

## LM-79-08 Test Report

for

### GREEN CREATIVE LTD

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

### LED Tube System

#### Model: 10.5T8/3F/830/EXT/A2

(LED tube model: 10.5T8/3F/830/EXT 2pcs and LED driver model: 15T8T5HEDRIVER/2CH 1pcs)

#### Laboratory: Leading Testing Laboratories

NVLAP CODE: 200960-0

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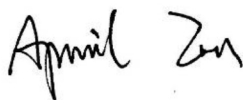
www.ledtestlab.com

Report No.: HZ18070047w/R1

This report is replaced the old report No. HZ18070047w dated Aug. 09, 2018

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

Review by:



Engineer: April Zou  
Aug. 28, 2018

Approved by:



Manager: Jim Zhang  
Aug. 28, 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: 10.5T8/3F/830/EXT/A2

Luminous Efficacy (Lumens /Watt)	Luminous Flux per lamp (Lumens)	Power (Watts)/2	Power Factor
120.5	1483.0	12.31	0.9964
CCT (K)	CRI	Stabilization Time (Light & Power)	
2976	82.1	60	

Table 1: Executive Data Summary

Note: The above results are recorded/ derived from measurements made using an Integrating Sphere.

### Test specifications:

**Date of Receipt** : Jul. 30, 2018

**Date of Test** : Aug. 02, 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

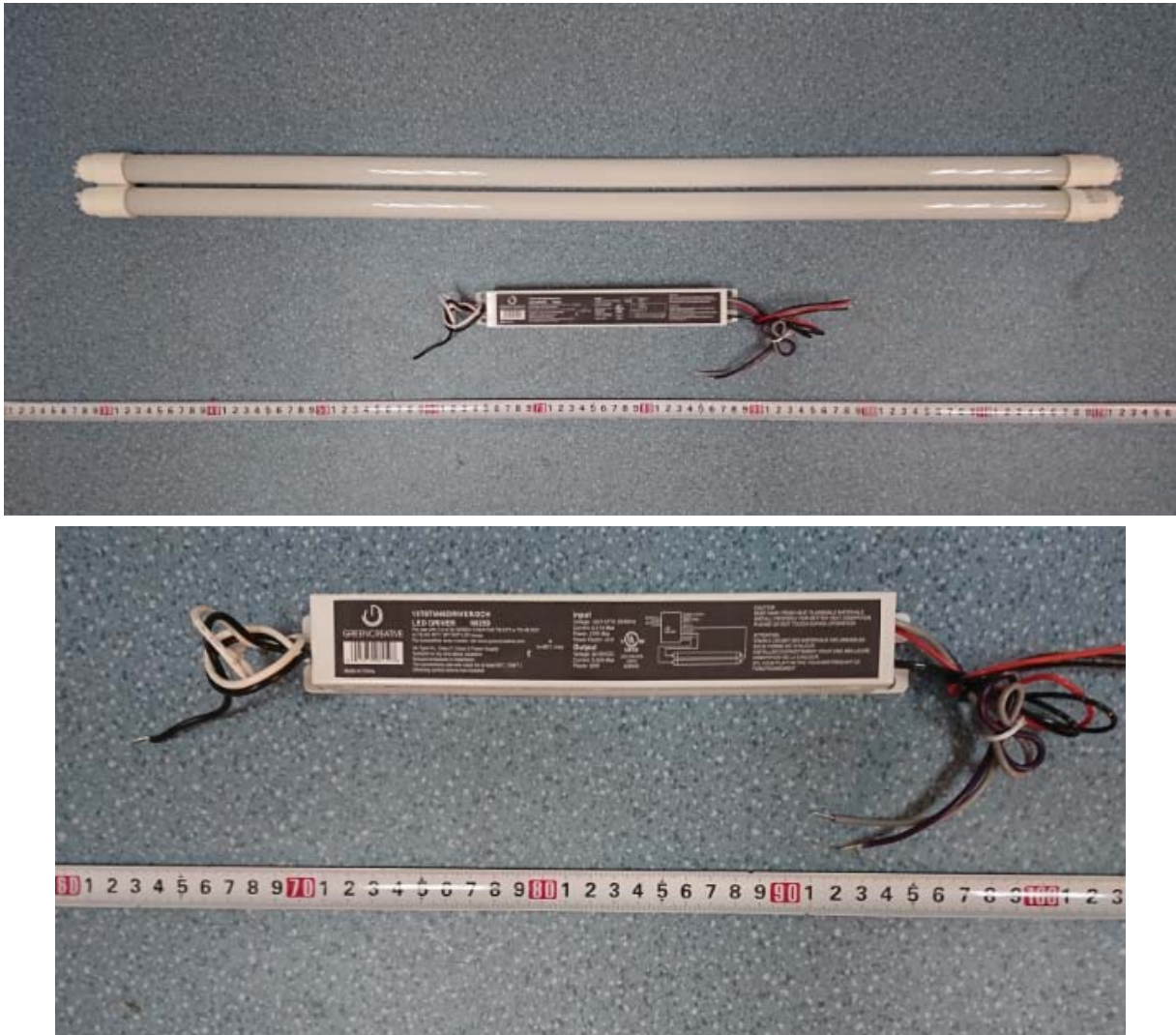


Figure 1- Overview of the sample

### Equipment Under Test (EUT)

<b>Name</b>	: LED Tube System
<b>Model</b>	: 10.5T8/3F/830/EXT/A2
<b>Electrical Ratings</b>	: 120-277V, 50/60Hz
<b>Product Description</b>	: 3000K LED tube model: 10.5T8/3F/830/EXT 2 LED tubes supplied by a LED driver:15T8T5HEDRIVER/2CH
<b>Manufacturer</b>	: GREEN CREATIVE LTD
<b>Address</b>	: 756 North Zhongshan Rd., Unit B301 Zhabei District, Shanghai

## TEST RESULTS

Test ambient temperature was 24.9°C.

