



LM-79-08 Test Report

for

GREEN CREATIVE LTD

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

LED Strip Light

Model: 38.5STRIPDIM/840/277V/R

Laboratory: Leading Testing Laboratories

NVLAP CODE: 200960-0

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Report No.: HZ18110058d

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

Review by:

April Zou

Engineer: April Zou
Dec. 06, 2018

Approved by  *Jim Zhang*

Manager: Jim Zhang
Dec. 06, 2018

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: **38.5STRIPDIM/840/277V/R**

Luminous Efficacy (Lumens /Watt)	Total Luminous Flux (Lumens)	Power (Watts)	Power Factor
142.1	5495.8	38.68	0.9952
CCT (K)	CRI	Stabilization Time (Light & Power)	
4087	86.1	60	

Table 1: Executive Data Summary

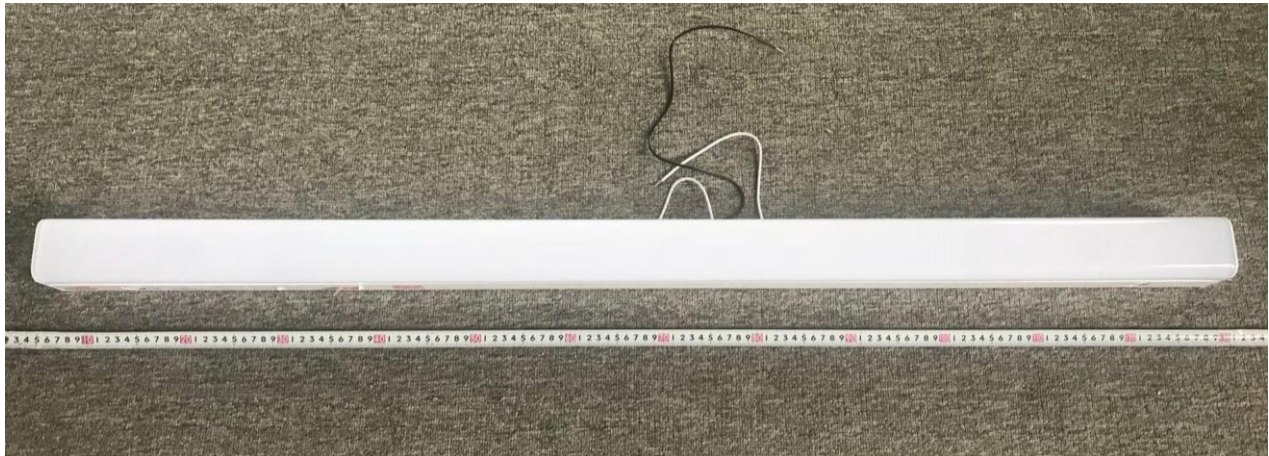
Test specifications:

Date of Receipt	: Nov. 30, 2018
Date of Test	: Dec. 03, 2018
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



Overview of the sample

Equipment Under Test (EUT)

Name	: LED Strip Light
Model	: 38.5STRIPDIM/840/277V/R
Electrical Ratings	: 120-277V, 50/60Hz
Product Description	: 4000K
Manufacturer	: GREEN CREATIVE LTD
Address	: 756 North Zhongshan Rd., Unit B301 Zhabei District, 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 95 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		Special Color Rendering Indices	
Test Voltage (V)	120.0	277.0	R1	86
Voltage frequency (Hz)	60	60	R2	94
Test Current (A)	0.324	0.148	R3	96
Power Factor	0.9952	0.9440	R4	84
Test Power (W)	38.68	38.66	R5	85
THD A%	8.00	9.70	R6	90
Luminous Efficacy (lm/W)	142.1	142.2	R7	86
Total Luminous Flux (lm)	5495.8	5502.4	R8	68
Color Rendering Index (CRI)	86.1		R9	22
R9	22		R10	84
Correlated Color Temperature (CCT) (K)	4087		R11	84
Chromaticity (Chroma x, Chroma y)	(0.3760, 0.3715)		R12	65
Chromaticity (Chroma u, Chroma v)	(0.2243, 0.3324)		R13	88
Chromaticity (Chroma u', Chroma v')	(0.2243, 0.4986)		R14	99
Duv	-0.0012			
Average Beam Angle (°)	123.0			
Center Beam Candle Power (cd)	1472			
Spacing Criteria	1.28 (0 °-180 °)/ 1.30 (90 °-270 °)			
Zonal Lumens in the 0 °-60 °Zone	63.77%			
Zonal Lumens in the 60 °-90 °Zone	25.51%			
Zonal Lumens in the 90 °-120 °Zone	7.80%			
Zonal Lumens in the 120 °-180 °Zone	2.92%			

