



LM-79-08 Test Report

for

GREEN CREATIVE LTD

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

LED Tube

Model: 13PLL/840/GL/DIR

Laboratory: Leading Testing Laboratories

NVLAP CODE: 200960-0

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Report No.: HZ19020002u

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

Review by:

April Zou

Engineer: April Zou
Feb. 21, 2019

Approved by:



Jim Zhang

Manager: Jim Zhang
Feb. 21, 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: 13PLL/840/GL/DIR

Luminous Efficacy (Lumens /Watt)	Total Luminous Flux (Lumens)	Power (Watts)/2	Power Factor
130.3	2148.0	16.49	0.9936
CCT (K)	CRI	Stabilization Time (Light & Power)	
4028	81.4	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 : Feb. 01, 2019

Date of Test : Feb. 13, 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

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Sample Photo

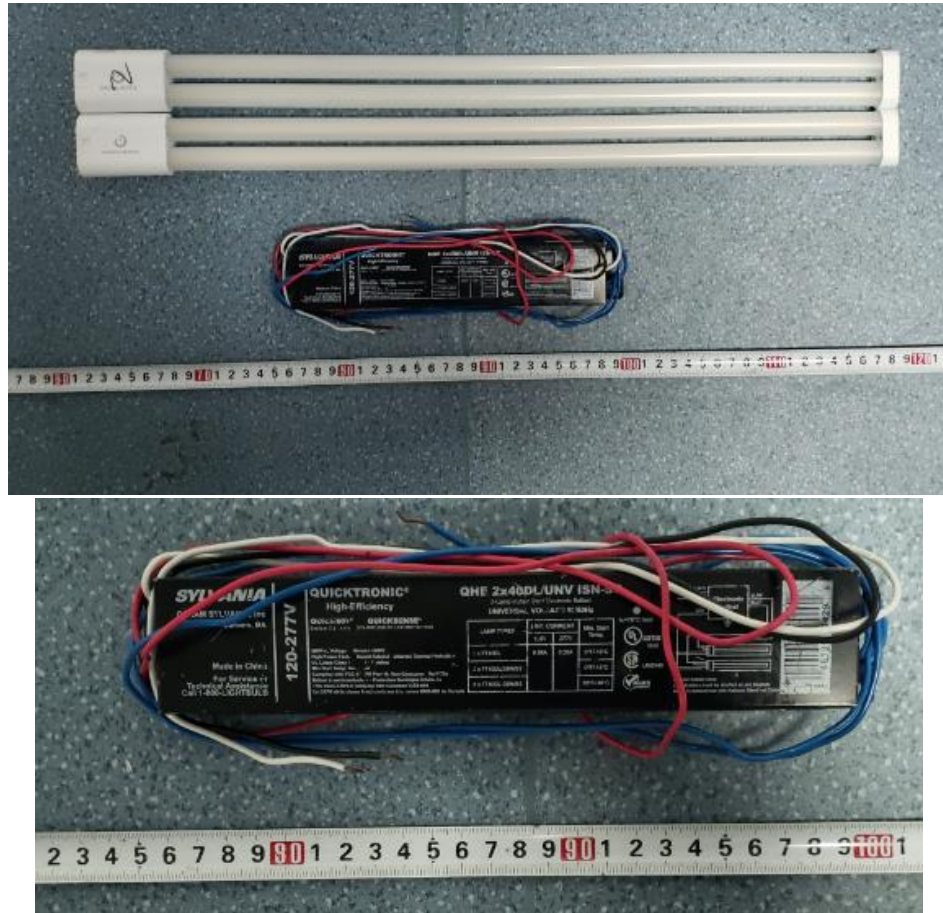


Figure 1- Overview of the sample

Equipment Under Test(EUT)

Name	: LED Tube
Model	: 13PLL/840/GL/DIR
Electrical Ratings	: 120-277V, 50/60Hz, 13W
Product Description	: 4000K LED Tubes supplied by a high frequency fluorescent lamp ballast: QHE 2x40DL/UNV ISN-SC
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 70 minutes.

Sphere-Spectroradiometer Method

Parameter	Result	
Test Voltage (V)	120.0	277.0
Voltage frequency (Hz)	60	60
Test Current (A)	0.276	0.132
Power Factor	0.9936	0.9302
Test Power (W)/2	16.49	17.02
THD A%	10.83	22.79
Luminous Efficacy (lm/W)	130.3	126.2
Total Luminous Flux (lm)	2148.0	2148.0
Color Rendering Index (CRI)	81.4	
R9	0.3	
Correlated Color Temperature (CCT)(K)	4028	
Chromaticity Chroma x	0.3810	
Chromaticity Chroma y	0.3832	
Chromaticity Chroma u	0.2229	
Chromaticity Chroma v	0.3363	
Duv	0.0021	
Chromaticity Chroma u'	0.2229	
Chromaticity Chroma v'	0.5045	

Special Color Rendering Indices	
R1	79
R2	86.9
R3	93.9
R4	81.2
R5	79.4
R6	82.6
R7	85.9
R8	62.4
R9	0.3
R10	69.8
R11	80.2
R12	61.2
R13	80.7
R14	96.7
Rf	84
Rg	96

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 24.8°C.

