



## **LM-79-08 Test Report**

for

### **ABOVE ALL LIGHTING INC**

1501 Industrial Way N. Toms River, NJ 08755.

### **LED Security Light**

**Model: ABBSEC14504**

### **Laboratory: Leading Testing Laboratories**

**NVLAP CODE: 200960-0**

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Report No.: HZ17060019b

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

**Reviewed by:**

Engineer: April Zou

Jun. 13, 2017

Approved by:

Manager: Jim Zhang

Jun. 13, 2017

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: **ABBSEC14504**

Luminous Efficacy (Lumens /Watt)	Total Luminous Flux (Lumens)	Power (Watts)	Power Factor
121.3	1402.3	11.56	0.9904
CCT (K)	CRI	BUG	Stabilization Time (Light & Power)
5292	84.1	B0-U3-G2	60

Table 1: Executive Data Summary

### Test specifications:

<b>Date of Receipt</b>	: Jun. 12, 2017
<b>Date of Test</b>	: Jun. 12, 2017
<b>Test item</b>	: Total Luminous Flux, Luminous Distribution Intensity, Luminous Efficacy, Correlated Color Temperature, Color Rendering Index, Chromaticity Coordinate, Electrical parameters
<b>Reference Standard</b>	: 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)

<b>Name</b>	: LED Security Light
<b>Model</b>	: ABBSEC14504
<b>Electrical Ratings</b>	: 120V, 50/60Hz, 14W
<b>Product Description</b>	: 5000K Manufacturer of light source: LG Innotek Co., Ltd Model of light source: LGIT 5630HE Package
<b>Manufacturer</b>	: ABOVE ALL LIGHTING (SHANGHAI) Co., Ltd.
<b>Address</b>	: Room 1012, North Minch Fortune 108 Plaza, # 1839 Qixin road, Shanghai

## TEST RESULTS

Test ambient temperature was 25.1 °C.

Base orientation was Base up. 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 2.47 m.

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

Parameter	Result
Test Voltage (V)	120.0
Voltage frequency (Hz)	60
Test Current (A)	0.097
Power Factor	0.9904
Test Power (W)	11.56
THD A%	11.67
Luminous Efficacy (lm/W)	121.3
Total Luminous Flux (lm)	1402.3
Color Rendering Index (CRI)	84.1
R9	11
Correlated Color Temperature (CCT) (K)	5292
Chromaticity (Chroma x, Chroma y)	(0.3372, 0.3416)
Chromaticity (Chroma u, Chroma v)	(0.2100, 0.3190)
Chromaticity (Chroma u', Chroma v')	(0.2100, 0.4785)
Duv	0.0019
Average Beam Angle (°)	105.0
Center Beam Candle Power (cd)	257
Spacing Criteria	0.44 (0°-180°)/ 1.29 (90°-270°)
Zonal Lumens in the 0°-60°Zone	47.46%
Zonal Lumens in the 60°-90°Zone	32.62%
Zonal Lumens in the 90°-120°Zone	15.85%
Zonal Lumens in the 120°-180°Zone	4.08%

Special Rendering Indices	Color
R1	83
R2	88
R3	92
R4	86
R5	85
R6	84
R7	86
R8	69
R9	11
R10	72
R11	87
R12	74
R13	84
R14	95

