CERTIFICATE OF ANALYSIS

ERM®-FD121

Porous glass beads I

Certified Values		
Pressure-volume curve between 0.1 MPa and 400 MPa (see Fig. A1 and A2 in Annex 1 and Table in Annex 2 for values at each data point)		
Diameter-volume curve between 3.7 nm and 14708 nm (see Fig. A3 and A4 in Annex 1 and Table in Annex 2 for values at each data point)		
Quantity	Certified value [1)]	Uncertainty [2)]
Pore volume at 100 MPa in $mm^3 \cdot g^{-1}$	425.0	± 47.1
Pore volume at 195 MPa in $mm^3 \cdot g^{-1}$	621.9	± 12.9
Pore volume at 200 MPa in $mm^3 \cdot g^{-1}$	621.9	± 12.9
Pore volume at 395 MPa in $mm^3 \cdot g^{-1}$	624.6	± 13.4
Mean pore width d_{50} in nm	15.1	± 0.2
Most frequent pore width $d_{p,m}$ in nm	15.3	± 0.2

[1)] Unweighted mean value of the means of 23 accepted sets of data, each set being obtained in a different laboratory.

[2)] Estimated expanded uncertainty U corresponding to a level of confidence > 95 %, as defined in the Guide to the expression of uncertainty in measurement, ISO (1995).

This certificate is valid for three years after purchase.

NOTE

European Reference Material ERM®-FD121 was originally certified as BAM-PM-121. It was produced and certified under the responsibility of BAM Bundesanstalt für Materialforschung und –prüfung according to the principles laid down in the technical guidelines of the European Reference Materials® co-operation agreement between BAM-LGC-IRMM. Information on these guidelines is available on the Internet (http://www.erm-crm.org).

Accepted as an ERM®, Berlin, 2004-04-14

Sales date:

BAM Berlin
Department I
Analytical Chemistry;
Reference Materials
12200 Berlin, Germany

Prof. Dr. I. Nehls
(Head of Department)

BAM Berlin
Division I.1
Inorganic Chemical Analysis;
Reference Materials
12200 Berlin, Germany

Dr. R. Matschat
(Head of Division)

Additional Material Information	
Quantity	Informative value
Specific surface area [3] in $m^2\,g^{-1}$	164.8
[3] only as additional information, given without uncertainty, calculated according to $A_{sp}= 4 \cdot V / d$ using the certified properties V_{200MPa} and d_{50} (diameter at 50 % specific pore volume)	

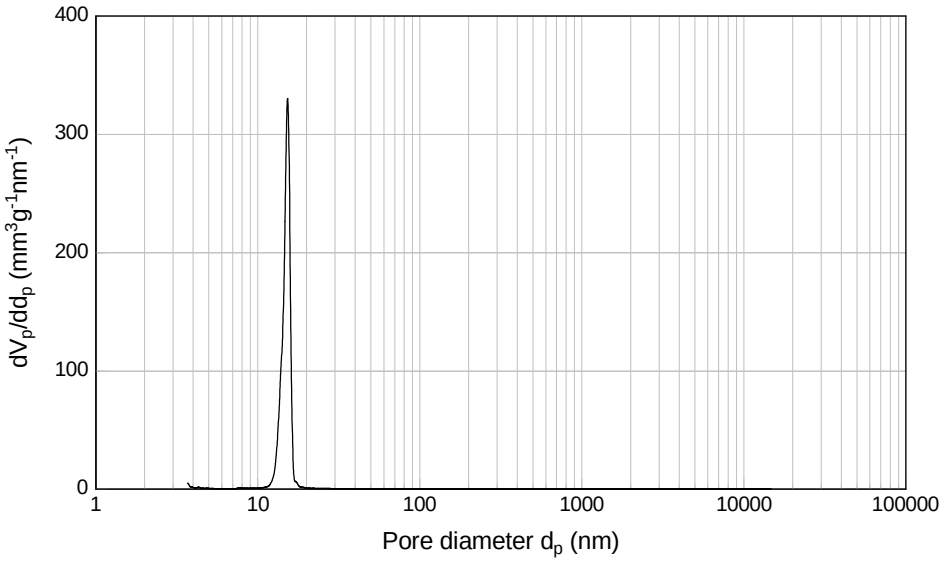

Figure 1: Pore size distribution of ERM®-FD121 (non-certified).

DESCRIPTION OF THE SAMPLE

The reference material is intended for use in the calibration and checking of high pressure mercury porosimeters in the pressure range between 0.1 and 400 MPa.
The reference material consists of porous glass beads.

