NVLAP LAB CODE 200960-0

LM-79-08 Test Report

for

ABBlighting, Inc.

3 Adams St Belvidere, NJ 07823.

38W WALLPACK

Model: ABBWP40501

Laboratory: Leading Testing Laboratories

NVLAP CODE: 200960-0

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

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Report No.: HZ15070017b

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: **ABBWP40501**

Luminous Efficacy (Lumens /Watt)	Total Luminous Flux (Lumens)	Power (Watts)	Power Factor
100.2	3662.5	36.55	0.9904

CCT (K)	CRI	Stabilization Time (Light & Power)
4974	76.1	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

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Sample Photo

Figure 1- Overview of the sample

Equipment Under Test (EUT)	
Name	: 38W WALLPACK
Model	: ABBWP40501
Electrical Ratings	: 100~277VAC, 50/60Hz, 38W
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: 60pcs
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)	0.308	0.374	0.139
Power Factor	0.9904	0.9848	0.9620
Test Power (W)	36.55	36.85	36.96
THD A%	8.94	9.96	7.12
Luminous Efficacy (lm/W)	100.2	99.0	98.7
Total Luminous Flux (lm)	3662.5	3646.9	3646.4
Color Rendering Index (CRI)	76.1		
R9	-14		
Correlated Color Temperature (CCT) (K)	4974		
Chromaticity (Chroma x, Chroma y)	(0.3461, 0.3548)		
Chromaticity (Chroma u, Chroma v)	(0.2109, 0.3242)		
Chromaticity (Chroma u', Chroma v')	(0.2109, 0.4863)		
Duv	0.0011		
Average Beam Angle (°)	97.3		
Center Beam Candle Power (cd)	1075		
Spacing Criteria	0.39 (0°-180°)/ 1.15 (90°-270°)		
Zonal Lumens in the 0°-60°Zone	57.71%		
Zonal Lumens in the 60°-90°Zone	31.04%		
Zonal Lumens in the 90°-120°Zone	10.38%		
Zonal Lumens in the 120°-180°Zone	0.87%		

Special Color Rendering Indices	
R1	74
R2	83
R3	86
R4	74
R5	74
R6	74
R7	84
R8	60
R9	-14
R10	56
R11	69
R12	46
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

