

LM-79-19 TEST REPORT

for

GREEN CREATIVE LTD

Room 3603, Level 36, Tower 1, Enterprise Square Five, 38 Wang Chiu Road, Kowloon Bay, KL,
Hong Kong

LED Tube

Model: 13PLL/835/GL/DIR/R

Laboratory: Leading Testing Laboratories

NVLAP CODE: 200960-0

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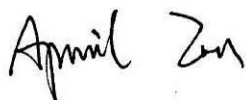
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www.ledtestlab.com

Report No.: HZ22070009b

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

Review by:



Engineer: April Zou
Jul. 15, 2022

Approved by:



Manager: Jim Zhang
Jul. 15, 2022

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/835/GL/DIR/R

Luminous Efficacy (Lumens /Watt)	Total Luminous Flux (Lumens)	Power (Watts)/2	Power Factor
126.6	2091.6	16.52	0.9931
CCT (K)	CRI	Stabilization Time (Light & Power)	
3445	81.8	50	

Table 1: Executive Data Summary

Note: The above results are recorded/ derived from measurements made using an Integrating Sphere.

Test specifications:

Date of Receipt	: Jul. 08, 2022
Date of Test	: Jul. 12, 2022
Test item	: Total Luminous Flux, Luminous Distribution Intensity, Luminous Efficacy, Correlated Color Temperature, Color Rendering Index, Chromaticity Coordinate, Electrical parameters
Reference Standard	: IESNA LM-79-2019 Approved Method: 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

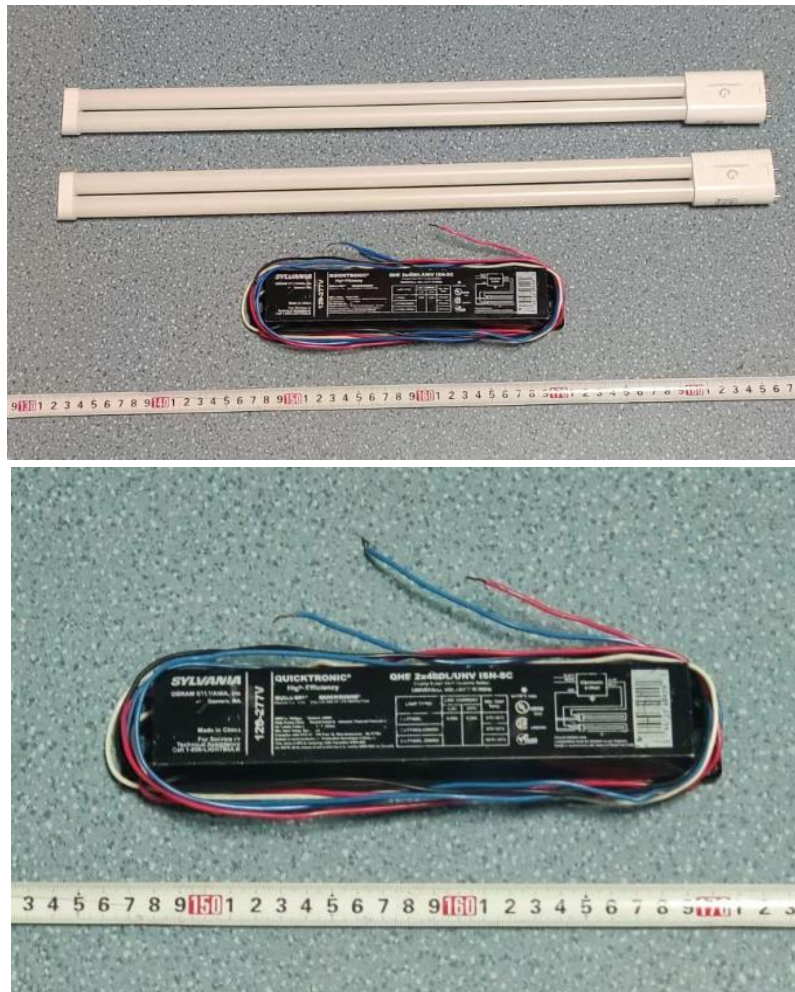


Figure 1- Overview of the sample

Equipment Under Test(EUT)

Name	: LED Tube
Model	: 13PLL/835/GL/DIR/R
Electrical Ratings	: 120-277V, 50/60Hz
Product Description	: 3500K LED Tubes supplied by a high frequency fluorescent lamp ballast: QHE2X40DL/UNV/ISN-SC
Manufacturer	: GREEN CREATIVE LTD
Address	: Room 3603, Level 36, Tower 1, Enterprise Square Five, 38 Wang Chiu Road, Kowloon Bay, KL, Hong Kong

TEST RESULTS

Test ambient temperature was 26.0 °C.

Base orientation was base up. Test was conducted without a dimmer in the circuit.

The stabilization time of the sample was 50 minutes, and the total operating time including stabilization was 55 minutes.

