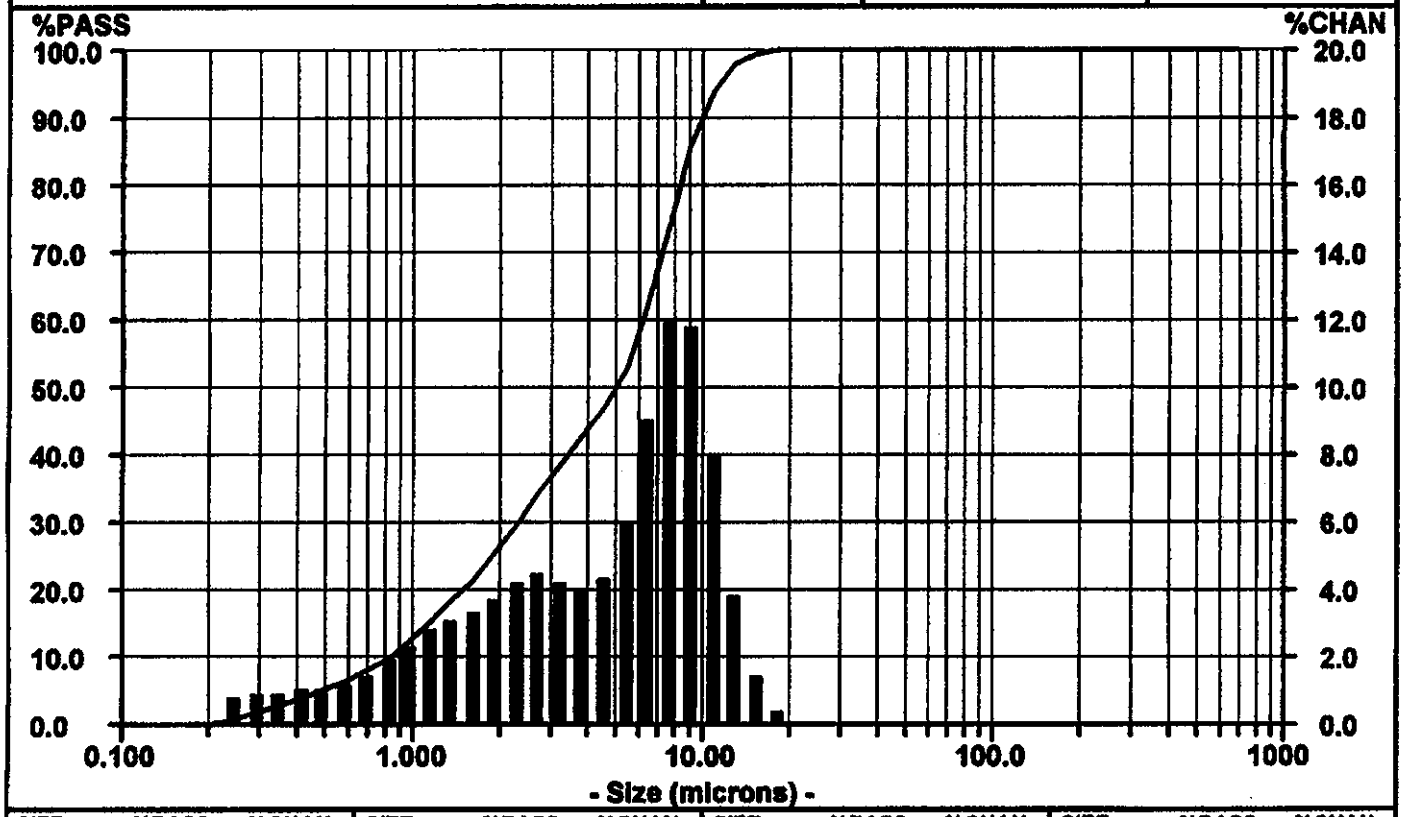
SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	83.36	11.98						
592.0	100.00	0.00	7.778	71.38	11.72						
497.8	100.00	0.00	6.541	59.66	8.67						
418.6	100.00	0.00	5.500	50.99	5.77						
352.0	100.00	0.00	4.625	45.22	4.26						
296.0	100.00	0.00	3.889	40.96	3.86						
248.9	100.00	0.00	3.270	37.10	4.04						
209.3	100.00	0.00	2.750	33.06	4.21						
176.0	100.00	0.00	2.312	28.85	4.01						
148.0	100.00	0.00	1.945	24.84	3.59						
124.5	100.00	0.00	1.635	21.25	3.26						
104.7	100.00	0.00	1.375	17.99	3.04						
88.00	100.00	0.00	1.156	14.95	2.78						
74.00	100.00	0.00	0.972	12.17	2.37						
62.23	100.00	0.00	0.818	9.80	1.89						
52.33	100.00	0.00	0.688	7.91	1.51						
44.00	100.00	0.00	0.578	6.40	1.27						
37.00	100.00	0.00	0.486	5.13	1.13						
31.11	100.00	0.00	0.409	4.00	1.08						
26.16	100.00	0.00	0.344	2.92	1.07						
22.00	100.00	0.33	0.289	1.85	1.04						
18.50	99.67	0.83	0.243	0.81	0.81						
15.56	98.84	2.08	0.204	0.00	0.00						
13.08	96.76	4.70	0.172	0.00	0.00						
11.00	92.06	8.70	0.145	0.00	0.00						

AY-101

AY-101 Sample — Date: 09/27/91 Time: 08:17 — Meas #: 00001 Pres #: 01

1 M NaOH and 1 M NaNO3
Flow Rate = 40 ml/sec.
Refractive Index = 2.00 Particle/1.33 Medium
File: 101AY004

Summary	Percentiles		Dia	Vol%	Width
mv = 5.214	10% = 0.821	60% = 6.313	7.269	61%	5.175
mn = 0.369	20% = 1.501	70% = 7.343	1.446	39%	2.005
ma = 1.975	30% = 2.337	80% = 8.436			
cs = 3.038	40% = 3.478	90% = 9.972			
sd = 3.873	50% = 5.074	95% = 11.36			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.260	86.04	11.86						
592.0	100.00	0.00	7.778	74.18	12.07						
497.8	100.00	0.00	6.541	62.11	9.02						
418.6	100.00	0.00	5.500	53.09	8.01						
352.0	100.00	0.00	4.625	47.08	4.45						
296.0	100.00	0.00	3.889	42.63	4.08						
248.9	100.00	0.00	3.270	38.55	4.31						
209.3	100.00	0.00	2.750	34.24	4.51						
176.0	100.00	0.00	2.312	29.73	4.27						
148.0	100.00	0.00	1.945	25.46	3.77						
124.5	100.00	0.00	1.635	21.69	3.36						
104.7	100.00	0.00	1.375	18.33	3.12						
88.00	100.00	0.00	1.156	15.21	2.84						
74.00	100.00	0.00	0.972	12.37	2.42						
62.23	100.00	0.00	0.818	9.95	1.93						
52.33	100.00	0.00	0.688	8.02	1.54						
44.00	100.00	0.00	0.578	6.48	1.29						
37.00	100.00	0.00	0.486	5.19	1.16						
31.11	100.00	0.00	0.409	4.03	1.10						
26.16	100.00	0.00	0.344	2.93	1.08						
22.00	100.00	0.00	0.289	1.85	1.04						
18.50	100.00	0.55	0.243	0.81	0.81						
15.56	99.45	1.52	0.204	0.00	0.00						
13.08	97.93	3.89	0.172	0.00	0.00						
11.00	94.04	8.00	0.145	0.00	0.00						

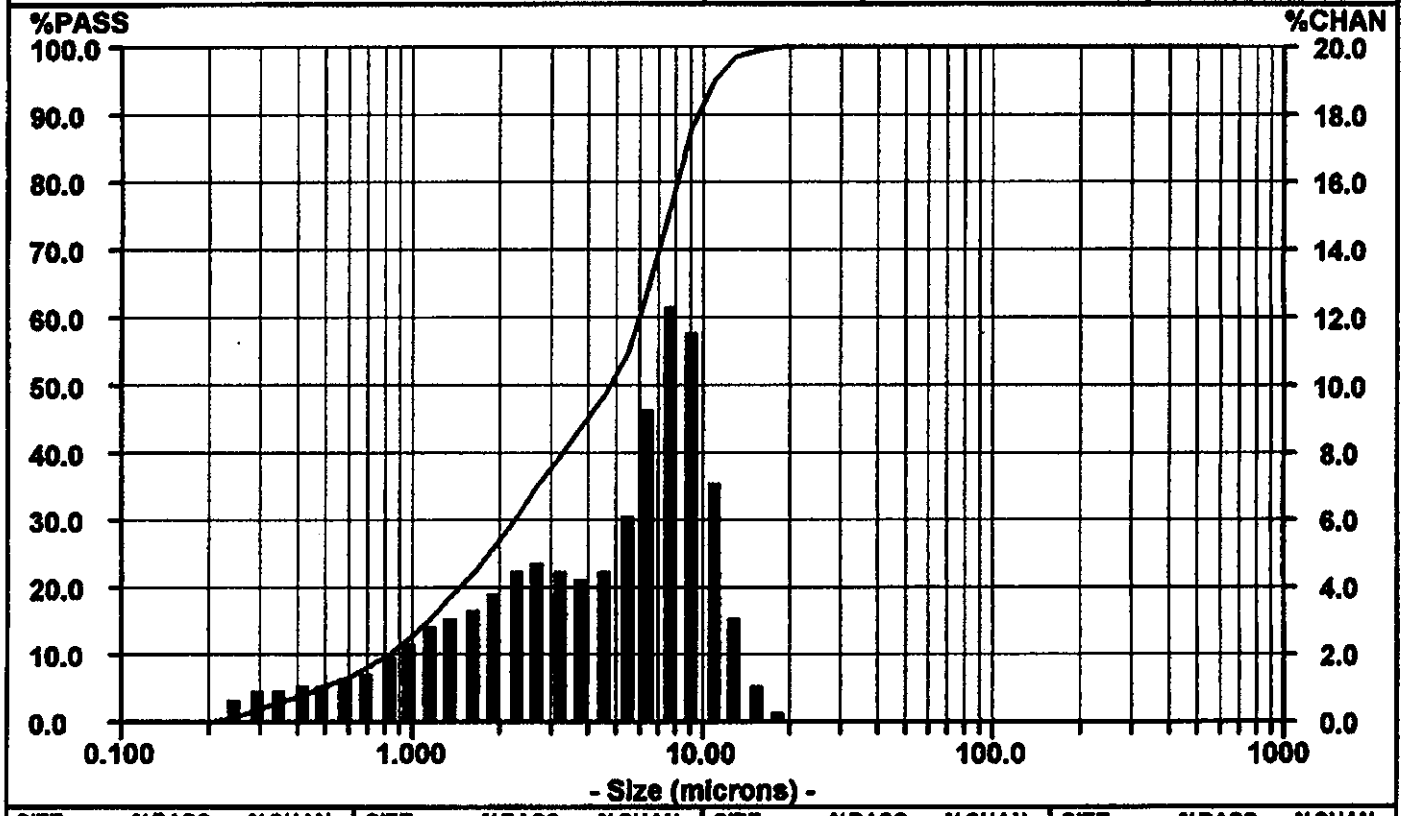
AY-101

AY-101
Sample

Date: 09/27/91 Meas #: 00001
Time: 08:22 Pres #: 01

1 M NaOH and 1 M NaNO3
Flow Rate = 40 ml/sec.
Refractive Index = 1.70 Particle/1.33 Medium
File: 101AY005

Summary	Percentiles		Dia	Vol%	Width
mv = 5.031	10% = 0.817	60% = 6.105	7.107	60%	4.911
mn = 0.362	20% = 1.482	70% = 7.120	1.472	40%	2.004
ma = 1.953	30% = 2.277	80% = 8.169			
cs = 3.073	40% = 3.307	90% = 9.598			
sd = 3.731	50% = 4.848	95% = 10.89			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	88.09	11.61						
592.0	100.00	0.00	7.778	76.48	12.35						
497.8	100.00	0.00	6.541	64.13	9.37						
418.6	100.00	0.00	5.500	54.76	6.22						
352.0	100.00	0.00	4.625	48.54	4.58						
296.0	100.00	0.00	3.889	43.96	4.23						
248.9	100.00	0.00	3.270	39.73	4.53						
209.3	100.00	0.00	2.750	35.20	4.78						
176.0	100.00	0.00	2.312	30.42	4.50						
148.0	100.00	0.00	1.945	25.92	3.92						
124.5	100.00	0.00	1.635	22.00	3.46						
104.7	100.00	0.00	1.375	18.54	3.18						
88.00	100.00	0.00	1.156	15.36	2.89						
74.00	100.00	0.00	0.972	12.47	2.46						
62.23	100.00	0.00	0.818	10.01	1.87						
52.33	100.00	0.00	0.688	8.04	1.57						
44.00	100.00	0.00	0.578	6.47	1.31						
37.00	100.00	0.00	0.486	5.16	1.17						
31.11	100.00	0.00	0.409	3.99	1.10						
26.16	100.00	0.00	0.344	2.89	1.08						
22.00	100.00	0.00	0.289	1.81	1.02						
18.50	100.00	0.37	0.243	0.79	0.79						
15.56	99.63	1.12	0.204	0.00	0.00						
13.08	98.51	3.18	0.172	0.00	0.00						
11.00	95.33	7.24	0.145	0.00	0.00						

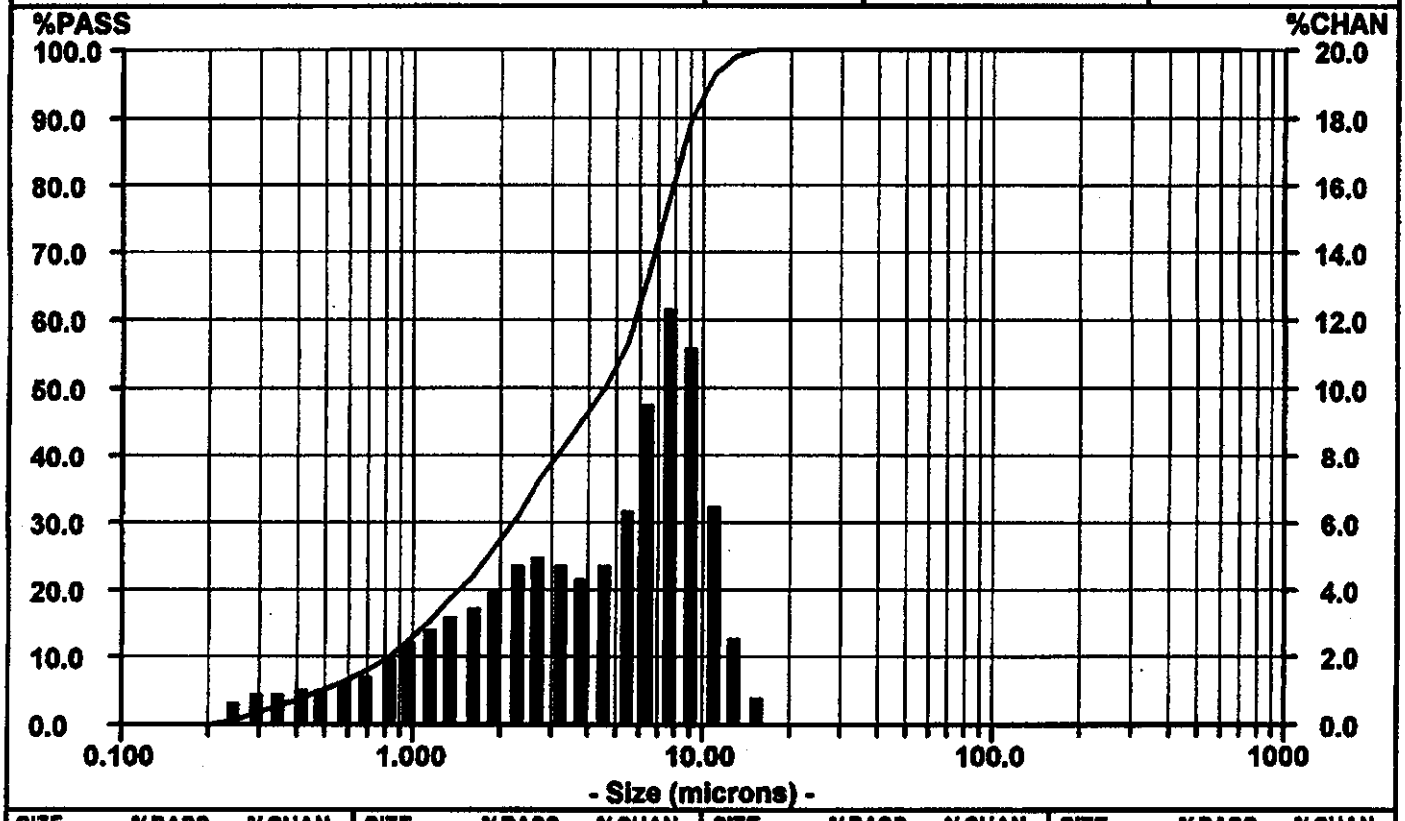
AY-101

AY-101 Sample

Date: 09/27/91 Meas #: 00001
Time: 08:26 Pres #: 01

1 M NaOH and 1 M NaNO3
Flow Rate = 40 ml/sec.
Refractive Index = 1.50 Particle/1.33 Medium
File: 101AY006

Summary	Percentiles		Dia	Vol%	Width
mv = 4.837	10% = 0.811	60% = 5.881	6.943	59%	4.701
mn = 0.364	20% = 1.459	70% = 6.897	1.493	41%	2.003
ms = 1.922	30% = 2.217	80% = 7.915			
cs = 3.121	40% = 3.157	90% = 9.252			
sd = 3.600	50% = 4.601	95% = 10.43			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	89.99	11.21						
592.0	100.00	0.00	7.778	78.78	12.45						
497.8	100.00	0.00	6.541	66.33	9.68						
418.6	100.00	0.00	5.500	56.65	6.49						
352.0	100.00	0.00	4.625	50.16	4.80						
296.0	100.00	0.00	3.889	45.36	4.42						
248.9	100.00	0.00	3.270	40.94	4.74						
209.3	100.00	0.00	2.750	36.20	5.01						
176.0	100.00	0.00	2.312	31.19	4.72						
148.0	100.00	0.00	1.945	26.47	4.08						
124.5	100.00	0.00	1.635	22.39	3.57						
104.7	100.00	0.00	1.375	18.82	3.26						
88.00	100.00	0.00	1.156	15.56	2.95						
74.00	100.00	0.00	0.972	12.61	2.50						
62.23	100.00	0.00	0.818	10.11	2.00						
52.33	100.00	0.00	0.688	8.11	1.59						
44.00	100.00	0.00	0.578	6.52	1.33						
37.00	100.00	0.00	0.486	5.19	1.18						
31.11	100.00	0.00	0.409	4.01	1.11						
26.16	100.00	0.00	0.344	2.90	1.08						
22.00	100.00	0.00	0.289	1.82	1.03						
18.50	100.00	0.00	0.243	0.79	0.79						
15.56	100.00	0.83	0.204	0.00	0.00						
13.08	99.17	2.63	0.172	0.00	0.00						
11.00	96.54	6.56	0.145	0.00	0.00						

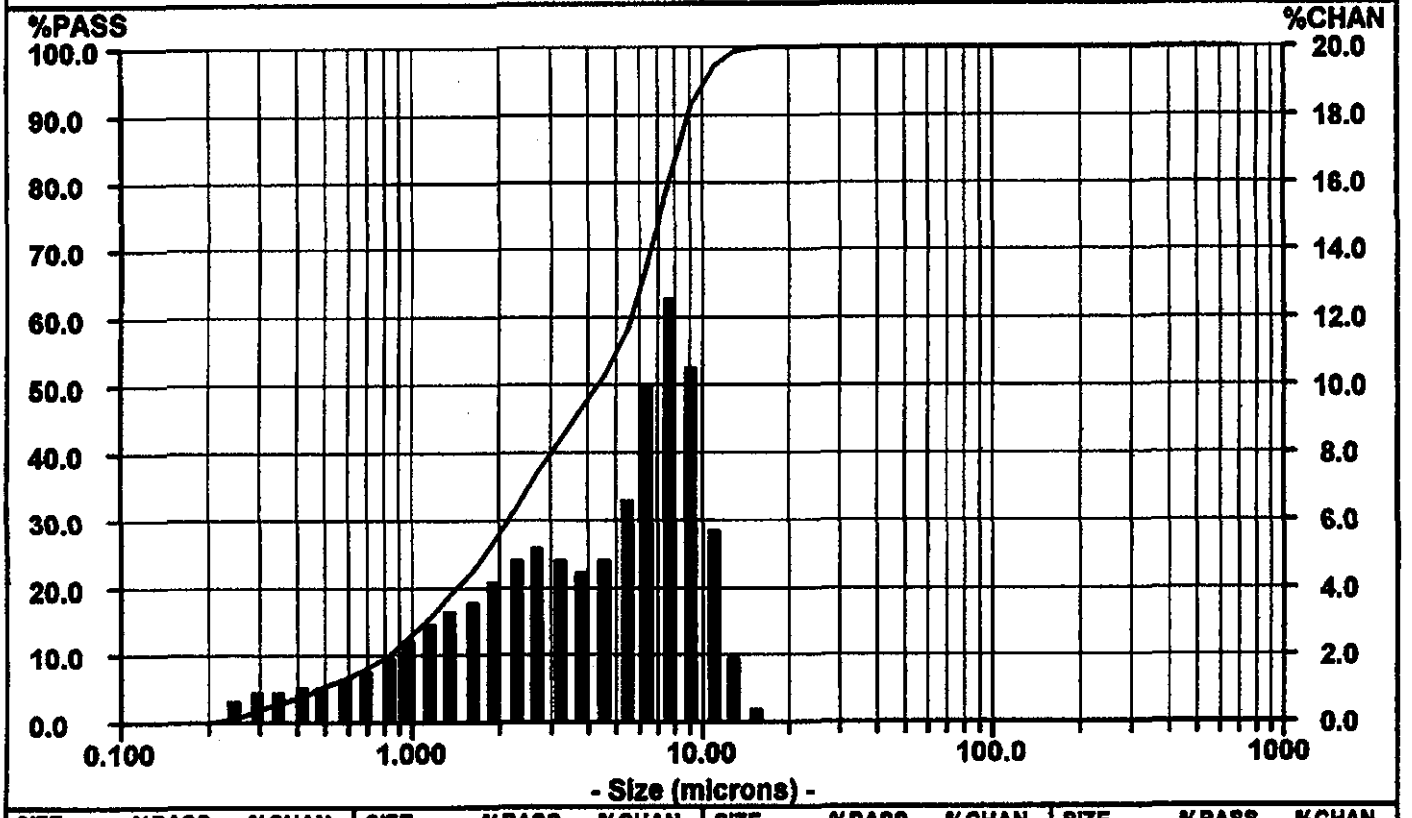
AY-101

AY-101
Sample

Date: 09/27/91 Meas #: 00001
Time: 08:30 Pres #: 01

1 M NaOH and 1 M NaNO3
Flow Rate = 60 ml/sec.
Refractive Index = 1.50 Particle/1.33 Medium
File: 101AY007

Summary	Percentiles		Dia	Vol%	Width
mv = 4.691	10% = 0.809	60% = 5.898	6.794	58%	4.501
mn = 0.366	20% = 1.444	70% = 6.702	1.513	42%	1.998
ma = 1.903	30% = 2.174	80% = 7.682			
cs = 3.154	40% = 3.048	90% = 8.972			
sd = 3.478	50% = 4.414	95% = 10.08			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	91.61	10.69						
592.0	100.00	0.00	7.778	80.92	12.63						
497.8	100.00	0.00	6.541	68.29	10.08						
418.6	100.00	0.00	5.500	58.21	6.76						
352.0	100.00	0.00	4.625	51.45	4.95						
296.0	100.00	0.00	3.889	46.50	4.55						
248.9	100.00	0.00	3.270	41.95	4.91						
209.3	100.00	0.00	2.750	37.04	5.22						
176.0	100.00	0.00	2.312	31.82	4.92						
148.0	100.00	0.00	1.945	26.90	4.23						
124.5	100.00	0.00	1.635	22.67	3.66						
104.7	100.00	0.00	1.375	19.01	3.32						
88.00	100.00	0.00	1.156	15.69	3.00						
74.00	100.00	0.00	0.972	12.69	2.54						
62.23	100.00	0.00	0.818	10.15	2.03						
52.33	100.00	0.00	0.688	8.12	1.61						
44.00	100.00	0.00	0.578	6.51	1.34						
37.00	100.00	0.00	0.486	5.17	1.18						
31.11	100.00	0.00	0.409	3.99	1.11						
26.16	100.00	0.00	0.344	2.88	1.08						
22.00	100.00	0.00	0.289	1.80	1.02						
18.50	100.00	0.00	0.243	0.78	0.78						
15.56	100.00	0.59	0.204	0.00	0.00						
13.08	99.41	2.08	0.172	0.00	0.00						
11.00	97.33	5.72	0.145	0.00	0.00						

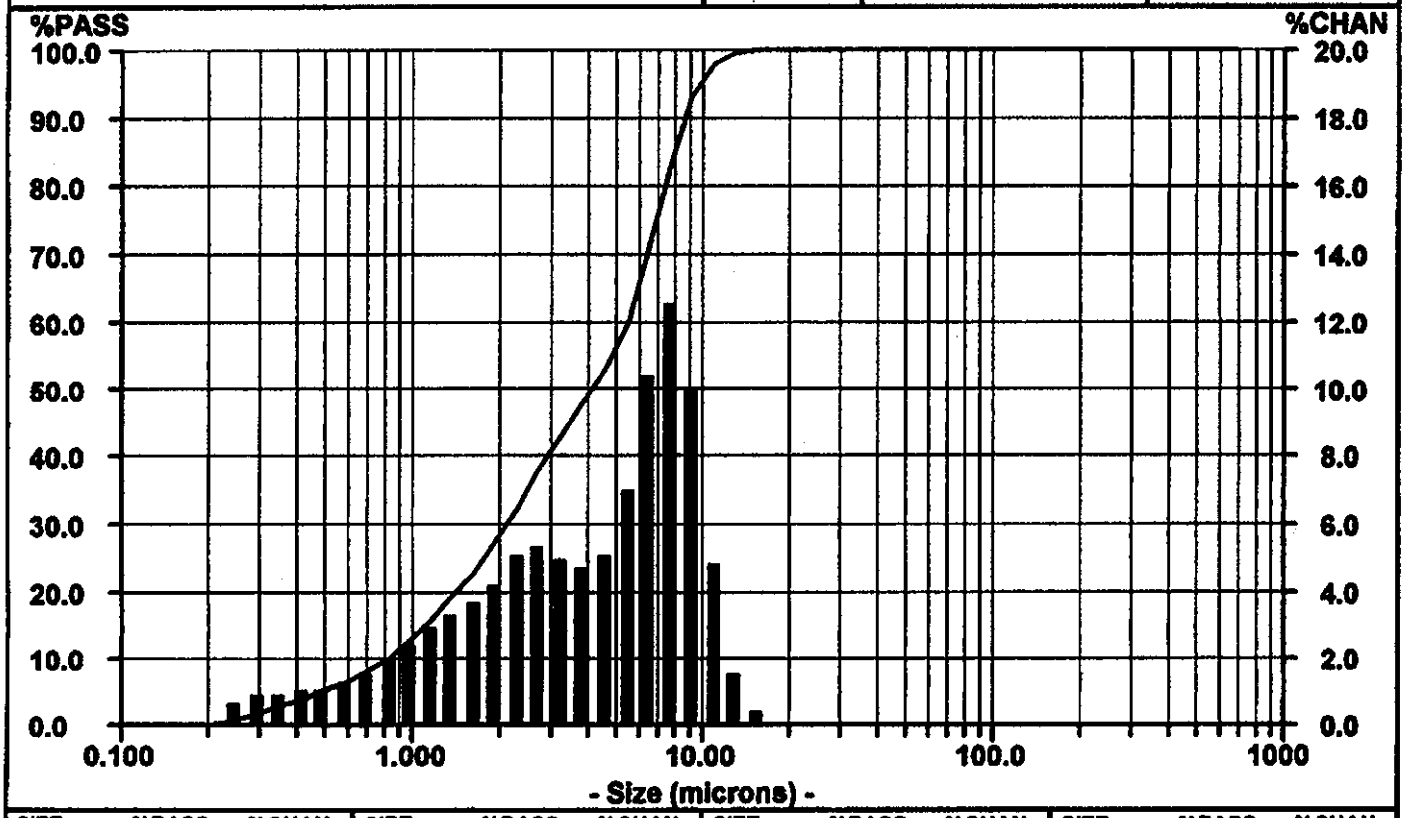
AY-101

AY-101
Sample

Date: 09/27/91 Meas #: 00001
Time: 08:34 Pres #: 01

1 M NaOH and 1 M NaNO3
Flow Rate = 60 ml/sec.
Refractive Index = 2.00 Particle/1.33 Medium
File: 101AY008

Summary	Percentiles		Dia	Vol%	Width
mv = 4.549	10% = 0.807	60% = 5.512	6.646	57%	4.320
mn = 0.369	20% = 1.428	70% = 6.509	1.529	43%	1.991
ma = 1.884	30% = 2.131	80% = 7.460			
cs = 3.184	40% = 2.952	90% = 8.705			
sd = 3.365	50% = 4.226	95% = 9.743			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	93.06	10.07						
592.0	100.00	0.00	7.778	82.99	12.65						
497.8	100.00	0.00	6.541	70.34	10.45						
418.6	100.00	0.00	5.500	59.89	7.07						
352.0	100.00	0.00	4.625	52.82	5.16						
296.0	100.00	0.00	3.889	47.66	4.71						
248.9	100.00	0.00	3.270	42.95	5.07						
209.3	100.00	0.00	2.750	37.88	5.40						
176.0	100.00	0.00	2.312	32.48	5.10						
148.0	100.00	0.00	1.945	27.38	4.38						
124.5	100.00	0.00	1.635	23.00	3.78						
104.7	100.00	0.00	1.375	19.22	3.41						
88.00	100.00	0.00	1.156	15.81	3.06						
74.00	100.00	0.00	0.972	12.75	2.58						
62.23	100.00	0.00	0.818	10.17	2.05						
52.33	100.00	0.00	0.688	8.12	1.62						
44.00	100.00	0.00	0.578	6.50	1.35						
37.00	100.00	0.00	0.486	5.15	1.19						
31.11	100.00	0.00	0.409	3.96	1.12						
26.16	100.00	0.00	0.344	2.84	1.08						
22.00	100.00	0.00	0.289	1.76	1.00						
18.50	100.00	0.00	0.243	0.76	0.76						
15.56	100.00	0.40	0.204	0.00	0.00						
13.08	99.60	1.60	0.172	0.00	0.00						
11.00	98.00	4.94	0.145	0.00	0.00						

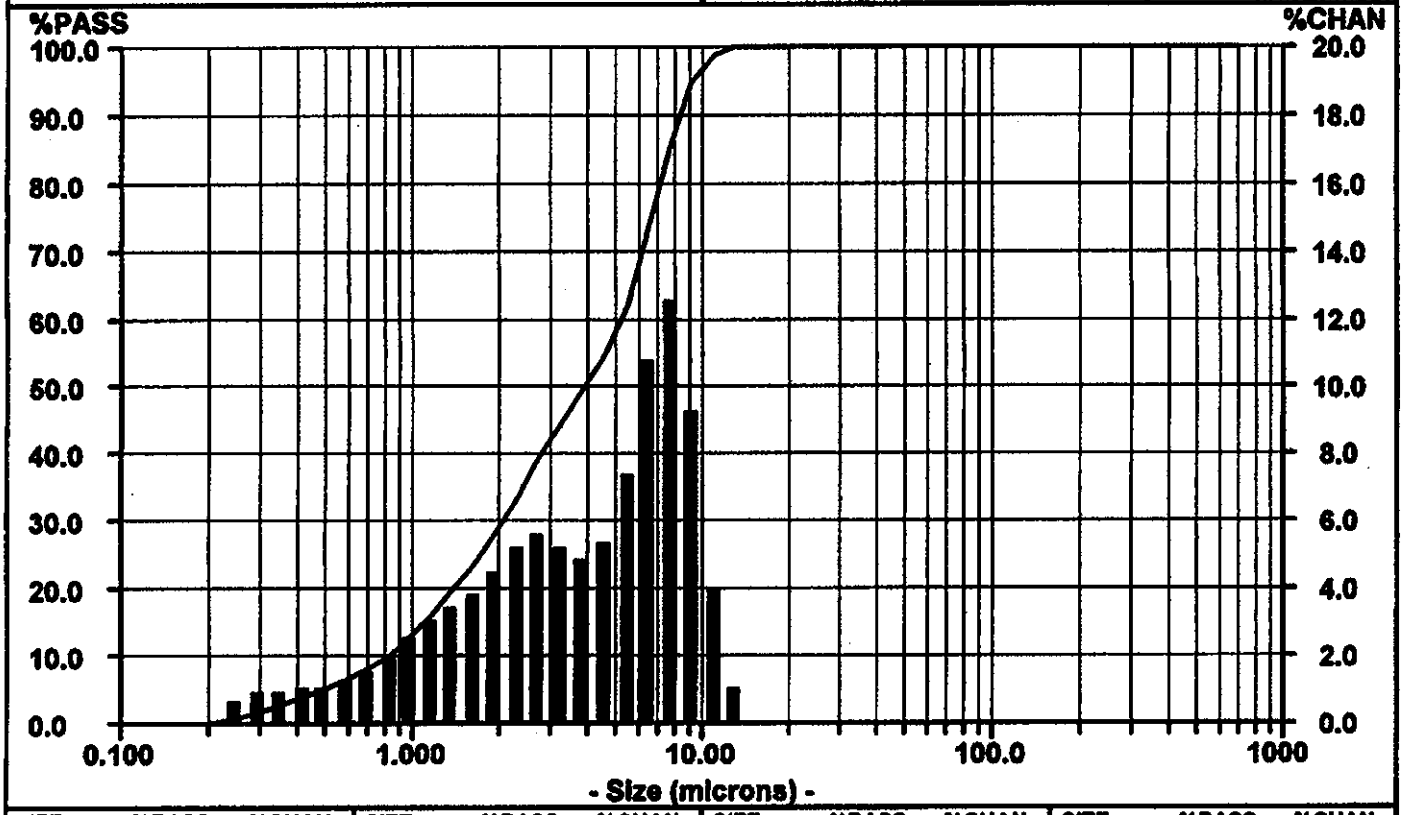
AY-101

AY-101
Sample

Date: 09/27/91 Meas #: 00001
Time: 08:38 Pres #: 01

1 M NaOH and 1 M NaNO3
Flow Rate = 60 ml/sec.
Refractive Index = 1.70 Particle/1.33 Medium
File: 101AY009

Summary	Percentiles		Dia	Vol%	Width
mv = 4.372	10% = 0.809	60% = 5.283	6.471	56%	4.103
mn = 0.374	20% = 1.414	70% = 6.275	1.564	44%	1.981
ma = 1.869	30% = 2.087	80% = 7.206			
cs = 3.211	40% = 2.846	90% = 8.378			
sd = 3.228	50% = 4.008	95% = 9.315			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	94.77	9.30						
592.0	100.00	0.00	7.778	85.47	12.61						
497.8	100.00	0.00	6.541	72.86	10.85						
418.6	100.00	0.00	5.500	62.01	7.46						
352.0	100.00	0.00	4.625	54.55	5.42						
296.0	100.00	0.00	3.889	49.13	4.92						
248.9	100.00	0.00	3.270	44.21	5.29						
209.3	100.00	0.00	2.750	38.92	5.66						
176.0	100.00	0.00	2.312	33.26	5.36						
148.0	100.00	0.00	1.945	27.90	4.58						
124.5	100.00	0.00	1.635	23.32	3.91						
104.7	100.00	0.00	1.375	19.41	3.50						
88.00	100.00	0.00	1.156	15.91	3.13						
74.00	100.00	0.00	0.972	12.78	2.63						
62.23	100.00	0.00	0.818	10.15	2.09						
52.33	100.00	0.00	0.688	8.06	1.65						
44.00	100.00	0.00	0.578	6.41	1.36						
37.00	100.00	0.00	0.486	5.05	1.20						
31.11	100.00	0.00	0.409	3.85	1.10						
26.16	100.00	0.00	0.344	2.75	1.05						
22.00	100.00	0.00	0.289	1.70	0.97						
18.50	100.00	0.00	0.243	0.73	0.73						
15.56	100.00	0.00	0.204	0.00	0.00						
13.08	100.00	1.15	0.172	0.00	0.00						
11.00	98.85	4.08	0.145	0.00	0.00						

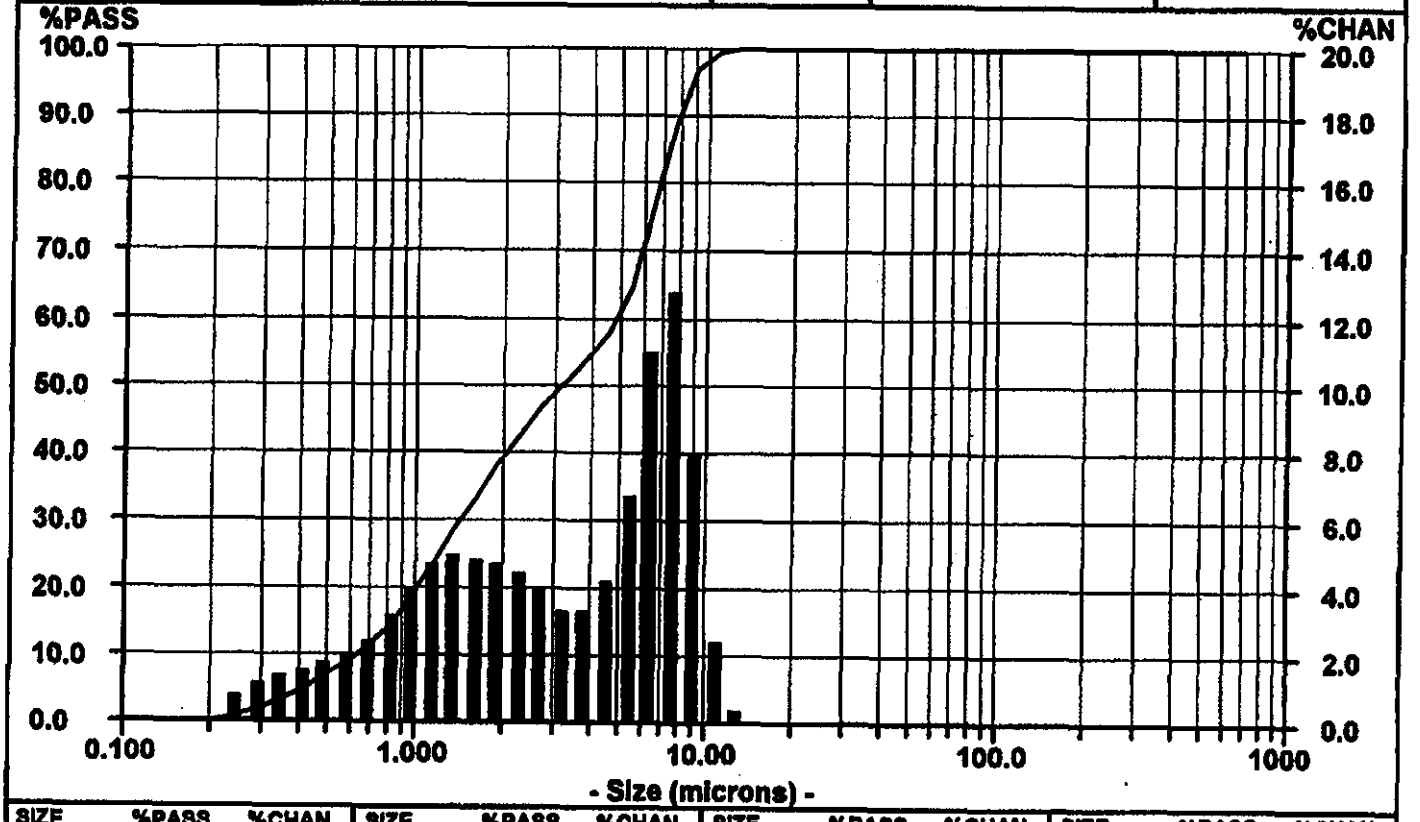
AY-101

1 M NaOH and 1 M NaNO3
2 minute sonication @ 40 W
Flow Rate = 17 ml/sec.
Refractive Index = 1.70 Particle/1.33 Medium
File: 101AY010

AY-101
Sample

Date: 09/27/91 Meas #: 00001
Time: 08:45 Pres #: 01

Summary	Percentiles		Dia	Vol%	Width
mv = 3.913	10% = 0.621	60% = 4.907	6.465	50%	3.548
mn = 0.382	20% = 1.015	70% = 5.993	1.223	50%	1.729
ma = 1.525	30% = 1.443	80% = 6.886			
cs = 3.936	40% = 2.069	90% = 7.927			
sd = 3.197	50% = 3.192	95% = 8.760			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	96.94	8.04						
592.0	100.00	0.00	7.778	88.90	12.81						
497.8	100.00	0.00	6.541	76.09	11.18						
418.6	100.00	0.00	5.500	64.91	6.87						
352.0	100.00	0.00	4.625	58.04	4.22						
296.0	100.00	0.00	3.889	53.82	3.35						
248.9	100.00	0.00	3.270	50.47	3.49						
209.3	100.00	0.00	2.750	46.98	4.07						
176.0	100.00	0.00	2.312	42.91	4.57						
148.0	100.00	0.00	1.946	38.34	4.79						
124.5	100.00	0.00	1.636	33.55	4.92						
104.7	100.00	0.00	1.375	28.63	5.00						
88.00	100.00	0.00	1.156	23.63	4.76						
74.00	100.00	0.00	0.972	18.87	4.08						
62.23	100.00	0.00	0.818	14.79	3.23						
52.33	100.00	0.00	0.688	11.56	2.55						
44.00	100.00	0.00	0.578	9.01	2.10						
37.00	100.00	0.00	0.486	6.91	1.82						
31.11	100.00	0.00	0.409	5.09	1.62						
26.16	100.00	0.00	0.344	3.47	1.45						
22.00	100.00	0.00	0.289	2.02	1.21						
18.50	100.00	0.00	0.243	0.81	0.81						
15.56	100.00	0.00	0.204	0.00	0.00						
13.08	100.00	0.47	0.172	0.00	0.00						
11.00	99.53	2.59	0.145	0.00	0.00						

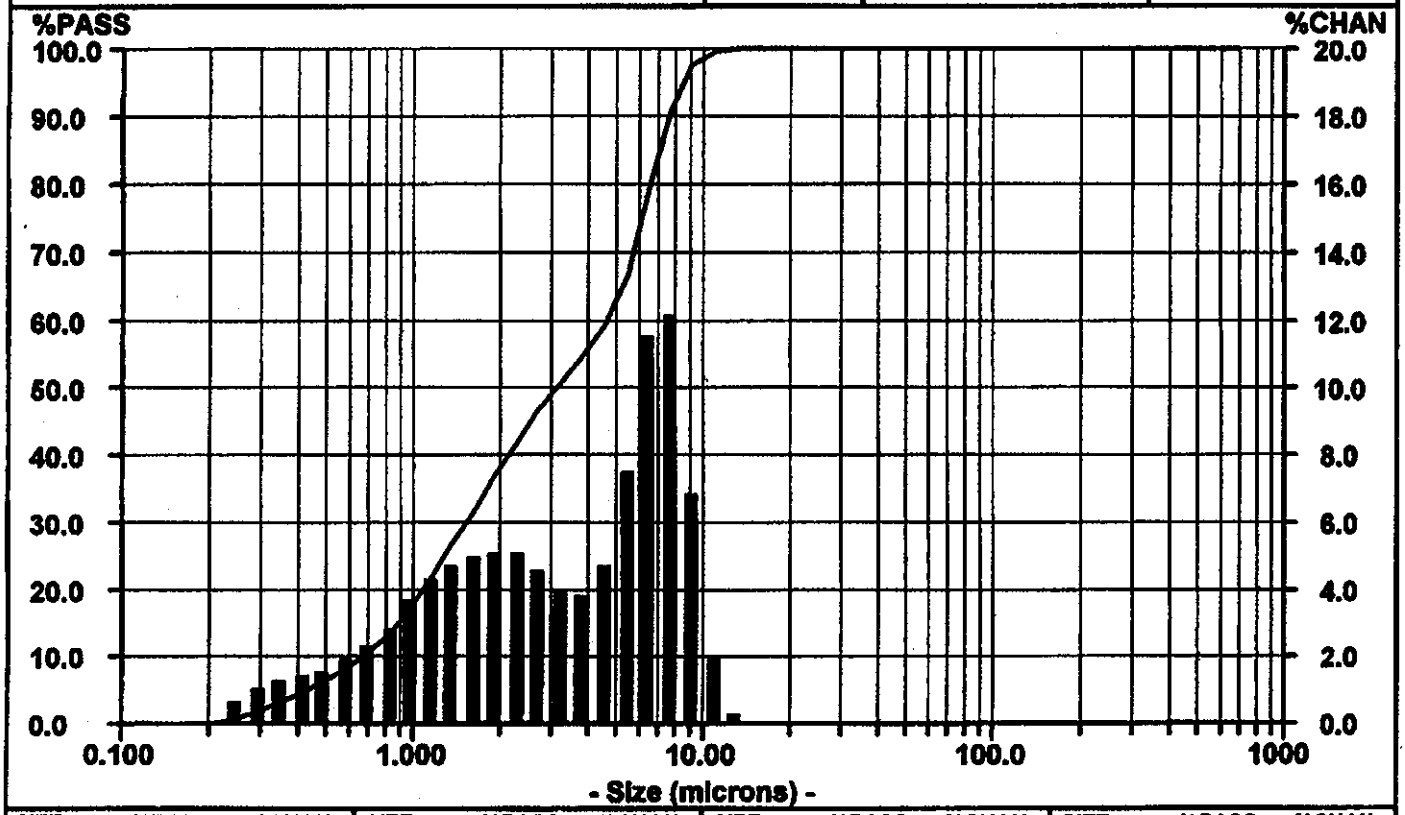
AY-101

AY-101
Sample

Date: 09/27/91 Meas #: 00001
Time: 08:49 Pres #: 01

1 M NaOH and 1 M NaNO3
2 minute sonication @ 40 W
Flow Rate = 17 ml/sec.
Refractive Index = 1.50 Particle/1.33 Medium
File: 101AY011

Summary	Percentiles		Dia	Vol%	Width
mv = 3.842	10% = 0.859	60% = 4.714	6.263	49%	3.483
mn = 0.386	20% = 1.080	70% = 5.790	1.314	51%	1.787
ma = 1.579	30% = 1.542	80% = 6.674			
cs = 3.799	40% = 2.155	90% = 7.690			
sd = 3.062	50% = 3.165	95% = 8.504			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	97.66	6.93						
592.0	100.00	0.00	7.778	90.73	12.22						
497.8	100.00	0.00	6.541	78.51	11.63						
418.6	100.00	0.00	5.500	66.88	7.56						
352.0	100.00	0.00	4.625	59.32	4.77						
296.0	100.00	0.00	3.889	54.55	3.82						
248.9	100.00	0.00	3.270	50.73	4.00						
209.3	100.00	0.00	2.750	46.73	4.66						
176.0	100.00	0.00	2.312	42.07	5.15						
148.0	100.00	0.00	1.945	36.92	5.19						
124.5	100.00	0.00	1.635	31.73	5.05						
104.7	100.00	0.00	1.375	26.68	4.87						
88.00	100.00	0.00	1.156	21.81	4.47						
74.00	100.00	0.00	0.972	17.34	3.76						
62.23	100.00	0.00	0.818	13.58	2.97						
52.33	100.00	0.00	0.688	10.61	2.34						
44.00	100.00	0.00	0.578	8.27	1.93						
37.00	100.00	0.00	0.486	6.34	1.66						
31.11	100.00	0.00	0.409	4.68	1.48						
26.16	100.00	0.00	0.344	3.20	1.33						
22.00	100.00	0.00	0.289	1.87	1.12						
18.50	100.00	0.00	0.243	0.75	0.75						
15.56	100.00	0.00	0.204	0.00	0.00						
13.08	100.00	0.33	0.172	0.00	0.00						
11.00	99.67	2.01	0.145	0.00	0.00						

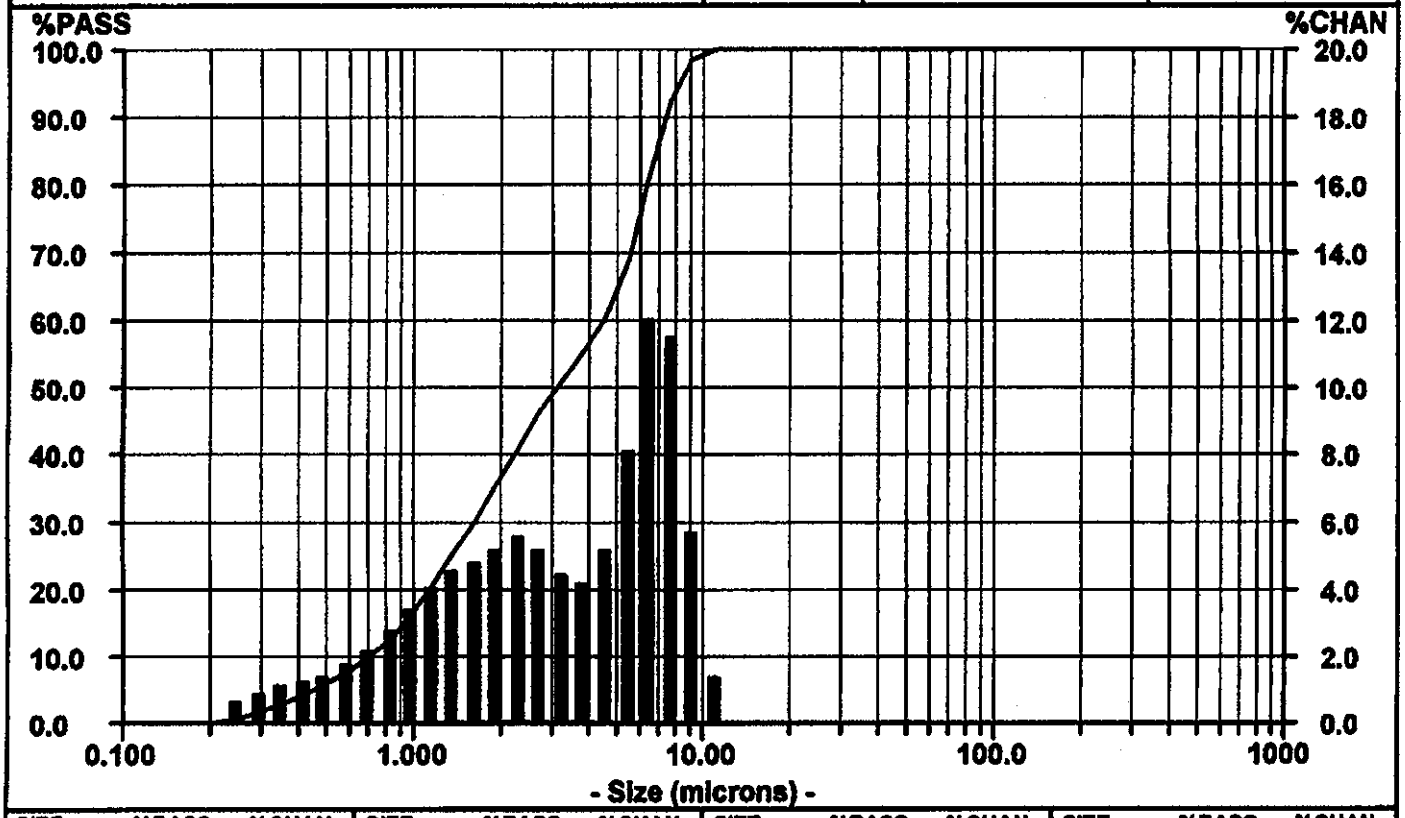
AY-101

AY-101
Sample

Date: 09/27/91 Meas #: 00001
Time: 08:53 Pres #: 01

1 M NaOH and 1 M NaNO3
2 minute sonication @ 40 W
Flow Rate = 17 ml/sec.
Refractive Index = 2.00 Particle/1.33 Medium
File: 101AY012

Summary	Percentiles		Dia	Vol%	Width
mv = 3.756	10% = 0.689	60% = 4.540	6.061	49%	3.322
mn = 0.380	20% = 1.132	70% = 5.591	1.392	51%	1.844
ma = 1.622	30% = 1.631	80% = 6.448			
cs = 3.699	40% = 2.236	90% = 7.428			
sd = 2.925	50% = 3.149	95% = 8.192			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	98.53	5.84						
592.0	100.00	0.00	7.778	92.69	11.63						
497.8	100.00	0.00	6.541	81.06	12.10						
418.6	100.00	0.00	5.500	68.96	8.29						
352.0	100.00	0.00	4.625	60.67	5.36						
296.0	100.00	0.00	3.889	55.31	4.35						
248.9	100.00	0.00	3.270	50.96	4.58						
209.3	100.00	0.00	2.750	46.38	5.29						
176.0	100.00	0.00	2.312	41.09	5.64						
148.0	100.00	0.00	1.945	35.45	5.37						
124.5	100.00	0.00	1.635	30.08	4.94						
104.7	100.00	0.00	1.375	25.14	4.60						
88.00	100.00	0.00	1.156	20.54	4.19						
74.00	100.00	0.00	0.972	16.35	3.55						
62.23	100.00	0.00	0.818	12.80	2.82						
52.33	100.00	0.00	0.688	9.98	2.23						
44.00	100.00	0.00	0.578	7.75	1.83						
37.00	100.00	0.00	0.486	5.92	1.57						
31.11	100.00	0.00	0.409	4.35	1.38						
26.16	100.00	0.00	0.344	2.97	1.23						
22.00	100.00	0.00	0.289	1.74	1.04						
18.50	100.00	0.00	0.243	0.70	0.70						
15.56	100.00	0.00	0.204	0.00	0.00						
13.08	100.00	0.00	0.172	0.00	0.00						
11.00	100.00	1.47	0.145	0.00	0.00						

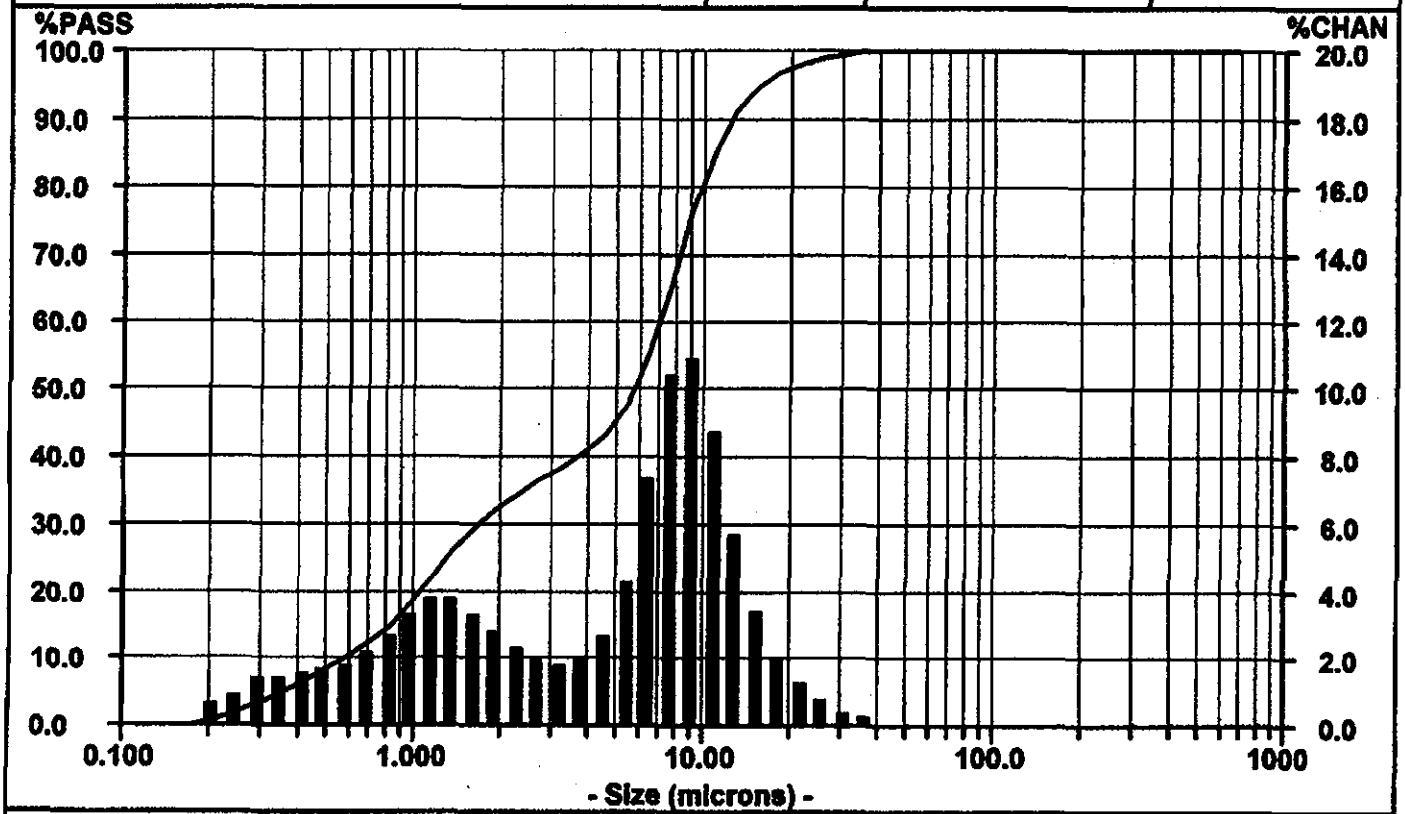
AY-101

AY-101 Sample

Date: 09/27/91 Meas #: 00001
Time: 09:02 Pres #: 01

1 M NaOH and 1 M NaNO3
2 minute sonication @ 40 W
Flow Rate = 40 ml/sec.
Refractive Index = 2.00 Particle/1.33 Medium
File: 101AY013

Summary	Percentiles		Dia	Vol%	Width
mv = 6.189	10% = 0.577	60% = 7.133	8.116	63%	7.111
mn = 0.307	20% = 1.051	70% = 8.336	0.971	37%	1.377
ma = 1.695	30% = 1.692	80% = 9.835			
cs = 3.761	40% = 3.760	90% = 12.51			
sd = 4.893	50% = 5.864	95% = 15.75			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	76.58	11.09						
592.0	100.00	0.00	7.778	65.49	10.46						
497.8	100.00	0.00	6.541	55.03	7.40						
418.6	100.00	0.00	5.500	47.63	4.46						
352.0	100.00	0.00	4.625	43.18	2.75						
296.0	100.00	0.00	3.889	40.43	2.04						
248.9	100.00	0.00	3.270	38.39	1.87						
209.3	100.00	0.00	2.750	36.52	2.00						
176.0	100.00	0.00	2.312	34.52	2.31						
148.0	100.00	0.00	1.945	32.21	2.80						
124.5	100.00	0.00	1.635	29.41	3.40						
104.7	100.00	0.00	1.375	26.01	3.86						
88.00	100.00	0.00	1.156	22.15	3.86						
74.00	100.00	0.00	0.972	18.29	3.36						
62.23	100.00	0.00	0.818	14.93	2.71						
52.33	100.00	0.00	0.688	12.22	2.20						
44.00	100.00	0.00	0.578	10.02	1.89						
37.00	100.00	0.38	0.486	8.13	1.71						
31.11	99.62	0.54	0.409	6.42	1.62						
26.16	99.08	0.82	0.344	4.80	1.56						
22.00	98.26	1.30	0.289	3.24	1.41						
18.50	96.96	2.14	0.243	1.83	1.09						
15.56	94.82	3.55	0.204	0.74	0.74						
13.08	91.27	5.84	0.172	0.00	0.00						
11.00	85.43	8.85	0.145	0.00	0.00						

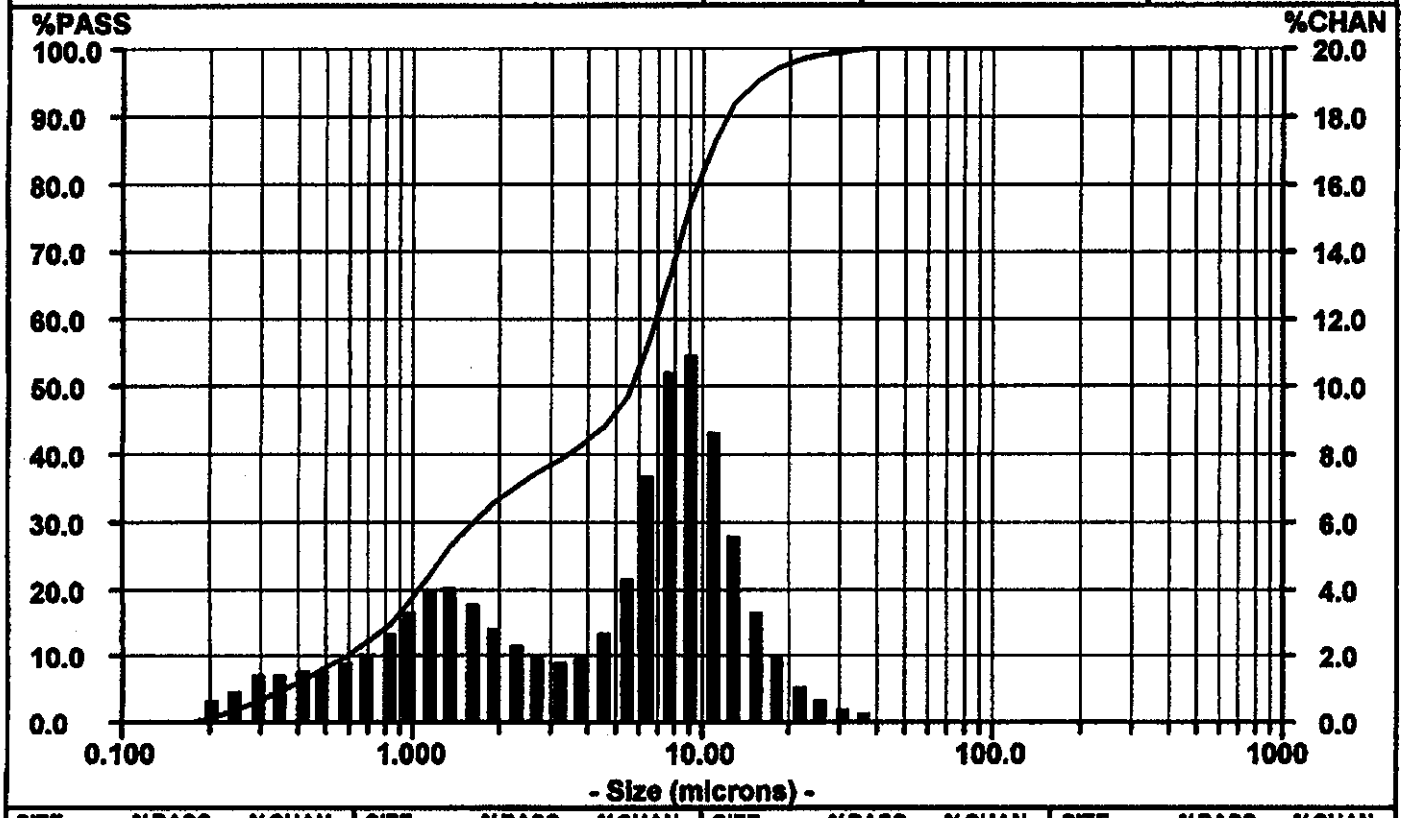
AY-101

AY-101 Sample

Date: 09/27/91 Meas #: 00001
Time: 09:06 Pres #: 01

1 M NaOH and 1 M NaNO3
2 minute sonication @ 40 W
Flow Rate = 40 ml/sec.
Refractive Index = 1.70 Particle/1.33 Medium
File: 101AY014

Summary	Percentiles		Dia	Vol%	Width
mv = 6.023	10% = 0.583	60% = 7.016	8.050	63%	6.881
mn = 0.308	20% = 1.045	70% = 8.206	0.990	37%	1.372
ma = 1.583	30% = 1.624	80% = 9.650			
cs = 3.790	40% = 3.458	90% = 12.19			
sd = 4.785	50% = 5.722	95% = 15.19			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	77.59	11.08						
592.0	100.00	0.00	7.778	66.51	10.50						
497.8	100.00	0.00	6.541	56.01	7.42						
418.6	100.00	0.00	5.500	48.59	4.43						
352.0	100.00	0.00	4.625	44.16	2.74						
296.0	100.00	0.00	3.889	41.42	2.04						
248.9	100.00	0.00	3.270	39.38	1.89						
209.3	100.00	0.00	2.750	37.49	2.04						
176.0	100.00	0.00	2.312	35.45	2.39						
148.0	100.00	0.00	1.945	33.06	2.93						
124.5	100.00	0.00	1.635	30.13	3.60						
104.7	100.00	0.00	1.375	26.53	4.11						
88.00	100.00	0.00	1.156	22.42	4.08						
74.00	100.00	0.00	0.972	18.34	3.49						
62.23	100.00	0.00	0.818	14.85	2.75						
52.33	100.00	0.00	0.688	12.10	2.19						
44.00	100.00	0.00	0.578	9.91	1.86						
37.00	100.00	0.32	0.486	8.05	1.68						
31.11	99.68	0.46	0.409	6.37	1.60						
26.16	99.22	0.71	0.344	4.77	1.55						
22.00	98.51	1.16	0.289	3.22	1.40						
18.50	97.35	1.97	0.243	1.82	1.09						
15.56	95.38	3.37	0.204	0.73	0.73						
13.08	92.01	5.67	0.172	0.00	0.00						
11.00	86.34	8.76	0.145	0.00	0.00						

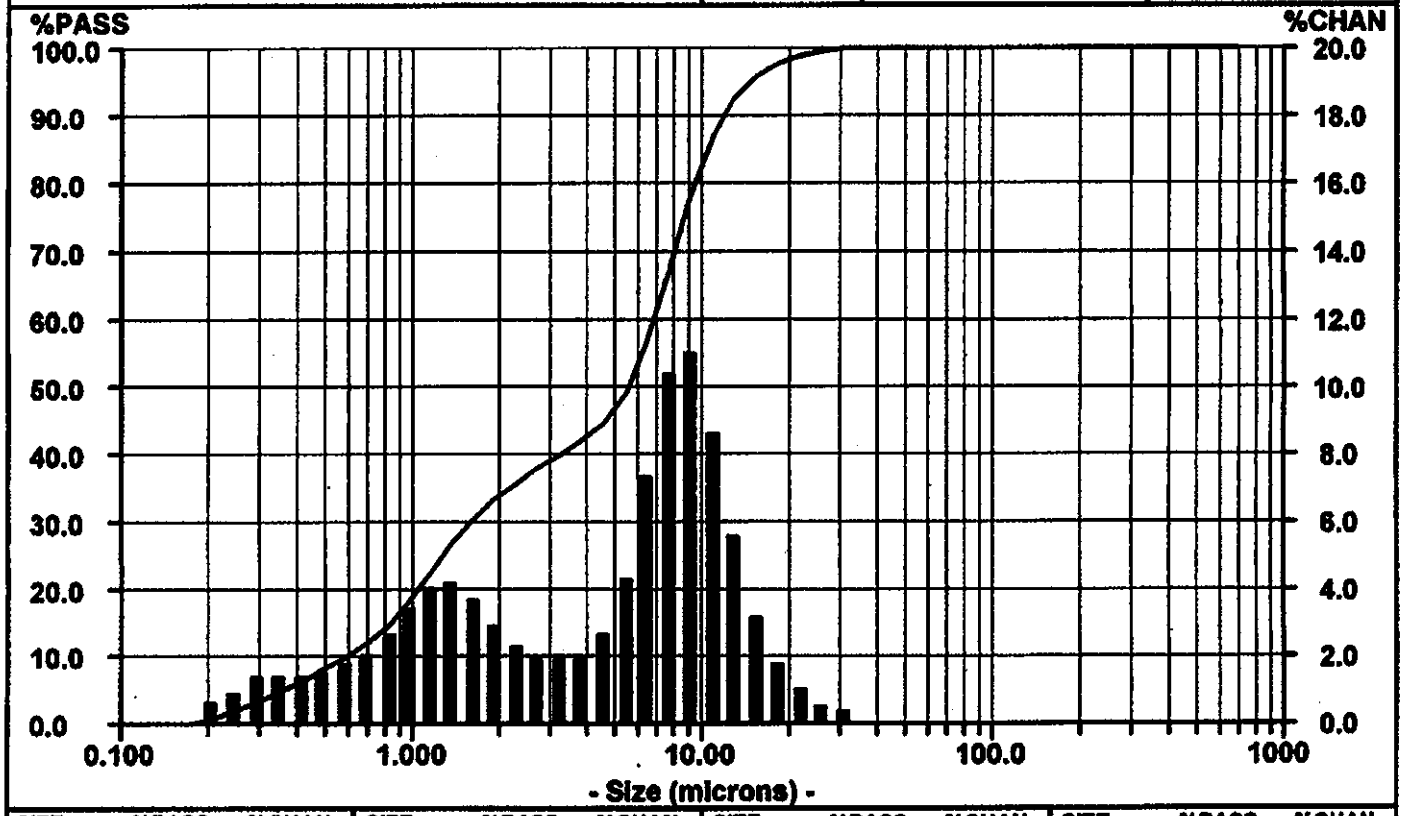
AY-101

AY-101
Sample

Date: 09/27/91 Meas #: 00001
Time: 09:10 Pres #: 01

1 M NaOH and 1 M NaNO3
2 minute sonication @ 40 W
Flow Rate = 40 ml/sec.
Refractive Index = 1.50 Particle/1.33 Medium
File: 101AY015

Summary	Percentiles		Dia	Vol%	Width
mv = 5.867	10% = 0.584	60% = 6.945	8.000	62%	6.671
mn = 0.308	20% = 1.043	70% = 8.123	0.999	38%	1.375
ma = 1.574	30% = 1.601	80% = 9.535			
cs = 3.812	40% = 3.309	90% = 11.93			
sd = 4.712	50% = 5.638	95% = 14.67			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	78.28	11.13						
592.0	100.00	0.00	7.778	67.15	10.56						
497.8	100.00	0.00	6.541	56.59	7.47						
418.6	100.00	0.00	5.500	49.12	4.46						
352.0	100.00	0.00	4.625	44.66	2.75						
296.0	100.00	0.00	3.889	41.91	2.04						
248.9	100.00	0.00	3.270	39.87	1.90						
209.3	100.00	0.00	2.750	37.97	2.07						
176.0	100.00	0.00	2.312	35.90	2.45						
148.0	100.00	0.00	1.945	33.45	3.02						
124.5	100.00	0.00	1.635	30.43	3.71						
104.7	100.00	0.00	1.375	26.72	4.21						
88.00	100.00	0.00	1.156	22.51	4.15						
74.00	100.00	0.00	0.972	18.36	3.52						
62.23	100.00	0.00	0.818	14.84	2.76						
52.33	100.00	0.00	0.688	12.08	2.19						
44.00	100.00	0.00	0.578	9.89	1.85						
37.00	100.00	0.00	0.486	8.04	1.67						
31.11	100.00	0.41	0.409	6.37	1.59						
26.16	99.59	0.66	0.344	4.78	1.54						
22.00	98.93	1.10	0.289	3.24	1.41						
18.50	97.83	1.89	0.243	1.83	1.09						
15.56	95.94	3.29	0.204	0.74	0.74						
13.08	92.65	5.62	0.172	0.00	0.00						
11.00	87.03	8.75	0.145	0.00	0.00						

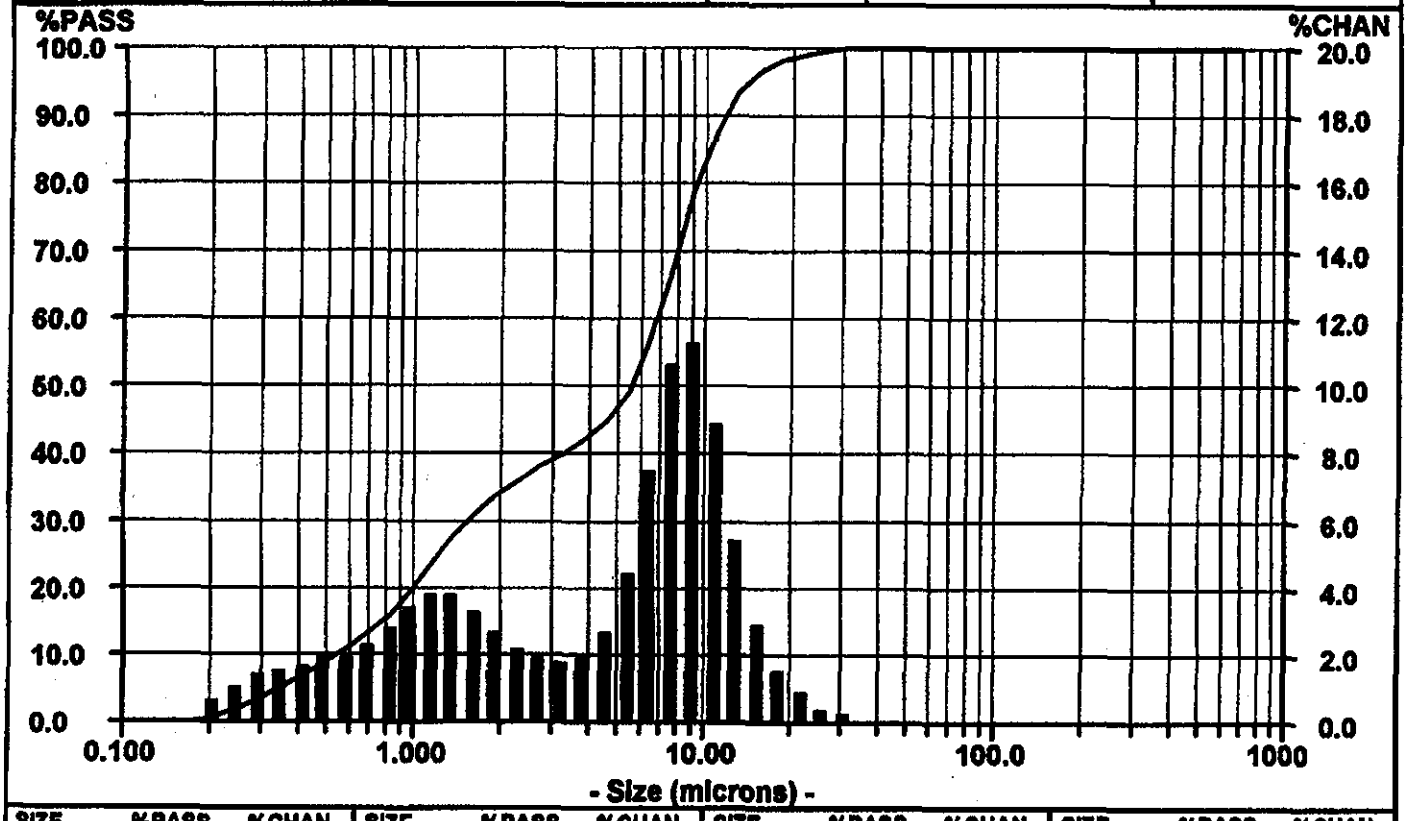
AY-101

AY-101 Sample

Date: 09/27/91 Meas #: 00001
Time: 09:17 Pres #: 01

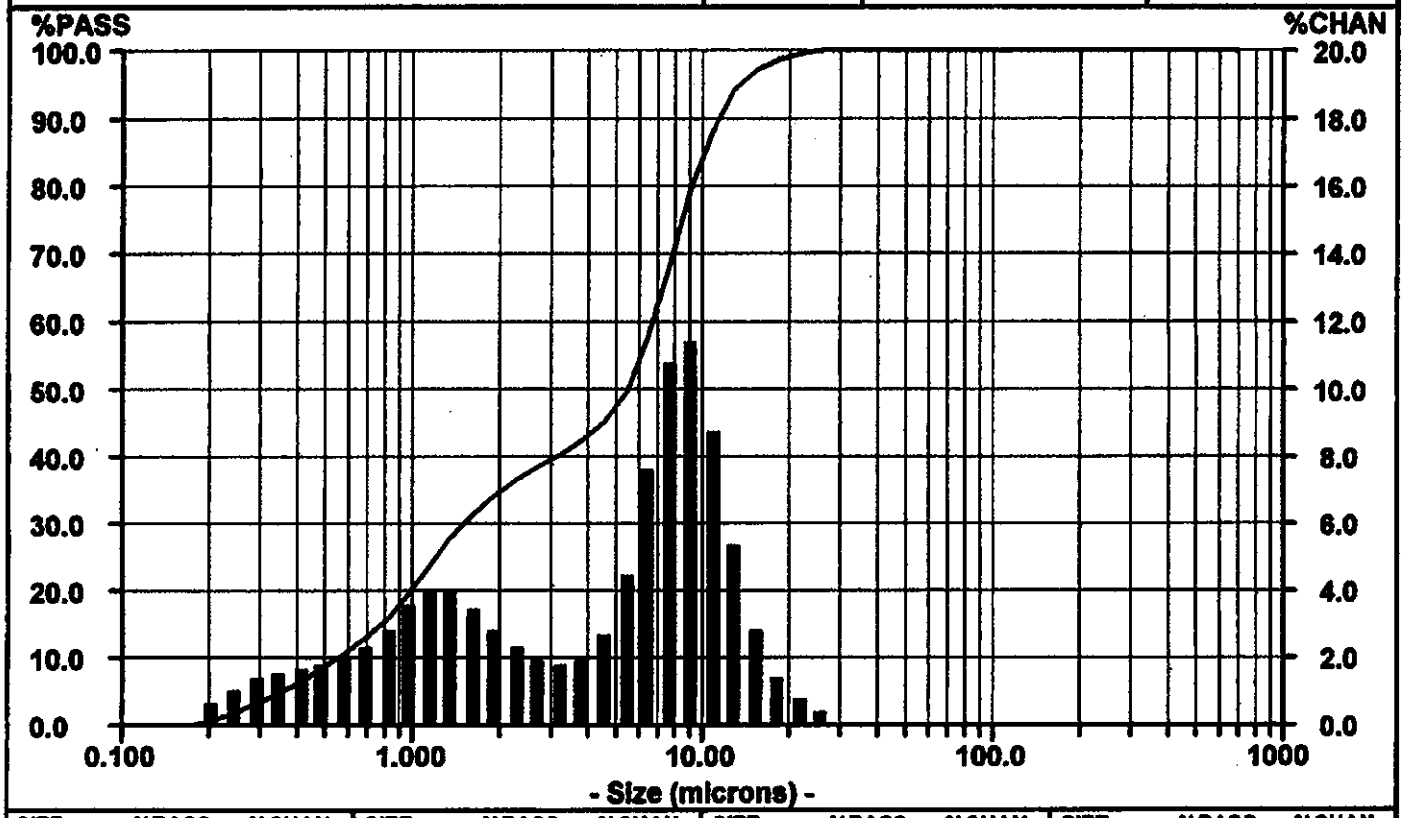
1 M NaOH and 1 M NaNO3
2 minute sonication @ 40 W
Flow Rate = 60 ml/sec.
Refractive Index = 1.50 Particle/1.33 Medium
File: 101AY016

Summary	Percentiles		Dia.	Vol%	Width
mv = 5.743	10% = 0.538	60% = 6.906	7.940	62%	6.370
mn = 0.308	20% = 0.987	70% = 8.056	0.943	38%	1.354
ma = 1.515	30% = 1.551	80% = 9.404			
cs = 3.959	40% = 3.297	90% = 11.61			
sd = 4.649	50% = 5.609	95% = 14.05			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	79.06	11.40						
592.0	100.00	0.00	7.778	67.65	10.77						
497.8	100.00	0.00	6.541	56.88	7.69						
418.6	100.00	0.00	5.500	49.29	4.53						
352.0	100.00	0.00	4.625	44.76	2.79						
296.0	100.00	0.00	3.889	41.97	2.06						
248.9	100.00	0.00	3.270	39.91	1.87						
209.3	100.00	0.00	2.750	38.04	1.98						
176.0	100.00	0.00	2.312	36.06	2.29						
148.0	100.00	0.00	1.945	33.77	2.79						
124.5	100.00	0.00	1.635	30.98	3.41						
104.7	100.00	0.00	1.375	27.57	3.93						
88.00	100.00	0.00	1.156	23.64	3.97						
74.00	100.00	0.00	0.972	19.67	3.50						
62.23	100.00	0.00	0.818	16.17	2.88						
52.33	100.00	0.00	0.688	13.29	2.39						
44.00	100.00	0.00	0.578	10.90	2.08						
37.00	100.00	0.00	0.486	8.82	1.90						
31.11	100.00	0.32	0.409	6.92	1.79						
26.16	99.68	0.51	0.344	5.13	1.70						
22.00	99.17	0.90	0.289	3.43	1.52						
18.50	98.27	1.66	0.243	1.91	1.15						
15.56	96.61	3.09	0.204	0.76	0.76						
13.08	93.52	5.56	0.172	0.00	0.00						
11.00	87.96	8.91	0.145	0.00	0.00						

AY-101	AY-101 Sample	Date: 09/27/91 Time: 09:21	Meas #: 00001 Pres #: 01
1 M NaOH and 1 M NaNO3 2 minute sonication @ 40 W Flow Rate = 60 ml/sec. Refractive Index = 1.70 Particle/1.33 Medium File: 101AY017	**Summary** mv = 5.594 mn = 0.311 ma = 1.514 os = 3.962 sd = 4.570	**Percentiles** 10% = 0.545 60% = 6.827 20% = 0.981 70% = 7.964 30% = 1.518 80% = 9.268 40% = 3.124 90% = 11.36 50% = 5.515 95% = 13.56	**Dia Vol% Width** 7.863 61% 6.160 0.952 39% 1.346



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	79.89	11.48						
592.0	100.00	0.00	7.778	68.41	10.87						
497.8	100.00	0.00	6.541	57.54	7.64						
418.6	100.00	0.00	5.500	49.90	4.55						
352.0	100.00	0.00	4.625	45.35	2.79						
296.0	100.00	0.00	3.889	42.56	2.06						
248.9	100.00	0.00	3.270	40.50	1.88						
209.3	100.00	0.00	2.750	38.62	2.01						
176.0	100.00	0.00	2.312	36.61	2.33						
148.0	100.00	0.00	1.945	34.28	2.85						
124.5	100.00	0.00	1.635	31.43	3.50						
104.7	100.00	0.00	1.375	27.93	4.04						
88.00	100.00	0.00	1.156	23.89	4.10						
74.00	100.00	0.00	0.972	19.79	3.63						
62.23	100.00	0.00	0.818	16.16	2.97						
52.33	100.00	0.00	0.688	13.19	2.44						
44.00	100.00	0.00	0.578	10.75	2.10						
37.00	100.00	0.00	0.486	8.65	1.89						
31.11	100.00	0.00	0.409	6.76	1.77						
26.16	100.00	0.46	0.344	4.99	1.67						
22.00	99.54	0.81	0.289	3.32	1.48						
18.50	98.73	1.54	0.243	1.84	1.11						
15.56	97.19	2.95	0.204	0.73	0.73						
13.08	94.24	5.46	0.172	0.00	0.00						
11.00	88.78	8.89	0.145	0.00	0.00						

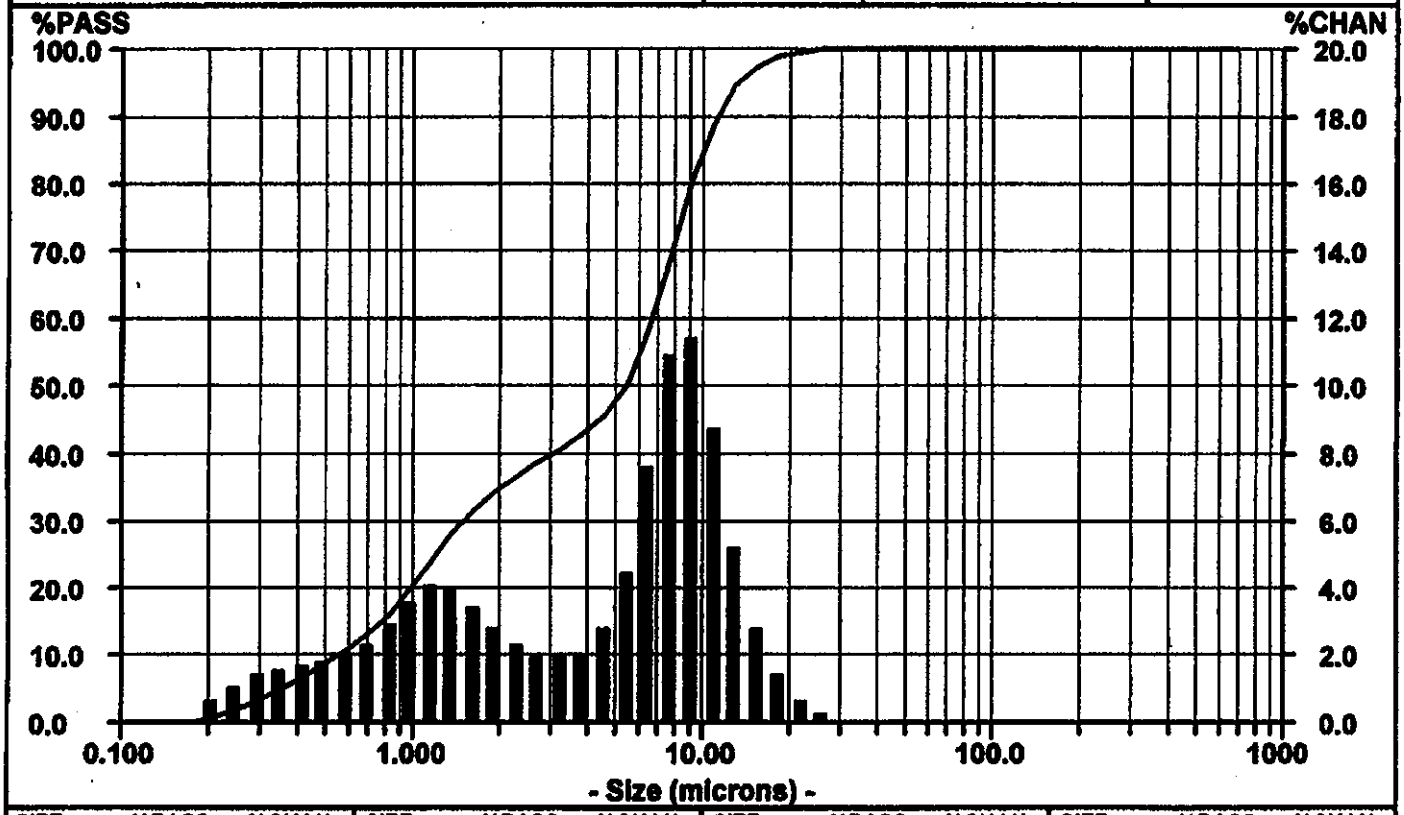
AY-101

AY-101 Sample

Date: 09/27/91 Meas #: 00001
Time: 09:26 Pres #: 01

1 M NaOH and 1 M NaNO3
2 minute sonication @ 40 W
Flow Rate = 60 ml/sec.
Refractive Index = 2.00 Particle/1.33 Medium
File: 101AY018

Summary	Percentiles		Dia	Vol%	Width
mv = 5.528	10% = 0.548	60% = 6.784	7.849	61%	6.050
mn = 0.312	20% = 0.979	70% = 7.914	0.956	39%	1.346
ma = 1.513	30% = 1.505	80% = 9.196			
cs = 3.966	40% = 3.047	90% = 11.22			
sd = 4.524	50% = 5.481	95% = 13.31			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	80.38	11.55						
592.0	100.00	0.00	7.778	68.83	10.93						
497.8	100.00	0.00	6.541	57.90	7.67						
418.6	100.00	0.00	5.500	50.23	4.67						
352.0	100.00	0.00	4.625	45.66	2.81						
296.0	100.00	0.00	3.889	42.85	2.07						
248.9	100.00	0.00	3.270	40.78	1.90						
209.3	100.00	0.00	2.750	38.88	2.03						
176.0	100.00	0.00	2.312	36.85	2.36						
148.0	100.00	0.00	1.945	34.49	2.88						
124.5	100.00	0.00	1.635	31.61	3.54						
104.7	100.00	0.00	1.375	28.07	4.09						
88.00	100.00	0.00	1.156	23.98	4.15						
74.00	100.00	0.00	0.972	19.83	3.67						
62.23	100.00	0.00	0.818	16.16	3.01						
52.33	100.00	0.00	0.688	13.15	2.46						
44.00	100.00	0.00	0.578	10.69	2.10						
37.00	100.00	0.00	0.486	8.59	1.89						
31.11	100.00	0.00	0.409	6.70	1.76						
26.16	100.00	0.38	0.344	4.94	1.66						
22.00	99.62	0.72	0.289	3.28	1.46						
18.50	98.90	1.42	0.243	1.82	1.10						
15.56	97.48	2.83	0.204	0.72	0.72						
13.08	94.65	5.38	0.172	0.00	0.00						
11.00	89.27	8.89	0.145	0.00	0.00						

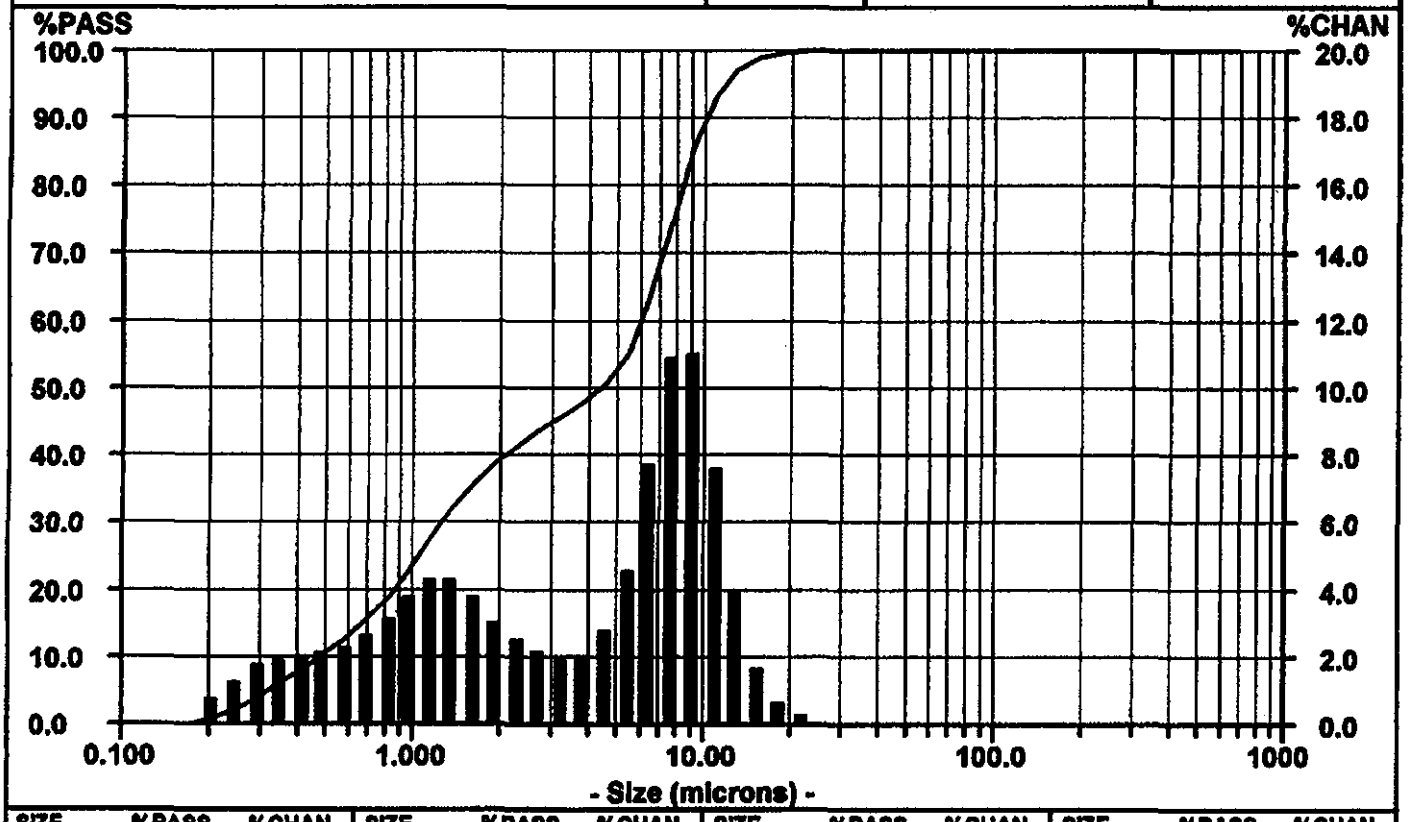
AY-101

AY-101
Sample

Date: 09/27/91 Meas #: 00001
Time: 09:50 Prea #: 01

1 M NaOH and 1 M NaNO3
20 minute sonication @ 40 W
Flow Rate = 17 ml/sec.
Refractive Index = 1.50 Particle/1.33 Medium
File: 101AY019

Summary	Percentiles		Dia	Vol%	Width
mv = 4.843	10% = 0.467	60% = 6.140	7.493	56%	5.334
mn = 0.306	20% = 0.856	70% = 7.289	0.928	44%	1.354
ma = 1.328	30% = 1.276	80% = 8.460			
cs = 4.518	40% = 2.091	90% = 10.13			
sd = 4.161	50% = 4.451	95% = 11.72			

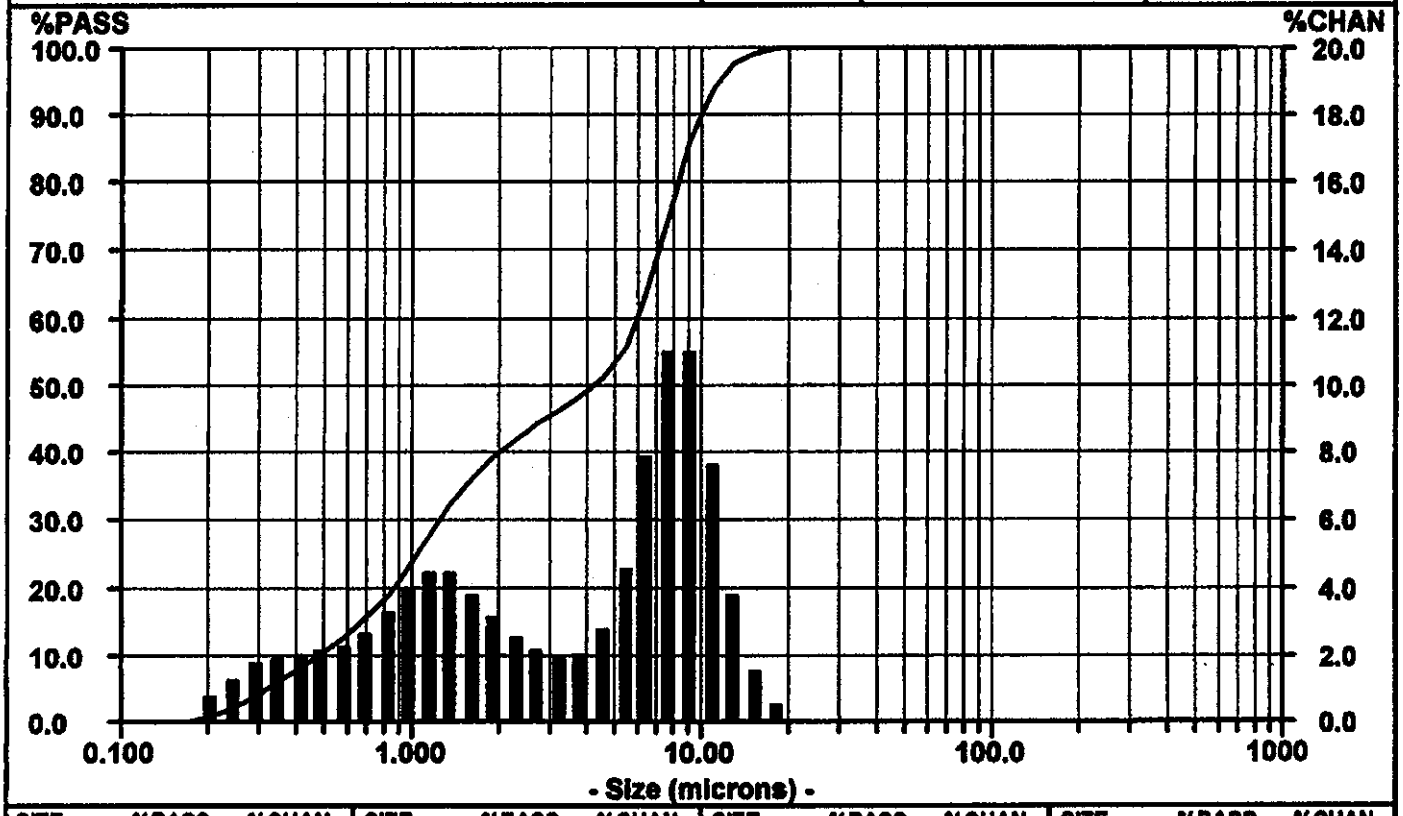


SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	86.50	11.13						
592.0	100.00	0.00	7.778	74.37	11.10						
497.8	100.00	0.00	6.541	63.27	7.88						
418.6	100.00	0.00	5.500	55.39	4.65						
352.0	100.00	0.00	4.625	50.74	2.86						
296.0	100.00	0.00	3.889	47.88	2.15						
248.9	100.00	0.00	3.270	45.73	2.03						
209.3	100.00	0.00	2.750	43.70	2.23						
176.0	100.00	0.00	2.312	41.47	2.61						
148.0	100.00	0.00	1.945	38.86	3.16						
124.5	100.00	0.00	1.635	35.70	3.84						
104.7	100.00	0.00	1.375	31.86	4.41						
88.00	100.00	0.00	1.156	27.45	4.47						
74.00	100.00	0.00	0.972	22.98	3.87						
62.23	100.00	0.00	0.818	19.01	3.29						
52.33	100.00	0.00	0.688	15.72	2.75						
44.00	100.00	0.00	0.578	12.97	2.43						
37.00	100.00	0.00	0.486	10.54	2.25						
31.11	100.00	0.00	0.409	8.29	2.15						
26.16	100.00	0.00	0.344	6.14	2.06						
22.00	100.00	0.31	0.289	4.08	1.83						
18.50	99.69	0.73	0.243	2.25	1.37						
15.56	98.96	1.76	0.204	0.88	0.88						
13.08	97.21	4.00	0.172	0.00	0.00						
11.00	93.21	7.71	0.145	0.00	0.00						

AY-101	AY-101 Sample	Date: 09/27/91 Time: 09:56	Meas #: 00001 Pres #: 01

1 M NaOH and 1 M NaNO3
20 minute sonication @ 40 W
Flow Rate = 60 ml/sec.
Refractive Index = 1.70 Particle/1.33 Medium
File: 101AY020

Summary	Percentiles		Dia	Vol%	Width
mv = 4.746	10% = 0.488	60% = 6.063	7.450	56%	5.222
mn = 0.308	20% = 0.863	70% = 7.218	0.933	44%	1.350
ma = 1.321	30% = 1.269	80% = 8.375			
cs = 4.543	40% = 2.023	90% = 9.983			
sd = 4.109	50% = 4.304	95% = 11.45			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.260	86.18	11.14						
592.0	100.00	0.00	7.778	75.04	11.15						
497.8	100.00	0.00	6.541	63.89	7.90						
418.6	100.00	0.00	5.500	55.99	4.66						
352.0	100.00	0.00	4.625	51.33	2.87						
296.0	100.00	0.00	3.889	48.46	2.16						
248.9	100.00	0.00	3.270	46.30	2.05						
209.3	100.00	0.00	2.750	44.25	2.25						
176.0	100.00	0.00	2.312	42.00	2.64						
148.0	100.00	0.00	1.945	39.36	3.20						
124.5	100.00	0.00	1.635	36.16	3.91						
104.7	100.00	0.00	1.375	32.25	4.51						
88.00	100.00	0.00	1.156	27.74	4.59						
74.00	100.00	0.00	0.972	23.15	4.07						
62.23	100.00	0.00	0.818	19.08	3.34						
52.33	100.00	0.00	0.688	15.74	2.78						
44.00	100.00	0.00	0.578	12.96	2.43						
37.00	100.00	0.00	0.486	10.53	2.25						
31.11	100.00	0.00	0.409	8.28	2.15						
26.16	100.00	0.00	0.344	6.13	2.07						
22.00	100.00	0.00	0.289	4.06	1.83						
18.50	100.00	0.65	0.243	2.23	1.36						
15.56	99.35	1.64	0.204	0.87	0.87						
13.08	97.71	3.58	0.172	0.00	0.00						
11.00	93.83	7.65	0.145	0.00	0.00						

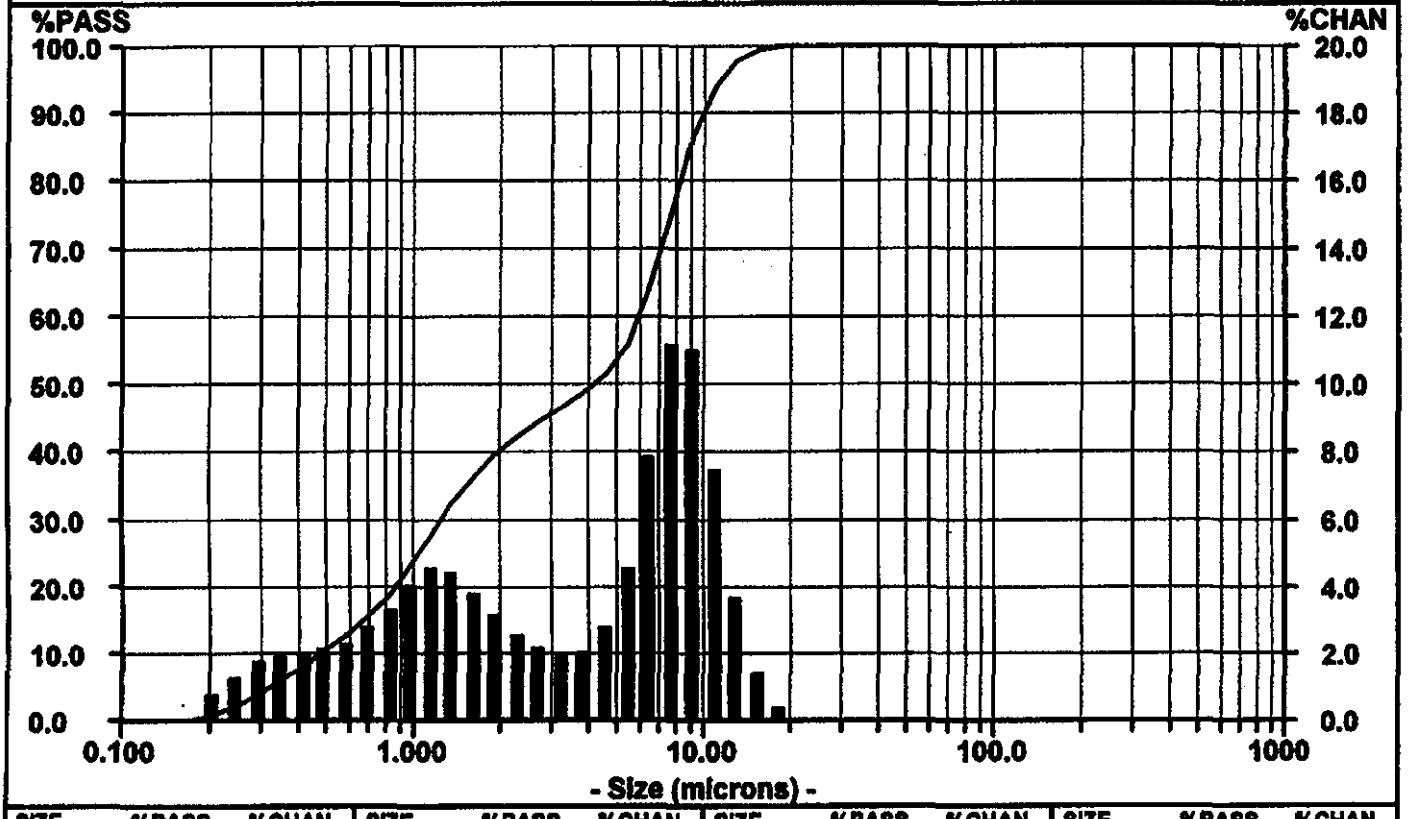
AY-101

AY-101
Sample

Date: 09/27/91 Meas #: 00001
Time: 09:59 Pres #: 01

1 M NaOH and 1 M NaNO3
20 minute sonication @ 40 W
Flow Rate = 17 ml/sec.
Refractive Index = 2.00 Particle/1.33 Medium
File: 101AY021

Summary	Percentiles		Dia	Vol%	Width
mv = 4.707	10% = 0.470	60% = 6.021	7.418	56%	5.162
mn = 0.309	20% = 0.852	70% = 7.174	0.936	44%	1.347
ma = 1.320	30% = 1.252	80% = 9.322			
cs = 4.545	40% = 1.996	90% = 9.907			
sd = 4.077	50% = 4.238	95% = 11.35			

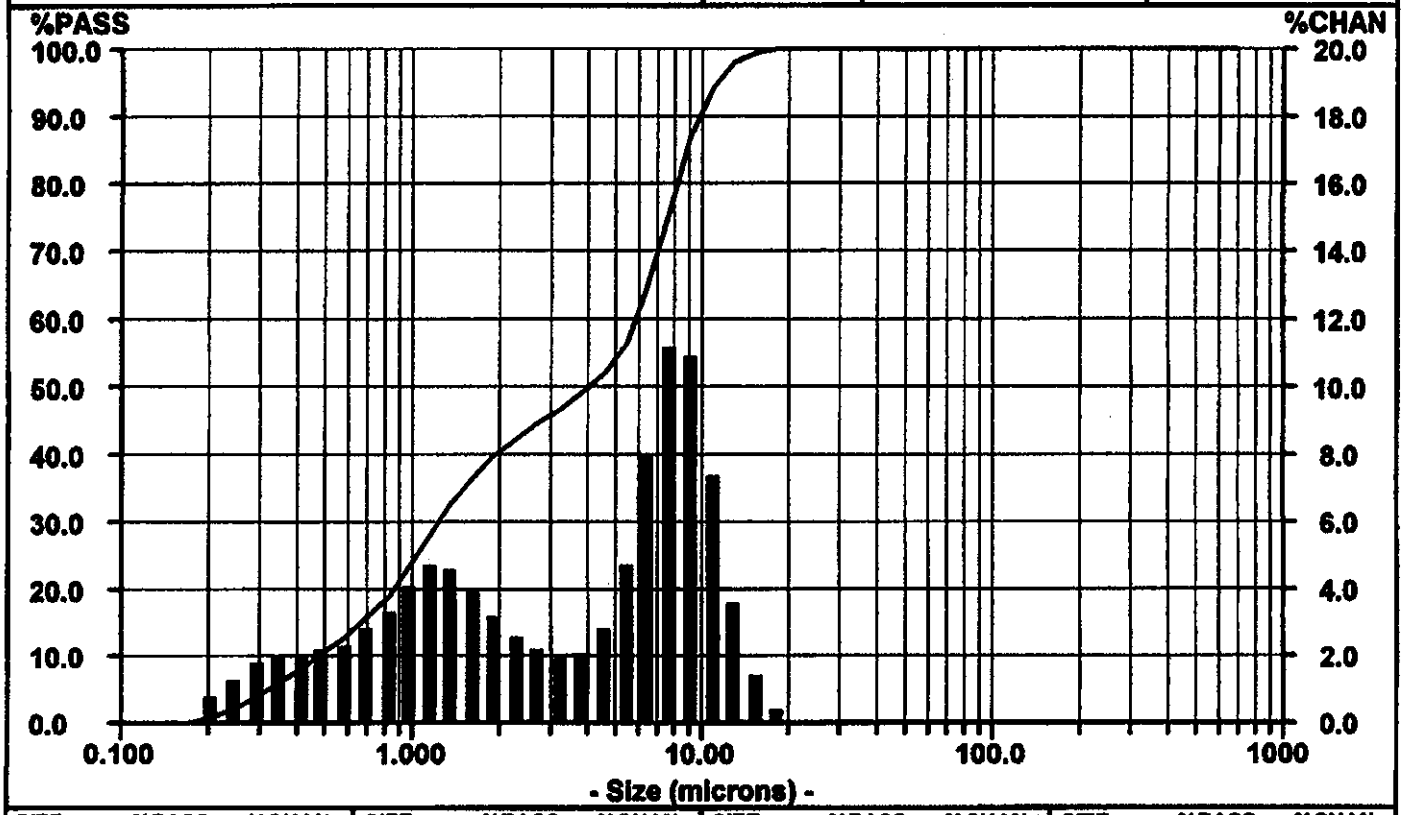


SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	86.58	11.12						
592.0	100.00	0.00	7.778	75.46	11.21						
497.8	100.00	0.00	6.541	64.25	7.96						
418.6	100.00	0.00	5.500	56.29	4.69						
352.0	100.00	0.00	4.625	51.60	2.86						
296.0	100.00	0.00	3.889	48.72	2.17						
248.9	100.00	0.00	3.270	46.55	2.06						
209.3	100.00	0.00	2.750	44.49	2.26						
176.0	100.00	0.00	2.312	42.23	2.65						
148.0	100.00	0.00	1.945	39.58	3.22						
124.5	100.00	0.00	1.636	36.36	3.94						
104.7	100.00	0.00	1.375	32.42	4.56						
88.00	100.00	0.00	1.156	27.86	4.65						
74.00	100.00	0.00	0.972	23.21	4.12						
62.23	100.00	0.00	0.818	19.09	3.39						
52.33	100.00	0.00	0.688	15.70	2.80						
44.00	100.00	0.00	0.578	12.90	2.44						
37.00	100.00	0.00	0.486	10.46	2.24						
31.11	100.00	0.00	0.409	8.22	2.14						
26.16	100.00	0.00	0.344	6.08	2.06						
22.00	100.00	0.00	0.289	4.02	1.82						
18.50	100.00	0.59	0.243	2.20	1.35						
15.56	99.41	1.54	0.204	0.85	0.85						
13.08	97.87	3.75	0.172	0.00	0.00						
11.00	94.12	7.54	0.145	0.00	0.00						

AY-101	AY-101 Sample	Date: 09/27/91 Meas #: 00001 Time: 10:03 Pres #: 01

1 M NaOH and 1 M NaNO3
20 minute sonication @ 40 W
Flow Rate = 40 ml/sec.
Refractive Index = 2.00 Particle/1.33 Medium
File: 101AY022

Summary	Percentiles		Dia	Vol%	Width
mv = 4.659	10% = 0.468	60% = 5.962	7.387	55%	5.106
mn = 0.309	20% = 0.849	70% = 7.124	0.939	45%	1.343
ma = 1.313	30% = 1.243	80% = 8.267			
cs = 4.569	40% = 1.955	90% = 9.823			
sd = 4.049	50% = 4.142	95% = 11.23			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	87.00	11.09						
592.0	100.00	0.00	7.778	75.91	11.20						
497.8	100.00	0.00	6.541	64.71	8.00						
418.6	100.00	0.00	5.500	56.71	4.73						
352.0	100.00	0.00	4.625	51.98	2.91						
296.0	100.00	0.00	3.889	49.07	2.18						
248.9	100.00	0.00	3.270	46.89	2.06						
209.3	100.00	0.00	2.750	44.83	2.25						
176.0	100.00	0.00	2.312	42.58	2.66						
148.0	100.00	0.00	1.945	39.92	3.25						
124.5	100.00	0.00	1.635	36.67	4.01						
104.7	100.00	0.00	1.375	32.66	4.64						
88.00	100.00	0.00	1.156	28.02	4.71						
74.00	100.00	0.00	0.972	23.31	4.14						
62.23	100.00	0.00	0.818	19.17	3.39						
52.33	100.00	0.00	0.688	15.78	2.81						
44.00	100.00	0.00	0.578	12.97	2.45						
37.00	100.00	0.00	0.486	10.52	2.26						
31.11	100.00	0.00	0.409	8.26	2.16						
26.16	100.00	0.00	0.344	6.10	2.07						
22.00	100.00	0.00	0.289	4.03	1.83						
18.50	100.00	0.53	0.243	2.20	1.35						
15.56	99.47	1.43	0.204	0.85	0.85						
13.08	98.04	3.61	0.172	0.00	0.00						
11.00	94.43	7.43	0.145	0.00	0.00						

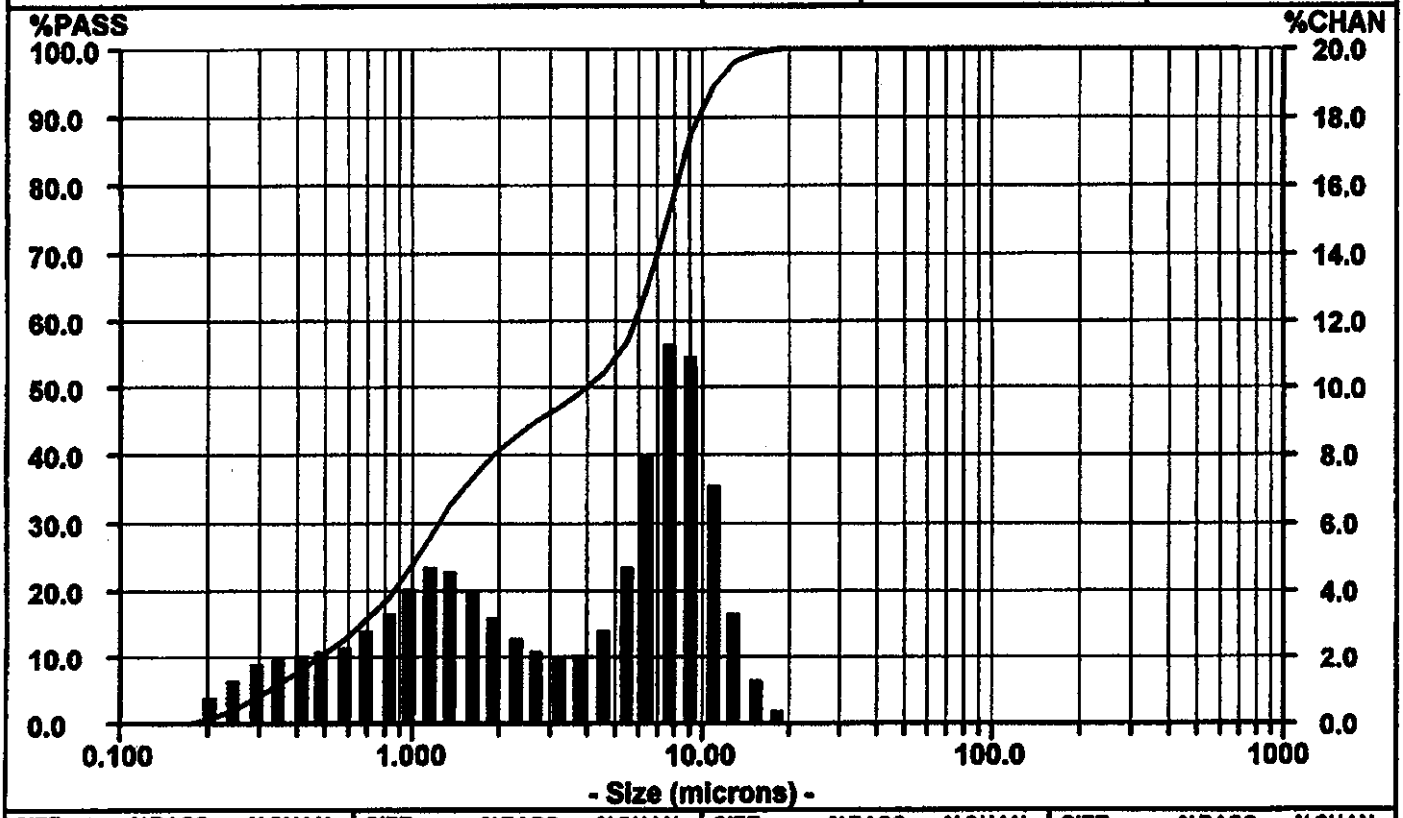
AY-101

AY-101
Sample

Date: 09/27/91 Meas #: 00001
Time: 10:07 Pres #: 01

1 M NaOH and 1 M NaNO3
20 minute sonication @ 40 W
Flow Rate = 40 ml/sec.
Refractive Index = 1.50 Particle/1.33 Medium
File: 101AY023

Summary	Percentiles		Dia	Vol%	Width
mv = 4.616	10% = 0.470	60% = 5.923	7.353	55%	5.025
mn = 0.310	20% = 0.847	70% = 7.079	0.940	45%	1.342
ma = 1.311	30% = 1.236	80% = 8.203			
cs = 4.578	40% = 1.929	90% = 9.722			
sd = 4.014	50% = 4.071	95% = 11.09			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	87.50	11.10						
592.0	100.00	0.00	7.778	76.40	11.35						
497.8	100.00	0.00	6.541	65.05	8.07						
418.6	100.00	0.00	5.500	56.98	4.74						
352.0	100.00	0.00	4.625	52.24	2.90						
296.0	100.00	0.00	3.889	49.34	2.18						
248.9	100.00	0.00	3.270	47.16	2.06						
209.3	100.00	0.00	2.750	45.10	2.27						
176.0	100.00	0.00	2.312	42.83	2.68						
148.0	100.00	0.00	1.945	40.15	3.28						
124.5	100.00	0.00	1.635	36.87	4.04						
104.7	100.00	0.00	1.375	32.83	4.67						
88.00	100.00	0.00	1.156	28.16	4.75						
74.00	100.00	0.00	0.972	23.41	4.19						
62.23	100.00	0.00	0.818	19.22	3.43						
52.33	100.00	0.00	0.688	15.79	2.84						
44.00	100.00	0.00	0.578	12.95	2.47						
37.00	100.00	0.00	0.486	10.48	2.27						
31.11	100.00	0.00	0.409	8.21	2.15						
26.16	100.00	0.00	0.344	6.06	2.06						
22.00	100.00	0.00	0.289	4.00	1.81						
18.50	100.00	0.47	0.243	2.19	1.34						
15.56	99.53	1.32	0.204	0.85	0.85						
13.08	98.21	3.43	0.172	0.00	0.00						
11.00	94.78	7.28	0.145	0.00	0.00						

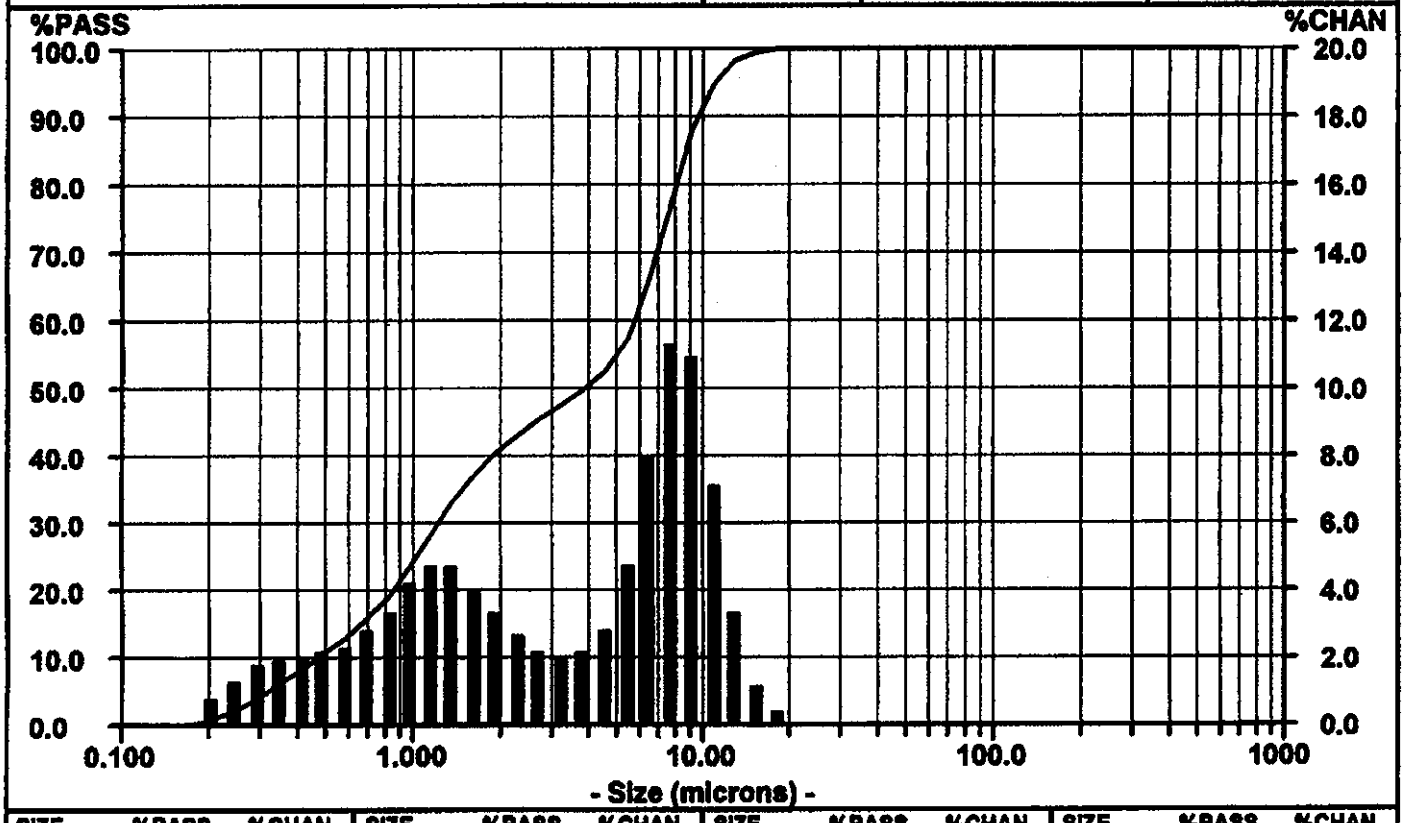
AY-101

AY-101
Sample

Date: 09/27/91 Meas #: 00001
Time: 10:11 Pres #: 01

1 M NaOH and 1 M NaNO3
20 minute sonication @ 40 W
Flow Rate = 40 ml/sec.
Refractive Index = 1.70 Particle/1.33 Medium
File: 101AY024

Summary	Percentiles		Dia	Vol%	Width
mv = 4.572	10% = 0.465	60% = 5.865	7.324	55%	4.988
mn = 0.309	20% = 0.842	70% = 7.031	0.941	45%	1.342
ma = 1.301	30% = 1.226	80% = 8.151			
cs = 4.613	40% = 1.896	90% = 9.647			
sd = 3.989	50% = 3.969	95% = 10.99			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	87.87	11.04						
592.0	100.00	0.00	7.778	76.83	11.33						
497.8	100.00	0.00	6.541	66.50	8.10						
418.6	100.00	0.00	5.500	57.40	4.77						
352.0	100.00	0.00	4.625	52.63	2.92						
296.0	100.00	0.00	3.889	49.71	2.20						
248.9	100.00	0.00	3.270	47.51	2.08						
209.3	100.00	0.00	2.750	45.43	2.28						
176.0	100.00	0.00	2.312	43.15	2.70						
148.0	100.00	0.00	1.945	40.45	3.30						
124.5	100.00	0.00	1.635	37.15	4.07						
104.7	100.00	0.00	1.375	33.08	4.72						
88.00	100.00	0.00	1.156	28.36	4.79						
74.00	100.00	0.00	0.972	23.57	4.22						
62.23	100.00	0.00	0.818	19.35	3.44						
52.33	100.00	0.00	0.688	15.91	2.84						
44.00	100.00	0.00	0.578	13.07	2.47						
37.00	100.00	0.00	0.486	10.60	2.28						
31.11	100.00	0.00	0.409	8.32	2.17						
26.16	100.00	0.00	0.344	6.15	2.09						
22.00	100.00	0.00	0.289	4.06	1.84						
18.50	100.00	0.42	0.243	2.22	1.36						
15.56	99.58	1.23	0.204	0.86	0.86						
13.08	98.35	3.31	0.172	0.00	0.00						
11.00	95.04	7.17	0.145	0.00	0.00						

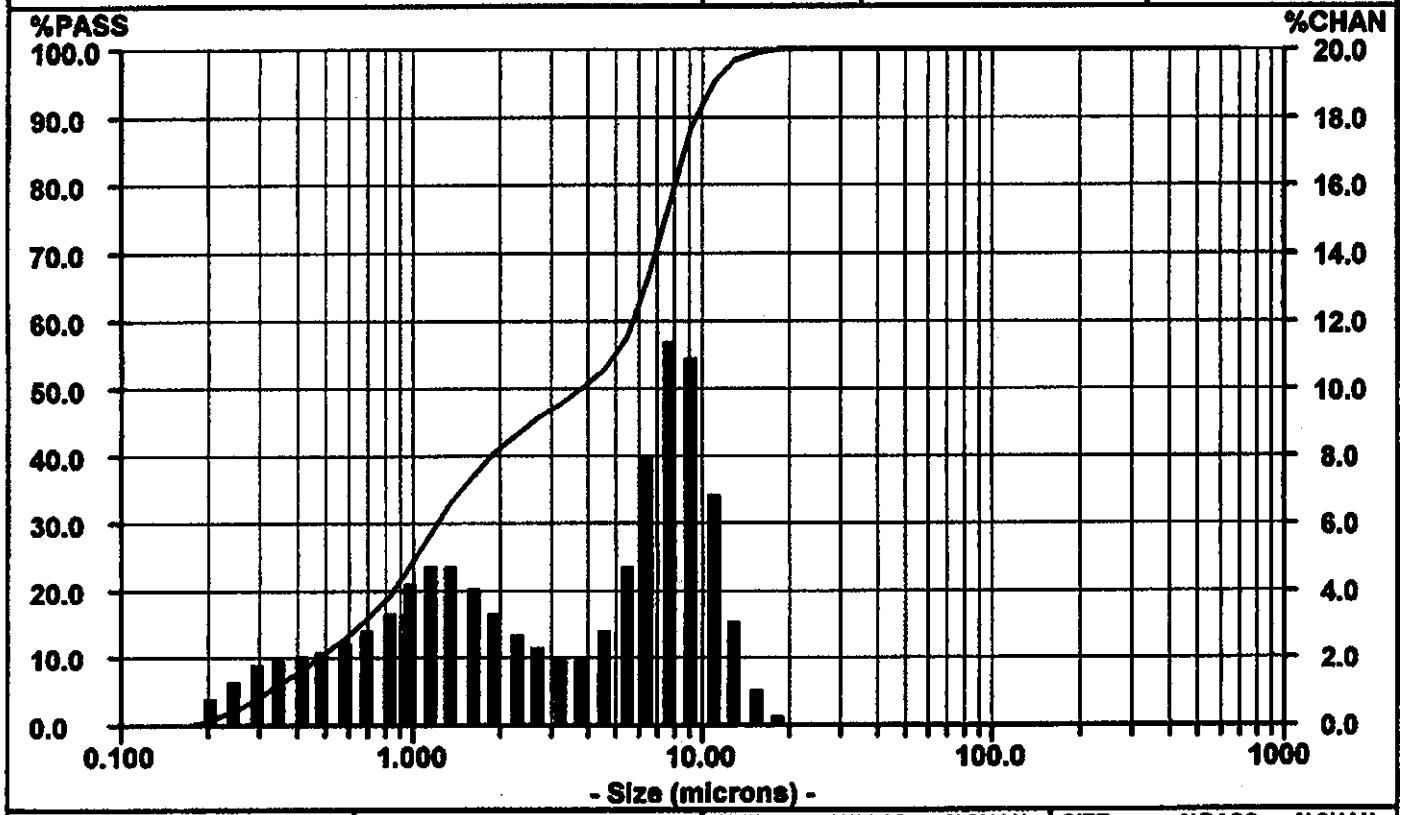
AY-101

AY-101
Sample

Date: 09/27/91 Meas #: 00001
Time: 10:17 Pres #: 01

1 M NaOH and 1 M NaNO3
20 minute sonication @ 40 W
Flow Rate = 60 ml/sec.
Refractive Index = 1.70 Particle/1.33 Medium
File: 101AY025

Summary	Percentiles		Dia	Vol%	Width
mv = 4.519	10% = 0.467	60% = 5.807	7.281	54%	4.902
mn = 0.310	20% = 0.838	70% = 6.971	0.943	46%	1.345
ma = 1.296	30% = 1.219	80% = 8.078			
cs = 4.628	40% = 1.866	90% = 9.548			
sd = 3.948	50% = 3.869	95% = 10.86			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	88.43	10.99						
592.0	100.00	0.00	7.778	77.44	11.43						
497.8	100.00	0.00	6.541	66.01	8.20						
418.6	100.00	0.00	5.500	57.81	4.81						
352.0	100.00	0.00	4.625	53.00	2.93						
296.0	100.00	0.00	3.889	50.07	2.19						
248.9	100.00	0.00	3.270	47.88	2.08						
209.3	100.00	0.00	2.750	45.80	2.31						
176.0	100.00	0.00	2.312	43.49	2.75						
148.0	100.00	0.00	1.945	40.74	3.37						
124.5	100.00	0.00	1.635	37.37	4.11						
104.7	100.00	0.00	1.375	33.26	4.74						
88.00	100.00	0.00	1.156	28.52	4.81						
74.00	100.00	0.00	0.972	23.71	4.25						
62.23	100.00	0.00	0.818	19.46	3.49						
52.33	100.00	0.00	0.688	15.97	2.89						
44.00	100.00	0.00	0.578	13.08	2.51						
37.00	100.00	0.00	0.486	10.57	2.29						
31.11	100.00	0.00	0.409	8.28	2.17						
26.16	100.00	0.00	0.344	6.11	2.07						
22.00	100.00	0.00	0.289	4.04	1.83						
18.50	100.00	0.36	0.243	2.21	1.35						
15.56	99.64	1.11	0.204	0.86	0.86						
13.08	98.53	3.12	0.172	0.00	0.00						
11.00	95.41	6.98	0.145	0.00	0.00						

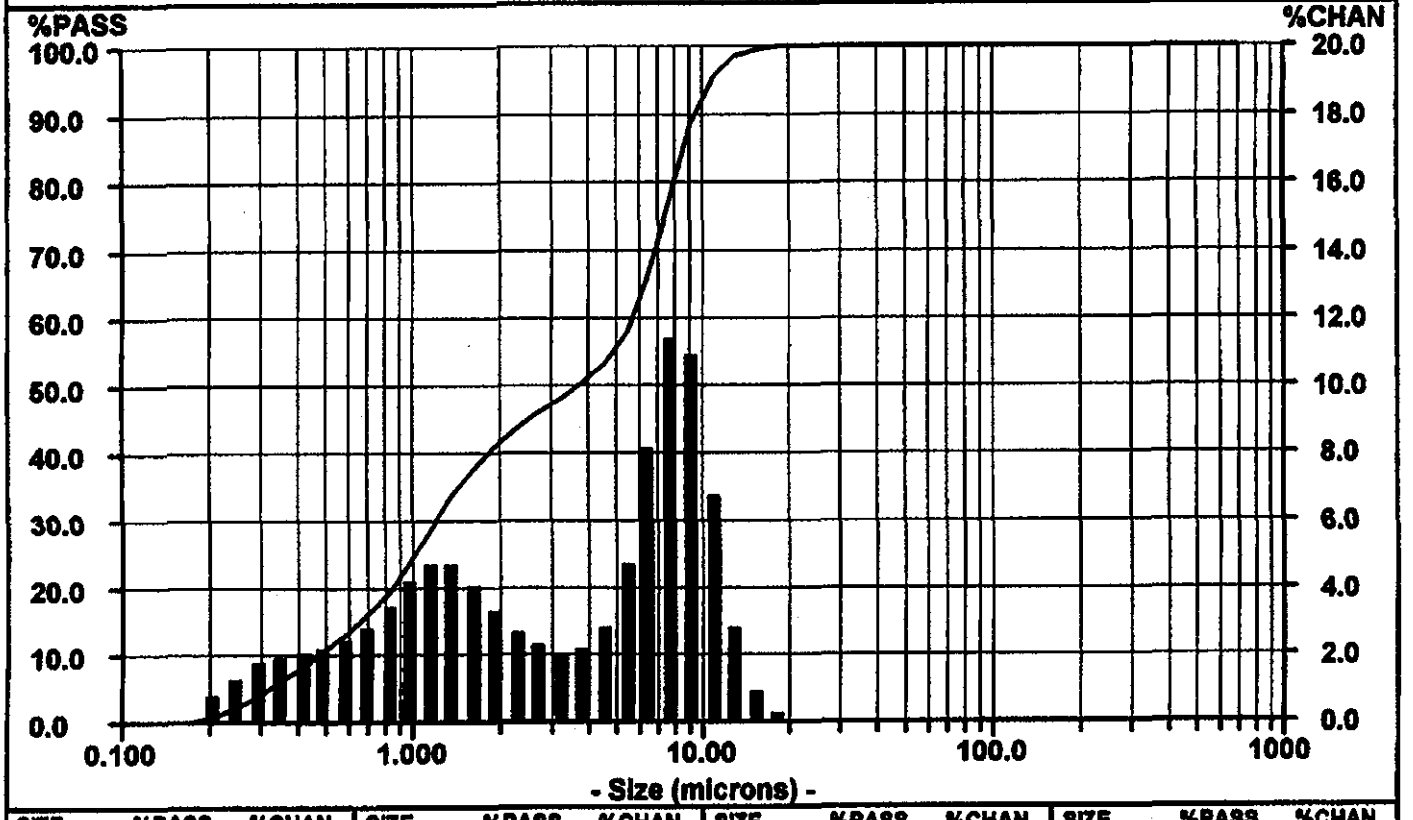
AY-101

1 M NaOH and 1 M NaNO3
20 minute sonication @ 40 W
Flow Rate = 80 ml/sec.
Refractive Index = 1.50 Particle/1.33 Medium
File: 101AY026

AY-101
Sample

Date: 09/27/91 Meas #: 00001
Time: 10:21 Pres #: 01

Summary		Percentiles		Dia	Vol%	Width
mv =	4.472	10% = 0.464	60% = 5.753	7.245	54%	4.838
mn =	0.310	20% = 0.833	70% = 6.920	0.943	46%	1.346
ma =	1.288	30% = 1.208	80% = 8.018			
cs =	4.659	40% = 1.838	90% = 9.464			
sd =	3.915	50% = 3.768	95% = 10.75			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	88.89	10.94						
592.0	100.00	0.00	7.778	77.95	11.48						
497.8	100.00	0.00	6.541	69.47	8.26						
418.6	100.00	0.00	5.500	63.21	4.84						
352.0	100.00	0.00	4.625	58.37	2.94						
296.0	100.00	0.00	3.889	55.43	2.20						
248.9	100.00	0.00	3.270	53.23	2.10						
209.3	100.00	0.00	2.750	51.13	2.33						
176.0	100.00	0.00	2.312	48.80	2.77						
148.0	100.00	0.00	1.945	46.03	3.38						
124.5	100.00	0.00	1.635	42.65	4.13						
104.7	100.00	0.00	1.375	38.52	4.78						
88.00	100.00	0.00	1.156	33.74	4.87						
74.00	100.00	0.00	0.972	28.87	4.30						
62.23	100.00	0.00	0.818	24.57	3.52						
52.33	100.00	0.00	0.688	21.05	2.89						
44.00	100.00	0.00	0.578	18.16	2.51						
37.00	100.00	0.00	0.486	15.65	2.29						
31.11	100.00	0.00	0.409	13.36	2.18						
26.16	100.00	0.00	0.344	11.18	2.09						
22.00	100.00	0.00	0.289	9.09	1.85						
18.50	100.00	0.32	0.243	7.24	1.37						
15.56	99.68	1.02	0.204	5.87	0.87						
13.08	98.66	2.96	0.172	5.00	0.00						
11.00	95.70	6.81	0.145	5.00	0.00						

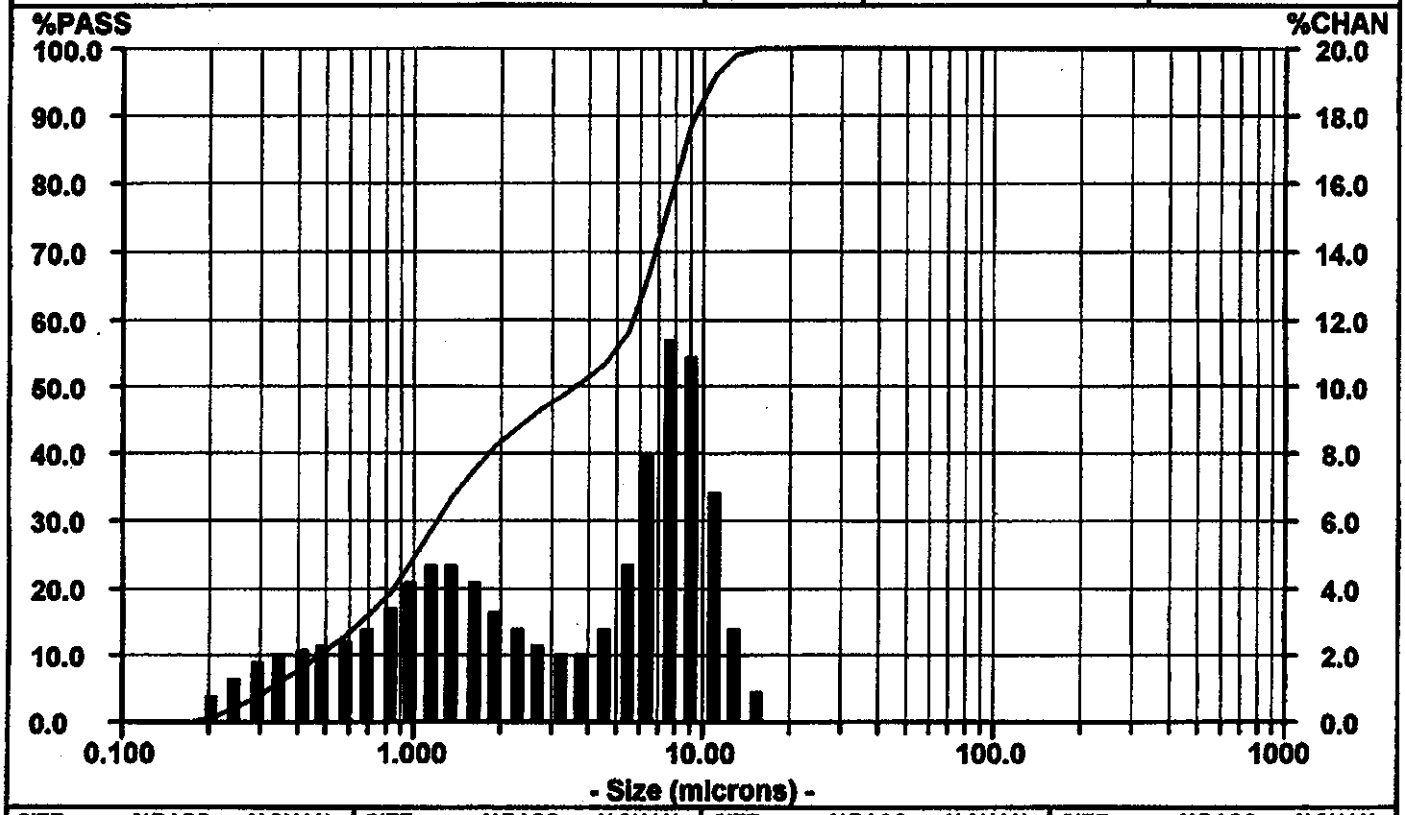
AY-101

AY-101
Sample

Date: 11/04/91 Meas #: 00001
Time: 11:44 Pres #: 01

1 M NaOH and 1 M NaNO3
20 minute sonication @ 40 W
Flow Rate = 60 ml/sec.
Refractive Index = 2.00 Particle/1.33 Medium
File: 101AY027

Summary	Percentiles		Dia	Vol%	Width
mv = 4.431	10% = 0.466	60% = 5.731	7.258	54%	4.782
mn = 0.313	20% = 0.834	70% = 6.913	0.950	46%	1.356
ma = 1.290	30% = 1.209	80% = 8.006			
cs = 4.651	40% = 1.822	90% = 9.417			
sd = 3.905	50% = 3.658	95% = 10.63			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	89.12	11.09						
592.0	100.00	0.00	7.778	78.03	11.48						
497.8	100.00	0.00	6.541	66.55	8.15						
418.6	100.00	0.00	5.500	58.40	4.72						
352.0	100.00	0.00	4.625	53.68	2.87						
296.0	100.00	0.00	3.889	50.81	2.19						
248.9	100.00	0.00	3.270	48.62	2.13						
209.3	100.00	0.00	2.750	46.49	2.40						
176.0	100.00	0.00	2.312	44.09	2.86						
148.0	100.00	0.00	1.945	41.23	3.47						
124.5	100.00	0.00	1.635	37.76	4.21						
104.7	100.00	0.00	1.375	33.55	4.82						
88.00	100.00	0.00	1.156	28.73	4.87						
74.00	100.00	0.00	0.972	23.86	4.30						
62.23	100.00	0.00	0.818	19.56	3.52						
52.33	100.00	0.00	0.688	16.04	2.91						
44.00	100.00	0.00	0.578	13.13	2.53						
37.00	100.00	0.00	0.486	10.60	2.31						
31.11	100.00	0.00	0.409	8.29	2.20						
26.16	100.00	0.00	0.344	6.09	2.10						
22.00	100.00	0.00	0.289	3.99	1.84						
18.50	100.00	0.00	0.243	2.15	1.35						
15.56	100.00	0.98	0.204	0.80	0.80						
13.08	99.02	2.97	0.172	0.00	0.00						
11.00	96.05	6.93	0.145	0.00	0.00						

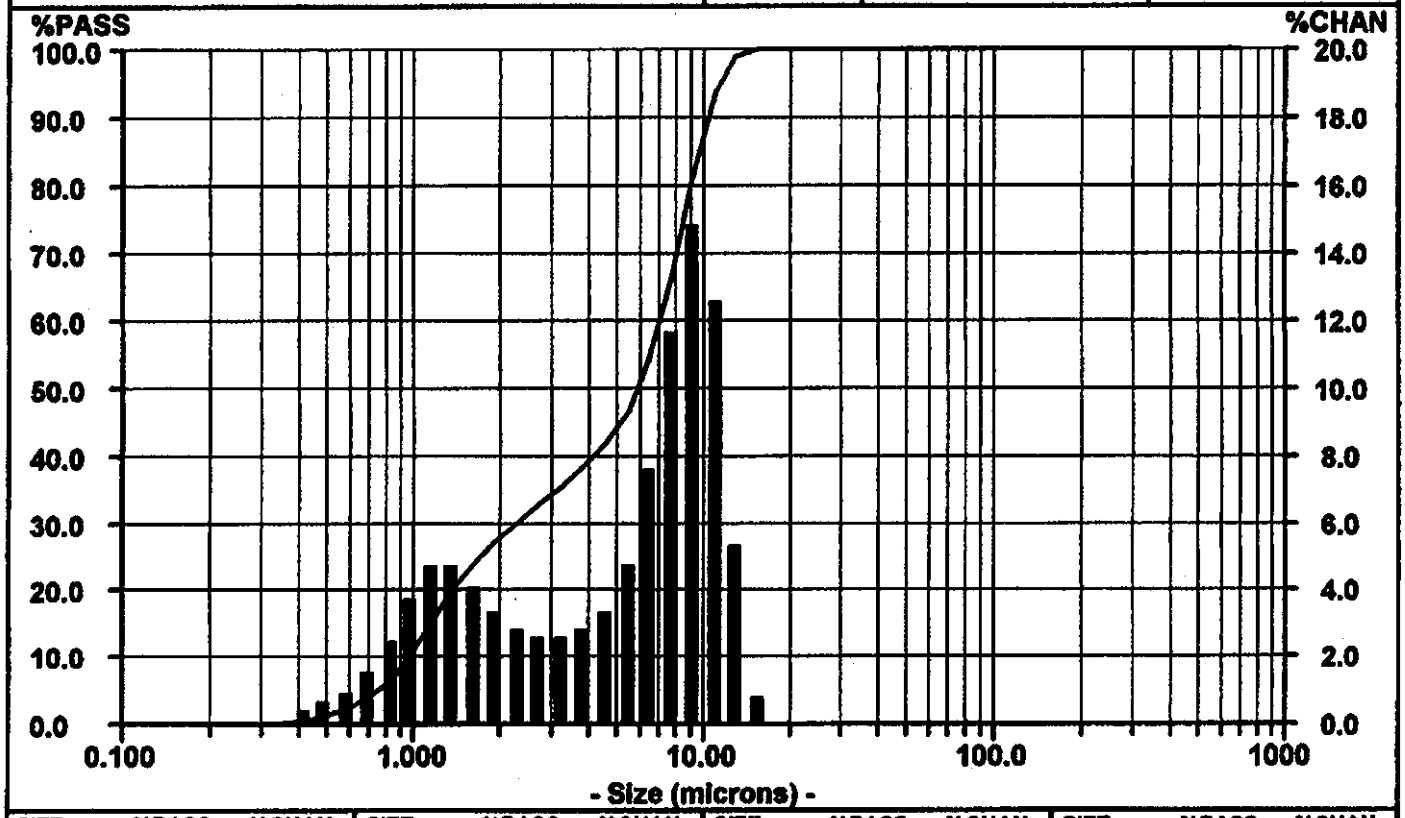
AY-101

AY-101
Sample

Date: 09/27/91 Meas #: 00001
Time: 14:21 Pres #: 01

1 M NaOH and 1 M NaNO3
2 minute sonication followed by a 60 min. delay
External Sonifier
Flow Rate = 60 ml/sec.
Refractive Index = 2.00 Particle/1.33 Medium
File: 101AY028

Summary		Percentiles		Dia	Vol%	Width
mv =	5.613	10% = 0.964	60% = 7.159	7.674	70%	5.675
mn =	0.724	20% = 1.388	70% = 8.144	1.163	30%	1.017
ma =	2.473	30% = 2.281	80% = 9.132			
cs =	2.426	40% = 4.224	90% = 10.36			
sd =	4.187	50% = 5.962	95% = 11.30			

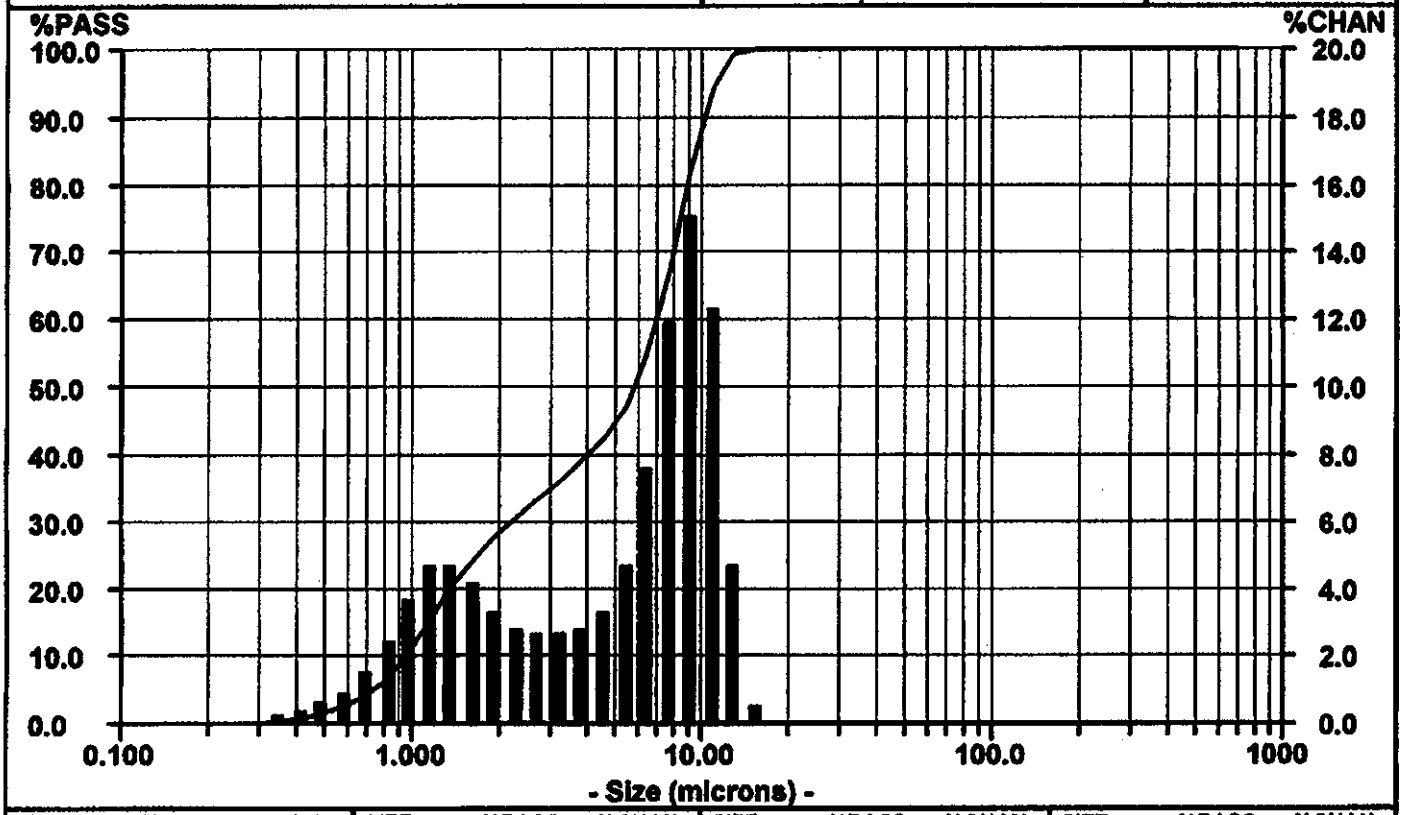


SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	81.13	14.97						
592.0	100.00	0.00	7.778	66.16	11.79						
497.8	100.00	0.00	6.541	54.37	7.61						
418.6	100.00	0.00	5.500	46.76	4.84						
352.0	100.00	0.00	4.625	41.92	3.46						
296.0	100.00	0.00	3.889	38.46	2.88						
248.9	100.00	0.00	3.270	35.58	2.68						
209.3	100.00	0.00	2.750	32.90	2.68						
176.0	100.00	0.00	2.312	30.22	2.89						
148.0	100.00	0.00	1.945	27.33	3.39						
124.5	100.00	0.00	1.635	23.94	4.17						
104.7	100.00	0.00	1.375	19.77	4.84						
88.00	100.00	0.00	1.156	14.93	4.72						
74.00	100.00	0.00	0.972	10.21	3.73						
62.23	100.00	0.00	0.818	6.48	2.55						
52.33	100.00	0.00	0.688	3.93	1.64						
44.00	100.00	0.00	0.578	2.29	1.07						
37.00	100.00	0.00	0.486	1.22	0.73						
31.11	100.00	0.00	0.409	0.49	0.49						
26.16	100.00	0.00	0.344	0.00	0.00						
22.00	100.00	0.00	0.289	0.00	0.00						
18.50	100.00	0.00	0.243	0.00	0.00						
15.56	100.00	0.82	0.204	0.00	0.00						
13.08	99.18	5.40	0.172	0.00	0.00						
11.00	93.78	12.65	0.145	0.00	0.00						

AY-101	AY-101 Sample	Date: 09/27/91 Meas #: 00001 Time: 14:26 Pres #: 01

1 M NaOH and 1 M NaNO3
2 minute sonication followed by a 60 min. delay
External Sonifier
Flow Rate = 60 ml/sec.
Refractive Index = 1.50 Particle/1.33 Medium
File: 101AY029

Summary	Percentiles		Dia	Vol%	Width
mv = 5.530	10% = 0.945	60% = 7.087	7.760	66%	5.194
mn = 0.648	20% = 1.362	70% = 8.063	1.212	34%	1.234
ma = 2.391	30% = 2.199	80% = 9.029			
cs = 2.509	40% = 4.085	90% = 10.23			
sd = 4.142	50% = 5.897	95% = 11.14			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	82.12	15.16						
592.0	100.00	0.00	7.778	66.96	11.97						
497.8	100.00	0.00	6.541	54.99	7.64						
418.6	100.00	0.00	5.500	47.35	4.81						
352.0	100.00	0.00	4.625	42.54	3.43						
296.0	100.00	0.00	3.889	39.11	2.87						
248.9	100.00	0.00	3.270	36.24	2.70						
209.3	100.00	0.00	2.750	33.54	2.72						
176.0	100.00	0.00	2.312	30.82	2.93						
148.0	100.00	0.00	1.945	27.89	3.42						
124.5	100.00	0.00	1.635	24.47	4.20						
104.7	100.00	0.00	1.375	20.27	4.85						
88.00	100.00	0.00	1.156	15.42	4.74						
74.00	100.00	0.00	0.972	10.68	3.76						
62.23	100.00	0.00	0.818	6.92	2.57						
52.33	100.00	0.00	0.688	4.35	1.66						
44.00	100.00	0.00	0.578	2.69	1.08						
37.00	100.00	0.00	0.486	1.61	0.73						
31.11	100.00	0.00	0.409	0.88	0.52						
26.16	100.00	0.00	0.344	0.36	0.36						
22.00	100.00	0.00	0.289	0.00	0.00						
18.50	100.00	0.00	0.243	0.00	0.00						
15.56	100.00	0.66	0.204	0.00	0.00						
13.08	99.34	4.88	0.172	0.00	0.00						
11.00	94.46	12.34	0.145	0.00	0.00						

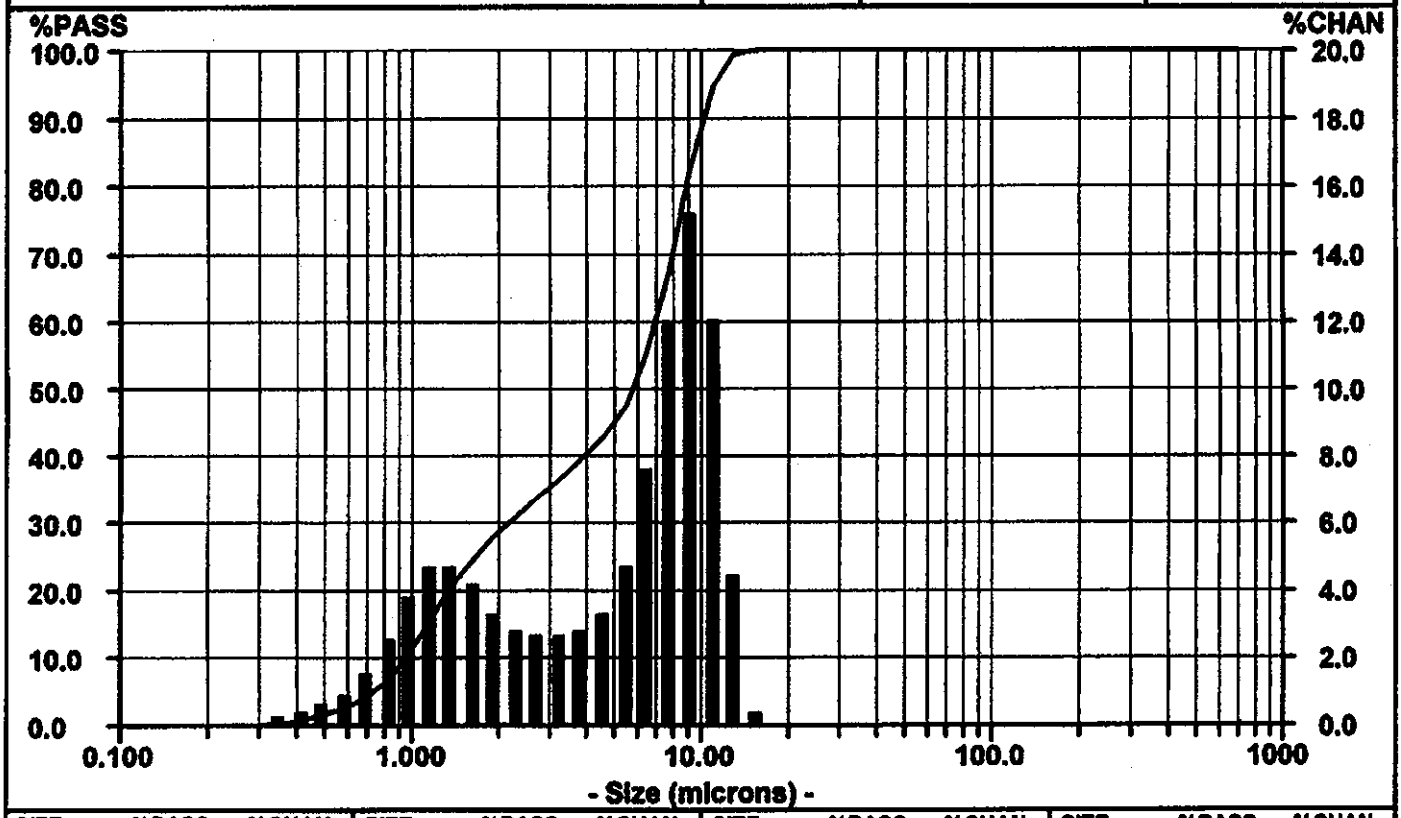
AY-101

AY-101 Sample

Date: 09/27/91 Meas #: 00001
Time: 14:30 Pres #: 01

1 M NaOH and 1 M NaNO3
2 minute sonication followed by a 60 min. delay
External Sonifier
Flow Rate = 60 ml/sec.
Refractive Index = 1.70 Particle/1.33 Medium
File: 101AY030

