



LM-79-08 Test Report

for

GREEN CREATIVE LTD

756 North Zhongshan Rd., Unit B301 Zhabei District, Shanghai

Commercial downlight

Model: 32CDL8G4DIM/830/277V

Laboratory: Leading Testing Laboratories

NVLAP CODE: 200960-0

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Report No.: HZ15060018d/R1

This report is replaced the old report No. HZ15060018d dated Jun. 23, 2015.

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

Review by:

Engineer: April Zou
Jun. 25, 2015

Approved by:



Manager: Jim Zhang
Jun. 25, 2015

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: 32CDL8G4DIM/830/277V

Luminous Efficacy (Lumens /Watt)	Total Luminous Flux (Lumens)	Power (Watts)	Power Factor
82.6	2542.8	30.80	0.9920
CCT (K)	CRI	Stabilization Time (Light & Power)	
2979	82.6	60	

Table 1: Executive Data Summary

Test specifications:

Date of Receipt	: Jun. 05, 2015
Date of Test	: Jun. 11, 2015
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 Photos



Figure 1- Overview of the sample

Equipment Under Test (EUT)

Name	: Commercial downlight
Model	: 32CDL8G4DIM/830/277V
Brand Name	: GREEN CREATIVE
Electrical Ratings	: AC120~277V, 60 Hz, 32W
Product Description	: 3000K, Frosted Plastic Cover, metal housing Nominal Flux:2150 lm SKU: 97696
Manufacturer	: GREEN CREATIVE LTD
Address	: 756 North Zhongshan Rd., Unit B301 Zhabei District, Shanghai

TEST RESULTS

Test ambient temperature was 24.3°C.

Sample orientation was light down. 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 95 minutes.

The photometric distance of Goniophotometer is 2.475m.

Luminous data was taken at 0.5°vertical intervals and 10°horizontal intervals.

Parameter	Result	
Test Voltage (V)	120.0	277.0
Voltage frequency (Hz)	60	60
Test Current (A)	0.259	0.121
Power Factor	0.9920	0.9411
Test Power (W)	30.80	31.42
Off-State Power (W)	0	0
THD A%	8.07	19.90
Luminous Efficacy (lm/W)	82.6	
Total Luminous Flux (lm)	2542.8	
Color Rendering Index (CRI)	82.6	
R9	15	
Correlated Color Temperature (CCT) (K)	2979	
Chromaticity (Chroma x, Chroma y)	(0.4393, 0.4062)	
Chromaticity (Chroma u, Chroma v)	(0.2511, 0.3484)	
Chromaticity (Chroma u', Chroma v')	(0.2511, 0.5226)	
Duv	0.0006	
Average Beam Angle (°)	77.8	
Center Beam Candle Power (cd)	1764	
Spacing Criteria	1.01 (0°-180°)/ 1.05 (90°-270°)	
Zonal Lumens in the 0°-60°Zone	96.95%	
Zonal Lumens in the 60°-90°Zone	2.98%	
Zonal Lumens in the 90°-120°Zone	0.01%	
Zonal Lumens in the 120°-180°Zone	0.06%	

Special Rendering Indices	Color
R1	80
R2	90
R3	97
R4	79
R5	80
R6	87
R7	85
R8	62
R9	15
R10	77
R11	77
R12	68
R13	82
R14	99

