

# Test Report

Report No.: EED35J000249-1

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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. : 35J0249-01  
Model/Type : SP-RLLH65-136  
Brand : SPARK  
Ratings : 100-240 V AC, 50/60Hz, 65W  
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  
Supervisor/Vivian Wang

Date Apr. 25, 2017  
Check No.: 2496502567



CENTRE TESTING INTERNATIONAL CORPORATION  
NO. 996, 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	: 25.6°C
Photometric Method	: Goniophotometer
Colorimetric Method	: Sphere-spectroradiometer
Tested	: 220V AC, 50Hz
Stabilization Time	: 70 minutes
Total Operation Time including Stabilization	: 2 hours and 30 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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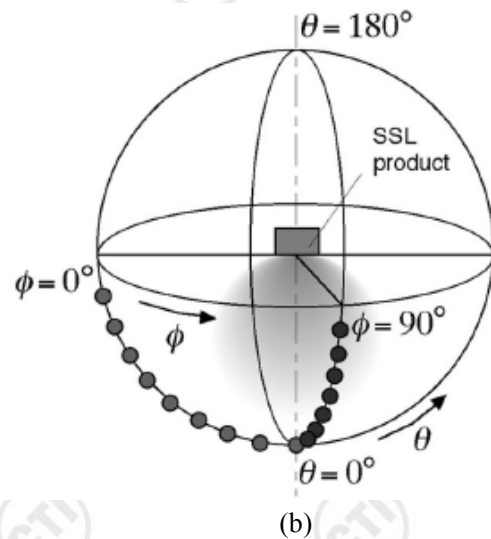
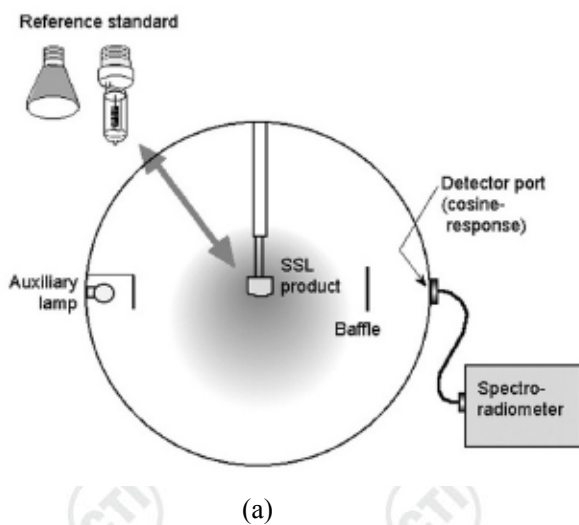
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## 2.4 Photometric and Electrical Measurements - Sphere-spectroradiometer Method

An EVERFINE CCD spectroradiometer and 2m integrating sphere was used to measure correlated color temperature, color rendering index, and chromaticity coordinates. The  $4\pi$  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	0.3002	64.21	0.9723	/
Total Luminous Flux (lm)	Luminous Efficacy (lm/W)	Correlated Color Temperature (K)	Color Rendering Index Ra	Color Rendering Index R9
9095	141.65	3995	73.0	0
Chromaticity Coordinate x	Chromaticity Coordinate y	Chromaticity Coordinate u'	Chromaticity Coordinate v'	Duv
0.3881	0.4043	0.2194	0.5143	0.0102

