

LM-79-08 TEST REPORT

for

GREEN CREATIVE LTD

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

LED Tube

Model: 8T8/3F/840/DIR/RC

Laboratory: Leading Testing Laboratories

NVLAP CODE: 200960-0

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Report No.: HZ19050020b

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

Review by:



Engineer: April Zou
May 23, 2019

Approved by:



Manager: Jim Zhang
May 23, 2019

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: **8T8/3F/840/DIR/RC**

Luminous Efficacy (Lumens /Watt)	Total Luminous Flux (Lumens)	Power (Watts)	Power Factor
131.5	1424.0	10.83	0.9886
CCT (K)	CRI	Stabilization Time (Light & Power)	
4062	82.2	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	: May 16, 2019
Date of Test	: May 21, 2019
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 ANSI/IES TM-30-18 IES Method for Evaluating Light Source Color Rendition

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SAMPLE PHOTO

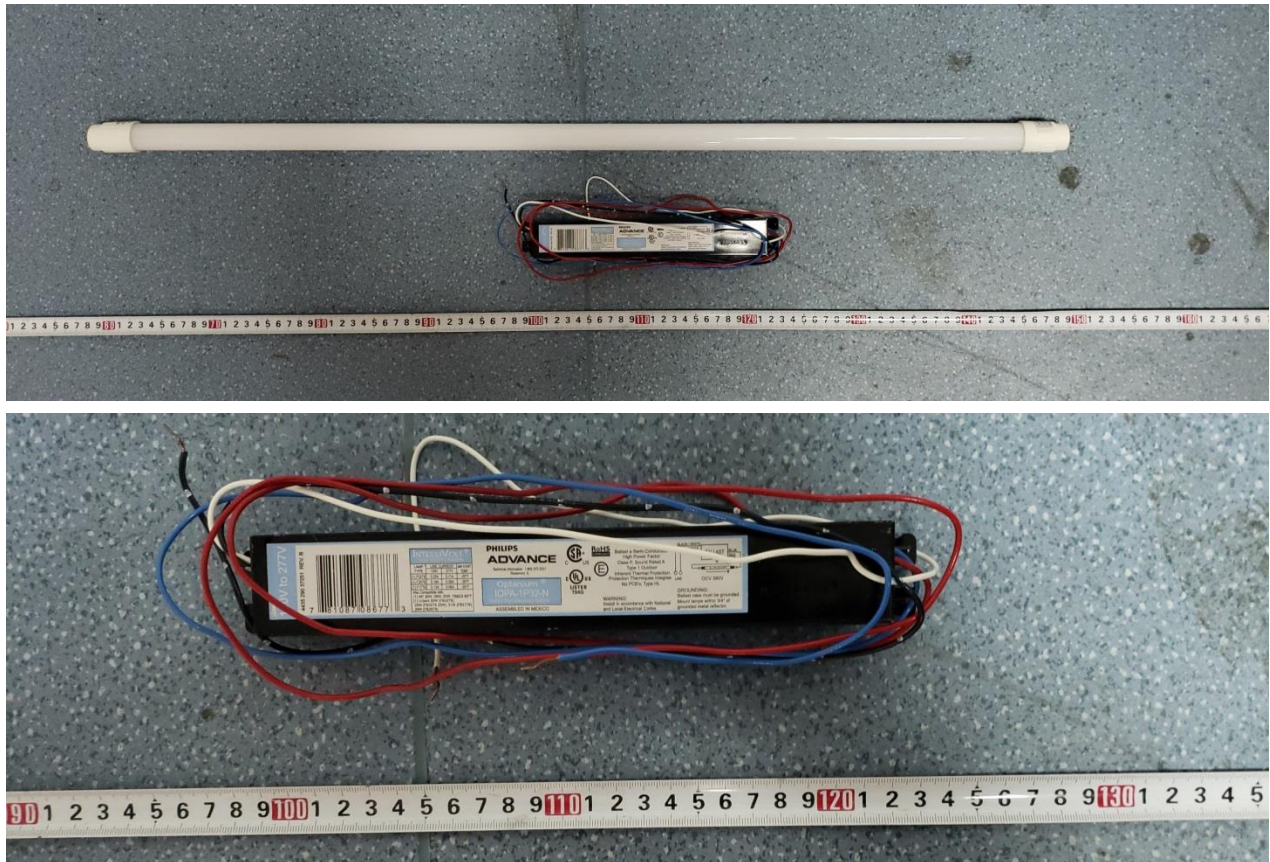


Figure 1- Overview of the sample

Equipment Under Test(EUT)

Name	: LED Tube
Model	: 8T8/3F/840/DIR/RC
Electrical Ratings	: 120-277V, 60Hz, 8W
Product Description	: 4000K LED Tubes supplied by a high frequency fluorescent lamp ballast: IOPA-1P32-N
Manufacturer	: GREEN CREATIVE LTD
Address	: 756 North Zhongshan Rd., Unit B301 Zhabei District, Shanghai

TEST RESULTS

Test ambient temperature was 25.0°C.

Base orientation was light down. 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 65 minutes.