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

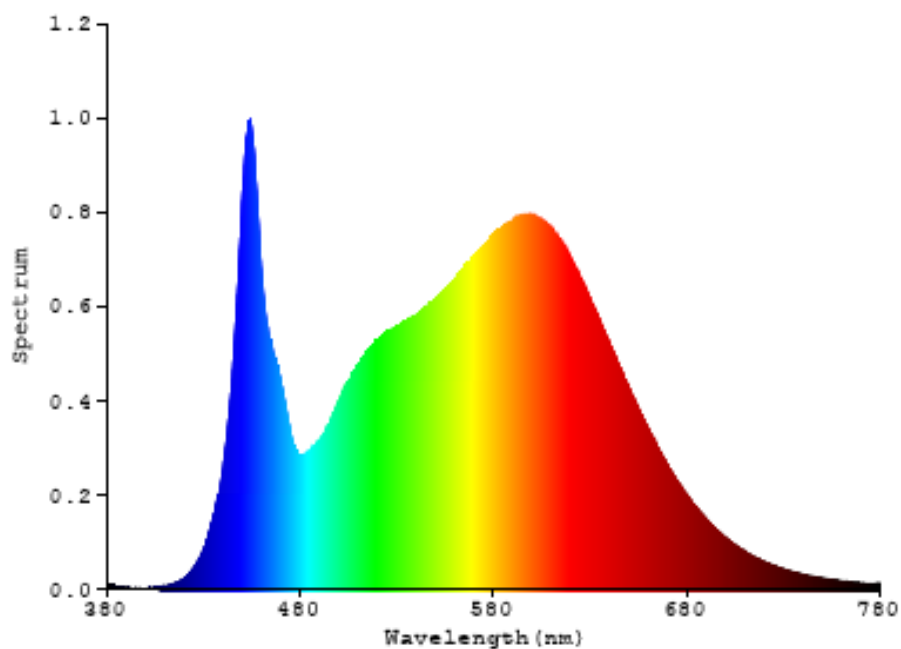


Chart 1: Spectral Power Distribution

Zonal Lumen Tabulation

$\gamma(^{\circ})$	Lumens	% Total
0- 10	139.478	2.54%
10- 20	401.83	7.31%
20- 30	616.281	11.21%
30- 40	758.044	13.79%
40- 50	812.646	14.79%
50- 60	776.188	14.12%
60- 70	654.593	11.91%
70- 80	468.854	8.53%
80- 90	278.621	5.07%
90-100	188.982	3.44%
100-110	141.403	2.57%
110-120	98.522	1.79%
120-130	70.169	1.28%
130-140	45.817	0.83%
140-150	26.677	0.49%
150-160	12.842	0.23%
160-170	4.23	0.08%
170-180	0.612	0.01%
Total	5495.8	100%

$\gamma(^{\circ})$	Lumens	% Total
0- 60	3504.467	63.77%
60- 90	1402.068	25.51%
0-90	4906.535	89.28%
90- 180	589.254	10.72%
0- 180	5495.8	100%