The photometric distance is 2.47m.

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)	0.277
Power Factor	0.9942
Test Power (W)/2	16.51
Luminous Efficacy (lm/W)	129.2
Total Luminous Flux (lm)	2132.1
Beam Angle (°)	111.7
Center Beam Candle Power (cd)	610
Spacing Criteria	1.21 (0 °-180 °)/ 1.36 (90 °-270 °)
Zonal Lumens in the 0 °-60 °Zone	65.36%
Zonal Lumens in the 60 °-90 °Zone	22.01%
Zonal Lumens in the 90 °-120 °Zone	7.37%
Zonal Lumens in the 120 °-180 °Zone	5.26%

Table 3: Test data per Goniophotometer Method

Spectral Power Distribution - Sphere Spectroradiometer Method

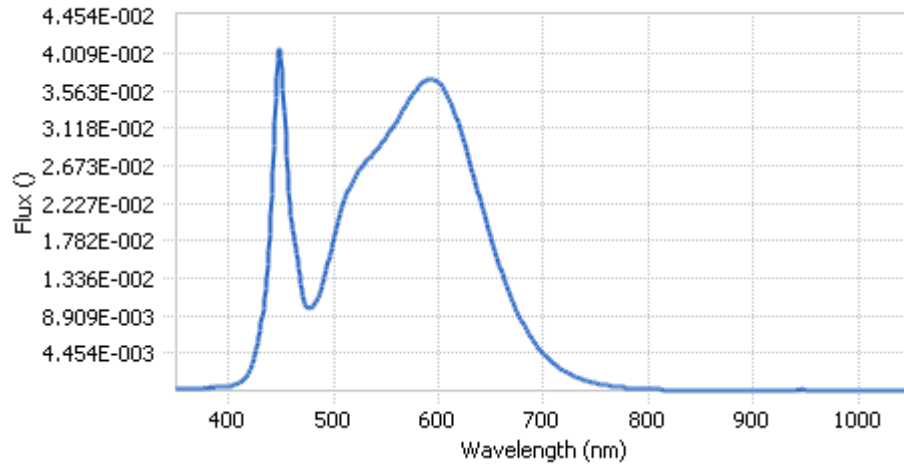
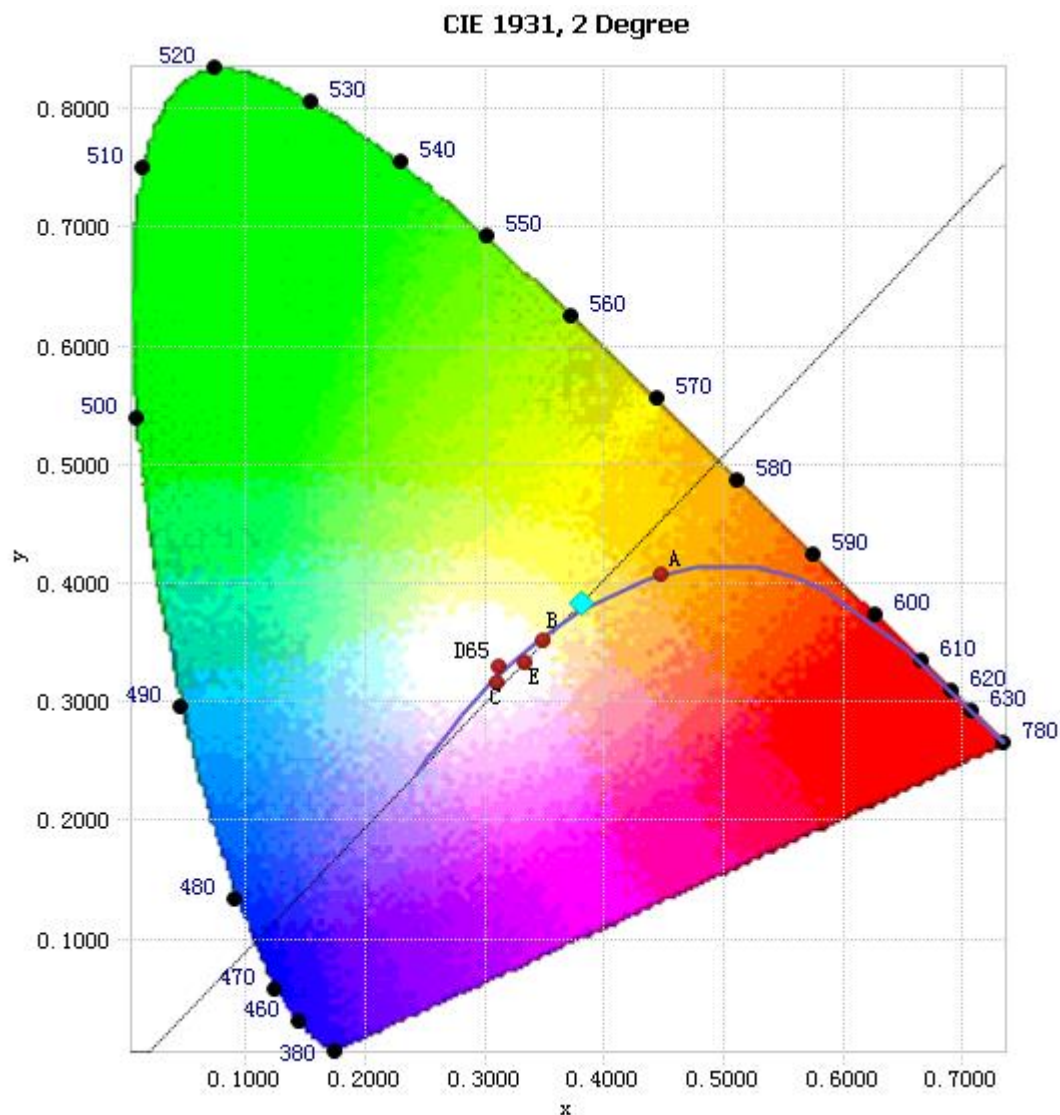


