

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 Lamp

Model: 25FHIDDIM/ED23/840/277V/E26

Laboratory: Leading Testing Laboratories

NVLAP CODE: 200960-0

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Report No.: HZ24060009k

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

Review by:

Wei Fei

Engineer: Wei Fei
Jul. 10, 2024

Approve by:



April Zou

1 Manager: April Zou
Jul. 10, 2024

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: 25FHIDDIM/ED23/840/277V/E26

Luminous Efficacy (Lumens /Watt)	Total Luminous Flux (Lumens)	Power (Watts)	Power Factor
178.1	4177.3	23.46	0.9939
CCT (K)	CRI	Stabilization Time (Light & Power)	
3908	82.2	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	: Jun. 13, 2024
Date of Test	: Jul. 09, 2024
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

TABLE OF CONTENT

LM-79-19 TEST REPORT.....	1
TEST SUMMARY	2
SAMPLE PHOTO	4
TEST RESULTS	5
Sphere-Spectroradiometer Method.....	5
Goniophotometer Method	6
Spectral Power Distribution - Sphere Spectroradiometer Method	7
Chromaticity Diagram - Sphere Spectroradiometer Method.....	8
Nominal CCT Quadrangles – Sphere Spectroradiometer Method	9
Color Rendition Report – Sphere Spectroradiometer Method	10
Zonal Lumen Tabulation- Goniophotometer Method	11
Illuminance Plots- Goniophotometer Method	12
Luminous Intensity Distribution Plots- Goniophotometer Method.....	13
Luminous Intensity Data- Goniophotometer Method	14
EQUIPMENT LIST	15
TEST METHODS	15
Seasoning of SSL Product.....	15
Sphere-Spectroradiometer Method- Photometric and Electrical Measurements.....	15
Goniophotometer Method	16
Photometric and Electrical Measurements	16
Color Characteristics Measurements.....	16

SAMPLE PHOTO



Figure 1- Overview of the sample

Equipment Under Test(EUT)

Name	: LED Lamp
Model	: 25FHIDDIM/ED23/840/277V/E26
Electrical Ratings	: 120-277V, 50/60Hz, 25W
Product Description	: 4000K
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)	0.197	0.092
Power Factor	0.9939	0.9108
Test Power (W)	23.46	23.17
THD A%	5.11	10.32
Luminous Efficacy (lm/W)	178.1	179.4
Total Luminous Flux (lm)	4177.3	4156.8
Color Rendering Index (CRI)	82.2	
R9	7.4	
Correlated Color Temperature (CCT)(K)	3908	
Chromaticity Chroma x	0.3863	
Chromaticity Chroma y	0.3857	
Chromaticity Chroma u	0.2254	
Chromaticity Chroma v	0.3375	
Duv	0.0025	
Chromaticity Chroma u'	0.2254	
Chromaticity Chroma v'	0.5063	

Special Color Rendering Indices	
R1	80.2
R2	88.8
R3	94.7
R4	79.8
R5	79.5
R6	84
R7	86.4
R8	63.9
R9	7.4
R10	72.3
R11	77.4
R12	58.5
R13	82.4
R14	97

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)	0.197
Power Factor	0.9959
Power (W)	23.56
Luminous Efficacy (lm/W)	178.4
Total Luminous Flux (lm)	4203.2
Beam Angle (°)	339.0 (0°-180°) / 336.2 (90°-270°)
Center Beam Candle Power (cd)	21.9
Maximum Beam Candle Power (cd)	576.7 (At: C=135.0, Gamma=90.5)
Spacing Criteria	5.94 (0°-180°) / 5.31 (90°-270°)
Zonal Lumens in the 0 °-60 °Zone	20.18%
Zonal Lumens in the 60 °-90 °Zone	30.79%
Zonal Lumens in the 90 °-120 °Zone	30.81%
Zonal Lumens in the 120 °-180 °Zone	18.21%

