



LM-79-08 Test Report

for

GREEN CREATIVE LTD

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

LED Strip Light

Model: 38.5STRIPDIM/835/277V/R

Laboratory: Leading Testing Laboratories

NVLAP CODE: 200960-0

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Report No.: HZ18110058c

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/835/277V/R**

Luminous Efficacy (Lumens /Watt)	Total Luminous Flux (Lumens)	Power (Watts)	Power Factor
139.1	5444.2	39.13	0.9951
CCT (K)	CRI	Stabilization Time (Light & Power)	
3434	84.6	60	

Table 1: Executive Data Summary

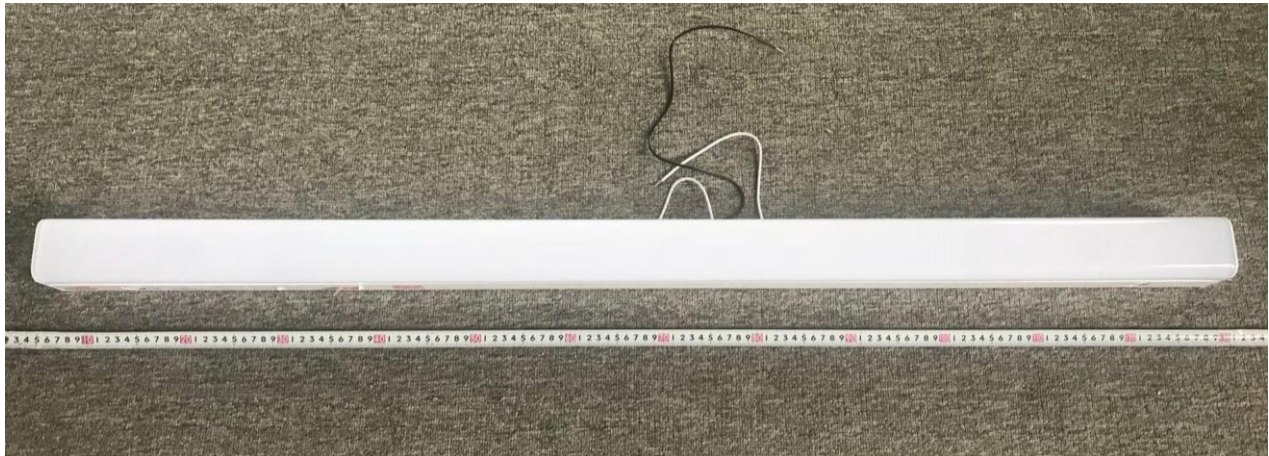
Test specifications:

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/835/277V/R
Electrical Ratings	: 120-277V, 50/60Hz
Product Description	: 3500K
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	
			R1	84
Test Voltage (V)	120.0	277.0	R2	93
Voltage frequency (Hz)	60	60	R3	96
Test Current (A)	0.328	0.149	R4	82
Power Factor	0.9951	0.9437	R5	84
Test Power (W)	39.13	39.09	R6	90
THD A%	8.16	9.31	R7	84
Luminous Efficacy (lm/W)	139.1	139.4	R8	64
Total Luminous Flux (lm)	5444.2	5450.8	R9	16
Color Rendering Index (CRI)	84.6		R10	82
R9	16		R11	82
Correlated Color Temperature (CCT) (K)	3434		R12	69
Chromaticity (Chroma x, Chroma y)	(0.4072, 0.3878)		R13	86
Chromaticity (Chroma u, Chroma v)	(0.2382, 0.3402)		R14	99
Chromaticity (Chroma u', Chroma v')	(0.2382, 0.5103)			
Duv	-0.0017			
Average Beam Angle (°)	124.0			
Center Beam Candle Power (cd)	1445			
Spacing Criteria	1.27 (0 °-180 °)/ 1.31 (90 °-270 °)			
Zonal Lumens in the 0 °-60 °Zone	63.39%			
Zonal Lumens in the 60 °-90 °Zone	25.57%			
Zonal Lumens in the 90 °-120 °Zone	8.03%			
Zonal Lumens in the 120 °-180 °Zone	3.01%			

