

Test Report

Report No.: EED35J000250-1

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Customer : Shenzhen SPARK Optoelectronics S&T Co., Ltd
Address : West of Floor 27, A Building, Shenzhen International Innovation Center, No. 1006, Shenzhen Road, Futian District, Shenzhen City, P. R. China

Description of the submitted sample(s):

Sample Name : LED Street Light
Sample No. : 35J0250-01
Model/Type : SP-RLLH39-124
Brand : SPARK
Ratings : 100-240 V AC, 50/60Hz, 39W
Test Item : Total Luminous Flux, Luminous Efficacy, Zonal Lumen Density, Luminous Intensity Distribution, Correlated Color Temperature, Color Rendering Index, Chromaticity Coordinate, Color Spatial Uniformity and Electrical Parameters
Sample Quantity : 1 pc
Manufacturer : Shenzhen SPARK Optoelectronics S&T Co., Ltd
Sample Received Date : Apr. 17, 2017
Sample Tested Date : Apr. 18, 2017 to Apr. 23, 2017
Test Requested : All test items were measured according to IES LM-79-08 Electrical and Photometric Measurements of Solid-State Lighting Products

Laboratory Note: The laboratory that conducted the testing items in this report has been accredited by the National Voluntary Laboratory Accreditation Program (NVLAP LAB CODE: 200889-0), for IES LM-79 testing of SSL products. And the report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

Compiled by Dan Wang Reviewed by Uno Wang
Approved by Uno Wang Date Apr. 25, 2017
Supervisor/Vivian Wang Check No.: 2496502567



CENTRE TESTING INTERNATIONAL CORPORATION, NO. 1996, Xin jin qiao Road, Pudong New District, Shanghai, 201206, China

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Equipment list:

Test Equipment	Equipment Model	Equipment No.	Calibration Date	Calibration Due Date
Goniophotometer	GO-R5000	ATTEELSH00105	---	---
Standard Lamp	D908	ATTEELSH00106	Jul. 06, 2016	Jul. 05, 2017
Digital Power Meter	WT210	BTTEELSZ10093	Jun. 17, 2016	Jun. 16, 2017
Spectroradiometer	HAAS-2000	TTF20120376	Sept. 05, 2016	Sept. 04, 2017
Integrating Sphere	2.0m	ATTEELSH00007	---	---
Standard Lamp	D204	TTE20141711	Jul. 06, 2016	Jul. 05, 2017
Digital Power Meter	PF2010	ATTEELSH00011	Jun. 17, 2016	Jun. 16, 2017

1 Test Condition

Ambient Condition	: 24.1°C
Photometric Method	: Goniophotometer
Colorimetric Method	: Sphere-spectroradiometer
Tested	: 220V AC, 50Hz
Stabilization Time	: 65 minutes
Total Operation Time including Stabilization	: 2 hours and 20 minutes
Orientation	: Light downwards

2 Test Method

2.1 Requirements of Ambient Condition

The ambient temperature in which measurements are being taken shall be maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$, measured at a point not more than 1 m from the SSL product and at the same height as the SSL product. Air flow around the SSL product being tested should be such that normal convective air flow induced by device under test is not affected.

2.2 Seasoning of SSL Product

For the purpose of rating new SSL products, SSL products shall be tested with no seasoning. Therefore, no seasoning was performed.

2.3 Stabilization of SSL Product

Before measurements are taken, the SSL product under test shall be operated long enough to reach stabilization and temperature equilibrium. The time required for stabilization depends on the type of SSL products under test. The stabilization time typically ranges from 30 minutes to 2 or more hours for SSL product. It can be judged that stability is reached when the variation (maximum – minimum) of at least 3 readings of the light output and electrical power over a period of 30 minutes, taken 15 minutes apart, is less than 0.5%.

