



LM-79-08 Test Report

for

GREEN CREATIVE LTD

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

LED Tube

Model: 13PLL/830/GL/DIR

Laboratory: Leading Testing Laboratories

NVLAP CODE: 200960-0

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Report No.: HZ19020002s

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

Review by:

Engineer: April Zou
Feb. 21, 2019

Approved by:



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/830/GL/DIR

Luminous Efficacy (Lumens /Watt)	Total Luminous Flux (Lumens)	Power (Watts)/2	Power Factor
126.8	2077.0	16.38	0.9938
CCT (K)	CRI	Stabilization Time (Light & Power)	
2976	81.8	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

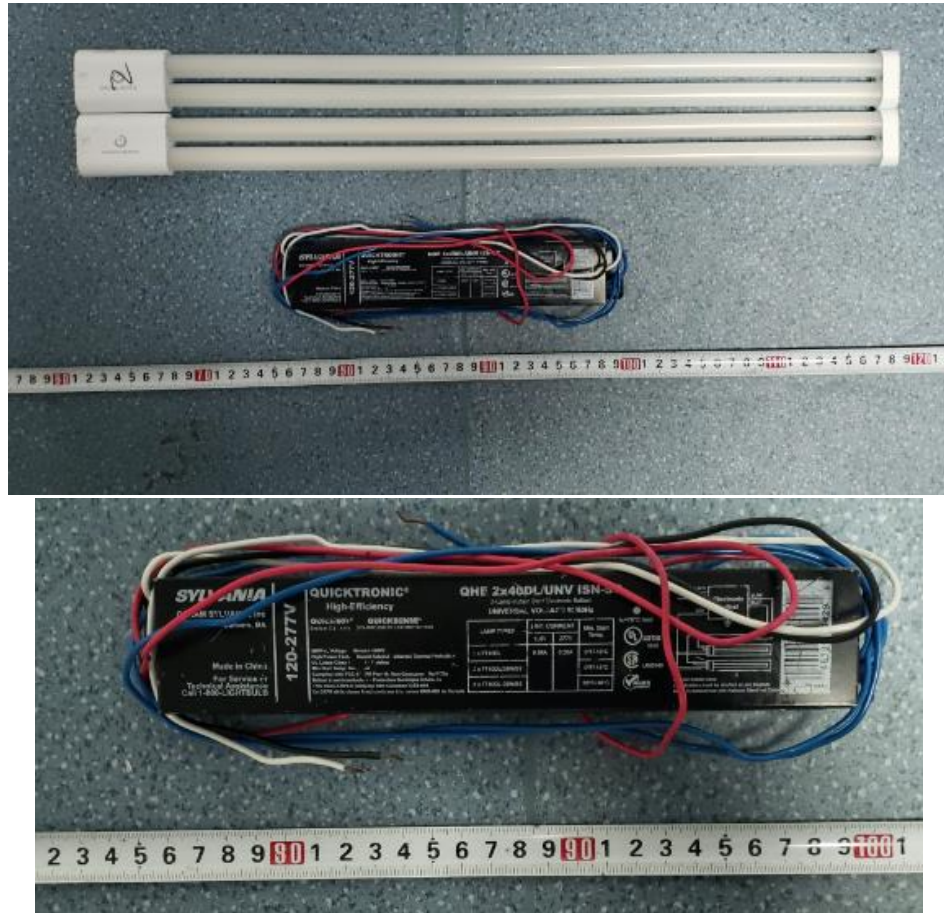


Figure 1- Overview of the sample

Equipment Under Test(EUT)

Name	: LED Tube
Model	: 13PLL/830/GL/DIR
Electrical Ratings	: 120-277V, 50/60Hz, 13W
Product Description	: 3000K 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)	0.275	0.133
Power Factor	0.9938	0.9155
Test Power (W)/2	16.38	16.91
THD A%	10.60	27.95
Luminous Efficacy (lm/W)	126.8	122.8
Total Luminous Flux (lm)	2077.0	2077.0
Color Rendering Index (CRI)	81.8	
R9	1.3	
Correlated Color Temperature (CCT)(K)	2976	
Chromaticity Chroma x	0.4374	
Chromaticity Chroma y	0.4023	
Chromaticity Chroma u	0.2516	
Chromaticity Chroma v	0.3472	
Duv	0.0010	
Chromaticity Chroma u'	0.2516	
Chromaticity Chroma v'	0.5207	

