

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: 8.5PLH/8CCTS/DIR

Laboratory: Leading Testing Laboratories

NVLAP CODE: 200960-0

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Report No.: HZ23050029a

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

Review by:

Wei Fei

Approved by



¹Manager: April Zou

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Jul. 26, 2023

Jul. 26, 2023

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	8.5PLH/8CCTS/DIR 3000K Setting	8.5PLH/8CCTS/DIR 3500K Setting	8.5PLH/8CCTS/DIR 4000K Setting
Luminous Efficacy (Lumens /Watt)	100.9	105.8	106.0
Total Luminous Flux (Lumens)	1081.2	1108.8	1146.1
Power (Watts)/2	10.72	10.48	10.81
Power Factor	0.9949	0.9946	0.9950
CCT (K)	3078	3457	3977
CRI	83.0	84.2	83.7
Stabilization Time(Light & Power)	50	50	50
Note	3000K	3500K	4000K

Table 1: Executive Data Summary

Test specifications:

Date of Receipt	: May 24, 2023
Date of Test	: May 25, 2023 & Jul. 26, 2023
Test item	: Total Luminous Flux, 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 Lamp
Model	: 8.5PLH/8CCTS/DIR
Electrical Ratings	: 120-277Vac, 50/60Hz
Product Description	: Color-Tunable 3000K/3500K/4000K LED Lamps supplied by a high frequency fluorescent lamp ballast: C2642UNVME
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 (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)	0.180	0.080
Power Factor	0.9949	0.9755
Test Power (W)/2	10.72	10.81
THD A%	8.56	8.43
Luminous Efficacy (lm/W)	100.9	100.0
Total Luminous Flux (lm)	1081.2	1081.2
Color Rendering Index (CRI)	83.0	
R9	8	
Correlated Color Temperature (CCT)(K)	3078	
Chromaticity Chroma x	0.4285	
Chromaticity Chroma y	0.3960	
Chromaticity Chroma u	0.2486	
Chromaticity Chroma v	0.3446	
Duv	-0.0021	
Chromaticity Chroma u'	0.2486	
Chromaticity Chroma v'	0.5169	

Special Color Rendering Indices	
R1	81.6
R2	91.3
R3	96
R4	81.3
R5	82.2
R6	89.5
R7	82.4
R8	59.5
R9	8
R10	80.4
R11	81.2
R12	75
R13	83.9
R14	98.4

Table 2: Test data per Sphere-Spectroradiometer Method

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

Spectral Power Distribution - Sphere Spectroradiometer Method

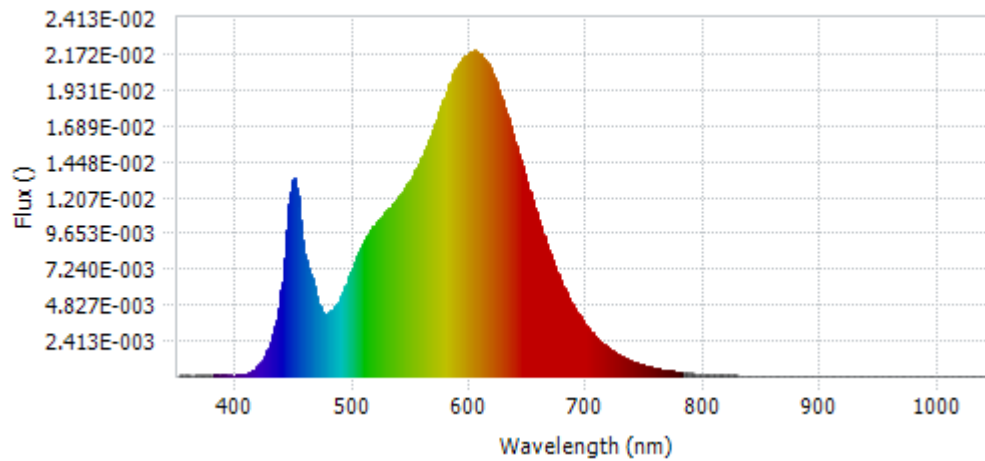
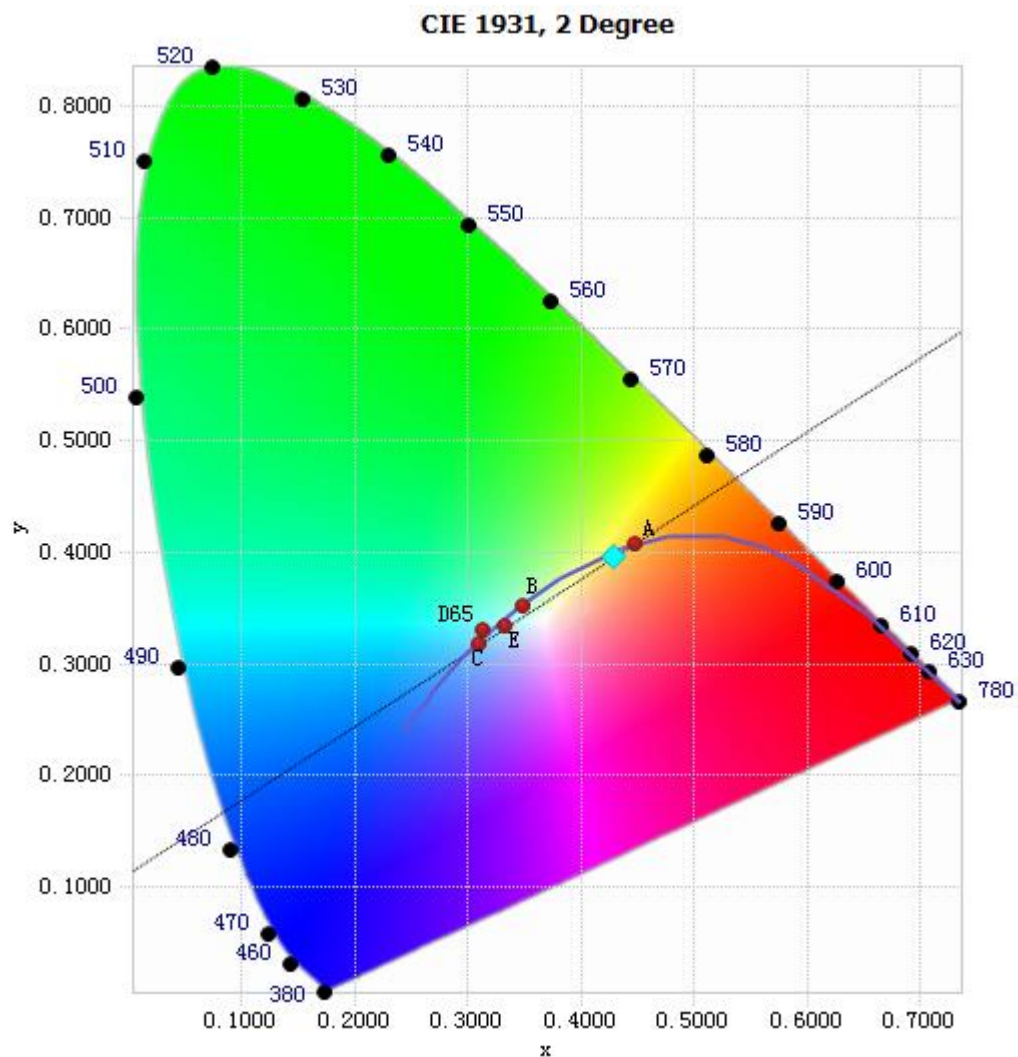


Chart 1: Spectral Power Distribution

Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	8.42E-05	485	4.75E-03	590	2.11E-02	695	3.88E-03
385	7.03E-05	490	5.50E-03	595	2.16E-02	700	3.32E-03
390	6.86E-05	495	6.50E-03	600	2.18E-02	705	2.85E-03
395	7.08E-05	500	7.49E-03	605	2.18E-02	710	2.43E-03
400	7.81E-05	505	8.39E-03	610	2.15E-02	715	2.10E-03
405	1.12E-04	510	9.20E-03	615	2.10E-02	720	1.81E-03
410	2.23E-04	515	9.90E-03	620	2.01E-02	725	1.54E-03
415	4.66E-04	520	1.04E-02	625	1.91E-02	730	1.30E-03
420	8.63E-04	525	1.08E-02	630	1.79E-02	735	1.12E-03
425	1.55E-03	530	1.13E-02	635	1.66E-02	740	9.56E-04
430	2.57E-03	535	1.17E-02	640	1.53E-02	745	8.21E-04
435	4.25E-03	540	1.22E-02	645	1.39E-02	750	7.02E-04
440	7.15E-03	545	1.28E-02	650	1.26E-02	755	5.97E-04
445	1.15E-02	550	1.34E-02	655	1.13E-02	760	5.04E-04
450	1.32E-02	555	1.41E-02	660	1.01E-02	765	4.45E-04
455	9.82E-03	560	1.50E-02	665	8.92E-03	770	3.79E-04
460	7.60E-03	565	1.60E-02	670	7.81E-03	775	3.23E-04
465	6.31E-03	570	1.70E-02	675	6.85E-03	780	2.76E-04
470	4.88E-03	575	1.81E-02	680	5.97E-03		
475	4.22E-03	580	1.92E-02	685	5.20E-03		
480	4.33E-03	585	2.03E-02	690	4.48E-03		

