

LM-79-08 TEST REPORT

for

GREEN CREATIVE LTD

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

LED Tube

Model: 17PLL/835/GL/BYP

Laboratory: Leading Testing Laboratories

NVLAP CODE: 200960-0

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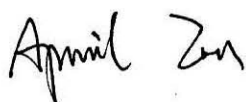
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Report No.: HZ19050020g

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: 17PLL/835/GL/BYP

Luminous Efficacy (Lumens /Watt)	Total Luminous Flux (Lumens)	Power (Watts)	Power Factor
139.5	2246.0	16.10	0.9789
CCT (K)	CRI	Stabilization Time (Light & Power)	
3477	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	: May 20, 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

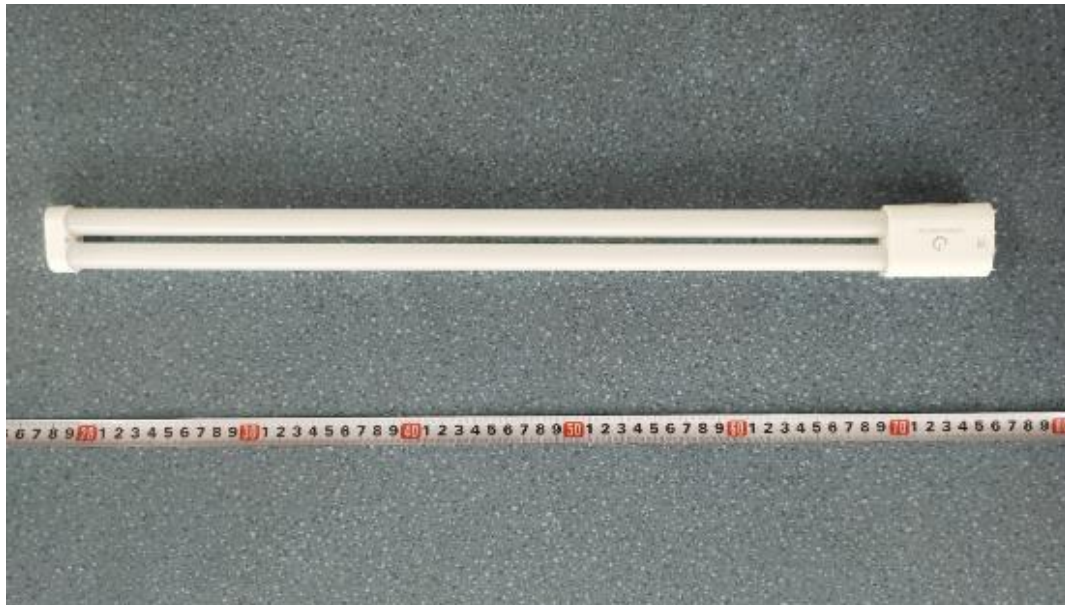


Figure 1- Overview of the sample

Equipment Under Test(EUT)

Name	: LED Tube
Model	: 17PLL/835/GL/BYP
Electrical Ratings	: 120-277V, 60Hz, 17W
Product Description	: 3500K
Manufacturer	: GREEN CREATIVE LTD
Address	: 756 North Zhongshan Rd., Unit B301 Zhabei District, Shanghai

TEST RESULTS

Test ambient temperature was 26.0°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	277.0
Voltage frequency (Hz)	60	60
Test Current (A)	0.137	0.063
Power Factor	0.9789	0.9219
Test Power (W)	16.10	16.08
THD A%	19.28	19.86
Luminous Efficacy (lm/W)	139.5	139.9
Total Luminous Flux (lm)	2246.0	2250.0
Color Rendering Index (CRI)	81.5	
R9	0	
Correlated Color Temperature (CCT)(K)	3477	
Chromaticity Chroma x	0.4071	
Chromaticity Chroma y	0.3928	
Chromaticity Chroma u	0.2360	
Chromaticity Chroma v	0.3416	
Duv	0.0003	
Chromaticity Chroma u'	0.2360	
Chromaticity Chroma v'	0.5124	

Special Color Rendering Indices	
R1	79.4
R2	89.1
R3	96
R4	79.7
R5	79.6
R6	85.7
R7	83.5
R8	58.8
R9	0
R10	74.9
R11	78.6
R12	64.4
R13	81.7
R14	98.2

Table 2: Test data per Sphere-Spectroradiometer Method

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

Goniophotometer Method

Test ambient temperature was 24.7°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)	0.139
Power Factor	0.9755
Power (W)	16.25
Luminous Efficacy (lm/W)	136.7
Total Luminous Flux (lm)	2221.3
Beam Angle (°)	101.8 (0°-180°) / 112.5 (90°-270°)
Center Beam Candle Power (cd)	664
Maximum Beam Candle Power (cd)	667.8 (At: C=60.0, Gamma=6.0)
Spacing Criteria	1.20 (0°-180°) / 1.26 (90°-270°)
Zonal Lumens in the 0 °-60 °Zone	66.19%
Zonal Lumens in the 60 °-90 °Zone	20.97%
Zonal Lumens in the 90 °-120 °Zone	7.14%
Zonal Lumens in the 120 °-180 °Zone	5.70%