ANALYTICAL METHOD USED FOR CERTIFICATION

Mercury intrusion according to DIN 66133

PARTICIPANTS

Co-ordination
BAM Bundesanstalt für Materialforschung und -prüfung, DE

Participants:
- BAM Bundesanstalt für Materialforschung und -prüfung, Berlin, DE (5 equipments in 2 laboratories)
- Degussa AG, Hanau, DE
- Delft University of Technology, Delft, NL
- Dr. C. Otto Feuerfest GmbH, Bochum, DE
- Forschungsinstitut der Zementindustrie Düsseldorf, Düsseldorf, DE
- Forschungsinstitut für anorganische Werkstoffe - Glas/Keramik - GmbH, Höhr-Grenzhausen, DE
- Fraunhofer-Institut für Bauphysik, Valley, DE
- Grace GmbH, Worms, DE
- Hermsdorfer Institut für Technische Keramik e.V., Hermsdorf/Thür., DE
- Hüls Infracor GmbH, Marl, DE
- Materialprüfanstalt für das Bauwesen, Braunschweig, DE
- MBF Gesellschaft für Materialprüfung und Baustofforschung mbH, Berlin, DE
- Merck KGaA, Darmstadt, DE
- Micromeritics GmbH, Mönchengladbach, DE
- Quantachrome GmbH, Odelzhausen, DE
- Rheinisch-Westfälische Technische Hochschule, Aachen, DE (2 laboratories)
- Technische Universität Dresden, Dresden, DE
- Technische Universität Hamburg-Harburg, Hamburg, DE
- ThermoQuest Italia S.p.A., CE Instruments, Rodano (Milan), IT
- Universität Gesamthochschule Siegen, Siegen, DE
- Universität Hannover, Hannover, DE
- Universität Karlsruhe, Karlsruhe, DE
- Universiteit van Amsterdam, Amsterdam, NL
- Bauhaus Universität Weimar

INSTRUCTIONS FOR USE

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 hours at 105 °C.
The recommended minimum sample intake is 0.3 g or more depending on the equipment used.

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, 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: $\gamma = 0.48$ N m^{-1} (surface tension of mercury) and $\theta = 140°$ (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).

STORAGE

The unopened bottle should be stored at normal ambient temperature in a dry place.

TECHNICAL REPORT

A detailed technical report (in German) describing the analysis procedures and the treatment of the analytical data used to certify ERM®-FD121 is available on request.

REFERENCES

Guidelines for the production and certification of BAM reference materials

BCR/48/93 (1994)	Guidelines for the production and certification of BCR 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 Oberfläche von Feststoffen durch Quecksilberintrusion (Determination of the pore volume distribution and the specific surface area of solids by mercury intrusion)
ISO/WD 155 901-1	Pore size distribution and porosity of solid materials – Evaluation by mercury porosimetry and gas sorption, Part 1: Mercury porosimetry (WG 3) July 1998

Supply of Reference Materials by BAM Bundesanstalt für Materialforschung und –prüfung:

Richard-Willstätter-Straße 11, 12489 Berlin, Germany

Phone: +49 30 8104 2061 E-mail: sales.crm@bam.de

Fax: +49 30 8104 1117 Internet: www.webshop.bam.de

ANNEX 1

Graphs of certified pressure-volume and diameter-volume curves for ERM®-FD121

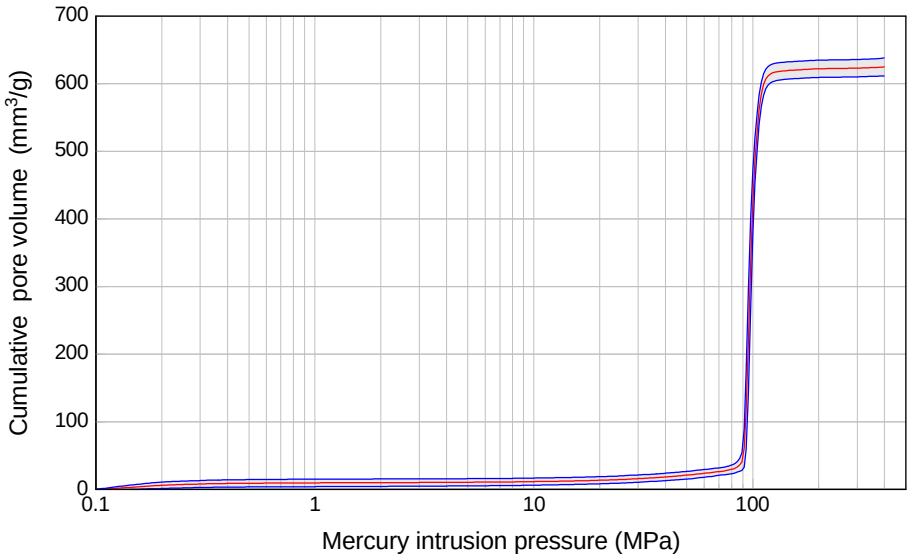

Figure A1: Certified pressure-volume curve of material ERM®-FD121 with uncertainty interval

