

## 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/ED23/850/277V/E26**

### Laboratory: Leading Testing Laboratories

**NVLAP CODE: 200960-0**

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Report No.: HZ24060009c

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

Review by:

*Wei Fei*

Engineer: Wei Fei  
Jun. 19, 2024

Approve by:



Manager: April Zou  
Jun. 19, 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/ED23/850/277V/E26

Luminous Efficacy (Lumens /Watt)	Total Luminous Flux (Lumens)	Power (Watts)	Power Factor
180.1	4188.3	23.26	0.9938
CCT (K)	CRI	Stabilization Time (Light & Power)	
5079	82.3	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** : Jun. 13, 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

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## SAMPLE PHOTO



Figure 1- Overview of the sample

### Equipment Under Test(EUT)

<b>Name</b>	: LED Lamp
<b>Model</b>	: 25FHIDDIM/ED23/850/277V/E26
<b>Electrical Ratings</b>	: 120-277V, 50/60Hz, 25W
<b>Product Description</b>	: 5000K
<b>Manufacturer</b>	: GREEN CREATIVE LTD
<b>Address</b>	: 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)	0.195	0.094
Power Factor	0.9938	0.9125
Test Power (W)	23.26	23.64
THD A%	4.95	10.35
Luminous Efficacy (lm/W)	180.1	180.3
Total Luminous Flux (lm)	4188.3	4263.2
Color Rendering Index (CRI)	82.3	
R9	7.5	
Correlated Color Temperature (CCT)(K)	5079	
Chromaticity Chroma x	0.3432	
Chromaticity Chroma y	0.3546	
Chromaticity Chroma u	0.2090	
Chromaticity Chroma v	0.3239	
Duv	0.0023	
Chromaticity Chroma u'	0.2090	
Chromaticity Chroma v'	0.4858	

Special Color Rendering Indices	
R1	80.7
R2	88
R3	91.7
R4	80.8
R5	80.5
R6	82.2
R7	87
R8	67.1
R9	7.5
R10	69.8
R11	78.6
R12	58.4
R13	82.7
R14	95.4

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)	0.195
Power Factor	0.9957
Power (W)	23.27
Luminous Efficacy (lm/W)	181.4
Total Luminous Flux (lm)	4222.1
Beam Angle ( ° )	338.9 (0°-180°) / 338.7 (90°-270°)
Center Beam Candle Power (cd)	21.9
Maximum Beam Candle Power (cd)	557.6 (At: C=0.0, Gamma=91.5)
Spacing Criteria	6.22 (0°-180°) / 5.94 (90°-270°)
Zonal Lumens in the 0 °-60 °Zone	20.18%
Zonal Lumens in the 60 °-90 °Zone	30.67%
Zonal Lumens in the 90 °-120 °Zone	30.73%
Zonal Lumens in the 120 °-180 °Zone	18.42%

