



LM-79-19 TEST REPORT

for

GREEN CREATIVE LTD

Room 3603, Level 36, Tower 1, Enterprise Square Five, 38 Wang Chiu Road, Kowloon Bay, KL,
Hong Kong

LED Lamp

Model: 7BR30DIM/9CCTS

Laboratory: Lea ding Testing Laboratories

NVLAP CODE: 200960-0

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Report No.: HZ24040021a

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

Review by:

Wei Fei

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Apr. 17, 2024

Approved by:



April Zou

Manager: April Zou
Apr. 17, 2024

Note: This report does not imply product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

TEST SUMMARY

Tested Model	7BR30DIM/9CCTS 2700K Setting	7BR30DIM/9CCTS 3000K Setting	7BR30DIM/9CCTS 3500K Setting
Luminous Efficacy (Lumens /Watt)	114.6	118.5	122.3
Total Luminous Flux (Lumens)	769.3	803.2	845.1
Power (Watts)	6.71	6.78	6.91
Power Factor	0.8087	0.8148	0.8242
CCT (K)	2754	2994	3425
CRI	92.8	94.6	96.1
Stabilization Time (Light & Power)	50 mins	50 mins	50 mins
Note	2700K	3000K	3500K

Tested Model	7BR30DIM/9CCTS 4000K Setting	7BR30DIM/9CCTS 5000K Setting
Luminous Efficacy (Lumens /Watt)	122.7	117.9
Total Luminous Flux (Lumens)	839.2	785.4
Power (Watts)	6.84	6.66
Power Factor	0.8192	0.8054
CCT (K)	3947	4965
CRI	96.3	94.0
Stabilization Time (Light & Power)	50 mins	50 mins
Note	4000K	5000K

Table 1: Executive Data Summary

Test specifications:

Date of Receipt	: Apr. 15, 2024
Date of Test	: Apr. 16, 2024
Test item	: Total Luminous Flux, Luminous Distribution Intensity, Luminous Efficacy, Correlated Color Temperature, Color Rendering Index, Chromaticity Coordinate, Electrical parameters
Reference Standard	: IESNA LM-79-2019 Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products ANSI/IES TM-30-18 IES Method for Evaluating Light Source Color Rendition

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SAMPLE PHOTO



Figure 1- Overview of the sample

Equipment Under Test(EUT)

Name	: LED Lamp
Model	: 7BR30DIM/9CCTS
Electrical Ratings	: 120V, 60Hz, 7W
Product Description	: Color- Tunable 2700K/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 (2700K 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
Voltage frequency (Hz)	60
Test Current (A)	0.069
Power Factor	0.8087
Test Power (W)	6.71
THD A%	58.65
Luminous Efficacy (lm/W)	114.6
Total Luminous Flux (lm)	769.3
Color Rendering Index (CRI)	92.8
R9	61
Correlated Color Temperature (CCT)(K)	2754
Chromaticity Chroma x	0.4586
Chromaticity Chroma y	0.4154
Chromaticity Chroma u	0.2595
Chromaticity Chroma v	0.3527
Duv	0.0019
Chromaticity Chroma u'	0.2595
Chromaticity Chroma v'	0.5290

Special Color Rendering Indices	
R1	94.7
R2	94.6
R3	92.2
R4	95.1
R5	92.9
R6	94.6
R7	93.8
R8	84.5
R9	61
R10	84.1
R11	95.5
R12	78.3
R13	94.1
R14	93.8

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

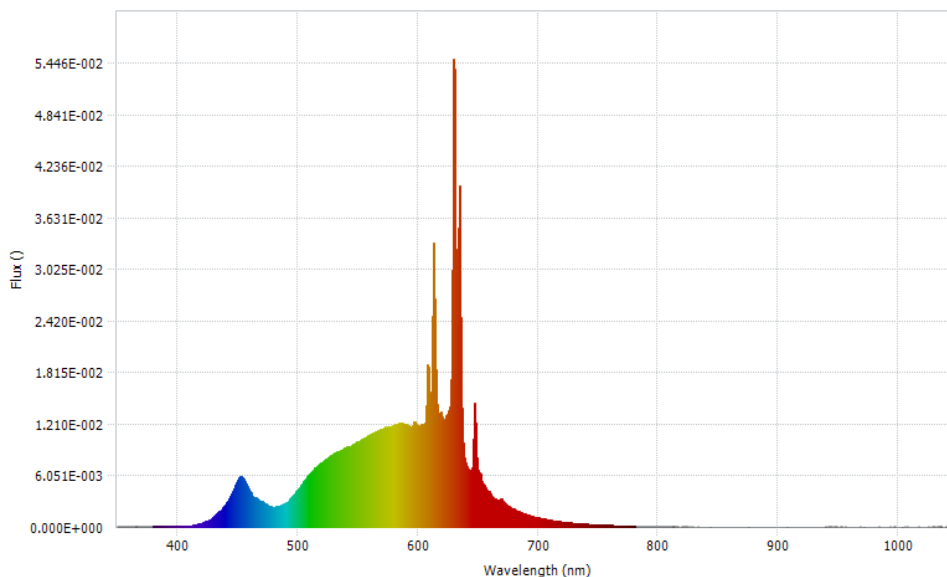
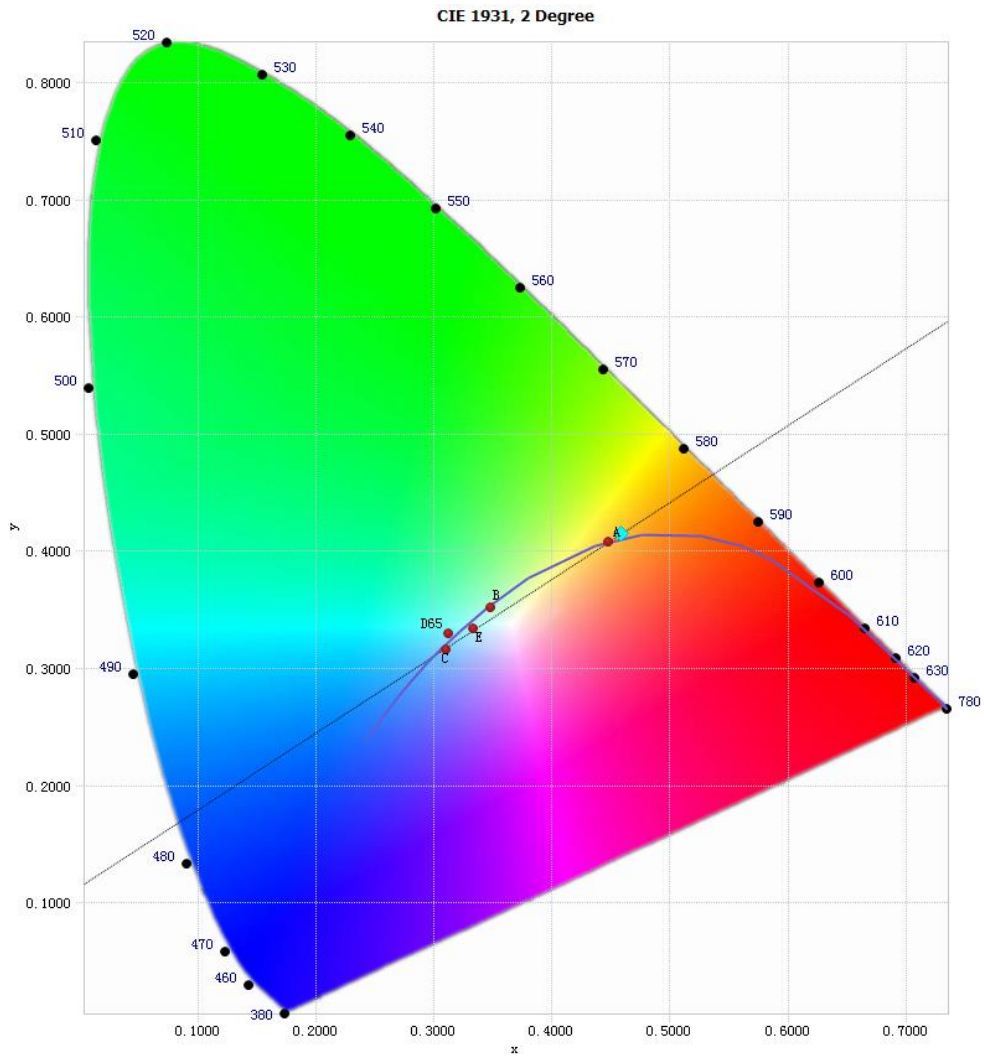


Chart 1: Spectral Power Distribution

Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	1.25E-04	485	2.50E-03	590	1.21E-02	695	1.28E-03
385	9.49E-05	490	2.85E-03	595	1.18E-02	700	1.10E-03
390	1.01E-04	495	3.46E-03	600	1.19E-02	705	9.40E-04
395	1.06E-04	500	4.35E-03	605	1.19E-02	710	8.08E-04
400	1.28E-04	505	5.32E-03	610	1.47E-02	715	7.03E-04
405	1.57E-04	510	6.20E-03	615	1.84E-02	720	6.09E-04
410	1.83E-04	515	6.98E-03	620	1.30E-02	725	5.35E-04
415	2.82E-04	520	7.60E-03	625	1.33E-02	730	4.74E-04
420	4.62E-04	525	8.09E-03	630	5.50E-02	735	3.95E-04
425	7.65E-04	530	8.57E-03	635	4.00E-02	740	3.48E-04
430	1.19E-03	535	8.91E-03	640	7.48E-03	745	3.00E-04
435	1.79E-03	540	9.31E-03	645	7.04E-03	750	2.60E-04
440	2.65E-03	545	9.64E-03	650	6.62E-03	755	2.32E-04
445	3.92E-03	550	9.98E-03	655	5.06E-03	760	1.96E-04
450	5.52E-03	555	1.04E-02	660	4.16E-03	765	1.69E-04
455	5.65E-03	560	1.07E-02	665	3.31E-03	770	1.55E-04
460	4.27E-03	565	1.11E-02	670	3.25E-03	775	1.28E-04
465	3.46E-03	570	1.15E-02	675	2.47E-03	780	1.16E-04
470	3.04E-03	575	1.17E-02	680	2.09E-03		
475	2.57E-03	580	1.19E-02	685	1.77E-03		
480	2.32E-03	585	1.23E-02	690	1.52E-03		

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

Chromaticity Diagram - Sphere Spectroradiometer Method



Tristimulus values(x, y): (0.4586, 0.4154)