Special Color Rendering Indices	
R1	80.3
R2	91.1
R3	95.4
R4	80
R5	81
R6	89.7
R7	81.2
R8	56.1
R9	1.3
R10	80.3
R11	80
R12	74.1
R13	82.9
R14	98.1
Rf	85
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 25.1 °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)	0.275
Power Factor	0.9942
Test Power (W)/2	16.40
Luminous Efficacy (lm/W)	126.1
Total Luminous Flux (lm)	2068.0
Beam Angle (°)	111.9
Center Beam Candle Power (cd)	592
Spacing Criteria	1.21 (0 °-180 °)/ 1.36 (90 °-270 °)
Zonal Lumens in the 0 °-60 °Zone	66.13%
Zonal Lumens in the 60 °-90 °Zone	21.49%
Zonal Lumens in the 90 °-120 °Zone	7.08%
Zonal Lumens in the 120 °-180 °Zone	5.30%

Table 3: Test data per Goniophotometer Method

Spectral Power Distribution - Sphere Spectroradiometer Method

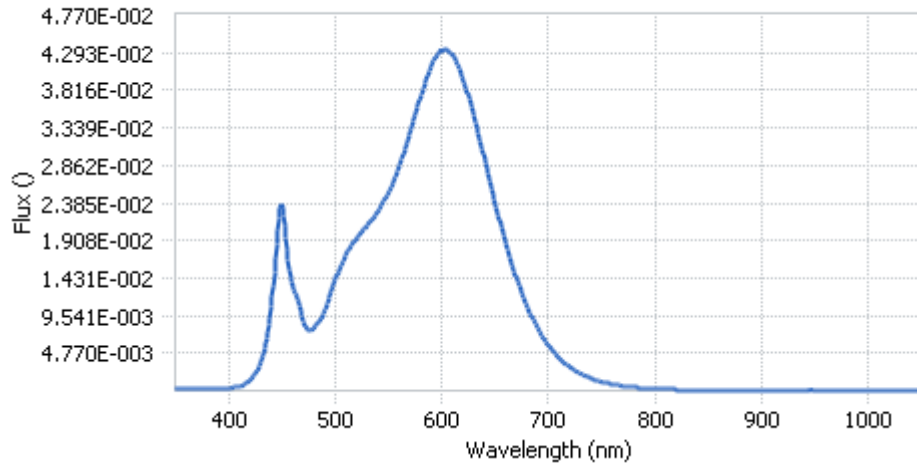
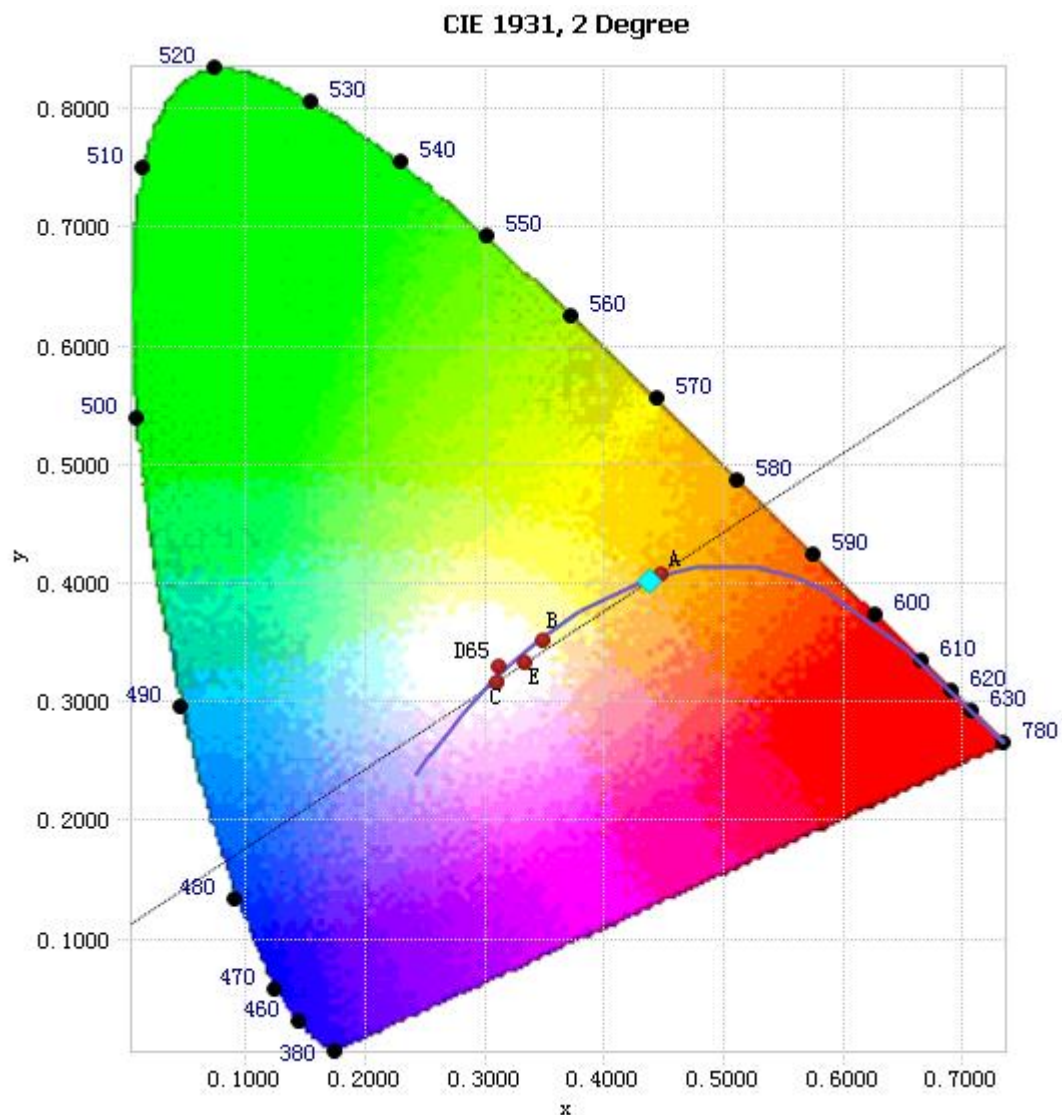