Chart 1: Spectral Power Distribution

Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	3.81E-04	485	1.10E-02	590	3.69E-02	695	5.14E-03
385	3.84E-04	490	1.29E-02	595	3.69E-02	700	4.41E-03
390	4.35E-04	495	1.55E-02	600	3.65E-02	705	3.75E-03
395	4.81E-04	500	1.81E-02	605	3.58E-02	710	3.20E-03
400	5.53E-04	505	2.05E-02	610	3.46E-02	715	2.73E-03
405	6.83E-04	510	2.25E-02	615	3.31E-02	720	2.33E-03
410	9.67E-04	515	2.41E-02	620	3.12E-02	725	2.00E-03
415	1.49E-03	520	2.53E-02	625	2.92E-02	730	1.70E-03
420	2.46E-03	525	2.62E-02	630	2.71E-02	735	1.45E-03
425	4.26E-03	530	2.71E-02	635	2.47E-02	740	1.23E-03
430	7.26E-03	535	2.77E-02	640	2.25E-02	745	1.05E-03
435	1.22E-02	540	2.85E-02	645	2.02E-02	750	9.13E-04
440	2.11E-02	545	2.92E-02	650	1.81E-02	755	7.72E-04
445	3.48E-02	550	3.01E-02	655	1.60E-02	760	6.68E-04
450	3.96E-02	555	3.10E-02	660	1.41E-02	765	5.76E-04
455	2.79E-02	560	3.20E-02	665	1.24E-02	770	4.92E-04
460	1.99E-02	565	3.31E-02	670	1.08E-02	775	4.20E-04
465	1.63E-02	570	3.41E-02	675	9.34E-03	780	3.69E-04
470	1.20E-02	575	3.50E-02	680	8.09E-03		
475	9.84E-03	580	3.60E-02	685	7.00E-03		
480	1.00E-02	585	3.67E-02	690	6.00E-03		

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

Chromaticity Diagram - Sphere Spectroradiometer Method



Tristimulus values(x, y): (0.3810, 0.3832)

