

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: 15T5HO/3F/8CCTS/UEB/C

Laboratory: Leading 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.: HZ25040003d

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

Review by:

Wei Fei

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	15T5HO/3F/8CC TS/UEB/C 3000K Setting	15T5HO/3F/8CC TS/UEB/C 3500K Setting	15T5HO/3F/8CC TS/UEB/C 4000K Setting	15T5HO/3F/8CCTS /UEB/C 5000K Setting
Luminous Efficacy (Lumens /Watt)	133.7	145.5	148.0	140.7
Total Luminous Flux (Lumens)	2003.0	2133.1	2161.0	2112.0
Power (Watts)	14.98	14.66	14.60	15.01
Power Factor	0.9696	0.9717	0.9722	0.9694
CCT (K)	3047	3526	4059	4958
CRI	82.1	84.3	85.0	84.1
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

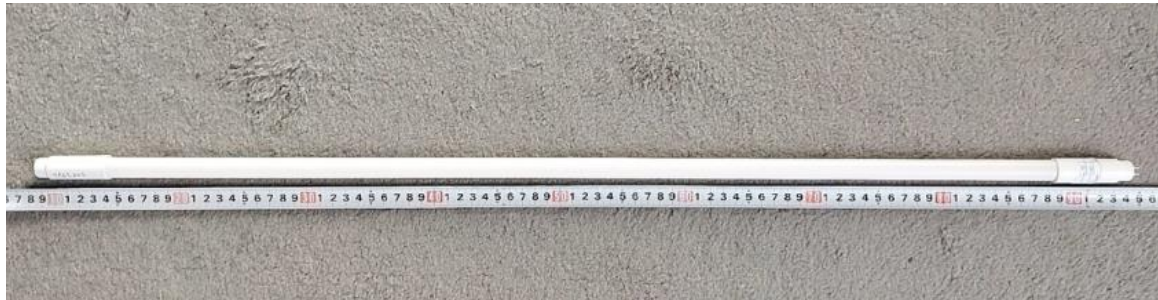


Figure 1- Overview of the sample

Equipment Under Test(EUT)

Name	: LED Tube
Model	: 15T5HO/3F/8CCTS/UEB/C
Electrical Ratings	: 120-277V, 50/60Hz, 15W
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 °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)	0.129	0.057
Power Factor	0.9696	0.9512
Test Power (W)	14.98	14.96
THD A%	19.82	17.27
Luminous Efficacy (lm/W)	133.7	136.3
Total Luminous Flux (lm)	2003.0	2038.3
Color Rendering Index (CRI)	82.1	
R9	6.3	
Correlated Color Temperature (CCT)(K)	3047	
Chromaticity Chroma x	0.4323	
Chromaticity Chroma y	0.4005	
Chromaticity Chroma u	0.2491	
Chromaticity Chroma v	0.3462	
Duv	-0.0008	
Chromaticity Chroma u'	0.2491	
Chromaticity Chroma v'	0.5193	

Special Color Rendering Indices	
R1	80.3
R2	90.1
R3	96.4
R4	80.2
R5	80.6
R6	87.7
R7	82.8
R8	59
R9	6.3
R10	77.6
R11	79.4
R12	70.3
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

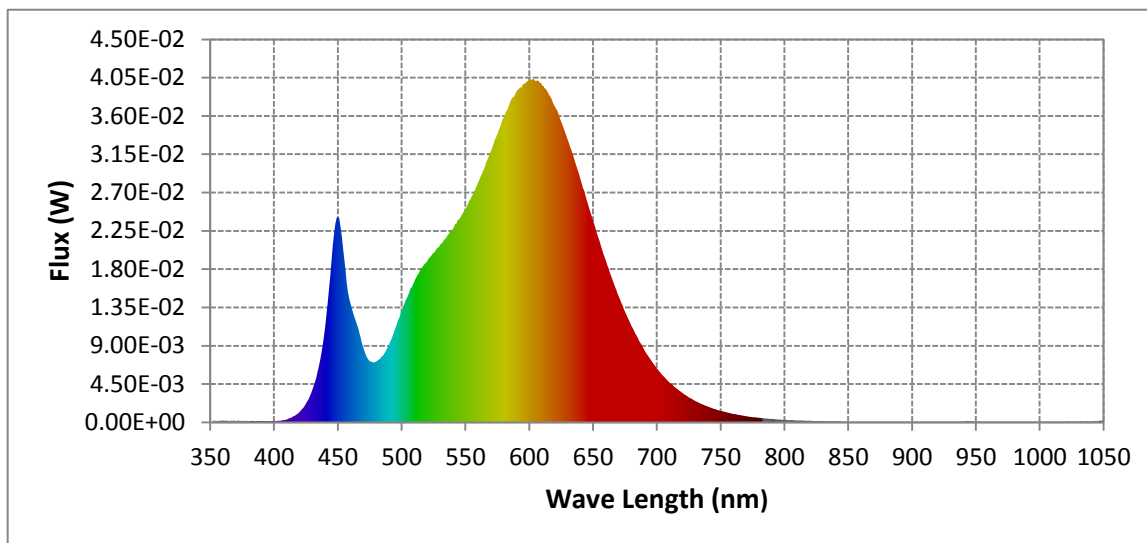
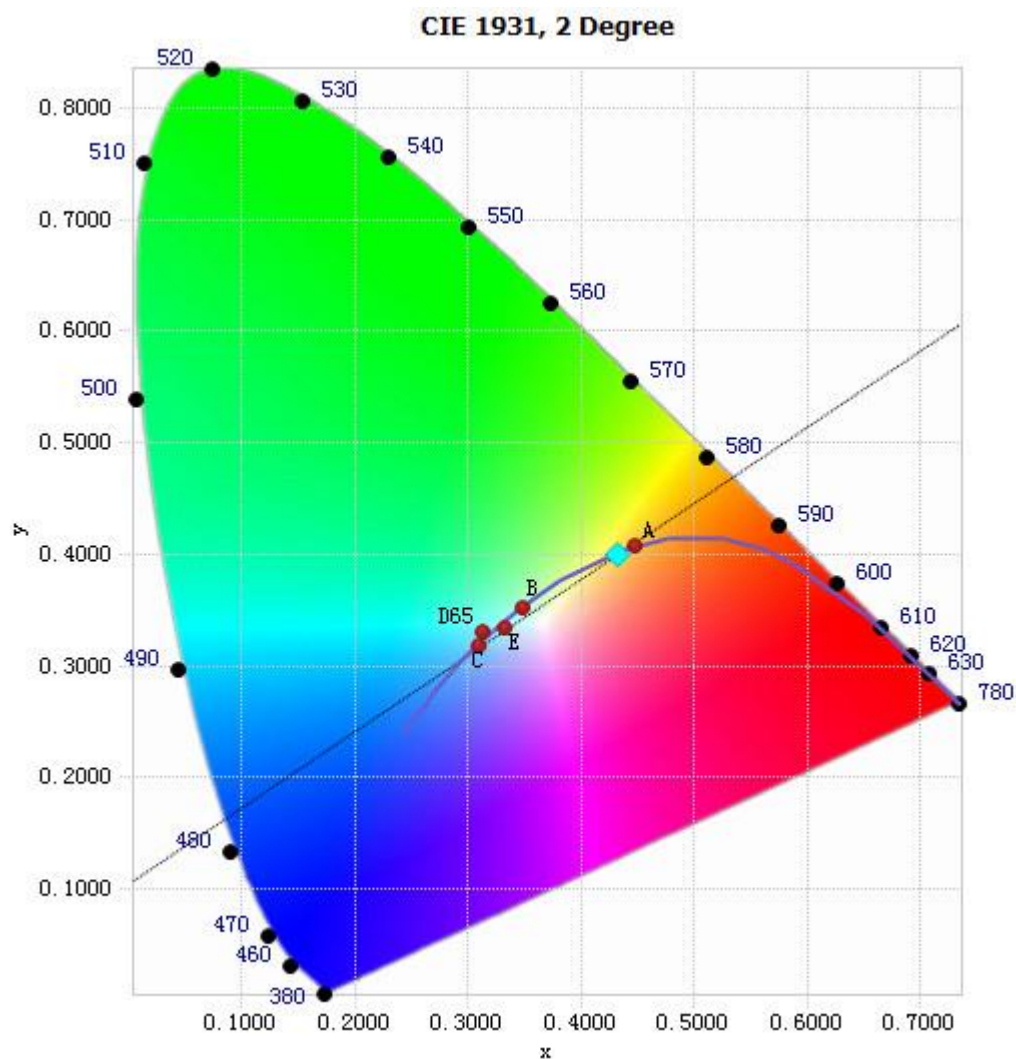


Chart 1: Spectral Power Distribution

Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	1.51E-04	485	7.79E-03	590	3.89E-02	695	7.39E-03
385	1.26E-04	490	9.08E-03	595	3.98E-02	700	6.37E-03
390	1.41E-04	495	1.10E-02	600	4.03E-02	705	5.47E-03
395	1.31E-04	500	1.31E-02	605	4.01E-02	710	4.68E-03
400	1.36E-04	505	1.49E-02	610	3.96E-02	715	4.03E-03
405	1.78E-04	510	1.66E-02	615	3.86E-02	720	3.44E-03
410	3.42E-04	515	1.80E-02	620	3.71E-02	725	2.95E-03
415	7.03E-04	520	1.89E-02	625	3.53E-02	730	2.52E-03
420	1.22E-03	525	1.99E-02	630	3.33E-02	735	2.14E-03
425	2.21E-03	530	2.09E-02	635	3.10E-02	740	1.85E-03
430	3.83E-03	535	2.17E-02	640	2.86E-02	745	1.58E-03
435	6.54E-03	540	2.27E-02	645	2.61E-02	750	1.34E-03
440	1.12E-02	545	2.39E-02	650	2.36E-02	755	1.15E-03
445	1.91E-02	550	2.50E-02	655	2.13E-02	760	9.78E-04
450	2.42E-02	555	2.65E-02	660	1.90E-02	765	8.48E-04
455	1.91E-02	560	2.82E-02	665	1.68E-02	770	7.27E-04
460	1.40E-02	565	2.99E-02	670	1.48E-02	775	6.15E-04
465	1.15E-02	570	3.19E-02	675	1.30E-02	780	5.33E-04
470	8.82E-03	575	3.39E-02	680	1.13E-02		
475	7.17E-03	580	3.58E-02	685	9.87E-03		
480	7.14E-03	585	3.77E-02	690	8.57E-03		