Chart 2: Chromaticity Diagram per Sphere - Spectroradiometer Method

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

Nominal CCT Quadrangles – Sphere Spectroradiometer Method

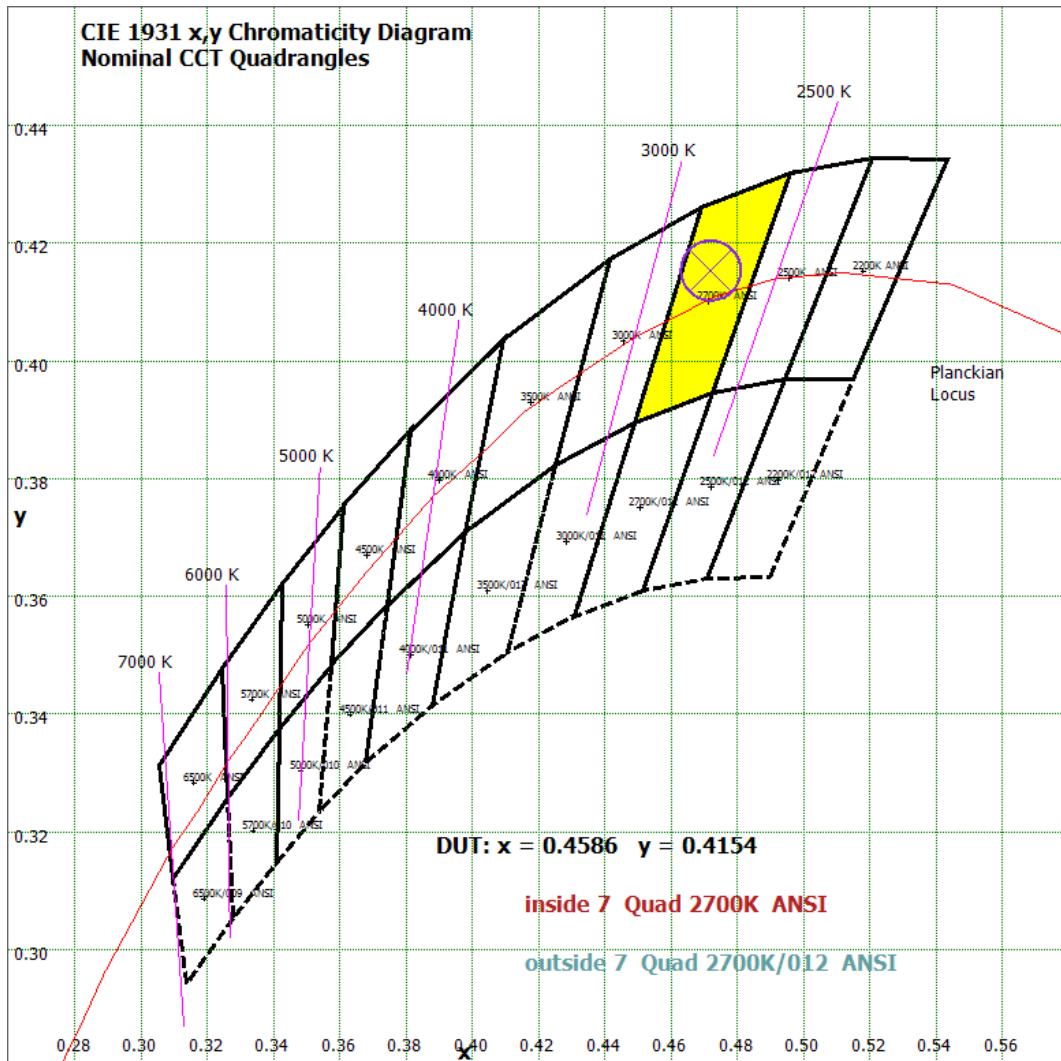


Chart 3: Plot of Lamp x/y coordinates on CIE 1931 Chromaticity Diagram

Color Rendition Report – Sphere Spectroradiometer Method

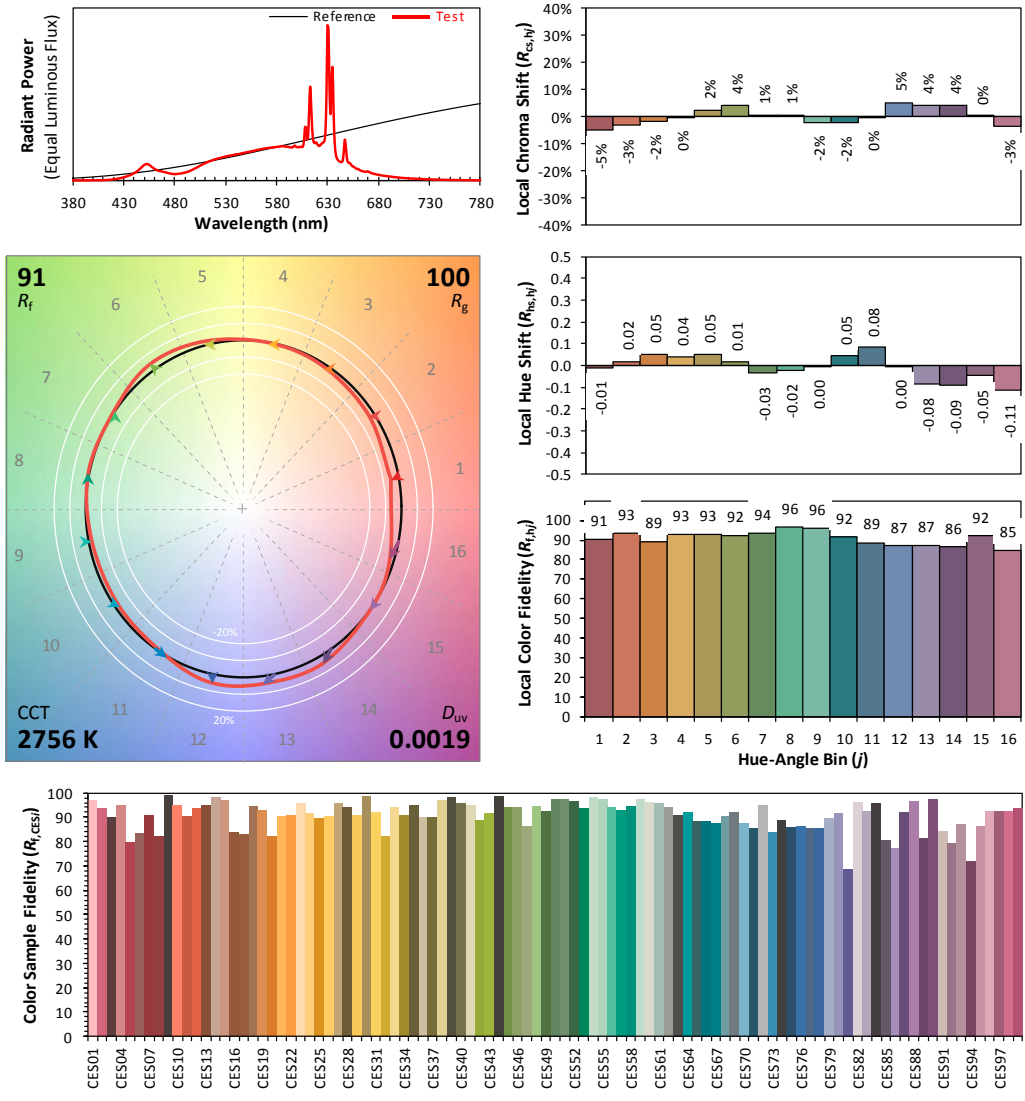
ANSI/IES TM-30-18 Color Rendition Report

Source: LED

Manufacturer: GREEN CREATIVE LTD

Date: 2024/04/16

Model: 7BR30DIM/9CCTS



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.	x	0.4586	CIE 13.3-1995 (CRI) R_a 93 R_g 61
	y	0.4154	
	u'	0.2595	
	v'	0.5290	

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 2.47 m.

Luminous data was taken at 0.5 ° vertical intervals and 10 ° horizontal intervals.

Parameter	Result
Test Voltage (V)	120.0
Voltage frequency (Hz)	60
Test Current (A)	0.070
Power Factor	0.8029
Power (W)	6.74
Luminous Efficacy (lm/W)	116.1
Total Luminous Flux (lm)	782.5
Beam Angle (°)	117.3 (0°-180°) / 117.3 (90°-270°)
Center Beam Candle Power (cd)	224
Maximum Beam Candle Power (cd)	224.6 (At: C=130.0, Gamma=3.0)
Spacing Criteria	1.29 (0°-180°) / 1.24 (90°-270°)
Zonal Lumens in the 0 °-60 °Zone	65.70%
Zonal Lumens in the 60 °-90 °Zone	25.35%
Zonal Lumens in the 90 °-120 °Zone	6.98%
Zonal Lumens in the 120 °-180 °Zone	1.97%

Table 4: Test data per Goniophotometer Method

Zonal Lumen Tabulation- Goniophotometer Method

$\gamma(^{\circ})$	Lumens	% Total
0- 10	21.192	2.71%
10- 20	60.753	7.76%
20- 30	92.196	11.78%
30- 40	111.7	14.27%
40- 50	117.87	15.06%
50- 60	110.372	14.10%
60- 70	91.219	11.66%
70- 80	65.607	8.38%
80- 90	41.582	5.31%
90-100	25.46	3.25%
100-110	17.202	2.20%
110-120	11.971	1.53%
120-130	7.75	0.99%
130-140	4.48	0.57%
140-150	2.191	0.28%
150-160	0.794	0.10%
160-170	0.164	0.02%
170-180	0.023	0.00%
Total	782.5	100%

$\gamma(^{\circ})$	Lumens	% Total
0- 60	514.083	65.70%
60- 90	198.408	25.35%
0-90	712.491	91.05%
90- 180	70.035	8.95%
0- 180	782.5	100%

Table 5: Zonal Lumen

Illuminance Plots- Goniophotometer Method

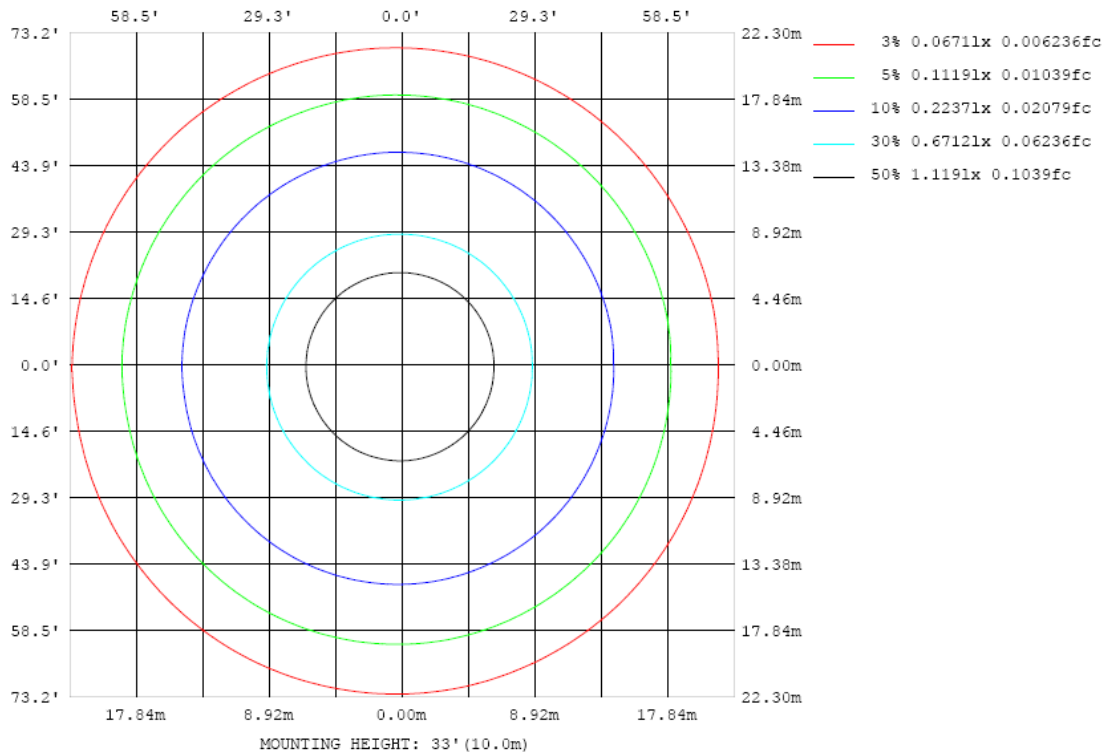


Chart 5: Illuminance Plot (Footcandles)

