

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: 15T5HE/4F/8CCTS/UEB/C

Laboratory: Leading Testing Laboratories

NVLAP CODE: 200960-0

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Report No.: HZ25040003e

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

Review by:

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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	15T5HE/4F/8CC TS/UEB/C 3000K Setting	15T5HE/4F/8CC TS/UEB/C 3500K Setting	15T5HE/4F/8CC TS/UEB/C 4000K Setting	15T5HE/4F/8CC TS/UEB/C 5000K Setting
Luminous Efficacy (Lumens /Watt)	138.0	147.8	151.0	144.6
Total Luminous Flux (Lumens)	2081.3	2189.2	2228.2	2182.3
Power (Watts)	15.08	14.81	14.76	15.09
Power Factor	0.9724	0.9737	0.9739	0.9723
CCT (K)	3033	3490	4110	4974
CRI	82.6	84.6	85.3	84.2
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. 08, 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	: 15T5HE/4F/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	0.058
Power Factor	0.9724	0.9459
Test Power (W)	15.08	15.24
THD A%	19.46	17.56
Luminous Efficacy (lm/W)	138.0	139.5
Total Luminous Flux (lm)	2081.3	2126.1
Color Rendering Index (CRI)	82.6	
R9	8.5	
Correlated Color Temperature (CCT)(K)	3033	
Chromaticity Chroma x	0.4330	
Chromaticity Chroma y	0.4001	
Chromaticity Chroma u	0.2497	
Chromaticity Chroma v	0.3462	
Duv	-0.0010	
Chromaticity Chroma u'	0.2497	
Chromaticity Chroma v'	0.5192	

Special Color Rendering Indices	
R1	81
R2	90.5
R3	96.4
R4	80.9
R5	81.3
R6	88.3
R7	83
R8	59.8
R9	8.5
R10	78.5
R11	80.5
R12	71.1
R13	83.2
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

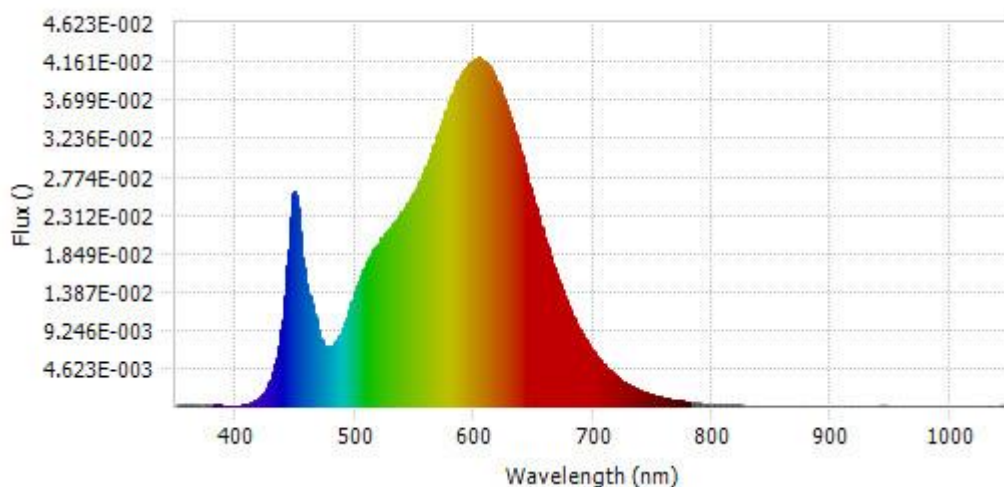
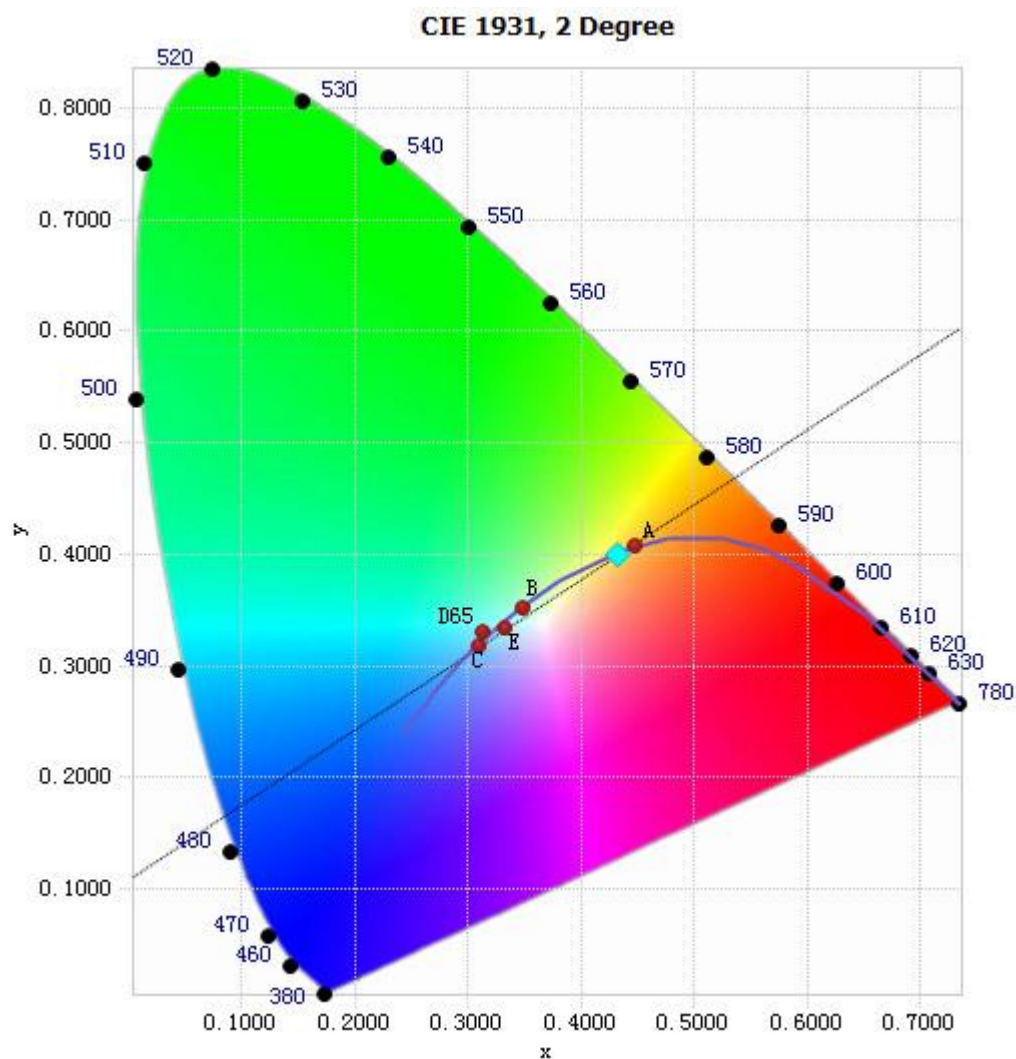


Chart 1: Spectral Power Distribution

Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	1.37E-04	485	8.06E-03	590	4.04E-02	695	7.73E-03
385	1.39E-04	490	9.52E-03	595	4.12E-02	700	6.64E-03
390	1.40E-04	495	1.16E-02	600	4.19E-02	705	5.68E-03
395	1.09E-04	500	1.38E-02	605	4.19E-02	710	4.86E-03
400	1.30E-04	505	1.57E-02	610	4.14E-02	715	4.16E-03
405	1.53E-04	510	1.74E-02	615	4.05E-02	720	3.56E-03
410	2.87E-04	515	1.89E-02	620	3.89E-02	725	3.05E-03
415	5.85E-04	520	1.97E-02	625	3.71E-02	730	2.58E-03
420	1.07E-03	525	2.07E-02	630	3.50E-02	735	2.21E-03
425	1.99E-03	530	2.17E-02	635	3.27E-02	740	1.88E-03
430	3.62E-03	535	2.25E-02	640	3.02E-02	745	1.62E-03
435	6.44E-03	540	2.35E-02	645	2.77E-02	750	1.38E-03
440	1.18E-02	545	2.47E-02	650	2.50E-02	755	1.19E-03
445	2.09E-02	550	2.59E-02	655	2.25E-02	760	1.00E-03
450	2.59E-02	555	2.74E-02	660	2.00E-02	765	8.68E-04
455	1.94E-02	560	2.90E-02	665	1.78E-02	770	7.28E-04
460	1.41E-02	565	3.09E-02	670	1.55E-02	775	6.37E-04
465	1.18E-02	570	3.29E-02	675	1.36E-02	780	5.38E-04
470	8.75E-03	575	3.50E-02	680	1.19E-02		
475	7.21E-03	580	3.71E-02	685	1.04E-02		
480	7.32E-03	585	3.90E-02	690	8.96E-03		

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

Chromaticity Diagram - Sphere Spectroradiometer Method



Tristimulus values(x, y): (0.4330, 0.4001)