Chart 1: Spectral Power Distribution

Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	2.81E-04	485	8.81E-03	590	4.12E-02	695	6.77E-03
385	2.80E-04	490	1.03E-02	595	4.26E-02	700	5.77E-03
390	3.07E-04	495	1.22E-02	600	4.32E-02	705	4.94E-03
395	3.21E-04	500	1.41E-02	605	4.33E-02	710	4.19E-03
400	3.62E-04	505	1.58E-02	610	4.25E-02	715	3.57E-03
405	4.21E-04	510	1.73E-02	615	4.14E-02	720	3.04E-03
410	5.74E-04	515	1.84E-02	620	3.95E-02	725	2.59E-03
415	8.36E-04	520	1.94E-02	625	3.74E-02	730	2.20E-03
420	1.32E-03	525	2.02E-02	630	3.49E-02	735	1.86E-03
425	2.18E-03	530	2.11E-02	635	3.22E-02	740	1.58E-03
430	3.66E-03	535	2.19E-02	640	2.94E-02	745	1.34E-03
435	6.08E-03	540	2.28E-02	645	2.66E-02	750	1.14E-03
440	1.06E-02	545	2.40E-02	650	2.38E-02	755	9.73E-04
445	1.87E-02	550	2.52E-02	655	2.12E-02	760	8.36E-04
450	2.38E-02	555	2.67E-02	660	1.87E-02	765	7.10E-04
455	1.80E-02	560	2.85E-02	665	1.64E-02	770	6.11E-04
460	1.32E-02	565	3.06E-02	670	1.42E-02	775	5.17E-04
465	1.16E-02	570	3.28E-02	675	1.24E-02	780	4.46E-04
470	9.07E-03	575	3.51E-02	680	1.07E-02		
475	7.64E-03	580	3.74E-02	685	9.24E-03		
480	7.99E-03	585	3.96E-02	690	7.94E-03		

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

Chromaticity Diagram - Sphere Spectroradiometer Method



Tristimulus values(x, y): (0.4374, 0.4023)