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

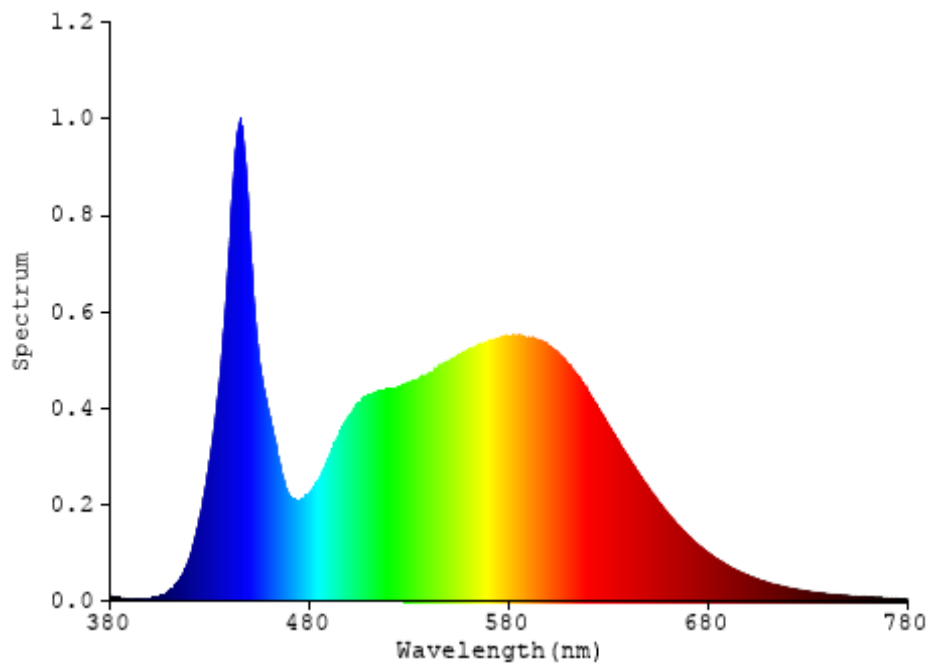


Chart 1: Spectral Power Distribution

## Zonal Lumen Tabulation

$\gamma(^{\circ})$	Lumens	% Total
0- 10	25.243	1.80%
10- 20	73.55	5.25%
20- 30	108.639	7.75%
30- 40	134.723	9.61%
40- 50	153.457	10.94%
50- 60	169.854	12.11%
60- 70	175.067	12.48%
70- 80	156.237	11.14%
80- 90	126.063	8.99%
90-100	97.3	6.94%
100-110	74.513	5.31%
110-120	50.417	3.60%
120-130	29.303	2.09%
130-140	15.054	1.07%
140-150	7.662	0.55%
150-160	3.937	0.28%
160-170	1.175	0.08%
170-180	0.083	0.01%
Total	1402.3	100%

$\gamma(^{\circ})$	Lumens	% Total
0- 60	665.466	47.46%
60- 90	457.367	32.62%
0-90	1122.833	80.07%
90- 180	279.444	19.93%
0- 180	1402.3	100%