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

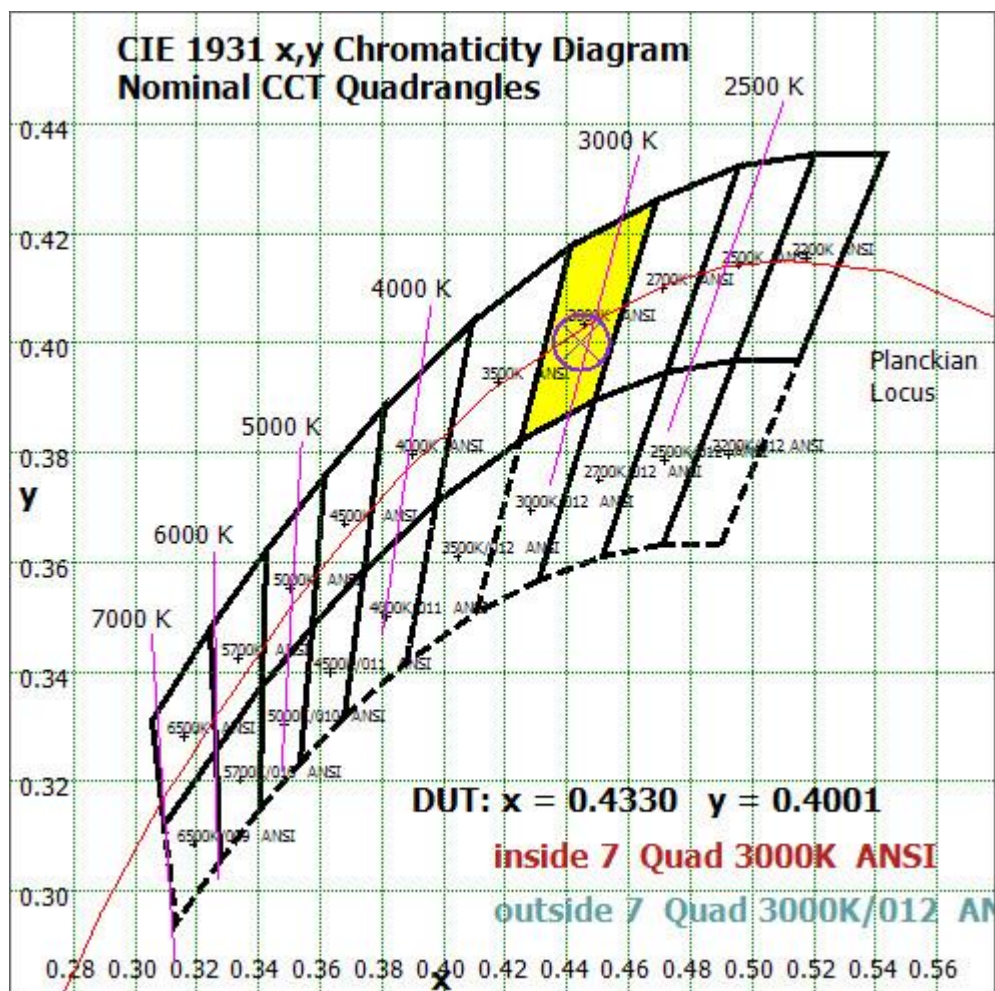


Chart 3: Plot of Lamp x/y coordinates on CIE 1931 Chromaticity Diagram

Color Rendition Report – Sphere Spectroradiometer Method

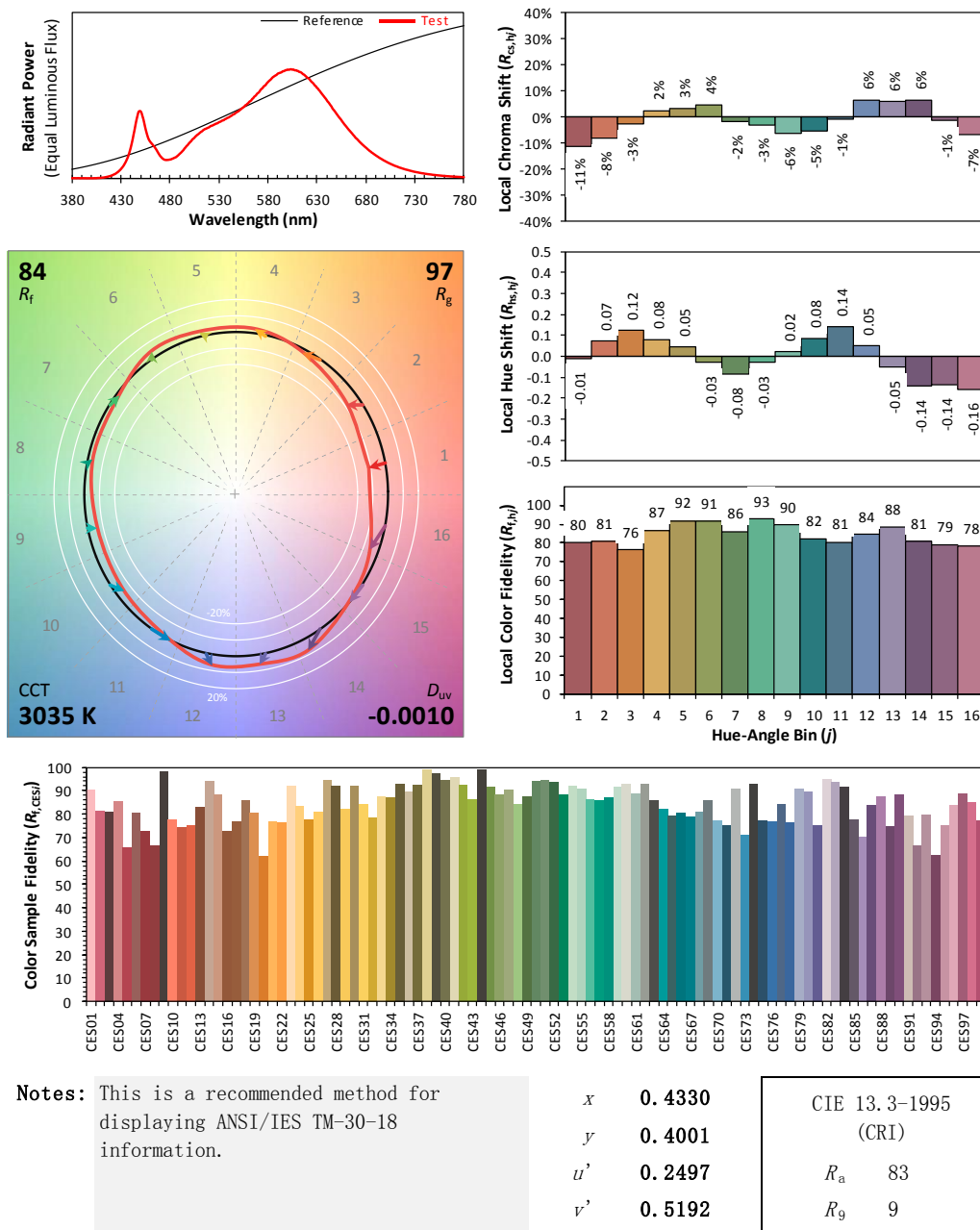
ANSI/IES TM-30-18 Color Rendition Report

Source: LED

Manufacturer: GREEN CREATIVE LTD

Date: 2025/04/08

Model: 15T5HE/4F/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	0.9725
Power (W)	15.10
Luminous Efficacy (lm/W)	139.2
Total Luminous Flux (lm)	2101.8
Beam Angle (°)	114.6 (0°-180°) / 203.5 (90°-270°)
Center Beam Candle Power (cd)	377
Maximum Beam Candle Power (cd)	379.0 (At: C=250.0, Gamma=6.0)
Spacing Criteria	1.27 (0°-180°) / 1.46 (90°-270°)
Zonal Lumens in the 0 °-60 °Zone	46.73%
Zonal Lumens in the 60 °-90 °Zone	28.43%
Zonal Lumens in the 90 °-120 °Zone	16.41%
Zonal Lumens in the 120 °-180 °Zone	8.43%

Table 4: Test data per Goniophotometer Method

Zonal Lumen Tabulation- Goniophotometer Method

$\gamma(^{\circ})$	Lumens	% Total
0- 10	35.869	1.71%
10- 20	104.244	4.96%
20- 30	163.057	7.76%
30- 40	207.118	9.85%
40- 50	232.896	11.08%
50- 60	239.086	11.38%
60- 70	227.019	10.80%
70- 80	201.285	9.58%
80- 90	169.148	8.05%
90-100	139.506	6.64%
100-110	114.246	5.44%
110-120	91.124	4.34%
120-130	69.737	3.32%
130-140	49.728	2.37%
140-150	32.428	1.54%
150-160	18.143	0.86%
160-170	6.032	0.29%
170-180	1.127	0.05%
Total	2101.8	100%

$\gamma(^{\circ})$	Lumens	% Total
0- 60	982.27	46.73%
60- 90	597.452	28.43%
0-90	1579.722	75.16%
90- 180	522.071	24.84%
0- 180	2101.8	100%

