

## 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: 9T5HE/2F/8CCTS/UEB/C**

### Laboratory: Leading Testing Laboratories

**NVLAP CODE: 200960-0**

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Report No.: HZ25040003a

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

Review by:

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Engineer: Wei Fei

Apr. 09, 2025

Approved by:



*April Zou*

Manager: April Zou

Apr. 09, 2025

Note: This report does not imply product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

## TEST SUMMARY

Tested Model	9T5HE/2F/8CCT S/UEB/C 3000K Setting	9T5HE/2F/8CCT S/UEB/C 3500K Setting	9T5HE/2F/8CCT S/UEB/C 4000K Setting	9T5HE/2F/8CCTS/ UEB/C 5000K Setting
Luminous Efficacy (Lumens /Watt)	130.4	141.6	145.7	136.2
Total Luminous Flux (Lumens)	1150.5	1228.7	1254.2	1201.2
Power (Watts)	8.82	8.68	8.61	8.82
Power Factor	0.9756	0.9763	0.9765	0.9756
CCT (K)	3046	3533	4076	5031
CRI	82.1	84.3	85.1	84.4
Stabilization Time (Light & Power)	50 mins	50 mins	50 mins	50 mins
Note	3000K	3500K	4000K	5000K

Table 1: Executive Data Summary

### Test specifications:

Date of Receipt	: Apr. 02, 2025
Date of Test	: Apr. 07, 2025
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 Tube
<b>Model</b>	: 9T5HE/2F/8CCTS/UEB/C
<b>Electrical Ratings</b>	: 120-277V, 50/60Hz, 9W
<b>Product Description</b>	: Color- Tunable 3000K/3500K/4000K/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 (3000K Setting)

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)	0.075	0.037
Power Factor	0.9756	0.9004
Test Power (W)	8.82	9.11
THD A%	18.05	19.54
Luminous Efficacy (lm/W)	130.4	128.9
Total Luminous Flux (lm)	1150.5	1174.4
Color Rendering Index (CRI)	82.1	
R9	6.4	
Correlated Color Temperature (CCT)(K)	3046	
Chromaticity Chroma x	0.4320	
Chromaticity Chroma y	0.3997	
Chromaticity Chroma u	0.2493	
Chromaticity Chroma v	0.3459	
Duv	-0.0011	
Chromaticity Chroma u'	0.2493	
Chromaticity Chroma v'	0.5189	

Special Color Rendering Indices	
R1	80.4
R2	90.1
R3	96.3
R4	80.3
R5	80.6
R6	87.7
R7	82.7
R8	59
R9	6.4
R10	77.6
R11	79.6
R12	70.6
R13	82.6
R14	98.5

Table 2: Test data per Sphere-Spectroradiometer Method

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

## Spectral Power Distribution - Sphere Spectroradiometer Method

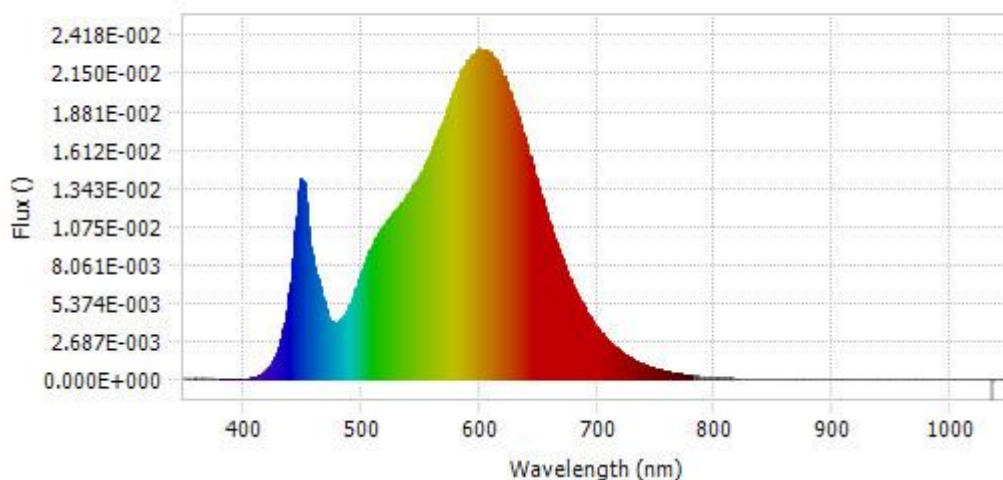


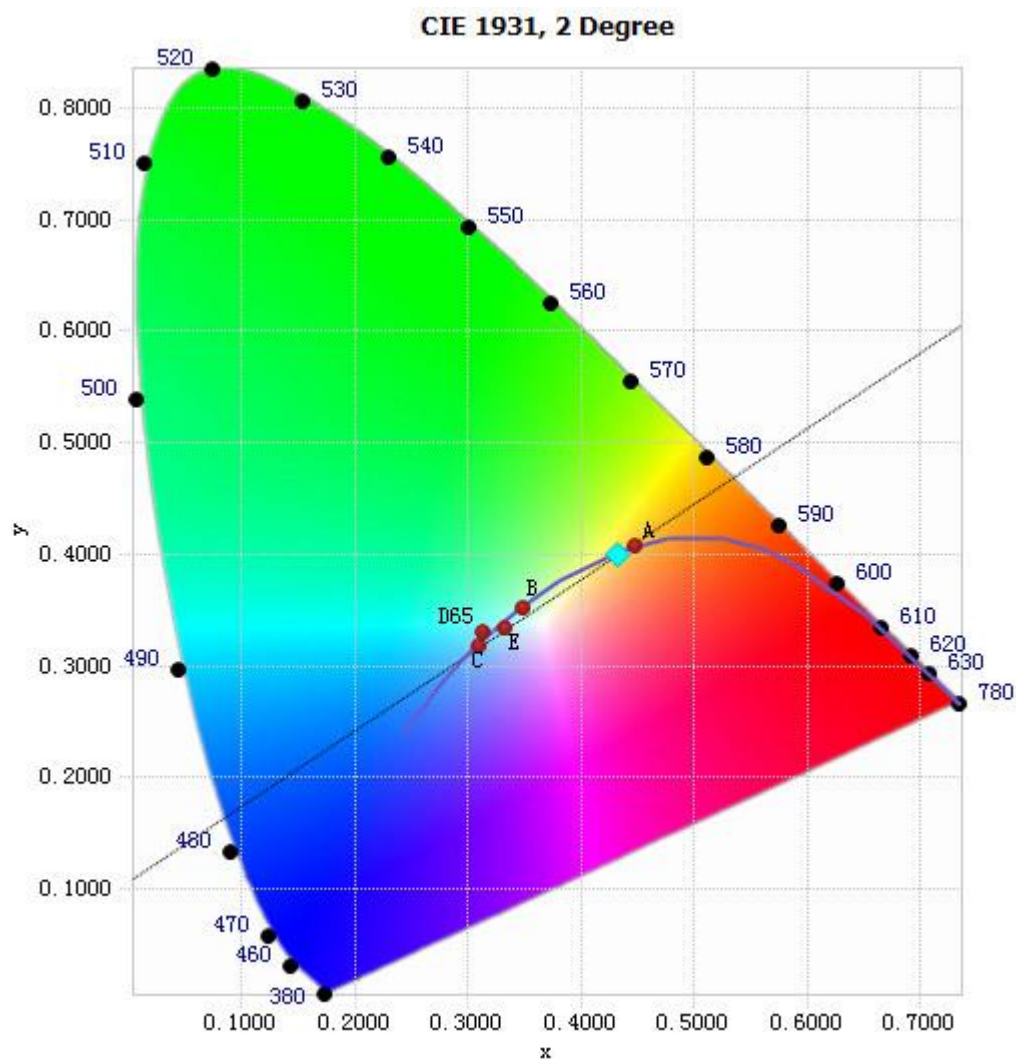
Chart 1: Spectral Power Distribution

Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	8.60E-05	485	4.43E-03	590	2.24E-02	695	4.22E-03
385	7.97E-05	490	5.20E-03	595	2.28E-02	700	3.63E-03
390	7.82E-05	495	6.33E-03	600	2.32E-02	705	3.10E-03
395	6.03E-05	500	7.50E-03	605	2.31E-02	710	2.66E-03
400	7.36E-05	505	8.57E-03	610	2.28E-02	715	2.28E-03
405	1.05E-04	510	9.51E-03	615	2.22E-02	720	1.96E-03
410	2.06E-04	515	1.04E-02	620	2.13E-02	725	1.68E-03
415	3.76E-04	520	1.09E-02	625	2.03E-02	730	1.42E-03
420	7.16E-04	525	1.15E-02	630	1.91E-02	735	1.22E-03
425	1.31E-03	530	1.19E-02	635	1.79E-02	740	1.04E-03
430	2.27E-03	535	1.24E-02	640	1.65E-02	745	8.92E-04
435	3.91E-03	540	1.31E-02	645	1.50E-02	750	7.62E-04
440	6.79E-03	545	1.37E-02	650	1.36E-02	755	6.54E-04
445	1.15E-02	550	1.44E-02	655	1.22E-02	760	5.62E-04
450	1.40E-02	555	1.52E-02	660	1.09E-02	765	4.79E-04
455	1.08E-02	560	1.62E-02	665	9.63E-03	770	4.10E-04
460	7.92E-03	565	1.71E-02	670	8.47E-03	775	3.48E-04
465	6.49E-03	570	1.83E-02	675	7.43E-03	780	3.01E-04
470	4.91E-03	575	1.94E-02	680	6.48E-03		
475	4.06E-03	580	2.06E-02	685	5.64E-03		
480	4.04E-03	585	2.16E-02	690	4.89E-03		

Table 3: Spectral Power Distribution Numerical Data per Sphere - Spectroradiometer Method



## Chromaticity Diagram - Sphere Spectroradiometer Method



Tristimulus values(x, y): (0.4320, 0.3997)