Base orientation was horizontal. 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 70 minutes.

### Sphere-Spectroradiometer Method

Parameter	Result	
Test Voltage (V)	120.0	277.0
Voltage frequency (Hz)	60	60
Test Current (A)	0.206	0.097
Power Factor	0.9964	0.9360
Test Power (W)/2	12.31	12.60
THD A%	2.35	7.42
Luminous Efficacy (lm/W)	120.5	117.8
Luminous Flux per lamp (lm)	1483.0	1484.0
Color Rendering Index (CRI)	82.1	
R9	4.2	
Correlated Color Temperature (CCT)(K)	2976	
Chromaticity Chroma x	0.4386	
Chromaticity Chroma y	0.4048	
Chromaticity Chroma u	0.2513	
Chromaticity Chroma v	0.3479	
Duv	0.0001	
Chromaticity Chroma u'	0.2513	
Chromaticity Chroma v'	0.5219	

Special Color Rendering Indices	
R1	81.1
R2	92.7
R3	93.8
R4	79
R5	81.5
R6	91.6
R7	80.8
R8	56.6
R9	4.2
R10	83.5
R11	78.5
R12	72.8
R13	84.1
R14	97.2
Rf	82
Rg	93

Table 2: Test data per Sphere-Spectroradiometer Method

Note: According to CIE 1976 (u',v') diagram,  $u' = u = 4x/(-2x+12y+3)$ ,  $v' = 3v/2 = 9y/(-2x+12y+3)$ .

## Goniophotometer Method

Test ambient temperature was 25.0°C.

The photometric distance is 30m.

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

Parameter	Result
Test Voltage (V)	120.0
Voltage frequency (Hz)	60
Test Current (A)	0.206
Power Factor	0.9964
Test Power (W)/2	12.32
Luminous Efficacy (lm/W)	118.7
Luminous Flux per lamp (lm)	1462.1
Beam Angle (°)	170.5
Center Beam Candle Power (cd)	238
Spacing Criteria	1.26 (0°-180°)/ 1.45(90°-270°)
Zonal Lumens in the 0°-60°Zone	42.43%
Zonal Lumens in the 60°-90°Zone	26.95%
Zonal Lumens in the 90°-120°Zone	17.72%
Zonal Lumens in the 120°-180°Zone	12.89%

