



LM-79-08 Test Report

for

ABBlighting, Inc.

3 Adams St Belvidere, NJ 07823.

52W WALLPACK

Model: ABBWP55501

Laboratory: Leading Testing Laboratories

NVLAP CODE: 200960-0

No.1805, DongLiu road, BinJiang District, Hangzhou, China

Tel: +86-571-56680806

www.ledtestlab.com

Report No.: HZ15070017c

The laboratory that conducted the testing detailed in this report has been accredited for SSL by NVLAP.

Reviewed by:

April Zou

Engineer: April Zou
Jul. 13, 2015

Approved by:  *Jim Zhang*

Manager: Jim Zhang
Jul. 13, 2015

Note: This report does not imply product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

Test Summary

Sample Tested: **ABBWP55501**

Luminous Efficacy (Lumens /Watt)	Total Luminous Flux (Lumens)	Power (Watts)	Power Factor
100.6	4941.1	49.14	0.9955
CCT (K)	CRI	Stabilization Time (Light & Power)	
4938	76.5	60	

Table 1: Executive Data Summary

Test specifications:

Date of Receipt : Jul. 08, 2015

Date of Test : Jul. 13, 2015

Test item : Total Luminous Flux, Luminous Distribution Intensity, Luminous Efficacy, Correlated Color Temperature, Color Rendering Index, Chromaticity Coordinate, Electrical parameters

Reference Standard : IESNA LM-79-2008 Approved Method for the Electrical and Photometric Measurements of Solid-State Lighting Products

TABLE OF CONTENT

LM-79-08 Test Report.....	1
Test Summary.....	2
Sample Photo.....	4
TEST RESULTS	5
Spectral Power Distribution	6
Zonal Lumen Tabulation	7
Illuminance Plots.....	8
Luminous Intensity Distribution Plots.....	10
Luminous Intensity Data	11
EQUIPMENT LIST	13
TEST METHODS	13
Seasoning of SSL Product.....	13
Goniophotometer Method	13
Photometric and Electrical Measurements	13
Color Characteristics Measurements.....	14
Color Spatial Uniformity	14

Sample Photo



Figure 1- Overview of the sample

Equipment Under Test (EUT)

Name	: 52W WALLPACK
Model	: ABBWP55501
Electrical Ratings	: 100~277VAC, 50/60Hz, 52W
Product Description	: 5000K, Outdoor Wall-Mounted Area Luminaires Manufacturer of light source: Philips Lumileds Model of light source: LUXEON 3030 2D Quantity of light source: 75pcs
Manufacturer	: ABB Lighting (shanghai) Co., Ltd.
Address	: Room 1012, North Minch Fortune 108 Plaza,# 1839 Qixin road, Shanghai

TEST RESULTS

Test ambient temperature was 25.1°C.

Base orientation was Light down. Test was conducted without a dimmer in the circuit.

The stabilization time of the sample was 60 minutes, and the total operating time including stabilization was 85 minutes.

The photometric distance of Goniophotometer is 2.475 m.

Luminous data was taken at 0.5° vertical intervals and 10.0° horizontal intervals.

Parameter	Result		
Test Voltage (V)	120.0	100.0	277.0
Voltage frequency (Hz)	60	60	60
Test Current (A)	0.412	0.498	0.186
Power Factor	0.9955	0.9969	0.9527
Test Power (W)	49.14	49.61	49.05
THD A%	5.97	5.28	15.94
Luminous Efficacy (lm/W)	100.6	99.5	100.7
Total Luminous Flux (lm)	4941.1	4937.8	4939.4
Color Rendering Index (CRI)	76.5		
R9	-13		
Correlated Color Temperature (CCT) (K)	4938		
Chromaticity (Chroma x, Chroma y)	(0.3471, 0.3556)		
Chromaticity (Chroma u, Chroma v)	(0.2112, 0.3246)		
Chromaticity (Chroma u', Chroma v')	(0.2112, 0.4869)		
Duv	0.0012		
Average Beam Angle (°)	89.9		
Center Beam Candle Power (cd)	1228		
Spacing Criteria	0.34 (0°-180°)/ 1.18 (90°-270°)		
Zonal Lumens in the 0°-60°Zone	56.61%		
Zonal Lumens in the 60°-90°Zone	31.93%		
Zonal Lumens in the 90°-120°Zone	10.58%		
Zonal Lumens in the 120°-180°Zone	0.88%		

Special Color Rendering Indices	
R1	74
R2	83
R3	87
R4	74
R5	74
R6	75
R7	84
R8	60
R9	-13
R10	57
R11	69
R12	47
R13	76
R14	93