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

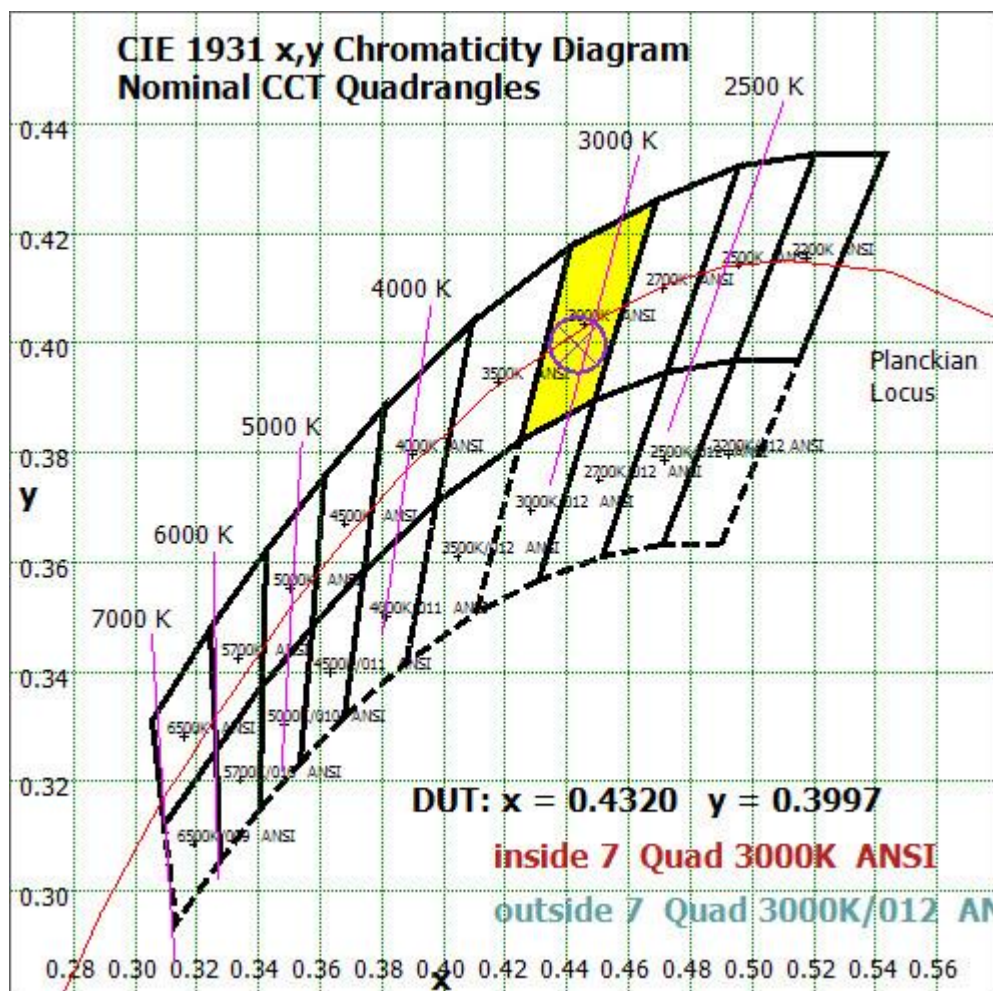


Chart 3: Plot of Lamp x/y coordinates on CIE 1931 Chromaticity Diagram

# Color Rendition Report – Sphere Spectroradiometer Method

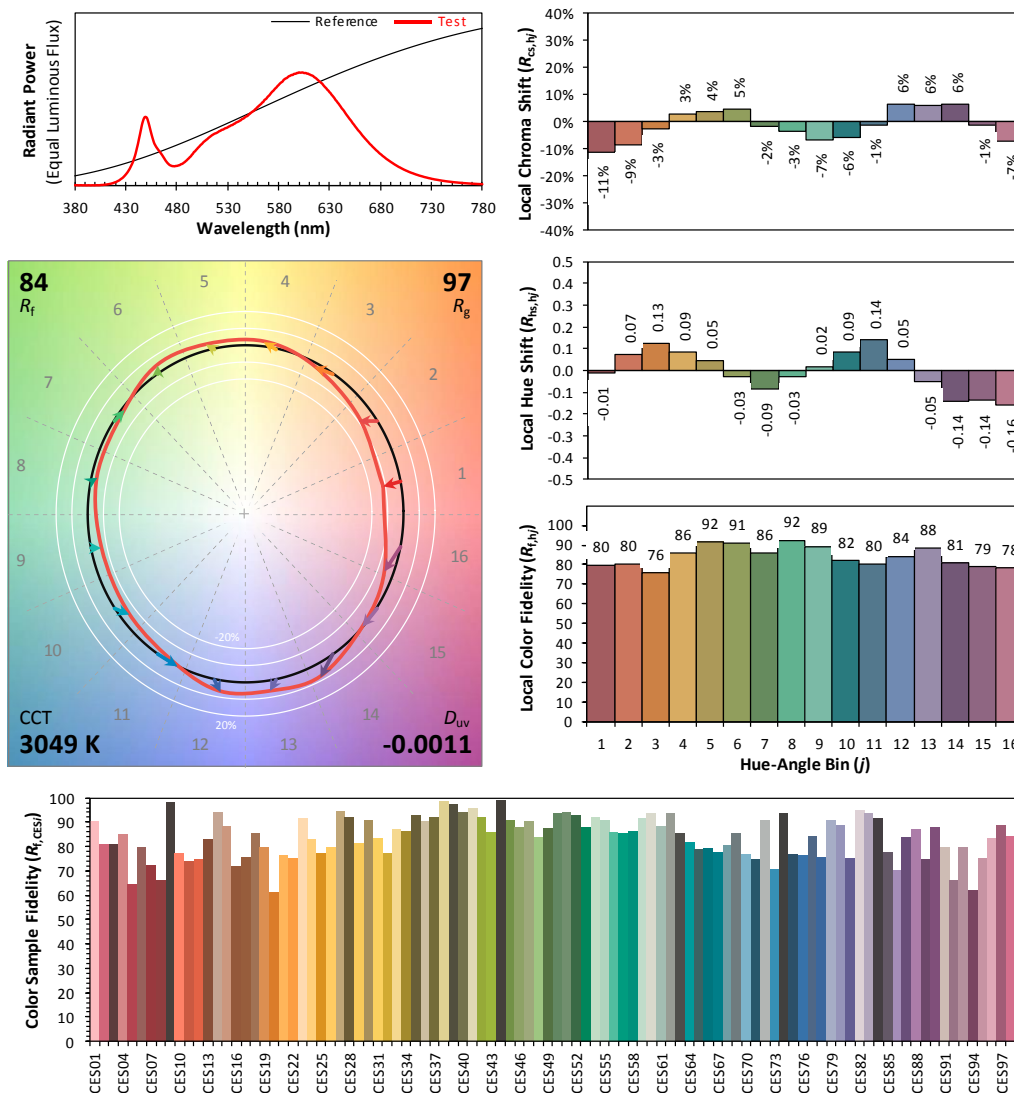
## ANSI/IES TM-30-18 Color Rendition Report

Source: LED

Manufacturer: GREEN CREATIVE LTD

Date: 2025/04/07

Model: 9T5HE/2F/8CCTS/UEB/C



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

$x$  0.4320  
 $y$  0.3997  
 $u'$  0.2493  
 $v'$  0.5189

CIE 13.3-1995  
(CRI)

$R_a$  82  
 $R_g$  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.

### Goniophotometer Method

Test ambient temperature was 25.1 °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)	0.075
Power Factor	0.9760
Power (W)	8.83
Luminous Efficacy (lm/W)	131.3
Total Luminous Flux (lm)	1159.1
Beam Angle (°)	110.4 (0°-180°) / 208.0 (90°-270°)
Center Beam Candle Power (cd)	210
Maximum Beam Candle Power (cd)	210.7 (At: C=80.0, Gamma=5.5)
Spacing Criteria	1.23 (0°-180°) / 1.44 (90°-270°)
Zonal Lumens in the 0 °-60 °Zone	46.55%
Zonal Lumens in the 60 °-90 °Zone	28.25%
Zonal Lumens in the 90 °-120 °Zone	16.61%
Zonal Lumens in the 120 °-180 °Zone	8.58%

Table 4: Test data per Goniophotometer Method

**Zonal Lumen Tabulation- Goniophotometer Method**

$\gamma(^{\circ})$	Lumens	% Total
0- 10	19.894	1.72%
10- 20	57.747	4.98%
20- 30	90.022	7.77%
30- 40	113.826	9.82%
40- 50	127.526	11.00%
50- 60	130.588	11.27%
60- 70	123.93	10.69%
70- 80	110.246	9.51%
80- 90	93.304	8.05%
90-100	77.625	6.70%
100-110	63.83	5.51%
110-120	51.037	4.40%
120-130	39.233	3.38%
130-140	28.237	2.44%
140-150	18.387	1.59%
150-160	9.488	0.82%
160-170	3.513	0.30%
170-180	0.647	0.06%
Total	1159.1	100%

$\gamma(^{\circ})$	Lumens	% Total
0- 60	539.603	46.55%
60- 90	327.48	28.25%
0-90	867.083	74.81%
90- 180	291.997	25.19%
0- 180	1159.1	100%

Table 5: Zonal Lumen

## Illuminance Plots- Goniophotometer Method

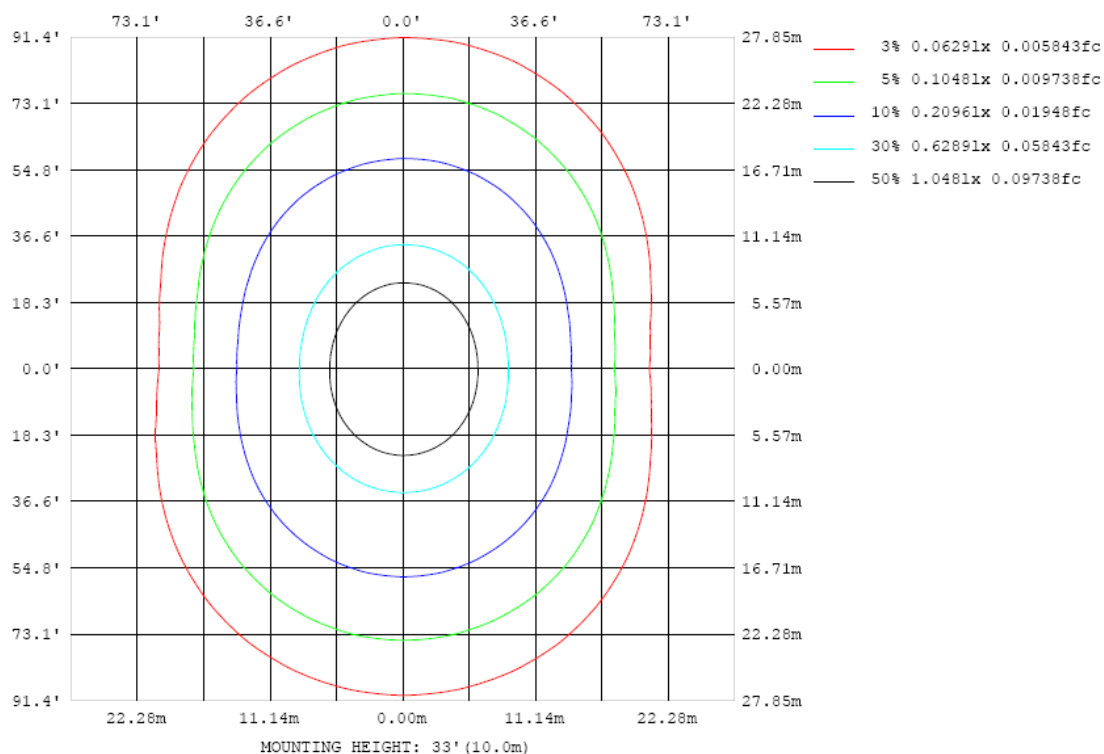


Chart 5: Illuminance Plot (Footcandles)

