



LM-79-08 Test Report

for

ABBlighting, Inc.

3 Adams St Belvidere, NJ 07823.

55W CANOPY

Model: ABBCAN55501

Laboratory: Leading Testing Laboratories

NVLAP CODE: 200960-0

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Report No.: HZ15050026d

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

Reviewed by:

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May 29, 2015



Jim Zhang

Manager: Jim Zhang
May 29, 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: **ABBCAN55501**

Luminous Efficacy (Lumens /Watt)	Total Luminous Flux (Lumens)	Power (Watts)	Power Factor
98.7	4863.5	49.28	0.9957
CCT (K)	CRI	Stabilization Time (Light & Power)	
4962	77.3	60	

Table 1: Executive Data Summary

Test specifications:

Date of Receipt : May 26, 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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Figure 1- Overview of the sample

Equipment Under Test (EUT)

Name	: 55W CANOPY
Model	: ABBCAN55501
Electrical Ratings	: 100~277VAC, 50/60Hz, 55W
Product Description	: 5000K, Fuel Pump Canopy Luminaires, Plastic Light Cover 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°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 95 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	0.499	0.186
Power Factor	0.9957	0.9970	0.9537
Test Power (W)	49.28	49.72	49.19
THD A%	5.92	5.15	15.48
Luminous Efficacy (lm/W)	98.7	97.6	98.6
Total Luminous Flux (lm)	4863.5	4851.3	4848.9
Color Rendering Index (CRI)	77.3		
R9	-9		
Correlated Color Temperature (CCT) (K)	4962		
Chromaticity (Chroma x, Chroma y)	(0.3463, 0.3537)		
Chromaticity (Chroma u, Chroma v)	(0.2114, 0.3239)		
Chromaticity (Chroma u', Chroma v')	(0.2114, 0.4859)		
Duv	0.0006		
Average Beam Angle (°)	120.8		
Center Beam Candle Power (cd)	1183		
Spacing Criteria	1.50 (0°-180°)/ 1.51 (90°-270°)		
Zonal Lumens in the 0°-60°Zone	71.25%		
Zonal Lumens in the 60°-90°Zone	20.18%		
Zonal Lumens in the 90°-120°Zone	6.17%		
Zonal Lumens in the 120°-180°Zone	2.40%		

Special Color Rendering Indices	
R1	75
R2	84
R3	87
R4	75
R5	75
R6	76
R7	84
R8	62
R9	-9
R10	59
R11	70
R12	49
R13	77
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

