IRON ORE GREEN BALL
POROSITY MEASUREMENT

COLERAINE MINERALS RESEARCH LABORATORY

September 13, 2005

By _____
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High Temperature Processing

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Summary:

Understanding the factors that influence fired pellet quality is required to create opportunities to make improvements. For the taconite industry to compete globally, pellet quality must meet or exceed the standards being set by its competitors.

An understanding of the parameters that are key to the production of these quality standards will help to improve the value of their products. The objective of this research project is to investigate the potential for mercury porosimetry to measure and characterize pore characteristics for iron ore green balls and fired pellets. Pellet porosity is significant to the diffusion of oxygen during the oxidation and reducing gases through fired pellets and therefore critical to both physical and metallurgical quality.

A technique for measuring the porosity and pore size distribution of green balls has been demonstrated. A strong relationship exists between the particle size distribution and the pore characteristics of fired pellets. The data shows that as the fraction of fine particles are increased, fired pellet quality is improved with regard to %1/4"AT. Although the theory was shown to be relevant, the accuracy of this technique should be further investigated and compare to macro and microscopic techniques. Further study is also recommended to explore the dramatic porosity increase identified and the transition from second stage drying to pre-heat.

Introduction:

For the taconite industry to compete in today's global economy, pellet quality must meet or exceed the standards being set by its competitors. Improvements in mining have created larger and more efficient equipment that have inadvertently altered the mineralogical blending capabilities and therefore grind characteristics of the taconite. Changes in grind, mineralogy, additives (binders and fluxes) and the distribution of the particle size influence the porosity of fired pellets. An understanding of the parameters that are key to the production of these quality standards will help to improve the value of their products.

The purpose of this research is to evaluate mercury porosimetry as an effective tool for measuring the porosity and pore size distribution of iron ore green balls (i.e. before firing) and to examine the pore characteristics of fired pellets for relations to physical and metallurgical quality. Technological advances in mercury porosimetry used to measure pore size and pore size distributions in uncured resins created an opportunity to see if these techniques will work on

unfired taconite pellets. This study will investigate the relationship between the agglomerate and the fired pellet at various stages of induration.

Reducibility (R40) and Low Temperature Disintegration (LTD) are established metallurgical tests used to distinguish the quality of iron ore pellets for their performance in the blast furnace. Pellet porosity and its pore characteristics are significant to heat transfer and the diffusion of oxygen during the oxidation of magnetite concentrates and are important to the diffusion of reducing gases through fired pellets and therefore critical to the metallurgical properties. Mineralogy, fluxstone and gangue components are influencing factors that effect the porosity of fired pellets and their transition from the green ball. A better understanding of the relationship between the green ball and the fired pellet porosity will provide additional knowledge on the physical changes that occur during induration.

Although the importance of green ball quality is accepted by the industry as one of these key parameters, currently no procedures exist for an accurate measurement of their porosity. Technological advances in characterization of particles and minerals create opportunities to explore a procedure to measure green ball porosity.

Background:

Green ball porosity and pore characteristics are important to the release of moisture, CO2 and other gases from concentrates, fluxstones or other pellet additives during drying and induration. In addition, fired pellet porosity and its pore characteristics are significant to heat transfer and the diffusion of oxygen during the oxidation of magnetite concentrates and the permeation of reducing gases during the reduction process to form iron.

Mercury porosimetry is by far the most popular and widely accepted method for the characterization of pore structures, and in particular, macro porous systems, (> 0.5 μm). This technique is routinely used to characterize void morphology in high surface area solids such as catalysts, sorbents, or filters. Practical applications of this technique have led to the development of internationally recognized standard procedures for its use (ASTM, DIN).

The basis for mercury porosimetry is the fact that mercury is a non-wetting fluid at room temperature. E.W. Washburn, in 1921, postulated that injection of this fluid into a porous material could be used to measure pore size distributions. He determined that the minimum pressure (P) required to force this fluid into a pore of radius R was given by the expression:

Eq. 1 $$P = \frac{-2\,\gamma\cos(\theta)}{R}$$ Washburn Equation

where γ is the fluid surface tension and θ is the fluid contact angle. The Washburn equation clearly provides a simple clear-cut relationship between pore size and applied pressure. Pore size distributions are generated by assessing the volume of non-wetting fluid into pores with the related applied pressure. The Washburn equation assumes the geometry of the pore structure to a random network of cylindrical tubes. This geometry choice was one of convenience to relieve the complexity of mean radii and contact angles in pores with irregular cross sections.

Mercury porosimetry collects data over a range of pressure to develop a distribution of pore size characteristics. The data is reported statistically to provide the pore volume, mean pore size and diameter, surface area, permeability and pore tortuosity or the connectivity of the pore structure.

Based on the success of the previous results, green balls were specifically prepared with varying size distributions of concentrate particles to intentionally alter the porosity. These samples of fired and unfired pellets with known variances in porosity were sent to Micromeritics, Inc. in Norcross, GA for analysis. The results showed good correlation with the size of the particles used to create the green balls that prompted further study (Figure 1).

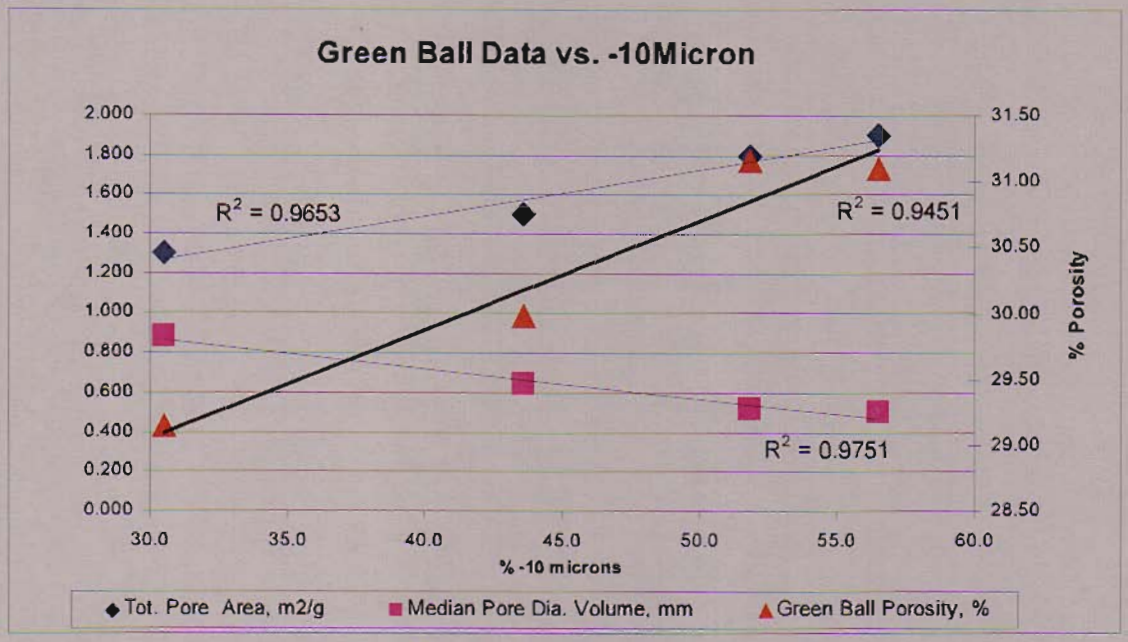


Figure 1. Preliminary Results of Green Ball Porosity Measurement

The results show that the porosity of the green ball, including median pore diameter (volume), median pore diameter (area), pore size distribution, bulk density, skeletal density and green ball porosity were effectively measured using high pressure mercury intrusion techniques.

Discussion:

A Quantachrome - Poremaster 33 mercury porosimeter was used to measure porosity, pore size distribution, pore diameter, surface area and pore volume. The device has the capability to use high pressure mercury intrusion, up to 33,000 psi, to uniformly penetrate mercury into the pores of the samples. The pore measurement range is from 440 μm to 0.0064 μm. PC interfaced and integrated software is used for data collection, statistical analysis and reporting, (Figure 2).

Figure 2. Quantachrome – Poremaster 33

Pore characteristics were measured and compared on both the fired pellets and green balls. Green balls were fired in the pot grate furnace to various stages of induration, then quenched in nitrogen to freeze the oxidation process. The pore characteristics of these pellets were characterized to track the transition from the green ball to the fired pellet. Concentrates and green balls were prepared and designed to alter the porosity of the pellets. This includes varying particle size distribution while holding a constant % passing 270 Mesh, grinding and changing additives to influence the mineralogy. Moisture content and balling techniques were also varied to physically alter the pore characteristics of the green balls. The pellets were fired in the pot grate and mini-pot furnaces using a standardized grate-kiln induration cycle to maintain a constant time and temperature profile. Standardized tests, used to measure physical and metallurgical quality of iron ore pellet, were used to quantify and evaluate the fired pellets.

Results:

Fired pellets and green balls were evaluated using mercury porosimetry techniques and the data compared to quality results. The standardized balling technique used at the Coleraine Minerals Lab was altered in an attempt to change the physical quality and pore structure of the green balls. No significant relationship or technique was identified that could consistently change pellet porosity. The effect of particle size distribution was evaluated by preparing concentrates with a constant grind (94% ± 0.2% -270 Mesh). Figure 3 below, displays the particle size distribution curve for these prepared concentrates:

Figure 3. Particle Size Distribution Curve

Green balls were prepared from these concentrates using 15#/LT of bentonite as a binder and approximately 9.5% moisture. They were each fired in the mini-pot furnace using an identical firing cycle. Table 1 shows the results:

Table 1. Particle Size Distribution, Pelletizing Results

Mini-Pot Test #	%-500M	Blaine	Porosity, %	Tot. Int. Volume	Tot. Surface	Calc Perm	median pore dia.	Median Surface	Comp. lbs.	%+1/4" AT	5% Intrusion
40	69.2	2035	26.4	0.0738	0.1430	3.794	2.2490	2.0030	516	96.6	5.60
36	70.5	2101	25.7	0.0744	0.1667	3.053	2.0450	1.8210	580	96.9	5.14
37	72.5	2140	25.0	0.0719	0.1801	2.558	1.8980	1.6750	536	97.2	3.50
38	73.6	2218	24.6	0.0684	0.1505	2.759	1.9880	1.7520	555	96.8	5.01
39	75.3	2309	24.9	0.0704	0.1436	3.004	2.0590	1.8620	544	96.5	5.89

The data shows that as the %-500M and Blaine specific surface area increase, the fired pellet porosity decreases. This is likely the result of the improved packing factor for fine particles and the increased surface area enhancing particle grain growth during induration. This is supported by the relationship between the low pressure intrusion of mercury into the sample (5% intrusion), used to identify the samples macro-porosity, and the effect on the fired pellet after tumble index (%+1/4" AT) shown in Figure 4.

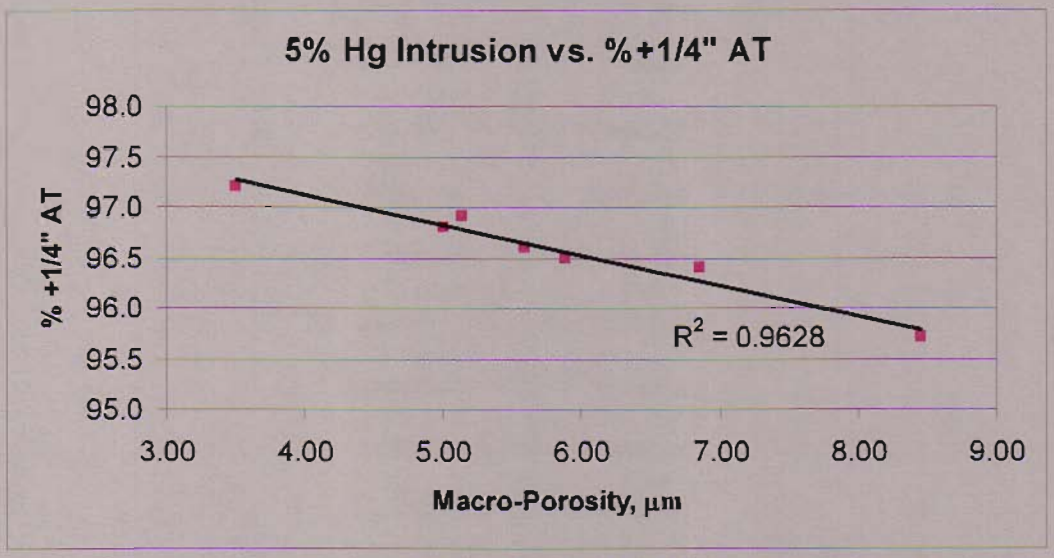


Figure 4. Low Pressure Hg Intrusion Relationship to the Fired Pellet After Tumble Index

An alternative means to show the relationship between the pore characteristics and the effect of the distribution of particles in the concentrate is to interpret the pore size distribution, shown in Figure 5 below.

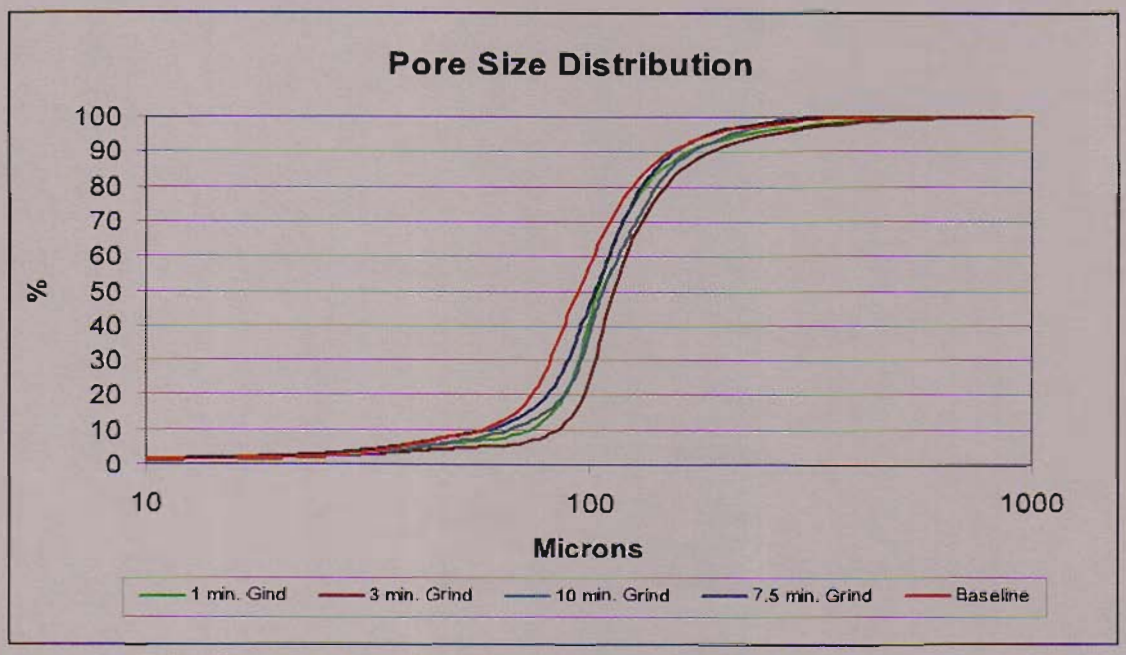


Figure 5. Pellet Pore Size Distribution

The slope of the distribution curves explains the dispersal of pores within the sample and related to the Blaine, shown in Figure 6.

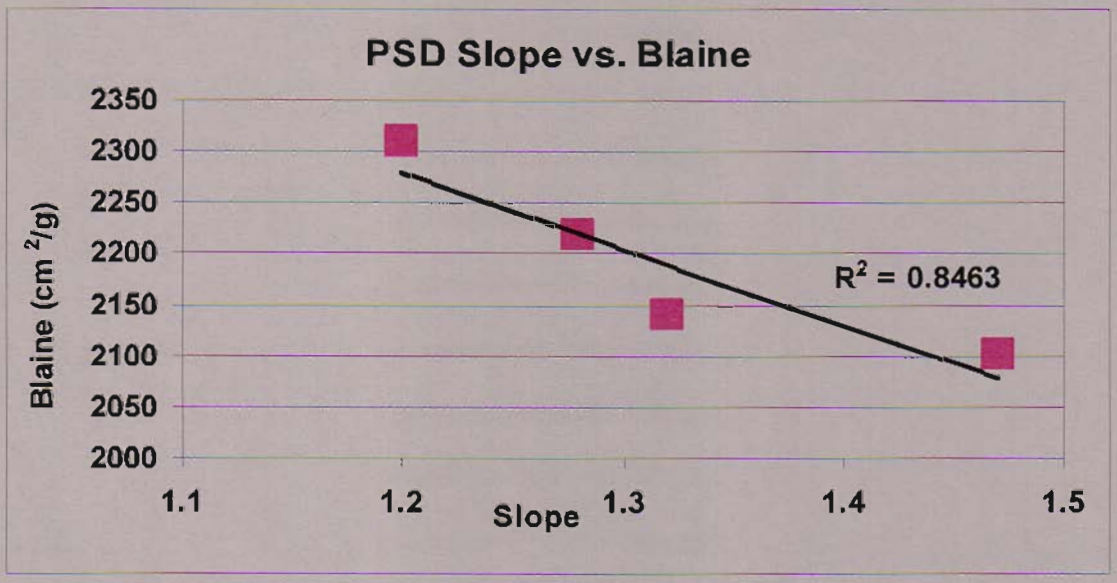


Figure 6. Particle Size Distribution vs. Blaine

The data indicates that a relationship does exist between the pore characteristics of fired pellets with varying particle size distributions and the physical quality of the fired pellets. The pellets

prepared in the mini-pot have shown not to be sufficient for metallurgical analysis or comparison due to insufficient time at temperature for typical fired pellet metallurgical characteristics.

To further evaluate the relationships with green ball porosity, a series of pot grate tests were conducted, varying the moisture content in the green ball to three levels (low, standard, and high), for 4 distinct phases of induration. The pellets were removed from the pot grate and cooled in nitrogen to quench the oxidization reaction following 1st stage down draft drying (DD1 @ 600 °F), 2nd stage down draft drying (DD2 @ 1350 °F), Pre-heat (1750 °F) and fully fired pellets at 2400 °F and conventionally cooled.

Figure 7 shows the porosity of each stage of induration at the three moisture levels. The spike in porosity at the end of DD2 was evident in all three samples, however at this point is unexplained and should be further investigated.

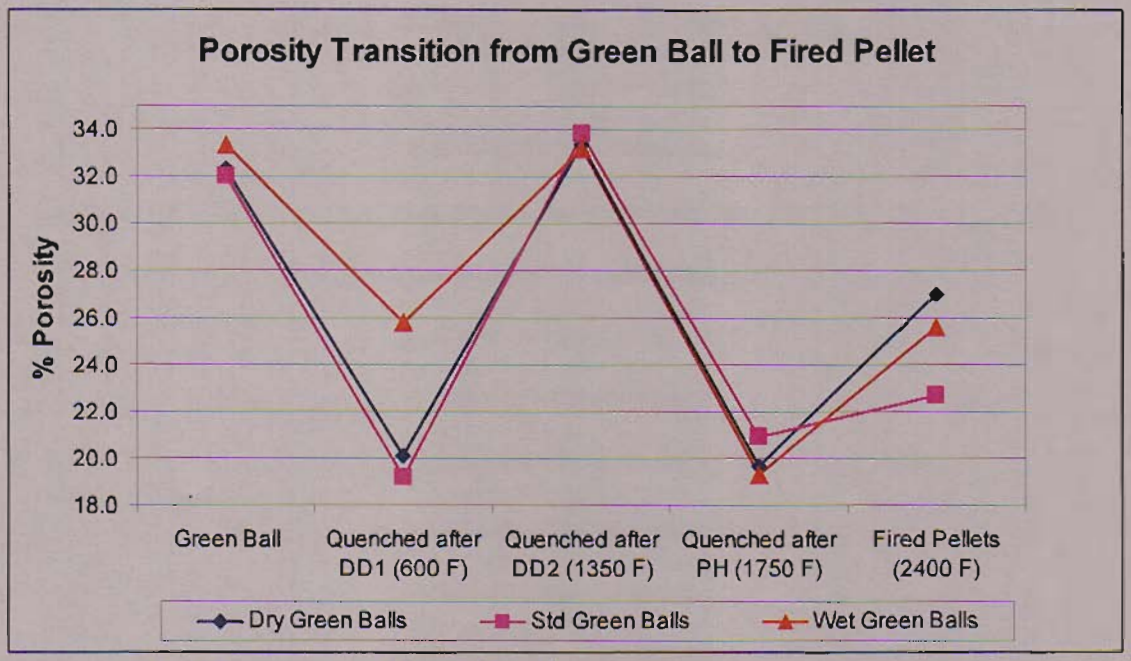


Figure 7. Pore Measurement Results of Quenched Pellets

Figure 8 shows the transition of permeability through induration. The increase at the end of firing in the permeability of the fired pellets can be explained by the coagulation of the gangue components and the sintering of the grains in the iron ore pellet, reducing the surface area.

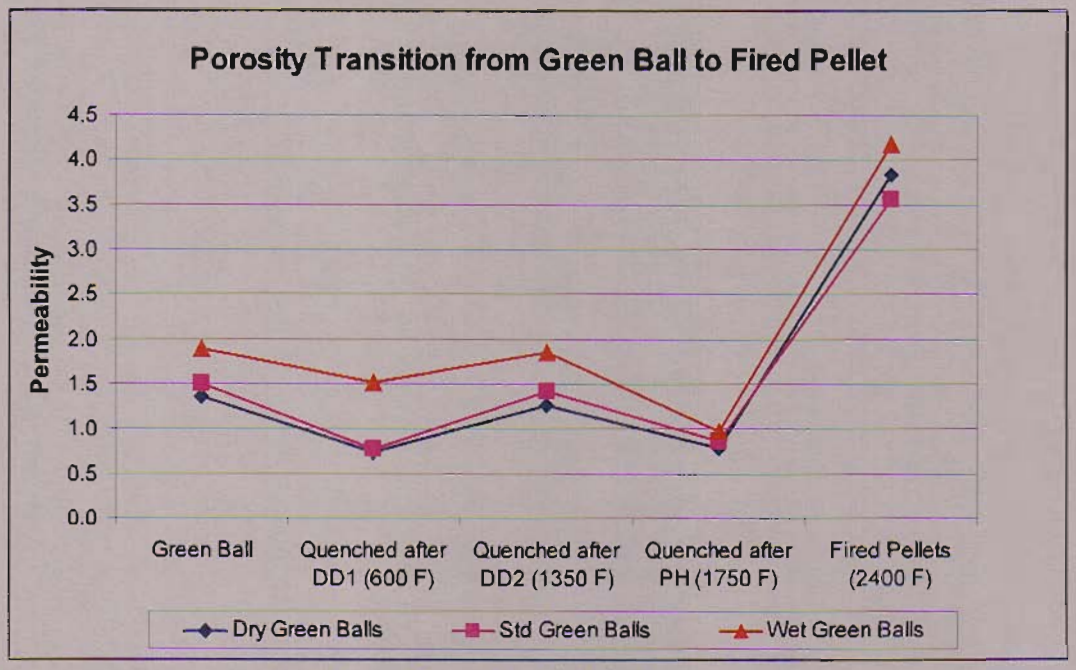


Figure 8. *Pore Measurement Results of Quenched Pellets*

This concept is supported by the decrease in total surface area of pores shown in Figure 9 below.

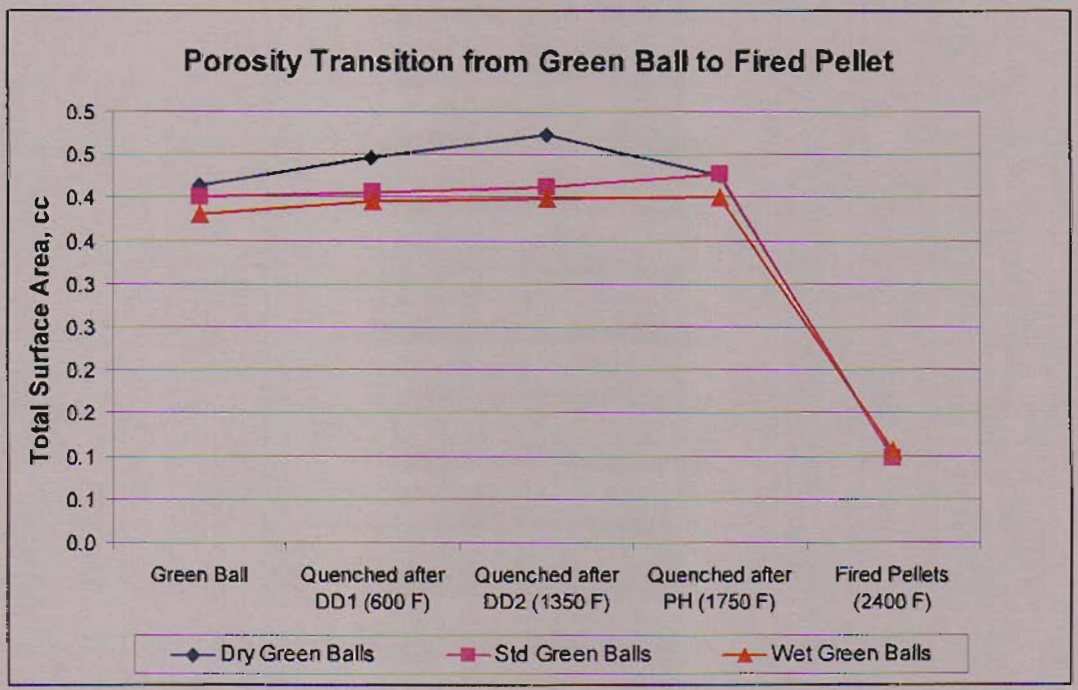


Figure 9. Pore Measurement Results of Quenched Pellets

Conclusions:

Mercury porosimetry is a widely accepted method for the characterization of pore structures, and in particular, macro porous systems, (> 0.5 μm). A technique for measuring the porosity and pore size distribution of green balls has been demonstrated. A strong relationship exists between the particle size distribution and the pore characteristics of fired pellets. The data shows that as the fraction of fine particles are increased, fired pellet quality is improved with regard to %1/4"AT. No significant relationship to metallurgical properties was identified, however the reliability of metallurgical test results from pot grate or mini-pot furnaces may have some influence. Further investigation of these relationships should be conducted on plant green balls and fired pellets to eliminate any influence due to the test furnace results.

The increase in pellet permeability at the end of firing shows that the combination of gangue components and grain growth decreases the pore surface area of the fine particles and increases porosity. The explanation for the increase in porosity following second stage drying should be further investigated. Although the concept for green ball porosity measurement has been demonstrated, additional study is recommended to examine the accuracy of this technique using macro and microscopic evaluations and particle science techniques to confirm these results. Determining the effect of these factors creates opportunities for taconite operations to improve pellet quality making them more competitive in today's global economy

Table 2. Pot Grate Results for Green Ball to Pellet Analysis

Pot Grate Data

Comments		Test #	Bentonite #/LT	Moist	18" Drop	Dry Comp	Comp. lbs.	%+1/4" AT	R40 %/min	LTD %+1/4"
Moisture Effect, Quenched Pellets										
Green Ball										
Quenched after DD1 (600 F)	Dry Green Balls	05-10	15	8.6	3.2	10.2	7			
Quenched after DD2 (1350 F)	Dry Green Balls	05-11	15	8.7	4.2	9.5	26			
Quenched after PH (1750 F)	Dry Green Balls	05-12	15	8.8	4.3	9.8	83			
Fired Pellets (2400 F)	Dry Green Balls	05-3R	15	8.6	5.2	11.2	515	98.0	0.84	97.8
Green Ball										
Quenched after DD1 (600 F)	Std Green Balls	05-7	15	9.0	7.7	7.2	6			
Quenched after DD2 (1350 F)	Std Green Balls	05-8	15	9.3	9.2	8.6	15			
Quenched after PH (1750 F)	Std Green Balls	05-9	15	9.2	7.0	9.5	80			
Fired Pellets (2400 F)	Std Green Balls	05-1R	15	9.6	9.4	10.4	589	97.4	1.01	96.9
Green Ball										
Quenched after DD1 (600 F)	Wet Green Balls	05-4	15	10.1	10.9	7.7	5			
Quenched after DD2 (1350 F)	Wet Green Balls	05-5	15	10.1	12.5	10.5	18			
Quenched after PH (1750 F)	Wet Green Balls	05-6	15	10.2	12.4	10.2	81			
Fired Pellets (2400 F)	Wet Green Balls	05-2R	15	9.8	10.7	10.2	589	97.8	0.92	97.9

			Dried Green Balls						Fired Pellets					
Comments		Test #	Porosity, %	Tot. Int. Volume	Tot. Surface	Perm	median pore dia.	Median Surface	Porosity, %	Tot. Int. Volume	Tot. Surface	Perm	median pore dia.	Median Surface
Moisture Effect, Quenched Pellets														
Green Ball									32.4	0.0851	0.4	1.4	1.2	0.9
Quenched after DD1 (600 F)	Dry Green Balls	05-10	32.1	0.0895	0.4723	1.274	1.182	0.79	20.1	0.0865	0.4468	0.749	1.145	0.8538
Quenched after DD2 (1350 F)	Dry Green Balls	05-11	32.9	0.0854	0.4191	1.172	1.12	0.8472	33.4	0.0876	0.4743	1.268	1.156	0.7735
Quenched after PH (1750 F)	Dry Green Balls	05-12	32.1	0.0809	0.3753	1.221	1.157	0.9019	19.7	0.0882	0.4252	0.794	1.191	0.9399
Fired Pellets (2400 F)	Dry Green Balls	05-3R	32.3	0.0844	0.3866	1.791	1.397	0.8893	27.0	0.0514	0.0987	3.838	2.237	2.076
Green Ball									32.0	0.08383	0.4	1.5	1.3	0.9
Quenched after DD1 (600 F)	Std Green Balls	05-7	33.1	0.083	0.4369	1.352	1.199	0.8042	19.2	0.0823	0.4053	0.776	1.193	0.9135
Quenched after DD2 (1350 F)	Std Green Balls	05-8	33.4	0.085	0.3995	1.545	1.276	0.9108	33.8	0.0839	0.4121	1.420	1.216	0.914
Quenched after PH (1750 F)	Std Green Balls	05-9	27.9	0.0804	0.337	1.276	1.269	0.98	20.9	0.0875	0.4274	0.871	1.211	0.9229
Fired Pellets (2400 F)	Std Green Balls	05-1R	33.6	0.0869	0.4317	1.823	1.382	0.7631	22.7	0.0495	0.0973	3.549	2.346	2.123
Green Ball									33.3	0.0863	0.4	1.9	1.4	0.9
Quenched after DD1 (600 F)	Wet Green Balls	05-4	33.8	0.0895	0.4148	1.877	1.398	0.8715	25.8	0.0903	0.3965	1.516	1.438	0.9745
Quenched after DD2 (1350 F)	Wet Green Balls	05-5	34.0	0.087	0.385	2.062	1.461	0.9125	33.2	0.0875	0.3983	1.857	1.403	0.9245
Quenched after PH (1750 F)	Wet Green Balls	05-6	31.7	0.0826	0.3261	1.790	1.41	1.021	19.3	0.0870	0.4007	0.973	1.332	0.94
Fired Pellets (2400 F)	Wet Green Balls	05-2R	33.8	0.0861	0.3963	1.842	1.385	0.8793	25.6	0.0592	0.1056	4.179	2.397	2.24

APPENDIX A

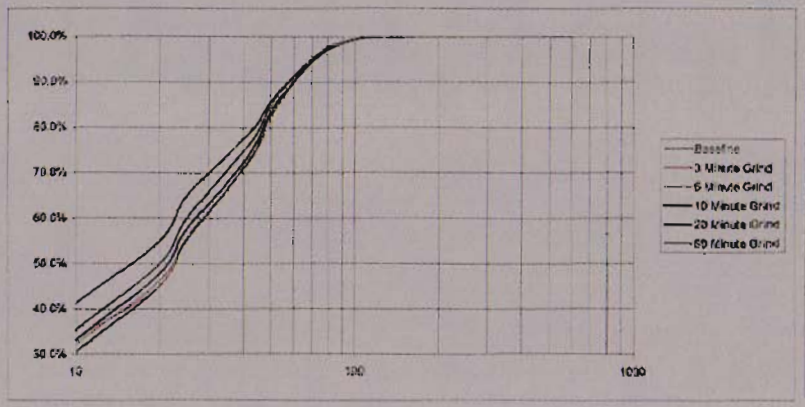
Concentrate Particle Size Distributions

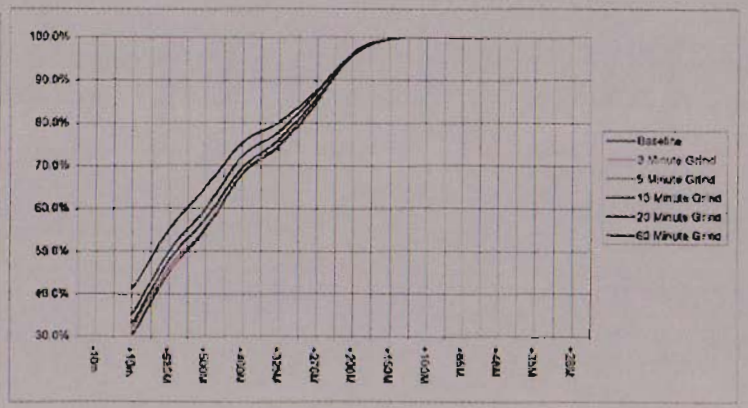
Quantachrome Instruments Data Reports For Porosity Results

Minntac Concentrate

		Baseline			3 Minute Grind			5 Minute Grind			10 Minute Grind			20 Minute Grind			60 Minute Grind		
	microns	wt (g)	%	Cum. % Passing	wt (g)	%	Cum. % Passing	wt (g)	%	Cum. % Passing	wt (g)	%	Cum. % Passing	wt (g)	%	Cum. % Passing	wt (g)	%	Cum. % Passing
+28M	595	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%
+35M	420	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%
+48M	297	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%
+65M	210	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%
+100M	149	0.1	0.1%	99.9%	0.1	0.1%	99.9%	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.1	0.1%	99.9%	0.1	0.1%	99.9%
+150M	105	0.3	0.2%	99.7%	0.2	0.2%	99.8%	0.3	0.3%	99.7%	0.3	0.3%	99.7%	0.3	0.3%	99.6%	0.3	0.3%	99.6%
+200M	74	4.5	3.6%	96.1%	4.0	3.2%	96.6%	4.5	4.0%	95.7%	3.8	4.0%	95.6%	3.8	3.6%	95.0%	3.5	3.5%	96.1%
+270M	53	14.3	11.4%	84.7%	14.8	11.7%	84.9%	11.9	10.6%	85.1%	9.4	10.0%	85.7%	9.6	9.1%	86.9%	8.6	8.6%	87.5%
+325M	44	12.7	10.1%	74.5%	12.5	9.9%	75.0%	11.1	9.9%	75.2%	9.0	9.8%	76.1%	9.5	9.0%	77.9%	7.4	7.4%	80.1%
+400M	37	8.0	6.4%	68.2%	8.4	6.7%	68.3%	7.6	6.8%	68.4%	6.2	6.6%	69.5%	5.9	5.6%	72.3%	4.7	4.7%	75.4%
+500M	25	16.4	13.1%	55.1%	15.8	12.5%	55.8%	14.4	12.9%	55.5%	11.3	12.0%	57.5%	13.2	12.5%	59.8%	10.7	10.7%	64.8%
+635M	20	12.5	10.0%	45.1%	13.4	10.6%	45.2%	10.4	9.3%	46.3%	9.1	9.7%	47.8%	10.4	9.8%	50.0%	9.8	9.8%	55.0%
-10µ	10	18.3	14.6%	30.5%	15.0	11.9%	33.3%	15.7	14.0%	32.2%	13.8	14.7%	33.2%	15.4	14.6%	35.4%	13.6	13.6%	41.4%
-10µ		38.2	30.5%		42.0	33.3%		36.1	32.2%		31.3	33.2%		37.4	35.4%		41.5	41.4%	
		125.3			126.2			112.0			94.2			105.6			100.2		
-635M		56.6			57			51.8			45.1			52.0			55.1		

		wt (g)	%		wt (g)	%		wt (g)	%		wt (g)	%		wt (g)	%		wt (g)	%
	+10µ	0.97	32.3%	+10µ	0.79	26.3%	+10µ	0.91	30.3%	+10µ	0.92	30.7%	+10µ	0.86	28.2%	-10µ	0.76	24.7%
	-10µ	2.03	67.7%	-10µ	2.21	73.7%	-10µ	2.09	69.7%	-10µ	2.08	69.3%	-10µ	2.139	70.8%	-10µ	2.316	75.3%
		3.000			3.000			3.000			3.000			3.018			3.078	
+270M		15.3%			15.1%			14.9%			14.3%			13.1%			12.5%	
-270M		84.7%			84.9%			85.1%			85.7%			86.9%			87.5%	
								14.9%			14.3%			13.1%				





Quantachrome Instruments
Quantachrome Poremaster for Windows® Data Report
Version 4.03

Sample ID	test 86	**File Name**	S512501H_Merged.PRM
Sample Weight	16.8652 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	pot grate 1-05-1r dry balls		
Comments	dry balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Data Acquisition Parameters

Density of Mercury ..... 13.5000 [g/cc]
Temperature ..... 20.00 [°C]

High Pressure

Data File Name S512501H.PRM
Analysis Date 01/25/2005
# of repeat cycles 0
Penetrometer Constant . 2701 [mV/cc]
Auto-Oil Fill Time .... 5 [sec]
Run Mode ..... Fixed Speed
Motor Speed 1

Low Pressure

Data File Name S5125011.PRM
Analysis Date 01/25/2005
# of repeat cycles 0
Penetrometer Constant . 3307 [mV/cc]
Evacuation Rate 8
Fine Evac. Until ..... 0.5000 [min.]
Coarse Evac. Until .... 4.0000 [min.]

