



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: 14PAR38DIM/9CCTS/BAS

Laboratory: Leading Testing Laboratories

NVLAP CODE: 200960-0

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Report No.: HZ23110050i

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

Review by:

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April Zou

Engineer: Wei Fei
Jan. 18, 2024

Manager: April Zou
Jan. 18, 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	14PAR38DIM/9CCT	14PAR38DIM/9CCT	14PAR38DIM/9CCTS/	14PAR38DIM/9CCT
	S/BAS 2700K 25° Setting	S/BAS 2700K 40° Setting	BAS 5000K 25° Setting	S/BAS 5000K 40° Setting
Luminous Efficacy (Lumens /Watt)	107.0	107.7	117.0	117.9
Total Luminous Flux (Lumens)	1381.3	1390.3	1514.7	1527.6
Power (Watts)	12.91	12.91	12.95	12.96
Power Factor	0.9831	0.9831	0.9831	0.9831
CCT (K)	2732	2733	5091	5100
CRI	94.2	94.3	95.2	94.9
Stabilization Time (Light & Power)	50 mins	50 mins	50 mins	50 mins
Note	2700K	2700K	5000K	5000K

Table 1: Executive Data Summary

Test specifications:

Date of Receipt : Nov. 27, 2023

Date of Test : Jan. 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	: 14PAR38DIM/9CCTS/BAS
Electrical Ratings	: 120V, 60Hz, 14W
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 of Model 14PAR38DIM/9CCTS/BAS (2700K 25 °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)	0.110
Power Factor	0.9831
Test Power (W)	12.91
THD A%	11.42
Luminous Efficacy (lm/W)	107.0
Total Luminous Flux (lm)	1381.3
Color Rendering Index (CRI)	94.2
R9	64.7
Correlated Color Temperature (CCT)(K)	2732
Chromaticity Chroma x	0.4567
Chromaticity Chroma y	0.4091
Chromaticity Chroma u	0.2611
Chromaticity Chroma v	0.3509
Duv	0.0003
Chromaticity Chroma u'	0.2611
Chromaticity Chroma v'	0.5263

Special Color Rendering Indices	
R1	99
R2	97.7
R3	95.2
R4	98.7
R5	98.3
R6	91.3
R7	90.4
R8	82.9
R9	64.7
R10	94.6
R11	92.7
R12	88.5
R13	98.5
R14	98

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

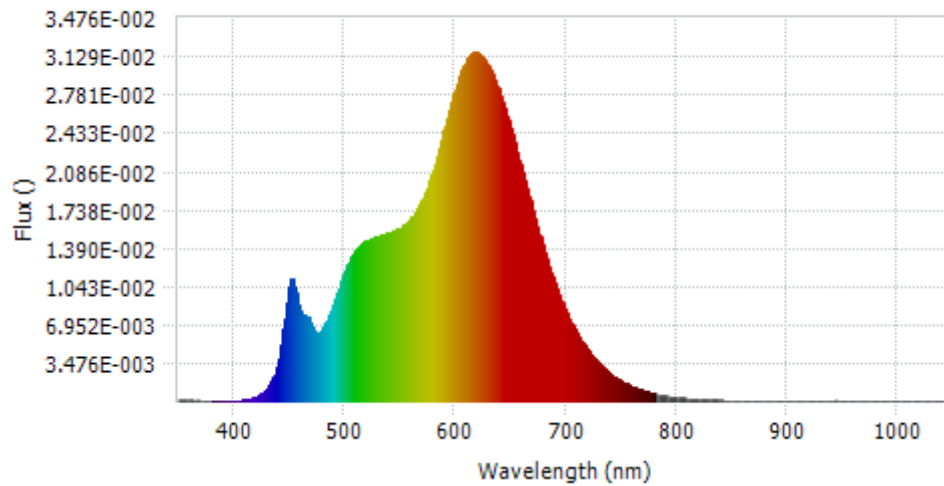
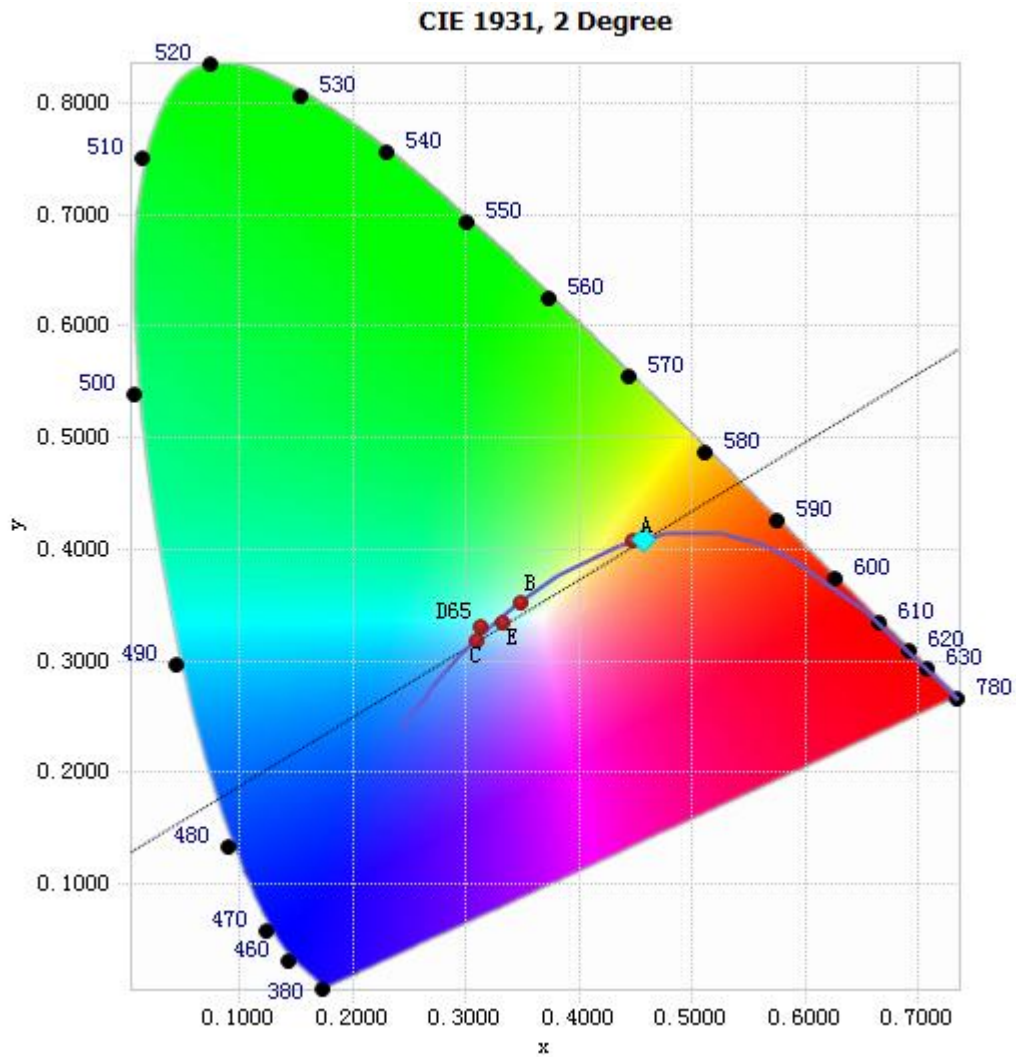


Chart 1: Spectral Power Distribution

Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	1.10E-04	485	7.56E-03	590	2.45E-02	695	9.46E-03
385	8.75E-05	490	8.77E-03	595	2.64E-02	700	8.23E-03
390	9.05E-05	495	1.03E-02	600	2.82E-02	705	7.13E-03
395	7.97E-05	500	1.17E-02	605	2.97E-02	710	6.17E-03
400	7.49E-05	505	1.28E-02	610	3.08E-02	715	5.36E-03
405	9.84E-05	510	1.36E-02	615	3.15E-02	720	4.67E-03
410	1.36E-04	515	1.43E-02	620	3.15E-02	725	4.03E-03
415	2.42E-04	520	1.45E-02	625	3.11E-02	730	3.45E-03
420	4.09E-04	525	1.48E-02	630	3.04E-02	735	2.95E-03
425	6.90E-04	530	1.50E-02	635	2.93E-02	740	2.51E-03
430	1.15E-03	535	1.51E-02	640	2.81E-02	745	2.14E-03
435	1.96E-03	540	1.53E-02	645	2.66E-02	750	1.84E-03
440	3.50E-03	545	1.55E-02	650	2.48E-02	755	1.58E-03
445	6.53E-03	550	1.57E-02	655	2.31E-02	760	1.34E-03
450	1.04E-02	555	1.61E-02	660	2.12E-02	765	1.15E-03
455	1.04E-02	560	1.66E-02	665	1.93E-02	770	9.81E-04
460	8.19E-03	565	1.73E-02	670	1.73E-02	775	8.34E-04
465	7.75E-03	570	1.82E-02	675	1.56E-02	780	7.08E-04
470	7.00E-03	575	1.94E-02	680	1.38E-02		
475	6.14E-03	580	2.09E-02	685	1.23E-02		
480	6.54E-03	585	2.27E-02	690	1.08E-02		