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

Chromaticity Diagram - Sphere Spectroradiometer Method



Tristimulus values(x, y): (0.4285, 0.3960)

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

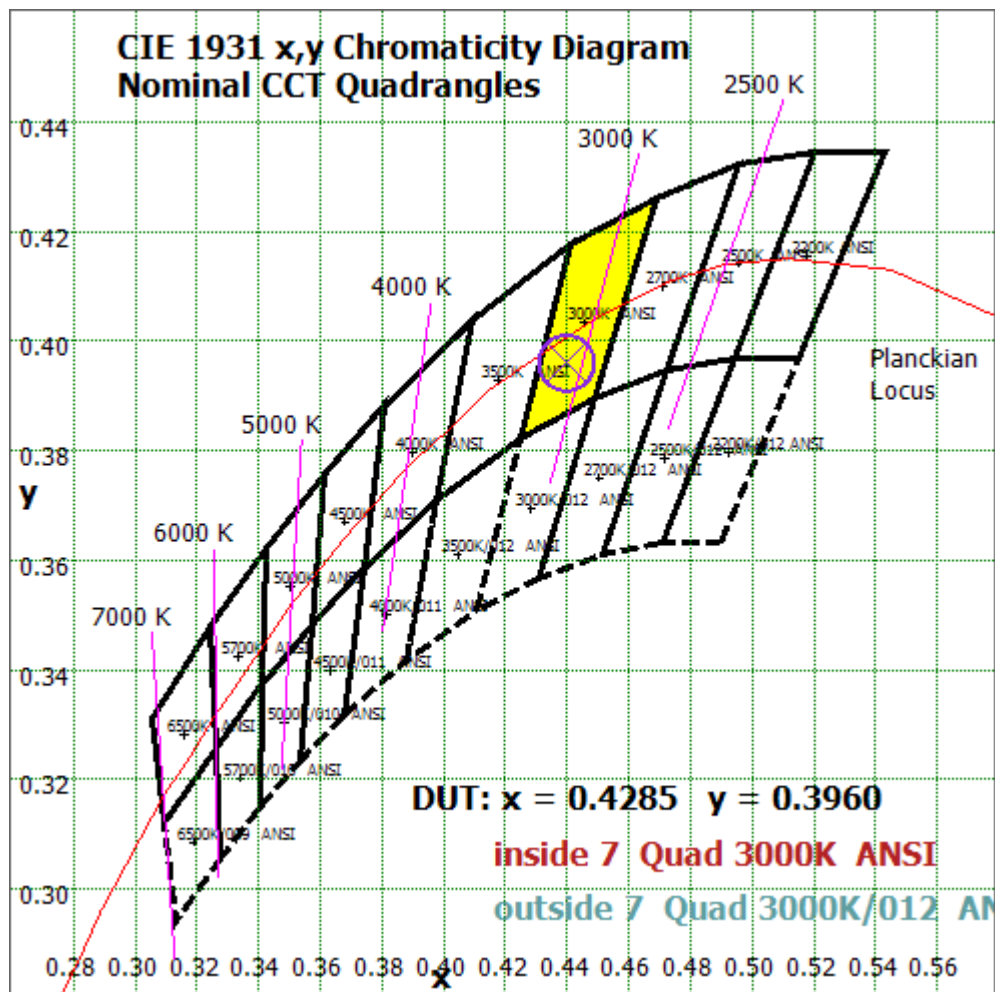


Chart 3: Plot of Lamp x/y coordinates on CIE 1931 Chromaticity Diagram

Color Rendition Report – Sphere Spectroradiometer Method

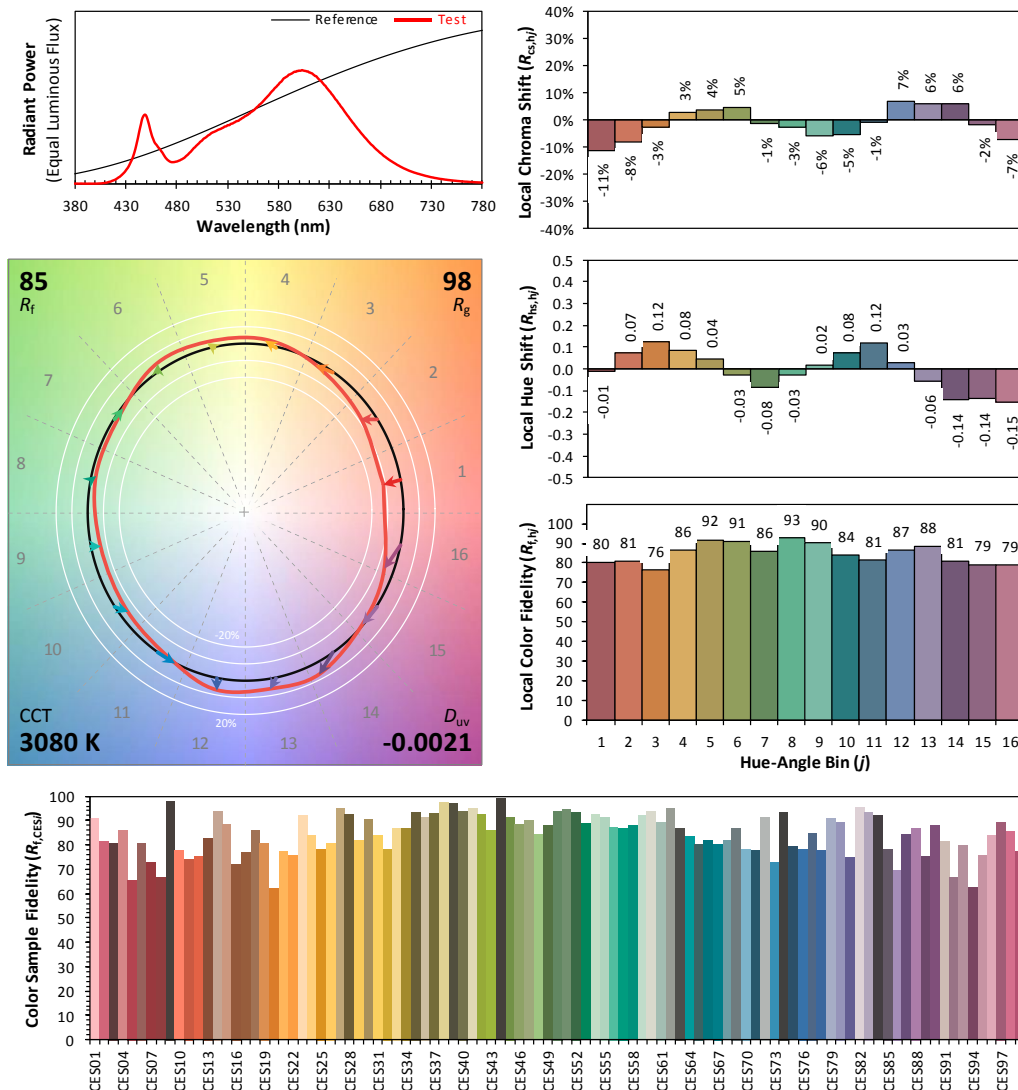
ANSI/IES TM-30-18 Color Rendition Report

Source: LED

Manufacturer: GREEN CREATIVE LTD

Date: 2023/05/25

Model: 8.5PLH/8CCTS/DIR



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

x 0.4285
 y 0.3960
 u' 0.2486
 v' 0.5169

CIE 13.3-1995
(CRI)
 R_a 83
 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.

