

LM-79-08 Test Report

for

GREEN CREATIVE LTD

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

LED Strip Light

Model: 38.5STRIPDIM/850/277V/R

Laboratory: Leading Testing Laboratories

NVLAP CODE: 200960-0

3rd Floor, Bld. 2, NO. 96 Longchuanwu Rd Qianjiang Economy Dev. Zone, Yuhang Dist,
Hangzhou, Zhejiang Province, China 311100


Tel: +86 571 86376106

www.ledtestlab.com


Report No.: HZ18110058e

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

Review by:



Engineer: April Zou
Dec. 06, 2018



Approved by

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/850/277V/R**

Luminous Efficacy (Lumens /Watt)	Total Luminous Flux (Lumens)	Power (Watts)	Power Factor
139.0	5434.6	39.10	0.9951
CCT (K)	CRI	Stabilization Time (Light & Power)	
4945	85.0	60	

Table 1: Executive Data Summary

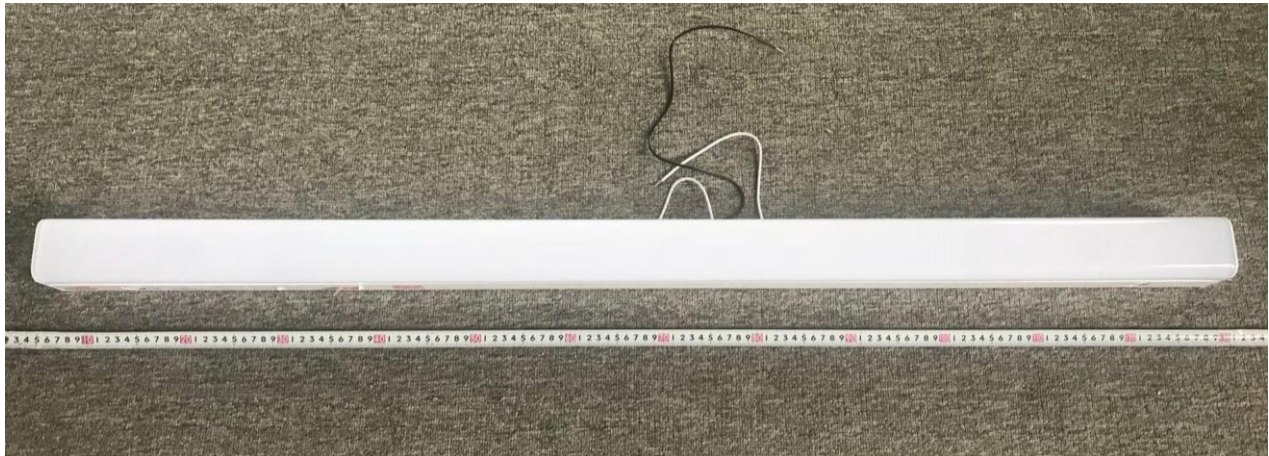
Test specifications:

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

TABLE OF CONTENT

LM-79-08 Test Report.....	1
Sample Photos	4
TEST RESULTS	5
Spectral Power Distribution	6
Zonal Lumen Tabulation	7
Luminous Intensity Distribution Plots.....	9
Luminous Intensity Data	10
EQUIPMENT LIST	12
TEST METHODS	12
Seasoning of SSL Product.....	12
Goniophotometer Method	12
Photometric and Electrical Measurements	12
Color Characteristics Measurements.....	13
Color Spatial Uniformity	13

Sample Photos



Overview of the sample

Equipment Under Test (EUT)

Name	: LED Strip Light
Model	: 38.5STRIPDIM/850/277V/R
Electrical Ratings	: 120-277V, 50/60Hz
Product Description	: 5000K
Manufacturer	: GREEN CREATIVE LTD
Address	: 756 North Zhongshan Rd., Unit B301 Zhabei District, Shanghai