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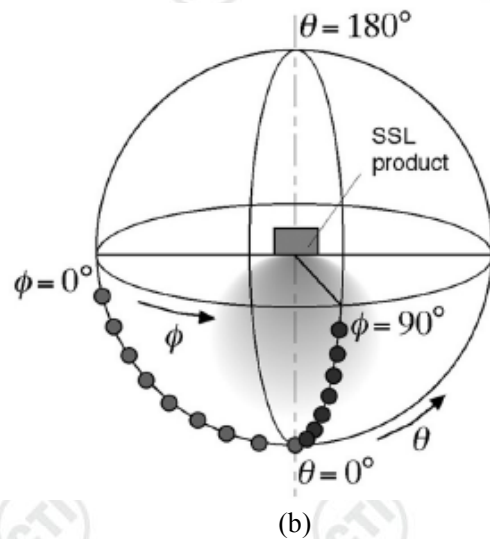
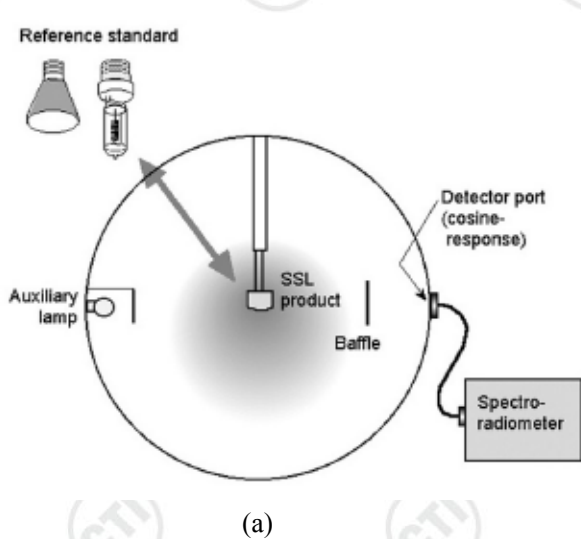
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2.4 Photometric and Electrical Measurements - Sphere-spectroradiometer Method

An EVERFINE CCD spectroradiometer and 2m integrating sphere was used to measure correlated color temperature, color rendering index, and chromaticity coordinates. The 4π geometry, shown as following, chart (a), is used for measurement. Ambient temperature was measured at a position inside the integrating sphere. Electrical measurements including voltage, current, and power were measured using the Digital Power Meter.

2.5 Photometric and Electrical Measurements - Goniophotometer Method

An EVERFINE Type C Model GO-R5000 Goniophotometer was used to measure total luminous flux and the intensity at each angle of distribution. The photometric distance is 2.1m for near-field measurement or 26m for far-field measurement. Ambient temperature was measured at the same height of the sample mounted on the Goniophotometer equipment. Electrical measurements including voltage, current, and power were measured using the Digital Power Meter. Some graphics were created with Photometric Plus software. The geometry for the photometric measurement using gonio-photometer is shown as chart (b).



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3 Test Results

3.1 Summary

Input Voltage (V AC)	Input Current (A)	Input Power (W)	Power Factor	THD of Current (%)
220.0	0.1743	37.21	0.9701	/
Total Luminous Flux (lm)	Luminous Efficacy (lm/W)	Correlated Color Temperature (K)	Color Rendering Index Ra	Color Rendering Index R9
5348	143.73	4021	73.9	0
Chromaticity Coordinate x	Chromaticity Coordinate y	Chromaticity Coordinate u'	Chromaticity Coordinate v'	Duv
0.3813	0.3832	0.2231	0.5045	0.0028