Table 3: Zonal Lumen Data

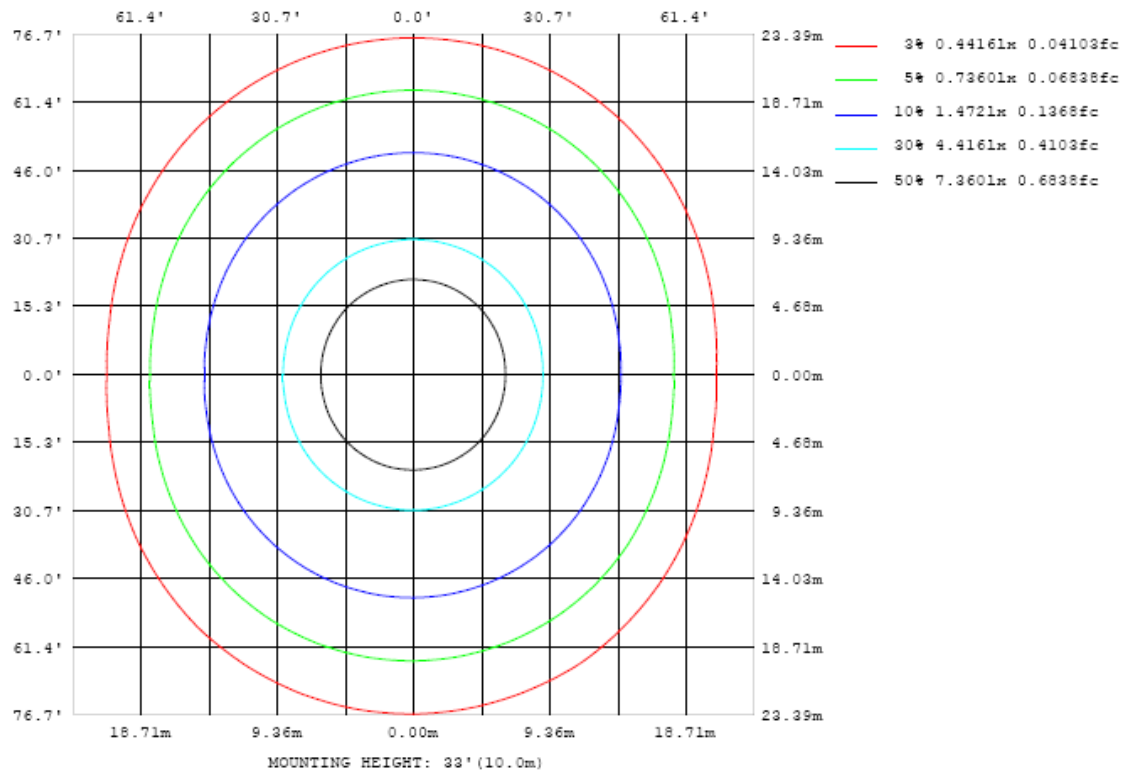


Chart 2: Illuminance Plot (Footcandles)