475 Points Acquired 316 Pts in Intrusion Range 159 Pts in Extrusion Range
473 Points Used 315 Intrusion Pts Used 158 Extrusion Pts Used

T = 2.120

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Sample ID	test 86	**File Name**	S512501E_Merged.PRM
Sample Weight	16.8652 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	pot grate 1-05-1r dry balls		
Comments	dry balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Intrusion Statistics

Pressure Range : 2.966 PSIA to 4975.520 PSIA
Pore Diameter Range : 71.914497 µm to 0.042874 µm

Pore Diameter Statistics Summary

	Mean	Mode (df/d(log D))	Median
Volume	7.295E-02 cc/g at a diameter of 8.055E-01 µm	5.062E+03 cc/(µm-g) at a diameter of 1.514E+00 µm	4.347E-02 cc/g at a diameter of 1.382E+00 µm
Surface Area	2.083E-01 m²/g at a diameter of 8.055E-01 µm	3.592E-04 m²/(µm-g) at a diameter of 4.797E-02 µm	2.159E-01 m²/g at a diameter of 7.361E-01 µm
Pore Number Fraction	2.114E-03 at a diameter of 4.797E-02 µm	2.622E-04 at a diameter of 4.797E-02 µm	5.011E-01 at a diameter of 7.000E-02 µm

Mercury Porosimetry Data Summary

Total Intruded Volume	0.0869 cc/g	Bulk (Particle) Density	n/a [g/cc]
Total Surface Area	0.4317 m²/g	Apparent Density	n/a [g/cc]

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Sample ID	test 86	**File Name**	S512501H_Merged.PRM
Sample Weight	16.8652 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	pot grate 1-05-1r dry balls		
Comments	dry balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Total Surface Area 0.4317 m²/g Apparent Density n/a [g/cc]

Extrusion Statistics

Pressure Range : 4959.054 PSIA to 20.200 PSIA
Pore Diameter Range : 0.043017 µm to 10.560722 µm

Pore Diameter Statistics Summary

	Mean	Mode (df/d(log D))	Median
Volume	8.693E-02 cc/g at a diameter of 1.447E-01 µm	5.442E+01 cc/(µm-g) at a diameter of 5.322E-02 µm	8.593E-02 cc/g at a diameter of 7.499E-02 µm
Surface Area	4.310E-01 m²/g at a diameter of 1.447E-01 µm	3.427E-04 m²/(µm-g) at a diameter of 5.100E-02 µm	4.031E-01 m²/g at a diameter of 5.270E-02 µm
Pore Number Fraction	6.697E-03 at a diameter of 1.447E-01 µm	2.476E-04 at a diameter of 5.100E-02 µm	5.161E-01 at a diameter of 5.172E-02 µm

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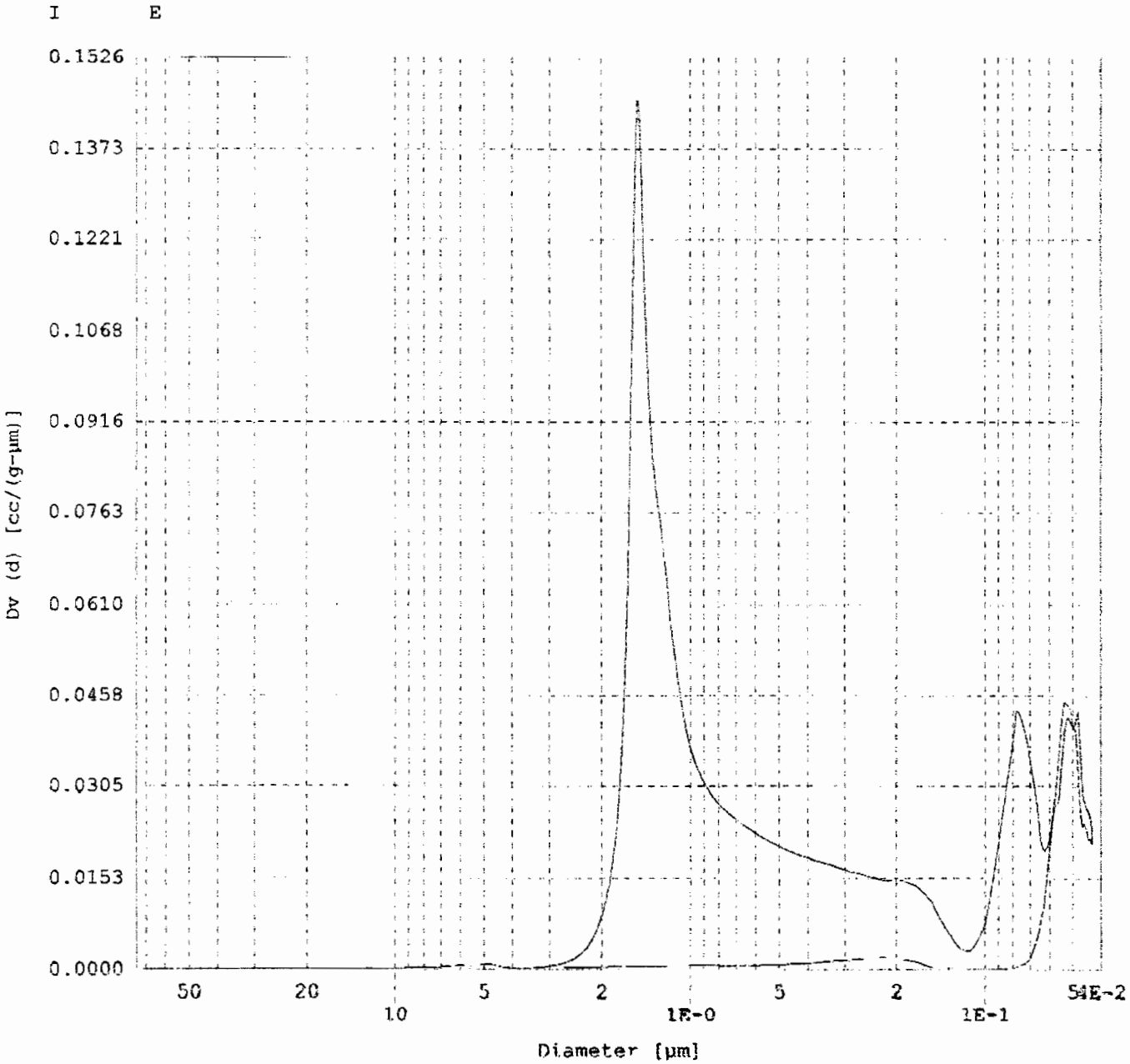
Sample ID	test 86	**File Name**	S512501H_Merged.PRM
Sample Weight	16.8652 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	pot grate 1-05-1r dry balls		
Comments	dry balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Dv(d) vs. Pore Size



Report date: 09/13/2005

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Sample ID	test 87	**File Name**	S5126011_Merged.PRM
Sample Weight	16.3656 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	pot grate 1-05-1r fired balls		
Comments	fired balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(R)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Data Acquisition Parameters

Density of Mercury ..... 13.5000 [g/cc]
Temperature ..... 20.00 [°C]

High Pressure

Data File Name S5126011.PRM
Analysis Date 01/26/2005
# of repeat cycles 0
Penetrometer Constant . 2701 [mV/cc]
Auto-Oil Fill Time .... 5 [sec]
Run Mode ..... Fixed Speed
Motor Speed 1

Low Pressure

Data File Name S5126011.PRM
Analysis Date 01/26/2005
# of repeat cycles 0
Penetrometer Constant . 3307 [mV/cc]
Evacuation Rate 8
Fine Evac. Until ..... 0.5000 [min.]
Coarse Evac. Until .... 4.0000 [min.]

449 Points Acquired 291 Pts in Intrusion Range 158 Pts in Extrusion Range
447 Points Used 290 Intrusion Pts Used 157 Extrusion Pts Used

Hg 2-2-06

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Sample ID	test 87	**File Name**	S5126018_Merged.PRM
Sample Weight	16.3656 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	pot grate 1-08-1r fired balls		
Comments	fired balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(R)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Intrusion Statistics

Pressure Range : 2.680 PSIA to 4963.021 PSIA
Pore Diameter Range : 74.074203 µm to 0.042982 µm

Pore Diameter Statistics Summary

	Mean	Mode (df/d(log D))	Median
Volume	3.703E-02 cc/g at a diameter of 2.037E+00 µm	1.925E+03 cc/(µm-g) at a diameter of 2.306E+00 µm	2.477E-02 cc/g at a diameter of 2.346E+00 µm
Surface Area	5.482E-02 m²/g at a diameter of 2.037E+00 µm	8.615E-05 m²/(µm-g) at a diameter of 5.836E-02 µm	4.864E-02 m²/g at a diameter of 2.123E+00 µm
Pore Number Fraction	4.969E-03 at a diameter of 5.836E-02 µm	6.363E-03 at a diameter of 5.836E-02 µm	5.244E-01 at a diameter of 6.019E-02 µm

Mercury Porosimetry Data Summary

Total Intruded Volume	0.0495 cc/g	Bulk (Particle) Density	n/a [g/cc]
Total Surface Area	0.0973 m²/g	Apparent Density	n/a [g/cc]

Quantachrome Instruments
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Sample ID	test #7	**File Name**	S512601H_Merged.PRM
Sample Weight	16.3656 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	pot grate 1-05-1r fired balls		
Comments	fired balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Total Surface Area 0.0973 m²/g Apparent Density n/a [g/cc]

Extrusion Statistics

Pressure Range : 4952.593 PSIA to 20.175 PSIA
Pore Diameter Range : 0.043073 µm to 10.573781 µm

Pore Diameter Statistics Summary

	Mean	Mode (df/d(log D))	Median
Volume	4.954E-02 cc/g at a diameter of 5.169E-02 µm	1.750E+01 cc/(µm-g) at a diameter of 6.293E-02 µm	4.948E-02 cc/g at a diameter of 5.836E-02 µm
Surface Area	9.728E-02 m²/g at a diameter of 5.169E-02 µm	7.783E-05 m²/(µm-g) at a diameter of 6.293E-02 µm	9.250E-02 m²/g at a diameter of 5.926E-02 µm
Pore Number Fraction	0.000E+00 at a diameter of 5.169E-02 µm	5.627E-05 at a diameter of 6.293E-02 µm	5.359E-01 at a diameter of 6.191E-02 µm

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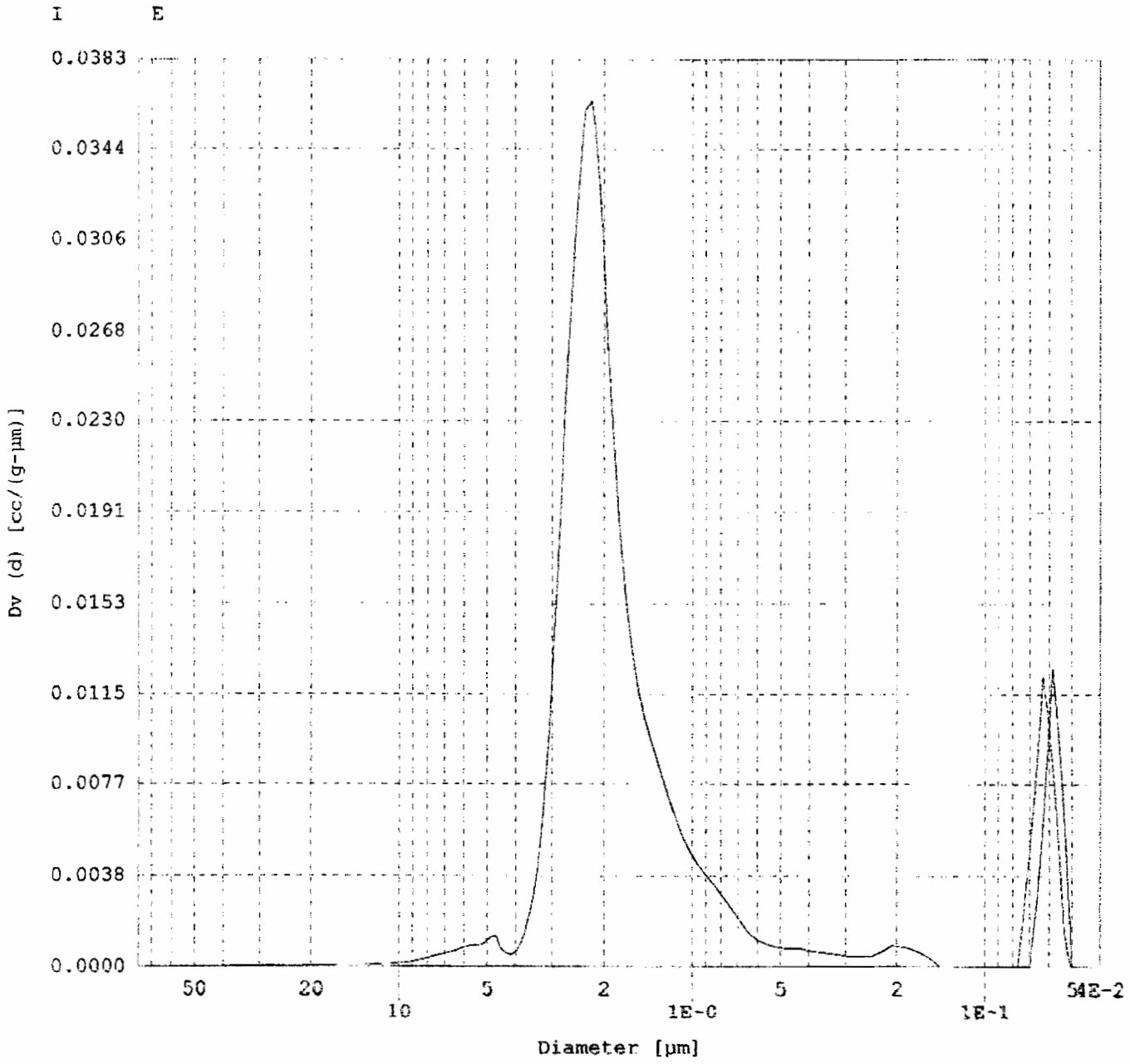
Sample ID	test 87	**File Name**	S512601H_Merged.PRM
Sample Weight	16.3656 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	pot grate 1-05-1r fired balls		
Comments	fired balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Dv(d) vs. Pore Size



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Sample ID	test 98	**File Name**	S512602H_Merged.PRM
Sample Weight	16.8493 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	pot grate 1-05-2 dry balls		
Comments	fdry balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Data Acquisition Parameters

Density of Mercury ..... 13.5000 [g/cc]
Temperature ..... 20.00 [°C]

High Pressure

Data File Name S512602H.PRM
Analysis Date 01/26/2005
# of repeat cycles 0
Penetrometer Constant . 2701 [mV/cc]
Auto-Oil Fill Time .... 5 [sec]
Run Mode ..... Fixed Speed
Motor Speed 1

Low Pressure

Data File Name S5126021.PRM
Analysis Date 01/26/2005
# of repeat cycles 0
Penetrometer Constant . 3307 [mV/cc]
Evacuation Rate 8
Fine Evac. Until ..... 0.5000 [min.]
Coarse Evac. Until .... 4.0000 [min.]

491 Points Acquired 326 Pts in Intrusion Range 165 Pts in Extrusion Range
486 Points Used 325 Intrusion Pts Used 161 Extrusion Pts Used

Quantachrome Instruments
Quantachrome Poremaster for Windows® Data Report
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Sample ID	test 88	**File Name**	S512602H_Merged.PRM
Sample Weight	16.8493 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	pot grate 1-05-2 dry balls		
Comments	fdry balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Intrusion Statistics

Pressure Range : 2.615 PSIA to 4981.108 PSIA
Pore Diameter Range : 81.564041 µm to 0.042828 µm

Pore Diameter Statistics Summary

	Mean	Mode (dE/d(log D))	Median
Volume	7.030E-02 cc/g at a diameter of 8.693E-01 µm	4.808E+03 cc/(µm-g) at a diameter of 1.529E+00 µm	4.306E-02 cc/g at a diameter of 1.388E+00 µm
Surface Area	1.982E-01 m²/g at a diameter of 8.693E-01 µm	2.202E-04 m²/(µm-g) at a diameter of 4.724E-02 µm	1.982E-01 m²/g at a diameter of 8.793E-01 µm
Pore Number Fraction	2.683E-03 at a diameter of 4.724E-02 µm	1.640E-04 at a diameter of 4.724E-02 µm	5.034E-01 at a diameter of 8.314E-02 µm

Mercury Porosimetry Data Summary

Total Intruded Volume	0.0861 cc/g	Bulk (Particle) Density	n/a [g/cc]
Total Surface Area	0.3963 m²/g	Apparent Density	n/a [g/cc]

Quantachrome Instruments
Quantachrome Poremaster for Windows® Data Report
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Sample ID	test 88	**File Name**	S512602H_Merged.PRM
Sample Weight	16.8493 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	pot grate 1-05-2 dry balls		
Comments	fdry balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Total Surface Area 0.3963 m²/g Apparent Density n/a [g/cc]

Extrusion Statistics

Pressure Range : 4962.996 PSIA to 20.125 PSIA
Pore Diameter Range : 0.042983 µm to 10.599998 µm

Pore Diameter Statistics Summary

	Mean	Mode (df/d(log D))	Median
Volume	9.613E-02 cc/g at a diameter of 1.559E-01 µm	1.242E+02 cc/(µm-g) at a diameter of 1.060E+01 µm	8.570E-02 cc/g at a diameter of 6.690E-02 µm
Surface Area	3.963E-01 m²/g at a diameter of 1.559E-01 µm	4.015E-05 m²/(µm-g) at a diameter of 4.298E-02 µm	3.854E-01 m²/g at a diameter of 4.844E-02 µm
Pore Number Fraction	7.464E-03 at a diameter of 1.559E-01 µm	2.808E-05 at a diameter of 4.298E-02 µm	5.050E-01 at a diameter of 5.892E-02 µm

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Sample ID	test 89	**File Name**	S512603H_Merged.PRM
Sample Weight	16.4568 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	pot grate 1 05 2 fired balls		
Comments	fired ballls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Data Acquisition Parameters

Density of Mercury ..... 13.5000 [g/cc]
Temperature ..... 20.00 [°C]

High Pressure

Data File Name S512603H.PRM
Analysis Date 01/26/2005
# of repeat cycles 0
Penetrometer Constant . 2701 [mV/cc]
Auto-Oil Fill Time .... 5 [sec]
Run Mode ..... Fixed Speed
Motor Speed 1

Low Pressure

Data File Name S512603L.PRM
Analysis Date 01/26/2005
# of repeat cycles 0
Penetrometer Constant . 3307 [mV/cc]
Evacuation Rate 8
Fine Evac. Until ..... 0.5000 [min.]
Coarse Evac. Until .... 4.0000 [min.]

464 Points Acquired	305 Pts in Intrusion Range	159 Pts in Extrusion Range
461 Points Used	304 Intrusion Pts Used	157 Extrusion Pts Used

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Sample ID	test 89	**File Name**	S512603H_Merged.PRM
Sample Weight	16.4568 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	pot grate 1 05 2 fired balls		
Comments	fired balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Intrusion Statistics

Pressure Range : 2.131 PSIA to 4992.859 PSIA
Pore Diameter Range : 100.085434 µm to 0.042725 µm

Pore Diameter Statistics Summary

	Mean	Mode (dV/d(log D))	Median
Volume	3.646E-02 cc/g at a diameter of 2.242E+00 µm	2.699E+03 cc/(µm-g) at a diameter of 2.507E+00 µm	2.959E-02 cc/g at a diameter of 2.397E+00 µm
Surface Area	5.195E-02 m²/g at a diameter of 2.242E+00 µm	7.823E-06 m²/(µm-g) at a diameter of 2.425E+00 µm	5.278E-02 m²/g at a diameter of 2.240E+00 µm
Pore Number Fraction	1.654E-02 at a diameter of 1.409E+00 µm	5.751E-06 at a diameter of 1.409E+00 µm	5.179E-01 at a diameter of 1.820E+00 µm

Mercury Porosimetry Data Summary

Total Intruded Volume	0.0592 cc/g	Bulk (Particle) Density	n/a [g/cc]
Total Surface Area	0.1056 m²/g	Apparent Density	n/a [g/cc]

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Sample ID	test 89	**File Name**	S512603H_Merged.PRM
Sample Weight	16.4568 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	pot grate 1 05 2 fired balls		
Comments	fired ballls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Total Surface Area 0.1056 m²/g Apparent Density n/a [g/cc]

Extrusion Statistics

Pressure Range : 4965.965 PSIA to 20.075 PSIA
Pore Diameter Range : 0.042957 µm to 10.626344 µm

Pore Diameter Statistics Summary

	Mean	Mode (df/d(log D))	Median
Volume	5.967E-02 cc/g at a diameter of 9.578E+00 µm	1.417E+02 cc/(µm-g) at a diameter of 1.063E+01 µm	5.974E-02 cc/g at a diameter of 4.440E 02 µm
Surface Area	1.053E-01 m²/g at a diameter of 9.578E+00 µm	3.162E-08 m²/(µm-g) at a diameter of 4.296E-02 µm	1.053E-01 m²/g at a diameter of 3.107E-01 µm
Pore Number Fraction	6.084E-02 at a diameter of 9.578E+00 µm	2.201E-08 at a diameter of 4.296E-02 µm	5.080E-01 at a diameter of 9.036E+00 µm

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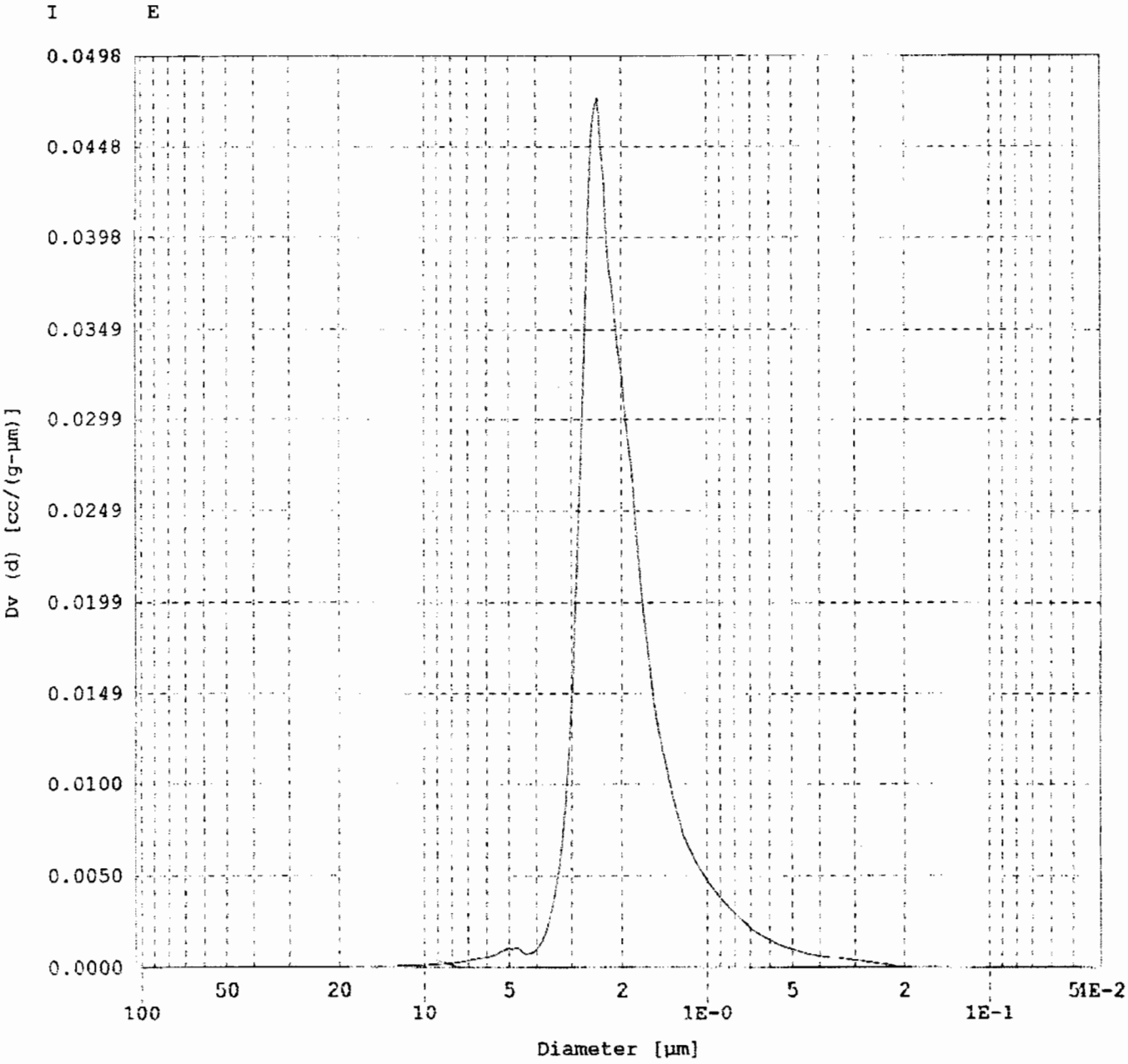
Sample ID	test 89	**File Name**	S512603H_Merged.PRM
Sample Weight	16.4568 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	pot grate 1-05-2 fired balls		
Comments	fired ballls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rig	Mercury volume normalized by sample weight.	

Dv(d) vs. Pore Size



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Sample ID	test 90	**File Name**	S522301H_Merged.PRM
Sample Weight	15.9264 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 1r		
Comments	fired balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Data Acquisition Parameters

Density of Mercury ..... 13.5000 [g/cc]
Temperature ..... 20.00 [°C]

High Pressure

Data File Name S522301H.PRM
Analysis Date 02/23/2005
# of repeat cycles 0
Penetrometer Constant . 2701 [mV/cc]
Auto-Oil Fill Time .... 5 [sec]
Run Mode ..... Fixed Speed
Motor Speed 1

Low Pressure

Data File Name S5223011.PRM
Analysis Date 02/23/2005
# of repeat cycles 0
Penetrometer Constant . 3307 [mV/cc]
Evacuation Rate 8
Fine Evac. Until ..... 0.5000 [min.]
Coarse Evac. Until .... 4.0000 [min.]

