

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: 12T5HE/3F/8CCTS/UEB/C

Laboratory: Leading Testing Laboratories

NVLAP CODE: 200960-0

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Report No.: HZ25040003c

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

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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	12T5HE/3F/8CC TS/UEB/C 3000K Setting	12T5HE/3F/8CC TS/UEB/C 3500K Setting	12T5HE/3F/8CC TS/UEB/C 4000K Setting	12T5HE/3F/8CC TS/UEB/C 5000K Setting
Luminous Efficacy (Lumens /Watt)	136.0	145.3	149.3	142.0
Total Luminous Flux (Lumens)	1562.8	1644.9	1678.6	1631.4
Power (Watts)	11.49	11.32	11.24	11.49
Power Factor	0.9746	0.9755	0.9759	0.9745
CCT (K)	3046	3484	4078	4958
CRI	82.5	84.4	85.1	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	: 12T5HE/3F/8CCTS/UEB/C
Electrical Ratings	: 120-277V, 50/60Hz, 12W
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)	0.098	0.045
Power Factor	0.9746	0.9261
Test Power (W)	11.49	11.63
THD A%	19.99	17.69
Luminous Efficacy (lm/W)	136.0	135.3
Total Luminous Flux (lm)	1562.8	1573.8
Color Rendering Index (CRI)	82.5	
R9	7.9	
Correlated Color Temperature (CCT)(K)	3046	
Chromaticity Chroma x	0.4320	
Chromaticity Chroma y	0.3995	
Chromaticity Chroma u	0.2493	
Chromaticity Chroma v	0.3459	
Duv	-0.0011	
Chromaticity Chroma u'	0.2493	
Chromaticity Chroma v'	0.5188	

Special Color Rendering Indices	
R1	80.8
R2	90.4
R3	96.4
R4	80.7
R5	81.1
R6	88
R7	82.9
R8	59.6
R9	7.9
R10	78.1
R11	80.2
R12	70.9
R13	83
R14	98.6

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

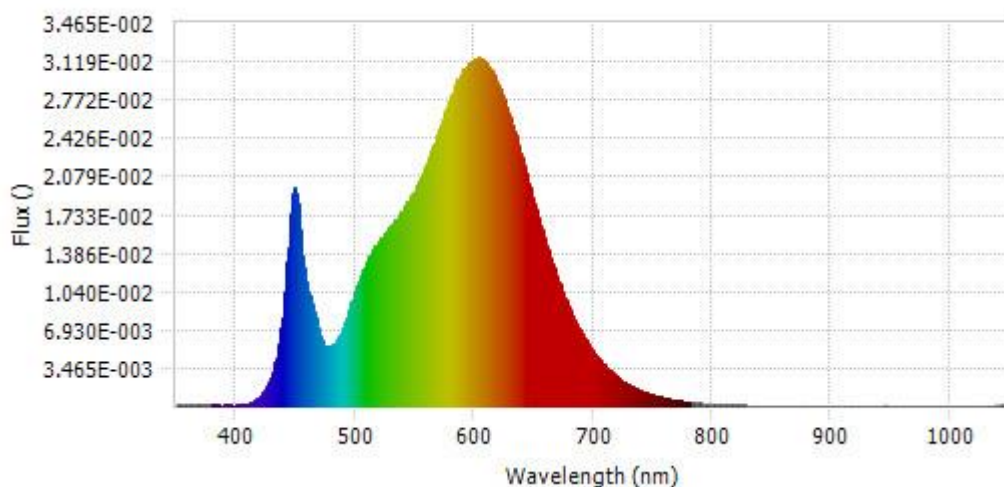
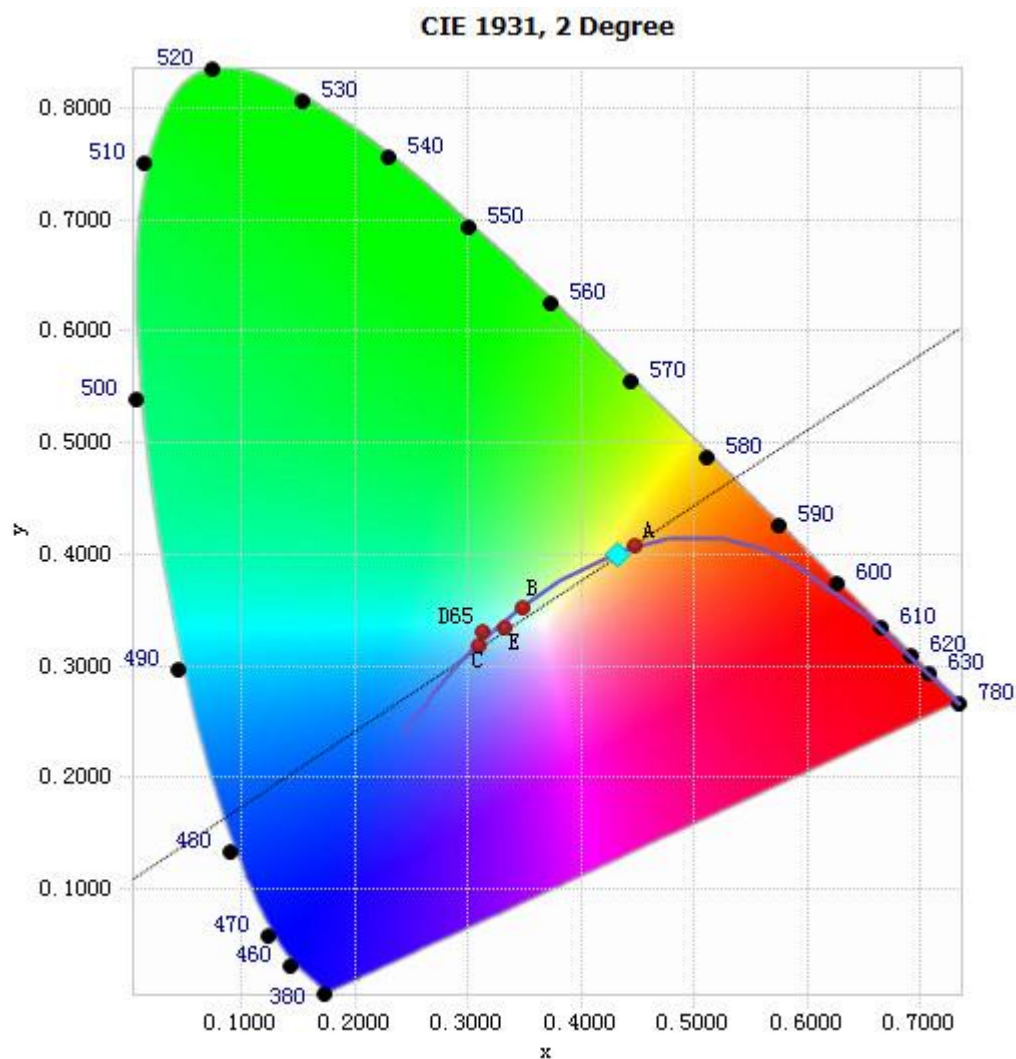


Chart 1: Spectral Power Distribution

Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	1.21E-04	485	6.03E-03	590	3.03E-02	695	5.75E-03
385	1.18E-04	490	7.09E-03	595	3.10E-02	700	4.94E-03
390	1.00E-04	495	8.66E-03	600	3.14E-02	705	4.23E-03
395	7.71E-05	500	1.03E-02	605	3.13E-02	710	3.63E-03
400	9.96E-05	505	1.18E-02	610	3.10E-02	715	3.08E-03
405	1.45E-04	510	1.30E-02	615	3.03E-02	720	2.66E-03
410	2.31E-04	515	1.41E-02	620	2.91E-02	725	2.27E-03
415	4.68E-04	520	1.49E-02	625	2.77E-02	730	1.94E-03
420	8.56E-04	525	1.56E-02	630	2.62E-02	735	1.65E-03
425	1.59E-03	530	1.63E-02	635	2.44E-02	740	1.42E-03
430	2.85E-03	535	1.69E-02	640	2.25E-02	745	1.21E-03
435	5.05E-03	540	1.77E-02	645	2.06E-02	750	1.02E-03
440	9.06E-03	545	1.86E-02	650	1.86E-02	755	8.82E-04
445	1.59E-02	550	1.95E-02	655	1.67E-02	760	7.48E-04
450	1.97E-02	555	2.06E-02	660	1.49E-02	765	6.46E-04
455	1.47E-02	560	2.19E-02	665	1.32E-02	770	5.51E-04
460	1.08E-02	565	2.33E-02	670	1.16E-02	775	4.67E-04
465	8.89E-03	570	2.48E-02	675	1.01E-02	780	4.10E-04
470	6.67E-03	575	2.63E-02	680	8.87E-03		
475	5.43E-03	580	2.78E-02	685	7.69E-03		
480	5.49E-03	585	2.93E-02	690	6.69E-03		

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

Chromaticity Diagram - Sphere Spectroradiometer Method



Tristimulus values(x, y): (0.4320, 0.3995)