Table 5: Zonal Lumen

Illuminance Plots- Goniophotometer Method

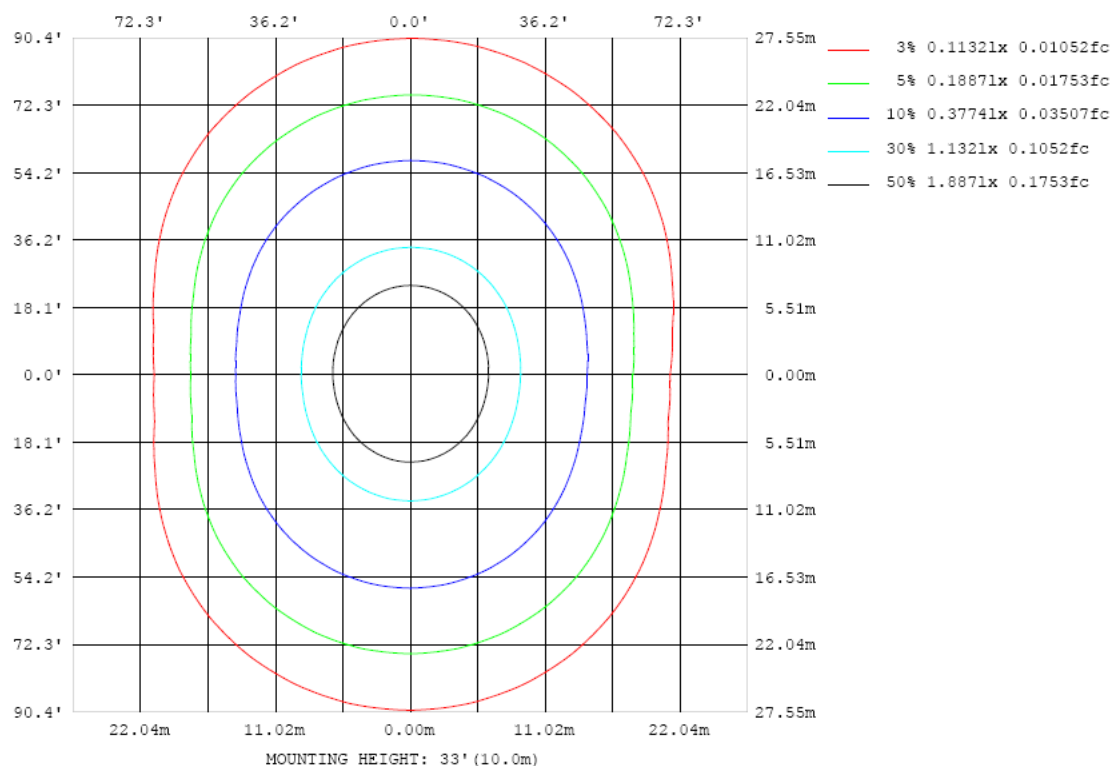


Chart 5: Illuminance Plot (Footcandles)

Luminous Intensity Distribution Plots- Goniophotometer Method

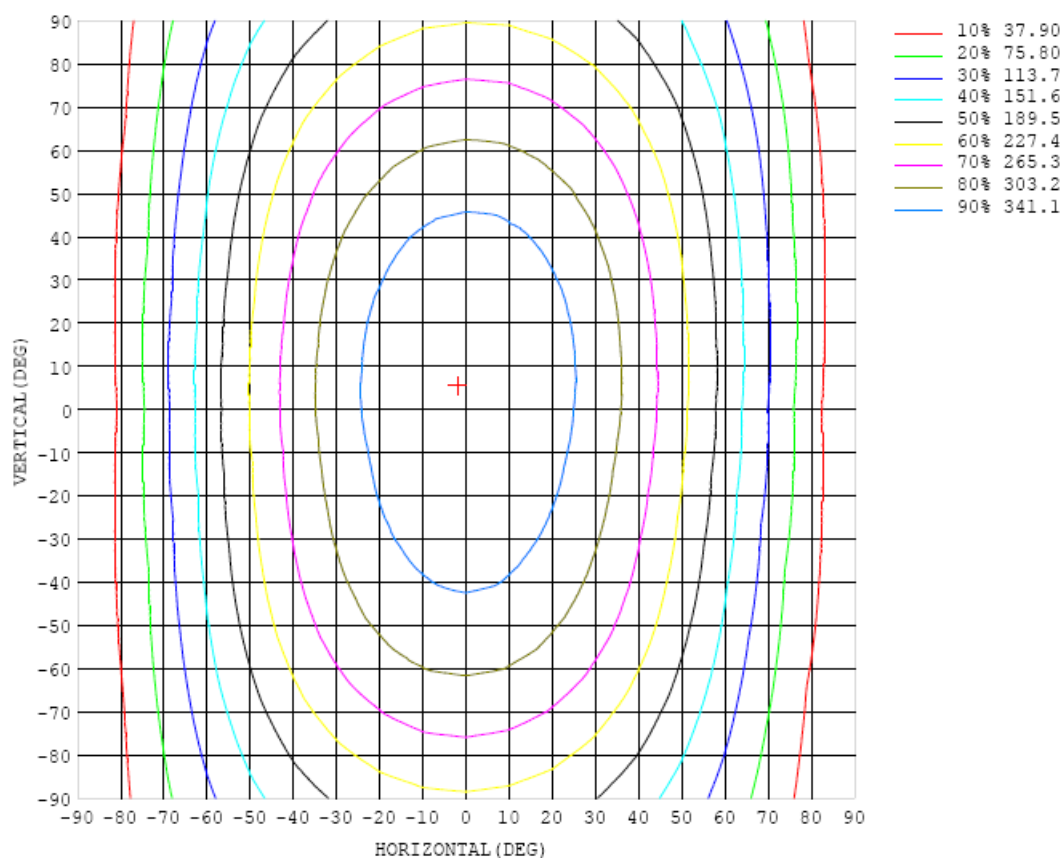


Chart 6: Isocandela Plot

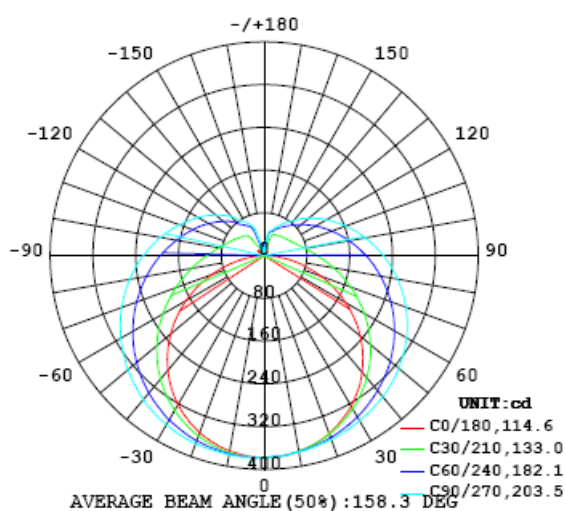


Chart 7: Polar Candela Distribution

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	377	377	377	377	377	377	377	377	377	377	377	377	377	377	377	377	377	377	377
5	376	376	376	376	376	376	376	376	376	376	376	376	376	375	375	375	376	375	376
10	372	371	372	372	372	373	373	373	373	373	373	372	372	372	371	371	370	371	371
15	365	364	364	365	366	367	368	369	370	370	370	369	368	367	365	363	362	362	363
20	354	354	354	356	358	360	363	364	366	367	366	364	362	360	357	354	352	352	352
25	341	341	342	344	348	352	356	359	361	362	361	359	356	352	348	342	339	338	339
30	325	324	326	331	337	343	348	353	356	357	356	352	348	342	336	329	324	321	322
35	306	306	309	316	324	332	339	346	350	351	350	346	339	333	323	314	307	302	303
40	285	285	290	299	309	320	330	338	343	345	343	338	330	320	309	297	287	281	280
45	261	261	268	280	293	307	319	329	335	337	335	329	320	308	293	279	266	256	255
50	235	235	244	260	276	293	308	319	326	328	327	320	308	294	277	259	242	231	228
55	206	208	220	238	259	279	295	308	315	318	316	308	296	280	260	238	218	203	199
60	176	178	194	216	240	263	281	296	304	307	305	297	283	265	243	217	193	174	169
65	144	148	167	194	222	247	267	282	292	295	292	283	269	249	224	196	168	144	137
70	113	118	141	172	203	230	252	268	278	282	279	270	254	233	206	175	143	114	105
75	81.1	88.1	116	151	184	213	236	253	264	268	265	255	239	217	189	156	119	85.8	72.8
80	51.3	60.9	93.4	132	167	197	221	238	249	254	250	241	224	201	172	137	98.5	60.9	42.8
85	24.6	38.6	74.7	114	151	181	206	223	234	238	235	225	209	186	156	121	81.4	40.9	17.3
90	4.32	23.1	60.1	99.5	136	166	191	208	219	223	220	210	194	171	142	107	68.5	29.0	2.91
95	2.41	17.1	50.3	87.4	122	152	175	193	203	207	205	195	179	157	128	94.8	58.8	23.6	1.37
100	3.29	15.6	44.1	77.7	110	139	161	178	188	192	189	180	165	144	117	85.1	52.0	22.1	1.54
105	4.87	16.1	40.3	69.8	99.5	126	148	163	173	177	175	166	152	131	106	77.0	47.6	22.5	2.38
110	5.80	17.7	38.3	63.8	90.3	115	134	149	159	162	160	152	138	120	96.4	70.9	45.0	24.0	3.72
115	5.54	19.8	37.5	59.0	82.3	104	122	136	145	148	146	138	126	109	88.1	65.6	43.1	25.8	6.60
120	1.96	22.3	37.4	55.7	75.6	94.7	111	123	131	134	133	126	115	99.3	80.8	61.2	42.0	28.0	8.89
125	3.72	25.1	37.8	52.7	69.4	86.2	100	111	119	121	120	114	104	90.3	74.2	57.4	41.6	28.9	13.4
130	2.87	27.5	38.5	50.5	64.2	78.3	90.6	100	106	109	108	102	93.7	82.1	68.6	54.6	41.2	25.1	14.8
135	3.93	26.0	38.6	48.8	60.0	71.3	81.7	89.9	95.2	97.5	96.4	91.7	84.4	74.6	63.6	52.3	41.8	23.9	12.8
140	6.66	16.6	37.1	47.6	56.5	65.3	73.5	80.3	84.8	86.7	85.7	82.0	76.0	67.9	59.2	50.0	42.9	18.6	4.68
145	5.92	5.48	37.3	45.7	53.1	60.5	66.5	71.8	75.4	76.8	76.2	73.1	68.3	62.6	56.0	47.6	41.8	23.5	9.58
150	5.54	9.25	36.5	44.4	49.7	56.0	60.7	64.4	67.1	68.3	67.7	65.5	62.3	58.1	51.9	44.7	39.1	21.3	7.75
155	4.60	4.98	23.9	43.4	46.8	50.7	55.5	58.7	60.6	61.3	61.0	59.6	57.1	52.9	47.3	42.8	31.3	11.6	10.6
160	4.24	6.51	10.0	40.2	45.3	47.1	49.2	51.5	53.2	53.9	53.6	52.2	50.2	47.5	42.3	35.3	19.1	0.72	10.4
165	2.11	5.79	9.14	18.2	37.0	44.6	46.3	47.2	47.9	48.3	48.2	47.8	45.6	40.5	33.1	21.0	8.46	7.39	3.18
170	4.80	8.24	7.87	6.00	9.86	20.5	29.1	39.5	41.6	42.0	42.3	39.7	31.6	19.4	12.5	5.58	7.64	10.6	6.13
175	6.38	2.69	7.51	10.0	5.35	9.22	10.8	9.17	7.83	8.51	7.48	6.20	6.44	7.79	7.11	4.74	10.1	10.5	4.61
180	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48