Table 3: Test data per Goniophotometer Method

Spectral Power Distribution - Sphere Spectroradiometer Method

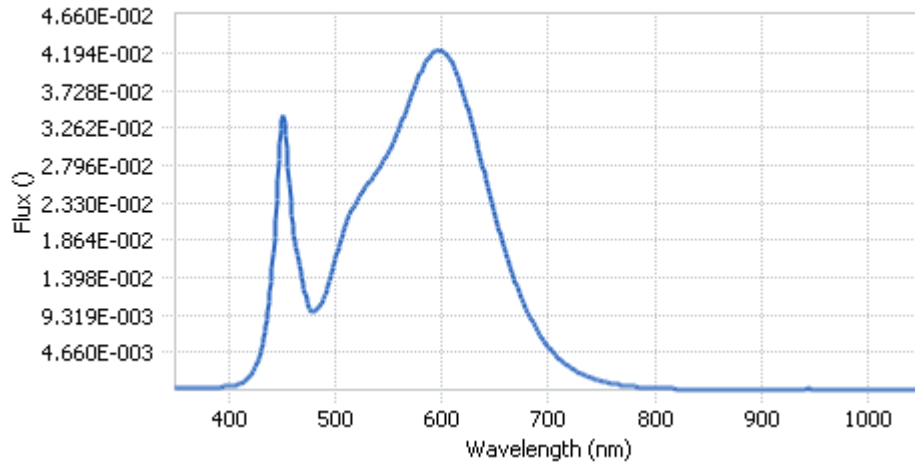
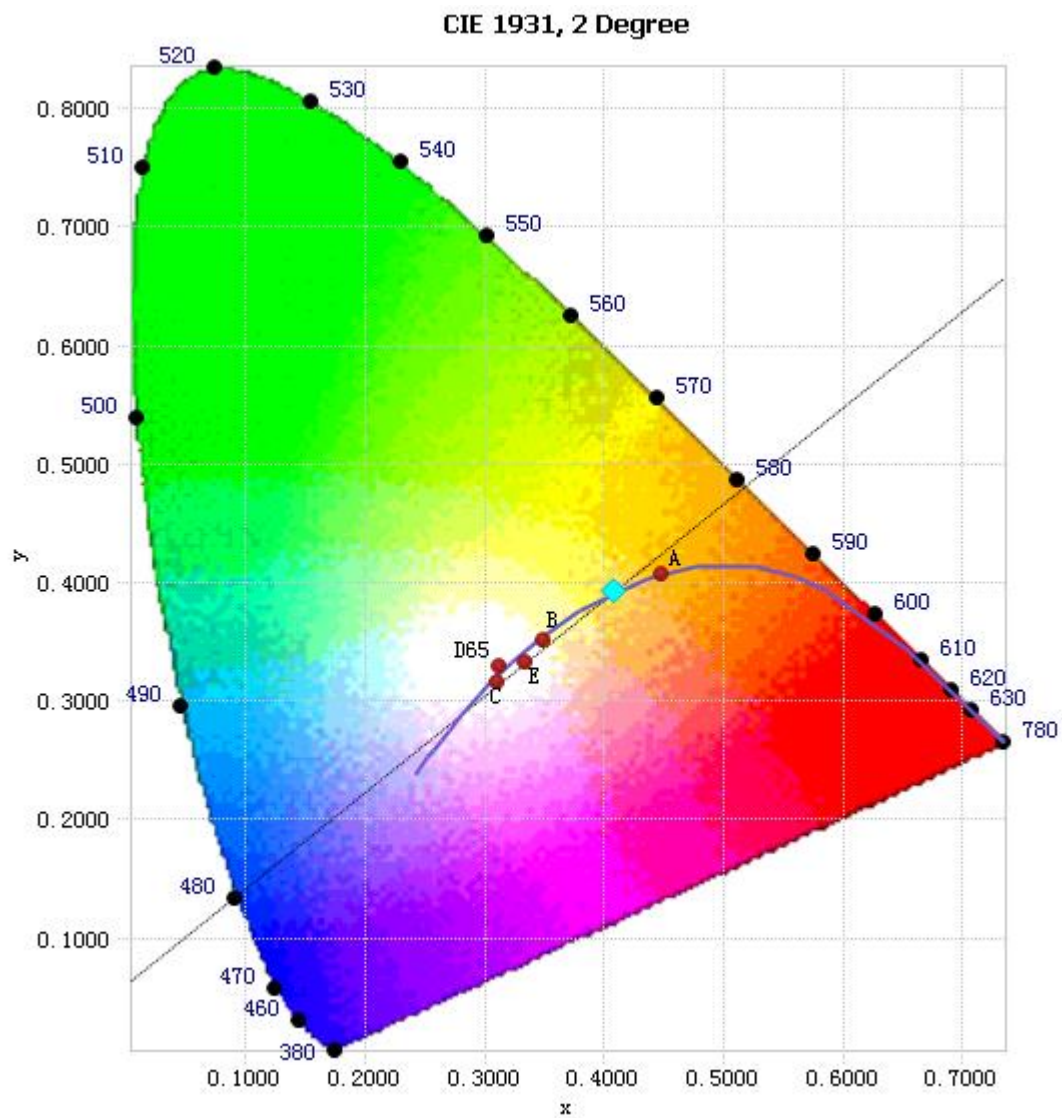


