



LM-79-08 Test Report

for

GREEN CREATIVE LTD

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

Commercial downlight

Model: 32CDL8G4DIM/840/277V

Laboratory: Leading Testing Laboratories

NVLAP CODE: 200960-0

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Report No.: HZ15060018f/R1

This report is replaced the old report No. HZ15060018f 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/840/277V

Luminous Efficacy (Lumens /Watt)	Total Luminous Flux (Lumens)	Power (Watts)	Power Factor
98.3	2999.0	30.52	0.9919
CCT (K)	CRI	Stabilization Time (Light & Power)	
3950	84.3	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

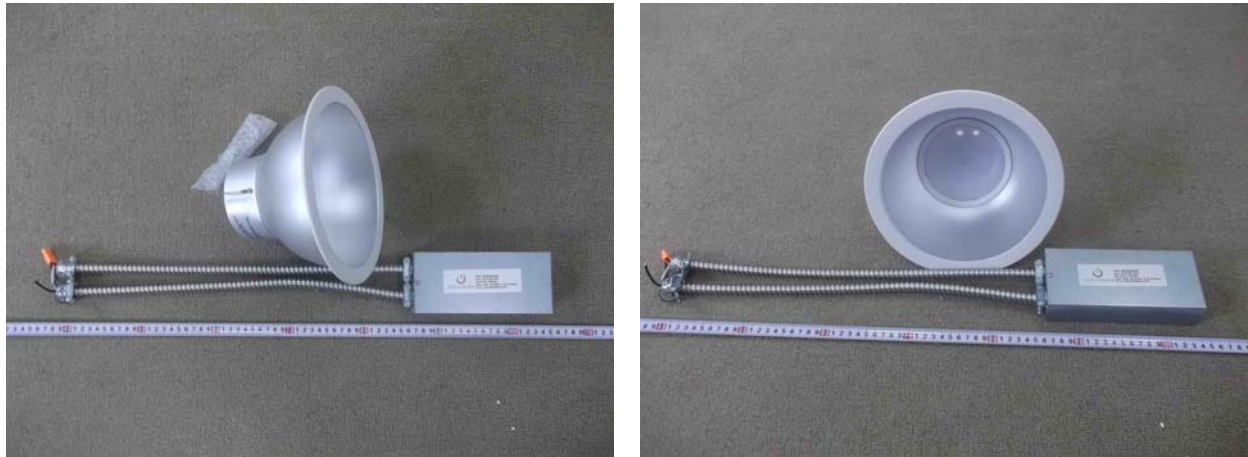


Figure 1- Overview of the sample

Equipment Under Test (EUT)

Name	: Commercial downlight
Model	: 32CDL8G4DIM/840/277V
Brand Name	: GREEN CREATIVE
Electrical Ratings	: AC120~277V, 60 Hz, 32W
Product Description	: 4000K, Frosted Plastic Cover, metal housing Nominal Flux:2450 lm SKU: 97698
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)	0.256	0.119
Power Factor	0.9919	0.9394
Test Power (W)	30.52	31.05
Off-State Power (W)	0	0
THD A%	8.24	19.76
Luminous Efficacy (lm/W)	98.3	
Total Luminous Flux (lm)	2999.0	
Color Rendering Index (CRI)	84.3	
R9	14	
Correlated Color Temperature (CCT) (K)	3950	
Chromaticity (Chroma x, Chroma y)	(0.3830, 0.3792)	
Chromaticity (Chroma u, Chroma v)	(0.2258, 0.3353)	
Chromaticity (Chroma u', Chroma v')	(0.2258, 0.5030)	
Duv	0.0004	
Average Beam Angle (°)	77.2	
Center Beam Candle Power (cd)	2093	
Spacing Criteria	1.05 (0°-180°)/ 1.01 (90°-270°)	
Zonal Lumens in the 0°-60°Zone	96.76%	
Zonal Lumens in the 60°-90°Zone	3.17%	
Zonal Lumens in the 90°-120°Zone	0.01%	
Zonal Lumens in the 120°-180°Zone	0.06%	