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## 3.2 Zonal Lumen Density

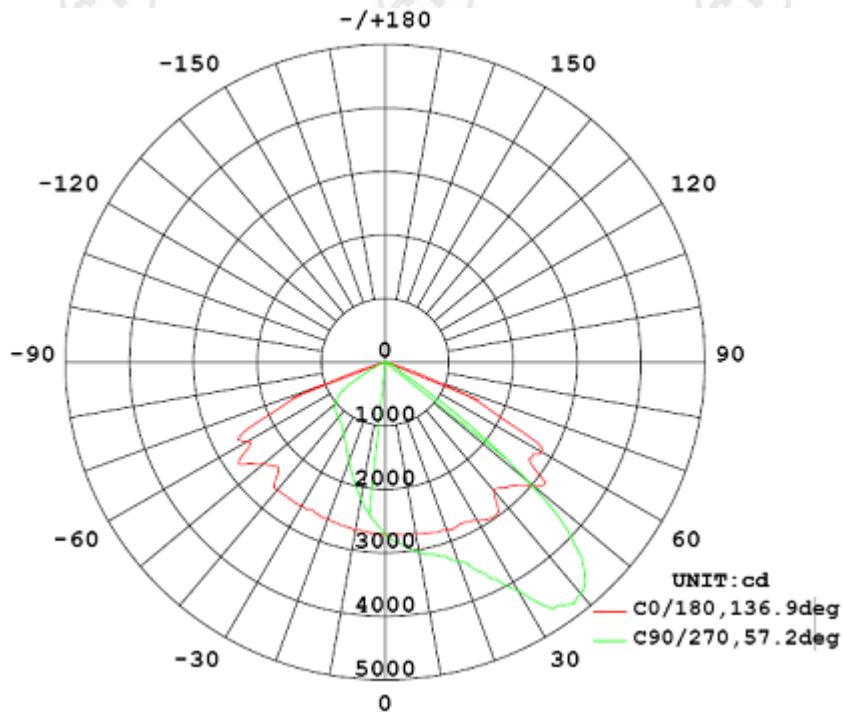
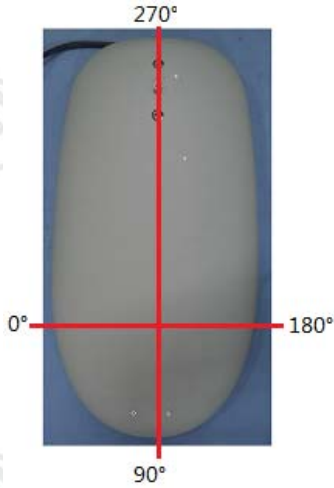
$\gamma$	C0	C45	C90	C135	C180	C225	C270	C315	$\gamma$	$\Phi$ zone	$\Phi$ total	%lum, lam
10	2738	2972	3028	2933	2691	2336	2200	2403	0- 10	256.0	256.0	2.81, 2.81
20	2810	3185	3337	3108	2637	1941	1657	2075	10- 20	742.1	998.0	11, 11
30	2880	3514	4153	3360	2599	1605	1303	1757	20- 30	1203	2201	24.2, 24.2
40	2641	4368	4759	4259	2625	1365	1138	1525	30- 40	1739	3940	43.3, 43.3
50	3026	4219	2925	4222	2489	1221	1021	1271	40- 50	2120	6060	66.6, 66.6
60	2816	2785	234.5	2419	2498	909.0	439.5	1022	50- 60	1894	7954	87.5, 87.5
70	727.2	194.9	126.1	175.0	957.2	319.1	105.5	339.2	60- 70	984.8	8939	98.3, 98.3
80	10.99	13.53	57.42	12.21	11.19	13.53	41.41	12.53	70- 80	125.4	9065	99.7, 99.7
90	0.0029	0	15.08	0	0	0	0.0025	0	80- 90	8.096	9073	99.8, 99.8
100	0.7336	3.662	0.2394	4.027	1.368	0.4456	0.6188	0.5059	90-100	1.784	9075	99.8, 99.8
110	1.494	0.8630	0.2657	0.8977	3.661	4.482	0.5063	4.554	100-110	1.726	9076	99.8, 99.8
120	2.729	1.108	0.7227	1.244	4.275	7.247	5.694	7.442	110-120	2.891	9079	99.8, 99.8
130	3.762	2.647	0.8437	2.105	6.723	8.649	9.375	8.007	120-130	4.001	9083	99.9, 99.9
140	4.696	3.124	1.525	3.222	8.320	7.880	9.695	7.714	130-140	4.242	9087	99.9, 99.9
150	4.698	2.933	1.713	3.032	7.006	7.665	7.804	7.339	140-150	3.452	9091	99.9, 100
160	3.822	3.155	2.507	3.224	6.825	7.373	7.136	7.083	150-160	2.371	9093	100, 100
170	6.762	5.083	4.570	5.179	6.974	7.276	6.858	7.048	160-170	1.582	9095	100, 100
180	6.934	6.496	6.414	6.681	6.934	7.023	5.965	6.147	170-180	0.6102	9095	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	2711	2711	2711	2711	2711	2711	2711	2711	2711	2711	2711	2711	2711	2711	2711	2711	2711	2711	2711