Summary	Percentiles		Dia	Vol%	Width
mv = 5.488	10% = 0.942	60% = 7.046	7.728	66%	5.150
mn = 0.649	20% = 1.354	70% = 8.017	1.212	34%	1.239
ma = 2.378	30% = 2.174	80% = 8.972			
cs = 2.523	40% = 4.010	90% = 10.16			
sd = 4.113	50% = 5.850	95% = 11.04			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	82.68	15.26						
592.0	100.00	0.00	7.778	67.42	12.08						
497.8	100.00	0.00	6.541	55.34	7.66						
418.6	100.00	0.00	5.500	47.68	4.80						
352.0	100.00	0.00	4.625	42.88	3.43						
296.0	100.00	0.00	3.889	39.45	2.90						
248.9	100.00	0.00	3.270	36.55	2.75						
209.3	100.00	0.00	2.750	33.80	2.77						
176.0	100.00	0.00	2.312	31.03	2.97						
148.0	100.00	0.00	1.945	28.06	3.44						
124.5	100.00	0.00	1.635	24.62	4.20						
104.7	100.00	0.00	1.375	20.42	4.87						
88.00	100.00	0.00	1.156	15.55	4.77						
74.00	100.00	0.00	0.972	10.78	3.80						
62.23	100.00	0.00	0.816	6.98	2.60						
52.33	100.00	0.00	0.686	4.38	1.68						
44.00	100.00	0.00	0.578	2.70	1.09						
37.00	100.00	0.00	0.486	1.61	0.73						
31.11	100.00	0.00	0.409	0.88	0.52						
26.16	100.00	0.00	0.344	0.36	0.36						
22.00	100.00	0.00	0.289	0.00	0.00						
18.50	100.00	0.00	0.243	0.00	0.00						
15.56	100.00	0.58	0.204	0.00	0.00						
13.08	99.42	4.58	0.172	0.00	0.00						
11.00	94.84	12.16	0.145	0.00	0.00						

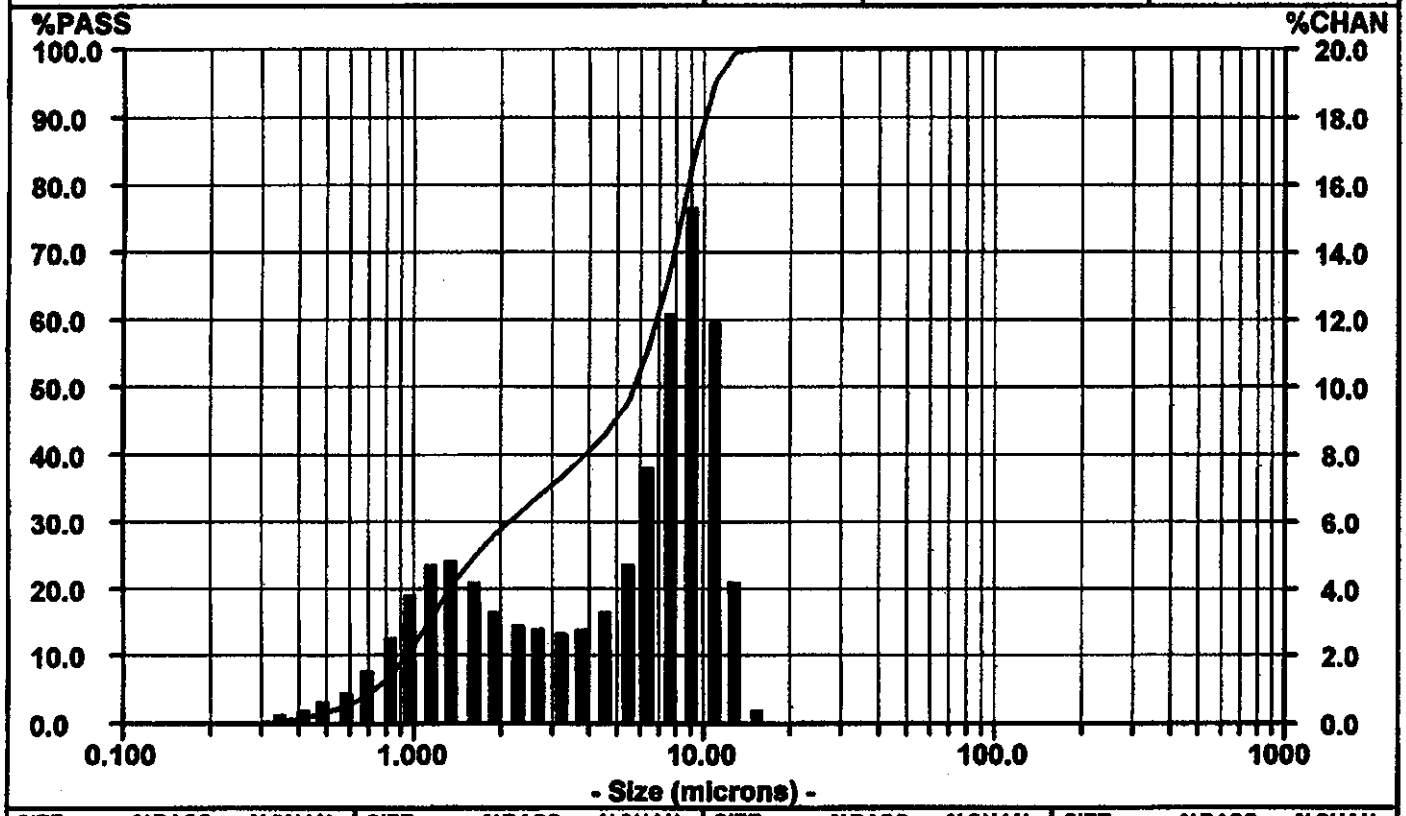
AY-101

AY-101
Sample

Date: 09/27/91 Meas #: 00001
Time: 14:36 Pres #: 01

1 M NaOH and 1 M NaNO3
2 minute sonication followed by a 60 min. delay
External Sonifier
Flow Rate = 17 ml/sec.
Refractive Index = 1.70 Particle/1.33 Medium
File: 101AY031

Summary	Percentiles		Dia	Vol%	Width
mv = 5.439	10% = 0.940	60% = 7.000	7.690	66%	5.080
mn = 0.650	20% = 1.348	70% = 7.962	1.213	34%	1.240
ma = 2.365	30% = 2.143	80% = 8.896			
cs = 2.537	40% = 3.940	90% = 10.06			
sd = 4.073	50% = 5.804	95% = 10.94			



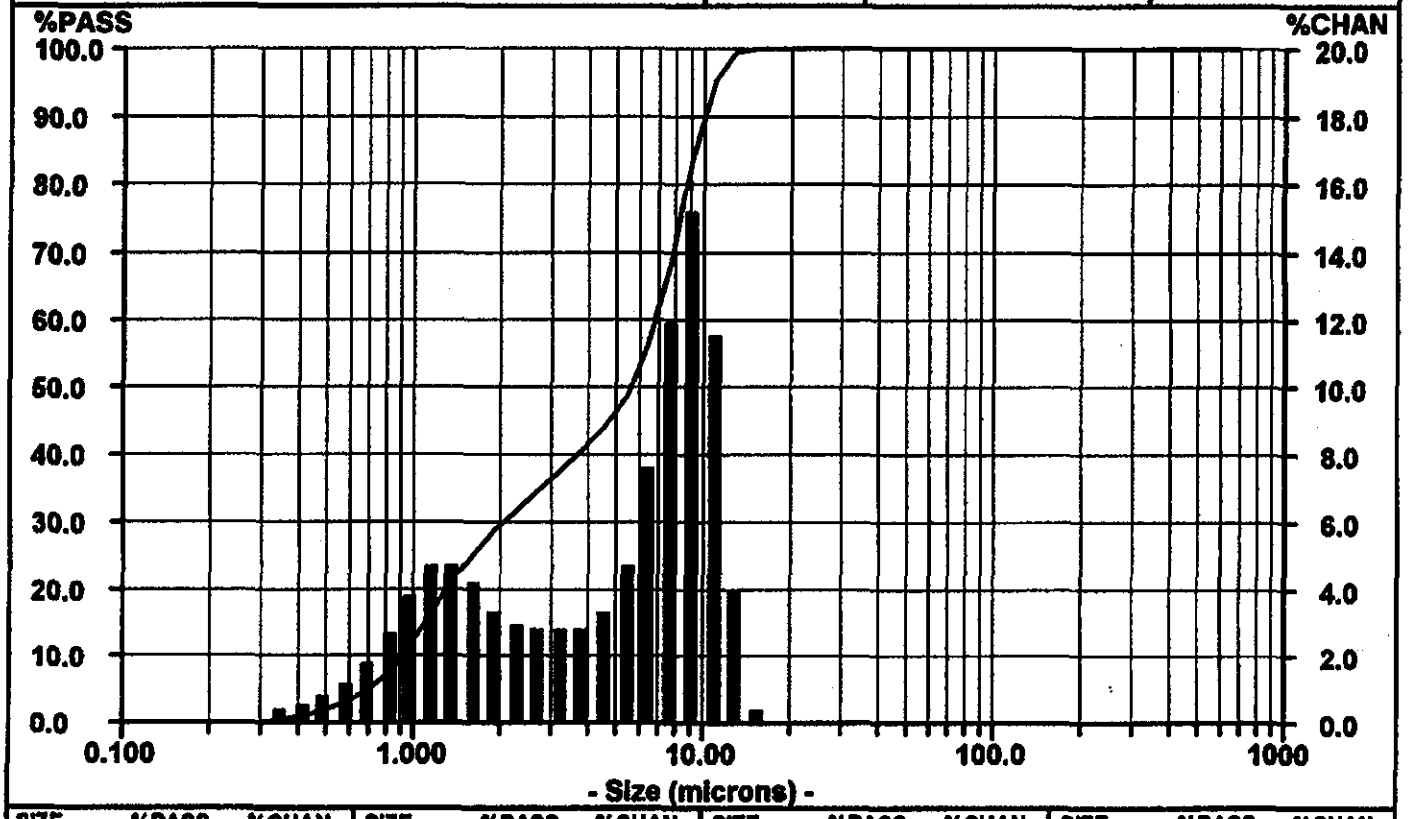
SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.260	83.42	16.44						
592.0	100.00	0.00	7.778	67.98	12.27						
497.8	100.00	0.00	6.541	55.71	7.72						
418.6	100.00	0.00	5.500	47.99	4.80						
352.0	100.00	0.00	4.625	43.19	3.42						
296.0	100.00	0.00	3.889	39.77	2.90						
248.9	100.00	0.00	3.270	36.87	2.77						
209.3	100.00	0.00	2.750	34.10	2.81						
176.0	100.00	0.00	2.312	31.29	3.01						
148.0	100.00	0.00	1.945	28.28	3.46						
124.5	100.00	0.00	1.635	24.80	4.24						
104.7	100.00	0.00	1.375	20.56	4.91						
88.00	100.00	0.00	1.156	15.65	4.81						
74.00	100.00	0.00	0.972	10.84	3.83						
62.23	100.00	0.00	0.818	7.01	2.62						
52.33	100.00	0.00	0.688	4.39	1.69						
44.00	100.00	0.00	0.578	2.70	1.09						
37.00	100.00	0.00	0.486	1.61	0.73						
31.11	100.00	0.00	0.409	0.88	0.52						
26.16	100.00	0.00	0.344	0.36	0.36						
22.00	100.00	0.00	0.289	0.00	0.00						
18.50	100.00	0.00	0.243	0.00	0.00						
15.56	100.00	0.48	0.204	0.00	0.00						
13.08	99.52	4.20	0.172	0.00	0.00						
11.00	95.32	11.90	0.145	0.00	0.00						

AY-101

1 M NaOH and 1 M NaNO3
2 minute sonication followed by a 60 min. delay
External Sonifier
Flow Rate = 17 ml/sec.
Refractive Index = 1.50 Particle/1.33 Medium
File: 101AY032

AY-101 Sample
Date: 09/27/91 Meas #: 00001
Time: 14:41 Pres #: 01

Summary	Percentiles		Dia	Vol%	Width
mv = 5.364	10% = 0.910	60% = 6.923	7.666	65%	5.103
mn = 0.620	20% = 1.311	70% = 7.907	1.197	35%	1.260
ma = 2.283	30% = 2.056	80% = 8.847			
cs = 2.628	40% = 3.745	90% = 10.02			
sd = 4.064	50% = 5.671	95% = 10.89			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	83.85	15.25						
592.0	100.00	0.00	7.778	68.60	12.09						
497.8	100.00	0.00	6.541	56.51	7.61						
418.6	100.00	0.00	5.500	48.90	4.78						
352.0	100.00	0.00	4.625	44.12	3.45						
296.0	100.00	0.00	3.889	40.67	2.96						
248.9	100.00	0.00	3.270	37.71	2.83						
209.3	100.00	0.00	2.750	34.88	2.85						
176.0	100.00	0.00	2.312	32.03	3.03						
148.0	100.00	0.00	1.945	29.00	3.47						
124.5	100.00	0.00	1.635	25.53	4.21						
104.7	100.00	0.00	1.375	21.32	4.89						
88.00	100.00	0.00	1.156	16.43	4.82						
74.00	100.00	0.00	0.972	11.61	3.89						
62.23	100.00	0.00	0.818	7.72	2.72						
52.33	100.00	0.00	0.688	5.00	1.81						
44.00	100.00	0.00	0.578	3.19	1.22						
37.00	100.00	0.00	0.486	1.97	0.86						
31.11	100.00	0.00	0.409	1.11	0.64						
26.16	100.00	0.00	0.344	0.47	0.47						
22.00	100.00	0.00	0.289	0.00	0.00						
18.50	100.00	0.00	0.243	0.00	0.00						
15.56	100.00	0.44	0.204	0.00	0.00						
13.08	99.56	4.02	0.172	0.00	0.00						
11.00	95.54	11.69	0.145	0.00	0.00						

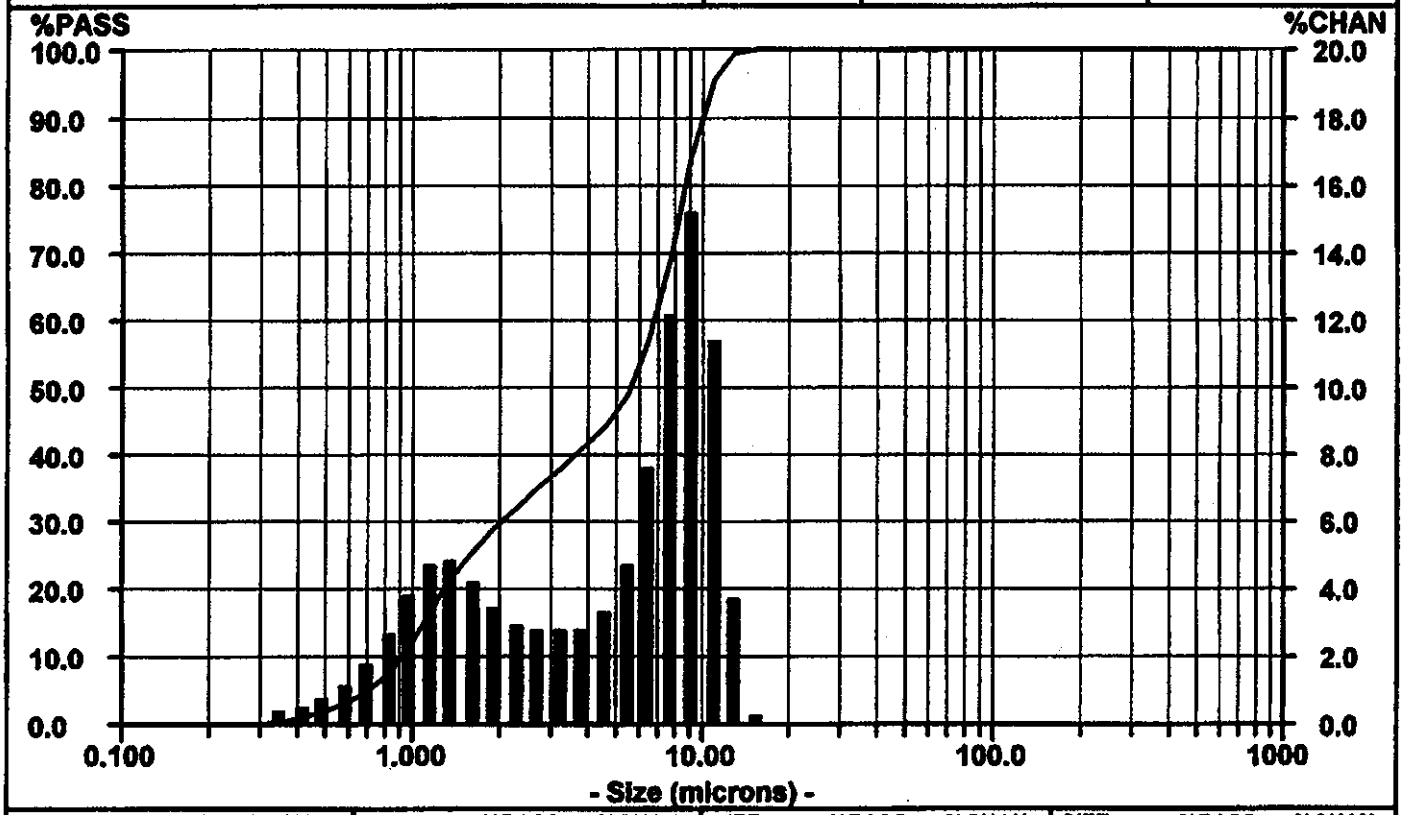
AY-101

AY-101
Sample

Date: 09/27/91 Meas #: 00001
Time: 14:45 Pres #: 01

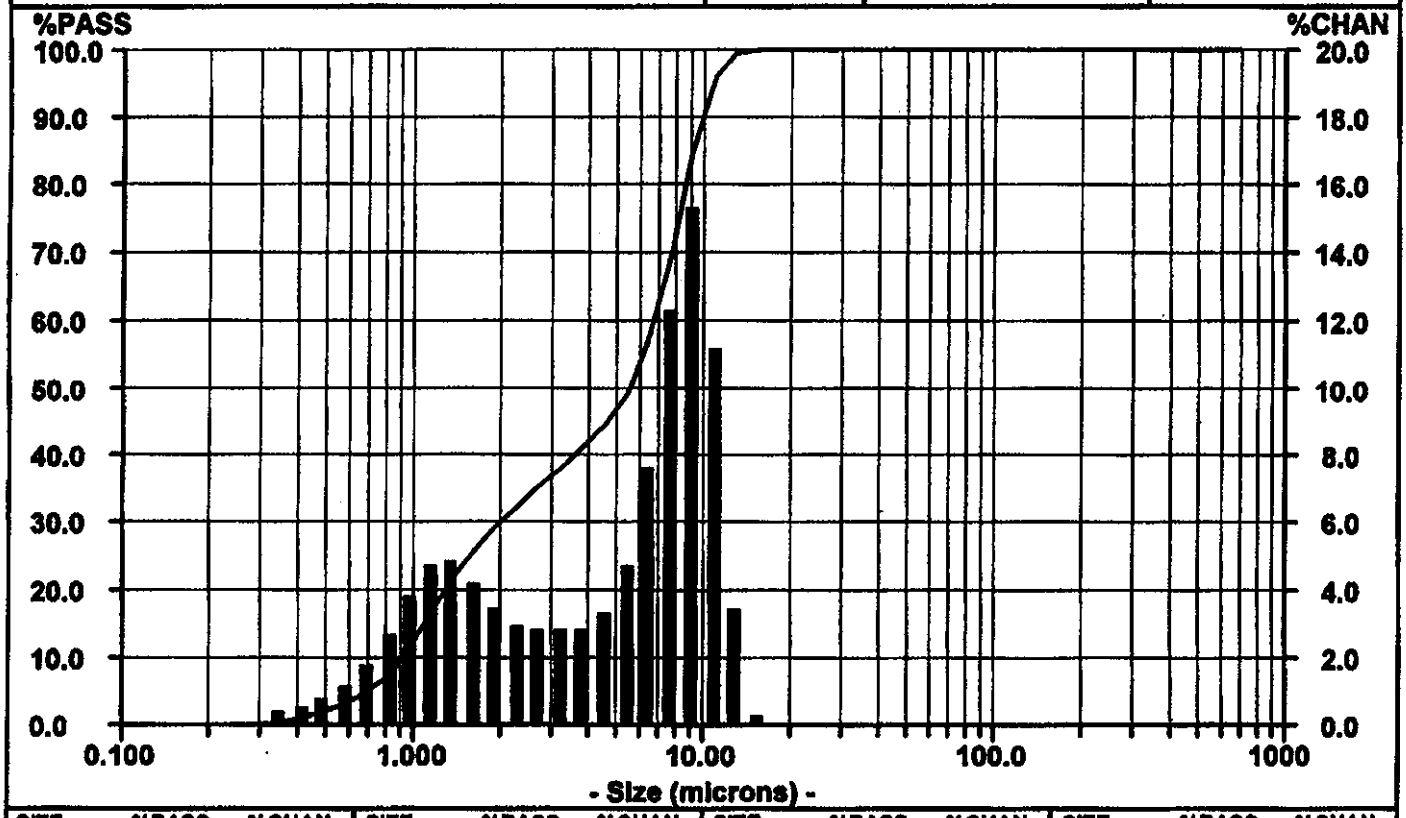
1 M NaOH and 1 M NaNO3
2 minute sonication followed by a 60 min. delay
External Sonifier
Flow Rate = 17 ml/sec.
Refractive Index = 2.00 Particle/1.33 Medium
File: 101AY033

Summary	Percentiles		Dia	Vol%	Width
mv = 5.328	10% = 0.908	60% = 6.889	7.638	65%	5.056
mn = 0.620	20% = 1.307	70% = 7.867	1.199	35%	1.265
ma = 2.272	30% = 2.037	80% = 8.797			
cs = 2.641	40% = 3.687	90% = 9.958			
sd = 4.037	50% = 5.632	95% = 10.82			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	84.37	15.34						
592.0	100.00	0.00	7.778	69.03	12.23						
497.8	100.00	0.00	6.541	56.80	7.85						
418.6	100.00	0.00	5.500	49.15	4.77						
352.0	100.00	0.00	4.625	44.38	3.44						
296.0	100.00	0.00	3.889	40.94	2.96						
248.9	100.00	0.00	3.270	37.98	2.86						
209.3	100.00	0.00	2.750	35.12	2.90						
176.0	100.00	0.00	2.312	32.22	3.07						
148.0	100.00	0.00	1.945	29.15	3.51						
124.5	100.00	0.00	1.635	25.64	4.24						
104.7	100.00	0.00	1.375	21.40	4.90						
88.00	100.00	0.00	1.156	16.50	4.83						
74.00	100.00	0.00	0.972	11.67	3.90						
62.23	100.00	0.00	0.818	7.77	2.73						
52.33	100.00	0.00	0.688	5.04	1.82						
44.00	100.00	0.00	0.578	3.22	1.23						
37.00	100.00	0.00	0.486	1.99	0.87						
31.11	100.00	0.00	0.409	1.12	0.65						
26.16	100.00	0.00	0.344	0.47	0.47						
22.00	100.00	0.00	0.289	0.00	0.00						
18.50	100.00	0.00	0.243	0.00	0.00						
15.56	100.00	0.39	0.204	0.00	0.00						
13.08	99.61	3.76	0.172	0.00	0.00						
11.00	95.85	11.48	0.145	0.00	0.00						

AY-101	AY-101 Sample	Date: 09/27/91 Time: 14:50	Meas #: 00001 Pres #: 01
1 M NaOH and 1 M NaNO3 2 minute sonication followed by a 60 min. delay External Sonifier Flow Rate = 40 ml/sec. Refractive Index = 2.00 Particle/1.33 Medium File: 101AY034	Summary mv = 5.296 mn = 0.620 ma = 2.266 cs = 2.648 sd = 4.012	Percentiles 10% = 0.908 60% = 6.855 20% = 1.304 70% = 7.829 30% = 2.024 80% = 8.750 40% = 3.645 90% = 9.899 50% = 5.593 95% = 10.75	Dia Vol% Width 7.608 65% 5.020 1.200 35% 1.265



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	84.86	16.42						
592.0	100.00	0.00	7.778	69.44	12.34						
497.8	100.00	0.00	6.541	57.10	7.70						
418.6	100.00	0.00	5.500	49.40	4.79						
352.0	100.00	0.00	4.625	44.61	3.46						
296.0	100.00	0.00	3.889	41.15	2.99						
248.9	100.00	0.00	3.270	38.16	2.89						
209.3	100.00	0.00	2.750	35.27	2.92						
176.0	100.00	0.00	2.312	32.35	3.09						
148.0	100.00	0.00	1.945	29.26	3.52						
124.5	100.00	0.00	1.635	25.74	4.26						
104.7	100.00	0.00	1.375	21.48	4.94						
88.00	100.00	0.00	1.156	16.54	4.86						
74.00	100.00	0.00	0.972	11.68	3.91						
62.23	100.00	0.00	0.818	7.77	2.73						
52.33	100.00	0.00	0.688	5.04	1.82						
44.00	100.00	0.00	0.578	3.22	1.23						
37.00	100.00	0.00	0.486	1.99	0.87						
31.11	100.00	0.00	0.409	1.12	0.65						
26.16	100.00	0.00	0.344	0.47	0.47						
22.00	100.00	0.00	0.289	0.00	0.00						
18.50	100.00	0.00	0.243	0.00	0.00						
15.56	100.00	0.34	0.204	0.00	0.00						
13.08	99.66	3.53	0.172	0.00	0.00						
11.00	96.13	11.27	0.145	0.00	0.00						

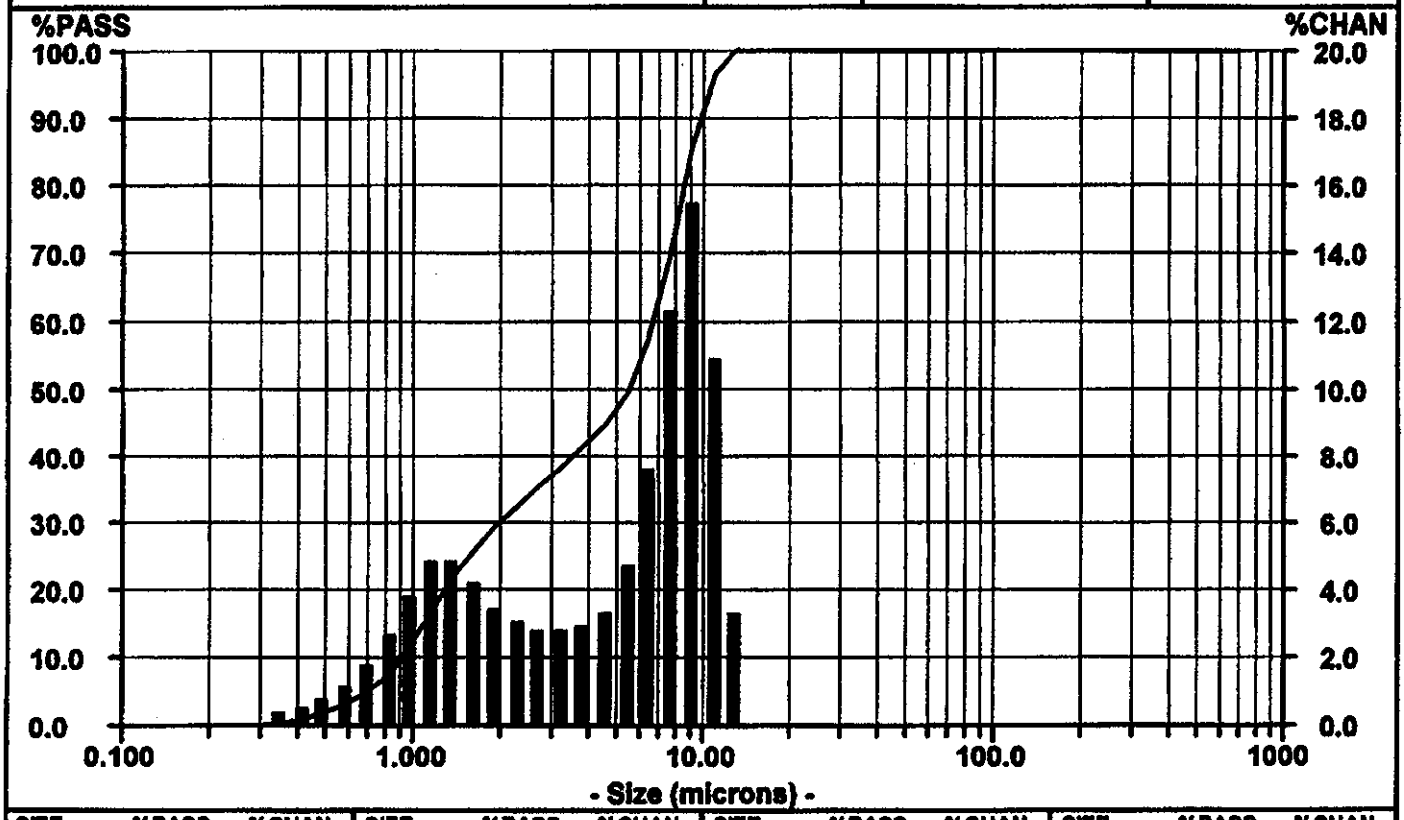
AY-101

AY-101
Sample

Date: 09/27/91 Meas #: 00001
Time: 14:54 Pres #: 01

1 M NaOH and 1 M NaNO3
2 minute sonication followed by a 60 min. delay
External Sonifier
Flow Rate = 40 ml/sec.
Refractive index = 1.70 Particle/1.33 Medium
File: 101AY035

Summary	Percentiles		Dia	Vol%	Width
mv = 5.239	10% = 0.907	60% = 6.807	7.570	64%	4.948
mn = 0.623	20% = 1.299	70% = 7.776	1.203	36%	1.266
ma = 2.255	30% = 1.999	80% = 8.682			
cs = 2.661	40% = 3.671	90% = 9.799			
sd = 3.975	50% = 5.534	95% = 10.61			



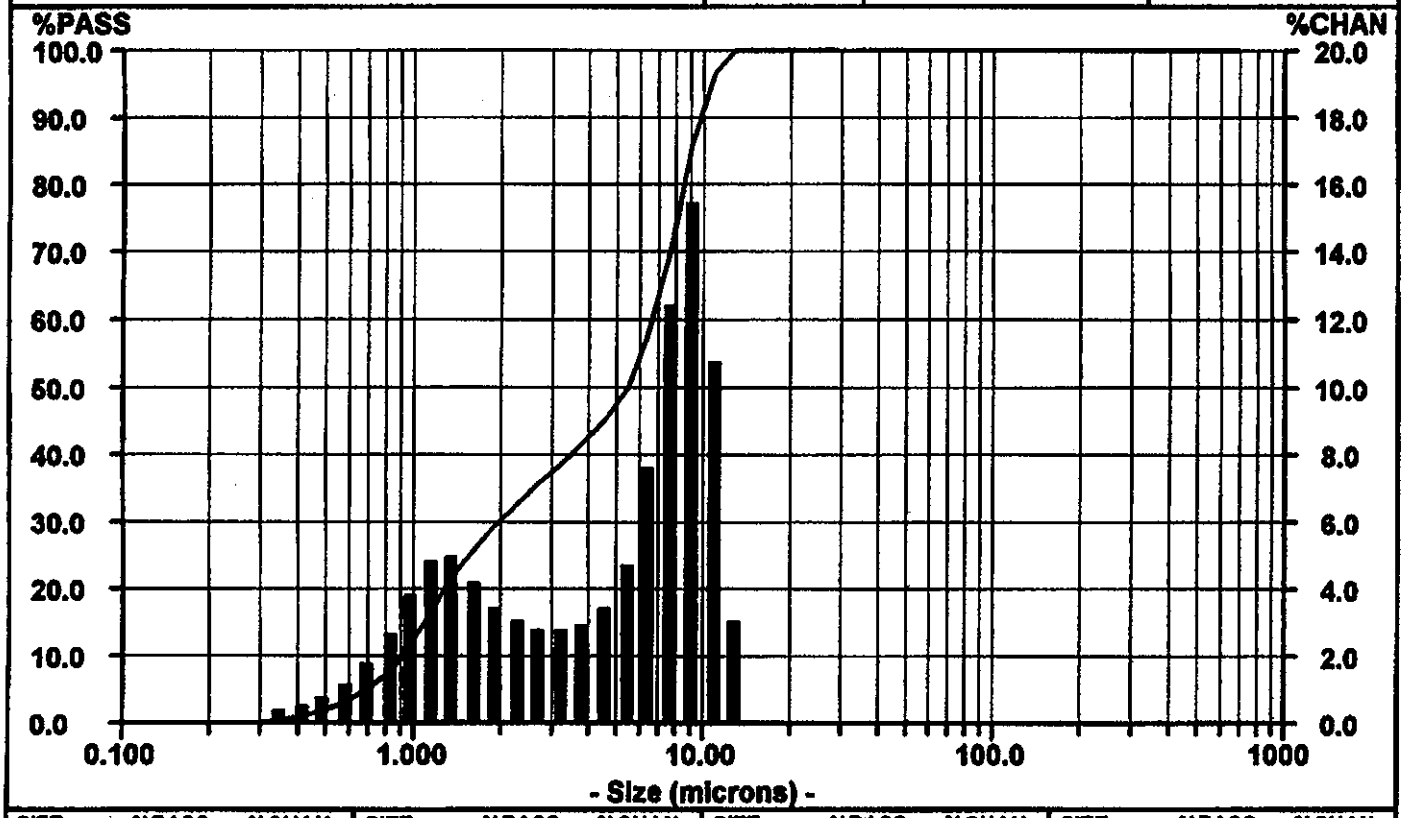
SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	85.61	15.59						
592.0	100.00	0.00	7.778	70.02	12.49						
497.8	100.00	0.00	6.541	57.53	7.75						
418.6	100.00	0.00	5.500	49.78	4.80						
352.0	100.00	0.00	4.625	44.98	3.47						
296.0	100.00	0.00	3.889	41.51	3.01						
248.9	100.00	0.00	3.270	38.50	2.92						
209.3	100.00	0.00	2.750	35.58	2.96						
176.0	100.00	0.00	2.312	32.62	3.13						
148.0	100.00	0.00	1.945	29.49	3.57						
124.5	100.00	0.00	1.635	25.92	4.31						
104.7	100.00	0.00	1.375	21.61	4.88						
88.00	100.00	0.00	1.156	16.63	4.90						
74.00	100.00	0.00	0.972	11.73	3.94						
62.23	100.00	0.00	0.818	7.79	2.75						
52.33	100.00	0.00	0.688	5.04	1.83						
44.00	100.00	0.00	0.578	3.21	1.24						
37.00	100.00	0.00	0.486	1.97	0.87						
31.11	100.00	0.00	0.409	1.10	0.64						
26.16	100.00	0.00	0.344	0.46	0.46						
22.00	100.00	0.00	0.289	0.00	0.00						
18.50	100.00	0.00	0.243	0.00	0.00						
15.56	100.00	0.00	0.204	0.00	0.00						
13.08	100.00	3.30	0.172	0.00	0.00						
11.00	96.70	11.09	0.145	0.00	0.00						

AY-101

AY-101 Sample — Date: 09/27/91 Time: 14:58 — Meas #: 00001 Pres #: 01

1 M NaOH and 1 M NaNO3
2 minute sonication followed by a 60 min. delay
External Sonifier
Flow Rate = 40 ml/sec.
Refractive Index = 1.50 Particle/1.33 Medium
File: 101AY036

Summary	Percentiles		Dia	Vol%	Width
mv = 5.206	10% = 0.904	60% = 6.765	7.541	64%	4.929
mn = 0.620	20% = 1.294	70% = 7.735	1.203	36%	1.270
ma = 2.241	30% = 1.982	80% = 8.641			
cs = 2.677	40% = 3.517	90% = 9.750			
sd = 3.955	50% = 5.482	95% = 10.56			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	86.01	15.55						
592.0	100.00	0.00	7.778	70.46	12.56						
497.8	100.00	0.00	6.541	57.90	7.79						
418.6	100.00	0.00	5.500	50.11	4.82						
352.0	100.00	0.00	4.625	45.29	3.50						
296.0	100.00	0.00	3.889	41.79	3.04						
248.9	100.00	0.00	3.270	38.75	2.95						
209.3	100.00	0.00	2.750	35.80	2.99						
176.0	100.00	0.00	2.312	32.81	3.16						
148.0	100.00	0.00	1.945	29.65	3.59						
124.5	100.00	0.00	1.635	26.06	4.34						
104.7	100.00	0.00	1.375	21.72	5.00						
88.00	100.00	0.00	1.156	16.72	4.91						
74.00	100.00	0.00	0.972	11.81	3.94						
62.23	100.00	0.00	0.818	7.87	2.76						
52.33	100.00	0.00	0.688	5.11	1.84						
44.00	100.00	0.00	0.578	3.27	1.25						
37.00	100.00	0.00	0.486	2.02	0.88						
31.11	100.00	0.00	0.409	1.14	0.66						
26.16	100.00	0.00	0.344	0.48	0.48						
22.00	100.00	0.00	0.289	0.00	0.00						
18.50	100.00	0.00	0.243	0.00	0.00						
15.56	100.00	0.00	0.204	0.00	0.00						
13.08	100.00	3.11	0.172	0.00	0.00						
11.00	96.89	10.88	0.145	0.00	0.00						

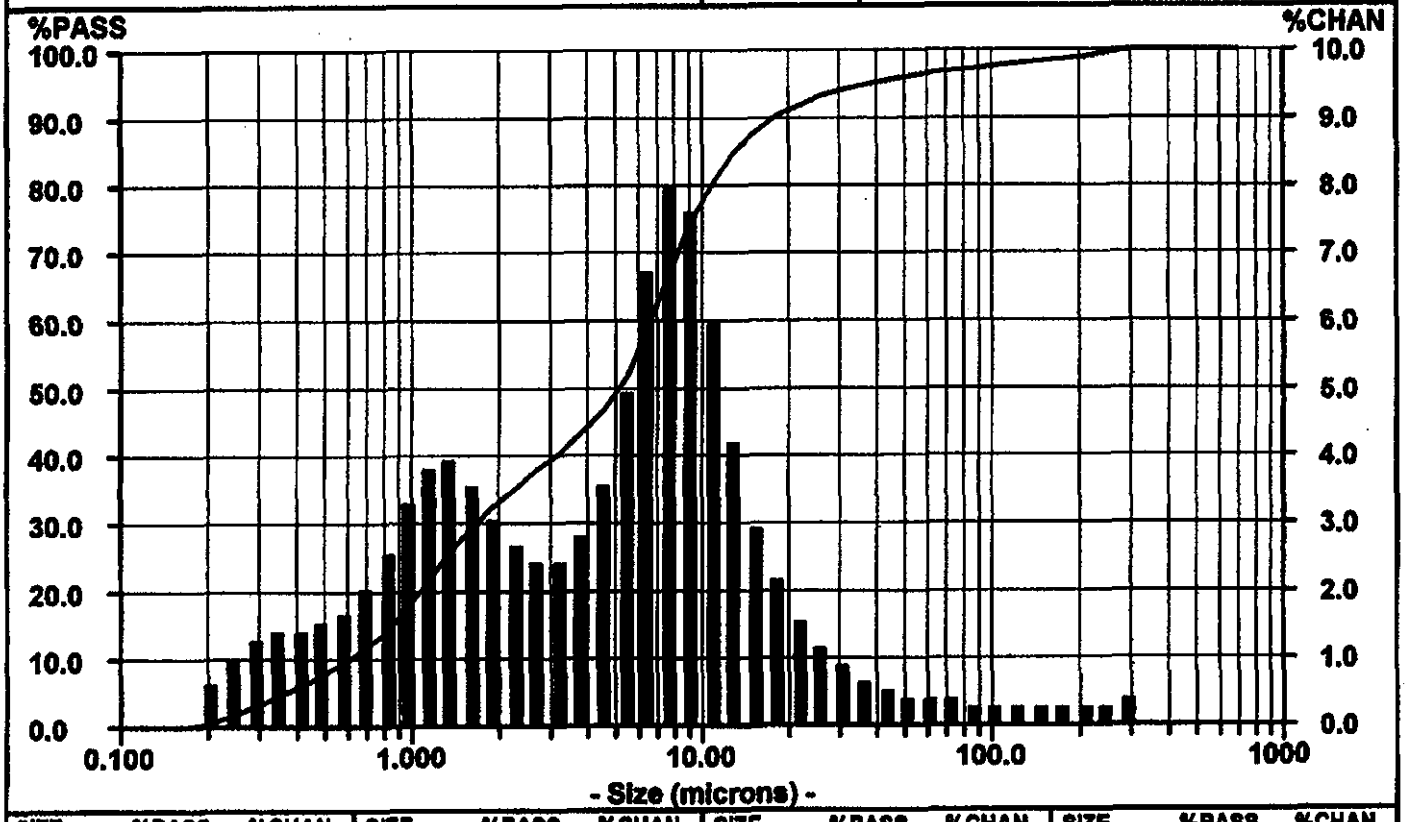
AY-101

AY-101
Sample

Date: 09/28/91 Meas #: 00001
Time: 10:58 Pres #: 01

1M NaNO3 and 1M NaOH
20 min. sonication followed by a 60 min. delay
External Sonifier
Flow Rate = 60 ml/sec.
Refractive Index = 1.50 Particle/1.33 Medium
File: 101AYD20

Summary	Percentiles		Dia	Vol%	Width
mv = 11.75	10% = 0.599	60% = 6.713	186.1	2%	134.0
mn = 0.305	20% = 1.070	70% = 8.309	7.715	62%	10.86
ma = 1.604	30% = 1.678	80% = 10.73	0.965	36%	1.268
cs = 3.741	40% = 3.165	90% = 17.87			
sd = 5.777	50% = 5.170	95% = 36.82			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	74.69	7.75						
592.0	100.00	0.00	7.778	66.94	8.11						
497.8	100.00	0.00	6.541	58.83	6.85						
418.6	100.00	0.00	5.500	51.98	5.00						
352.0	100.00	0.00	4.625	46.98	3.61						
296.0	100.00	0.50	3.889	43.37	2.87						
248.9	99.50	0.39	3.270	40.50	2.65						
209.3	99.11	0.35	2.750	37.92	2.56						
176.0	98.76	0.34	2.312	35.36	2.73						
148.0	98.42	0.34	1.945	32.63	3.11						
124.5	98.08	0.34	1.635	29.52	3.64						
104.7	97.74	0.35	1.375	25.88	4.06						
88.00	97.39	0.37	1.156	21.82	3.99						
74.00	97.02	0.41	0.972	17.83	3.40						
62.23	96.61	0.46	0.818	14.43	2.69						
52.33	96.15	0.52	0.688	11.74	2.13						
44.00	95.63	0.61	0.578	9.61	1.79						
37.00	95.02	0.75	0.486	7.82	1.60						
31.11	94.27	0.95	0.409	6.22	1.61						
26.16	93.32	1.26	0.344	4.71	1.47						
22.00	92.06	1.66	0.289	3.24	1.36						
18.50	90.40	2.23	0.243	1.88	1.10						
15.56	88.17	3.06	0.204	0.78	0.78						
13.08	85.11	4.33	0.172	0.00	0.00						
11.00	80.78	6.09	0.145	0.00	0.00						

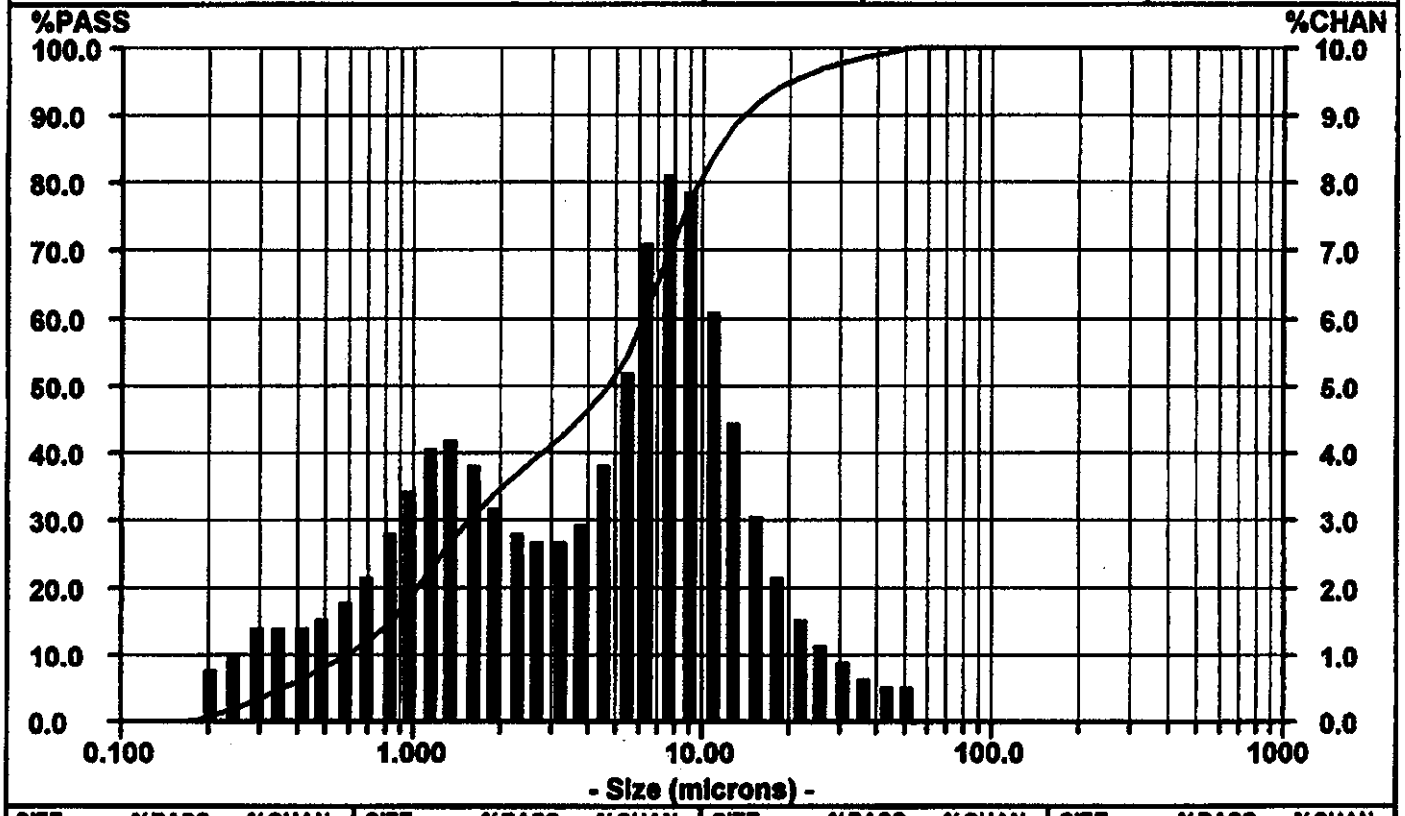
AY-101

AY-101
Sample

Date: 09/28/91 Meas #: 00001
Time: 11:02 Pres #: 01

1M NaNO3 and 1M NaOH
20 min. sonication followed by a 60 min. delay
External Sonifier
Flow Rate = 60 ml/sec.
Refractive Index = 1.70 Particle/1.33 Medium
File: 101AYD21

Summary		Percentiles		Dia	Vol%	Width
mv =	6.486	10% = 0.582	60% = 6.298	7.541	63%	9.712
mn =	0.303	20% = 1.034	70% = 7.785	0.967	37%	1.270
ma =	1.538	30% = 1.575	80% = 9.765			
cs =	3.900	40% = 2.821	90% = 13.98			
sd =	5.046	50% = 4.750	95% = 20.10			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	77.86	7.90						
592.0	100.00	0.00	7.778	69.96	8.28						
497.8	100.00	0.00	6.541	61.68	7.10						
418.6	100.00	0.00	5.500	54.58	5.29						
352.0	100.00	0.00	4.625	49.29	3.87						
296.0	100.00	0.00	3.889	45.42	3.07						
248.9	100.00	0.00	3.270	42.35	2.74						
209.3	100.00	0.00	2.750	39.61	2.70						
176.0	100.00	0.00	2.312	36.91	2.87						
148.0	100.00	0.00	1.945	34.04	3.27						
124.5	100.00	0.00	1.635	30.77	3.81						
104.7	100.00	0.00	1.375	26.96	4.23						
88.00	100.00	0.00	1.156	22.73	4.16						
74.00	100.00	0.00	0.972	18.57	3.57						
62.23	100.00	0.00	0.818	15.00	2.83						
52.33	100.00	0.63	0.688	12.17	2.24						
44.00	99.37	0.66	0.578	9.93	1.85						
37.00	98.71	0.76	0.486	8.08	1.64						
31.11	97.96	0.93	0.409	6.44	1.53						
26.16	97.03	1.23	0.344	4.91	1.49						
22.00	95.80	1.66	0.289	3.42	1.40						
18.50	94.14	2.29	0.243	2.02	1.16						
15.56	91.85	3.19	0.204	0.86	0.86						
13.08	88.66	4.52	0.172	0.00	0.00						
11.00	84.14	6.28	0.145	0.00	0.00						

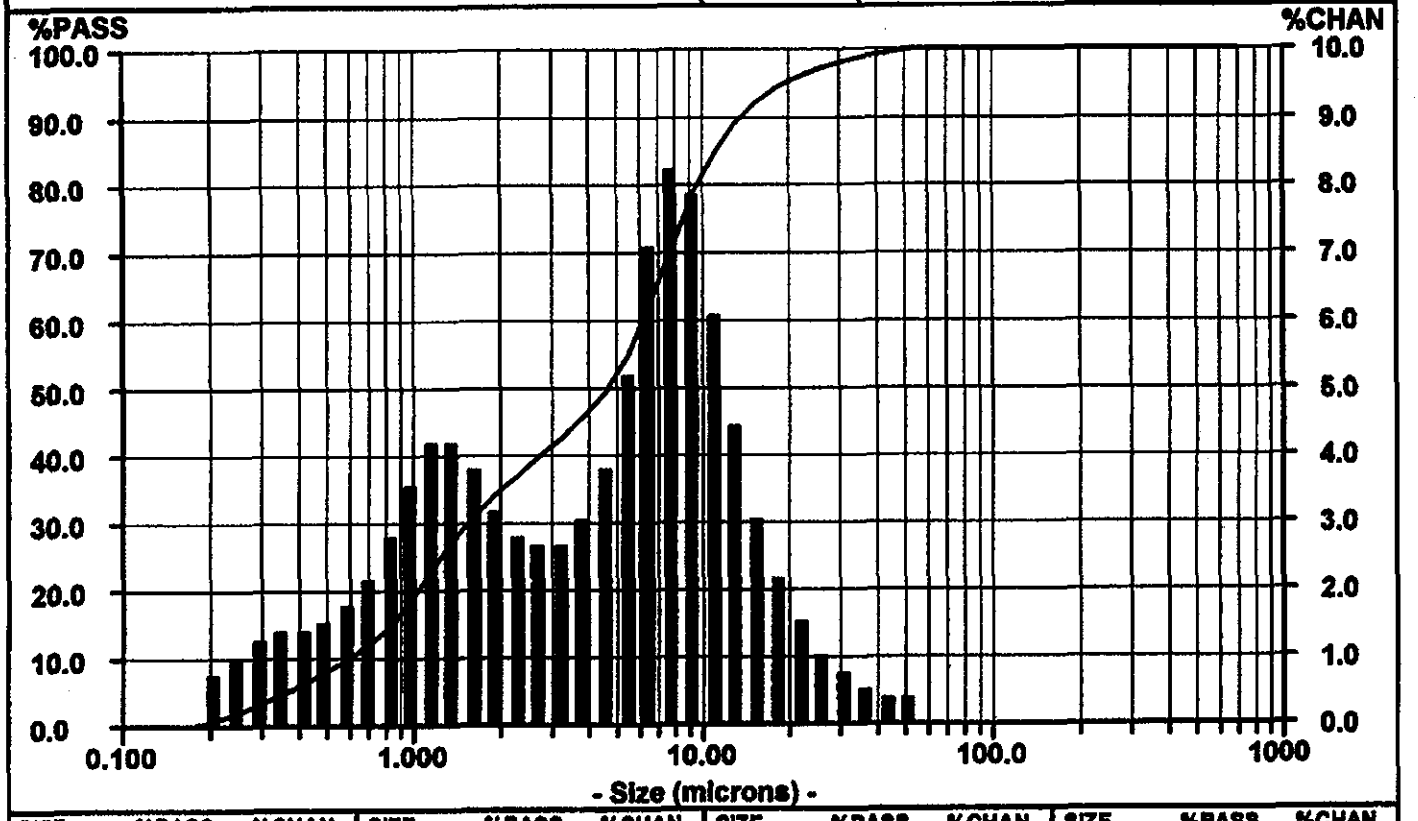
AY-101

AY-101
Sample

Date: 09/28/91 Meas #: 00001
Time: 11:07 Pres #: 01

1M NaNO3 and 1M NaOH
20 min. sonication followed by a 60 min. delay
External Sonifier
Flow Rate = 60 ml/sec.
Refractive Index = 2.00 Particle/1.33 Medium
File: 101AYD22

Summary	Percentiles		Dia	Vol%	Width
mv = 6.330	10% = 0.583	60% = 6.232	7.489	63%	9.413
mn = 0.304	20% = 1.031	70% = 7.709	0.971	37%	1.267
ma = 1.534	30% = 1.559	80% = 9.636			
cs = 3.911	40% = 2.764	90% = 13.61			
sd = 4.961	50% = 4.677	95% = 19.22			



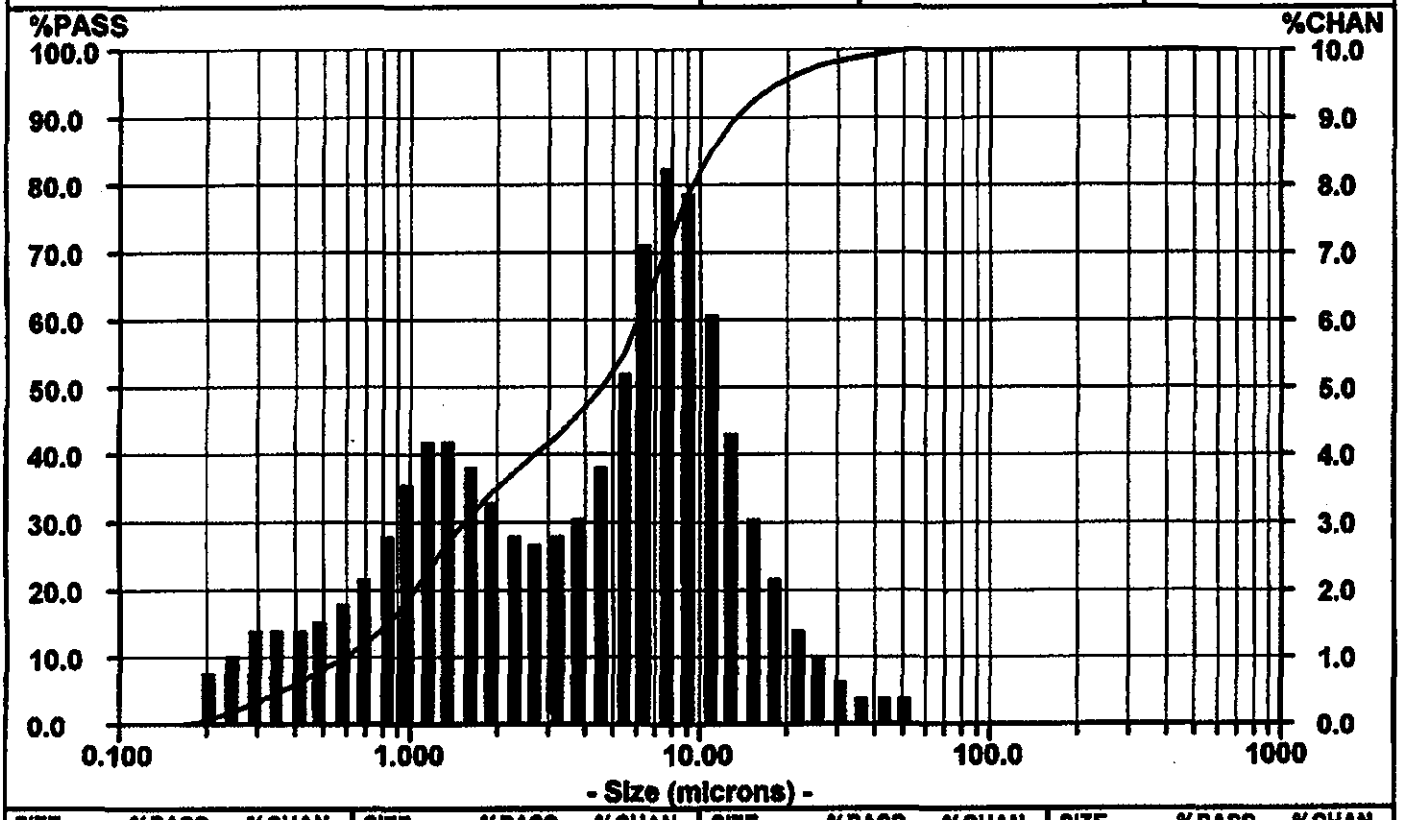
SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	78.36	7.92						
592.0	100.00	0.00	7.778	70.44	8.30						
497.8	100.00	0.00	6.541	62.14	7.12						
418.6	100.00	0.00	5.500	55.02	5.32						
352.0	100.00	0.00	4.625	49.70	3.90						
296.0	100.00	0.00	3.889	45.80	3.11						
248.9	100.00	0.00	3.270	42.69	2.77						
209.3	100.00	0.00	2.750	39.92	2.72						
176.0	100.00	0.00	2.312	37.20	2.90						
148.0	100.00	0.00	1.945	34.30	3.29						
124.5	100.00	0.00	1.635	31.01	3.86						
104.7	100.00	0.00	1.375	27.15	4.30						
88.00	100.00	0.00	1.156	22.85	4.23						
74.00	100.00	0.00	0.972	18.62	3.62						
62.23	100.00	0.00	0.818	15.00	2.85						
52.33	100.00	0.52	0.688	12.15	2.24						
44.00	99.48	0.56	0.578	9.91	1.86						
37.00	98.92	0.67	0.486	8.05	1.64						
31.11	98.25	0.86	0.409	6.41	1.53						
26.16	97.39	1.17	0.344	4.88	1.49						
22.00	96.22	1.62	0.289	3.39	1.39						
18.50	94.60	2.26	0.243	2.00	1.15						
15.56	92.34	3.17	0.204	0.85	0.85						
13.08	89.17	4.52	0.172	0.00	0.00						
11.00	84.65	6.29	0.145	0.00	0.00						

AY-101

AY-101 Sample — Date: 09/28/91 Time: 11:11 — Meas #: 00001 Pres #: 01

1M NaNO3 and 1M NaOH
20 min. sonication followed by a 60 min. delay
External Sonifier
Flow Rate = 17 ml/sec.
Refractive Index = 2.00 Particle/1.33 Medium
File: 101AYD23

Summary		Percentiles		Dia	Vol%	Width
mv =	6.202	10% = 0.581	60% = 6.179	7.437	63%	9.181
mn =	0.306	20% = 1.027	70% = 7.635	0.974	37%	1.267
ma =	1.528	30% = 1.546	80% = 9.518			
cs =	3.926	40% = 2.716	90% = 13.33			
sd =	4.880	50% = 4.618	95% = 18.54			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	78.86	7.94						
592.0	100.00	0.00	7.778	70.92	8.39						
497.8	100.00	0.00	6.541	62.53	7.16						
418.6	100.00	0.00	5.500	55.37	6.33						
352.0	100.00	0.00	4.625	50.04	3.91						
296.0	100.00	0.00	3.889	46.13	3.13						
248.9	100.00	0.00	3.270	43.00	2.80						
209.3	100.00	0.00	2.750	40.20	2.75						
176.0	100.00	0.00	2.312	37.45	2.92						
148.0	100.00	0.00	1.945	34.53	3.32						
124.5	100.00	0.00	1.635	31.21	3.89						
104.7	100.00	0.00	1.375	27.32	4.36						
88.00	100.00	0.00	1.156	22.96	4.28						
74.00	100.00	0.00	0.972	18.68	3.64						
62.23	100.00	0.00	0.818	15.04	2.85						
52.33	100.00	0.45	0.688	12.19	2.24						
44.00	99.55	0.49	0.578	9.95	1.86						
37.00	99.06	0.60	0.486	8.09	1.65						
31.11	98.46	0.79	0.409	6.44	1.55						
26.16	97.67	1.11	0.344	4.89	1.51						
22.00	96.56	1.58	0.289	3.38	1.41						
18.50	94.98	2.23	0.243	1.97	1.15						
15.56	92.75	3.14	0.204	0.82	0.82						
13.08	89.61	4.48	0.172	0.00	0.00						
11.00	85.13	6.27	0.145	0.00	0.00						

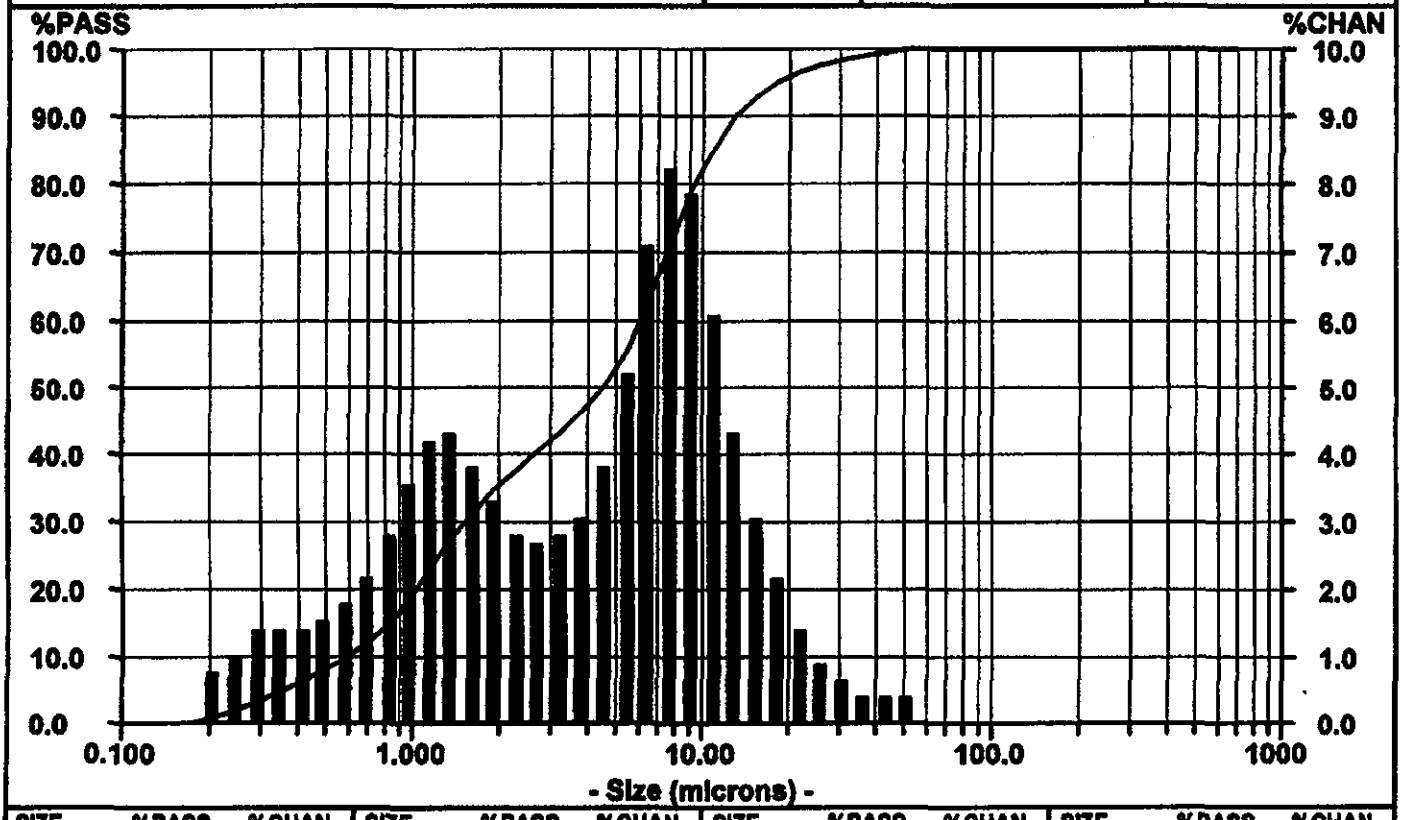
AY-101

AY-101
Sample

Date: 09/28/91 Meas #: 00001
Time: 11:15 Pres #: 01

1M NaNO3 and 1M NaOH
20 min. sonication followed by a 60 min. delay
External Sonifier
Flow Rate = 17 ml/sec.
Refractive Index = 1.50 Particle/1.33 Medium
File: 101AYD24

Summary	Percentiles		Dia	Vol%	Width
mv = 6.106	10% = 0.580	60% = 6.127	7.400	62%	9.005
mn = 0.306	20% = 1.024	70% = 7.579	0.976	38%	1.266
ma = 1.524	30% = 1.534	80% = 9.431			
cs = 3.938	40% = 2.674	90% = 13.11			
sd = 4.822	50% = 4.562	95% = 18.08			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.260	79.23	7.95						
592.0	100.00	0.00	7.778	71.28	8.38						
497.8	100.00	0.00	6.541	62.90	7.19						
418.6	100.00	0.00	5.500	55.71	5.36						
352.0	100.00	0.00	4.625	50.35	3.93						
296.0	100.00	0.00	3.889	46.42	3.15						
248.8	100.00	0.00	3.270	43.27	2.82						
209.3	100.00	0.00	2.750	40.45	2.78						
176.0	100.00	0.00	2.312	37.67	2.94						
148.0	100.00	0.00	1.945	34.73	3.34						
124.5	100.00	0.00	1.635	31.39	3.93						
104.7	100.00	0.00	1.375	27.46	4.40						
88.00	100.00	0.00	1.156	23.06	4.32						
74.00	100.00	0.00	0.972	18.74	3.66						
62.23	100.00	0.00	0.818	15.08	2.86						
52.33	100.00	0.40	0.688	12.22	2.26						
44.00	99.60	0.44	0.578	9.97	1.67						
37.00	99.16	0.55	0.486	8.10	1.66						
31.11	98.61	0.74	0.409	6.44	1.56						
26.16	97.87	1.07	0.344	4.88	1.52						
22.00	96.80	1.54	0.289	3.36	1.41						
18.50	95.26	2.20	0.243	1.95	1.14						
15.56	93.06	3.11	0.204	0.81	0.81						
13.08	89.95	4.46	0.172	0.00	0.00						
11.00	85.49	6.26	0.145	0.00	0.00						

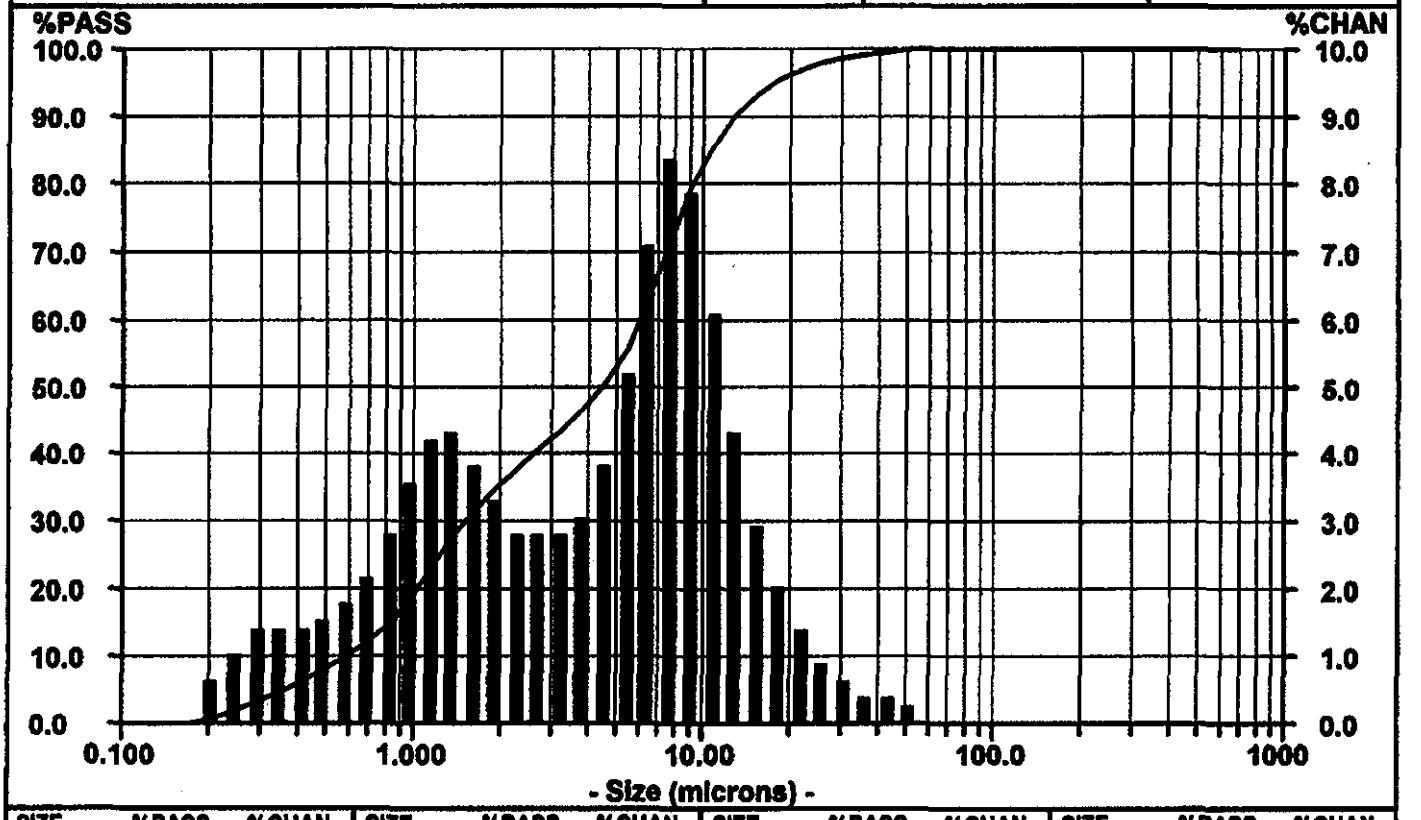
AY-101

AY-101 Sample

Date: 09/28/91 Meas #: 00001
Time: 11:19 Pres #: 01

1M NaNO3 and 1M NaOH
20 min. sonication followed by a 60 min. delay
External Sonifier
Flow Rate = 17 ml/sec.
Refractive Index = 1.70 Particle/1.33 Medium
File: 101AYD25

Summary	Percentiles		Dia	Vol%	Width
mv = 6.016	10% = 0.578	60% = 6.088	7.367	62%	8.845
mn = 0.308	20% = 1.022	70% = 7.529	0.978	38%	1.265
ma = 1.520	30% = 1.524	80% = 9.346			
cs = 3.947	40% = 2.640	90% = 12.91			
sd = 4.770	50% = 4.512	95% = 17.63			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.260	79.59	7.98						
592.0	100.00	0.00	7.778	71.61	8.43						
497.8	100.00	0.00	6.541	63.18	7.20						
418.6	100.00	0.00	5.500	55.98	5.35						
352.0	100.00	0.00	4.625	50.63	3.94						
296.0	100.00	0.00	3.889	46.69	3.17						
248.9	100.00	0.00	3.270	43.52	2.86						
209.3	100.00	0.00	2.750	40.66	2.81						
176.0	100.00	0.00	2.312	37.85	2.96						
148.0	100.00	0.00	1.945	34.89	3.35						
124.5	100.00	0.00	1.636	31.54	3.95						
104.7	100.00	0.00	1.375	27.59	4.44						
88.00	100.00	0.00	1.156	23.15	4.38						
74.00	100.00	0.00	0.972	18.79	3.68						
62.23	100.00	0.00	0.818	15.11	2.86						
52.33	100.00	0.35	0.688	12.25	2.24						
44.00	99.65	0.40	0.578	10.01	1.87						
37.00	99.25	0.51	0.486	8.14	1.67						
31.11	98.74	0.70	0.409	6.47	1.59						
26.16	98.04	1.02	0.344	4.88	1.55						
22.00	97.02	1.49	0.289	3.33	1.43						
18.50	95.53	2.16	0.243	1.90	1.12						
15.56	93.37	3.08	0.204	0.78	0.78						
13.08	90.29	4.44	0.172	0.00	0.00						
11.00	85.85	6.26	0.145	0.00	0.00						

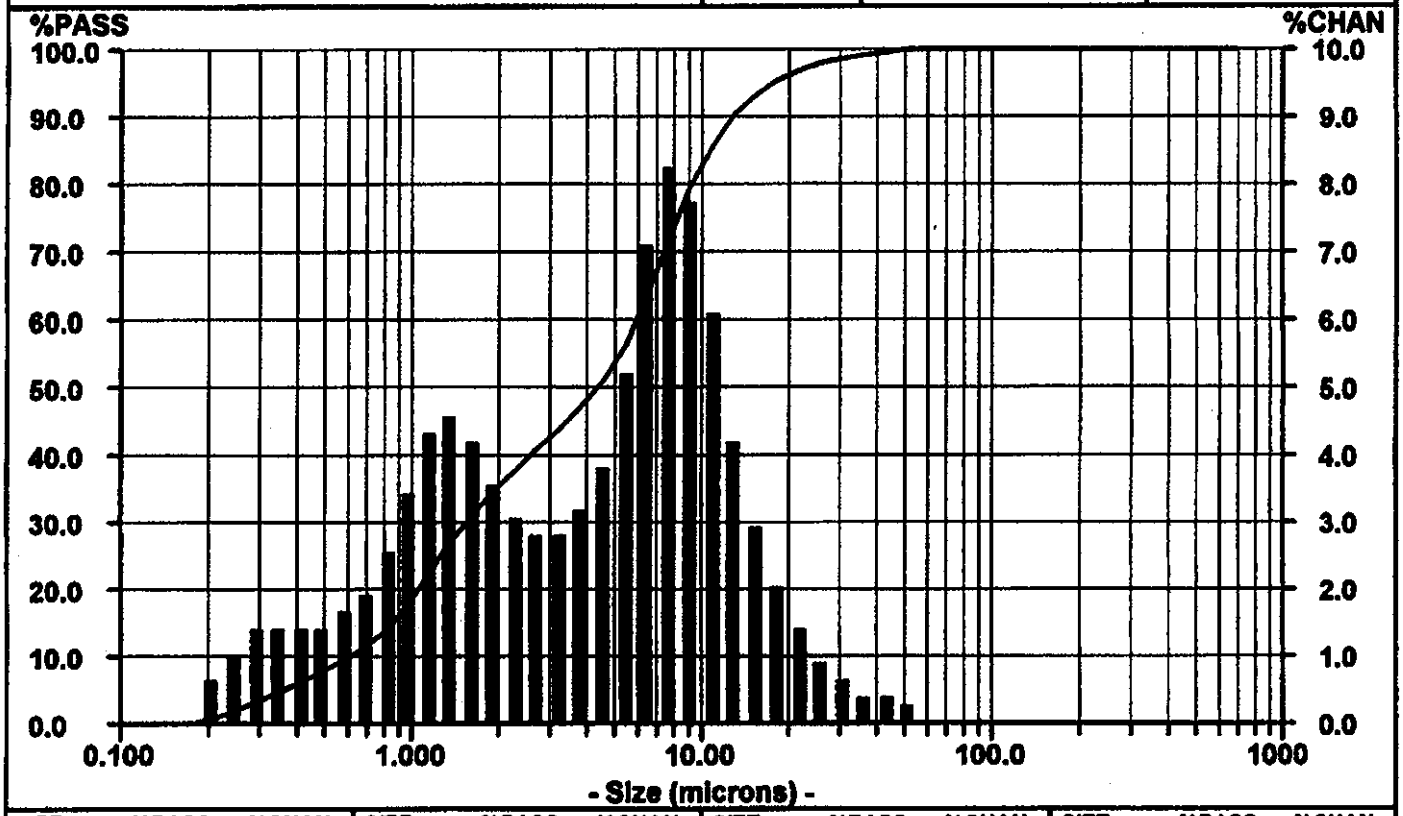
AY-101

AY-101
Sample

Date: 09/28/91 Meas #: 00001
Time: 11:24 Pres #: 01

1M NaNO3 and 1M NaOH
20 min. sonication followed by a 60 min. delay
External Sonifier
Flow Rate = 40 ml/sec.
Refractive Index = 1.70 Particle/1.33 Medium
File: 101AYD26

Summary	Percentiles		Dia	Vol%	Width
mv = 5.988	10% = 0.599	60% = 6.021	7.320	62%	8.863
mn = 0.306	20% = 1.057	70% = 7.472	1.015	38%	1.292
ma = 1.540	30% = 1.554	80% = 9.293			
cs = 3.896	40% = 2.603	90% = 12.85			
sd = 4.727	50% = 4.427	95% = 17.57			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.260	79.82	7.87						
592.0	100.00	0.00	7.778	71.95	8.33						
497.8	100.00	0.00	6.541	63.62	7.16						
418.6	100.00	0.00	5.500	56.47	5.36						
352.0	100.00	0.00	4.625	51.11	3.98						
296.0	100.00	0.00	3.889	47.13	3.24						
248.9	100.00	0.00	3.270	43.89	2.96						
209.3	100.00	0.00	2.750	40.93	2.96						
176.0	100.00	0.00	2.312	37.97	3.17						
148.0	100.00	0.00	1.945	34.80	3.61						
124.5	100.00	0.00	1.635	31.19	4.21						
104.7	100.00	0.00	1.375	26.98	4.63						
88.00	100.00	0.00	1.156	22.35	4.40						
74.00	100.00	0.00	0.972	17.95	3.58						
62.23	100.00	0.00	0.818	14.37	2.69						
52.33	100.00	0.35	0.688	11.68	2.07						
44.00	99.65	0.40	0.578	9.61	1.72						
37.00	99.25	0.51	0.486	7.89	1.56						
31.11	98.74	0.70	0.409	6.33	1.51						
26.16	98.04	1.01	0.344	4.82	1.50						
22.00	97.03	1.47	0.289	3.32	1.41						
18.50	95.56	2.13	0.243	1.91	1.12						
15.56	93.43	3.04	0.204	0.79	0.79						
13.08	90.39	4.39	0.172	0.00	0.00						
11.00	86.00	6.18	0.145	0.00	0.00						

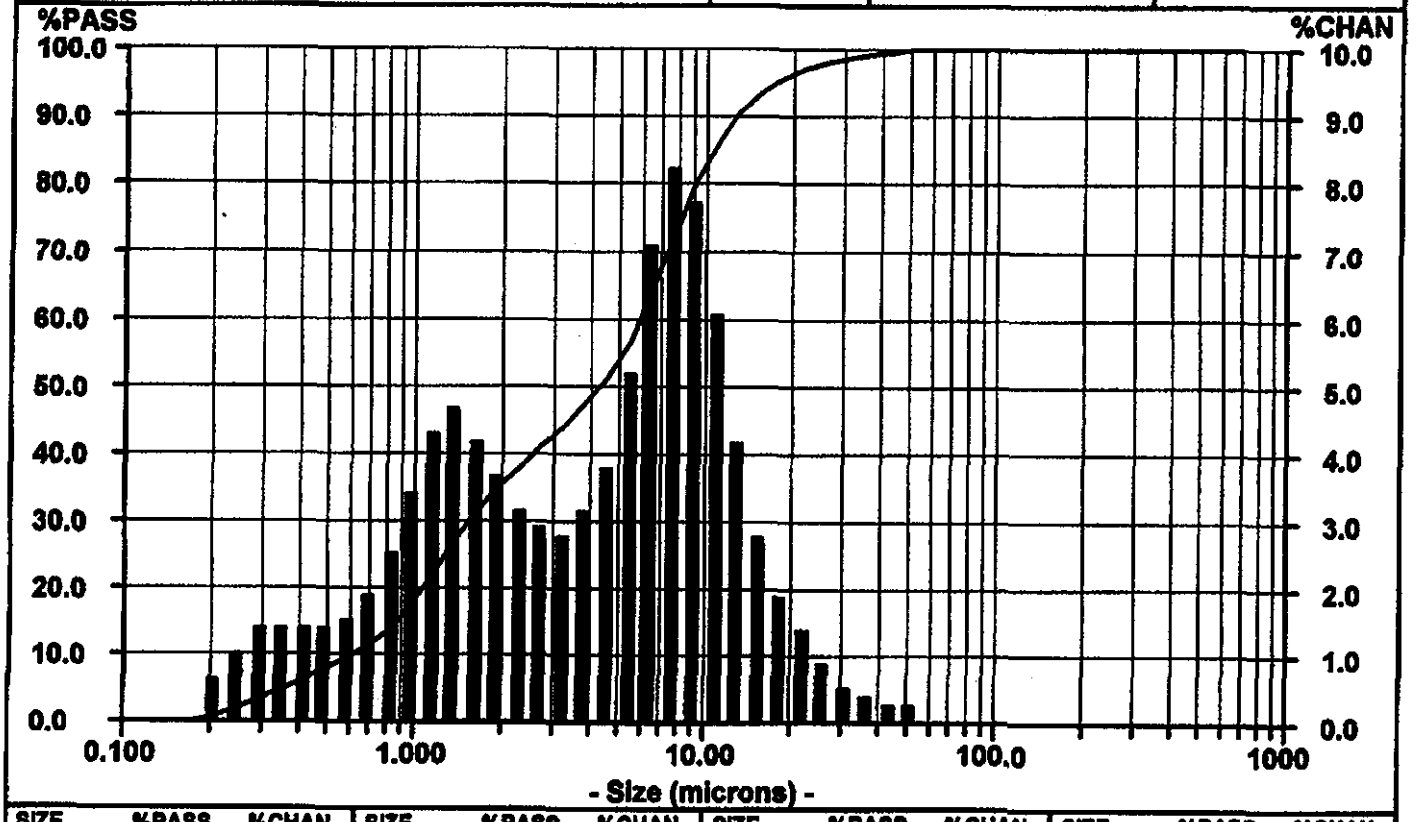
AY-101

1M NaNO3 and 1M NaOH
20 min. sonication followed by a 60 min. delay
External Sonifier
Flow Rate = 40 ml/sec.
Refractive Index = 1.50 Particle/1.33 Medium
File: 101AYD27

AY-101
Sample

Date: 09/26/91 Meas #: 00001
Time: 11:28 Pres #: 01

Summary	Percentiles		Dia	Vol%	Width
mv = 5.930	10% = 0.602	60% = 5.968	7.516	59%	8.604
mn = 0.306	20% = 1.065	70% = 7.418	1.193	36%	1.349
ma = 1.538	30% = 1.549	80% = 9.220	0.260	5%	0.111
cs = 3.902	40% = 2.555	90% = 12.73			
sd = 4.679	50% = 4.357	95% = 17.37			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	80.14	7.84						
592.0	100.00	0.00	7.778	72.30	8.32						
497.8	100.00	0.00	6.541	63.98	7.14						
418.6	100.00	0.00	5.500	56.84	5.35						
352.0	100.00	0.00	4.625	51.49	3.98						
296.0	100.00	0.00	3.889	47.51	3.25						
248.9	100.00	0.00	3.270	44.26	2.99						
209.3	100.00	0.00	2.750	41.27	3.01						
176.0	100.00	0.00	2.312	38.26	3.24						
148.0	100.00	0.00	1.945	35.02	3.71						
124.5	100.00	0.00	1.635	31.31	4.35						
104.7	100.00	0.00	1.375	26.96	4.76						
88.00	100.00	0.00	1.156	22.20	4.46						
74.00	100.00	0.00	0.972	17.74	3.56						
62.23	100.00	0.00	0.818	14.19	2.62						
52.33	100.00	0.34	0.688	11.57	1.99						
44.00	99.66	0.38	0.578	9.58	1.67						
37.00	99.28	0.49	0.486	7.91	1.54						
31.11	98.79	0.68	0.409	6.37	1.51						
26.16	98.11	0.99	0.344	4.86	1.52						
22.00	97.12	1.44	0.289	3.34	1.42						
18.50	95.68	2.09	0.243	1.92	1.13						
15.56	93.59	2.99	0.204	0.79	0.79						
13.08	90.60	4.33	0.172	0.00	0.00						
11.00	86.27	6.13	0.145	0.00	0.00						

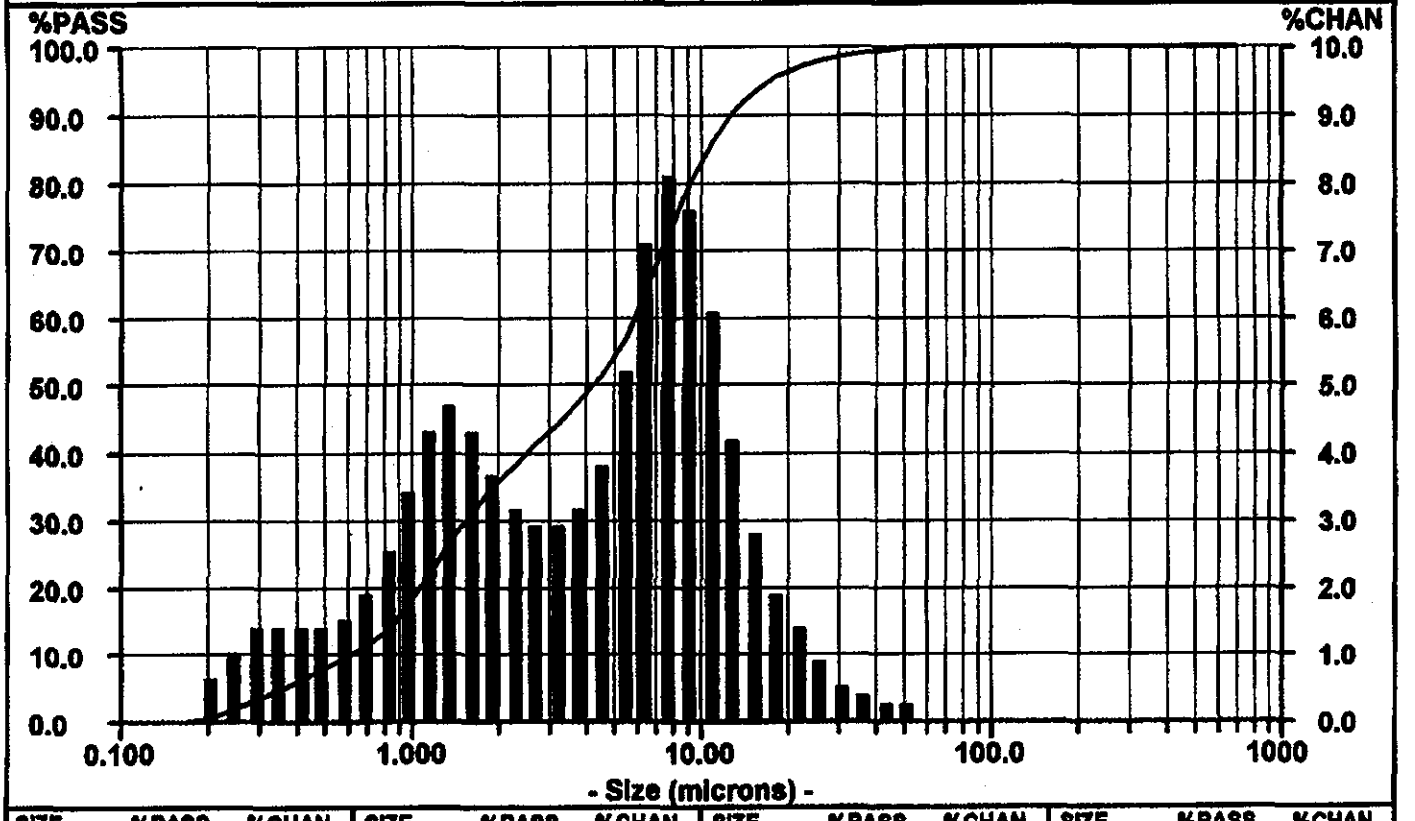
AY-101

AY-101
Sample

Date: 09/28/91 Meas #: 00001
Time: 11:32 Pres #: 01

1M NaNO3 and 1M NaOH
20 min. sonication followed by a 60 min. delay
External Sonifier
Flow Rate = 40 ml/sec.
Refractive Index = 2.00 Particle/1.33 Medium
File: 101AYD28

Summary		Percentiles		Dia	Vol%	Width
mv =	5.902	10% = 0.606	60% = 5.935	7.502	59%	8.581
mn =	0.306	20% = 1.068	70% = 7.388	1.200	37%	1.348
ma =	1.538	30% = 1.546	80% = 9.190	0.269	4%	0.111
cs =	3.900	40% = 2.527	90% = 12.67			
sd =	4.659	50% = 4.315	95% = 17.27			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.260	80.28	7.80						
592.0	100.00	0.00	7.778	72.48	8.28						
497.8	100.00	0.00	6.541	64.20	7.13						
418.6	100.00	0.00	5.500	57.07	5.35						
352.0	100.00	0.00	4.625	51.72	3.96						
296.0	100.00	0.00	3.889	47.74	3.26						
248.9	100.00	0.00	3.270	44.48	3.01						
209.3	100.00	0.00	2.750	41.47	3.04						
176.0	100.00	0.00	2.312	38.43	3.29						
148.0	100.00	0.00	1.945	35.14	3.77						
124.5	100.00	0.00	1.635	31.37	4.42						
104.7	100.00	0.00	1.375	26.95	4.82						
88.00	100.00	0.00	1.156	22.13	4.49						
74.00	100.00	0.00	0.972	17.64	3.55						
62.23	100.00	0.00	0.818	14.09	2.60						
52.33	100.00	0.34	0.688	11.49	1.97						
44.00	99.66	0.38	0.578	9.52	1.65						
37.00	99.28	0.48	0.486	7.87	1.52						
31.11	98.80	0.66	0.409	6.35	1.50						
26.16	98.14	0.97	0.344	4.85	1.51						
22.00	97.17	1.43	0.289	3.34	1.42						
18.50	95.74	2.07	0.243	1.92	1.13						
15.56	93.67	2.98	0.204	0.79	0.79						
13.08	90.69	4.31	0.172	0.00	0.00						
11.00	86.38	6.10	0.145	0.00	0.00						

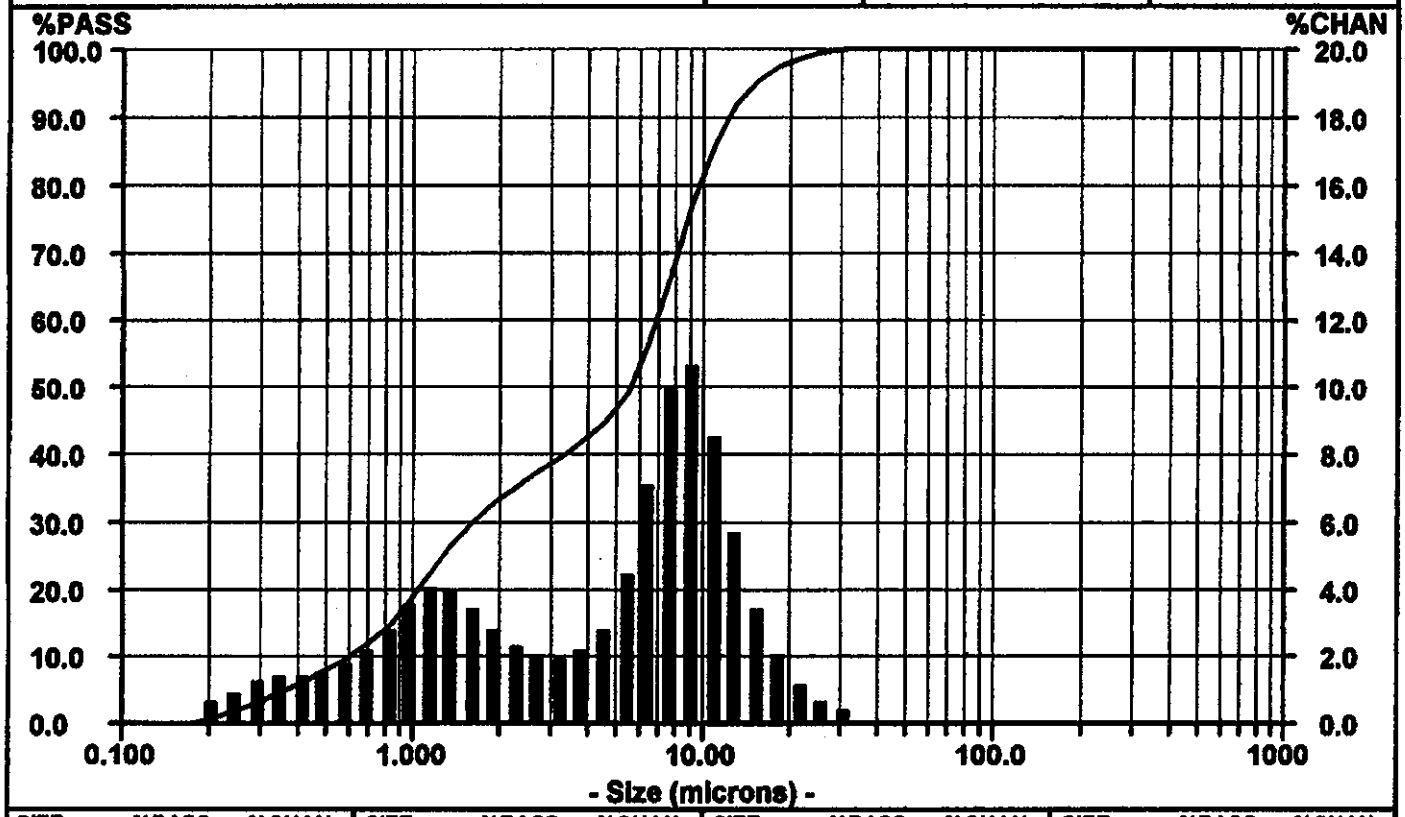
AY-101

AY-101
Duplicate

Date: 09/28/91 Meas #: 00001
Time: 04:42 Pres #: 01

1 M NaOH and 1 M NaNO3
Flow Rate = 17 ml/sec.
Refractive Index = 1.50 Particle/1.33 Medium
File: 101AYD11

Summary	Percentiles		Dia	Vol%	Width
mv = 5.962	10% = 0.593	60% = 6.973	8.051	62%	7.082
mn = 0.309	20% = 1.038	70% = 8.206	0.386	38%	1.368
ma = 1.587	30% = 1.618	80% = 9.700			
cs = 3.781	40% = 3.376	90% = 12.29			
sd = 4.818	50% = 5.625	95% = 15.19			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	77.37	10.74						
592.0	100.00	0.00	7.778	66.63	10.14						
497.8	100.00	0.00	6.541	56.49	7.28						
418.8	100.00	0.00	5.500	49.21	4.60						
352.0	100.00	0.00	4.625	44.71	2.89						
296.0	100.00	0.00	3.889	41.82	2.20						
248.9	100.00	0.00	3.270	39.62	2.03						
209.3	100.00	0.00	2.750	37.59	2.12						
176.0	100.00	0.00	2.312	35.47	2.40						
148.0	100.00	0.00	1.945	33.07	2.87						
124.5	100.00	0.00	1.635	30.20	3.51						
104.7	100.00	0.00	1.375	26.69	4.08						
88.00	100.00	0.00	1.156	22.61	4.15						
74.00	100.00	0.00	0.972	18.46	3.62						
62.23	100.00	0.00	0.818	14.84	2.87						
52.33	100.00	0.00	0.688	11.97	2.27						
44.00	100.00	0.00	0.578	9.70	1.87						
37.00	100.00	0.00	0.486	7.83	1.65						
31.11	100.00	0.43	0.409	6.18	1.54						
26.16	99.57	0.74	0.344	4.64	1.47						
22.00	98.83	1.27	0.289	3.17	1.35						
18.50	97.56	2.15	0.243	1.82	1.07						
15.56	95.41	3.58	0.204	0.75	0.75						
13.08	91.83	5.80	0.172	0.00	0.00						
11.00	86.03	8.66	0.145	0.00	0.00						

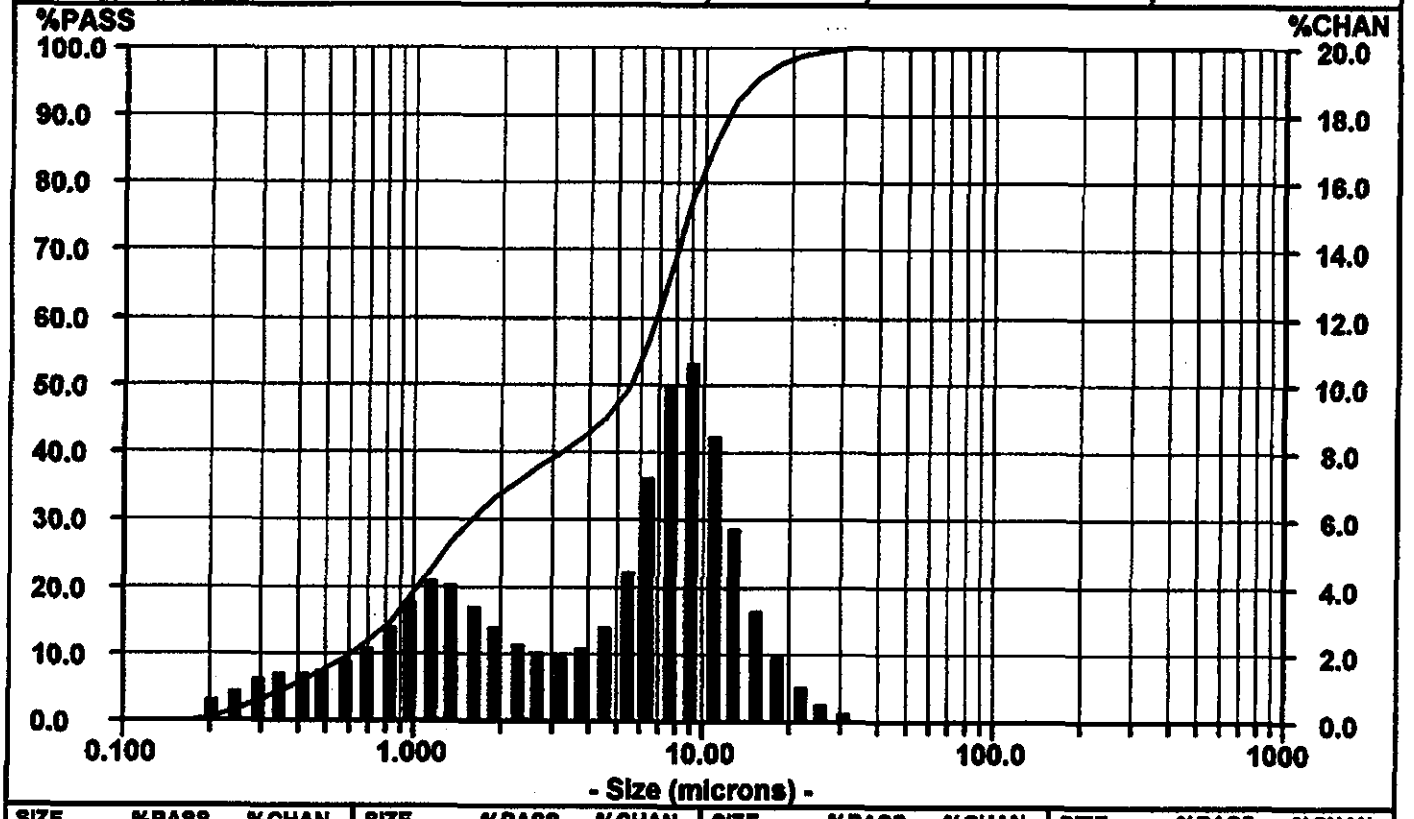
AY-101

AY-101
Duplicate

Date: 09/28/91 Meas #: 00002
Time: 04:48 Pres #: 01

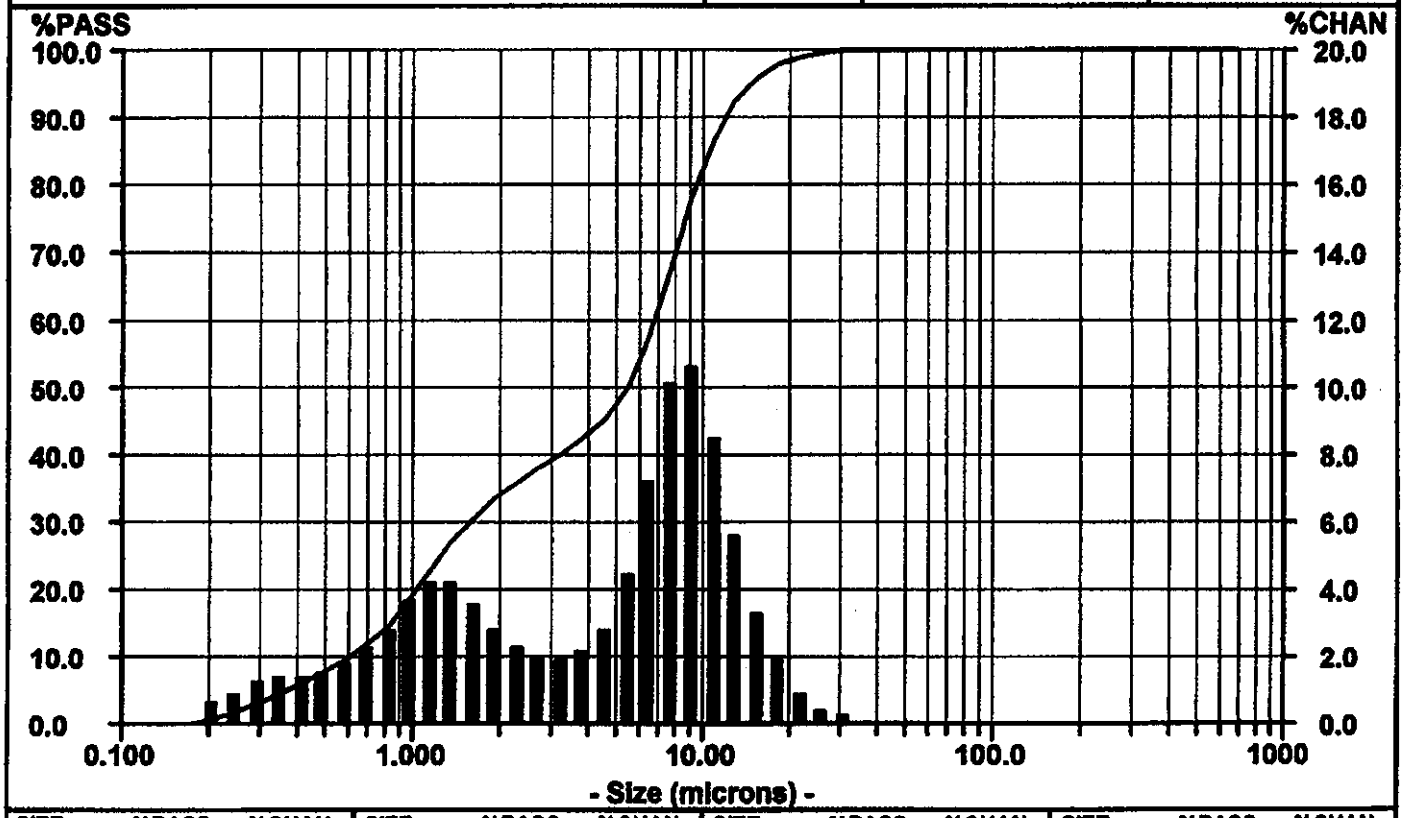
1 M NaOH and 1 M NaNO3
Flow Rate = 17 ml/sec.
Refractive Index = 1.70 Particle/1.33 Medium
File: 101AY012

Summary	Percentiles		Dia	Vol%	Width
mv = 5.868	10% = 0.595	60% = 6.911	8.006	62%	6.924
mn = 0.310	20% = 1.034	70% = 8.133	0.991	38%	1.366
ma = 1.583	30% = 1.596	80% = 9.597			
cs = 3.790	40% = 3.262	90% = 12.08			
sd = 4.758	50% = 5.551	95% = 14.82			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	77.95	10.78						
592.0	100.00	0.00	7.778	67.17	10.18						
497.8	100.00	0.00	6.541	59.99	7.31						
418.6	100.00	0.00	5.500	49.68	4.52						
352.0	100.00	0.00	4.625	45.16	2.91						
296.0	100.00	0.00	3.889	42.25	2.22						
248.9	100.00	0.00	3.270	40.03	2.05						
209.3	100.00	0.00	2.750	37.98	2.15						
176.0	100.00	0.00	2.312	35.83	2.44						
148.0	100.00	0.00	1.945	33.39	2.92						
124.5	100.00	0.00	1.635	30.47	3.57						
104.7	100.00	0.00	1.375	26.90	4.15						
88.00	100.00	0.00	1.156	22.75	4.22						
74.00	100.00	0.00	0.972	18.53	3.68						
62.23	100.00	0.00	0.818	14.85	2.91						
52.33	100.00	0.00	0.688	11.94	2.29						
44.00	100.00	0.00	0.578	9.65	1.88						
37.00	100.00	0.00	0.486	7.77	1.65						
31.11	100.00	0.36	0.409	6.12	1.53						
26.16	99.64	0.64	0.344	4.59	1.46						
22.00	99.00	1.15	0.289	3.13	1.33						
18.50	97.85	2.04	0.243	1.80	1.06						
15.56	95.81	3.48	0.204	0.74	0.74						
13.08	92.33	5.74	0.172	0.00	0.00						
11.00	86.59	8.64	0.145	0.00	0.00						

AY-101	AY-101 Duplicate	Date: 09/28/91 Time: 04:52	Meas #: 00002 Pres #: 01
1 M NaOH and 1 M NaNO3 Flow Rate = 17 ml/sec. Refractive Index = 2.00 Particle/1.33 Medium File: 101AY013	Summary mv = 5.812 mn = 0.310 ma = 1.578 cs = 3.802 sd = 4.723	Percentiles 10% = 0.595 60% = 6.867 20% = 1.031 70% = 8.086 30% = 1.580 80% = 9.539 40% = 3.193 90% = 11.97 50% = 5.498 95% = 14.63	Dia Vol% Width 7.975 62% 6.839 0.994 38% 1.364



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	78.30	10.75						
592.0	100.00	0.00	7.778	67.55	10.20						
497.8	100.00	0.00	6.541	57.35	7.34						
418.6	100.00	0.00	5.500	50.01	4.55						
352.0	100.00	0.00	4.625	45.46	2.93						
296.0	100.00	0.00	3.889	42.53	2.24						
248.9	100.00	0.00	3.270	40.29	2.06						
209.3	100.00	0.00	2.750	38.23	2.17						
176.0	100.00	0.00	2.312	36.06	2.45						
148.0	100.00	0.00	1.945	33.61	2.94						
124.5	100.00	0.00	1.635	30.67	3.61						
104.7	100.00	0.00	1.375	27.06	4.20						
88.00	100.00	0.00	1.156	22.86	4.27						
74.00	100.00	0.00	0.972	18.59	3.71						
62.23	100.00	0.00	0.818	14.88	2.93						
52.33	100.00	0.00	0.688	11.95	2.30						
44.00	100.00	0.00	0.578	9.65	1.89						
37.00	100.00	0.00	0.486	7.76	1.65						
31.11	100.00	0.32	0.409	6.11	1.53						
26.16	99.68	0.59	0.344	4.58	1.46						
22.00	99.09	1.09	0.289	3.12	1.33						
18.50	98.00	1.97	0.243	1.79	1.05						
15.56	96.03	3.42	0.204	0.74	0.74						
13.08	92.61	5.69	0.172	0.00	0.00						
11.00	86.92	8.62	0.145	0.00	0.00						

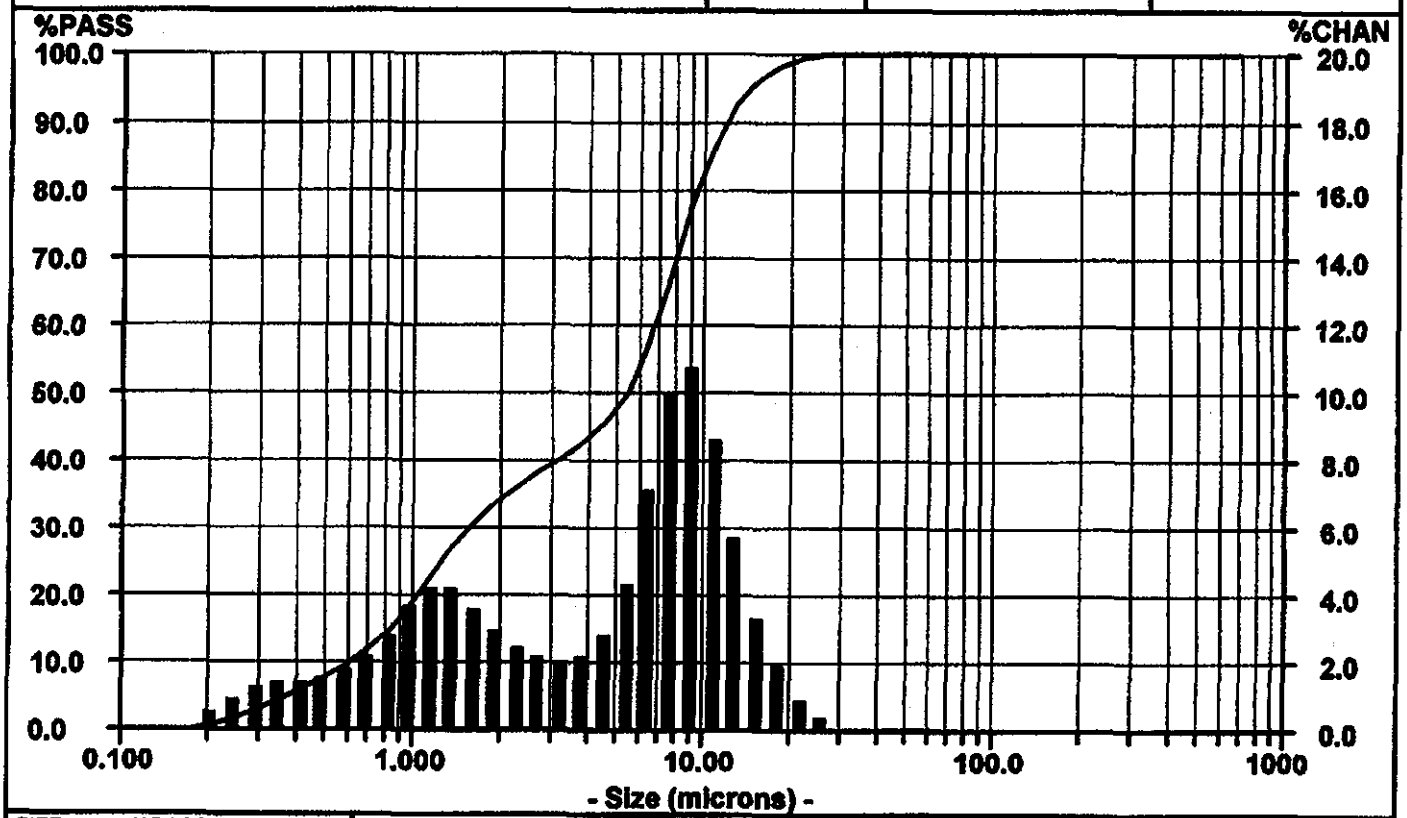
AY-101

AY-101
Duplicate

Date: 09/28/91 Meas #: 00002
Time: 04:56 Pres #: 01

1 M NaOH and 1 M NaNO3
Flow Rate = 40 ml/sec.
Refractive Index = 1.50 Particle/1.33 Medium
File: 101AY014

Summary	Percentiles		Dia	Vol%	Width
mv = 5.743	10% = 0.699	60% = 6.866	7.994	62%	6.759
mn = 0.313	20% = 1.036	70% = 8.091	1.002	38%	1.366
ma = 1.683	30% = 1.575	80% = 9.526			
cs = 3.789	40% = 3.128	90% = 11.87			
sd = 4.705	50% = 5.470	95% = 14.34			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	78.35	10.85						
592.0	100.00	0.00	7.778	67.50	10.11						
497.8	100.00	0.00	6.541	57.39	7.22						
418.6	100.00	0.00	5.500	50.17	4.47						
352.0	100.00	0.00	4.625	45.70	2.91						
296.0	100.00	0.00	3.889	42.79	2.25						
248.9	100.00	0.00	3.270	40.54	2.09						
209.3	100.00	0.00	2.750	38.45	2.20						
176.0	100.00	0.00	2.312	36.25	2.50						
148.0	100.00	0.00	1.945	33.75	3.00						
124.5	100.00	0.00	1.635	30.75	3.89						
104.7	100.00	0.00	1.375	27.06	4.27						
88.00	100.00	0.00	1.156	22.79	4.30						
74.00	100.00	0.00	0.972	18.49	3.71						
62.23	100.00	0.00	0.818	14.78	2.92						
52.33	100.00	0.00	0.688	11.86	2.28						
44.00	100.00	0.00	0.578	9.58	1.89						
37.00	100.00	0.00	0.486	7.69	1.65						
31.11	100.00	0.00	0.409	6.04	1.53						
26.16	100.00	0.57	0.344	4.51	1.46						
22.00	99.43	1.07	0.289	3.05	1.32						
18.50	98.36	1.96	0.243	1.73	1.04						
15.56	96.40	3.46	0.204	0.69	0.69						
13.08	92.94	5.81	0.172	0.00	0.00						
11.00	87.13	8.78	0.145	0.00	0.00						

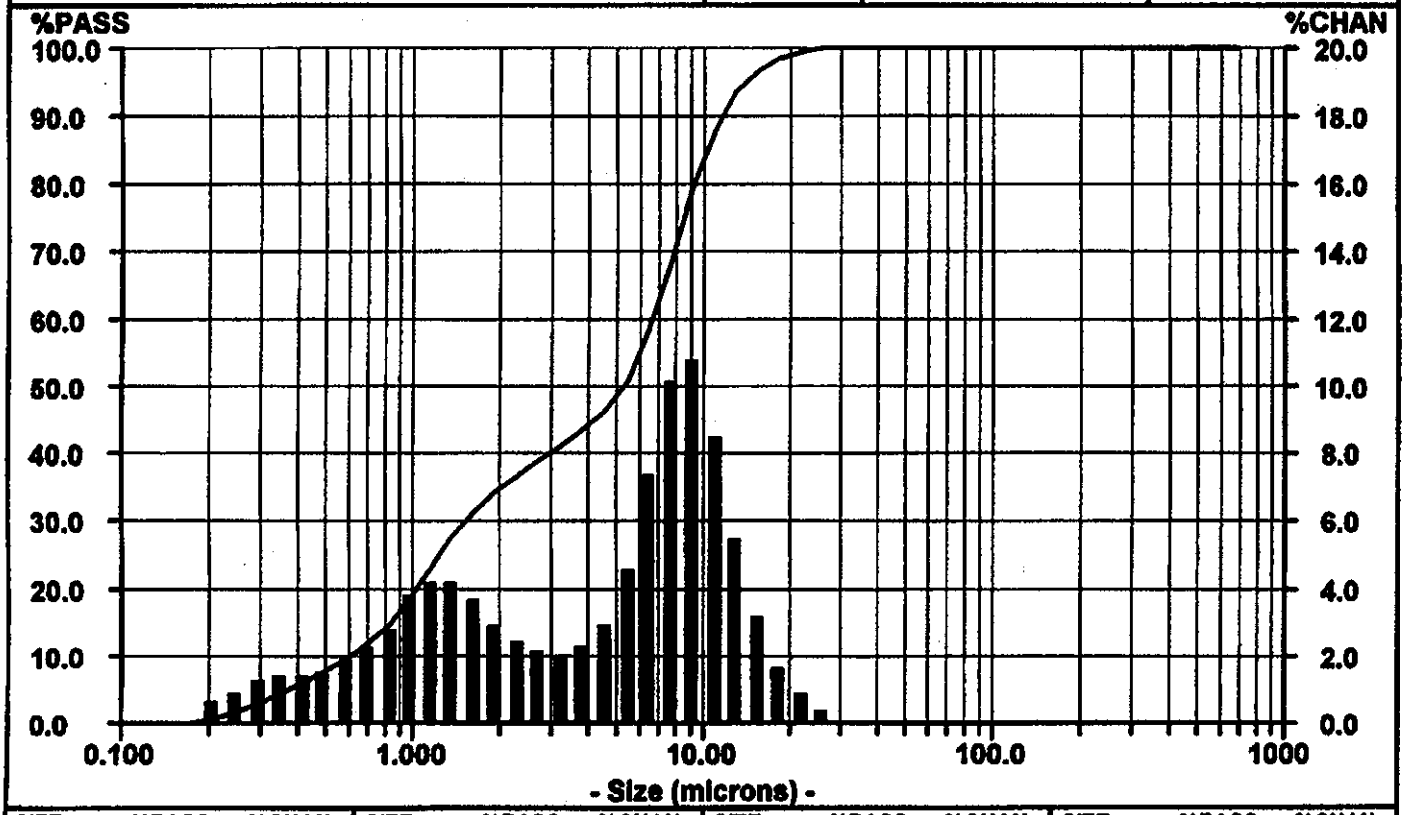
AY-101

AY-101
Duplicate

Date: 09/28/91 Meas #: 00002
Time: 05:07 Pres #: 01

1 M NaOH and 1 M NaNO3
Flow Rate = 40 ml/sec.
Refractive Index = 1.70 Particle/1.33 Medium
File: 101AY015

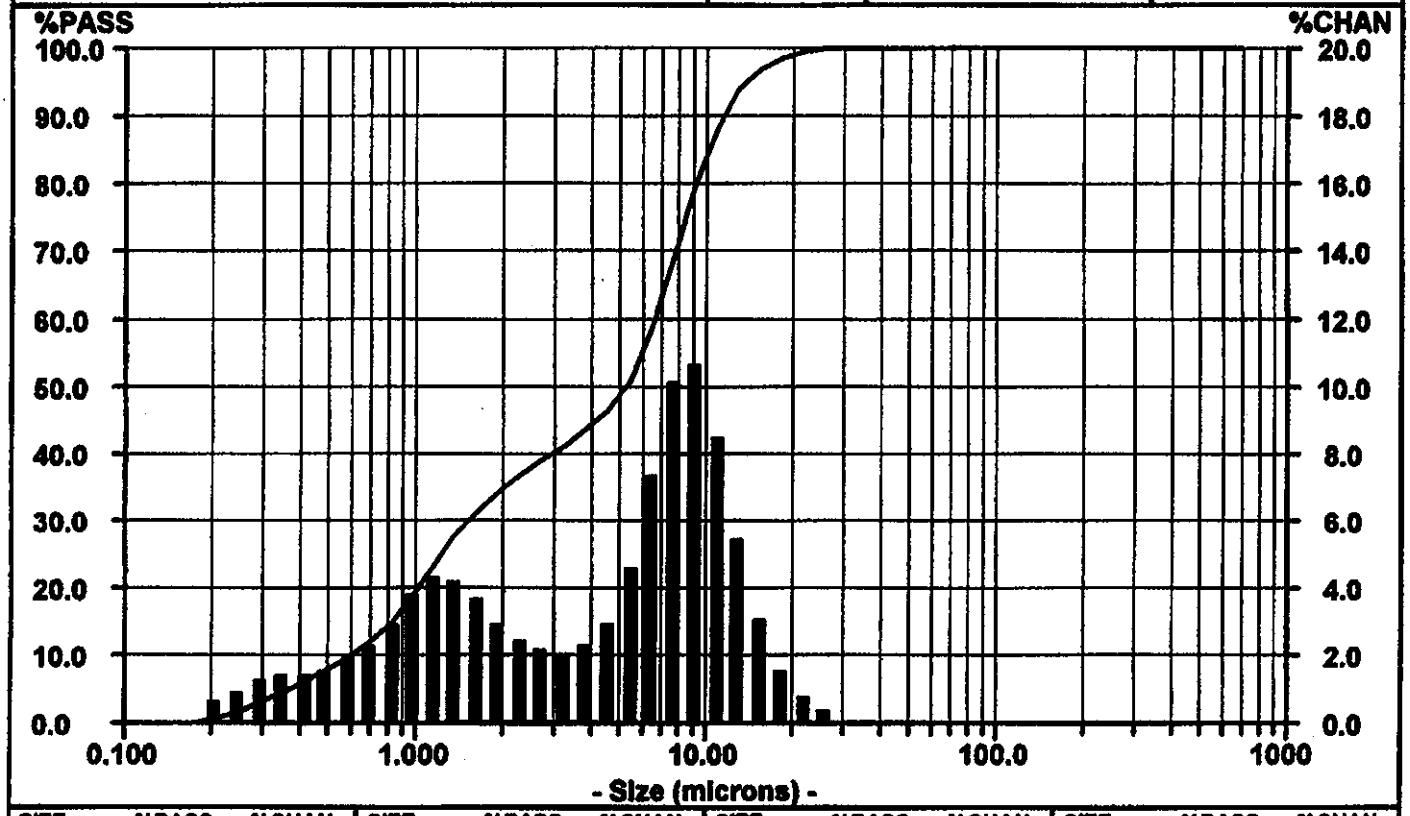
Summary	Percentiles		Dia	Vol%	Width
mv = 5.603	10% = 0.595	60% = 6.732	7.877	61%	6.553
mn = 0.312	20% = 1.021	70% = 7.840	1.000	39%	1.362
ma = 1.563	30% = 1.540	80% = 9.331			
cs = 3.839	40% = 2.989	90% = 11.57			
sd = 4.598	50% = 5.326	95% = 13.91			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	79.52	10.82						
592.0	100.00	0.00	7.778	68.70	10.26						
497.8	100.00	0.00	6.541	58.44	7.41						
418.6	100.00	0.00	5.500	51.03	4.62						
352.0	100.00	0.00	4.625	46.41	3.00						
296.0	100.00	0.00	3.889	43.41	2.30						
248.9	100.00	0.00	3.270	41.11	2.13						
209.3	100.00	0.00	2.750	38.98	2.23						
176.0	100.00	0.00	2.312	36.75	2.52						
148.0	100.00	0.00	1.945	34.23	3.02						
124.5	100.00	0.00	1.635	31.21	3.71						
104.7	100.00	0.00	1.375	27.50	4.32						
88.00	100.00	0.00	1.156	23.18	4.39						
74.00	100.00	0.00	0.972	18.79	3.81						
62.23	100.00	0.00	0.818	14.98	2.99						
52.33	100.00	0.00	0.688	11.99	2.33						
44.00	100.00	0.00	0.578	9.66	1.91						
37.00	100.00	0.00	0.486	7.75	1.66						
31.11	100.00	0.00	0.409	6.09	1.53						
26.16	100.00	0.46	0.344	4.56	1.46						
22.00	99.54	0.91	0.289	3.10	1.32						
18.50	98.63	1.76	0.243	1.78	1.05						
15.56	96.88	3.21	0.204	0.73	0.73						
13.08	93.67	5.56	0.172	0.00	0.00						
11.00	88.11	8.59	0.145	0.00	0.00						

AY-101	AY-101 Duplicate	Date: 09/28/91 Time: 05:11	Meas #: 00002 Pres #: 01
1 M NaOH and 1 M NaNO3 Flow Rate = 40 ml/sec. Refractive Index = 2.00 Particle/1.33 Medium File: 101AY016			

Summary	Percentiles		Dia	Vol%	Width
mv = 5.571	10% = 0.593	60% = 6.702	7.856	61%	6.507
mn = 0.312	20% = 1.018	70% = 7.909	1.001	39%	1.363
ma = 1.558	30% = 1.531	80% = 9.294			
cs = 3.852	40% = 2.947	90% = 11.50			
sd = 4.579	50% = 5.287	95% = 13.80			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	79.74	10.79						
592.0	100.00	0.00	7.778	68.95	10.27						
497.8	100.00	0.00	6.541	58.68	7.42						
418.6	100.00	0.00	5.500	51.26	4.64						
352.0	100.00	0.00	4.625	46.62	3.01						
296.0	100.00	0.00	3.889	43.61	2.32						
248.9	100.00	0.00	3.270	41.29	2.14						
209.3	100.00	0.00	2.750	39.15	2.24						
176.0	100.00	0.00	2.312	36.91	2.54						
148.0	100.00	0.00	1.945	34.37	3.03						
124.5	100.00	0.00	1.636	31.34	3.73						
104.7	100.00	0.00	1.375	27.61	4.34						
88.00	100.00	0.00	1.156	23.27	4.41						
74.00	100.00	0.00	0.972	18.86	3.82						
62.23	100.00	0.00	0.818	15.04	3.00						
52.33	100.00	0.00	0.688	12.04	2.34						
44.00	100.00	0.00	0.578	9.70	1.91						
37.00	100.00	0.00	0.486	7.79	1.67						
31.11	100.00	0.00	0.409	6.12	1.54						
26.16	100.00	0.44	0.344	4.58	1.47						
22.00	99.56	0.87	0.289	3.11	1.33						
18.50	98.69	1.70	0.243	1.78	1.05						
15.56	96.99	3.15	0.204	0.73	0.73						
13.08	93.84	5.52	0.172	0.00	0.00						
11.00	88.32	8.58	0.145	0.00	0.00						

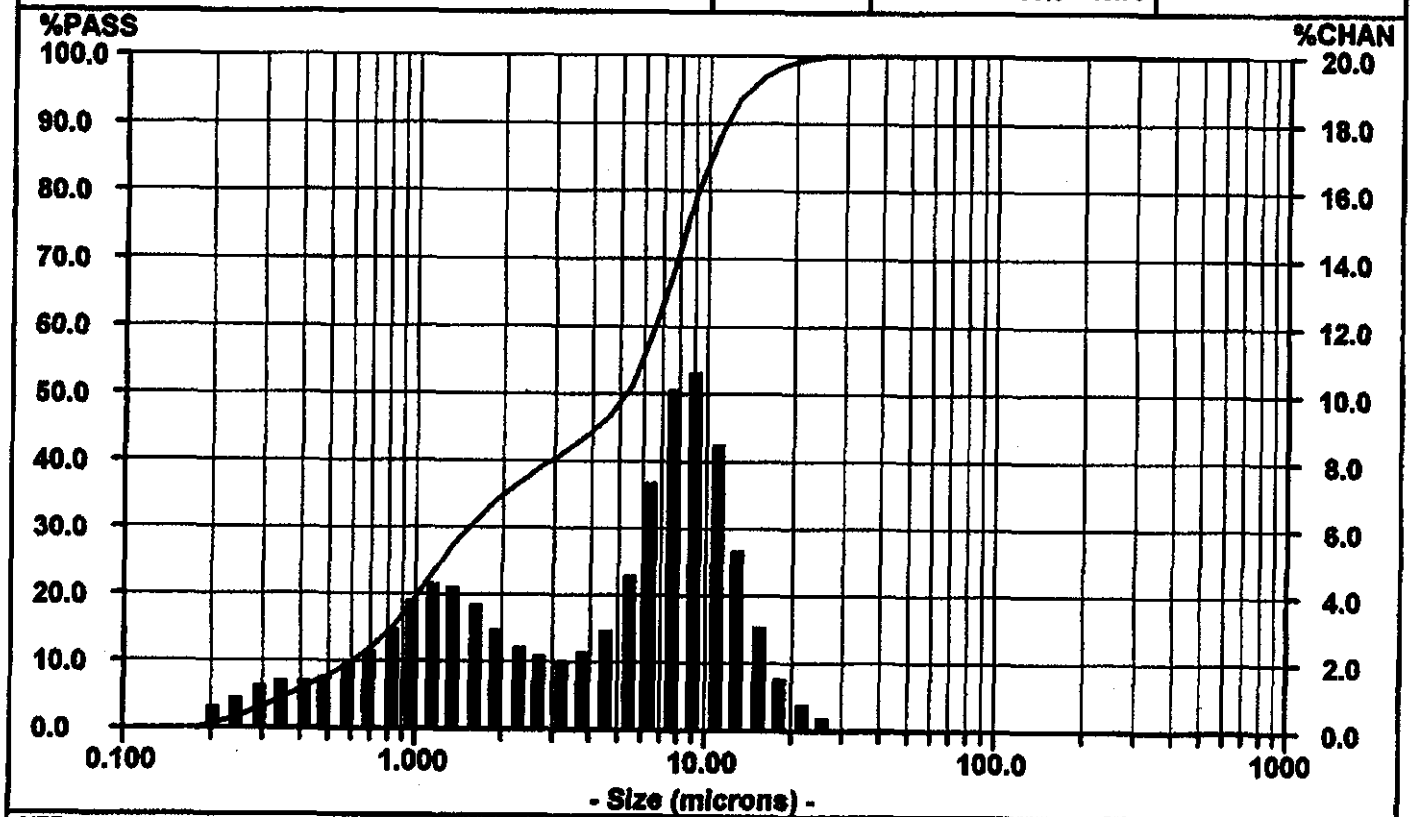
AY-101

1 M NaOH and 1 M NaNO3
Flow Rate = 60 ml/sec.
Refractive Index = 1.50 Particle/1.33 Medium
File: 101AY017

AY-101
Sample

Date: 09/28/91 Meas #: 00002
Time: 06:16 Pres #: 01

Summary	Percentiles		Dia	Vol%	Width
mv = 5.556	10% = 0.592	60% = 6.686	7.842	61%	6.484
mn = 0.312	20% = 1.017	70% = 7.890	1.001	39%	1.363
ma = 1.556	30% = 1.628	80% = 9.267			
cs = 3.856	40% = 2.929	90% = 11.47			
sd = 4.666	50% = 5.271	95% = 13.76			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	79.90	10.80						
592.0	100.00	0.00	7.778	69.10	10.29						
497.8	100.00	0.00	6.541	58.81	7.45						
418.6	100.00	0.00	5.500	51.36	4.65						
352.0	100.00	0.00	4.625	46.71	3.02						
296.0	100.00	0.00	3.889	43.69	2.32						
248.9	100.00	0.00	3.270	41.37	2.15						
209.3	100.00	0.00	2.750	39.22	2.25						
176.0	100.00	0.00	2.312	36.97	2.54						
148.0	100.00	0.00	1.945	34.43	3.04						
124.5	100.00	0.00	1.636	31.39	3.74						
104.7	100.00	0.00	1.375	27.65	4.35						
88.00	100.00	0.00	1.156	23.30	4.42						
74.00	100.00	0.00	0.972	18.88	3.83						
62.23	100.00	0.00	0.818	15.05	3.00						
52.33	100.00	0.00	0.688	12.05	2.34						
44.00	100.00	0.00	0.578	9.71	1.92						
37.00	100.00	0.00	0.486	7.79	1.67						
31.11	100.00	0.00	0.409	6.12	1.54						
26.16	100.00	0.44	0.344	4.58	1.47						
22.00	99.56	0.86	0.289	3.11	1.33						
18.50	98.70	1.68	0.243	1.78	1.05						
15.56	97.02	3.12	0.204	0.73	0.73						
13.08	93.90	5.47	0.172	0.00	0.00						
11.00	88.43	8.53	0.145	0.00	0.00						

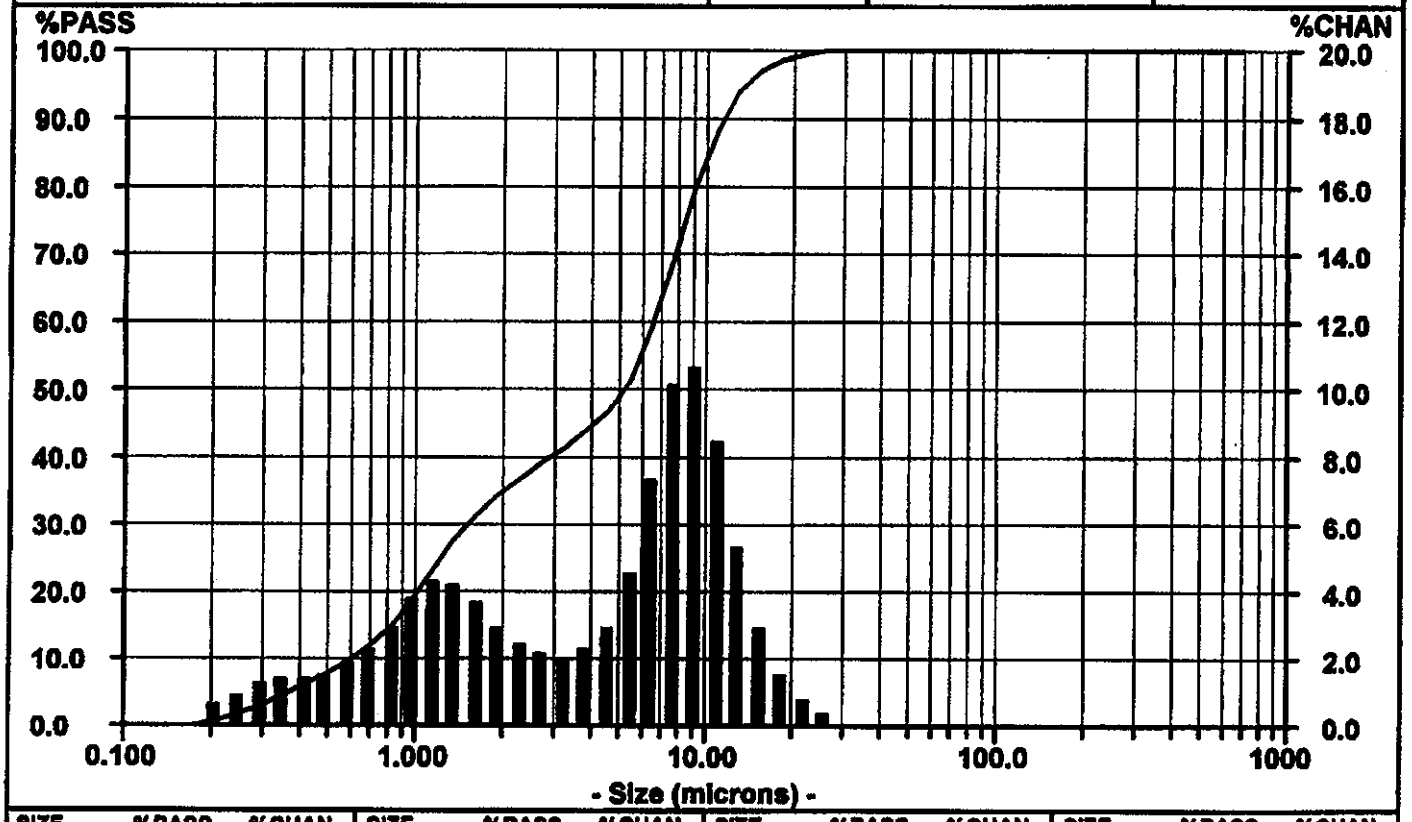
AY-101

AY-101
Duplicate

Date: 09/28/91 Meas #: 00002
Time: 05:19 Pres #: 01

1 M NaOH and 1 M NaNO3
Flow Rate = 60 ml/sec.
Refractive Index = 1.70 Particle/1.33 Medium
File: 101AY018

Summary	Percentiles		Dia	Vol%	Width
mv = 5.532	10% = 0.593	60% = 6.664	7.826	61%	6.449
mn = 0.313	20% = 1.017	70% = 7.868	1.003	39%	1.364
ma = 1.556	30% = 1.524	80% = 9.238			
cs = 3.856	40% = 2.902	90% = 11.42			
sd = 4.548	50% = 5.242	95% = 13.67			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	80.08	10.80						
592.0	100.00	0.00	7.778	69.28	10.29						
497.8	100.00	0.00	6.541	58.99	7.46						
418.6	100.00	0.00	5.500	51.53	4.67						
352.0	100.00	0.00	4.625	46.86	3.03						
296.0	100.00	0.00	3.889	43.83	2.34						
248.9	100.00	0.00	3.270	41.49	2.16						
209.3	100.00	0.00	2.750	39.33	2.27						
176.0	100.00	0.00	2.312	37.06	2.56						
148.0	100.00	0.00	1.945	34.50	3.06						
124.5	100.00	0.00	1.635	31.44	3.75						
104.7	100.00	0.00	1.375	27.69	4.37						
88.00	100.00	0.00	1.156	23.32	4.44						
74.00	100.00	0.00	0.972	18.88	3.84						
62.23	100.00	0.00	0.818	15.04	3.01						
52.33	100.00	0.00	0.688	12.03	2.34						
44.00	100.00	0.00	0.578	9.69	1.92						
37.00	100.00	0.00	0.486	7.77	1.67						
31.11	100.00	0.00	0.409	6.10	1.54						
26.16	100.00	0.42	0.344	4.56	1.47						
22.00	99.58	0.83	0.289	3.09	1.33						
18.50	98.75	1.64	0.243	1.76	1.04						
15.56	97.11	3.08	0.204	0.72	0.72						
13.08	94.03	5.44	0.172	0.00	0.00						
11.00	88.59	8.61	0.145	0.00	0.00						

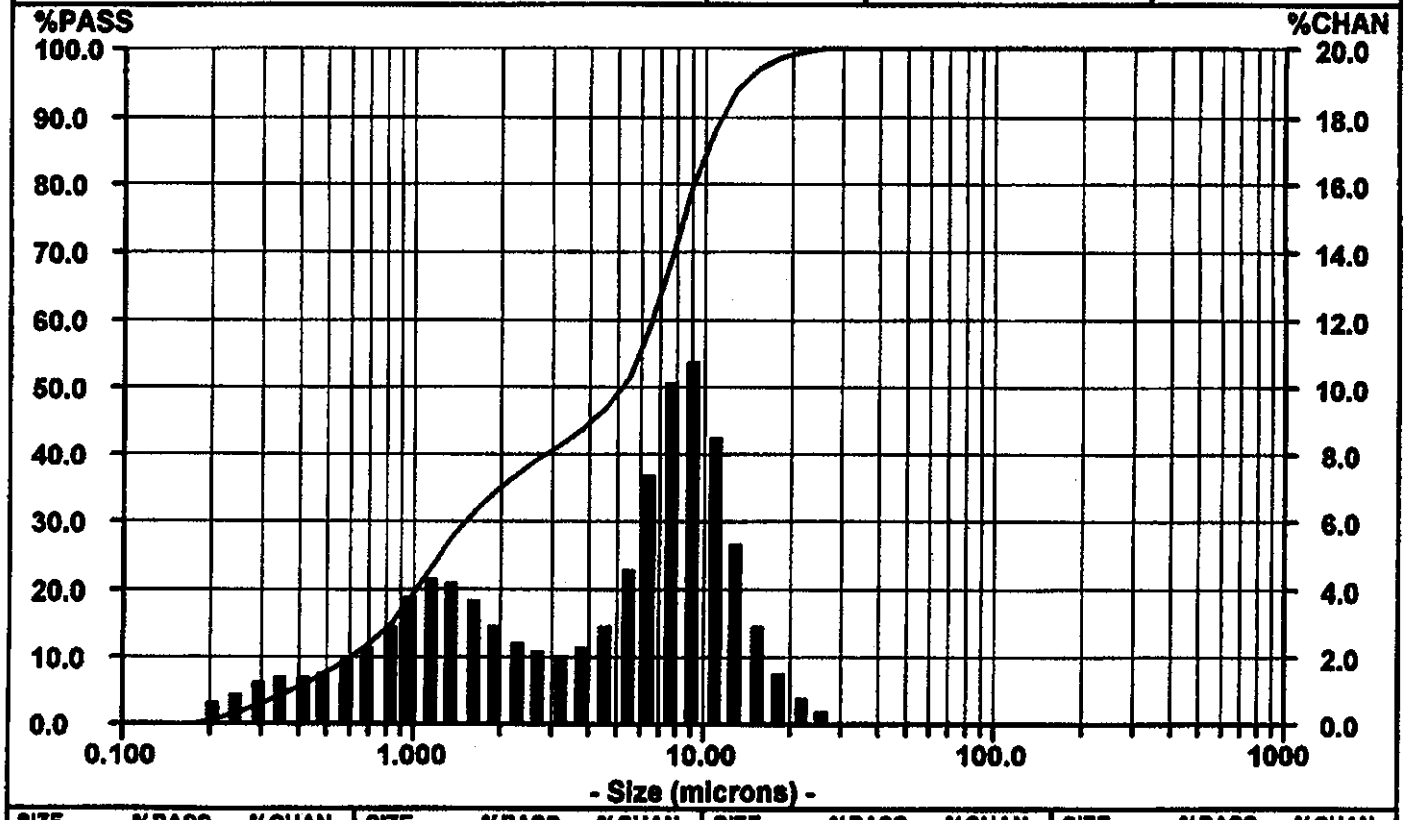
AY-101

AY-101
Duplicate

Date: 09/28/91 Meas #: 00002
Time: 05:23 Pres #: 01

1 M NaOH and 1 M NaNO3
Flow Rate = 60 ml/sec.
Refractive Index = 2.00 Particle/1.33 Medium
File: 101AY019

Summary	Percentiles		Dia	Vol%	Width
mv = 5.509	10% = 0.593	60% = 6.645	7.812	61%	6.416
mn = 0.313	20% = 1.015	70% = 7.848	1.004	39%	1.364
ma = 1.564	30% = 1.520	80% = 9.212			
cs = 3.861	40% = 2.880	90% = 11.38			
sd = 4.533	50% = 5.215	95% = 13.60			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	80.25	10.81						
592.0	100.00	0.00	7.778	69.44	10.29						
497.8	100.00	0.00	6.541	59.15	7.47						
418.6	100.00	0.00	5.500	51.68	4.68						
352.0	100.00	0.00	4.625	47.00	3.05						
296.0	100.00	0.00	3.889	43.95	2.35						
248.9	100.00	0.00	3.270	41.60	2.18						
209.3	100.00	0.00	2.750	39.42	2.28						
176.0	100.00	0.00	2.312	37.14	2.57						
148.0	100.00	0.00	1.945	34.57	3.07						
124.5	100.00	0.00	1.635	31.50	3.76						
104.7	100.00	0.00	1.375	27.74	4.38						
88.00	100.00	0.00	1.156	23.36	4.46						
74.00	100.00	0.00	0.972	18.91	3.85						
62.23	100.00	0.00	0.818	15.06	3.02						
52.33	100.00	0.00	0.688	12.04	2.35						
44.00	100.00	0.00	0.578	9.69	1.92						
37.00	100.00	0.00	0.486	7.77	1.68						
31.11	100.00	0.00	0.409	6.09	1.54						
26.16	100.00	0.40	0.344	4.55	1.47						
22.00	99.60	0.80	0.289	3.08	1.32						
18.50	98.80	1.60	0.243	1.76	1.04						
15.56	97.20	3.04	0.204	0.72	0.72						
13.08	94.16	5.41	0.172	0.00	0.00						
11.00	88.75	8.50	0.145	0.00	0.00						

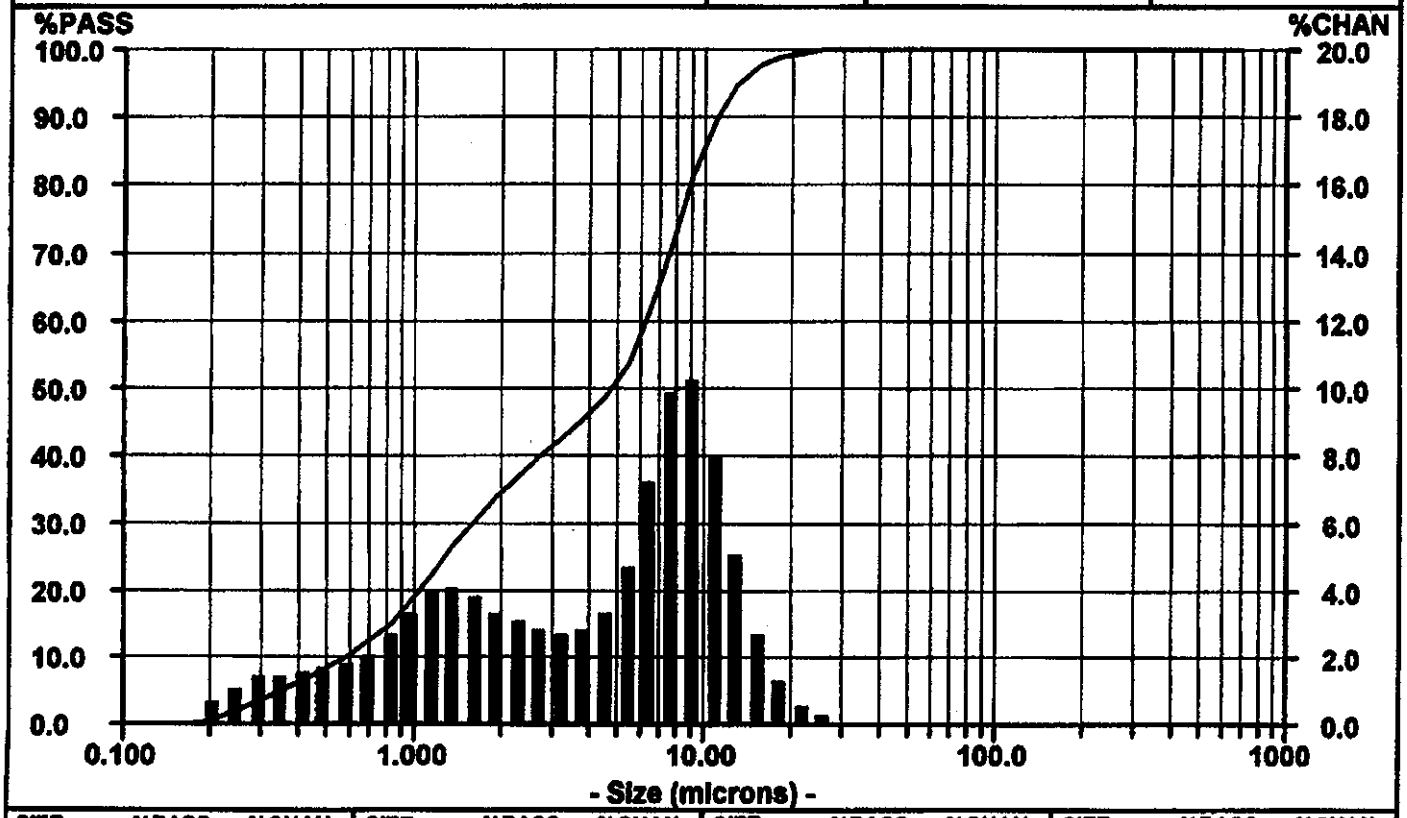
AY-101

AY-101
Duplicate

Date: 09/28/91 Meas #: 00002
Time: 05:29 Pres #: 01

1 M NaOH and 1 M NaNO3
2 minute sonication @ 40 W
Flow Rate = 17 ml/sec.
Refractive Index = 1.50 Particle/1.33 Medium
File: 101AY020

Summary	Percentiles		Dia	Vol%	Width
mv = 5.337	10% = 0.570	60% = 6.378	7.624	60%	6.472
mn = 0.306	20% = 1.037	70% = 7.628	1.036	40%	1.508
ma = 1.528	30% = 1.596	80% = 9.003			
cs = 3.928	40% = 2.762	90% = 11.09			
sd = 4.413	50% = 4.826	95% = 13.18			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	81.56	10.37						
592.0	100.00	0.00	7.778	71.19	9.95						
497.8	100.00	0.00	6.541	61.24	7.39						
418.6	100.00	0.00	5.500	53.85	4.87						
352.0	100.00	0.00	4.625	48.98	3.42						
296.0	100.00	0.00	3.889	45.56	2.85						
248.9	100.00	0.00	3.270	42.71	2.78						
209.3	100.00	0.00	2.750	39.93	2.92						
176.0	100.00	0.00	2.312	37.01	3.11						
148.0	100.00	0.00	1.945	33.90	3.39						
124.5	100.00	0.00	1.635	30.51	3.80						
104.7	100.00	0.00	1.375	26.71	4.13						
88.00	100.00	0.00	1.156	22.58	4.05						
74.00	100.00	0.00	0.972	18.53	3.46						
62.23	100.00	0.00	0.818	15.07	2.73						
52.33	100.00	0.00	0.688	12.34	2.18						
44.00	100.00	0.00	0.578	10.16	1.87						
37.00	100.00	0.00	0.486	8.29	1.71						
31.11	100.00	0.00	0.409	6.58	1.64						
26.16	100.00	0.32	0.344	4.94	1.58						
22.00	99.68	0.68	0.289	3.36	1.44						
18.50	99.02	1.39	0.243	1.92	1.13						
15.56	97.63	2.78	0.204	0.79	0.79						
13.08	94.85	5.12	0.172	0.00	0.00						
11.00	89.73	8.17	0.145	0.00	0.00						

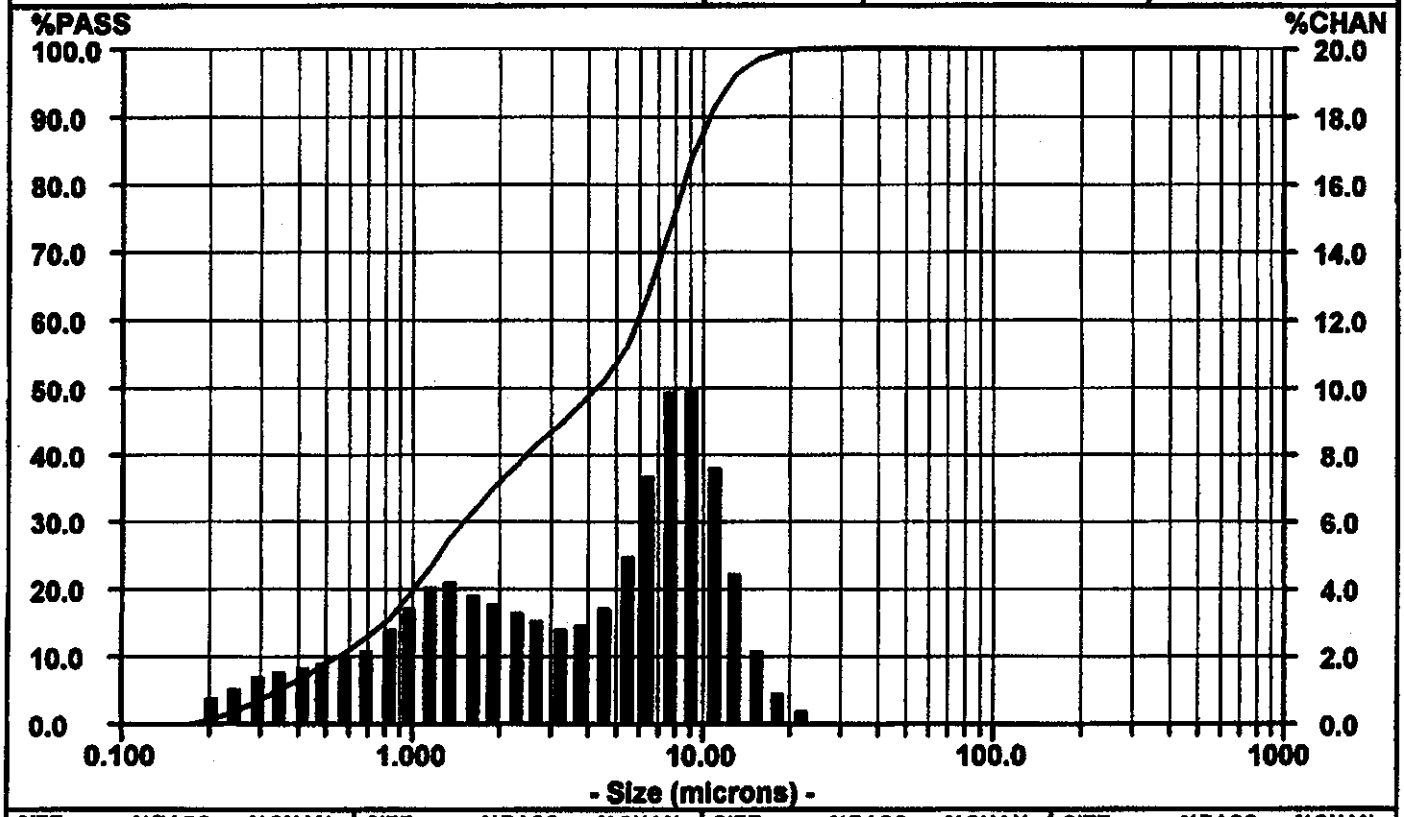
AY-101

AY-101
Duplicate

Date: 09/28/91 Meas #: 00002
Time: 05:34 Pres #: 01

1 M NaOH and 1 M NaNO3
2 minute sonication @ 40 W
Flow Rate = 17 ml/sec.
Refractive Index = 1.70 Particle/1.33 Medium
File: 101AY021

Summary	Percentiles		Dia	Vol%	Width
mv = 5.003	10% = 0.542	60% = 6.016	7.406	58%	6.140
mn = 0.306	20% = 1.001	70% = 7.290	1.042	42%	1.531
ma = 1.466	30% = 1.513	80% = 8.612			
cs = 4.094	40% = 2.478	90% = 10.51			
sd = 4.206	50% = 4.333	95% = 12.35			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	84.04	10.15						
592.0	100.00	0.00	7.778	73.89	9.94						
497.8	100.00	0.00	6.541	63.95	7.49						
418.6	100.00	0.00	5.500	56.46	5.01						
352.0	100.00	0.00	4.625	51.45	3.56						
296.0	100.00	0.00	3.889	47.89	3.02						
248.9	100.00	0.00	3.270	44.87	2.99						
209.3	100.00	0.00	2.750	41.88	3.16						
176.0	100.00	0.00	2.312	38.72	3.36						
148.0	100.00	0.00	1.945	35.36	3.62						
124.5	100.00	0.00	1.635	31.74	3.98						
104.7	100.00	0.00	1.375	27.76	4.28						
88.00	100.00	0.00	1.156	23.48	4.15						
74.00	100.00	0.00	0.972	19.33	3.53						
62.23	100.00	0.00	0.818	15.80	2.80						
52.33	100.00	0.00	0.688	13.00	2.25						
44.00	100.00	0.00	0.578	10.75	1.95						
37.00	100.00	0.00	0.486	8.80	1.81						
31.11	100.00	0.00	0.409	6.99	1.76						
26.16	100.00	0.00	0.344	5.24	1.70						
22.00	100.00	0.46	0.289	3.54	1.53						
18.50	99.54	1.04	0.243	2.01	1.19						
15.56	98.50	2.27	0.204	0.82	0.82						
13.08	96.23	4.53	0.172	0.00	0.00						
11.00	91.70	7.66	0.145	0.00	0.00						