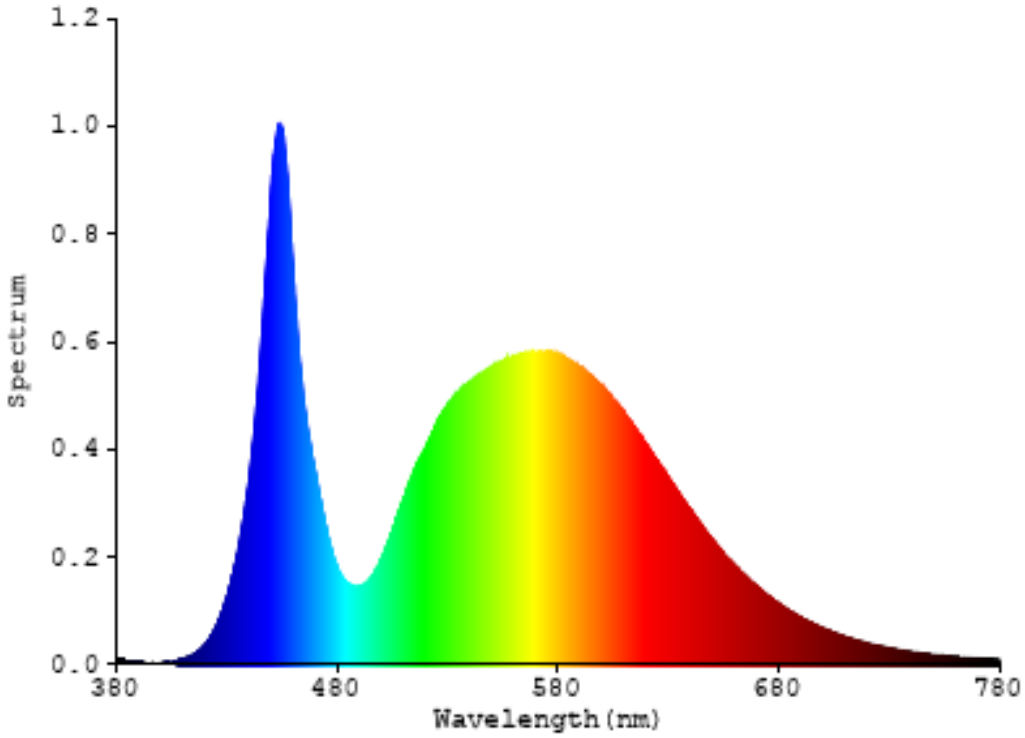


Chart 1: Spectral Power Distribution

Zonal Lumen Tabulation

γ(°)	Lumens	% Total
0- 10	94.984	2.59%
10- 20	262.777	7.17%
20- 30	366.526	10.01%
30- 40	419.781	11.46%
40- 50	465.179	12.70%
50- 60	504.319	13.77%
60- 70	455.327	12.43%
70- 80	386.854	10.56%
80- 90	294.564	8.04%
90-100	211.892	5.79%
100-110	124.906	3.41%
110-120	43.53	1.19%
120-130	15.522	0.42%
130-140	9.275	0.25%
140-150	4.888	0.13%
150-160	1.752	0.05%
160-170	0.332	0.01%
170-180	0.051	0.00%
Total	3662.5	100%

γ(°)	Lumens	% Total
0- 60	2113.566	57.71%
60- 90	1136.745	31.04%
0-90	3250.311	88.75%
90- 180	412.148	11.25%
0- 180	3662.5	100%

