LM-79-08 TEST REPORT

for

GREEN CREATIVE LTD

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

LED Tube

Model: 16PLL/840/GL/BYP

Laboratory: Leading Testing Laboratories

NVLAP CODE: 200960-0

3rd Floor, Bld. 2, NO. 96 Longchuanwu Rd Qianjiang Economy Dev. Zone, YuhangDist,
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Report No.: HZ19050020e

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

Review by: April Zou

Engineer: April Zou
May23, 2019

Approved by: Jim Zhang

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: **16PLL/840/GL/BYP**

Luminous Efficacy (Lumens /Watt)	Total Luminous Flux (Lumens)	Power (Watts)	Power Factor
136.9	2171.0	15.86	0.9796

CCT (K)	CRI	Stabilization Time (Light & Power)
4106	81.5	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 : May20, 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-30-18IES Method forEvaluating Light Source Color Rendition

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SAMPLE PHOTO

Figure 1- Overview of the sample

Equipment Under Test(EUT)	
Name	:LED Tube
Model	:16PLL/840/GL/BYP
Electrical Ratings	:120-277V,60Hz, 16W
Product Description	: 4000K
Manufacturer	:GREEN CREATIVE LTD
Address	: 756 North Zhongshan Rd., Unit B301 Zhabei District, Shanghai

TEST RESULTS

Test ambient temperature was 26.0℃.

Base orientation waslight down.Test was conducted without a dimmer in the circuit.

The stabilization time of the sample was60minutes, and the total operating time including stabilization was 65minutes.

Sphere-Spectroradiometer Method

Parameter	Result	
Test Voltage (V)	120.0	277.0
Voltage frequency (Hz)	60	60
Test Current (A)	0.135	0.062
Power Factor	0.9796	0.9219
Test Power (W)	15.86	15.79
THD A%	18.59	19.52
Luminous Efficacy (lm/W)	136.9	137.7
Total Luminous Flux (lm)	2171.0	2175.0
Color Rendering Index (CRI)	81.5	
R9	0.5	
Correlated Color Temperature (CCT)(K)	4106	
Chromaticity Chroma x	0.3771	
Chromaticity Chroma y	0.3791	
Chromaticity Chroma u	0.2220	
Chromaticity Chroma v	0.3347	
Duv	0.0016	
Chromaticity Chroma u ’	0.2220	
Chromaticity Chroma v’	0.5021	

Special Color Rendering Indices	
R1	79.2
R2	88
R3	94.6
R4	80
R5	79.3
R6	83.4
R7	85.6
R8	62.2
R9	0.5
R10	71.6
R11	78.5
R12	59.2
R13	81.4
R14	97.2

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).

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Goniophotometer Method

Test ambient temperature was 24.7℃.

The photometric distance is30m.

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)	0.136
Power Factor	0.9766
Power (W)	15.93
Luminous Efficacy (lm/W)	135.9
Total Luminous Flux (lm)	2165.4
Beam Angle (°)	101.4(0^o-180^o)/ 118.5(90^o-270^o)
Center Beam Candle Power (cd)	623
Maximum Beam Candle Power (cd)	623.7 (At: C=340.0, Gamma=3.5)
Spacing Criteria	1.20(0^o-180^o)/ 1.38(90^o-270^o)
Zonal Lumens in the 0 °-60 °Zone	65.59%
Zonal Lumens in the 60 °-90 °Zone	21.90%
Zonal Lumens in the 90 °-120 °Zone	7.29%
Zonal Lumens in the 120 °-180 °Zone	5.22%

Table 3: Test data per Goniophotometer Method

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Spectral Power Distribution - Sphere Spectroradiometer Method

