



## LM-79-08 Test Report

for

**ABBlighting, Inc.**

3 Adams St Belvidere, NJ 07823.

**55W DS WALLPACK**

**Model: ABWP60LED50DS**

**Laboratory: Leading Testing Laboratories**

**NVLAP CODE: 200960-0**

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Report No.: HZ15050028c/R1

This report is replaced the old report No. HZ15050028c dated Jun. 02, 2015

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

Reviewed by:

Engineer: April Zou  
Oct. 21, 2015

Approved by:

Manager: Jim Zhang  
Oct. 21, 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: **ABWP60LED50DS**

Luminous Efficacy (Lumens /Watt)	Total Luminous Flux (Lumens)	Power (Watts)	Power Factor
113.9	5638.2	49.49	0.9955
CCT (K)	CRI	Stabilization Time (Light & Power)	
5003	76.1	60	

Table 1: Executive Data Summary

### Test specifications:

**Date of Receipt** : May 25, 2015

**Date of Test** : May 28, 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

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## Photo



Figure 1- Overview of the sample

### Equipment Under Test (EUT)

<b>Name</b>	: 55W DS WALLPACK
<b>Model</b>	: ABWP60LED50DS
<b>Electrical Ratings</b>	: 100~277VAC, 50/60Hz, 55W
<b>Product Description</b>	: 5000K, Outdoor Wall-Mounted Area Luminaires Manufacturer of light source: Philips Lumileds Model of light source: LUXEON 3030 2D Quantity of light source: 75pcs
<b>Manufacturer</b>	: ABB Lighting (shanghai) Co., Ltd.
<b>Address</b>	: Room 1012, North Minch Fortune 108 Plaza,# 1839 Qixin road, Shanghai

## TEST RESULTS

Test ambient temperature was 24.6°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			Special Color Rendering Indices	
Test Voltage (V)	120.0	100.0	277.0	R1	74
Voltage frequency (Hz)	60	60	60	R2	83
Test Current (A)	0.414	0.501	0.187	R3	87
Power Factor	0.9955	0.9968	0.9548	R4	74
Test Power (W)	49.49	49.95	49.39	R5	74
THD A%	6.12	5.27	16.12	R6	74
Luminous Efficacy (lm/W)	113.9	112.9	114.1	R7	84
Total Luminous Flux (lm)	5638.2	5637.0	5636.6	R8	60
Color Rendering Index (CRI)	76.1			R9	-16
R9	-16			R10	56
Correlated Color Temperature (CCT) (K)	5003			R11	69
Chromaticity (Chroma x, Chroma y)	(0.3455, 0.3574)			R12	46
Chromaticity (Chroma u, Chroma v)	(0.2095, 0.3250)			R13	76
Chromaticity (Chroma u', Chroma v')	(0.2095, 0.4875)			R14	92
Duv	0.0027				
Average Beam Angle (°)	112.1				
Center Beam Candle Power (cd)	2008				
Spacing Criteria	1.31 (0°-180°)/ 1.32 (90°-270°)				
Zonal Lumens in the 0°-60°Zone	83.16%				
Zonal Lumens in the 60°-90°Zone	16.77%				
Zonal Lumens in the 90°-120°Zone	0.02%				
Zonal Lumens in the 120°-180°Zone	0.05%				