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	377	377	377	377	377	377	377	377	377	377	377	377	377	377	377	377	377		
5	376	378	378	377	377	378	379	378	378	378	379	379	379	378	377	377	377		
10	372	373	374	375	376	376	378	378	378	379	378	377	376	376	375	374	372		
15	364	366	368	370	372	373	375	376	376	377	376	374	373	372	370	368	366		
20	354	356	360	363	366	369	372	373	374	374	372	370	368	364	361	358	356		
25	341	344	347	353	358	362	367	370	371	370	369	365	361	356	351	347	343		
30	324	328	335	342	349	355	361	364	365	365	362	358	352	345	339	332	328		
35	305	310	319	329	338	346	353	358	359	358	355	349	342	333	324	316	310		
40	284	291	302	314	325	335	344	350	352	351	347	340	330	319	308	296	289		
45	259	269	282	297	312	324	334	340	342	342	337	328	317	304	290	276	266		
50	233	245	262	280	297	311	322	330	333	331	326	316	303	288	270	253	241		
55	205	220	241	262	282	298	310	318	321	321	314	304	288	270	250	230	214		
60	176	194	219	244	266	284	297	307	310	308	301	289	273	253	229	205	186		
65	146	168	197	225	249	269	284	293	297	295	288	275	257	235	208	180	157		
70	117	143	176	207	233	254	270	280	283	281	274	260	241	216	187	156	129		
75	87.6	120	156	189	217	239	255	265	269	267	259	245	225	199	167	133	100		
80	61.3	98.9	138	172	201	224	241	251	255	254	245	230	209	182	149	112	74.0		
85	39.6	81.1	122	157	186	209	226	237	241	239	230	215	194	166	131	91.4	50.6		
90	25.3	67.3	107	142	171	194	211	222	226	224	215	201	179	151	115	73.5	30.2		
95	18.3	56.8	95.3	130	158	180	197	207	211	209	201	186	165	137	102	62.4	22.4		
100	15.3	49.8	85.6	118	145	166	183	193	197	195	186	172	152	126	91.8	54.6	19.2		
105	14.7	45.6	77.8	108	134	154	169	179	183	181	172	159	140	115	83.1	49.5	18.1		
110	14.6	43.4	71.6	99.3	123	142	156	165	169	167	159	147	129	105	76.1	46.0	18.2		
115	15.7	41.9	66.7	91.5	113	131	144	152	155	153	147	135	118	96.3	70.4	43.8	17.5		
120	16.4	41.3	62.5	84.5	104	120	132	140	143	142	135	124	108	88.4	65.6	42.4	7.76		
125	16.7	37.4	58.4	77.7	95.6	110	121	128	130	129	123	113	98.7	81.6	60.0	40.9	12.1		
130	2.80	22.9	54.7	70.8	87.6	99.8	110	116	118	117	111	102	90.3	73.7	55.8	38.9	5.62		
135	6.28	23.2	53.0	63.2	77.7	91.0	99.1	105	107	105	100	92.7	80.3	66.0	52.3	33.4	5.50		
140	13.0	24.3	48.2	60.2	68.7	78.2	88.2	93.9	95.5	94.4	89.7	80.6	70.4	61.7	49.3	5.79	5.44		
145	11.4	0.00	22.6	58.7	64.0	70.6	75.2	78.3	79.4	78.3	75.9	72.3	65.6	57.5	42.9	10.2	11.2		
150	13.4	1.75	18.2	48.5	59.3	64.5	68.8	71.6	72.8	72.1	69.7	65.4	60.7	51.5	4.47	4.58	9.88		
155	17.1	12.3	1.85	13.6	43.5	59.3	62.1	64.2	65.0	64.4	62.6	60.2	51.6	15.1	5.79	5.74	15.1		
160	15.7	11.8	5.25	6.98	2.73	11.0	41.4	53.7	55.6	55.1	51.1	32.6	2.20	6.84	7.27	9.76	19.8		
165	10.1	16.8	11.0	5.37	3.31	4.23	4.69	3.94	3.78	5.21	6.62	8.06	12.7	2.85	8.94	19.1	14.6		
170	4.10	10.0	18.0	16.0	16.6	10.5	5.78	3.55	3.55	4.19	4.94	5.52	12.0	14.0	16.5	20.3	8.29		
175	5.00	7.22	4.29	12.2	24.3	23.6	23.3	22.1	14.1	11.1	21.8	23.6	21.5	18.8	7.03	4.33	7.38		
180	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48		

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)	0.127	0.058
Power Factor	0.9737	0.9441
Test Power (W)	14.81	15.01
THD A%	19.91	17.79
Luminous Efficacy (lm/W)	147.8	148.5
Total Luminous Flux (lm)	2189.2	2229.6
Color Rendering Index (CRI)	84.6	
R9	16.6	
Correlated Color Temperature (CCT)(K)	3490	
Chromaticity Chroma x	0.4031	
Chromaticity Chroma y	0.3841	
Chromaticity Chroma u	0.2371	
Chromaticity Chroma v	0.3388	
Duv	-0.0025	
Chromaticity Chroma u'	0.2371	
Chromaticity Chroma v'	0.5081	

Special Color Rendering Indices	
R1	83.6
R2	92.1
R3	96.1
R4	82.7
R5	83.8
R6	89
R7	84.7
R8	64.7
R9	16.6
R10	81.1
R11	82.2
R12	68.2
R13	85.9
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

