



LM-79-08 Test Report

for

ABOVE ALL LIGHTING INC

1501 Industrial Way N. Toms River, NJ 08755.

V-Line Wall Pack

Model: WL38301

Laboratory: Leading Testing Laboratories

NVLAP CODE: 200960-0

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Report No.: HZ17030090k

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

Reviewed by:

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Apr. 13, 2017

 *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: **WL38301**

Luminous Efficacy (Lumens /Watt)	Total Luminous Flux (Lumens)	Power (Watts)	Power Factor
107.6	4374.0	40.66	0.9936
CCT (K)	CRI	BUG	Stabilization Time (Light & Power)
2994	73.2	B1-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 Wall Pack
Model	: WL38301
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)	0.341	0.152
Power Factor	0.9936	0.9667
Test Power (W)	40.66	40.63
THD A%	6.63	7.20
Luminous Efficacy (lm/W)	107.6	107.1
Total Luminous Flux (lm)	4374.0	4352.2
Color Rendering Index (CRI)	73.2	
R9	-25	
Correlated Color Temperature (CCT) (K)	2994	
Chromaticity (Chroma x, Chroma y)	(0.4385, 0.4066)	
Chromaticity (Chroma u, Chroma v)	(0.2505, 0.3484)	
Chromaticity (Chroma u', Chroma v')	(0.2505, 0.5226)	
Duv	0.0008	
Average Beam Angle (°)	77.0	
Center Beam Candle Power (cd)	1474	
Spacing Criteria	0.44 (0°-180°)/ 1.24 (90°-270°)	
Zonal Lumens in the 0°-60°Zone	86.94%	
Zonal Lumens in the 60°-90°Zone	12.98%	
Zonal Lumens in the 90°-120°Zone	0.02%	
Zonal Lumens in the 120°-180°Zone	0.06%	

Special Color Rendering Indices	
R1	69
R2	83
R3	95
R4	68
R5	68
R6	77
R7	79
R8	46
R9	-25
R10	62
R11	62
R12	52
R13	72
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

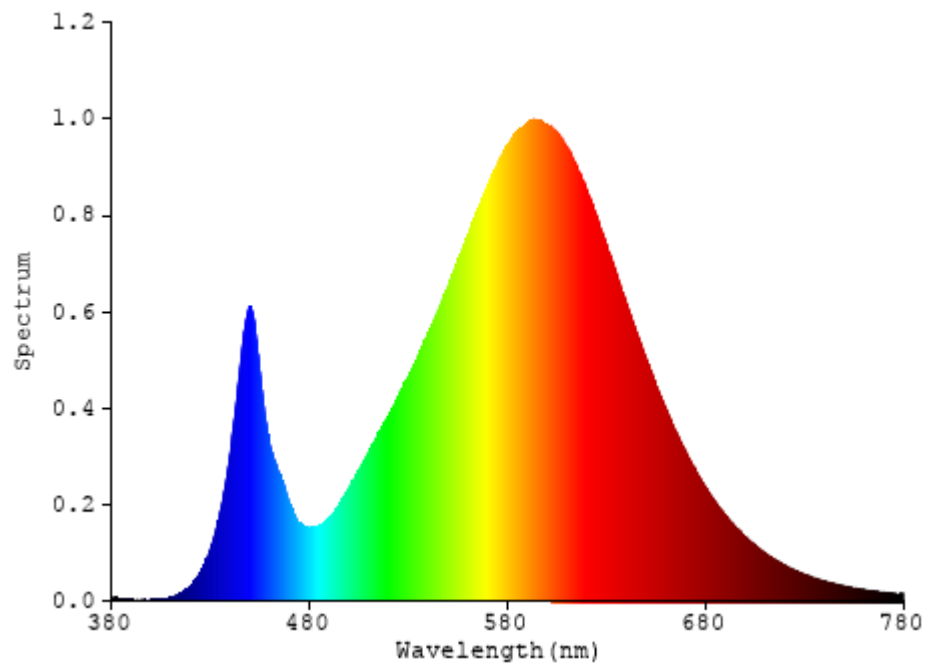


Chart 1: Spectral Power Distribution

Zonal Lumen Tabulation

$\gamma(^{\circ})$	Lumens	% Total
0- 10	149.994	3.43%
10- 20	413.662	9.46%
20- 30	646.322	14.78%
30- 40	847.517	19.38%
40- 50	936.156	21.40%
50- 60	809.159	18.50%
60- 70	467.69	10.69%
70- 80	96.547	2.21%
80- 90	3.606	0.08%
90-100	0.156	0.00%
100-110	0.311	0.01%
110-120	0.414	0.01%
120-130	0.497	0.01%
130-140	0.59	0.01%
140-150	0.579	0.01%
150-160	0.447	0.01%
160-170	0.269	0.01%
170-180	0.09	0.00%
Total	4374.0	100%