5	2726	2740	2820	2816	2837	2858	2860	2900	2919	2875	2895	2906	2857	2848	2815	2785	2766	2729	2699
10	2738	2805	2879	2915	2971	2973	3010	3040	3041	3028	3030	3033	2994	2951	2915	2847	2797	2731	2691
15	2779	2866	2956	3009	3082	3082	3147	3170	3176	3149	3165	3134	3097	3044	3000	2907	2836	2725	2665
20	2810	2894	3004	3105	3151	3220	3261	3349	3351	3337	3324	3267	3180	3139	3077	2945	2852	2717	2637
25	2806	2933	3066	3180	3262	3374	3491	3589	3650	3659	3641	3532	3379	3243	3130	2992	2883	2757	2611
30	2880	2993	3147	3267	3396	3632	3748	4035	4109	4153	4117	3938	3746	3454	3267	3056	2924	2774	2599
35	2969	3141	3307	3445	3691	4072	4293	4624	4656	4692	4669	4610	4275	3908	3485	3143	2997	2827	2621
40	2641	2890	3214	3701	4122	4615	4746	4797	4824	4759	4799	4750	4640	4493	4025	3357	3006	2814	2625
45	2754	2960	3188	3725	4577	4808	4616	4564	4403	4347	4339	4470	4539	4604	4497	3878	3010	2567	2356
50	3026	3315	3813	4200	4135	4303	4023	3680	3233	2925	3090	3514	3856	4217	4226	3718	3171	2724	2489
55	2775	3282	4045	4201	3920	3449	2946	1956	1202	866	1087	1696	2642	3237	3505	3805	3848	3126	2799
60	2816	3220	3440	3151	3147	2423	1196	342	244	234	241	292	958	1940	2897	3214	3075	2882	2498
65	1855	2026	2096	2101	1671	800	222	175	164	165	164	172	193	565	1476	2065	2470	2399	2130
70	727	716	698	560	247	143	126	126	125	126	125	125	129	121	229	591	937	980	957
75	61.8	52.3	42.0	45.6	55.4	72.2	87.1	90.5	94.0	93.0	96.1	89.0	85.8	73.3	54.5	47.9	70.8	77.5	109
80	11.0	10.5	9.42	7.93	7.07	20.0	40.0	54.0	57.9	57.4	56.8	48.7	36.3	17.1	7.37	8.29	9.81	10.9	11.2
85	8.38	8.00	7.16	5.79	4.70	3.56	2.38	1.08	0.95	0.45	1.01	1.69	2.47	3.71	4.91	6.15	7.33	8.46	8.62
90	0.00	0.00	0.00	0.00	0.00	0.00	3.10	13.1	16.3	15.1	16.6	11.7	2.62	0.00	0.00	0.00	0.00	0.00	0.00