265 Points Acquired	170 Pts in Intrusion Range	95 Pts in Extrusion Range
263 Points Used	169 Intrusion Pts Used	94 Extrusion Pts Used

Quantachrome Instruments
Quantachrome Poremaster for Windows® Data Report
Version 4.03

Sample ID	test 90	**File Name**	S522301H_Merged.PRM
Sample Weight	15.9264 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 1r		
Comments	fired balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Intrusion Statistics

Pressure Range : 2.190 PSIA to 4978.938 PSIA
Pore Diameter Range : 97.387611 µm to 0.042845 µm

Pore Diameter Statistics Summary

	Mean	Mode (df/d(log D))	Median
Volume	4.224E-03 cc/g at a diameter of 1.513E+01 µm	1.775E+02 cc/(µm-g) at a diameter of 9.739E+01 µm	2.171E-03 cc/g at a diameter of 8.455E+01 µm
Surface Area	2.570E-04 m²/g at a diameter of 1.513E+01 µm	1.416E-06 m²/(µm-g) at a diameter of 1.251E-01 µm	5.738E-04 m²/g at a diameter of 1.560E-01 µm
Pore Number Fraction	3.647E-05 at a diameter of 1.251E-01 µm	1.025E-06 at a diameter of 1.251E-01 µm	5.046E-01 at a diameter of 1.326E-01 µm

Mercury Porosimetry Data Summary

Total Intruded Volume	0.0043 cc/g	Bulk (Particle) Density	n/a [g/cc]
Total Surface Area	0.0011 m²/g	Apparent Density	n/a [g/cc]

Quantachrome Instruments
Quantachrome Poremaster for Windows® Data Report
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Sample ID	test 90	**File Name**	S522301H_Merged.PRM
Sample Weight	15.9264 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 lr		
Comments	fired ballls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Total Surface Area 0.0011 m²/g Apparent Density n/a [g/cc]

Extrusion Statistics

Pressure Range : 4967.960 PSIA to 21.098 PSIA
Pore Diameter Range : 0.042940 µm to 10.111179 µm

Pore Diameter Statistics Summary

	Mean	Mode (df/d(log D))	Median
Volume	4.342E-03 cc/g at a diameter of 1.943E-01 µm	1.223E+00 cc/(µm-g) at a diameter of 1.323E-01 µm	4.321E-03 cc/g at a diameter of 1.616E-01 µm
Surface Area	1.148E-03 m²/g at a diameter of 1.943E-01 µm	1.343E-06 m²/(µm-g) at a diameter of 1.284E-01 µm	7.120E-04 m²/g at a diameter of 1.412E-01 µm
Pore Number Fraction	5.210E-06 at a diameter of 1.943E-01 µm	9.426E-07 at a diameter of 1.284E-01 µm	5.542E-01 at a diameter of 1.365E-01 µm

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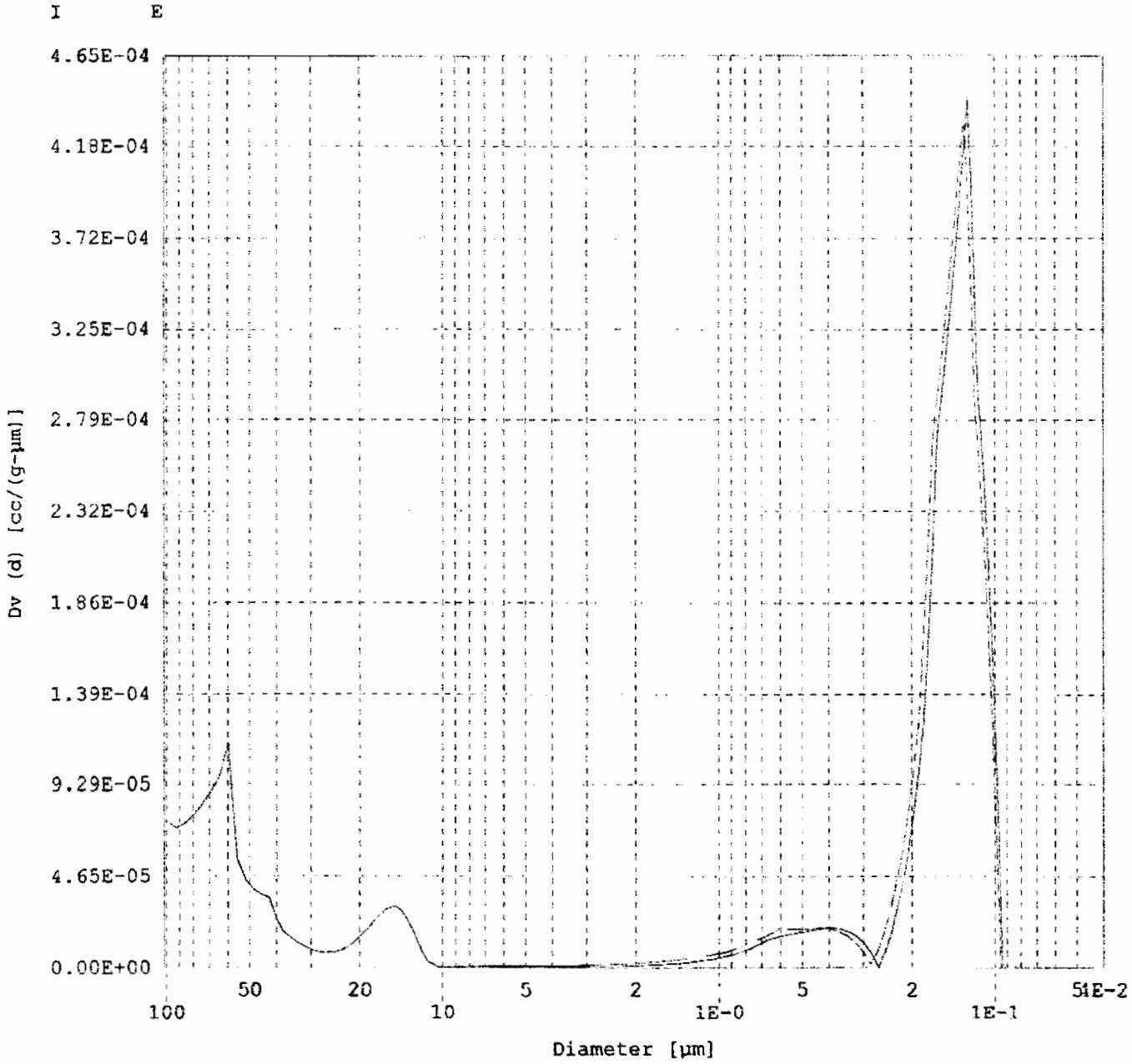
Sample ID	test 90	**File Name**	S522301H_Merged.PRM
Sample Weight	15.9264 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 1r		
Comments	fired ballls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Dv(d) vs. Pore Size



Quantachrome Instruments
Quantachrome Poremaster for Windows® Data Report
Version 4.03

Sample ID	test 91	**File Name**	S522401H_Merged.PRM
Sample Weight	16.6624 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 2		
Comments	fired ballls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Data Acquisition Parameters

Density of Mercury ..... 13.5000 [g/cc]
Temperature ..... 20.00 [°C]

High Pressure

Data File Name S522401H.PRM
Analysis Date 02/24/2005
# of repeat cycles 0
Penetrometer Constant . 2701 [mV/cc]
Auto-Oil Fill Time .... 5 [sec]
Run Mode ..... Fixed Speed
Motor Speed 1

Low Pressure

Data File Name S5224011.PRM
Analysis Date 02/24/2005
# of repeat cycles 0
Penetrometer Constant . 3307 [mV/cc]
Evacuation Rate 8
Fine Evac. Until ..... 0.5000 [min.]
Coarse Evac. Until .... 4.0000 [min.]

478 Points Acquired	310 Pts in Intrusion Range	168 Pts in Extrusion Range
476 Points Used	309 Intrusion Pts Used	167 Extrusion Pts Used

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Sample ID	test 91	**File Name**	S522401H_Merged.PRM
Sample Weight	16.6624 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 2		
Comments	fired balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(R)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Intrusion Statistics

Pressure Range : 3.260 PSIA to 4979.312 PSIA
Pore Diameter Range : 65.438307 µm to 0.042642 µm

Pore Diameter Statistics Summary

	Mean	Mode (df/d(log D))	Median
Volume	4.107E-02 cc/g at a diameter of 1.968E+00 µm	3.383E+03 cc/(µm-g) at a diameter of 2.358E+00 µm	3.150E-02 cc/g at a diameter of 2.152E+00 µm
Surface Area	6.776E-02 m²/g at a diameter of 1.968E+00 µm	1.065E-05 m²/(µm-g) at a diameter of 2.335E+00 µm	6.402E-02 m²/g at a diameter of 1.987E+00 um
Pore Number Fraction	1.636E-02 at a diameter of 1.075E+00 µm	7.832E-06 at a diameter of 1.075E+00 µm	5.060E-01 at a diameter of 1.652E+00 um

Mercury Porosimetry Data Summary

Total Intruded Volume	0.0630 cc/g	Bulk (Particle) Density	n/a [g/cc]
Total Surface Area	0.1280 m²/g	Apparent Density	n/a [g/cc]

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Sample ID	test 31	**File Name**	S522401H_Merged.PRM
Sample Weight	16.6624 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 2		
Comments	fired balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Total Surface Area 0.1280 m²/g Apparent Density n/a [g/cc]

Extrusion Statistics

Pressure Range : 4966.688 PSIA to 20.075 PSIA
Pore Diameter Range : 0.042951 µm to 10.626344 µm

Pore Diameter Statistics Summary

	Mean	Mode (df/d(log D))	Median
Volume	6.301E-02 cc/g at a diameter of 1.246E+00 µm	2.833E+01 cc/(µm-g) at a diameter of 1.063E+01 µm	6.339E-02 cc/g at a diameter of 4.461E-02 µm
Surface Area	1.263E-01 m²/g at a diameter of 1.248E+00 µm	6.949E-07 m²/(µm-g) at a diameter of 3.550E-01 µm	1.268E-01 m²/g at a diameter of 3.996E-01 µm
Pore Number Fraction	8.793E-03 at a diameter of 1.248E+00 µm	4.455E-07 at a diameter of 3.550E-01 µm	5.203E-01 at a diameter of 3.938E-01 µm

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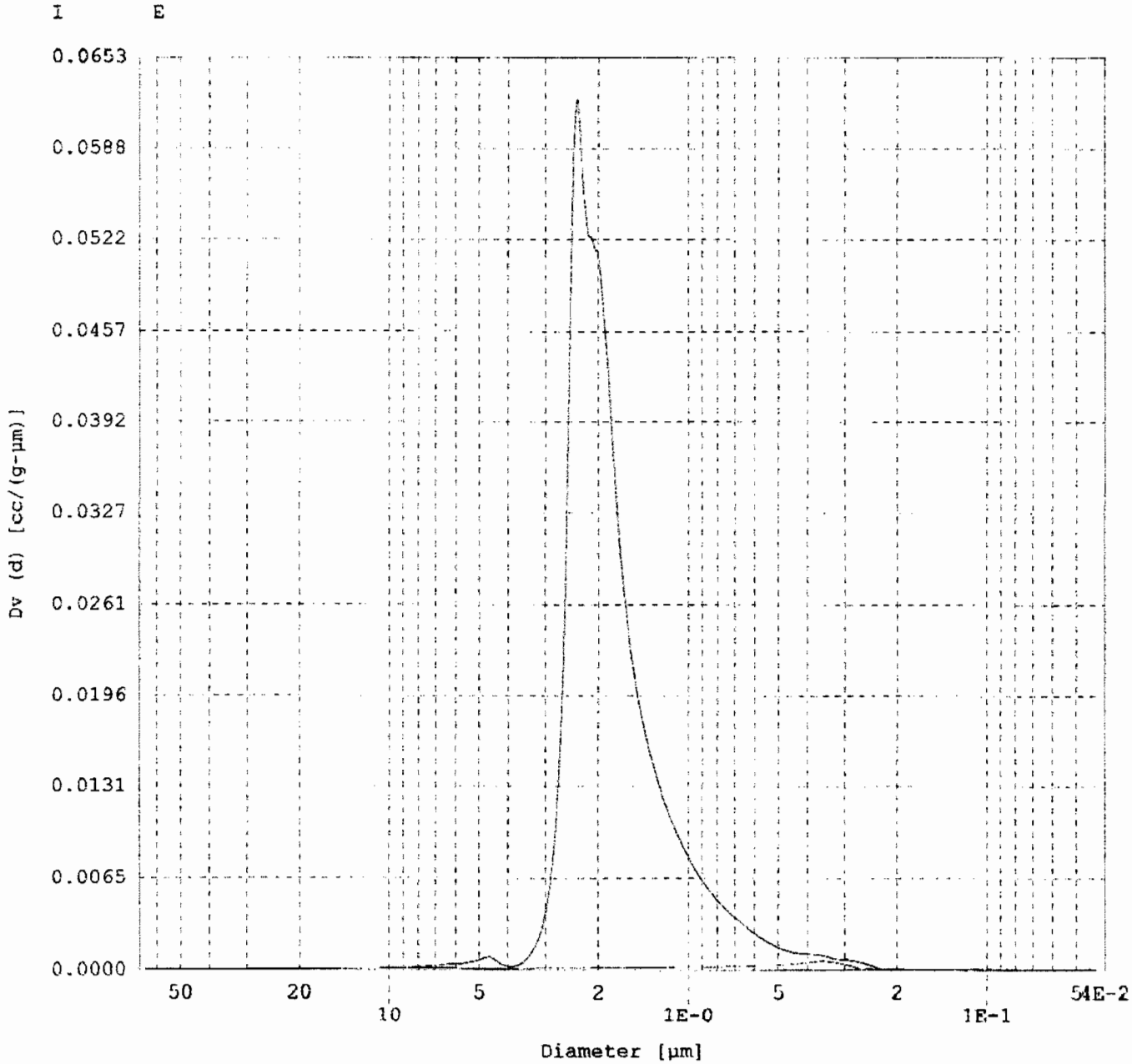
Sample ID	test 91	**File Name**	S522401H_Merged.PRM
Sample Weight	16.6624 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 2		
Comments	fired ballls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Dv(d) vs. Pore Size



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Sample ID	test 92	**File Name**	S522402H_Merged.PRM
Sample Weight	16.5807 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 3		
Comments	fired balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Data Acquisition Parameters

Density of Mercury ..... 13.5000 [g/cc]
Temperature ..... 20.00 [°C]

High Pressure

Data File Name S522402H.PRM
Analysis Date 02/24/2005
# of repeat cycles 0
Penetrometer Constant . 2701 [mV/cc]
Auto-Oil Fill Time .... 5 [sec]
Run Mode ..... Fixed Speed
Motor Speed 1

Low Pressure

Data File Name S5224021.PRM
Analysis Date 02/24/2005
# of repeat cycles 0
Penetrometer Constant . 3307 [mV/cc]
Evacuation Rate 8
Fine Evac. Until ..... 0.5000 [min.]
Coarse Evac. Until .... 4.0000 [min.]

446 Points Acquired	288 Pts in Intrusion Range	158 Pts in Extrusion Range
441 Points Used	287 Intrusion Pts Used	154 Extrusion Pts Used

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Sample ID	test 92	**File Name**	S522402H_Merged.PRM
Sample Weight	16.5807 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 3		
Comments	fired balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Intrusion Statistics

Pressure Range : 2.563 PSIA to 4970.930 PSIA
Pore Diameter Range : 83.231316 µm to 0.042914 µm

Pore Diameter Statistics Summary

	Mean	Mode (df/d(log D))	Median
Volume	5.048E-02 cc/g at a diameter of 1.523E+00 µm	2.834E+03 cc/(µm-g) at a diameter of 2.283E+00 µm	3.043E-02 cc/g at a diameter of 2.066E+00 µm
Surface Area	9.349E-02 m²/g at a diameter of 1.523E+00 µm	1.947E-04 m²/(µm-g) at a diameter of 4.916E-02 µm	7.991E-02 m²/g at a diameter of 1.708E+00 µm
Pore Number Fraction	2.961E-03 at a diameter of 4.979E-02 µm	1.439E-04 at a diameter of 4.979E-02 µm	5.153E-01 at a diameter of 5.391E-02 µm

Mercury Porosimetry Data Summary

Total Intruded Volume	0.0609 cc/g	Bulk (Particle) Density	n/a [g/cc]
Total Surface Area	0.1598 m²/g	Apparent Density	n/a [g/cc]

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Sample ID	test 92	**File Name**	S522402H_Merged.PRM
Sample Weight	16.5807 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 3		
Comments	fired ballls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Total Surface Area 0.1598 m²/g Apparent Density n/a [g/cc]

Extrusion Statistics

Pressure Range : 4963.246 PSIA to 19.875 PSIA
Pore Diameter Range : 0.042980 µm to 10.733052 µm

Pore Diameter Statistics Summary

	Mean	Mode (df/d(log D))	Median
Volume	6.070E-02 cc/g at a diameter of 2.322E-01 µm	2.059E+02 cc/(µm-g) at a diameter of 1.073E+01 µm	6.148E-02 cc/g at a diameter of 4.566E-02 µm
Surface Area	1.396E-01 m²/g at a diameter of 2.322E-01 µm	1.841E-04 m²/(µm-g) at a diameter of 5.017E-02 µm	1.490E-01 m²/g at a diameter of 5.175E-02 µm
Pore Number Fraction	4.918E-04 at a diameter of 2.322E-01 µm	1.339E-04 at a diameter of 5.017E-02 µm	5.591E-01 at a diameter of 5.085E-02 µm

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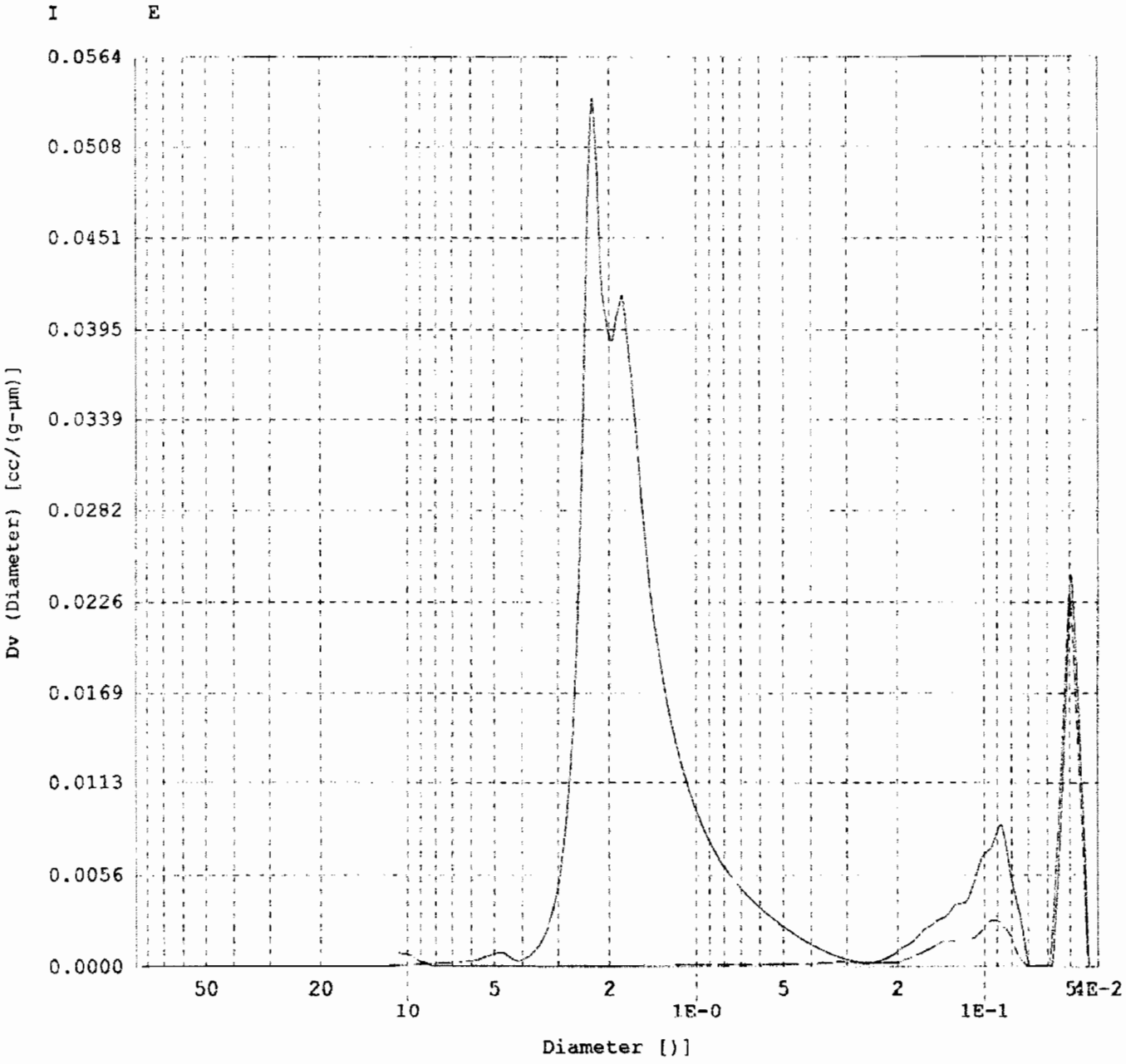
Sample ID	test 92	**File Name**	S522402H_Merged.PRM
Sample Weight	16.5807 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 3		
Comments	fired ballls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Dv(d) vs. Pore Size



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Sample ID	test107	**File Name**	S530901H_Merged.PRM
Sample Weight	16.6385 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	minntac pot grate 1 05 3		
Comments	fired balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rig	Mercury volume normalized by sample weight.	

Standard Report

Data Acquisition Parameters

Density of Mercury ..... 13.5000 [g/cc]
Temperature ..... 20.00 [°C]

High Pressure

Data File Name S530901H.PRM
Analysis Date 03/09/2005
# of repeat cycles 0
Penetrometer Constant . 2701 [mV/cc]
Auto-Oil Fill Time .... 5 [sec]
Run Mode ..... Fixed Speed
Motor Speed 1

Low Pressure

Data File Name S5309011.PRM
Analysis Date 03/09/2005
# of repeat cycles 0
Penetrometer Constant . 3307 [mV/cc]
Evacuation Rate 8
Fine Evac. Until ..... 0.5000 [min.]
Coarse Evac. Until .... 4.0000 [min.]

470 Points Acquired	287 Pts in Intrusion Range	183 Pts in Extrusion Range
468 Points Used	286 Intrusion Pts Used	182 Extrusion Pts Used

Quantachrome Instruments
Quantachrome Poremaster for Windows® Data Report
Version 4.03

Sample ID	test107	**File Name**	S530901H_Merged.PRM
Sample Weight	16.6385 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	minntac pot grate 1 05 3		
Comments	fired ballls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Intrusion Statistics

Pressure Range : 3.000 PSIA to 5011.770 PSIA
Pore Diameter Range : 71.097282 µm to 0.042564 µm

Pore Diameter Statistics Summary

	Mean	Mode (df/d(log D))	Median
Volume	3.261E-02 cc/g at a diameter of 2.083E+00 µm	2.594E+03 cc/(µm-g) at a diameter of 2.320E+00 µm	2.571E-02 cc/g at a diameter of 2.237E+00 µm
Surface Area	4.991E-02 m²/g at a diameter of 2.083E+00 µm	8.426E-06 m²/(µm-g) at a diameter of 2.294E+00 µm	4.936E-02 m²/g at a diameter of 2.076E+00 µm
Pore Number Fraction	1.834E-02 at a diameter of 1.844E+00 µm	6.199E-06 at a diameter of 1.844E+00 µm	5.029E-01 at a diameter of 1.690E+00 µm

Mercury Porosimetry Data Summary

Total Intruded Volume	0.0514 cc/g	Bulk (Particle) Density	n/a [g/cc]
Total Surface Area	0.0987 m²/g	Apparent Density	n/a [g/cc]

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Sample ID	test107	**File Name**	S530901H_Merged.PRM
Sample Weight	16.6385 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	minntac pot grate 1 05 3		
Comments	fired balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Total Surface Area 0.0987 m²/g Apparent Density n/a [g/cc]

Extrusion Statistics

Pressure Range : 4968.410 PSIA to 20.025 PSIA
Pore Diameter Range : 0.042936 µm to 10.652622 µm

Pore Diameter Statistics Summary

	Mean	Mode (df/d(log D))	Median
Volume	5.141E-02 cc/g at a diameter of 2.941E-01 µm	2.817E+00 cc/(µm-g) at a diameter of 3.256E-01 µm	5.137E-02 cc/g at a diameter of 2.753E-01 µm
Surface Area	9.872E-02 m²/g at a diameter of 2.941E-01 µm	6.691E-07 m²/(µm-g) at a diameter of 2.206E-01 µm	9.808E-02 m²/g at a diameter of 2.753E-01 µm
Pore Number Fraction	1.981E-04 at a diameter of 2.941E-01 µm	4.586E-07 at a diameter of 2.206E-01 µm	5.028E-01 at a diameter of 2.497E-01 µm

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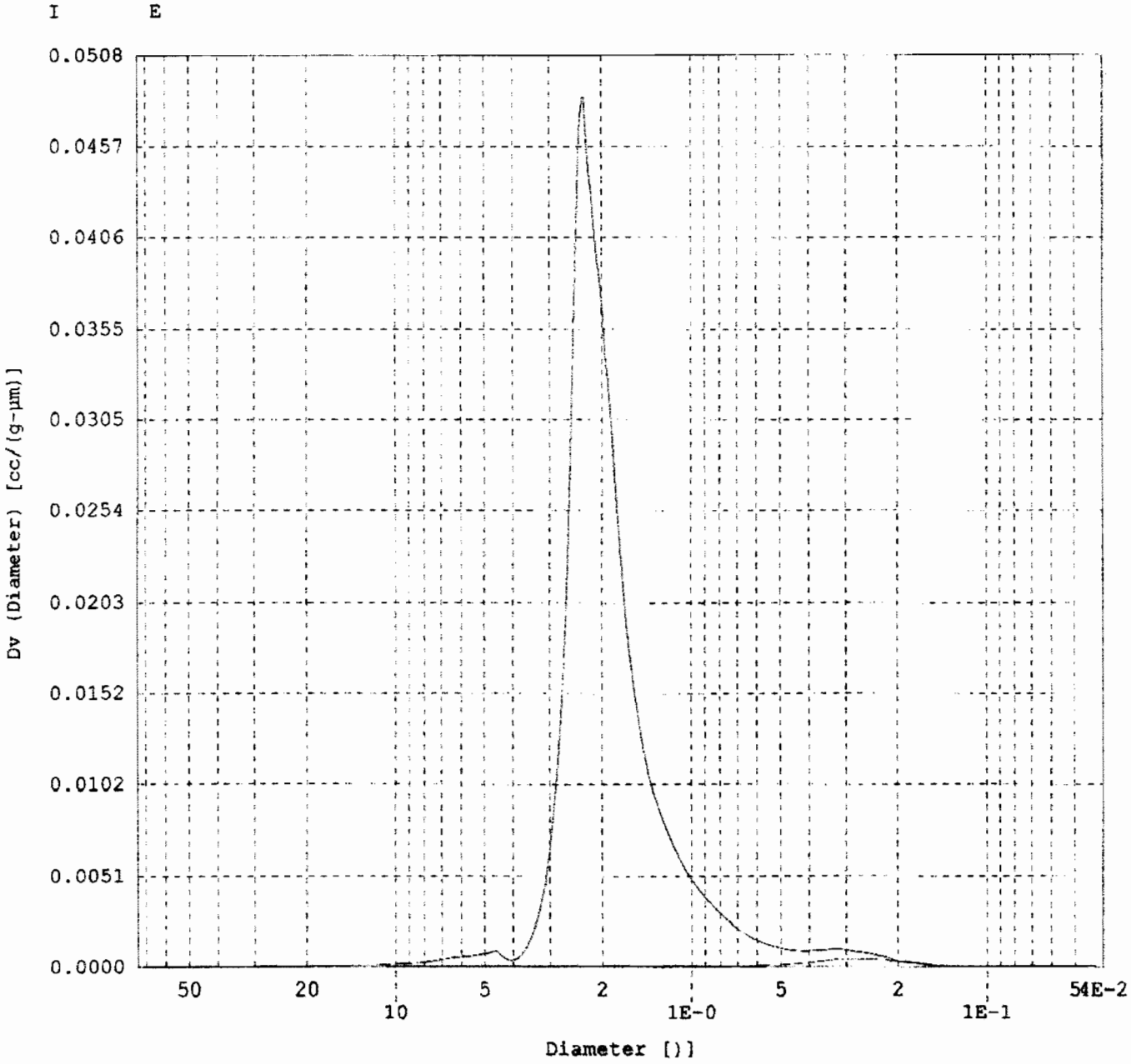
Sample ID	test107	**File Name**	S530901H_Merged.PRM
Sample Weight	16.6385 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	minntac pot grate 1 05 3		
Comments	fired ballls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Dv(d) vs. Pore Size



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Sample ID	test 93	**File Name**	S522403H_Merged.PRM
Sample Weight	15.5416 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 4		
Comments	fired balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Data Acquisition Parameters

Density of Mercury ..... 13.5000 [g/cc]
Temperature ..... 20.00 [°C]

High Pressure

Data File Name S522403H.PRM
Analysis Date 02/24/2005
# of repeat cycles 0
Penetrometer Constant . 2701 [mV/cc]
Auto-Oil Fill Time .... 5 [sec]
Run Mode ..... Fixed Speed
Motor Speed 1

Low Pressure

Data File Name S5224031.PRM
Analysis Date 02/24/2005
# of repeat cycles 0
Penetrometer Constant . 3307 [mV/cc]
Evacuation Rate 8
Fine Evac. Until ..... 0.5000 [min.]
Coarse Evac. Until .... 4.0000 [min.]

508 Points Acquired	335 Pts in Intrusion Range	173 Pts in Extrusion Range
504 Points Used	334 Intrusion Pts Used	170 Extrusion Pts Used

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Sample ID	test 93	**File Name**	S522403H_Merged.PRM
Sample Weight	15.5416 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 4		
Comments	fired ballis		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Intrusion Statistics

Pressure Range : 2.891 PSIA to 4956.235 PSIA
Pore Diameter Range : 73.797157 µm to 0.043041 µm

Pore Diameter Statistics Summary

	Mean	Mode (df/d(log D))	Median
Volume	7.315E-02 cc/g at a diameter of 8.629E-01 µm	5.293E+03 cc/(µm-g) at a diameter of 1.516E+00 µm	4.474E-02 cc/g at a diameter of 1.398E+00 µm
Surface Area	2.072E-01 m²/g at a diameter of 8.629E-01 µm	2.498E-04 m²/(µm-g) at a diameter of 4.304E-02 µm	2.074E-01 m²/g at a diameter of 8.715E-01 µm
Pore Number Fraction	2.631E-03 at a diameter of 4.304E-02 µm	1.775E-04 at a diameter of 4.304E-02 µm	5.056E-01 at a diameter of 7.079E-02 µm

Mercury Porosimetry Data Summary

Total Intruded Volume	0.0895 cc/g	Bulk (Particle) Density	n/a [g/cc]
Total Surface Area	0.4148 m²/g	Apparent Density	n/a [g/cc]

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Sample ID	test 93	**File Name**	S522403H_Merged.PRM
Sample Weight	15.5416 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pct 1 05 4		
Comments	firod balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Total Surface Area 0.4148 m²/g Apparent Density n/a [g/cc]

Extrusion Statistics

Pressure Range : 4954.040 PSIA to 19.925 PSIA
Pore Diameter Range : 0.043060 µm to 10.706175 µm

Pore Diameter Statistics Summary

	Mean	Mode (df/d(log D))	Median
Volume	8.949E-02 cc/g at a diameter of 1.651E-01 µm	1.541E+01 cc/(µm-g) at a diameter of 8.071E+00 µm	8.904E-02 cc/g at a diameter of 6.045E-02 µm
Surface Area	4.148E-01 m²/g at a diameter of 1.651E-01 µm	6.587E-05 m²/(µm-g) at a diameter of 4.972E-02 µm	4.041E-01 m²/g at a diameter of 4.790E-02 µm
Pore Number Fraction	6.335E-04 at a diameter of 1.651E-01 µm	4.716E-05 at a diameter of 4.972E-02 µm	5.181E-01 at a diameter of 5.476E-02 µm

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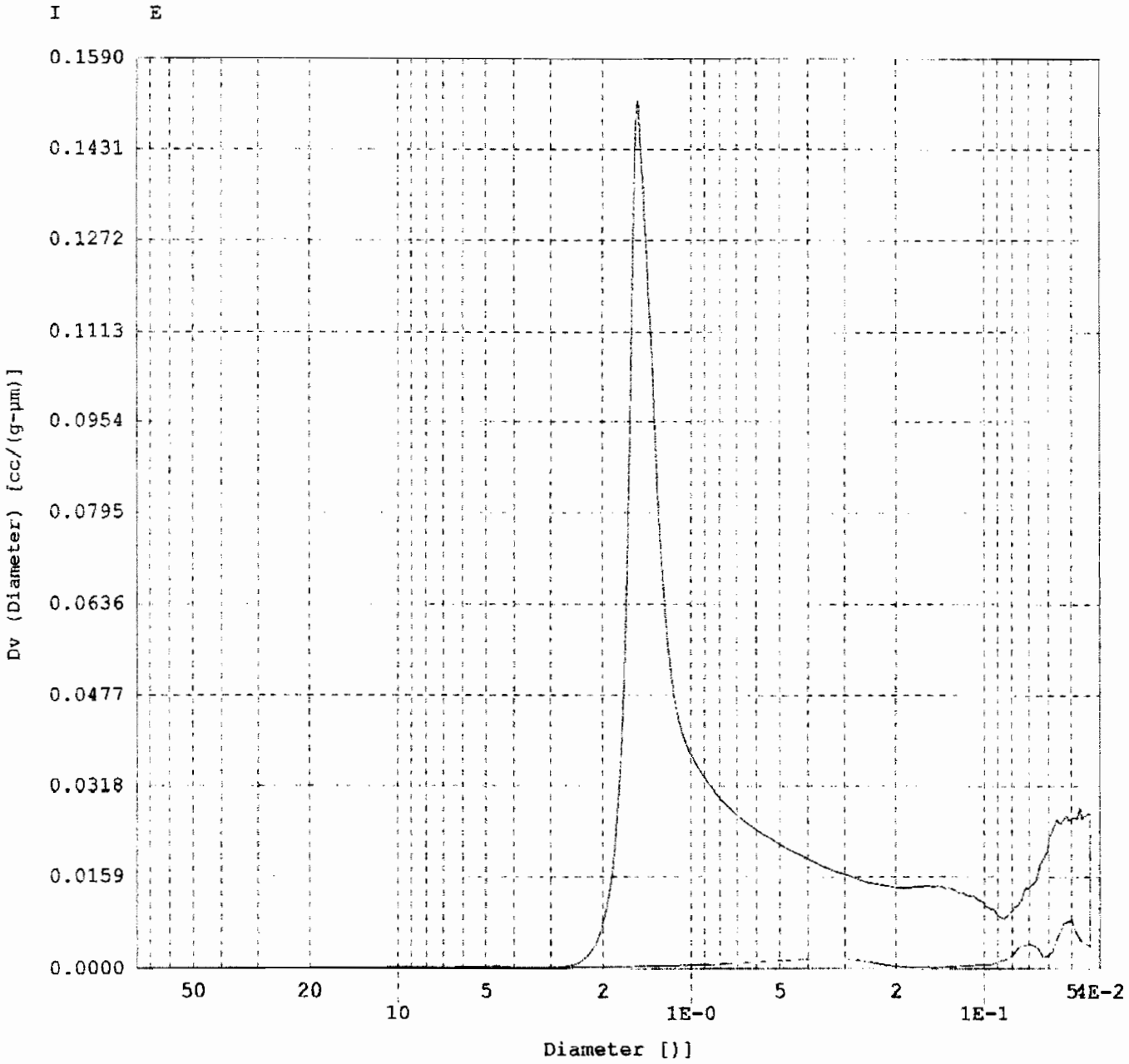
Sample ID	test 93	**File Name**	S522403H_Merged.PRM
Sample Weight	15.5416 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 4		
Comments	fired ballls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Dv(d) vs. Pore Size



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Sample ID	test 94	**File Name**	S522501H_Merged.PRM
Sample Weight	16.4472 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 5		
Comments	fired balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Data Acquisition Parameters

Density of Mercury ..... 13.5000 [g/cc]
Temperature ..... 20.00 [°C]

High Pressure

Data File Name S522501H.PRM
Analysis Date 02/25/2005
# of repeat cycles 0
Penetrometer Constant . 2701 [mV/cc]
Auto-Oil Fill Time .... 5 [sec]
Run Mode ..... Fixed Speed
Motor Speed 1

Low Pressure

Data File Name S522501L.PRM
Analysis Date 02/25/2005
# of repeat cycles 0
Penetrometer Constant . 3307 [mV/cc]
Evacuation Rate 8
Fine Evac. Until ..... 0.5000 [min.]
Coarse Evac. Until .... 4.0000 [min.]