Goniophotometer Method

Test ambient temperature was 25.0 °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)	0.180
Power Factor	0.9957
Power (W)/2	10.74
Luminous Efficacy (lm/W)	101.5
Total Luminous Flux (lm)	1090.3
Beam Angle (°)	102.0 (0°-180°) / 122.3 (90°-270°)
Center Beam Candle Power (cd)	333
Maximum Beam Candle Power (cd)	333.3 (At: C=190.0, Gamma=0.5)
Spacing Criteria	1.21 (0°-180°) / 1.26 (90°-270°)
Zonal Lumens in the 0 °-60 °Zone	67.05%
Zonal Lumens in the 60 °-90 °Zone	24.72%
Zonal Lumens in the 90 °-120 °Zone	6.91%
Zonal Lumens in the 120 °-180 °Zone	1.32%

Table 4: Test data per Goniophotometer Method

Zonal Lumen Tabulation- Goniophotometer Method

$\gamma(^{\circ})$	Lumens	% Total
0- 10	31.437	2.88%
10- 20	89.42	8.20%
20- 30	133.926	12.28%
30- 40	159.553	14.63%
40- 50	164.853	15.12%
50- 60	151.879	13.93%
60- 70	124.679	11.43%
70- 80	89.154	8.18%
80- 90	55.678	5.11%
90-100	35.7	3.27%
100-110	24.218	2.22%
110-120	15.419	1.41%
120-130	8.272	0.76%
130-140	3.673	0.34%
140-150	1.592	0.15%
150-160	0.635	0.06%
160-170	0.208	0.02%
170-180	0.045	0.00%
Total	1090.3	100%

$\gamma(^{\circ})$	Lumens	% Total
0- 60	731.068	67.05%
60- 90	269.511	24.72%
0-90	1000.58	91.77%
90- 180	89.762	8.23%
0- 180	1090.3	100%

Table 5: Zonal Lumen

Illuminance Plots- Goniophotometer Method

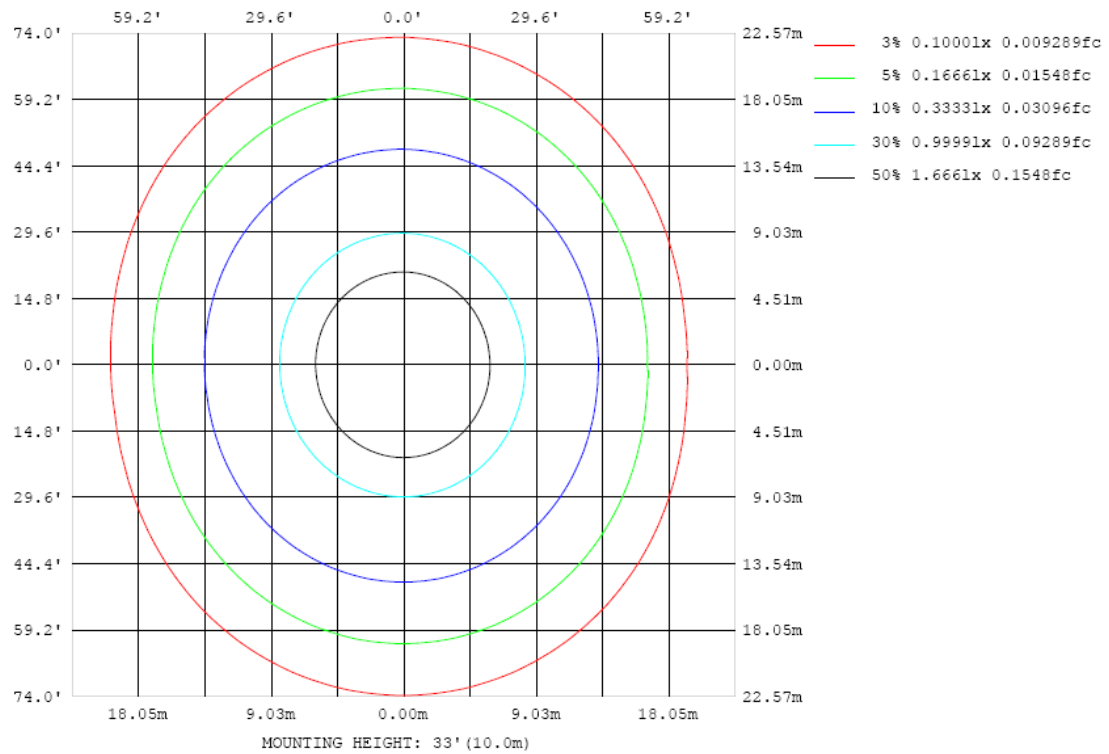


Chart 5: Illuminance Plot (Footcandles)

