



LM-79-08 Test Report

for

ABOVE ALL LIGHTING INC

1501 Industrial Way N. Toms River, NJ 08755.

V-Line Flood Light

Model: FL52501

Laboratory: Leading Testing Laboratories

NVLAP CODE: 200960-0

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Report No.: HZ17030090f

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: **FL52501**

Luminous Efficacy (Lumens /Watt)	Total Luminous Flux (Lumens)	Power (Watts)	Power Factor
127.9	6642.9	51.93	0.9944
CCT (K)	CRI	BUG	Stabilization Time (Light & Power)
4874	67.5	B2-U1-G0	60

Table 1: Executive Data Summary

Test specifications:

Date of Receipt	: Mar. 24, 2017
Date of Test	: Apr. 09, 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	: FL52501
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)	0.435	0.197
Power Factor	0.9944	0.9471
Test Power (W)	51.93	51.63
THD A%	5.91	10.07
Luminous Efficacy (lm/W)	127.9	127.9
Total Luminous Flux (lm)	6642.9	6603.9
Color Rendering Index (CRI)	67.5	
R9	-36	
Correlated Color Temperature (CCT) (K)	4874	
Chromaticity (Chroma x, Chroma y)	(0.3492, 0.3587)	
Chromaticity (Chroma u, Chroma v)	(0.2114, 0.3258)	
Chromaticity (Chroma u', Chroma v')	(0.2114, 0.4887)	
Duv	0.0020	
Average Beam Angle (°)	83.3	
Center Beam Candle Power (cd)	3156	
Spacing Criteria	0.68 (0°-180°)/ 1.36 (90°-270°)	
Zonal Lumens in the 0°-60°Zone	94.30%	
Zonal Lumens in the 60°-90°Zone	5.63%	
Zonal Lumens in the 90°-120°Zone	0.01%	
Zonal Lumens in the 120°-180°Zone	0.06%	

Special Color Rendering Indices	
R1	66
R2	71
R3	75
R4	69
R5	66
R6	61
R7	77
R8	55
R9	-36
R10	32
R11	66
R12	36
R13	65
R14	85

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

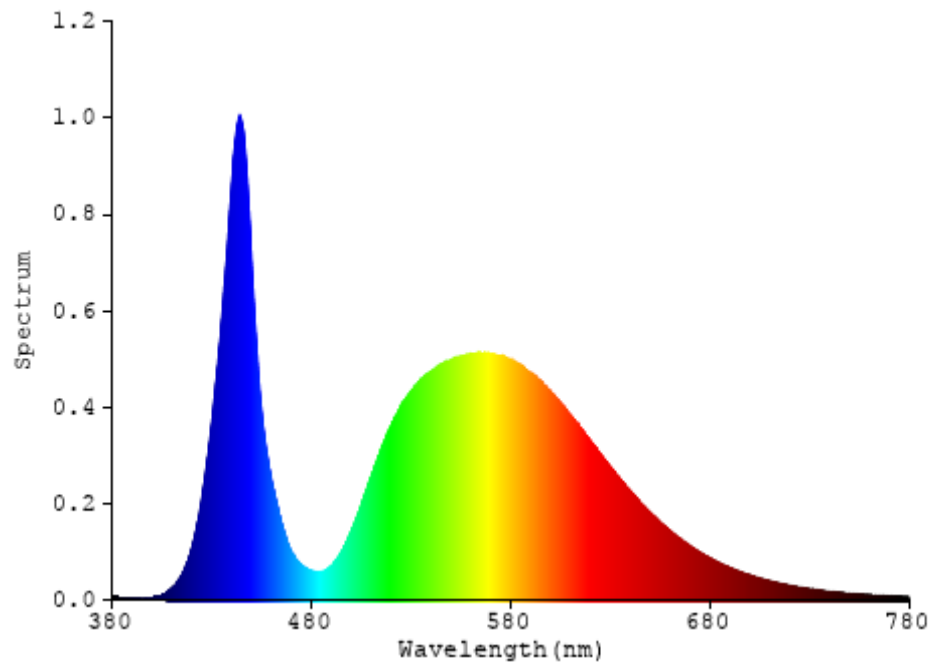


Chart 1: Spectral Power Distribution

Zonal Lumen Tabulation

$\gamma(^{\circ})$	Lumens	% Total
0- 10	301.081	4.53%
10- 20	869.03	13.08%
20- 30	1302.229	19.60%
30- 40	1455.359	21.91%
40- 50	1407.526	21.19%
50- 60	928.839	13.98%
60- 70	329.563	4.96%
70- 80	43.69	0.66%
80- 90	0.874	0.01%
90-100	0.101	0.00%
100-110	0.251	0.00%
110-120	0.408	0.01%
120-130	0.602	0.01%
130-140	0.856	0.01%
140-150	0.967	0.01%
150-160	0.821	0.01%
160-170	0.543	0.01%
170-180	0.193	0.00%
Total	6642.9	100%