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

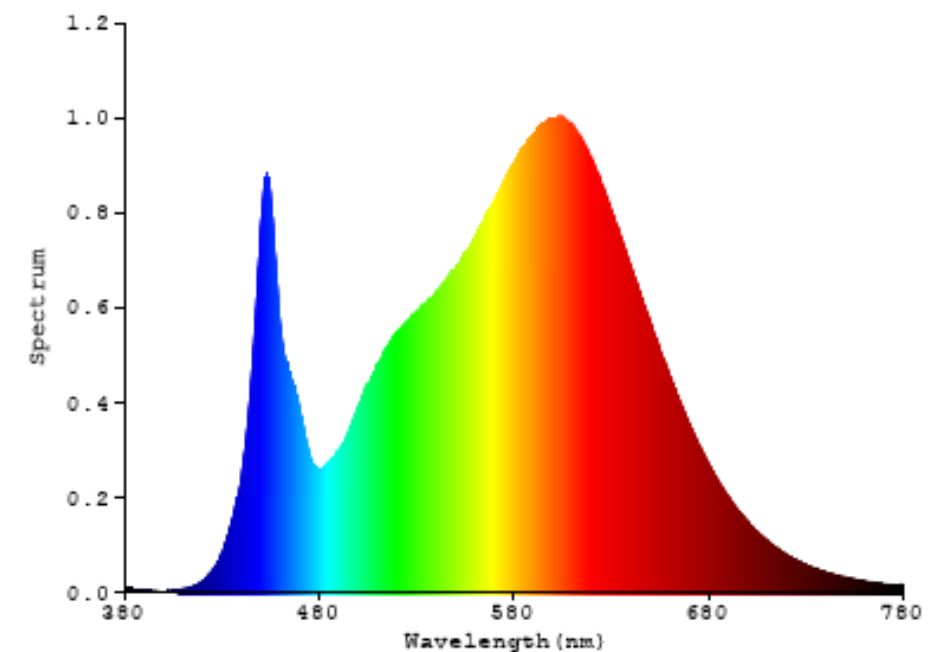


Chart 1: Spectral Power Distribution

Zonal Lumen Tabulation

$\gamma(^{\circ})$	Lumens	% Total
0- 10	136.897	2.51%
10- 20	394.566	7.25%
20- 30	605.797	11.13%
30- 40	746.202	13.71%
40- 50	801.227	14.72%
50- 60	766.626	14.08%
60- 70	648.094	11.90%
70- 80	465.644	8.55%
80- 90	278.368	5.11%
90-100	191.492	3.52%
100-110	144.614	2.66%
110-120	100.9	1.85%
120-130	71.887	1.32%
130-140	46.88	0.86%
140-150	27.234	0.50%
150-160	13.009	0.24%
160-170	4.184	0.08%
170-180	0.544	0.01%
Total	5444.2	100%

$\gamma(^{\circ})$	Lumens	% Total
0- 60	3451.315	63.39%
60- 90	1392.106	25.57%
0-90	4843.421	88.97%
90- 180	600.744	11.03%
0- 180	5444.2	100%