Table 2: Test data per Goniophotometer Method

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

Spectral Power Distribution

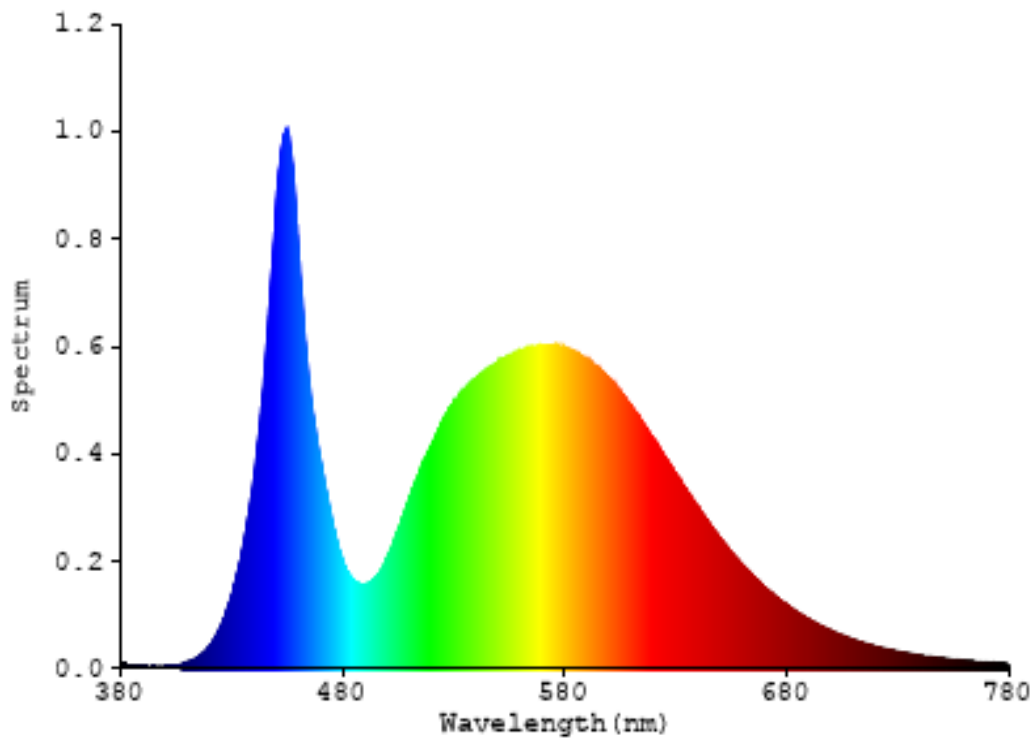


Chart 1: Spectral Power Distribution

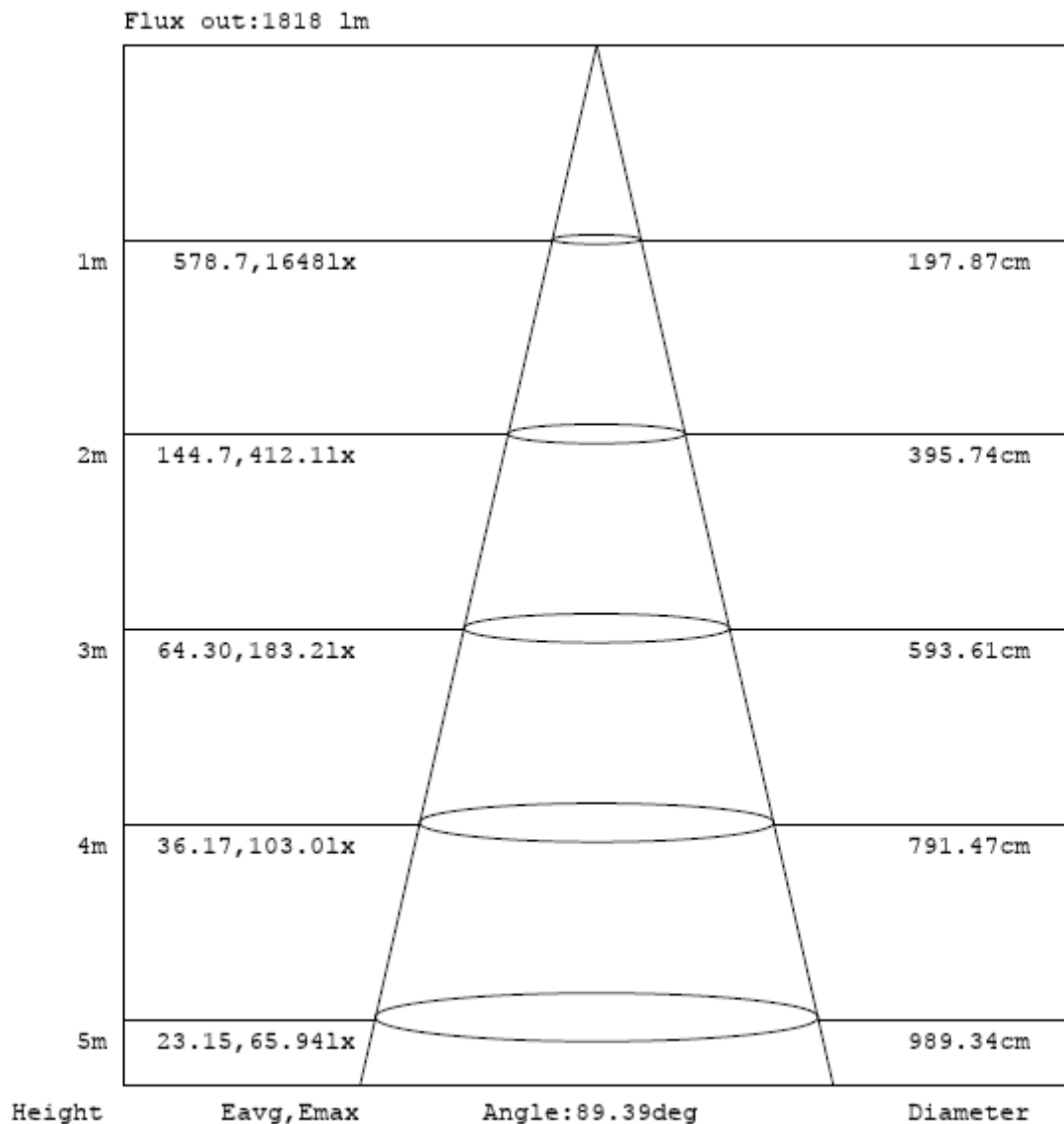
Zonal Lumen Tabulation

$\gamma(^{\circ})$	Lumens	% Total
0- 10	116.742	2.36%
10- 20	318.257	6.44%
20- 30	470.899	9.53%
30- 40	585.251	11.84%
40- 50	651.869	13.19%
50- 60	654.111	13.24%
60- 70	610.484	12.36%
70- 80	544.322	11.02%
80- 90	422.684	8.55%
90-100	293.527	5.94%
100-110	169.572	3.43%
110-120	59.694	1.21%
120-130	20.579	0.42%
130-140	12.228	0.25%
140-150	7.439	0.15%
150-160	2.801	0.06%
160-170	0.568	0.01%
170-180	0.067	0.00%
Total	4941.1	100%

$\gamma(^{\circ})$	Lumens	% Total
0- 60	2797.129	56.61%
60- 90	1577.49	31.93%
0-90	4374.619	88.54%
90- 180	566.475	11.46%
0- 180	4941.1	100%

Table 3: Zonal Lumen Data

Illuminance Plots



Note: The Curves indicate the illuminated area and the average illumination when the luminaire is at different distance.

