



## LM-79-08 Test Report

for

### ABOVE ALL LIGHTING INC

1501 Industrial Way N. Toms River, NJ 08755.

### V-Line Wall Pack

### Model: WL38501

### Laboratory: Leading Testing Laboratories

**NVLAP CODE: 200960-0**

3rd Floor, Bld. 2, NO. 96 Longchuanwu Rd Qianjiang Economy Dev. Zone, Yuhang Dist,  
Hangzhou, Zhejiang Province, China 311100

Tel: +86 571 86376106

[www.ledtestlab.com](http://www.ledtestlab.com)

Report No.: HZ170300901

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

Reviewed by:

*April Zou*

Engineer: April Zou

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: **WL38501**

Luminous Efficacy (Lumens /Watt)	Total Luminous Flux (Lumens)	Power (Watts)	Power Factor
120.9	4960.8	41.00	0.995
CCT (K)	CRI	BUG	Stabilization Time (Light & Power)
5053	66.5	B2-U1-G1	60

Table 1: Executive Data Summary

### Test specifications:

<b>Date of Receipt</b>	: Mar. 24, 2017
<b>Date of Test</b>	: Apr. 09, 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

## TABLE OF CONTENT

LM-79-08 Test Report.....	1
Test Summary.....	2
Sample Photo .....	4
TEST RESULTS .....	5
Spectral Power Distribution .....	6
Zonal Lumen Tabulation .....	7
Luminous Intensity Distribution Plots .....	9
Luminous Intensity Data.....	10
EQUIPMENT LIST .....	12
TEST METHODS.....	12
Seasoning of SSL Product.....	12
Goniophotometer Method .....	12
Photometric and Electrical Measurements.....	12
Color Characteristics Measurements .....	13
Color Spatial Uniformity .....	13

## Sample Photo



Figure 1- Overview of the sample

### Equipment Under Test (EUT)

<b>Name</b>	: V-Line Wall Pack
<b>Model</b>	: WL38501
<b>Electrical Ratings</b>	: 120~277Vac, 50/60Hz
<b>Product Description</b>	: 5000K Manufacturer of light source: Samsung Model of light source: LH351B
<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 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)	0.343	0.153
Power Factor	0.9950	0.9673
Test Power (W)	41.00	41.01
THD A%	5.15	8.31
Luminous Efficacy (lm/W)	120.9	119.4
Total Luminous Flux (lm)	4960.8	4895.2
Color Rendering Index (CRI)	66.5	
R9	-40.7	
Correlated Color Temperature (CCT) (K)	5053	
Chromaticity (Chroma x, Chroma y)	(0.3438, 0.3513)	
Chromaticity (Chroma u, Chroma v)	(0.2107, 0.3229)	
Chromaticity (Chroma u', Chroma v')	(0.2107, 0.4843)	
Duv	0.0003	
Average Beam Angle (°)	78.2	
Center Beam Candle Power (cd)	1701	
Spacing Criteria	0.44 (0°-180°)/ 1.26 (90°-270°)	
Zonal Lumens in the 0°-60°Zone	87.65%	
Zonal Lumens in the 60°-90°Zone	12.27%	
Zonal Lumens in the 90°-120°Zone	0.02%	
Zonal Lumens in the 120°-180°Zone	0.06%	

Special Color Rendering Indices	
R1	64.2
R2	68.8
R3	72.1
R4	69.7
R5	68.3
R6	62.3
R7	74.1
R8	52.5
R9	-40.7
R10	27.1
R11	77.2
R12	38.3
R13	62.0
R14	83.6