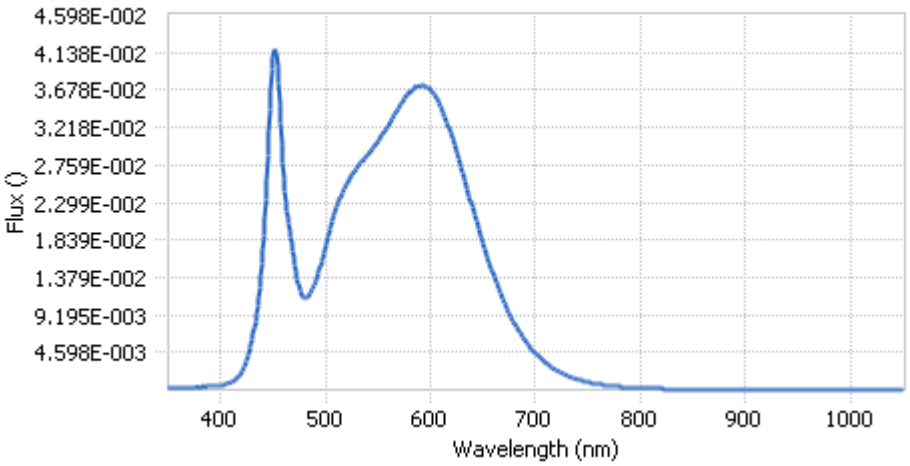

Chart 1: Spectral Power Distribution

Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	3.58E-04	485	1.18E-02	590	3.73E-02	695	5.19E-03
385	3.69E-04	490	1.30E-02	595	3.72E-02	700	4.48E-03
390	3.97E-04	495	1.52E-02	600	3.67E-02	705	3.84E-03
395	4.59E-04	500	1.77E-02	605	3.59E-02	710	3.28E-03
400	5.09E-04	505	2.01E-02	610	3.47E-02	715	2.80E-03
405	6.59E-04	510	2.23E-02	615	3.30E-02	720	2.39E-03
410	9.22E-04	515	2.41E-02	620	3.11E-02	725	2.05E-03
415	1.39E-03	520	2.53E-02	625	2.90E-02	730	1.76E-03
420	2.22E-03	525	2.63E-02	630	2.69E-02	735	1.51E-03
425	3.72E-03	530	2.72E-02	635	2.46E-02	740	1.28E-03
430	6.22E-03	535	2.80E-02	640	2.23E-02	745	1.10E-03
435	1.04E-02	540	2.88E-02	645	2.01E-02	750	9.41E-04
440	1.71E-02	545	2.97E-02	650	1.79E-02	755	8.08E-04
445	2.87E-02	550	3.05E-02	655	1.59E-02	760	6.93E-04
450	4.09E-02	555	3.14E-02	660	1.41E-02	765	6.02E-04
455	3.76E-02	560	3.25E-02	665	1.24E-02	770	5.14E-04
460	2.59E-02	565	3.36E-02	670	1.08E-02	775	4.41E-04
465	2.03E-02	570	3.47E-02	675	9.38E-03	780	3.85E-04
470	1.61E-02	575	3.57E-02	680	8.13E-03		
475	1.23E-02	580	3.65E-02	685	7.05E-03		
480	1.13E-02	585	3.72E-02	690	6.07E-03		

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

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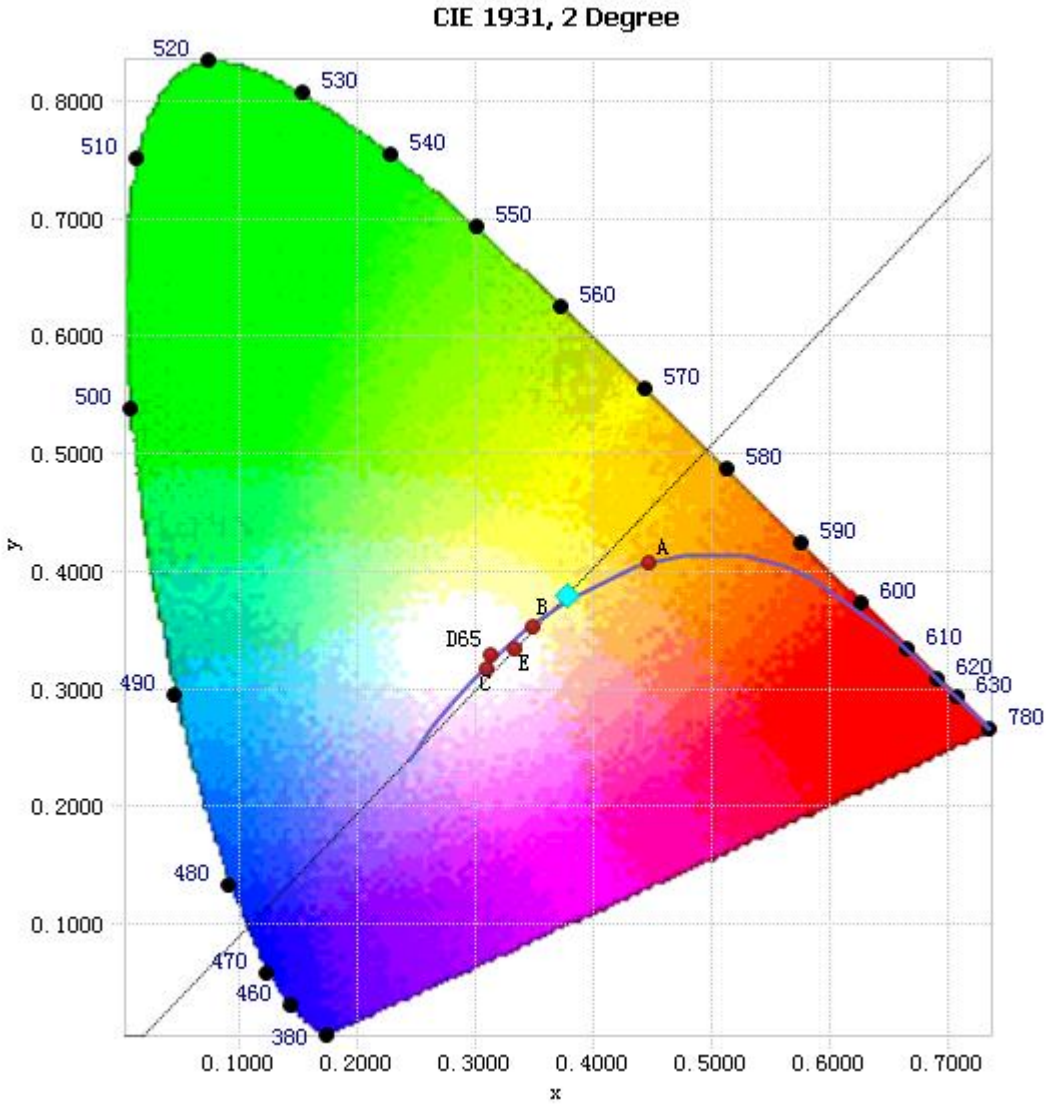
Chromaticity Diagram - Sphere Spectroradiometer Method



