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: 17PLO/8CCTS/BYP

Laboratory: Lea ding Testing Laboratories

NVLAP CODE: 200960-0

3rd Floor, Bld. 2, NO. 96 Longchuanwu Rd Qianjiang Economy Dev. Zone, YuhangDist, Hangzhou, Zhejiang Province, China 311100

Tel: +86571 86376106

www.ltlqa.com

Report No.: HZ24120003a

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

Review by: Wei Fei

Engineer: Wei Fei

Dec. 11, 2024

Approved by: April Zou

Manager: April Zou

Dec. 11, 2024

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	17PLO/8CCTS/BYP 3000K Setting	17PLO/8CCTS/BYP 3500K Setting	17PLO/8CCTS/BYP 4000K Setting	17PLO/8CCTS/BYP 5000K Setting
Luminous Efficacy (Lumens /Watt)	147.0	151.1	154.8	153.5
Total Luminous Flux (Lumens)	2413.5	2460.3	2511.7	2548.5
Power (Watts)	16.42	16.28	16.22	16.60
Power Factor	0.9714	0.9716	0.9717	0.9711
CCT (K)	3066	3385	3786	4986
CRI	82.9	84.6	85.7	84.6
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 : Dec. 03, 2024

Date of Test : Dec. 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

SAMPLE PHOTO

Figure 1- Overview of the sample

Equipment Under Test(EUT)	
Name	: LED Lamp
Model	: 17PLO/8CCTS/BYP
Electrical Ratings	: 120-277V, 50/60Hz, 17W
Product Description	: Color- Tunable 3000K/3500K/4000K/5000K
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 ℃.

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)	0.141	0.064
Power Factor	0.9714	0.9120
Test Power (W)	16.42	16.22
THD A%	19.82	17.87
Luminous Efficacy (lm/W)	147.0	148.1
Total Luminous Flux (lm)	2413.5	2402.2
Color Rendering Index (CRI)	82.9	
R9	8.5	
Correlated Color Temperature (CCT)(K)	3066	
Chromaticity Chroma x	0.4304	
Chromaticity Chroma y	0.3986	
Chromaticity Chroma u	0.2487	
Chromaticity Chroma v	0.3455	
Duv	-0.0013	
Chromaticity Chroma u ’	0.2487	
Chromaticity Chroma v’	0.5182	

Special Color Rendering Indices	
R1	82.2
R2	93.8
R3	93.1
R4	79.5
R5	82.7
R6	92.3
R7	80.9
R8	58.4
R9	8.5
R10	85.8
R11	79.1
R12	73.5
R13	85.4
R14	96.9

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

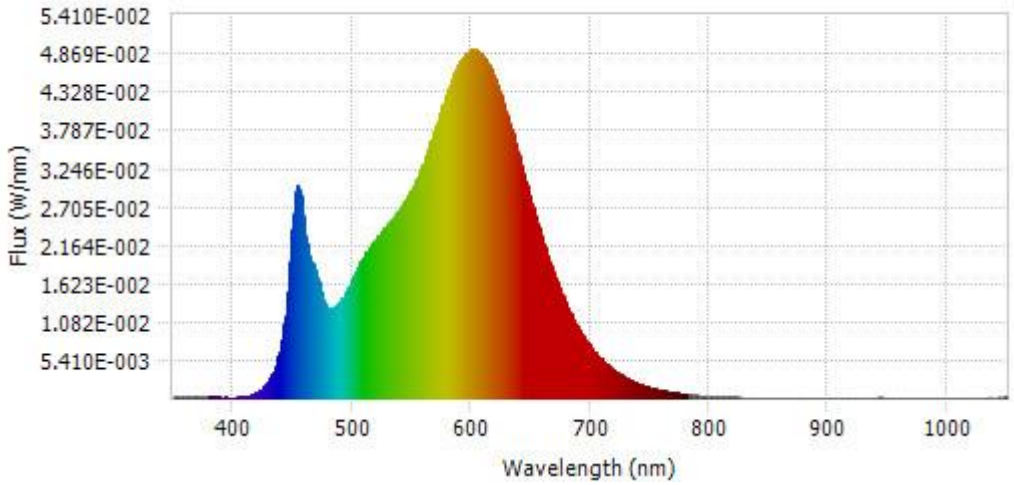
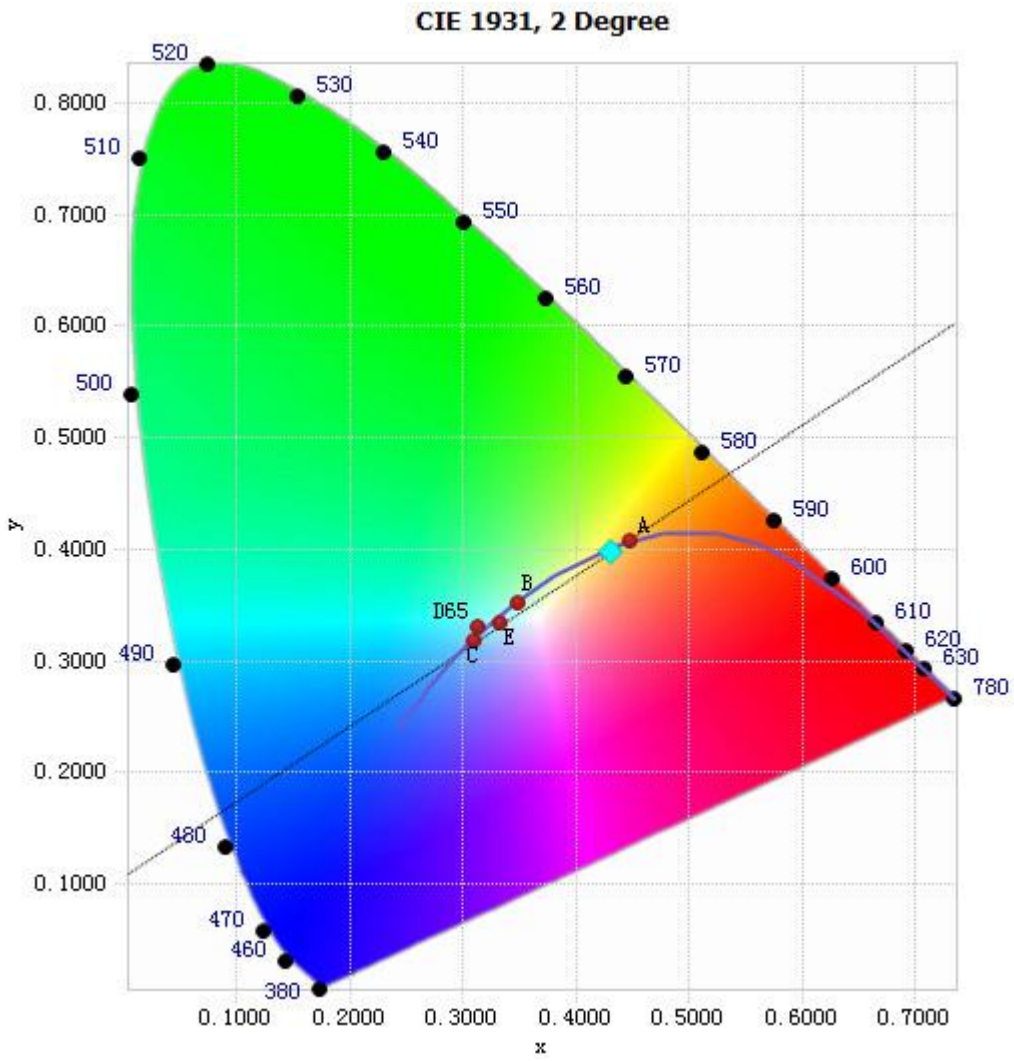


Chart 1: Spectral Power Distribution

Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	2.20E-04	485	1.29E-02	590	4.74E-02	695	8.61E-03
385	1.72E-04	490	1.37E-02	595	4.85E-02	700	7.34E-03
390	1.71E-04	495	1.50E-02	600	4.92E-02	705	6.30E-03
395	1.61E-04	500	1.67E-02	605	4.90E-02	710	5.38E-03
400	1.47E-04	505	1.85E-02	610	4.83E-02	715	4.62E-03
405	1.63E-04	510	2.00E-02	615	4.70E-02	720	3.96E-03
410	2.54E-04	515	2.14E-02	620	4.51E-02	725	3.40E-03
415	4.59E-04	520	2.23E-02	625	4.27E-02	730	2.90E-03
420	8.14E-04	525	2.35E-02	630	4.01E-02	735	2.48E-03
425	1.51E-03	530	2.45E-02	635	3.73E-02	740	2.11E-03
430	2.50E-03	535	2.54E-02	640	3.43E-02	745	1.80E-03
435	4.22E-03	540	2.66E-02	645	3.12E-02	750	1.54E-03
440	7.28E-03	545	2.80E-02	650	2.81E-02	755	1.32E-03
445	1.33E-02	550	2.94E-02	655	2.52E-02	760	1.14E-03
450	2.38E-02	555	3.12E-02	660	2.25E-02	765	9.67E-04
455	3.01E-02	560	3.33E-02	665	1.98E-02	770	8.28E-04
460	2.43E-02	565	3.56E-02	670	1.73E-02	775	7.06E-04
465	1.97E-02	570	3.81E-02	675	1.52E-02	780	6.21E-04
470	1.76E-02	575	4.07E-02	680	1.32E-02		
475	1.43E-02	580	4.32E-02	685	1.15E-02		
480	1.26E-02	585	4.56E-02	690	9.96E-03		

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

Chromaticity Diagram - Sphere Spectroradiometer Method



Tristimulus values(x, y): (0.4304, 0.3986)