Luminous Intensity Distribution Plots

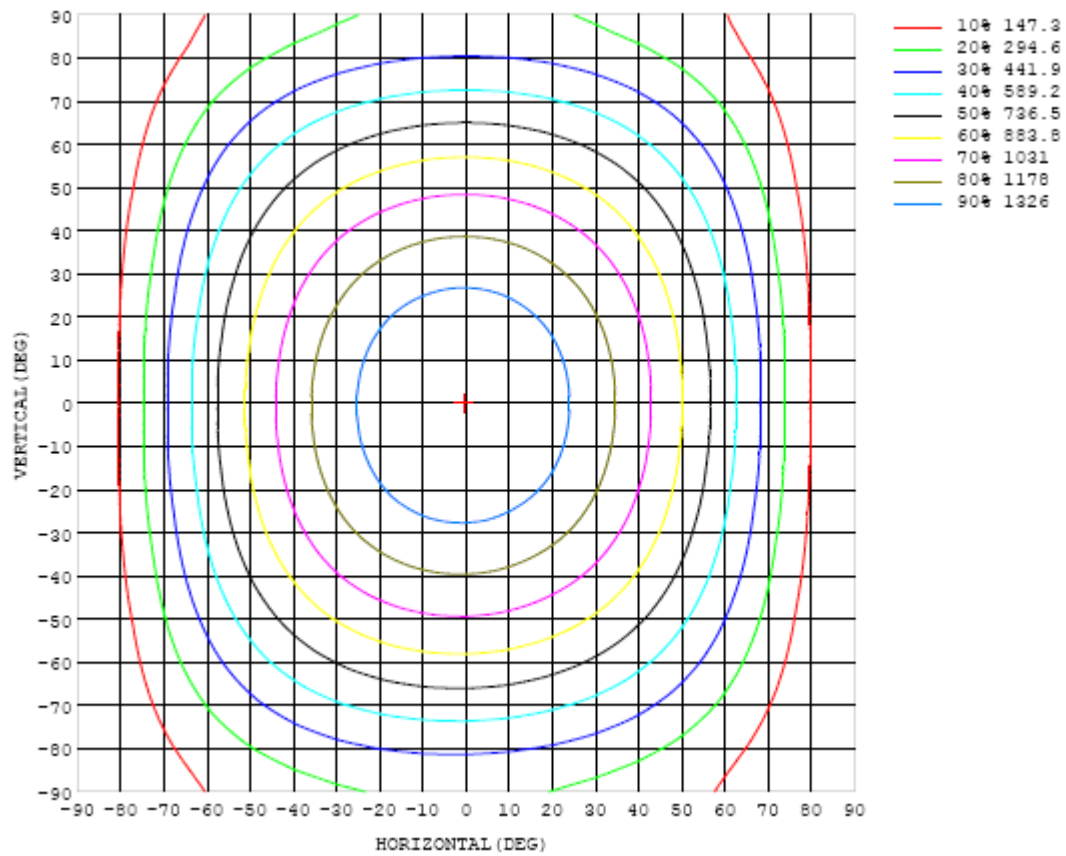


Chart 3: Isocandela Plot

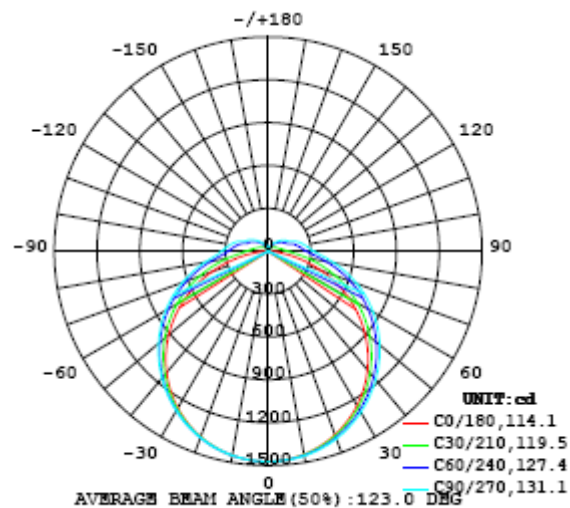


Chart 4: Polar Candela Distribution

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	1472	1472	1472	1472	1472	1472	1472	1472	1472	1472	1472	1472	1472	1472	1472	1472	1472	1472	1472
5	1464	1464	1465	1465	1466	1466	1466	1467	1468	1468	1468	1468	1469	1469	1468	1468	1468	1467	1470
10	1444	1444	1444	1446	1448	1450	1451	1452	1454	1455	1455	1456	1455	1454	1454	1452	1452	1452	1451
15	1412	1412	1413	1416	1419	1423	1425	1427	1429	1431	1432	1432	1431	1430	1429	1426	1425	1424	1423
20	1368	1369	1371	1375	1380	1385	1388	1391	1395	1397	1398	1398	1397	1395	1393	1389	1386	1384	1382
25	1313	1315	1318	1324	1331	1336	1341	1346	1350	1353	1354	1355	1353	1350	1347	1341	1336	1332	1330
30	1247	1249	1254	1262	1271	1280	1286	1291	1297	1301	1302	1302	1299	1296	1290	1282	1276	1270	1266
35	1171	1173	1180	1191	1203	1214	1222	1229	1236	1240	1241	1241	1237	1232	1224	1214	1205	1196	1193
40	1084	1087	1098	1112	1126	1140	1151	1160	1168	1173	1174	1173	1168	1161	1150	1137	1125	1113	1108
45	988	993	1007	1024	1043	1059	1073	1084	1094	1100	1101	1098	1092	1083	1069	1052	1035	1020	1014
50	884	890	908	930	952	973	990	1004	1015	1021	1022	1019	1010	998	981	960	939	919	910
55	771	780	802	829	857	881	902	918	931	938	939	934	923	907	886	861	834	809	799
60	649	665	688	723	756	785	809	828	842	849	850	844	831	812	787	756	723	693	679
65	524	538	573	612	650	684	712	734	749	757	757	750	735	713	682	646	606	569	553
70	393	412	453	499	543	581	612	635	652	660	660	652	635	609	575	533	487	442	421
75	262	285	334	387	435	477	510	536	554	563	563	553	534	505	467	420	367	314	288
80	138	167	222	279	331	376	412	440	458	467	466	455	434	403	362	310	253	193	161
85	41.6	71.0	129	188	242	288	325	353	372	380	379	367	345	312	267	214	154	91.4	53.7
