National Institute of Standards & Technology

BAM Bundesanstalt für Materialforschung und -prüfung

Standard Reference Material®
NIST SRM 1917

Certified Reference Material
CRM BAM-P127

CERTIFICATE

Mercury Porosimetry Standard

This SRM/CRM jointly developed and certified by NIST and BAM is intended for use in calibrating and monitoring the performance of mercury porosimeters. The SRM/CRM unit consists of a single bottle containing approximately 10 g of alumina beads.

Certified properties:

A) Pressure-volume curve (mercury intrusion curve) between 0.1 MPa and 400 MPa (see Fig. A1 and A2 in Annex 2 and Table in Annex 3 for values at each data point)

B) Diameter-volume curve (cumulative pore volume curve) between 3.7 nm and 14708 nm (see Fig. A3 and A4 in Annex 2 and Table in Annex 3 for values at each data point)

C) (i) Pore volume values at selected intrusion pressure points; (ii) Values for the pore diameter (see Table 1)

Table 1. Certified Pore Volume Values at selected intrusion pressures and Certified Pore Diameter

Property	$\overline{\overline{x}}$	U	2s	Unit
Specific Pore Volume at 50 MPa	69.4	1.5	8.0	$mm^3 \cdot g^{-1}$
Specific Pore Volume at 100 MPa	625.4	2.5	13.6	$mm^3 \cdot g^{-1}$
Specific Pore Volume at 195 MPa	637.1	2.6	14.4	$mm^3 \cdot g^{-1}$
Specific Pore Volume at 395 MPa	638.6	3.9	21.6	$mm^3 \cdot g^{-1}$
Mean Pore Diameter d_{50}	24.2	0.2	1.0	nm
Most Frequent Pore Diameter $d_{p,m}$	23.9	0.5	2.8	nm

$\overline{\overline{x}}$ - mean of the laboratory means (certified value)

U - expanded uncertainty (coverage factor 2) $U = 2u$ with $u = s / \sqrt{N}$ u - standard error of the certified value

N - number of laboratory means (= 30) s - standard deviation of the laboratory means

Note: all certified pore volumes are normalized values $V'_p = V_p(p_{Hg}) - V_p(0.1\ MPa)$

Table 2. Information Values (noncertified)

Property	Value	Unit
Density (by He Pycnometry)	3.41	$g \cdot cm^{-3}$
Bulk Density (by Mercury Porosimetry)	1.07	$g \cdot cm^{-3}$
Total Sample Porosity (by Mercury Porosimetry)	70	%

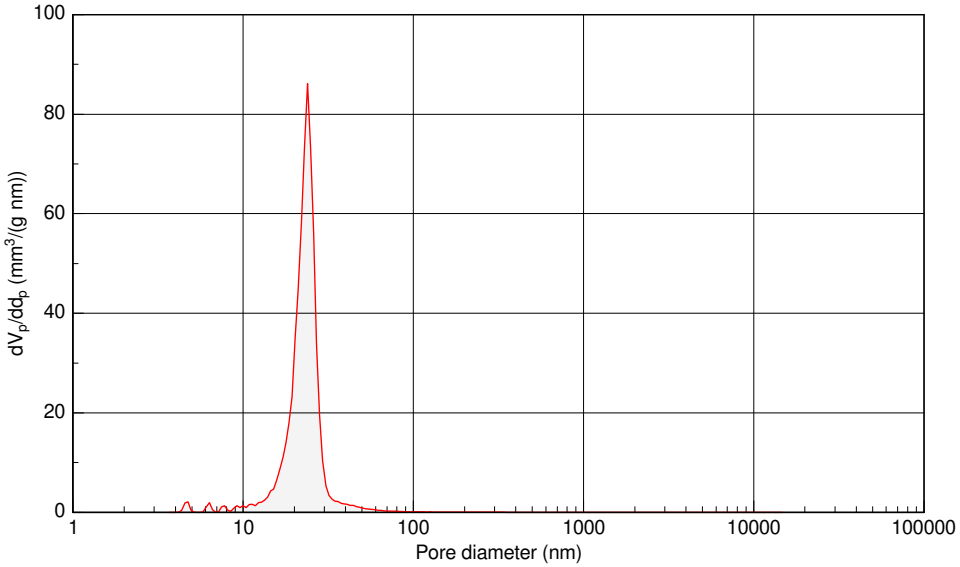

Figure 1. Pore size distribution of NIST SRM 1917 / CRM BAM-P127 (noncertified)

DESCRIPTION OF THE SAMPLE

The material consists of alumina beads. The primary particles of the material form stable agglomerates. With mercury porosimetry, the pores within the agglomerates are measured.

INSTRUCTION FOR USE

This SRM/CRM is intended for use in the calibration and checking the performance of high pressure mercury porosimeters in the pressure range between 0.1 MPa and 400 MPa.

After first use, the bottle should be kept tightly capped and in a cool storage facility at 20 °C ± 5 °C. The material need not be kept under vacuum during normal storage conditions.

The recommended minimum sample intake is 0.3 g.

Use mercury with a purity of 99.9999 % (outgassed) or better.

Prior to the analysis, a heating procedure for drying the sample is necessary. Heat the reference material for 3 h at 105 °C.

Because of the volume between the particles of the sample (intergranular volume with a more or less random character), the mercury filling procedure of the penetrometer (dilatometer) should be carried out with caution.