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

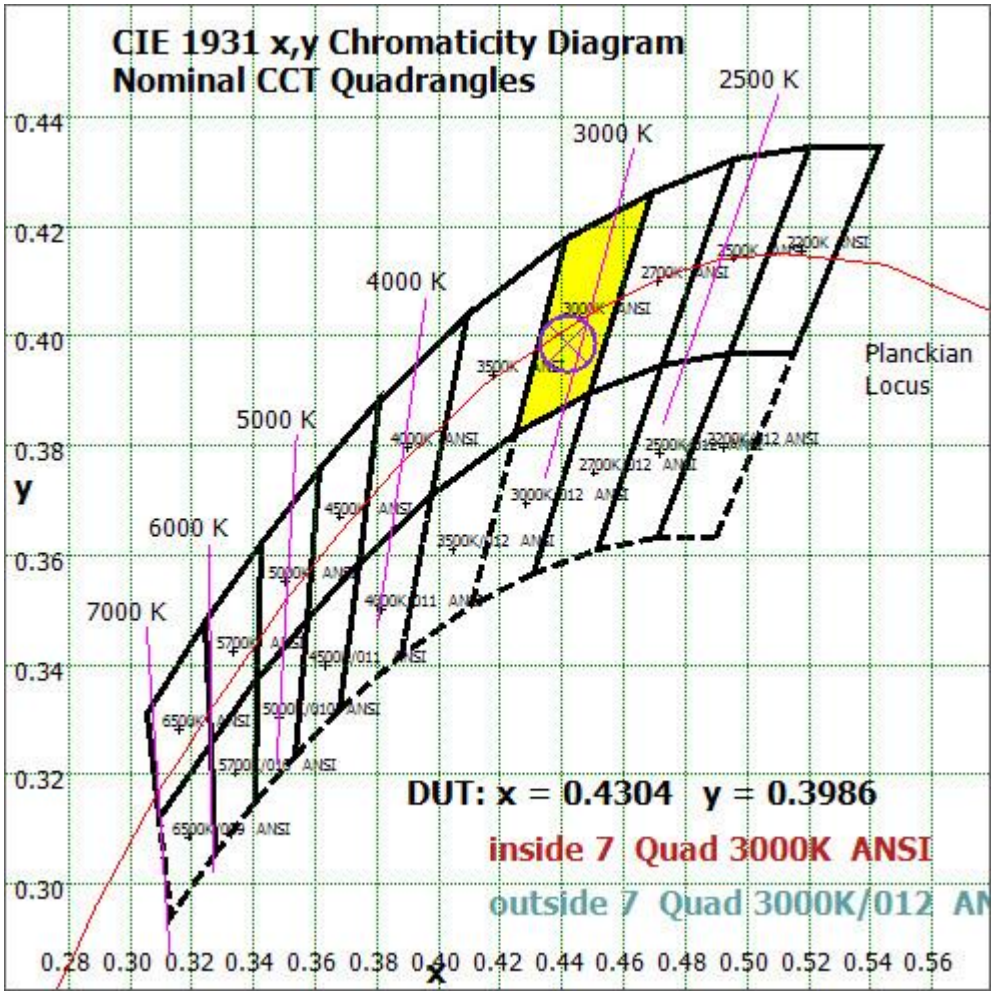


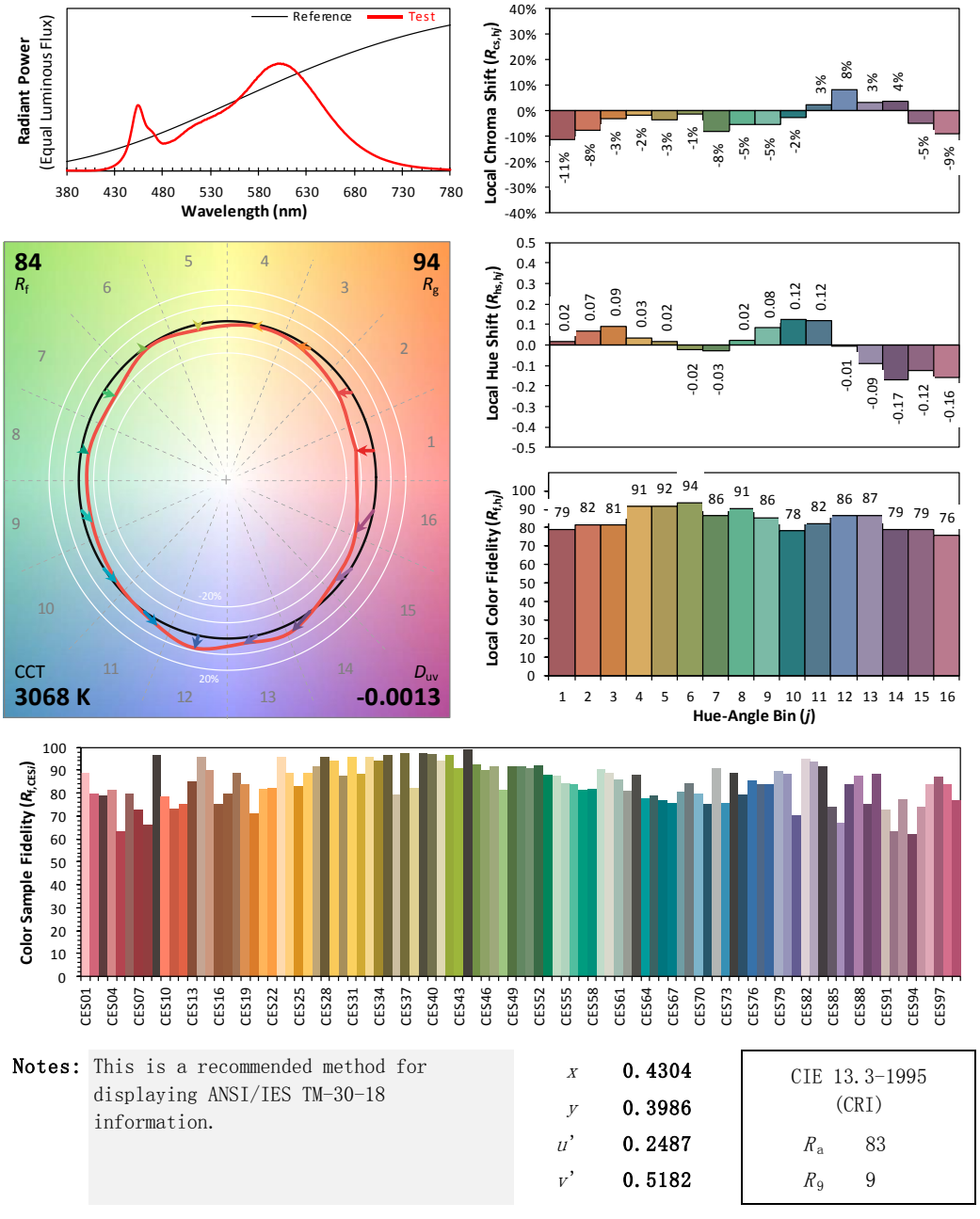
Chart 3: Plot of Lamp x/y coordinates on CIE 1931 Chromaticity Diagram

Color Rendition Report – Sphere Spectroradiometer Method

ANSI/IES TM-30-18 Color Rendition Report

Source: LED **Manufacturer:** GREEN CREATIVE LTD

Date: 2024/12/09 **Model:** 17PLO/8CCTS/BYP



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

x	0.4304
y	0.3986
u'	0.2487
v'	0.5182

CIE 13.3-1995 (CRI)	
R_a	83
R_9	9

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 ℃.

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)	0.141
Power Factor	0.9751
Power (W)	16.45
Luminous Efficacy (lm/W)	148.0
Total Luminous Flux (lm)	2433.9
Beam Angle (°)	338.7 (0^o-180^o) / 339.1 (90^o-270^o)
Center Beam Candle Power (cd)	18.6
Maximum Beam Candle Power (cd)	275.6 (At: C=290.0, Gamma=87.5)
Spacing Criteria	5.17 (0^o-180^o) / 5.24 (90^o-270^o)
Zonal Lumens in the 0 °-60 °Zone	18.82%
Zonal Lumens in the 60 °-90 °Zone	32.25%
Zonal Lumens in the 90 °-120 °Zone	31.94%
Zonal Lumens in the 120 °-180 °Zone	17.00%

Table 4: Test data per Goniophotometer Method

Zonal Lumen Tabulation- Goniophotometer Method

γ(°)	Lumens	% Total
0- 10	2.691	0.11%
10- 20	15.837	0.65%
20- 30	43.123	1.77%
30- 40	83.002	3.41%
40- 50	130.967	5.38%
50- 60	182.36	7.49%
60- 70	230.261	9.46%
70- 80	267.305	10.98%
80- 90	287.315	11.80%
90-100	286.829	11.78%
100-110	264.99	10.89%
110-120	225.534	9.27%
120-130	175.315	7.20%
130-140	122.302	5.02%
140-150	73.2	3.01%
150-160	34.148	1.40%
160-170	8.536	0.35%
170-180	0.189	0.01%
Total	2433.9	100%

γ(°)	Lumens	% Total
0- 60	457.98	18.82%
60- 90	784.881	32.25%
0-90	1242.86	51.06%
90- 180	1191.04	48.94%
0- 180	2433.9	100%

Table 5: Zonal Lumen

Illuminance Plots- Goniophotometer Method

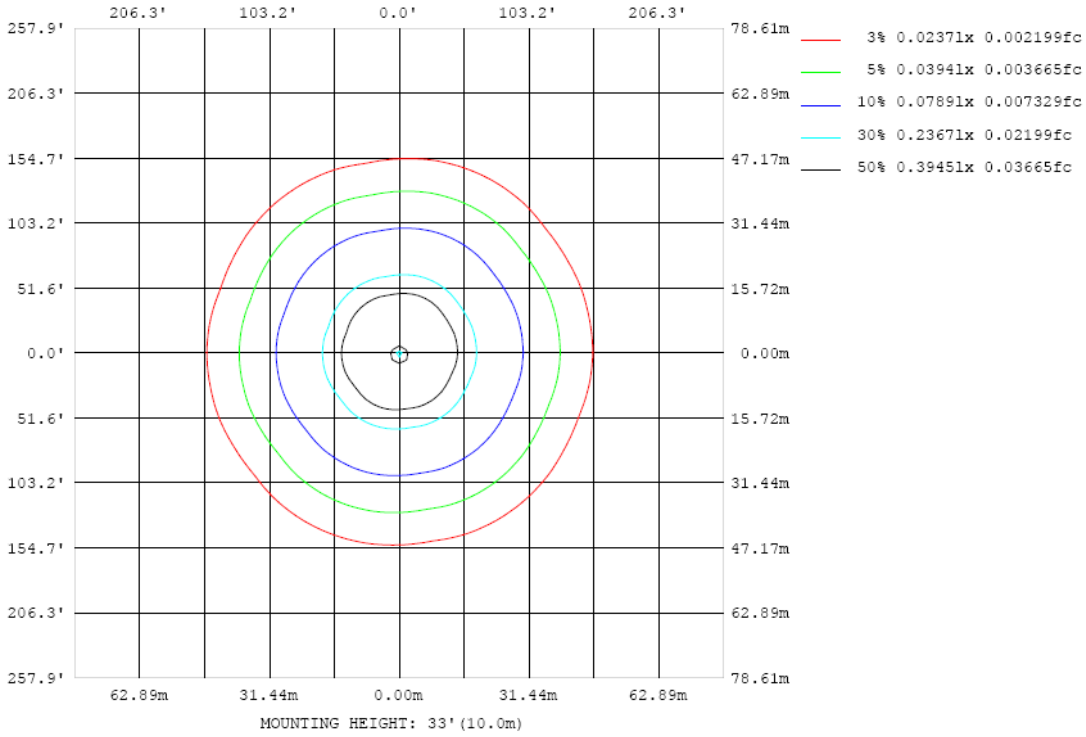


Chart 5: Illuminance Plot (Footcandles)