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

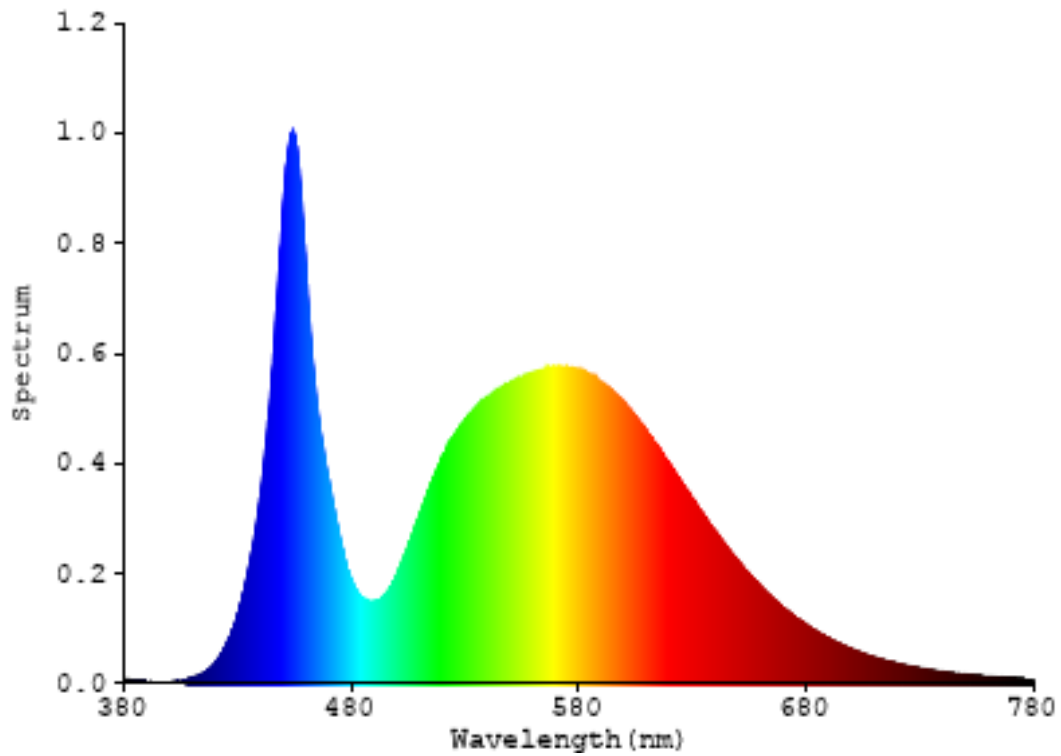


Chart 1: Spectral Power Distribution

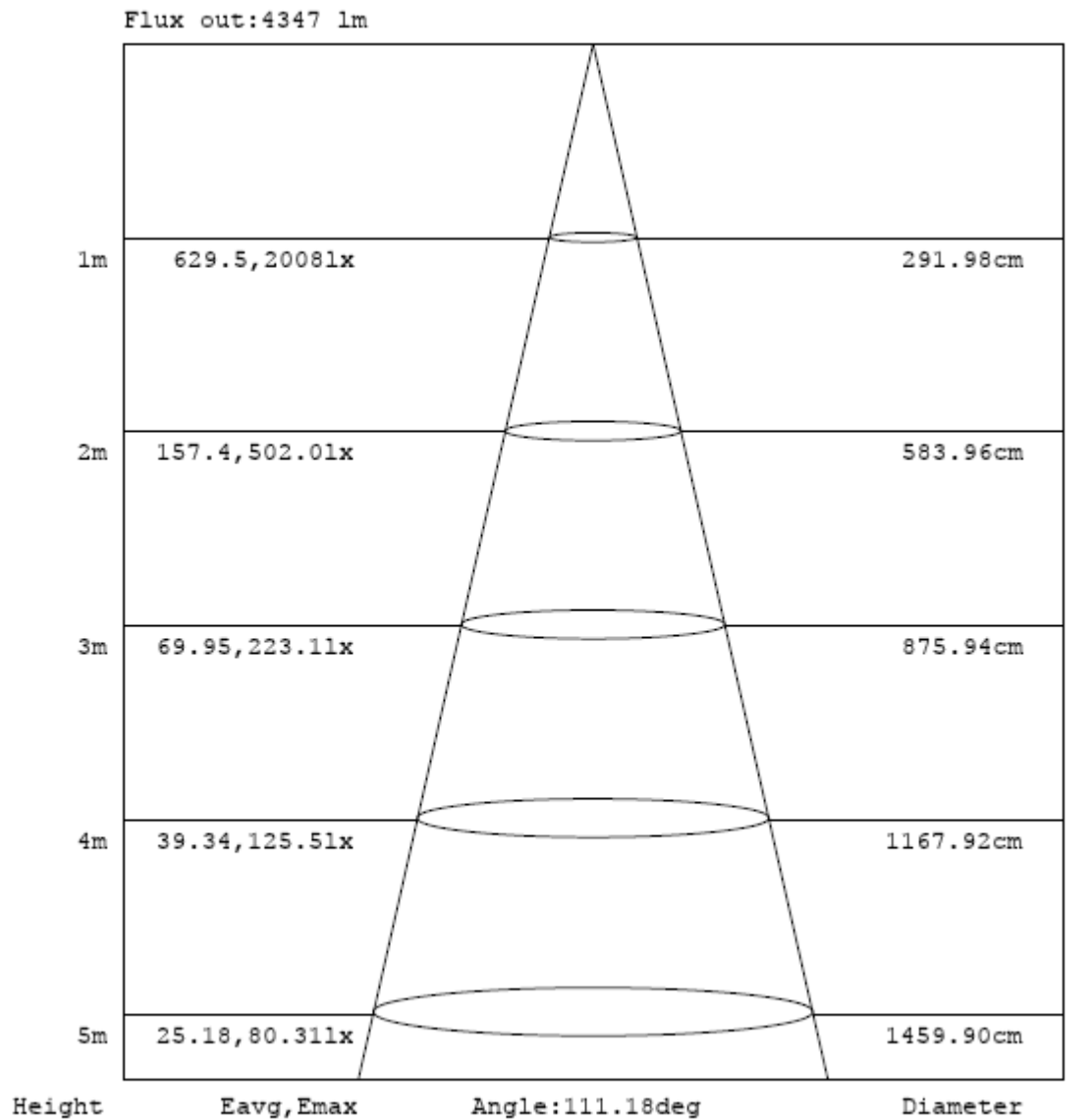
## Zonal Lumen Tabulation

$\gamma(^{\circ})$	Lumens	% Total
0- 10	190.417	3.38%
10- 20	552.02	9.79%
20- 30	853.408	15.14%
30- 40	1054.519	18.70%
40- 50	1101.597	19.54%
50- 60	937.044	16.62%
60- 70	617.425	10.95%
70- 80	281.015	4.98%
80- 90	46.641	0.83%
90-100	0.444	0.01%
100-110	0.504	0.01%
110-120	0.529	0.01%
120-130	0.544	0.01%
130-140	0.593	0.01%
140-150	0.586	0.01%
150-160	0.492	0.01%
160-170	0.328	0.01%
170-180	0.12	0.00%
Total	5638.2	100%

$\gamma(^{\circ})$	Lumens	% Total
0- 60	4689.005	83.16%
60- 90	945.081	16.77%
0-90	5634.086	99.93%
90- 180	4.14	0.07%
0- 180	5638.2	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