Table 3: Zonal Lumen Data

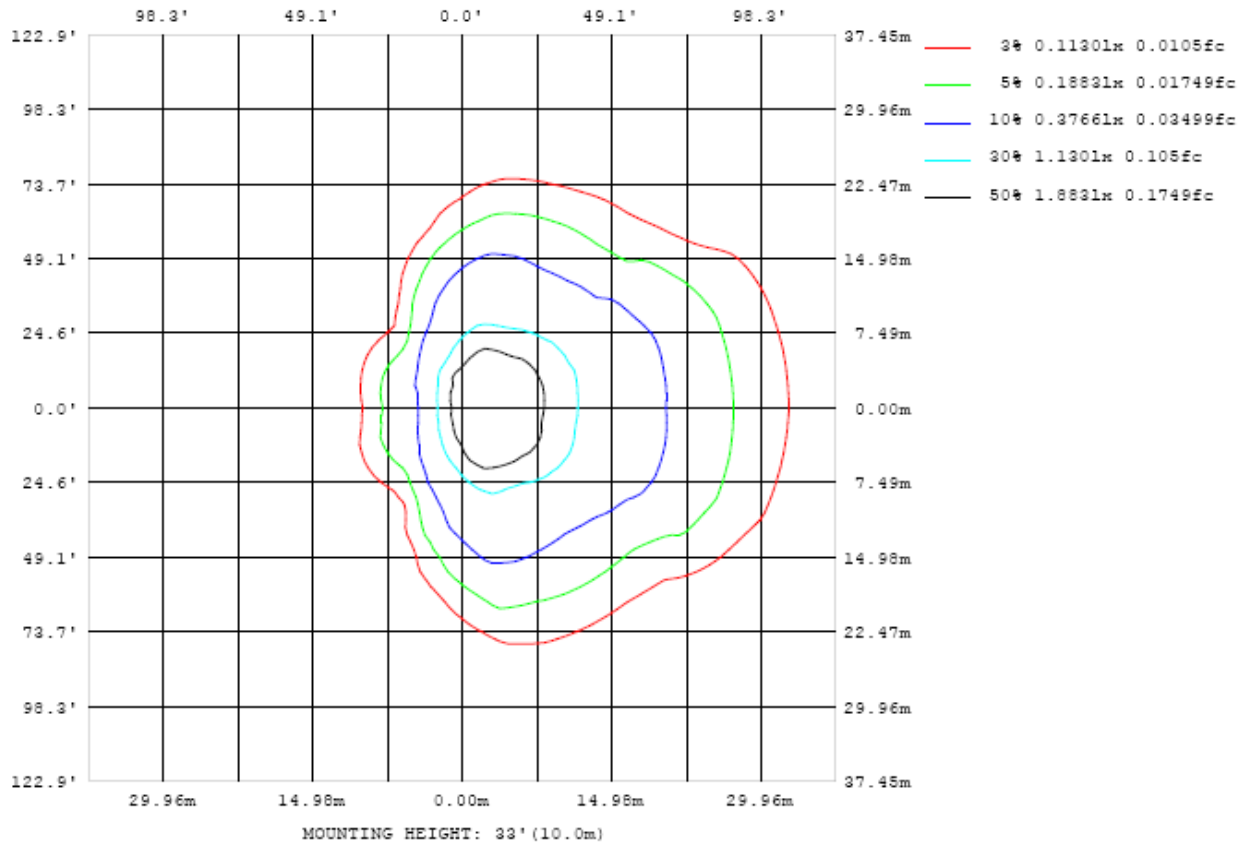


Chart 2: Illuminance Plot (Footcandles)