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

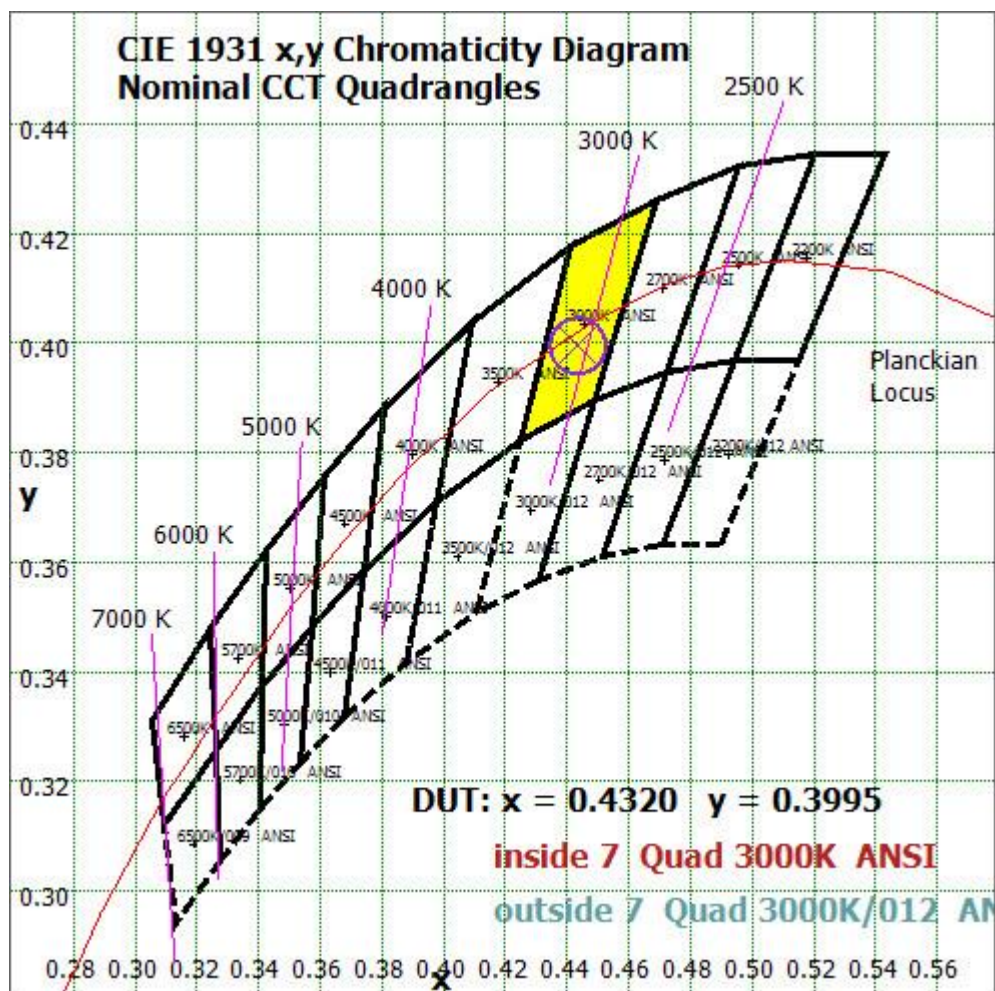


Chart 3: Plot of Lamp x/y coordinates on CIE 1931 Chromaticity Diagram

Color Rendition Report – Sphere Spectroradiometer Method

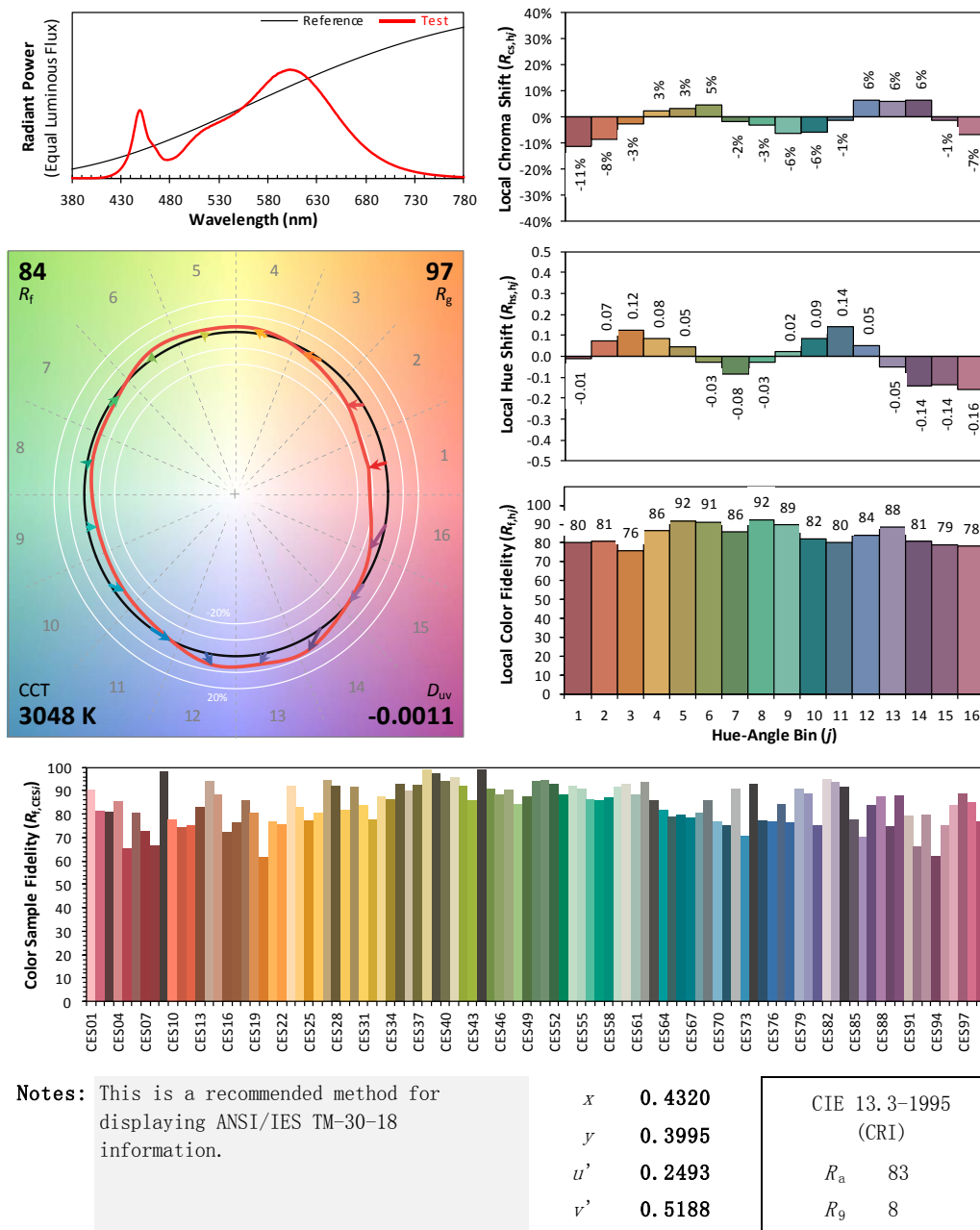
ANSI/IES TM-30-18 Color Rendition Report

Source: LED

Manufacturer: GREEN CREATIVE LTD

Date: 2025/04/07

Model: 12T5HE/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)	0.098
Power Factor	0.9747
Power (W)	11.50
Luminous Efficacy (lm/W)	136.9
Total Luminous Flux (lm)	1574.6
Beam Angle (°)	113.1 (0°-180°) / 211.0 (90°-270°)
Center Beam Candle Power (cd)	279
Maximum Beam Candle Power (cd)	279.4 (At: C=290.0, Gamma=2.5)
Spacing Criteria	1.25 (0°-180°) / 1.49 (90°-270°)
Zonal Lumens in the 0 °-60 °Zone	46.19%
Zonal Lumens in the 60 °-90 °Zone	28.53%
Zonal Lumens in the 90 °-120 °Zone	16.70%
Zonal Lumens in the 120 °-180 °Zone	8.59%

Table 4: Test data per Goniophotometer Method

Zonal Lumen Tabulation- Goniophotometer Method

$\gamma(^{\circ})$	Lumens	% Total
0- 10	26.45	1.68%
10- 20	76.912	4.88%
20- 30	120.373	7.64%
30- 40	153.125	9.72%
40- 50	172.588	10.96%
50- 60	177.78	11.29%
60- 70	169.695	10.78%
70- 80	151.362	9.61%
80- 90	128.127	8.14%
90-100	106.154	6.74%
100-110	87.212	5.54%
110-120	69.546	4.42%
120-130	53.263	3.38%
130-140	38.076	2.42%
140-150	24.833	1.58%
150-160	13.957	0.89%
160-170	4.531	0.29%
170-180	0.606	0.04%
Total	1574.6	100%

$\gamma(^{\circ})$	Lumens	% Total
0- 60	727.228	46.19%
60- 90	449.184	28.53%
0-90	1176.412	74.71%
90- 180	398.178	25.29%
0- 180	1574.6	100%

Table 5: Zonal Lumen

Illuminance Plots- Goniophotometer Method

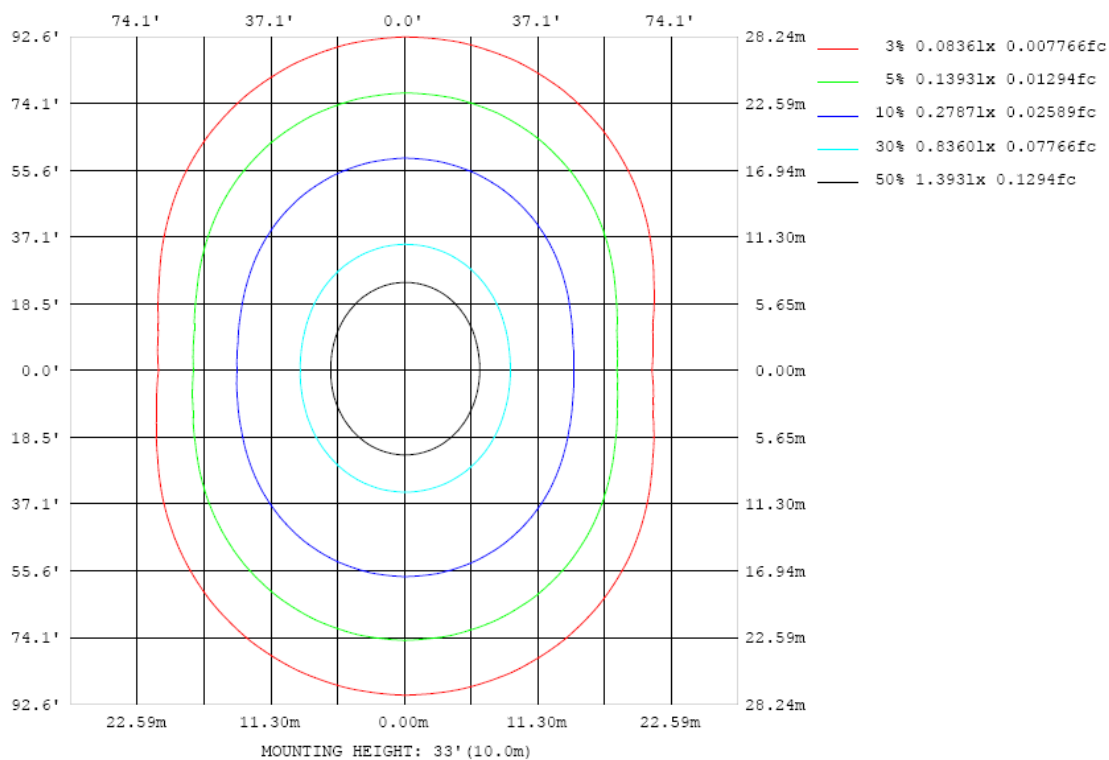


Chart 5: Illuminance Plot (Footcandles)