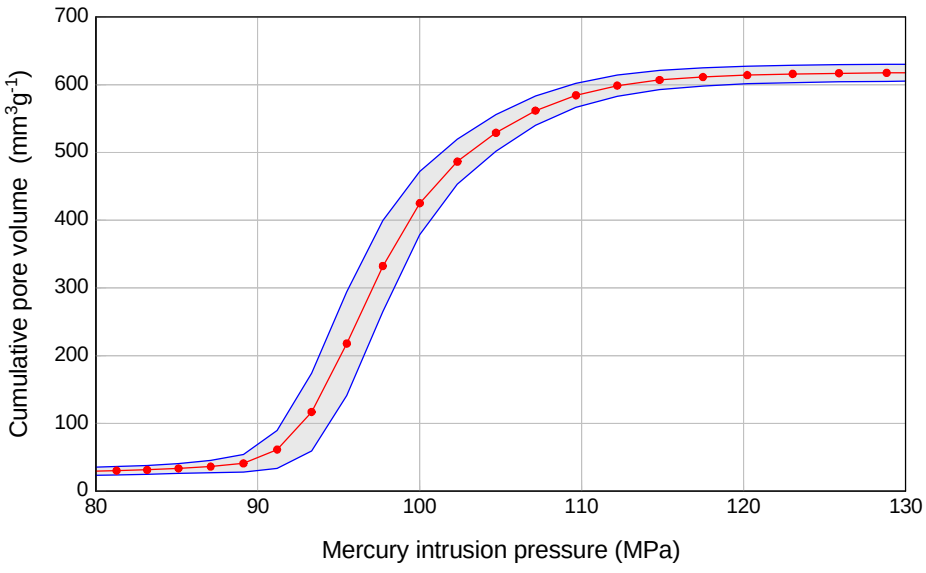

Figure A2: Certified pressure-volume curve of material ERM®-FD121 with uncertainty interval (detail between 80 and 130 MPa)

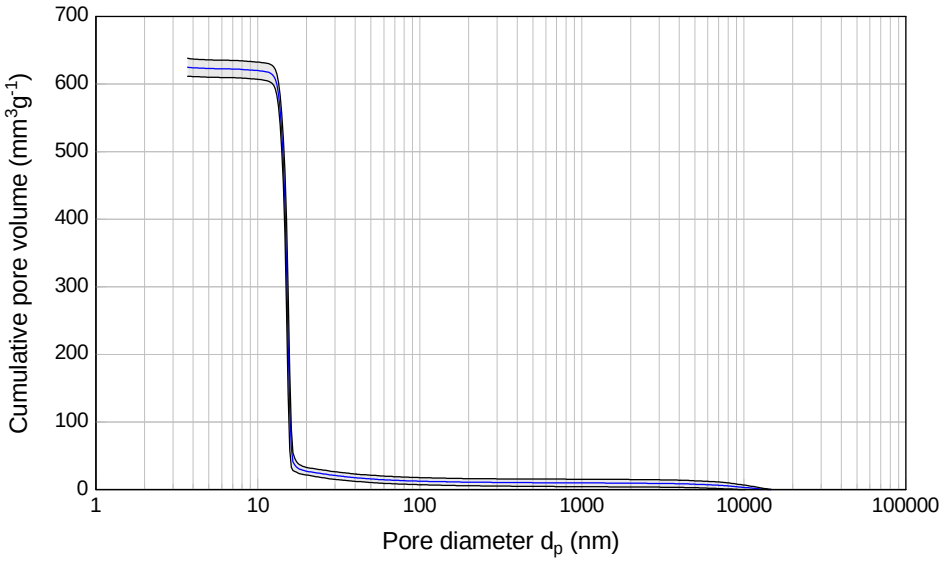

Figure A3: Certified diameter-volume curve of material ERM®-FD121 with uncertainty interval

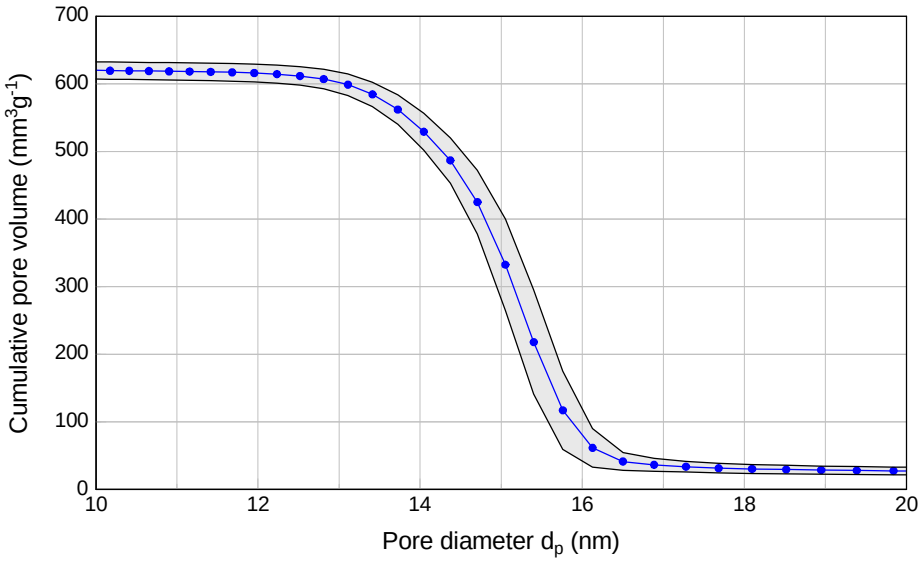

Figure A4: Certified diameter-volume curve of material ERM®-FD121 with uncertainty interval (detail between 10 and 20 nm)

ANNEX 2

Certified values of pressure-volume and diameter-volume curves for ERM®-FD121 at each data point