Sphere-Spectroradiometer Method

Parameter	Result	
	Test Voltage (V)	120.0
Voltage frequency (Hz)	60	60
Test Current (A)	0.091	0.045
Power Factor	0.9886	0.8990
Test Power (W)	10.83	11.08
THD A%	11.24	18.37
Luminous Efficacy (lm/W)	131.5	128.5
Total Luminous Flux (lm)	1424.0	1424.0
Color Rendering Index (CRI)	82.2	
R9	4.2	
Correlated Color Temperature (CCT)(K)	4062	
Chromaticity Chroma x	0.3789	
Chromaticity Chroma y	0.3798	
Chromaticity Chroma u	0.2229	
Chromaticity Chroma v	0.3351	
Duv	0.0013	
Chromaticity Chroma u'	0.2229	
Chromaticity Chroma v'	0.5027	

Special Color Rendering Indices	
R1	80.2
R2	88.4
R3	94.7
R4	81.1
R5	80.2
R6	83.9
R7	86
R8	63.4
R9	4.2
R10	72.6
R11	80
R12	59.6
R13	82.2
R14	97.2

Table 2: Test data per Sphere-Spectroradiometer Method

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

Goniophotometer Method

Test ambient temperature was 25.2°C.

The photometric distance is 30 m.

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)	0.092
Power Factor	0.9893
Power (W)	10.86
Luminous Efficacy (lm/W)	129.2
Total Luminous Flux (lm)	1403.1
Beam Angle (°)	114.0 (0°-180°) / 237.4 (90°-270°)
Center Beam Candle Power (cd)	220
Maximum Beam Candle Power (cd)	219.7 (At: C=270.0, Gamma=3.0)
Spacing Criteria	1.26 (0°-180°) / 1.48 (90°-270°)
Zonal Lumens in the 0°-60° Zone	41.31%
Zonal Lumens in the 60°-90° Zone	26.99%
Zonal Lumens in the 90°-120° Zone	18.19%
Zonal Lumens in the 120°-180° Zone	13.51%

Table 3: Test data per Goniophotometer Method

Spectral Power Distribution - Sphere Spectroradiometer Method

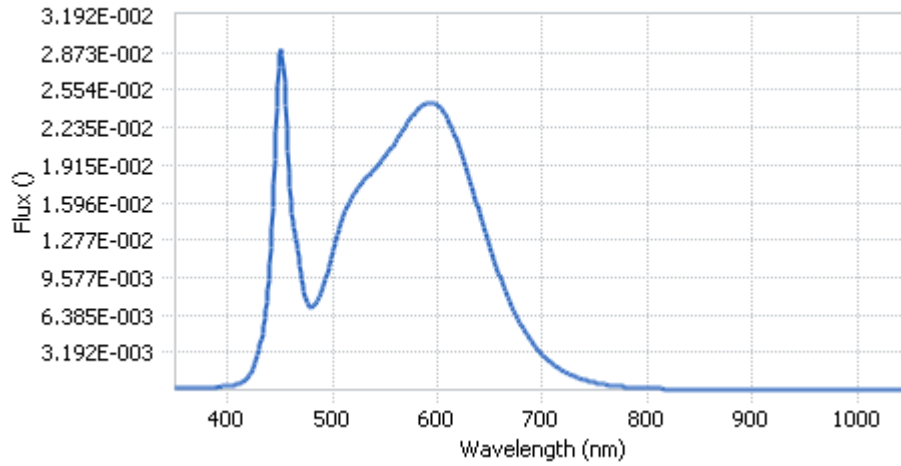
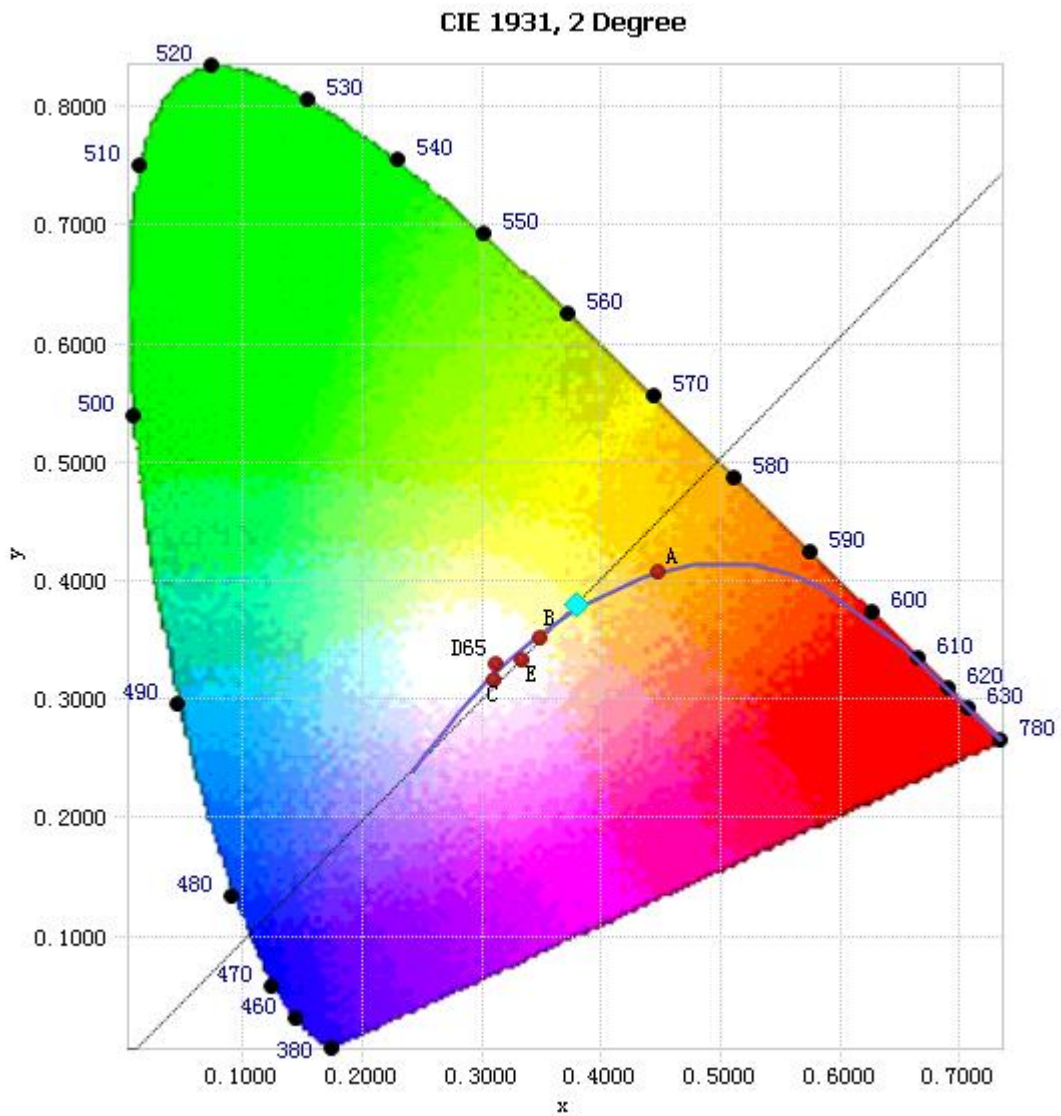


