



LM-79-08 Test Report

for

ABOVE ALL LIGHTING INC

1501 Industrial Way N. Toms River, NJ 08755.

V-Line Flood Light

Model: FL38301

Laboratory: Leading Testing Laboratories

NVLAP CODE: 200960-0

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Report No.: HZ17030090c

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

 *Jim Zhang*

Approved by:

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: **FL38301**

Luminous Efficacy (Lumens /Watt)	Total Luminous Flux (Lumens)	Power (Watts)	Power Factor
111.3	4583.1	41.17	0.9933
CCT (K)	CRI	BUG	Stabilization Time (Light & Power)
2958	72.8	B2-U1-G0	60

Table 1: Executive Data Summary

Test specifications:

Date of Receipt	: Mar. 24, 2017
Date of Test	: Apr. 01, 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	: FL38301
Electrical Ratings	: 120~277Vac, 50/60Hz
Product Description	: 3000K 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)	0.354	0.153
Power Factor	0.9933	0.9726
Test Power (W)	41.17	41.21
THD A%	5.57	7.78
Luminous Efficacy (lm/W)	111.3	110.5
Total Luminous Flux (lm)	4583.1	4556.1
Color Rendering Index (CRI)	72.8	
R9	-27	
Correlated Color Temperature (CCT) (K)	2958	
Chromaticity (Chroma x, Chroma y)	(0.4431, 0.4113)	
Chromaticity (Chroma u, Chroma v)	(0.2514, 0.3501)	
Chromaticity (Chroma u', Chroma v')	(0.2514, 0.5251)	
Duv	0.0020	
Average Beam Angle (°)	84.7	
Center Beam Candle Power (cd)	2325	
Spacing Criteria	0.71 (0°-180°)/ 1.27 (90°-270°)	
Zonal Lumens in the 0°-60°Zone	94.39%	
Zonal Lumens in the 60°-90°Zone	5.54%	
Zonal Lumens in the 90°-120°Zone	0.01%	
Zonal Lumens in the 120°-180°Zone	0.06%	

Special Color Rendering Indices	
R1	69
R2	83
R3	95
R4	68
R5	68
R6	76
R7	79
R8	46
R9	-27
R10	61
R11	62
R12	51
R13	71
R14	97

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

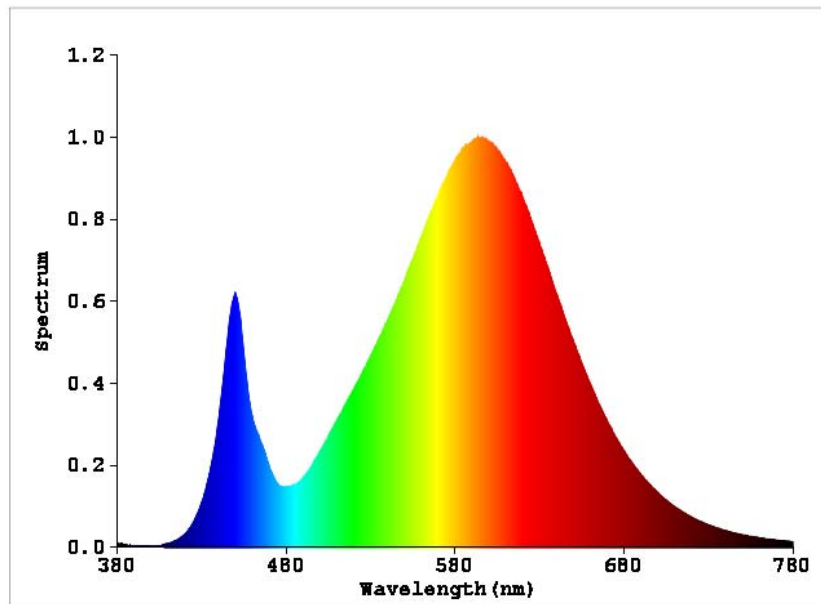


Chart 1: Spectral Power Distribution

Zonal Lumen Tabulation

$\gamma(^{\circ})$	Lumens	% Total
0- 10	221.862	4.84%
10- 20	622.474	13.58%
20- 30	913.493	19.93%
30- 40	1010.203	22.04%
40- 50	943.765	20.59%
50- 60	614.183	13.40%
60- 70	220.62	4.81%
70- 80	32.406	0.71%
80- 90	0.768	0.02%
90-100	0.059	0.00%
100-110	0.159	0.00%
110-120	0.276	0.01%
120-130	0.415	0.01%
130-140	0.597	0.01%
140-150	0.683	0.01%
150-160	0.589	0.01%
160-170	0.396	0.01%
170-180	0.142	0.00%
Total	4583.1	100%