$\gamma(^{\circ})$	Lumens	% Total
0- 60	3802.81	86.94%
60- 90	567.843	12.98%
0-90	4370.653	99.92%
90- 180	3.353	0.08%
0- 180	4374.0	100%

Table 3: Zonal Lumen Data

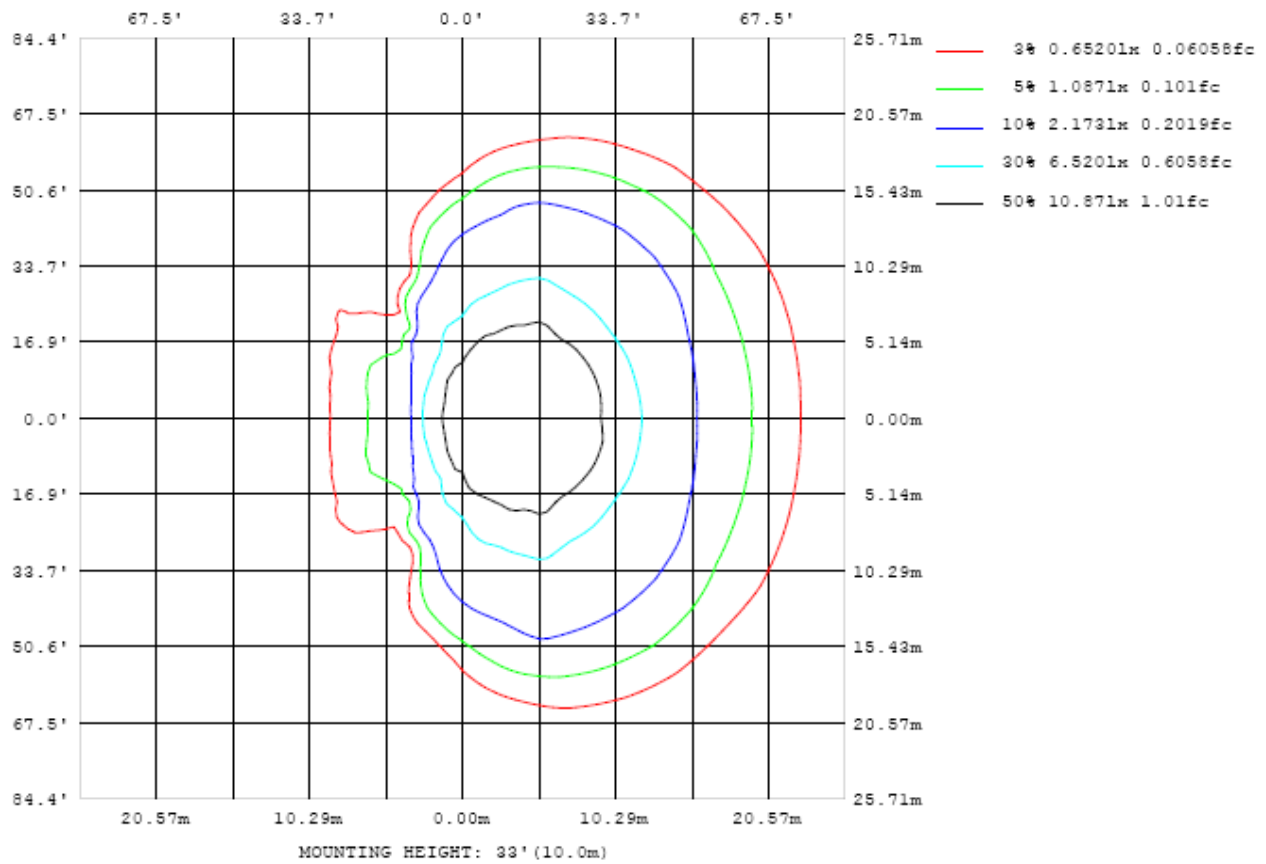


Chart 2: Illuminance Plot (Footcandles)