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

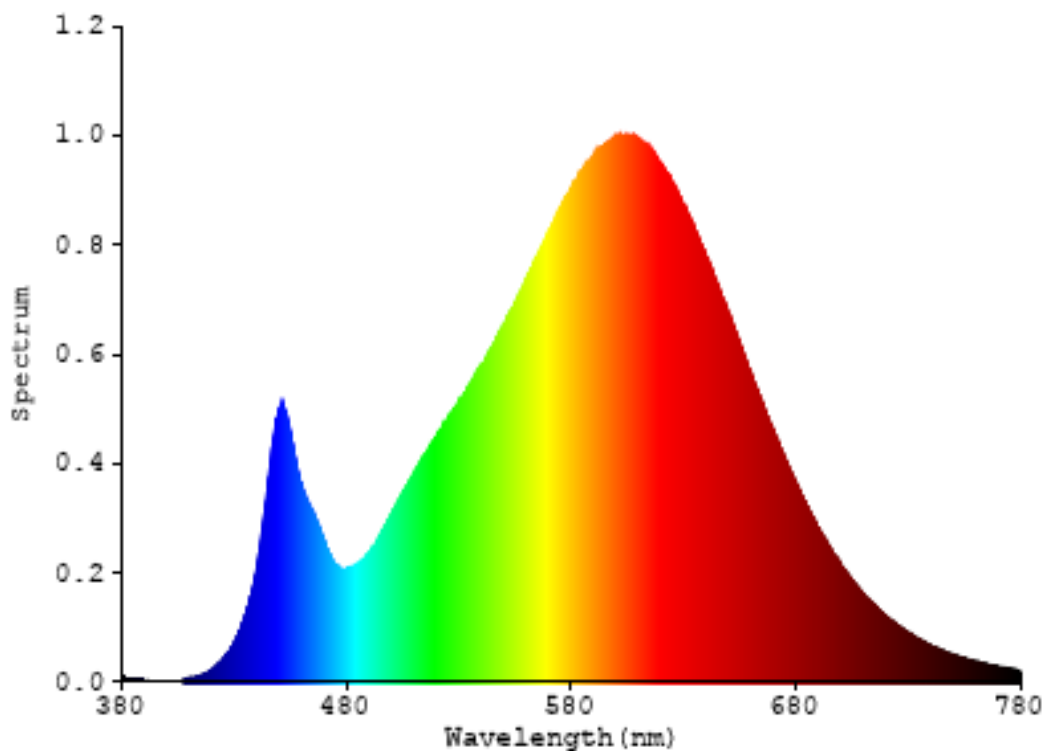


