



71784
2X4 LED Troffer



RoHS

0-10V Dimmable



QPL ID #
PWPKZKEY



	Model:	71784
OVERALL LAMP PARAMETERS	Input Voltage	120-277 VAC 60HZ
	Input Current	.3339A Max @ 120V; 0.18A Max @ 277V
	Input Power	50W
	Power Factor	PF>0.98
	Luminance	6,059 LM
	Luminous Efficiency	130 LM/W
	CRI	>82
	Beam Angle	112°
	SDCM	<7
	UGR	<19
LED DRIVER	Brand	Arcata 2835
	Output Voltage	12-24 VDC
	Output Current	1.2A
	Driver Efficiency	88%
LED	LED Manufacturer	Edison
	LED Type	2835 SMD
	LED Quantity	238 PCS
	LED Efficacy	140 LM/W
	Color Temperature	4000K
LIFESPAN & ENVIRONMENT	Output Current	50mA Max; 37.5mA Applied
	Lifespan	50,000+ Hrs.
	Warranty	5 Years
	IP Rating	IP21 Dry Locations
	Operating Temperature	-20°C---+40°C
SAFETY/EMC	Storage Temperature/Humidity	-40°C---+80°C , 10---90% RH
	Safety Norms	UL1598, UL8750, EN60598, EN61347-2-13, EN62031, EN62471
	Withstand Voltage	1/P-PG: 2121VDC
	Grounding Resistance	25A 100mΩ
OTHERS	Electromagnetic Compatibility	EN55015, EN61000-2-3, EN61000-3-3, EN61547
	Dimension	Pls refer to attached dimension drawing
	Net Weight	0.6KG
	Gross Weight	0.8KG
	Qty / Carton	2 PCS
	Volume	0.530m³/carton
	Housing Color	White
	Main Structure	Aluminium Frame + Polystyrene Lens

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Customer : Morris Products Inc.
Address : 53 Carey Rd. Queensbury, NY 12804

Description of the submitted sample(s):

Sample Name : LED Luminaire
Model/Type : 71783, 71784, 71785
Brand : MORRIS
Sample No. : 35I0626-02
Ratings : 120-277 V AC, 50/60 Hz, 50 W, 5000 K
Test Item : Total Luminous Flux, Luminous Efficacy, Zonal Lumen Density, Luminous Intensity Distribution, Correlated Color Temperature, Color Rendering Index, Chromaticity Coordinate and Electrical Parameters
State of Sample(s) : Normal
Sample Quantity : 1 pc
Manufacturer : Morris Products Inc.

Sample Received Date : Nov. 09, 2016
Sample Tested Date : Nov. 09, 2016 to Nov. 10, 2016
Test Requested : All test items were measured according to IES LM-79-08 Approved Method for the 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

Jinling Jiang

Reviewed by

Heavenlin

Approved by

Heavenlin

Engineer/Heven Liu

Date

Dec. 22, 2016

Check No.: 2457570188



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	---	---
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	: 25.1 °C
Photometric Method	: Goniophotometer
Colorimetric Method	: Sphere-spectroradiometer
Tested	: 120 V AC, 60 Hz
Stabilization Time	: 60 minutes
Total Operation Time including Stabilization	: 95 minutes

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.

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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%.

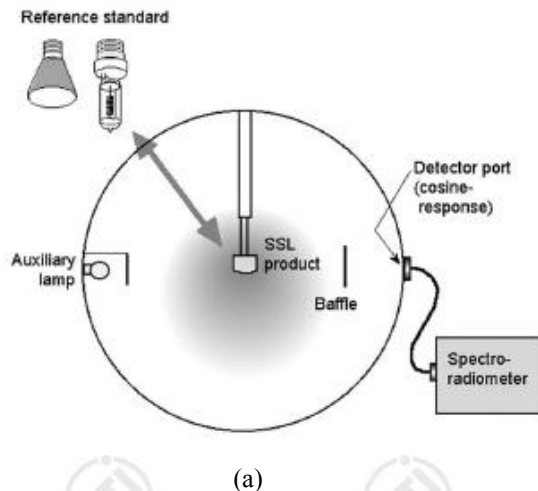
2.4 Photometric and Electrical Measurements –Sphere-spectroradiometer Method

A spectroradiometer and an integrating sphere were 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.