Table 3: Zonal Lumen Data

Illuminance Plots

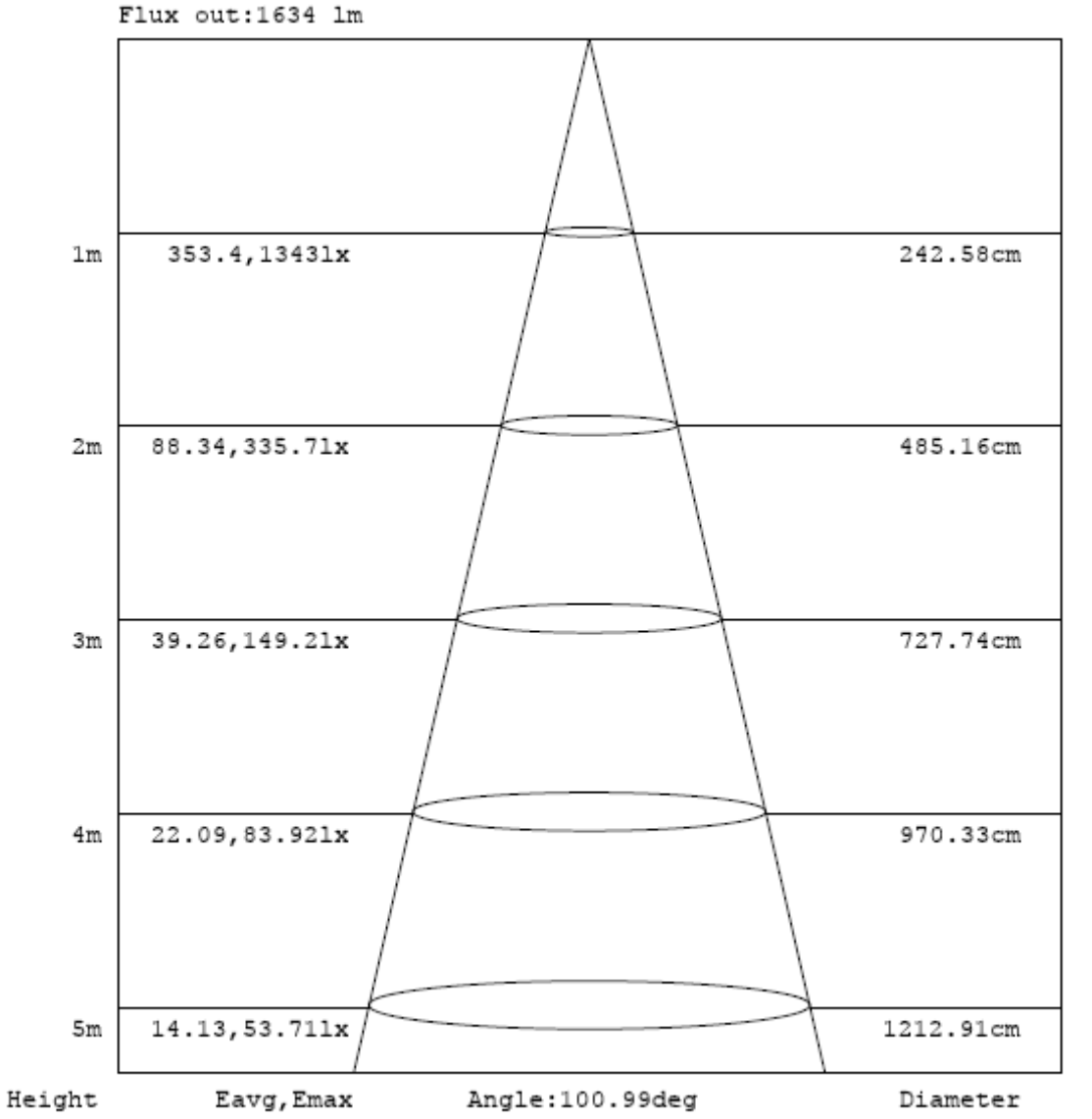