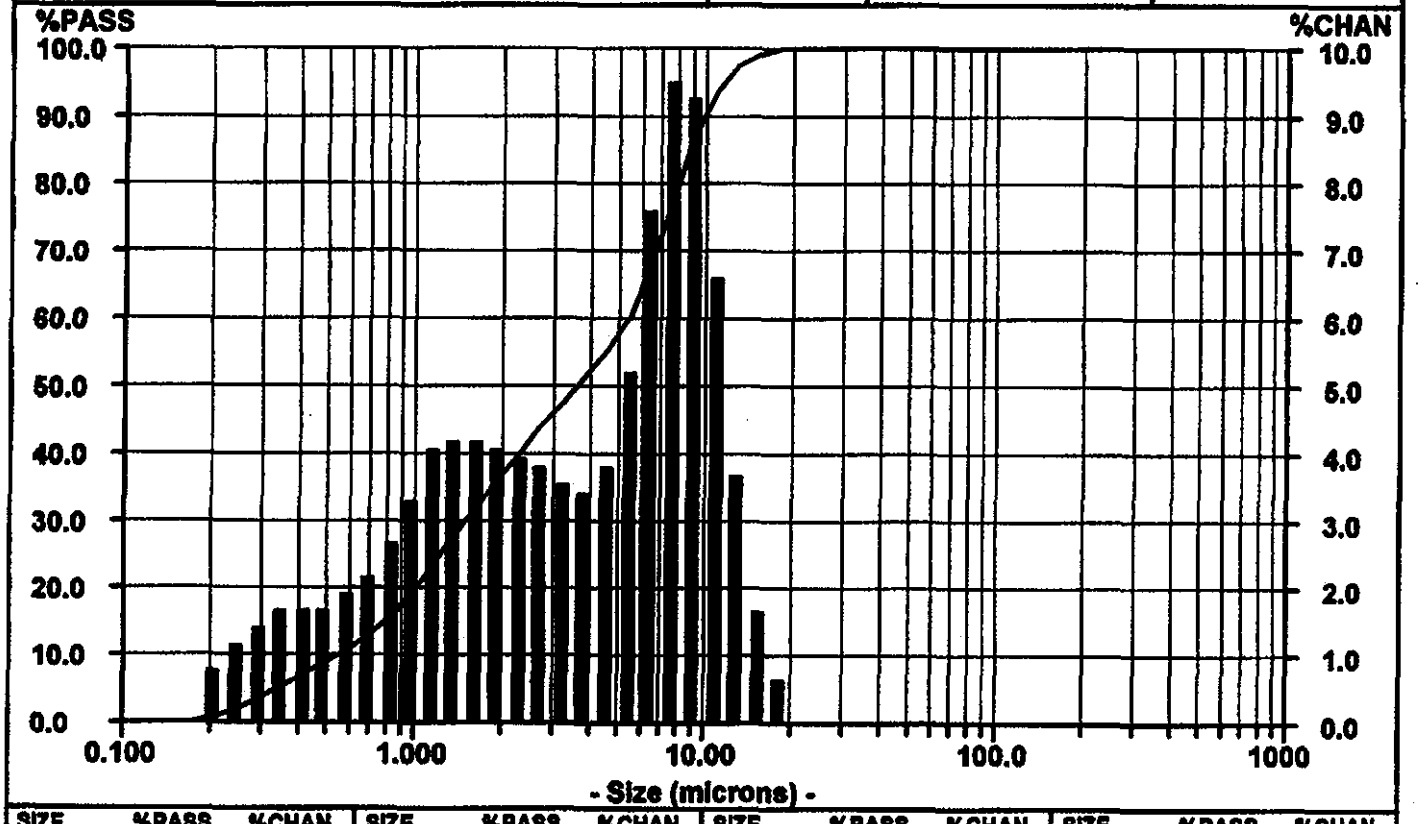
AY-101

AY-101
Duplicate

Date: 09/26/91 Meas #: 00002
Time: 05:42 Pres #: 01

1 M NaOH and 1 M NaNO3
2 minute sonication @ 40 W
Flow Rate = 17 ml/sec.
Refractive Index = 2.00 Particle/1.33 Medium
File: 101AY022

Summary	Percentiles		Dia	Vol%	Width
mv = 4.616	10% = 0.539	60% = 5.412	7.266	52%	5.521
mn = 0.305	20% = 1.009	70% = 6.772	1.185	48%	1.870
ma = 1.436	30% = 1.509	80% = 8.087			
cs = 4.177	40% = 2.289	90% = 9.874			
sd = 3.933	50% = 3.651	95% = 11.47			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	87.15	9.36						
592.0	100.00	0.00	7.778	77.79	9.62						
497.8	100.00	0.00	6.541	68.17	7.60						
418.6	100.00	0.00	5.500	60.57	5.31						
352.0	100.00	0.00	4.625	55.26	3.96						
296.0	100.00	0.00	3.889	51.30	3.52						
248.9	100.00	0.00	3.270	47.78	3.63						
209.3	100.00	0.00	2.750	44.15	3.91						
176.0	100.00	0.00	2.312	40.24	4.08						
148.0	100.00	0.00	1.945	36.16	4.18						
124.5	100.00	0.00	1.635	31.98	4.31						
104.7	100.00	0.00	1.375	27.67	4.39						
88.00	100.00	0.00	1.156	23.28	4.12						
74.00	100.00	0.00	0.972	19.16	3.45						
62.23	100.00	0.00	0.818	15.71	2.72						
52.33	100.00	0.00	0.688	12.99	2.20						
44.00	100.00	0.00	0.578	10.79	1.91						
37.00	100.00	0.00	0.486	8.88	1.79						
31.11	100.00	0.00	0.409	7.09	1.75						
26.16	100.00	0.00	0.344	5.34	1.72						
22.00	100.00	0.00	0.289	3.62	1.56						
18.50	100.00	0.72	0.243	2.06	1.22						
15.56	99.28	1.71	0.204	0.84	0.84						
13.08	97.57	3.71	0.172	0.00	0.00						
11.00	93.86	6.71	0.145	0.00	0.00						

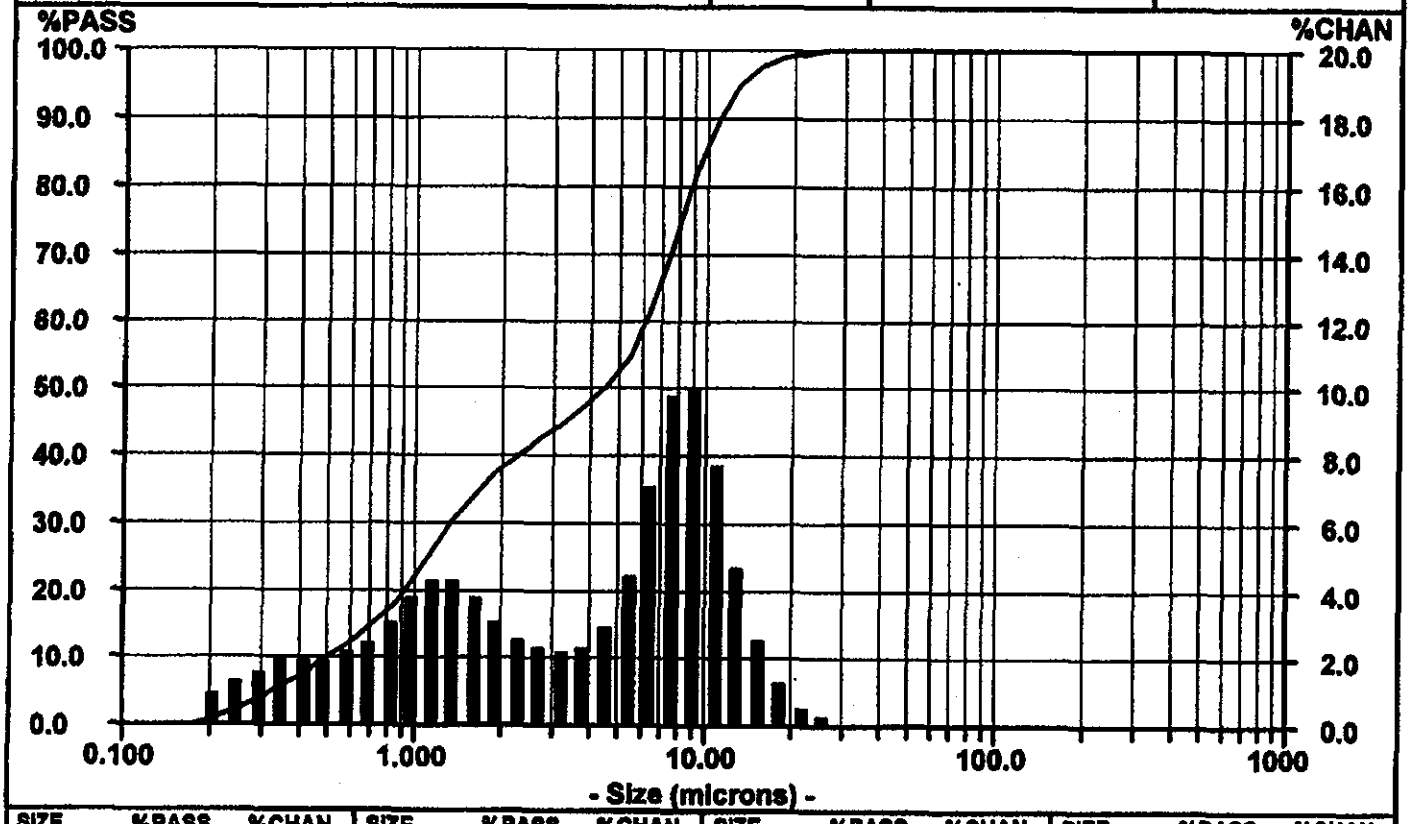
AY-101

AY-101
Duplicate

Date: 09/28/91 Meas #: 00002
Time: 05:57 Pres #: 01

1 M NaOH and 1 M NaNO3
2 minute sonication @ 40 W
Flow Rate = 40 ml/sec.
Refractive Index = 1.50 Particle/1.33 Medium
File: 101AY023

Summary	Percentiles		Dia	Vol%	Width
mv = 5.168	10% = 0.493	60% = 6.244	7.690	57%	6.320
mn = 0.304	20% = 0.907	70% = 7.518	0.959	43%	1.386
ma = 1.380	30% = 1.344	80% = 8.891			
cs = 4.347	40% = 2.267	90% = 10.98			
sd = 4.416	50% = 4.532	95% = 13.11			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	82.21	10.17						
592.0	100.00	0.00	7.778	72.04	9.83						
497.8	100.00	0.00	6.541	62.21	7.21						
418.6	100.00	0.00	5.500	55.00	4.59						
352.0	100.00	0.00	4.625	50.41	3.05						
296.0	100.00	0.00	3.889	47.36	2.40						
248.9	100.00	0.00	3.270	44.96	2.27						
209.3	100.00	0.00	2.750	42.69	2.40						
176.0	100.00	0.00	2.312	40.29	2.69						
148.0	100.00	0.00	1.945	37.60	3.18						
124.5	100.00	0.00	1.635	34.42	3.84						
104.7	100.00	0.00	1.375	30.58	4.43						
88.00	100.00	0.00	1.156	26.15	4.48						
74.00	100.00	0.00	0.972	21.67	3.91						
62.23	100.00	0.00	0.818	17.76	3.14						
52.33	100.00	0.00	0.688	14.62	2.56						
44.00	100.00	0.00	0.578	12.06	2.22						
37.00	100.00	0.00	0.486	9.84	2.05						
31.11	100.00	0.00	0.409	7.79	1.97						
26.16	100.00	0.35	0.344	5.82	1.90						
22.00	99.65	0.68	0.289	3.92	1.70						
18.50	98.97	1.36	0.243	2.22	1.31						
15.56	97.61	2.65	0.204	0.91	0.91						
13.08	94.96	4.88	0.172	0.00	0.00						
11.00	90.08	7.87	0.145	0.00	0.00						

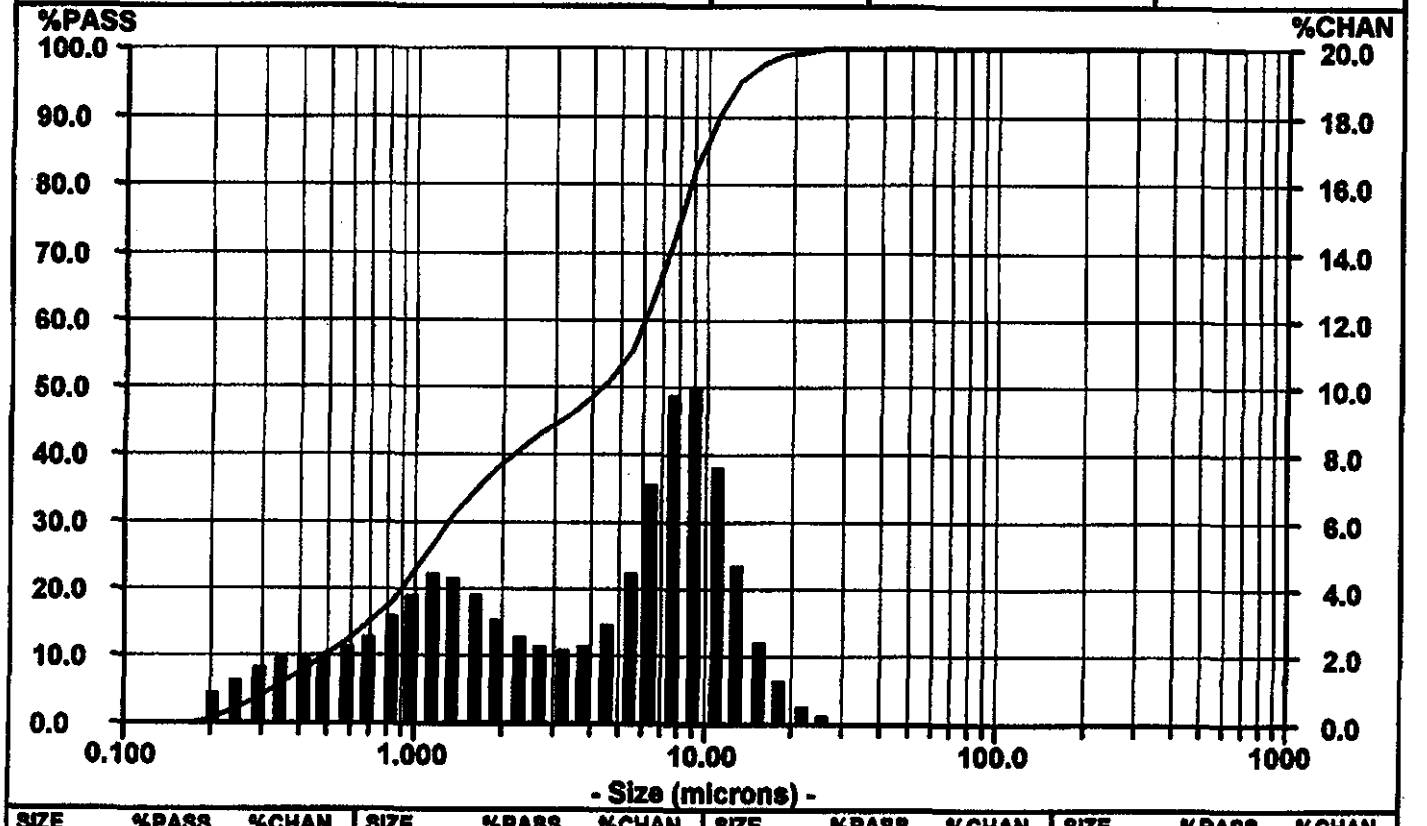
AY-101

AY-101
Duplicate

Date: 09/28/91 Meas #: 00002
Time: 06:02 Pres #: 01

1 M NaOH and 1 M NaNO3
2 minute sonication @ 40 W
Flow Rate = 40 ml/sec.
Refractive Index = 1.70 Particle/1.33 Medium
File: 101AY024

Summary	Percentiles		Dia	Vol%	Width
mv = 5.101	10% = 0.480	60% = 6.172	7.658	57%	6.254
mn = 0.304	20% = 0.885	70% = 7.463	0.948	43%	1.380
ma = 1.356	30% = 1.313	80% = 8.817			
cs = 4.426	40% = 2.187	90% = 10.88			
sd = 4.386	50% = 4.418	95% = 12.98			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	82.67	10.12						
592.0	100.00	0.00	7.778	72.55	9.82						
497.8	100.00	0.00	6.541	62.73	7.23						
418.6	100.00	0.00	5.500	55.50	4.59						
352.0	100.00	0.00	4.625	50.91	3.04						
296.0	100.00	0.00	3.889	47.87	2.39						
248.9	100.00	0.00	3.270	45.48	2.26						
209.3	100.00	0.00	2.750	43.22	2.39						
176.0	100.00	0.00	2.312	40.83	2.69						
148.0	100.00	0.00	1.945	38.14	3.16						
124.5	100.00	0.00	1.635	34.98	3.83						
104.7	100.00	0.00	1.375	31.15	4.42						
88.00	100.00	0.00	1.156	26.73	4.50						
74.00	100.00	0.00	0.972	22.23	3.95						
62.23	100.00	0.00	0.818	18.28	3.20						
52.33	100.00	0.00	0.688	15.08	2.63						
44.00	100.00	0.00	0.578	12.45	2.30						
37.00	100.00	0.00	0.486	10.15	2.13						
31.11	100.00	0.00	0.409	8.02	2.04						
26.16	100.00	0.32	0.344	5.98	1.96						
22.00	99.68	0.64	0.289	4.02	1.74						
18.50	99.04	1.30	0.243	2.28	1.34						
15.56	97.74	2.57	0.204	0.94	0.94						
13.08	95.17	4.76	0.172	0.00	0.00						
11.00	90.41	7.74	0.145	0.00	0.00						

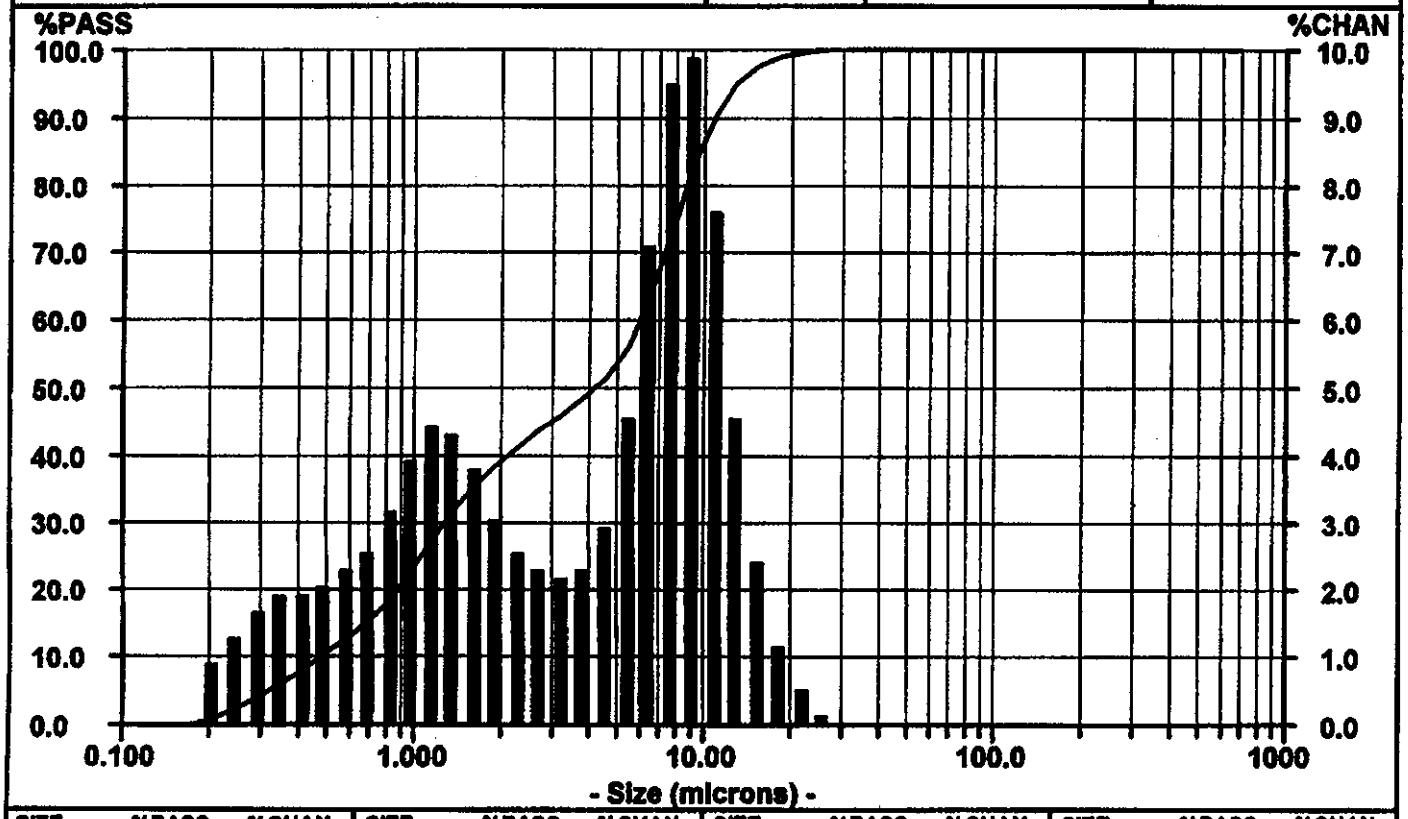
AY-101

AY-101
Duplicate

Date: 09/28/91 Meas #: 00002
Time: 06:07 Pres #: 01

1 M NaOH and 1 M NaNO3
2 minute sonication @ 40 W
Flow Rate = 40 ml/sec.
Refractive Index = 2.00 Particle/1.33 Medium
File: 101AY025

Summary	Percentiles		Dia	Vol%	Width
mv = 5.032	10% = 0.473	60% = 6.072	7.628	56%	6.250
mn = 0.303	20% = 0.869	70% = 7.379	0.943	44%	1.371
ma = 1.335	30% = 1.282	80% = 8.756			
cs = 4.496	40% = 2.099	90% = 10.82			
sd = 4.361	50% = 4.249	95% = 12.89			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	83.02	9.93						
592.0	100.00	0.00	7.778	73.09	9.68						
497.8	100.00	0.00	6.541	63.41	7.18						
418.6	100.00	0.00	5.500	56.23	4.60						
352.0	100.00	0.00	4.625	51.63	3.07						
296.0	100.00	0.00	3.889	48.56	2.42						
248.9	100.00	0.00	3.270	46.14	2.28						
209.3	100.00	0.00	2.750	43.86	2.40						
176.0	100.00	0.00	2.312	41.46	2.68						
148.0	100.00	0.00	1.945	38.78	3.16						
124.5	100.00	0.00	1.635	35.62	3.85						
104.7	100.00	0.00	1.375	31.77	4.48						
88.00	100.00	0.00	1.156	27.29	4.59						
74.00	100.00	0.00	0.972	22.70	4.04						
62.23	100.00	0.00	0.818	18.66	3.27						
52.33	100.00	0.00	0.688	15.39	2.68						
44.00	100.00	0.00	0.578	12.71	2.35						
37.00	100.00	0.00	0.486	10.36	2.18						
31.11	100.00	0.00	0.409	8.18	2.09						
26.16	100.00	0.30	0.344	6.09	1.99						
22.00	99.70	0.61	0.289	4.10	1.77						
18.50	99.09	1.26	0.243	2.33	1.37						
15.56	97.83	2.51	0.204	0.96	0.96						
13.08	95.32	4.68	0.172	0.00	0.00						
11.00	90.64	7.62	0.145	0.00	0.00						

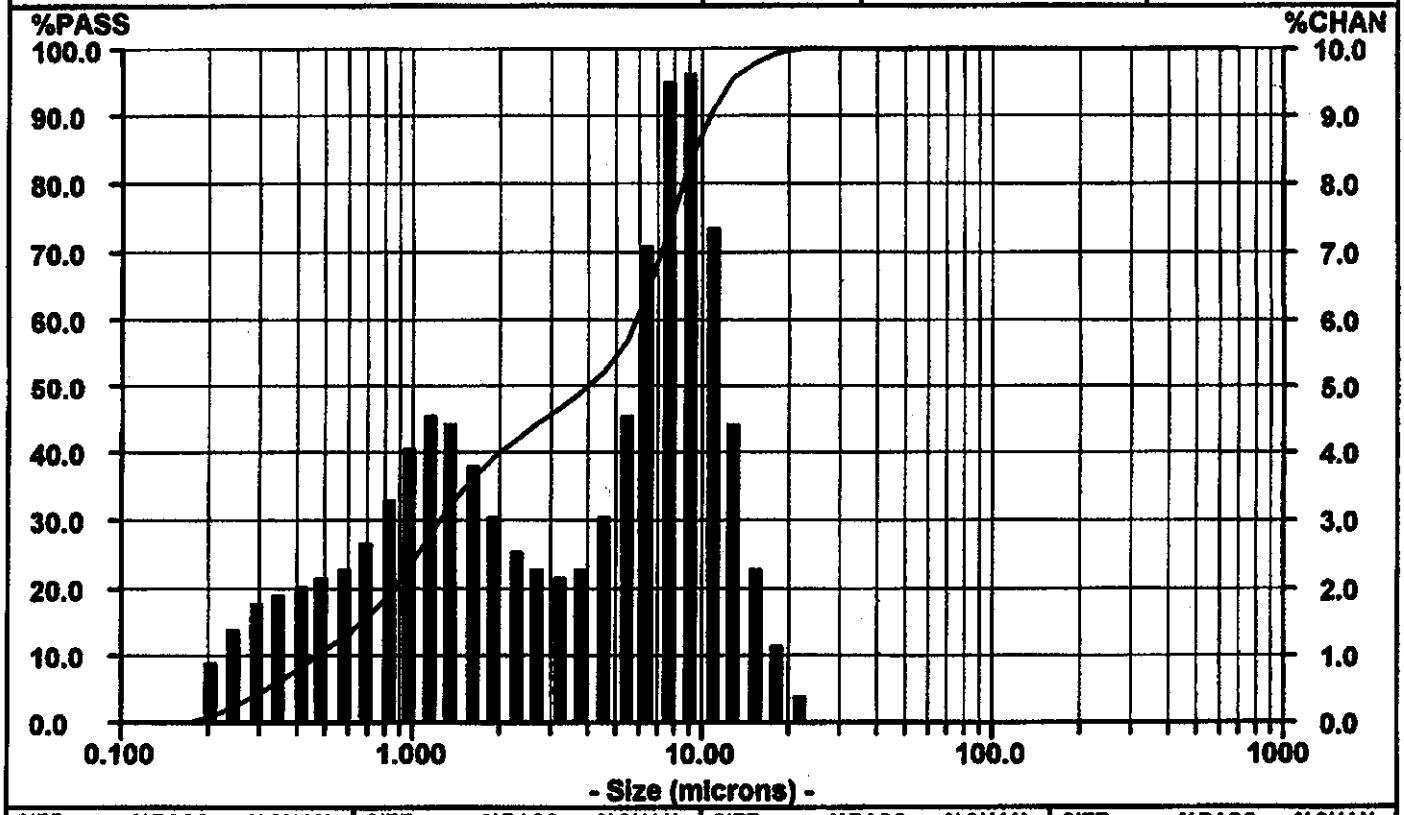
AY-101

AY-101
Duplicate

Date: 09/28/91 Meas #: 00002
Time: 06:11 Pres #: 01

1 M NaOH and 1 M NaNO3
2 minute sonication @ 40 W
Flow Rate = 60 ml/sec.
Refractive Index = 1.50 Particle/1.33 Medium
File: 101AY026

Summary	Percentiles		Dia	Vol%	Width
mv = 4.911	10% = 0.463	60% = 5.949	7.565	55%	6.154
mn = 0.303	20% = 0.849	70% = 7.271	0.934	45%	1.363
ma = 1.309	30% = 1.249	80% = 8.645			
cs = 4.585	40% = 2.008	90% = 10.66			
sd = 4.309	50% = 4.067	95% = 12.64			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	83.68	9.77						
592.0	100.00	0.00	7.778	73.91	9.63						
497.8	100.00	0.00	6.541	64.28	7.22						
418.6	100.00	0.00	5.500	57.06	4.66						
352.0	100.00	0.00	4.625	52.40	3.11						
296.0	100.00	0.00	3.889	49.29	2.44						
248.9	100.00	0.00	3.270	46.85	2.29						
209.3	100.00	0.00	2.750	44.56	2.40						
176.0	100.00	0.00	2.312	42.16	2.68						
148.0	100.00	0.00	1.945	39.48	3.16						
124.5	100.00	0.00	1.635	36.32	3.86						
104.7	100.00	0.00	1.375	32.46	4.52						
88.00	100.00	0.00	1.156	27.94	4.65						
74.00	100.00	0.00	0.972	23.29	4.11						
62.23	100.00	0.00	0.818	19.18	3.34						
52.33	100.00	0.00	0.688	15.84	2.75						
44.00	100.00	0.00	0.578	13.09	2.42						
37.00	100.00	0.00	0.486	10.67	2.25						
31.11	100.00	0.00	0.409	8.42	2.16						
26.16	100.00	0.00	0.344	6.26	2.05						
22.00	100.00	0.59	0.289	4.21	1.82						
18.50	99.41	1.23	0.243	2.39	1.40						
15.56	98.18	2.45	0.204	0.99	0.99						
13.08	95.73	4.58	0.172	0.00	0.00						
11.00	91.15	7.47	0.145	0.00	0.00						

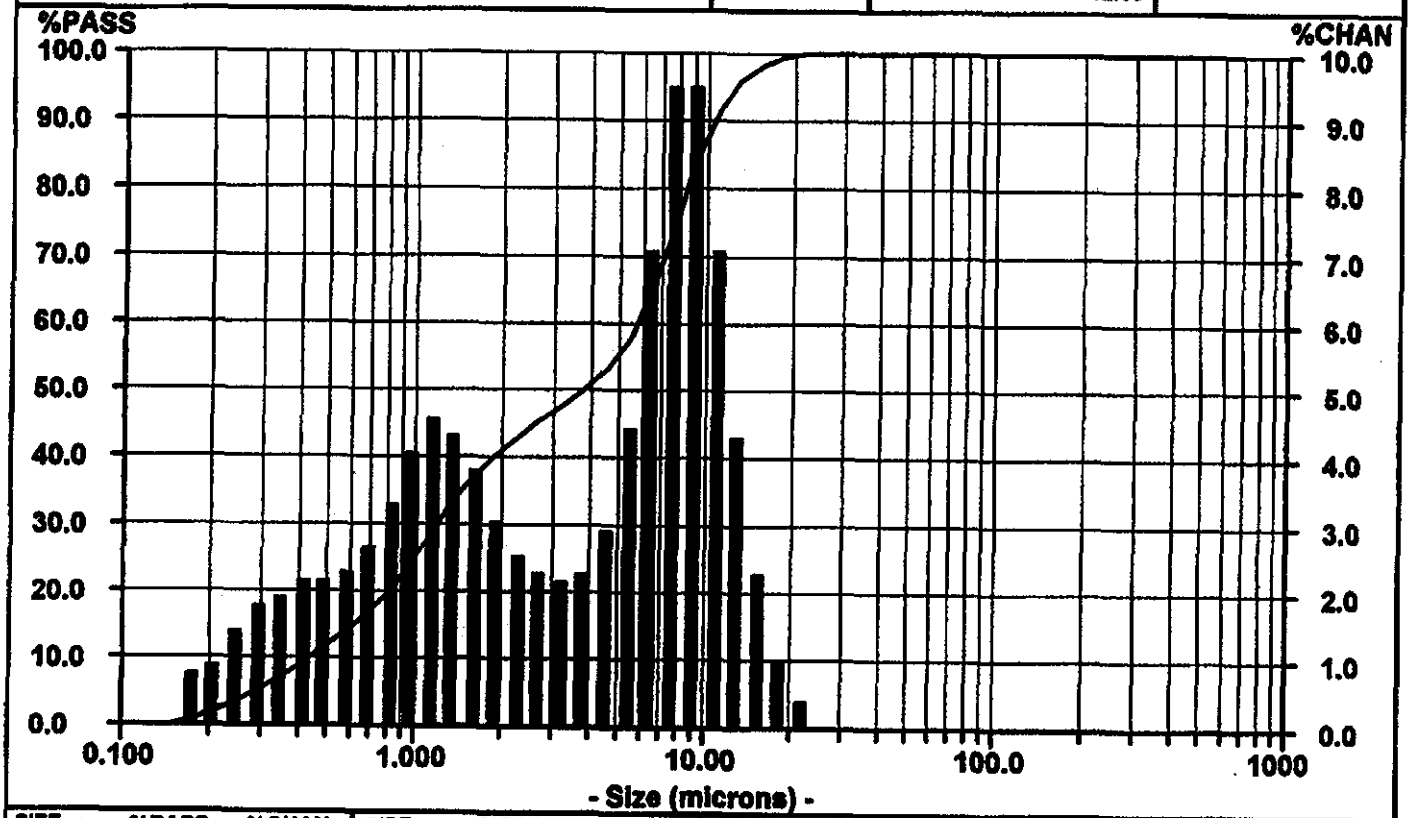
AY-101

1 M NaOH and 1 M NaNO3
2 minute sonication @ 40 W
Flow Rate = 60 ml/sec.
Refractive Index = 1.70 Particle/1.33 Medium
File: 101AY027

AY-101
Duplicate

Date: 09/28/91 Meas #: 00002
Time: 06:16 Pres #: 01

Summary	Percentiles		Dia	Vol%	Width
mv = 4.811	10% = 0.426	60% = 5.825	7.546	54%	6.111
mn = 0.262	20% = 0.805	70% = 7.182	0.909	46%	1.365
ma = 1.210	30% = 1.194	80% = 8.555			
cs = 4.957	40% = 1.882	90% = 10.55			
sd = 4.283	50% = 3.820	95% = 12.50			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	84.21	9.66						
592.0	100.00	0.00	7.778	74.55	9.50						
497.8	100.00	0.00	6.541	65.05	7.12						
418.6	100.00	0.00	5.500	57.93	4.59						
352.0	100.00	0.00	4.625	53.34	3.07						
296.0	100.00	0.00	3.889	50.27	2.42						
248.9	100.00	0.00	3.270	47.85	2.27						
209.3	100.00	0.00	2.750	45.58	2.38						
176.0	100.00	0.00	2.312	43.20	2.65						
148.0	100.00	0.00	1.945	40.55	3.12						
124.5	100.00	0.00	1.635	37.43	3.81						
104.7	100.00	0.00	1.375	33.62	4.49						
88.00	100.00	0.00	1.156	29.13	4.65						
74.00	100.00	0.00	0.972	24.48	4.13						
62.23	100.00	0.00	0.818	20.35	3.37						
52.33	100.00	0.00	0.688	16.98	2.78						
44.00	100.00	0.00	0.578	14.20	2.45						
37.00	100.00	0.00	0.486	11.75	2.29						
31.11	100.00	0.00	0.409	9.46	2.20						
26.16	100.00	0.00	0.344	7.26	2.09						
22.00	100.00	0.56	0.289	5.17	1.84						
18.50	99.44	1.16	0.243	3.33	1.41						
15.56	98.28	2.35	0.204	1.92	1.07						
13.08	95.93	4.43	0.172	0.85	0.85						
11.00	91.50	7.29	0.145	0.00	0.00						

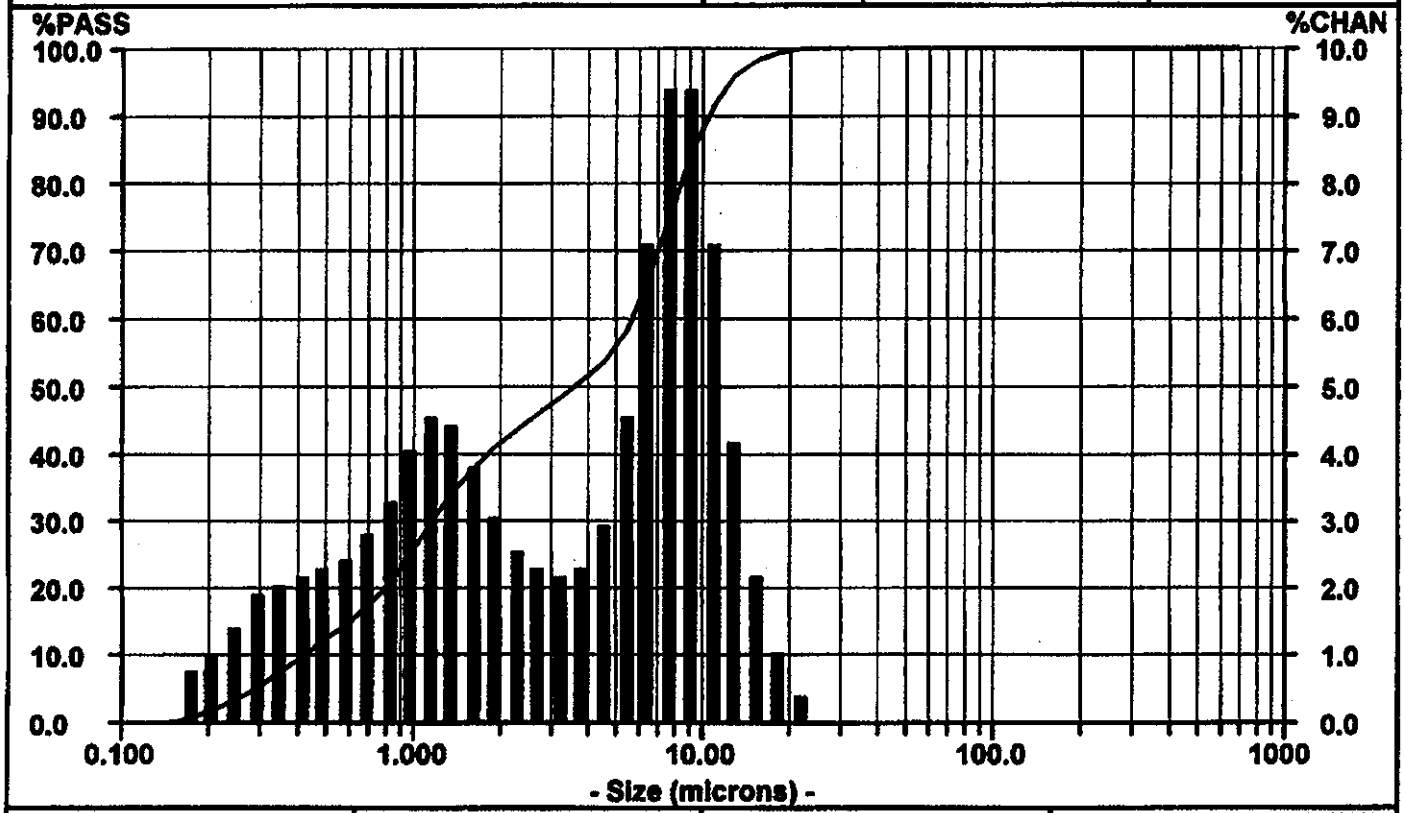
AY-101

AY-101
Duplicate

Date: 09/28/91 Meas #: 00002
Time: 06:21 Pres #: 01

1 M NaOH and 1 M NaNO3
2 minute sonication @ 40 W
Flow Rate = 60 ml/sec.
Refractive Index = 2.00 Particle/1.33 Medium
File: 101AY028

Summary	Percentiles		Dia	Vol%	Width
mv = 4.740	10% = 0.415	60% = 5.724	7.504	54%	6.073
mn = 0.260	20% = 0.784	70% = 7.097	0.901	46%	1.361
ma = 1.184	30% = 1.168	80% = 8.469			
cs = 5.067	40% = 1.809	90% = 10.46			
sd = 4.251	50% = 3.649	95% = 12.41			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	84.67	9.49						
592.0	100.00	0.00	7.778	75.18	9.48						
497.8	100.00	0.00	6.541	65.72	7.13						
418.6	100.00	0.00	5.500	58.59	4.60						
352.0	100.00	0.00	4.625	53.99	3.06						
296.0	100.00	0.00	3.889	50.93	2.41						
248.9	100.00	0.00	3.270	48.52	2.26						
209.3	100.00	0.00	2.750	46.26	2.37						
176.0	100.00	0.00	2.312	43.89	2.65						
148.0	100.00	0.00	1.945	41.24	3.14						
124.5	100.00	0.00	1.635	38.10	3.84						
104.7	100.00	0.00	1.375	34.26	4.53						
88.00	100.00	0.00	1.156	29.73	4.68						
74.00	100.00	0.00	0.972	25.05	4.16						
62.23	100.00	0.00	0.818	20.89	3.40						
52.33	100.00	0.00	0.688	17.49	2.82						
44.00	100.00	0.00	0.578	14.67	2.50						
37.00	100.00	0.00	0.486	12.17	2.35						
31.11	100.00	0.00	0.409	9.82	2.27						
26.16	100.00	0.00	0.344	7.55	2.16						
22.00	100.00	0.54	0.289	5.39	1.91						
18.50	99.46	1.12	0.243	3.48	1.47						
15.56	98.34	2.27	0.204	2.01	1.12						
13.08	96.07	4.29	0.172	0.89	0.89						
11.00	91.78	7.11	0.145	0.00	0.00						

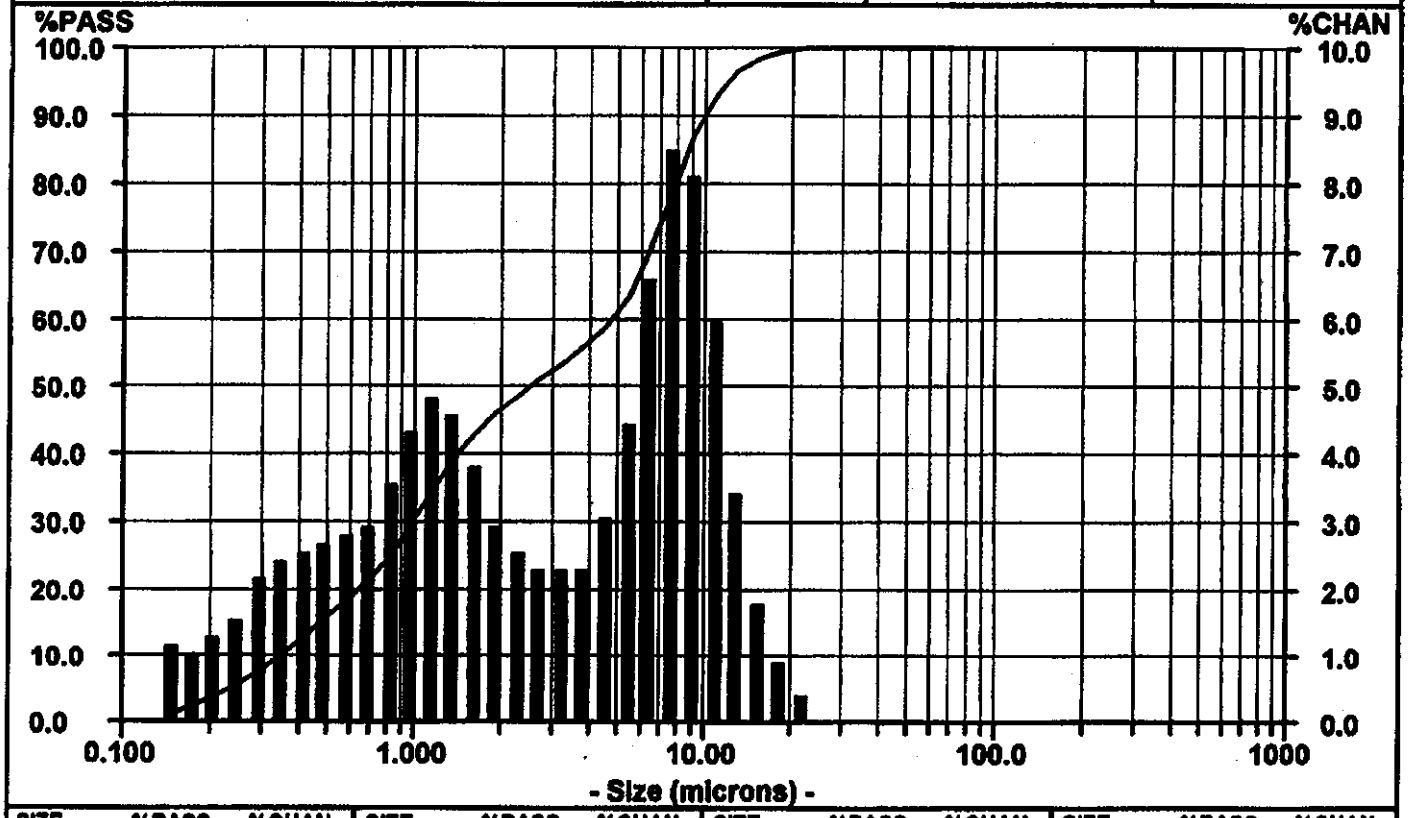
AY-101

AY-101
Duplicate

Date: 09/28/91 Meas #: 00002
Time: 06:47 Pres #: 01

1 M NaOH and 1 M NaNO3
20 minute sonication
Flow Rate = 17 ml/sec.
Refractive Index = 1.50 Particle/1.33 Medium
File: 101AY029

Summary	Percentiles		Dia	Vol%	Width
mv = 4.270	10% = 0.340	60% = 4.822	7.285	49%	6.040
mn = 0.210	20% = 0.633	70% = 6.488	0.854	50%	1.326
ma = 0.965	30% = 0.985	80% = 7.956	0.136	1%	0.012
cs = 6.217	40% = 1.423	90% = 9.965			
sd = 4.067	50% = 2.532	95% = 11.88			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	87.13	8.25						
592.0	100.00	0.00	7.778	78.88	8.52						
497.8	100.00	0.00	6.541	70.36	6.75						
418.6	100.00	0.00	5.500	63.61	4.54						
352.0	100.00	0.00	4.625	59.07	3.12						
296.0	100.00	0.00	3.889	55.95	2.49						
248.9	100.00	0.00	3.270	53.46	2.33						
209.3	100.00	0.00	2.750	51.13	2.41						
176.0	100.00	0.00	2.312	48.72	2.64						
148.0	100.00	0.00	1.945	46.08	3.08						
124.5	100.00	0.00	1.635	43.00	3.82						
104.7	100.00	0.00	1.375	39.18	4.63						
88.00	100.00	0.00	1.156	34.55	4.93						
74.00	100.00	0.00	0.972	29.62	4.46						
62.23	100.00	0.00	0.818	25.17	3.67						
52.33	100.00	0.00	0.688	21.50	3.09						
44.00	100.00	0.00	0.578	18.41	2.82						
37.00	100.00	0.00	0.486	15.59	2.73						
31.11	100.00	0.00	0.409	12.86	2.68						
26.16	100.00	0.00	0.344	10.18	2.53						
22.00	100.00	0.45	0.289	7.65	2.20						
18.50	99.55	0.93	0.243	5.45	1.68						
15.56	98.62	1.88	0.204	3.77	1.31						
13.08	96.74	3.58	0.172	2.46	1.19						
11.00	93.16	6.03	0.145	1.27	1.27						

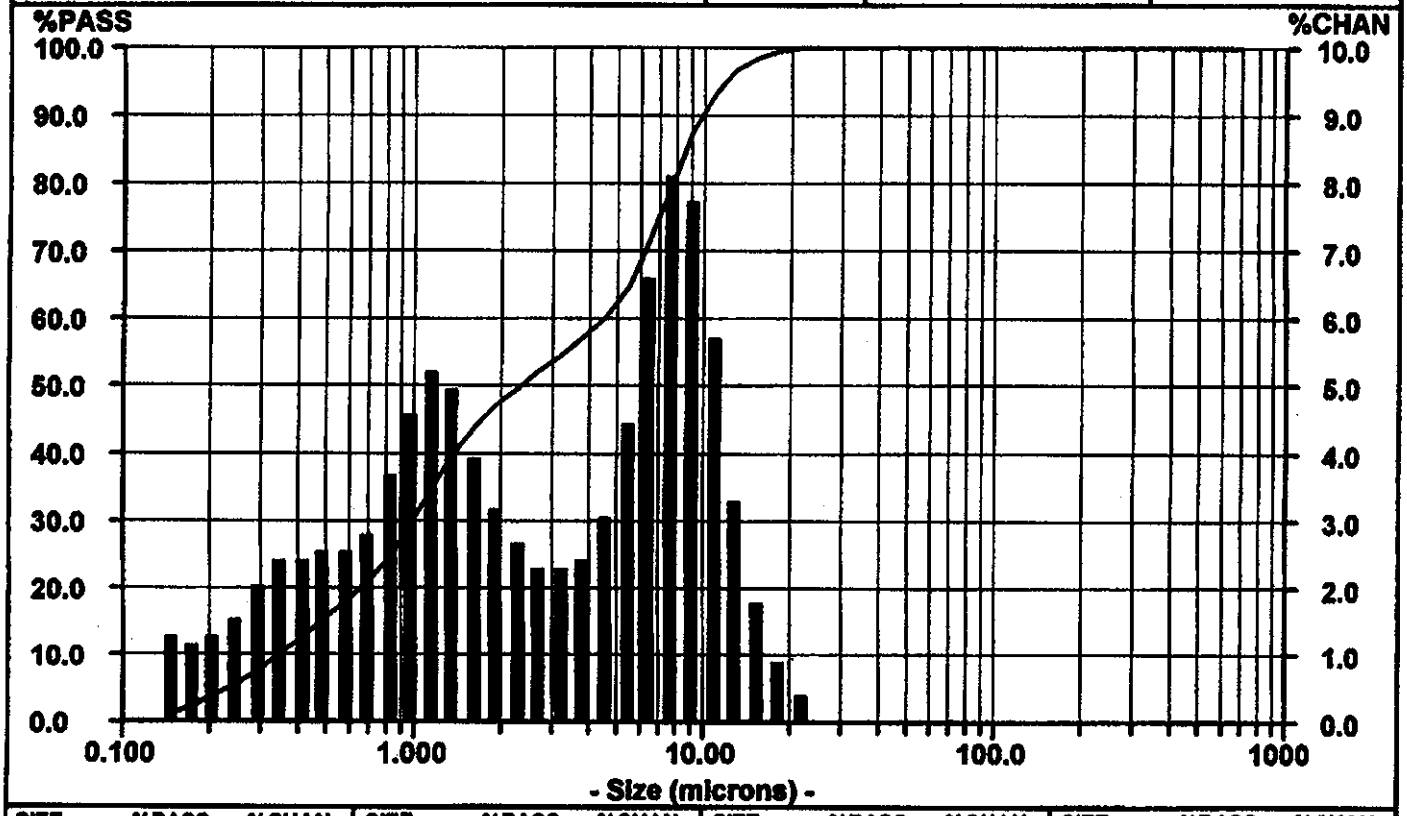
AY-101

AY-101
Duplicate

Date: 09/28/91 Meas #: 00001
Time: 06:59 Pres #: 01

1 M NaOH and 1 M NaNO3
20 minute sonication @ 40 W
Flow Rate = 17 ml/sec.
Refractive Index = 1.70 Particle/1.33 Medium
File: 101AYD12

Summary	Percentiles		Dia	Vol%	Width
mv = 4.176	10% = 0.339	60% = 4.546	7.220	48%	6.081
mn = 0.209	20% = 0.648	70% = 6.315	0.884	51%	1.328
ma = 0.960	30% = 0.990	80% = 7.818	0.136	1%	0.012
cs = 6.250	40% = 1.386	90% = 9.858			
sd = 4.000	50% = 2.349	95% = 11.80			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.260	87.64	7.88						
592.0	100.00	0.00	7.778	79.76	8.26						
497.8	100.00	0.00	6.541	71.50	6.81						
418.6	100.00	0.00	5.500	64.89	4.63						
352.0	100.00	0.00	4.625	60.36	3.17						
296.0	100.00	0.00	3.889	57.19	2.55						
248.9	100.00	0.00	3.270	54.64	2.40						
209.3	100.00	0.00	2.750	52.24	2.47						
176.0	100.00	0.00	2.312	49.77	2.71						
148.0	100.00	0.00	1.945	47.06	3.20						
124.5	100.00	0.00	1.635	43.86	4.06						
104.7	100.00	0.00	1.375	39.80	5.01						
88.00	100.00	0.00	1.156	34.79	5.33						
74.00	100.00	0.00	0.972	29.46	4.69						
62.23	100.00	0.00	0.818	24.77	3.70						
52.33	100.00	0.00	0.688	21.07	2.99						
44.00	100.00	0.00	0.578	18.08	2.68						
37.00	100.00	0.00	0.486	15.40	2.60						
31.11	100.00	0.00	0.409	12.80	2.59						
26.16	100.00	0.00	0.344	10.21	2.50						
22.00	100.00	0.44	0.289	7.71	2.19						
18.50	99.56	0.91	0.243	5.52	1.69						
15.56	98.65	1.82	0.204	3.83	1.32						
13.08	96.83	3.44	0.172	2.51	1.21						
11.00	93.39	5.75	0.145	1.30	1.30						

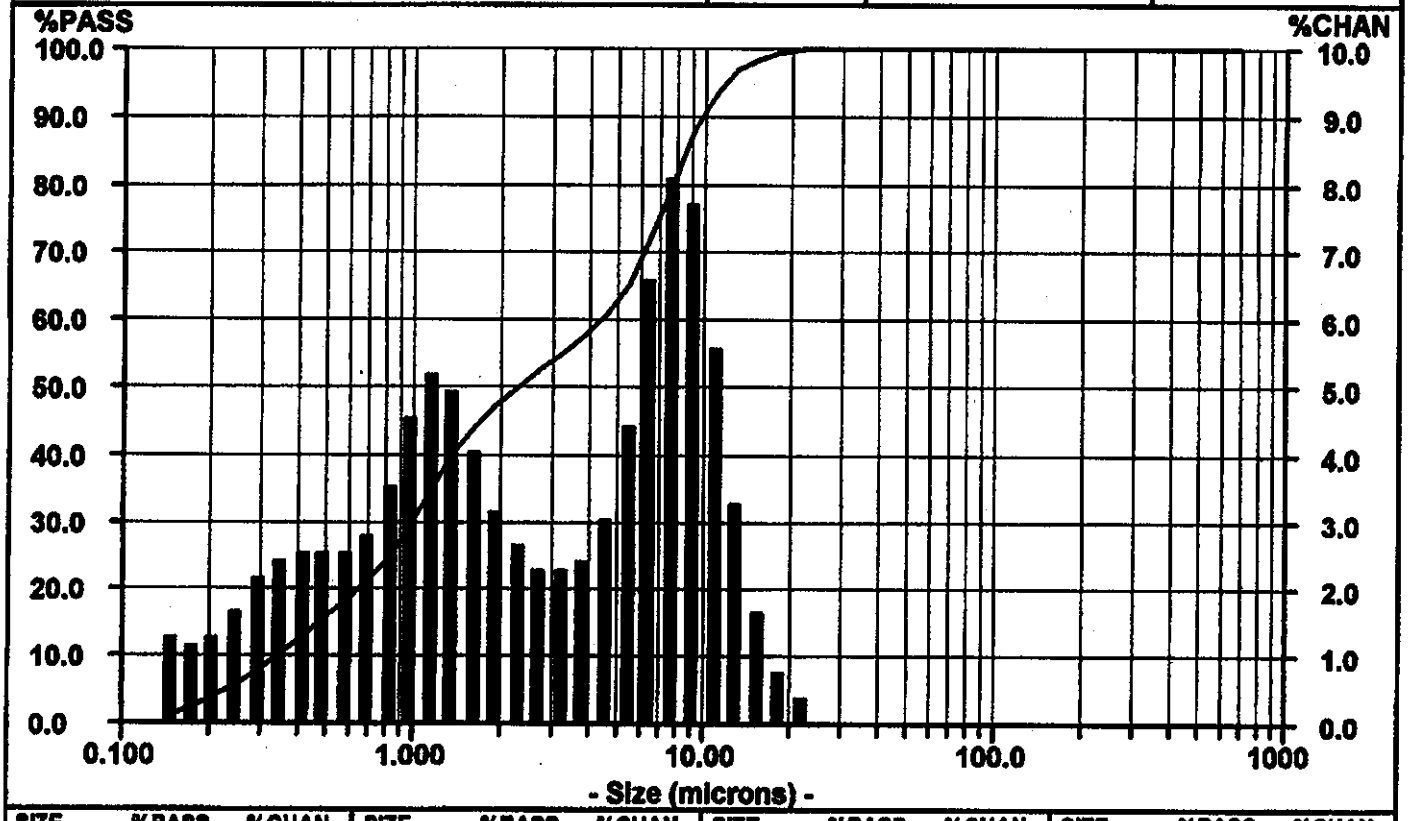
AY-101

AY-101
Duplicate

Date: 09/28/91 Meas #: 00001
Time: 07:03 Pres #: 01

1 M NaOH and 1 M NaNO3
20 minute sonication @ 40 W
Flow Rate = 17 ml/sec.
Refractive Index = 2.00 Particle/1.33 Medium
File: 101AYD13

Summary	Percentiles		Dia	Vol%	Width
mv = 4.136	10% = 0.335	60% = 4.461	7.198	47%	6.039
mn = 0.209	20% = 0.640	70% = 6.257	0.885	52%	1.330
ma = 0.951	30% = 0.983	80% = 7.764	0.136	1%	0.012
cs = 6.307	40% = 1.371	90% = 9.792			
sd = 3.976	50% = 2.283	95% = 11.72			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	87.90	7.81						
592.0	100.00	0.00	7.778	80.09	8.21						
497.8	100.00	0.00	6.541	71.88	6.61						
418.6	100.00	0.00	5.500	65.27	4.53						
352.0	100.00	0.00	4.625	60.74	3.15						
296.0	100.00	0.00	3.889	57.59	2.54						
248.9	100.00	0.00	3.270	55.05	2.39						
209.3	100.00	0.00	2.750	52.66	2.47						
176.0	100.00	0.00	2.312	50.19	2.73						
148.0	100.00	0.00	1.945	47.46	3.25						
124.5	100.00	0.00	1.635	44.21	4.12						
104.7	100.00	0.00	1.375	40.09	5.07						
88.00	100.00	0.00	1.156	35.02	5.36						
74.00	100.00	0.00	0.972	29.66	4.69						
62.23	100.00	0.00	0.818	24.97	3.69						
52.33	100.00	0.00	0.688	21.28	2.99						
44.00	100.00	0.00	0.578	18.29	2.68						
37.00	100.00	0.00	0.486	15.61	2.62						
31.11	100.00	0.00	0.409	12.99	2.62						
26.16	100.00	0.00	0.344	10.37	2.53						
22.00	100.00	0.43	0.289	7.84	2.23						
18.50	99.57	0.88	0.243	5.61	1.72						
15.56	98.69	1.77	0.204	3.89	1.35						
13.08	96.92	3.36	0.172	2.54	1.23						
11.00	93.56	5.66	0.145	1.31	1.31						

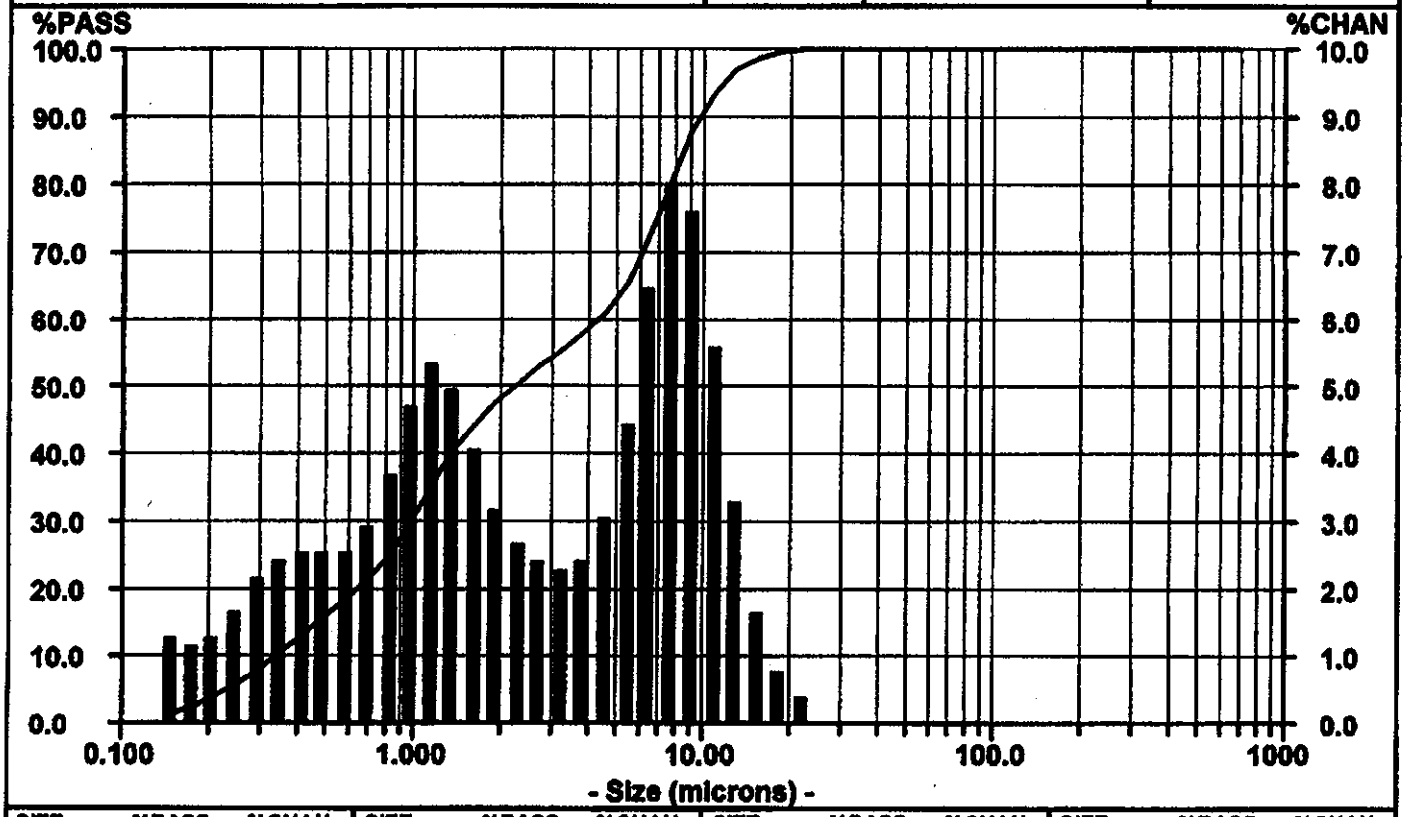
AY-101

AY-101
Duplicate

Date: 09/28/91 Meas #: 00001
Time: 07:08 Pres #: 01

1M NaNO3 and 1M NaOH
20 min. sonication @ 40 W
Flow Rate = 40 ml/sec.
Refractive Index = 1.50 Particle/1.33 Medium
File: 101AYD14

Summary	Percentiles		Dia	Vol%	Width
mv = 4.104	10% = 0.334	60% = 4.376	7.186	47%	6.034
mn = 0.209	20% = 0.635	70% = 6.211	1.077	40%	1.208
ma = 0.946	30% = 0.976	80% = 7.729	0.276	12%	0.174
cs = 6.340	40% = 1.368	90% = 9.753	0.136	1%	0.012
sd = 3.962	50% = 2.237	95% = 11.67			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	88.05	7.74						
592.0	100.00	0.00	7.778	80.31	8.15						
497.8	100.00	0.00	6.541	72.16	6.55						
418.6	100.00	0.00	5.500	65.61	4.50						
352.0	100.00	0.00	4.625	61.11	3.15						
296.0	100.00	0.00	3.889	57.96	2.55						
248.9	100.00	0.00	3.270	55.41	2.41						
209.3	100.00	0.00	2.750	53.00	2.50						
176.0	100.00	0.00	2.312	50.50	2.75						
148.0	100.00	0.00	1.945	47.75	3.26						
124.5	100.00	0.00	1.635	44.49	4.13						
104.7	100.00	0.00	1.375	40.36	5.09						
88.00	100.00	0.00	1.156	35.27	5.40						
74.00	100.00	0.00	0.972	29.87	4.73						
62.23	100.00	0.00	0.818	25.14	3.71						
52.33	100.00	0.00	0.688	21.43	3.00						
44.00	100.00	0.00	0.578	18.43	2.69						
37.00	100.00	0.00	0.486	15.74	2.64						
31.11	100.00	0.00	0.409	13.10	2.66						
26.16	100.00	0.00	0.344	10.44	2.57						
22.00	100.00	0.41	0.289	7.87	2.26						
18.50	99.59	0.85	0.243	5.61	1.73						
15.56	98.74	1.74	0.204	3.88	1.34						
13.08	97.00	3.33	0.172	2.54	1.23						
11.00	93.67	5.62	0.145	1.31	1.31						

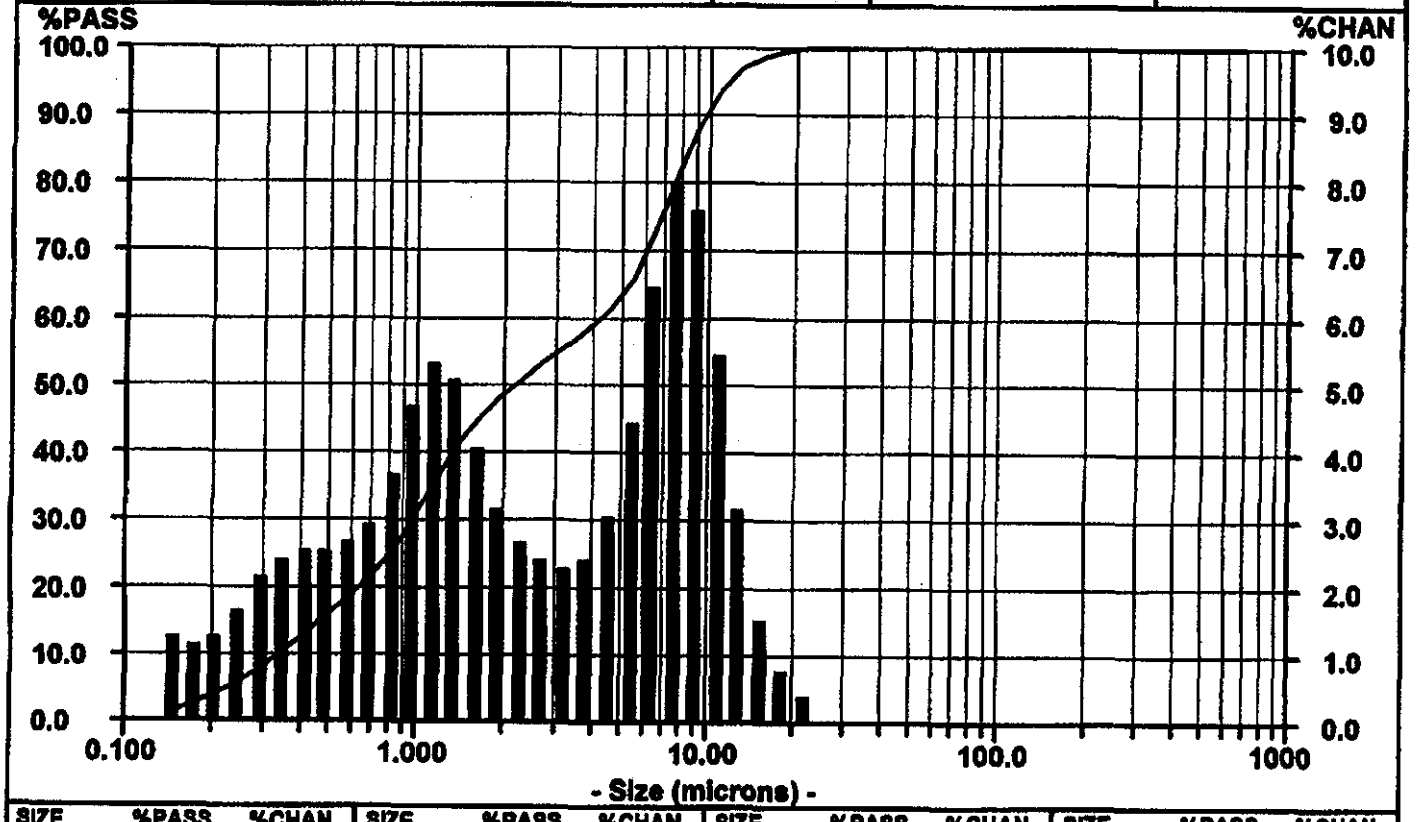
AY-101

1M NaNO3 and 1M NaOH
20 min. sonication @ 40 W
Flow Rate = 40 ml/sec.
Refractive Index = 1.70 Particle/1.33 Medium
File: 101AYD15

AY-101
Duplicate

Date: 09/26/91 Meas #: 00001
Time: 07:13 Pres #: 01

Summary	Percentiles		Dia	Vol%	Width
mv = 4.067	10% = 0.330	60% = 4.293	7.164	47%	6.011
mn = 0.208	20% = 0.627	70% = 6.156	1.076	40%	1.207
ma = 0.935	30% = 0.967	80% = 7.681	0.275	12%	0.175
cs = 6.420	40% = 1.341	90% = 9.693	0.136	1%	0.012
sd = 3.940	50% = 2.168	95% = 11.60			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	88.28	7.67						
592.0	100.00	0.00	7.778	80.61	8.10						
497.8	100.00	0.00	6.541	72.51	6.64						
418.6	100.00	0.00	5.500	66.97	4.50						
352.0	100.00	0.00	4.625	61.47	3.15						
296.0	100.00	0.00	3.889	58.32	2.55						
248.9	100.00	0.00	3.270	55.77	2.41						
209.3	100.00	0.00	2.750	53.36	2.51						
176.0	100.00	0.00	2.312	50.85	2.76						
148.0	100.00	0.00	1.945	48.09	3.26						
124.5	100.00	0.00	1.635	44.83	4.13						
104.7	100.00	0.00	1.375	40.70	5.10						
88.00	100.00	0.00	1.156	35.60	5.43						
74.00	100.00	0.00	0.972	30.17	4.77						
62.23	100.00	0.00	0.818	25.40	3.74						
52.33	100.00	0.00	0.688	21.66	3.02						
44.00	100.00	0.00	0.578	18.64	2.71						
37.00	100.00	0.00	0.486	15.93	2.65						
31.11	100.00	0.00	0.409	13.28	2.66						
26.16	100.00	0.00	0.344	10.62	2.57						
22.00	100.00	0.40	0.289	8.05	2.26						
18.50	99.60	0.83	0.243	5.79	1.75						
15.56	98.77	1.70	0.204	4.04	1.38						
13.08	97.07	3.26	0.172	2.66	1.28						
11.00	93.81	5.53	0.145	1.38	1.38						

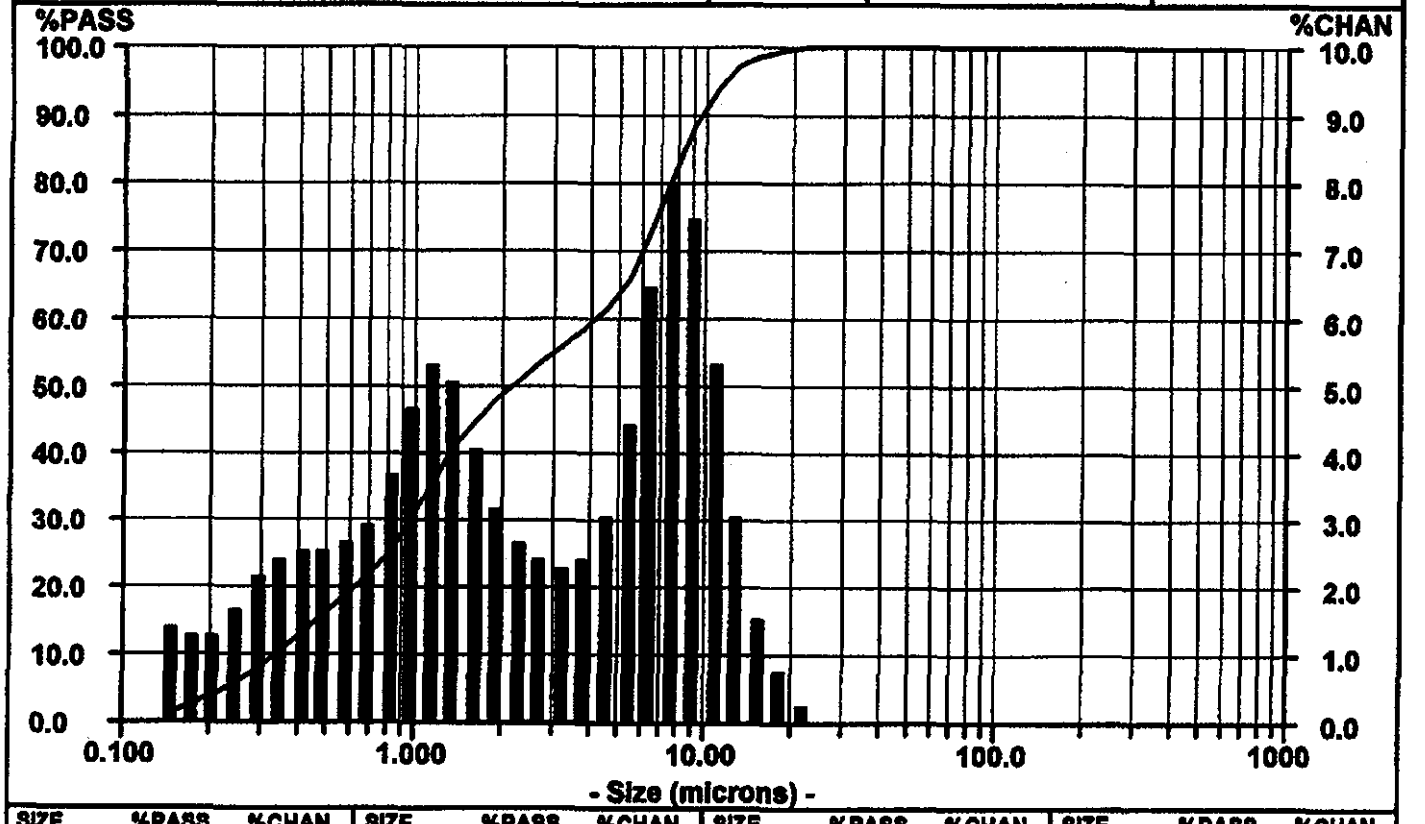
AY-101

AY-101
Duplicate

Date: 09/28/91 Meas #: 00001
Time: 07:18 Pres #: 01

1M NaNO3 and 1M NaOH
20 min. sonication @ 40 W
Flow Rate = 40 ml/sec.
Refractive Index = 2.00 Particle/1.33 Medium
File: 101AYD16

Summary	Percentiles		Dia	Vol%	Width
mv = 4.037	10% = 0.328	60% = 4.235	7.136	46%	5.979
mn = 0.207	20% = 0.621	70% = 6.110	1.075	40%	1.205
ma = 0.928	30% = 0.960	80% = 7.631	0.275	13%	0.175
cs = 6.468	40% = 1.329	90% = 9.636	0.136	1%	0.012
sd = 3.917	50% = 2.150	95% = 11.54			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	88.51	7.69						
592.0	100.00	0.00	7.778	80.92	8.11						
497.8	100.00	0.00	6.541	72.81	6.57						
418.6	100.00	0.00	5.500	66.24	4.52						
352.0	100.00	0.00	4.625	61.72	3.15						
296.0	100.00	0.00	3.889	58.57	2.54						
248.9	100.00	0.00	3.270	56.03	2.41						
209.3	100.00	0.00	2.750	53.62	2.50						
176.0	100.00	0.00	2.312	51.12	2.76						
148.0	100.00	0.00	1.945	48.36	3.27						
124.5	100.00	0.00	1.636	45.09	4.14						
104.7	100.00	0.00	1.375	40.95	5.12						
88.00	100.00	0.00	1.156	35.83	5.45						
74.00	100.00	0.00	0.972	30.38	4.79						
62.23	100.00	0.00	0.818	25.59	3.76						
52.33	100.00	0.00	0.688	21.83	3.03						
44.00	100.00	0.00	0.578	18.80	2.72						
37.00	100.00	0.00	0.486	16.08	2.67						
31.11	100.00	0.00	0.409	13.41	2.68						
26.16	100.00	0.00	0.344	10.73	2.69						
22.00	100.00	0.39	0.289	8.14	2.28						
18.50	99.61	0.82	0.243	5.86	1.78						
15.56	98.79	1.66	0.204	4.10	1.39						
13.08	97.13	3.19	0.172	2.71	1.30						
11.00	93.94	5.43	0.145	1.41	1.41						

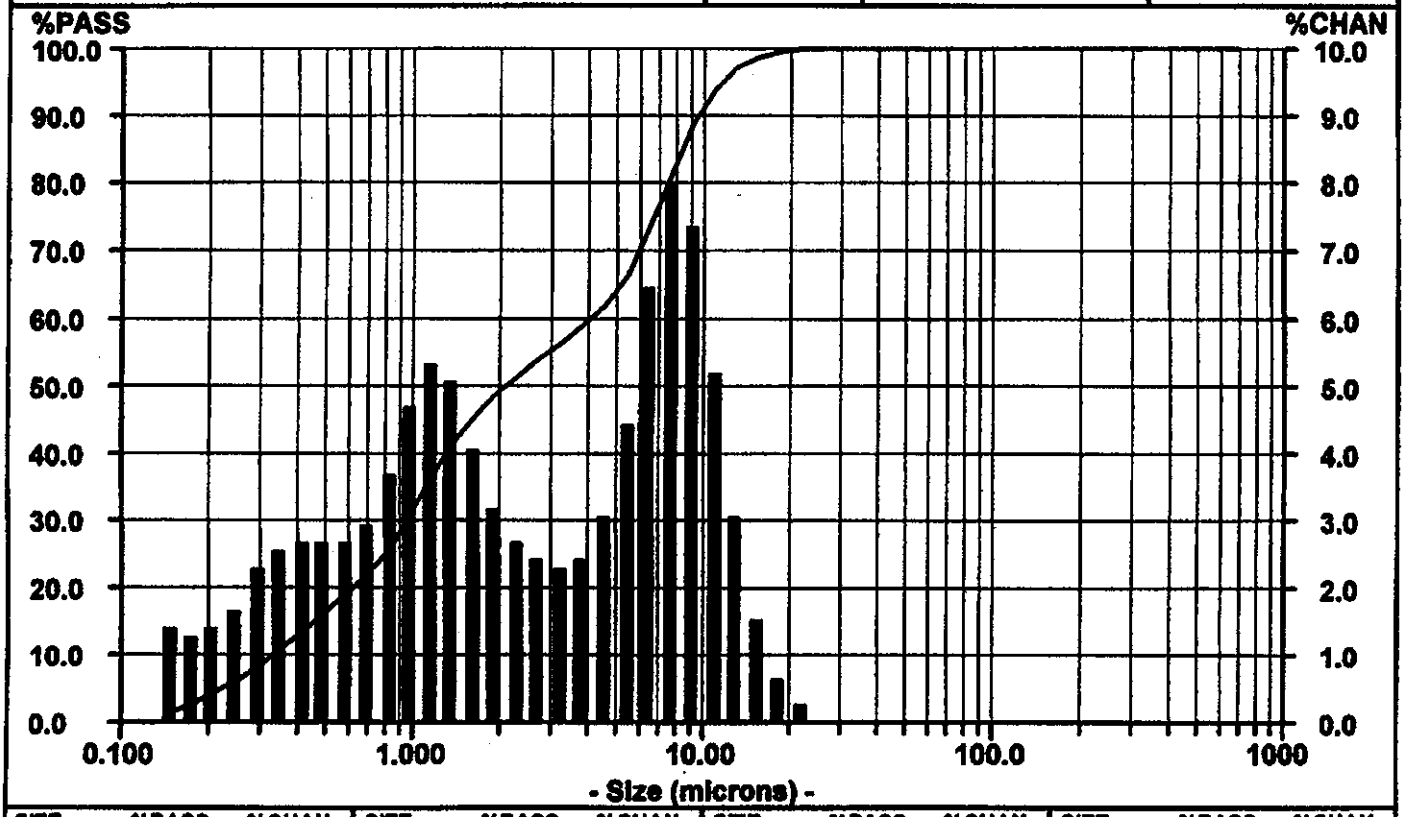
AY-101

AY-101
Duplicate

Date: 09/28/91 Meas #: 00001
Time: 07:23 Pres #: 01

1M NaNO3 and 1M NaOH
20 min. sonication @ 40 W
Flow Rate = 60 ml/sec.
Refractive Index = 1.50 Particle/1.33 Medium
File: 101AYD17

Summary	Percentiles		Dia	Vol%	Width
mv = 3.998	10% = 0.325	60% = 4.149	7.106	46%	5.949
mn = 0.207	20% = 0.613	70% = 6.049	1.074	40%	1.206
ma = 0.920	30% = 0.951	80% = 7.571	0.275	13%	0.175
cs = 6.521	40% = 1.315	90% = 9.577	0.136	1%	0.012
sd = 3.890	50% = 2.102	95% = 11.47			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	88.76	7.48						
592.0	100.00	0.00	7.778	81.28	8.07						
497.8	100.00	0.00	6.541	73.21	6.59						
418.6	100.00	0.00	5.500	66.62	4.54						
352.0	100.00	0.00	4.625	62.08	3.15						
296.0	100.00	0.00	3.889	58.83	2.53						
248.9	100.00	0.00	3.270	56.40	2.40						
209.3	100.00	0.00	2.750	54.00	2.51						
176.0	100.00	0.00	2.312	51.49	2.78						
148.0	100.00	0.00	1.945	48.71	3.29						
124.5	100.00	0.00	1.635	45.42	4.16						
104.7	100.00	0.00	1.375	41.26	5.13						
88.00	100.00	0.00	1.156	36.13	5.47						
74.00	100.00	0.00	0.972	30.66	4.80						
62.23	100.00	0.00	0.818	25.86	3.78						
52.33	100.00	0.00	0.688	22.08	3.06						
44.00	100.00	0.00	0.578	19.03	2.75						
37.00	100.00	0.00	0.486	16.28	2.70						
31.11	100.00	0.00	0.409	13.58	2.72						
26.16	100.00	0.00	0.344	10.86	2.63						
22.00	100.00	0.38	0.289	8.23	2.31						
18.50	99.62	0.79	0.243	5.92	1.79						
15.56	98.83	1.63	0.204	4.13	1.40						
13.08	97.20	3.12	0.172	2.73	1.31						
11.00	94.08	5.32	0.145	1.42	1.42						

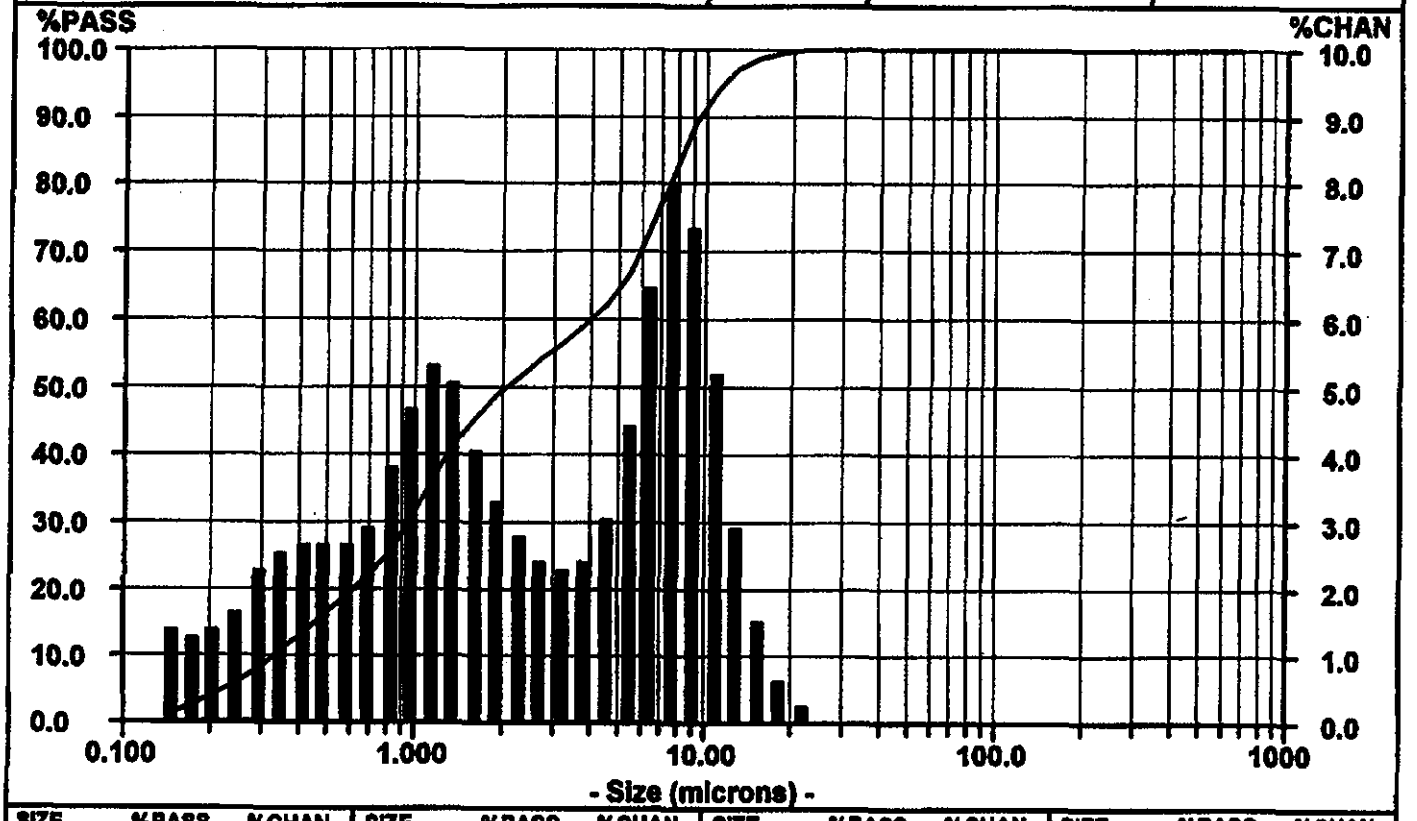
AY-101

AY-101
Duplicate

Date: 09/28/91 Meas #: 00001
Time: 07:27 Pres #: 01

1M NaNO3 and 1M NaOH
20 min. sonication @ 40 W
Flow Rate = 60 ml/sec.
Refractive Index = 1.70 Particle/1.33 Medium
File: 101AYD18

Summary	Percentiles		Dia	Vol%	Width
mv = 3.971	10% = 0.325	60% = 4.078	7.088	46%	5.933
mn = 0.207	20% = 0.608	70% = 6.004	0.877	53%	1.328
ma = 0.916	30% = 0.945	80% = 7.532	0.136	1%	0.012
cs = 6.552	40% = 1.305	90% = 9.535			
sd = 3.871	50% = 2.069	95% = 11.42			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	88.93	7.42						
592.0	100.00	0.00	7.778	81.51	8.01						
497.8	100.00	0.00	6.541	73.50	6.59						
418.6	100.00	0.00	5.500	66.91	4.54						
352.0	100.00	0.00	4.625	62.37	3.14						
296.0	100.00	0.00	3.889	59.23	2.53						
248.9	100.00	0.00	3.270	56.70	2.41						
209.3	100.00	0.00	2.750	54.29	2.53						
176.0	100.00	0.00	2.312	51.76	2.80						
148.0	100.00	0.00	1.945	48.96	3.31						
124.5	100.00	0.00	1.635	45.65	4.17						
104.7	100.00	0.00	1.375	41.48	5.14						
88.00	100.00	0.00	1.156	36.34	5.48						
74.00	100.00	0.00	0.972	30.86	4.83						
62.23	100.00	0.00	0.818	26.03	3.80						
52.33	100.00	0.00	0.688	22.23	3.08						
44.00	100.00	0.00	0.578	19.15	2.78						
37.00	100.00	0.00	0.486	16.37	2.74						
31.11	100.00	0.00	0.409	13.63	2.74						
26.16	100.00	0.00	0.344	10.89	2.64						
22.00	100.00	0.37	0.289	8.25	2.31						
18.50	99.63	0.78	0.243	5.94	1.78						
15.56	98.85	1.60	0.204	4.16	1.41						
13.08	97.25	3.07	0.172	2.75	1.32						
11.00	94.18	5.25	0.145	1.43	1.43						

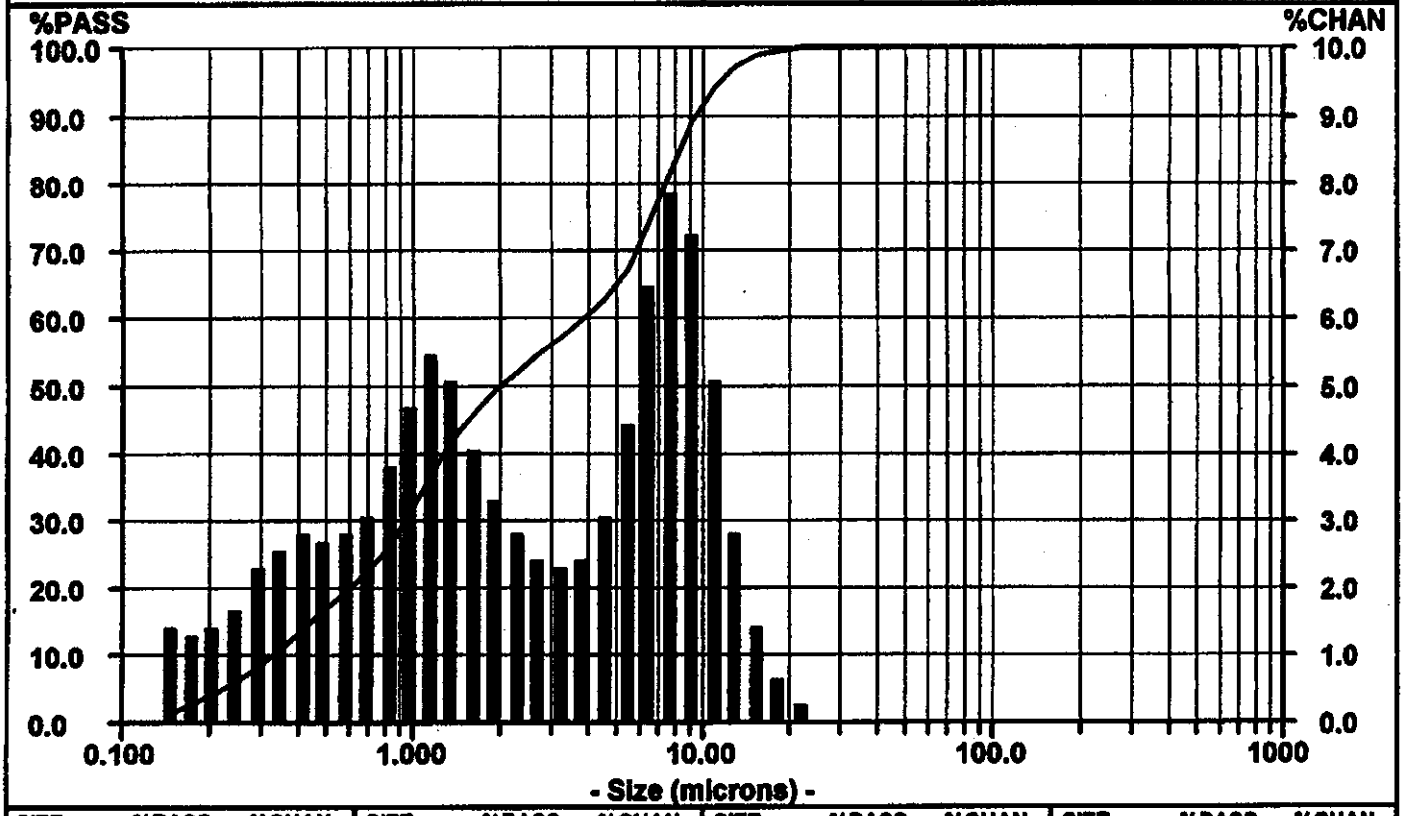
AY-101

AY-101
Duplicate

Date: 09/28/91 Meas #: 00001
Time: 07:34 Pres #: 01

1M NaNO3 and 1M NaOH
20 min. sonication @ 40 W
Flow Rate = 60 ml/sec.
Refractive Index = 2.00 Particle/1.33 Medium
File: 101AYD19

Summary	Percentiles		Dia	Vol%	Width
mv = 3.923	10% = 0.322	60% = 3.958	7.066	45%	5.900
mn = 0.207	20% = 0.598	70% = 5.938	1.070	41%	1.208
ma = 0.906	30% = 0.933	80% = 7.472	0.276	13%	0.176
cs = 6.620	40% = 1.286	90% = 9.484	0.136	1%	0.012
sd = 3.843	50% = 2.012	95% = 11.33			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	89.21	7.34						
592.0	100.00	0.00	7.778	81.87	7.97						
497.8	100.00	0.00	6.541	73.90	6.64						
418.6	100.00	0.00	5.500	67.36	4.51						
352.0	100.00	0.00	4.625	62.85	3.13						
296.0	100.00	0.00	3.889	59.72	2.53						
248.9	100.00	0.00	3.270	57.19	2.42						
209.3	100.00	0.00	2.750	54.77	2.54						
176.0	100.00	0.00	2.312	52.23	2.81						
148.0	100.00	0.00	1.945	49.42	3.32						
124.5	100.00	0.00	1.635	46.10	4.18						
104.7	100.00	0.00	1.375	41.92	5.16						
88.00	100.00	0.00	1.156	36.76	5.52						
74.00	100.00	0.00	0.972	31.24	4.86						
62.23	100.00	0.00	0.818	26.38	3.84						
52.33	100.00	0.00	0.688	22.54	3.12						
44.00	100.00	0.00	0.578	19.42	2.82						
37.00	100.00	0.00	0.486	16.60	2.79						
31.11	100.00	0.00	0.409	13.81	2.80						
26.16	100.00	0.00	0.344	11.01	2.68						
22.00	100.00	0.35	0.289	8.33	2.33						
18.50	99.65	0.75	0.243	6.00	1.79						
15.56	98.90	1.54	0.204	4.21	1.41						
13.08	97.36	2.99	0.172	2.80	1.33						
11.00	94.37	5.16	0.145	1.47	1.47						

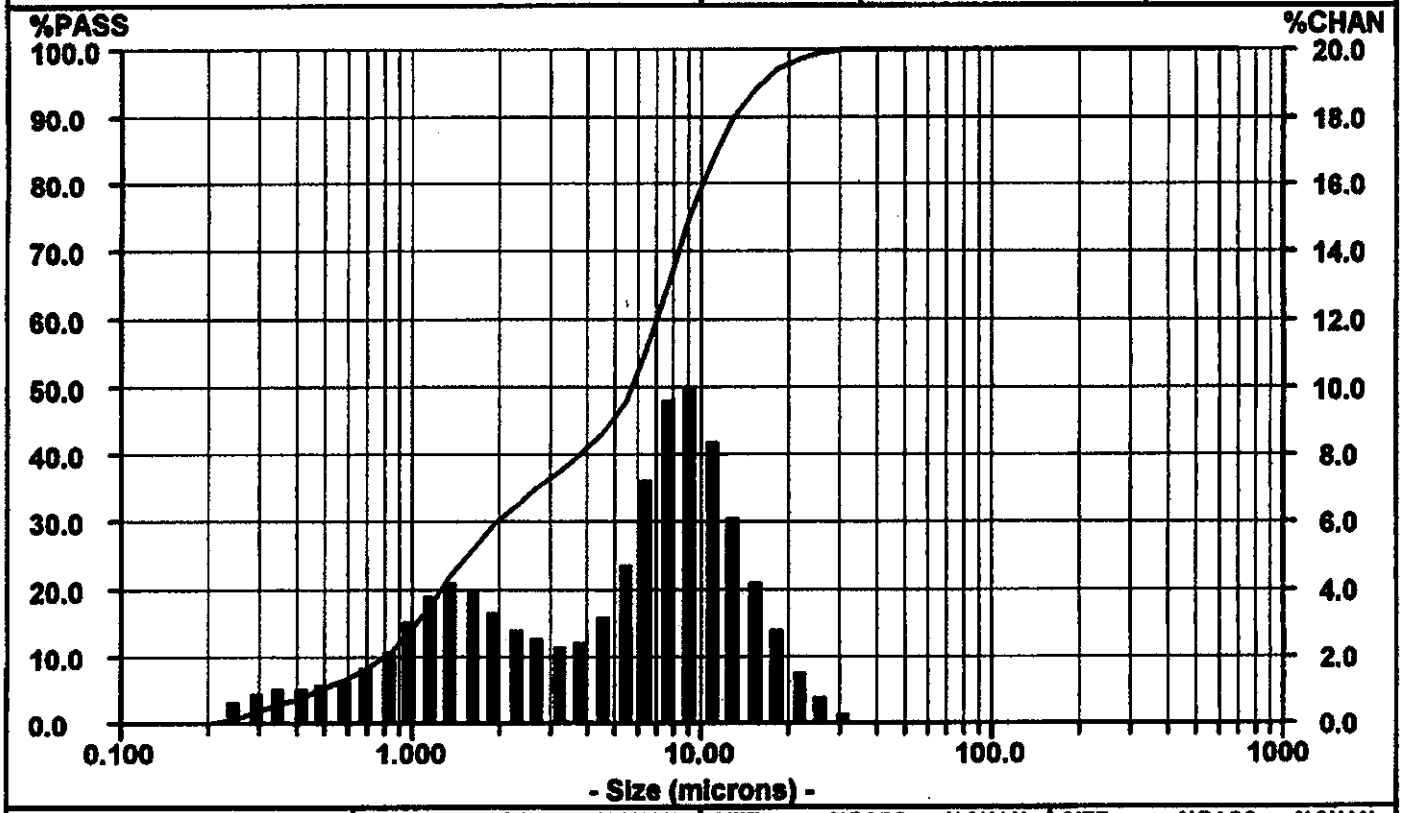
AY-101

AY-101
Duplicate

Date: 09/27/91 Meas #: 00001
Time: 15:16 Pres #: 01

1 M NaOH and 1 M NaNO3
2 minute sonication followed by a 60 min. delay
External Sonifier
Flow Rate = 40 ml/sec.
Refractive Index = 1.50 Particle/1.33 Medium
File: 101AYD01

Summary	Percentiles		Dia	Vol%	Width
mv = 6.296	10% = 0.782	60% = 7.110	8.092	65%	7.898
mn = 0.367	20% = 1.266	70% = 8.433	1.147	35%	1.431
ma = 1.933	30% = 1.995	80% = 10.14			
cs = 3.103	40% = 3.869	90% = 13.10			
sd = 5.000	50% = 5.781	95% = 16.16			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	75.30	10.08						
592.0	100.00	0.00	7.778	65.22	9.70						
497.8	100.00	0.00	6.541	55.52	7.37						
418.6	100.00	0.00	5.500	48.15	4.83						
352.0	100.00	0.00	4.625	43.32	3.24						
296.0	100.00	0.00	3.889	40.08	2.55						
248.9	100.00	0.00	3.270	37.53	2.42						
209.3	100.00	0.00	2.750	35.11	2.60						
176.0	100.00	0.00	2.312	32.51	2.97						
148.0	100.00	0.00	1.945	29.54	3.47						
124.5	100.00	0.00	1.635	26.07	4.02						
104.7	100.00	0.00	1.375	22.05	4.30						
88.00	100.00	0.00	1.156	17.75	3.96						
74.00	100.00	0.00	0.972	13.79	3.13						
62.23	100.00	0.00	0.818	10.66	2.29						
52.33	100.00	0.00	0.688	8.37	1.71						
44.00	100.00	0.00	0.578	6.66	1.38						
37.00	100.00	0.00	0.486	5.28	1.21						
31.11	100.00	0.37	0.409	4.07	1.14						
26.16	99.63	0.85	0.344	2.93	1.11						
22.00	98.78	1.67	0.289	1.82	1.04						
18.50	97.11	2.84	0.243	0.78	0.78						
15.56	94.27	4.32	0.204	0.00	0.00						
13.08	89.95	6.22	0.172	0.00	0.00						
11.00	83.73	8.43	0.145	0.00	0.00						

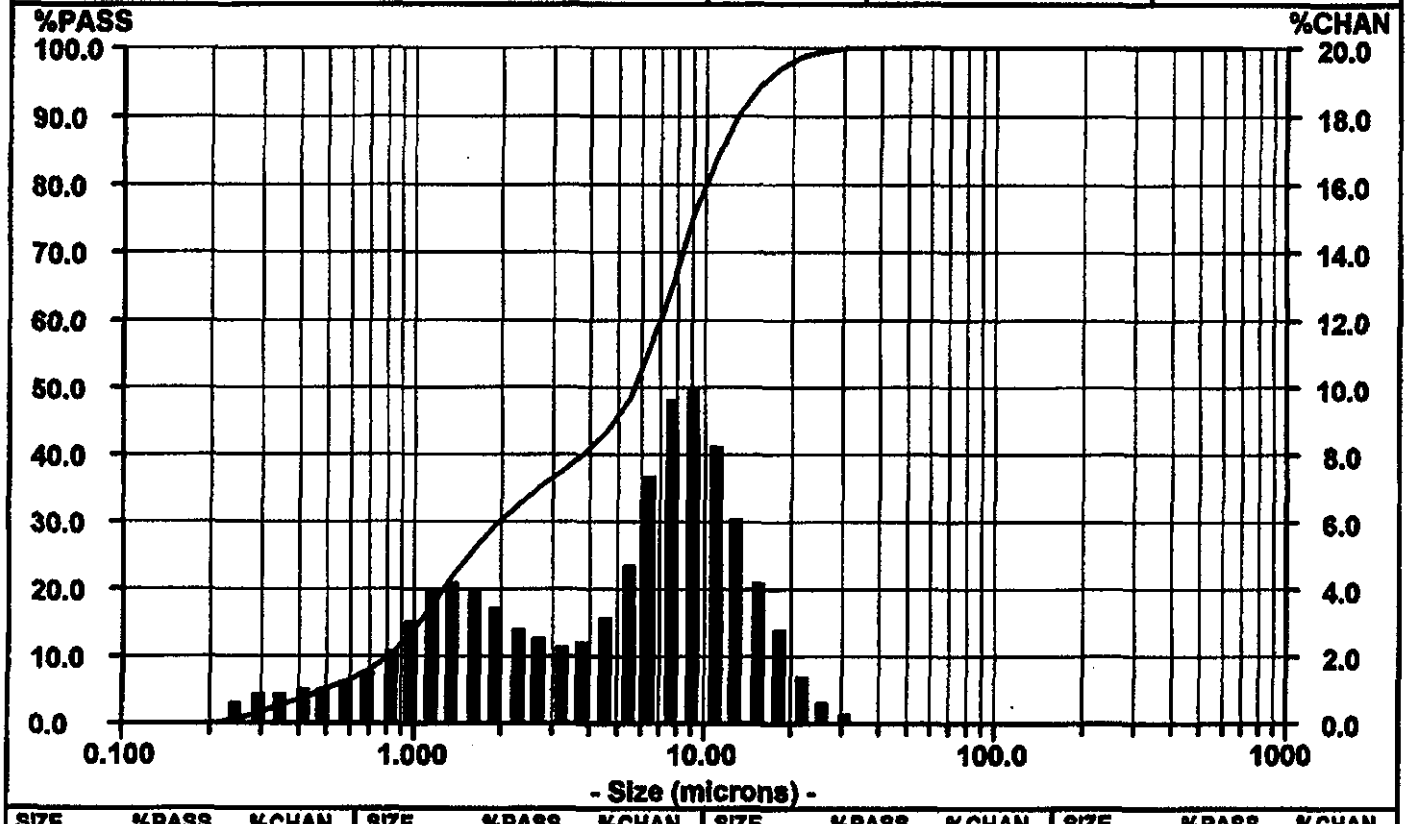
AY-101

AY-101
Duplicate

Date: 09/27/91 Meas #: 00001
Time: 15:20 Pres #: 01

1 M NaOH and 1 M NaNO3
2 minute sonication followed by a 60 min. delay
External Sonifier
Flow Rate = 40 ml/sec.
Refractive Index = 1.70 Particle/1.33 Medium
File: 101AYD02

Summary	Percentiles		Dia	Vol%	Width
mv = 6.240	10% = 0.792	60% = 7.064	8.052	65%	7.823
mn = 0.370	20% = 1.270	70% = 8.383	1.155	35%	1.421
ma = 1.943	30% = 1.983	80% = 10.07			
cs = 3.088	40% = 3.826	90% = 12.99			
sd = 4.957	50% = 5.736	95% = 15.94			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	75.63	10.04						
592.0	100.00	0.00	7.778	65.59	9.72						
497.8	100.00	0.00	6.541	55.87	7.43						
418.6	100.00	0.00	5.500	48.44	4.89						
352.0	100.00	0.00	4.625	43.55	3.29						
296.0	100.00	0.00	3.889	40.26	2.58						
248.9	100.00	0.00	3.270	37.68	2.43						
209.3	100.00	0.00	2.750	35.25	2.61						
176.0	100.00	0.00	2.312	32.64	2.99						
148.0	100.00	0.00	1.945	29.65	3.53						
124.5	100.00	0.00	1.635	26.12	4.10						
104.7	100.00	0.00	1.375	22.02	4.38						
88.00	100.00	0.00	1.156	17.64	4.02						
74.00	100.00	0.00	0.972	13.62	3.16						
62.23	100.00	0.00	0.818	10.47	2.28						
52.33	100.00	0.00	0.688	8.19	1.69						
44.00	100.00	0.00	0.578	6.50	1.35						
37.00	100.00	0.00	0.486	5.15	1.19						
31.11	100.00	0.31	0.409	3.96	1.11						
26.16	99.69	0.76	0.344	2.85	1.08						
22.00	98.93	1.59	0.289	1.77	1.01						
18.50	97.34	2.80	0.243	0.76	0.76						
15.56	94.54	4.32	0.204	0.00	0.00						
13.08	90.22	6.20	0.172	0.00	0.00						
11.00	84.02	8.39	0.145	0.00	0.00						

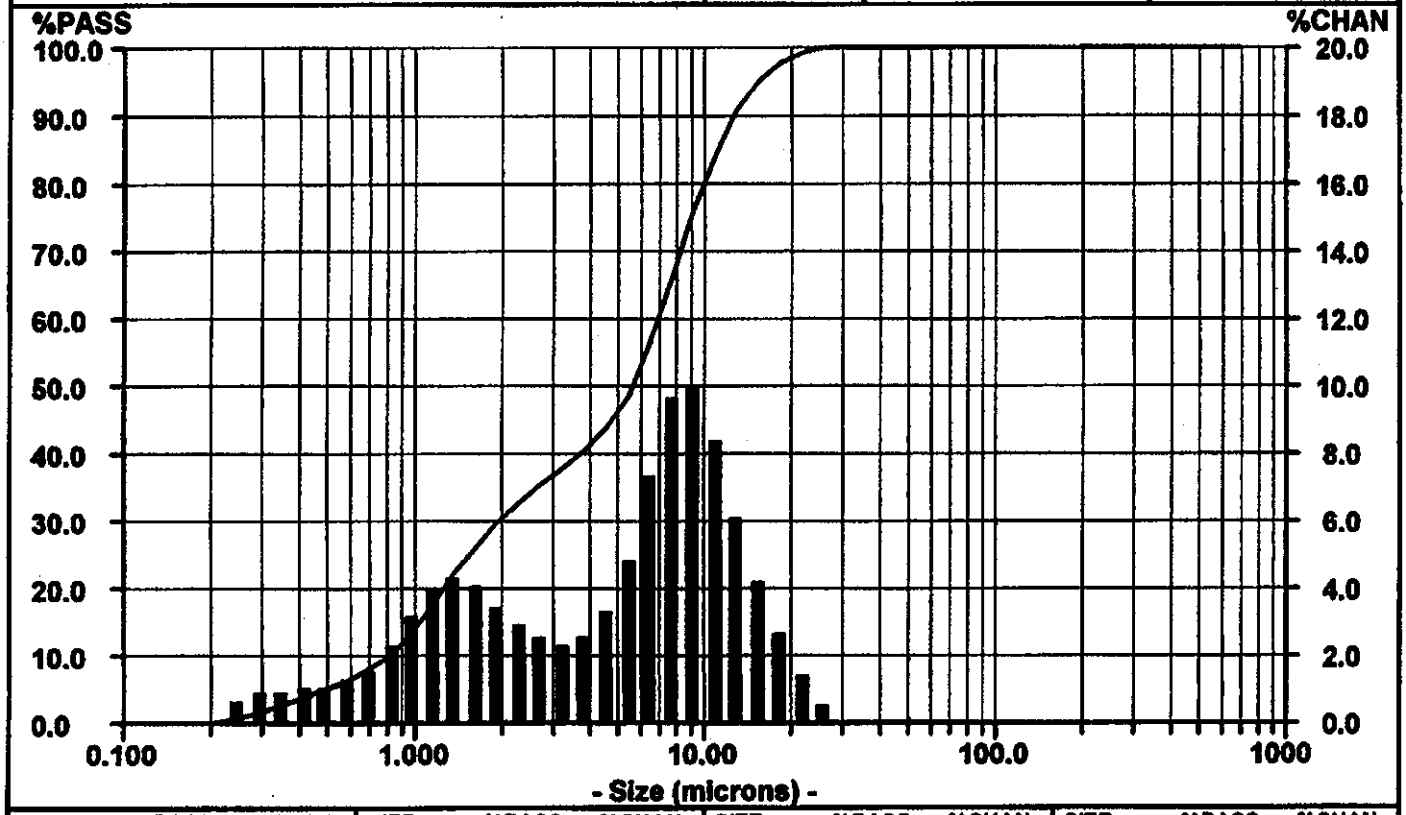
AY-101

AY-101
Duplicate

Date: 09/27/91 Meas #: 00001
Time: 15:25 Pres #: 01

1 M NaOH and 1 M NaNO3
2 minute sonication followed by a 60 min. delay
External Sonifier
Flow Rate = 40 ml/sec.
Refractive Index = 2.00 Particle/1.33 Medium
File: 101AYD03

Summary	Percentiles		Dia	Vol%	Width
mv = 6.120	10% = 0.797	60% = 7.000	7.996	65%	7.627
mn = 0.373	20% = 1.267	70% = 8.308	1.159	35%	1.416
ma = 1.945	30% = 1.967	80% = 9.958			
cs = 3.086	40% = 3.752	90% = 12.74			
sd = 4.883	50% = 5.668	95% = 15.47			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	76.19	10.08						
592.0	100.00	0.00	7.778	66.11	9.75						
497.8	100.00	0.00	6.541	56.36	7.48						
418.6	100.00	0.00	5.500	48.88	4.96						
352.0	100.00	0.00	4.625	43.92	3.34						
296.0	100.00	0.00	3.889	40.58	2.63						
248.9	100.00	0.00	3.270	37.95	2.48						
209.3	100.00	0.00	2.750	35.47	2.65						
176.0	100.00	0.00	2.312	32.82	3.02						
148.0	100.00	0.00	1.945	29.80	3.55						
124.5	100.00	0.00	1.635	26.25	4.14						
104.7	100.00	0.00	1.375	22.11	4.44						
88.00	100.00	0.00	1.156	17.67	4.08						
74.00	100.00	0.00	0.972	13.59	3.20						
62.23	100.00	0.00	0.818	10.39	2.30						
52.33	100.00	0.00	0.688	8.09	1.69						
44.00	100.00	0.00	0.578	6.40	1.35						
37.00	100.00	0.00	0.486	5.05	1.18						
31.11	100.00	0.00	0.409	3.87	1.10						
26.16	100.00	0.68	0.344	2.77	1.06						
22.00	99.32	1.49	0.289	1.71	0.98						
18.50	97.83	2.71	0.243	0.73	0.73						
15.56	95.12	4.28	0.204	0.00	0.00						
13.08	90.84	6.22	0.172	0.00	0.00						
11.00	84.62	8.43	0.145	0.00	0.00						

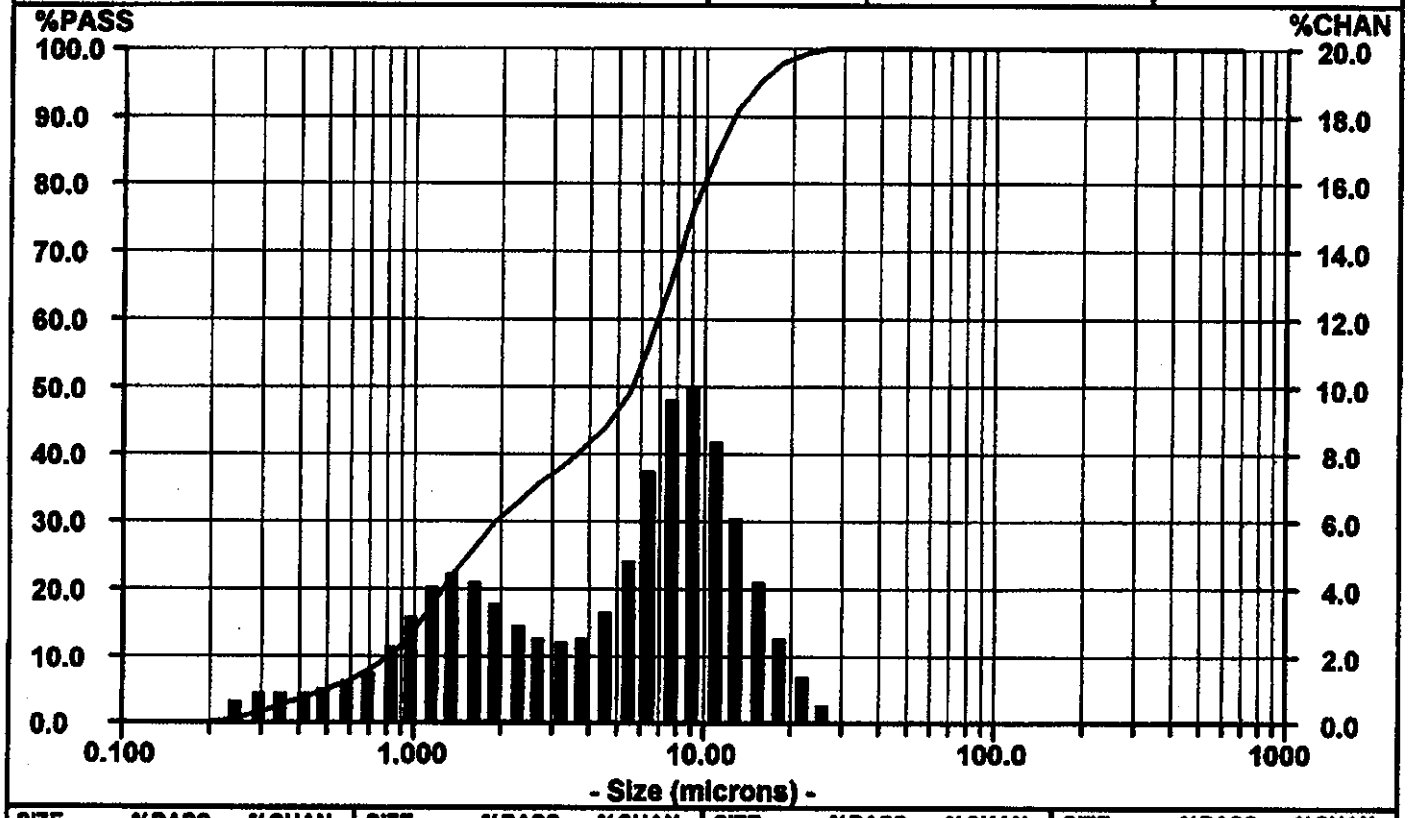
AY-101

AY-101
Duplicate

Date: 09/27/91 Meas #: 00001
Time: 15:29 Pres #: 01

1 M NaOH and 1 M NaNO3
2 minute sonication followed by a 60 min. delay
External Sonifier
Flow Rate = 17 ml/sec.
Refractive Index = 2.00 Particle/1.33 Medium
File: 101AYD04

Summary	Percentiles		Dia	Vol%	Width
mv = 6.066	10% = 0.800	60% = 6.953	7.964	64%	7.544
mn = 0.375	20% = 1.266	70% = 8.256	1.166	36%	1.413
ma = 1.944	30% = 1.946	80% = 9.892			
cs = 3.087	40% = 3.682	90% = 12.62			
sd = 4.843	50% = 5.617	95% = 15.30			

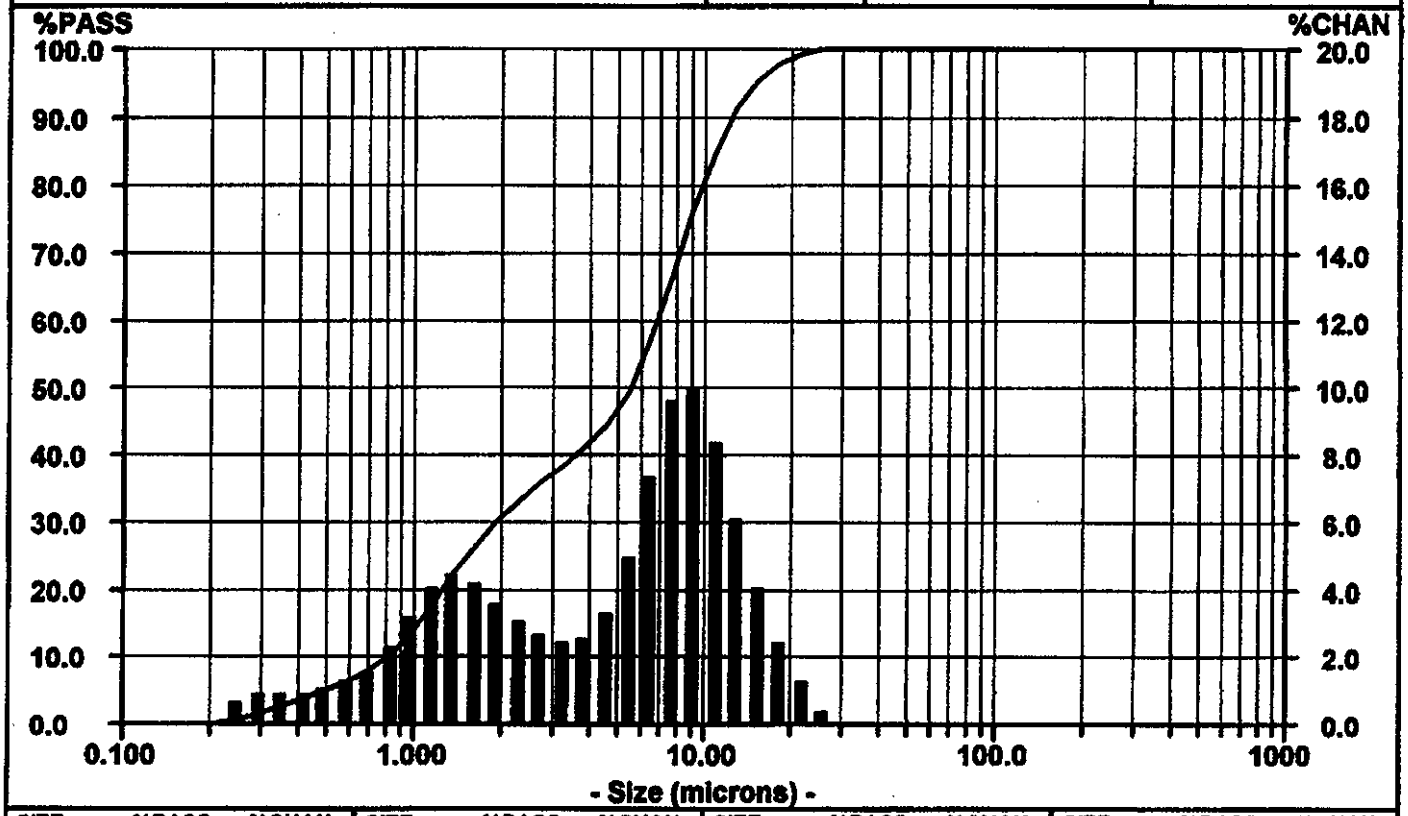


SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	76.53	10.04						
592.0	100.00	0.00	7.778	66.49	9.76						
497.8	100.00	0.00	6.541	56.73	7.51						
418.6	100.00	0.00	5.500	49.22	4.98						
352.0	100.00	0.00	4.625	44.24	3.36						
296.0	100.00	0.00	3.889	40.88	2.64						
248.9	100.00	0.00	3.270	38.24	2.50						
209.3	100.00	0.00	2.750	35.74	2.68						
176.0	100.00	0.00	2.312	33.06	3.07						
148.0	100.00	0.00	1.945	29.99	3.62						
124.5	100.00	0.00	1.635	26.37	4.21						
104.7	100.00	0.00	1.375	22.16	4.50						
88.00	100.00	0.00	1.156	17.66	4.12						
74.00	100.00	0.00	0.972	13.54	3.21						
62.23	100.00	0.00	0.818	10.33	2.30						
52.33	100.00	0.00	0.688	8.03	1.69						
44.00	100.00	0.00	0.578	6.34	1.34						
37.00	100.00	0.00	0.486	5.00	1.17						
31.11	100.00	0.00	0.409	3.83	1.09						
26.16	100.00	0.62	0.344	2.74	1.05						
22.00	99.38	1.40	0.289	1.69	0.97						
18.50	97.98	2.63	0.243	0.72	0.72						
15.56	95.35	4.22	0.204	0.00	0.00						
13.08	91.13	6.19	0.172	0.00	0.00						
11.00	84.94	8.41	0.145	0.00	0.00						

AY-101	AY-101 Duplicate	Date: 09/27/91 Time: 15:34	Meas #: 00001 Pres #: 01

1 M NaOH and 1 M NaNO3
2 minute sonication followed by a 60 min. delay
External Sonifier
Flow Rate = 17 ml/sec.
Refractive Index = 1.50 Particle/1.33 Medium
File: 101AYD05

Summary	Percentiles		Dia	Vol%	Width
mv = 6.015	10% = 0.801	60% = 6.917	7.944	64%	7.474
mn = 0.376	20% = 1.263	70% = 8.222	1.169	36%	1.413
ma = 1.940	30% = 1.933	80% = 9.840			
cs = 3.092	40% = 3.618	90% = 12.49			
sd = 4.809	50% = 5.564	95% = 15.08			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	76.78	10.04						
592.0	100.00	0.00	7.778	66.74	9.70						
497.8	100.00	0.00	6.541	57.04	7.47						
418.6	100.00	0.00	5.500	49.57	5.00						
352.0	100.00	0.00	4.625	44.57	3.40						
296.0	100.00	0.00	3.889	41.17	2.69						
248.9	100.00	0.00	3.270	38.48	2.54						
209.3	100.00	0.00	2.750	35.94	2.72						
176.0	100.00	0.00	2.312	33.22	3.10						
148.0	100.00	0.00	1.945	30.12	3.65						
124.5	100.00	0.00	1.635	26.47	4.24						
104.7	100.00	0.00	1.375	22.23	4.64						
88.00	100.00	0.00	1.156	17.69	4.15						
74.00	100.00	0.00	0.972	13.54	3.23						
62.23	100.00	0.00	0.818	10.31	2.31						
52.33	100.00	0.00	0.688	8.00	1.68						
44.00	100.00	0.00	0.578	6.32	1.34						
37.00	100.00	0.00	0.486	4.98	1.16						
31.11	100.00	0.00	0.409	3.82	1.09						
26.16	100.00	0.54	0.344	2.73	1.05						
22.00	99.46	1.30	0.289	1.68	0.97						
18.50	98.16	2.53	0.243	0.71	0.71						
15.56	95.63	4.18	0.204	0.00	0.00						
13.08	91.45	6.22	0.172	0.00	0.00						
11.00	85.23	8.45	0.145	0.00	0.00						

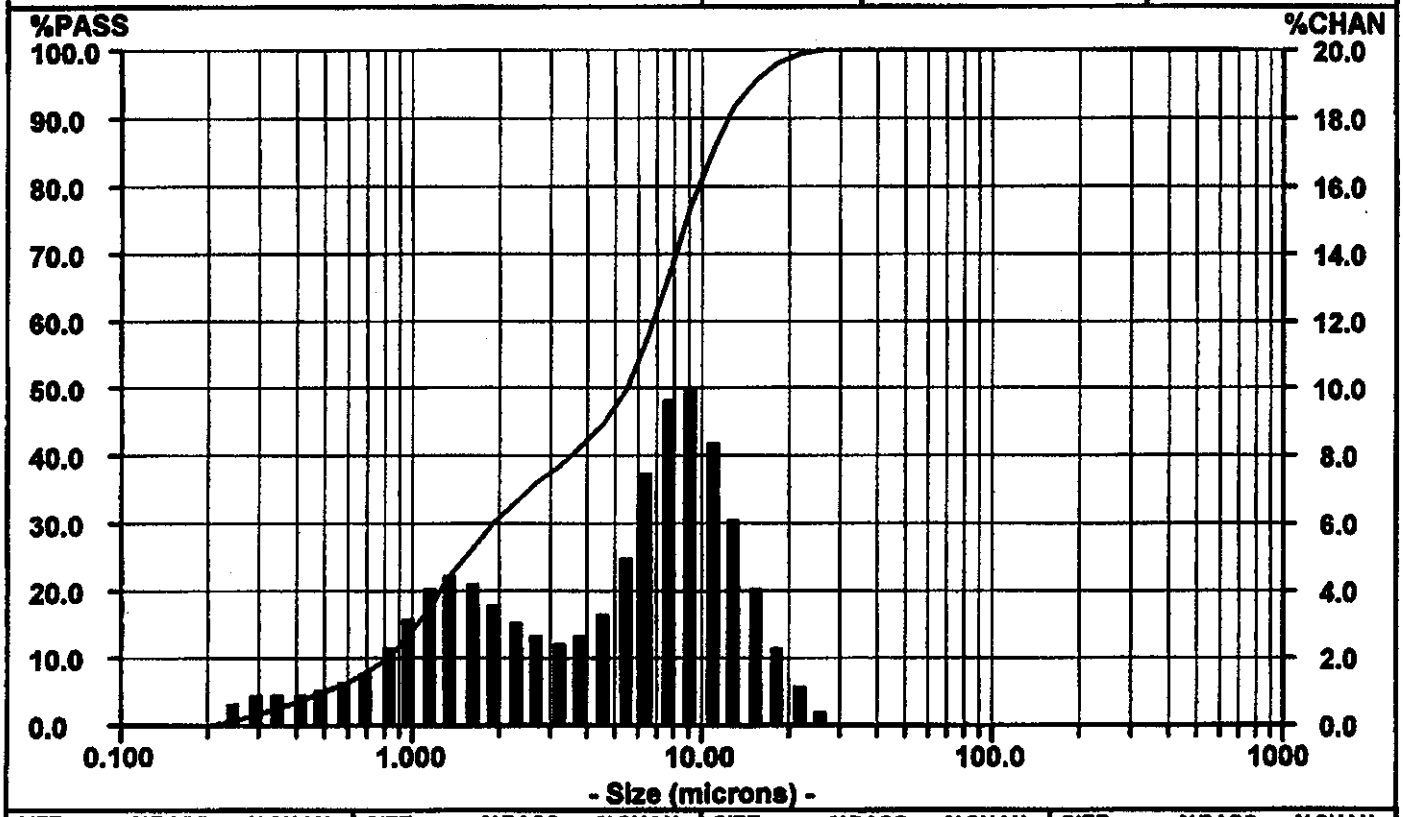
AY-101

AY-101
Duplicate

Date: 09/27/91 Meas #: 00001
Time: 15:39 Pres #: 01

1 M NaOH and 1 M NaNO3
2 minute sonication followed by a 60 min. delay
External Sonifier
Flow Rate = 17 ml/sec.
Refractive Index = 1.70 Particle/1.33 Medium
File: 101AYD06

Summary	Percentiles		Dia	Vol%	Width
mv = 5.967	10% = 0.804	60% = 6.872	7.909	64%	7.411
mn = 0.378	20% = 1.261	70% = 8.173	1.172	36%	1.406
ma = 1.941	30% = 1.919	80% = 9.777			
cs = 3.091	40% = 3.572	90% = 12.40			
sd = 4.772	50% = 5.519	95% = 14.92			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	77.11	10.02						
592.0	100.00	0.00	7.778	67.09	9.70						
497.8	100.00	0.00	6.541	57.39	7.52						
418.6	100.00	0.00	5.500	49.87	5.05						
352.0	100.00	0.00	4.625	44.82	3.44						
296.0	100.00	0.00	3.889	41.38	2.71						
248.9	100.00	0.00	3.270	38.67	2.55						
209.3	100.00	0.00	2.750	36.12	2.73						
176.0	100.00	0.00	2.312	33.39	3.12						
148.0	100.00	0.00	1.945	30.27	3.68						
124.5	100.00	0.00	1.635	26.59	4.29						
104.7	100.00	0.00	1.375	22.30	4.59						
88.00	100.00	0.00	1.156	17.71	4.19						
74.00	100.00	0.00	0.972	13.52	3.25						
62.23	100.00	0.00	0.818	10.27	2.32						
52.33	100.00	0.00	0.688	7.95	1.70						
44.00	100.00	0.00	0.578	6.25	1.34						
37.00	100.00	0.00	0.486	4.91	1.16						
31.11	100.00	0.00	0.409	3.75	1.07						
26.16	100.00	0.48	0.344	2.68	1.03						
22.00	99.52	1.22	0.289	1.65	0.95						
18.50	98.30	2.46	0.243	0.70	0.70						
15.56	95.84	4.14	0.204	0.00	0.00						
13.08	91.70	6.18	0.172	0.00	0.00						
11.00	85.52	8.41	0.145	0.00	0.00						

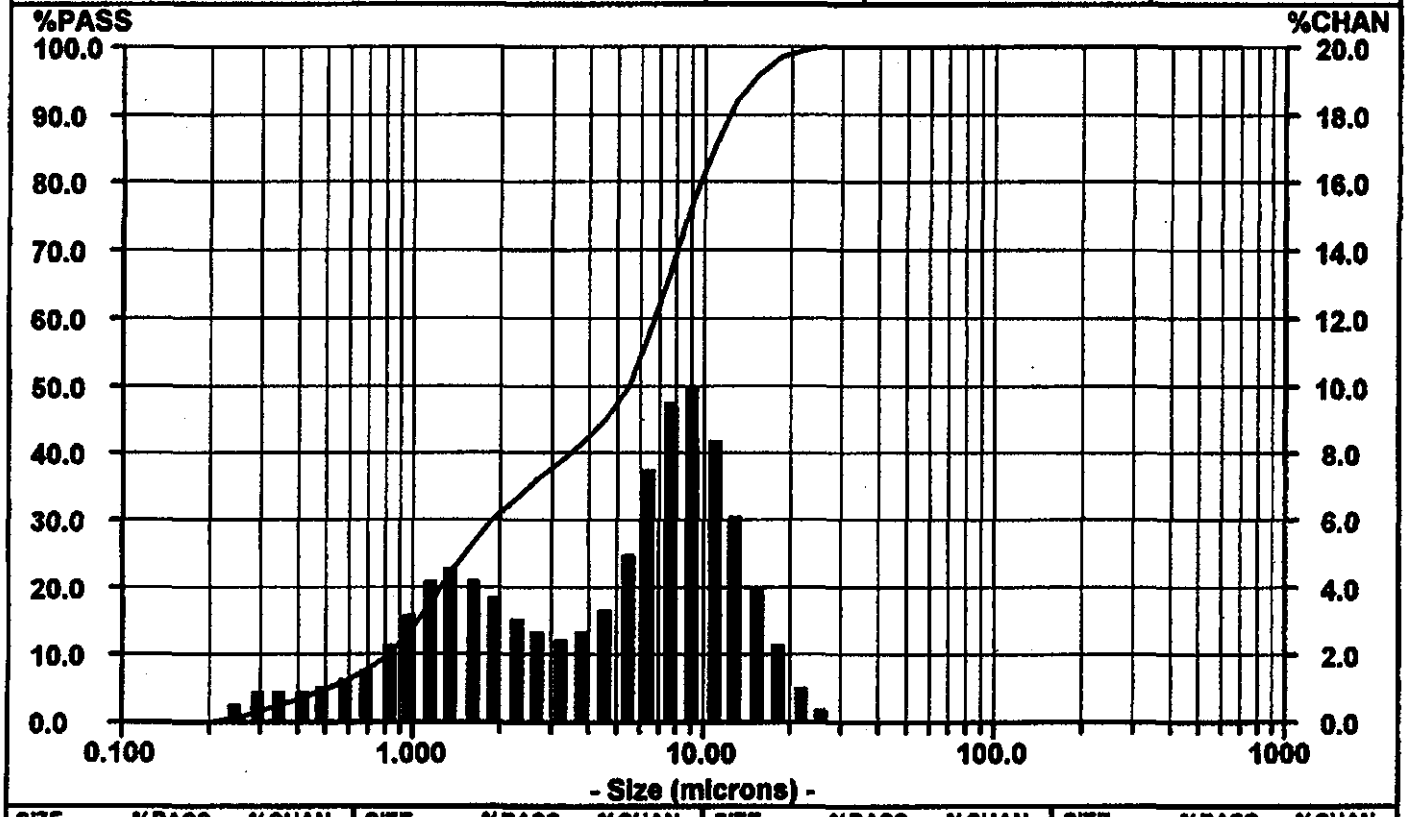
AY-101

AY-101
Duplicate

Date: 09/27/91 Meas #: 00001
Time: 15:43 Pres #: 01

1 M NaOH and 1 M NaNO3
2 minute sonication followed by a 60 min. delay
External Sonifier
Flow Rate = 60 ml/sec.
Refractive Index = 1.70 Particle/1.33 Medium
File: 101AYD07

Summary	Percentiles		Dia	Vol%	Width
mv = 5.923	10% = 0.806	60% = 6.835	7.885	64%	7.351
mn = 0.379	20% = 1.267	70% = 8.134	1.174	36%	1.403
ma = 1.938	30% = 1.905	80% = 9.723			
cs = 3.096	40% = 3.513	90% = 12.30			
sd = 4.738	50% = 5.470	95% = 14.78			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	77.38	10.01						
592.0	100.00	0.00	7.778	67.37	9.68						
497.8	100.00	0.00	6.541	57.69	7.50						
418.6	100.00	0.00	5.500	50.19	5.06						
352.0	100.00	0.00	4.625	45.13	3.47						
296.0	100.00	0.00	3.889	41.66	2.75						
248.9	100.00	0.00	3.270	38.91	2.59						
209.3	100.00	0.00	2.750	36.32	2.76						
176.0	100.00	0.00	2.312	33.56	3.14						
148.0	100.00	0.00	1.945	30.42	3.70						
124.5	100.00	0.00	1.635	26.72	4.32						
104.7	100.00	0.00	1.375	22.40	4.64						
88.00	100.00	0.00	1.156	17.76	4.24						
74.00	100.00	0.00	0.972	13.52	3.29						
62.23	100.00	0.00	0.818	10.23	2.33						
52.33	100.00	0.00	0.688	7.90	1.69						
44.00	100.00	0.00	0.578	6.21	1.33						
37.00	100.00	0.00	0.486	4.88	1.15						
31.11	100.00	0.00	0.409	3.73	1.07						
26.16	100.00	0.44	0.344	2.66	1.03						
22.00	99.56	1.15	0.289	1.63	0.94						
18.50	98.41	2.38	0.243	0.69	0.69						
15.56	96.03	4.07	0.204	0.00	0.00						
13.08	91.96	6.16	0.172	0.00	0.00						
11.00	85.80	8.42	0.145	0.00	0.00						

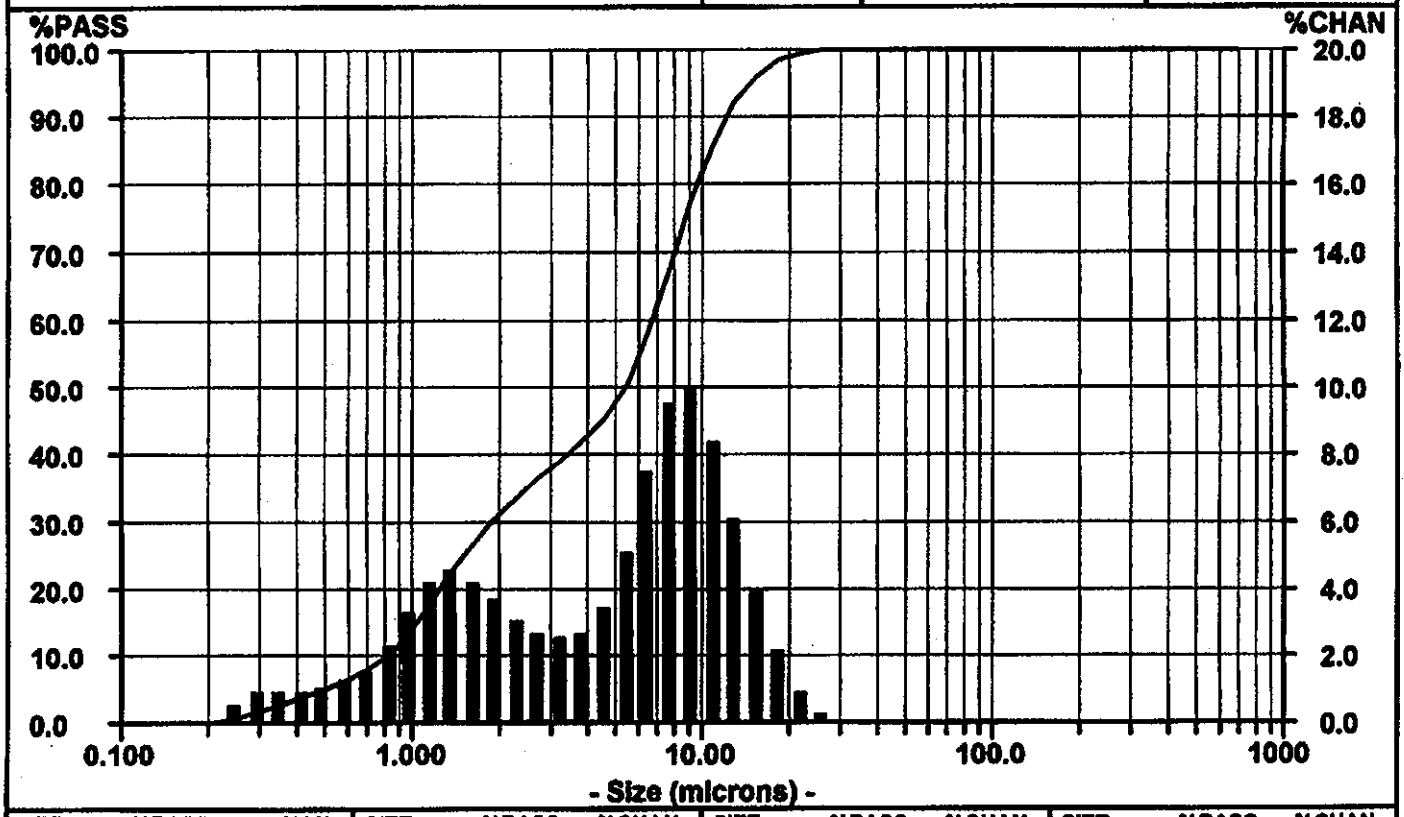
AY-101

AY-101
Duplicate

Date: 09/27/91 Meas #: 00001
Time: 15:47 Pres #: 01

1 M NaOH and 1 M NaNO3
2 minute sonication followed by a 60 min. delay
External Sonifier
Flow Rate = 60 ml/sec.
Refractive Index = 2.00 Particle/1.33 Medium
File: 101AYD08

Summary	Percentiles		Dia	Vol%	Width
mv = 5.871	10% = 0.802	60% = 6.789	7.850	63%	7.269
mn = 0.379	20% = 1.252	70% = 8.086	1.174	37%	1.404
ma = 1.928	30% = 1.888	80% = 9.653			
cs = 3.112	40% = 3.462	90% = 12.19			
sd = 4.701	50% = 5.418	95% = 14.61			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	77.74	10.01						
592.0	100.00	0.00	7.778	67.73	9.68						
497.8	100.00	0.00	6.541	58.05	7.53						
418.6	100.00	0.00	5.500	50.52	6.11						
352.0	100.00	0.00	4.625	45.41	3.51						
296.0	100.00	0.00	3.889	41.90	2.77						
248.9	100.00	0.00	3.270	39.13	2.60						
209.3	100.00	0.00	2.750	36.53	2.77						
176.0	100.00	0.00	2.312	33.76	3.16						
148.0	100.00	0.00	1.945	30.60	3.72						
124.5	100.00	0.00	1.635	26.88	4.35						
104.7	100.00	0.00	1.376	22.53	4.67						
88.00	100.00	0.00	1.156	17.86	4.26						
74.00	100.00	0.00	0.972	13.60	3.30						
62.23	100.00	0.00	0.818	10.30	2.34						
52.33	100.00	0.00	0.688	7.96	1.70						
44.00	100.00	0.00	0.578	6.26	1.34						
37.00	100.00	0.00	0.486	4.92	1.16						
31.11	100.00	0.00	0.409	3.76	1.08						
26.16	100.00	0.39	0.344	2.68	1.04						
22.00	99.61	1.07	0.289	1.64	0.95						
18.50	98.54	2.28	0.243	0.69	0.69						
15.56	96.26	4.00	0.204	0.00	0.00						
13.08	92.26	6.12	0.172	0.00	0.00						
11.00	86.14	8.40	0.145	0.00	0.00						

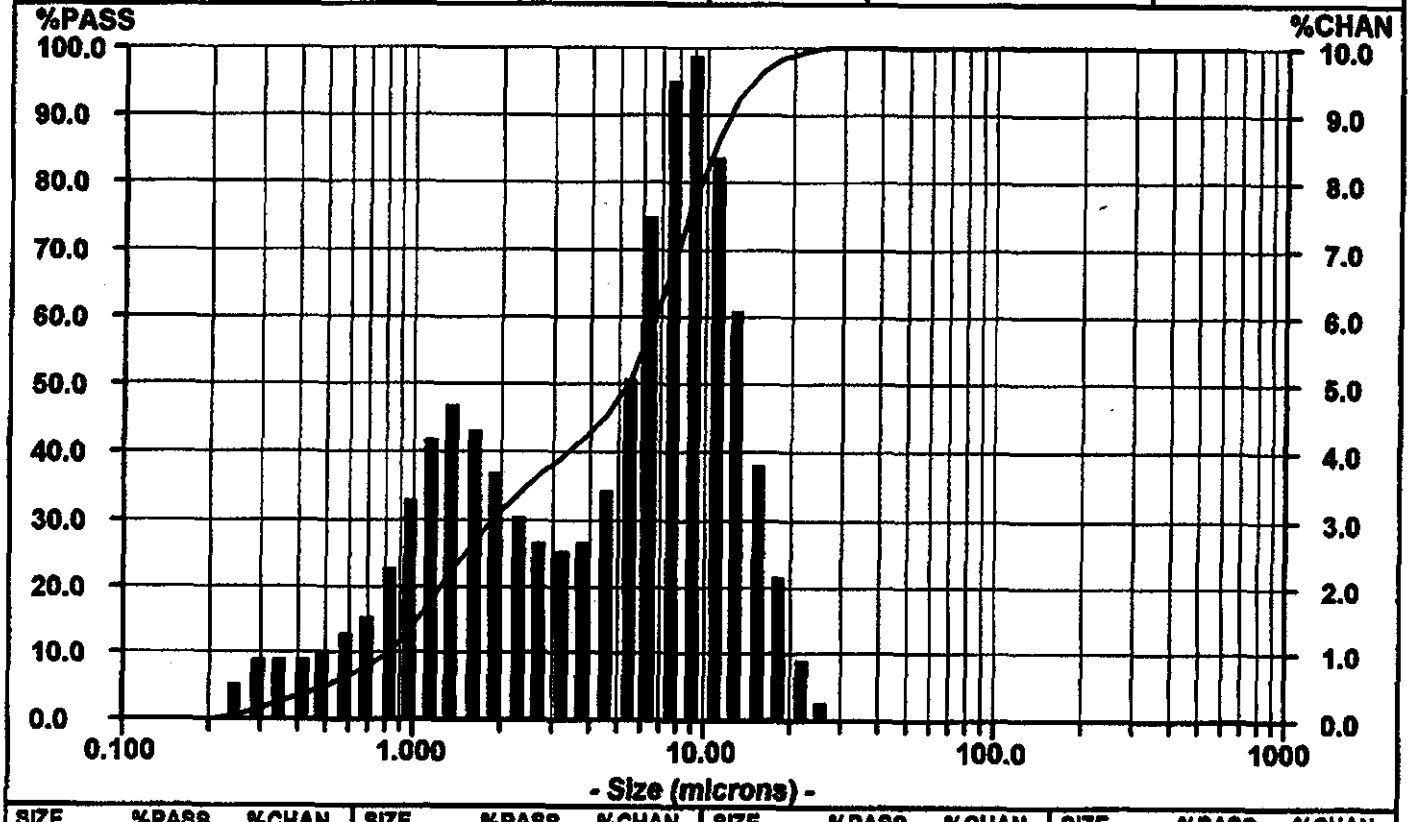
AY-101

AY-101
Duplicate

Date: 09/27/91 Meas #: 00001
Time: 15:51 Pres #: 01

1 M NaOH and 1 M NaNO3
2 minute sonication followed by a 60 min. delay
External Sonifier
Flow Rate = 60 ml/sec.
Refractive Index = 1.50 Particle/1.33 Medium
File: 101AYD09

Summary	Percentiles		Dia	Vol%	Width
mv = 5.834	10% = 0.804	50% = 6.757	7.830	63%	7.218
mn = 0.380	20% = 1.250	70% = 8.052	1.177	37%	1.399
ma = 1.927	30% = 1.874	80% = 9.614			
cs = 3.114	40% = 3.412	90% = 12.11			
sd = 4.678	50% = 5.379	95% = 14.49			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	77.96	9.98						
592.0	100.00	0.00	7.778	67.98	9.68						
497.8	100.00	0.00	6.541	58.30	7.53						
418.6	100.00	0.00	5.500	50.77	5.11						
352.0	100.00	0.00	4.625	45.66	3.52						
296.0	100.00	0.00	3.889	42.14	2.79						
248.9	100.00	0.00	3.270	39.35	2.63						
209.3	100.00	0.00	2.750	36.72	2.79						
176.0	100.00	0.00	2.312	33.93	3.18						
148.0	100.00	0.00	1.945	30.75	3.75						
124.5	100.00	0.00	1.635	27.00	4.40						
104.7	100.00	0.00	1.375	22.60	4.72						
88.00	100.00	0.00	1.156	17.88	4.30						
74.00	100.00	0.00	0.972	13.58	3.32						
62.23	100.00	0.00	0.818	10.26	2.35						
52.33	100.00	0.00	0.688	7.91	1.70						
44.00	100.00	0.00	0.578	6.21	1.34						
37.00	100.00	0.00	0.486	4.87	1.15						
31.11	100.00	0.00	0.409	3.72	1.07						
26.16	100.00	0.38	0.344	2.65	1.02						
22.00	99.64	1.01	0.289	1.63	0.94						
18.50	98.63	2.22	0.243	0.69	0.69						
15.56	96.41	3.95	0.204	0.00	0.00						
13.08	92.46	6.10	0.172	0.00	0.00						
11.00	86.36	8.40	0.145	0.00	0.00						

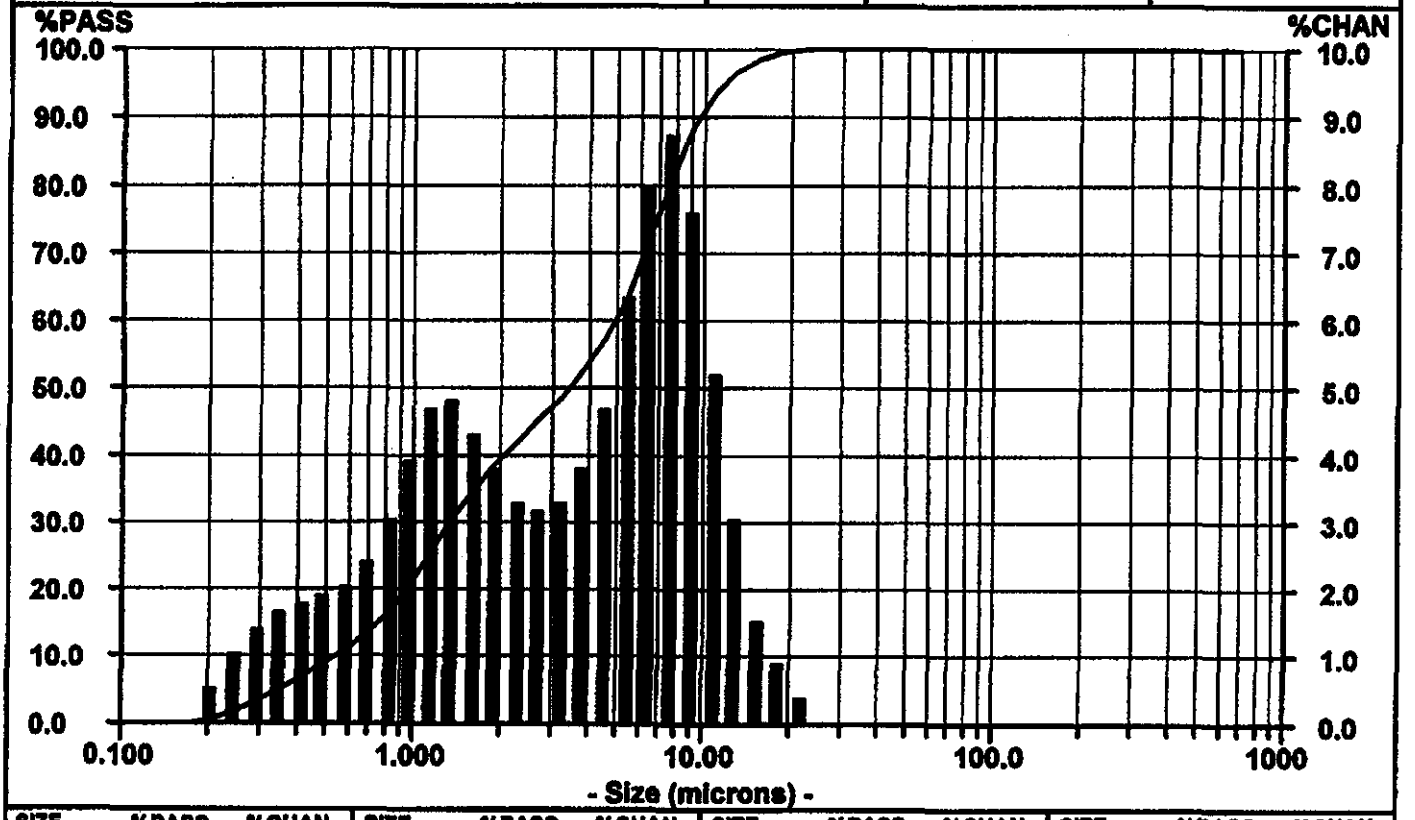
AY-101

AY-101
Duplicate

Date: 09/28/91 Meas #: 00001
Time: 10:08 Pres #: 01

1M NaNO3 and 1M NaOH
20 min. sonication followed by a 60 min. delay
External Sonifier
Flow Rate = 17 ml/sec.
Refractive Index = 1.50 Particle/1.33 Medium
File: 101AY037

Summary	Percentiles		Dia	Vol%	Width
mv = 4.450	10% = 0.532	60% = 4.989	6.427	58%	6.169
mn = 0.319	20% = 0.941	70% = 6.283	0.983	42%	1.263
ma = 1.395	30% = 1.348	80% = 7.647			
cs = 4.302	40% = 2.058	90% = 9.844			
sd = 3.764	50% = 3.467	95% = 11.66			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	88.51	7.65						
592.0	100.00	0.00	7.778	80.86	8.85						
497.8	100.00	0.00	6.541	72.01	8.18						
418.6	100.00	0.00	5.500	63.83	6.41						
352.0	100.00	0.00	4.625	57.42	4.81						
296.0	100.00	0.00	3.889	52.61	3.82						
248.9	100.00	0.00	3.270	48.79	3.34						
209.3	100.00	0.00	2.750	45.45	3.21						
176.0	100.00	0.00	2.312	42.24	3.37						
148.0	100.00	0.00	1.945	38.87	3.82						
124.5	100.00	0.00	1.636	35.05	4.48						
104.7	100.00	0.00	1.375	30.57	4.96						
88.00	100.00	0.00	1.156	25.61	4.79						
74.00	100.00	0.00	0.972	20.82	4.02						
62.23	100.00	0.00	0.818	16.80	3.17						
52.33	100.00	0.00	0.688	13.63	2.58						
44.00	100.00	0.00	0.578	11.07	2.18						
37.00	100.00	0.00	0.486	8.89	1.97						
31.11	100.00	0.00	0.409	6.92	1.84						
26.16	100.00	0.00	0.344	5.08	1.74						
22.00	100.00	0.50	0.289	3.34	1.53						
18.50	99.50	0.82	0.243	1.81	1.12						
15.56	98.68	1.70	0.204	0.69	0.69						
13.08	96.88	3.10	0.172	0.00	0.00						
11.00	93.78	5.27	0.145	0.00	0.00						

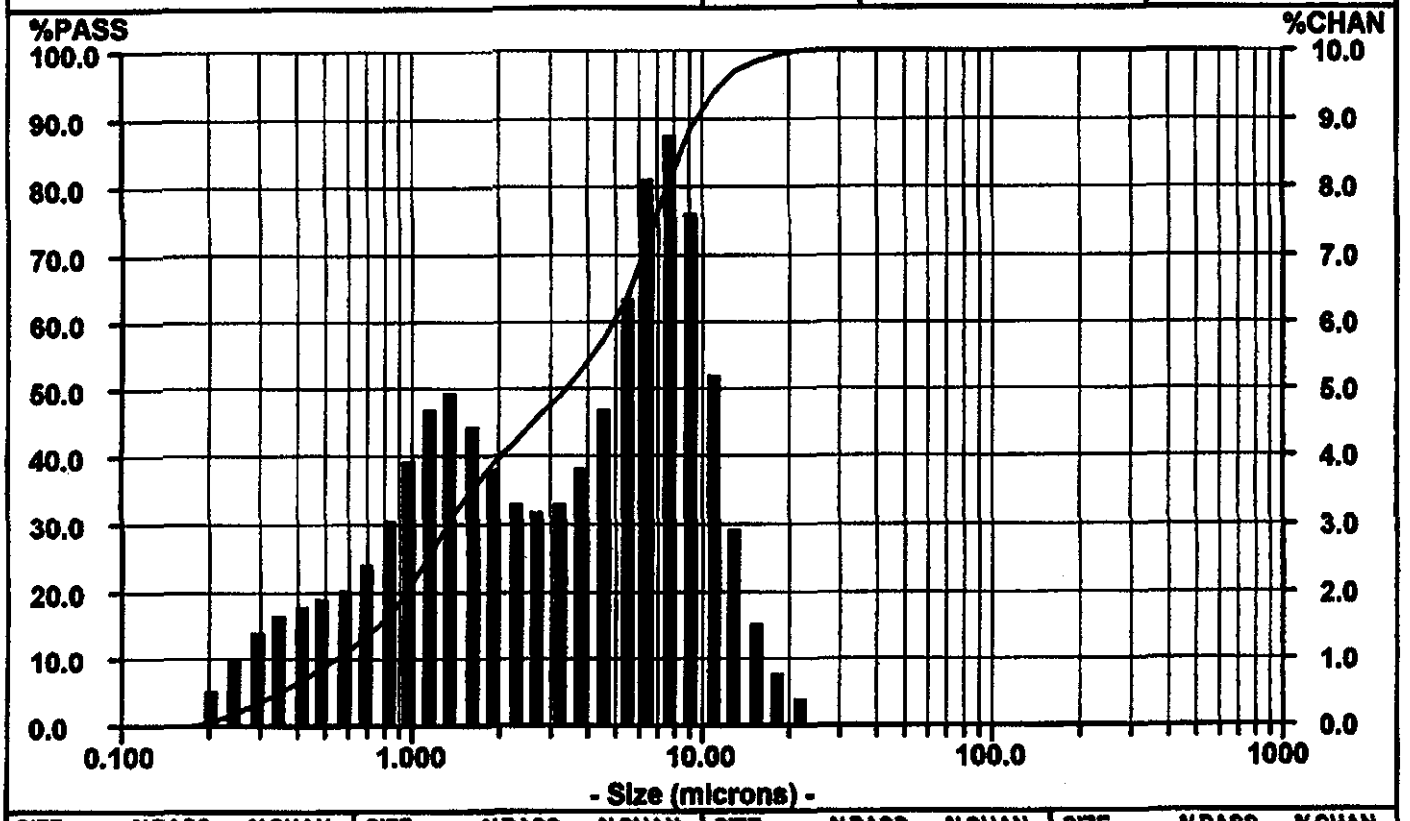
AY-101

AY-101
Duplicate

Date: 09/28/91 Meas #: 00001
Time: 10:12 Pres #: 01

1M NaNO3 and 1M NaOH
20 min. sonication followed by a 60 min. delay
External Sonifier
Flow Rate = 17 ml/sec.
Refractive Index = 1.70 Particle/1.33 Medium
File: 101AY038