479 Points Acquired	322 Pts in Intrusion Range	157 Pts in Extrusion Range
477 Points Used	321 Intrusion Pts Used	156 Extrusion Pts Used

Quantachrome Instruments
Quantachrome Poremaster for Windows® Data Report
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Sample ID	test 94	**File Name**	S522501H_Merged.PRM
Sample Weight	16.4472 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 5		
Comments	fired balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Intrusion Statistics

Pressure Range : 3.023 PSIA to 4940.118 PSIA
Pore Diameter Range : 70.569168 µm to 0.043182 µm

Pore Diameter Statistics Summary

	Mean	Mode (df/d(log D))	Median
Volume	7.004E-02 cc/g at a diameter of 9.035E-01 µm	4.747E+03 cc/(µm-g) at a diameter of 1.530E+00 µm	4.348E-02 cc/g at a diameter of 1.461E+00 µm
Surface Area	1.923E-01 m²/g at a diameter of 9.035E-01 µm	1.348E-04 m²/(µm-g) at a diameter of 6.232E-02 µm	1.925E-01 m²/g at a diameter of 9.125E-01 µm
Pore Number Fraction	3.273E-03 at a diameter of 6.232E-02 um	9.899E-05 at a diameter of 6.232E-02 µm	5.047E-01 at a diameter of 1.028E-01 µm

Mercury Porosimetry Data Summary

Total Intruded Volume	0.0870 cc/g	Bulk (Particle) Density	n/a [g/cc]
Total Surface Area	0.3850 m²/g	Apparent Density	n/a [g/cc]

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Sample ID	test 94	**File Name**	S522501H_Merged.PRM
Sample Weight	16.4472 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 5		
Comments	fired balllls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Total Surface Area 0.3850 m²/g Apparent Density n/a [g/cc]

Extrusion Statistics

Pressure Range : 4939.570 PSIA to 20.025 PSIA
Pore Diameter Range : 0.043186 µm to 10.652822 µm

Pore Diameter Statistics Summary

	Mean	Mode (df/d(log D))	Median
Volume	8.697E-02 cc/g at a diameter of 4.309E-01 µm	1.619E+01 cc/(µm-g) at a diameter of 2.731E+00 µm	9.566E-02 cc/g at a diameter of 1.435E-01 µm
Surface Area	3.850E-01 m²/g at a diameter of 4.309E-01 µm	3.602E-05 m²/(µm-g) at a diameter of 4.829E-02 µm	3.729E-01 m²/g at a diameter of 6.232E-02 um
Pore Number Fraction	1.097E-04 at a diameter of 4.309E-01 um	2.613E-05 at a diameter of 4.829E-02 µm	5.038E-01 at a diameter of 7.953E-02 µm

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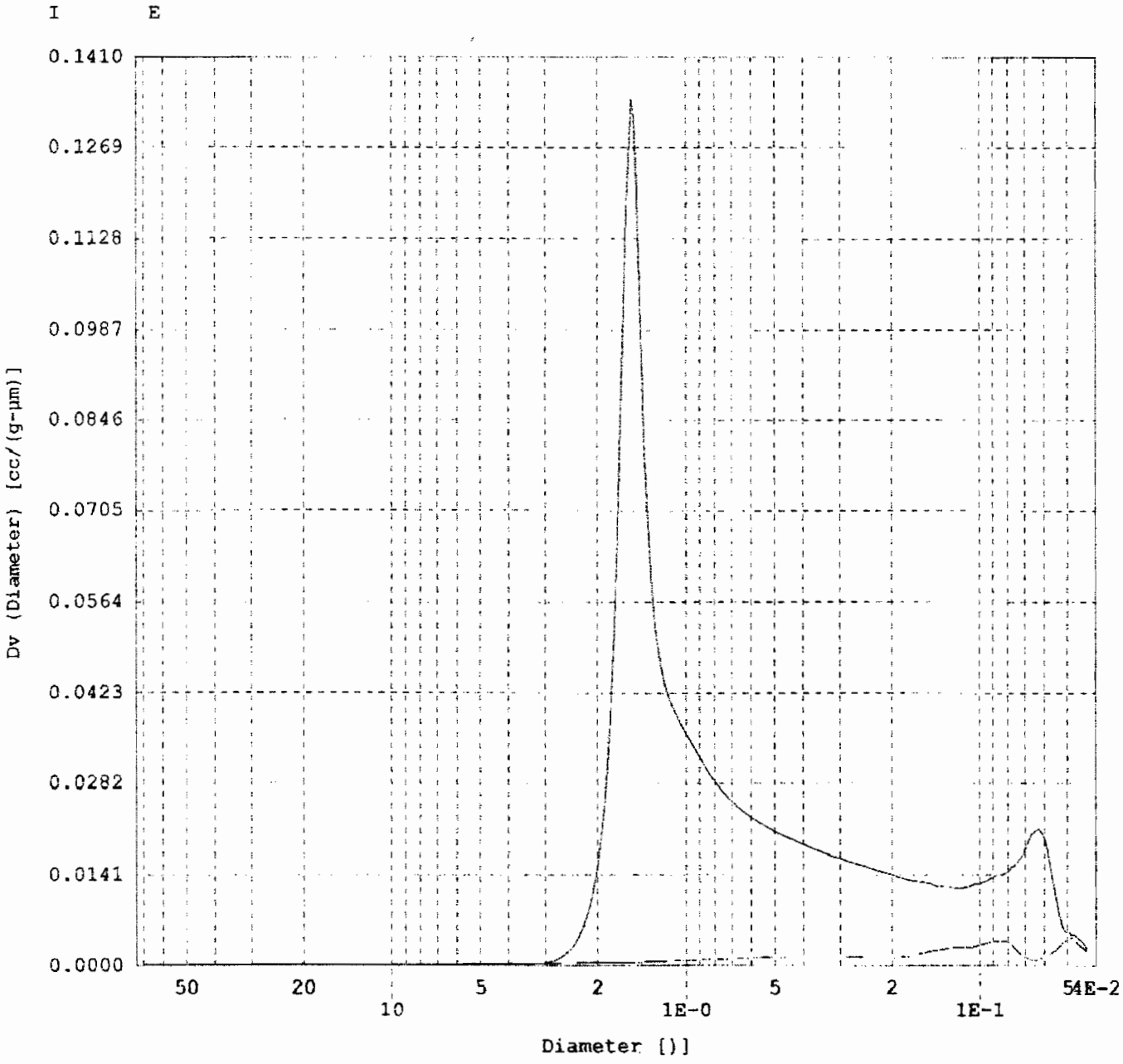
Sample ID	test 94	**File Name**	S522501H_Merged.PRM
Sample Weight	16.4472 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 5		
Comments	fired ballls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Dv(d) vs. Pore Size



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Sample ID	test 95	**File Name**	S522502H_Merged.PRM
Sample Weight	16.4164 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 6		
Comments	fired ballls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Data Acquisition Parameters

Density of Mercury ..... 13.5000 [g/cc]
Temperature ..... 20.00 [°C]

High Pressure

Data File Name S522502H.PRM
Analysis Date 02/25/2005
# of repeat cycles 0
Penetrometer Constant . 2701 [mV/cc]
Auto-Oil Fill Time .... 5 [sec]
Run Mode ..... Fixed Speed
Motor Speed 1

Low Pressure

Data File Name S5225021.PRM
Analysis Date 02/25/2005
# of repeat cycles 0
Penetrometer Constant . 3307 [mV/cc]
Evacuation Rate 8
Fine Evac. Until ..... 0.5000 [min.]
Coarse Evac. Until .... 4.0000 [min.]

487 Points Acquired	323 Pts in Intrusion Range	164 Pts in Extrusion Range
484 Points Used	322 Intrusion Pts Used	162 Extrusion Pts Used

Quantachrome Instruments
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Sample ID	test 95	**File Name**	S522502H_Merged.PRM
Sample Weight	16.4164 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 6		
Comments	fired balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Intrusion Statistics

Pressure Range : 2.321 PSIA to 5011.794 PSIA
Pore Diameter Range : 91.909332 µm to 0.042564 µm

Pore Diameter Statistics Summary

	Mean	Mode (dV/d(log D))	Median
Volume	6.225E-02 cc/g at a diameter of 1.014E+00 µm	4.199E+03 cc/(µm-g) at a diameter of 1.521E+00 µm	4.131E-02 cc/g at a diameter of 1.410E+00 µm
Surface Area	1.635E-01 m²/g at a diameter of 1.014E+00 µm	4.893E-05 m²/(µm-g) at a diameter of 5.435E-02 µm	1.630E-01 m²/g at a diameter of 1.021E+00 µm
Pore Number Fraction	5.215E-03 at a diameter of 3.745E-01 µm	3.610E-05 at a diameter of 3.745E-01 µm	5.044E-01 at a diameter of 2.442E-01 µm

Mercury Porosimetry Data Summary

Total Intruded Volume	0.0826 cc/g	Bulk (Particle) Density	n/a [g/cc]
Total Surface Area	0.3261 m²/g	Apparent Density	n/a [g/cc]

Quantachrome Instruments
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Sample ID	test 95	**File Name**	S522502H_Merged.PRM
Sample Weight	16.4164 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 6		
Comments	fired balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Total Surface Area 0.3261 m²/g Apparent Density n/a [g/cc]

Extrusion Statistics

Pressure Range : 4966.239 PSIA to 19.950 PSIA
Pore Diameter Range : 0.042954 µm to 10.692787 µm

Pore Diameter Statistics Summary

	Mean	Mode (df/d(log D))	Median
Volume	8.263E-02 cc/g at a diameter of 5.454E+00 µm	5.661E+02 cc/(µm-g) at a diameter of 1.069E+01 µm	7.832E-02 cc/g at a diameter of 4.507E-01 µm
Surface Area	3.261E-01 m²/g at a diameter of 5.454E+00 µm	1.598E-07 m²/(µm-g) at a diameter of 9.495E-01 µm	3.229E-01 m²/g at a diameter of 5.745E-02 µm
Pore Number Fraction	0.000E+00 at a diameter of 5.454E+00 µm	9.256E-08 at a diameter of 1.035E+00 µm	5.048E-01 at a diameter of 1.337E+00 µm

Report date: 09/13/2005

Merged File

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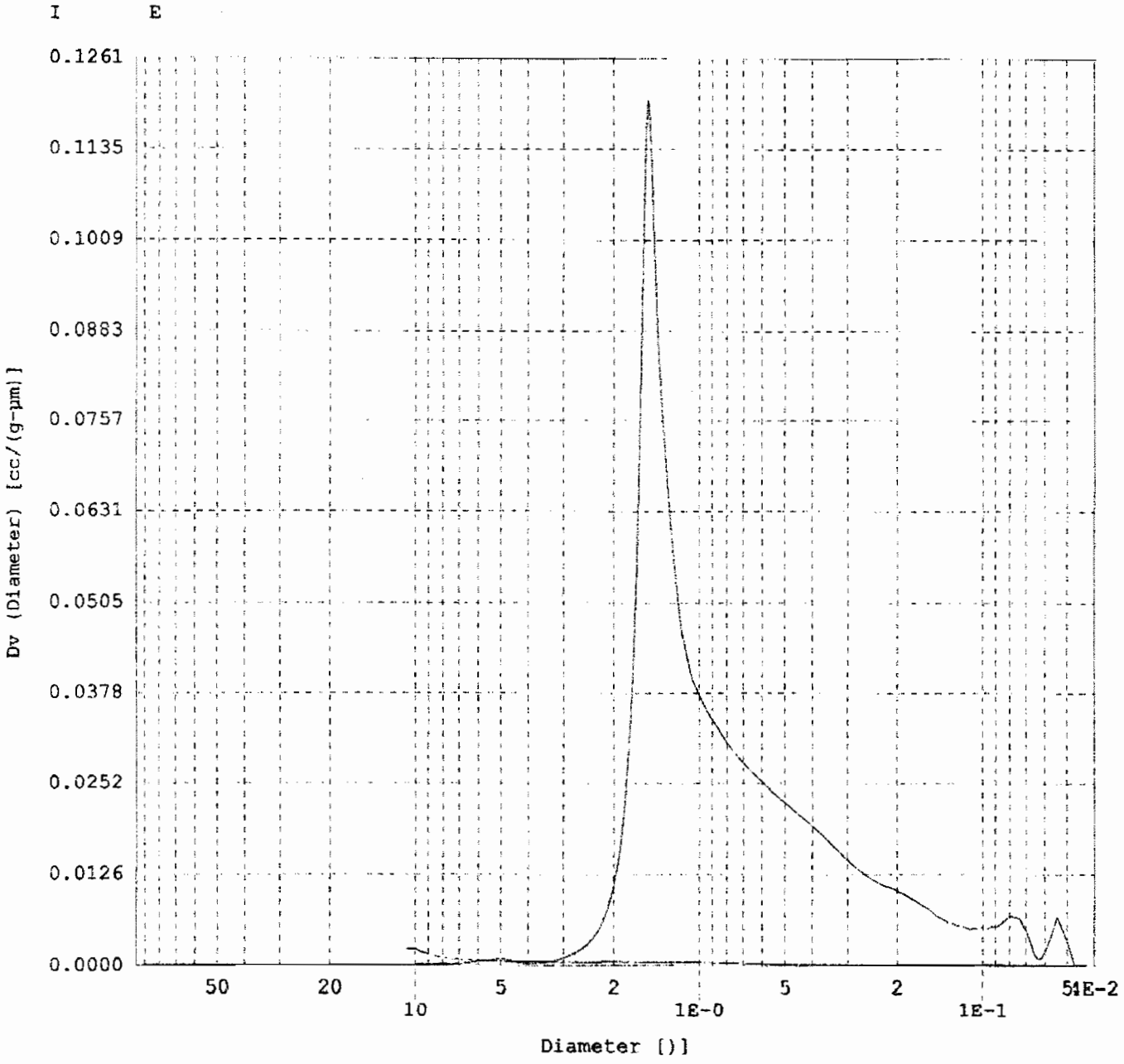
Sample ID	test 95	**File Name**	S522502H_Merged.PRM
Sample Weight	16.4164 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 6		
Comments	fired ballls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Dv(d) vs. Pore Size



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Sample ID	test 96	**File Name**	S522503H_Merged.PRM
Sample Weight	15.7757 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 7		
Comments	fired balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Data Acquisition Parameters

Density of Mercury ..... 13.5000 [g/cc]
Temperature ..... 20.00 [°C]

High Pressure

Data File Name S522503H.PRM
Analysis Date 02/25/2005
# of repeat cycles 0
Penetrometer Constant . 2701 [mV/cc]
Auto-Oil Fill Time .... 5 [sec]
Run Mode ..... Fixed Speed
Motor Speed 1

Low Pressure

Data File Name S5225031.PRM
Analysis Date 02/25/2005
# of repeat cycles 0
Penetrometer Constant . 3307 [mV/cc]
Evacuation Rate 8
Fine Evac. Until ..... 0.5000 [min.]
Coarse Evac. Until .... 4.0000 [min.]

528 Points Acquired 365 Pts in Intrusion Range 163 Pts in Extrusion Range
525 Points Used 364 Intrusion Pts Used 161 Extrusion Pts Used

Quantachrome Instruments
Quantachrome Poremaster for Windows© Data Report
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Sample ID	test 96	**File Name**	S522503H_Merged.PRM
Sample Weight	15.7757 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 7		
Comments	fired balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Intrusion Statistics

Pressure Range : 2.114 PSIA to 5000.992 PSIA
Pore Diameter Range : 100.912285 µm to 0.042656 µm

Pore Diameter Statistics Summary

	Mean	Mode (df/d(log D))	Median
Volume	6.879E-02 cc/g at a diameter of 7.599E-01 µm	4.569E+03 cc/(µm-g) at a diameter of 1.279E+00 µm	4.150E-02 cc/g at a diameter of 1.199E+00 µm
Surface Area	2.264E-01 m²/g at a diameter of 7.599E-01 µm	2.109E-04 m²/(µm-g) at a diameter of 4.674E-02 µm	2.184E-01 m²/g at a diameter of 8.042E-01 µm
Pore Number Fraction	3.081E-03 at a diameter of 4.674E-02 µm	1.550E-04 at a diameter of 4.674E-02 µm	5.022E-01 at a diameter of 7.902E-02 µm

Mercury Porosimetry Data Summary

Total Intruded Volume	0.0030 cc/g	Bulk (Particle) Density	n/a [g/cc]
Total Surface Area	0.4369 m²/g	Apparent Density	n/a [g/cc]

Quantachrome Instruments
Quantachrome Poremaster for Windows® Data Report
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Sample ID	test 96	**File Name**	S522503H_Merged.PRM
Sample Weight	15.7757 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 7		
Comments	fired balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Total Surface Area 0.4369 m²/g Apparent Density n/a [g/cc]

Extrusion Statistics

Pressure Range : 4971.902 PSIA to 19.875 PSIA
Pore Diameter Range : 0.042906 µm to 10.733052 µm

Pore Diameter Statistics Summary

	Mean	Mode (df/d(log D))	Median
Volume	8.299E-02 cc/g at a diameter of 3.707E-01 µm	2.720E+01 cc/(µm-g) at a diameter of 8.432E+00 µm	8.254E-02 cc/g at a diameter of 6.335E-02 µm
Surface Area	4.369E-01 m²/g at a diameter of 3.707E-01 µm	6.563E-05 m²/(µm-g) at a diameter of 4.291E-02 µm	4.319E-01 m²/g at a diameter of 4.552E-02 µm
Pore Number Fraction	5.678E-02 at a diameter of 3.707E-01 µm	4.671E-05 at a diameter of 4.291E-02 µm	5.278E-01 at a diameter of 4.568E-02 µm

Report date: 09/13/2005 Merged File

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Quantachrome Poremaster for Windows® Data Report
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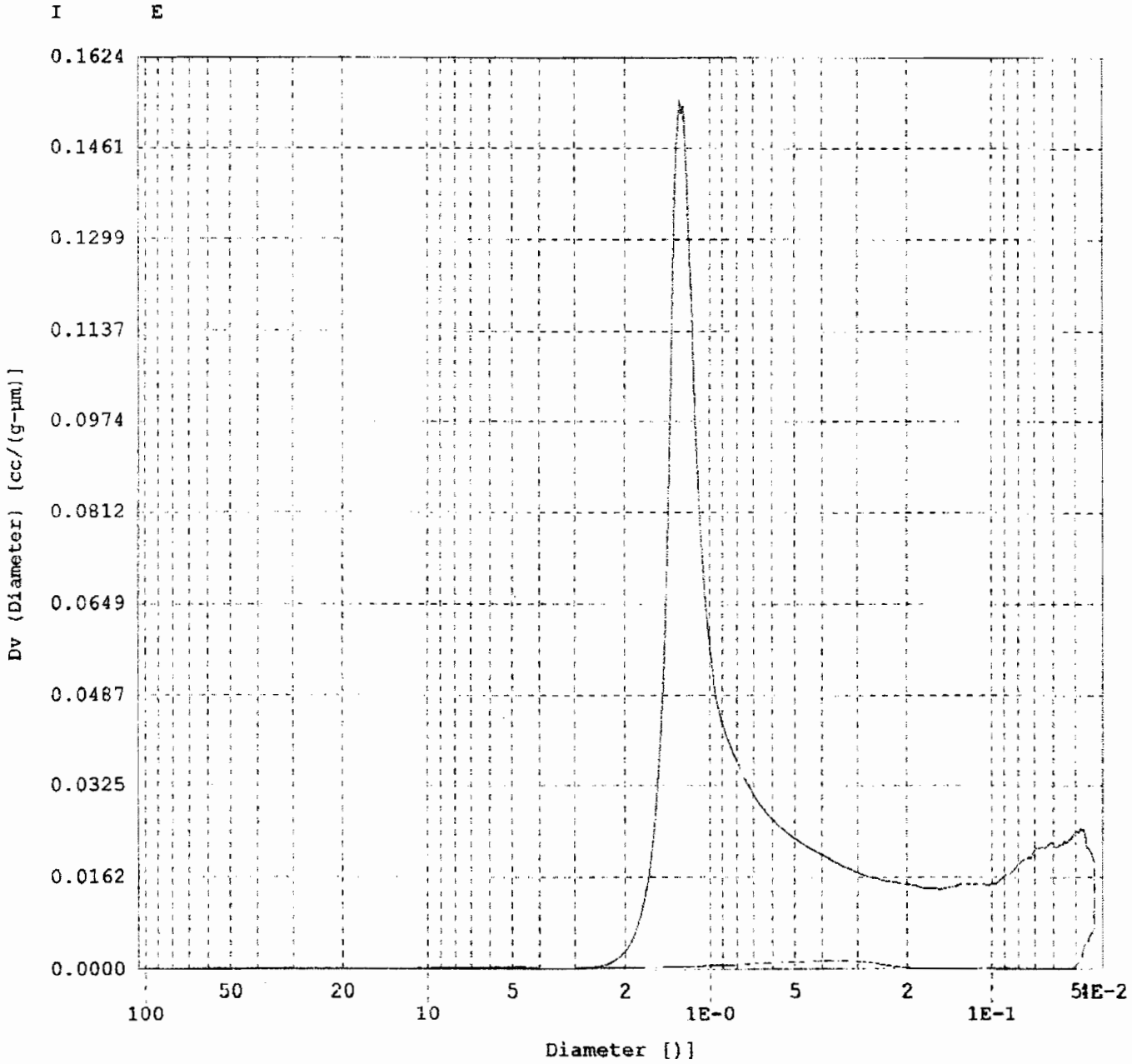
Sample ID	test 96	**File Name**	S522503H_Merged.PRM
Sample Weight	15.7757 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 7		
Comments	fired ballls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Dv(d) vs. Pore Size



Report date: 09/13/2005 Merged File

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Quantachrome Poremaster for Windows® Data Report
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Sample ID	test 97	**File Name**	S530301H_Merged.PRM
Sample Weight	16.6985 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 8		
Comments	fired ballls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Data Acquisition Parameters

Density of Mercury ..... 13.5000 [g/cc]
Temperature ..... 20.00 [°C]

High Pressure

Data File Name S530301H.PRM
Analysis Date 03/03/2005
# of repeat cycles 0
Penetrometer Constant . 2701 [mV/cc]
Auto-Oil Fill Time .... 5 [sec]
Run Mode ..... Fixed Speed
Motor Speed 1

Low Pressure

Data File Name S5303011.PRM
Analysis Date 03/03/2005
# of repeat cycles 0
Penetrometer Constant . 3307 [mV/cc]
Evacuation Rate 8
Fine Evac. Until ..... 0.5000 [min.]
Coarse Evac. Until .... 4.0000 [min.]

490 Points Acquired	322 Pts in Intrusion Range	168 Pts in Extrusion Range
488 Points Used	321 Intrusion Pts Used	167 Extrusion Pts Used

Quantachrome Instruments
Quantachrome Poremaster for Windows® Data Report
Version 4.03

Sample ID	test 97	**File Name**	S530301H_Merged.PRM
Sample Weight	16.6985 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 8		
Comments	fired balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Intrusion Statistics

Pressure Range : 3.653 PSIA to 4979.087 PSIA
Pore Diameter Range : 58.392670 µm to 0.042844 µm

Pore Diameter Statistics Summary

	Mean	Mode (df/d(log D))	Median
Volume	6.819E-02 cc/g at a diameter of 8.508E-01 µm	4.536E+03 cc/(µm-g) at a diameter of 1.320E+00 µm	4.249E-02 cc/g at a diameter of 1.276E+00 µm
Surface Area	2.068E-01 m²/g at a diameter of 8.508E-01 µm	2.472E-04 m²/(µm-g) at a diameter of 4.284E-02 µm	1.996E-01 m²/g at a diameter of 9.108E-01 µm
Pore Number Fraction	3.383E-03 at a diameter of 4.284E-02 µm	1.752E-04 at a diameter of 4.284E-02 µm	5.040E-01 at a diameter of 9.722E-02 µm

Mercury Porosimetry Data Summary

Total Intruded Volume	0.0850 cc/g	Bulk (Particle) Density	n/a [g/cc]
Total Surface Area	0.3995 m²/g	Apparent Density	n/a [g/cc]

Quantachrome Instruments
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Sample ID	test 97	**File Name**	S530301H_Merged.PRM
Sample Weight	16.6985 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 8		
Comments	fired balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Total Surface Area 0.3995 m²/g Apparent Density n/a [g/cc]

Extrusion Statistics

Pressure Range : 4977.441 PSIA to 20.025 PSIA
Pore Diameter Range : 0.042858 µm to 10.652822 µm

Pore Diameter Statistics Summary

	Mean	Mode (df/d(log D))	Median
Volume	8.498E-02 cc/g at a diameter of 2.887E-01 µm	1.798E+01 cc/(µm-g) at a diameter of 4.743E-02 µm	8.383E-02 cc/g at a diameter of 1.394E-01 µm
Surface Area	3.995E-01 m²/g at a diameter of 2.887E-01 µm	1.648E-04 m²/(µm-g) at a diameter of 4.286E-02 µm	3.837E-01 m²/g at a diameter of 5.926E-02 µm
Pore Number Fraction	1.440E-03 at a diameter of 2.887E-01 µm	1.162E-04 at a diameter of 4.286E-02 µm	5.105E-01 at a diameter of 5.000E-02 µm

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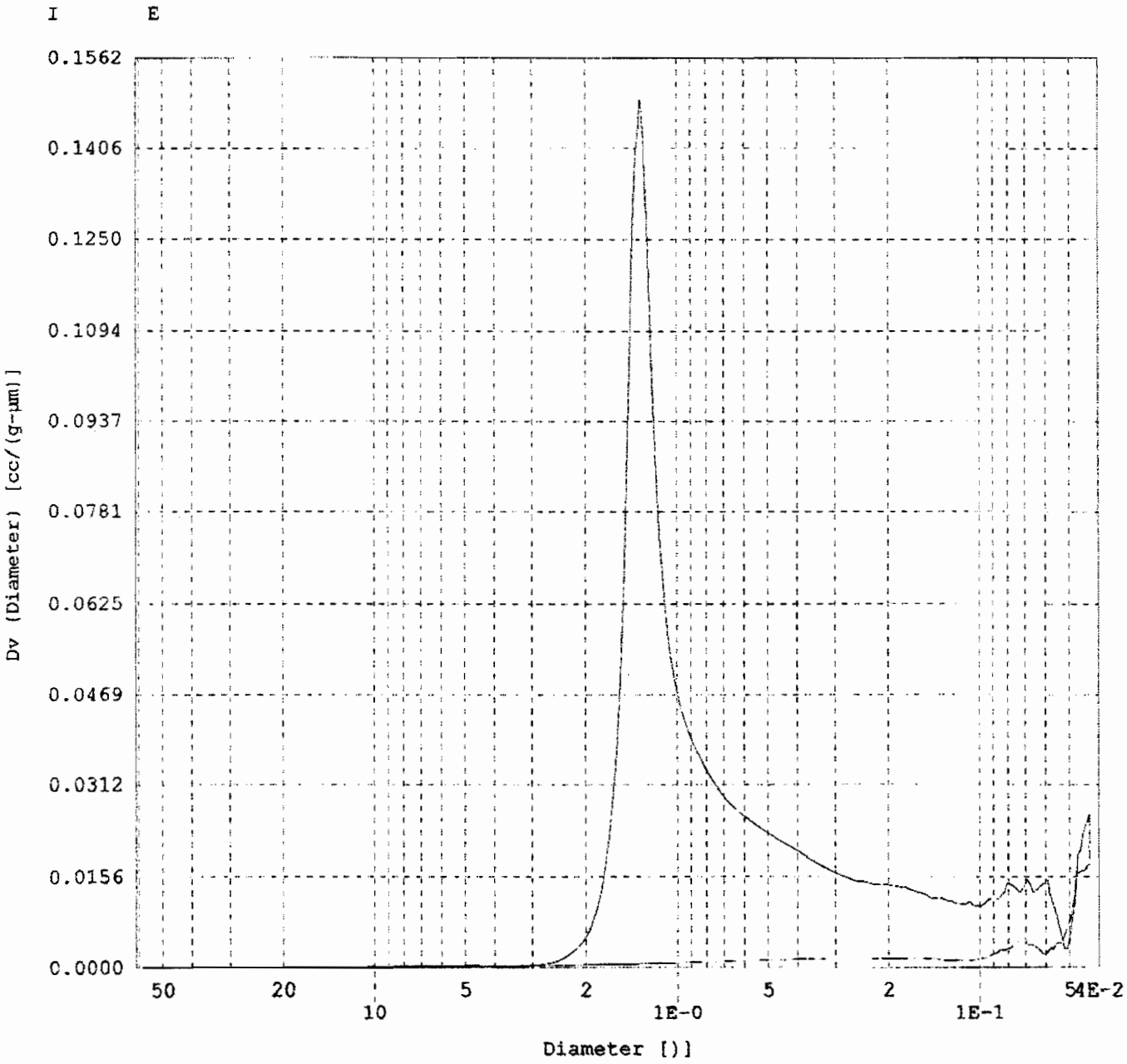
Sample ID	test 97	**File Name**	S530301H_Merged.PRM
Sample Weight	16.6985 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 8		
Comments	fired ballls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Dv(d) vs. Pore Size



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Sample ID	test 98	**File Name**	S530401H_Merged.PRM
Sample Weight	15.6696 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 9		
Comments	fired ballls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Data Acquisition Parameters

Density of Mercury ..... 13.5000 [g/cc]
Temperature ..... 20.00 [°C]

High Pressure

Data File Name S530401H.PRM
Analysis Date 03/04/2005
# of repeat cycles 0
Penetrometer Constant . 2701 [mV/cc]
Auto-Oil Fill Time .... 5 [sec]
Run Mode ..... Fixed Speed
Motor Speed 1

Low Pressure

Data File Name S5304021.PRM
Analysis Date 03/04/2005
# of repeat cycles 0
Penetrometer Constant . 3307 [mV/cc]
Evacuation Rate 8
Fine Evac. Until ..... 0.5000 [min.]
Coarse Evac. Until .... 4.0000 [min.]

482 Points Acquired	312 Pts in Intrusion Range	170 Pts in Extrusion Range
480 Points Used	311 Intrusion Pts Used	169 Extrusion Pts Used

Quantachrome Instruments
Quantachrome Poremaster for Windows® Data Report
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Sample ID	test 98	**File Name**	S530401H_Merged.PRM
Sample Weight	15.6696 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 9		
Comments	fired balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Intrusion Statistics

Pressure Range : 2.125 PSIA to 4961.474 PSIA
Pore Diameter Range : 100.398827 µm to 0.042996 µm

Pore Diameter Statistics Summary

	Mean	Mode (df/d(log D))	Median
Volume	5.938E-02 cc/g at a diameter of 9.538E-01 µm	4.906E+03 cc/(µm-g) at a diameter of 1.363E+00 µm	4.018E-02 cc/g at a diameter of 1.269E+00 µm
Surface Area	1.745E-01 m²/g at a diameter of 9.538E-01 µm	4.608E-05 m²/(µm-g) at a diameter of 1.352E+00 µm	1.685E-01 m²/g at a diameter of 9.800E-01 µm
Pore Number Fraction	7.009E-03 at a diameter of 8.957E-02 µm	3.387E-05 at a diameter of 8.957E-02 µm	5.132E-01 at a diameter of 3.528E-01 µm

Mercury Porosimetry Data Summary

Total Intruded Volume	0.0804 cc/g	Bulk (Particle) Density	n/a [g/cc]
Total Surface Area	0.3370 m²/g	Apparent Density	n/a [g/cc]

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Sample ID	test 98	**File Name**	S530401H_Merged.PRM
Sample Weight	15.6696 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 9		
Comments	fired ballls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Total Surface Area 0.3370 m²/g Apparent Density n/a (g/cc)

Extrusion Statistics

Pressure Range : 4957.632 PSIA to 20.075 PSIA
Pore Diameter Range : 0.043029 µm to 10.626344 µm

Pore Diameter Statistics Summary

	Mean	Mode (df/d(log D))	Median
Volume	8.036E-02 cc/g at a diameter of 1.882E+00 µm	8.735E+02 cc/(µm-g) at a diameter of 1.063E+01 µm	7.335E-02 cc/g at a diameter of 5.494E-01 µm
Surface Area	3.370E-01 m²/g at a diameter of 1.882E+00 µm	7.171E-05 m²/(µm-g) at a diameter of 8.108E-02 µm	3.221E-01 m²/g at a diameter of 1.546E-01 µm
Pore Number Fraction	0.000E+00 at a diameter of 1.882E+00 µm	5.149E-05 at a diameter of 8.108E-02 µm	5.352E-01 at a diameter of 8.295E-02 µm

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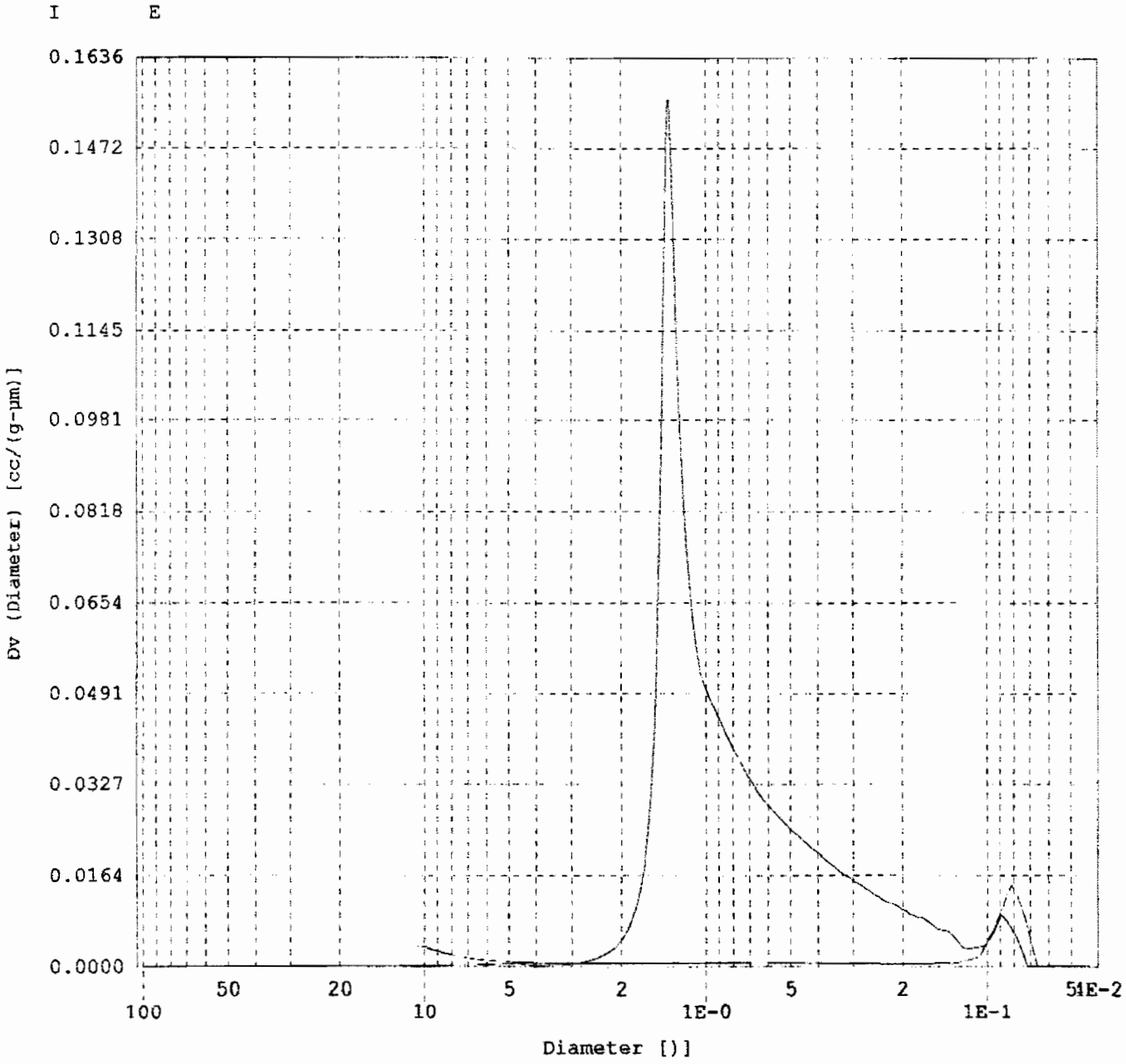
Sample ID	test 98	**File Name**	S530401H_Merged.PRM
Sample Weight	15.6696 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 9		
Comments	fired ballls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Dv(d) vs. Pore Size



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Quantachrome Poremaster for Windows® Data Report
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Sample ID	test99	**File Name**	S530402H_Merged.PRM
Sample Weight	16.8367 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 10		
Comments	firod ballls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Data Acquisition Parameters

Density of Mercury ..... 13.5000 [g/cc]
Temperature ..... 20.00 [°C]

High Pressure

Data File Name S530402H.PRM
Analysis Date 03/04/2005
# of repeat cycles 0
Penetrometer Constant . 2701 [mV/cc]
Auto-Oil Fill Time .... 5 [sec]
Run Mode ..... Fixed Speed
Motor Speed 1

Low Pressure

Data File Name S5304031.PRM
Analysis Date 03/04/2005
# of repeat cycles 0
Penetrometer Constant . 3307 [mV/cc]
Evacuation Rate 8
Fine Evac. Until ..... 0.5000 [min.]
Coarse Evac. Until .... 4.0000 [min.]