Data point No.	p_{Hg} (MPa)	d_p (nm)	V_p (mm^3g^{-1})	U (mm^3g^{-1})	V_p+U (mm^3g^{-1})	V_p-U (mm^3g^{-1})
1	0.100	14708.053	0.000	0.436	0.436	-0.436
2	0.102	14373.299	0.110	0.470	0.580	-0.360
3	0.105	14046.062	0.240	0.632	0.872	-0.392
4	0.107	13726.345	0.374	0.871	1.245	-0.497
5	0.110	13413.882	0.525	1.129	1.654	-0.605
6	0.112	13108.548	0.731	1.380	2.111	-0.649
7	0.115	12810.219	0.948	1.575	2.524	-0.627
8	0.117	12518.558	1.162	1.766	2.928	-0.604
9	0.120	12233.671	1.378	1.966	3.344	-0.588
10	0.123	11955.143	1.614	2.184	3.798	-0.570
11	0.126	11682.979	1.838	2.387	4.224	-0.549
12	0.129	11417.080	2.045	2.574	4.619	-0.530
13	0.132	11157.172	2.268	2.757	5.025	-0.489
14	0.135	10903.254	2.499	2.929	5.428	-0.430
15	0.138	10655.076	2.727	3.104	5.831	-0.377
16	0.141	10412.486	2.947	3.222	6.169	-0.275
17	0.145	10175.485	3.162	3.340	6.502	-0.178
18	0.148	9943.854	3.381	3.455	6.836	-0.075
19	0.151	9717.522	3.612	3.583	7.195	0.028
20	0.155	9496.296	3.846	3.710	7.555	0.136
21	0.158	9280.173	4.072	3.829	7.901	0.242
22	0.162	9068.913	4.296	3.944	8.240	0.352
23	0.166	8862.462	4.520	4.060	8.580	0.459
24	0.170	8660.762	4.741	4.180	8.920	0.561
25	0.174	8463.605	4.957	4.287	9.245	0.670
26	0.178	8270.943	5.169	4.399	9.568	0.770
27	0.182	8082.680	5.367	4.506	9.873	0.861
28	0.186	7898.680	5.567	4.625	10.193	0.942
29	0.191	7718.899	5.748	4.719	10.467	1.029
30	0.195	7543.210	5.909	4.780	10.689	1.129
31	0.200	7371.497	6.077	4.840	10.917	1.237
32	0.204	7203.686	6.250	4.904	11.154	1.346
33	0.209	7039.704	6.414	4.955	11.369	1.459
34	0.214	6879.480	6.549	4.970	11.520	1.579
35	0.219	6722.882	6.672	4.989	11.661	1.683
36	0.224	6569.849	6.799	4.995	11.794	1.804
37	0.229	6420.292	6.926	5.003	11.928	1.923
38	0.234	6274.151	7.048	5.031	12.079	2.017
39	0.240	6131.345	7.163	5.052	12.215	2.111
40	0.245	5991.768	7.273	5.075	12.348	2.198
41	0.251	5855.373	7.382	5.095	12.478	2.287
42	0.257	5722.087	7.482	5.112	12.594	2.370
43	0.263	5591.842	7.580	5.127	12.707	2.453
44	0.269	5464.570	7.678	5.141	12.818	2.537
45	0.275	5340.169	7.778	5.155	12.933	2.623
46	0.282	5218.620	7.870	5.164	13.034	2.706
47	0.288	5099.827	7.954	5.181	13.135	2.773
48	0.295	4983.737	8.037	5.198	13.234	2.839
49	0.302	4870.297	8.130	5.239	13.369	2.892
50	0.309	4759.426	8.219	5.265	13.484	2.953

p_{Hg} - mercury intrusion pressure
d_p - pore diameter
V_p - specific pore volume
U - uncertainty
V_p+U - upper limit of the uncertainty interval
V_p- U - lower limit of the uncertainty interval

Certified values of pressure-volume and diameter-volume curves for ERM®-FD121 at each data point