Luminous Intensity Distribution Plots

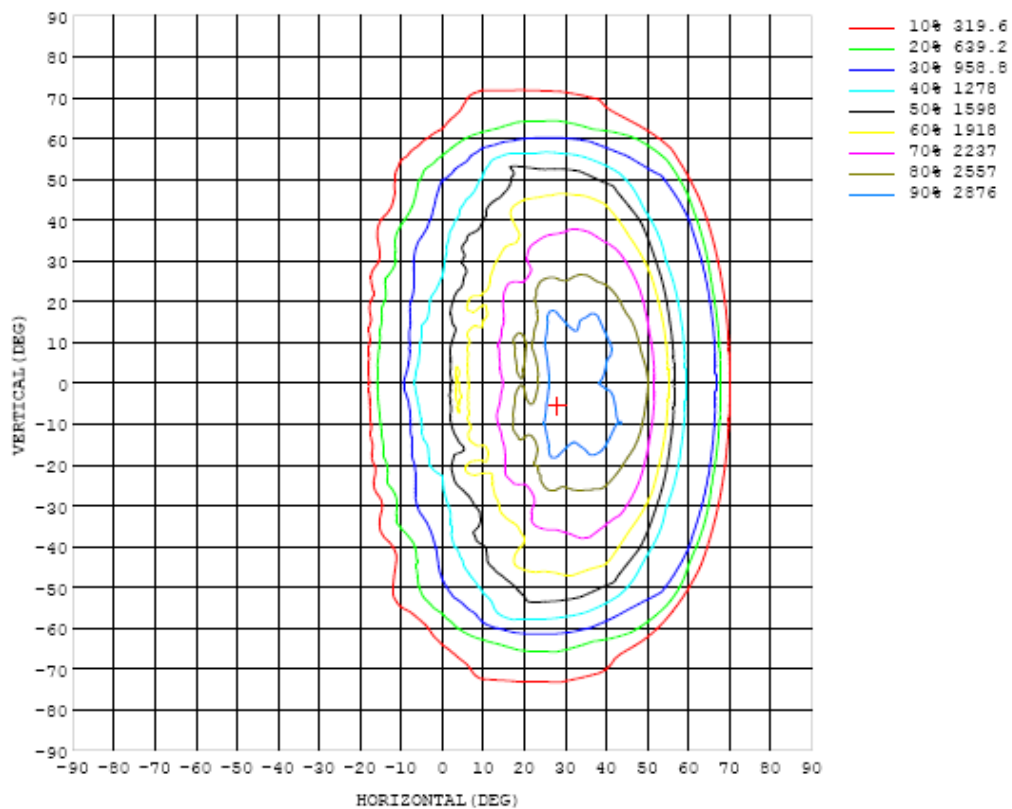


Chart 3: Isocandela Plot

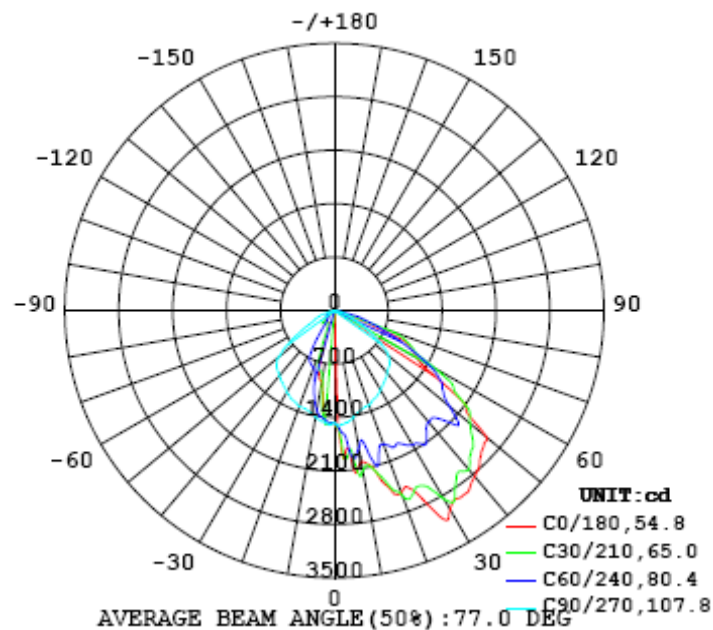


Chart 4: Polar Candela Distribution

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	1474	1474	1474	1474	1474	1474	1474	1474	1474	1474	1474	1474	1474	1474	1474	1474	1474	1474	1474
5	1821	1833	1849	1929	1985	1920	1655	1554	1526	1491	1447	1435	1450	1472	1483	1488	1464	1470	1422
10	2009	2034	2087	2130	2201	1898	1824	1877	1511	1418	1389	1387	1313	1155	994	907	899	930	946
15	2263	2296	2253	2223	2117	1986	2108	1678	1485	1344	1320	1251	964	817	799	782	777	757	745
20	2535	2587	2642	2571	2319	2001	1858	1882	1733	1316	1278	989	792	758	600	329	221	198	196
25	2735	2753	2714	2543	2457	2286	1923	1824	1668	1260	1198	781	734	418	195	184	177	176	176
30	3007	3091	3159	2851	2552	2318	2032	1726	1471	1199	1049	717	461	189	184	194	184	181	181
35	2938	3054	2898	2750	2705	2165	2086	1642	1523	1135	845	645	168	169	189	200	194	185	181
40	2836	3077	2921	2718	2428	2489	1906	1706	1525	1065	663	370	146	175	203	205	213	210	184
45	2689	2865	2705	2540	2400	2169	2047	1765	1369	1013	591	142	145	184	211	176	130	88.1	85.6
50	2578	2488	2439	2302	2247	2103	1957	1575	1238	917	545	151	151	175	146	86.2	41.2	35.3	25.5
55	1933	1956	1992	1978	1990	1887	1709	1494	1059	732	389	154	156	127	30.8	31.8	34.8	41.4	27.8
60	1248	1258	1277	1491	1626	1544	1406	1209	847	486	76.5	178	118	24.2	20.1	35.0	42.9	44.8	36.4
65	1066	1073	1082	1095	1052	1082	937	750	472	295	49.6	132	32.6	21.8	26.4	34.4	45.2	45.0	37.7
70	331	399	472	754	673	552	583	472	371	189	33.1	26.9	19.0	32.7	25.2	29.6	36.9	37.0	31.8
75	15.9	16.9	16.7	29.3	113	346	338	264	182	69.3	10.2	9.25	9.62	27.3	21.0	23.3	28.9	25.8	24.3
80	6.93	7.85	8.33	8.48	9.25	12.1	27.4	24.7	17.3	12.0	4.60	4.37	5.25	6.09	12.7	11.4	15.9	14.5	13.8
85	1.91	2.41	2.89	3.09	3.94	4.89	4.88	4.98	3.66	2.74	2.28	1.97	1.86	1.59	1.32	1.32	1.18	1.07	0.97