527 Points Acquired 366 Pts in Intrusion Range 161 Pts in Extrusion Range
524 Points Used 365 Intrusion Pts Used 159 Extrusion Pts Used

Quantachrome Instruments
Quantachrome Poremaster for Windows® Data Report
Version 4.03

Sample ID	test99	**File Name**	S530402H_Merged.PRM
Sample Weight	16.8367 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 10		
Comments	fired balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Intrusion Statistics

Pressure Range : 2.721 PSIA to 4996.402 PSIA
Pore Diameter Range : 78.398224 µm to 0.042695 µm

Pore Diameter Statistics Summary

	Mean	Mode (df/d(log D))	Median
Volume	7.270E-02 cc/g at a diameter of 7.583E-01 µm	5.951E+03 cc/(µm-g) at a diameter of 1.268E+00 µm	4.477E-02 cc/g at a diameter of 1.182E+00 µm
Surface Area	2.423E-01 m²/g at a diameter of 7.583E-01 µm	3.185E-04 m²/(µm-g) at a diameter of 4.270E-02 µm	2.362E-01 m²/g at a diameter of 7.900E-01 µm
Pore Number Fraction	3.201E-03 at a diameter of 4.321E-02 µm	2.270E-04 at a diameter of 4.321E-02 µm	5.003E-01 at a diameter of 8.143E-02 µm

Mercury Porosimetry Data Summary

Total Intruded Volume	0.0895 cc/g	Bulk (Particle) Density	n/a [g/cc]
Total Surface Area	0.4723 m²/g	Apparent Density	n/a [g/cc]

Quantachrome Instruments
Quantachrome Poremaster for Windows® Data Report
Version 4.03

Sample ID	test99	**File Name**	S530402H_Merged.PRM
Sample Weight	16.8367 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pct 1 05 10		
Comments	fired balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Total Surface Area 0.4723 m²/g Apparent Density n/a [g/cc]

Extrusion Statistics

Pressure Range : 4964.568 PSIA to 20.050 PSIA
Pore Diameter Range : 0.042969 µm to 10.639566 µm

Pore Diameter Statistics Summary

	Mean	Mode (df/d(log D))	Median
Volume	8.954E-02 cc/g at a diameter of 1.453E-01 µm	1.459E+01 cc/(µm-g) at a diameter of 4.297E-02 µm	8.901E-02 cc/g at a diameter of 6.681E-02 µm
Surface Area	4.723E-01 m²/g at a diameter of 1.453E-01 µm	1.420E-04 m²/(µm-g) at a diameter of 4.297E-02 µm	4.576E-01 m²/g at a diameter of 4.778E-02 µm
Pore Number Fraction	2.508E-02 at a diameter of 1.453E-01 µm	1.006E-04 at a diameter of 4.297E-02 µm	5.010E-01 at a diameter of 5.150E-02 µm

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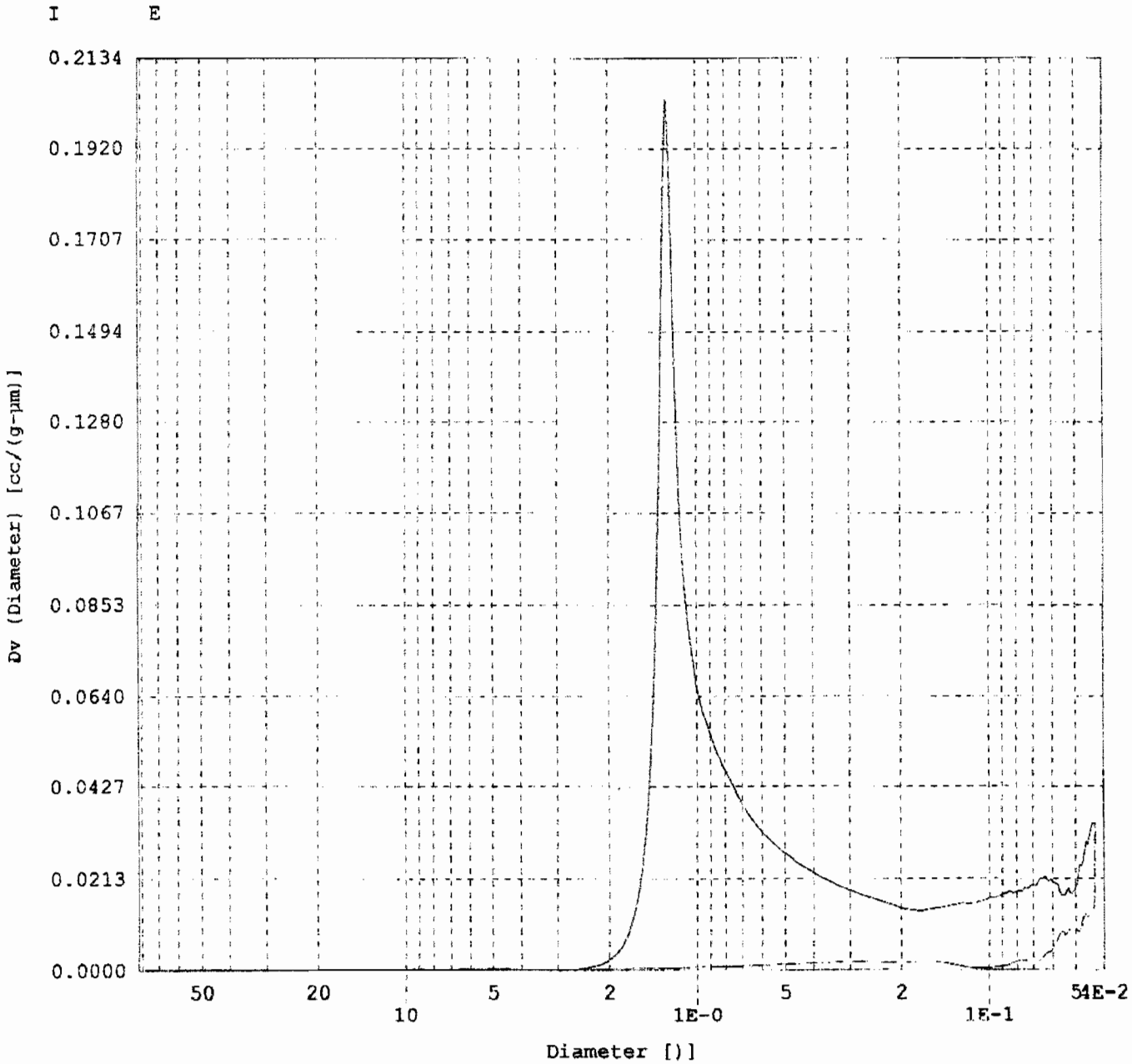
Sample ID	test99	**File Name**	S530402H_Merged.PRM
Sample Weight	16.8367 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 10		
Comments	fired balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Dv(d) vs. Pore Size



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Sample ID	test100	**File Name**	S530403H_Merged.PRM
Sample Weight	16.2935 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 11		
Comments	fired balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Data Acquisition Parameters

Density of Mercury ..... 13.5000 [g/cc]
Temperature ..... 20.00 [°C]

High Pressure

Data File Name S530403H.PRM
Analysis Date 03/04/2005
# of repeat cycles 0
Penetrometer Constant . 2701 [mV/cc]
Auto-Oil Fill Time .... 5 [sec]
Run Mode ..... Fixed Speed
Motor Speed 1

Low Pressure

Data File Name S5304041.PRM
Analysis Date 03/04/2005
# of repeat cycles 0
Penetrometer Constant . 3307 [mV/cc]
Evacuation Rate 8
Fine Evac. Until ..... 0.5000 [min.]
Coarse Evac. Until .... 4.0000 [min.]

510 Points Acquired 329 Pts in Intrusion Range 181 Pts in Extrusion Range
508 Points Used 328 Intrusion Pts Used 180 Extrusion Pts Used

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Sample ID	test100	**File Name**	S530403H_Merged.PRM
Sample Weight	16.2935 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 11		
Comments	fired balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Intrusion Statistics

Pressure Range : 2.766 PSIA to 4992.186 PSIA
Pore Diameter Range : 77.125366 µm to 0.042731 µm

Pore Diameter Statistics Summary

	Mean	Mode (dƒ/d(log D))	Median
Volume	6.656E-02 cc/g at a diameter of 8.150E-01 µm	4.076E+03 cc/(µm-g) at a diameter of 1.178E+00 µm	4.270E-02 cc/g at a diameter of 1.120E+00 µm
Surface Area	2.205E-01 m²/g at a diameter of 8.150E-01 µm	8.327E-05 m²/(µm-g) at a diameter of 6.320E-02 µm	2.095E-01 m²/g at a diameter of 8.472E-01 µm
Pore Number Fraction	5.137E-03 at a diameter of 6.320E-02 µm	6.121E-05 at a diameter of 6.320E-02 µm	5.014E-01 at a diameter of 1.608E-01 µm

Mercury Porosimetry Data Summary

Total Intruded Volume	0.0854 cc/g	Bulk (Particle) Density	n/a [g/cc]
Total Surface Area	0.4191 m²/g	Apparent Density	n/a [g/cc]

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Sample ID	test100	**File Name**	S530403H_Merged.PRM
Sample Weight	16.2935 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 11		
Comments	fired ballls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(R)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Total Surface Area 0.4191 m²/g Apparent Density n/a [g/cc]

Extrusion Statistics

Pressure Range : 4960.900 PSIA to 20.075 PSIA
Pore Diameter Range : 0.043001 µm to 10.626344 µm

Pore Diameter Statistics Summary

	Mean	Mode (df/d(log D))	Median
Volume	8.539E-02 cc/g at a diameter of 2.028E+00 µm	1.851E+01 cc/(µm-g) at a diameter of 1.063E+01 µm	8.457E-02 cc/g at a diameter of 1.258E-01 µm
Surface Area	4.191E-01 m²/g at a diameter of 2.028E+00 µm	2.475E-07 m²/(µm-g) at a diameter of 7.661E-01 µm	4.175E-01 m²/g at a diameter of 5.310E-02 µm
Pore Number Fraction	0.000E+00 at a diameter of 2.028E+00 µm	1.541E-07 at a diameter of 8.219E-01 µm	5.535E-01 at a diameter of 9.460E-01 µm

Report date: 09/13/2005 Merged File

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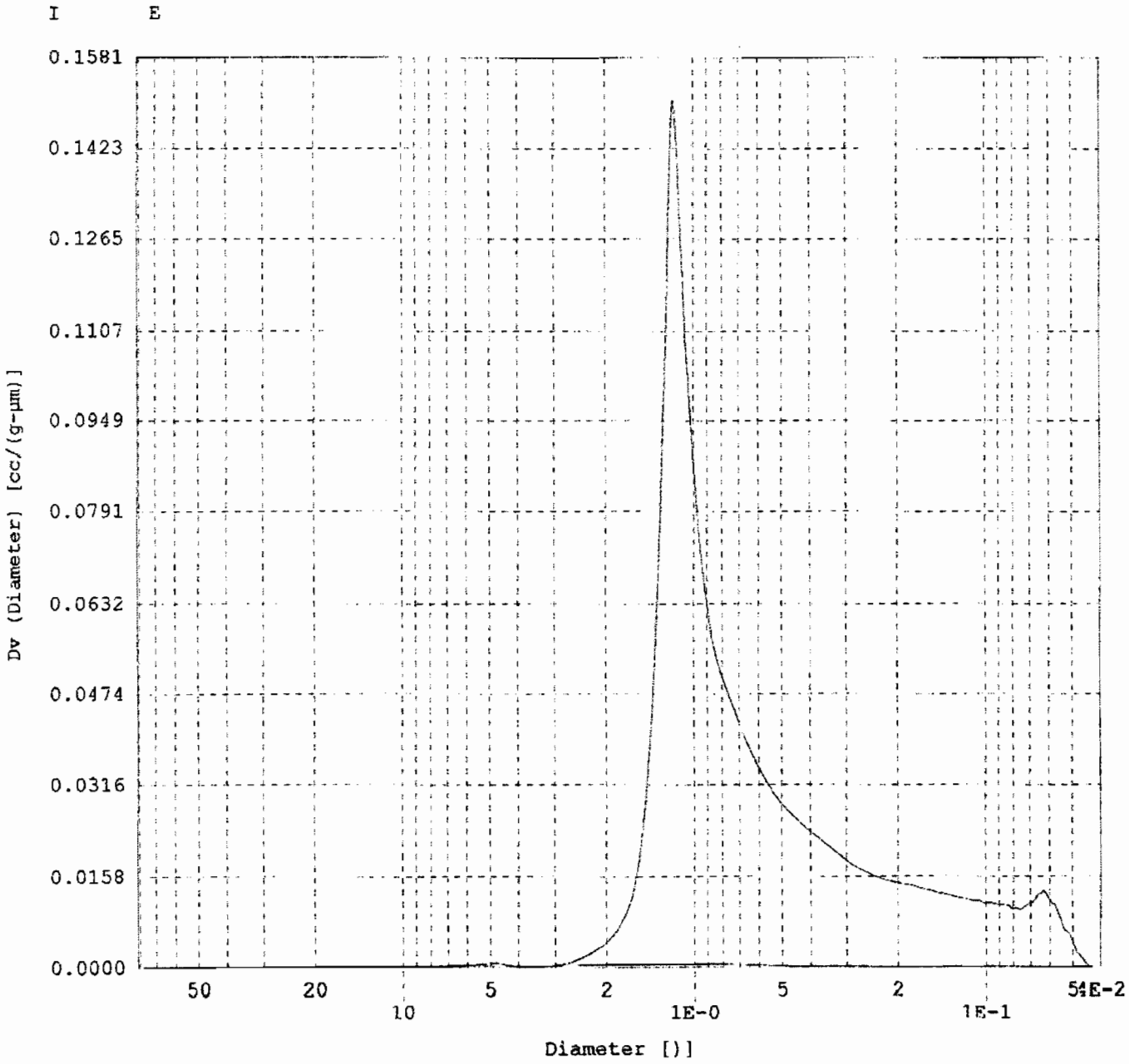
Sample ID	test100	**File Name**	S530403H_Merged.PRM
Sample Weight	16.2935 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 11		
Comments	fired ballls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rig	Mercury volume normalized by sample weight.	

Dv(d) vs. Pore Size



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Sample ID	test101	**File Name**	S530701H_Merged.PRM
Sample Weight	16.6847 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 12		
Comments	fired balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Data Acquisition Parameters

Density of Mercury ..... 13.5000 [g/cc]
Temperature ..... 20.00 [°C]

High Pressure

Data File Name S530701H.PRM
Analysis Date 03/07/2005
# of repeat cycles 0
Penetrometer Constant . 2701 [mV/cc]
Auto-Oil Fill Time .... 5 [sec]
Run Mode ..... Fixed Speed
Motor Speed 1

Low Pressure

Data File Name S5307021.PRM
Analysis Date 03/07/2005
# of repeat cycles 0
Penetrometer Constant . 3307 [mV/cc]
Evacuation Rate 8
Fine Evac. Until ..... 0.5000 [min.]
Coarse Evac. Until .... 4.0000 [min.]

504 Points Acquired	332 Pts in Intrusion Range	172 Pts in Extrusion Range
502 Points Used	331 Intrusion Pts Used	171 Extrusion Pts Used

Quantachrome Instruments
Quantachrome Poremaster for Windows® Data Report
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Sample ID	test101	**File Name**	S530701R_Merged.PRM
Sample Weight	16.6847 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 12		
Comments	fired balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Intrusion Statistics

Pressure Range : 3.665 PSIA to 5004.684 PSIA
Pore Diameter Range : 58.207157 µm to 0.042625 µm

Pore Diameter Statistics Summary

	Mean	Mode (df/d(log D))	Median
Volume	6.107E-02 cc/g at a diameter of 8.623E-01 µm	3.577E+03 cc/(µm-g) at a diameter of 1.264E+00 µm	4.045E-02 cc/g at a diameter of 1.157E+00 µm
Surface Area	1.965E-01 m²/g at a diameter of 8.623E-01 µm	7.336E-05 m²/(µm-g) at a diameter of 6.960E-02 µm	1.877E-01 m²/g at a diameter of 9.019E-01 µm
Pore Number Fraction	6.124E-03 at a diameter of 6.960E-02 µm	5.429E-05 at a diameter of 6.960E-02 µm	5.008E-01 at a diameter of 2.578E-01 µm

Mercury Porosimetry Data Summary

Total Intruded Volume	0.0809 cc/g	Bulk (Particle) Density	n/a [g/cc]
Total Surface Area	0.3753 m²/g	Apparent Density	n/a [g/cc]

Quantachrome Instruments
Quantachrome Poremaster for Windows® Data Report
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Sample ID	test101	**File Name**	S530701H_Merged.PRM
Sample Weight	16.6847 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 12		
Comments	fired ballls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Total Surface Area 0.3753 m²/g Apparent Density n/a [g/cc]

Extrusion Statistics

Pressure Range : 4972.301 PSIA to 20.100 PSIA
Pore Diameter Range : 0.042902 µm to 10.613154 µm

Pore Diameter Statistics Summary

	Mean	Mode (df/d(log D))	Median
Volume	8.091E-02 cc/g at a diameter of 2.525E+00 µm	9.019E+02 cc/(µm-g) at a diameter of 1.061E+01 µm	7.119E-02 cc/g at a diameter of 6.078E-01 um
Surface Area	3.753E-01 m²/g at a diameter of 2.525E+00 µm	6.476E-05 m²/(µm-g) at a diameter of 6.996E-02 µm	3.599E-01 m²/g at a diameter of 1.004E-01 µm
Pore Number Fraction	7.771E-06 at a diameter of 2.525E+00 µm	4.716E-05 at a diameter of 6.996E-02 µm	5.363E-01 at a diameter of 7.264E-02 µm

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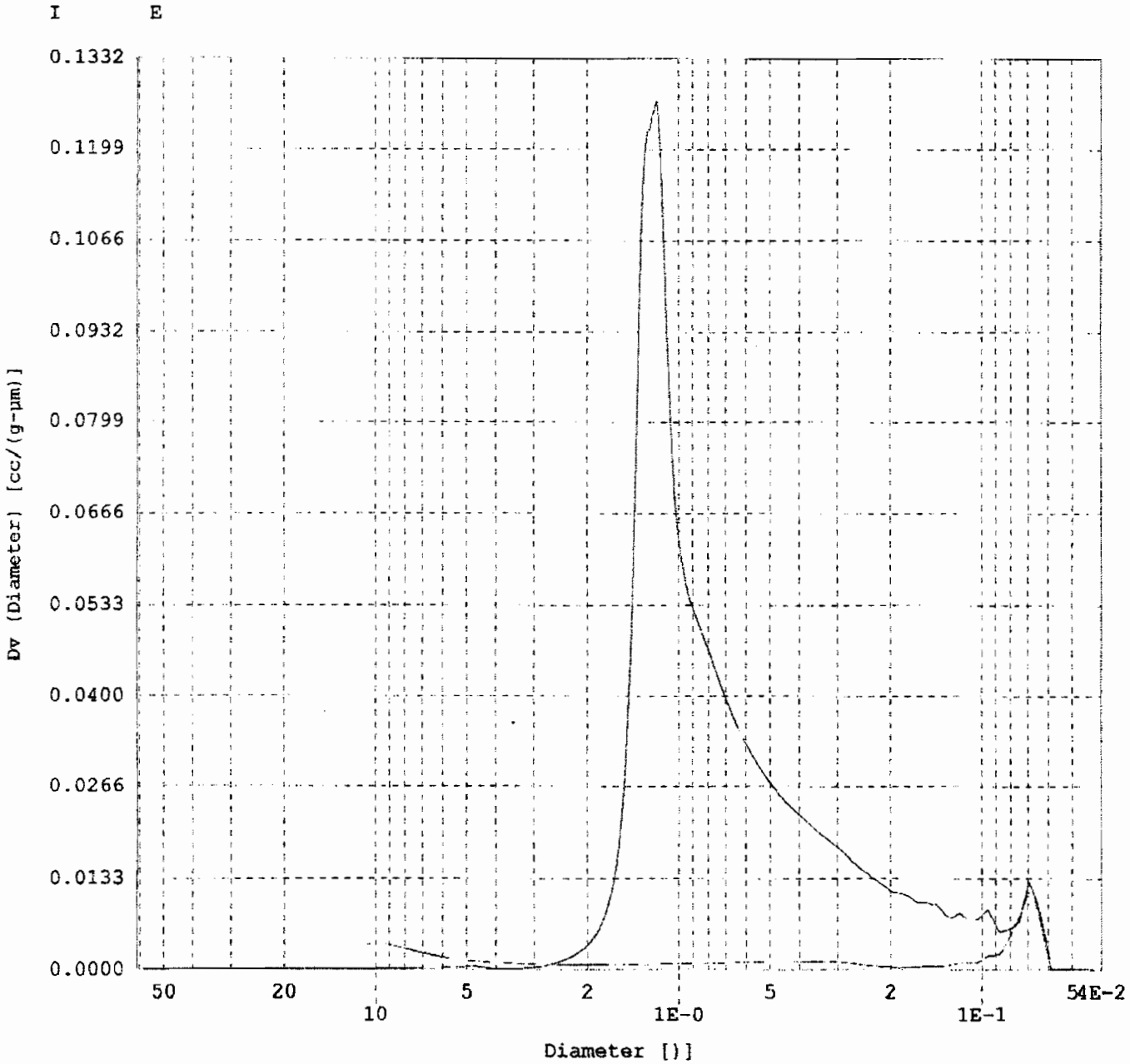
Sample ID	test101	**File Name**	S530701H_Merged.PRM
Sample Weight	16.6847 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 12		
Comments	fired ballls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Dv(d) vs. Pore Size



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Sample ID	test102	**File Name**	S530702H_Merged.PRM
Sample Weight	15.9014 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 13		
Comments	fired ballls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Data Acquisition Parameters

Density of Mercury ..... 13.5000 [g/cc]
Temperature ..... 20.00 [°C]

High Pressure

Data File Name S530702H.PRM
Analysis Date 03/07/2005
# of repeat cycles 0
Penetrometer Constant . 2701 [mV/cc]
Auto-Oil Fill Time .... 5 [sec]
Run Mode ..... Fixed Speed
Motor Speed 1

Low Pressure

Data File Name S5307031.PRM
Analysis Date 03/07/2005
# of repeat cycles 0
Penetrometer Constant . 3307 [mV/cc]
Evacuation Rate 8
Fine Evac. Until ..... 0.5000 [min.]
Coarse Evac. Until .... 4.0000 [min.]

490 Points Acquired	300 Pts in Intrusion Range	190 Pts in Extrusion Range
488 Points Used	299 Intrusion Pts Used	189 Extrusion Pts Used

Quantachrome Instruments
Quantachrome Poremaster for Windows® Data Report
Version 4.03

Sample ID	test102	**File Name**	S530702H_Merged.PRM
Sample Weight	15.9014 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 13		
Comments	fired balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rig	Mercury volume normalized by sample weight.	

Standard Report

Intrusion Statistics

Pressure Range : 2.422 PSIA to 4962.397 PSIA
Pore Diameter Range : 88.090294 µm to 0.042988 µm

Pore Diameter Statistics Summary

	Mean	Mode (df/d(log D))	Median
Volume	4.329E-02 cc/g at a diameter of 1.804E+00 µm	2.641E+03 cc/(µm-g) at a diameter of 1.979E+00 µm	3.416E-02 cc/g at a diameter of 1.955E+00 µm
Surface Area	7.329E-02 m²/g at a diameter of 1.804E+00 µm	1.255E-05 m²/(µm-g) at a diameter of 1.883E+00 µm	7.573E-02 m²/g at a diameter of 1.779E+00 µm
Pore Number Fraction	1.312E-02 at a diameter of 1.339E-01 µm	9.238E-06 at a diameter of 1.339E-01 µm	5.019E-01 at a diameter of 1.220E+00 µm

Mercury Porosimetry Data Summary

Total Intruded Volume	0.0683 cc/g	Bulk (Particle) Density	n/a [g/cc]
Total Surface Area	0.1515 m²/g	Apparent Density	n/a [g/cc]

Quantachrome Instruments
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Sample ID	test102	**File Name**	S530702H_Merged.PRM
Sample Weight	15.9014 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 13		
Comments	fired balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Total Surface Area 0.1515 m²/g Apparent Density n/a [g/cc]

Extrusion Statistics

Pressure Range : 4960.750 PSIA to 20.000 PSIA
Pore Diameter Range : 0.043002 µm to 10.666110 µm

Pore Diameter Statistics Summary

	Mean	Mode (df/d(log D))	Median
Volume	6.831E-02 cc/g at a diameter of 1.314E-01 µm	2.649E+00 cc/(µm-g) at a diameter of 1.341E-01 µm	6.829E-02 cc/g at a diameter of 1.229E-01 µm
Surface Area	1.515E-01 m²/g at a diameter of 1.314E-01 µm	2.609E-06 m²/(µm-g) at a diameter of 1.341E-01 µm	1.508E-01 m²/g at a diameter of 1.229E-01 µm
Pore Number Fraction	7.685E-06 at a diameter of 1.314E-01 µm	1.875E-06 at a diameter of 1.341E-01 µm	5.846E-01 at a diameter of 1.298E-01 µm

Report date: 09/13/2005

Merged File

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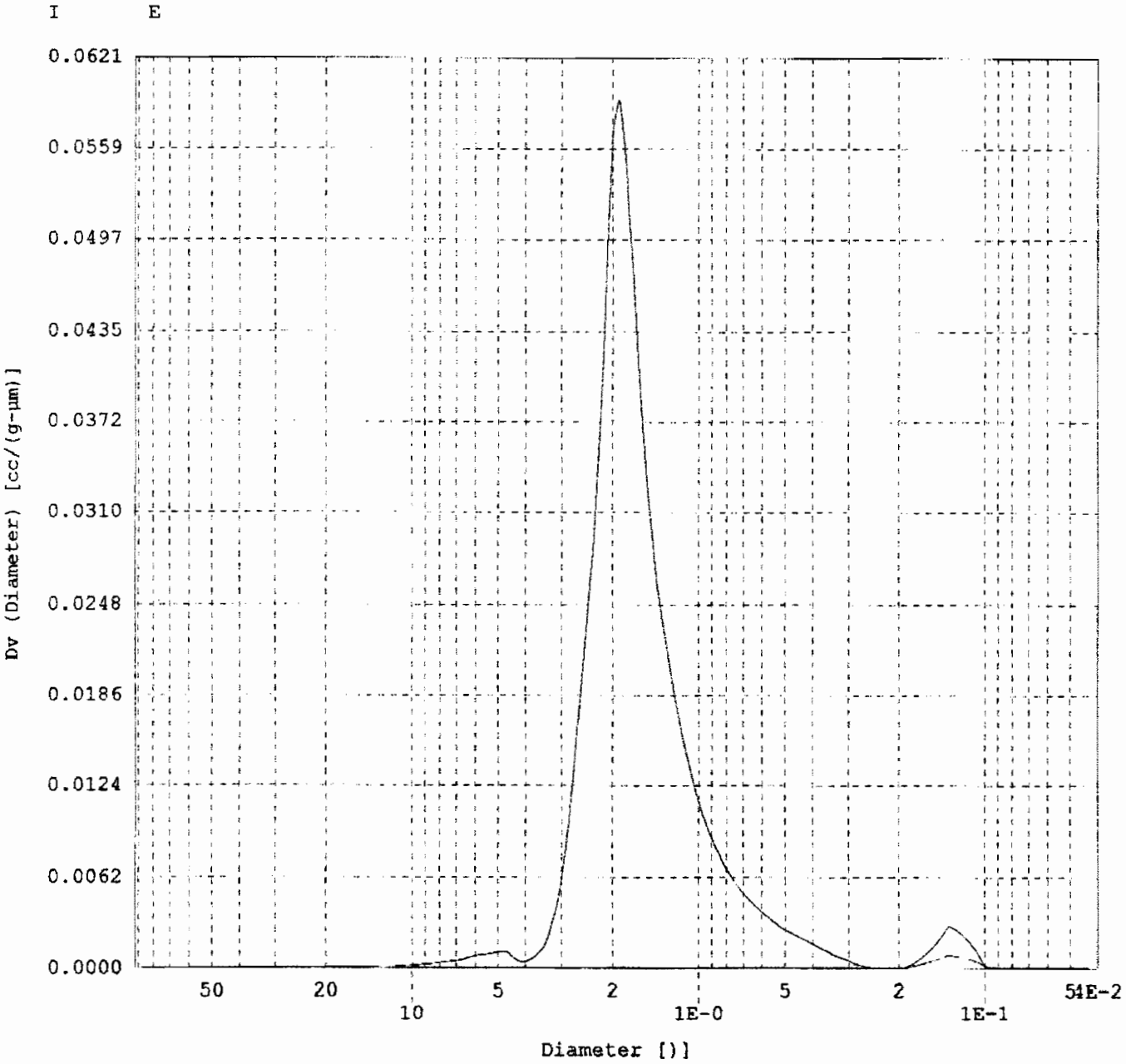
Sample ID	test102	**File Name**	S530702H_Merged.PRM
Sample Weight	15.9014 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 13		
Comments	fired ballls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Dv(d) vs. Pore Size



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Sample ID	test103	**File Name**	S530703H_Merged.PRM
Sample Weight	16.6546 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 15		
Comments	fired ballls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(T)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Data Acquisition Parameters

Density of Mercury ..... 13.5000 [g/cc]
Temperature ..... 20.00 [°C]

High Pressure

Data File Name S530703H.PRM
Analysis Date 03/07/2005
# of repeat cycles 0
Penetrometer Constant . 2701 [mV/cc]
Auto-Oil Fill Time .... 5 [sec]
Run Mode ..... Fixed Speed
Motor Speed 1

Low Pressure

Data File Name S5307041.PRM
Analysis Date 03/07/2005
# of repeat cycles 0
Penetrometer Constant . 3307 [mV/cc]
Evacuation Rate 8
Fine Evac. Until ..... 0.5000 [min.]
Coarse Evac. Until .... 4.0000 [min.]