$\gamma(^{\circ})$	Lumens	% Total
0- 60	4325.98	94.39%
60- 90	253.794	5.54%
0-90	4579.774	99.93%
90- 180	3.316	0.07%
0- 180	4583.1	100%

Table 3: Zonal Lumen Data

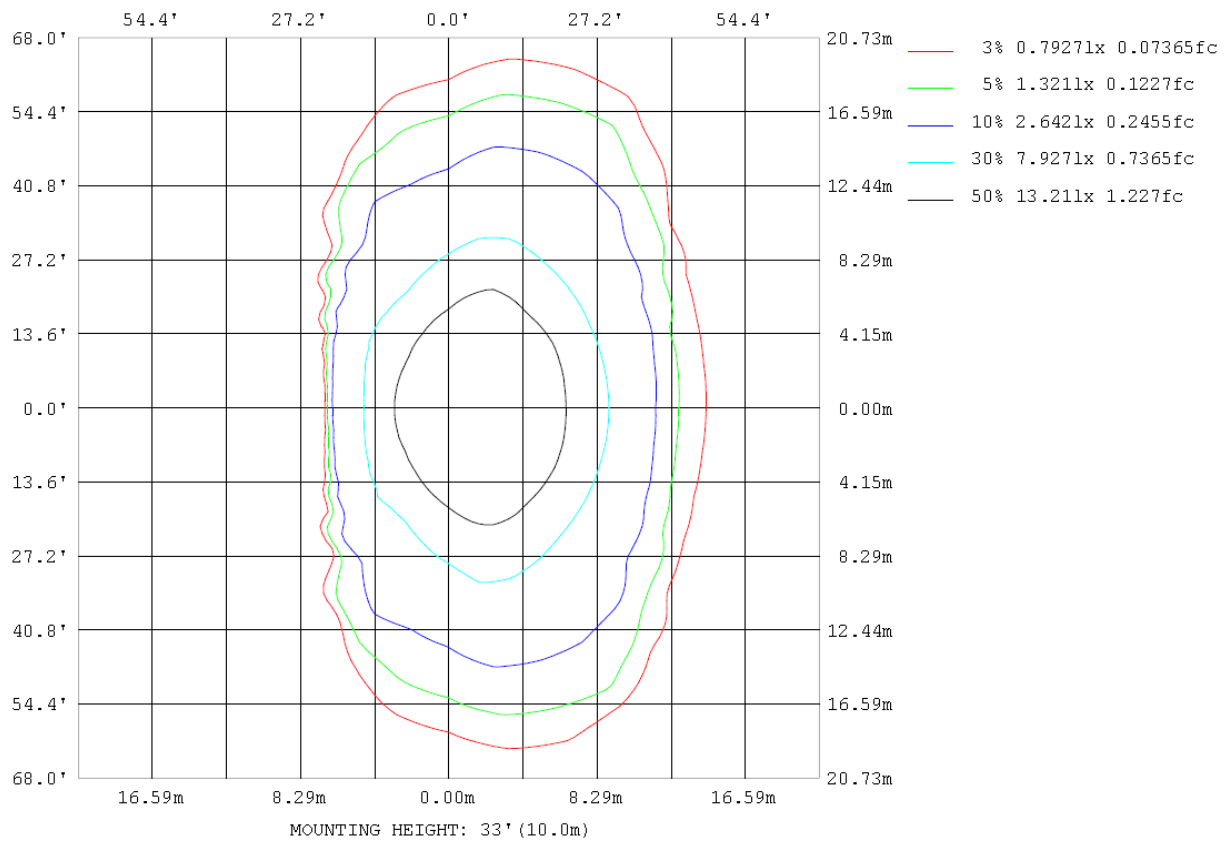


Chart 2: Illuminance Plot (Footcandles)