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3.2 Zonal Lumen Density

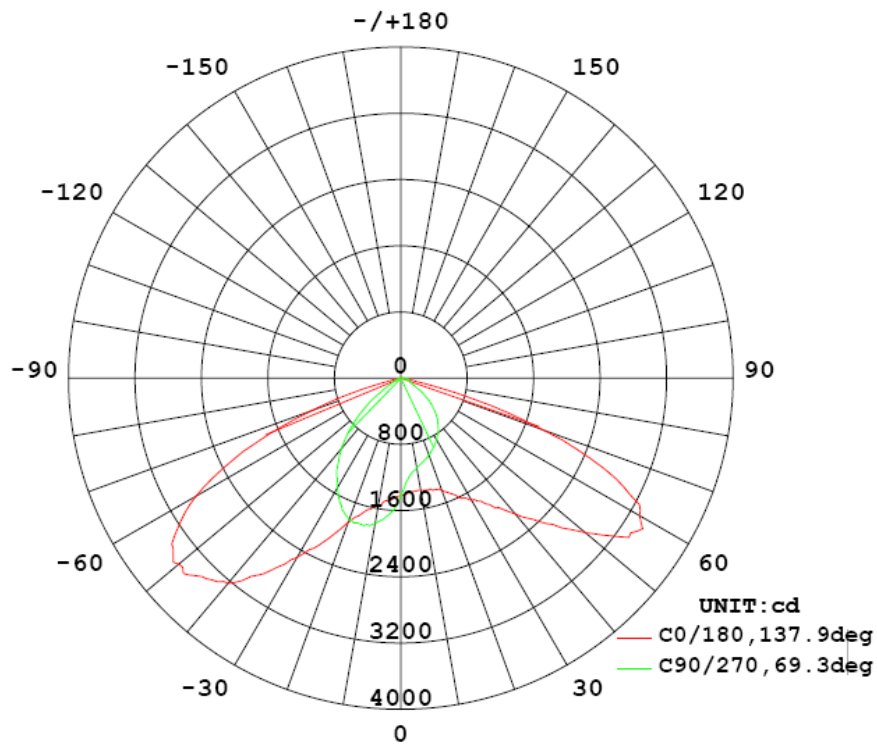
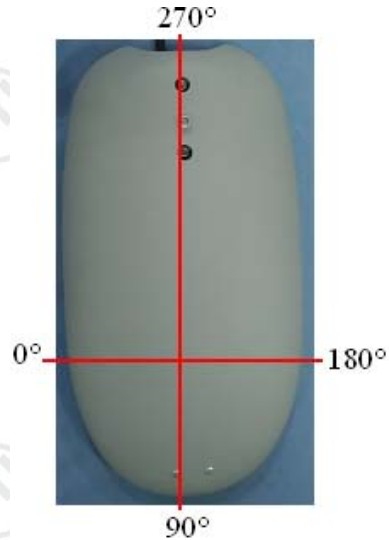
γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	%lum, lam
10	1375	1136	1101	1176	1569	1762	1784	1671	0- 10	136.4	136.4	2.55, 2.55
20	1442	1044	986.8	1140	1854	1969	1822	1774	10- 20	417.8	554.2	10.4, 10.4
30	1705	979.5	863.2	1129	2500	1969	1537	1711	20- 30	705.2	1259	23.6, 23.5
40	2140	904.9	692.5	1145	3238	1716	1115	1485	30- 40	964.6	2224	41.6, 41.6
50	2906	784.9	468.6	1154	3492	1098	586.2	1061	40- 50	1139	3363	62.9, 62.9
60	3317	629.4	210.1	821.8	2847	363.7	134.8	386.6	50- 60	1089	4452	83.2, 83.2
70	1795	243.9	113.0	288.0	1140	54.13	47.54	50.63	60- 70	680.5	5132	96, 96
80	105.1	50.82	59.66	50.53	43.88	34.43	32.08	29.11	70- 80	180.8	5313	99.3, 99.3
90	0.0075	0	0.0133	0.0007	0.4429	0	0	0	80- 90	25.39	5338	99.8, 99.8
100	0.1636	0	0.0635	0	3.701	0.2187	0	0.3533	90-100	0.3131	5339	99.8, 99.8
110	1.814	0	0	0	5.884	0.9285	0.1628	1.377	100-110	0.8249	5339	99.8, 99.8
120	3.081	0.0817	0.0543	0.1062	5.062	1.228	0.5976	1.728	110-120	1.223	5341	99.9, 99.9
130	4.401	0.9268	0.4839	0.8361	4.951	1.530	1.303	2.026	120-130	1.481	5342	99.9, 99.9
140	4.731	1.772	1.138	1.564	4.179	1.830	1.684	2.323	130-140	1.686	5344	99.9, 99.9
150	3.248	2.619	1.736	2.160	3.411	2.238	2.008	2.620	140-150	1.557	5345	100, 100
160	2.312	2.757	2.225	2.378	2.971	2.512	2.281	2.728	150-160	1.153	5347	100, 100
170	3.632	3.629	3.581	3.296	3.301	3.277	3.150	3.188	160-170	0.8136	5347	100, 100
180	3.356	3.714	3.800	3.538	3.466	3.935	3.745	3.377	170-180	0.3385	5348	100, 100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