## Luminous Intensity Distribution Plots- Goniophotometer Method

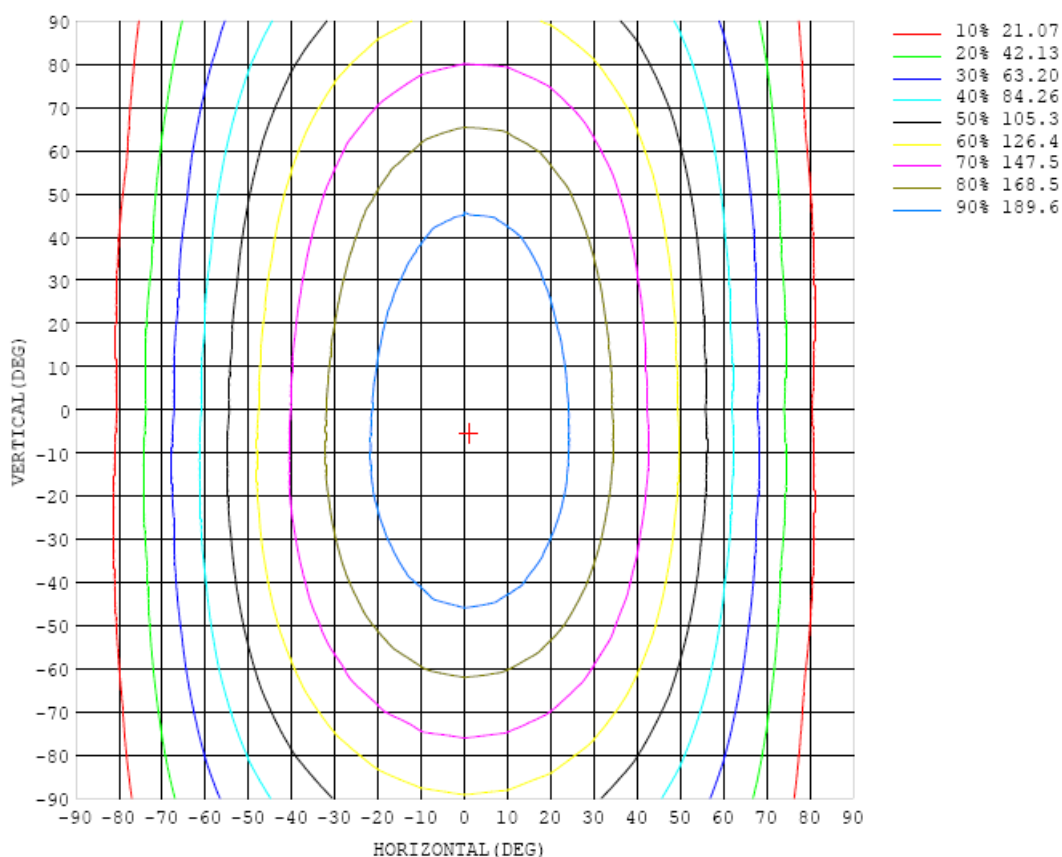


Chart 6: Isocandela Plot

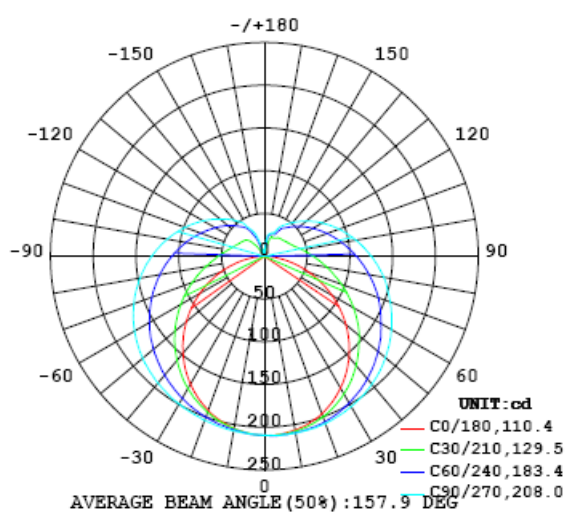


Chart 7: Polar Candela Distribution



## Luminous Intensity Data- Goniophotometer Method

Table--1

UNIT: cd

C (DEG) γ (DEG)	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
0	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210
5	209	209	209	209	209	210	210	211	210	210	210	210	210	210	209	209	209	208	208
10	207	207	207	208	209	209	210	210	210	210	210	209	208	208	207	206	205	205	205
15	202	203	204	205	206	207	208	209	209	209	209	208	207	205	204	202	201	200	199
20	196	197	198	200	202	204	206	207	208	208	208	206	204	202	199	197	194	193	192
25	188	189	191	194	197	200	203	205	206	206	205	203	200	197	194	190	187	184	183
30	178	179	182	186	190	195	198	201	203	203	202	200	196	191	187	182	178	174	173
35	167	168	172	177	183	188	193	197	199	200	198	195	190	185	179	173	167	163	161
40	154	156	161	167	174	181	187	192	195	195	194	190	184	177	170	162	156	151	148
45	139	143	148	156	165	173	181	186	190	191	189	185	178	170	161	152	145	138	134
50	124	128	135	145	155	165	173	180	184	185	183	178	171	161	151	141	131	124	119
55	108	113	121	133	145	156	166	173	177	178	176	171	163	153	142	129	118	109	103
60	91.0	96.2	106	120	135	147	157	166	170	171	170	164	155	145	132	117	104	93.0	87.2
65	73.5	79.4	91.8	108	124	138	150	158	163	164	162	156	147	136	121	106	89.9	77.4	70.5
70	56.1	62.7	77.6	95.9	113	129	142	150	155	157	154	149	139	127	111	94.1	76.6	61.8	54.4
75	38.8	46.8	64.4	84.4	103	120	133	142	148	149	147	141	131	118	101	83.3	64.1	47.0	38.0
80	22.5	32.4	52.6	74.1	93.8	111	124	134	140	142	139	133	122	109	92.3	73.4	53.0	33.7	22.4
85	9.13	20.7	42.9	65.0	84.9	102	116	126	132	133	131	124	114	100	83.7	64.5	43.6	22.8	9.19
90	1.86	13.0	35.2	57.1	77.0	93.9	108	117	123	125	123	116	106	92.4	75.8	56.8	36.0	14.8	1.67
95	0.80	8.08	29.0	50.5	69.7	86.1	99.8	109	115	117	115	108	98.2	85.0	68.8	50.0	29.6	8.52	0.00
100	0.83	6.71	24.1	44.8	63.3	79.1	92.1	101	107	109	107	101	90.9	78.1	62.6	44.5	24.3	7.02	0.10
105	0.85	7.18	21.4	39.9	57.6	72.6	84.8	93.6	99.2	101	98.6	92.9	83.7	71.7	56.9	39.6	21.9	7.03	0.59
110	0.75	8.02	20.5	36.1	52.4	66.6	78.0	86.1	91.2	92.8	91.0	85.6	77.0	65.7	51.9	36.1	20.6	7.20	0.93
115	0.45	9.23	20.1	33.6	47.9	61.0	71.5	79.1	83.8	85.2	83.5	78.5	70.6	60.3	47.7	33.7	19.8	8.04	0.76
120	0.40	10.7	20.0	31.8	44.3	55.8	65.4	72.3	76.6	77.9	76.3	71.8	64.6	55.2	44.1	31.6	19.4	9.02	0.30
125	1.38	12.2	20.2	30.3	41.0	51.2	59.6	65.7	69.6	70.7	69.3	65.3	58.9	50.6	40.8	29.7	19.5	10.2	0.52
130	0.33	10.7	21.0	29.1	38.2	46.9	54.3	59.6	63.0	64.0	62.7	59.1	53.5	46.4	37.8	28.4	19.8	12.0	1.50
135	2.33	10.1	22.2	28.2	35.7	42.9	49.2	53.8	56.7	57.5	56.5	53.4	48.6	42.4	35.2	27.5	20.3	13.5	2.47
140	3.62	13.8	22.6	27.7	33.6	39.5	44.5	48.3	50.7	51.5	50.5	48.0	44.0	38.8	33.1	26.3	20.4	12.0	3.09
145	1.71	12.5	22.7	26.3	29.9	36.1	40.4	43.4	45.4	45.9	45.1	43.1	39.9	35.8	30.7	25.5	22.4	8.71	0.51
150	2.53	3.03	21.8	24.4	26.7	29.9	35.1	39.1	40.4	40.9	40.3	38.8	35.7	29.8	26.8	24.6	22.0	11.9	2.42
155	3.90	6.42	18.1	23.8	26.0	27.5	28.4	30.3	33.1	33.9	33.4	31.1	28.2	28.1	25.9	23.6	19.3	4.09	1.42
160	3.13	4.12	11.7	24.0	25.2	26.5	27.6	28.5	29.0	29.4	29.6	29.2	28.3	26.6	24.9	23.2	16.8	7.31	2.83
165	2.63	5.57	4.34	14.8	23.8	25.4	26.2	26.6	27.0	27.4	27.5	27.2	26.3	25.4	24.6	20.5	9.17	3.66	5.60
170	3.11	3.84	4.45	2.81	8.10	16.6	22.7	25.0	25.3	25.4	25.5	25.5	25.0	21.8	15.8	8.82	3.31	6.19	6.13
175	2.33	4.82	6.22	4.75	5.83	5.23	2.36	0.98	1.62	2.65	2.64	1.72	0.96	1.83	4.43	6.23	4.69	5.83	7.30
180	4.83	4.83	4.83	4.83	4.83	4.83	4.83	4.83	4.83	4.83	4.83	4.83	4.83	4.83	4.83	4.83	4.83	4.83	4.83