Special Rendering Indices	Color
R1	83
R2	92
R3	96
R4	81
R5	83
R6	89
R7	85
R8	65
R9	14
R10	81
R11	80
R12	64
R13	86
R14	98

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

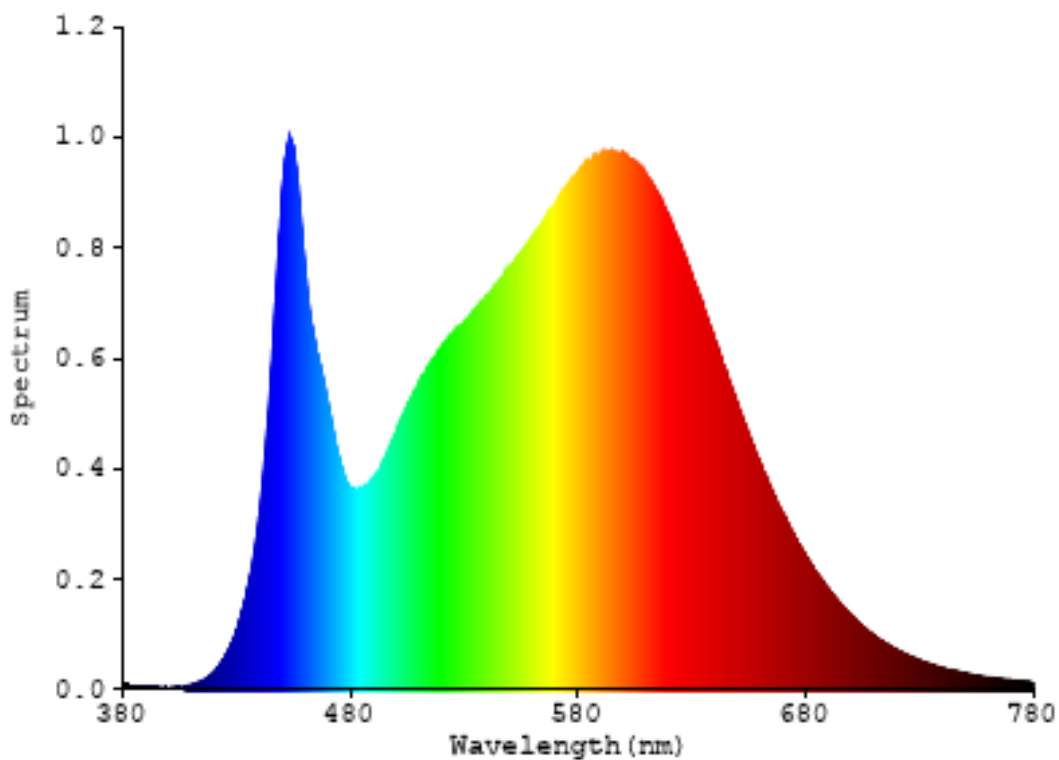


Chart 1: Spectral Power Distribution

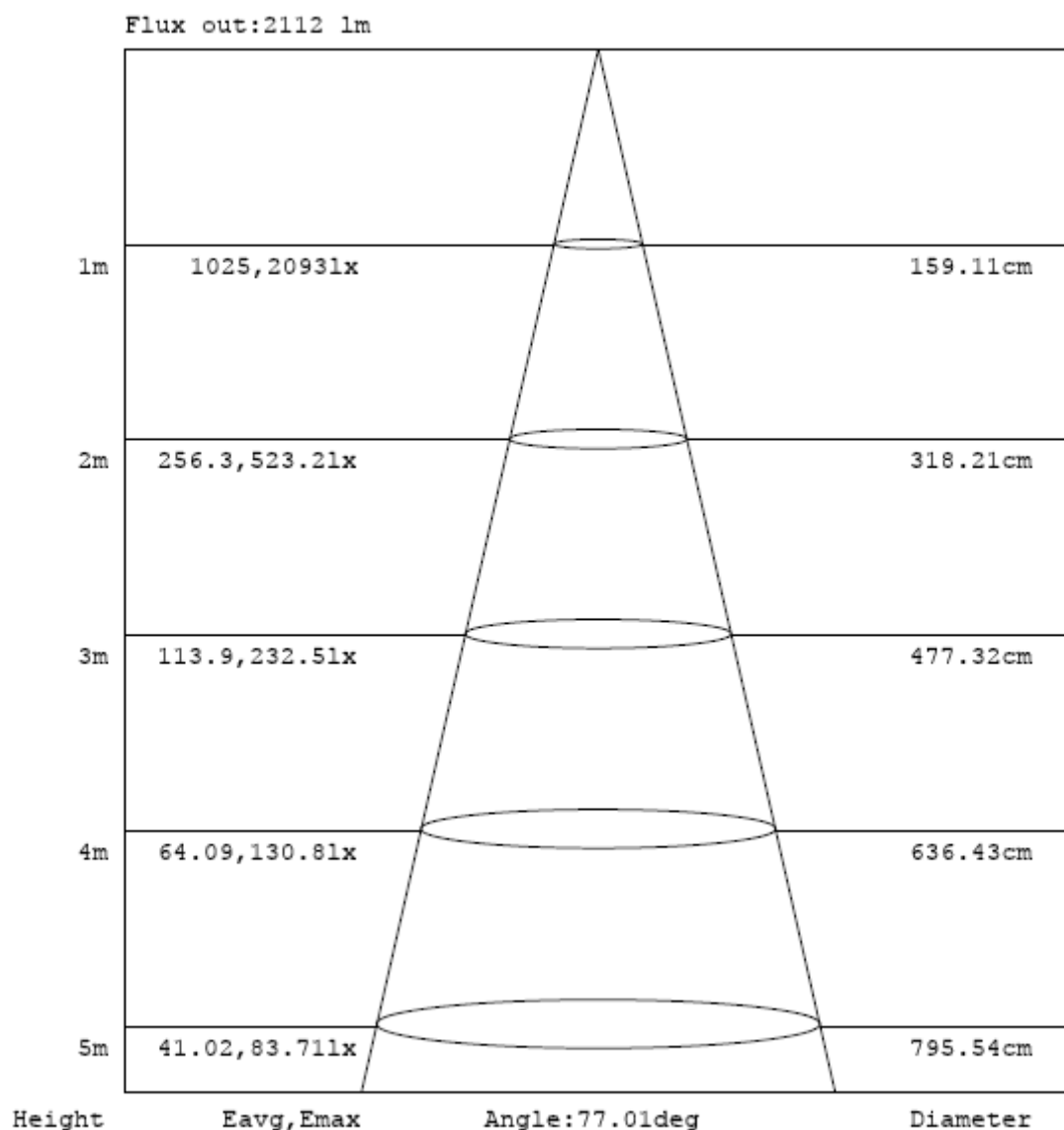
Zonal Lumen Tabulation- Goniophotometer Method

$\gamma(^{\circ})$	Lumens	% Total
0- 10	194.99	6.50%
10- 20	526.055	17.54%
20- 30	714.592	23.83%
30- 40	746.486	24.89%
40- 50	528.425	17.62%
50- 60	191.326	6.38%
60- 70	58.286	1.94%
70- 80	28.304	0.94%
80- 90	8.301	0.28%
90-100	0.11	0.00%
100-110	0.084	0.00%
110-120	0.136	0.00%
120-130	0.219	0.01%
130-140	0.344	0.01%
140-150	0.445	0.01%
150-160	0.44	0.01%
160-170	0.312	0.01%
170-180	0.112	0.00%
Total	2999.0	100%