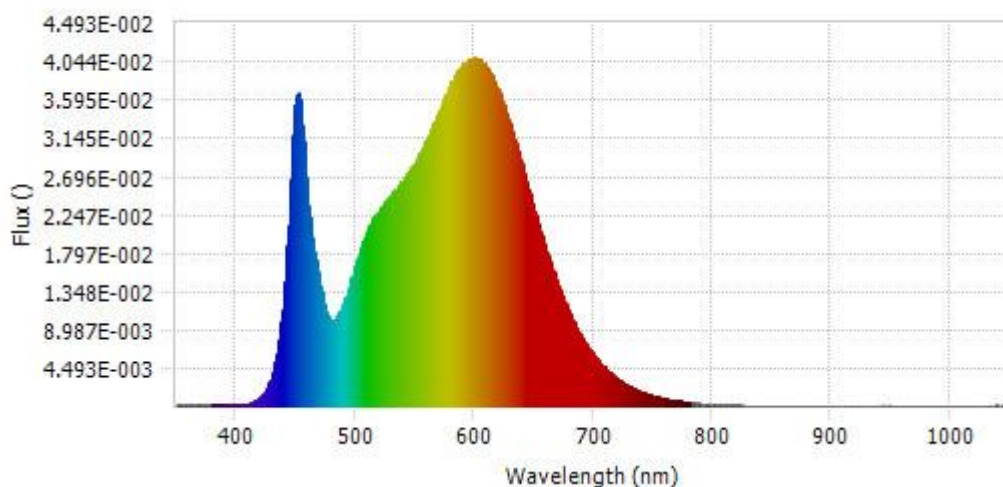
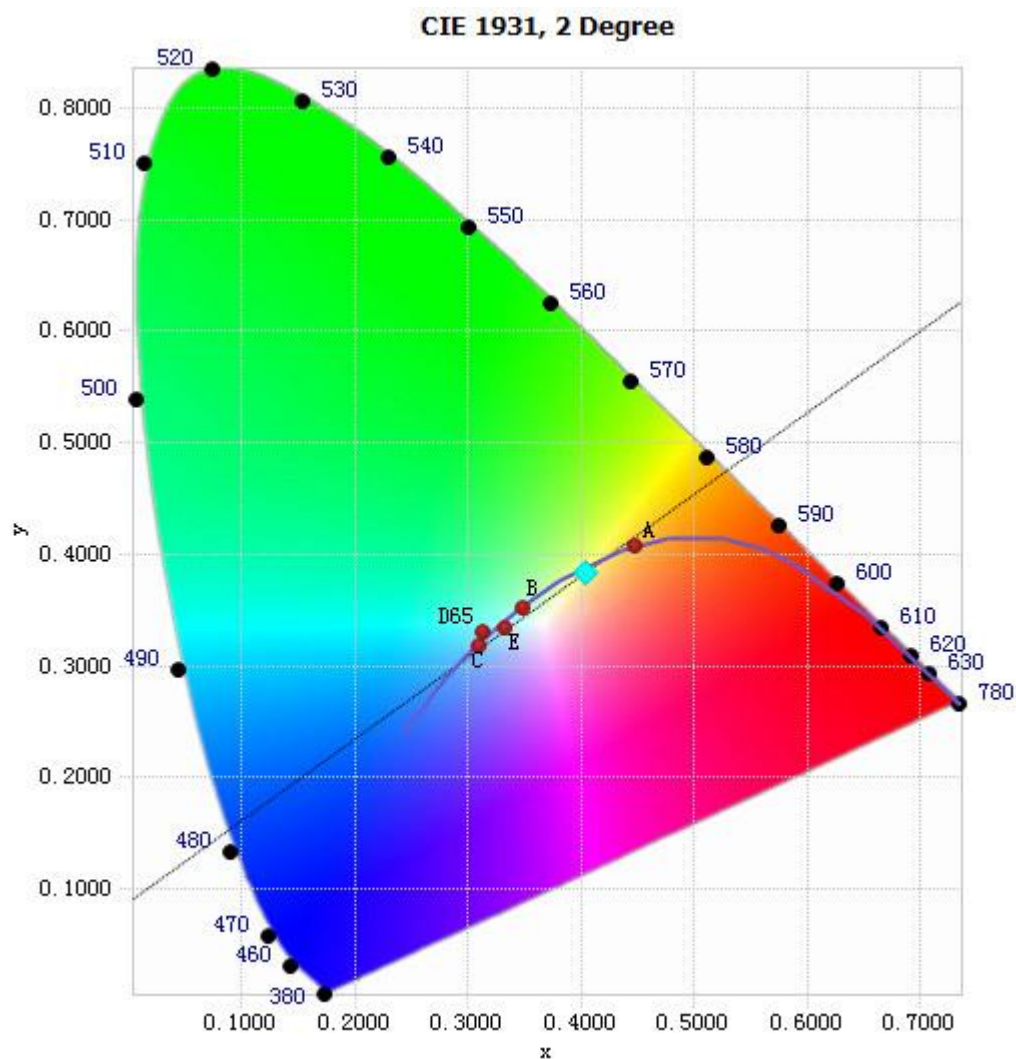


Chart 8: Spectral Power Distribution

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	4.00E-02	695	7.14E-03
385	1.64E-04	490	1.20E-02	595	4.06E-02	700	6.12E-03
390	1.87E-04	495	1.40E-02	600	4.09E-02	705	5.23E-03
395	1.71E-04	500	1.64E-02	605	4.06E-02	710	4.48E-03
400	1.55E-04	505	1.86E-02	610	3.99E-02	715	3.82E-03
405	1.72E-04	510	2.04E-02	615	3.87E-02	720	3.27E-03
410	2.63E-04	515	2.20E-02	620	3.71E-02	725	2.79E-03
415	5.42E-04	520	2.29E-02	625	3.53E-02	730	2.40E-03
420	1.02E-03	525	2.39E-02	630	3.31E-02	735	2.04E-03
425	1.95E-03	530	2.48E-02	635	3.08E-02	740	1.74E-03
430	3.63E-03	535	2.55E-02	640	2.84E-02	745	1.48E-03
435	6.79E-03	540	2.65E-02	645	2.59E-02	750	1.28E-03
440	1.28E-02	545	2.75E-02	650	2.34E-02	755	1.09E-03
445	2.39E-02	550	2.85E-02	655	2.10E-02	760	9.18E-04
450	3.53E-02	555	2.98E-02	660	1.87E-02	765	7.95E-04
455	3.47E-02	560	3.12E-02	665	1.66E-02	770	6.76E-04
460	2.51E-02	565	3.28E-02	670	1.44E-02	775	5.78E-04
465	1.89E-02	570	3.44E-02	675	1.26E-02	780	5.00E-04
470	1.48E-02	575	3.60E-02	680	1.11E-02		
475	1.14E-02	580	3.77E-02	685	9.60E-03		
480	1.01E-02	585	3.92E-02	690	8.30E-03		

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

Chromaticity Diagram - Sphere Spectroradiometer Method



Tristimulus values(x, y): (0.4031, 0.3841)

Chart 9: Chromaticity Diagram per Sphere - Spectroradiometer Method

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

CIE 1931 x,y Chromaticity Diagram
Nominal CCT Quadrangles

2500 K
 3000 K
 4000 K
 5000 K
 6000 K
 7000 K

Planckian Locus

3500K ANSI
 3000K ANSI
 2700K ANSI
 2500K ANSI
 3500K/012 ANSI
 3000K/012 ANSI
 2700K/012 ANSI
 2500K/012 ANSI
 4000K/011 ANSI
 3500K/011 ANSI
 3000K/011 ANSI
 2500K/011 ANSI
 5000K/010 ANSI
 4500K/010 ANSI
 4000K/010 ANSI
 3500K/010 ANSI
 6500K/009 ANSI
 6000K/009 ANSI
 5500K/009 ANSI
 5000K/009 ANSI
 4500K/009 ANSI
 4000K/009 ANSI
 3500K/009 ANSI
 3000K/009 ANSI
 2500K/009 ANSI

DUT: $x = 0.4031$ $y = 0.3841$

inside 7 Quad 3500K ANSI
outside 7 Quad 3500K/012 ANSI

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Color Rendition Report – Sphere Spectroradiometer Method

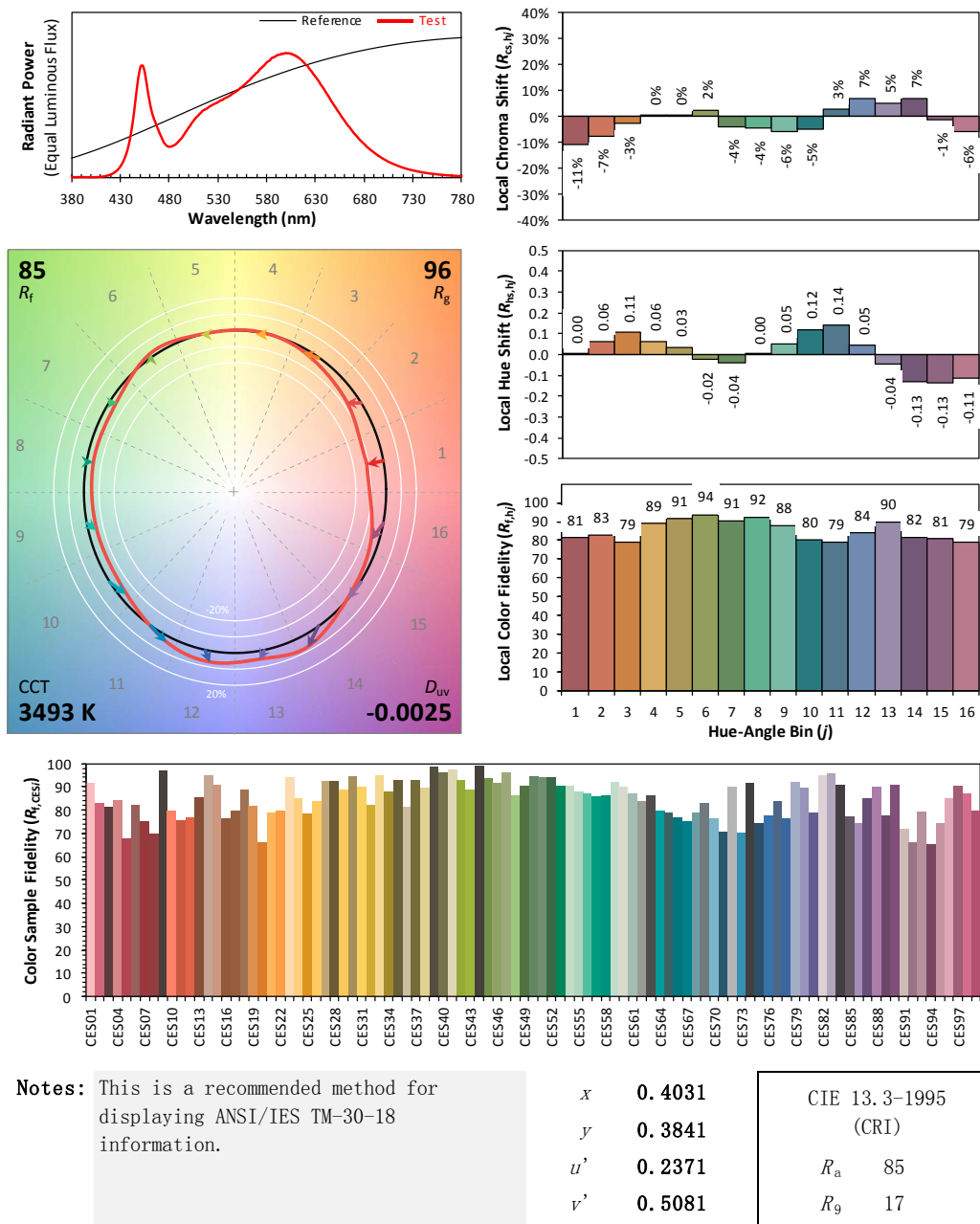
ANSI/IES TM-30-18 Color Rendition Report