Data point No.	p_{Hg} (MPa)	d_p (nm)	V_p (mm^3g^{-1})	U (mm^3g^{-1})	V_p+U (mm^3g^{-1})	V_p-U (mm^3g^{-1})
51	0.316	4651.091	8.301	5.299	13.600	3.003
52	0.324	4545.218	8.372	5.318	13.689	3.054
53	0.331	4441.763	8.439	5.331	13.770	3.107
54	0.339	4340.656	8.507	5.356	13.863	3.151
55	0.347	4241.847	8.573	5.389	13.962	3.183
56	0.355	4145.297	8.632	5.417	14.050	3.215
57	0.363	4050.935	8.683	5.426	14.110	3.257
58	0.372	3958.726	8.730	5.428	14.158	3.301
59	0.380	3868.616	8.775	5.431	14.207	3.344
60	0.389	3780.553	8.822	5.440	14.262	3.382
61	0.398	3694.498	8.869	5.449	14.318	3.420
62	0.407	3610.401	8.911	5.459	14.371	3.452
63	0.417	3528.219	8.951	5.470	14.421	3.482
64	0.427	3447.900	8.989	5.477	14.466	3.512
65	0.437	3369.419	9.023	5.482	14.505	3.541
66	0.447	3292.720	9.057	5.488	14.545	3.569
67	0.457	3217.773	9.088	5.493	14.581	3.596
68	0.468	3144.527	9.117	5.497	14.614	3.620
69	0.479	3072.948	9.145	5.502	14.647	3.643
70	0.490	3002.998	9.173	5.505	14.678	3.668
71	0.501	2934.644	9.203	5.509	14.711	3.694
72	0.513	2867.844	9.232	5.511	14.744	3.721
73	0.525	2802.564	9.262	5.513	14.775	3.749
74	0.537	2738.767	9.289	5.515	14.804	3.775
75	0.550	2676.425	9.316	5.516	14.832	3.800
76	0.562	2615.504	9.340	5.516	14.856	3.824
77	0.575	2555.966	9.365	5.517	14.881	3.848
78	0.589	2497.784	9.391	5.521	14.912	3.870
79	0.603	2440.928	9.417	5.526	14.943	3.891
80	0.617	2385.367	9.440	5.530	14.970	3.910
81	0.631	2331.071	9.460	5.533	14.993	3.927
82	0.646	2278.009	9.479	5.536	15.015	3.942
83	0.661	2226.155	9.498	5.540	15.037	3.958
84	0.676	2175.480	9.516	5.543	15.059	3.973
85	0.692	2125.960	9.535	5.547	15.082	3.988
86	0.708	2077.567	9.553	5.549	15.103	4.004
87	0.724	2030.276	9.572	5.553	15.125	4.019
88	0.741	1984.062	9.590	5.555	15.145	4.035
89	0.759	1938.898	9.608	5.557	15.165	4.050
90	0.776	1894.765	9.624	5.559	15.183	4.064
91	0.794	1851.635	9.636	5.561	15.198	4.075
92	0.813	1809.485	9.648	5.564	15.212	4.084
93	0.832	1768.296	9.659	5.566	15.224	4.093
94	0.851	1728.046	9.670	5.568	15.237	4.102
95	0.871	1688.710	9.681	5.570	15.251	4.111
96	0.891	1650.271	9.692	5.572	15.264	4.120
97	0.912	1612.706	9.703	5.574	15.277	4.129
98	0.933	1575.997	9.712	5.574	15.285	4.138
99	0.955	1540.122	9.720	5.573	15.293	4.147
100	0.977	1505.065	9.728	5.572	15.300	4.156

p_{Hg} - mercury intrusion pressure
d_p - pore diameter
V_p - specific pore volume

U - uncertainty
V_p+U - upper limit of the uncertainty interval
V_p- U - lower limit of the uncertainty interval

Certified values of pressure-volume and diameter-volume curves for ERM®-FD121 at each data point

Data point No.	p_{Hg} (MPa)	d_p (nm)	V_p (mm^3g^{-1})	U (mm^3g^{-1})	V_p+U (mm^3g^{-1})	V_p-U (mm^3g^{-1})
101	1.000	1470.805	9.736	5.572	15.308	4.164
102	1.023	1437.330	9.745	5.572	15.317	4.173
103	1.047	1404.606	9.756	5.568	15.324	4.188
104	1.072	1372.635	9.765	5.568	15.333	4.197
105	1.096	1341.388	9.774	5.568	15.342	4.207
106	1.122	1310.855	9.784	5.567	15.351	4.216
107	1.148	1281.022	9.793	5.567	15.359	4.226
108	1.175	1251.856	9.803	5.565	15.369	4.238
109	1.202	1223.367	9.814	5.565	15.379	4.249
110	1.230	1195.514	9.824	5.565	15.389	4.259
111	1.259	1168.298	9.836	5.565	15.402	4.271
112	1.288	1141.708	9.848	5.565	15.413	4.283
113	1.318	1115.717	9.859	5.564	15.423	4.295
114	1.349	1090.325	9.870	5.564	15.434	4.306
115	1.380	1065.508	9.881	5.564	15.444	4.317
116	1.413	1041.249	9.891	5.564	15.455	4.328
117	1.445	1017.549	9.901	5.563	15.464	4.338
118	1.479	994.385	9.913	5.557	15.471	4.356
119	1.514	971.752	9.923	5.557	15.480	4.366
120	1.549	949.630	9.933	5.556	15.488	4.377
121	1.585	928.017	9.943	5.554	15.497	4.388
122	1.622	906.891	9.952	5.553	15.505	4.399
123	1.660	886.246	9.962	5.552	15.513	4.410
124	1.698	866.076	9.974	5.550	15.524	4.424
125	1.738	846.361	9.988	5.548	15.536	4.440
126	1.778	827.094	10.002	5.547	15.549	4.456
127	1.820	808.268	10.014	5.545	15.559	4.469
128	1.862	789.868	10.026	5.544	15.570	4.481
129	1.905	771.890	10.037	5.543	15.580	4.494
130	1.950	754.321	10.048	5.542	15.590	4.505
131	1.995	737.150	10.058	5.541	15.599	4.517
132	2.042	720.369	10.068	5.539	15.607	4.529
133	2.089	703.970	10.080	5.537	15.617	4.543
134	2.138	687.948	10.092	5.535	15.627	4.556
135	2.188	672.288	10.107	5.530	15.637	4.577
136	2.239	656.985	10.119	5.528	15.647	4.591
137	2.291	642.029	10.130	5.527	15.657	4.603
138	2.344	627.415	10.141	5.525	15.666	4.617
139	2.399	613.134	10.153	5.523	15.675	4.630
140	2.455	599.177	10.164	5.521	15.685	4.644
141	2.512	585.537	10.176	5.518	15.694	4.658
142	2.570	572.209	10.188	5.516	15.704	4.672
143	2.630	559.184	10.201	5.512	15.713	4.688
144	2.692	546.457	10.213	5.508	15.721	4.705
145	2.754	534.017	10.225	5.504	15.729	4.721
146	2.818	521.862	10.236	5.493	15.729	4.743
147	2.884	509.983	10.246	5.487	15.733	4.758
148	2.951	498.374	10.256	5.482	15.737	4.774
149	3.020	487.030	10.266	5.476	15.742	4.790
150	3.090	475.943	10.280	5.471	15.751	4.809