$\gamma(^{\circ})$	Lumens	% Total
0- 60	2901.874	96.76%
60- 90	94.891	3.17%
0-90	2996.765	99.93%
90- 180	2.202	0.07%
0- 180	2999.0	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

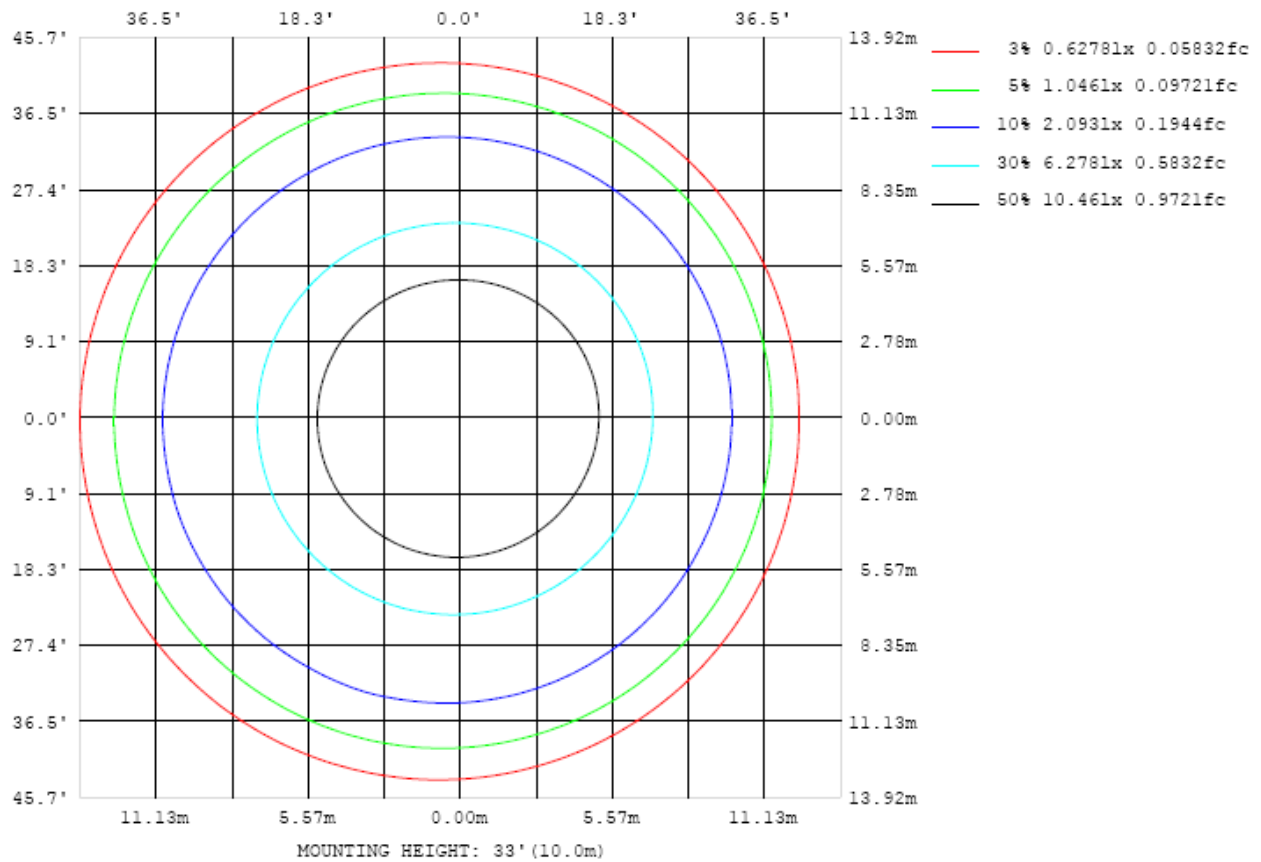


Chart 3: Illuminance Plot (Footcandles)