TEST RESULTS

Test ambient temperature was 24.7°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	84
Voltage frequency (Hz)	60	60	R2	91
Test Current (A)	0.328	0.149	R3	95
Power Factor	0.9951	0.9437	R4	83
Test Power (W)	39.10	38.98	R5	83
THD A%	7.90	9.61	R6	86
Luminous Efficacy (lm/W)	139.0	139.3	R7	88
Total Luminous Flux (lm)	5434.6	5431.3	R8	70
Color Rendering Index (CRI)	85.0		R9	18
R9	18		R10	78
Correlated Color Temperature (CCT) (K)	4945		R11	82
Chromaticity (Chroma x, Chroma y)	(0.3469, 0.3556)		R12	59
Chromaticity (Chroma u, Chroma v)	(0.2111, 0.3246)		R13	86
Chromaticity (Chroma u', Chroma v')	(0.2111, 0.4869)		R14	98
Duv	0.0013			
Average Beam Angle (°)	124.4			
Center Beam Candle Power (cd)	1428			
Spacing Criteria	1.27 (0 °-180 °)/ 1.31 (90 °-270 °)			
Zonal Lumens in the 0 °-60 °Zone	62.99%			
Zonal Lumens in the 60 °-90 °Zone	25.70%			
Zonal Lumens in the 90 °-120 °Zone	8.22%			
Zonal Lumens in the 120 °-180 °Zone	3.09%			

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

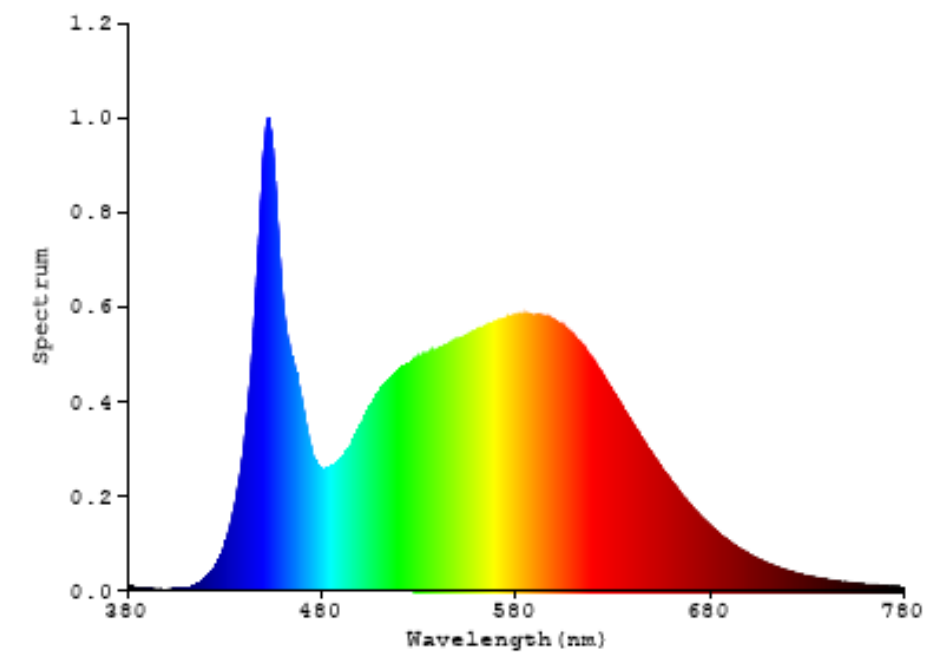


Chart 1: Spectral Power Distribution

Zonal Lumen Tabulation

$\gamma(^{\circ})$	Lumens	% Total
0- 10	135.284	2.49%
10- 20	390.133	7.18%
20- 30	599.611	11.03%
30- 40	739.618	13.61%
40- 50	795.578	14.64%
50- 60	762.925	14.04%
60- 70	647.065	11.91%
70- 80	467.432	8.60%
80- 90	282.189	5.19%
90-100	195.218	3.59%
100-110	147.879	2.72%
110-120	103.676	1.91%
120-130	73.893	1.36%
130-140	48.284	0.89%
140-150	27.98	0.51%
150-160	13.238	0.24%
160-170	4.118	0.08%
170-180	0.455	0.01%
Total	5434.6	100%

$\gamma(^{\circ})$	Lumens	% Total
0- 60	3423.149	62.99%
60- 90	1396.686	25.70%
0-90	4819.835	88.69%
90- 180	614.741	11.31%
0- 180	5434.6	100%