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	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210		
5	208	208	208	208	208	209	209	209	209	209	209	209	209	209	209	209	209		
10	205	204	205	205	206	206	207	207	208	208	208	208	207	207	207	206	206		
15	199	199	200	202	203	204	205	206	206	206	206	206	204	204	203	203	202		
20	192	193	194	196	198	200	202	204	204	204	204	203	201	200	198	197	196		
25	183	185	187	190	193	196	199	201	202	202	201	200	197	194	192	190	188		
30	173	175	179	183	188	192	195	198	199	200	198	196	192	188	184	181	179		
35	162	165	169	175	181	187	192	195	197	196	195	191	186	180	175	171	168		
40	149	153	159	166	174	182	187	192	194	193	191	186	180	172	166	159	155		
45	135	140	148	157	166	176	182	188	190	190	187	181	173	164	155	147	142		
50	121	127	137	148	159	169	177	183	186	185	182	175	165	155	144	134	127		
55	106	113	125	138	151	163	171	178	181	180	176	168	158	145	132	120	111		
60	89.8	99.2	113	128	142	155	165	172	175	175	170	162	150	136	120	106	95.2		
65	73.8	85.2	101	118	134	148	158	166	169	168	163	154	141	126	109	91.9	78.6		
70	58.6	71.8	89.8	108	125	140	151	159	162	161	156	146	133	116	97.4	78.1	62.3		
75	43.4	59.5	79.0	98.6	117	132	144	152	155	154	149	139	124	107	86.7	65.8	47.0		
80	29.5	48.3	69.3	89.7	108	124	136	144	148	147	141	131	116	97.7	76.7	54.5	32.6		
85	18.5	39.0	60.7	81.6	100	116	128	136	140	139	133	122	108	89.4	68.5	45.4	21.5		
90	11.8	31.9	54.0	74.2	92.6	108	120	128	132	131	125	114	99.7	81.7	61.1	38.2	15.1		
95	8.96	27.1	48.0	67.5	85.4	101	112	120	124	122	117	107	92.4	74.7	54.8	33.0	12.5		
100	8.00	24.2	43.2	61.8	78.6	93.3	104	112	115	114	109	98.9	85.2	68.4	49.6	29.6	11.8		
105	7.73	22.5	39.4	56.5	72.1	86.0	96.8	104	107	106	101	91.4	78.5	63.4	45.5	27.5	12.0		
110	6.69	21.7	36.4	52.2	66.7	79.1	89.1	96.0	98.8	97.9	93.0	84.2	72.2	58.3	42.1	26.2	12.4		
115	4.49	21.4	34.0	48.1	61.3	72.5	81.8	88.0	90.7	90.0	85.3	77.2	66.4	53.8	39.3	25.4	12.5		
120	3.29	20.9	32.2	44.6	56.4	66.8	74.6	80.4	82.8	82.0	78.1	70.6	61.4	49.8	37.0	24.7	10.8		
125	2.29	19.6	30.8	41.3	51.9	61.0	67.9	73.0	75.2	74.5	70.9	64.4	56.4	46.0	35.2	24.1	9.99		
130	1.13	16.5	29.2	38.6	47.5	55.7	61.9	65.7	67.8	67.3	64.3	59.1	51.6	42.7	33.9	21.6	8.83		
135	0.21	11.2	26.1	36.3	43.6	50.5	56.0	59.9	61.6	61.1	58.3	53.5	47.3	38.2	30.8	10.7	4.59		
140	0.66	0.00	18.1	34.2	40.1	45.7	50.3	53.5	55.0	54.5	52.3	48.4	42.0	34.0	27.3	6.70	3.78		
145	2.31	0.00	9.16	29.5	36.5	41.3	45.1	47.7	48.8	48.6	46.9	42.1	35.1	30.3	23.6	2.91	4.97		
150	6.70	0.82	4.10	14.8	28.7	34.9	37.0	38.4	39.5	39.0	37.0	34.3	30.9	25.3	15.3	5.92	6.16		
155	5.85	3.81	3.80	0.70	12.1	25.7	29.1	31.6	32.2	32.3	31.3	29.8	25.4	8.84	4.71	8.68	7.57		
160	4.54	6.91	2.25	0.83	2.59	4.17	13.7	17.5	23.0	22.7	18.7	13.1	3.71	2.91	3.71	10.5	10.6		
165	1.93	3.51	7.19	3.96	1.09	1.65	4.29	3.60	2.29	2.15	2.13	6.04	5.47	2.67	8.68	7.99	10.8		
170	2.94	2.08	4.25	6.47	5.23	4.26	3.47	1.73	1.01	1.69	1.93	5.64	6.53	6.26	7.95	11.7	6.40		
175	3.95	2.90	3.70	2.88	3.74	5.43	5.84	4.99	4.80	5.80	7.01	8.35	9.27	6.79	3.25	2.32	3.07		
180	4.83	4.83	4.83	4.83	4.83	4.83	4.83	4.83	4.83	4.83	4.83	4.83	4.83	4.83	4.83	4.83	4.83		

Table 7: Luminous Intensity Data

## TEST RESULTS (3500K Setting)

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)	0.074	0.036
Power Factor	0.9763	0.9006
Test Power (W)	8.68	8.94
THD A%	17.59	19.83
Luminous Efficacy (lm/W)	141.6	140.0
Total Luminous Flux (lm)	1228.7	1251.3
Color Rendering Index (CRI)	84.3	
R9	15.5	
Correlated Color Temperature (CCT)(K)	3533	
Chromaticity Chroma x	0.4008	
Chromaticity Chroma y	0.3828	
Chromaticity Chroma u	0.2360	
Chromaticity Chroma v	0.3382	
Duv	-0.0025	
Chromaticity Chroma u'	0.2360	
Chromaticity Chroma v'	0.5073	

Special Color Rendering Indices	
R1	83.4
R2	92
R3	96
R4	82.3
R5	83.5
R6	88.7
R7	84.5
R8	64.4
R9	15.5
R10	80.8
R11	81.6
R12	67.8
R13	85.7
R14	98.5

Table 8: Test data per Sphere-Spectroradiometer Method

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

### Spectral Power Distribution - Sphere Spectroradiometer Method

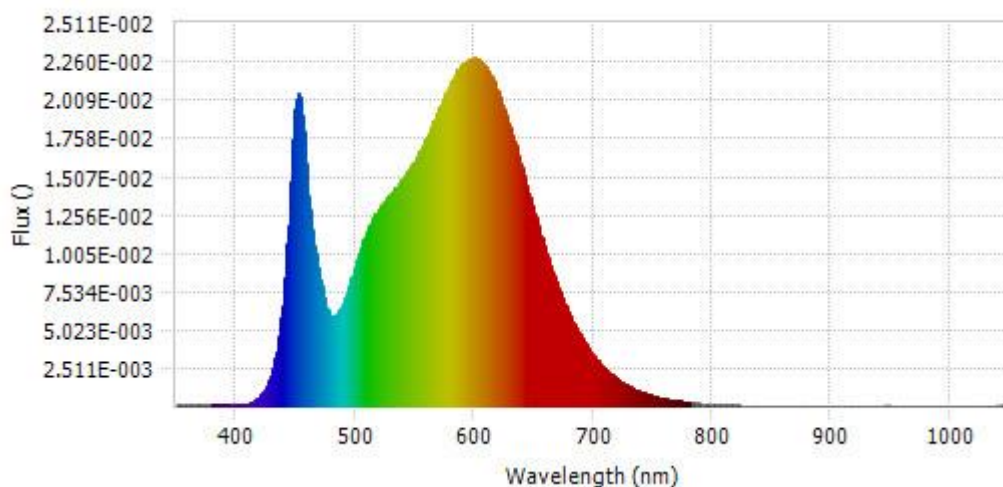


Chart 8: Spectral Power Distribution

Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	1.21E-04	485	6.05E-03	590	2.24E-02	695	3.91E-03
385	9.26E-05	490	6.78E-03	595	2.27E-02	700	3.37E-03
390	1.01E-04	495	7.88E-03	600	2.28E-02	705	2.89E-03
395	1.05E-04	500	9.14E-03	605	2.26E-02	710	2.47E-03
400	8.73E-05	505	1.04E-02	610	2.22E-02	715	2.11E-03
405	1.01E-04	510	1.14E-02	615	2.15E-02	720	1.81E-03
410	1.82E-04	515	1.24E-02	620	2.06E-02	725	1.54E-03
415	3.43E-04	520	1.29E-02	625	1.95E-02	730	1.32E-03
420	6.55E-04	525	1.35E-02	630	1.83E-02	735	1.13E-03
425	1.22E-03	530	1.40E-02	635	1.71E-02	740	9.63E-04
430	2.25E-03	535	1.44E-02	640	1.57E-02	745	8.29E-04
435	4.07E-03	540	1.49E-02	645	1.43E-02	750	7.06E-04
440	7.42E-03	545	1.55E-02	650	1.29E-02	755	6.03E-04
445	1.33E-02	550	1.61E-02	655	1.15E-02	760	5.17E-04
450	1.94E-02	555	1.68E-02	660	1.03E-02	765	4.46E-04
455	1.98E-02	560	1.76E-02	665	9.08E-03	770	3.76E-04
460	1.49E-02	565	1.84E-02	670	7.95E-03	775	3.21E-04
465	1.10E-02	570	1.94E-02	675	6.97E-03	780	2.77E-04
470	8.71E-03	575	2.03E-02	680	6.05E-03		
475	6.73E-03	580	2.11E-02	685	5.27E-03		
480	5.89E-03	585	2.20E-02	690	4.56E-03		

Table 9: Spectral Power Distribution Numerical Data per Sphere - Spectroradiometer Method