Table 3: Test data per Goniophotometer Method

## Spectral Power Distribution - Sphere Spectroradiometer Method

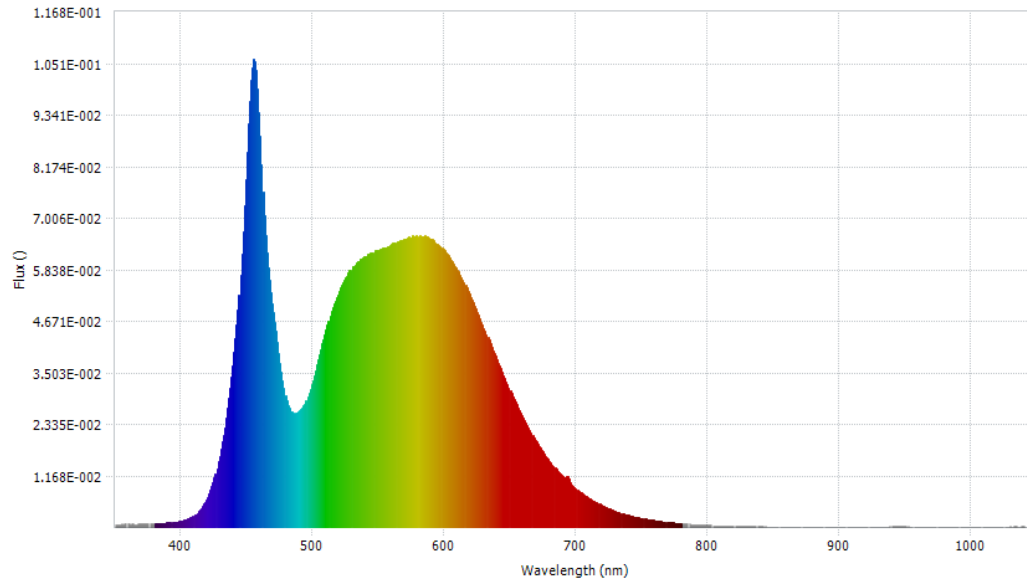
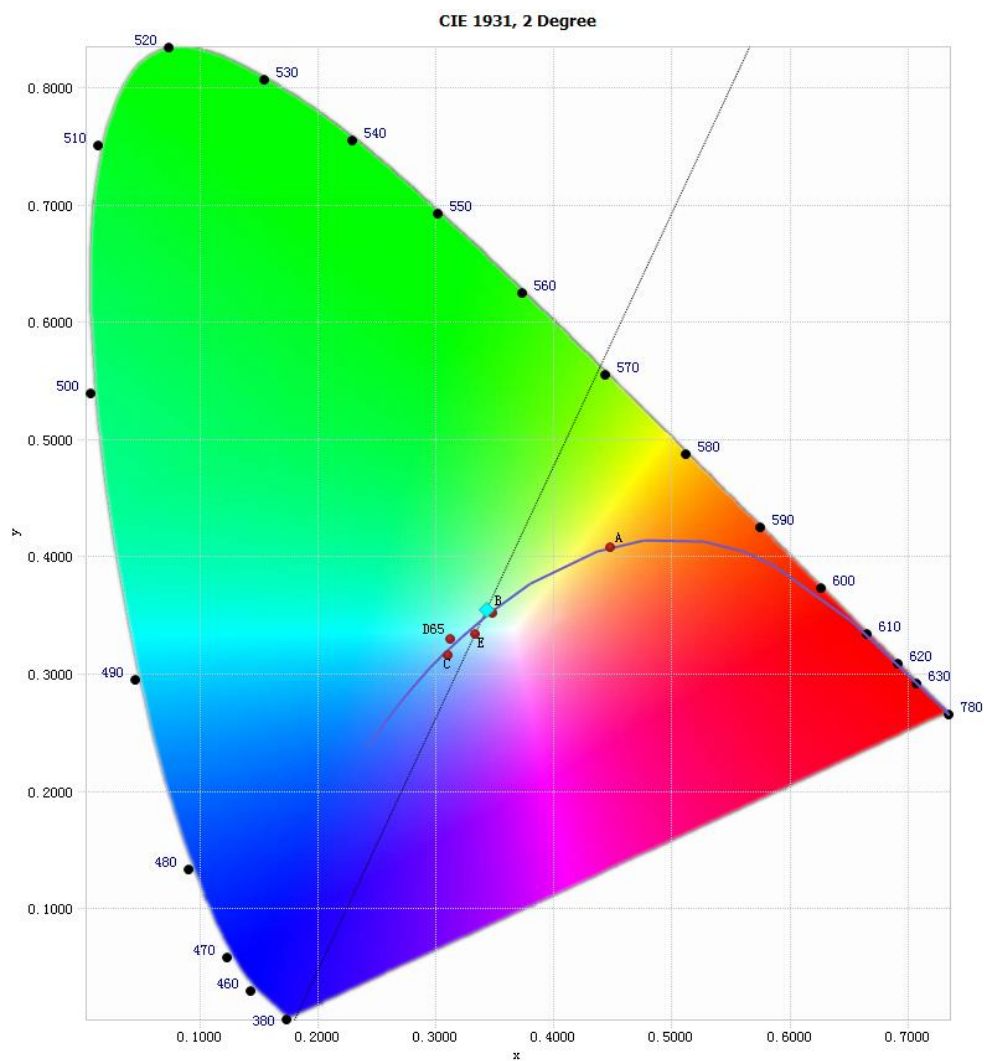