Luminous Intensity Distribution Plots

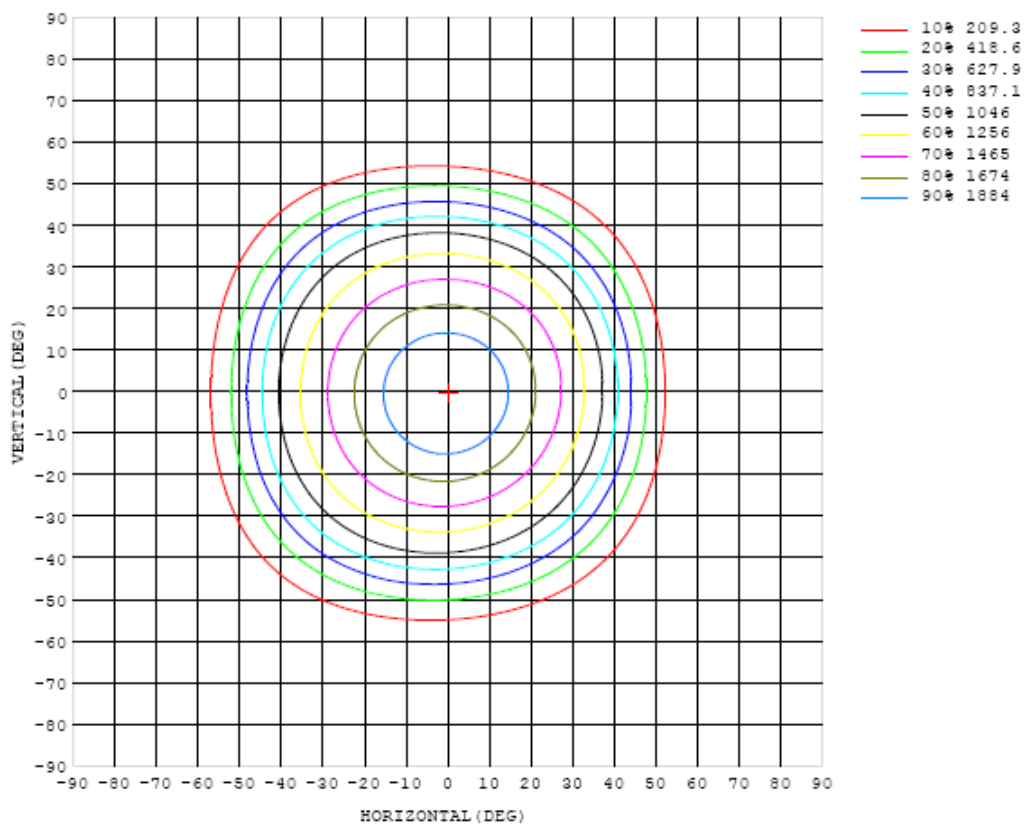


Chart 4: Isocandla Plot

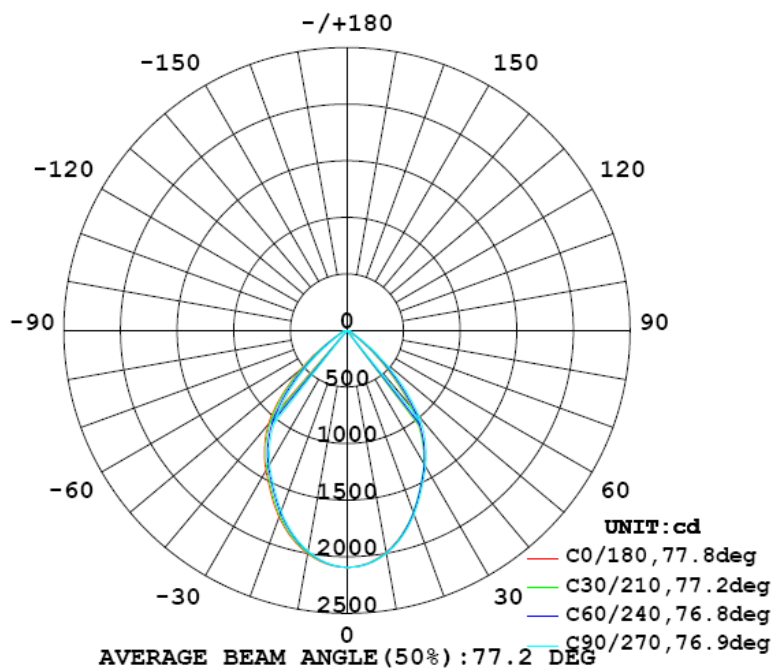


Chart 5: Polar Candela Distribution

Luminous Intensity Data

Table--1 UNIT: cd

C (DEG) γ (DEG)	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
0	2093	2093	2093	2093	2093	2093	2093	2093	2093	2093	2093	2093	2093	2093	2093	2093	2093	2093	2093
5	2066	2067	2068	2069	2069	2070	2071	2072	2072	2072	2073	2073	2073	2074	2073	2072	2072	2071	2070
10	1990	1992	1993	1994	1995	1997	1998	1999	2001	2002	2003	2004	2006	2006	2006	2007	2006	2004	2002
15	1869	1871	1872	1872	1873	1875	1877	1880	1882	1885	1889	1891	1894	1896	1898	1899	1900	1897	1894
20	1712	1712	1711	1711	1712	1714	1717	1721	1726	1732	1738	1743	1747	1752	1755	1757	1758	1757	1754
25	1540	1537	1534	1532	1532	1534	1537	1542	1548	1556	1563	1570	1577	1583	1588	1592	1594	1593	1589
30	1366	1361	1357	1355	1356	1359	1365	1372	1381	1389	1398	1406	1414	1420	1425	1429	1431	1431	1431
35	1157	1153	1151	1151	1156	1164	1173	1185	1198	1211	1223	1235	1247	1256	1264	1269	1273	1272	1271
40	883	882	884	890	900	914	931	949	969	988	1007	1025	1041	1055	1066	1074	1078	1078	1078
45	572	575	581	590	606	621	640	661	683	706	729	751	771	788	802	812	818	818	818