Summary	Percentiles		Dia	Vol%	Width
mv = 4.416	10% = 0.532	60% = 4.956	6.409	58%	6.103
mn = 0.320	20% = 0.940	70% = 6.250	0.986	42%	1.261
ma = 1.391	30% = 1.340	80% = 7.699			
cs = 4.313	40% = 2.031	90% = 9.571			
sd = 3.736	50% = 3.426	95% = 11.53			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	88.80	7.62						
592.0	100.00	0.00	7.778	81.18	8.90						
497.8	100.00	0.00	6.541	72.28	8.21						
418.6	100.00	0.00	5.500	64.07	6.42						
352.0	100.00	0.00	4.625	57.65	4.80						
296.0	100.00	0.00	3.889	52.85	3.81						
248.9	100.00	0.00	3.270	49.04	3.33						
209.3	100.00	0.00	2.750	45.71	3.21						
176.0	100.00	0.00	2.312	42.50	3.38						
148.0	100.00	0.00	1.945	39.12	3.85						
124.5	100.00	0.00	1.635	35.27	4.53						
104.7	100.00	0.00	1.375	30.74	5.03						
88.00	100.00	0.00	1.156	25.71	4.85						
74.00	100.00	0.00	0.972	20.86	4.06						
62.23	100.00	0.00	0.818	16.80	3.18						
52.33	100.00	0.00	0.688	13.62	2.55						
44.00	100.00	0.00	0.578	11.07	2.16						
37.00	100.00	0.00	0.486	8.89	1.97						
31.11	100.00	0.00	0.409	6.92	1.84						
26.16	100.00	0.00	0.344	5.08	1.74						
22.00	100.00	0.47	0.289	3.34	1.53						
18.50	99.53	0.87	0.243	1.81	1.12						
15.56	98.66	1.63	0.204	0.69	0.69						
13.08	97.03	3.03	0.172	0.00	0.00						
11.00	94.00	5.20	0.145	0.00	0.00						

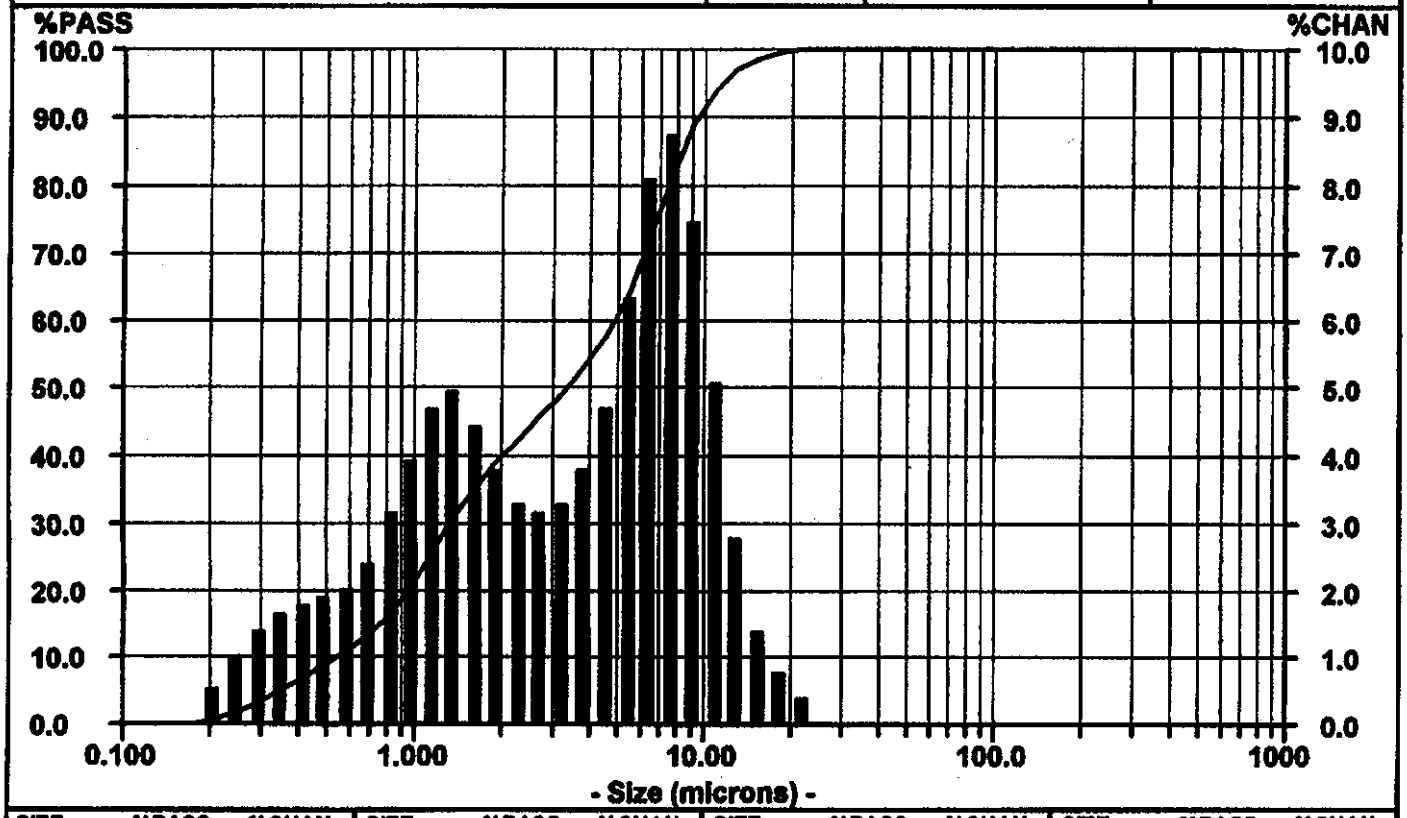
AY-101

AY-101
Duplicate

Date: 09/28/91 Meas #: 00001
Time: 10:16 Pres #: 01

1M NaNO3 and 1M NaOH
20 min. sonication followed by a 60 min. delay
External Sonifier
Flow Rate = 17 ml/sec.
Refractive Index = 2.00 Particle/1.33 Medium
File: 101AY039

Summary	Percentiles		Dia	Vol%	Width
mv = 4.391	10% = 0.636	60% = 4.927	6.383	57%	6.060
mn = 0.321	20% = 0.939	70% = 6.217	0.987	43%	1.259
ma = 1.392	30% = 1.337	80% = 7.662			
cs = 4.311	40% = 2.022	90% = 9.519			
sd = 3.714	50% = 3.403	95% = 11.45			

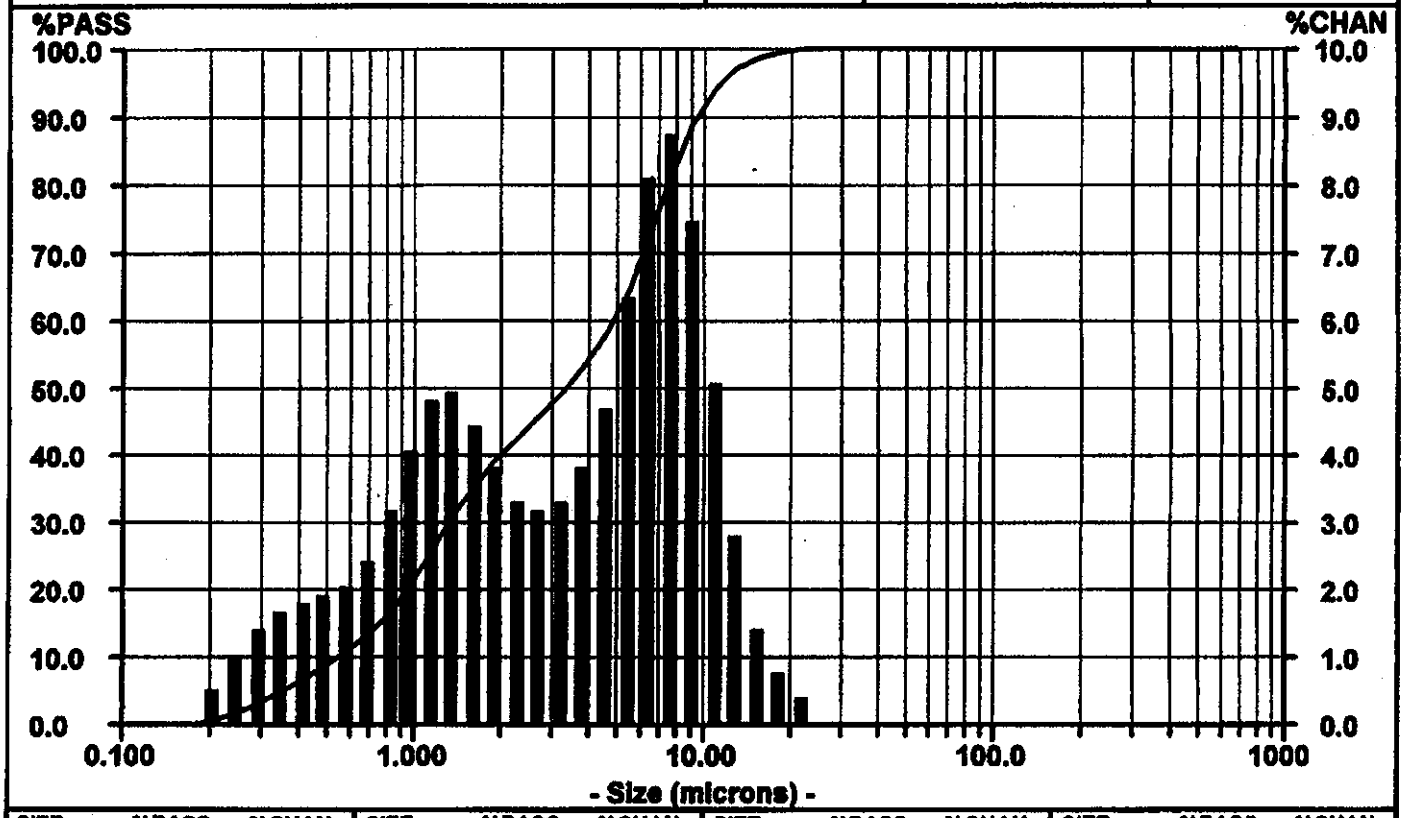


SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.260	89.00	7.58						
592.0	100.00	0.00	7.778	81.42	8.88						
497.8	100.00	0.00	6.541	72.54	8.23						
418.6	100.00	0.00	5.500	64.31	6.48						
352.0	100.00	0.00	4.625	57.85	4.84						
296.0	100.00	0.00	3.889	53.01	3.83						
248.9	100.00	0.00	3.270	49.18	3.35						
209.3	100.00	0.00	2.750	45.83	3.23						
176.0	100.00	0.00	2.312	42.60	3.39						
148.0	100.00	0.00	1.945	39.21	3.85						
124.5	100.00	0.00	1.635	35.36	4.54						
104.7	100.00	0.00	1.375	30.82	5.05						
88.00	100.00	0.00	1.156	25.77	4.89						
74.00	100.00	0.00	0.972	20.88	4.10						
62.23	100.00	0.00	0.818	16.78	3.20						
52.33	100.00	0.00	0.688	13.58	2.56						
44.00	100.00	0.00	0.578	11.02	2.18						
37.00	100.00	0.00	0.486	8.84	1.96						
31.11	100.00	0.00	0.409	6.88	1.84						
26.16	100.00	0.00	0.344	5.04	1.74						
22.00	100.00	0.44	0.289	3.30	1.52						
18.50	99.56	0.83	0.243	1.78	1.10						
15.56	98.73	1.59	0.204	0.68	0.68						
13.08	97.14	2.98	0.172	0.00	0.00						
11.00	94.16	5.16	0.145	0.00	0.00						

AY-101	AY-101 Duplicate	Date: 09/28/91 Time: 10:21	Meas #: 00001 Pres #: 01

1M NaNO3 and 1M NaOH
20 min. sonication followed by a 60 min. delay
External Sonifier
Flow Rate = 40 ml/sec.
Refractive Index = 2.00 Particle/1.33 Medium
File: 101AY040

Summary	Percentiles		Dia	Vol%	Width
mv = 4.375	10% = 0.538	60% = 4.906	6.371	57%	6.043
mn = 0.321	20% = 0.940	70% = 6.198	0.990	43%	1.257
ma = 1.393	30% = 1.334	80% = 7.542			
cs = 4.307	40% = 2.011	90% = 9.493			
sd = 3.702	50% = 3.382	95% = 11.41			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	89.10	7.55						
592.0	100.00	0.00	7.778	81.55	8.86						
497.8	100.00	0.00	6.541	72.69	8.22						
418.6	100.00	0.00	5.500	64.47	6.47						
352.0	100.00	0.00	4.625	58.00	4.85						
296.0	100.00	0.00	3.889	53.15	3.84						
248.9	100.00	0.00	3.270	49.31	3.36						
209.3	100.00	0.00	2.750	45.95	3.23						
176.0	100.00	0.00	2.312	42.72	3.40						
148.0	100.00	0.00	1.945	39.32	3.88						
124.5	100.00	0.00	1.635	35.44	4.57						
104.7	100.00	0.00	1.375	30.87	5.08						
88.00	100.00	0.00	1.156	25.79	4.92						
74.00	100.00	0.00	0.972	20.87	4.13						
62.23	100.00	0.00	0.818	16.74	3.23						
52.33	100.00	0.00	0.688	13.51	2.57						
44.00	100.00	0.00	0.578	10.94	2.18						
37.00	100.00	0.00	0.486	8.76	1.95						
31.11	100.00	0.00	0.409	6.81	1.82						
26.16	100.00	0.00	0.344	4.99	1.71						
22.00	100.00	0.42	0.289	3.28	1.50						
18.50	99.58	0.80	0.243	1.78	1.10						
15.56	98.78	1.57	0.204	0.68	0.68						
13.08	97.21	2.97	0.172	0.00	0.00						
11.00	94.24	5.14	0.145	0.00	0.00						

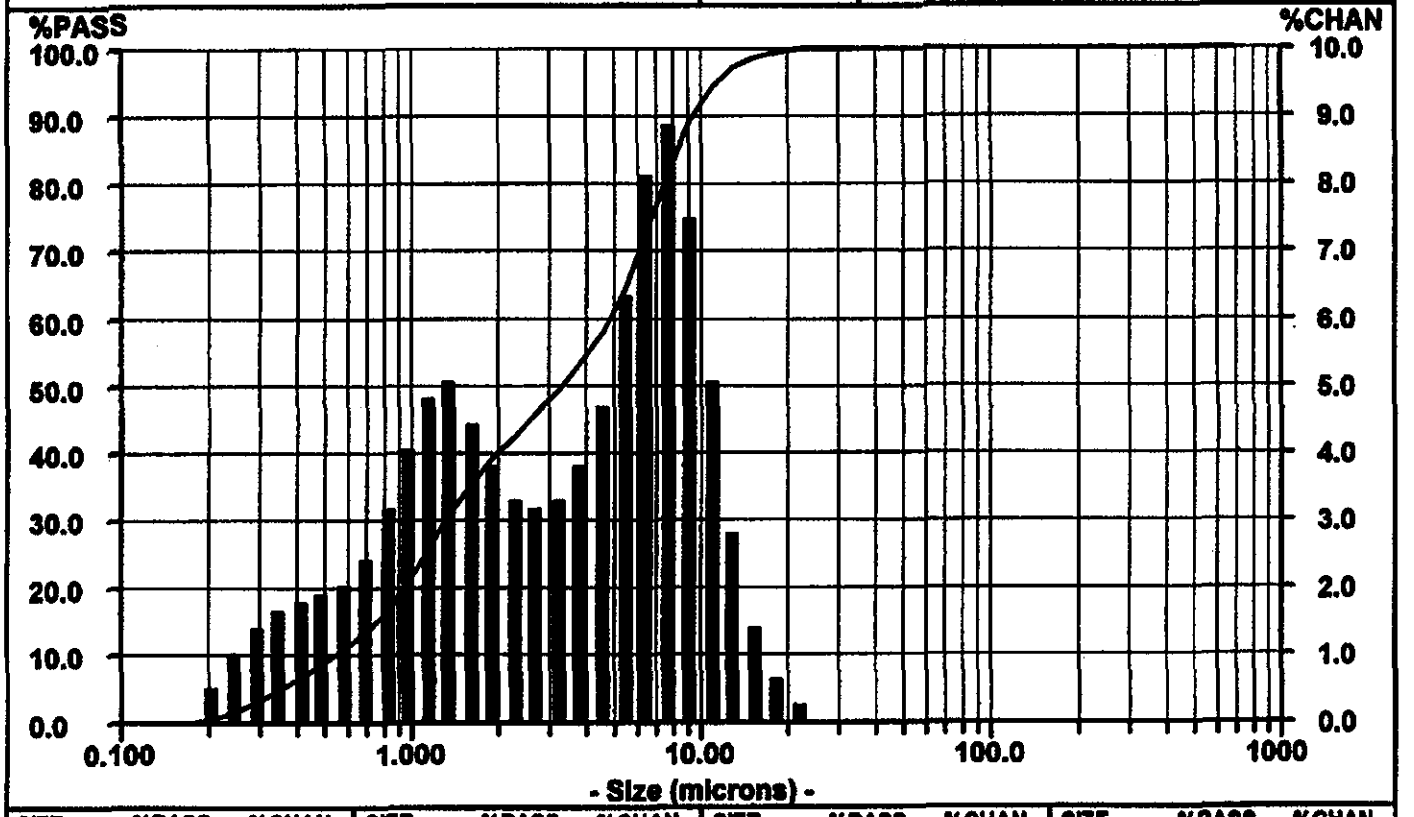
AY-101

AY-101
Duplicate

Date: 09/28/91 Meas #: 00001
Time: 10:25 Pres #: 01

1M NaNO3 and 1M NaOH
20 min. sonication followed by a 60 min. delay
External Sonifier
Flow Rate = 40 ml/sec.
Refractive Index = 1.50 Particle/1.33 Medium
File: 101AY041

Summary	Percentiles		Dia	Vol%	Width
mv = 4.348	10% = 0.538	60% = 4.879	6.349	57%	5.974
mn = 0.321	20% = 0.939	70% = 6.172	0.989	43%	1.253
ma = 1.391	30% = 1.329	80% = 7.506			
cs = 4.315	40% = 2.003	90% = 9.418			
sd = 3.678	50% = 3.361	95% = 11.28			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	89.38	7.58						
592.0	100.00	0.00	7.778	81.80	8.90						
497.8	100.00	0.00	6.541	72.90	8.23						
418.6	100.00	0.00	5.500	64.67	6.48						
352.0	100.00	0.00	4.625	58.19	4.88						
296.0	100.00	0.00	3.889	53.31	3.88						
248.9	100.00	0.00	3.270	49.43	3.39						
209.3	100.00	0.00	2.750	46.04	3.24						
176.0	100.00	0.00	2.312	42.80	3.39						
148.0	100.00	0.00	1.945	39.41	3.86						
124.5	100.00	0.00	1.635	35.55	4.56						
104.7	100.00	0.00	1.375	30.99	5.11						
88.00	100.00	0.00	1.156	25.88	4.96						
74.00	100.00	0.00	0.972	20.92	4.16						
62.23	100.00	0.00	0.818	16.76	3.24						
52.33	100.00	0.00	0.688	13.52	2.58						
44.00	100.00	0.00	0.578	10.94	2.18						
37.00	100.00	0.00	0.486	8.76	1.95						
31.11	100.00	0.00	0.409	6.81	1.82						
26.16	100.00	0.00	0.344	4.99	1.71						
22.00	100.00	0.39	0.289	3.28	1.50						
18.50	99.61	0.75	0.243	1.78	1.10						
15.56	98.86	1.49	0.204	0.68	0.68						
13.08	97.37	2.89	0.172	0.00	0.00						
11.00	94.48	5.10	0.145	0.00	0.00						

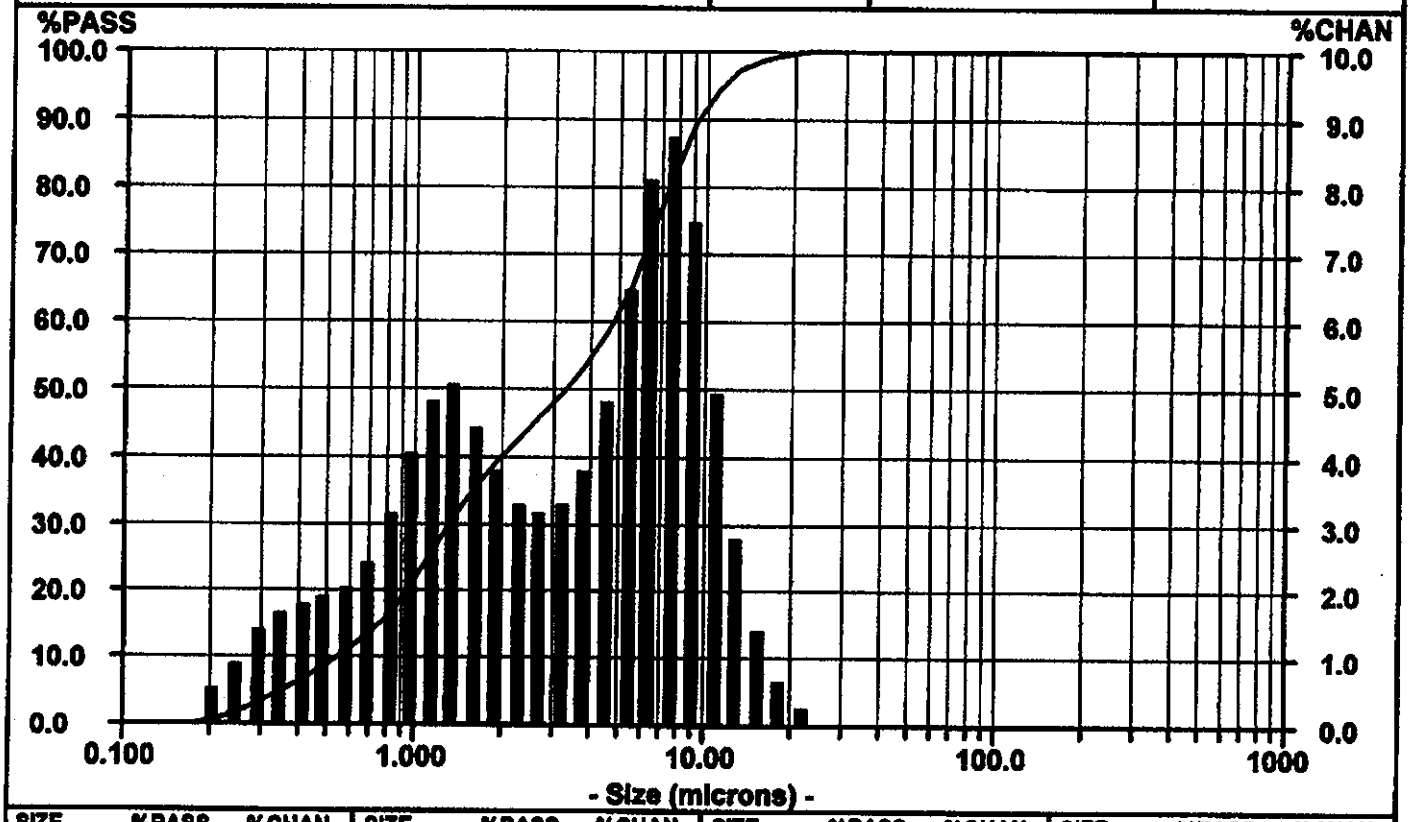
AY-101

AY-101
Duplicate

Date: 09/28/91 Meas #: 00001
Time: 10:29 Pres #: 01

1M NaNO3 and 1M NaOH
20 min. sonication followed by a 60 min. delay
External Sonifier
Flow Rate = 40 ml/sec.
Refractive Index = 1.70 Particle/1.33 Medium
File: 101AY042

Summary	Percentiles		Dia	Vol%	Width
mv = 4.325	10% = 0.537	60% = 4.847	6.324	57%	5.956
mn = 0.322	20% = 0.937	70% = 6.141	0.990	43%	1.253
ma = 1.390	30% = 1.327	80% = 7.475			
cs = 4.318	40% = 1.995	90% = 9.381			
sd = 3.664	50% = 3.338	95% = 11.23			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	89.52	7.54						
592.0	100.00	0.00	7.778	81.98	8.84						
497.8	100.00	0.00	6.541	73.14	8.23						
418.6	100.00	0.00	5.500	64.91	6.50						
352.0	100.00	0.00	4.625	58.41	4.92						
296.0	100.00	0.00	3.889	53.49	3.92						
248.9	100.00	0.00	3.270	49.57	3.42						
209.3	100.00	0.00	2.750	46.15	3.26						
176.0	100.00	0.00	2.312	42.89	3.40						
148.0	100.00	0.00	1.945	39.49	3.87						
124.5	100.00	0.00	1.635	35.62	4.58						
104.7	100.00	0.00	1.375	31.04	5.12						
88.00	100.00	0.00	1.156	25.92	4.97						
74.00	100.00	0.00	0.972	20.95	4.16						
62.23	100.00	0.00	0.818	16.79	3.25						
52.33	100.00	0.00	0.688	13.54	2.58						
44.00	100.00	0.00	0.578	10.96	2.19						
37.00	100.00	0.00	0.486	8.77	1.97						
31.11	100.00	0.00	0.409	6.80	1.83						
26.16	100.00	0.00	0.344	4.97	1.72						
22.00	100.00	0.37	0.289	3.25	1.50						
18.50	99.63	0.73	0.243	1.75	1.08						
15.56	98.90	1.46	0.204	0.67	0.67						
13.08	97.44	2.85	0.172	0.00	0.00						
11.00	94.59	5.07	0.145	0.00	0.00						

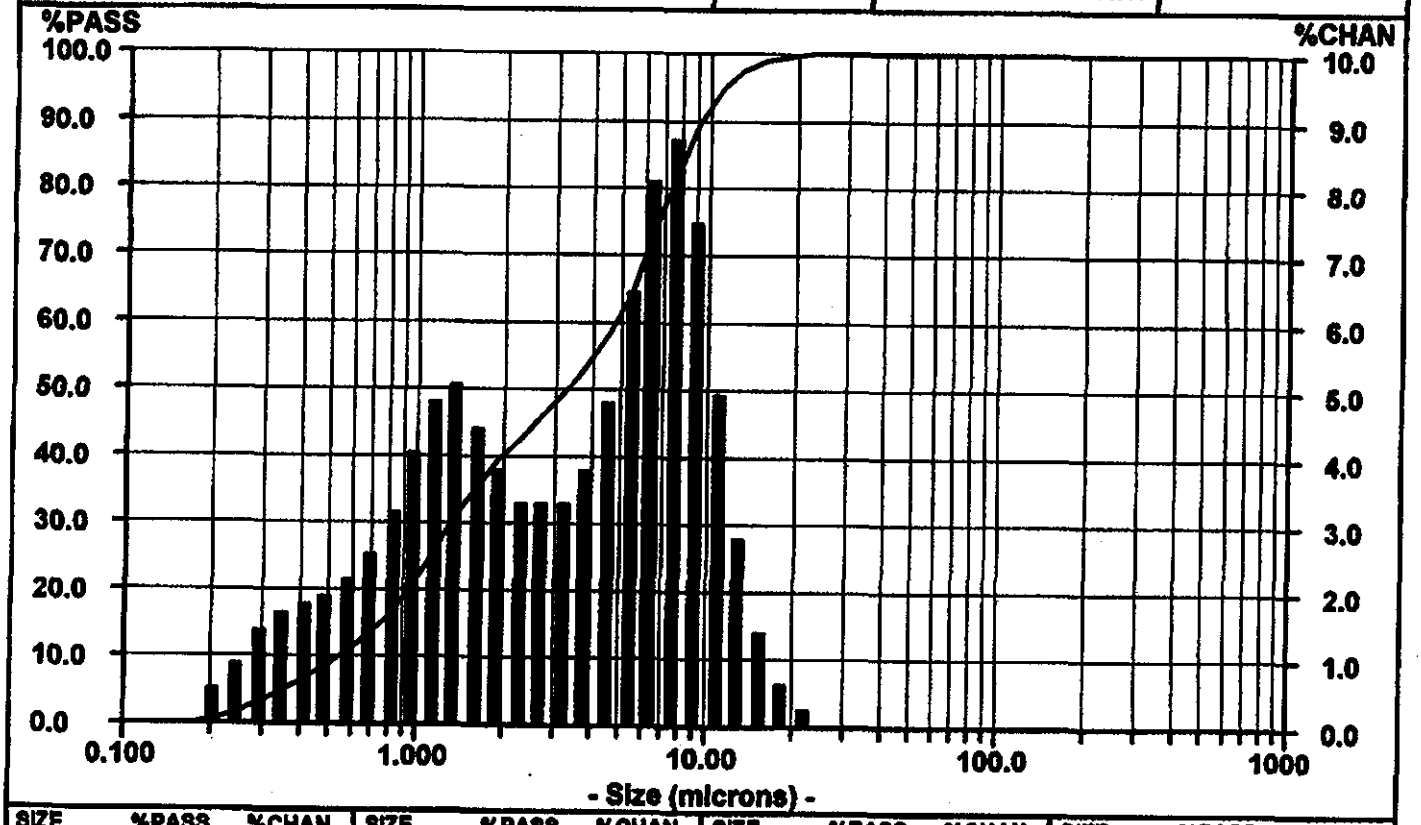
AY-101

1M NaNO3 and 1M NaOH
20 min. sonication followed by a 60 min. delay
External Sonifier
Flow Rate = 60 ml/sec.
Refractive Index = 1.70 Particle/1.33 Medium
File: 101AY043

AY-101
Duplicate

Date: 09/28/91 Meas #: 00001
Time: 10:34 Pres #: 01

Summary	Percentiles		Dia	Vol%	Width
mv = 4.304	10% = 0.537	60% = 4.826	6.310	57%	5.926
mn = 0.322	20% = 0.935	70% = 6.121	0.969	43%	1.255
ma = 1.386	30% = 1.323	80% = 7.447			
cs = 4.328	40% = 1.988	90% = 9.332			
sd = 3.649	50% = 3.311	95% = 11.15			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	89.70	7.53						
592.0	100.00	0.00	7.778	82.17	8.86						
497.8	100.00	0.00	6.541	73.31	8.24						
418.6	100.00	0.00	5.500	65.07	6.50						
352.0	100.00	0.00	4.625	58.57	4.91						
296.0	100.00	0.00	3.889	53.66	3.92						
248.9	100.00	0.00	3.270	49.74	3.44						
209.3	100.00	0.00	2.750	46.30	3.30						
176.0	100.00	0.00	2.312	43.00	3.44						
148.0	100.00	0.00	1.945	39.56	3.88						
124.5	100.00	0.00	1.635	35.68	4.67						
104.7	100.00	0.00	1.375	31.11	5.11						
88.00	100.00	0.00	1.156	26.00	4.97						
74.00	100.00	0.00	0.972	21.03	4.18						
62.23	100.00	0.00	0.818	16.85	3.27						
52.33	100.00	0.00	0.688	13.58	2.60						
44.00	100.00	0.00	0.578	10.98	2.20						
37.00	100.00	0.00	0.486	8.78	1.97						
31.11	100.00	0.00	0.409	6.81	1.83						
26.16	100.00	0.00	0.344	4.98	1.72						
22.00	100.00	0.35	0.289	3.26	1.50						
18.50	99.65	0.70	0.243	1.76	1.09						
15.56	98.95	1.42	0.204	0.67	0.67						
13.08	97.53	2.80	0.172	0.00	0.00						
11.00	94.73	5.03	0.145	0.00	0.00						

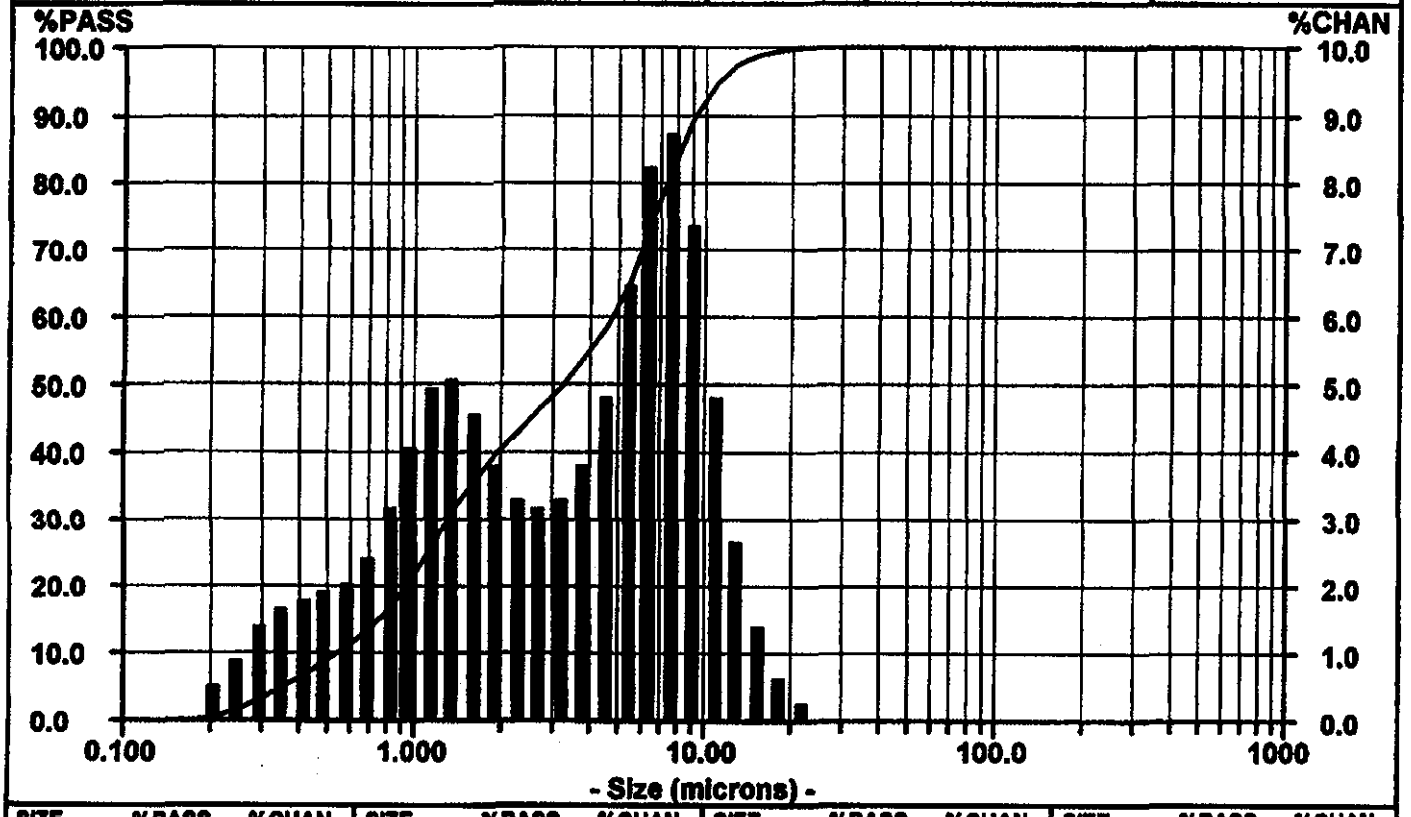
AY-101

AY-101
Duplicate

Date: 09/28/91 Meas #: 00001
Time: 10:38 Pres #: 01

1M NaNO3 and 1M NaOH
20 min. sonication followed by a 60 min. delay
External Sonifier
Flow Rate = 60 ml/sec.
Refractive Index = 2.00 Particle/1.33 Medium
File: 101AY044

Summary	Percentiles		Dia	Vol%	Width
mv = 4.290	10% = 0.536	60% = 4.807	6.287	57%	5.896
mn = 0.322	20% = 0.934	70% = 6.092	0.991	43%	1.254
ma = 1.383	30% = 1.320	80% = 7.411			
cs = 4.338	40% = 1.974	90% = 9.295			
sd = 3.631	50% = 3.297	95% = 11.13			

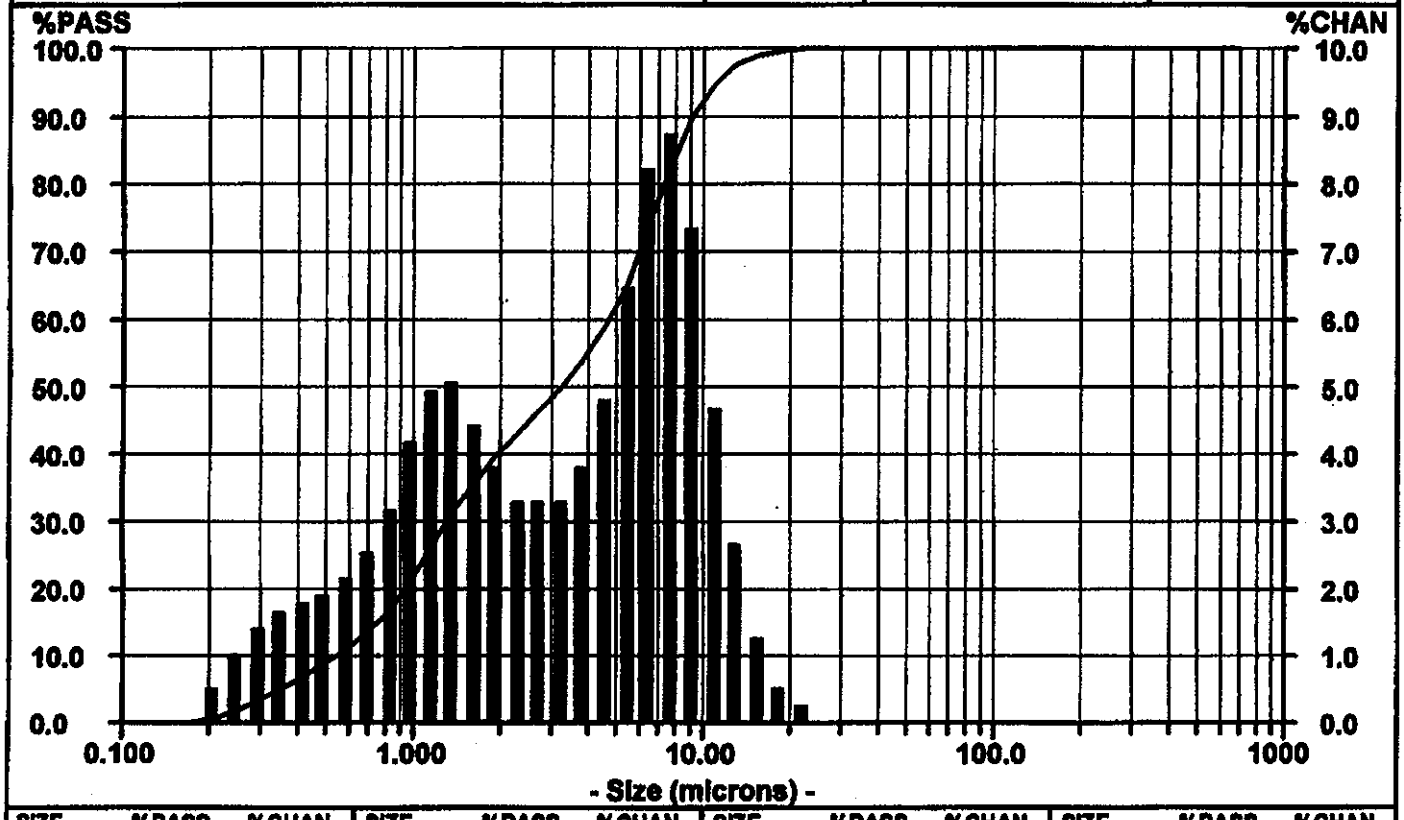


SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	89.84	7.43						
592.0	100.00	0.00	7.778	82.41	8.85						
497.8	100.00	0.00	6.541	73.56	8.30						
418.6	100.00	0.00	5.500	65.26	6.57						
352.0	100.00	0.00	4.626	58.69	4.94						
296.0	100.00	0.00	3.889	53.75	3.92						
248.9	100.00	0.00	3.270	49.83	3.42						
209.3	100.00	0.00	2.750	46.41	3.28						
176.0	100.00	0.00	2.312	43.13	3.43						
148.0	100.00	0.00	1.945	39.70	3.90						
124.5	100.00	0.00	1.636	35.80	4.61						
104.7	100.00	0.00	1.376	31.19	5.15						
88.00	100.00	0.00	1.156	26.04	5.00						
74.00	100.00	0.00	0.972	21.04	4.19						
62.23	100.00	0.00	0.818	16.85	3.26						
52.33	100.00	0.00	0.688	13.59	2.59						
44.00	100.00	0.00	0.578	11.00	2.19						
37.00	100.00	0.00	0.486	8.81	1.97						
31.11	100.00	0.00	0.409	6.84	1.83						
26.16	100.00	0.00	0.344	5.01	1.73						
22.00	100.00	0.36	0.289	3.28	1.51						
18.50	99.64	0.70	0.243	1.77	1.09						
15.56	98.94	1.41	0.204	0.68	0.68						
13.08	97.53	2.76	0.172	0.00	0.00						
11.00	94.77	4.93	0.145	0.00	0.00						

AY-101	AY-101 Duplicate	Date: 09/28/91 Meas #: 00001 Time: 10:42 Pres #: 01

1M NaNO3 and 1M NaOH
20 min. sonication followed by a 60 min. delay
External Sonifier
Flow Rate = 60 ml/sec.
Refractive Index = 1.50 Particle/1.33 Medium
File: 101AY045

Summary	Percentiles		Dia	Vol%	Width
mv = 4.264	10% = 0.533	60% = 4.776	8.265	57%	5.860
mn = 0.322	20% = 0.930	70% = 6.064	0.988	43%	1.256
ma = 1.377	30% = 1.316	80% = 7.380			
cs = 4.356	40% = 1.967	90% = 9.238			
sd = 3.614	50% = 3.272	95% = 11.03			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	90.05	7.42						
592.0	100.00	0.00	7.778	82.63	8.85						
497.8	100.00	0.00	6.541	73.78	8.30						
418.6	100.00	0.00	5.500	65.48	6.57						
352.0	100.00	0.00	4.625	58.91	4.96						
296.0	100.00	0.00	3.889	53.95	3.96						
248.9	100.00	0.00	3.270	49.99	3.46						
209.3	100.00	0.00	2.750	46.53	3.31						
176.0	100.00	0.00	2.312	43.22	3.45						
148.0	100.00	0.00	1.945	39.77	3.89						
124.5	100.00	0.00	1.635	35.88	4.58						
104.7	100.00	0.00	1.375	31.30	5.13						
88.00	100.00	0.00	1.156	26.17	5.01						
74.00	100.00	0.00	0.972	21.16	4.21						
62.23	100.00	0.00	0.818	16.95	3.28						
52.33	100.00	0.00	0.688	13.67	2.60						
44.00	100.00	0.00	0.578	11.07	2.20						
37.00	100.00	0.00	0.486	8.87	1.97						
31.11	100.00	0.00	0.409	6.90	1.84						
26.16	100.00	0.00	0.344	5.06	1.74						
22.00	100.00	0.33	0.289	3.32	1.53						
18.50	99.67	0.67	0.243	1.79	1.11						
15.56	99.00	1.36	0.204	0.68	0.68						
13.08	97.64	2.70	0.172	0.00	0.00						
11.00	94.94	4.89	0.145	0.00	0.00						

This document was too large to scan as a single document. It has been divided into smaller sections.

Section 6 of

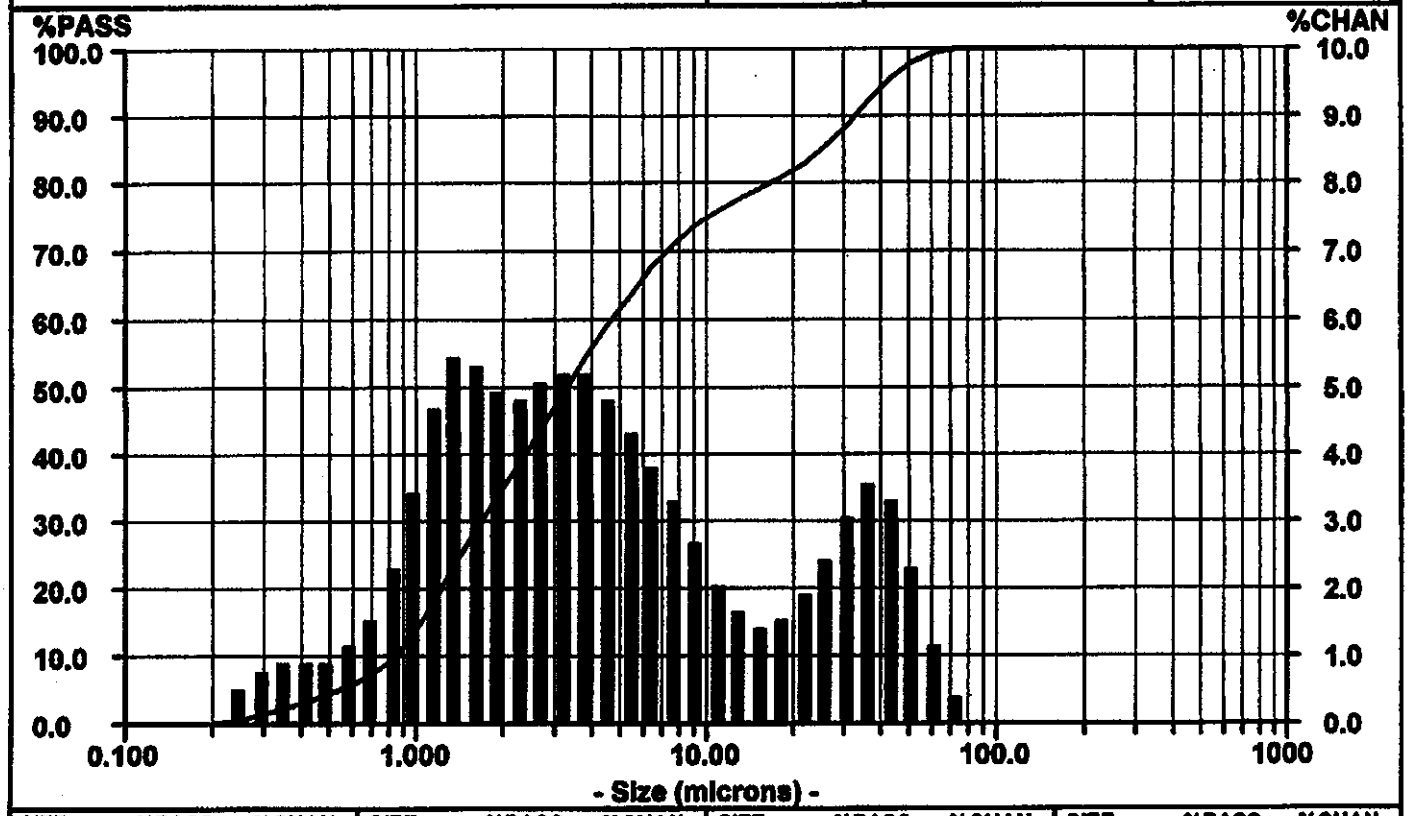
Document Information			
Document #	**HNF-8862**	**Revision**	**0**
Title	PARTICLE PROPERTY ANALYSES OF HLW TANK SLUDGES		
Date	**0/3/04/2002**		
Originator	**DB BECHTOLD** **L JENSEN** **JB DUNCAN** **JR JEWETT** **JM TINGEY**	**Originator Co.**	**FH** **CHG** **OTHER** **NHC** **PNL**
Recipient		**Recipient Co.**	
References	**EDT-628492**, BCR-67		
Keywords	Sieve Test Results		
Projects	**Tank Farms** 241C104, 241SY102		
Other Information	App G Pages G-244 — 44		

C-104

C-104 in 1M NaOH and 1M NaNO3
Flow rate = 17 ml/sec.
Refractive index of the particle = 1.50 and the medium = 1.33
File: WPA030

C-104 Sample
Date: 09/26/91 Meas #: 00001
Time: 04:56 Pres #: 01

Summary	Percentiles		Dia	Vol%	Width
mv = 9.792	10% = 0.830	60% = 4.727	31.47	22%	26.87
mn = 0.396	20% = 1.231	70% = 7.278	4.078	44%	5.111
ma = 1.885	30% = 1.693	80% = 16.62	1.116	34%	1.056
cs = 3.217	40% = 2.401	90% = 33.19			
sd = 11.30	50% = 3.347	95% = 42.25			



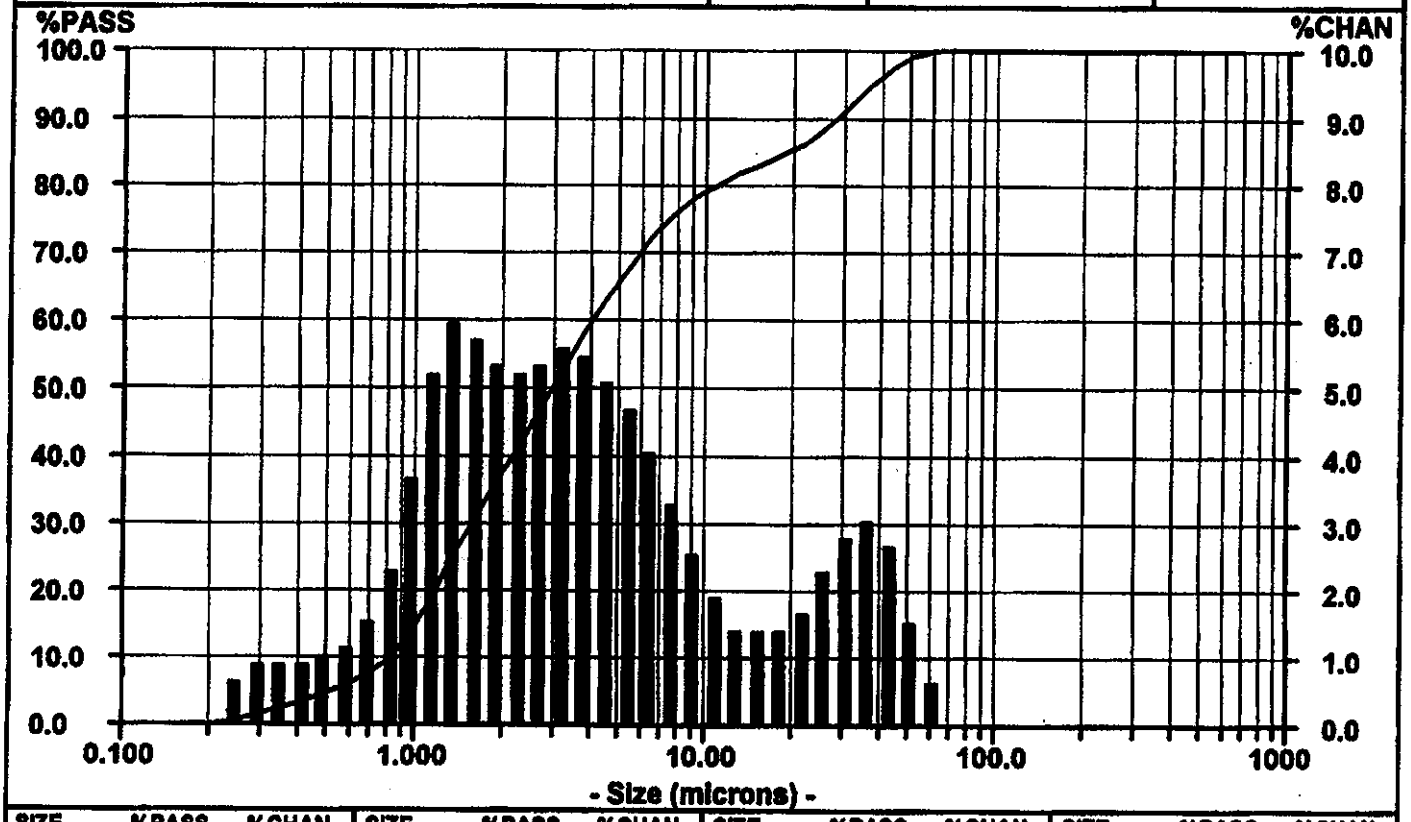
SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	73.92	2.70						
592.0	100.00	0.00	7.778	71.22	3.36						
497.8	100.00	0.00	6.541	67.86	3.97						
418.6	100.00	0.00	5.500	63.89	4.47						
352.0	100.00	0.00	4.625	59.42	4.90						
296.0	100.00	0.00	3.889	54.52	5.22						
248.9	100.00	0.00	3.270	49.30	5.28						
209.3	100.00	0.00	2.750	44.02	5.10						
176.0	100.00	0.00	2.312	38.92	4.92						
148.0	100.00	0.00	1.945	34.00	5.03						
124.5	100.00	0.00	1.635	28.97	5.40						
104.7	100.00	0.00	1.375	23.57	5.52						
88.00	100.00	0.00	1.156	18.05	4.80						
74.00	100.00	0.51	0.972	13.25	3.51						
62.23	99.49	1.29	0.818	9.74	2.36						
52.33	98.20	2.46	0.688	7.38	1.65						
44.00	95.74	3.43	0.578	5.73	1.27						
37.00	92.31	3.64	0.486	4.46	1.07						
31.11	88.67	3.16	0.409	3.39	0.97						
26.16	85.51	2.50	0.344	2.42	0.92						
22.00	83.01	1.96	0.289	1.50	0.85						
18.50	81.05	1.66	0.243	0.65	0.65						
15.56	79.39	1.58	0.204	0.00	0.00						
13.08	77.80	1.75	0.172	0.00	0.00						
11.00	76.05	2.13	0.145	0.00	0.00						

C-104

C-104 in 1M NaOH and 1M NaNO3
Flow rate = 17 ml/sec.
Refractive index of the particle = 1.70 and the medium = 1.33
File: WPA031

C-104 Sample
Date: 09/26/91 Meas #: 00001
Time: 05:09 Pres #: 01

Summary	Percentiles		Dia	Vol%	Width
mv = 8.149	10% = 0.814	60% = 4.118	29.76	18%	23.87
mn = 0.395	20% = 1.189	70% = 5.926	4.004	45%	4.855
ma = 1.764	30% = 1.586	80% = 10.70	1.127	37%	1.047
cs = 3.401	40% = 2.188	90% = 28.20			
sd = 8.005	50% = 3.008	95% = 37.24			



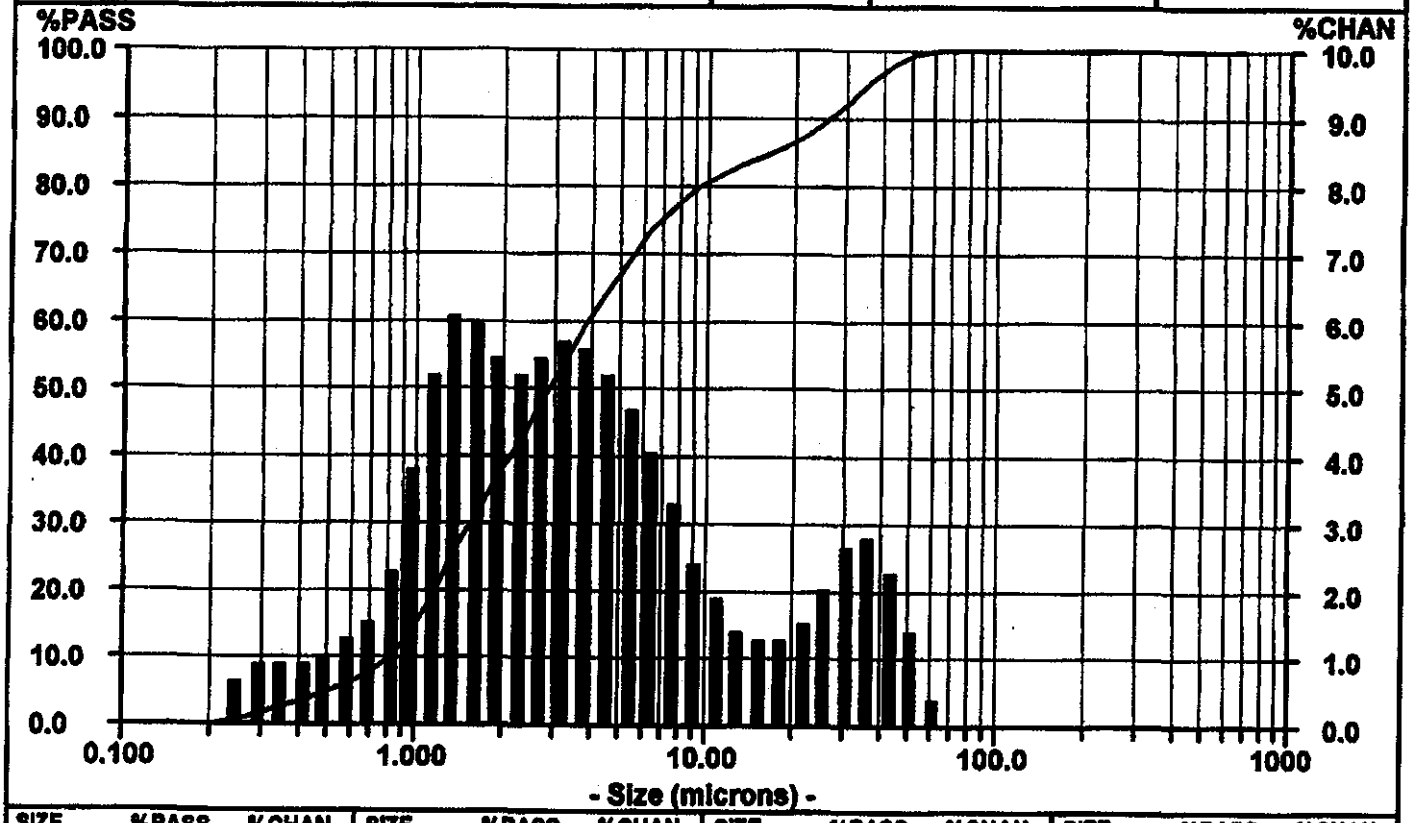
SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.260	78.31	2.63						
592.0	100.00	0.00	7.778	75.68	3.40						
497.8	100.00	0.00	6.541	72.28	4.13						
418.6	100.00	0.00	5.500	68.15	4.71						
352.0	100.00	0.00	4.625	63.44	5.19						
296.0	100.00	0.00	3.889	58.25	5.53						
248.9	100.00	0.00	3.270	52.72	5.61						
209.3	100.00	0.00	2.750	47.11	5.42						
176.0	100.00	0.00	2.312	41.69	5.25						
148.0	100.00	0.00	1.945	36.44	5.43						
124.5	100.00	0.00	1.635	31.01	5.89						
104.7	100.00	0.00	1.375	25.12	6.07						
88.00	100.00	0.00	1.156	19.05	5.23						
74.00	100.00	0.00	0.972	13.82	3.74						
62.23	100.00	0.73	0.818	10.08	2.44						
52.33	99.27	1.68	0.688	7.64	1.67						
44.00	97.59	2.70	0.578	5.97	1.28						
37.00	94.89	3.18	0.486	4.69	1.10						
31.11	91.71	2.91	0.409	3.59	1.01						
26.16	88.80	2.31	0.344	2.58	0.97						
22.00	86.49	1.78	0.289	1.61	0.91						
18.50	84.71	1.47	0.243	0.70	0.70						
15.56	83.24	1.40	0.204	0.00	0.00						
13.08	81.84	1.56	0.172	0.00	0.00						
11.00	80.28	1.97	0.145	0.00	0.00						

C-104

C-104 in 1M NaOH and 1M NaNO3
Flow rate = 17 ml/sec.
Refractive index of the particle = 2.00 and the medium = 1.33
File: WPA032

C-104 Sample
Date: 09/26/91 Meas #: 00001
Time: 05:13 Pres #: 01

Summary	Percentiles		Dia	Vol%	Width
mv = 7.676	10% = 0.807	60% = 3.948	29.38	17%	23.33
mn = 0.396	20% = 1.177	70% = 5.581	3.977	46%	4.766
ma = 1.732	30% = 1.557	80% = 9.396	1.130	37%	1.046
cs = 3.463	40% = 2.127	90% = 26.48			
sd = 6.706	50% = 2.910	95% = 35.84			



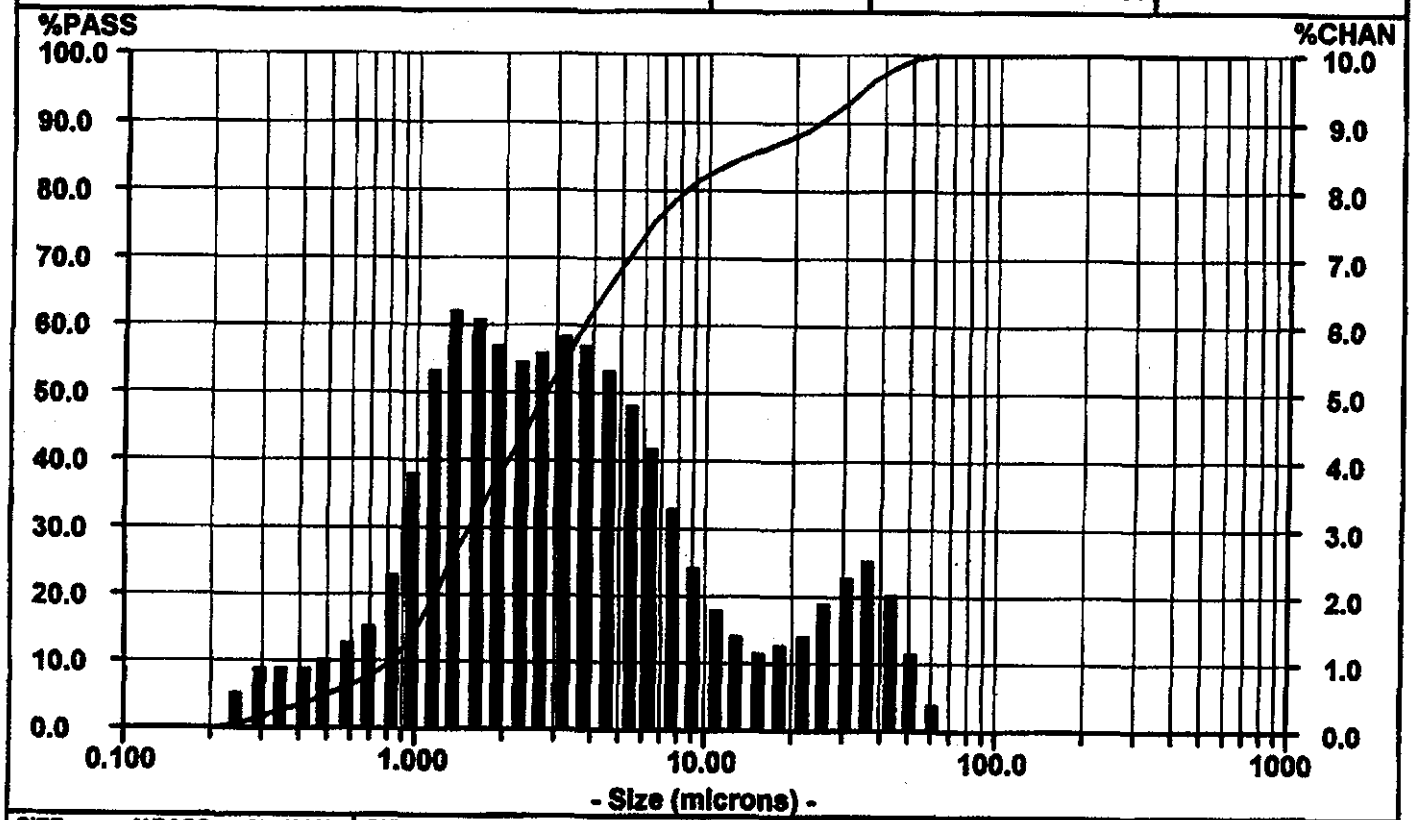
SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.260	79.81	2.59						
592.0	100.00	0.00	7.778	77.22	3.41						
497.8	100.00	0.00	6.541	73.81	4.18						
418.6	100.00	0.00	5.500	69.63	4.80						
352.0	100.00	0.00	4.625	64.83	5.30						
296.0	100.00	0.00	3.889	59.53	5.65						
248.9	100.00	0.00	3.270	53.88	5.73						
209.3	100.00	0.00	2.750	48.15	5.54						
176.0	100.00	0.00	2.312	42.61	5.38						
148.0	100.00	0.00	1.945	37.23	5.56						
124.5	100.00	0.00	1.635	31.67	6.06						
104.7	100.00	0.00	1.375	25.61	6.23						
88.00	100.00	0.00	1.156	19.38	5.35						
74.00	100.00	0.00	0.972	14.03	3.80						
62.23	100.00	0.59	0.818	10.23	2.47						
52.33	99.41	1.44	0.688	7.76	1.69						
44.00	97.97	2.44	0.578	6.07	1.30						
37.00	95.53	2.96	0.486	4.77	1.11						
31.11	92.57	2.75	0.409	3.66	1.03						
26.16	89.82	2.19	0.344	2.63	0.99						
22.00	87.63	1.68	0.289	1.64	0.93						
18.50	85.95	1.39	0.243	0.71	0.71						
15.56	84.56	1.33	0.204	0.00	0.00						
13.08	83.23	1.50	0.172	0.00	0.00						
11.00	81.73	1.92	0.145	0.00	0.00						

C-104

C-104 in 1M NaOH and 1M NaNO3.
Flow rate = 40 ml/sec
Refractive index of the particle = 1.50 and the medium = 1.33
File: WPA033

C-104 Sample
Date: 09/26/91 Meas #: 00001
Time: 05:20 Pres #: 01

Summary	Percentiles		Dia	Vol%	Width
mv = 7.173	10% = 0.805	60% = 3.792	28.96	15%	23.24
mn = 0.398	20% = 1.172	70% = 5.247	3.952	47%	4.658
ma = 1.710	30% = 1.538	80% = 8.287	1.137	38%	1.045
cs = 3.509	40% = 2.078	90% = 24.14			
sd = 5.372	50% = 2.825	95% = 34.34			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.260	81.54	2.58						
592.0	100.00	0.00	7.778	78.96	3.43						
497.8	100.00	0.00	6.541	75.55	4.26						
418.6	100.00	0.00	5.500	71.29	4.95						
352.0	100.00	0.00	4.625	66.34	5.49						
296.0	100.00	0.00	3.889	60.85	5.85						
248.9	100.00	0.00	3.270	55.00	5.90						
209.3	100.00	0.00	2.750	49.10	5.68						
176.0	100.00	0.00	2.312	43.42	5.52						
148.0	100.00	0.00	1.945	37.90	5.74						
124.5	100.00	0.00	1.635	32.16	6.25						
104.7	100.00	0.00	1.375	25.91	6.39						
88.00	100.00	0.00	1.156	19.52	5.43						
74.00	100.00	0.00	0.972	14.09	3.83						
62.23	100.00	0.51	0.818	10.26	2.48						
52.33	99.49	1.25	0.688	7.78	1.68						
44.00	98.24	2.13	0.578	6.10	1.30						
37.00	96.11	2.62	0.486	4.80	1.12						
31.11	93.49	2.49	0.409	3.68	1.04						
26.16	91.00	2.02	0.344	2.64	1.01						
22.00	88.98	1.57	0.289	1.63	0.95						
18.50	87.41	1.31	0.243	0.68	0.68						
15.56	86.10	1.26	0.204	0.00	0.00						
13.08	84.84	1.44	0.172	0.00	0.00						
11.00	83.40	1.86	0.145	0.00	0.00						

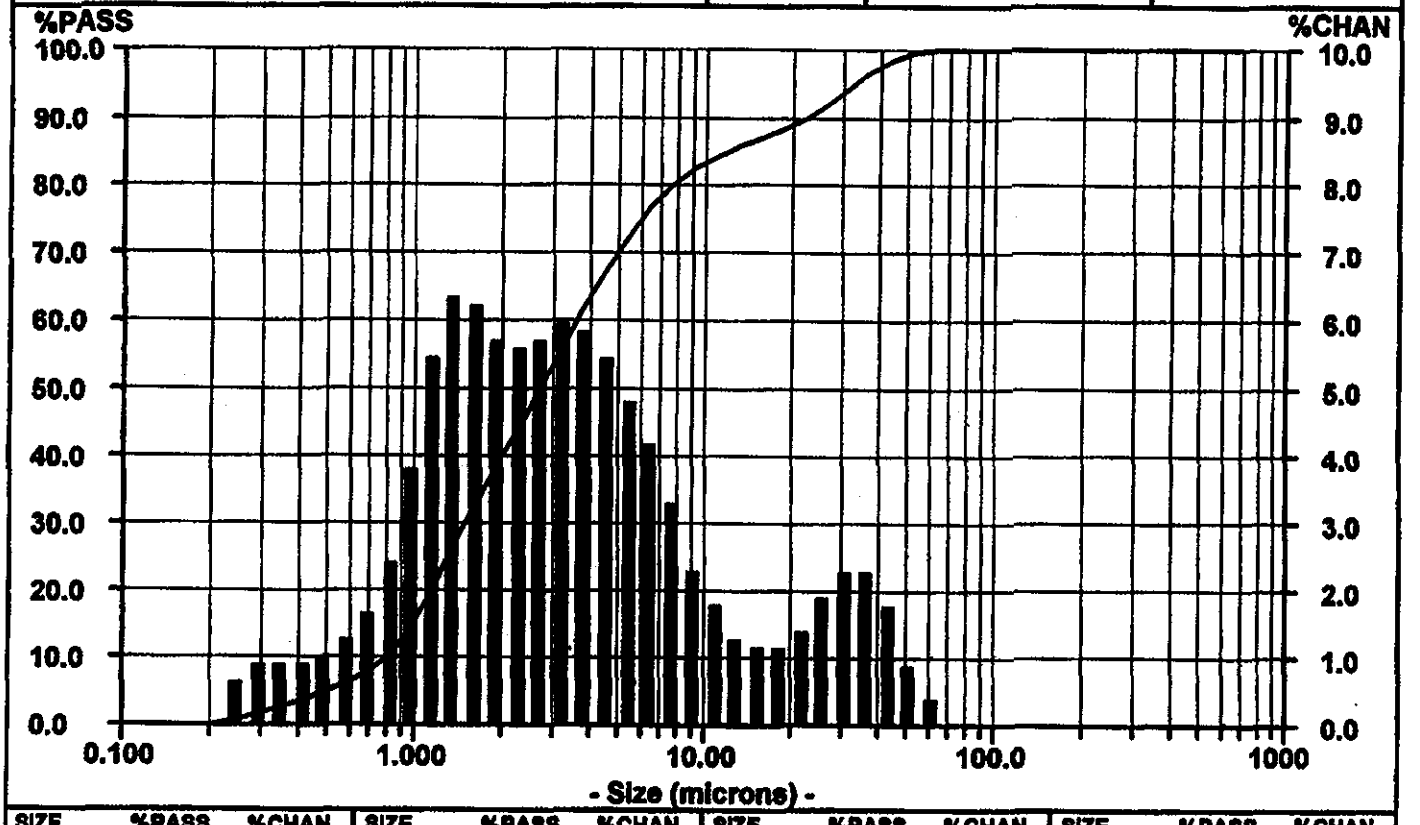
C-104

C-104 Sample

Date: 09/26/91 Meas #: 00001
Time: 05:24 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3.
Flow rate = 40 ml/sec.
Refractive index of the particle = 1.70 and the medium = 1.33
File: WPA034

Summary	Percentiles		Dia	Vol%	Width
mv = 6.791	10% = 0.792	60% = 3.656	28.33	14%	22.87
mn = 0.395	20% = 1.153	70% = 5.005	3.912	47%	4.573
ma = 1.673	30% = 1.509	80% = 7.690	1.132	39%	1.044
cs = 3.586	40% = 2.023	90% = 22.15			
sd = 4.714	50% = 2.738	95% = 32.86			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	82.68	2.48						
592.0	100.00	0.00	7.778	80.20	3.35						
497.8	100.00	0.00	6.541	76.85	4.22						
418.6	100.00	0.00	5.500	72.63	4.97						
352.0	100.00	0.00	4.625	67.66	5.56						
296.0	100.00	0.00	3.889	62.10	5.94						
248.9	100.00	0.00	3.270	56.16	6.01						
209.3	100.00	0.00	2.750	50.15	5.80						
176.0	100.00	0.00	2.312	44.35	5.64						
148.0	100.00	0.00	1.945	38.71	5.63						
124.5	100.00	0.00	1.635	32.85	5.32						
104.7	100.00	0.00	1.375	26.56	6.46						
88.00	100.00	0.00	1.156	20.10	5.56						
74.00	100.00	0.00	0.972	14.54	3.97						
62.23	100.00	0.44	0.818	10.57	2.58						
52.33	99.56	1.08	0.688	7.99	1.75						
44.00	98.48	1.87	0.578	6.24	1.33						
37.00	96.61	2.38	0.486	4.91	1.14						
31.11	94.23	2.34	0.409	3.77	1.05						
26.16	91.89	1.96	0.344	2.72	1.01						
22.00	89.93	1.54	0.289	1.71	0.96						
18.50	88.39	1.29	0.243	0.75	0.75						
15.56	87.10	1.23	0.204	0.00	0.00						
13.08	85.87	1.39	0.172	0.00	0.00						
11.00	84.48	1.80	0.145	0.00	0.00						

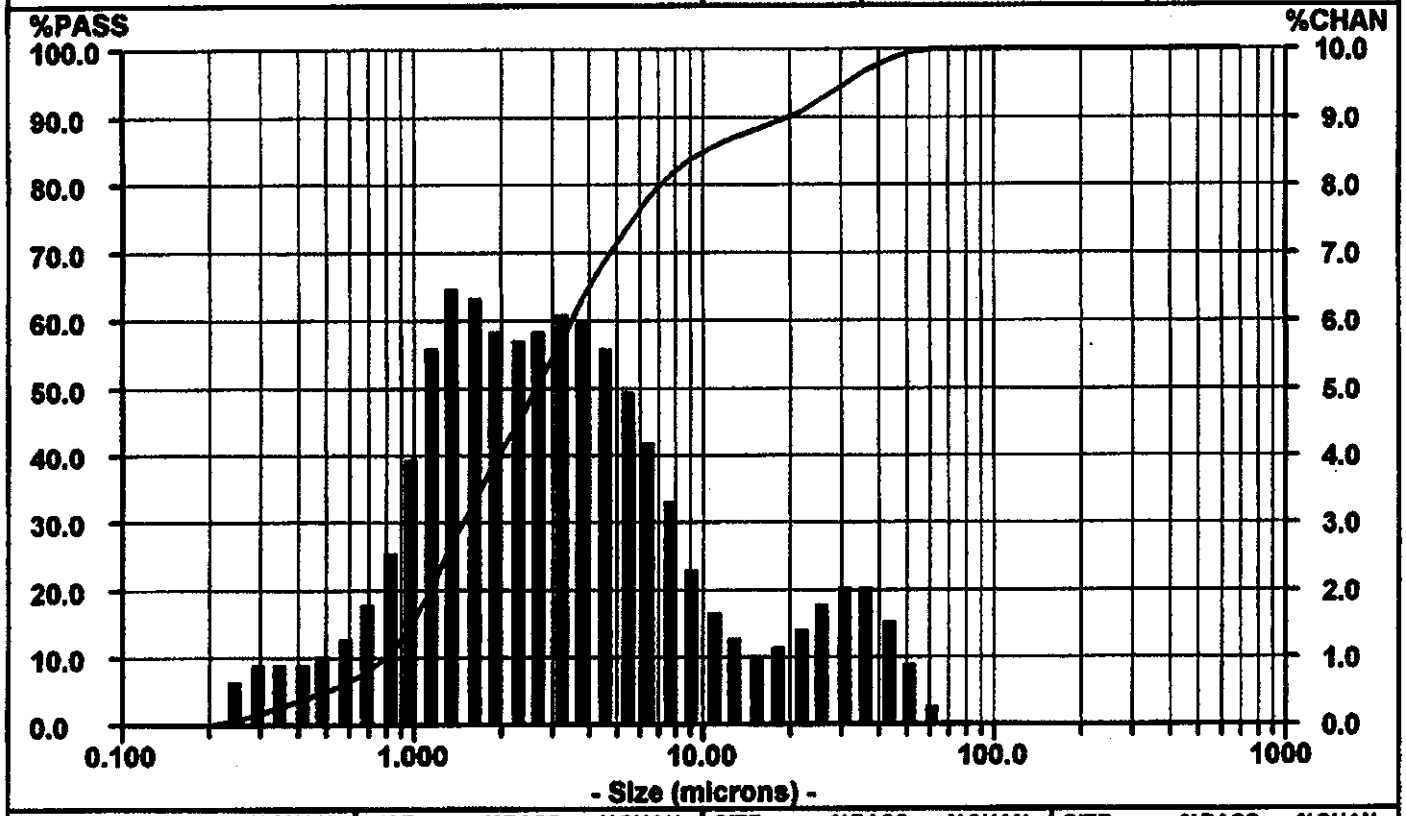
C-104

C-104 Sample

Date: 09/26/91 Meas #: 00001
Time: 05:29 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3.
Flow rate = 40 ml/sec.
Refractive index of the particle = 2.00 and the medium = 1.33
File: WPA035

Summary	Percentiles		Dia	Vol%	Width
mv = 6.384	10% = 0.782	60% = 3.532	27.86	13%	22.66
mn = 0.395	20% = 1.141	70% = 4.778	3.881	48%	4.492
ma = 1.645	30% = 1.488	80% = 7.110	1.132	39%	1.045
cs = 3.648	40% = 1.979	90% = 19.60			
sd = 4.105	50% = 2.661	95% = 31.24			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	84.04	2.43						
592.0	100.00	0.00	7.778	81.61	3.32						
497.8	100.00	0.00	6.541	78.29	4.24						
418.6	100.00	0.00	5.500	74.05	5.04						
352.0	100.00	0.00	4.625	69.01	5.66						
296.0	100.00	0.00	3.889	63.35	6.07						
248.9	100.00	0.00	3.270	57.28	6.14						
209.3	100.00	0.00	2.750	51.14	5.94						
176.0	100.00	0.00	2.312	45.20	5.78						
148.0	100.00	0.00	1.945	39.42	5.97						
124.5	100.00	0.00	1.635	33.45	6.43						
104.7	100.00	0.00	1.375	27.02	6.55						
88.00	100.00	0.00	1.156	20.47	5.63						
74.00	100.00	0.00	0.972	14.84	4.04						
62.23	100.00	0.38	0.818	10.80	2.65						
52.33	99.62	0.93	0.688	8.15	1.80						
44.00	98.69	1.63	0.578	6.35	1.37						
37.00	97.06	2.11	0.486	4.98	1.16						
31.11	94.95	2.13	0.409	3.82	1.06						
26.16	92.82	1.82	0.344	2.76	1.02						
22.00	91.00	1.45	0.289	1.74	0.97						
18.50	89.55	1.23	0.243	0.77	0.77						
15.56	88.32	1.18	0.204	0.00	0.00						
13.08	87.14	1.35	0.172	0.00	0.00						
11.00	85.79	1.75	0.145	0.00	0.00						

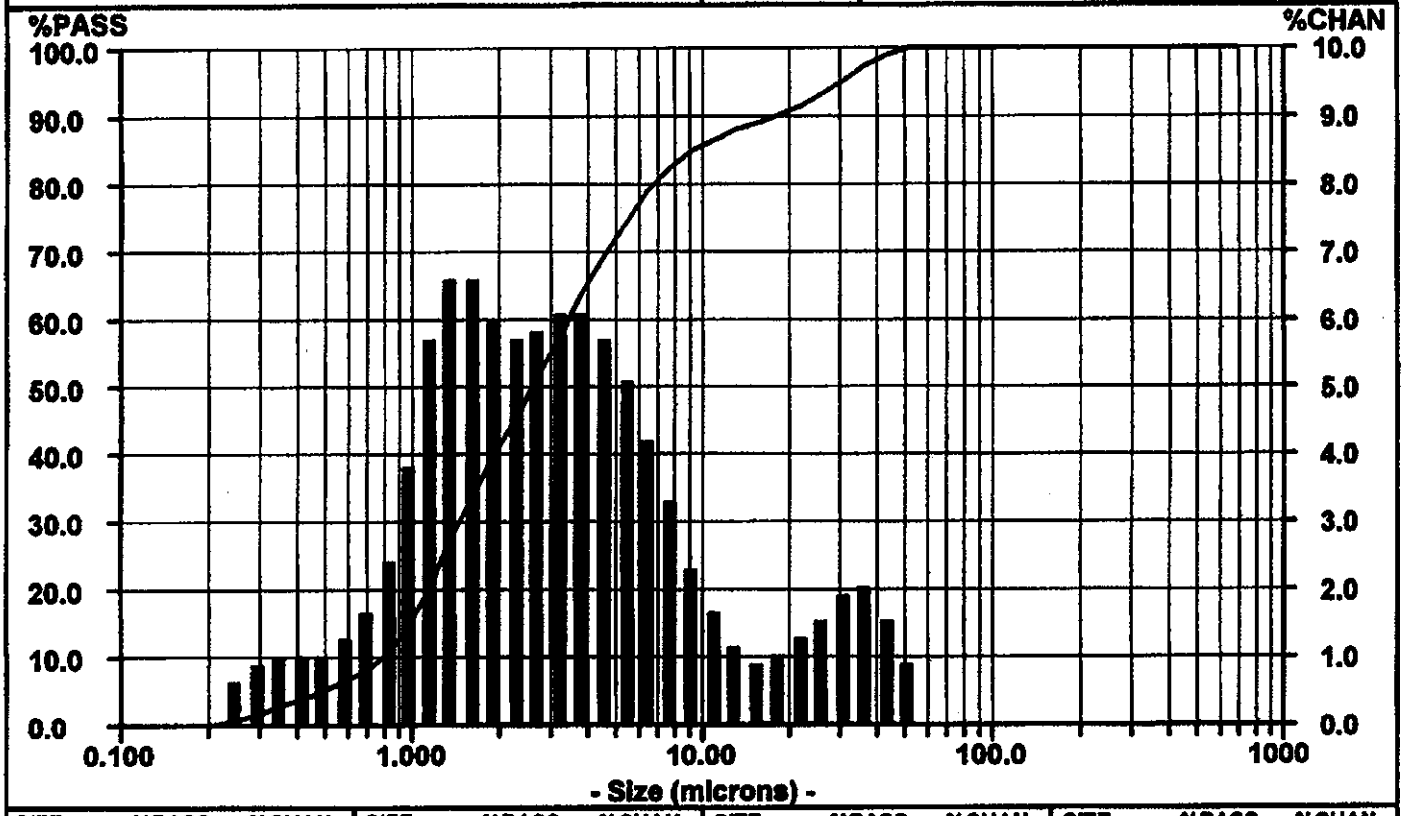
C-104

C-104 Sample

Date: 09/26/91 Meas #: 00001
Time: 05:34 Pres #: 01

C-104 in 1M NaOH, 1M NaNO3.
Flow rate = 60 ml/sec.
Refractive index of the particle = 1.50 and the medium = 1.33
File: WPA036

Summary		Percentiles		Dia	Vol%	Width
mv =	6.075	10% = 0.778	60% = 3.487	27.94	12%	21.54
mn =	0.396	20% = 1.139	70% = 4.678	3.903	48%	4.452
ma =	1.626	30% = 1.474	80% = 6.786	1.138	40%	1.051
cs =	3.689	40% = 1.951	90% = 17.77			
sd =	3.752	50% = 2.630	95% = 30.25			



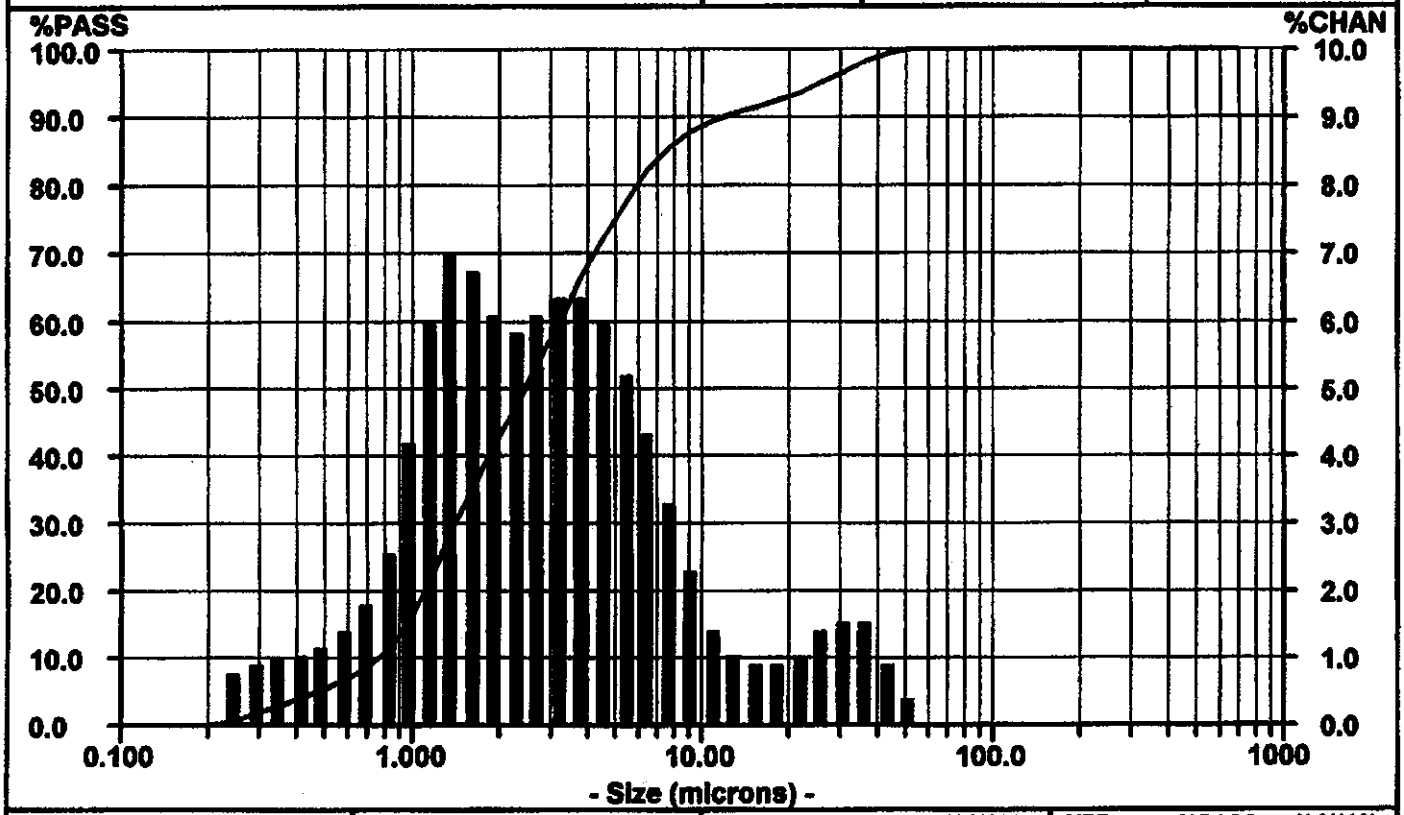
SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.260	85.07	2.46						
592.0	100.00	0.00	7.778	82.61	3.41						
497.8	100.00	0.00	6.541	79.20	4.37						
418.6	100.00	0.00	5.500	74.83	5.18						
352.0	100.00	0.00	4.625	69.65	5.79						
296.0	100.00	0.00	3.889	63.86	6.15						
248.9	100.00	0.00	3.270	57.71	6.17						
209.3	100.00	0.00	2.750	51.54	5.91						
176.0	100.00	0.00	2.312	45.63	5.73						
148.0	100.00	0.00	1.945	39.90	6.00						
124.5	100.00	0.00	1.635	33.90	6.60						
104.7	100.00	0.00	1.375	27.30	6.76						
88.00	100.00	0.00	1.156	20.54	5.72						
74.00	100.00	0.00	0.972	14.82	3.98						
62.23	100.00	0.00	0.818	10.84	2.55						
52.33	100.00	0.90	0.688	8.29	1.74						
44.00	99.10	1.63	0.578	6.55	1.36						
37.00	97.47	2.12	0.486	5.19	1.20						
31.11	95.35	2.07	0.409	3.99	1.13						
26.16	93.28	1.69	0.344	2.86	1.10						
22.00	91.59	1.32	0.289	1.76	1.03						
18.50	90.27	1.11	0.243	0.73	0.73						
15.56	89.16	1.09	0.204	0.00	0.00						
13.08	88.07	1.28	0.172	0.00	0.00						
11.00	86.79	1.72	0.145	0.00	0.00						

C-104

C-104 in 1M NaOH and 1M NaNO3.
Flow rate = 60 ml/sec.
Refractive index of the particle = 1.70 and the medium = 1.33
File: WPA037

C-104 Sample — Date: 09/26/91 Time: 05:44 — Meas #: 00001 Pres #: 01

Summary	Percentiles		Dia	Vol%	Width
mv = 5.254	10% = 0.758	60% = 3.255	26.71	9%	20.23
mn = 0.394	20% = 1.109	70% = 4.286	3.841	49%	4.237
ma = 1.564	30% = 1.423	80% = 5.943	1.134	42%	1.047
cs = 3.837	40% = 1.855	90% = 11.84			
sd = 3.060	50% = 2.478	95% = 25.85			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	87.96	2.30						
592.0	100.00	0.00	7.778	85.66	3.33						
497.8	100.00	0.00	6.541	82.33	4.42						
418.6	100.00	0.00	5.500	77.91	5.33						
352.0	100.00	0.00	4.625	72.58	6.00						
296.0	100.00	0.00	3.889	66.58	6.40						
248.9	100.00	0.00	3.270	60.18	6.43						
209.3	100.00	0.00	2.750	53.75	6.16						
176.0	100.00	0.00	2.312	47.59	5.95						
148.0	100.00	0.00	1.945	41.64	6.19						
124.5	100.00	0.00	1.635	35.45	6.82						
104.7	100.00	0.00	1.375	28.63	7.06						
88.00	100.00	0.00	1.156	21.57	6.05						
74.00	100.00	0.00	0.972	15.52	4.21						
62.23	100.00	0.00	0.818	11.31	2.68						
52.33	100.00	0.51	0.688	8.63	1.82						
44.00	99.49	1.09	0.578	6.81	1.41						
37.00	98.40	1.60	0.486	5.40	1.24						
31.11	96.80	1.69	0.409	4.16	1.17						
26.16	95.11	1.45	0.344	2.99	1.13						
22.00	93.66	1.15	0.289	1.86	1.06						
18.50	92.51	0.96	0.243	0.80	0.80						
15.56	91.55	0.94	0.204	0.00	0.00						
13.08	90.61	1.11	0.172	0.00	0.00						
11.00	89.50	1.54	0.145	0.00	0.00						

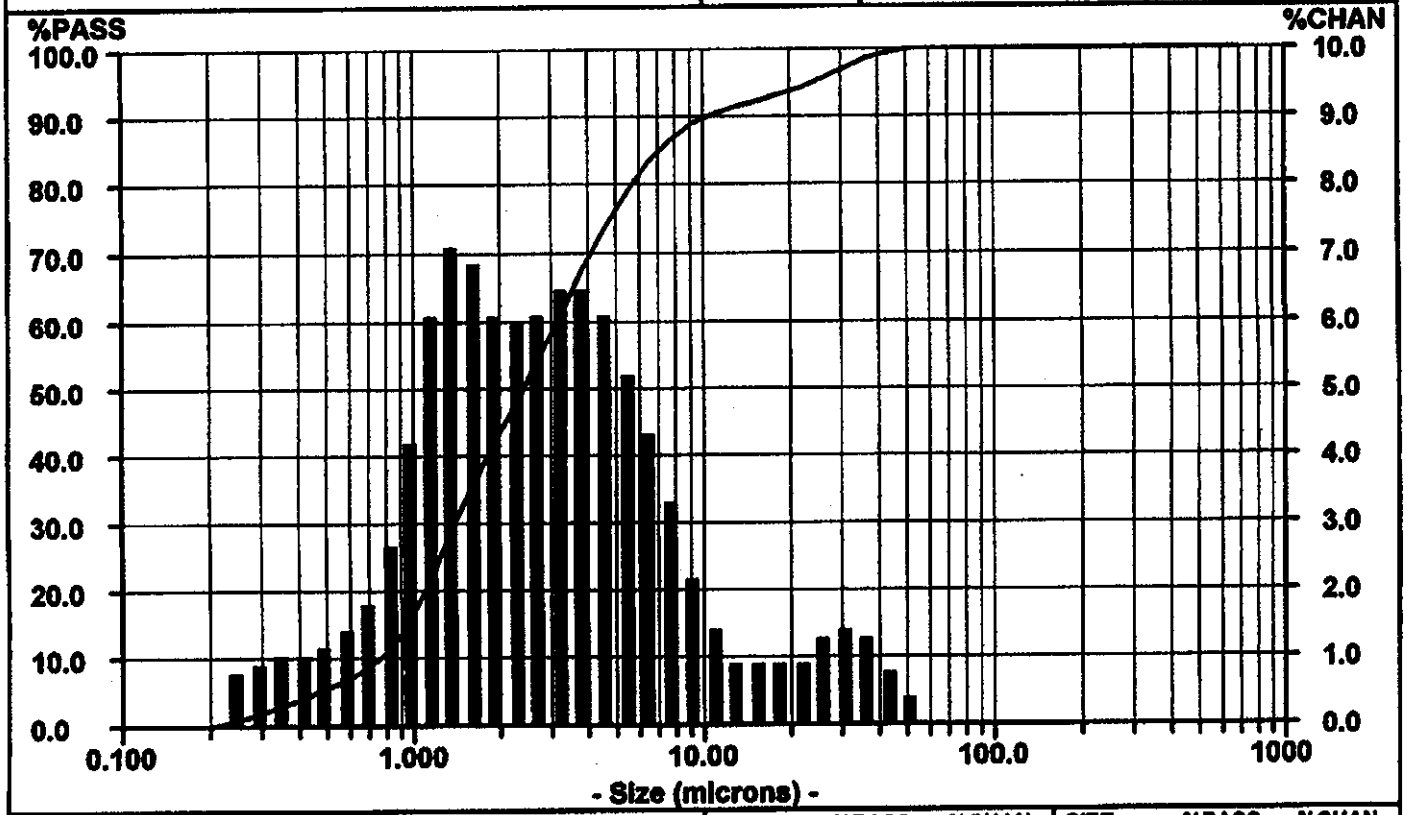
C-104

C-104 Sample

Date: 09/26/91 Meas #: 00001
Time: 05:48 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Flow rate = 60 ml/sec.
Refractive index = 2.00 particle/1.33 medium
File: WPA038

Summary	Percentiles		Dia	Vol%	Width
mv = 4.954	10% = 0.752	60% = 3.186	26.08	8%	19.74
mn = 0.394	20% = 1.101	70% = 4.165	3.822	49%	4.168
ma = 1.545	30% = 1.409	80% = 5.696	1.133	43%	1.046
cs = 3.884	40% = 1.828	90% = 10.31			
sd = 2.884	50% = 2.432	95% = 23.65			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	89.01	2.25						
592.0	100.00	0.00	7.778	86.76	3.30						
497.8	100.00	0.00	6.541	83.46	4.43						
418.6	100.00	0.00	5.500	79.03	5.39						
352.0	100.00	0.00	4.625	73.64	6.11						
296.0	100.00	0.00	3.889	67.53	6.52						
248.9	100.00	0.00	3.270	61.01	6.54						
209.3	100.00	0.00	2.750	54.47	6.25						
176.0	100.00	0.00	2.312	48.22	6.03						
148.0	100.00	0.00	1.945	42.19	6.27						
124.5	100.00	0.00	1.635	35.92	6.91						
104.7	100.00	0.00	1.375	29.01	7.13						
88.00	100.00	0.00	1.156	21.88	6.13						
74.00	100.00	0.00	0.972	15.75	4.28						
62.23	100.00	0.00	0.818	11.47	2.73						
52.33	100.00	0.40	0.688	8.74	1.85						
44.00	99.60	0.89	0.578	6.89	1.44						
37.00	98.71	1.38	0.486	5.45	1.25						
31.11	97.33	1.52	0.409	4.20	1.18						
26.16	95.81	1.34	0.344	3.02	1.14						
22.00	94.47	1.08	0.289	1.88	1.07						
18.50	93.39	0.92	0.243	0.81	0.81						
15.56	92.47	0.90	0.204	0.00	0.00						
13.08	91.57	1.07	0.172	0.00	0.00						
11.00	90.50	1.49	0.145	0.00	0.00						

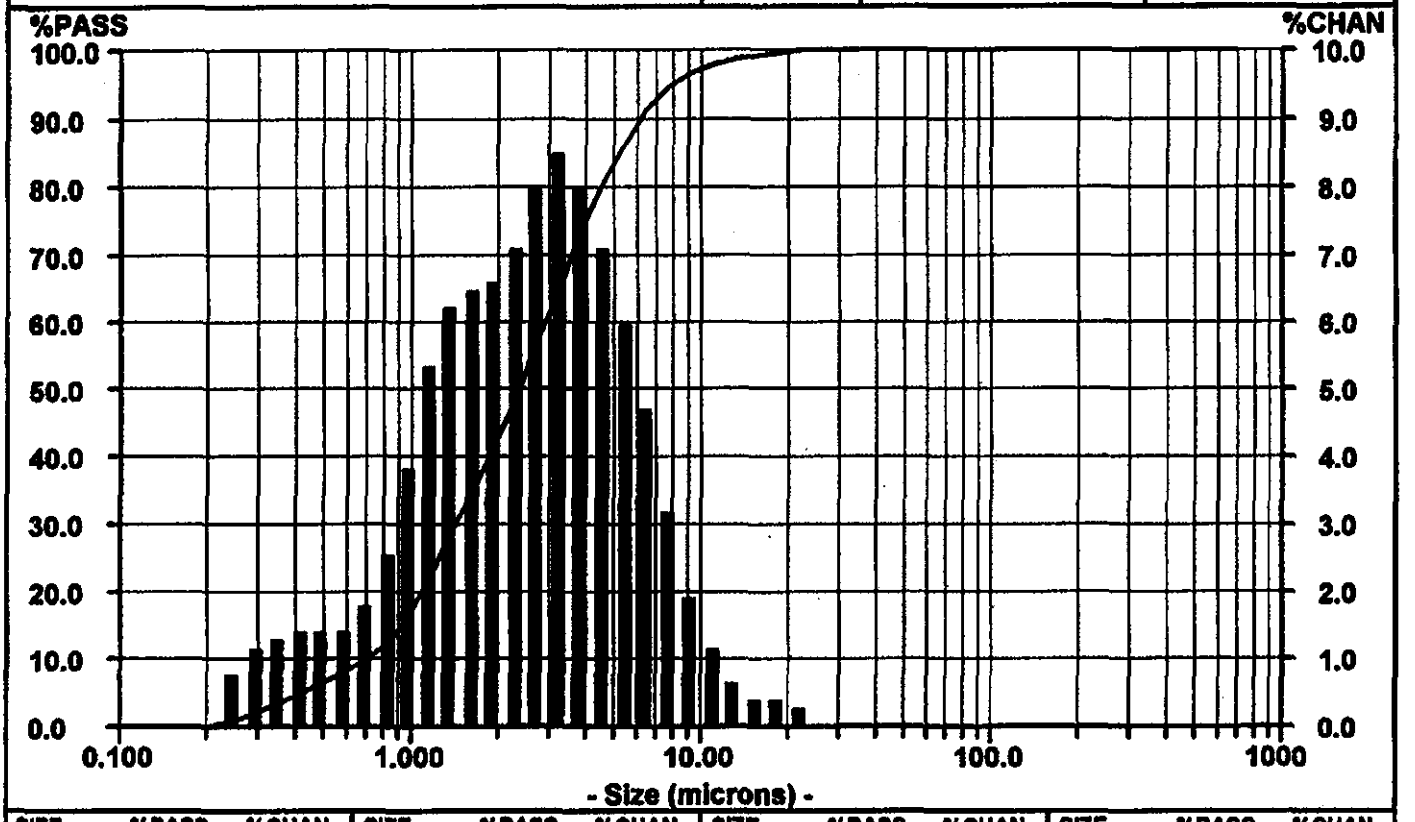
C-104

C-104 in 1M NaOH and 1M NaNO3
Sonicate for 2 min. @ 40 W
Flow Rate = 17 ml/sec.
Refractive Index = 1.50 Particle/1.33 Medium
File: WPA039

C-104
Sample

Date: 09/26/91 Meas #: 00001
Time: 05:54 Pres #: 01

Summary	Percentiles		Dia	Vol%	Width
mv = 3.090	10% = 0.693	60% = 2.953	2.394	100%	4.131
mn = 0.383	20% = 1.094	70% = 3.626			
ma = 1.457	30% = 1.443	80% = 4.567			
cs = 4.118	40% = 1.881	90% = 6.197			
sd = 2.065	50% = 2.394	95% = 7.981			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.260	96.69	2.07						
592.0	100.00	0.00	7.778	94.62	3.29						
497.8	100.00	0.00	6.541	91.33	4.73						
418.6	100.00	0.00	5.500	86.60	6.09						
352.0	100.00	0.00	4.625	80.51	7.27						
296.0	100.00	0.00	3.889	73.24	8.19						
248.9	100.00	0.00	3.270	65.05	8.54						
209.3	100.00	0.00	2.750	56.51	8.05						
176.0	100.00	0.00	2.312	48.46	7.17						
148.0	100.00	0.00	1.945	41.29	6.60						
124.5	100.00	0.00	1.635	34.69	6.50						
104.7	100.00	0.00	1.375	28.19	6.34						
88.00	100.00	0.00	1.156	21.85	5.42						
74.00	100.00	0.00	0.972	16.43	3.90						
62.23	100.00	0.00	0.818	12.53	2.62						
52.33	100.00	0.00	0.688	9.91	1.89						
44.00	100.00	0.00	0.578	8.02	1.58						
37.00	100.00	0.00	0.486	6.44	1.47						
31.11	100.00	0.00	0.409	4.97	1.44						
26.16	100.00	0.00	0.344	3.53	1.39						
22.00	100.00	0.31	0.289	2.14	1.25						
18.50	99.69	0.41	0.243	0.89	0.89						
15.56	99.28	0.55	0.204	0.00	0.00						
13.08	98.73	0.79	0.172	0.00	0.00						
11.00	97.94	1.25	0.145	0.00	0.00						

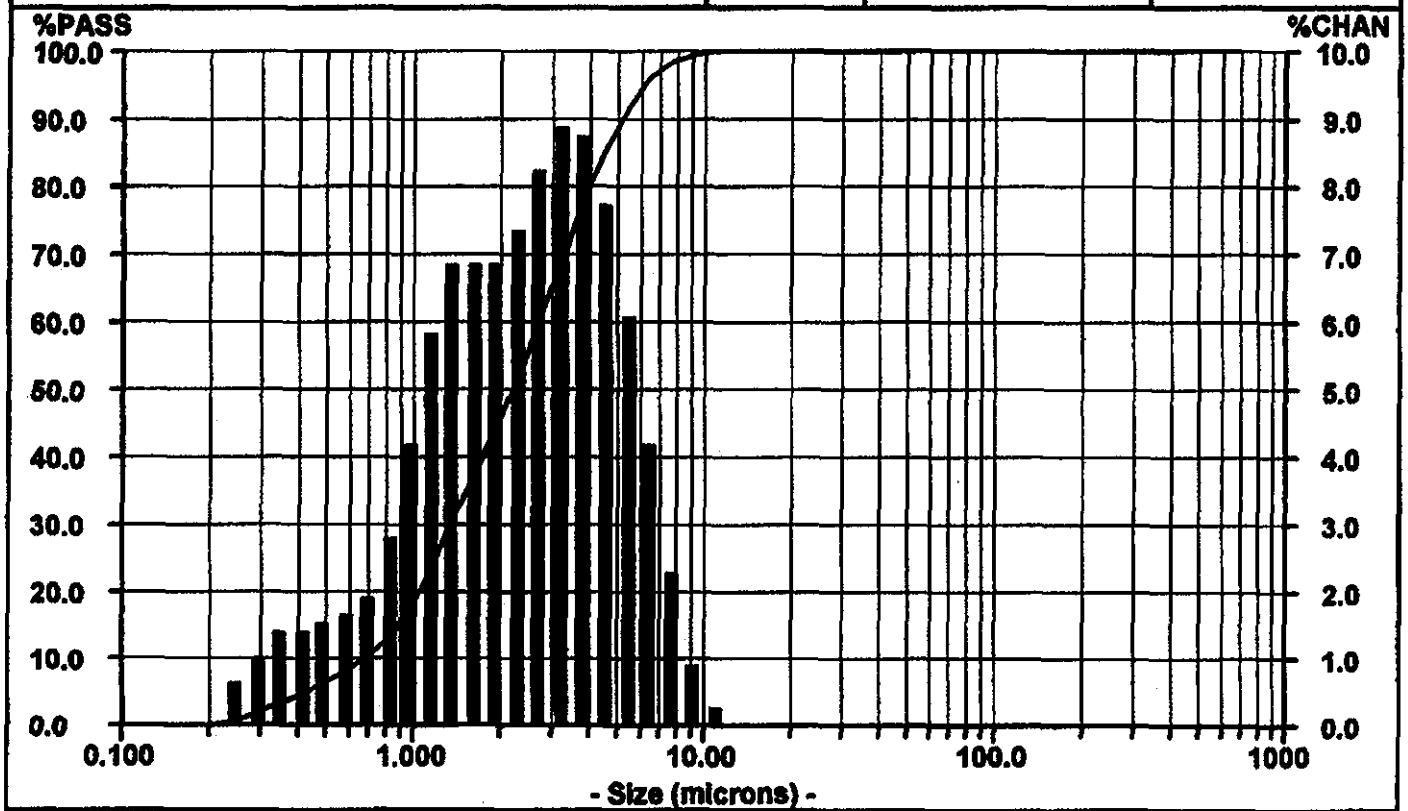
C-104

C-104 Sample

Date: 09/26/91 Meas #: 00001
Time: 05:58 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Sonicate for 2 min.
Flow rate = 17 ml/sec.
Refractive Index = 1.70 particle/1.33 medium
File: WPA040

Summary	Percentiles		Dia	Vol%	Width
mv = 2.627	10% = 0.672	60% = 2.744	3.247	63%	3.076
mn = 0.397	20% = 1.050	70% = 3.329	1.009	37%	0.948
ma = 1.398	30% = 1.361	80% = 4.065			
cs = 4.291	40% = 1.746	90% = 5.174			
sd = 1.759	50% = 2.223	95% = 6.151			



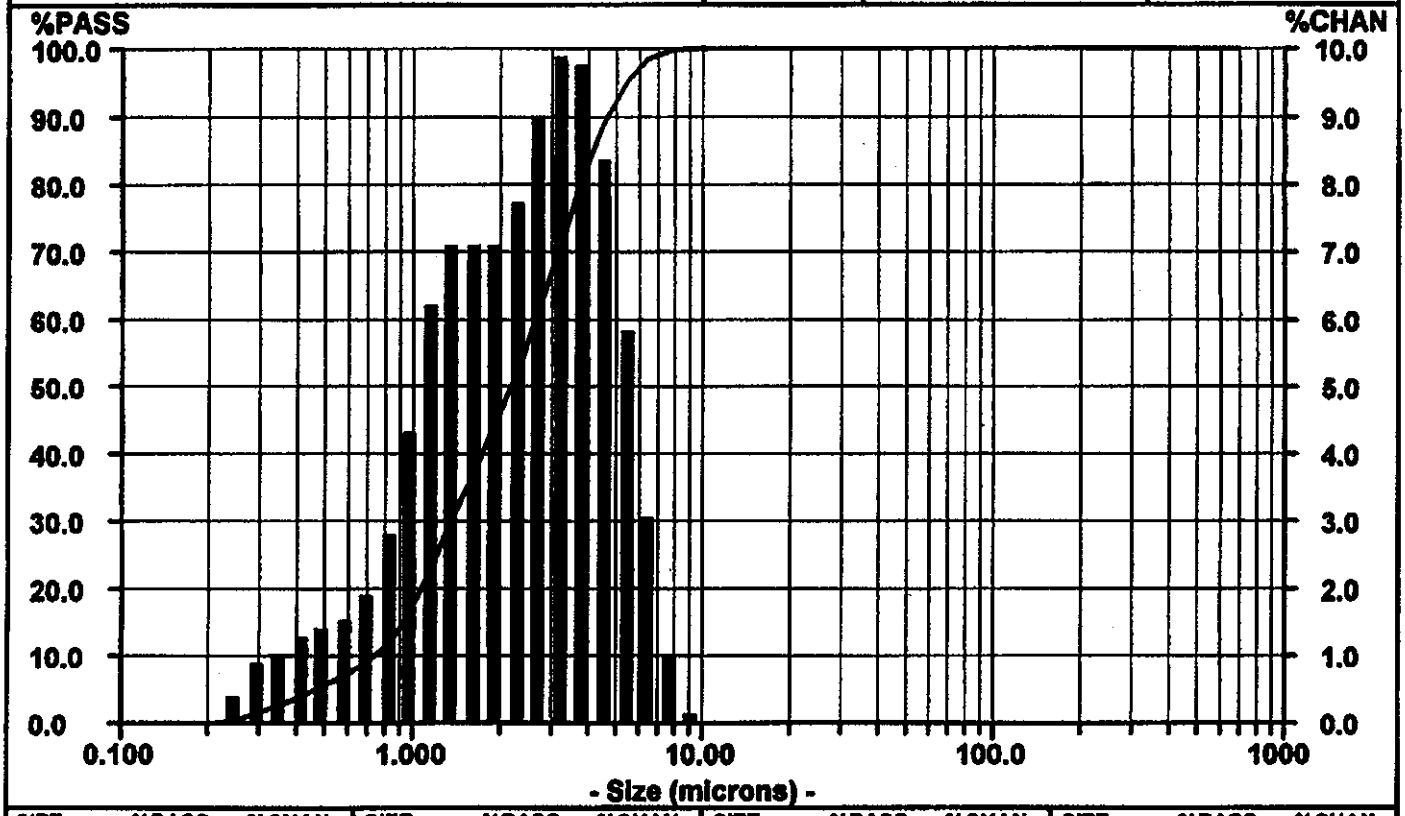
SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	99.63	1.01						
592.0	100.00	0.00	7.778	98.62	2.32						
497.8	100.00	0.00	6.541	96.30	4.27						
418.6	100.00	0.00	5.500	92.03	6.29						
352.0	100.00	0.00	4.625	85.74	7.86						
296.0	100.00	0.00	3.889	77.88	8.80						
248.9	100.00	0.00	3.270	69.08	8.97						
209.3	100.00	0.00	2.750	60.11	8.35						
176.0	100.00	0.00	2.312	51.76	7.43						
148.0	100.00	0.00	1.945	44.33	6.92						
124.5	100.00	0.00	1.635	37.41	6.97						
104.7	100.00	0.00	1.375	30.44	6.93						
88.00	100.00	0.00	1.156	23.51	5.99						
74.00	100.00	0.00	0.972	17.52	4.32						
62.23	100.00	0.00	0.818	13.20	2.89						
52.33	100.00	0.00	0.688	10.31	2.09						
44.00	100.00	0.00	0.578	8.22	1.74						
37.00	100.00	0.00	0.486	6.48	1.60						
31.11	100.00	0.00	0.409	4.88	1.52						
26.16	100.00	0.00	0.344	3.36	1.40						
22.00	100.00	0.00	0.289	1.96	1.18						
18.50	100.00	0.00	0.243	0.78	0.78						
15.56	100.00	0.00	0.204	0.00	0.00						
13.08	100.00	0.00	0.172	0.00	0.00						
11.00	100.00	0.37	0.146	0.00	0.00						

C-104

C-104 Sample
Date: 09/26/91 Meas #: 00001
Time: 06:03 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Sonicate for 2 min.
Flow rate = 17 ml/sec.
Refractive index = 2.00 particle/1.33 medium
File: WPA041

Summary		Percentiles		Dia	Vol%	Width
mv =	2.486	10% = 0.729	60% = 2.684	3.128	63%	2.606
mn =	0.422	20% = 1.075	70% = 3.200	1.036	37%	0.905
ma =	1.435	30% = 1.372	80% = 3.814			
cs =	4.181	40% = 1.745	90% = 4.686			
sd =	1.579	50% = 2.201	95% = 5.423			



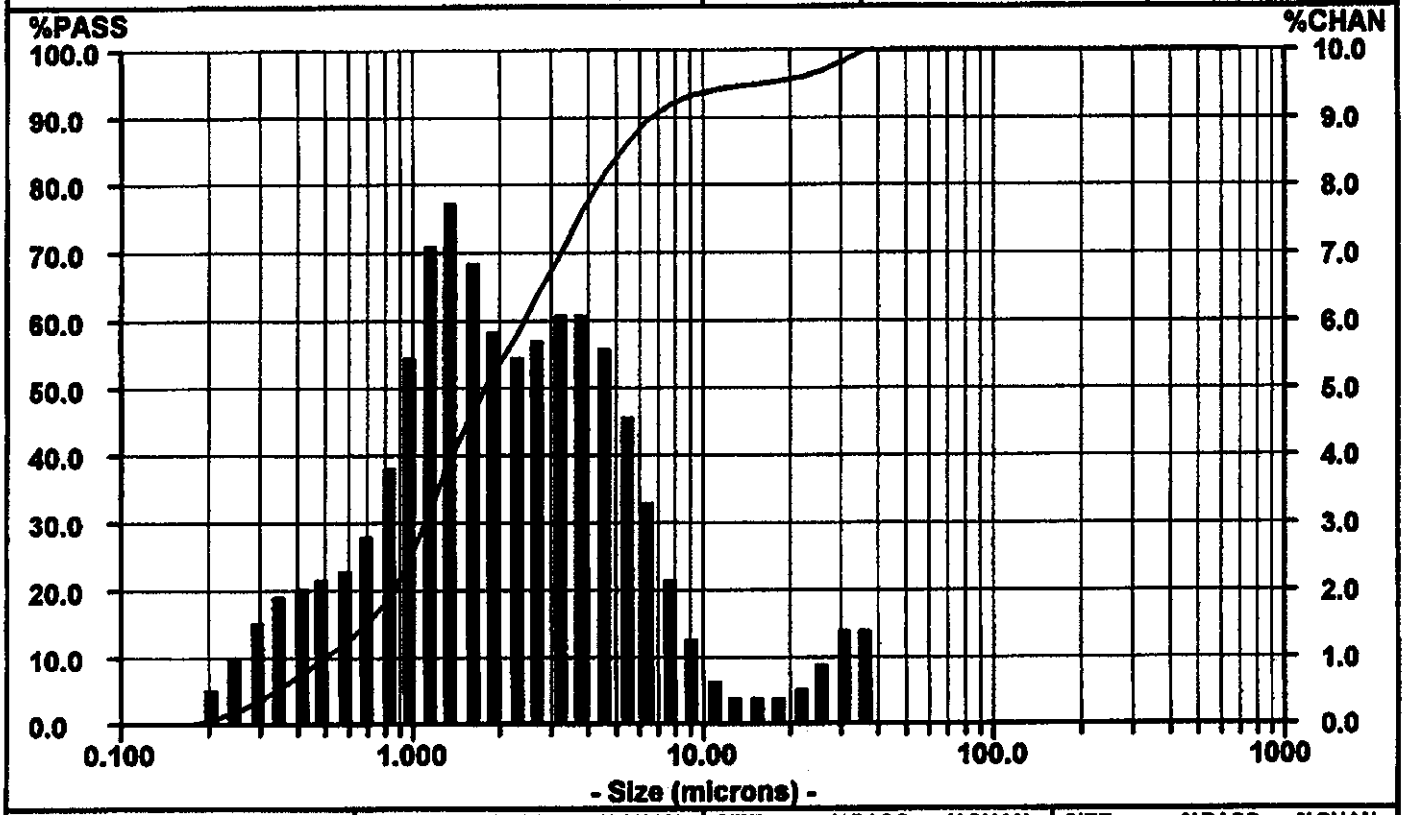
SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.260	100.00	0.30						
592.0	100.00	0.00	7.778	99.70	1.16						
497.8	100.00	0.00	6.541	98.54	3.14						
418.6	100.00	0.00	5.500	95.40	5.92						
352.0	100.00	0.00	4.625	89.48	8.40						
296.0	100.00	0.00	3.889	81.08	9.81						
248.9	100.00	0.00	3.270	71.27	9.94						
209.3	100.00	0.00	2.750	61.33	9.01						
176.0	100.00	0.00	2.312	52.32	7.81						
148.0	100.00	0.00	1.945	44.51	7.17						
124.5	100.00	0.00	1.635	37.34	7.23						
104.7	100.00	0.00	1.375	30.11	7.28						
88.00	100.00	0.00	1.156	22.83	6.31						
74.00	100.00	0.00	0.972	16.52	4.48						
62.23	100.00	0.00	0.818	12.04	2.90						
52.33	100.00	0.00	0.688	9.14	2.01						
44.00	100.00	0.00	0.578	7.13	1.81						
37.00	100.00	0.00	0.486	5.52	1.44						
31.11	100.00	0.00	0.409	4.08	1.33						
26.16	100.00	0.00	0.344	2.75	1.19						
22.00	100.00	0.00	0.289	1.56	0.96						
18.50	100.00	0.00	0.243	0.60	0.60						
15.56	100.00	0.00	0.204	0.00	0.00						
13.08	100.00	0.00	0.172	0.00	0.00						
11.00	100.00	0.00	0.145	0.00	0.00						

C-104

C-104 Sample — Date: 09/26/91 Meas #: 00001 Time: 06:08 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Sonicate for 2 min.
Flow rate = 40 ml/sec.
Refractive index = 1.50 particle/1.33 medium
File: WPA042

Summary	Percentiles		Dia	Vol%	Width
mv = 3.696	10% = 0.489	60% = 2.463	27.12	5%	14.68
mn = 0.335	20% = 0.847	70% = 3.274	3.619	42%	3.493
ma = 1.163	30% = 1.109	80% = 4.377	1.016	53%	1.100
cs = 5.159	40% = 1.387	90% = 6.624			
sd = 2.148	50% = 1.801	95% = 15.49			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	93.35	1.31						
592.0	100.00	0.00	7.778	92.04	2.23						
497.8	100.00	0.00	6.541	89.81	3.44						
418.6	100.00	0.00	5.500	86.37	4.66						
352.0	100.00	0.00	4.626	81.71	5.62						
296.0	100.00	0.00	3.889	76.09	6.13						
248.9	100.00	0.00	3.270	69.96	6.12						
209.3	100.00	0.00	2.750	63.84	5.76						
176.0	100.00	0.00	2.312	58.08	5.54						
148.0	100.00	0.00	1.945	52.54	5.93						
124.5	100.00	0.00	1.635	46.61	6.96						
104.7	100.00	0.00	1.375	39.65	7.81						
88.00	100.00	0.00	1.156	31.84	7.30						
74.00	100.00	0.00	0.972	24.54	5.52						
62.23	100.00	0.00	0.818	19.02	3.82						
52.33	100.00	0.00	0.688	15.20	2.85						
44.00	100.00	0.00	0.578	12.35	2.42						
37.00	100.00	1.55	0.486	9.93	2.25						
31.11	98.45	1.41	0.409	7.68	2.15						
26.16	97.04	0.97	0.344	5.53	2.00						
22.00	96.07	0.62	0.289	3.53	1.68						
18.50	95.45	0.44	0.243	1.85	1.16						
15.56	95.01	0.41	0.204	0.69	0.69						
13.08	94.60	0.49	0.172	0.00	0.00						
11.00	94.11	0.76	0.145	0.00	0.00						

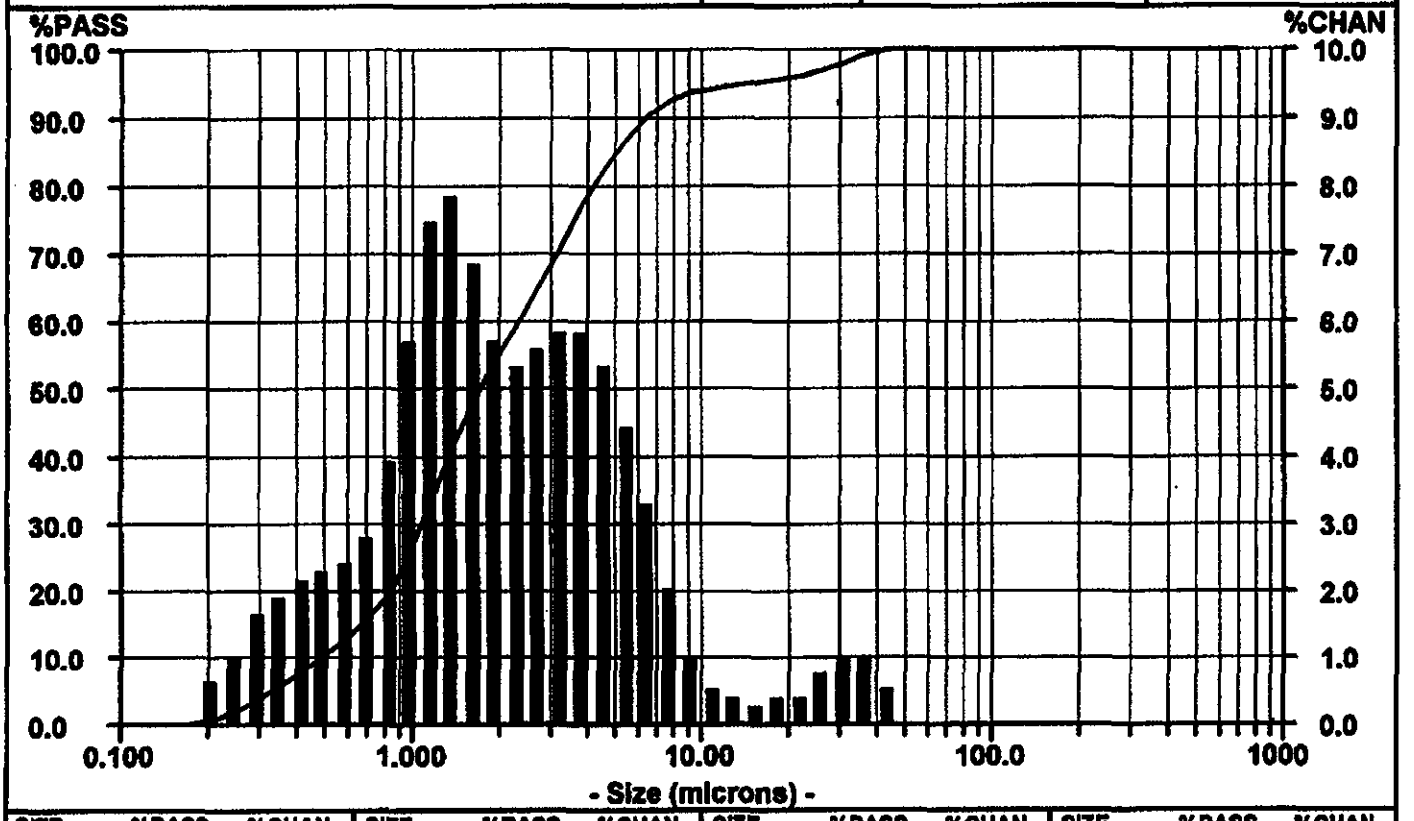
C-104

C-104 Sample

Date: 09/26/91 Meas #: 00001
Time: 06:13 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Sonicate for 2 min.
Flow rate = 40 ml/sec.
Refractive index = 1.70 particle/1.33 medium
File: WPA043

Summary	Percentiles		Dia	Vol%	Width
mv = 3.652	10% = 0.477	60% = 2.356	27.77	5%	17.33
mn = 0.336	20% = 0.824	70% = 3.171	3.595	41%	3.431
ma = 1.136	30% = 1.080	80% = 4.257	1.006	54%	1.091
cs = 5.280	40% = 1.343	90% = 6.385			
sd = 2.088	50% = 1.729	95% = 14.16			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	93.71	1.20						
592.0	100.00	0.00	7.778	92.51	2.11						
497.8	100.00	0.00	6.541	90.40	3.33						
418.6	100.00	0.00	5.500	87.07	4.54						
352.0	100.00	0.00	4.625	82.53	5.47						
296.0	100.00	0.00	3.889	77.06	5.98						
248.9	100.00	0.00	3.270	71.08	5.99						
209.3	100.00	0.00	2.750	65.09	5.68						
176.0	100.00	0.00	2.312	59.41	5.49						
148.0	100.00	0.00	1.945	53.92	5.89						
124.5	100.00	0.00	1.635	48.03	6.96						
104.7	100.00	0.00	1.376	41.07	7.96						
88.00	100.00	0.00	1.156	33.11	7.53						
74.00	100.00	0.00	0.972	25.58	5.78						
62.23	100.00	0.00	0.818	19.80	4.03						
52.33	100.00	0.00	0.688	15.77	2.99						
44.00	100.00	0.69	0.578	12.78	2.52						
37.00	99.31	1.12	0.486	10.26	2.34						
31.11	98.19	1.15	0.409	7.92	2.23						
26.16	97.04	0.88	0.344	5.69	2.07						
22.00	96.18	0.57	0.289	3.62	1.73						
18.50	95.61	0.41	0.243	1.89	1.19						
15.56	95.20	0.37	0.204	0.70	0.70						
13.08	94.83	0.44	0.172	0.00	0.00						
11.00	94.39	0.68	0.145	0.00	0.00						

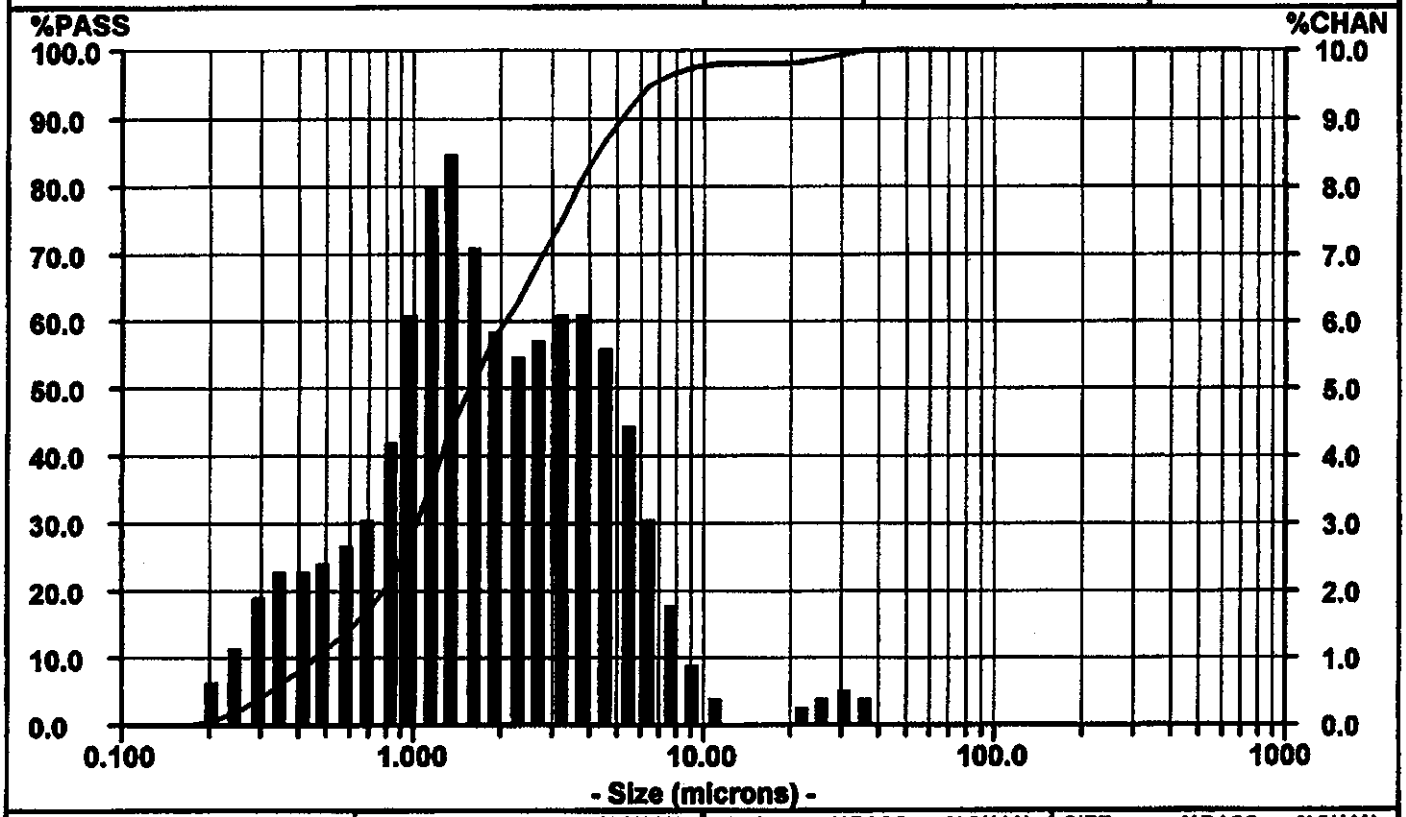
C-104

C-104 Sample

Date: 09/26/91 Meas #: 00001
Time: 06:28 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Sonicate for 2 min.
Flow rate = 40 ml/sec.
Refractive index = 2.00 particle/1.33 medium
File: WPA044

Summary		Percentiles		Dia	Vol%	Width
mv =	2.703	10% = 0.449	60% = 2.093	27.43	2%	11.24
mn =	0.337	20% = 0.777	70% = 2.835	3.527	40%	3.120
ma =	1.066	30% = 1.023	80% = 3.747	0.997	58%	1.081
cs =	5.629	40% = 1.255	90% = 5.159			
sd =	1.780	50% = 1.566	95% = 6.672			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	97.54	0.95						
592.0	100.00	0.00	7.778	96.59	1.85						
497.8	100.00	0.00	6.541	94.74	3.18						
418.6	100.00	0.00	5.500	91.56	4.59						
352.0	100.00	0.00	4.625	86.97	5.66						
296.0	100.00	0.00	3.889	81.31	6.20						
248.9	100.00	0.00	3.270	75.11	6.16						
209.3	100.00	0.00	2.750	68.95	5.77						
176.0	100.00	0.00	2.312	63.18	5.53						
148.0	100.00	0.00	1.945	57.65	5.98						
124.5	100.00	0.00	1.635	51.67	7.24						
104.7	100.00	0.00	1.375	44.43	8.51						
88.00	100.00	0.00	1.156	35.92	8.20						
74.00	100.00	0.00	0.972	27.72	6.28						
62.23	100.00	0.00	0.818	21.44	4.33						
52.33	100.00	0.00	0.688	17.11	3.19						
44.00	100.00	0.00	0.578	13.92	2.71						
37.00	100.00	0.54	0.486	11.21	2.56						
31.11	99.46	0.61	0.409	8.65	2.47						
26.16	98.85	0.49	0.344	6.18	2.30						
22.00	98.36	0.34	0.289	3.88	1.90						
18.50	98.02	0.00	0.243	1.98	1.26						
15.56	98.02	0.00	0.204	0.72	0.72						
13.08	98.02	0.00	0.172	0.00	0.00						
11.00	98.02	0.48	0.145	0.00	0.00						

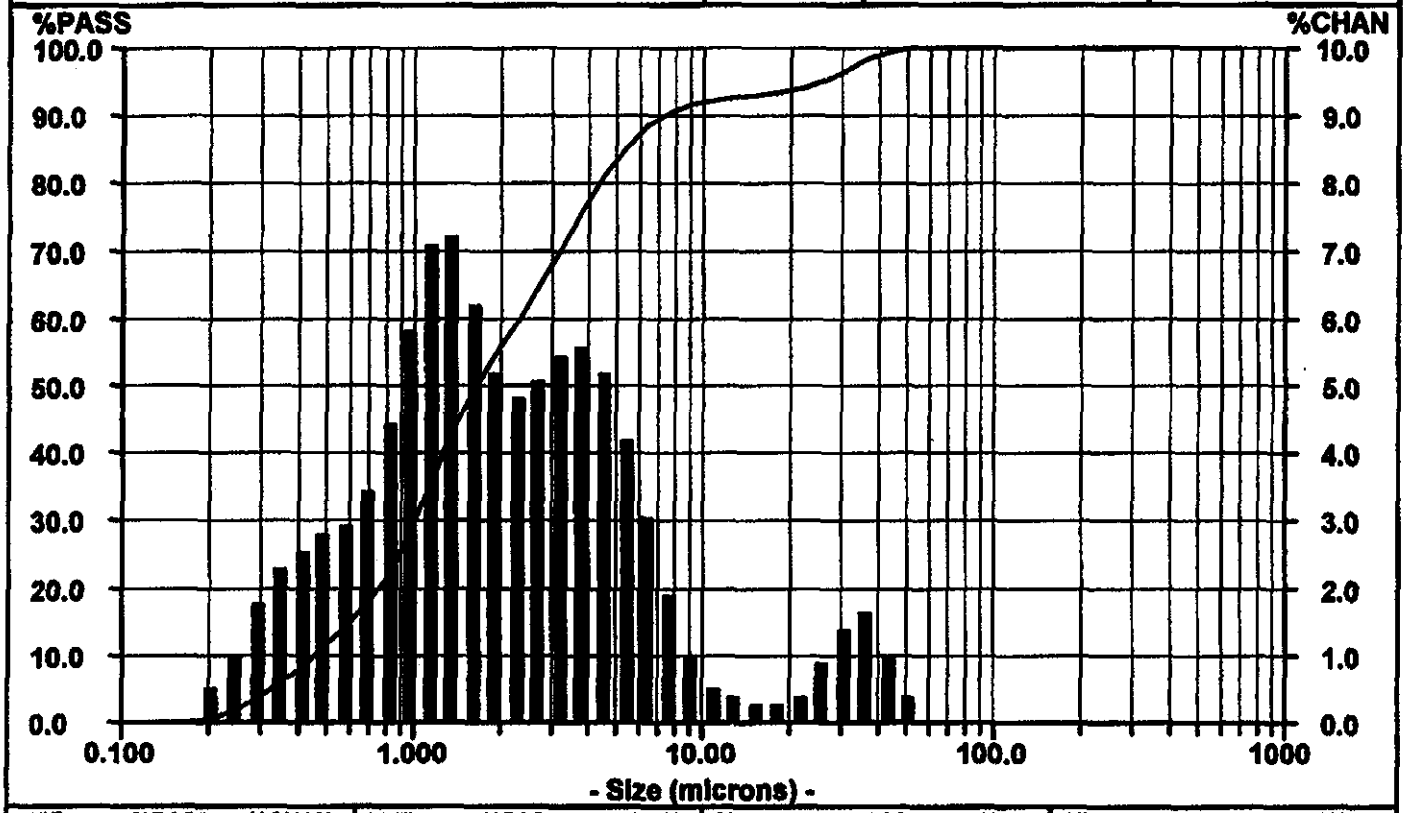
C-104

C-104 Sample

Date: 09/26/91 Meas #: 00001
Time: 06:35 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Sonicate for 2 min.
Flow rate = 60 ml/sec.
Refractive Index = 2.00 particle/1.33 medium
File: WPA045

Summary	Percentiles		Dia	Vol%	Width
mv = 4.263	10% = 0.445	60% = 2.326	30.15	7%	17.86
mn = 0.339	20% = 0.744	70% = 3.225	3.628	38%	3.408
ma = 1.091	30% = 1.008	80% = 4.418	0.944	55%	1.071
cs = 5.601	40% = 1.274	90% = 7.249			
sd = 2.253	50% = 1.658	95% = 25.61			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	91.78	1.10						
592.0	100.00	0.00	7.778	90.68	1.96						
497.8	100.00	0.00	6.541	88.73	3.11						
418.6	100.00	0.00	5.500	85.62	4.31						
352.0	100.00	0.00	4.625	81.31	5.22						
296.0	100.00	0.00	3.889	76.09	5.63						
248.9	100.00	0.00	3.270	70.46	5.51						
209.3	100.00	0.00	2.750	64.95	5.12						
176.0	100.00	0.00	2.312	59.83	4.94						
148.0	100.00	0.00	1.945	54.89	5.34						
124.5	100.00	0.00	1.635	49.55	6.36						
104.7	100.00	0.00	1.375	43.19	7.36						
88.00	100.00	0.00	1.156	35.81	7.26						
74.00	100.00	0.00	0.972	28.56	5.95						
62.23	100.00	0.00	0.818	22.61	4.51						
52.33	100.00	0.42	0.688	18.10	3.56						
44.00	99.58	1.14	0.578	14.54	3.08						
37.00	98.44	1.73	0.486	11.46	2.62						
31.11	96.71	1.56	0.409	8.84	2.60						
26.16	95.15	1.02	0.344	6.04	2.32						
22.00	94.13	0.60	0.289	3.72	1.85						
18.50	93.53	0.39	0.243	1.87	1.20						
15.56	93.14	0.34	0.204	0.67	0.67						
13.08	92.80	0.40	0.172	0.00	0.00						
11.00	92.40	0.62	0.145	0.00	0.00						

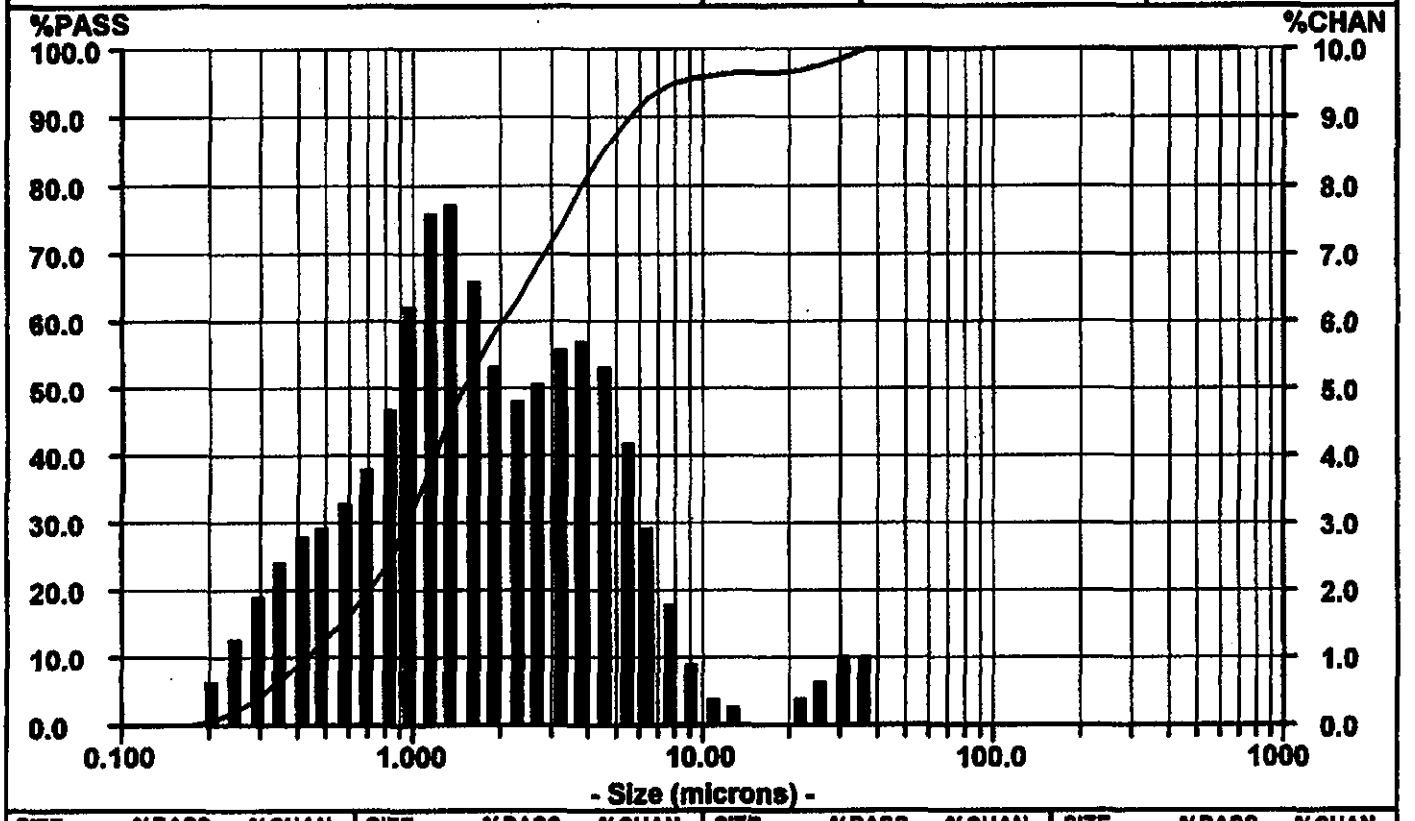
C-104

C-104 Sample

Date: 09/26/91 Meas #: 00001
Time: 06:42 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Sonicate for 2 min.
Flow rate = 60 ml/sec.
Refractive Index = 1.50 particle/1.33 medium
File: WPA046

Summary	Percentiles		Dia	Vol%	Width
mv = 3.084	10% = 0.422	60% = 2.054	28.43	4%	10.95
mn = 0.338	20% = 0.698	70% = 2.876	3.599	38%	3.247
ma = 1.023	30% = 0.952	80% = 3.881	0.934	58%	1.063
cs = 5.867	40% = 1.191	90% = 5.539			
sd = 1.909	50% = 1.504	95% = 8.109			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	95.67	0.96						
592.0	100.00	0.00	7.778	94.71	1.81						
497.8	100.00	0.00	6.541	92.90	3.04						
418.6	100.00	0.00	5.500	89.86	4.38						
352.0	100.00	0.00	4.625	85.48	5.41						
296.0	100.00	0.00	3.889	80.07	5.84						
248.9	100.00	0.00	3.270	74.23	5.65						
209.3	100.00	0.00	2.750	68.58	5.16						
176.0	100.00	0.00	2.312	63.40	4.97						
148.0	100.00	0.00	1.945	58.43	5.42						
124.5	100.00	0.00	1.635	53.01	6.60						
104.7	100.00	0.00	1.375	46.41	7.80						
88.00	100.00	0.00	1.156	38.61	7.76						
74.00	100.00	0.00	0.972	30.85	6.38						
62.23	100.00	0.00	0.818	24.47	4.82						
52.33	100.00	0.00	0.688	19.65	3.82						
44.00	100.00	0.00	0.578	15.83	3.32						
37.00	100.00	1.13	0.486	12.51	3.06						
31.11	98.87	1.13	0.409	9.45	2.84						
26.16	97.74	0.78	0.344	6.61	2.56						
22.00	96.96	0.46	0.289	4.05	2.04						
18.50	96.50	0.00	0.243	2.01	1.30						
15.56	96.50	0.00	0.204	0.71	0.71						
13.08	96.50	0.32	0.172	0.00	0.00						
11.00	96.18	0.51	0.145	0.00	0.00						

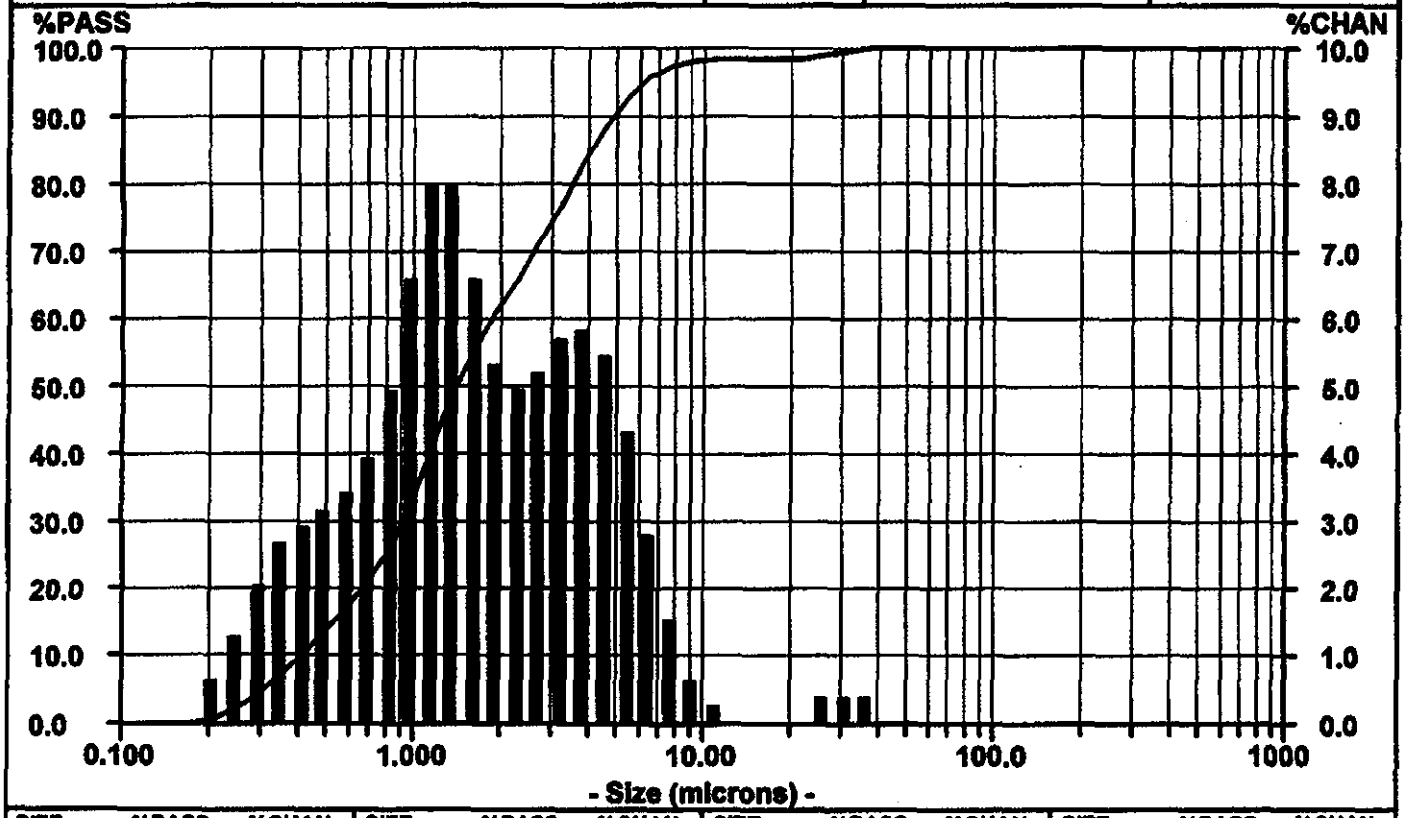
C-104

C-104
Sample

Date: 09/26/91 Meas #: 00001
Time: 06:48 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Sonicate for 2 min.
Flow rate = 60 ml/sec.
Refractive Index = 1.70 particle/1.33 medium
File: WPA047

Summary		Percentiles		Dia	Vol%	Width
mv = 2.449		10% = 0.406	60% = 1.883	28.43	1%	8.878
mn = 0.338		20% = 0.661	70% = 2.645	3.647	38%	3.031
ma = 0.976		30% = 0.911	80% = 3.569	0.922	61%	1.058
cs = 6.146		40% = 1.138	90% = 4.883			
sd = 1.730		50% = 1.416	95% = 6.180			



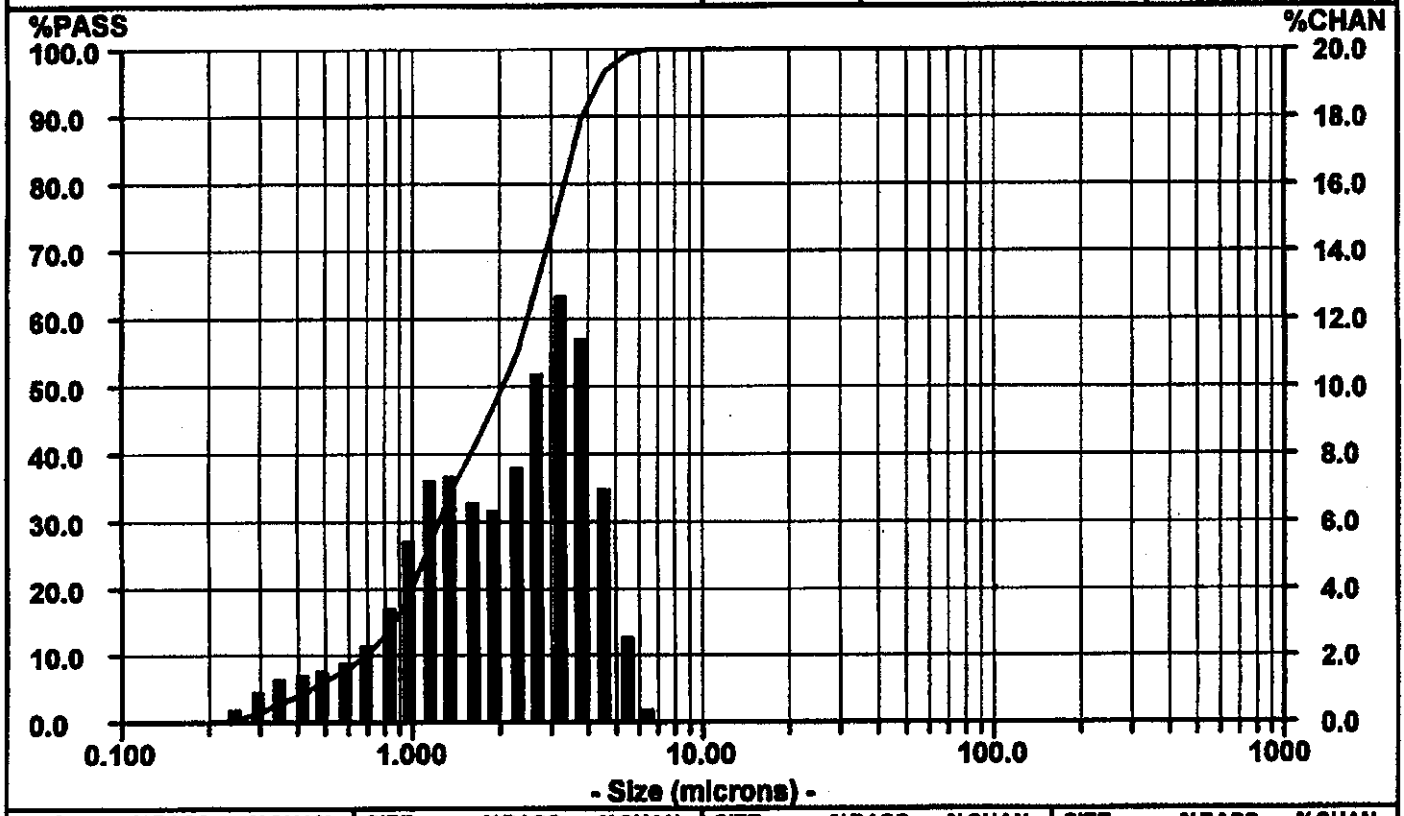
SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	99.21	0.79						
592.0	100.00	0.00	7.778	97.42	1.61						
497.8	100.00	0.00	6.541	95.81	2.92						
418.6	100.00	0.00	5.500	92.89	4.40						
352.0	100.00	0.00	4.625	88.49	5.54						
296.0	100.00	0.00	3.889	82.95	5.98						
248.9	100.00	0.00	3.270	76.97	5.75						
209.3	100.00	0.00	2.750	71.22	5.24						
176.0	100.00	0.00	2.312	65.98	5.01						
148.0	100.00	0.00	1.945	60.97	5.48						
124.5	100.00	0.00	1.635	55.49	6.72						
104.7	100.00	0.00	1.375	48.77	8.02						
88.00	100.00	0.00	1.156	40.75	8.06						
74.00	100.00	0.00	0.972	32.69	6.67						
62.23	100.00	0.00	0.818	26.02	5.06						
52.33	100.00	0.00	0.688	20.96	4.03						
44.00	100.00	0.00	0.578	16.93	3.53						
37.00	100.00	0.42	0.486	13.40	3.28						
31.11	99.58	0.54	0.409	10.12	3.07						
26.16	99.04	0.44	0.344	7.05	2.76						
22.00	98.60	0.00	0.289	4.29	2.18						
18.50	98.60	0.00	0.243	2.11	1.37						
15.56	98.60	0.00	0.204	0.74	0.74						
13.08	98.60	0.00	0.172	0.00	0.00						
11.00	98.60	0.39	0.145	0.00	0.00						

C-104

C-104 Sample
Date: 09/26/91 Meas #: 00001
Time: 07:09 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Sonicate for 20 min.
Flow rate = 17 ml/sec.
Refractive Index = 1.50 particle/1.33 medium
File: 104C001

Summary	Percentiles		Dia	Vol%	Width
mv = 2.192	10% = 0.677	60% = 2.526	2.946	59%	1.853
mn = 0.432	20% = 0.987	70% = 2.929	0.998	41%	0.866
ma = 1.338	30% = 1.245	80% = 3.352			
cs = 4.486	40% = 1.598	90% = 3.904			
sd = 1.332	50% = 2.077	95% = 4.365			