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

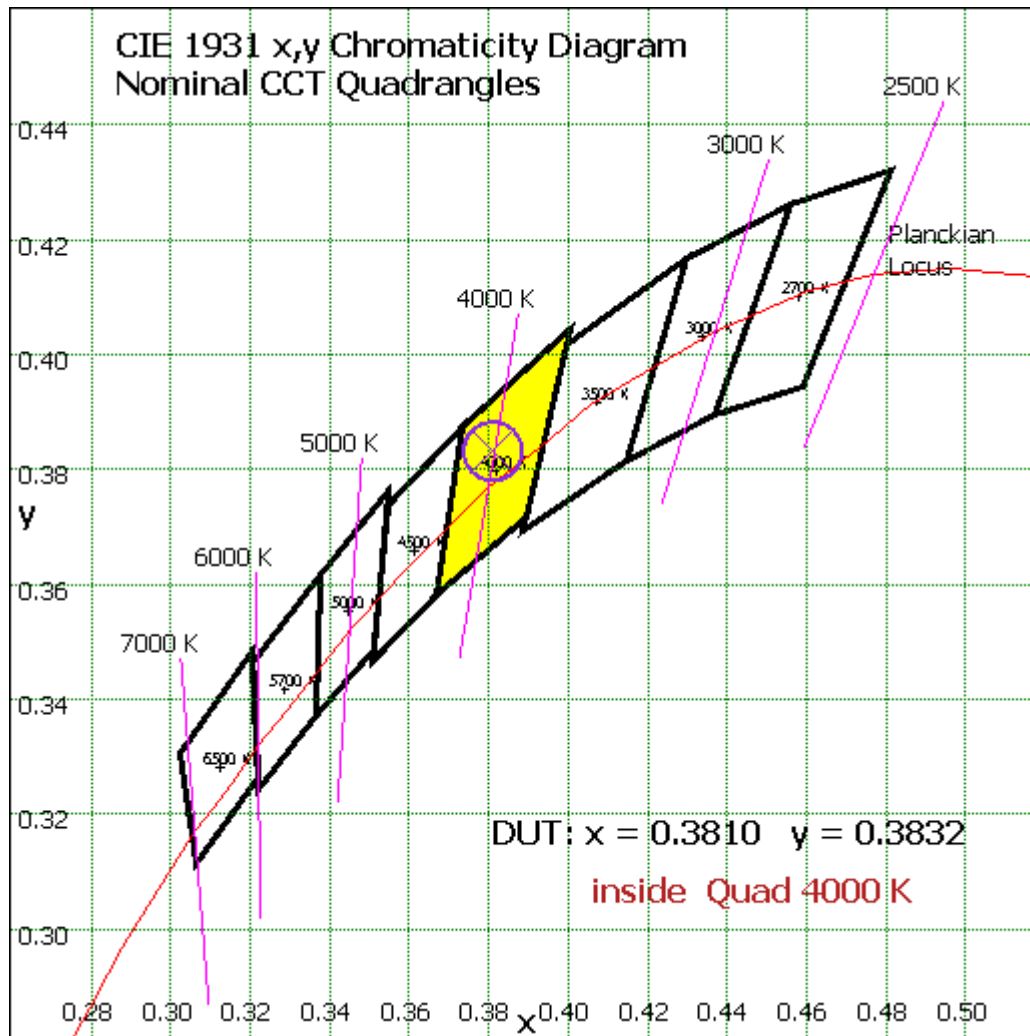


Chart 3: Plot of Lamp x/y coordinates on CIE 1931 Chromaticity Diagram

Color Vector – Sphere Spectroradiometer Method

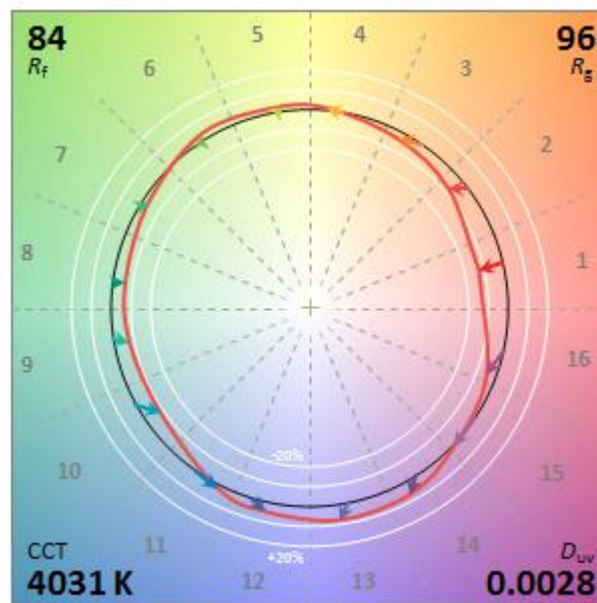


Chart 4: Color Vector Diagram of TM-30-18

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	57.784	2.71%
10- 20	166.124	7.79%
20- 30	253.56	11.89%
30- 40	308.447	14.47%
40- 50	321.224	15.07%
50- 60	286.316	13.43%
60- 70	220.693	10.35%
70- 80	153.182	7.18%
80- 90	95.407	4.47%
90-100	64.173	3.01%
100-110	50.486	2.37%
110-120	42.525	1.99%
120-130	37.066	1.74%
130-140	30.172	1.42%
140-150	22.075	1.04%
150-160	13.964	0.65%
160-170	7.194	0.34%
170-180	1.728	0.08%
Total	2132.1	100%

$\gamma(^{\circ})$	Lumens	% Total
0- 60	1393.455	65.36%
60- 90	469.282	22.01%
0-90	1862.737	87.37%
90- 180	269.383	12.63%
0- 180	2132.1	100%