Luminous Intensity Distribution Plots- Goniophotometer Method

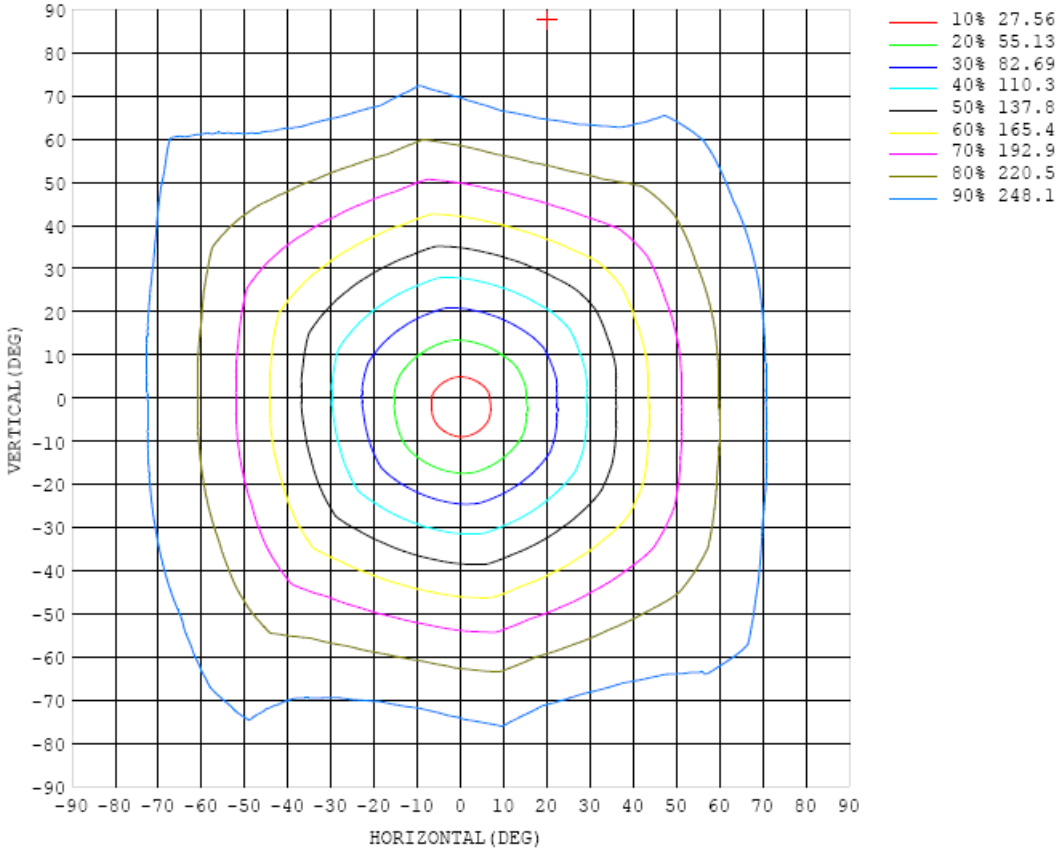


Chart 6: Isocandela Plot

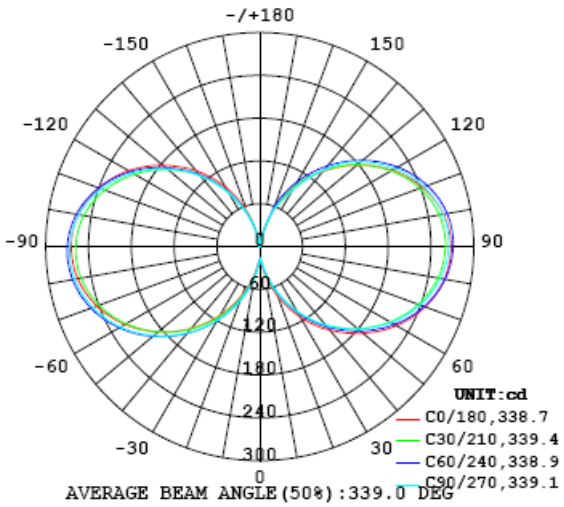


Chart 7: Polar Candela Distribution

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	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6
5	23.8	23.0	22.3	21.6	20.9	20.5	20.0	19.7	19.7	19.7	19.8	20.0	20.5	20.9	21.5	22.2	22.9	23.5	23.9
10	37.0	35.8	34.6	33.0	32.1	31.5	31.0	30.6	30.2	30.1	30.6	31.1	31.6	32.0	32.9	34.2	35.3	36.4	36.7
15	54.4	52.8	51.1	49.0	48.3	48.1	47.5	46.8	46.0	46.2	46.9	47.5	48.0	48.2	48.9	50.5	52.0	53.2	53.6
20	73.6	71.9	69.5	67.0	67.2	67.0	66.4	65.6	64.2	64.7	65.7	66.5	66.8	66.8	66.7	68.9	70.7	72.0	71.5
25	93.7	91.6	88.6	86.2	86.9	87.1	86.6	85.6	83.7	84.4	85.7	86.7	87.0	86.4	85.4	88.0	90.3	91.5	91.0
30	114	112	108	106	107	108	107	106	103	105	106	107	107	106	104	107	110	111	111
35	134	131	127	125	127	128	127	126	123	124	126	128	127	126	123	126	130	131	130
40	152	150	146	144	146	148	147	146	142	144	146	147	147	145	141	145	148	149	150
45	171	168	162	161	164	166	166	164	159	162	164	166	165	163	158	162	166	167	168
50	189	186	180	179	183	185	184	182	177	180	183	184	184	181	175	179	183	185	186
55	206	202	196	195	200	202	202	200	194	196	200	202	201	198	191	195	200	201	203
60	221	218	211	211	216	218	218	216	209	213	217	218	217	214	206	210	215	217	218
65	235	231	224	224	230	233	233	230	224	227	231	232	231	228	220	223	228	230	232
70	247	243	235	237	243	245	245	243	236	239	243	245	244	240	231	234	240	241	243
75	256	252	244	246	253	256	256	253	246	250	254	255	254	250	241	243	249	251	252
80	263	259	251	254	260	263	263	261	253	257	262	263	262	258	248	250	256	257	259
85	267	263	255	258	265	269	269	266	258	262	267	268	266	262	252	254	260	261	263
90	268	265	257	260	267	271	271	269	260	265	269	270	269	264	255	256	262	263	264
95	266	263	255	259	267	270	270	268	261	264	269	270	268	264	254	255	260	261	263
100	262	258	251	256	262	266	267	265	257	261	265	266	264	260	250	250	256	257	258
105	253	250	244	248	256	259	260	258	250	254	258	260	258	253	244	244	248	249	250
110	243	240	233	239	246	249	250	248	241	245	249	250	248	244	234	234	238	239	240
115	229	227	221	227	233	237	238	236	229	233	237	238	236	232	223	222	226	226	227
120	214	212	207	212	218	222	223	221	216	219	222	223	222	217	209	208	211	211	213
125	197	195	190	196	202	206	207	205	200	203	206	207	205	201	193	191	195	195	196
130	178	177	173	178	184	187	188	187	182	185	188	188	187	183	176	174	177	176	177
135	158	157	154	160	164	167	168	167	163	166	168	169	168	164	158	155	157	157	158
140	138	137	135	140	144	147	148	146	139	141	146	148	147	144	139	136	137	137	139
145	116	116	115	119	123	125	126	122	114	114	123	125	126	123	119	116	117	116	118
150	94.8	94.6	94.5	98.3	101	104	105	99.6	89.0	89.9	98.5	103	104	102	98.7	95.5	96.0	95.0	96.1
155	73.1	73.6	74.1	77.3	80.0	82.0	82.9	77.8	66.5	66.9	74.7	80.5	81.9	80.9	77.9	75.2	74.7	73.9	74.5
160	51.1	50.3	51.4	53.2	54.6	55.3	57.7	56.9	49.3	51.3	53.9	58.0	59.0	59.4	58.1	55.4	53.1	52.4	51.8
165	27.7	25.9	27.3	24.4	19.8	19.2	25.6	27.2	21.0	26.8	29.0	29.8	31.5	31.2	30.7	29.4	27.1	27.3	27.3
170	9.05	9.75	10.7	10.8	10.7	10.2	8.01	7.88	6.62	7.65	6.55	5.56	6.17	5.97	5.81	5.40	4.62	3.77	4.83
175	0.24	0.25	0.25	0.25	0.26	0.26	0.26	0.26	0.28	0.28	0.28	0.27	0.26	0.26	0.25	0.23	0.22	0.22	0.20
180	0.15	0.16	0.16	0.12	0.14	0.17	0.18	0.18	0.16	0.13	0.15	0.16	0.17	0.16	0.13	0.15	0.13	0.12	0.16