Table 3: Test data per Goniophotometer Method

Spectral Power Distribution - Sphere Spectroradiometer Method

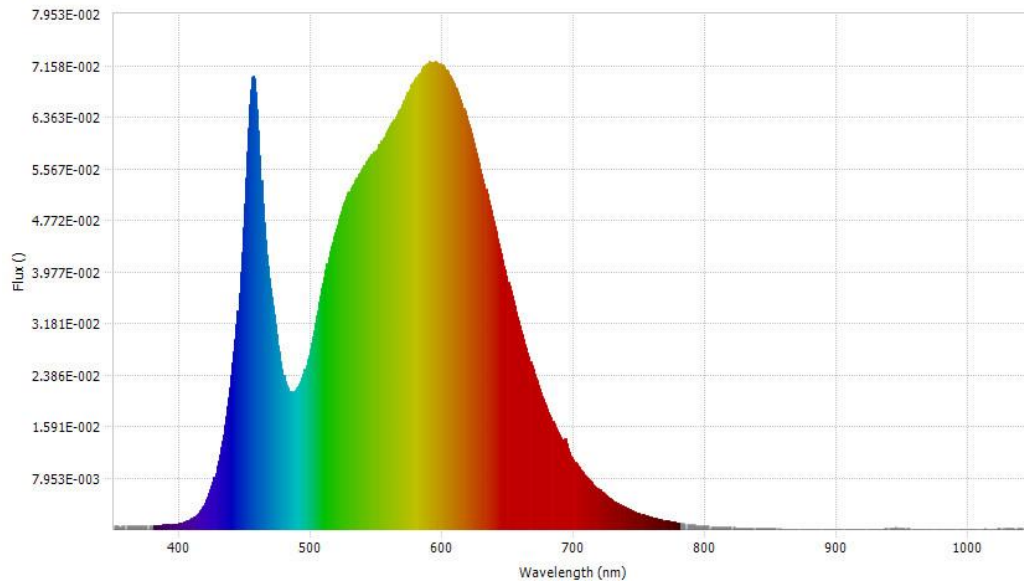
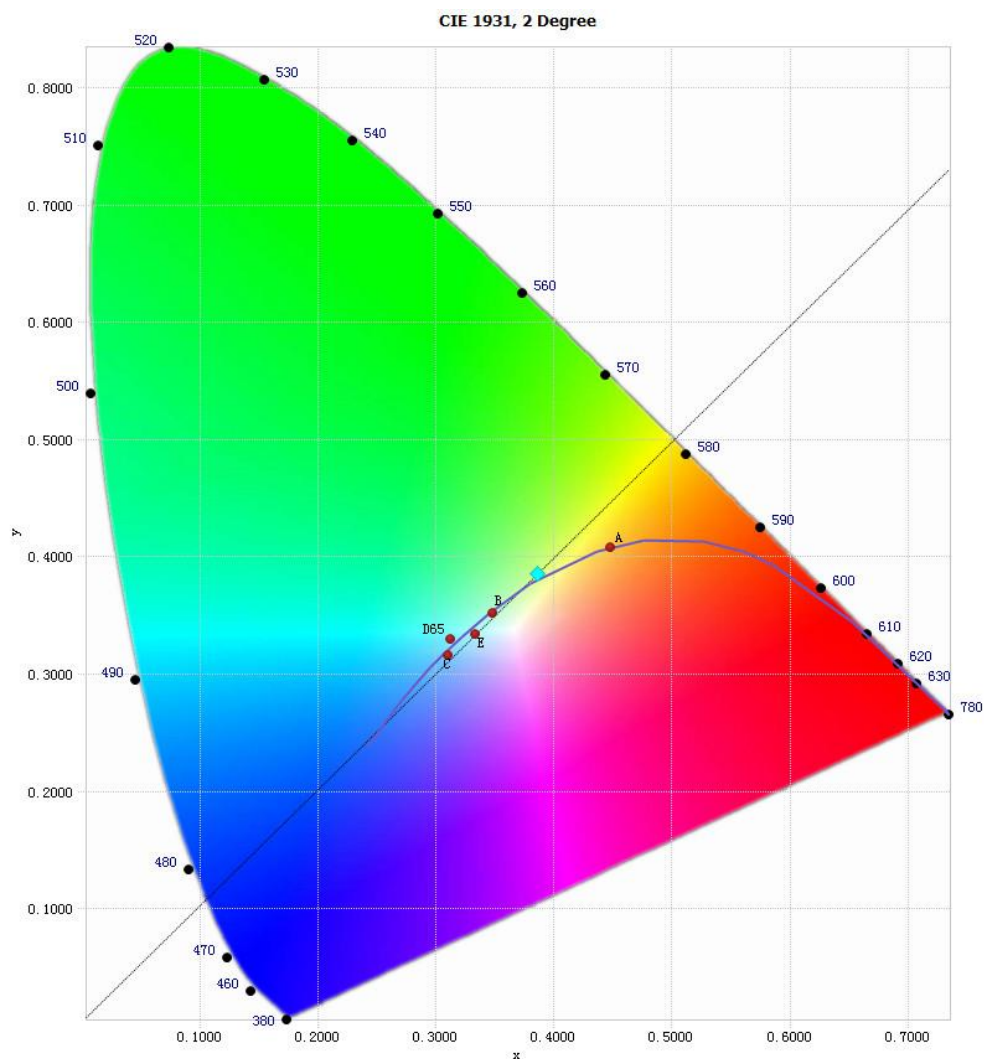