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3.3 Luminous Intensity Distribution



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3.4 Luminous Intensity Distribution Data

Table--1 UNIT: cd

C (DEG) \ γ (DEG)	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
0	1421	1421	1421	1421	1421	1421	1421	1421	1421	1421	1421	1421	1421	1421	1421	1421	1421	1421	1421
5	1386	1349	1297	1272	1238	1223	1191	1207	1184	1188	1199	1209	1222	1225	1292	1323	1388	1420	1480
10	1375	1304	1219	1164	1140	1132	1100	1102	1088	1101	1107	1116	1126	1147	1205	1260	1351	1453	1569
15	1386	1284	1181	1127	1093	1082	1042	1043	1034	1045	1047	1065	1090	1133	1180	1231	1370	1531	1665
20	1442	1283	1166	1111	1056	1032	985	989	967	987	1003	1022	1057	1103	1178	1262	1431	1678	1854
25	1559	1344	1195	1093	1035	999	950	938	928	924	937	972	1031	1096	1202	1317	1591	1953	2170
30	1705	1434	1222	1101	1003	956	895	868	856	863	876	919	975	1064	1195	1407	1777	2236	2500
35	1864	1513	1240	1087	985	910	827	797	778	786	815	859	921	1046	1227	1530	2020	2609	2882
40	2140	1688	1307	1115	957	853	768	720	680	693	726	775	870	1020	1273	1683	2299	2947	3238
45	2485	1885	1366	1107	920	786	681	630	587	588	624	696	809	1002	1323	1788	2462	3136	3387
50	2906	2208	1449	1100	859	711	588	522	468	469	513	600	727	973	1341	1796	2521	3187	3492
55	3352	2569	1611	1136	828	618	471	399	345	338	381	461	618	852	1240	1598	2297	3011	3327
60	3317	2657	1672	1146	758	501	343	262	220	210	238	304	450	669	979	1354	1880	2610	2847
65	2839	2266	1443	941	570	324	197	140	130	131	133	160	248	428	699	982	1348	1848	2098
70	1795	1455	969	610	330	159	94.4	85.4	102	113	88.4	88.1	114	199	379	586	816	1040	1140
75	681	618	403	231	106	71.3	66.9	68.3	80.6	74.6	68.5	65.1	66.8	76.0	129	225	332	375	333
80	105	127	85.5	57.0	51.4	50.3	49.3	42.8	53.0	59.7	44.9	41.3	49.9	51.8	49.2	49.0	54.1	50.5	43.9
85	22.6	43.2	36.1	14.1	14.7	23.0	22.8	31.9	90.6	77.6	47.7	27.6	25.8	24.5	16.3	15.7	26.2	30.6	12.3