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

Chromaticity Diagram - Sphere Spectroradiometer Method



Tristimulus values(x, y): (0.4567, 0.4091)

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

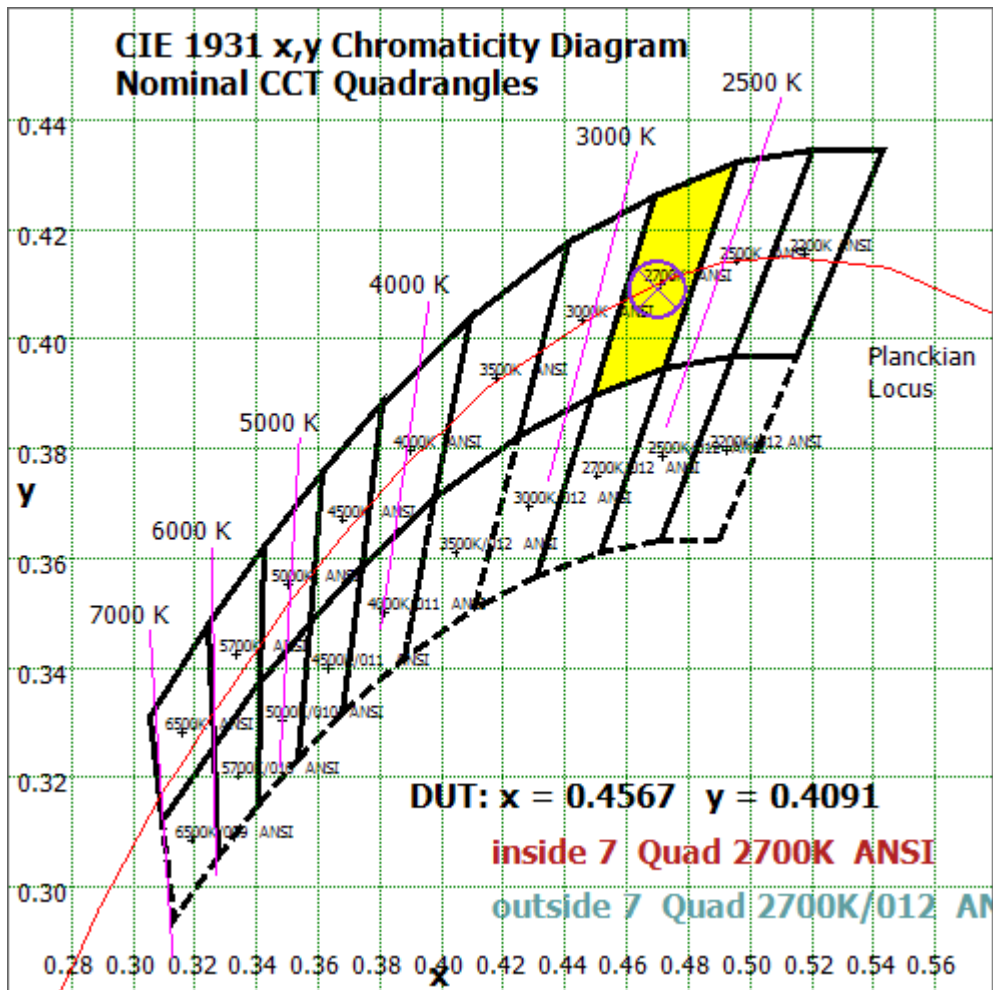


Chart 3: Plot of Lamp x/y coordinates on CIE 1931 Chromaticity Diagram

Color Rendition Report – Sphere Spectroradiometer Method

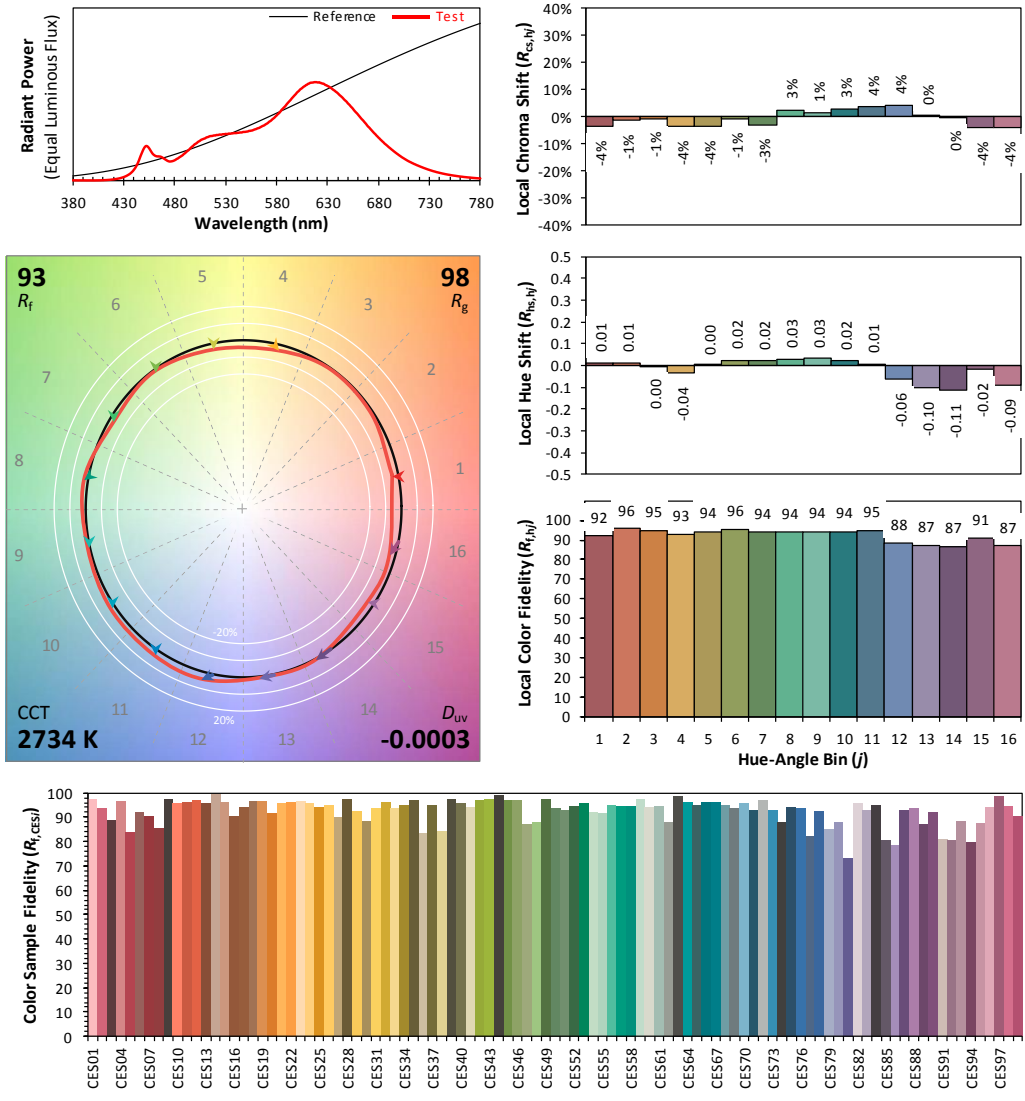
ANSI/IES TM-30-18 Color Rendition Report

Source: LED

Manufacturer: GREEN CREATIVE LTD

Date: 2024/01/16

Model: 14PAR38DIM/9CCTS/BAS



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.	x	0.4567	CIE 13.3-1995 (CRI) R_a 94 R_g 65
	y	0.4091	
	u'	0.2611	
	v'	0.5263	