Chart 1: Spectral Power Distribution

Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	9.05E-04	485	2.60E-02	590	6.54E-02	695	1.12E-02
385	9.16E-04	490	2.65E-02	595	6.43E-02	700	8.74E-03
390	1.06E-03	495	2.89E-02	600	6.28E-02	705	7.58E-03
395	1.26E-03	500	3.33E-02	605	6.06E-02	710	6.62E-03
400	1.48E-03	505	3.90E-02	610	5.82E-02	715	5.78E-03
405	1.92E-03	510	4.47E-02	615	5.54E-02	720	4.97E-03
410	2.84E-03	515	4.98E-02	620	5.21E-02	725	4.28E-03
415	4.29E-03	520	5.34E-02	625	4.87E-02	730	3.69E-03
420	6.87E-03	525	5.67E-02	630	4.52E-02	735	3.19E-03
425	1.12E-02	530	5.91E-02	635	4.16E-02	740	2.74E-03
430	1.77E-02	535	6.02E-02	640	3.81E-02	745	2.37E-03
435	2.70E-02	540	6.15E-02	645	3.44E-02	750	2.07E-03
440	3.97E-02	545	6.24E-02	650	3.10E-02	755	1.80E-03
445	5.70E-02	550	6.27E-02	655	2.79E-02	760	1.57E-03
450	8.51E-02	555	6.34E-02	660	2.48E-02	765	1.36E-03
455	1.06E-01	560	6.41E-02	665	2.20E-02	770	1.19E-03
460	8.86E-02	565	6.47E-02	670	1.94E-02	775	1.01E-03
465	6.22E-02	570	6.52E-02	675	1.71E-02	780	8.90E-04
470	4.87E-02	575	6.57E-02	680	1.50E-02		
475	3.71E-02	580	6.60E-02	685	1.31E-02		
480	2.87E-02	585	6.62E-02	690	1.15E-02		

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

## Chromaticity Diagram - Sphere Spectroradiometer Method



Tristimulus values(x, y): (0.3432, 0.3546)