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

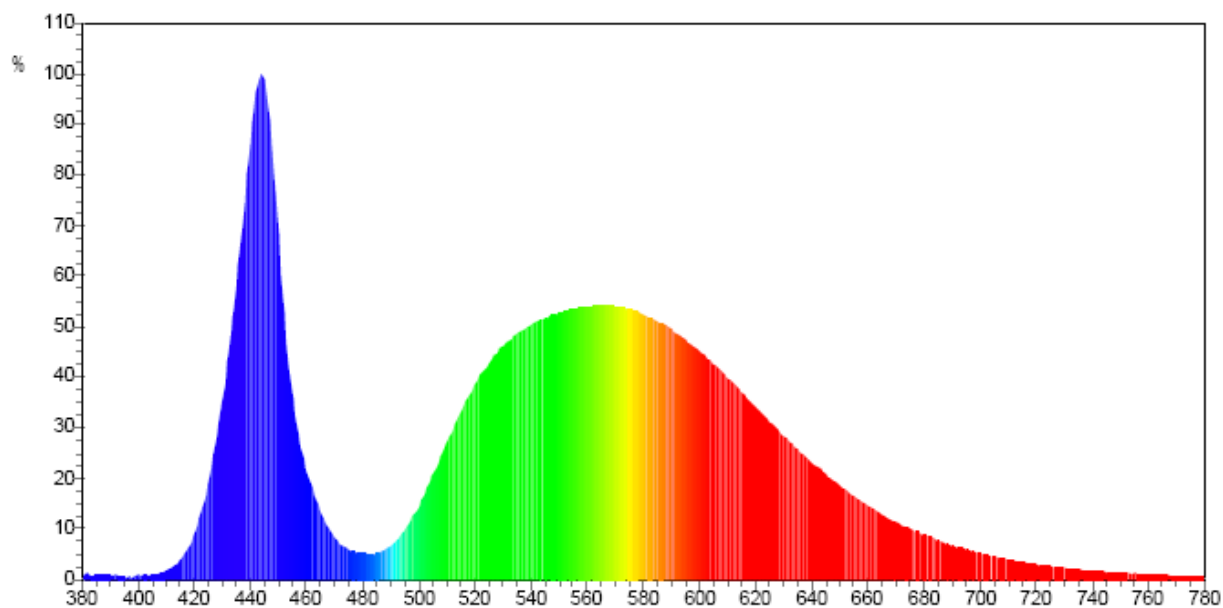


Chart 1: Spectral Power Distribution

### Zonal Lumen Tabulation

$\gamma(^{\circ})$	Lumens	% Total
0- 10	167.906	3.38%
10- 20	460.077	9.27%
20- 30	722.427	14.56%
30- 40	965.259	19.46%
40- 50	1088.698	21.95%
50- 60	943.761	19.02%
60- 70	512.628	10.33%
70- 80	92.138	1.86%
80- 90	3.977	0.08%
90-100	0.196	0.00%
100-110	0.371	0.01%
110-120	0.456	0.01%
120-130	0.544	0.01%
130-140	0.661	0.01%
140-150	0.672	0.01%
150-160	0.531	0.01%
160-170	0.335	0.01%
170-180	0.115	0.00%
Total	4960.8	100%

$\gamma(^{\circ})$	Lumens	% Total
0- 60	4348.128	87.65%
60- 90	608.743	12.27%
0-90	4956.871	99.92%
90- 180	3.881	0.08%
0- 180	4960.8	100%