The calibration of the sphere-spectroradiometer system is traceable to the National Institute of Standards and Technology.

2.5 Photometric and Electrical Measurements - Goniophotometer Method

A type C goniophotometer was used to measure total luminous flux and 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.



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3 Test Results

3.1 Photometric and Electrical Measurements

Input Voltage (V AC)	Input Current (A)	Input Power (W)	Power Factor	THD of Current (%)
120.0	0.3931	46.59	0.9890	13.29
Total Luminous Flux (lm)	Luminous Efficacy (lm/W)	Correlated Color Temperature (K)	Color Rendering Index/R _a	Color Rendering Index/R ₉
6059.2	130.05	5026	82.3	7
Chromaticity Coordinate x	Chromaticity Coordinate y	Chromaticity Coordinate u'	Chromaticity Coordinate v'	Duv
0.3450	0.3584	0.2088	0.4879	0.0034

Note: According to CIE 1976 (u', v') diagram, $u' = u = 4x/(-2x+12y+3)$, $v' = 3v/2 = 9y/(-2x+12y+3)$.

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3.2 Zonal Lumen Density

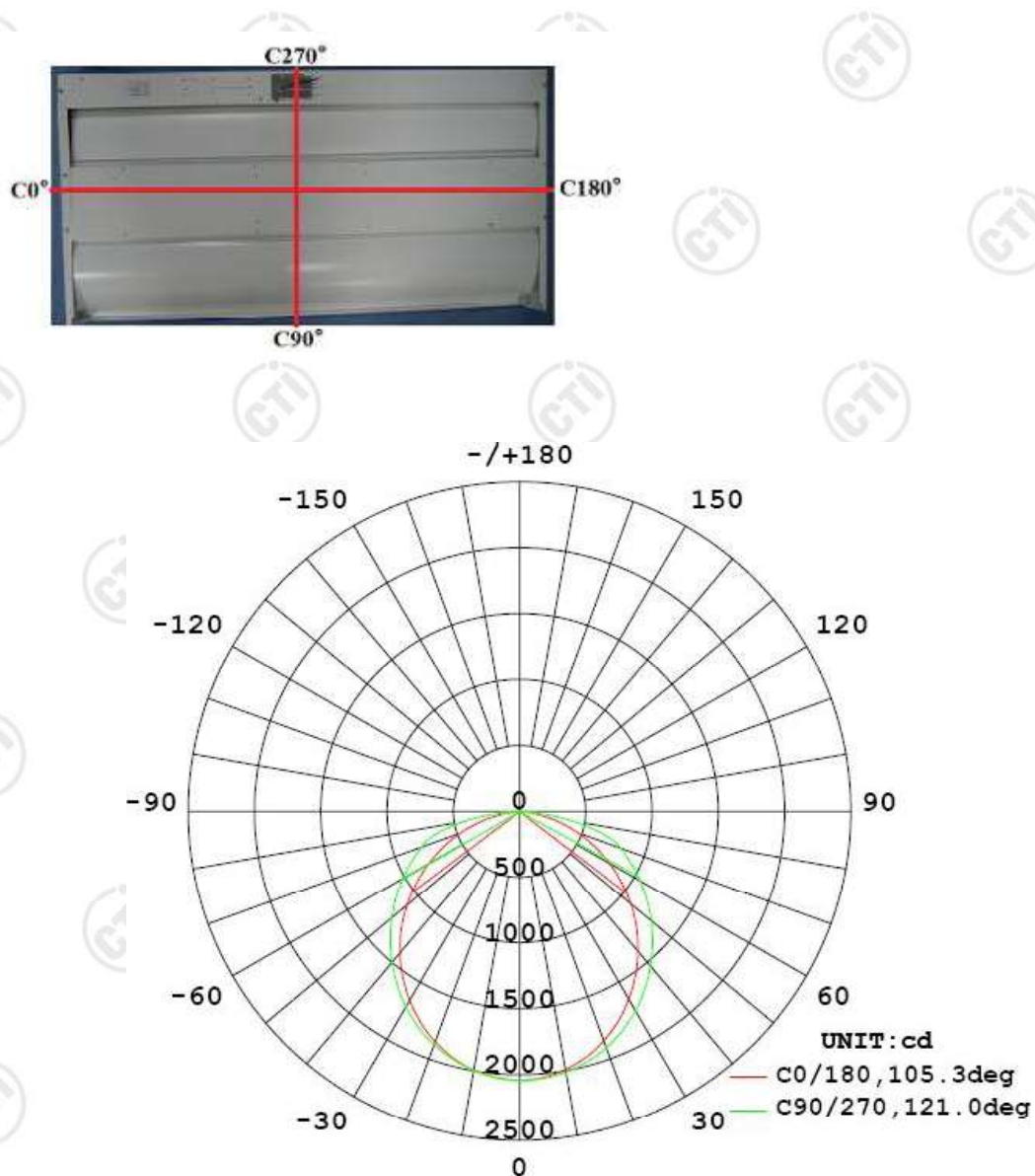
γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	η lum, lamp
10	1990	2001	2010	2015	1995	2002	1997	1990	0- 10	192.9	192.9	3.18,3.18
20	1855	1889	1910	1916	1863	1890	1887	1877	10- 20	551.1	744.0	12.3,12.3
30	1648	1711	1748	1748	1659	1714	1716	1708	20- 30	832.3	1576	26,26
40	1392	1474	1537	1522	1406	1484	1499	1485	30- 40	1000	2577	42.5,42.5
50	1096	1200	1298	1257	1110	1217	1260	1221	40- 50	1041	3617	59.7,59.7