Table 6: Luminous Intensity Data

Table--2 UNIT: cd

γ (DEG) \ C (DEG)	190	200	210	220	230	240	250	260	270	280	290	300	310	320	330	340	350		
0	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6		
5	24.5	25.3	26.0	26.6	27.2	27.5	27.7	27.8	27.9	27.9	27.7	27.4	27.0	26.3	25.6	24.8	23.9		
10	37.3	38.6	39.9	41.1	42.0	42.6	42.9	42.8	43.2	43.5	43.3	42.8	41.9	40.8	39.2	38.0	37.0		
15	54.0	55.3	57.1	58.8	59.8	60.4	61.0	60.2	61.5	61.5	61.6	60.9	59.9	58.4	56.1	55.2	54.1		
20	71.9	72.3	74.8	76.9	78.6	79.4	79.5	78.6	79.6	80.8	81.1	80.3	78.9	76.4	73.8	73.4	72.4		
25	90.9	90.8	94.0	96.7	98.5	99.3	99.2	97.7	99.5	101	101	101	99.0	95.7	92.8	93.1	92.0		
30	110	109	113	116	119	119	119	117	119	121	122	121	119	115	112	113	112		
35	130	128	132	136	138	139	139	136	139	141	142	141	139	134	131	132	132		
40	148	146	151	155	158	159	158	154	158	161	162	161	158	153	150	152	151		
45	167	163	168	174	177	178	177	172	176	180	181	181	177	171	168	170	170		
50	184	180	186	191	195	196	195	190	194	198	200	199	195	188	185	188	188		
55	201	196	202	207	211	212	211	206	210	215	216	216	212	204	202	205	204		
60	216	210	216	223	226	227	226	220	225	230	232	231	227	218	217	220	220		
65	229	223	229	235	240	241	239	233	238	244	246	244	240	231	230	233	233		
70	241	234	240	247	251	252	250	243	249	254	257	256	251	242	241	245	245		
75	250	243	249	255	259	261	259	252	258	263	266	265	260	250	250	254	254		
80	256	249	254	261	266	267	265	258	263	269	272	271	266	256	256	261	261		
85	260	253	258	265	269	269	268	260	267	272	275	274	270	259	260	264	265		
90	262	254	258	265	269	270	268	261	267	273	276	274	270	259	261	265	266		
95	260	252	256	263	267	267	265	257	264	270	272	272	267	257	259	263	265		
100	255	247	250	257	261	261	259	252	258	263	266	266	261	252	254	259	260		
105	247	240	243	248	252	252	250	243	249	254	257	256	252	243	246	250	252		
110	237	230	231	237	240	240	238	231	237	242	245	245	240	232	235	240	241		
115	224	217	218	223	226	226	224	217	223	228	230	230	226	218	222	227	228		
120	209	202	203	207	210	210	208	202	206	211	214	213	210	203	207	211	213		
125	192	186	186	190	192	192	190	184	188	193	195	195	192	186	190	194	196		
130	174	168	168	171	173	172	171	166	170	173	176	176	173	167	172	176	177		
135	155	150	149	151	153	152	151	147	150	153	155	155	152	149	152	156	157		
140	136	131	129	132	133	132	130	127	130	133	134	135	133	130	133	137	139		
145	115	111	109	110	111	110	109	106	108	111	112	112	111	109	112	115	117		
150	93.7	90.3	88.0	88.7	88.8	88.0	86.9	84.9	86.4	88.5	89.8	89.9	89.2	88.3	91.2	93.7	95.3		
155	72.2	69.7	67.3	67.3	67.2	66.3	65.2	64.1	64.9	66.3	67.4	67.8	67.5	67.5	69.8	72.0	73.6		
160	49.7	49.4	47.7	46.8	46.2	45.4	44.6	43.8	44.1	44.9	45.8	46.2	46.7	47.1	48.9	50.4	50.4		
165	25.8	26.7	27.6	26.6	25.9	25.4	25.1	25.0	25.1	25.3	25.8	26.0	26.8	27.7	28.7	29.0	29.2		
170	4.75	4.62	5.76	6.19	6.54	6.93	7.22	7.45	7.75	7.69	7.96	8.58	9.00	8.65	9.17	10.5	11.0		
175	0.20	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.20	0.20	0.20	0.19	0.19	0.18	0.19	0.19	0.21		
180	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16		

Table 7: Luminous Intensity Data

TEST RESULTS (3500K Setting)

Test ambient temperature was 26.0 ℃.

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)	0.140	0.064
Power Factor	0.9716	0.9108
Test Power (W)	16.28	16.11
THD A%	19.58	17.91
Luminous Efficacy (lm/W)	151.1	151.7
Total Luminous Flux (lm)	2460.3	2444.5
Color Rendering Index (CRI)	84.6	
R9	15	
Correlated Color Temperature (CCT)(K)	3385	
Chromaticity Chroma x	0.4090	
Chromaticity Chroma y	0.3868	
Chromaticity Chroma u	0.2397	
Chromaticity Chroma v	0.3401	
Duv	-0.0025	
Chromaticity Chroma u ’	0.2397	
Chromaticity Chroma v’	0.5102	

Special Color Rendering Indices	
R1	84.1
R2	93.9
R3	94.7
R4	82.1
R5	84.5
R6	91.5
R7	83.1
R8	62.8
R9	15
R10	85.5
R11	81.8
R12	72.8
R13	86.9
R14	97.9

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

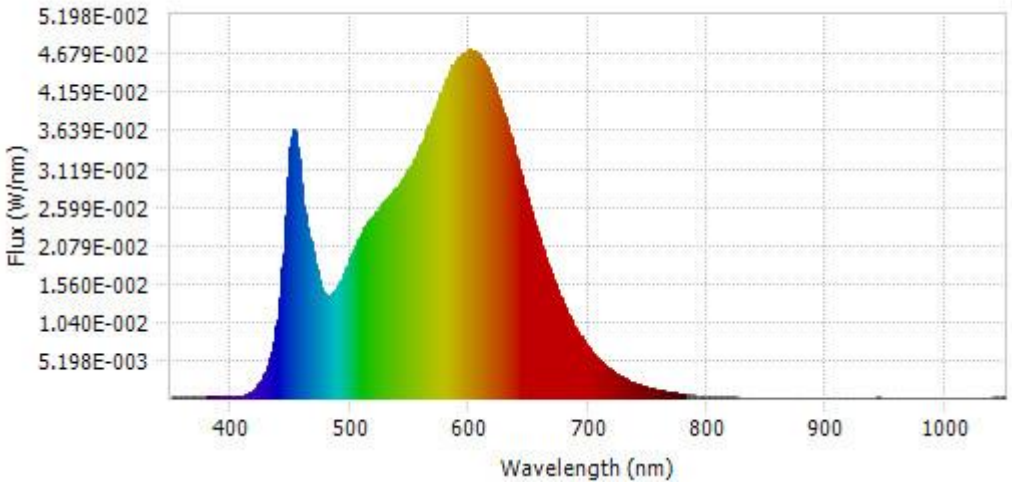
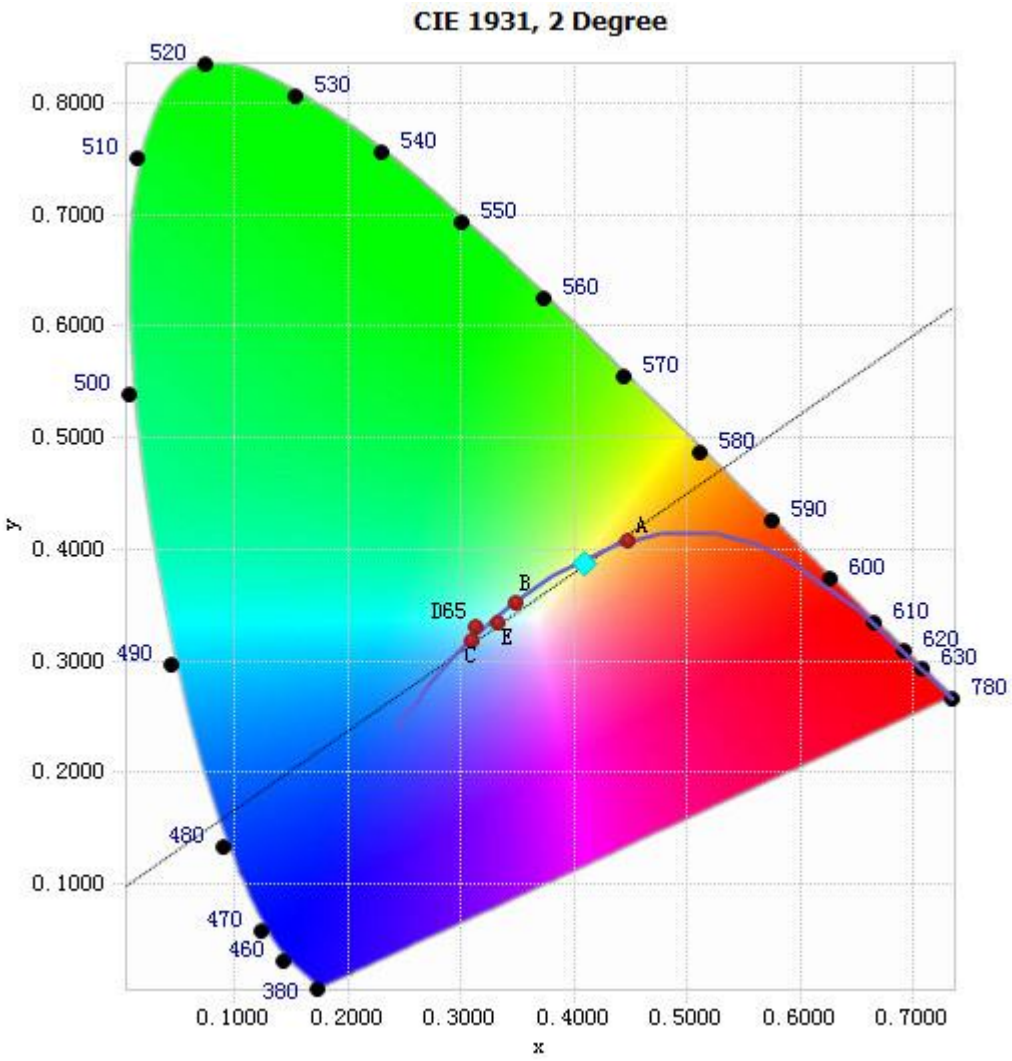