Chart 1: Spectral Power Distribution

Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	3.56E-04	485	1.04E-02	590	4.16E-02	695	6.20E-03
385	3.49E-04	490	1.17E-02	595	4.22E-02	700	5.35E-03
390	3.47E-04	495	1.38E-02	600	4.22E-02	705	4.55E-03
395	4.07E-04	500	1.63E-02	605	4.17E-02	710	3.88E-03
400	4.49E-04	505	1.86E-02	610	4.06E-02	715	3.31E-03
405	5.35E-04	510	2.06E-02	615	3.89E-02	720	2.83E-03
410	7.38E-04	515	2.23E-02	620	3.69E-02	725	2.42E-03
415	1.06E-03	520	2.35E-02	625	3.47E-02	730	2.06E-03
420	1.70E-03	525	2.46E-02	630	3.22E-02	735	1.76E-03
425	2.84E-03	530	2.55E-02	635	2.95E-02	740	1.50E-03
430	4.77E-03	535	2.64E-02	640	2.69E-02	745	1.28E-03
435	8.06E-03	540	2.73E-02	645	2.42E-02	750	1.09E-03
440	1.36E-02	545	2.84E-02	650	2.16E-02	755	9.35E-04
445	2.37E-02	550	2.96E-02	655	1.93E-02	760	8.04E-04
450	3.37E-02	555	3.09E-02	660	1.70E-02	765	6.90E-04
455	2.98E-02	560	3.25E-02	665	1.49E-02	770	5.85E-04
460	2.04E-02	565	3.42E-02	670	1.30E-02	775	5.05E-04
465	1.66E-02	570	3.61E-02	675	1.13E-02	780	4.35E-04
470	1.32E-02	575	3.78E-02	680	9.77E-03		
475	1.02E-02	580	3.95E-02	685	8.43E-03		
480	9.70E-03	585	4.08E-02	690	7.26E-03		

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

Chromaticity Diagram - Sphere Spectroradiometer Method



Tristimulus values(x, y): (0.4071, 0.3928)