Chart 1: Spectral Power Distribution

Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	7.32E-04	485	2.13E-02	590	7.24E-02	695	1.34E-02
385	6.92E-04	490	2.22E-02	595	7.23E-02	700	1.08E-02
390	7.64E-04	495	2.48E-02	600	7.17E-02	705	9.33E-03
395	8.77E-04	500	2.88E-02	605	7.03E-02	710	8.10E-03
400	1.06E-03	505	3.39E-02	610	6.83E-02	715	7.07E-03
405	1.34E-03	510	3.90E-02	615	6.57E-02	720	6.14E-03
410	1.93E-03	515	4.38E-02	620	6.25E-02	725	5.29E-03
415	2.89E-03	520	4.71E-02	625	5.89E-02	730	4.54E-03
420	4.64E-03	525	5.04E-02	630	5.49E-02	735	3.90E-03
425	7.38E-03	530	5.28E-02	635	5.09E-02	740	3.35E-03
430	1.15E-02	535	5.44E-02	640	4.68E-02	745	2.89E-03
435	1.76E-02	540	5.62E-02	645	4.25E-02	750	2.50E-03
440	2.57E-02	545	5.76E-02	650	3.83E-02	755	2.18E-03
445	3.66E-02	550	5.87E-02	655	3.45E-02	760	1.90E-03
450	5.43E-02	555	6.05E-02	660	3.08E-02	765	1.64E-03
455	6.98E-02	560	6.23E-02	665	2.74E-02	770	1.43E-03
460	6.16E-02	565	6.41E-02	670	2.41E-02	775	1.24E-03
465	4.47E-02	570	6.61E-02	675	2.12E-02	780	1.08E-03
470	3.59E-02	575	6.79E-02	680	1.87E-02		
475	2.85E-02	580	6.98E-02	685	1.64E-02		
480	2.28E-02	585	7.16E-02	690	1.42E-02		

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

Chromaticity Diagram - Sphere Spectroradiometer Method



Tristimulus values(x, y): (0.3863, 0.3857)