Table 3: Test data per Goniophotometer Method

## Spectral Power Distribution - Sphere Spectroradiometer Method

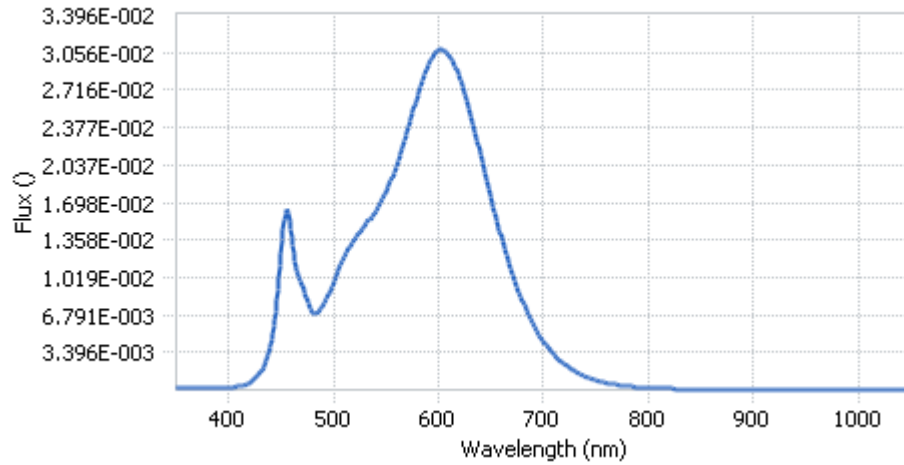
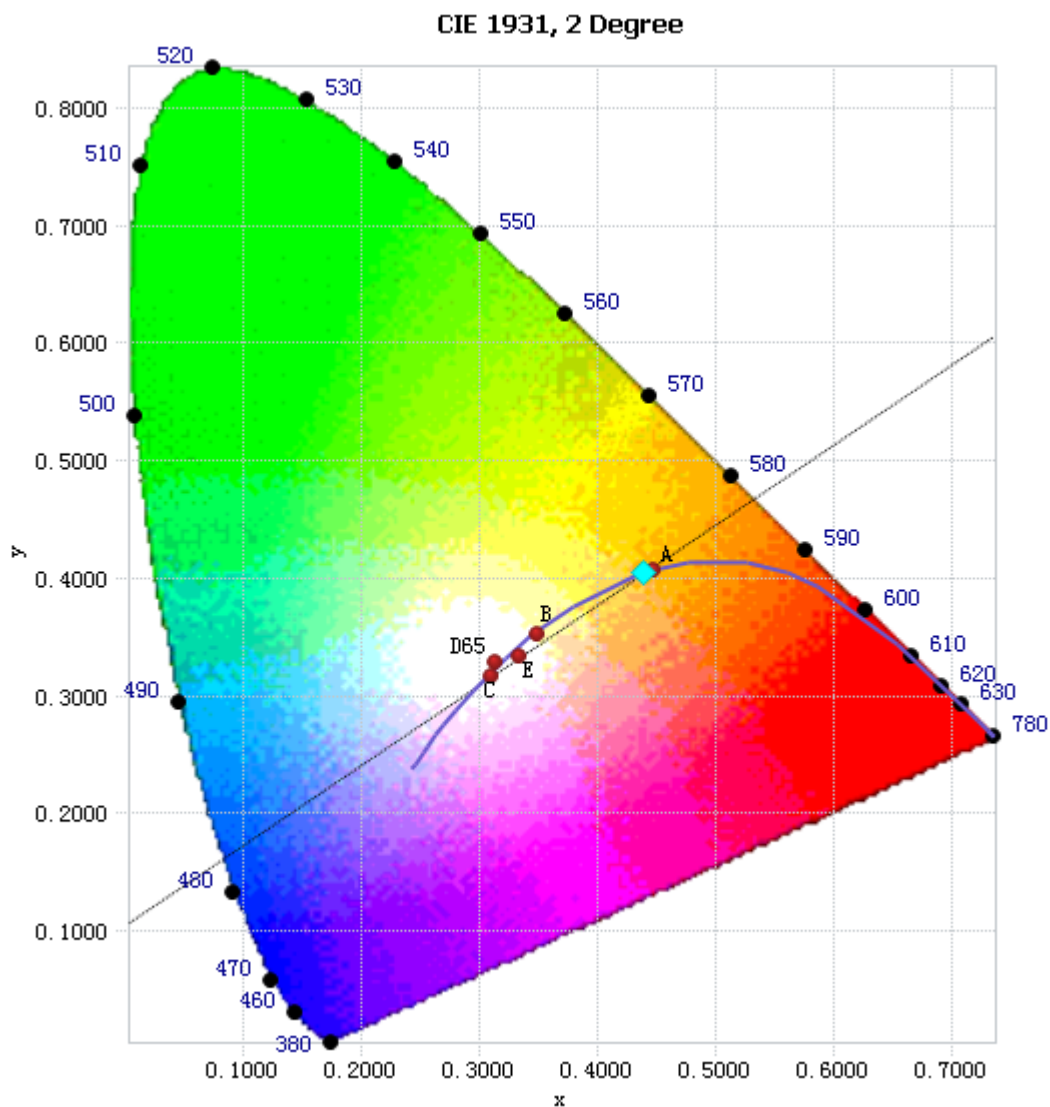


Chart 1: Spectral Power Distribution

Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	2.34E-04	485	7.01E-03	590	2.94E-02	695	5.11E-03
385	1.97E-04	490	7.70E-03	595	3.02E-02	700	4.39E-03
390	2.34E-04	495	8.66E-03	600	3.08E-02	705	3.75E-03
395	2.33E-04	500	9.83E-03	605	3.07E-02	710	3.19E-03
400	2.39E-04	505	1.11E-02	610	3.03E-02	715	2.71E-03
405	2.72E-04	510	1.20E-02	615	2.95E-02	720	2.32E-03
410	3.23E-04	515	1.29E-02	620	2.82E-02	725	1.98E-03
415	4.41E-04	520	1.37E-02	625	2.68E-02	730	1.68E-03
420	6.46E-04	525	1.43E-02	630	2.51E-02	735	1.42E-03
425	1.02E-03	530	1.49E-02	635	2.32E-02	740	1.21E-03
430	1.60E-03	535	1.55E-02	640	2.13E-02	745	1.03E-03
435	2.54E-03	540	1.61E-02	645	1.93E-02	750	8.78E-04
440	4.16E-03	545	1.70E-02	650	1.74E-02	755	7.45E-04
445	7.16E-03	550	1.79E-02	655	1.56E-02	760	6.40E-04
450	1.23E-02	555	1.91E-02	660	1.37E-02	765	5.46E-04
455	1.63E-02	560	2.03E-02	665	1.21E-02	770	4.67E-04
460	1.38E-02	565	2.18E-02	670	1.06E-02	775	3.94E-04
465	1.07E-02	570	2.34E-02	675	9.24E-03	780	3.46E-04
470	9.54E-03	575	2.50E-02	680	8.05E-03		
475	8.05E-03	580	2.68E-02	685	6.94E-03		
480	6.94E-03	585	2.82E-02	690	5.97E-03		

Table 4: Spectral Power Distribution Numerical Data per Sphere - Spectroradiometer Method

## Chromaticity Diagram - Sphere Spectroradiometer Method



Tristimulus values(x, y): (0.4386, 0.4048)

Chart 2: Chromaticity Diagram per Sphere - Spectroradiometer Method

Note: The location on the diagram of the tristimulus coordinates are indicated by the blue diamond.

