



LM-79-08 Test Report

for

ABOVE ALL LIGHTING INC

1501 Industrial Way N. Toms River, NJ 08755.

V-Line Flood Light

Model: FL70501

Laboratory: Leading Testing Laboratories

NVLAP CODE: 200960-0

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Report No.: HZ17030090h

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

Reviewed by:

April Zou

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Apr. 13, 2017

Approved by:  *Jim Zhang*

Manager: Jim Zhang

Apr. 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: **FL70501**

Luminous Efficacy (Lumens /Watt)	Total Luminous Flux (Lumens)	Power (Watts)	Power Factor
121.0	9619.4	79.52	0.9917
CCT (K)	CRI	BUG	Stabilization Time (Light & Power)
4759	67.2	B3-U1-G1	60

Table 1: Executive Data Summary

Test specifications:

Date of Receipt	: Mar. 24, 2017
Date of Test	: Apr. 06, 2017
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	: V-Line Flood Light
Model	: FL70501
Electrical Ratings	: 120~277Vac, 50/60Hz
Product Description	: 5000K Manufacturer of light source: Samsung Model of light source: LH351B
Manufacturer	: ABOVE ALL LIGHTING (SHANGHAI) Co., Ltd.
Address	: Room 1012, North Minch Fortune 108 Plaza, # 1839 Qixin road, Shanghai

TEST RESULTS

Test ambient temperature was 24.6°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	277.0
Voltage frequency (Hz)	60	60
Test Current (A)	0.668	0.296
Power Factor	0.9917	0.9564
Test Power (W)	79.52	78.41
THD A%	9.16	13.60
Luminous Efficacy (lm/W)	121.0	122.2
Total Luminous Flux (lm)	9619.4	9579.3
Color Rendering Index (CRI)	67.2	
R9	-39	
Correlated Color Temperature (CCT) (K)	4759	
Chromaticity (Chroma x, Chroma y)	(0.3534, 0.3662)	
Chromaticity (Chroma u, Chroma v)	(0.2114, 0.3285)	
Chromaticity (Chroma u', Chroma v')	(0.2114, 0.4928)	
Duv	0.0040	
Average Beam Angle (°)	83.8	
Center Beam Candle Power (cd)	5008	
Spacing Criteria	0.61 (0°-180°)/ 1.43 (90°-270°)	
Zonal Lumens in the 0°-60°Zone	93.81%	
Zonal Lumens in the 60°-90°Zone	6.12%	
Zonal Lumens in the 90°-120°Zone	0.01%	
Zonal Lumens in the 120°-180°Zone	0.06%	

Special Color Rendering Indices	
R1	65
R2	71
R3	76
R4	69
R5	65
R6	61
R7	77
R8	54
R9	-39
R10	32
R11	65
R12	35
R13	65
R14	86

