

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: 24T5HO/4F/8CCTS/UEB

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.: HZ25040003f

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	24T5HO/4F/8CC TS/UEB 3000K Setting	24T5HO/4F/8CC TS/UEB 3500K Setting	24T5HO/4F/8CC TS/UEB 4000K Setting	24T5HO/4F/8CCTS /UEB 5000K Setting
Luminous Efficacy (Lumens /Watt)	135.6	141.9	148.0	137.3
Total Luminous Flux (Lumens)	3203.4	3300.3	3500.4	3301.1
Power (Watts)	23.62	23.26	23.65	24.05
Power Factor	0.9749	0.9759	0.9748	0.9717
CCT (K)	3045	3462	3962	5054
CRI	81.4	83.6	84.6	84.3
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	: 24T5HO/4F/8CCTS/UEB
Electrical Ratings	: 120-277V, 50/60Hz, 24W
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)	0.202	0.092
Power Factor	0.9749	0.9139
Test Power (W)	23.62	23.31
THD A%	19.33	19.04
Luminous Efficacy (lm/W)	135.6	138.5
Total Luminous Flux (lm)	3203.4	3229.4
Color Rendering Index (CRI)	81.4	
R9	2.7	
Correlated Color Temperature (CCT)(K)	3045	
Chromaticity Chroma x	0.4325	
Chromaticity Chroma y	0.4006	
Chromaticity Chroma u	0.2492	
Chromaticity Chroma v	0.3462	
Duv	-0.0008	
Chromaticity Chroma u'	0.2492	
Chromaticity Chroma v'	0.5193	

Special Color Rendering Indices	
R1	79.5
R2	90.2
R3	96
R4	79
R5	79.8
R6	87.7
R7	81.9
R8	57.2
R9	2.7
R10	77.7
R11	78
R12	69.4
R13	82
R14	98.4

Table 2: Test data per Sphere-Spectroradiometer Method

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

Spectral Power Distribution - Sphere Spectroradiometer Method

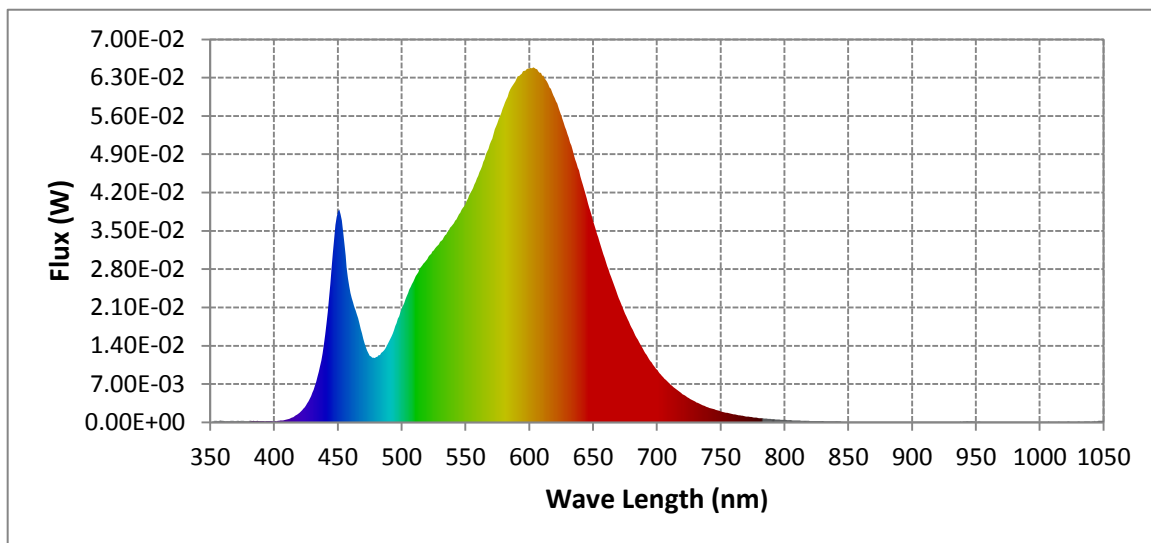
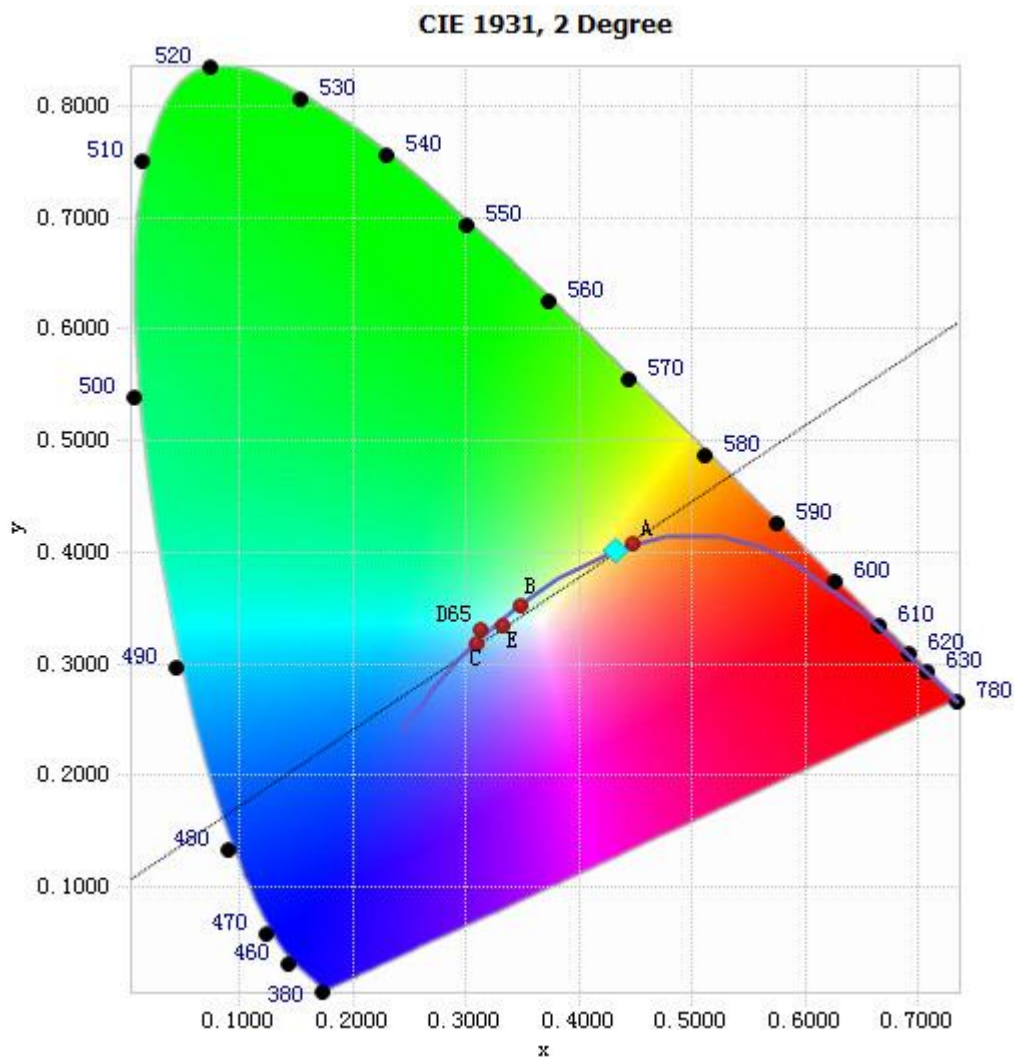


Chart 1: Spectral Power Distribution

Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	2.14E-04	485	1.29E-02	590	6.28E-02	695	1.12E-02
385	2.49E-04	490	1.48E-02	595	6.42E-02	700	9.62E-03
390	2.09E-04	495	1.76E-02	600	6.47E-02	705	8.25E-03
395	2.27E-04	500	2.08E-02	605	6.46E-02	710	7.09E-03
400	1.95E-04	505	2.36E-02	610	6.34E-02	715	6.05E-03
405	3.54E-04	510	2.62E-02	615	6.18E-02	720	5.15E-03
410	5.15E-04	515	2.84E-02	620	5.92E-02	725	4.44E-03
415	9.52E-04	520	2.98E-02	625	5.62E-02	730	3.78E-03
420	1.74E-03	525	3.14E-02	630	5.26E-02	735	3.22E-03
425	3.07E-03	530	3.30E-02	635	4.89E-02	740	2.73E-03
430	5.43E-03	535	3.44E-02	640	4.50E-02	745	2.38E-03
435	9.27E-03	540	3.61E-02	645	4.09E-02	750	2.01E-03
440	1.60E-02	545	3.80E-02	650	3.68E-02	755	1.72E-03
445	2.82E-02	550	3.99E-02	655	3.30E-02	760	1.46E-03
450	3.86E-02	555	4.24E-02	660	2.93E-02	765	1.25E-03
455	3.27E-02	560	4.50E-02	665	2.59E-02	770	1.07E-03
460	2.36E-02	565	4.81E-02	670	2.27E-02	775	9.33E-04
465	1.97E-02	570	5.14E-02	675	1.98E-02	780	7.79E-04
470	1.53E-02	575	5.47E-02	680	1.73E-02		
475	1.22E-02	580	5.78E-02	685	1.51E-02		
480	1.19E-02	585	6.09E-02	690	1.30E-02		

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

Chromaticity Diagram - Sphere Spectroradiometer Method



Tristimulus values(x, y): (0.4325, 0.4006)