Table 3: Zonal Lumen Data

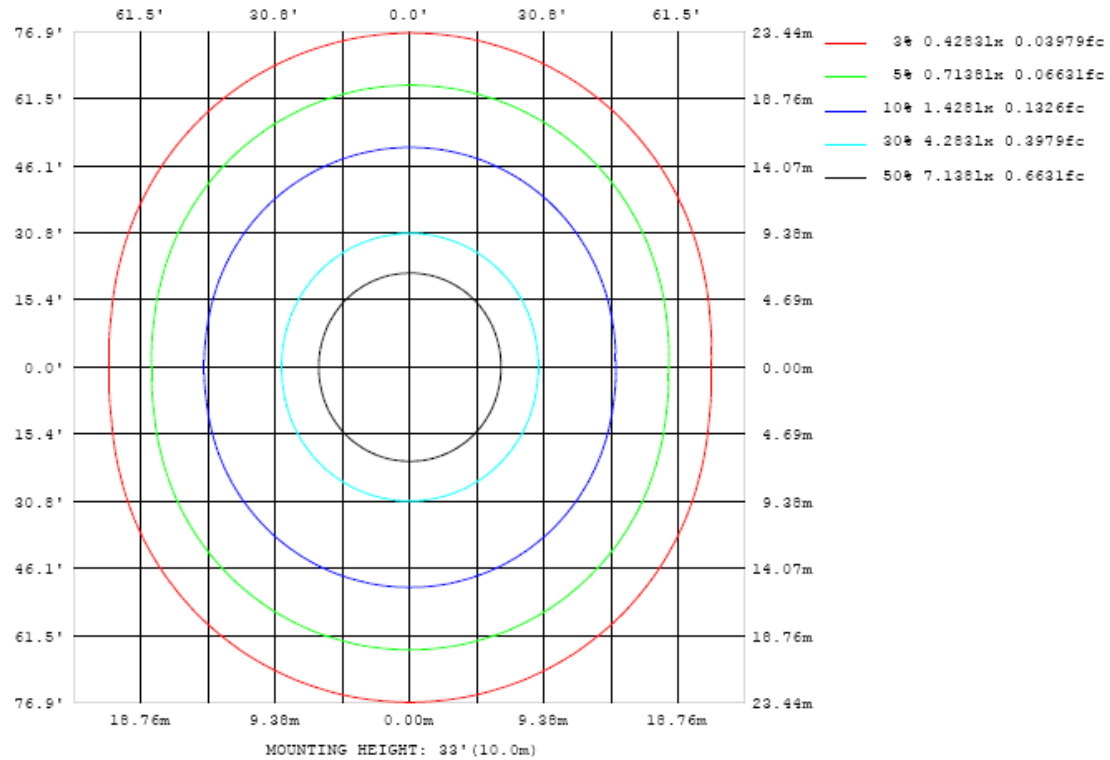


Chart 2: Illuminance Plot (Footcandles)