$\gamma(^{\circ})$	Lumens	% Total
0- 60	6264.064	94.30%
60- 90	374.127	5.63%
0-90	6638.191	99.93%
90- 180	4.742	0.07%
0- 180	6642.9	100%

Table 3: Zonal Lumen Data

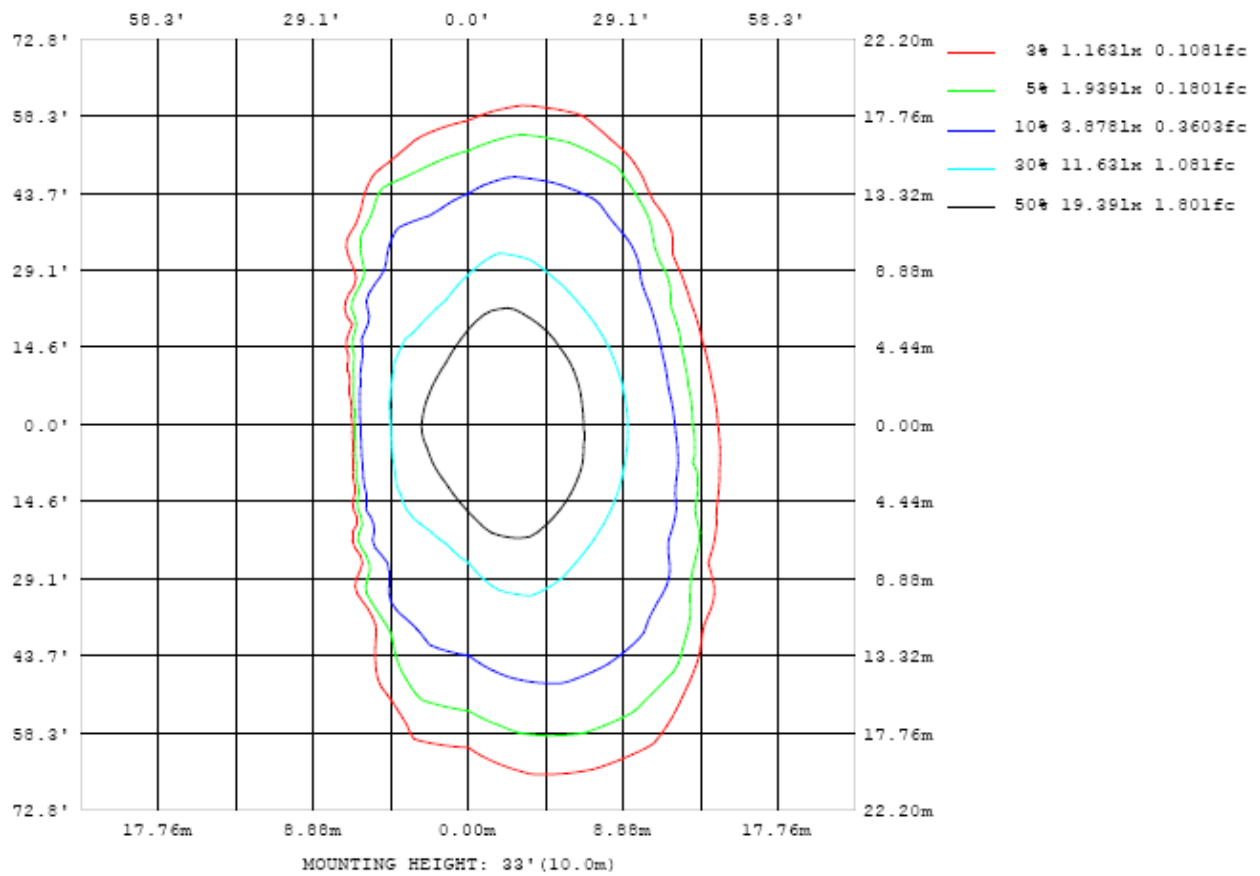


Chart 2: Illuminance Plot (Footcandles)