### Chromaticity Diagram - Sphere Spectroradiometer Method

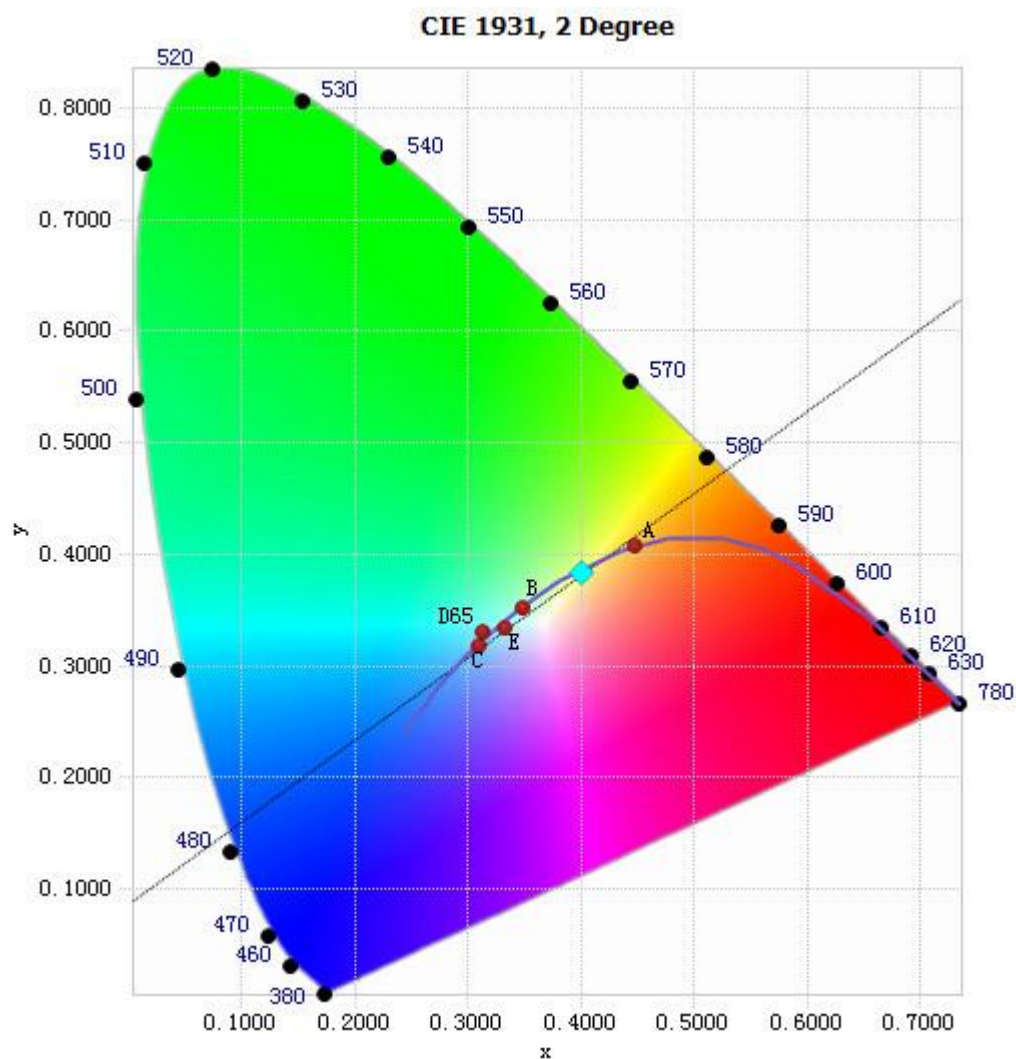


Chart 9: Chromaticity Diagram per Sphere - Spectroradiometer Method

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

# Nominal CCT Quadrangles – Sphere Spectroradiometer Method

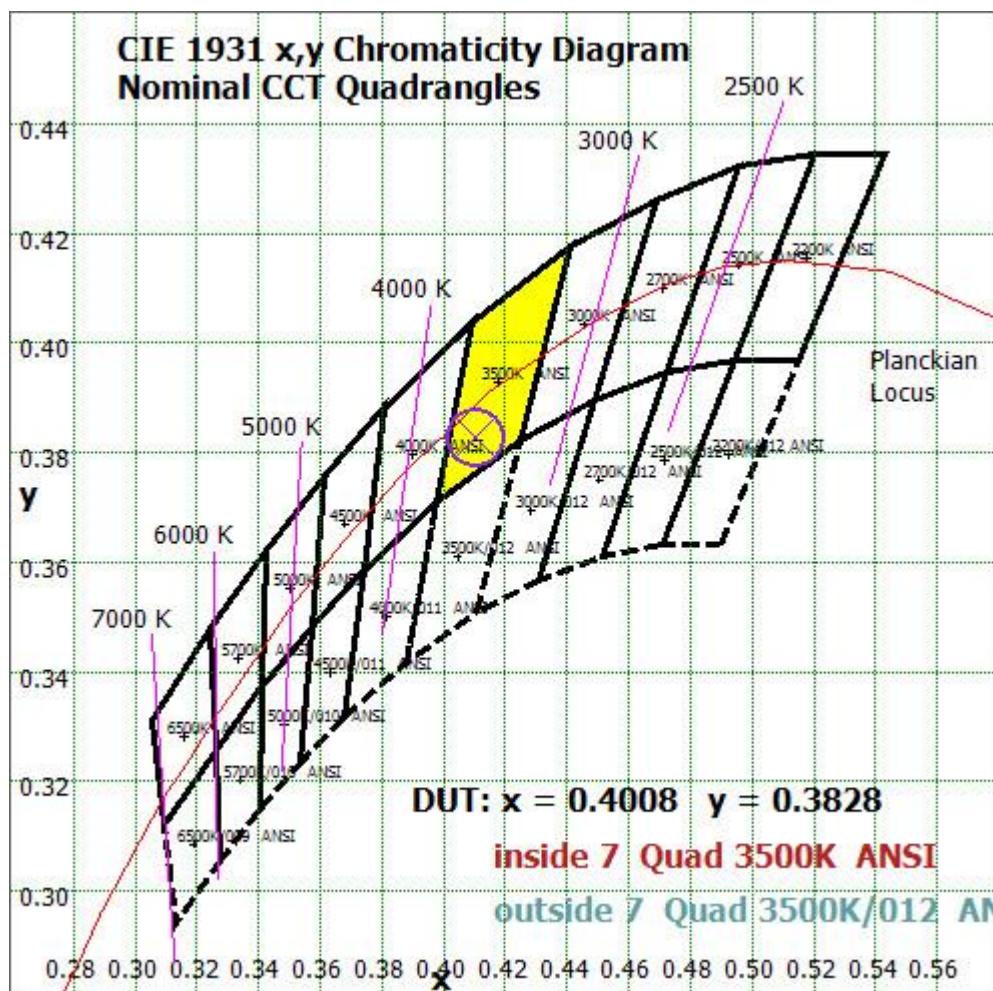


Chart 10: Plot of Lamp x/y coordinates on CIE 1931 Chromaticity Diagram



# Color Rendition Report – Sphere Spectroradiometer Method

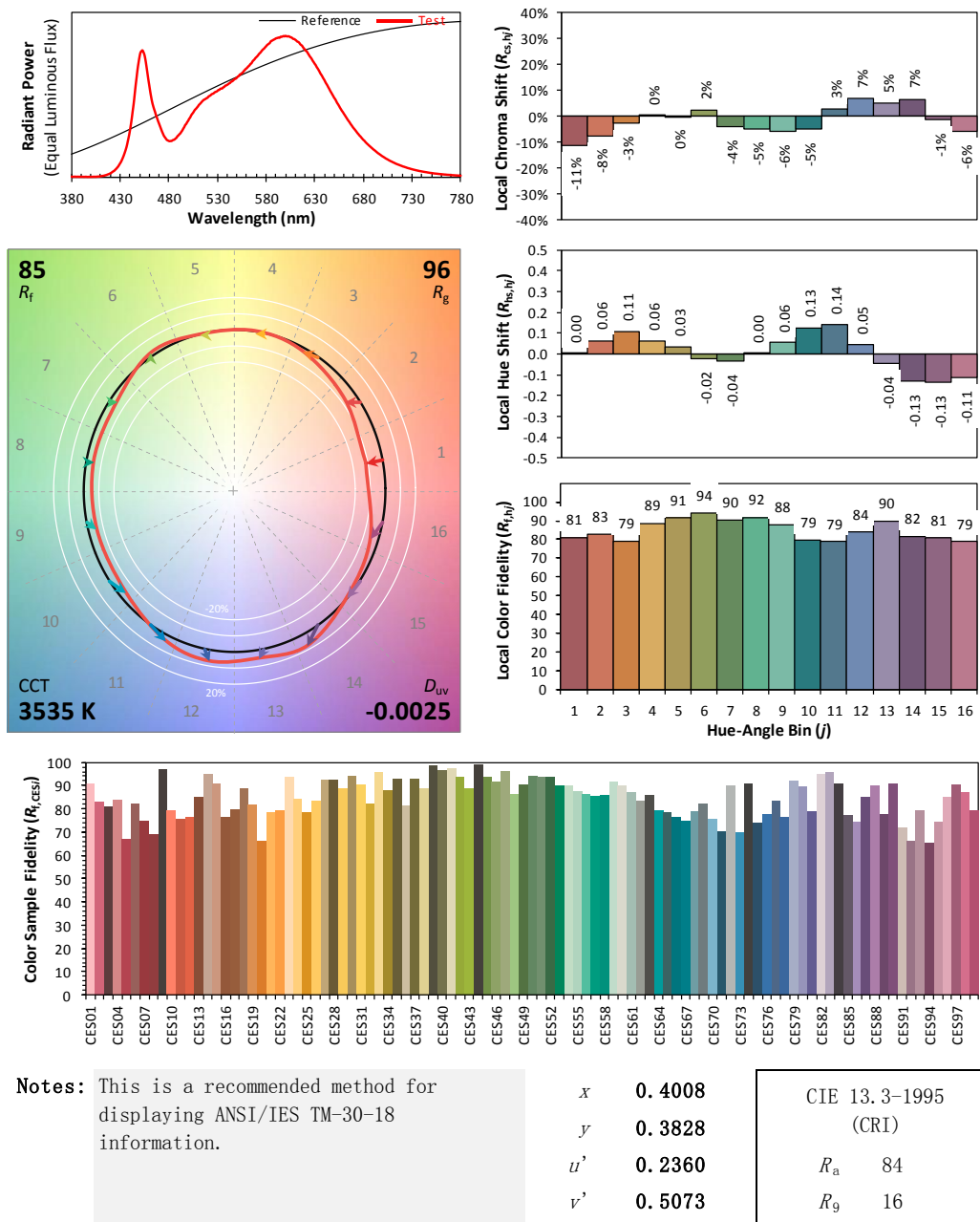
## ANSI/IES TM-30-18 Color Rendition Report

Source: LED

Manufacturer: GREEN CREATIVE LTD

Date: 2025/04/07

Model: 9T5HE/2F/8CCTS/UEB/C



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

Chart 11: 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 8 due to rounding.