Luminous Intensity Distribution Plots

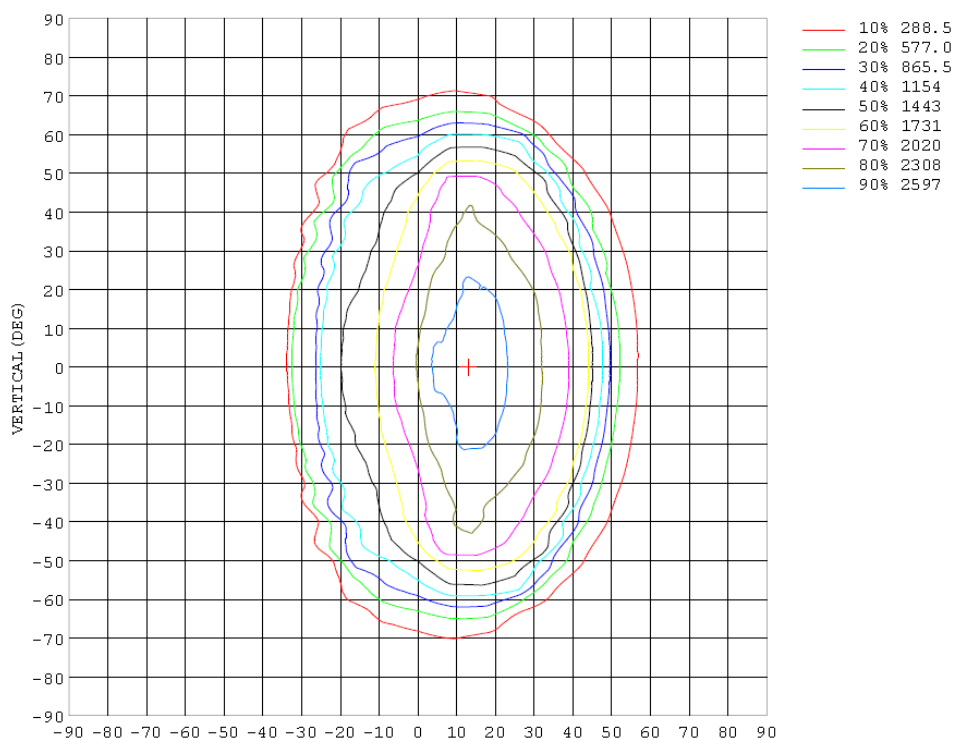


Chart 3: Isocandela Plot

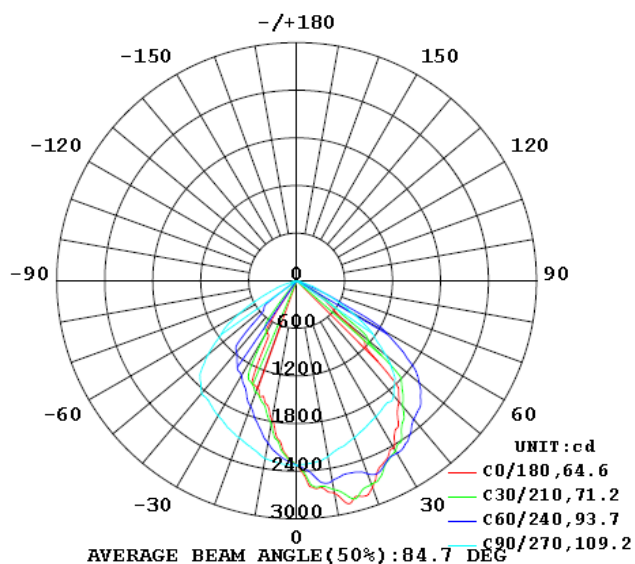


Chart 4: Polar Candela Distribution

Luminous Intensity Data

Table--1

UNIT: cd

C(°) γ (°)	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
0	2325	2325	2325	2325	2325	2325	2325	2325	2325	2325	2325	2325	2325	2325	2325	2325	2325	2325	2325
5	2624	2621	2613	2607	2594	2545	2465	2393	2340	2305	2283	2258	2228	2198	2171	2150	2128	2111	2107
10	2717	2710	2692	2669	2628	2586	2562	2508	2364	2251	2203	2140	2067	1999	1919	1841	1789	1778	1779
15	2820	2816	2826	2843	2770	2619	2512	2439	2367	2171	2093	1974	1867	1767	1659	1610	1589	1569	1560
20	2775	2775	2773	2729	2697	2689	2586	2414	2350	2105	1978	1840	1695	1577	1503	1486	1463	1438	1440
25	2548	2551	2560	2591	2637	2623	2578	2428	2274	2038	1872	1676	1508	1449	1398	1396	1356	1232	1172
30	2430	2436	2441	2472	2472	2519	2510	2485	2214	1978	1764	1530	1386	1339	1245	844	736	747	745
35	2220	2231	2259	2285	2336	2362	2438	2398	2202	1920	1666	1403	1292	1121	760	704	314	97.3	56.6
40	1987	1994	2019	2067	2155	2230	2278	2373	2259	1890	1559	1288	1217	753	352	98.9	58.3	64.0	59.9
45	1420	1534	1815	1860	1925	2041	2196	2305	2221	1747	1435	1208	692	351	91.0	61.0	52.6	47.8	51.6
50	708	789	1061	1168	1719	1812	1999	2043	1915	1451	1165	1084	598	63.9	44.3	49.9	53.6	60.5	61.8
55	435	437	463	584	1041	1563	1675	1668	1547	1156	934	674	61.3	21.1	53.1	62.7	63.7	62.3	57.6
60	66.0	60.0	86.8	276	397	763	1271	1209	1087	796	645	384	27.4	33.6	51.0	69.1	68.2	67.9	65.6
65	57.4	61.7	63.7	51.5	48.2	241	479	670	606	437	356	40.9	21.1	40.5	66.3	77.0	75.7	74.3	73.9
70	23.8	27.0	38.7	38.7	33.5	29.3	80.9	251	313	227	192	10.8	21.4	58.4	72.7	57.3	43.8	42.1	42.1
75	4.56	4.96	6.14	6.47	9.27	11.9	6.98	10.3	26.0	21.5	6.07	5.63	28.5	30.3	36.0	16.8	8.24	6.73	6.34
80	0.25	0.25	0.26	0.33	1.87	2.77	3.26	3.62	4.23	4.58	2.96	2.38	5.00	3.52	0.99	0.49	0.46	0.47	0.48