Chart 2: Beam Angle

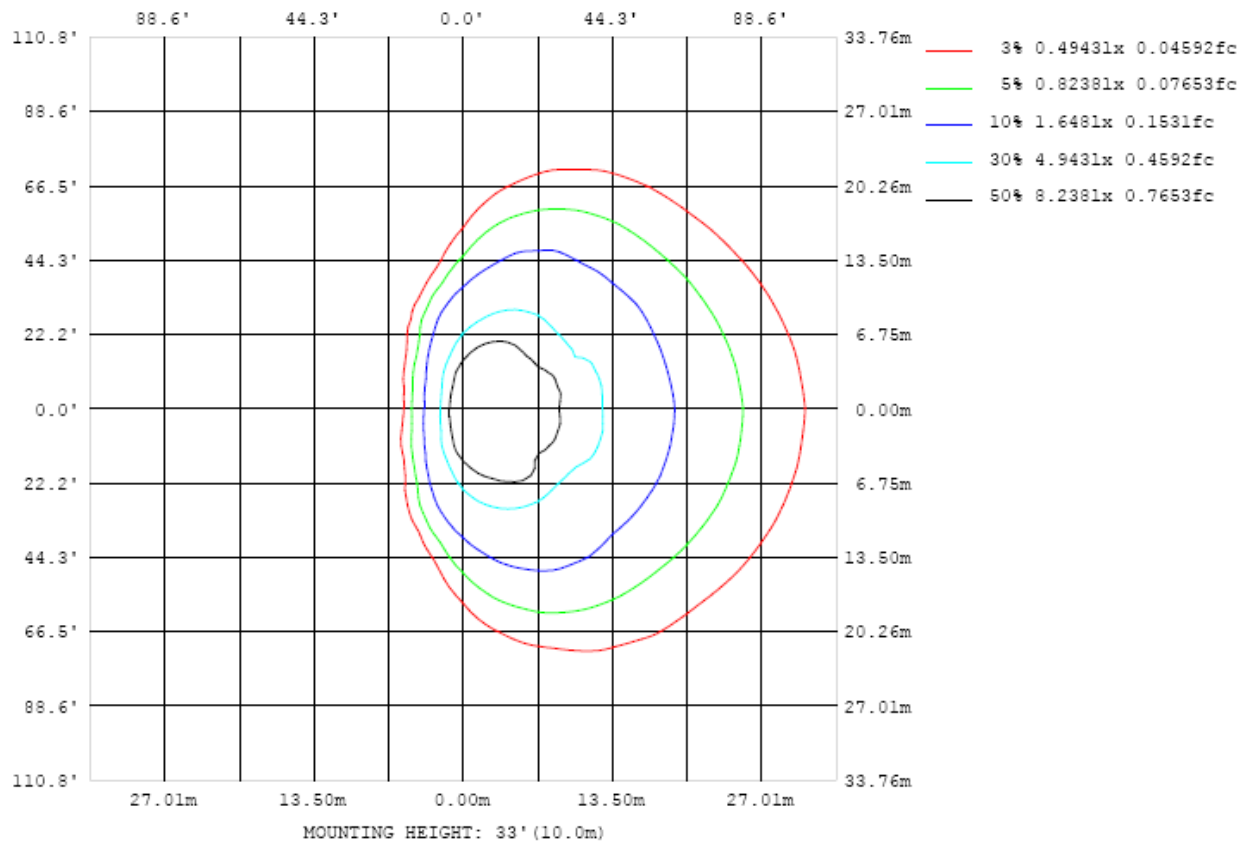


Chart 3: Illuminance Plot (Footcandles)