DATA EVALUATION

In order to obtain the certified values of the pore volume, the intergranular volume recorded during the filling procedure has to be subtracted from the intrusion curve at the beginning of the data evaluation. The transformation of the intrusion pressure data p_{Hg} into pore diameter values d_p according to the Washburn equation $d_p = 4\ \gamma \cos\theta / p_{Hg}$ (assuming a cylindrical pore model) has to be carried out using the following values of the parameters: γ = 0.48 N m^{-1} (surface tension of mercury) and θ = 140° (contact angle of mercury). The most frequent pore diameter is the maximum of the pore size distribution curve dv_p/dd_p (see Fig. 1)

SHELF LIFE

The certification of this SRM/CRM is considered valid until **01 October 2020**, within the measurement uncertainties specified, provided the SRM/CRM is handled and stored in accordance with the Instructions for Use section of this certificate.

EXPIRATION DATE

The certification is nullified **24 months after the SRM/CRM bottle is first opened** by the SRM/CRM user, or immediately if the SRM/CRM is contaminated or otherwise modified.

REFERENCES

J. K. Taylor	Standard Reference Materials, Handbook for SRM Users NIST Special Publication 260-100
BAM (1997)	Guidelines for the Production and Certification of BAM Reference Materials
ASTM D 4284-92	Standard test method for determining pore volume distribution of catalysts by mercury intrusion porosimetry
BS 7591-1 (1992)	Porosity and pore size distribution of materials. Method of evaluation by mercury porosimetry
DIN 66133 (1993)	Bestimmung der Porenvolumenverteilung und der spezifischen Oberflaeche von Feststoffen durch Quecksilberintrusion (Determination of the pore volume distribution and the specific surface area of solids by mercury intrusion)

Gaithersburg, MD, United States of America and Berlin, Germany
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See Revision History on last page

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ANNEX 1: COORDINATION, STATISTICS AND PARTICIPATING LABORATORIES

Coordination of the Interlaboratory Testing

P. Klobes	Bundesanstalt für Materialforschung und -prüfung (BAM)
D.B. Minor	NIST Ceramics Division

Statistical Analysis

S.D. Leigh, A.N. Heckert	NIST Statistical Engineering Division

Participants in the Interlaboratory Testing

Bayer AG, Feststoffverfahrenstechnik / Partikelcharakterisierung, Leverkusen, DE

Bundesanstalt für Materialforschung und -prüfung (BAM), FG I.1 Anorganisch-chemische Analytik; Referenzmaterialien, Berlin, DE

Bundesanstalt für Materialforschung und -prüfung (BAM), FG VII.1 Baustoffe, Berlin, DE

CISP at Pennsylvania State University, University Park, PA, US

Chevron Corporation, Geotechnical Center, San Ramon, CA, US

Chevron Research and Technology Corporation, Richmond, CA, US

Condea Vista-Sasol North America, Austin, US

Corning Incorporation, Corning, NY, US

Eastman Kodak, Rochester, NY, US

Eidgenössische Materialprüfungs- und Forschungsanstalt (EMPA), Dübendorf, CH

Engelhard Corporation, Attapulugus, GA, US

Engelhard Corporation, Iselin, NJ, US

Exxon Mobil Research Engineering, Paulsboro, NJ, US

Hermsdorfer Institut für Technische Keramik e.V., Hermsdorf, DE

IKO Minerals, Industriemineralien und Kohlenstoffe GmbH & Co. KG, Marl, DE

Infracor GmbH, Marl, DE

Micromeritics GmbH, Mönchengladbach, DE

NIST, Ceramics Division, Gaithersburg, MD, US

Oerlikon Stationary Batteries LTD, Aesch, CH

Oil Dri Corporation, Vernon Hills, IL, US

POROTEC GmbH Applikationslabor, Hofheim, DE

Quantachrome Corporation, Boynton Beach, FL, US

Quantachrome GmbH, Odelzhausen, DE

Shima Technology Center, San Jose, CA, US

Technische Universität Hamburg-Harburg, Arbeitsbereich Bauphysik und Werkstoffe im Bauwesen, Hamburg, DE

ThermoQuest Italia S.p.A., Rodano, Milan, IT

Thiele Kaolin Company, Sandersville, GA, US

Universität Kassel, Institut für Thermische Energietechnik, Kassel, DE

University of Amsterdam, Department of Chemical Engineering, Amsterdam, NL

University of California-Berkeley, Department of Chemistry, Berkeley, CA, US

University of Michigan, Ann Arbor, MI, US

Washington State University, Mechanical and Materials Engineering, Pullman, WA, US