60	782.0	916.2	1049	972.0	791.7	936.7	1017	940.3	50- 60	960.2	4577	75.5,75.5
70	465.7	644.8	812.1	694.9	474.4	666.9	788.7	663.8	60- 70	785.5	5363	88.5,88.5
80	163.0	361.2	396.1	391.5	169.4	391.8	422.8	383.2	70- 80	539.9	5903	97.4,97.4
90	0.0129	0.1331	0.1393	0.0692	0.4376	0.4577	0.3454	0.4748	80- 90	151.1	6054	99.9,99.9
100	0	0.0654	0	0.1020	2.455	1.012	0.9671	1.118	90-100	0.5031	6054	99.9,99.9
110	0	0.1969	0.2764	0.6454	3.585	1.079	1.384	1.355	100-110	1.015	6055	99.9,99.9
120	0	0.2954	0.4836	0.6788	2.281	1.079	1.590	1.355	110-120	1.028	6056	100,100
130	0	0.2954	0.4836	0.6788	0.7616	1.079	1.933	1.355	120-130	0.7723	6057	100,100
140	0	0.2954	0.4836	0.6102	0.8704	1.047	1.865	1.221	130-140	0.6411	6058	100,100
150	0	0.2954	0.5527	0.6102	0.8704	1.014	1.865	1.153	140-150	0.5440	6058	100,100
160	0.3263	0.2954	0.5527	0.5759	0.8704	0.9154	1.382	1.051	150-160	0.3817	6059	100,100
170	0.8152	0.8831	0.8981	0.8474	0.8704	0.9154	1.382	1.051	160-170	0.2560	6059	100,100
180	0.8160	0.9154	1.313	0.9479	0.9248	0.9154	1.311	1.016	170-180	0.0984	6059	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	2040	2040	2040	2040	2040	2040	2040	2040	2040	2040	2040	2040	2040	2040	2040	2040	2040	2040	2040
5	2027	2029	2027	2029	2032	2029	2029	2026	2030	2035	2040	2043	2038	2037	2037	2039	2035	2030	2029
10	1990	1994	1992	1998	2003	2000	1998	1996	2002	2010	2022	2027	2019	2016	2015	2018	2008	1998	1995
15	1933	1938	1935	1948	1957	1950	1950	1949	1959	1968	1986	1994	1982	1976	1974	1978	1959	1943	1939
20	1855	1862	1858	1882	1892	1886	1886	1886	1900	1910	1933	1943	1928	1919	1914	1918	1887	1866	1863