Luminous Intensity Distribution Plots- Goniophotometer Method

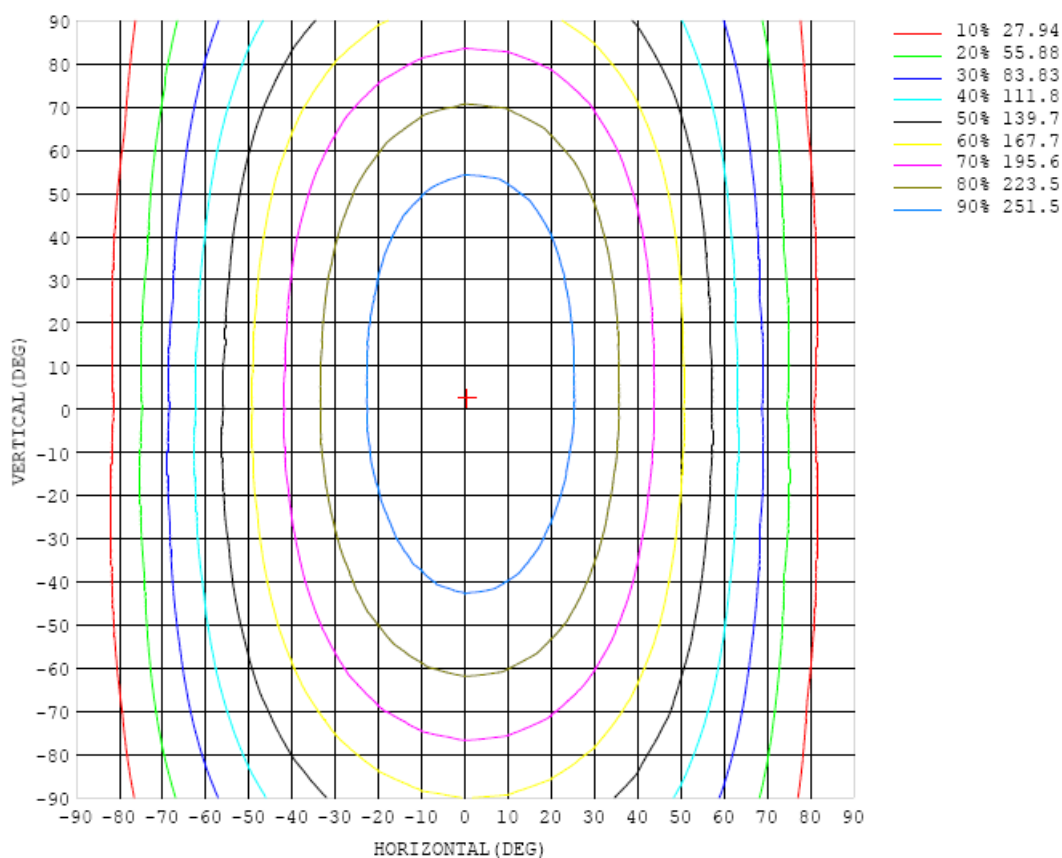


Chart 6: Isocandela Plot

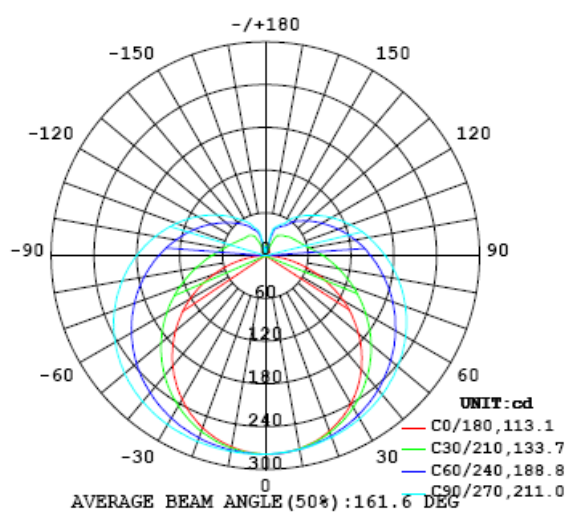


Chart 7: Polar Candela Distribution

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	279	279	279	279	279	279	279	279	279	279	279	279	279	279	279	279	279	279	279
5	278	278	278	278	278	277	278	278	278	277	278	277	277	277	277	277	276	277	277
10	275	275	275	275	276	276	276	277	276	276	276	276	275	274	274	273	273	272	272
15	270	269	270	271	272	273	273	274	274	274	273	273	271	270	269	267	266	266	266
20	262	262	263	264	266	268	269	271	271	271	270	269	267	264	262	261	259	258	257
25	252	253	254	256	259	262	265	267	268	268	267	265	262	258	255	252	249	247	246
30	240	240	243	246	251	255	259	262	264	264	263	260	256	251	246	241	237	235	233
35	226	227	230	235	241	247	253	257	259	259	258	254	249	242	236	229	224	220	218
40	209	211	215	222	230	238	246	251	254	255	253	248	242	233	225	216	209	204	202
45	191	193	199	208	219	229	237	244	248	248	246	241	233	223	213	202	193	187	184
50	170	173	181	193	206	219	229	237	241	242	240	233	225	213	200	188	176	168	164
55	149	153	163	178	194	208	220	229	233	235	232	225	215	202	188	172	158	149	144
60	126	132	145	162	180	197	211	220	226	227	224	217	206	191	175	157	141	129	122
65	102	110	126	147	167	186	200	211	217	218	215	207	195	180	162	143	123	108	99.5
70	77.8	87.1	108	132	155	174	190	201	207	209	206	197	185	168	149	128	105	86.5	76.7
75	54.1	65.7	90.1	117	142	162	179	191	198	199	195	187	174	157	137	114	88.5	66.2	54.8
80	31.8	46.4	74.7	104	130	152	168	181	187	189	185	177	163	146	125	100	73.4	47.7	33.4
85	13.0	30.5	61.5	91.6	119	141	158	170	177	179	175	166	153	136	114	87.8	59.9	31.8	14.7
90	1.97	18.8	50.4	80.8	108	131	147	159	166	168	164	156	143	126	103	76.3	47.2	18.0	1.84
95	0.92	12.3	40.9	71.2	98.3	120	138	149	156	157	154	146	133	115	92.7	66.2	38.2	12.2	0.76
100	1.15	11.0	35.1	62.8	89.0	111	128	139	146	147	144	136	123	106	84.1	58.9	33.5	10.7	1.57
105	1.38	11.0	32.5	56.6	80.7	102	118	129	136	137	134	126	114	97.3	76.8	53.7	30.5	10.3	3.11
110	2.01	11.4	31.1	52.4	73.9	93.0	109	119	126	127	124	116	105	89.4	70.3	49.1	28.6	10.7	3.57
115	2.72	12.1	30.2	49.1	68.2	85.4	99.8	110	115	117	114	107	96.2	81.9	64.6	45.7	27.6	10.6	2.87
120	4.37	13.4	29.6	46.2	63.1	78.4	91.3	100	106	107	104	97.9	88.1	75.2	59.6	42.8	27.6	7.81	0.21
125	5.94	14.3	29.5	43.9	58.6	72.0	83.4	91.5	96.0	97.4	95.0	89.3	80.5	69.0	55.3	40.5	26.9	10.6	0.00
130	7.63	0.93	26.8	41.6	54.4	66.2	76.0	83.1	87.2	88.2	86.1	81.0	73.4	63.3	51.4	38.2	27.0	9.48	0.00
135	7.44	2.96	26.3	38.8	49.0	60.4	69.1	75.2	78.7	79.6	77.7	73.3	66.6	58.5	44.3	33.2	24.9	9.14	0.00
140	7.05	8.71	27.2	37.1	44.1	53.4	62.4	67.8	70.6	71.3	69.7	66.0	60.7	49.4	39.5	34.7	14.2	0.63	3.86
145	9.28	1.64	10.7	34.4	42.4	47.4	53.0	58.2	62.4	63.5	61.9	57.3	49.1	44.2	39.1	33.1	16.0	2.90	6.27
150	11.4	3.37	5.19	32.4	40.2	44.1	47.9	50.5	51.4	51.2	50.9	49.4	46.5	41.9	38.0	22.1	2.77	6.36	6.28
155	13.4	11.5	10.4	4.07	36.8	41.3	44.0	46.1	47.1	47.5	46.8	45.0	42.3	39.5	34.4	18.7	2.68	4.37	7.27
160	11.7	9.24	5.22	7.85	3.69	32.9	40.3	41.8	42.6	42.7	42.1	40.8	39.5	35.8	18.1	4.01	11.7	3.54	9.51
165	10.2	14.4	8.92	5.75	12.2	3.93	3.80	17.7	29.8	32.8	32.5	25.2	11.4	2.20	6.85	9.31	3.76	8.62	9.76
170	7.50	13.9	12.2	8.55	4.23	3.47	7.33	4.73	3.90	5.10	6.38	6.59	5.17	3.33	1.40	3.49	6.18	7.64	8.22
175	12.9	14.2	14.2	11.8	10.0	12.2	8.30	4.16	3.28	3.32	3.77	4.39	5.32	7.43	10.5	10.4	9.68	11.8	12.3
180	9.12	9.12	9.12	9.12	9.12	9.12	9.12	9.12	9.12	9.12	9.12	9.12	9.12	9.12	9.12	9.12	9.12	9.12	9.12