Luminous Intensity Distribution Plots- Goniophotometer Method

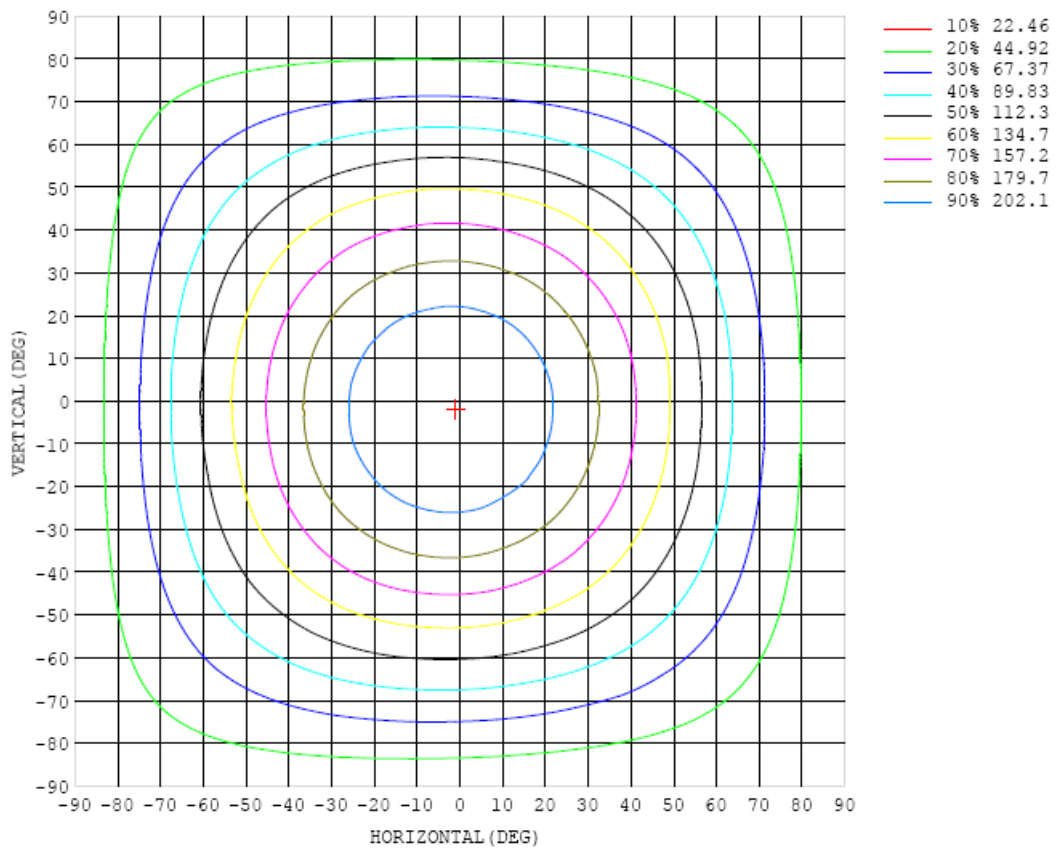


Chart 6: Isocandela Plot

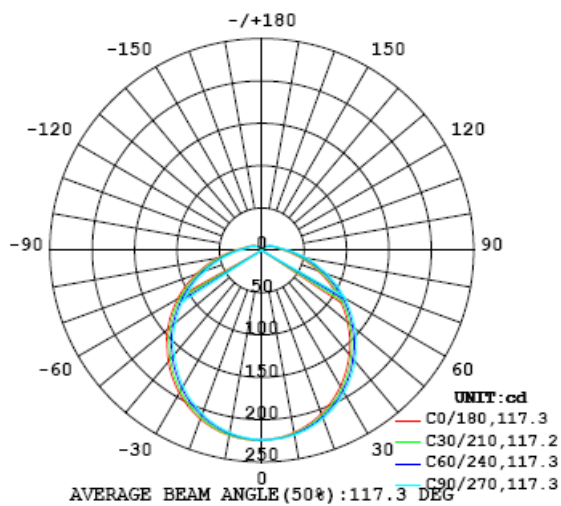


Chart 7: Polar Candela Distribution

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	224	224	224	224	224	224	224	224	224	224	224	224	224	224	224	224	224	224	224
5	222	222	222	223	223	223	223	223	224	224	224	224	224	225	224	224	224	224	224
10	219	219	219	220	220	220	220	221	221	221	222	222	222	223	222	222	222	222	222
15	213	213	214	214	214	215	216	216	217	217	218	218	219	219	219	219	218	218	218
20	205	205	206	207	208	208	209	210	211	211	212	212	213	213	213	213	212	212	212
25	196	196	197	199	199	201	201	202	203	203	205	205	205	206	205	205	205	204	204
30	185	186	187	188	189	190	191	192	193	194	195	195	196	196	196	196	195	195	195
35	173	174	175	177	177	179	180	181	182	183	184	184	185	186	185	185	185	184	184
40	160	161	162	164	165	166	168	169	170	171	172	173	173	173	173	173	172	172	171
45	147	147	149	150	151	153	154	155	157	158	159	159	160	160	160	160	159	159	158
50	132	133	134	136	137	138	140	141	143	144	145	145	146	146	146	146	145	144	145
55	117	118	119	121	122	124	125	126	128	129	130	130	131	131	131	131	130	130	130
60	101	102	104	105	107	108	110	111	112	113	115	115	116	116	115	116	115	114	115
65	85.8	86.8	88.2	89.7	91.0	92.5	93.8	95.4	96.6	97.6	98.9	99.3	99.9	100	99.8	99.6	99.0	98.3	98.6
70	71.5	71.4	72.7	74.2	75.5	76.8	78.3	79.6	80.8	81.9	83.0	83.7	84.1	84.4	84.0	84.1	83.1	82.6	82.6
75	56.9	57.8	58.9	60.2	61.4	62.8	64.0	65.3	66.4	67.1	68.1	68.5	68.9	69.2	68.9	68.8	67.9	67.6	67.2
80	44.5	45.2	46.2	47.4	48.3	49.4	50.5	51.5	52.6	53.4	54.3	54.8	55.2	55.4	55.1	54.9	54.4	53.7	53.2
85	34.3	34.9	35.6	36.5	37.3	38.2	39.1	39.9	40.7	41.4	42.1	42.5	42.7	42.9	42.9	42.7	42.2	41.7	41.2
90	26.6	27.1	27.6	28.3	28.9	29.5	30.1	30.8	31.4	31.9	32.4	32.7	33.0	33.1	32.9	32.8	32.4	32.0	31.7
95	21.2	21.5	21.9	22.4	22.7	23.1	23.6	24.1	24.5	24.8	25.2	25.4	25.6	25.7	25.6	25.5	25.2	24.9	24.7
100	17.7	17.9	18.2	18.4	18.7	19.0	19.3	19.6	19.9	20.0	20.3	20.4	20.5	20.6	20.5	20.4	20.3	20.1	20.0
105	15.4	15.5	15.7	15.9	16.1	16.3	16.5	16.7	16.9	17.0	17.2	17.2	17.3	17.3	17.2	17.3	17.1	17.0	16.9
110	13.3	13.4	13.6	13.8	13.9	14.1	14.3	14.5	14.6	14.7	14.9	14.9	15.0	15.0	14.9	14.9	14.8	14.8	14.7
115	11.4	11.5	11.7	11.9	12.0	12.2	12.3	12.5	12.6	12.7	12.8	12.9	12.9	12.9	12.9	12.9	12.8	12.7	12.6
120	9.69	9.79	9.93	10.1	10.2	10.4	10.5	10.6	10.8	10.8	11.0	11.0	11.0	11.1	11.0	11.0	10.9	10.9	10.7
125	8.13	8.20	8.32	8.46	8.56	8.69	8.81	8.93	9.06	9.14	9.24	9.26	9.28	9.31	9.26	9.27	9.23	9.16	9.05
130	6.63	6.71	6.80	6.92	7.01	7.16	7.26	7.40	7.51	7.57	7.66	7.70	7.71	7.72	7.69	7.68	7.64	7.59	7.50
135	5.33	5.40	5.49	5.58	5.67	5.79	5.87	5.98	6.06	6.12	6.20	6.23	6.22	6.25	6.22	6.22	6.18	6.14	6.11
140	4.15	4.21	4.29	4.38	4.46	4.55	4.64	4.73	4.81	4.86	4.92	4.94	4.95	4.96	4.94	4.94	4.90	4.87	4.85
145	3.10	3.15	3.22	3.30	3.37	3.45	3.53	3.61	3.67	3.71	3.77	3.79	3.79	3.80	3.79	3.79	3.76	3.73	3.73
150	2.17	2.22	2.27	2.34	2.40	2.48	2.55	2.62	2.68	2.71	2.75	2.77	2.78	2.79	2.77	2.77	2.75	2.73	2.73
155	1.39	1.43	1.47	1.53	1.58	1.65	1.71	1.77	1.81	1.84	1.88	1.89	1.90	1.90	1.90	1.90	1.88	1.86	1.87
160	0.77	0.80	0.83	0.88	0.92	0.97	1.02	1.06	1.10	1.12	1.15	1.16	1.17	1.18	1.17	1.17	1.16	1.15	1.16
165	0.36	0.37	0.39	0.42	0.45	0.48	0.51	0.54	0.56	0.58	0.60	0.61	0.61	0.62	0.61	0.61	0.60	0.60	0.61
170	0.23	0.22	0.23	0.23	0.23	0.24	0.24	0.25	0.26	0.27	0.28	0.28	0.28	0.28	0.28	0.28	0.27	0.27	0.29
175	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.25	0.25	0.24	0.25	0.25	0.25	0.24	0.24	0.24
180	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.23	0.23	0.23	0.24

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	224	224	224	224	224	224	224	224	224	224	224	224	224	224	224	224	224		
5	223	223	224	223	223	223	223	223	222	223	222	221	222	222	221	222	222		
10	222	221	221	220	220	220	219	219	218	219	218	218	218	218	218	218	218		
15	217	217	217	216	215	214	214	213	213	213	212	212	212	212	212	212	213		
20	211	211	211	209	208	207	206	206	205	205	204	204	205	204	205	204	205		
25	203	203	202	201	200	199	198	197	196	196	195	195	195	195	195	195	196		
30	194	193	192	190	190	188	187	187	185	185	185	184	184	184	184	184	185		
35	183	182	181	179	178	177	176	175	173	173	172	172	172	172	172	172	173		
40	170	169	168	166	165	164	163	162	160	160	159	159	159	159	159	159	160		
45	157	156	155	154	153	152	150	149	148	147	146	146	146	146	146	146	147		
50	144	143	142	140	139	137	136	134	133	132	132	131	131	131	131	132	133		
55	129	128	126	124	123	122	120	119	118	117	116	116	116	116	116	117	117		
60	113	112	111	109	108	106	105	103	102	101	101	100	100	99.9	101	101	102		
65	97.4	96.0	94.6	92.8	91.5	90.2	88.7	87.4	86.2	85.6	84.9	84.5	84.3	84.3	84.7	85.0	86.1		
70	81.5	80.2	78.8	77.2	75.7	74.3	73.0	71.9	70.7	70.1	69.4	69.1	69.0	68.8	69.3	69.8	70.6		
75	66.0	64.8	63.7	62.1	60.8	59.5	58.4	57.4	56.4	55.9	55.3	54.9	54.9	54.9	55.2	55.6	56.3		
80	52.2	51.2	50.1	48.8	47.7	46.6	45.6	44.8	44.0	43.6	43.0	42.8	42.7	42.6	43.0	43.4	43.9		
85	40.4	39.5	38.8	37.7	36.9	36.0	35.2	34.6	34.0	33.6	33.2	33.0	32.9	32.9	33.2	33.4	34.0		
90	31.1	30.5	29.8	29.1	28.5	27.8	27.3	26.8	26.3	26.1	25.8	25.6	25.6	25.6	25.8	26.0	26.3		
95	24.3	23.9	23.4	22.9	22.5	22.1	21.7	21.3	21.1	20.9	20.7	20.6	20.6	20.6	20.7	20.9	21.1		
100	19.7	19.5	19.2	18.9	18.6	18.3	18.1	17.9	17.7	17.6	17.4	17.4	17.4	17.4	17.4	17.5	17.7		
105	16.8	16.6	16.4	16.2	16.0	15.8	15.7	15.5	15.4	15.3	15.2	15.1	15.1	15.1	15.1	15.2	15.3		
110	14.5	14.3	14.2	13.9	13.8	13.6	13.5	13.3	13.2	13.1	13.0	13.0	12.9	12.9	13.0	13.0	13.1		
115	12.4	12.3	12.2	12.0	11.9	11.7	11.6	11.4	11.3	11.3	11.2	11.1	11.1	11.1	11.1	11.2	11.3		
120	10.6	10.5	10.4	10.2	10.1	9.95	9.84	9.72	9.62	9.55	9.46	9.41	9.41	9.40	9.44	9.48	9.57		
125	8.94	8.84	8.73	8.58	8.49	8.37	8.26	8.14	8.06	7.99	7.91	7.87	7.86	7.85	7.88	7.92	8.00		
130	7.41	7.32	7.22	7.11	7.01	6.90	6.82	6.72	6.64	6.57	6.49	6.45	6.45	6.44	6.48	6.51	6.58		
135	6.02	5.95	5.87	5.76	5.68	5.60	5.52	5.43	5.36	5.30	5.23	5.19	5.18	5.18	5.20	5.24	5.30		
140	4.78	4.72	4.65	4.56	4.49	4.42	4.34	4.27	4.20	4.15	4.08	4.04	4.04	4.03	4.05	4.08	4.14		
145	3.67	3.61	3.55	3.48	3.41	3.35	3.29	3.24	3.17	3.12	3.06	3.02	3.02	3.01	3.03	3.05	3.10		
150	2.68	2.63	2.59	2.52	2.47	2.42	2.37	2.32	2.26	2.22	2.16	2.13	2.12	2.11	2.13	2.15	2.19		
155	1.84	1.80	1.76	1.71	1.66	1.62	1.57	1.53	1.48	1.44	1.40	1.37	1.35	1.35	1.36	1.38	1.41		
160	1.14	1.11	1.08	1.04	1.01	0.97	0.94	0.90	0.86	0.83	0.80	0.77	0.76	0.75	0.76	0.77	0.79		
165	0.61	0.59	0.57	0.56	0.54	0.51	0.49	0.46	0.44	0.42	0.40	0.38	0.37	0.37	0.36	0.36	0.38		
170	0.29	0.29	0.29	0.29	0.28	0.27	0.27	0.26	0.25	0.25	0.25	0.24	0.24	0.24	0.24	0.24	0.24		
175	0.24	0.24	0.25	0.25	0.25	0.25	0.24	0.24	0.24	0.24	0.25	0.25	0.24	0.24	0.24	0.24	0.24		
180	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.23	0.24	0.24	0.24	0.24	0.24	0.24	0.24		

Table 7: Luminous Intensity Data

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
Voltage frequency (Hz)	60
Test Current (A)	0.069
Power Factor	0.8148
Test Power (W)	6.78
THD A%	57.79
Luminous Efficacy (lm/W)	118.5
Total Luminous Flux (lm)	803.2
Color Rendering Index (CRI)	94.6
R9	69.6
Correlated Color Temperature (CCT)(K)	2994
Chromaticity Chroma x	0.4373
Chromaticity Chroma y	0.4044
Chromaticity Chroma u	0.2507
Chromaticity Chroma v	0.3477
Duv	0.0001
Chromaticity Chroma u'	0.2507
Chromaticity Chroma v'	0.5216

Special Color Rendering Indices	
R1	97
R2	96.4
R3	93.2
R4	96.3
R5	95.3
R6	95.8
R7	94.6
R8	88.2
R9	69.6
R10	88.1
R11	96.1
R12	79.7
R13	96.5
R14	94.5