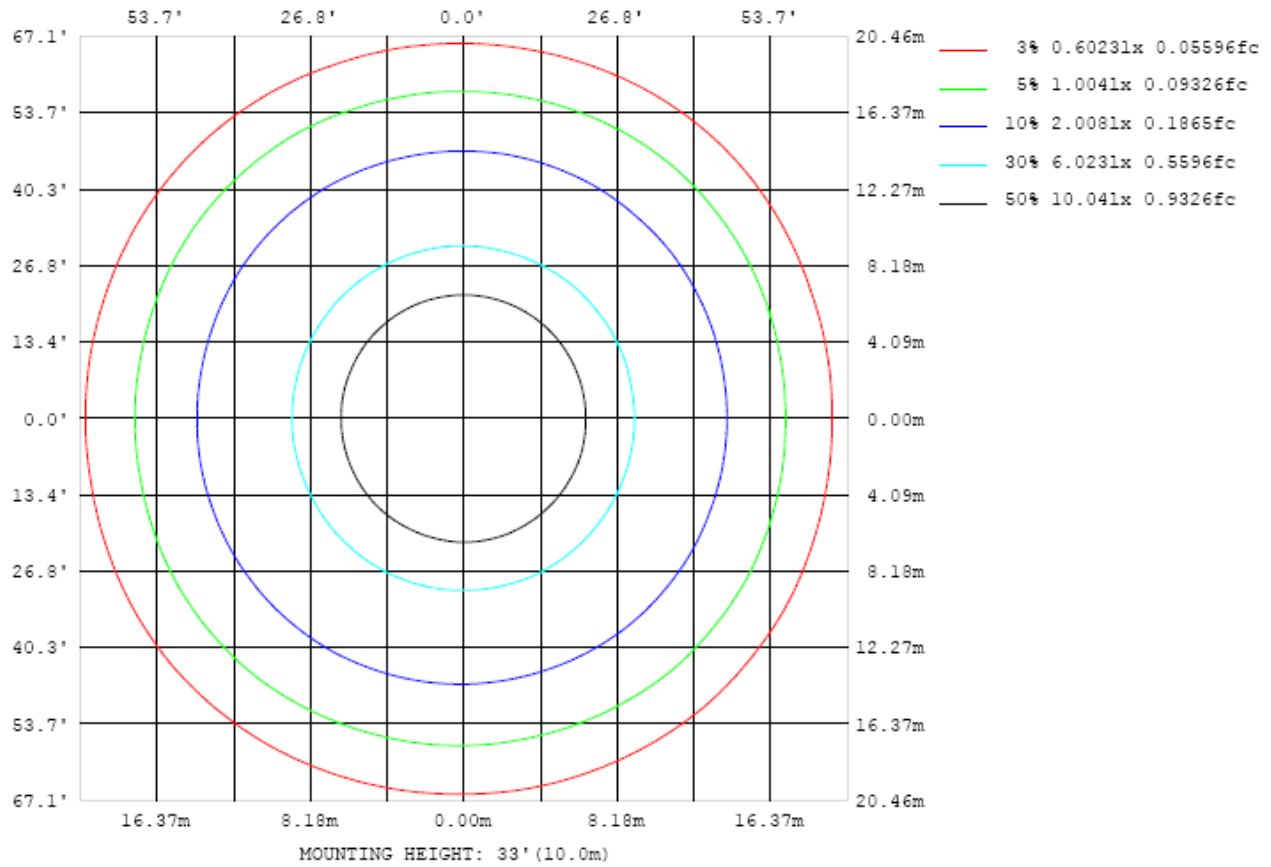


Chart 3: Illuminance Plot (Footcandles)