Chart 1: Spectral Power Distribution

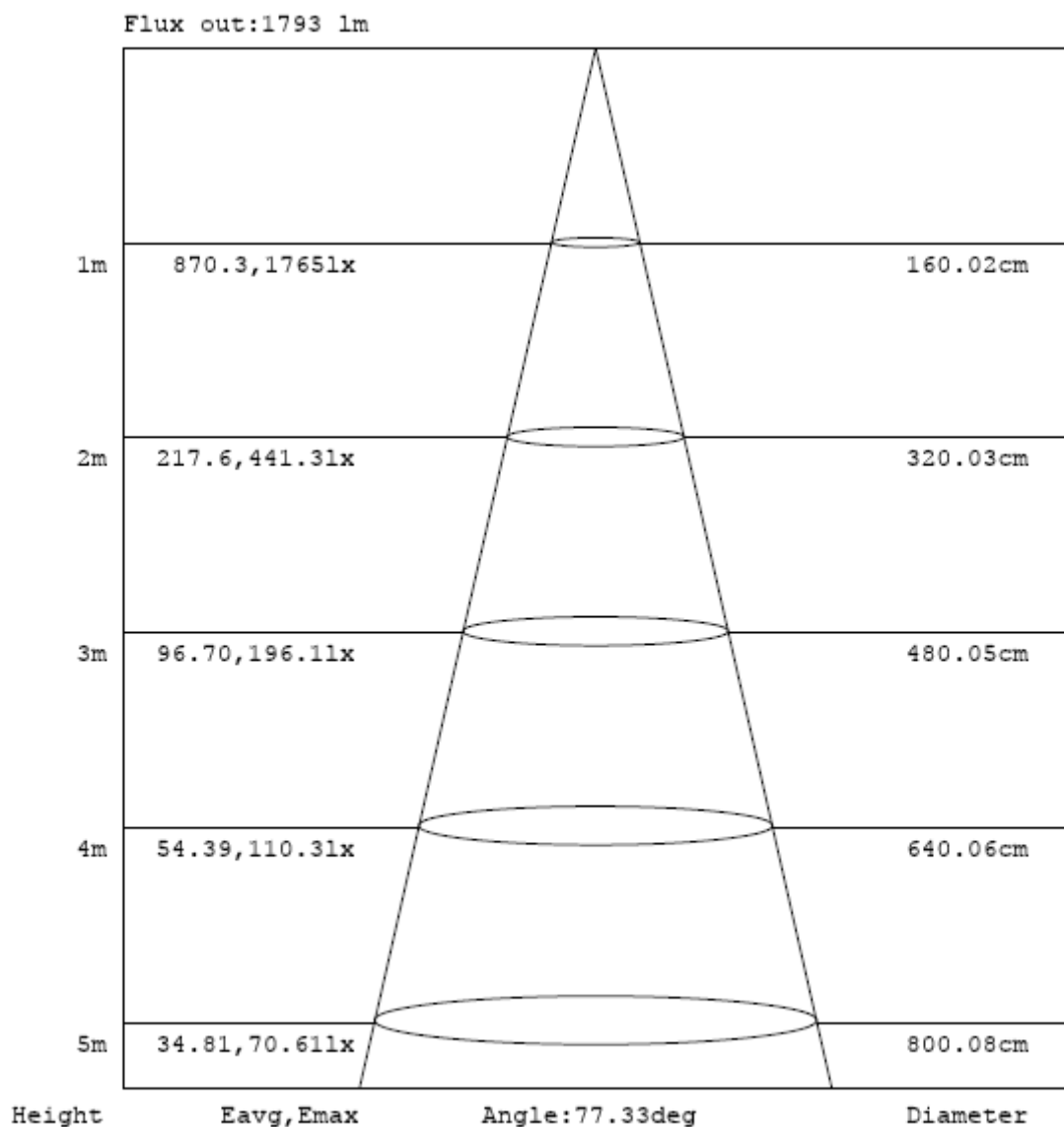
Zonal Lumen Tabulation- Goniophotometer Method