Table 5: Zonal Lumen

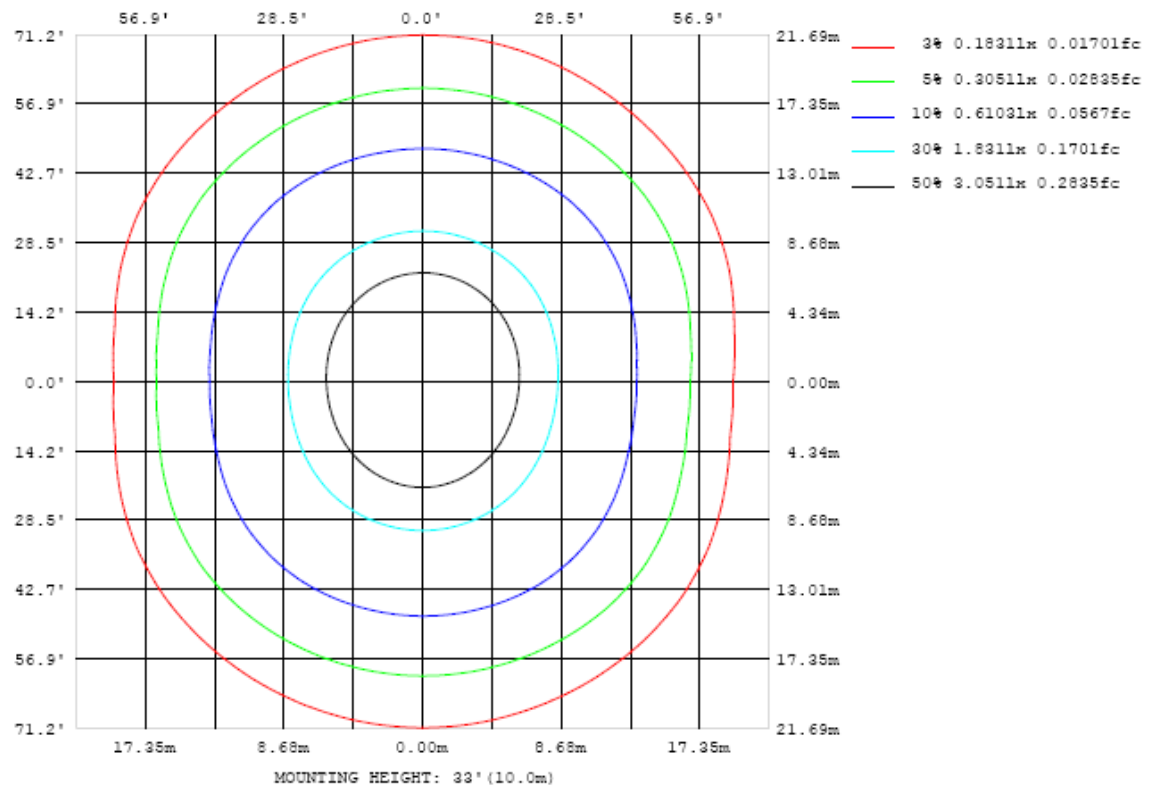


Chart 5: Illuminance Plot (Footcandles)