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

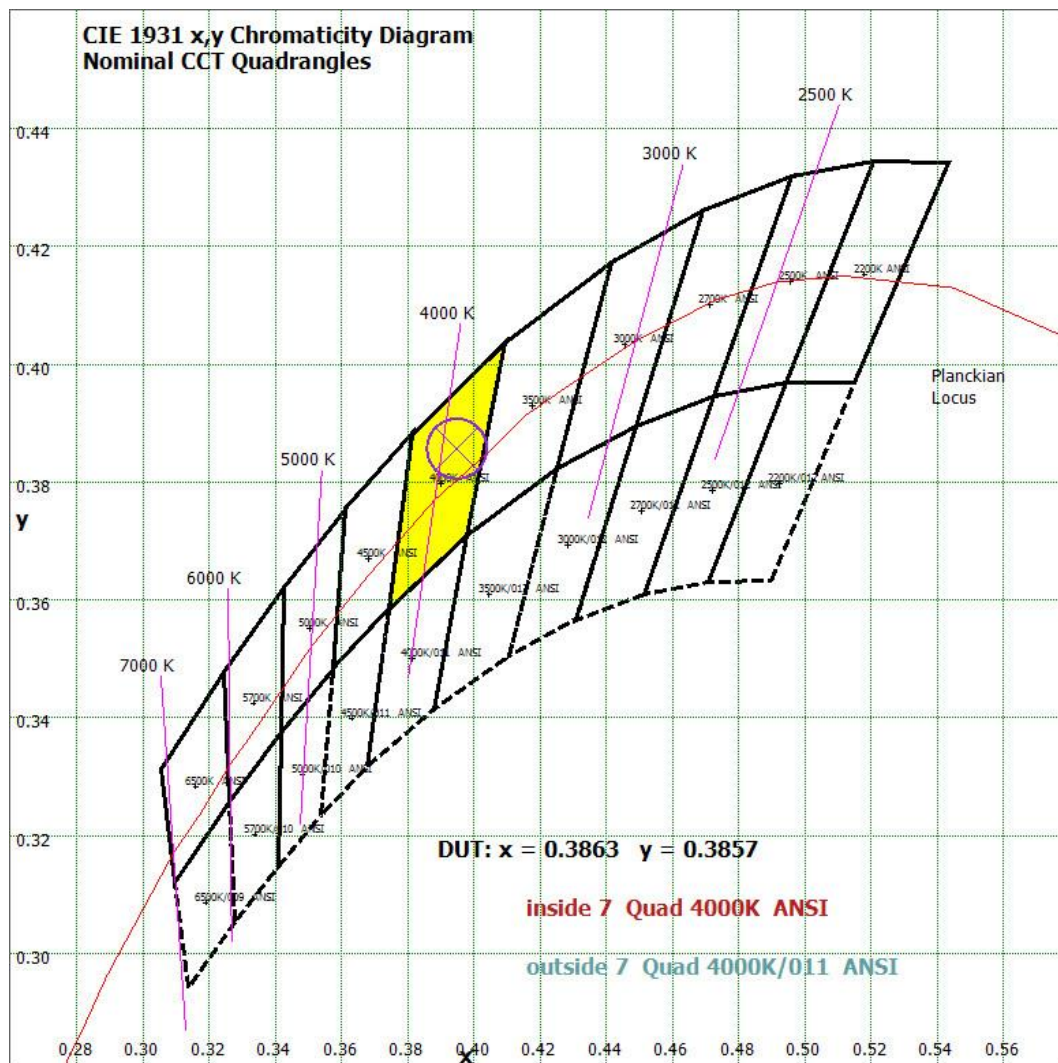


Chart 3: Plot of Lamp x/y coordinates on CIE 1931 Chromaticity Diagram

Color Rendition Report – Sphere Spectroradiometer Method

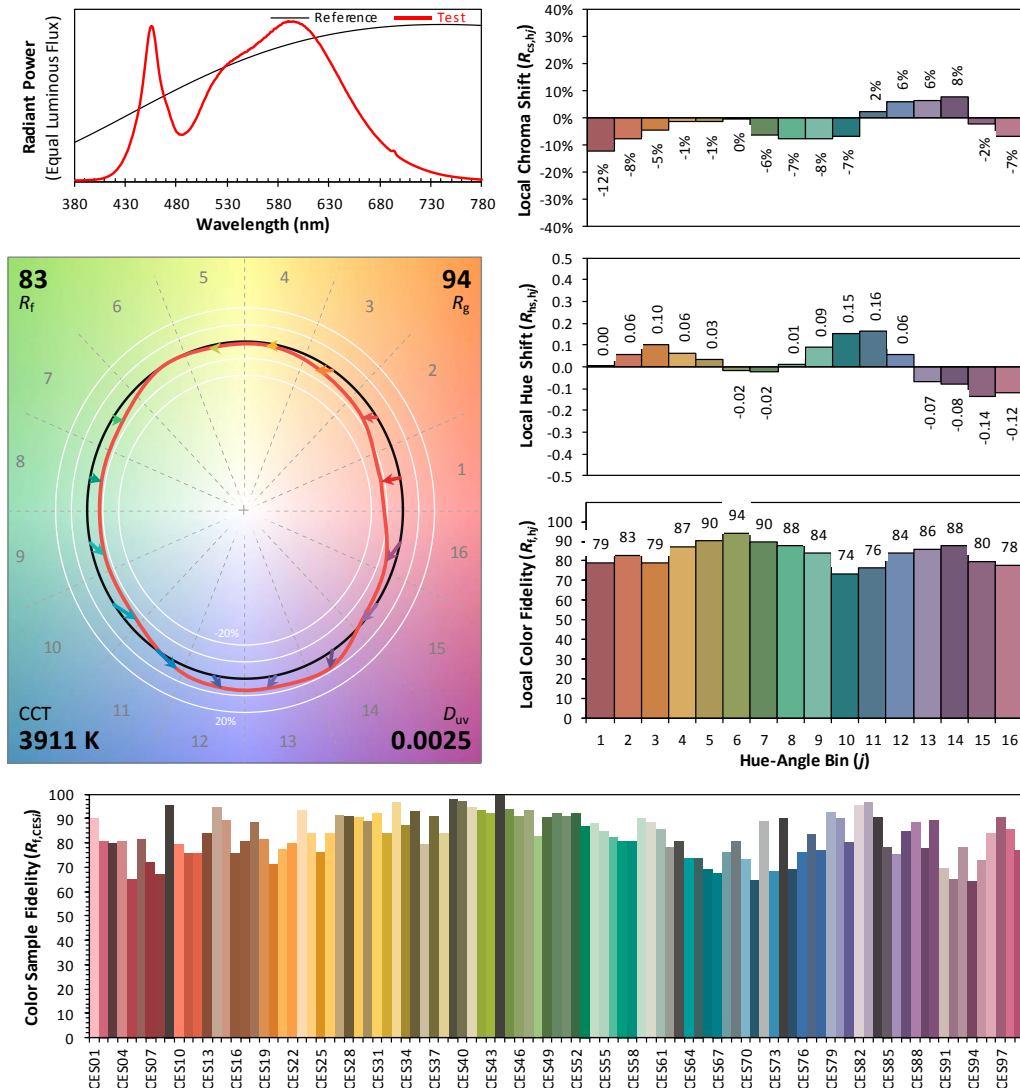
ANSI/IES TM-30-18 Color Rendition Report

Source: LED

Manufacturer: GREEN CREATIVE LTD

Date: 2024/07/09

Model: 25FHIDDIM/ED23/840/277V/E26



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

x 0.3863
 y 0.3857
 u' 0.2254
 v' 0.5063

CIE 13.3-1995
(CRI)
 R_a 82
 R_9 8

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	4.6	0.11%
10- 20	32.483	0.77%
20- 30	88.404	2.10%
30- 40	162.2	3.86%
40- 50	241.454	5.74%
50- 60	319.145	7.59%
60- 70	386.405	9.19%
70- 80	438.801	10.44%
80- 90	469.133	11.16%
90-100	469.065	11.16%
100-110	440.132	10.47%
110-120	386.021	9.18%
120-130	312.331	7.43%
130-140	227.376	5.41%
140-150	143.05	3.40%
150-160	67.593	1.61%
160-170	14.843	0.35%
170-180	0.18	0.00%
Total	4203.2	100%

$\gamma(^{\circ})$	Lumens	% Total
0-130	3750.17	89.22%
130-180	453.042	10.78%
0-180	4203.2	100%