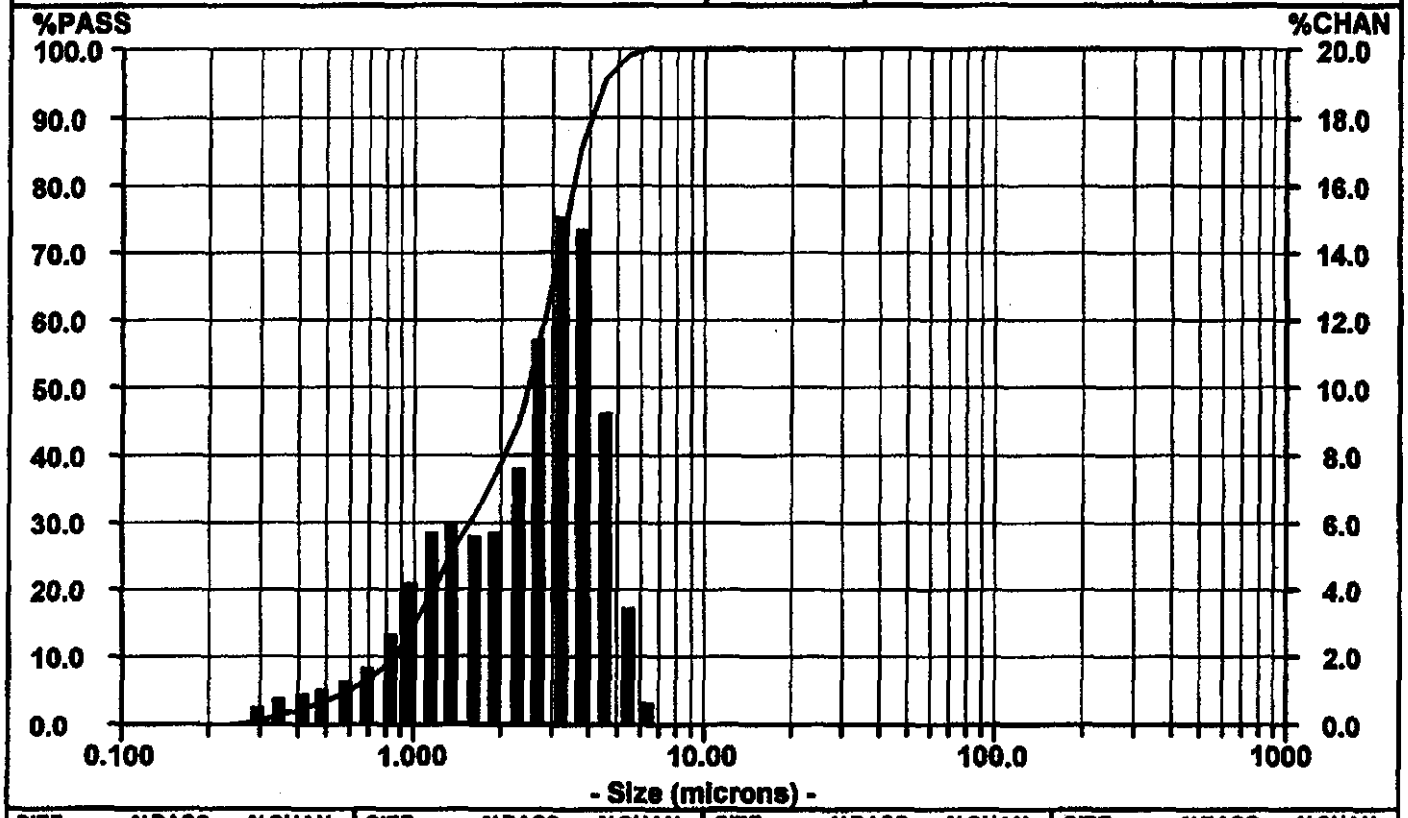
SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	100.00	0.00						
592.0	100.00	0.00	7.778	100.00	0.00						
497.8	100.00	0.00	6.541	100.00	0.54						
418.6	100.00	0.00	5.500	99.46	2.61						
352.0	100.00	0.00	4.625	96.85	7.04						
296.0	100.00	0.00	3.889	89.81	11.59						
248.9	100.00	0.00	3.270	78.22	12.73						
209.3	100.00	0.00	2.750	65.49	10.45						
176.0	100.00	0.00	2.312	55.04	7.74						
148.0	100.00	0.00	1.945	47.30	6.44						
124.5	100.00	0.00	1.635	40.86	6.63						
104.7	100.00	0.00	1.375	34.23	7.48						
88.00	100.00	0.00	1.156	26.75	7.35						
74.00	100.00	0.00	0.972	19.40	5.58						
62.23	100.00	0.00	0.818	13.82	3.58						
52.33	100.00	0.00	0.688	10.24	2.38						
44.00	100.00	0.00	0.578	7.86	1.85						
37.00	100.00	0.00	0.486	6.01	1.65						
31.11	100.00	0.00	0.409	4.36	1.51						
26.16	100.00	0.00	0.344	2.85	1.31						
22.00	100.00	0.00	0.289	1.54	0.99						
18.50	100.00	0.00	0.243	0.55	0.55						
15.56	100.00	0.00	0.204	0.00	0.00						
13.08	100.00	0.00	0.172	0.00	0.00						
11.00	100.00	0.00	0.145	0.00	0.00						

C-104

C-104 Sample
Date: 09/26/91 Meas #: 00001
Time: 07:13 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Sonicate for 20 min.
Flow rate = 17 ml/sec.
Refractive Index = 1.70 Particle/1.33 Medium
File: 104C002

Summary	Percentiles		Dia	Vol%	Width
mv = 2.470	10% = 0.839	60% = 2.872	2.968	74%	2.025
mn = 0.524	20% = 1.168	70% = 3.213	0.940	26%	0.897
ma = 1.618	30% = 1.570	80% = 3.591			
cs = 3.709	40% = 2.085	90% = 4.108			
sd = 1.365	50% = 2.515	95% = 4.539			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	100.00	0.00						
592.0	100.00	0.00	7.778	100.00	0.00						
497.8	100.00	0.00	6.541	100.00	0.72						
418.6	100.00	0.00	5.500	99.28	3.51						
352.0	100.00	0.00	4.625	95.77	9.36						
296.0	100.00	0.00	3.889	86.41	14.79						
248.9	100.00	0.00	3.270	71.62	15.19						
209.3	100.00	0.00	2.750	56.43	11.47						
176.0	100.00	0.00	2.312	44.96	7.75						
148.0	100.00	0.00	1.945	37.21	5.89						
124.5	100.00	0.00	1.635	31.32	5.63						
104.7	100.00	0.00	1.375	25.69	6.05						
88.00	100.00	0.00	1.156	19.64	5.82						
74.00	100.00	0.00	0.972	13.82	4.38						
62.23	100.00	0.00	0.818	9.44	2.77						
52.33	100.00	0.00	0.688	6.67	1.78						
44.00	100.00	0.00	0.578	4.89	1.32						
37.00	100.00	0.00	0.486	3.57	1.11						
31.11	100.00	0.00	0.409	2.46	0.98						
26.16	100.00	0.00	0.344	1.48	0.85						
22.00	100.00	0.00	0.289	0.63	0.63						
18.50	100.00	0.00	0.243	0.00	0.00						
15.56	100.00	0.00	0.204	0.00	0.00						
13.08	100.00	0.00	0.172	0.00	0.00						
11.00	100.00	0.00	0.145	0.00	0.00						

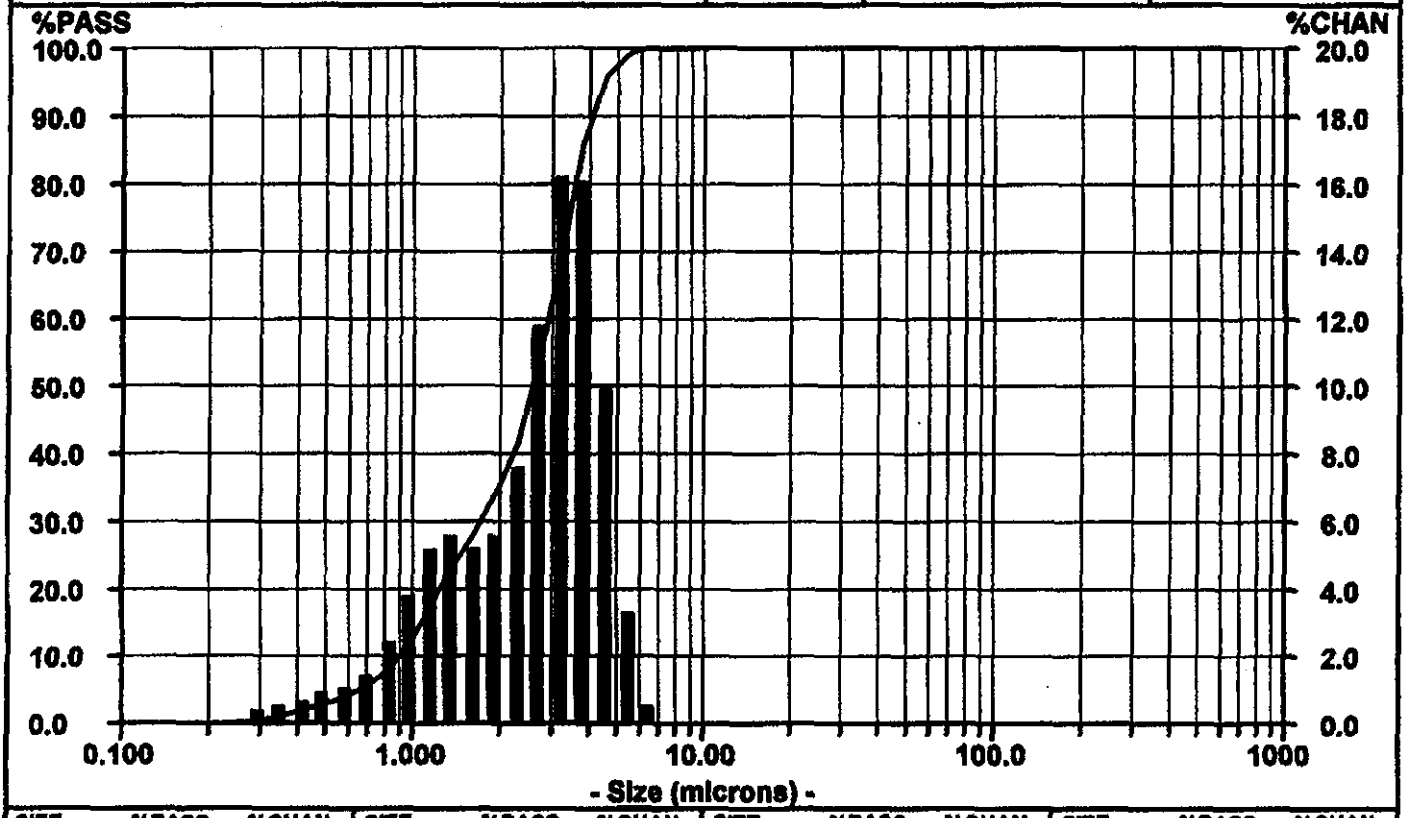
C-104

C-104 Sample

Date: 09/26/91 Meas #: 00001
Time: 07:18 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Sonicate for 20 min.
Flow rate = 17 ml/sec.
Refractive Index = 2.00 Particle/1.33 Medium
File: 104C003

Summary		Percentiles		Dia	Vol%	Width
mv =	2.547	10% = 0.896	60% = 2.960	3.007	77%	1.965
mn =	0.553	20% = 1.262	70% = 3.278	0.952	23%	0.673
ma =	1.720	30% = 1.729	80% = 3.633			
cs =	3.488	40% = 2.242	90% = 4.119			
sd =	1.347	50% = 2.633	95% = 4.524			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	100.00	0.00						
592.0	100.00	0.00	7.778	100.00	0.00						
497.8	100.00	0.00	6.541	100.00	0.61						
418.6	100.00	0.00	5.500	99.39	3.44						
352.0	100.00	0.00	4.625	95.95	9.99						
296.0	100.00	0.00	3.889	85.96	16.21						
248.9	100.00	0.00	3.270	69.75	16.33						
209.3	100.00	0.00	2.750	53.42	11.82						
176.0	100.00	0.00	2.312	41.60	7.66						
148.0	100.00	0.00	1.945	33.94	5.64						
124.5	100.00	0.00	1.635	28.30	5.28						
104.7	100.00	0.00	1.375	23.02	5.60						
88.00	100.00	0.00	1.156	17.42	5.34						
74.00	100.00	0.00	0.972	12.08	3.99						
62.23	100.00	0.00	0.818	8.09	2.50						
52.33	100.00	0.00	0.688	5.59	1.58						
44.00	100.00	0.00	0.578	4.01	1.14						
37.00	100.00	0.00	0.486	2.87	0.93						
31.11	100.00	0.00	0.409	1.94	0.79						
26.16	100.00	0.00	0.344	1.15	0.67						
22.00	100.00	0.00	0.289	0.48	0.48						
18.50	100.00	0.00	0.243	0.00	0.00						
15.56	100.00	0.00	0.204	0.00	0.00						
13.08	100.00	0.00	0.172	0.00	0.00						
11.00	100.00	0.00	0.145	0.00	0.00						

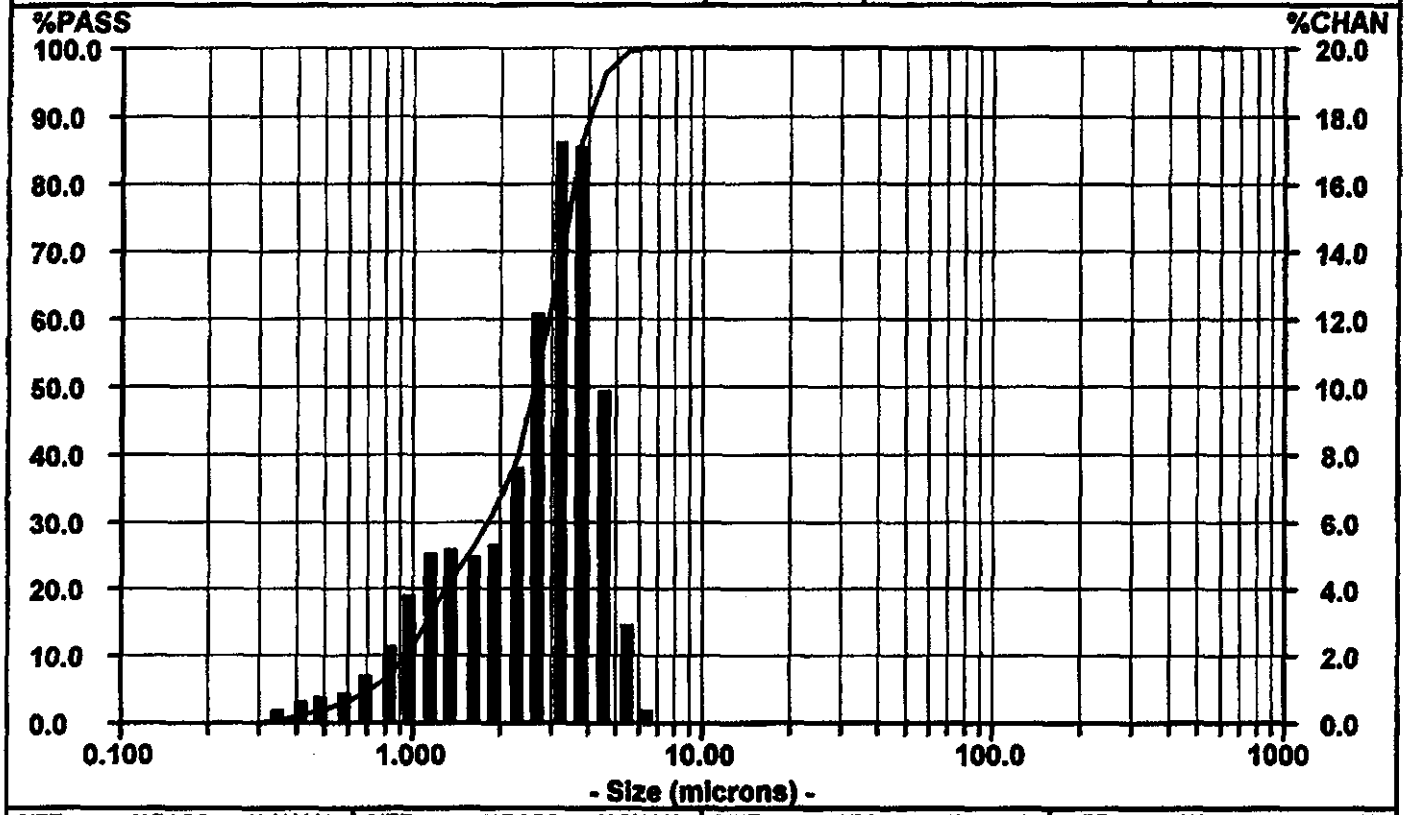
C-104

C-104 Sample

Date: 09/26/91 Meas #: 00001
Time: 07:22 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Sonicate for 20 min.
Flow rate = 40 ml/sec
Refractive Index = 2.00 Particle/1.33 Medium
File: 104C004

Summary	Percentiles		Dia	Vol%	Width
mv = 2.579	10% = 0.937	60% = 2.989	3.011	79%	1.890
mn = 0.664	20% = 1.310	70% = 3.289	0.965	21%	0.629
ma = 1.814	30% = 1.829	80% = 3.623			
cs = 3.307	40% = 2.322	90% = 4.080			
sd = 1.315	50% = 2.684	95% = 4.465			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	100.00	0.00						
592.0	100.00	0.00	7.778	100.00	0.00						
497.6	100.00	0.00	6.541	100.00	0.47						
418.6	100.00	0.00	5.500	99.53	3.08						
352.0	100.00	0.00	4.625	96.45	9.96						
296.0	100.00	0.00	3.889	86.49	17.10						
248.9	100.00	0.00	3.270	69.39	17.37						
209.3	100.00	0.00	2.750	52.02	12.28						
176.0	100.00	0.00	2.312	39.74	7.67						
148.0	100.00	0.00	1.945	32.07	5.49						
124.5	100.00	0.00	1.635	26.58	5.08						
104.7	100.00	0.00	1.375	21.50	5.39						
88.00	100.00	0.00	1.156	16.11	5.17						
74.00	100.00	0.00	0.972	10.94	3.88						
62.23	100.00	0.00	0.818	7.06	2.41						
52.33	100.00	0.00	0.688	4.65	1.50						
44.00	100.00	0.00	0.578	3.15	1.05						
37.00	100.00	0.00	0.486	2.10	0.84						
31.11	100.00	0.00	0.409	1.26	0.71						
26.16	100.00	0.00	0.344	0.55	0.55						
22.00	100.00	0.00	0.289	0.00	0.00						
18.50	100.00	0.00	0.243	0.00	0.00						
15.56	100.00	0.00	0.204	0.00	0.00						
13.08	100.00	0.00	0.172	0.00	0.00						
11.00	100.00	0.00	0.145	0.00	0.00						

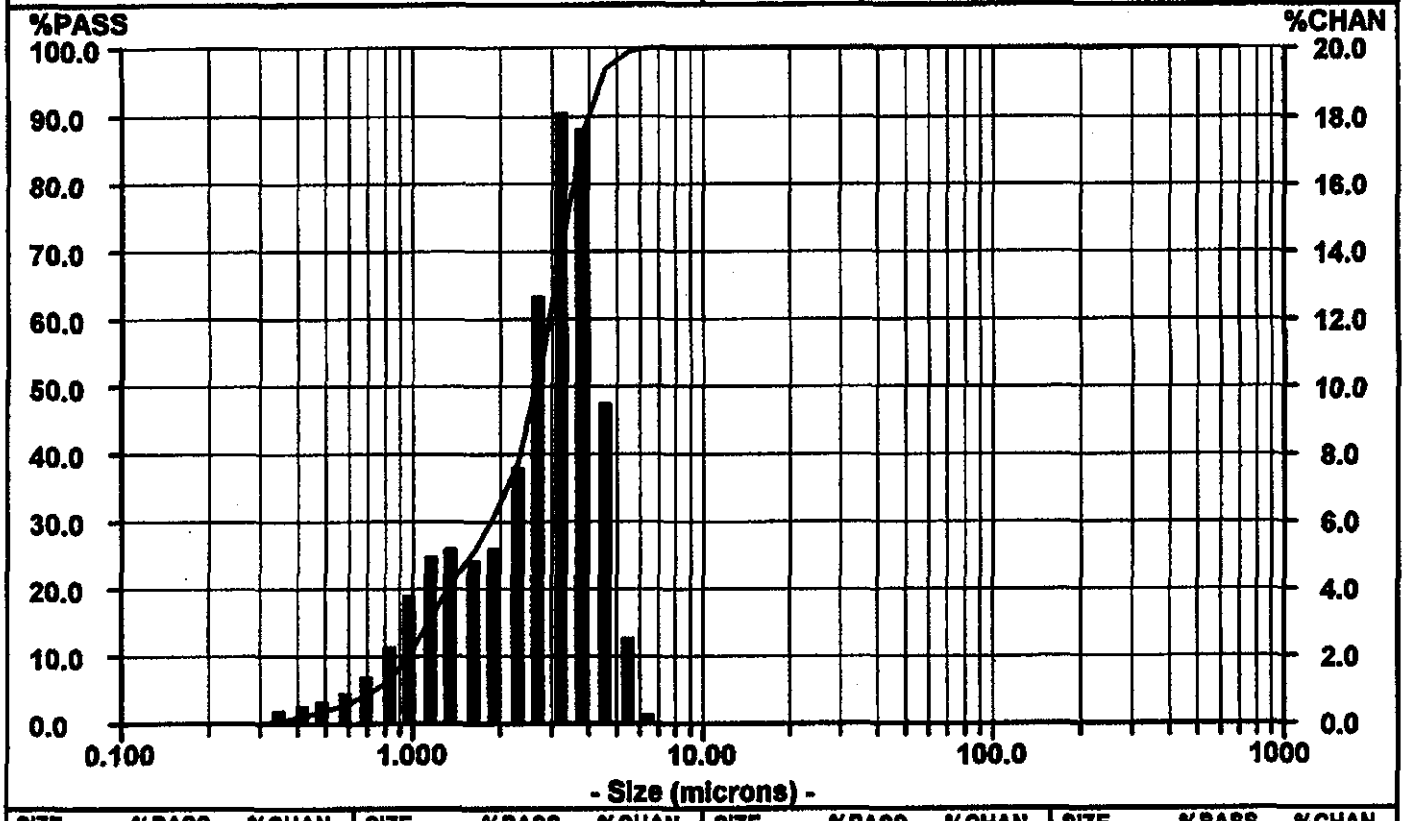
C-104

C-104 Sample

Date: 09/26/91 Meas #: 00001
Time: 07:27 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Sonicate for 20 min.
Flow Rate = 40 ml/sec.
Refractive Index = 1.50 Particle/1.33 Medium
File: 104C005

Summary	Percentiles		Dia	Vol%	Width
mv = 2.581	10% = 0.952	60% = 2.991	3.002	79%	1.818
mn = 0.682	20% = 1.337	70% = 3.276	0.968	21%	0.616
ma = 1.841	30% = 1.880	80% = 3.595			
cs = 3.260	40% = 2.366	90% = 4.030			
sd = 1.286	50% = 2.701	95% = 4.397			

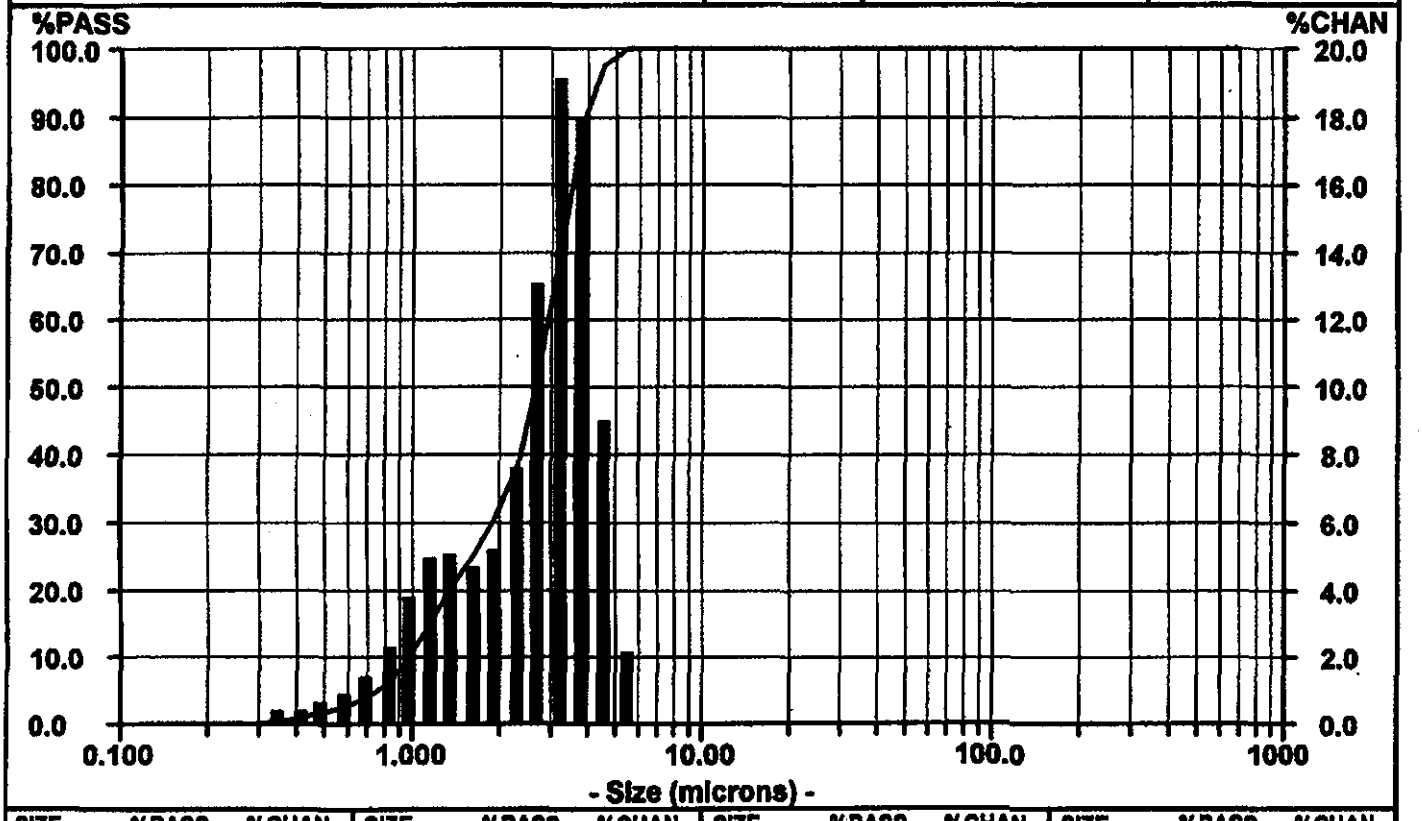


SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	100.00	0.00						
592.0	100.00	0.00	7.778	100.00	0.00						
497.8	100.00	0.00	6.541	100.00	0.34						
418.6	100.00	0.00	5.500	99.66	2.65						
352.0	100.00	0.00	4.625	97.01	9.62						
296.0	100.00	0.00	3.889	87.39	17.60						
248.9	100.00	0.00	3.270	69.79	18.21						
209.3	100.00	0.00	2.750	51.58	12.71						
176.0	100.00	0.00	2.312	38.87	7.72						
148.0	100.00	0.00	1.945	31.15	5.39						
124.5	100.00	0.00	1.635	25.76	4.92						
104.7	100.00	0.00	1.375	20.84	5.24						
88.00	100.00	0.00	1.156	15.60	5.07						
74.00	100.00	0.00	0.972	10.53	3.82						
62.23	100.00	0.00	0.818	6.71	2.37						
52.33	100.00	0.00	0.688	4.34	1.45						
44.00	100.00	0.00	0.578	2.89	0.99						
37.00	100.00	0.00	0.486	1.90	0.77						
31.11	100.00	0.00	0.409	1.13	0.64						
26.16	100.00	0.00	0.344	0.49	0.49						
22.00	100.00	0.00	0.289	0.00	0.00						
18.50	100.00	0.00	0.243	0.00	0.00						
15.56	100.00	0.00	0.204	0.00	0.00						
13.08	100.00	0.00	0.172	0.00	0.00						
11.00	100.00	0.00	0.145	0.00	0.00						

C-104	C-104 Sample	Date: 09/26/91 Time: 07:31	Meas #: 00001 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Sonicate for 20 min.
Flow Rate = 40 ml/sec.
Refractive Index = 1.70 Particle/1.33 Medium
File: 104C006

Summary	Percentiles		Dia	Vol%	Width
mv = 2.570	10% = 0.964	60% = 2.985	2.991	80%	1.743
mn = 0.701	20% = 1.355	70% = 3.256	0.972	20%	0.602
ma = 1.860	30% = 1.919	80% = 3.556			
cs = 3.226	40% = 2.382	90% = 3.963			
sd = 1.256	50% = 2.711	95% = 4.306			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	100.00	0.00						
592.0	100.00	0.00	7.778	100.00	0.00						
497.8	100.00	0.00	6.541	100.00	0.00						
418.6	100.00	0.00	5.500	100.00	2.20						
352.0	100.00	0.00	4.625	97.80	9.15						
296.0	100.00	0.00	3.889	88.65	18.13						
248.9	100.00	0.00	3.270	70.52	19.22						
209.3	100.00	0.00	2.750	51.30	13.14						
176.0	100.00	0.00	2.312	38.16	7.70						
148.0	100.00	0.00	1.945	30.46	5.25						
124.5	100.00	0.00	1.635	25.21	4.78						
104.7	100.00	0.00	1.375	20.43	5.16						
88.00	100.00	0.00	1.156	15.27	5.06						
74.00	100.00	0.00	0.972	10.21	3.82						
62.23	100.00	0.00	0.818	6.39	2.33						
52.33	100.00	0.00	0.688	4.06	1.40						
44.00	100.00	0.00	0.578	2.66	0.94						
37.00	100.00	0.00	0.486	1.72	0.71						
31.11	100.00	0.00	0.409	1.01	0.58						
26.16	100.00	0.00	0.344	0.43	0.43						
22.00	100.00	0.00	0.289	0.00	0.00						
18.50	100.00	0.00	0.243	0.00	0.00						
15.56	100.00	0.00	0.204	0.00	0.00						
13.08	100.00	0.00	0.172	0.00	0.00						
11.00	100.00	0.00	0.145	0.00	0.00						

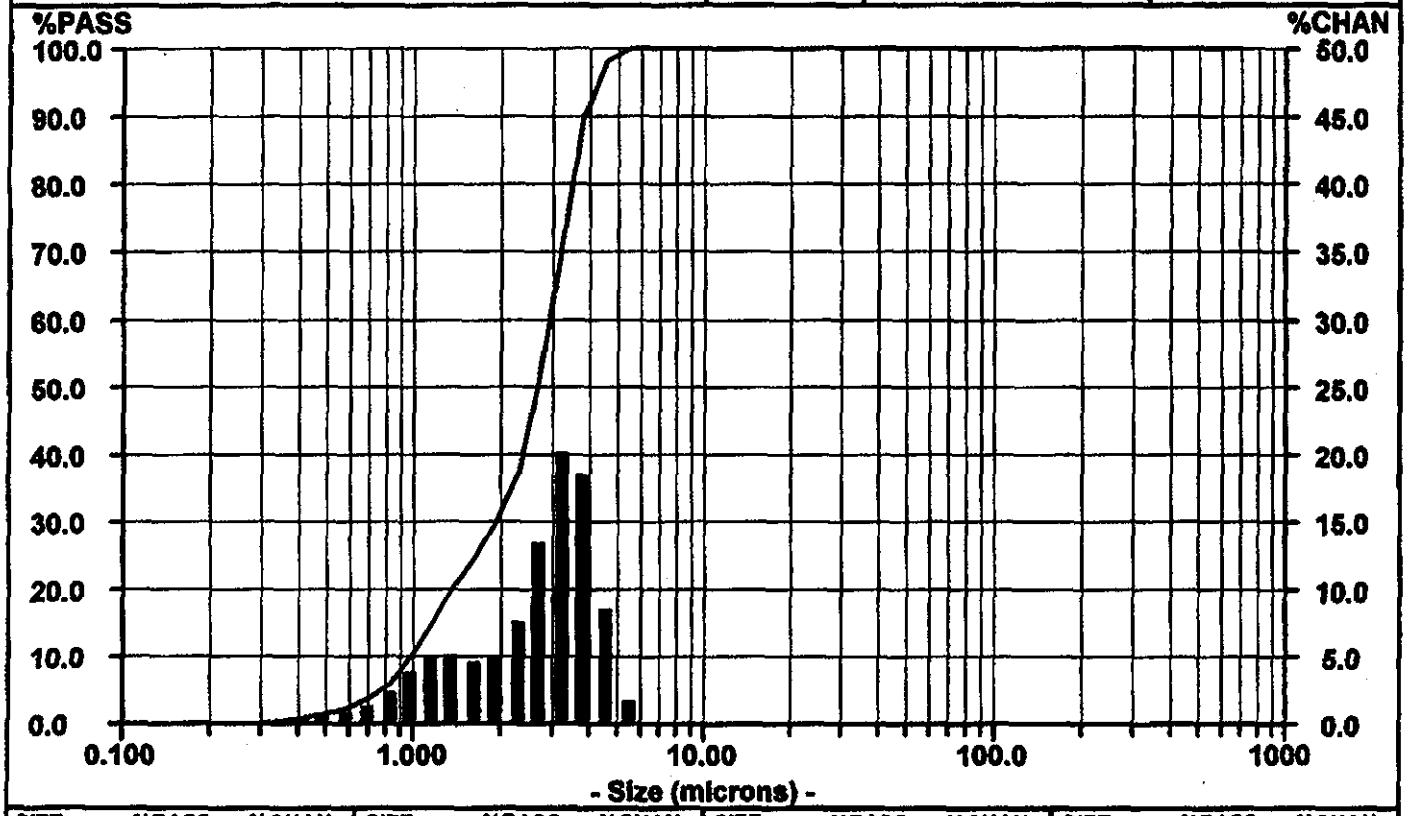
C-104

C-104 Sample

Date: 09/26/91 Meas #: 00001
Time: 07:36 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Sonicate for 20 min.
Flow Rate = 60 ml/sec.
Refractive Index = 1.70 Particle/1.33 Medium
File: 104C007

Summary		Percentiles		Dia	Vol%	Width
mv	= 2.566	10% = 0.975	60% = 2.980	2.981	60%	1.673
mn	= 0.718	20% = 1.371	70% = 3.237	0.976	20%	0.588
ma	= 1.878	30% = 1.956	80% = 3.525			
cs	= 3.196	40% = 2.407	90% = 3.904			
sd	= 1.232	50% = 2.720	95% = 4.231			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	100.00	0.00						
592.0	100.00	0.00	7.778	100.00	0.00						
497.8	100.00	0.00	6.541	100.00	0.00						
418.6	100.00	0.00	5.500	100.00	1.76						
352.0	100.00	0.00	4.625	98.25	8.51						
296.0	100.00	0.00	3.889	89.74	18.50						
248.9	100.00	0.00	3.270	71.24	20.21						
209.3	100.00	0.00	2.750	51.03	13.56						
176.0	100.00	0.00	2.312	37.47	7.66						
148.0	100.00	0.00	1.945	29.81	5.09						
124.5	100.00	0.00	1.635	24.72	4.64						
104.7	100.00	0.00	1.375	20.08	5.09						
88.00	100.00	0.00	1.156	14.99	5.07						
74.00	100.00	0.00	0.972	9.92	3.82						
62.23	100.00	0.00	0.818	6.10	2.30						
52.33	100.00	0.00	0.688	3.80	1.34						
44.00	100.00	0.00	0.578	2.46	0.88						
37.00	100.00	0.00	0.486	1.58	0.66						
31.11	100.00	0.00	0.409	0.92	0.53						
26.16	100.00	0.00	0.344	0.39	0.39						
22.00	100.00	0.00	0.289	0.00	0.00						
18.50	100.00	0.00	0.243	0.00	0.00						
15.56	100.00	0.00	0.204	0.00	0.00						
13.08	100.00	0.00	0.172	0.00	0.00						
11.00	100.00	0.00	0.145	0.00	0.00						

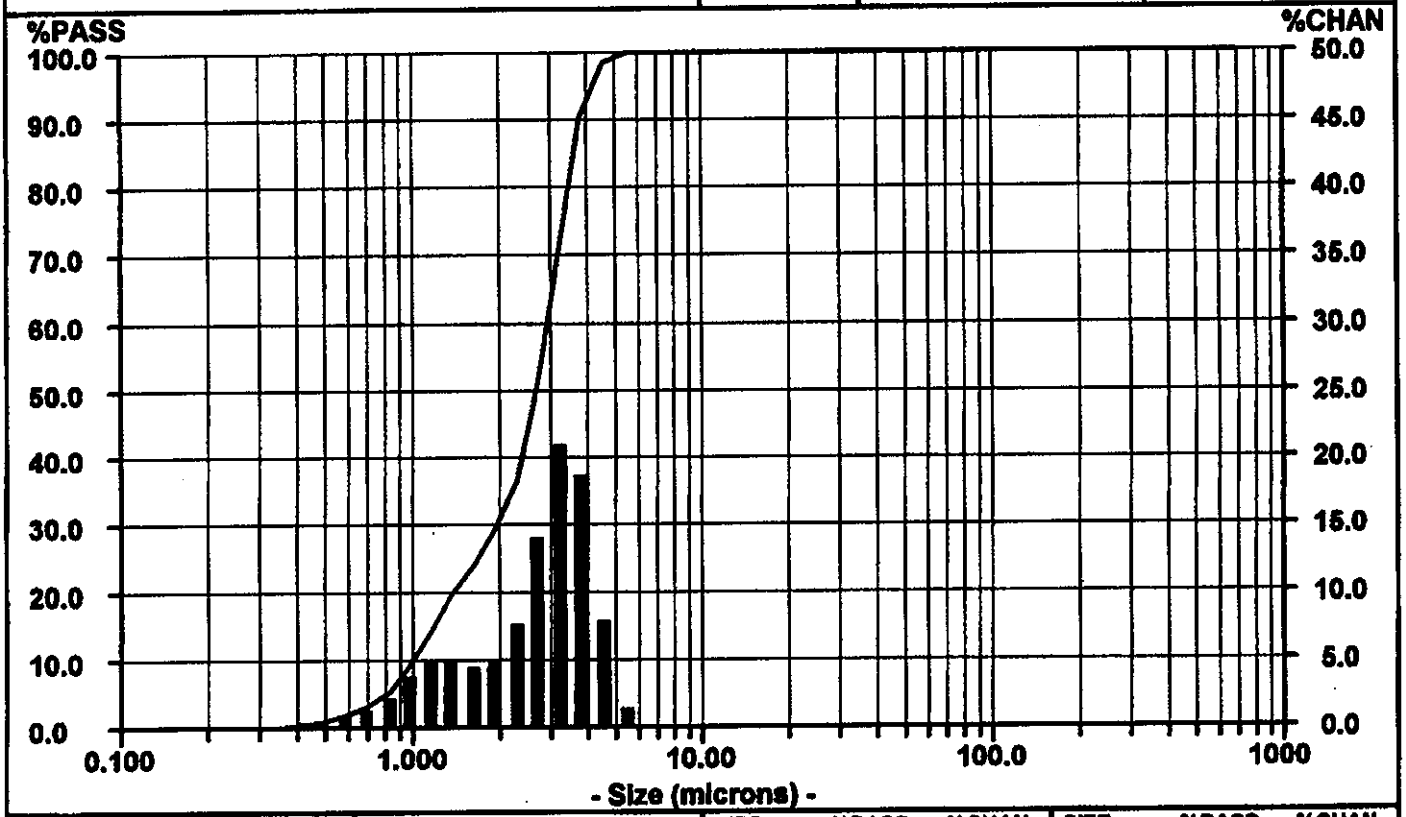
C-104

C-104 Sample

Date: 09/26/91 Meas #: 00001
Time: 07:40 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Sonicate for 20 min.
Flow Rate = 60 ml/sec.
Refractive Index = 1.50 Particle/1.33 Medium
File: 104C008

Summary	Percentiles		Dia	Vol%	Width
mv = 2.568	10% = 0.994	60% = 2.976	2.970	80%	1.618
mn = 0.832	20% = 1.400	70% = 3.222	0.986	20%	0.555
ma = 1.926	30% = 1.996	80% = 3.500			
cs = 3.115	40% = 2.428	90% = 3.863			
sd = 1.206	50% = 2.726	95% = 4.182			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	100.00	0.00						
592.0	100.00	0.00	7.778	100.00	0.00						
497.8	100.00	0.00	6.541	100.00	0.00						
418.6	100.00	0.00	5.500	100.00	1.44						
352.0	100.00	0.00	4.625	98.56	7.96						
296.0	100.00	0.00	3.889	90.60	18.72						
248.9	100.00	0.00	3.270	71.88	21.07						
209.3	100.00	0.00	2.750	50.81	14.02						
176.0	100.00	0.00	2.312	36.79	7.71						
148.0	100.00	0.00	1.945	29.08	5.01						
124.5	100.00	0.00	1.636	24.07	4.55						
104.7	100.00	0.00	1.375	19.52	5.05						
88.00	100.00	0.00	1.156	14.47	5.09						
74.00	100.00	0.00	0.972	9.38	3.84						
62.23	100.00	0.00	0.818	5.54	2.29						
52.33	100.00	0.00	0.688	3.25	1.31						
44.00	100.00	0.00	0.578	1.94	0.85						
37.00	100.00	0.00	0.486	1.09	0.63						
31.11	100.00	0.00	0.409	0.46	0.46						
26.16	100.00	0.00	0.344	0.00	0.00						
22.00	100.00	0.00	0.289	0.00	0.00						
18.50	100.00	0.00	0.243	0.00	0.00						
15.56	100.00	0.00	0.204	0.00	0.00						
13.08	100.00	0.00	0.172	0.00	0.00						
11.00	100.00	0.00	0.145	0.00	0.00						

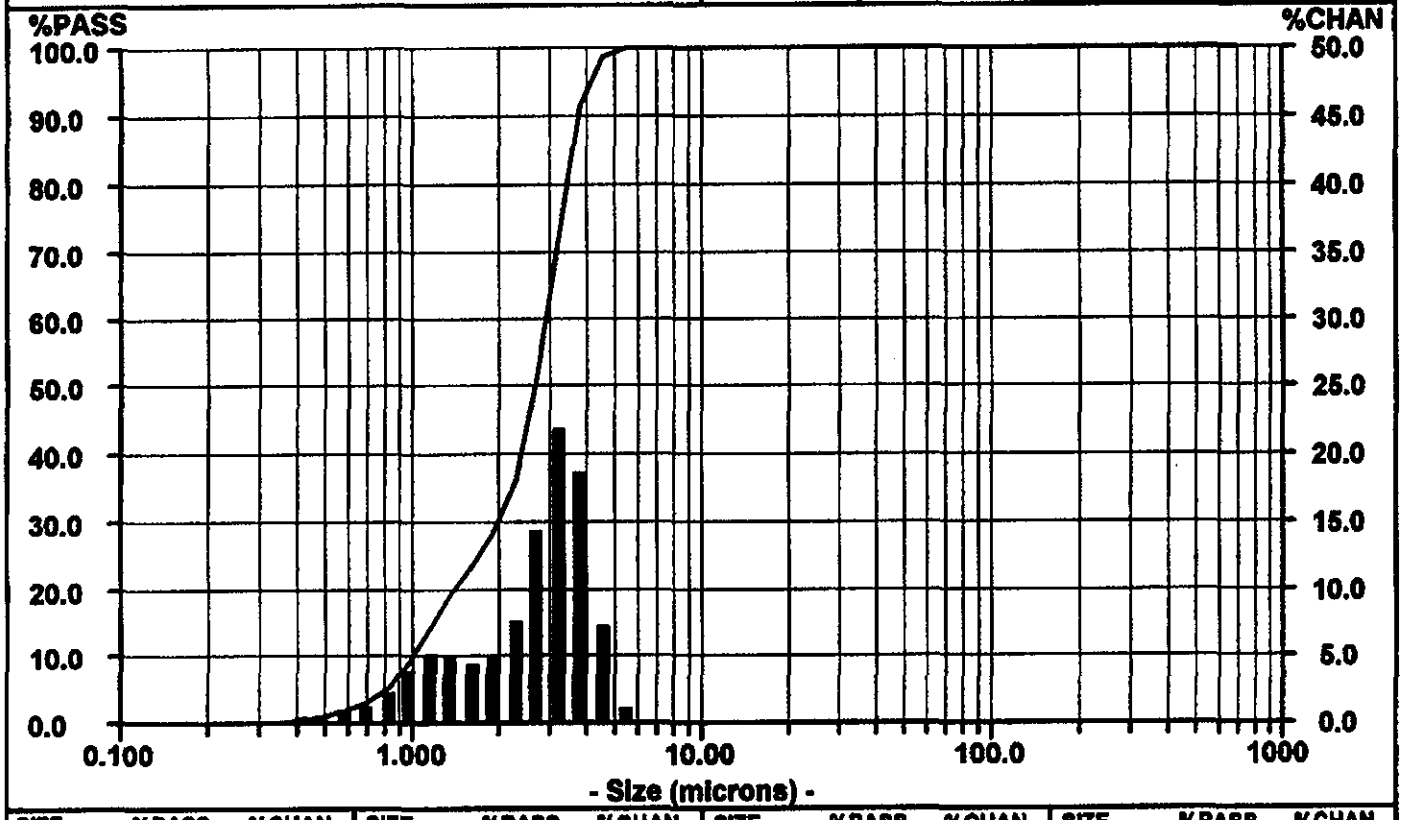
C-104

C-104
Sample

Date: 09/26/91 Meas #: 00001
Time: 07:44 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Sonicate for 20 min.
Flow Rate = 60 ml/sec.
Refractive Index = 2.00 Particle/1.33 Medium
File: 104C009

Summary	Percentiles		Dia	Vol%	Width
mv = 2.561	10% = 1.000	60% = 2.967	2.959	81%	1.569
mn = 0.847	20% = 1.412	70% = 3.203	0.988	19%	0.545
ma = 1.936	30% = 2.020	80% = 3.471			
cs = 3.099	40% = 2.438	90% = 3.824			
sd = 1.185	50% = 2.728	95% = 4.124			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	100.00	0.00						
592.0	100.00	0.00	7.778	100.00	0.00						
497.8	100.00	0.00	6.541	100.00	0.00						
418.6	100.00	0.00	5.500	100.00	1.15						
352.0	100.00	0.00	4.625	98.85	7.35						
296.0	100.00	0.00	3.889	91.50	18.79						
248.9	100.00	0.00	3.270	72.71	21.88						
209.3	100.00	0.00	2.750	50.83	14.44						
176.0	100.00	0.00	2.312	36.39	7.72						
148.0	100.00	0.00	1.945	28.67	4.91						
124.5	100.00	0.00	1.635	23.76	4.45						
104.7	100.00	0.00	1.375	19.31	5.00						
88.00	100.00	0.00	1.156	14.31	5.10						
74.00	100.00	0.00	0.972	9.21	3.86						
62.23	100.00	0.00	0.818	5.35	2.27						
52.33	100.00	0.00	0.688	3.08	1.27						
44.00	100.00	0.00	0.578	1.81	0.81						
37.00	100.00	0.00	0.486	1.00	0.58						
31.11	100.00	0.00	0.409	0.42	0.42						
26.16	100.00	0.00	0.344	0.00	0.00						
22.00	100.00	0.00	0.289	0.00	0.00						
18.50	100.00	0.00	0.243	0.00	0.00						
15.56	100.00	0.00	0.204	0.00	0.00						
13.08	100.00	0.00	0.172	0.00	0.00						
11.00	100.00	0.00	0.145	0.00	0.00						

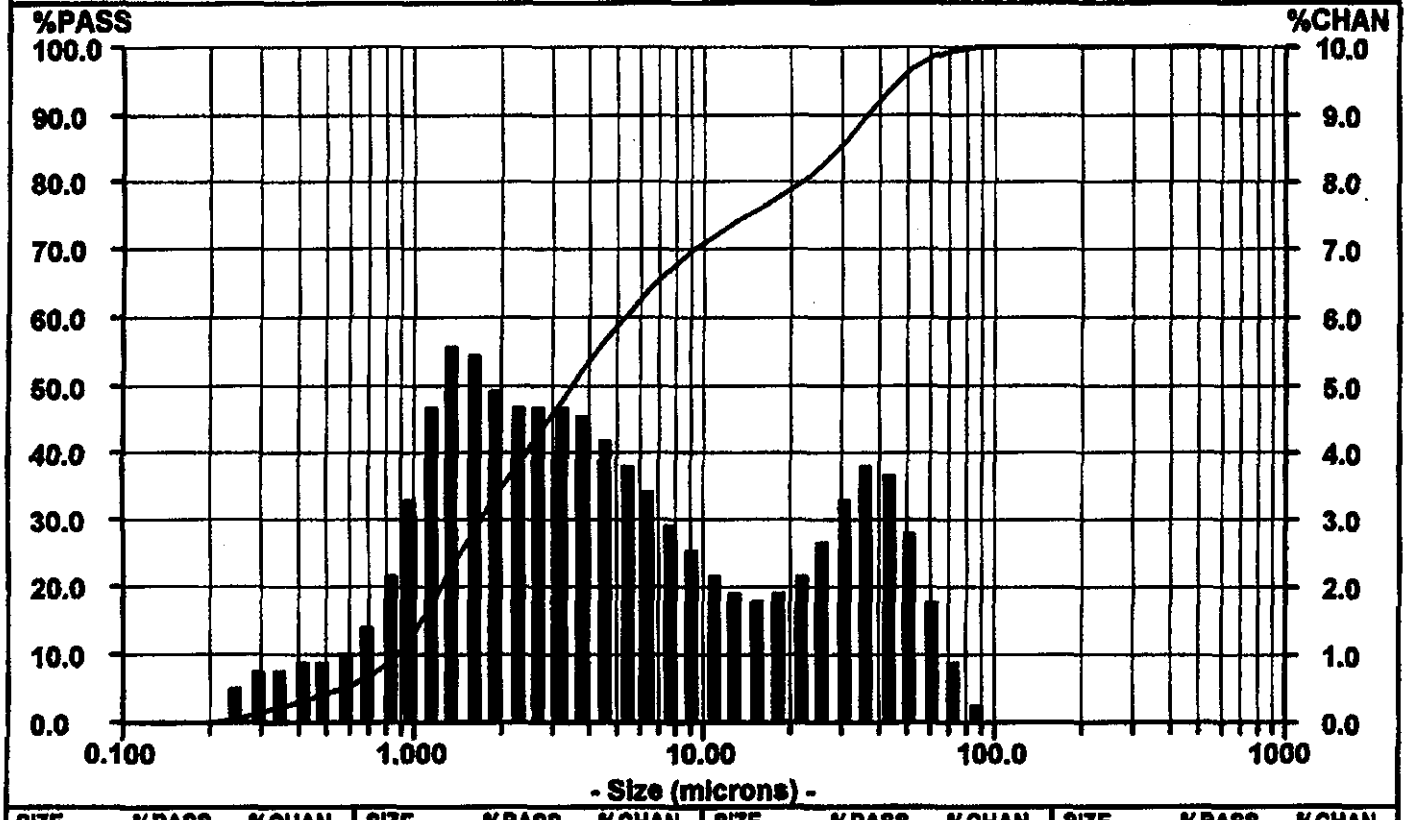
C-104

C-104 Sample

Date: 09/26/91 Meas #: 00001
Time: 11:41 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Sonicate for 2 min. followed by a 60 min delay
External Sonifier
Flow Rate = 17 ml/sec.
Refractive Index = 1.50 Particle/1.33 Medium
File: 104C010

Summary	Percentiles		Dia	Vol%	Width
mv = 11.27	10% = 0.864	60% = 5.315	32.22	26%	29.89
mn = 0.396	20% = 1.267	70% = 9.285	4.089	41%	5.470
ma = 1.937	30% = 1.716	80% = 21.77	1.137	33%	1.038
cs = 3.098	40% = 2.463	90% = 36.74			
sd = 13.32	50% = 3.526	95% = 46.59			



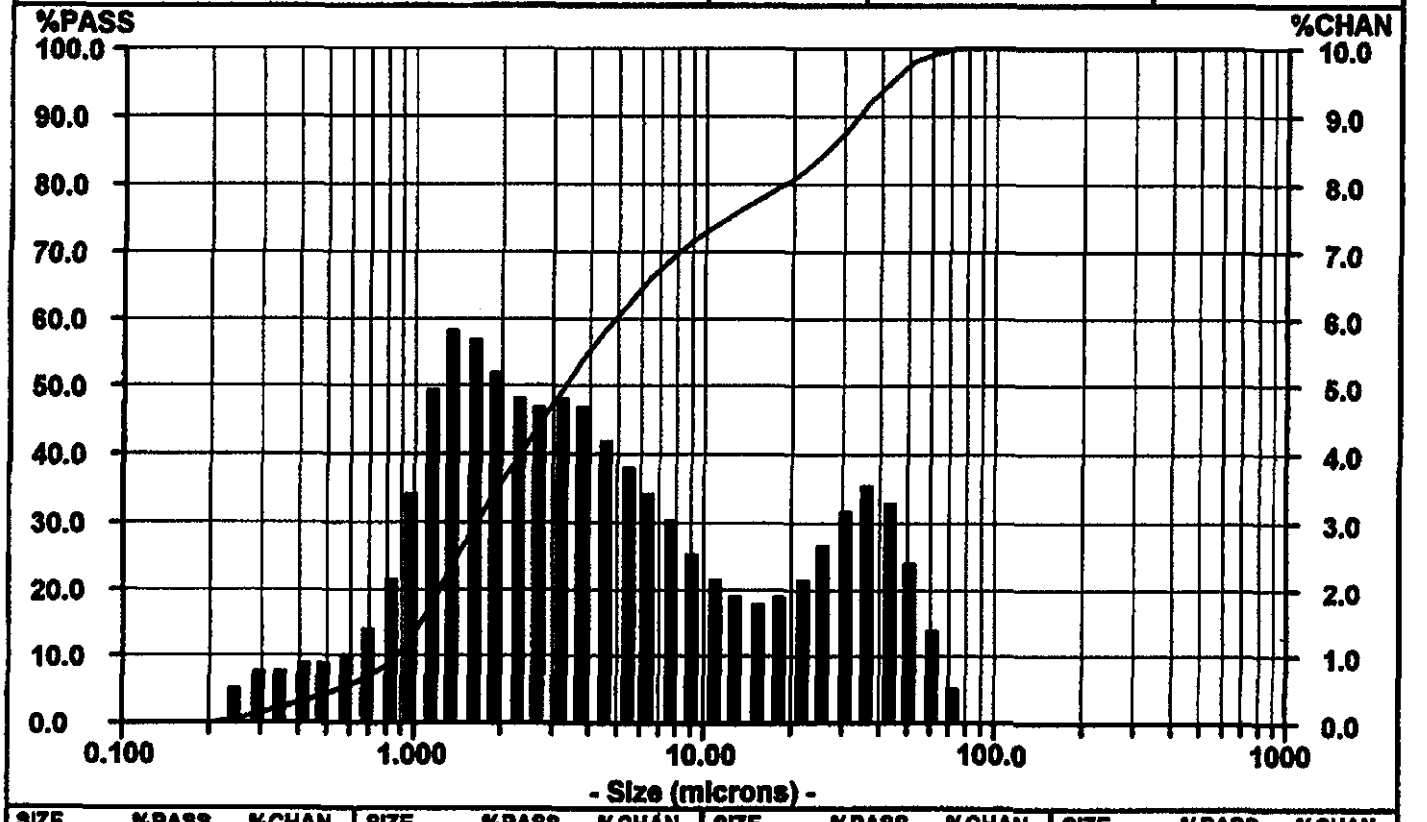
SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	69.95	2.63						
592.0	100.00	0.00	7.778	67.32	3.08						
497.8	100.00	0.00	6.541	64.24	3.50						
418.6	100.00	0.00	5.500	60.74	3.88						
352.0	100.00	0.00	4.625	56.86	4.27						
296.0	100.00	0.00	3.889	52.59	4.62						
248.9	100.00	0.00	3.270	47.97	4.80						
209.3	100.00	0.00	2.750	43.17	4.78						
176.0	100.00	0.00	2.312	38.39	4.78						
148.0	100.00	0.00	1.945	33.61	5.06						
124.5	100.00	0.00	1.635	28.55	5.56						
104.7	100.00	0.00	1.375	23.00	5.68						
88.00	100.00	0.38	1.156	17.32	4.84						
74.00	99.62	0.90	0.972	12.48	3.42						
62.23	98.72	1.83	0.818	9.06	2.22						
52.33	96.89	2.97	0.688	6.84	1.50						
44.00	93.92	3.76	0.578	5.34	1.14						
37.00	90.16	3.88	0.486	4.20	0.97						
31.11	86.30	3.38	0.409	3.23	0.90						
26.16	82.92	2.77	0.344	2.33	0.87						
22.00	80.15	2.25	0.289	1.46	0.82						
18.50	77.90	1.95	0.243	0.64	0.64						
15.56	75.95	1.84	0.204	0.00	0.00						
13.08	74.11	1.94	0.172	0.00	0.00						
11.00	72.17	2.22	0.145	0.00	0.00						

C-104

C-104 Sample
Date: 09/26/91 Meas #: 00001
Time: 11:45 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Sonicate for 2 min. followed by a 60 min delay
External Sonifier
Flow Rate = 17 ml/sec.
Refractive Index = 1.70 Particle/1.33 Medium
File: 104C011

Summary	Percentiles		Dia	Vol%	Width
mv = 10.20	10% = 0.854	60% = 4.917	30.87	24%	27.71
mn = 0.397	20% = 1.233	70% = 8.125	4.507	37%	5.461
ma = 1.866	30% = 1.660	80% = 18.52	1.227	39%	1.206
cs = 3.181	40% = 2.341	90% = 33.82			
sd = 11.81	50% = 3.335	95% = 43.16			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	71.97	2.69						
592.0	100.00	0.00	7.778	69.28	3.16						
497.8	100.00	0.00	6.541	66.12	3.59						
418.6	100.00	0.00	5.500	62.53	3.97						
352.0	100.00	0.00	4.625	58.56	4.37						
296.0	100.00	0.00	3.889	54.19	4.73						
248.9	100.00	0.00	3.270	49.46	4.91						
209.3	100.00	0.00	2.750	44.55	4.89						
176.0	100.00	0.00	2.312	39.66	4.90						
148.0	100.00	0.00	1.945	34.76	5.22						
124.5	100.00	0.00	1.635	29.54	5.77						
104.7	100.00	0.00	1.375	23.77	5.92						
88.00	100.00	0.00	1.156	17.85	5.06						
74.00	100.00	0.64	0.972	12.79	3.55						
62.23	99.36	1.44	0.818	9.24	2.27						
52.33	97.92	2.56	0.688	6.97	1.53						
44.00	95.36	3.44	0.578	5.44	1.16						
37.00	91.92	3.67	0.486	4.28	0.99						
31.11	88.25	3.29	0.409	3.29	0.91						
26.16	84.96	2.73	0.344	2.38	0.89						
22.00	82.23	2.24	0.289	1.49	0.84						
18.50	79.99	1.95	0.243	0.65	0.65						
15.56	78.04	1.85	0.204	0.00	0.00						
13.08	76.19	1.96	0.172	0.00	0.00						
11.00	74.23	2.26	0.145	0.00	0.00						

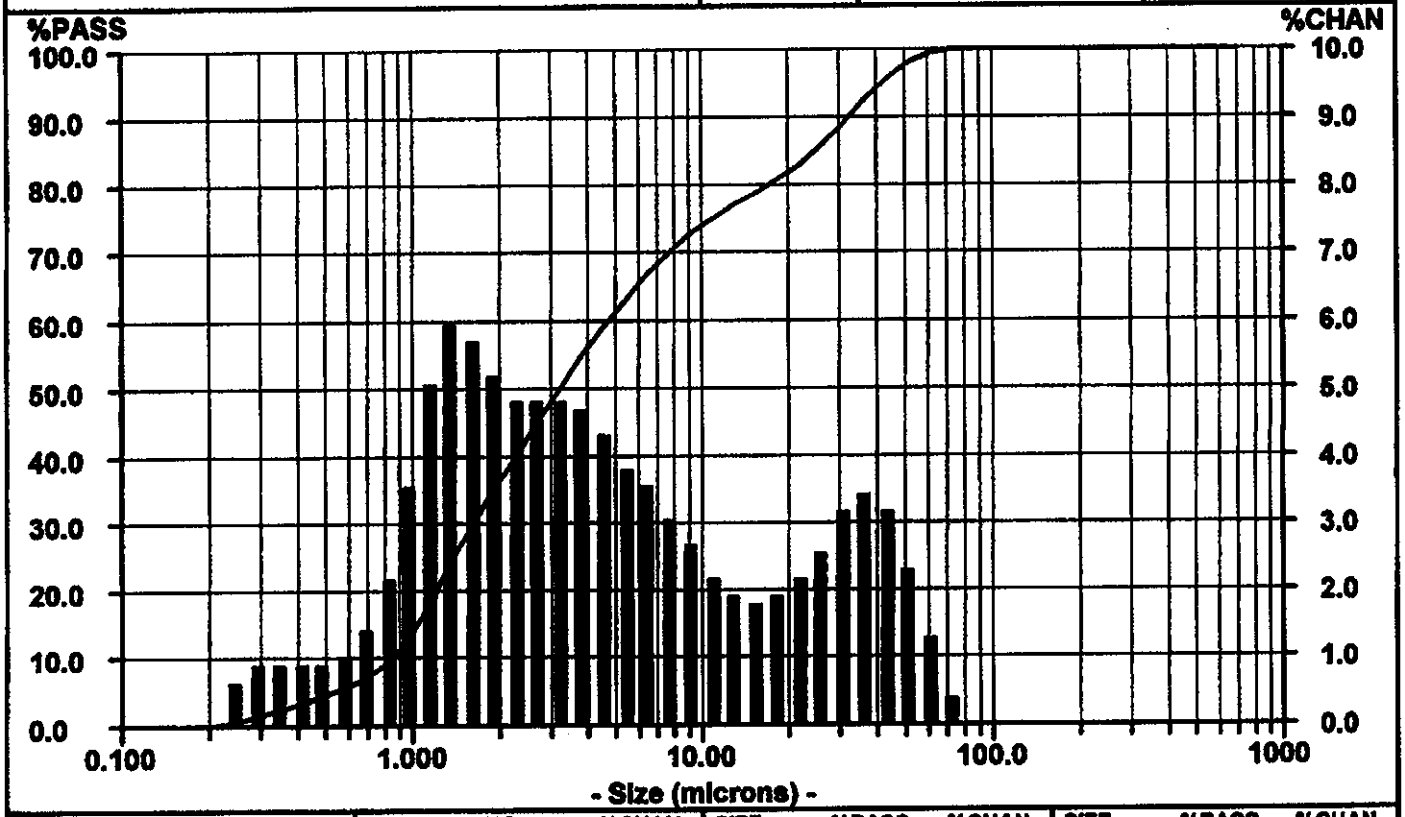
C-104

C-104 Sample

Date: 09/26/91 Meas #: 00001
Time: 11:50 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Sonicate 2 min. followed by a 60 min delay
External Sonifier
Flow Rate = 17 ml/sec
Refractive Index = 2.00 Particle/1.33 Medium
File: 104C012

Summary	Percentiles		Dia	Vol%	Width
mv = 9.824	10% = 0.842	60% = 4.746	30.40	23%	27.37
mn = 0.392	20% = 1.217	70% = 7.708	4.083	42%	5.461
ma = 1.844	30% = 1.627	80% = 17.10	1.137	35%	1.037
cs = 3.253	40% = 2.285	90% = 32.69			
sd = 11.15	50% = 3.246	95% = 42.12			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	72.87	2.71						
592.0	100.00	0.00	7.778	70.16	3.18						
497.8	100.00	0.00	6.541	66.98	3.60						
418.6	100.00	0.00	5.500	63.38	3.99						
352.0	100.00	0.00	4.625	59.39	4.40						
296.0	100.00	0.00	3.889	54.99	4.78						
248.9	100.00	0.00	3.270	50.21	4.95						
209.3	100.00	0.00	2.750	45.26	4.92						
176.0	100.00	0.00	2.312	40.34	4.92						
148.0	100.00	0.00	1.945	35.42	5.26						
124.5	100.00	0.00	1.635	30.16	5.85						
104.7	100.00	0.00	1.375	24.31	6.05						
88.00	100.00	0.00	1.156	18.26	5.16						
74.00	100.00	0.58	0.972	13.10	3.60						
62.23	99.42	1.31	0.818	9.50	2.29						
52.33	98.11	2.36	0.688	7.21	1.54						
44.00	95.75	3.23	0.578	5.67	1.17						
37.00	92.52	3.51	0.486	4.50	1.01						
31.11	89.01	3.20	0.409	3.49	0.95						
26.16	85.81	2.69	0.344	2.54	0.94						
22.00	83.12	2.22	0.289	1.60	0.90						
18.50	80.90	1.94	0.243	0.70	0.70						
15.56	78.96	1.85	0.204	0.00	0.00						
13.08	77.11	1.97	0.172	0.00	0.00						
11.00	75.14	2.27	0.145	0.00	0.00						

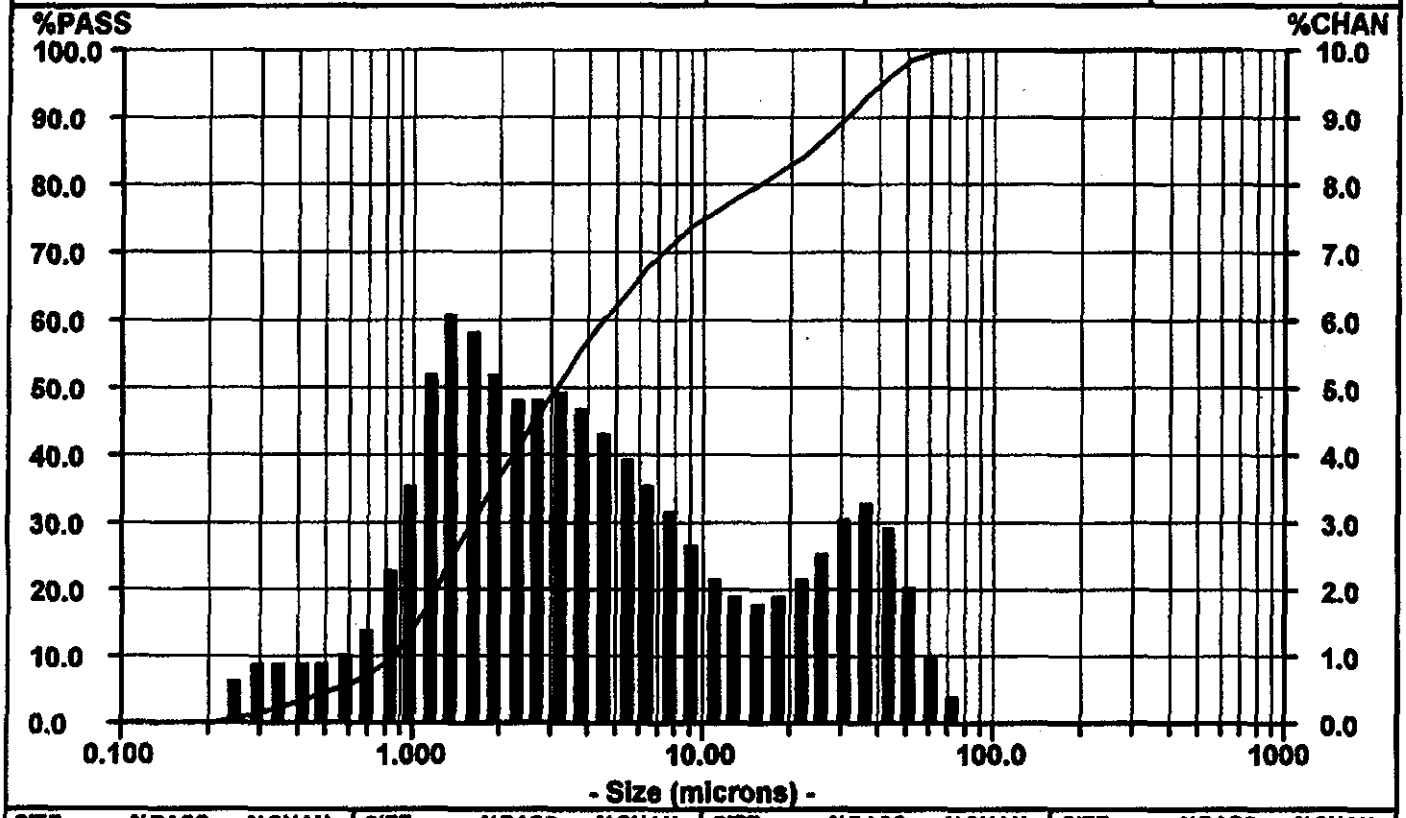
C-104

C-104 Sample

Date: 09/26/91 Meas #: 00001
Time: 11:54 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Sonicate for 2 min. followed by a 60 min delay
External Sonifier
Flow Rate = 40 ml/sec
Refractive Index = 2.00 Particle/1.33 Medium
File: 104C013

Summary	Percentiles		Dia	Vol%	Width
mv = 9.385	10% = 0.838	60% = 4.581	29.78	22%	26.60
mn = 0.393	20% = 1.207	70% = 7.288	4.499	37%	5.433
ma = 1.824	30% = 1.605	80% = 15.67	1.224	41%	1.205
cs = 3.289	40% = 2.237	90% = 31.29			
sd = 10.37	50% = 3.167	95% = 40.69			



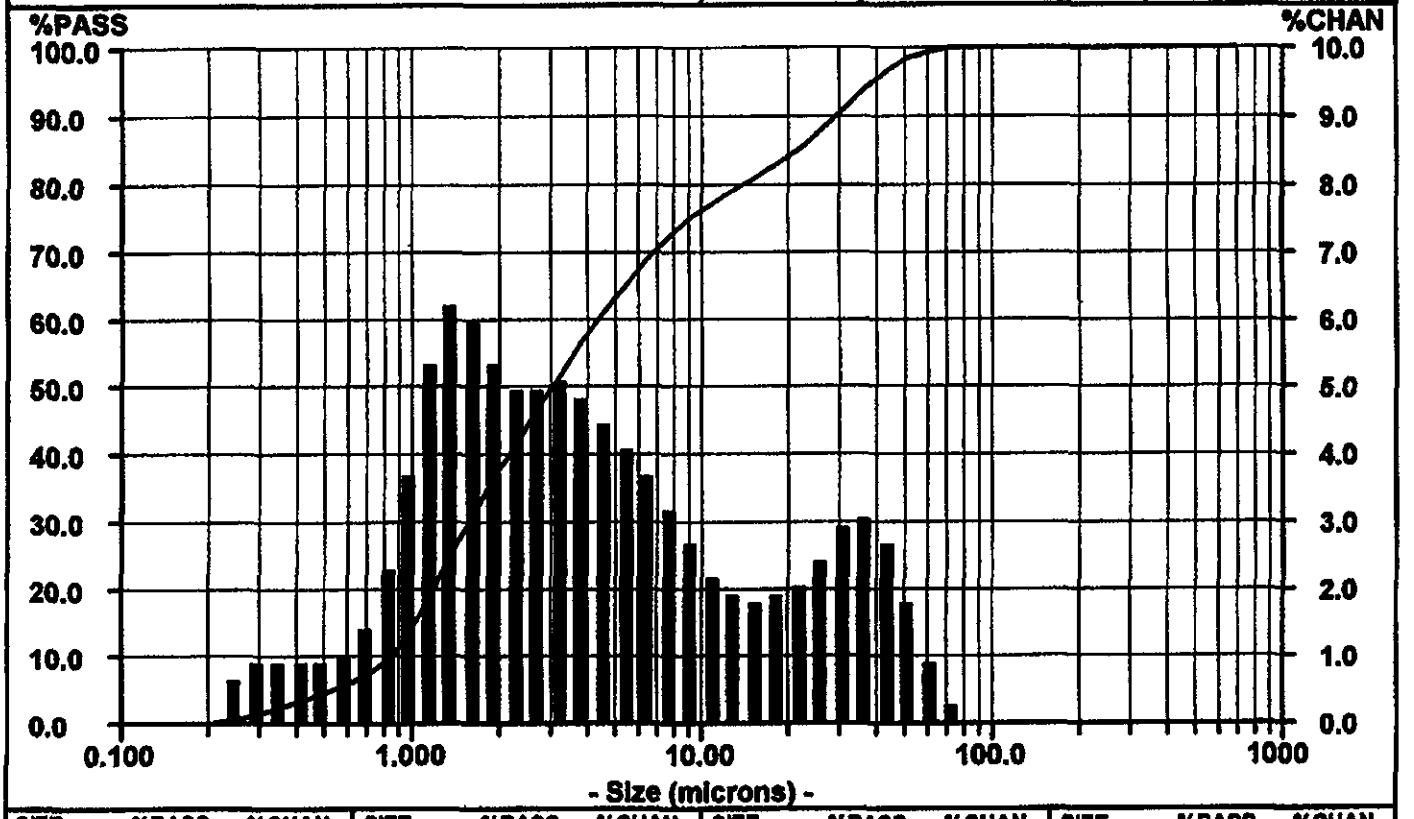
SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	73.89	2.73						
592.0	100.00	0.00	7.778	71.16	3.21						
497.8	100.00	0.00	6.541	67.95	3.65						
418.6	100.00	0.00	5.500	64.30	4.06						
352.0	100.00	0.00	4.625	60.24	4.47						
296.0	100.00	0.00	3.889	55.77	4.84						
248.9	100.00	0.00	3.270	50.93	5.01						
209.3	100.00	0.00	2.750	45.92	4.97						
176.0	100.00	0.00	2.312	40.95	4.98						
148.0	100.00	0.00	1.945	35.96	5.34						
124.5	100.00	0.00	1.635	30.62	5.96						
104.7	100.00	0.00	1.375	24.66	6.18						
88.00	100.00	0.00	1.156	18.50	5.27						
74.00	100.00	0.46	0.972	13.23	3.67						
62.23	99.54	1.12	0.818	9.56	2.32						
52.33	98.42	2.13	0.688	7.24	1.55						
44.00	96.29	3.03	0.578	5.69	1.18						
37.00	93.26	3.37	0.486	4.51	1.02						
31.11	89.89	3.12	0.409	3.49	0.95						
26.16	86.77	2.65	0.344	2.54	0.94						
22.00	84.12	2.20	0.289	1.60	0.90						
18.50	81.92	1.93	0.243	0.70	0.70						
15.56	79.99	1.85	0.204	0.00	0.00						
13.08	78.14	1.97	0.172	0.00	0.00						
11.00	76.17	2.28	0.145	0.00	0.00						

C-104

C-104 Sample — Date: 09/26/91 Meas #: 00001 — Time: 11:59 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Sonicate for 2 min. followed by a 60 min delay
External Sonifier
Flow Rate = 40 ml/sec
Refractive index = 1.50 Particle/1.33 Medium
File: 104C014

Summary	Percentiles		Dia	Vol%	Width
mv = 8.880	10% = 0.834	60% = 4.397	29.02	21%	25.87
mn = 0.395	20% = 1.196	70% = 6.837	4.490	38%	5.404
ma = 1.799	30% = 1.579	80% = 13.85	1.225	41%	1.200
cs = 3.335	40% = 2.183	90% = 29.52			
sd = 9.380	50% = 3.072	95% = 39.04			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	75.13	2.75						
592.0	100.00	0.00	7.778	72.38	3.26						
497.8	100.00	0.00	6.541	69.12	3.71						
418.6	100.00	0.00	5.500	65.41	4.12						
352.0	100.00	0.00	4.625	61.29	4.54						
296.0	100.00	0.00	3.889	56.75	4.91						
248.9	100.00	0.00	3.270	51.84	5.10						
209.3	100.00	0.00	2.750	46.74	5.06						
176.0	100.00	0.00	2.312	41.68	5.07						
148.0	100.00	0.00	1.945	36.61	5.43						
124.5	100.00	0.00	1.635	31.18	5.08						
104.7	100.00	0.00	1.375	25.10	6.31						
88.00	100.00	0.00	1.156	18.79	5.40						
74.00	100.00	0.37	0.972	13.39	3.74						
62.23	99.63	0.94	0.818	9.65	2.35						
52.33	98.69	1.86	0.688	7.30	1.56						
44.00	96.83	2.74	0.578	5.74	1.19						
37.00	94.09	3.15	0.486	4.55	1.03						
31.11	90.94	3.00	0.409	3.52	0.97						
26.16	87.94	2.59	0.344	2.55	0.95						
22.00	85.35	2.18	0.289	1.60	0.90						
18.50	83.17	1.93	0.243	0.70	0.70						
15.56	81.24	1.85	0.204	0.00	0.00						
13.08	79.39	1.97	0.172	0.00	0.00						
11.00	77.42	2.29	0.145	0.00	0.00						

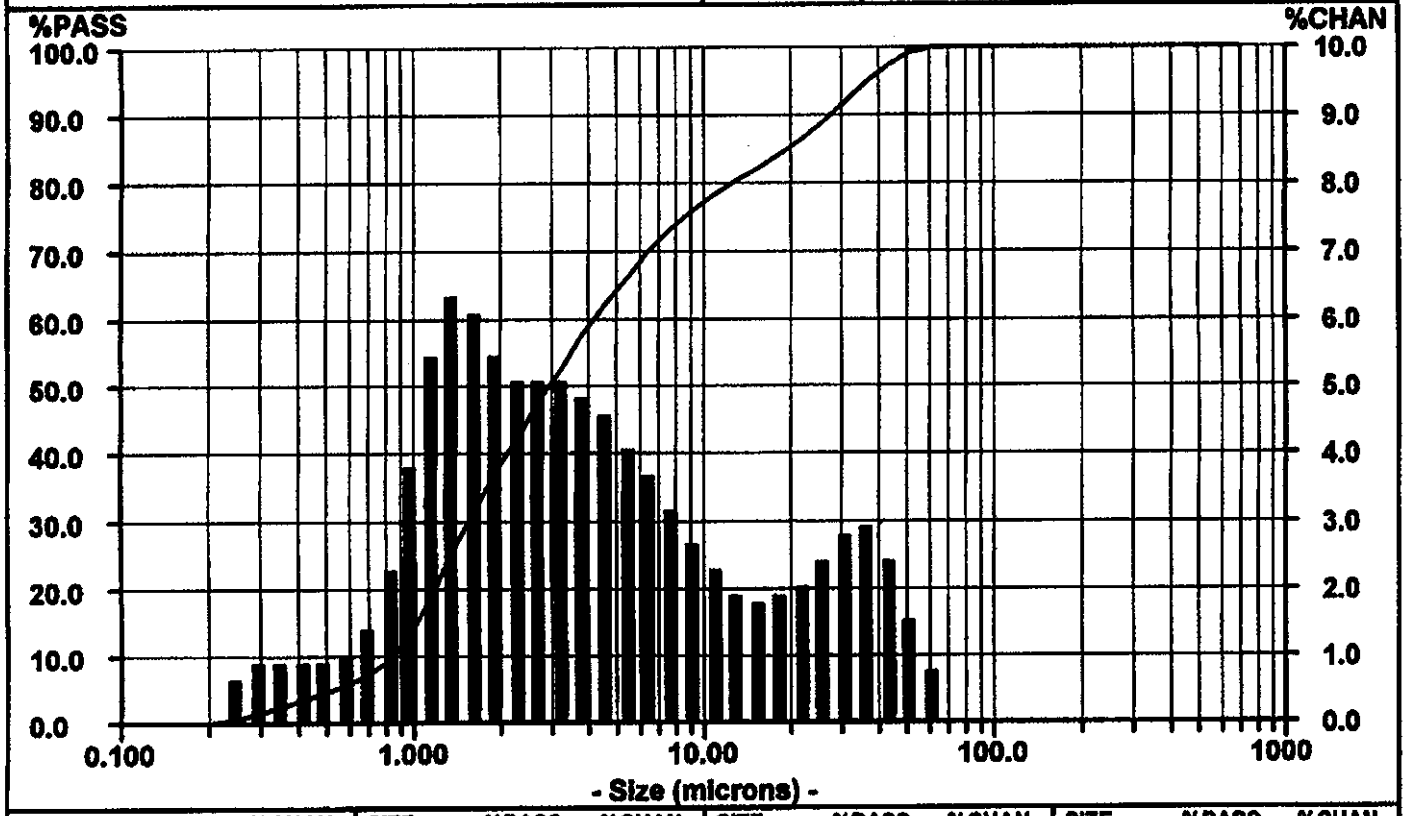
C-104

C-104
Sample

Date: 09/26/91 Meas #: 00001
Time: 12:03 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Sonicate for 2 min. followed by a 60 min delay
External Sonifier
Flow Rate = 40 ml/sec
Refractive Index = 1.70 Particle/1.33 Medium
File: 104C015

Summary	Percentiles		Dia	Vol%	Width
mv = 8.319	10% = 0.830	60% = 4.237	28.12	19%	24.39
mn = 0.396	20% = 1.187	70% = 6.470	4.484	38%	5.382
ma = 1.777	30% = 1.557	80% = 12.43	1.227	43%	1.194
cs = 3.376	40% = 2.133	90% = 27.65			
sd = 8.448	50% = 2.989	95% = 38.96			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	76.29	2.77						
592.0	100.00	0.00	7.778	73.52	3.29						
497.8	100.00	0.00	6.541	70.23	3.76						
418.6	100.00	0.00	5.500	66.47	4.19						
352.0	100.00	0.00	4.625	62.28	4.61						
296.0	100.00	0.00	3.889	57.67	4.99						
248.9	100.00	0.00	3.270	52.68	5.16						
209.3	100.00	0.00	2.750	47.52	5.13						
176.0	100.00	0.00	2.312	42.39	5.15						
148.0	100.00	0.00	1.945	37.24	5.53						
124.5	100.00	0.00	1.635	31.71	6.21						
104.7	100.00	0.00	1.375	25.50	6.47						
88.00	100.00	0.00	1.156	19.03	5.60						
74.00	100.00	0.00	0.972	13.53	3.80						
62.23	100.00	0.80	0.818	9.73	2.39						
52.33	99.20	1.65	0.688	7.34	1.58						
44.00	97.55	2.53	0.578	5.76	1.20						
37.00	95.02	3.00	0.486	4.56	1.04						
31.11	92.02	2.92	0.409	3.52	0.97						
26.16	89.10	2.57	0.344	2.55	0.95						
22.00	86.53	2.18	0.289	1.60	0.90						
18.50	84.35	1.93	0.243	0.70	0.70						
15.56	82.42	1.85	0.204	0.00	0.00						
13.08	80.57	1.98	0.172	0.00	0.00						
11.00	78.59	2.30	0.145	0.00	0.00						

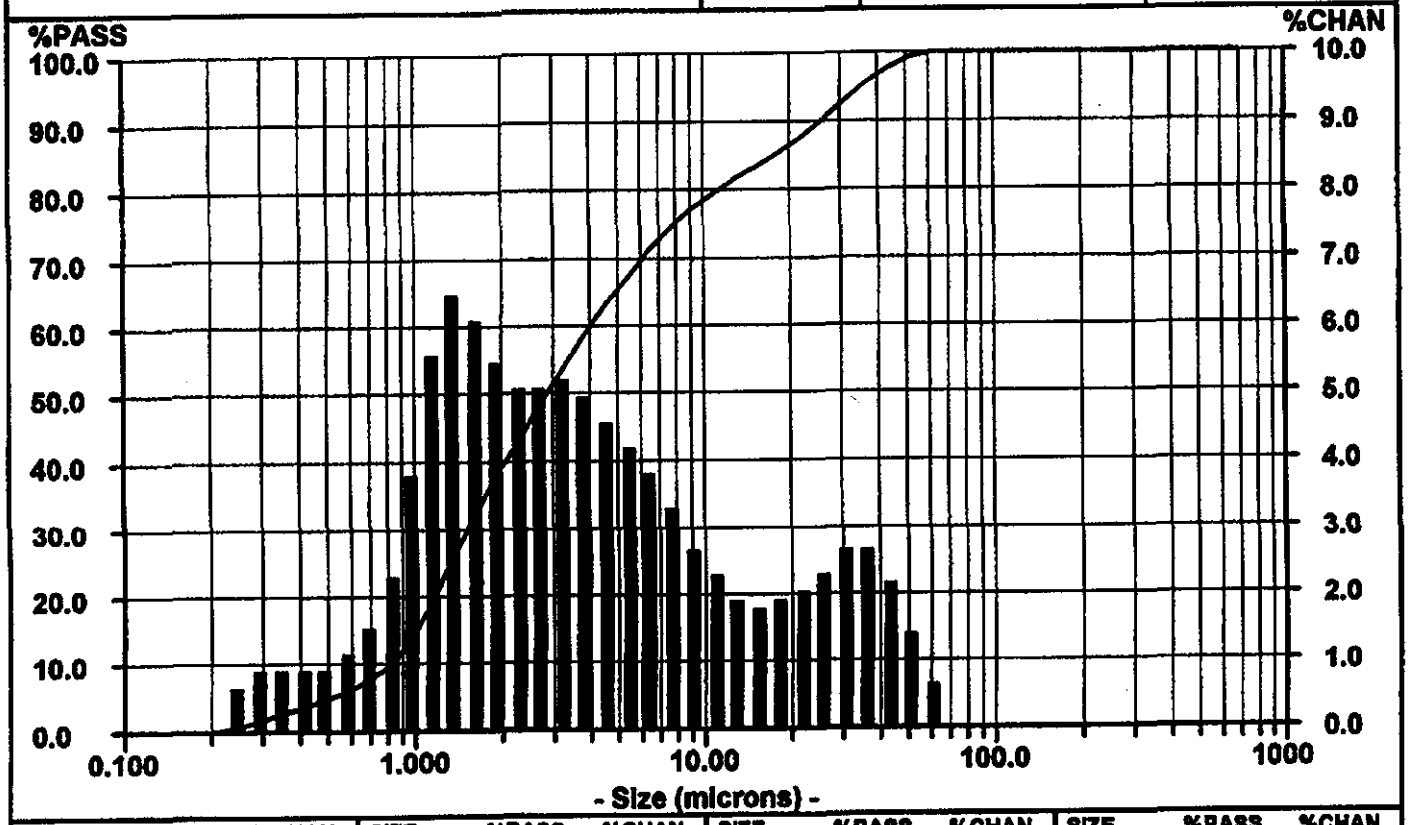
C-104

C-104 Sample

Date: 09/26/91 Meas #: 00001
Time: 12:08 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Sonicate for 2 min. followed by a 60 min delay
External Sonifier
Flow Rate = 60 ml/sec
Refractive Index = 1.70 Particle/1.33 Medium
File: 104C016

Summary		Percentiles		Dia	Vol%	Width
mv = 7.910		10% = 0.811	60% = 4.081	27.61	18%	24.08
mn = 0.391		20% = 1.168	70% = 6.135	4.061	44%	5.346
ma = 1.730		30% = 1.525	80% = 11.23	1.137	38%	1.034
cs = 3.469		40% = 2.078	90% = 26.01			
sd = 7.580		50% = 2.903	95% = 35.64			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	77.46	2.78						
592.0	100.00	0.00	7.778	74.68	3.32						
497.8	100.00	0.00	6.541	71.36	3.80						
418.6	100.00	0.00	5.500	67.56	4.23						
352.0	100.00	0.00	4.625	63.33	4.67						
296.0	100.00	0.00	3.889	58.66	5.06						
248.9	100.00	0.00	3.270	53.60	5.23						
209.3	100.00	0.00	2.750	48.37	5.18						
176.0	100.00	0.00	2.312	43.19	5.18						
148.0	100.00	0.00	1.945	38.01	5.56						
124.5	100.00	0.00	1.635	32.45	6.27						
104.7	100.00	0.00	1.375	26.18	6.57						
88.00	100.00	0.00	1.156	19.61	5.60						
74.00	100.00	0.00	0.972	14.01	3.87						
62.23	100.00	0.70	0.818	10.14	2.43						
52.33	99.30	1.46	0.688	7.71	1.62						
44.00	97.84	2.27	0.578	6.09	1.24						
37.00	95.57	2.74	0.486	4.85	1.08						
31.11	92.83	2.74	0.409	3.77	1.03						
26.16	90.09	2.47	0.344	2.74	1.02						
22.00	87.62	2.14	0.289	1.72	0.97						
18.50	85.48	1.91	0.243	0.75	0.75						
15.56	83.57	1.84	0.204	0.00	0.00						
13.08	81.73	1.97	0.172	0.00	0.00						
11.00	79.76	2.30	0.145	0.00	0.00						

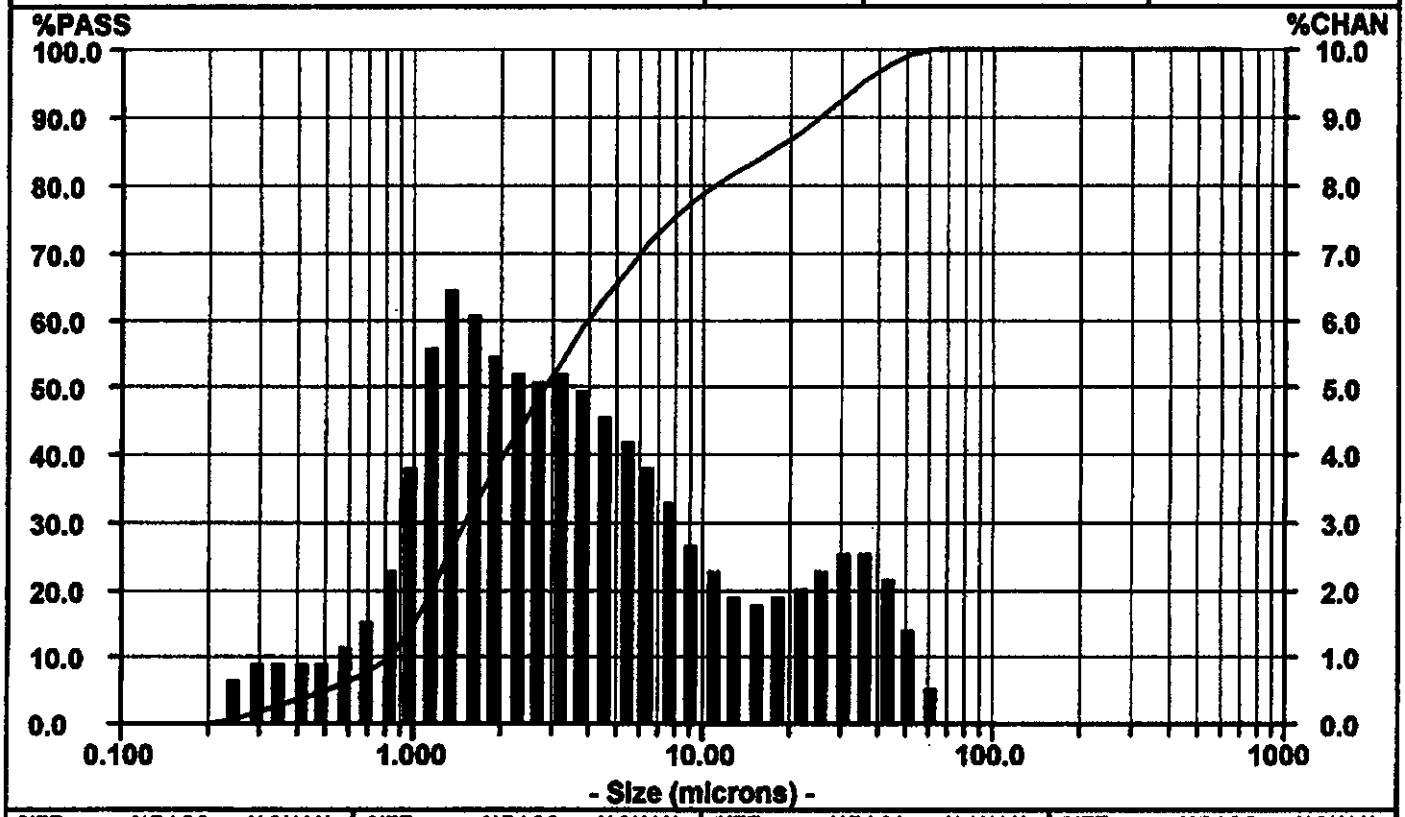
C-104

C-104
Sample

Date: 09/26/91 Meas #: 00001
Time: 12:12 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Sonicate for 2 min. followed by a 60 min delay
External Sonifier
Flow Rate = 60 ml/sec
Refractive Index = 1.50 Particle/1.33 Medium
File: 104C017

Summary	Percentiles		Dia	Vol%	Width
mv = 7.801	10% = 0.808	60% = 4.041	27.37	18%	24.21
mn = 0.391	20% = 1.165	70% = 6.045	4.474	39%	5.358
ma = 1.720	30% = 1.518	80% = 10.91	1.219	43%	1.205
cs = 3.488	40% = 2.063	90% = 25.51			
sd = 7.299	50% = 2.880	95% = 35.36			



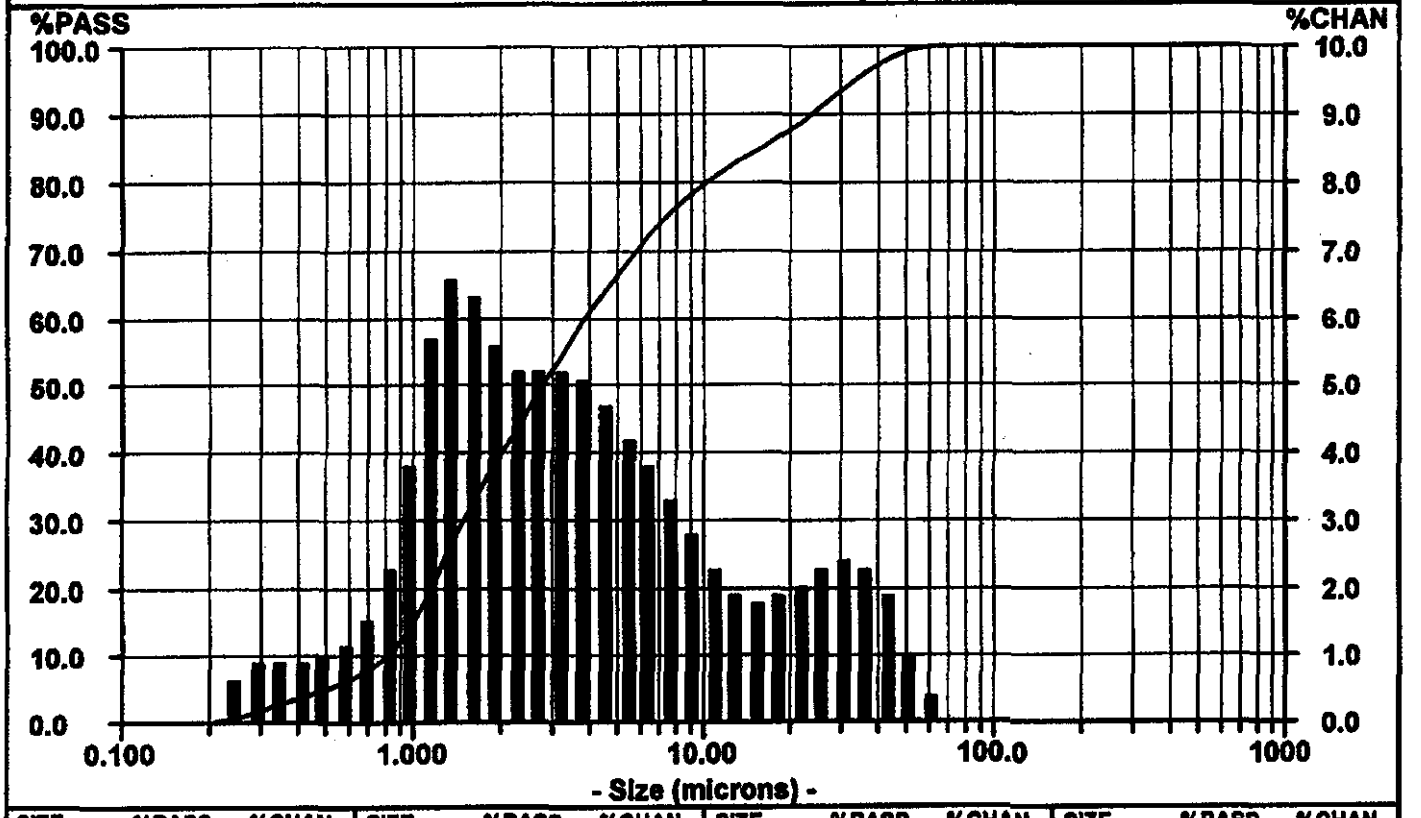
SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	77.79	2.79						
592.0	100.00	0.00	7.778	75.00	3.32						
497.8	100.00	0.00	6.541	71.68	3.81						
418.6	100.00	0.00	5.500	67.87	4.25						
352.0	100.00	0.00	4.625	63.62	4.69						
296.0	100.00	0.00	3.889	58.93	5.08						
248.9	100.00	0.00	3.270	53.85	5.25						
209.3	100.00	0.00	2.750	48.60	5.19						
176.0	100.00	0.00	2.312	43.41	5.20						
148.0	100.00	0.00	1.945	38.21	5.59						
124.5	100.00	0.00	1.635	32.62	6.30						
104.7	100.00	0.00	1.375	26.32	6.59						
88.00	100.00	0.00	1.156	19.73	5.64						
74.00	100.00	0.00	0.972	14.09	3.89						
62.23	100.00	0.69	0.818	10.20	2.44						
52.33	99.31	1.43	0.688	7.76	1.62						
44.00	97.88	2.21	0.578	6.14	1.24						
37.00	95.67	2.65	0.486	4.90	1.09						
31.11	93.02	2.65	0.409	3.81	1.04						
26.16	90.37	2.40	0.344	2.77	1.03						
22.00	87.97	2.11	0.289	1.74	0.98						
18.50	85.86	1.91	0.243	0.76	0.76						
15.56	83.95	1.86	0.204	0.00	0.00						
13.08	82.09	1.99	0.172	0.00	0.00						
11.00	80.10	2.31	0.145	0.00	0.00						

C-104

C-104 Sample
Date: 09/26/91 Meas #: 00001
Time: 12:17 Pres #: 01

C-104 In 1M NaOH and 1M NaNO3
Sonicate for 2 min. followed by a 60 min delay
External Sonifier
Flow Rate = 60 ml/sec
Refractive Index = 2.00 Particle/1.33 Medium
File: 104C018

Summary	Percentiles		Dia	Vol%	Width
mv = 7.416	10% = 0.802	60% = 3.930	26.57	17%	23.34
mn = 0.390	20% = 1.156	70% = 5.799	4.469	39%	5.334
ma = 1.695	30% = 1.501	80% = 10.09	1.219	44%	1.203
cs = 3.532	40% = 2.025	90% = 23.78			
sd = 6.598	50% = 2.818	95% = 33.66			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	78.79	2.80						
592.0	100.00	0.00	7.778	75.99	3.35						
497.8	100.00	0.00	6.541	72.64	3.86						
418.6	100.00	0.00	5.500	68.78	4.31						
352.0	100.00	0.00	4.625	64.47	4.76						
296.0	100.00	0.00	3.889	59.71	5.14						
248.9	100.00	0.00	3.270	54.57	5.31						
209.3	100.00	0.00	2.750	49.26	5.25						
176.0	100.00	0.00	2.312	44.01	5.26						
148.0	100.00	0.00	1.945	38.75	5.67						
124.5	100.00	0.00	1.635	33.08	6.40						
104.7	100.00	0.00	1.375	26.68	6.69						
88.00	100.00	0.00	1.156	19.99	5.72						
74.00	100.00	0.00	0.972	14.27	3.94						
62.23	100.00	0.56	0.818	10.33	2.47						
52.33	99.44	1.20	0.688	7.86	1.64						
44.00	98.24	1.94	0.578	6.22	1.26						
37.00	96.30	2.44	0.486	4.96	1.10						
31.11	93.86	2.53	0.409	3.86	1.05						
26.16	91.33	2.36	0.344	2.81	1.04						
22.00	88.97	2.10	0.289	1.77	1.00						
18.50	86.87	1.91	0.243	0.77	0.77						
15.56	84.96	1.86	0.204	0.00	0.00						
13.08	83.10	1.99	0.172	0.00	0.00						
11.00	81.11	2.32	0.145	0.00	0.00						

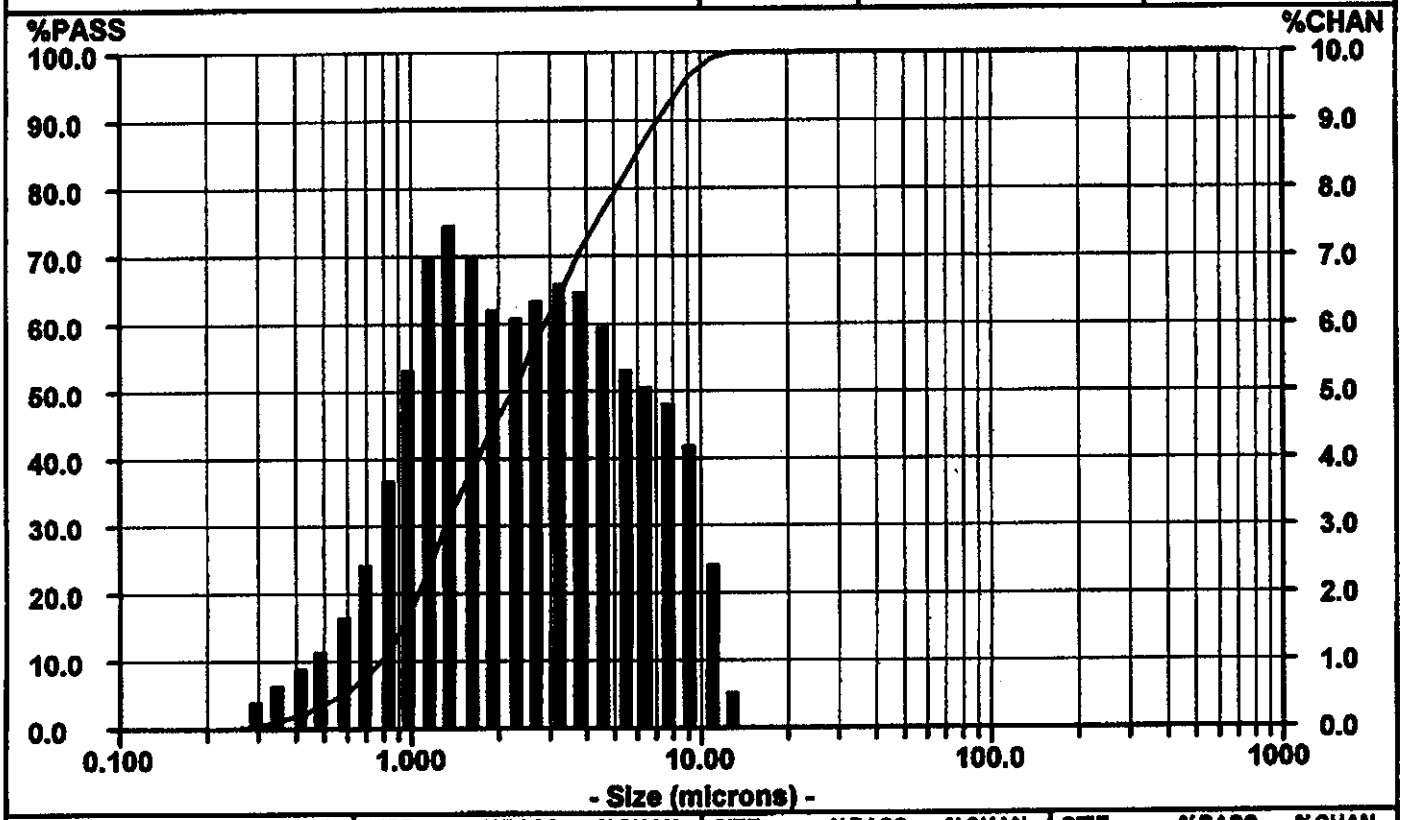
C-104

C-104 Sample

Date: 09/26/91 Meas #: 00001
Time: 12:42 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Sonicate for 20 min. followed by a 60 min delay
External Sonifier
Flow Rate = 60 ml/sec
Refractive Index = 2.00 Particle/1.33 Medium
File: 104C019

Summary		Percentiles		Dia	Vol%	Width
mv =	3.129	10% = 0.769	60% = 2.926	4.068	55%	4.968
mn =	0.549	20% = 1.051	70% = 3.800	1.116	45%	0.935
ma =	1.579	30% = 1.327	80% = 5.102			
cs =	3.799	40% = 1.698	90% = 7.148			
sd =	2.438	50% = 2.239	95% = 8.568			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	96.79	4.39						
592.0	100.00	0.00	7.778	92.40	4.98						
497.8	100.00	0.00	6.541	87.42	5.11						
418.6	100.00	0.00	5.500	82.31	5.44						
352.0	100.00	0.00	4.625	76.87	6.01						
296.0	100.00	0.00	3.888	70.86	6.54						
248.9	100.00	0.00	3.270	64.32	6.70						
209.3	100.00	0.00	2.750	57.62	6.46						
176.0	100.00	0.00	2.312	51.16	6.20						
148.0	100.00	0.00	1.945	44.96	6.38						
124.5	100.00	0.00	1.635	38.58	7.02						
104.7	100.00	0.00	1.375	31.56	7.57						
88.00	100.00	0.00	1.156	23.99	7.02						
74.00	100.00	0.00	0.972	16.97	5.47						
62.23	100.00	0.00	0.818	11.50	3.78						
52.33	100.00	0.00	0.688	7.72	2.54						
44.00	100.00	0.00	0.578	5.18	1.75						
37.00	100.00	0.00	0.486	3.43	1.25						
31.11	100.00	0.00	0.409	2.18	0.93						
26.16	100.00	0.00	0.344	1.25	0.72						
22.00	100.00	0.00	0.289	0.53	0.53						
18.50	100.00	0.00	0.243	0.00	0.00						
15.56	100.00	0.00	0.204	0.00	0.00						
13.08	100.00	0.66	0.172	0.00	0.00						
11.00	99.34	2.55	0.145	0.00	0.00						

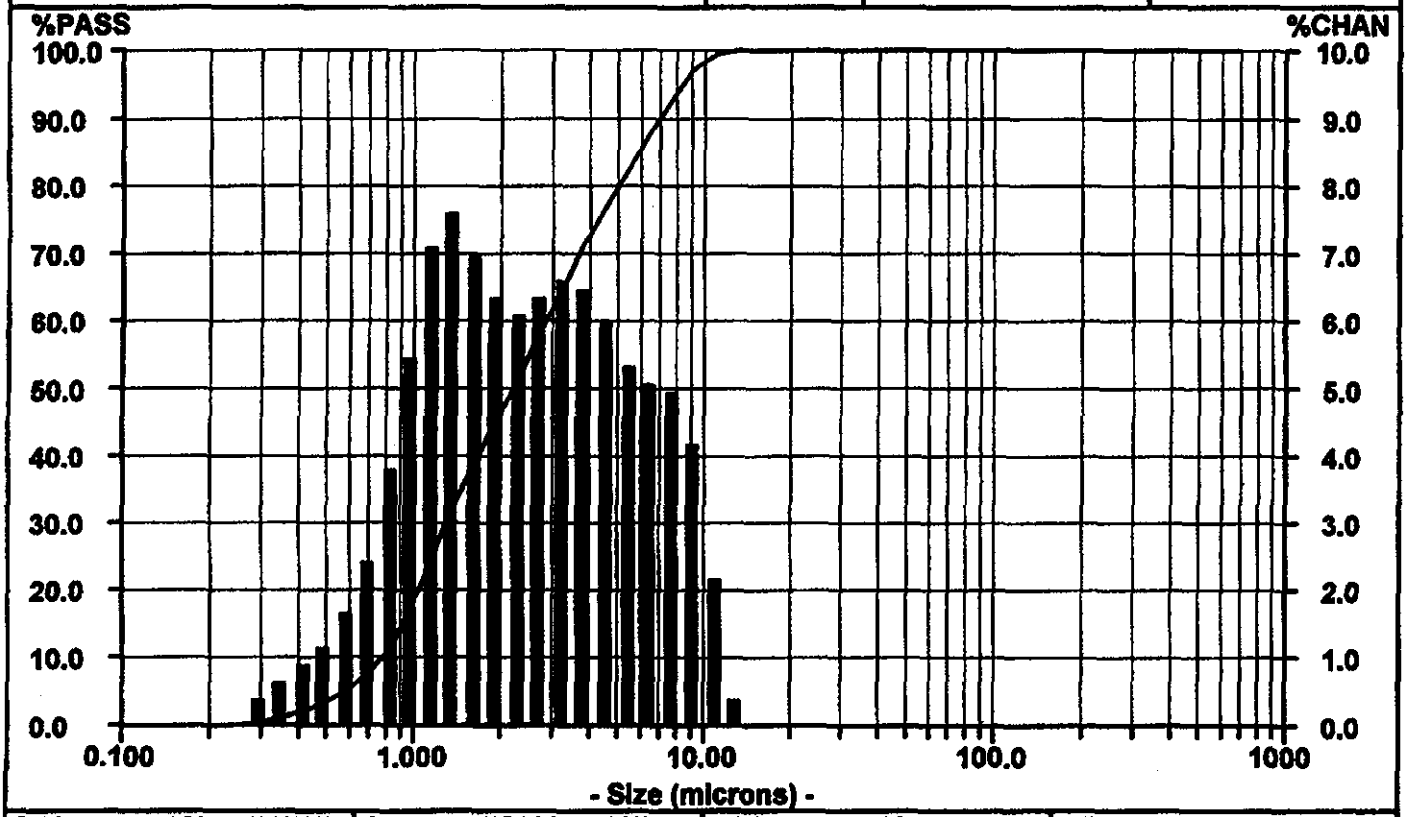
C-104

C-104
Sample

Date: 09/26/91 Meas #: 00001
Time: 12:47 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Sonicate for 20 min. followed by a 60 min delay
External Sonifier
Flow Rate = 60 ml/sec
Refractive Index = 1.50 Particle/1.33 Medium
File: 104C020

Summary		Percentiles		Dia	Vol%	Width
mv =	3.085	10% = 0.768	80% = 2.894	4.045	55%	4.850
mn =	0.554	20% = 1.045	70% = 3.758	1.114	45%	0.931
ma =	1.572	30% = 1.316	80% = 5.031			
cs =	3.816	40% = 1.681	90% = 7.016			
sd =	2.394	50% = 2.213	95% = 8.397			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	97.22	4.27						
592.0	100.00	0.00	7.778	92.95	5.01						
497.8	100.00	0.00	6.541	87.94	5.17						
418.6	100.00	0.00	5.500	82.77	5.48						
352.0	100.00	0.00	4.625	77.29	6.02						
296.0	100.00	0.00	3.889	71.27	6.63						
248.9	100.00	0.00	3.270	64.74	6.69						
209.3	100.00	0.00	2.750	58.05	6.46						
176.0	100.00	0.00	2.312	51.59	6.22						
148.0	100.00	0.00	1.945	45.37	6.40						
124.5	100.00	0.00	1.635	38.97	7.06						
104.7	100.00	0.00	1.375	31.91	7.62						
88.00	100.00	0.00	1.156	24.29	7.13						
74.00	100.00	0.00	0.972	17.16	5.58						
62.23	100.00	0.00	0.818	11.58	3.86						
52.33	100.00	0.00	0.688	7.72	2.59						
44.00	100.00	0.00	0.578	5.13	1.77						
37.00	100.00	0.00	0.486	3.36	1.24						
31.11	100.00	0.00	0.409	2.12	0.91						
26.16	100.00	0.00	0.344	1.21	0.70						
22.00	100.00	0.00	0.289	0.51	0.51						
18.50	100.00	0.00	0.243	0.00	0.00						
15.56	100.00	0.00	0.204	0.00	0.00						
13.08	100.00	0.50	0.172	0.00	0.00						
11.00	99.50	2.28	0.145	0.00	0.00						

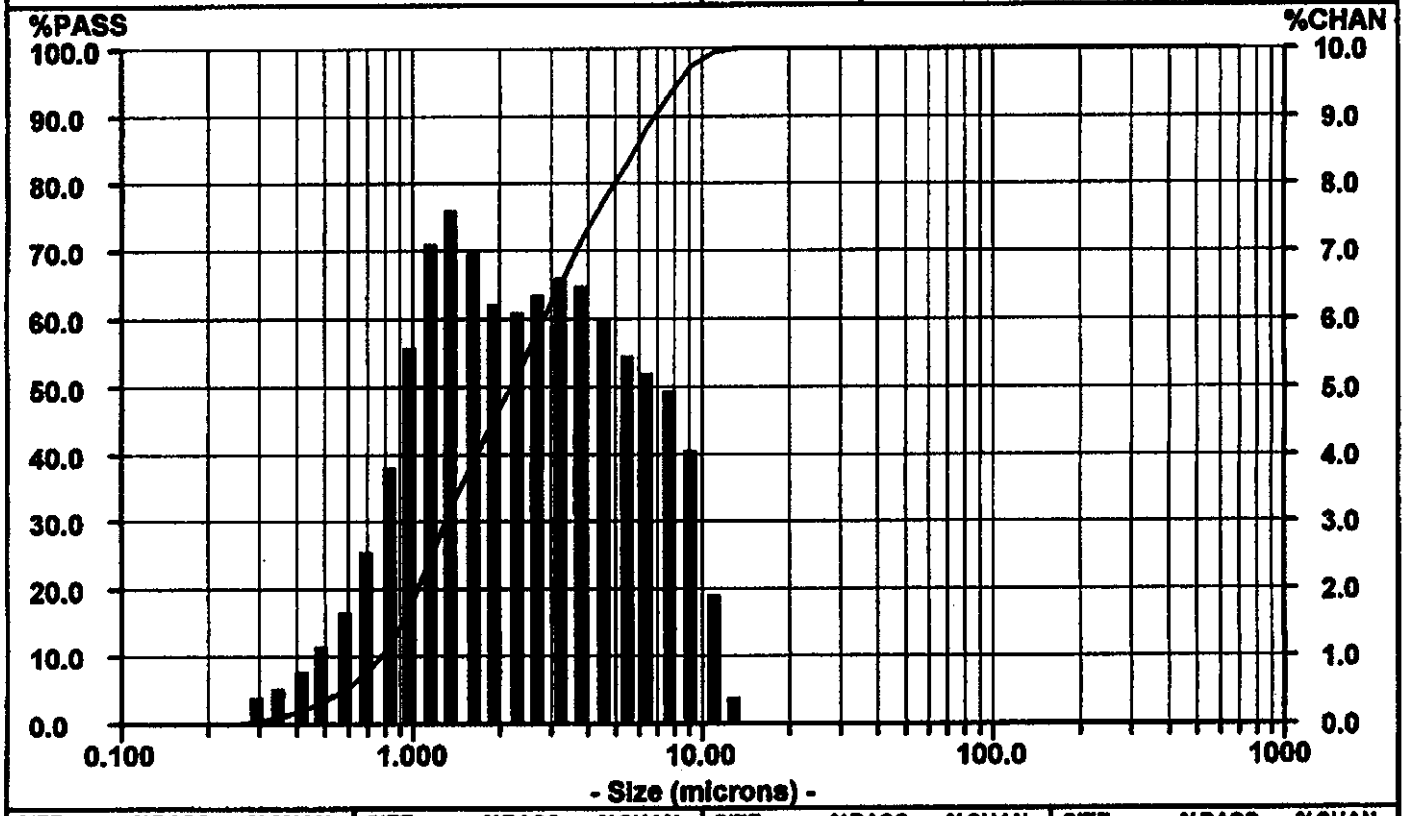
C-104

C-104 Sample

Date: 09/26/91 Meas #: 00001
Time: 12:51 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Sonicate for 20 min. followed by a 60 min delay
External Sonifier
Flow Rate = 60 ml/sec
Refractive Index = 1.70 Particle/1.33 Medium
File: 104C021

Summary	Percentiles		Dia	Vol%	Width
mv = 3.051	10% = 0.767	60% = 2.873	4.026	54%	4.736
mn = 0.558	20% = 1.040	70% = 3.728	1.112	46%	0.926
ma = 1.567	30% = 1.309	80% = 4.977			
cs = 3.828	40% = 1.670	90% = 6.897			
sd = 2.358	50% = 2.198	95% = 8.260			



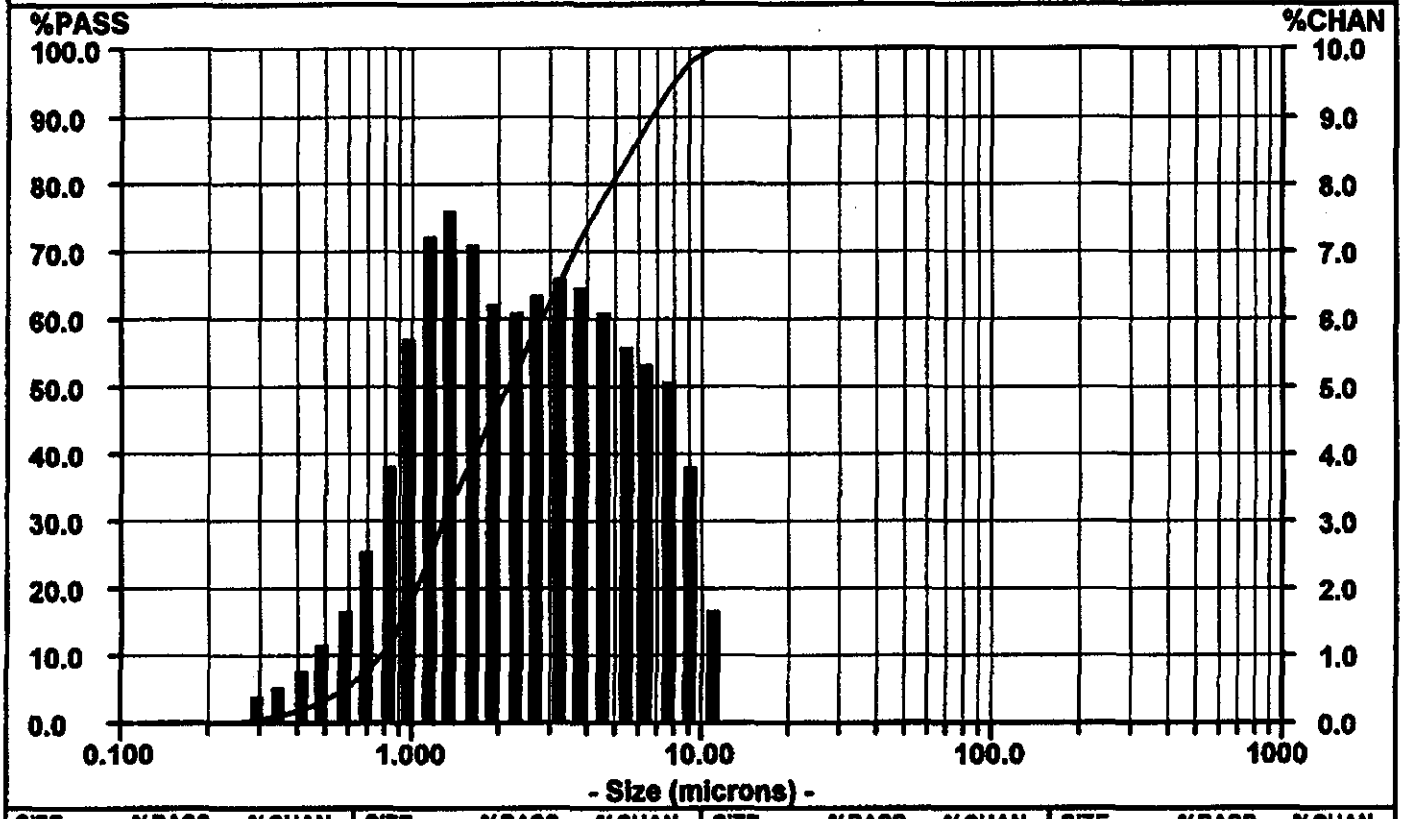
SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	97.56	4.11						
592.0	100.00	0.00	7.776	93.45	5.03						
497.8	100.00	0.00	6.541	88.42	5.26						
418.6	100.00	0.00	5.500	83.16	5.55						
352.0	100.00	0.00	4.625	77.61	6.05						
296.0	100.00	0.00	3.889	71.56	6.54						
248.9	100.00	0.00	3.270	65.02	6.70						
209.3	100.00	0.00	2.750	58.32	6.48						
176.0	100.00	0.00	2.312	51.84	6.23						
148.0	100.00	0.00	1.945	45.61	6.39						
124.5	100.00	0.00	1.635	39.22	7.06						
104.7	100.00	0.00	1.375	32.16	7.64						
88.00	100.00	0.00	1.156	24.52	7.21						
74.00	100.00	0.00	0.972	17.31	5.67						
62.23	100.00	0.00	0.818	11.64	3.93						
52.33	100.00	0.00	0.688	7.71	2.63						
44.00	100.00	0.00	0.578	5.08	1.78						
37.00	100.00	0.00	0.486	3.30	1.23						
31.11	100.00	0.00	0.409	2.07	0.89						
26.16	100.00	0.00	0.344	1.18	0.68						
22.00	100.00	0.00	0.289	0.50	0.50						
18.50	100.00	0.00	0.243	0.00	0.00						
15.56	100.00	0.00	0.204	0.00	0.00						
13.08	100.00	0.41	0.172	0.00	0.00						
11.00	99.59	2.03	0.145	0.00	0.00						

C-104

C-104 Sample — Date: 09/26/91 Meas #: 00001 Time: 12:56 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Sonicate for 20 min. followed by a 60 min delay
External Sonifier
Flow Rate = 17 ml/sec
Refractive Index = 1.70 Particle/1.33 Medium
File: 104C022

Summary		Percentiles			Dia	Vol%	Width
mv	= 2.989	10% = 0.766	60% = 2.842		4.002	54%	4.558
mn	= 0.564	20% = 1.035	70% = 3.686		1.111	46%	0.920
ma	= 1.559	30% = 1.298	80% = 4.894				
cs	= 3.848	40% = 1.649	90% = 6.717				
sd	= 2.301	50% = 2.171	95% = 7.992				



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.260	98.25	3.96						
592.0	100.00	0.00	7.778	94.29	5.10						
497.8	100.00	0.00	6.541	89.19	5.40						
418.6	100.00	0.00	5.500	83.79	5.67						
352.0	100.00	0.00	4.625	78.12	6.12						
296.0	100.00	0.00	3.889	72.00	6.56						
248.9	100.00	0.00	3.270	65.44	6.70						
209.3	100.00	0.00	2.750	58.74	6.46						
176.0	100.00	0.00	2.312	52.28	6.21						
148.0	100.00	0.00	1.945	46.07	6.39						
124.5	100.00	0.00	1.635	39.68	7.11						
104.7	100.00	0.00	1.375	32.57	7.75						
88.00	100.00	0.00	1.156	24.82	7.35						
74.00	100.00	0.00	0.972	17.47	5.78						
62.23	100.00	0.00	0.818	11.69	3.99						
52.33	100.00	0.00	0.688	7.70	2.65						
44.00	100.00	0.00	0.578	5.05	1.79						
37.00	100.00	0.00	0.486	3.26	1.24						
31.11	100.00	0.00	0.409	2.02	0.88						
26.16	100.00	0.00	0.344	1.14	0.67						
22.00	100.00	0.00	0.289	0.47	0.47						
18.50	100.00	0.00	0.243	0.00	0.00						
15.56	100.00	0.00	0.204	0.00	0.00						
13.08	100.00	0.00	0.172	0.00	0.00						
11.00	100.00	1.75	0.145	0.00	0.00						

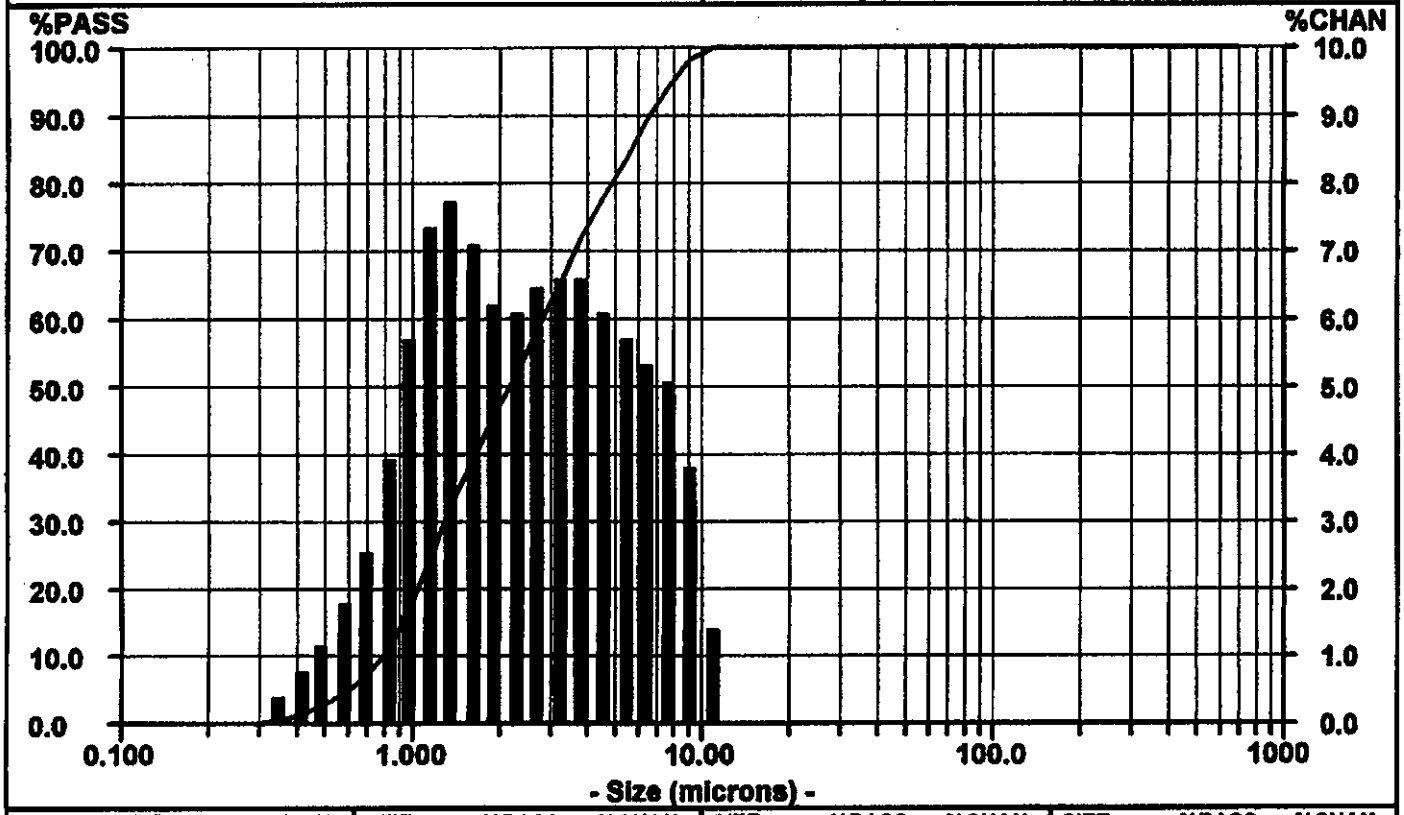
C-104

C-104
Sample

Date: 09/26/91 Meas #: 00001
Time: 13:00 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Sonicate for 20 min. followed by a 60 min delay
External Sonifier
Flow Rate = 17 ml/sec.
Refractive Index = 1.50 Particle/1.33 Medium
File: 104C023

Summary		Percentiles		Dia	Vol%	Width
mv =	2.983	10% = 0.781	60% = 2.848	3.990	54%	4.490
mn =	0.643	20% = 1.042	70% = 3.684	1.115	46%	0.902
ma =	1.696	30% = 1.302	80% = 4.878			
cs =	3.759	40% = 1.654	90% = 6.663			
sd =	2.283	50% = 2.179	95% = 7.906			



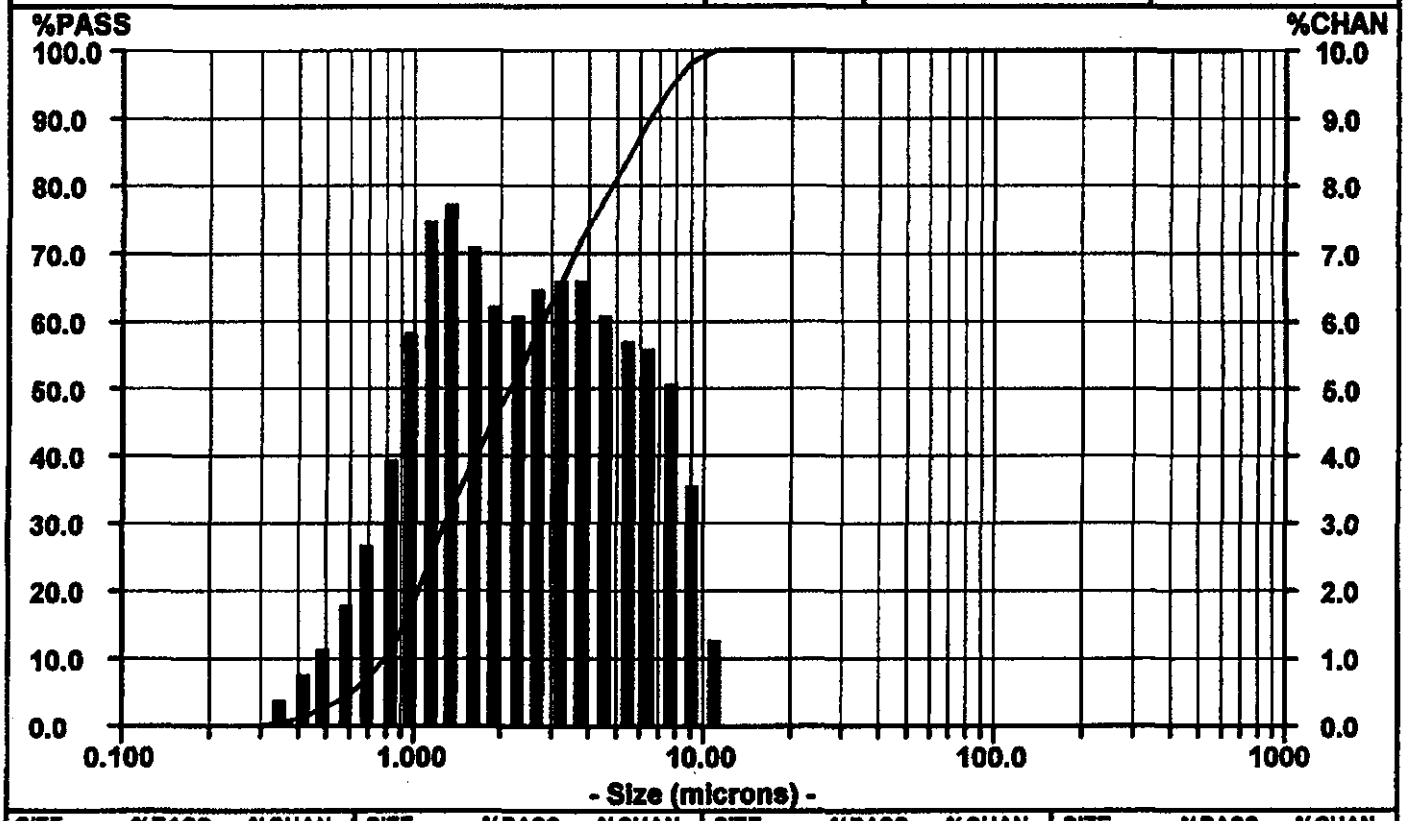
SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	98.43	3.85						
592.0	100.00	0.00	7.778	94.58	5.15						
497.8	100.00	0.00	6.541	89.43	5.49						
418.6	100.00	0.00	5.500	83.94	5.73						
352.0	100.00	0.00	4.625	78.21	6.17						
296.0	100.00	0.00	3.889	72.04	6.62						
248.9	100.00	0.00	3.270	65.42	6.77						
209.3	100.00	0.00	2.750	58.65	6.50						
176.0	100.00	0.00	2.312	52.15	6.21						
148.0	100.00	0.00	1.945	45.94	6.37						
124.5	100.00	0.00	1.635	39.57	7.12						
104.7	100.00	0.00	1.375	32.45	7.83						
88.00	100.00	0.00	1.156	24.62	7.48						
74.00	100.00	0.00	0.972	17.14	5.89						
62.23	100.00	0.00	0.818	11.25	4.06						
52.33	100.00	0.00	0.688	7.19	2.69						
44.00	100.00	0.00	0.578	4.50	1.80						
37.00	100.00	0.00	0.486	2.70	1.23						
31.11	100.00	0.00	0.409	1.47	0.87						
26.16	100.00	0.00	0.344	0.60	0.60						
22.00	100.00	0.00	0.289	0.00	0.00						
18.50	100.00	0.00	0.243	0.00	0.00						
15.56	100.00	0.00	0.204	0.00	0.00						
13.08	100.00	0.00	0.172	0.00	0.00						
11.00	100.00	1.57	0.145	0.00	0.00						

C-104

C-104 Sample
Date: 09/26/91 Meas #: 00001
Time: 13:04 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Sonicate for 20 min. followed by a 60 min delay
External Sonifier
Flow Rate = 17 ml/sec.
Refractive Index = 2.00 Particle/1.33 Medium
File: 104C024

Summary	Percentiles		Dia	Vol%	Width
mv = 2.960	10% = 0.780	60% = 2.833	3.983	54%	4.410
mn = 0.643	20% = 1.039	70% = 3.668	1.114	46%	0.901
ma = 1.591	30% = 1.298	80% = 4.849			
cs = 3.770	40% = 1.646	90% = 6.583			
sd = 2.263	50% = 2.167	95% = 7.787			



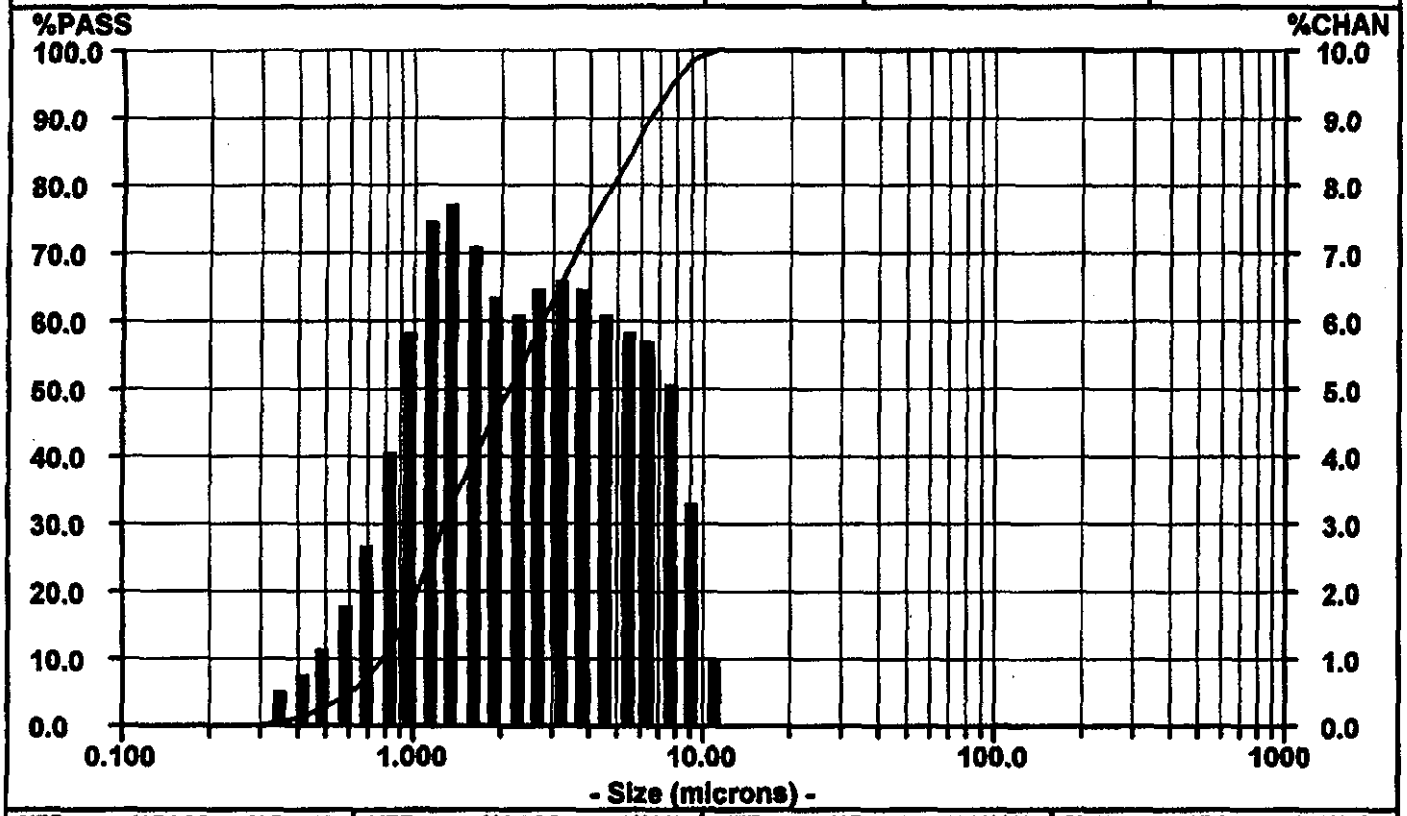
SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	98.63	3.66						
592.0	100.00	0.00	7.778	94.97	5.17						
497.8	100.00	0.00	6.541	89.80	5.60						
418.6	100.00	0.00	5.500	84.20	5.81						
352.0	100.00	0.00	4.625	78.39	6.19						
296.0	100.00	0.00	3.889	72.20	6.60						
248.9	100.00	0.00	3.270	65.60	6.74						
209.3	100.00	0.00	2.750	58.86	6.50						
176.0	100.00	0.00	2.312	52.36	6.22						
148.0	100.00	0.00	1.945	46.14	6.39						
124.5	100.00	0.00	1.635	39.75	7.14						
104.7	100.00	0.00	1.375	32.61	7.87						
88.00	100.00	0.00	1.156	24.74	7.52						
74.00	100.00	0.00	0.972	17.22	5.93						
62.23	100.00	0.00	0.818	11.29	4.08						
52.33	100.00	0.00	0.688	7.21	2.70						
44.00	100.00	0.00	0.578	4.51	1.81						
37.00	100.00	0.00	0.486	2.70	1.23						
31.11	100.00	0.00	0.409	1.47	0.87						
26.16	100.00	0.00	0.344	0.60	0.60						
22.00	100.00	0.00	0.289	0.00	0.00						
18.50	100.00	0.00	0.243	0.00	0.00						
15.56	100.00	0.00	0.204	0.00	0.00						
13.08	100.00	0.00	0.172	0.00	0.00						
11.00	100.00	1.37	0.145	0.00	0.00						

C-104

C-104 Sample — Date: 09/26/91 Meas #: 00001 — Time: 13:08 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Sonicate for 20 min. followed by a 60 min delay
External Sonifier
Flow Rate = 40 ml/sec.
Refractive Index = 2.00 Particle/1.33 Medium
File: 104C025

Summary	Percentiles		Dia	Vol%	Width
mv = 2.935	10% = 0.774	60% = 2.814	3.975	54%	4.333
mn = 0.841	20% = 1.034	70% = 3.648	1.112	46%	0.904
ma = 1.682	30% = 1.292	80% = 4.817			
cs = 3.792	40% = 1.637	90% = 6.501			
sd = 2.242	50% = 2.151	95% = 7.679			



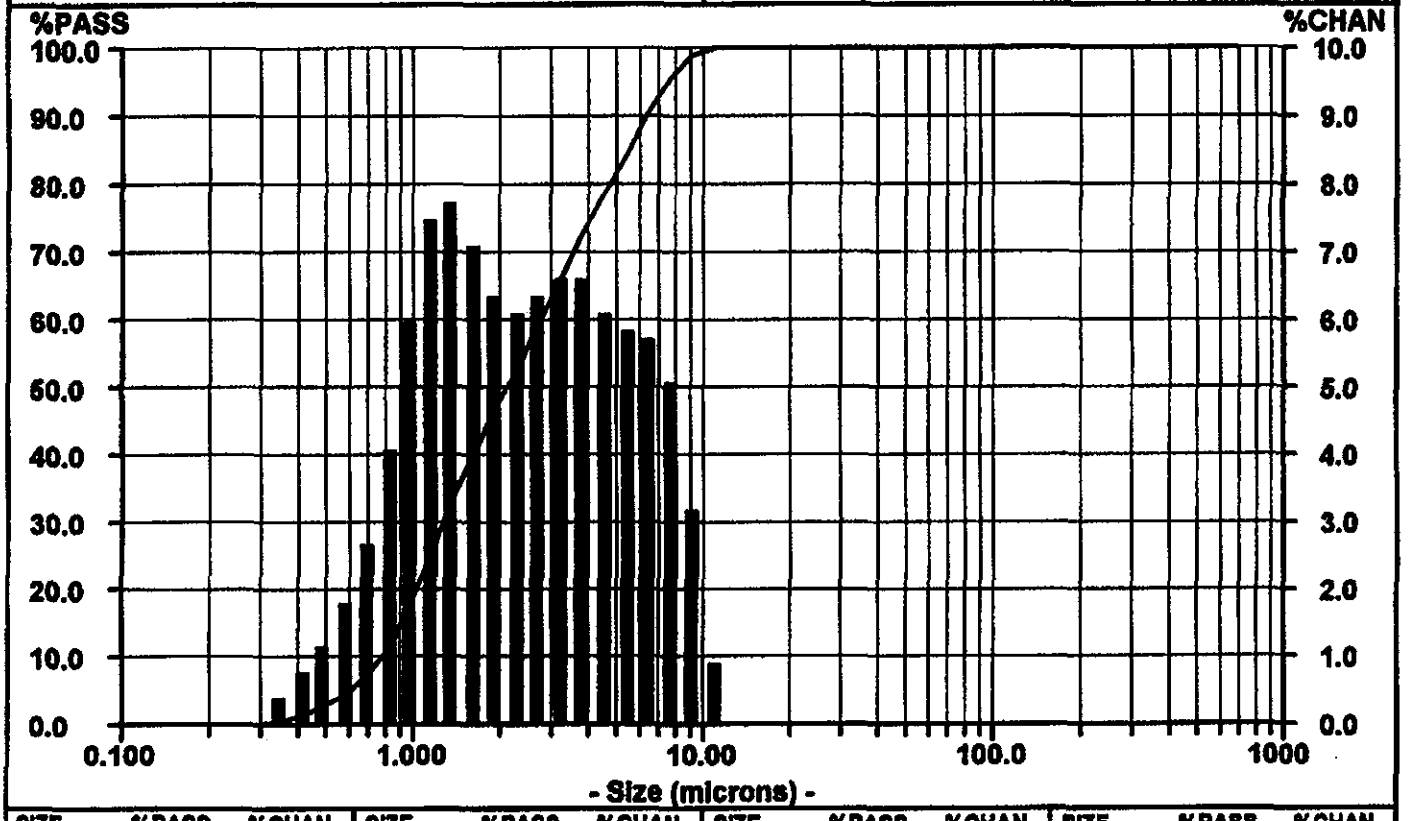
SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	98.80	3.45						
592.0	100.00	0.00	7.778	95.35	5.15						
497.8	100.00	0.00	6.541	90.20	5.70						
418.6	100.00	0.00	5.500	84.50	5.90						
352.0	100.00	0.00	4.625	78.60	6.20						
296.0	100.00	0.00	3.889	72.40	6.56						
248.9	100.00	0.00	3.270	65.84	6.71						
209.3	100.00	0.00	2.750	59.13	6.50						
176.0	100.00	0.00	2.312	52.63	6.25						
148.0	100.00	0.00	1.945	46.38	6.42						
124.5	100.00	0.00	1.635	39.96	7.16						
104.7	100.00	0.00	1.375	32.81	7.85						
88.00	100.00	0.00	1.156	24.96	7.51						
74.00	100.00	0.00	0.972	17.45	5.97						
62.23	100.00	0.00	0.818	11.48	4.15						
52.33	100.00	0.00	0.688	7.33	2.75						
44.00	100.00	0.00	0.578	4.58	1.84						
37.00	100.00	0.00	0.486	2.74	1.25						
31.11	100.00	0.00	0.409	1.49	0.88						
26.16	100.00	0.00	0.344	0.61	0.61						
22.00	100.00	0.00	0.289	0.00	0.00						
18.50	100.00	0.00	0.243	0.00	0.00						
15.56	100.00	0.00	0.204	0.00	0.00						
13.08	100.00	0.00	0.172	0.00	0.00						
11.00	100.00	1.20	0.145	0.00	0.00						

C-104

C-104 Sample — Date: 09/26/91 Meas #: 00001 Time: 13:13 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Sonicate for 20 min. followed by a 60 min delay
External Sonifier
Flow Rate = 40 ml/sec.
Refractive Index = 1.50 Particle/1.33 Medium
File: 104C026

Summary		Percentiles		Dia	Vol%	Width
mv	= 2.916	10% = 0.775	60% = 2.805	3.963	53%	4.264
mn	= 0.644	20% = 1.032	70% = 3.632	1.111	47%	0.900
ms	= 1.580	30% = 1.287	80% = 4.782			
cs	= 3.798	40% = 1.630	90% = 6.432			
sd	= 2.219	50% = 2.143	95% = 7.586			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	98.96	3.29						
592.0	100.00	0.00	7.778	95.67	5.12						
497.8	100.00	0.00	6.541	90.55	5.75						
418.6	100.00	0.00	5.500	84.80	5.96						
352.0	100.00	0.00	4.625	78.84	6.26						
296.0	100.00	0.00	3.889	72.58	6.61						
248.9	100.00	0.00	3.270	65.97	6.73						
209.3	100.00	0.00	2.750	59.24	6.49						
176.0	100.00	0.00	2.312	52.75	6.22						
148.0	100.00	0.00	1.945	46.53	6.40						
124.5	100.00	0.00	1.635	40.13	7.16						
104.7	100.00	0.00	1.375	32.98	7.89						
88.00	100.00	0.00	1.156	25.09	7.59						
74.00	100.00	0.00	0.972	17.50	6.02						
62.23	100.00	0.00	0.818	11.48	4.17						
52.33	100.00	0.00	0.688	7.31	2.76						
44.00	100.00	0.00	0.578	4.55	1.84						
37.00	100.00	0.00	0.486	2.71	1.25						
31.11	100.00	0.00	0.409	1.46	0.87						
26.16	100.00	0.00	0.344	0.59	0.59						
22.00	100.00	0.00	0.289	0.00	0.00						
18.50	100.00	0.00	0.243	0.00	0.00						
15.56	100.00	0.00	0.204	0.00	0.00						
13.08	100.00	0.00	0.172	0.00	0.00						
11.00	100.00	1.04	0.145	0.00	0.00						

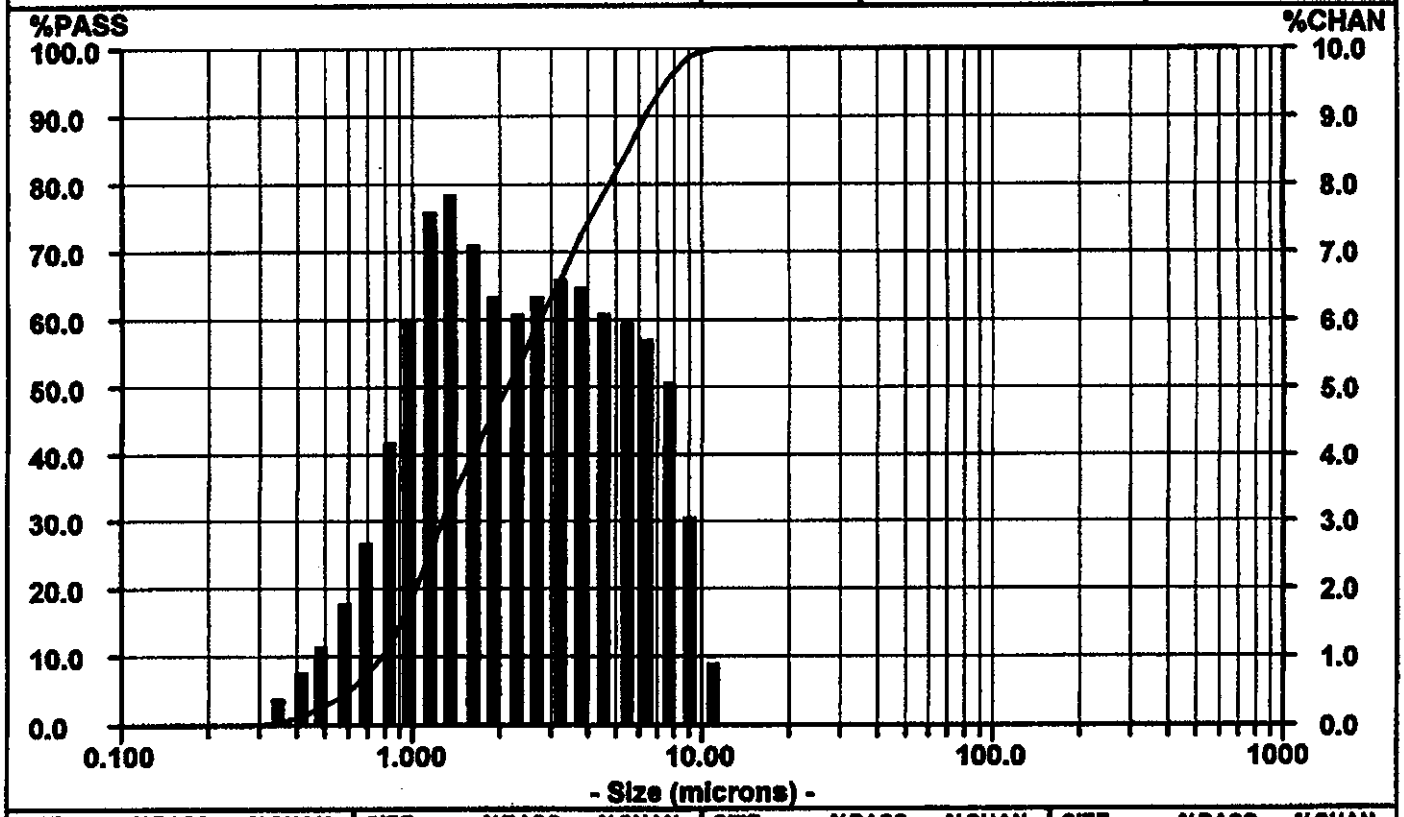
C-104

C-104
Sample

Date: 09/26/91 Meas #: 00001
Time: 13:17 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Sonicate for 20 min. followed by a 60 min delay
External Sonifier
Flow Rate = 40 ml/sec.
Refractive Index = 1.70 Particle/1.33 Medium
File: 104C027

Summary	Percentiles		Dia	Vol%	Width
mv = 2.898	10% = 0.772	60% = 2.793	3.962	53%	4.219
mn = 0.843	20% = 1.029	70% = 3.621	1.110	47%	0.900
ma = 1.574	30% = 1.282	80% = 4.765			
cs = 3.813	40% = 1.621	90% = 6.384			
sd = 2.207	50% = 2.131	95% = 7.513			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	99.06	3.15						
592.0	100.00	0.00	7.778	95.91	5.11						
497.8	100.00	0.00	6.541	90.80	5.82						
418.6	100.00	0.00	5.500	84.98	6.02						
352.0	100.00	0.00	4.625	78.96	6.27						
296.0	100.00	0.00	3.889	72.69	6.59						
248.9	100.00	0.00	3.270	66.10	6.69						
209.3	100.00	0.00	2.750	59.41	6.46						
176.0	100.00	0.00	2.312	52.95	6.21						
148.0	100.00	0.00	1.945	46.74	6.40						
124.5	100.00	0.00	1.635	40.34	7.17						
104.7	100.00	0.00	1.375	33.17	7.92						
88.00	100.00	0.00	1.156	25.25	7.62						
74.00	100.00	0.00	0.972	17.63	6.06						
62.23	100.00	0.00	0.818	11.57	4.20						
52.33	100.00	0.00	0.688	7.37	2.78						
44.00	100.00	0.00	0.578	4.59	1.85						
37.00	100.00	0.00	0.486	2.74	1.26						
31.11	100.00	0.00	0.409	1.48	0.88						
26.16	100.00	0.00	0.344	0.60	0.60						
22.00	100.00	0.00	0.289	0.00	0.00						
18.50	100.00	0.00	0.243	0.00	0.00						
15.56	100.00	0.00	0.204	0.00	0.00						
13.08	100.00	0.00	0.172	0.00	0.00						
11.00	100.00	0.94	0.145	0.00	0.00						

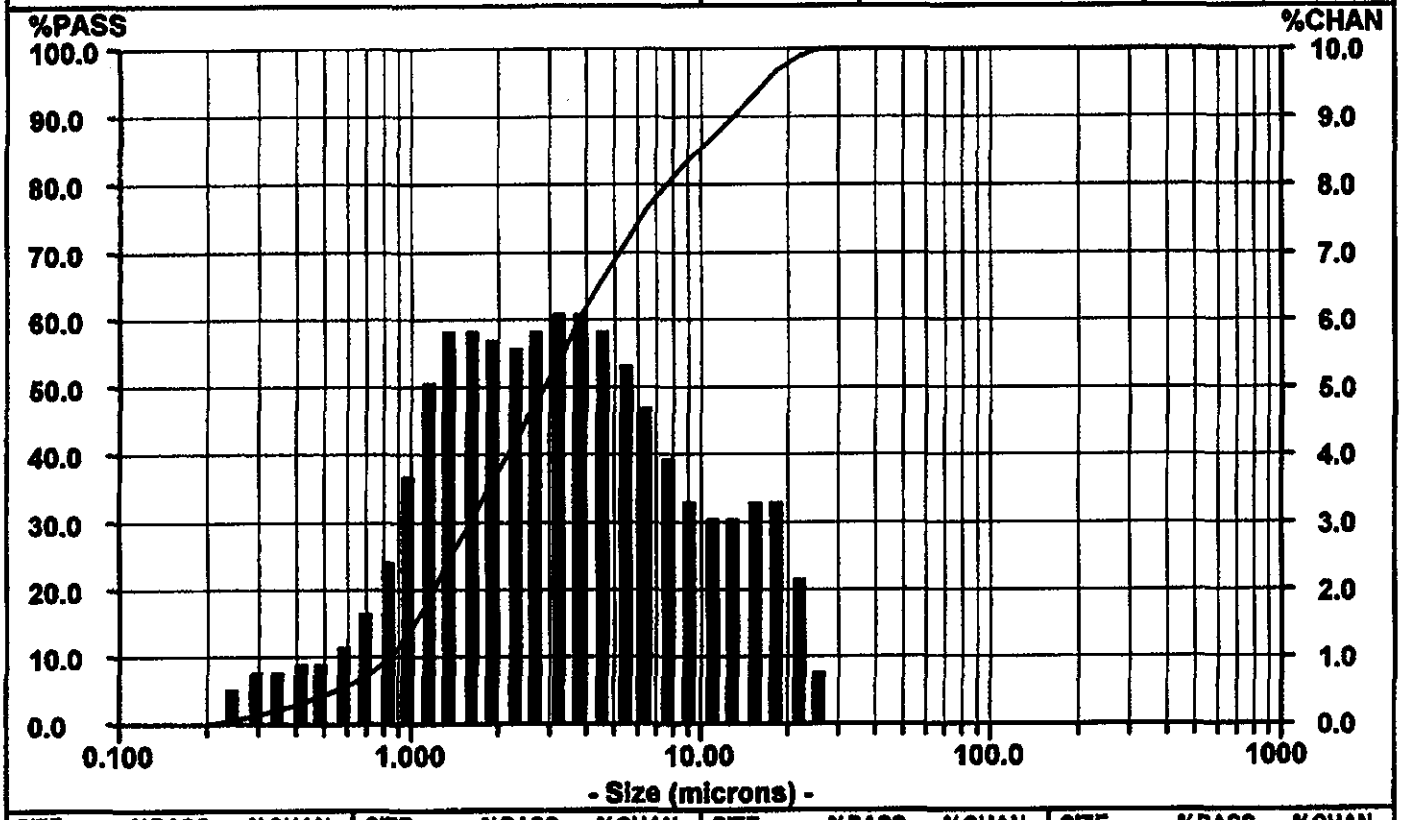
C-104

C-104 Duplicate

Date: 09/26/91 Meas #: 00001
Time: 14:36 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Flow Rate = 17 ml/sec.
Refractive Index = 1.50 Particle/1.33 Medium
File: 104C029