Table 3: Zonal Lumen Data

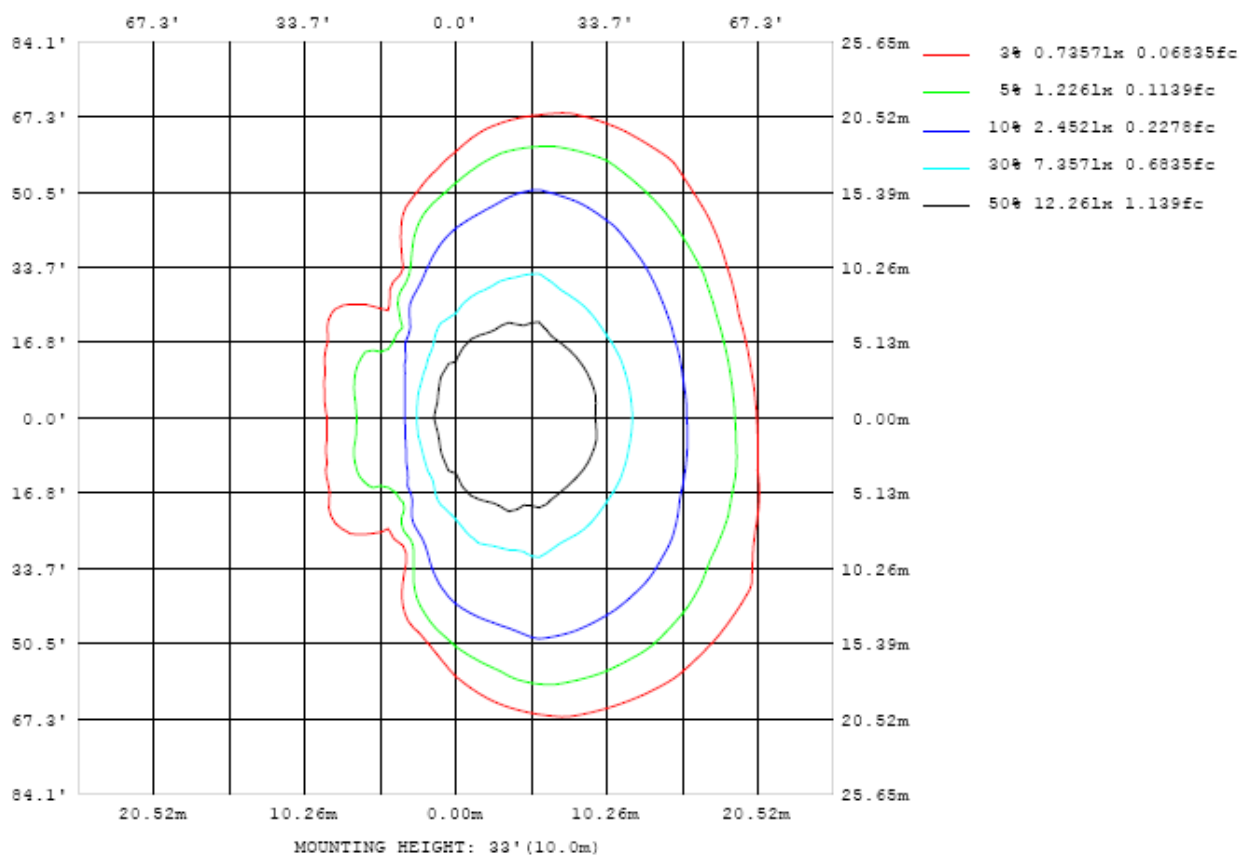


Chart 2: Illuminance Plot (Footcandles)