Table 5: Zonal Lumen

Illuminance Plots- Goniophotometer Method

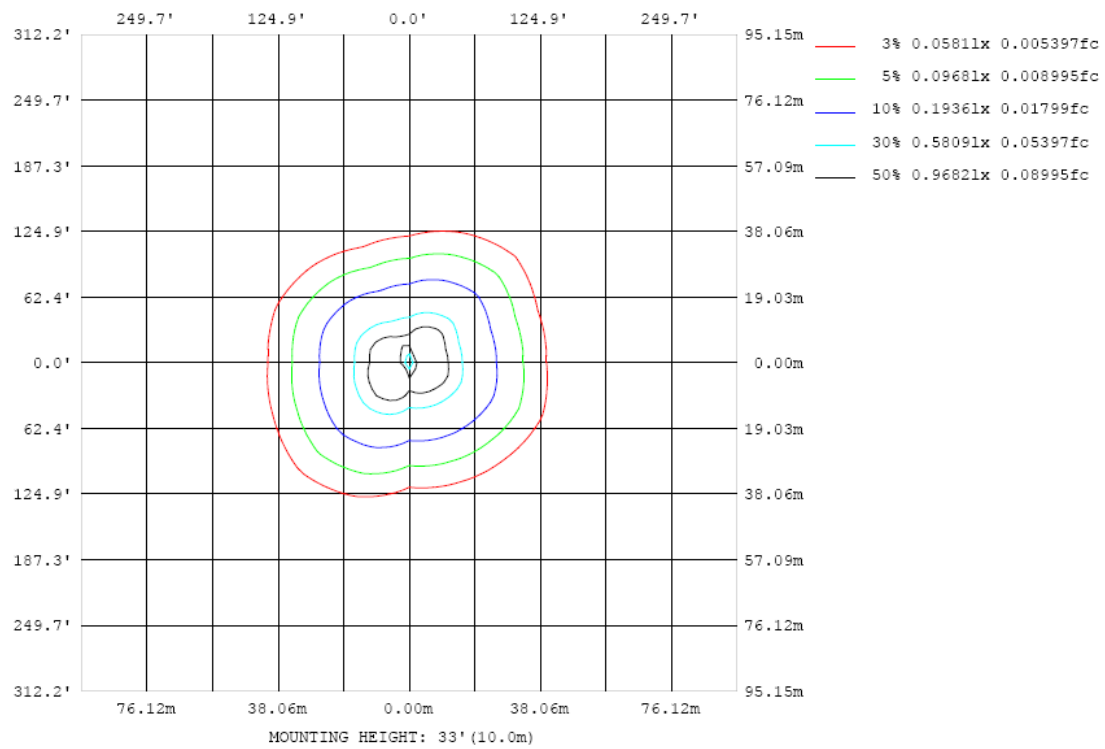


Chart 5: Illuminance Plot (Footcandles)