Luminous Intensity Distribution Plots

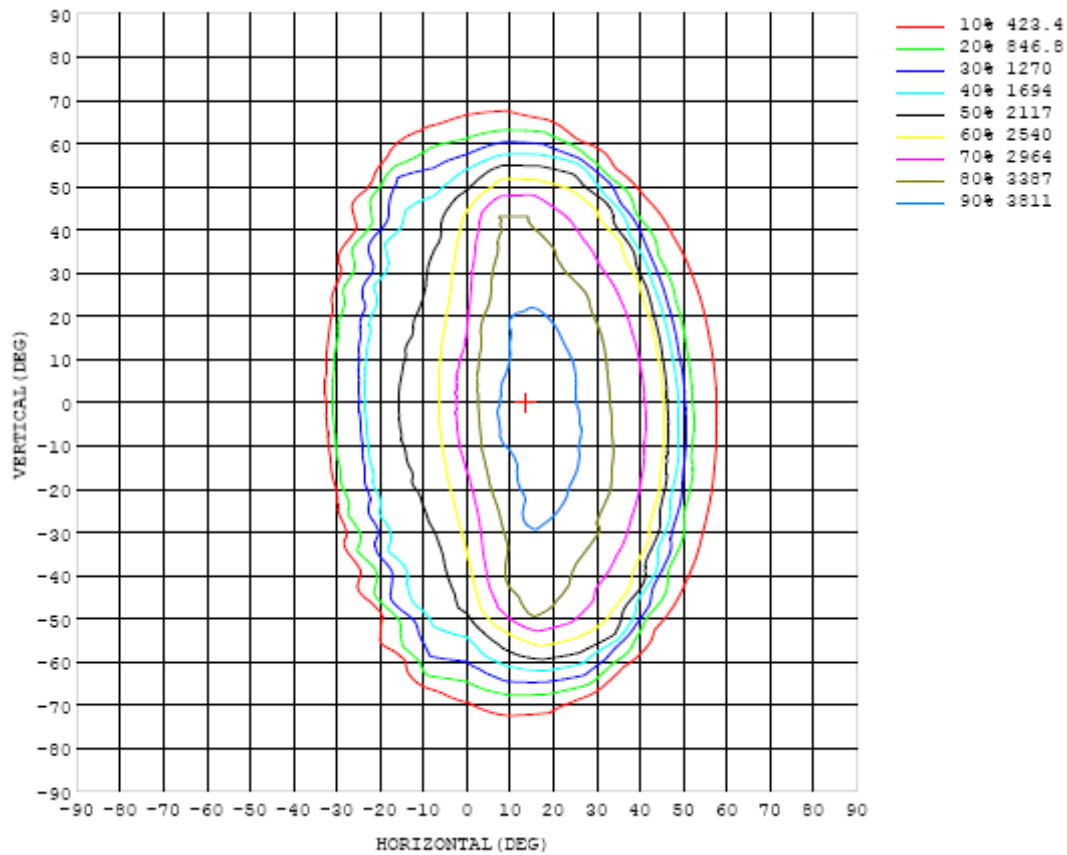


Chart 3: Isocandela Plot

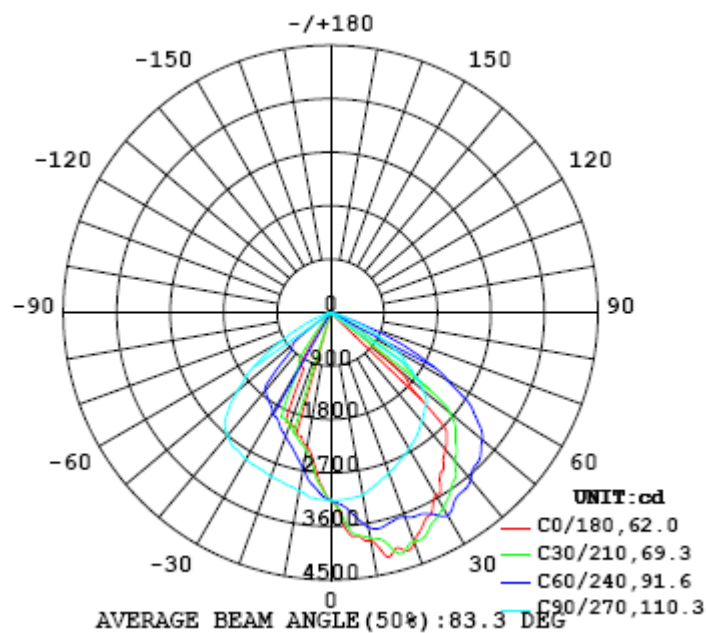


Chart 4: Polar Candela Distribution

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	3156	3156	3156	3156	3156	3156	3156	3156	3156	3156	3156	3156	3156	3156	3156	3156	3156	3156	3156
5	3750	3741	3714	3665	3574	3457	3327	3235	3186	3156	3104	3022	2950	2899	2846	2792	2736	2707	2702
10	3894	3915	3899	3854	3806	3786	3669	3395	3205	3118	2965	2815	2638	2492	2382	2326	2322	2315	2300
15	4142	4183	4233	4151	3909	3780	3688	3496	3147	2994	2777	2527	2358	2283	2217	2145	2145	2158	2156
20	4127	4174	4182	4100	4129	3910	3662	3567	3127	2873	2575	2329	2210	2121	2080	2019	2008	2000	1992
25	3815	3868	3915	3971	4016	4029	3731	3509	3126	2759	2399	2190	2054	1982	1979	1925	1520	1250	1209
30	3545	3615	3731	3796	3824	3892	3940	3508	3143	2641	2227	2046	1944	1858	1344	1026	1036	1030	1021
35	3266	3301	3497	3564	3632	3696	3752	3489	3194	2534	2114	1955	1795	1160	969	599	176	105	99.5
40	3007	3044	3160	3252	3397	3525	3671	3695	3183	2387	2005	1813	1419	897	175	97.8	82.2	74.5	74.8
45	2671	2797	2876	2975	3108	3281	3529	3624	3081	2250	1900	1680	856	117	105	81.6	62.9	72.8	72.7
50	1416	1692	1797	2616	2831	2999	3328	3498	2835	2026	1804	1227	419	51.6	74.4	74.0	81.7	83.1	83.9
55	626	703	800	1520	2439	2717	2946	2907	2337	1645	1500	760	25.1	48.6	86.5	91.9	89.4	82.4	84.7
60	137	235	410	576	1213	2208	2276	2291	1814	1258	1177	187	24.5	55.6	84.6	99.4	96.0	94.3	94.5
65	103	104	92.6	152	319	922	1473	1420	1246	807	624	9.53	35.3	75.9	106	107	103	88.5	84.4
70	57.3	68.7	68.4	71.0	59.3	122	504	662	609	390	196	16.4	50.7	93.7	104	63.7	59.8	45.5	40.5
75	7.03	7.68	19.4	22.9	40.2	12.5	51.2	231	191	135	4.30	17.4	51.3	50.7	44.3	7.35	7.97	7.22	6.03
80	0.44	0.47	2.77	5.28	6.24	5.16	5.58	5.28	5.78	4.76	2.65	10.5	29.2	6.83	4.00	0.29	0.29	0.26	0.24