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)	0.110
Power Factor	0.9826
Power (W)	12.93
Luminous Efficacy (lm/W)	108.3
Total Luminous Flux (lm)	1399.8
Beam Angle (°)	24.2 (0°-180°) / 24.3 (90°-270°)
Center Beam Candle Power (cd)	4455
Maximum Beam Candle Power (cd)	4455 (At: C=0.0, Gamma=0.0)
Spacing Criteria	0.41 (0°-180°) / 0.43 (90°-270°)
Zonal Lumens in the 0°-60° Zone	94.29%
Zonal Lumens in the 60°-90° Zone	5.54%
Zonal Lumens in the 90°-120° Zone	0.07%
Zonal Lumens in the 120°-180° Zone	0.11%

Table 4: Test data per Goniophotometer Method

Zonal Lumen Tabulation- Goniophotometer Method

$\gamma(^{\circ})$	Lumens	% Total
0- 10	336.979	24.07%
10- 20	442.454	31.61%
20- 30	236.581	16.90%
30- 40	140.08	10.01%
40- 50	93.544	6.68%
50- 60	70.245	5.02%
60- 70	46.437	3.32%
70- 80	23.692	1.69%
80- 90	7.408	0.53%
90-100	0.794	0.06%
100-110	0.075	0.01%
110-120	0.048	0.00%
120-130	0.075	0.01%
130-140	0.184	0.01%
140-150	0.361	0.03%
150-160	0.445	0.03%
160-170	0.334	0.02%
170-180	0.108	0.01%
Total	1399.8	100%

$\gamma(^{\circ})$	Lumens	% Total
0- 60	1319.88	94.29%
60- 90	77.537	5.54%
0-90	1397.42	99.83%
90- 180	2.424	0.17%
0- 180	1399.8	100%

Table 5: Zonal Lumen

Illuminance Plots- Goniophotometer Method

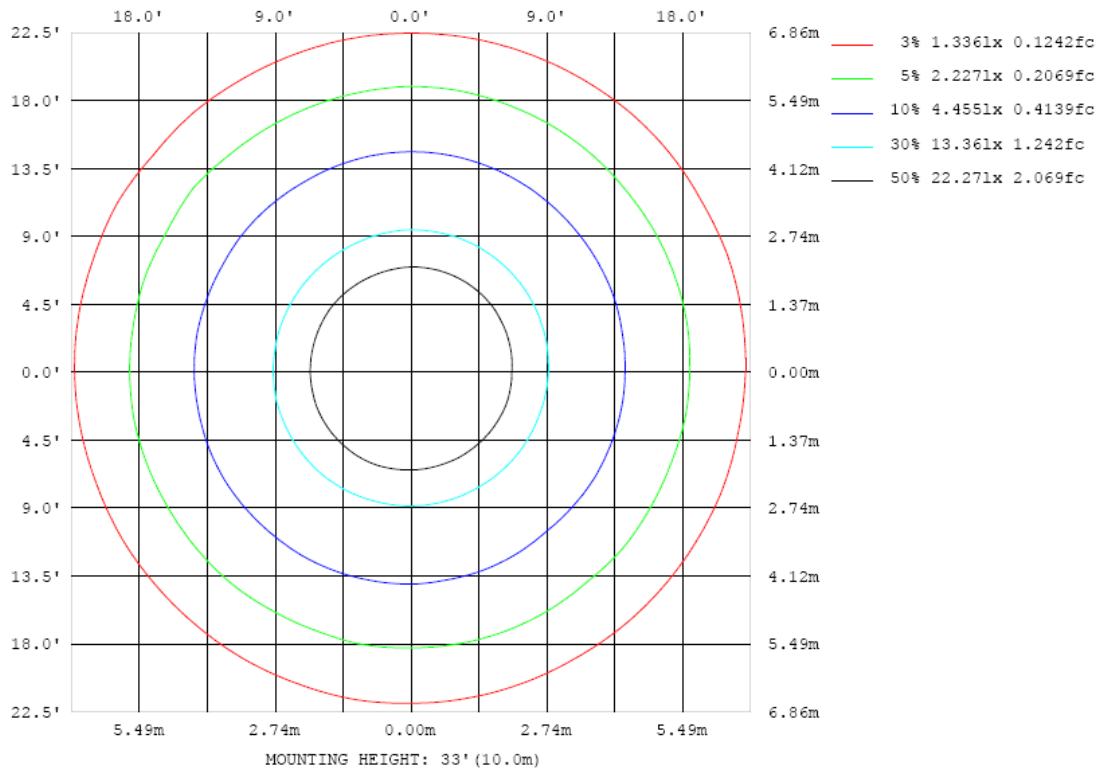


Chart 5: Illuminance Plot (Footcandles)