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

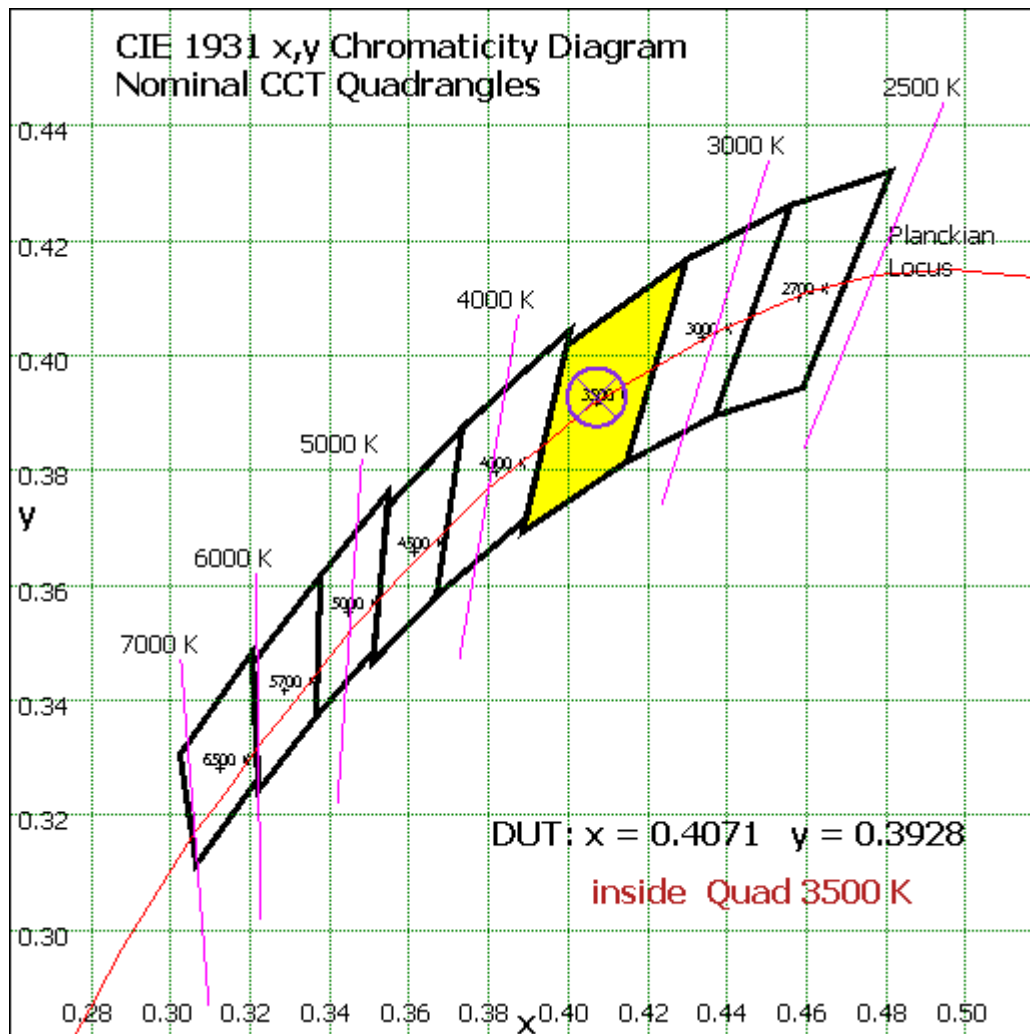
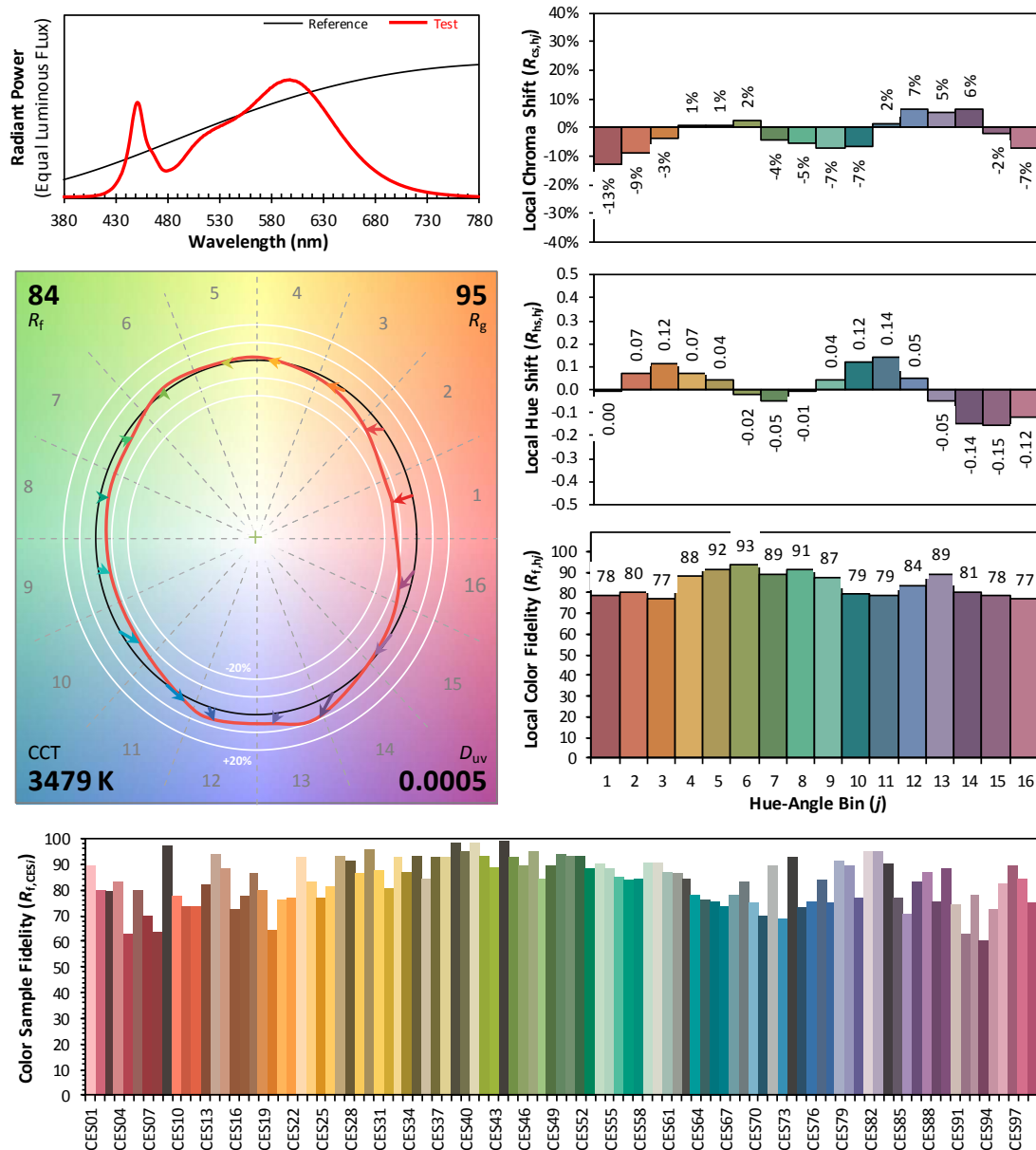