Luminous Intensity Distribution Plots- Goniophotometer Method

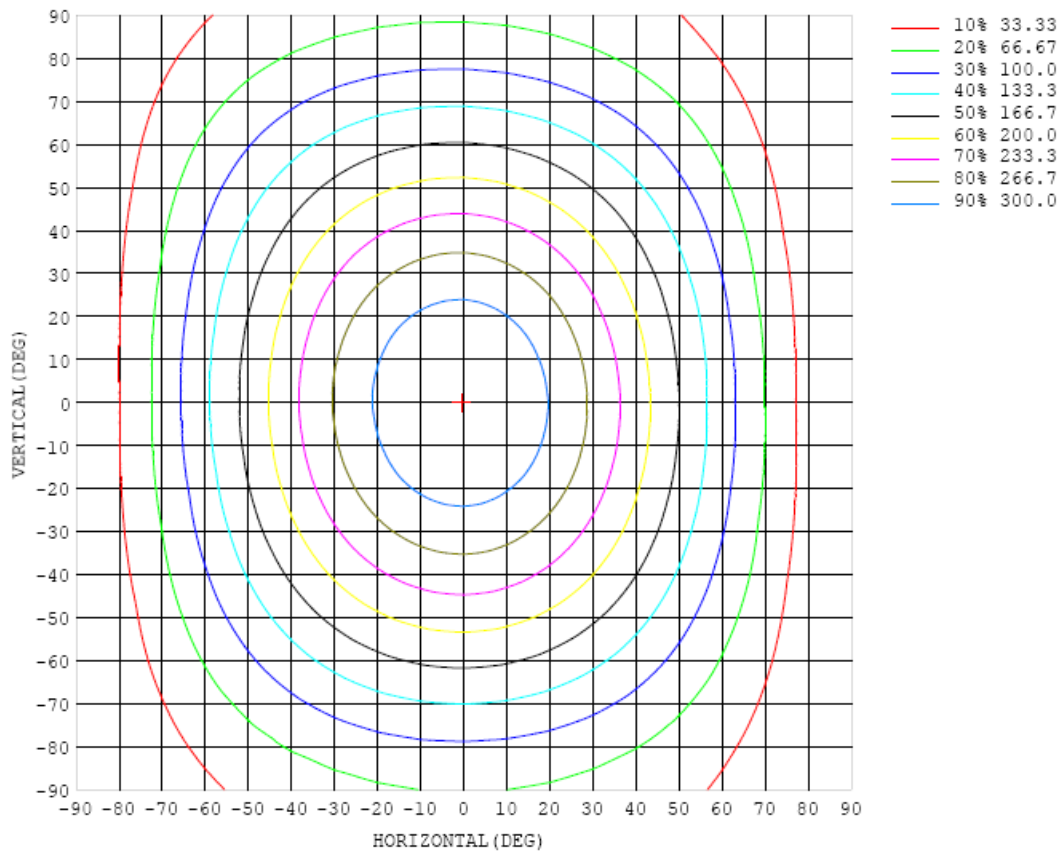


Chart 6: Isocandela Plot

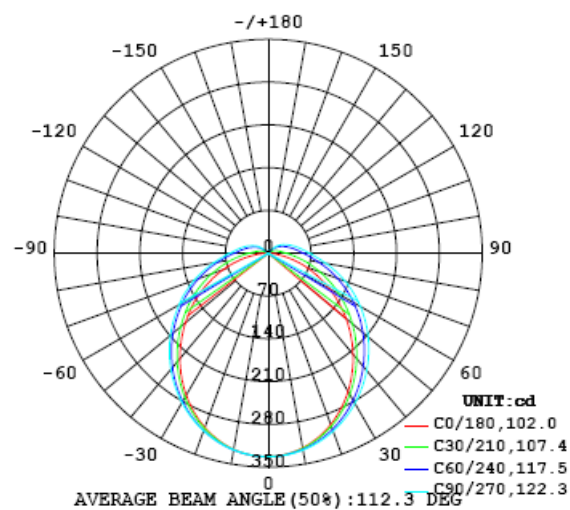


Chart 7: Polar Candela Distribution

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	333	333	333	333	333	333	333	333	333	333	333	333	333	333	333	333	333	333	333
5	330	330	330	330	331	331	331	331	331	331	332	332	332	332	331	331	331	331	331
10	323	324	324	324	325	325	326	326	327	327	327	327	327	327	326	326	326	326	326
15	313	313	313	314	316	317	318	319	319	320	320	320	319	319	318	317	317	316	316
20	298	299	300	301	303	305	307	308	309	310	310	310	309	307	306	305	304	303	303
25	281	281	283	285	288	291	293	296	297	298	298	297	295	294	292	290	288	287	287
30	261	262	264	267	270	274	278	281	283	284	283	282	280	277	275	272	270	269	268
35	239	240	243	247	251	256	260	264	267	268	267	266	263	259	256	252	250	248	248
40	216	217	220	225	230	236	242	246	249	251	250	248	244	240	235	231	228	225	225
45	191	193	197	203	209	216	222	227	231	232	232	229	225	220	214	209	204	202	201
50	166	168	173	180	187	195	202	208	212	213	212	209	205	198	192	186	181	178	177
55	141	143	149	157	165	174	182	188	192	194	193	189	184	177	170	163	157	153	153
60	115	118	125	134	143	153	161	168	172	174	173	169	163	156	148	140	133	128	128
65	89.8	93.8	102	111	122	132	141	148	152	154	153	149	143	135	126	117	109	103	103
70	66.0	70.5	79.4	90.1	101	111	121	128	132	134	133	129	122	114	105	94.9	85.8	79.1	78.3
75	42.4	48.7	59.3	70.6	81.7	92.3	101	108	113	114	113	109	103	94.6	84.7	74.2	64.7	56.7	54.7
80	22.0	29.4	41.0	53.3	65.0	74.6	83.4	90.1	94.2	95.8	94.9	91.2	84.9	76.5	67.2	56.2	44.8	35.5	33.0
85	7.59	15.3	27.1	39.2	50.5	60.6	68.9	74.4	78.2	79.6	78.7	75.1	69.5	61.4	51.4	40.2	28.3	17.7	14.7
90	0.87	7.73	18.4	29.7	40.4	49.8	57.6	63.4	66.8	68.0	66.9	63.3	57.3	49.2	39.4	28.5	17.2	7.17	2.04
95	0.65	4.58	13.3	23.5	33.4	42.2	49.4	54.7	57.7	58.7	57.6	54.0	48.3	40.6	31.4	21.2	10.8	2.43	0.29
100	0.62	3.51	10.0	18.9	27.8	35.9	42.6	47.5	50.4	51.2	50.1	46.7	41.3	34.0	25.5	15.9	4.41	1.23	0.47
105	0.56	2.57	7.70	15.2	23.2	30.6	36.7	41.3	43.9	44.7	43.5	40.3	35.2	28.5	20.6	9.21	0.68	0.90	0.35
110	0.48	1.78	5.68	12.1	19.4	25.9	31.5	35.7	38.1	38.7	37.6	34.6	29.9	23.7	15.8	5.85	0.63	0.58	0.25
115	0.32	1.24	3.90	8.74	15.9	21.9	26.9	30.6	32.8	33.4	32.2	29.5	25.2	18.8	9.02	2.36	1.09	0.51	0.30
120	0.37	0.95	2.67	5.87	11.7	18.1	22.6	26.0	28.0	28.4	27.4	24.9	20.9	13.0	4.75	1.96	1.15	0.57	0.38
125	0.42	0.84	2.08	4.25	7.86	13.2	18.4	21.6	23.4	23.8	22.8	20.4	14.4	6.98	2.82	2.12	1.06	0.64	0.49
130	0.47	0.77	1.68	3.30	5.88	8.93	12.6	16.3	18.5	18.9	17.8	14.9	9.63	5.23	2.21	2.01	0.54	0.61	0.48
135	0.51	0.73	1.38	2.60	4.48	6.52	8.74	10.7	12.1	12.5	11.9	10.5	7.35	4.30	2.45	0.81	0.52	0.43	0.45
140	0.54	0.70	1.17	1.96	3.47	4.90	6.30	7.57	8.38	8.78	8.43	7.49	5.81	3.92	1.77	0.78	0.54	0.36	0.52
145	0.56	0.69	1.03	1.64	2.69	3.69	4.63	5.44	5.93	6.07	5.87	5.33	4.46	2.76	1.19	0.79	0.51	0.45	0.48
150	0.55	0.69	0.98	1.47	2.09	2.77	3.41	3.95	4.27	4.33	4.09	3.57	2.41	1.47	0.95	0.62	0.45	0.31	0.36
155	0.55	0.64	0.92	1.28	1.65	2.06	2.48	2.81	3.01	3.00	2.65	2.14	1.57	1.12	0.83	0.59	0.37	0.32	0.34
160	0.55	0.57	0.68	0.81	1.16	1.48	1.75	1.92	1.97	1.87	1.67	1.40	1.13	0.89	0.73	0.59	0.34	0.32	0.34
165	0.54	0.55	0.59	0.64	0.74	0.95	1.09	1.16	1.19	1.15	1.06	0.93	0.78	0.66	0.37	0.31	0.32	0.32	0.36
170	0.45	0.48	0.51	0.51	0.58	0.61	0.63	0.63	0.66	0.64	0.62	0.59	0.56	0.52	0.39	0.32	0.33	0.34	0.42
175	0.49	0.49	0.50	0.50	0.50	0.48	0.45	0.43	0.44	0.43	0.40	0.37	0.34	0.34	0.35	0.35	0.34	0.36	0.36
180	0.18	0.19	0.22	0.25	0.18	0.17	0.25	0.22	0.23	0.30	0.29	0.29	0.29	0.19	0.27	0.25	0.36	0.34	0.29

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	333	333	333	333	333	333	333	333	333	333	333	333	333	333	333	333	333		
5	331	331	331	331	332	332	331	331	331	331	331	331	331	331	330	330	330		
10	326	326	326	327	327	327	327	327	327	327	326	326	325	325	324	324	324		
15	317	317	317	318	319	319	320	320	319	319	318	317	316	315	314	313	313		
20	304	304	305	307	308	309	309	310	309	309	308	306	304	302	301	299	299		
25	288	289	290	292	294	296	297	297	297	296	294	292	289	287	284	282	281		
30	269	271	273	275	278	280	282	282	282	281	279	276	272	269	266	263	261		
35	248	250	253	256	260	263	265	266	266	264	262	258	253	249	245	242	240		
40	226	228	232	236	240	244	247	248	248	246	243	238	233	228	223	219	216		
45	203	205	210	215	220	224	227	229	229	227	223	218	212	205	200	195	192		
50	178	182	187	193	199	204	207	209	209	207	203	197	190	183	176	171	167		
55	155	159	164	171	177	183	187	189	189	186	182	175	168	161	154	147	143		
60	130	136	142	150	157	162	166	168	168	166	162	155	147	138	130	122	117		
65	106	112	120	128	136	142	147	149	149	146	141	134	126	116	107	98.3	92.3		
70	82.1	89.4	98.1	107	115	122	126	129	129	126	121	114	105	95.1	84.7	75.1	67.8		
75	59.5	68.2	77.8	87.2	95.5	102	107	109	109	107	102	94.7	85.7	75.4	64.3	53.6	44.9		
80	39.1	48.9	59.3	69.0	77.4	84.1	88.7	91.0	91.0	88.8	84.1	77.2	68.2	57.9	46.5	34.9	25.1		
85	22.1	32.9	43.5	53.3	61.7	68.3	72.9	75.2	75.3	73.4	69.1	62.4	53.9	43.7	32.5	20.9	10.7		
90	11.1	21.3	31.7	41.3	49.6	56.1	60.6	62.9	63.2	61.6	57.6	51.5	43.5	33.9	23.4	12.5	3.60		
95	5.63	14.5	24.1	33.2	41.1	47.3	51.7	54.1	54.5	53.0	49.3	43.6	36.1	27.3	17.6	8.10	1.90		
100	3.09	10.1	18.7	27.1	34.5	40.5	44.7	46.9	47.3	45.9	42.4	37.1	30.1	22.0	13.2	5.55	1.48		
105	2.09	7.07	14.3	22.0	28.8	34.4	38.4	40.6	40.9	39.6	36.4	31.4	25.0	17.7	9.88	4.01	0.92		
110	1.25	3.92	10.7	17.7	23.9	29.1	32.8	34.8	35.2	33.9	31.0	26.4	20.6	13.6	6.68	2.55	0.62		
115	0.89	2.78	5.69	13.4	19.4	24.2	27.6	29.5	29.8	28.7	26.0	21.8	16.1	8.57	4.21	1.52	0.44		
120	0.75	1.93	3.73	7.58	14.3	19.4	22.7	24.4	24.7	23.7	21.0	16.5	10.0	5.33	2.82	1.14	0.45		
125	0.67	1.45	2.98	5.13	8.15	12.5	16.5	18.7	18.9	17.5	13.8	9.81	6.52	3.80	2.08	0.92	0.46		
130	0.56	1.18	2.34	4.15	5.84	7.75	9.76	11.1	11.2	10.5	8.72	6.81	4.77	2.82	1.59	0.78	0.48		
135	0.55	1.06	1.97	3.16	4.49	5.92	6.86	7.51	7.69	7.23	6.33	5.07	3.67	2.15	1.26	0.71	0.51		
140	0.56	1.02	1.65	2.48	3.39	4.24	4.61	5.22	5.56	5.31	3.78	2.91	2.77	1.64	1.03	0.66	0.53		
145	0.58	0.79	1.40	1.98	2.57	3.24	2.40	2.70	4.03	3.63	3.45	2.86	2.05	1.29	0.87	0.64	0.55		
150	0.45	0.58	1.03	1.40	1.73	2.33	2.61	2.20	2.69	2.67	2.53	2.15	1.64	1.01	0.75	0.62	0.57		
155	0.37	0.41	0.73	1.01	1.32	1.68	1.74	1.66	1.83	1.83	1.64	1.46	1.26	0.96	0.71	0.62	0.58		
160	0.34	0.40	0.48	0.74	0.99	1.03	0.96	1.04	1.33	1.35	0.91	0.67	0.86	0.70	0.64	0.59	0.57		
165	0.39	0.46	0.54	0.58	0.72	0.78	0.82	0.93	0.98	0.97	0.84	0.64	0.53	0.54	0.59	0.57	0.56		
170	0.43	0.47	0.53	0.59	0.62	0.65	0.68	0.70	0.71	0.72	0.70	0.64	0.58	0.52	0.41	0.42	0.45		
175	0.36	0.37	0.38	0.39	0.39	0.39	0.43	0.43	0.52	0.59	0.54	0.54	0.55	0.49	0.48	0.48	0.48		
180	0.30	0.30	0.30	0.30	0.29	0.29	0.29	0.29	0.28	0.28	0.28	0.29	0.29	0.29	0.29	0.29	0.30		