90	0.61	25.4	78.4	135	186	231	267	293	310	318	315	303	279	246	202	150	92.6	35.6	1.01
95	0.56	16.7	61.9	113	162	204	238	263	279	286	283	270	248	216	175	126	72.8	23.4	0.34
100	0.64	13.5	47.0	94.8	141	181	213	237	252	259	256	244	223	193	154	108	55.5	18.6	0.48
105	0.74	12.3	40.7	77.9	116	157	189	212	227	233	230	219	199	169	129	85.3	49.1	16.8	0.67
110	0.99	11.6	36.1	68.6	101	128	157	181	197	203	200	188	166	136	108	76.6	43.6	15.7	0.90
115	1.11	11.1	32.4	60.6	90.7	116	136	149	160	165	162	153	140	123	97.2	68.5	38.7	15.1	1.44
120	1.26	10.7	29.2	53.6	79.9	103	122	137	146	149	147	140	128	109	86.0	60.5	34.9	14.5	1.82
125	1.47	10.3	26.3	47.4	70.1	90.2	108	121	130	133	132	125	113	96.2	75.7	53.6	31.6	13.8	1.87
130	1.64	10.0	23.7	41.8	61.0	79.0	94.0	106	114	117	115	109	98.5	83.9	66.6	47.3	28.4	13.2	2.27
135	1.85	9.63	21.1	36.6	52.9	68.9	81.1	91.5	98.2	101	99.7	94.4	85.1	72.6	57.9	41.7	25.5	12.6	2.57
140	2.05	9.40	18.7	31.7	45.4	59.2	69.4	77.9	83.8	86.2	85.0	80.5	72.6	62.5	49.7	36.5	22.1	11.8	2.90
145	2.20	8.77	16.3	27.0	38.4	49.9	58.3	65.7	70.7	71.9	71.4	67.9	61.4	52.7	42.1	31.5	19.2	10.9	3.08
150	2.31	8.09	14.5	21.2	31.8	41.0	47.9	53.9	57.8	59.4	58.8	55.8	50.5	43.5	35.1	25.6	17.4	10.1	3.11
155	2.36	7.15	12.5	18.4	24.6	32.6	38.3	42.9	46.0	47.2	46.7	44.4	40.3	35.0	28.3	21.3	14.9	9.35	3.16
160	2.41	5.45	10.8	15.1	19.6	23.6	28.7	32.6	35.0	36.0	35.6	33.9	30.9	26.2	21.9	17.1	12.2	8.16	3.20
165	2.41	3.84	9.00	11.9	14.9	18.0	21.1	23.2	24.2	25.0	24.9	23.9	22.1	19.4	14.9	12.3	9.57	6.71	3.09
170	2.42	2.85	4.97	9.12	10.8	12.3	13.8	15.3	16.1	16.6	16.5	16.0	14.1	11.8	10.1	8.74	7.08	5.41	3.03
175	2.74	2.95	3.48	4.80	5.98	7.22	8.25	8.86	9.86	10.0	10.0	8.37	7.37	7.30	6.79	5.99	5.29	4.36	3.16
180	2.64	2.64	2.64	2.64	2.65	2.65	2.65	2.66	2.66	2.66	2.67	2.67	2.67	2.68	2.68	2.68	2.68	2.69	2.69