Table 3: Zonal Lumen Data

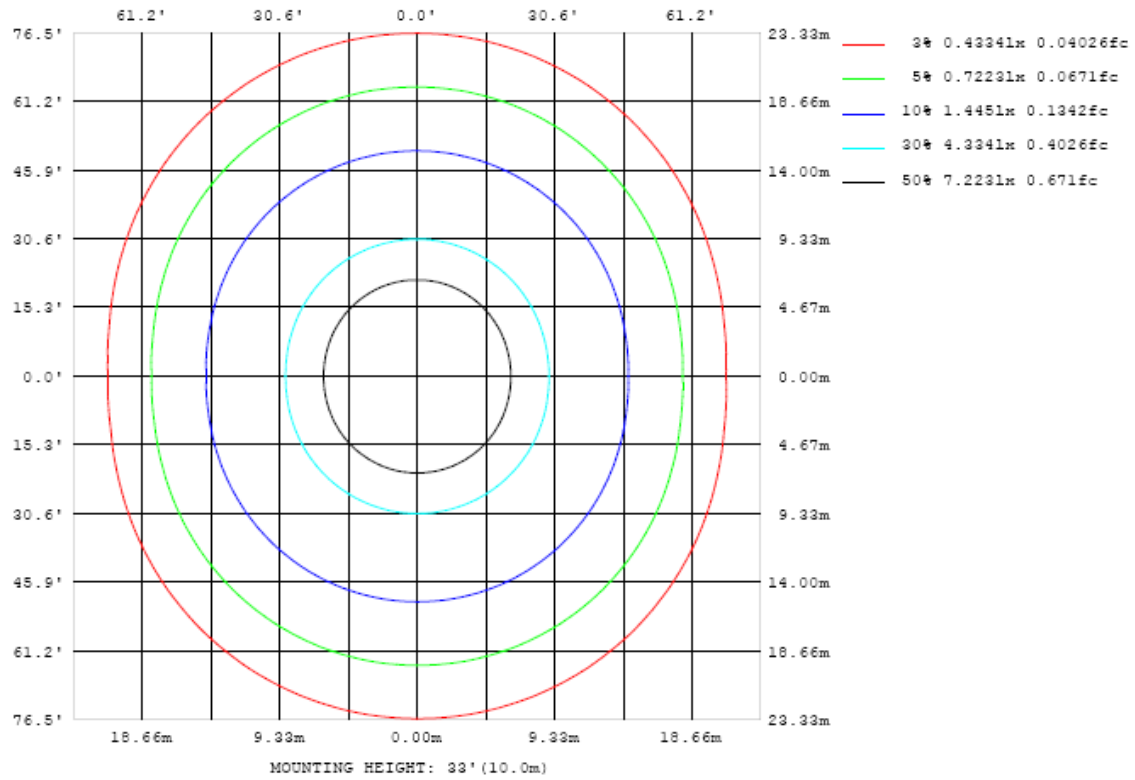


Chart 2: Illuminance Plot (Footcandles)