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

Chromaticity Diagram - Sphere Spectroradiometer Method



Tristimulus values(x, y): (0.4323, 0.4005)

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

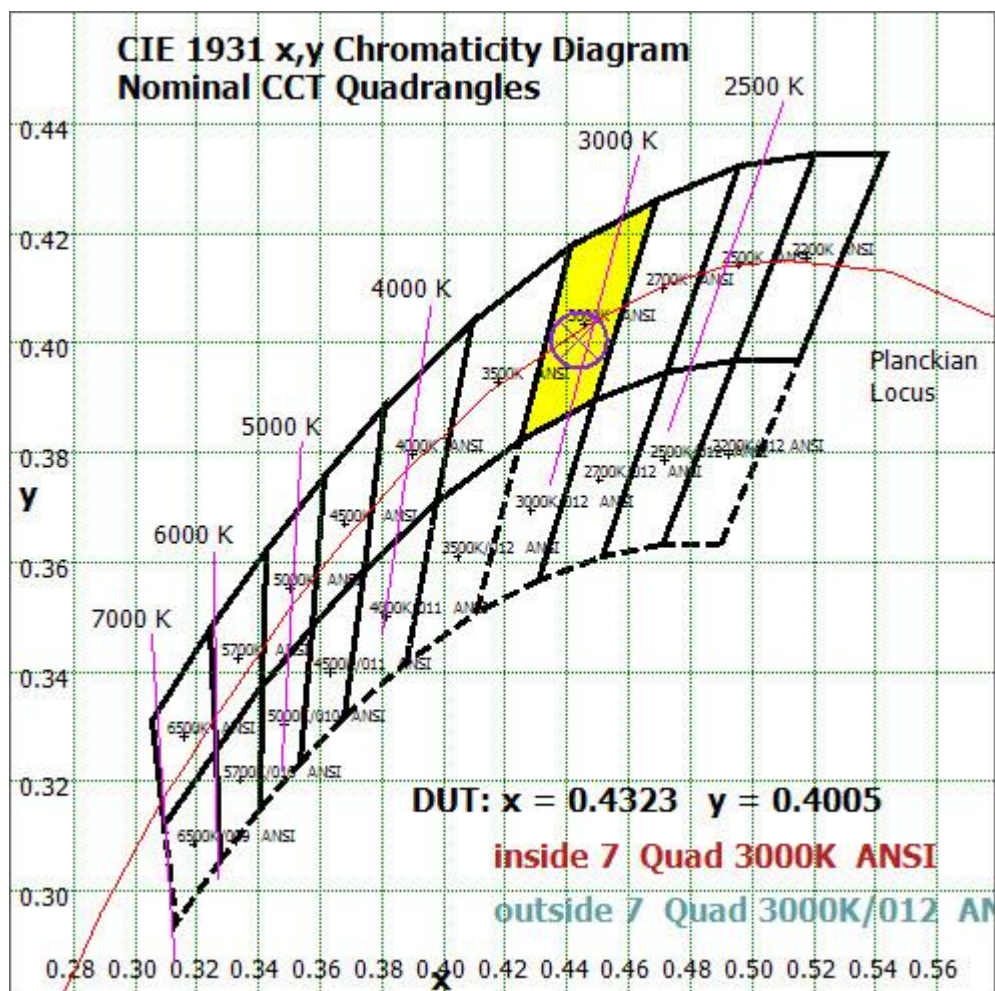


Chart 3: Plot of Lamp x/y coordinates on CIE 1931 Chromaticity Diagram

Color Rendition Report – Sphere Spectroradiometer Method

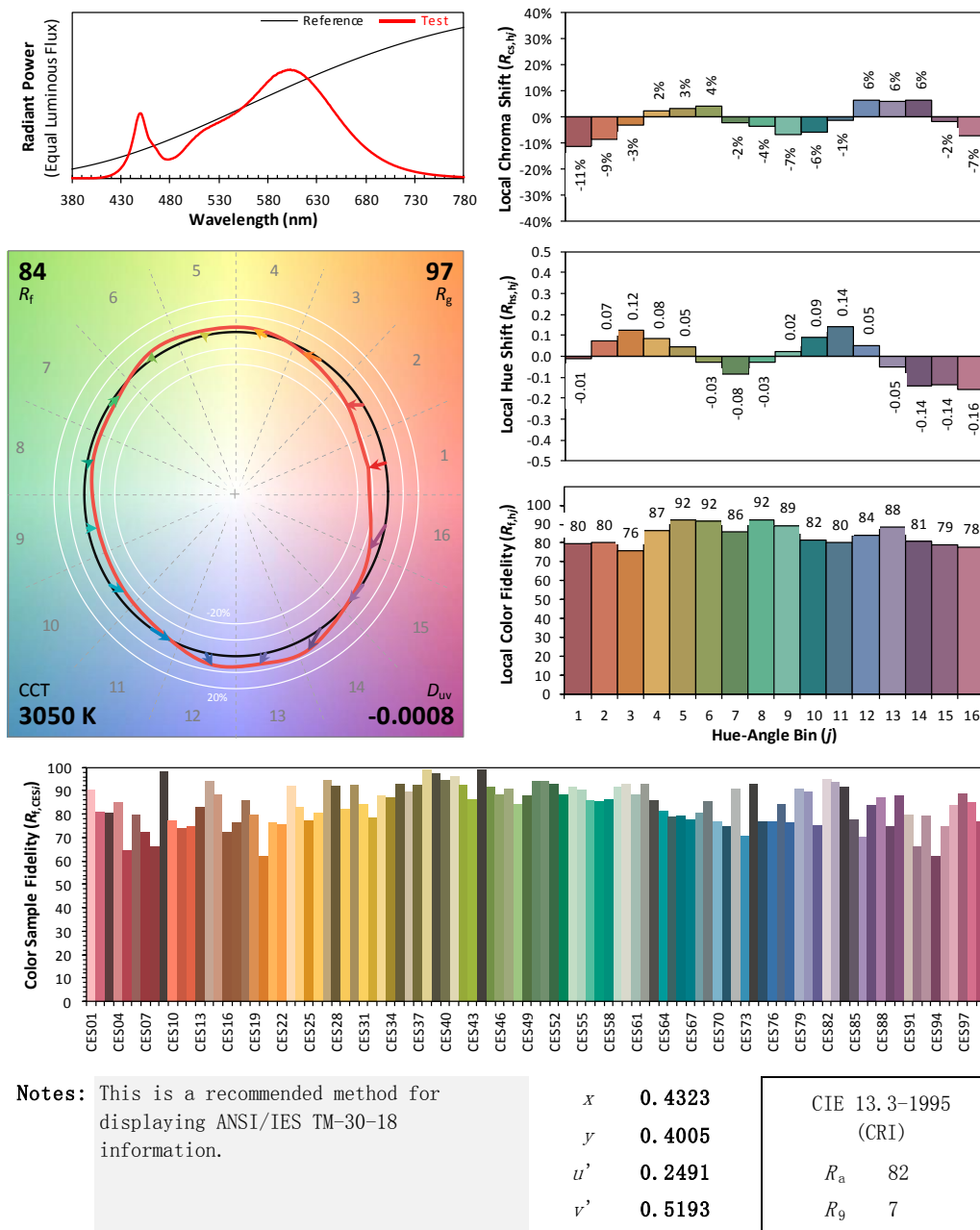
ANSI/IES TM-30-18 Color Rendition Report

Source: LED

Manufacturer: GREEN CREATIVE LTD

Date: 2025/04/07

Model: 15T5HO/3F/8CCTS/UEB/C



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)	0.129
Power Factor	0.9703
Power (W)	15.02
Luminous Efficacy (lm/W)	134.5
Total Luminous Flux (lm)	2020.1
Beam Angle (°)	111.7 (0°-180°) / 204.5 (90°-270°)
Center Beam Candle Power (cd)	368
Maximum Beam Candle Power (cd)	369.5 (At: C=90.0, Gamma=0.5)
Spacing Criteria	1.24 (0°-180°) / 1.45 (90°-270°)
Zonal Lumens in the 0 °-60 °Zone	46.73%
Zonal Lumens in the 60 °-90 °Zone	28.18%
Zonal Lumens in the 90 °-120 °Zone	16.47%
Zonal Lumens in the 120 °-180 °Zone	8.62%

Table 4: Test data per Goniophotometer Method

Zonal Lumen Tabulation- Goniophotometer Method

$\gamma(^{\circ})$	Lumens	% Total
0- 10	34.971	1.73%
10- 20	101.398	5.02%
20- 30	157.808	7.81%
30- 40	199.247	9.86%
40- 50	222.797	11.03%
50- 60	227.73	11.27%
60- 70	215.9	10.69%
70- 80	191.635	9.49%
80- 90	161.716	8.01%
90-100	133.917	6.63%
100-110	110.303	5.46%
110-120	88.528	4.38%
120-130	68.223	3.38%
130-140	49.04	2.43%
140-150	32.034	1.59%
150-160	18.111	0.90%
160-170	5.989	0.30%
170-180	0.772	0.04%
Total	2020.1	100%

$\gamma(^{\circ})$	Lumens	% Total
0- 60	943.951	46.73%
60- 90	569.251	28.18%
0-90	1513.202	74.91%
90- 180	506.917	25.09%
0- 180	2020.1	100%