50	302	307	314	324	336	351	367	386	405	426	446	467	485	502	514	524	529	530	529
55	119	124	130	138	147	157	168	180	194	208	222	237	251	264	274	281	285	286	286
60	54.6	58.9	62.8	66.3	69.7	73.0	76.9	81.4	86.5	92.3	98.5	105	111	117	122	126	127	127	127
65	35.3	38.0	41.3	44.7	47.8	50.5	53.0	55.5	58.2	61.0	63.8	66.7	69.1	70.8	72.7	73.6	73.8	73.5	73.6
70	22.9	25.0	27.6	30.4	33.0	35.3	37.3	39.2	41.2	43.4	45.5	47.6	49.4	50.9	51.9	52.5	52.6	52.3	51.8
75	14.5	16.0	17.9	20.0	22.0	23.9	25.5	27.0	28.5	30.0	31.4	32.7	33.9	34.8	35.3	35.6	35.6	35.4	35.2
80	8.13	9.09	10.3	11.8	13.3	14.7	15.9	17.2	18.3	19.4	20.3	21.1	21.8	22.2	22.4	22.5	22.4	22.2	22.1
85	2.46	2.82	3.38	4.12	4.96	5.90	6.86	7.85	8.79	9.66	10.4	11.0	11.5	11.7	11.8	11.8	11.7	11.6	11.5
90	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.06	0.24	0.66	1.20	1.72	2.15	2.44	2.60	2.67	2.61	2.63
95	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	0.03	0.03	0.03	0.03	0.05
100	0.04	0.04	0.04	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	0.06
105	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.09
110	0.09	0.08	0.08	0.08	0.08	0.08	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.12
115	0.13	0.13	0.13	0.13	0.12	0.12	0.12	0.11	0.11	0.10	0.10	0.10	0.09	0.09	0.09	0.09	0.09	0.09	0.15