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

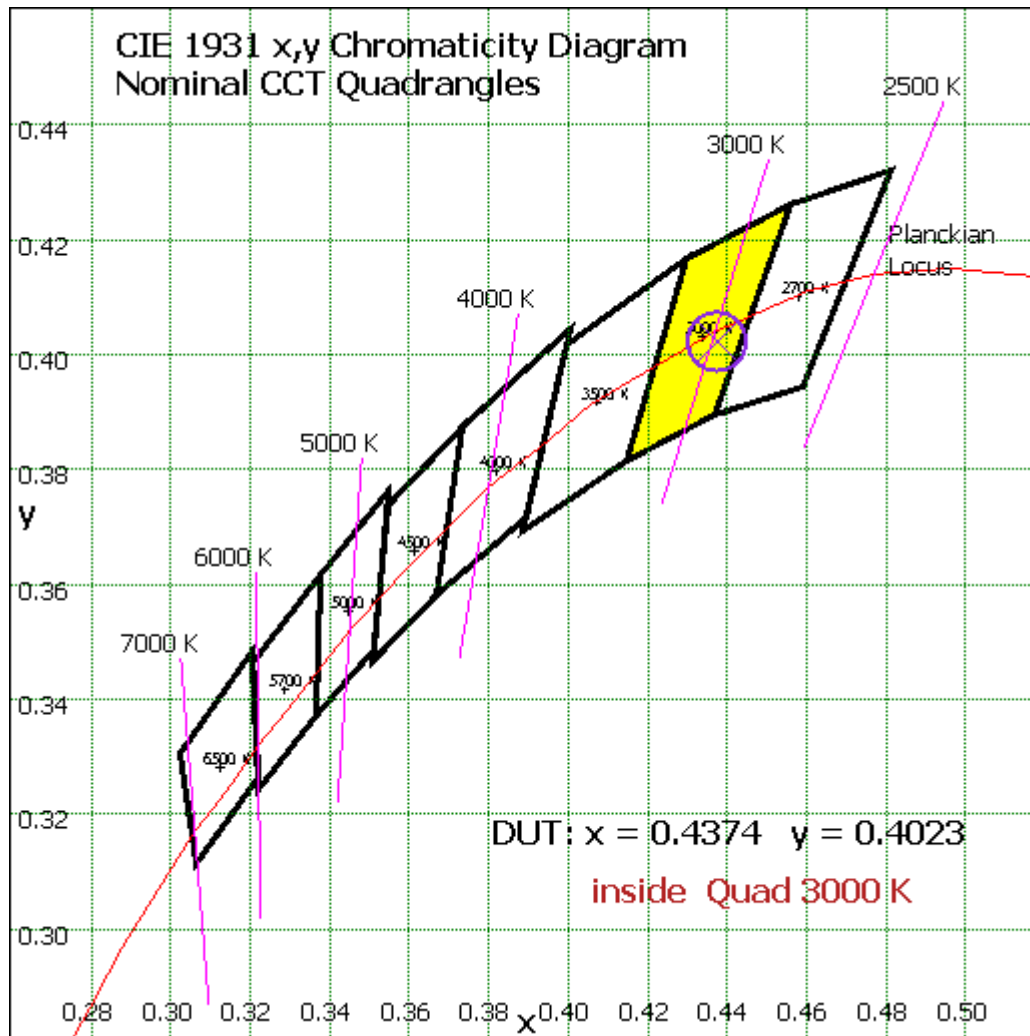


Chart 3: Plot of Lamp x/y coordinates on CIE 1931 Chromaticity Diagram

Color Vector – Sphere Spectroradiometer Method

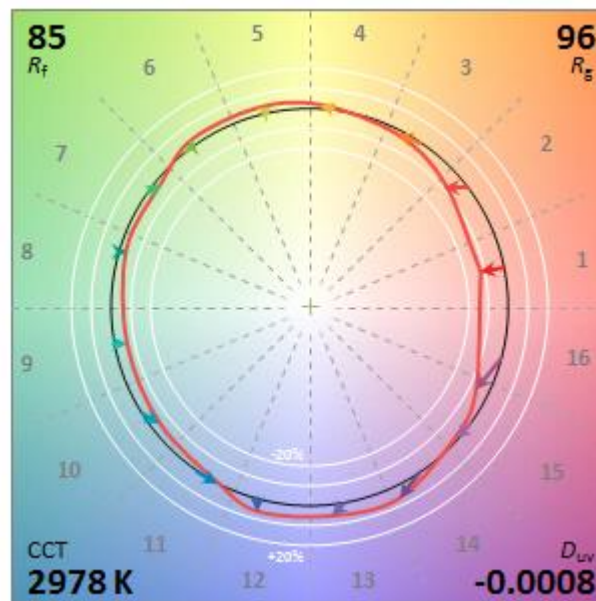


Chart 4: Color Vector Diagram of TM-30-18

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	56.187	2.72%
10- 20	162.408	7.85%
20- 30	249.396	12.06%
30- 40	303.907	14.70%
40- 50	315.783	15.27%
50- 60	279.911	13.54%
60- 70	212	10.25%
70- 80	144.43	6.98%
80- 90	87.913	4.25%
90-100	58.714	2.84%
100-110	47.097	2.28%
110-120	40.67	1.97%
120-130	35.977	1.74%
130-140	29.51	1.43%
140-150	21.589	1.04%
150-160	13.653	0.66%
160-170	7.148	0.35%
170-180	1.709	0.08%
Total	2068.0	100%