Chart 2: Beam Angle

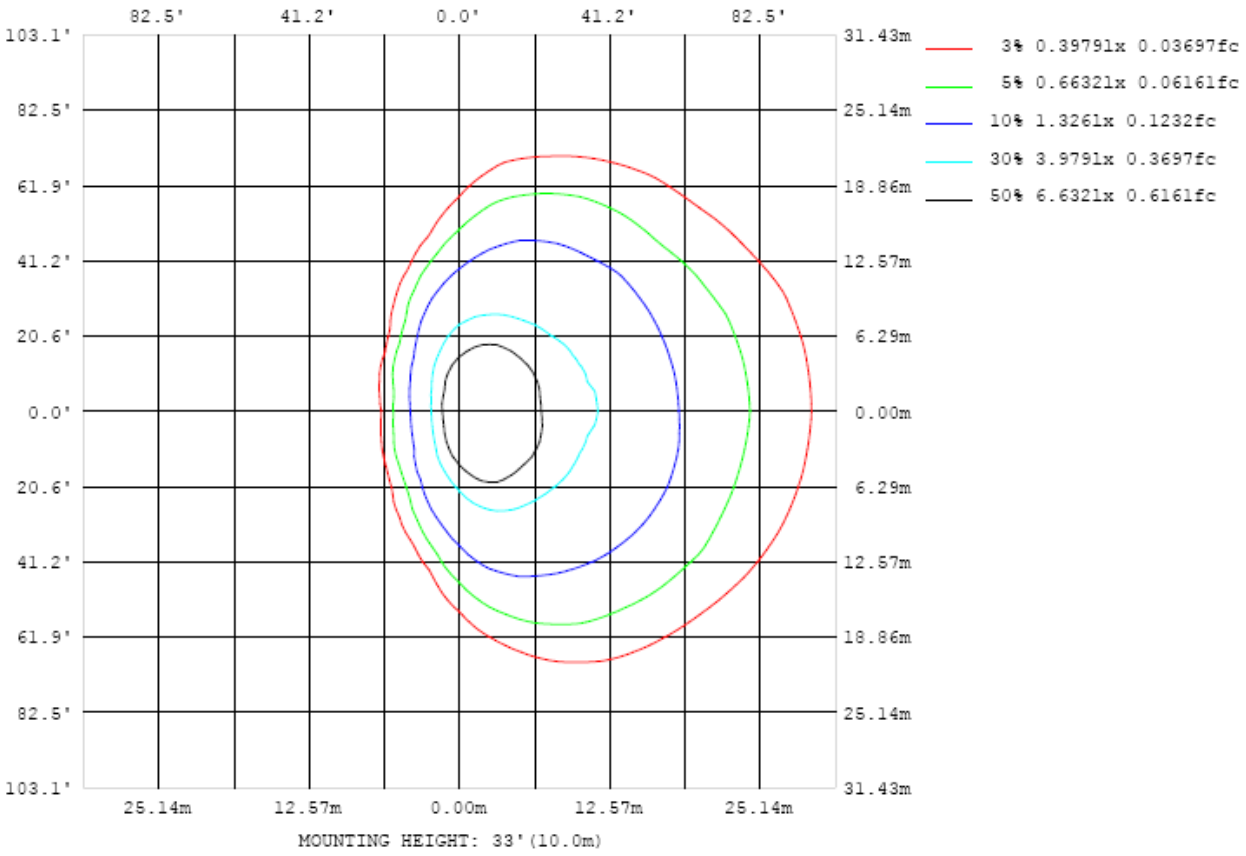


Chart 3: Illuminance Plot (Footcandles)