Table 5: Zonal Lumen

Illuminance Plots- Goniophotometer Method

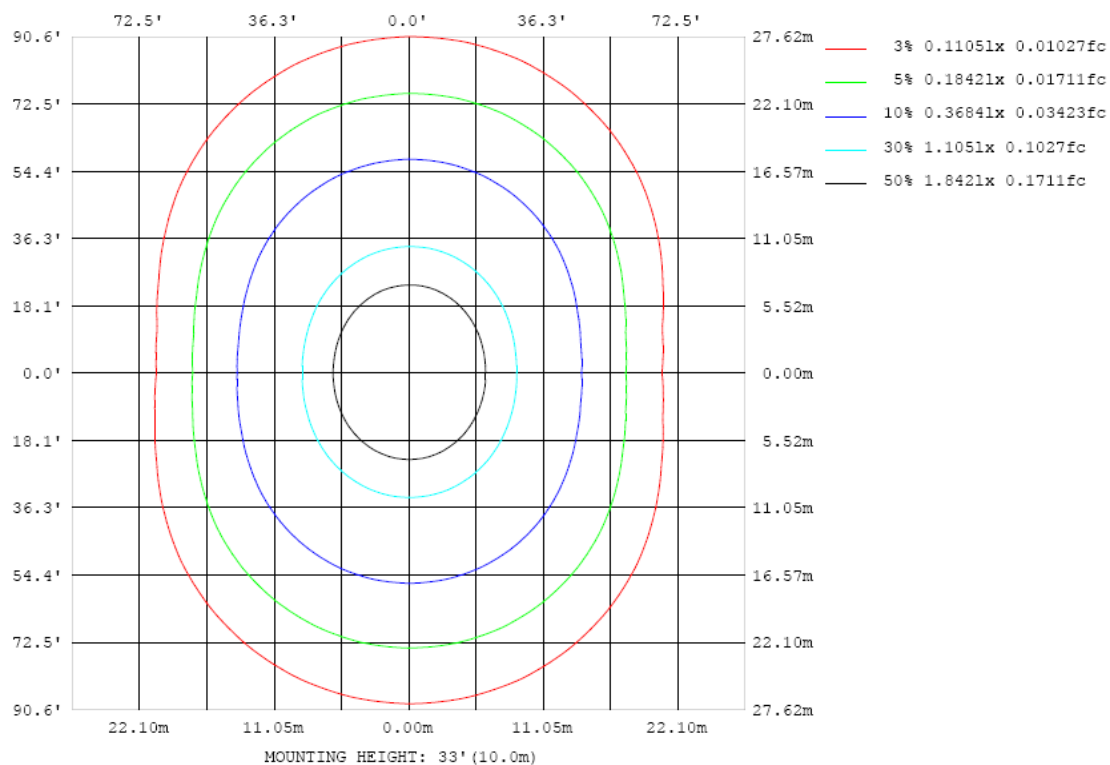


Chart 5: Illuminance Plot (Footcandles)

Luminous Intensity Distribution Plots- Goniophotometer Method

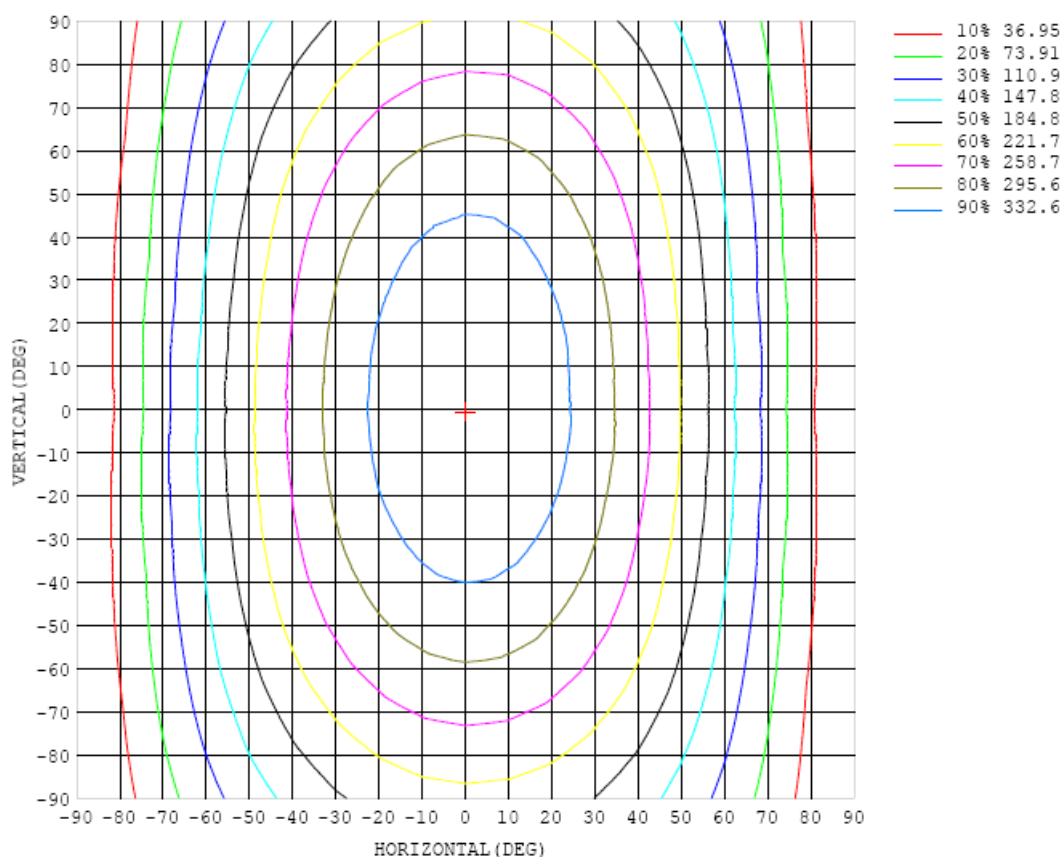


Chart 6: Isocandela Plot

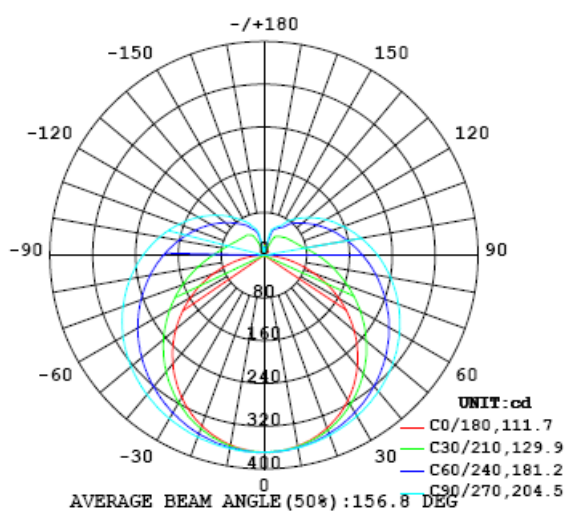


Chart 7: Polar Candela Distribution

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	368	368	368	368	368	368	368	368	368	368	368	368	368	368	368	368	368	368	368
5	367	367	367	367	367	368	368	367	367	367	367	367	367	367	366	365	366	366	366
10	363	363	364	364	364	366	366	366	366	366	366	365	364	364	362	361	360	360	361
15	355	356	356	357	359	360	361	362	362	362	362	361	359	358	357	354	352	351	351
20	344	345	346	349	351	354	355	357	359	359	357	356	353	350	348	344	341	340	340
25	330	332	334	337	341	345	348	351	353	353	353	349	345	341	336	332	328	325	325
30	314	315	318	323	329	335	340	345	347	347	346	342	336	331	324	317	312	308	307
35	294	296	300	307	315	323	330	336	340	341	338	334	327	319	310	301	294	289	287
40	271	274	280	289	300	311	320	328	332	333	330	325	316	306	295	283	274	267	265
45	247	250	258	270	284	298	309	318	323	324	321	315	304	292	279	265	252	244	241
50	220	224	235	250	267	283	296	307	313	314	311	304	292	278	262	245	230	219	215
55	192	197	210	229	249	268	284	296	302	304	300	292	279	263	245	225	206	193	187
60	162	168	185	208	232	252	270	283	290	292	289	279	265	248	227	204	182	166	159
65	132	140	160	186	213	237	256	270	278	280	276	266	251	232	209	184	158	139	130
70	100	111	137	166	196	221	241	257	265	267	263	253	237	217	192	164	136	112	100
75	69.7	83.5	114	147	179	206	227	243	251	254	250	239	223	201	175	146	115	86.0	71.1
80	41.3	58.3	93.4	130	163	190	213	229	238	240	236	225	208	186	159	129	94.7	61.8	44.0
85	17.2	37.7	76.5	114	148	176	198	215	224	226	222	211	194	171	145	112	76.7	41.2	19.5
90	2.66	22.7	62.2	100	135	163	185	201	210	212	208	197	181	158	131	97.1	60.3	23.8	2.65
95	1.53	14.7	50.2	88.3	122	150	171	187	196	199	194	184	167	146	118	84.2	48.8	16.0	1.23
100	1.92	13.3	43.1	77.7	111	138	159	174	182	185	181	171	155	134	106	74.7	42.6	13.9	2.47
105	2.19	13.3	39.8	70.0	100	127	146	160	169	171	167	157	143	123	96.8	67.8	38.6	13.3	3.98
110	3.12	13.8	38.0	64.6	91.6	116	135	148	156	158	154	146	132	112	88.5	61.9	36.1	13.8	5.05
115	4.02	14.9	37.0	60.4	84.3	106	124	137	144	146	143	134	121	103	81.0	57.3	34.9	13.7	4.10
120	6.07	16.7	36.4	56.9	77.9	97.2	113	125	132	133	130	122	110	94.1	74.5	53.6	34.9	9.88	0.00
125	8.90	16.6	36.1	54.0	72.2	89.1	103	114	119	121	118	111	100	86.1	69.0	50.7	34.2	13.6	0.00
130	11.0	0.65	32.9	51.5	67.0	81.6	94.0	103	108	110	107	101	91.3	78.9	64.1	47.7	34.4	12.1	0.00
135	10.1	4.22	33.1	48.2	60.3	74.6	85.4	93.0	97.5	98.8	96.4	91.0	82.8	72.7	55.7	42.0	31.5	11.8	0.00
140	8.78	10.8	34.5	46.2	54.5	66.0	77.0	83.7	87.3	88.2	86.4	81.8	75.4	62.0	49.9	43.9	18.3	0.52	4.12
145	12.3	2.70	12.7	42.9	52.9	59.1	65.4	71.9	77.2	78.7	76.7	71.0	60.9	55.0	49.2	42.0	21.0	4.77	9.63
150	14.4	4.58	7.71	38.6	50.3	55.0	59.6	62.8	63.9	63.7	63.0	61.1	58.0	52.6	47.6	30.1	7.47	9.39	8.80
155	17.2	15.6	6.13	5.01	46.2	51.8	55.0	57.5	58.6	59.0	58.3	56.0	52.7	49.6	42.9	23.3	4.21	6.13	9.96
160	14.5	14.5	6.62	11.0	4.33	39.7	50.5	52.5	53.3	53.4	52.7	51.1	49.6	44.6	21.9	4.92	12.6	4.68	11.7
165	12.2	18.5	13.3	4.26	6.01	9.24	17.2	22.4	36.1	39.8	39.0	34.8	19.1	2.31	10.6	15.4	5.36	11.3	12.3
170	9.40	16.5	16.7	9.90	4.84	3.67	3.57	4.64	4.91	5.60	5.42	5.84	8.70	10.9	2.41	4.85	7.77	10.4	10.6
175	18.1	17.1	17.5	16.3	14.3	16.5	12.9	7.81	3.91	3.88	5.35	6.22	5.70	8.66	14.4	14.4	13.3	14.6	14.6
180	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5