$\gamma(^{\circ})$	Lumens	% Total
0- 60	1367.592	66.13%
60- 90	444.343	21.49%
0-90	1811.935	87.62%
90- 180	256.067	12.38%
0- 180	2068.0	100%

Table 5: Zonal Lumen

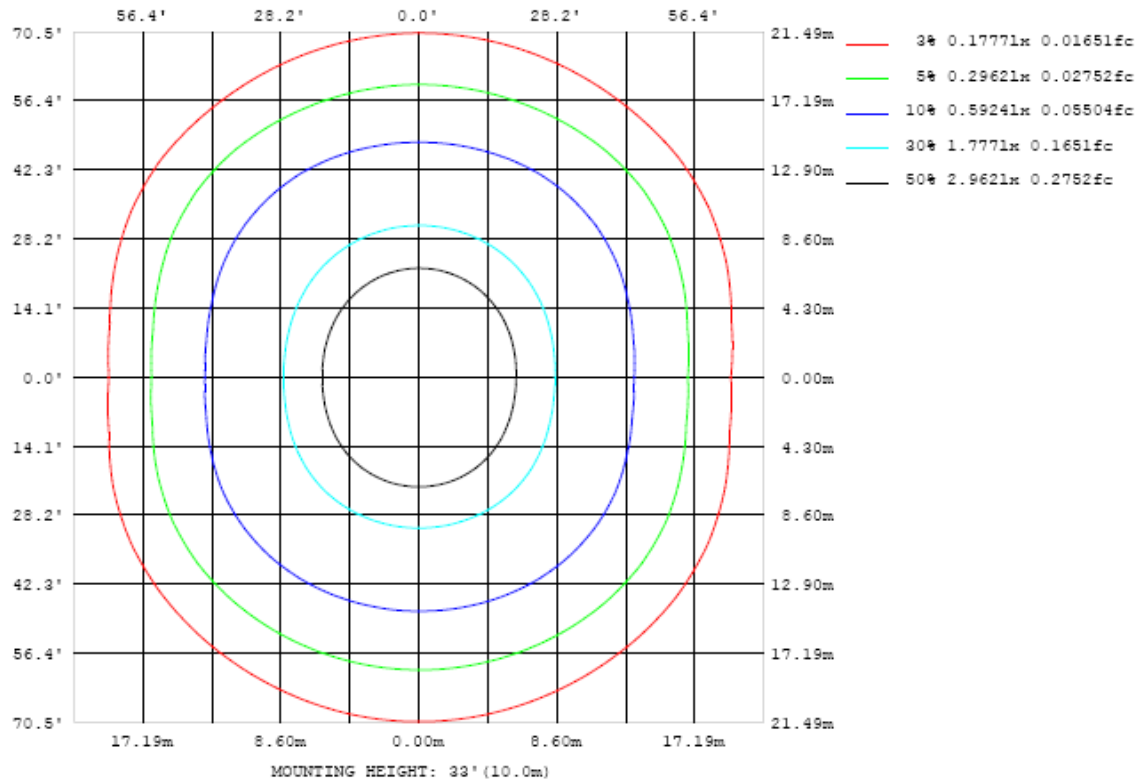


Chart 5: Illuminance Plot (Footcandles)

