NVLAP LAB CODE 200960-0

LM-79-08 Test Report

for

ABBlighting, Inc.

3 Adams St Belvidere, NJ 07823.

30W WALLPACK

Model: ABBWP30501

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.: HZ15070017a

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

Reviewed by:

Engineer: April Zou

Jul. 13, 2015

Approved by:

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: **ABBWP30501**

Luminous Efficacy (Lumens /Watt)	Total Luminous Flux (Lumens)	Power (Watts)	Power Factor
92.9	2668.7	28.74	0.9771

CCT (K)	CRI	Stabilization Time (Light & Power)
4947	76.0	60

Table 1: Executive Data Summary

Test specifications:

Date of Receipt : Jul. 08, 2015

Date of Test : Jul. 10, 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	: 30W WALLPACK
Model	: ABBWP30501
Electrical Ratings	: 100~277VAC, 50/60Hz, 30W
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: 36 pcs
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℃.

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)	0.245	0.295	0.142
Power Factor	0.9771	0.9866	0.7326
Test Power (W)	28.74	29.13	28.85
THD A%	11.76	10.71	16.89
Luminous Efficacy (lm/W)	92.9	92.0	91.5
Total Luminous Flux (lm)	2668.7	2681.0	2638.4
Color Rendering Index (CRI)	76.0		
R9	-12		
Correlated Color Temperature (CCT) (K)	4947		
Chromaticity (Chroma x, Chroma y)	(0.3468, 0.3541)		
Chromaticity (Chroma u, Chroma v)	(0.2116, 0.3241)		
Chromaticity (Chroma u', Chroma v')	(0.2116, 0.4862)		
Duv	0.0006		
Average Beam Angle (°)	96.7		
Center Beam Candle Power (cd)	564		
Spacing Criteria	0.42 (0°-180°)/ 1.17 (90°-270°)		
Zonal Lumens in the 0°-60°Zone	51.08%		
Zonal Lumens in the 60°-90°Zone	32.09%		
Zonal Lumens in the 90°-120°Zone	14.67%		
Zonal Lumens in the 120°-180°Zone	2.16%		

Special Color Rendering Indices	
R1	74
R2	83
R3	87
R4	73
R5	72
R6	73
R7	85
R8	61
R9	-12
R10	56
R11	67
R12	41
R13	76
R14	92