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	368	368	368	368	368	368	368	368	368	368	368	368	368	368	368	368	368		
5	366	367	367	367	367	368	368	368	369	369	369	369	368	368	369	369	368		
10	361	361	362	363	364	365	366	367	367	367	367	366	366	365	365	364	363		
15	352	353	355	358	359	361	364	365	365	365	365	363	362	361	359	357	355		
20	341	342	345	349	352	356	359	361	363	363	361	359	356	353	350	346	345		
25	326	329	333	339	344	349	354	356	358	358	356	352	348	344	339	334	331		
30	308	312	319	327	333	341	347	351	353	353	350	345	339	332	325	319	314		
35	289	294	302	313	322	331	340	345	348	347	343	336	329	320	310	301	295		
40	267	274	284	297	310	321	331	337	340	340	335	327	317	305	293	281	274		
45	244	252	265	281	296	310	322	330	333	332	327	317	304	290	274	260	250		
50	218	229	245	264	282	298	312	320	324	323	317	306	291	273	254	237	224		
55	191	205	224	246	267	286	301	310	314	314	306	293	277	257	234	212	197		
60	164	180	203	229	252	272	289	299	304	303	295	281	262	239	213	188	168		
65	136	155	182	211	236	259	276	287	292	290	282	267	247	222	192	163	139		
70	108	131	162	193	221	245	263	275	280	279	270	254	232	204	172	139	111		
75	80.9	109	142	176	206	230	250	262	268	266	256	240	217	188	153	116	83.1		
80	56.5	88.1	125	160	191	216	236	249	254	252	242	226	202	172	136	96.5	59.0		
85	36.6	71.2	109	145	176	202	222	235	240	238	229	211	187	157	120	80.1	39.3		
90	22.7	58.0	95.6	131	162	188	208	221	226	224	215	197	173	143	107	67.7	27.8		
95	17.2	49.3	84.9	119	149	174	194	206	212	210	201	184	160	131	95.6	58.7	23.1		
100	15.8	43.5	76.1	108	137	161	180	192	198	196	187	171	148	120	86.6	52.7	22.0		
105	16.1	40.2	69.1	98.8	126	149	167	178	183	182	173	158	136	110	79.4	49.0	22.0		
110	17.1	38.4	63.7	90.6	116	137	154	164	169	168	160	145	125	101	73.4	46.6	24.0		
115	17.9	37.8	59.3	83.3	106	126	141	151	156	154	147	133	115	93.2	69.0	44.8	26.1		
120	17.9	38.0	55.9	77.0	97.2	115	129	138	142	141	134	122	106	86.2	65.2	42.7	28.1		
125	18.2	38.6	53.6	71.5	88.9	105	117	125	129	128	122	111	96.9	79.7	61.6	43.3	30.1		
130	17.7	38.4	51.6	66.5	81.4	95.0	106	113	116	116	110	101	88.4	73.8	58.0	41.9	24.4		
135	16.6	38.0	50.1	62.2	74.6	86.0	95.6	102	105	104	99.3	91.3	80.9	68.7	55.5	42.6	16.6		
140	10.2	32.6	49.6	58.6	68.5	77.7	85.7	91.0	93.4	92.8	89.0	82.4	73.9	64.9	51.6	41.7	4.11		
145	0.75	19.7	46.3	54.1	63.6	70.4	76.8	81.0	82.9	82.7	79.7	74.5	67.7	59.1	48.9	39.9	7.64		
150	0.42	14.7	42.1	49.5	57.0	64.4	68.8	72.2	73.7	73.4	71.3	67.3	61.2	53.1	46.7	29.8	5.18		
155	1.08	7.26	29.7	46.1	51.0	55.3	60.0	63.6	65.2	64.9	62.5	58.3	54.1	49.8	41.9	19.2	12.0		
160	3.72	6.08	5.96	34.2	46.7	50.1	52.9	55.0	55.8	56.0	54.9	52.2	48.8	41.5	21.1	3.86	12.4		
165	3.50	1.47	2.65	5.62	22.5	34.7	43.8	46.7	47.0	47.3	46.8	40.2	28.1	13.3	4.48	3.88	4.79		
170	6.63	2.11	5.38	7.47	6.91	5.15	5.92	9.43	11.0	11.4	4.85	7.94	5.79	4.26	8.91	4.05	4.77		
175	11.7	5.32	3.76	4.73	4.21	2.72	2.24	4.14	8.51	7.46	7.06	5.21	2.32	3.44	5.81	5.15	6.08		
180	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5		

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)	0.126	0.056
Power Factor	0.9717	0.9497
Test Power (W)	14.66	14.67
THD A%	19.16	17.42
Luminous Efficacy (lm/W)	145.5	147.6
Total Luminous Flux (lm)	2133.1	2165.1
Color Rendering Index (CRI)	84.3	
R9	15.1	
Correlated Color Temperature (CCT)(K)	3526	
Chromaticity Chroma x	0.4014	
Chromaticity Chroma y	0.3838	
Chromaticity Chroma u	0.2361	
Chromaticity Chroma v	0.3385	
Duv	-0.0022	
Chromaticity Chroma u'	0.2361	
Chromaticity Chroma v'	0.5077	

Special Color Rendering Indices	
R1	83.2
R2	91.9
R3	96
R4	82.2
R5	83.3
R6	88.7
R7	84.6
R8	64.2
R9	15.1
R10	80.7
R11	81.5
R12	67.6
R13	85.6
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

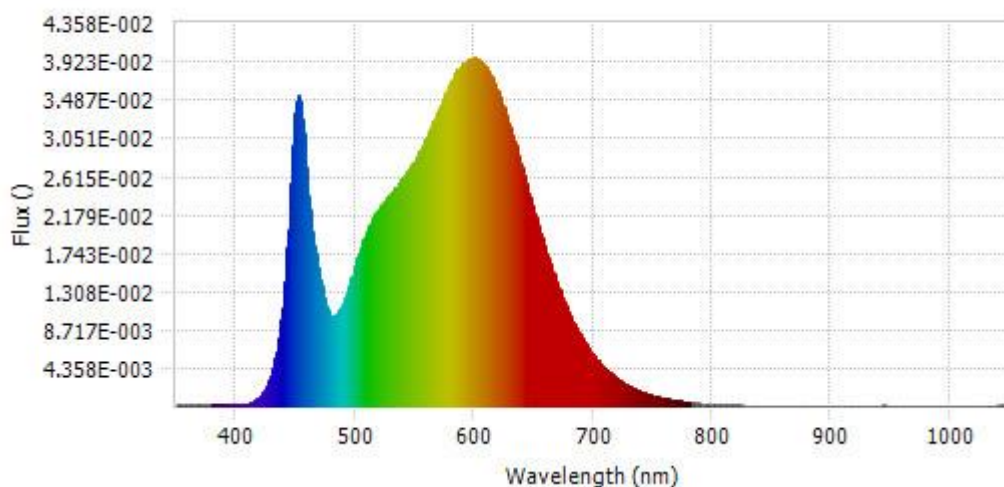
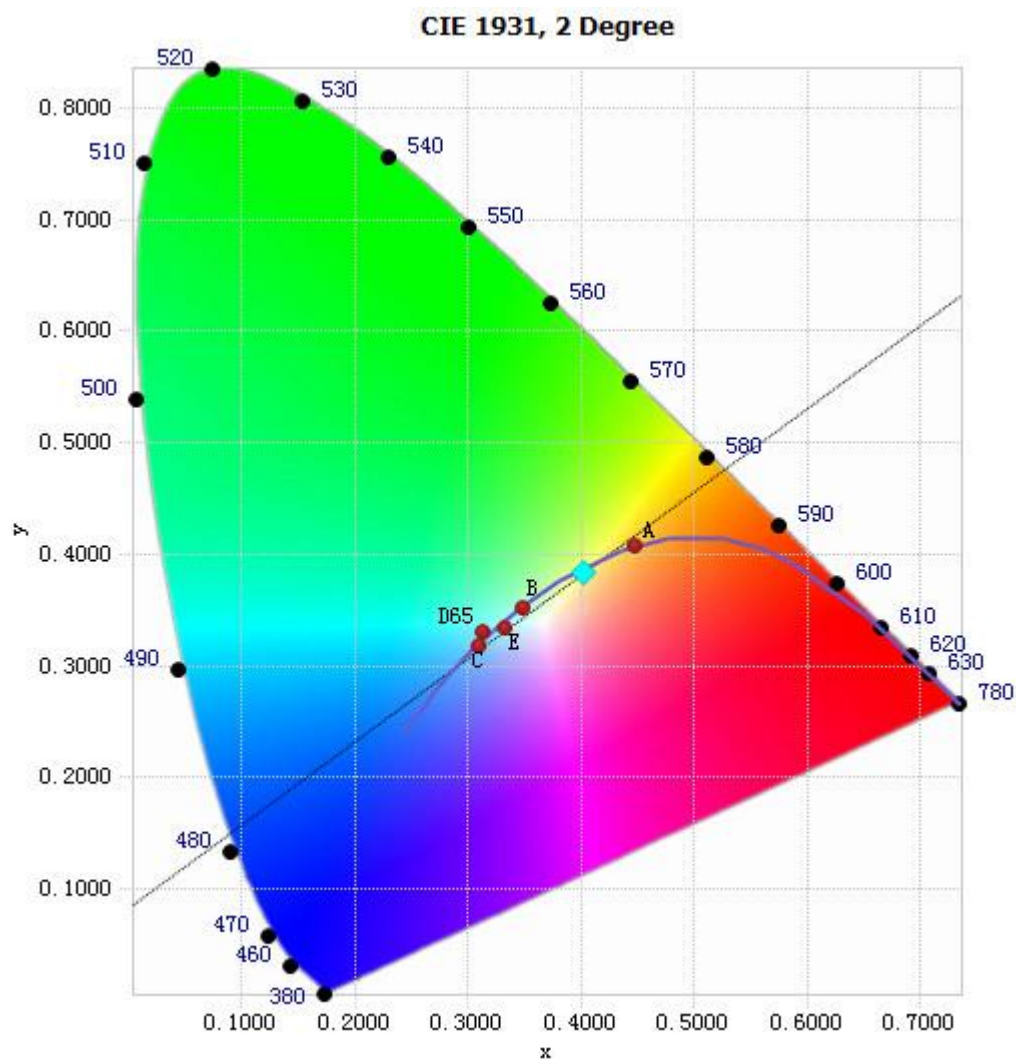


