



## LM-79-08 Test Report

for

### ABOVE ALL LIGHTING INC.

1501 Industrial Way N. Toms River, NJ 08755.

### WRAP

### Model: WRP12D38LED501S

### 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.: HZ16100018j

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

Reviewed by:

*April Zou*

Engineer: April Zou

Dec. 27, 2016



Approved by:

*Jim Zhang*

Manager: Jim Zhang

Dec. 27, 2016

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: **WRP12D38LED501S**

Luminous Efficacy (Lumens /Watt)	Total Luminous Flux (Lumens)	Power (Watts)	Power Factor
139.8	5048.5	36.12	0.9963
CCT (K)	CRI	Stabilization Time (Light & Power)	
4989	82.8	60	

Table 1: Executive Data Summary

### Test specifications:

<b>Date of Receipt</b>	: Dec. 14, 2016
<b>Date of Test</b>	: Dec. 22, 2016
<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



Sample view

### Equipment Under Test (EUT)

<b>Name</b>	: WRAP
<b>Model</b>	: WRP12D38LED501S
<b>Electrical Ratings</b>	: 120~277Vac, 50/60Hz, 38W
<b>Product Description</b>	: 5000K, Aluminum frame, Frosted Lens, SPCC with powder paint Manufacturer of light source: LG Innotek Co., Ltd Model of light source: LGIT 5630HE Package
<b>Manufacturer</b>	: ABOVE ALL LIGHTING INC.
<b>Address</b>	: Room 1012, North Minch Fortune 108 Plaza,# 1839 Qixin road, Shanghai

## TEST RESULTS

Test ambient temperature was 24.7°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 30 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)	0.302	0.136
Power Factor	0.9963	0.9470
Test Power (W)	36.12	35.69
THD A%	8.62	9.86
Luminous Efficacy (lm/W)	139.8	141.5
Total Luminous Flux (lm)	5048.5	5050.4
Color Rendering Index (CRI)	82.8	
R9	3	
Correlated Color Temperature (CCT) (K)	4989	
Chromaticity (Chroma x, Chroma y)	(0.3453, 0.3508)	
Chromaticity (Chroma u, Chroma v)	(0.2119, 0.3229)	
Chromaticity (Chroma u', Chroma v')	(0.2119, 0.4843)	
Duv	0.0004	
Average Beam Angle (°)	95.1	
Center Beam Candle Power (cd)	1862	
Spacing Criteria	1.28 (0°-180°)/ 1.20 (90°-270°)	
Zonal Lumens in the 0°-60°Zone	73.96%	
Zonal Lumens in the 60°-90°Zone	17.53%	
Zonal Lumens in the 90°-120°Zone	5.90%	
Zonal Lumens in the 120°-180°Zone	2.61%	

Special Color Rendering Indices	
R1	81
R2	87
R3	93
R4	84
R5	83
R6	83
R7	86
R8	66
R9	3
R10	71
R11	84
R12	69
R13	82
R14	96