## Luminous Intensity Distribution Plots

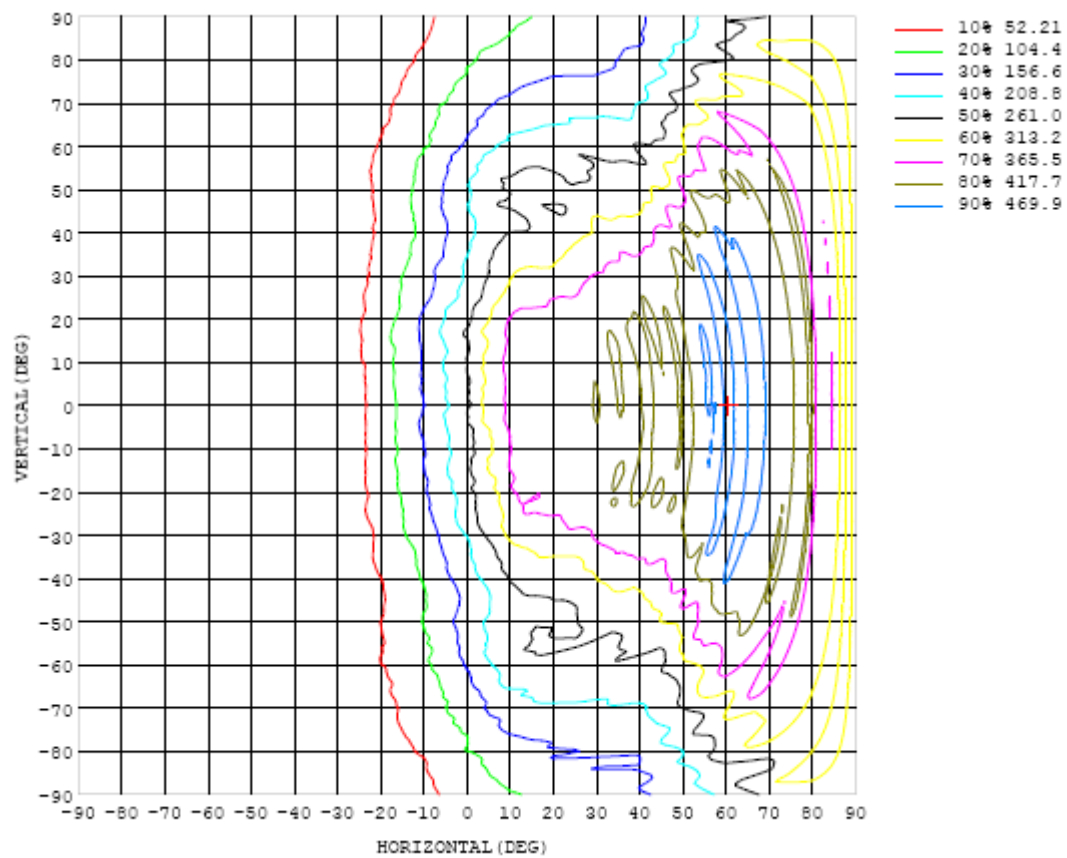


Chart 3: Isocandela Plot

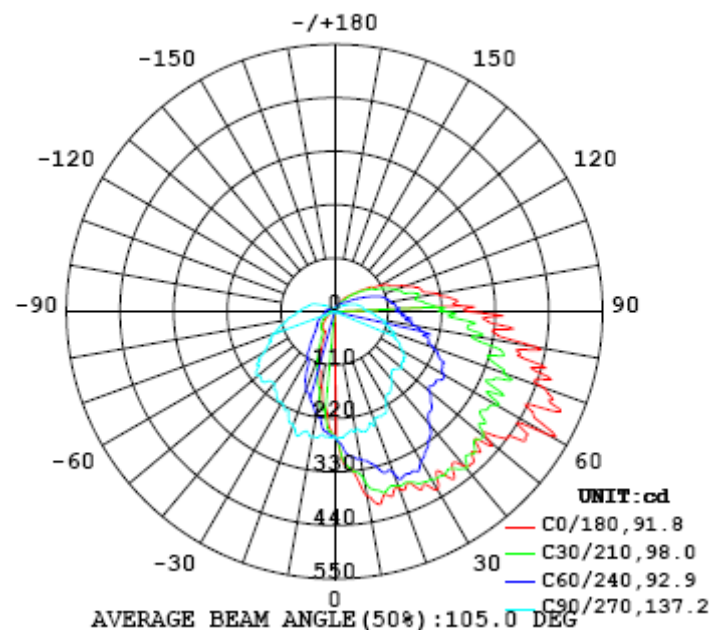


Chart 4: Polar Candela Distribution

## 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	257	257	257	257	257	257	257	257	257	257	257	257	257	257	257	257	257	257	257
5	321	319	319	320	318	311	294	270	258	255	252	250	243	234	219	215	213	206	200
10	385	385	386	352	328	317	308	298	264	250	240	221	201	197	186	169	167	161	156
15	391	390	391	386	380	362	330	316	281	254	234	203	185	157	142	126	129	129	126
20	387	379	374	382	390	386	353	318	288	239	208	185	148	133	119	94.5	88.0	82.5	79.3
25	400	385	379	388	375	372	367	317	286	234	193	160	126	106	81.7	64.7	53.2	45.9	44.6
30	422	416	405	398	391	373	355	330	274	212	170	136	106	77.8	53.9	46.9	48.2	46.2	45.4
35	421	405	395	402	389	358	335	305	252	200	154	110	79.4	53.1	45.7	47.7	45.8	43.4	42.1
40	415	397	405	421	371	329	303	290	240	182	140	93.2	64.6	41.7	44.2	45.6	44.8	40.2	37.9
45	407	408	419	407	366	313	282	269	221	169	119	76.9	46.1	36.2	40.6	41.9	40.9	33.8	31.2
50	416	425	400	399	339	301	253	252	237	181	122	72.8	36.4	34.0	35.5	35.5	33.0	27.0	25.1
55	453	442	427	364	311	291	254	265	238	174	109	65.0	35.6	30.4	31.4	28.9	25.5	20.6	20.0
60	506	477	434	385	296	257	258	256	235	161	104	62.0	32.8	29.6	27.1	22.9	18.7	15.3	14.5
65	467	449	457	346	271	263	249	232	218	144	87.5	51.2	35.4	28.5	21.7	17.3	12.7	10.6	10.2
70	456	457	453	367	267	223	215	209	191	131	78.6	43.6	26.4	26.9	18.6	12.7	7.11	6.53	6.71
75	449	418	413	353	242	192	188	177	167	111	69.6	40.6	23.5	22.2	17.1	9.79	3.48	2.86	2.05
80	421	426	380	290	219	173	166	156	141	103	58.6	32.2	20.9	18.0	15.2	8.40	2.28	0.33	0.37
85	357	353	342	289	216	158	158	149	124	84.9	49.0	28.2	19.2	15.6	14.7	8.17	2.20	0.30	0.33