Chart 3: Plot of Lamp x/y coordinates on CIE 1931 Chromaticity Diagram

Color Rendition Report – Sphere Spectroradiometer Method



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

x 0.4070
 y 0.3928
 u' 0.2360
 v' 0.5124

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	62.687	2.82%
10- 20	178.811	8.05%
20- 30	269.92	12.15%
30- 40	325.499	14.65%
40- 50	336.525	15.15%
50- 60	296.869	13.36%
60- 70	223.416	10.06%
70- 80	150.814	6.79%
80- 90	91.637	4.13%
90-100	61.909	2.79%
100-110	51.404	2.31%
110-120	45.254	2.04%
120-130	40.538	1.82%
130-140	33.741	1.52%
140-150	25.054	1.13%
150-160	16.283	0.73%
160-170	8.803	0.40%
170-180	2.122	0.10%
Total	2221.3	100%

$\gamma(^{\circ})$	Lumens	% Total
0- 60	1470.311	66.19%
60- 90	465.867	20.97%
0-90	1936.178	87.16%
90- 180	285.108	12.84%
0- 180	2221.3	100%

Table 5: Zonal Lumen

Illuminance Plots- Goniophotometer Method

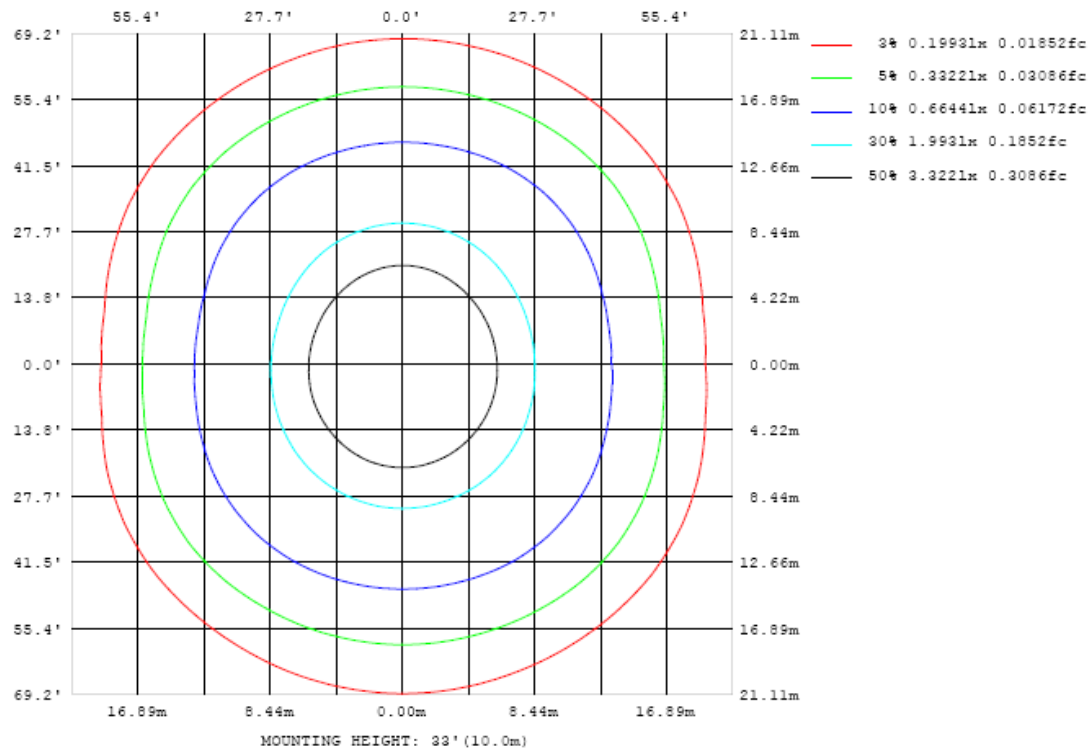


Chart 5: Illuminance Plot (Footcandles)