Luminous Intensity Distribution Plots

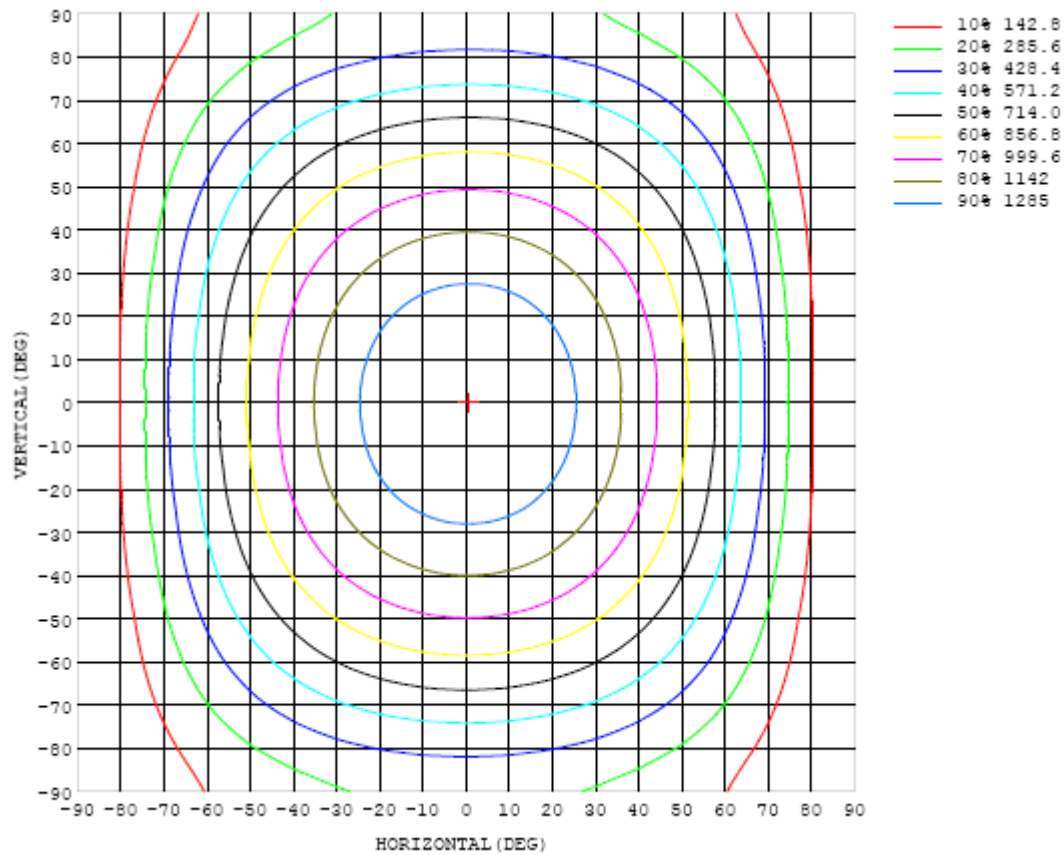


Chart 3: Isocandela Plot

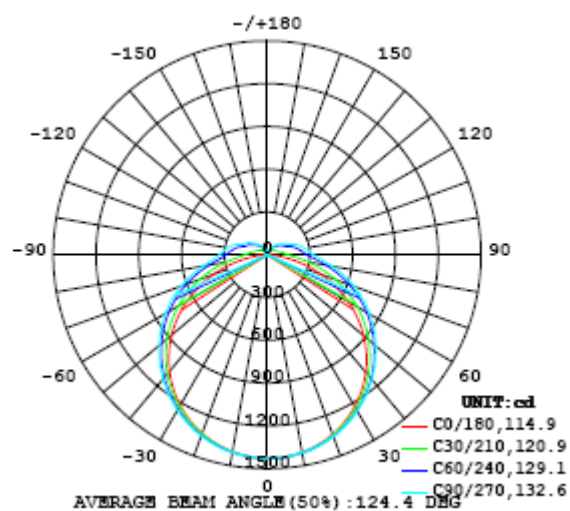


Chart 4: Polar Candela Distribution

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	1428	1428	1428	1428	1428	1428	1428	1428	1428	1428	1428	1428	1428	1428	1428	1428	1428	1428	1428
5	1422	1423	1423	1423	1423	1423	1424	1424	1424	1424	1424	1423	1423	1422	1422	1421	1421	1421	1421
10	1406	1407	1408	1408	1409	1409	1411	1411	1411	1411	1410	1409	1409	1407	1406	1404	1403	1402	1402
15	1378	1379	1380	1382	1384	1385	1388	1388	1389	1388	1388	1386	1385	1382	1379	1377	1374	1373	1372
20	1339	1341	1343	1346	1349	1352	1354	1356	1356	1356	1356	1354	1351	1348	1343	1339	1336	1333	1332
25	1289	1291	1295	1299	1304	1308	1312	1313	1315	1315	1314	1311	1307	1303	1298	1292	1286	1282	1282
30	1228	1231	1236	1242	1249	1255	1260	1263	1265	1264	1263	1260	1256	1250	1243	1236	1227	1221	1219
35	1157	1160	1168	1176	1185	1193	1200	1204	1206	1206	1205	1201	1196	1189	1179	1169	1158	1149	1146
40	1075	1080	1090	1102	1113	1123	1132	1138	1142	1141	1140	1135	1129	1119	1107	1094	1080	1068	1064
45	984	990	1003	1019	1033	1047	1059	1067	1071	1072	1069	1064	1055	1043	1028	1012	994	978	973
50	884	891	909	929	948	965	979	989	995	995	994	986	976	962	943	922	899	880	874
55	775	784	807	832	855	877	895	907	914	916	913	904	892	874	851	826	798	773	766
60	658	670	699	730	759	784	805	820	828	831	828	818	803	782	755	724	691	660	649
65	534	549	584	622	657	687	712	729	739	742	738	728	710	685	654	618	578	541	526
70	404	424	467	512	552	587	615	634	645	649	645	634	614	586	551	509	462	417	399
75	273	298	349	401	446	486	516	538	550	555	550	538	516	485	446	400	346	293	269
80	148	178	236	293	344	386	420	444	458	463	458	444	421	387	345	294	235	176	146
85	48.2	79.8	141	201	255	299	335	360	375	380	375	360	336	301	256	203	142	80.0	45.2