Source: LED

Manufacturer: GREEN CREATIVE LTD

Date: 2025/04/08

Model: 15T5HE/4F/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)	0.126	0.057
Power Factor	0.9739	0.9437
Test Power (W)	14.76	14.94
THD A%	19.82	17.74
Luminous Efficacy (lm/W)	151.0	152.1
Total Luminous Flux (lm)	2228.2	2271.8
Color Rendering Index (CRI)	85.3	
R9	20.2	
Correlated Color Temperature (CCT)(K)	4110	
Chromaticity Chroma x	0.3743	
Chromaticity Chroma y	0.3683	
Chromaticity Chroma u	0.2244	
Chromaticity Chroma v	0.3313	
Duv	-0.0021	
Chromaticity Chroma u'	0.2244	
Chromaticity Chroma v'	0.4969	

Special Color Rendering Indices	
R1	84.5
R2	92.2
R3	95.6
R4	83.3
R5	84.2
R6	87.8
R7	86.4
R8	68.2
R9	20.2
R10	80.6
R11	82.6
R12	62.7
R13	86.9
R14	98.1

Table 10: Test data per Sphere-Spectroradiometer Method

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

Spectral Power Distribution - Sphere Spectroradiometer Method

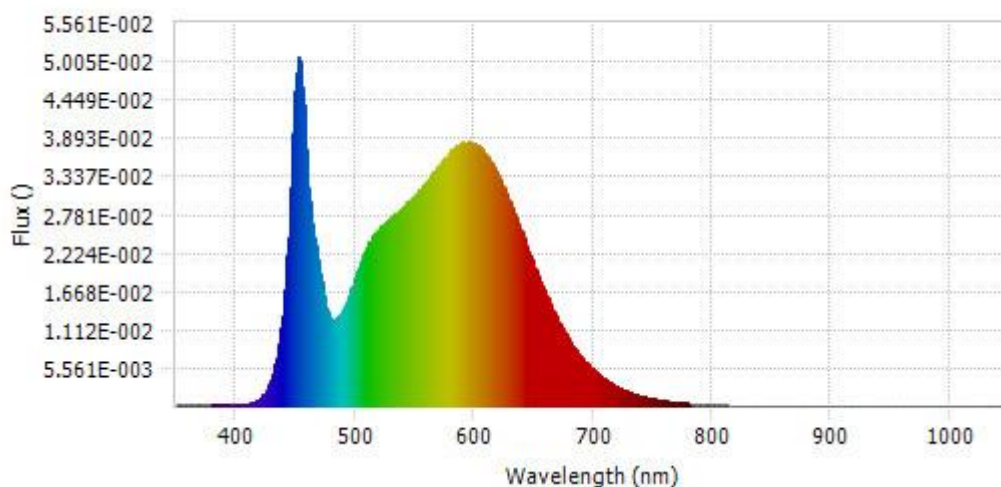
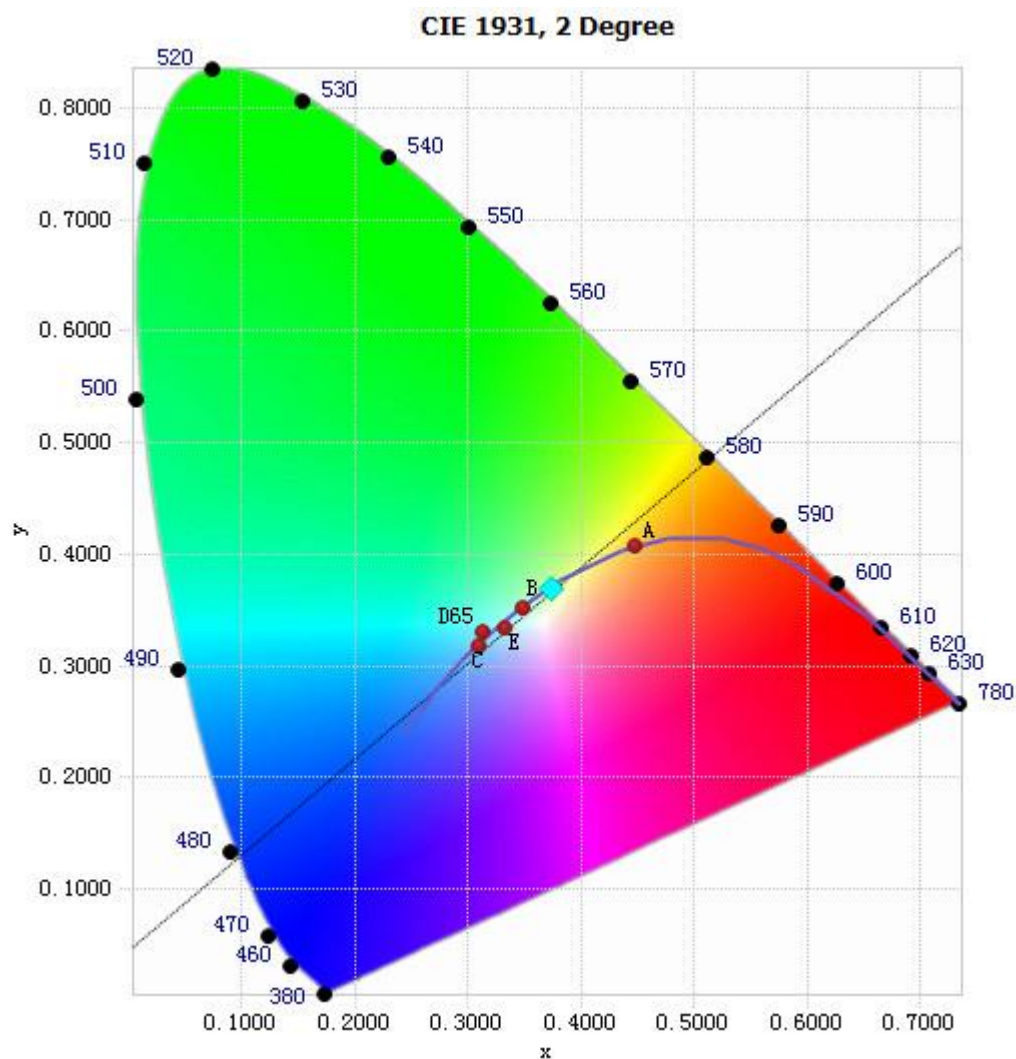


Chart 12: Spectral Power Distribution

Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	2.37E-04	485	1.29E-02	590	3.83E-02	695	6.18E-03
385	2.54E-04	490	1.41E-02	595	3.84E-02	700	5.31E-03
390	1.99E-04	495	1.61E-02	600	3.82E-02	705	4.55E-03
395	1.74E-04	500	1.86E-02	605	3.75E-02	710	3.90E-03
400	1.74E-04	505	2.10E-02	610	3.65E-02	715	3.34E-03
405	2.01E-04	510	2.30E-02	615	3.53E-02	720	2.88E-03
410	3.07E-04	515	2.47E-02	620	3.36E-02	725	2.43E-03
415	5.81E-04	520	2.57E-02	625	3.18E-02	730	2.09E-03
420	1.11E-03	525	2.66E-02	630	2.97E-02	735	1.78E-03
425	2.17E-03	530	2.74E-02	635	2.75E-02	740	1.52E-03
430	4.18E-03	535	2.80E-02	640	2.53E-02	745	1.31E-03
435	7.83E-03	540	2.88E-02	645	2.30E-02	750	1.10E-03
440	1.49E-02	545	2.97E-02	650	2.06E-02	755	9.39E-04
445	2.81E-02	550	3.05E-02	655	1.85E-02	760	8.08E-04
450	4.58E-02	555	3.15E-02	660	1.64E-02	765	7.04E-04
455	4.88E-02	560	3.26E-02	665	1.45E-02	770	6.00E-04
460	3.44E-02	565	3.36E-02	670	1.26E-02	775	5.15E-04
465	2.54E-02	570	3.48E-02	675	1.11E-02	780	4.39E-04
470	2.02E-02	575	3.59E-02	680	9.63E-03		
475	1.50E-02	580	3.70E-02	685	8.37E-03		
480	1.27E-02	585	3.79E-02	690	7.22E-03		