Luminous Intensity Distribution Plots- Goniophotometer Method

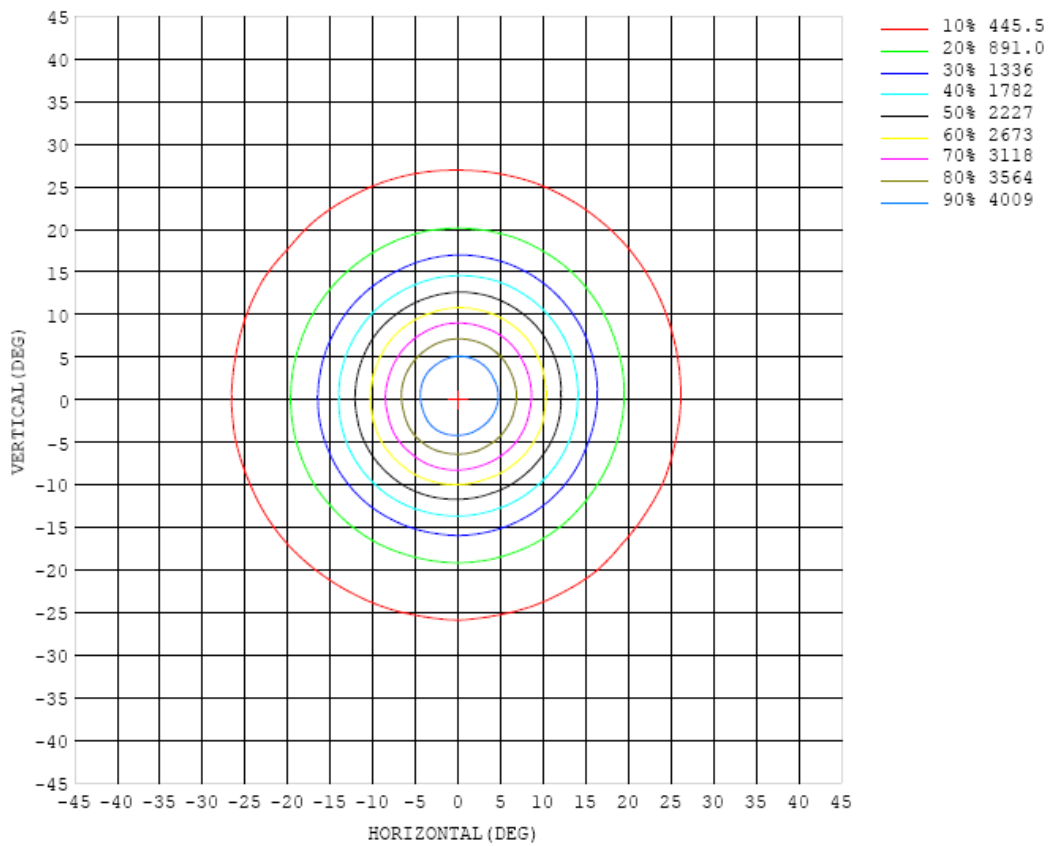


Chart 6: Isocandela Plot

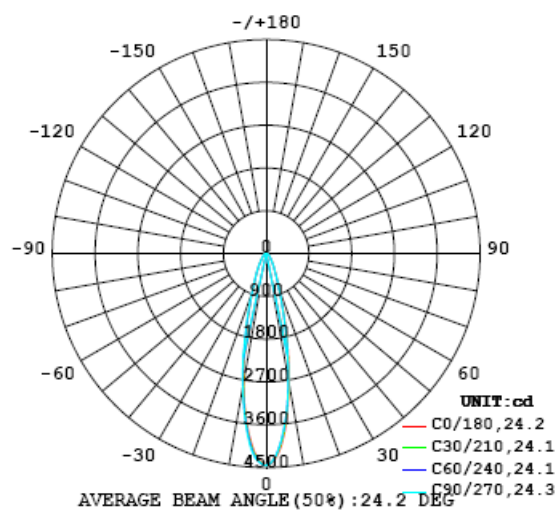


Chart 7: Polar Candela Distribution

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	4455	4455	4455	4455	4455	4455	4455	4455	4455	4455	4455	4455	4455	4455	4455	4455	4455	4455	4455
5	3955	3942	3921	3910	3885	3879	3863	3854	3852	3859	3864	3879	3890	3897	3902	3894	3887	3887	3899
10	2751	2742	2742	2719	2704	2674	2667	2645	2656	2664	2683	2696	2709	2705	2720	2733	2731	2736	2746
15	1591	1567	1542	1533	1523	1510	1501	1504	1502	1512	1512	1522	1536	1551	1559	1569	1584	1592	1592
20	838	820	807	801	793	790	793	794	797	806	809	809	817	820	829	842	847	851	855
25	494	484	482	469	462	469	470	475	474	482	476	481	480	481	489	494	496	505	515
30	321	318	310	310	311	306	312	313	313	310	314	311	314	317	317	318	321	327	328
35	218	214	216	214	215	211	211	213	212	213	214	213	215	215	215	217	216	220	222
40	158	155	153	151	151	149	149	150	149	151	152	151	148	148	149	151	153	153	156
45	121	120	120	119	118	118	117	116	117	117	117	116	117	117	117	117	116	117	119
50	100	99.0	98.5	97.2	96.1	95.9	96.0	95.8	95.7	95.3	94.5	93.9	93.9	94.1	94.3	94.2	94.3	95.0	96.1
55	81.6	81.1	79.8	78.8	78.6	77.7	77.6	77.8	77.4	77.2	76.8	76.2	75.3	75.3	75.8	75.7	76.1	76.6	77.2
60	64.3	64.0	63.3	62.0	61.8	61.3	61.7	62.1	61.7	61.5	60.9	60.3	60.2	59.7	60.2	60.0	60.2	60.5	60.4
65	48.6	48.5	48.6	47.7	47.0	46.8	46.8	47.2	47.0	46.7	46.4	46.1	45.9	45.7	45.4	45.4	45.6	45.8	45.3
70	34.8	34.5	34.6	34.8	34.2	33.6	33.9	34.2	34.1	33.9	33.5	33.3	33.2	32.9	32.3	32.5	32.6	32.5	32.2
75	23.2	23.1	23.0	22.9	23.0	22.7	23.1	23.0	22.8	22.5	22.2	22.1	22.0	21.9	21.5	21.3	21.2	21.3	21.0
80	13.7	13.8	13.7	13.5	13.5	13.6	13.9	13.9	13.5	13.4	13.2	12.9	12.9	12.8	12.6	12.4	12.2	12.2	12.0
85	6.97	7.07	7.01	6.88	6.99	6.97	7.15	7.19	6.86	6.77	6.73	6.44	6.42	6.41	6.30	6.02	5.92	5.93	5.81
90	2.64	2.73	2.72	2.71	2.74	2.73	2.77	2.81	2.64	2.57	2.54	2.40	2.34	2.32	2.23	2.15	2.12	2.11	2.09
95	0.60	0.63	0.64	0.65	0.66	0.66	0.66	0.65	0.63	0.61	0.58	0.55	0.52	0.50	0.47	0.44	0.43	0.42	0.39
100	0.11	0.11	0.11	0.12	0.12	0.12	0.12	0.12	0.12	0.13	0.14	0.16	0.17	0.16	0.15	0.14	0.13	0.11	0.08
105	0.08	0.08	0.08	0.09	0.09	0.09	0.09	0.09	0.10	0.11	0.13	0.13	0.13	0.12	0.12	0.11	0.10	0.09	0.07
110	0.05	0.05	0.05	0.06	0.06	0.06	0.06	0.06	0.07	0.08	0.10	0.10	0.10	0.10	0.09	0.09	0.07	0.06	0.05
115	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.06	0.07	0.08	0.08	0.07	0.07	0.06	0.05	0.04	0.04
120	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.06	0.06	0.07	0.07	0.07	0.06	0.06	0.05	0.05	0.05
125	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.09
130	0.11	0.11	0.11	0.11	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.15
135	0.19	0.20	0.19	0.19	0.20	0.20	0.20	0.20	0.21	0.21	0.22	0.22	0.22	0.22	0.22	0.22	0.21	0.21	0.26
140	0.30	0.30	0.31	0.31	0.32	0.32	0.32	0.33	0.33	0.33	0.34	0.35	0.35	0.35	0.36	0.35	0.35	0.34	0.42
145	0.45	0.46	0.47	0.47	0.48	0.48	0.49	0.49	0.50	0.50	0.51	0.51	0.51	0.51	0.50	0.50	0.50	0.48	0.62
150	0.57	0.59	0.60	0.60	0.61	0.62	0.62	0.63	0.64	0.64	0.65	0.65	0.65	0.65	0.65	0.65	0.64	0.62	0.83
155	0.69	0.70	0.71	0.72	0.73	0.73	0.74	0.75	0.76	0.76	0.77	0.77	0.78	0.78	0.78	0.78	0.78	0.75	0.98
160	0.80	0.81	0.81	0.82	0.83	0.83	0.84	0.85	0.86	0.87	0.87	0.88	0.89	0.89	0.89	0.89	0.89	0.87	1.01
165	0.88	0.88	0.89	0.90	0.91	0.91	0.92	0.93	0.94	0.95	0.95	0.96	0.97	0.97	0.98	0.98	0.98	0.97	0.96
170	0.93	0.93	0.94	0.95	0.96	0.96	0.97	0.98	0.99	1.00	1.01	1.01	1.02	1.03	1.03	1.03	1.03	1.02	1.00
175	0.94	0.95	0.96	0.97	0.97	0.98	0.98	0.99	1.00	1.01	1.01	1.02	1.03	1.04	1.05	1.06	1.07	1.08	1.09
180	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06