Luminous Intensity Distribution Plots- Goniophotometer Method

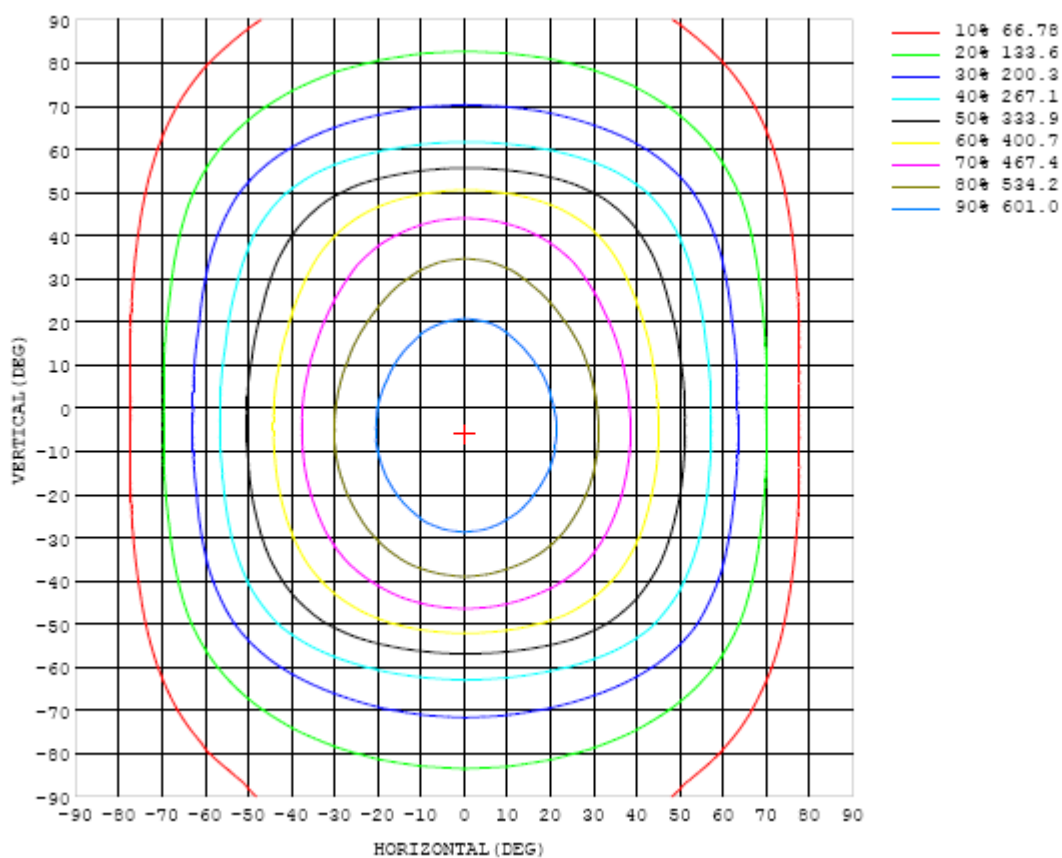


Chart 6: Isocandela Plot

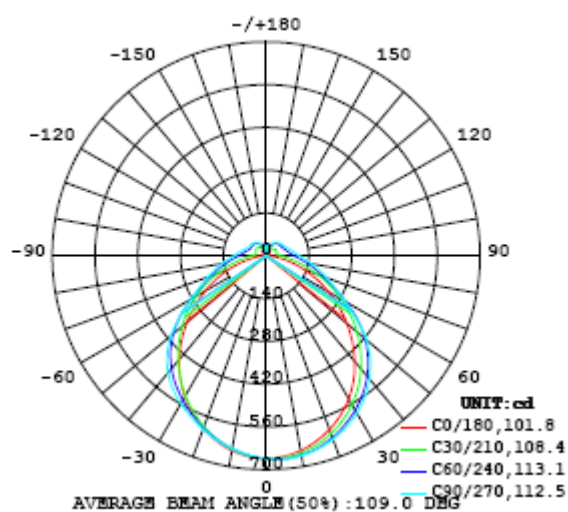


Chart 7: Polar Candela Distribution

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	664	664	664	664	664	664	664	664	664	664	664	664	664	664	664	664	664	664	664
5	659	661	662	663	664	665	667	667	667	667	667	667	666	665	664	663	662	660	659
10	647	651	653	656	658	660	663	663	664	664	664	664	661	659	658	655	653	649	647
15	629	633	636	641	644	647	651	653	654	655	653	653	650	646	643	639	636	631	627
20	605	610	615	620	624	628	633	637	639	639	638	636	632	627	622	616	611	606	602
25	576	582	588	594	599	604	611	615	618	619	617	614	608	601	595	588	581	575	569
30	540	547	554	562	569	576	583	589	594	594	593	588	580	571	563	554	547	539	533
35	498	506	515	525	534	543	552	557	562	564	562	557	548	538	527	516	507	497	490
40	451	459	470	482	495	507	515	519	524	526	524	519	510	500	488	474	462	450	443
45	399	408	421	436	452	464	471	476	480	483	480	474	466	456	444	428	413	399	392
50	345	355	370	388	403	415	422	425	427	428	426	423	417	408	396	380	362	346	338
55	290	300	318	337	351	361	365	363	360	360	359	360	360	355	345	330	310	292	284
60	235	246	266	284	297	302	300	297	297	297	296	295	295	296	290	278	260	239	230
65	182	194	215	231	240	242	244	246	248	249	248	244	240	237	234	225	210	188	178
70	132	145	165	178	187	194	201	206	210	211	210	205	198	190	182	174	161	141	130
75	86.7	101	119	132	144	156	166	173	178	179	177	172	163	153	141	129	116	98.4	85.4
80	47.8	62.1	77.9	94.3	110	124	135	144	149	151	149	143	134	122	108	92.6	76.4	60.5	46.9
85	17.2	29.2	47.0	65.4	82.3	97.7	110	119	125	127	125	119	109	96.8	81.3	65.2	46.7	29.0	17.8
90	0.22	10.3	27.2	45.8	63.9	78.9	91.5	100	106	108	106	100	91.3	78.8	64.1	46.4	28.2	11.1	0.36