Luminous Intensity Distribution Plots

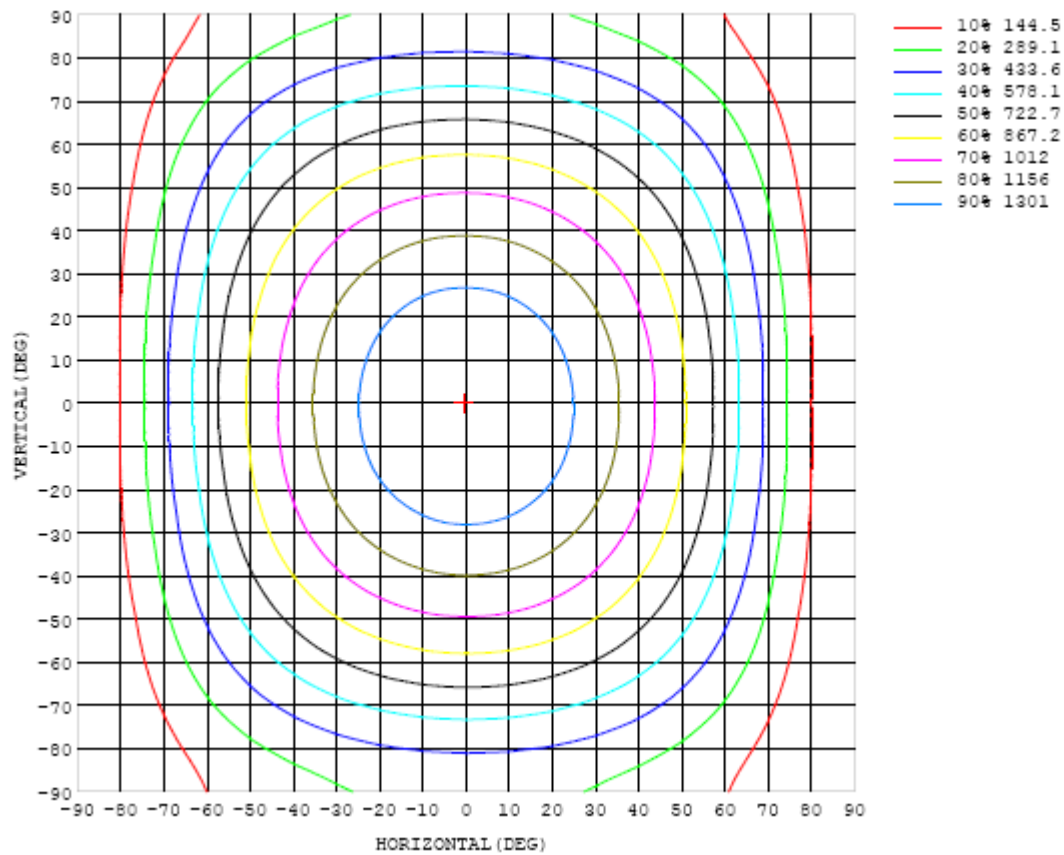


Chart 3: Isocandela Plot

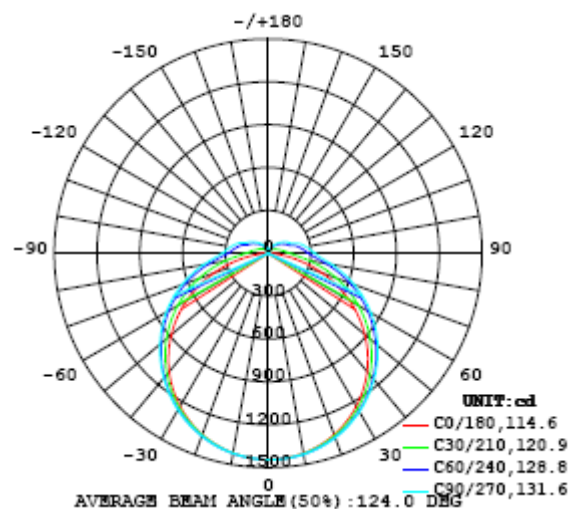


Chart 4: Polar Candela Distribution

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	1445	1445	1445	1445	1445	1445	1445	1445	1445	1445	1445	1445	1445	1445	1445	1445	1445	1445	1445
5	1439	1439	1439	1441	1441	1441	1441	1441	1441	1441	1442	1442	1442	1441	1441	1440	1440	1440	1439
10	1421	1422	1423	1424	1426	1427	1428	1429	1429	1429	1429	1429	1427	1426	1425	1424	1423	1421	1420
15	1392	1392	1394	1397	1400	1403	1405	1406	1406	1407	1407	1407	1406	1404	1402	1399	1397	1394	1392
20	1351	1353	1356	1360	1364	1368	1371	1373	1374	1374	1374	1373	1370	1366	1363	1359	1355	1352	1351
25	1299	1302	1307	1312	1318	1323	1327	1330	1331	1332	1331	1329	1325	1321	1317	1311	1305	1301	1299
30	1237	1240	1247	1254	1262	1269	1274	1278	1279	1280	1280	1276	1272	1267	1261	1253	1246	1239	1236
35	1163	1167	1176	1187	1196	1206	1213	1218	1220	1221	1220	1216	1210	1203	1195	1185	1175	1167	1163
40	1080	1086	1097	1111	1123	1135	1144	1150	1154	1155	1153	1148	1141	1132	1121	1108	1096	1084	1080
45	987	994	1009	1026	1042	1057	1068	1076	1080	1082	1080	1074	1065	1054	1039	1023	1007	993	988
50	885	894	913	934	954	972	986	996	1002	1003	1001	993	983	968	951	930	910	892	887
55	775	786	810	835	859	882	899	911	918	920	917	908	895	877	856	831	806	784	777
60	657	670	699	731	760	786	806	821	829	831	828	818	802	781	756	726	695	668	659
65	532	549	584	622	656	687	710	727	736	738	734	723	705	681	651	616	579	546	535
70	402	422	465	510	550	584	610	629	639	642	638	625	606	578	544	504	460	420	405
75	270	296	347	397	442	480	509	530	542	545	540	526	504	474	436	391	341	293	274
80	145	177	234	290	339	381	413	436	448	452	447	432	408	374	333	283	228	173	150