# Nominal CCT Quadrangles – Sphere Spectroradiometer Method

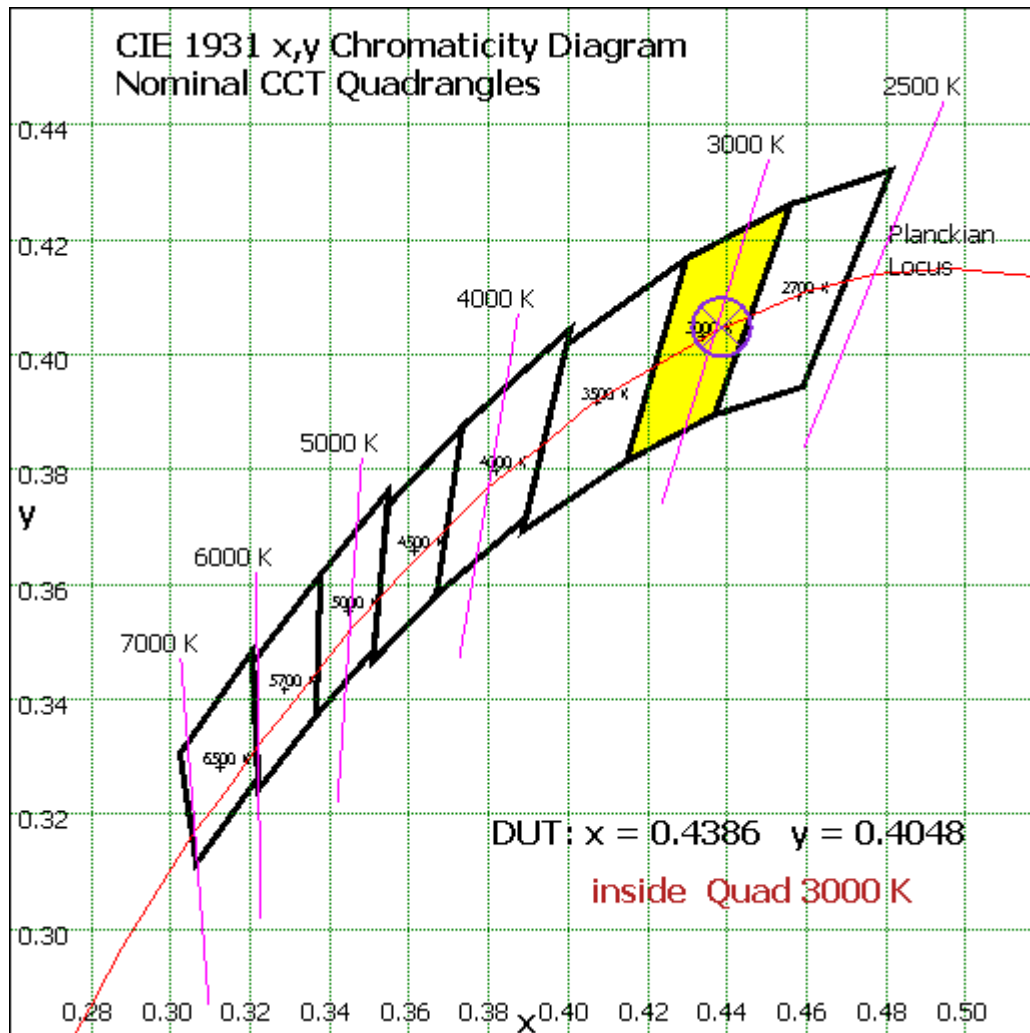


Chart 3: Plot of Lamp x/y coordinates on CIE 1931 Chromaticity Diagram

### Zonal Lumen Tabulation- Goniophotometer Method

$\gamma(^{\circ})$	Lumens	% Total
0- 10	22.634	1.55%
10- 20	65.768	4.50%
20- 30	102.778	7.03%
30- 40	130.491	8.92%
40- 50	147.001	10.05%
50- 60	151.754	10.38%
60- 70	145.886	9.98%
70- 80	132.374	9.05%
80- 90	115.831	7.92%
90-100	100.682	6.89%
100-110	86.193	5.89%
110-120	72.24	4.94%
120-130	59.6	4.08%
130-140	48.302	3.30%
140-150	36.978	2.53%
150-160	25.737	1.76%
160-170	13.993	0.96%
170-180	3.899	0.27%
Total	1462.1	100%

$\gamma(^{\circ})$	Lumens	% Total
0- 60	620.426	42.43%
60- 90	394.091	26.95%
0-90	1014.517	69.39%
90- 180	447.624	30.61%
0- 180	1462.1	100%