Tristimulus values(x, y):(0.3771, 0.3791)

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

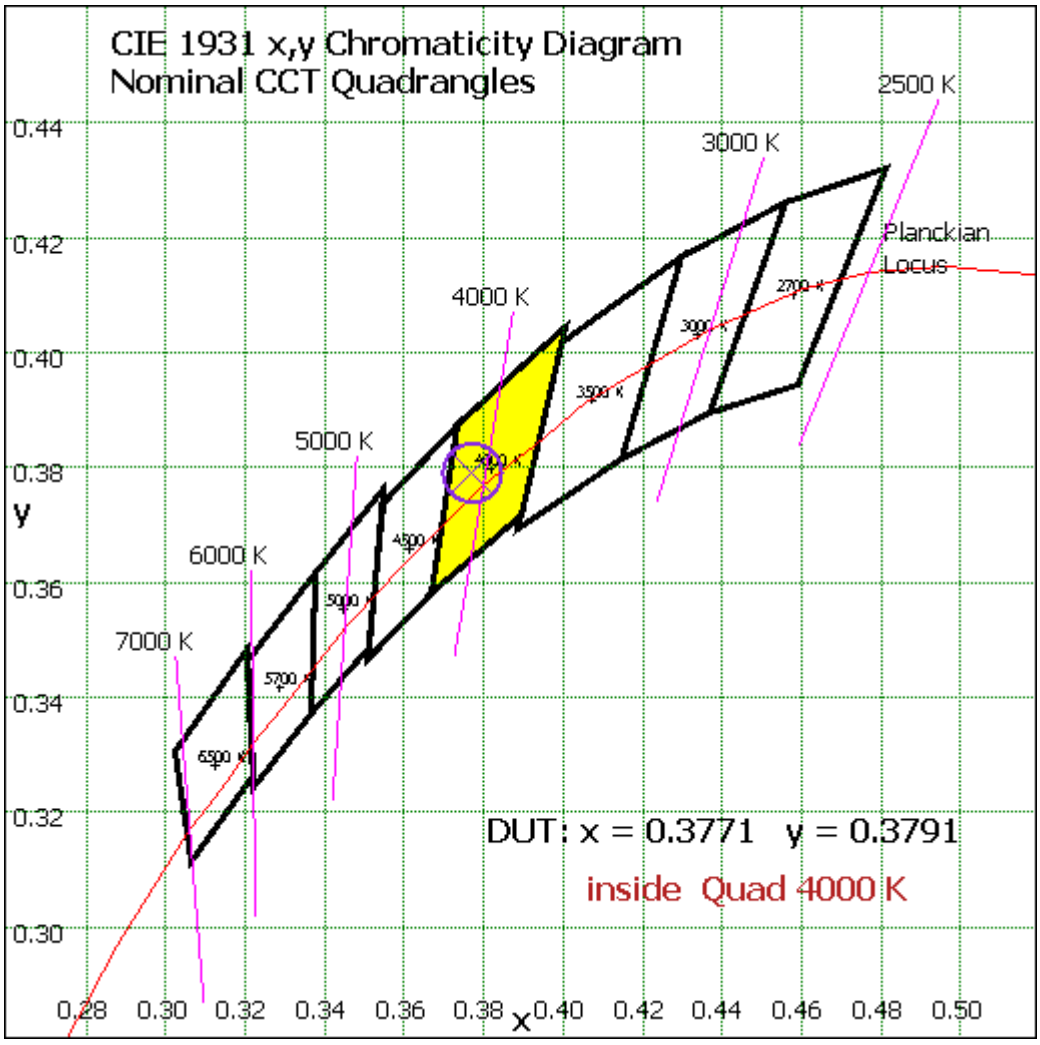
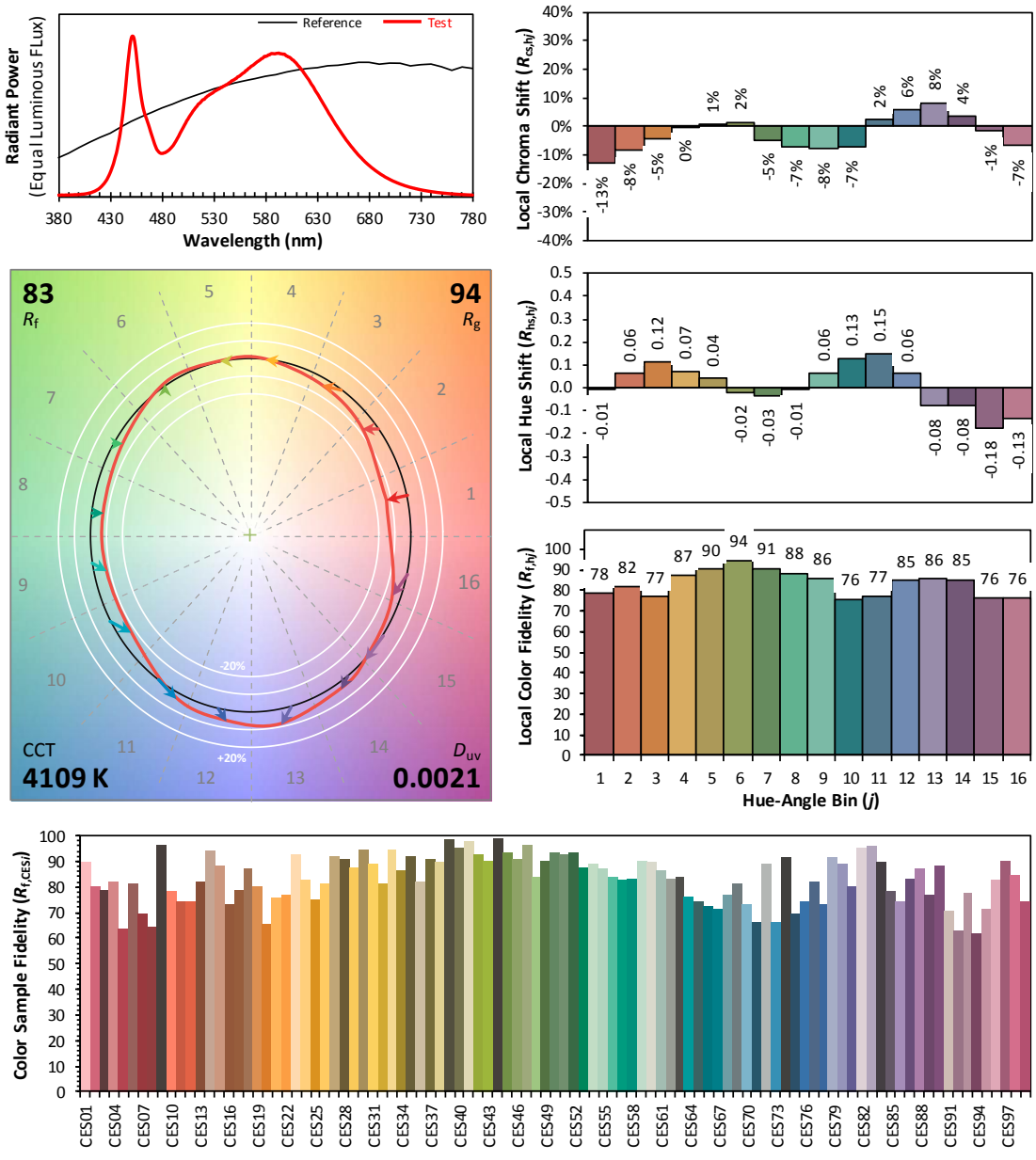


Chart 3: Plot of Lamp x/y coordinates on CIE 1931 Chromaticity Diagram

Color Rendition Report – Sphere Spectroradiometer Method



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

x	0.3771
y	0.3791
u'	0.2220
v'	0.5021

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

γ(°)	Lumens	% Total
0- 10	58.96	2.72%
10- 20	168.995	7.80%
20- 30	257.388	11.89%
30- 40	313.708	14.49%
40- 50	327.912	15.14%
50- 60	293.189	13.54%
60- 70	224.761	10.38%
70- 80	153.865	7.11%
80- 90	95.594	4.41%
90-100	63.283	2.92%
100-110	51.002	2.36%
110-120	43.641	2.02%
120-130	37.312	1.72%
130-140	30.082	1.39%
140-150	21.922	1.01%
150-160	14.191	0.66%
160-170	7.579	0.35%
170-180	1.971	0.09%
Total	2165.4	100%