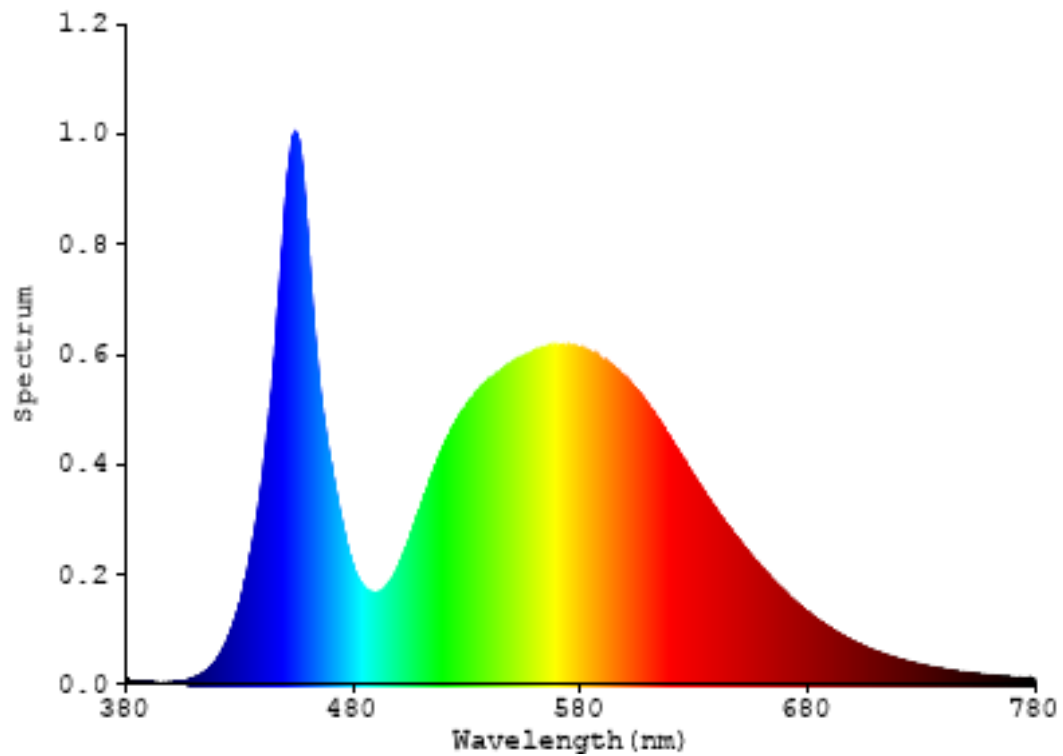


Chart 1: Spectral Power Distribution

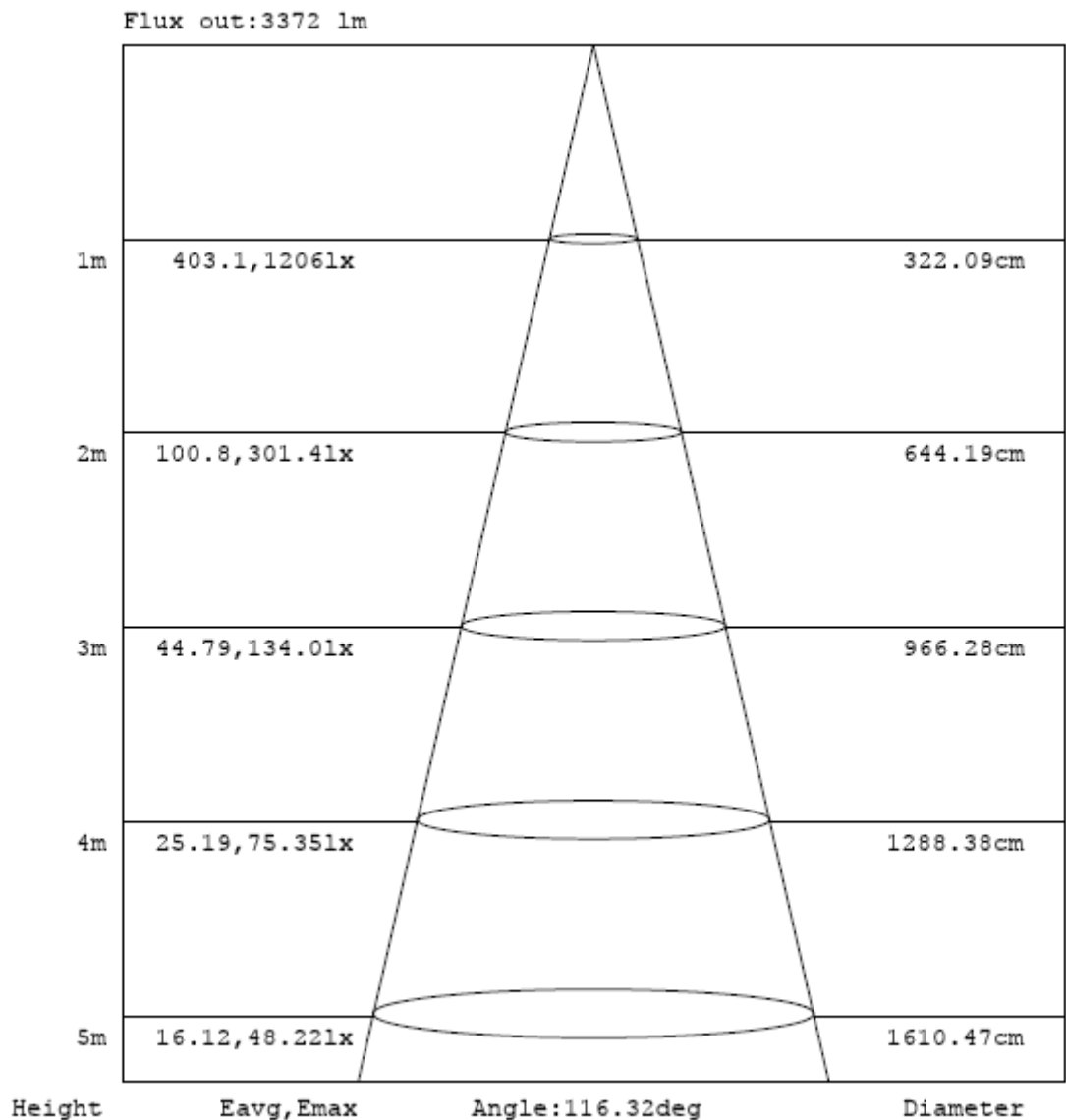
Zonal Lumen Tabulation

$\gamma(^{\circ})$	Lumens	% Total
0- 10	115.208	2.37%
10- 20	356.187	7.32%
20- 30	616.969	12.69%
30- 40	832.878	17.13%
40- 50	843.49	17.34%
50- 60	700.33	14.40%
60- 70	503.598	10.35%
70- 80	304.003	6.25%
80- 90	173.809	3.57%
90-100	121.417	2.50%
100-110	96.221	1.98%
110-120	82.866	1.70%
120-130	68.231	1.40%
130-140	34.625	0.71%
140-150	11.228	0.23%
150-160	2.034	0.04%
160-170	0.304	0.01%
170-180	0.107	0.00%
Total	4863.5	100%

$\gamma(^{\circ})$	Lumens	% Total
0- 60	3465.062	71.25%
60- 90	981.41	20.18%
0-90	4446.472	91.43%
90- 180	417.033	8.57%
0- 180	4863.5	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