Sphere-Spectroradiometer Method

Parameter	Result	
Test Voltage (V)	120.0	277.0
Voltage frequency (Hz)	60	60
Test Current (A)	0.277	0.131
Power Factor	0.9931	0.9387
Test Power (W)/2	16.52	17.04
THD A%	11.08	19.97
Luminous Efficacy (lm/W)	126.6	122.8
Total Luminous Flux (lm)	2091.6	2092.5
Color Rendering Index (CRI)	81.8	
R9	1.2	
Correlated Color Temperature (CCT)(K)	3445	
Chromaticity Chroma x	0.4095	
Chromaticity Chroma y	0.3953	
Chromaticity Chroma u	0.2365	
Chromaticity Chroma v	0.3425	
Duv	0.0011	
Chromaticity Chroma u'	0.2365	
Chromaticity Chroma v'	0.5138	

Special Color Rendering Indices	
R1	79.7
R2	89.1
R3	96.3
R4	80.4
R5	80
R6	85.9
R7	83.9
R8	59.4
R9	1.2
R10	75.1
R11	79.6
R12	65.5
R13	81.8
R14	98.3

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 2.47 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)	0.277
Power Factor	0.9931
Power (W)/2	16.53
Luminous Efficacy (lm/W)	125.6
Total Luminous Flux (lm)	2076.3
Beam Angle (°)	108.5 (0°-180°) / 143.4 (90°-270°)
Center Beam Candle Power (cd)	467
Maximum Beam Candle Power (cd)	472.2 (At: C=300.0, Gamma=3.5)
Spacing Criteria	1.21 (0°-180°) / 1.44 (90°-270°)
Zonal Lumens in the 0 °-60 °Zone	55.50%
Zonal Lumens in the 60 °-90 °Zone	24.32%
Zonal Lumens in the 90 °-120 °Zone	10.49%
Zonal Lumens in the 120 °-180 °Zone	9.69%

Table 3: Test data per Goniophotometer Method

Spectral Power Distribution - Sphere Spectroradiometer Method

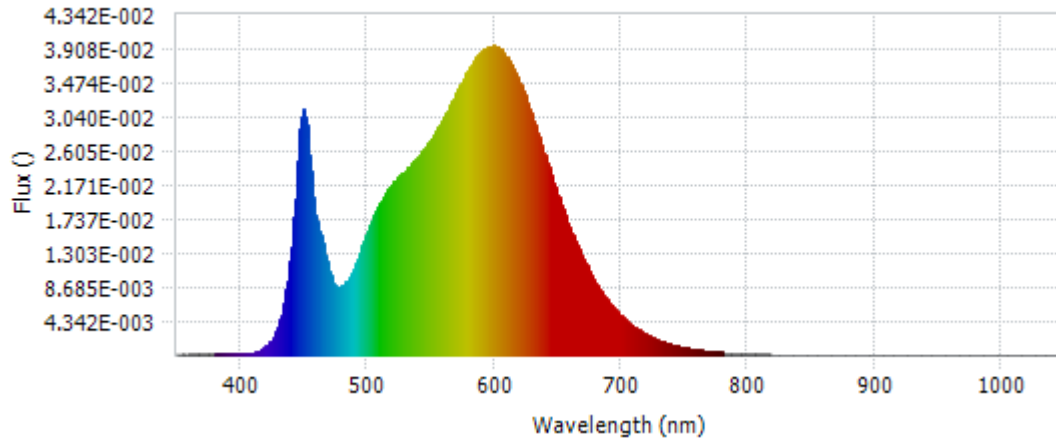
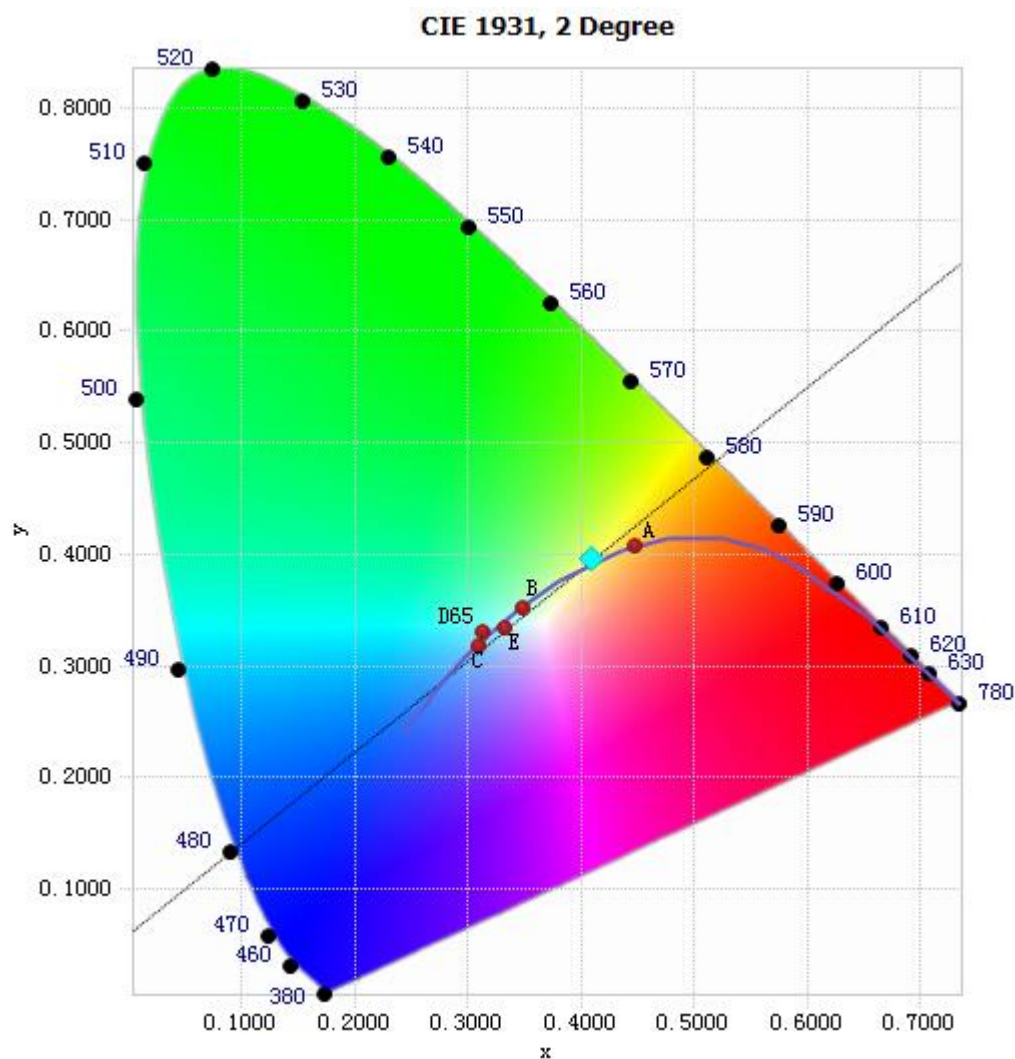