Summary	Percentiles		Dia	Vol%	Width
mv = 4.864	10% = 0.826	60% = 3.847	14.36	16%	8.459
mn = 0.409	20% = 1.201	70% = 5.199	3.862	48%	4.065
ma = 1.752	30% = 1.604	80% = 7.604	1.136	36%	1.033
cs = 3.425	40% = 2.176	90% = 12.96			
sd = 4.114	50% = 2.913	95% = 16.70			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	83.93	3.43						
592.0	100.00	0.00	7.778	80.50	4.04						
497.8	100.00	0.00	6.541	76.46	4.76						
418.6	100.00	0.00	5.500	71.70	5.40						
352.0	100.00	0.00	4.625	66.30	5.91						
296.0	100.00	0.00	3.889	60.39	6.22						
248.9	100.00	0.00	3.270	54.17	6.21						
209.3	100.00	0.00	2.750	47.96	5.94						
176.0	100.00	0.00	2.312	42.02	5.67						
148.0	100.00	0.00	1.945	36.35	5.70						
124.5	100.00	0.00	1.635	30.65	5.96						
104.7	100.00	0.00	1.375	24.69	5.95						
88.00	100.00	0.00	1.156	18.74	5.14						
74.00	100.00	0.00	0.972	13.60	3.78						
62.23	100.00	0.00	0.818	9.82	2.54						
52.33	100.00	0.00	0.688	7.28	1.74						
44.00	100.00	0.00	0.578	5.54	1.29						
37.00	100.00	0.00	0.486	4.25	1.05						
31.11	100.00	0.00	0.409	3.20	0.92						
26.16	100.00	0.86	0.344	2.28	0.85						
22.00	99.14	2.24	0.289	1.43	0.80						
18.50	96.90	3.32	0.243	0.63	0.63						
15.56	93.58	3.41	0.204	0.00	0.00						
13.08	90.17	3.14	0.172	0.00	0.00						
11.00	87.03	3.10	0.145	0.00	0.00						

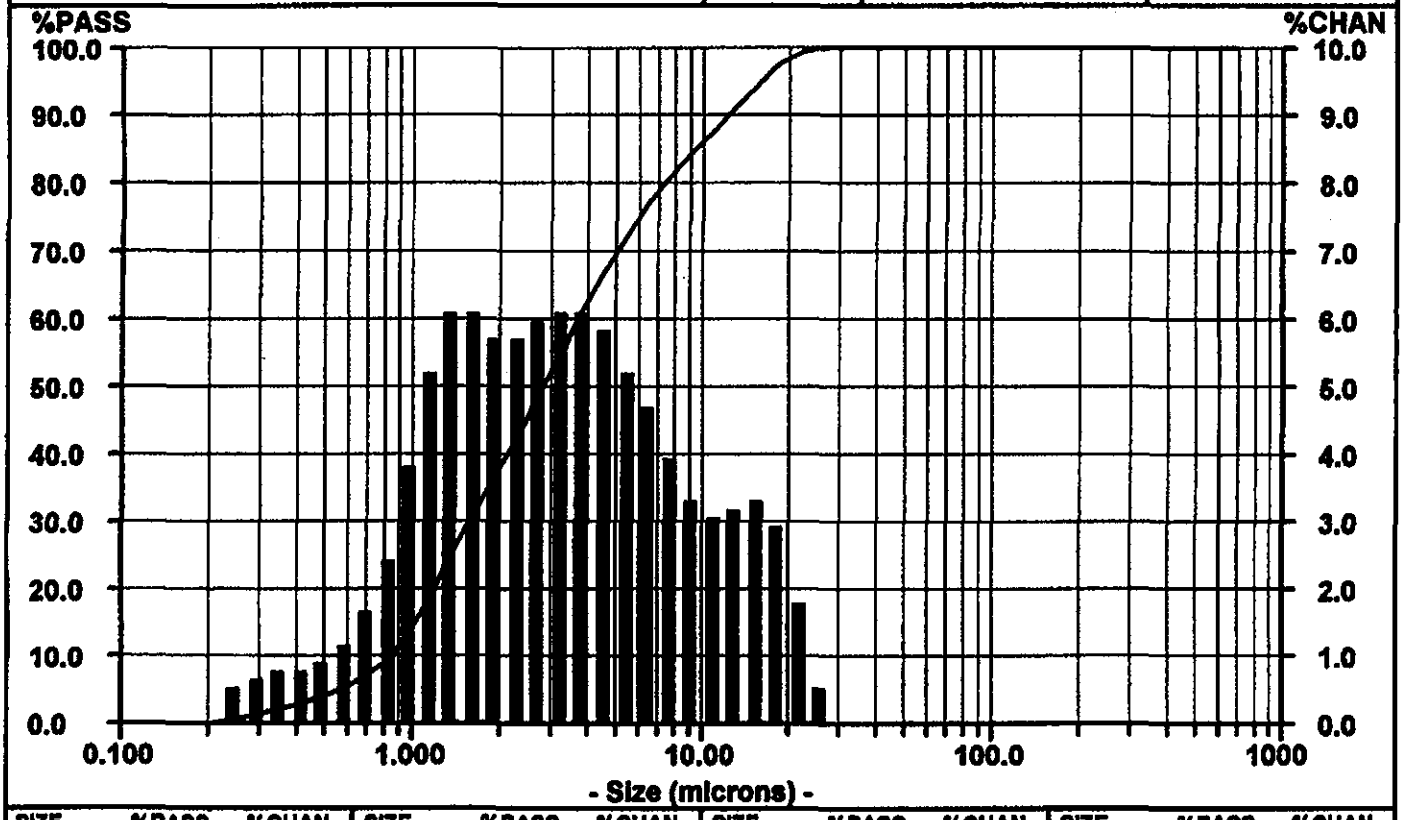
C-104

C-104
Duplicate

Date: 09/26/91 Meas #: 00001
Time: 14:40 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Flow Rate = 17 ml/sec.
Refractive Index = 1.70 Particle/1.33 Medium
File: 104C030

Summary	Percentiles		Dia	Vol%	Width
mv = 4.720	10% = 0.836	60% = 3.773	13.98	15%	7.964
mn = 0.414	20% = 1.200	70% = 5.083	3.853	48%	4.062
ma = 1.752	30% = 1.590	80% = 7.372	1.146	37%	1.017
cs = 3.424	40% = 2.141	90% = 12.39			
sd = 3.937	50% = 2.862	95% = 16.03			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	84.66	3.47						
592.0	100.00	0.00	7.778	81.19	4.05						
497.8	100.00	0.00	6.541	77.14	4.75						
418.6	100.00	0.00	5.500	72.39	5.39						
352.0	100.00	0.00	4.625	67.00	5.92						
296.0	100.00	0.00	3.889	61.08	6.24						
248.9	100.00	0.00	3.270	54.84	6.26						
209.3	100.00	0.00	2.750	48.58	6.00						
176.0	100.00	0.00	2.312	42.58	5.76						
148.0	100.00	0.00	1.945	36.82	5.83						
124.5	100.00	0.00	1.635	30.99	6.14						
104.7	100.00	0.00	1.375	24.85	6.14						
88.00	100.00	0.00	1.156	18.71	5.29						
74.00	100.00	0.00	0.972	13.42	3.83						
62.23	100.00	0.00	0.818	9.59	2.54						
52.33	100.00	0.00	0.688	7.05	1.71						
44.00	100.00	0.00	0.578	5.34	1.25						
37.00	100.00	0.00	0.486	4.09	1.01						
31.11	100.00	0.00	0.409	3.08	0.88						
26.16	100.00	0.61	0.344	2.20	0.82						
22.00	99.39	1.87	0.289	1.38	0.77						
18.50	97.52	3.09	0.243	0.61	0.61						
15.56	94.43	3.39	0.204	0.00	0.00						
13.08	91.04	3.21	0.172	0.00	0.00						
11.00	87.83	3.17	0.145	0.00	0.00						

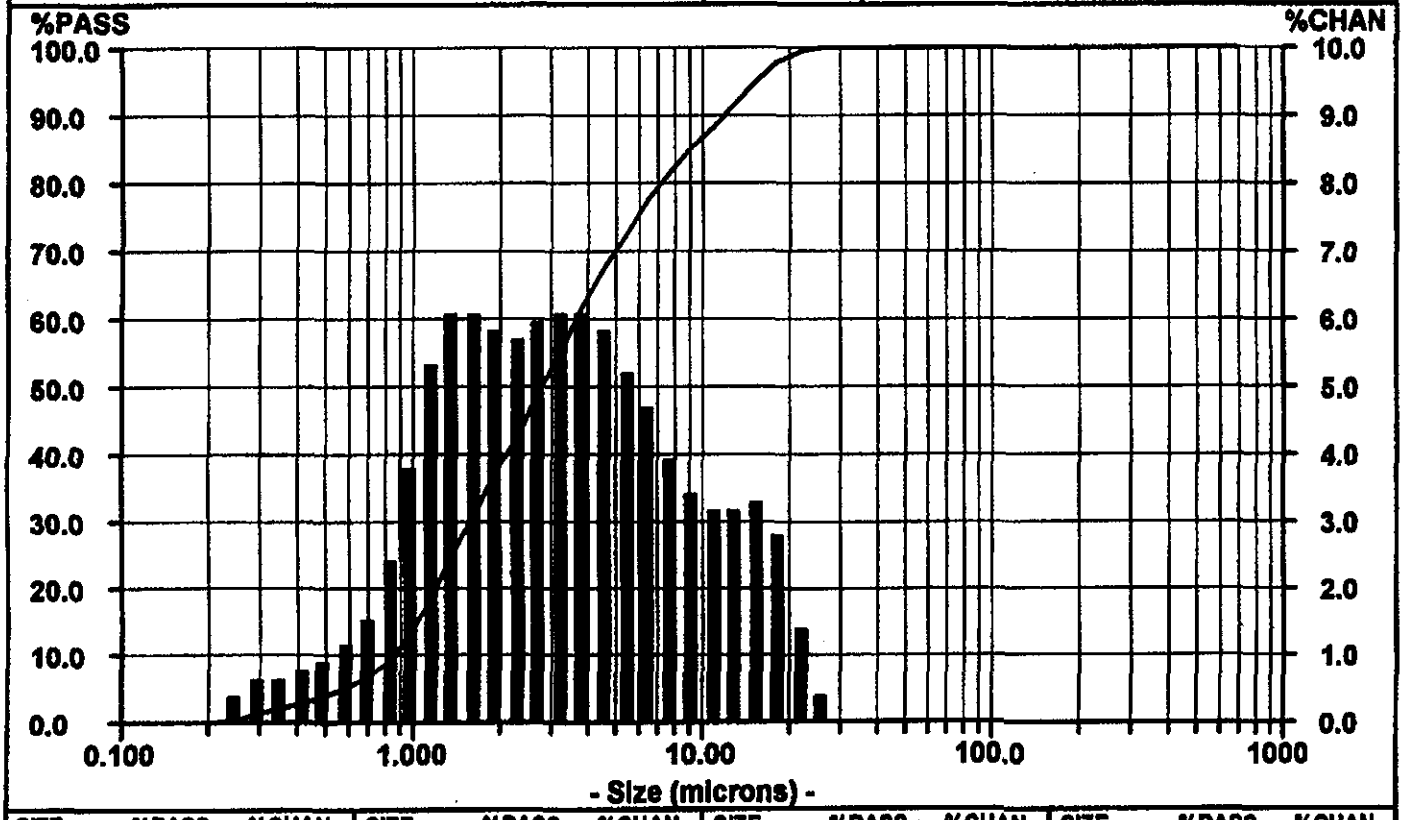
C-104

C-104
Duplicate

Date: 09/26/91 Meas #: 00001
Time: 14:44 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Flow Rate = 17ml/sec
Refractive Index = 2.00 Particle/1.33 Medium
File: 104C031

Summary	Percentiles		Dia	Vol%	Width
mv = 4.605	10% = 0.845	60% = 3.714	13.68	15%	7.557
mn = 0.419	20% = 1.201	70% = 4.987	3.842	48%	4.063
ma = 1.754	30% = 1.580	80% = 7.192	1.153	37%	1.004
cs = 3.421	40% = 2.117	90% = 11.93			
sd = 3.803	50% = 2.824	95% = 15.46			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	85.28	3.50						
592.0	100.00	0.00	7.778	81.76	4.05						
497.8	100.00	0.00	6.541	77.71	4.73						
418.6	100.00	0.00	5.500	72.98	5.39						
352.0	100.00	0.00	4.625	67.59	5.94						
296.0	100.00	0.00	3.889	61.65	6.29						
248.9	100.00	0.00	3.270	55.36	6.30						
209.3	100.00	0.00	2.750	49.06	6.07						
176.0	100.00	0.00	2.312	42.99	5.84						
148.0	100.00	0.00	1.945	37.15	5.93						
124.5	100.00	0.00	1.635	31.22	6.27						
104.7	100.00	0.00	1.375	24.95	6.29						
88.00	100.00	0.00	1.156	18.66	5.40						
74.00	100.00	0.00	0.972	13.26	3.88						
62.23	100.00	0.00	0.818	9.38	2.53						
52.33	100.00	0.00	0.688	6.85	1.68						
44.00	100.00	0.00	0.578	5.17	1.22						
37.00	100.00	0.00	0.486	3.95	0.97						
31.11	100.00	0.00	0.409	2.98	0.85						
26.16	100.00	0.44	0.344	2.13	0.79						
22.00	99.56	1.56	0.289	1.34	0.75						
18.50	98.00	2.88	0.243	0.59	0.59						
15.56	95.12	3.36	0.204	0.00	0.00						
13.08	91.76	3.27	0.172	0.00	0.00						
11.00	88.49	3.23	0.145	0.00	0.00						

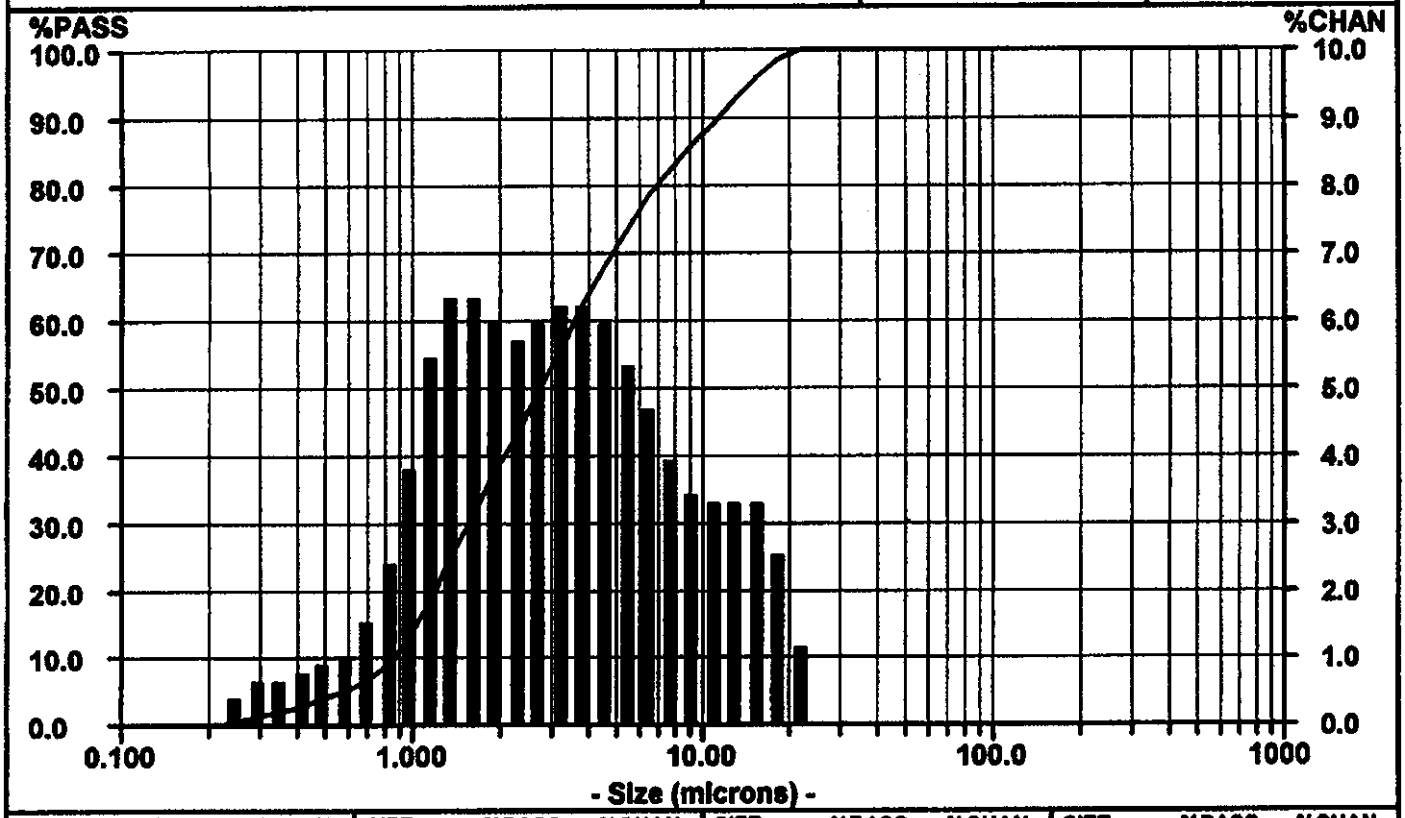
C-104

C-104 Duplicate

Date: 09/26/91 Meas #: 00001
Time: 14:50 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Flow Rate = 40 ml/sec
Refractive Index = 1.50 Particle/1.33 Medium
File: 104C032

Summary	Percentiles		Dia	Vol%	Width
mv = 4.434	10% = 0.861	60% = 3.650	13.28	14%	6.829
mn = 0.423	20% = 1.198	70% = 4.870	3.844	49%	4.065
ma = 1.748	30% = 1.564	80% = 6.947	1.159	37%	0.991
cs = 3.432	40% = 2.087	90% = 11.33			
sd = 3.622	50% = 2.782	95% = 14.66			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	86.15	3.55						
592.0	100.00	0.00	7.778	82.60	4.08						
497.8	100.00	0.00	6.541	78.52	4.76						
418.6	100.00	0.00	5.500	73.76	5.44						
352.0	100.00	0.00	4.625	68.32	6.01						
296.0	100.00	0.00	3.889	62.31	6.36						
248.9	100.00	0.00	3.270	55.95	6.36						
209.3	100.00	0.00	2.750	49.59	6.09						
176.0	100.00	0.00	2.312	43.50	5.88						
148.0	100.00	0.00	1.945	37.62	6.01						
124.5	100.00	0.00	1.635	31.61	6.42						
104.7	100.00	0.00	1.375	25.19	6.48						
88.00	100.00	0.00	1.156	18.71	5.54						
74.00	100.00	0.00	0.972	13.17	3.93						
62.23	100.00	0.00	0.816	9.24	2.52						
52.33	100.00	0.00	0.686	6.72	1.65						
44.00	100.00	0.00	0.576	5.07	1.19						
37.00	100.00	0.00	0.486	3.88	0.96						
31.11	100.00	0.00	0.409	2.92	0.84						
26.16	100.00	0.00	0.344	2.08	0.78						
22.00	100.00	1.25	0.289	1.30	0.73						
18.50	98.75	2.64	0.243	0.57	0.57						
15.56	96.11	3.33	0.204	0.00	0.00						
13.08	92.78	3.33	0.172	0.00	0.00						
11.00	89.45	3.30	0.145	0.00	0.00						

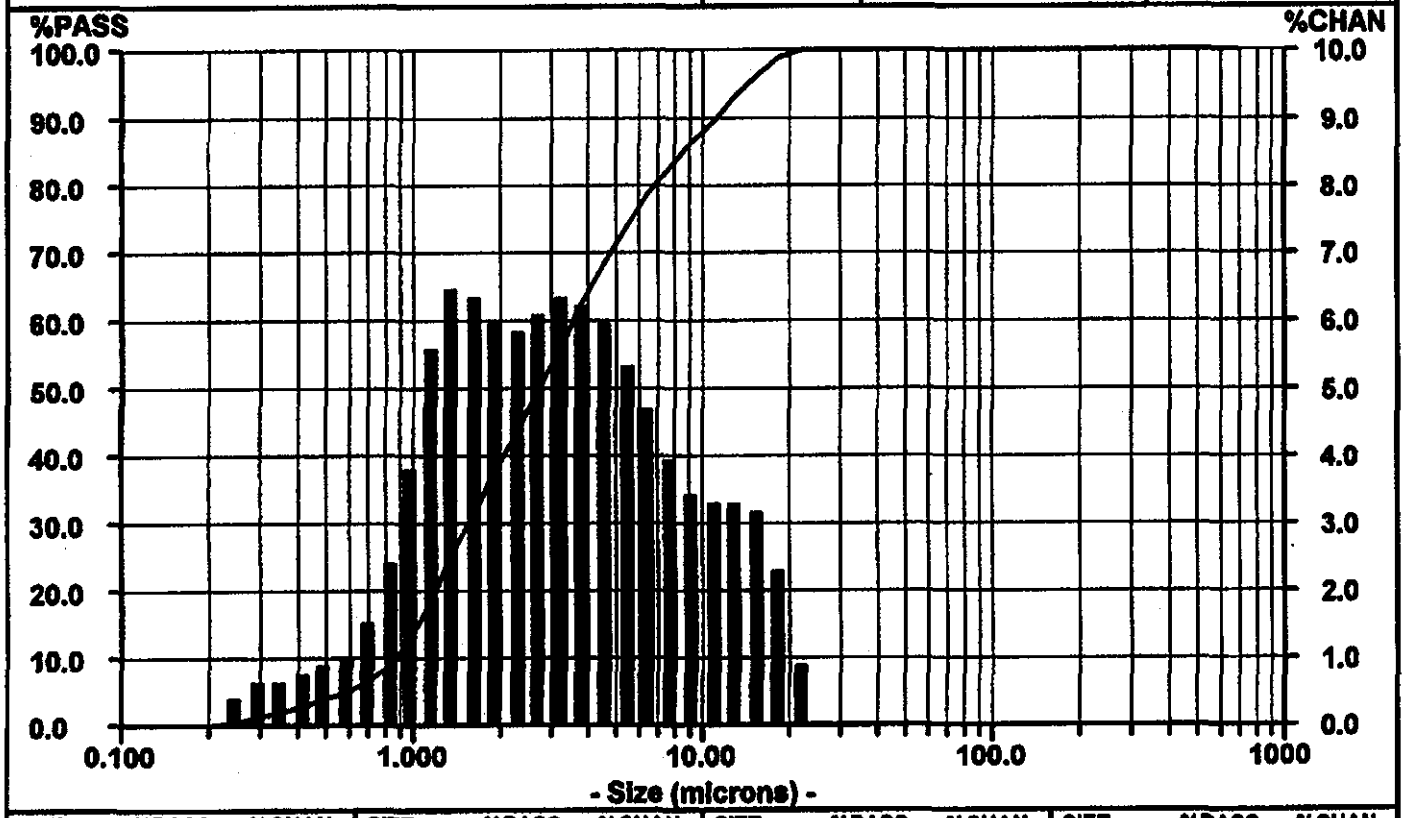
C-104

C-104 Duplicate

Date: 09/26/91 Meas #: 00001
Time: 14:54 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Flow Rate = 40 ml/sec
Refractive Index = 1.70 Particle/1.33 Medium
File: 104C033

Summary	Percentiles		Dia	Vol%	Width
mv = 4.373	10% = 0.854	60% = 3.616	4.957	62%	8.518
mn = 0.426	20% = 1.196	70% = 4.814	1.161	38%	0.984
ma = 1.748	30% = 1.568	80% = 6.845			
cs = 3.433	40% = 2.074	90% = 11.08			
sd = 3.551	50% = 2.760	95% = 14.39			

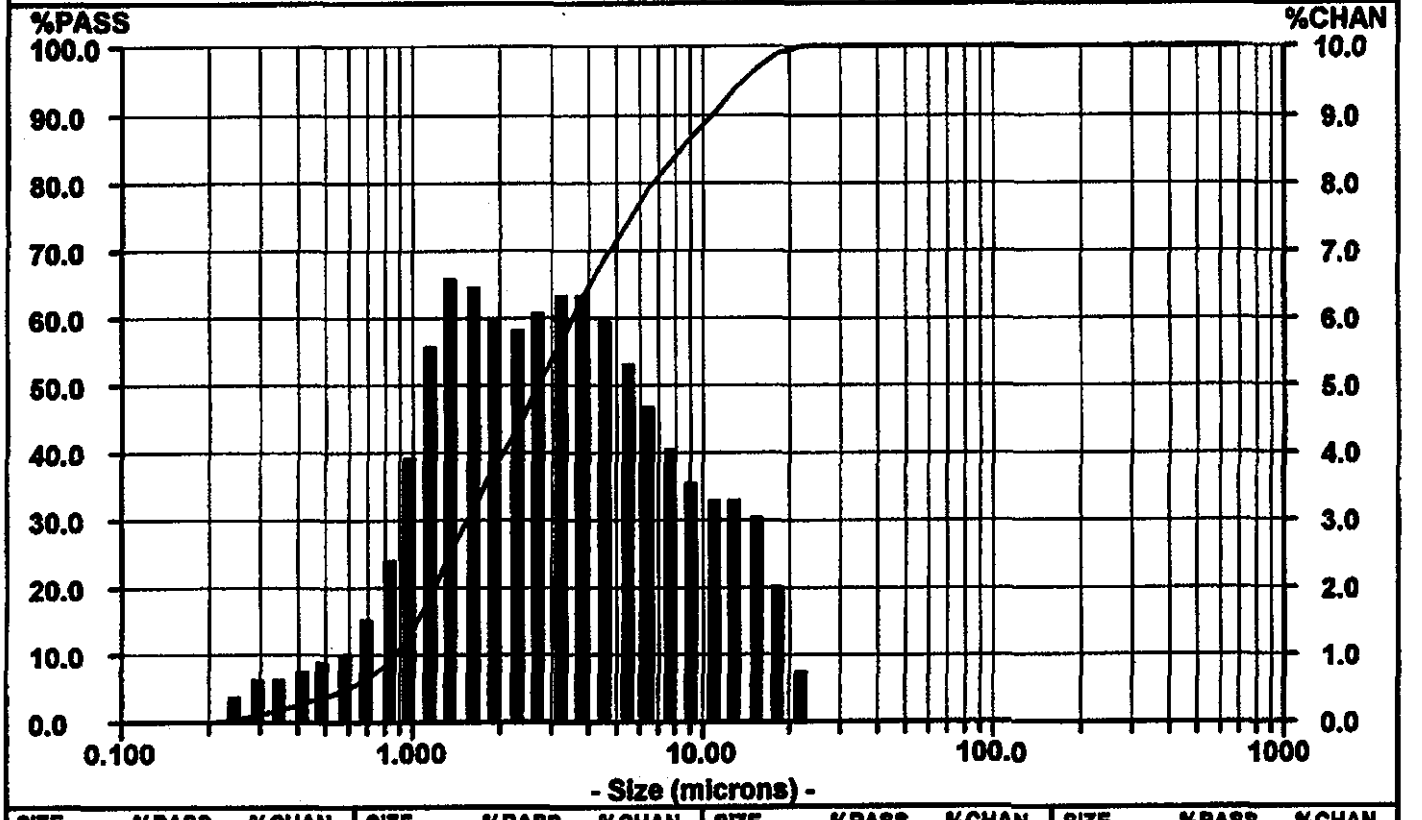


SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	86.52	3.57						
592.0	100.00	0.00	7.778	82.95	4.08						
497.8	100.00	0.00	6.541	78.87	4.75						
418.6	100.00	0.00	5.500	74.12	5.43						
352.0	100.00	0.00	4.625	68.69	6.02						
296.0	100.00	0.00	3.889	62.67	6.39						
248.9	100.00	0.00	3.270	56.28	6.41						
209.3	100.00	0.00	2.750	49.87	6.14						
176.0	100.00	0.00	2.312	43.73	5.91						
148.0	100.00	0.00	1.945	37.82	6.05						
124.5	100.00	0.00	1.635	31.77	6.47						
104.7	100.00	0.00	1.375	25.30	6.56						
88.00	100.00	0.00	1.156	18.74	5.61						
74.00	100.00	0.00	0.972	13.13	3.97						
62.23	100.00	0.00	0.816	9.16	2.53						
52.33	100.00	0.00	0.686	6.63	1.66						
44.00	100.00	0.00	0.576	4.98	1.18						
37.00	100.00	0.00	0.486	3.80	0.94						
31.11	100.00	0.00	0.409	2.86	0.82						
26.16	100.00	0.00	0.344	2.04	0.76						
22.00	100.00	1.08	0.289	1.28	0.72						
18.50	98.92	2.46	0.243	0.56	0.56						
15.56	96.46	3.26	0.204	0.00	0.00						
13.08	93.20	3.34	0.172	0.00	0.00						
11.00	89.86	3.34	0.145	0.00	0.00						

C-104	C-104 Duplicate	Date: 09/26/91 Time: 14:59	Meas #: 00001 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Flow Rate = 40 ml/sec
Refractive Index = 2.00 Particle/1.33 Medium
File: 104C034

Summary	Percentiles		Dia	Vol%	Width
mv = 4.291	10% = 0.857	60% = 3.582	4.817	62%	3.216
mn = 0.430	20% = 1.195	70% = 4.756	1.164	38%	0.977
ma = 1.746	30% = 1.651	80% = 6.722			
cs = 3.437	40% = 2.059	90% = 10.76			
sd = 3.460	50% = 2.739	95% = 13.92			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	87.04	3.61						
592.0	100.00	0.00	7.778	83.43	4.11						
497.8	100.00	0.00	6.541	79.32	4.77						
418.6	100.00	0.00	5.500	74.55	5.48						
352.0	100.00	0.00	4.625	69.08	6.06						
296.0	100.00	0.00	3.889	63.03	6.43						
248.9	100.00	0.00	3.270	56.60	6.45						
209.3	100.00	0.00	2.750	50.15	6.16						
176.0	100.00	0.00	2.312	43.99	5.93						
148.0	100.00	0.00	1.945	38.06	6.09						
124.5	100.00	0.00	1.635	31.97	6.55						
104.7	100.00	0.00	1.375	25.42	6.64						
88.00	100.00	0.00	1.156	18.78	5.69						
74.00	100.00	0.00	0.972	13.09	4.00						
62.23	100.00	0.00	0.818	9.09	2.53						
52.33	100.00	0.00	0.688	6.56	1.64						
44.00	100.00	0.00	0.578	4.92	1.18						
37.00	100.00	0.00	0.486	3.74	0.94						
31.11	100.00	0.00	0.409	2.80	0.81						
26.16	100.00	0.00	0.344	1.99	0.76						
22.00	100.00	0.84	0.289	1.24	0.70						
18.50	99.16	2.18	0.243	0.54	0.54						
15.56	96.98	3.16	0.204	0.00	0.00						
13.08	93.82	3.38	0.172	0.00	0.00						
11.00	90.44	3.40	0.145	0.00	0.00						

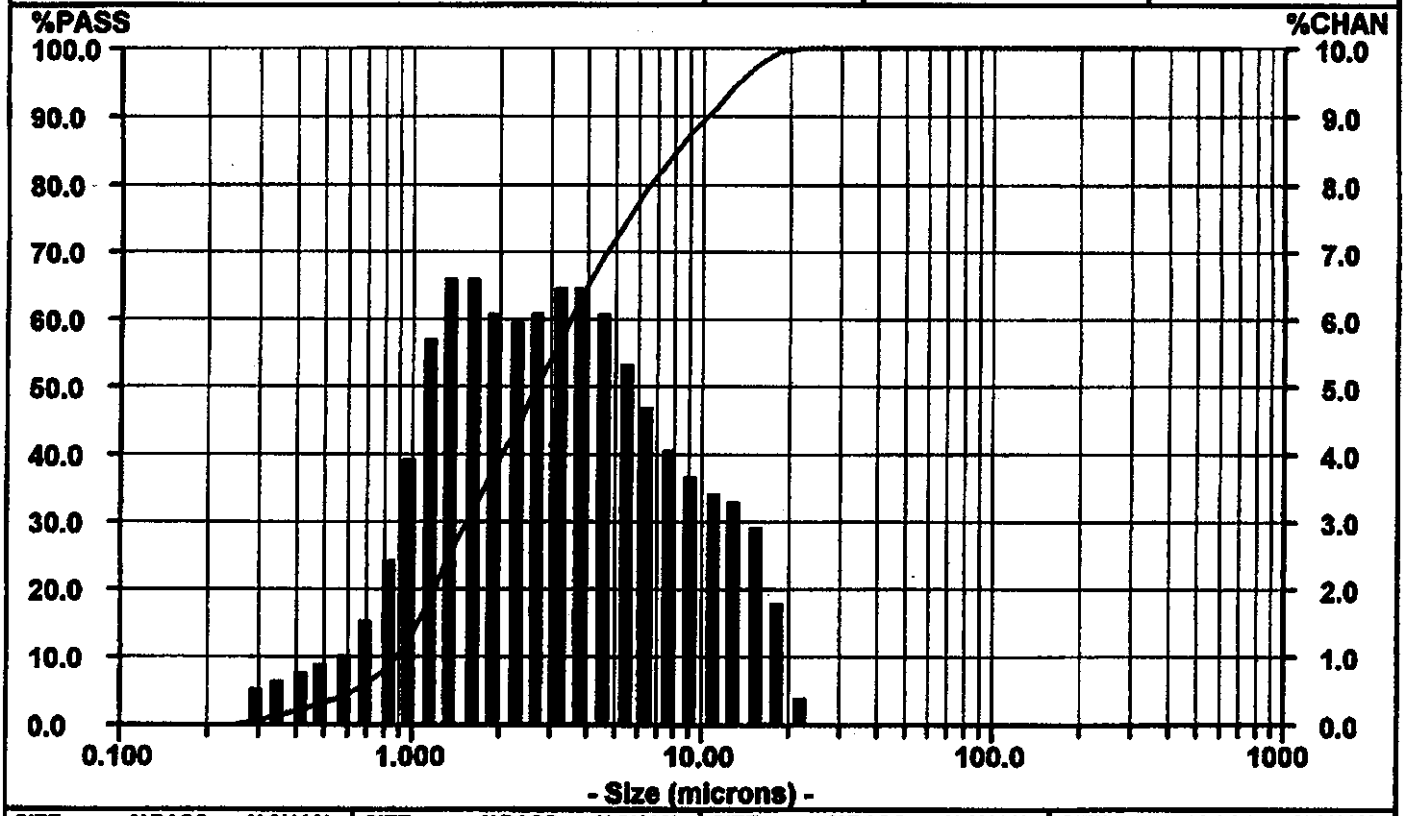
C-104

C-104
Duplicate

Date: 09/26/91 Meas #: 00001
Time: 15:04 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Flow Rate = 60 ml/sec
Refractive Index = 1.50 Particle/1.33 Medium
File: 104C035

Summary	Percentiles		Dia	Vol%	Width
mv = 4.210	10% = 0.879	60% = 3.554	4.565	62%	7.862
mn = 0.517	20% = 1.205	70% = 4.699	1.175	38%	0.943
ma = 1.809	30% = 1.556	80% = 6.602			
cs = 3.316	40% = 2.058	90% = 10.40			
sd = 3.381	50% = 2.728	95% = 13.39			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	87.63	3.70						
592.0	100.00	0.00	7.778	83.93	4.16						
497.8	100.00	0.00	6.541	79.77	4.80						
418.6	100.00	0.00	5.500	74.97	5.49						
352.0	100.00	0.00	4.625	69.48	6.12						
296.0	100.00	0.00	3.889	63.36	6.52						
248.9	100.00	0.00	3.270	56.84	6.54						
209.3	100.00	0.00	2.750	50.30	6.25						
176.0	100.00	0.00	2.312	44.05	6.00						
148.0	100.00	0.00	1.945	38.05	6.17						
124.5	100.00	0.00	1.635	31.88	6.67						
104.7	100.00	0.00	1.375	25.21	6.80						
88.00	100.00	0.00	1.156	18.41	5.82						
74.00	100.00	0.00	0.972	12.59	4.08						
62.23	100.00	0.00	0.818	8.51	2.56						
52.33	100.00	0.00	0.688	5.95	1.64						
44.00	100.00	0.00	0.578	4.31	1.17						
37.00	100.00	0.00	0.486	3.14	0.93						
31.11	100.00	0.00	0.409	2.21	0.81						
26.16	100.00	0.00	0.344	1.40	0.75						
22.00	100.00	0.59	0.289	0.65	0.65						
18.50	99.41	1.83	0.243	0.00	0.00						
15.56	97.58	3.02	0.204	0.00	0.00						
13.08	94.56	3.43	0.172	0.00	0.00						
11.00	91.13	3.60	0.145	0.00	0.00						

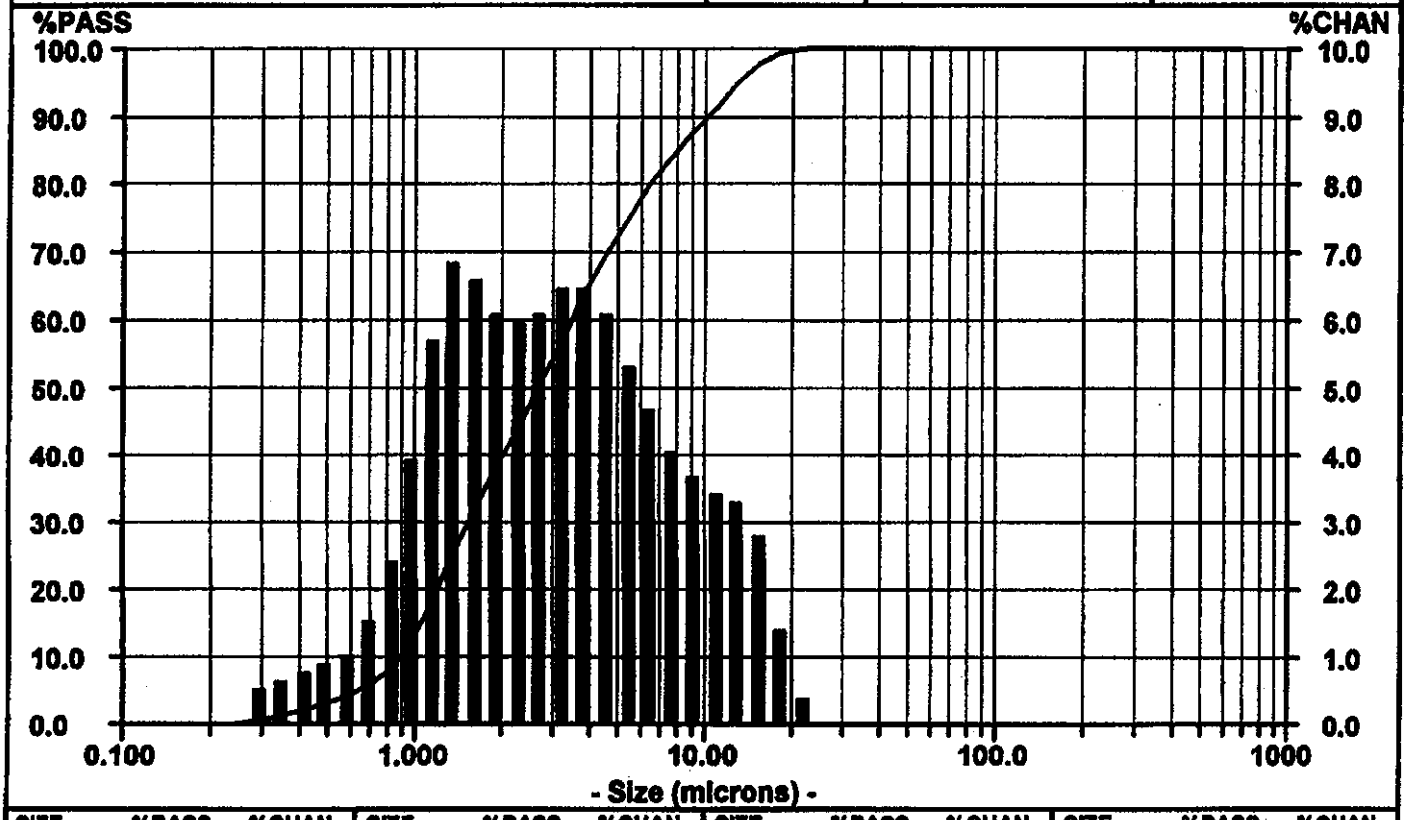
C-104

C-104
Duplicate

Date: 09/26/91 Meas #: 00001
Time: 15:09 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Flow Rate = 60 ml/sec
Refractive Index = 1.70 Particle/1.33 Medium
File: 104C036

Summary	Percentiles		Dia	Vol%	Width
mv = 4.139	10% = 0.880	60% = 3.523	4.529	62%	7.634
mn = 0.619	20% = 1.203	70% = 4.644	1.177	38%	0.938
ma = 1.804	30% = 1.547	80% = 6.507			
cs = 3.326	40% = 2.044	90% = 10.15			
sd = 3.296	50% = 2.708	95% = 13.00			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	88.08	3.76						
592.0	100.00	0.00	7.778	84.32	4.18						
497.8	100.00	0.00	6.541	80.14	4.79						
418.6	100.00	0.00	5.500	75.35	5.48						
352.0	100.00	0.00	4.625	69.87	6.14						
296.0	100.00	0.00	3.889	63.73	6.57						
248.9	100.00	0.00	3.270	57.16	6.59						
209.3	100.00	0.00	2.750	50.57	6.27						
176.0	100.00	0.00	2.312	44.30	6.01						
148.0	100.00	0.00	1.945	38.29	6.19						
124.5	100.00	0.00	1.635	32.10	6.73						
104.7	100.00	0.00	1.375	25.37	6.92						
88.00	100.00	0.00	1.156	18.45	5.89						
74.00	100.00	0.00	0.972	12.56	4.09						
62.23	100.00	0.00	0.818	8.47	2.65						
52.33	100.00	0.00	0.688	5.92	1.63						
44.00	100.00	0.00	0.578	4.29	1.16						
37.00	100.00	0.00	0.486	3.13	0.93						
31.11	100.00	0.00	0.409	2.20	0.81						
26.16	100.00	0.00	0.344	1.39	0.75						
22.00	100.00	0.43	0.289	0.64	0.64						
18.50	99.57	1.57	0.243	0.00	0.00						
15.56	98.00	2.88	0.204	0.00	0.00						
13.08	95.12	3.46	0.172	0.00	0.00						
11.00	91.66	3.58	0.145	0.00	0.00						

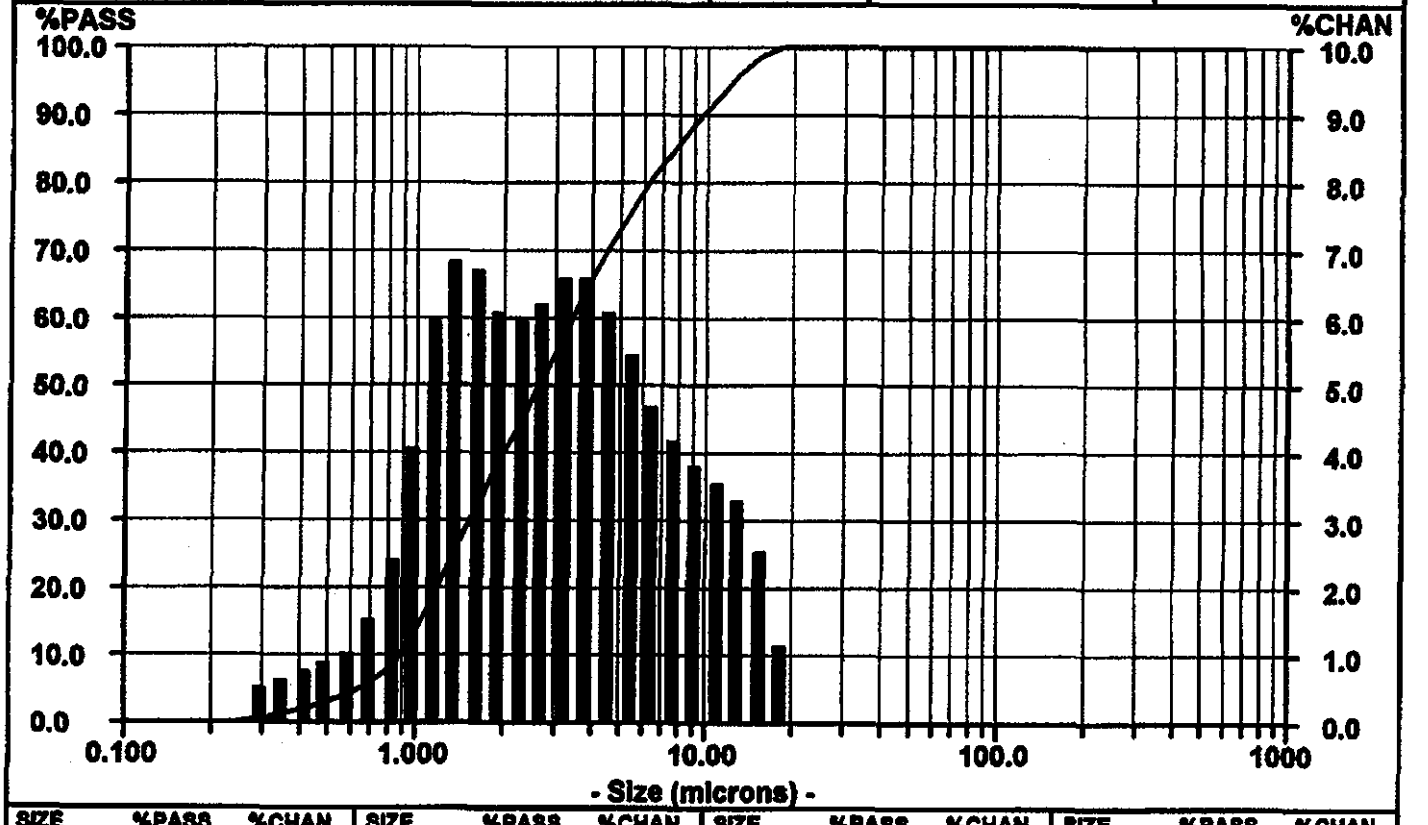
C-104

C-104 Duplicate

Date: 09/26/91 Meas #: 00001
Time: 15:14 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Flow Rate = 60 ml/sec
Refractive Index = 2.00 Particle/1.33 Medium
File: 104C037

Summary	Percentiles		Dia	Vol%	Width
mv = 4.008	10% = 0.880	60% = 3.468	4.463	61%	7.242
mn = 0.523	20% = 1.198	70% = 4.551	1.178	39%	0.933
ma = 1.794	30% = 1.536	80% = 6.329			
cs = 3.345	40% = 2.021	90% = 9.721			
sd = 3.172	50% = 2.673	95% = 12.38			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.260	88.94	3.84						
592.0	100.00	0.00	7.778	85.10	4.23						
497.8	100.00	0.00	6.541	80.87	4.81						
418.6	100.00	0.00	5.500	76.06	5.50						
352.0	100.00	0.00	4.625	70.56	6.18						
296.0	100.00	0.00	3.889	64.38	6.65						
248.9	100.00	0.00	3.270	57.73	6.67						
209.3	100.00	0.00	2.750	51.06	6.34						
176.0	100.00	0.00	2.312	44.72	6.06						
148.0	100.00	0.00	1.945	38.66	6.25						
124.5	100.00	0.00	1.635	32.41	6.62						
104.7	100.00	0.00	1.375	25.79	6.98						
88.00	100.00	0.00	1.156	18.81	6.00						
74.00	100.00	0.00	0.972	12.81	4.16						
62.23	100.00	0.00	0.818	8.45	2.67						
52.33	100.00	0.00	0.688	5.88	1.63						
44.00	100.00	0.00	0.578	4.25	1.16						
37.00	100.00	0.00	0.486	3.09	0.92						
31.11	100.00	0.00	0.409	2.17	0.80						
26.16	100.00	0.00	0.344	1.37	0.74						
22.00	100.00	0.00	0.289	0.63	0.63						
18.50	100.00	1.28	0.243	0.00	0.00						
15.56	98.72	2.67	0.204	0.00	0.00						
13.08	96.05	3.45	0.172	0.00	0.00						
11.00	92.60	3.66	0.145	0.00	0.00						

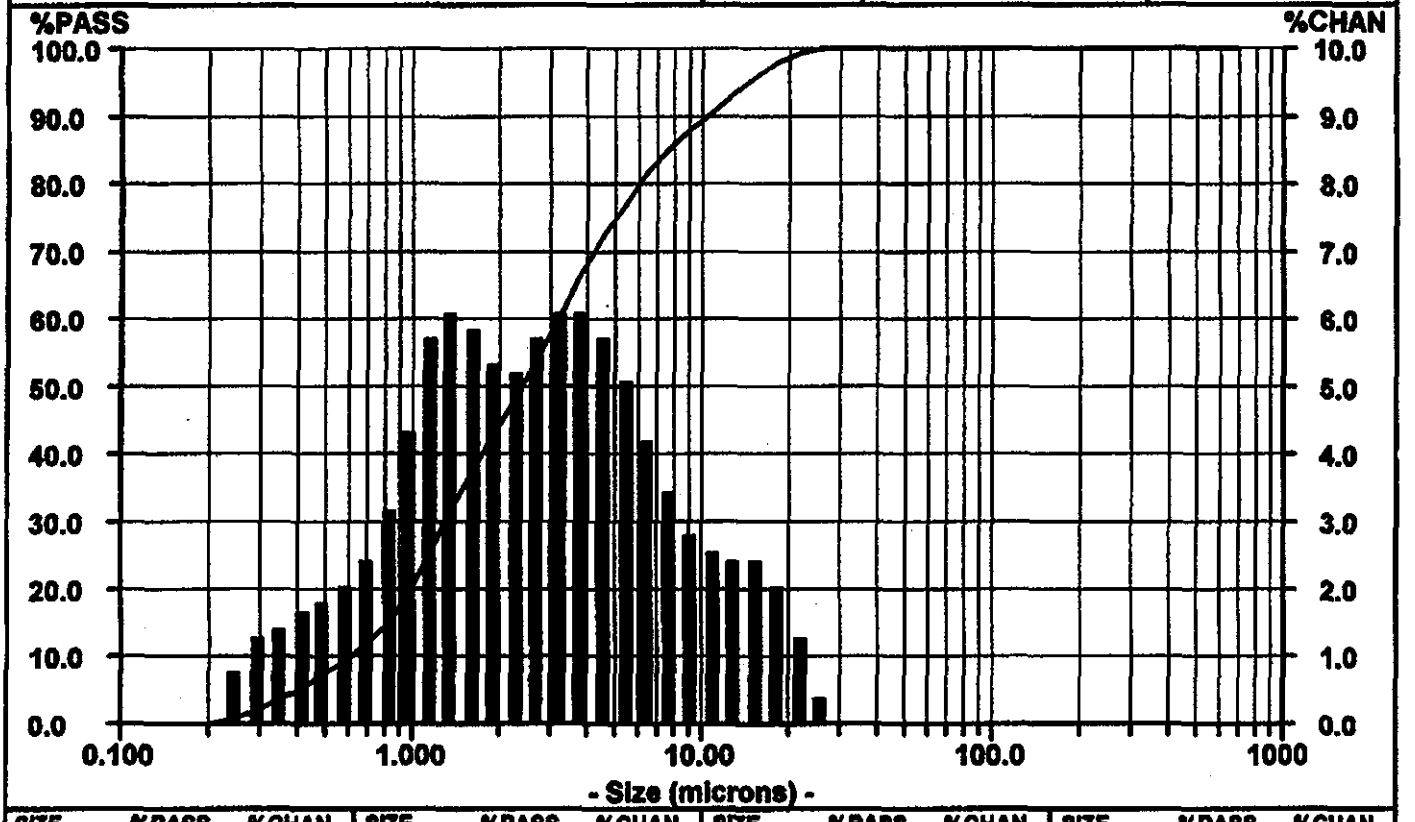
C-104

C-104
Duplicate

Date: 09/26/91 Meas #: 00001
Time: 15:21 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Sonicate for 2 min. @ 40 W
Flow Rate = 60 ml/sec
Refractive Index = 2.00 Particle/1.33 Medium
File: 104C038

Summary	Percentiles		Dia	Vol%	Width
mv = 4.073	10% = 0.604	60% = 3.243	4.516	57%	8.454
mn = 0.385	20% = 0.983	70% = 4.308	1.033	43%	1.096
ma = 1.417	30% = 1.313	80% = 6.077			
cs = 4.235	40% = 1.760	90% = 10.40			
sd = 3.217	50% = 2.428	95% = 14.61			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	88.22	2.94						
592.0	100.00	0.00	7.778	85.28	3.64						
497.8	100.00	0.00	6.541	81.74	4.31						
418.6	100.00	0.00	5.500	77.43	5.11						
352.0	100.00	0.00	4.625	72.32	5.80						
296.0	100.00	0.00	3.889	66.52	6.21						
248.9	100.00	0.00	3.270	60.31	6.15						
209.3	100.00	0.00	2.750	54.16	5.72						
176.0	100.00	0.00	2.312	48.44	5.35						
148.0	100.00	0.00	1.945	43.09	5.44						
124.5	100.00	0.00	1.635	37.65	5.96						
104.7	100.00	0.00	1.375	31.69	6.30						
88.00	100.00	0.00	1.156	25.39	5.73						
74.00	100.00	0.00	0.972	19.66	4.46						
62.23	100.00	0.00	0.818	15.20	3.26						
52.33	100.00	0.00	0.688	11.94	2.51						
44.00	100.00	0.00	0.578	9.43	2.12						
37.00	100.00	0.00	0.486	7.31	1.89						
31.11	100.00	0.00	0.409	5.42	1.71						
26.16	100.00	0.55	0.344	3.71	1.54						
22.00	99.45	1.35	0.289	2.17	1.30						
18.50	98.10	2.19	0.243	0.87	0.87						
15.56	95.91	2.54	0.204	0.00	0.00						
13.08	93.37	2.54	0.172	0.00	0.00						
11.00	90.83	2.61	0.145	0.00	0.00						

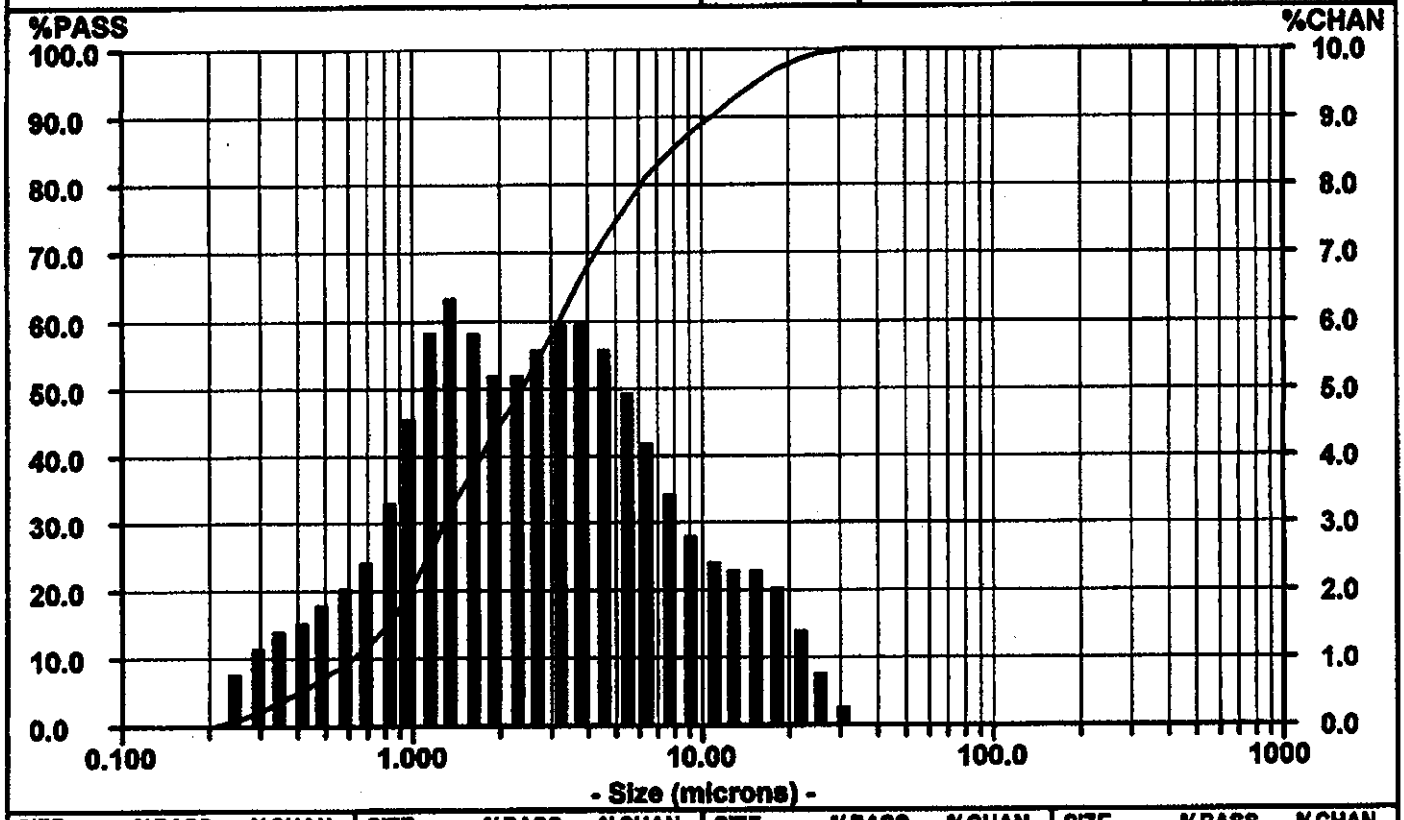
C-104

C-104 Duplicate

Date: 09/26/91 Meas #: 00001
Time: 15:26 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Sonicate for 2 min. @ 40 W
Flow Rate = 60 ml/sec
Refractive Index = 1.50 Particle/1.33 Medium
File: 104C039

Summary	Percentiles		Dia	Vol%	Width
mv = 4.194	10% = 0.610	60% = 3.226	4.573	56%	8.892
mn = 0.388	20% = 0.974	70% = 4.319	1.030	44%	1.079
ma = 1.417	30% = 1.294	80% = 6.152			
cs = 4.236	40% = 1.729	90% = 10.72			
sd = 3.278	50% = 2.396	95% = 15.41			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	87.85	2.90						
592.0	100.00	0.00	7.778	84.95	3.52						
497.8	100.00	0.00	6.541	81.43	4.26						
418.6	100.00	0.00	5.500	77.17	5.00						
352.0	100.00	0.00	4.625	72.17	5.64						
296.0	100.00	0.00	3.889	66.53	6.04						
248.9	100.00	0.00	3.270	60.49	6.00						
209.3	100.00	0.00	2.750	54.49	5.60						
176.0	100.00	0.00	2.312	48.89	5.27						
148.0	100.00	0.00	1.945	43.62	5.39						
124.5	100.00	0.00	1.635	38.23	5.97						
104.7	100.00	0.00	1.375	32.26	6.40						
88.00	100.00	0.00	1.156	25.86	5.94						
74.00	100.00	0.00	0.972	19.92	4.66						
62.23	100.00	0.00	0.818	15.26	3.41						
52.33	100.00	0.00	0.688	11.85	2.59						
44.00	100.00	0.00	0.578	9.26	2.13						
37.00	100.00	0.00	0.486	7.13	1.86						
31.11	100.00	0.39	0.409	5.27	1.66						
26.16	99.61	0.84	0.344	3.61	1.49						
22.00	98.77	1.52	0.289	2.12	1.26						
18.50	97.25	2.12	0.243	0.86	0.86						
15.56	95.13	2.38	0.204	0.00	0.00						
13.08	92.77	2.40	0.172	0.00	0.00						
11.00	90.37	2.52	0.145	0.00	0.00						

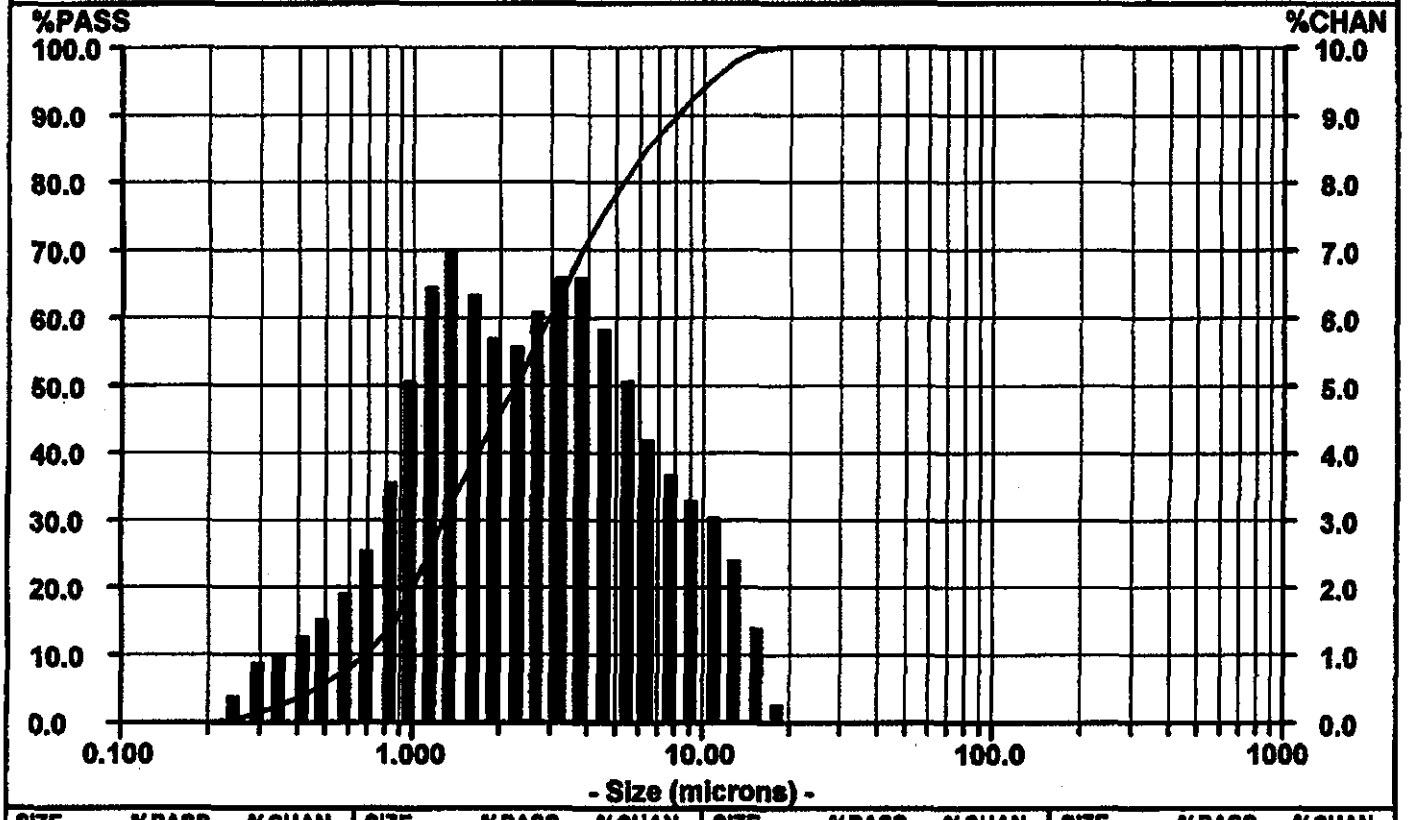
C-104

C-104
Duplicate

Date: 09/26/91 Meas #: 00001
Time: 15:31 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Sonicate for 2 min. @ 40 W
Flow Rate = 60 ml/sec
Refractive Index = 1.70 Particle/1.33 Medium
File: 104C040

Summary	Percentiles		Dia	Vol%	Width
mv = 3.402	10% = 0.675	60% = 3.003	4.180	55%	6.091
mn = 0.426	20% = 0.999	70% = 3.901	1.068	45%	1.017
ma = 1.456	30% = 1.288	80% = 5.307			
cs = 4.122	40% = 1.677	90% = 8.119			
sd = 2.649	50% = 2.272	95% = 10.69			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	92.53	3.40						
592.0	100.00	0.00	7.778	89.13	3.78						
497.8	100.00	0.00	6.541	85.35	4.35						
418.6	100.00	0.00	5.500	81.00	5.13						
352.0	100.00	0.00	4.625	75.87	5.98						
296.0	100.00	0.00	3.889	69.89	6.60						
248.9	100.00	0.00	3.270	63.29	6.61						
209.3	100.00	0.00	2.750	56.68	6.10						
176.0	100.00	0.00	2.312	50.58	5.66						
148.0	100.00	0.00	1.945	44.92	5.79						
124.5	100.00	0.00	1.635	39.13	6.48						
104.7	100.00	0.00	1.375	32.65	7.06						
88.00	100.00	0.00	1.156	25.59	6.57						
74.00	100.00	0.00	0.972	19.02	5.10						
62.23	100.00	0.00	0.818	13.92	3.61						
52.33	100.00	0.00	0.688	10.31	2.62						
44.00	100.00	0.00	0.578	7.69	2.04						
37.00	100.00	0.00	0.486	5.65	1.66						
31.11	100.00	0.00	0.409	3.99	1.37						
26.16	100.00	0.00	0.344	2.62	1.14						
22.00	100.00	0.00	0.289	1.48	0.90						
18.50	100.00	0.39	0.243	0.58	0.58						
15.56	99.61	1.42	0.204	0.00	0.00						
13.08	98.19	2.65	0.172	0.00	0.00						
11.00	95.64	3.11	0.145	0.00	0.00						

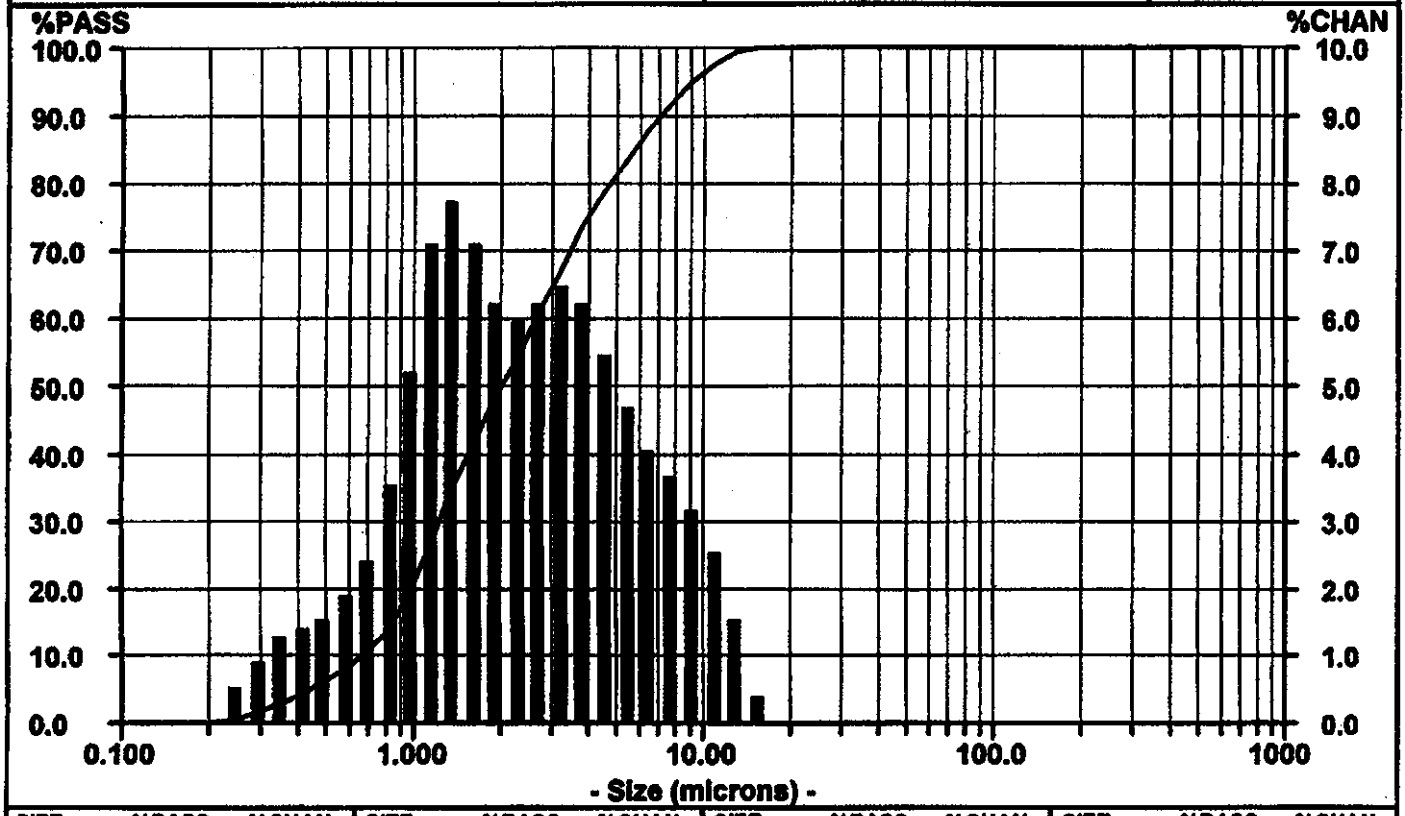
C-104

C-104
Duplicate

Date: 09/26/91 Meas #: 00001
Time: 15:47 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Sonicate for 2 min. @ 40 W
Flow Rate = 40 ml/sec
Refractive index = 1.50 Particle/1.33 Medium
File: 104C041

Summary	Percentiles		Dia	Vol%	Width
mv = 3.038	10% = 0.656	60% = 2.691	3.948	52%	5.266
mn = 0.417	20% = 0.979	70% = 3.507	1.086	48%	1.021
ma = 1.379	30% = 1.237	80% = 4.744			
cs = 4.350	40% = 1.553	90% = 7.105			
sd = 2.313	50% = 2.035	95% = 9.164			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	95.17	3.28						
592.0	100.00	0.00	7.778	91.89	3.71						
497.8	100.00	0.00	6.541	88.18	4.15						
418.6	100.00	0.00	5.500	84.03	4.76						
352.0	100.00	0.00	4.625	79.27	5.56						
296.0	100.00	0.00	3.889	73.71	6.31						
248.9	100.00	0.00	3.270	67.40	6.59						
209.3	100.00	0.00	2.750	60.81	6.33						
176.0	100.00	0.00	2.312	54.48	6.06						
148.0	100.00	0.00	1.945	48.42	6.35						
124.5	100.00	0.00	1.635	42.07	7.24						
104.7	100.00	0.00	1.375	34.83	7.88						
88.00	100.00	0.00	1.156	26.95	7.22						
74.00	100.00	0.00	0.972	19.73	5.36						
62.23	100.00	0.00	0.818	14.37	3.62						
52.33	100.00	0.00	0.688	10.75	2.55						
44.00	100.00	0.00	0.578	8.20	2.00						
37.00	100.00	0.00	0.486	6.20	1.70						
31.11	100.00	0.00	0.409	4.50	1.49						
26.16	100.00	0.00	0.344	3.01	1.30						
22.00	100.00	0.00	0.289	1.71	1.05						
18.50	100.00	0.00	0.243	0.66	0.66						
15.56	100.00	0.57	0.204	0.00	0.00						
13.08	99.43	1.61	0.172	0.00	0.00						
11.00	97.82	2.65	0.145	0.00	0.00						

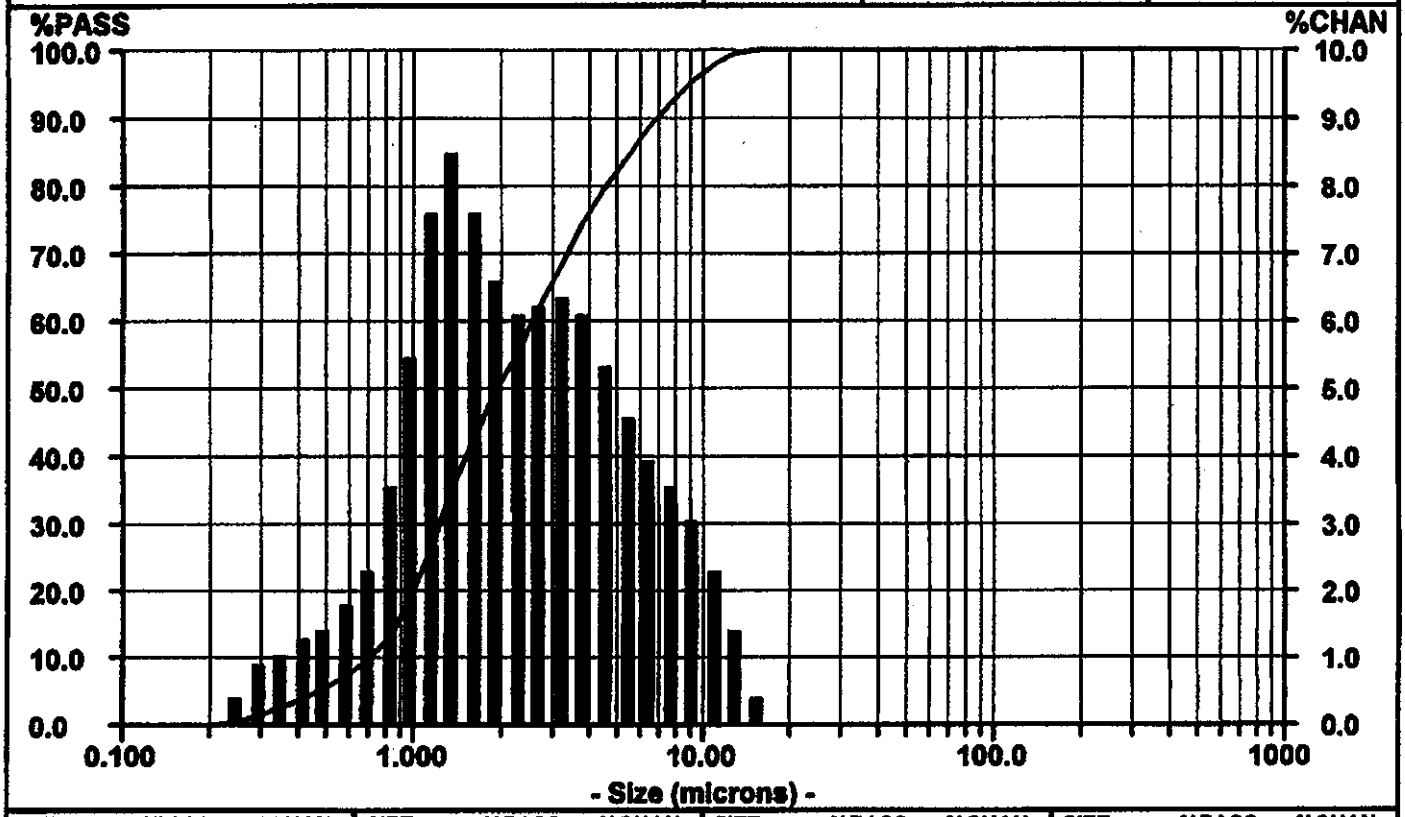
C-104

C-104 In 1M NaOH and 1M NaNO3
Sonicate for 2 min. @ 40 W
Flow Rate = 40 ml/sec.
Refractive Index = 1.70 Particle/1.33 Medium
File: 104C042

C-104
Duplicate

Date: 09/26/91 Meas #: 00001
Time: 15:51 Pres #: 01

Summary	Percentiles		Dia	Vol%	Width
mv = 2.976	10% = 0.699	60% = 2.605	3.906	50%	5.158
mn = 0.431	20% = 0.999	70% = 3.409	1.111	50%	0.977
ma = 1.402	30% = 1.238	80% = 4.622			
cs = 4.281	40% = 1.527	90% = 6.928			
sd = 2.231	50% = 1.972	95% = 8.939			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	96.59	3.19						
592.0	100.00	0.00	7.778	92.40	3.65						
497.8	100.00	0.00	6.541	88.75	4.08						
418.6	100.00	0.00	5.500	84.67	4.66						
352.0	100.00	0.00	4.625	80.02	5.40						
296.0	100.00	0.00	3.889	74.62	6.14						
248.9	100.00	0.00	3.270	68.48	6.48						
209.3	100.00	0.00	2.750	62.00	6.32						
176.0	100.00	0.00	2.312	55.68	6.16						
148.0	100.00	0.00	1.945	49.52	6.61						
124.5	100.00	0.00	1.635	42.91	7.71						
104.7	100.00	0.00	1.375	35.20	8.56						
88.00	100.00	0.00	1.156	26.65	7.74						
74.00	100.00	0.00	0.972	18.91	5.58						
62.23	100.00	0.00	0.818	13.33	3.60						
52.33	100.00	0.00	0.688	9.73	2.42						
44.00	100.00	0.00	0.578	7.31	1.82						
37.00	100.00	0.00	0.486	5.49	1.51						
31.11	100.00	0.00	0.409	3.98	1.31						
26.16	100.00	0.00	0.344	2.67	1.14						
22.00	100.00	0.00	0.289	1.53	0.93						
18.50	100.00	0.00	0.243	0.60	0.60						
15.56	100.00	0.48	0.204	0.00	0.00						
13.08	99.52	1.44	0.172	0.00	0.00						
11.00	98.08	2.49	0.145	0.00	0.00						

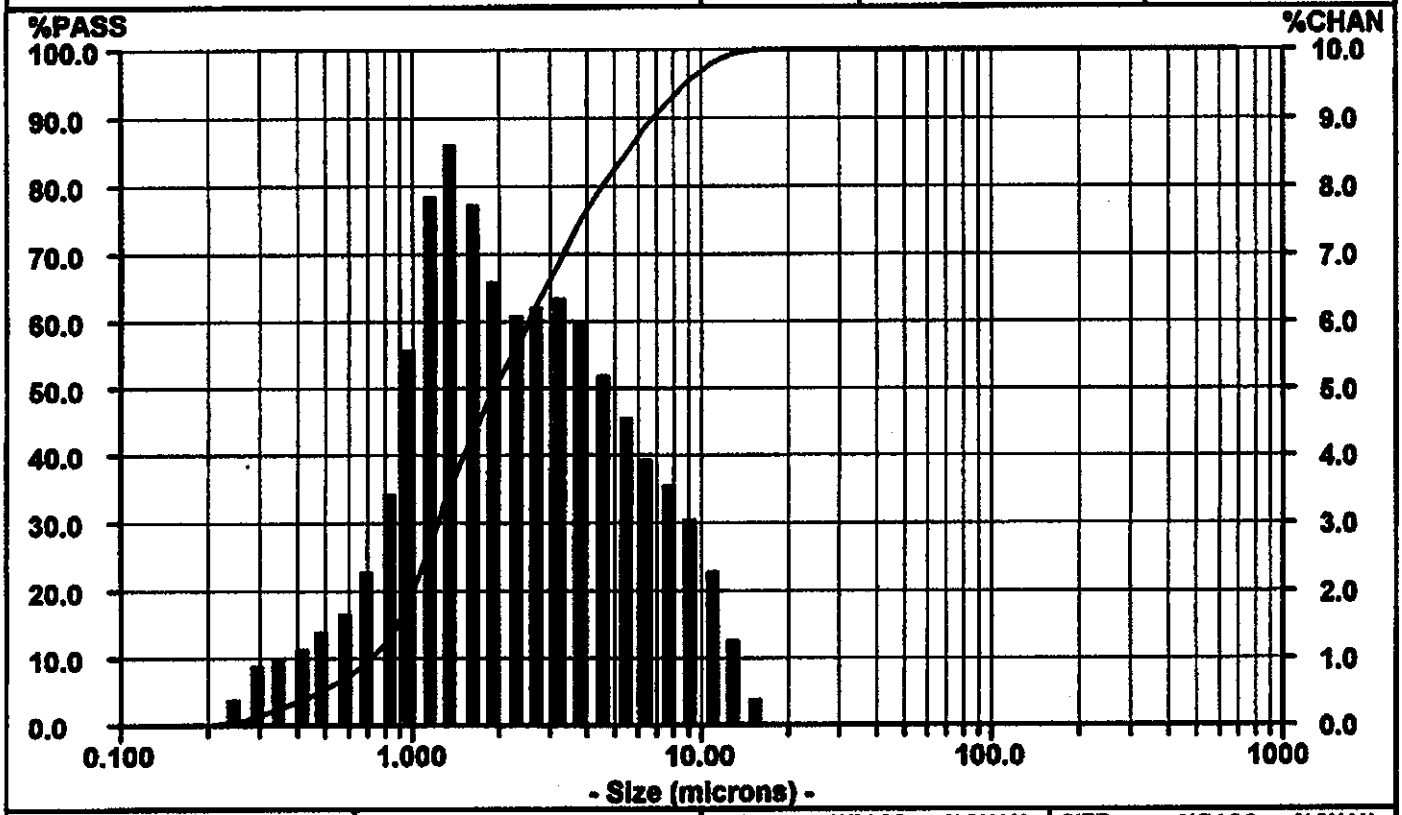
C-104

C-104 Duplicate

Date: 09/26/91 Meas #: 00001
Time: 15:55 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Sonicate for 2 min. @ 40 W
Flow Rate = 40 ml/sec.
Refractive Index = 2.00 Particle/1.33 Medium
File: 104C043

Summary	Percentiles		Dia	Vol%	Width
mv = 2.943	10% = 0.708	60% = 2.569	3.886	50%	5.092
mn = 0.433	20% = 1.003	70% = 3.367	1.118	50%	0.967
ma = 1.402	30% = 1.236	80% = 4.568			
cs = 4.280	40% = 1.516	90% = 6.837			
sd = 2.196	50% = 1.945	95% = 8.810			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	95.83	3.16						
592.0	100.00	0.00	7.778	92.67	3.84						
497.8	100.00	0.00	6.541	89.03	4.06						
418.6	100.00	0.00	5.500	84.97	4.60						
352.0	100.00	0.00	4.625	80.37	5.34						
296.0	100.00	0.00	3.889	75.03	6.08						
248.9	100.00	0.00	3.270	68.95	6.44						
209.3	100.00	0.00	2.750	62.51	6.31						
176.0	100.00	0.00	2.312	56.20	6.20						
148.0	100.00	0.00	1.945	50.00	6.70						
124.5	100.00	0.00	1.635	43.30	7.89						
104.7	100.00	0.00	1.375	35.41	8.77						
88.00	100.00	0.00	1.156	26.64	7.92						
74.00	100.00	0.00	0.972	18.72	5.64						
62.23	100.00	0.00	0.818	13.08	3.57						
52.33	100.00	0.00	0.688	9.51	2.38						
44.00	100.00	0.00	0.578	7.15	1.77						
37.00	100.00	0.00	0.486	5.38	1.46						
31.11	100.00	0.00	0.409	3.92	1.28						
26.16	100.00	0.00	0.344	2.64	1.12						
22.00	100.00	0.00	0.289	1.52	0.92						
18.50	100.00	0.00	0.243	0.60	0.60						
15.56	100.00	0.42	0.204	0.00	0.00						
13.08	99.58	1.34	0.172	0.00	0.00						
11.00	98.24	2.41	0.145	0.00	0.00						

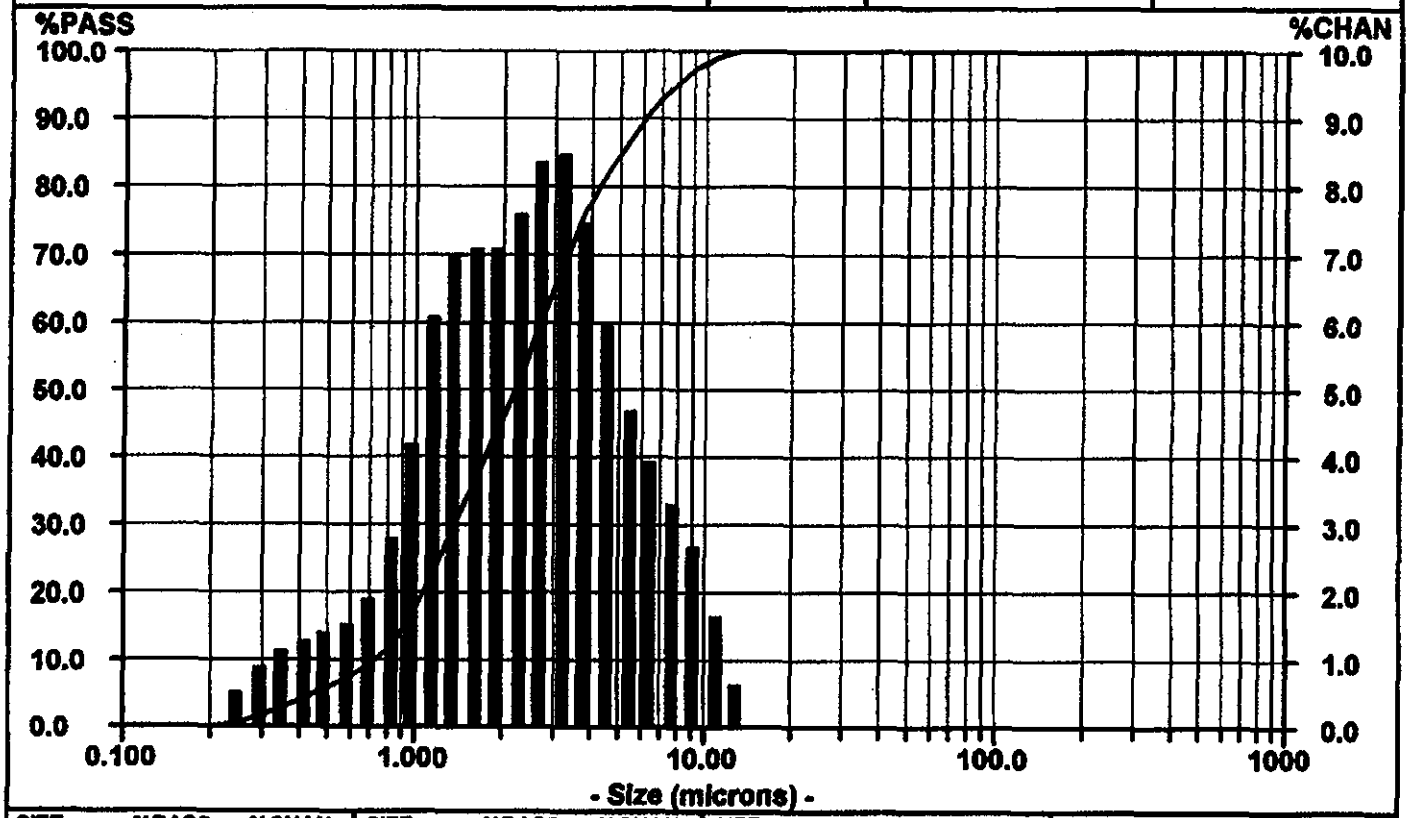
C-104

C-104 Duplicate

Date: 09/26/91 Meas #: 00002
Time: 18:01 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Sonicate for 2 min. @ 40 W
Flow Rate = 17 ml/sec.
Refractive Index = 1.50 Particle/1.33 Medium
File: 104C043

Summary	Percentiles		Dia	Vol%	Width
mv = 2.876	10% = 0.721	60% = 2.737	2.226	100%	3.926
mn = 0.411	20% = 1.077	70% = 3.358			
ma = 1.456	30% = 1.383	80% = 4.301			
cs = 4.120	40% = 1.764	90% = 6.153			
sd = 1.963	50% = 2.226	95% = 7.841			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	97.89	2.73						
592.0	100.00	0.00	7.778	94.86	3.48						
497.8	100.00	0.00	6.541	91.38	4.10						
418.6	100.00	0.00	5.500	87.28	4.89						
352.0	100.00	0.00	4.625	82.39	6.07						
296.0	100.00	0.00	3.889	76.32	7.63						
248.9	100.00	0.00	3.270	68.79	8.55						
209.3	100.00	0.00	2.750	60.24	8.49						
176.0	100.00	0.00	2.312	51.75	7.70						
148.0	100.00	0.00	1.945	44.05	7.15						
124.5	100.00	0.00	1.635	36.90	7.15						
104.7	100.00	0.00	1.375	29.75	7.09						
88.00	100.00	0.00	1.156	22.66	6.10						
74.00	100.00	0.00	0.972	16.56	4.36						
62.23	100.00	0.00	0.818	12.20	2.87						
52.33	100.00	0.00	0.688	9.33	2.01						
44.00	100.00	0.00	0.578	7.32	1.62						
37.00	100.00	0.00	0.486	5.70	1.45						
31.11	100.00	0.00	0.409	4.25	1.34						
26.16	100.00	0.00	0.344	2.91	1.23						
22.00	100.00	0.00	0.289	1.68	1.02						
18.50	100.00	0.00	0.243	0.66	0.66						
15.56	100.00	0.00	0.204	0.00	0.00						
13.08	100.00	0.70	0.172	0.00	0.00						
11.00	99.30	1.71	0.145	0.00	0.00						

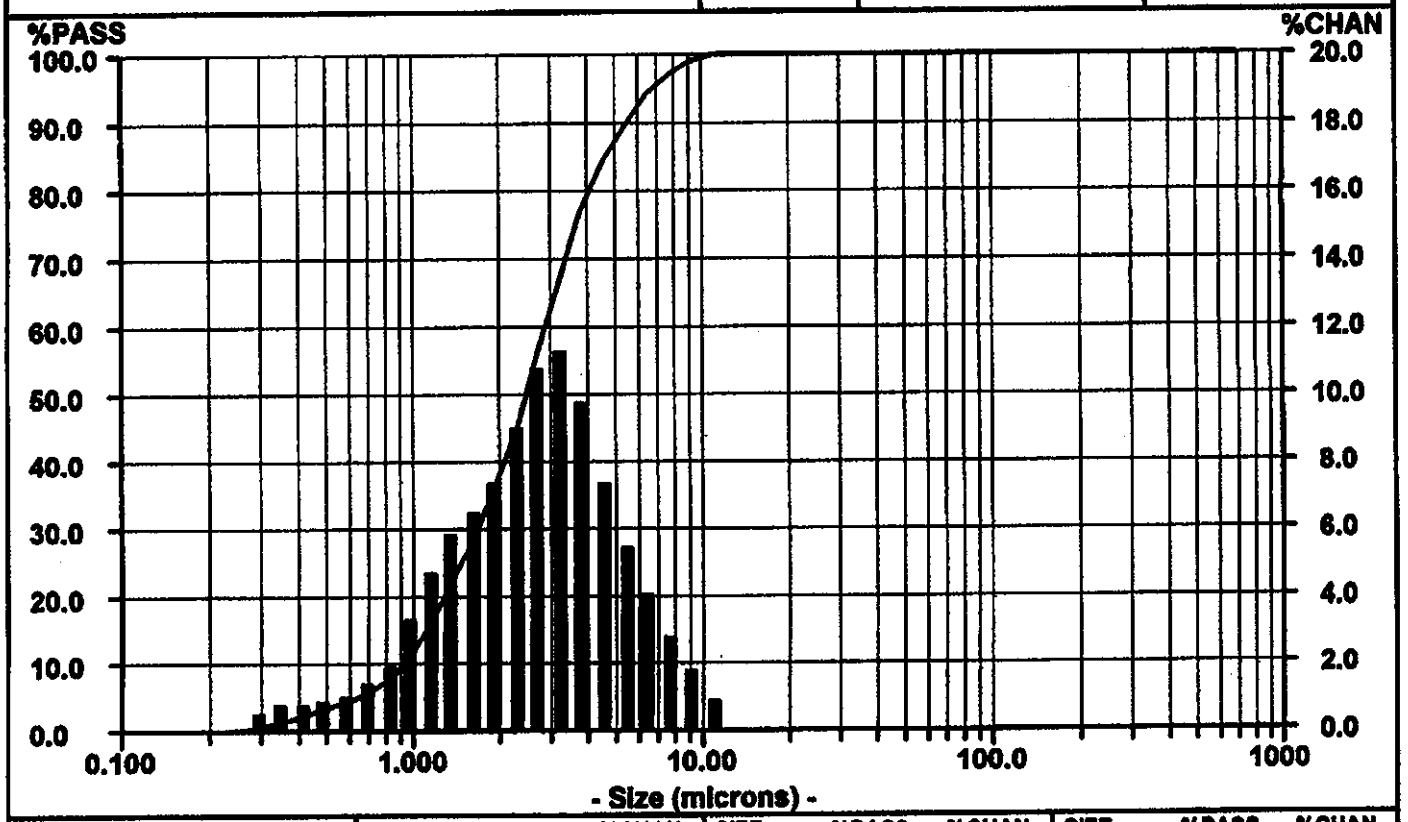
C-104

C-104
Duplicate

Date: 09/26/91 Meas #: 00001
Time: 16:08 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Sonicate for 2 min. @ 40 W
Flow Rate = 17 ml/sec.
Refractive Index = 1.70 Particle/1.33 Medium
File: 104C045

Summary	Percentiles		Dia	Vol%	Width
mv = 2.888	10% = 0.917	60% = 2.925	2.509	100%	3.401
mn = 0.511	20% = 1.298	70% = 3.418			
ma = 1.733	30% = 1.692	80% = 4.134			
cs = 3.463	40% = 2.109	90% = 5.473			
sd = 1.700	50% = 2.509	95% = 6.797			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	99.10	1.88						
592.0	100.00	0.00	7.778	97.22	2.97						
497.8	100.00	0.00	6.541	94.25	4.11						
418.6	100.00	0.00	5.500	90.14	5.52						
352.0	100.00	0.00	4.625	84.62	7.49						
296.0	100.00	0.00	3.889	77.13	9.83						
248.9	100.00	0.00	3.270	67.30	11.37						
209.3	100.00	0.00	2.750	55.93	10.88						
176.0	100.00	0.00	2.312	45.05	9.02						
148.0	100.00	0.00	1.945	36.03	7.40						
124.5	100.00	0.00	1.635	28.63	6.56						
104.7	100.00	0.00	1.375	22.07	5.95						
88.00	100.00	0.00	1.156	16.12	4.83						
74.00	100.00	0.00	0.972	11.29	3.32						
62.23	100.00	0.00	0.818	7.97	2.09						
52.33	100.00	0.00	0.688	5.88	1.41						
44.00	100.00	0.00	0.578	4.47	1.10						
37.00	100.00	0.00	0.486	3.37	0.96						
31.11	100.00	0.00	0.409	2.41	0.89						
26.16	100.00	0.00	0.344	1.52	0.84						
22.00	100.00	0.00	0.289	0.68	0.68						
18.50	100.00	0.00	0.243	0.00	0.00						
15.56	100.00	0.00	0.204	0.00	0.00						
13.08	100.00	0.00	0.172	0.00	0.00						
11.00	100.00	0.90	0.145	0.00	0.00						

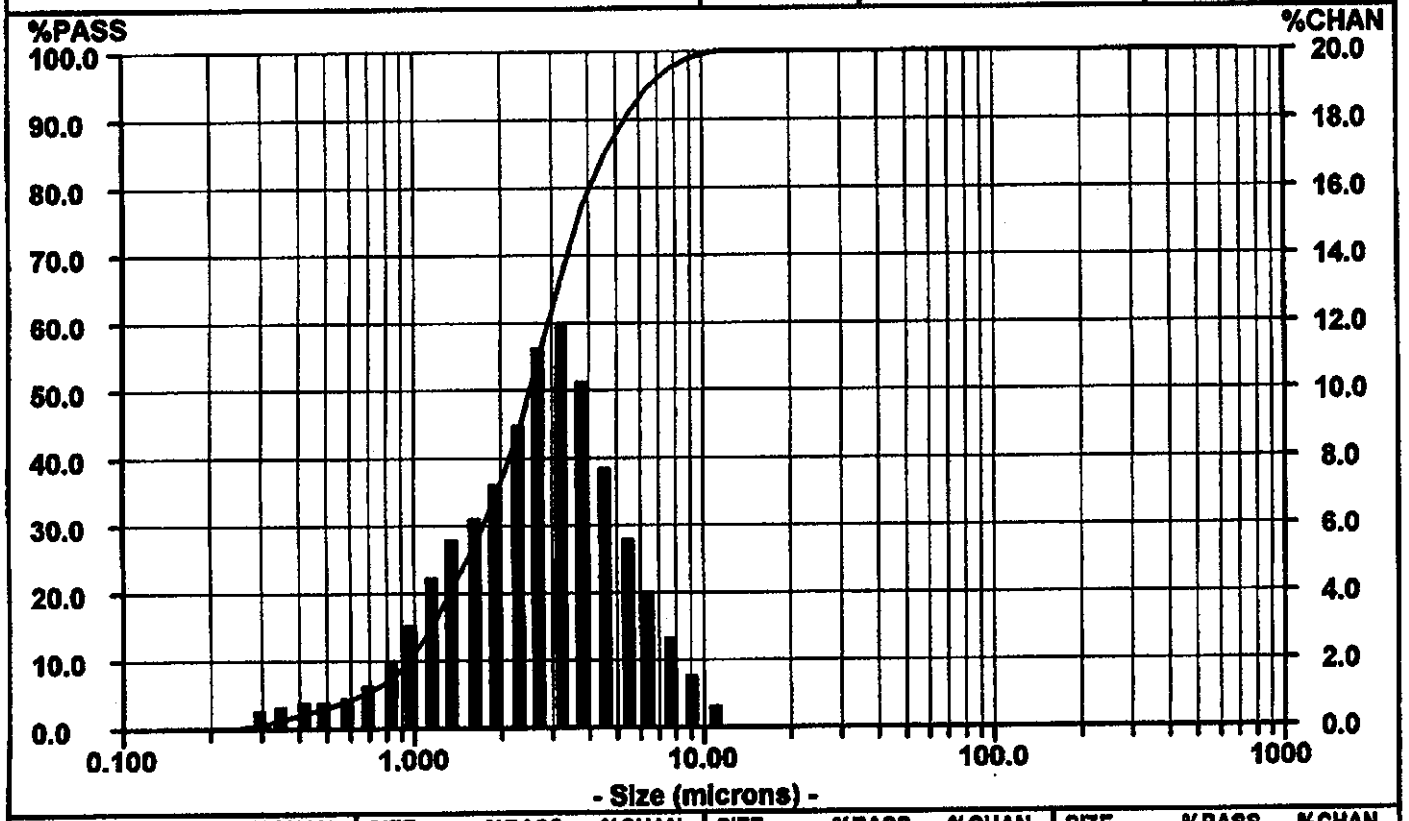
C-104

C-104
Duplicate

Date: 09/26/91 Meas #: 00001
Time: 16:13 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Sonicate for 2 min. @ 40 W
Flow Rate = 17 ml/sec.
Refractive Index = 2.00 Particle/1.33 Medium
File: 104C046

Summary	Percentiles		Dia	Vol%	Width
mv = 2.890	10% = 0.947	60% = 2.958	2.557	100%	3.305
mn = 0.521	20% = 1.343	70% = 3.431			
ma = 1.779	30% = 1.756	80% = 4.105			
cs = 3.374	40% = 2.169	90% = 5.345			
sd = 1.653	50% = 2.557	95% = 6.580			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	99.29	1.63						
592.0	100.00	0.00	7.778	97.66	2.77						
497.8	100.00	0.00	6.541	94.89	4.06						
418.8	100.00	0.00	5.500	90.83	5.67						
352.0	100.00	0.00	4.625	85.16	7.85						
296.0	100.00	0.00	3.889	77.31	10.39						
248.9	100.00	0.00	3.270	66.92	11.99						
209.3	100.00	0.00	2.750	54.93	11.30						
176.0	100.00	0.00	2.312	43.63	9.16						
148.0	100.00	0.00	1.945	34.47	7.32						
124.5	100.00	0.00	1.635	27.15	6.34						
104.7	100.00	0.00	1.375	20.81	5.67						
88.00	100.00	0.00	1.156	15.14	4.59						
74.00	100.00	0.00	0.972	10.55	3.15						
62.23	100.00	0.00	0.818	7.40	1.98						
52.33	100.00	0.00	0.688	5.42	1.32						
44.00	100.00	0.00	0.578	4.10	1.02						
37.00	100.00	0.00	0.486	3.08	0.88						
31.11	100.00	0.00	0.409	2.20	0.82						
26.16	100.00	0.00	0.344	1.38	0.76						
22.00	100.00	0.00	0.289	0.62	0.62						
18.50	100.00	0.00	0.243	0.00	0.00						
15.56	100.00	0.00	0.204	0.00	0.00						
13.08	100.00	0.00	0.172	0.00	0.00						
11.00	100.00	0.71	0.145	0.00	0.00						

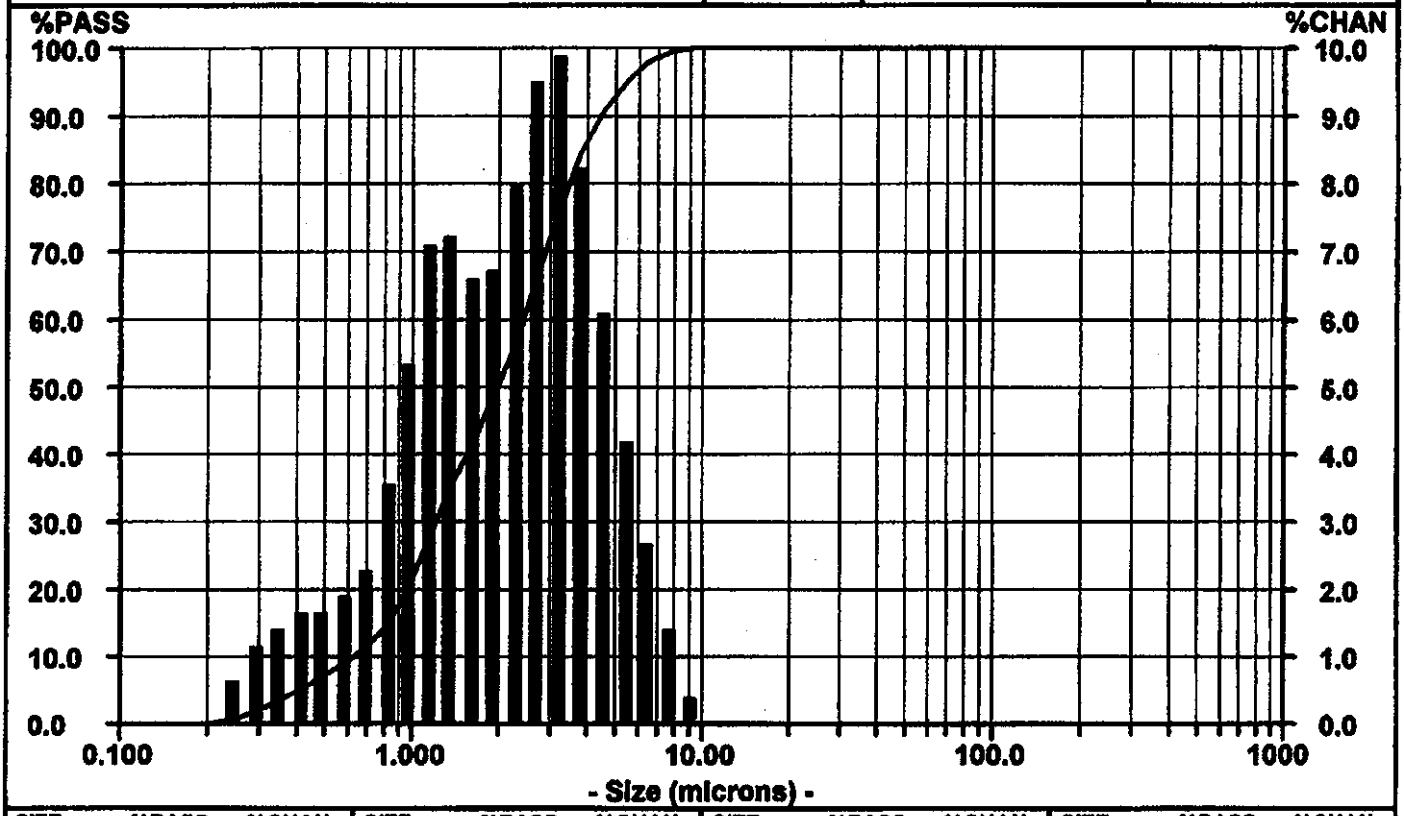
C-104

C-104
Duplicate

Date: 09/26/91 Meas #: 00001
Time: 16:33 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Sonicate for 20 min. @ 40 W
Flow Rate = 17 ml/sec.
Refractive Index = 1.50 Particle/1.33 Medium
File: 104CD001

Summary	Percentiles		Dia	Vol%	Width
mv = 2.325	10% = 0.624	60% = 2.459	2.803	65%	2.640
mn = 0.407	20% = 0.958	70% = 2.927	0.890	35%	0.782
ma = 1.294	30% = 1.222	80% = 3.513			
cs = 4.636	40% = 1.562	90% = 4.493			
sd = 1.491	50% = 2.007	95% = 5.439			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	100.00	0.55						
592.0	100.00	0.00	7.778	99.45	1.45						
497.8	100.00	0.00	6.541	98.00	2.76						
418.6	100.00	0.00	5.500	95.24	4.32						
352.0	100.00	0.00	4.625	90.92	6.22						
296.0	100.00	0.00	3.889	84.70	8.38						
248.9	100.00	0.00	3.270	76.32	9.94						
209.3	100.00	0.00	2.750	66.38	9.66						
176.0	100.00	0.00	2.312	56.72	8.08						
148.0	100.00	0.00	1.945	48.64	6.87						
124.5	100.00	0.00	1.635	41.77	6.80						
104.7	100.00	0.00	1.375	34.97	7.34						
88.00	100.00	0.00	1.156	27.63	7.11						
74.00	100.00	0.00	0.972	20.52	5.47						
62.23	100.00	0.00	0.818	15.05	3.60						
52.33	100.00	0.00	0.688	11.45	2.44						
44.00	100.00	0.00	0.578	9.01	1.94						
37.00	100.00	0.00	0.486	7.07	1.79						
31.11	100.00	0.00	0.409	5.28	1.72						
26.16	100.00	0.00	0.344	3.56	1.58						
22.00	100.00	0.00	0.289	1.98	1.25						
18.50	100.00	0.00	0.243	0.73	0.73						
15.56	100.00	0.00	0.204	0.00	0.00						
13.08	100.00	0.00	0.172	0.00	0.00						
11.00	100.00	0.00	0.145	0.00	0.00						

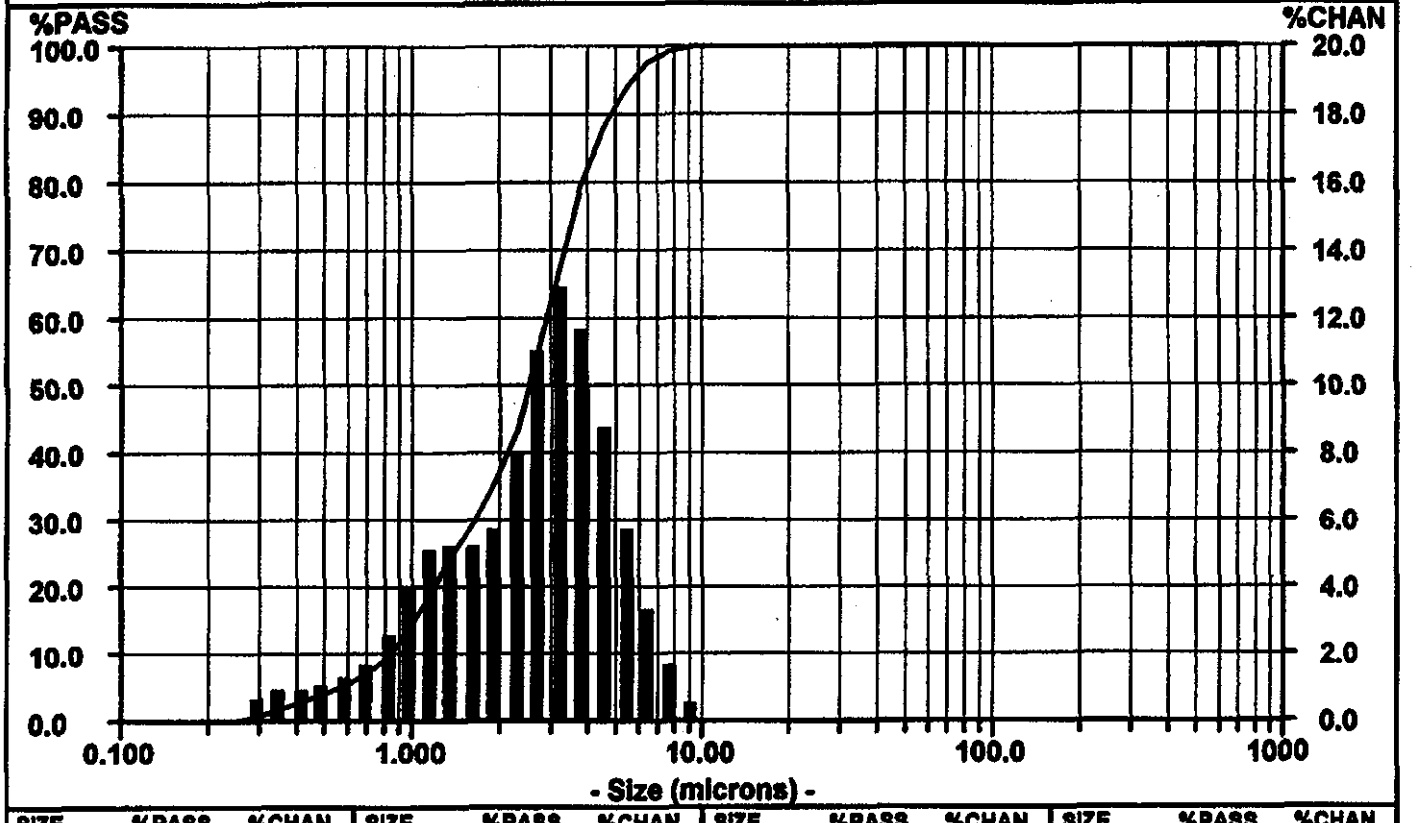
C-104

C-104
Duplicate

Date: 09/26/91 Meas #: 00001
Time: 16:37 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Sonicate for 20 min. @ 40 W
Flow Rate = 17 ml/sec.
Refractive Index = 1.70 Particle/1.33 Medium
File: 104CD002

Summary	Percentiles		Dia	Vol%	Width
mv = 2.711	10% = 0.830	60% = 2.957	3.042	76%	2.594
mn = 0.492	20% = 1.196	70% = 3.378	0.914	24%	0.734
ma = 1.645	30% = 1.658	80% = 3.928			
cs = 3.647	40% = 2.161	90% = 4.530			
sd = 1.586	50% = 2.572	95% = 5.691			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	100.00	0.63						
592.0	100.00	0.00	7.778	99.37	1.72						
497.8	100.00	0.00	6.541	97.65	3.49						
418.6	100.00	0.00	5.500	94.16	5.89						
352.0	100.00	0.00	4.625	88.27	8.53						
296.0	100.00	0.00	3.889	79.44	11.79						
248.9	100.00	0.00	3.270	67.65	13.02						
209.3	100.00	0.00	2.750	54.63	11.16						
176.0	100.00	0.00	2.312	43.47	8.01						
148.0	100.00	0.00	1.945	35.46	5.89						
124.5	100.00	0.00	1.635	29.57	5.24						
104.7	100.00	0.00	1.375	24.33	5.38						
88.00	100.00	0.00	1.156	18.95	5.19						
74.00	100.00	0.00	0.972	13.76	4.05						
62.23	100.00	0.00	0.818	9.71	2.66						
52.33	100.00	0.00	0.688	7.05	1.74						
44.00	100.00	0.00	0.578	5.31	1.31						
37.00	100.00	0.00	0.486	4.00	1.14						
31.11	100.00	0.00	0.409	2.86	1.07						
26.16	100.00	0.00	0.344	1.79	1.00						
22.00	100.00	0.00	0.289	0.79	0.79						
18.50	100.00	0.00	0.243	0.00	0.00						
15.56	100.00	0.00	0.204	0.00	0.00						
13.08	100.00	0.00	0.172	0.00	0.00						
11.00	100.00	0.00	0.145	0.00	0.00						

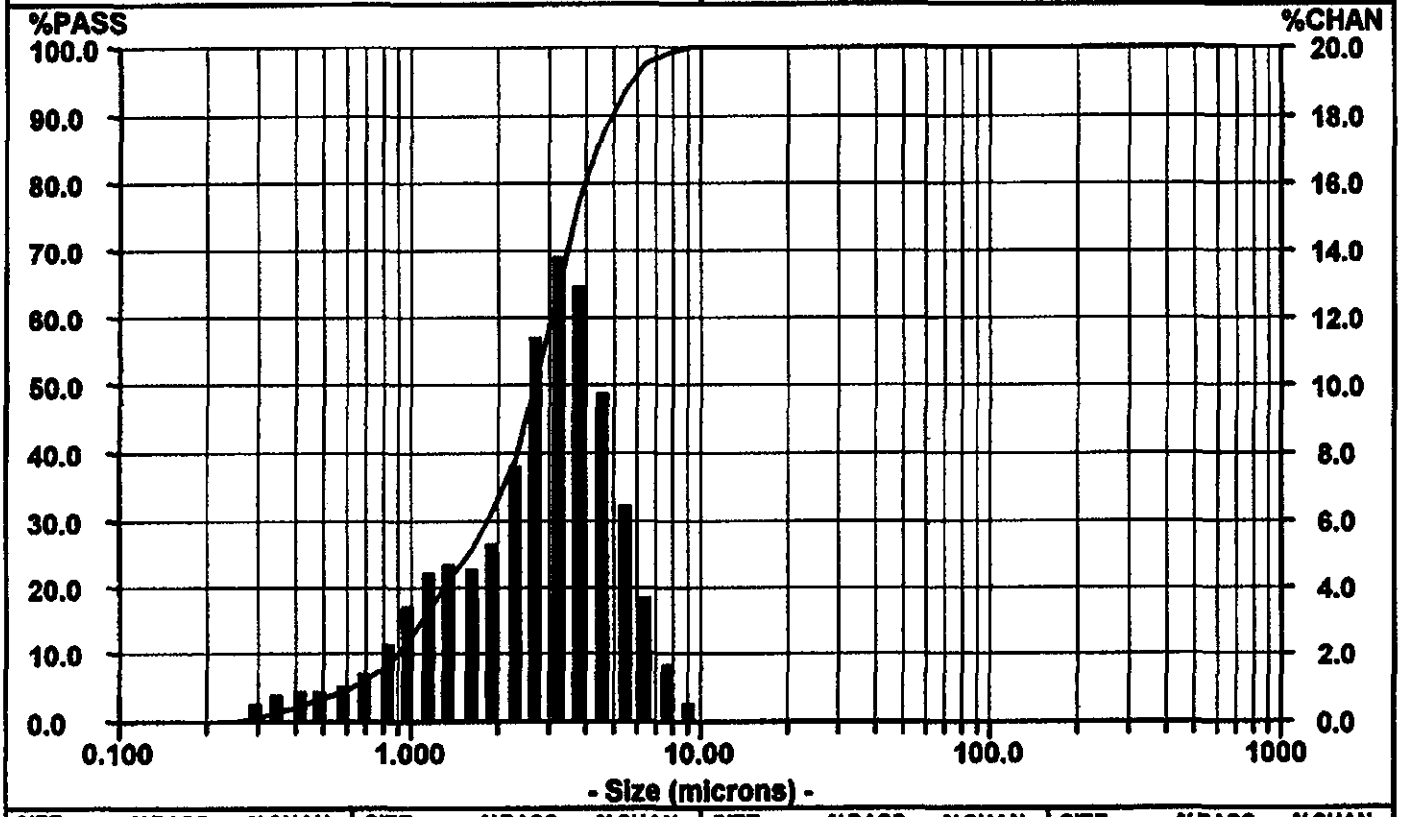
C-104

C-104 Duplicate

Date: 09/26/91 Meas #: 00001
Time: 16:41 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Sonicate for 20 min. @ 40 W
Flow Rate = 17 ml/sec.
Refractive Index = 2.00 Particle/1.33 Medium
File: 104CD003

Summary	Percentiles		Dia	Vol%	Width
mv = 2.833	10% = 0.887	60% = 3.095	3.120	79%	2.561
mn = 0.504	20% = 1.311	70% = 3.509	0.914	21%	0.727
ma = 1.761	30% = 1.867	80% = 4.044			
os = 3.408	40% = 2.344	90% = 4.920			
sd = 1.601	50% = 2.727	95% = 5.739			

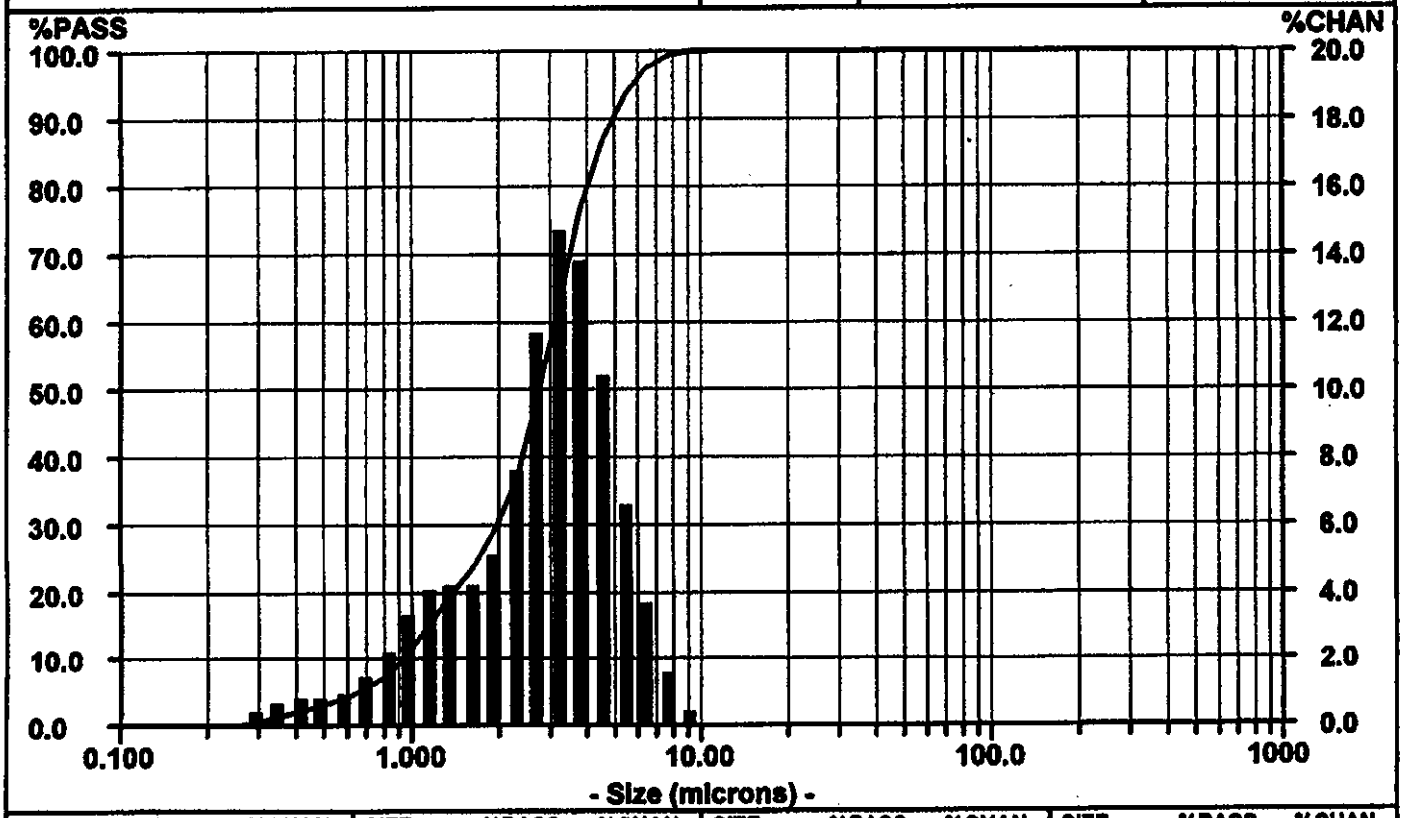


SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	100.00	0.63						
592.0	100.00	0.00	7.778	99.37	1.77						
497.8	100.00	0.00	6.541	97.60	3.74						
418.6	100.00	0.00	5.500	93.86	6.51						
352.0	100.00	0.00	4.625	87.35	9.86						
296.0	100.00	0.00	3.889	77.49	13.00						
248.9	100.00	0.00	3.270	64.49	13.87						
209.3	100.00	0.00	2.750	50.62	11.41						
176.0	100.00	0.00	2.312	39.21	7.79						
148.0	100.00	0.00	1.945	31.42	5.46						
124.5	100.00	0.00	1.635	25.96	4.67						
104.7	100.00	0.00	1.375	21.29	4.70						
88.00	100.00	0.00	1.156	16.59	4.54						
74.00	100.00	0.00	0.972	12.05	3.59						
62.23	100.00	0.00	0.818	8.46	2.37						
52.33	100.00	0.00	0.688	6.09	1.54						
44.00	100.00	0.00	0.578	4.55	1.14						
37.00	100.00	0.00	0.486	3.41	0.98						
31.11	100.00	0.00	0.409	2.43	0.91						
26.16	100.00	0.00	0.344	1.52	0.85						
22.00	100.00	0.00	0.289	0.67	0.67						
18.50	100.00	0.00	0.243	0.00	0.00						
15.56	100.00	0.00	0.204	0.00	0.00						
13.08	100.00	0.00	0.172	0.00	0.00						
11.00	100.00	0.00	0.145	0.00	0.00						

C-104	C-104 Duplicate	Date: 09/26/91 Time: 16:49	Meas #: 00001 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Sonicate for 20 min. @ 40 W
Flow Rate = 40 ml/sec.
Refractive Index = 1.50 Particle/1.33 Medium
File: 104CD004

Summary	Percentiles		Dia	Vol%	Width
mv = 2.888	10% = 0.923	60% = 3.157	2.807	100%	3.158
mn = 0.516	20% = 1.402	70% = 3.554			
ma = 1.834	30% = 2.002	80% = 4.070			
cs = 3.272	40% = 2.446	90% = 4.914			
sd = 1.579	50% = 2.807	95% = 5.708			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	100.00	0.58						
592.0	100.00	0.00	7.778	99.42	1.69						
497.8	100.00	0.00	6.541	97.73	3.73						
418.6	100.00	0.00	5.500	94.00	6.70						
352.0	100.00	0.00	4.625	87.30	10.40						
296.0	100.00	0.00	3.889	76.90	13.84						
248.9	100.00	0.00	3.270	63.06	14.70						
209.3	100.00	0.00	2.750	48.36	11.76						
176.0	100.00	0.00	2.312	36.61	7.68						
148.0	100.00	0.00	1.945	28.93	5.14						
124.5	100.00	0.00	1.635	23.79	4.26						
104.7	100.00	0.00	1.375	19.53	4.26						
88.00	100.00	0.00	1.156	15.27	4.18						
74.00	100.00	0.00	0.972	11.11	3.34						
62.23	100.00	0.00	0.818	7.77	2.23						
52.33	100.00	0.00	0.688	5.54	1.44						
44.00	100.00	0.00	0.578	4.10	1.05						
37.00	100.00	0.00	0.486	3.05	0.89						
31.11	100.00	0.00	0.409	2.16	0.81						
26.16	100.00	0.00	0.344	1.35	0.75						
22.00	100.00	0.00	0.289	0.60	0.60						
18.50	100.00	0.00	0.243	0.00	0.00						
15.56	100.00	0.00	0.204	0.00	0.00						
13.08	100.00	0.00	0.172	0.00	0.00						
11.00	100.00	0.00	0.145	0.00	0.00						

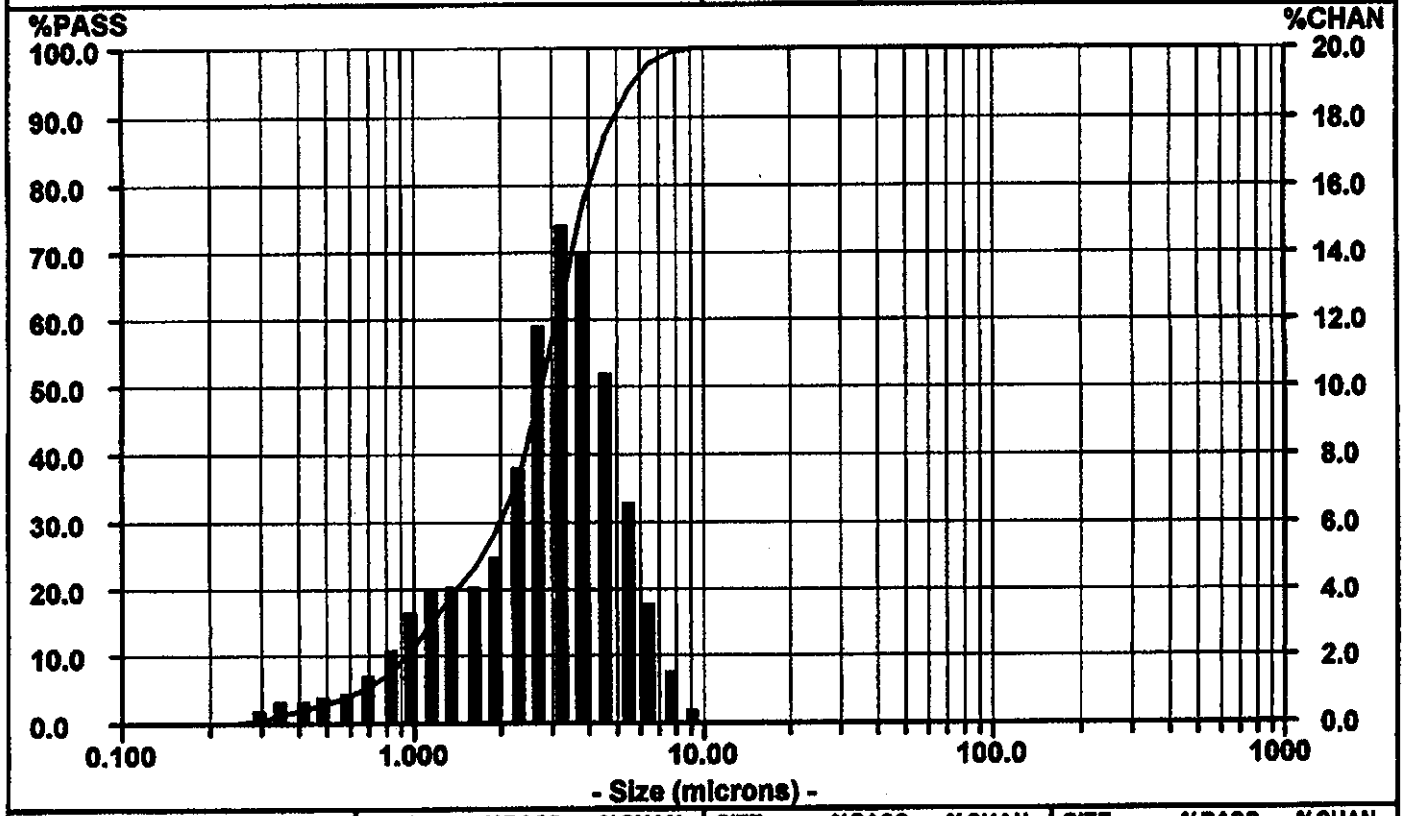
C-104

C-104
Duplicate

Date: 09/26/91 Meas #: 00001
Time: 16:53 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Sonicate for 20 min. @ 40 W
Flow Rate = 40 ml/sec.
Refractive Index = 1.70 Particle/1.33 Medium
File: 104CD005

Summary	Percentiles		Dia	Vol%	Width
mv = 2.892	10% = 0.930	60% = 3.163	2.818	100%	3.132
mn = 0.618	20% = 1.423	70% = 3.554			
ma = 1.847	30% = 2.029	80% = 4.061			
cs = 3.248	40% = 2.464	90% = 4.890			
sd = 1.566	50% = 2.818	95% = 5.675			

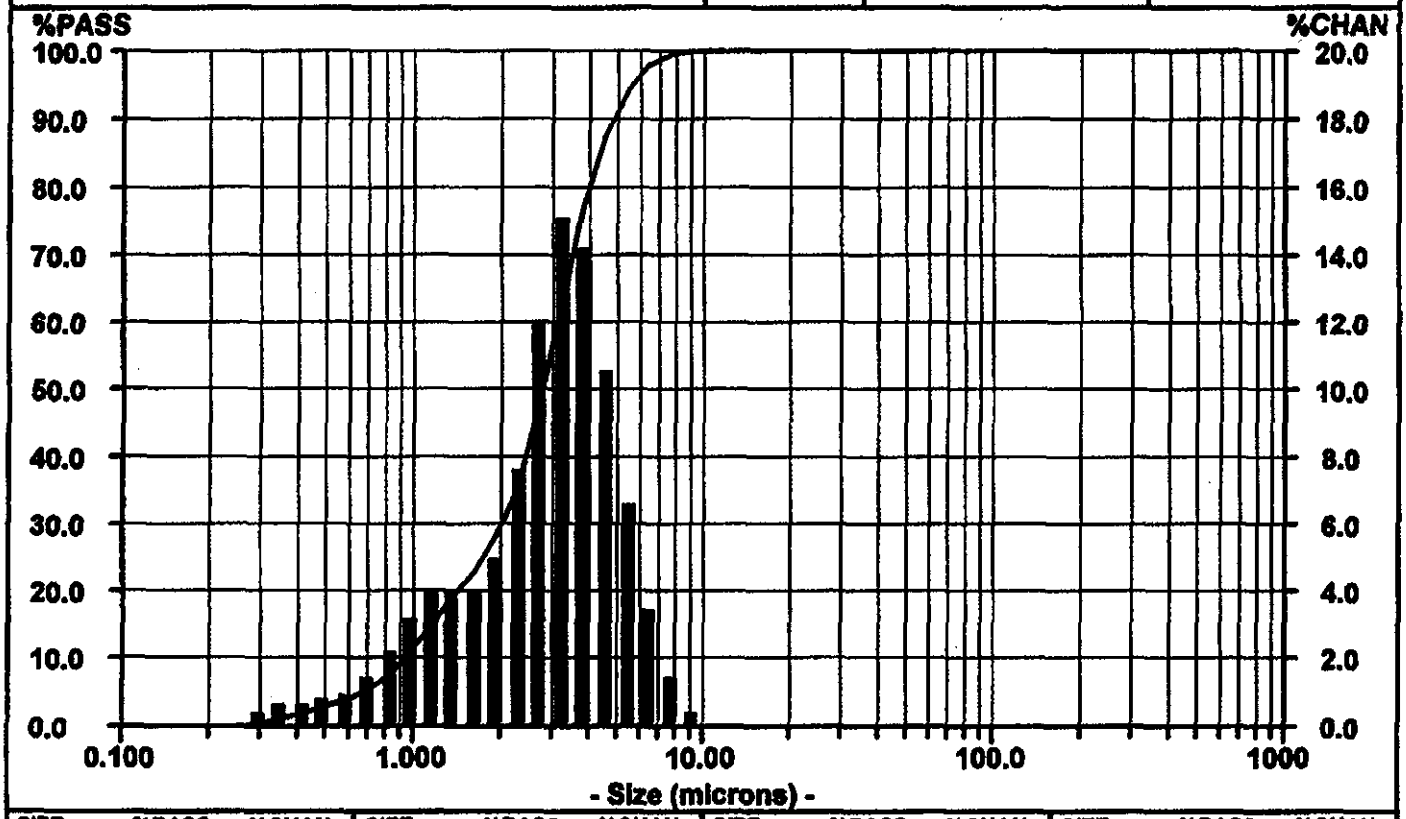


SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	100.00	0.55						
592.0	100.00	0.00	7.778	99.45	1.63						
497.8	100.00	0.00	6.541	97.82	3.65						
418.6	100.00	0.00	5.500	94.17	6.67						
352.0	100.00	0.00	4.625	87.50	10.49						
296.0	100.00	0.00	3.889	77.01	14.07						
248.9	100.00	0.00	3.270	62.94	14.94						
209.3	100.00	0.00	2.750	48.00	11.88						
176.0	100.00	0.00	2.312	36.12	7.68						
148.0	100.00	0.00	1.945	28.44	5.07						
124.5	100.00	0.00	1.635	23.37	4.17						
104.7	100.00	0.00	1.375	19.20	4.16						
88.00	100.00	0.00	1.156	15.04	4.09						
74.00	100.00	0.00	0.972	10.95	3.30						
62.23	100.00	0.00	0.818	7.65	2.21						
52.33	100.00	0.00	0.688	5.44	1.43						
44.00	100.00	0.00	0.578	4.01	1.04						
37.00	100.00	0.00	0.486	2.97	0.87						
31.11	100.00	0.00	0.409	2.10	0.79						
26.16	100.00	0.00	0.344	1.31	0.73						
22.00	100.00	0.00	0.289	0.58	0.58						
18.50	100.00	0.00	0.243	0.00	0.00						
15.56	100.00	0.00	0.204	0.00	0.00						
13.08	100.00	0.00	0.172	0.00	0.00						
11.00	100.00	0.00	0.145	0.00	0.00						

C-104	C-104 Duplicate	Date: 09/26/91 Time: 16:58	Meas #: 00001 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Sonicate for 20 min. @ 40 W
Flow Rate = 40 ml/sec.
Refractive Index = 2.00 Particle/1.33 Medium
File: 104CD006

Summary	Percentiles		Dia	Vol%	Width
mv = 2.889	10% = 0.935	60% = 3.167	2.827	100%	3.096
mn = 0.520	20% = 1.439	70% = 3.550			
ma = 1.858	30% = 2.049	80% = 4.044			
cs = 3.230	40% = 2.476	90% = 4.843			
sd = 1.548	50% = 2.827	95% = 5.607			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	100.00	0.49						
592.0	100.00	0.00	7.778	99.51	1.50						
497.8	100.00	0.00	6.541	98.01	3.50						
418.6	100.00	0.00	5.500	94.51	6.62						
352.0	100.00	0.00	4.625	87.89	10.64						
296.0	100.00	0.00	3.889	77.25	14.36						
248.9	100.00	0.00	3.270	62.89	15.18						
209.3	100.00	0.00	2.750	47.71	12.00						
176.0	100.00	0.00	2.312	35.71	7.67						
148.0	100.00	0.00	1.945	28.04	5.01						
124.5	100.00	0.00	1.635	23.03	4.08						
104.7	100.00	0.00	1.375	18.95	4.08						
88.00	100.00	0.00	1.156	14.87	4.04						
74.00	100.00	0.00	0.972	10.83	3.29						
62.23	100.00	0.00	0.818	7.54	2.20						
52.33	100.00	0.00	0.688	5.34	1.42						
44.00	100.00	0.00	0.578	3.92	1.02						
37.00	100.00	0.00	0.486	2.90	0.85						
31.11	100.00	0.00	0.409	2.05	0.77						
26.16	100.00	0.00	0.344	1.28	0.71						
22.00	100.00	0.00	0.289	0.57	0.57						
18.50	100.00	0.00	0.243	0.00	0.00						
15.56	100.00	0.00	0.204	0.00	0.00						
13.08	100.00	0.00	0.172	0.00	0.00						
11.00	100.00	0.00	0.145	0.00	0.00						

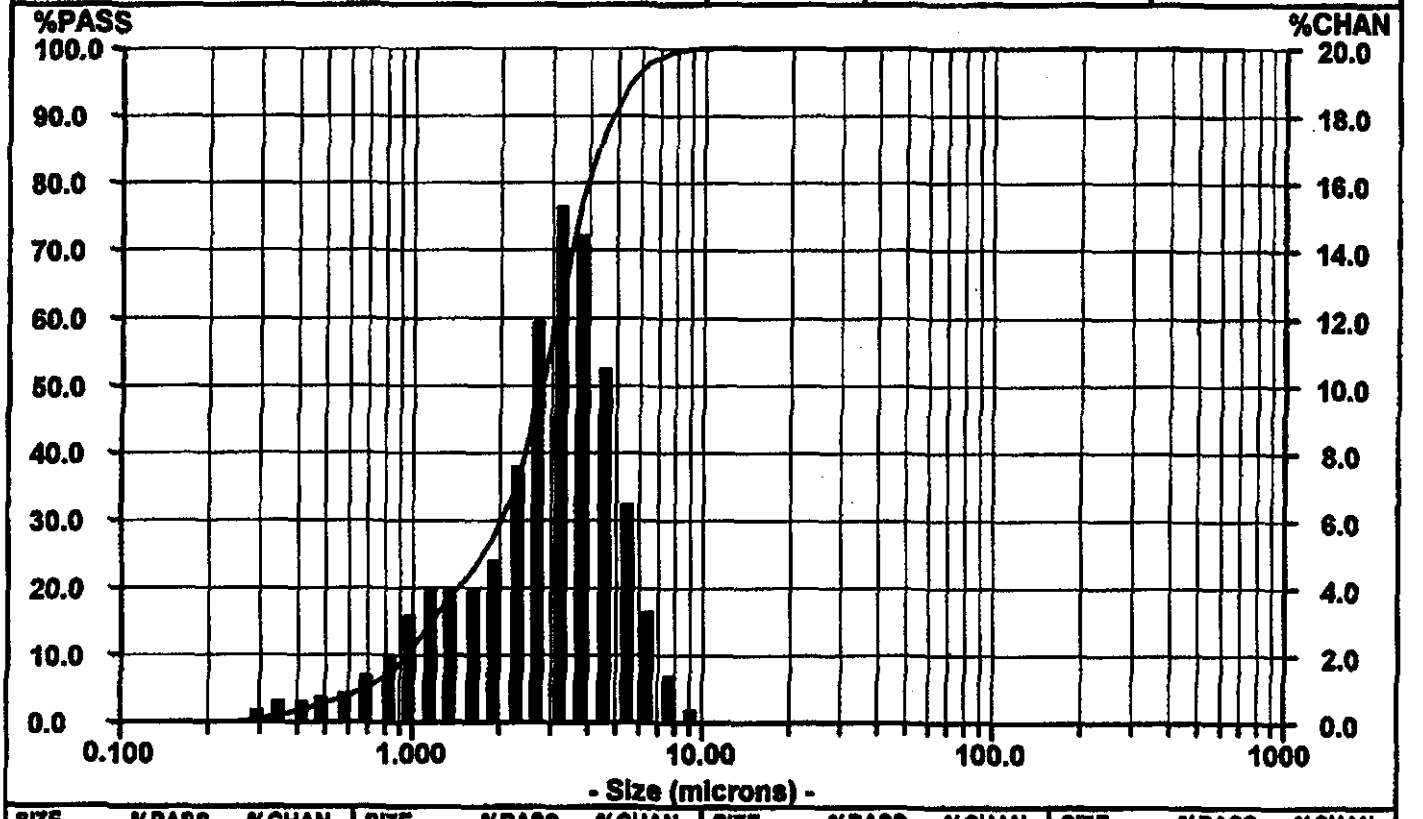
C-104

C-104 Duplicate

Date: 09/26/91 Meas #: 00001
Time: 17:03 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Sonicate for 20 min. @ 40 W
Flow Rate = 60 ml/sec.
Refractive Index = 1.50 Particle/1.33 Medium
File: 104CD007

Summary	Percentiles		Dia	Vol%	Width
mv = 2.881	10% = 0.940	60% = 3.164	3.144	81%	2.365
mn = 0.622	20% = 1.449	70% = 3.540	0.912	19%	0.708
ma = 1.863	30% = 2.061	80% = 4.023			
cs = 3.220	40% = 2.486	90% = 4.801			
sd = 1.530	50% = 2.830	95% = 5.543			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	100.00	0.44						
592.0	100.00	0.00	7.778	99.56	1.40						
497.8	100.00	0.00	6.541	98.16	3.35						
418.6	100.00	0.00	5.500	94.81	6.52						
352.0	100.00	0.00	4.625	88.29	10.88						
296.0	100.00	0.00	3.889	77.61	14.59						
248.9	100.00	0.00	3.270	63.02	15.45						
209.3	100.00	0.00	2.750	47.57	12.10						
176.0	100.00	0.00	2.312	35.47	7.65						
148.0	100.00	0.00	1.945	27.82	4.96						
124.5	100.00	0.00	1.635	22.86	4.05						
104.7	100.00	0.00	1.375	18.81	4.06						
88.00	100.00	0.00	1.156	14.75	4.03						
74.00	100.00	0.00	0.972	10.72	3.27						
62.23	100.00	0.00	0.818	7.45	2.18						
52.33	100.00	0.00	0.688	5.27	1.40						
44.00	100.00	0.00	0.578	3.87	1.01						
37.00	100.00	0.00	0.486	2.86	0.84						
31.11	100.00	0.00	0.409	2.02	0.78						
26.16	100.00	0.00	0.344	1.26	0.70						
22.00	100.00	0.00	0.289	0.56	0.56						
18.50	100.00	0.00	0.243	0.00	0.00						
15.56	100.00	0.00	0.204	0.00	0.00						
13.08	100.00	0.00	0.172	0.00	0.00						
11.00	100.00	0.00	0.145	0.00	0.00						

C-104

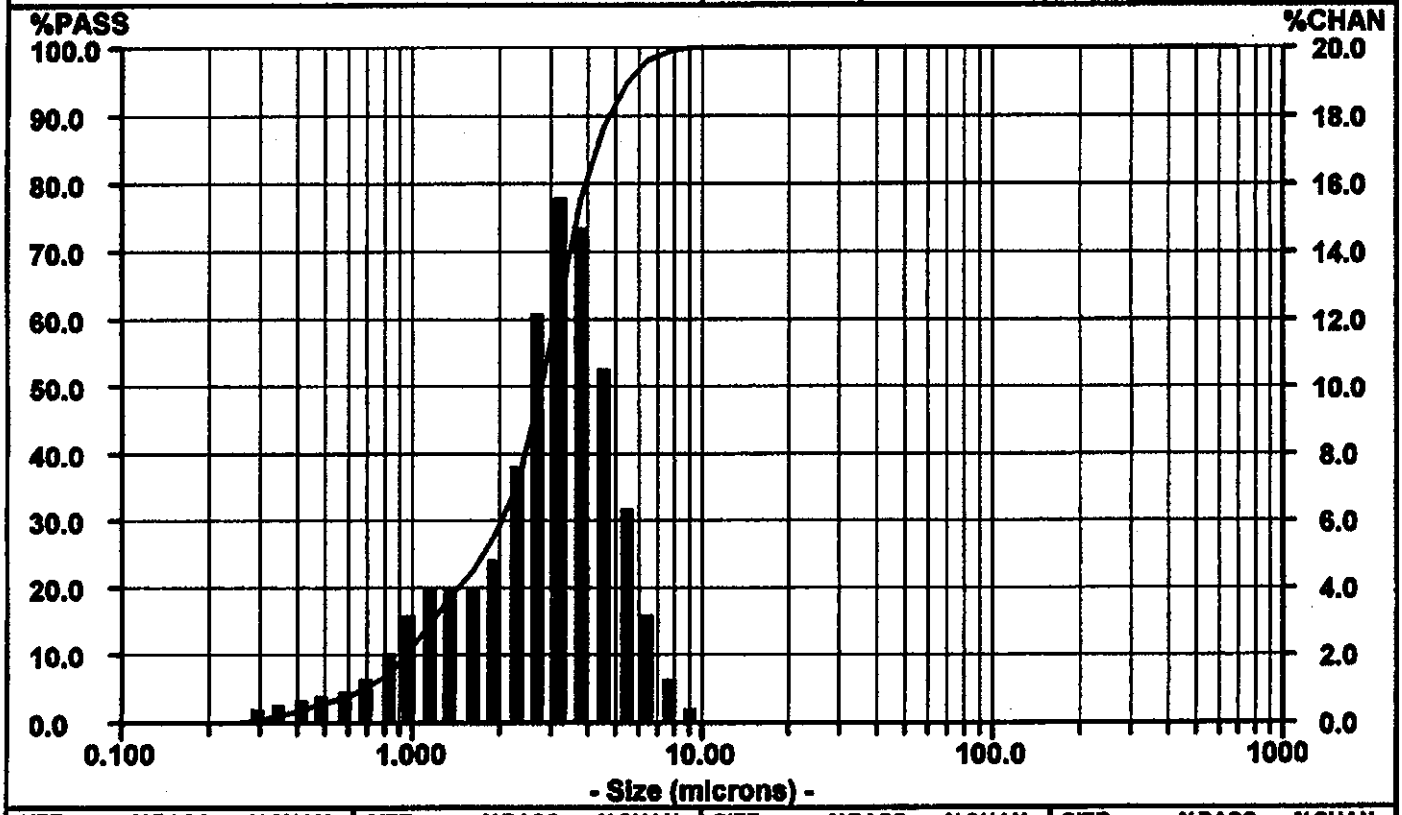
C-104
Duplicate

Date: 09/26/91 Meas #: 00001
Time: 17:07 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Sonicate for 20 min. @ 40 W
Flow Rate = 60 ml/sec.
Refractive Index = 1.70 Particle/1.33 Medium
File: 104CD008

Summary		Percentiles			
mv	= 2.874	10% = 0.943	60% = 3.160		
mn	= 0.526	20% = 1.453	70% = 3.530		
ma	= 1.868	30% = 2.068	80% = 4.005		
os	= 3.211	40% = 2.489	90% = 4.772		
sd	= 1.517	50% = 2.830	95% = 5.498		

Dia	Vol%	Width
3.138	81%	2.334
0.916	19%	0.703



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	100.00	0.41						
592.0	100.00	0.00	7.778	99.59	1.33						
497.8	100.00	0.00	6.541	98.26	3.25						
418.6	100.00	0.00	5.500	95.01	6.42						
352.0	100.00	0.00	4.625	88.59	10.68						
296.0	100.00	0.00	3.889	77.91	14.72						
248.9	100.00	0.00	3.270	63.19	15.64						
209.3	100.00	0.00	2.750	47.55	12.20						
176.0	100.00	0.00	2.312	35.35	7.65						
148.0	100.00	0.00	1.945	27.70	4.93						
124.5	100.00	0.00	1.635	22.77	4.02						
104.7	100.00	0.00	1.375	18.75	4.05						
88.00	100.00	0.00	1.156	14.70	4.05						
74.00	100.00	0.00	0.972	10.65	3.29						
62.23	100.00	0.00	0.818	7.36	2.18						
52.33	100.00	0.00	0.688	5.18	1.39						
44.00	100.00	0.00	0.578	3.79	0.99						
37.00	100.00	0.00	0.486	2.80	0.82						
31.11	100.00	0.00	0.409	1.98	0.75						
26.16	100.00	0.00	0.344	1.23	0.69						
22.00	100.00	0.00	0.289	0.54	0.54						
18.50	100.00	0.00	0.243	0.00	0.00						
15.56	100.00	0.00	0.204	0.00	0.00						
13.08	100.00	0.00	0.172	0.00	0.00						
11.00	100.00	0.00	0.145	0.00	0.00						

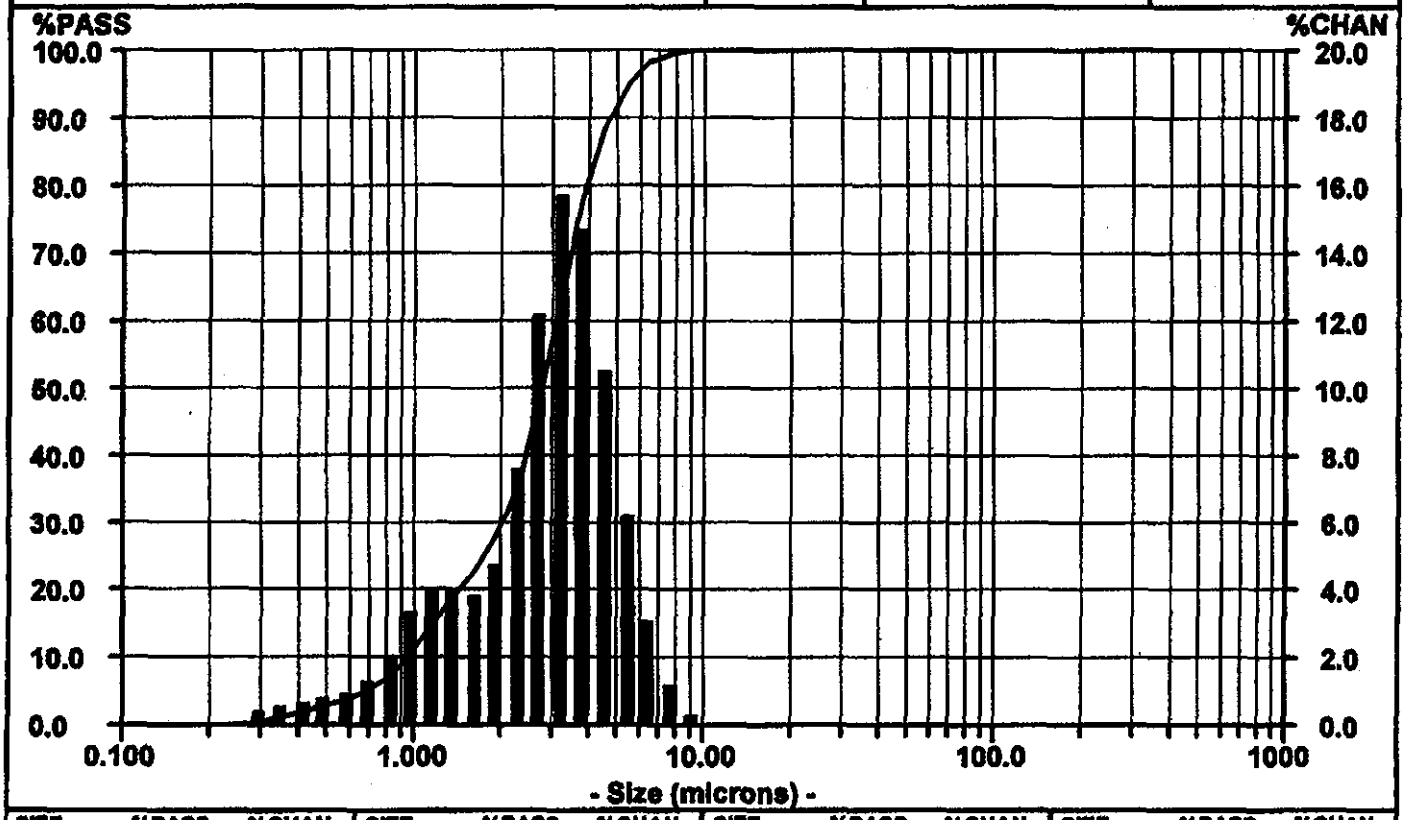
C-104

C-104
Duplicate

Date: 09/26/91 Meas #: 00001
Time: 17:11 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Sonicate for 20 min. @ 40 W
Flow Rate = 60 ml/sec.
Refractive Index = 2.00 Particle/1.33 Medium
File: 104CD009

Summary		Percentiles				Dia	Vol%	Width
mv	= 2.866	10%	= 0.942	60%	= 3.156	3.135	81%	2.303
mn	= 0.626	20%	= 1.463	70%	= 3.521	0.914	19%	0.703
ma	= 1.867	30%	= 2.071	80%	= 3.989			
cs	= 3.214	40%	= 2.491	90%	= 4.741			
sd	= 1.507	50%	= 2.830	95%	= 5.458			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	100.00	0.38						
592.0	100.00	0.00	7.778	99.62	1.26						
497.8	100.00	0.00	6.541	98.36	3.14						
418.6	100.00	0.00	5.500	95.22	6.33						
352.0	100.00	0.00	4.625	88.89	10.69						
296.0	100.00	0.00	3.889	78.20	14.86						
248.9	100.00	0.00	3.270	63.34	15.80						
209.3	100.00	0.00	2.750	47.54	12.26						
176.0	100.00	0.00	2.312	35.28	7.64						
148.0	100.00	0.00	1.945	27.64	4.89						
124.5	100.00	0.00	1.635	22.75	3.99						
104.7	100.00	0.00	1.375	18.76	4.03						
88.00	100.00	0.00	1.156	14.73	4.05						
74.00	100.00	0.00	0.972	10.68	3.30						
62.23	100.00	0.00	0.818	7.38	2.19						
52.33	100.00	0.00	0.688	5.19	1.39						
44.00	100.00	0.00	0.578	3.80	0.99						
37.00	100.00	0.00	0.486	2.81	0.83						
31.11	100.00	0.00	0.409	1.98	0.75						
26.16	100.00	0.00	0.344	1.23	0.69						
22.00	100.00	0.00	0.289	0.54	0.54						
18.50	100.00	0.00	0.243	0.00	0.00						
15.56	100.00	0.00	0.204	0.00	0.00						
13.08	100.00	0.00	0.172	0.00	0.00						
11.00	100.00	0.00	0.145	0.00	0.00						

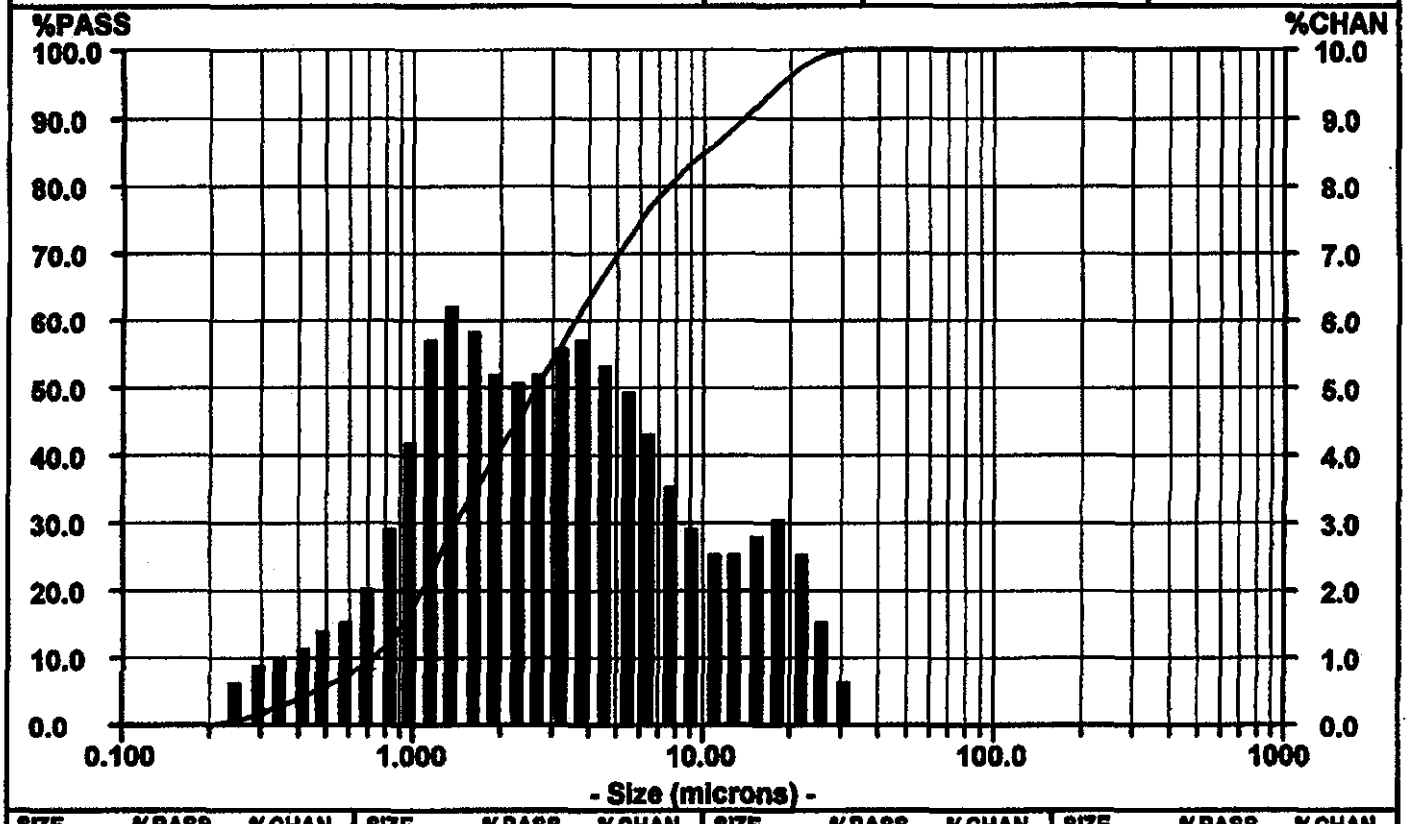
C-104

C-104 Duplicate

Date: 09/26/91 Meas #: 00001
Time: 17:31 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Sonicate for 2 min. followed by a 90 min delay
External Sonifier
Flow Rate = 17 ml/sec.
Refractive Index = 1.50 Particle/1.33 Medium
File: 104CD010