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

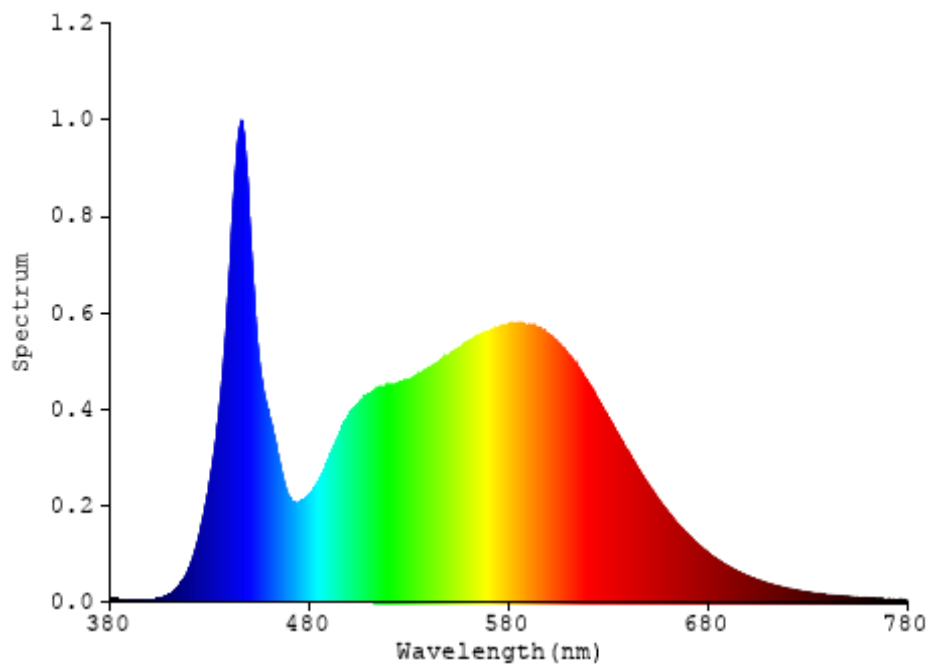


Chart 1: Spectral Power Distribution

## Zonal Lumen Tabulation

$\gamma(^{\circ})$	Lumens	% Total
0- 10	176.046	3.49%
10- 20	508.079	10.06%
20- 30	770.794	15.27%
30- 40	889.439	17.62%
40- 50	806.292	15.97%
50- 60	583.317	11.55%
60- 70	393.45	7.79%
70- 80	304.091	6.02%
80- 90	187.224	3.71%
90-100	107.064	2.12%
100-110	102.249	2.03%
110-120	88.62	1.76%
120-130	61.855	1.23%
130-140	36.719	0.73%
140-150	19.432	0.38%
150-160	9.853	0.20%
160-170	3.609	0.07%
170-180	0.359	0.01%
Total	5048.5	100%

$\gamma(^{\circ})$	Lumens	% Total
0- 60	3733.967	73.96%
60- 90	884.765	17.53%
0-90	4618.732	91.49%
90- 180	429.76	8.51%
0- 180	5048.5	100%