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)	0.176	0.078
Power Factor	0.9946	0.9745
Test Power (W)/2	10.48	10.56
THD A%	8.71	8.53
Luminous Efficacy (lm/W)	105.8	105.0
Total Luminous Flux (lm)	1108.8	1108.5
Color Rendering Index (CRI)	84.2	
R9	13.1	
Correlated Color Temperature (CCT)(K)	3457	
Chromaticity Chroma x	0.4052	
Chromaticity Chroma y	0.3855	
Chromaticity Chroma u	0.2378	
Chromaticity Chroma v	0.3394	
Duv	-0.0023	
Chromaticity Chroma u'	0.2378	
Chromaticity Chroma v'	0.5090	

Special Color Rendering Indices	
R1	83
R2	91.2
R3	96.2
R4	83.1
R5	83.5
R6	88.5
R7	84.5
R8	63.6
R9	13.1
R10	79.6
R11	83
R12	72
R13	85
R14	98.4

Table 8: Test data per Sphere-Spectroradiometer Method

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

Spectral Power Distribution - Sphere Spectroradiometer Method

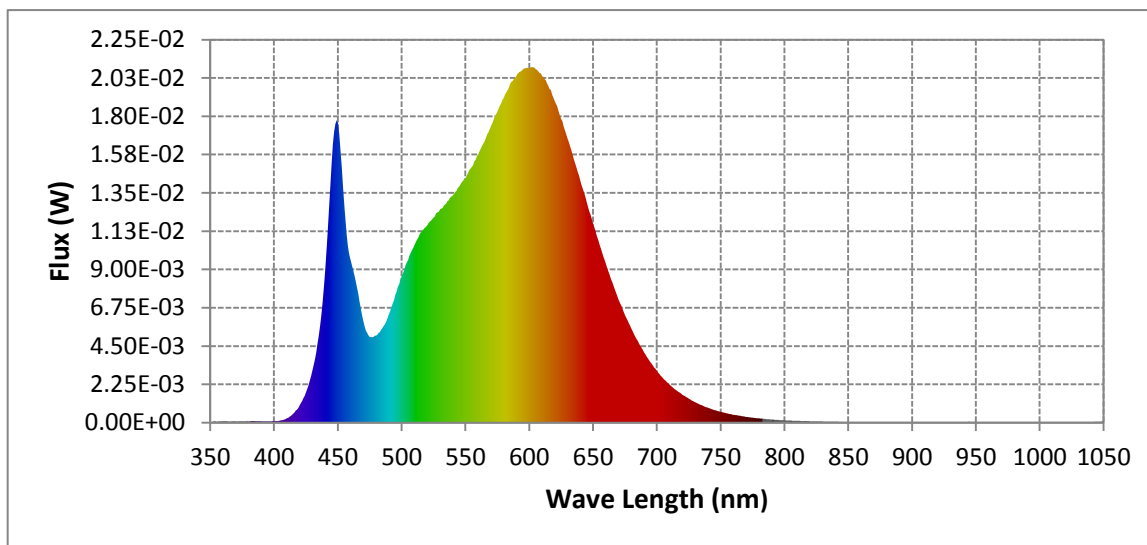
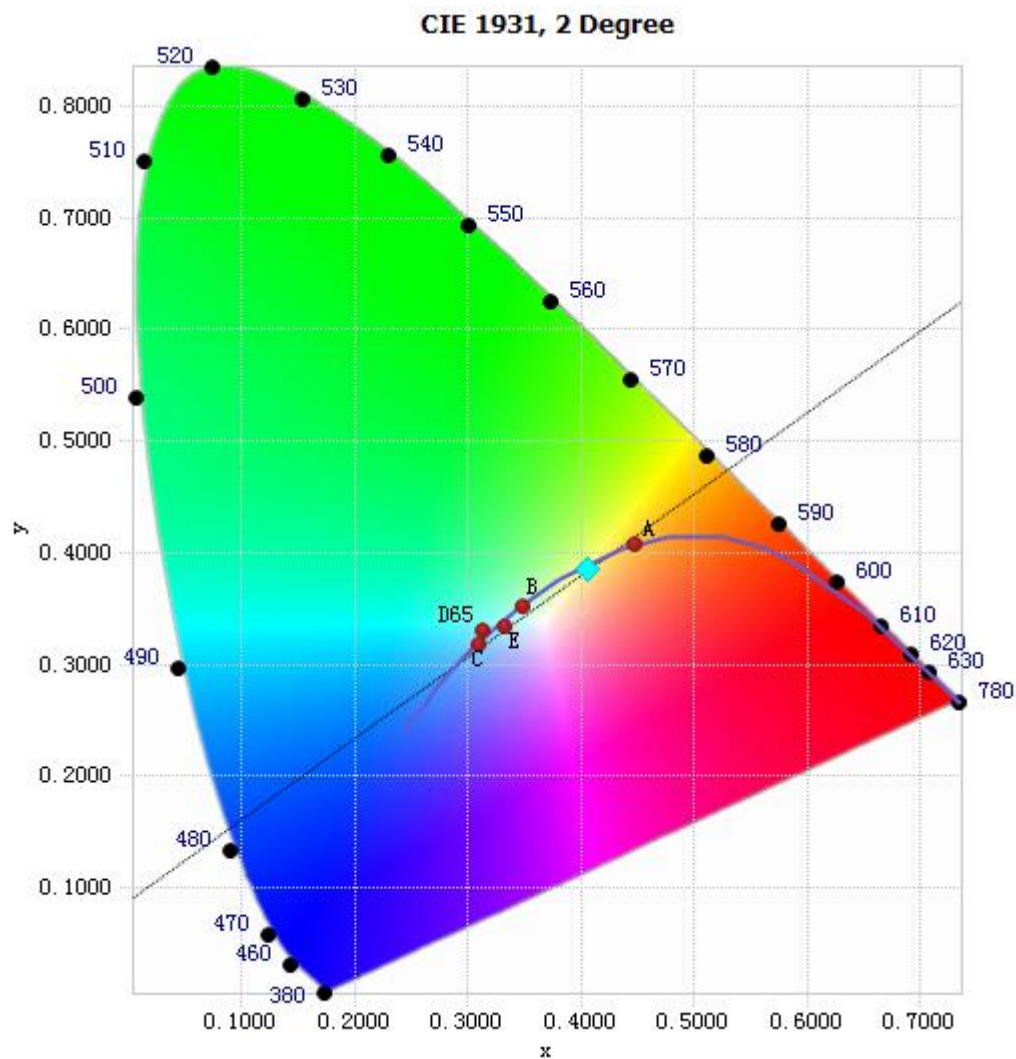