p_{Hg} - mercury intrusion pressure
d_p - pore diameter
V_p - specific pore volume
U - uncertainty
V_p+U - upper limit of the uncertainty interval
V_p- U - lower limit of the uncertainty interval

Certified values of pressure-volume and diameter-volume curves for ERM®-FD121 at each data point

Data point No.	p_{Hg} (MPa)	d_p (nm)	V_p (mm^3g^{-1})	U (mm^3g^{-1})	V_p+U (mm^3g^{-1})	V_p-U (mm^3g^{-1})
151	3.162	465.109	10.298	5.467	15.765	4.830
152	3.236	454.522	10.316	5.463	15.780	4.853
153	3.311	444.176	10.336	5.457	15.793	4.878
154	3.388	434.066	10.358	5.452	15.811	4.906
155	3.467	424.185	10.378	5.448	15.826	4.930
156	3.548	414.530	10.398	5.444	15.841	4.954
157	3.631	405.093	10.416	5.435	15.851	4.982
158	3.715	395.873	10.430	5.431	15.861	4.999
159	3.802	386.862	10.445	5.428	15.873	5.017
160	3.890	378.055	10.459	5.426	15.885	5.033
161	3.981	369.450	10.482	5.418	15.900	5.064
162	4.074	361.040	10.504	5.416	15.919	5.088
163	4.169	352.822	10.526	5.414	15.940	5.112
164	4.266	344.790	10.548	5.413	15.961	5.135
165	4.365	336.942	10.572	5.412	15.984	5.159
166	4.467	329.272	10.595	5.410	16.005	5.185
167	4.571	321.777	10.609	5.405	16.014	5.204
168	4.677	314.453	10.621	5.397	16.019	5.224
169	4.786	307.295	10.642	5.385	16.027	5.257
170	4.898	300.300	10.670	5.377	16.047	5.294
171	5.012	293.464	10.700	5.372	16.072	5.327
172	5.129	286.784	10.722	5.368	16.090	5.353
173	5.248	280.256	10.743	5.367	16.110	5.376
174	5.370	273.877	10.767	5.367	16.134	5.400
175	5.495	267.643	10.790	5.364	16.154	5.427
176	5.623	261.550	10.809	5.363	16.172	5.446
177	5.754	255.597	10.833	5.363	16.196	5.470
178	5.888	249.778	10.855	5.363	16.218	5.492
179	6.026	244.093	10.875	5.359	16.234	5.516
180	6.166	238.537	10.898	5.355	16.253	5.544
181	6.310	233.107	10.926	5.345	16.271	5.581
182	6.457	227.801	10.949	5.340	16.289	5.610
183	6.607	222.616	10.976	5.335	16.311	5.641
184	6.761	217.548	11.009	5.328	16.337	5.682
185	6.918	212.596	11.038	5.325	16.363	5.713
186	7.079	207.757	11.069	5.323	16.392	5.746
187	7.244	203.028	11.098	5.321	16.420	5.777
188	7.413	198.406	11.129	5.323	16.453	5.806
189	7.586	193.890	11.167	5.333	16.500	5.834
190	7.762	189.476	11.198	5.331	16.529	5.866
191	7.943	185.163	11.227	5.328	16.555	5.898
192	8.128	180.948	11.256	5.329	16.584	5.927
193	8.318	176.830	11.294	5.344	16.638	5.950
194	8.511	172.805	11.336	5.346	16.682	5.990
195	8.710	168.871	11.376	5.345	16.722	6.031
196	8.913	165.027	11.417	5.347	16.764	6.070
197	9.120	161.271	11.456	5.349	16.805	6.107
198	9.333	157.600	11.496	5.339	16.835	6.157
199	9.550	154.012	11.538	5.331	16.869	6.206
200	9.772	150.507	11.582	5.327	16.910	6.255