Chart 1: Spectral Power Distribution

Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	1.59E-04	485	9.76E-03	590	3.88E-02	695	5.89E-03
385	1.65E-04	490	1.13E-02	595	3.94E-02	700	5.03E-03
390	1.52E-04	495	1.36E-02	600	3.94E-02	705	4.29E-03
395	1.49E-04	500	1.58E-02	605	3.90E-02	710	3.66E-03
400	1.45E-04	505	1.78E-02	610	3.80E-02	715	3.11E-03
405	1.77E-04	510	1.95E-02	615	3.66E-02	720	2.64E-03
410	3.10E-04	515	2.09E-02	620	3.48E-02	725	2.24E-03
415	6.15E-04	520	2.19E-02	625	3.27E-02	730	1.91E-03
420	1.18E-03	525	2.28E-02	630	3.04E-02	735	1.62E-03
425	2.17E-03	530	2.36E-02	635	2.79E-02	740	1.38E-03
430	4.01E-03	535	2.45E-02	640	2.55E-02	745	1.17E-03
435	7.35E-03	540	2.53E-02	645	2.30E-02	750	1.00E-03
440	1.38E-02	545	2.64E-02	650	2.05E-02	755	8.44E-04
445	2.48E-02	550	2.75E-02	655	1.82E-02	760	7.27E-04
450	3.13E-02	555	2.89E-02	660	1.61E-02	765	6.13E-04
455	2.36E-02	560	3.04E-02	665	1.41E-02	770	5.25E-04
460	1.70E-02	565	3.19E-02	670	1.23E-02	775	4.47E-04
465	1.43E-02	570	3.34E-02	675	1.07E-02	780	3.81E-04
470	1.08E-02	575	3.51E-02	680	9.26E-03		
475	8.78E-03	580	3.65E-02	685	7.97E-03		
480	8.92E-03	585	3.77E-02	690	6.87E-03		

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

Chromaticity Diagram - Sphere Spectroradiometer Method



Tristimulus values(x, y): (0.4095, 0.3953)

Chart 2: Chromaticity Diagram per Sphere - Spectroradiometer Method

Note: The location on the diagram of the tristimulus coordinates are indicated by the blue diamond.