Table 5: Zonal Lumen Data

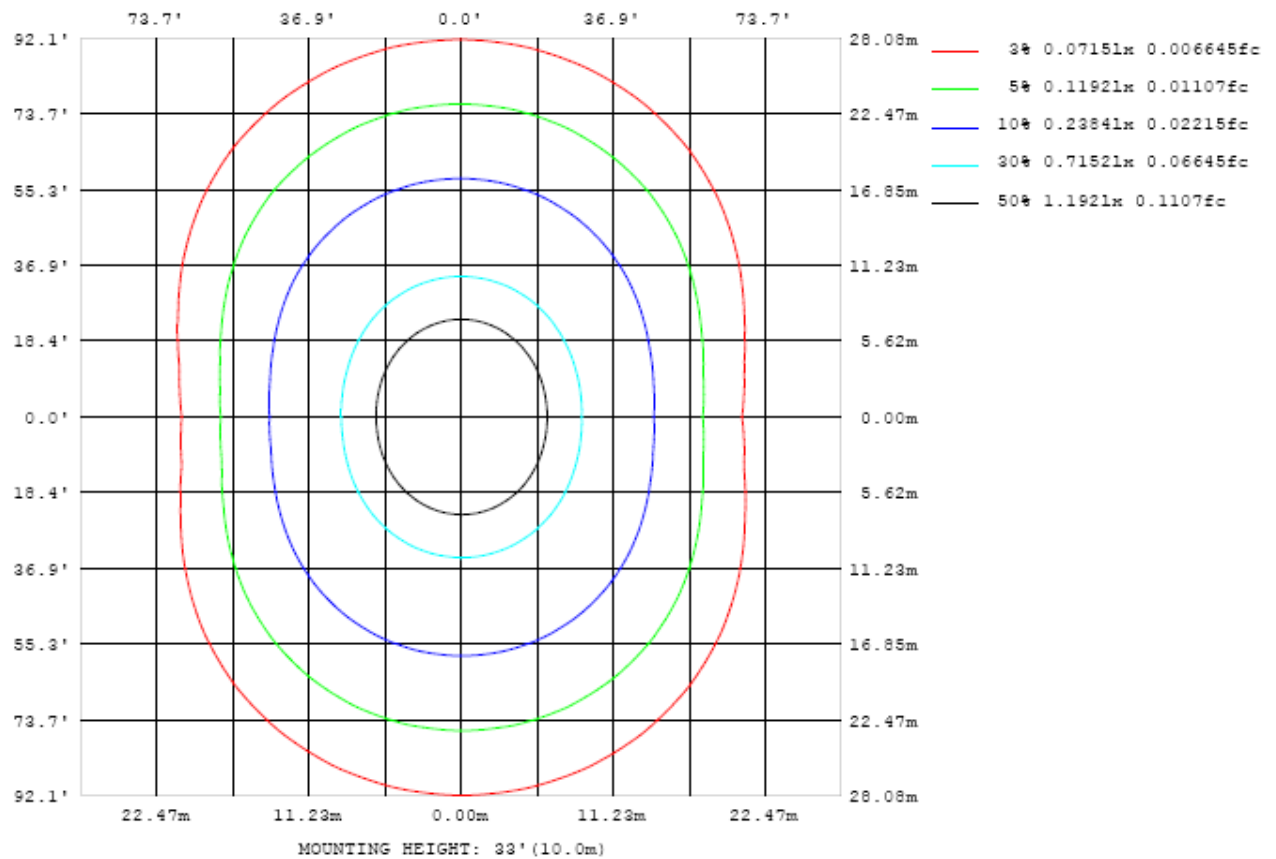


Chart 4: Illuminance Plot (Footcandles)