$\gamma(^{\circ})$	Lumens	% Total
0- 10	164.511	6.47%
10- 20	444.72	17.49%
20- 30	606.845	23.87%
30- 40	636.356	25.03%
40- 50	450.9	17.73%
50- 60	161.923	6.37%
60- 70	47.719	1.88%
70- 80	21.984	0.86%
80- 90	5.989	0.24%
90-100	0.062	0.00%
100-110	0.074	0.00%
110-120	0.115	0.00%
120-130	0.185	0.01%
130-140	0.293	0.01%
140-150	0.379	0.01%
150-160	0.375	0.01%
160-170	0.264	0.01%
170-180	0.094	0.00%
Total	2542.8	100%

$\gamma(^{\circ})$	Lumens	% Total
0- 60	2465.255	96.95%
60- 90	75.692	2.98%
0-90	2540.947	99.93%
90- 180	1.841	0.07%
0- 180	2542.8	100%

Table 3: Zonal Lumen Data

Illuminance Plots



Note:The Curves indicate the illuminated area and the average illumination when the luminaire is at different distance.

Chart 2: Beam angle

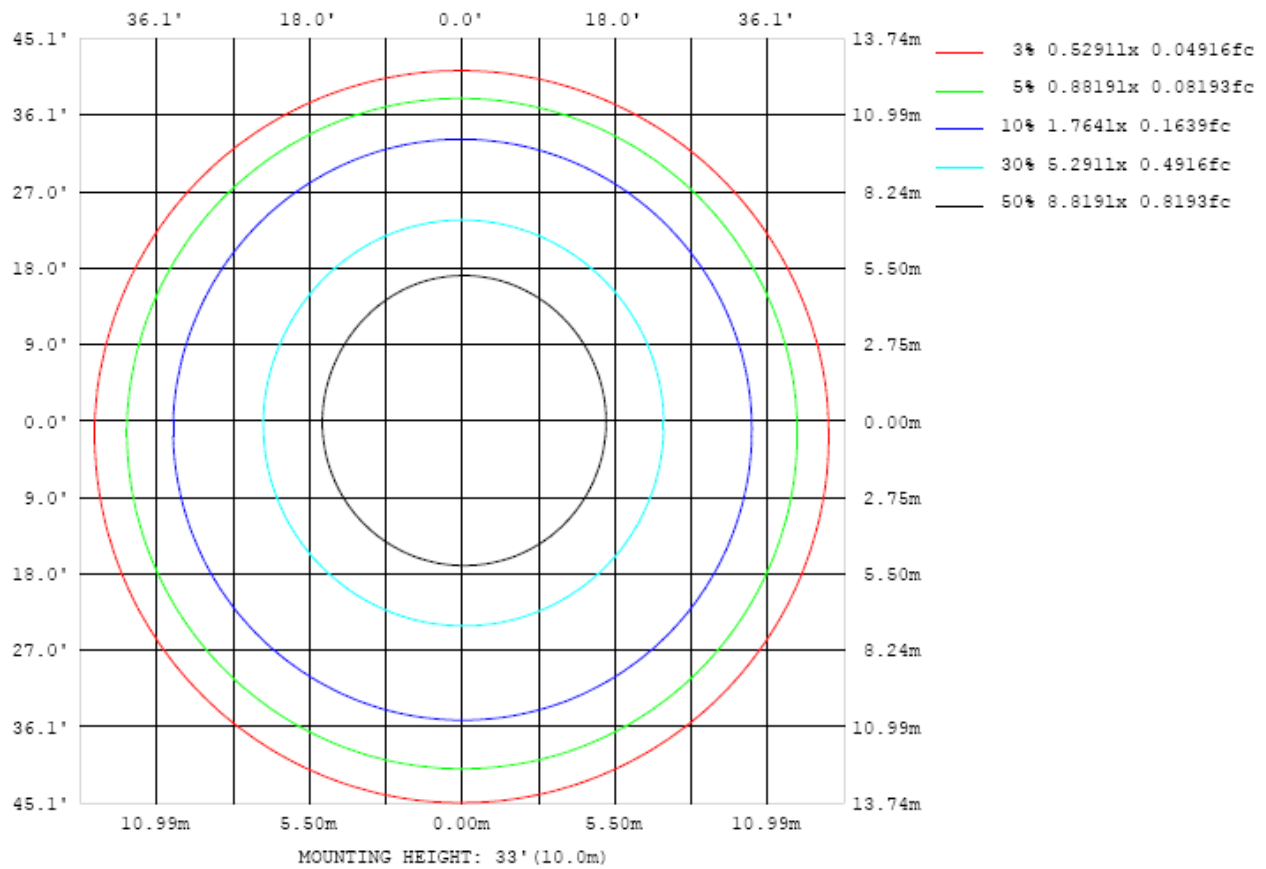


Chart 3: Illuminance Plot (Footcandles)