## Luminous Intensity Distribution Plots

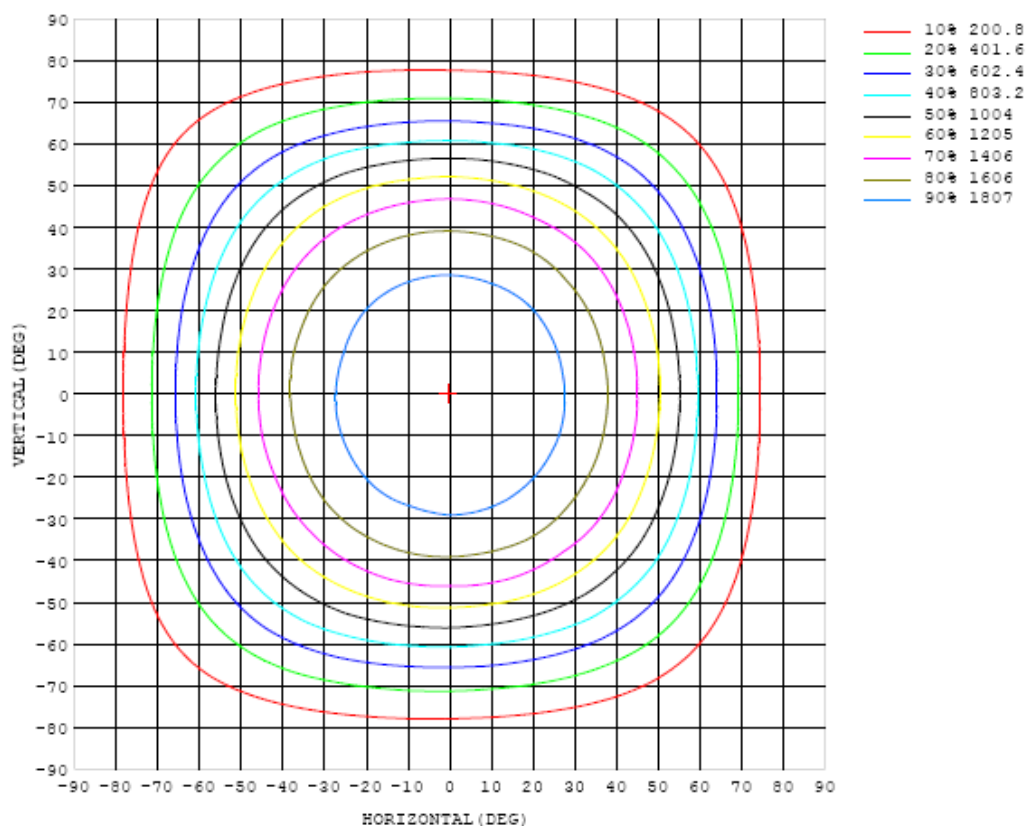


Chart 4: Isocandela Plot

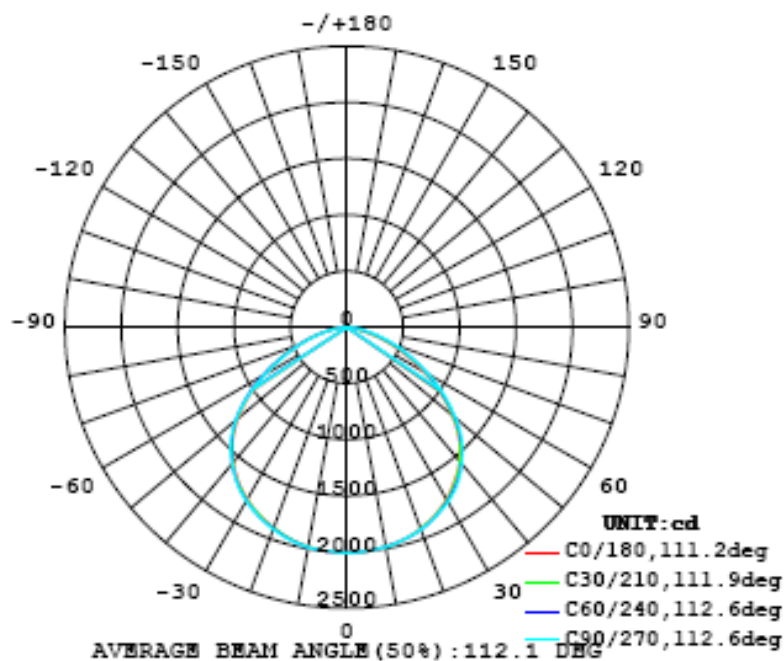


Chart 5: Polar Candela Distribution

## 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	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008
5	2000	2000	2000	2000	2001	2001	2001	2000	2001	2001	2001	2002	2002	2002	2003	2000	2000	2001	2001
10	1980	1980	1980	1981	1982	1981	1981	1981	1982	1983	1985	1984	1985	1986	1986	1985	1986	1985	1983
15	1951	1953	1953	1955	1959	1958	1956	1955	1955	1954	1954	1957	1957	1955	1954	1954	1953	1951	1949
20	1907	1907	1907	1909	1915	1919	1916	1914	1915	1916	1916	1916	1913	1911	1910	1908	1906	1901	1901
25	1846	1845	1845	1849	1854	1857	1859	1859	1860	1859	1856	1856	1857	1852	1848	1846	1845	1844	1840
30	1767	1769	1772	1773	1775	1778	1785	1790	1794	1796	1789	1783	1784	1786	1781	1774	1771	1770	1767
35	1665	1668	1676	1675	1680	1687	1695	1701	1707	1708	1703	1697	1694	1693	1692	1685	1679	1679	1678
40	1554	1554	1554	1559	1564	1575	1583	1581	1579	1584	1588	1586	1583	1582	1575	1567	1562	1564	1565
45	1405	1405	1407	1417	1422	1421	1434	1447	1448	1444	1450	1451	1443	1434	1428	1426	1424	1434	1433
50	1221	1213	1216	1230	1234	1241	1251	1257	1256	1259	1268	1270	1265	1261	1259	1254	1251	1255	1259
55	1008	1009	1010	1020	1025	1034	1037	1039	1044	1054	1059	1064	1072	1070	1068	1063	1057	1055	1052
60	775	784	795	810	815	828	825	826	829	837	844	850	861	871	866	863	850	840	841
65	564	568	579	596	607	617	620	623	628	628	635	645	656	662	664	656	643	635	634
70	372	375	383	398	411	421	431	437	440	448	451	455	461	468	465	461	454	453	452
75	173	181	201	224	242	255	265	274	281	285	290	293	294	295	293	292	292	290	291
80	42.2	45.2	50.0	63.2	80.2	114	131	139	145	149	153	154	155	155	155	157	157	157	160
85	0.29	0.29	0.33	0.65	1.80	5.21	15.4	32.1	39.0	42.5	46.7	49.7	52.4	54.3	55.8	57.0	57.9	58.1	58.9