## Luminous Intensity Distribution Plots

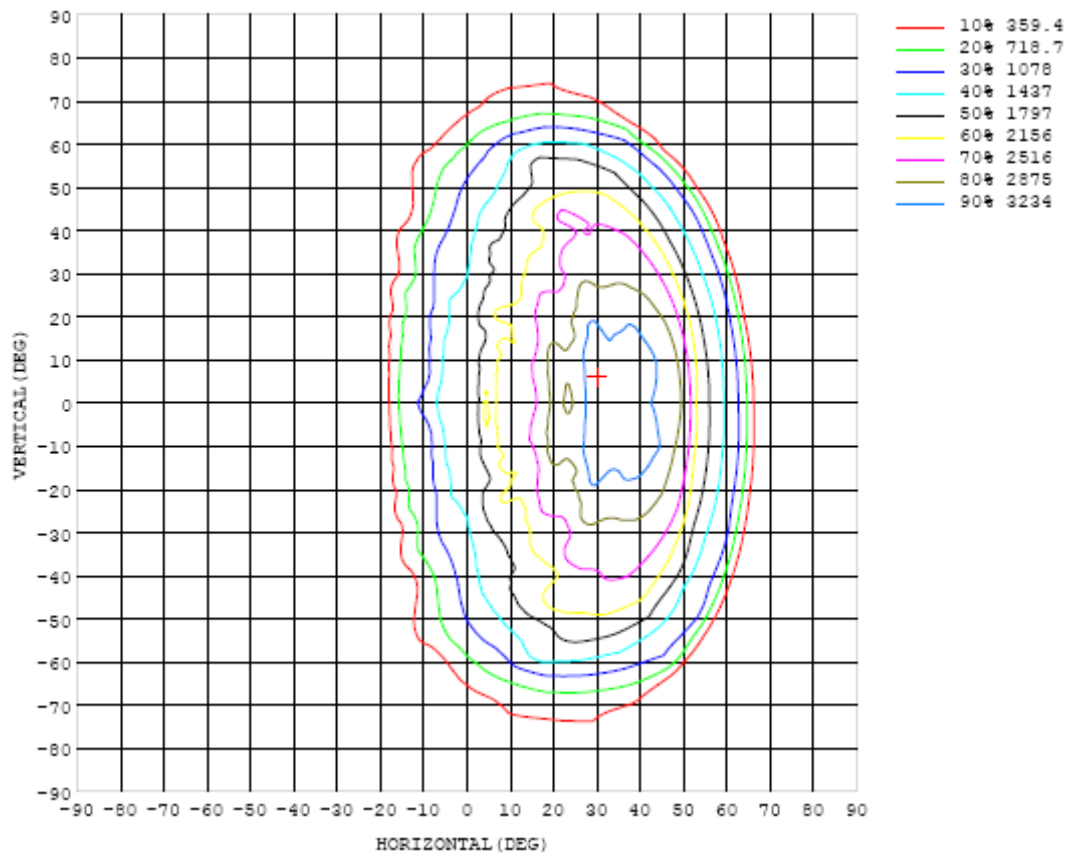


Chart 3: Isocandela Plot

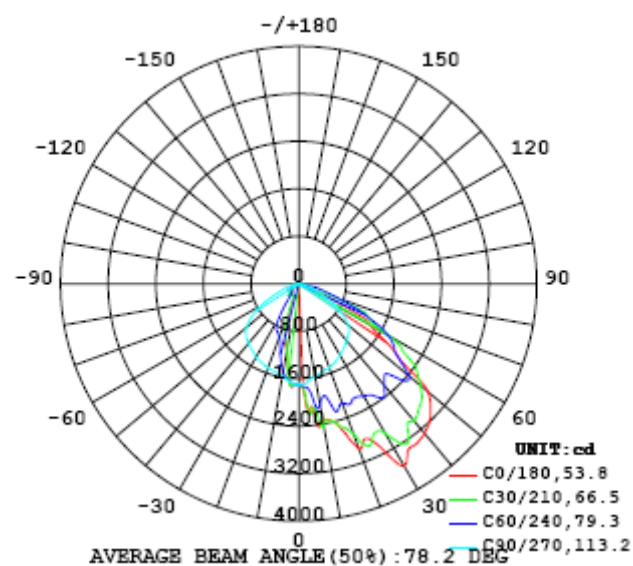


Chart 4: Polar Candela Distribution

## 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	1701	1701	1701	1701	1701	1701	1701	1701	1701	1701	1701	1701	1701	1701	1701	1701	1701	1701	1701
5	2127	2146	2187	2228	2146	1904	1769	1745	1702	1668	1648	1642	1648	1691	1724	1711	1669	1679	1702
10	2357	2348	2376	2433	2347	2018	2074	1823	1620	1578	1579	1561	1464	1290	1140	1085	1089	1116	1126
15	2433	2484	2495	2429	2312	2214	2119	1950	1589	1531	1527	1411	1124	969	917	912	872	829	830
20	2954	2962	2915	2692	2412	2174	2141	1939	1743	1514	1468	1143	930	865	656	357	253	225	229
25	2914	2946	2945	2920	2771	2479	2147	2141	1829	1459	1372	947	846	443	227	218	206	206	207
30	3536	3589	3408	2912	2836	2707	2202	1993	1747	1389	1212	841	490	216	213	231	227	218	217
35	3337	3406	3303	3218	2849	2405	2338	1877	1669	1322	1001	735	200	203	230	241	236	222	218
40	3287	3500	3300	3013	2846	2665	2237	1833	1702	1250	819	403	166	211	247	241	261	226	212
45	3129	3257	3120	2886	2746	2598	2169	1984	1617	1190	703	163	170	222	273	197	159	101	91.9
50	2839	2775	2776	2667	2627	2449	2417	1888	1448	1089	629	172	177	223	177	80.9	53.7	46.9	37.3
55	1933	1967	2173	2350	2349	2254	1968	1659	1269	911	478	180	180	134	48.2	40.1	46.7	54.9	46.8
60	1401	1430	1484	1695	1877	1839	1728	1601	1020	639	130	205	143	31.4	28.9	44.2	54.1	61.8	57.6
65	602	819	1071	1275	1261	1377	1212	1026	692	374	58.0	205	36.7	32.4	39.1	49.8	57.4	60.7	55.5
70	15.4	38.6	59.5	378	955	780	690	580	394	206	46.5	51.9	21.7	41.4	40.8	46.5	51.4	49.9	48.7
75	3.68	4.65	5.38	8.51	25.9	197	390	334	258	96.7	17.2	11.9	24.5	36.7	30.7	35.2	39.3	37.5	38.0
80	1.10	1.25	1.50	2.18	2.63	4.84	27.0	55.3	42.2	15.1	5.02	8.20	10.1	20.7	17.2	10.1	8.73	8.65	8.75
85	0.41	0.33	0.29	0.27	0.25	0.33	1.13	2.68	3.11	2.63	3.06	3.55	4.26	4.87	5.96	6.30	6.85	7.20	7.05