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

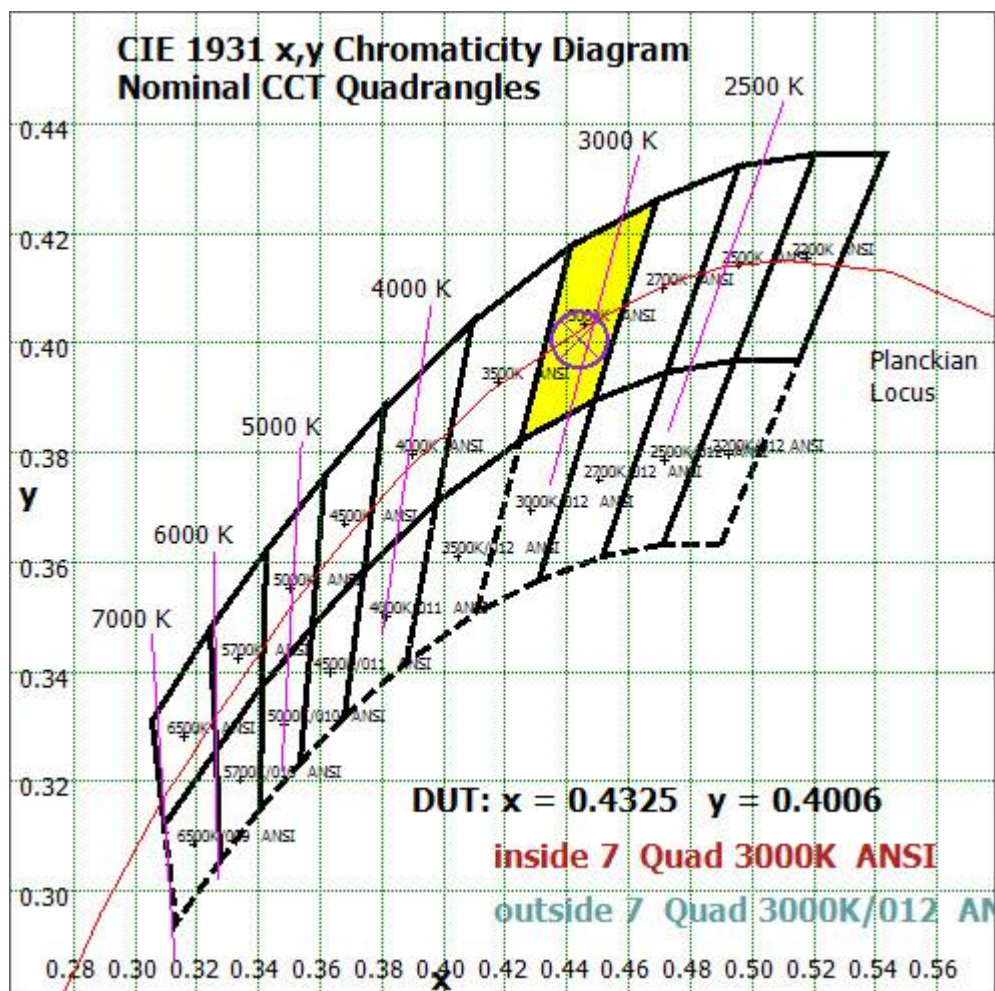


Chart 3: Plot of Lamp x/y coordinates on CIE 1931 Chromaticity Diagram

Color Rendition Report – Sphere Spectroradiometer Method

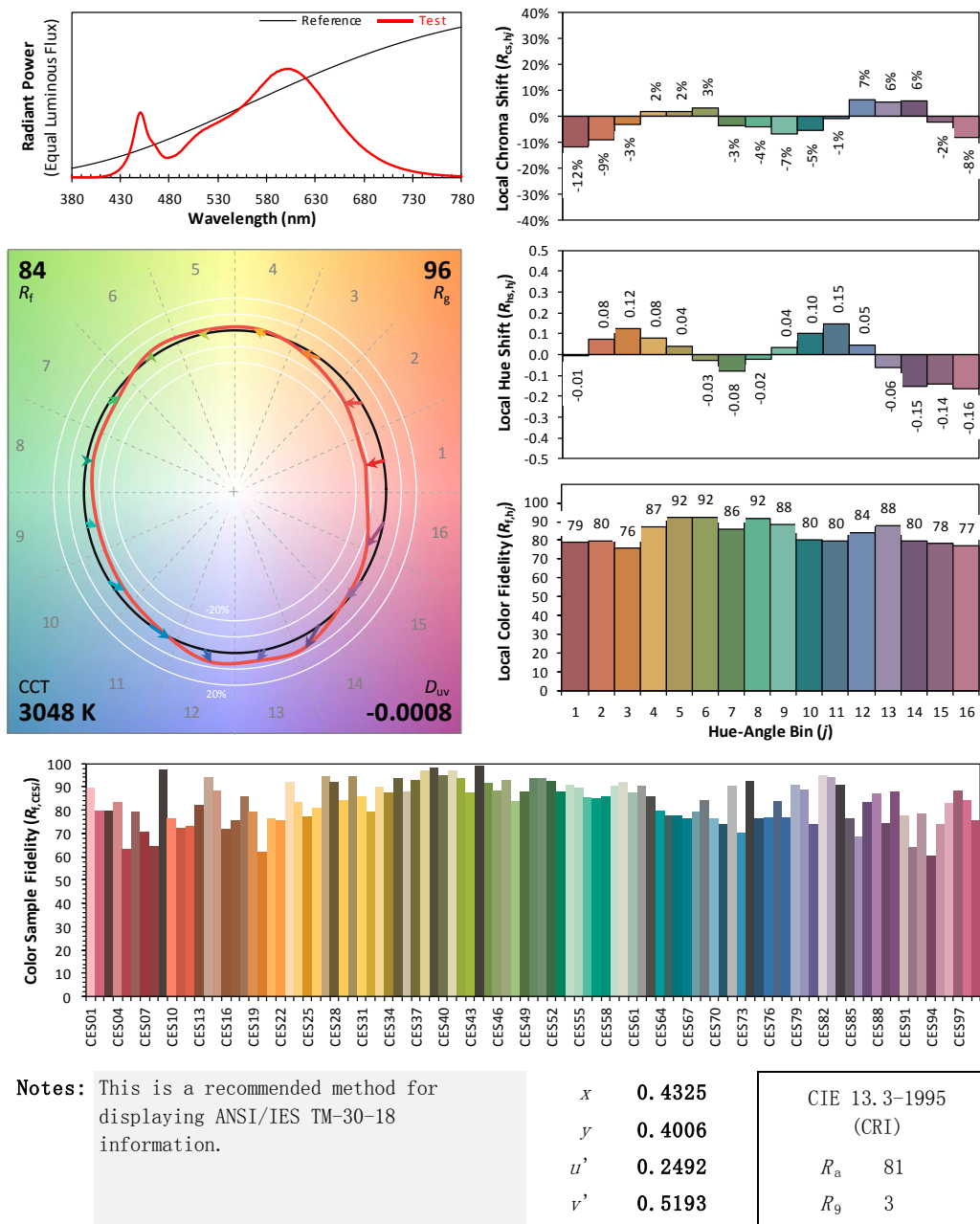
ANSI/IES TM-30-18 Color Rendition Report

Source: LED

Manufacturer: GREEN CREATIVE LTD

Date: 2025/04/08

Model: 24T5HO/4F/8CCTS/UEB



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)	0.202
Power Factor	0.9752
Power (W)	23.63
Luminous Efficacy (lm/W)	136.7
Total Luminous Flux (lm)	3230.5
Beam Angle (°)	114.3 (0°-180°) / 200.9 (90°-270°)
Center Beam Candle Power (cd)	590
Maximum Beam Candle Power (cd)	591.0 (At: C=200.0, Gamma=2.0)
Spacing Criteria	1.29 (0°-180°) / 1.43 (90°-270°)
Zonal Lumens in the 0 °-60 °Zone	46.88%
Zonal Lumens in the 60 °-90 °Zone	27.97%
Zonal Lumens in the 90 °-120 °Zone	16.35%
Zonal Lumens in the 120 °-180 °Zone	8.81%

Table 4: Test data per Goniophotometer Method

Zonal Lumen Tabulation- Goniophotometer Method

$\gamma(^{\circ})$	Lumens	% Total
0- 10	55.969	1.73%
10- 20	162.336	5.03%
20- 30	253.044	7.83%
30- 40	319.959	9.90%
40- 50	357.856	11.08%
50- 60	365.204	11.30%
60- 70	344.688	10.67%
70- 80	303.786	9.40%
80- 90	254.952	7.89%
90-100	211.783	6.56%
100-110	175.066	5.42%
110-120	141.298	4.37%
120-130	109.446	3.39%
130-140	80.04	2.48%
140-150	52.985	1.64%
150-160	30.325	0.94%
160-170	10.074	0.31%
170-180	1.687	0.05%
Total	3230.5	100%

$\gamma(^{\circ})$	Lumens	% Total
0- 60	1514.368	46.88%
60- 90	903.426	27.97%
0-90	2417.794	74.84%
90- 180	812.704	25.16%
0- 180	3230.5	100%

Table 5: Zonal Lumen

Illuminance Plots- Goniophotometer Method

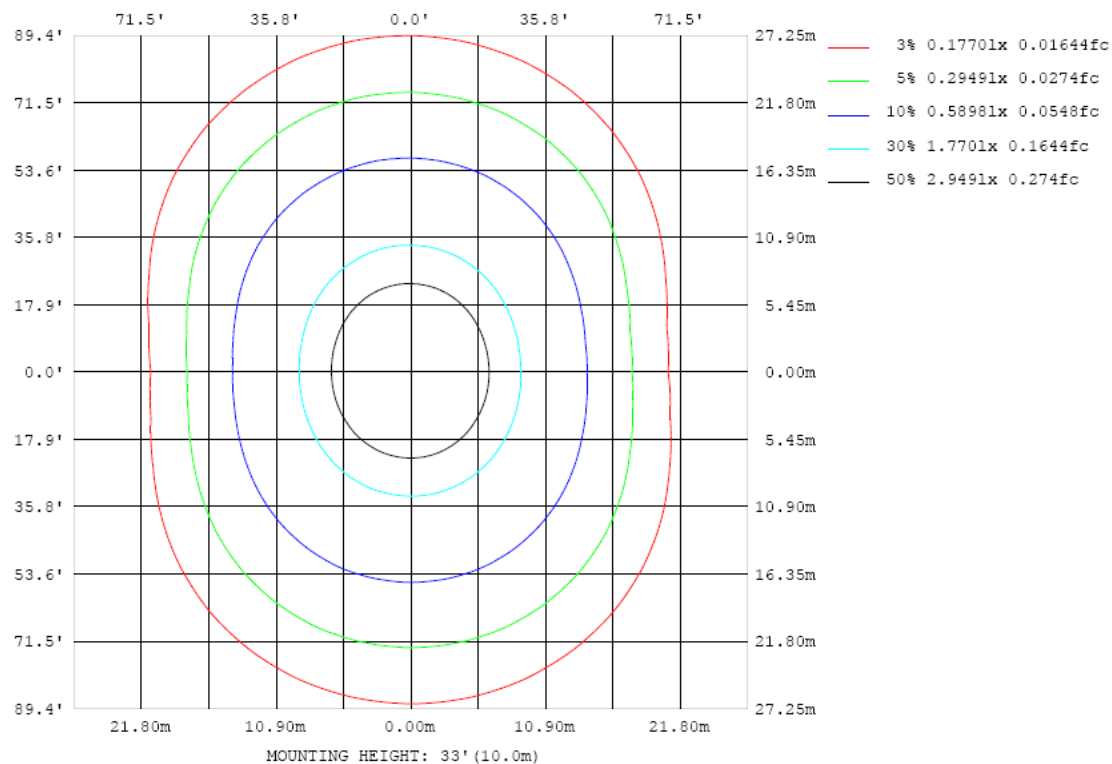


Chart 5: Illuminance Plot (Footcandles)