Chart 8: Spectral Power Distribution

Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	2.27E-04	485	1.43E-02	590	4.61E-02	695	8.13E-03
385	1.63E-04	490	1.53E-02	595	4.69E-02	700	6.92E-03
390	2.01E-04	495	1.69E-02	600	4.73E-02	705	5.92E-03
395	1.80E-04	500	1.90E-02	605	4.69E-02	710	5.10E-03
400	1.58E-04	505	2.08E-02	610	4.61E-02	715	4.34E-03
405	2.19E-04	510	2.23E-02	615	4.48E-02	720	3.75E-03
410	3.21E-04	515	2.39E-02	620	4.28E-02	725	3.21E-03
415	6.70E-04	520	2.47E-02	625	4.05E-02	730	2.73E-03
420	1.22E-03	525	2.59E-02	630	3.80E-02	735	2.34E-03
425	2.33E-03	530	2.69E-02	635	3.54E-02	740	2.00E-03
430	4.02E-03	535	2.77E-02	640	3.25E-02	745	1.70E-03
435	6.92E-03	540	2.87E-02	645	2.95E-02	750	1.47E-03
440	1.22E-02	545	2.99E-02	650	2.66E-02	755	1.26E-03
445	2.22E-02	550	3.12E-02	655	2.38E-02	760	1.08E-03
450	3.39E-02	555	3.27E-02	660	2.12E-02	765	9.26E-04
455	3.53E-02	560	3.45E-02	665	1.87E-02	770	7.85E-04
460	2.76E-02	565	3.64E-02	670	1.64E-02	775	6.71E-04
465	2.24E-02	570	3.86E-02	675	1.44E-02	780	5.83E-04
470	1.90E-02	575	4.07E-02	680	1.25E-02		
475	1.54E-02	580	4.28E-02	685	1.09E-02		
480	1.39E-02	585	4.48E-02	690	9.39E-03		

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

Chromaticity Diagram - Sphere Spectroradiometer Method



Tristimulus values(x, y): (0.4090, 0.3868)

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

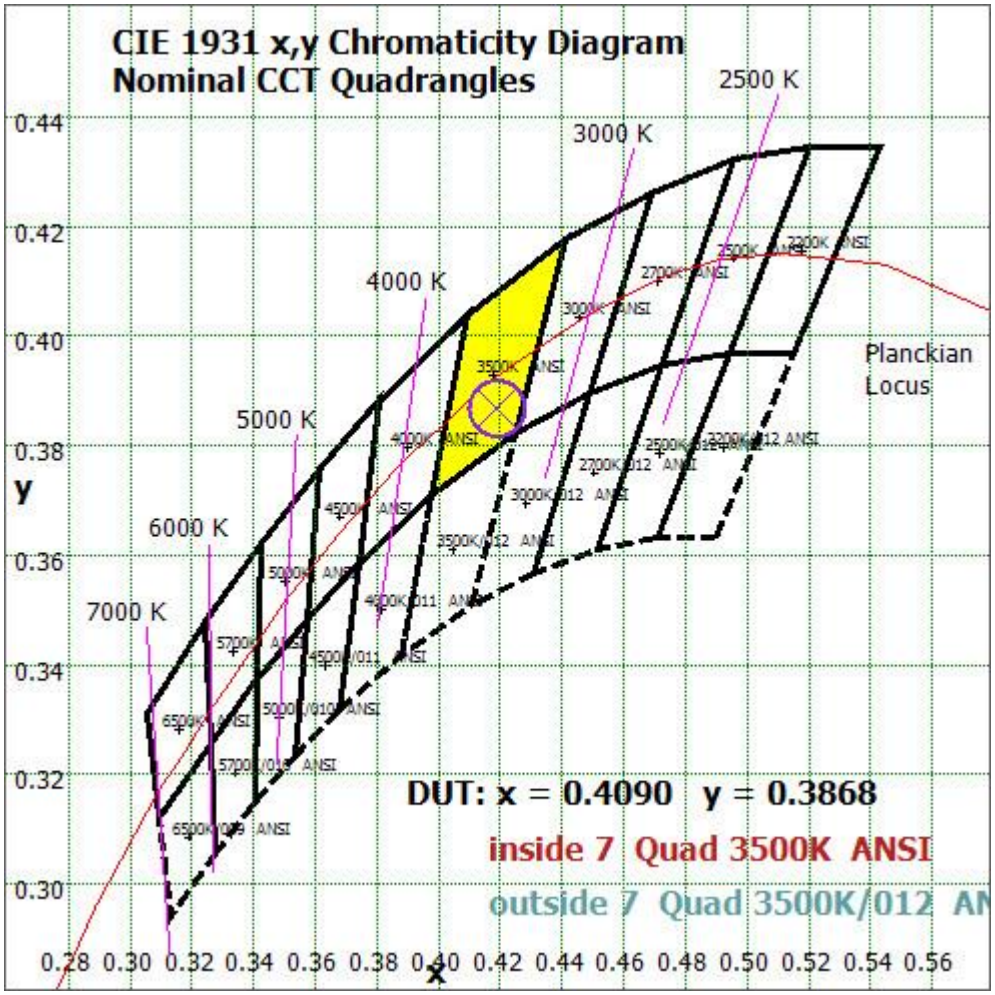


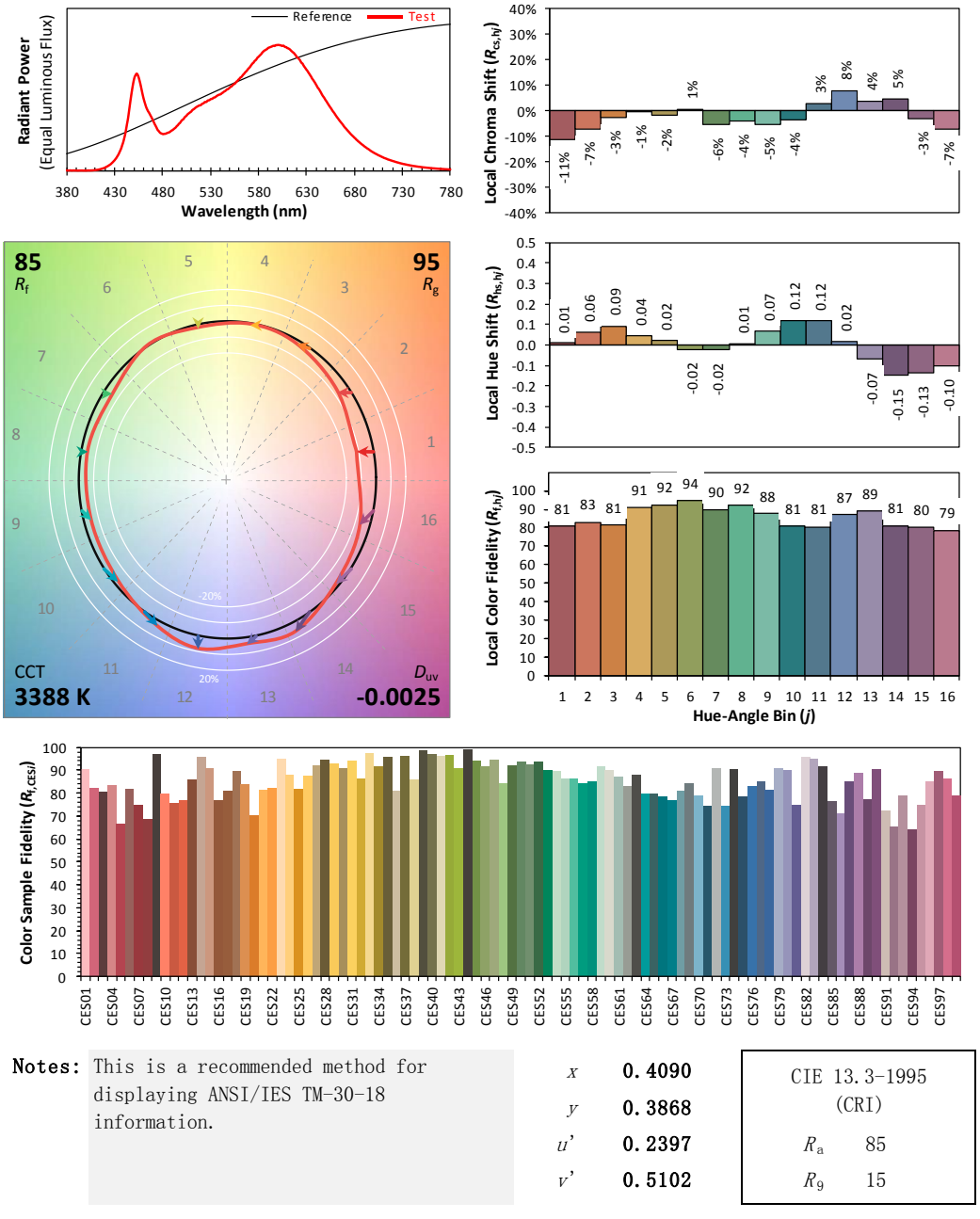
Chart 10: Plot of Lamp x/y coordinates on CIE 1931 Chromaticity Diagram

Color Rendition Report – Sphere Spectroradiometer Method

ANSI/IES TM-30-18 Color Rendition Report

Source: LED **Manufacturer:** GREEN CREATIVE LTD

Date: 2024/12/09 **Model:** 17PLO/8CCTS/BYP



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

x	0.4090
y	0.3868
u'	0.2397
v'	0.5102

CIE 13.3-1995 (CRI)	
R_a	85
R_9	15

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 ℃.