Summary		Percentiles		Dia	Vol%	Width
mv =	4.972	10% = 0.711	60% = 3.652	16.67	14%	9.639
mn =	0.395	20% = 1.074	70% = 5.033	4.040	46%	4.683
ma =	1.576	30% = 1.418	80% = 7.551	1.078	40%	1.054
cs =	3.806	40% = 1.930	90% = 13.92			
sd =	4.260	50% = 2.688	95% = 18.48			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.260	83.64	3.06						
592.0	100.00	0.00	7.778	80.59	3.69						
497.8	100.00	0.00	6.541	76.90	4.40						
418.6	100.00	0.00	5.500	72.50	5.00						
352.0	100.00	0.00	4.625	67.50	5.44						
296.0	100.00	0.00	3.889	62.06	5.70						
248.9	100.00	0.00	3.270	56.36	5.64						
209.3	100.00	0.00	2.750	50.72	5.34						
176.0	100.00	0.00	2.312	45.38	5.14						
148.0	100.00	0.00	1.945	40.24	5.36						
124.5	100.00	0.00	1.636	34.88	5.96						
104.7	100.00	0.00	1.375	28.92	6.36						
88.00	100.00	0.00	1.156	22.56	5.72						
74.00	100.00	0.00	0.972	16.84	4.33						
62.23	100.00	0.00	0.818	12.51	3.01						
52.33	100.00	0.00	0.688	9.50	2.16						
44.00	100.00	0.00	0.578	7.34	1.69						
37.00	100.00	0.00	0.486	5.65	1.43						
31.11	100.00	0.74	0.409	4.22	1.26						
26.16	99.26	1.62	0.344	2.96	1.16						
22.00	97.64	2.62	0.289	1.80	1.04						
18.50	95.02	3.10	0.243	0.76	0.76						
15.56	91.92	2.93	0.204	0.00	0.00						
13.08	88.99	2.67	0.172	0.00	0.00						
11.00	86.32	2.68	0.145	0.00	0.00						

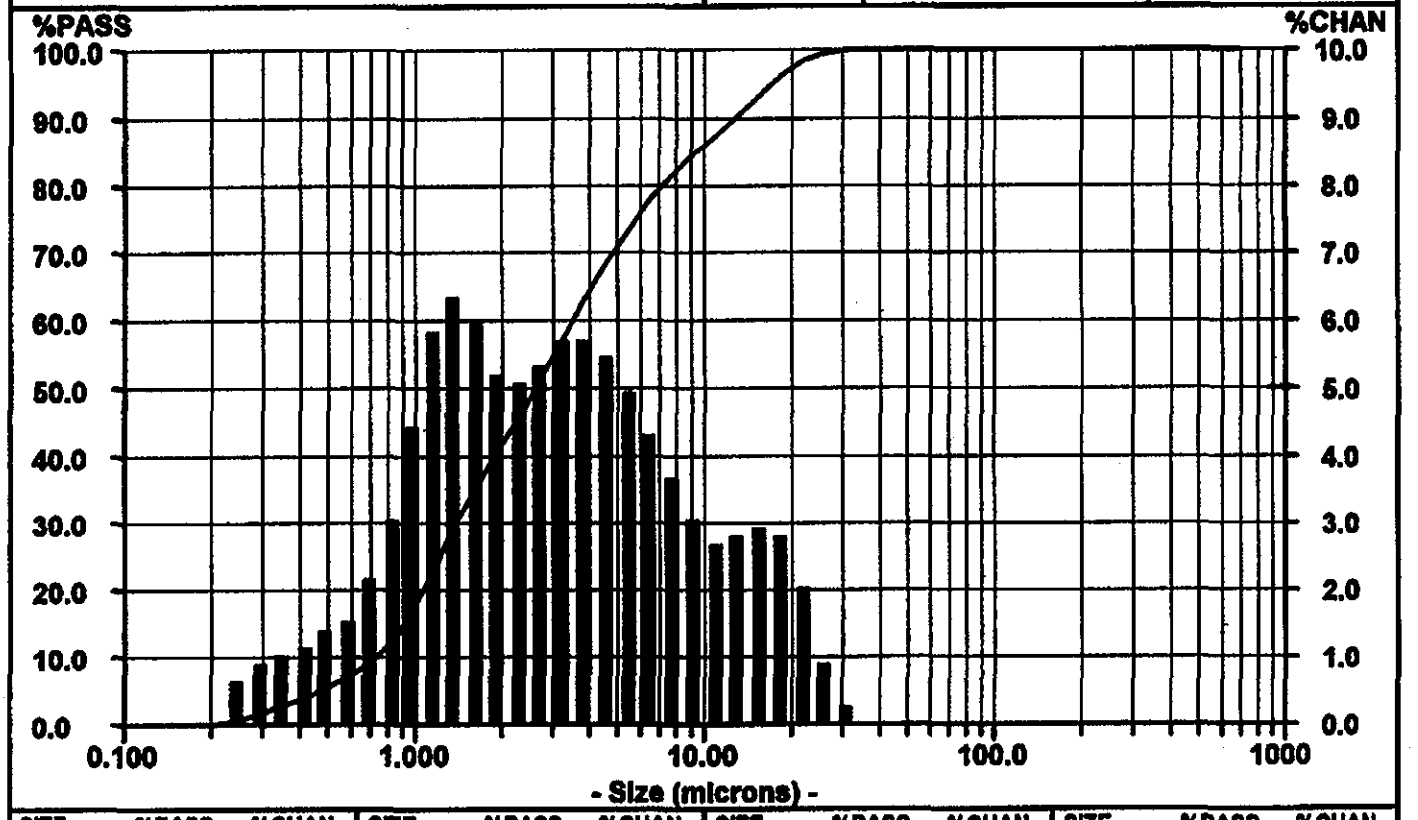
C-104

C-104
Duplicate

Date: 09/26/91 Meas #: 00001
Time: 17:35 Pres #: 01

C-104 in 1M NaOH and 1M NaNO3
Sonicate for 2 min. followed by a 90 min. delay
External Sonifier
Flow Rate = 17 ml/sec.
Refractive Index = 1.70 Particle/1.33 Medium
File: 104CD011

Summary		Percentiles		Dia	Vol%	Width
mv	= 4.701	10% = 0.715	60% = 3.559	14.69	15%	9.373
mn	= 0.402	20% = 1.065	70% = 4.863	3.867	44%	4.023
ma	= 1.569	30% = 1.399	80% = 7.175	1.077	41%	1.037
cs	= 3.823	40% = 1.895	90% = 12.81			
sd	= 3.955	50% = 2.634	95% = 17.02			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	84.76	3.10						
592.0	100.00	0.00	7.778	81.65	3.71						
497.8	100.00	0.00	6.541	77.94	4.41						
418.6	100.00	0.00	5.500	73.53	5.04						
352.0	100.00	0.00	4.625	68.49	5.53						
296.0	100.00	0.00	3.889	62.96	5.82						
248.9	100.00	0.00	3.270	57.14	5.76						
209.3	100.00	0.00	2.750	51.38	5.42						
176.0	100.00	0.00	2.312	45.96	5.17						
148.0	100.00	0.00	1.945	40.79	5.38						
124.5	100.00	0.00	1.635	35.41	6.02						
104.7	100.00	0.00	1.375	29.39	6.46						
88.00	100.00	0.00	1.156	22.93	5.92						
74.00	100.00	0.00	0.972	17.01	4.60						
62.23	100.00	0.00	0.818	12.51	3.12						
52.33	100.00	0.00	0.688	9.39	2.21						
44.00	100.00	0.00	0.578	7.18	1.70						
37.00	100.00	0.00	0.486	5.48	1.41						
31.11	100.00	0.38	0.409	4.07	1.24						
26.16	99.62	1.08	0.344	2.83	1.12						
22.00	98.54	2.17	0.289	1.71	0.99						
18.50	96.37	2.97	0.243	0.72	0.72						
15.56	93.40	3.04	0.204	0.00	0.00						
13.08	90.36	2.82	0.172	0.00	0.00						
11.00	87.54	2.79	0.145	0.00	0.00						

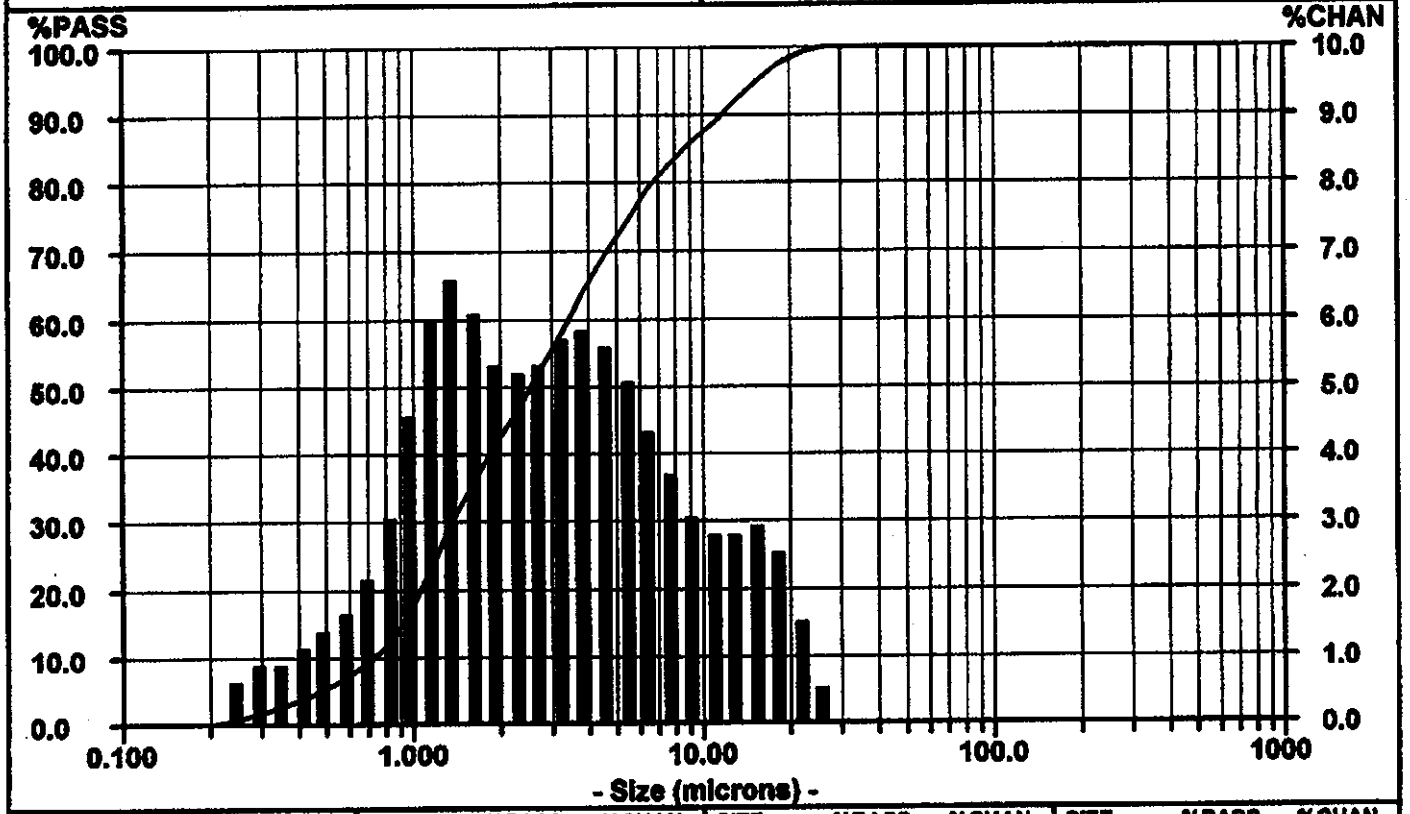
C-104

C-104
Duplicate

Date: 09/26/91 Meas #: 00001
Time: 17:41 Pres #: 01

C-104 in 1M NaOH and 1 M NaNO3
Sonicate for 2 min. followed by a 90 min. delay
External Sonifier
Flow Rate = 17 ml/sec.
Refractive Index = 2.00 Particle/1.33 Medium
File: 104CD012

Summary		Percentiles		Dia	Vol%	Width
mv =	4.386	10% = 0.716	60% = 3.459	13.87	14%	7.976
mn =	0.407	20% = 1.056	70% = 4.666	3.867	45%	4.012
ma =	1.566	30% = 1.380	80% = 6.744	1.081	41%	1.025
cs =	3.856	40% = 1.862	90% = 11.60			
sd =	3.624	50% = 2.569	95% = 15.45			

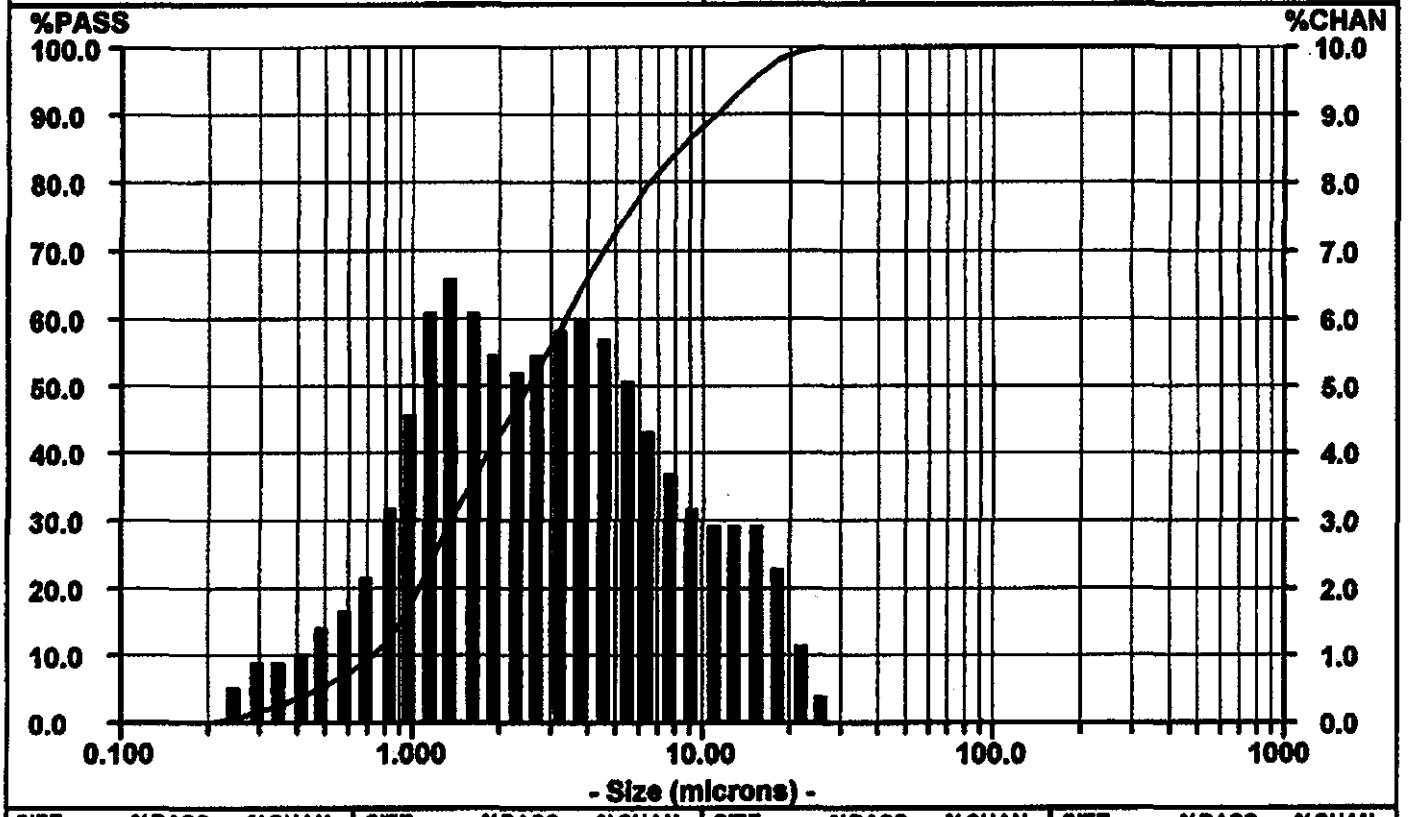


SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	86.20	3.17						
592.0	100.00	0.00	7.778	83.03	3.73						
497.8	100.00	0.00	6.541	79.30	4.44						
418.6	100.00	0.00	5.500	74.86	5.13						
352.0	100.00	0.00	4.625	69.73	5.69						
296.0	100.00	0.00	3.889	64.04	5.97						
248.9	100.00	0.00	3.270	58.07	5.87						
209.3	100.00	0.00	2.750	52.20	5.48						
176.0	100.00	0.00	2.312	46.72	5.23						
148.0	100.00	0.00	1.945	41.49	5.48						
124.5	100.00	0.00	1.635	36.03	6.15						
104.7	100.00	0.00	1.375	29.88	6.64						
88.00	100.00	0.00	1.156	23.24	6.06						
74.00	100.00	0.00	0.972	17.16	4.62						
62.23	100.00	0.00	0.818	12.54	3.19						
52.33	100.00	0.00	0.688	9.35	2.25						
44.00	100.00	0.00	0.578	7.10	1.72						
37.00	100.00	0.00	0.486	5.38	1.41						
31.11	100.00	0.00	0.409	3.97	1.22						
26.16	100.00	0.62	0.344	2.75	1.09						
22.00	99.38	1.60	0.289	1.66	0.96						
18.50	97.78	2.66	0.243	0.70	0.70						
15.56	95.12	3.05	0.204	0.00	0.00						
13.08	92.07	2.96	0.172	0.00	0.00						
11.00	89.11	2.91	0.145	0.00	0.00						

C-104	C-104 Duplicate	Date: 09/26/91 Time: 17:45	Meas #: 00001 Pres #: 01

C-104 in 1M NaOH and 1 M NaNO3
Sonicate for 2 min. followed by a 90 min. delay
External Sonifier
Flow Rate = 40 ml/sec.
Refractive Index = 1.50 Particle/1.33 Medium
File: 104CD013

Summary	Percentiles		Dia	Vol%	Width
mv = 4.255	10% = 0.719	60% = 3.413	13.46	13%	7.374
mn = 0.410	20% = 1.067	70% = 4.584	3.865	45%	4.017
ma = 1.553	30% = 1.373	80% = 6.570	1.083	42%	1.019
cs = 3.863	40% = 1.836	90% = 11.06			
sd = 3.491	50% = 2.542	95% = 14.71			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	86.89	3.23						
592.0	100.00	0.00	7.778	83.66	3.76						
497.8	100.00	0.00	6.541	79.90	4.46						
418.6	100.00	0.00	5.500	75.45	5.16						
352.0	100.00	0.00	4.625	70.29	5.74						
296.0	100.00	0.00	3.889	64.55	6.05						
248.9	100.00	0.00	3.270	58.50	5.94						
209.3	100.00	0.00	2.750	52.56	5.53						
176.0	100.00	0.00	2.312	47.03	5.26						
148.0	100.00	0.00	1.945	41.77	5.50						
124.5	100.00	0.00	1.635	36.27	6.21						
104.7	100.00	0.00	1.375	30.06	6.72						
88.00	100.00	0.00	1.156	23.34	6.17						
74.00	100.00	0.00	0.972	17.17	4.68						
62.23	100.00	0.00	0.818	12.49	3.22						
52.33	100.00	0.00	0.688	9.27	2.26						
44.00	100.00	0.00	0.578	7.01	1.72						
37.00	100.00	0.00	0.486	5.29	1.40						
31.11	100.00	0.00	0.409	3.89	1.20						
26.16	100.00	0.40	0.344	2.69	1.07						
22.00	99.60	1.25	0.289	1.62	0.94						
18.50	98.35	2.40	0.243	0.68	0.68						
15.56	95.95	3.01	0.204	0.00	0.00						
13.08	92.94	3.04	0.172	0.00	0.00						
11.00	89.90	3.01	0.145	0.00	0.00						

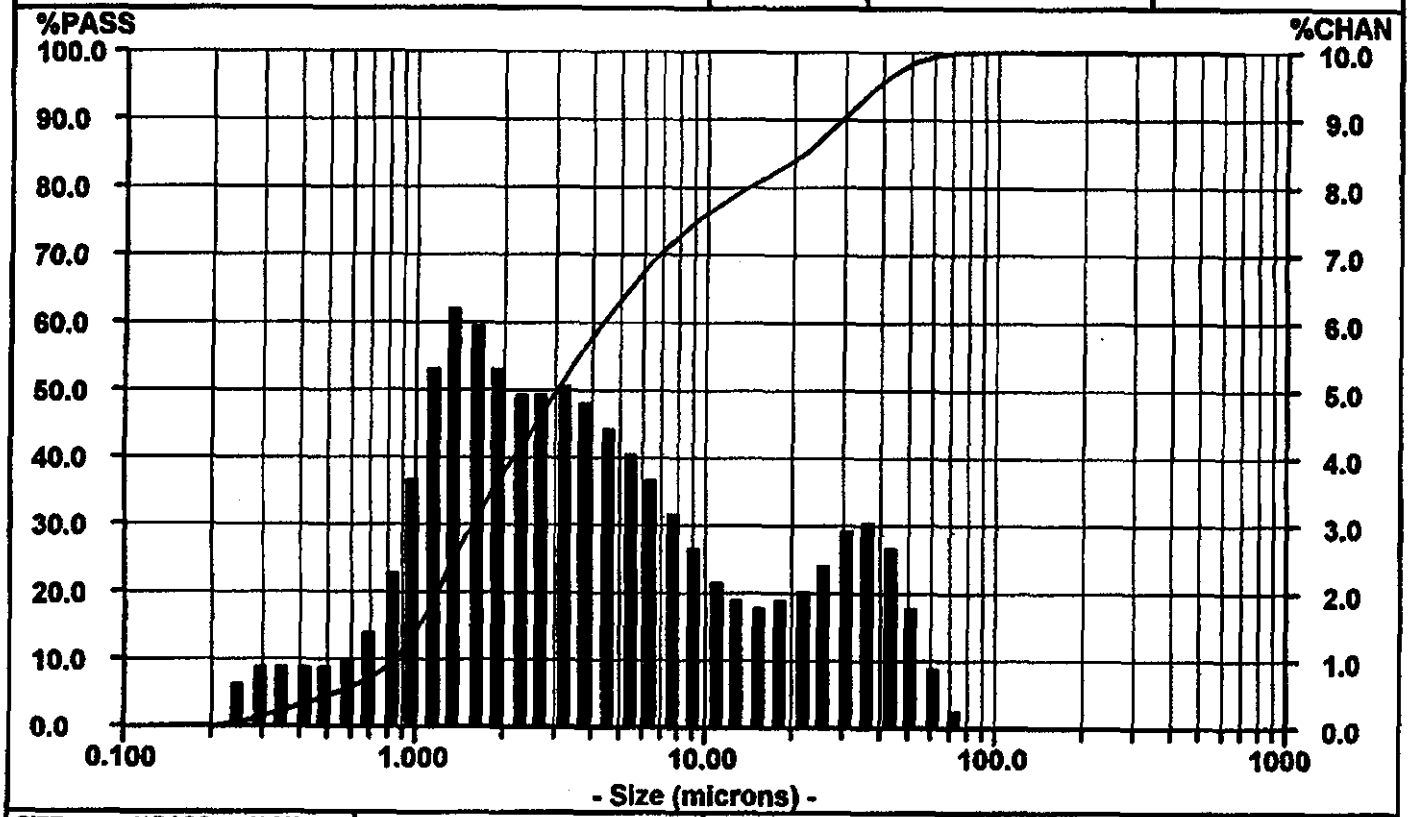
C-104

C-104
Duplicate

Date: 09/26/91 Meas #: 00001
Time: 11:59 Pres #: 01

1M NaOH 1M NaNO3
Sonicate 2 min. @ 40 W with 60 min delay before measurement
40 ml/sec
Refractive Index = 1.33 medium 1.7 particle
File 104CD014

Summary		Percentiles		Dia	Vol%	Width
mv =	8.880	10% = 0.834	60% = 4.397	29.02	21%	25.87
mn =	0.395	20% = 1.196	70% = 6.837	4.490	38%	5.404
ma =	1.799	30% = 1.579	80% = 13.85	1.225	41%	1.200
cs =	3.335	40% = 2.183	90% = 29.52			
sd =	9.380	50% = 3.072	95% = 39.04			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	75.13	2.75						
592.0	100.00	0.00	7.778	72.38	3.26						
497.8	100.00	0.00	6.541	69.12	3.71						
418.6	100.00	0.00	5.500	65.41	4.12						
352.0	100.00	0.00	4.625	61.29	4.54						
296.0	100.00	0.00	3.889	56.75	4.91						
248.9	100.00	0.00	3.270	51.84	5.10						
209.3	100.00	0.00	2.750	46.74	5.06						
176.0	100.00	0.00	2.312	41.68	5.07						
148.0	100.00	0.00	1.945	36.61	5.43						
124.5	100.00	0.00	1.635	31.18	6.08						
104.7	100.00	0.00	1.375	25.10	6.31						
88.00	100.00	0.00	1.156	18.79	5.40						
74.00	100.00	0.37	0.972	13.39	3.74						
62.23	99.63	0.84	0.818	9.65	2.35						
52.33	98.69	1.86	0.688	7.30	1.56						
44.00	96.83	2.74	0.578	5.74	1.19						
37.00	94.09	3.15	0.486	4.55	1.03						
31.11	90.94	3.00	0.409	3.52	0.97						
26.16	87.94	2.59	0.344	2.55	0.95						
22.00	85.35	2.18	0.289	1.60	0.90						
18.50	83.17	1.93	0.243	0.70	0.70						
15.56	81.24	1.85	0.204	0.00	0.00						
13.08	79.39	1.97	0.172	0.00	0.00						
11.00	77.42	2.29	0.145	0.00	0.00						

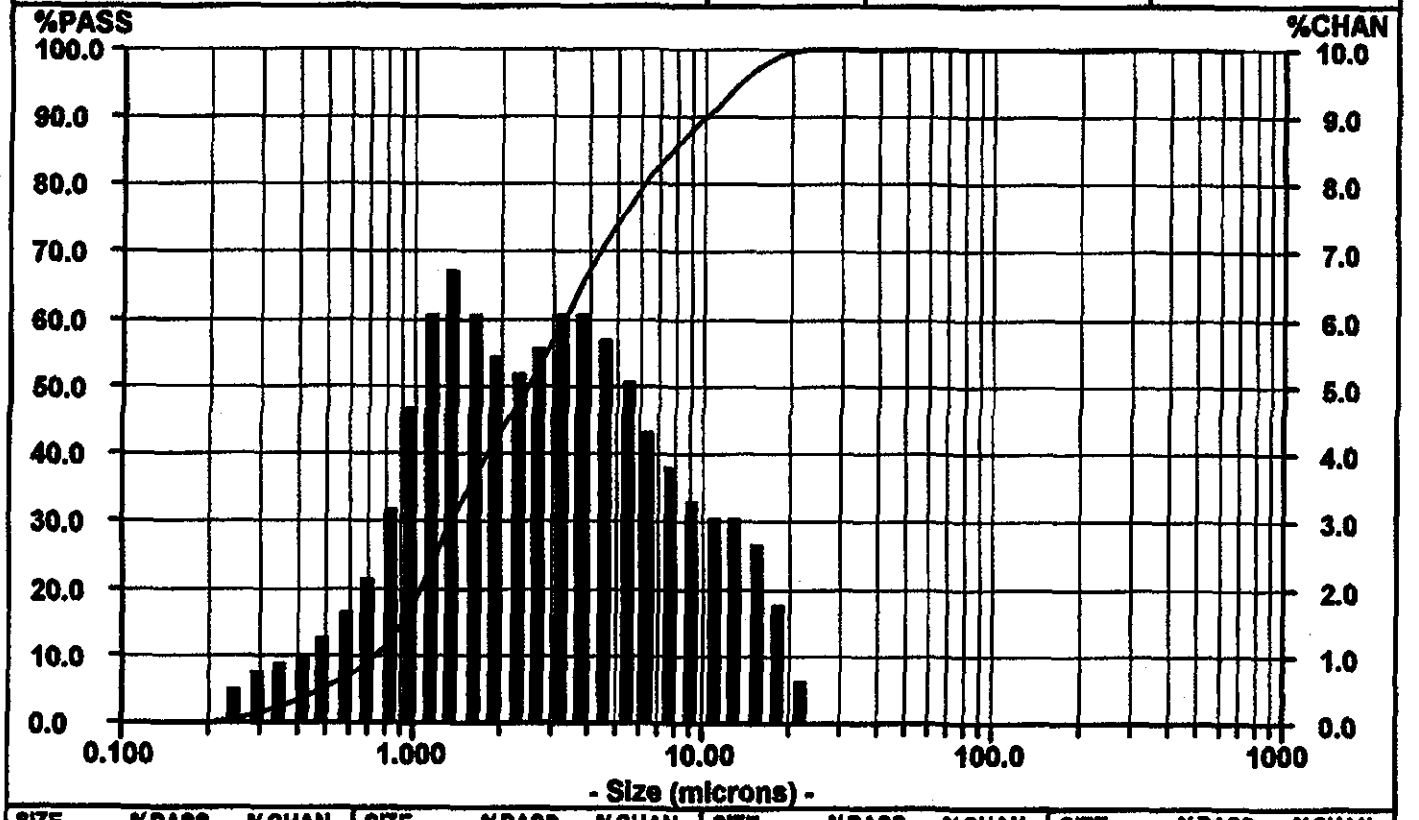
C-104

C-104
Duplicate

Date: 09/26/91 Meas #: 00001
Time: 17:53 Pres #: 01

C-104 in 1M NaOH and 1 M NaNO3
Sonicate for 2 min. followed by a 90 min. delay
External Sonifier
Flow Rate = 40 ml/sec.
Refractive Index = 2.00 Particle/1.33 Medium
File: 104CD015

Summary	Percentiles		Dia	Vol%	Width
mv = 4.003	10% = 0.725	60% = 3.324	4.577	58%	7.922
mn = 0.417	20% = 1.054	70% = 4.421	1.087	42%	1.007
ma = 1.548	30% = 1.363	80% = 6.243			
cs = 3.875	40% = 1.811	90% = 10.11			
sd = 3.244	50% = 2.491	95% = 13.34			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.260	88.37	3.39						
592.0	100.00	0.00	7.778	84.98	3.84						
497.8	100.00	0.00	6.541	81.14	4.48						
418.6	100.00	0.00	5.500	76.66	5.19						
352.0	100.00	0.00	4.625	71.47	5.84						
296.0	100.00	0.00	3.889	65.63	6.21						
248.9	100.00	0.00	3.270	59.42	6.12						
209.3	100.00	0.00	2.750	53.30	5.68						
176.0	100.00	0.00	2.312	47.62	5.37						
148.0	100.00	0.00	1.945	42.25	5.59						
124.5	100.00	0.00	1.635	36.66	6.30						
104.7	100.00	0.00	1.375	30.36	6.56						
88.00	100.00	0.00	1.156	23.80	6.30						
74.00	100.00	0.00	0.972	17.20	4.79						
62.23	100.00	0.00	0.818	12.41	3.29						
52.33	100.00	0.00	0.688	9.12	2.29						
44.00	100.00	0.00	0.578	6.83	1.72						
37.00	100.00	0.00	0.486	5.11	1.38						
31.11	100.00	0.00	0.409	3.73	1.17						
26.16	100.00	0.00	0.344	2.56	1.03						
22.00	100.00	0.74	0.289	1.53	0.89						
18.50	99.26	1.83	0.243	0.64	0.64						
15.56	97.43	2.77	0.204	0.00	0.00						
13.08	94.66	3.11	0.172	0.00	0.00						
11.00	91.55	3.18	0.145	0.00	0.00						

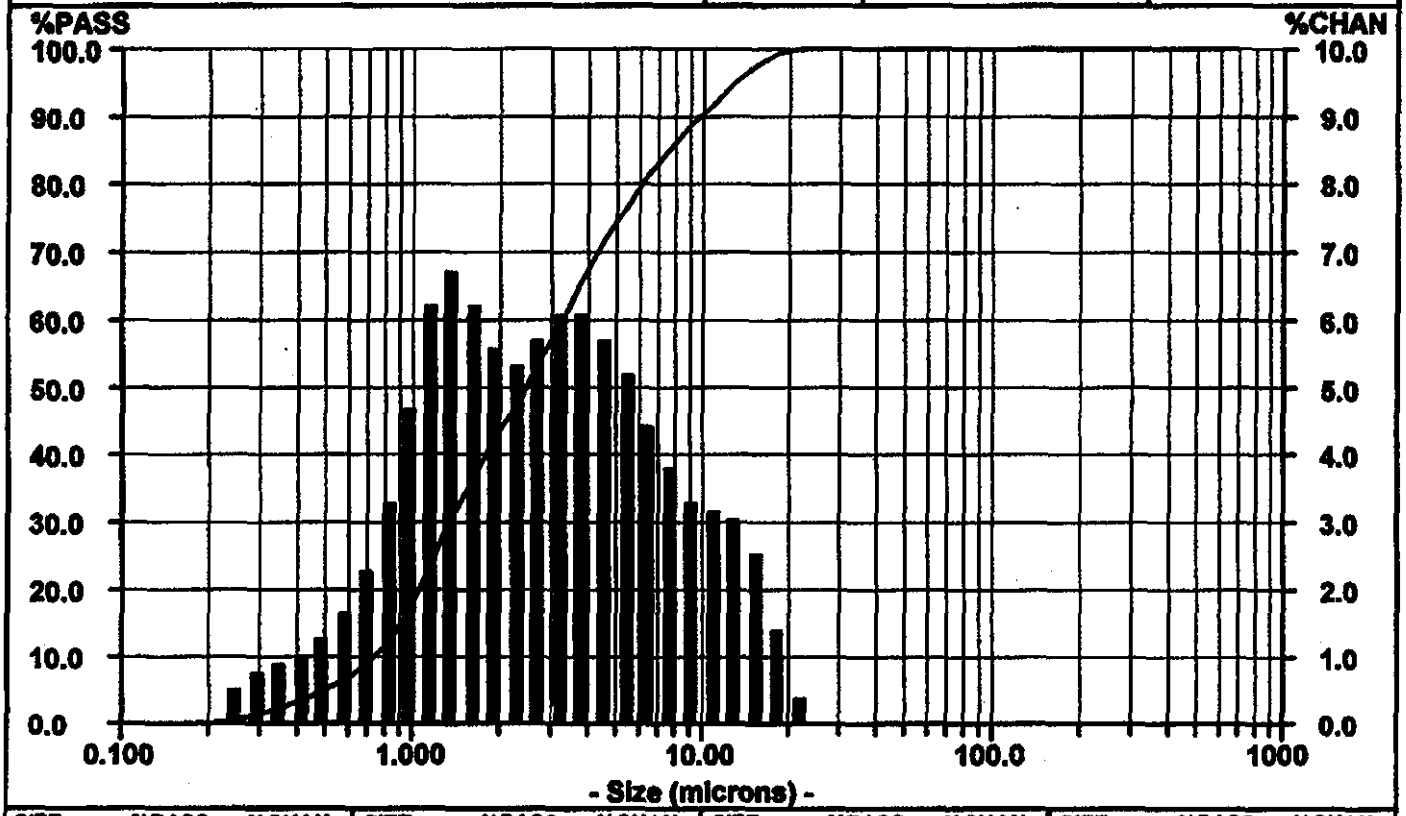
C-104

C-104
Duplicate

Date: 09/26/91 Meas #: 00001
Time: 17:58 Pres #: 01

C-104 in 1M NaOH and 1 M NaNO3
Sonicate for 2 min. followed by a 90 min. delay
External Sonifier
Flow Rate = 60 ml/sec.
Refractive Index = 1.50 Particle/1.33 Medium
File: 104CD016

Summary	Percentiles		Dia	Vol%	Width
mv = 3.924	10% = 0.728	60% = 3.298	4.631	58%	7.617
mn = 0.420	20% = 1.054	70% = 4.371	1.088	42%	1.002
ma = 1.549	30% = 1.361	80% = 6.136			
cs = 3.874	40% = 1.804	90% = 9.799			
sd = 3.166	50% = 2.477	95% = 12.87			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	88.91	3.45						
592.0	100.00	0.00	7.778	85.46	3.87						
497.8	100.00	0.00	6.541	81.59	4.50						
418.6	100.00	0.00	5.500	77.09	5.22						
352.0	100.00	0.00	4.625	71.87	5.89						
296.0	100.00	0.00	3.889	65.98	6.28						
248.9	100.00	0.00	3.270	59.70	6.18						
209.3	100.00	0.00	2.750	53.52	5.73						
176.0	100.00	0.00	2.312	47.79	5.41						
148.0	100.00	0.00	1.945	42.38	5.62						
124.5	100.00	0.00	1.635	36.76	6.35						
104.7	100.00	0.00	1.375	30.41	6.87						
88.00	100.00	0.00	1.156	23.54	6.36						
74.00	100.00	0.00	0.972	17.18	4.83						
62.23	100.00	0.00	0.816	12.35	3.31						
52.33	100.00	0.00	0.686	9.04	2.30						
44.00	100.00	0.00	0.576	6.74	1.72						
37.00	100.00	0.00	0.486	5.02	1.37						
31.11	100.00	0.00	0.409	3.65	1.16						
26.16	100.00	0.00	0.344	2.50	1.01						
22.00	100.00	0.54	0.289	1.49	0.87						
18.50	99.46	1.56	0.243	0.62	0.62						
15.56	97.90	2.62	0.204	0.00	0.00						
13.08	95.28	3.12	0.172	0.00	0.00						
11.00	92.16	3.25	0.145	0.00	0.00						

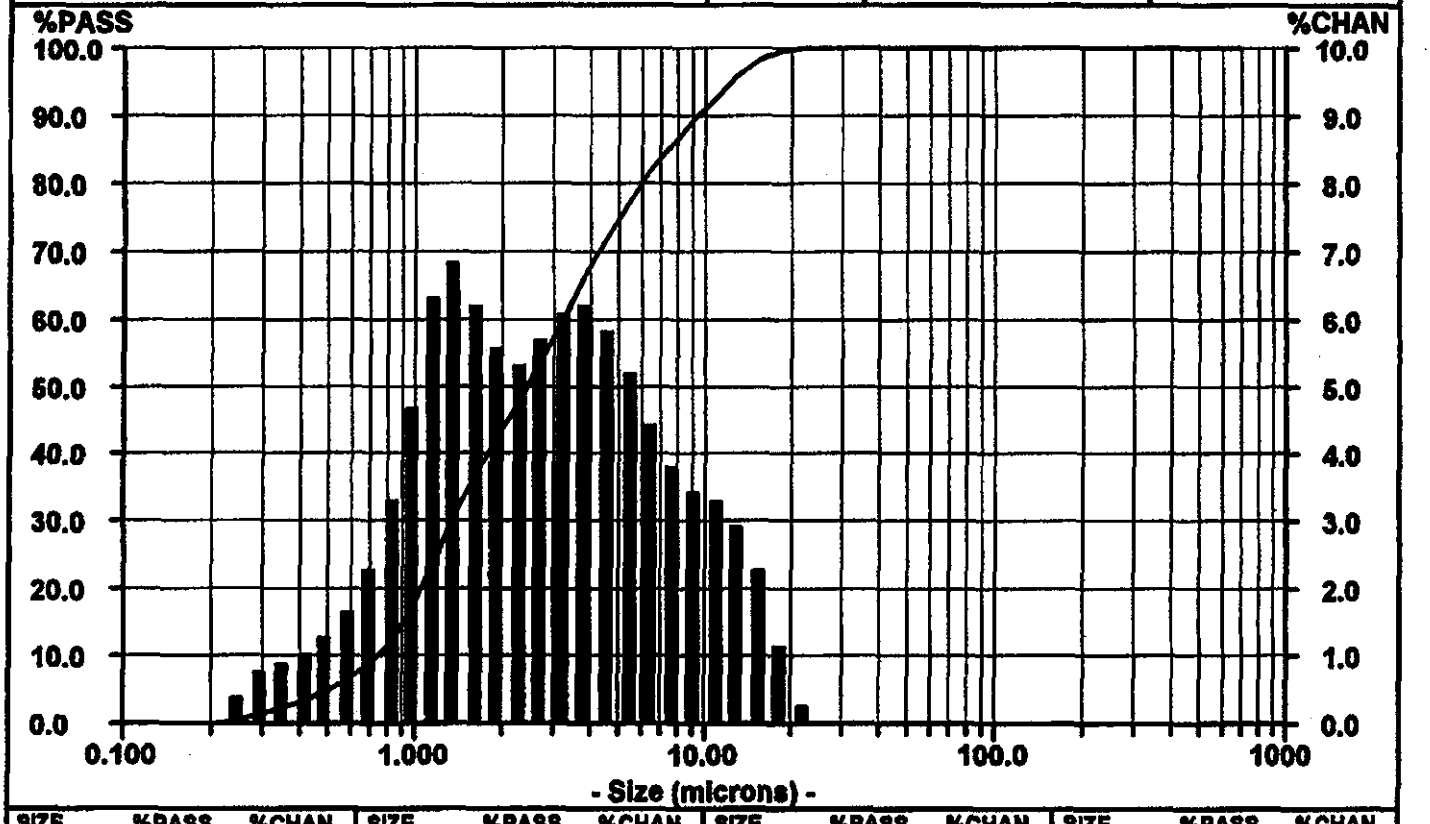
C-104

C-104
Duplicate

Date: 09/26/91 Meas #: 00001
Time: 18:03 Pres #: 01

C-104 in 1M NaOH and 1 M NaNO3
Sonicate for 2 min. followed by a 90 min. delay
External Sonifier
Flow Rate = 60 ml/sec.
Refractive Index = 1.70 Particle/1.33 Medium
File: 104CD017

Summary		Percentiles			Dia	Vol%	Width
mv	= 3.838	10% = 0.733	60% = 3.265		4.482	57%	7.271
mn	= 0.425	20% = 1.055	70% = 4.316		1.091	43%	0.995
ma	= 1.552	30% = 1.359	80% = 6.029				
cs	= 3.867	40% = 1.797	90% = 9.461				
sd	= 3.084	50% = 2.459	95% = 12.35				



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	89.56	3.56						
592.0	100.00	0.00	7.778	86.00	3.95						
497.8	100.00	0.00	6.541	82.05	4.52						
418.6	100.00	0.00	5.500	77.53	5.23						
352.0	100.00	0.00	4.625	72.30	5.91						
296.0	100.00	0.00	3.889	66.39	6.33						
248.9	100.00	0.00	3.270	60.06	6.26						
209.3	100.00	0.00	2.750	53.80	5.80						
176.0	100.00	0.00	2.312	48.00	5.47						
148.0	100.00	0.00	1.945	42.53	5.67						
124.5	100.00	0.00	1.635	36.86	6.39						
104.7	100.00	0.00	1.375	30.47	6.93						
88.00	100.00	0.00	1.156	23.54	6.42						
74.00	100.00	0.00	0.972	17.12	4.88						
62.23	100.00	0.00	0.818	12.24	3.33						
52.33	100.00	0.00	0.688	8.91	2.31						
44.00	100.00	0.00	0.578	6.60	1.71						
37.00	100.00	0.00	0.486	4.89	1.35						
31.11	100.00	0.00	0.409	3.54	1.13						
26.16	100.00	0.00	0.344	2.41	0.98						
22.00	100.00	0.37	0.289	1.43	0.84						
18.50	99.63	1.26	0.243	0.59	0.59						
15.56	98.37	2.39	0.204	0.00	0.00						
13.08	95.98	3.08	0.172	0.00	0.00						
11.00	92.90	3.34	0.145	0.00	0.00						

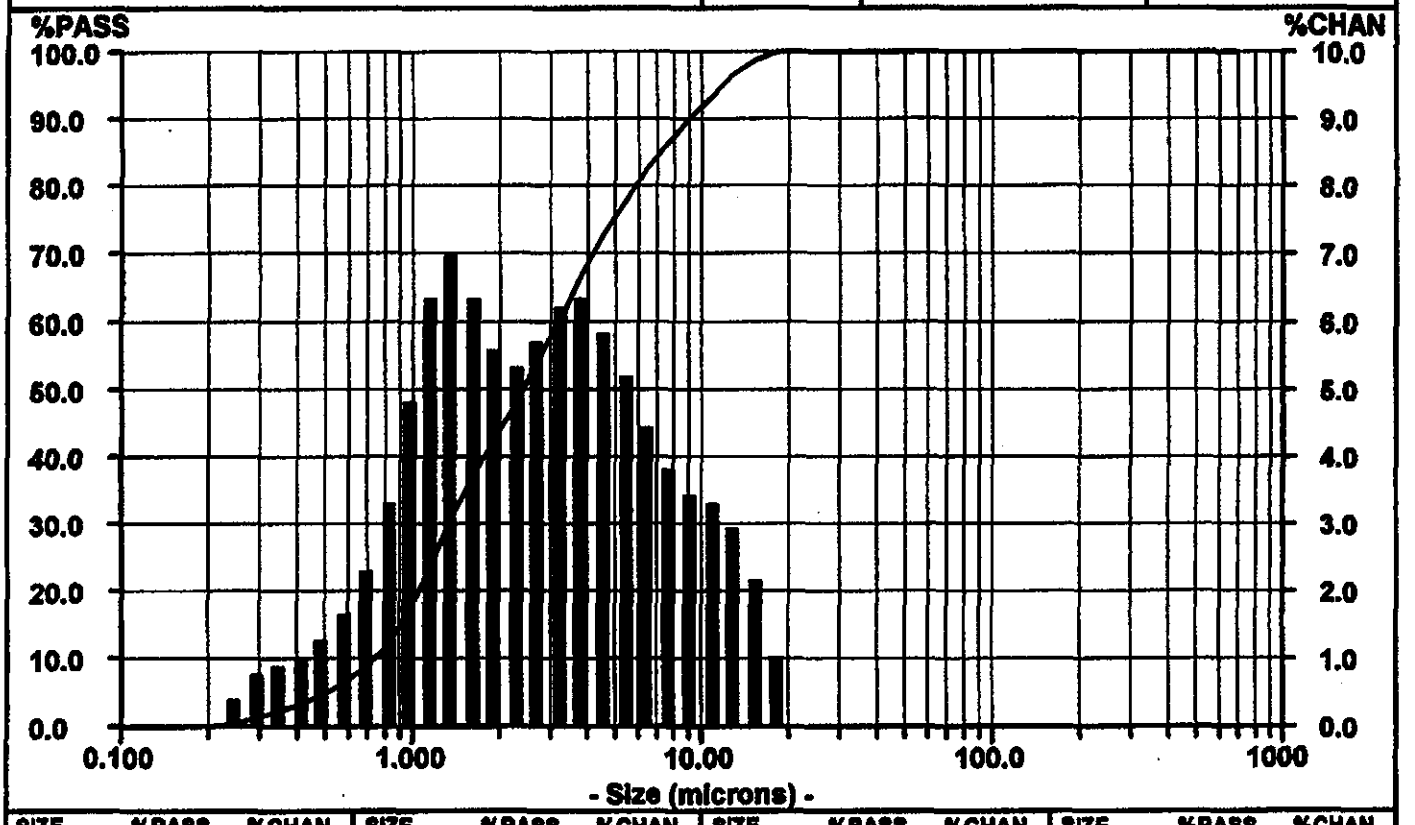
C-104

C-104
Duplicate

Date: 09/26/91 Meas #: 00001
Time: 18:07 Pres #: 01

C-104 in 1M NaOH and 1 M NaNO3
Sonicate for 2 min. followed by a 90 min. delay
External Sonifier
Flow Rate = 60 ml/sec.
Refractive Index = 2.00 Particle/1.33 Medium
File: 104CD018

Summary	Percentiles		Dia	Vol%	Width
mv = 3.739	10% = 0.733	60% = 3.231	4.427	57%	6.957
mn = 0.426	20% = 1.052	70% = 4.261	1.092	43%	0.892
ma = 1.545	30% = 1.353	80% = 5.892			
cs = 3.885	40% = 1.783	90% = 9.142			
sd = 2.988	50% = 2.438	95% = 11.90			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	90.24	3.58						
592.0	100.00	0.00	7.778	86.66	3.98						
497.8	100.00	0.00	6.541	82.68	4.56						
418.6	100.00	0.00	5.500	78.12	5.28						
352.0	100.00	0.00	4.625	72.84	5.98						
296.0	100.00	0.00	3.889	66.86	6.41						
248.9	100.00	0.00	3.270	60.45	6.33						
209.3	100.00	0.00	2.750	54.12	5.85						
176.0	100.00	0.00	2.312	48.27	5.49						
148.0	100.00	0.00	1.945	42.78	5.69						
124.5	100.00	0.00	1.635	37.09	6.43						
104.7	100.00	0.00	1.375	30.66	7.01						
88.00	100.00	0.00	1.156	23.65	6.48						
74.00	100.00	0.00	0.972	17.17	4.91						
62.23	100.00	0.00	0.818	12.26	3.35						
52.33	100.00	0.00	0.688	8.91	2.31						
44.00	100.00	0.00	0.578	6.60	1.71						
37.00	100.00	0.00	0.486	4.89	1.35						
31.11	100.00	0.00	0.409	3.54	1.13						
26.16	100.00	0.00	0.344	2.41	0.98						
22.00	100.00	0.00	0.289	1.43	0.84						
18.50	100.00	1.12	0.243	0.59	0.59						
15.56	98.88	2.27	0.204	0.00	0.00						
13.08	96.61	3.03	0.172	0.00	0.00						
11.00	93.58	3.34	0.145	0.00	0.00						

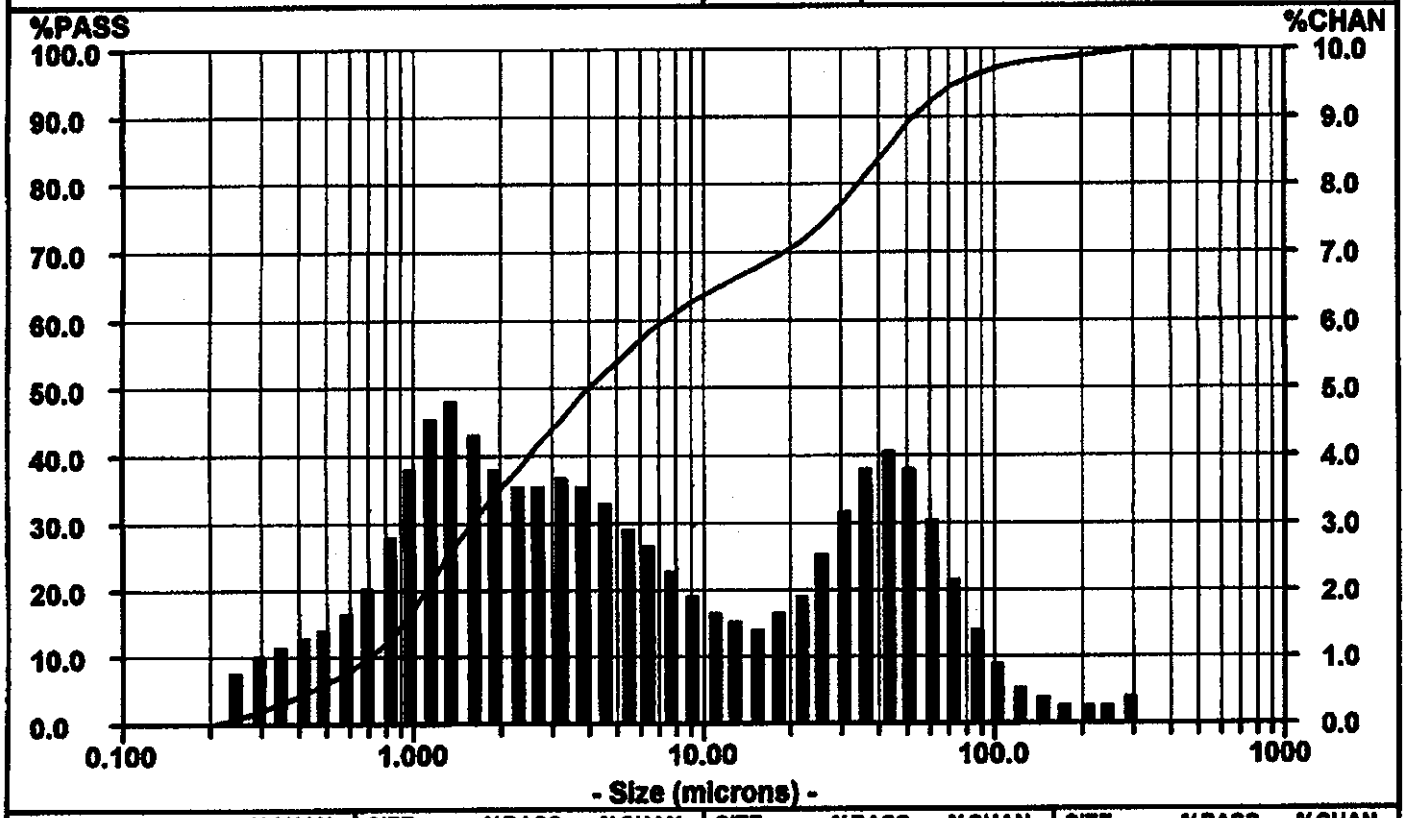
C-104

C-104
Duplicate

Date: 09/26/91 Meas #: 00001
Time: 18:56 Pres #: 01

C-104 in 1M NaOH and 1 M NaNO3
Sonicate for 20 min. followed by a 90 min. delay
External Sonifier
Flow Rate = 17 ml/sec.
Refractive Index = 2.00 Particle/1.33 Medium
File: 104CD019

Summary		Percentiles		Dia	Vol%	Width
mv =	19.39	10% = 0.695	60% = 7.286	39.61	34%	50.52
mn =	0.376	20% = 1.107	70% = 19.09	4.645	28%	5.527
ma =	1.786	30% = 1.597	80% = 34.61	1.072	38%	1.248
cs =	3.359	40% = 2.520	90% = 53.71			
sd =	20.04	50% = 4.047	95% = 75.12			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	62.95	2.07						
592.0	100.00	0.00	7.778	60.88	2.43						
497.8	100.00	0.00	6.541	58.45	2.77						
418.6	100.00	0.00	5.500	55.68	3.09						
352.0	100.00	0.00	4.625	52.59	3.39						
296.0	100.00	0.43	3.889	49.20	3.63						
248.9	99.57	0.38	3.270	45.57	3.72						
209.3	99.21	0.35	2.750	41.85	3.66						
176.0	98.86	0.38	2.312	38.19	3.67						
148.0	98.48	0.47	1.945	34.52	3.94						
124.5	98.01	0.66	1.635	30.58	4.47						
104.7	97.35	0.99	1.375	26.11	4.90						
88.00	96.36	1.51	1.156	21.21	4.67						
74.00	94.85	2.26	0.972	16.54	3.82						
62.23	92.59	3.10	0.818	12.72	2.87						
52.33	89.49	3.83	0.688	9.85	2.17						
44.00	85.66	4.11	0.578	7.68	1.74						
37.00	81.55	3.88	0.486	5.94	1.46						
31.11	77.67	3.29	0.409	4.46	1.33						
26.16	74.38	2.64	0.344	3.13	1.22						
22.00	71.74	2.09	0.289	1.91	1.10						
18.50	69.65	1.75	0.243	0.81	0.81						
15.56	67.90	1.58	0.204	0.00	0.00						
13.08	66.32	1.60	0.172	0.00	0.00						
11.00	64.72	1.77	0.145	0.00	0.00						

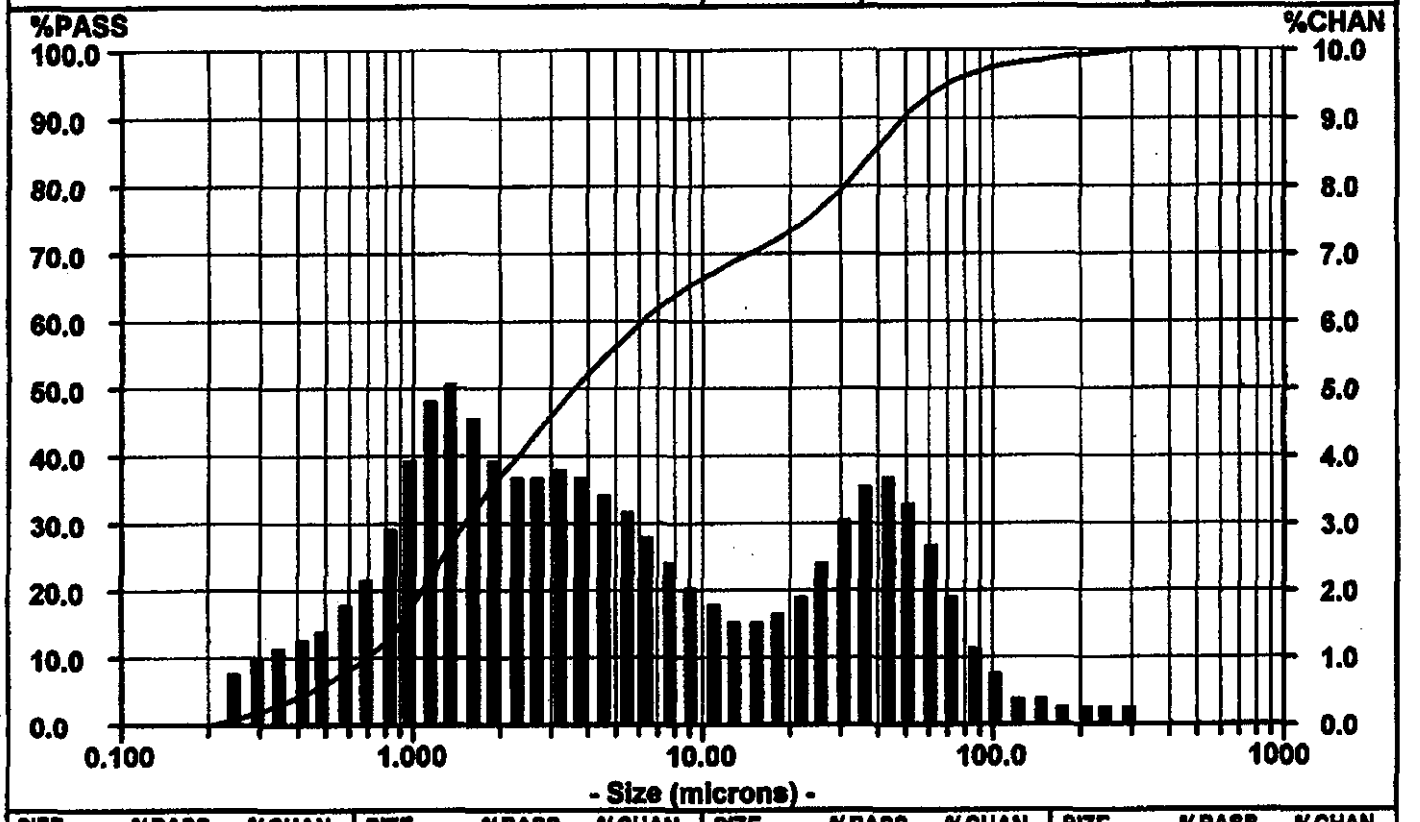
C-104

C-104 Duplicate

Date: 09/26/91 Meas #: 00001
Time: 19:02 Pres #: 01

C-104 in 1M NaOH and 1 M NaNO3
Sonicate for 20 min. followed by a 90 min. delay
External Sonifier
Flow Rate = 17 ml/sec.
Refractive Index = 1.70 Particle/1.33 Medium
File: 104CD020

Summary	Percentiles		Dia	Vol%	Width
mv = 17.58	10% = 0.684	60% = 6.194	38.33	31%	48.98
mn = 0.379	20% = 1.074	70% = 14.54	4.649	29%	5.533
ma = 1.726	30% = 1.512	80% = 30.95	1.072	40%	1.233
cs = 3.477	40% = 2.321	90% = 49.78			
sd = 18.26	50% = 3.661	95% = 69.92			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	65.53	2.15						
592.0	100.00	0.00	7.778	63.38	2.51						
497.8	100.00	0.00	6.541	60.87	2.87						
418.6	100.00	0.00	5.500	58.00	3.20						
352.0	100.00	0.00	4.625	54.80	3.51						
296.0	100.00	0.36	3.889	51.29	3.75						
248.9	99.64	0.31	3.270	47.54	3.84						
209.3	99.33	0.31	2.750	43.70	3.78						
176.0	99.02	0.34	2.312	39.92	3.79						
148.0	98.68	0.41	1.945	36.13	4.09						
124.5	98.27	0.57	1.635	32.04	4.69						
104.7	97.70	0.85	1.375	27.35	5.16						
88.00	96.85	1.29	1.156	22.19	4.98						
74.00	95.56	1.83	0.972	17.21	4.08						
62.23	93.63	2.70	0.818	13.13	3.04						
52.33	90.93	3.42	0.688	10.09	2.28						
44.00	87.51	3.77	0.578	7.81	1.80						
37.00	83.74	3.64	0.486	6.01	1.51						
31.11	80.10	3.12	0.409	4.50	1.34						
26.16	76.98	2.54	0.344	3.16	1.23						
22.00	74.44	2.05	0.289	1.93	1.11						
18.50	72.39	1.75	0.243	0.82	0.82						
15.56	70.64	1.62	0.204	0.00	0.00						
13.08	69.02	1.65	0.172	0.00	0.00						
11.00	67.37	1.84	0.145	0.00	0.00						

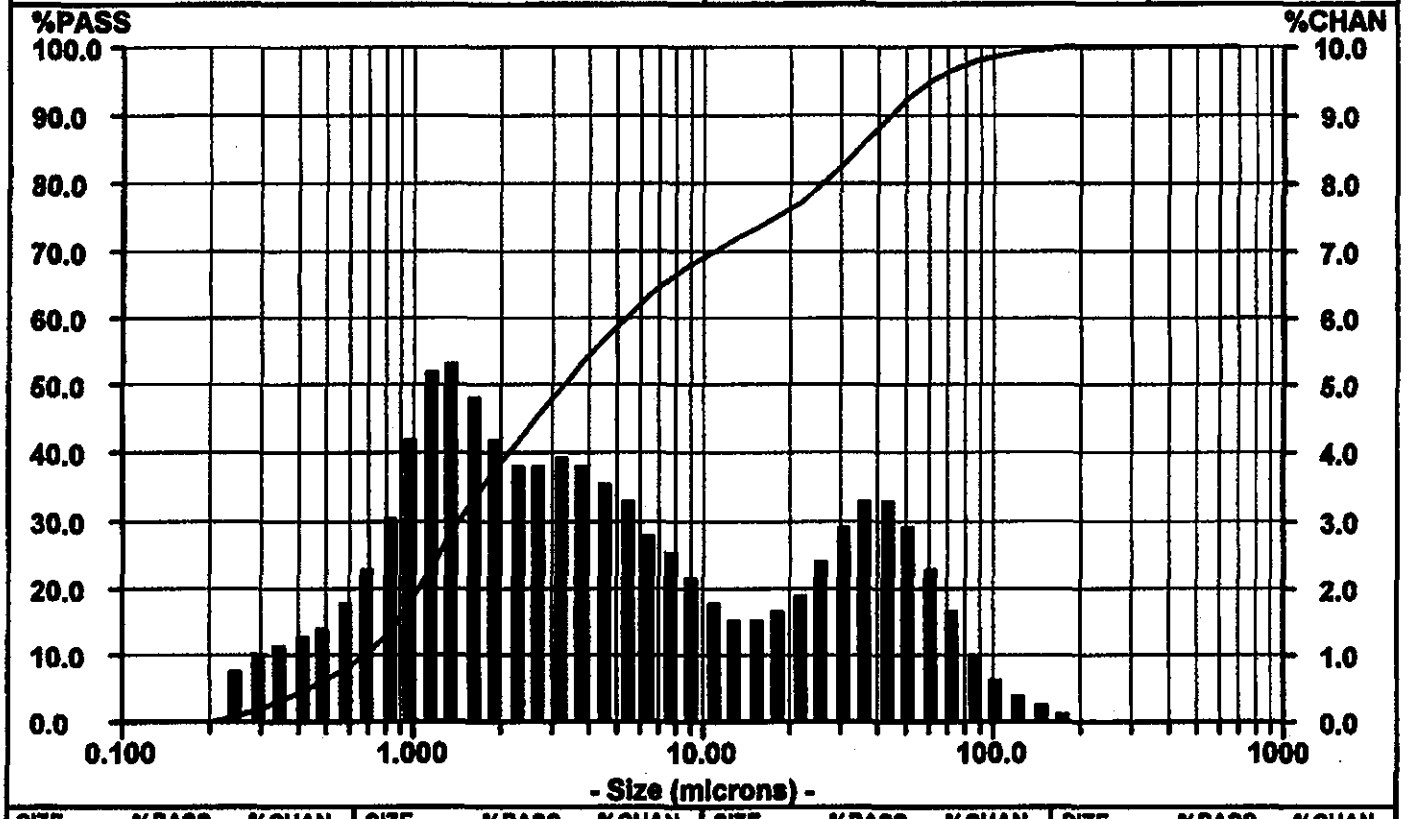
C-104

C-104
Duplicate

Date: 09/26/91 Meas #: 00001
Time: 19:07 Pres #: 01

C-104 in 1M NaOH and 1 M NaNO3
Sonicate for 20 min. followed by a 90 min. delay
External Sonifier
Flow Rate = 17 ml/sec.
Refractive Index = 1.50 Particle/1.33 Medium
File: 104CD021

Summary	Percentiles		Dia	Vol%	Width
mv = 14.26	10% = 0.669	60% = 5.329	36.28	28%	44.15
mn = 0.381	20% = 1.044	70% = 10.73	4.130	34%	5.484
ma = 1.681	30% = 1.440	80% = 26.16	1.006	38%	1.051
cs = 3.612	40% = 2.144	90% = 44.61			
sd = 15.96	50% = 3.325	95% = 61.58			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	68.38	2.21						
592.0	100.00	0.00	7.778	66.17	2.60						
497.8	100.00	0.00	6.541	63.57	2.98						
418.6	100.00	0.00	5.500	60.59	3.35						
352.0	100.00	0.00	4.625	57.24	3.68						
296.0	100.00	0.00	3.889	53.56	3.94						
248.9	100.00	0.00	3.270	49.62	4.00						
209.3	100.00	0.00	2.750	45.62	3.92						
176.0	100.00	0.30	2.312	41.70	3.92						
148.0	99.70	0.38	1.945	37.78	4.25						
124.5	99.32	0.53	1.635	33.53	4.90						
104.7	98.79	0.78	1.375	28.63	5.45						
88.00	98.01	1.17	1.156	23.18	5.27						
74.00	96.84	1.71	0.972	17.91	4.30						
62.23	95.13	2.37	0.818	13.61	3.19						
52.33	92.76	3.01	0.688	10.42	2.37						
44.00	89.75	3.38	0.578	8.05	1.87						
37.00	86.37	3.37	0.486	6.18	1.56						
31.11	83.00	3.00	0.409	4.62	1.38						
26.16	80.00	2.52	0.344	3.24	1.27						
22.00	77.48	2.08	0.289	1.97	1.14						
18.50	75.40	1.79	0.243	0.83	0.83						
15.56	73.61	1.66	0.204	0.00	0.00						
13.08	71.95	1.69	0.172	0.00	0.00						
11.00	70.26	1.88	0.145	0.00	0.00						

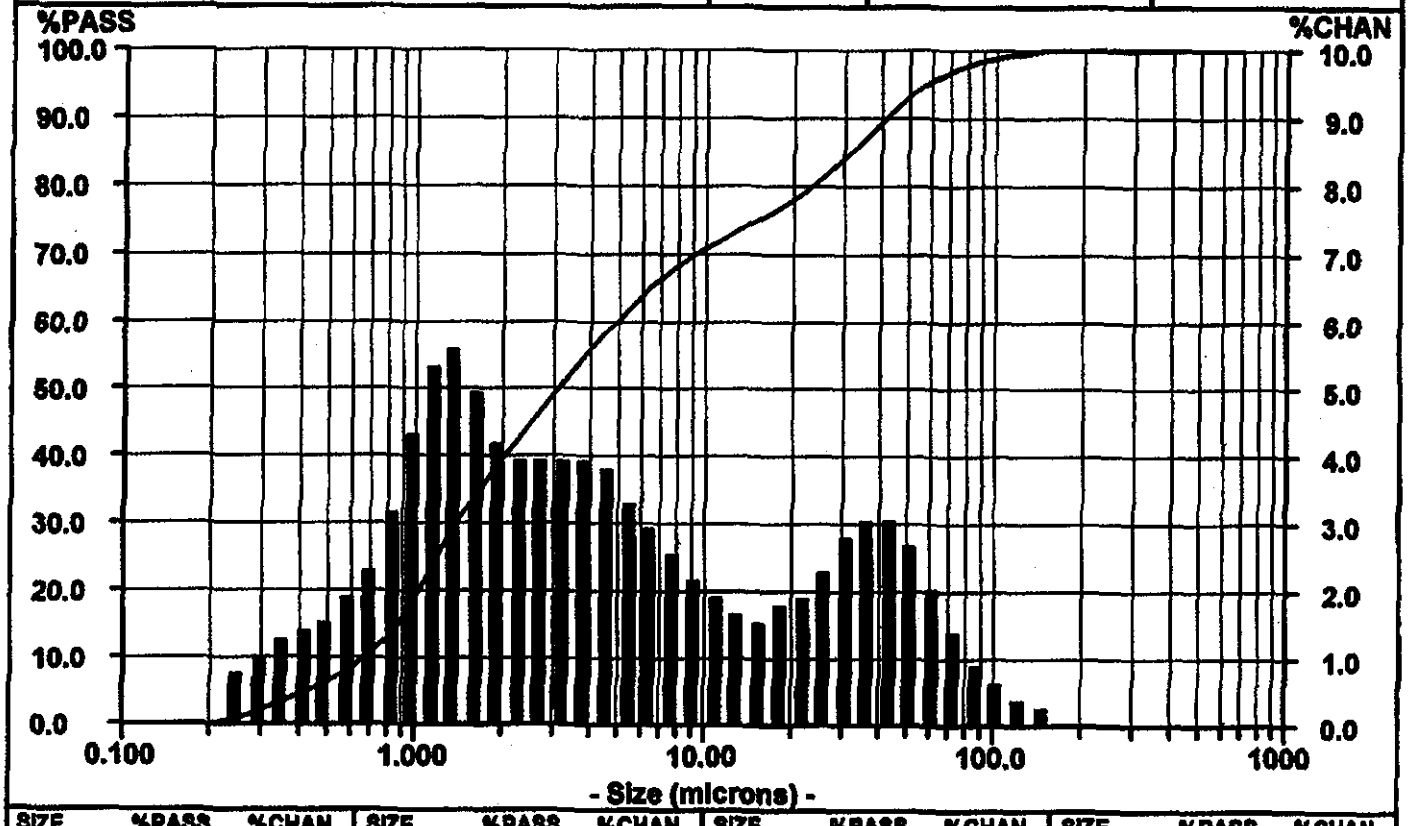
C-104

C-104 Duplicate

Date: 09/26/91 Meas #: 00001
Time: 19:11 Pres #: 01

C-104 in 1M NaOH and 1 M NaNO3
Sonicate for 20 min. followed by a 90 min. delay
External Sonifier
Flow Rate = 40 ml/sec.
Refractive Index = 1.50 Particle/1.33 Medium
File: 104CD022

Summary	Percentiles		Dia	Vol%	Width
mv = 13.04	10% = 0.857	60% = 4.910	35.27	26%	42.68
mn = 0.382	20% = 1.025	70% = 9.138	4.125	35%	5.464
ma = 1.620	30% = 1.402	80% = 23.16	1.006	39%	1.050
cs = 3.703	40% = 2.046	90% = 41.80			
sd = 14.66	50% = 3.145	95% = 58.11			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	70.16	2.24						
592.0	100.00	0.00	7.778	67.91	2.64						
497.8	100.00	0.00	6.541	65.27	3.05						
418.6	100.00	0.00	5.500	62.22	3.44						
352.0	100.00	0.00	4.625	58.78	3.80						
296.0	100.00	0.00	3.889	54.98	4.05						
248.9	100.00	0.00	3.270	50.93	4.10						
209.3	100.00	0.00	2.750	46.83	4.01						
176.0	100.00	0.00	2.312	42.82	4.01						
148.0	100.00	0.36	1.945	38.81	4.35						
124.5	99.64	0.50	1.635	34.46	5.04						
104.7	99.14	0.73	1.375	29.42	5.60						
88.00	98.41	1.07	1.156	23.82	5.42						
74.00	97.34	1.56	0.972	18.40	4.42						
62.23	95.78	2.14	0.818	13.98	3.28						
52.33	93.64	2.74	0.688	10.70	2.44						
44.00	90.90	3.12	0.578	8.26	1.92						
37.00	87.78	3.16	0.486	6.34	1.61						
31.11	84.62	2.86	0.409	4.73	1.42						
26.16	81.76	2.44	0.344	3.31	1.30						
22.00	79.32	2.05	0.289	2.01	1.16						
18.50	77.27	1.80	0.243	0.85	0.85						
15.56	75.47	1.68	0.204	0.00	0.00						
13.08	73.79	1.72	0.172	0.00	0.00						
11.00	72.07	1.92	0.145	0.00	0.00						

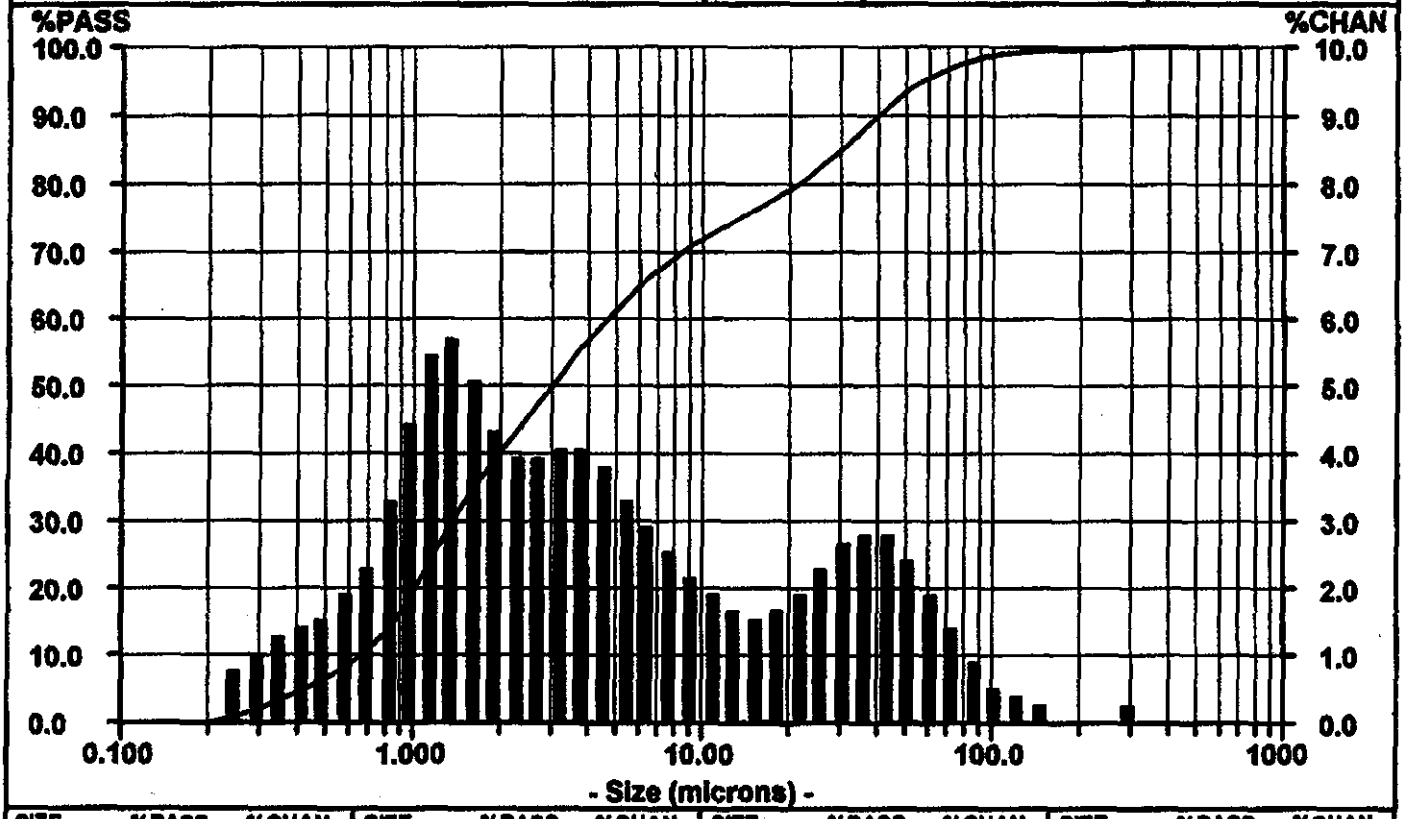
C-104

C-104 Duplicate

Date: 09/26/91 Meas #: 00001
Time: 19:15 Pres #: 01

C-104 in 1M NaOH and 1 M NaNO3
Sonicate for 20 min. followed by a 90 min. delay
External Sonifier
Flow Rate = 40 ml/sec.
Refractive Index = 1.70 Particle/1.33 Medium
File: 104CD023

Summary	Percentiles		Dia	Vol%	Width
mv = 13.23	10% = 0.653	60% = 4.704	34.92	25%	43.56
mn = 0.383	20% = 1.017	70% = 8.454	4.121	35%	5.475
ma = 1.601	30% = 1.380	80% = 21.43	1.007	40%	1.046
cs = 3.748	40% = 1.996	90% = 40.55			
sd = 13.80	50% = 3.051	95% = 57.34			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	71.14	2.28						
592.0	100.00	0.00	7.778	68.86	2.67						
497.8	100.00	0.00	6.541	66.19	3.07						
418.6	100.00	0.00	5.500	63.12	3.47						
352.0	100.00	0.00	4.625	59.65	3.85						
296.0	100.00	0.34	3.889	55.80	4.12						
248.9	99.66	0.00	3.270	51.68	4.17						
209.3	99.66	0.00	2.750	47.51	4.06						
176.0	99.66	0.00	2.312	43.45	4.05						
148.0	99.66	0.32	1.945	39.40	4.40						
124.5	99.34	0.44	1.635	35.00	5.11						
104.7	98.90	0.65	1.375	29.89	5.74						
88.00	98.25	0.97	1.156	24.15	5.52						
74.00	97.28	1.42	0.972	18.63	4.51						
62.23	95.86	1.97	0.818	14.12	3.33						
52.33	93.89	2.64	0.688	10.79	2.47						
44.00	91.35	2.92	0.578	8.32	1.94						
37.00	88.43	2.99	0.486	6.38	1.62						
31.11	85.44	2.74	0.409	4.76	1.43						
26.16	82.70	2.37	0.344	3.33	1.31						
22.00	80.33	2.02	0.289	2.02	1.17						
18.50	78.31	1.78	0.243	0.85	0.85						
15.56	76.53	1.69	0.204	0.00	0.00						
13.08	74.84	1.75	0.172	0.00	0.00						
11.00	73.09	1.95	0.145	0.00	0.00						

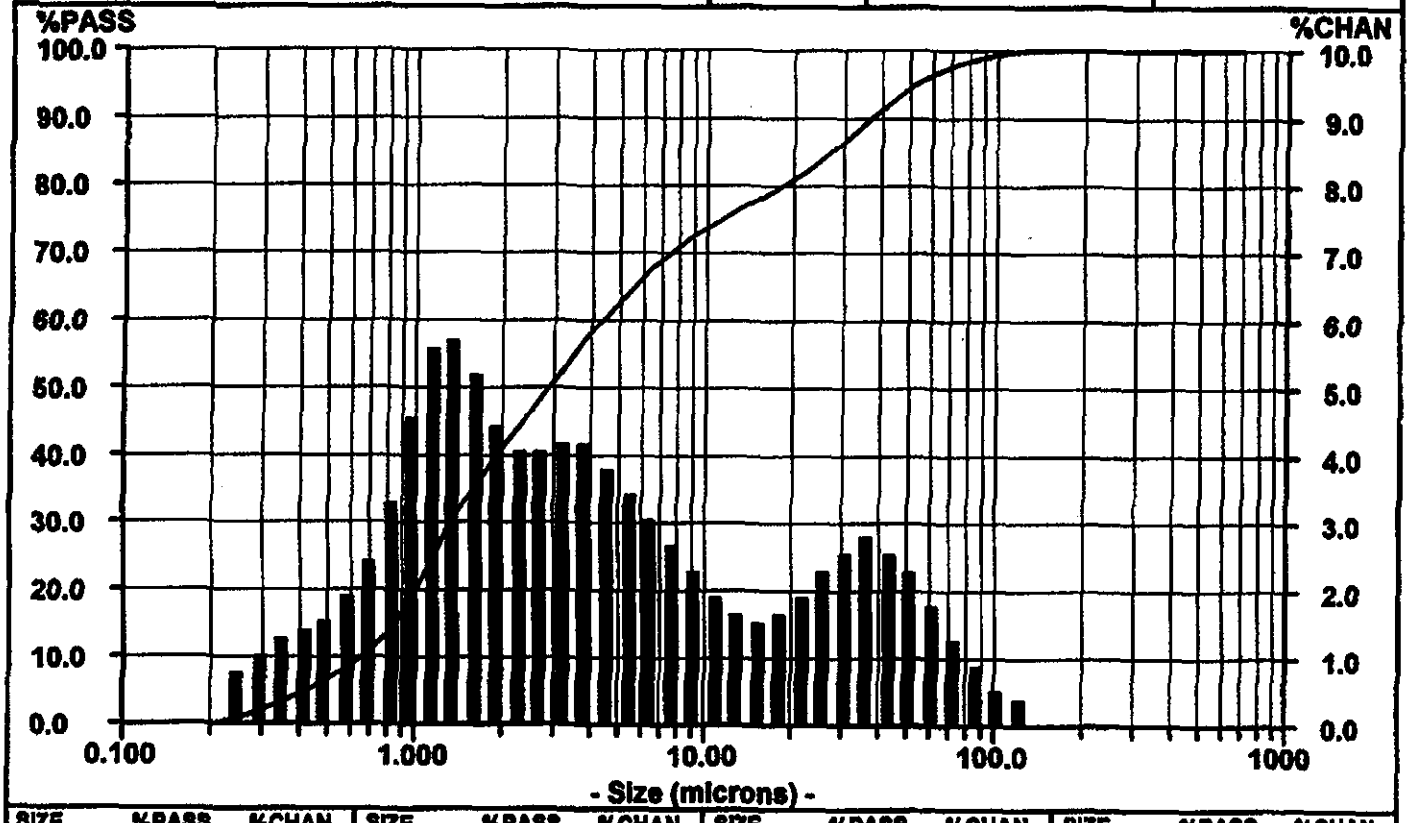
C-104

C-104 Duplicate

Date: 09/26/91 Meas #: 00001
Time: 19:20 Pres #: 01

C-104 in 1M NaOH and 1 M NaNO3
Sonicate for 20 min. followed by a 90 min. delay
External Sonifier
Flow Rate = 40 ml/sec.
Refractive Index = 2.00 Particle/1.33 Medium
File: 104CD024

Summary	Percentiles		Dia	Vol%	Width
mv = 11.34	10% = 0.643	60% = 4.393	33.49	23%	40.17
mn = 0.383	20% = 1.001	70% = 7.475	4.117	36%	5.439
ma = 1.563	30% = 1.348	80% = 18.28	1.007	41%	1.046
os = 3.839	40% = 1.914	90% = 37.12			
sd = 12.21	50% = 2.900	95% = 52.56			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.260	72.91	2.32						
592.0	100.00	0.00	7.778	70.59	2.73						
497.8	100.00	0.00	6.541	67.86	3.15						
418.6	100.00	0.00	5.500	64.71	3.57						
352.0	100.00	0.00	4.625	61.14	3.95						
296.0	100.00	0.00	3.889	57.19	4.22						
248.9	100.00	0.00	3.270	52.97	4.27						
209.3	100.00	0.00	2.750	48.70	4.16						
176.0	100.00	0.00	2.312	44.54	4.14						
148.0	100.00	0.00	1.945	40.40	4.50						
124.5	100.00	0.41	1.635	35.90	5.24						
104.7	99.59	0.61	1.375	30.66	5.89						
88.00	98.98	0.91	1.156	24.77	5.68						
74.00	98.07	1.32	0.972	19.09	4.62						
62.23	96.75	1.80	0.818	14.47	3.41						
52.33	94.95	2.31	0.688	11.06	2.53						
44.00	92.64	2.69	0.578	8.53	1.98						
37.00	89.95	2.82	0.486	6.55	1.66						
31.11	87.13	2.65	0.409	4.89	1.47						
26.16	84.48	2.34	0.344	3.42	1.35						
22.00	82.14	2.01	0.289	2.07	1.20						
18.50	80.13	1.79	0.243	0.87	0.87						
15.56	78.34	1.70	0.204	0.00	0.00						
13.08	76.64	1.76	0.172	0.00	0.00						
11.00	74.88	1.97	0.145	0.00	0.00						

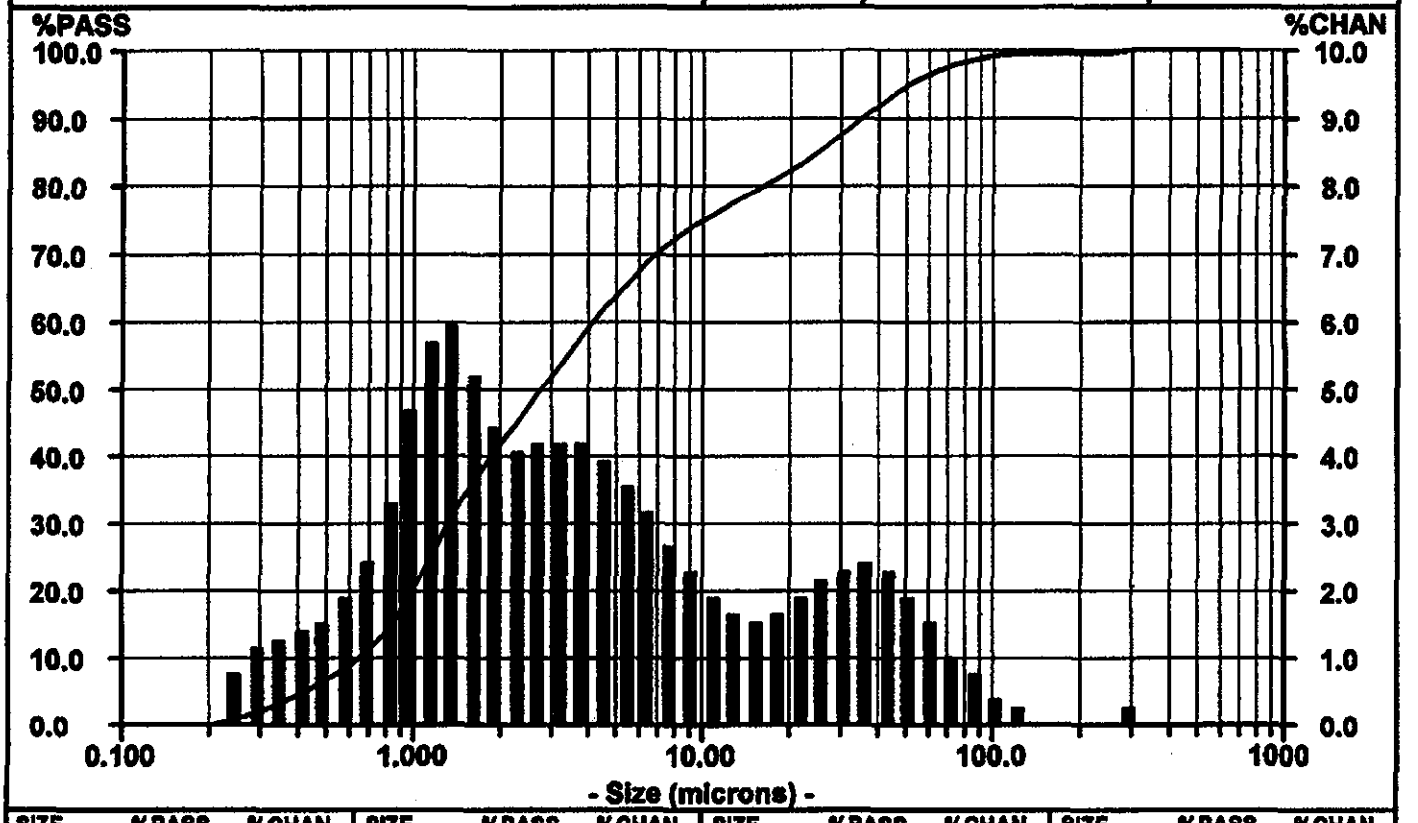
C-104

C-104 Duplicate

Date: 09/26/91 Meas #: 00001
Time: 19:24 Pres #: 01

C-104 in 1M NaOH and 1 M NaNO3
Sonicate for 20 min. followed by a 90 min. delay
External Sonifier
Flow Rate = 60 ml/sec.
Refractive Index = 1.50 Particle/1.33 Medium
File: 104CD025

Summary	Percentiles		Dia	Vol%	Width
mv = 11.47	10% = 0.637	60% = 4.200	33.08	22%	41.56
mn = 0.383	20% = 0.990	70% = 6.924	4.113	37%	5.413
ma = 1.539	30% = 1.327	80% = 16.18	1.007	41%	1.044
cs = 3.900	40% = 1.861	90% = 35.48			
sd = 11.16	50% = 2.805	95% = 51.73			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	74.15	2.34						
592.0	100.00	0.00	7.778	71.81	2.76						
497.8	100.00	0.00	6.541	69.05	3.20						
418.6	100.00	0.00	5.500	65.85	3.64						
352.0	100.00	0.00	4.625	62.21	4.04						
296.0	100.00	0.31	3.889	58.17	4.31						
248.9	99.69	0.00	3.270	53.86	4.35						
209.3	99.69	0.00	2.750	49.51	4.22						
176.0	99.69	0.00	2.312	45.29	4.19						
148.0	99.69	0.00	1.945	41.10	4.56						
124.5	99.69	0.38	1.635	36.54	5.32						
104.7	99.31	0.56	1.375	31.22	6.00						
88.00	98.75	0.82	1.156	25.22	5.80						
74.00	97.93	1.18	0.972	19.42	4.72						
62.23	96.75	1.62	0.818	14.70	3.48						
52.33	95.13	2.08	0.688	11.22	2.57						
44.00	93.05	2.43	0.578	8.65	2.01						
37.00	90.62	2.57	0.486	6.64	1.68						
31.11	88.05	2.47	0.409	4.96	1.49						
26.16	85.58	2.23	0.344	3.47	1.37						
22.00	83.35	1.96	0.289	2.10	1.22						
18.50	81.39	1.78	0.243	0.88	0.88						
15.56	79.61	1.70	0.204	0.00	0.00						
13.08	77.91	1.77	0.172	0.00	0.00						
11.00	76.14	1.99	0.145	0.00	0.00						

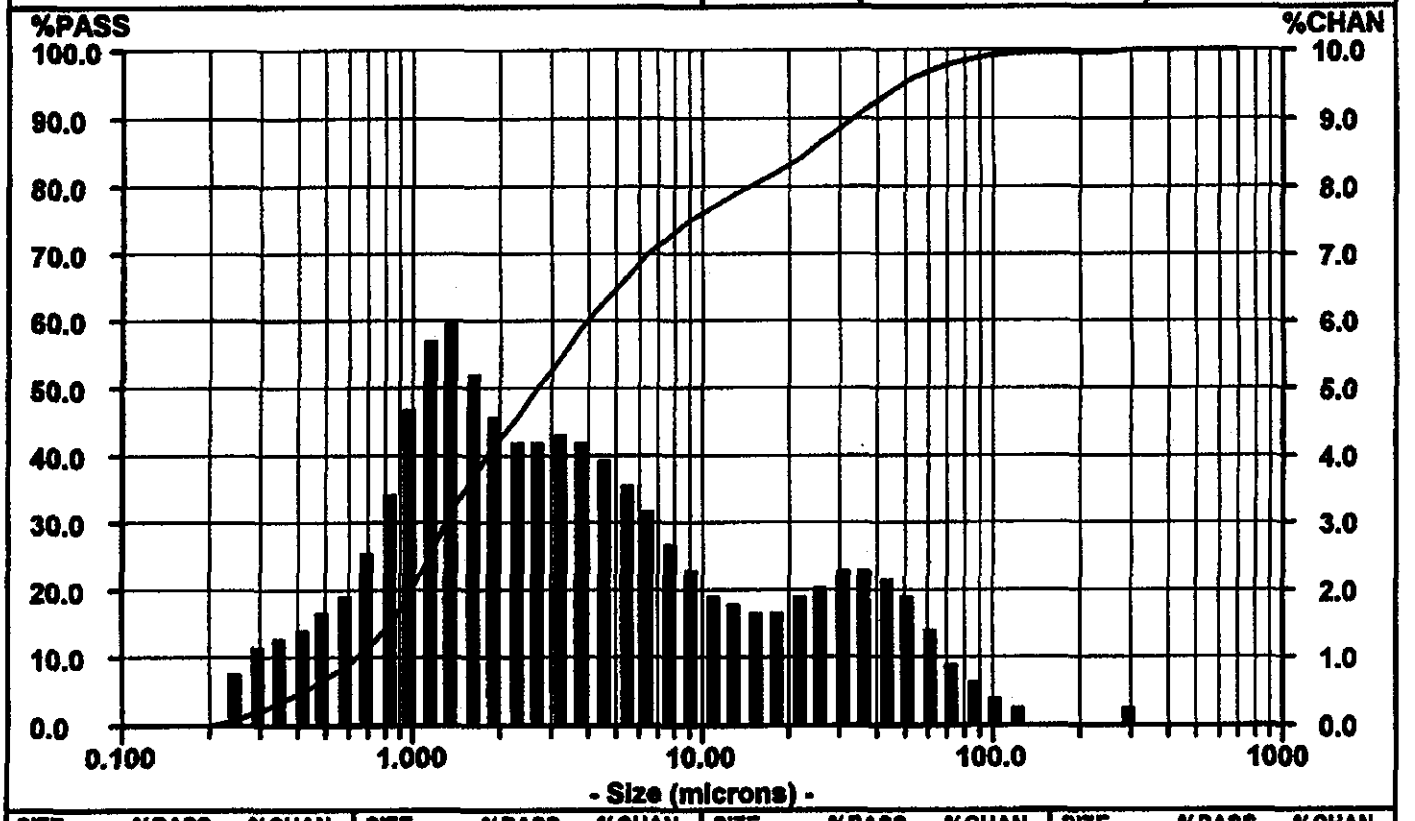
C-104

C-104
Duplicate

Date: 09/26/91 Meas #: 00001
Time: 19:28 Pres #: 01

C-104 in 1M NaOH and 1 M NaNO3
Sonicate for 20 min. followed by a 90 min. delay
External Sonifier
Flow Rate = 60 ml/sec.
Refractive Index = 1.70 Particle/1.33 Medium
File: 104CD026

Summary	Percentiles		Dia	Vol%	Width
mv = 10.98	10% = 0.631	60% = 4.052	32.33	21%	40.69
mn = 0.383	20% = 0.981	70% = 6.537	4.104	37%	5.406
ma = 1.519	30% = 1.311	80% = 14.51	1.006	42%	1.044
cs = 3.950	40% = 1.825	90% = 33.54			
sd = 10.17	50% = 2.730	95% = 49.54			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	75.16	2.36						
592.0	100.00	0.00	7.778	72.80	2.79						
497.8	100.00	0.00	6.541	70.01	3.24						
418.6	100.00	0.00	5.500	66.77	3.68						
352.0	100.00	0.00	4.625	63.09	4.09						
296.0	100.00	0.34	3.889	59.00	4.38						
248.9	99.66	0.00	3.270	54.62	4.43						
209.3	99.66	0.00	2.750	50.19	4.29						
176.0	99.66	0.00	2.312	45.90	4.26						
148.0	99.66	0.00	1.945	41.64	4.62						
124.5	99.66	0.32	1.635	37.02	5.39						
104.7	99.34	0.48	1.375	31.63	6.05						
88.00	98.86	0.73	1.156	25.58	5.88						
74.00	98.13	1.07	0.972	19.70	4.79						
62.23	97.06	1.49	0.818	14.91	3.53						
52.33	95.57	1.93	0.688	11.38	2.61						
44.00	93.64	2.27	0.578	8.77	2.05						
37.00	91.37	2.42	0.486	6.72	1.71						
31.11	88.95	2.36	0.409	5.01	1.51						
26.16	86.60	2.16	0.344	3.50	1.38						
22.00	84.44	1.95	0.289	2.12	1.23						
18.50	82.49	1.78	0.243	0.89	0.89						
15.56	80.70	1.73	0.204	0.00	0.00						
13.08	78.97	1.80	0.172	0.00	0.00						
11.00	77.17	2.01	0.145	0.00	0.00						

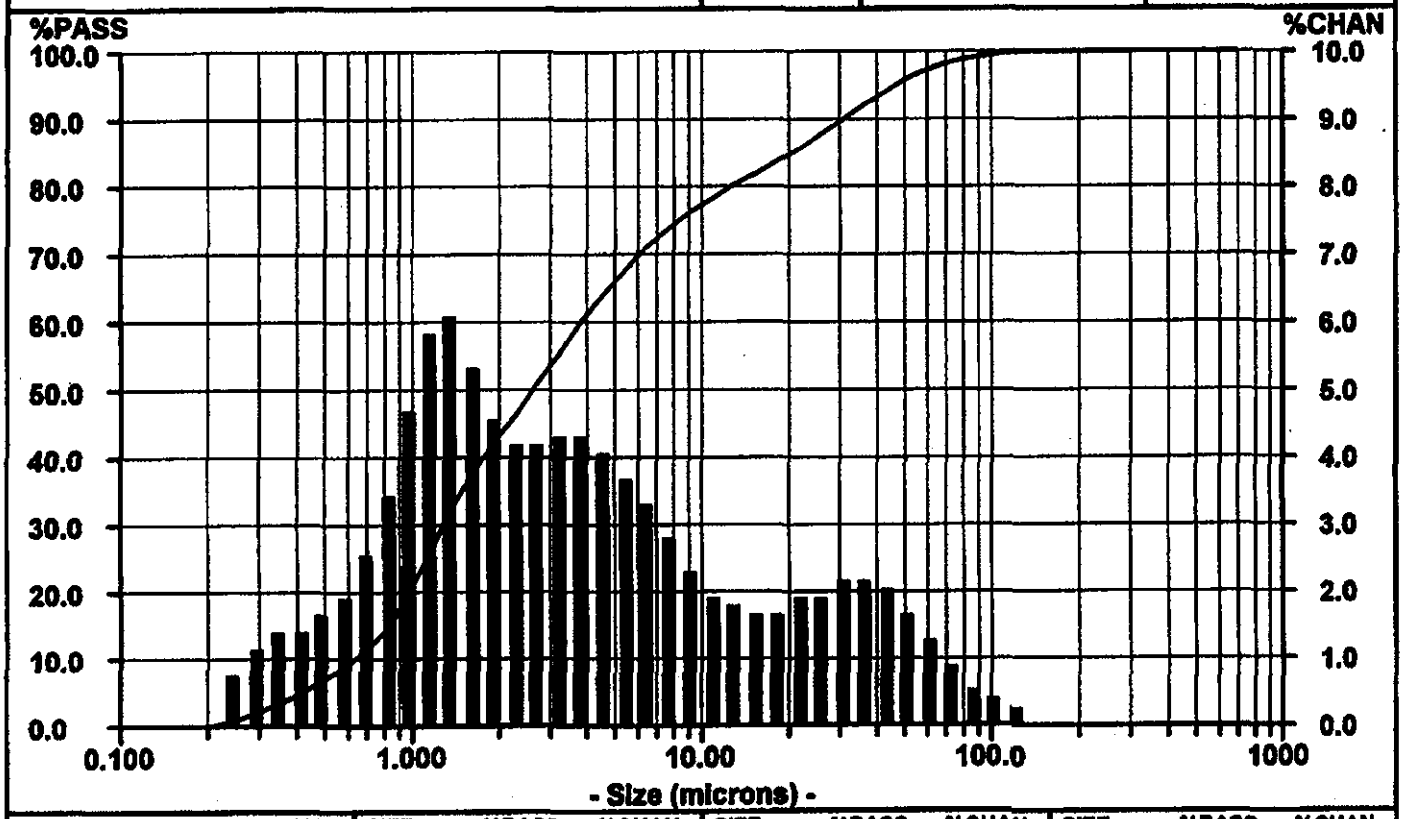
C-104

C-104
Duplicate

Date: 09/26/91 Meas #: 00001
Time: 19:32 Pres #: 01

C-104 in 1M NaOH and 1 M NaNO3
Sonicate for 20 min. followed by a 90 min. delay
External Sonifier
Flow Rate = 60 ml/sec.
Refractive Index = 2.00 Particle/1.33 Medium
File: 104CD027

Summary		Percentiles		Dia	Vol%	Width
mv =	9.657	10% = 0.624	60% = 3.891	31.40	20%	38.85
mn =	0.385	20% = 0.971	70% = 6.125	4.107	38%	5.389
ma =	1.496	30% = 1.292	80% = 12.71	1.006	42%	1.042
cs =	4.011	40% = 1.777	90% = 31.04			
sd =	8.978	50% = 2.639	95% = 46.57			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	76.46	2.40						
592.0	100.00	0.00	7.778	74.06	2.85						
497.8	100.00	0.00	6.541	71.21	3.31						
418.6	100.00	0.00	5.500	67.90	3.75						
352.0	100.00	0.00	4.625	64.15	4.16						
296.0	100.00	0.00	3.889	59.99	4.45						
248.9	100.00	0.00	3.270	55.54	4.49						
209.3	100.00	0.00	2.750	51.05	4.36						
176.0	100.00	0.00	2.312	46.69	4.33						
148.0	100.00	0.00	1.945	42.36	4.69						
124.5	100.00	0.31	1.635	37.67	5.46						
104.7	99.69	0.46	1.375	32.19	6.16						
88.00	99.23	0.69	1.156	26.03	5.99						
74.00	98.54	1.00	0.972	20.04	4.88						
62.23	97.54	1.38	0.818	15.16	3.59						
52.33	96.16	1.78	0.688	11.57	2.66						
44.00	94.38	2.10	0.578	8.91	2.09						
37.00	92.28	2.25	0.486	6.82	1.75						
31.11	90.03	2.21	0.409	5.07	1.54						
26.16	87.82	2.08	0.344	3.53	1.40						
22.00	85.74	1.91	0.289	2.13	1.24						
18.50	83.83	1.79	0.243	0.89	0.89						
15.56	82.04	1.74	0.204	0.00	0.00						
13.08	80.30	1.81	0.172	0.00	0.00						
11.00	78.49	2.03	0.145	0.00	0.00						

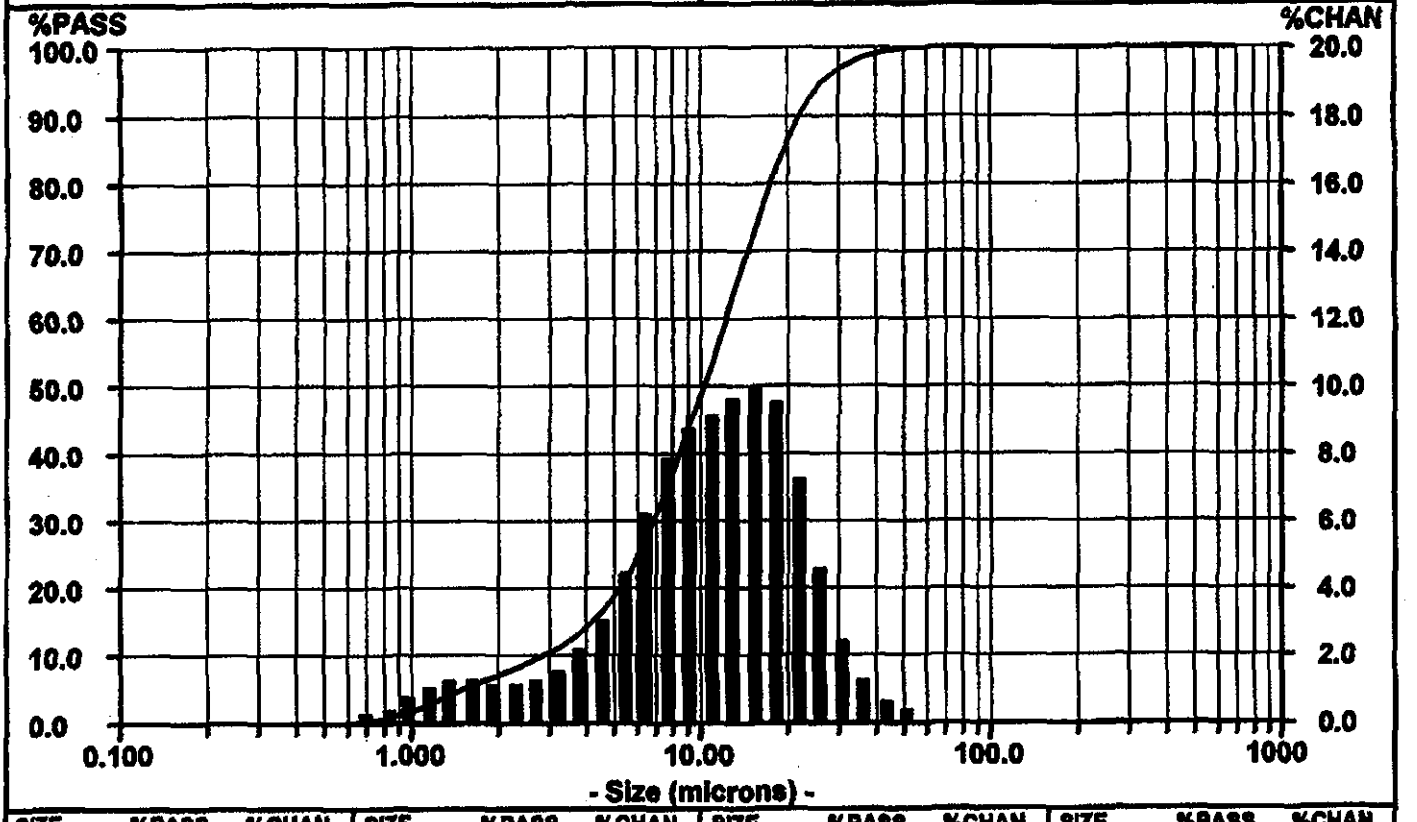
BCR 67 Sample

BCR67, riffled 7-12-01

Date: 07/13/91 Meas #: 00004
Time: 08:17 Pres #: 01

17.1 megohm/cm DI H2O
Flow Rate = 17 ml/sec
Refractive index of the medium = 1.33 and the particle = 1.54
File: BCR6701

Summary	Percentiles		Dia	Vol%	Width
mv = 11.82	10% = 2.878	60% = 12.37	11.00	93%	13.80
mn = 1.168	20% = 5.295	70% = 14.70	1.241	7%	0.814
ma = 5.907	30% = 6.935	80% = 17.54			
cs = 1.016	40% = 8.628	90% = 21.90			
sd = 7.238	50% = 10.31	95% = 26.38			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	44.22	8.83						
592.0	100.00	0.00	7.778	35.39	7.92						
497.6	100.00	0.00	6.541	27.47	6.33						
418.6	100.00	0.00	5.500	21.14	4.55						
352.0	100.00	0.00	4.625	16.59	3.13						
296.0	100.00	0.00	3.889	13.46	2.20						
248.9	100.00	0.00	3.270	11.26	1.66						
209.3	100.00	0.00	2.750	9.60	1.38						
176.0	100.00	0.00	2.312	8.22	1.27						
148.0	100.00	0.00	1.945	6.95	1.29						
124.5	100.00	0.00	1.635	5.66	1.36						
104.7	100.00	0.00	1.375	4.30	1.37						
88.00	100.00	0.00	1.156	2.93	1.18						
74.00	100.00	0.00	0.972	1.75	0.86						
62.23	100.00	0.10	0.816	0.89	0.55						
52.33	99.90	0.44	0.686	0.34	0.34						
44.00	99.46	0.73	0.578	0.00	0.00						
37.00	98.73	1.34	0.486	0.00	0.00						
31.11	97.39	2.54	0.408	0.00	0.00						
26.16	94.85	4.67	0.344	0.00	0.00						
22.00	90.18	7.38	0.289	0.00	0.00						
18.50	82.80	8.50	0.243	0.00	0.00						
15.56	73.30	10.08	0.204	0.00	0.00						
13.08	63.22	9.72	0.172	0.00	0.00						
11.00	53.50	9.28	0.145	0.00	0.00						

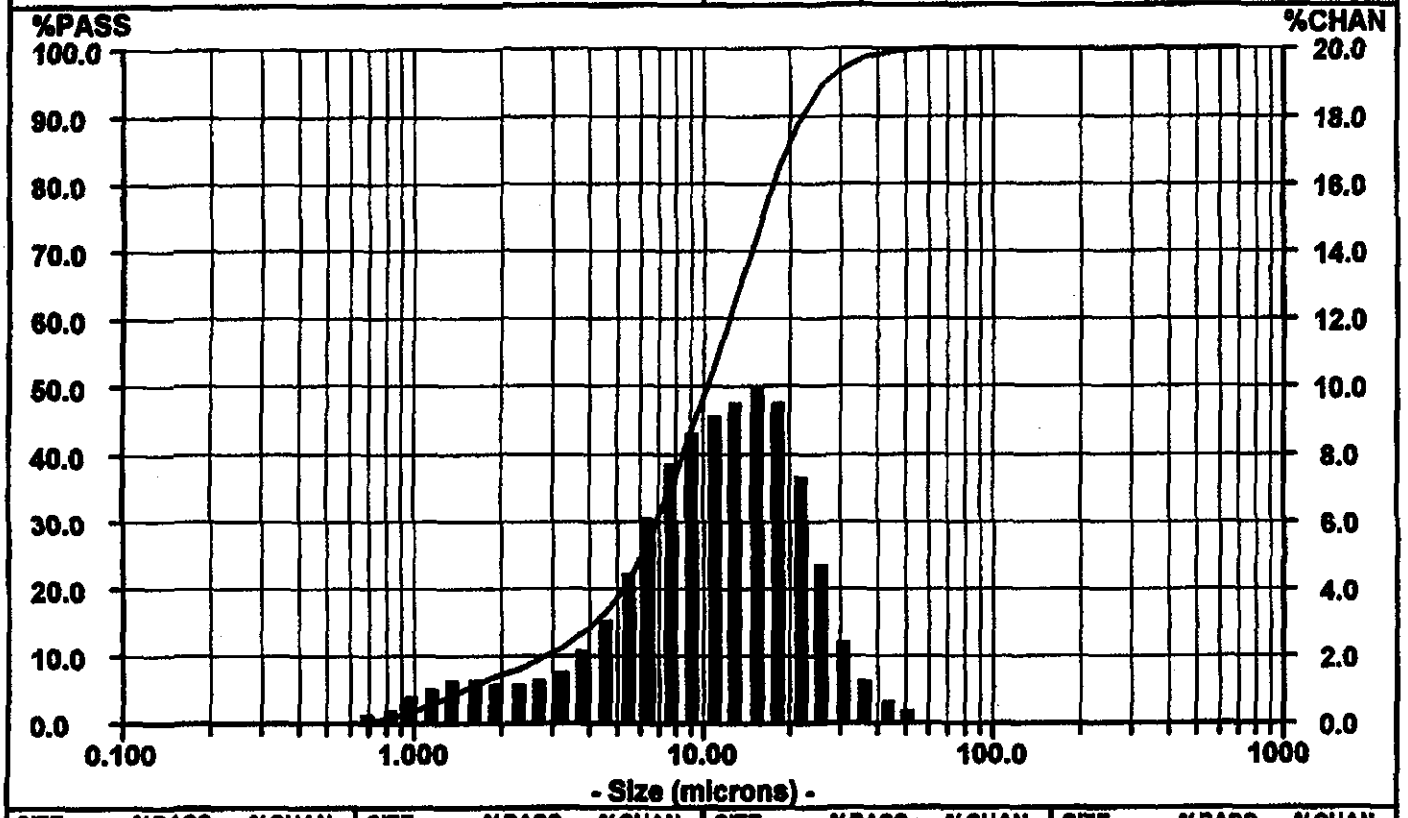
BCR 67 Sample

BCR67, riffled
7-12-01

Date: 07/13/91 Meas #: 00004
Time: 06:59 Pres #: 01

17.1 megohm/cm DI H2O
Flow Rate = 17 ml/sec
Refractive index of the medium = 1.33 and the particle = 2.00
File: BCR6702

Summary		Percentiles		Dia	Vol%	Width
mv =	11.87	10% = 2.859	60% = 12.43	11.05	93%	13.89
mn =	1.162	20% = 5.292	70% = 14.78	1.238	7%	0.814
ma =	5.897	30% = 6.945	80% = 17.62			
cs =	1.018	40% = 8.553	90% = 21.99			
sd =	7.288	50% = 10.36	95% = 26.50			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.260	44.04	8.76						
592.0	100.00	0.00	7.778	36.28	7.85						
497.8	100.00	0.00	6.541	27.43	6.28						
418.6	100.00	0.00	5.500	21.15	4.52						
352.0	100.00	0.00	4.625	16.63	3.11						
296.0	100.00	0.00	3.889	13.52	2.20						
248.9	100.00	0.00	3.270	11.32	1.66						
209.3	100.00	0.00	2.750	9.66	1.38						
176.0	100.00	0.00	2.312	8.28	1.27						
148.0	100.00	0.00	1.945	7.01	1.29						
124.5	100.00	0.00	1.635	5.72	1.37						
104.7	100.00	0.00	1.375	4.35	1.38						
88.00	100.00	0.00	1.156	2.97	1.19						
74.00	100.00	0.00	0.972	1.78	0.87						
62.23	100.00	0.11	0.818	0.91	0.56						
52.33	99.89	0.45	0.688	0.35	0.35						
44.00	99.44	0.74	0.578	0.00	0.00						
37.00	98.70	1.36	0.486	0.00	0.00						
31.11	97.34	2.58	0.409	0.00	0.00						
26.16	94.76	4.74	0.344	0.00	0.00						
22.00	90.02	7.46	0.289	0.00	0.00						
18.50	82.56	9.55	0.243	0.00	0.00						
15.56	73.01	10.07	0.204	0.00	0.00						
13.08	62.94	9.68	0.172	0.00	0.00						
11.00	53.26	9.22	0.145	0.00	0.00						

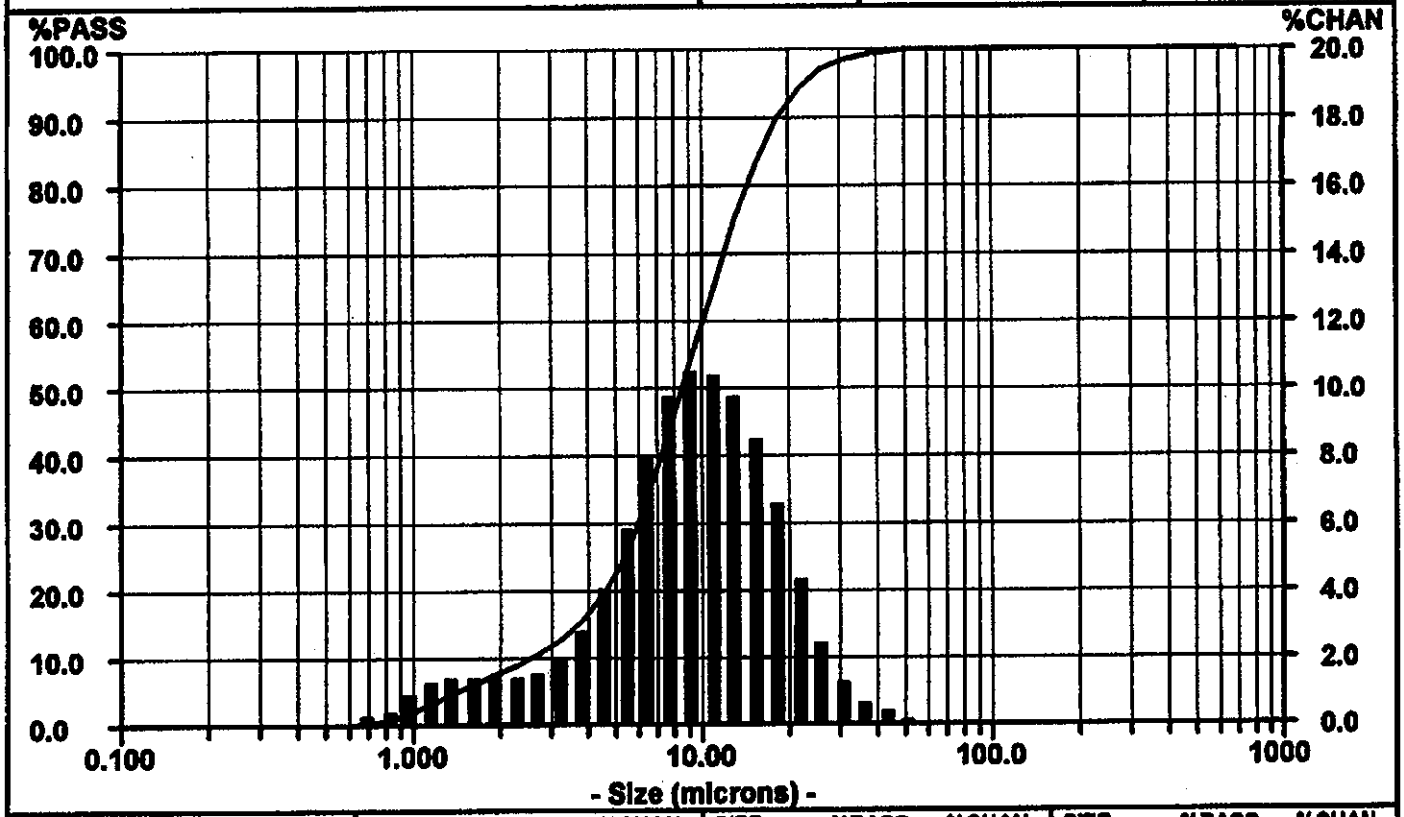
BCR 67 Sample

BCR67, riffled 7-12-01

Date: 07/13/91 Meas #: 00004
Time: 07:12 Pres #: 01

17.1 megohm/cm DI H2O
Flow Rate = 17 ml/sec
Refractive Index of the medium = 1.33 and the particle = 2.00
Sonicate for 2 min. @ 40 W
File: BCR6703

Summary	Percentiles		Dia	Vol%	Width
mv = 9.973	10% = 2.551	60% = 10.14	9.068	94%	11.31
mn = 1.186	20% = 4.652	70% = 12.01	1.142	6%	0.632
ma = 5.282	30% = 6.052	80% = 14.49			
os = 1.136	40% = 7.304	90% = 18.45			
sd = 5.922	50% = 8.619	95% = 22.50			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	54.39	10.66						
592.0	100.00	0.00	7.778	43.73	9.86						
497.8	100.00	0.00	6.541	33.87	8.08						
418.6	100.00	0.00	5.500	25.79	5.96						
352.0	100.00	0.00	4.625	19.83	4.15						
296.0	100.00	0.00	3.889	15.68	2.87						
248.9	100.00	0.00	3.270	12.81	2.07						
209.3	100.00	0.00	2.750	10.74	1.62						
176.0	100.00	0.00	2.312	9.12	1.42						
148.0	100.00	0.00	1.945	7.70	1.42						
124.5	100.00	0.00	1.635	6.28	1.51						
104.7	100.00	0.00	1.375	4.77	1.53						
88.00	100.00	0.00	1.156	3.24	1.32						
74.00	100.00	0.00	0.972	1.92	0.95						
62.23	100.00	0.00	0.818	0.97	0.60						
52.33	100.00	0.22	0.688	0.37	0.37						
44.00	99.78	0.46	0.578	0.00	0.00						
37.00	99.32	0.76	0.486	0.00	0.00						
31.11	98.56	1.38	0.409	0.00	0.00						
26.16	97.18	2.59	0.344	0.00	0.00						
22.00	94.59	4.49	0.289	0.00	0.00						
18.50	90.10	6.74	0.243	0.00	0.00						
15.56	83.36	8.60	0.204	0.00	0.00						
13.08	74.76	9.83	0.172	0.00	0.00						
11.00	64.93	10.54	0.145	0.00	0.00						

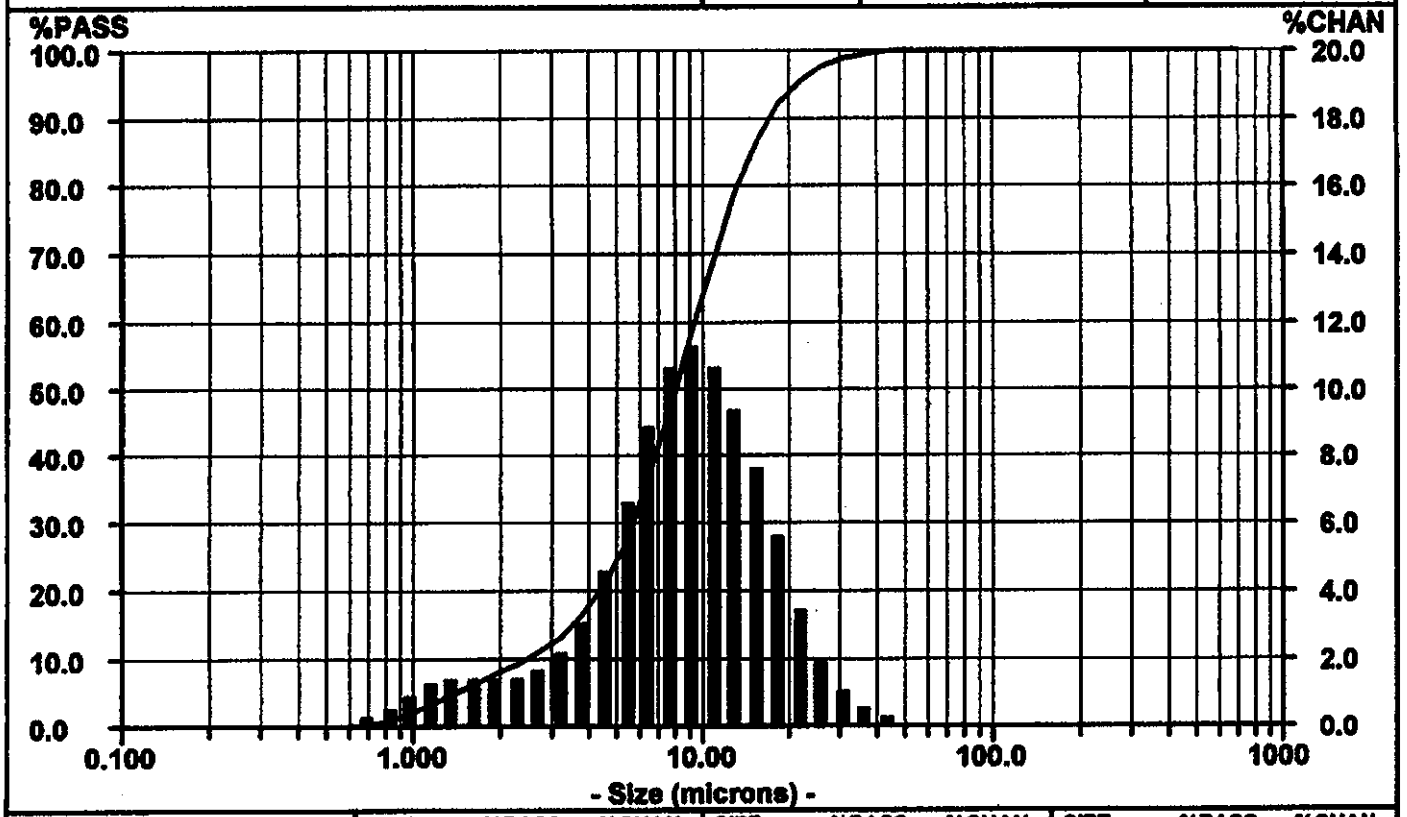
BCR 67 Sample

BCR67, riffled 7-12-01

Date: 07/13/91 Meas #: 00004
Time: 07:24 Pres #: 01

17.1 megohm/cm DI H2O
Flow Rate = 17 ml/sec
Refractive index of the medium = 1.33 and the particle = 1.54
Sonicate for 2 min. @ 40 W
File: BCR6704

Summary	Percentiles		Dia	Vol%	Width
mv = 9.300	10% = 2.461	60% = 9.430	8.495	94%	10.31
mn = 1.197	20% = 4.446	70% = 11.10	1.144	6%	0.631
ma = 5.078	30% = 5.759	80% = 13.38			
cs = 1.182	40% = 6.908	90% = 17.14			
sd = 5.411	50% = 8.087	95% = 20.97			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	58.78	11.30						
592.0	100.00	0.00	7.778	47.48	10.71						
497.8	100.00	0.00	6.541	36.77	8.92						
418.6	100.00	0.00	5.500	27.85	6.64						
352.0	100.00	0.00	4.625	21.21	4.63						
296.0	100.00	0.00	3.889	16.58	3.18						
248.9	100.00	0.00	3.270	13.40	2.25						
209.3	100.00	0.00	2.750	11.15	1.73						
176.0	100.00	0.00	2.312	9.42	1.49						
148.0	100.00	0.00	1.945	7.93	1.47						
124.5	100.00	0.00	1.635	6.46	1.56						
104.7	100.00	0.00	1.375	4.90	1.58						
88.00	100.00	0.00	1.156	3.32	1.36						
74.00	100.00	0.00	0.972	1.96	0.97						
62.23	100.00	0.00	0.818	0.99	0.61						
52.33	100.00	0.00	0.688	0.38	0.38						
44.00	100.00	0.39	0.578	0.00	0.00						
37.00	99.61	0.63	0.486	0.00	0.00						
31.11	98.98	1.11	0.409	0.00	0.00						
26.16	97.87	2.05	0.344	0.00	0.00						
22.00	95.82	3.59	0.289	0.00	0.00						
18.50	92.23	5.63	0.243	0.00	0.00						
15.56	86.60	7.67	0.204	0.00	0.00						
13.08	78.93	9.42	0.172	0.00	0.00						
11.00	69.51	10.73	0.145	0.00	0.00						

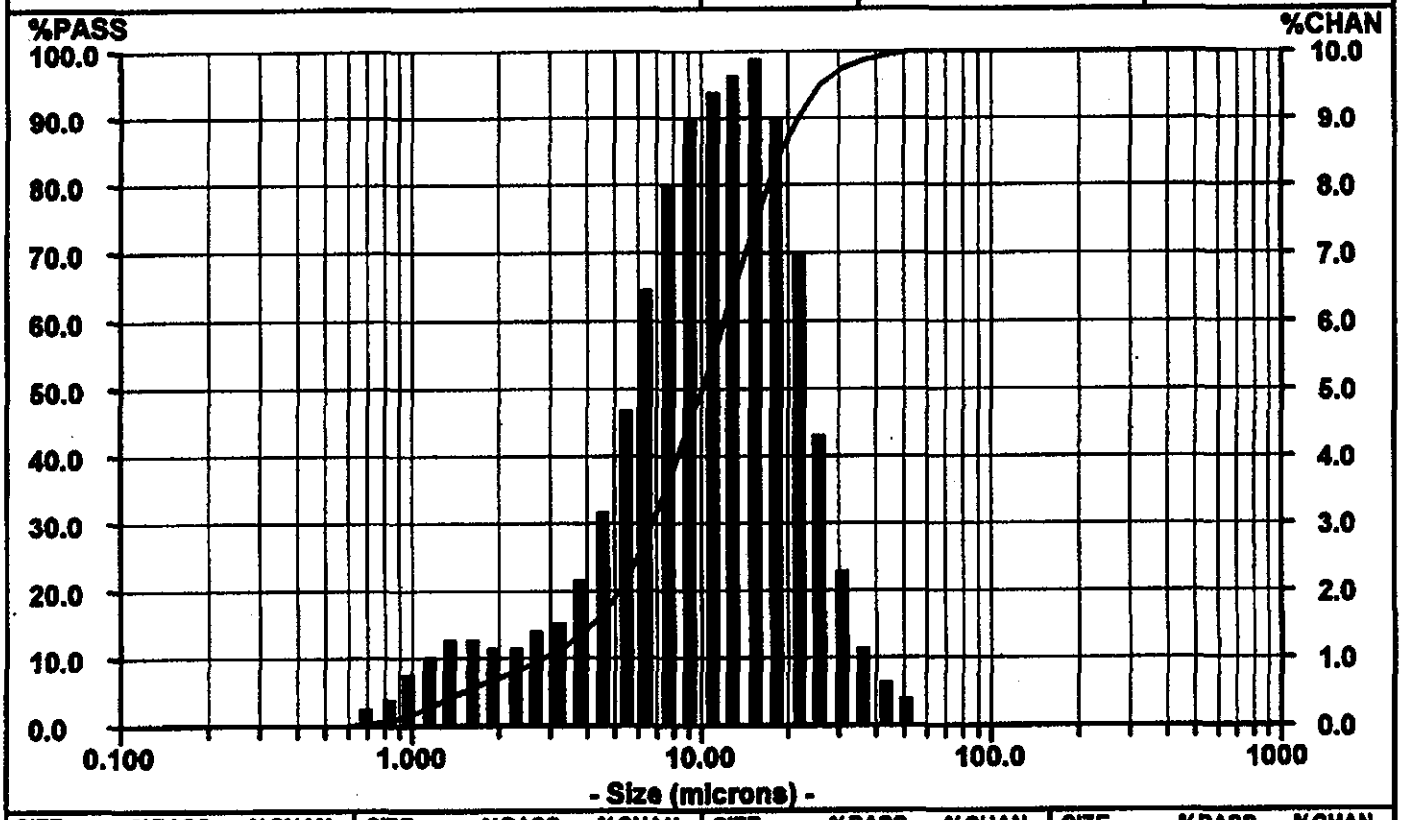
BCR 67 Sample

BCR67, riffled 7-12-01

Date: 07/13/01 Time: 07:51 Meas #: 00004 Pres #: 01

17.1 megohm/cm DI H2O
Flow Rate = 40 ml/sec
Refractive index of the medium = 1.33 and the particle = 1.54
File: BCR6705

Summary	Percentiles		Dia	Vol%	Width
mv = 11.63	10% = 2.870	60% = 12.08	10.74	93%	13.56
mn = 1.176	20% = 5.231	70% = 14.39	1.241	7%	0.812
ma = 5.858	30% = 6.831	80% = 17.22			
cs = 1.024	40% = 8.368	90% = 21.59			
sd = 7.099	50% = 10.09	95% = 26.05			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	45.33	9.08						
592.0	100.00	0.00	7.778	36.25	8.17						
497.8	100.00	0.00	6.541	28.08	6.54						
418.6	100.00	0.00	5.500	21.54	4.71						
352.0	100.00	0.00	4.625	16.83	3.24						
296.0	100.00	0.00	3.889	13.59	2.27						
248.9	100.00	0.00	3.270	11.32	1.70						
209.3	100.00	0.00	2.750	9.62	1.40						
176.0	100.00	0.00	2.312	8.22	1.28						
148.0	100.00	0.00	1.945	6.94	1.29						
124.5	100.00	0.00	1.635	5.65	1.36						
104.7	100.00	0.00	1.375	4.29	1.37						
88.00	100.00	0.00	1.156	2.92	1.18						
74.00	100.00	0.00	0.972	1.74	0.88						
62.23	100.00	0.10	0.816	0.88	0.55						
52.33	99.90	0.43	0.686	0.33	0.33						
44.00	99.47	0.70	0.578	0.00	0.00						
37.00	98.77	1.27	0.486	0.00	0.00						
31.11	97.50	2.41	0.409	0.00	0.00						
26.16	95.09	4.42	0.344	0.00	0.00						
22.00	90.67	7.03	0.289	0.00	0.00						
18.50	83.64	9.17	0.243	0.00	0.00						
15.56	74.47	9.92	0.204	0.00	0.00						
13.08	64.55	9.76	0.172	0.00	0.00						
11.00	54.79	9.46	0.145	0.00	0.00						

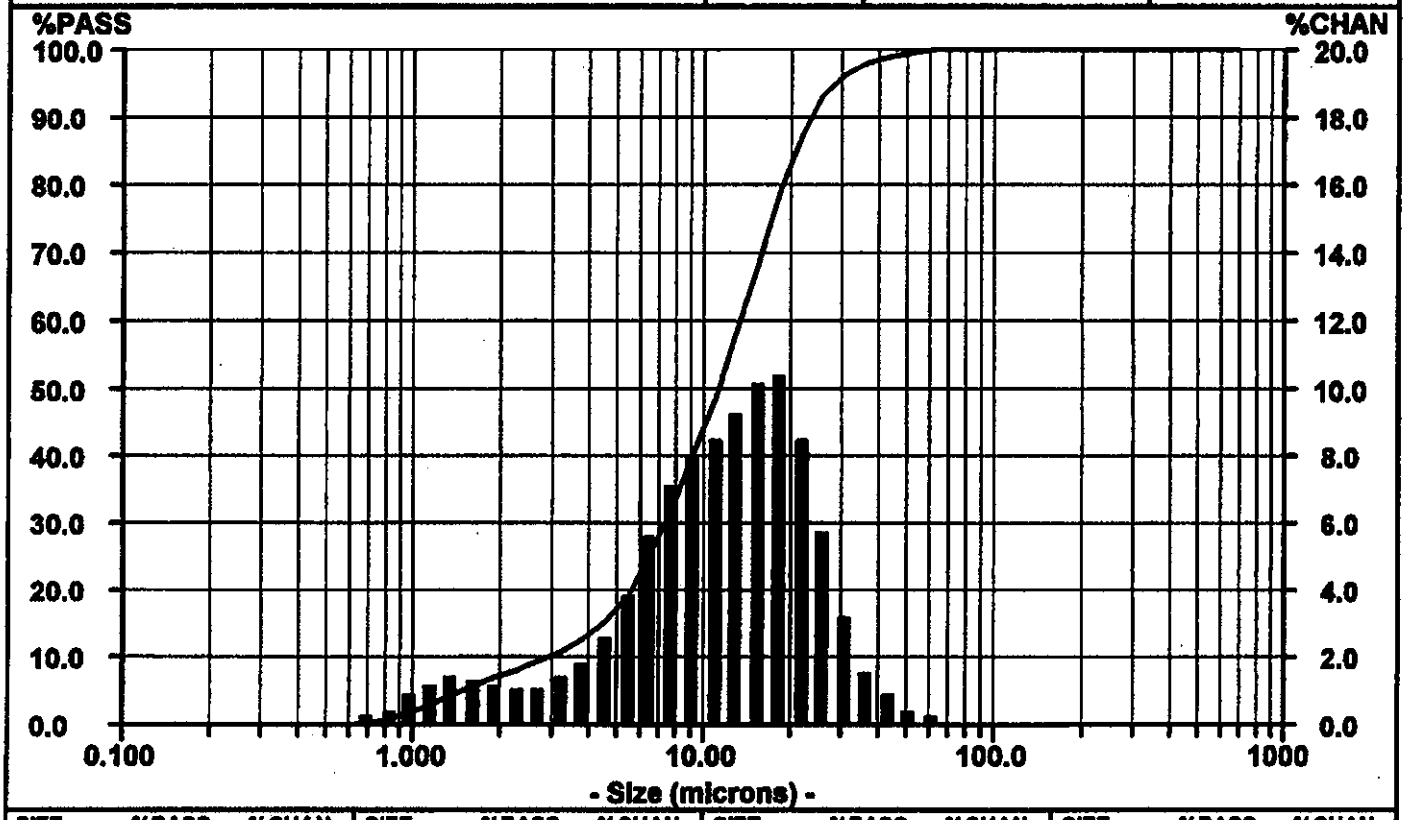
BCR 67 Sample

BCR67, rinsed
7-12-01

Date: 07/13/91 Meas #: 00004
Time: 08:01 Pres #: 02

17.1 megohm/cm DI H2O
Flow Rate = 40 ml/sec
Refractive index of the medium = 1.33 and the particle = 1.54
Sonicate for 2 min. @ 40 W
File: BCR6706

Summary		Percentiles		Dia	Vol%	Width
mv =	12.78	10% = 2.965	60% = 13.53	12.06	93%	14.86
mn =	1.127	20% = 5.643	70% = 15.99	1.224	7%	0.809
ma =	6.103	30% = 7.423	80% = 18.90			
cs =	0.983	40% = 9.231	90% = 23.49			
sd =	7.802	50% = 11.28	95% = 28.35			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	40.10	8.06						
592.0	100.00	0.00	7.778	32.04	7.15						
497.8	100.00	0.00	6.541	24.89	5.62						
418.6	100.00	0.00	5.500	19.27	3.94						
352.0	100.00	0.00	4.625	15.33	2.65						
296.0	100.00	0.00	3.889	12.68	1.85						
248.9	100.00	0.00	3.270	10.83	1.40						
209.3	100.00	0.00	2.750	9.43	1.20						
176.0	100.00	0.00	2.312	8.23	1.15						
148.0	100.00	0.00	1.945	7.08	1.23						
124.5	100.00	0.00	1.635	5.85	1.36						
104.7	100.00	0.00	1.375	4.49	1.40						
88.00	100.00	0.00	1.156	3.09	1.22						
74.00	100.00	0.00	0.972	1.87	0.90						
62.23	100.00	0.36	0.818	0.97	0.69						
52.33	99.64	0.55	0.688	0.38	0.38						
44.00	99.09	0.92	0.578	0.00	0.00						
37.00	98.17	1.69	0.486	0.00	0.00						
31.11	96.48	3.21	0.409	0.00	0.00						
26.16	93.27	5.76	0.344	0.00	0.00						
22.00	87.51	8.69	0.289	0.00	0.00						
18.50	78.82	10.49	0.243	0.00	0.00						
15.56	68.33	10.29	0.204	0.00	0.00						
13.08	58.04	9.34	0.172	0.00	0.00						
11.00	48.70	8.60	0.145	0.00	0.00						

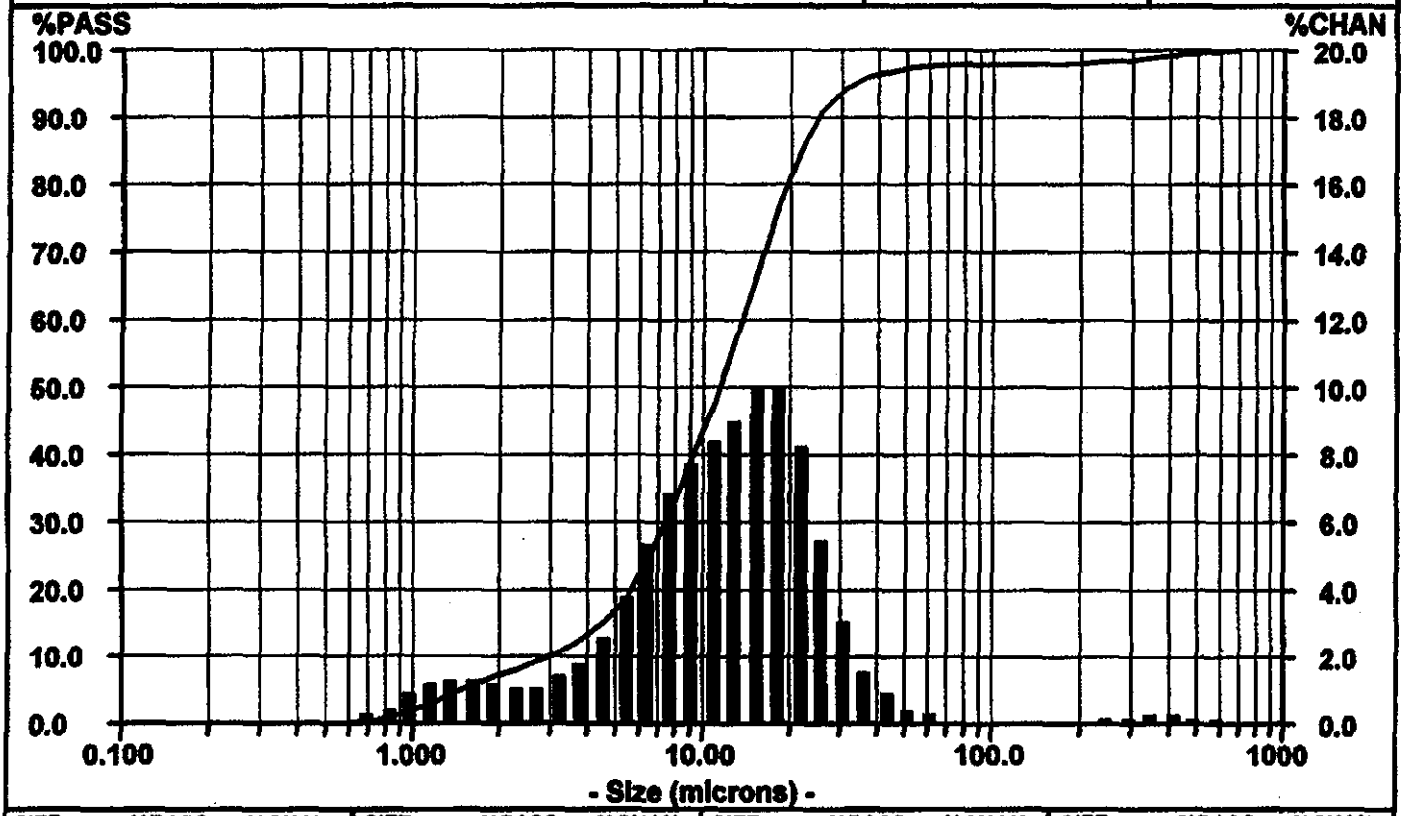
BCR 67 Sample

BCR67, riffled 7-12-01

Date: 07/13/01 Meas #: 00004
Time: 08:16 Pres #: 01

17.1 megohm/cm DI H2O
Flow Rate = 40 ml/sec
Refractive index of the medium = 1.33 and the particle = 2.00
File: BCR6707

Summary	Percentiles		Dia	Vol%	Width
mv = 20.15	10% = 2.987	60% = 13.78	348.3	2%	297.1
mn = 1.120	20% = 5.676	70% = 16.33	12.03	91%	14.93
ma = 6.182	30% = 7.501	80% = 19.50	1.222	7%	0.811
cs = 0.971	40% = 9.368	90% = 25.05			
sd = 8.195	50% = 11.48	95% = 33.26			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.15	9.250	39.41	7.86						
592.0	99.85	0.24	7.778	31.55	6.95						
497.8	99.61	0.30	6.541	24.60	5.48						
418.6	99.31	0.33	5.500	19.12	3.88						
352.0	98.98	0.31	4.625	15.24	2.63						
296.0	98.67	0.26	3.889	12.61	1.84						
248.9	98.41	0.21	3.270	10.77	1.40						
209.3	98.20	0.16	2.750	9.37	1.18						
176.0	98.04	0.12	2.312	8.18	1.14						
148.0	97.92	0.00	1.945	7.04	1.22						
124.5	97.92	0.00	1.635	5.82	1.35						
104.7	97.92	0.00	1.375	4.47	1.38						
88.00	97.92	0.00	1.156	3.09	1.21						
74.00	97.92	0.11	0.972	1.88	0.90						
62.23	97.81	0.38	0.816	0.98	0.59						
52.33	97.43	0.57	0.686	0.39	0.39						
44.00	96.86	0.94	0.578	0.00	0.00						
37.00	95.92	1.68	0.486	0.00	0.00						
31.11	94.24	3.11	0.409	0.00	0.00						
26.16	91.13	5.64	0.344	0.00	0.00						
22.00	85.59	8.36	0.289	0.00	0.00						
18.50	77.23	10.11	0.243	0.00	0.00						
15.56	67.12	10.08	0.204	0.00	0.00						
13.08	57.04	9.19	0.172	0.00	0.00						
11.00	47.85	8.44	0.145	0.00	0.00						

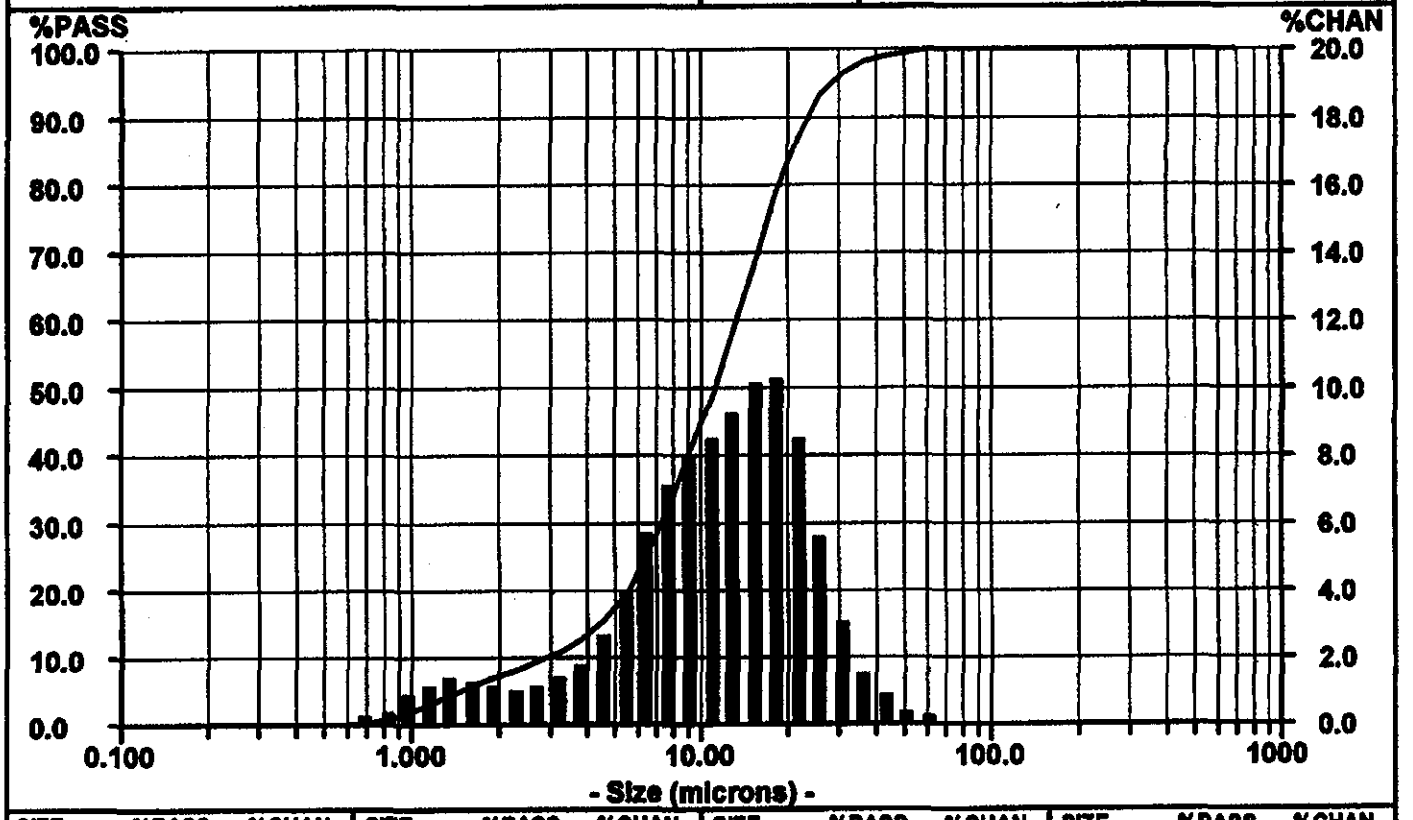
BCR 67 Sample

BCR67, riffled
7-12-01

Date: 07/13/91 Meas #: 00004
Time: 08:42 Pres #: 01

17.1 megohm/cm DI H2O
Flow Rate = 40 ml/sec
Refractive index of the medium = 1.33 and the particle = 2.00
Sonicate for 2 min. @ 40 W
File: BCR6708

Summary	Percentiles		Dia	Vol%	Width
mv = 12.68	10% = 2.898	60% = 13.42	11.96	93%	14.82
mn = 1.124	20% = 5.567	70% = 15.88	1.222	7%	0.809
ma = 6.035	30% = 7.338	80% = 18.79			
cs = 0.394	40% = 9.131	90% = 23.36			
sd = 7.781	50% = 11.17	95% = 28.20			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	40.63	8.08						
592.0	100.00	0.00	7.778	32.55	7.20						
497.8	100.00	0.00	6.541	25.35	5.70						
418.6	100.00	0.00	5.500	19.65	4.02						
352.0	100.00	0.00	4.625	15.63	2.71						
296.0	100.00	0.00	3.889	12.92	1.69						
248.9	100.00	0.00	3.270	11.03	1.43						
209.3	100.00	0.00	2.750	9.60	1.22						
176.0	100.00	0.00	2.312	8.38	1.17						
148.0	100.00	0.00	1.945	7.21	1.25						
124.5	100.00	0.00	1.635	5.96	1.38						
104.7	100.00	0.00	1.375	4.58	1.42						
88.00	100.00	0.00	1.156	3.16	1.25						
74.00	100.00	0.00	0.972	1.91	0.92						
62.23	100.00	0.35	0.818	0.99	0.60						
52.33	99.65	0.53	0.688	0.39	0.39						
44.00	99.12	0.90	0.578	0.00	0.00						
37.00	98.22	1.66	0.486	0.00	0.00						
31.11	96.56	3.16	0.409	0.00	0.00						
26.16	93.40	5.67	0.344	0.00	0.00						
22.00	87.73	8.58	0.289	0.00	0.00						
18.50	79.15	10.37	0.243	0.00	0.00						
15.56	68.78	10.24	0.204	0.00	0.00						
13.08	58.54	9.32	0.172	0.00	0.00						
11.00	49.22	8.59	0.145	0.00	0.00						

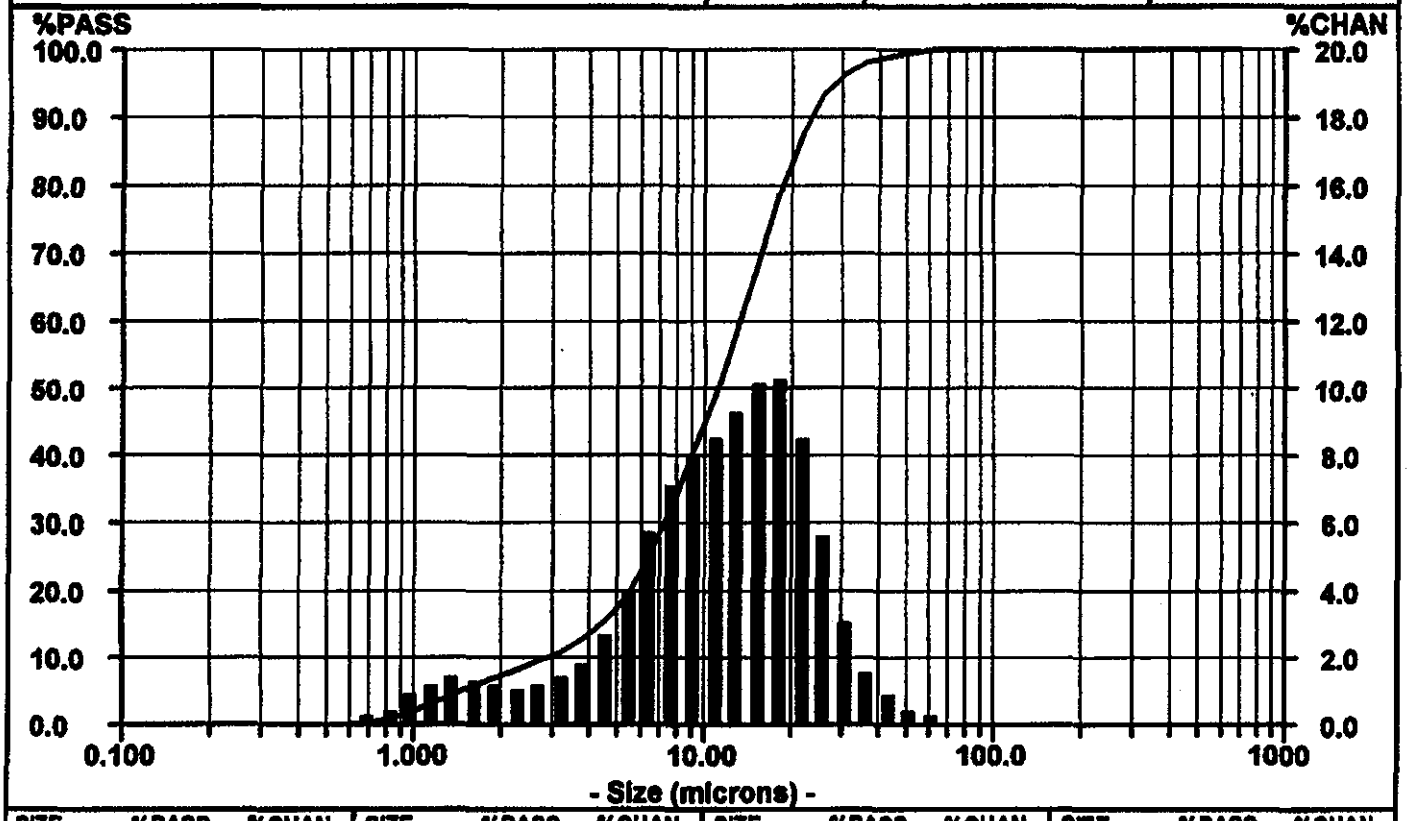
BCR 67 Sample

BCR67, riffed 7-12-01

Date: 07/13/01 Meas #: 00004
Time: 08:51 Pres #: 01

17.1 megohm/cm DI H2O
Flow Rate = 60 ml/sec
Refractive Index of the medium = 1.33 and the particle = 2.00
File: BCR6709

Summary	Percentiles		Dia	Vol%	Width
mv = 12.67	10% = 2.898	60% = 13.41	11.96	93%	14.81
mn = 1.124	20% = 5.563	70% = 15.87	1.222	7%	0.809
ma = 6.033	30% = 7.335	80% = 18.76			
cs = 0.995	40% = 9.127	90% = 23.34			
sd = 7.773	50% = 11.16	95% = 26.17			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	40.65	8.08						
592.0	100.00	0.00	7.778	32.57	7.20						
497.8	100.00	0.00	6.541	25.37	5.70						
418.6	100.00	0.00	5.500	19.67	4.03						
352.0	100.00	0.00	4.625	15.64	2.72						
296.0	100.00	0.00	3.889	12.92	1.89						
248.9	100.00	0.00	3.270	11.03	1.43						
209.3	100.00	0.00	2.750	9.60	1.22						
176.0	100.00	0.00	2.312	8.38	1.17						
148.0	100.00	0.00	1.945	7.21	1.26						
124.5	100.00	0.00	1.635	5.96	1.38						
104.7	100.00	0.00	1.375	4.58	1.42						
88.00	100.00	0.00	1.156	3.16	1.25						
74.00	100.00	0.00	0.972	1.91	0.92						
62.23	100.00	0.34	0.818	0.99	0.60						
52.33	99.66	0.53	0.688	0.39	0.39						
44.00	99.13	0.90	0.578	0.00	0.00						
37.00	98.23	1.66	0.486	0.00	0.00						
31.11	96.57	3.14	0.409	0.00	0.00						
26.16	93.43	5.66	0.344	0.00	0.00						
22.00	87.77	8.67	0.289	0.00	0.00						
18.50	79.20	10.38	0.243	0.00	0.00						
15.56	68.82	10.25	0.204	0.00	0.00						
13.08	58.57	9.32	0.172	0.00	0.00						
11.00	49.25	8.60	0.145	0.00	0.00						