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

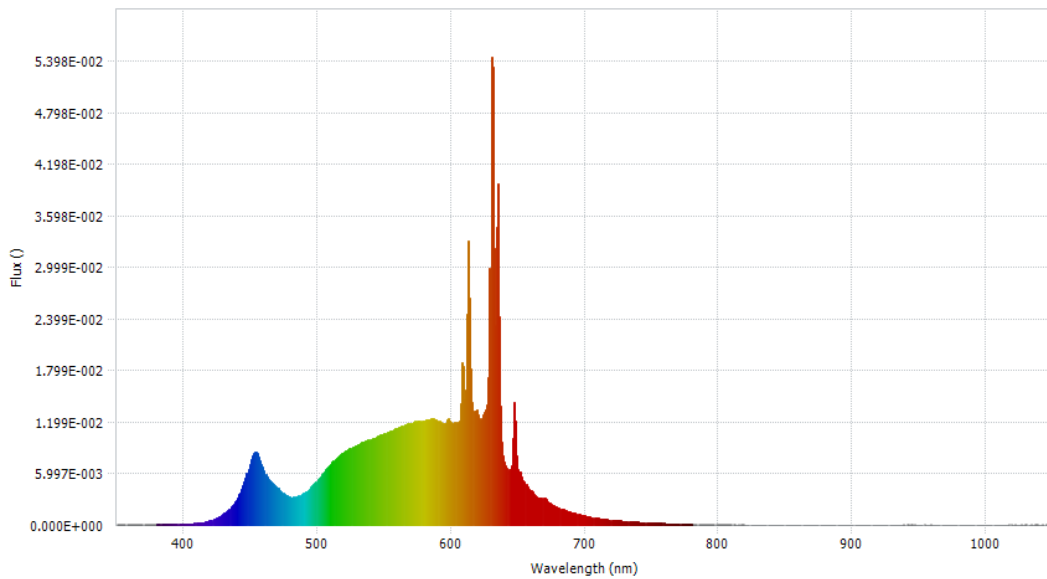
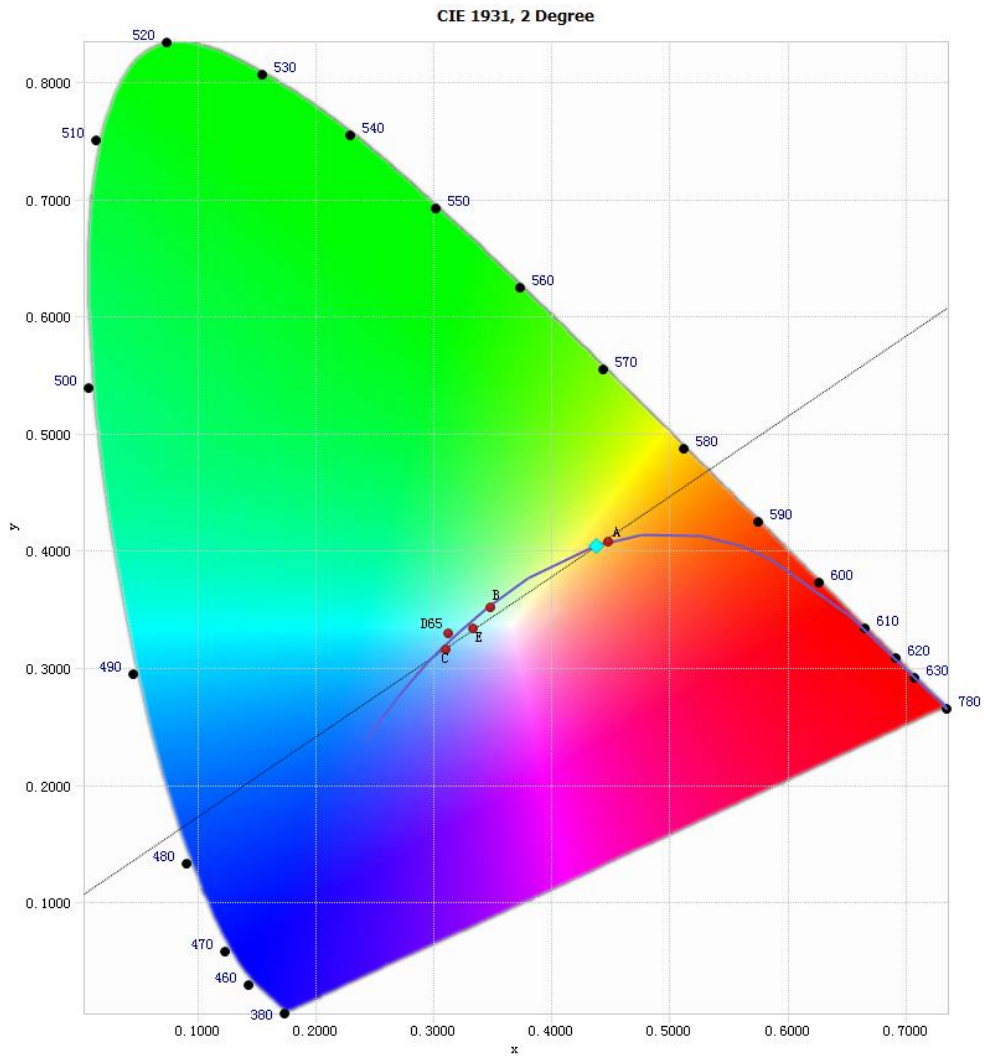


Chart 8: Spectral Power Distribution

Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	1.35E-04	485	3.33E-03	590	1.21E-02	695	1.25E-03
385	1.01E-04	490	3.74E-03	595	1.18E-02	700	1.07E-03
390	9.53E-05	495	4.40E-03	600	1.19E-02	705	9.09E-04
395	1.18E-04	500	5.26E-03	605	1.19E-02	710	7.80E-04
400	1.38E-04	505	6.24E-03	610	1.45E-02	715	6.77E-04
405	1.75E-04	510	7.12E-03	615	1.81E-02	720	6.02E-04
410	2.21E-04	515	7.90E-03	620	1.28E-02	725	5.15E-04
415	3.18E-04	520	8.46E-03	625	1.32E-02	730	4.55E-04
420	5.39E-04	525	9.00E-03	630	5.45E-02	735	3.93E-04
425	8.52E-04	530	9.40E-03	635	3.97E-02	740	3.42E-04
430	1.37E-03	535	9.68E-03	640	7.29E-03	745	2.88E-04
435	2.08E-03	540	1.00E-02	645	6.88E-03	750	2.50E-04
440	3.22E-03	545	1.04E-02	650	6.49E-03	755	2.19E-04
445	5.01E-03	550	1.06E-02	655	4.96E-03	760	1.87E-04
450	7.64E-03	555	1.10E-02	660	4.05E-03	765	1.70E-04
455	8.33E-03	560	1.13E-02	665	3.22E-03	770	1.46E-04
460	6.37E-03	565	1.16E-02	670	3.17E-03	775	1.19E-04
465	5.02E-03	570	1.19E-02	675	2.42E-03	780	1.12E-04
470	4.38E-03	575	1.21E-02	680	2.03E-03		
475	3.62E-03	580	1.22E-02	685	1.72E-03		
480	3.20E-03	585	1.24E-02	690	1.48E-03		

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

Chromaticity Diagram - Sphere Spectroradiometer Method



Tristimulus values(x, y): (0.4373, 0.4044)

Chart 9: Chromaticity Diagram per Sphere - Spectroradiometer Method

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

Nominal CCT Quadrangles – Sphere Spectroradiometer Method

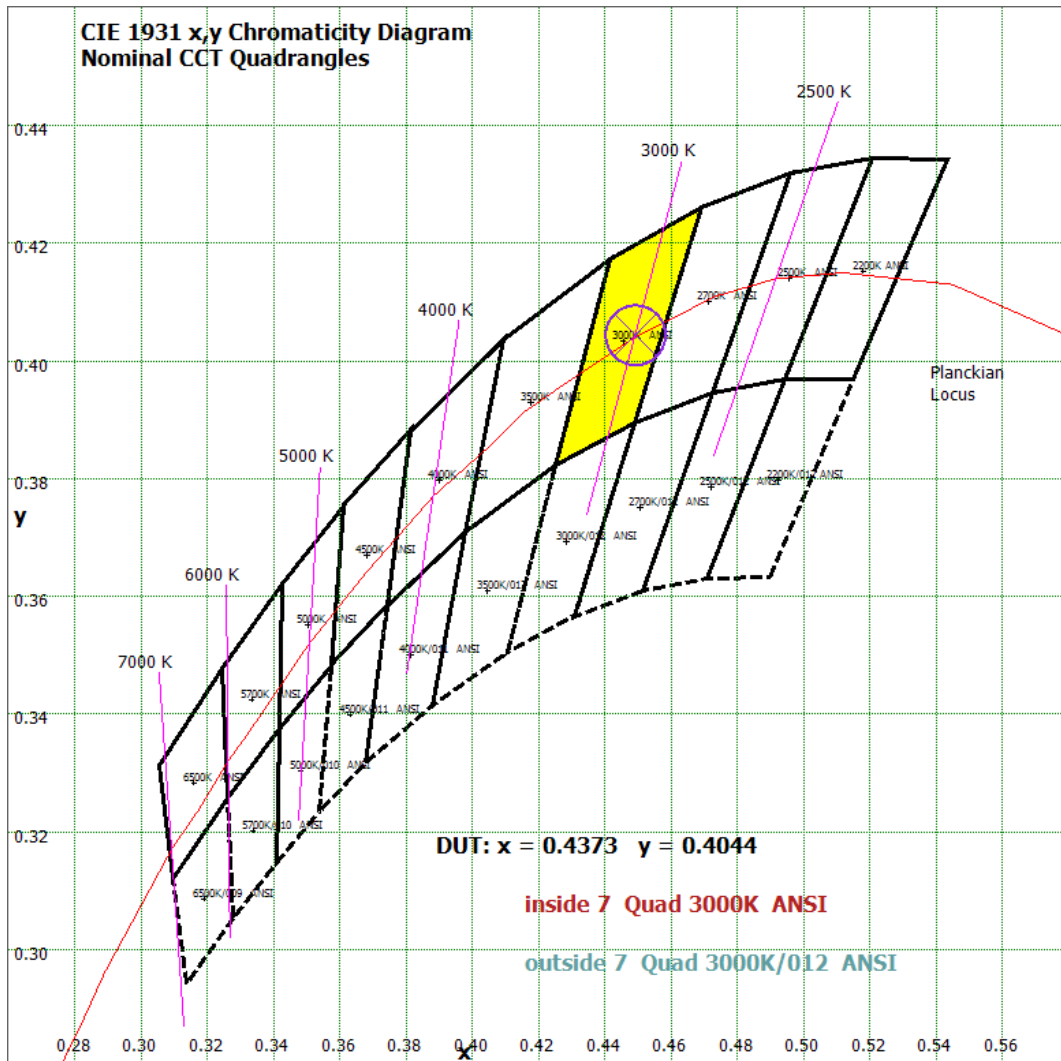


Chart 10: Plot of Lamp x/y coordinates on CIE 1931 Chromaticity Diagram

Color Rendition Report – Sphere Spectroradiometer Method

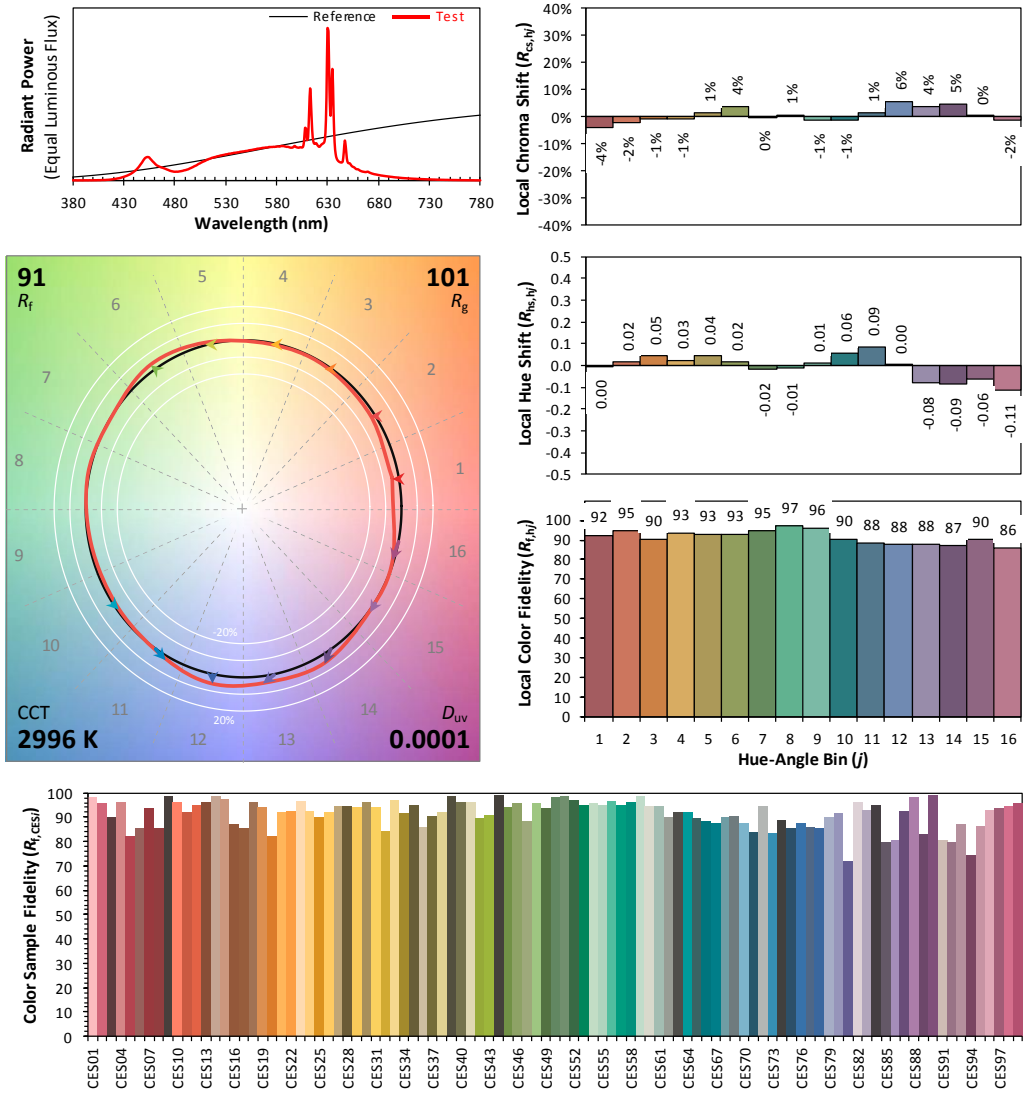
ANSI/IES TM-30-18 Color Rendition Report