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)	0.139	0.064
Power Factor	0.9717	0.9097
Test Power (W)	16.22	16.05
THD A%	19.29	17.93
Luminous Efficacy (lm/W)	154.9	155.4
Total Luminous Flux (lm)	2511.7	2494.9
Color Rendering Index (CRI)	85.7	
R9	19.6	
Correlated Color Temperature (CCT)(K)	3786	
Chromaticity Chroma x	0.3880	
Chromaticity Chroma y	0.3756	
Chromaticity Chroma u	0.2306	
Chromaticity Chroma v	0.3348	
Duv	-0.0027	
Chromaticity Chroma u ’	0.2306	
Chromaticity Chroma v’	0.5022	

Special Color Rendering Indices	
R1	85
R2	93.2
R3	96
R4	84.1
R5	85.4
R6	90
R7	85.4
R8	66.7
R9	19.6
R10	83.4
R11	83.9
R12	70.6
R13	87.4
R14	98.6

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

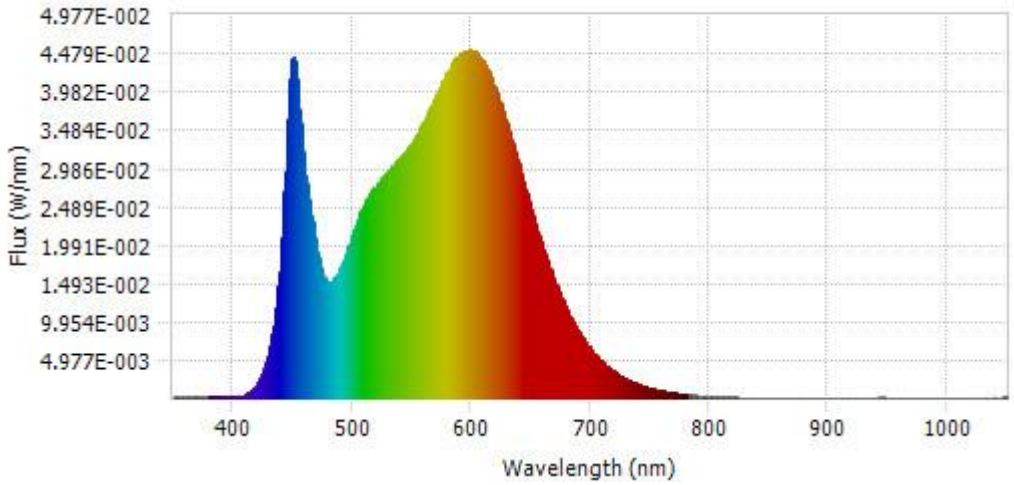
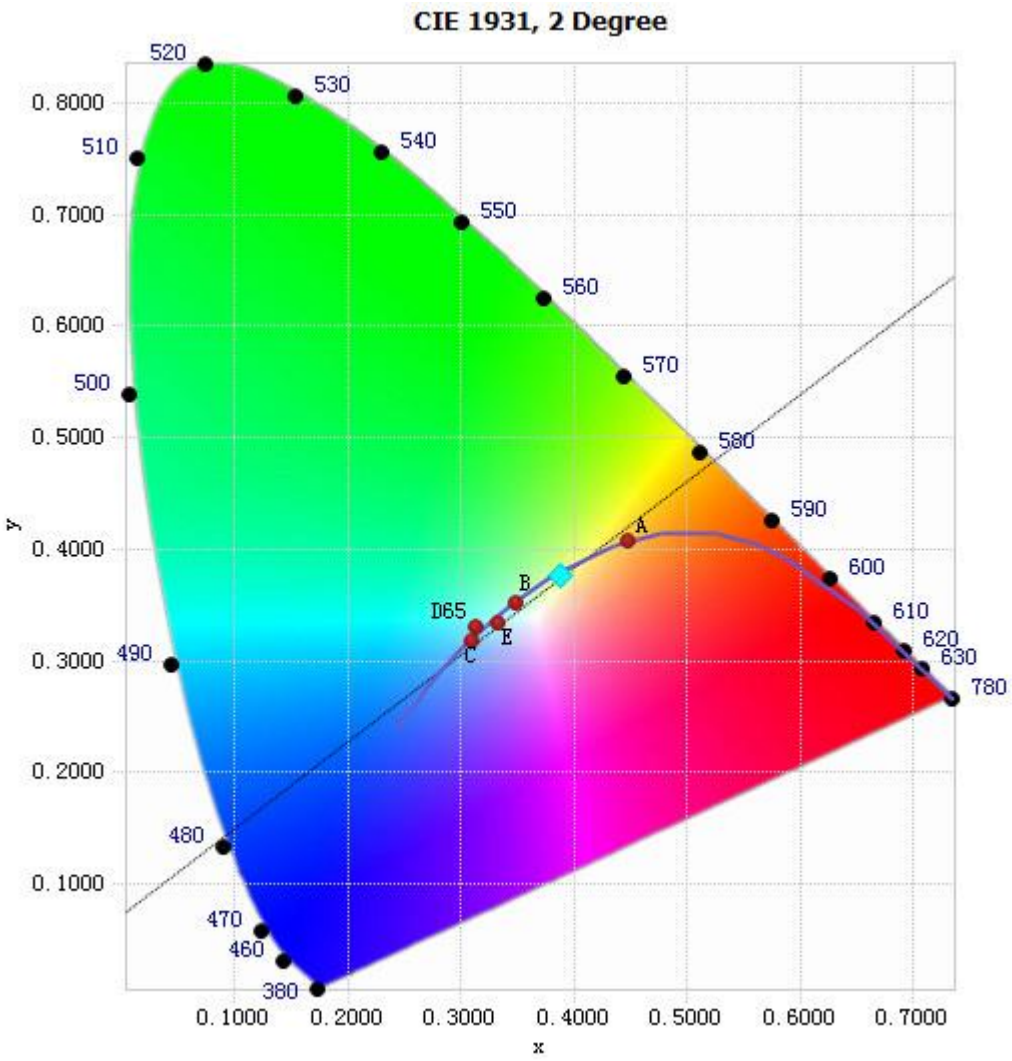


Chart 12: Spectral Power Distribution

Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	2.19E-04	485	1.56E-02	590	4.47E-02	695	7.56E-03
385	2.19E-04	490	1.69E-02	595	4.52E-02	700	6.49E-03
390	1.91E-04	495	1.89E-02	600	4.52E-02	705	5.56E-03
395	1.93E-04	500	2.12E-02	605	4.47E-02	710	4.77E-03
400	1.87E-04	505	2.32E-02	610	4.38E-02	715	4.07E-03
405	2.34E-04	510	2.50E-02	615	4.25E-02	720	3.51E-03
410	4.46E-04	515	2.66E-02	620	4.05E-02	725	3.00E-03
415	9.55E-04	520	2.74E-02	625	3.82E-02	730	2.55E-03
420	1.90E-03	525	2.86E-02	630	3.57E-02	735	2.20E-03
425	3.48E-03	530	2.95E-02	635	3.31E-02	740	1.87E-03
430	6.06E-03	535	3.02E-02	640	3.04E-02	745	1.59E-03
435	1.05E-02	540	3.12E-02	645	2.76E-02	750	1.37E-03
440	1.85E-02	545	3.22E-02	650	2.48E-02	755	1.17E-03
445	3.30E-02	550	3.31E-02	655	2.22E-02	760	1.01E-03
450	4.41E-02	555	3.45E-02	660	1.98E-02	765	8.62E-04
455	3.96E-02	560	3.59E-02	665	1.75E-02	770	7.40E-04
460	3.05E-02	565	3.74E-02	670	1.53E-02	775	6.38E-04
465	2.47E-02	570	3.91E-02	675	1.34E-02	780	5.48E-04
470	2.00E-02	575	4.07E-02	680	1.16E-02		
475	1.62E-02	580	4.24E-02	685	1.01E-02		
480	1.50E-02	585	4.38E-02	690	8.78E-03		

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

Chromaticity Diagram - Sphere Spectroradiometer Method



Tristimulus values(x, y): (0.3880, 0.3756)