120	0.20	0.20	0.20	0.19	0.19	0.18	0.18	0.17	0.17	0.16	0.16	0.15	0.15	0.15	0.14	0.14	0.14	0.14	0.18
125	0.29	0.29	0.28	0.28	0.27	0.27	0.26	0.26	0.25	0.24	0.24	0.23	0.22	0.22	0.22	0.22	0.21	0.21	0.21
130	0.39	0.39	0.39	0.38	0.37	0.37	0.36	0.35	0.34	0.34	0.33	0.33	0.32	0.32	0.31	0.31	0.31	0.31	0.28
135	0.50	0.50	0.50	0.49	0.48	0.48	0.47	0.46	0.46	0.45	0.44	0.44	0.43	0.43	0.42	0.42	0.42	0.42	0.38
140	0.63	0.62	0.62	0.61	0.60	0.60	0.59	0.58	0.57	0.56	0.56	0.55	0.55	0.54	0.54	0.54	0.54	0.53	0.52
145	0.74	0.74	0.74	0.73	0.72	0.72	0.71	0.70	0.70	0.69	0.68	0.68	0.67	0.67	0.66	0.66	0.66	0.66	0.66
150	0.86	0.85	0.85	0.84	0.84	0.83	0.83	0.82	0.82	0.81	0.80	0.80	0.79	0.79	0.79	0.78	0.78	0.78	0.80
155	0.94	0.94	0.94	0.94	0.93	0.93	0.92	0.92	0.92	0.92	0.91	0.90	0.90	0.90	0.89	0.89	0.89	0.88	0.94
160	0.99	0.99	0.99	0.99	1.00	1.00	1.00	1.00	1.00	0.99	0.99	0.99	0.98	0.98	0.98	0.98	0.97	0.97	1.04
165	1.05	1.05	1.06	1.06	1.06	1.07	1.06	1.05	1.04	1.03	1.03	1.03	1.03	1.03	1.03	1.03	1.02	1.01	1.11
170	1.05	1.05	1.06	1.07	1.07	1.07	1.08	1.08	1.07	1.07	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.05	1.15
175	1.23	1.23	1.22	1.21	1.20	1.18	1.16	1.14	1.12	1.10	1.09	1.08	1.08	1.08	1.08	1.08	1.08	1.07	1.10
180	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24