## TEST RESULTS (4000K Setting)

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)	0.074	0.036
Power Factor	0.9765	0.9009
Test Power (W)	8.61	8.88
THD A%	17.40	19.96
Luminous Efficacy (lm/W)	145.7	143.8
Total Luminous Flux (lm)	1254.2	1277.3
Color Rendering Index (CRI)	85.1	
R9	19.1	
Correlated Color Temperature (CCT)(K)	4076	
Chromaticity Chroma x	0.3756	
Chromaticity Chroma y	0.3690	
Chromaticity Chroma u	0.2250	
Chromaticity Chroma v	0.3316	
Duv	-0.0022	
Chromaticity Chroma u'	0.2250	
Chromaticity Chroma v'	0.4974	

Special Color Rendering Indices	
R1	84.3
R2	92.3
R3	95.6
R4	82.9
R5	84
R6	87.9
R7	86.1
R8	67.6
R9	19.1
R10	80.8
R11	82.1
R12	63.2
R13	86.8
R14	98.2

Table 10: Test data per Sphere-Spectroradiometer Method

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



### Spectral Power Distribution - Sphere Spectroradiometer Method

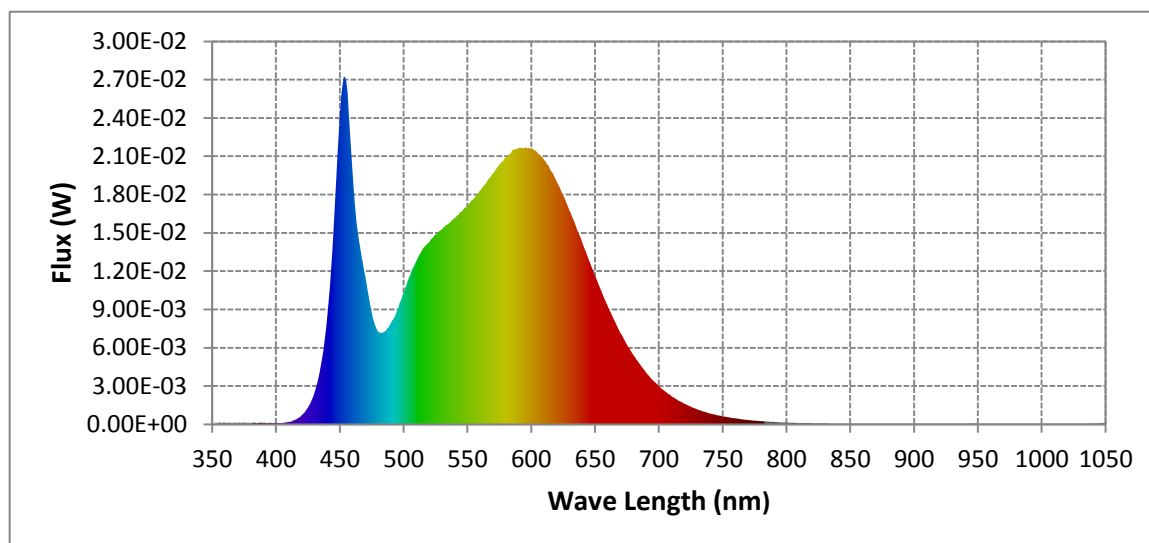
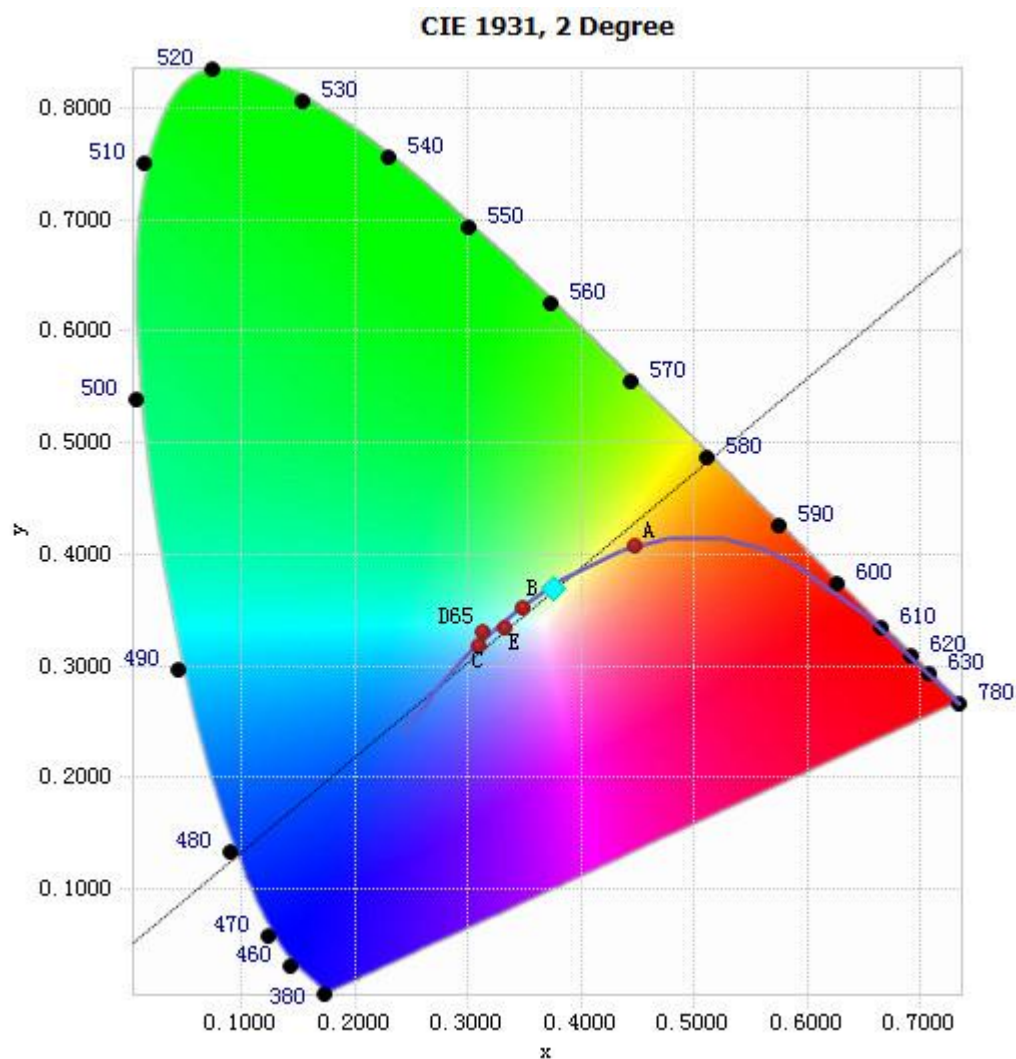


Chart 12: Spectral Power Distribution

Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	1.32E-04	485	7.26E-03	590	2.17E-02	695	3.49E-03
385	1.09E-04	490	7.92E-03	595	2.17E-02	700	3.01E-03
390	1.16E-04	495	8.99E-03	600	2.16E-02	705	2.58E-03
395	1.15E-04	500	1.03E-02	605	2.12E-02	710	2.20E-03
400	1.11E-04	505	1.17E-02	610	2.07E-02	715	1.89E-03
405	1.04E-04	510	1.28E-02	615	1.99E-02	720	1.61E-03
410	1.89E-04	515	1.38E-02	620	1.90E-02	725	1.38E-03
415	3.57E-04	520	1.43E-02	625	1.79E-02	730	1.18E-03
420	6.93E-04	525	1.49E-02	630	1.67E-02	735	1.01E-03
425	1.33E-03	530	1.53E-02	635	1.55E-02	740	8.59E-04
430	2.46E-03	535	1.57E-02	640	1.42E-02	745	7.33E-04
435	4.57E-03	540	1.62E-02	645	1.29E-02	750	6.25E-04
440	8.36E-03	545	1.66E-02	650	1.16E-02	755	5.38E-04
445	1.53E-02	550	1.71E-02	655	1.04E-02	760	4.62E-04
450	2.44E-02	555	1.77E-02	660	9.23E-03	765	3.96E-04
455	2.68E-02	560	1.83E-02	665	8.14E-03	770	3.37E-04
460	1.98E-02	565	1.89E-02	670	7.12E-03	775	2.93E-04
465	1.45E-02	570	1.96E-02	675	6.21E-03	780	2.52E-04
470	1.16E-02	575	2.03E-02	680	5.41E-03		
475	8.76E-03	580	2.09E-02	685	4.71E-03		
480	7.28E-03	585	2.15E-02	690	4.07E-03		

Table 11: Spectral Power Distribution Numerical Data per Sphere - Spectroradiometer Method

# Chromaticity Diagram - Sphere Spectroradiometer Method



Tristimulus values(x, y): (0.3756, 0.3690)