Chart 1: Spectral Power Distribution

Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	2.49E-04	485	7.57E-03	590	2.45E-02	695	3.49E-03
385	2.47E-04	490	8.51E-03	595	2.44E-02	700	2.99E-03
390	2.70E-04	495	1.00E-02	600	2.42E-02	705	2.57E-03
395	2.97E-04	500	1.18E-02	605	2.38E-02	710	2.19E-03
400	3.26E-04	505	1.34E-02	610	2.30E-02	715	1.87E-03
405	3.86E-04	510	1.48E-02	615	2.20E-02	720	1.60E-03
410	5.13E-04	515	1.59E-02	620	2.08E-02	725	1.38E-03
415	7.44E-04	520	1.67E-02	625	1.95E-02	730	1.18E-03
420	1.17E-03	525	1.73E-02	630	1.81E-02	735	1.00E-03
425	2.01E-03	530	1.79E-02	635	1.65E-02	740	8.59E-04
430	3.49E-03	535	1.83E-02	640	1.51E-02	745	7.32E-04
435	6.09E-03	540	1.89E-02	645	1.35E-02	750	6.27E-04
440	1.07E-02	545	1.94E-02	650	1.21E-02	755	5.42E-04
445	1.97E-02	550	1.99E-02	655	1.07E-02	760	4.70E-04
450	2.87E-02	555	2.05E-02	660	9.52E-03	765	4.04E-04
455	2.43E-02	560	2.12E-02	665	8.31E-03	770	3.44E-04
460	1.60E-02	565	2.18E-02	670	7.26E-03	775	3.00E-04
465	1.29E-02	570	2.26E-02	675	6.31E-03	780	2.58E-04
470	1.00E-02	575	2.32E-02	680	5.47E-03		
475	7.54E-03	580	2.38E-02	685	4.72E-03		
480	7.09E-03	585	2.43E-02	690	4.07E-03		

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

Chromaticity Diagram - Sphere Spectroradiometer Method



Tristimulus values(x, y): (0.3789, 0.3798)