Luminous Intensity Distribution Plots- Goniophotometer Method

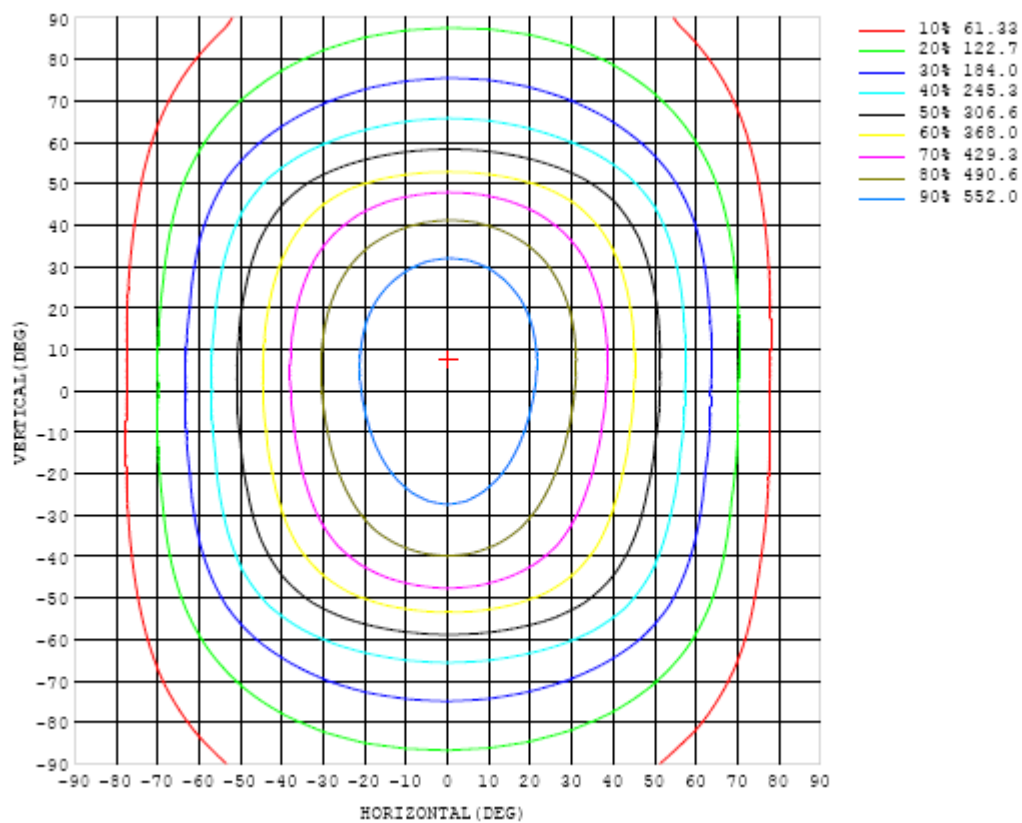


Chart 6: Isocandela Plot

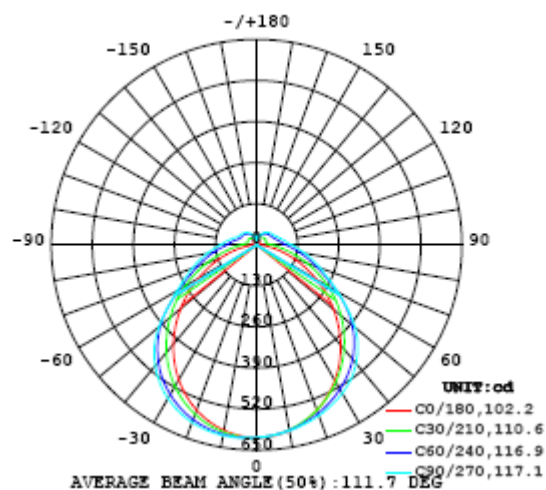


Chart 7: Polar Candela Distribution

Luminous Intensity Data- Goniophotometer Method

Table--1

UNIT: cd

C (DEG) y (DEG)	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
0	610	610	610	610	610	610	610	610	610	610	610	610	610	610	610	610	610	610	610
5	607	606	606	605	605	605	605	605	605	605	605	605	605	605	605	605	605	606	606
10	597	595	594	594	595	595	596	596	597	597	597	596	596	595	595	594	594	595	596
15	580	578	577	578	579	581	584	585	587	587	587	586	584	582	580	578	577	578	579
20	557	555	555	557	560	564	568	572	574	575	574	572	569	565	561	557	555	555	556
25	529	526	527	531	537	543	549	555	559	560	559	556	551	544	538	532	528	526	527
30	495	493	495	501	510	519	527	535	540	542	540	536	529	520	511	502	495	492	493
35	457	455	459	468	479	491	502	511	518	520	518	512	504	493	481	469	459	453	454
40	414	412	419	431	446	461	473	481	488	490	488	482	474	462	447	432	418	410	410
45	367	366	375	391	409	425	437	445	451	453	450	446	438	426	411	392	375	365	363
50	318	318	330	349	369	385	395	402	406	407	405	402	395	385	370	351	331	317	314
55	268	270	284	306	325	339	347	350	350	350	349	348	346	338	325	307	285	268	264
60	218	221	238	261	278	289	293	294	295	295	294	293	290	286	277	261	241	221	214
65	170	174	195	215	230	238	243	246	249	250	249	246	242	236	227	215	196	175	166
70	123	130	152	170	183	193	202	208	213	215	213	209	202	192	182	170	153	132	121
75	81.5	90.4	111	128	143	157	168	176	182	184	182	177	169	158	144	129	113	93.8	79.2
80	45.3	56.4	75.1	93.5	111	126	138	147	153	156	154	149	140	128	113	95.9	77.6	59.7	43.1
85	17.0	27.2	46.5	66.1	83.8	100	113	123	129	131	129	124	115	103	86.9	69.1	50.2	30.7	16.1