Chart 8: Spectral Power Distribution

Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	1.93E-04	485	1.06E-02	590	3.90E-02	695	6.84E-03
385	1.57E-04	490	1.17E-02	595	3.95E-02	700	5.89E-03
390	1.89E-04	495	1.37E-02	600	3.96E-02	705	5.02E-03
395	1.79E-04	500	1.59E-02	605	3.92E-02	710	4.32E-03
400	1.65E-04	505	1.81E-02	610	3.85E-02	715	3.71E-03
405	1.73E-04	510	1.99E-02	615	3.74E-02	720	3.16E-03
410	3.25E-04	515	2.14E-02	620	3.58E-02	725	2.72E-03
415	5.94E-04	520	2.24E-02	625	3.39E-02	730	2.32E-03
420	1.11E-03	525	2.34E-02	630	3.18E-02	735	1.98E-03
425	2.10E-03	530	2.42E-02	635	2.96E-02	740	1.68E-03
430	3.85E-03	535	2.50E-02	640	2.73E-02	745	1.46E-03
435	6.96E-03	540	2.59E-02	645	2.48E-02	750	1.23E-03
440	1.26E-02	545	2.68E-02	650	2.23E-02	755	1.06E-03
445	2.24E-02	550	2.79E-02	655	2.01E-02	760	9.02E-04
450	3.34E-02	555	2.93E-02	660	1.79E-02	765	7.71E-04
455	3.39E-02	560	3.05E-02	665	1.58E-02	770	6.65E-04
460	2.57E-02	565	3.20E-02	670	1.39E-02	775	5.74E-04
465	1.91E-02	570	3.37E-02	675	1.21E-02	780	4.95E-04
470	1.51E-02	575	3.52E-02	680	1.06E-02		
475	1.17E-02	580	3.67E-02	685	9.19E-03		
480	1.02E-02	585	3.82E-02	690	7.96E-03		

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

Chromaticity Diagram - Sphere Spectroradiometer Method



Tristimulus values(x, y): (0.4014, 0.3838)

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

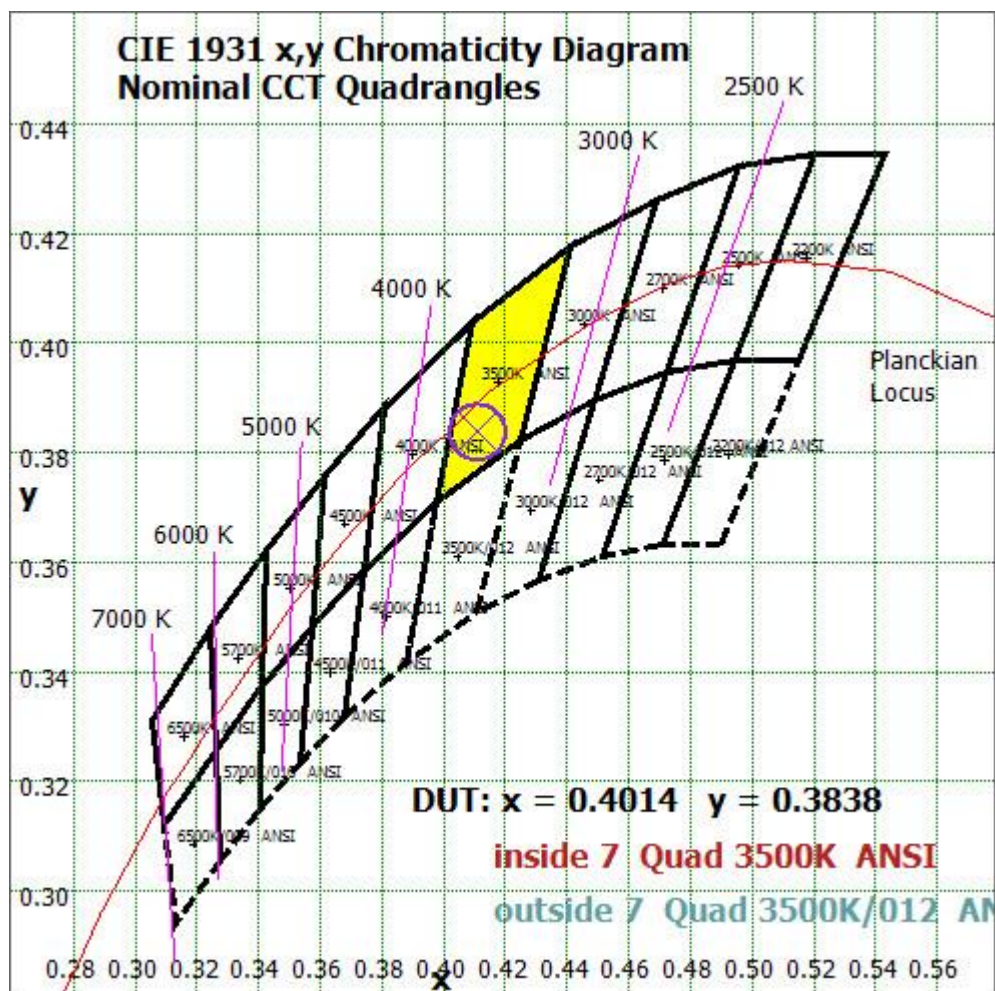


Chart 10: Plot of Lamp x/y coordinates on CIE 1931 Chromaticity Diagram

Color Rendition Report – Sphere Spectroradiometer Method

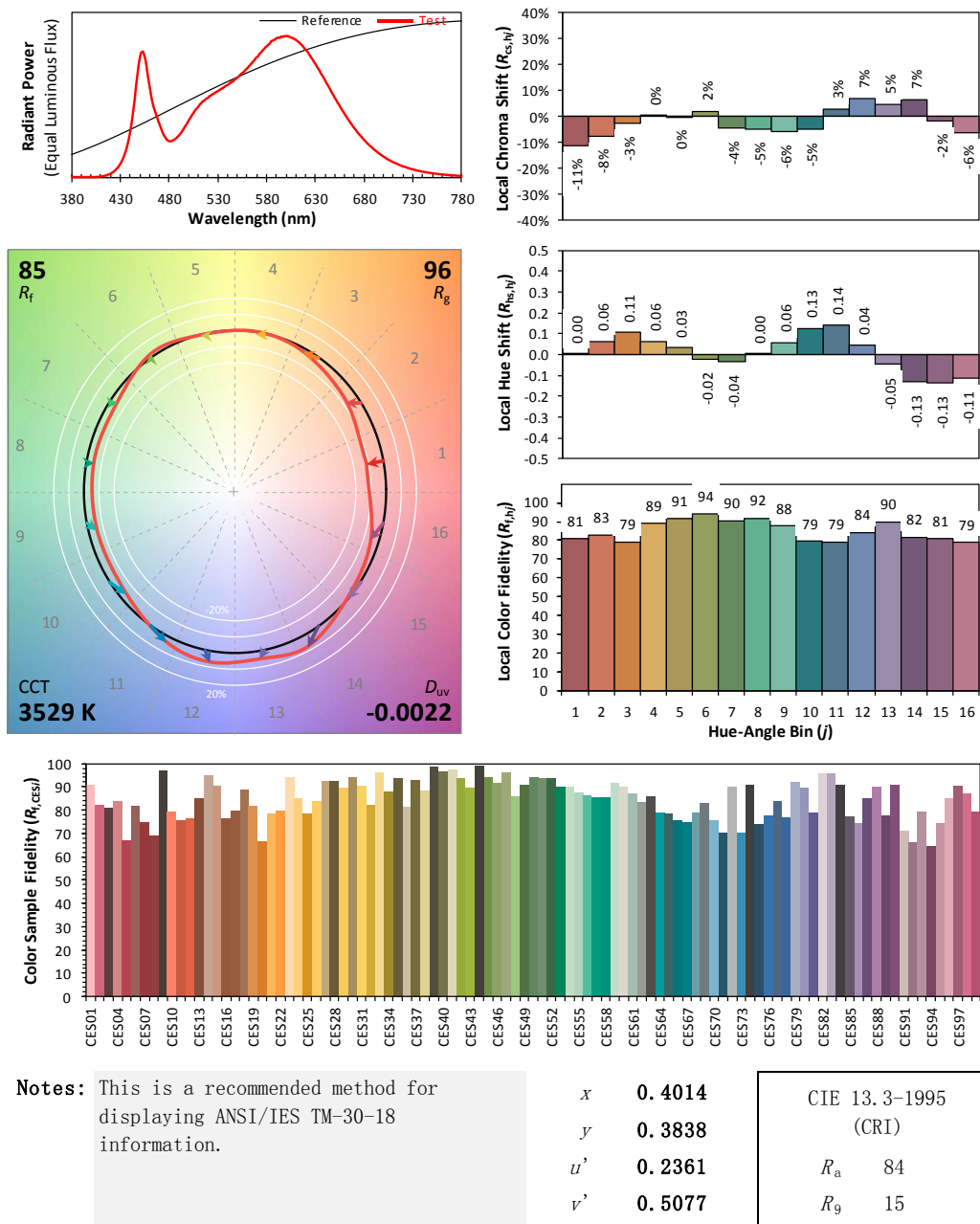
ANSI/IES TM-30-18 Color Rendition Report

Source: LED

Manufacturer: GREEN CREATIVE LTD

Date: 2025/04/07

Model: 15T5HO/3F/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)	0.125	0.056
Power Factor	0.9722	0.9494
Test Power (W)	14.60	14.65
THD A%	19.03	17.42
Luminous Efficacy (lm/W)	148.0	149.7
Total Luminous Flux (lm)	2161.0	2193.8
Color Rendering Index (CRI)	85.0	
R9	18.5	
Correlated Color Temperature (CCT)(K)	4059	
Chromaticity Chroma x	0.3765	
Chromaticity Chroma y	0.3702	
Chromaticity Chroma u	0.2251	
Chromaticity Chroma v	0.3320	
Duv	-0.0019	
Chromaticity Chroma u'	0.2251	
Chromaticity Chroma v'	0.4980	

Special Color Rendering Indices	
R1	84.1
R2	92.2
R3	95.7
R4	82.8
R5	83.8
R6	87.8
R7	86.1
R8	67.4
R9	18.5
R10	80.4
R11	82
R12	63.2
R13	86.5
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