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

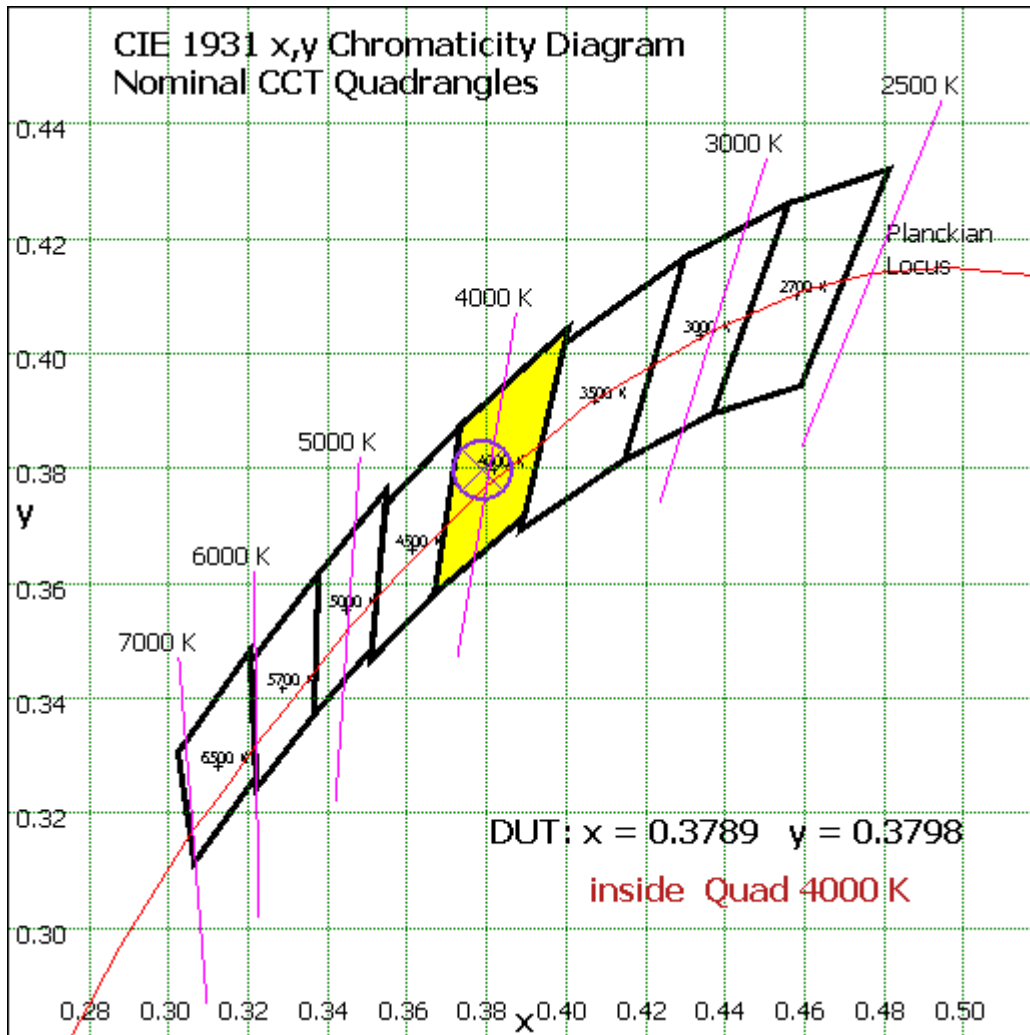
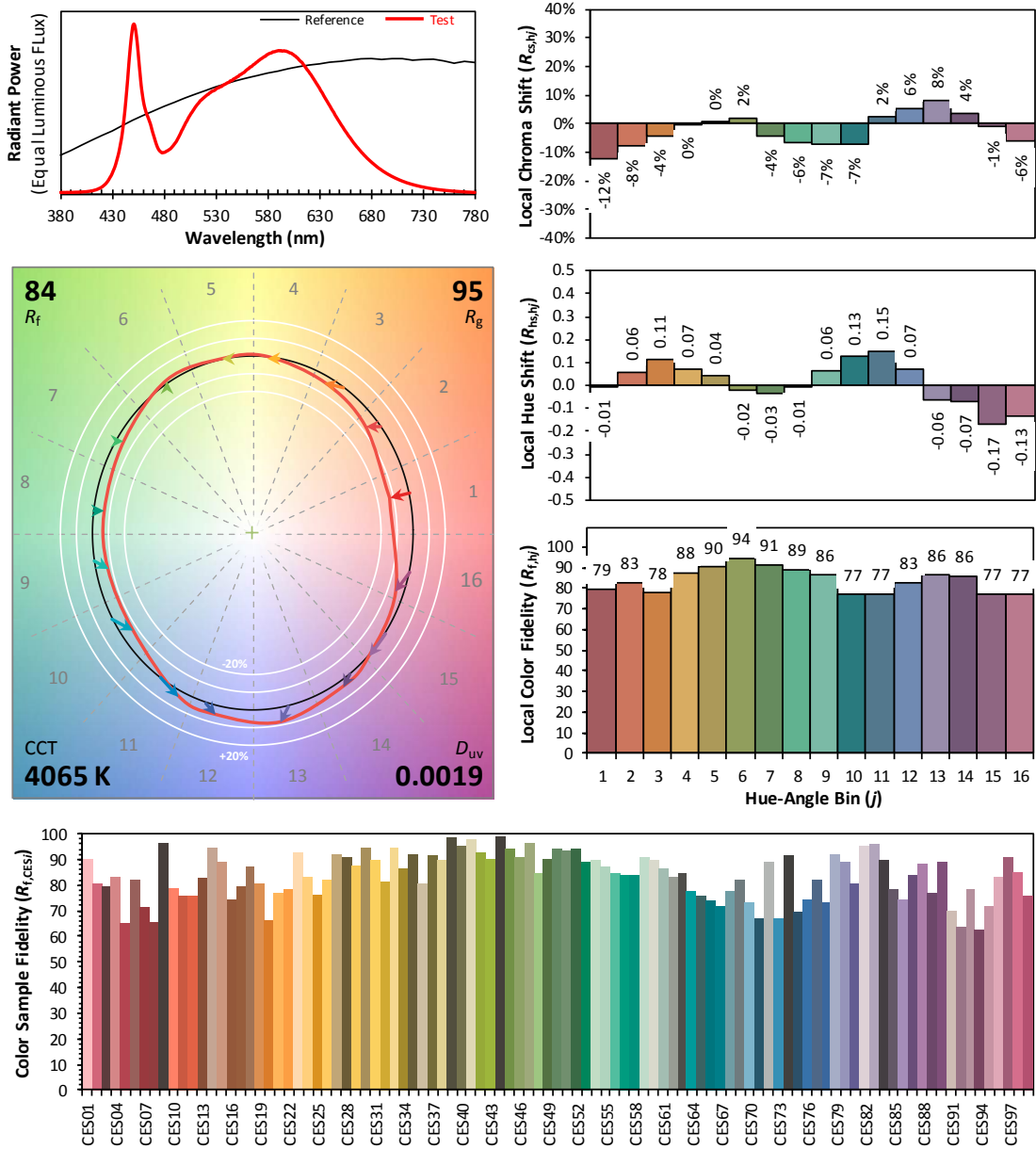


Chart 3: Plot of Lamp x/y coordinates on CIE 1931 Chromaticity Diagram

Color Rendition Report – Sphere Spectroradiometer Method



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x	0.3789
y	0.3798
u'	0.2229
v'	0.5027

Chart 4: Full Report Created with the IES TM-30 Calculator

Note: The values in this diagram might be a little different from the values in Table 2 due to rounding.