Luminous Intensity Distribution Plots

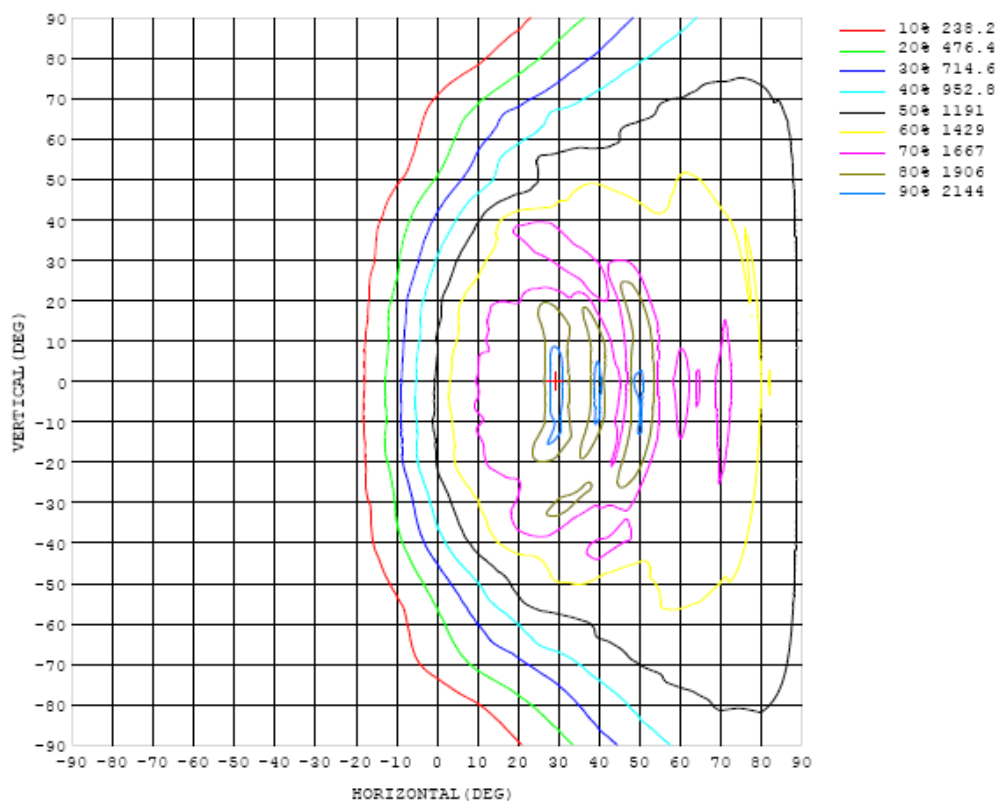


Chart 4: Isocandela Plot

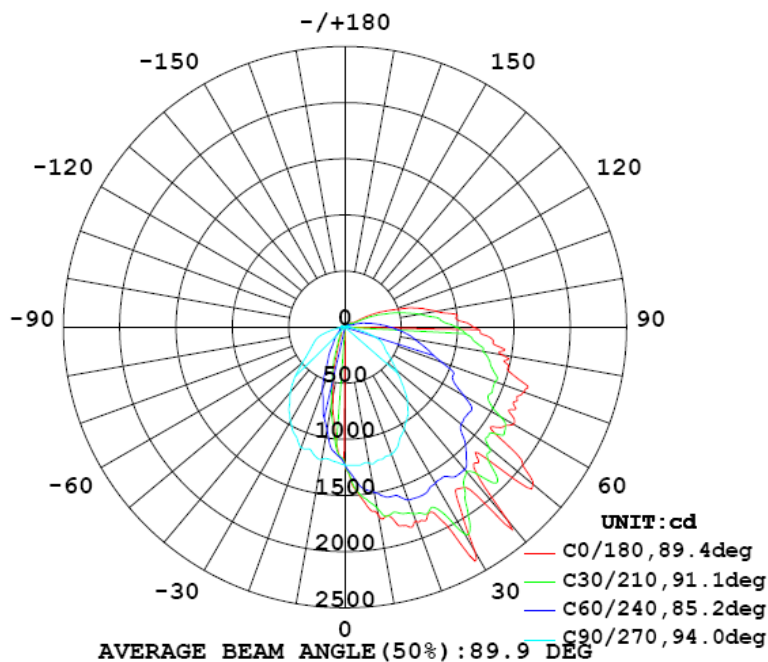


Chart 5: Polar Candela Distribution

Luminous Intensity 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	1228	1228	1228	1228	1228	1228	1228	1228	1228	1228	1228	1228	1228	1228	1228	1228	1228	1228	1228
5	1508	1508	1503	1491	1472	1447	1408	1353	1282	1237	1189	1150	1126	1099	1067	1032	1002	981	971
10	1698	1651	1622	1635	1608	1549	1493	1420	1328	1230	1170	1075	966	875	794	725	671	633	616
15	1829	1758	1777	1704	1668	1666	1563	1475	1354	1221	1072	945	817	654	527	459	415	390	382
20	1839	1779	1854	1767	1771	1690	1637	1542	1386	1204	1039	843	641	487	369	276	218	190	183
25	1815	1781	1797	1787	1770	1735	1648	1526	1328	1131	909	665	448	296	206	156	127	113	111
30	2306	2331	2053	2126	1780	1671	1605	1449	1261	1053	775	508	320	209	143	107	80.3	65.6	60.3
35	1757	1735	1935	1853	1678	1700	1628	1418	1216	968	678	426	231	133	89.0	70.7	58.7	54.3	54.3
40	2248	2171	2093	1682	1842	1885	1653	1389	1152	862	568	329	169	97.9	71.5	61.9	55.7	55.0	56.8
45	1675	1660	1754	1917	1784	1718	1517	1291	1027	720	454	252	137	86.8	65.2	57.8	56.3	57.0	58.5
50	2178	2104	2042	1673	1501	1524	1344	1162	885	592	339	178	103	73.7	56.8	52.6	51.6	51.5	52.0
55	1579	1734	1636	1670	1700	1491	1336	1090	778	500	256	124	71.4	57.7	49.0	44.8	41.8	40.4	40.5
60	1729	1640	1600	1597	1406	1380	1218	933	690	420	209	86.8	53.4	48.5	39.7	33.8	31.0	30.1	30.5
65	1659	1632	1555	1414	1313	1202	1052	853	594	377	181	73.6	50.0	40.8	30.8	24.2	20.6	19.0	19.0
70	1688	1654	1557	1420	1267	1160	914	679	509	315	147	72.1	52.4	34.1	20.8	13.8	10.1	8.55	8.63
75	1499	1513	1461	1340	1211	1003	754	557	381	200	94.7	71.3	49.4	25.6	10.9	3.37	0.78	0.66	1.25
80	1411	1395	1351	1245	1101	869	631	427	233	92.8	53.6	56.9	38.8	17.1	5.81	2.04	1.06	0.99	1.36