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	279	279	279	279	279	279	279	279	279	279	279	279	279	279	279	279	279		
5	277	277	277	278	278	278	278	279	279	279	279	279	279	278	278	279	278		
10	273	273	274	275	276	277	278	278	279	279	279	279	278	277	277	277	275		
15	266	267	269	271	273	275	276	278	278	278	278	277	276	274	273	271	270		
20	258	260	262	265	269	272	275	277	278	278	277	275	272	269	267	265	263		
25	247	250	254	259	263	268	272	274	276	276	275	272	268	263	259	256	253		
30	235	238	244	250	257	263	268	272	274	274	272	268	262	256	250	245	241		
35	220	225	232	241	249	258	264	269	271	271	268	263	255	247	240	232	227		
40	204	210	219	230	240	251	259	265	267	267	263	257	248	237	227	218	211		
45	186	194	206	219	232	244	253	260	263	262	258	250	239	226	213	202	194		
50	168	177	191	206	222	236	246	254	258	256	251	242	229	215	199	185	174		
55	147	159	175	193	210	227	239	247	250	250	244	234	219	202	184	166	153		
60	126	140	159	180	200	216	230	239	243	242	236	224	208	189	168	147	131		
65	105	121	143	167	188	206	221	230	235	233	226	214	197	175	152	128	109		
70	83.2	102	127	153	175	195	210	220	225	223	216	203	184	162	136	109	86.0		
75	62.5	84.8	112	139	163	184	199	210	215	213	206	192	172	149	121	91.2	64.7		
80	44.1	69.1	98.5	126	151	172	189	199	204	202	194	180	161	136	107	75.3	45.2		
85	28.2	55.8	86.2	115	140	161	177	188	192	191	183	169	149	124	94.3	62.6	29.9		
90	17.6	45.9	75.4	104	128	149	165	176	180	179	171	157	137	113	83.5	52.3	20.7		
95	13.2	38.4	66.5	93.6	118	138	154	164	169	167	159	146	126	102	74.4	44.9	16.9		
100	11.8	33.6	59.3	84.7	108	127	142	152	156	155	148	135	116	93.1	67.5	40.1	15.9		
105	12.1	30.6	53.8	77.0	98.4	117	131	140	144	143	136	124	106	84.8	61.4	37.0	15.0		
110	12.5	28.9	49.3	70.2	89.6	107	120	129	133	131	125	113	96.8	77.4	56.2	34.8	17.1		
115	13.3	28.2	45.5	64.1	81.7	97.3	109	118	121	120	114	103	88.5	70.9	52.2	33.6	18.8		
120	13.7	28.2	42.6	58.8	74.3	88.4	99.3	107	110	109	103	93.6	80.5	65.5	48.8	32.7	20.4		
125	13.5	28.7	40.1	54.5	67.9	79.8	89.7	96.3	99.1	98.1	93.2	84.7	73.2	60.2	46.1	30.9	21.4		
130	13.6	29.0	38.4	50.4	61.7	72.0	80.6	86.2	88.8	88.0	83.7	76.4	66.5	55.6	43.8	30.3	16.5		
135	12.0	27.8	37.3	46.8	56.6	65.1	72.0	77.0	79.2	78.4	74.9	68.7	60.9	51.6	41.8	31.3	8.19		
140	7.64	24.3	36.7	43.7	51.8	59.1	64.5	68.3	70.1	69.6	66.7	62.3	55.7	48.0	37.2	30.8	3.94		
145	1.05	15.2	34.7	40.0	47.6	53.1	58.0	61.1	62.4	62.2	60.1	56.2	50.8	44.3	36.4	29.3	6.38		
150	0.38	11.3	31.7	36.8	42.3	48.2	51.9	54.4	55.5	55.3	53.6	50.7	45.5	39.4	34.6	20.5	3.90		
155	1.19	5.59	22.3	34.8	37.9	41.0	44.8	47.8	49.1	48.9	46.4	43.2	40.1	36.8	30.3	13.3	9.29		
160	2.98	4.69	3.95	23.9	34.2	37.4	39.2	40.6	41.2	41.3	40.7	38.9	36.6	29.9	14.9	3.64	9.68		
165	2.86	1.26	2.49	4.60	16.1	25.1	32.4	34.3	35.3	35.1	34.1	29.9	19.6	8.29	2.23	3.11	3.46		
170	5.42	1.63	4.16	5.13	5.75	3.26	5.34	7.60	8.38	8.53	9.23	5.57	5.43	3.57	6.97	3.37	3.39		
175	9.65	3.50	3.20	4.07	3.41	2.11	1.76	3.23	6.32	5.68	5.45	4.01	1.82	2.77	4.81	3.72	4.29		
180	9.12	9.12	9.12	9.12	9.12	9.12	9.12	9.12	9.12	9.12	9.12	9.12	9.12	9.12	9.12	9.12	9.12		

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)	0.097	0.045
Power Factor	0.9755	0.9242
Test Power (W)	11.32	11.47
THD A%	19.69	17.85
Luminous Efficacy (lm/W)	145.3	144.5
Total Luminous Flux (lm)	1644.9	1657.3
Color Rendering Index (CRI)	84.4	
R9	15.7	
Correlated Color Temperature (CCT)(K)	3484	
Chromaticity Chroma x	0.4036	
Chromaticity Chroma y	0.3844	
Chromaticity Chroma u	0.2372	
Chromaticity Chroma v	0.3389	
Duv	-0.0024	
Chromaticity Chroma u'	0.2372	
Chromaticity Chroma v'	0.5083	

Special Color Rendering Indices	
R1	83.4
R2	92
R3	96
R4	82.5
R5	83.6
R6	88.9
R7	84.5
R8	64.3
R9	15.7
R10	80.9
R11	81.9
R12	68.2
R13	85.8
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

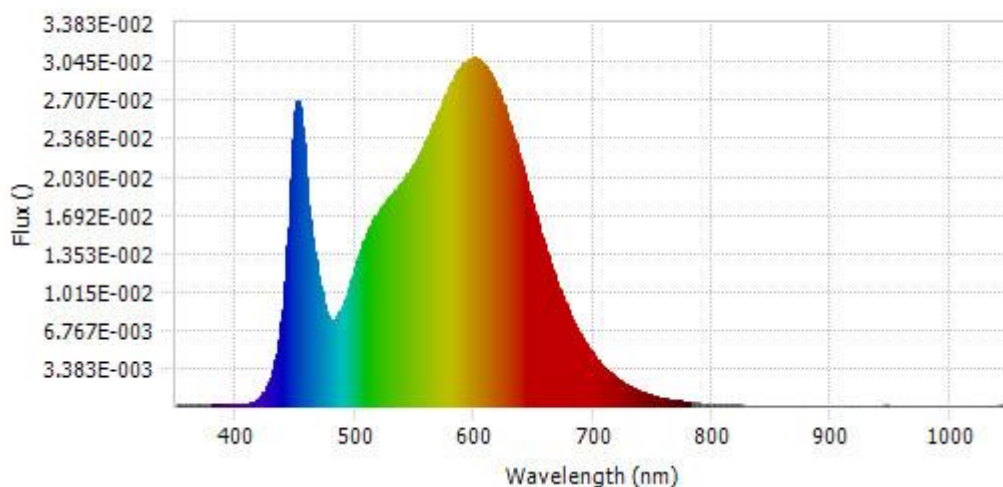
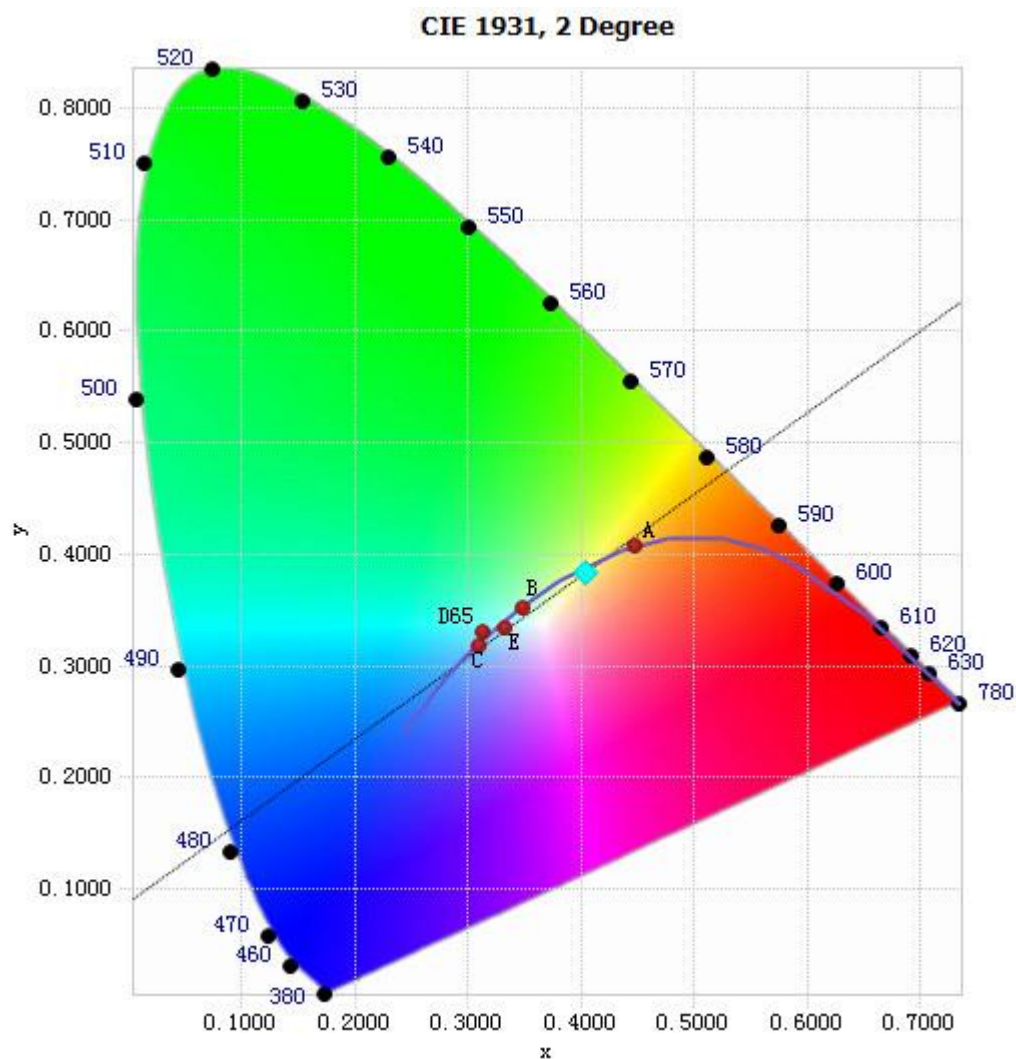