95	0.33	0.00	0.89	0.82	1.32	2.22	3.71	2.81	1.87	0.89	1.96	2.95	4.02	1.82	0.89	0.11	0.00	0.00	0.16
100	0.73	0.65	1.32	2.97	3.76	3.56	2.99	2.24	1.24	0.24	1.68	2.58	3.40	3.92	4.13	3.07	1.10	0.00	1.37
105	0.94	0.76	1.03	0.98	0.78	1.17	1.50	1.57	0.95	0.25	1.47	2.02	1.96	1.34	0.95	0.82	0.88	0.65	3.06
110	1.49	1.04	1.01	0.95	0.80	0.93	0.98	1.07	0.89	0.27	1.37	1.12	1.00	0.99	0.80	0.85	0.94	1.15	3.66
115	1.96	1.31	1.10	0.91	0.83	0.90	0.96	1.07	0.89	0.28	1.18	1.14	0.94	1.25	0.95	0.87	1.20	1.52	4.31
120	2.73	1.91	1.70	0.88	0.83	1.39	0.98	1.07	0.92	0.72	1.21	1.18	0.99	1.51	0.98	1.26	1.92	2.47	4.28
125	3.49	2.44	2.47	1.43	0.83	1.88	0.9930	1.07	0.97	0.78	1.25	1.22	1.11	1.77	1.06	1.75	2.42	2.90	5.09
130	3.76	2.55	2.65	1.65	2.24	3.05	0.9933	1.07	1.02	0.84	1.29	1.25	1.61	2.60	1.61	2.52	2.75	3.34	6.72
135	4.03	3.05	3.02	4.76	4.02	2.88	1.50	1.07	1.06	1.06	1.33	1.29	1.72	2.60	4.47	4.72	3.25	3.73	7.04
140	4.70	3.82	4.28	5.11	3.64	2.61	1.56	1.51	1.51	1.52	1.68	1.57	1.76	2.60	3.85	4.79	4.13	6.91	8.32
145	4.84	5.36	4.29	3.41	3.44	2.51	1.62	1.64	1.73	1.62	1.68	1.70	1.79	2.60	3.57	3.62	5.08	5.49	7.31
150	4.70	4.80	4.02	3.49	3.31	2.55	1.68	1.74	1.73	1.71	1.70	1.72	1.82	2.60	3.47	3.59	4.24	4.83	7.01
155	4.10	4.16	3.58	3.57	3.44	2.64	1.82	1.85	1.84	1.78	1.90	1.91	2.17	2.60	3.54	3.62	3.80	4.28	6.92
160	3.82	3.93	3.95	3.64	3.59	2.72	2.48	2.35	2.51	2.51	2.61	2.46	2.56	2.83	3.62	3.66	3.97	3.95	6.82
165	5.18	5.29	4.83	4.67	4.19	3.82	3.64	3.75	3.96	3.96	3.80	3.64	3.84	4.14	4.28	4.82	5.01	5.49	6.61
170	6.76	6.81	6.05	5.99	5.35	4.82	4.47	4.54	4.47	4.57	4.48	4.32	4.62	5.08	5.28	5.98	6.01	6.86	6.97
175	6.93	6.93	6.93	6.93	6.06	5.54	5.19	5.17	5.09	5.13	5.20	5.05	5.23	5.58	6.34	6.86	7.05	7.00	7.02
180	6.93	7.04	6.93	6.98	7.01	5.99	5.96	5.89	5.76	6.41	5.65	5.50	6.35	6.13	7.23	6.86	7.00	7.02	6.93