Source: LED

Manufacturer: GREEN CREATIVE LTD

Date: 2024/04/16

Model: 7BR30DIM/9CCTS



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.	x	0.4373	CIE 13.3-1995 (CRI) R_a 95 R_g 70
	y	0.4044	
	u'	0.2507	
	v'	0.5216	

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 (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
Voltage frequency (Hz)	60
Test Current (A)	0.070
Power Factor	0.8242
Test Power (W)	6.91
THD A%	56.38
Luminous Efficacy (lm/W)	122.3
Total Luminous Flux (lm)	845.1
Color Rendering Index (CRI)	96.1
R9	79.3
Correlated Color Temperature (CCT)(K)	3425
Chromaticity Chroma x	0.4083
Chromaticity Chroma y	0.3900
Chromaticity Chroma u	0.2380
Chromaticity Chroma v	0.3409
Duv	-0.0010
Chromaticity Chroma u'	0.2380
Chromaticity Chroma v'	0.5114

Special Color Rendering Indices	
R1	98.7
R2	97.5
R3	93.5
R4	97.3
R5	97.1
R6	95.7
R7	96.1
R8	92.5
R9	79.3
R10	90.7
R11	96
R12	78.2
R13	98.4
R14	94.9

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

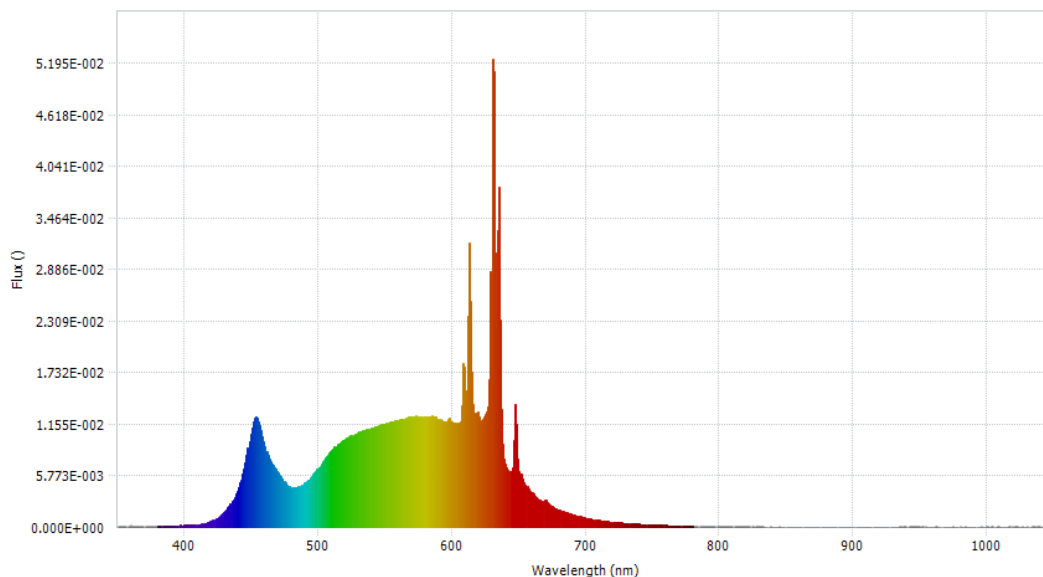
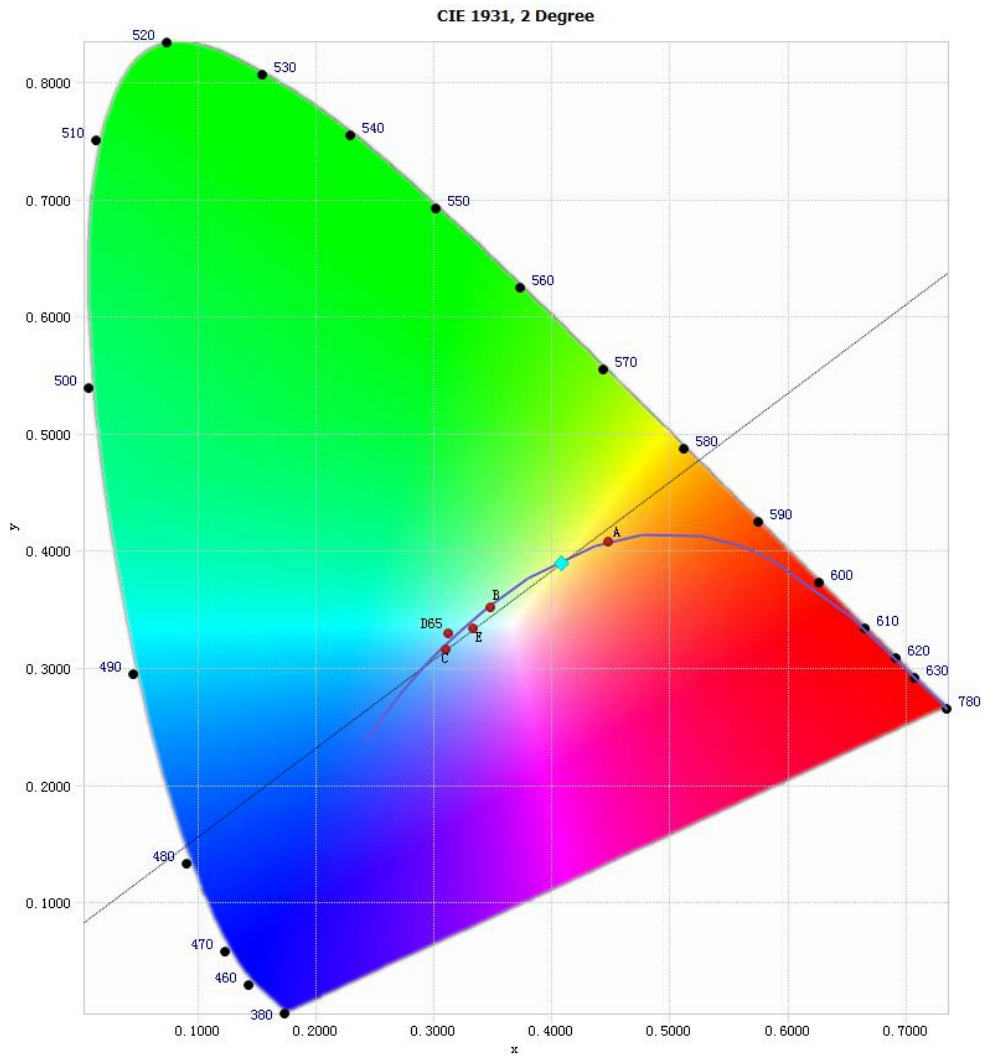


Chart 12: Spectral Power Distribution

Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	1.30E-04	485	4.50E-03	590	1.21E-02	695	1.20E-03
385	1.03E-04	490	4.97E-03	595	1.17E-02	700	1.00E-03
390	1.31E-04	495	5.71E-03	600	1.17E-02	705	8.56E-04
395	1.71E-04	500	6.69E-03	605	1.16E-02	710	7.37E-04
400	1.80E-04	505	7.75E-03	610	1.41E-02	715	6.38E-04
405	2.09E-04	510	8.61E-03	615	1.74E-02	720	5.58E-04
410	2.78E-04	515	9.34E-03	620	1.23E-02	725	4.84E-04
415	4.06E-04	520	9.82E-03	625	1.26E-02	730	4.23E-04
420	6.88E-04	525	1.03E-02	630	5.24E-02	735	3.66E-04
425	1.08E-03	530	1.06E-02	635	3.80E-02	740	3.13E-04
430	1.77E-03	535	1.08E-02	640	7.00E-03	745	2.74E-04
435	2.83E-03	540	1.11E-02	645	6.59E-03	750	2.37E-04
440	4.48E-03	545	1.13E-02	650	6.18E-03	755	2.05E-04
445	7.23E-03	550	1.16E-02	655	4.71E-03	760	1.81E-04
450	1.11E-02	555	1.18E-02	660	3.86E-03	765	1.53E-04
455	1.18E-02	560	1.20E-02	665	3.04E-03	770	1.39E-04
460	8.97E-03	565	1.22E-02	670	3.04E-03	775	1.22E-04
465	7.08E-03	570	1.23E-02	675	2.28E-03	780	1.07E-04
470	6.03E-03	575	1.24E-02	680	1.91E-03		
475	4.91E-03	580	1.23E-02	685	1.64E-03		
480	4.34E-03	585	1.24E-02	690	1.39E-03		

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

Chromaticity Diagram - Sphere Spectroradiometer Method



Tristimulus values(x, y): (0.4083, 0.3900)