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

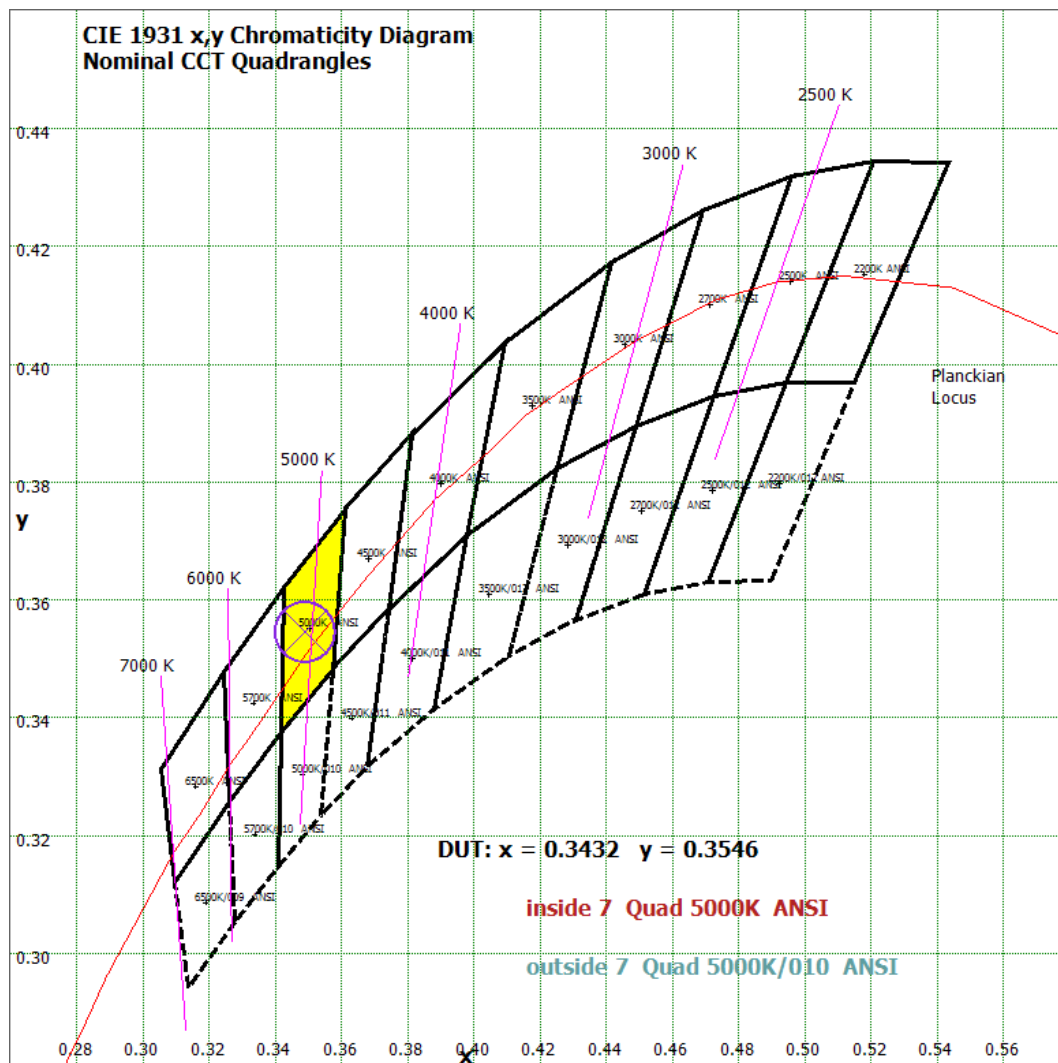


Chart 3: Plot of Lamp x/y coordinates on CIE 1931 Chromaticity Diagram

## Color Rendition Report – Sphere Spectroradiometer Method

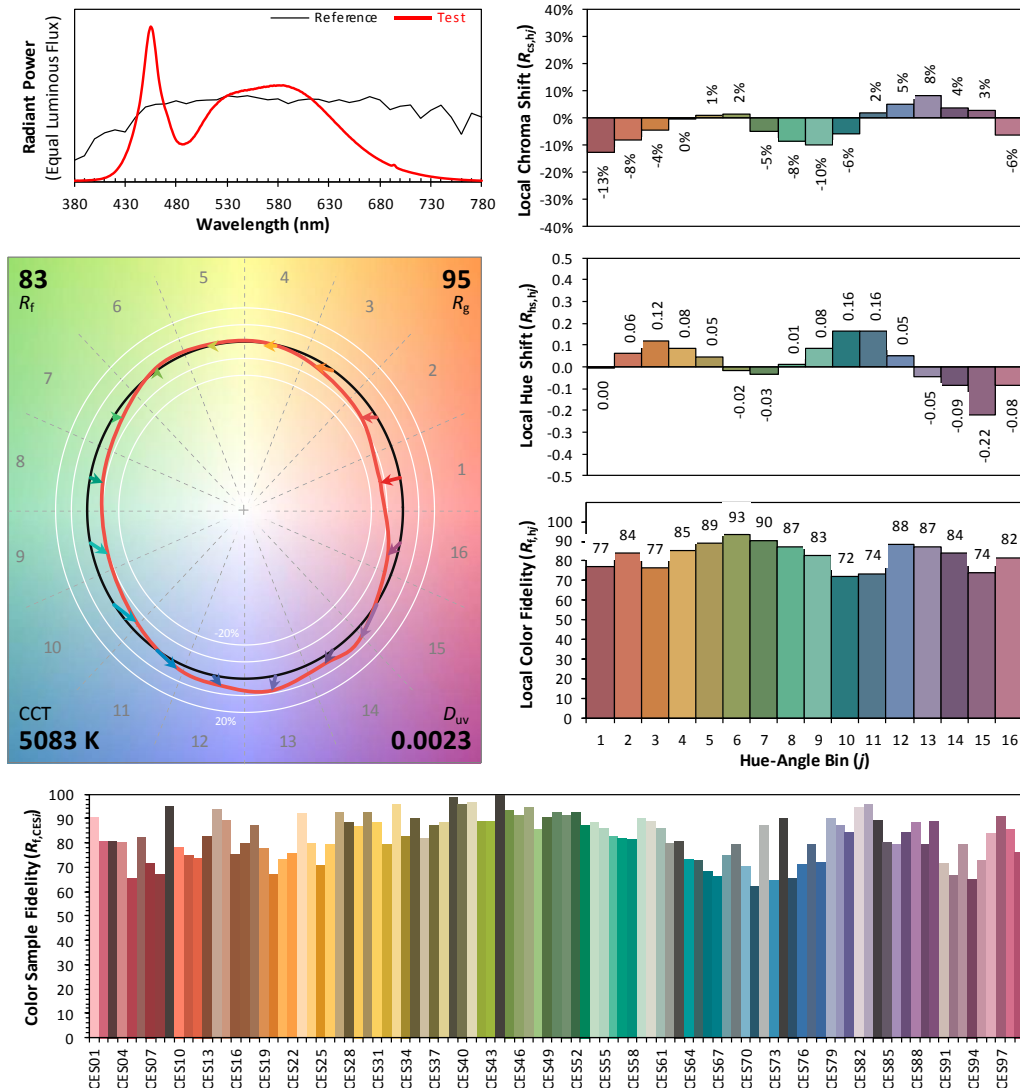
## ANSI/IES TM-30-18 Color Rendition Report