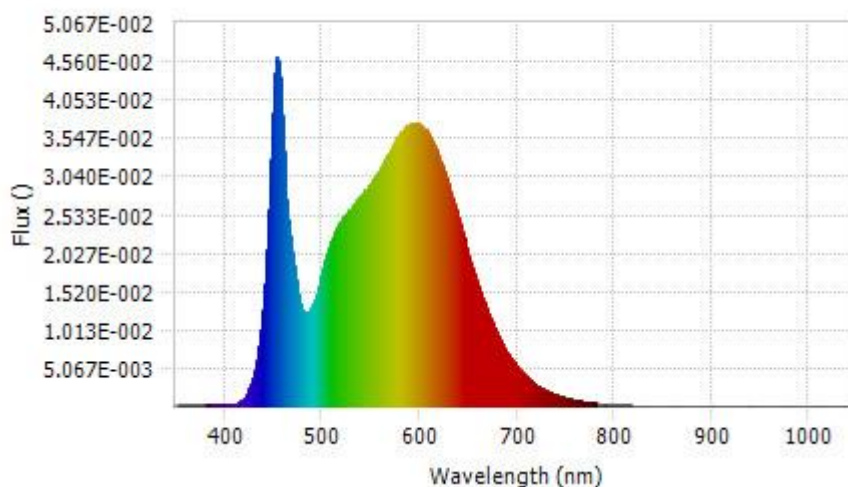
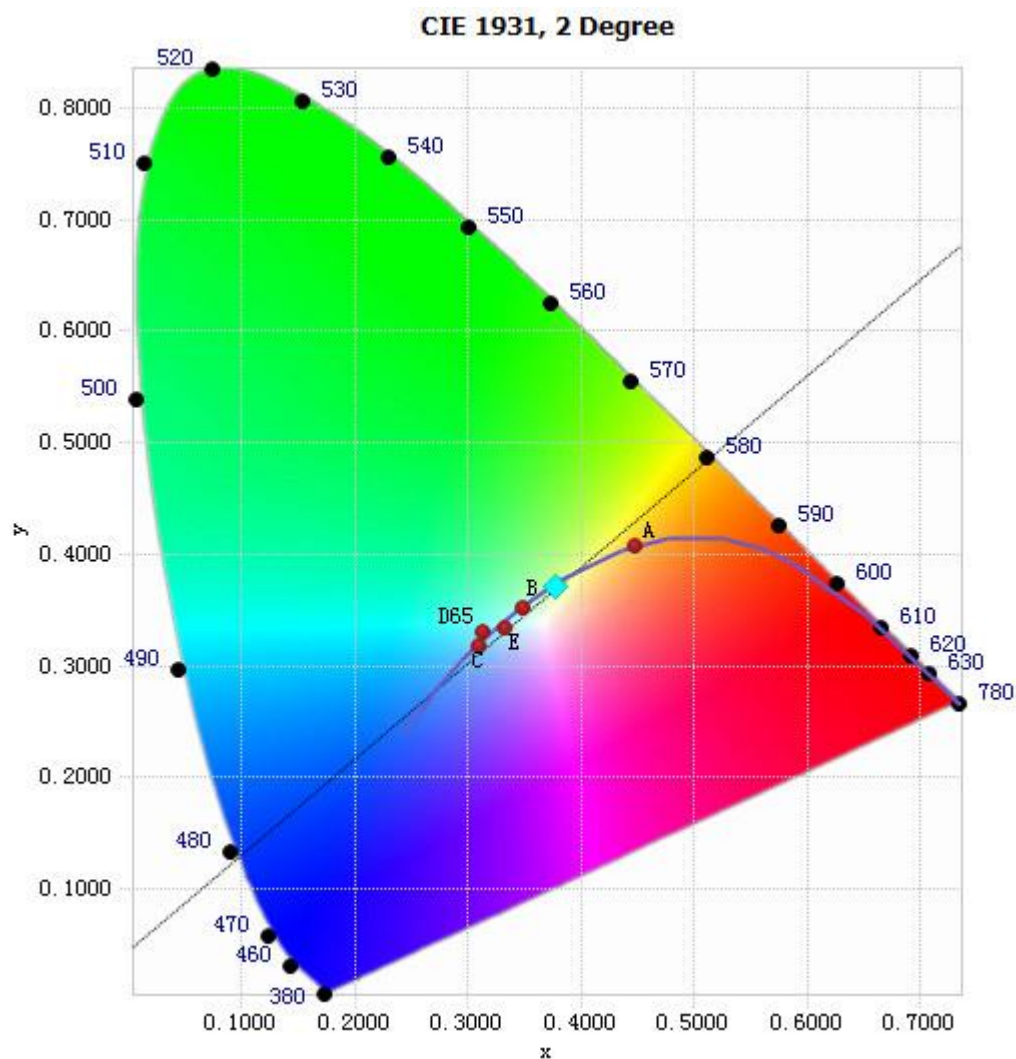


Chart 12: Spectral Power Distribution

Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	2.08E-04	485	1.25E-02	590	3.73E-02	695	6.08E-03
385	1.83E-04	490	1.36E-02	595	3.74E-02	700	5.21E-03
390	2.06E-04	495	1.54E-02	600	3.72E-02	705	4.45E-03
395	2.02E-04	500	1.78E-02	605	3.66E-02	710	3.83E-03
400	1.44E-04	505	2.01E-02	610	3.56E-02	715	3.27E-03
405	2.08E-04	510	2.20E-02	615	3.44E-02	720	2.80E-03
410	3.25E-04	515	2.37E-02	620	3.27E-02	725	2.41E-03
415	6.20E-04	520	2.46E-02	625	3.09E-02	730	2.04E-03
420	1.16E-03	525	2.56E-02	630	2.89E-02	735	1.75E-03
425	2.33E-03	530	2.64E-02	635	2.68E-02	740	1.51E-03
430	4.29E-03	535	2.70E-02	640	2.46E-02	745	1.28E-03
435	7.96E-03	540	2.78E-02	645	2.23E-02	750	1.10E-03
440	1.44E-02	545	2.87E-02	650	2.00E-02	755	9.38E-04
445	2.61E-02	550	2.94E-02	655	1.80E-02	760	7.99E-04
450	4.16E-02	555	3.05E-02	660	1.60E-02	765	6.88E-04
455	4.51E-02	560	3.16E-02	665	1.41E-02	770	5.90E-04
460	3.37E-02	565	3.27E-02	670	1.23E-02	775	5.05E-04
465	2.46E-02	570	3.39E-02	675	1.08E-02	780	4.30E-04
470	1.97E-02	575	3.50E-02	680	9.39E-03		
475	1.49E-02	580	3.60E-02	685	8.17E-03		
480	1.25E-02	585	3.70E-02	690	7.03E-03		

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

Chromaticity Diagram - Sphere Spectroradiometer Method



Tristimulus values(x, y): (0.3765, 0.3702)