90	278	280	274	221	176	150	132	122	98.3	70.5	42.5	25.4	18.2	15.0	12.6	8.48	2.22	0.33	0.34
95	254	234	207	190	160	144	127	109	85.6	60.5	37.5	23.8	18.1	14.6	12.3	8.43	2.27	0.35	0.34
100	213	208	195	170	149	136	117	92.9	79.6	58.2	36.0	22.9	16.8	13.4	11.9	7.89	2.29	0.37	0.35
105	182	174	159	148	148	122	108	79.2	69.5	50.7	30.9	20.2	15.6	12.2	10.7	7.03	2.33	0.40	0.40
110	154	156	145	134	121	111	90.9	68.2	61.3	44.4	28.0	17.2	14.0	10.7	9.17	6.05	2.34	0.43	0.40
115	125	128	124	114	106	88.9	71.2	55.6	50.3	35.7	22.5	14.7	12.2	9.34	7.25	5.30	2.25	0.45	0.39
120	108	108	102	93.3	82.4	73.6	53.9	42.5	39.5	27.5	18.1	12.6	9.88	7.29	5.85	4.93	2.07	0.46	0.38
125	86.6	87.3	81.9	76.9	68.8	57.0	40.2	33.1	31.9	22.1	15.6	10.5	7.57	5.92	5.03	4.07	1.89	0.47	0.36
130	64.8	58.8	62.3	61.7	54.7	44.4	30.9	27.2	26.1	17.3	12.3	8.46	6.28	5.25	4.35	3.22	1.72	0.47	0.37
135	50.1	38.9	41.3	47.1	39.6	31.2	27.0	25.1	20.5	13.5	10.1	7.59	5.74	4.63	3.61	2.94	1.55	0.47	0.39
140	39.8	29.7	26.2	32.5	27.7	24.9	23.4	22.3	18.3	12.2	9.07	6.70	4.86	3.79	3.31	2.78	1.45	0.48	0.41
145	31.1	24.6	18.8	22.1	22.0	20.7	19.9	17.5	14.1	9.31	7.04	5.24	4.10	3.58	3.20	2.53	1.30	0.46	0.42
150	20.6	17.1	15.0	17.3	18.5	19.0	17.9	15.5	11.2	7.31	5.90	4.98	4.25	3.48	2.89	2.28	1.16	0.42	0.39
155	14.3	13.7	14.0	14.7	16.9	16.3	15.5	13.0	10.2	7.35	6.07	4.96	4.03	3.27	2.69	2.01	1.02	0.40	0.36
160	12.3	12.1	11.5	10.3	12.1	13.6	12.9	11.0	8.70	6.49	5.58	4.78	4.17	3.40	2.56	1.76	0.79	0.31	0.34
165	1.72	1.07	2.87	5.90	7.45	8.64	9.33	8.85	7.49	6.30	5.60	4.78	3.90	3.10	2.35	1.42	0.55	0.28	0.32
170	0.22	0.22	0.15	1.66	4.07	5.14	5.47	5.53	5.28	4.86	4.35	3.79	3.18	2.49	1.57	0.64	0.28	0.31	0.31
175	0.24	0.24	0.24	0.25	0.26	0.27	0.28	0.49	0.84	1.04	0.94	0.64	0.38	0.30	0.30	0.30	0.30	0.30	0.30
180	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27

