

LM-79-08 TEST REPORT

for

GREEN CREATIVE LTD

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

LED Downlight

Model: 35139

Laboratory: Leading Testing Laboratories

NVLAP CODE: 200960-0

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Report No.: HZ20010008i

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

Review by:



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Jan. 16, 2020

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Jan. 16, 2020

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: 35139

Luminous Efficacy (Lumens /Watt)	Total Luminous Flux (Lumens)	Power (Watts)	Power Factor
95.2	2905.7	30.51	0.9921
CCT (K)	CRI	Stabilization Time (Light & Power)	
3412	83.0	60	

Table 1: Executive Data Summary

Test specifications:

Date of Receipt	: Jan. 10, 2020
Date of Test	: Jan. 13, 2020
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	: LED Downlight
Model	: 35139
Electrical Ratings	: 120-277V, 50/60Hz, 30W
Product Description	: 30CDL9.5DIM/835/277V
Manufacturer	: GREEN CREATIVE LTD
Address	: 756 North Zhongshan Rd., Unit B301 Zhabei District, Shanghai

TEST RESULTS

Test ambient temperature was 24.9 °C.

Test orientation was base up. Test was conducted without a dimmer in the circuit.

The stabilization time of the sample was 70 minutes, and the total operating time including stabilization was 90 minutes.

The photometric distance is 2.47 m.

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

Parameter	Result		Special Color Rendering Indices	
Test Voltage (V)	120.0	277.0	R1	82
Voltage frequency (Hz)	60	60	R2	91
Test Current (A)	0.256	0.120	R3	96
Power Factor	0.9921	0.9077	R4	81
Test Power (W)	30.51	30.23	R5	82
THD A%	10.24	8.34	R6	88
Luminous Efficacy (lm/W)	95.2	95.9	R7	83
Total Luminous Flux (lm)	2905.7	2900.0	R8	61
Color Rendering Index (CRI)	83.0		R9	7
R9	7		R10	79
Correlated Color Temperature (CCT) (K)	3412		R11	80
Chromaticity (Chroma x, Chroma y)	(0.4083, 0.3880)		R12	69
Chromaticity (Chroma u, Chroma v)	(0.2388, 0.3304)		R13	84
Chromaticity (Chroma u', Chroma v')	(0.2388, 0.5106)		R14	98
Duv	-0.0018			
Average Beam Angle (°)	90.3			
Center Beam Candle Power (cd)	1477			
Spacing Criteria	1.25 (0°-180°)/ 1.21(90°-270°)			
Zonal Lumens in the 0°-60° Zone	94.05%			
Zonal Lumens in the 60°-90° Zone	5.83%			
Zonal Lumens in the 90°-120° Zone	0.01%			
Zonal Lumens in the 120°-180° Zone	0.11%			

Table 2: Test data per Goniophotometer Method

Spectral Power Distribution- Goniophotometer Method

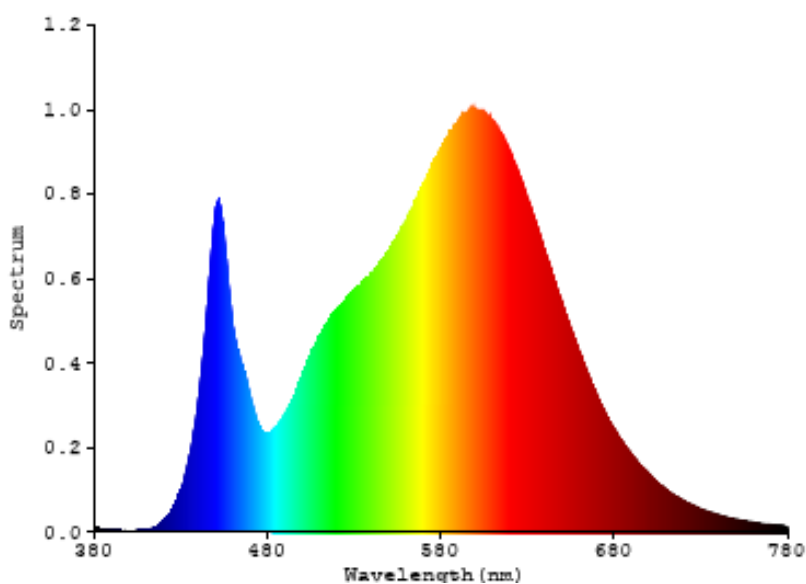


Chart 1: Spectral Power Distribution

Zonal Lumen Tabulation- Goniophotometer Method

$\gamma(^{\circ})$	Lumens	% Total
0- 10	139.868	4.81%
10- 20	403.938	13.90%
20- 30	617.445	21.25%
30- 40	689.311	23.72%
40- 50	569.73	19.61%
50- 60	312.638	10.76%
60- 70	113.19	3.90%
70- 80	48.599	1.67%
80- 90	7.567	0.26%
90-100	0.052	0.00%
100-110	0.112	0.00%
110-120	0.22	0.01%
120-130	0.391	0.01%
130-140	0.612	0.02%
140-150	0.742	0.03%
150-160	0.682	0.02%
160-170	0.463	0.02%
170-180	0.166	0.01%
Total	2905.7	100%