Chart 8: Spectral Power Distribution

Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	8.82E-05	485	5.56E-03	590	2.04E-02	695	3.54E-03
385	8.77E-05	490	6.38E-03	595	2.08E-02	700	3.05E-03
390	7.88E-05	495	7.49E-03	600	2.08E-02	705	2.59E-03
395	7.46E-05	500	8.61E-03	605	2.08E-02	710	2.23E-03
400	9.37E-05	505	9.56E-03	610	2.04E-02	715	1.92E-03
405	1.21E-04	510	1.04E-02	615	1.98E-02	720	1.64E-03
410	2.53E-04	515	1.12E-02	620	1.89E-02	725	1.41E-03
415	5.31E-04	520	1.16E-02	625	1.78E-02	730	1.20E-03
420	1.01E-03	525	1.20E-02	630	1.67E-02	735	1.03E-03
425	1.79E-03	530	1.25E-02	635	1.55E-02	740	8.77E-04
430	3.07E-03	535	1.29E-02	640	1.42E-02	745	7.41E-04
435	5.11E-03	540	1.33E-02	645	1.30E-02	750	6.30E-04
440	8.94E-03	545	1.39E-02	650	1.17E-02	755	5.47E-04
445	1.52E-02	550	1.44E-02	655	1.05E-02	760	4.67E-04
450	1.76E-02	555	1.50E-02	660	9.32E-03	765	4.04E-04
455	1.27E-02	560	1.58E-02	665	8.25E-03	770	3.45E-04
460	9.59E-03	565	1.65E-02	670	7.21E-03	775	2.98E-04
465	7.96E-03	570	1.74E-02	675	6.31E-03	780	2.54E-04
470	5.98E-03	575	1.83E-02	680	5.51E-03		
475	5.04E-03	580	1.91E-02	685	4.79E-03		
480	5.11E-03	585	1.99E-02	690	4.13E-03		

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

Chromaticity Diagram - Sphere Spectroradiometer Method



Tristimulus values(x, y): (0.4052, 0.3855)

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

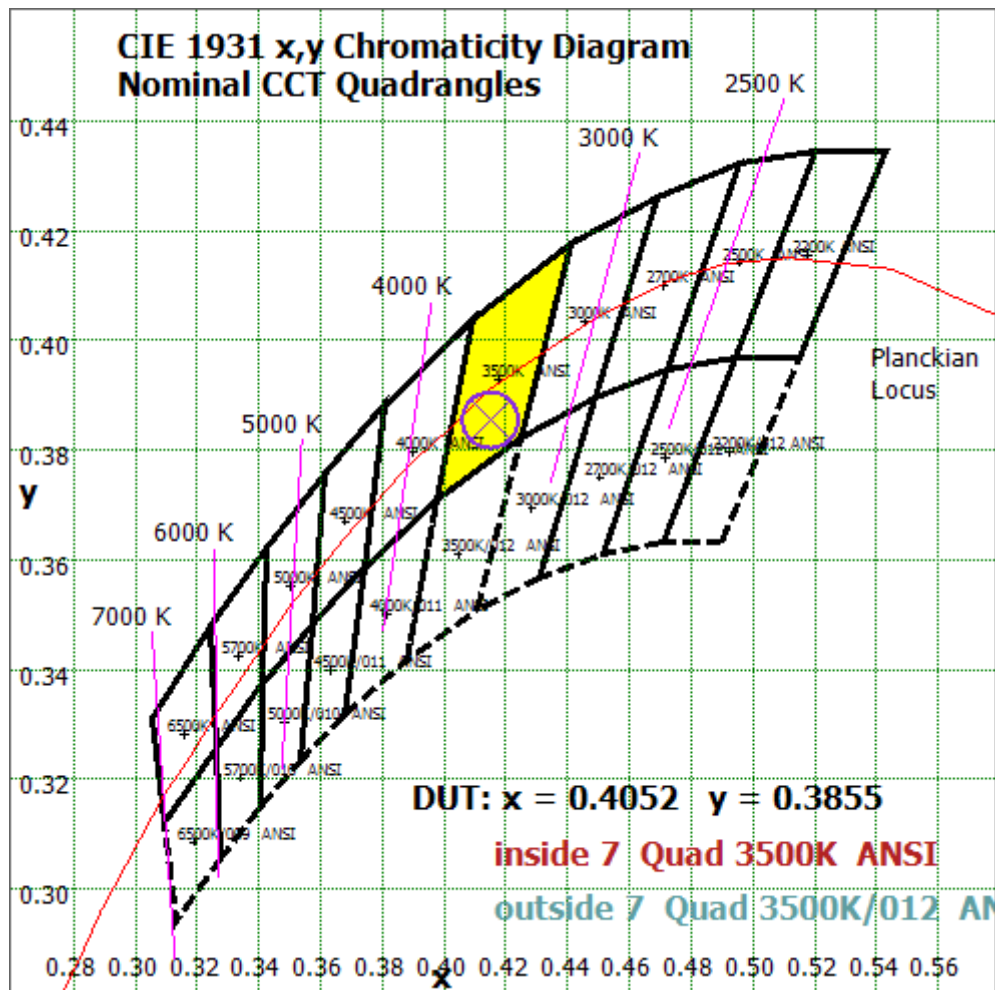


Chart 10: Plot of Lamp x/y coordinates on CIE 1931 Chromaticity Diagram

Color Rendition Report – Sphere Spectroradiometer Method

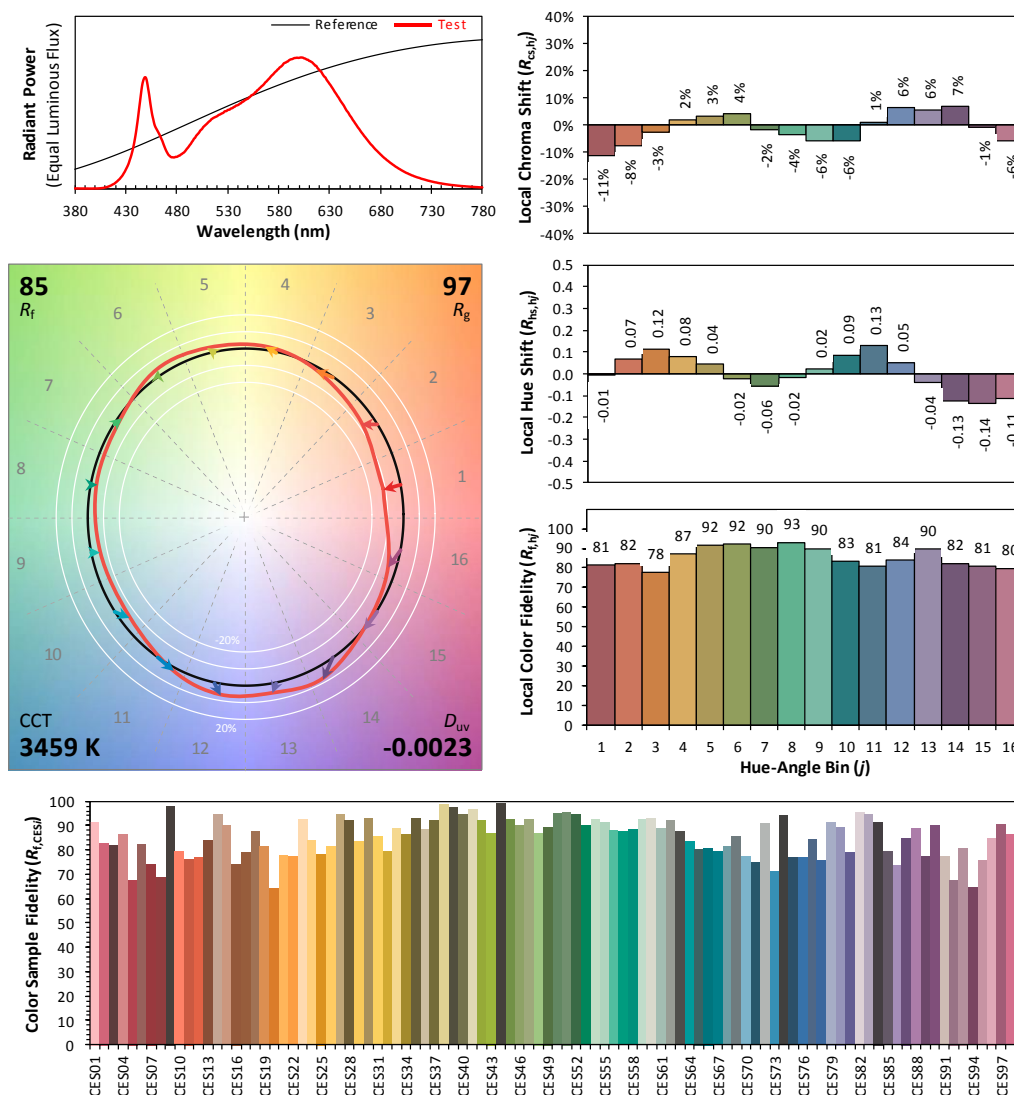
ANSI/IES TM-30-18 Color Rendition Report