Luminous Intensity Distribution Plots

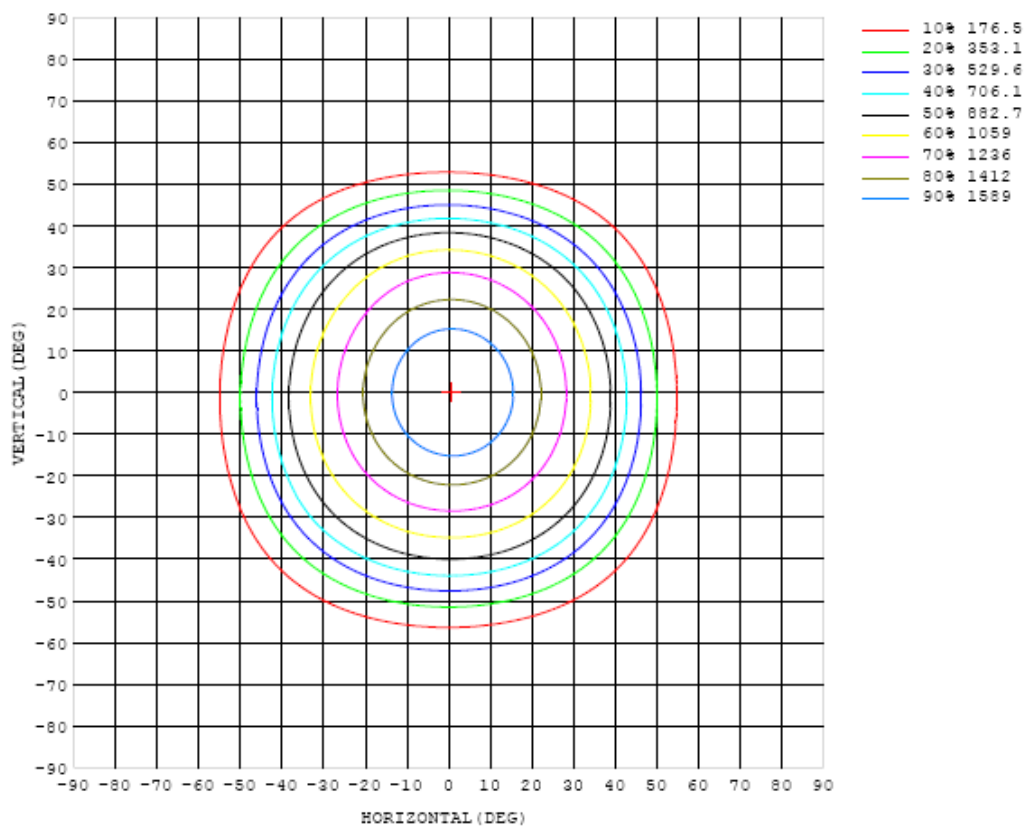


Chart 4: Isocandla Plot

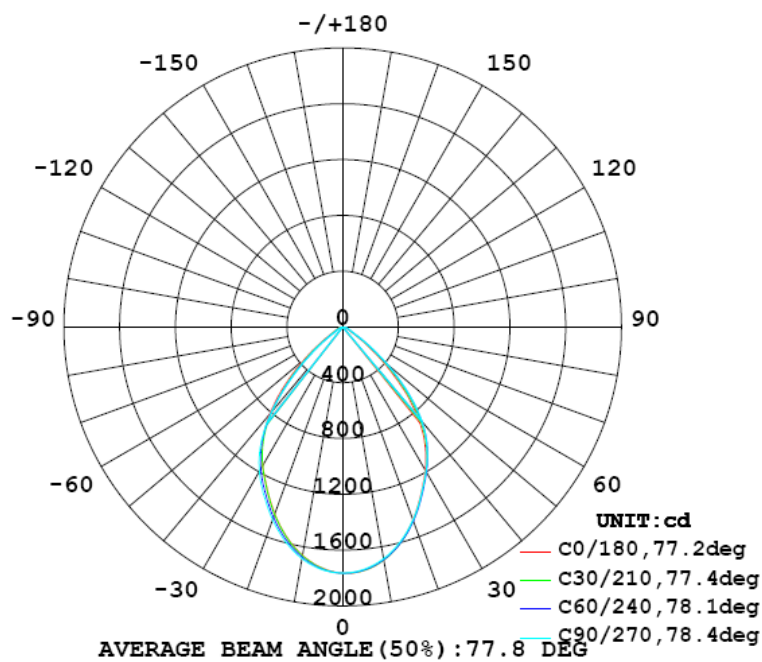


Chart 5: Polar Candela Distribution

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	1764	1764	1764	1764	1764	1764	1764	1764	1764	1764	1764	1764	1764	1764	1764	1764	1764	1764	1764
5	1752	1752	1751	1751	1750	1749	1749	1748	1746	1744	1743	1741	1739	1738	1737	1736	1735	1734	1734
10	1696	1697	1696	1695	1695	1695	1693	1691	1689	1686	1682	1679	1676	1674	1670	1667	1665	1663	1663
15	1600	1602	1602	1602	1603	1603	1602	1600	1597	1594	1590	1585	1580	1575	1570	1565	1562	1559	1557
20	1472	1474	1476	1478	1479	1480	1481	1479	1476	1472	1468	1463	1457	1451	1445	1438	1433	1430	1428
25	1326	1328	1331	1335	1337	1339	1339	1337	1336	1332	1327	1322	1316	1310	1303	1296	1290	1286	1284
30	1186	1188	1192	1196	1199	1201	1202	1200	1198	1195	1191	1186	1181	1176	1169	1163	1157	1153	1150
35	1030	1036	1041	1048	1053	1056	1059	1060	1058	1056	1053	1049	1043	1037	1030	1023	1015	1008	1003
40	833	843	853	862	871	878	883	886	886	885	882	878	872	864	856	846	836	825	815
45	588	601	613	626	635	644	653	657	659	659	657	653	646	639	634	620	605	593	582
50	351	362	374	385	396	405	412	417	420	420	419	415	410	403	394	384	373	362	353
55	168	177	185	193	200	207	212	217	219	221	221	219	215	210	203	196	188	181	176
60	72.6	76.9	81.2	85.0	88.6	91.6	94.0	96.0	97.7	98.7	98.9	98.1	96.7	94.8	92.4	89.7	86.9	83.9	81.5
65	46.4	49.4	51.8	53.9	55.6	56.9	58.0	59.0	59.8	60.4	60.9	60.9	60.8	60.1	59.4	58.7	57.8	56.6	55.0
70	30.6	32.7	34.7	36.3	37.7	38.9	39.8	40.7	41.4	42.0	42.3	42.4	42.3	41.9	41.5	41.1	40.4	39.5	38.4
75	19.4	20.9	22.2	23.4	24.4	25.2	26.0	26.6	27.1	27.6	27.9	28.0	28.0	27.8	27.6	27.3	26.9	26.3	25.4
80	11.2	12.1	12.9	13.7	14.4	15.0	15.5	15.9	16.3	16.6	16.8	16.9	16.9	16.8	16.6	16.4	16.1	15.7	15.1