Luminous Intensity Distribution Plots- Goniophotometer Method

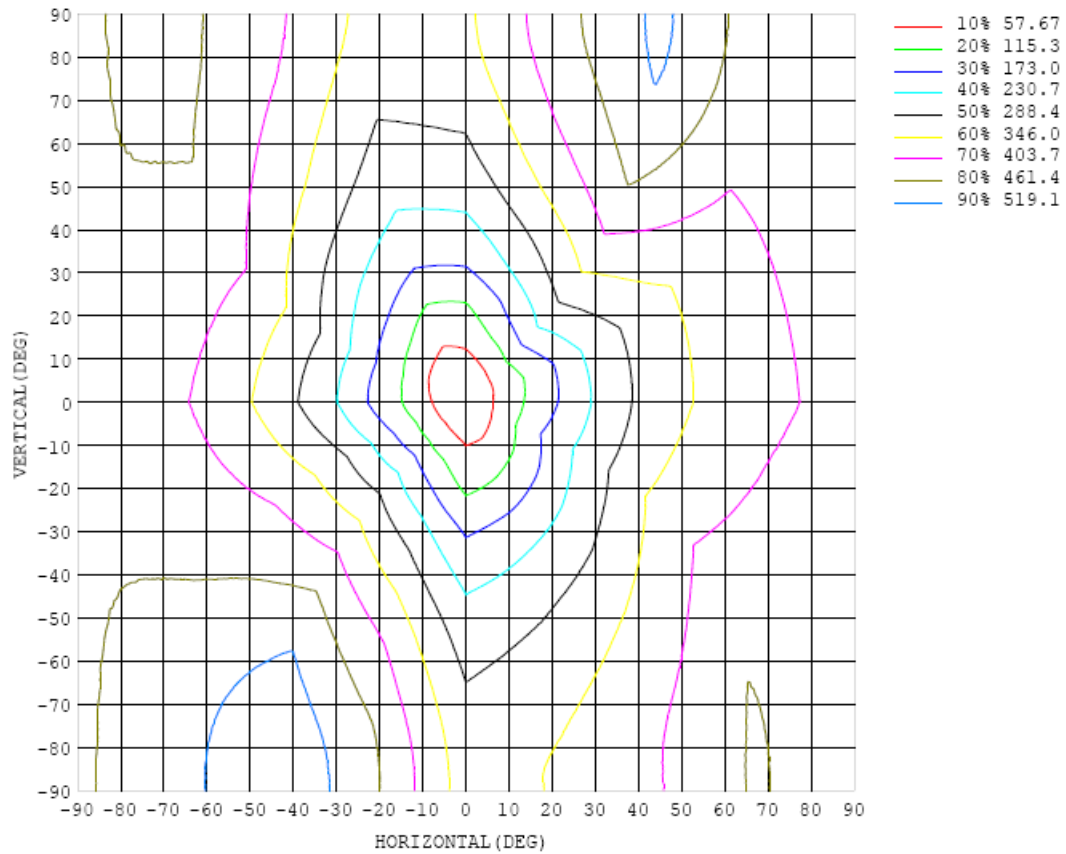


Chart 6: Isocandela Plot

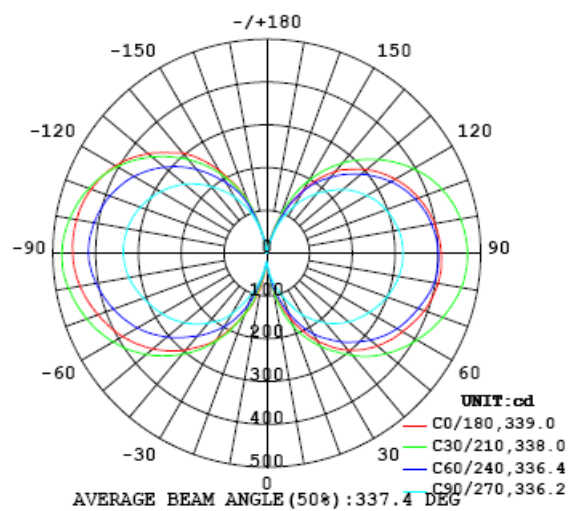


Chart 7: Polar Candela Distribution

Luminous Intensity Data- Goniophotometer Method

Table--1 UNIT: cd

C (DEG) γ (DEG)	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5			
0	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9			
5	45.9	42.9	41.1	36.4	35.8	40.6	44.5	41.6	37.0	31.2	24.0	23.1	26.0	32.7	40.2	43.4			
10	87.4	87.6	74.7	62.7	57.4	78.4	89.9	87.9	75.9	62.1	49.1	39.6	45.4	64.1	78.9	81.9			
15	127	141	110	92.6	80.6	124	149	143	118	108	85.0	62.4	71.5	107	134	118			
20	163	183	148	123	106	163	207	191	152	151	127	88.1	97.5	150	193	156			
25	201	218	185	157	135	205	253	242	190	196	164	121	129	183	241	199			
30	237	251	218	191	167	245	299	288	232	236	198	155	163	224	279	237			
35	269	281	244	218	190	280	337	323	264	275	225	183	191	256	317	266			
40	296	312	270	240	212	310	373	356	295	308	252	205	213	282	350	293			
45	318	341	294	262	232	339	407	383	323	339	279	225	235	311	380	315			
50	337	365	316	279	249	367	440	408	348	368	305	242	253	338	411	335			
55	353	387	336	294	264	391	469	428	370	393	329	258	269	361	440	353			
60	366	405	352	308	277	412	495	444	389	415	349	271	283	381	463	369			
65	380	423	366	320	289	430	516	458	406	433	367	283	295	397	484	384			
70	392	438	377	331	299	446	535	470	420	448	382	295	307	412	499	399			
75	401	451	389	340	307	461	552	480	434	461	395	306	319	424	513	411			
80	406	462	397	348	313	472	566	489	443	470	405	315	328	435	524	420			
85	409	467	401	353	318	478	574	493	451	478	413	323	333	442	530	428			
90	407	469	401	353	319	480	576	493	454	480	417	326	336	445	533	431			
95	405	466	398	350	317	477	574	489	454	475	416	327	335	444	528	433			
100	398	460	391	345	313	470	568	483	452	468	409	324	331	438	520	430			
105	390	450	382	335	306	460	556	475	446	457	402	318	325	428	510	425			
110	377	436	369	321	297	446	540	461	437	443	391	311	315	414	494	417			
115	364	418	354	306	286	429	521	444	424	425	376	299	302	398	475	405			