Chart 13: 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

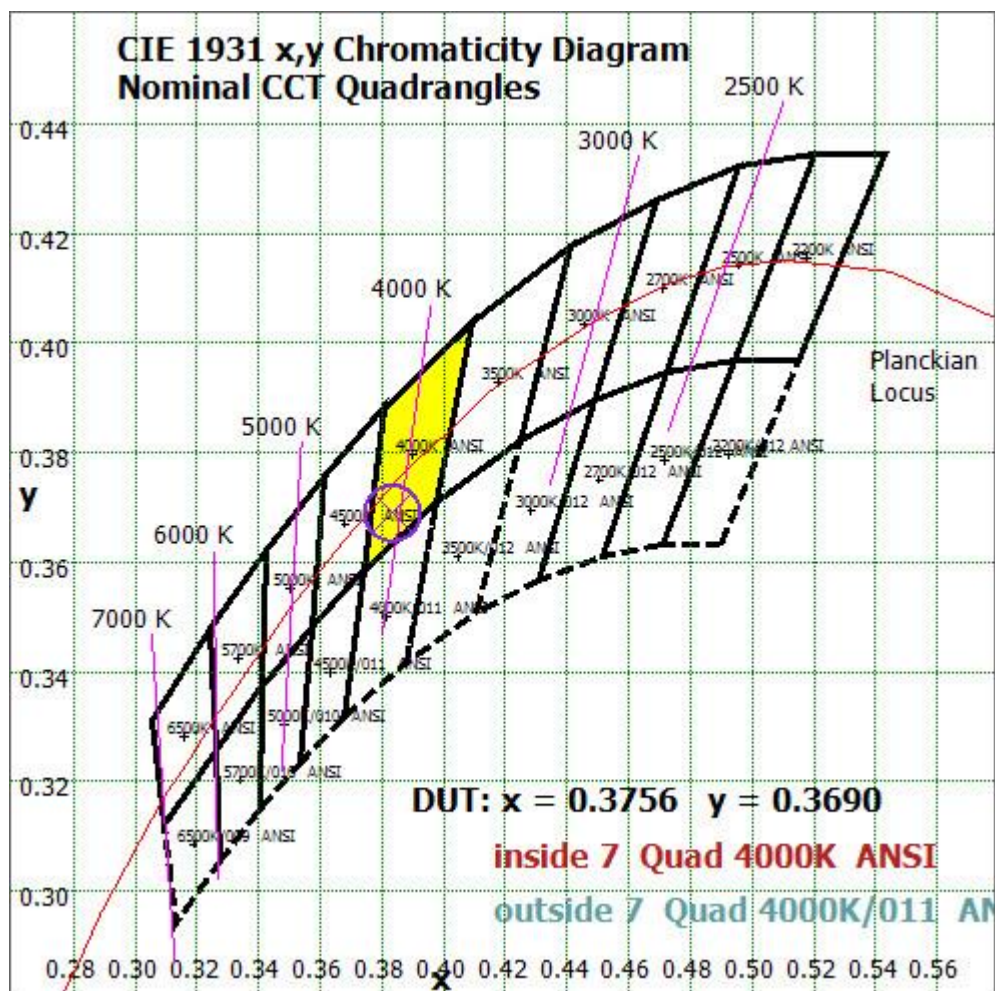


Chart14: Plot of Lamp x/y coordinates on CIE 1931 Chromaticity Diagram

# Color Rendition Report – Sphere Spectroradiometer Method

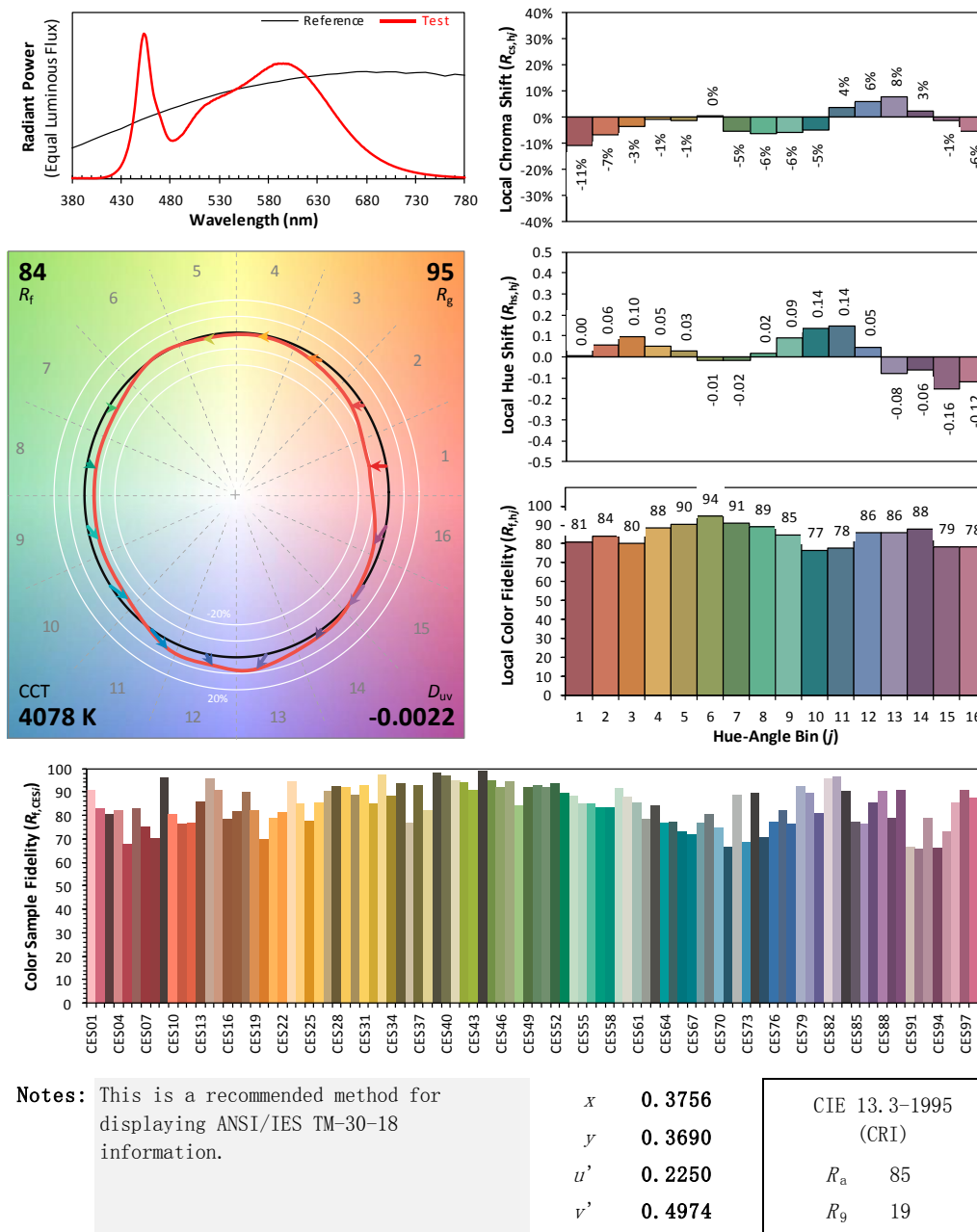
## ANSI/IES TM-30-18 Color Rendition Report

Source: LED

Manufacturer: GREEN CREATIVE LTD

Date: 2025/04/07

Model: 9T5HE/2F/8CCTS/UEB/C



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

Chart 15: 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 10 due to rounding.

## TEST RESULTS (5000K Setting)

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)	0.075	0.036
Power Factor	0.9756	0.9007
Test Power (W)	8.82	9.10
THD A%	18.02	19.57
Luminous Efficacy (lm/W)	136.2	134.8
Total Luminous Flux (lm)	1201.2	1226.3
Color Rendering Index (CRI)	84.4	
R9	13.8	
Correlated Color Temperature (CCT)(K)	5031	
Chromaticity Chroma x	0.3442	
Chromaticity Chroma y	0.3518	
Chromaticity Chroma u	0.2108	
Chromaticity Chroma v	0.3231	
Duv	0.0005	
Chromaticity Chroma u'	0.2108	
Chromaticity Chroma v'	0.4846	

Special Color Rendering Indices	
R1	83.3
R2	91.3
R3	94.4
R4	82.4
R5	83.3
R6	86.1
R7	86.4
R8	68
R9	13.8
R10	78.1
R11	81.5
R12	61.9
R13	85.9
R14	97.5

Table 12: Test data per Sphere-Spectroradiometer Method

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



### Spectral Power Distribution - Sphere Spectroradiometer Method

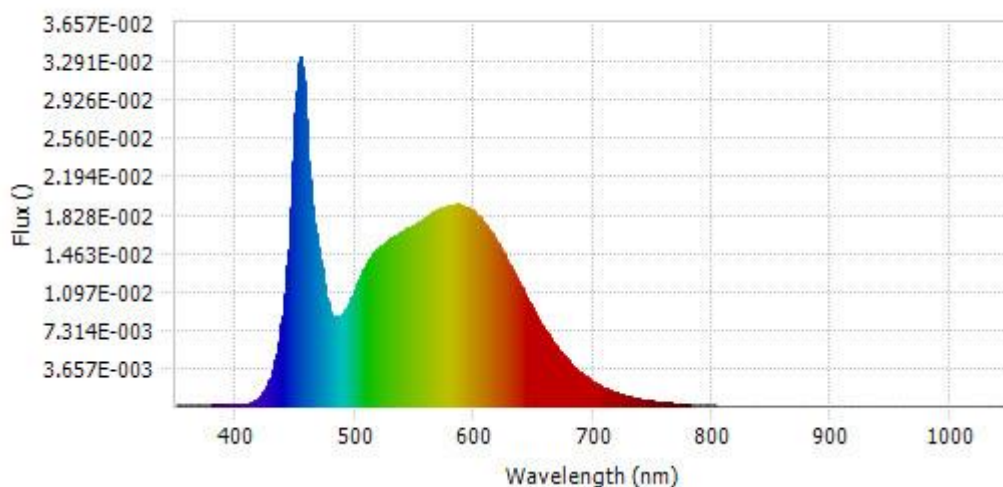
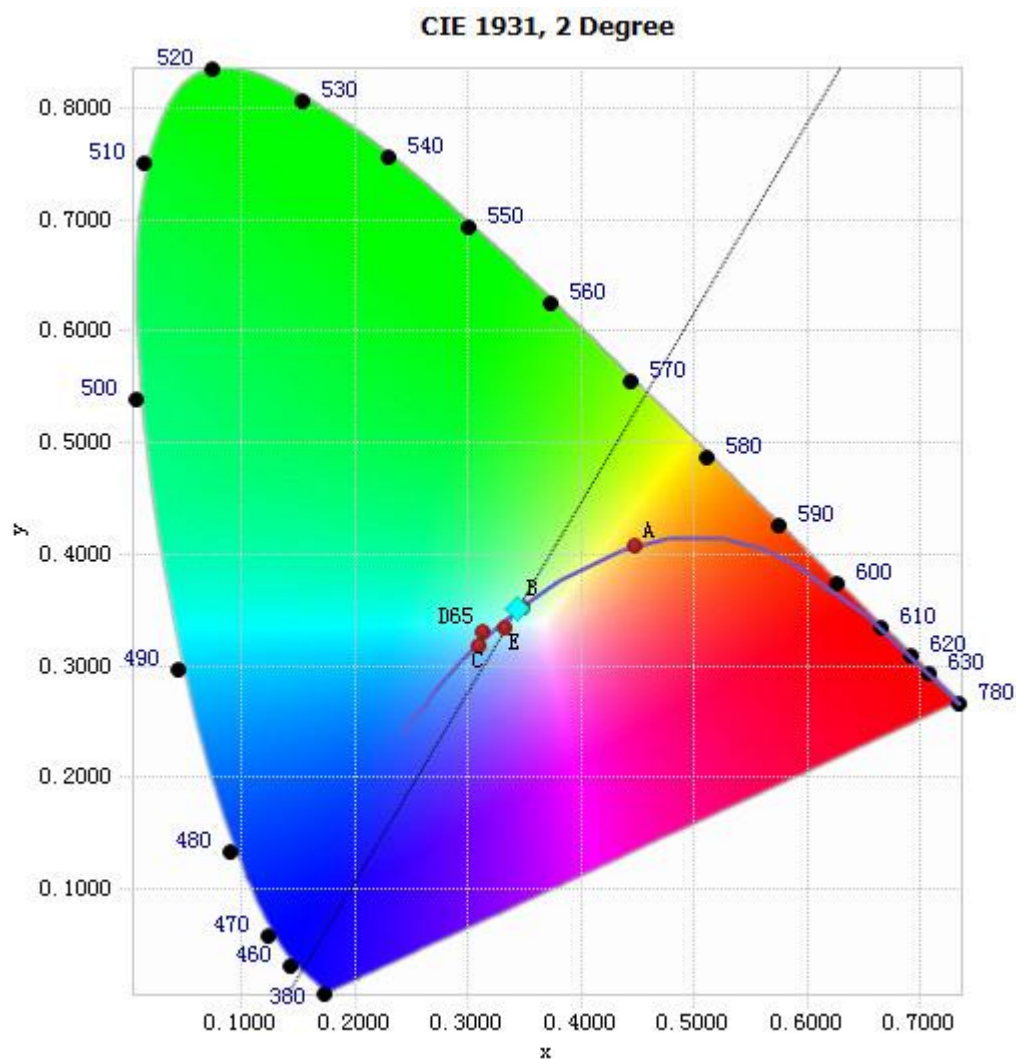