Source: LED

Manufacturer: GREEN CREATIVE LTD

Date: 2024/06/13

Model: 25FHIDDIM/ED23/850/277V/E26



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

$x$  0.3432  
 $y$  0.3546  
 $u'$  0.2090  
 $v'$  0.4858

CIE 13.3-1995  
(CRI)  
 $R_a$  82  
 $R_9$  7

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	4.356	0.10%
10- 20	32.292	0.76%
20- 30	89.189	2.11%
30- 40	162.825	3.86%
40- 50	242.702	5.75%
50- 60	320.72	7.60%
60- 70	388.7	9.21%
70- 80	438.934	10.40%
80- 90	467.18	11.06%
90-100	468.537	11.10%
100-110	440.996	10.44%
110-120	388.041	9.19%
120-130	315.182	7.46%
130-140	229.801	5.44%
140-150	145.663	3.45%
150-160	70.191	1.66%
160-170	16.365	0.39%
170-180	0.472	0.01%
Total	4222.1	100%

$\gamma(^{\circ})$	Lumens	% Total
0-130	3759.65	89.05%
130-180	462.492	10.95%
0-180	4222.1	100%

Table 5: Zonal Lumen

## Illuminance Plots- Goniophotometer Method

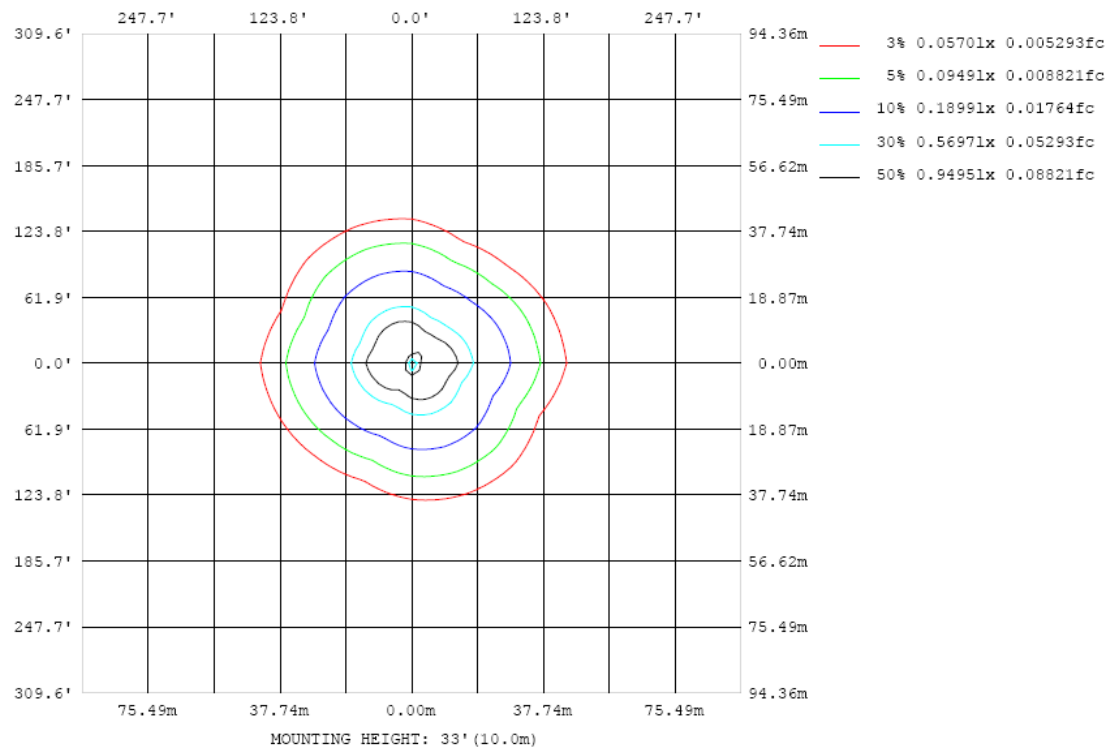


Chart 5: Illuminance Plot (Footcandles)