85	46.3	80.1	140	200	252	296	331	355	369	373	368	352	327	291	246	194	134	75.6	47.2
90	2.17	32.2	90.1	149	202	247	282	307	321	326	321	305	280	244	199	145	86.1	28.9	0.84
95	0.36	21.3	71.5	127	177	220	254	278	293	297	292	277	252	217	174	123	68.0	18.7	0.66
100	0.43	16.7	54.6	106	155	196	229	251	265	270	265	250	227	194	152	102	51.1	14.7	0.73
105	0.59	14.6	46.9	87.0	127	169	202	225	238	243	238	224	200	166	123	83.0	45.0	13.0	0.91
110	0.79	13.4	40.9	76.1	111	138	166	189	203	208	202	187	163	135	107	73.5	39.0	11.9	1.07
115	1.00	12.4	36.1	66.5	98.6	125	146	159	168	171	167	157	144	123	95.4	64.9	34.3	11.0	1.29
120	1.22	11.4	32.0	58.3	86.6	110	130	145	153	156	153	144	129	109	83.8	57.1	30.6	10.2	1.52
125	1.43	10.4	28.3	50.9	75.0	96.3	114	128	136	138	136	127	114	95.1	73.1	50.0	27.1	9.34	1.74
130	1.67	9.47	24.9	44.3	65.0	83.5	98.9	111	118	121	118	111	98.6	82.5	63.9	43.6	23.8	8.08	2.08
135	1.80	8.42	21.6	38.1	55.3	71.7	84.9	95.2	101	104	101	95.0	84.5	70.8	54.9	37.8	20.7	6.95	2.24
140	2.03	7.42	18.5	32.3	46.7	61.0	71.6	80.4	85.8	87.7	85.8	80.3	71.5	60.3	46.6	32.0	17.1	6.44	2.52
145	2.38	6.34	15.2	26.7	38.7	50.7	59.7	66.9	71.1	72.7	71.4	67.0	59.7	50.0	38.9	26.8	14.2	5.47	2.78
150	2.40	5.24	12.4	20.7	30.8	40.8	48.1	54.0	57.7	59.0	57.9	54.2	48.2	40.5	31.2	20.9	11.8	4.52	2.95
155	2.66	4.21	9.74	16.6	23.4	31.0	37.4	41.9	44.8	45.9	45.0	42.2	37.6	31.4	24.0	16.5	9.21	3.76	2.94
160	2.71	3.24	7.14	12.0	17.1	22.0	26.3	30.1	32.8	33.8	33.1	30.8	27.1	22.8	16.9	11.3	6.71	2.97	2.73
165	2.75	2.56	4.74	8.04	11.5	14.6	17.5	20.2	21.6	22.2	21.9	20.4	17.1	13.0	9.59	6.75	4.29	2.38	2.13
170	2.92	2.18	3.23	4.30	6.28	8.22	9.88	11.3	12.3	12.6	12.3	9.79	8.05	6.73	5.45	3.92	2.74	2.00	2.25
175	2.56	2.03	2.10	2.47	2.84	3.20	3.67	4.03	4.56	5.10	3.17	3.69	3.50	3.34	3.03	2.19	2.08	2.01	2.32
180	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43