533 Points Acquired 351 Pts in Intrusion Range 182 Pts in Extrusion Range
531 Points Used 350 Intrusion Pts Used 181 Extrusion Pts Used

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Sample ID	test103	**File Name**	S530703H_Merged.PRM
Sample Weight	16.5546 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 15		
Comments	fired balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Intrusion Statistics

Pressure Range : 2.649 PSIA to 4962.572 PSIA
Pore Diameter Range : 80.539703 µm to 0.042986 µm

Pore Diameter Statistics Summary

	Mean	Mode (df/d(log D))	Median
Volume	4.373E-02 cc/g at a diameter of 1.587E+00 µm	3.374E+03 cc/(µm-g) at a diameter of 1.740E+00 µm	3.306E-02 cc/g at a diameter of 1.740E+00 µm
Surface Area	8.564E-02 m²/g at a diameter of 1.587E+00 µm	1.950E-05 m²/(µm-g) at a diameter of 1.724E+00 µm	8.335E-02 m²/g at a diameter of 1.607E+00 µm
Pore Number Fraction	1.360E-02 at a diameter of 8.228E-01 µm	1.433E-05 at a diameter of 8.228E-01 µm	5.026E-01 at a diameter of 1.193E+00 µm

Mercury Porosimetry Data Summary

Total Intruded Volume	0.0661 cc/g	Bulk (Particle) Density	n/a [g/cc]
Total Surface Area	0.1667 m²/g	Apparent Density	n/a [g/cc]

Quantachrome Instruments
Quantachrome Poremaster for Windows® Data Report
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Sample ID	test103	**File Name**	S530703H_Merged.PRM
Sample Weight	16.5546 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 15		
Comments	fired ballls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Total Surface Area 0.1667 m²/g Apparent Density n/a [g/cc]

Extrusion Statistics

Pressure Range : 4898.904 PSIA to 20.225 PSIA
Pore Diameter Range : 0.043545 µm to 10.547694 µm

Pore Diameter Statistics Summary

	Mean	Mode (df/d(log D))	Median
Volume	6.612E-02 cc/g at a diameter of 0.000E+00 µm	2.209E-03 cc/(µm-g) at a diameter of 4.354E-02 µm	6.612E-02 cc/g at a diameter of 4.299E-02 µm
Surface Area	1.667E-01 m²/g at a diameter of 0.000E+00 µm	2.121E-08 m²/(µm-g) at a diameter of 4.354E-02 µm	1.667E-01 m²/g at a diameter of 4.299E-02 µm
Pore Number Fraction	1.845E-01 at a diameter of 0.000E+00 µm	1.484E-08 at a diameter of 4.354E-02 µm	5.888E-01 at a diameter of 4.533E-02 µm

Report date: 09/13/2005 Merged File

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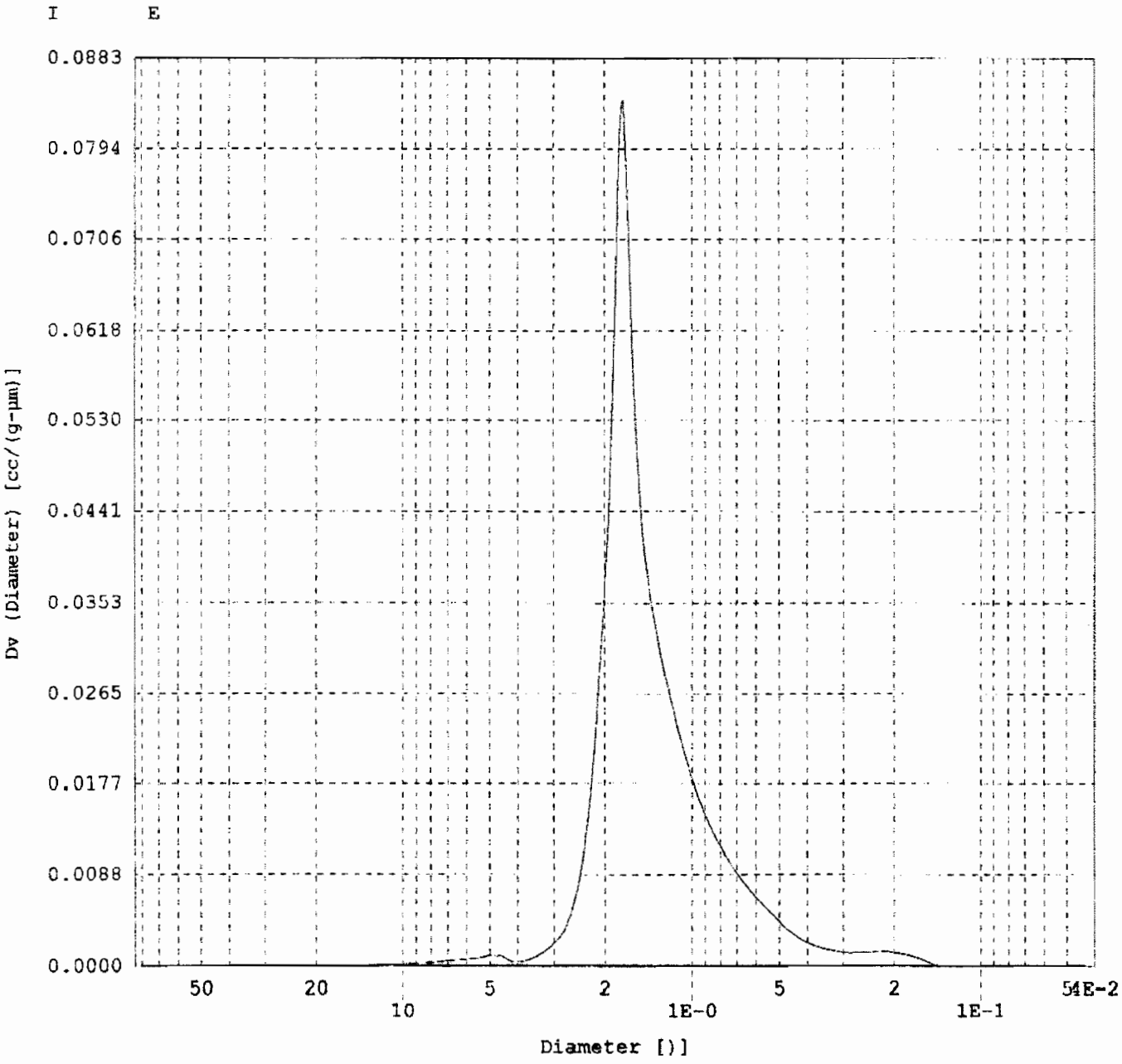
Sample ID	test103	**File Name**	S530703H_Merged.PRM
Sample Weight	16.5546 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 15		
Comments	fired ballls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Dv(d) vs. Pore Size



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Sample ID	test103	**File Name**	S530703H_Merged.PRM
Sample Weight	16.5546 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pct 1 05 15		
Comments	fired balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°, (E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Data Acquisition Parameters

Density of Mercury ..... 13.5000 [g/cc]
Temperature ..... 20.00 [°C]

High Pressure

Data File Name S530703H.PRM
Analysis Date 03/07/2005
# of repeat cycles 0
Penetrometer Constant . 2701 [mV/cc]
Auto-Oil Fill Time .... 5 [sec]
Run Mode ..... Fixed Speed
Motor Speed 1

Low Pressure

Data File Name S5307041.PRM
Analysis Date 03/07/2005
# of repeat cycles 0
Penetrometer Constant . 3307 [mV/cc]
Evacuation Rate 8
Fine Evac. Until ..... 0.5000 [min.]
Coarse Evac. Until .... 4.0000 [min.]

533 Points Acquired	351 Pts in Intrusion Range	182 Pts in Extrusion Range
531 Points Used	350 Intrusion Pts Used	181 Extrusion Pts Used

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Quantachrome Poremaster for Windows® Data Report
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Sample ID	test103	**File Name**	S530703H_Merged.PRM
Sample Weight	16.5546 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 15		
Comments	fired balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Intrusion Statistics

Pressure Range : 2.649 PSIA to 4962.572 PSIA
Pore Diameter Range : 80.539703 µm to 0.042986 µm

Pore Diameter Statistics Summary

	Mean	Mode (df/d(log D))	Median
Volume	4.373E-02 cc/g at a diameter of 1.587E+00 µm	3.374E+03 cc/(µm-g) at a diameter of 1.740E+00 µm	3.306E-02 cc/g at a diameter of 1.740E+00 µm
Surface Area	8.564E-02 m²/g at a diameter of 1.587E+00 µm	1.950E-05 m²/(µm-g) at a diameter of 1.724E+00 µm	8.335E-02 m²/g at a diameter of 1.607E+00 µm
Pore Number Fraction	1.360E-02 at a diameter of 8.228E-01 µm	1.433E-05 at a diameter of 8.228E-01 µm	5.026E-01 at a diameter of 1.193E+00 µm

Mercury Porosimetry Data Summary

Total Intruded Volume	0.0661 cc/g	Bulk (Particle) Density	n/a [g/cc]
Total Surface Area	0.1667 m²/g	Apparent Density	n/a [g/cc]

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Sample ID	test103	**File Name**	S530703H_Merged.PRM
Sample Weight	16.5546 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 15		
Comments	fired ballis		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Total Surface Area 0.1667 m²/g Apparent Density n/a [g/cc]

Extrusion Statistics

Pressure Range : 4898.904 PSIA to 20.225 PSIA
Pore Diameter Range : 0.043545 µm to 10.547694 µm

Pore Diameter Statistics Summary

	Mean	Mode (df/d(log D))	Median
Volume	6.612E-02 cc/g at a diameter of 0.000E+00 µm	2.209E-03 cc/(µm-g) at a diameter of 4.354E-02 µm	6.612E-02 cc/g at a diameter of 4.299E-02 µm
Surface Area	1.667E-01 m²/g at a diameter of 0.000E+00 µm	2.123E-08 m²/(µm-g) at a diameter of 4.354E-02 µm	1.667E-01 m²/g at a diameter of 4.299E-02 µm
Pore Number Fraction	1.845E-01 at a diameter of 0.000E+00 µm	1.484E-08 at a diameter of 4.354E-02 µm	5.888E-01 at a diameter of 4.533E-02 µm

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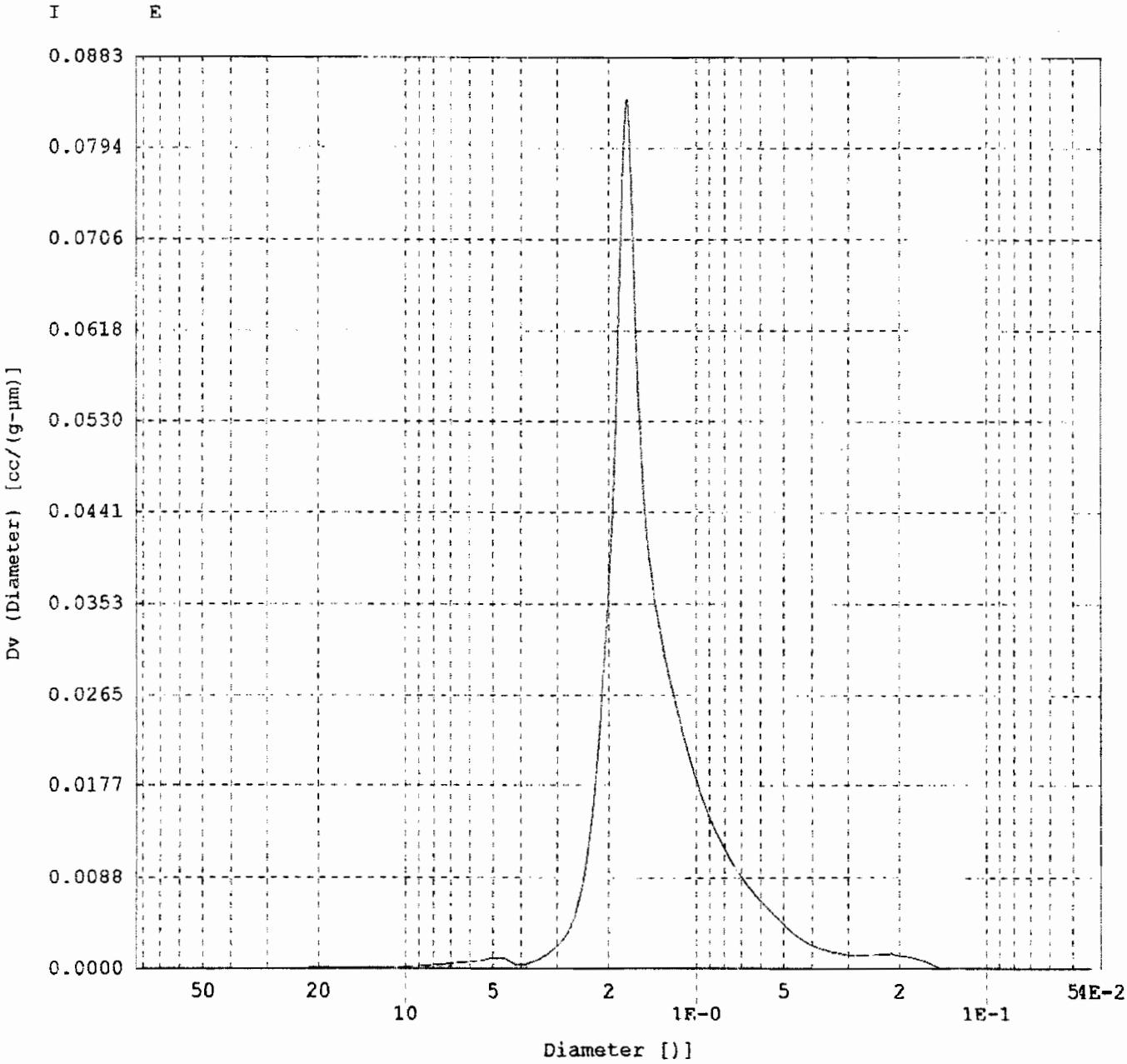
Sample ID	test103	**File Name**	S530703H_Merged.PRM
Sample Weight	16.5546 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 15		
Comments	fired ballls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Dv(d) vs. Pore Size



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Sample ID	test104	**File Name**	S530801H_Merged.PRM
Sample Weight	16.8060 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 16		
Comments	fired balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rig	Mercury volume normalized by sample weight.	

Standard Report

Data Acquisition Parameters

Density of Mercury ..... 13.5000 [g/cc]
Temperature ..... 20.00 [°C]

High Pressure

Data File Name S530801H.PRM
Analysis Date 03/08/2005
# of repeat cycles 0
Penetrometer Constant . 2701 [mV/cc]
Auto-Oil Fill Time .... 5 [sec]
Run Mode ..... Fixed Speed
Motor Speed 1

Low Pressure

Data File Name S5308011.PRM
Analysis Date 03/08/2005
# of repeat cycles 0
Penetrometer Constant . 3307 [mV/cc]
Evacuation Rate 8
Fine Evac. Until ..... 0.5000 [min.]
Coarse Evac. Until .... 4.0000 [min.]

491 Points Acquired 329 Pts in Intrusion Range 162 Pts in Extrusion Range
489 Points Used 328 Intrusion Pts Used 161 Extrusion Pts Used

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Quantachrome Poremaster for Windows® Data Report
Version 4.03

Sample ID	test104	**File Name**	S530801H_Merged.PRM
Sample Weight	16.8060 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 16		
Comments	fired balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rig	Mercury volume normalized by sample weight.	

Standard Report

Intrusion Statistics

Pressure Range : 2.203 PSIA to 4994.057 PSIA
Pore Diameter Range : 96.836151 µm to 0.042715 µm

Pore Diameter Statistics Summary

	Mean	Mode (df/d(log D))	Median
Volume	3.872E-02 cc/g at a diameter of 1.667E+00 µm	2.470E+03 cc/(µm-g) at a diameter of 2.231E+00 µm	3.046E-02 cc/g at a diameter of 2.045E+00 µm
Surface Area	6.457E-02 m²/g at a diameter of 1.867E+00 µm	1.004E-05 m²/(µm-g) at a diameter of 1.924E+00 µm	6.528E-02 m²/g at a diameter of 1.868E+00 µm
Pore Number Fraction	1.546E-02 at a diameter of 8.681E-01 µm	7.373E-06 at a diameter of 8.681E-01 µm	5.012E-01 at a diameter of 1.467E+00 µm

Mercury Porosimetry Data Summary

Total Intruded Volume	0.0609 cc/g	Bulk (Particle) Density	n/a [g/cc]
Total Surface Area	0.1306 m²/g	Apparent Density	n/a [g/cc]

Quantachrome Instruments
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Sample ID	test104	**File Name**	S530801H_Merged.PRM
Sample Weight	16.8060 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 16		
Comments	fired balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Total Surface Area 0.1306 m²/g Apparent Density n/a [g/cc]

Extrusion Statistics

Pressure Range : 4967.162 PSIA to 20.025 PSIA
Pore Diameter Range : 0.042946 µm to 10.652822 µm

Pore Diameter Statistics Summary

	Mean	Mode (df/d(log D))	Median
Volume	6.116E-02 cc/g at a diameter of 2.039E+00 µm	2.301E+01 cc/(µm-g) at a diameter of 9.172E+00 µm	6.142E-02 cc/g at a diameter of 4.424E-02 µm
Surface Area	1.292E-01 m²/g at a diameter of 2.039E+00 µm	3.310E-07 m²/(µm-g) at a diameter of 3.914E-01 µm	1.296E-01 m²/g at a diameter of 4.344E-01 µm
Pore Number Fraction	4.583E-03 at a diameter of 2.039E+00 µm	2.189E-07 at a diameter of 4.142E-01 µm	5.245E-01 at a diameter of 4.392E-01 µm

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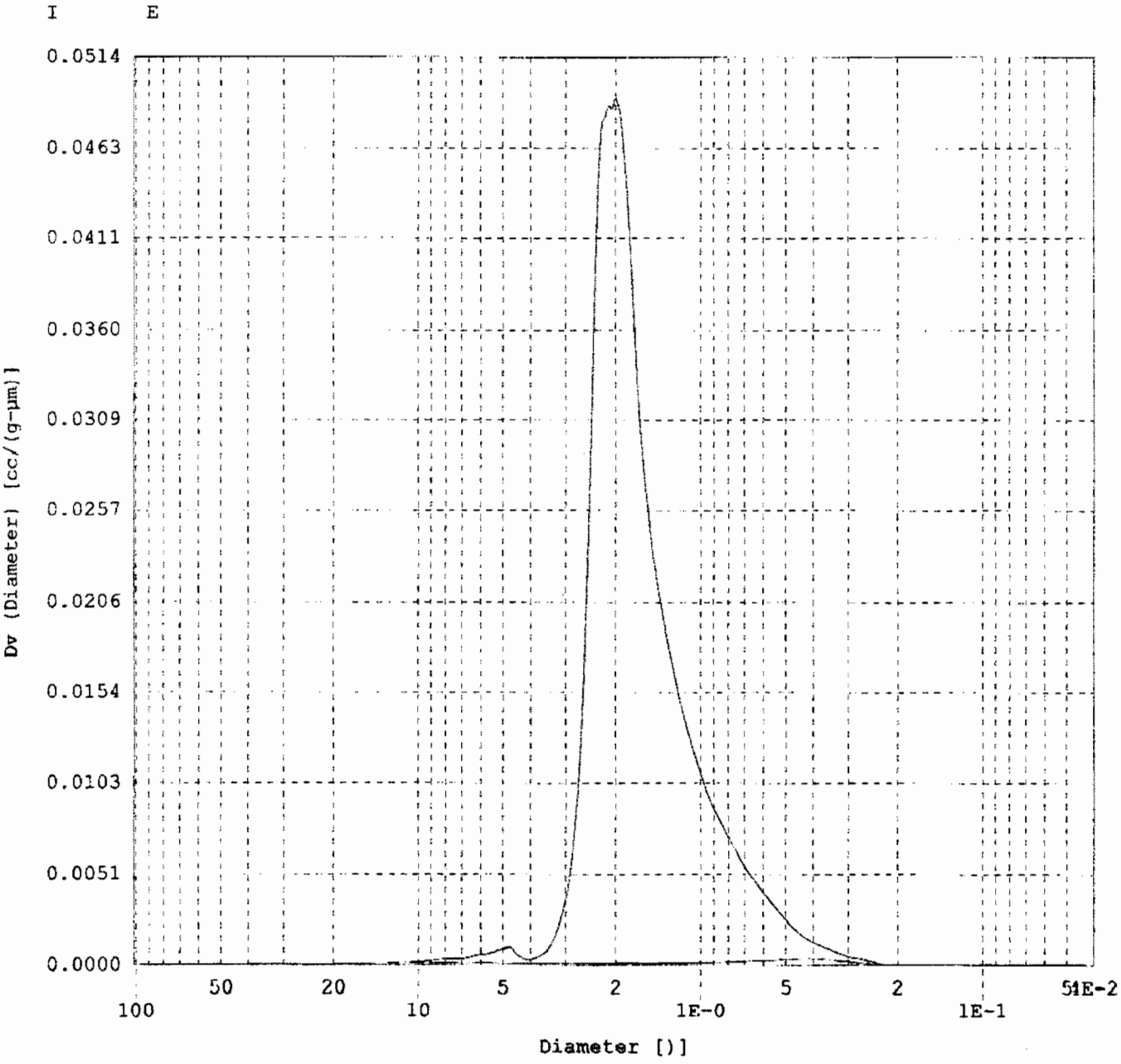
Sample ID	test104	**File Name**	S530801H_Merged.PRM
Sample Weight	16.8060 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 16		
Comments	fired ballls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Dv(d) vs. Pore Size



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Sample ID	test105	**File Name**	S530802H_Merged.PRM
Sample Weight	16.7282 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 17		
Comments	fired balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Data Acquisition Parameters

Density of Mercury ..... 13.5000 [g/cc]
Temperature ..... 20.00 [°C]

High Pressure

Data File Name S530802H.PRM
Analysis Date 03/08/2005
# of repeat cycles 0
Penetrometer Constant . 2701 [mV/cc]
Auto-Oil Fill Time .... 5 [sec]
Run Mode ..... Fixed Speed
Motor Speed 1

Low Pressure

Data File Name S5308021.PRM
Analysis Date 03/08/2005
# of repeat cycles 0
Penetrometer Constant . 3307 [mV/cc]
Evacuation Rate 8
Fine Evac. Until ..... 0.5000 [min.]
Coarse Evac. Until .... 4.0000 [min.]

446 Points Acquired	292 Pts in Intrusion Range	154 Pts in Extrusion Range
444 Points Used	291 Intrusion Pts Used	153 Extrusion Pts Used

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Sample ID	test105	**File Name**	S530802H_Merged.PRM
Sample Weight	16.7282 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 17		
Comments	fired balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Intrusion Statistics

Pressure Range : 1.968 PSIA to 4969.158 PSIA
Pore Diameter Range : 108.418839 µm to 0.042929 µm

Pore Diameter Statistics Summary

	Mean	Mode (df/d(log D))	Median
Volume	4.670E-02 cc/g at a diameter of 1.516E+00 µm	2.837E+03 cc/(µm-g) at a diameter of 1.948E+00 µm	3.439E-02 cc/g at a diameter of 1.785E+00 µm
Surface Area	9.193E-02 m²/g at a diameter of 1.516E+00 µm	1.754E-05 m²/(µm-g) at a diameter of 1.423E-01 µm	9.076E-02 m²/g at a diameter of 1.514E+00 µm
Pore Number Fraction	8.495E-03 at a diameter of 1.423E-01 µm	1.282E-05 at a diameter of 1.423E-01 µm	5.046E-01 at a diameter of 8.068E-01 µm

Mercury Porosimetry Data Summary

Total Intruded Volume	0.0688 cc/g	Bulk (Particle) Density	n/a [g/cc]
Total Surface Area	0.1815 m²/g	Apparent Density	n/a [g/cc]

Quantachrome Instruments
Quantachrome Poremaster for Windows® Data Report
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Sample ID	test105	**File Name**	S530802H_Merged.PRM
Sample Weight	16.7282 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 17		
Comments	fired balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Total Surface Area 0.1815 m²/g Apparent Density n/a [g/cc]

Extrusion Statistics

Pressure Range : 4903.844 PSIA to 20.349 PSIA
Pore Diameter Range : 0.043501 µm to 10.483038 µm

Pore Diameter Statistics Summary

	Mean	Mode (df/d(log D))	Median
Volume	0.000E+00 cc/g at a diameter of 0.000E+00 µm	0.000E+00 cc/(µm-g) at a diameter of 0.000E+00 µm	6.877E-02 cc/g at a diameter of 4.293E-02 µm
Surface Area	0.000E+00 m²/g at a diameter of 0.000E+00 µm	0.000E+00 m²/(µm-g) at a diameter of 0.000E+00 µm	1.815E-01 m²/g at a diameter of 4.293E-02 µm
Pore Number Fraction	0.000E+00 at a diameter of 0.000E+00 µm	0.000E+00 at a diameter of 0.000E+00 µm	0.000E+00 at a diameter of 0.000E+00 µm

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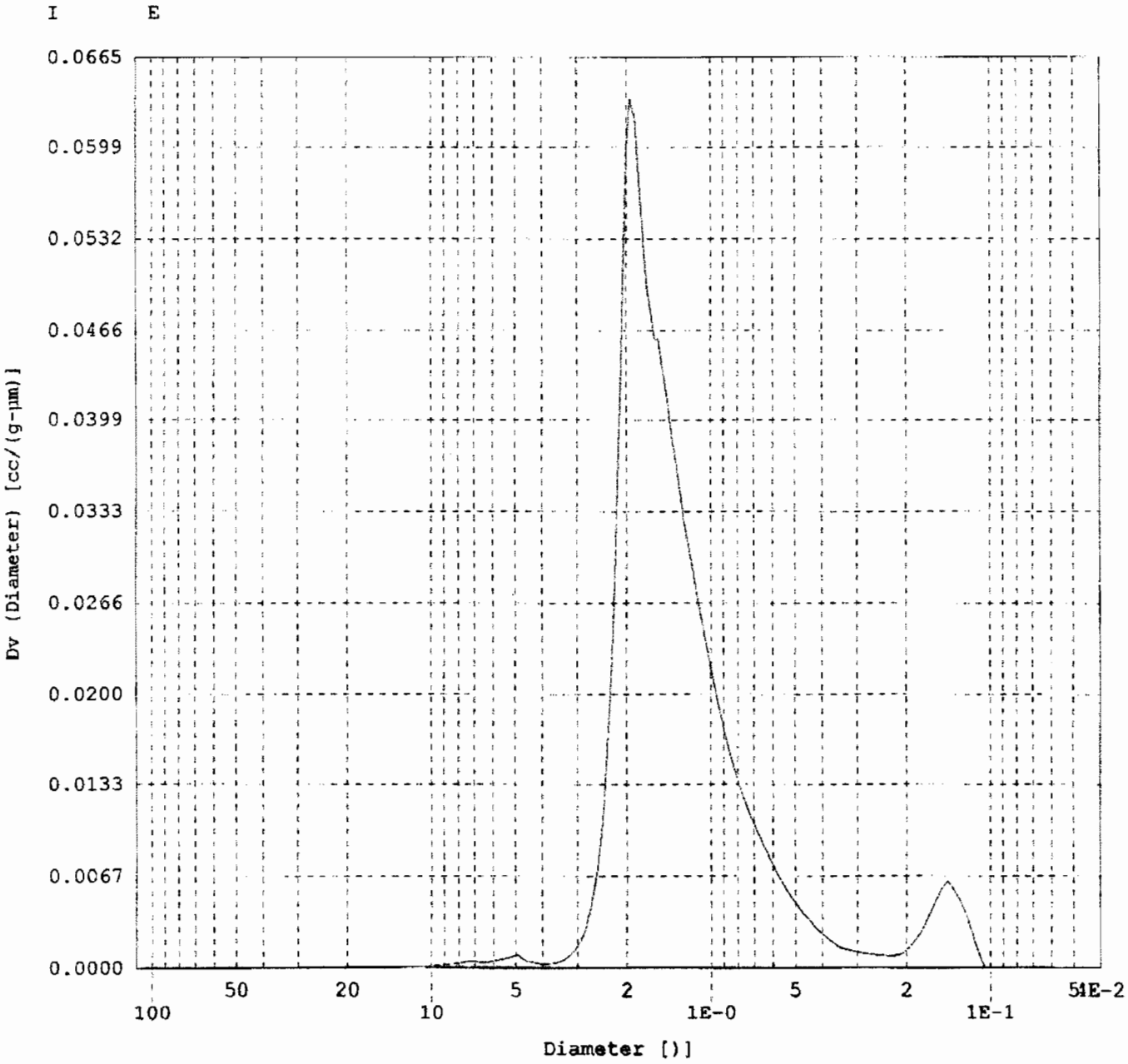
Sample ID	test105	**File Name**	S530802H_Merged.PRM
Sample Weight	16.7282 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 17		
Comments	fired ballls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Dv(d) vs. Pore Size



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Version 4.03

Sample ID	test106	**File Name**	S530803H_Merged.PRM
Sample Weight	16.5076 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 18		
Comments	fired balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Data Acquisition Parameters

Density of Mercury ..... 13.5000 [g/cc]
Temperature ..... 20.00 [°C]

High Pressure

Data File Name S530803H.PRM
Analysis Date 03/08/2005
# of repeat cycles 0
Penetrometer Constant . 2701 [mV/cc]
Auto-Oil Fill Time .... 5 [sec]
Run Mode ..... Fixed Speed
Motor Speed 1

Low Pressure

Data File Name S5308031.PRM
Analysis Date 03/08/2005
# of repeat cycles 0
Penetrometer Constant . 3307 [mV/cc]
Evacuation Rate 8
Fine Evac. Until ..... 0.5000 [min.]
Coarse Evac. Until .... 4.0000 [min.]

460 Points Acquired	305 Pts in Intrusion Range	155 Pts in Extrusion Range
458 Points Used	304 Intrusion Pts Used	154 Extrusion Pts Used

Quantachrome Instruments
Quantachrome Poremaster for Windows® Data Report
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Sample ID	test106	**File Name**	S530803H_Merged.PRM
Sample Weight	16.5078 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 18		
Comments	fired balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Intrusion Statistics

Pressure Range : 2.086 PSIA to 4961.000 PSIA
Pore Diameter Range : 102.280281 µm to 0.043000 µm

Pore Diameter Statistics Summary

	Mean	Mode (df/d(log D))	Median
Volume	3.922E-02 cc/g at a diameter of 1.744E+00 µm	2.031E+03 cc/(µm-g) at a diameter of 2.074E+00 µm	3.202E-02 cc/g at a diameter of 1.886E+00 µm
Surface Area	6.720E-02 m²/g at a diameter of 1.744E+00 µm	1.069E-05 m²/(µm-g) at a diameter of 1.720E+00 µm	7.345E-02 m²/g at a diameter of 1.693E+00 µm
Pore Number Fraction	1.391E-02 at a diameter of 8.312E-01 µm	7.857E-06 at a diameter of 8.312E-01 µm	5.175E-01 at a diameter of 1.261E+00 µm

Mercury Porosimetry Data Summary

Total Intruded Volume	0.0640 cc/g	Bulk (Particle) Density	n/a [g/cc]
Total Surface Area	0.1469 m²/g	Apparent Density	n/a [g/cc]

Quantachrome Instruments
Quantachrome Poremaster for Windows® Data Report
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Sample ID	test106	**File Name**	S530303H_Merged.PRM
Sample Weight	16.5078 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 16		
Comments	fired balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Total Surface Area 0.1469 m²/g Apparent Density n/a [g/cc]

Extrusion Statistics

Pressure Range : 4895.687 PSIA to 20.000 PSIA
Pore Diameter Range : 0.043574 µm to 10.666110 µm

Pore Diameter Statistics Summary

	Mean	Mode (df/d(log D))	Median
Volume	0.000E+00 cc/g at a diameter of 0.000E+00 µm	0.000E+00 cc/(µm-g) at a diameter of 0.000E+00 µm	6.403E-02 cc/g at a diameter of 4.300E-02 µm
Surface Area	0.000E+00 m²/g at a diameter of 0.000E+00 µm	0.000E+00 m²/(µm-g) at a diameter of 0.000E+00 µm	1.469E-01 m²/g at a diameter of 4.300E-02 µm
Pore Number Fraction	0.000E+00 at a diameter of 0.000E+00 µm	0.000E+00 at a diameter of 0.000E+00 µm	0.000E+00 at a diameter of 0.000E+00 µm

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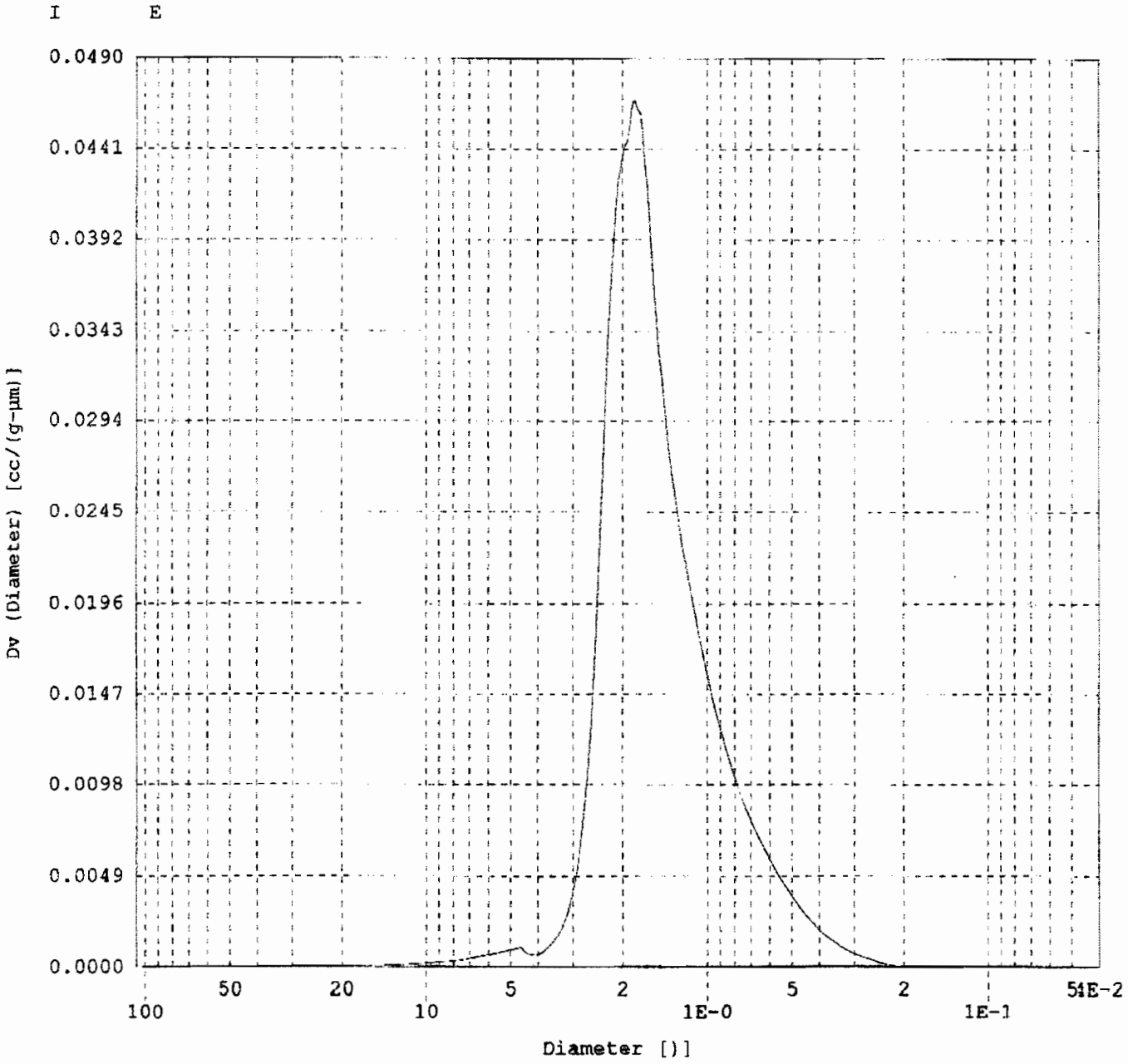
Sample ID	test106	**File Name**	S530803H_Merged.PRM
Sample Weight	16.5078 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot 1 05 18		
Comments	fired ballls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Dv(d) vs. Pore Size



Report date: 09/13/2005 Merged File

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Sample ID	test108	**File Name**	S561501H_Merged.PRM
Sample Weight	16.5191 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	minntac pot grate 1 05 4		
Comments	fired ballls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Data Acquisition Parameters

Density of Mercury ..... 13.5000 [g/cc]
Temperature ..... 20.00 [°C]

High Pressure

Data File Name S561501H.PRM
Analysis Date 06/15/2005
# of repeat cycles 0
Penetrometer Constant . 2701 [mV/cc]
Auto-Oil Fill Time .... 5 [sec]
Run Mode ..... Fixed Speed
Motor Speed 1

Low Pressure

Data File Name S5615011.PRM
Analysis Date 06/15/2005
# of repeat cycles 0
Penetrometer Constant . 3307 [mV/cc]
Evacuation Rate 8
Fine Evac. Until ..... 0.5000 [min.]
Coarse Evac. Until .... 4.0000 [min.]