Luminous Intensity Distribution Plots- Goniophotometer Method

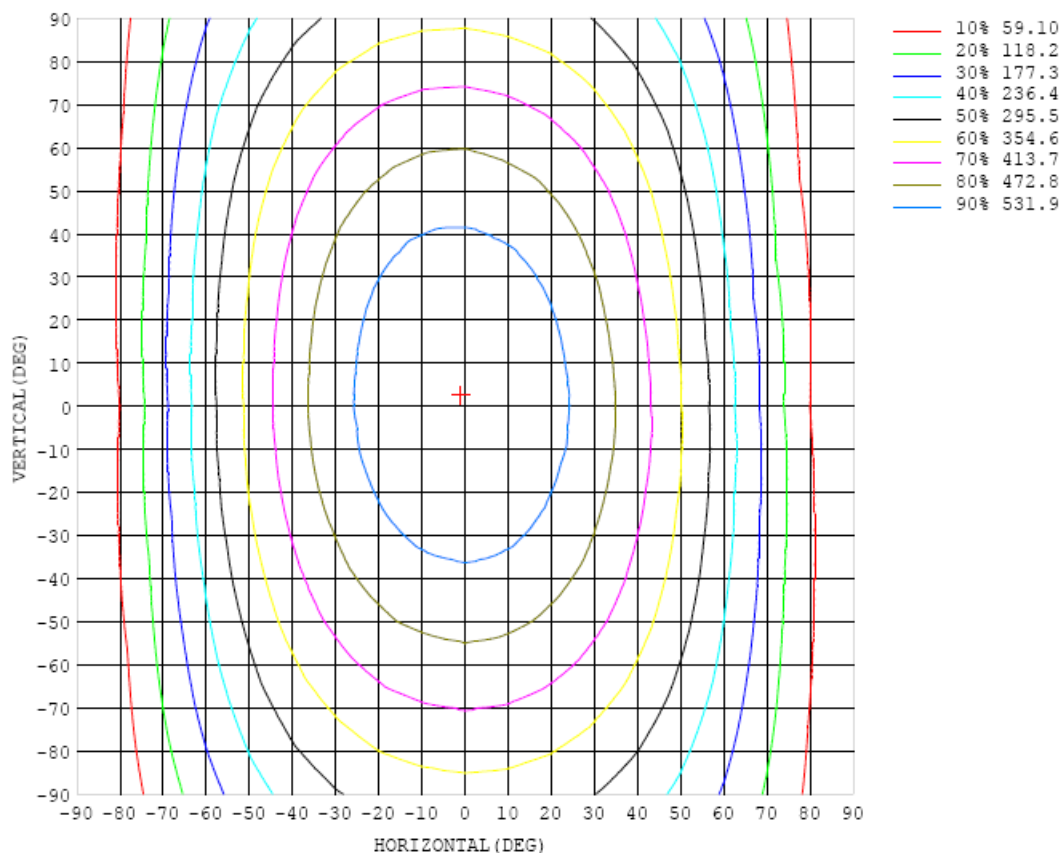


Chart 6: Isocandela Plot

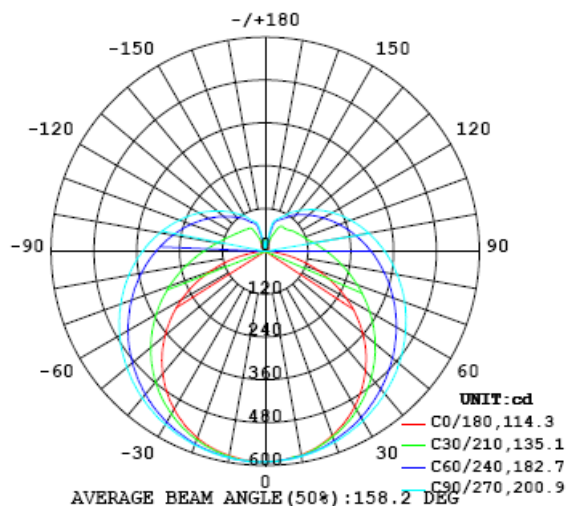


Chart 7: Polar Candela Distribution

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	590	590	590	590	590	590	590	590	590	590	590	590	590	590	590	590	590	590	590
5	587	586	586	587	588	586	587	587	588	587	588	589	588	587	588	588	588	588	587
10	580	579	578	581	580	580	582	583	583	584	584	583	583	583	583	582	581	582	581
15	567	566	568	568	570	572	575	575	576	576	576	577	576	574	573	573	572	571	571
20	549	550	552	553	557	560	564	567	569	569	568	568	565	562	560	558	558	554	556
25	528	528	533	535	540	546	551	556	558	559	558	557	554	549	544	541	537	534	536
30	501	504	509	513	522	530	538	543	547	548	546	544	538	533	526	519	515	511	511
35	471	475	480	489	500	512	521	529	534	535	534	530	523	514	504	495	488	482	481
40	437	442	450	462	477	492	504	514	519	520	517	515	505	494	480	467	457	449	447
45	398	405	416	433	452	470	485	497	504	506	502	498	485	472	455	437	423	412	409
50	357	364	380	402	425	449	465	479	487	489	487	480	466	449	427	405	386	371	367
55	310	321	342	370	399	425	445	461	469	473	468	460	444	424	398	371	346	327	320
60	262	276	303	338	371	401	425	442	451	453	449	441	423	399	370	336	304	280	271
65	211	230	264	306	344	378	402	421	432	436	431	420	401	374	341	301	262	231	219
70	159	183	226	275	318	354	382	401	412	415	411	399	379	349	312	268	220	181	164
75	107	139	191	245	292	331	359	381	392	396	391	379	356	325	285	235	181	132	110
80	58.6	99.5	159	218	267	308	338	360	372	376	370	358	334	302	259	206	146	86.7	60.0
85	20.4	68.7	134	194	245	286	317	340	351	355	349	337	313	279	234	178	116	50.7	18.8
90	2.15	47.5	112	172	223	265	297	319	332	335	330	316	291	258	212	154	88.5	24.3	0.91
95	0.73	33.1	94.1	154	204	246	277	299	311	315	309	295	272	237	191	135	71.9	17.4	1.79
100	1.11	30.8	81.4	137	186	227	257	279	291	295	289	275	252	218	173	120	64.3	17.1	3.99
105	1.64	31.5	75.6	125	170	209	239	259	272	275	269	256	233	200	159	110	59.7	19.0	7.12
110	2.81	33.4	72.0	116	157	193	221	241	252	255	249	237	215	185	147	102	57.5	21.9	7.93
115	6.75	36.1	69.9	109	146	178	204	223	233	236	231	219	198	170	136	95.5	56.9	25.0	7.59
120	12.1	39.1	68.8	103	135	164	188	205	214	217	212	201	182	157	126	90.5	58.8	11.5	2.29
125	8.59	30.5	67.5	97.6	127	152	172	188	197	199	194	184	167	145	118	86.8	60.3	16.2	2.30
130	6.84	18.5	69.2	91.3	118	141	158	172	180	182	178	168	154	134	110	82.7	60.3	15.3	0.69
135	12.9	30.8	69.0	86.8	111	130	146	157	163	164	161	153	141	124	101	79.4	56.9	17.5	1.88
140	4.02	21.0	65.3	84.2	101	120	134	143	149	149	147	140	129	113	94.4	81.0	29.2	1.76	10.9
145	8.25	0.00	39.1	85.2	94.9	107	120	130	134	135	133	127	115	101	90.2	78.4	37.2	11.1	17.9
150	16.7	8.32	38.5	78.7	90.8	99.6	107	113	117	117	115	111	104	96.2	87.9	64.4	22.7	15.9	19.2
155	19.2	6.26	0.17	51.9	88.6	93.2	98.4	103	105	106	104	101	96.6	91.0	80.6	45.4	7.06	12.2	31.5
160	28.0	9.20	18.0	15.8	57.3	84.2	90.7	93.4	95.3	95.7	95.0	92.9	88.9	80.7	47.5	5.72	28.0	10.6	27.9
165	25.8	17.2	7.10	14.9	10.7	14.2	51.3	74.4	81.4	84.1	82.0	74.4	55.9	23.7	9.47	30.6	13.5	19.1	28.1
170	33.6	26.8	17.1	8.17	8.66	10.4	12.1	11.8	12.8	10.6	11.3	12.8	13.4	26.2	20.6	5.58	12.5	26.2	30.7
175	37.2	32.9	25.9	26.8	20.1	9.34	6.22	5.85	7.45	9.60	10.2	10.7	11.0	10.4	11.6	22.6	33.0	29.4	34.7
180	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4