Table 3: Zonal Lumen Data

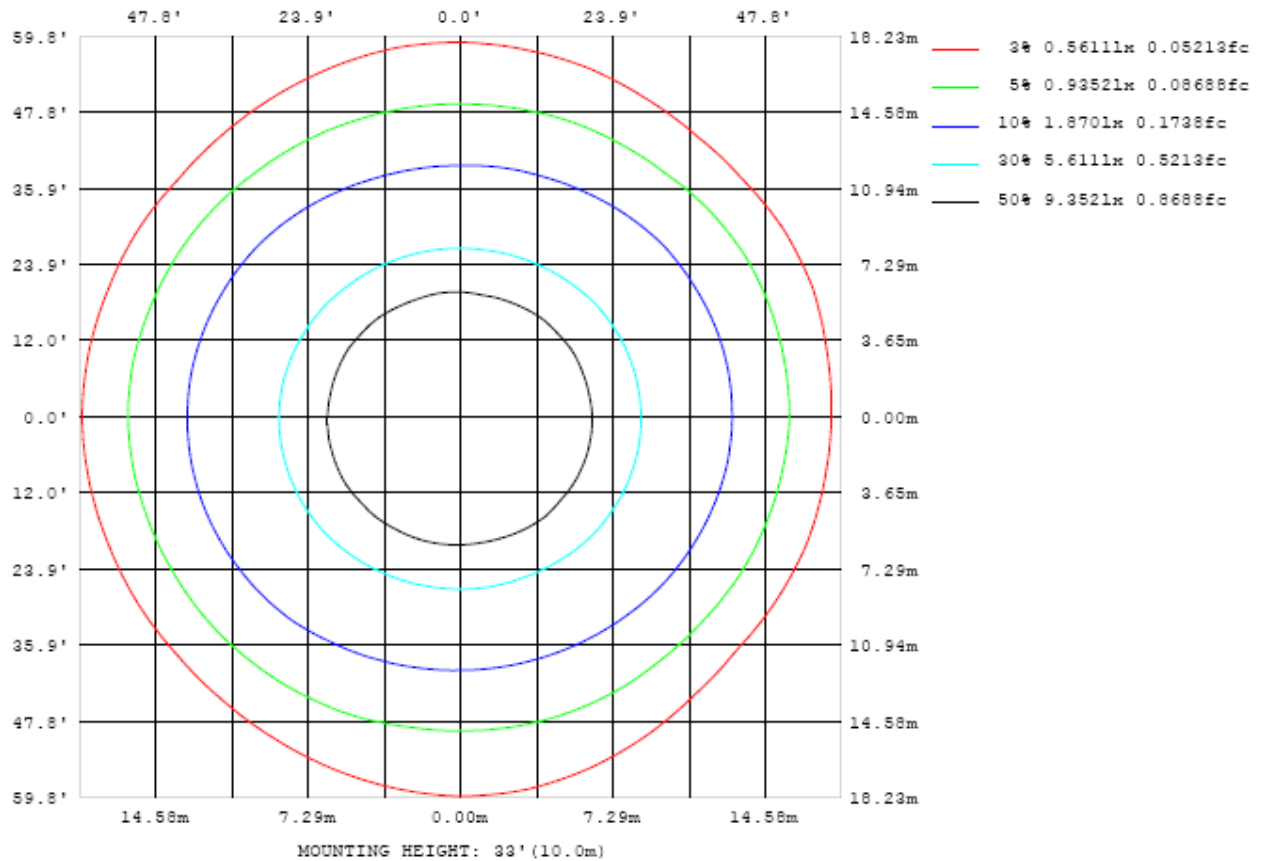


Chart 2: Illuminance Plot (Footcandles)