ANNEX 2: CERTIFIED CURVES

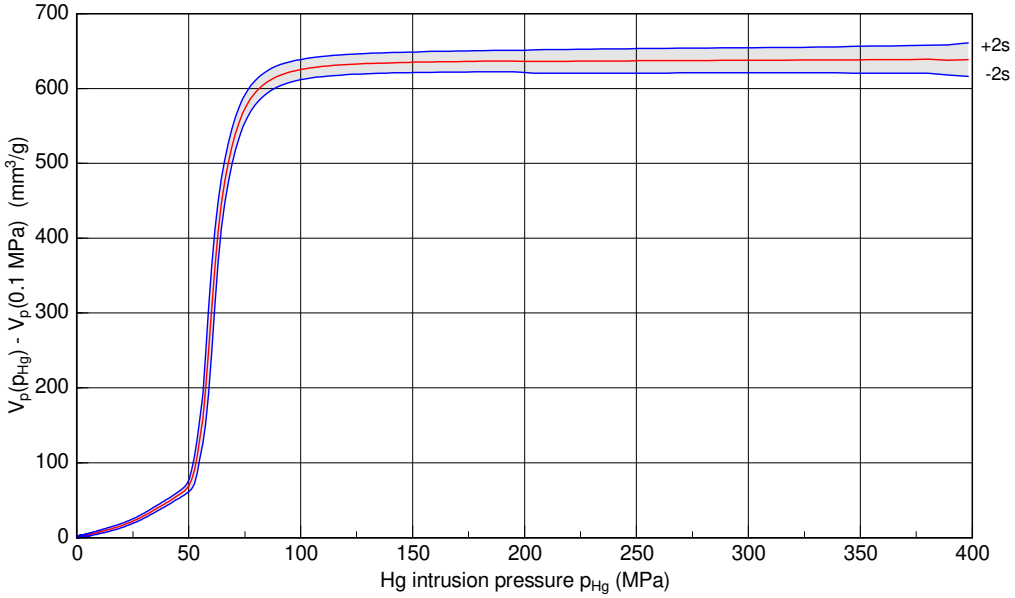

Figure A1. Certified mercury intrusion curve with uncertainty interval ± 2s (whole range)

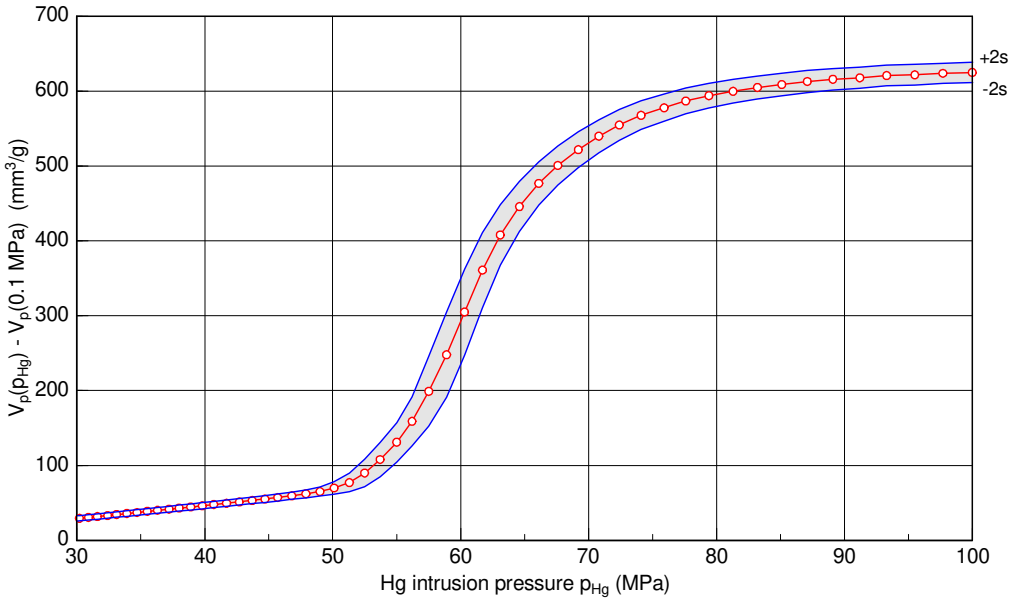

Figure A2. Certified mercury intrusion curve with uncertainty interval ± 2s (detail between 30 MPa and 100 MPa)

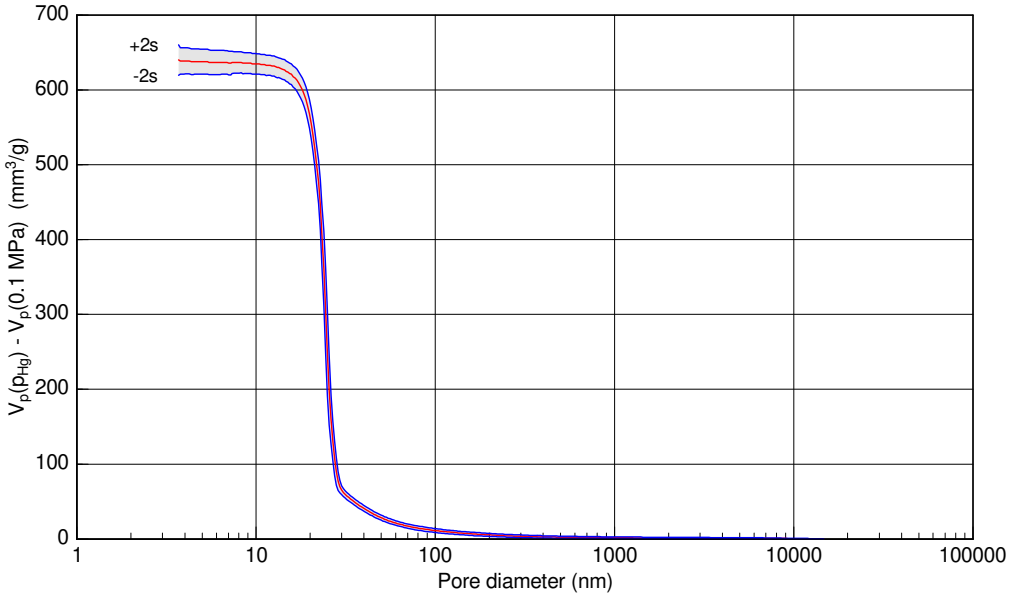

Figure A3. Certified curve of the cumulative pore volume with uncertainty interval ± 2s (whole range, logarithmic p-axis)