90	2.30	29.9	86.6	145	198	243	277	302	317	322	317	303	278	243	199	147	88.6	31.7	0.58
95	0.35	19.3	68.5	123	173	215	249	273	287	292	287	273	249	216	174	125	70.7	21.3	0.34
100	0.44	15.0	52.2	105	152	192	224	247	261	266	261	248	225	194	154	107	53.8	17.0	0.42
105	0.53	13.3	44.7	83.9	129	170	201	223	236	241	237	224	202	172	131	84.5	48.0	15.3	0.53
110	0.62	12.2	39.4	74.6	107	139	171	195	209	214	210	196	173	140	108	76.3	42.2	14.2	0.66
115	0.78	11.3	35.1	65.5	96.7	123	142	158	171	176	172	159	142	123	97.8	68.0	37.5	13.4	0.83
120	0.88	10.7	31.3	57.7	85.6	109	129	143	150	152	150	143	130	111	86.5	60.3	33.8	12.6	0.94
125	0.99	9.92	27.8	50.7	75.2	95.9	114	127	135	138	136	128	116	97.7	76.2	53.4	30.2	11.7	1.10
130	1.09	9.01	24.2	44.4	65.6	83.4	99.5	111	119	121	119	112	101	85.3	67.0	47.1	26.8	10.9	1.31
135	1.19	8.23	21.4	38.4	56.2	71.9	85.6	96.3	103	105	103	97.1	87.2	73.7	58.1	41.4	23.7	9.99	1.60
140	1.30	7.25	18.6	32.2	47.6	61.6	72.5	81.7	87.2	89.4	87.9	82.8	74.2	63.2	49.6	35.6	20.1	8.94	1.79
145	1.38	6.07	15.4	27.2	39.5	51.5	60.9	68.8	72.8	74.6	73.4	69.9	62.5	52.9	41.6	30.0	17.2	7.65	1.91
150	1.45	4.97	13.0	21.2	31.9	41.9	49.5	55.6	59.5	61.0	60.1	56.6	50.9	43.0	33.9	23.7	15.0	6.49	1.93
155	1.52	4.10	10.4	17.2	24.3	32.7	38.3	43.4	46.7	47.8	47.2	44.5	39.7	33.9	26.4	19.0	12.1	5.31	1.93
160	1.58	3.02	7.89	13.2	18.4	23.2	28.2	32.3	34.5	35.4	35.1	33.3	29.8	24.7	20.3	14.5	8.82	4.09	1.96
165	1.64	2.16	5.40	9.13	12.8	16.5	19.8	21.9	23.1	23.8	23.8	22.6	20.5	17.2	12.4	9.35	5.84	3.06	1.91
170	1.69	1.77	2.83	5.28	7.43	9.45	11.5	13.0	14.0	14.5	14.2	13.5	11.4	8.91	7.20	5.39	3.63	2.32	1.87
175	1.76	1.77	1.92	2.45	3.08	3.90	4.59	5.27	5.93	6.10	5.98	4.83	4.26	3.97	3.53	2.89	2.36	1.89	1.80
180	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.41	0.41	0.41	0.42	0.42	0.42	0.43	0.43	0.43	0.43	0.43