## Luminous Intensity Distribution Plots- Goniophotometer Method

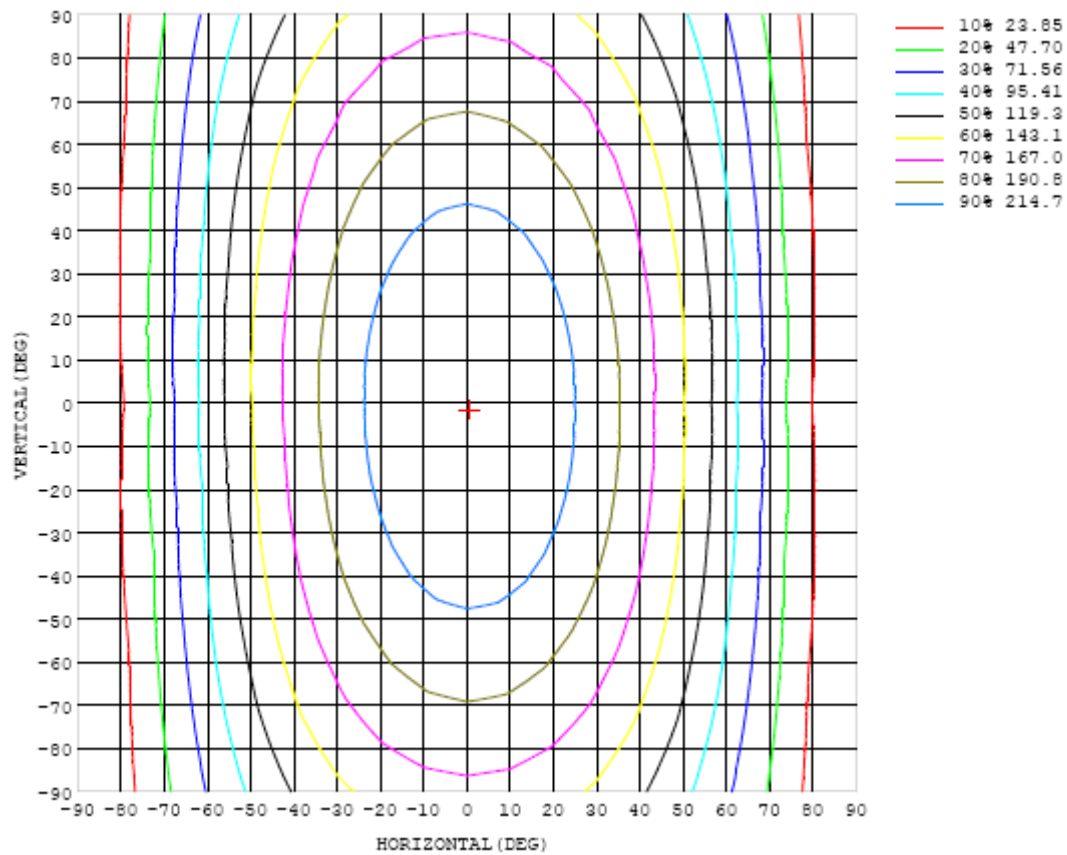


Chart 5: Isocandela Plot

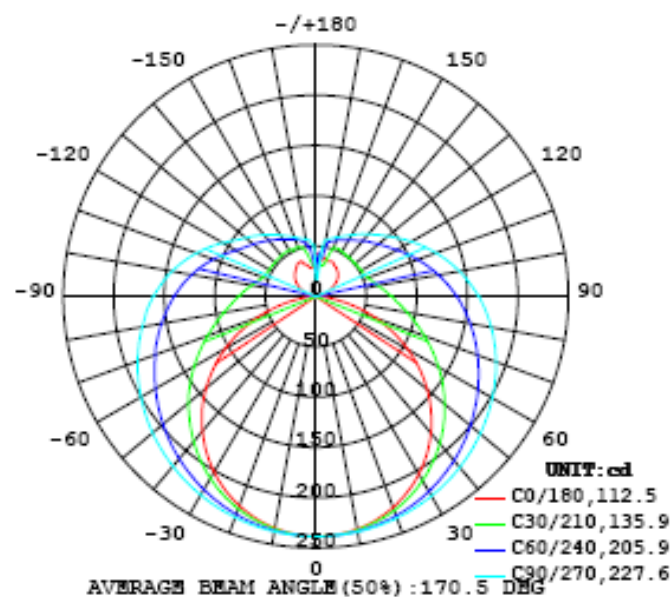


Chart 6: Polar Candela Distribution

## 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	238	238	238	238	238	238	238	238	238	238	238	238	238	238	238	238	238	238	238
5	238	238	238	238	238	238	238	238	238	238	238	238	238	238	238	237	237	237	237
10	235	235	235	236	236	236	237	237	238	238	237	237	236	236	235	235	234	234	234
15	230	230	231	232	233	234	235	236	236	236	236	235	234	233	232	230	229	229	228
20	223	224	225	226	228	230	232	233	234	234	234	232	231	229	227	225	223	222	221
25	214	215	217	220	222	225	228	230	232	232	231	229	227	224	220	217	215	213	212
30	204	205	207	211	216	220	224	227	228	229	228	226	222	218	213	209	205	202	201
35	191	193	196	202	208	213	218	223	225	226	224	221	217	211	205	199	193	190	189
40	177	179	184	191	199	206	213	218	221	222	220	216	211	204	196	188	181	176	175
45	161	164	170	179	189	198	206	213	216	217	215	211	204	196	186	176	167	160	159
50	144	147	155	167	179	190	200	207	211	212	210	205	198	187	175	163	152	144	142
55	125	129	140	154	168	181	192	201	206	207	205	199	190	179	165	150	136	126	123
60	105	110	124	140	157	173	185	195	200	202	199	193	183	170	154	137	120	107	103
65	84.4	91.1	107	127	147	164	178	188	194	196	193	187	176	161	143	123	103	87.4	82.6
70	63.6	72.1	91.4	114	136	155	170	181	188	190	187	180	168	153	133	111	87.4	68.5	61.6
75	42.5	53.3	76.9	103	126	147	163	174	181	183	181	173	161	144	123	99.0	73.1	49.9	40.8
80	22.9	36.7	63.9	91.9	117	139	155	167	174	176	174	166	153	136	115	88.6	60.4	33.4	21.7
85	7.76	24.0	53.5	82.5	109	130	147	159	167	169	166	159	146	128	106	79.7	50.4	21.2	6.96
90	0.33	16.7	45.8	75.2	101	122	140	152	159	161	159	151	138	121	98.8	72.8	43.3	14.8	0.77
95	1.59	13.8	40.2	68.4	93.3	115	131	144	151	153	150	143	130	113	91.6	66.5	38.3	12.7	1.86
100	4.43	14.2	36.7	62.7	86.5	107	123	135	142	144	142	135	122	106	85.0	61.3	35.5	13.8	4.37
105	8.10	16.4	35.1	58.2	80.2	99.7	115	127	133	136	133	126	114	98.7	79.1	57.2	34.4	16.3	7.83
110	11.7	19.2	35.1	54.9	74.8	92.7	107	118	125	127	124	118	107	92.0	74.3	54.3	35.0	19.0	11.4
115	15.9	21.8	35.9	52.9	70.6	86.3	99.8	110	116	118	116	109	99.3	85.8	70.0	52.8	36.3	21.8	15.4
120	20.2	25.6	37.4	51.8	67.0	80.7	92.6	102	107	109	107	101	92.3	80.3	66.8	52.1	37.8	25.3	19.4
125	24.2	29.1	39.0	51.4	64.3	76.0	86.3	94.1	99.1	101	99.0	94.0	86.0	75.8	64.5	51.8	39.5	28.5	23.3
130	28.2	32.1	40.4	51.0	62.2	72.6	80.9	87.6	91.8	93.1	91.8	87.6	80.9	72.7	62.4	51.5	41.0	30.5	26.7
135	31.5	35.2	42.5	50.9	60.4	69.2	76.6	81.8	85.4	86.6	85.4	81.9	76.4	69.3	60.7	51.5	43.1	33.2	29.4
140	33.2	37.1	44.6	50.8	58.5	66.0	72.3	76.8	79.5	80.6	79.6	76.8	72.4	66.3	59.2	51.2	43.6	33.4	31.9
145	35.2	37.2	45.9	51.1	57.0	63.1	68.2	72.2	74.7	75.6	74.7	72.2	68.4	63.7	57.5	50.7	45.0	33.7	34.2
150	36.3	35.8	45.6	51.7	56.0	60.4	64.6	67.9	69.8	70.6	69.8	67.9	65.0	61.4	56.4	50.9	46.0	32.8	37.0
155	38.3	33.8	44.4	52.4	55.3	58.9	61.7	63.9	65.6	66.3	65.8	64.4	62.6	58.3	54.4	52.0	45.1	30.8	37.7
160	37.1	32.4	35.9	50.7	55.3	57.0	59.6	61.4	62.5	62.8	62.6	62.0	58.3	53.9	50.2	46.2	35.7	28.4	34.4
165	38.1	30.2	31.7	34.7	48.2	55.0	56.8	57.7	59.2	59.7	59.8	54.6	47.0	41.3	38.6	33.3	28.8	29.1	31.7
170	36.8	30.7	30.7	30.9	31.0	35.8	42.0	50.7	56.8	57.0	46.0	33.5	33.7	31.3	29.7	27.5	28.3	28.5	28.7
175	38.1	37.4	36.1	36.0	38.9	42.1	43.3	43.1	40.1	18.1	35.7	38.0	38.3	38.0	36.3	34.6	32.6	31.6	31.9
180	24.8	24.8	24.8	24.8	24.8	24.8	24.8	24.8	24.8	24.8	24.8	24.8	24.8	24.8	24.8	24.8	24.8	24.8	24.8