Zonal Lumen Tabulation- Goniophotometer Method

$\gamma(^{\circ})$	Lumens	% Total
0- 10	20.859	1.49%
10- 20	60.743	4.33%
20- 30	95.254	6.79%
30- 40	121.553	8.66%
40- 50	137.845	9.82%
50- 60	143.34	10.22%
60- 70	138.992	9.91%
70- 80	127.317	9.07%
80- 90	112.365	8.01%
90-100	98.153	7.00%
100-110	84.922	6.05%
110-120	72.169	5.14%
120-130	60.137	4.29%
130-140	48.621	3.47%
140-150	37.264	2.66%
150-160	25.484	1.82%
160-170	13.515	0.96%
170-180	4.609	0.33%
Total	1403.1	100%

$\gamma(^{\circ})$	Lumens	% Total
0- 60	579.594	41.31%
60- 90	378.674	26.99%
0-90	958.268	68.29%
90- 180	444.874	31.71%
0- 180	1403.1	100%

Table 5: Zonal Lumen

Illuminance Plots- Goniophotometer Method

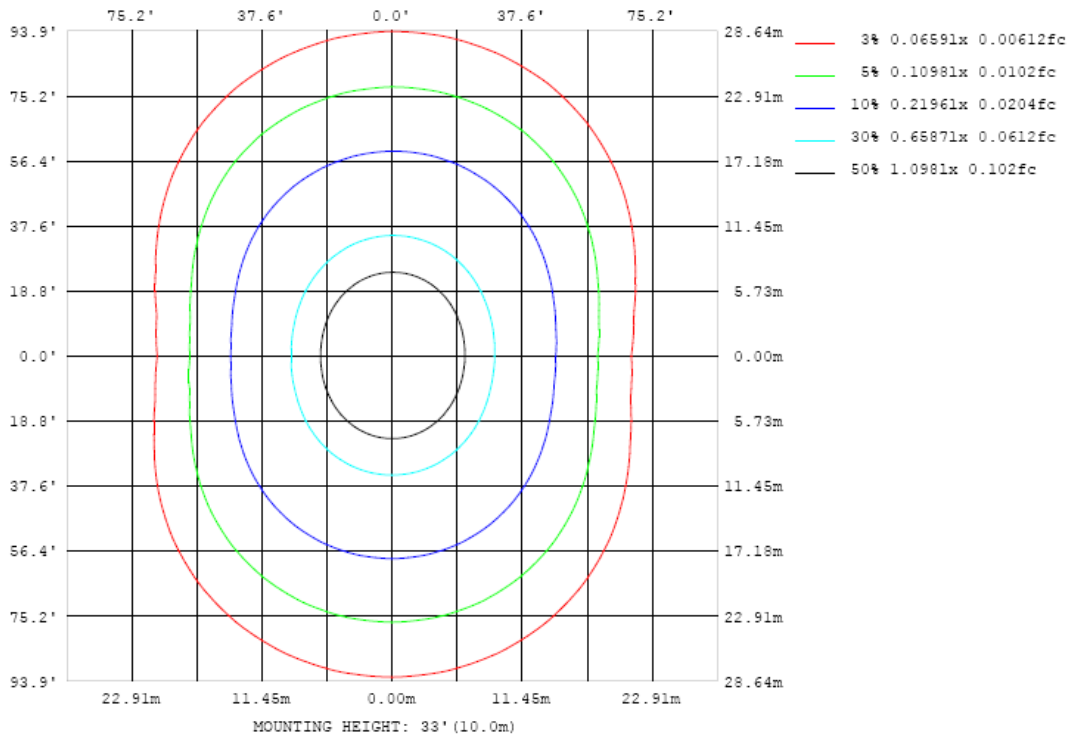


Chart 5: Illuminance Plot (Footcandles)