Chart 13: Chromaticity Diagram per Sphere - Spectroradiometer Method

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

Nominal CCT Quadrangles – Sphere Spectroradiometer Method

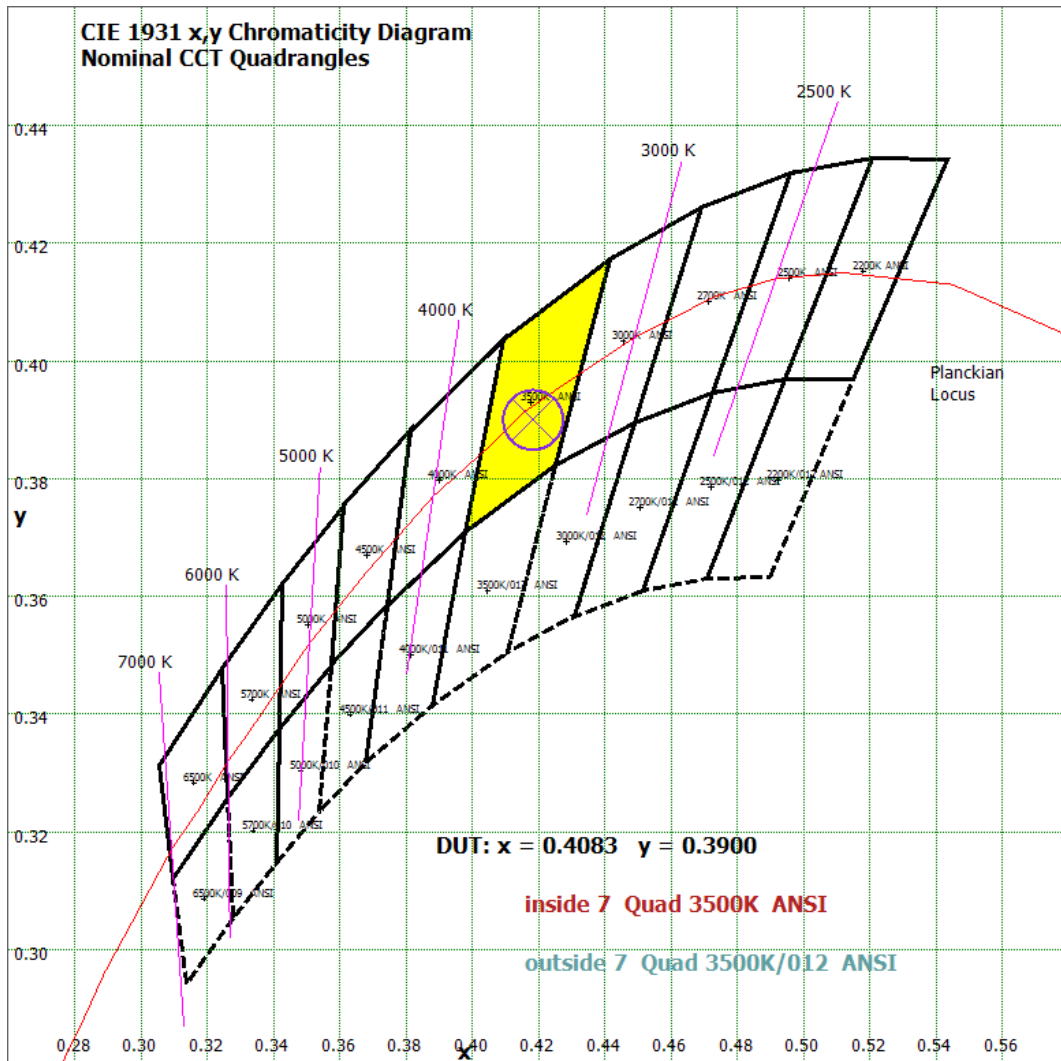


Chart14: Plot of Lamp x/y coordinates on CIE 1931 Chromaticity Diagram

Color Rendition Report – Sphere Spectroradiometer Method

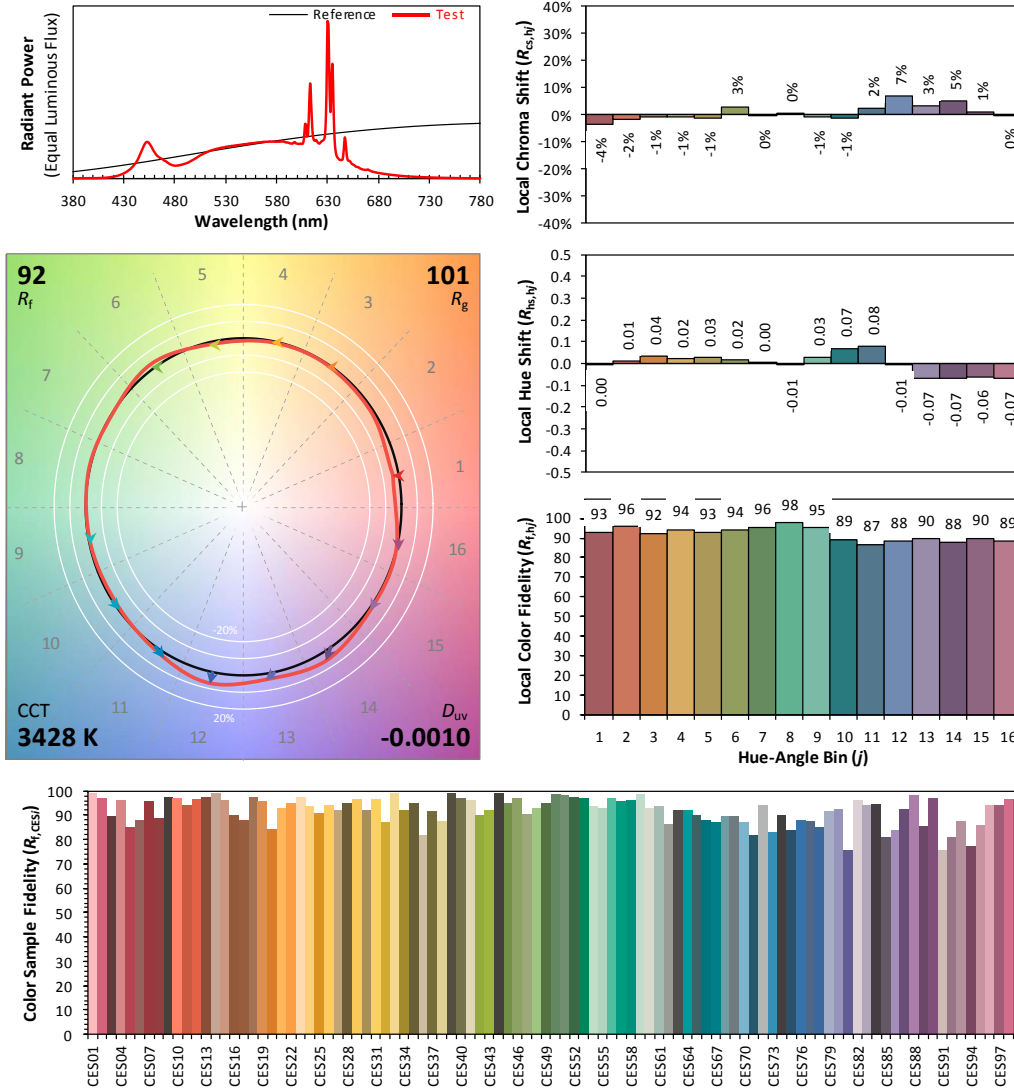
ANSI/IES TM-30-18 Color Rendition Report

Source: LED

Manufacturer: GREEN CREATIVE LTD

Date: 2024/04/16

Model: 7BR30DIM/9CCTS



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

x 0.4083
 y 0.3900
 u' 0.2380
 v' 0.5114

CIE 13.3-1995
(CRI)

R_a 96
 R_g 80

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 (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
Voltage frequency (Hz)	60
Test Current (A)	0.070
Power Factor	0.8192
Test Power (W)	6.84
THD A%	57.23
Luminous Efficacy (lm/W)	122.7
Total Luminous Flux (lm)	839.2
Color Rendering Index (CRI)	96.3
R9	83.7
Correlated Color Temperature (CCT)(K)	3947
Chromaticity Chroma x	0.3824
Chromaticity Chroma y	0.3773
Chromaticity Chroma u	0.2262
Chromaticity Chroma v	0.3347
Duv	-0.0003
Chromaticity Chroma u'	0.2262
Chromaticity Chroma v'	0.5021

Special Color Rendering Indices	
R1	98.7
R2	97.3
R3	93.1
R4	97.6
R5	96.8
R6	94.9
R7	97.3
R8	94.7
R9	83.7
R10	90.4
R11	96
R12	74.7
R13	98.3
R14	94.9

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

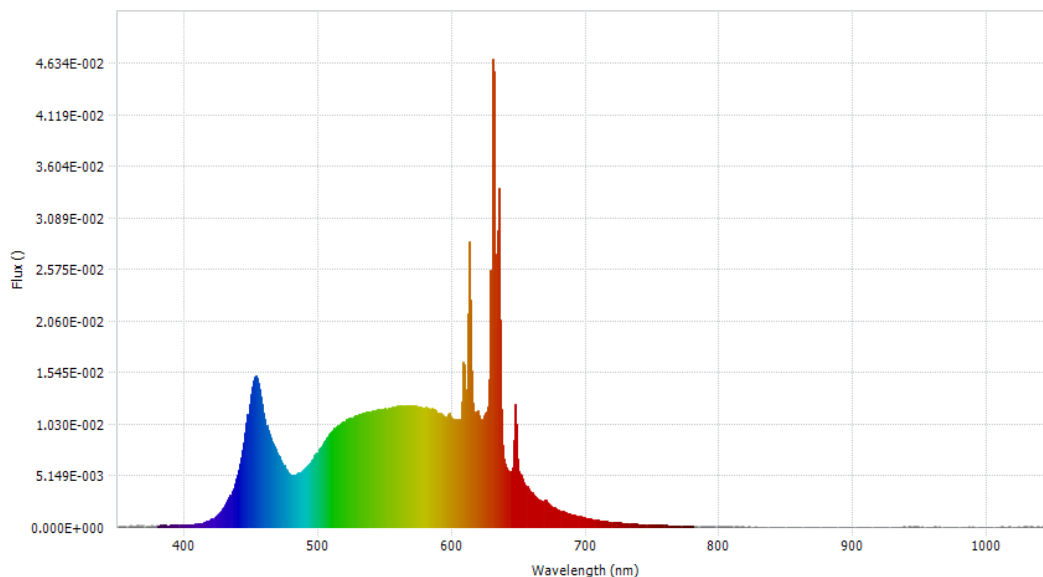
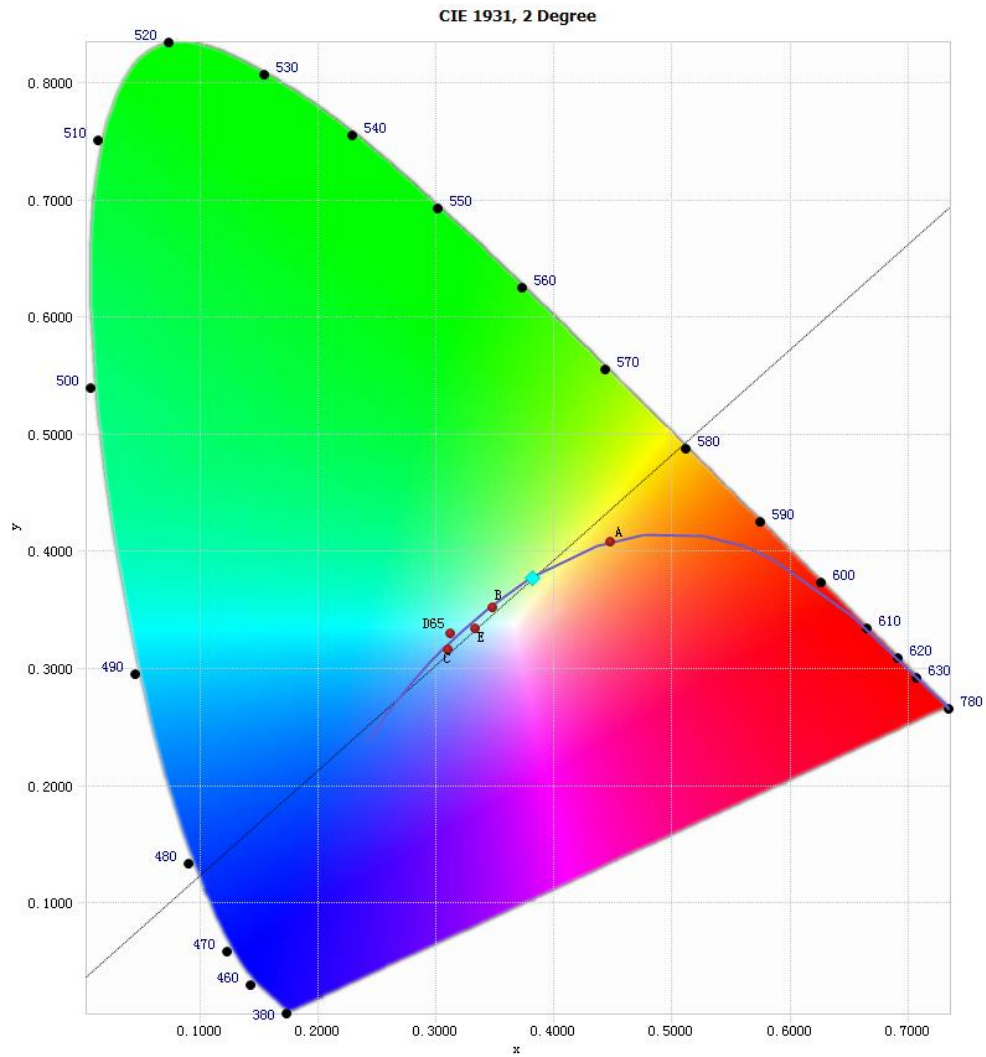


Chart16: Spectral Power Distribution

Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	1.47E-04	485	5.38E-03	590	1.14E-02	695	1.05E-03
385	1.70E-04	490	5.92E-03	595	1.10E-02	700	8.91E-04
390	1.74E-04	495	6.66E-03	600	1.09E-02	705	7.49E-04
395	1.94E-04	500	7.74E-03	605	1.06E-02	710	6.50E-04
400	2.17E-04	505	8.72E-03	610	1.28E-02	715	5.64E-04
405	2.40E-04	510	9.52E-03	615	1.57E-02	720	4.99E-04
410	3.30E-04	515	1.02E-02	620	1.11E-02	725	4.33E-04
415	4.98E-04	520	1.05E-02	625	1.13E-02	730	3.66E-04
420	8.10E-04	525	1.09E-02	630	4.68E-02	735	3.27E-04
425	1.34E-03	530	1.13E-02	635	3.39E-02	740	2.79E-04
430	2.22E-03	535	1.14E-02	640	6.26E-03	745	2.36E-04
435	3.54E-03	540	1.16E-02	645	5.94E-03	750	2.05E-04
440	5.74E-03	545	1.17E-02	650	5.54E-03	755	1.80E-04
445	9.36E-03	550	1.18E-02	655	4.19E-03	760	1.63E-04
450	1.40E-02	555	1.20E-02	660	3.45E-03	765	1.34E-04
455	1.44E-02	560	1.20E-02	665	2.73E-03	770	1.25E-04
460	1.08E-02	565	1.21E-02	670	2.69E-03	775	1.12E-04
465	8.52E-03	570	1.21E-02	675	2.02E-03	780	9.41E-05
470	7.19E-03	575	1.20E-02	680	1.70E-03		
475	5.82E-03	580	1.20E-02	685	1.46E-03		
480	5.16E-03	585	1.18E-02	690	1.26E-03		