## Luminous Intensity Distribution Plots

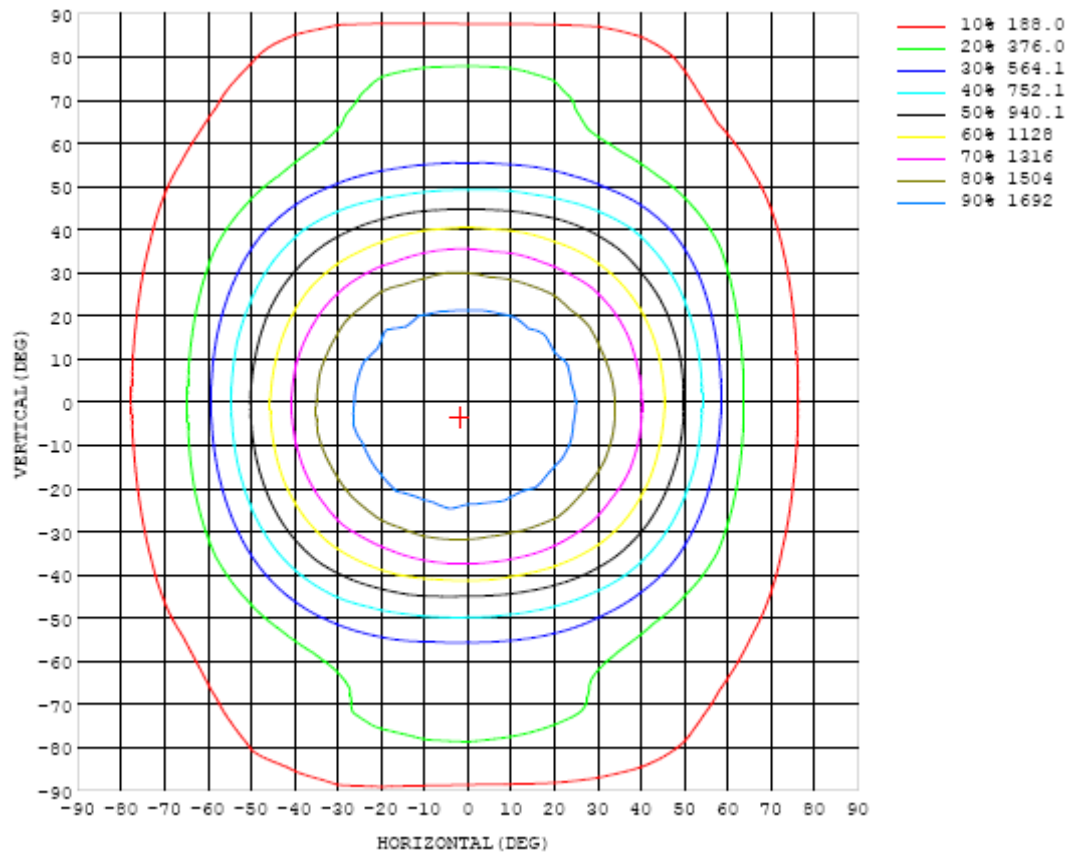


Chart 3: Isocandela Plot

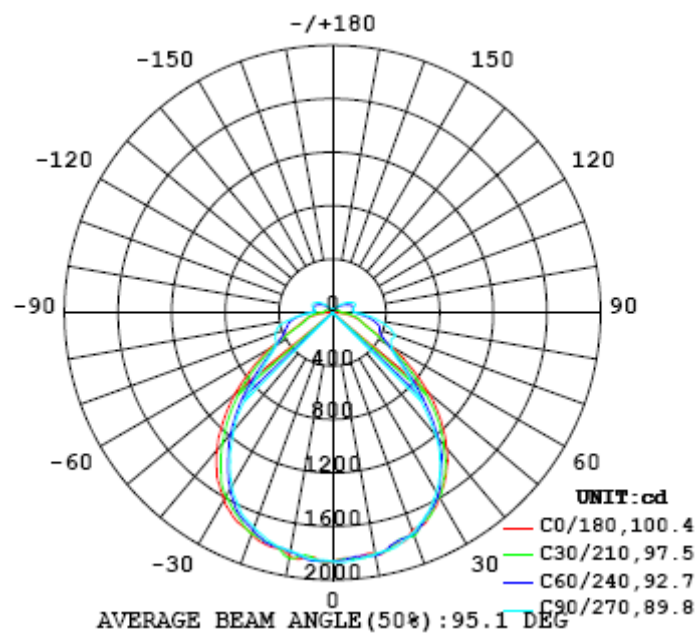


Chart 4: Polar Candela Distribution

## Luminous Intensity Data

Table--1

UNIT: cd

C (DEG) γ (DEG)	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
0	1862	1862	1862	1862	1862	1862	1862	1862	1862	1862	1862	1862	1862	1862	1862	1862	1862	1862	1862
5	1847	1847	1847	1847	1842	1836	1835	1838	1850	1861	1866	1877	1872	1864	1860	1847	1841	1835	1836
10	1835	1836	1830	1831	1840	1844	1843	1827	1826	1835	1845	1837	1827	1841	1859	1859	1856	1849	1848
15	1793	1787	1783	1794	1813	1802	1784	1802	1802	1818	1800	1791	1821	1820	1810	1803	1812	1813	1811
20	1738	1751	1769	1777	1755	1753	1760	1749	1749	1753	1752	1768	1766	1773	1769	1786	1786	1767	1761
25	1690	1686	1701	1695	1684	1692	1668	1684	1661	1667	1692	1682	1689	1708	1710	1704	1707	1714	1712
30	1589	1597	1601	1594	1578	1578	1579	1565	1542	1549	1569	1576	1581	1605	1613	1625	1625	1630	1619
35	1476	1482	1471	1463	1449	1433	1413	1406	1402	1400	1412	1425	1432	1445	1470	1482	1500	1515	1503
40	1324	1325	1316	1293	1285	1253	1222	1205	1204	1197	1205	1224	1243	1272	1302	1316	1335	1340	1343
45	1146	1132	1123	1101	1071	1034	994	963	944	934	957	1000	1028	1068	1104	1130	1148	1159	1155
50	934	928	900	872	840	801	776	756	746	747	756	776	817	855	889	919	936	947	952
55	712	700	675	650	630	605	594	586	580	576	586	611	631	652	682	698	714	732	740
60	497	490	483	467	447	456	479	496	505	507	502	496	493	489	493	505	516	531	540
65	341	350	348	326	326	358	401	449	479	482	474	446	408	369	346	347	369	373	369
70	252	267	255	246	262	310	375	434	481	496	485	435	370	306	259	242	262	277	265
75	201	196	198	209	242	301	353	386	420	441	429	399	355	292	237	204	199	209	213
80	143	135	143	169	211	264	299	318	343	350	349	330	301	270	217	180	155	148	159