90	1.29	9.59	26.7	45.5	63.6	79.1	92.0	101	107	109	108	103	94.1	82.0	67.4	49.8	31.3	13.5	0.83
95	2.02	6.60	20.9	37.9	54.8	69.5	81.0	89.5	94.8	96.9	95.7	91.4	83.6	72.8	58.9	42.6	25.5	10.3	2.19
100	3.40	8.05	19.0	33.5	48.4	62.1	72.5	80.6	85.5	87.4	86.3	82.4	75.1	65.4	52.4	37.9	23.4	11.8	3.79
105	4.97	10.5	19.7	31.5	44.3	56.0	65.9	72.7	77.0	78.8	77.7	74.1	68.4	59.2	48.2	36.0	24.2	14.6	5.70
110	6.61	11.5	20.8	31.6	42.1	52.1	60.3	66.5	70.3	72.1	71.1	68.2	62.7	55.1	45.8	35.9	26.3	16.9	7.69
115	8.21	12.5	22.8	31.7	41.5	49.8	56.5	61.7	64.9	66.2	65.6	63.2	58.8	52.7	45.2	37.0	28.4	18.3	9.61
120	9.90	15.0	24.0	31.4	40.7	48.9	54.6	58.6	61.2	62.3	61.9	60.0	56.7	51.7	45.3	37.8	29.7	19.9	11.3
125	11.7	17.9	23.7	33.4	39.9	47.2	53.2	57.0	59.3	60.2	59.9	58.4	55.5	50.9	45.0	38.2	29.5	21.2	12.9
130	13.0	19.7	23.5	33.0	39.1	45.7	51.0	54.3	56.9	58.1	58.0	56.6	53.8	49.6	44.1	37.9	29.2	22.4	14.2
135	14.1	20.7	23.5	31.6	38.6	43.5	48.4	52.3	54.4	55.4	55.0	53.6	51.3	47.6	43.0	36.1	28.9	23.1	15.4
140	15.0	21.6	24.6	30.3	36.9	42.0	45.5	48.3	50.5	51.6	51.5	50.3	48.2	45.1	40.3	34.3	28.7	23.4	16.0
145	15.5	21.3	24.9	28.6	34.4	39.1	43.1	45.8	47.4	48.0	47.9	46.9	45.0	41.6	37.1	32.5	28.2	24.2	16.8
150	15.8	20.5	24.2	28.1	32.3	35.7	39.0	41.6	43.4	44.2	44.0	42.8	40.7	37.9	34.6	30.8	24.0	22.9	17.2
155	15.2	18.0	23.2	27.0	29.8	32.4	35.2	37.1	38.6	39.2	39.1	38.3	36.8	34.8	32.1	28.6	23.4	20.6	16.6
160	15.3	16.5	20.7	24.7	27.4	30.3	31.2	32.6	34.4	34.9	34.8	34.2	32.5	31.0	29.4	26.2	23.6	18.9	15.8
165	15.3	15.4	18.6	23.3	25.5	26.9	28.7	30.3	30.7	30.6	30.5	30.3	29.7	28.0	26.9	25.4	21.8	17.5	15.7
170	15.0	14.6	14.7	18.5	22.2	24.6	26.1	25.9	26.7	26.8	26.5	26.0	25.2	25.0	22.5	18.6	15.6	14.4	14.6
175	14.7	14.6	14.2	14.0	16.0	18.1	19.9	21.3	21.8	21.5	21.5	19.6	15.9	13.1	12.7	12.5	12.6	12.8	13.5
180	5.38	5.38	5.38	5.38	5.38	5.38	5.38	5.38	5.38	5.38	5.38	5.38	5.38	5.38	5.38	5.38	5.38	5.38	5.38