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

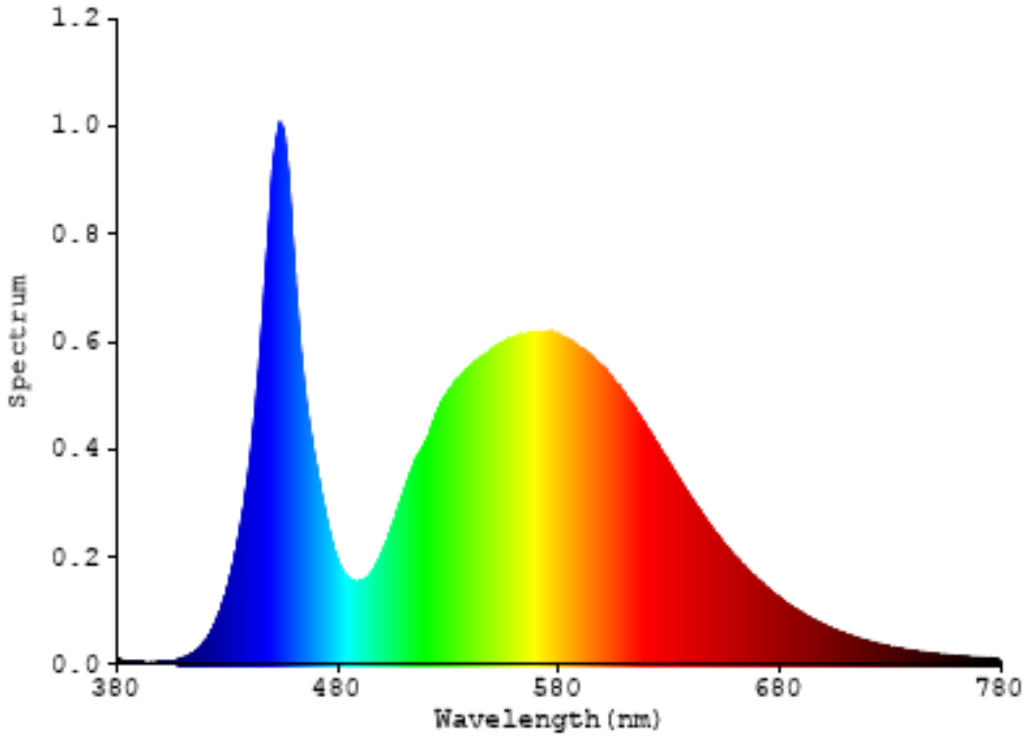


Chart 1: Spectral Power Distribution

Zonal Lumen Tabulation

γ(°)	Lumens	% Total
0- 10	51.834	1.94%
10- 20	151.918	5.69%
20- 30	243.923	9.14%
30- 40	287.018	10.75%
40- 50	305.515	11.45%
50- 60	322.872	12.10%
60- 70	316.282	11.85%
70- 80	288.219	10.80%
80- 90	251.886	9.44%
90-100	189.129	7.09%
100-110	125.69	4.71%
110-120	76.55	2.87%
120-130	28.545	1.07%
130-140	15.739	0.59%
140-150	8.82	0.33%
150-160	3.805	0.14%
160-170	0.927	0.03%
170-180	0.037	0.00%
Total	2668.7	100%

γ(°)	Lumens	% Total
0- 60	1363.08	51.08%
60- 90	856.387	32.09%
0-90	2219.467	83.17%
90- 180	449.242	16.83%
0- 180	2668.7	100%