85	63.0	78.2	86.9	116	163	201	226	244	255	260	262	258	240	206	178	133	103	90.1	77.8
90	1.78	15.3	31.8	66.2	115	150	168	174	174	173	174	179	178	155	116	68.2	32.5	16.8	0.35
95	0.28	13.4	31.8	62.9	111	142	156	157	155	153	155	159	160	143	110	66.4	32.1	13.8	0.42
100	0.34	13.3	29.4	58.7	105	139	156	159	156	154	155	158	155	137	104	61.7	30.2	13.0	0.46
105	0.38	12.7	26.6	53.1	96.0	136	160	169	170	169	168	167	156	133	95.8	55.9	25.5	13.5	0.54
110	0.52	11.6	25.1	46.3	85.3	124	154	171	179	181	178	170	151	123	86.8	48.4	24.3	12.6	0.63
115	0.60	10.8	23.0	40.3	72.6	109	139	160	171	175	171	158	137	109	75.1	41.9	22.1	11.8	0.71
120	0.69	9.53	21.1	34.1	61.9	92.0	119	140	153	157	152	140	119	93.2	65.3	34.6	20.3	10.3	0.81
125	0.79	8.35	19.7	28.8	51.0	76.6	99.6	118	129	133	130	118	101	79.3	53.4	28.8	19.0	9.25	0.94
130	0.91	7.29	18.3	25.5	41.0	62.4	81.5	96.1	106	109	106	97.3	83.3	64.7	42.3	25.4	18.1	8.37	1.06
135	1.04	5.97	16.4	23.6	33.4	49.4	64.7	75.9	83.6	86.1	84.0	77.1	66.1	50.9	34.3	23.4	16.7	7.09	1.12
140	1.16	4.31	14.3	22.0	28.8	39.5	50.6	59.1	64.3	66.1	64.6	59.9	51.2	40.1	29.3	21.9	15.2	5.33	1.27
145	1.26	2.66	11.7	19.4	25.7	32.8	40.5	46.3	49.6	50.7	49.7	46.3	40.4	33.4	26.2	20.0	13.1	4.18	1.43
150	1.30	1.67	8.87	16.3	22.4	28.5	33.6	37.8	40.3	41.3	40.5	38.1	33.9	28.7	23.1	17.2	10.1	2.95	1.63
155	1.34	1.33	6.51	12.8	18.6	24.1	28.6	31.9	34.1	34.7	34.2	32.2	28.9	24.6	19.5	14.1	8.23	1.95	1.69
160	1.38	1.34	3.81	9.22	14.1	19.0	23.3	26.2	28.1	28.7	28.1	26.4	23.6	19.8	15.6	10.5	5.78	1.41	1.75
165	1.41	1.43	1.65	5.15	8.77	12.2	15.8	18.4	20.0	20.7	20.5	19.3	17.2	13.9	10.1	6.51	2.71	1.45	1.75
170	1.44	1.45	1.44	1.69	3.19	5.64	7.68	9.34	10.4	10.9	10.6	9.82	8.42	6.27	4.34	2.34	1.54	1.55	1.77
175	1.38	1.42	1.46	1.51	1.52	1.52	1.57	1.78	1.95	2.05	2.06	1.93	1.79	1.60	1.56	1.58	1.59	1.61	1.72
180	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49