$\gamma(^{\circ})$	Lumens	% Total
0- 60	2732.93	94.05%
60- 90	169.356	5.83%
0-90	2902.286	99.88%
90- 180	3.44	0.12%
0- 180	2905.7	100%

Table 3: Zonal Lumen Data

Illuminance Plots- Goniophotometer Method

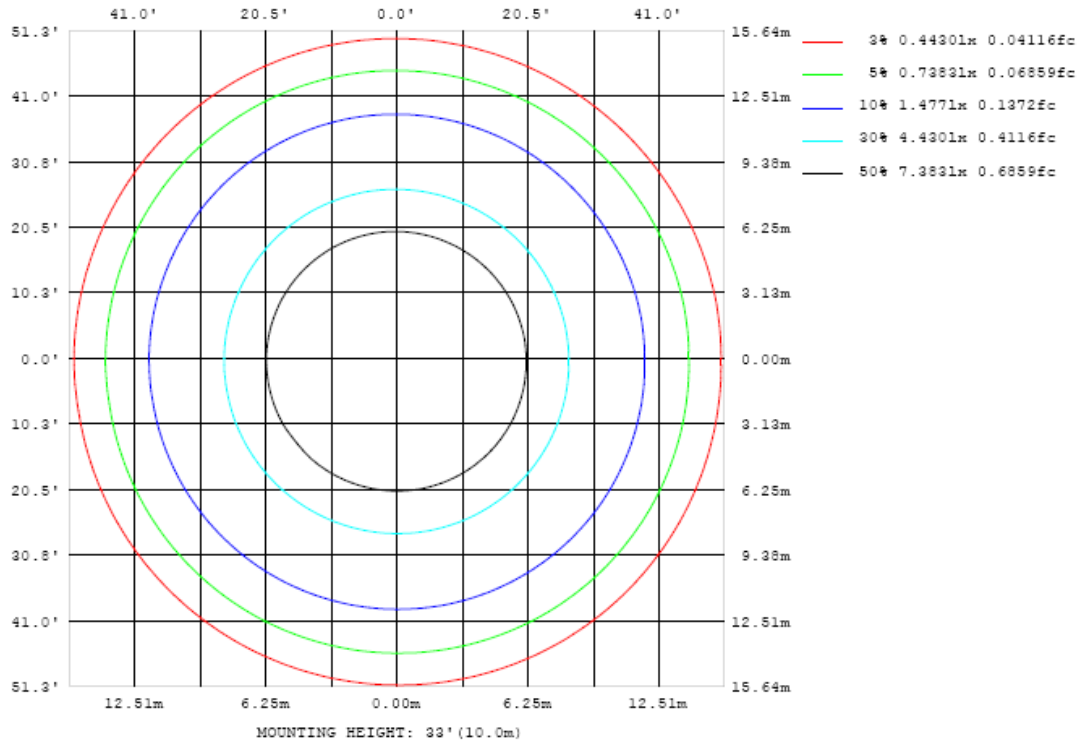


Chart 2: Illuminance Plot (Footcandles)