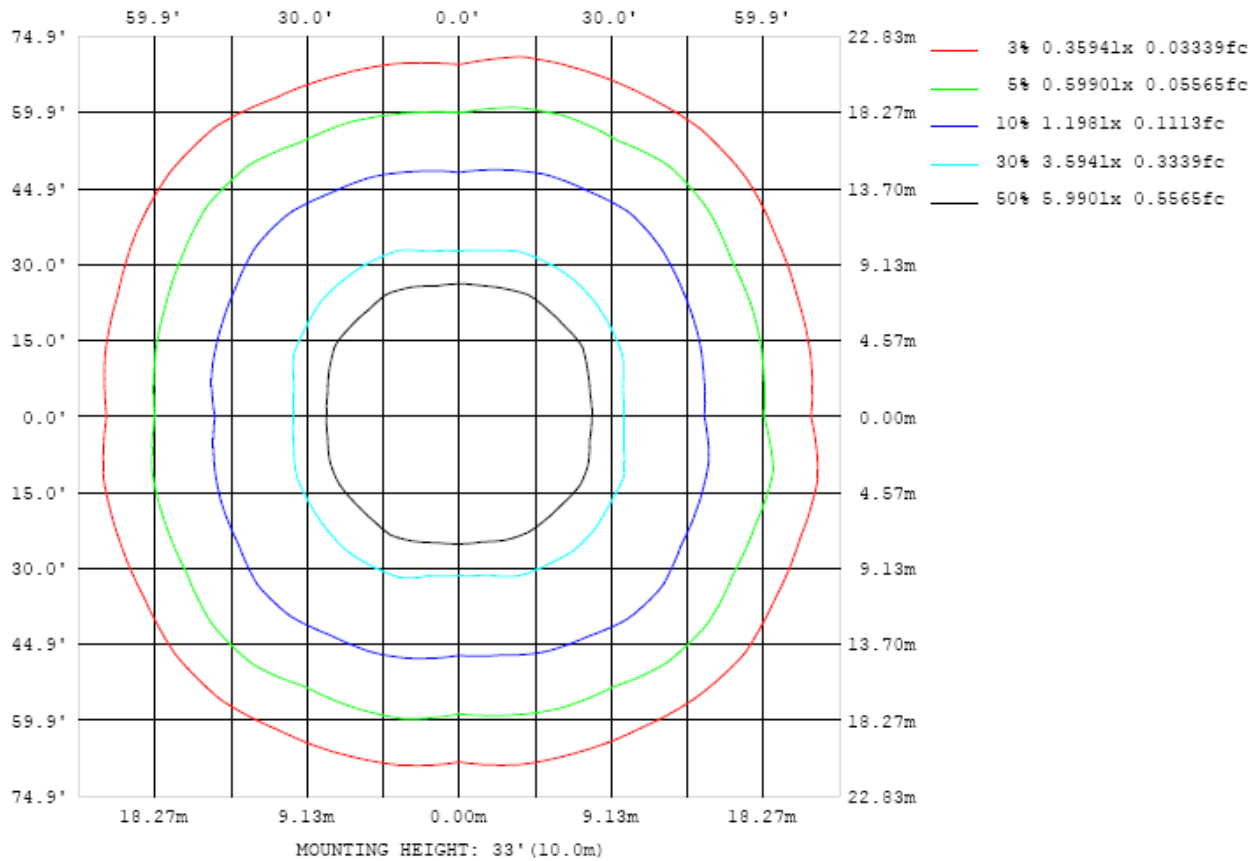


Chart 3: Illuminance Plot (Footcandles)