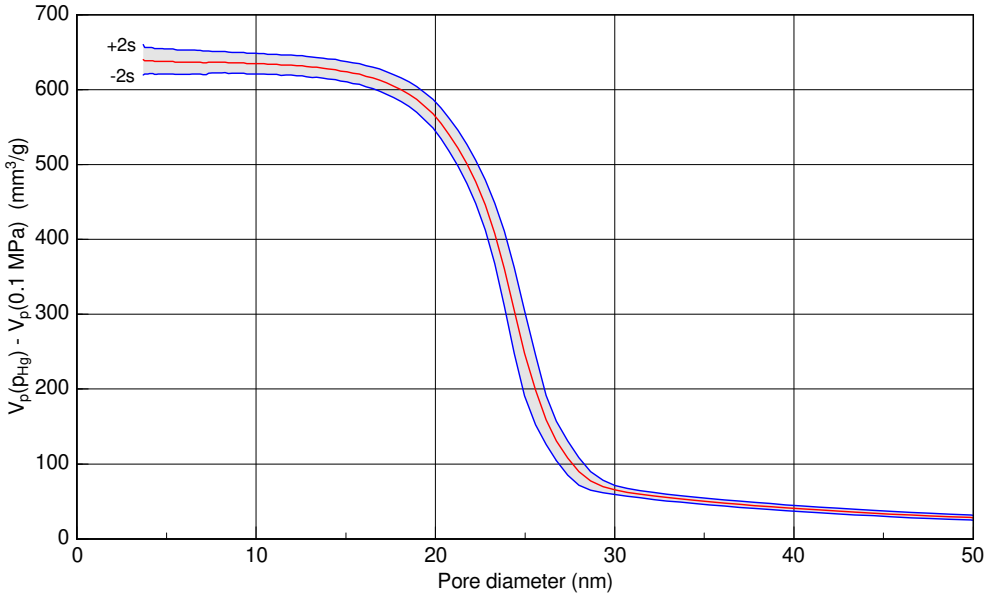

Figure A4. Certified curve of the cumulative pore volume with uncertainty interval ± 2s (detail between 3.7 nm and 50 nm, linear p-axis)

ANNEX 3: DATA POINTS FOR THE CERTIFIED CURVES

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Certified values for the pressure/volume and the diameter/volume curves at each data point

p_{Hg} -mercury intrusion pressure

d_p -pore diameter

V'_p - normalized specific pore volume
$V'_p = V_p(p_{Hg}) - V_p(0.1\ MPa)$

U -expanded uncertainty (coverage factor 2)

u -standard error of the certified value

s - standard deviation of the certified value
$U = 2\ u$ with $u = s / \sqrt{N}$ (N laboratories)

Data point No.	p_{Hg} (MPa)	d_p (nm)	V'_p (mm^3/g)	U (mm^3/g)	2s (mm^3/g)
1	0.100	14708.053	0.00	0.00	0.00
2	0.102	14373.257	0.06	0.01	0.05
3	0.105	14046.082	0.10	0.02	0.11
4	0.107	13726.354	0.14	0.02	0.11
5	0.110	13413.904	0.17	0.03	0.16
6	0.112	13108.566	0.21	0.04	0.22
7	0.115	12810.179	0.23	0.04	0.22
8	0.117	12518.584	0.26	0.05	0.27
9	0.120	12233.626	0.28	0.05	0.27
10	0.123	11955.155	0.31	0.05	0.27
11	0.126	11683.022	0.33	0.06	0.33
12	0.129	11417.084	0.36	0.06	0.33
13	0.132	11157.199	0.38	0.06	0.33
14	0.135	10903.231	0.41	0.07	0.38
15	0.138	10655.043	0.42	0.07	0.38
16	0.141	10412.504	0.44	0.07	0.38
17	0.145	10175.487	0.47	0.08	0.44
18	0.148	9943.864	0.49	0.08	0.44
19	0.151	9717.514	0.51	0.08	0.44
20	0.155	9496.317	0.53	0.09	0.49
21	0.158	9280.154	0.56	0.09	0.49
22	0.162	9068.912	0.58	0.09	0.49
23	0.166	8862.479	0.60	0.10	0.55
24	0.170	8660.744	0.62	0.10	0.55
25	0.174	8463.601	0.60	0.10	0.55
26	0.178	8270.946	0.58	0.09	0.49
27	0.182	8082.676	0.60	0.09	0.49
28	0.186	7898.692	0.60	0.10	0.55
29	0.191	7718.896	0.62	0.10	0.55
30	0.195	7543.193	0.63	0.10	0.55
31	0.200	7371.489	0.65	0.10	0.55
32	0.204	7203.693	0.66	0.10	0.55
33	0.209	7039.717	0.68	0.11	0.60
34	0.214	6879.473	0.70	0.11	0.60
35	0.219	6722.877	0.72	0.11	0.60
36	0.224	6569.846	0.73	0.12	0.66
37	0.229	6420.298	0.75	0.12	0.66
38	0.234	6274.154	0.77	0.12	0.66
39	0.240	6131.337	0.80	0.13	0.71
40	0.245	5991.771	0.84	0.13	0.71
41	0.251	5855.381	0.87	0.14	0.77
42	0.257	5722.097	0.89	0.14	0.77
43	0.263	5591.846	0.90	0.15	0.82
44	0.269	5464.560	0.91	0.15	0.82
45	0.275	5340.171	0.89	0.15	0.82
46	0.282	5218.614	0.91	0.15	0.82
47	0.288	5099.824	0.92	0.16	0.88
48	0.295	4983.738	0.94	0.16	0.88
49	0.302	4870.294	0.95	0.16	0.88
50	0.309	4759.433	0.96	0.16	0.88