Luminous Intensity Distribution Plots- Goniophotometer Method

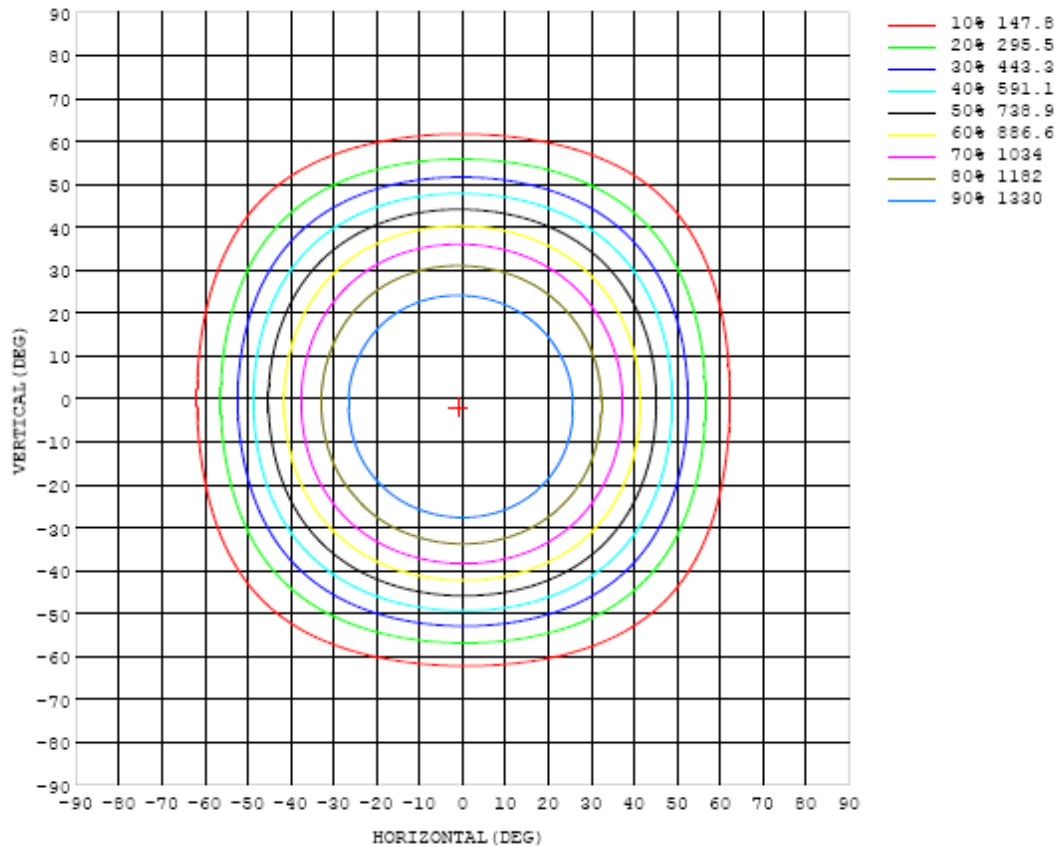


Chart 3: Isocandela Plot

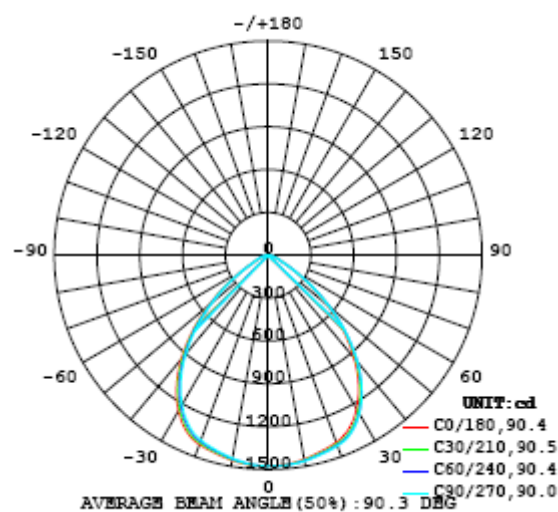


Chart 4: Polar Candela Distribution

Luminous Intensity Data- Goniophotometer Method

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	1477	1477	1477	1477	1477	1477	1477	1477	1477	1477	1477	1477	1477	1477	1477	1477	1477	1477	1477
5	1469	1470	1471	1472	1473	1474	1475	1475	1476	1476	1476	1476	1476	1476	1476	1475	1475	1474	1473
10	1450	1453	1454	1456	1458	1459	1461	1463	1463	1463	1464	1464	1464	1464	1463	1462	1461	1459	1458
15	1423	1426	1429	1432	1434	1437	1439	1440	1441	1442	1443	1443	1443	1442	1441	1440	1438	1437	1434
20	1394	1398	1402	1407	1410	1413	1415	1418	1419	1420	1420	1420	1420	1420	1418	1417	1415	1412	1409
25	1340	1347	1353	1359	1363	1367	1370	1372	1374	1374	1375	1374	1373	1372	1370	1367	1364	1361	1358
30	1240	1248	1255	1262	1267	1273	1276	1279	1280	1280	1280	1278	1277	1275	1273	1270	1267	1262	1259
35	1104	1113	1120	1128	1134	1139	1143	1145	1146	1146	1145	1143	1141	1139	1136	1134	1129	1124	1122
40	936	944	951	959	964	970	973	975	976	976	973	971	969	967	964	962	957	952	949
45	743	751	758	764	769	773	776	777	777	776	774	772	769	767	764	761	757	752	751
50	540	547	554	559	562	565	566	566	565	564	562	560	559	556	553	550	546	542	542
55	349	354	358	362	364	365	366	365	364	362	361	359	357	356	354	351	348	344	346
60	196	198	200	202	203	203	203	202	201	200	198	197	196	195	193	193	191	189	191
65	107	107	108	108	108	107	106	105	104	103	102	102	102	102	103	102	102	101	102
70	74.1	73.7	72.7	72.4	72.9	71.6	70.7	69.7	68.7	67.9	67.3	67.3	68.0	68.5	68.9	68.9	68.6	68.3	68.7
75	47.4	47.0	46.6	46.3	45.9	45.4	44.7	43.9	43.1	42.5	42.0	42.1	42.4	42.8	43.0	43.1	42.6	42.6	42.7
80	23.4	23.3	23.3	23.4	23.4	23.3	23.2	22.9	22.4	22.0	21.6	21.4	21.5	21.6	21.7	21.7	21.5	21.3	21.5