90	0.10	0.19	0.26	0.32	0.32	0.27	0.18	0.14	0.09	0.08	0.09	0.11	0.12	0.13	0.13	0.12	0.11	0.10	0.09
95	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.05	0.06	0.10	0.15	0.20	0.23	0.25	0.26	0.25	0.23	0.21	0.21
100	0.03	0.10	0.13	0.14	0.14	0.10	0.08	0.07	0.08	0.16	0.23	0.30	0.36	0.40	0.42	0.42	0.40	0.39	0.39
105	0.03	0.05	0.07	0.07	0.07	0.07	0.08	0.10	0.12	0.24	0.33	0.42	0.50	0.56	0.59	0.60	0.60	0.59	0.59
110	0.03	0.03	0.05	0.05	0.06	0.07	0.11	0.14	0.17	0.30	0.40	0.50	0.60	0.68	0.74	0.77	0.78	0.78	0.78
115	0.03	0.04	0.04	0.05	0.07	0.10	0.14	0.18	0.23	0.36	0.46	0.56	0.67	0.77	0.84	0.88	0.92	0.94	0.95
120	0.04	0.04	0.05	0.06	0.09	0.13	0.19	0.24	0.30	0.44	0.53	0.63	0.72	0.83	0.92	0.99	1.04	1.07	1.09
125	0.05	0.05	0.06	0.08	0.12	0.18	0.25	0.32	0.39	0.52	0.61	0.72	0.81	0.92	1.05	1.13	1.20	1.24	1.25
130	0.06	0.07	0.08	0.11	0.17	0.24	0.32	0.40	0.49	0.63	0.74	0.84	0.96	1.07	1.20	1.33	1.41	1.47	1.49
135	0.09	0.10	0.13	0.17	0.24	0.32	0.42	0.51	0.60	0.74	0.86	0.98	1.12	1.26	1.39	1.50	1.58	1.66	1.68
140	0.13	0.14	0.18	0.24	0.31	0.39	0.49	0.59	0.69	0.84	0.96	1.09	1.23	1.39	1.54	1.64	1.71	1.76	1.75
145	0.20	0.20	0.25	0.31	0.38	0.46	0.55	0.64	0.73	0.92	1.03	1.16	1.29	1.44	1.60	1.70	1.77	1.79	1.82
150	0.25	0.28	0.33	0.40	0.47	0.55	0.63	0.69	0.76	0.96	1.05	1.17	1.29	1.42	1.53	1.61	1.70	1.73	1.70
155	0.33	0.38	0.45	0.51	0.59	0.65	0.72	0.76	0.82	0.98	1.04	1.15	1.28	1.35	1.40	1.46	1.52	1.55	1.57
160	0.43	0.50	0.57	0.64	0.71	0.77	0.81	0.85	0.89	1.02	1.04	1.09	1.17	1.25	1.30	1.31	1.34	1.37	1.33
165	0.55	0.63	0.71	0.78	0.83	0.88	0.92	0.94	0.96	1.02	1.03	1.06	1.09	1.12	1.16	1.17	1.18	1.18	1.20
170	0.66	0.69	0.79	0.86	0.91	0.95	0.98	1.01	1.04	1.02	1.02	1.03	1.04	1.05	1.04	1.03	1.01	0.99	1.02
175	0.72	0.79	0.86	0.93	0.98	1.04	1.08	1.12	1.17	1.03	1.03	1.03	1.02	1.01	0.98	0.96	0.93	0.92	0.91
180	0.81	0.81	0.81	0.86	0.90	0.91	0.93	0.94	0.95	0.95	0.95	0.95	0.94	0.93	0.91	0.89	0.86	0.84	0.81