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Certified values for the pressure/volume and the diameter/volume curves at each data point

p_{Hg} -mercury intrusion pressure

d_p -pore diameter

V'_p - normalized specific pore volume
$V'_p = V_p(p_{Hg}) - V_p(0.1\ MPa)$

U -expanded uncertainty (coverage factor 2)

u -standard error of the certified value

s - standard deviation of the certified value
$U = 2\ u$ with $u = s / \sqrt{N}$ (N laboratories)

Data point No.	p_{Hg} (MPa)	d_p (nm)	V'_p (mm^3/g)	U (mm^3/g)	2s (mm^3/g)
51	0.316	4651.095	0.98	0.16	0.88
52	0.324	4545.223	0.99	0.16	0.88
53	0.331	4441.761	1.01	0.17	0.93
54	0.339	4340.654	1.02	0.17	0.93
55	0.347	4241.849	1.03	0.17	0.93
56	0.355	4145.293	1.04	0.17	0.93
57	0.363	4050.934	1.05	0.17	0.93
58	0.372	3958.724	1.06	0.17	0.93
59	0.380	3868.612	1.06	0.17	0.93
60	0.389	3780.552	1.07	0.17	0.93
61	0.398	3694.496	1.08	0.17	0.93
62	0.407	3610.399	1.08	0.17	0.93
63	0.417	3528.216	1.09	0.17	0.93
64	0.427	3447.904	1.10	0.17	0.93
65	0.437	3369.420	1.11	0.17	0.93
66	0.447	3292.723	1.12	0.17	0.93
67	0.457	3217.771	1.13	0.17	0.93
68	0.468	3144.526	1.14	0.18	0.99
69	0.479	3072.948	1.15	0.18	0.99
70	0.490	3002.999	1.16	0.18	0.99
71	0.501	2934.642	1.17	0.18	0.99
72	0.513	2867.842	1.17	0.18	0.99
73	0.525	2802.562	1.18	0.18	0.99
74	0.537	2738.768	1.19	0.18	0.99
75	0.550	2676.426	1.20	0.18	0.99
76	0.562	2615.503	1.21	0.18	0.99
77	0.575	2555.967	1.22	0.18	0.99
78	0.589	2497.786	1.22	0.18	0.99
79	0.603	2440.929	1.23	0.18	0.99
80	0.617	2385.367	1.24	0.18	0.99
81	0.631	2331.069	1.25	0.18	0.99
82	0.646	2278.008	1.26	0.18	0.99
83	0.661	2226.154	1.27	0.18	0.99
84	0.676	2175.481	1.28	0.18	0.99
85	0.692	2125.961	1.29	0.18	0.99
86	0.708	2077.568	1.30	0.18	0.99
87	0.724	2030.277	1.32	0.19	1.04
88	0.741	1984.062	1.33	0.19	1.04
89	0.759	1938.899	1.34	0.19	1.04
90	0.776	1894.764	1.35	0.19	1.04
91	0.794	1851.634	1.36	0.19	1.04
92	0.813	1809.486	1.37	0.19	1.04
93	0.832	1768.297	1.38	0.19	1.04
94	0.851	1728.046	1.40	0.19	1.04
95	0.871	1688.710	1.41	0.19	1.04
96	0.891	1650.271	1.42	0.19	1.04
97	0.912	1612.706	1.43	0.19	1.04
98	0.933	1575.996	1.44	0.19	1.04
99	0.955	1540.122	1.45	0.19	1.04
100	0.977	1505.065	1.46	0.19	1.04

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Certified values for the pressure/volume and the diameter/volume curves at each data point

p_{Hg} -mercury intrusion pressure

d_p -pore diameter

V'_p - normalized specific pore volume
$V'_p = V_p(p_{Hg}) - V_p(0.1\ MPa)$

U -expanded uncertainty (coverage factor 2)

u -standard error of the certified value

s - standard deviation of the certified value
$U = 2\ u$ with $u = s / \sqrt{N}$ (N laboratories)