85	4.51	5.05	5.59	6.12	6.59	6.99	7.33	7.62	7.83	8.01	8.11	8.16	8.14	8.03	7.84	7.62	7.36	7.03	6.62
90	0.03	0.03	0.08	0.18	0.37	0.57	0.77	0.94	1.06	1.14	1.16	1.16	1.08	0.91	0.70	0.47	0.27	0.12	0.07
95	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.05
100	0.03	0.03	0.03	0.03	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.02	0.03	0.03	0.03	0.07
105	0.04	0.04	0.04	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.10
110	0.06	0.06	0.06	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.12
115	0.10	0.09	0.09	0.09	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.09	0.09	0.14
120	0.15	0.14	0.14	0.14	0.13	0.13	0.13	0.13	0.12	0.12	0.12	0.12	0.13	0.13	0.13	0.13	0.14	0.14	0.16
125	0.21	0.21	0.20	0.20	0.20	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.20	0.20	0.20	0.21	0.21	0.20
130	0.30	0.29	0.29	0.28	0.28	0.28	0.28	0.27	0.27	0.27	0.27	0.27	0.28	0.28	0.28	0.28	0.29	0.30	0.27
135	0.39	0.39	0.38	0.38	0.38	0.37	0.37	0.37	0.37	0.37	0.39	0.37	0.37	0.38	0.38	0.38	0.39	0.39	0.37
140	0.49	0.49	0.48	0.49	0.48	0.48	0.49	0.47	0.47	0.50	0.49	0.47	0.47	0.47	0.48	0.48	0.48	0.49	0.48
145	0.59	0.59	0.58	0.59	0.61	0.59	0.67	0.62	0.57	0.57	0.57	0.58	0.58	0.58	0.58	0.59	0.59	0.59	0.60
150	0.69	0.69	0.68	0.68	0.70	0.83	0.94	0.96	0.67	0.68	0.68	0.68	0.68	0.68	0.68	0.69	0.69	0.69	0.72
155	0.77	0.77	0.77	0.77	0.76	0.80	0.91	0.81	0.76	0.77	0.77	0.77	0.77	0.77	0.77	0.78	0.78	0.78	0.82
160	0.84	0.84	0.83	0.83	0.83	0.83	0.83	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.85	0.84	0.84	0.88
165	0.88	0.87	0.87	0.87	0.88	0.89	0.90	0.89	0.88	0.87	0.87	0.87	0.88	0.88	0.88	0.88	0.88	0.88	0.91
170	0.90	0.90	0.90	0.91	0.91	0.92	0.93	0.93	0.92	0.91	0.91	0.91	0.91	0.91	0.90	0.90	0.90	0.91	0.90
175	0.97	0.96	0.95	0.94	0.94	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.94	0.95	0.96	0.97
180	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07