Table 6: Luminous Intensity Data

Table--2		UNIT: cd																	
γ (DEG)	C (DEG)	190	200	210	220	230	240	250	260	270	280	290	300	310	320	330	340	350	
0		590	590	590	590	590	590	590	590	590	590	590	590	590	590	590	590	590	
5		589	590	589	589	590	590	590	591	591	589	588	589	589	588	588	587	587	
10		582	582	584	584	585	586	587	587	585	585	585	585	583	582	581	580	579	
15		571	573	575	578	580	582	583	584	584	581	579	578	575	573	570	568	568	
20		556	559	562	567	571	575	577	578	577	576	573	570	565	560	556	552	550	
25		536	540	546	553	559	563	568	569	569	566	564	558	551	544	537	532	530	
30		512	518	526	536	545	553	559	561	561	557	552	545	536	526	516	508	503	
35		484	493	504	516	529	538	546	550	548	545	540	530	517	504	490	480	473	
40		452	462	478	494	510	523	533	536	537	532	524	512	497	481	462	448	439	
45		415	429	450	470	490	504	517	522	521	516	508	493	474	454	432	414	402	
50		375	394	418	445	468	486	500	505	507	501	490	473	452	426	399	376	360	
55		332	355	387	417	444	465	481	489	490	484	471	453	428	398	365	336	315	
60		285	315	353	389	421	444	461	471	471	463	451	430	403	368	330	295	268	
65		237	275	319	361	396	421	441	450	452	444	431	408	377	339	296	252	218	
70		187	234	286	332	370	399	419	429	431	424	409	385	351	310	261	211	168	
75		140	196	253	304	346	376	397	409	411	402	387	362	326	282	229	172	120	
80		97.1	161	223	277	321	353	375	386	388	381	365	338	302	256	200	137	76.3	
85		63.8	132	197	252	296	329	353	364	366	358	342	316	278	231	173	108	44.3	
90		43.3	109	173	229	274	307	329	342	345	336	321	293	256	209	152	87.6	26.4	
95		33.9	92.3	153	207	252	284	307	319	321	314	298	271	235	189	133	74.0	20.8	
100		31.0	81.1	137	188	231	263	285	297	300	293	277	251	216	172	120	65.9	20.8	
105		31.4	74.0	124	171	211	242	264	275	278	271	256	231	198	156	109	61.5	22.8	
110		33.3	69.6	113	155	193	222	242	253	256	250	236	213	181	143	101	60.1	25.7	
115		35.9	67.3	104	142	176	203	222	233	235	229	216	195	166	131	94.2	59.9	29.6	
120		38.6	66.5	97.3	130	161	185	202	212	215	209	198	178	152	122	89.1	60.5	32.8	
125		39.8	66.5	91.7	120	146	168	184	193	195	191	180	162	139	113	85.1	61.0	35.1	
130		39.8	66.8	87.5	111	133	152	166	174	176	172	163	147	128	105	81.6	58.9	36.3	
135		29.8	59.6	84.4	103	121	137	149	156	158	155	147	134	118	99.1	80.6	55.0	25.7	
140		13.6	49.7	80.5	95.4	112	124	134	140	142	139	132	122	109	92.1	77.9	48.5	16.9	
145		0.61	31.5	79.0	88.0	102	113	121	126	127	125	120	111	99.4	85.2	76.4	28.3	1.87	
150		3.42	26.7	71.2	83.4	91.0	100	108	113	114	112	108	98.9	88.9	79.5	66.2	24.2	3.31	
155		5.43	10.2	40.5	79.4	85.2	90.2	94.0	96.8	97.9	96.7	94.5	89.3	77.8	66.6	38.5	13.6	5.83	
160		9.83	18.2	7.18	44.2	75.3	82.9	86.5	88.1	88.7	88.2	84.2	71.7	60.2	38.1	6.98	9.93	9.01	
165		18.6	5.62	6.06	7.68	19.9	43.7	61.5	72.6	74.9	71.0	53.2	36.1	24.1	7.43	15.2	12.1	10.1	
170		30.7	14.9	5.65	8.94	16.9	11.8	13.0	11.0	8.48	7.48	9.10	11.7	12.8	16.2	10.0	8.00	14.5	
175		35.5	31.1	20.0	9.72	9.02	10.6	10.8	9.55	0.00	3.77	0.71	8.79	11.1	10.9	13.0	26.3	36.2	
180		20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	

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)	0.199	0.091
Power Factor	0.9759	0.9116
Test Power (W)	23.26	23.03
THD A%	19.05	19.02
Luminous Efficacy (lm/W)	141.9	143.6
Total Luminous Flux (lm)	3300.3	3307.6
Color Rendering Index (CRI)	83.6	
R9	11.4	
Correlated Color Temperature (CCT)(K)	3462	
Chromaticity Chroma x	0.4050	
Chromaticity Chroma y	0.3857	
Chromaticity Chroma u	0.2376	
Chromaticity Chroma v	0.3394	
Duv	-0.0022	
Chromaticity Chroma u'	0.2376	
Chromaticity Chroma v'	0.5091	

Special Color Rendering Indices	
R1	82.4
R2	91.8
R3	95.8
R4	81.1
R5	82.6
R6	88.6
R7	83.7
R8	62.3
R9	11.4
R10	80.5
R11	80.3
R12	67.6
R13	84.9
R14	98.4

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

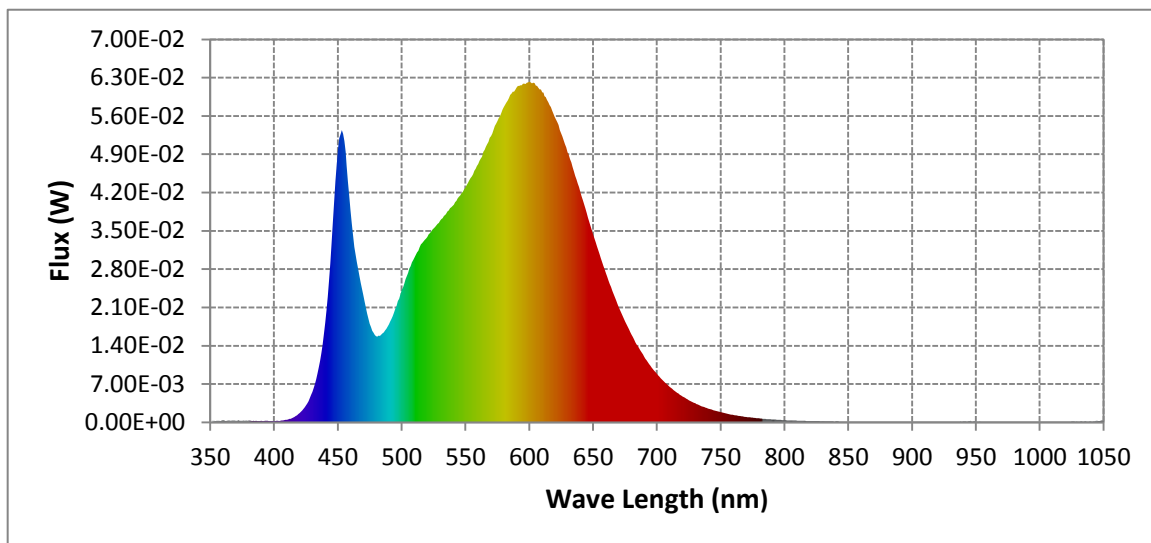
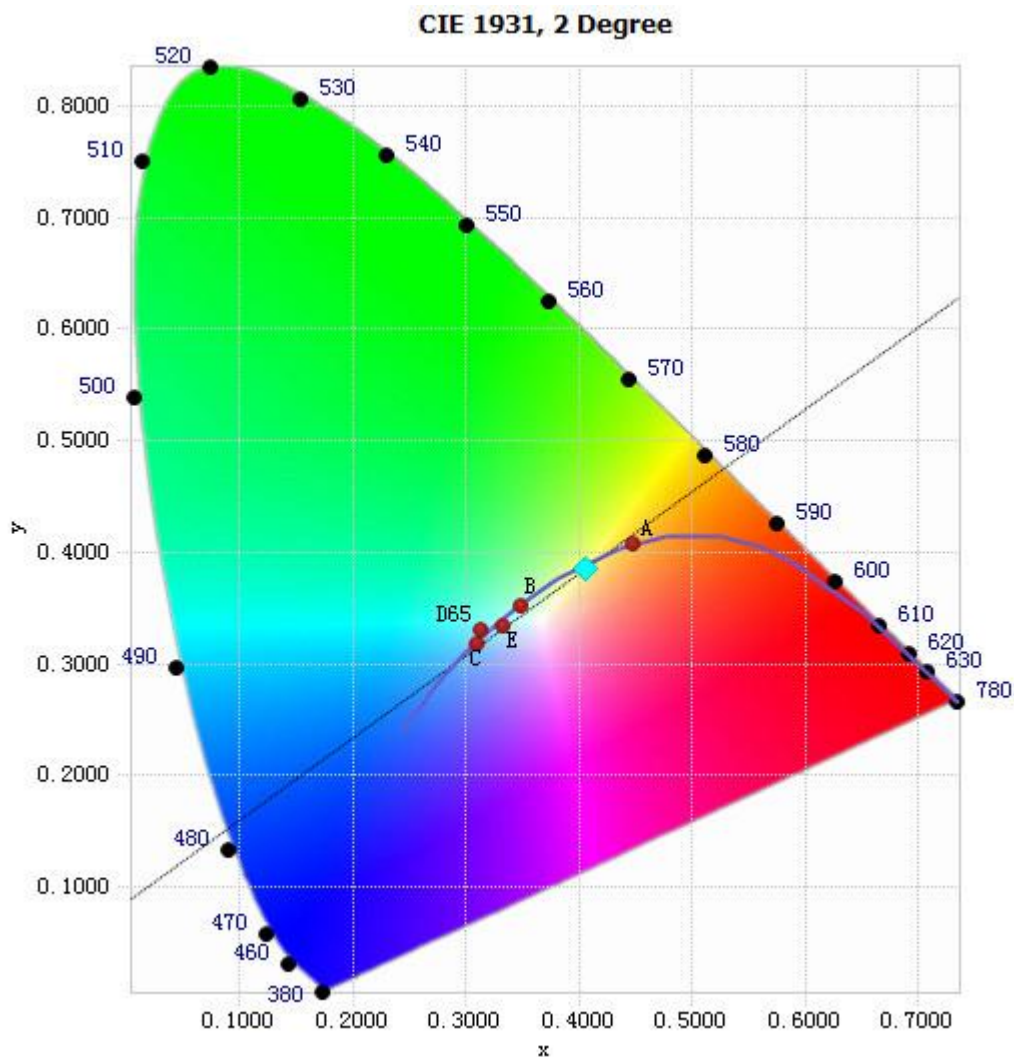