Table 6: 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	238	238	238	238	238	238	238	238	238	238	238	238	238	238	238	238	238		
5	237	237	237	237	238	238	238	238	238	238	238	238	238	238	238	238	238		
10	234	234	235	235	236	236	237	237	237	237	237	237	236	236	235	235	235		
15	229	229	230	231	233	234	235	235	236	236	235	234	234	233	232	231	230		
20	222	223	225	227	229	230	232	233	234	233	232	231	230	228	226	225	223		
25	213	215	217	220	224	226	229	230	231	231	229	227	225	222	219	217	215		
30	203	205	209	213	218	222	225	227	228	227	225	222	219	215	211	207	205		
35	190	194	199	205	211	216	220	223	224	223	221	217	212	206	201	196	193		
40	177	181	188	196	204	210	216	219	220	219	216	211	204	197	190	183	179		
45	162	168	176	186	196	204	211	214	216	214	211	204	196	187	178	170	164		
50	146	154	165	177	188	197	205	209	211	209	205	198	188	177	166	155	148		
55	128	138	152	166	179	190	199	204	206	204	199	190	179	167	153	140	130		
60	109	122	139	156	171	183	193	198	200	198	192	183	170	156	139	123	111		
65	89.9	106	126	146	163	176	186	192	194	192	185	175	162	145	126	106	91.3		
70	70.9	90.9	114	136	155	169	179	186	188	185	178	168	153	134	113	90.2	71.6		
75	52.7	76.6	103	126	147	162	173	179	181	178	171	160	144	124	100	75.1	52.7		
80	36.8	64.2	92.5	118	139	155	167	173	175	172	165	153	136	115	89.3	61.6	35.8		
85	24.8	54.4	83.8	110	131	148	160	166	168	165	158	145	128	106	79.8	50.7	22.5		
90	18.3	47.4	76.6	102	124	140	152	159	161	158	150	137	120	97.9	71.8	42.8	14.7		
95	15.2	42.4	70.4	95.6	117	133	144	151	153	150	142	130	112	90.7	65.1	37.1	10.9		
100	15.5	38.5	64.6	88.7	109	125	136	143	144	141	134	121	105	83.5	58.9	32.5	12.0		
105	17.7	36.6	59.5	82.1	101	117	127	134	135	132	125	113	96.7	76.5	53.4	30.9	15.0		
110	21.0	36.6	56.0	75.8	93.8	108	118	124	126	123	116	104	88.9	70.0	49.6	32.0	18.7		
115	24.9	37.8	54.2	70.7	86.5	99.6	109	115	116	113	107	95.8	81.5	64.8	48.8	33.8	22.5		
120	28.2	39.5	53.4	67.6	80.5	91.6	100	105	107	104	97.6	87.7	75.6	62.6	48.7	36.5	26.5		
125	31.8	41.2	53.0	65.3	76.5	85.5	92.3	96.5	97.5	95.1	89.7	81.9	72.5	61.1	49.0	39.1	30.4		
130	35.0	43.2	52.9	63.4	73.1	81.0	86.6	90.0	90.7	88.8	84.5	78.1	69.8	59.9	49.9	41.6	34.3		
135	38.4	45.0	53.0	61.7	69.9	76.7	81.6	84.6	85.3	83.7	80.0	74.4	67.3	59.0	51.0	44.0	37.7		
140	41.2	46.6	53.3	60.2	67.0	72.6	76.9	79.5	80.1	78.7	75.6	70.9	64.9	58.2	52.0	46.5	40.1		
145	43.4	47.5	53.1	59.1	64.3	68.9	72.4	74.6	75.0	73.9	71.4	67.6	62.8	57.6	52.9	48.6	42.7		
150	45.7	49.0	53.5	58.3	62.1	65.5	68.3	70.1	70.3	69.5	67.5	64.6	61.1	57.2	53.8	50.9	45.2		
155	47.2	50.6	51.3	55.5	60.5	62.6	64.6	66.0	66.2	65.6	64.3	62.2	59.7	57.1	54.8	52.7	48.6		
160	47.1	51.3	52.4	54.4	57.7	60.2	61.6	62.6	62.8	62.4	61.5	60.2	58.6	57.0	55.5	54.1	50.9		
165	38.1	45.3	50.5	51.9	54.2	57.0	59.0	59.6	59.8	59.6	59.2	58.5	57.7	56.9	56.1	55.4	52.1		
170	31.4	35.5	39.5	44.6	48.9	52.6	55.7	57.4	57.6	57.4	57.2	56.9	56.7	56.5	56.2	55.6	51.4		
175	31.3	31.7	31.0	32.1	35.8	41.0	46.2	50.3	53.1	54.9	55.8	55.7	55.6	55.5	54.3	50.1	43.3		
180	24.8	24.8	24.8	24.8	24.8	24.8	24.8	24.8	24.8	24.8	24.8	24.8	24.8	24.8	24.8	24.8	24.8		