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	610	610	610	610	610	610	610	610	610	610	610	610	610	610	610	610	610		
5	607	608	609	610	611	612	612	613	613	613	613	612	611	611	610	609	608		
10	598	600	602	605	607	609	611	612	612	612	611	610	608	605	603	600	598		
15	581	585	589	593	598	601	605	607	608	607	605	603	599	595	590	586	583		
20	560	565	570	577	583	589	593	597	598	597	595	591	585	579	572	566	561		
25	531	538	546	555	563	570	576	580	582	582	578	573	566	558	549	541	534		
30	498	506	517	528	538	547	554	559	562	561	557	550	541	532	521	511	502		
35	459	470	483	496	509	519	526	532	534	533	529	522	512	501	488	476	465		
40	417	429	444	460	474	484	491	497	500	499	494	488	479	466	451	436	423		
45	370	384	402	420	434	444	451	456	458	458	454	448	439	427	410	393	377		
50	322	338	357	375	389	398	402	403	404	404	403	401	394	383	367	346	329		
55	272	290	311	327	338	342	342	341	342	342	342	344	343	335	320	299	280		
60	222	242	262	276	282	285	287	289	290	290	289	287	286	283	271	252	231		
65	175	196	213	224	231	238	244	248	250	249	246	241	235	229	221	205	183		
70	131	152	166	178	189	200	209	215	217	216	211	203	194	183	172	160	139		
75	90.7	110	125	141	155	168	178	184	187	185	180	171	160	147	132	116	98.7		
80	55.6	73.1	91.3	109	125	139	150	157	160	158	153	143	131	115	97.7	79.6	62.1		
85	26.2	44.9	64.1	82.9	100	114	125	132	135	133	128	118	105	88.7	70.3	51.0	31.8		
90	9.86	27.5	46.5	64.9	81.6	95.2	105	112	114	113	108	98.5	85.8	69.6	51.5	32.3	14.0		
95	6.08	21.3	38.9	56.1	71.5	84.1	93.5	99.2	101	100	95.4	87.0	75.2	60.4	43.4	25.5	9.02		
100	7.10	17.3	33.1	48.5	62.4	73.9	82.3	87.5	89.5	88.4	84.1	76.5	65.8	52.2	37.1	21.6	8.77		
105	8.31	18.0	29.9	43.2	55.3	65.1	72.3	76.7	78.5	77.5	73.7	67.2	58.1	46.8	34.2	21.5	10.1		
110	9.06	19.4	30.2	40.7	50.6	59.1	65.2	68.8	70.1	69.4	66.3	60.9	53.4	44.2	34.0	22.8	10.8		
115	9.94	20.5	31.1	40.6	48.9	55.5	60.3	63.1	64.2	63.6	61.1	57.0	51.3	43.8	34.7	24.0	11.5		
120	10.9	20.6	31.4	40.6	48.3	54.2	58.3	60.3	61.1	60.6	58.8	55.5	50.4	43.6	35.1	24.5	12.3		
125	12.0	20.4	31.4	40.0	47.3	53.1	57.0	58.9	59.6	59.1	57.4	54.3	49.5	43.2	34.9	23.9	13.4		
130	12.9	20.3	30.1	38.9	45.6	51.1	54.9	56.8	57.6	57.1	55.4	52.4	48.0	42.1	34.0	23.6	14.5		
135	13.7	20.2	28.5	37.1	43.6	48.4	52.1	53.9	54.6	54.2	52.5	49.8	46.0	40.6	32.1	23.5	15.5		
140	14.5	20.4	27.4	34.3	41.1	45.9	49.0	50.5	51.1	50.8	49.4	47.2	43.7	37.6	30.7	23.5	16.4		
145	15.1	20.5	26.4	32.0	37.3	42.1	45.8	47.3	47.9	47.6	46.3	43.6	39.8	35.1	29.6	23.7	17.4		
150	15.0	20.1	25.6	30.0	34.1	37.8	40.8	42.3	43.0	42.7	41.5	39.4	36.6	33.1	28.9	23.7	17.1		
155	16.2	18.6	23.4	28.2	31.5	34.3	36.6	37.7	38.3	38.2	37.3	36.0	34.1	31.7	28.4	23.7	17.6		
160	16.0	18.9	22.8	25.3	28.6	31.3	33.1	34.1	34.5	34.6	34.1	33.3	32.2	30.7	27.9	23.3	18.6		
165	15.5	17.1	20.4	23.8	26.0	27.3	30.0	31.3	31.6	31.7	31.6	31.3	30.7	29.5	26.4	21.5	17.3		
170	15.6	15.6	15.8	16.6	18.0	19.6	22.6	28.3	29.6	29.7	29.7	29.2	28.3	24.6	18.9	16.4	15.5		
175	14.4	14.5	14.6	14.7	14.7	14.7	14.7	14.4	15.2	18.0	19.3	16.6	14.4	14.4	14.5	14.6	14.7		
180	5.38	5.38	5.38	5.38	5.38	5.38	5.38	5.38	5.38	5.38	5.38	5.38	5.38	5.38	5.38	5.38	5.38		

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

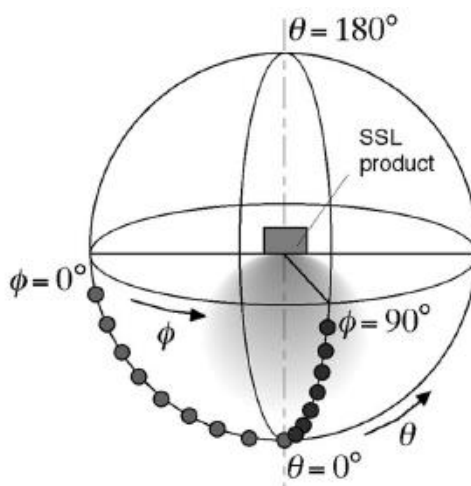
The color characteristics of SSL products include chromaticity coordinates, correlated color temperature, and color rendering index. These characteristics of SSL products may be spatially non-uniform, and thus, in order that they can be specified accurately, the color quantities shall be measured as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