90	0.01	0.06	0.00	0.00	0.00	0.00	0.00	0.06	0.04	0.01	0.02	0.00	0.00	0.00	0.00	0.01	0.02	0.07	0.44
95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.42	0.27	0.68	0.21	0.00	0.00	0.00	0.00	0.00	0.11	1.76
100	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28	0.06	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.32	3.70
105	1.09	0.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16	1.30	5.40
110	1.81	1.43	0.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.82	2.01	5.88
115	2.53	2.03	1.15	0.44	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.59	1.47	2.56	5.39
120	3.08	2.53	1.92	0.82	0.16	0.00	0.00	0.05	0.11	0.05	0.05	0.05	0.05	0.00	0.22	0.91	1.90	2.77	5.06
125	4.29	3.31	2.63	1.31	0.71	0.44	0.16	0.05	0.11	0.05	0.05	0.05	0.11	0.27	0.82	1.40	2.50	3.27	4.57
130	4.40	3.53	3.28	1.91	1.03	0.82	0.70	0.38	0.54	0.48	0.32	0.38	0.48	0.70	0.98	1.78	2.72	3.32	4.95
135	4.78	4.19	3.57	2.51	1.53	1.20	0.81	0.76	0.86	0.76	0.71	0.76	0.75	1.02	1.52	2.26	2.99	3.54	4.46
140	4.73	4.25	4.00	3.22	1.96	1.58	1.34	1.19	1.13	1.14	1.08	1.03	1.23	1.39	1.74	2.43	3.05	3.43	4.18
145	4.30	4.03	3.90	3.39	2.56	1.80	1.61	1.58	1.51	1.63	1.52	1.62	1.56	1.55	2.12	2.64	2.99	3.10	3.74
150	3.25	3.42	2.97	3.17	2.84	2.40	1.77	1.74	1.74	1.74	1.74	1.67	1.61	1.82	2.51	2.59	2.62	2.67	3.41
155	2.75	2.98	2.58	2.95	3.06	2.62	1.99	1.96	2.05	1.90	1.85	1.94	1.99	2.36	2.56	2.48	2.34	2.45	3.30
160	2.31	2.54	2.31	2.62	2.89	2.62	2.10	2.18	2.37	2.22	2.12	2.00	1.99	2.36	2.40	2.21	2.12	2.12	2.97
165	3.19	3.58	3.45	3.49	3.16	2.90	3.06	3.15	3.23	3.20	3.14	2.92	2.79	2.57	2.83	2.85	2.83	2.94	2.97
170	3.63	4.13	4.06	4.15	3.82	3.44	3.33	3.59	3.56	3.58	3.58	3.35	3.22	3.21	3.38	3.39	3.32	3.27	3.30
175	3.85	4.08	4.17	4.21	4.15	3.55	3.49	3.59	3.83	3.85	3.69	3.40	3.39	3.32	3.70	3.82	3.48	3.59	3.36
180	3.36	3.53	3.57	3.99	3.88	3.55	3.44	3.59	3.72	3.80	3.69	3.40	3.33	3.32	3.76	3.88	3.54	3.48	3.47