Source: LED

Manufacturer: GREEN CREATIVE LTD

Date: 2023/05/25

Model: 8.5PLH/8CCTS/DIR



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

x 0.4052
 y 0.3855
 u' 0.2378
 v' 0.5090

CIE 13.3-1995
(CRI)
 R_a 84
 R_9 13

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)	0.181	0.081
Power Factor	0.9950	0.9761
Test Power (W)/2	10.81	10.90
THD A%	8.36	8.21
Luminous Efficacy (lm/W)	106.0	105.2
Total Luminous Flux (lm)	1146.1	1146.2
Color Rendering Index (CRI)	83.7	
R9	12.2	
Correlated Color Temperature (CCT)(K)	3977	
Chromaticity Chroma x	0.3808	
Chromaticity Chroma y	0.3752	
Chromaticity Chroma u	0.2259	
Chromaticity Chroma v	0.3340	
Duv	-0.0008	
Chromaticity Chroma u'	0.2259	
Chromaticity Chroma v'	0.5009	

Special Color Rendering Indices	
R1	82.2
R2	89.2
R3	94.6
R4	83.5
R5	82.7
R6	85.4
R7	86.2
R8	66
R9	12.2
R10	74.7
R11	83.1
R12	67.6
R13	83.8
R14	97.1

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

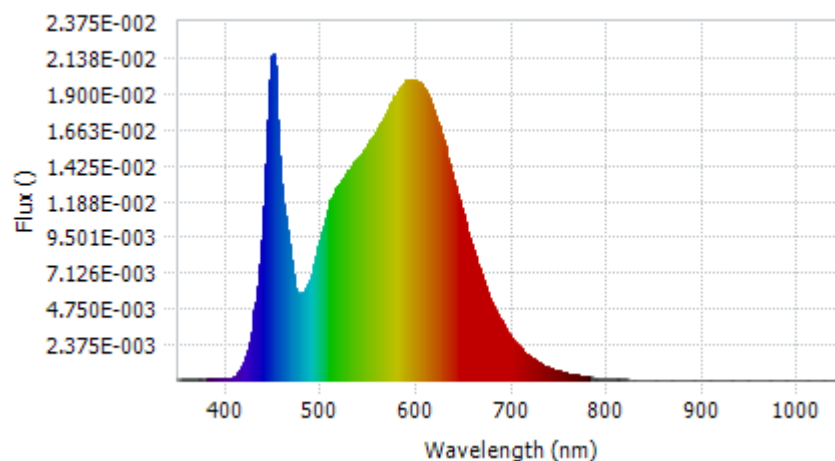
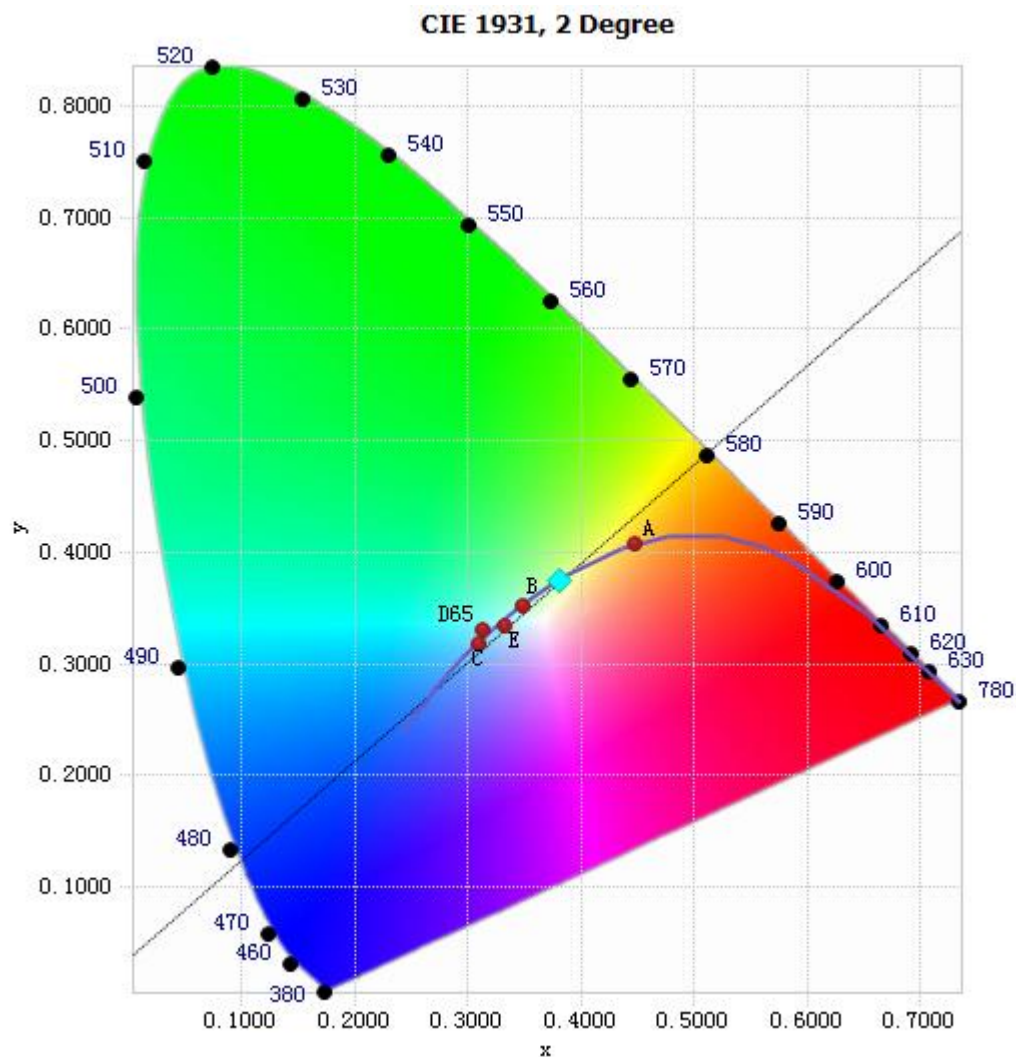


Chart 12: Spectral Power Distribution

Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	1.02E-04	485	6.33E-03	590	1.99E-02	695	3.20E-03
385	9.62E-05	490	7.29E-03	595	1.99E-02	700	2.75E-03
390	9.16E-05	495	8.58E-03	600	1.98E-02	705	2.35E-03
395	8.23E-05	500	9.87E-03	605	1.95E-02	710	2.02E-03
400	8.88E-05	505	1.10E-02	610	1.89E-02	715	1.74E-03
405	1.69E-04	510	1.19E-02	615	1.83E-02	720	1.50E-03
410	3.78E-04	515	1.27E-02	620	1.73E-02	725	1.28E-03
415	8.51E-04	520	1.31E-02	625	1.63E-02	730	1.09E-03
420	1.59E-03	525	1.36E-02	630	1.52E-02	735	9.29E-04
425	2.81E-03	530	1.41E-02	635	1.40E-02	740	7.92E-04
430	4.70E-03	535	1.44E-02	640	1.29E-02	745	6.76E-04
435	7.66E-03	540	1.48E-02	645	1.17E-02	750	5.80E-04
440	1.29E-02	545	1.53E-02	650	1.05E-02	755	5.01E-04
445	1.99E-02	550	1.57E-02	655	9.43E-03	760	4.28E-04
450	2.08E-02	555	1.62E-02	660	8.39E-03	765	3.69E-04
455	1.48E-02	560	1.68E-02	665	7.43E-03	770	3.12E-04
460	1.12E-02	565	1.74E-02	670	6.48E-03	775	2.72E-04
465	8.97E-03	570	1.80E-02	675	5.67E-03	780	2.29E-04
470	6.71E-03	575	1.86E-02	680	4.93E-03		
475	5.75E-03	580	1.91E-02	685	4.30E-03		
480	5.84E-03	585	1.97E-02	690	3.71E-03		