90	0.25	0.17	0.12	0.09	0.10	0.12	0.18	0.18	0.11	0.29	0.42	0.23	0.34	0.38	0.38	0.26	0.28	0.20	0.13
95	0.14	0.14	0.10	0.07	0.05	0.03	0.05	0.08	0.08	0.09	0.11	0.12	0.14	0.14	0.12	0.11	0.10	0.11	0.19
100	0.17	0.12	0.09	0.07	0.07	0.08	0.10	0.12	0.12	0.16	0.19	0.24	0.29	0.23	0.21	0.20	0.19	0.19	0.36
105	0.13	0.11	0.09	0.07	0.07	0.08	0.11	0.14	0.18	0.22	0.25	0.29	0.33	0.35	0.35	0.33	0.31	0.30	0.60
110	0.11	0.10	0.09	0.07	0.08	0.09	0.14	0.18	0.23	0.29	0.33	0.37	0.40	0.43	0.44	0.43	0.42	0.43	0.79
115	0.10	0.09	0.09	0.08	0.09	0.11	0.15	0.22	0.29	0.37	0.44	0.48	0.50	0.53	0.55	0.56	0.56	0.57	0.95
120	0.10	0.09	0.09	0.09	0.10	0.14	0.19	0.25	0.35	0.44	0.52	0.58	0.62	0.67	0.70	0.72	0.73	0.75	1.14
125	0.10	0.10	0.08	0.11	0.13	0.18	0.25	0.29	0.42	0.54	0.63	0.72	0.77	0.83	0.87	0.91	0.92	0.94	1.33
130	0.11	0.11	0.12	0.14	0.16	0.22	0.31	0.39	0.49	0.62	0.75	0.87	0.95	1.00	1.06	1.13	1.15	1.18	1.56
135	0.13	0.14	0.16	0.19	0.21	0.27	0.36	0.50	0.56	0.73	0.87	1.00	1.10	1.22	1.34	1.36	1.38	1.39	1.77
140	0.16	0.18	0.21	0.26	0.28	0.35	0.43	0.55	0.63	0.80	0.95	1.13	1.26	1.42	1.48	1.52	1.56	1.55	1.96
145	0.23	0.24	0.28	0.32	0.35	0.41	0.50	0.61	0.75	0.88	1.04	1.23	1.35	1.45	1.53	1.56	1.60	1.59	2.03
150	0.30	0.33	0.39	0.43	0.44	0.46	0.53	0.66	0.73	0.86	1.02	1.17	1.28	1.40	1.48	1.51	1.53	1.50	2.02
155	0.40	0.46	0.51	0.59	0.53	0.51	0.60	0.68	0.74	0.84	0.99	1.14	1.23	1.34	1.42	1.46	1.42	1.41	1.92
160	0.53	0.60	0.64	0.71	0.69	0.63	0.64	0.71	0.79	0.80	1.03	1.17	1.24	1.33	1.39	1.39	1.36	1.34	1.77
165	0.65	0.73	0.78	0.83	0.84	0.76	0.75	0.81	0.84	0.89	1.09	1.23	1.27	1.33	1.35	1.33	1.31	1.27	1.49
170	0.82	0.87	0.92	0.96	0.95	0.81	0.82	0.86	0.95	1.00	1.07	1.24	1.28	1.30	1.32	1.31	1.29	1.25	1.29
175	0.93	1.01	1.05	1.09	1.12	1.03	1.03	1.05	1.08	1.05	1.20	1.32	1.37	1.40	1.43	1.43	1.40	1.37	1.19
180	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06