504 Points Acquired	340 Pts in Intrusion Range	164 Pts in Extrusion Range
502 Points Used	339 Intrusion Pts Used	163 Extrusion Pts Used

Quantachrome Instruments
Quantachrome Poremaster for Windows® Data Report
Version 4.03

Sample ID	test108	**File Name**	S561501H_Merged.PRM
Sample Weight	16.5191 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	minntac pot grate 1 05 4		
Comments	fired balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rig	Mercury volume normalized by sample weight.	

Standard Report

Intrusion Statistics

Pressure Range : 2.797 PSIA to 4959.628 PSIA
Pore Diameter Range : 76.276833 µm to 0.043012 µm

Pore Diameter Statistics Summary

	Mean	Mode (df/d(log D))	Median
Volume	7.472E-02 cc/g at a diameter of 9.113E-01 µm	5.803E+03 cc/(µm-g) at a diameter of 1.508E+00 µm	4.517E-02 cc/g at a diameter of 1.438E+00 µm
Surface Area	2.046E-01 m²/g at a diameter of 9.113E-01 µm	1.578E-04 m²/(µm-g) at a diameter of 4.350E-02 µm	1.982E-01 m²/g at a diameter of 9.745E-01 µm
Pore Number Fraction	2.653E-03 at a diameter of 7.233E-02 µm	1.139E-04 at a diameter of 7.233E-02 µm	5.076E-01 at a diameter of 8.447E-02 µm

Mercury Porosimetry Data Summary

Total Intruded Volume	0.0903 cc/g	Bulk (Particle) Density	n/a [g/cc]
Total Surface Area	0.3965 m²/g	Apparent Density	n/a [g/cc]

Quantachrome Instruments
Quantachrome Poremaster for Windows® Data Report
Version 4.03

Sample ID	test108	**File Name**	S561501H_Merged.PRM
Sample Weight	16.5191 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	minntac pot grate 1 05 4		
Comments	fired ballls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Total Surface Area 0.3965 m²/g Apparent Density n/a [g/cc]

Extrusion Statistics

Pressure Range : 4954.688 PSIA to 19.975 PSIA
Pore Diameter Range : 0.043055 µm to 10.679431 µm

Pore Diameter Statistics Summary

	Mean	Mode (df/d(log D))	Median
Volume	9.035E-02 cc/g at a diameter of 5.583E-01 µm	5.620E+01 cc/(µm-g) at a diameter of 4.305E-02 µm	8.856E-02 cc/g at a diameter of 1.664E-01 µm
Surface Area	3.952E-01 m²/g at a diameter of 5.583E-01 µm	5.274E-04 m²/(µm-g) at a diameter of 4.305E-02 µm	3.824E-01 m²/g at a diameter of 5.336E-02 µm
Pore Number Fraction	1.650E-02 at a diameter of 5.583E-01 µm	3.860E-04 at a diameter of 4.305E-02 µm	5.791E-01 at a diameter of 4.528E-02 µm

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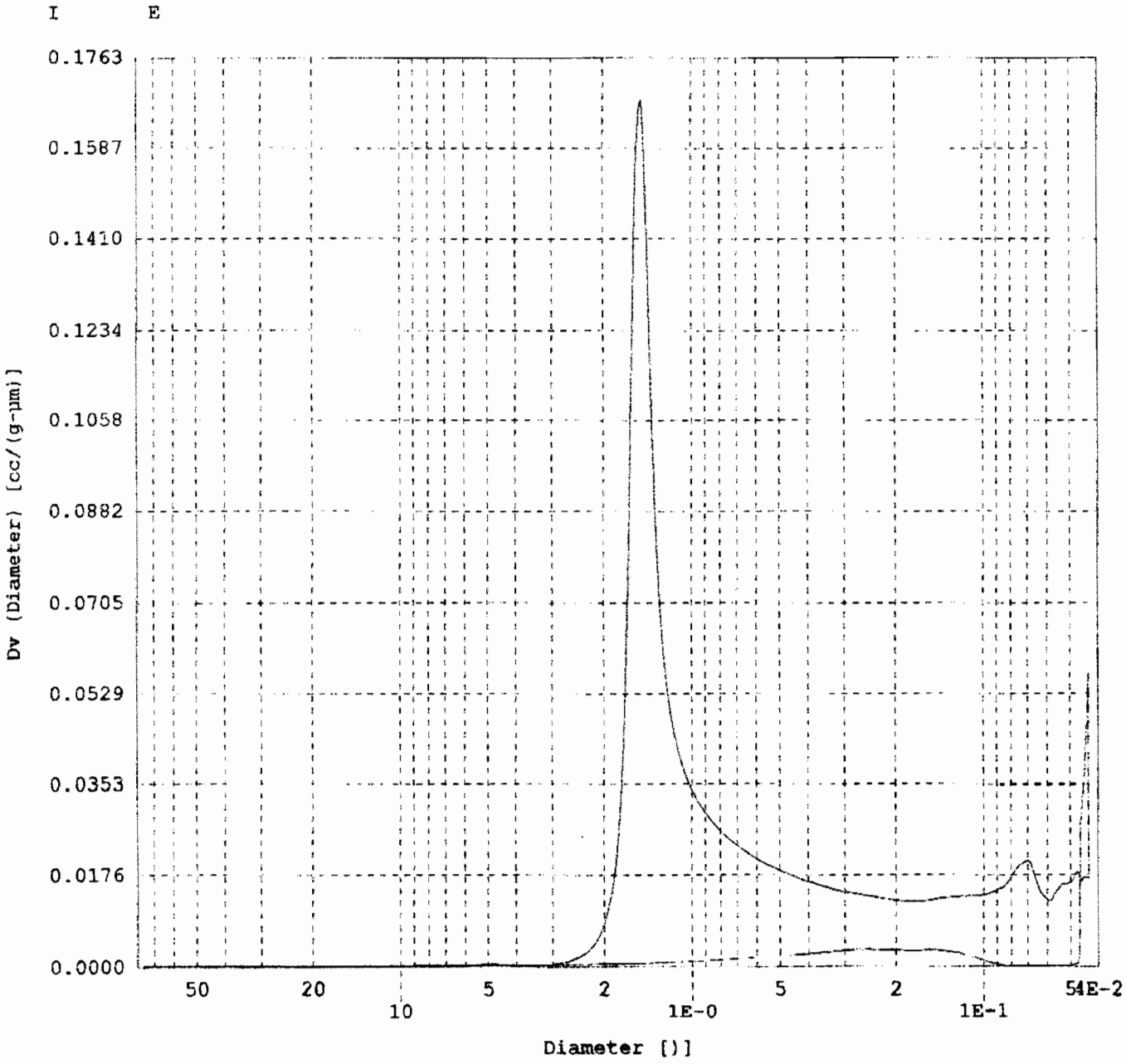
Sample ID	test108	**File Name**	S561501H_Merged.PRM
Sample Weight	16.5191 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	minntac pot grate 1 05 4		
Comments	fired ballls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Dv(d) vs. Pore Size



Report date: 09/13/2005 Merged File

Quantachrome Instruments
Quantachrome Poremaster for Windows® Data Report
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Sample ID	test~~109~~ 110	**File Name**	S561601H_Merged.PRM
Sample Weight	13.6088 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot minntac 2 05 5a		
Comments	fired balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Data Acquisition Parameters

Density of Mercury ..... 13.5000 [g/cc]
Temperature ..... 20.00 [°C]

High Pressure

Data File Name S561601H.PRM
Analysis Date 06/16/2005
# of repeat cycles 0
Penetrometer Constant . 2701 [mV/cc]
Auto-Oil Fill Time .... 5 [sec]
Run Mode ..... Fixed Speed
Motor Speed 1

Low Pressure

Data File Name S5616011.PRM
Analysis Date 06/16/2005
# of repeat cycles 0
Penetrometer Constant . 3307 [mV/cc]
Evacuation Rate 8
Fine Evac. Until ..... 0.5000 [min.]
Coarse Evac. Until .... 4.0000 [min.]

497 Points Acquired 319 Pts in Intrusion Range 178 Pts in Extrusion Range
495 Points Used 318 Intrusion Pts Used 177 Extrusion Pts Used

Quantachrome Instruments
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Sample ID	test109	**File Name**	S561601H_Merged.PRM
Sample Weight	13.6088 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot minntac 2 05 5a		
Comments	fired balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Intrusion Statistics

Pressure Range : 2.688 PSIA to 5007.578 PSIA
Pore Diameter Range : 79.368500 µm to 0.042600 µm

Pore Diameter Statistics Summary

	Mean	Mode (df/d(log D))	Median
Volume	7.183E-02 cc/g at a diameter of 8.788E-01 µm	7.496E+03 cc/(µm-g) at a diameter of 1.465E+00 µm	4.376E-02 cc/g at a diameter of 1.403E+00 µm
Surface Area	2.027E-01 m²/g at a diameter of 8.788E-01 µm	1.451E-04 m²/(µm-g) at a diameter of 5.491E-02 µm	1.992E-01 m²/g at a diameter of 9.265E-01 µm
Pore Number Fraction	2.872E-03 at a diameter of 5.491E-02 µm	1.067E-04 at a diameter of 5.491E-02 µm	5.019E-01 at a diameter of 9.087E-02 µm

Mercury Porosimetry Data Summary

Total Intruded Volume	0.0875 cc/g	Bulk (Particle) Density	n/a [g/cc]
Total Surface Area	0.3983 m²/g	Apparent Density	n/a [g/cc]

Quantachrome Instruments
Quantachrome Poremaster for Windows® Data Report
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Sample ID	test109	**File Name**	S561601H_Merged.PRM
Sample Weight	13.6088 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot minntac 2 05 5a		
Comments	fired balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Total Surface Area 0.3983 m²/g Apparent Density n/a [g/cc]

Extrusion Statistics

Pressure Range : 4966.414 PSIA to 20.100 PSIA
Pore Diameter Range : 0.042953 µm to 10.613154 µm

Pore Diameter Statistics Summary

	Mean	Mode (df/d(log D))	Median
Volume	8.751E-02 cc/g at a diameter of 2.477E-01 µm	1.727E+01 cc/(µm-g) at a diameter of 7.883E-01 µm	8.649E-02 cc/g at a diameter of 1.104E-01 µm
Surface Area	3.983E-01 m²/g at a diameter of 2.477E-01 µm	8.315E-05 m²/(µm-g) at a diameter of 4.687E-02 µm	3.818E-01 m²/g at a diameter of 5.718E-02 µm
Pore Number Fraction	1.938E-02 at a diameter of 2.477E-01 µm	6.063E-05 at a diameter of 4.687E-02 µm	5.023E-01 at a diameter of 6.266E-02 µm

Report date: 09/13/2005 Merged File

Quantachrome Instruments
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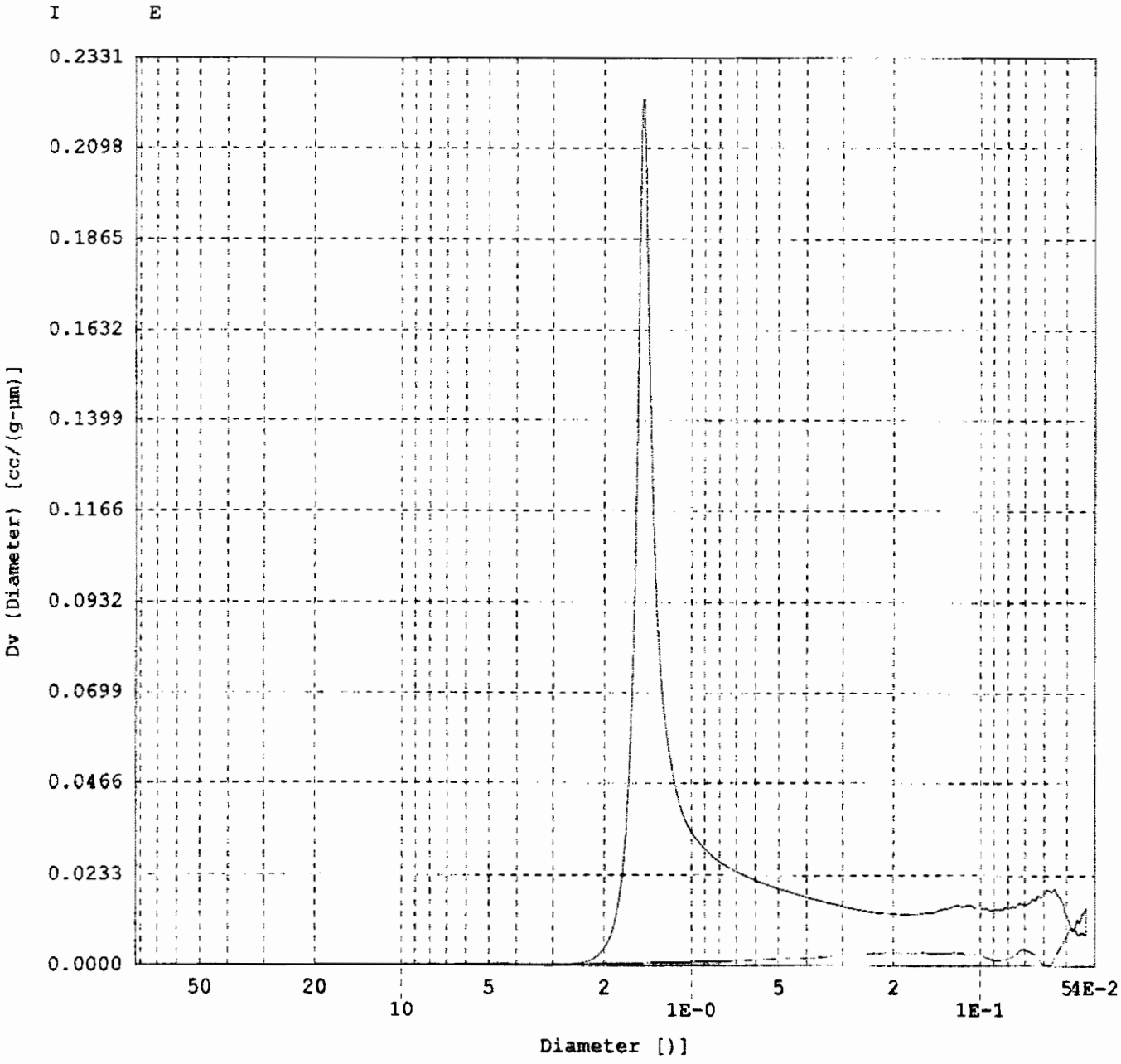
Sample ID	test109	**File Name**	S561601H_Merged.PRM
Sample Weight	13.6088 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot minntac 2 05 5a		
Comments	fired ballls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Dv(d) vs. Pore Size



Report date: 09/13/2005

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Quantachrome Poremaster for Windows® Data Report
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Sample ID	test111	**File Name**	S561701H_Merged.PRM
Sample Weight	13.9865 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot minntac 2 05 6		
Comments	fired balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rig	Mercury volume normalized by sample weight.	

Standard Report

Data Acquisition Parameters

Density of Mercury ..... 13.5000 [g/cc]
Temperature ..... 20.00 [°C]

High Pressure

Data File Name S561701H.PRM
Analysis Date 06/17/2005
# of repeat cycles 0
Penetrometer Constant . 2701 [mV/cc]
Auto-Oil Fill Time .... 5 [sec]
Run Mode ..... Fixed Speed
Motor Speed 1

Low Pressure

Data File Name S5617011.PRM
Analysis Date 06/17/2005
# of repeat cycles 0
Penetrometer Constant . 3307 [mV/cc]
Evacuation Rate 8
Fine Evac. Until ..... 0.5000 [min.]
Coarse Evac. Until .... 4.0000 [min.]

485 Points Acquired 319 Pts in Intrusion Range 166 Pts in Extrusion Range
482 Points Used 318 Intrusion Pts Used 164 Extrusion Pts Used

Quantachrome Instruments
Quantachrome Poremaster for Windows® Data Report
Version 4.03

Sample ID	test111	**File Name**	S561701H_Merged.PRM
Sample Weight	13.9865 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot minntac 2 05 6		
Comments	fired ballis		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Intrusion Statistics

Pressure Range : 2.742 PSIA to 5007.229 PSIA
Pore Diameter Range : 77.803764 µm to 0.042603 µm

Pore Diameter Statistics Summary

	Mean	Mode (df/d(log D))	Median
Volume	7.176E-02 cc/g at a diameter of 8.684E-01 µm	6.141E+03 cc/(µm-g) at a diameter of 1.358E+00 µm	4.350E-02 cc/g at a diameter of 1.332E+00 µm
Surface Area	2.084E-01 m²/g at a diameter of 8.684E-01 µm	1.934E-04 m²/(µm-g) at a diameter of 4.843E-02 µm	2.004E-01 m²/g at a diameter of 9.400E-01 µm
Pore Number Fraction	2.946E-03 at a diameter of 4.843E-02 µm	1.425E-04 at a diameter of 4.843E-02 µm	5.065E-01 at a diameter of 8.403E-02 µm

Mercury Porosimetry Data Summary

Total Intruded Volume	0.0870 cc/g	Bulk (Particle) Density	n/a [g/cc]
Total Surface Area	0.4007 m²/g	Apparent Density	n/a [g/cc]

Quantachrome Instruments
Quantachrome Poremaster for Windows® Data Report
Version 4.03

Sample ID	test111	**File Name**	S561701H_Merged.PRM
Sample Weight	13.9865 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot minntac 2 05 6		
Comments	fired balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Total Surface Area 0.4007 m²/g Apparent Density n/a [g/cc]

Extrusion Statistics

Pressure Range : 4969.906 PSIA to 20.225 PSIA
Pore Diameter Range : 0.042923 µm to 10.547694 µm

Pore Diameter Statistics Summary

	Mean	Mode (df/d(log D))	Median
Volume	8.700E-02 cc/g at a diameter of 1.531E-01 µm	2.828E+01 cc/(µm-g) at a diameter of 1.037E+01 µm	8.631E-02 cc/g at a diameter of 8.589E-02 µm
Surface Area	4.007E-01 m²/g at a diameter of 1.531E-01 µm	1.568E-04 m²/(µm-g) at a diameter of 4.864E-02 µm	3.827E-01 m²/g at a diameter of 5.671E-02 µm
Pore Number Fraction	5.605E-03 at a diameter of 1.531E-01 µm	1.136E-04 at a diameter of 4.864E-02 µm	5.233E-01 at a diameter of 5.266E-02 µm

Report date: 09/13/2005

Merged File

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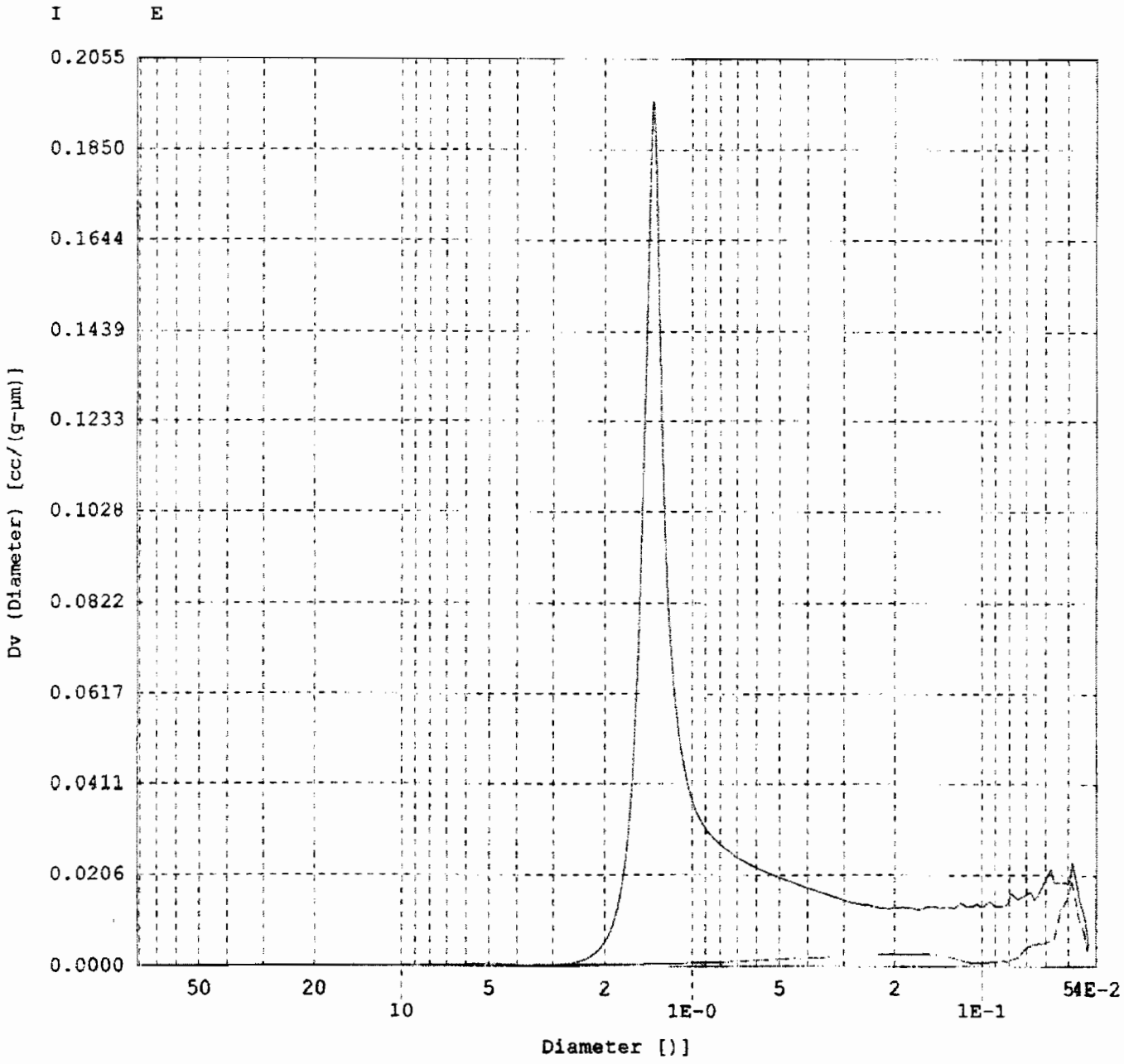
Sample ID	test111	**File Name**	S561701H_Merged.PRM
Sample Weight	13.9865 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot minntac 2 05 6		
Comments	fired ballls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Dv(d) vs. Pore Size



Report date: 09/13/2005

Merged File

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Sample ID	test112	**File Name**	S562301H_Merged.PRM
Sample Weight	13.5803 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot minntac 2 05 7		
Comments	fired balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Data Acquisition Parameters

Density of Mercury ..... 13.5000 [g/cc]
Temperature ..... 20.00 [°C]

High Pressure

Data File Name S562301H.PRM
Analysis Date 06/23/2005
# of repeat cycles 0
Penetrometer Constant . 2701 [mV/cc]
Auto-Oil Fill Time .... 5 [sec]
Run Mode ..... Fixed Speed
Motor Speed 1

Low Pressure

Data File Name S5623011.PRM
Analysis Date 06/23/2005
# of repeat cycles 0
Penetrometer Constant . 3307 [mV/cc]
Evacuation Rate 8
Fine Evac. Until ..... 0.5000 [min.]
Coarse Evac. Until .... 4.0000 [min.]

514 Points Acquired	331 Pts in Intrusion Range	183 Pts in Extrusion Range
512 Points Used	330 Intrusion Pts Used	182 Extrusion Pts Used

Quantachrome Instruments
Quantachrome Poremaster for Windows® Data Report
Version 4.03

Sample ID	test112	**File Name**	S562301H_Merged.PRM
Sample Weight	13.5803 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot minntac 2 05 7		
Comments	fired ballls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rig	Mercury volume normalized by sample weight.	

Standard Report

Intrusion Statistics

Pressure Range : 2.854 PSIA to 4969.981 PSIA
Pore Diameter Range : 74.743286 µm to 0.042922 µm

Pore Diameter Statistics Summary

	Mean	Mode (df/d(log D))	Median
Volume	6.735E-02 cc/g at a diameter of 8.126E-01 um	6.574E+03 cc/(µm-g) at a diameter of 1.248E+00 µm	4.117E-02 cc/g at a diameter of 1.193E+00 µm
Surface Area	2.199E-01 m²/g at a diameter of 8.126E-01 µm	2.546E-04 m²/(µm-g) at a diameter of 5.061E-02 um	2.027E-01 m²/g at a diameter of 9.135E-01 µm
Pore Number Fraction	3.969E-03 at a diameter of 5.061E-02 µm	1.878E-04 at a diameter of 5.061E-02 µm	5.011E-01 at a diameter of 1.011E-01 µm

Mercury Porosimetry Data Summary

Iotal Intruded Volume	0.0823 cc/g	Bulk (Particle) Density	n/a [g/cc]
Total Surface Area	0.4053 m²/g	Apparent Density	n/a [g/cc]

Quantachrome Instruments
Quantachrome Poremaster for Windows® Data Report
Version 4.03

Sample ID	test112	**File Name**	S562301H_Merged.PRM
Sample Weight	13.5803 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot minntac 2 05 7		
Comments	fired ballls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Total Surface Area 0.4053 m²/g Apparent Density n/a [g/cc]

Extrusion Statistics

Pressure Range : 4906.313 PSIA to 20.075 PSIA
Pore Diameter Range : 0.043479 µm to 10.626344 µm

Pore Diameter Statistics Summary

	Mean	Mode (df/d(log D))	Median
Volume	8.234E-02 cc/g at a diameter of 1.297E-01 µm	3.191E+01 cc/(µm-g) at a diameter of 9.487E+00 µm	8.176E-02 cc/g at a diameter of 8.475E-02 µm
Surface Area	4.053E-01 m²/g at a diameter of 1.297E-01 µm	1.455E-04 m²/(µm-g) at a diameter of 5.106E-02 µm	3.875E-01 m²/g at a diameter of 5.472E-02 µm
Pore Number Fraction	0.000E+00 at a diameter of 1.297E-01 µm	1.052E-04 at a diameter of 5.106E-02 µm	5.170E-01 at a diameter of 5.538E-02 µm

Report date: 09/13/2005 Merged File

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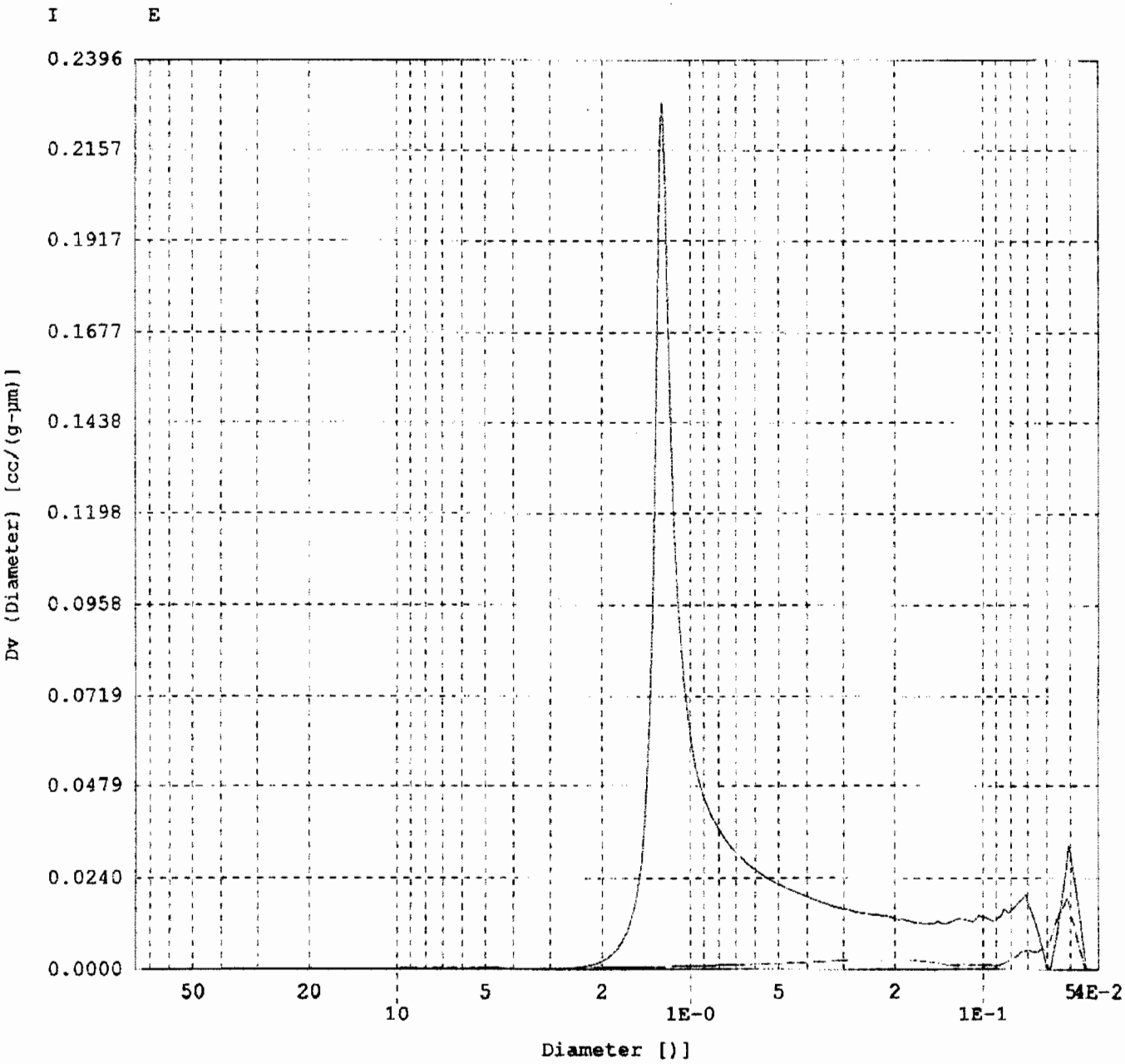
Sample ID	test112	**File Name**	S562301H_Merged.PRM
Sample Weight	13.5803 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot minntac 2 05 7		
Comments	fired ballls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Dv(d) vs. Pore Size



Quantachrome Instruments
Quantachrome Poremaster for Windows® Data Report
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Sample ID	test113	**File Name**	S562701H_Merged.PRM
Sample Weight	13.3144 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot minntac 2 05 8		
Comments	fired ballls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Data Acquisition Parameters

Density of Mercury ..... 13.5000 [g/cc]
Temperature ..... 20.00 [°C]

High Pressure

Data File Name S562701H.PRM
Analysis Date 06/27/2005
# of repeat cycles 0
Penetrometer Constant . 2701 [mV/cc]
Auto-Oil Fill Time .... 5 [sec]
Run Mode ..... Fixed Speed
Motor Speed 1

Low Pressure

Data File Name S5627011.PRM
Analysis Date 06/27/2005
# of repeat cycles 0
Penetrometer Constant . 3307 [mV/cc]
Evacuation Rate 8
Fine Evac. Until ..... 0.5000 [min.]
Coarse Evac. Until .... 4.0000 [min.]