95	1.54	7.40	21.9	38.8	55.5	69.8	81.8	90.3	95.5	97.2	95.4	90.3	81.8	70.1	56.1	39.7	23.2	8.79	2.08
100	3.45	9.56	20.8	35.6	50.4	63.6	73.9	81.7	86.5	88.0	86.4	81.9	74.1	64.2	51.2	36.8	22.5	11.2	3.98
105	5.80	13.0	22.2	34.5	47.5	59.2	68.4	75.1	79.3	80.6	79.3	75.2	68.5	59.7	48.4	36.0	24.4	14.6	6.10
110	8.20	13.0	24.9	35.0	46.0	56.1	64.4	69.9	73.5	74.7	73.5	70.1	64.6	56.7	47.1	36.8	27.6	15.3	8.40
115	10.4	13.8	25.9	36.5	45.8	54.3	61.1	66.0	68.7	69.8	68.7	66.4	61.6	55.2	47.1	38.8	29.3	15.4	10.8
120	12.5	16.6	25.2	37.9	46.2	53.4	59.4	63.5	65.9	66.8	66.1	64.0	60.0	54.4	47.8	40.3	25.8	18.9	12.9
125	14.7	18.6	23.4	37.0	46.4	53.0	58.2	61.8	64.0	64.9	64.2	62.2	58.8	54.2	48.1	38.7	24.6	21.5	14.8
130	16.7	20.4	22.2	35.3	45.4	52.1	57.0	60.2	62.2	62.9	62.4	60.7	57.6	53.2	47.0	34.9	25.9	23.1	16.6
135	18.3	21.1	24.8	32.1	43.2	50.1	55.1	58.1	60.0	60.7	60.1	58.5	55.5	50.9	41.8	33.3	27.5	24.9	18.1
140	19.4	22.7	26.8	29.6	38.7	48.0	52.7	55.3	57.0	57.6	57.0	55.4	51.5	45.4	39.2	32.8	29.4	26.0	19.4
145	19.8	22.4	27.5	30.7	35.4	42.5	48.7	51.8	53.6	54.2	53.5	50.7	46.6	42.5	37.4	33.5	30.2	26.8	20.4
150	20.0	22.8	27.9	31.2	34.0	37.8	42.5	45.6	48.2	49.0	47.9	45.8	43.0	39.6	36.4	33.0	30.1	27.4	20.9
155	19.8	23.5	28.2	30.6	33.5	35.5	37.3	40.4	42.7	43.5	42.6	41.1	39.2	37.1	34.9	33.0	30.5	28.2	20.6
160	19.4	24.5	28.4	30.0	32.5	34.5	35.8	37.1	38.5	39.1	38.4	37.8	36.6	35.5	33.9	32.5	29.8	27.4	20.5
165	18.9	23.2	27.4	30.0	30.9	32.8	34.0	34.9	35.7	35.9	35.8	35.3	34.6	33.9	32.2	30.5	27.6	24.9	19.7
170	17.7	18.1	18.8	21.2	27.4	31.5	32.1	32.1	32.5	33.0	32.8	32.3	32.1	28.8	25.8	23.1	21.5	19.4	18.3
175	16.9	16.8	16.9	16.6	16.2	16.9	20.6	25.3	29.0	29.9	25.7	19.3	17.9	17.6	17.5	17.4	17.4	17.4	17.5
180	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.03