Luminous Intensity Distribution Plots- Goniophotometer Method

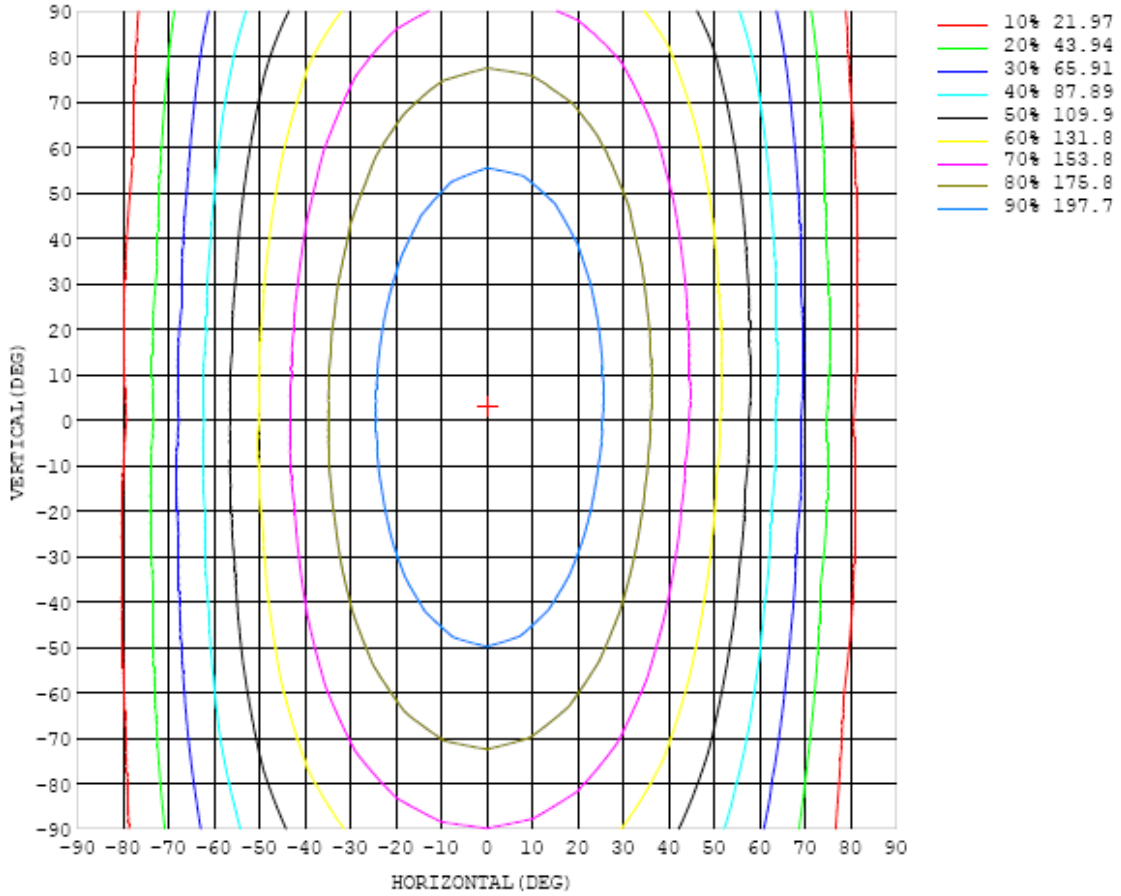


Chart 6: Isocandela Plot

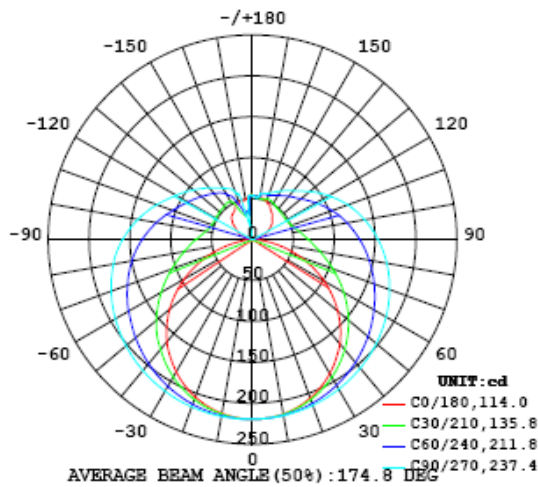


Chart 7: Polar Candela Distribution

Luminous Intensity Data- Goniophotometer Method

Table--1 UNIT: cd

C (DEG) γ (DEG)	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
0	220	220	220	220	220	220	220	220	220	220	220	220	220	220	220	220	220	220	220
5	219	219	219	219	219	219	219	219	219	219	219	219	219	219	219	218	218	218	218
10	216	216	217	217	217	218	218	218	218	218	218	218	218	217	217	216	216	216	216
15	212	212	213	213	214	215	216	217	217	217	217	216	216	215	213	212	212	211	211
20	206	206	207	208	210	212	213	215	215	216	215	214	213	211	209	207	206	205	205
25	199	199	200	202	204	207	210	212	213	214	213	212	209	207	204	201	199	197	197
30	189	189	191	194	198	202	206	209	210	211	210	208	205	202	197	193	190	187	187
35	178	179	181	185	191	196	201	205	207	208	207	205	201	196	190	184	180	177	175
40	166	167	170	176	183	190	196	201	204	205	204	201	196	190	182	175	169	165	163
45	152	152	157	165	174	183	190	196	200	202	200	197	191	183	174	164	156	151	148
50	136	137	144	153	164	175	184	192	196	198	196	192	185	176	165	153	142	135	132
55	119	121	129	141	155	167	178	186	191	193	192	187	179	168	156	141	128	119	115
60	101	103	114	129	145	159	172	181	187	189	187	182	173	161	146	130	113	101	96.4
65	81.9	85.3	98.7	117	135	152	165	175	182	184	182	176	167	154	137	118	98.9	83.7	77.0
70	62.3	67.6	83.7	105	126	144	159	169	176	179	177	171	160	146	128	107	85.0	66.2	57.1
75	42.7	49.8	69.6	93.6	116	136	152	163	170	173	171	165	154	139	120	97.0	72.2	49.4	37.6
80	24.7	33.5	57.3	83.7	108	129	145	157	164	167	165	159	147	132	112	88.1	61.4	34.8	19.7
85	9.07	20.6	47.2	74.7	100	122	138	150	158	160	159	152	141	125	105	80.2	52.6	24.0	5.86