Luminous Intensity Distribution Plots- Goniophotometer Method

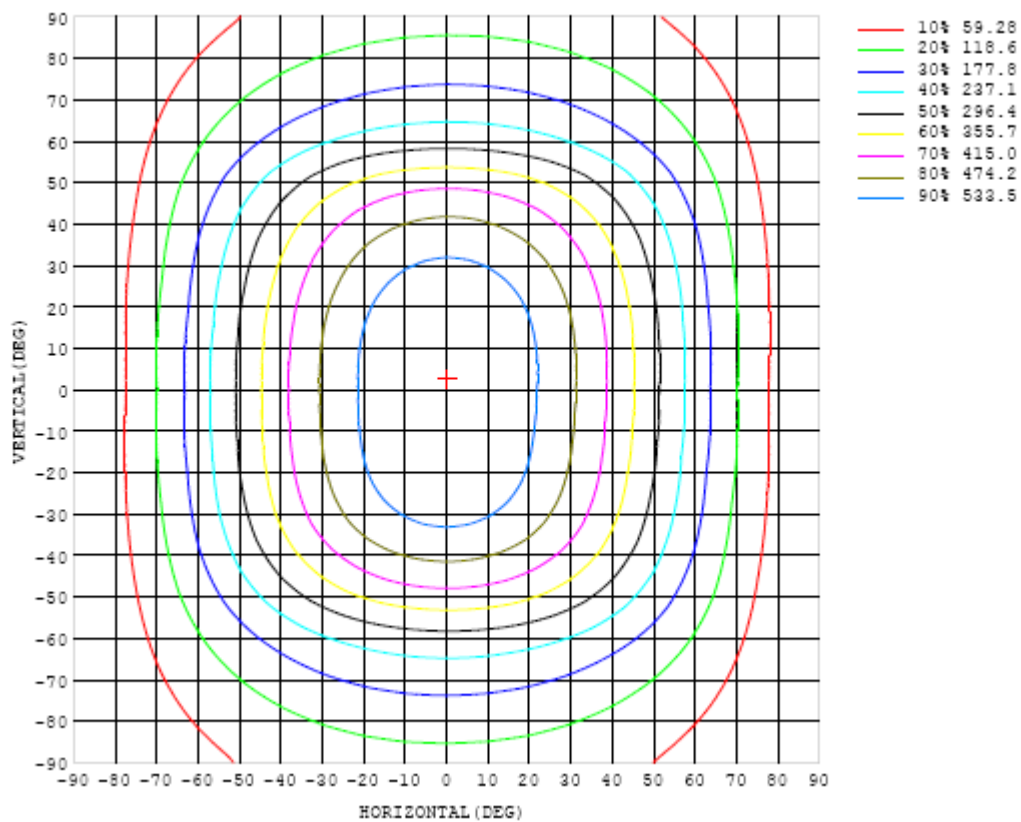


Chart 6: Isocandela Plot

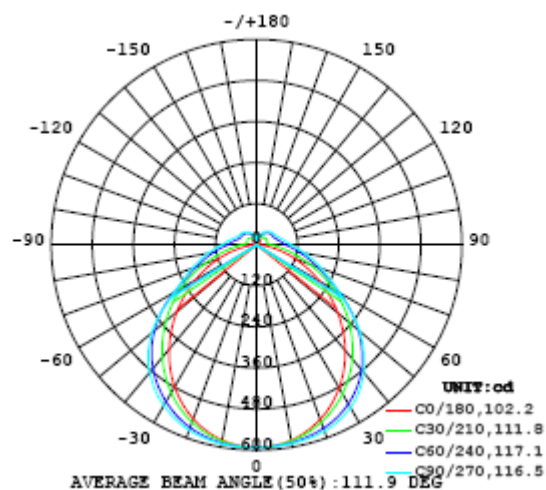


Chart 7: Polar Candela Distribution

Luminous Intensity Data- Goniophotometer Method

Table--1

UNIT: cd

C (DEG) γ (DEG)	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
0	592	592	592	592	592	592	592	592	592	592	592	592	592	592	592	592	592	592	592
5	589	589	589	590	590	590	591	591	591	591	591	591	591	590	590	589	589	589	589
10	580	580	581	582	583	585	587	588	589	590	589	588	587	585	583	582	580	579	579
15	564	564	566	569	573	577	580	583	585	586	585	583	580	577	573	569	566	564	563
20	543	543	547	552	558	565	570	575	578	579	578	575	571	565	558	552	546	542	541
25	515	516	522	529	539	548	556	562	566	567	566	562	556	548	539	529	520	515	513
30	482	484	492	502	515	527	536	543	547	549	547	543	536	526	514	501	490	482	479
35	445	447	457	471	486	499	510	517	521	523	521	517	510	499	485	469	455	444	441
40	403	406	418	435	452	467	477	483	485	486	485	482	475	466	451	433	416	403	398
45	357	362	376	395	414	427	435	440	443	444	442	439	434	425	412	393	374	358	352
50	310	315	331	353	371	382	389	392	393	393	392	390	386	379	368	351	329	311	305
55	261	267	285	308	323	332	336	336	334	333	333	334	333	329	320	305	284	264	256
60	212	219	240	260	273	279	280	279	279	278	278	277	277	275	269	257	239	217	208
65	165	173	195	212	222	226	230	233	235	236	235	232	228	223	218	209	193	172	162
70	120	129	150	165	174	183	190	196	200	201	200	196	190	181	172	162	149	129	117
75	79.1	89.8	109	123	136	147	157	165	169	171	170	165	157	147	135	122	108	91.3	76.8
80	43.8	55.8	72.4	88.5	104	117	129	137	142	144	142	138	129	118	104	89.3	73.3	57.3	41.7
85	16.2	26.5	44.0	61.6	77.8	92.5	105	113	118	120	119	114	105	93.7	79.3	63.5	46.0	28.5	15.5
90	1.07	9.42	25.3	42.7	59.1	73.8	85.2	93.8	98.8	101	99.4	94.7	86.5	75.2	61.7	45.4	28.5	12.2	0.59
95	1.79	6.43	19.8	35.8	51.4	65.2	75.8	83.8	88.6	90.4	89.2	85.0	77.2	67.3	53.9	38.9	23.0	9.11	2.09
100	3.14	8.85	18.5	31.9	45.6	58.0	68.3	75.3	79.9	81.6	80.5	76.6	70.1	60.3	48.3	35.1	21.7	11.2	3.66
105	4.69	11.1	20.5	30.9	42.5	53.2	62.0	68.7	72.8	74.0	73.3	70.0	64.0	55.5	45.3	34.0	23.3	14.4	5.48
110	6.34	10.3	22.5	31.8	41.3	50.2	57.7	63.4	66.9	68.3	67.6	64.8	59.5	52.4	43.7	34.6	26.0	16.5	7.33