Luminous Intensity Distribution Plots

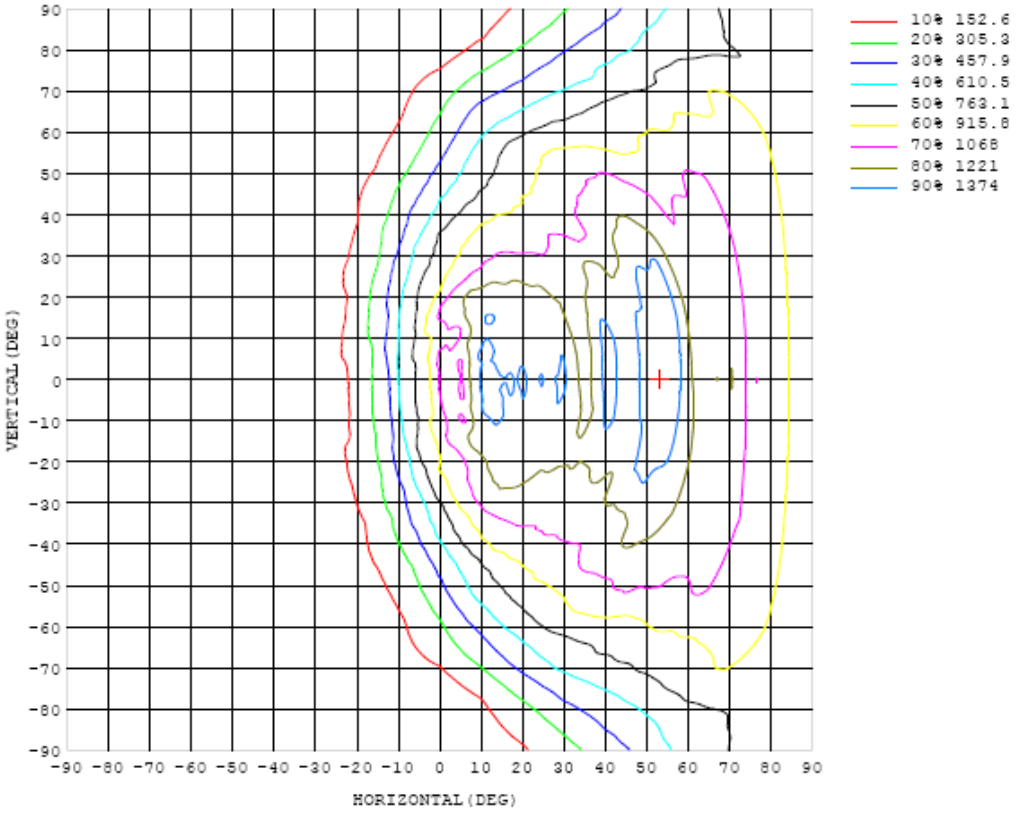


Chart 4: Isocandela Plot

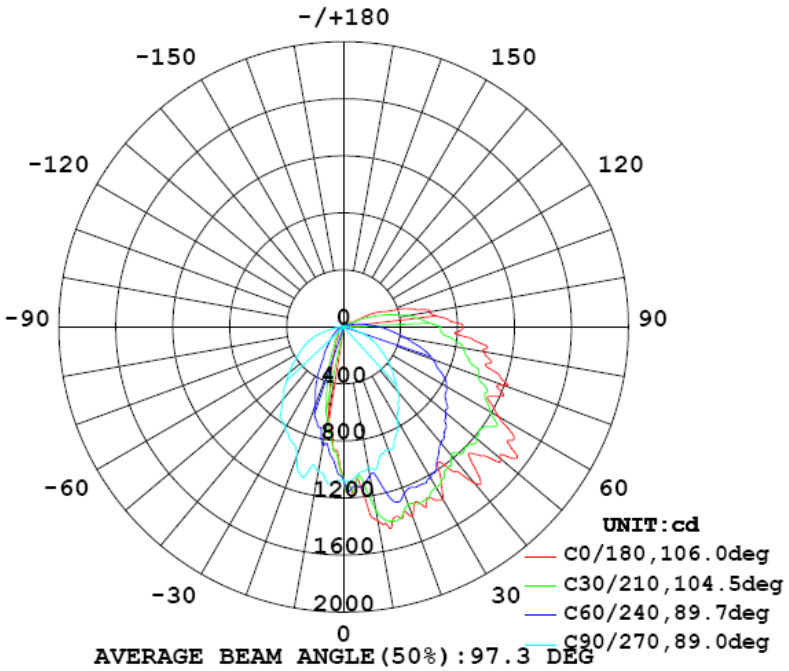


Chart 5: Polar Candela Distribution

Luminous Intensity Data

Table--1 UNIT: cd

γ (DEG) \ C (DEG)	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
0	1075	1075	1075	1075	1075	1075	1075	1075	1075	1075	1075	1075	1075	1075	1075	1075	1075	1075	1075
5	1063	1056	1059	1082	1126	1154	1121	1121	1129	1047	996	948	883	851	855	862	861	856	853
10	1382	1380	1352	1302	1249	1128	1059	1094	1076	1007	930	887	792	714	704	669	636	618	613
15	1383	1367	1399	1409	1362	1294	1233	1164	1114	958	852	780	691	578	470	402	373	367	373
20	1411	1373	1355	1325	1349	1359	1243	1103	995	917	836	639	512	418	322	254	228	214	212
25	1375	1358	1342	1342	1323	1314	1232	1118	1000	856	694	536	383	278	202	156	138	137	143
30	1391	1366	1333	1297	1273	1254	1223	1121	953	755	566	407	290	197	152	130	106	90.2	83.7
35	1157	1215	1225	1234	1197	1180	1143	1043	862	666	502	316	199	137	98.8	81.7	69.4	63.6	62.2
40	1429	1357	1309	1180	1140	1103	1063	979	801	594	408	244	138	94.8	75.4	64.3	55.7	52.1	52.3
45	1250	1302	1253	1206	1143	1075	1012	874	695	501	312	179	115	81.2	62.2	53.4	49.4	47.9	48.0
50	1435	1379	1350	1212	1095	1035	936	811	643	433	239	133	85.0	63.8	50.6	45.2	40.8	37.2	35.9
55	1399	1418	1348	1218	1161	1024	873	751	574	354	181	96.0	63.6	49.5	39.5	33.8	29.1	26.1	25.6
60	1254	1315	1308	1191	1076	968	833	679	478	284	146	78.2	53.3	40.7	30.6	24.3	20.6	19.1	19.2
65	1151	1158	1104	1096	1030	875	755	580	393	225	117	69.6	47.8	32.1	22.1	16.6	13.7	12.4	12.4
70	1203	1186	1109	1002	871	768	667	495	299	148	79.2	58.6	39.1	23.1	14.1	9.63	7.49	6.65	6.72
75	1031	1074	1040	913	799	700	561	376	196	81.2	50.8	44.4	28.3	14.7	7.24	3.75	2.11	1.26	1.15
80	997	986	947	847	708	569	444	270	127	48.6	32.6	30.1	18.6	8.10	2.94	1.30	0.84	0.80	0.99