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

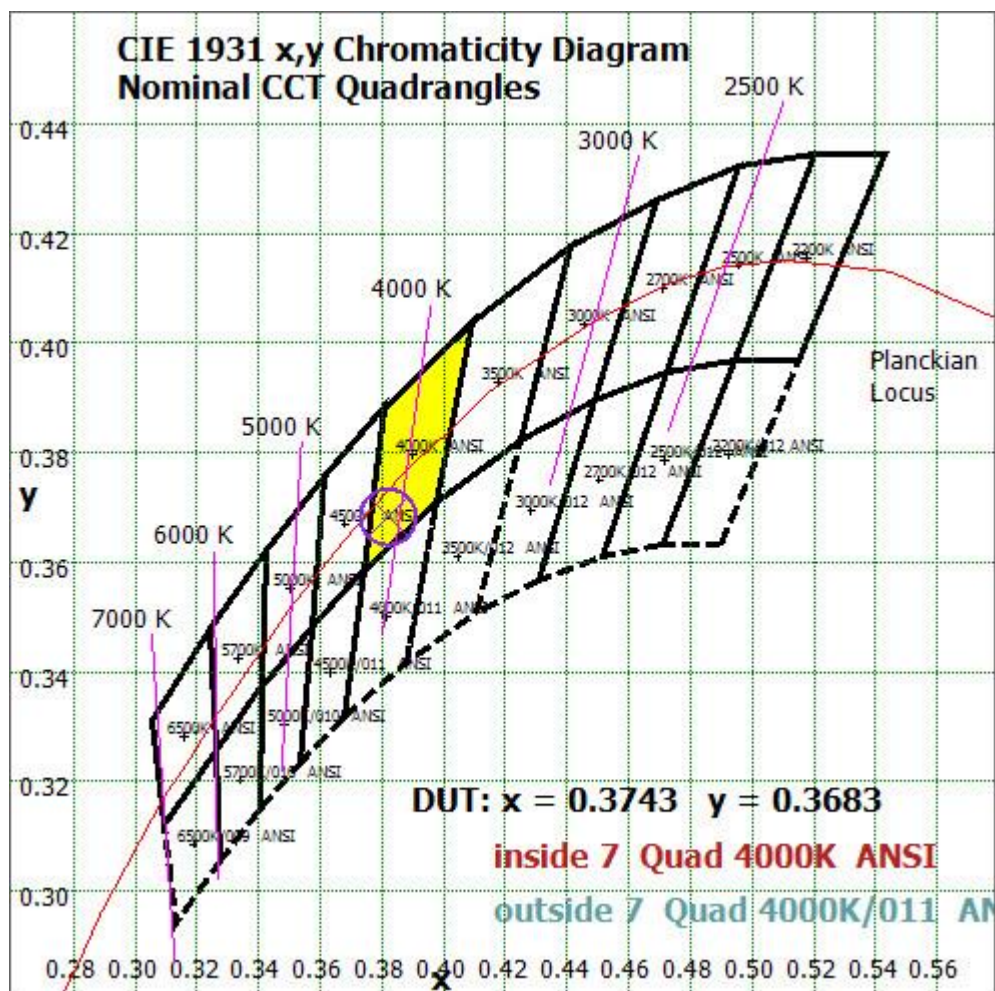
Chromaticity Diagram - Sphere Spectroradiometer Method



Tristimulus values(x, y): (0.3743, 0.3683)

Chart 13: 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

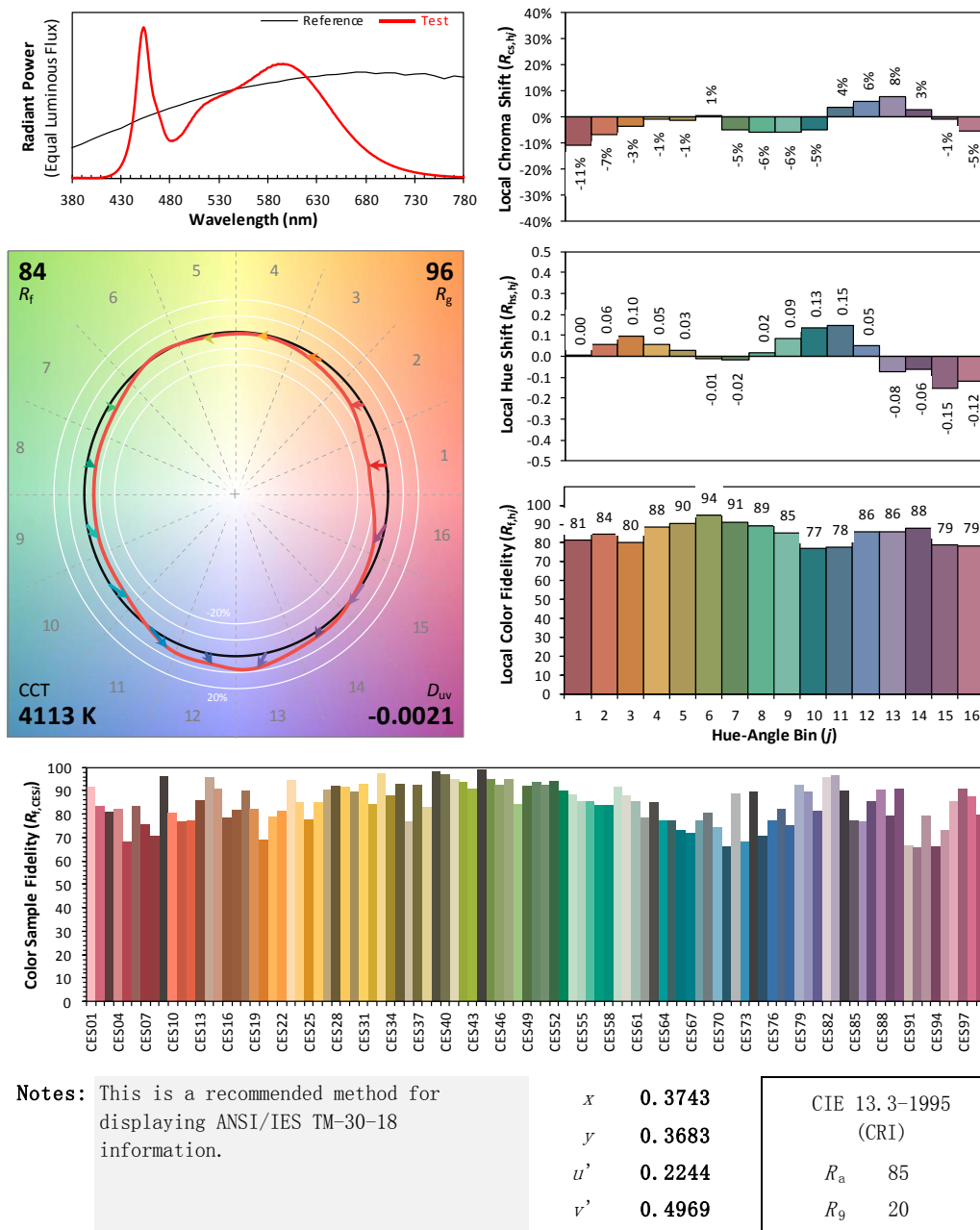
ANSI/IES TM-30-18 Color Rendition Report

Source: LED

Manufacturer: GREEN CREATIVE LTD

Date: 2025/04/08

Model: 15T5HE/4F/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	0.058
Power Factor	0.9723	0.9462
Test Power (W)	15.09	15.27
THD A%	19.99	17.54
Luminous Efficacy (lm/W)	144.6	145.7
Total Luminous Flux (lm)	2182.3	2225.0
Color Rendering Index (CRI)	84.2	
R9	15.3	
Correlated Color Temperature (CCT)(K)	4974	
Chromaticity Chroma x	0.3458	
Chromaticity Chroma y	0.3531	
Chromaticity Chroma u	0.2113	
Chromaticity Chroma v	0.3237	
Duv	0.0005	
Chromaticity Chroma u'	0.2113	
Chromaticity Chroma v'	0.4855	

Special Color Rendering Indices	
R1	83
R2	91
R3	94.6
R4	81.6
R5	82.3
R6	85.4
R7	87.3
R8	68.7
R9	15.3
R10	77.3
R11	80.6
R12	56.1
R13	85.6
R14	97.5