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

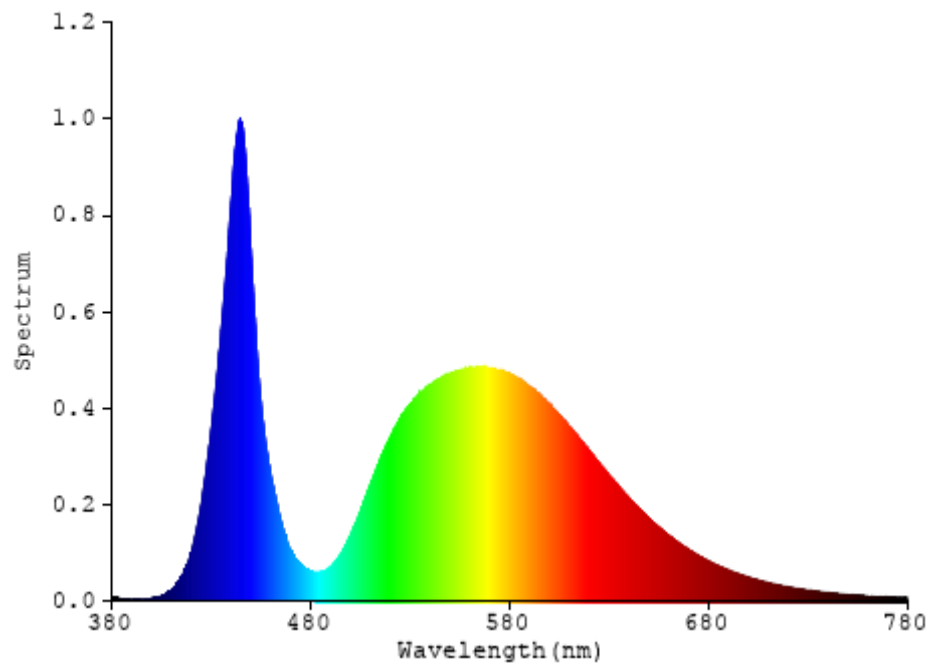


Chart 1: Spectral Power Distribution

Zonal Lumen Tabulation

$\gamma(^{\circ})$	Lumens	% Total
0- 10	467.862	4.86%
10- 20	1322.985	13.75%
20- 30	1886.687	19.61%
30- 40	2075.84	21.58%
40- 50	1962.961	20.41%
50- 60	1307.585	13.59%
60- 70	513.574	5.34%
70- 80	73.355	0.76%
80- 90	1.552	0.02%
90-100	0.163	0.00%
100-110	0.363	0.00%
110-120	0.601	0.01%
120-130	0.87	0.01%
130-140	1.234	0.01%
140-150	1.412	0.01%
150-160	1.232	0.01%
160-170	0.838	0.01%
170-180	0.303	0.00%
Total	9619.4	100%

$\gamma(^{\circ})$	Lumens	% Total
0- 60	9023.92	93.81%
60- 90	588.481	6.12%
0-90	9612.401	99.93%
90- 180	7.016	0.07%
0- 180	9619.4	100%