85	1318	1308	1235	1133	963	763	524	305	140	39.3	31.6	40.1	28.1	13.1	4.25	1.94	1.38	1.35	1.57
90	1140	1142	1096	992	838	618	402	222	87.2	24.6	24.2	30.9	22.1	8.84	3.29	1.99	1.58	1.56	1.65
95	986	983	939	845	670	480	302	155	64.5	27.8	26.1	20.3	8.39	5.13	1.95	0.88	1.58	1.57	1.58
100	822	820	776	672	523	351	208	111	44.5	29.6	18.5	9.89	15.3	5.95	1.97	1.52	1.47	1.41	1.46
105	659	650	600	502	368	239	135	62.7	51.0	17.4	11.5	18.7	10.6	5.03	2.12	1.32	1.29	1.24	1.26
110	458	451	407	331	233	98.3	60.6	34.0	32.3	36.2	23.5	14.4	7.77	3.73	1.66	1.09	1.13	1.12	1.10
115	287	274	218	118	51.9	43.7	45.6	56.6	47.9	31.2	17.7	9.84	5.54	2.85	1.20	0.85	1.03	1.03	1.03
120	63.4	58.9	49.3	43.7	48.5	36.0	39.7	44.8	35.9	22.8	12.1	6.70	3.99	2.13	1.11	0.81	0.88	0.90	0.88
125	69.8	75.3	74.3	58.7	42.1	39.0	42.8	36.7	27.4	17.1	8.85	4.81	2.82	1.87	1.05	0.94	0.99	1.00	0.97
130	47.5	44.7	39.0	34.3	36.8	38.8	35.1	28.5	21.3	12.9	6.68	1.17	1.45	0.94	0.90	0.88	0.95	0.97	0.97
135	32.7	33.9	36.4	39.5	39.5	34.6	28.2	21.9	15.5	8.55	3.36	1.36	1.04	1.14	0.98	0.93	0.93	0.95	0.94
140	46.2	46.1	44.3	40.1	34.4	27.9	21.5	15.8	10.4	4.88	1.67	1.10	0.96	0.89	0.83	0.90	0.92	0.92	0.95
145	40.3	39.0	36.2	32.0	27.0	21.2	14.9	9.42	4.38	1.20	1.07	0.90	0.77	0.75	0.82	0.86	0.85	0.91	0.95
150	31.6	30.6	28.3	25.0	20.3	14.8	8.81	3.59	0.91	1.06	0.99	0.76	0.81	0.80	1.06	0.87	0.84	0.87	0.88
155	22.7	22.1	20.4	17.7	13.9	8.81	3.77	0.62	0.52	0.60	0.71	0.75	0.79	0.87	0.81	0.84	0.90	0.89	0.85
160	14.1	13.8	12.6	10.6	7.78	4.56	2.11	0.84	0.66	0.70	0.74	0.77	0.80	0.82	0.85	0.89	0.89	0.90	0.88
165	6.59	6.22	5.28	3.85	2.11	0.66	0.60	0.66	0.70	0.74	0.77	0.80	0.84	0.88	0.92	0.91	0.94	0.97	0.80
170	0.59	0.59	0.59	0.61	0.62	0.65	0.67	0.70	0.73	0.76	0.79	0.82	0.85	0.85	0.84	0.82	0.81	0.78	0.72
175	0.63	0.64	0.65	0.66	0.67	0.69	0.70	0.71	0.73	0.75	0.76	0.79	0.80	0.80	0.79	0.77	0.75	0.72	0.71
180	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68