85	0.07	0.07	0.07	0.07	0.08	0.09	0.12	0.36	1.04	1.08	0.92	0.41	0.23	0.22	0.24	0.27	0.30	0.33	0.34
90	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.05	0.06	0.05	0.05	0.05	0.03	0.02	0.01	0.01	0.02	0.03
95	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.04	0.05	0.07	0.07	0.08	0.08	0.07	0.05	0.03	0.02	0.02	0.02
100	0.02	0.02	0.02	0.02	0.02	0.04	0.06	0.07	0.09	0.11	0.12	0.13	0.13	0.12	0.10	0.06	0.04	0.03	0.05
105	0.02	0.02	0.02	0.02	0.04	0.06	0.08	0.11	0.14	0.16	0.18	0.18	0.19	0.17	0.15	0.12	0.08	0.07	0.12
110	0.02	0.02	0.02	0.04	0.06	0.09	0.13	0.17	0.19	0.23	0.25	0.24	0.24	0.23	0.21	0.18	0.14	0.12	0.22
115	0.03	0.02	0.03	0.05	0.08	0.13	0.16	0.23	0.26	0.29	0.32	0.31	0.31	0.30	0.27	0.24	0.20	0.20	0.34
120	0.04	0.04	0.05	0.08	0.11	0.18	0.24	0.27	0.34	0.40	0.42	0.41	0.41	0.39	0.36	0.34	0.30	0.31	0.51
125	0.07	0.08	0.10	0.14	0.17	0.24	0.32	0.35	0.44	0.52	0.54	0.52	0.51	0.50	0.47	0.46	0.44	0.46	0.70
130	0.14	0.14	0.17	0.22	0.23	0.31	0.41	0.49	0.53	0.65	0.67	0.68	0.67	0.63	0.62	0.63	0.60	0.63	0.94
135	0.23	0.23	0.27	0.31	0.33	0.39	0.48	0.60	0.64	0.77	0.81	0.81	0.81	0.83	0.84	0.81	0.81	0.87	1.22
140	0.33	0.32	0.36	0.40	0.43	0.53	0.62	0.69	0.78	0.88	0.94	0.99	1.01	1.04	1.00	0.98	0.98	1.07	1.48
145	0.47	0.43	0.47	0.49	0.53	0.58	0.69	0.78	0.90	1.00	1.06	1.10	1.11	1.12	1.13	1.11	1.11	1.22	1.71
150	0.63	0.56	0.61	0.64	0.65	0.67	0.72	0.82	0.90	0.96	1.04	1.09	1.13	1.18	1.22	1.22	1.22	1.37	1.86
155	0.82	0.71	0.76	0.82	0.79	0.76	0.79	0.85	0.92	0.93	1.04	1.10	1.14	1.21	1.27	1.31	1.29	1.49	1.93
160	1.09	0.90	0.92	0.94	0.95	0.90	0.86	0.89	0.93	0.92	1.08	1.14	1.19	1.27	1.32	1.34	1.34	1.59	1.94
165	1.33	1.03	1.09	1.11	1.12	1.06	1.04	1.05	1.08	1.09	1.21	1.28	1.32	1.36	1.39	1.41	1.40	1.61	1.81
170	1.55	1.15	1.21	1.22	1.22	1.16	1.08	1.10	1.15	1.16	1.23	1.32	1.34	1.38	1.40	1.45	1.45	1.62	1.67
175	1.68	1.63	1.38	1.44	1.44	1.44	1.37	1.35	1.37	1.32	1.42	1.51	1.54	1.59	1.63	1.63	1.58	1.56	1.63
180	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40