Table 3: Zonal Lumen Data

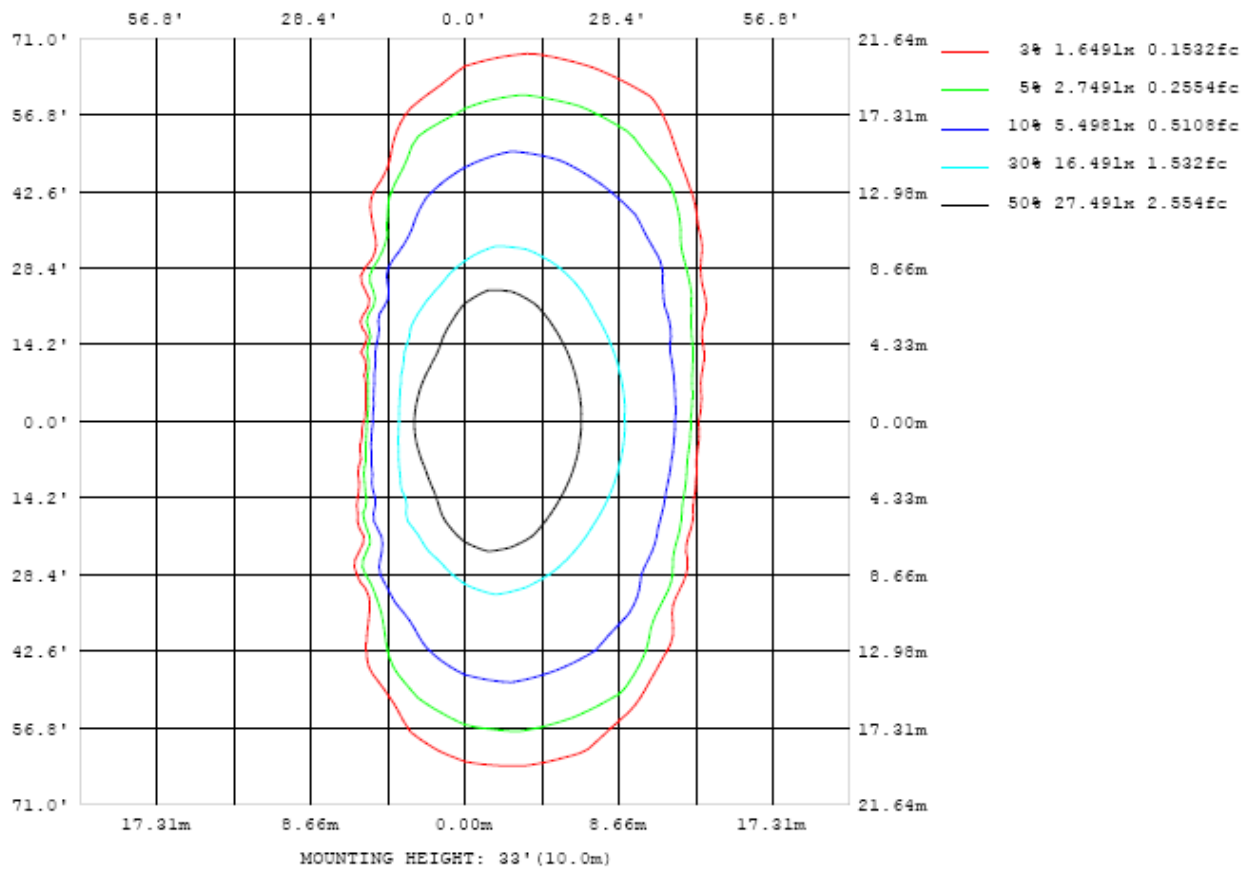


Chart 2: Illuminance Plot (Footcandles)