115	8.13	13.4	22.6	33.0	41.5	48.8	54.8	59.5	62.4	63.6	63.1	60.8	56.5	50.7	43.8	36.3	28.2	17.9	9.14
120	9.82	15.8	24.1	33.3	41.8	48.6	53.7	57.4	59.6	60.7	60.3	58.4	55.1	50.4	44.4	37.3	29.1	19.4	10.6
125	11.4	18.2	22.3	32.4	41.6	48.1	53.0	56.3	58.4	59.2	58.8	57.3	54.3	50.1	44.4	37.7	28.7	20.7	12.0
130	12.7	20.0	23.6	31.6	39.2	46.8	51.6	54.9	56.9	57.7	57.3	55.8	52.9	48.7	43.6	37.0	28.5	21.8	13.2
135	13.7	21.4	23.9	30.1	37.6	43.6	49.1	52.4	54.4	55.2	54.8	53.3	50.6	47.0	42.4	35.1	28.3	22.4	14.1
140	14.6	22.5	24.3	27.4	34.5	41.1	45.4	48.5	50.6	51.6	51.4	50.2	48.0	44.8	39.3	33.4	28.1	22.5	14.9
145	15.1	22.4	25.4	29.0	30.7	36.8	41.7	45.3	47.1	47.9	47.7	46.5	44.0	40.4	36.3	31.9	27.6	23.8	15.3
150	15.5	21.8	24.5	28.0	31.8	31.6	36.6	39.6	41.7	42.8	42.7	41.5	39.5	36.7	33.2	30.1	23.4	22.8	15.6
155	15.4	18.6	23.6	27.2	30.5	32.7	32.3	33.7	36.3	37.1	37.1	36.1	34.1	33.6	31.5	27.9	23.3	19.5	15.4
160	15.6	16.6	21.7	24.1	27.7	30.8	31.4	33.0	33.7	33.9	34.0	33.8	32.5	31.3	28.8	24.8	23.2	17.0	15.1
165	15.6	15.7	18.4	22.4	25.0	27.4	27.9	29.8	30.3	30.6	30.5	30.1	28.7	27.6	26.2	24.1	19.2	15.8	15.1
170	15.4	15.0	14.6	16.6	22.2	24.9	26.2	26.4	26.0	25.8	25.5	25.4	25.6	22.5	18.4	15.2	13.9	13.5	14.7
175	15.0	14.5	14.2	14.1	14.4	15.8	17.2	19.9	21.4	21.3	20.7	13.9	11.7	11.7	11.7	11.8	12.1	12.9	13.9
180	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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	592	592	592	592	592	592	592	592	592	592	592	592	592	592	592	592	592		
5	589	590	590	591	591	592	592	592	593	592	592	592	591	591	590	590	590		
10	580	581	582	584	586	588	589	590	591	590	590	588	587	585	583	582	581		
15	564	567	570	573	577	580	583	585	585	585	584	581	578	575	571	568	566		
20	543	546	551	557	563	568	572	575	576	576	574	570	565	560	554	549	545		
25	515	520	528	536	544	552	557	560	562	561	558	554	547	540	532	524	518		
30	482	489	499	510	521	529	536	540	542	541	538	532	525	515	505	495	487		
35	444	454	466	480	492	503	511	515	518	517	513	506	497	485	473	460	450		
40	402	414	429	445	459	471	479	484	486	485	481	475	465	452	437	421	409		
45	357	371	388	407	422	434	442	446	448	448	445	438	428	415	397	379	365		
50	310	326	346	365	380	390	396	399	400	400	398	394	387	373	355	335	318		
55	262	280	302	320	332	339	340	338	337	338	341	343	338	328	311	289	271		