Table 3: Zonal Lumen Data

Illuminance Plots

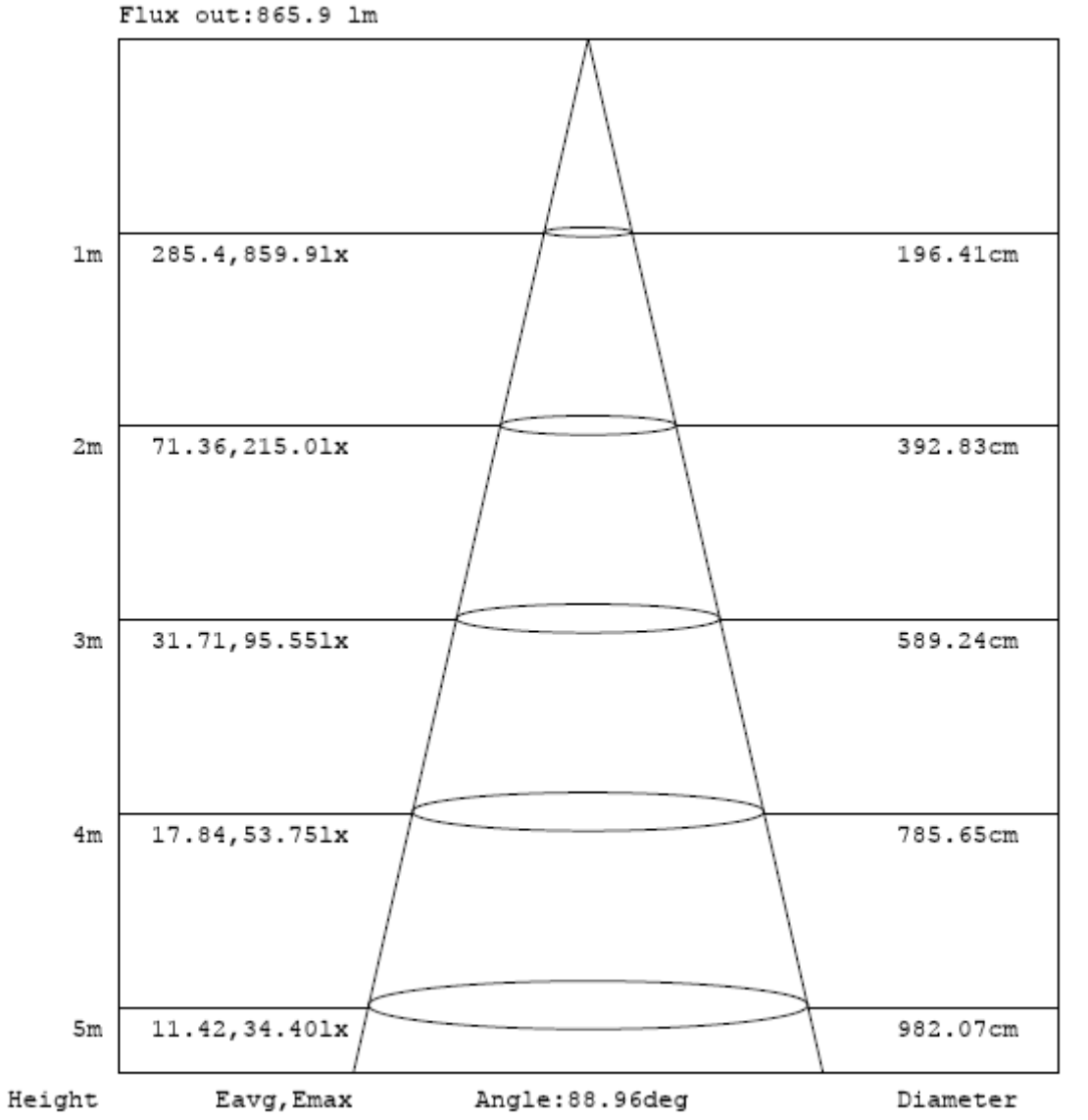