85	0.20	0.21	0.23	0.26	0.35	1.12	1.76	1.65	2.78	2.03	1.41	0.61	0.27	0.19	0.16	0.15	0.15	0.14	0.14
90	0.03	0.05	0.06	0.08	0.09	0.10	0.05	0.08	0.20	0.49	0.12	0.08	0.08	0.06	0.06	0.05	0.05	0.03	0.02
95	0.02	0.02	0.02	0.02	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.08	0.07	0.05	0.03	0.03	0.03	0.04
100	0.02	0.03	0.02	0.02	0.03	0.05	0.06	0.08	0.10	0.12	0.13	0.15	0.15	0.14	0.11	0.08	0.06	0.05	0.09
105	0.03	0.03	0.03	0.03	0.06	0.08	0.11	0.14	0.17	0.19	0.21	0.22	0.23	0.21	0.19	0.15	0.11	0.10	0.20
110	0.03	0.03	0.03	0.05	0.08	0.12	0.17	0.21	0.25	0.29	0.30	0.31	0.32	0.30	0.28	0.24	0.20	0.18	0.34
115	0.04	0.04	0.05	0.08	0.11	0.17	0.22	0.29	0.33	0.38	0.40	0.40	0.41	0.40	0.37	0.33	0.29	0.28	0.52
120	0.05	0.05	0.07	0.11	0.16	0.24	0.29	0.39	0.45	0.50	0.52	0.52	0.53	0.52	0.49	0.47	0.44	0.44	0.74
125	0.08	0.10	0.14	0.18	0.24	0.34	0.43	0.44	0.58	0.65	0.68	0.67	0.68	0.67	0.65	0.65	0.64	0.64	1.00
130	0.17	0.19	0.24	0.28	0.32	0.44	0.56	0.62	0.73	0.83	0.85	0.85	0.87	0.86	0.83	0.88	0.87	0.89	1.32
135	0.28	0.32	0.38	0.42	0.45	0.57	0.70	0.85	0.91	1.06	1.11	1.12	1.10	1.11	1.15	1.17	1.18	1.19	1.69
140	0.40	0.45	0.50	0.54	0.60	0.70	0.81	0.98	1.03	1.19	1.24	1.30	1.34	1.41	1.41	1.41	1.44	1.44	2.03
145	0.54	0.59	0.63	0.65	0.72	0.87	1.00	1.11	1.25	1.39	1.48	1.57	1.61	1.63	1.63	1.62	1.66	1.62	2.29
150	0.71	0.78	0.81	0.82	0.87	0.93	1.06	1.20	1.33	1.46	1.53	1.61	1.64	1.72	1.76	1.77	1.81	1.76	2.45
155	0.93	0.99	1.04	1.05	0.99	1.00	1.10	1.24	1.30	1.38	1.46	1.57	1.63	1.73	1.81	1.90	1.92	1.87	2.48
160	1.20	1.24	1.27	1.28	1.18	1.14	1.20	1.26	1.34	1.37	1.52	1.62	1.69	1.78	1.88	1.95	1.98	1.95	2.41
165	1.43	1.46	1.46	1.46	1.41	1.33	1.31	1.35	1.39	1.41	1.59	1.71	1.76	1.83	1.91	1.96	2.01	1.99	2.21
170	1.66	1.70	1.72	1.67	1.55	1.51	1.52	1.56	1.66	1.63	1.78	1.89	1.95	1.99	2.02	2.05	2.09	2.09	2.08
175	1.98	1.94	1.93	1.86	1.72	1.74	1.72	1.72	1.72	1.71	1.81	1.94	2.02	2.05	2.11	2.18	2.24	2.29	2.29
180	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88