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Table--2 UNIT: cd

C (DEG) \ γ (DEG)	190	200	210	220	230	240	250	260	270	280	290	300	310	320	330	340	350
0	1421	1421	1421	1421	1421	1421	1421	1421	1421	1421	1421	1421	1421	1421	1421	1421	1421
5	1509	1531	1580	1607	1603	1621	1655	1631	1659	1645	1627	1609	1576	1578	1511	1472	1431
10	1615	1675	1717	1747	1777	1763	1802	1770	1784	1765	1761	1720	1673	1668	1602	1542	1463
15	1781	1824	1865	1866	1883	1849	1864	1838	1831	1817	1789	1768	1758	1758	1696	1625	1526
20	1994	2015	2004	1990	1949	1870	1848	1823	1822	1799	1780	1784	1766	1783	1725	1703	1585
25	2272	2268	2149	2038	1948	1826	1798	1728	1696	1719	1696	1712	1735	1791	1792	1801	1739
30	2571	2492	2269	2066	1873	1697	1648	1560	1537	1548	1570	1591	1661	1762	1833	1914	1893
35	2876	2668	2314	1994	1754	1545	1444	1364	1346	1343	1366	1426	1547	1724	1877	1993	2042
40	3181	2804	2288	1866	1567	1325	1196	1138	1115	1123	1171	1244	1380	1593	1862	2182	2296
45	3325	2801	2135	1614	1289	1057	945	883	866	876	919	999	1168	1449	1800	2263	2589
50	3268	2644	1802	1247	950	749	649	598	586	605	648	742	914	1212	1662	2359	2871
55	3049	2250	1359	859	604	445	369	330	323	341	373	444	594	874	1362	2253	3103
60	2479	1596	809	453	275	186	155	138	135	141	155	193	281	495	910	1857	2970
65	1650	885	348	157	94.6	74.9	75.1	76.5	77.0	76.8	72.0	71.3	90.2	172	441	1205	2339
70	818	312	94.9	54.9	53.4	55.4	53.3	49.5	47.5	50.7	52.7	52.2	49.9	51.3	110	495	1330
75	207	71.2	37.7	38.0	45.0	42.2	36.6	32.4	32.9	34.0	36.4	41.9	40.6	35.4	39.2	108	418
80	41.5	28.2	22.1	29.1	39.7	28.4	26.1	23.0	32.1	24.5	26.3	27.7	34.7	23.4	23.5	44.7	92.5
85	22.6	11.9	10.8	18.7	23.5	16.6	16.8	14.1	13.5	15.6	16.2	14.7	22.2	14.7	9.41	20.8	37.0
90	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.22
95	1.33	0.77	0.33	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27	0.61	0.87
100	2.87	1.70	1.04	0.38	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.55	1.03	1.58	2.18
105	4.25	2.58	1.59	0.87	0.28	0.11	0.00	0.05	0.05	0.00	0.11	0.27	0.54	1.15	1.72	2.56	3.59
110	4.25	2.58	1.69	1.20	0.66	0.27	0.22	0.22	0.16	0.22	0.32	0.54	1.07	1.69	2.32	3.27	4.52
115	4.13	2.63	1.75	1.31	0.93	0.54	0.44	0.38	0.27	0.49	0.65	0.92	1.39	1.96	2.59	3.43	4.90
120	3.69	2.36	1.75	1.31	1.15	0.81	0.76	0.60	0.60	0.65	0.86	1.13	1.50	1.96	2.64	3.32	4.95
125	3.36	2.31	1.80	1.53	1.26	1.13	1.04	0.92	0.93	0.98	1.19	1.40	1.56	2.18	2.75	3.71	4.74
130	3.36	2.74	1.86	1.64	1.42	1.29	1.25	1.24	1.30	1.25	1.35	1.50	1.77	2.29	2.80	4.41	5.77
135	3.36	2.74	2.02	1.80	1.64	1.51	1.52	1.46	1.47	1.47	1.51	1.72	1.99	2.40	3.13	4.46	5.33
140	3.14	2.74	2.40	1.86	1.80	1.72	1.69	1.73	1.68	1.74	1.78	1.94	2.14	2.51	3.40	4.25	5.06
145	3.14	2.74	2.68	2.07	1.97	1.83	1.80	1.84	1.95	2.01	2.00	2.15	2.25	2.56	3.40	4.19	4.57
150	2.98	2.74	2.73	2.35	2.13	1.99	2.07	2.00	2.01	2.01	2.16	2.31	2.41	2.83	3.29	3.76	3.97
155	2.92	2.74	2.73	2.40	2.19	2.15	2.28	2.21	2.06	2.06	2.32	2.47	2.52	2.73	3.18	3.32	3.59
160	2.92	2.80	2.79	2.68	2.35	2.26	2.39	2.37	2.28	2.33	2.43	2.47	2.62	2.83	3.23	3.27	3.21
165	2.98	2.91	2.90	2.95	2.68	2.53	2.67	2.65	2.61	2.61	2.70	2.74	2.79	2.83	3.23	3.32	3.27
170	3.25	3.24	3.28	3.33	3.22	3.07	3.05	3.13	3.15	3.09	3.13	3.07	3.11	3.27	3.50	3.65	3.48
175	3.36	3.35	3.44	3.71	3.72	3.49	3.48	3.51	3.53	3.53	3.56	3.44	3.38	3.38	3.72	3.81	3.54
180	3.42	3.51	3.66	3.93	3.94	3.49	3.48	3.56	3.75	3.80	3.67	3.39	3.38	3.38	3.77	3.92	3.54

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Photos of the Sample



Fig.1- Overall view



Fig.2- Back view

*** End of Report ***

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