Chart16: Spectral Power Distribution

Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	1.43E-04	485	8.47E-03	590	1.92E-02	695	2.72E-03
385	1.22E-04	490	8.88E-03	595	1.89E-02	700	2.33E-03
390	1.39E-04	495	9.80E-03	600	1.86E-02	705	2.01E-03
395	1.21E-04	500	1.11E-02	605	1.79E-02	710	1.72E-03
400	1.19E-04	505	1.24E-02	610	1.72E-02	715	1.47E-03
405	1.45E-04	510	1.35E-02	615	1.64E-02	720	1.26E-03
410	2.34E-04	515	1.45E-02	620	1.55E-02	725	1.08E-03
415	4.57E-04	520	1.51E-02	625	1.45E-02	730	9.29E-04
420	8.76E-04	525	1.56E-02	630	1.34E-02	735	7.94E-04
425	1.66E-03	530	1.60E-02	635	1.23E-02	740	6.79E-04
430	3.07E-03	535	1.63E-02	640	1.13E-02	745	5.92E-04
435	5.54E-03	540	1.67E-02	645	1.02E-02	750	4.99E-04
440	9.64E-03	545	1.70E-02	650	9.08E-03	755	4.30E-04
445	1.68E-02	550	1.73E-02	655	8.13E-03	760	3.70E-04
450	2.79E-02	555	1.77E-02	660	7.20E-03	765	3.18E-04
455	3.33E-02	560	1.80E-02	665	6.32E-03	770	2.74E-04
460	2.54E-02	565	1.84E-02	670	5.52E-03	775	2.32E-04
465	1.81E-02	570	1.87E-02	675	4.84E-03	780	2.03E-04
470	1.46E-02	575	1.90E-02	680	4.21E-03		
475	1.10E-02	580	1.92E-02	685	3.65E-03		
480	8.80E-03	585	1.93E-02	690	3.17E-03		

Table 13: Spectral Power Distribution Numerical Data per Sphere - Spectroradiometer Method

# Chromaticity Diagram - Sphere Spectroradiometer Method



Tristimulus values(x, y): (0.3442, 0.3518)

Chart 17: 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

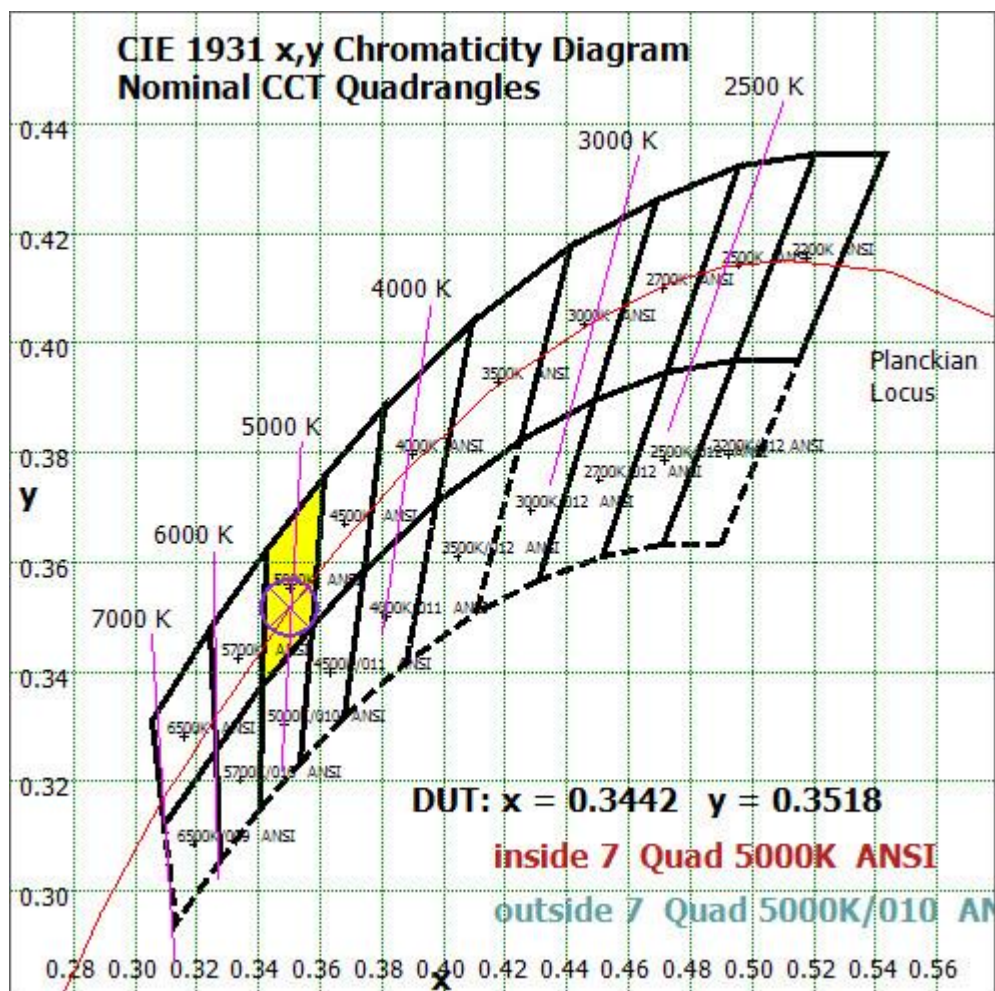


Chart 18: Plot of Lamp x/y coordinates on CIE 1931 Chromaticity Diagram

# Color Rendition Report – Sphere Spectroradiometer Method

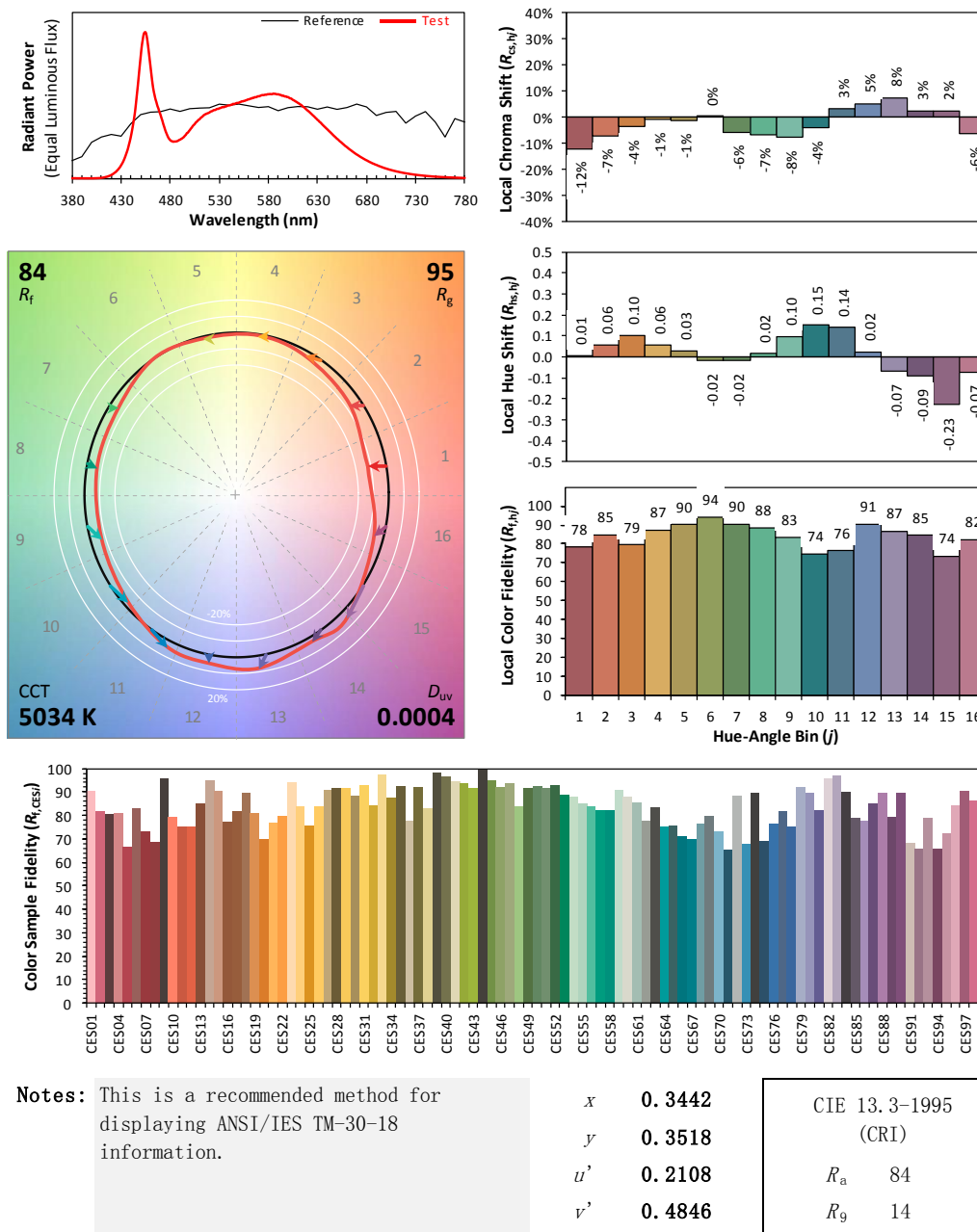
## ANSI/IES TM-30-18 Color Rendition Report

Source: LED

Manufacturer: GREEN CREATIVE LTD

Date: 2025/04/07

Model: 9T5HE/2F/8CCTS/UEB/C



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

Chart 19: 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 12 due to rounding.

## EQUIPMENT LIST

Test Equipment	Model	Equipment No.	Calibration Date	Calibration Due date
Goniophotometer system	GO-R5000	HZTE011-01	Feb. 05, 2025	-
Digital Power Meter	PF2010A	HZTE028-01	Aug. 08, 2024	Aug. 07, 2025
AC Power Supply	DPS1060	HZTE001-06	Aug. 08, 2024	Aug. 07, 2025
DC Power Supply	WY12010	HZTE004-03	Aug. 08, 2024	Aug. 07, 2025
Temperature recorder	JM624U	HZTE018-08	Aug. 08, 2024	Aug. 07, 2025
Temperature and humidity recorder	JR900	HZTE018-01	Aug. 08, 2024	Aug. 07, 2025
Standard source	D908	HZTE012-01	Aug. 14, 2018	-
Integrate Sphere system	3M	HZTE015-04	Dec. 10, 2024	-
Digital Power Meter	WT210	HZTE008-01	Aug. 08, 2024	Aug. 07, 2025
AC Power Supply	PCR 500L	HZTE001-07	Aug. 08, 2024	Aug. 07, 2025
DC Power Supply	IT6154	HZTE004-04	Aug. 08, 2024	Aug. 07, 2025
Standard source	SCL-1400	HZTE012-06	Nov. 04, 2021	-
Temperature and humidity recorder	JR900	HZTE018-02	Aug. 08, 2024	Aug. 07, 2025
Temperature Meter	TES1310	HZTE017-01	Aug. 08, 2024	Aug. 07, 2025

Table 14: 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

Prepared by: Leading Testing Laboratories

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3rd Floor, Bld. 2, NO. 96 Longchuanwu Rd Qianjiang Economy Dev. Zone, YuhangDist,

Hangzhou, Zhejiang Province, China 311100

Tel: +86 571 86376106 [www.ltlqa.com](http://www.ltlqa.com)

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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