Chart 2: Beam Angle

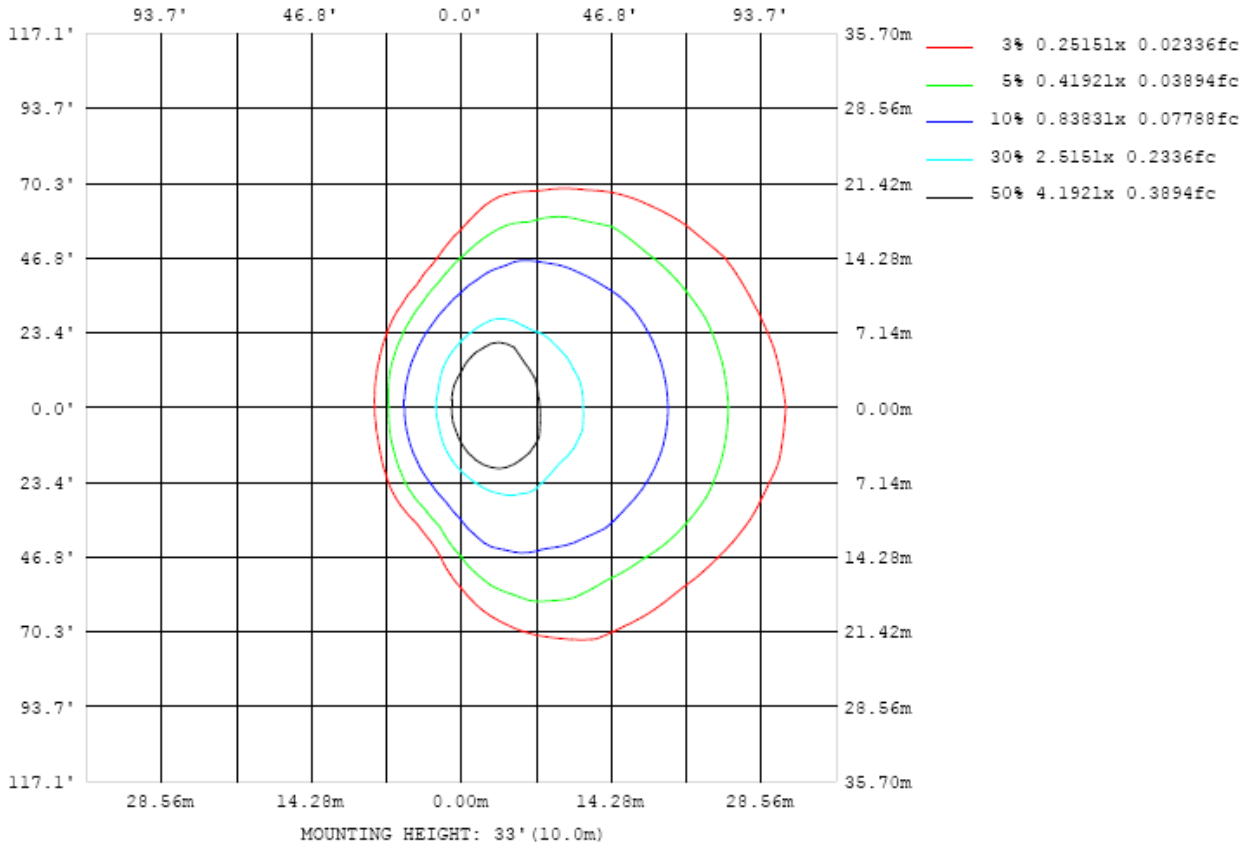


Chart 3: Illuminance Plot (Footcandles)