25	1759	1767	1762	1799	1811	1804	1804	1810	1826	1836	1864	1877	1857	1846	1834	1838	1795	1769	1768
30	1648	1657	1652	1700	1713	1708	1709	1722	1740	1748	1778	1794	1773	1758	1738	1738	1685	1655	1659
35	1525	1531	1532	1585	1598	1599	1604	1622	1641	1648	1680	1697	1675	1655	1628	1621	1562	1528	1539
40	1392	1397	1406	1457	1471	1478	1488	1513	1533	1537	1570	1589	1566	1538	1506	1491	1428	1392	1406
45	1248	1254	1272	1316	1333	1348	1366	1398	1418	1420	1450	1470	1447	1413	1375	1348	1287	1250	1262
50	1096	1108	1132	1166	1189	1211	1239	1279	1297	1298	1325	1344	1321	1280	1234	1198	1143	1106	1110
55	939	957	983	1012	1042	1074	1110	1154	1172	1173	1195	1212	1188	1143	1086	1050	998	956	952
60	782	804	826	861	896	936	980	1027	1047	1049	1064	1076	1054	1005	939	903	846	799	792
65	624	644	666	713	755	802	853	903	926	928	938	942	919	869	794	755	692	637	635
70	466	482	515	569	616	674	731	784	811	812	816	815	787	735	655	609	540	479	474
75	309	328	375	432	488	554	608	643	657	653	659	666	654	605	524	468	396	328	316
80	163	189	246	309	346	376	390	401	401	396	403	414	419	408	375	338	259	189	169
85	52.2	73.6	114	131	129	128	124	122	118	116	120	126	134	140	140	144	121	73.7	57.0
90	0.01	0.00	0.07	0.14	0.13	0.13	0.07	0.07	0.21	0.14	0.14	0.07	0.21	0.07	0.07	0.14	0.07	0.03	0.44
95	0.00	0.00	0.00	0.07	0.06	0.07	0.07	0.07	0.07	0.00	0.07	0.00	0.07	0.07	0.07	0.07	0.07	0.00	1.36
100	0.00	0.00	0.00	0.07	0.06	0.07	0.07	0.27	0.28	0.00	0.07	0.00	0.14	0.14	0.07	0.07	0.28	0.00	2.45
105	0.00	0.00	0.00	0.07	0.06	0.07	0.27	0.97	0.84	0.20	0.21	0.21	0.63	0.41	0.33	0.14	0.41	0.00	3.38