γ(°)	Lumens	% Total
0- 60	1420.152	65.59%
60- 90	474.22	21.90%
0-90	1894.372	87.49%
90- 180	270.983	12.51%
0- 180	2165.4	100%

Table 5: Zonal Lumen

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Illuminance Plots- Goniophotometer Method

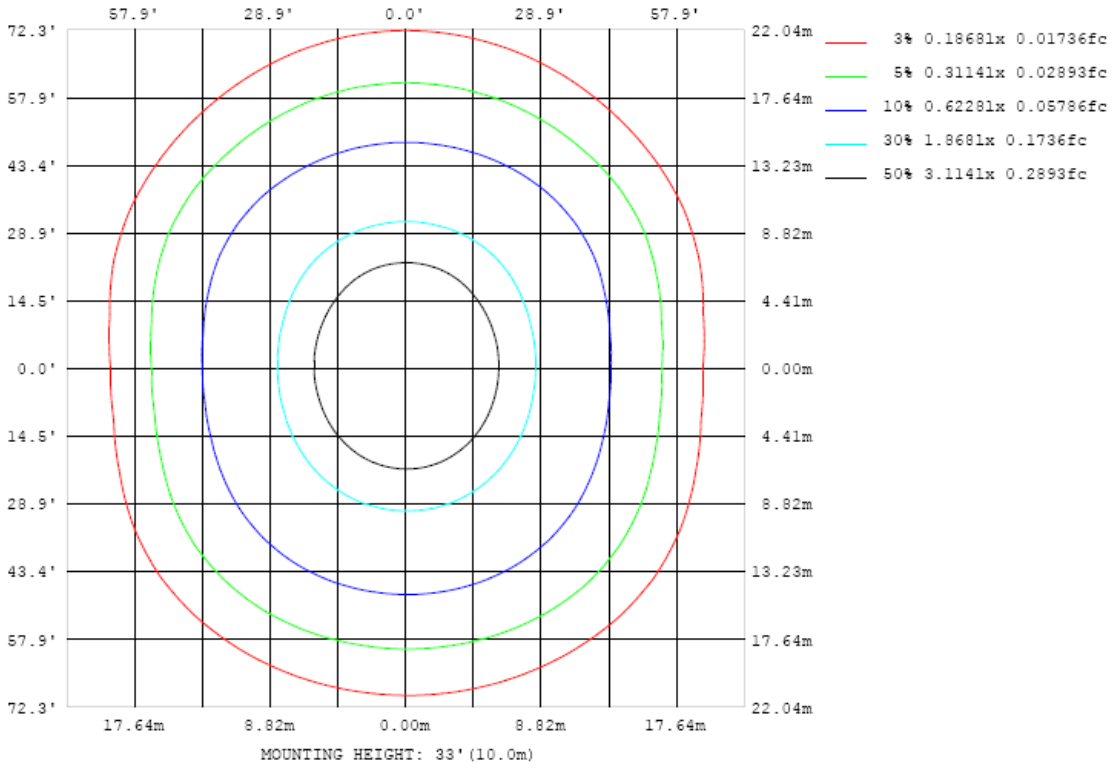

Chart 5: Illuminance Plot (Footcandles)