Data point No.	p_{Hg} (MPa)	d_p (nm)	V'_p (mm^3/g)	U (mm^3/g)	2s (mm^3/g)
101	1.000	1470.805	1.47	0.19	1.04
102	1.023	1437.326	1.48	0.19	1.04
103	1.047	1404.608	1.49	0.20	1.10
104	1.072	1372.635	1.51	0.20	1.10
105	1.096	1341.390	1.52	0.20	1.10
106	1.122	1310.857	1.53	0.20	1.10
107	1.148	1281.018	1.54	0.20	1.10
108	1.175	1251.858	1.56	0.20	1.10
109	1.202	1223.363	1.57	0.20	1.10
110	1.230	1195.515	1.59	0.20	1.10
111	1.259	1168.302	1.60	0.20	1.10
112	1.288	1141.708	1.61	0.20	1.10
113	1.318	1115.720	1.63	0.21	1.15
114	1.349	1090.323	1.64	0.21	1.15
115	1.380	1065.504	1.65	0.21	1.15
116	1.413	1041.250	1.66	0.21	1.15
117	1.445	1017.549	1.68	0.21	1.15
118	1.479	994.386	1.69	0.21	1.15
119	1.514	971.751	1.71	0.21	1.15
120	1.549	949.632	1.73	0.21	1.15
121	1.585	928.015	1.75	0.21	1.15
122	1.622	906.891	1.77	0.21	1.15
123	1.660	886.248	1.79	0.22	1.20
124	1.698	866.074	1.81	0.22	1.20
125	1.738	846.360	1.83	0.22	1.20
126	1.778	827.095	1.85	0.22	1.20
127	1.820	808.268	1.87	0.22	1.20
128	1.862	789.869	1.90	0.22	1.20
129	1.905	771.890	1.92	0.22	1.20
130	1.950	754.319	1.95	0.23	1.26
131	1.995	737.149	1.97	0.23	1.26
132	2.042	720.369	2.00	0.23	1.26
133	2.089	703.972	2.02	0.23	1.26
134	2.138	687.947	2.04	0.23	1.26
135	2.188	672.288	2.07	0.23	1.26
136	2.239	656.985	2.09	0.23	1.26
137	2.291	642.030	2.12	0.23	1.26
138	2.344	627.415	2.14	0.24	1.31
139	2.399	613.134	2.17	0.24	1.31
140	2.455	599.177	2.20	0.24	1.31
141	2.512	585.538	2.23	0.24	1.31
142	2.570	572.210	2.26	0.24	1.31
143	2.630	559.185	2.29	0.25	1.37
144	2.692	546.456	2.32	0.25	1.37
145	2.754	534.017	2.36	0.25	1.37
146	2.818	521.861	2.40	0.25	1.37
147	2.884	509.982	2.43	0.26	1.42
148	2.951	498.374	2.46	0.26	1.42
149	3.020	487.029	2.49	0.26	1.42
150	3.090	475.943	2.53	0.26	1.42

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Certified values for the pressure/volume and the diameter/volume curves at each data point

p_{Hg} -mercury intrusion pressure

d_p -pore diameter

V'_p - normalized specific pore volume
$V'_p = V_p(p_{Hg}) - V_p(0.1\ MPa)$

U -expanded uncertainty (coverage factor 2)

u -standard error of the certified value

s - standard deviation of the certified value
$U = 2\ u$ with $u = s / \sqrt{N}$ (N laboratories)

Data point No.	p_{Hg} (MPa)	d_p (nm)	V'_p (mm^3/g)	U (mm^3/g)	2s (mm^3/g)
151	3.162	465.109	2.56	0.26	1.42
152	3.236	454.522	2.60	0.26	1.42
153	3.311	444.176	2.64	0.27	1.48
154	3.388	434.065	2.68	0.27	1.48
155	3.467	424.185	2.73	0.27	1.48
156	3.548	414.529	2.78	0.27	1.48
157	3.631	405.093	2.83	0.28	1.53
158	3.715	395.872	2.88	0.28	1.53
159	3.802	386.861	2.93	0.28	1.53
160	3.890	378.055	2.99	0.28	1.53
161	3.981	369.450	3.05	0.29	1.59
162	4.074	361.040	3.11	0.29	1.59
163	4.169	352.822	3.16	0.29	1.59
164	4.266	344.790	3.22	0.30	1.64
165	4.365	336.942	3.29	0.30	1.64
166	4.467	329.272	3.35	0.31	1.70
167	4.571	321.777	3.42	0.31	1.70
168	4.677	314.453	3.48	0.31	1.70
169	4.786	307.295	3.55	0.32	1.75
170	4.898	300.300	3.63	0.32	1.75
171	5.012	293.464	3.70	0.32	1.75
172	5.129	286.784	3.78	0.33	1.81
173	5.248	280.256	3.86	0.33	1.81
174	5.370	273.877	3.94	0.33	1.81
175	5.495	267.643	4.03	0.34	1.86
176	5.623	261.550	4.14	0.34	1.86
177	5.754	255.597	4.24	0.34	1.86
178	5.888	249.779	4.34	0.34	1.86
179	6.026	244.093	4.44	0.35	1.92
180	6.166	238.537	4.54	0.35	1.92
181	6.310	233.107	4.67	0.35	1.92
182	6.457	227.801	4.79	0.35	1.92
183	6.607	222.615	4.89	0.35	1.92
184	6.761	217.548	5.02	0.35	1.92
185	6.918	212.596	5.15	0.36	1.97
186	7.079	207.757	5.27	0.36	1.97
187	7.244	203.028	5.39	0.36	1.97
188	7.413	198.406	5.51	0.37	2.03
189	7.586	193.890	5.65	0.37	2.03
190	7.762	189.476	5.79	0.37	2.03
191	7.943	185.163	5.92	0.38	2.08
192	8.128	180.949	6.05	0.38	2.08
193	8.318	176.830	6.17	0.38	2.08
194	8.511	172.805	6.31	0.38	2.08
195	8.710	168.871	6.45	0.39	2.14
196	8.913	165.027	6.59	0.39	2.14
197	9.120	161.271	6.76	0.40	2.19
198	9.333	157.600	6.92	0.40	2.19
199	9.550	154.012	7.09	0.41	2.25
200	9.772	150.506	7.26	0.41	2.25