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	664	664	664	664	664	664	664	664	664	664	664	664	664	664	664	664	664		
5	658	657	657	656	656	655	654	654	654	654	655	655	655	655	656	658	658		
10	645	643	642	641	641	641	642	641	641	641	642	641	641	642	643	645	646		
15	625	622	622	622	621	623	624	624	624	624	625	623	622	622	623	625	627		
20	598	595	595	596	597	601	602	604	604	604	603	601	599	598	598	600	602		
25	566	563	564	566	570	574	578	580	582	581	579	575	572	569	569	570	572		
30	529	526	529	532	538	545	552	557	558	557	554	547	542	537	536	535	536		
35	486	486	490	497	506	516	524	530	532	530	527	518	510	503	497	495	495		
40	440	441	448	459	471	482	491	497	500	498	493	485	477	465	456	450	448		
45	389	393	404	419	433	443	451	457	459	457	454	447	439	427	412	402	397		
50	336	344	359	376	389	397	402	406	407	406	405	402	395	383	367	352	345		
55	284	295	313	328	338	343	342	341	342	343	346	348	345	336	321	303	292		
60	232	247	265	277	282	283	283	283	284	284	286	287	288	285	273	255	239		
65	183	201	216	224	228	232	234	237	238	238	237	235	234	231	223	208	189		
70	138	156	168	177	184	191	197	201	202	201	199	194	189	182	174	162	143		
75	97.7	114	127	139	150	159	166	170	172	171	168	161	153	143	131	118	101		
80	61.1	76.7	92.6	107	120	132	139	144	146	145	141	134	123	111	95.8	79.8	63.3		
85	29.9	47.7	65.4	81.9	96.2	108	116	122	124	122	118	110	98.7	84.3	67.7	49.7	31.3		
90	11.4	28.2	45.9	62.6	77.2	89.2	97.5	103	104	103	98.6	90.3	79.0	64.3	47.4	29.3	11.7		
95	7.70	22.3	38.7	54.5	68.4	79.7	87.6	92.4	94.1	92.5	88.3	80.3	69.5	55.5	39.4	22.5	7.55		
100	10.9	20.5	34.5	48.7	61.4	71.8	79.1	83.7	85.2	83.7	79.7	72.2	62.2	49.2	34.6	20.0	9.85		
105	14.6	22.7	33.5	45.0	56.0	65.1	71.7	75.7	77.0	75.7	72.0	65.3	56.2	44.9	32.9	21.7	13.8		
110	16.2	26.6	35.3	44.3	52.6	60.1	65.6	69.0	70.0	68.9	65.7	59.9	52.6	43.4	33.9	25.3	15.9		
115	16.8	29.5	37.8	45.4	52.2	57.7	61.6	64.1	64.9	63.8	61.5	57.2	51.6	44.2	36.3	28.1	16.7		
120	19.6	30.4	39.6	46.8	52.7	57.3	60.4	62.0	62.6	61.8	60.2	56.9	52.1	45.5	38.5	29.2	19.0		
125	20.6	30.0	40.5	47.5	53.1	57.2	60.0	61.6	62.1	61.5	60.0	56.9	52.5	46.6	39.4	29.5	20.0		
130	22.9	28.3	39.5	47.0	52.5	56.6	59.3	60.9	61.4	60.8	59.3	56.4	52.2	46.4	38.7	28.2	22.3		
135	24.6	28.3	37.7	45.8	51.0	55.1	57.8	59.4	59.9	59.2	57.7	54.8	50.7	45.2	37.3	28.8	24.0		
140	26.0	28.2	35.5	42.6	48.9	52.5	55.1	56.7	57.1	56.5	55.0	52.3	48.5	42.4	35.4	28.5	25.4		
145	27.2	27.6	33.5	39.9	45.1	49.2	51.7	53.1	53.5	53.1	51.7	48.9	44.6	39.8	33.7	28.3	26.5		
150	27.2	28.7	31.0	36.4	41.1	44.7	47.2	48.7	49.1	48.6	47.2	44.5	41.4	37.0	31.9	29.8	27.2		
155	27.0	30.2	30.7	32.8	36.2	40.6	42.5	43.7	44.0	43.7	42.8	41.0	38.4	34.2	31.4	30.6	25.8		
160	24.3	30.3	31.7	32.3	33.0	32.9	38.8	39.7	40.1	39.9	39.5	37.9	35.7	33.6	32.6	31.3	26.4		
165	19.9	27.1	30.6	32.0	32.5	33.1	31.7	36.1	37.1	37.1	36.9	36.2	34.6	33.7	32.8	31.0	24.3		
170	18.2	18.7	21.5	23.7	25.6	28.6	32.2	31.9	30.6	32.5	34.4	34.4	33.4	32.6	27.4	20.8	18.5		
175	17.4	17.4	17.5	17.4	17.4	17.5	17.7	18.3	26.0	30.8	27.7	24.2	20.3	16.9	16.5	16.8	17.0		
180	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	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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