Chart 8: Spectral Power Distribution

Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	3.18E-04	485	1.63E-02	590	6.12E-02	695	1.04E-02
385	2.55E-04	490	1.79E-02	595	6.19E-02	700	8.87E-03
390	2.82E-04	495	2.07E-02	600	6.22E-02	705	7.61E-03
395	2.71E-04	500	2.41E-02	605	6.16E-02	710	6.52E-03
400	2.23E-04	505	2.73E-02	610	6.03E-02	715	5.55E-03
405	2.76E-04	510	3.01E-02	615	5.85E-02	720	4.75E-03
410	4.37E-04	515	3.25E-02	620	5.58E-02	725	4.05E-03
415	8.81E-04	520	3.39E-02	625	5.28E-02	730	3.48E-03
420	1.67E-03	525	3.55E-02	630	4.94E-02	735	2.94E-03
425	3.10E-03	530	3.68E-02	635	4.58E-02	740	2.52E-03
430	5.57E-03	535	3.81E-02	640	4.21E-02	745	2.14E-03
435	1.00E-02	540	3.96E-02	645	3.83E-02	750	1.85E-03
440	1.81E-02	545	4.13E-02	650	3.43E-02	755	1.59E-03
445	3.28E-02	550	4.29E-02	655	3.08E-02	760	1.34E-03
450	5.00E-02	555	4.50E-02	660	2.72E-02	765	1.15E-03
455	5.14E-02	560	4.72E-02	665	2.41E-02	770	9.86E-04
460	3.88E-02	565	4.98E-02	670	2.10E-02	775	8.49E-04
465	2.92E-02	570	5.23E-02	675	1.84E-02	780	7.39E-04
470	2.33E-02	575	5.51E-02	680	1.60E-02		
475	1.80E-02	580	5.76E-02	685	1.39E-02		
480	1.58E-02	585	5.99E-02	690	1.20E-02		

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

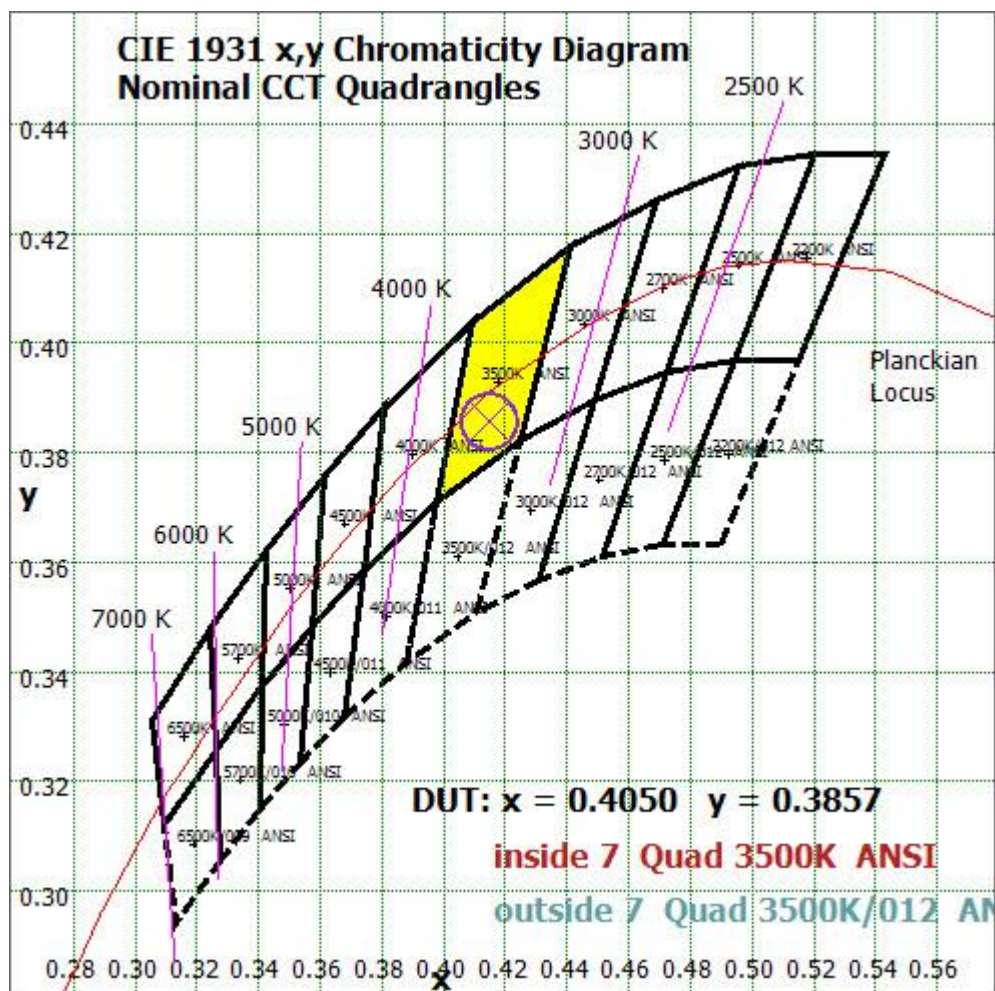
Chromaticity Diagram - Sphere Spectroradiometer Method



Tristimulus values(x, y): (0.4050, 0.3857)

Chart 9: 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

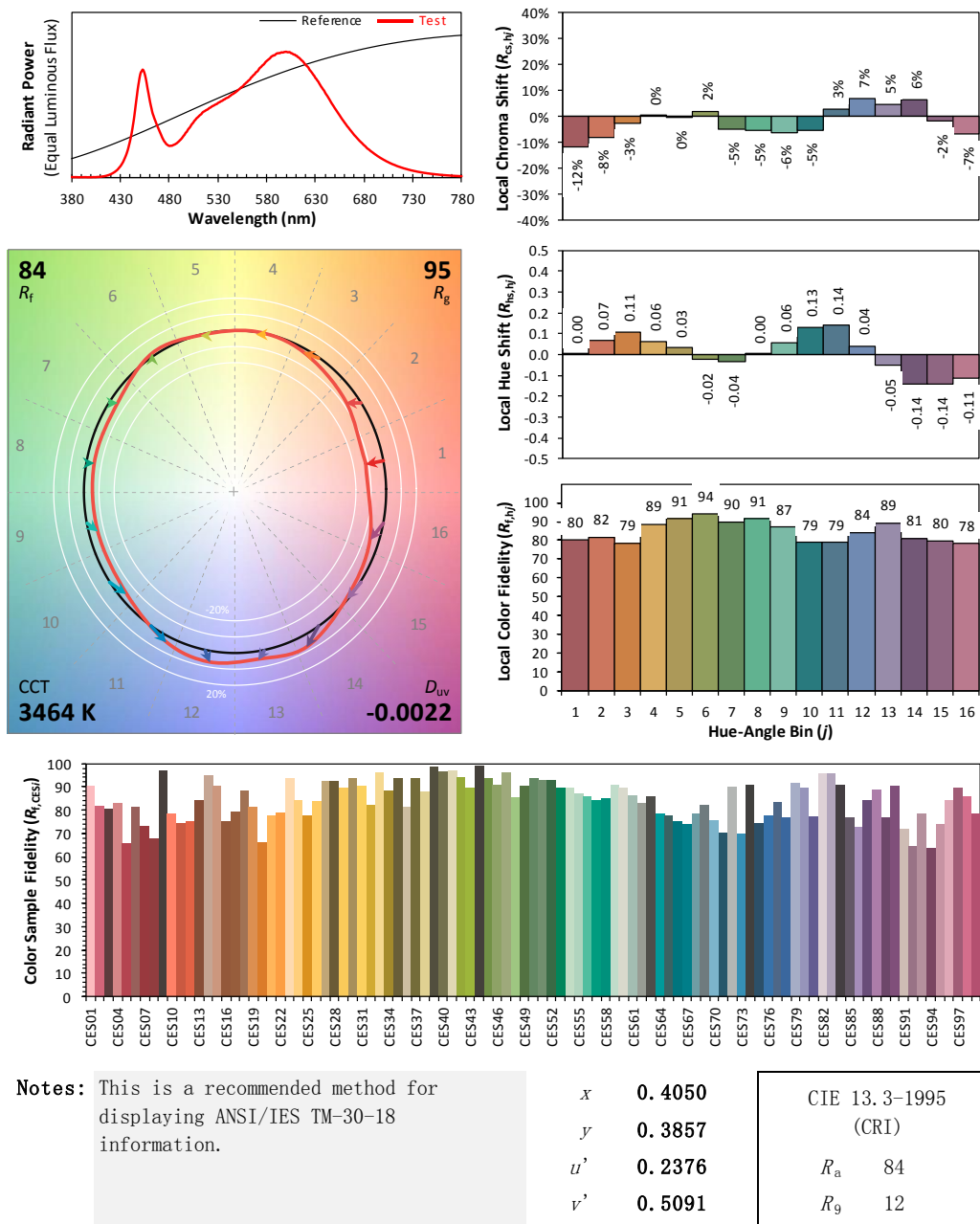
ANSI/IES TM-30-18 Color Rendition Report

Source: LED

Manufacturer: GREEN CREATIVE LTD

Date: 2025/04/08

Model: 24T5HO/4F/8CCTS/UEB



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)	0.202	0.092
Power Factor	0.9748	0.9144
Test Power (W)	23.65	23.34
THD A%	19.38	19.01
Luminous Efficacy (lm/W)	148.0	150.5
Total Luminous Flux (lm)	3500.4	3512.5
Color Rendering Index (CRI)	84.6	
R9	16.4	
Correlated Color Temperature (CCT)(K)	3962	
Chromaticity Chroma x	0.3804	
Chromaticity Chroma y	0.3720	
Chromaticity Chroma u	0.2270	
Chromaticity Chroma v	0.3330	
Duv	-0.0022	
Chromaticity Chroma u'	0.2270	
Chromaticity Chroma v'	0.4995	

Special Color Rendering Indices	
R1	83.8
R2	92.2
R3	95.7
R4	82.2
R5	83.6
R6	88
R7	85.4
R8	66.1
R9	16.4
R10	80.7
R11	81.4
R12	63.9
R13	86.3
R14	98.3