Luminous Intensity Distribution Plots

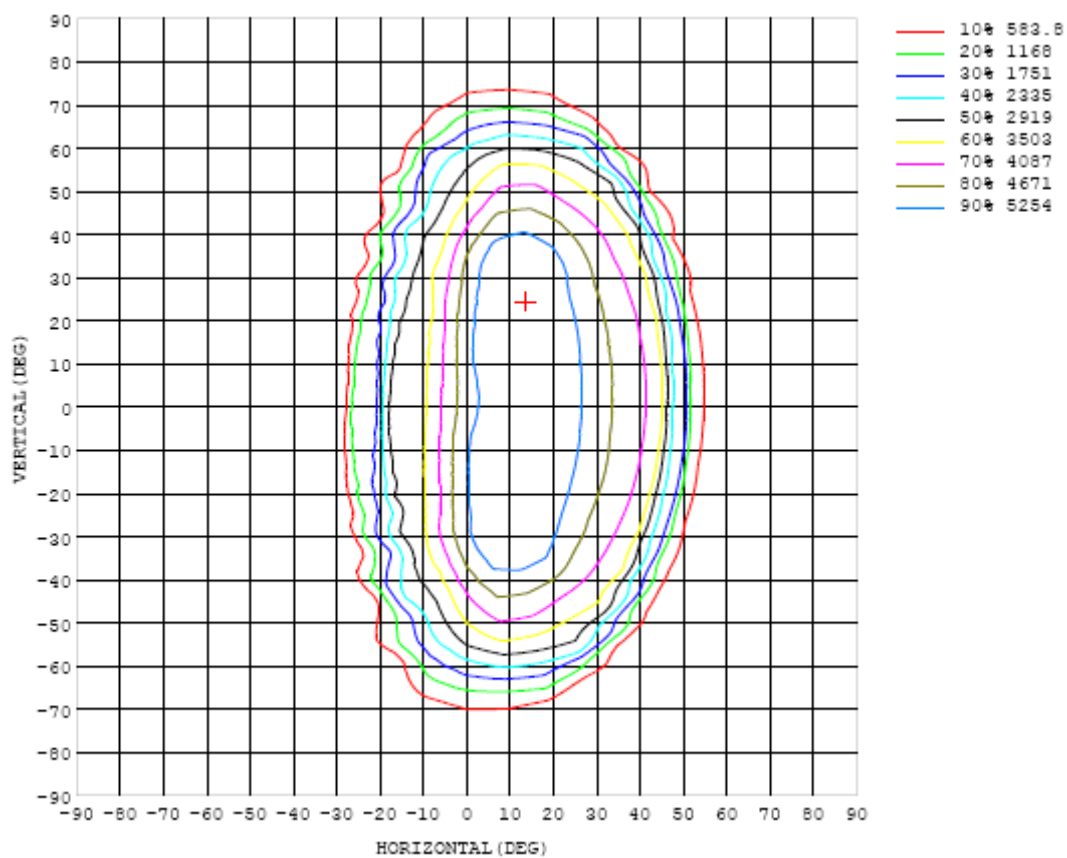


Chart 3: Isocandela Plot

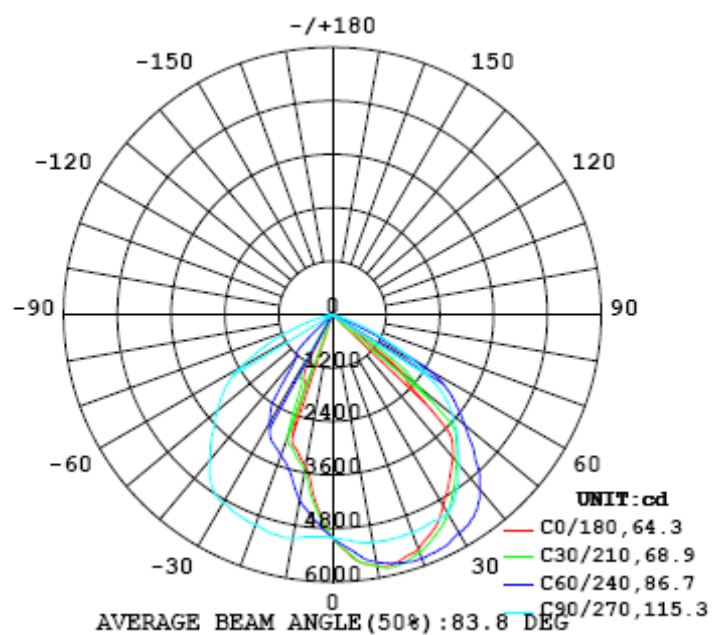


Chart 4: Polar Candela Distribution

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	5008	5008	5008	5008	5008	5008	5008	5008	5008	5008	5008	5008	5008	5008	5008	5008	5008	5008	5008
5	5491	5496	5486	5461	5429	5384	5328	5272	5199	5103	4992	4858	4714	4592	4475	4370	4306	4265	4249
10	5725	5723	5725	5733	5744	5717	5635	5529	5395	5194	4947	4648	4345	4055	3786	3601	3515	3468	3453
15	5734	5740	5782	5813	5829	5798	5773	5717	5503	5209	4825	4351	3845	3512	3356	3253	3185	3140	3127
20	5599	5612	5648	5674	5712	5777	5830	5775	5585	5207	4684	3961	3481	3213	3113	2987	2665	2238	2042
25	5335	5343	5391	5457	5550	5677	5786	5798	5597	5164	4501	3641	3179	3074	2277	1716	1583	1602	1494
30	4956	4968	5039	5158	5305	5456	5660	5804	5672	5121	4307	3440	3047	1942	1605	1154	597	242	208
35	4551	4562	4634	4736	4912	5192	5521	5578	5447	4829	3857	3128	2356	1675	607	228	189	185	170
40	4190	4191	4229	4312	4464	4731	5123	5202	5103	4407	3400	2795	1610	560	217	169	174	160	153
45	3538	3535	3765	3914	4052	4245	4499	4648	4610	3950	2935	2470	1324	284	142	173	170	162	156
50	2022	2009	2121	2469	3514	3740	3857	4095	4089	3506	2570	1382	249	145	169	180	185	177	169
55	560	553	601	851	2039	2902	3288	3414	3445	2941	2139	1134	208	153	180	190	163	147	142
60	113	111	147	332	538	1379	2496	2494	2460	2107	1513	204	136	172	161	155	149	139	136
65	71.3	72.2	85.1	93.2	93.8	282	841	1446	1402	1277	909	114	126	141	150	130	105	78.5	74.6
70	10.0	9.78	10.2	15.4	38.2	63.4	101	433	599	579	245	64.5	96.1	114	67.4	30.6	7.07	4.07	2.90
75	7.03	7.50	7.45	6.69	6.24	7.78	19.0	26.6	105	105	26.2	24.2	46.9	9.74	1.82	1.07	1.13	1.17	1.26
80	0.73	0.67	0.67	1.01	2.72	4.78	3.95	4.32	4.71	4.80	3.54	1.87	1.03	0.73	0.37	0.32	0.31	0.30	0.32
85	0.32	0.32	0.32	0.34	0.33	0.32	0.31	0.34	0.81	1.02	0.67	0.22	0.16	0.13	0.12	0.12	0.13	0.13	0.13