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

Chromaticity Diagram - Sphere Spectroradiometer Method



Tristimulus values(x, y): (0.3808, 0.3752)

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

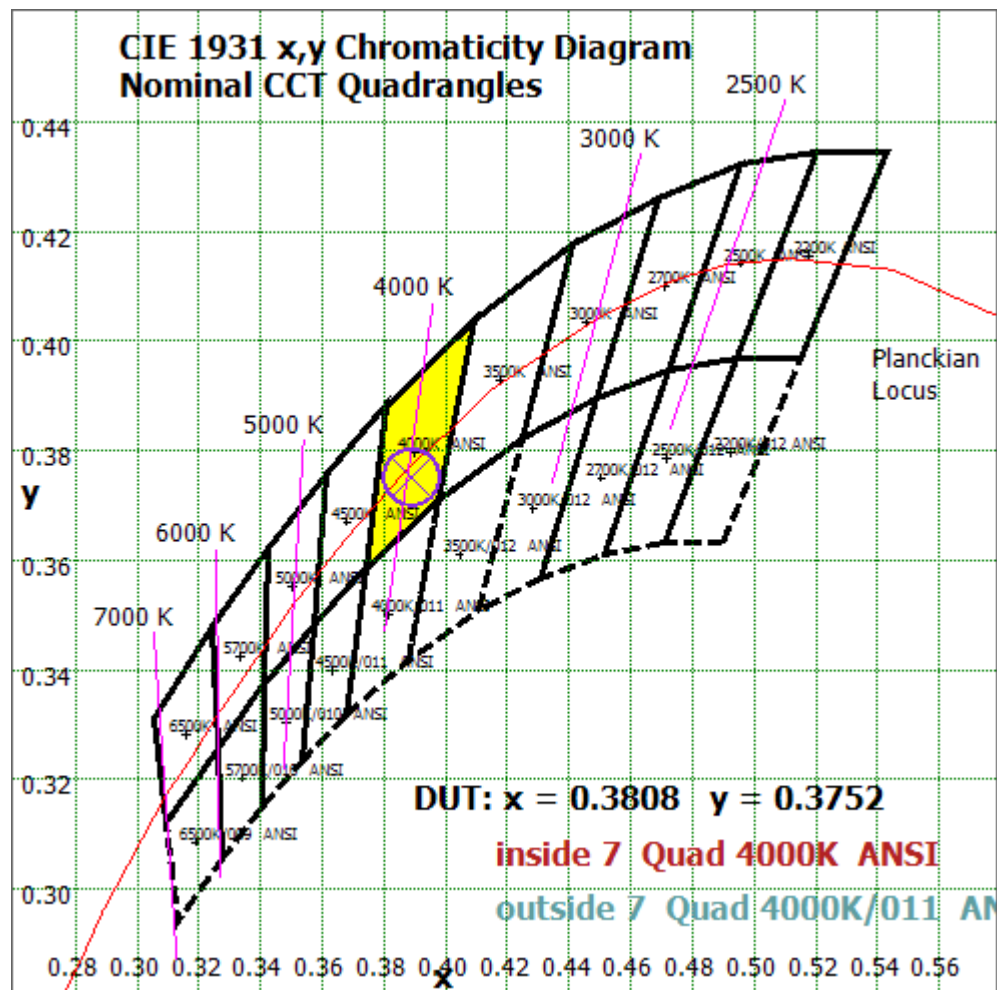


Chart 14: Plot of Lamp x/y coordinates on CIE 1931 Chromaticity Diagram

Color Rendition Report – Sphere Spectroradiometer Method

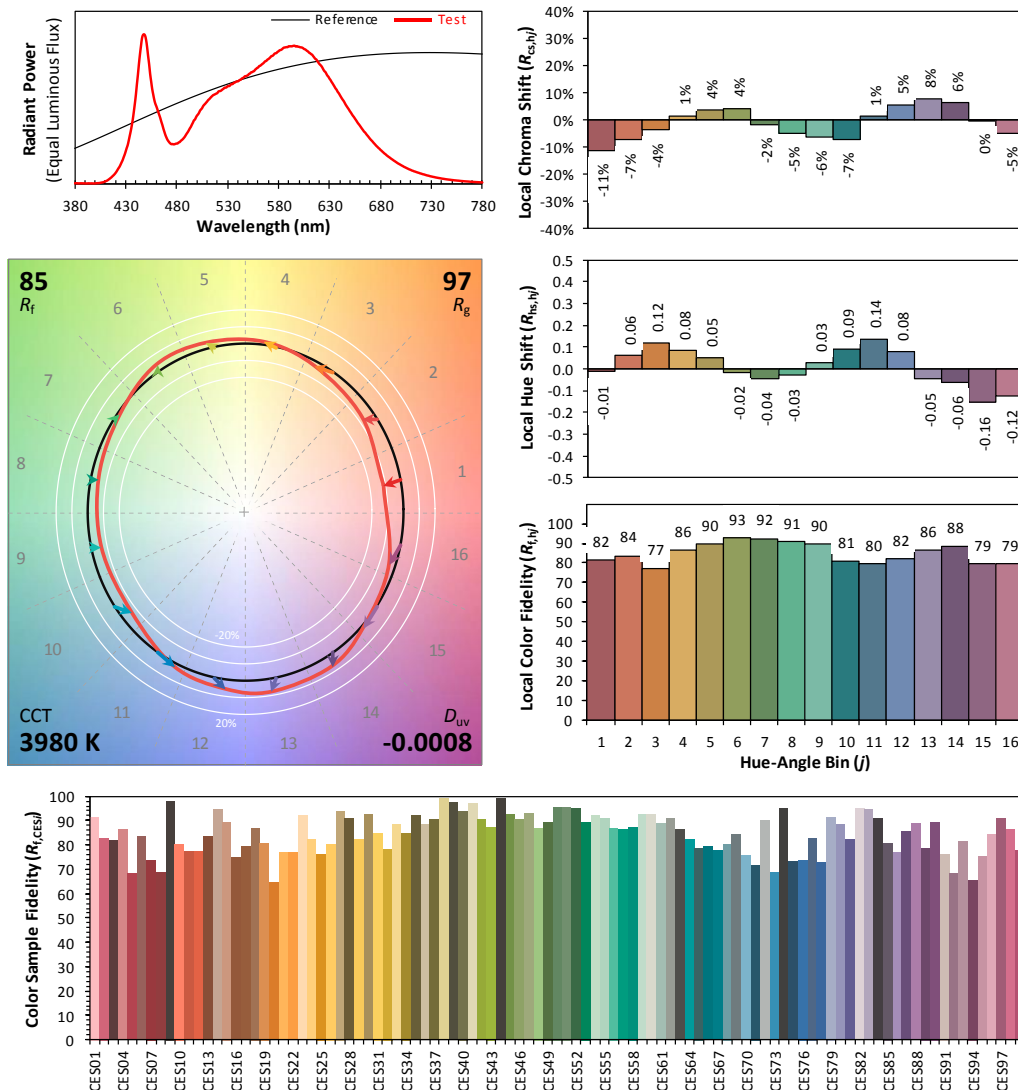
ANSI/IES TM-30-18 Color Rendition Report

Source: LED

Manufacturer: GREEN CREATIVE LTD

Date: 2023/05/25

Model: 8.5PLH/8CCTS/DIR



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

x 0.3808
 y 0.3752
 u' 0.2259
 v' 0.5009

CIE 13.3-1995
 (CRI)
 R_a 84
 R_9 12

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.

EQUIPMENT LIST

Test Equipment	Model	Equipment No.	Calibration Date	Calibration Due date
Integrate Sphere system	3M	HZTE015-04	Aug. 05, 2022	Aug. 04, 2023
Digital Power Meter	WT210	HZTE008-01	Aug. 05, 2022	Aug. 04, 2023
AC Power Supply	PCR 500L	HZTE001-07	Aug. 05, 2022	Aug. 04, 2023
DC Power Supply	IT6154	HZTE004-04	Aug. 05, 2022	Aug. 04, 2023
Temperature and humidity recorder	JR900	HZTE018-02	Aug. 05, 2022	Aug. 04, 2023
Standard source	SCL-1400	HZTE012-02	Aug. 05, 2022	Aug. 04, 2023
Temperature Meter	TES1310	HZTE017-01	Aug. 05, 2022	Aug. 04, 2023

Table 12: 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 $k=2$.

*** End of Report ***

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