90	0.20	0.19	0.20	0.20	0.21	0.21	0.21	0.22	0.22	0.22	0.42	0.24	1.96	2.34	2.48	3.72	3.68	2.52	0.97
95	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.21	0.21	0.21	0.49
100	0.24	0.24	0.23	0.23	0.24	0.24	0.24	0.24	0.24	0.25	0.24	0.24	0.24	0.24	0.25	0.24	0.23	0.23	0.59
105	0.29	0.29	0.28	0.27	0.27	0.28	0.28	0.29	0.29	0.30	0.29	0.30	0.30	0.29	0.29	0.28	0.27	0.27	0.69
110	0.36	0.36	0.35	0.34	0.34	0.34	0.35	0.35	0.34	0.36	0.35	0.35	0.35	0.34	0.33	0.33	0.32	0.32	0.72
115	0.45	0.44	0.43	0.42	0.41	0.42	0.42	0.43	0.41	0.42	0.43	0.42	0.41	0.41	0.40	0.40	0.39	0.39	0.70
120	0.55	0.54	0.52	0.51	0.50	0.52	0.52	0.50	0.50	0.51	0.51	0.51	0.49	0.49	0.49	0.50	0.49	0.49	0.67
125	0.64	0.63	0.62	0.60	0.59	0.63	0.62	0.59	0.59	0.59	0.60	0.59	0.58	0.57	0.58	0.60	0.59	0.59	0.66
130	0.74	0.74	0.72	0.70	0.68	0.70	0.72	0.70	0.69	0.70	0.70	0.69	0.68	0.67	0.67	0.70	0.69	0.69	0.69
135	0.81	0.81	0.81	0.78	0.76	0.78	0.79	0.78	0.76	0.79	0.79	0.77	0.76	0.75	0.75	0.78	0.77	0.77	0.76
140	0.90	0.89	0.88	0.86	0.84	0.86	0.83	0.82	0.82	0.84	0.83	0.82	0.81	0.82	0.82	0.83	0.83	0.84	0.84
145	0.98	0.98	0.98	0.94	0.91	0.90	0.90	0.89	0.90	0.90	0.89	0.89	0.89	0.89	0.89	0.90	0.90	0.90	0.94
150	1.06	1.06	1.05	1.03	0.96	0.94	0.94	0.94	0.96	0.97	0.96	0.95	0.95	0.96	0.96	0.97	0.99	0.99	1.04
155	1.11	1.11	1.09	1.07	0.98	0.95	0.95	0.96	0.98	0.99	0.99	0.99	1.01	1.04	1.06	1.06	1.05	1.06	1.11
160	1.14	1.14	1.13	1.10	1.03	0.97	0.96	0.99	0.96	1.00	1.02	1.03	1.06	1.10	1.13	1.12	1.10	1.11	1.17
165	1.21	1.21	1.20	1.17	1.09	1.05	1.06	1.05	1.03	1.06	1.08	1.10	1.13	1.15	1.15	1.14	1.14	1.15	1.22
170	1.27	1.24	1.23	1.19	1.10	1.08	1.12	1.12	1.07	1.10	1.15	1.18	1.19	1.20	1.20	1.20	1.20	1.20	1.24
175	1.36	1.35	1.30	1.25	1.25	1.23	1.21	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.21	1.21	1.20	1.21	1.28
180	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35