Table 4: Luminous Intensity Data

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	1228	1228	1228	1228	1228	1228	1228	1228	1228	1228	1228	1228	1228	1228	1228	1228	1228		
5	977	995	1023	1059	1094	1115	1130	1155	1198	1245	1307	1379	1415	1436	1457	1478	1496		
10	625	656	705	772	842	927	1031	1136	1195	1274	1361	1460	1530	1570	1606	1640	1656		
15	384	404	442	499	601	758	910	1020	1146	1302	1424	1522	1605	1660	1667	1740	1752		
20	185	206	255	339	444	591	761	963	1141	1294	1490	1586	1672	1720	1756	1812	1765		
25	111	122	147	192	266	395	600	840	1056	1244	1427	1595	1669	1739	1729	1743	1765		
30	62.8	74.2	96.1	126	184	289	454	693	974	1203	1383	1545	1611	1696	1977	1956	2348		
35	53.5	56.7	66.8	80.8	116	193	363	593	866	1130	1355	1521	1584	1623	1829	1914	1699		
40	54.8	54.5	59.3	69.0	92.7	150	283	493	755	1031	1326	1640	1701	1645	1608	2065	2069		
45	56.9	56.0	57.9	65.4	82.5	117	204	377	631	923	1205	1527	1808	1796	1869	1645	1611		
50	51.6	51.9	53.3	57.1	69.7	87.4	136	265	493	783	1036	1238	1472	1469	1593	1982	2013		
55	41.0	43.1	45.9	48.8	56.2	61.6	91.7	194	399	686	1007	1172	1377	1619	1523	1638	1720		
60	30.0	30.8	33.8	39.4	47.1	51.0	74.2	158	340	616	894	1180	1269	1431	1602	1517	1592		
65	18.8	20.2	23.4	29.2	39.4	49.7	69.8	141	297	547	799	996	1163	1268	1348	1497	1587		
70	8.26	9.47	12.6	19.3	32.9	53.0	71.7	120	247	439	646	939	1091	1206	1345	1499	1613		
75	0.76	0.86	2.20	8.83	24.2	50.5	72.2	90.1	156	319	513	728	965	1128	1259	1393	1471		
80	1.05	1.10	1.71	4.81	15.8	38.7	60.9	67.1	77.2	201	384	586	819	1038	1178	1307	1374		
85	1.40	1.40	1.68	3.44	11.6	26.7	43.2	48.0	38.6	122	282	476	681	879	1058	1171	1272		
90	1.58	1.57	1.99	2.71	7.43	20.0	31.3	34.0	24.8	73.8	192	343	556	746	907	1023	1105		
95	1.53	1.55	1.25	1.44	2.47	6.99	19.0	28.0	27.2	55.6	126	251	417	591	763	880	953		
100	1.41	1.43	1.58	2.26	3.15	7.34	3.37	18.0	26.9	41.7	92.8	171	296	454	607	716	792		
105	1.23	1.26	1.32	1.77	2.80	5.71	13.2	12.6	11.8	45.1	57.2	118	203	321	450	559	630		
110	1.11	1.11	1.08	1.37	2.19	4.51	10.3	20.8	38.2	39.3	23.6	56.8	99.7	208	301	380	435		
115	0.99	0.99	0.88	0.93	1.64	3.36	7.53	15.6	31.8	46.4	51.3	46.6	41.7	58.5	118	213	268		
120	0.90	0.89	0.82	0.87	1.39	2.51	5.35	11.0	23.0	35.6	41.6	34.0	34.0	44.7	44.0	50.5	60.2		
125	0.97	0.95	0.87	0.85	0.95	1.97	3.97	7.94	16.4	26.8	36.0	39.4	33.2	38.2	56.9	73.3	74.4		
130	0.93	0.90	0.86	0.91	1.10	1.42	1.51	5.80	11.4	18.7	26.4	33.6	37.6	35.1	33.4	39.0	44.9		
135	0.92	0.89	0.92	0.89	1.01	1.48	2.31	4.15	7.38	12.7	18.8	25.2	32.4	37.0	36.7	34.5	32.9		
140	0.95	0.96	0.96	0.95	0.89	1.09	1.66	2.71	5.09	8.16	12.5	18.1	25.4	32.8	39.4	43.9	45.8		
145	0.93	0.94	0.97	0.98	0.93	0.86	1.05	1.09	1.98	3.74	6.91	11.8	19.0	25.9	31.9	36.2	39.1		
150	0.84	0.91	0.97	0.97	0.91	0.78	0.77	0.78	0.68	0.34	1.89	5.88	12.7	19.5	25.1	28.6	30.8		
155	0.83	0.90	0.97	0.92	0.81	0.77	0.76	0.74	0.68	0.48	0.68	2.81	7.29	12.6	17.1	20.2	22.0		
160	0.86	0.94	0.90	0.79	0.77	0.76	0.74	0.73	0.70	0.68	0.71	1.69	3.81	6.78	9.63	12.0	13.5		
165	0.88	0.83	0.78	0.78	0.77	0.75	0.73	0.71	0.69	0.67	0.64	0.59	0.52	1.36	3.16	4.77	5.95		
170	0.73	0.73	0.72	0.73	0.73	0.73	0.72	0.70	0.67	0.66	0.64	0.62	0.60	0.59	0.59	0.58	0.58		
175	0.70	0.70	0.70	0.71	0.71	0.71	0.71	0.69	0.67	0.66	0.65	0.65	0.64	0.64	0.63	0.63	0.63		
180	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68		