Luminous Intensity Distribution Plots- Goniophotometer Method

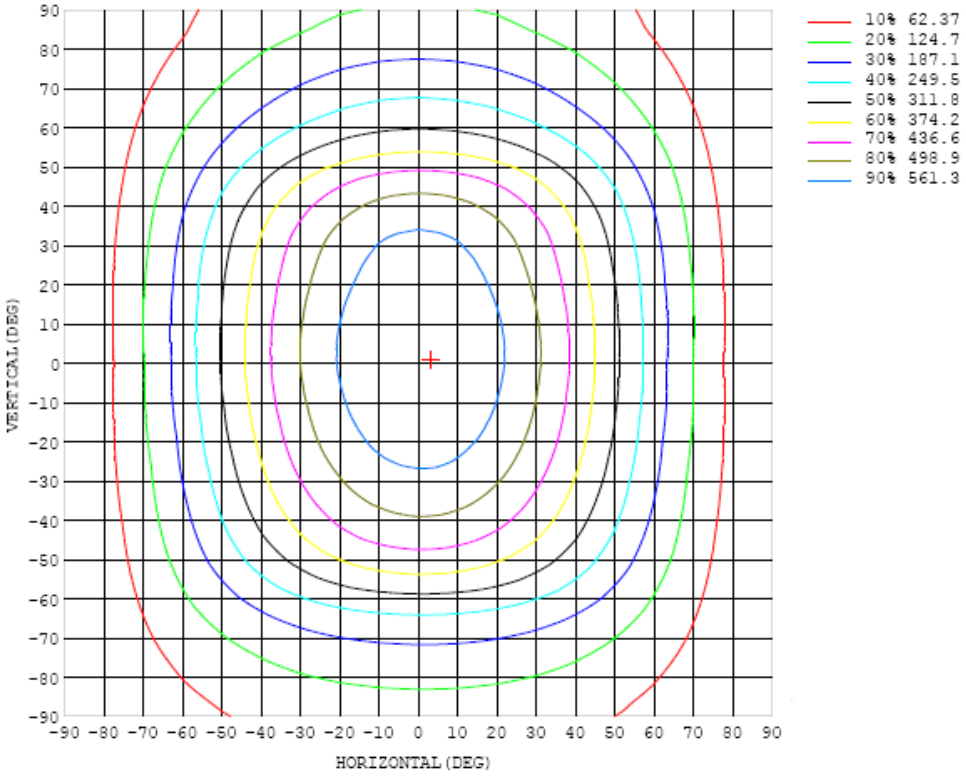

Chart 6: Isocandela Plot

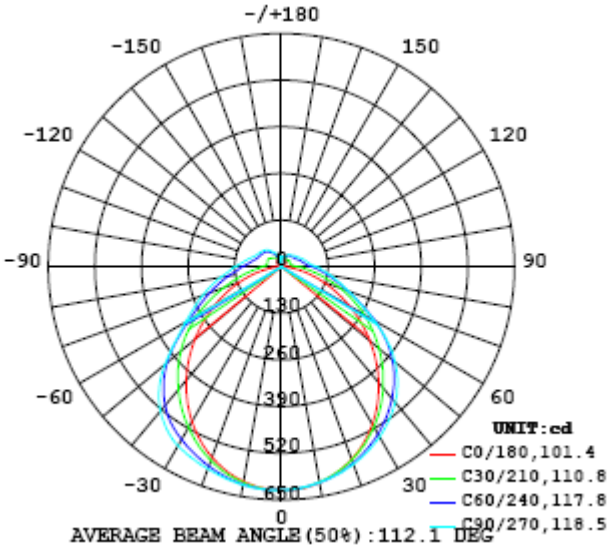

Chart 7: Polar Candela Distribution

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Luminous Intensity Data- Goniophotometer Method