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

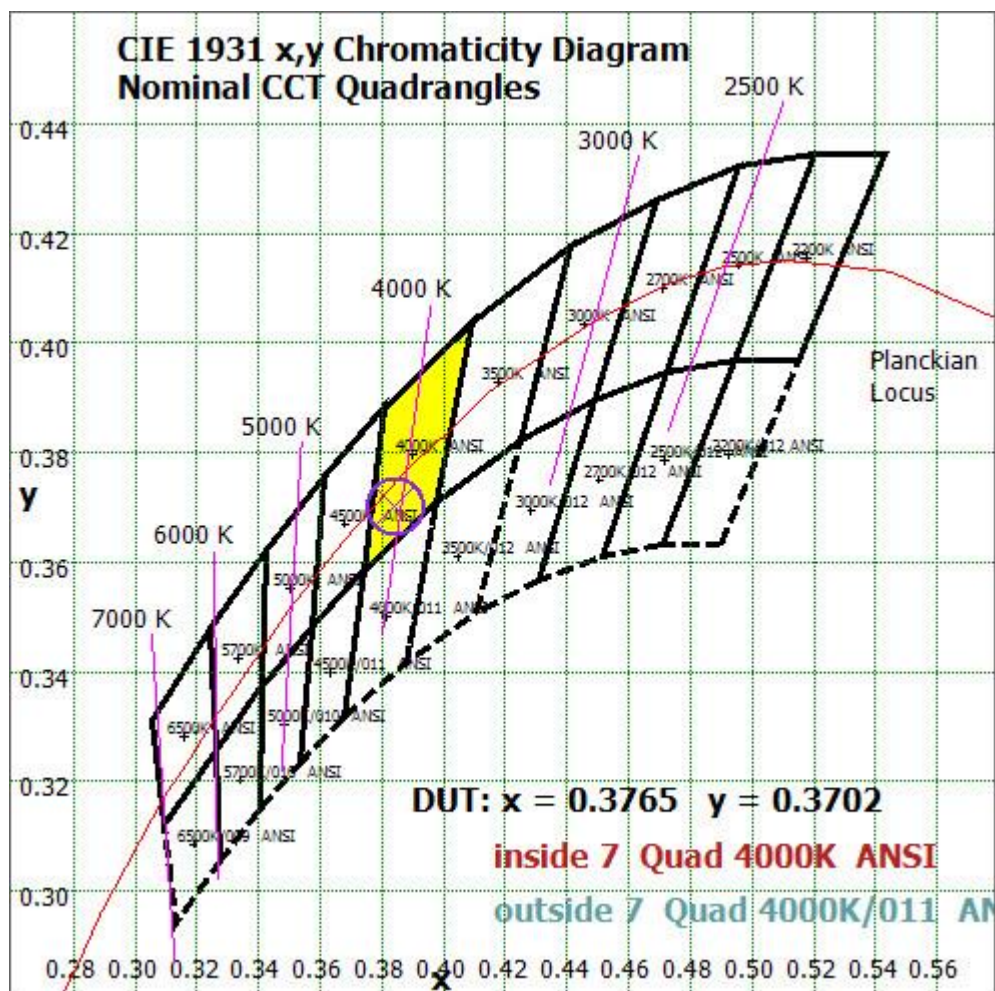


Chart14: Plot of Lamp x/y coordinates on CIE 1931 Chromaticity Diagram

Color Rendition Report – Sphere Spectroradiometer Method

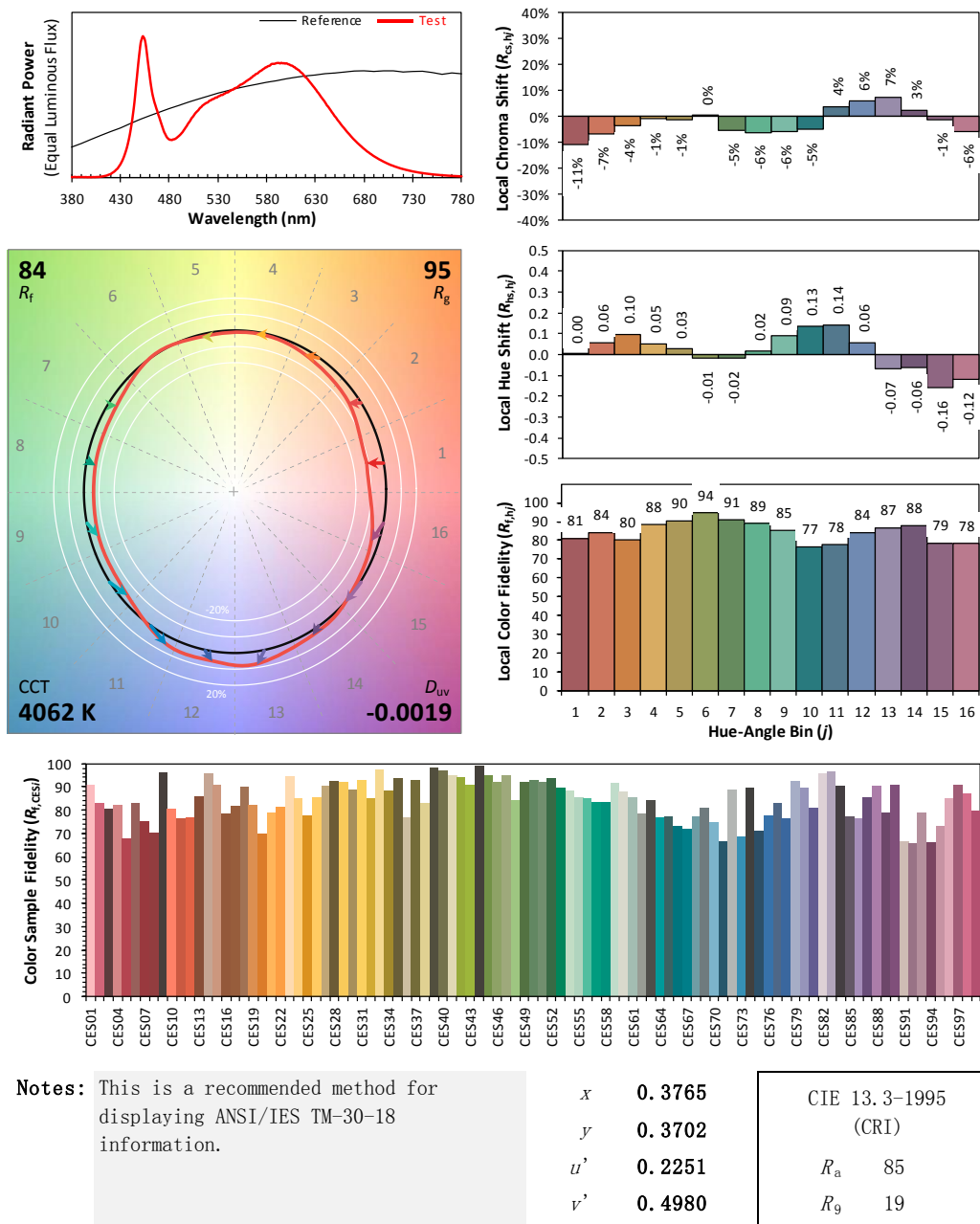
ANSI/IES TM-30-18 Color Rendition Report

Source: LED

Manufacturer: GREEN CREATIVE LTD

Date: 2025/04/07

Model: 15T5HO/3F/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)	0.129	0.057
Power Factor	0.9694	0.9523
Test Power (W)	15.01	15.01
THD A%	19.86	17.21
Luminous Efficacy (lm/W)	140.7	142.9
Total Luminous Flux (lm)	2112.0	2144.7
Color Rendering Index (CRI)	84.1	
R9	14.4	
Correlated Color Temperature (CCT)(K)	4958	
Chromaticity Chroma x	0.3463	
Chromaticity Chroma y	0.3536	
Chromaticity Chroma u	0.2115	
Chromaticity Chroma v	0.3239	
Duv	0.0005	
Chromaticity Chroma u'	0.2115	
Chromaticity Chroma v'	0.4858	

Special Color Rendering Indices	
R1	82.8
R2	91.2
R3	94.8
R4	81
R5	82.1
R6	85.6
R7	87
R8	68.2
R9	14.4
R10	77.7
R11	79.9
R12	56.8
R13	85.5
R14	97.6

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

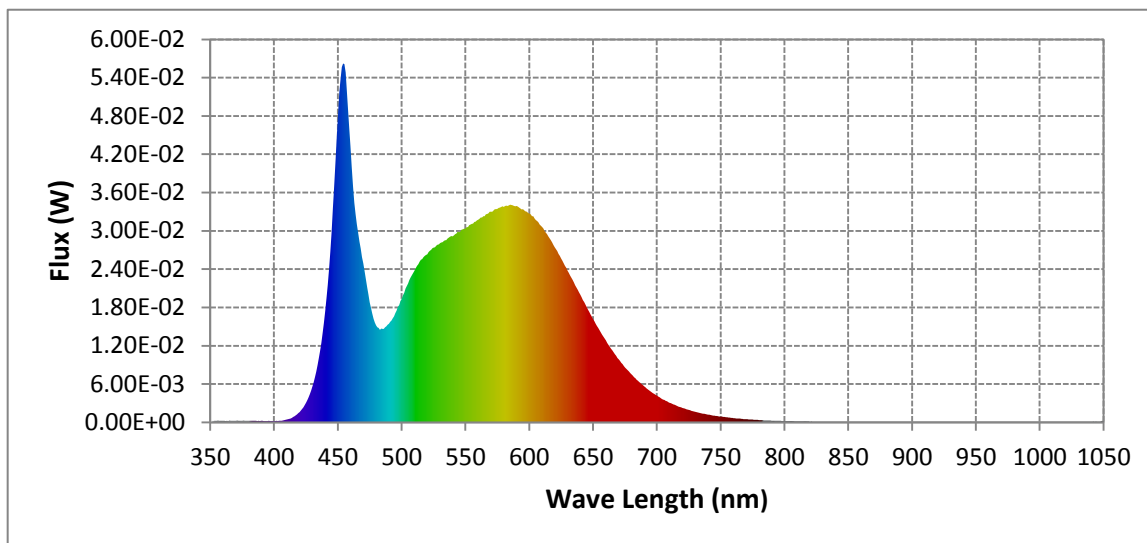
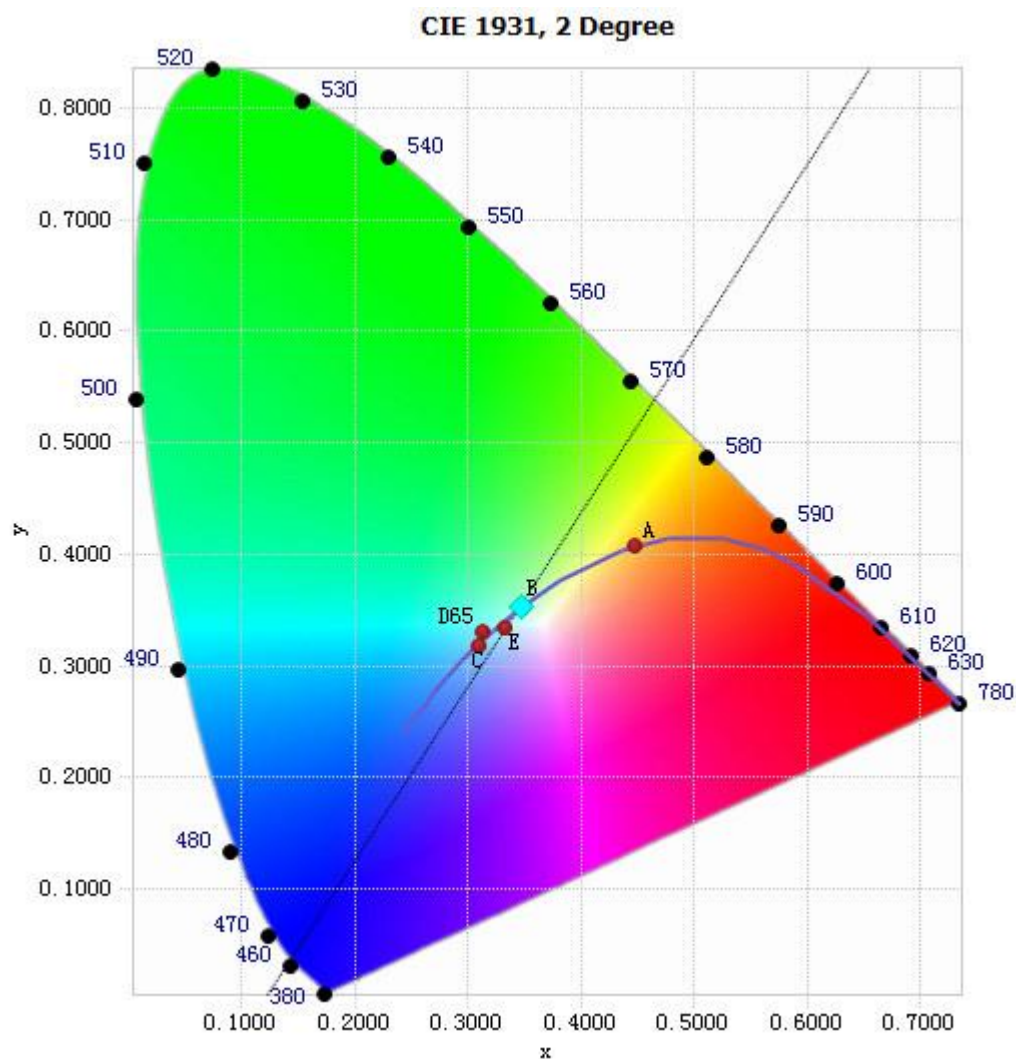