Chart 8: Spectral Power Distribution

Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	1.46E-04	485	7.95E-03	590	3.02E-02	695	5.33E-03
385	1.44E-04	490	8.95E-03	595	3.06E-02	700	4.56E-03
390	1.36E-04	495	1.04E-02	600	3.08E-02	705	3.92E-03
395	1.07E-04	500	1.22E-02	605	3.05E-02	710	3.36E-03
400	1.15E-04	505	1.39E-02	610	2.99E-02	715	2.87E-03
405	1.31E-04	510	1.52E-02	615	2.91E-02	720	2.46E-03
410	2.00E-04	515	1.65E-02	620	2.79E-02	725	2.10E-03
415	4.15E-04	520	1.72E-02	625	2.66E-02	730	1.79E-03
420	7.91E-04	525	1.79E-02	630	2.49E-02	735	1.53E-03
425	1.52E-03	530	1.86E-02	635	2.31E-02	740	1.30E-03
430	2.83E-03	535	1.91E-02	640	2.13E-02	745	1.11E-03
435	5.22E-03	540	1.98E-02	645	1.94E-02	750	9.45E-04
440	9.68E-03	545	2.06E-02	650	1.75E-02	755	8.09E-04
445	1.78E-02	550	2.14E-02	655	1.57E-02	760	6.87E-04
450	2.60E-02	555	2.24E-02	660	1.40E-02	765	5.90E-04
455	2.57E-02	560	2.35E-02	665	1.23E-02	770	5.13E-04
460	1.90E-02	565	2.46E-02	670	1.08E-02	775	4.36E-04
465	1.41E-02	570	2.59E-02	675	9.47E-03	780	3.73E-04
470	1.12E-02	575	2.71E-02	680	8.26E-03		
475	8.60E-03	580	2.83E-02	685	7.17E-03		
480	7.61E-03	585	2.95E-02	690	6.19E-03		

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

Chromaticity Diagram - Sphere Spectroradiometer Method



Tristimulus values(x, y): (0.4036, 0.3844)

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

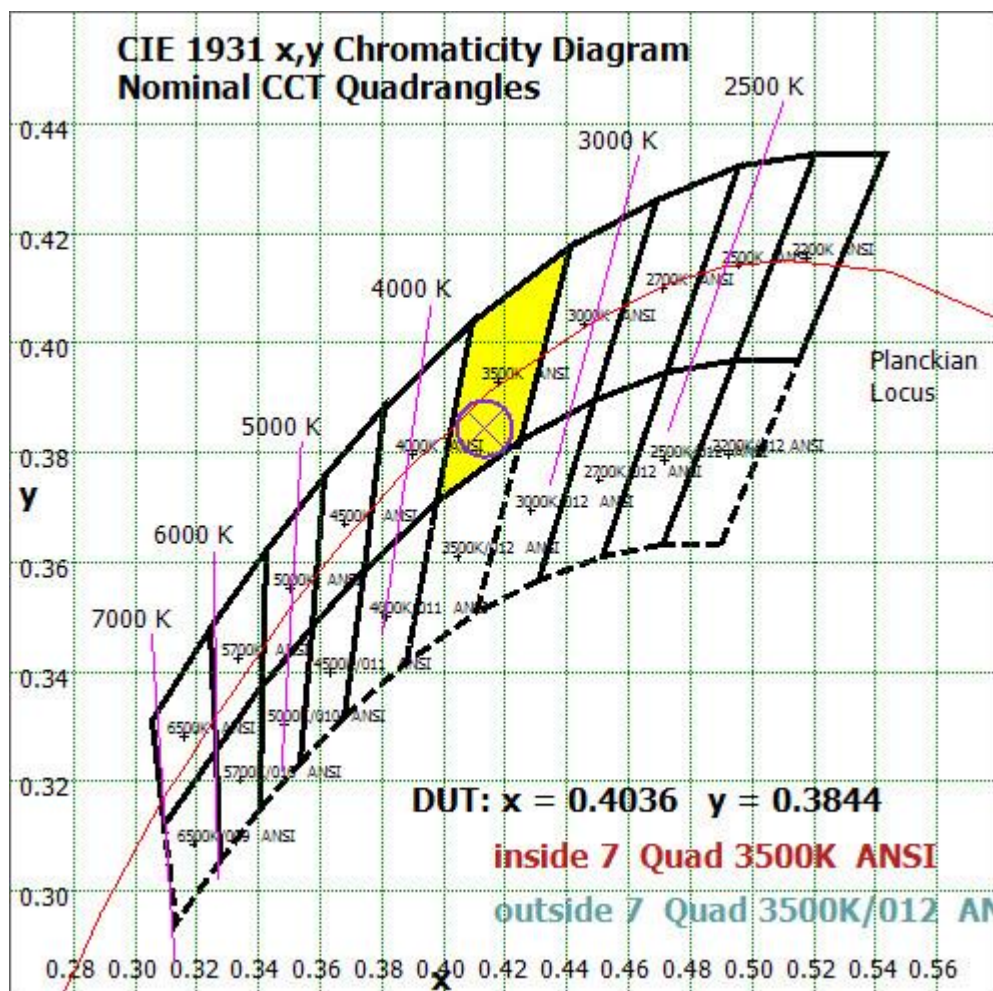


Chart 10: Plot of Lamp x/y coordinates on CIE 1931 Chromaticity Diagram

Color Rendition Report – Sphere Spectroradiometer Method

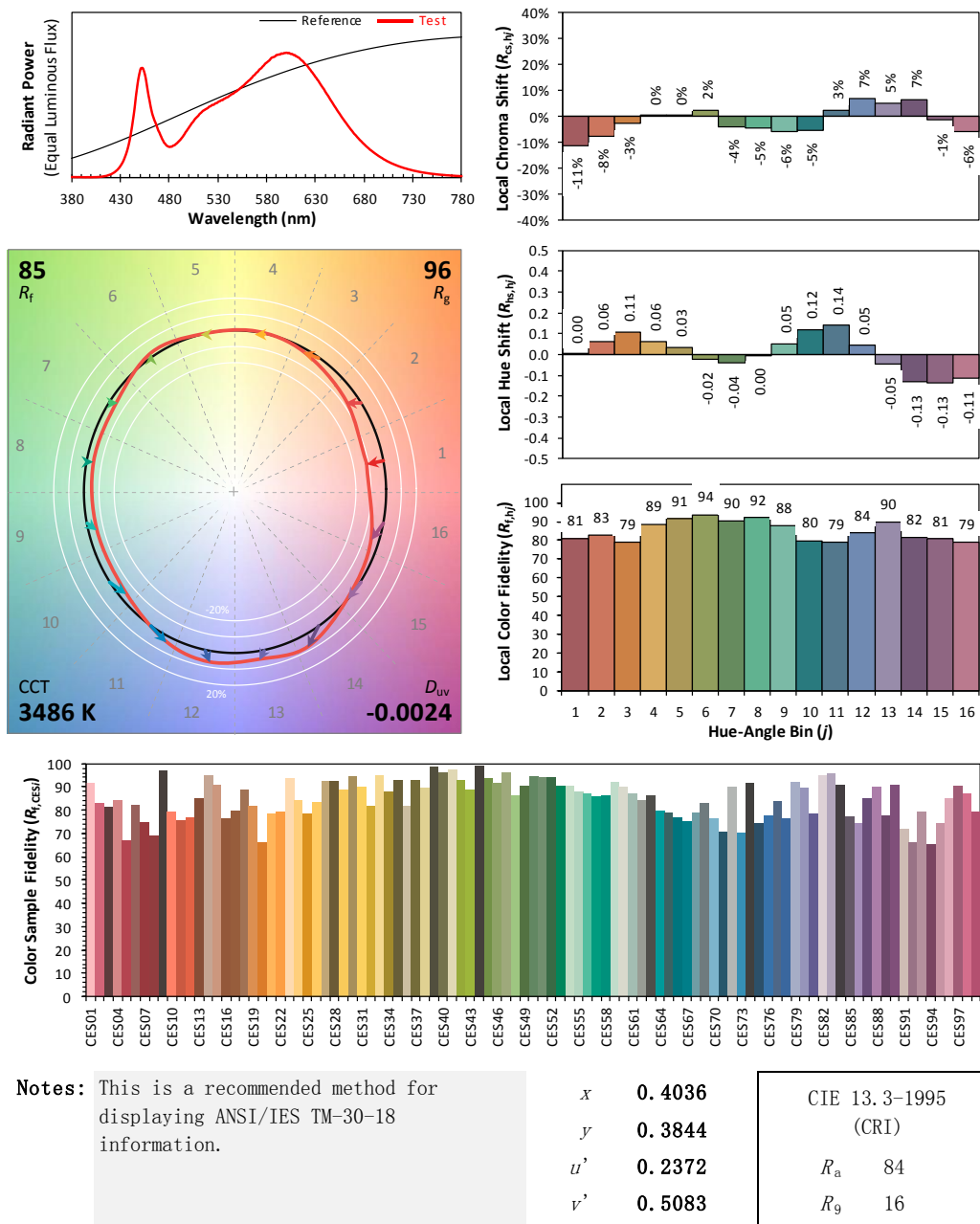
ANSI/IES TM-30-18 Color Rendition Report

Source: LED

Manufacturer: GREEN CREATIVE LTD

Date: 2025/04/07

Model: 12T5HE/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)	0.096	0.045
Power Factor	0.9759	0.9232
Test Power (W)	11.24	11.41
THD A%	19.44	18.51
Luminous Efficacy (lm/W)	149.3	148.0
Total Luminous Flux (lm)	1678.6	1689.0
Color Rendering Index (CRI)	85.1	
R9	19.3	
Correlated Color Temperature (CCT)(K)	4078	
Chromaticity Chroma x	0.3757	
Chromaticity Chroma y	0.3696	
Chromaticity Chroma u	0.2248	
Chromaticity Chroma v	0.3318	
Duv	-0.0020	
Chromaticity Chroma u'	0.2248	
Chromaticity Chroma v'	0.4977	