Table--1 UNIT: cd

γ (DEG) \ C (DEG)	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
0	623	623	623	623	623	623	623	623	623	623	623	623	623	623	623	623	623	623	623
5	621	621	621	620	620	620	620	619	619	619	619	619	619	619	618	619	618	619	619
10	611	610	610	610	610	611	611	612	612	611	611	610	610	608	607	607	607	608	608
15	595	594	593	594	596	597	600	600	601	600	599	599	596	594	592	589	589	589	590
20	572	570	571	574	576	580	582	586	586	586	585	583	579	575	571	567	565	565	566
25	542	541	543	548	552	558	562	567	569	569	567	564	558	552	545	539	535	534	535
30	507	506	510	516	524	532	539	545	548	548	545	541	534	525	516	507	500	498	499
35	467	466	472	480	491	502	511	519	523	523	519	515	506	494	483	471	461	457	458
40	422	422	430	441	455	469	480	488	493	494	490	484	474	460	446	431	419	413	413
45	373	375	385	400	416	432	445	454	458	458	454	449	438	424	407	389	373	365	365
50	323	325	338	355	375	392	404	411	413	414	411	406	398	384	365	345	327	316	315
55	271	275	289	311	332	347	356	360	361	360	358	356	350	339	323	301	279	266	264
60	220	225	242	266	285	297	301	300	298	297	296	297	296	290	277	257	233	217	215
65	170	177	198	220	236	243	244	243	242	241	240	240	240	236	229	213	190	170	167
70	124	133	155	175	186	193	196	199	199	199	198	196	193	188	181	169	149	127	122
75	82.3	93.4	115	131	144	153	160	164	167	167	165	162	157	149	139	127	110	88.9	80.9
80	46.0	59.9	78.3	95.2	110	122	131	136	139	140	138	135	128	118	107	91.7	74.9	56.6	45.1
85	17.1	30.5	49.0	66.8	83.0	95.9	106	113	116	117	115	111	104	93.1	79.9	64.3	46.6	28.7	17.9
90	0.27	11.3	28.1	45.6	62.4	75.4	85.8	93.1	97.0	97.7	96.0	91.5	83.9	72.7	59.4	43.2	26.2	10.4	0.68
95	1.37	6.45	19.6	34.3	48.7	61.2	70.3	77.1	80.8	81.5	80.1	76.0	69.1	59.5	47.2	33.1	18.7	6.41	1.79
100	3.49	6.16	16.9	30.0	43.2	54.8	64.0	70.1	73.6	74.8	73.1	69.3	63.0	53.5	42.0	29.1	16.7	7.68	3.91
105	5.89	9.42	15.8	27.4	39.3	50.0	58.6	64.7	68.2	68.6	67.4	64.0	57.8	49.0	38.3	26.9	17.5	10.2	5.88
110	8.24	11.8	16.6	25.8	36.2	45.9	53.7	59.5	62.8	63.6	62.2	58.8	53.0	45.0	35.7	26.7	19.9	12.8	7.90
115	10.1	13.3	19.1	25.6	34.0	42.1	49.3	54.5	57.4	58.2	57.0	53.9	48.8	42.1	34.9	27.8	22.2	13.9	9.72
120	12.3	14.3	19.5	26.8	33.6	40.3	45.1	50.1	52.7	53.5	52.5	50.1	46.2	40.9	34.9	29.5	21.4	14.9	12.0
125	13.5	15.2	20.7	28.4	32.4	38.7	44.1	47.7	49.6	50.3	49.9	48.0	44.5	39.9	35.3	30.5	20.1	15.8	14.2
130	15.7	16.0	19.6	27.4	34.0	36.8	41.1	45.3	47.2	47.9	47.2	45.4	42.7	39.3	36.0	27.0	18.4	17.8	16.1
135	17.5	18.2	19.9	26.3	33.6	37.7	40.0	41.9	43.9	44.7	44.3	43.1	41.0	38.7	33.3	24.8	20.3	19.9	17.8
140	18.2	19.5	21.1	25.0	32.2	37.0	39.6	41.2	42.3	42.6	42.2	41.3	39.8	35.9	29.2	23.7	21.8	21.7	19.5
145	19.8	20.1	22.1	24.2	29.5	35.3	38.5	40.0	40.9	41.1	40.8	39.7	36.7	31.9	27.8	25.1	23.5	22.7	20.9
150	21.0	21.8	23.6	25.4	27.9	31.8	35.2	37.3	38.6	38.9	38.4	36.1	33.2	30.8	28.3	26.1	24.5	23.3	22.8
155	21.3	22.8	24.2	26.0	27.6	29.2	31.0	33.1	34.8	35.2	34.7	33.3	31.5	29.7	28.1	26.6	25.3	24.5	23.7
160	21.4	24.4	25.4	26.0	27.3	27.9	29.4	30.9	31.9	32.3	31.7	30.8	30.0	29.0	27.9	26.6	26.0	25.7	23.3
165	24.0	25.8	26.3	26.5	26.7	27.7	28.5	29.3	30.0	30.2	29.8	29.2	28.6	28.1	27.1	26.4	26.2	26.0	25.3
170	22.7	26.1	26.6	27.5	27.7	27.5	27.3	27.5	27.8	27.8	27.6	27.2	26.9	26.8	27.0	27.0	26.5	26.0	23.9
175	18.2	22.3	26.1	27.2	27.3	27.4	27.6	27.7	27.7	27.7	27.7	27.5	27.2	26.9	26.9	26.5	24.2	20.6	18.3
180	27.6	27.6	27.6	27.6	27.6	27.6	27.6	27.6	27.6	27.6	27.6	27.6	27.6	27.6	27.6	27.6	27.6	27.6	27.6