CIE 1931 x,y Chromaticity Diagram
Nominal CCT Quadrangles

2500 K
 3000 K
 4000 K
 5000 K
 6000 K
 7000 K

Planckian Locus

3500K ANSI
 3500K/012 ANSI
 3500K/011 ANSI
 3500K/010 ANSI
 3500K/009 ANSI

DUT: $x = 0.4095$ $y = 0.3953$

inside 7 Quad 3500K ANSI
 outside 7 Quad 3500K/012 ANSI

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

Color Rendition Report – Sphere Spectroradiometer Method

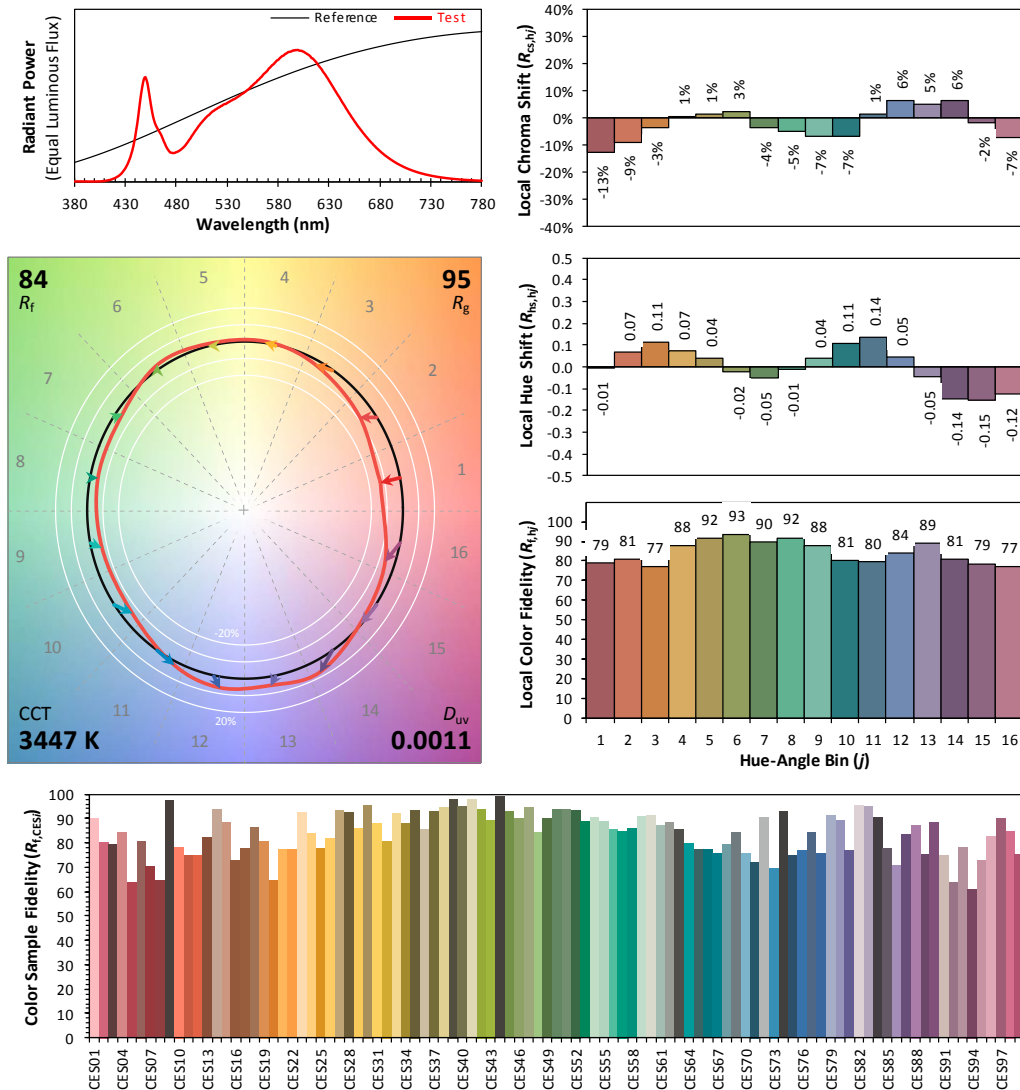
ANSI/IES TM-30-18 Color Rendition Report

Source: LED

Manufacturer: GREEN CREATIVE LTD

Date: 2022/07/12

Model: 13PLL/835/GL/DIR/R



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

x 0.4095
 y 0.3953
 u' 0.2365
 v' 0.5138

CIE 13.3-1995
 (CRI)
 R_a 82
 R_9 1

Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.00.