90	0.99	13.1	40.2	68.5	93.4	115	131	143	151	154	152	145	134	118	98.0	74.1	46.3	18.4	0.50
95	1.77	10.6	35.7	62.8	87.0	108	124	136	144	147	145	138	127	112	91.9	68.7	42.2	16.2	1.83
100	4.60	11.1	32.6	58.2	81.2	102	118	129	137	139	138	131	121	106	86.4	64.1	39.2	16.5	4.57
105	8.09	13.0	31.0	54.0	76.3	95.2	111	122	129	132	130	124	114	99.3	80.9	60.1	37.3	18.6	8.43
110	12.5	16.7	31.2	50.8	71.1	88.8	104	115	121	124	122	117	107	92.9	76.2	56.6	37.0	21.7	12.9
115	17.5	20.4	32.2	48.7	66.7	82.8	96.5	107	113	116	114	109	99.5	86.7	71.4	54.1	37.9	25.5	18.0
120	22.6	24.4	33.8	47.8	63.0	77.5	89.5	99.0	105	107	106	101	92.5	81.2	67.5	52.8	39.4	29.3	22.1
125	27.2	28.8	35.9	47.6	60.2	72.5	83.1	91.5	97.0	99.2	98.0	93.5	85.9	75.9	64.4	52.5	41.3	32.1	25.9
130	31.4	33.2	38.2	47.8	58.5	68.6	77.5	84.5	89.4	91.3	90.3	86.2	80.1	71.8	62.4	52.4	43.3	36.6	31.9
135	34.2	37.0	40.4	48.0	57.1	65.6	73.0	78.4	82.2	83.9	83.0	79.8	75.1	68.5	60.7	52.4	45.1	40.4	36.3
140	38.1	40.7	43.7	48.6	55.8	63.0	69.1	73.9	76.9	77.8	77.5	75.2	71.1	65.6	59.2	52.7	47.2	40.9	38.9
145	40.7	43.9	46.1	49.4	54.9	60.4	65.5	69.5	72.1	73.2	72.7	70.7	67.3	62.9	57.9	52.9	49.5	43.7	40.6
150	43.8	45.4	47.9	51.2	54.1	58.4	62.2	65.3	67.4	68.3	68.0	66.4	63.8	60.5	56.8	53.7	50.9	45.5	43.4
155	47.1	46.3	49.0	52.8	54.6	56.6	59.5	61.7	63.3	64.0	63.8	62.7	60.9	58.5	56.4	54.9	51.4	45.4	47.3
160	50.0	49.0	48.4	53.3	55.5	56.6	57.6	58.8	59.8	60.3	60.2	59.5	58.6	57.7	56.8	54.7	49.1	46.7	47.3
165	51.7	50.8	49.4	50.7	55.0	56.9	57.5	58.1	58.5	58.8	58.7	58.4	58.0	57.4	55.8	51.6	48.8	48.6	48.4
170	52.6	52.2	51.5	51.6	52.5	53.3	54.0	55.3	56.5	57.1	56.9	56.1	54.5	52.4	50.9	50.5	51.3	51.6	49.6
175	53.7	53.7	53.7	53.7	53.9	54.1	53.6	52.8	52.1	51.5	51.4	51.5	51.6	51.8	52.2	52.8	53.5	54.2	54.1
180	54.1	54.1	54.1	54.1	54.1	54.1	54.1	54.1	54.1	54.1	54.1	54.1	54.1	54.1	54.1	54.1	54.1	54.1	54.1