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	2093	2093	2093	2093	2093	2093	2093	2093	2093	2093	2093	2093	2093	2093	2093	2093	2093		
5	2069	2068	2066	2065	2064	2063	2062	2061	2061	2061	2061	2061	2061	2062	2063	2064	2065		
10	2000	1997	1995	1991	1988	1985	1983	1981	1980	1979	1979	1980	1981	1983	1985	1987	1989		
15	1892	1887	1883	1878	1872	1866	1862	1859	1855	1854	1854	1855	1858	1861	1863	1866	1867		
20	1750	1745	1739	1731	1724	1716	1708	1703	1698	1696	1696	1698	1700	1705	1708	1710	1711		
25	1585	1580	1572	1564	1554	1545	1537	1531	1526	1524	1525	1527	1531	1536	1540	1542	1541		
30	1427	1421	1414	1406	1397	1388	1378	1371	1365	1361	1360	1362	1365	1369	1372	1373	1371		
35	1267	1260	1251	1241	1229	1216	1203	1191	1181	1173	1168	1166	1166	1167	1167	1165	1163		
40	1071	1062	1050	1036	1019	1001	982	963	946	931	919	910	904	899	895	891	887		
45	810	798	783	766	746	724	702	680	659	640	625	612	602	593	585	580	576		
50	522	511	497	482	464	443	423	403	384	367	352	340	329	320	312	307	304		
55	279	271	260	248	234	220	206	192	180	170	161	151	142	132	126	121	120		
60	124	119	115	109	104	98.2	92.7	87.7	83.1	78.7	74.4	69.9	65.2	60.7	56.8	54.1	53.4		
65	72.4	71.1	69.6	68.0	66.2	64.1	61.7	59.1	56.3	53.3	49.9	46.2	42.3	38.7	35.8	34.2	34.1		
70	51.1	50.2	49.2	48.0	46.7	45.1	43.2	41.2	38.9	36.3	33.4	30.3	27.2	24.5	22.6	21.7	21.8		
75	34.7	34.1	33.4	32.5	31.5	30.3	29.0	27.4	25.6	23.5	21.2	18.8	16.6	14.9	13.8	13.4	13.7		
80	21.7	21.3	20.7	20.1	19.3	18.4	17.3	16.1	14.8	13.2	11.6	10.1	8.85	7.96	7.49	7.40	7.64		
85	11.2	10.8	10.3	9.76	9.11	8.38	7.58	6.71	5.83	4.94	4.11	3.40	2.87	2.51	2.33	2.29	2.37		
90	2.40	2.06	1.65	1.17	0.67	0.26	0.08	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06		
95	0.05	0.05	0.06	0.06	0.06	0.06	0.06	0.07	0.07	0.07	0.07	0.07	0.07	0.08	0.08	0.08	0.08		
100	0.07	0.07	0.07	0.07	0.08	0.08	0.08	0.09	0.09	0.09	0.09	0.10	0.10	0.10	0.10	0.10	0.10		
105	0.09	0.10	0.10	0.10	0.10	0.11	0.11	0.11	0.12	0.12	0.12	0.13	0.13	0.13	0.13	0.13	0.13		
110	0.12	0.12	0.12	0.13	0.13	0.13	0.13	0.14	0.14	0.14	0.14	0.15	0.15	0.15	0.15	0.16	0.16		
115	0.15	0.15	0.15	0.15	0.15	0.15	0.16	0.16	0.16	0.17	0.17	0.17	0.17	0.18	0.18	0.18	0.18		
120	0.18	0.18	0.18	0.18	0.18	0.18	0.19	0.19	0.19	0.19	0.20	0.20	0.20	0.20	0.21	0.21	0.21		
125	0.21	0.22	0.21	0.21	0.22	0.22	0.23	0.23	0.24	0.24	0.25	0.25	0.25	0.26	0.26	0.26	0.26		
130	0.27	0.28	0.28	0.28	0.29	0.29	0.30	0.31	0.32	0.33	0.33	0.34	0.34	0.35	0.35	0.35	0.35		
135	0.38	0.39	0.39	0.40	0.41	0.42	0.43	0.44	0.44	0.45	0.46	0.47	0.47	0.47	0.48	0.48	0.48		
140	0.52	0.52	0.53	0.54	0.54	0.55	0.56	0.61	0.61	0.59	0.59	0.60	0.61	0.61	0.61	0.62	0.62		
145	0.66	0.67	0.67	0.68	0.69	0.69	0.73	0.84	0.94	0.79	0.73	0.75	0.75	0.76	0.76	0.76	0.76		
150	0.81	0.82	0.82	0.83	0.84	0.84	0.88	1.02	1.15	0.99	0.88	0.90	0.90	0.91	0.91	0.91	0.91		
155	0.96	0.96	0.97	0.97	0.98	0.98	0.99	1.00	1.04	1.06	1.02	1.01	1.01	1.02	1.02	1.02	1.01		
160	1.07	1.07	1.07	1.08	1.08	1.09	1.10	1.11	1.12	1.12	1.12	1.12	1.12	1.13	1.13	1.13	1.11		
165	1.17	1.16	1.16	1.17	1.17	1.17	1.18	1.19	1.21	1.22	1.21	1.20	1.20	1.21	1.21	1.21	1.17		
170	1.23	1.22	1.22	1.22	1.22	1.23	1.23	1.23	1.24	1.25	1.25	1.23	1.23	1.23	1.23	1.24	1.17		
175	1.22	1.25	1.24	1.24	1.24	1.24	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.24	1.25	1.25	1.23		
180	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24		

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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