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	44.279	2.13%
10- 20	128.159	6.17%
20- 30	198.724	9.57%
30- 40	248.998	11.99%
40- 50	270.787	13.04%
50- 60	261.418	12.59%
60- 70	224.993	10.84%
70- 80	170.115	8.19%
80- 90	109.808	5.29%
90-100	79.081	3.81%
100-110	71.735	3.45%
110-120	66.906	3.22%
120-130	61.673	2.97%
130-140	53.861	2.59%
140-150	41.589	2.00%
150-160	26.68	1.28%
160-170	14.038	0.68%
170-180	3.429	0.17%
Total	2076.3	100%

$\gamma(^{\circ})$	Lumens	% Total
0- 60	1152.37	1152.37
60- 90	504.916	504.916
0-90	1657.28	1657.28
90- 180	418.992	418.992
0- 180	2076.3	2076.3

Table 5: Zonal Lumen

Illuminance Plots- Goniophotometer Method

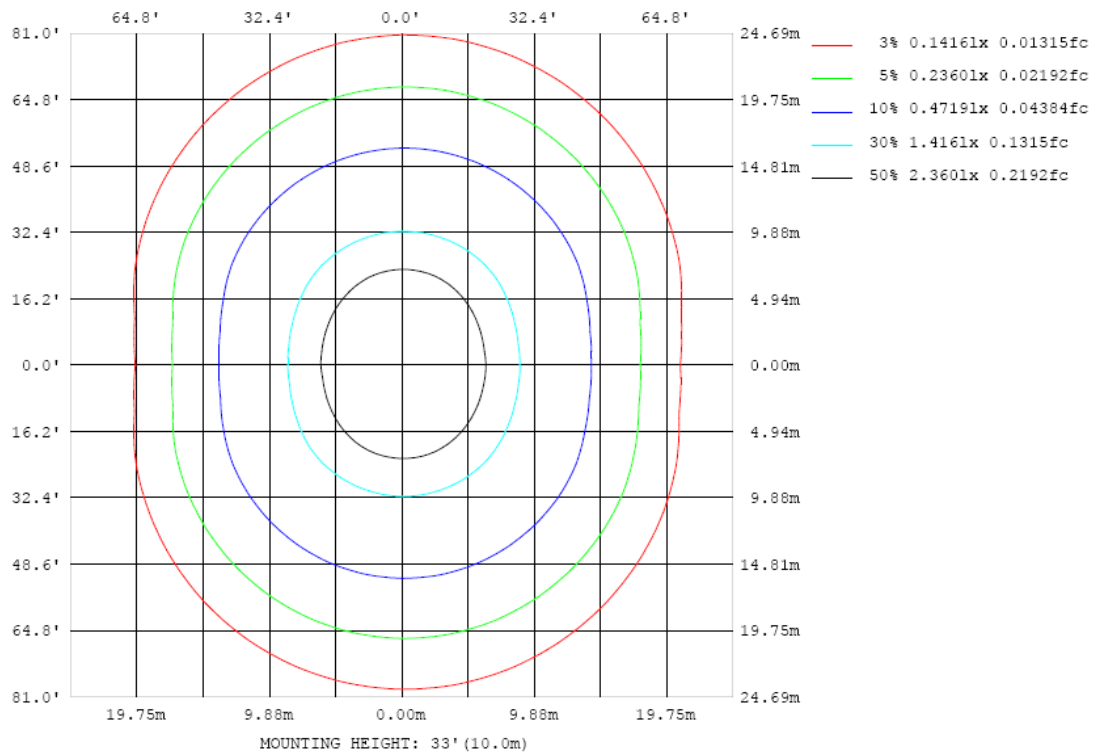


Chart 5: Illuminance Plot (Footcandles)