Special Color Rendering Indices	
R1	84.3
R2	92.2
R3	95.7
R4	83.1
R5	84
R6	87.8
R7	86.2
R8	67.7
R9	19.3
R10	80.5
R11	82.3
R12	62.8
R13	86.7
R14	98.2

Table 10: Test data per Sphere-Spectroradiometer Method

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

Spectral Power Distribution - Sphere Spectroradiometer Method

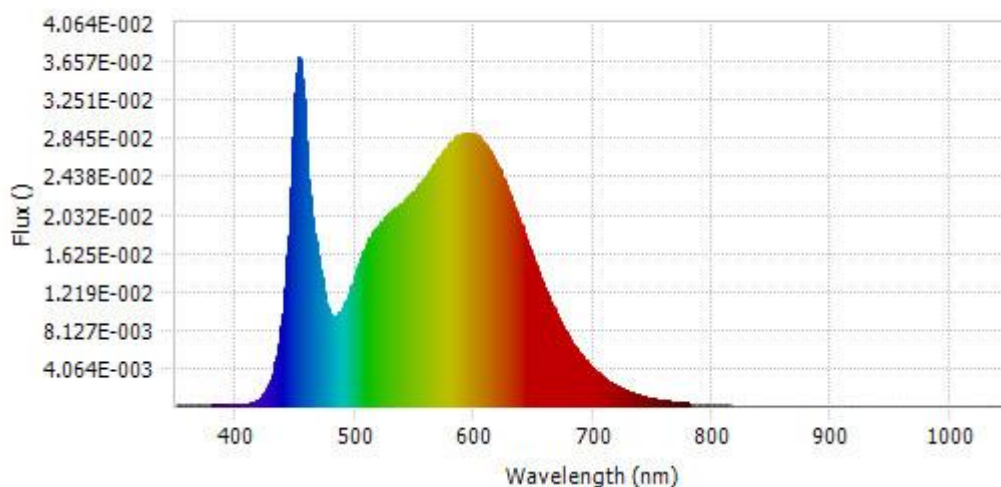
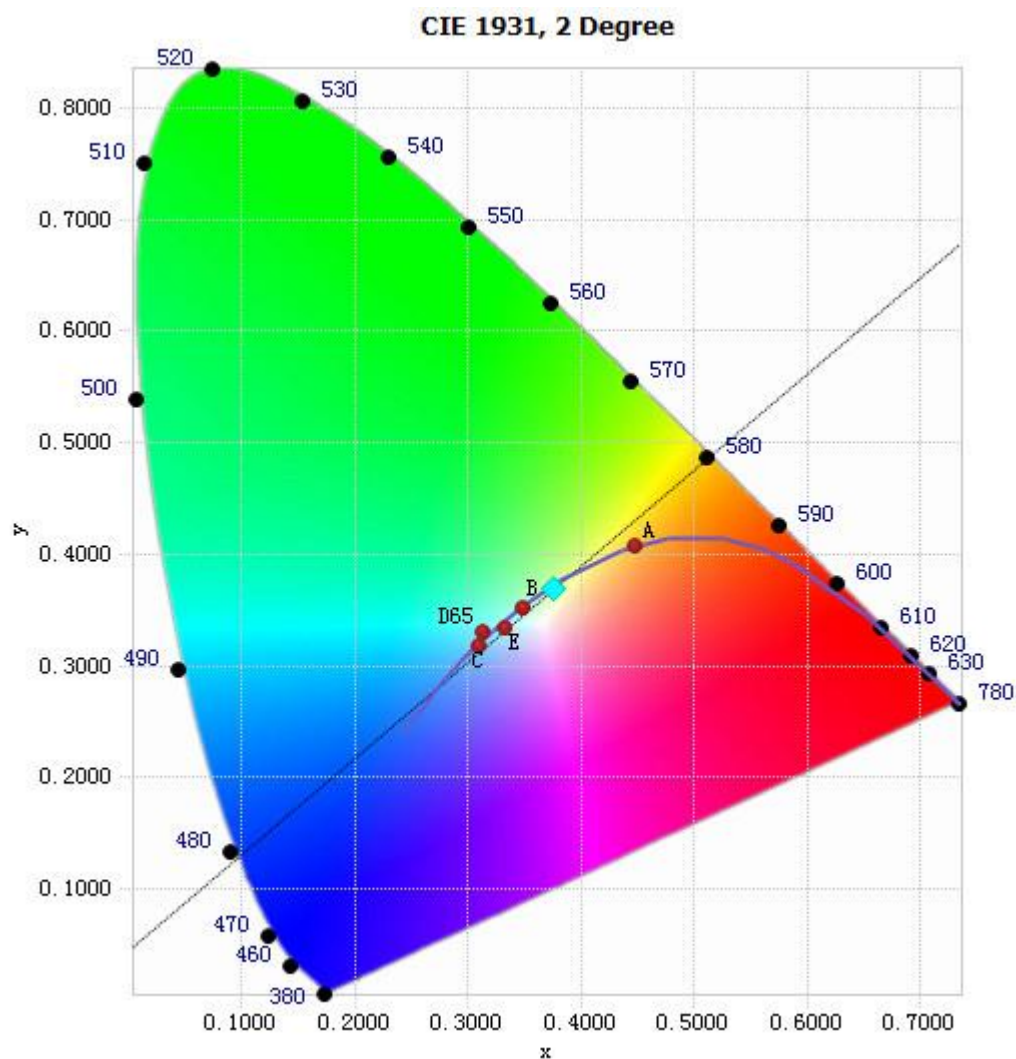


Chart 12: Spectral Power Distribution

Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	1.52E-04	485	9.66E-03	590	2.89E-02	695	4.68E-03
385	1.49E-04	490	1.05E-02	595	2.90E-02	700	4.02E-03
390	1.58E-04	495	1.20E-02	600	2.89E-02	705	3.41E-03
395	1.54E-04	500	1.39E-02	605	2.83E-02	710	2.95E-03
400	1.39E-04	505	1.57E-02	610	2.76E-02	715	2.51E-03
405	1.24E-04	510	1.72E-02	615	2.67E-02	720	2.15E-03
410	2.24E-04	515	1.85E-02	620	2.54E-02	725	1.83E-03
415	4.42E-04	520	1.93E-02	625	2.40E-02	730	1.57E-03
420	8.39E-04	525	2.00E-02	630	2.24E-02	735	1.34E-03
425	1.64E-03	530	2.06E-02	635	2.07E-02	740	1.14E-03
430	3.13E-03	535	2.10E-02	640	1.91E-02	745	9.72E-04
435	5.94E-03	540	2.16E-02	645	1.73E-02	750	8.37E-04
440	1.11E-02	545	2.23E-02	650	1.56E-02	755	7.17E-04
445	2.05E-02	550	2.29E-02	655	1.39E-02	760	6.16E-04
450	3.33E-02	555	2.37E-02	660	1.24E-02	765	5.24E-04
455	3.61E-02	560	2.45E-02	665	1.09E-02	770	4.55E-04
460	2.61E-02	565	2.54E-02	670	9.55E-03	775	3.86E-04
465	1.90E-02	570	2.63E-02	675	8.32E-03	780	3.34E-04
470	1.53E-02	575	2.71E-02	680	7.23E-03		
475	1.14E-02	580	2.79E-02	685	6.28E-03		
480	9.55E-03	585	2.87E-02	690	5.45E-03		

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

Chromaticity Diagram - Sphere Spectroradiometer Method



Tristimulus values(x, y): (0.3757, 0.3696)