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	1472	1472	1472	1472	1472	1472	1472	1472	1472	1472	1472	1472	1472	1472	1472	1472	1472		
5	1469	1468	1468	1468	1469	1468	1467	1467	1467	1466	1467	1466	1465	1464	1464	1463	1464		
10	1451	1450	1451	1452	1452	1452	1452	1452	1451	1450	1450	1449	1447	1446	1445	1444	1444		
15	1422	1422	1424	1424	1426	1426	1426	1426	1426	1424	1423	1421	1420	1417	1414	1412	1412		
20	1382	1382	1385	1387	1389	1389	1390	1390	1389	1388	1387	1384	1381	1377	1374	1370	1369		
25	1330	1332	1335	1338	1341	1343	1344	1344	1344	1342	1340	1336	1332	1328	1323	1318	1315		
30	1267	1270	1275	1280	1284	1287	1289	1289	1289	1288	1285	1279	1275	1268	1261	1254	1249		
35	1193	1199	1206	1212	1218	1223	1226	1228	1228	1226	1221	1215	1209	1201	1191	1181	1174		
40	1110	1117	1127	1136	1145	1151	1155	1159	1159	1157	1152	1144	1136	1125	1112	1099	1089		
45	1017	1027	1040	1053	1065	1074	1080	1084	1085	1082	1076	1067	1056	1041	1025	1009	995		
50	915	929	946	963	978	990	999	1004	1005	1002	994	984	969	951	931	910	893		
55	805	824	846	866	885	900	911	918	920	917	908	895	877	855	831	805	783		
60	689	712	739	765	788	806	820	828	831	827	817	802	781	755	725	694	666		
65	565	595	628	659	687	709	724	734	737	733	722	705	680	651	615	578	545		
70	437	474	514	550	582	608	626	637	640	636	625	605	578	544	503	460	418		
75	308	353	399	442	478	506	527	539	543	539	526	505	475	437	392	342	293		
80	187	239	291	338	378	410	432	446	451	446	432	409	377	335	286	231	175		
85	85.3	143	200	251	294	328	353	368	372	368	353	328	294	250	197	139	79.1		
90	32.8	91.0	150	203	247	282	307	322	327	322	307	282	246	202	150	90.6	32.5		
95	21.0	71.7	127	177	220	254	277	292	297	292	278	253	220	177	127	72.3	21.9		
100	15.5	55.1	107	156	195	227	250	264	268	264	250	227	195	156	106	56.3	17.1		
105	13.2	46.1	87.4	126	169	202	224	237	241	237	224	201	168	126	88.6	47.5	14.8		
110	11.9	40.2	75.5	112	138	165	187	201	206	201	187	165	139	113	77.0	41.4	13.4		
115	10.9	35.4	66.2	97.7	127	149	161	168	171	168	161	149	128	99.2	67.1	36.5	12.2		
120	9.98	31.4	58.0	85.5	111	132	147	156	159	156	148	133	112	86.2	58.7	32.2	11.1		
125	8.84	27.7	50.7	74.5	96.5	115	129	137	140	138	130	117	97.9	74.9	51.3	28.4	9.77		
130	8.07	23.1	44.0	64.6	83.6	99.9	112	119	122	119	113	101	84.4	64.9	44.5	24.9	8.78		
135	6.58	20.3	37.9	55.5	71.7	85.7	96.0	102	105	102	96.6	86.9	72.1	55.7	38.4	21.6	7.81		
140	6.08	17.4	31.3	46.9	60.7	72.5	81.3	86.8	88.5	86.8	81.8	73.4	60.7	47.1	32.5	17.8	6.91		
145	5.35	13.4	25.8	38.9	50.3	60.1	67.5	72.0	73.5	72.0	68.0	60.7	50.4	39.1	27.1	14.8	6.12		
150	4.72	11.1	20.8	30.6	40.6	48.5	54.4	58.2	59.4	58.2	55.1	49.0	40.8	31.7	21.5	12.1	5.47		
155	3.91	8.70	14.6	23.2	29.9	37.3	42.1	45.1	46.2	45.3	43.0	38.1	32.0	24.4	16.4	10.1	4.91		
160	3.03	5.70	9.61	15.5	21.5	25.9	29.3	32.9	33.9	33.4	32.0	26.8	23.5	17.5	12.9	8.43	4.58		
165	2.36	3.19	5.29	8.05	11.8	16.1	18.7	20.6	21.6	21.6	20.3	18.1	15.6	12.9	9.79	6.72	4.16		
170	2.75	2.59	3.14	4.34	5.38	6.74	9.16	11.2	12.0	12.2	11.9	10.9	9.53	7.94	6.31	4.84	3.56		
175	3.15	2.70	2.78	3.04	3.42	3.55	3.45	3.70	5.02	5.30	5.20	4.85	4.44	3.99	3.42	3.05	2.74		
180	2.69	2.68	2.68	2.68	2.68	2.67	2.67	2.67	2.66	2.66	2.66	2.65	2.65	2.65	2.64	2.64	2.64		