120	346	396	335	288	270	408	498	423	409	404	359	286	287	380	451	390			
125	327	370	312	266	252	384	470	398	387	379	337	270	271	356	423	371			
130	304	340	287	241	232	354	435	368	362	350	313	250	251	330	392	347			
135	277	309	261	214	207	323	397	334	333	319	285	227	229	300	356	317			
140	249	275	232	185	182	289	355	301	305	286	256	202	204	267	314	286			
145	213	238	201	155	156	248	307	260	267	251	223	176	178	231	272	255			
150	167	196	165	118	126	203	253	210	224	213	190	152	152	196	229	212			
155	127	149	123	62.0	93.4	154	194	155	177	171	157	122	124	157	175	164			
160	88.6	91.0	70.9	20.0	58.0	92.1	123	105	129	127	115	87.5	91.3	109	116	109			
165	43.6	35.2	22.2	5.28	16.6	32.1	54.1	56.8	69.5	66.4	59.1	51.4	55.9	55.2	53.8	48.6			
170	5.18	2.66	1.37	1.14	1.26	1.39	4.96	7.64	11.3	11.7	9.47	12.0	13.9	13.0	6.70	5.75			
175	0.82	0.72	0.62	0.50	0.49	0.60	0.73	0.85	0.91	0.92	1.01	1.01	1.01	1.09	1.03	0.97			
180	0.22	0.24	0.25	0.24	0.24	0.24	0.24	0.23	0.22	0.23	0.24	0.24	0.24	0.25	0.24	0.23			

Table 6: Luminous Intensity Data

EQUIPMENT LIST

Test Equipment	Model	Equipment No.	Calibration Date	Calibration Due date
Goniophotometer system	GO-R5000	HZTE011-01	Jun. 18, 2024	-
Digital Power Meter	PF2010A	HZTE028-01	Aug. 01, 2023	Jul. 31, 2024
AC Power Supply	DPS1060	HZTE001-06	Aug. 01, 2023	Jul. 31, 2024
DC Power Supply	WY12010	HZTE004-03	Aug. 01, 2023	Jul. 31, 2024
Temperature recorder	JM624U	HZTE018-08	Aug. 04, 2023	Aug. 03, 2024
Temperature and humidity recorder	JR900	HZTE018-01	Aug. 04, 2023	Aug. 03, 2024
Standard source	D908	HZTE012-01	Aug. 14, 2018	-
Integrate Sphere system	3M	HZTE015-04	Jun. 18, 2024	-
Digital Power Meter	WT210	HZTE008-01	Aug. 01, 2023	Jul. 31, 2024
AC Power Supply	PCR 500L	HZTE001-07	Aug. 01, 2023	Jul.31, 2024
DC Power Supply	IT6154	HZTE004-04	Aug. 01, 2023	Jul. 31, 2024
Standard source	SCL-1400	HZTE012-06	Nov. 04, 2021	-
Temperature and humidity recorder	JR900	HZTE018-02	Aug. 04, 2023	Aug. 03, 2024
Temperature Meter	TES1310	HZTE017-01	Aug. 04, 2023	Aug. 03, 2024

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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