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

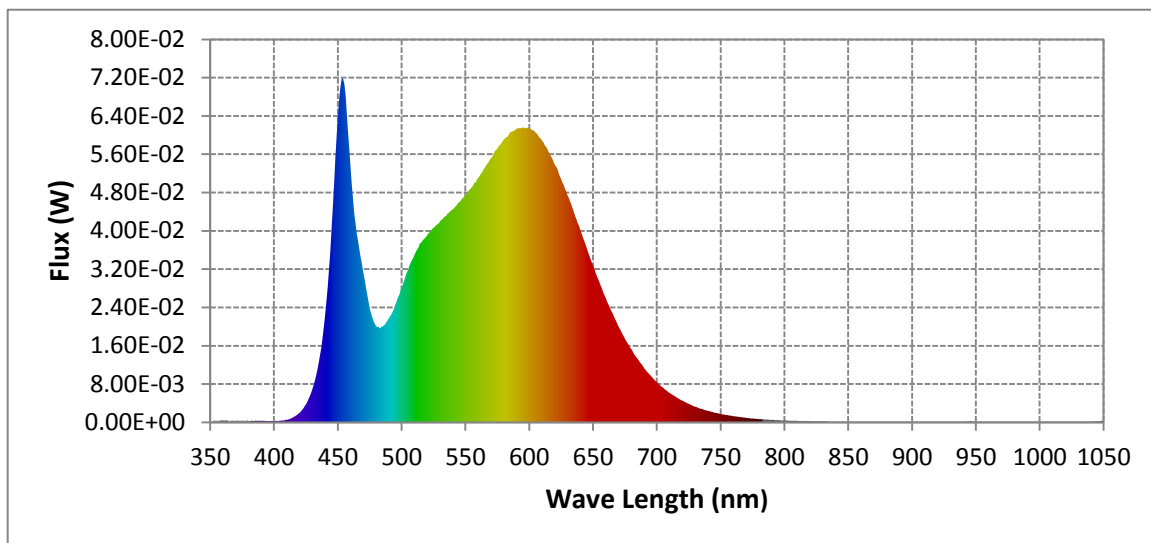
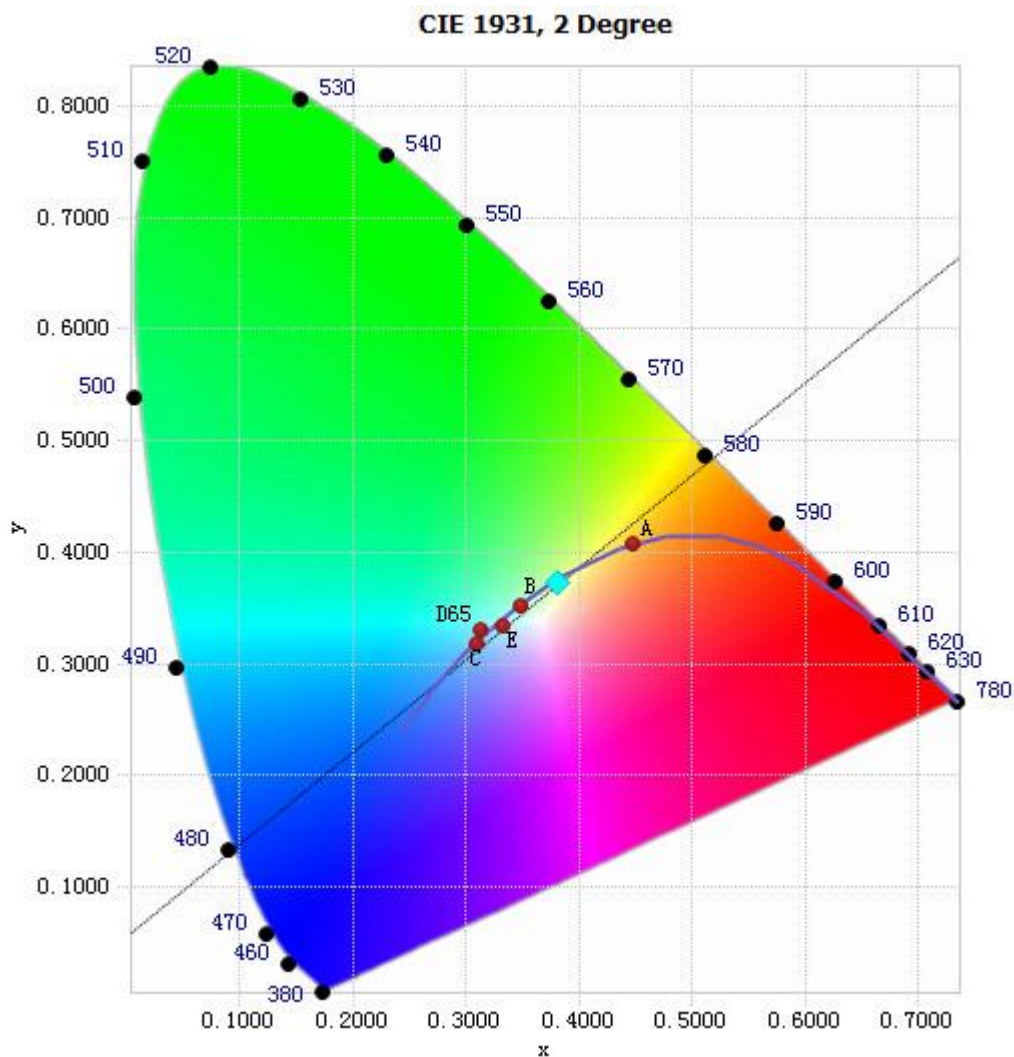


Chart 12: Spectral Power Distribution

Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	3.23E-04	485	2.01E-02	590	6.13E-02	695	9.80E-03
385	3.34E-04	490	2.17E-02	595	6.17E-02	700	8.39E-03
390	3.26E-04	495	2.46E-02	600	6.15E-02	705	7.19E-03
395	2.80E-04	500	2.82E-02	605	6.04E-02	710	6.13E-03
400	2.80E-04	505	3.19E-02	610	5.87E-02	715	5.29E-03
405	3.34E-04	510	3.49E-02	615	5.66E-02	720	4.52E-03
410	5.48E-04	515	3.75E-02	620	5.38E-02	725	3.85E-03
415	1.06E-03	520	3.91E-02	625	5.08E-02	730	3.27E-03
420	1.97E-03	525	4.06E-02	630	4.74E-02	735	2.78E-03
425	3.73E-03	530	4.20E-02	635	4.38E-02	740	2.38E-03
430	6.93E-03	535	4.31E-02	640	4.02E-02	745	2.03E-03
435	1.26E-02	540	4.45E-02	645	3.65E-02	750	1.75E-03
440	2.25E-02	545	4.60E-02	650	3.27E-02	755	1.50E-03
445	4.04E-02	550	4.74E-02	655	2.92E-02	760	1.28E-03
450	6.43E-02	555	4.91E-02	660	2.59E-02	765	1.10E-03
455	7.06E-02	560	5.11E-02	665	2.28E-02	770	9.48E-04
460	5.35E-02	565	5.30E-02	670	1.99E-02	775	8.09E-04
465	3.93E-02	570	5.51E-02	675	1.74E-02	780	6.86E-04
470	3.13E-02	575	5.72E-02	680	1.52E-02		
475	2.38E-02	580	5.90E-02	685	1.32E-02		
480	2.01E-02	585	6.06E-02	690	1.14E-02		

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

Chromaticity Diagram - Sphere Spectroradiometer Method



Tristimulus values(x, y): (0.3804, 0.3720)