480 Points Acquired 318 Pts in Intrusion Range 162 Pts in Extrusion Range
478 Points Used 317 Intrusion Pts Used 161 Extrusion Pts Used

Quantachrome Instruments
Quantachrome Poremaster for Windows® Data Report
Version 4.03

Sample ID	test113	**File Name**	S562701H_Merged.PRM
Sample Weight	13.3144 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot minntac 2 05 8		
Comments	fired balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Intrusion Statistics

Pressure Range : 2.970 PSIA to 5011.844 PSIA
Pore Diameter Range : 71.813805 µm to 0.042564 µm

Pore Diameter Statistics Summary

	Mean	Mode (df/d(log D))	Median
Volume	6.866E-02 cc/g at a diameter of 8.143E-01 µm	7.032E+03 cc/(µm-g) at a diameter of 1.261E+00 µm	4.195E-02 cc/g at a diameter of 1.216E+00 µm
Surface Area	2.230E-01 m²/g at a diameter of 8.143E-01 µm	2.435E-04 m²/(µm-g) at a diameter of 5.584E-02 µm	2.061E-01 m²/g at a diameter of 9.140E-01 µm
Pore Number Fraction	4.461E-03 at a diameter of 5.584E-02 µm	1.796E-04 at a diameter of 5.584E-02 µm	5.089E-01 at a diameter of 1.104E-01 µm

Mercury Porosimetry Data Summary

Total Intruded Volume	0.0839 cc/g	Bulk (Particle) Density	n/a [g/cc]
Total Surface Area	0.4121 m²/g	Apparent Density	n/a [g/cc]

Quantachrome Instruments
Quantachrome Poremaster for Windows® Data Report
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Sample ID	test113	**File Name**	S562701H_Merged.PRM
Sample Weight	13.3144 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot minntac 2 05 8		
Comments	fired balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Total Surface Area 0.4121 m²/g Apparent Density n/a [g/cc]

Extrusion Statistics

Pressure Range : 4970.131 PSIA to 19.775 PSIA
Pore Diameter Range : 0.042921 µm to 10.787214 µm

Pore Diameter Statistics Summary

	Mean	Mode (df/d(log D))	Median
Volume	8.390E-02 cc/g at a diameter of 1.739E-01 µm	2.979E+01 cc/(µm-g) at a diameter of 5.615E-02 µm	8.315E-02 cc/g at a diameter of 1.003E-01 µm
Surface Area	4.121E-01 m²/g at a diameter of 1.739E-01 µm	1.653E-04 m²/(µm-g) at a diameter of 5.615E-02 µm	3.950E-01 m²/g at a diameter of 5.900E-02 µm
Pore Number Fraction	0.000E+00 at a diameter of 1.739E-01 µm	1.203E-04 at a diameter of 5.615E-02 µm	5.110E-01 at a diameter of 5.702E-02 µm

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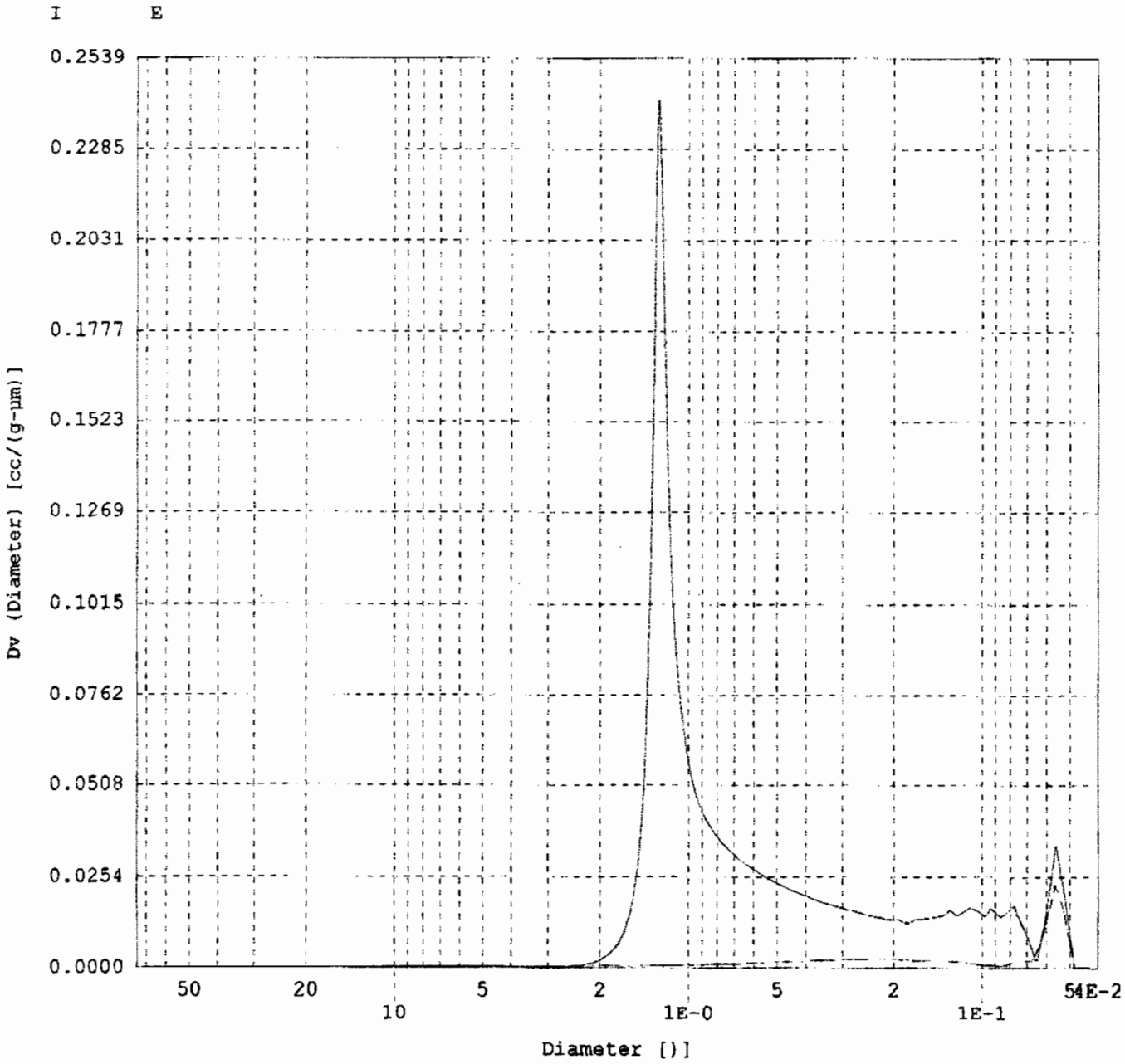
Sample ID	test113	**File Name**	S562701H_Merged.PRM
Sample Weight	13.3144 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot minntac 2 05 8		
Comments	fired ballls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Dv(d) vs. Pore Size



Quantachrome Instruments
Quantachrome Poremaster for Windows® Data Report
Version 4.03

Sample ID	test114	**File Name**	S562702H_Merged.PRM
Sample Weight	13.6216 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot minntac 2 05 9		
Comments	fired balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Data Acquisition Parameters

Density of Mercury ..... 13.5000 [g/cc]
Temperature ..... 20.00 [°C]

High Pressure

Data File Name S562702H.PRM
Analysis Date 06/27/2005
# of repeat cycles 0
Penetrometer Constant . 2701 [mV/cc]
Auto-Oil Fill Time .... 5 [sec]
Run Mode ..... Fixed Speed
Motor Speed 1

Low Pressure

Data File Name S5627021.PRM
Analysis Date 06/27/2005
# of repeat cycles 0
Penetrometer Constant . 3307 [mV/cc]
Evacuation Rate 8
Fine Evac. Until ..... 0.5000 [min.]
Coarse Evac. Until .... 4.0000 [min.]

500 Points Acquired	305 Pts in Intrusion Range	195 Pts in Extrusion Range
498 Points Used	304 Intrusion Pts Used	194 Extrusion Pts Used

Quantachrome Instruments
Quantachrome Poremaster for Windows® Data Report
Version 4.03

Sample ID	test114	**File Name**	S562702H_Merged.PRM
Sample Weight	13.6216 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot minntac 2 05 9		
Comments	fired ballls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Intrusion Statistics

Pressure Range : 2.754 PSIA to 4960.726 PSIA
Pore Diameter Range : 77.451393 µm to 0.043002 µm

Pore Diameter Statistics Summary

	Mean	Mode (df/d(log D))	Median
Volume	7.189E-02 cc/g at a diameter of 8.194E-01 µm	8.383E+03 cc/(µm-g) at a diameter of 1.243E+00 µm	4.377E-02 cc/g at a diameter of 1.211E+00 µm
Surface Area	2.318E-01 m²/g at a diameter of 8.194E-01 µm	1.630E-04 m²/(µm-g) at a diameter of 4.905E-02 µm	2.137E-01 m²/g at a diameter of 9.229E-01 µm
Pore Number Fraction	3.440E-03 at a diameter of 6.228E-02 µm	1.201E-04 at a diameter of 6.228E-02 µm	5.048E-01 at a diameter of 9.378E-02 µm

Mercury Porosimetry Data Summary

Total Intruded Volume	0.0875 cc/g	Bulk (Particle) Density	n/a [g/cc]
Total Surface Area	0.4274 m²/g	Apparent Density	n/a [g/cc]

Quantachrome Instruments
Quantachrome Poremaster for Windows® Data Report
Version 4.03

Sample ID	test114	**File Name**	S562702H_Merged.PRM
Sample Weight	13.6216 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot minntac 2 05 9		
Comments	fired ballls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Total Surface Area 0.4274 m²/g Apparent Density n/a [g/cc]

Extrusion Statistics

Pressure Range : 4956.335 PSIA to 19.975 PSIA
Pore Diameter Range : 0.043040 µm to 10.679431 µm

Pore Diameter Statistics Summary

	Mean	Mode (df/d(log D))	Median
Volume	8.755E-02 cc/g at a diameter of 4.276E-01 µm	2.224E+01 cc/(µm-g) at a diameter of 7.067E+00 µm	8.707E-02 cc/g at a diameter of 7.282E-02 µm
Surface Area	4.274E-01 m²/g at a diameter of 4.276E-01 µm	1.886E-06 m²/(µm-g) at a diameter of 3.517E-01 µm	4.229E-01 m²/g at a diameter of 4.847E-02 µm
Pore Number Fraction	2.998E-05 at a diameter of 4.276E-01 µm	1.271E-06 at a diameter of 3.517E-01 µm	5.336E-01 at a diameter of 3.860E-01 µm

Report date: 09/13/2005 Merged File

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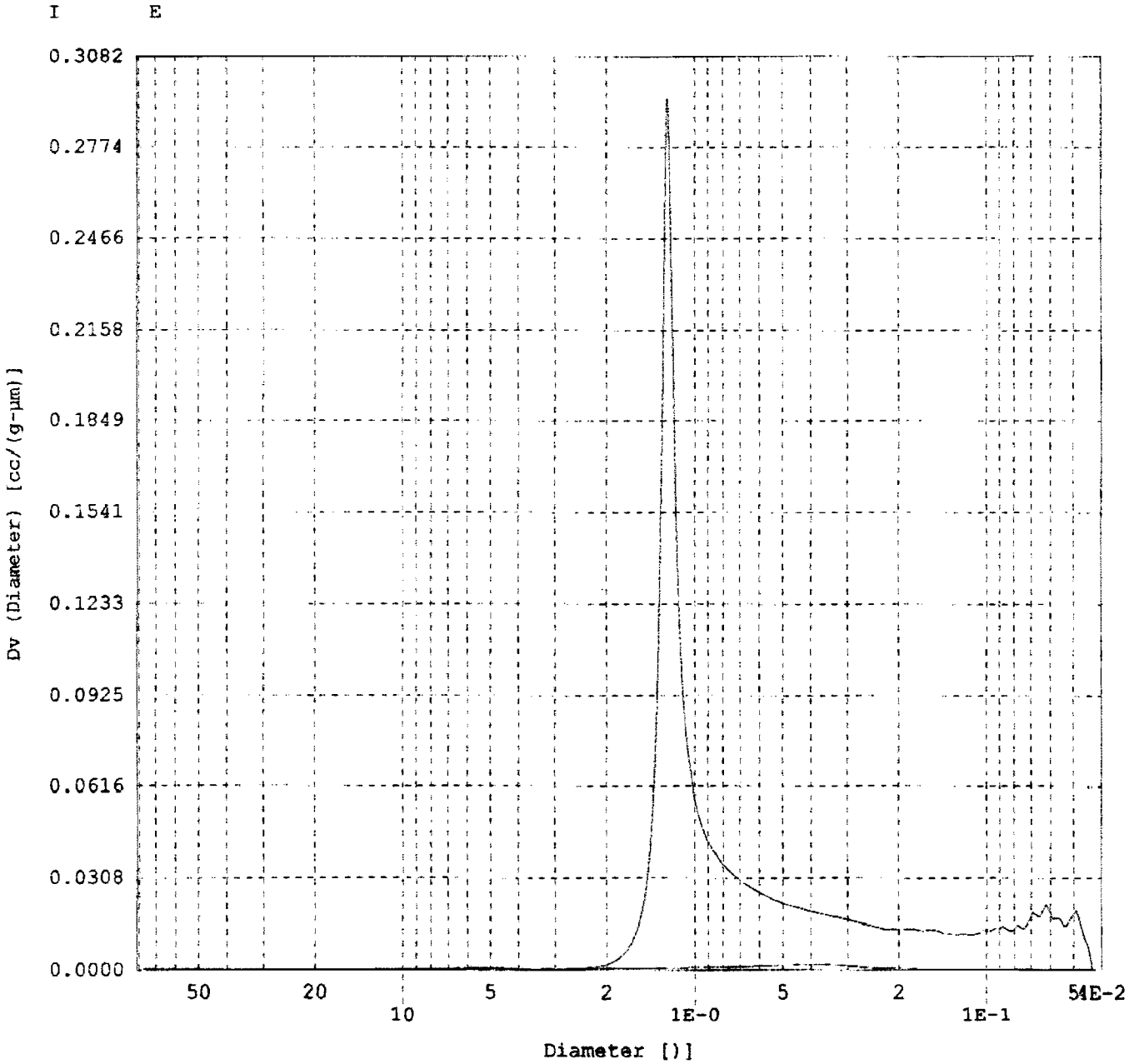
Sample ID	test114	**File Name**	S562702H_Merged.PRM
Sample Weight	13.6216 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot minntac 2 05 9		
Comments	fired ballls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Dv(d) vs. Pore Size



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Sample ID	test115	**File Name**	S563001H_Merged.PRM
Sample Weight	13.3224 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot minntac 2 05 10		
Comments	fired ballls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rig	Mercury volume normalized by sample weight.	

Standard Report

Data Acquisition Parameters

Density of Mercury ..... 13.5000 [g/cc]
Temperature ..... 20.00 [°C]

High Pressure

Data File Name S563001H.PRM
Analysis Date 06/30/2005
# of repeat cycles 0
Penetrometer Constant . 2701 [mV/cc]
Auto-Oil Fill Time .... 5 [sec]
Run Mode ..... Fixed Speed
Motor Speed 1

Low Pressure

Data File Name S5630011.PRM
Analysis Date 06/30/2005
# of repeat cycles 0
Penetrometer Constant . 3307 [mV/cc]
Evacuation Rate 8
Fine Evac. Until ..... 0.5000 [min.]
Coarse Evac. Until .... 4.0000 [min.]

520 Points Acquired	331 Pts in Intrusion Range	189 Pts in Extrusion Range
518 Points Used	330 Intrusion Pts Used	188 Extrusion Pts Used

Quantachrome Instruments
Quantachrome Poremaster for Windows® Data Report
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Sample ID	test115	**File Name**	S563001H_Merged.PRM
Sample Weight	13.3224 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot minntac 2 05 10		
Comments	fired ballls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Intrusion Statistics

Pressure Range : 2.966 PSIA to 4985.275 PSIA
Pore Diameter Range : 71.934647 µm to 0.042790 µm

Pore Diameter Statistics Summary

	Mean	Mode (df/d(log D))	Median
Volume	7.018E-02 cc/g at a diameter of 7.745E-01 µm	6.275E+03 cc/(µm-g) at a diameter of 1.180E+00 µm	4.326E-02 cc/g at a diameter of 1.145E+00 µm
Surface Area	2.411E-01 m²/g at a diameter of 7.745E-01 µm	1.182E-04 m²/(µm-g) at a diameter of 5.167E-02 µm	2.234E-01 m²/g at a diameter of 8.538E-01 µm
Pore Number Fraction	4.205E-03 at a diameter of 7.725E-02 µm	8.683E-05 at a diameter of 7.725E-02 µm	5.045E-01 at a diameter of 1.116E-01 µm

Mercury Porosimetry Data Summary

Total Intruded Volume	0.0865 cc/g	Bulk (Particle) Density	n/a [g/cc]
Total Surface Area	0.4468 m²/g	Apparent Density	n/a [g/cc]

Quantachrome Instruments
Quantachrome Poremaster for Windows® Data Report
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Sample ID	test115	**File Name**	S563001H_Merged.PRM
Sample Weight	13.3224 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot minntac 2 05 10		
Comments	fired balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Total Surface Area 0.4468 m²/g Apparent Density n/a [g/cc]

Extrusion Statistics

Pressure Range : 4953.990 PSIA to 19.900 PSIA
Pore Diameter Range : 0.043061 µm to 10.719597 µm

Pore Diameter Statistics Summary

	Mean	Mode (df/d(log D))	Median
Volume	8.652E-02 cc/g at a diameter of 3.577E-01 µm	1.854E+01 cc/(µm-g) at a diameter of 9.939E-01 µm	8.532E-02 cc/g at a diameter of 1.245E-01 µm
Surface Area	4.468E-01 m²/g at a diameter of 3.577E-01 µm	4.704E-05 m²/(µm-g) at a diameter of 4.893E-02 µm	4.334E-01 m²/g at a diameter of 5.915E-02 µm
Pore Number Fraction	2.974E-03 at a diameter of 3.577E-01 µm	3.439E-05 at a diameter of 4.893E-02 µm	5.046E-01 at a diameter of 6.016E-02 µm

Report date: 09/13/2005 Merged File

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Quantachrome Poremaster for Windows® Data Report
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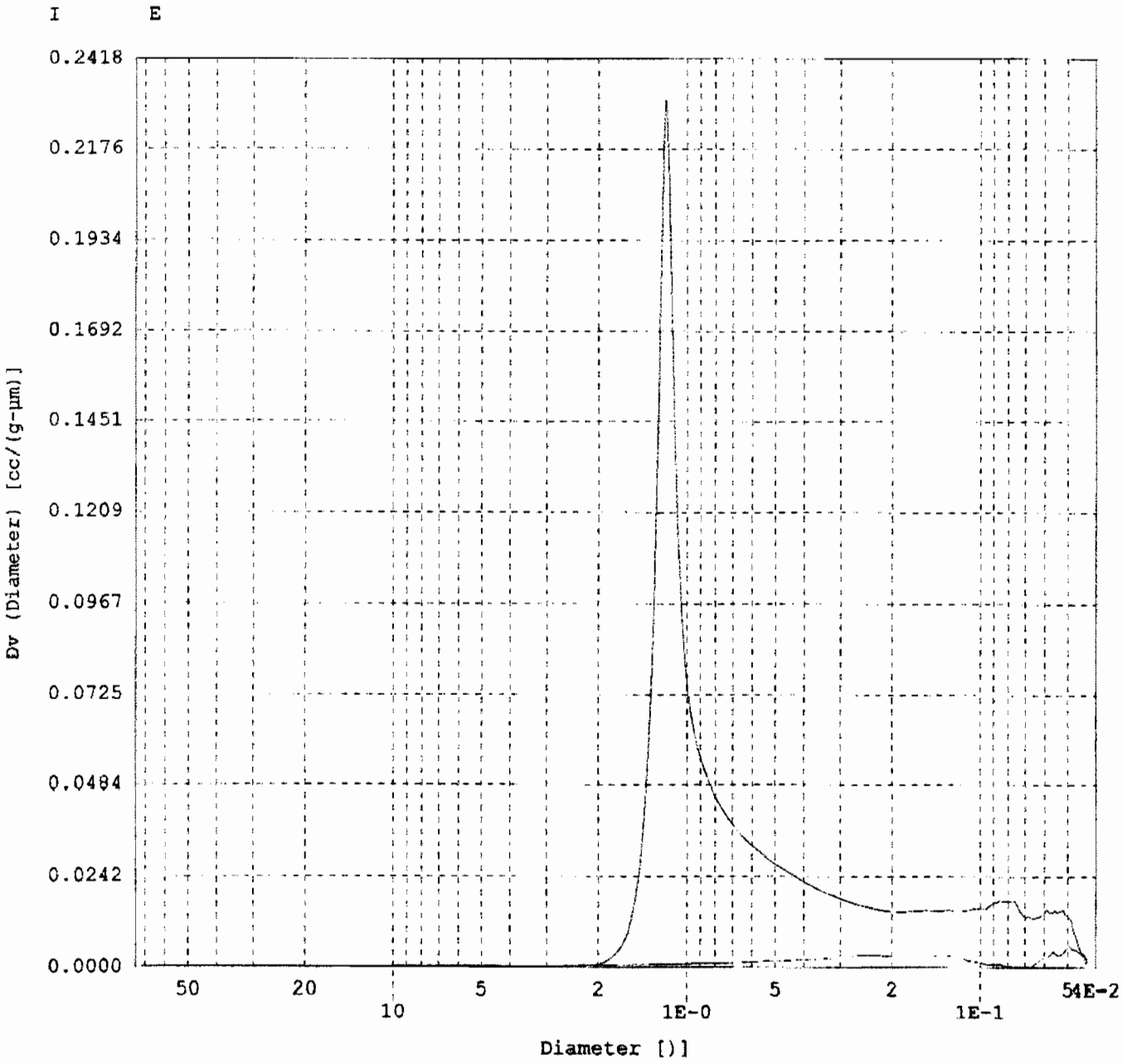
Sample ID	test115	**File Name**	S563001H_Merged.PRM
Sample Weight	13.3224 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot minntac 2 05 10		
Comments	fired ballls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Dv(d) vs. Pore Size



Quantachrome Instruments
Quantachrome Poremaster for Windows® Data Report
Version 4.03

Sample ID	test116	**File Name**	S563002H_Merged.PRM
Sample Weight	12.5546 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot minntac 2 05 11		
Comments	fired balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Data Acquisition Parameters

Density of Mercury ..... 13.5000 [g/cc]
Temperature ..... 20.00 [°C]

High Pressure

Data File Name S563002H.PRM
Analysis Date 06/30/2005
# of repeat cycles 0
Penetrometer Constant . 2701 [mV/cc]
Auto-Oil Fill Time .... 5 [sec]
Run Mode ..... Fixed Speed
Motor Speed 1

Low Pressure

Data File Name S5630021.PRM
Analysis Date 06/30/2005
# of repeat cycles 0
Penetrometer Constant . 3307 [mV/cc]
Evacuation Rate 8
Fine Evac. Until ..... 0.5000 [min.]
Coarse Evac. Until .... 4.0000 [min.]

564 Points Acquired 338 Pts in Intrusion Range 226 Pts in Extrusion Range
557 Points Used 337 Intrusion Pts Used 220 Extrusion Pts Used

Quantachrome Instruments
Quantachrome Poremaster for Windows® Data Report
Version 4.03

Sample ID	test116	**File Name**	S563002E_Merged.PRM
Sample Weight	12.5548 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot minntac 2 05 11		
Comments	fired balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Intrusion Statistics

Pressure Range : 3.102 PSIA to 4999.420 PSIA
Pore Diameter Range : 68.771843 µm to 0.042669 µm

Pore Diameter Statistics Summary

	Mean	Mode (df/d(log D))	Median
Volume	7.243E-02 cc/g at a diameter of 7.391E-01 µm	6.007E+03 cc/(µm-g) at a diameter of 1.200E+00 µm	4.381E-02 cc/g at a diameter of 1.156E+00 µm
Surface Area	2.478E-01 m²/g at a diameter of 7.391E-01 µm	2.730E-04 m²/(µm-g) at a diameter of 4.386E-02 µm	2.371E-01 m²/g at a diameter of 7.735E-01 µm
Pore Number Fraction	3.029E-03 at a diameter of 4.267E-02 µm	1.964E-04 at a diameter of 4.267E-02 µm	5.012E-01 at a diameter of 7.229E-02 µm

Mercury Porosimetry Data Summary

Total Intruded Volume	0.0876 cc/g	Bulk (Particle) Density	n/a [g/cc]
Total Surface Area	0.4743 m²/g	Apparent Density	n/a [g/cc]

Quantachrome Instruments
Quantachrome Poremaster for Windows® Data Report
Version 4.03

Sample ID	test116	**File Name**	S563002H_Merged.PRM
Sample Weight	12.5548 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot minntac 2 05 11		
Comments	fired balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rig	Mercury volume normalized by sample weight.	

Standard Report

Total Surface Area 0.4743 m²/g Apparent Density n/a [g/cc]

Extrusion Statistics

Pressure Range : 4971.429 PSIA to 20.150 PSIA
Pore Diameter Range : 0.042910 µm to 10.586873 µm

Pore Diameter Statistics Summary

	Mean	Mode (df/d(log D))	Median
Volume	8.763E-02 cc/g at a diameter of 2.073E-01 µm	7.165E+01 cc/(µm-g) at a diameter of 9.407E+00 µm	8.696E-02 cc/g at a diameter of 6.742E-02 µm
Surface Area	4.743E-01 m²/g at a diameter of 2.073E-01 µm	3.949E-05 m²/(µm-g) at a diameter of 5.142E-02 µm	4.613E-01 m²/g at a diameter of 4.795E-02 µm
Pore Number Fraction	8.693E-03 at a diameter of 2.073E-01 um	2.857E-05 at a diameter of 5.142E-02 µm	5.150E-01 at a diameter of 6.107E-02 um

Report date: 09/13/2005 Merged File

Quantachrome Instruments
Quantachrome Poremaster for Windows® Data Report
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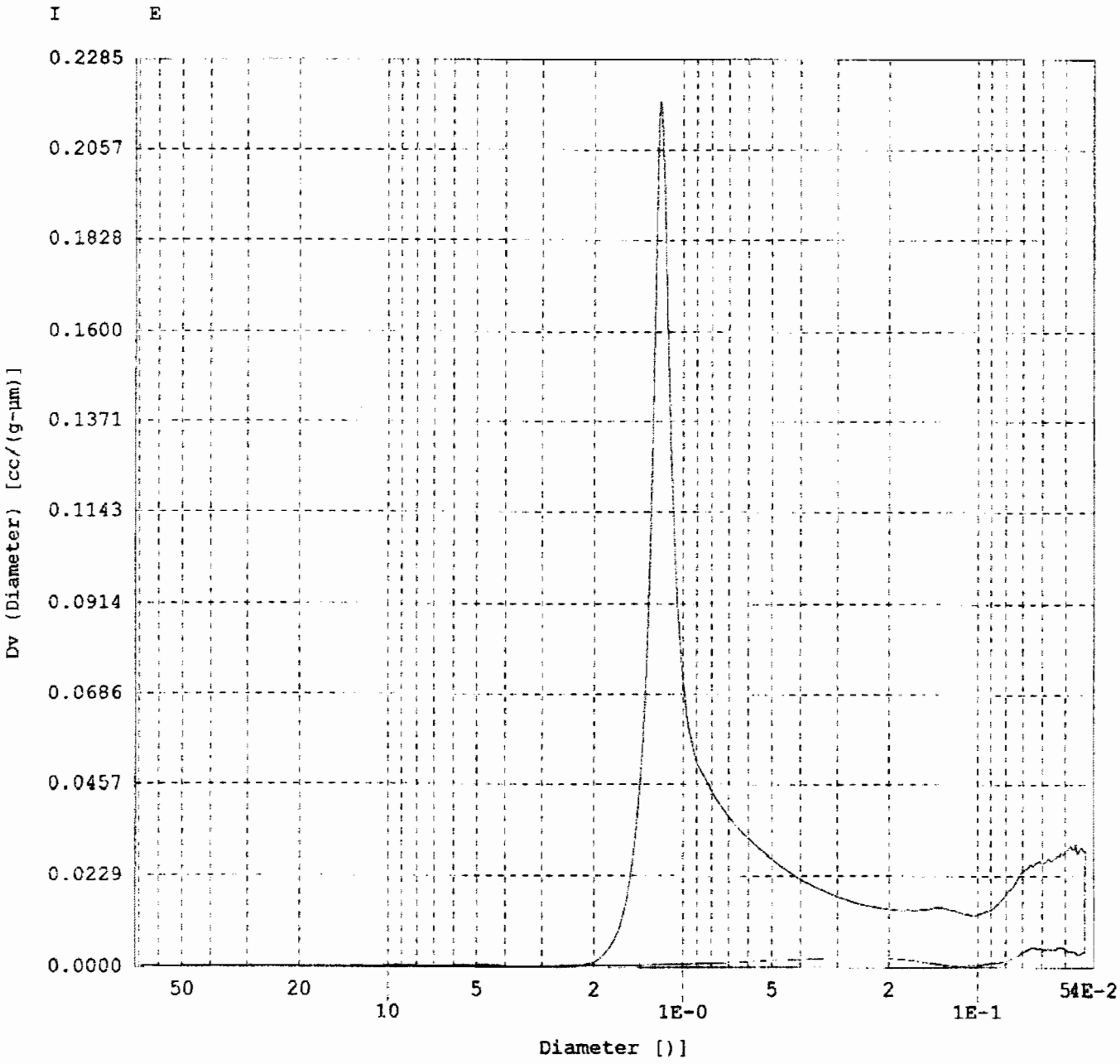
Sample ID	test116	**File Name**	S563002H_Merged.PRM
Sample Weight	12.5548 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot minntac 2 05 11		
Comments	fired ballls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Dv(d) vs. Pore Size



Quantachrome Instruments
Quantachrome Poremaster for Windows® Data Report
Version 4.03

Sample ID	test117	**File Name**	S570501H_Merged.PRM
Sample Weight	13.2853 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot minntac 2 05 12		
Comments	fired balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Data Acquisition Parameters

Density of Mercury ..... 13.5000 [g/cc]
Temperature ..... 20.00 [°C]

High Pressure

Data File Name S570501H.PRM
Analysis Date 07/05/2005
# of repeat cycles 0
Penetrometer Constant . 2701 [mV/cc]
Auto-Oil Fill Time .... 5 [sec]
Run Mode ..... Fixed Speed
Motor Speed 1

Low Pressure

Data File Name S5705011.PRM
Analysis Date 07/05/2005
# of repeat cycles 0
Penetrometer Constant . 3307 [mV/cc]
Evacuation Rate 8
Fine Evac. Until ..... 0.5000 [min.]
Coarse Evac. Until .... 4.0000 [min.]

487 Points Acquired 324 Pts in Intrusion Range 163 Pts in Extrusion Range
485 Points Used 323 Intrusion Pts Used 162 Extrusion Pts Used

Quantachrome Instruments
Quantachrome Poremaster for Windows® Data Report
Version 4.03

Sample ID	test117	**File Name**	S570501H_Merged.PRM
Sample Weight	13.2853 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot minntac 2 05 12		
Comments	fired ballls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Intrusion Statistics

Pressure Range : 2.884 PSIA to 5011.046 PSIA
Pore Diameter Range : 73.967400 µm to 0.042570 µm

Pore Diameter Statistics Summary

	Mean	Mode (df/d(log D))	Median
Volume	7.204E-02 cc/g at a diameter of 8.301E-01 µm	8.479E+03 cc/(µm-g) at a diameter of 1.226E+00 µm	4.412E-02 cc/g at a diameter of 1.191E+00 µm
Surface Area	2.383E-01 m²/g at a diameter of 8.301E-01 µm	9.901E-05 m²/(µm-g) at a diameter of 5.385E-02 µm	2.126E-01 m²/g at a diameter of 9.399E-01 µm
Pore Number Fraction	4.691E-03 at a diameter of 7.322E-02 µm	7.258E-05 at a diameter of 7.322E-02 µm	5.014E-01 at a diameter of 1.145E-01 µm

Mercury Porosimetry Data Summary

Total Intruded Volume	0.0882 cc/g	Bulk (Particle) Density	n/a [g/cc]
Total Surface Area	0.4252 m²/g	Apparent Density	n/a [g/cc]

Quantachrome Instruments
Quantachrome Poremaster for Windows® Data Report
Version 4.03

Sample ID	test117	**File Name**	S570501N_Merged.PRM
Sample Weight	13.2853 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot minntac 2 05 12		
Comments	fired balls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Standard Report

Total Surface Area 0.4252 m²/g Apparent Density n/a [g/cc]

Extrusion Statistics

Pressure Range : 4972.077 PSIA to 20.000 PSIA
Pore Diameter Range : 0.042904 µm to 10.666110 µm

Pore Diameter Statistics Summary

	Mean	Mode (df/d(log D))	Median
Volume	8.824E-02 cc/g at a diameter of 7.029E-01 µm	1.705E+01 cc/(µm-g) at a diameter of 7.253E-01 µm	8.733E-02 cc/g at a diameter of 1.208E-01 µm
Surface Area	4.252E-01 m²/g at a diameter of 7.029E-01 µm	2.751E-05 m²/(µm-g) at a diameter of 4.290E-02 um	4.200E-01 m²/g at a diameter of 5.113E-02 µm
Pore Number Fraction	3.863E-02 at a diameter of 7.029E-01 µm	1.951E-05 at a diameter of 4.621E-02 µm	5.110E-01 at a diameter of 4.740E-02 µm

Quantachrome Instruments
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Sample ID	test117	**File Name**	S570501H_Merged.PRM
Sample Weight	13.2853 grams	**Bulk Sample Volume**	1.0000 cc
Sample Description	mini pot minntac 2 05 12		
Comments	fired ballls		
Hg Surface Tension	480.00 erg/cm²	**Hg Contact Angle**	(I)140.00°,(E)140.00°
Minimum Delta Vol.	0.000 % FS	**Moving Point Avg.**	11 (Scan Mode)
Operator	rlg	Mercury volume normalized by sample weight.	

Dv(d) vs. Pore Size