90	0.09	0.08	0.07	0.07	0.08	0.09	0.10	0.11	0.13	0.15	0.16	0.16	0.15	0.12	0.07	0.05	0.05	0.04	0.04
95	0.06	0.06	0.07	0.07	0.07	0.09	0.12	0.15	0.18	0.21	0.23	0.25	0.23	0.20	0.15	0.10	0.06	0.05	0.06
100	0.06	0.06	0.07	0.07	0.08	0.12	0.16	0.21	0.26	0.29	0.32	0.35	0.34	0.30	0.25	0.18	0.11	0.08	0.11
105	0.07	0.07	0.07	0.07	0.10	0.15	0.23	0.29	0.36	0.40	0.44	0.47	0.46	0.42	0.36	0.30	0.21	0.16	0.24
110	0.07	0.07	0.08	0.09	0.13	0.20	0.31	0.40	0.47	0.52	0.57	0.60	0.59	0.54	0.47	0.41	0.32	0.28	0.45
115	0.09	0.08	0.08	0.11	0.15	0.27	0.36	0.52	0.61	0.67	0.74	0.78	0.76	0.70	0.62	0.55	0.46	0.44	0.71
120	0.10	0.10	0.10	0.14	0.20	0.36	0.52	0.59	0.78	0.88	0.96	0.99	0.97	0.90	0.82	0.77	0.68	0.70	1.04
125	0.13	0.13	0.15	0.23	0.29	0.47	0.67	0.81	0.97	1.11	1.22	1.25	1.20	1.15	1.04	1.03	0.95	1.00	1.43
130	0.22	0.22	0.28	0.39	0.43	0.61	0.87	1.10	1.16	1.41	1.55	1.63	1.56	1.46	1.40	1.38	1.28	1.40	1.93
135	0.42	0.38	0.45	0.56	0.64	0.79	1.00	1.28	1.39	1.61	1.76	1.87	1.88	1.89	1.84	1.76	1.72	1.91	2.52
140	0.61	0.53	0.62	0.76	0.84	1.04	1.26	1.46	1.68	1.87	2.06	2.24	2.29	2.29	2.20	2.14	2.09	2.38	3.10
145	0.91	0.73	0.87	0.95	1.04	1.13	1.34	1.59	1.76	2.01	2.20	2.34	2.37	2.43	2.44	2.42	2.39	2.78	3.60
150	1.33	1.02	1.17	1.28	1.29	1.32	1.41	1.61	1.72	1.88	2.10	2.26	2.37	2.51	2.62	2.66	2.60	3.17	3.96
155	1.82	1.36	1.50	1.64	1.64	1.55	1.59	1.68	1.82	1.83	2.13	2.30	2.42	2.58	2.74	2.85	2.78	3.50	4.16
160	2.48	1.73	1.89	1.95	2.00	1.89	1.76	1.78	1.87	1.88	2.22	2.39	2.52	2.71	2.83	2.90	2.92	3.75	4.19
165	3.07	2.09	2.27	2.32	2.34	2.22	2.08	2.09	2.23	2.22	2.53	2.70	2.81	2.91	2.99	3.12	3.13	3.77	3.92
170	3.45	2.95	2.51	2.55	2.55	2.50	2.24	2.28	2.41	2.39	2.61	2.77	2.87	2.98	3.07	3.13	3.34	3.60	3.68
175	3.45	3.51	3.50	2.88	3.02	3.01	3.03	2.86	2.92	2.74	3.00	3.22	3.37	3.48	3.49	3.31	3.35	3.50	3.56
180	2.94	2.94	2.94	2.94	2.94	2.94	2.94	2.94	2.94	2.94	2.94	2.94	2.94	2.94	2.94	2.94	2.94	2.94	2.94