Table 6: Luminous Intensity Data

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Table--2 UNIT: cd

γ (DEG) \ C (DEG)	190	200	210	220	230	240	250	260	270	280	290	300	310	320	330	340	350		
0	623	623	623	623	623	623	623	623	623	623	623	623	623	623	623	623	623		
5	619	619	620	621	622	622	623	623	622	622	622	623	623	623	623	622	621		
10	609	610	611	613	615	616	617	617	618	618	618	618	617	615	614	613	612		
15	591	593	596	599	602	606	608	609	610	610	609	608	606	603	601	598	596		
20	568	571	575	580	586	592	596	599	600	600	598	594	589	584	580	576	574		
25	538	542	549	557	566	575	583	587	589	588	584	578	570	562	555	549	545		
30	503	509	518	530	543	557	567	574	577	575	569	560	548	536	525	517	510		
35	463	471	484	501	518	535	547	553	556	554	549	539	524	507	491	479	471		
40	418	430	447	469	489	505	516	522	525	523	518	509	495	475	454	437	427		
45	372	386	409	432	450	465	475	480	482	481	478	471	457	439	414	393	380		
50	323	341	366	389	405	416	422	424	424	425	425	422	412	396	372	347	330		
55	274	296	321	340	351	356	358	360	360	360	361	362	358	346	327	301	280		
60	226	249	271	285	292	298	304	307	309	308	306	303	299	292	277	253	231		
65	180	204	220	231	241	251	260	266	268	266	262	254	245	237	225	207	183		
70	136	158	171	185	199	213	224	231	234	231	225	215	202	188	175	160	138		
75	96.5	114	130	147	164	179	192	199	202	199	193	181	166	149	132	116	96.8		
80	60.1	76.7	95.6	115	134	150	162	170	173	170	163	151	135	116	96.2	77.1	59.9		
85	29.9	48.5	68.6	89.0	108	124	137	144	147	144	137	125	108	89.2	68.4	47.6	28.6		
90	13.4	33.0	53.9	74.5	93.3	109	121	128	130	128	121	109	92.9	73.7	52.4	31.0	11.5		
95	9.31	26.0	45.1	63.9	80.7	94.6	105	111	113	111	105	94.3	79.9	62.6	43.0	23.3	7.02		
100	12.1	24.5	40.3	57.2	72.4	84.9	94.2	99.6	101	99.4	93.9	84.6	71.5	55.5	37.8	21.3	9.87		
105	14.4	26.3	40.1	53.3	65.9	77.1	85.4	90.1	91.7	90.0	85.1	76.7	64.9	51.2	36.6	23.3	11.8		
110	15.9	29.4	41.5	52.6	62.8	71.2	77.6	81.5	82.9	81.5	77.4	70.6	61.2	49.7	37.8	25.9	13.1		
115	16.7	30.8	42.7	52.7	61.4	68.4	73.4	76.3	77.2	76.2	73.1	67.8	59.5	49.7	39.3	26.7	14.2		
120	17.4	28.6	42.4	52.7	60.3	66.4	70.7	73.1	73.9	73.1	70.4	65.8	58.6	50.1	39.6	25.9	14.9		
125	18.4	28.8	41.4	51.8	59.0	64.4	68.2	70.4	71.1	70.3	67.9	63.9	57.9	49.5	37.9	25.8	16.2		
130	19.4	26.2	35.9	49.0	57.2	62.3	65.6	67.6	68.2	67.5	65.4	61.9	56.1	47.0	35.2	24.9	18.2		
135	20.3	27.4	35.4	44.6	53.2	59.6	63.1	64.7	65.3	64.7	62.8	59.0	52.1	43.0	34.0	25.4	19.3		
140	20.5	28.0	32.2	39.4	48.3	54.1	58.4	60.9	61.7	60.6	58.0	53.2	47.1	39.2	31.0	25.1	19.9		
145	21.0	27.2	29.9	35.2	42.5	48.3	51.9	54.0	54.7	53.9	51.6	47.8	42.5	33.7	29.5	25.3	20.4		
150	20.8	27.2	30.5	31.1	37.4	42.6	45.8	47.6	48.1	47.6	46.1	43.0	36.8	29.8	30.1	25.4	20.2		
155	20.7	25.6	29.2	29.2	30.2	35.8	40.1	42.0	42.6	42.3	41.1	37.7	33.3	30.5	29.4	24.9	19.5		
160	20.6	20.9	25.7	29.1	30.0	30.7	31.9	35.8	37.7	37.7	37.1	34.3	32.1	30.4	27.1	22.3	19.0		
165	22.1	18.6	19.8	24.4	28.2	29.5	30.7	31.2	30.0	32.0	33.8	31.8	30.5	27.3	23.2	18.3	20.1		
170	20.1	17.5	16.3	16.2	16.4	16.8	17.0	17.8	25.7	23.8	19.1	16.8	15.9	15.4	15.0	15.2	17.0		
175	16.5	15.6	15.5	15.6	15.7	15.7	14.7	14.4	0.96	13.1	13.2	14.1	14.2	14.1	14.1	14.2	15.4		
180	27.6	27.6	27.6	27.6	27.6	27.6	27.6	27.6	27.6	27.6	27.6	27.6	27.6	27.6	27.6	27.6	27.6		

Table 7: Luminous Intensity Data

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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.

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The uncertainty of integrating sphere system reported in this document is expended 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 expended 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 °/180 ° and C=90 °/270 °) 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

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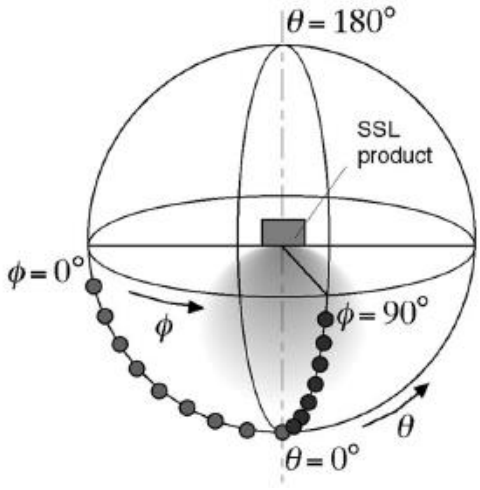
was calculated from these points. The data was then analyzed to check for delta color differences of the u', v' chromaticity coordinates. The spatial non-uniformity of chromaticity, Δu'v', is determined as the maximum deviation (distance on the CIE (u', v') diagram) among all measured points from the spatially averaged chromaticity coordinate.

The geometry for the chromaticity measurement using gonio-spectroradiometer is shown as following.



*** End of Report ***

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