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	3156	3156	3156	3156	3156	3156	3156	3156	3156	3156	3156	3156	3156	3156	3156	3156	3156		
5	2712	2750	2800	2845	2892	2963	3040	3102	3138	3189	3276	3393	3519	3621	3684	3720	3747		
10	2307	2313	2353	2429	2535	2672	2832	2963	3046	3228	3486	3619	3703	3774	3825	3865	3883		
15	2142	2134	2169	2235	2291	2407	2604	2818	2981	3344	3503	3620	3760	4000	4152	4149	4128		
20	1989	1988	2017	2063	2113	2222	2386	2663	2925	3369	3540	3820	3925	3989	4059	4101	4106		
25	1363	1690	1955	1915	1958	2055	2208	2517	2881	3297	3607	3765	3898	3875	3850	3846	3820		
30	1028	995	1114	1602	1866	1959	2089	2396	2857	3321	3704	3776	3702	3676	3669	3607	3554		
35	115	311	791	1055	1537	1821	1962	2230	2793	3322	3603	3571	3542	3454	3368	3303	3268		
40	74.4	86.4	143	447	1018	1713	1835	2062	2692	3335	3554	3413	3316	3177	3054	3013	2993		
45	64.1	68.4	69.8	96.0	513	1047	1747	1904	2490	3297	3387	3144	2969	2854	2775	2721	2589		
50	83.2	79.3	74.0	42.6	79.3	833	1492	1577	2047	2737	2956	2820	2641	2425	1746	1399	1238		
55	86.9	94.5	78.7	51.5	13.6	78.9	1149	1218	1545	2177	2321	2362	1834	1180	709	610	588		
60	96.0	100	88.5	65.5	32.4	27.8	450	788	981	1391	1514	1394	542	372	306	205	167		
65	89.6	109	109	87.9	44.9	16.3	30.9	371	498	654	703	246	157	66.8	86.0	101	106		
70	43.5	58.6	65.7	73.7	62.8	17.6	6.80	147	193	250	104	43.4	33.6	47.4	57.6	60.5	51.4		
75	5.95	7.38	8.25	19.9	34.7	18.8	2.46	4.31	6.43	5.05	6.48	5.65	11.4	11.6	7.88	6.95	6.52		
80	0.23	0.22	0.21	0.25	0.36	0.68	1.53	2.01	3.02	2.44	1.92	2.69	2.94	0.58	0.43	0.42	0.42		
85	0.12	0.11	0.09	0.08	0.08	0.11	0.17	0.51	0.84	0.47	0.15	0.14	0.15	0.17	0.18	0.19	0.20		
90	0.02	0.03	0.04	0.06	0.10	0.14	0.16	0.14	0.11	0.08	0.04	0.03	0.03	0.03	0.03	0.03	0.02		
95	0.05	0.07	0.10	0.18	0.25	0.31	0.33	0.29	0.23	0.15	0.09	0.04	0.03	0.04	0.04	0.03	0.03		