## Luminous Intensity Distribution Plots- Goniophotometer Method

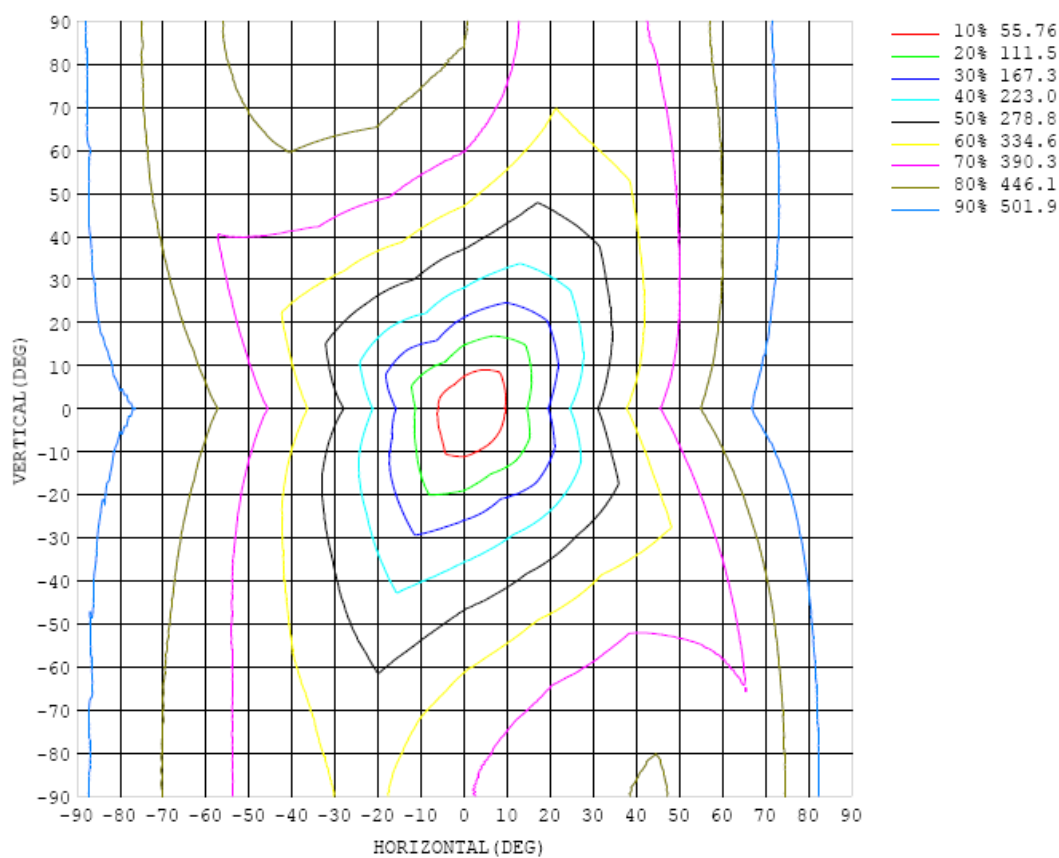


Chart 6: Isocandela Plot

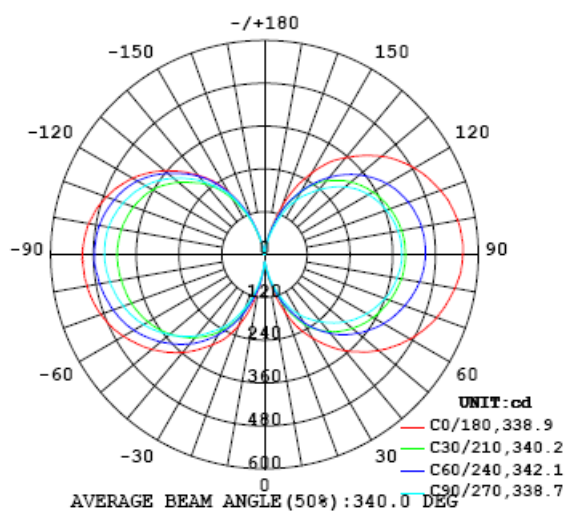


Chart 7: Polar Candela Distribution

## 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	25.6	25.5	25.2	24.7	25.2	30.1	37.5	43.9	46.7	46.9	47.7	46.8	39.2	31.0	26.1	25.2			
10	61.2	58.8	56.5	53.6	47.5	49.3	72.5	85.9	94.0	84.9	91.4	95.0	74.8	57.8	46.6	53.0			
15	117	100	95.1	98.8	83.9	74.6	108	137	158	125	134	146	114	89.6	75.1	94.3			
20	173	140	137	147	120	102	141	179	210	169	177	194	157	124	109	137			
25	227	186	176	185	160	133	175	212	257	213	220	233	199	158	146	179			
30	270	225	219	215	194	160	207	245	290	248	258	265	236	191	184	222			
35	312	256	255	246	220	184	233	272	325	277	294	298	265	219	216	260			
40	351	282	288	275	246	205	256	300	357	304	326	329	296	242	244	295			
45	386	303	318	303	270	222	276	325	387	326	354	359	324	261	267	327			
50	419	322	342	329	293	239	293	350	413	346	381	385	348	279	290	357			
55	446	338	365	352	314	254	308	371	437	363	403	407	371	295	310	385			
60	473	353	387	371	331	270	323	388	457	377	423	424	392	309	329	411			
65	495	364	404	388	346	283	334	404	475	389	440	442	407	322	346	431			
70	515	374	419	401	360	296	344	415	489	397	452	453	422	333	359	448			
75	529	384	431	413	370	305	352	426	499	404	462	463	432	339	372	462			
80	542	390	442	423	377	311	357	431	505	408	470	470	440	342	383	475			
85	553	394	449	430	384	318	359	435	509	412	476	473	446	344	392	486			
90	556	396	451	433	384	321	360	437	511	414	477	475	449	345	396	490			
95	556	394	451	433	385	323	358	434	508	412	476	473	448	343	397	491			
100	550	391	447	429	381	321	352	428	501	408	471	466	444	338	394	484			
105	540	385	440	423	373	318	343	417	488	401	462	455	435	331	388	477			