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

Chromaticity Diagram - Sphere Spectroradiometer Method



Tristimulus values(x, y): (0.3824, 0.3773)

Chart 17: Chromaticity Diagram per Sphere - Spectroradiometer Method

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

Nominal CCT Quadrangles – Sphere Spectroradiometer Method

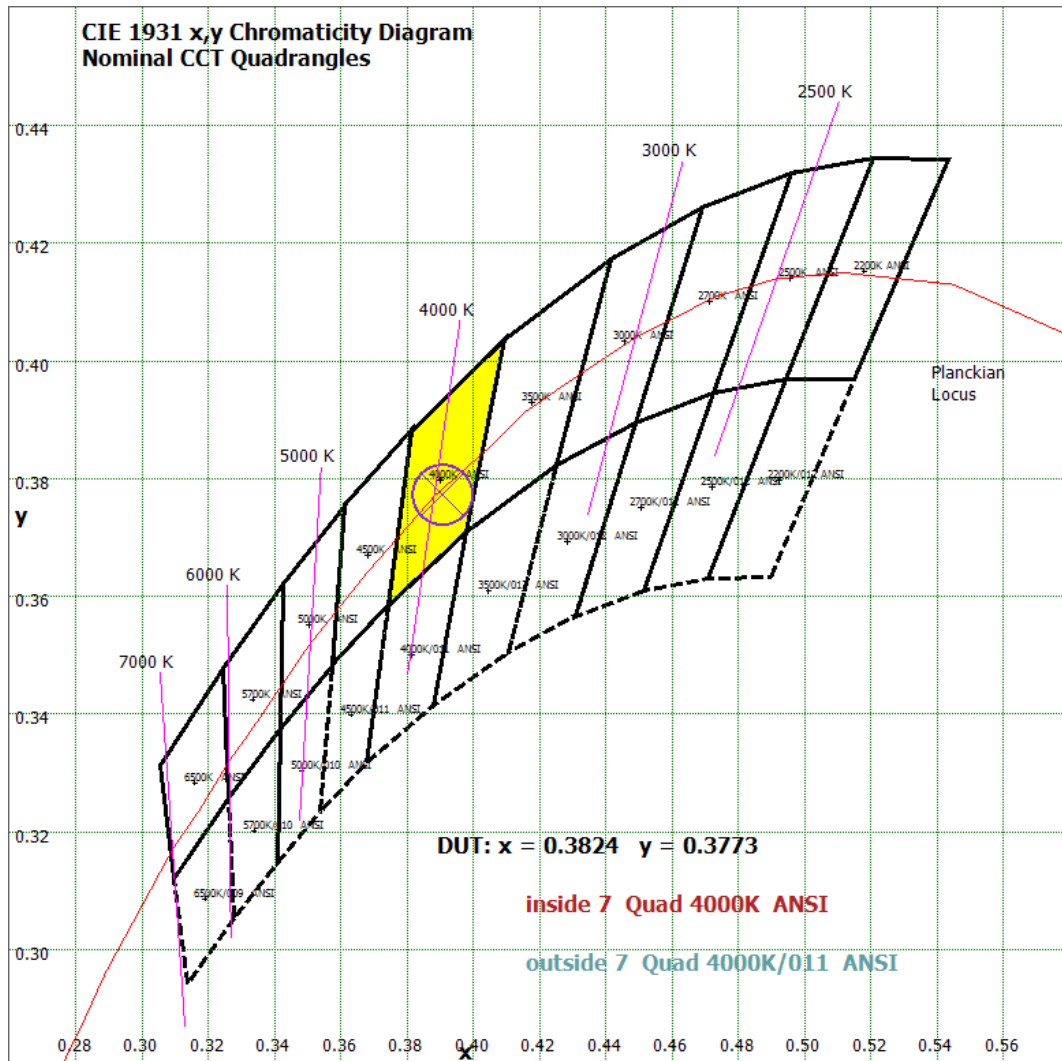


Chart 18: Plot of Lamp x/y coordinates on CIE 1931 Chromaticity Diagram

Color Rendition Report – Sphere Spectroradiometer Method

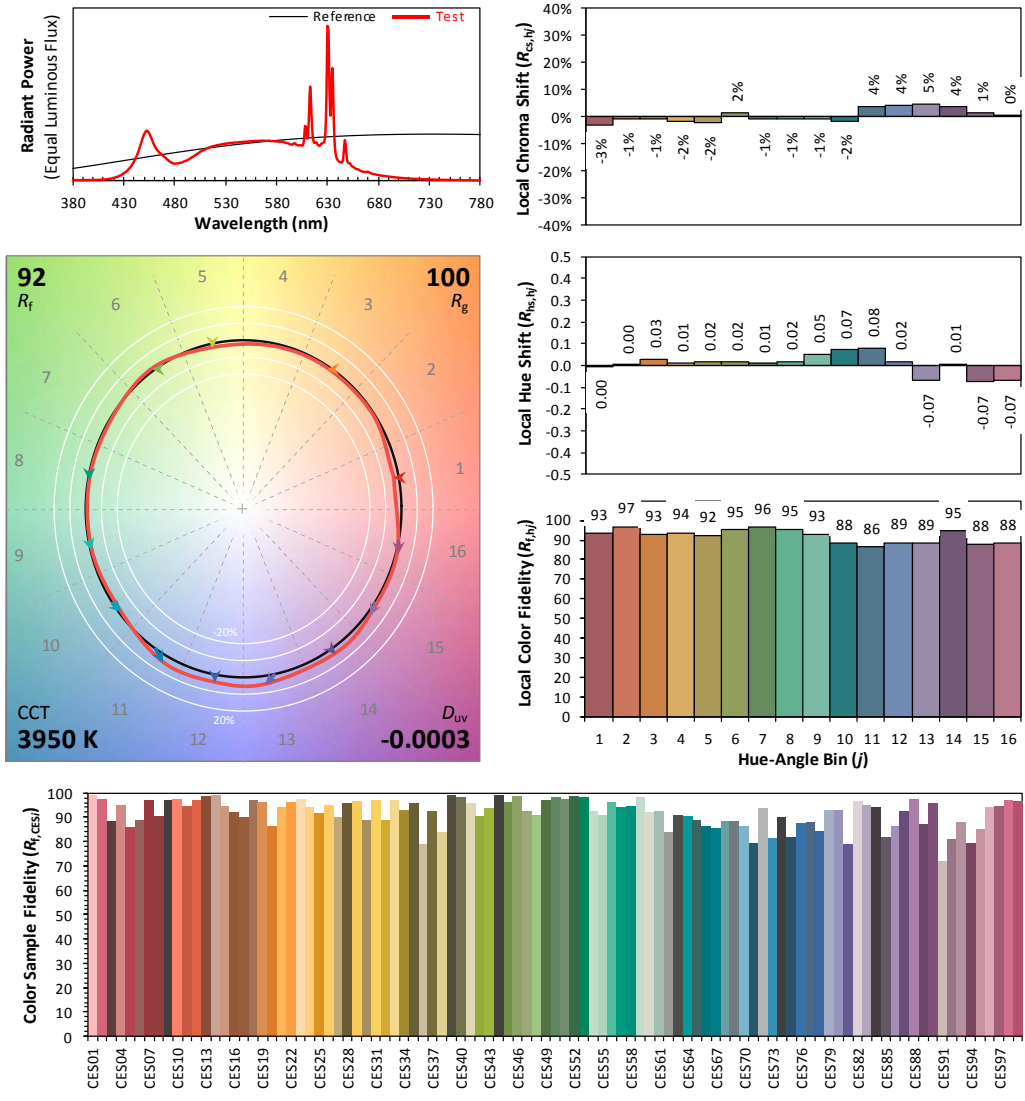
ANSI/IES TM-30-18 Color Rendition Report

Source: LED

Manufacturer: GREEN CREATIVE LTD

Date: 2024/04/16

Model: 7BR30DIM/9CCTS



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.	x	0.3824	CIE 13.3-1995 (CRI) R_a 96 R_g 84
	y	0.3773	
	u'	0.2262	
	v'	0.5021	

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.

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
Voltage frequency (Hz)	60
Test Current (A)	0.070
Power Factor	0.8054
Test Power (W)	6.66
THD A%	59.05
Luminous Efficacy (lm/W)	117.9
Total Luminous Flux (lm)	785.4
Color Rendering Index (CRI)	94.0
R9	76.8
Correlated Color Temperature (CCT)(K)	4965
Chromaticity Chroma x	0.3468
Chromaticity Chroma y	0.3603
Chromaticity Chroma u	0.2092
Chromaticity Chroma v	0.3261
Duv	0.0037
Chromaticity Chroma u'	0.2092
Chromaticity Chroma v'	0.4891

Special Color Rendering Indices	
R1	94.9
R2	94.7
R3	92.6
R4	94.8
R5	92.9
R6	91.8
R7	97.6
R8	92.7
R9	76.8
R10	85.3
R11	93.7
R12	67.4
R13	94.4
R14	95.3

Table 14: 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

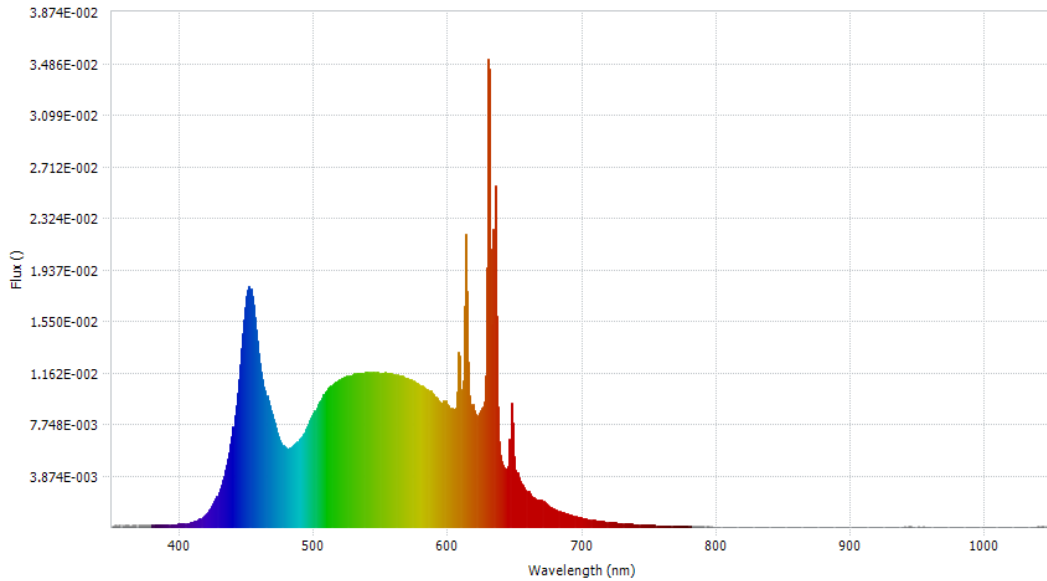
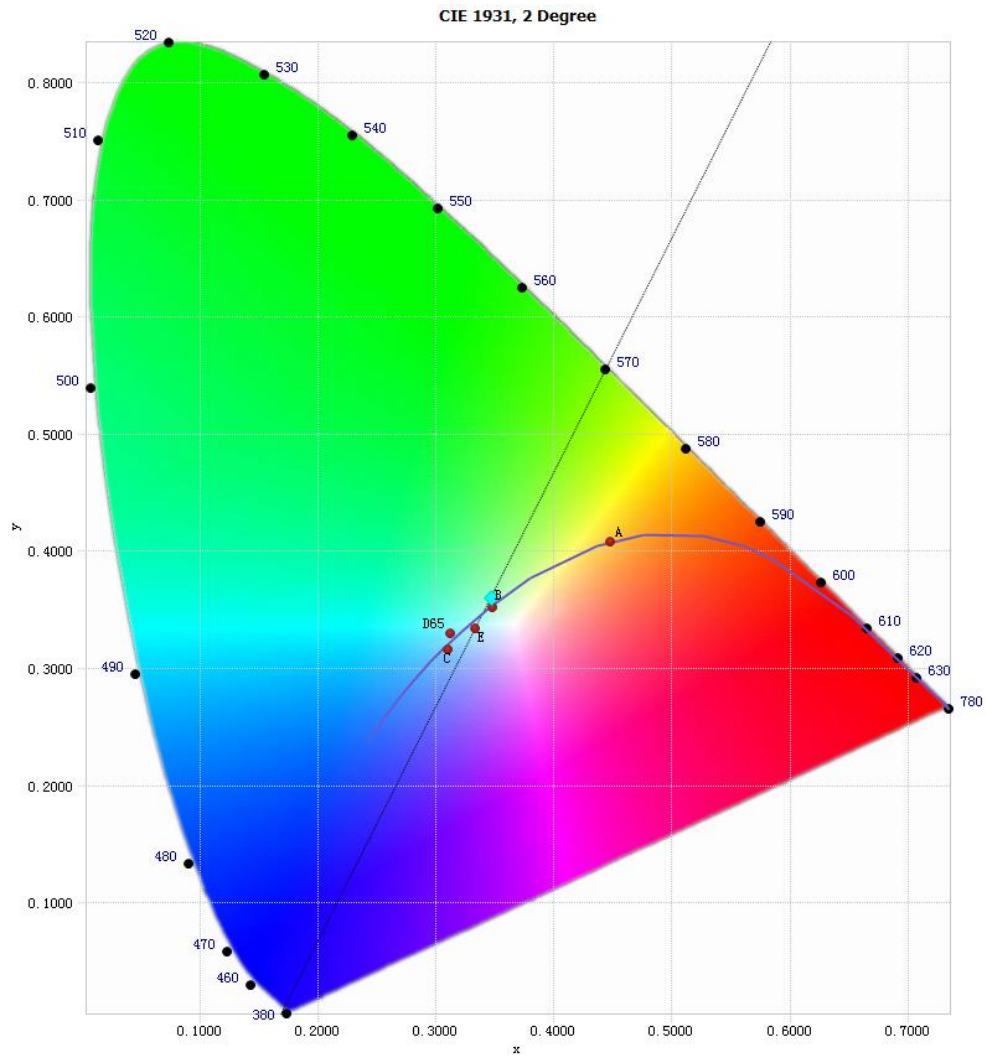