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	1862	1862	1862	1862	1862	1862	1862	1862	1862	1862	1862	1862	1862	1862	1862	1862	1862		
5	1831	1830	1834	1847	1854	1863	1864	1863	1853	1838	1837	1833	1840	1849	1845	1845	1843		
10	1855	1861	1867	1850	1825	1818	1827	1826	1810	1804	1817	1829	1836	1837	1830	1829	1831		
15	1803	1801	1788	1781	1802	1795	1763	1786	1777	1776	1780	1773	1794	1805	1786	1782	1790		
20	1772	1774	1759	1742	1741	1734	1726	1719	1712	1718	1723	1740	1729	1736	1757	1755	1744		
25	1701	1700	1678	1696	1651	1657	1634	1637	1631	1623	1644	1632	1651	1658	1665	1676	1674		
30	1616	1614	1585	1569	1558	1526	1511	1516	1501	1483	1502	1518	1537	1549	1562	1575	1580		
35	1499	1484	1452	1433	1400	1363	1349	1340	1332	1327	1347	1355	1388	1414	1430	1449	1464		
40	1335	1307	1277	1248	1210	1183	1164	1150	1148	1146	1165	1185	1213	1254	1279	1302	1311		
45	1138	1117	1087	1052	1021	986	967	938	924	936	966	994	1025	1058	1087	1115	1135		
50	937	922	888	858	821	774	743	727	724	737	748	778	824	864	882	910	931		
55	735	708	688	664	627	603	588	579	576	579	592	601	622	667	688	705	712		
60	533	515	506	484	481	484	488	492	491	487	485	475	472	483	509	515	504		
65	369	370	350	348	376	412	440	461	470	457	433	395	365	351	357	371	350		
70	272	261	244	262	312	375	420	447	455	446	409	359	301	264	255	267	261		
75	209	205	205	237	287	347	389	415	418	407	381	341	280	227	203	197	200		
80	156	159	179	213	264	305	326	336	337	333	321	301	254	202	160	143	140		
85	93.7	103	133	169	207	231	241	243	240	238	236	227	201	159	112	88.3	80.2		
90	17.9	32.9	69.4	114	150	164	163	159	156	156	158	158	144	110	61.4	30.2	15.7		
95	15.4	33.3	68.6	109	137	145	140	134	131	132	135	137	130	105	62.4	30.6	14.1		
100	14.6	31.6	63.4	104	131	144	141	137	135	134	136	136	126	101	59.6	29.7	13.0		
105	14.8	29.5	57.6	95.6	127	148	154	153	151	150	149	143	126	95.0	55.5	28.6	13.3		
110	14.7	27.2	52.4	86.4	120	146	159	164	164	161	155	143	121	88.0	52.4	26.6	13.0		
115	14.2	24.9	48.4	78.2	108	134	152	161	163	159	151	134	110	80.3	48.2	24.8	12.1		
120	12.8	22.0	41.6	70.4	96.9	119	136	146	150	146	136	121	99.9	71.4	42.0	22.5	11.4		
125	11.3	20.2	34.9	59.9	83.9	106	121	130	133	130	122	107	85.8	59.6	35.4	20.1	10.4		
130	10.4	19.4	29.7	50.2	69.6	87.7	104	114	116	113	104	89.0	69.8	48.8	30.1	18.9	9.45		
135	9.71	18.8	26.5	41.4	56.8	70.6	82.2	91.4	94.2	90.9	82.9	70.5	56.0	40.1	26.3	18.1	8.66		
140	8.47	17.7	24.5	34.8	46.2	56.3	64.6	70.3	72.2	70.3	64.4	56.1	45.6	33.5	24.0	16.8	7.62		
145	6.81	15.3	22.7	30.3	37.9	45.1	50.7	54.6	55.4	53.9	50.1	44.6	37.0	28.8	22.0	15.0	6.28		
150	5.11	12.9	20.5	27.0	32.5	37.2	40.8	43.2	43.6	42.7	40.1	36.2	31.1	25.3	19.7	13.0	4.77		
155	3.15	11.0	17.0	23.2	27.9	31.5	33.9	35.4	35.8	35.0	33.0	30.4	26.7	22.3	16.5	11.2	3.63		
160	1.86	7.04	12.2	17.6	22.9	26.2	28.4	29.5	29.6	29.1	27.8	26.0	22.8	18.5	14.0	9.40	3.14		
165	1.76	2.44	6.48	10.3	15.2	18.9	21.5	23.2	23.7	23.4	22.3	20.6	17.9	15.1	11.6	7.16	2.54		
170	1.78	1.78	2.12	4.28	6.62	9.31	12.5	13.9	14.6	14.9	14.6	13.5	11.8	9.32	6.58	3.46	1.78		
175	1.73	1.73	1.74	1.83	2.13	2.28	2.51	3.59	4.60	4.56	4.30	3.67	2.84	2.20	1.74	1.57	1.55		
180	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49		

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 6: 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.

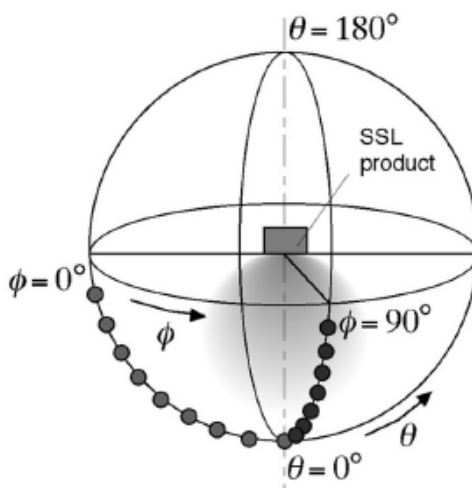
## Color Characteristics Measurements

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