Table 12: Test data per Sphere-Spectroradiometer Method

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

Spectral Power Distribution - Sphere Spectroradiometer Method

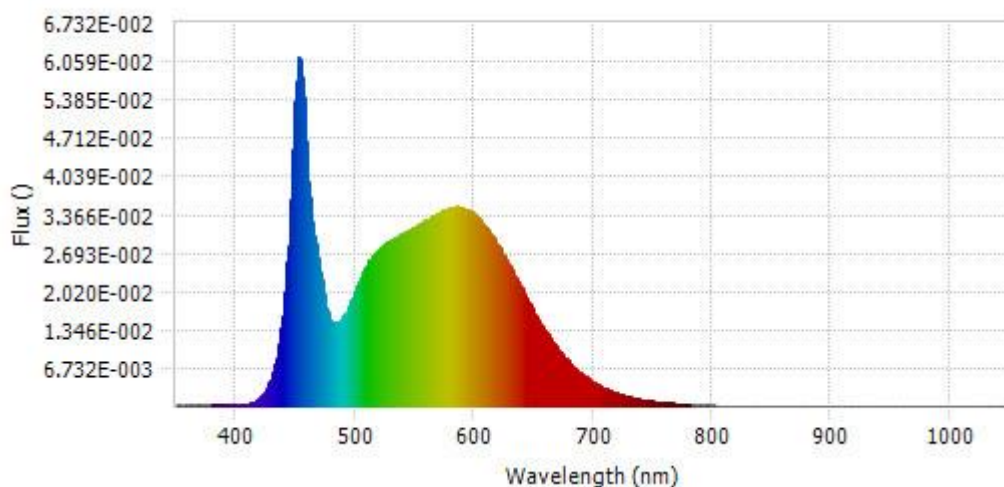
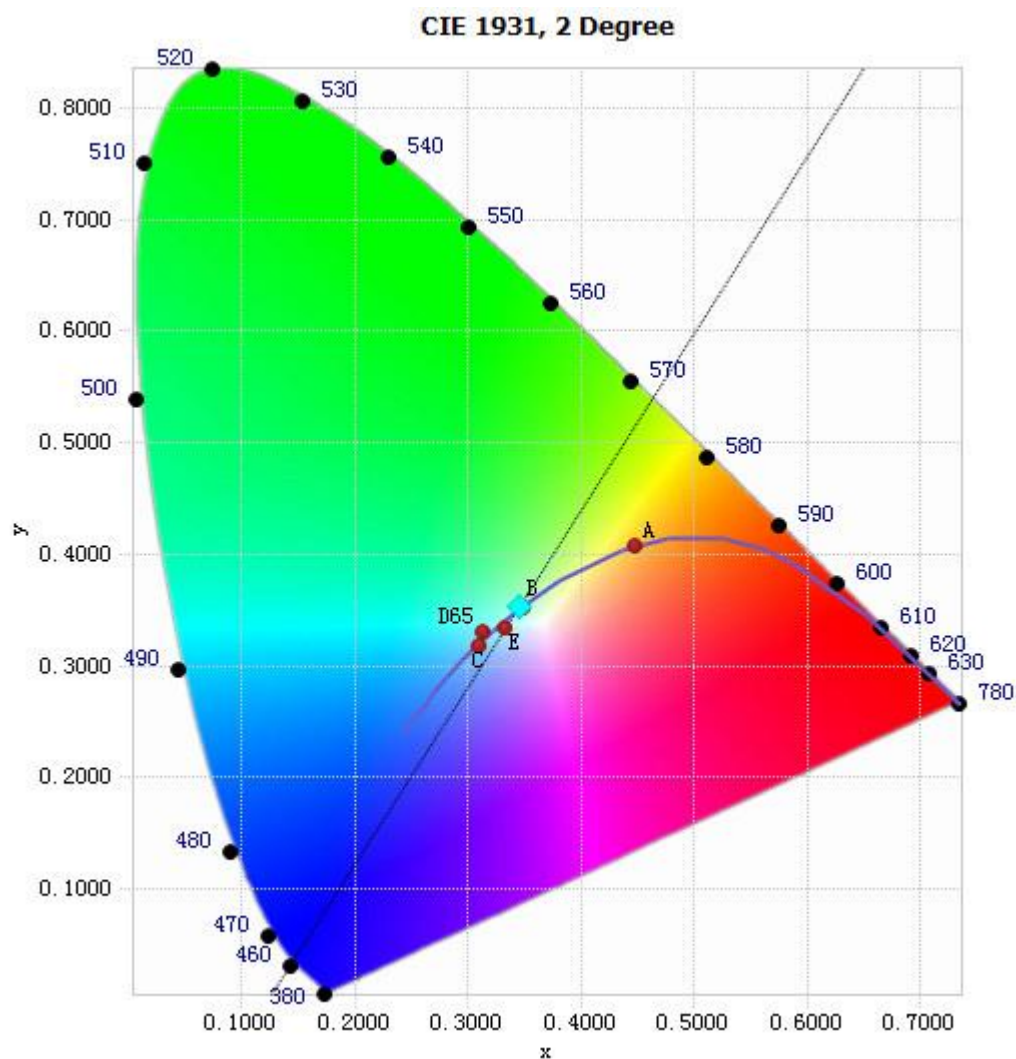


Chart16: Spectral Power Distribution

Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	2.30E-04	485	1.48E-02	590	3.50E-02	695	4.99E-03
385	2.39E-04	490	1.57E-02	595	3.44E-02	700	4.28E-03
390	2.48E-04	495	1.76E-02	600	3.37E-02	705	3.67E-03
395	2.03E-04	500	2.02E-02	605	3.27E-02	710	3.14E-03
400	1.86E-04	505	2.27E-02	610	3.15E-02	715	2.69E-03
405	2.33E-04	510	2.48E-02	615	3.01E-02	720	2.31E-03
410	3.84E-04	515	2.66E-02	620	2.83E-02	725	1.98E-03
415	7.14E-04	520	2.76E-02	625	2.65E-02	730	1.70E-03
420	1.37E-03	525	2.84E-02	630	2.46E-02	735	1.44E-03
425	2.73E-03	530	2.92E-02	635	2.27E-02	740	1.24E-03
430	5.21E-03	535	2.96E-02	640	2.07E-02	745	1.06E-03
435	9.72E-03	540	3.03E-02	645	1.87E-02	750	9.04E-04
440	1.77E-02	545	3.09E-02	650	1.67E-02	755	7.85E-04
445	3.22E-02	550	3.14E-02	655	1.50E-02	760	6.59E-04
450	5.35E-02	555	3.20E-02	660	1.32E-02	765	5.72E-04
455	6.00E-02	560	3.27E-02	665	1.17E-02	770	4.94E-04
460	4.28E-02	565	3.33E-02	670	1.02E-02	775	4.27E-04
465	3.09E-02	570	3.39E-02	675	8.89E-03	780	3.68E-04
470	2.48E-02	575	3.45E-02	680	7.74E-03		
475	1.83E-02	580	3.49E-02	685	6.71E-03		
480	1.50E-02	585	3.51E-02	690	5.80E-03		

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

Chromaticity Diagram - Sphere Spectroradiometer Method



Tristimulus values(x, y): (0.3458, 0.3531)

Chart 17: Chromaticity Diagram per Sphere - Spectroradiometer Method

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

CIE 1931 x,y Chromaticity Diagram
Nominal CCT Quadrangles

2500 K
 3000 K
 4000 K
 5000 K
 6000 K
 7000 K

Planckian Locus

ANSI

DUT: $x = 0.3458$ $y = 0.3531$

inside 7 Quad 5000K ANSI

outside 7 Quad 5000K/010 ANSI

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Color Rendition Report – Sphere Spectroradiometer Method

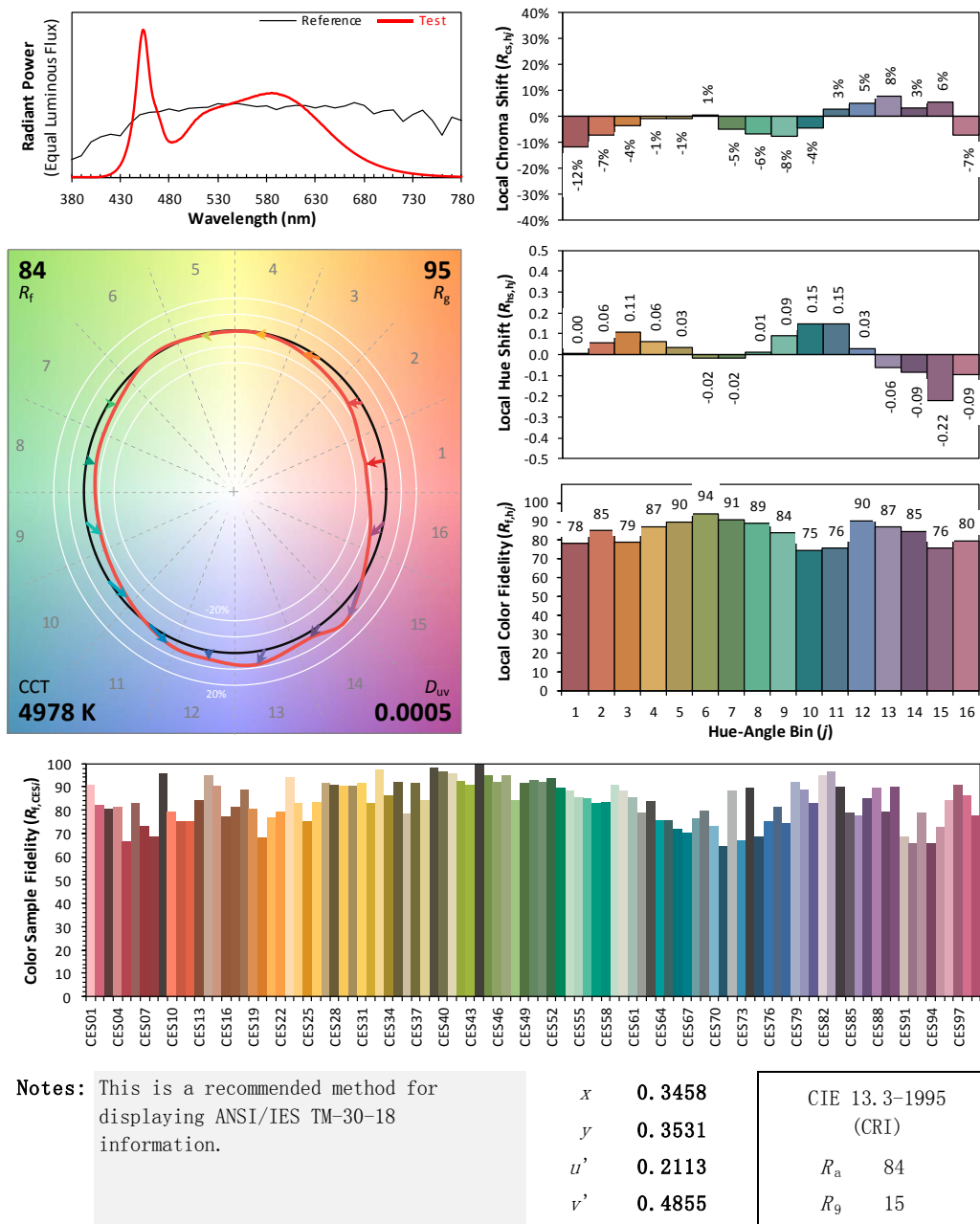
ANSI/IES TM-30-18 Color Rendition Report

Source: LED

Manufacturer: GREEN CREATIVE LTD

Date: 2025/04/08

Model: 15T5HE/4F/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

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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.