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	257	257	257	257	257	257	257	257	257	257	257	257	257	257	257	257	257		
5	206	212	216	222	235	246	252	254	255	265	282	300	312	315	319	322	322		
10	158	164	177	190	201	214	234	249	261	287	311	327	334	344	365	379	386		
15	123	123	135	150	166	189	210	242	258	295	315	347	378	398	402	394	391		
20	81.8	89.0	105	120	138	170	199	229	250	294	338	376	383	395	394	388	386		
25	47.2	53.1	67.0	92.1	114	137	167	196	225	272	333	369	391	385	389	394	398		
30	46.8	47.7	48.1	61.1	84.8	112	139	174	217	264	315	336	365	393	409	415	418		
35	44.4	46.3	45.8	44.7	58.3	88.7	121	154	207	260	306	318	338	375	398	417	423		
40	41.6	43.4	43.6	41.5	42.5	68.8	103	143	193	251	281	297	326	379	406	417	415		
45	35.5	38.5	38.6	37.7	35.4	55.1	91.7	145	205	249	262	274	322	367	408	418	415		
50	28.1	31.2	33.3	33.3	32.0	47.2	90.0	140	204	257	269	257	319	341	393	421	421		
55	21.1	25.1	28.2	30.0	31.6	42.3	80.5	128	192	251	274	261	288	320	388	433	453		
60	14.6	18.4	22.6	26.8	30.9	38.9	68.3	111	167	222	240	250	276	300	388	476	506		
65	9.72	12.2	17.2	23.7	29.2	32.2	56.0	95.7	144	193	216	236	242	270	383	464	473		
70	5.63	6.20	12.7	20.7	24.3	25.8	48.3	86.9	131	169	190	205	220	273	370	442	447		
75	1.55	3.87	10.7	17.9	19.9	23.2	38.3	72.1	115	148	165	174	197	267	363	417	441		
80	0.39	3.30	9.95	16.3	16.8	21.1	32.2	59.0	98.1	130	145	148	168	243	317	379	412		
85	0.34	3.10	9.35	14.5	15.5	18.9	30.1	50.1	82.0	108	126	135	154	222	258	306	344		
90	0.33	2.87	9.13	13.4	15.1	19.1	27.2	45.4	73.7	94.6	115	127	152	184	255	262	278		
95	0.33	2.58	8.89	12.5	14.5	18.4	25.0	42.2	67.1	86.0	100	119	153	165	192	228	257		
100	0.32	2.40	7.62	11.0	13.5	17.3	22.4	37.1	57.9	73.5	85.2	115	139	171	183	194	209		
105	0.33	2.21	7.06	9.82	11.9	15.5	19.8	33.0	52.4	67.0	79.2	106	122	144	159	173	186		
110	0.35	1.94	5.90	8.85	10.1	13.1	16.5	27.9	47.1	60.0	66.4	87.8	108	129	143	152	159		
115	0.34	1.64	4.68	6.77	8.63	10.9	13.7	21.1	34.2	45.4	51.4	69.3	88.8	104	113	125	130		
120	0.34	1.22	3.99	4.97	6.40	8.66	12.0	17.8	27.1	35.8	39.1	53.5	71.0	84.4	96.5	102	107		
125	0.35	1.01	3.43	4.29	5.06	6.64	9.59	14.5	20.9	29.9	29.7	38.4	56.1	68.1	78.5	84.9	86.8		
130	0.37	0.95	2.59	3.94	4.68	5.75	8.41	11.4	15.9	24.9	27.8	31.7	42.5	53.9	55.5	46.6	67.7		
135	0.40	0.80	2.31	3.09	4.27	5.51	7.34	10.2	14.2	21.3	25.2	27.2	31.2	38.2	39.3	30.7	54.5		
140	0.43	0.74	2.16	2.91	3.43	4.64	6.55	9.00	12.3	19.3	22.2	22.6	24.1	26.2	24.8	25.1	42.1		
145	0.44	0.70	1.76	2.86	3.57	4.08	5.02	6.40	8.40	14.0	18.6	19.7	20.2	20.3	18.4	24.0	31.2		
150	0.42	0.56	1.45	2.38	3.32	4.72	5.87	6.69	8.04	12.6	17.6	19.1	18.2	16.1	16.0	19.5	20.6		
155	0.41	0.34	1.03	1.95	3.08	4.27	5.42	6.54	7.81	11.0	13.8	15.3	14.2	14.0	14.7	13.2	15.2		
160	0.37	0.34	0.48	1.11	2.42	3.93	5.07	6.33	7.34	9.28	10.9	11.2	10.2	9.04	7.34	7.11	10.8		
165	0.33	0.33	0.32	0.29	0.80	2.41	4.23	5.45	6.11	7.17	7.84	7.94	7.06	2.86	0.00	0.46	1.18		
170	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.35	0.66	0.68	0.35	0.27	0.29	0.28	0.28	0.28	0.23		
175	0.30	0.26	0.27	0.26	0.26	0.26	0.27	0.28	0.28	0.29	0.29	0.29	0.28	0.28	0.28	0.25	0.24		
180	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27		

Table 5: Luminous Intensity Data

## EQUIPMENT LIST

Test Equipment	Model	Equipment No.	Calibration Date	Calibration Due date
Goniophotometer system	GO-R5000	HZTE011-01	Jul. 26, 2016	Jul. 25, 2017
Digital Power Meter	PF2010A	HZTE028-01	Jul. 26, 2016	Jul. 25, 2017
AC Power Supply	DPS1060	HZTE001-06	Dec. 25, 2016	Dec. 24, 2017
DC Power Supply	WY12010	HZTE004-03	Dec. 25, 2016	Dec. 24, 2017
Temperature Meter	TES1310	HZTE017-01	Aug. 08, 2016	Aug. 07, 2017
Standard Source	D908	HZTE012-01	Jul. 28, 2016	Jul. 27, 2017
Standard source	SCL-1400	HZTE012-02	Jul. 28, 2016	Jul. 27, 2017

Table 8: 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 expanded uncertainty is 2.3% 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 \*\*\*

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.

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