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	1474	1474	1474	1474	1474	1474	1474	1474	1474	1474	1474	1474	1474	1474	1474	1474	1474		
5	1426	1456	1463	1444	1438	1433	1428	1439	1470	1517	1554	1689	1929	1937	1900	1817	1804		
10	931	902	908	1000	1178	1328	1378	1376	1415	1497	1875	1748	1970	2151	2092	2073	2039		
15	767	799	785	806	825	1014	1281	1312	1351	1614	1642	2012	1968	2081	2195	2243	2308		
20	201	228	371	644	771	791	1064	1274	1337	1695	1975	1872	1995	2322	2560	2592	2558		
25	176	177	180	203	506	748	825	1222	1288	1543	1821	1979	2330	2424	2489	2656	2719		
30	180	184	193	179	193	573	717	1131	1238	1613	1732	2100	2308	2560	2875	3106	3067		
35	182	193	202	186	162	194	657	973	1165	1611	1685	2080	2236	2694	2705	2864	2984		
40	212	197	205	199	167	133	519	793	1116	1441	1760	1912	2457	2425	2707	2907	2914		
45	93.2	150	190	203	166	111	216	632	1062	1335	1744	2177	2200	2403	2502	2691	2710		
50	33.8	39.7	98.0	163	148	126	134	530	944	1225	1558	1893	2105	2225	2283	2403	2457		
55	36.0	29.9	31.0	31.3	89.1	132	131	384	683	1045	1599	1685	1851	2039	1954	1959	1944		
60	43.1	37.9	31.5	18.9	27.4	127	126	189	425	769	1065	1310	1489	1611	1452	1264	1258		
65	44.3	40.4	24.5	19.8	20.1	40.8	66.6	75.4	283	425	658	823	1014	1035	1083	1077	1069		
70	34.7	35.9	24.6	22.0	23.9	15.5	25.4	25.9	204	382	413	515	455	637	724	502	388		
75	26.4	27.1	16.1	18.9	18.6	5.38	10.2	8.85	63.4	155	230	289	249	57.5	19.8	15.5	16.5		
80	14.3	12.2	9.85	10.7	4.03	3.55	3.48	3.84	11.3	14.3	21.4	32.9	7.95	6.78	7.34	7.78	7.04		
85	1.02	1.01	0.98	1.01	1.29	1.28	1.34	1.57	2.07	2.88	3.01	2.56	2.39	2.14	1.95	2.24	1.97		
90	0.10	0.11	0.12	0.14	0.14	0.14	0.13	0.11	0.07	0.08	0.08	0.14	0.17	0.18	0.17	0.12	0.10		
95	0.22	0.24	0.26	0.27	0.27	0.25	0.22	0.16	0.07	0.05	0.03	0.03	0.03	0.03	0.03	0.03	0.03		