60	215	234	256	270	279	279	277	277	277	277	278	281	283	277	264	244	223		
65	169	191	208	220	223	227	231	233	234	234	232	230	227	225	216	199	177		
70	127	148	163	171	180	188	194	198	200	199	196	191	184	176	169	155	135		
75	88.7	107	121	134	146	156	164	169	171	170	166	159	150	139	127	113	95.5		
80	54.8	71.1	87.5	103	117	128	137	142	145	143	139	132	121	108	92.8	76.5	60.1		
85	26.0	43.4	61.0	77.6	92.4	105	113	119	121	120	116	108	96.3	82.0	65.8	48.2	30.2		
90	9.77	25.7	42.8	59.0	73.4	85.2	93.7	98.8	101	99.6	95.3	87.5	76.3	62.2	46.2	29.0	12.4		
95	6.06	20.0	36.0	51.4	64.9	75.9	83.8	88.5	90.3	89.2	85.1	77.9	67.5	54.2	39.0	22.8	7.88		
100	7.07	16.6	30.9	44.7	57.2	67.3	74.6	79.0	80.8	79.8	75.9	69.1	59.5	47.2	33.4	19.4	8.26		
105	8.38	17.3	28.1	40.2	51.0	59.6	66.1	70.0	71.6	70.6	67.2	61.1	52.9	42.7	31.2	19.9	9.75		
110	9.05	19.0	28.8	38.1	47.1	54.7	60.1	63.3	64.5	63.7	61.0	56.1	49.2	40.9	31.7	21.6	10.3		
115	9.87	20.2	29.9	38.5	45.8	51.8	56.1	58.6	59.6	58.9	56.7	53.0	47.8	41.1	32.9	23.0	11.0		
120	10.8	20.4	30.5	38.8	45.7	51.1	54.6	56.4	57.1	56.7	55.0	52.1	47.5	41.4	33.7	23.5	11.9		
125	11.8	20.3	30.7	38.5	45.2	50.4	53.8	55.5	56.2	55.8	54.2	51.4	47.0	41.4	33.8	23.1	12.9		
130	12.6	20.2	29.7	37.8	43.8	48.9	52.3	54.0	54.7	54.3	52.8	50.0	46.0	40.6	32.8	22.9	13.9		
135	13.3	20.2	28.1	36.3	42.2	46.6	49.9	51.6	52.3	51.9	50.3	47.8	44.5	39.3	31.2	23.0	15.0		
140	14.0	20.4	27.1	33.7	40.1	44.4	47.2	48.5	49.2	48.9	47.6	45.7	42.5	36.5	30.0	23.1	16.0		
145	14.7	20.7	26.2	31.5	36.6	41.1	44.5	45.8	46.4	46.1	44.9	42.4	38.9	34.3	29.0	23.4	17.1		
150	14.9	20.8	25.5	29.7	33.7	37.2	40.0	41.3	42.0	41.7	40.4	38.5	35.9	32.5	28.4	23.8	17.3		
155	15.8	20.0	24.0	28.0	31.2	33.9	36.1	37.1	37.7	37.5	36.7	35.4	33.6	31.2	28.2	24.1	18.1		
160	16.0	19.6	23.5	25.7	28.8	31.1	32.8	33.6	34.1	34.1	33.7	32.9	31.9	30.4	28.1	23.5	19.0		
165	15.1	17.8	21.5	24.9	26.0	28.0	30.2	31.0	31.4	31.5	31.4	31.0	30.5	29.6	27.4	22.8	18.4		
170	15.1	15.0	15.5	17.2	19.2	21.4	24.6	29.0	29.4	29.6	29.6	29.4	28.7	26.8	21.5	17.6	16.4		
175	14.2	14.3	14.3	14.3	14.2	14.1	14.2	15.3	18.7	23.4	23.3	20.5	17.2	15.0	14.8	14.9	14.9		
180	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		

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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