100	0.11	0.16	0.24	0.36	0.47	0.54	0.54	0.48	0.37	0.26	0.16	0.09	0.04	0.04	0.04	0.04	0.04		
105	0.24	0.32	0.45	0.58	0.70	0.77	0.76	0.68	0.54	0.39	0.26	0.15	0.07	0.05	0.05	0.05	0.05		
110	0.40	0.50	0.63	0.76	0.88	0.93	0.92	0.84	0.68	0.50	0.34	0.21	0.11	0.05	0.05	0.05	0.05		
115	0.59	0.68	0.81	0.95	1.03	1.04	1.02	0.93	0.78	0.60	0.43	0.29	0.18	0.09	0.06	0.06	0.06		
120	0.82	0.90	1.01	1.10	1.16	1.16	1.11	1.04	0.89	0.72	0.55	0.39	0.28	0.18	0.12	0.09	0.08		
125	1.09	1.15	1.23	1.30	1.37	1.35	1.30	1.23	1.08	0.89	0.71	0.53	0.42	0.30	0.22	0.18	0.15		
130	1.42	1.47	1.55	1.60	1.63	1.62	1.57	1.49	1.33	1.13	0.95	0.72	0.61	0.49	0.39	0.33	0.29		
135	1.82	1.86	1.93	2.00	2.00	1.94	1.86	1.77	1.60	1.41	1.15	1.02	0.86	0.75	0.64	0.54	0.48		
140	2.20	2.22	2.26	2.33	2.31	2.22	2.13	2.01	1.85	1.63	1.48	1.27	1.14	0.98	0.87	0.76	0.66		
145	2.52	2.52	2.53	2.54	2.50	2.42	2.31	2.16	2.06	1.76	1.75	1.54	1.39	1.21	1.12	1.03	0.88		
150	2.69	2.69	2.68	2.65	2.56	2.46	2.36	2.20	2.06	2.01	1.90	1.72	1.62	1.49	1.44	1.33	1.12		
155	2.78	2.75	2.73	2.65	2.52	2.41	2.27	2.24	2.09	2.07	1.93	1.86	1.79	1.76	1.69	1.56	1.33		
160	2.75	2.71	2.67	2.64	2.54	2.41	2.32	2.22	2.06	2.01	2.00	1.96	1.96	1.98	1.96	1.93	1.62		
165	2.52	2.54	2.56	2.52	2.48	2.41	2.34	2.22	2.13	2.06	2.03	2.03	2.03	2.13	2.14	2.16	1.77		
170	2.31	2.34	2.42	2.43	2.39	2.34	2.28	2.19	2.10	2.14	2.17	2.10	2.16	2.30	2.34	2.30	1.73		
175	2.25	2.18	2.22	2.29	2.29	2.23	2.18	2.10	2.03	2.06	2.14	2.17	2.31	2.37	2.43	2.10	1.99		
180	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88		

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 $k=2$.

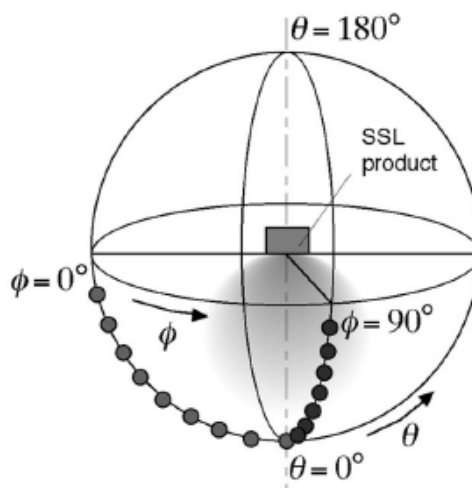
Color Characteristics Measurements

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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