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

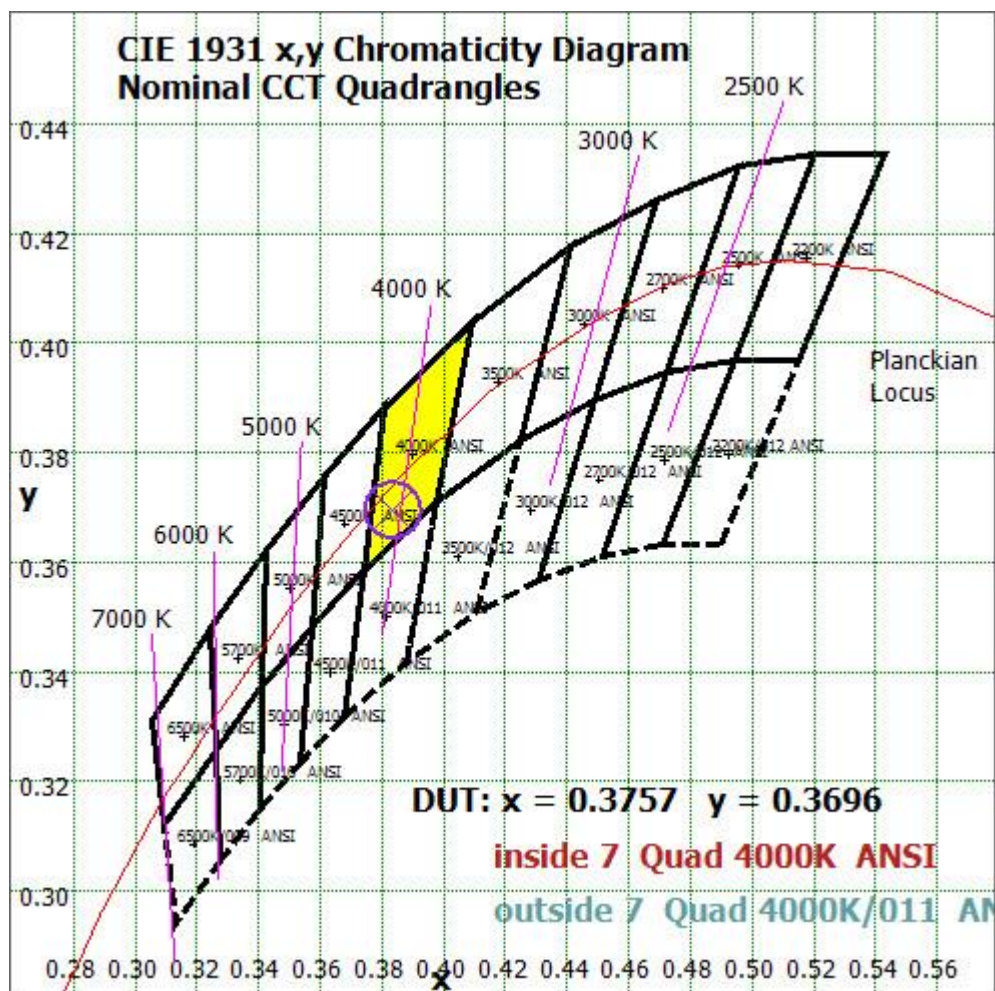


Chart14: Plot of Lamp x/y coordinates on CIE 1931 Chromaticity Diagram

Color Rendition Report – Sphere Spectroradiometer Method

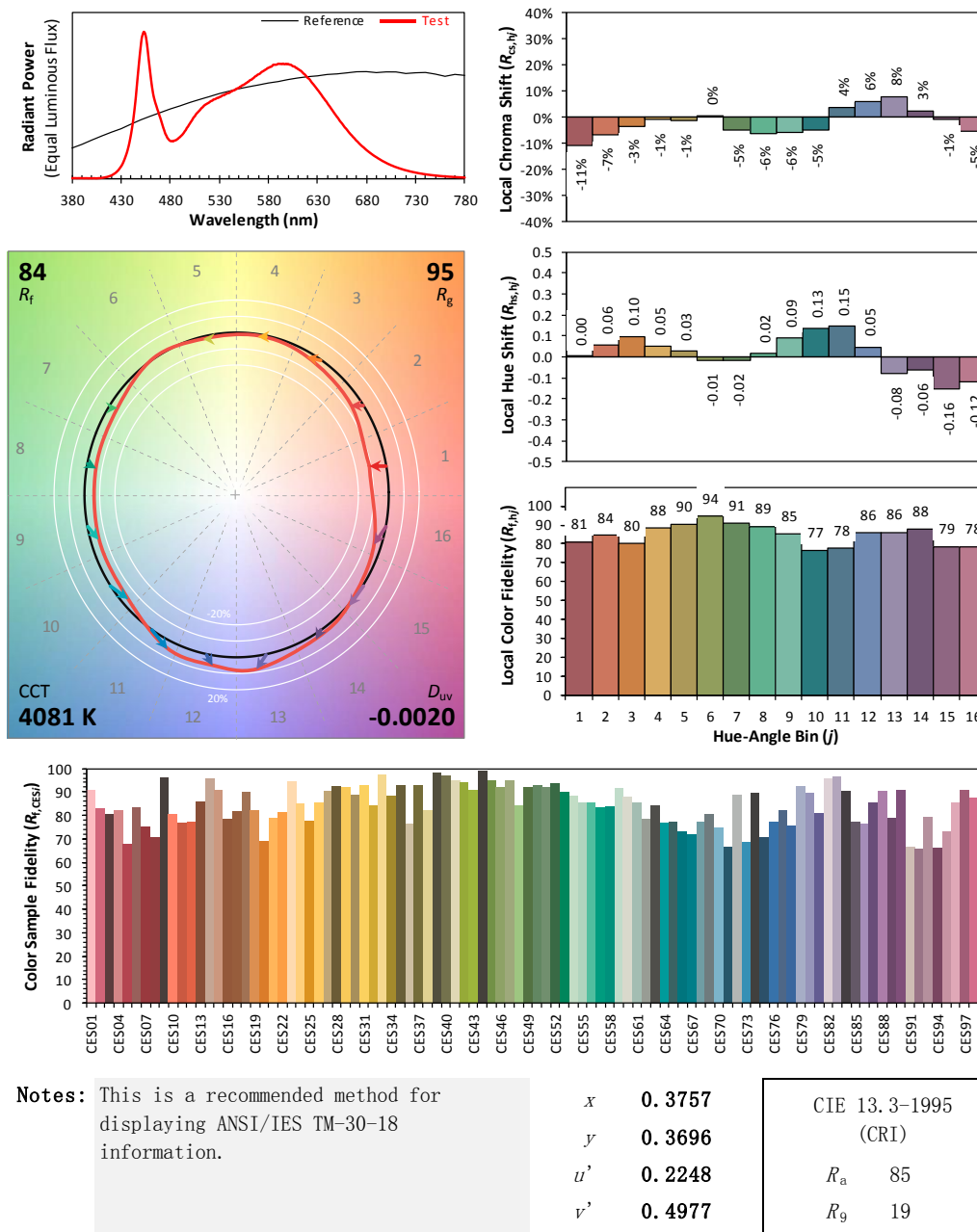
ANSI/IES TM-30-18 Color Rendition Report

Source: LED

Manufacturer: GREEN CREATIVE LTD

Date: 2025/04/07

Model: 12T5HE/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)	0.098	0.045
Power Factor	0.9745	0.9265
Test Power (W)	11.49	11.63
THD A%	19.98	17.72
Luminous Efficacy (lm/W)	142.0	141.4
Total Luminous Flux (lm)	1631.4	1644.7
Color Rendering Index (CRI)	84.1	
R9	14.4	
Correlated Color Temperature (CCT)(K)	4958	
Chromaticity Chroma x	0.3463	
Chromaticity Chroma y	0.3540	
Chromaticity Chroma u	0.2113	
Chromaticity Chroma v	0.3240	
Duv	0.0007	
Chromaticity Chroma u'	0.2113	
Chromaticity Chroma v'	0.4860	

Special Color Rendering Indices	
R1	82.8
R2	91.1
R3	94.7
R4	81.2
R5	82.1
R6	85.5
R7	87.1
R8	68.3
R9	14.4
R10	77.4
R11	80.1
R12	56
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

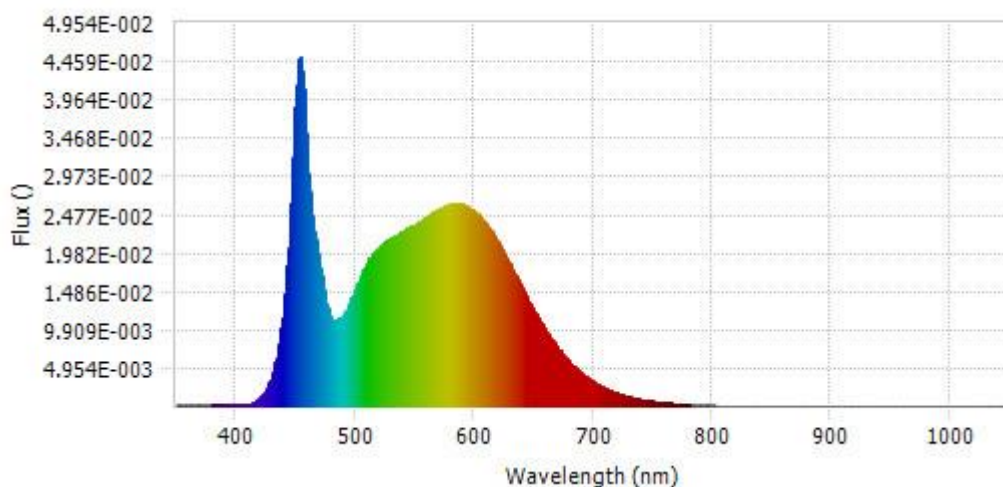
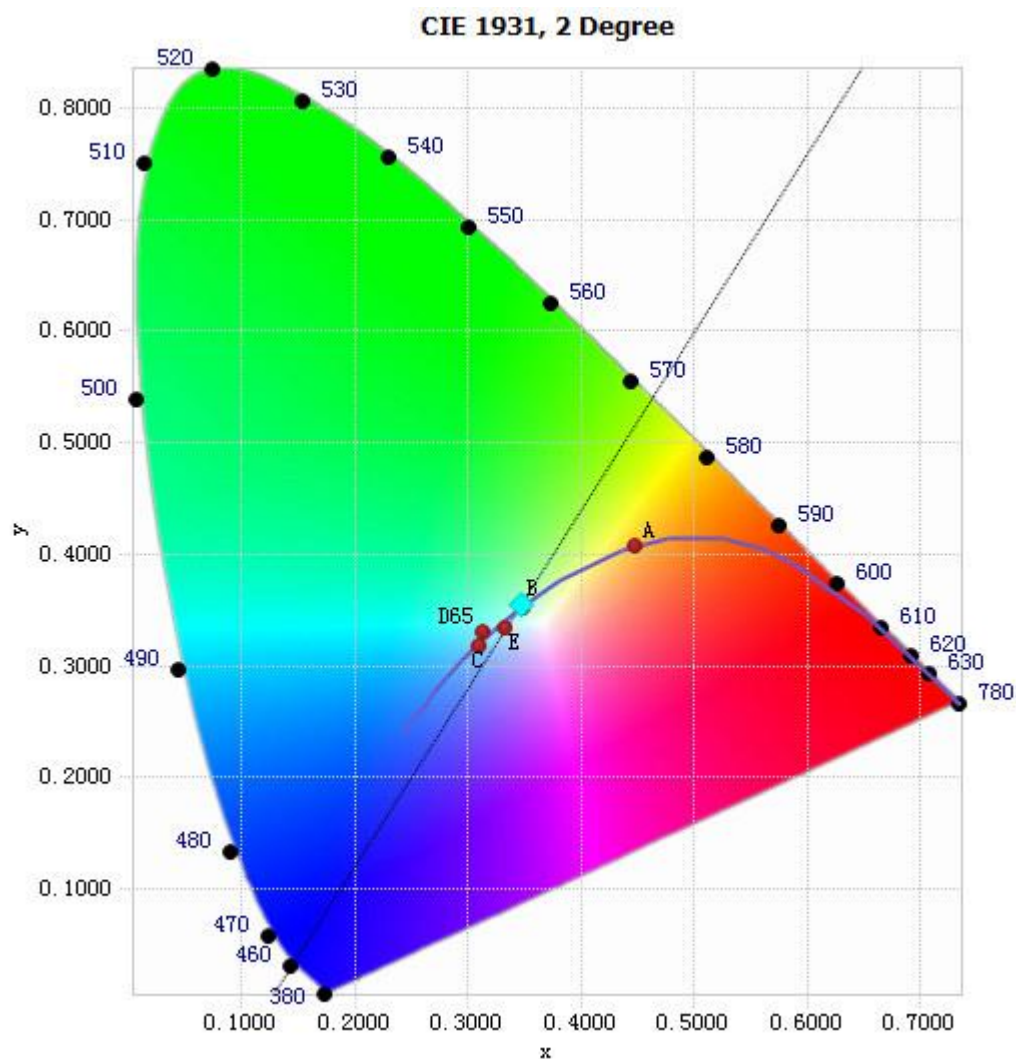