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

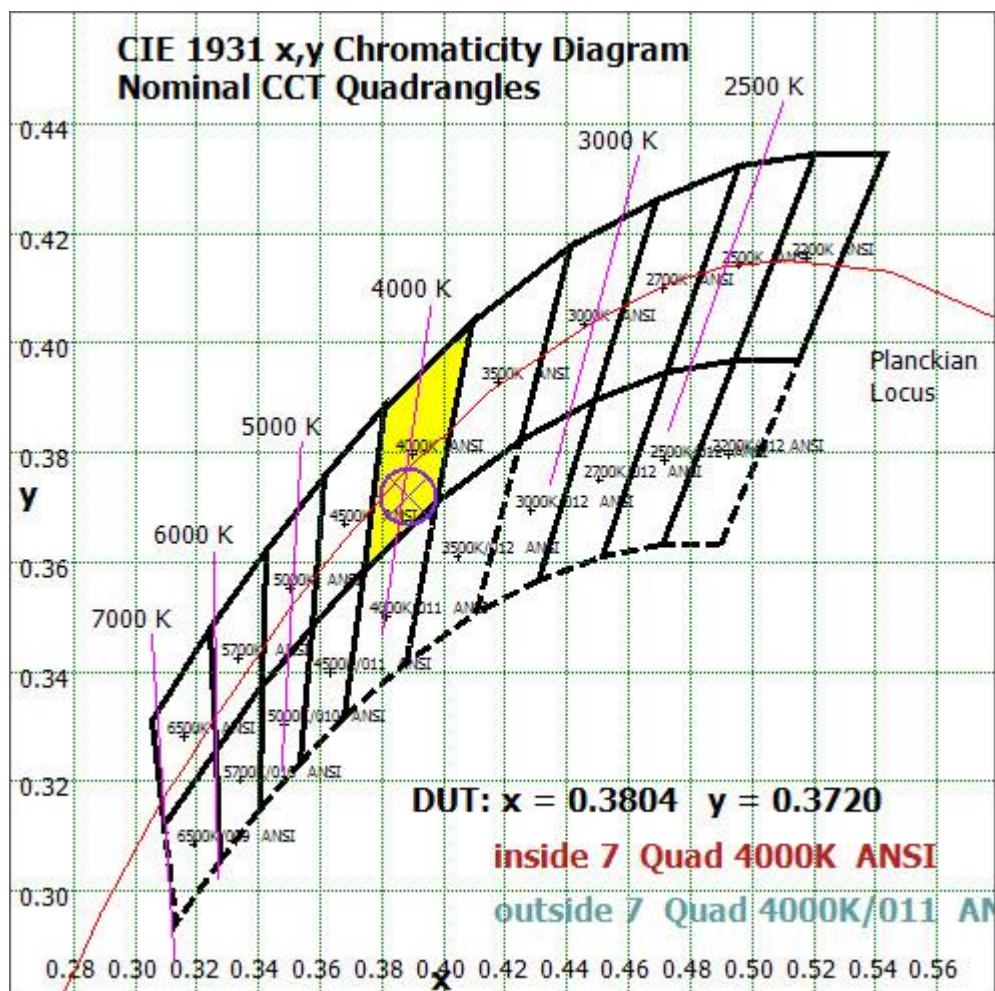


Chart14: Plot of Lamp x/y coordinates on CIE 1931 Chromaticity Diagram

Color Rendition Report – Sphere Spectroradiometer Method

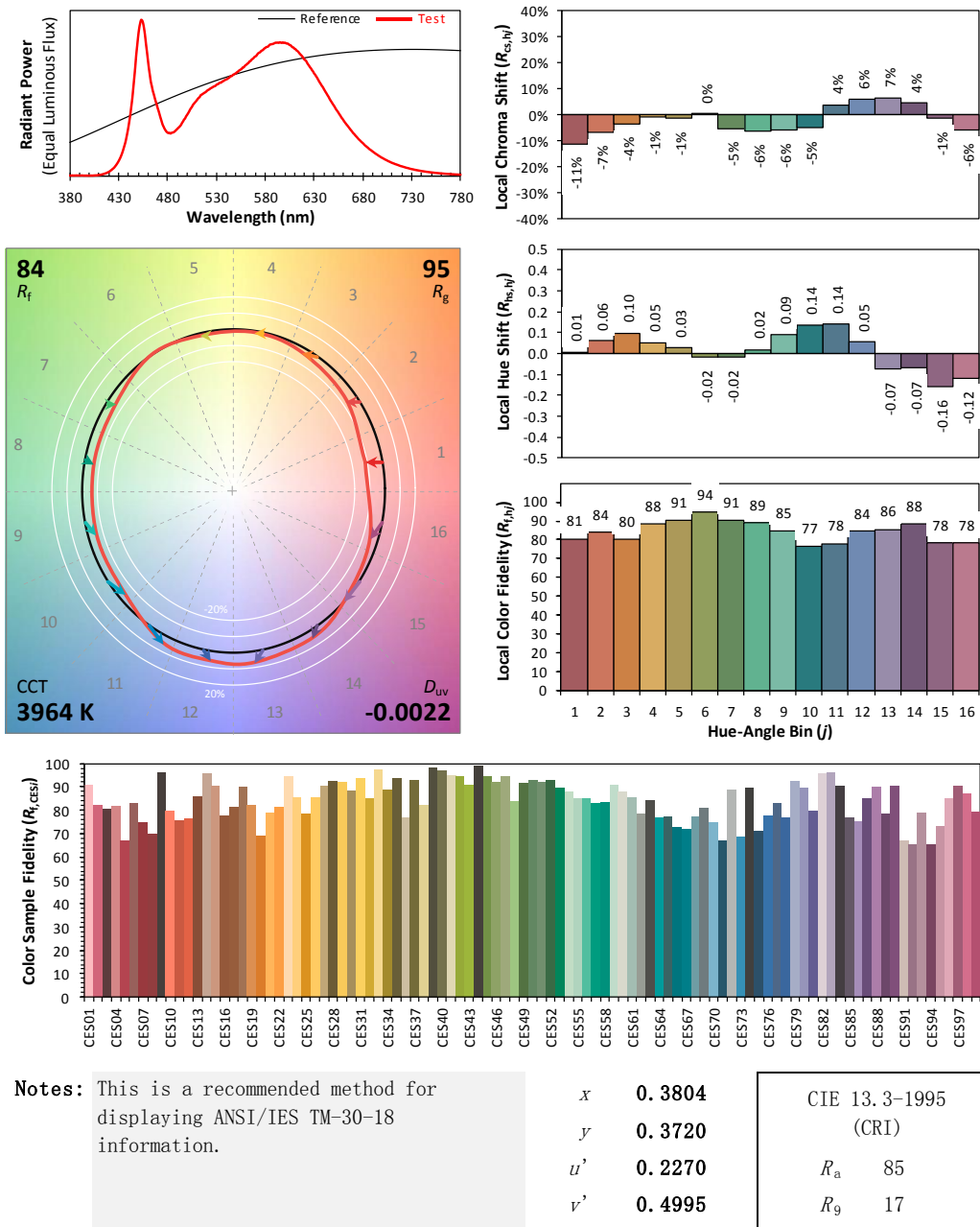
ANSI/IES TM-30-18 Color Rendition Report

Source: LED

Manufacturer: GREEN CREATIVE LTD

Date: 2025/04/08

Model: 24T5HO/4F/8CCTS/UEB



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)	0.206	0.093
Power Factor	0.9717	0.9202
Test Power (W)	24.05	23.72
THD A%	19.96	18.23
Luminous Efficacy (lm/W)	137.3	140.1
Total Luminous Flux (lm)	3301.1	3322.7
Color Rendering Index (CRI)	84.3	
R9	13	
Correlated Color Temperature (CCT)(K)	5054	
Chromaticity Chroma x	0.3436	
Chromaticity Chroma y	0.3516	
Chromaticity Chroma u	0.2104	
Chromaticity Chroma v	0.3230	
Duv	0.0006	
Chromaticity Chroma u'	0.2104	
Chromaticity Chroma v'	0.4844	

Special Color Rendering Indices	
R1	83.1
R2	91.2
R3	94.4
R4	82.1
R5	83.2
R6	86
R7	86.4
R8	67.8
R9	13
R10	77.9
R11	81.1
R12	62.5
R13	85.7
R14	97.4

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

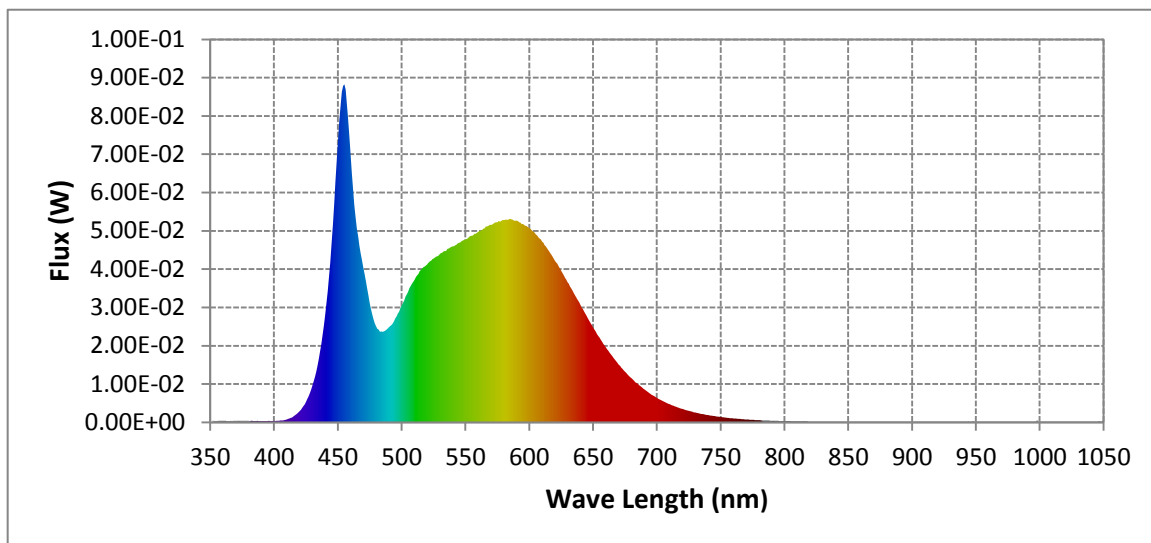
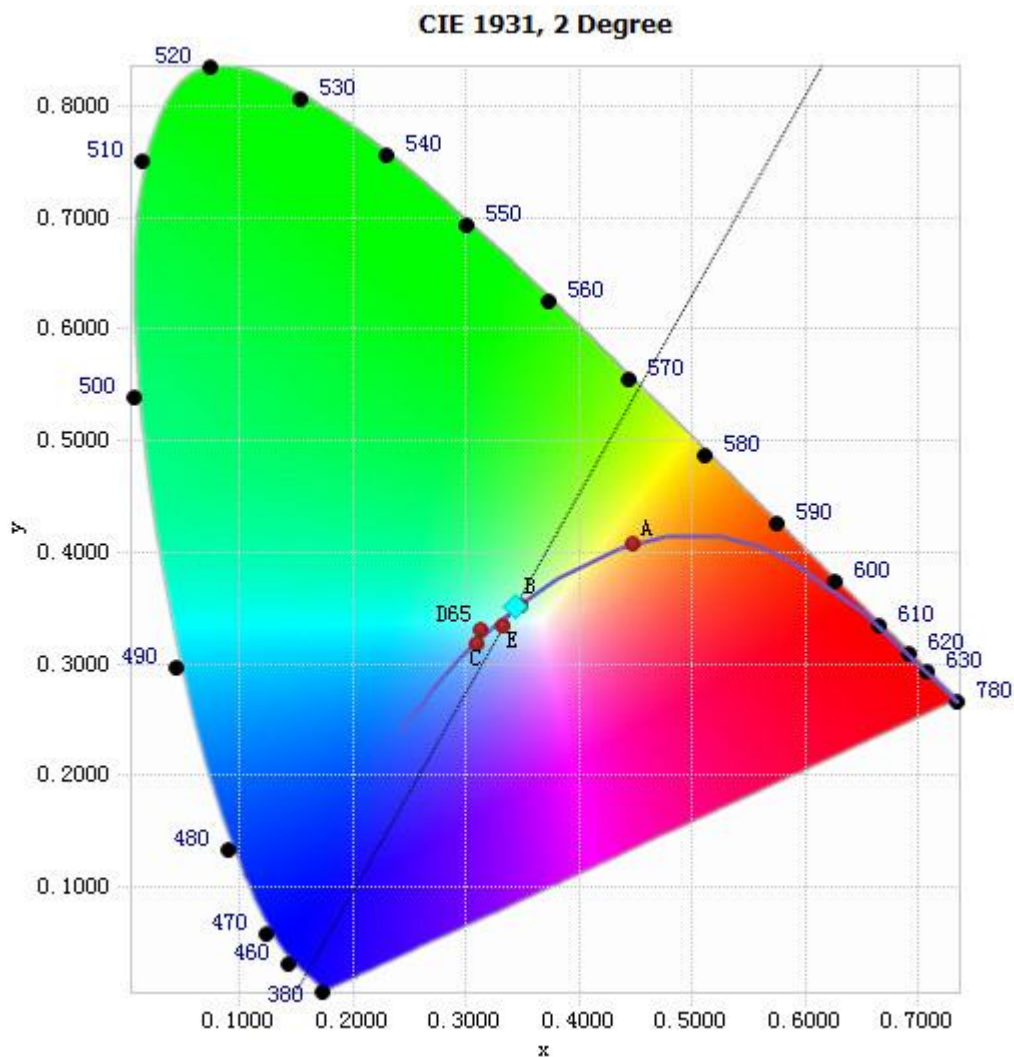