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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	2711	2711	2711	2711	2711	2711	2711	2711	2711	2711	2711	2711	2711	2711	2711	2711	2711
5	2642	2614	2582	2549	2503	2485	2484	2473	2464	2491	2511	2514	2532	2588	2594	2657	2666
10	2580	2527	2411	2355	2316	2241	2223	2186	2200	2216	2244	2287	2350	2457	2509	2605	2658
15	2546	2414	2277	2175	2096	2003	1958	1909	1922	1927	1990	2071	2161	2305	2416	2542	2671
20	2473	2330	2157	1992	1890	1758	1712	1659	1657	1676	1738	1832	1980	2170	2316	2506	2640
25	2432	2231	2040	1825	1684	1542	1497	1448	1450	1476	1524	1616	1808	2022	2236	2454	2654
30	2396	2145	1916	1683	1526	1385	1349	1316	1303	1329	1378	1467	1630	1884	2155	2448	2672
35	2379	2116	1819	1563	1385	1277	1225	1203	1195	1218	1262	1326	1491	1777	2072	2443	2716
40	2349	2061	1714	1449	1281	1170	1160	1133	1138	1158	1194	1245	1384	1665	2008	2290	2460
45	2120	1898	1658	1365	1219	1141	1125	1108	1101	1117	1152	1214	1313	1490	1741	2185	2503
50	2201	1805	1413	1269	1172	1094	1052	1032	1021	1038	1084	1146	1187	1355	1738	2303	2730
55	2373	1896	1393	1100	1023	973	919	876	867	895	954	1042	1055	1295	1811	2308	2547
60	2069	1574	1266	1003	815	799	680	497	439	522	725	782	922	1122	1356	1991	2502
65	1823	1404	923	635	633	461	242	162	163	169	265	536	596	773	1086	1376	1691
70	888	725	496	349	289	196	103	105	106	109	105	191	315	363	550	623	725
75	105	87.6	77.7	91.7	88.1	62.5	59.8	62.6	61.7	61.6	58.2	62.1	76.9	74.7	48.1	69.1	71.7
80	11.1	11.1	11.1	11.0	16.1	23.9	35.8	41.9	41.4	41.7	34.4	23.3	15.1	9.96	9.60	9.80	10.1
85	8.41	8.05	7.93	7.75	7.25	6.73	4.97	3.46	1.73	3.12	4.59	6.76	7.23	7.62	7.21	7.42	7.78
90	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	0.00	0.00	0.00
95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.39	4.21	0.71	0.00	0.49	0.00	0.00	0.01	0.06	0.28
100	1.26	1.11	1.05	0.72	0.17	0.00	0.05	0.39	0.62	0.06	0.00	0.06	0.17	0.84	1.49	1.66	1.92
105	3.23	3.19	3.08	2.76	1.83	0.62	0.17	0.49	0.42	0.39	0.23	0.56	1.72	3.23	3.57	3.69	3.68
110	3.93	4.28	4.78	4.86	4.11	2.83	1.52	0.96	0.51	0.73	1.19	2.68	4.10	5.01	5.27	4.65	4.14
115	4.11	4.65	5.65	5.74	6.05	5.47	4.67	3.15	2.57	2.87	3.99	5.29	6.36	6.18	5.76	4.51	4.33
120	4.30	4.54	6.03	7.06	7.43	7.79	7.06	6.11	5.69	5.89	6.40	7.19	7.47	7.42	6.20	4.25	4.26
125	5.24	6.55	6.82	8.27	8.45	8.78	8.69	8.51	8.15	8.01	8.02	8.19	8.35	7.77	6.51	6.78	5.60
130	6.66	7.70	7.37	8.44	8.86	8.67	8.83	9.68	9.38	9.35	8.47	8.59	8.45	7.57	6.65	7.10	6.15
135	6.93	8.08	8.48	8.13	8.48	8.60	8.87	9.68	9.69	9.44	8.59	8.62	8.29	7.54	7.68	7.18	6.36
140	8.07	7.70	8.53	7.83	7.93	8.53	8.75	9.11	9.70	9.17	8.72	8.51	7.90	7.52	8.51	7.33	6.58
145	6.88	7.79	8.61	7.87	7.59	8.33	8.30	8.50	8.75	8.56	8.08	8.02	7.49	7.58	8.40	7.33	6.60
150	6.92	7.48	8.19	7.84	7.49	7.89	8.03	7.83	7.80	7.50	7.65	7.40	7.28	7.40	7.84	7.20	6.80
155	6.88	7.24	7.46	7.72	7.39	7.34	7.79	7.22	7.18	7.16	7.29	7.17	7.06	7.21	7.24	7.06	6.45
160	6.76	7.16	7.12	7.45	7.30	6.99	7.30	7.18	7.14	7.16	7.11	7.12	7.03	7.13	7.22	7.06	6.33
165	6.61	7.09	6.97	7.41	7.23	7.01	7.20	7.05	6.86	6.95	6.90	6.85	6.86	7.07	7.19	7.05	6.59
170	6.95	7.07	6.95	7.37	7.18	7.01	7.15	6.70	6.86	6.97	7.02	7.03	6.99	7.10	7.16	7.44	7.03
175	6.97	7.05	6.93	7.34	7.20	7.01	7.00	6.35	6.58	7.05	6.62	6.12	6.91	7.08	7.14	7.53	7.00
180	6.93	7.04	6.92	7.01	7.04	6.28	6.05	6.10	5.97	6.04	5.66	5.62	6.08	6.21	6.91	6.99	6.97



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## Photos of the Sample



Fig.1- Overall view



Fig.2- Back view

\*\*\* End of Report \*\*\*

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