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	4455	4455	4455	4455	4455	4455	4455	4455	4455	4455	4455	4455	4455	4455	4455	4455	4455		
5	3917	3937	3955	3968	3972	3980	3997	4014	4028	4033	4025	4022	4010	4000	3979	3978	3968		
10	2753	2760	2778	2800	2815	2824	2838	2856	2873	2863	2874	2874	2872	2868	2833	2810	2777		
15	1595	1603	1611	1620	1629	1641	1654	1676	1691	1691	1698	1690	1675	1670	1644	1630	1612		
20	857	853	858	863	869	877	890	900	904	899	900	889	885	875	868	853	848		
25	514	515	514	509	515	520	525	529	529	530	528	521	514	511	504	504	497		
30	329	333	329	341	333	334	335	338	342	341	337	336	333	328	328	326	324		
35	223	223	226	223	226	226	226	228	227	227	228	228	228	227	224	225	222		
40	157	158	157	157	157	158	158	160	160	159	160	161	161	160	160	159	159		
45	119	119	120	120	121	120	121	122	122	122	122	123	124	124	123	123	123		
50	95.8	96.4	96.5	96.5	96.7	96.6	97.9	98.6	99.0	98.7	99.1	99.2	99.8	101	101	101	101		
55	77.2	76.9	77.2	77.6	77.6	78.3	78.5	79.3	79.9	79.5	79.5	80.0	80.7	81.2	81.5	81.8	82.0		
60	60.3	59.9	59.9	60.1	60.2	60.5	61.3	61.8	62.5	62.7	62.1	62.6	63.7	64.1	64.1	64.5	64.6		
65	45.0	45.0	45.2	45.5	45.2	45.2	46.2	46.8	47.1	47.0	46.7	47.1	47.9	48.0	48.3	48.9	48.9		
70	31.8	31.8	32.5	32.4	31.9	32.2	32.9	33.3	33.4	33.4	33.6	33.8	34.0	33.9	34.7	35.1	35.2		
75	20.9	20.8	21.1	21.3	21.1	21.3	21.6	21.8	22.0	22.2	22.2	22.2	22.4	22.7	22.8	23.1	23.1		
80	11.9	11.8	11.9	12.1	12.1	12.2	12.3	12.5	12.7	12.9	12.8	12.9	13.2	13.5	13.5	13.4	13.6		
85	5.75	5.68	5.72	5.80	5.74	5.81	5.94	5.98	6.15	6.27	6.17	6.27	6.46	6.71	6.64	6.65	6.78		
90	2.03	1.97	1.96	1.97	1.95	1.95	1.99	2.02	2.12	2.18	2.18	2.27	2.39	2.49	2.48	2.53	2.59		
95	0.35	0.31	0.29	0.27	0.25	0.25	0.26	0.29	0.33	0.35	0.37	0.41	0.45	0.49	0.53	0.56	0.59		
100	0.06	0.04	0.02	0.01	0.01	0.01	0.01	0.01	0.02	0.03	0.04	0.05	0.06	0.08	0.10	0.10	0.11		
105	0.04	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.04	0.04	0.06	0.07	0.08	0.08		
110	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.05	0.05	0.06		
115	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04		
120	0.06	0.06	0.05	0.05	0.06	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05		
125	0.09	0.09	0.09	0.09	0.09	0.09	0.08	0.09	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08		
130	0.16	0.16	0.16	0.16	0.15	0.15	0.15	0.15	0.15	0.14	0.14	0.14	0.14	0.13	0.13	0.13	0.13		
135	0.27	0.27	0.27	0.27	0.27	0.26	0.26	0.26	0.26	0.26	0.25	0.25	0.25	0.25	0.25	0.25	0.24		
140	0.45	0.45	0.44	0.44	0.44	0.44	0.44	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.40		
145	0.70	0.69	0.69	0.69	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.62		
150	0.99	0.97	0.97	0.97	0.97	0.97	0.97	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.99	0.85		
155	1.26	1.23	1.24	1.25	1.24	1.24	1.24	1.23	1.23	1.23	1.22	1.22	1.22	1.22	1.22	1.26	1.01		
160	1.45	1.42	1.43	1.44	1.44	1.45	1.44	1.44	1.44	1.43	1.43	1.42	1.42	1.41	1.40	1.43	1.05		
165	1.51	1.49	1.51	1.53	1.53	1.54	1.55	1.54	1.54	1.53	1.53	1.51	1.51	1.50	1.50	1.48	0.96		
170	1.25	1.40	1.42	1.45	1.47	1.49	1.50	1.50	1.50	1.50	1.50	1.49	1.48	1.47	1.50	1.29	0.90		
175	1.08	1.05	1.16	1.23	1.28	1.28	1.28	1.28	1.29	1.29	1.29	1.29	1.32	1.27	1.02	0.92	0.93		
180	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06		

Table 7: Luminous Intensity Data

TEST RESULTS of Model 14PAR38DIM/9CCTS/BAS (2700K 40 °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)	0.120
Power Factor	0.9831
Test Power (W)	12.91
THD A%	11.44
Luminous Efficacy (lm/W)	107.7
Total Luminous Flux (lm)	1390.3
Color Rendering Index (CRI)	94.3
R9	64
Correlated Color Temperature (CCT)(K)	2733
Chromaticity Chroma x	0.4568
Chromaticity Chroma y	0.4094
Chromaticity Chroma u	0.2610
Chromaticity Chroma v	0.3510
Duv	0.0002
Chromaticity Chroma u'	0.2610
Chromaticity Chroma v'	0.5264

Special Color Rendering Indices	
R1	99
R2	97.9
R3	95.3
R4	98.9
R5	98.6
R6	91.7
R7	90.4
R8	82.6
R9	64
R10	95.1
R11	93
R12	88.9
R13	98.8
R14	98.1

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

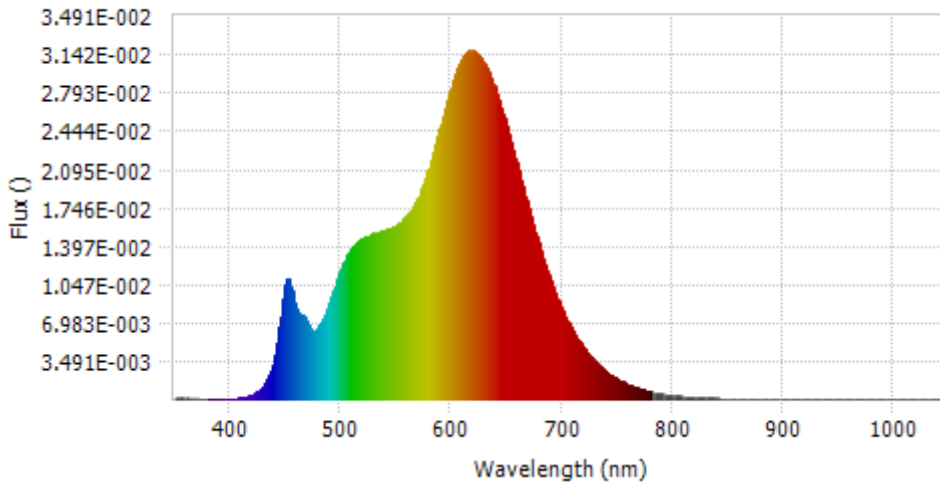
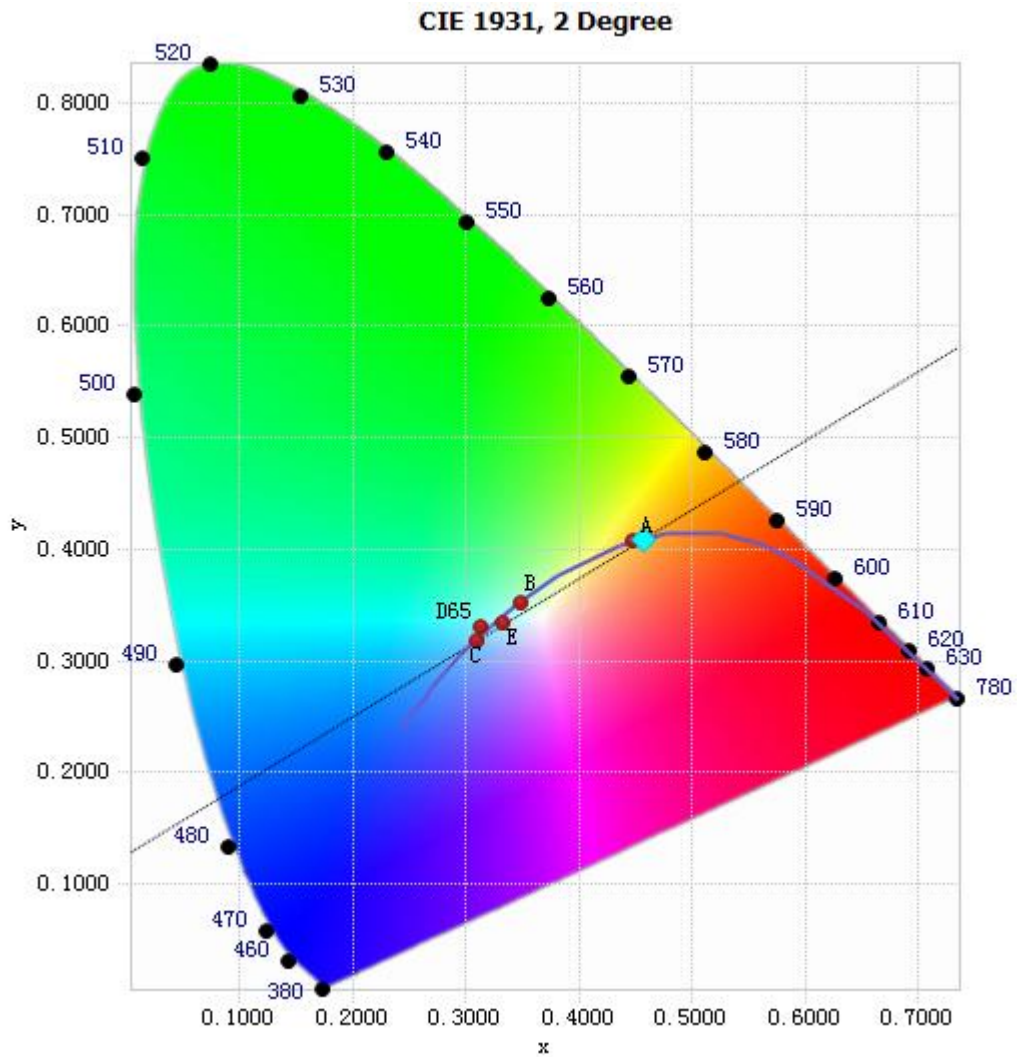