85	890	879	851	720	600	476	335	203	88.3	31.4	21.7	19.9	12.5	5.94	2.53	1.42	1.07	1.06	1.18
90	838	815	766	680	516	376	255	137	58.2	24.3	18.0	14.7	9.44	4.18	2.28	1.55	1.19	1.17	1.20
95	712	704	660	559	428	301	185	88.8	41.3	22.8	15.8	9.01	3.72	2.39	1.36	0.89	1.18	1.17	1.16
100	616	602	563	468	343	224	124	64.7	31.5	17.6	8.90	3.64	5.73	2.45	1.14	1.00	1.09	1.07	1.07
105	495	473	421	339	238	141	84.6	37.5	27.1	8.84	6.30	8.16	4.52	2.33	1.16	0.88	0.96	0.94	0.93
110	323	315	277	210	150	77.8	39.2	20.7	17.4	18.6	11.3	6.65	3.68	1.87	0.93	0.72	0.83	0.84	0.82
115	229	209	160	89.8	42.6	31.0	26.6	30.5	24.9	15.4	8.87	5.10	2.94	1.54	0.68	0.58	0.76	0.77	0.77
120	43.0	37.6	31.7	30.2	34.0	23.9	28.1	26.9	18.8	11.5	6.69	4.03	2.39	1.26	0.74	0.61	0.64	0.65	0.64
125	56.8	58.4	56.5	46.1	36.4	33.8	29.2	21.2	13.4	8.12	5.15	3.28	1.93	1.28	0.78	0.68	0.72	0.72	0.71
130	38.9	36.3	32.0	30.8	31.5	28.7	22.1	15.2	9.32	5.80	3.92	0.76	1.28	0.80	0.63	0.66	0.69	0.70	0.70
135	31.4	32.3	33.7	33.5	29.1	23.1	17.0	11.1	6.57	3.71	1.92	1.24	0.81	0.68	0.68	0.69	0.68	0.69	0.67
140	35.7	34.2	31.0	26.6	22.0	17.1	11.9	7.50	4.30	2.03	0.98	0.90	0.69	0.62	0.63	0.69	0.69	0.69	0.70
145	27.8	26.4	23.7	20.2	16.2	11.8	7.37	3.90	1.43	0.72	0.91	0.71	0.59	0.57	0.64	0.67	0.67	0.70	0.72
150	20.7	19.7	17.6	14.8	11.3	7.41	3.47	0.53	0.37	0.86	0.61	0.57	0.59	0.61	0.63	0.62	0.66	0.67	0.68
155	14.4	13.6	12.1	10.0	7.16	3.94	1.57	0.48	0.48	0.52	0.54	0.57	0.60	0.62	0.63	0.64	0.69	0.69	0.66
160	8.43	7.92	6.85	5.33	3.53	1.84	0.67	0.44	0.51	0.54	0.57	0.60	0.62	0.63	0.64	0.66	0.67	0.69	0.68
165	3.43	2.93	2.09	1.16	0.59	0.46	0.49	0.52	0.54	0.56	0.59	0.61	0.63	0.65	0.68	0.68	0.72	0.74	0.61
170	0.46	0.46	0.47	0.48	0.49	0.51	0.52	0.54	0.56	0.57	0.59	0.61	0.62	0.63	0.62	0.61	0.61	0.59	0.55
175	0.49	0.50	0.50	0.51	0.52	0.53	0.54	0.54	0.55	0.56	0.57	0.59	0.60	0.60	0.59	0.57	0.56	0.54	0.53
180	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52