85	4.62	4.75	5.00	5.31	5.52	5.70	5.95	5.90	5.59	5.43	5.22	4.95	4.48	4.81	4.73	4.74	4.39	4.57	4.31
90	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	0.04
95	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.05
100	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	0.06	0.06	0.06	0.06	0.08
105	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	0.08	0.08	0.13
110	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.11	0.11	0.12	0.11	0.11	0.12	0.12	0.12	0.12	0.12	0.12	0.18
115	0.18	0.18	0.18	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.18	0.18	0.18	0.26
120	0.26	0.26	0.26	0.26	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.26	0.26	0.26	0.36
125	0.36	0.36	0.36	0.36	0.36	0.36	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.36	0.36	0.36	0.36	0.50
130	0.49	0.49	0.48	0.48	0.48	0.48	0.48	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.48	0.48	0.48	0.49	0.70
135	0.64	0.64	0.63	0.63	0.63	0.63	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.63	0.63	0.63	0.64	0.95
140	0.80	0.79	0.79	0.79	0.78	0.78	0.78	0.78	0.78	0.77	0.78	0.78	0.78	0.78	0.78	0.79	0.79	0.79	1.20
145	0.95	0.94	0.94	0.94	0.93	0.93	0.93	0.93	0.93	0.92	0.92	0.92	0.92	0.93	0.93	0.93	0.94	0.94	1.43
150	1.08	1.07	1.07	1.07	1.07	1.07	1.06	1.06	1.06	1.06	1.05	1.06	1.06	1.06	1.06	1.07	1.07	1.07	1.61
155	1.22	1.22	1.22	1.22	1.21	1.21	1.21	1.21	1.20	1.20	1.20	1.20	1.20	1.20	1.21	1.21	1.21	1.21	1.73
160	1.35	1.34	1.34	1.34	1.34	1.34	1.34	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.34	1.34	1.34	1.82
165	1.43	1.43	1.43	1.42	1.42	1.42	1.42	1.42	1.42	1.42	1.42	1.42	1.42	1.42	1.42	1.42	1.42	1.42	1.83
170	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.53	1.54	1.53	1.53	1.53	1.54	1.54	1.54	1.54	1.54	1.54	1.82
175	1.73	1.73	1.73	1.73	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.73	1.73	1.72	1.73	1.73	1.73	1.73	1.82
180	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83