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	1428	1428	1428	1428	1428	1428	1428	1428	1428	1428	1428	1428	1428	1428	1428	1428	1428		
5	1421	1421	1421	1421	1421	1422	1421	1422	1422	1422	1422	1422	1423	1423	1423	1423	1423		
10	1403	1402	1403	1404	1405	1406	1406	1408	1408	1408	1409	1408	1408	1407	1407	1407	1407		
15	1373	1373	1374	1376	1379	1381	1383	1384	1385	1385	1385	1385	1383	1382	1381	1379	1379		
20	1333	1334	1336	1340	1343	1347	1349	1351	1352	1352	1352	1351	1349	1347	1344	1342	1341		
25	1282	1284	1288	1294	1298	1302	1306	1309	1310	1311	1310	1308	1305	1302	1298	1294	1292		
30	1220	1224	1231	1238	1244	1250	1254	1258	1259	1260	1259	1256	1253	1247	1241	1236	1231		
35	1149	1155	1164	1173	1182	1189	1194	1199	1202	1202	1200	1197	1192	1184	1176	1168	1161		
40	1068	1078	1089	1101	1113	1122	1128	1133	1137	1137	1134	1129	1123	1113	1102	1090	1081		
45	978	991	1006	1022	1036	1048	1056	1062	1066	1066	1062	1056	1046	1034	1020	1005	992		
50	880	897	916	935	953	968	978	986	990	989	985	976	964	948	930	911	894		
55	774	795	820	844	866	883	895	905	909	908	902	892	877	856	834	809	788		
60	661	688	718	747	772	794	808	819	823	822	815	802	784	760	732	702	674		
65	542	575	612	646	676	700	717	728	734	732	723	709	687	659	625	588	554		
70	418	458	502	542	576	603	623	636	641	639	629	612	587	554	515	472	430		
75	294	343	393	437	476	506	527	542	548	545	534	515	486	449	405	354	304		
80	177	233	289	338	380	413	437	452	458	455	442	421	389	348	299	243	185		
85	81.4	142	202	255	300	335	360	376	382	378	364	341	307	262	209	149	86.1		
90	34.3	94.6	156	209	254	290	315	331	336	332	317	292	257	211	158	95.9	34.6		
95	23.0	75.9	133	184	228	262	287	302	307	303	288	264	230	186	134	76.4	22.8		
100	17.6	59.7	111	163	204	237	260	275	280	275	262	238	206	164	113	59.6	17.7		
105	15.4	50.2	93.8	132	176	211	234	248	253	249	235	212	177	133	94.1	50.2	15.5		
110	13.7	44.1	81.3	119	148	171	195	210	215	211	196	172	149	120	81.8	43.9	13.7		
115	12.5	39.2	71.5	104	135	158	171	179	182	179	172	158	136	106	71.6	38.9	12.3		
120	11.4	35.1	63.1	91.7	118	141	157	165	169	166	157	142	120	92.3	62.9	34.6	11.1		
125	10.4	31.1	55.6	80.5	104	123	137	147	150	148	139	125	105	80.5	55.3	30.5	10.1		
130	9.45	25.9	48.7	70.3	90.2	107	120	127	130	128	121	109	90.6	70.0	48.2	26.6	9.06		
135	8.14	22.8	42.4	60.8	77.9	92.4	103	110	112	110	104	93.4	77.7	60.3	41.6	23.1	7.93		
140	7.04	19.8	35.5	51.8	66.3	78.6	87.8	93.6	95.5	93.7	88.6	79.1	65.9	51.2	35.3	19.0	6.59		
145	5.96	16.0	28.9	43.3	55.5	65.7	73.4	78.2	79.8	78.2	74.0	65.8	55.0	42.7	29.4	16.2	5.56		
150	4.88	13.3	23.5	33.7	45.1	53.4	59.6	63.6	64.9	63.7	60.3	53.5	44.9	34.8	23.5	12.8	4.56		
155	3.36	9.89	17.1	26.2	32.9	41.5	46.6	49.8	50.9	50.1	47.5	42.0	35.5	27.0	17.8	10.5	3.74		
160	2.05	5.88	10.9	17.4	24.3	29.1	33.6	36.8	37.9	37.5	35.5	30.1	26.4	19.7	13.8	8.40	3.16		
165	1.89	2.74	5.60	8.92	13.1	18.0	21.2	23.5	24.7	24.7	23.4	20.6	17.4	14.0	10.3	6.20	2.60		
170	1.88	1.93	2.75	4.41	5.87	7.42	10.1	12.6	13.5	13.6	13.2	12.0	10.1	7.93	5.67	3.52	2.05		
175	1.81	1.82	1.86	2.09	2.54	2.95	3.13	3.29	4.25	4.52	4.32	3.79	3.13	2.50	2.04	1.86	1.82		
180	0.43	0.43	0.43	0.43	0.42	0.42	0.42	0.41	0.41	0.41	0.40	0.40	0.40	0.40	0.40	0.40	0.40		

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 $k=2$.

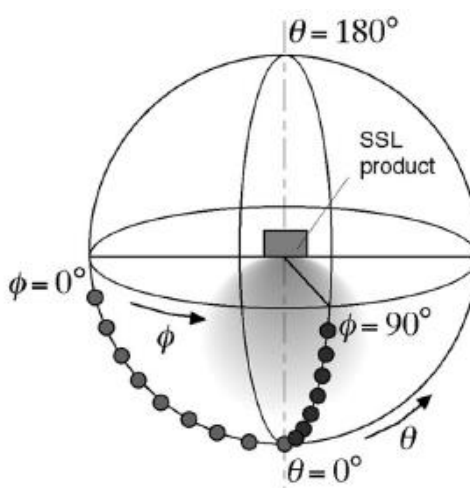
Color Characteristics Measurements

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 ***

This report is considered invalidated without the Special Seal for Inspection of the LTL. This report shall not be altered, increased or deleted. The results shown in this test report refer only to the sample(s) tested. Without written approval of LTL, this test report shall not be copied except in full and published as advertisement.