110	526	375	430	412	364	309	331	403	473	391	449	442	422	322	379	465			
115	507	365	415	400	351	299	317	386	451	379	433	425	407	310	367	448			
120	485	351	397	384	337	285	300	368	428	362	413	403	386	293	352	429			
125	460	335	374	364	318	269	281	345	398	341	386	379	363	271	335	405			
130	428	316	347	339	295	250	257	319	366	315	354	350	333	247	313	379			
135	394	293	317	311	267	228	230	290	329	285	321	319	302	220	285	349			
140	354	270	282	280	237	204	202	257	291	258	286	284	267	193	257	314			
145	315	240	245	245	206	180	174	221	252	223	247	247	229	170	228	278			
150	263	203	204	210	174	151	146	185	204	180	200	206	192	141	195	238			
155	208	159	163	170	136	119	114	139	149	134	152	160	141	106	154	189			
160	143	118	119	122	92.1	81.0	76.7	86.2	94.8	87.2	97.8	100	89.2	72.4	104	133			
165	76.7	73.2	70.2	70.2	51.6	36.3	34.9	37.2	31.9	35.7	45.5	49.3	40.7	38.5	53.0	72.7			
170	25.1	30.4	21.8	5.79	4.43	8.42	8.85	5.15	3.10	5.89	10.8	8.08	10.0	15.2	18.8	23.0			
175	2.96	3.50	1.20	0.77	0.69	0.41	0.41	0.41	0.78	0.90	1.08	1.24	1.51	1.66	2.14	2.87			
180	0.27	0.27	0.27	0.27	0.26	0.25	0.24	0.24	0.27	0.27	0.26	0.27	0.26	0.26	0.25	0.25			

Table 6: Luminous Intensity Data

## EQUIPMENT LIST

Test Equipment	Model	Equipment No.	Calibration Date	Calibration Due date
Goniophotometer system	GO-R5000	HZTE011-01	Feb. 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	Feb. 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  $4\pi$ . 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 \*\*\*

This report is considered invalidated without the Special Seal for Inspection of the LTL. This report shall not be altered, increased or deleted. The results shown in this test report refer only to the sample(s) tested. Without written approval of LTL, this test report shall not be copied except in full and published as advertisement.