Table 5: Luminous Intensity Data

EQUIPMENT LIST

Test Equipment	Model	Equipment No.	Calibration Date	Calibration Due date
Goniophotometer system	GO-R5000	HZTE011-01	Aug. 14, 2018	Aug. 13, 2019
Digital Power Meter	PF2010A	HZTE028-01	Sep. 12, 2018	Sep. 11, 2019
AC Power Supply	DPS1060	HZTE001-06	Aug. 09, 2018	Aug. 08, 2019
DC Power Supply	WY12010	HZTE004-03	Aug. 09, 2018	Aug. 08, 2019
Standard Source	D908	HZTE012-01	Aug. 14, 2018	Aug. 13, 2019
Standard source	SCL-1400	HZTE012-02	Aug. 16, 2018	Aug. 15, 2019
Temperature and humidity recorder	JR900	HZTE018-01	Aug. 09, 2018	Aug. 08, 2019
Temperature recorder	JM624U	HZTE018-08	Aug. 09, 2018	Aug. 08, 2019

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 $k=2$.

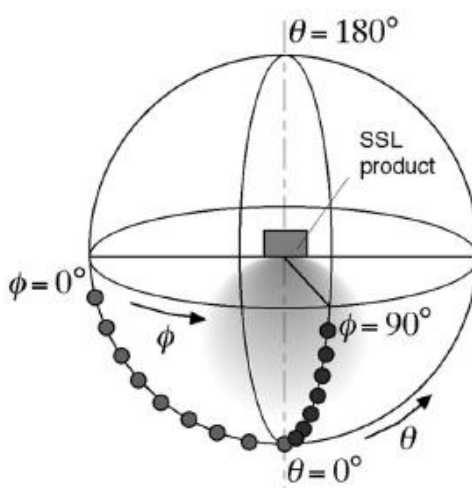
Color Characteristics Measurements

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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