110	0.00	0.00	0.00	0.07	0.06	0.33	0.41	0.90	0.97	0.28	0.28	0.57	0.84	0.82	0.47	0.28	0.55	0.00	3.59
115	0.00	0.00	0.00	0.07	0.19	0.33	0.75	0.97	1.04	0.48	0.43	0.64	0.84	0.82	0.53	0.28	0.48	0.00	3.05
120	0.00	0.00	0.00	0.07	0.19	0.40	0.75	0.97	1.04	0.48	0.49	0.64	0.84	0.82	0.53	0.28	0.48	0.00	2.28
125	0.00	0.00	0.00	0.07	0.19	0.40	0.75	0.97	1.04	0.48	0.49	0.64	0.84	0.82	0.53	0.28	0.48	0.00	1.19
130	0.00	0.00	0.00	0.07	0.19	0.40	0.75	0.97	1.04	0.48	0.49	0.64	0.84	0.82	0.53	0.28	0.48	0.00	0.76
135	0.00	0.00	0.00	0.07	0.19	0.40	0.75	0.97	1.04	0.48	0.49	0.64	0.84	0.76	0.53	0.28	0.48	0.00	0.71
140	0.00	0.00	0.00	0.07	0.19	0.40	0.75	0.97	1.04	0.48	0.49	0.64	0.84	0.69	0.53	0.28	0.48	0.00	0.87
145	0.00	0.00	0.00	0.07	0.19	0.40	0.75	0.97	1.04	0.55	0.49	0.64	0.84	0.69	0.53	0.28	0.48	0.00	0.87
150	0.00	0.12	0.00	0.07	0.19	0.40	0.75	0.97	1.04	0.55	0.49	0.64	0.84	0.69	0.53	0.28	0.48	0.00	0.87
155	0.05	0.12	0.13	0.07	0.19	0.40	0.75	0.97	1.11	0.55	0.49	0.64	0.84	0.69	0.53	0.28	0.48	0.24	0.87
160	0.33	0.36	0.66	0.20	0.19	0.40	0.75	0.91	0.97	0.55	0.49	0.64	0.77	0.62	0.53	0.34	0.62	0.54	0.87
165	0.54	0.77	1.01	0.74	0.32	0.40	0.75	0.91	0.97	0.83	0.99	0.86	0.77	0.62	0.53	0.68	0.89	0.84	0.87
170	0.82	0.77	0.95	0.94	0.84	0.93	0.88	1.04	1.04	0.90	1.06	0.93	0.91	0.89	0.80	0.90	0.89	0.84	0.87
175	0.82	0.77	0.95	0.94	0.90	0.93	1.02	1.32	1.25	1.24	1.27	1.14	1.06	0.96	0.87	0.90	0.89	0.84	0.87
180	0.82	0.77	0.95	0.94	0.90	0.93	1.09	1.39	1.25	1.31	1.27	1.21	1.20	0.96	0.93	0.90	0.89	0.84	0.92