Table 4: Luminous Intensity Data

Table--2

UNIT: cd

C (DEG) γ (DEG)	190	200	210	220	230	240	250	260	270	280	290	300	310	320	330	340	350		
0	2325	2325	2325	2325	2325	2325	2325	2325	2325	2325	2325	2325	2325	2325	2325	2325	2325		
5	2112	2126	2152	2175	2198	2229	2259	2286	2311	2349	2399	2476	2547	2602	2616	2614	2629		
10	1777	1795	1841	1916	1993	2072	2160	2222	2273	2362	2508	2579	2588	2631	2677	2707	2717		
15	1568	1587	1604	1672	1758	1875	1988	2100	2180	2343	2471	2515	2633	2758	2831	2829	2818		
20	1442	1458	1495	1517	1561	1685	1844	1981	2105	2344	2408	2563	2706	2682	2749	2783	2788		
25	1241	1369	1392	1400	1431	1510	1683	1867	2042	2306	2412	2617	2598	2654	2608	2561	2552		
30	747	749	835	1262	1346	1384	1539	1758	1963	2234	2405	2493	2531	2460	2471	2439	2436		
35	98.7	402	689	690	1196	1296	1399	1652	1890	2181	2438	2431	2343	2345	2322	2248	2227		
40	62.7	70.4	44.4	578	669	1170	1283	1548	1849	2197	2336	2278	2220	2163	2103	2018	1984		
45	47.3	52.8	71.6	52.0	563	823	1186	1411	1708	2116	2270	2180	2042	1929	1869	1803	1568		
50	60.9	57.0	48.6	53.2	25.0	536	1071	1204	1448	1989	2087	1994	1825	1689	1194	1084	854		
55	61.6	61.9	58.1	54.1	27.4	80.7	801	948	1140	1594	1723	1741	1553	976	558	489	449		
60	66.3	65.4	64.3	50.4	36.3	12.1	377	702	826	1202	1284	1299	829	418	327	105	58.6		
65	74.6	75.3	74.2	63.3	40.2	18.4	66.0	411	492	689	771	545	255	49.3	55.9	65.0	62.8		
70	42.4	46.6	69.2	73.2	51.3	22.4	7.40	208	260	366	331	83.4	24.7	40.0	34.9	42.6	30.8		
75	6.03	16.2	34.7	40.0	40.9	22.4	7.07	33.9	52.0	63.6	59.6	7.29	14.0	15.1	8.66	5.16	4.79		
80	0.48	0.54	1.47	5.33	8.80	8.98	2.82	3.29	5.36	4.80	4.61	3.77	3.31	3.00	0.29	0.29	0.26		
85	0.34	0.32	0.30	0.28	0.28	0.41	1.11	1.46	1.93	1.86	0.79	0.21	0.14	0.09	0.08	0.07	0.07		
90	0.05	0.06	0.08	0.09	0.09	0.08	0.09	0.09	0.06	0.05	0.04	0.03	0.04	0.04	0.03	0.03	0.03		