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	5008	5008	5008	5008	5008	5008	5008	5008	5008	5008	5008	5008	5008	5008	5008	5008	5008		
5	4258	4291	4338	4409	4514	4621	4740	4883	5009	5109	5189	5254	5310	5368	5416	5449	5473		
10	3460	3492	3552	3683	3916	4233	4496	4783	5091	5272	5439	5566	5639	5652	5669	5694	5718		
15	3134	3165	3240	3335	3442	3662	4149	4644	5092	5377	5608	5723	5781	5816	5798	5752	5737		
20	2115	2487	2930	3079	3187	3365	3711	4437	5030	5471	5759	5799	5795	5753	5701	5658	5607		
25	1497	1615	1593	2068	2900	3171	3403	4247	4974	5532	5792	5829	5728	5609	5510	5423	5365		
30	171	283	982	1507	1845	2794	3230	3947	4887	5526	5755	5762	5578	5397	5260	5100	4993		
35	172	192	193	441	1328	2131	2945	3596	4698	5491	5763	5675	5365	5094	4857	4681	4607		
40	154	163	182	175	368	1284	2671	3237	4267	5183	5447	5383	5101	4666	4446	4301	4220		
45	155	159	168	173	134	925	1954	2842	3792	4719	4979	4884	4594	4237	4046	3901	3749		
50	170	177	181	173	173	132	1206	2481	3359	4234	4454	4255	4056	3824	3419	2271	2106		
55	144	165	190	181	171	146	841	2160	2949	3724	3865	3649	3469	2924	1809	752	603		
60	139	146	156	172	181	162	112	1604	2344	2958	3144	2989	2631	1176	487	370	163		
65	91.0	104	143	154	162	159	112	691	1632	2047	2085	2015	1055	300	95.6	97.1	85.1		
70	3.76	16.9	41.5	105	135	125	97.9	299	905	1118	1078	657	145	69.2	58.2	26.6	13.4		
75	1.31	1.40	1.69	3.77	46.1	92.4	67.3	26.9	333	404	388	71.8	42.6	14.9	7.34	7.24	7.46		
80	0.37	0.42	0.59	0.89	1.24	7.48	24.9	6.36	45.1	62.7	25.1	10.1	5.89	6.16	4.71	2.43	1.16		
85	0.13	0.14	0.14	0.16	0.23	0.41	0.91	2.28	3.36	3.93	4.24	2.14	1.08	0.50	0.39	0.33	0.31		
90	0.06	0.06	0.09	0.10	0.12	0.16	0.20	0.23	0.29	0.33	0.19	0.20	0.18	0.15	0.15	0.14	0.13		
95	0.06	0.06	0.08	0.12	0.20	0.28	0.34	0.35	0.31	0.24	0.15	0.10	0.09	0.08	0.07	0.07	0.07		
100	0.11	0.13	0.19	0.29	0.41	0.53	0.60	0.60	0.52	0.40	0.25	0.15	0.10	0.09	0.09	0.09	0.08		
105	0.24	0.30	0.41	0.56	0.71	0.84	0.92	0.90	0.78	0.59	0.40	0.24	0.13	0.11	0.10	0.10	0.09		
110	0.46	0.54	0.69	0.84	1.02	1.17	1.23	1.18	1.02	0.80	0.57	0.34	0.19	0.12	0.11	0.11	0.10		
115	0.71	0.79	0.93	1.10	1.26	1.37	1.41	1.35	1.18	0.94	0.70	0.45	0.27	0.15	0.12	0.11	0.11		
120	1.03	1.10	1.23	1.37	1.50	1.58	1.59	1.50	1.31	1.09	0.85	0.58	0.38	0.23	0.15	0.13	0.13		
125	1.42	1.47	1.54	1.65	1.74	1.82	1.80	1.69	1.49	1.28	1.04	0.75	0.55	0.38	0.26	0.21	0.19		
130	1.88	1.90	1.96	2.03	2.15	2.21	2.15	2.03	1.83	1.57	1.32	1.03	0.82	0.61	0.47	0.37	0.34		
135	2.45	2.44	2.51	2.58	2.64	2.65	2.60	2.47	2.24	1.97	1.72	1.37	1.17	0.99	0.80	0.64	0.60		
140	3.04	3.01	3.07	3.18	3.20	3.17	3.04	2.85	2.59	2.36	2.03	1.87	1.62	1.39	1.17	0.98	0.87		
145	3.54	3.54	3.54	3.60	3.64	3.55	3.38	3.16	2.92	2.64	2.45	2.27	2.07	1.81	1.58	1.41	1.28		
150	3.90	3.89	3.85	3.86	3.82	3.73	3.57	3.34	3.17	2.75	2.75	2.57	2.40	2.18	2.01	1.89	1.79		
155	4.11	4.14	4.09	3.94	3.82	3.69	3.52	3.27	3.14	3.02	2.92	2.72	2.63	2.53	2.49	2.37	2.23		
160	4.16	4.13	4.08	3.93	3.74	3.57	3.41	3.28	3.02	2.99	2.84	2.83	2.79	2.81	2.86	2.85	2.80		
165	4.00	3.99	3.97	3.89	3.74	3.58	3.41	3.22	3.02	2.90	2.83	2.84	2.87	2.88	2.95	3.05	3.15		
170	3.82	3.86	3.83	3.77	3.67	3.58	3.44	3.27	3.15	3.07	2.96	2.93	2.95	2.92	3.08	3.23	3.35		
175	3.60	3.60	3.53	3.48	3.44	3.39	3.28	3.19	3.13	3.02	3.05	3.18	3.11	3.05	3.06	3.19	3.34		
180	2.94	2.94	2.94	2.94	2.94	2.94	2.94	2.94	2.94	2.94	2.94	2.94	2.94	2.94	2.94	2.94	2.94		