Luminous Intensity Distribution Plots- Goniophotometer Method

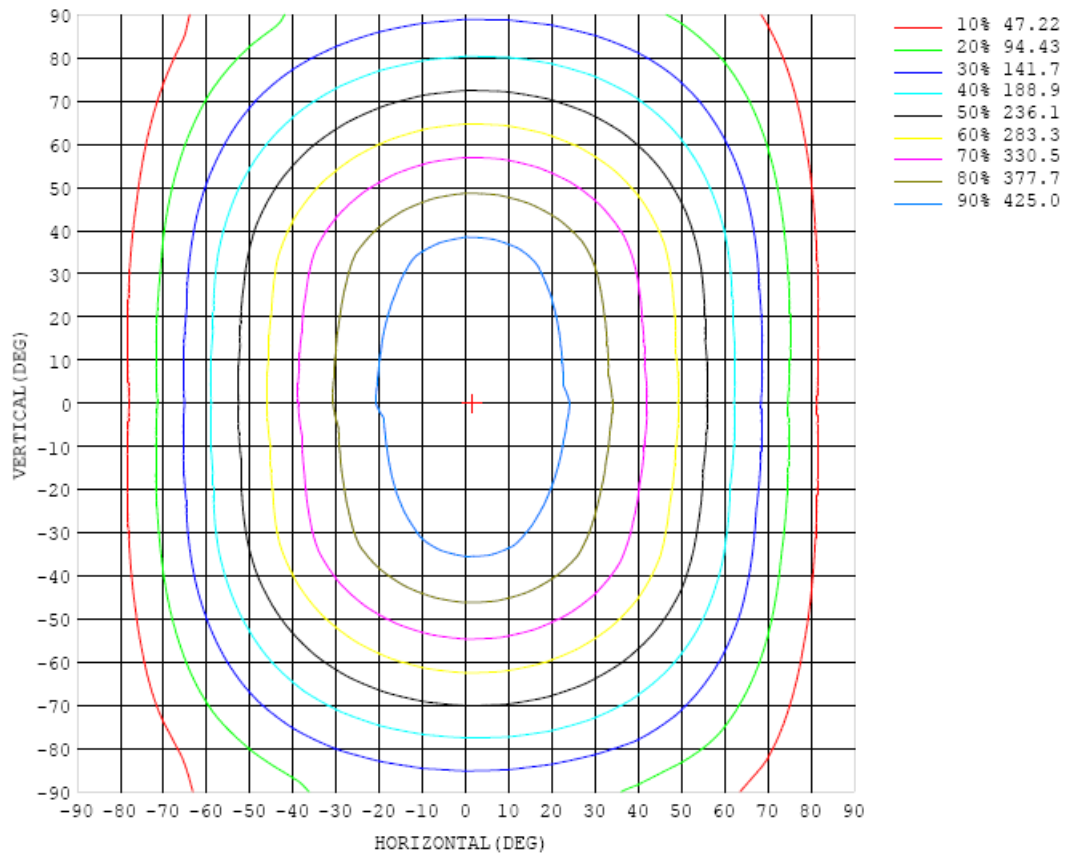


Chart 6: Isocandela Plot

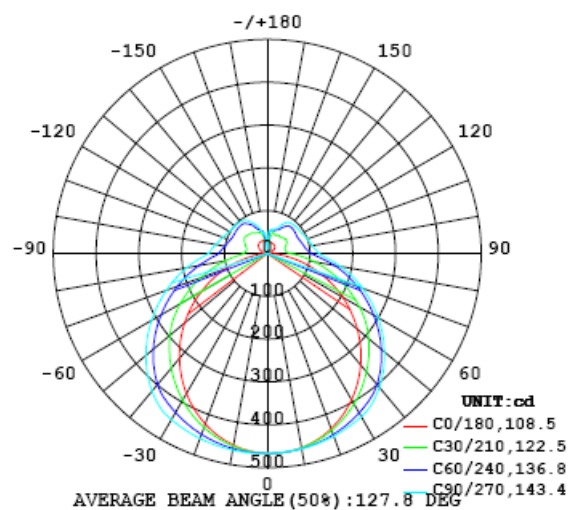


Chart 7: Polar Candela Distribution

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	467	467	467	467	467	467	467	467	467	467	467	467	467	467	467	467	467	467	467
5	466	466	466	466	466	466	466	466	466	465	465	465	464	464	463	463	463	463	463
10	461	460	460	461	461	462	463	463	463	463	462	461	460	458	457	456	455	454	454
15	450	450	450	452	454	456	458	459	459	459	458	456	454	451	448	445	443	441	441
20	436	435	437	440	443	447	450	453	454	454	452	449	445	441	436	431	427	424	424
25	417	417	420	424	430	435	441	445	447	447	445	441	436	428	421	414	408	404	402
30	394	395	399	405	413	422	429	435	439	440	437	432	424	414	404	394	385	379	378
35	368	369	375	384	395	406	417	424	427	427	425	419	411	399	385	372	360	353	350
40	340	341	349	361	375	389	399	405	408	408	405	399	391	380	365	348	334	323	319
45	308	311	321	336	353	366	375	381	384	384	381	375	367	356	342	323	305	292	287
50	275	278	291	309	327	339	348	354	358	358	354	348	339	328	314	297	275	259	252
55	240	244	260	281	297	309	318	325	329	329	326	319	309	297	282	266	245	224	216
60	203	209	228	249	264	277	287	294	299	299	296	289	278	265	250	233	213	190	179
65	166	173	196	215	231	244	255	263	268	268	265	257	247	233	216	198	179	155	141
70	128	137	161	180	196	211	223	232	237	237	233	226	215	200	183	164	143	121	104
75	90.8	102	125	145	163	179	191	200	205	205	202	194	183	168	150	130	108	86.4	67.0
80	55.5	69.3	90.3	112	131	147	159	168	172	173	170	163	152	136	118	97.7	75.3	53.3	33.6
85	24.5	37.9	59.5	81.2	98.6	114	127	136	142	143	140	133	122	107	88.9	67.8	46.1	25.6	8.99
90	4.70	13.9	34.1	54.0	72.4	88.9	103	113	119	121	120	114	103	89.6	72.7	54.1	33.4	13.4	1.61