Chart16: Spectral Power Distribution

Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	2.40E-04	485	1.46E-02	590	3.39E-02	695	4.85E-03
385	2.37E-04	490	1.54E-02	595	3.34E-02	700	4.19E-03
390	2.21E-04	495	1.71E-02	600	3.27E-02	705	3.57E-03
395	2.17E-04	500	1.93E-02	605	3.17E-02	710	3.06E-03
400	1.92E-04	505	2.18E-02	610	3.06E-02	715	2.65E-03
405	2.42E-04	510	2.38E-02	615	2.91E-02	720	2.26E-03
410	4.27E-04	515	2.54E-02	620	2.74E-02	725	1.94E-03
415	8.35E-04	520	2.63E-02	625	2.57E-02	730	1.66E-03
420	1.62E-03	525	2.74E-02	630	2.38E-02	735	1.42E-03
425	3.06E-03	530	2.81E-02	635	2.19E-02	740	1.22E-03
430	5.61E-03	535	2.85E-02	640	2.00E-02	745	1.04E-03
435	1.00E-02	540	2.91E-02	645	1.80E-02	750	9.02E-04
440	1.74E-02	545	2.98E-02	650	1.61E-02	755	7.73E-04
445	2.98E-02	550	3.03E-02	655	1.44E-02	760	6.62E-04
450	4.81E-02	555	3.11E-02	660	1.28E-02	765	5.73E-04
455	5.61E-02	560	3.18E-02	665	1.13E-02	770	4.88E-04
460	4.32E-02	565	3.23E-02	670	9.85E-03	775	4.21E-04
465	3.10E-02	570	3.30E-02	675	8.59E-03	780	3.66E-04
470	2.49E-02	575	3.34E-02	680	7.49E-03		
475	1.88E-02	580	3.38E-02	685	6.53E-03		
480	1.52E-02	585	3.41E-02	690	5.64E-03		

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

Chromaticity Diagram - Sphere Spectroradiometer Method



Tristimulus values(x, y): (0.3463, 0.3536)

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

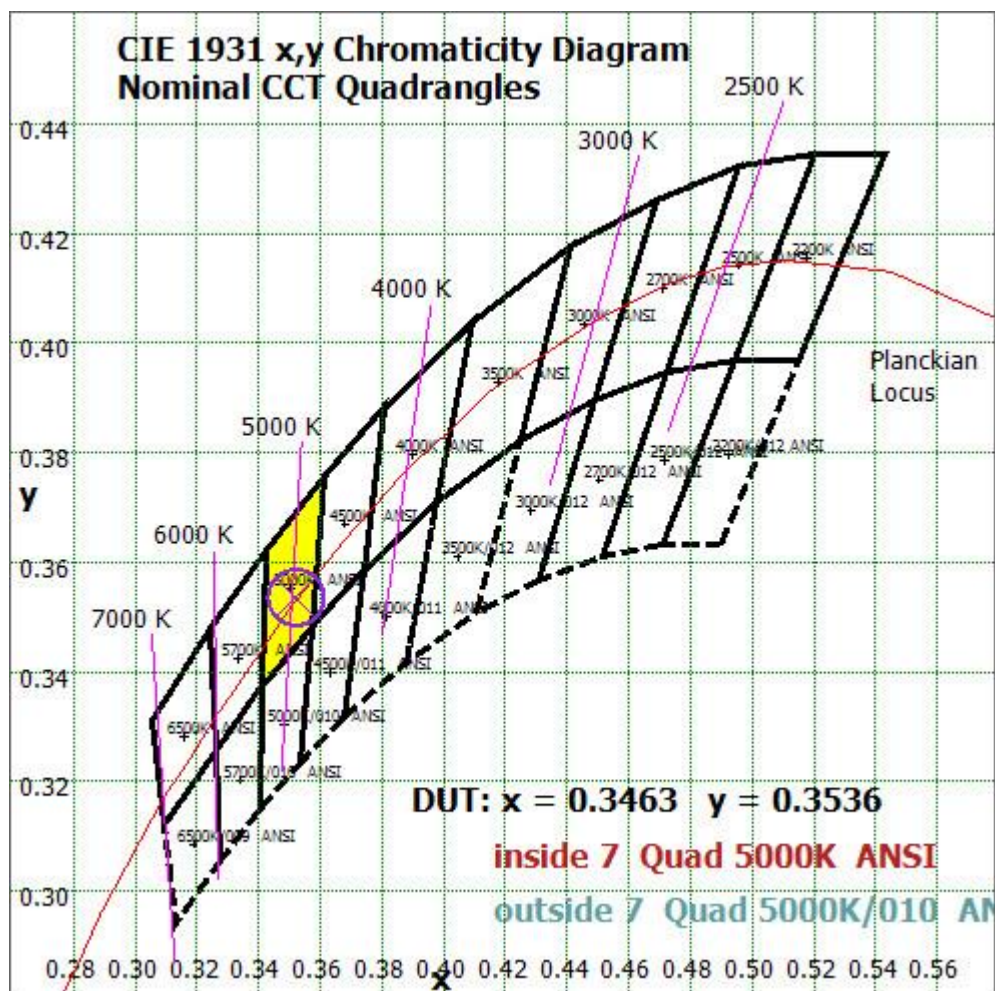


Chart 18: Plot of Lamp x/y coordinates on CIE 1931 Chromaticity Diagram

Color Rendition Report – Sphere Spectroradiometer Method

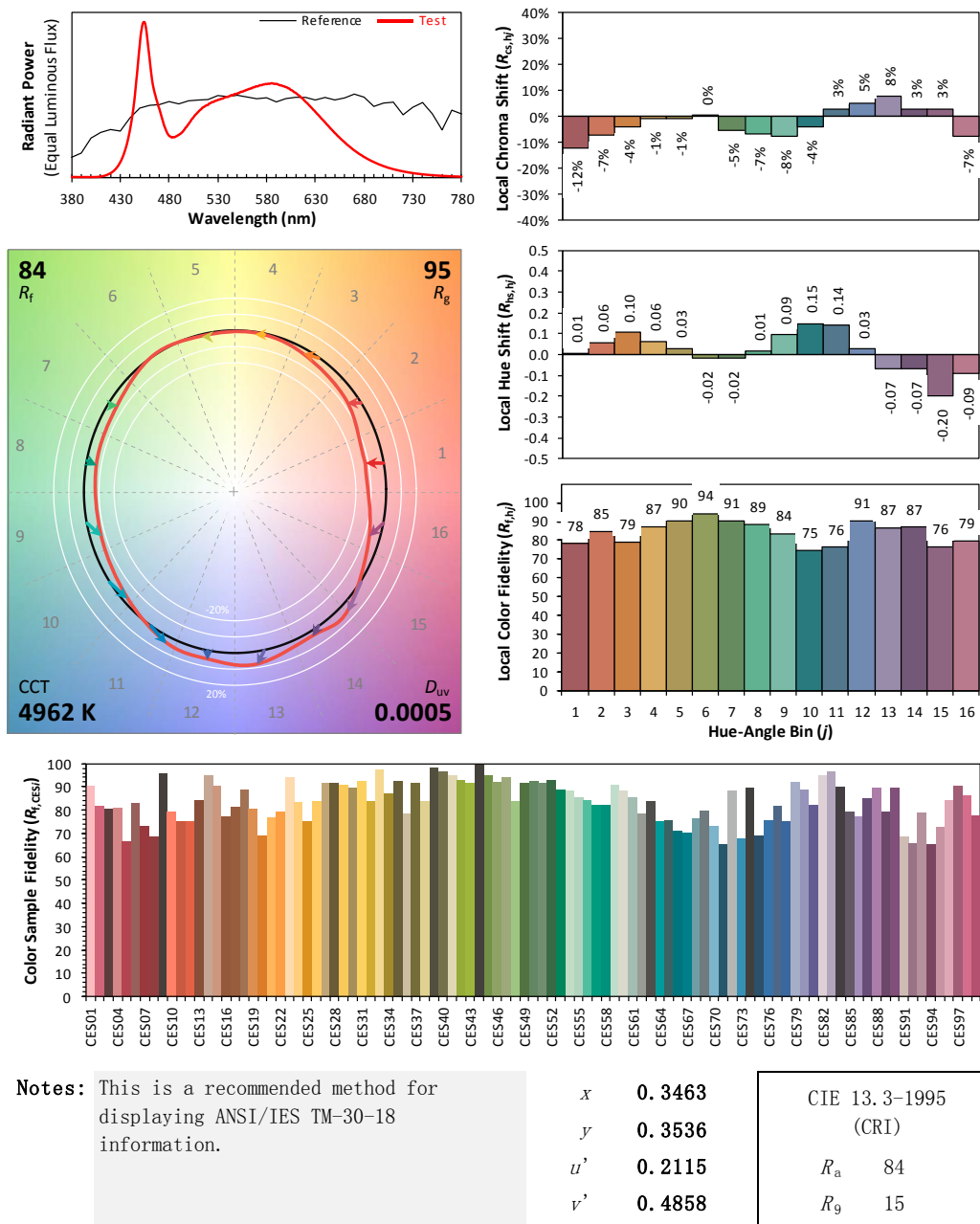
ANSI/IES TM-30-18 Color Rendition Report

Source: LED

Manufacturer: GREEN CREATIVE LTD

Date: 2025/04/07

Model: 15T5HO/3F/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 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

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

coverage factor $k=2$.

Goniophotometer Method

Photometric and Electrical Measurements

An EVERFINE Type C Model GO-R5000 Goniophotometer was used to measure the intensity at each angle of distribution for each sample. The photometric distance is 2.475m for near-field measurement or 30m for far-field measurement. Bandwidth of spectroradiometer is 380nm-780nm.

Ambient temperature was measured at the same height of the sample mounted on the Goniophotometer equipment. Each SSL unit was operated on the client provided driver at the rated input voltage in its designated orientation.

The stabilization time typically ranges from 30 min (small integrated LED lamps) to 2 or more hours for large SSL luminaires). It can be judged that stability is reached when the variation (maximum – minimum) of at least 3 readings of the light output and electrical power over a period of 20 min, taken 10 minutes apart, is less than 0.5 %.

Electrical measurements including voltage, current, and power were measured using the Everfine Digital Power Meter.

Some graphics were created with Photometric Plus software.

The standard reference of the Goniophotometer system is halogen incandescent lamp, the intensity distribution type is omni-directional, and is traceable to the National Institute of Metrology P.R. China.

The uncertainty of goniophotometer system reported in this document is expanded uncertainty is 2.3% with a coverage factor $k=2$.

Color Characteristics Measurements

The color characteristics of SSL products include chromaticity coordinates, correlated color temperature, and color rendering index. These characteristics of SSL products may be spatially non-uniform, and thus, in order that they can be specified accurately, the color quantities shall be measured as values that are spatially average, weighted to intensity, over the angular range where light is intentionally emitted from the SSL product. The color characteristics measurements are using gonio-spectroradiometer.

*** End of Report ***

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