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Data point No.	p_{Hg} (MPa)	d_p (nm)	V_p (mm^3g^{-1})	U (mm^3g^{-1})	V_p+U (mm^3g^{-1})	V_p-U (mm^3g^{-1})
201	10.000	147.081	11.637	5.328	16.965	6.309
202	10.233	143.733	11.688	5.335	17.024	6.353
203	10.471	140.461	11.735	5.335	17.070	6.401
204	10.715	137.263	11.786	5.336	17.122	6.450
205	10.965	134.139	11.841	5.332	17.173	6.509
206	11.220	131.085	11.890	5.334	17.224	6.556
207	11.482	128.102	11.940	5.337	17.277	6.603
208	11.749	125.186	11.993	5.341	17.334	6.652
209	12.023	122.337	12.047	5.333	17.380	6.713
210	12.303	119.551	12.097	5.325	17.422	6.772
211	12.589	116.830	12.157	5.315	17.473	6.842
212	12.882	114.171	12.222	5.318	17.541	6.904
213	13.183	111.572	12.287	5.315	17.602	6.973
214	13.490	109.033	12.358	5.307	17.664	7.051
215	13.804	106.551	12.429	5.308	17.737	7.121
216	14.125	104.125	12.494	5.315	17.808	7.179
217	14.454	101.755	12.561	5.307	17.867	7.254
218	14.791	99.439	12.630	5.310	17.940	7.320
219	15.136	97.175	12.694	5.311	18.005	7.383
220	15.488	94.963	12.772	5.306	18.078	7.466
221	15.849	92.802	12.851	5.292	18.143	7.558
222	16.218	90.689	12.932	5.283	18.216	7.649
223	16.596	88.625	13.008	5.276	18.285	7.732
224	16.982	86.608	13.088	5.291	18.379	7.798
225	17.378	84.636	13.170	5.296	18.465	7.874
226	17.783	82.709	13.261	5.290	18.551	7.970
227	18.197	80.827	13.336	5.281	18.617	8.055
228	18.621	78.987	13.401	5.288	18.689	8.113
229	19.055	77.189	13.483	5.287	18.770	8.196
230	19.498	75.432	13.584	5.294	18.878	8.290
231	19.953	73.715	13.672	5.317	18.989	8.355
232	20.417	72.037	13.747	5.316	19.064	8.431
233	20.893	70.397	13.847	5.323	19.170	8.524
234	21.380	68.795	13.961	5.304	19.265	8.657
235	21.878	67.229	14.086	5.290	19.376	8.797
236	22.387	65.698	14.189	5.303	19.492	8.886
237	22.909	64.203	14.304	5.297	19.601	9.007
238	23.442	62.742	14.425	5.316	19.741	9.110
239	23.988	61.313	14.546	5.318	19.864	9.227
240	24.547	59.918	14.689	5.354	20.043	9.335
241	25.119	58.554	14.825	5.360	20.185	9.465
242	25.704	57.221	14.973	5.371	20.343	9.602
243	26.303	55.918	15.118	5.373	20.491	9.745
244	26.915	54.646	15.266	5.361	20.627	9.904
245	27.542	53.402	15.430	5.341	20.770	10.089
246	28.184	52.186	15.589	5.338	20.927	10.252
247	28.840	50.998	15.736	5.335	21.071	10.402
248	29.512	49.837	15.896	5.340	21.236	10.556
249	30.200	48.703	16.083	5.336	21.419	10.747
250	30.903	47.594	16.245	5.359	21.604	10.886

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Data point No.	p_{Hg} (MPa)	d_p (nm)	V_p (mm^3g^{-1})	U (mm^3g^{-1})	V_p+U (mm^3g^{-1})	V_p-U (mm^3g^{-1})
251	31.623	46.511	16.434	5.344	21.778	11.090
252	32.359	45.452	16.627	5.344	21.971	11.283
253	33.113	44.418	16.808	5.358	22.166	11.450
254	33.884	43.407	17.002	5.337	22.338	11.665
255	34.674	42.418	17.171	5.321	22.492	11.850
256	35.481	41.453	17.392	5.347	22.739	12.045
257	36.308	40.509	17.611	5.359	22.969	12.252
258	37.154	39.587	17.831	5.384	23.215	12.447
259	38.019	38.686	18.072	5.385	23.457	12.687
260	38.904	37.806	18.313	5.382	23.695	12.931
261	39.811	36.945	18.586	5.406	23.991	13.180
262	40.738	36.104	18.817	5.448	24.266	13.369
263	41.687	35.282	19.062	5.465	24.528	13.597
264	42.658	34.479	19.317	5.475	24.793	13.842
265	43.652	33.694	19.569	5.471	25.040	14.098
266	44.668	32.927	19.838	5.524	25.362	14.315
267	45.709	32.178	20.093	5.526	25.619	14.567
268	46.774	31.445	20.349	5.525	25.875	14.824
269	47.863	30.729	20.602	5.552	26.155	15.050
270	48.978	30.030	20.844	5.558	26.402	15.286
271	50.119	29.346	21.095	5.582	26.677	15.513
272	51.286	28.678	21.360	5.596	26.956	15.764
273	52.481	28.026	21.646	5.591	27.237	16.056
274	53.703	27.388	22.028	5.566	27.594	16.461
275	54.954	26.764	22.431	5.623	28.054	16.808
276	56.234	26.155	22.852	5.662	28.514	17.190
277	57.544	25.560	23.211	5.644	28.855	17.567
278	58.884	24.978	23.526	5.662	29.188	17.863
279	60.256	24.409	23.870	5.666	29.536	18.204
280	61.660	23.854	24.203	5.642	29.845	18.561
281	63.096	23.311	24.586	5.615	30.201	18.972
282	64.565	22.780	24.938	5.611	30.549	19.327
283	66.069	22.262	25.319	5.637	30.956	19.682
284	67.608	21.755	25.733	5.642	31.375	20.090
285	69.183	21.260	26.105	5.619	31.724	20.485
286	70.795	20.776	26.519	5.629	32.148	20.891
287	72.444	20.303	26.975	5.651	32.625	21.324
288	74.131	19.841	27.422	5.687	33.109	21.734
289	75.858	19.389	28.015	5.800	33.815	22.215
290	77.625	18.948	28.710	5.978	34.688	22.732
291	79.433	18.516	29.497	6.284	35.781	23.213
292	81.283	18.095	30.351	6.662	37.014	23.689
293	83.176	17.683	31.552	7.118	38.670	24.434
294	85.114	17.280	33.655	7.804	41.459	25.852
295	87.096	16.887	36.415	9.481	45.897	26.934
296	89.125	16.503	41.340	13.284	54.624	28.056
297	91.201	16.127	61.547	28.444	89.992	33.103
298	93.325	15.760	117.044	57.920	174.964	59.123
299	95.499	15.401	217.964	76.928	294.892	141.035
300	97.724	15.051	332.379	67.639	400.018	264.740