95	2.03	7.76	25.7	45.7	63.9	80.5	94.1	104	111	113	111	106	95.9	83.0	67.6	50.6	31.3	13.5	3.95
100	4.98	11.3	25.0	43.3	61.1	76.0	88.6	98.4	105	107	106	101	91.9	80.3	65.8	49.3	31.8	19.2	7.10
105	7.87	16.5	27.8	42.9	59.2	73.5	85.8	95.2	101	104	102	97.4	89.1	78.0	64.2	49.6	36.4	23.6	10.6
110	11.0	19.2	33.2	45.0	58.9	71.7	83.1	91.8	97.5	99.8	98.6	94.1	86.6	76.4	63.9	52.7	41.2	25.2	14.0
115	13.8	23.2	36.0	48.8	60.1	70.9	81.1	89.0	94.2	96.4	95.4	91.5	84.7	75.7	65.9	56.6	42.6	26.8	17.5
120	17.2	26.3	36.9	53.0	62.9	71.8	80.3	87.0	91.7	93.8	92.9	89.6	84.1	77.0	68.6	59.9	44.2	31.2	21.2
125	20.3	28.7	38.0	54.6	66.2	73.8	81.2	86.9	90.8	92.7	92.1	89.4	84.9	78.5	70.8	57.9	44.5	34.4	24.4
130	23.1	32.2	39.8	53.5	67.5	75.9	82.3	87.3	90.8	92.4	91.7	89.4	85.4	79.7	70.7	59.1	45.1	37.9	27.0
135	24.8	34.9	41.7	52.4	68.1	76.9	83.0	87.4	90.4	91.8	91.1	89.1	85.4	78.2	69.3	57.9	47.9	40.0	29.1
140	25.9	35.4	42.5	48.3	63.6	75.7	82.8	86.8	89.5	90.7	90.0	87.7	82.0	77.0	66.8	57.0	48.6	40.9	30.5
145	26.4	34.0	41.4	50.7	57.0	69.1	78.4	84.7	87.8	89.0	87.7	84.7	79.9	71.9	61.9	56.0	49.3	41.5	31.3
150	27.0	32.5	42.8	49.5	55.0	61.2	70.5	76.4	80.2	81.8	80.0	77.0	72.2	64.3	60.3	52.9	48.7	42.0	31.8
155	27.2	30.5	45.6	46.4	54.2	58.7	61.4	65.5	69.1	71.0	69.5	66.3	63.8	60.7	55.9	52.1	49.0	39.2	31.8
160	26.8	33.0	45.6	49.4	50.4	55.2	58.0	61.7	61.7	62.0	62.2	61.4	59.7	57.3	54.0	48.8	47.5	37.5	32.2
165	26.3	31.0	41.3	50.6	52.8	53.4	55.9	58.1	59.0	59.5	58.8	58.0	55.9	51.7	51.0	50.6	43.2	34.3	32.3
170	25.7	26.5	28.9	34.1	46.7	54.0	55.5	56.4	56.3	56.0	56.0	55.6	54.3	48.5	41.9	35.7	32.6	30.6	30.8
175	25.5	26.0	25.9	26.1	26.0	28.0	34.9	42.5	48.5	50.9	43.3	31.7	29.9	29.6	29.4	29.6	29.7	29.7	29.5
180	34.8	34.4	33.2	30.9	27.5	22.9	17.0	10.2	13.8	8.15	10.4	6.26	7.46	23.2	25.4	32.3	34.4	36.0	34.8