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	1701	1701	1701	1701	1701	1701	1701	1701	1701	1701	1701	1701	1701	1701	1701	1701	1701		
5	1680	1705	1716	1683	1654	1632	1624	1628	1650	1678	1723	1754	1928	2133	2195	2144	2102		
10	1131	1106	1097	1184	1352	1511	1586	1588	1589	1632	1913	1994	2011	2368	2396	2347	2372		
15	854	896	911	930	995	1193	1471	1525	1538	1632	1888	2218	2207	2276	2421	2448	2436		
20	234	276	439	729	890	952	1252	1486	1522	1888	2102	2150	2193	2401	2705	2891	2964		
25	207	209	211	244	581	873	1013	1428	1472	1830	2114	2196	2519	2787	2881	2940	2926		
30	218	223	225	214	226	659	861	1333	1431	1788	1999	2274	2733	2817	2939	3432	3573		
35	225	232	244	222	196	251	783	1181	1364	1824	1919	2443	2437	2944	3214	3261	3392		
40	242	252	250	244	202	163	627	993	1315	1732	1968	2215	2812	2815	3032	3289	3443		
45	115	159	221	260	211	155	290	817	1249	1631	2115	2359	2598	2748	2884	3091	3206		
50	50.7	51.3	93.3	188	211	174	175	691	1145	1476	1906	2440	2490	2602	2624	2756	2796		
55	54.9	43.4	39.5	48.3	160	180	179	570	969	1380	1891	2056	2219	2179	2108	1993	1958		
60	67.2	57.1	41.9	26.8	38.0	189	200	315	715	1210	1653	1809	1830	1622	1474	1416	1415		
65	64.9	58.1	45.5	31.5	27.6	48.7	162	119	450	785	1122	1295	1238	1152	901	638	532		
70	52.8	52.6	46.3	39.2	36.1	20.4	63.3	37.6	270	476	553	646	489	194	31.4	19.8	16.3		
75	37.2	41.0	31.5	33.3	34.9	16.3	13.5	10.6	137	294	364	133	30.3	9.05	6.37	4.46	4.15		
80	8.94	8.43	8.55	13.5	16.8	7.16	5.35	3.47	20.1	30.8	52.9	5.82	5.14	3.31	2.58	1.87	1.27		
85	7.15	6.48	5.54	4.52	3.83	3.03	2.33	1.81	2.10	1.93	1.14	1.73	2.17	2.03	1.39	0.81	0.55		
90	0.11	0.12	0.15	0.20	0.23	0.25	0.22	0.21	0.18	0.23	0.37	0.86	1.04	1.33	1.05	0.58	0.39		
95	0.20	0.24	0.27	0.31	0.34	0.34	0.27	0.20	0.13	0.07	0.05	0.04	0.04	0.04	0.69	0.45	0.22		
100	0.38	0.44	0.49	0.53	0.61	0.75	0.57	0.41	0.30	0.16	0.22	0.30	0.45	0.47	0.40	0.29	0.19		