Table 7: Luminous Intensity Data

## EQUIPMENT LIST

Test Equipment	Model	Equipment No.	Calibration Date	Calibration Due date
Goniophotometer system	GO-R5000	HZTE011-01	Aug. 23, 2017	Aug. 22, 2018
Digital Power Meter	PF2010A	HZTE028-01	Aug. 10, 2017	Aug. 09, 2018
AC Power Supply	DPS1060	HZTE001-06	Aug. 10, 2017	Aug. 09, 2018
DC Power Supply	WY12010	HZTE004-03	Aug. 10, 2017	Aug. 09, 2018
Temperature recorder	JM624U	HZTE018-08	Aug. 17, 2017	Aug. 16, 2018
Temperature and humidity recorder	JR900	HZTE018-01	Aug. 16, 2017	Aug. 15, 2018
Standard source	D908	HZTE012-01	Aug. 20, 2017	Aug. 19, 2018
Integrate Sphere system	2M	HZTE015-01	Aug. 23, 2017	Aug. 22, 2018
Digital Power Meter	WT210	HZTE008-01	Aug. 10, 2017	Aug. 09, 2018
AC Power Supply	PCR 500L	HZTE001-07	Aug. 10, 2017	Aug. 09, 2018
DC Power Supply	IT6154	HZTE004-04	Aug. 10, 2017	Aug. 09, 2018
Standard source	SCL-1400	HZTE012-02	Aug. 20, 2017	Aug. 19, 2018
Temperature and humidity recorder	JR900	HZTE018-02	Aug. 16, 2017	Aug. 15, 2018
Temperature Meter	TES1310	HZTE017-01	Aug. 17, 2017	Aug. 16, 2018

Table 8: 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.

### Sphere-Spectroradiometer Method- Photometric and Electrical Measurements

A Labsphere Model CDS 2100 Spectroradiometer and Two Meter Sphere was used to measure correlated color temperature, chromaticity coordinates, and the color rendering index for each SSL unit. The coating reflectance of each sphere is 98%. The measure geometry is  $4\pi$ . Self-absorption correction is conducted in testing. Bandwidth of spectroradiometer is 350nm-1050nm.

Ambient temperature was measured at a position inside the sphere. 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 Yokogawa Power Analyzer.

The standard reference of the integrated sphere system is halogen incandescent lamp, the intensity distribution type is omni-directional, and is traceable to the National Institute of Standards and Technology.

The uncertainty of integrating sphere system reported in this document is expanded uncertainty is 2.1% with a coverage factor  $k=2$ .

## **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**

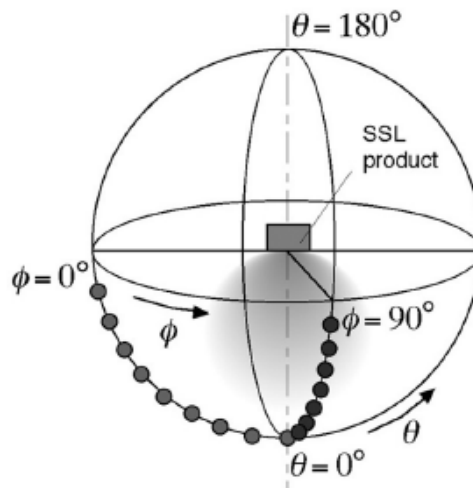
The color characteristics of SSL products include chromaticity coordinates, correlated color temperature, and color rendering index. These characteristics of SSL products may be spatially non-uniform, and thus, in order that they can be specified accurately, the color quantities shall be measured as 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  $10^\circ$  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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