Luminous Intensity Distribution Plots

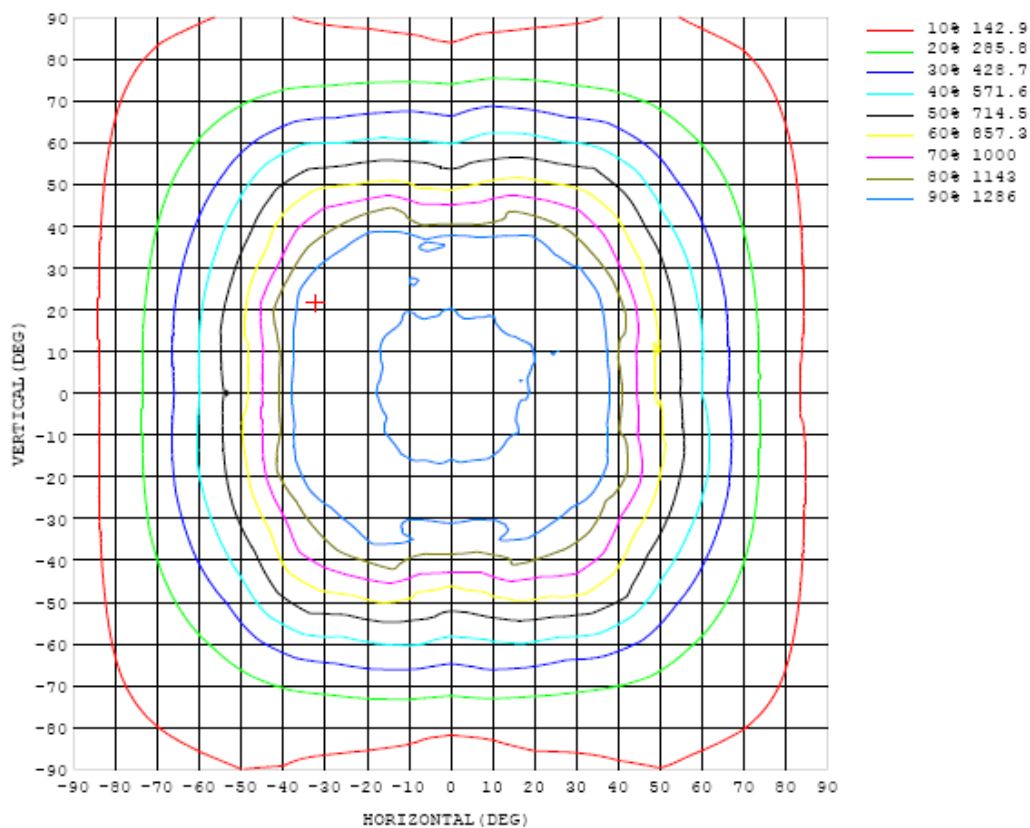


Chart 4: Isocandela Plot

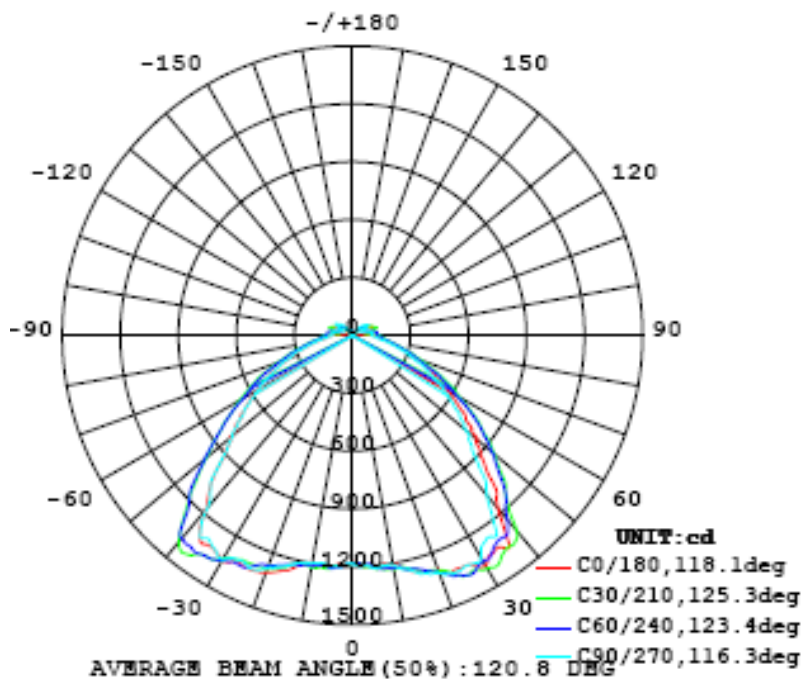


Chart 5: Polar Candela Distribution

Luminous Intensity Data

Table--1

UNIT: cd

C (DEG) y (DEG)	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
0	1183	1183	1183	1183	1183	1183	1183	1183	1183	1183	1183	1183	1183	1183	1183	1183	1183	1183	1183
5	1208	1213	1212	1204	1202	1198	1208	1199	1196	1206	1210	1203	1210	1196	1206	1208	1214	1216	1203
10	1213	1220	1221	1228	1226	1226	1226	1212	1200	1206	1208	1209	1214	1208	1220	1226	1221	1216	1206
15	1264	1272	1278	1254	1232	1237	1251	1270	1272	1272	1274	1266	1259	1233	1228	1244	1263	1265	1257
20	1294	1307	1299	1298	1324	1340	1310	1311	1307	1310	1302	1304	1298	1310	1335	1302	1313	1327	1308
25	1330	1324	1322	1375	1407	1391	1374	1325	1330	1338	1328	1292	1327	1375	1395	1369	1332	1342	1319
30	1377	1368	1361	1396	1394	1402	1351	1323	1307	1326	1311	1307	1361	1387	1387	1400	1364	1347	1343
35	1339	1322	1352	1368	1348	1323	1306	1268	1246	1275	1258	1279	1353	1363	1346	1369	1358	1321	1323
40	1171	1175	1294	1321	1253	1236	1247	1174	1077	1083	1095	1213	1291	1250	1254	1295	1286	1192	1179
45	979	1012	1170	1119	1157	1142	1108	1078	932	902	939	1107	1123	1151	1128	1114	1138	1042	1001
50	848	911	958	957	1021	1023	944	896	814	770	835	910	944	995	1016	938	913	895	830
55	707	782	797	804	867	874	791	755	672	642	702	781	784	845	864	777	777	734	686
60	568	645	646	639	729	705	620	609	563	536	589	613	621	710	707	633	632	610	571
65	455	511	496	516	549	536	495	473	459	421	459	481	502	545	545	507	497	496	455
70	337	372	375	377	396	385	357	350	346	321	346	362	372	397	403	371	376	376	345
75	259	284	279	279	291	283	270	263	256	241	260	271	277	292	290	278	281	285	261
80	195	217	213	208	209	201	201	198	186	173	191	203	209	211	210	213	213	214	193