105	0.63	0.67	0.75	0.89	0.88	0.79	0.66	0.51	0.38	0.30	0.39	0.22	0.37	0.30	0.27	0.21	0.16		
110	0.85	0.90	0.98	0.97	0.93	0.86	0.75	0.60	0.46	0.37	0.28	0.24	0.29	0.21	0.20	0.17	0.14		
115	0.97	1.02	1.05	1.02	0.97	0.91	0.80	0.65	0.51	0.40	0.29	0.35	0.24	0.18	0.17	0.15	0.13		
120	1.15	1.14	1.11	1.09	1.04	0.96	0.84	0.70	0.56	0.44	0.34	0.26	0.21	0.16	0.16	0.14	0.12		
125	1.32	1.29	1.25	1.21	1.14	1.03	0.92	0.79	0.64	0.51	0.40	0.27	0.22	0.17	0.16	0.15	0.13		
130	1.55	1.51	1.46	1.39	1.30	1.20	1.07	0.94	0.77	0.61	0.50	0.35	0.27	0.21	0.19	0.17	0.15		
135	1.78	1.76	1.73	1.64	1.54	1.40	1.25	1.10	0.91	0.76	0.59	0.48	0.38	0.32	0.25	0.22	0.19		
140	1.99	1.97	1.92	1.87	1.75	1.60	1.42	1.25	1.06	0.88	0.76	0.61	0.51	0.43	0.35	0.28	0.25		
145	2.07	2.08	2.04	1.99	1.90	1.73	1.56	1.34	1.19	0.96	0.91	0.78	0.67	0.56	0.47	0.38	0.36		
150	2.05	2.07	2.05	2.02	1.90	1.76	1.62	1.43	1.19	1.12	1.03	0.90	0.82	0.72	0.66	0.55	0.50		
155	1.96	1.99	2.03	1.97	1.84	1.71	1.58	1.45	1.27	1.21	1.07	0.99	0.92	0.89	0.85	0.73	0.65		
160	1.81	1.83	1.86	1.87	1.77	1.67	1.58	1.44	1.28	1.19	1.17	1.06	1.05	1.07	1.03	0.96	0.87		
165	1.53	1.58	1.62	1.66	1.65	1.59	1.53	1.40	1.30	1.16	1.17	1.15	1.11	1.19	1.18	1.16	1.08		
170	1.31	1.39	1.45	1.49	1.50	1.47	1.44	1.33	1.25	1.22	1.23	1.21	1.18	1.30	1.37	1.32	1.24		
175	1.19	1.27	1.32	1.37	1.35	1.36	1.33	1.25	1.18	1.19	1.28	1.28	1.27	1.38	1.44	1.41	1.37		
180	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06		

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.

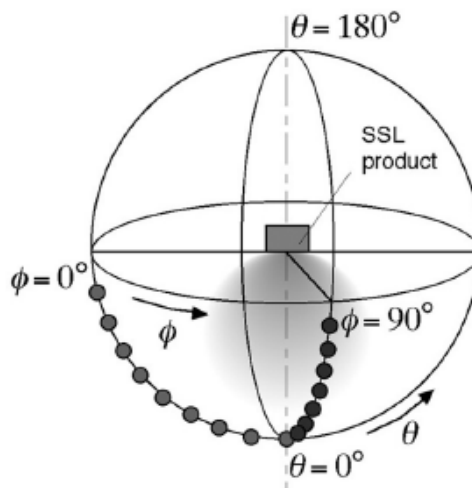
## Color Characteristics Measurements

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  $10^\circ$  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.

Prepared by: Leading Testing Laboratories  
3rd Floor, Bld. 2, NO. 96 Longchuanwu Rd Qianjiang Economy Dev. Zone, Yuhang Dist,  
Hangzhou, Zhejiang Province, China 311100  
Tel: +86 571 86376106 [www.ledtestlab.com](http://www.ledtestlab.com)

Page 13 of 13