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Certified values for the pressure/volume and the diameter/volume curves at each data point

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V'_p - normalized specific pore volume
$V'_p = V_p(p_{Hg}) - V_p(0.1\ MPa)$

U -expanded uncertainty (coverage factor 2)

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Data point No.	p_{Hg} (MPa)	d_p (nm)	V'_p (mm^3/g)	U (mm^3/g)	2s (mm^3/g)
201	10.000	147.081	7.43	0.41	2.25
202	10.233	143.733	7.62	0.41	2.25
203	10.471	140.461	7.81	0.41	2.25
204	10.715	137.264	8.00	0.42	2.30
205	10.965	134.139	8.20	0.42	2.30
206	11.220	131.086	8.39	0.43	2.36
207	11.482	128.102	8.60	0.43	2.36
208	11.749	125.186	8.82	0.43	2.36
209	12.023	122.336	9.04	0.44	2.41
210	12.303	119.552	9.25	0.45	2.46
211	12.589	116.830	9.50	0.45	2.46
212	12.882	114.171	9.73	0.46	2.52
213	13.183	111.572	9.95	0.46	2.52
214	13.490	109.032	10.21	0.47	2.57
215	13.804	106.550	10.47	0.48	2.63
216	14.125	104.125	10.72	0.48	2.63
217	14.454	101.755	11.02	0.48	2.63
218	14.791	99.439	11.29	0.49	2.68
219	15.136	97.175	11.61	0.49	2.68
220	15.488	94.963	11.91	0.49	2.68
221	15.849	92.802	12.21	0.50	2.74
222	16.218	90.689	12.56	0.50	2.74
223	16.596	88.625	12.89	0.50	2.74
224	16.982	86.607	13.24	0.51	2.79
225	17.378	84.636	13.60	0.51	2.79
226	17.783	82.709	13.97	0.51	2.79
227	18.197	80.827	14.37	0.51	2.79
228	18.621	78.987	14.80	0.51	2.79
229	19.055	77.189	15.25	0.51	2.79
230	19.498	75.432	15.70	0.51	2.79
231	19.953	73.715	16.16	0.51	2.79
232	20.417	72.037	16.65	0.51	2.79
233	20.893	70.397	17.16	0.51	2.79
234	21.380	68.795	17.67	0.51	2.79
235	21.878	67.229	18.23	0.52	2.85
236	22.387	65.698	18.77	0.53	2.90
237	22.909	64.203	19.36	0.53	2.90
238	23.442	62.742	20.01	0.54	2.96
239	23.988	61.313	20.65	0.55	3.01
240	24.547	59.918	21.36	0.55	3.01
241	25.119	58.554	22.10	0.56	3.07
242	25.704	57.221	22.86	0.57	3.12
243	26.303	55.918	23.67	0.58	3.18
244	26.915	54.646	24.54	0.59	3.23
245	27.542	53.402	25.46	0.60	3.29
246	28.184	52.186	26.40	0.60	3.29
247	28.840	50.998	27.37	0.62	3.40
248	29.512	49.837	28.43	0.63	3.45
249	30.200	48.703	29.53	0.63	3.45
250	30.903	47.594	30.63	0.66	3.61

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Certified values for the pressure/volume and the diameter/volume curves at each data point

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Data point No.	p_{Hg} (MPa)	d_p (nm)	V'_p (mm^3/g)	U (mm^3/g)	2s (mm^3/g)
251	31.623	46.511	31.80	0.67	3.67
252	32.359	45.452	33.07	0.67	3.67
253	33.113	44.418	34.37	0.67	3.67
254	33.884	43.407	35.78	0.67	3.67
255	34.674	42.418	37.23	0.68	3.72
256	35.481	41.453	38.67	0.68	3.72
257	36.308	40.509	40.10	0.69	3.78
258	37.154	39.587	41.58	0.71	3.89
259	38.019	38.686	43.05	0.72	3.94
260	38.905	37.806	44.58	0.73	4.00
261	39.811	36.945	46.23	0.74	4.05
262	40.738	36.104	47.88	0.76	4.16
263	41.687	35.282	49.59	0.77	4.22
264	42.658	34.479	51.37	0.78	4.27
265	43.652	33.694	53.28	0.79	4.33
266	44.668	32.927	55.24	0.82	4.49
267	45.709	32.178	57.34	0.84	4.60
268	46.774	31.445	59.61	0.87	4.77
269	47.863	30.729	62.14	0.95	5.20
270	48.978	30.030	65.29	1.12	6.13
271	50.119	29.346	69.87	1.49	8.16
272	51.286	28.678	77.30	2.26	12.38
273	52.481	28.026	89.89	3.35	18.35
274	53.703	27.388	108.29	4.20	23.00
275	54.954	26.764	131.31	4.81	26.35
276	56.234	26.155	158.98	5.99	32.81
277	57.544	25.560	198.55	8.53	46.72
278	58.884	24.978	248.36	10.41	57.02
279	60.256	24.409	305.32	10.50	57.51
280	61.660	23.854	361.01	9.20	50.39
281	63.096	23.311	408.27	7.40	40.53
282	64.565	22.780	445.99	6.11	33.47
283	66.069	22.262	476.59	5.27	28.86
284	67.608	21.755	501.14	4.77	26.13
285	69.183	21.260	522.12	4.37	23.94
286	70.795	20.776	539.88	4.04	22.13
287	72.444	20.303	555.01	3.75	20.54
288	74.131	19.841	567.51	3.50	19.17
289	75.858	19.389	577.96	3.30	18.07
290	77.625	18.948	586.70	3.14	17.20
291	79.433	18.516	593.84	3.00	16.43
292	81.283	18.095	599.96	2.89	15.83
293	83.176	17.683	605.00	2.79	15.28
294	85.114	17.280	609.25	2.72	14.90
295	87.096	16.887	612.83	2.66	14.57
296	89.125	16.503	615.89	2.62	14.35
297	91.201	16.127	618.43	2.58	14.13
298	93.325	15.760	620.56	2.54	13.91
299	95.499	15.401	622.42	2.52	13.80
300	97.724	15.051	624.05	2.49	13.64