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	1477	1477	1477	1477	1477	1477	1477	1477	1477	1477	1477	1477	1477	1477	1477	1477	1477		
5	1472	1471	1470	1470	1468	1468	1467	1466	1466	1465	1466	1466	1466	1466	1466	1467	1468	1469	
10	1456	1454	1452	1451	1449	1447	1445	1444	1443	1442	1442	1442	1443	1444	1445	1447	1449		
15	1432	1429	1426	1424	1421	1418	1416	1413	1412	1410	1410	1410	1412	1413	1415	1418	1421		
20	1406	1402	1398	1394	1390	1386	1383	1380	1377	1376	1375	1375	1377	1379	1382	1386	1390		
25	1353	1348	1343	1337	1331	1327	1322	1318	1315	1313	1312	1313	1315	1318	1323	1329	1335		
30	1253	1247	1240	1234	1227	1222	1217	1212	1208	1205	1204	1205	1209	1213	1219	1227	1235		
35	1115	1108	1102	1095	1088	1082	1077	1072	1067	1065	1063	1064	1068	1074	1081	1090	1099		
40	943	935	929	923	917	911	906	901	897	893	892	893	897	903	911	920	930		
45	745	738	733	728	722	717	713	708	705	703	701	703	707	713	721	729	738		
50	537	533	529	525	520	517	513	510	507	506	505	507	511	515	521	529	537		
55	343	340	337	335	332	330	328	325	324	323	323	324	327	331	336	342	348		
60	190	188	187	187	186	185	184	184	183	182	182	183	185	187	191	193	196		
65	102	102	103	104	105	105	106	106	105	105	105	105	105	106	107	108	108		
70	68.8	69.6	70.4	71.6	72.8	73.9	74.7	75.2	75.5	75.7	75.9	75.9	75.9	76.0	75.9	75.7	75.4		
75	43.0	43.3	43.8	44.5	45.4	46.2	47.0	47.8	48.4	48.9	49.4	49.7	49.7	49.7	49.3	48.9	48.4		
80	21.5	21.4	21.4	21.4	21.4	21.6	22.0	22.7	23.4	24.1	24.6	25.0	25.3	25.2	24.9	24.5	24.1		
85	4.13	3.93	3.70	3.44	3.24	3.13	3.17	3.36	3.62	3.89	4.13	4.36	4.52	4.61	4.64	4.59	4.51		
90	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04		
95	0.05	0.05	0.06	0.06	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.06	0.05	0.05	0.06	0.05	0.05		
100	0.08	0.08	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	0.08	0.08		
105	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13		
110	0.18	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.18	0.18	0.18		
115	0.26	0.26	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26		
120	0.36	0.36	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.36	0.36	0.36		
125	0.50	0.50	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.50	0.50		
130	0.70	0.71	0.71	0.71	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.71	0.71	0.71	0.70		
135	0.95	0.96	0.96	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.96	0.96	0.96		
140	1.20	1.21	1.22	1.22	1.22	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.22	1.22	1.21	1.21		
145	1.44	1.45	1.46	1.46	1.46	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.46	1.46	1.46	1.45	1.45		
150	1.62	1.63	1.63	1.64	1.64	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.64	1.64	1.63	1.63		
155	1.74	1.75	1.75	1.76	1.76	1.77	1.77	1.77	1.77	1.77	1.77	1.77	1.77	1.76	1.76	1.76	1.75		
160	1.83	1.83	1.83	1.84	1.84	1.84	1.85	1.85	1.85	1.85	1.85	1.85	1.85	1.85	1.84	1.84	1.84		
165	1.84	1.84	1.85	1.85	1.85	1.85	1.85	1.85	1.85	1.85	1.86	1.86	1.86	1.86	1.86	1.85	1.85		
170	1.83	1.83	1.83	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.83	1.84	1.84	1.84		
175	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83		
180	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83		

Table 5: Luminous Intensity Data

EQUIPMENT LIST

Test Equipment	Model	Equipment No.	Calibration Date	Calibration Due date
Goniophotometer system	GO-R5000	HZTE011-01	Aug. 02, 2019	Aug. 01, 2020
Digital Power Meter	PF2010A	HZTE028-01	Aug. 02, 2019	Aug. 01, 2020
AC Power Supply	DPS1060	HZTE001-06	Aug. 02, 2019	Aug. 01, 2020
DC Power Supply	WY12010	HZTE004-03	Aug. 02, 2019	Aug. 01, 2020
Standard Source	D908	HZTE012-01	Aug. 02, 2019	Aug. 01, 2020
Standard source	SCL-1400	HZTE012-02	Aug. 02, 2019	Aug. 01, 2020
Temperature and humidity recorder	JR900	HZTE018-01	Aug. 02, 2019	Aug. 01, 2020
Temperature recorder	JM624U	HZTE018-08	Aug. 02, 2019	Aug. 01, 2020

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 expanded uncertainty is 2.3% with a coverage factor k=2.

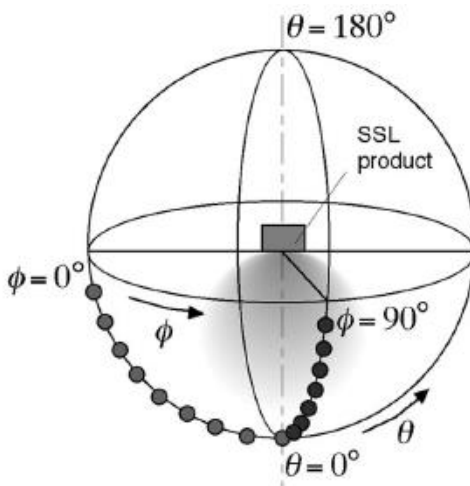
Color Characteristics Measurements

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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