Chart 8: Spectral Power Distribution

Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	9.56E-05	485	7.55E-03	590	2.47E-02	695	9.47E-03
385	8.14E-05	490	8.77E-03	595	2.66E-02	700	8.24E-03
390	9.10E-05	495	1.03E-02	600	2.84E-02	705	7.14E-03
395	8.47E-05	500	1.17E-02	605	2.98E-02	710	6.19E-03
400	7.45E-05	505	1.29E-02	610	3.10E-02	715	5.38E-03
405	1.02E-04	510	1.37E-02	615	3.16E-02	720	4.67E-03
410	1.48E-04	515	1.44E-02	620	3.17E-02	725	4.04E-03
415	2.55E-04	520	1.46E-02	625	3.13E-02	730	3.46E-03
420	4.33E-04	525	1.49E-02	630	3.05E-02	735	2.95E-03
425	7.07E-04	530	1.51E-02	635	2.95E-02	740	2.52E-03
430	1.20E-03	535	1.52E-02	640	2.82E-02	745	2.16E-03
435	2.01E-03	540	1.54E-02	645	2.66E-02	750	1.84E-03
440	3.57E-03	545	1.56E-02	650	2.49E-02	755	1.58E-03
445	6.65E-03	550	1.58E-02	655	2.31E-02	760	1.34E-03
450	1.04E-02	555	1.62E-02	660	2.12E-02	765	1.15E-03
455	1.03E-02	560	1.67E-02	665	1.93E-02	770	9.83E-04
460	8.18E-03	565	1.74E-02	670	1.73E-02	775	8.40E-04
465	7.74E-03	570	1.84E-02	675	1.56E-02	780	7.12E-04
470	6.94E-03	575	1.96E-02	680	1.39E-02		
475	6.12E-03	580	2.11E-02	685	1.23E-02		
480	6.53E-03	585	2.29E-02	690	1.08E-02		

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

Chromaticity Diagram - Sphere Spectroradiometer Method



Tristimulus values(x, y): (0.4568, 0.4094)

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

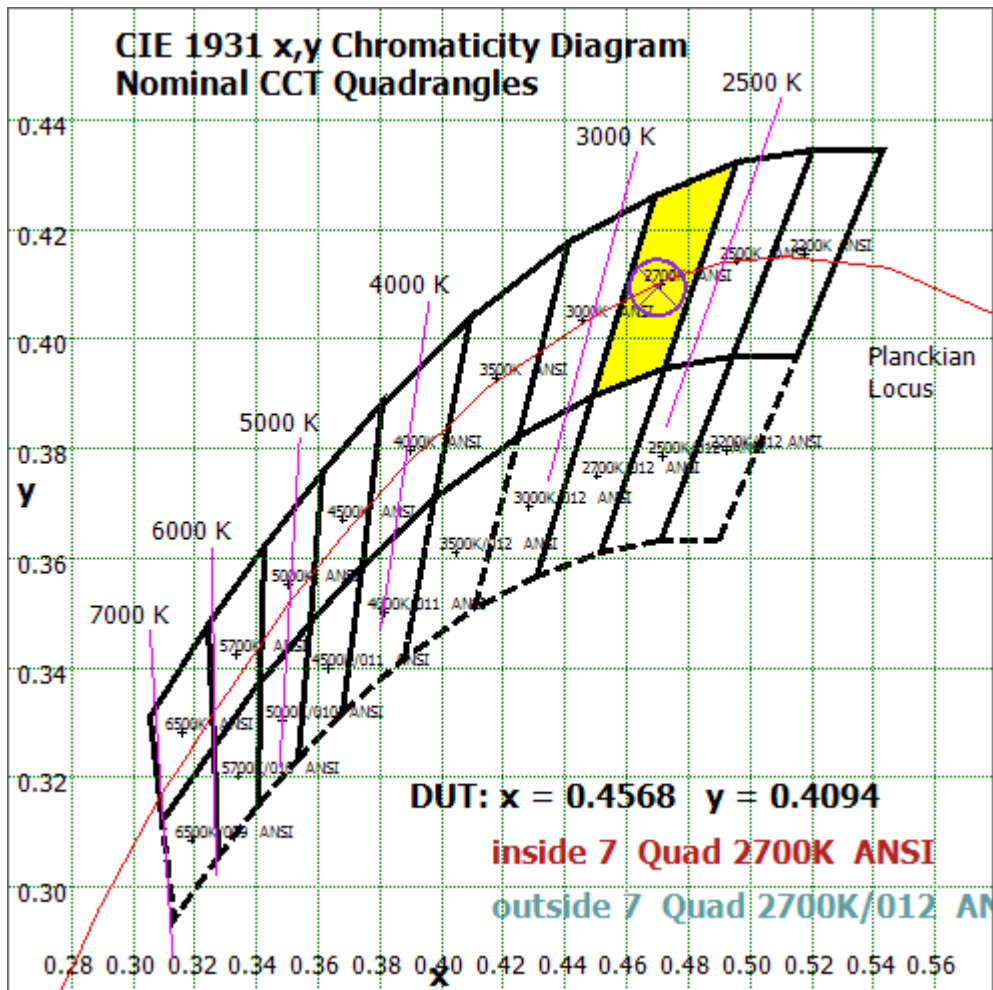


Chart 10: Plot of Lamp x/y coordinates on CIE 1931 Chromaticity Diagram

Color Rendition Report – Sphere Spectroradiometer Method

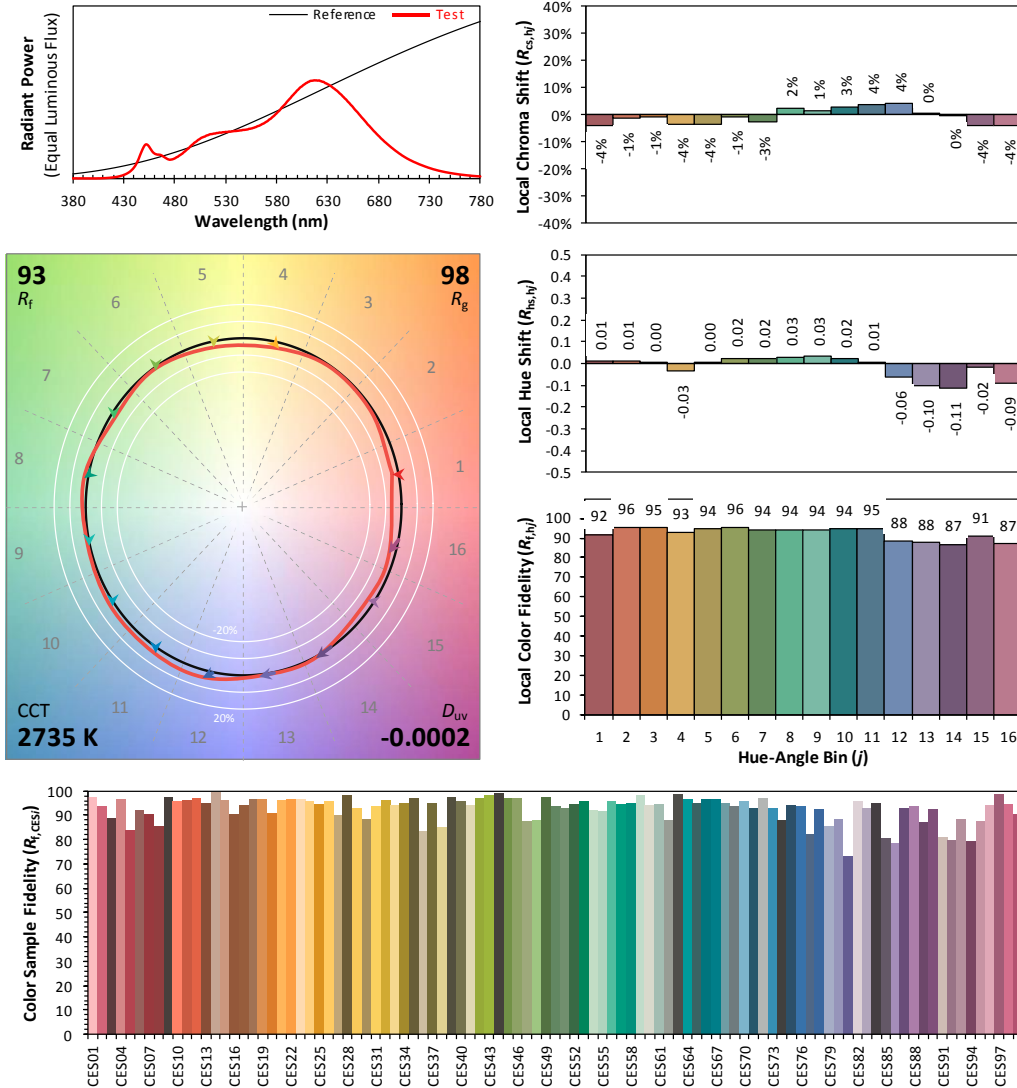
ANSI/IES TM-30-18 Color Rendition Report