Luminous Intensity Distribution Plots

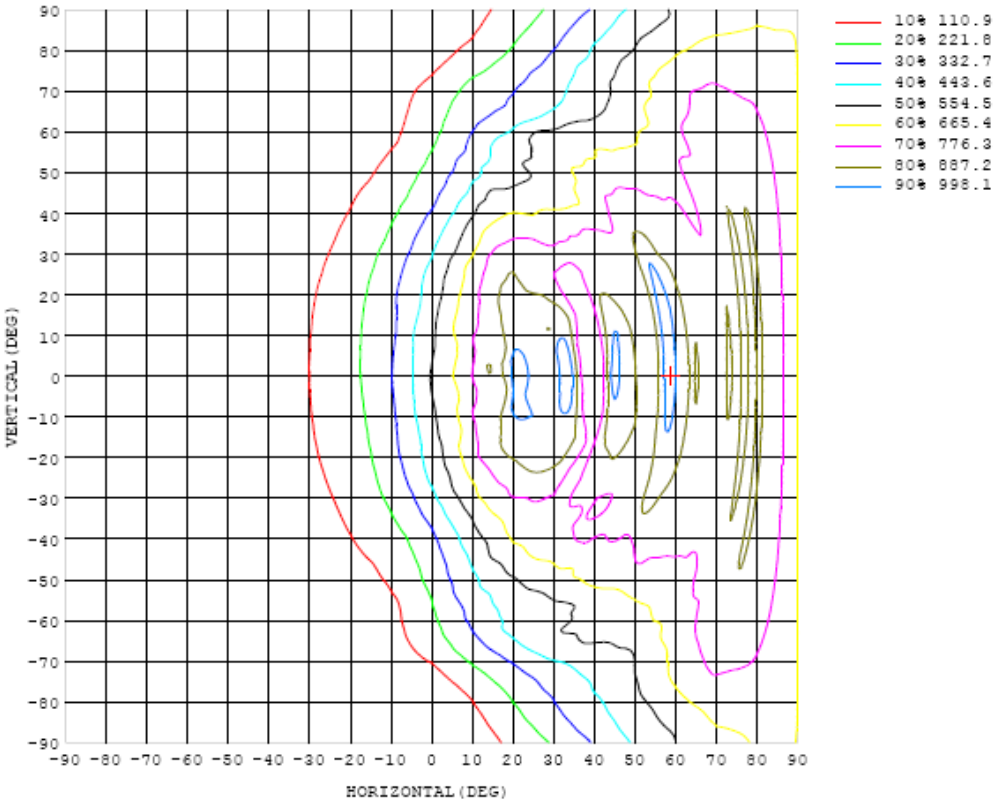


Chart 4: Isocandela Plot

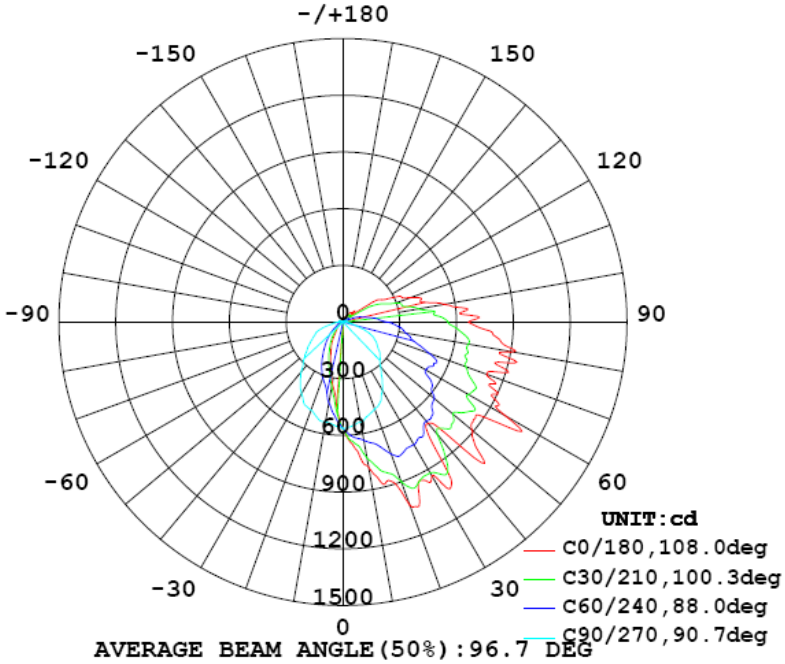


Chart 5: Polar Candela Distribution

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	564	564	564	564	564	564	564	564	564	564	564	564	564	564	564	564	564	564	564
5	661	656	647	638	628	621	610	590	569	552	535	519	501	483	466	450	438	429	426
10	779	762	738	730	692	670	635	600	566	538	502	465	415	377	356	343	335	330	329
15	878	849	844	820	804	754	668	617	574	513	452	398	355	317	291	272	260	253	253
20	1030	985	948	898	842	811	742	659	569	489	423	357	302	259	230	211	199	193	192
25	939	938	1032	941	922	849	758	658	550	467	376	304	247	210	184	165	155	150	150
30	941	932	940	922	913	827	749	638	527	417	322	253	205	169	146	131	120	113	111
35	960	990	955	964	875	805	737	601	484	360	268	206	163	134	113	97.0	82.3	74.6	72.9
40	701	716	803	776	787	761	684	578	440	309	219	164	129	102	80.6	65.7	57.2	53.7	53.4
45	1058	954	863	798	771	766	671	554	405	278	179	127	101	78.5	59.6	48.5	43.8	41.8	41.7
50	892	917	845	758	787	725	629	511	388	255	144	95.4	71.6	56.8	44.6	37.9	34.4	32.9	32.9
55	858	848	821	822	720	663	575	469	367	222	114	66.9	50.9	40.9	32.7	27.9	25.5	25.1	25.8
60	984	980	921	767	725	608	504	453	339	199	96.6	53.0	39.6	31.2	24.2	19.5	17.1	16.5	16.9
65	902	868	821	762	633	558	528	435	295	168	79.9	47.0	34.4	23.8	15.6	10.3	5.88	3.41	2.62
70	809	818	784	689	604	562	485	351	233	118	56.1	41.5	28.3	15.0	5.22	1.43	0.52	0.48	0.77
75	830	824	793	669	547	481	385	283	155	66.7	38.4	34.3	21.1	8.77	3.05	1.07	0.66	0.65	0.83
80	908	895	813	673	536	442	337	224	109	37.0	24.7	25.2	15.7	6.55	2.02	0.92	0.91	0.90	0.97
85	798	805	758	629	500	407	298	182	74.4	21.9	17.4	19.0	12.3	5.20	1.60	1.19	1.01	1.00	1.02