Chart16: Spectral Power Distribution

Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	4.01E-04	485	2.37E-02	590	5.27E-02	695	7.43E-03
385	3.29E-04	490	2.48E-02	595	5.18E-02	700	6.41E-03
390	3.27E-04	495	2.72E-02	600	5.07E-02	705	5.51E-03
395	3.33E-04	500	3.05E-02	605	4.90E-02	710	4.72E-03
400	3.69E-04	505	3.41E-02	610	4.72E-02	715	4.08E-03
405	4.56E-04	510	3.71E-02	615	4.50E-02	720	3.49E-03
410	7.79E-04	515	3.98E-02	620	4.23E-02	725	2.99E-03
415	1.51E-03	520	4.13E-02	625	3.96E-02	730	2.56E-03
420	2.89E-03	525	4.28E-02	630	3.66E-02	735	2.17E-03
425	5.31E-03	530	4.40E-02	635	3.37E-02	740	1.88E-03
430	9.57E-03	535	4.48E-02	640	3.07E-02	745	1.62E-03
435	1.66E-02	540	4.59E-02	645	2.78E-02	750	1.40E-03
440	2.81E-02	545	4.69E-02	650	2.48E-02	755	1.20E-03
445	4.67E-02	550	4.77E-02	655	2.21E-02	760	1.02E-03
450	7.36E-02	555	4.87E-02	660	1.96E-02	765	8.91E-04
455	8.83E-02	560	4.97E-02	665	1.73E-02	770	7.62E-04
460	7.04E-02	565	5.06E-02	670	1.51E-02	775	6.56E-04
465	5.06E-02	570	5.16E-02	675	1.32E-02	780	5.73E-04
470	4.05E-02	575	5.23E-02	680	1.15E-02		
475	3.12E-02	580	5.28E-02	685	9.98E-03		
480	2.51E-02	585	5.31E-02	690	8.67E-03		

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

Chromaticity Diagram - Sphere Spectroradiometer Method



Tristimulus values(x, y): (0.3436, 0.3516)

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

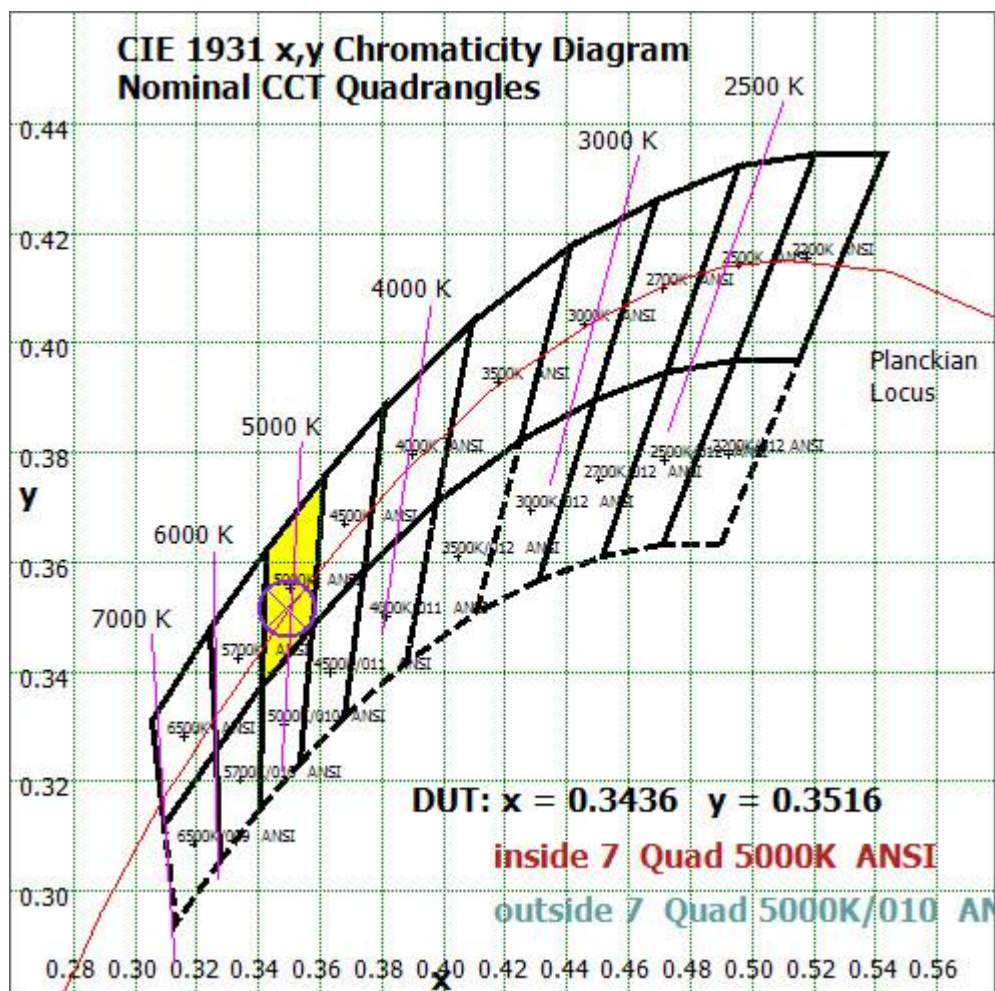


Chart 18: Plot of Lamp x/y coordinates on CIE 1931 Chromaticity Diagram

Color Rendition Report – Sphere Spectroradiometer Method

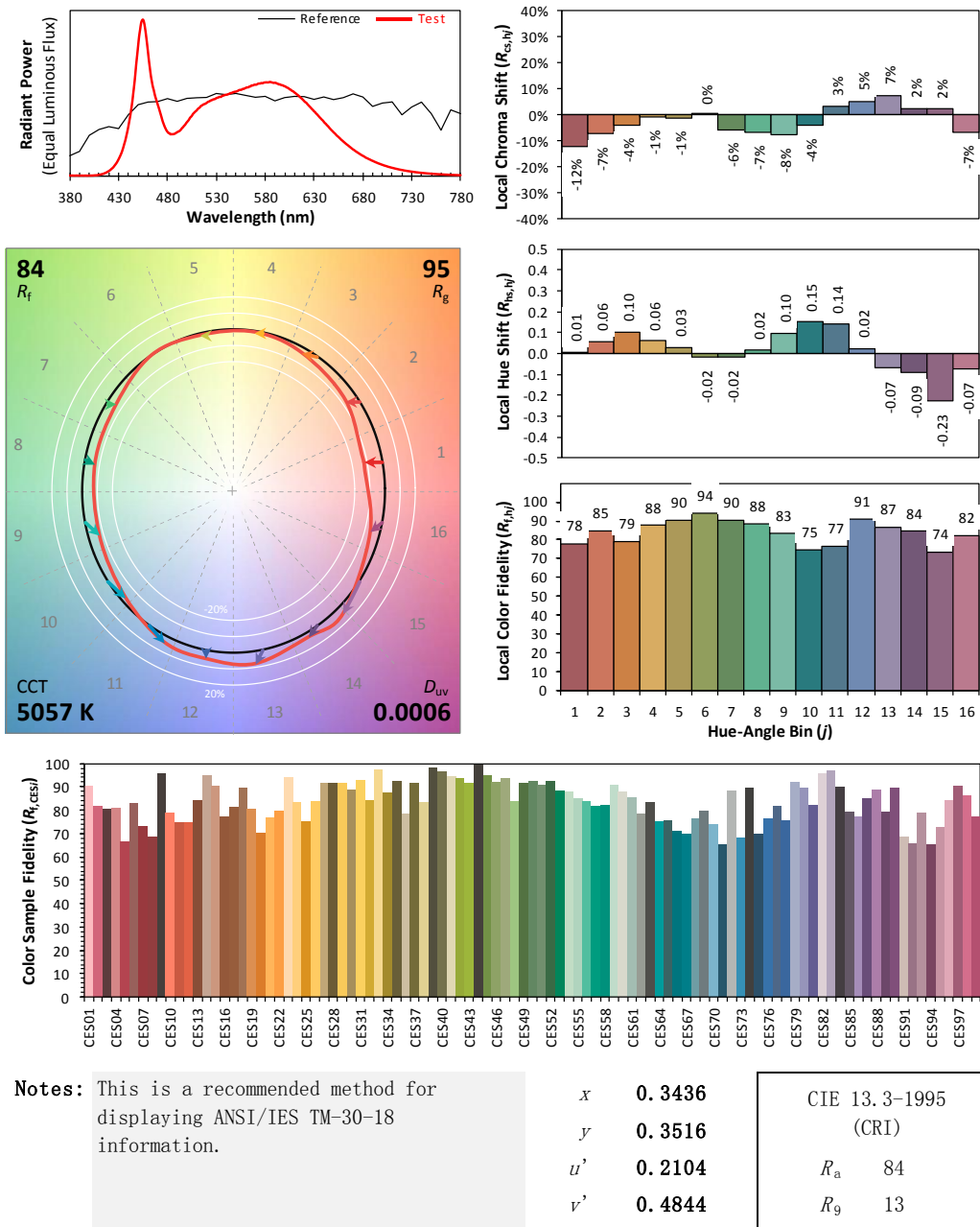
ANSI/IES TM-30-18 Color Rendition Report

Source: LED

Manufacturer: GREEN CREATIVE LTD

Date: 2025/04/08

Model: 24T5HO/4F/8CCTS/UEB



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.