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	1764	1764	1764	1764	1764	1764	1764	1764	1764	1764	1764	1764	1764	1764	1764	1764	1764		
5	1734	1735	1735	1737	1739	1740	1742	1744	1745	1747	1748	1749	1750	1751	1752	1752	1752		
10	1662	1664	1666	1669	1673	1677	1680	1683	1686	1689	1691	1692	1693	1695	1695	1695	1695		
15	1557	1558	1561	1566	1572	1578	1583	1588	1592	1595	1597	1598	1598	1598	1598	1598	1599		
20	1427	1428	1431	1437	1445	1453	1461	1467	1472	1474	1476	1474	1473	1472	1470	1470	1472		
25	1282	1283	1287	1294	1304	1315	1325	1332	1336	1338	1337	1333	1330	1327	1326	1325	1325		
30	1147	1146	1150	1156	1166	1177	1187	1194	1197	1198	1195	1191	1187	1184	1182	1182	1184		
35	997	993	993	996	1004	1012	1020	1025	1026	1026	1022	1019	1017	1016	1017	1020	1025		
40	804	796	791	788	789	793	795	796	795	794	792	792	794	798	805	814	824		
45	569	557	548	541	537	533	531	528	526	525	525	528	533	541	551	564	577		
50	340	328	318	310	302	295	288	284	281	281	283	288	295	304	315	327	340		
55	167	158	149	140	132	124	117	112	110	110	112	117	123	131	141	152	163		
60	77.8	73.8	69.5	64.3	58.5	52.4	46.9	42.9	40.9	41.1	42.8	45.7	49.4	53.8	58.5	63.4	68.5		
65	52.8	50.0	46.5	42.3	37.5	32.6	28.4	25.4	24.0	24.2	25.4	27.5	30.1	33.2	36.6	40.0	43.4		
70	36.6	34.3	31.5	28.0	24.3	20.8	17.9	15.9	15.0	15.1	15.9	17.3	19.0	21.2	23.5	25.9	28.4		
75	24.1	22.4	20.2	17.8	15.3	12.8	11.0	9.80	9.29	9.37	9.89	10.7	11.8	13.2	14.8	16.4	18.0		
80	14.2	13.0	11.5	9.96	8.45	7.13	6.16	5.57	5.32	5.38	5.67	6.14	6.77	7.53	8.40	9.33	10.3		
85	6.03	5.33	4.57	3.80	3.15	2.62	2.26	2.06	1.98	2.01	2.12	2.32	2.57	2.89	3.27	3.68	4.14		
90	0.03	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05		
95	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06		
100	0.07	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08		
105	0.10	0.10	0.10	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.10		
110	0.12	0.12	0.12	0.12	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.12		
115	0.14	0.14	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.14		
120	0.17	0.17	0.17	0.17	0.17	0.18	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		
125	0.20	0.20	0.20	0.21	0.21	0.23	0.22	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.20	0.20		
130	0.26	0.27	0.27	0.28	0.28	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.28	0.28	0.28	0.27	0.27		
135	0.37	0.38	0.38	0.39	0.39	0.39	0.39	0.40	0.40	0.39	0.39	0.39	0.38	0.38	0.37	0.37	0.37		
140	0.49	0.49	0.50	0.50	0.50	0.51	0.51	0.51	0.51	0.51	0.51	0.50	0.50	0.49	0.49	0.48	0.48		
145	0.61	0.61	0.62	0.62	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.62	0.62	0.61	0.61	0.60	0.60		
150	0.74	0.74	0.75	0.75	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.75	0.75	0.74	0.74	0.73	0.72		
155	0.85	0.85	0.85	0.85	0.85	0.86	0.86	0.86	0.86	0.85	0.85	0.85	0.85	0.84	0.84	0.84	0.81		
160	0.94	0.94	0.94	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.94	0.94	0.94	0.94	0.93	0.93	0.88		
165	1.01	1.00	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.00	1.00	1.00	0.92		
170	1.02	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.03	0.89		
175	0.98	1.04	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.05	1.00	0.99		
180	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07		

Table 5: Luminous Intensity Data

EQUIPMENT LIST

Test Equipment	Model	Equipment No.	Calibration Date	Calibration Due date
Goniophotometer system	GO-R5000	HZTE011-01	Sep. 18, 2014	Sep. 17, 2015
Digital Power Meter	PF2010A	HZTE028-01	Sep. 18, 2014	Sep. 17, 2015
AC Power Supply	PCR 500L	HZTE001-08	Sep. 18, 2014	Sep. 17, 2015
DC Power Supply	WY12010	HZTE004-03	Sep. 18, 2014	Sep. 17, 2015
Temperature Meter	TES1310	HZTE017-01	Sep. 18, 2014	Sep. 17, 2015
Standard Source	D908	HZTE012-01	Sep. 18, 2014	Sep. 17, 2015
Standard source	SCL-1400	HZTE012-02	Sep. 18, 2014	Sep. 17, 2015

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.

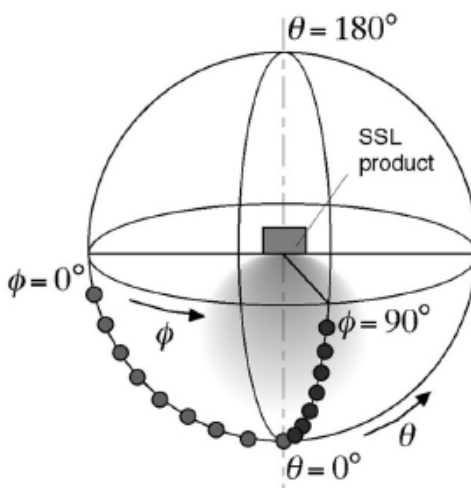
Color Characteristics Measurements

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° 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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