Chart 20: Spectral Power Distribution

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	6.15E-03	590	9.85E-03	695	8.23E-04
385	1.65E-04	490	6.71E-03	595	9.39E-03	700	6.97E-04
390	1.83E-04	495	7.61E-03	600	9.11E-03	705	5.89E-04
395	2.08E-04	500	8.64E-03	605	8.83E-03	710	5.13E-04
400	2.41E-04	505	9.53E-03	610	1.03E-02	715	4.48E-04
405	3.05E-04	510	1.03E-02	615	1.24E-02	720	3.81E-04
410	4.03E-04	515	1.08E-02	620	8.80E-03	725	3.41E-04
415	6.18E-04	520	1.11E-02	625	8.92E-03	730	2.95E-04
420	1.04E-03	525	1.14E-02	630	3.52E-02	735	2.49E-04
425	1.73E-03	530	1.16E-02	635	2.57E-02	740	2.20E-04
430	2.92E-03	535	1.16E-02	640	4.95E-03	745	1.84E-04
435	4.70E-03	540	1.16E-02	645	4.62E-03	750	1.56E-04
440	7.57E-03	545	1.16E-02	650	4.31E-03	755	1.42E-04
445	1.22E-02	550	1.16E-02	655	3.28E-03	760	1.25E-04
450	1.73E-02	555	1.16E-02	660	2.69E-03	765	1.11E-04
455	1.67E-02	560	1.15E-02	665	2.13E-03	770	9.47E-05
460	1.23E-02	565	1.14E-02	670	2.10E-03	775	8.17E-05
465	9.89E-03	570	1.12E-02	675	1.59E-03	780	7.27E-05
470	8.13E-03	575	1.09E-02	680	1.33E-03		
475	6.51E-03	580	1.06E-02	685	1.14E-03		
480	5.90E-03	585	1.04E-02	690	9.70E-04		

Table 15: Spectral Power Distribution Numerical Data per Sphere - Spectroradiometer Method

Chromaticity Diagram - Sphere Spectroradiometer Method



Tristimulus values(x, y): (0.3468, 0.3603)

Chart 21: 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

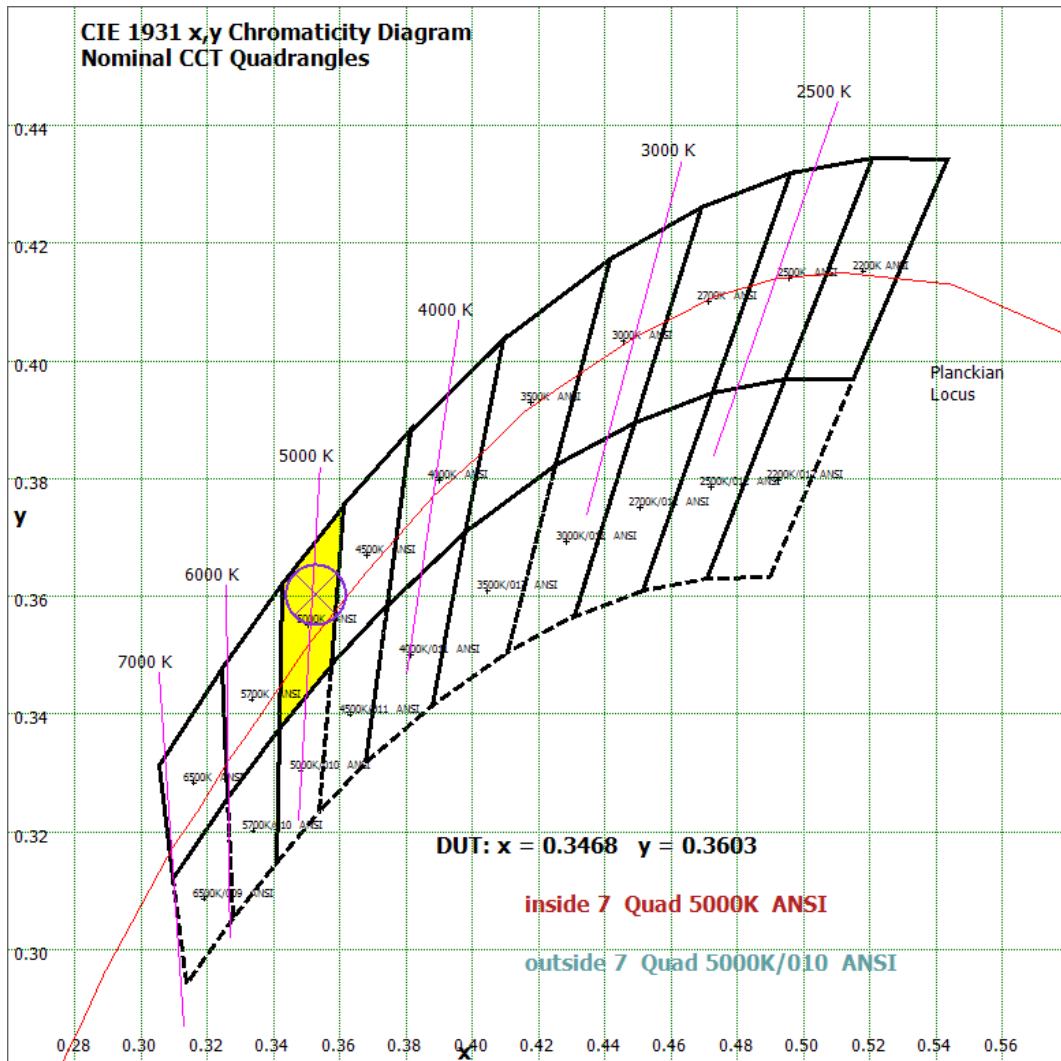


Chart 22: Plot of Lamp x/y coordinates on CIE 1931 Chromaticity Diagram

Color Rendition Report – Sphere Spectroradiometer Method

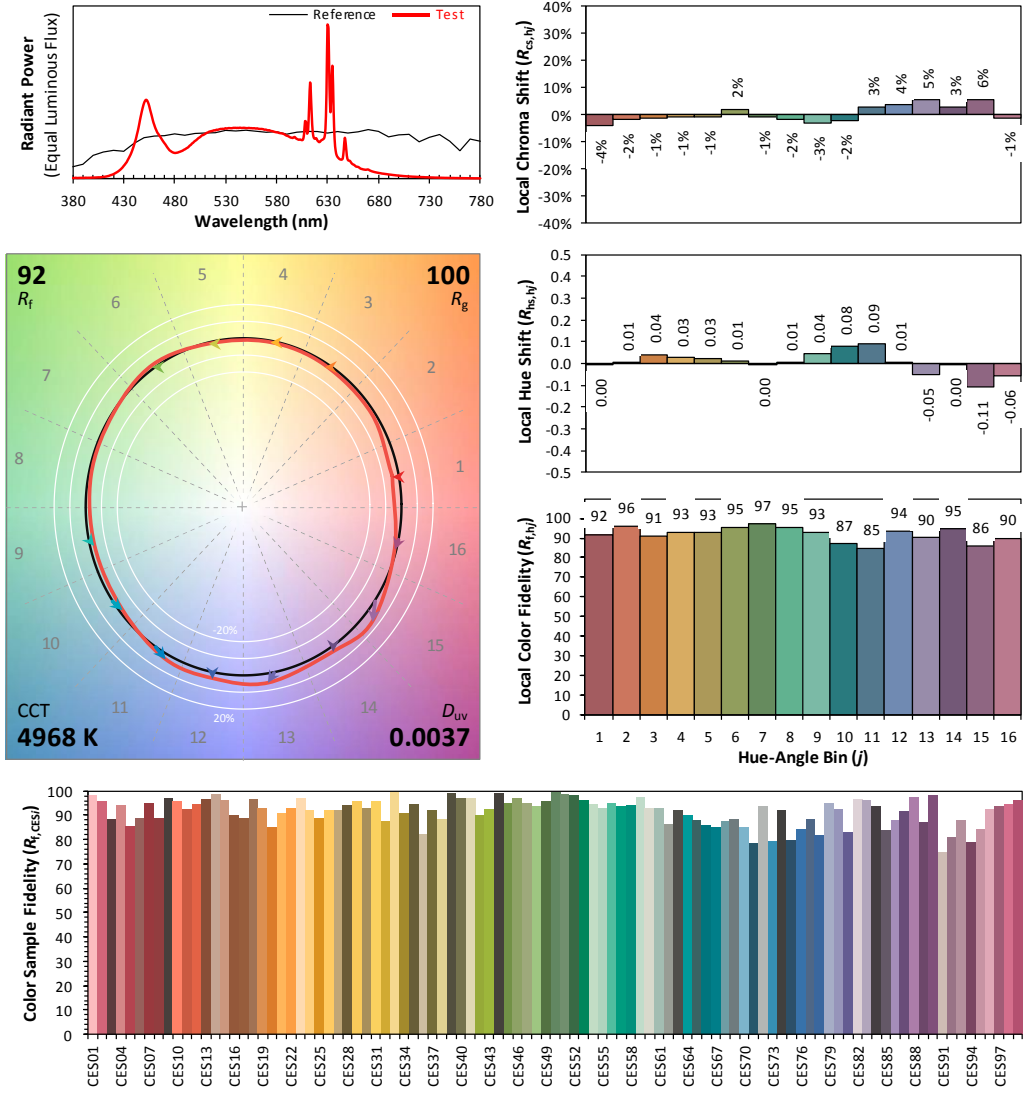
ANSI/IES TM-30-18 Color Rendition Report

Source: LED

Manufacturer: GREEN CREATIVE LTD

Date: 2024/04/16

Model: 7BR30DIM/9CCTS



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.	x	0.3468	CIE 13.3-1995 (CRI) R_a 94 R_g 77
	y	0.3603	
	u'	0.2092	
	v'	0.4891	

Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.00.

Chart 23: 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 14 due to rounding.

EQUIPMENT LIST

Test Equipment	Model	Equipment No.	Calibration Date	Calibration Due date
Goniophotometer system	GO-R5000	HZTE011-01	Feb. 18, 2024	-
Digital Power Meter	PF2010A	HZTE028-01	Aug. 01, 2023	Jul. 31, 2024
AC Power Supply	DPS1060	HZTE001-06	Aug. 01, 2023	Jul. 31, 2024
DC Power Supply	WY12010	HZTE004-03	Aug. 01, 2023	Jul. 31, 2024
Temperature recorder	JM624U	HZTE018-08	Aug. 04, 2023	Aug. 03, 2024
Temperature and humidity recorder	JR900	HZTE018-01	Aug. 04, 2023	Aug. 03, 2024
Standard source	D908	HZTE012-01	Aug. 14, 2018	-
Integrate Sphere system	3M	HZTE015-04	Feb. 18, 2024	-
Digital Power Meter	WT210	HZTE008-01	Aug. 01, 2023	Jul. 31, 2024
AC Power Supply	PCR 500L	HZTE001-07	Aug. 01, 2023	Jul.31, 2024
DC Power Supply	IT6154	HZTE004-04	Aug. 01, 2023	Jul. 31, 2024
Standard source	SCL-1400	HZTE012-06	Nov. 04, 2021	-
Temperature and humidity recorder	JR900	HZTE018-02	Aug. 04, 2023	Aug. 03, 2024
Temperature Meter	TES1310	HZTE017-01	Aug. 04, 2023	Aug. 03, 2024
Goniophotometer system	GO-R5000	HZTE011-01	Jun. 05, 2023	-

Table 16: 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 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 ***

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