Chart16: Spectral Power Distribution

Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	1.77E-04	485	1.11E-02	590	2.61E-02	695	3.71E-03
385	1.73E-04	490	1.18E-02	595	2.57E-02	700	3.18E-03
390	1.77E-04	495	1.32E-02	600	2.53E-02	705	2.74E-03
395	1.79E-04	500	1.50E-02	605	2.44E-02	710	2.34E-03
400	1.51E-04	505	1.69E-02	610	2.36E-02	715	1.99E-03
405	1.67E-04	510	1.85E-02	615	2.25E-02	720	1.71E-03
410	2.60E-04	515	1.98E-02	620	2.12E-02	725	1.47E-03
415	5.38E-04	520	2.05E-02	625	1.98E-02	730	1.25E-03
420	1.05E-03	525	2.12E-02	630	1.84E-02	735	1.08E-03
425	2.06E-03	530	2.18E-02	635	1.69E-02	740	9.14E-04
430	3.88E-03	535	2.21E-02	640	1.54E-02	745	7.95E-04
435	7.19E-03	540	2.26E-02	645	1.39E-02	750	6.76E-04
440	1.29E-02	545	2.30E-02	650	1.25E-02	755	5.77E-04
445	2.30E-02	550	2.34E-02	655	1.11E-02	760	4.95E-04
450	3.86E-02	555	2.40E-02	660	9.84E-03	765	4.27E-04
455	4.47E-02	560	2.45E-02	665	8.68E-03	770	3.69E-04
460	3.28E-02	565	2.50E-02	670	7.56E-03	775	3.16E-04
465	2.34E-02	570	2.55E-02	675	6.61E-03	780	2.75E-04
470	1.90E-02	575	2.58E-02	680	5.74E-03		
475	1.41E-02	580	2.61E-02	685	4.99E-03		
480	1.13E-02	585	2.63E-02	690	4.31E-03		

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

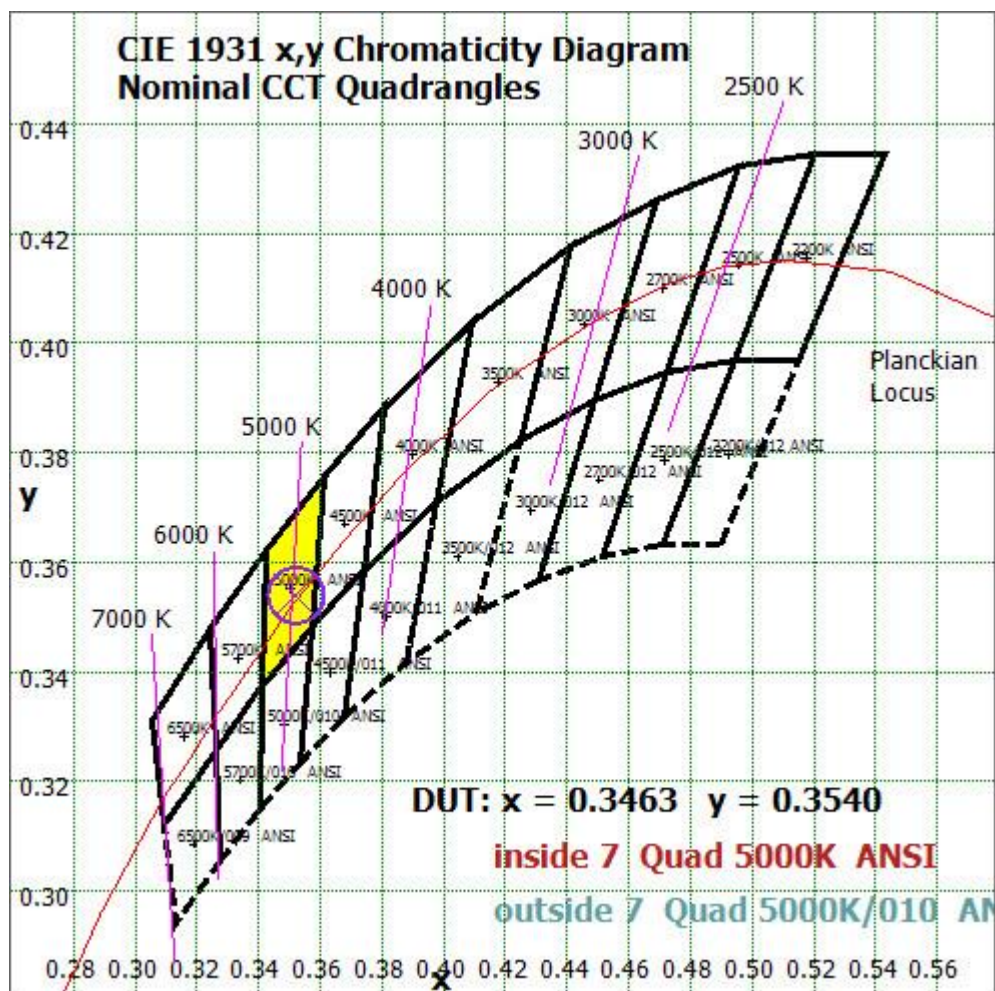
Chromaticity Diagram - Sphere Spectroradiometer Method



Tristimulus values(x, y): (0.3463, 0.3540)

Chart 17: Chromaticity Diagram per Sphere - Spectroradiometer Method

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



Color Rendition Report – Sphere Spectroradiometer Method

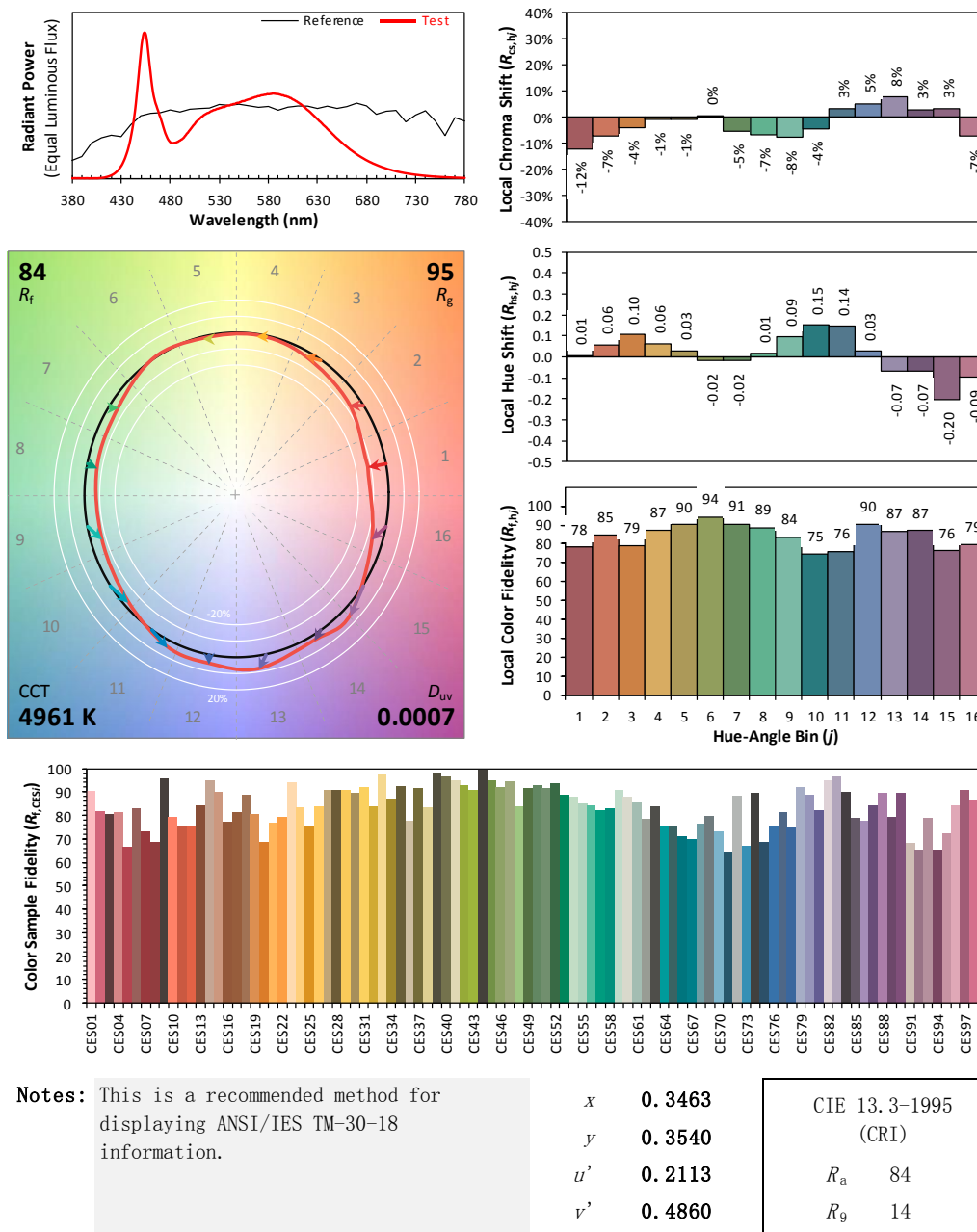
ANSI/IES TM-30-18 Color Rendition Report

Source: LED

Manufacturer: GREEN CREATIVE LTD

Date: 2025/04/07

Model: 12T5HE/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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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.