Table 4: Luminous Intensity Data

Table--2

UNIT: cd

C (DEG) y (DEG)	190	200	210	220	230	240	250	260	270	280	290	300	310	320	330	340	350		
0	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008		
5	2000	1999	1999	2000	2000	2000	2001	1999	1997	1998	1999	2000	2000	2000	2000	2000	2001		
10	1982	1982	1983	1985	1986	1987	1988	1989	1988	1987	1987	1986	1985	1983	1982	1982	1980		
15	1948	1948	1947	1950	1952	1955	1958	1958	1958	1957	1958	1955	1953	1954	1953	1952	1952		
20	1899	1899	1900	1905	1905	1907	1911	1912	1913	1915	1913	1911	1909	1907	1908	1907	1908		
25	1836	1835	1841	1849	1853	1853	1852	1854	1854	1852	1851	1853	1850	1845	1845	1846	1845		
30	1767	1766	1773	1779	1779	1782	1785	1786	1785	1783	1779	1778	1779	1777	1769	1764	1763		
35	1683	1683	1687	1691	1691	1696	1699	1697	1697	1696	1693	1689	1681	1677	1675	1668	1665		
40	1569	1568	1572	1578	1579	1582	1583	1586	1583	1578	1577	1577	1571	1561	1563	1556	1550		
45	1434	1435	1440	1446	1450	1450	1454	1456	1458	1450	1444	1434	1432	1426	1418	1411	1406		
50	1264	1268	1275	1279	1285	1288	1289	1287	1287	1282	1275	1261	1257	1246	1238	1227	1224		
55	1051	1058	1071	1080	1083	1087	1079	1072	1071	1069	1062	1058	1044	1042	1029	1019	1009		
60	838	844	855	860	861	860	846	840	835	832	835	838	833	819	808	793	780		
65	636	638	645	647	647	639	629	622	618	613	615	618	615	606	587	573	569		
70	451	451	449	453	450	445	442	435	429	426	421	417	413	403	390	381	376		
75	291	290	287	286	285	283	282	277	271	267	261	254	243	232	218	200	185		
80	160	159	157	155	153	153	151	147	141	137	131	123	107	78.8	62.9	51.2	45.3		
85	59.0	58.4	57.1	55.4	53.6	50.8	47.5	44.1	39.4	38.3	33.8	19.7	5.66	0.42	0.57	0.50	0.47		
90	0.93	1.09	0.96	1.11	1.02	0.98	0.73	0.48	0.46	0.46	0.45	0.45	0.45	0.45	0.44	0.43	0.43		
95	0.49	0.50	0.51	0.52	0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.52	0.52	0.51	0.51		
100	0.60	0.61	0.62	0.62	0.62	0.62	0.62	0.61	0.62	0.61	0.61	0.61	0.61	0.61	0.61	0.60	0.59		
105	0.69	0.69	0.69	0.70	0.71	0.71	0.71	0.70	0.70	0.69	0.68	0.67	0.66	0.65	0.63	0.62	0.62		
110	0.73	0.73	0.73	0.73	0.73	0.73	0.72	0.71	0.70	0.68	0.67	0.65	0.64	0.62	0.61	0.60	0.61		
115	0.70	0.70	0.69	0.69	0.69	0.69	0.68	0.67	0.66	0.64	0.63	0.61	0.59	0.58	0.58	0.58	0.60		
120	0.67	0.66	0.64	0.63	0.63	0.63	0.63	0.61	0.60	0.58	0.58	0.56	0.55	0.55	0.55	0.57	0.59		
125	0.66	0.64	0.62	0.60	0.60	0.60	0.61	0.60	0.60	0.58	0.58	0.56	0.57	0.57	0.60	0.61	0.62		
130	0.68	0.67	0.66	0.64	0.64	0.65	0.65	0.65	0.66	0.64	0.66	0.64	0.64	0.67	0.68	0.70	0.71		
135	0.76	0.76	0.77	0.75	0.75	0.75	0.75	0.77	0.77	0.75	0.73	0.75	0.76	0.77	0.78	0.79	0.80		
140	0.86	0.87	0.88	0.88	0.87	0.86	0.86	0.87	0.86	0.83	0.82	0.84	0.86	0.87	0.87	0.89	0.89		
145	0.96	0.95	0.97	0.97	0.97	0.97	0.96	0.97	0.98	0.92	0.92	0.94	0.96	0.97	0.97	1.00	0.99		
150	1.06	1.05	1.04	1.05	1.05	1.04	1.03	1.04	1.02	1.00	1.02	1.01	1.04	1.07	1.11	1.10	1.09		
155	1.12	1.12	1.13	1.14	1.13	1.10	1.08	1.08	1.08	1.06	1.06	1.06	1.09	1.12	1.18	1.18	1.18		
160	1.18	1.18	1.20	1.21	1.19	1.16	1.13	1.13	1.12	1.08	1.10	1.08	1.11	1.17	1.21	1.22	1.21		
165	1.23	1.22	1.22	1.23	1.24	1.24	1.22	1.18	1.15	1.14	1.16	1.15	1.16	1.18	1.25	1.28	1.27		
170	1.25	1.25	1.26	1.28	1.29	1.30	1.31	1.29	1.25	1.20	1.22	1.27	1.24	1.22	1.31	1.34	1.33		
175	1.32	1.32	1.32	1.33	1.33	1.34	1.34	1.33	1.32	1.30	1.27	1.24	1.23	1.26	1.22	1.31	1.32		
180	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35		

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  $10^\circ$  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 \*\*\*

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