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	1445	1445	1445	1445	1445	1445	1445	1445	1445	1445	1445	1445	1445	1445	1445	1445	1445		
5	1439	1438	1438	1438	1437	1438	1439	1439	1438	1439	1438	1438	1438	1438	1438	1438	1439		
10	1420	1420	1420	1421	1421	1422	1423	1423	1422	1423	1422	1422	1422	1422	1421	1420	1420		
15	1391	1390	1391	1393	1395	1397	1398	1398	1397	1398	1397	1395	1395	1393	1392	1391	1391		
20	1350	1351	1353	1356	1359	1361	1363	1363	1362	1363	1361	1360	1357	1356	1353	1351	1350		
25	1300	1301	1305	1309	1313	1316	1318	1319	1318	1318	1317	1314	1311	1308	1304	1301	1299		
30	1238	1241	1248	1254	1258	1262	1265	1267	1266	1266	1264	1260	1255	1250	1245	1240	1236		
35	1166	1172	1180	1189	1196	1200	1204	1207	1206	1205	1203	1197	1191	1185	1177	1170	1165		
40	1084	1093	1105	1116	1125	1133	1138	1141	1140	1139	1135	1128	1120	1111	1101	1090	1082		
45	994	1007	1022	1036	1049	1058	1065	1069	1069	1067	1061	1053	1042	1030	1016	1002	991		
50	895	911	931	950	966	979	987	992	992	990	983	972	959	943	925	906	891		
55	788	810	835	859	878	894	905	911	911	908	900	887	870	850	827	803	784		
60	674	702	733	762	786	805	818	825	826	822	813	797	777	752	724	694	669		
65	554	589	627	662	690	712	727	735	737	732	721	703	679	651	616	580	548		
70	430	473	518	558	591	616	634	643	645	640	627	607	579	546	506	462	422		
75	305	357	408	454	491	518	538	549	551	545	531	508	478	440	396	345	296		
80	187	246	303	353	393	424	445	457	460	453	438	413	380	338	289	233	178		
85	89.1	152	212	263	307	339	363	375	378	371	355	329	294	250	197	139	79.3		
90	37.1	95.9	155	206	249	282	305	318	321	315	299	274	239	195	143	85.1	28.8		
95	25.3	76.9	132	180	221	253	276	289	292	286	271	246	212	170	121	67.1	18.7		
100	19.5	60.1	114	160	199	229	251	263	266	260	246	222	190	151	103	51.8	14.4		
105	17.2	51.5	92.2	137	177	206	226	238	241	236	222	199	168	125	84.1	43.9	12.8		
110	15.7	45.6	81.3	116	144	175	199	212	215	209	194	168	136	109	73.6	38.7	11.9		
115	14.8	40.8	71.7	103	131	149	163	171	174	168	159	145	125	96.6	64.6	34.6	11.3		
120	14.0	36.6	63.6	90.8	116	136	150	157	159	156	147	132	111	84.5	57.1	30.9	10.5		
125	13.3	32.8	56.3	79.9	102	119	133	140	142	139	130	117	97.2	74.0	50.4	27.7	9.82		
130	12.3	28.7	49.6	70.0	88.7	104	116	122	124	121	114	102	84.4	64.7	44.4	24.9	9.16		
135	11.3	25.7	43.2	60.8	76.8	90.2	100.0	106	107	104	98.1	87.9	72.7	56.0	38.6	22.1	8.28		
140	10.5	22.8	37.3	51.9	65.7	77.0	85.3	90.4	91.5	89.2	83.7	75.0	62.0	47.8	33.3	19.2	7.67		
145	9.40	19.1	31.4	43.9	54.9	64.7	71.7	75.8	76.7	74.8	70.3	62.7	51.9	40.4	28.5	16.4	7.06		
150	8.32	16.2	25.8	35.4	45.3	52.5	58.4	61.9	62.8	61.1	57.6	51.0	42.8	33.6	23.6	14.1	6.32		
155	7.25	13.2	20.6	28.0	34.9	41.9	46.2	48.8	49.5	48.3	45.9	40.8	34.5	26.7	18.6	11.4	6.08		
160	5.62	9.66	14.9	21.1	26.2	30.6	34.9	37.0	37.6	36.9	35.1	31.2	26.1	20.6	14.9	10.4	5.84		
165	4.02	6.53	9.31	13.5	17.7	21.0	23.7	25.1	25.2	25.3	24.6	22.2	18.6	15.3	12.1	8.69	5.64		
170	3.27	4.55	6.04	7.88	9.67	12.2	14.2	15.2	15.9	15.8	15.3	14.2	12.6	10.6	8.56	6.52	4.88		
175	2.91	3.48	4.15	4.80	5.23	5.72	6.54	7.29	7.79	7.84	7.70	7.36	6.65	5.90	5.20	4.45	3.50		
180	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43		

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 $k=2$.

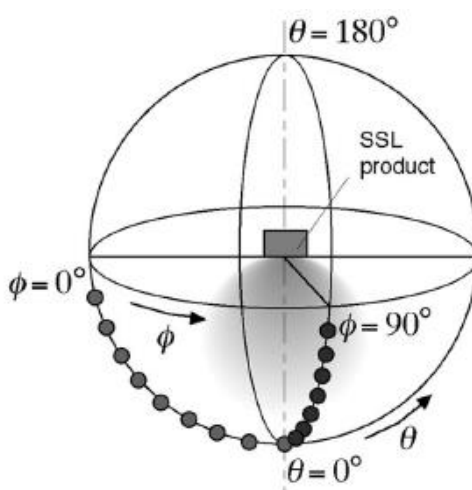
Color Characteristics Measurements

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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