100	0.40	0.42	0.44	0.44	0.42	0.38	0.32	0.24	0.10	0.07	0.05	0.06	0.08	0.09	0.08	0.07	0.04		
105	0.60	0.61	0.62	0.61	0.59	0.53	0.44	0.34	0.13	0.10	0.07	0.05	0.05	0.06	0.05	0.04	0.03		
110	0.79	0.79	0.78	0.75	0.70	0.60	0.50	0.40	0.17	0.13	0.09	0.06	0.05	0.05	0.04	0.03	0.03		
115	0.94	0.93	0.89	0.84	0.77	0.67	0.56	0.46	0.21	0.16	0.11	0.07	0.05	0.05	0.04	0.04	0.03		
120	1.09	1.06	1.00	0.93	0.85	0.74	0.63	0.53	0.27	0.21	0.15	0.10	0.06	0.05	0.04	0.04	0.04		
125	1.23	1.19	1.11	1.03	0.92	0.81	0.71	0.61	0.34	0.26	0.19	0.13	0.09	0.07	0.05	0.05	0.05		
130	1.44	1.39	1.28	1.17	1.06	0.99	0.85	0.74	0.41	0.33	0.25	0.18	0.13	0.10	0.08	0.06	0.06		
135	1.64	1.54	1.44	1.35	1.29	1.16	1.03	0.88	0.50	0.41	0.32	0.24	0.18	0.14	0.12	0.10	0.09		
140	1.71	1.62	1.57	1.49	1.42	1.28	1.15	1.00	0.57	0.48	0.39	0.31	0.24	0.20	0.17	0.14	0.13		
145	1.75	1.73	1.67	1.60	1.48	1.38	1.26	1.12	0.61	0.54	0.46	0.39	0.32	0.27	0.23	0.20	0.19		
150	1.70	1.71	1.62	1.60	1.51	1.50	1.38	1.25	0.64	0.59	0.52	0.46	0.40	0.35	0.30	0.27	0.25		
155	1.58	1.54	1.52	1.47	1.50	1.52	1.39	1.30	0.66	0.63	0.59	0.55	0.48	0.43	0.39	0.36	0.34		
160	1.36	1.33	1.35	1.38	1.43	1.46	1.43	1.37	0.71	0.69	0.66	0.62	0.58	0.52	0.47	0.45	0.45		
165	1.17	1.15	1.17	1.17	1.23	1.28	1.33	1.30	0.75	0.74	0.73	0.70	0.67	0.62	0.59	0.57	0.56		
170	1.01	1.01	0.98	0.97	1.11	1.19	1.24	1.22	0.80	0.79	0.78	0.77	0.75	0.70	0.68	0.65	0.67		
175	0.87	0.96	0.98	0.96	1.06	1.15	1.17	1.22	0.91	0.90	0.88	0.86	0.83	0.79	0.76	0.75	0.75		
180	0.81	0.81	0.82	0.85	0.87	0.89	0.91	0.91	0.93	0.92	0.92	0.91	0.90	0.88	0.86	0.85	0.82		

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 expended uncertainty is 1.94% with a coverage factor k=2.

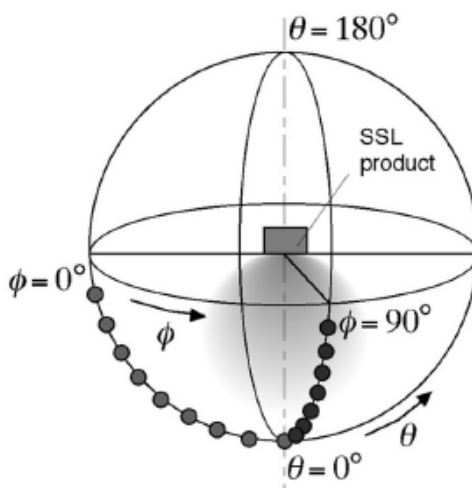
Color Characteristics Measurements

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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