90	665	673	633	554	458	343	233	134	56.4	18.6	16.6	15.8	8.86	1.83	1.40	0.76	1.03	1.02	0.99
95	635	634	580	480	384	267	185	96.8	41.3	21.2	17.7	9.39	3.13	3.49	0.74	0.66	0.98	0.95	0.92
100	545	541	492	405	312	232	139	69.2	33.6	19.3	9.73	6.84	5.94	2.08	0.86	0.72	0.86	0.84	0.80
105	422	421	391	328	265	181	106	50.5	17.4	9.56	11.1	10.7	4.44	1.63	0.77	0.61	0.74	0.72	0.68
110	381	374	352	292	212	143	79.1	26.7	16.8	22.6	16.5	9.33	3.54	1.31	0.66	0.48	0.65	0.66	0.63
115	323	308	276	233	174	88.6	20.8	29.6	26.3	19.6	14.2	7.40	2.96	1.08	0.51	0.49	0.46	0.47	0.47
120	238	233	214	168	71.3	27.8	35.9	29.4	21.7	15.9	10.6	5.72	2.36	0.98	0.58	0.53	0.57	0.56	0.53
125	138	116	73.7	42.5	34.5	40.8	36.5	25.5	17.5	11.9	7.66	4.17	0.87	0.76	0.50	0.50	0.53	0.52	0.51
130	32.8	38.9	52.6	56.3	45.8	39.0	28.8	19.8	13.5	8.88	5.22	2.37	1.46	0.60	0.43	0.51	0.49	0.49	0.49
135	78.2	69.9	59.6	51.8	45.5	33.7	22.5	15.7	10.5	6.15	3.15	1.83	1.02	0.50	0.46	0.51	0.52	0.50	0.49
140	64.5	62.8	57.9	47.4	35.9	26.2	18.3	12.4	7.92	2.80	0.79	1.25	0.68	0.45	0.41	0.48	0.49	0.50	0.51
145	53.5	49.9	43.5	35.7	27.9	20.7	14.5	8.93	3.21	0.59	1.51	0.96	0.45	0.42	0.46	0.46	0.44	0.48	0.46
150	40.9	38.2	33.5	27.7	22.2	16.7	10.8	3.94	1.00	1.05	0.79	0.56	0.43	0.44	0.47	0.47	0.50	0.48	0.45
155	31.2	29.5	26.4	22.5	18.0	12.4	6.84	2.54	0.60	0.38	0.50	0.41	0.44	0.45	0.46	0.47	0.50	0.50	0.45
160	22.7	21.6	19.6	16.6	12.9	8.49	3.93	0.42	0.32	0.39	0.40	0.43	0.44	0.48	0.48	0.57	0.51	0.50	0.48
165	13.7	12.8	10.9	7.95	4.06	0.48	0.27	0.36	0.37	0.39	0.41	0.42	0.44	0.46	0.47	0.47	0.53	0.45	0.41
170	1.15	0.87	0.46	0.32	0.35	0.35	0.36	0.37	0.38	0.39	0.41	0.42	0.43	0.44	0.45	0.44	0.42	0.40	0.39
175	0.35	0.36	0.36	0.36	0.36	0.37	0.37	0.38	0.38	0.39	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40
180	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40