85	140	154	160	165	165	158	152	148	134	125	138	149	157	164	165	162	156	149	138
90	109	117	129	137	142	139	132	126	109	104	113	126	133	142	143	138	129	117	111
95	93.4	96.7	100.0	112	128	132	130	124	106	101	110	124	129	132	127	112	101	96.1	94.1
100	33.5	36.7	56.7	74.2	83.1	104	116	117	105	103	106	116	114	101	80.1	71.8	59.6	37.5	35.9
105	118	100	115	117	83.9	78.4	80.5	81.3	81.3	83.6	81.6	81.3	77.0	77.2	84.2	125	106	96.2	115
110	113	94.3	104	127	102	72.1	60.0	56.2	59.2	58.9	60.2	55.5	58.4	74.7	104	123	93.7	89.7	109
115	105	87.4	92.2	113	111	95.1	68.4	50.9	44.6	42.1	46.7	52.7	70.6	95.7	106	109	82.1	83.0	102
120	96.7	79.0	80.5	98.4	94.7	93.9	80.3	78.2	73.3	71.7	74.1	78.7	83.3	91.5	90.9	93.6	70.1	75.1	93.3
125	83.1	65.7	62.6	75.7	74.6	71.7	75.2	92.4	97.3	98.7	96.1	90.3	74.3	70.9	72.0	71.8	53.8	64.0	78.8
130	22.4	37.1	40.1	52.3	51.6	46.9	65.0	80.6	83.5	84.8	82.0	79.0	63.7	46.4	50.1	49.7	39.1	44.6	29.5
135	33.2	31.3	25.3	24.0	22.3	37.3	52.2	65.1	68.2	69.9	67.0	63.6	51.2	36.0	17.7	21.7	24.8	32.4	32.6
140	14.7	13.0	5.93	1.24	14.5	27.7	40.0	47.5	51.1	52.8	50.8	47.1	38.9	23.0	12.5	1.25	5.58	11.3	14.0
145	1.28	1.21	1.22	1.22	3.23	17.0	26.7	32.1	34.6	36.0	34.6	30.6	22.3	15.6	3.30	1.18	1.21	1.23	1.27
150	1.21	1.22	1.15	1.19	1.16	2.73	13.1	18.4	20.5	20.3	18.6	17.6	12.4	3.95	1.13	1.14	1.09	1.18	1.21
155	1.16	1.18	1.09	1.15	1.09	1.06	1.07	3.92	6.28	7.62	6.58	3.73	1.10	1.11	1.12	1.11	1.05	1.14	1.15
160	1.14	1.15	1.13	1.06	1.06	1.01	1.01	0.98	0.98	0.98	1.02	1.06	1.07	1.09	1.11	1.05	1.12	1.12	1.16
165	1.14	1.15	1.15	1.12	1.03	0.98	0.96	0.96	0.94	0.94	0.98	1.05	1.07	1.07	1.08	1.15	1.14	1.12	1.15
170	1.16	1.15	1.15	1.13	1.10	0.9996	0.96	0.93	0.97	0.94	0.94	1.01	1.08	1.14	1.16	1.15	1.16	1.15	1.20
175	1.21	1.21	1.20	1.18	1.18	1.13	1.08	1.06	1.08	1.05	1.08	1.11	1.15	1.18	1.20	1.22	1.22	1.20	1.23
180	1.17	1.19	1.20	1.22	1.21	1.19	1.18	1.15	1.15	1.12	1.11	1.12	1.15	1.17	1.17	1.16	1.16	1.14	1.17