Table 5: Luminous Intensity Data

EQUIPMENT LIST

Test Equipment	Model	Equipment No.	Calibration Date	Calibration Due date
Goniophotometer system	GO-R5000	HZTE011-01	Jul. 27, 2016	Jul. 26, 2017
Digital Power Meter	PF2010A	HZTE028-01	Jul. 27, 2016	Jul. 26, 2017
AC Power Supply	PCR 500L	HZTE001-08	Jul. 27, 2016	Jul. 26, 2017
DC Power Supply	WY12010	HZTE004-03	Jul. 27, 2016	Jul. 26, 2017
Temperature Meter	TES1310	HZTE017-01	Jul. 27, 2016	Jul. 26, 2017
Standard Source	D908	HZTE012-01	Jul. 27, 2016	Jul. 26, 2017
Standard source	SCL-1400	HZTE012-02	Jul. 27, 2016	Jul. 26, 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 1.94% with a coverage factor $k=2$.

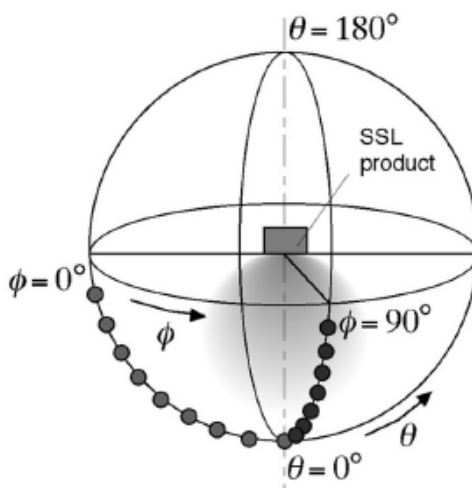
Color Characteristics Measurements

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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