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	1075	1075	1075	1075	1075	1075	1075	1075	1075	1075	1075	1075	1075	1075	1075	1075	1075		
5	850	854	863	876	892	924	971	1044	1101	1091	1112	1137	1114	1092	1068	1064	1063		
10	620	634	649	684	768	844	874	925	1032	1043	1014	1128	1205	1265	1345	1351	1381		
15	383	412	468	544	630	712	791	970	1092	1092	1152	1229	1310	1376	1373	1353	1347		
20	228	262	305	357	448	590	735	818	963	1150	1255	1318	1380	1303	1342	1357	1371		
25	144	156	189	252	338	467	608	762	880	994	1150	1259	1268	1281	1268	1318	1320		
30	90.9	106	126	151	218	338	509	670	820	933	1053	1152	1225	1266	1289	1315	1376		
35	65.8	75.8	94.7	119	167	241	385	578	780	894	994	1060	1107	1142	1201	1188	1140		
40	52.8	56.8	64.9	76.2	107	179	316	491	665	821	927	1021	1039	1144	1170	1316	1391		
45	46.3	47.0	53.8	62.0	84.6	137	240	402	581	731	865	947	1023	1094	1277	1242	1239		
50	36.5	39.6	45.2	54.7	71.8	104	183	321	501	678	821	923	1037	1105	1178	1318	1419		
55	26.7	30.4	37.3	47.2	64.6	81.1	131	245	423	631	810	923	1024	1146	1272	1378	1430		
60	19.5	21.8	27.7	37.3	50.8	61.1	93.3	187	355	570	749	902	980	1124	1152	1205	1258		
65	12.3	13.9	18.8	27.7	39.6	49.8	73.1	149	298	500	626	778	871	926	1032	1086	1115		
70	6.39	7.45	11.4	19.0	30.6	44.4	63.1	116	238	402	526	665	789	889	1001	1127	1174		
75	0.92	1.83	4.56	10.7	21.0	35.4	52.6	81.7	159	300	429	552	675	828	920	984	1025		
80	0.73	0.88	2.03	5.27	12.7	25.6	38.6	51.9	81.7	194	333	469	592	726	854	930	979		
85	0.93	0.97	1.80	3.83	9.41	18.5	28.4	34.6	40.9	126	248	374	508	630	707	828	880		
90	1.08	1.09	1.82	3.30	6.56	14.9	22.6	26.9	27.6	81.6	182	296	410	539	690	789	823		
95	1.10	1.11	0.78	1.86	3.77	5.87	14.1	22.9	27.6	63.5	127	220	333	449	562	676	714		
100	0.98	1.03	1.30	1.62	4.16	9.47	5.88	13.1	21.8	34.6	90.7	156	259	365	486	566	607		
105	0.86	0.92	1.22	2.05	3.92	7.25	12.2	9.62	11.4	36.6	38.7	104	180	258	357	436	480		
110	0.79	0.81	0.99	1.62	3.02	5.46	9.32	14.2	24.5	31.0	26.6	42.3	74.6	176	238	286	316		
115	0.72	0.72	0.73	1.12	2.34	4.22	7.10	11.3	20.9	32.8	38.0	36.7	34.4	41.8	88.5	170	218		
120	0.64	0.63	0.59	0.92	1.94	3.33	5.45	8.93	16.4	25.2	32.8	31.3	27.0	37.0	29.7	31.2	36.9		
125	0.70	0.68	0.61	0.78	1.58	2.63	4.19	6.49	11.5	18.6	26.0	32.2	34.6	35.1	45.7	57.3	59.2		
130	0.67	0.65	0.62	0.61	0.74	1.38	1.57	4.41	7.07	12.4	18.8	24.9	29.4	30.5	29.0	30.7	35.6		
135	0.66	0.65	0.66	0.69	0.69	0.72	1.02	1.60	4.17	7.64	13.0	19.0	24.7	30.3	34.0	33.4	32.0		
140	0.70	0.71	0.71	0.70	0.69	0.70	0.74	0.46	1.77	4.83	8.82	13.6	18.9	23.8	28.3	32.0	34.6		
145	0.69	0.70	0.72	0.73	0.68	0.61	0.75	1.09	0.84	1.82	5.03	9.09	13.7	18.1	21.9	25.0	27.0		
150	0.64	0.69	0.73	0.73	0.67	0.56	0.55	0.74	1.04	0.74	2.01	5.22	9.27	13.1	16.3	18.7	20.3		
155	0.64	0.68	0.74	0.69	0.62	0.56	0.54	0.53	0.49	0.46	0.49	2.09	5.33	8.69	11.3	13.1	14.1		
160	0.66	0.72	0.68	0.59	0.57	0.55	0.54	0.52	0.50	0.49	0.47	1.15	2.56	4.49	6.24	7.52	8.27		
165	0.67	0.62	0.58	0.58	0.57	0.56	0.53	0.52	0.50	0.49	0.47	0.46	0.44	0.65	1.65	2.62	3.22		
170	0.56	0.56	0.54	0.55	0.54	0.54	0.54	0.52	0.51	0.49	0.48	0.47	0.47	0.46	0.46	0.46	0.46		
175	0.53	0.53	0.53	0.54	0.54	0.54	0.53	0.52	0.52	0.51	0.51	0.50	0.49	0.49	0.49	0.49	0.49		
180	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52		

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

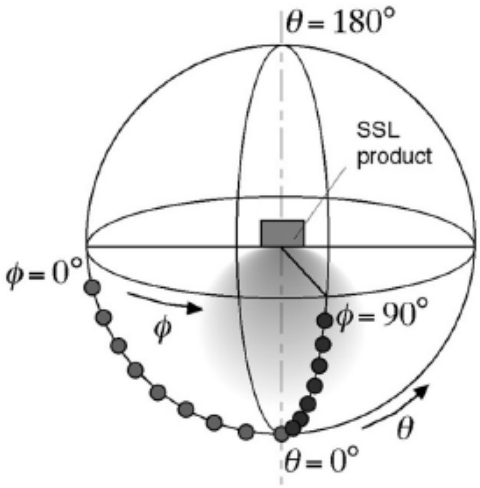
An EVERFINE Type C Model GO-R5000 Goniophotometer was used to measure the intensity at each angle of distribution for each sample. The photometric distance is 2.475m for near-field measurement or 30m for far-field measurement. Bandwidth of spectroradiometer is 380nm-780nm.
Ambient temperature was measured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