95	0.02	0.03	0.04	0.06	0.10	0.13	0.15	0.14	0.12	0.09	0.06	0.03	0.02	0.02	0.02	0.02	0.02		
100	0.06	0.07	0.10	0.15	0.21	0.27	0.28	0.26	0.22	0.16	0.10	0.06	0.03	0.03	0.03	0.03	0.03		
105	0.13	0.15	0.21	0.29	0.36	0.41	0.43	0.40	0.33	0.25	0.17	0.11	0.06	0.03	0.03	0.03	0.03		
110	0.23	0.27	0.34	0.42	0.50	0.56	0.57	0.55	0.46	0.36	0.25	0.16	0.09	0.04	0.03	0.03	0.03		
115	0.36	0.40	0.46	0.55	0.62	0.65	0.65	0.62	0.54	0.43	0.32	0.22	0.14	0.08	0.05	0.04	0.04		
120	0.51	0.55	0.61	0.68	0.73	0.74	0.73	0.69	0.61	0.51	0.40	0.29	0.21	0.14	0.09	0.07	0.06		
125	0.70	0.73	0.76	0.81	0.84	0.85	0.82	0.78	0.71	0.60	0.50	0.38	0.30	0.23	0.17	0.14	0.13		
130	0.94	0.95	0.98	1.00	1.03	1.04	1.00	0.95	0.88	0.76	0.65	0.53	0.44	0.36	0.30	0.25	0.24		
135	1.21	1.21	1.24	1.27	1.27	1.25	1.21	1.17	1.09	0.96	0.84	0.69	0.62	0.55	0.48	0.42	0.38		
140	1.46	1.47	1.49	1.53	1.52	1.48	1.42	1.36	1.25	1.15	0.99	0.92	0.82	0.74	0.66	0.59	0.54		
145	1.69	1.69	1.69	1.71	1.71	1.66	1.59	1.50	1.42	1.30	1.20	1.12	1.03	0.92	0.83	0.78	0.73		
150	1.84	1.84	1.81	1.81	1.78	1.74	1.68	1.60	1.53	1.36	1.35	1.25	1.18	1.08	1.03	0.99	0.96		
155	1.90	1.91	1.90	1.84	1.79	1.73	1.65	1.57	1.54	1.47	1.43	1.33	1.27	1.23	1.24	1.18	1.13		
160	1.92	1.90	1.88	1.83	1.76	1.69	1.62	1.58	1.46	1.46	1.41	1.40	1.37	1.37	1.39	1.37	1.37		
165	1.83	1.84	1.82	1.80	1.76	1.70	1.64	1.57	1.50	1.43	1.39	1.41	1.42	1.41	1.43	1.47	1.52		
170	1.73	1.76	1.76	1.75	1.72	1.68	1.64	1.57	1.53	1.50	1.47	1.47	1.45	1.45	1.52	1.57	1.61		
175	1.66	1.67	1.66	1.63	1.62	1.60	1.56	1.52	1.51	1.43	1.49	1.55	1.52	1.50	1.54	1.61	1.65		
180	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40		

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.

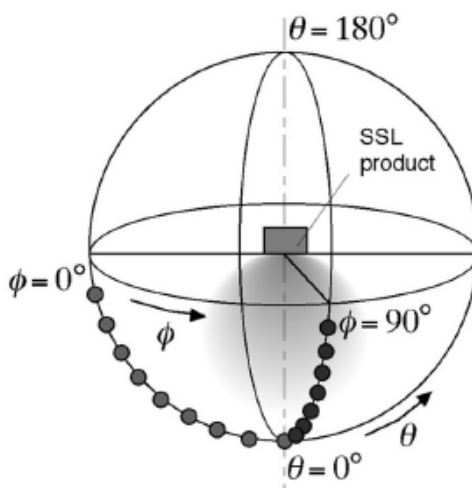
Color Characteristics Measurements

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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