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

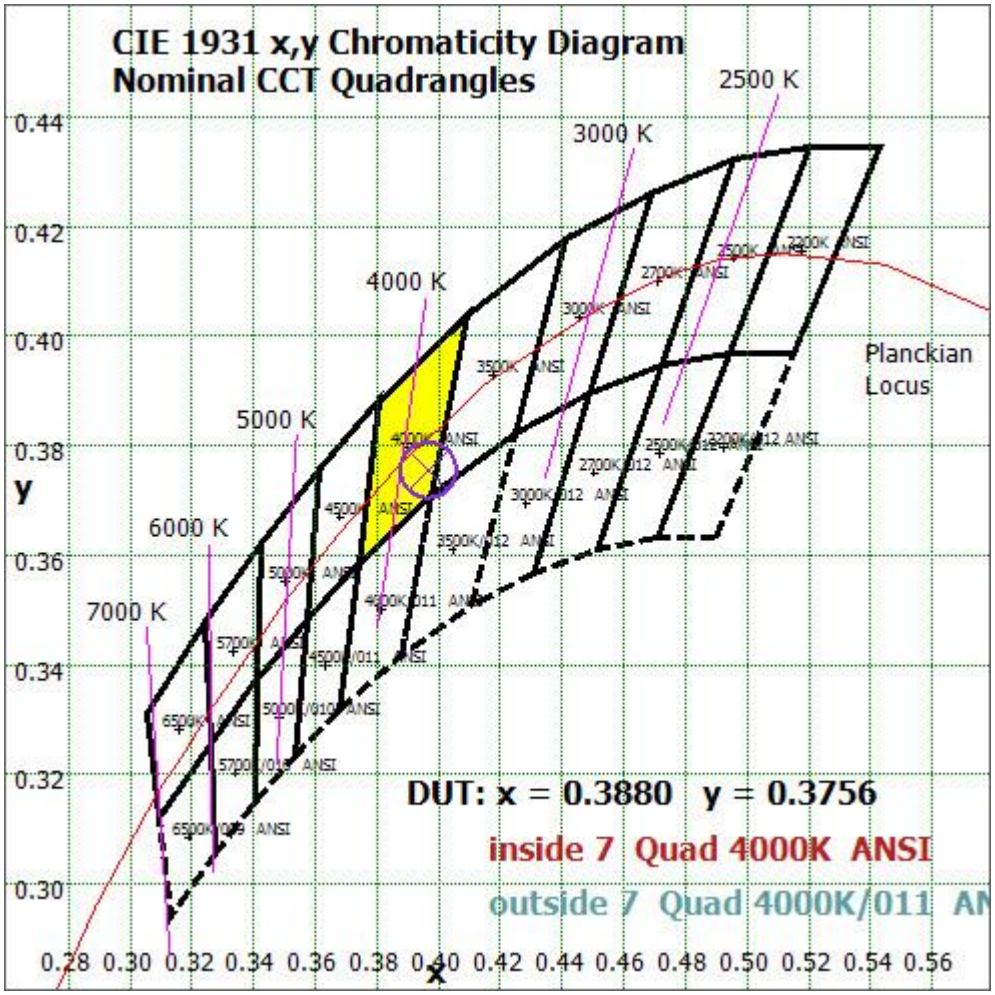


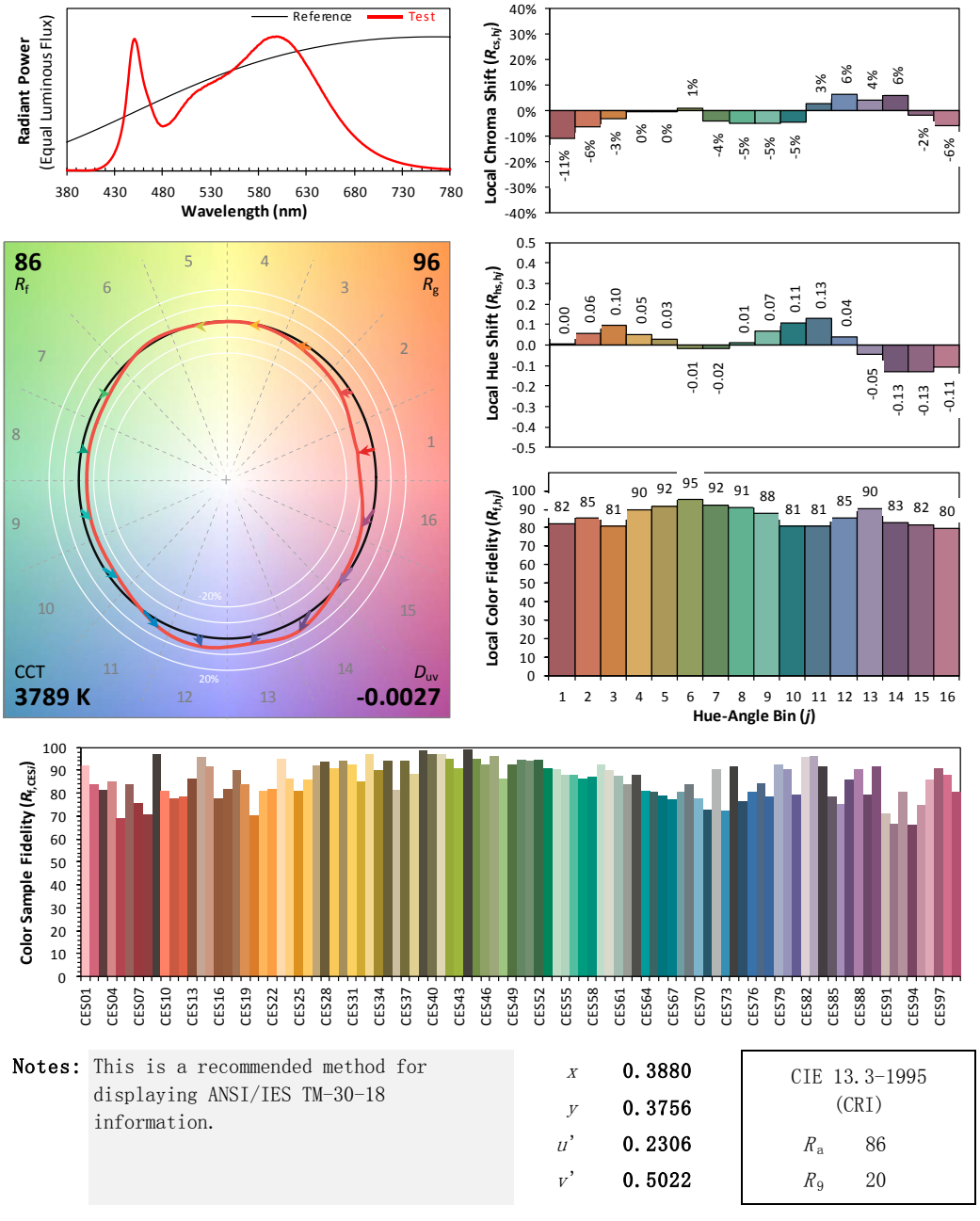
Chart14: Plot of Lamp x/y coordinates on CIE 1931 Chromaticity Diagram

Color Rendition Report – Sphere Spectroradiometer Method

ANSI/IES TM-30-18 Color Rendition Report

Source: LED **Manufacturer:** GREEN CREATIVE LTD

Date: 2024/12/09 **Model:** 17PLO/8CCTS/BYP



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.	x	0.3880	CIE 13.3-1995 (CRI)
	y	0.3756	R_a 86
	u'	0.2306	R_9 20
	v'	0.5022	

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 ℃.

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)	0.142	0.065
Power Factor	0.9711	0.9134
Test Power (W)	16.60	16.41
THD A%	19.98	17.76
Luminous Efficacy (lm/W)	153.5	154.5
Total Luminous Flux (lm)	2548.5	2535.2
Color Rendering Index (CRI)	84.6	
R9	16.7	
Correlated Color Temperature (CCT)(K)	4986	
Chromaticity Chroma x	0.3456	
Chromaticity Chroma y	0.3535	
Chromaticity Chroma u	0.2110	
Chromaticity Chroma v	0.3238	
Duv	0.0008	
Chromaticity Chroma u ’	0.2110	
Chromaticity Chroma v’	0.4857	

Special Color Rendering Indices	
R1	83
R2	89
R3	93
R4	84.5
R5	83.4
R6	84.2
R7	88.5
R8	70.6
R9	16.7
R10	73.7
R11	83.9
R12	62.2
R13	84.6
R14	96.3

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

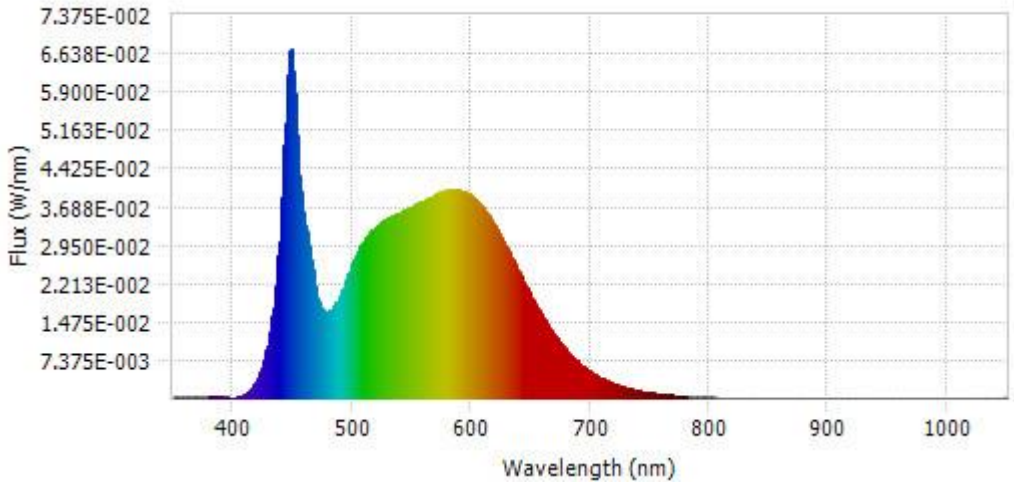
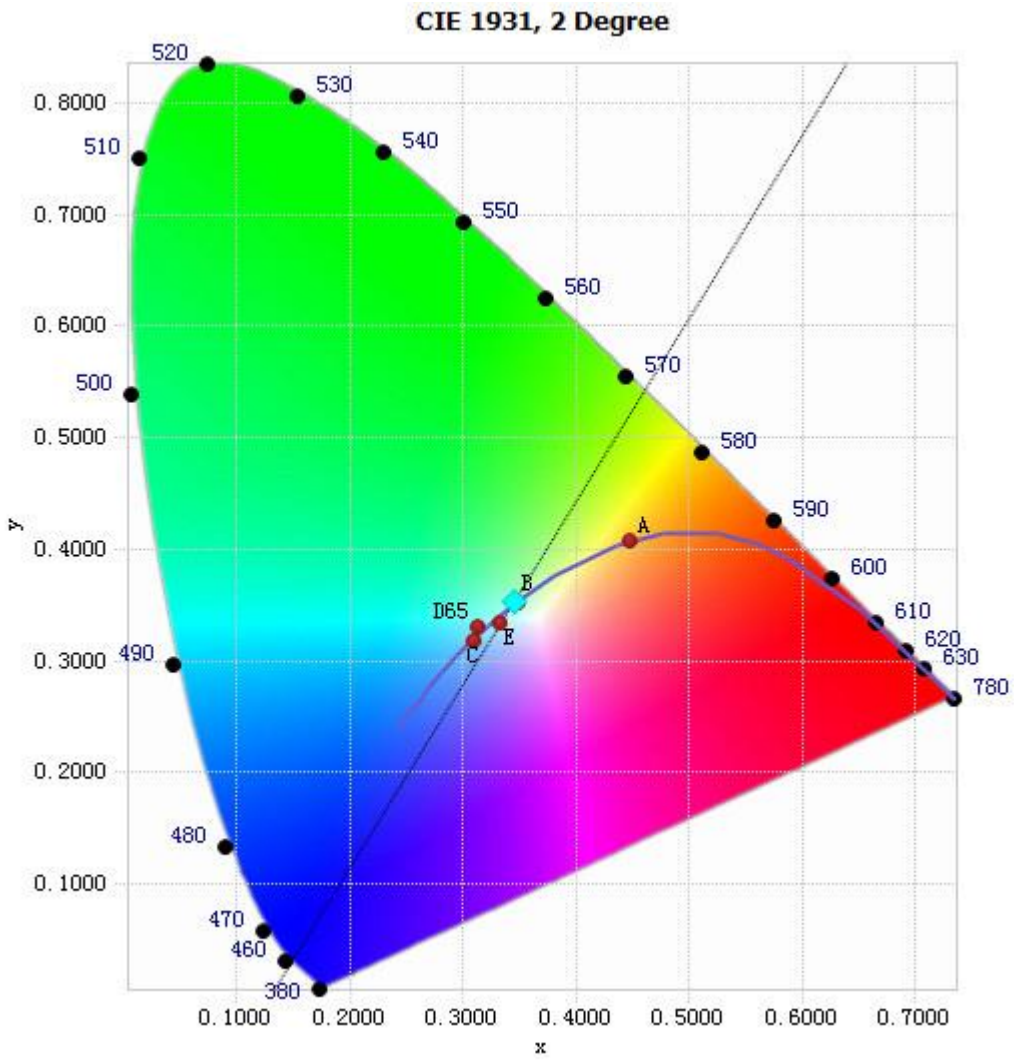