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	1183	1183	1183	1183	1183	1183	1183	1183	1183	1183	1183	1183	1183	1183	1183	1183	1183		
5	1207	1205	1201	1212	1202	1213	1215	1207	1202	1191	1200	1210	1201	1209	1203	1205	1204		
10	1209	1216	1225	1211	1207	1214	1203	1209	1197	1197	1211	1214	1214	1203	1218	1226	1217		
15	1260	1256	1228	1209	1214	1232	1238	1247	1232	1252	1251	1223	1222	1223	1246	1266	1277		
20	1309	1305	1286	1274	1277	1270	1298	1291	1283	1308	1294	1280	1313	1281	1270	1281	1299		
25	1320	1301	1296	1341	1346	1326	1302	1311	1306	1338	1321	1355	1365	1355	1320	1293	1321		
30	1332	1304	1334	1376	1359	1346	1301	1318	1340	1338	1318	1345	1381	1408	1362	1320	1364		
35	1313	1308	1385	1381	1382	1383	1320	1273	1292	1289	1312	1347	1376	1384	1400	1328	1319		
40	1195	1304	1397	1354	1336	1373	1301	1180	1169	1186	1264	1342	1311	1317	1382	1265	1173		
45	1033	1166	1193	1234	1226	1193	1177	1036	1002	1049	1148	1176	1213	1182	1170	1150	1000		
50	850	962	987	1043	1055	998	955	843	812	873	961	1010	1042	1025	950	914	860		
55	752	783	820	905	896	814	785	734	687	744	803	836	887	865	805	771	748		
60	605	631	672	726	731	652	634	591	563	616	655	663	735	705	636	620	585		
65	485	501	546	588	591	526	499	483	453	516	528	545	572	561	514	486	470		
70	366	384	410	436	440	396	386	370	349	393	405	401	433	415	383	371	352		
75	280	294	308	319	320	299	289	280	263	297	302	301	312	305	292	285	274		
80	210	222	228	228	225	221	218	205	195	221	222	223	224	217	221	218	206		
85	151	164	170	173	171	165	160	147	137	152	164	167	171	169	166	160	148		
90	120	133	141	147	145	137	129	114	108	117	131	137	147	146	139	130	114		
95	101	110	121	135	136	132	125	109	102	111	127	132	138	134	122	112	99.3		
100	37.5	51.0	68.3	92.0	115	125	123	110	106	111	124	122	111	84.9	54.1	42.8	35.5		
105	97.6	120	108	83.1	78.1	85.2	88.9	87.9	88.3	86.5	87.2	82.3	78.7	86.0	129	113	106		
110	90.6	109	124	97.2	68.3	62.9	60.7	61.8	61.0	62.3	59.9	61.8	77.2	113	130	101	101		
115	81.3	96.6	109	107	91.8	69.4	52.9	46.8	46.2	49.3	53.8	75.5	101	115	116	85.8	93.8		
120	72.2	84.9	95.5	94.3	96.1	83.5	80.3	76.1	74.5	78.3	81.4	91.6	96.9	100.0	99.8	73.1	85.8		
125	59.6	69.6	78.6	78.6	76.9	81.6	100	105	107	104	97.8	76.9	76.2	80.2	79.7	56.2	73.8		
130	41.6	39.6	56.3	57.3	54.0	73.1	87.6	90.3	92.8	90.1	86.7	69.2	53.4	56.5	55.7	41.4	23.7		
135	28.8	23.4	30.1	28.7	44.1	60.7	73.4	76.8	79.6	76.3	72.2	57.2	40.5	28.9	26.2	27.3	31.7		
140	11.4	5.78	5.01	20.6	34.0	47.7	55.5	59.3	61.3	59.0	54.7	44.6	31.3	17.3	1.21	7.62	12.1		
145	1.06	1.22	1.20	11.5	24.1	34.5	39.8	42.5	44.0	42.8	39.4	32.8	21.8	7.78	1.14	1.14	1.20		
150	1.15	1.16	1.16	1.15	12.2	21.8	26.5	29.1	30.4	29.0	26.2	20.1	9.24	1.09	1.10	0.98	1.16		
155	1.15	1.02	1.12	1.14	1.14	2.51	10.7	13.9	15.2	13.8	10.1	1.10	1.06	1.07	1.10	1.00	1.13		
160	1.17	1.15	1.04	1.14	1.13	1.12	1.11	1.07	1.00	1.00	1.01	1.06	1.05	1.08	1.03	1.13	1.14		
165	1.15	1.17	1.18	1.07	1.08	1.11	1.07	1.01	0.97	0.96	0.97	1.00	1.01	1.01	1.06	1.14	1.14		
170	1.20	1.21	1.23	1.23	1.22	1.11	1.05	0.99	0.97	0.97	0.96	0.97	0.99	1.06	1.14	1.16	1.16		
175	1.23	1.24	1.23	1.24	1.19	1.15	1.10	1.05	1.04	1.03	1.06	1.04	1.05	1.11	1.14	1.15	1.16		
180	1.17	1.19	1.19	1.21	1.20	1.19	1.17	1.16	1.15	1.15	1.13	1.14	1.16	1.19	1.19	1.17	1.16		

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.

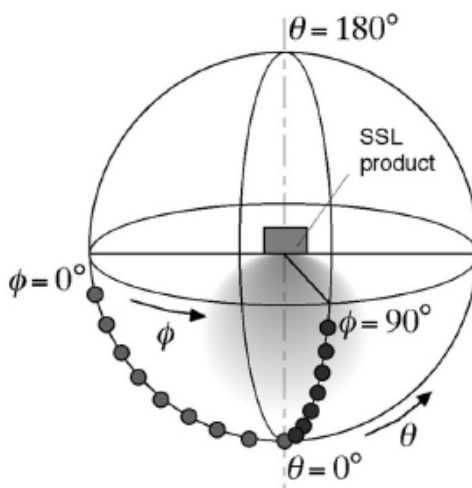
Color Characteristics Measurements

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 ***

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