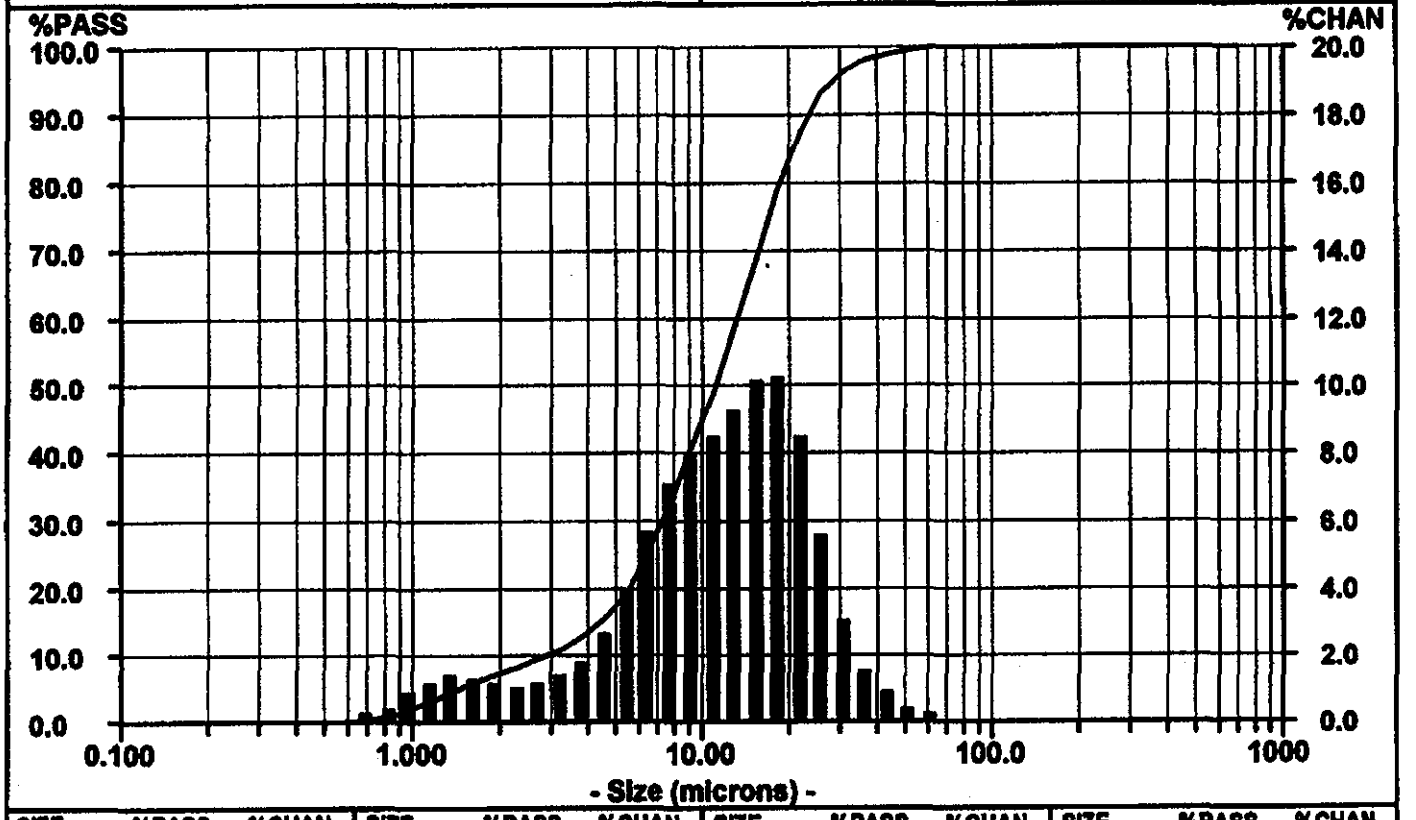
BCR 67 Sample

BCR67, riffled
7-12-01

Date: 07/13/91 Meas #: 00004
Time: 09:10 Pres #: 01

17.1 megohm/cm DI H2O
Flow Rate = 50 ml/sec
Refractive index of the medium = 1.33 and the particle = 1.54
File: BCR6710

Summary	Percentiles		Dia	Vol%	Width
mv = 12.66	10% = 2.898	60% = 13.41	11.95	93%	14.80
mn = 1.124	20% = 5.563	70% = 15.86	1.222	7%	0.809
ma = 6.032	30% = 7.332	80% = 18.78			
cs = 0.995	40% = 9.124	90% = 23.33			
sd = 7.772	50% = 11.16	95% = 28.16			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	40.67	8.08						
592.0	100.00	0.00	7.778	32.59	7.21						
497.8	100.00	0.00	6.541	25.38	5.71						
418.6	100.00	0.00	5.500	19.67	4.03						
352.0	100.00	0.00	4.625	15.64	2.72						
296.0	100.00	0.00	3.889	12.92	1.89						
248.9	100.00	0.00	3.270	11.03	1.43						
209.3	100.00	0.00	2.750	9.60	1.22						
176.0	100.00	0.00	2.312	8.38	1.17						
148.0	100.00	0.00	1.945	7.21	1.25						
124.5	100.00	0.00	1.635	5.96	1.38						
104.7	100.00	0.00	1.375	4.58	1.42						
88.00	100.00	0.00	1.156	3.16	1.25						
74.00	100.00	0.00	0.972	1.91	0.92						
62.23	100.00	0.34	0.818	0.99	0.60						
52.33	99.66	0.53	0.688	0.39	0.39						
44.00	99.13	0.90	0.578	0.00	0.00						
37.00	98.23	1.65	0.486	0.00	0.00						
31.11	96.58	3.14	0.409	0.00	0.00						
26.16	93.44	5.66	0.344	0.00	0.00						
22.00	87.78	8.58	0.289	0.00	0.00						
18.50	79.20	10.37	0.243	0.00	0.00						
15.56	68.83	10.24	0.204	0.00	0.00						
13.08	58.59	9.32	0.172	0.00	0.00						
11.00	49.27	8.60	0.145	0.00	0.00						

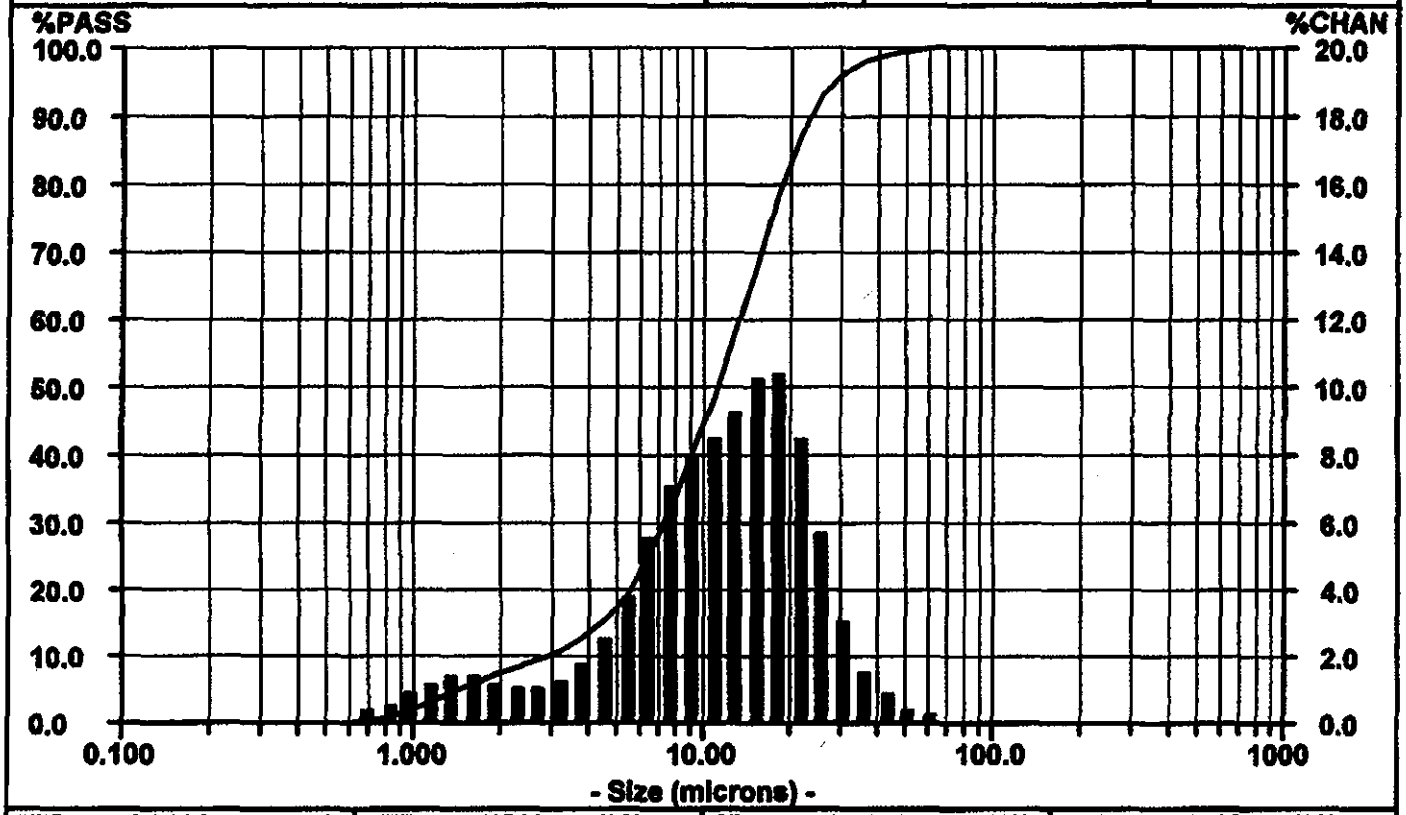
BCR 67 Sample

BCR67, rinsed
7-12-01

Date: 07/13/91 Meas #: 00004
Time: 09:20 Pres #: 01

17.1 megohm/cm DI H2O
Flow Rate = 60 ml/sec
Refractive index of the medium = 1.33 and the particle = 1.54
Sonicate for 2 min. @ 40 W
File: BCR6711

Summary	Percentiles		Dia	Vol%	Width
mv = 12.71	10% = 2.883	60% = 13.47	12.03	93%	14.81
mn = 1.118	20% = 5.595	70% = 15.92	1.220	7%	0.806
ma = 6.024	30% = 7.377	80% = 18.83			
cs = 0.996	40% = 9.180	90% = 23.40			
sd = 7.789	50% = 11.23	95% = 28.24			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.260	40.37	8.06						
592.0	100.00	0.00	7.778	32.31	7.16						
497.8	100.00	0.00	6.541	25.15	5.64						
418.6	100.00	0.00	5.500	19.51	3.97						
352.0	100.00	0.00	4.625	15.54	2.66						
296.0	100.00	0.00	3.889	12.88	1.84						
248.9	100.00	0.00	3.270	11.04	1.39						
209.3	100.00	0.00	2.750	9.65	1.18						
176.0	100.00	0.00	2.312	8.47	1.15						
148.0	100.00	0.00	1.945	7.32	1.25						
124.5	100.00	0.00	1.635	6.07	1.40						
104.7	100.00	0.00	1.375	4.67	1.45						
88.00	100.00	0.00	1.156	3.22	1.27						
74.00	100.00	0.00	0.972	1.95	0.94						
62.23	100.00	0.35	0.818	1.01	0.81						
52.33	99.65	0.54	0.688	0.40	0.40						
44.00	99.11	0.91	0.578	0.00	0.00						
37.00	98.20	1.67	0.486	0.00	0.00						
31.11	96.53	3.16	0.409	0.00	0.00						
26.16	93.37	5.70	0.344	0.00	0.00						
22.00	87.67	8.64	0.289	0.00	0.00						
18.50	79.03	10.42	0.243	0.00	0.00						
15.56	68.61	10.30	0.204	0.00	0.00						
13.08	58.31	9.35	0.172	0.00	0.00						
11.00	48.96	8.59	0.145	0.00	0.00						

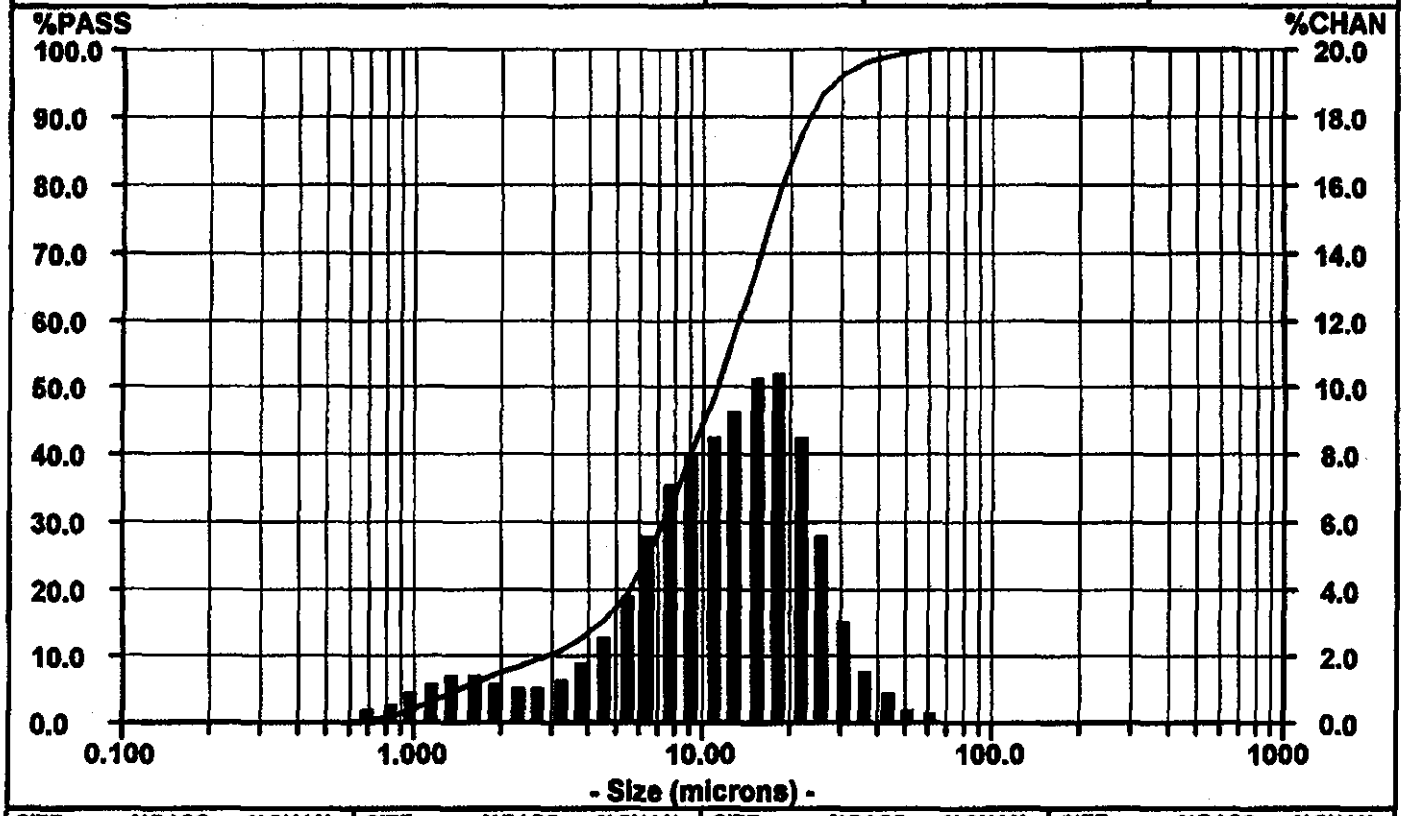
BCR 67 Sample

BCR67, riffled
7-12-01

Date: 07/13/91 Meas #: 00004
Time: 09:33 Pres #: 01

17.1 megohm/cm DI H2O
Flow Rate = 60 ml/sec
Refractive index of the medium = 1.33 and the particle = 2.00
Sonicate for 2 min. @ 40 W
File: BCR6712

Summary	Percentiles		Dia	Vol%	Width
mv = 12.71	10% = 2.876	60% = 13.46	12.03	93%	14.80
mn = 1.116	20% = 5.592	70% = 15.91	1.218	7%	0.807
ma = 6.016	30% = 7.374	80% = 18.82			
cs = 0.997	40% = 9.176	90% = 23.38			
sd = 7.783	50% = 11.22	95% = 28.24			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	40.39	8.06						
592.0	100.00	0.00	7.778	32.33	7.16						
497.8	100.00	0.00	6.541	25.17	5.64						
418.6	100.00	0.00	5.500	19.53	3.97						
352.0	100.00	0.00	4.625	15.56	2.66						
296.0	100.00	0.00	3.889	12.90	1.84						
248.9	100.00	0.00	3.270	11.06	1.39						
209.3	100.00	0.00	2.750	9.67	1.18						
176.0	100.00	0.00	2.312	8.49	1.15						
148.0	100.00	0.00	1.945	7.34	1.25						
124.5	100.00	0.00	1.636	6.09	1.40						
104.7	100.00	0.00	1.375	4.69	1.45						
88.00	100.00	0.00	1.156	3.24	1.28						
74.00	100.00	0.00	0.972	1.96	0.94						
62.23	100.00	0.35	0.818	1.02	0.62						
52.33	99.65	0.54	0.688	0.40	0.40						
44.00	99.11	0.91	0.578	0.00	0.00						
37.00	98.20	1.67	0.486	0.00	0.00						
31.11	96.53	3.15	0.409	0.00	0.00						
26.16	93.38	5.68	0.344	0.00	0.00						
22.00	87.70	8.83	0.289	0.00	0.00						
18.50	79.07	10.42	0.243	0.00	0.00						
15.56	68.65	10.31	0.204	0.00	0.00						
13.08	58.34	9.35	0.172	0.00	0.00						
11.00	48.99	8.60	0.145	0.00	0.00						

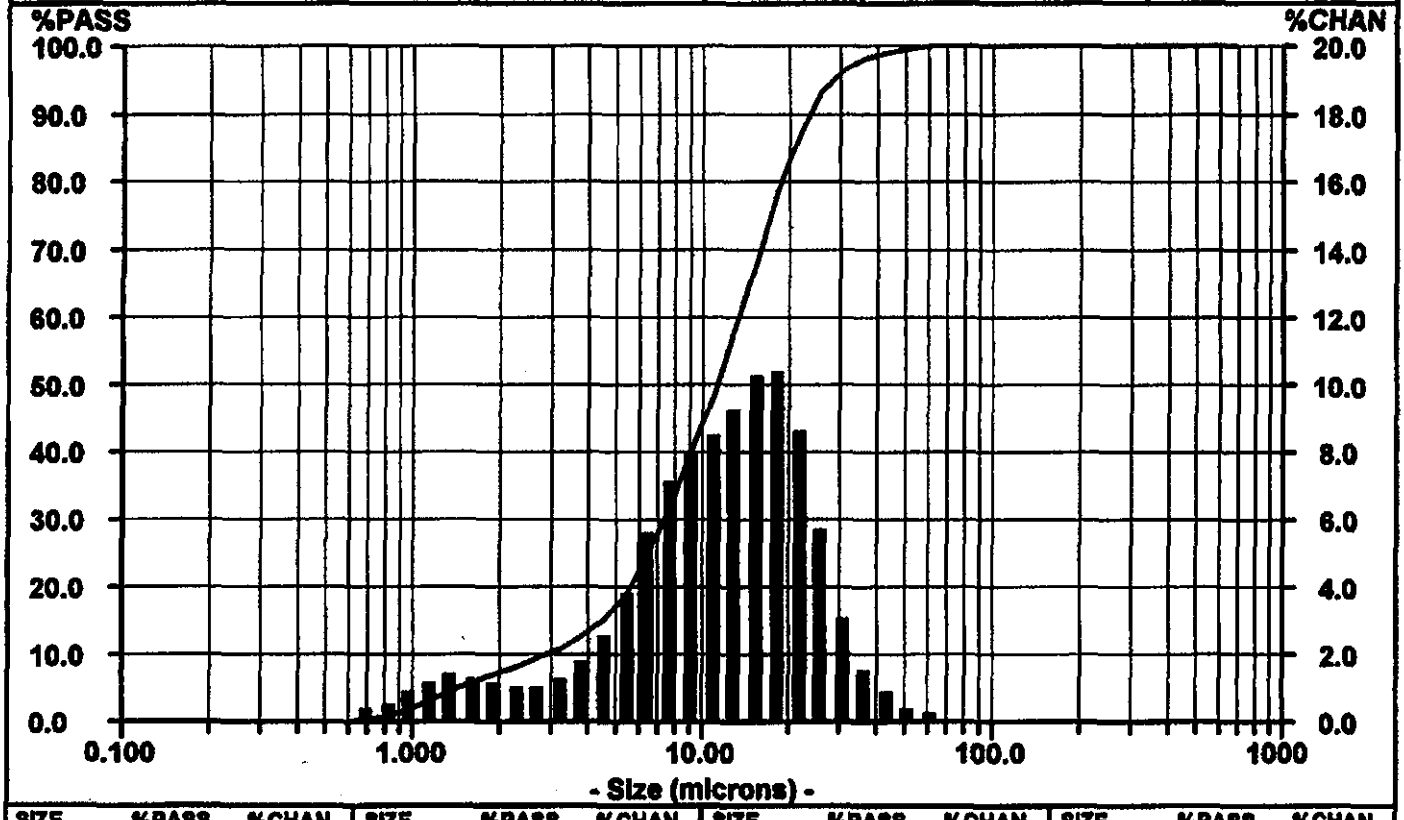
BCR 67 Duplicate

BCR67, riffled 7-12-01

Date: 07/13/91 Meas #: 00004
Time: 09:50 Pres #: 01

17.1 megohm/cm DI H2O
Flow Rate = 17 ml/sec
Refractive index of the medium = 1.33 and the particle = 1.54
File: BCR6713

Summary	Percentiles		Dia	Vol%	Width
mv = 12.76	10% = 2.920	60% = 13.52	12.08	93%	14.82
mn = 1.116	20% = 5.639	70% = 15.97	1.218	7%	0.808
ma = 6.056	30% = 7.423	80% = 18.88			
cs = 0.991	40% = 9.231	90% = 23.44			
sd = 7.791	50% = 11.28	95% = 28.28			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	40.10	8.06						
592.0	100.00	0.00	7.778	32.04	7.14						
497.8	100.00	0.00	6.541	24.90	5.61						
418.6	100.00	0.00	5.500	19.29	3.93						
352.0	100.00	0.00	4.625	15.36	2.62						
296.0	100.00	0.00	3.889	12.74	1.81						
248.9	100.00	0.00	3.270	10.93	1.37						
209.3	100.00	0.00	2.750	9.56	1.17						
176.0	100.00	0.00	2.312	8.39	1.14						
148.0	100.00	0.00	1.945	7.25	1.24						
124.5	100.00	0.00	1.635	6.01	1.38						
104.7	100.00	0.00	1.375	4.63	1.43						
88.00	100.00	0.00	1.156	3.20	1.26						
74.00	100.00	0.00	0.972	1.94	0.93						
62.23	100.00	0.35	0.818	1.01	0.61						
52.33	99.65	0.54	0.688	0.40	0.40						
44.00	99.11	0.91	0.578	0.00	0.00						
37.00	98.20	1.68	0.486	0.00	0.00						
31.11	96.52	3.19	0.409	0.00	0.00						
26.16	93.33	5.75	0.344	0.00	0.00						
22.00	87.58	8.70	0.289	0.00	0.00						
18.50	78.88	10.47	0.243	0.00	0.00						
15.56	68.41	10.33	0.204	0.00	0.00						
13.08	58.08	9.37	0.172	0.00	0.00						
11.00	48.71	8.61	0.145	0.00	0.00						

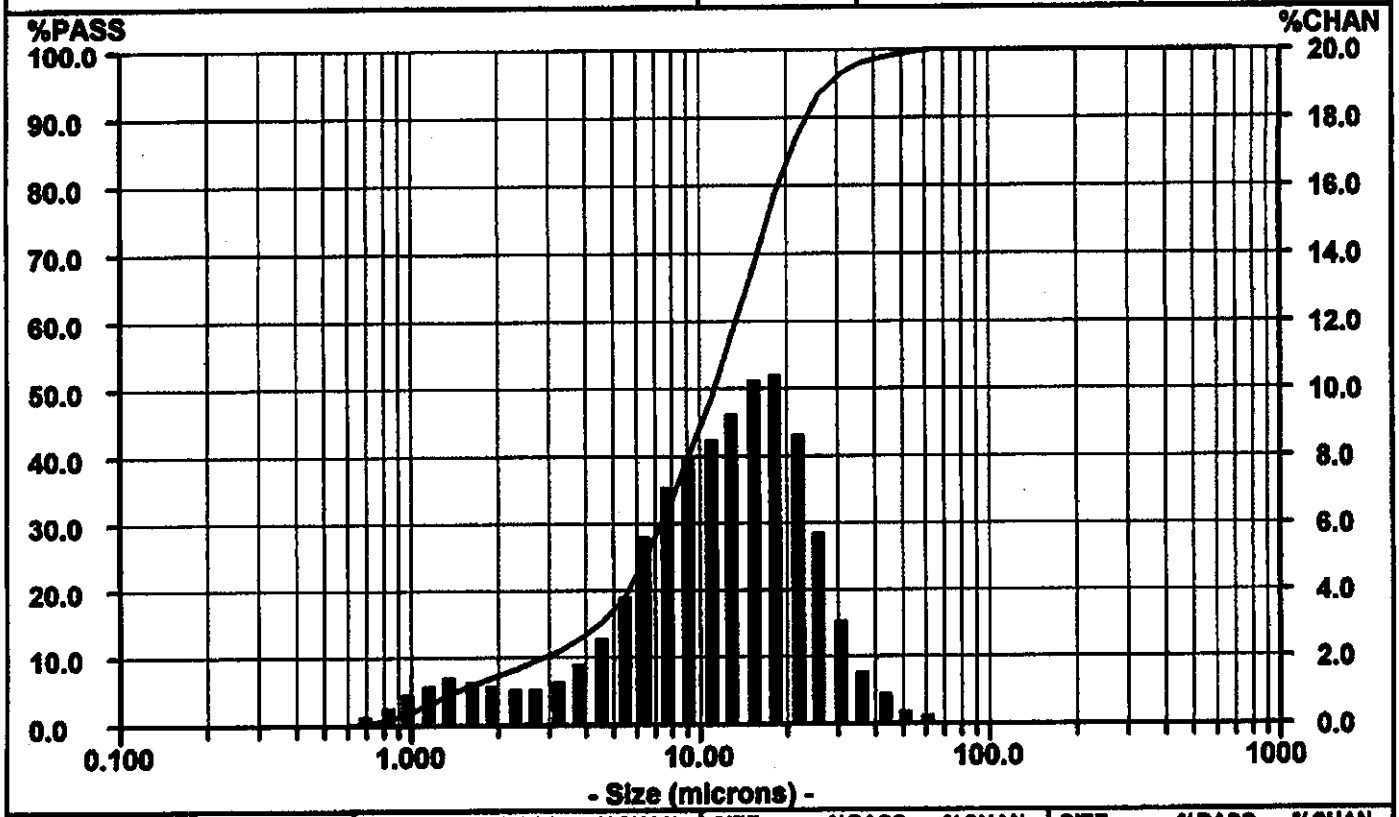
BCR 67 Duplicate

BCR67, riffed 7-12-01

Date: 07/13/91 Meas #: 00004
Time: 10:04 Pres #: 01

17.1 megohm/cm DI H2O
Flow Rate = 17 ml/sec
Refractive Index of the medium = 1.33 and the particle = 2.00
File: BCR6714

Summary	Percentiles		Dia	Vol%	Width
mv = 12.76	10% = 2.931	60% = 13.53	12.07	93%	14.82
mn = 1.119	20% = 5.641	70% = 15.98	1.219	7%	0.806
ma = 6.066	30% = 7.420	80% = 18.88			
cs = 0.989	40% = 9.227	90% = 23.44			
sd = 7.787	50% = 11.28	95% = 28.26			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.260	40.12	8.06						
592.0	100.00	0.00	7.778	32.06	7.15						
497.8	100.00	0.00	6.541	24.91	5.63						
418.6	100.00	0.00	5.500	19.28	3.94						
352.0	100.00	0.00	4.626	15.34	2.63						
296.0	100.00	0.00	3.889	12.71	1.81						
248.9	100.00	0.00	3.270	10.90	1.37						
209.3	100.00	0.00	2.750	9.53	1.17						
176.0	100.00	0.00	2.312	8.36	1.14						
148.0	100.00	0.00	1.945	7.22	1.23						
124.5	100.00	0.00	1.635	5.99	1.38						
104.7	100.00	0.00	1.375	4.61	1.43						
88.00	100.00	0.00	1.156	3.18	1.26						
74.00	100.00	0.00	0.972	1.92	0.92						
62.23	100.00	0.35	0.818	1.00	0.61						
52.33	99.65	0.53	0.688	0.39	0.39						
44.00	99.12	0.91	0.578	0.00	0.00						
37.00	98.21	1.68	0.486	0.00	0.00						
31.11	96.53	3.19	0.409	0.00	0.00						
26.16	93.34	5.75	0.344	0.00	0.00						
22.00	87.59	8.71	0.289	0.00	0.00						
18.50	78.88	10.49	0.243	0.00	0.00						
15.56	68.39	10.32	0.204	0.00	0.00						
13.08	58.07	9.35	0.172	0.00	0.00						
11.00	48.72	8.60	0.145	0.00	0.00						

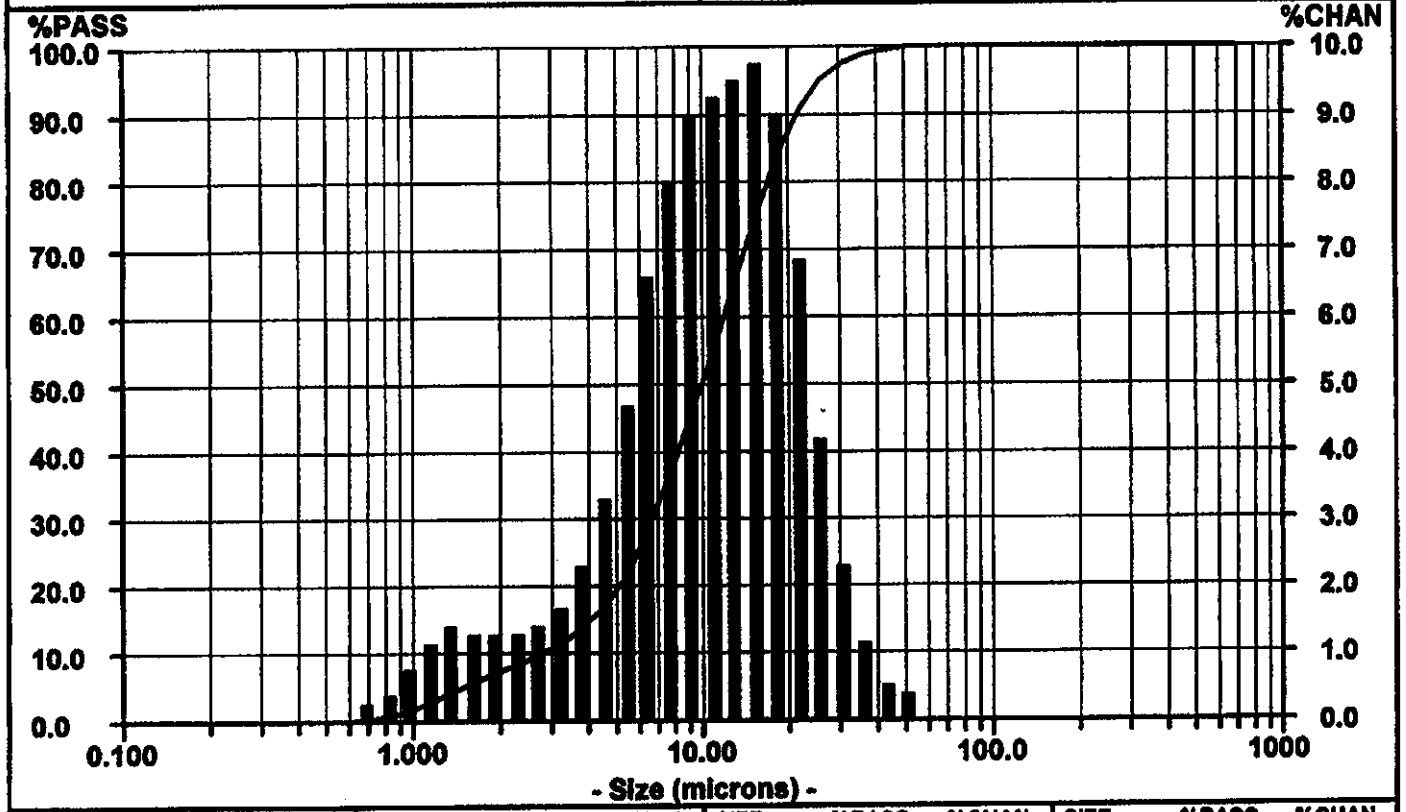
BCR 67 Duplicate

BCR67, riffled 7-12-01

Date: 07/13/91 Meas #: 00004
Time: 10:15 Pres #: 01

17.1 megohm/cm DI H2O
Flow Rate = 17 ml/sec
Refractive index of the medium = 1.33 and the particle = 1.54
Sonicate for 2 min. @ 40 W
File: BCR6715

Summary	Percentiles		Dia	Vol%	Width
mv = 11.49	10% = 2.806	60% = 11.96	10.64	93%	13.50
mn = 1.170	20% = 5.142	70% = 14.27	1.239	7%	0.812
ma = 5.779	30% = 6.731	80% = 17.09			
cs = 1.038	40% = 8.261	90% = 21.42			
sd = 7.070	50% = 9.973	95% = 25.78			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	46.98	9.05						
592.0	100.00	0.00	7.778	38.93	8.20						
497.8	100.00	0.00	6.541	28.73	6.65						
418.6	100.00	0.00	5.500	22.08	4.84						
352.0	100.00	0.00	4.625	17.24	3.34						
296.0	100.00	0.00	3.889	13.90	2.34						
248.9	100.00	0.00	3.270	11.56	1.74						
209.3	100.00	0.00	2.750	9.82	1.42						
176.0	100.00	0.00	2.312	8.40	1.30						
148.0	100.00	0.00	1.945	7.10	1.31						
124.5	100.00	0.00	1.635	5.79	1.39						
104.7	100.00	0.00	1.375	4.40	1.40						
88.00	100.00	0.00	1.156	3.00	1.21						
74.00	100.00	0.00	0.972	1.79	0.88						
62.23	100.00	0.00	0.818	0.91	0.56						
52.33	100.00	0.41	0.688	0.35	0.35						
44.00	99.59	0.68	0.578	0.00	0.00						
37.00	98.91	1.24	0.486	0.00	0.00						
31.11	97.67	2.37	0.408	0.00	0.00						
26.16	95.30	4.36	0.344	0.00	0.00						
22.00	90.94	6.96	0.289	0.00	0.00						
18.50	83.98	9.09	0.243	0.00	0.00						
15.56	74.89	9.84	0.204	0.00	0.00						
13.08	65.05	9.69	0.172	0.00	0.00						
11.00	55.36	9.38	0.145	0.00	0.00						

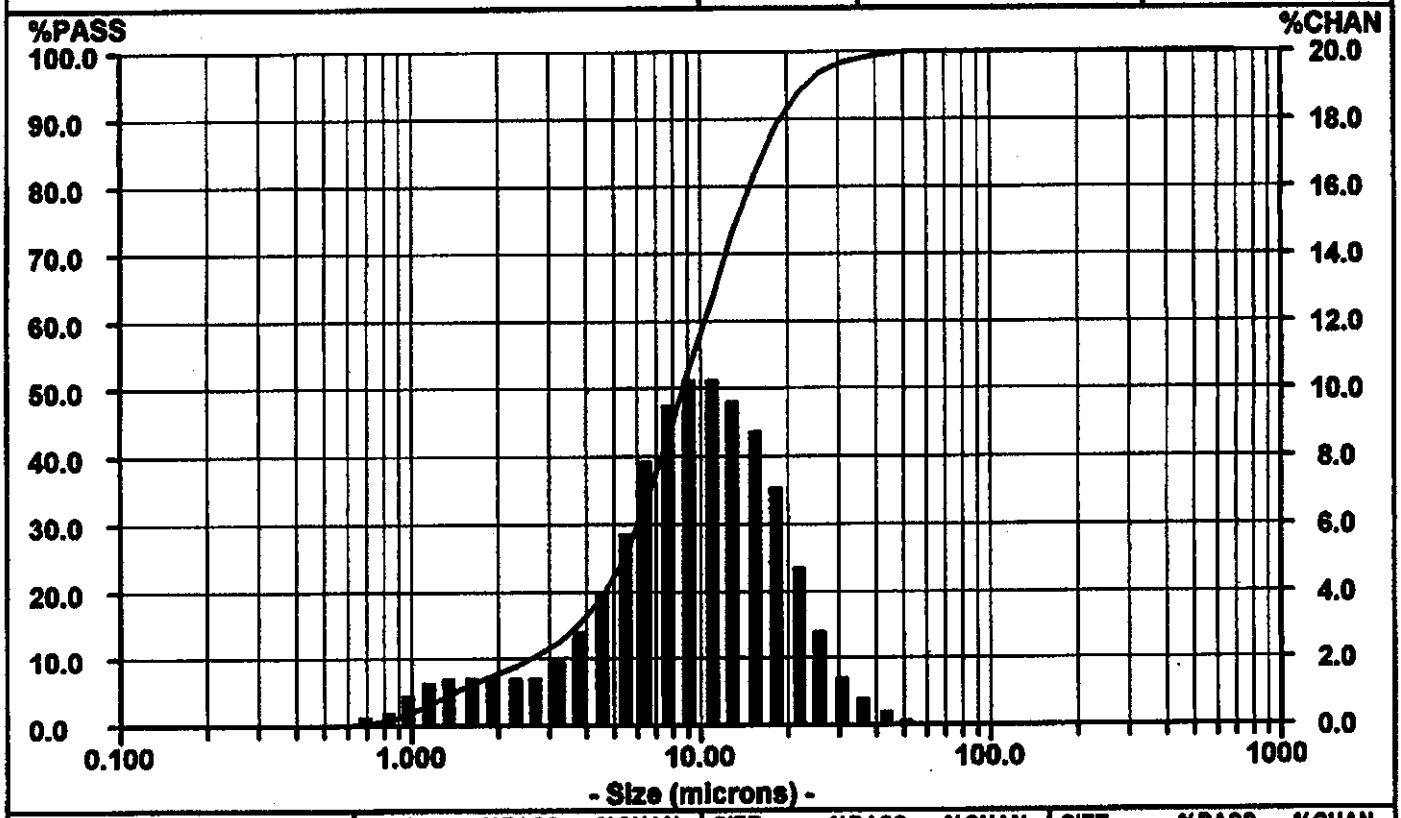
BCR 67 Duplicate

BCR67, riffled
7-12-01

Date: 07/13/91 Meas #: 00004
Time: 10:26 Pres #: 01

17.1 megohm/cm DI H2O
Flow Rate = 17 ml/sec
Refractive Index of the medium = 1.33 and the particle = 2.00
Sonicate for 2 min. @ 40 W
File: BCR6716

Summary	Percentiles		Dia	Vol%	Width
mv = 10.18	10% = 2.597	60% = 10.36	9.233	94%	11.69
mn = 1.184	20% = 4.716	70% = 12.33	1.141	6%	0.633
ma = 5.355	30% = 6.129	80% = 14.89			
cs = 1.120	40% = 7.409	90% = 18.94			
sd = 6.104	50% = 8.774	95% = 22.99			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	53.20	10.36						
592.0	100.00	0.00	7.778	42.82	9.62						
497.8	100.00	0.00	6.541	33.20	7.92						
418.6	100.00	0.00	5.500	25.28	5.86						
352.0	100.00	0.00	4.625	19.43	4.05						
296.0	100.00	0.00	3.889	15.38	2.80						
248.9	100.00	0.00	3.270	12.58	2.02						
209.3	100.00	0.00	2.750	10.56	1.59						
176.0	100.00	0.00	2.312	8.97	1.40						
148.0	100.00	0.00	1.945	7.57	1.40						
124.5	100.00	0.00	1.635	6.17	1.48						
104.7	100.00	0.00	1.375	4.69	1.50						
88.00	100.00	0.00	1.156	3.19	1.30						
74.00	100.00	0.00	0.972	1.89	0.93						
62.23	100.00	0.00	0.818	0.96	0.59						
52.33	100.00	0.22	0.688	0.37	0.37						
44.00	99.78	0.48	0.578	0.00	0.00						
37.00	99.30	0.82	0.486	0.00	0.00						
31.11	98.48	1.52	0.409	0.00	0.00						
26.16	96.96	2.85	0.344	0.00	0.00						
22.00	94.11	4.87	0.289	0.00	0.00						
18.50	89.24	7.12	0.243	0.00	0.00						
15.56	82.12	8.81	0.204	0.00	0.00						
13.08	73.31	9.79	0.172	0.00	0.00						
11.00	63.52	10.32	0.145	0.00	0.00						

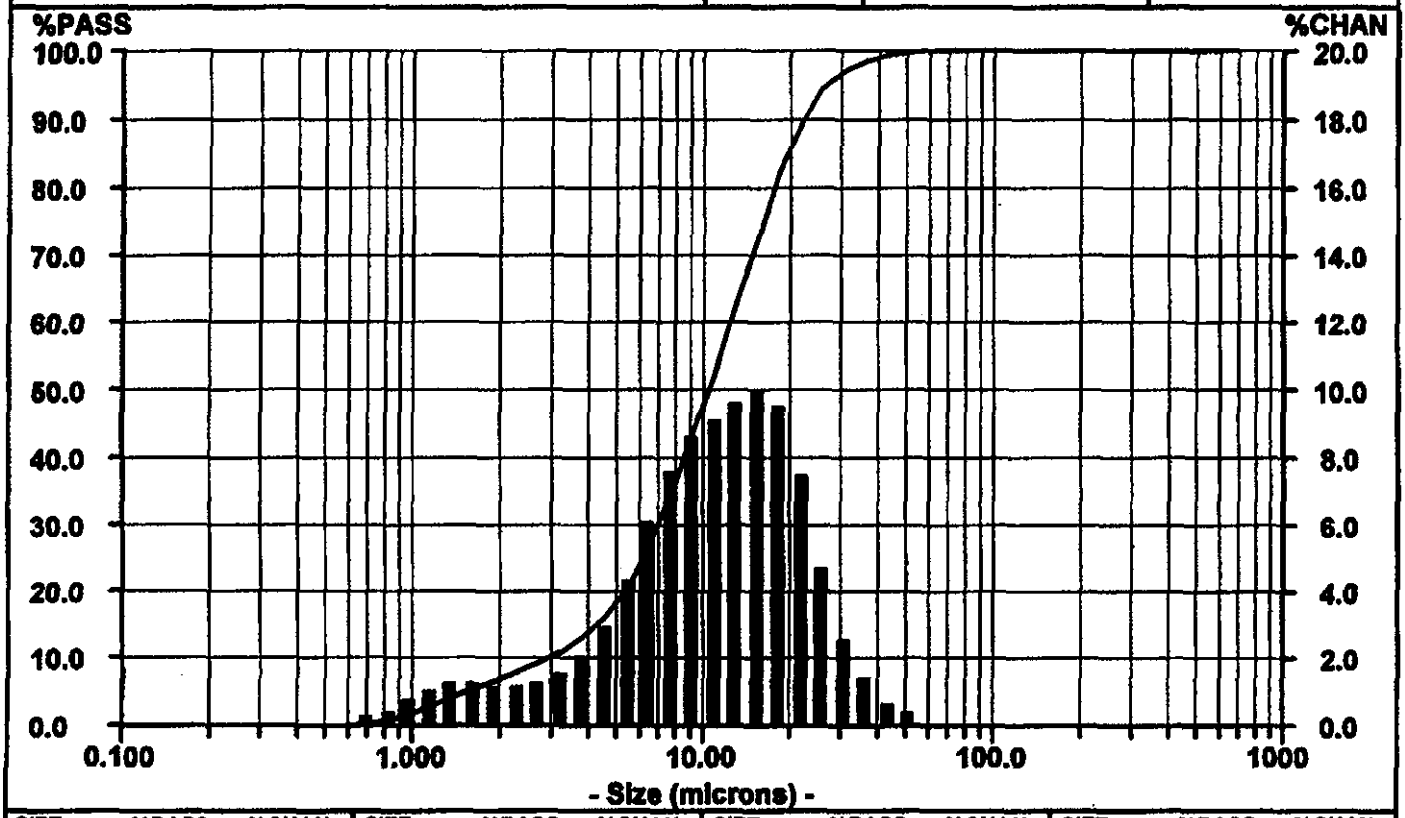
BCR 67 Duplicate

BCR67, riffled 7-18-01

Date: 07/19/91 Meas #: 00008
Time: 06:53 Pres #: 01

17.1 megohm/cm DI H2O
Flow Rate = 40 ml/sec
Refractive index of the medium = 1.33 and the particle = 1.54
File: BCR6716

Summary	Percentiles		Dia	Vol%	Width
mv = 12.00	10% = 2.966	60% = 12.57	11.16	93%	13.98
mn = 1.174	20% = 5.386	70% = 14.92	1.242	7%	0.813
ma = 6.007	30% = 7.045	80% = 17.77			
cs = 0.999	40% = 8.688	90% = 22.18			
sd = 7.313	50% = 10.49	95% = 26.74			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	43.36	8.74						
592.0	100.00	0.00	7.778	34.62	7.50						
497.8	100.00	0.00	6.541	26.82	6.21						
418.6	100.00	0.00	5.500	20.61	4.45						
352.0	100.00	0.00	4.625	16.16	3.05						
296.0	100.00	0.00	3.889	13.11	2.15						
248.9	100.00	0.00	3.270	10.96	1.62						
209.3	100.00	0.00	2.750	9.34	1.34						
176.0	100.00	0.00	2.312	8.00	1.24						
148.0	100.00	0.00	1.945	6.76	1.26						
124.5	100.00	0.00	1.635	5.50	1.33						
104.7	100.00	0.00	1.375	4.17	1.33						
88.00	100.00	0.00	1.156	2.84	1.15						
74.00	100.00	0.00	0.972	1.69	0.83						
62.23	100.00	0.11	0.818	0.86	0.54						
52.33	99.89	0.46	0.688	0.32	0.32						
44.00	99.43	0.77	0.578	0.00	0.00						
37.00	98.66	1.41	0.486	0.00	0.00						
31.11	97.25	2.67	0.409	0.00	0.00						
26.16	94.58	4.85	0.344	0.00	0.00						
22.00	89.73	7.59	0.289	0.00	0.00						
18.50	82.14	9.66	0.243	0.00	0.00						
15.56	72.48	10.17	0.204	0.00	0.00						
13.08	62.31	9.73	0.172	0.00	0.00						
11.00	52.58	9.22	0.145	0.00	0.00						

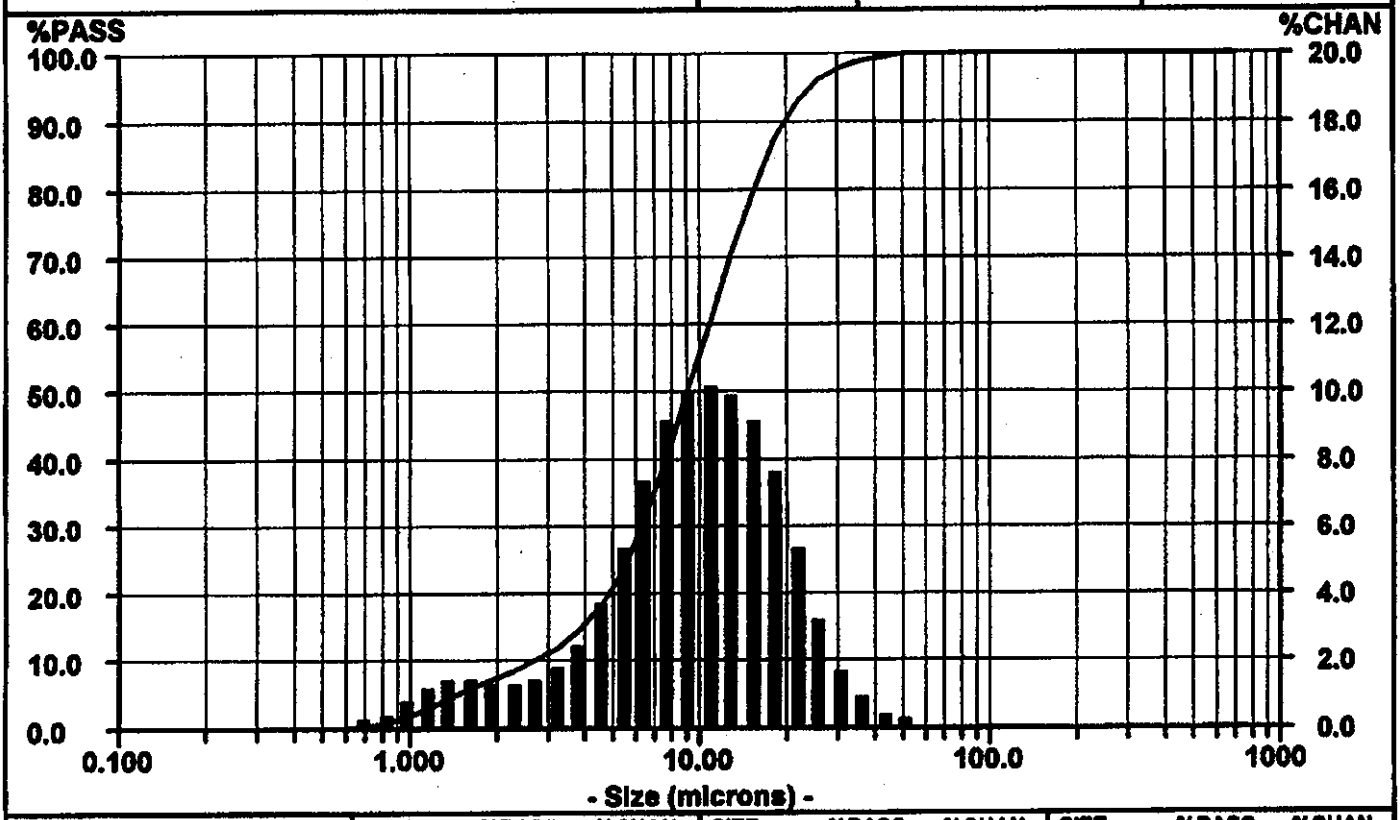
BCR 67 Duplicate

BCR67, riffled 7-18-01

Date: 07/19/91 Meas #: 00004
Time: 07:03 Pres #: 01

17.1 megohm/cm DI H2O
Flow Rate = 40 ml/sec
Refractive Index of the medium = 1.33 and the particle = 2.00
File: BCR6718

Summary	Percentiles		Dia	Vol%	Width
mv = 10.65	10% = 2.718	60% = 10.87	9.761	93%	12.16
mn = 1.185	20% = 4.916	70% = 12.93	1.242	7%	0.811
ma = 5.543	30% = 6.382	80% = 15.58			
cs = 1.082	40% = 7.728	90% = 19.76			
sd = 6.377	50% = 9.180	95% = 24.01			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	50.46	10.09						
592.0	100.00	0.00	7.778	40.37	9.20						
497.8	100.00	0.00	6.541	31.17	7.45						
418.6	100.00	0.00	5.500	23.72	5.42						
352.0	100.00	0.00	4.625	18.30	3.73						
296.0	100.00	0.00	3.889	14.57	2.58						
248.9	100.00	0.00	3.270	11.99	1.88						
209.3	100.00	0.00	2.750	10.11	1.50						
176.0	100.00	0.00	2.312	8.61	1.34						
148.0	100.00	0.00	1.945	7.27	1.35						
124.5	100.00	0.00	1.635	5.92	1.43						
104.7	100.00	0.00	1.375	4.49	1.44						
88.00	100.00	0.00	1.156	3.05	1.24						
74.00	100.00	0.00	0.972	1.81	0.89						
62.23	100.00	0.00	0.818	0.92	0.57						
52.33	100.00	0.36	0.688	0.35	0.35						
44.00	99.64	0.55	0.578	0.00	0.00						
37.00	99.09	0.95	0.486	0.00	0.00						
31.11	98.14	1.76	0.409	0.00	0.00						
26.16	96.38	3.26	0.344	0.00	0.00						
22.00	93.12	5.45	0.289	0.00	0.00						
18.50	87.67	7.74	0.243	0.00	0.00						
15.56	79.93	9.26	0.204	0.00	0.00						
13.08	70.67	9.96	0.172	0.00	0.00						
11.00	60.71	10.25	0.145	0.00	0.00						

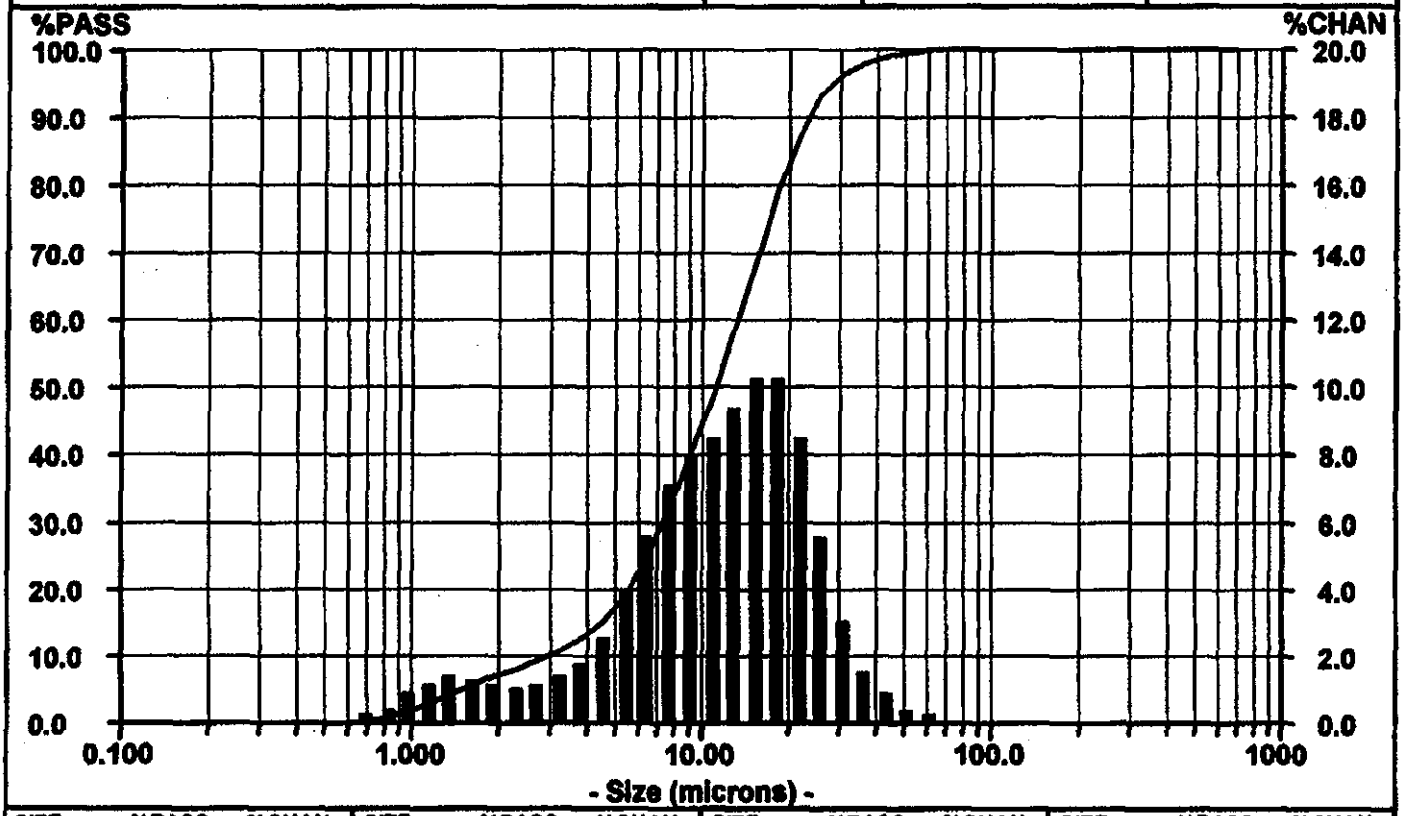
BCR 67 Duplicate

BCR67, riffled 7-18-01

Date: 07/19/91 Meas #: 00004
Time: 07:13 Pres #: 01

17.1 megohm/cm DI H2O
Flow Rate = 40 ml/sec
Refractive Index of the medium = 1.33 and the particle = 1.54
Sonicate for 2 min. @ 40 W
File: BCR6719

Summary	Percentiles		Dia	Vol%	Width
mv = 12.70	10% = 2.943	60% = 13.42	11.97	93%	14.78
mn = 1.128	20% = 5.603	70% = 15.88	1.224	7%	0.809
ma = 6.074	30% = 7.376	80% = 18.77			
cs = 0.988	40% = 9.166	90% = 23.36			
sd = 7.783	50% = 11.19	95% = 28.23			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	40.45	8.12						
592.0	100.00	0.00	7.778	32.33	7.18						
497.8	100.00	0.00	6.541	25.14	5.67						
418.6	100.00	0.00	5.500	19.47	4.00						
352.0	100.00	0.00	4.625	15.47	2.69						
296.0	100.00	0.00	3.889	12.78	1.68						
248.9	100.00	0.00	3.270	10.90	1.42						
209.3	100.00	0.00	2.750	9.48	1.21						
176.0	100.00	0.00	2.312	8.27	1.16						
148.0	100.00	0.00	1.945	7.11	1.24						
124.5	100.00	0.00	1.636	5.87	1.37						
104.7	100.00	0.00	1.375	4.50	1.40						
88.00	100.00	0.00	1.156	3.10	1.23						
74.00	100.00	0.00	0.972	1.87	0.90						
62.23	100.00	0.36	0.818	0.97	0.59						
52.33	99.64	0.54	0.688	0.38	0.38						
44.00	99.10	0.91	0.578	0.00	0.00						
37.00	98.19	1.66	0.486	0.00	0.00						
31.11	96.53	3.14	0.409	0.00	0.00						
26.16	93.39	5.64	0.344	0.00	0.00						
22.00	87.75	8.54	0.289	0.00	0.00						
18.50	79.21	10.38	0.243	0.00	0.00						
15.56	68.83	10.30	0.204	0.00	0.00						
13.08	58.53	9.41	0.172	0.00	0.00						
11.00	49.12	8.67	0.145	0.00	0.00						

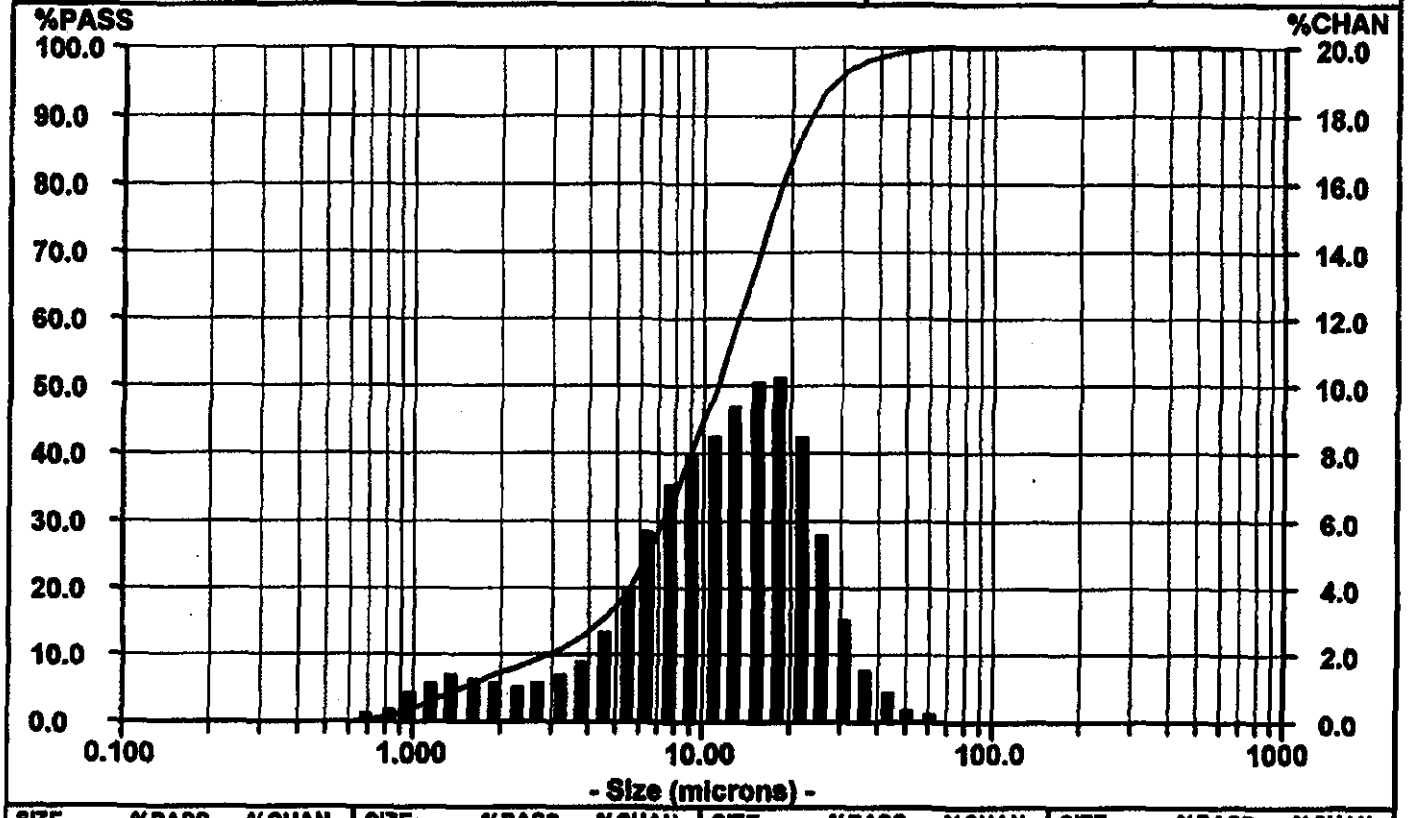
BCR 67 Duplicate

BCR67, riffled
7-18-01

Date: 07/19/91 Meas #: 00004
Time: 07:22 Pres #: 01

17.1 megohm/cm DI H2O
Flow Rate = 40 ml/sec
Refractive index of the medium = 1.33 and the particle = 2.00
Sonicate for 2 min. @ 40 W
File: BCR6720

Summary	Percentiles		Dia	Vol%	Width
mv = 12.67	10% = 2.942	60% = 13.39	11.83	93%	14.76
mn = 1.129	20% = 5.594	70% = 15.83	1.224	7%	0.809
ma = 6.067	30% = 7.359	80% = 18.75			
cs = 0.989	40% = 9.140	90% = 23.33			
sd = 7.743	50% = 11.16	95% = 28.19			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	40.69	8.15						
592.0	100.00	0.00	7.776	32.44	7.23						
497.8	100.00	0.00	6.541	25.21	5.70						
418.6	100.00	0.00	5.500	19.51	4.01						
352.0	100.00	0.00	4.625	15.50	2.71						
296.0	100.00	0.00	3.889	12.79	1.88						
248.9	100.00	0.00	3.270	10.91	1.43						
209.3	100.00	0.00	2.750	9.48	1.21						
176.0	100.00	0.00	2.312	8.27	1.16						
148.0	100.00	0.00	1.945	7.11	1.24						
124.5	100.00	0.00	1.635	5.87	1.37						
104.7	100.00	0.00	1.375	4.50	1.40						
88.00	100.00	0.00	1.156	3.10	1.23						
74.00	100.00	0.00	0.972	1.87	0.90						
62.23	100.00	0.35	0.818	0.97	0.69						
52.33	99.65	0.54	0.688	0.38	0.38						
44.00	99.11	0.90	0.578	0.00	0.00						
37.00	98.21	1.66	0.486	0.00	0.00						
31.11	96.55	3.13	0.409	0.00	0.00						
26.16	93.42	5.62	0.344	0.00	0.00						
22.00	87.80	8.51	0.289	0.00	0.00						
18.50	79.29	10.33	0.243	0.00	0.00						
15.56	68.96	10.28	0.204	0.00	0.00						
13.08	58.68	9.41	0.172	0.00	0.00						
11.00	49.27	8.68	0.145	0.00	0.00						

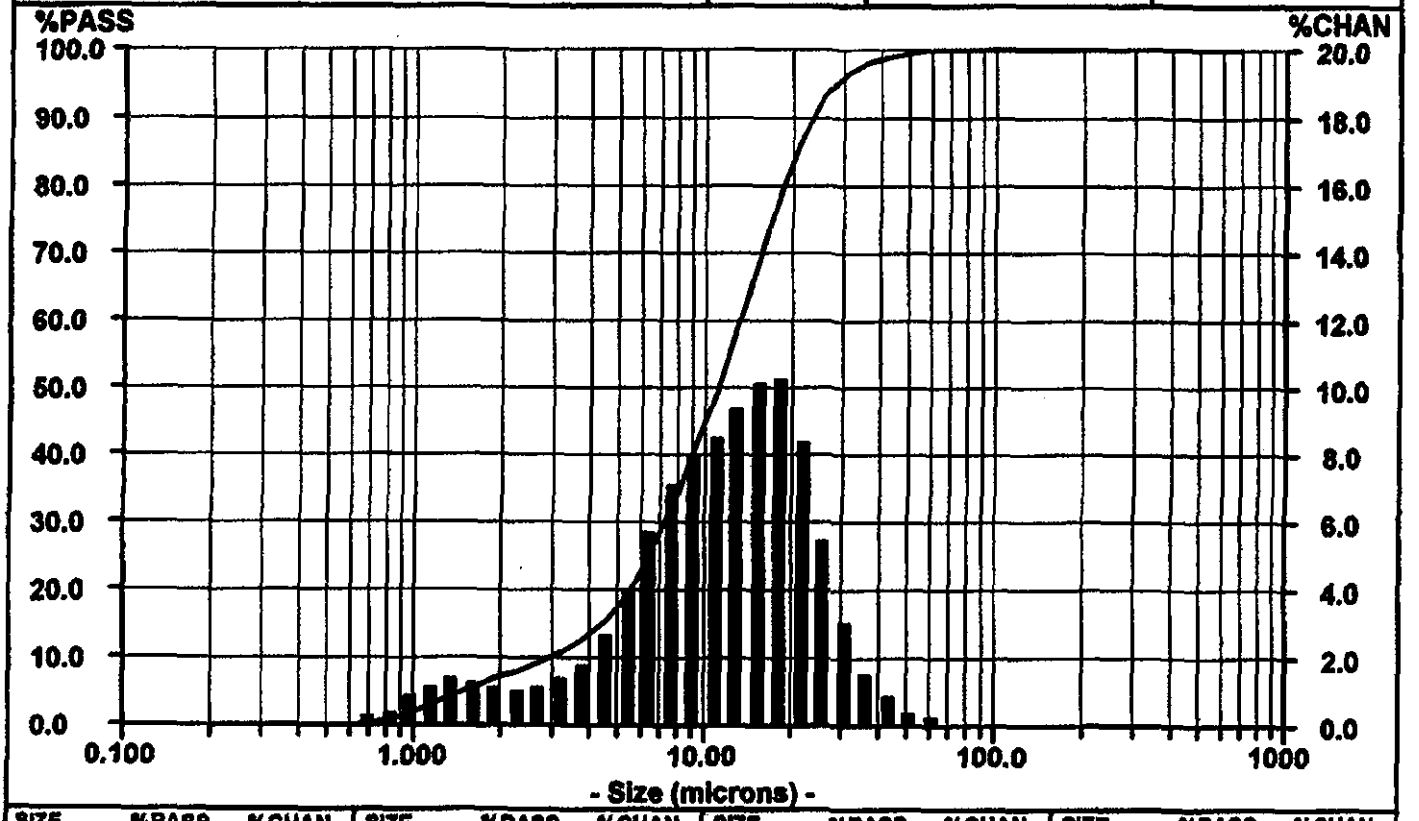
BCR 67 Duplicate

BCR67, riffled 7-18-01

Date: 07/19/91 Meas #: 00004
Time: 07:36 Pres #: 01

17.1 megohm/cm DI H2O
Flow Rate = 60 ml/sec
Refractive Index of the medium = 1.33 and the particle = 1.54
File: BCR6721

Summary	Percentiles		Dia	Vol%	Width
mv = 12.65	10% = 2.839	60% = 13.36	11.90	93%	14.74
mn = 1.129	20% = 5.582	70% = 15.80	1.225	7%	0.808
ma = 6.059	30% = 7.340	80% = 18.72			
cs = 0.990	40% = 9.115	90% = 23.30			
sd = 7.731	50% = 11.13	95% = 28.17			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	40.72	8.16						
592.0	100.00	0.00	7.778	32.56	7.26						
497.8	100.00	0.00	6.541	25.30	5.73						
418.6	100.00	0.00	5.500	19.57	4.04						
352.0	100.00	0.00	4.625	15.53	2.72						
296.0	100.00	0.00	3.889	12.81	1.89						
248.9	100.00	0.00	3.270	10.92	1.43						
209.3	100.00	0.00	2.750	9.49	1.21						
176.0	100.00	0.00	2.312	8.28	1.16						
148.0	100.00	0.00	1.945	7.12	1.24						
124.5	100.00	0.00	1.635	5.88	1.37						
104.7	100.00	0.00	1.375	4.51	1.41						
88.00	100.00	0.00	1.156	3.10	1.23						
74.00	100.00	0.00	0.972	1.87	0.90						
62.23	100.00	0.35	0.818	0.97	0.59						
52.33	99.65	0.54	0.688	0.38	0.38						
44.00	99.11	0.90	0.578	0.00	0.00						
37.00	98.21	1.65	0.486	0.00	0.00						
31.11	96.56	3.11	0.409	0.00	0.00						
26.16	93.45	5.59	0.344	0.00	0.00						
22.00	87.86	8.48	0.289	0.00	0.00						
18.50	79.38	10.31	0.243	0.00	0.00						
15.56	69.07	10.26	0.204	0.00	0.00						
13.08	58.81	9.40	0.172	0.00	0.00						
11.00	49.41	8.69	0.145	0.00	0.00						

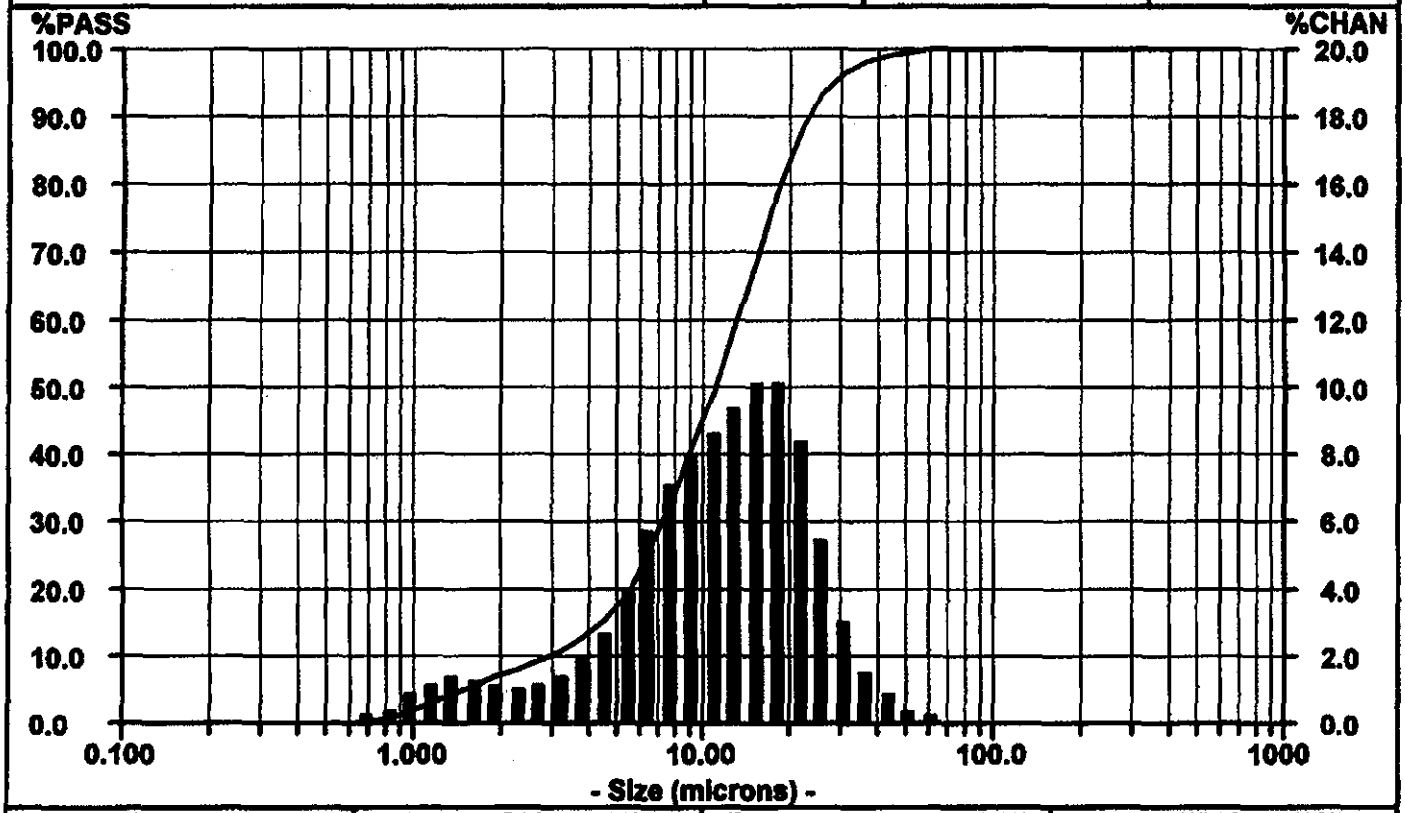
BCR 67 Duplicate

BCR67, riffled
7-18-01

Date: 07/19/91 Meas #: 00004
Time: 07:45 Pres #: 01

17.1 megohm/cm DI H2O
Flow Rate = 60 ml/sec
Refractive index of the medium = 1.33 and the particle = 2.00
File: BCR6722

Summary	Percentiles		Dia	Vol%	Width
mv = 12.63	10% = 2.939	60% = 13.33	11.88	93%	14.73
mn = 1.130	20% = 5.574	70% = 15.78	1.226	7%	0.808
ma = 6.054	30% = 7.329	80% = 18.70			
cs = 0.991	40% = 9.101	90% = 23.27			
sd = 7.723	50% = 11.11	95% = 28.14			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.260	40.80	8.17						
592.0	100.00	0.00	7.778	32.63	7.27						
497.8	100.00	0.00	6.541	25.36	5.75						
418.6	100.00	0.00	5.500	19.61	4.06						
352.0	100.00	0.00	4.625	15.55	2.73						
296.0	100.00	0.00	3.889	12.82	1.90						
248.9	100.00	0.00	3.270	10.92	1.43						
209.3	100.00	0.00	2.750	9.49	1.21						
176.0	100.00	0.00	2.312	8.28	1.16						
148.0	100.00	0.00	1.945	7.12	1.24						
124.5	100.00	0.00	1.635	5.88	1.37						
104.7	100.00	0.00	1.375	4.51	1.41						
88.00	100.00	0.00	1.156	3.10	1.23						
74.00	100.00	0.00	0.972	1.87	0.90						
62.23	100.00	0.35	0.818	0.97	0.59						
52.33	99.65	0.53	0.688	0.38	0.38						
44.00	99.12	0.90	0.578	0.00	0.00						
37.00	98.22	1.64	0.486	0.00	0.00						
31.11	96.58	3.11	0.409	0.00	0.00						
26.16	93.47	5.57	0.344	0.00	0.00						
22.00	87.90	8.46	0.289	0.00	0.00						
18.50	79.44	10.28	0.243	0.00	0.00						
15.56	69.16	10.26	0.204	0.00	0.00						
13.08	58.90	9.40	0.172	0.00	0.00						
11.00	49.50	8.70	0.145	0.00	0.00						

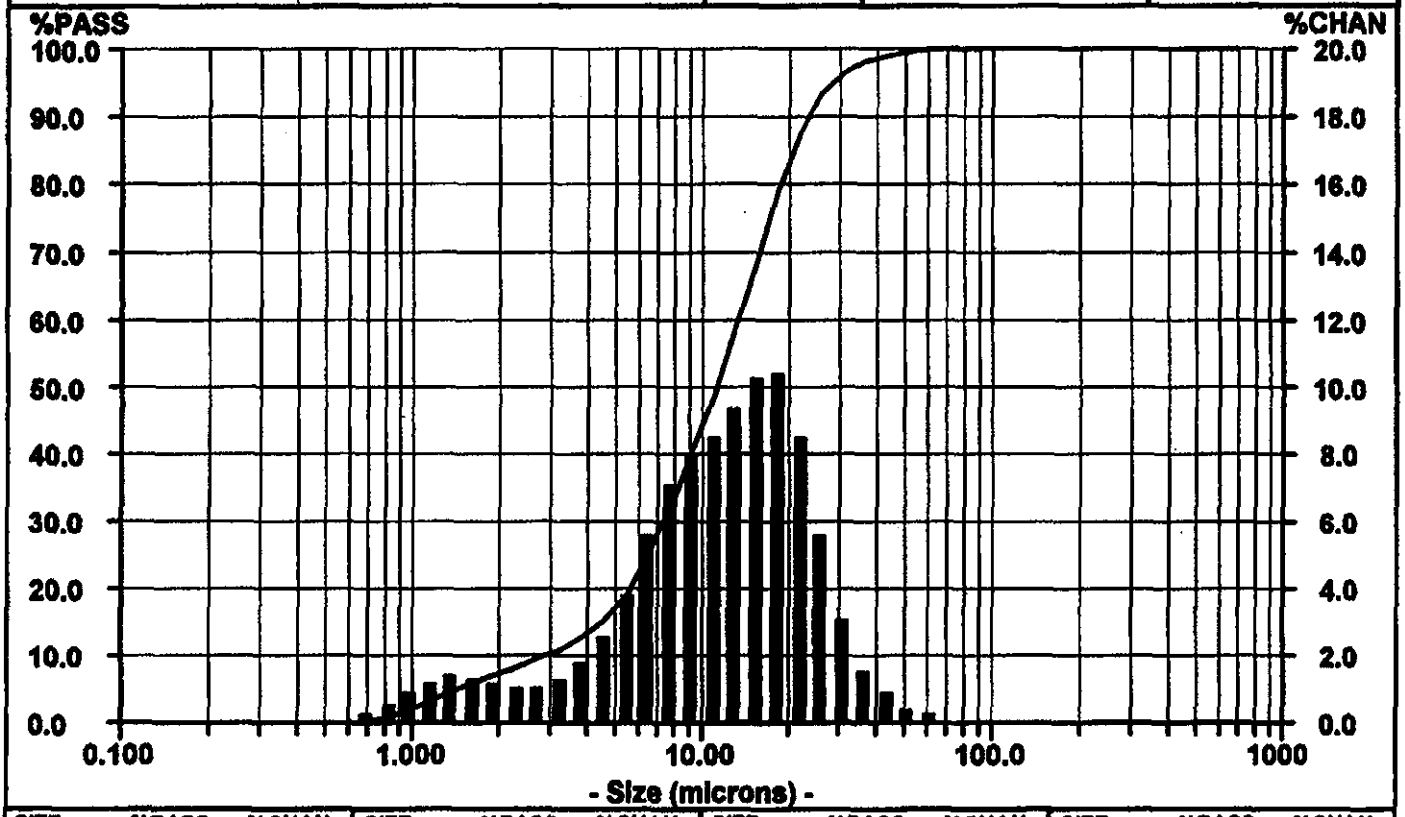
BCR 67 Duplicate

BCR67, rifled 7-18-01

Date: 07/19/91 Meas #: 00004
Time: 07:55 Pres #: 01

17.1 megohm/cm DI H2O
Flow Rate = 60 ml/sec
Refractive index of the medium = 1.33 and the particle = 2.00
Sonicate for 2 min. @ 40 W
File: BCR6723

Summary	Percentiles		Dia	Vol%	Width
mv = 12.72	10% = 2.926	60% = 13.46	12.02	93%	14.78
mn = 1.120	20% = 5.625	70% = 15.91	1.220	7%	0.807
ma = 6.054	30% = 7.399	80% = 18.81			
cs = 0.991	40% = 9.185	90% = 23.39			
sd = 7.763	50% = 11.23	95% = 28.24			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	40.29	8.10						
592.0	100.00	0.00	7.778	32.19	7.18						
497.8	100.00	0.00	6.541	25.01	5.65						
418.6	100.00	0.00	5.500	19.36	3.96						
352.0	100.00	0.00	4.625	15.40	2.65						
296.0	100.00	0.00	3.889	12.75	1.83						
248.9	100.00	0.00	3.270	10.92	1.38						
209.3	100.00	0.00	2.750	9.54	1.17						
176.0	100.00	0.00	2.312	8.37	1.14						
148.0	100.00	0.00	1.945	7.23	1.24						
124.5	100.00	0.00	1.635	5.99	1.38						
104.7	100.00	0.00	1.375	4.61	1.43						
88.00	100.00	0.00	1.156	3.18	1.26						
74.00	100.00	0.00	0.972	1.92	0.92						
62.23	100.00	0.35	0.818	1.00	0.61						
52.33	99.65	0.54	0.688	0.39	0.39						
44.00	99.11	0.91	0.578	0.00	0.00						
37.00	98.20	1.67	0.486	0.00	0.00						
31.11	96.53	3.16	0.409	0.00	0.00						
26.16	93.37	5.68	0.344	0.00	0.00						
22.00	87.69	8.60	0.289	0.00	0.00						
18.50	79.09	10.43	0.243	0.00	0.00						
15.56	68.66	10.31	0.204	0.00	0.00						
13.08	58.35	9.40	0.172	0.00	0.00						
11.00	48.95	8.66	0.145	0.00	0.00						

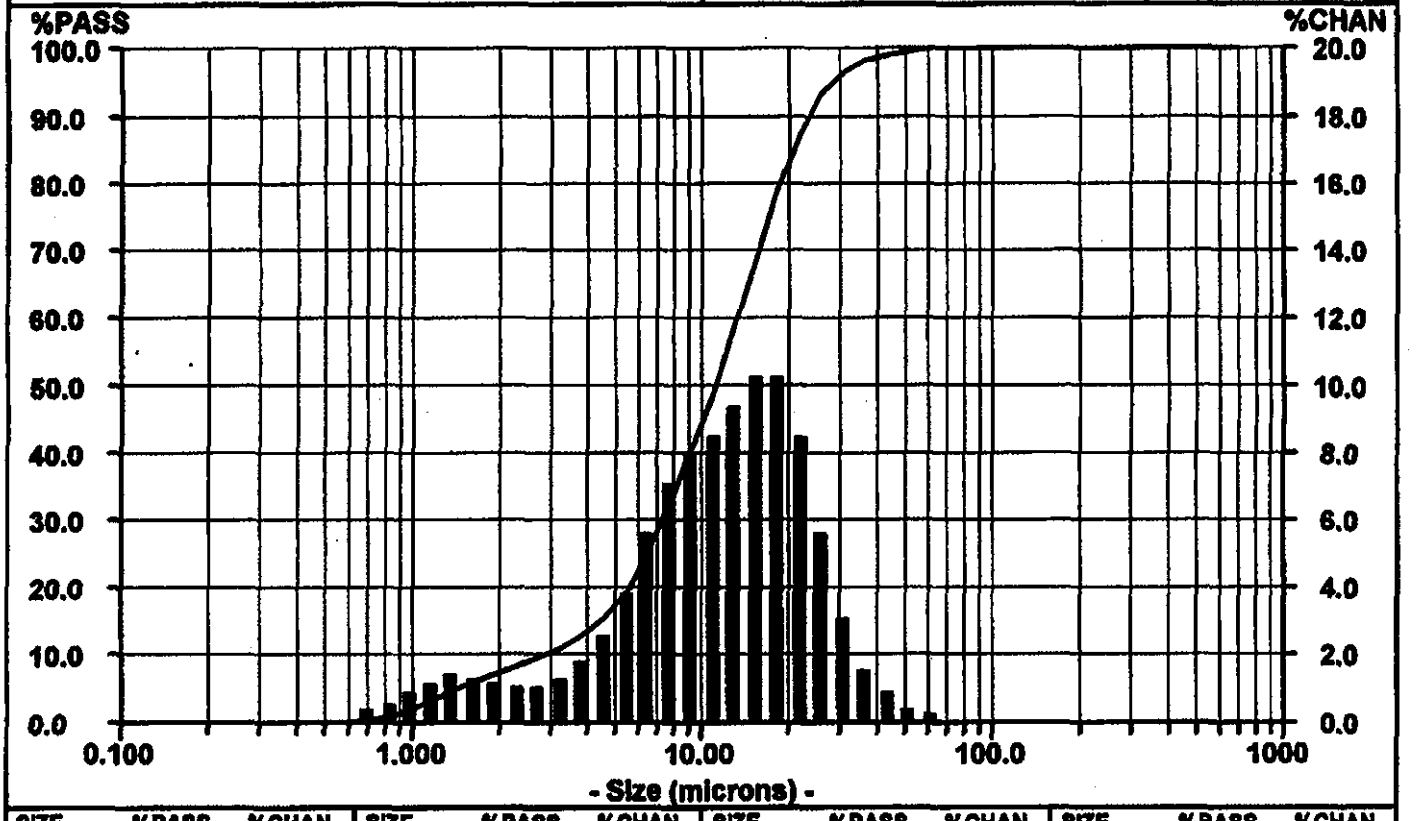
BCR 67 Duplicate

BCR67, riffled 7-18-01

Date: 07/19/91 Meas #: 00004
Time: 08:07 Pres #: 01

17.1 megohm/cm DI H2O
Flow Rate = 60 ml/sec
Refractive index of the medium = 1.33 and the particle = 1.54
Sonicate for 2 min. @ 40 W
File: BCR6724

Summary	Percentiles		Dia	Vol%	Width
mv = 12.72	10% = 2.919	60% = 13.45	12.01	93%	14.78
mn = 1.117	20% = 5.621	70% = 15.90	1.218	7%	0.808
ma = 6.044	30% = 7.396	80% = 18.81			
cs = 0.993	40% = 9.182	90% = 23.38			
sd = 7.763	50% = 11.22	95% = 28.24			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	40.31	8.10						
592.0	100.00	0.00	7.778	32.21	7.16						
497.5	100.00	0.00	6.541	25.03	5.65						
418.6	100.00	0.00	5.500	19.38	3.96						
352.0	100.00	0.00	4.625	15.42	2.65						
296.0	100.00	0.00	3.889	12.77	1.83						
248.9	100.00	0.00	3.270	10.94	1.38						
209.3	100.00	0.00	2.750	9.56	1.17						
176.0	100.00	0.00	2.312	8.39	1.14						
148.0	100.00	0.00	1.945	7.25	1.24						
124.5	100.00	0.00	1.635	6.01	1.38						
104.7	100.00	0.00	1.375	4.63	1.43						
88.00	100.00	0.00	1.156	3.20	1.26						
74.00	100.00	0.00	0.972	1.94	0.93						
62.23	100.00	0.35	0.818	1.01	0.61						
52.33	99.65	0.54	0.688	0.40	0.40						
44.00	99.11	0.91	0.578	0.00	0.00						
37.00	98.20	1.67	0.486	0.00	0.00						
31.11	96.53	3.16	0.409	0.00	0.00						
26.16	93.37	5.67	0.344	0.00	0.00						
22.00	87.70	8.60	0.289	0.00	0.00						
18.50	79.10	10.40	0.243	0.00	0.00						
15.56	68.70	10.32	0.204	0.00	0.00						
13.08	58.38	9.41	0.172	0.00	0.00						
11.00	48.97	8.66	0.145	0.00	0.00						

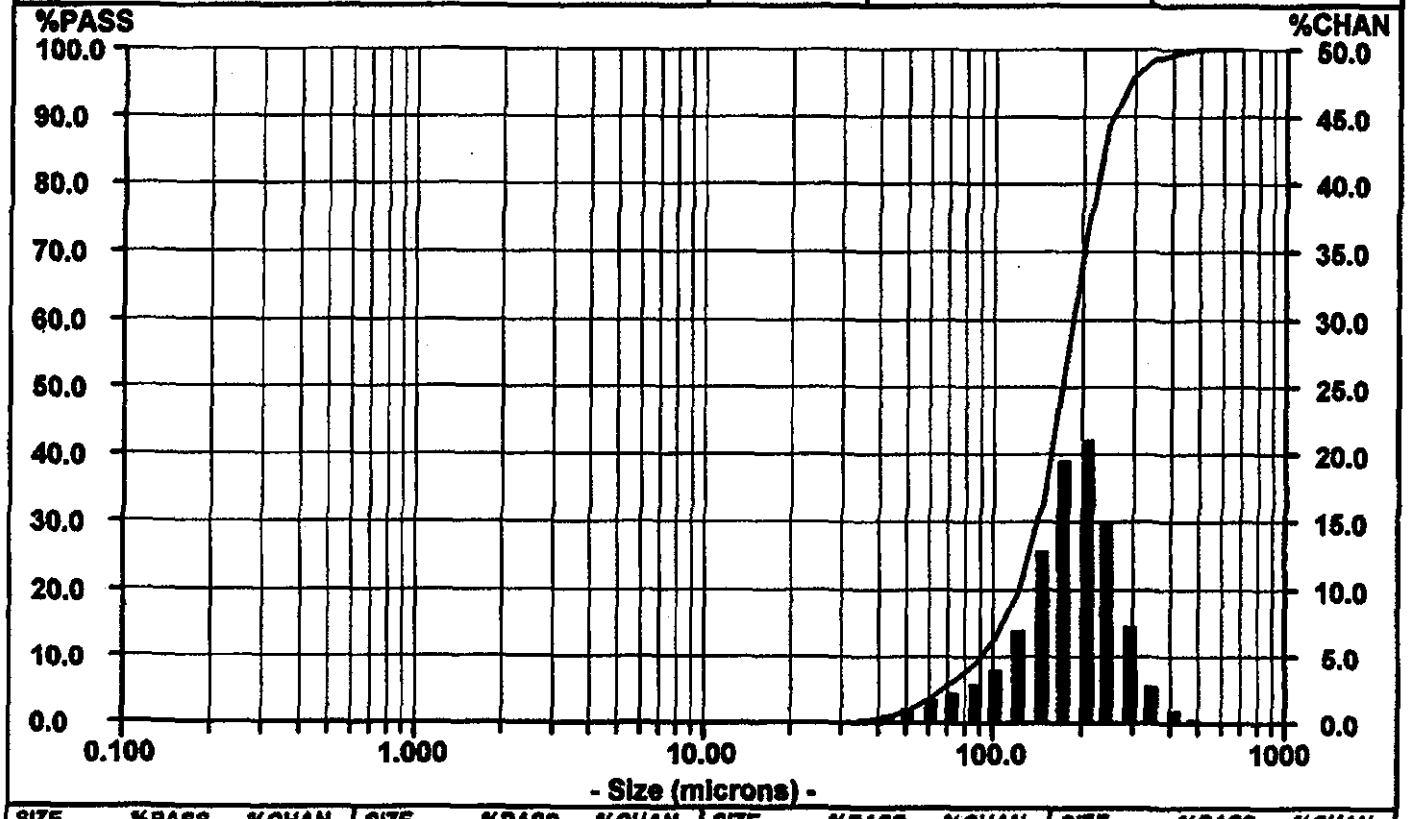
BCR 130 Sample

BCR130, riffled
7-20-01

Date: 07/21/91 Meas #: 00004
Time: 06:27 Pres #: 01

17.1 megohm/cm DI H2O
Flow Rate = 17 ml/sec
Refractive index of the medium = 1.33 and the particle = 1.54
File: BR13001

Summary	Percentiles		Dia	Vol%	Width
mv = 175.3	10% = 92.48	60% = 186.8	172.4	100%	119.7
mn = 81.97	20% = 124.3	70% = 202.7			
ma = 146.5	30% = 143.3	80% = 223.1			
cs = 0.041	40% = 158.4	90% = 255.0			
sd = 59.84	50% = 172.4	95% = 286.5			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	0.00	0.00						
592.0	100.00	0.00	7.778	0.00	0.00						
497.8	100.00	0.38	6.541	0.00	0.00						
418.6	99.62	0.93	5.500	0.00	0.00						
352.0	98.69	2.73	4.625	0.00	0.00						
296.0	95.96	7.32	3.889	0.00	0.00						
248.9	88.64	14.96	3.270	0.00	0.00						
209.3	73.68	21.16	2.750	0.00	0.00						
176.0	52.53	19.62	2.312	0.00	0.00						
148.0	32.91	12.81	1.945	0.00	0.00						
124.5	20.10	7.01	1.635	0.00	0.00						
104.7	13.09	4.08	1.375	0.00	0.00						
88.00	9.01	2.85	1.156	0.00	0.00						
74.00	6.16	2.29	0.972	0.00	0.00						
62.23	3.87	1.77	0.818	0.00	0.00						
52.33	2.10	1.15	0.688	0.00	0.00						
44.00	0.95	0.63	0.578	0.00	0.00						
37.00	0.32	0.32	0.486	0.00	0.00						
31.11	0.00	0.00	0.409	0.00	0.00						
26.16	0.00	0.00	0.344	0.00	0.00						
22.00	0.00	0.00	0.289	0.00	0.00						
18.50	0.00	0.00	0.243	0.00	0.00						
15.56	0.00	0.00	0.204	0.00	0.00						
13.08	0.00	0.00	0.172	0.00	0.00						
11.00	0.00	0.00	0.145	0.00	0.00						

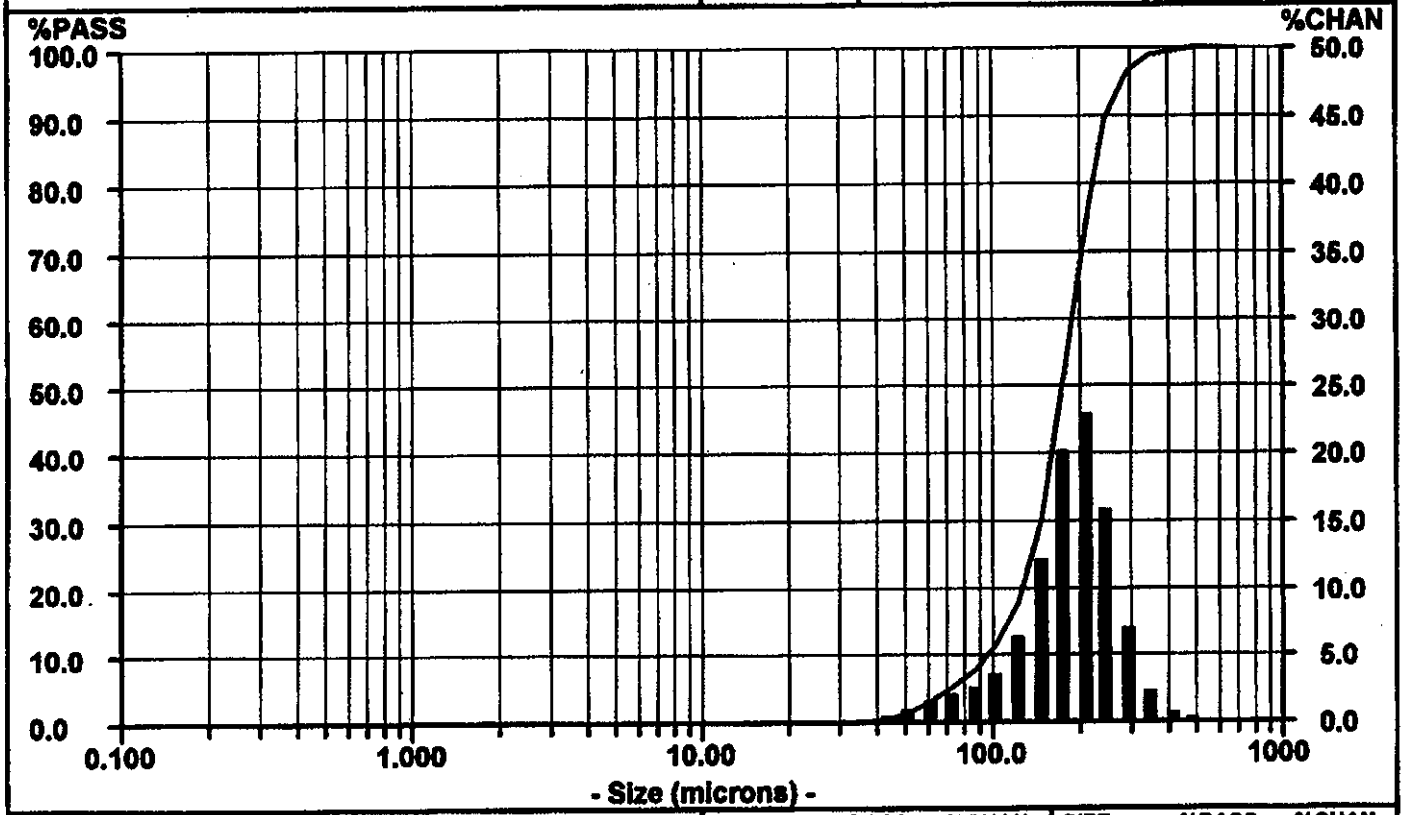
BCR 130 Sample

BCR130, riffed 7-20-01

Date: 07/21/91 Meas #: 00004
Time: 06:44 Pres #: 01

17.1 megohm/cm DI H2O
Flow Rate = 17 ml/sec
Refractive index of the medium = 1.33 and the particle = 2.00
File: BR13002

Summary	Percentiles		Dia	Vol%	Width
mv = 176.9	10% = 98.14	60% = 188.7	175.3	100%	112.5
mn = 90.62	20% = 129.2	70% = 203.5			
ma = 161.1	30% = 147.6	80% = 222.2			
cs = 0.040	40% = 161.9	90% = 251.0			
sd = 56.24	50% = 175.3	95% = 280.0			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	0.00	0.00						
592.0	100.00	0.00	7.778	0.00	0.00						
497.8	100.00	0.32	6.541	0.00	0.00						
418.6	99.68	0.75	5.500	0.00	0.00						
352.0	98.93	2.33	4.625	0.00	0.00						
296.0	96.60	7.08	3.889	0.00	0.00						
248.9	89.52	15.97	3.270	0.00	0.00						
209.3	73.55	23.02	2.750	0.00	0.00						
176.0	50.53	20.28	2.312	0.00	0.00						
148.0	30.25	12.29	1.945	0.00	0.00						
124.5	17.96	6.40	1.636	0.00	0.00						
104.7	11.56	3.69	1.375	0.00	0.00						
88.00	7.87	2.60	1.156	0.00	0.00						
74.00	5.27	2.10	0.972	0.00	0.00						
62.23	3.17	1.60	0.818	0.00	0.00						
52.33	1.57	1.02	0.688	0.00	0.00						
44.00	0.55	0.55	0.578	0.00	0.00						
37.00	0.00	0.00	0.486	0.00	0.00						
31.11	0.00	0.00	0.409	0.00	0.00						
26.15	0.00	0.00	0.344	0.00	0.00						
22.00	0.00	0.00	0.289	0.00	0.00						
18.50	0.00	0.00	0.243	0.00	0.00						
15.56	0.00	0.00	0.204	0.00	0.00						
13.08	0.00	0.00	0.172	0.00	0.00						
11.00	0.00	0.00	0.145	0.00	0.00						

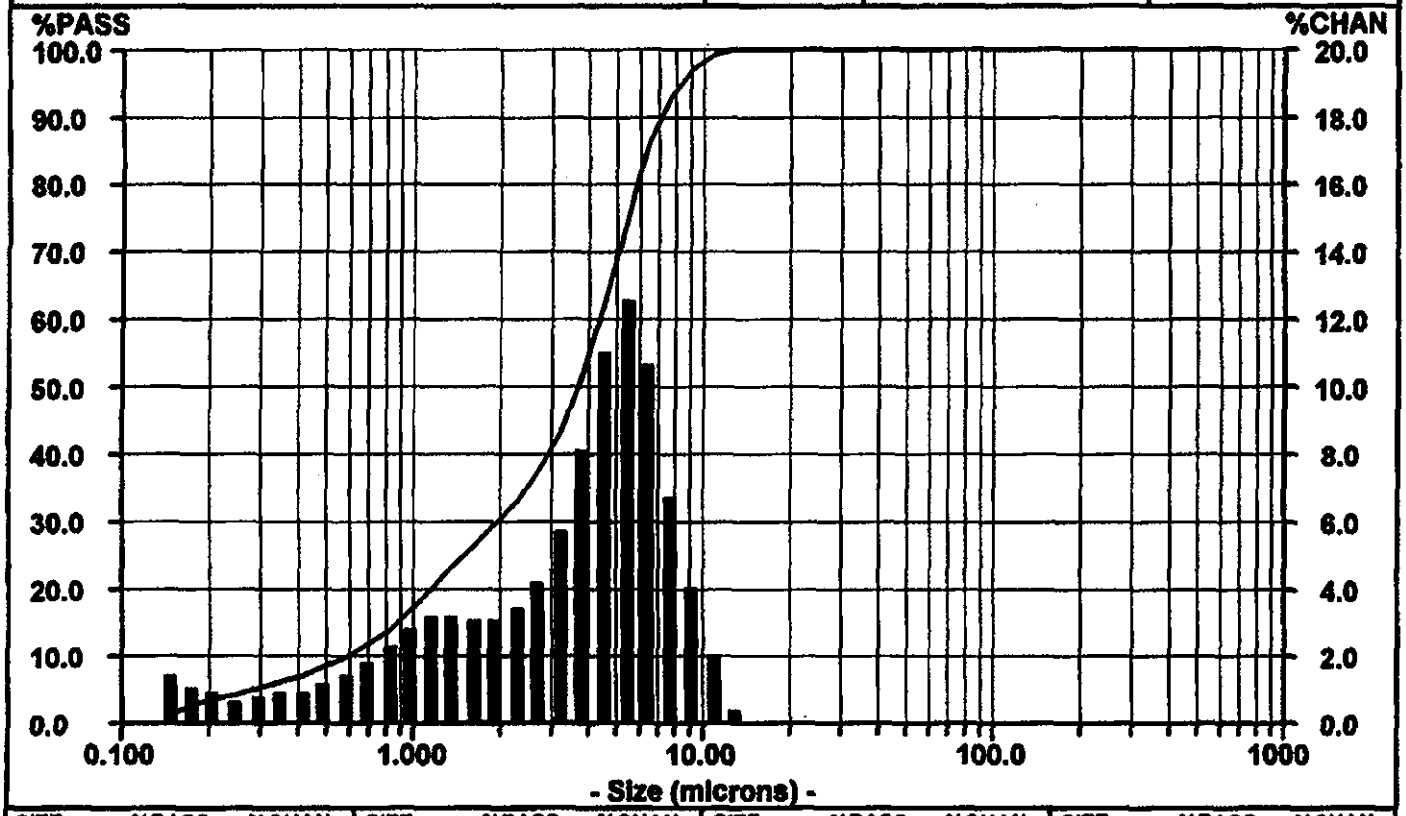
BCR 130 Sample

BCR130, riffled 7-20-01

Date: 07/21/91 Meas #: 00004
Time: 06:54 Pres #: 01

17.1 megohm/cm DI H2O
Flow Rate = 17 ml/sec
Refractive index of the medium = 1.33 and the particle = 1.54
Sonicate for 2 min. @ 40 W
File: BR13003

Summary	Percentiles		Dia	Vol%	Width
mv = 3.798	10% = 0.580	60% = 4.444	4.556	77%	4.186
mn = 0.184	20% = 1.145	70% = 5.103	0.784	20%	0.781
ma = 1.302	30% = 1.976	80% = 5.883	0.153	3%	0.049
cs = 4.609	40% = 2.975	90% = 7.114			
sd = 2.679	50% = 3.770	95% = 8.321			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	97.30	4.18						
592.0	100.00	0.00	7.778	93.12	6.87						
497.8	100.00	0.00	6.541	86.25	10.77						
418.6	100.00	0.00	5.500	75.48	12.70						
352.0	100.00	0.00	4.625	62.78	11.11						
296.0	100.00	0.00	3.889	51.67	8.22						
248.9	100.00	0.00	3.270	43.45	5.88						
209.3	100.00	0.00	2.750	37.57	4.36						
176.0	100.00	0.00	2.312	33.21	3.51						
148.0	100.00	0.00	1.945	29.70	3.15						
124.5	100.00	0.00	1.635	26.55	3.12						
104.7	100.00	0.00	1.375	23.43	3.24						
88.00	100.00	0.00	1.156	20.19	3.21						
74.00	100.00	0.00	0.972	16.98	2.86						
62.23	100.00	0.00	0.818	14.12	2.32						
52.33	100.00	0.00	0.688	11.80	1.84						
44.00	100.00	0.00	0.578	9.96	1.48						
37.00	100.00	0.00	0.486	8.48	1.23						
31.11	100.00	0.00	0.409	7.25	1.06						
26.16	100.00	0.00	0.344	6.19	0.95						
22.00	100.00	0.00	0.289	5.24	0.88						
18.50	100.00	0.00	0.243	4.36	0.76						
15.56	100.00	0.00	0.204	3.60	0.90						
13.08	100.00	0.57	0.172	2.70	1.20						
11.00	99.43	2.13	0.145	1.50	1.50						

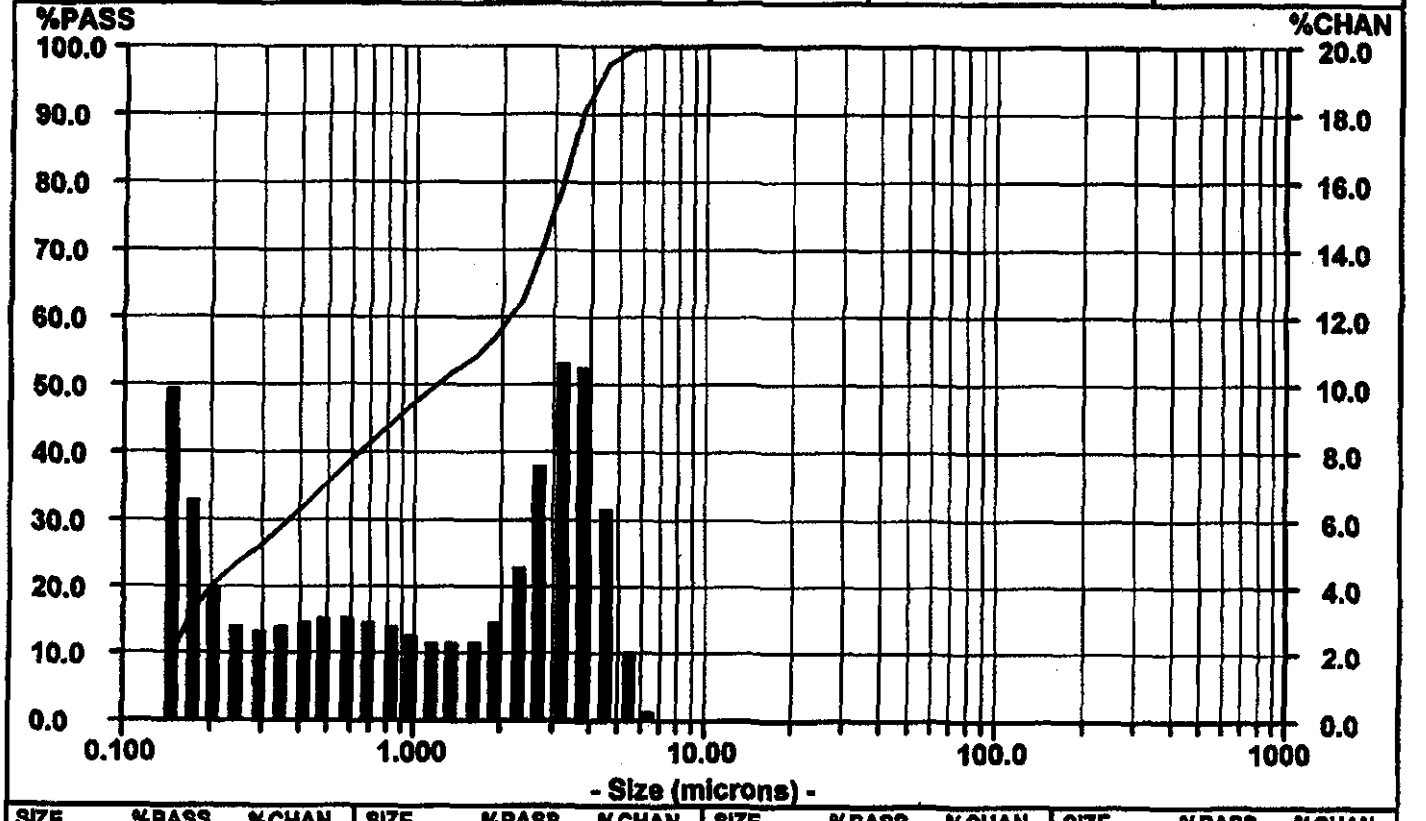
BCR 130 Sample

BCR130, riffled 7-20-01

Date: 07/21/91 Meas #: 00004
Time: 07:04 Pres #: 01

17.1 megohm/cm DI H2O
Flow Rate = 17 ml/sec
Refractive index of the medium = 1.33 and the particle = 2.00
Sonicate for 2 min. @ 40 W
File: BR13004

Summary	Percentiles		Dia	Vol%	Width
mv = 1.701	10% = 0.145	60% = 2.166	3.000	50%	1.990
mn = 0.159	20% = 0.198	70% = 2.788	0.519	26%	0.555
ma = 0.443	30% = 0.361	80% = 3.250	0.154	24%	0.065
cs = 13.54	40% = 0.628	90% = 3.815			
sd = 1.643	50% = 1.190	95% = 4.256			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	100.00	0.00						
592.0	100.00	0.00	7.778	100.00	0.00						
497.8	100.00	0.00	6.541	100.00	0.33						
418.6	100.00	0.00	5.500	99.67	2.16						
352.0	100.00	0.00	4.625	97.51	6.43						
296.0	100.00	0.00	3.889	91.08	10.67						
248.9	100.00	0.00	3.270	80.41	10.77						
209.3	100.00	0.00	2.750	69.64	7.62						
176.0	100.00	0.00	2.312	62.02	4.64						
148.0	100.00	0.00	1.945	57.38	3.04						
124.5	100.00	0.00	1.635	54.34	2.42						
104.7	100.00	0.00	1.375	51.92	2.31						
88.00	100.00	0.00	1.156	49.61	2.46						
74.00	100.00	0.00	0.972	47.15	2.69						
62.23	100.00	0.00	0.818	44.46	2.89						
52.33	100.00	0.00	0.688	41.57	3.04						
44.00	100.00	0.00	0.578	38.53	3.15						
37.00	100.00	0.00	0.486	35.38	3.17						
31.11	100.00	0.00	0.409	32.21	3.05						
26.16	100.00	0.00	0.344	29.16	2.84						
22.00	100.00	0.00	0.289	26.32	2.76						
18.50	100.00	0.00	0.243	23.56	2.97						
15.56	100.00	0.00	0.204	20.59	4.04						
13.08	100.00	0.00	0.172	16.55	6.64						
11.00	100.00	0.00	0.145	9.91	9.91						

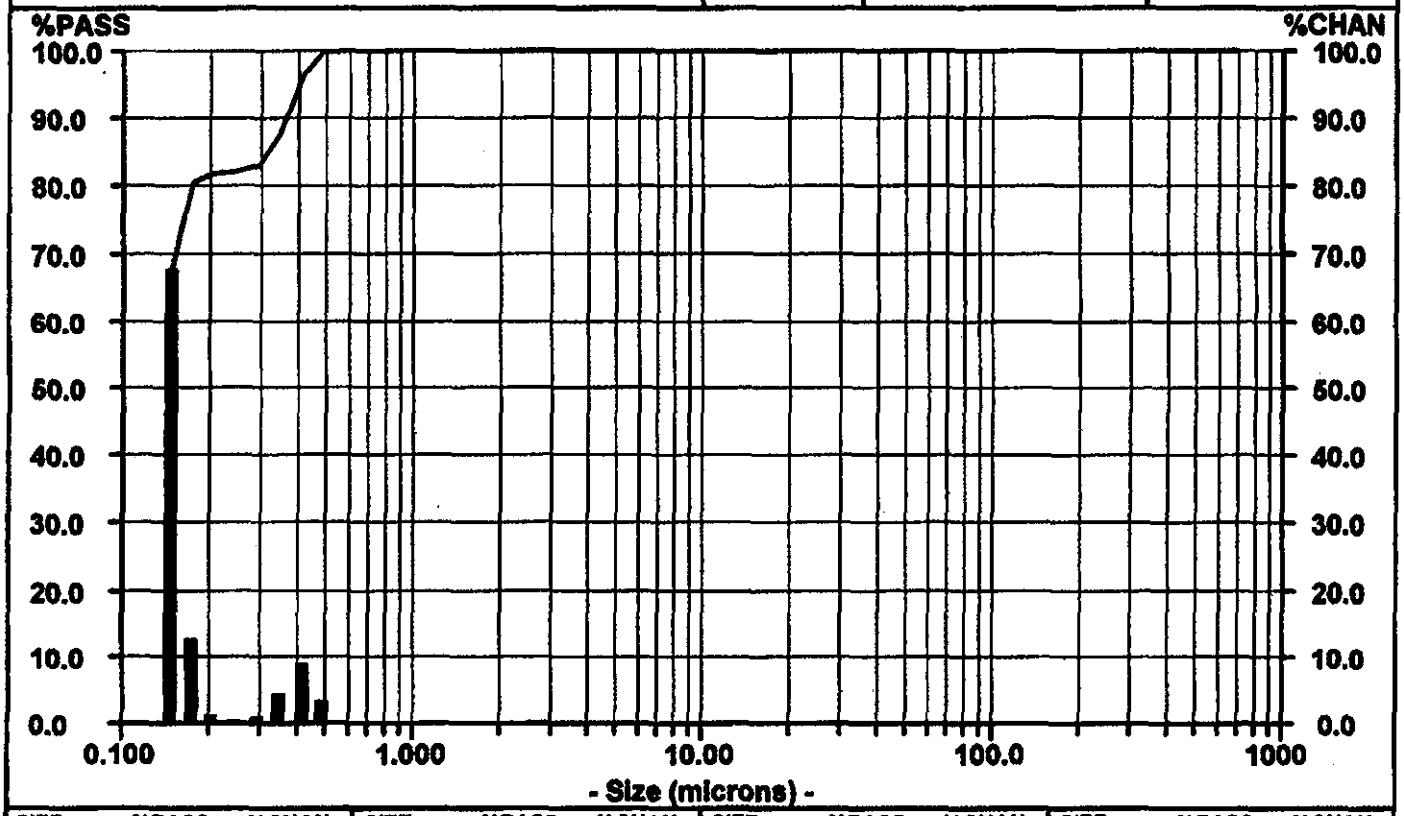
BCR 130 Sample

BCR130, riffled
7-20-01

Date: 07/21/91 Meas #: 00004
Time: 07:27 Pres #: 01

17.1 megohm/cm DI H2O
Flow Rate = 40 ml/sec
Refractive index of the medium = 1.33 and the particle = 1.54
File: BR13005

Summary		Percentiles		Dia	Vol%	Width
mv =	0.178	10% = 0.125	60% = 0.141	0.367	18%	0.102
mn =	0.137	20% = 0.128	70% = 0.147	0.137	82%	0.018
ma =	0.163	30% = 0.131	80% = 0.167			
cs =	39.22	40% = 0.134	90% = 0.361			
sd =	0.088	50% = 0.137	95% = 0.395			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	100.00	0.00						
592.0	100.00	0.00	7.778	100.00	0.00						
497.8	100.00	0.00	6.541	100.00	0.00						
418.6	100.00	0.00	5.500	100.00	0.00						
352.0	100.00	0.00	4.625	100.00	0.00						
296.0	100.00	0.00	3.889	100.00	0.00						
248.9	100.00	0.00	3.270	100.00	0.00						
209.3	100.00	0.00	2.750	100.00	0.00						
176.0	100.00	0.00	2.312	100.00	0.00						
148.0	100.00	0.00	1.945	100.00	0.00						
124.5	100.00	0.00	1.635	100.00	0.00						
104.7	100.00	0.00	1.375	100.00	0.00						
88.00	100.00	0.00	1.156	100.00	0.00						
74.00	100.00	0.00	0.972	100.00	0.00						
62.23	100.00	0.00	0.818	100.00	0.00						
52.33	100.00	0.00	0.688	100.00	0.00						
44.00	100.00	0.00	0.578	100.00	0.12						
37.00	100.00	0.00	0.486	99.88	3.35						
31.11	100.00	0.00	0.409	96.53	8.91						
26.16	100.00	0.00	0.344	87.62	4.46						
22.00	100.00	0.00	0.289	83.17	0.96						
18.50	100.00	0.00	0.243	82.21	0.34						
15.56	100.00	0.00	0.204	81.87	1.24						
13.08	100.00	0.00	0.172	80.63	12.74						
11.00	100.00	0.00	0.145	67.89	67.89						

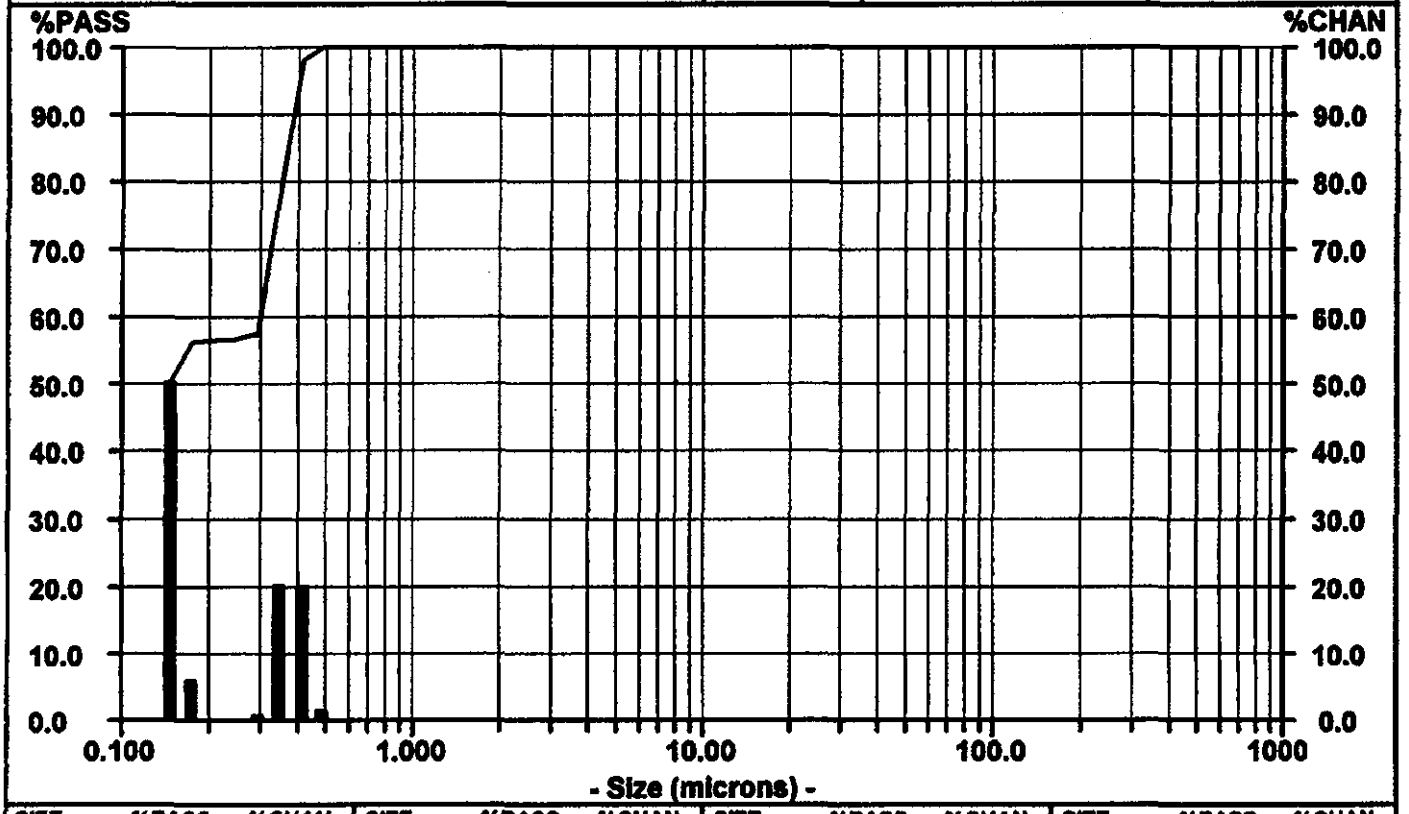
BCR 130 Sample

BCR130, riffed
7-20-01

Date: 07/21/91 Meas #: 00004
Time: 07:36 Pres #: 01

17.1 megohm/cm DI H2O
Flow Rate = 40 ml/sec
Refractive index of the medium = 1.33 and the particle = 2.00
File: BR13006

Summary	Percentiles		Dia	Vol%	Width
mv = 0.226	10% = 0.126	60% = 0.297	0.345	43%	0.078
mn = 0.142	20% = 0.130	70% = 0.324	0.136	57%	0.014
ma = 0.182	30% = 0.134	80% = 0.349			
cs = 32.92	40% = 0.138	90% = 0.376			
sd = 0.116	50% = 0.145	95% = 0.393			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	100.00	0.00						
592.0	100.00	0.00	7.778	100.00	0.00						
497.8	100.00	0.00	6.541	100.00	0.00						
418.6	100.00	0.00	5.600	100.00	0.00						
352.0	100.00	0.00	4.625	100.00	0.00						
296.0	100.00	0.00	3.889	100.00	0.00						
248.9	100.00	0.00	3.270	100.00	0.00						
209.3	100.00	0.00	2.750	100.00	0.00						
176.0	100.00	0.00	2.312	100.00	0.00						
148.0	100.00	0.00	1.945	100.00	0.00						
124.5	100.00	0.00	1.635	100.00	0.00						
104.7	100.00	0.00	1.375	100.00	0.00						
88.00	100.00	0.00	1.156	100.00	0.00						
74.00	100.00	0.00	0.972	100.00	0.00						
62.23	100.00	0.00	0.818	100.00	0.00						
52.33	100.00	0.00	0.688	100.00	0.00						
44.00	100.00	0.00	0.578	100.00	0.00						
37.00	100.00	0.00	0.486	100.00	1.70						
31.11	100.00	0.00	0.409	98.30	20.22						
26.16	100.00	0.00	0.344	78.08	20.38						
22.00	100.00	0.00	0.289	57.70	0.83						
18.50	100.00	0.00	0.243	56.87	0.14						
15.56	100.00	0.00	0.204	56.73	0.29						
13.08	100.00	0.00	0.172	56.44	6.00						
11.00	100.00	0.00	0.145	50.44	50.44						

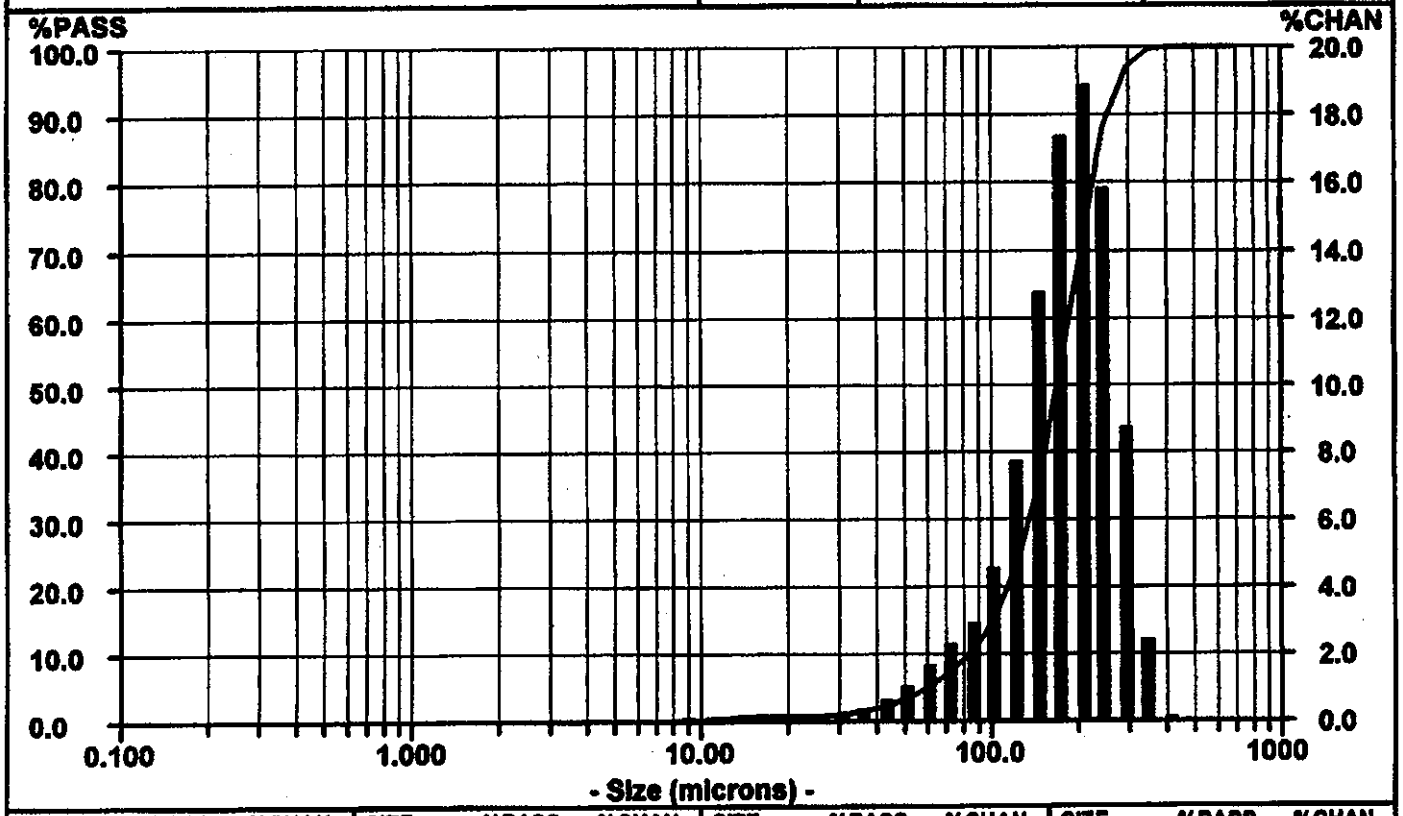
BCR 130 Sample

BCR130, riffled 7-20-01

Date: 07/21/91 Meas #: 00004
Time: 07:46 Pres #: 01

17.1 megohm/cm DI H2O
Flow Rate = 40 ml/sec
Refractive index of the medium = 1.33 and the particle = 1.54
Sonicate for 2 min. @ 40 W
File: BR13007

Summary		Percentiles		Dia	Vol%	Width
mv =	170.9	10% = 85.25	60% = 186.7	170.3	100%	129.1
mn =	14.49	20% = 117.1	70% = 204.5			
ma =	127.4	30% = 137.5	80% = 225.6			
cs =	0.047	40% = 154.5	90% = 255.0			
sd =	64.54	50% = 170.3	95% = 279.2			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	0.31	0.21						
592.0	100.00	0.00	7.778	0.10	0.10						
497.8	100.00	0.00	6.541	0.00	0.00						
418.6	100.00	0.25	5.500	0.00	0.00						
352.0	99.75	2.52	4.625	0.00	0.00						
296.0	97.23	8.82	3.889	0.00	0.00						
248.9	88.41	15.90	3.270	0.00	0.00						
209.3	72.51	18.98	2.750	0.00	0.00						
176.0	53.53	17.46	2.312	0.00	0.00						
148.0	36.07	12.85	1.945	0.00	0.00						
124.5	23.22	7.88	1.635	0.00	0.00						
104.7	15.34	4.69	1.375	0.00	0.00						
88.00	10.65	3.09	1.156	0.00	0.00						
74.00	7.56	2.30	0.972	0.00	0.00						
62.23	5.26	1.72	0.818	0.00	0.00						
52.33	3.54	1.18	0.688	0.00	0.00						
44.00	2.36	0.73	0.578	0.00	0.00						
37.00	1.63	0.46	0.486	0.00	0.00						
31.11	1.17	0.32	0.409	0.00	0.00						
26.16	0.85	0.00	0.344	0.00	0.00						
22.00	0.85	0.00	0.289	0.00	0.00						
18.50	0.85	0.00	0.243	0.00	0.00						
15.56	0.85	0.10	0.204	0.00	0.00						
13.08	0.75	0.22	0.172	0.00	0.00						
11.00	0.53	0.22	0.145	0.00	0.00						

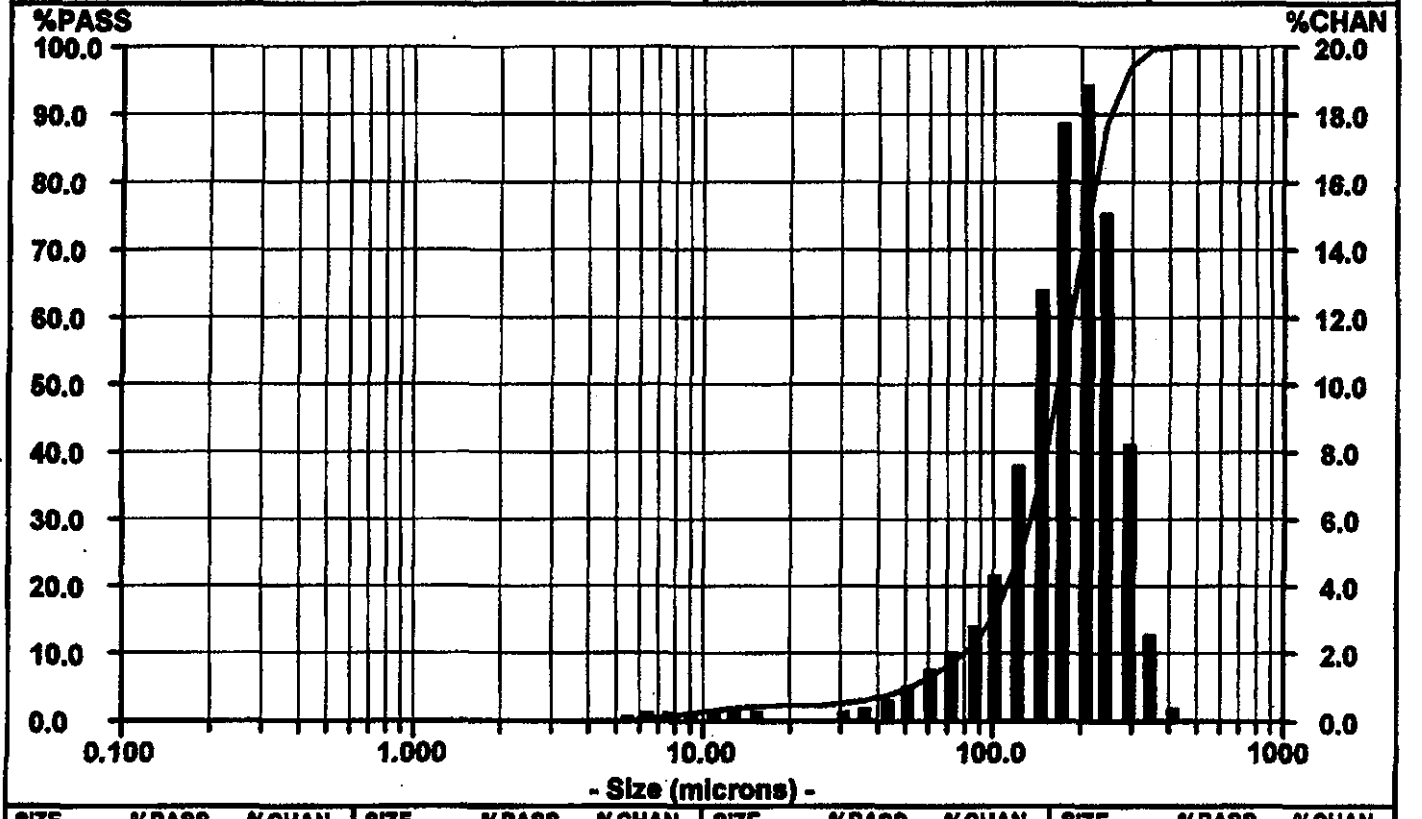
BCR 130 Sample

BCR130, riffled
7-20-01

Date: 07/21/91 Meas #: 00004
Time: 07:55 Pres #: 01

17.1 megohm/cm DI H2O
Flow Rate = 40 ml/sec
Refractive index of the medium = 1.33 and the particle = 2.00
Sonicate for 2 min. @ 40 W
File: BR13008

Summary	Percentiles		Dia	Vol%	Width
mv = 168.9	10% = 80.44	60% = 184.9	170.8	98%	124.9
mn = 7.952	20% = 115.8	70% = 202.5	8.990	2%	7.333
ma = 103.3	30% = 136.5	80% = 223.9			
cs = 0.058	40% = 153.3	90% = 254.5			
sd = 64.88	50% = 168.9	95% = 280.4			



SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN	SIZE	%PASS	%CHAN
704.0	100.00	0.00	9.250	1.26	0.36						
592.0	100.00	0.00	7.778	0.90	0.35						
497.8	100.00	0.00	6.541	0.55	0.34						
418.6	100.00	0.47	5.500	0.21	0.21						
352.0	99.53	2.61	4.625	0.00	0.00						
296.0	96.92	8.30	3.889	0.00	0.00						
248.9	88.62	15.15	3.270	0.00	0.00						
209.3	73.47	18.96	2.750	0.00	0.00						
176.0	54.51	17.82	2.312	0.00	0.00						
148.0	36.69	12.97	1.945	0.00	0.00						
124.5	23.72	7.70	1.635	0.00	0.00						
104.7	16.02	4.42	1.375	0.00	0.00						
88.00	11.60	2.84	1.156	0.00	0.00						
74.00	8.76	2.11	0.972	0.00	0.00						
62.23	6.65	1.61	0.818	0.00	0.00						
52.33	5.04	1.14	0.688	0.00	0.00						
44.00	3.90	0.72	0.578	0.00	0.00						
37.00	3.18	0.46	0.486	0.00	0.00						
31.11	2.72	0.32	0.409	0.00	0.00						
26.16	2.40	0.00	0.344	0.00	0.00						
22.00	2.40	0.00	0.289	0.00	0.00						
18.50	2.40	0.10	0.243	0.00	0.00						
15.56	2.30	0.33	0.204	0.00	0.00						
13.08	1.97	0.35	0.172	0.00	0.00						
11.00	1.62	0.36	0.145	0.00	0.00						

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SIEVE TEST RESULTS

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EXPLANATION OF TABLES

COLUMNS

ITEM – The datum or data being displayed in the subsequent rows.

SIEVE TESTS – The items relating to the tank sieve test as a whole.

ELUATE – Items relating to the material that passed through all sieves.

53 MICRON – Items relating to the smallest bottom sieve of 53 micron mesh.

106 MICRON – Items relating to the next-to-lowest sieve of 106 micron mesh.

212 MICRON – Items relating to the next-to-highest sieve of 212 micron mesh.

500 MICRON – Items relating to the highest sieve of 500 microns mesh.

ROWS

REF. – The laboratory notebook reference where the data was recorded.

DATE WORKED – The date(s) when the work was performed.

TANK – The high-level waste (HLW) tank whose composite sample was sieved.

GROUP – The LABCORE group number assigned to the tank composite and the samples derived from it as a result of this sieve test.

SLURRY JAR (OR CONE) TARE (#) – The tare weight (grams) of the jar or cone used to slurry the (#rd) aliquot of composite to be sieved.

SLURRY JAR (OR CONE) GROSS (#) – The gross weight (grams) of the jar or cone used to slurry the (#rd) aliquot of composite to be sieved.

COMPOSITE NET – The total net weight (grams) of composite sieved.

SIEVE WET TARE – The tare weight (grams) of each of the 4 sieves before any aliquot has been added, wetted with wash liquid and shaken to remove the excess.

SIEVE GROSS – The gross weight (grams) of each of the 4 sieves after sieving, drained free of excess wash liquid.

SIEVE NET – The net weight (grams), obtained by difference, of sieved composite retained on each sieve.

BIN LOWER BOUND – The smallest diameter (microns) of a particle expected to be found in each sieve fraction. This is equal to the particular sieve mesh size, except for the eluate. For the latter, 0.1 micron was estimated as the smallest particle size extant.

ln[BIN LOWER BOUND] – The natural logarithm of the bin lower bound.

BIN UPPER BOUND – The highest diameter (microns) of a particle expected to be found in each sieve fraction. This is equal to the mesh size of the next coarser sieve immediately above the particular sieve, except for the uppermost (coarsest) sieve. For the latter, the largest particle observed in the sieve tests of all four tanks ~ 5000 microns, was used to estimate that bin upper bound.

ln[BIN UPPER BOUND] – The natural logarithm of the bin upper bound.

PERCENT RETAINED – The fraction (%) of the total sieved tank composite actually retained on each sieve.

PERCENT/(ln[HI]-ln[LO] – The ratio of percent retained over the natural-logarithms of bin intervals for each sieve. This is calculated to provide data for mass probability density versus log diameter plots of the sieve data.

CUM PERCENT RETAINED – The cumulative fraction (%) of composite retained in or below each sieve. This is calculated by adding the fractions of all bins below and including that represented by a particular sieve, and as such represents a cumulative undersize fraction.

Sample vial number – The identification number on the vial used for each sieve to contain a subsample of the mass retained on that sieve.

Sample Vial Tare – The empty weight (grams) of the sample vial for each sieve before adding any sample.

Sample Vial Gross – The weight (grams) of the sample vial for each sieve after adding a sample of material and some wash liquid to cover it.

Sample Vial Net (solids+wash) – The net weight (grams) for each sieve of the sample vial and wash liquid, obtained by difference.

Sample Vial ID – The LABCORE sample identification number assigned to each sieve sample.

MOTHER JAR ID – The LABCORE sample identification number of the tank composite jar whence came the aliquot to be sieved.

MOTHER JAR # -- The identification number on the tank composite jar.

MOTHER JAR INITIAL – The gross weight (grams) of the tank composite jar before any aliquots of tank composite are removed for sieving.

MOTHER JAR FINAL – The re-gross weight (grams) of the tank composite jar after all aliquots of tank composite have been removed for sieving.

MOTHER JAR TARE – The empty weight (grams) of the tank composite jar.

MOTHER JAR USED – The net weight (grams) of composite removed from the tank composite jar for sieving.

MOTHER JAR LEFT – The estimated net weight of composite left in the tank composite jar for other testing.

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AW-103 SIEVE TEST RESULTS

ITEM	SIEVE TESTS	ELUATE	53 MICRON	106 MICRON	212 MICRON	500 MICRON
REF.	HNF-N-211-1 P.107-9					
DATE WORKED	7/27/01, 7/30/01					
TANK	AW-103					
GROUP	20010163					
SLURRY JAR TARE 1	119.982					
SLURRY JAR GROSS 1	130.68					
SLURRY JAR TARE 2	119.982					
SLURRY JAR GROSS 2	129.52					
COMPOSITE NET	20.236					
SIEVE WET TARE			34.4581	35.166	36.901	39.95
SIEVE GROSS			35.32	36.14	37.58	41.54
SIEVE NET			0.8619	0.974	0.679	3.373373873
BIN LOWER BOUND		0.1	53	106	212	500
ln[BIN LOWER BOUND]		-2.30258509	3.970291914	4.663439094	5.356586275	6.214608098
BIN UPPER BOUND		53	106	212	500	5000
ln[BIN UPPER BOUND]		3.970291914	4.663439094	5.356586275	6.214608098	8.517193191
PERCENT RETAINED		70.90198719	4.259240957	4.813204191	3.355406207	16.67016146
PERCENT/(ln[HI]-ln[LO]		11.30294554	6.144785806	6.943985816	3.910630375	7.239759134
CUM PERCENT RETAINED		70.90198719	75.16122814	79.97443233	83.32983854	100
Sample vial number		1294	1295	1292	1293	1291
Sample Vial Tare		18.4	18.44	cancelled	18.5	18.57
Sample Vial Gross		33.65	27.82	cancelled	29.98	29.86
Sample Vial Net(solids+wash)		15.25	9.38	#VALUE!	11.48	11.29
Sample Vial ID		S01T001294	S01T001295	S01T001292	S01T001293	S01T001291
MOTHER JAR ID	S01T001018					
MOTHER JAR #	16981					
MOTHER JAR INITIAL	319.28					
MOTHER JAR FINAL	298.1					
MOTHER JAR TARE	217.6					
MOTHER JAR USED	21.18					
MOTHER JAR LEFT	80.5					

AY-101 SIEVE TEST RESULTS

ITEM	SIEVE TESTS	ELUATE	53 MICRON	106 MICRON	212 MICRON	500 MICRON
REF.	HNF-N-211-1 P.110-1					
DATE WORKED	7/31/01					
TANK	AY-101					
GROUP	20010162					
SLURRY CONE TARE	13.63					
SLURRY CONE GROSS	49.01					
COMPOSITE NET	35.38					
SIEVE WET TARE			34.51	35.35	36.96	39.95
SIEVE GROSS			35.33	35.87	37.71	43.03
SIEVE NET			0.82	0.52	0.75	3.08
BIN LOWER BOUND		0.1	53	106	212	500
ln[BIN LOWER BOUND]		-2.30258509	3.970291914	4.663439094	5.356586275	6.214608098
BIN UPPER BOUND		53	106	212	500	5000
ln[BIN UPPER BOUND]		3.970291914	4.663439094	5.356586275	6.214608098	8.517193191
PERCENT RETAINED		85.38722442	2.317693612	1.469756925	2.119841718	8.705483324
PERCENT/(ln[HI]-ln[LO]		13.61213114	3.343725081	2.120411027	2.470615152	3.78074337
CUM PERCENT RETAINED		85.38722442	87.70491803	89.17467496	91.29451668	100
Sample vial number		1299	1300	1297	1298	1296
Sample Vial Tare		18.41	18.46	18.45	18.4	18.5
Sample Vial Gross		32.2	26.67	27.98	28.56	37.62
Sample Vial Net(solids+wash)		13.79	8.21	9.53	10.16	19.12
Sample Vial ID		S01T001299	S01T001300	S01T001297	S01T001298	S01T001296
MOTHER JAR ID	S01T001015					
MOTHER JAR #	18730					
MOTHER JAR INITIAL	547.772					
MOTHER JAR FINAL	509.367					
MOTHER JAR TARE	289.9					
MOTHER JAR USED	38.405					
MOTHER JAR LEFT	219.467					

C-104 SIEVE TEST RESULTS

ITEM	SIEVE TESTS	ELUATE	53 MICRON	106 MICRON	212 MICRON	500 MICRON
REF.	HNF-N-211-1 P.112-4					
DATE WORKED	8/1/01					
TANK	C-104					
GROUP	20010160					
SLURRY CONE TARE	14.01					
SLURRY CONE GROSS	56.21					
COMPOSITE NET	42.2					
SIEVE WET TARE			34.38	35.16	36.67	39.18
SIEVE GROSS			37.18	35.63	37.44	40.49
SIEVE NET			2.8	0.47	0.77	1.31
BIN LOWER BOUND		0.1	53	106	212	500
ln[BIN LOWER BOUND]		-2.30258509	3.970291914	4.663439094	5.356586275	6.214608098
BIN UPPER BOUND		53	106	212	500	5000
ln[BIN UPPER BOUND]		3.970291914	4.663439094	5.356586275	6.214608098	8.517193191
PERCENT RETAINED		87.32227488	6.63507109	1.113744076	1.82464455	3.104265403
PERCENT/(ln[HI]-ln[LO]		13.92061008	9.572384158	1.606793055	2.126571259	1.348165335
CUM PERCENT RETAINED		87.32227488	93.95734597	95.07109005	96.8957346	100
Sample vial number		1284	1285	1282	1283	1281
Sample Vial Tare		18.4	18.55	18.48	18.57	18.57
Sample Vial Gross		37.22	30.33	28.09	28.2	27.2
Sample Vial Net(solids+wash)		18.82	11.78	9.61	9.63	8.63
SAMPLE VIAL ID		S01T001284	S01T001285	S01T001282	S01T001283	S01T001281
MOTHER JAR ID	S01T001012					
MOTHER JAR #	17009					
MOTHER JAR INITIAL	326.25					
MOTHER JAR FINAL	284.05					
MOTHER JAR TARE	217.8					
MOTHER JAR USED	42.2					
MOTHER JAR LEFT	66.25					

SY-102 SIEVE TEST RESULTS

ITEM	SIEVE TESTS	ELUATE	53 MICRON	106 MICRON	212 MICRON	500 MICRON
REF.	HNF-N-211-1 P.114-6					
DATE WORKED	8/1/01					
TANK	SY-102					
GROUP	20010167					
SLURRY CONE TARE	13.64					
SLURRY CONE GROSS	56.39					
COMPOSITE NET	42.75					
SIEVE WET TARE			34.75	35.39	37.02	39.37
SIEVE GROSS			35.38	36.48	38.65	43.15
SIEVE NET			0.63	1.09	1.63	3.78
BIN LOWER BOUND		0.1	53	106	212	500
ln[BIN LOWER BOUND]		-2.30258509	3.970291914	4.663439094	5.356586275	6.214608098
BIN UPPER BOUND		53	106	212	500	5000
ln[BIN UPPER BOUND]		3.970291914	4.663439094	5.356586275	6.214608098	8.517193191
PERCENT RETAINED		83.32163743	1.473684211	2.549707602	3.812865497	8.842105263
PERCENT/(ln[HI]-ln[LO]		13.28284252	2.126076902	3.678450514	4.44378615	3.840077524
CUM PERCENT RETAINED		83.32163743	84.79532164	87.34502924	91.15789474	100
Sample vial number		1289	1290	1287	1288	1286
Sample Vial Tare		18.32	18.69	18.49	18.42	18.42
Sample Vial Gross		35.38	28.6	29.4	29.46	28.53
Sample Vial Net(solids+wash)		17.06	9.91	10.91	11.04	10.11
SAMPLE VIAL ID		S01T001289	S01T001290	S01T001287	S01T001288	S01T001286
MOTHER JAR ID	S01T001027					
MOTHER JAR #	18546					
MOTHER JAR INITIAL	353.37					
MOTHER JAR FINAL	308.68					
MOTHER JAR TARE	231.2					
MOTHER JAR USED	44.69					
MOTHER JAR LEFT	77.48					

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Document Information			
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APPENDIX I
PLM OBSERVATION NOTES AND IMAGES

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BCR-67 STANDARD

Notes

BCR67A, 4x objective no analyzer

BCR67B same settings different field same slide

BCR67D same settings different field same slide

BCR67H 16x different field same slide different exposure and aperture

BCR-67 STANDARD

Notes

BCR67A, 4x objective no analyzer

BCR67B same settings different field same slide

BCR67D same settings different field same slide

BCR67H 16x different field same slide different exposure and aperture

BCR-67 STANDARD

Notes

BCR67A, 4x objective no analyzer

BCR67B same settings different field same slide

BCR67D same settings different field same slide

BCR67H 16x different field same slide different exposure and aperture

BCR-67 STANDARD

Notes

BCR67A, 4x objective no analyzer

BCR67B same settings different field same slide

BCR67D same settings different field same slide

BCR67H 16x different field same slide different exposure and aperture

BCR-67 STANDARD

Notes

BCR67A, 4x objective no analyzer

BCR67B same settings different field same slide

BCR67D same settings different field same slide

BCR67H 16x different field same slide different exposure and aperture

BCR-69 STANDARD

NOTES

BCR69A, 4x objective no analyzer

BCR69B same settings different field same slide

BCR69C same settings different field same slide

BCR-69 STANDARD

NOTES

BCR69A, 4x objective no analyzer

BCR69B same settings different field same slide

BCR69C same settings different field same slide

BCR-69 STANDARD

NOTES

BCR69A, 4x objective no analyzer

BCR69B same settings different field same slide

BCR69C same settings different field same slide

BCR-69 STANDARD

NOTES

BCR69A, 4x objective no analyzer

BCR69B same settings different field same slide

BCR69C same settings different field same slide

AW-103 BEFORE TESTS SAMPLE S01T001670, VIAL 1670

NOTES

WPPA1670e 25x objective no analyzer probably no hope of actually measuring particles

AW-103 BEFORE TESTS SAMPLE S01T001670, VIAL 1670

NOTES

WPPA1670e 25x objective no analyzer probably no hope of actually measuring particles

AW-103 SIEVE FRACTION < 53 MICRON SAMPLE S01T001294, VIAL 1294

NOTES

Physical appearance much different than 1291 it was coffee & cream this is uniform gray

WPPA1294a d slide #1 all at 25x objective no analyzer

AW-103 SIEVE FRACTION < 53 MICRON SAMPLE S01T001294, VIAL 1294

NOTES

Physical appearance much different than 1291 it was coffee & cream this is uniform gray

WPPA1294a d slide #1 all at 25x objective no analyzer

AW-103 SIEVE FRACTION > 500 MICRON SAMPLE S01T001291, VIAL 1291

NOTES

Sample very clumpy & hard to disperse

WPPA1291a d slide #1 all at 25x objective no analyzer

AW-103 SIEVE FRACTION > 500 MICRON SAMPLE S01T001291, VIAL 1291

NOTES

Sample very clumpy & hard to disperse

WPPA1291a d slide #1 all at 25x objective no analyzer

AW-103 SETTLED FRACTION SAMPLE S01T001344, VIALS 1344, 1345

NOTES

WPPA1344b c 25x objective no analyzer all particles are isotropic clearly bi modal size distribution slide 1 (no second slide made)

AW-103 SETTLED FRACTION SAMPLE S01T001344, VIALS 1344, 1345

NOTES

WPPA1344b c 25x objective no analyzer all particles are isotropic clearly bi modal size distribution slide 1 (no second slide made)

AY-101 BEFORE TESTS SAMPLE S01T001493, VIALS 1493, 1494

NOTES

WPPA1493b 63x objective no analyzer trying to get close up

AY-101 BEFORE TESTS SAMPLE S01T001493, VIALS 1493, 1494

NOTES

WPPA1493b 63x objective no analyzer trying to get close up

AY-101 SIEVE FRACTION < 53 MICRON SAMPLE S01T001299, VIAL 1299

NOTES

Similar in physical appearance to 1296 but no chunks or clumps

WPPA1299a d slide #1 all at 25x objective no analyzer

WPPA1299e h, slide #2 all at 25x objective no analyzer

AY-101 SIEVE FRACTION < 53 MICRON SAMPLE S01T001299, VIAL 1299

NOTES

Similar in physical appearance to 1296 but no chunks or clumps

WPPA1299a d slide #1 all at 25x objective no analyzer

WPPA1299e h, slide #2 all at 25x objective no analyzer

AY-101 SIEVE FRACTION < 53 MICRON SAMPLE S01T001299, VIAL 1299

NOTES

Similar in physical appearance to 1296 but no chunks or clumps

WPPA1299a d slide #1 all at 25x objective no analyzer

WPPA1299e h, slide #2 all at 25x objective no analyzer

AY-101 SIEVE FRACTION > 500 MICRON SAMPLE S01T001296, VIAL 1296

NOTES

Sample very clumpy but easy to disperse except for one large (small pea) unbreakable chunk

WPPA1296gEFI an extended focal image at 25x objective no analyzer

AY-101 SIEVE FRACTION > 500 MICRON SAMPLE S01T001296, VIAL 1296

NOTES

Sample very clumpy but easy to disperse except for one large (small pea) unbreakable chunk

WPPA1296gEFI an extended focal image at 25x objective no analyzer

AY-101 SETTLED FRACTION SAMPLE S01T001326, VIAL 1326

NOTES

WPPA1326d 4x objective no analyzer slide 2 largest particle on slide

WPPA1326e g 16x objective no analyzer all from slide 2 showing variations within slide mount

AY-101 SETTLED FRACTION SAMPLE S01T001326, VIAL 1326

NOTES

WPPA1326d 4x objective no analyzer slide 2 largest particle on slide

WPPA1326e g 16x objective no analyzer all from slide 2 showing variations within slide mount

AY-101 SETTLED FRACTION SAMPLE S01T001326, VIAL 1326

NOTES

WPPA1326d 4x objective no analyzer slide 2 largest particle on slide

WPPA1326e g 16x objective no analyzer all from slide 2 showing variations within slide mount

C-104 BEFORE TESTS SAMPLE S01T001450, VIAL 1450

NOTES

This sample had some very granular material on the bottom of the vial Very little liquid (and not much sample) in vial very difficult to get representative slide mount

None of these images were suitable for image analysis due to the heavy load of particulate

C-104 SIEVE FRACTION < 53 MICRON SAMPLE S01T001284, VIAL 1284

NOTES

WPPA1284a b slide #1 both at 25x objective no analyzer same exposure & aperture concern that radial distribution on slide is not uniform larger particles are more concentrated on outside rim of sample particles shown are more or less representative but may favor the larger particles

WPPA1284e g slide #2 all at 25x objective no analyzer same exposure & aperture better prep than first slide appears very tiny pin point opaque particles are held together by transparent gel

C-104 SIEVE FRACTION < 53 MICRON SAMPLE S01T001284, VIAL 1284

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C-104 SIEVE FRACTION > 53 MICRON, < 106 MICRON SAMPLE S01T001285, VIAL 1285

NOTES

WPPA1285a b slide #1 all at 25x objective no analyzer

C-104 SIEVE FRACTION > 53 MICRON, < 106 MICRON SAMPLE S01T001285, VIAL 1285

NOTES

WPPA1285a b slide #1 all at 25x objective no analyzer

C-104 SETTLED FRACTION SAMPLE S01T001332, VIALS 1332, 1333

NOTES

WPPA1332befi b1-b6 16x objective no analyzer EFI image of photos 1332b1 6 wide range of sizes

C-104 SETTLED FRACTION SAMPLE S01T001332, VIALS 1332, 1333

NOTES

WPPA1332befi b1-b6 16x objective no analyzer EFI image of photos 1332b1 6 wide range of sizes

SY-102 BEFORE TESTS SAMPLE S01T001650

NOTES

WPPA1650d 16x objective no analyzer amber & clear particles not unusual fairly typical view

SY-102 BEFORE TESTS SAMPLE S01T001650

NOTES

WPPA1650d 16x objective no analyzer amber & clear particles not unusual fairly typical view

SY-102 SIEVE FRACTION < 53 MICRON SAMPLE S01T001289, VIAL 1289

NOTES

WPPA1289a d slide #1 all at 25x objective no analyzer

SY-102 SIEVE FRACTION < 53 MICRON SAMPLE S01T001289, VIAL 1289

NOTES

WPPA1289a d slide #1 all at 25x objective no analyzer

SY-102 SIEVE FRACTION > 500 MICRON SAMPLE S01T001286, VIAL 1286

NOTES

WPPA1286a c slide #1 all at 25x objective no analyzer

SY-102 SIEVE FRACTION > 500 MICRON SAMPLE S01T001286, VIAL 1286

NOTES

WPPA1286a c slide #1 all at 25x objective no analyzer

SY-102 SETTLED FRACTION SAMPLE S01T001338, VIALS 1338, 1339

NOTES

WPPA1338c d 16x objective no analyzer & crossed polarizers with Red I compensator (same view) slide 1

SY-102 SETTLED FRACTION SAMPLE S01T001338, VIALS 1338, 1339

NOTES

WPPA1338c d 16x objective no analyzer & crossed polarizers with Red I compensator (same view) slide 1