Table 6: Luminous Intensity Data

Table--2 UNIT: cd

C (DEG) γ (DEG)	190	200	210	220	230	240	250	260	270	280	290	300	310	320	330	340	350		
0	220	220	220	220	220	220	220	220	220	220	220	220	220	220	220	220	220		
5	219	219	219	219	219	219	220	220	220	220	220	220	219	219	219	219	219		
10	216	216	217	217	218	218	219	219	219	219	219	219	218	218	217	217	217		
15	211	212	213	214	215	217	218	218	219	219	218	217	216	215	214	213	213		
20	205	206	208	210	212	214	216	217	218	217	217	215	214	212	210	208	207		
25	197	199	202	205	208	211	214	215	216	216	215	213	210	207	204	201	199		
30	188	190	194	198	203	207	211	213	214	214	212	209	205	201	197	193	190		
35	177	180	185	191	197	203	207	210	212	211	209	205	200	194	188	183	180		
40	165	169	175	183	191	198	203	207	209	208	205	201	194	187	179	173	168		
45	150	157	165	174	184	192	199	204	206	205	201	196	188	179	170	161	155		
50	135	143	154	166	177	187	195	200	202	201	197	190	181	170	159	148	140		
55	118	128	141	156	170	181	190	196	198	197	192	185	174	162	148	134	124		
60	100	113	129	147	162	175	185	191	194	192	187	179	167	153	136	120	107		
65	82.1	97.3	117	137	155	169	179	186	189	188	182	173	160	143	124	105	89.4		
70	63.7	82.3	105	128	147	163	174	181	184	182	177	167	153	134	113	90.7	71.5		
75	45.8	68.4	94.4	119	140	157	169	176	179	177	171	161	145	126	102	77.2	54.2		
80	30.1	56.4	84.8	111	132	150	163	170	173	171	165	154	138	117	92.7	65.2	38.5		
85	18.6	47.1	76.6	103	125	143	156	164	167	165	158	147	131	110	84.2	55.4	26.4		
90	12.7	40.3	69.3	95.6	118	135	148	156	159	157	151	139	123	102	76.5	47.8	19.0		
95	11.1	35.5	63.0	88.5	110	127	140	148	151	149	143	131	115	94.4	69.5	41.7	15.4		
100	12.2	33.2	58.1	82.1	103	119	132	139	142	141	134	123	107	87.3	63.6	37.9	15.4		
105	15.1	33.2	54.8	76.5	95.9	112	123	131	134	132	126	115	99.9	80.9	58.9	36.4	17.3		
110	18.6	34.5	53.1	72.2	89.5	104	115	122	125	123	117	107	92.8	75.5	55.8	36.4	20.6		
115	21.9	36.5	52.2	69.0	84.6	97.5	107	114	116	114	109	99.7	87.1	71.4	53.8	37.6	24.3		
120	25.3	38.7	52.0	66.5	80.2	91.8	101	106	108	107	102	93.6	82.1	68.0	53.0	39.6	27.7		
125	28.1	41.1	52.2	64.6	76.4	86.5	94.3	99.3	101	99.8	95.3	88.0	77.8	65.5	53.0	41.8	30.8		
130	30.1	43.3	52.7	63.1	73.1	81.8	88.5	92.9	94.5	93.3	89.4	82.9	74.1	63.8	53.5	44.0	33.3		
135	31.6	44.4	53.1	61.8	70.2	77.5	83.2	86.9	88.3	87.2	83.9	78.3	71.0	62.5	54.1	45.7	35.6		
140	33.9	43.0	53.5	59.8	67.4	73.6	78.3	81.5	82.5	81.7	78.9	74.3	68.3	61.6	54.8	46.9	38.3		
145	35.5	40.3	54.7	58.1	64.5	69.9	73.8	76.5	77.3	76.7	74.6	70.9	66.2	60.8	55.5	46.9	38.0		
150	38.9	35.6	54.1	58.6	60.6	64.8	69.6	72.0	72.6	72.3	70.8	68.0	64.4	60.3	55.8	43.8	35.7		
155	43.0	35.8	42.8	51.7	54.4	57.0	59.7	67.1	68.4	68.4	67.5	65.6	63.2	58.9	50.9	36.2	37.7		
160	43.9	34.9	33.6	38.3	41.8	43.0	43.5	52.5	61.3	64.9	64.4	63.7	60.3	45.6	36.8	32.6	45.4		
165	42.2	35.6	30.1	31.2	32.4	31.9	36.3	39.5	35.0	50.9	43.5	36.6	34.1	33.3	31.0	36.2	48.7		
170	42.5	36.1	33.0	29.3	32.2	35.7	40.2	43.5	11.5	45.2	41.0	35.2	32.1	30.8	37.9	49.8	52.0		
175	51.9	47.9	44.5	42.1	41.1	40.1	44.5	54.6	54.0	53.8	53.3	53.1	52.9	53.6	53.4	53.2	53.5		
180	54.1	54.1	54.1	54.1	54.1	54.1	54.1	54.1	54.1	54.1	54.1	54.1	54.1	54.1	54.1	54.1	54.1		

Table 7: 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
Temperature recorder	JM624U	HZTE018-08	Aug. 09, 2018	Aug. 08, 2019
Temperature and humidity recorder	JR900	HZTE018-01	Aug. 09, 2018	Aug. 08, 2019
Standard source	D908	HZTE012-01	Aug. 14, 2018	Aug. 13, 2019
Integrate Sphere system	3M	HZTE015-04	Aug. 16, 2018	Aug. 15, 2019
Digital Power Meter	WT210	HZTE008-01	Aug. 02, 2018	Aug. 01, 2019
AC Power Supply	PCR 500L	HZTE001-07	Aug. 09, 2018	Aug. 08, 2019
DC Power Supply	IT6154	HZTE004-04	Aug. 09, 2018	Aug. 08, 2019
Standard source	SCL-1400	HZTE012-02	Aug. 16, 2018	Aug. 15, 2019
Temperature and humidity recorder	JR900	HZTE018-02	Aug. 09, 2018	Aug. 08, 2019
Temperature Meter	TES1310	HZTE017-01	Aug. 09, 2018	Aug. 08, 2019

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 4π . 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

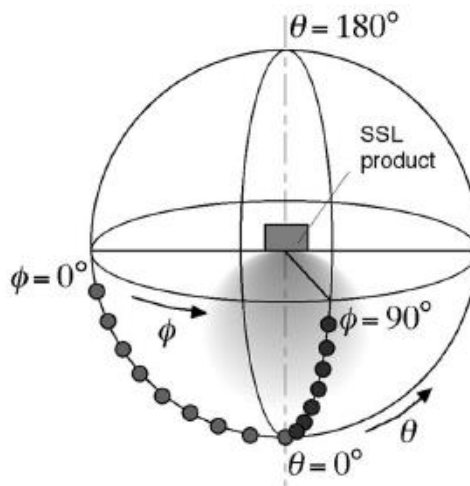
The color characteristics of SSL products include chromaticity coordinates, correlated color temperature, and color rendering index. These characteristics of SSL products may be spatially non-uniform, and thus, in order that they can be specified accurately, the color quantities shall be measured as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