Table 5: Luminous Intensity Data

EQUIPMENT LIST

Test Equipment	Model	Equipment No.	Calibration Date	Calibration Due date
Goniophotometer system	GO-R5000	HZTE011-01	Sep. 18, 2014	Sep. 17, 2015
Digital Power Meter	PF2010A	HZTE028-01	Sep. 18, 2014	Sep. 17, 2015
AC Power Supply	PCR 500L	HZTE001-08	Sep. 18, 2014	Sep. 17, 2015
DC Power Supply	WY12010	HZTE004-03	Sep. 18, 2014	Sep. 17, 2015
Temperature Meter	TES1310	HZTE017-01	Sep. 18, 2014	Sep. 17, 2015
Standard Source	D908	HZTE012-01	Sep. 18, 2014	Sep. 17, 2015
Standard source	SCL-1400	HZTE012-02	Sep. 18, 2014	Sep. 17, 2015

Table 6: Test Equipment List

TEST METHODS

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.

Goniophotometer Method

Photometric and Electrical Measurements

An EVERFINE Type C Model GO-R5000 Goniophotometer was used to measure the intensity at each angle of distribution for each sample. The photometric distance is 2.475m for near-field measurement or 30m for far-field measurement. Bandwidth of spectroradiometer is 380nm-780nm.

Ambient temperature was measured at the same height of the sample mounted on the Goniophotometer equipment. Each SSL unit was operated on the client provided driver at the rated input voltage in its designated orientation.

The stabilization time typically ranges from 30 min (small integrated LED lamps) to 2 or more hours for large SSL luminaires). 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 min, taken 15 minutes apart, is less than 0.5 %.

Electrical measurements including voltage, current, and power were measured using the Everfine Digital Power Meter.

Some graphics were created with Photometric Plus software.

The standard reference of the Goniophotometer system is halogen incandescent lamp, the intensity distribution type is omni-directional, and is traceable to the National Institute of Metrology P.R. China.

The uncertainty of goniophotometer system reported in this document is expended uncertainty is 1.94% with a coverage factor k=2.

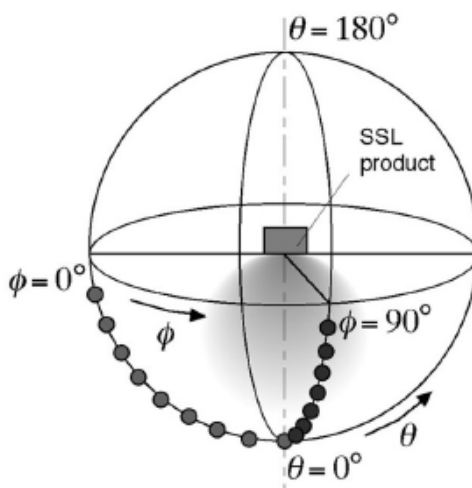
Color Characteristics Measurements

The color characteristics of SSL products include chromaticity coordinates, correlated color temperature, and color rendering index. These characteristics of SSL products may be spatially non-uniform, and thus, in order that they can be specified accurately, the color quantities shall be measured as values that are spatially average, weighted to intensity, over the angular range where light is intentionally emitted from the SSL product. The color characteristics measurements are using gonio-spectroradiometer.

Color Spatial Uniformity

The characteristics of SSL products may be spatially non-uniform, the chromaticity coordinate shall be measured at two vertical planes ($C=0^\circ/180^\circ$ and $C=90^\circ/270^\circ$) and at 10° or less intervals for vertical angle until the light output dropped to below 10% of the peak intensity. The averaged weighted chromaticity coordinate was calculated from these points. The data was then analyzed to check for delta color differences of the u' , v' chromaticity coordinates. The spatial non-uniformity of chromaticity, $\Delta u'v'$, is determined as the maximum deviation (distance on the CIE (u' , v') diagram) among all measured points from the spatially averaged chromaticity coordinate.

The geometry for the chromaticity measurement using gonio-spectroradiometer is shown as following.



*** End of Report ***

This report is considered invalidated without the Special Seal for Inspection of the LTL. This report shall not be altered, increased or deleted. The results shown in this test report refer only to the sample(s) tested. Without written approval of LTL, this test report shall not be copied except in full and published as advertisement.