Source: LED

Manufacturer: GREEN CREATIVE LTD

Date: 2024/01/16

Model: 14PAR38DIM/9CCTS/BAS



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.	x	0.4568	CIE 13.3-1995 (CRI) R_a 94 R_g 64
	y	0.4094	
	u'	0.2610	
	v'	0.5264	

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.

Goniophotometer Method

Test ambient temperature was 24.9 °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)	0.110
Power Factor	0.9826
Power (W)	12.95
Luminous Efficacy (lm/W)	109.0
Total Luminous Flux (lm)	1410.9
Beam Angle (°)	36.6 (0°-180°) / 36.6 (90°-270°)
Center Beam Candle Power (cd)	2534
Maximum Beam Candle Power (cd)	2534 (At: C=0.0, Gamma=0.0)
Spacing Criteria	0.58 (0°-180°) / 0.60 (90°-270°)
Zonal Lumens in the 0 °-60 °Zone	95.08%
Zonal Lumens in the 60 °-90 °Zone	4.76%
Zonal Lumens in the 90 °-120 °Zone	0.06%
Zonal Lumens in the 120 °-180 °Zone	0.11%

Table 10: Test data per Goniophotometer Method

Zonal Lumen Tabulation- Goniophotometer Method

$\gamma(^{\circ})$	Lumens	% Total
0- 10	221.09	15.67%
10- 20	442.888	31.39%
20- 30	318.674	22.59%
30- 40	181.836	12.89%
40- 50	110.724	7.85%
50- 60	66.258	4.70%
60- 70	40.308	2.86%
70- 80	20.295	1.44%
80- 90	6.511	0.46%
90-100	0.739	0.05%
100-110	0.07	0.00%
110-120	0.049	0.00%
120-130	0.09	0.01%
130-140	0.218	0.02%
140-150	0.363	0.03%
150-160	0.409	0.03%
160-170	0.312	0.02%
170-180	0.106	0.01%
Total	1410.9	100%

$\gamma(^{\circ})$	Lumens	% Total
0- 60	1341.47	95.08%
60- 90	67.114	4.76%
0-90	1408.58	99.83%
90- 180	2.356	0.17%
0- 180	1410.9	100%

Table 11: Zonal Lumen

Illuminance Plots- Goniophotometer Method

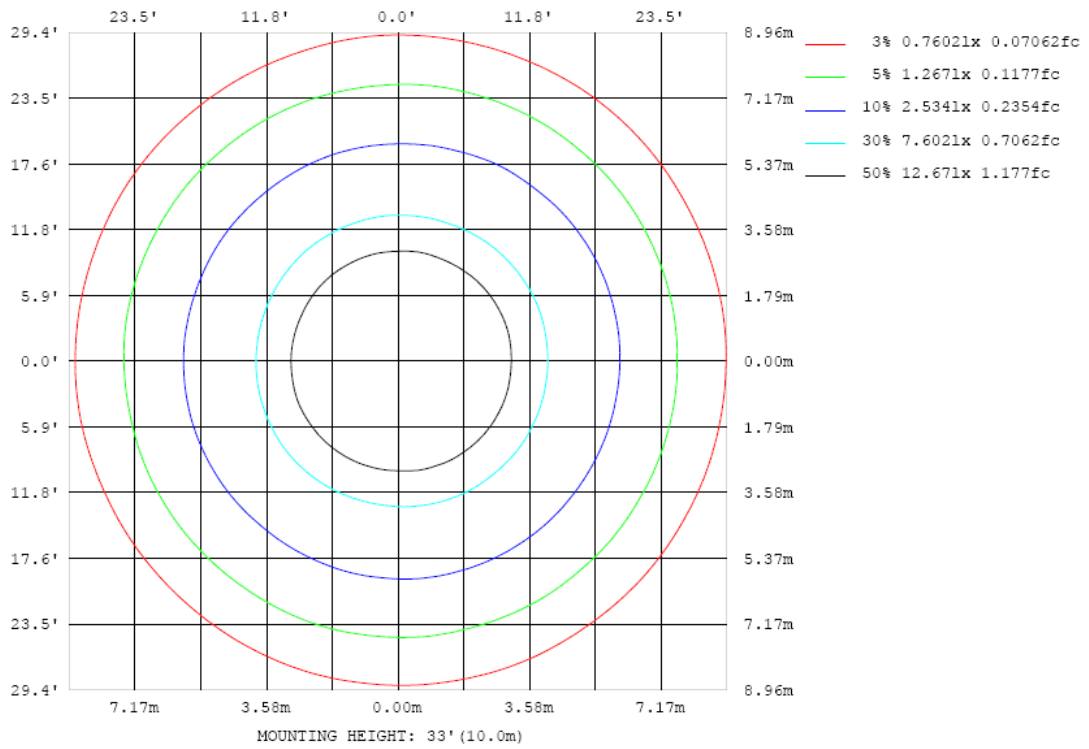


Chart 12: Illuminance Plot (Footcandles)