Chart16: Spectral Power Distribution

Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	3.14E-04	485	1.77E-02	590	4.01E-02	695	6.04E-03
385	2.68E-04	490	1.98E-02	595	3.97E-02	700	5.15E-03
390	2.37E-04	495	2.28E-02	600	3.90E-02	705	4.44E-03
395	2.32E-04	500	2.58E-02	605	3.79E-02	710	3.80E-03
400	1.83E-04	505	2.83E-02	610	3.66E-02	715	3.27E-03
405	3.12E-04	510	3.02E-02	615	3.51E-02	720	2.82E-03
410	7.96E-04	515	3.20E-02	620	3.31E-02	725	2.41E-03
415	1.75E-03	520	3.29E-02	625	3.11E-02	730	2.05E-03
420	3.49E-03	525	3.39E-02	630	2.89E-02	735	1.77E-03
425	6.55E-03	530	3.46E-02	635	2.67E-02	740	1.51E-03
430	1.14E-02	535	3.51E-02	640	2.44E-02	745	1.29E-03
435	1.94E-02	540	3.57E-02	645	2.21E-02	750	1.12E-03
440	3.43E-02	545	3.64E-02	650	1.99E-02	755	9.51E-04
445	5.81E-02	550	3.68E-02	655	1.78E-02	760	8.13E-04
450	6.56E-02	555	3.75E-02	660	1.58E-02	765	7.12E-04
455	4.64E-02	560	3.80E-02	665	1.39E-02	770	6.05E-04
460	3.44E-02	565	3.86E-02	670	1.22E-02	775	5.21E-04
465	2.80E-02	570	3.92E-02	675	1.07E-02	780	4.50E-04
470	2.04E-02	575	3.97E-02	680	9.31E-03		
475	1.69E-02	580	4.00E-02	685	8.06E-03		
480	1.68E-02	585	4.03E-02	690	7.00E-03		

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

Chromaticity Diagram - Sphere Spectroradiometer Method



Tristimulus values(x, y): (0.3456, 0.3535)

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

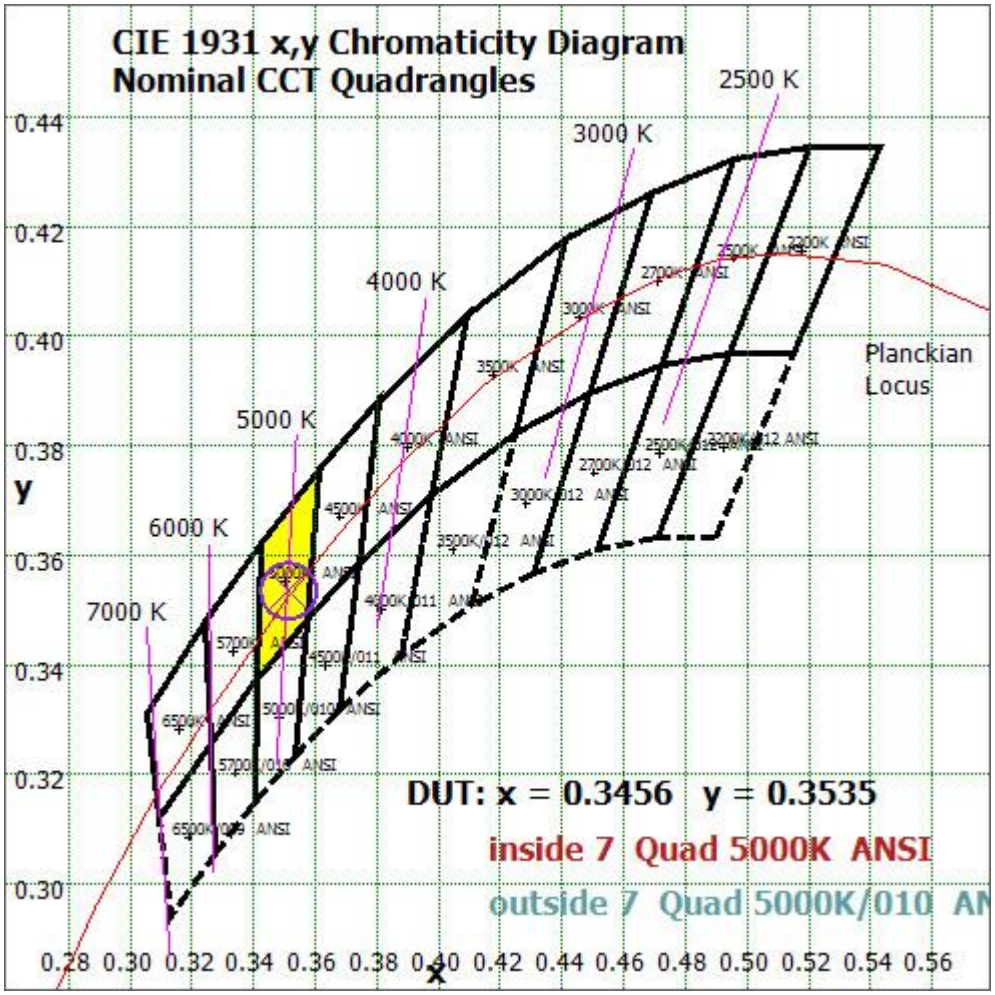


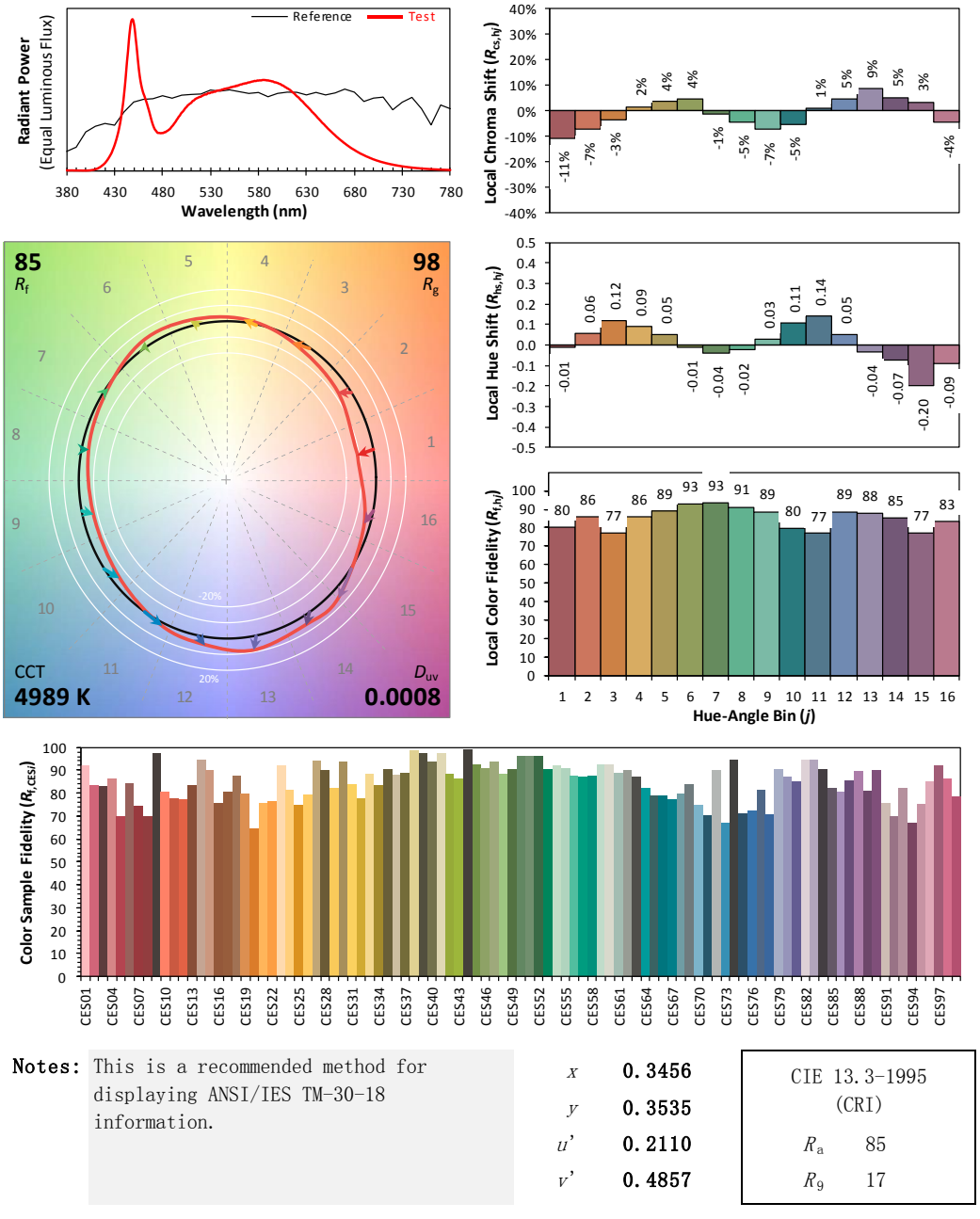
Chart 18: Plot of Lamp x/y coordinates on CIE 1931 Chromaticity Diagram

Color Rendition Report – Sphere Spectroradiometer Method

ANSI/IES TM-30-18 Color Rendition Report

Source: LED **Manufacturer:** GREEN CREATIVE LTD

Date: 2024/12/09 **Model:** 17PLO/8CCTS/BYP



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.	x	0.3456
	y	0.3535
	u'	0.2110
	v'	0.4857

CIE 13.3-1995 (CRI)

R_a	85
R_9	17

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	Jun. 18, 2024	-
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	Jun. 18, 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 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 expended uncertainty is 2.1% with a

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

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 expended 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 ***