Table 4: Luminous Intensity Data

Table--2 UNIT: cd

γ (DEG) \ C (DEG)	190	200	210	220	230	240	250	260	270	280	290	300	310	320	330	340	350		
0	564	564	564	564	564	564	564	564	564	564	564	564	564	564	564	564	564		
5	430	439	453	468	484	499	517	533	547	564	581	593	605	619	632	645	656		
10	330	336	347	368	399	434	472	510	537	572	612	641	668	713	735	748	773		
15	255	263	275	293	317	355	406	466	525	581	647	723	756	792	826	846	884		
20	197	207	222	244	274	314	367	427	495	578	667	740	802	832	870	912	1017		
25	153	160	173	195	227	267	323	395	482	574	678	783	873	952	961	947	937		
30	114	123	136	154	180	219	276	346	439	550	676	808	894	902	921	891	945		
35	77.5	87.5	103	119	142	175	225	299	393	515	654	798	858	819	851	953	929		
40	55.4	60.7	70.7	86.2	109	139	184	247	344	470	623	740	793	811	721	728	677		
45	42.5	45.3	51.1	63.4	81.4	107	145	205	299	417	573	652	685	782	788	896	980		
50	33.5	35.4	39.4	46.8	59.7	79.5	111	169	259	376	501	578	625	749	867	844	883		
55	25.8	27.0	30.1	35.2	43.9	53.7	75.9	130	225	340	477	577	626	712	786	845	867		
60	16.4	17.2	20.4	26.4	33.8	38.2	53.3	99.5	191	316	458	572	631	729	839	902	998		
65	3.18	5.65	10.8	17.8	25.6	32.1	43.5	82.2	166	292	360	498	636	679	749	840	873		
70	0.30	0.40	2.53	8.28	18.2	27.4	37.8	66.9	144	252	326	407	519	628	697	755	797		
75	0.49	0.51	1.84	5.42	11.9	21.5	32.2	49.7	101	196	284	392	493	598	730	788	844		
80	0.74	0.74	1.49	3.79	8.98	16.8	25.5	35.7	59.7	140	233	343	469	601	726	823	885		
85	0.87	0.89	1.66	3.02	7.38	14.3	20.7	25.6	35.2	99.1	192	294	419	544	651	736	791		
90	0.97	0.95	0.84	2.39	3.61	10.8	18.2	21.0	22.7	73.2	155	246	345	473	573	614	656		
95	0.87	0.90	0.58	0.73	5.00	3.44	11.1	19.4	21.8	52.0	118	212	308	399	525	568	624		
100	0.76	0.81	0.91	1.44	3.51	8.58	8.57	10.4	13.6	40.9	85.7	160	259	349	423	495	539		
105	0.68	0.69	0.74	1.29	2.96	6.68	12.5	11.9	13.9	11.6	57.5	130	202	283	360	403	422		
110	0.63	0.62	0.48	0.91	2.27	5.06	10.1	16.6	24.6	29.9	33.8	89.2	167	237	300	349	375		
115	0.47	0.41	0.38	0.71	1.70	4.01	8.23	14.6	18.8	29.6	38.5	28.7	104	188	245	288	314		
120	0.54	0.51	0.45	0.76	1.51	3.08	6.42	11.3	14.8	21.8	31.0	37.6	30.4	78.4	177	219	234		
125	0.50	0.49	0.46	0.59	1.23	1.62	4.69	7.65	11.3	17.3	27.1	39.9	41.9	34.4	45.5	75.9	118		
130	0.46	0.47	0.49	0.44	0.58	1.12	0.85	4.81	7.90	13.6	21.6	32.2	44.2	52.5	64.2	57.0	39.3		
135	0.51	0.51	0.51	0.48	0.50	0.65	0.69	2.03	5.62	10.5	17.3	26.4	38.1	49.5	57.0	63.7	72.1		
140	0.52	0.53	0.53	0.52	0.48	0.59	0.91	0.00	3.36	8.55	14.0	21.1	29.5	39.3	50.5	60.3	64.3		
145	0.47	0.51	0.53	0.53	0.47	0.48	0.58	1.44	0.90	5.12	11.2	17.3	23.7	30.6	37.8	45.0	50.7		
150	0.44	0.48	0.51	0.48	0.43	0.42	0.61	0.37	0.90	1.14	7.27	13.8	19.8	25.4	30.4	35.3	39.1		
155	0.44	0.51	0.49	0.42	0.42	0.41	0.41	0.52	0.35	0.40	2.62	8.67	15.5	20.7	24.7	28.1	30.4		
160	0.49	0.44	0.43	0.55	0.41	0.40	0.40	0.39	0.40	0.33	1.46	5.52	10.3	14.9	18.3	20.8	22.2		
165	0.42	0.41	0.41	0.43	0.41	0.40	0.39	0.39	0.38	0.37	0.36	0.26	1.51	6.37	9.99	12.1	13.3		
170	0.38	0.38	0.39	0.40	0.40	0.39	0.40	0.39	0.38	0.36	0.36	0.36	0.35	0.35	0.32	0.45	0.87		
175	0.39	0.39	0.39	0.38	0.38	0.38	0.39	0.40	0.39	0.38	0.37	0.36	0.36	0.36	0.35	0.35	0.35		
180	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40		

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

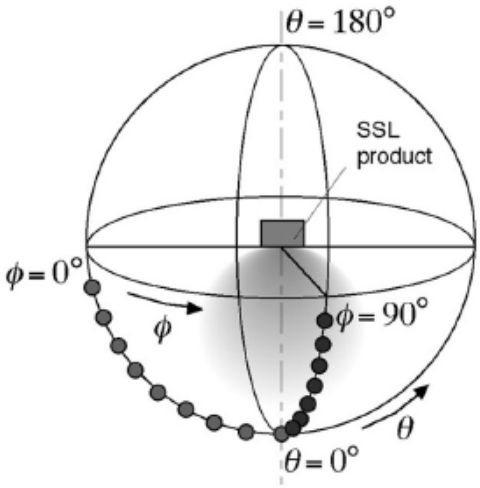
An EVERFINE Type C Model GO-R5000 Goniophotometer was used to measure the intensity at each angle of distribution for each sample. The photometric distance is 2.475m for near-field measurement or 30m for far-field measurement. Bandwidth of spectroradiometer is 380nm-780nm.
Ambient temperature was measured 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°/180° and C=90°/270°) 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, Δu'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 ***