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Certified values for the pressure/volume and the diameter/volume curves at each data point

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V'_p - normalized specific pore volume
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Data point No.	p_{Hg} (MPa)	d_p (nm)	V'_p (mm^3/g)	U (mm^3/g)	2s (mm^3/g)
301	100.000	14.708	625.44	2.48	13.58
302	102.329	14.373	626.66	2.47	13.53
303	104.713	14.046	627.76	2.46	13.47
304	107.152	13.726	628.68	2.45	13.42
305	109.648	13.414	629.53	2.45	13.42
306	112.202	13.109	630.28	2.46	13.47
307	114.815	12.810	630.97	2.46	13.47
308	117.490	12.519	631.57	2.47	13.53
309	120.226	12.234	632.08	2.47	13.53
310	123.027	11.955	632.53	2.47	13.53
311	125.893	11.683	632.97	2.47	13.53
312	128.825	11.417	633.37	2.48	13.58
313	131.826	11.157	633.72	2.48	13.58
314	134.896	10.903	634.03	2.48	13.58
315	138.038	10.655	634.34	2.48	13.58
316	141.254	10.413	634.63	2.49	13.64
317	144.544	10.175	634.86	2.49	13.64
318	147.911	9.944	635.07	2.50	13.69
319	151.356	9.718	635.30	2.50	13.69
320	154.882	9.496	635.50	2.51	13.75
321	158.489	9.280	635.70	2.53	13.86
322	162.181	9.069	635.88	2.54	13.91
323	165.959	8.862	636.06	2.55	13.97
324	169.824	8.661	636.24	2.56	14.02
325	173.780	8.464	636.40	2.57	14.08
326	177.828	8.271	636.56	2.58	14.13
327	181.970	8.083	636.70	2.60	14.24
328	186.209	7.899	636.84	2.61	14.30
329	190.546	7.719	636.97	2.62	14.35
330	194.984	7.543	637.10	2.63	14.41
331	199.526	7.371	636.61	2.68	14.68
332	204.174	7.204	636.29	2.87	15.72
333	208.930	7.040	636.40	2.88	15.77
334	213.796	6.879	636.50	2.89	15.83
335	218.776	6.723	636.60	2.91	15.94
336	223.872	6.570	636.71	2.92	15.99
337	229.087	6.420	636.81	2.93	16.05
338	234.423	6.274	636.92	2.94	16.10
339	239.883	6.131	637.01	2.96	16.21
340	245.471	5.992	637.12	2.97	16.27
341	251.189	5.855	637.21	2.98	16.32
342	257.040	5.722	637.29	2.99	16.38
343	263.027	5.592	637.37	3.00	16.43
344	269.153	5.465	637.46	3.01	16.49
345	275.423	5.340	637.55	3.03	16.60
346	281.838	5.219	637.64	3.04	16.65
347	288.403	5.100	637.74	3.05	16.71
348	295.121	4.984	637.83	3.06	16.76
349	301.995	4.870	637.92	3.07	16.82
350	309.030	4.759	638.03	3.09	16.92

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Data point No.	p_{Hg} (MPa)	d_p (nm)	V'_p (mm^3/g)	U (mm^3/g)	2s (mm^3/g)
351	316.228	4.651	638.14	3.10	16.98
352	323.594	4.545	638.25	3.11	17.03
353	331.131	4.442	638.34	3.13	17.14
354	338.844	4.341	638.42	3.14	17.20
355	346.737	4.242	638.52	3.31	18.13
356	354.813	4.145	638.65	3.33	18.24
357	363.078	4.051	638.78	3.36	18.40
358	371.535	3.959	638.92	3.39	18.57
359	380.189	3.869	639.15	3.42	18.73
360	389.045	3.781	638.12	3.66	20.05
361	398.107	3.694	638.81	4.08	22.35

Revision History: 07 October 2010 (Extension of the certification period with minor editorial changes); 22 August 2002 (Original certification date)