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301	100.000	14.708	424.953	47.081	472.034	377.872
302	102.329	14.373	486.529	33.619	520.148	452.910
303	104.713	14.046	529.053	27.256	556.308	501.797
304	107.152	13.726	561.730	21.942	583.672	539.787
305	109.648	13.414	584.287	18.162	602.449	566.125
306	112.202	13.109	598.637	16.057	614.694	582.580
307	114.815	12.810	606.963	14.498	621.461	592.465
308	117.490	12.519	611.444	13.733	625.177	597.711
309	120.226	12.234	614.158	13.399	627.557	600.759
310	123.027	11.955	615.804	13.135	628.939	602.669
311	125.893	11.683	616.797	13.024	629.821	603.773
312	128.825	11.417	617.471	12.952	630.423	604.518
313	131.826	11.157	618.006	12.905	630.911	605.101
314	134.896	10.903	618.430	12.835	631.265	605.595
315	138.038	10.655	618.793	12.750	631.543	606.042
316	141.254	10.412	619.092	12.704	631.796	606.388
317	144.544	10.175	619.361	12.733	632.093	606.628
318	147.911	9.944	619.569	12.716	632.285	606.852
319	151.356	9.718	619.774	12.736	632.510	607.038
320	154.882	9.496	620.001	12.712	632.713	607.289
321	158.489	9.280	620.191	12.676	632.866	607.515
322	162.181	9.069	620.359	12.712	633.071	607.646
323	165.959	8.862	620.535	12.733	633.268	607.802
324	169.824	8.661	620.687	12.740	633.427	607.947
325	173.780	8.464	620.895	12.716	633.611	608.179
326	177.828	8.271	621.055	12.750	633.804	608.305
327	181.970	8.083	621.207	12.766	633.973	608.441
328	186.209	7.899	621.382	12.791	634.173	608.590
329	190.546	7.719	621.577	12.819	634.395	608.758
330	194.984	7.543	621.759	12.845	634.604	608.913
331	199.526	7.371	621.906	12.861	634.767	609.044
332	204.174	7.204	621.949	12.868	634.817	609.081
333	208.930	7.040	621.999	12.876	634.875	609.122
334	213.796	6.879	622.049	12.870	634.919	609.178
335	218.776	6.723	622.094	12.858	634.952	609.236
336	223.872	6.570	622.153	12.852	635.004	609.301
337	229.087	6.420	622.210	12.849	635.058	609.361
338	234.423	6.274	622.266	12.842	635.108	609.424
339	239.883	6.131	622.319	12.824	635.143	609.495
340	245.471	5.992	622.362	12.828	635.190	609.533
341	251.189	5.855	622.388	12.825	635.213	609.562
342	257.040	5.722	622.437	12.833	635.269	609.604
343	263.027	5.592	622.480	12.834	635.314	609.645
344	269.153	5.465	622.534	12.834	635.368	609.700
345	275.423	5.340	622.587	12.844	635.430	609.743
346	281.838	5.219	622.662	12.836	635.498	609.825
347	288.403	5.100	622.729	12.843	635.572	609.886
348	295.121	4.984	622.803	12.854	635.657	609.948
349	301.995	4.870	622.894	12.863	635.757	610.031
350	309.030	4.759	622.993	12.871	635.864	610.122

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351	316.228	4.651	623.072	12.865	635.937	610.206
352	323.594	4.545	623.165	12.858	636.023	610.307
353	331.131	4.442	623.258	12.849	636.107	610.409
354	338.844	4.341	623.395	12.848	636.242	610.547
355	346.737	4.242	623.572	12.888	636.460	610.684
356	354.813	4.145	623.687	12.914	636.601	610.773
357	363.078	4.051	623.801	12.964	636.765	610.837
358	371.535	3.959	623.927	13.032	636.959	610.894
359	380.189	3.869	624.115	13.115	637.230	611.000
360	389.045	3.781	624.316	13.214	637.530	611.102
361	398.107	3.694	624.718	13.500	638.217	611.218

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