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	467	467	467	467	467	467	467	467	467	467	467	467	467	467	467	467	467		
5	463	463	464	464	465	466	466	467	467	467	467	467	467	467	467	467	466		
10	455	456	457	459	461	462	464	465	466	466	466	466	465	464	463	462	461		
15	442	444	446	450	454	457	460	462	464	464	463	462	460	458	455	453	451		
20	425	428	432	438	444	449	454	458	460	460	459	456	452	448	444	440	437		
25	404	409	415	423	432	440	447	452	454	455	452	448	442	436	429	423	419		
30	380	386	396	406	418	429	438	444	448	448	445	439	430	421	412	403	398		
35	353	361	373	388	403	416	427	434	438	438	435	427	416	404	392	381	373		
40	323	334	349	367	386	399	408	415	419	420	417	411	401	386	370	355	345		
45	291	305	324	345	362	375	385	392	397	397	394	388	379	365	346	328	315		
50	258	274	297	318	334	348	358	366	371	371	368	362	352	339	321	299	283		
55	223	243	268	287	304	318	329	338	342	343	339	332	322	309	293	269	249		
60	187	211	235	255	272	287	299	307	312	313	309	301	291	277	260	238	215		
65	151	178	200	220	239	255	267	277	282	282	278	270	258	243	226	206	180		
70	117	143	165	187	206	223	237	246	251	251	247	238	225	209	191	171	145		
75	83.5	108	132	154	175	192	206	216	221	221	216	206	193	176	156	135	112		
80	50.4	74.3	100	124	145	162	176	186	191	191	186	176	162	144	124	100	77.3		
85	22.2	46.8	72.1	96.0	117	135	148	158	162	162	157	147	133	115	93.0	68.7	44.3		
90	11.1	32.9	56.2	78.3	98.0	114	127	135	138	137	131	121	107	88.4	67.2	43.8	20.2		
95	12.1	29.9	51.2	72.2	91.2	107	119	127	130	128	122	111	96.4	78.2	57.2	34.8	13.6		
100	18.1	31.3	49.6	68.6	85.8	100	112	119	122	121	115	104	89.9	72.6	53.1	32.9	15.2		
105	22.1	36.2	50.4	66.9	82.7	96.2	107	113	116	114	108	98.7	85.6	69.7	52.0	34.5	21.3		
110	25.1	42.1	54.1	66.9	80.6	92.8	102	108	111	109	104	94.8	82.8	68.4	52.8	38.8	25.0		
115	27.9	46.6	58.3	69.3	80.1	90.2	98.7	104	106	105	99.9	91.8	81.0	68.4	55.6	43.9	27.3		
120	29.9	47.8	62.2	72.2	81.4	89.6	96.1	101	103	101	96.8	89.9	80.9	70.2	59.2	47.9	28.2		
125	30.8	48.5	65.1	74.7	83.0	90.1	95.6	99.2	100	99.1	95.4	89.5	81.6	72.7	63.2	48.2	28.9		
130	33.9	49.1	64.3	76.7	84.4	90.6	95.3	98.3	99.4	98.2	95.0	89.9	83.2	75.2	64.7	48.4	29.2		
135	36.6	49.1	62.7	76.2	85.0	90.7	94.8	97.5	98.3	97.3	94.5	90.0	84.1	76.3	62.5	47.9	32.3		
140	38.2	48.6	61.1	72.4	83.4	90.1	93.8	96.2	96.9	96.0	93.5	89.4	83.6	72.6	60.3	45.3	34.6		
145	38.1	47.5	58.9	68.7	77.7	85.6	91.4	94.0	94.7	93.9	91.4	86.0	77.9	68.5	57.5	43.8	34.8		
150	37.8	47.8	55.0	63.3	70.8	78.4	83.3	86.5	87.6	86.7	83.6	78.7	72.1	64.0	53.1	43.3	34.8		
155	36.6	47.0	53.6	58.7	64.0	67.6	75.0	77.7	78.6	78.0	75.5	71.4	65.8	57.9	50.7	45.2	35.6		
160	36.6	44.4	52.1	56.1	58.4	61.0	60.6	68.3	69.3	68.8	66.8	63.3	58.3	53.3	50.4	45.7	37.9		
165	33.8	39.9	46.7	52.3	54.4	55.4	55.5	53.3	55.1	58.0	56.9	55.1	53.5	52.8	51.4	47.7	37.1		
170	30.9	31.0	32.2	34.8	39.0	44.8	51.6	51.7	49.4	49.5	49.2	52.4	52.2	51.3	45.4	33.3	27.9		
175	29.5	29.4	29.2	28.9	28.7	28.3	27.8	28.3	38.1	46.8	45.5	39.3	33.9	26.6	24.5	23.7	24.1		
180	34.9	34.5	33.3	31.6	28.4	23.0	17.8	11.6	11.2	4.24	10.5	11.9	17.0	21.5	27.0	31.0	33.2		

Table 7: Luminous Intensity Data

EQUIPMENT LIST

Test Equipment	Model	Equipment No.	Calibration Date	Calibration Due date
Goniophotometer system	GO-R5000	HZTE011-01	Aug. 05, 2021	Aug. 04, 2022
Digital Power Meter	PF2010A	HZTE028-01	Aug. 05, 2021	Aug. 04, 2022
AC Power Supply	DPS1060	HZTE001-06	Aug. 05, 2021	Aug. 04, 2022
DC Power Supply	WY12010	HZTE004-03	Aug. 05, 2021	Aug. 04, 2022
Temperature recorder	JM624U	HZTE018-08	Aug. 05, 2021	Aug. 04, 2022
Temperature and humidity recorder	JR900	HZTE018-01	Aug. 05, 2021	Aug. 04, 2022
Standard source	D908	HZTE012-01	Aug. 05, 2021	Aug. 04, 2022
Integrate Sphere system	3M	HZTE015-04	Aug. 05, 2021	Aug. 04, 2022
Digital Power Meter	WT210	HZTE008-01	Aug. 05, 2021	Aug. 04, 2022
AC Power Supply	PCR 500L	HZTE001-07	Aug. 05, 2021	Aug. 04, 2022
DC Power Supply	IT6154	HZTE004-04	Aug. 05, 2021	Aug. 04, 2022
Standard source	SCL-1400	HZTE012-02	Aug. 05, 2021	Aug. 04, 2022
Temperature and humidity recorder	JR900	HZTE018-02	Aug. 05, 2021	Aug. 04, 2022
Temperature Meter	TES1310	HZTE017-01	Aug. 05, 2021	Aug. 04, 2022

Table 7: 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 3 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 20 min, taken 10 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 20 min, taken 10 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.

*** End of Report ***

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