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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	2040	2040	2040	2040	2040	2040	2040	2040	2040	2040	2040	2040	2040	2040	2040	2040	2040
5	2028	2030	2031	2029	2032	2034	2036	2032	2028	2023	2020	2023	2023	2025	2023	2022	2027
10	1993	1999	2001	1999	2005	2007	2014	2007	1997	1990	1984	1990	1989	1992	1990	1984	1994
15	1937	1944	1951	1950	1959	1966	1975	1966	1950	1941	1933	1939	1939	1944	1942	1927	1940
20	1859	1870	1882	1883	1897	1907	1920	1908	1887	1879	1869	1873	1874	1880	1878	1850	1866
25	1762	1778	1795	1799	1821	1832	1848	1834	1808	1801	1790	1793	1796	1803	1802	1759	1773
30	1651	1668	1694	1699	1729	1743	1761	1746	1716	1712	1700	1700	1705	1710	1710	1652	1664
35	1525	1547	1576	1586	1622	1640	1660	1643	1611	1612	1598	1595	1602	1603	1603	1535	1539
40	1390	1414	1446	1465	1502	1527	1547	1530	1499	1501	1489	1481	1487	1482	1479	1410	1403
45	1249	1273	1307	1335	1374	1404	1427	1410	1381	1386	1375	1359	1360	1353	1341	1277	1259
50	1103	1128	1161	1195	1240	1276	1300	1284	1260	1266	1258	1234	1227	1215	1190	1135	1110
55	951	982	1019	1051	1103	1144	1169	1157	1139	1145	1139	1109	1093	1071	1035	984	959
60	792	831	878	908	966	1011	1036	1029	1017	1024	1017	984	956	925	883	825	801
65	631	679	736	768	831	878	904	906	900	907	898	861	820	780	735	666	640
70	472	531	596	632	702	751	782	789	789	796	785	743	691	636	588	516	479
75	323	390	460	505	578	628	652	654	652	662	660	627	571	503	447	378	325
80	188	259	334	374	410	427	431	427	423	432	435	423	402	365	320	251	189
85	76.3	130	161	163	166	165	161	155	151	154	157	157	155	149	145	122	75.7
90	0.48	0.61	0.54	0.45	0.46	0.41	0.42	0.35	0.35	0.49	0.50	0.56	0.48	0.47	0.55	0.68	0.54
95	1.37	1.29	0.87	0.65	0.53	0.48	0.49	0.56	0.55	0.64	0.64	0.56	0.55	0.74	0.97	1.30	1.32
100	2.26	1.89	1.21	1.10	0.93	0.82	0.90	0.84	0.97	0.99	1.00	0.99	1.10	1.14	1.45	2.12	2.34
105	2.98	1.96	1.21	1.03	1.13	1.16	1.18	1.11	1.24	1.41	1.43	1.41	1.38	1.27	1.45	2.47	3.35
110	3.15	1.89	1.21	1.03	1.13	1.22	1.32	1.39	1.38	1.62	1.57	1.55	1.44	1.27	1.45	2.33	3.40
115	2.56	1.49	1.01	1.03	1.13	1.22	1.39	1.46	1.45	1.55	1.64	1.69	1.44	1.27	1.38	2.05	2.75
120	1.78	0.94	0.87	1.03	1.13	1.22	1.53	1.53	1.59	1.62	1.78	1.76	1.44	1.27	1.31	1.23	1.97
125	0.66	0.47	0.87	1.03	1.13	1.22	1.60	1.67	1.66	1.84	1.93	1.76	1.44	1.27	0.97	0.62	0.66
130	0.48	0.47	0.81	1.03	1.13	1.22	1.60	1.74	1.93	1.98	2.00	1.76	1.44	1.27	0.83	0.62	0.42
135	0.48	0.61	0.81	0.97	1.13	1.22	1.60	1.74	1.87	1.98	2.00	1.76	1.44	1.20	0.83	0.89	0.54
140	0.71	0.81	0.87	0.97	1.13	1.22	1.60	1.74	1.87	1.98	2.00	1.76	1.44	1.00	1.04	1.09	0.78
145	0.89	0.88	1.01	0.97	1.13	1.22	1.67	1.74	1.87	1.98	1.93	1.76	1.37	1.00	1.10	1.03	0.96
150	0.95	1.01	1.01	0.97	1.06	1.22	1.46	1.67	1.87	1.90	1.92	1.69	1.31	1.00	1.11	0.96	0.96
155	0.89	1.01	1.01	0.90	0.99	1.16	1.32	1.39	1.52	1.62	1.64	1.41	1.23	1.00	1.03	0.89	0.95
160	0.89	1.01	0.94	0.90	0.93	1.09	1.25	1.39	1.38	1.41	1.43	1.41	1.17	0.93	1.03	0.89	0.78
165	0.89	1.01	0.94	0.90	0.93	1.09	1.25	1.39	1.38	1.41	1.43	1.34	1.17	0.93	0.97	0.89	0.78
170	0.89	1.01	0.94	0.90	0.93	1.09	1.25	1.39	1.38	1.41	1.43	1.34	1.17	0.93	0.97	0.89	0.78
175	0.89	1.01	0.94	0.90	0.93	1.15	1.25	1.39	1.38	1.41	1.50	1.34	1.17	0.93	0.97	0.89	0.78
180	0.89	0.88	0.94	0.90	0.93	0.95	1.11	1.32	1.31	1.34	1.29	1.26	1.10	0.93	0.97	0.89	0.78

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Photos of the Sample



Fig.1- Overall view



Fig.2- Back view

*** End of Report ***

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