Luminous Intensity Distribution Plots- Goniophotometer Method

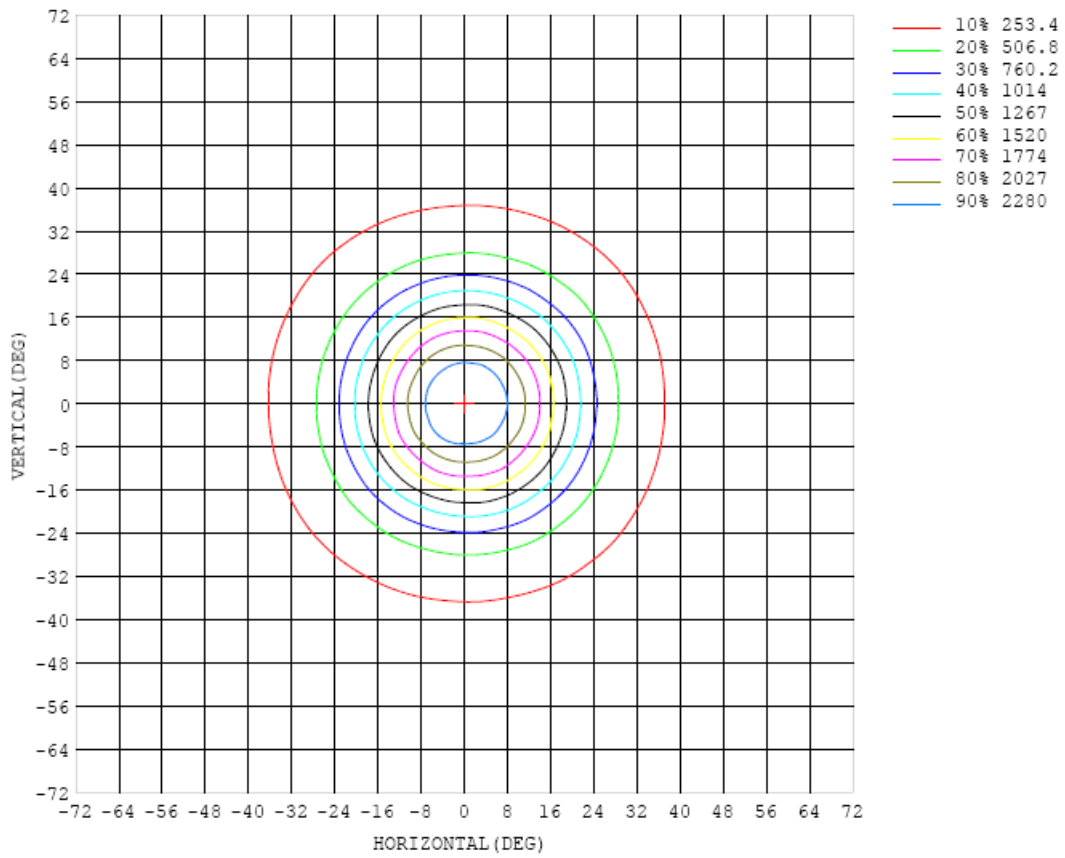


Chart 13: Isocandela Plot

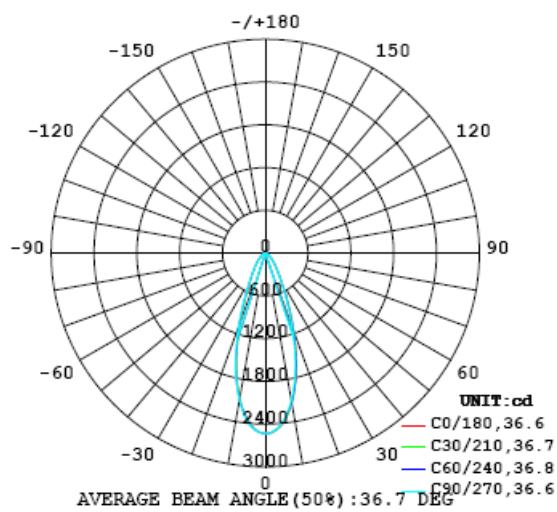


Chart 14: Polar Candela Distribution

Luminous Intensity Data- Goniophotometer Method

Table--3 UNIT: cd

C (DEG) \ γ (DEG)	190	195	200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280
0	2534	2534	2534	2534	2534	2534	2534	2534	2534	2534	2534	2534	2534	2534	2534	2534	2534	2534	2534
5	2401	2403	2406	2410	2413	2417	2419	2421	2421	2422	2422	2423	2423	2424	2426	2430	2434	2437	2437
10	2075	2071	2066	2065	2070	2076	2082	2084	2084	2086	2090	2094	2097	2098	2100	2099	2096	2096	2098
15	1570	1570	1568	1566	1569	1576	1583	1588	1591	1595	1600	1605	1609	1613	1617	1618	1618	1623	1628
20	1044	1044	1046	1048	1051	1053	1056	1061	1068	1072	1074	1076	1081	1089	1094	1094	1097	1101	1109
25	641	642	641	639	639	642	646	649	651	653	655	659	661	662	663	667	671	676	682
30	401	400	399	400	401	403	404	404	403	404	406	409	411	414	415	417	419	423	425
35	279	278	278	278	278	278	278	278	279	280	280	281	282	282	283	284	285	286	286
40	197	198	197	197	197	198	198	198	198	198	199	199	200	201	201	201	202	204	204
45	139	139	138	138	139	139	139	139	139	140	140	141	141	142	142	143	143	144	144
50	96.7	96.5	96.1	95.8	95.8	96.1	96.4	96.5	96.6	97.0	97.5	98.1	98.8	99.0	99.0	99.8	100	101	101
55	69.9	69.7	69.5	69.7	69.8	69.9	69.9	69.8	69.9	70.1	70.4	70.9	71.6	72.0	72.2	72.6	72.9	73.1	73.0
60	51.7	51.5	51.4	51.4	51.4	51.5	51.7	51.7	51.7	51.9	52.1	52.5	52.9	53.2	53.4	53.7	53.9	53.9	54.0
65	37.8	37.6	37.5	37.4	37.4	37.5	37.6	37.6	37.7	37.7	37.8	38.1	38.5	38.7	38.9	39.0	39.2	39.4	39.6
70	26.4	26.2	26.1	26.0	26.1	26.1	26.2	26.1	26.1	26.1	26.3	26.5	26.7	26.9	27.0	27.1	27.3	27.5	27.7
75	17.1	16.9	16.8	16.8	16.8	16.8	16.9	16.8	16.8	16.9	16.9	17.1	17.3	17.3	17.4	17.5	17.7	17.9	18.1
80	9.64	9.53	9.43	9.41	9.42	9.40	9.39	9.42	9.46	9.46	9.49	9.63	9.78	9.81	9.81	9.93	10.1	10.3	10.4
85	4.55	4.47	4.41	4.39	4.37	4.37	4.37	4.39	4.42	4.41	4.42	4.49	4.57	4.60	4.62	4.72	4.84	4.94	5.06
90	1.50	1.46	1.42	1.40	1.39	1.38	1.37	1.38	1.38	1.38	1.39	1.41	1.44	1.46	1.49	1.54	1.60	1.67	1.73
95	0.21	0.19	0.17	0.16	0.15	0.14	0.13	0.13	0.13	0.13	0.13	0.14	0.15	0.16	0.18	0.19	0.21	0.23	0.25
100	0.04	0.04	0.03	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02
105	0.04	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
110	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
115	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
120	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
125	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.11	0.11	0.11	0.11	0.11	0.11	0.10	0.10
130	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.21	0.21	0.21	0.21	0.21	0.20	0.20	0.20	0.19	0.19
135	0.36	0.36	0.36	0.36	0.36	0.36	0.35	0.35	0.35	0.35	0.35	0.35	0.34	0.34	0.34	0.34	0.33	0.33	0.33
140	0.54	0.53	0.54	0.54	0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.52	0.52	0.52	0.51	0.51	0.51	0.50	0.50
145	0.75	0.74	0.74	0.74	0.74	0.74	0.74	0.73	0.73	0.73	0.73	0.73	0.72	0.72	0.72	0.72	0.71	0.71	0.70
150	0.96	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.93	0.93	0.93	0.93	0.93	0.92	0.92	0.91	0.91
155	1.15	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.12	1.12	1.12	1.11	1.10	1.10	1.10
160	1.29	1.28	1.28	1.28	1.28	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.28	1.28	1.27	1.27	1.26	1.26	1.25
165	1.31	1.38	1.36	1.36	1.37	1.37	1.38	1.38	1.38	1.38	1.39	1.38	1.38	1.38	1.38	1.37	1.37	1.36	1.36
170	1.00	1.24	1.33	1.31	1.32	1.33	1.34	1.35	1.36	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.36	1.36	1.36
175	1.17	1.18	1.18	1.17	1.16	1.19	1.25	1.27	1.25	1.24	1.24	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.24
180	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12

Table 12: Luminous Intensity Data

Table--4 UNIT: cd

C (DEG) γ (DEG)	285	290	295	300	305	310	315	320	325	330	335	340	345	350	355				
0	2534	2534	2534	2534	2534	2534	2534	2534	2534	2534	2534	2534	2534	2534	2534				
5	2435	2431	2427	2428	2432	2438	2439	2437	2434	2432	2430	2432	2433	2434	2434				
10	2104	2110	2113	2117	2118	2120	2123	2126	2124	2121	2128	2131	2134	2136	2137				
15	1632	1632	1632	1636	1643	1646	1654	1662	1672	1677	1681	1681	1678	1677	1676				
20	1114	1117	1122	1129	1138	1147	1151	1154	1157	1166	1167	1167	1166	1161	1161				
25	685	689	694	698	699	701	708	716	721	725	729	729	727	725	724				
30	424	428	435	438	437	437	442	445	448	448	449	449	450	449	447				
35	286	288	290	289	290	291	292	293	295	295	296	296	297	297	298				
40	204	205	205	206	206	206	208	207	207	208	209	208	208	208	209				
45	145	146	146	147	147	147	148	148	148	148	149	148	148	148	148				
50	101	102	103	103	103	104	104	104	105	105	105	104	104	105	105				
55	73.2	73.6	74.1	74.7	75.3	75.8	75.9	76.0	76.3	76.5	76.6	76.8	77.0	77.2	77.1				
60	54.3	54.6	55.0	55.5	56.0	56.5	56.7	56.8	57.0	57.5	57.5	57.6	57.8	58.1	58.1				
65	39.9	40.2	40.5	40.9	41.3	41.8	42.1	42.1	42.3	42.6	42.7	42.8	43.0	43.2	43.3				
70	27.9	28.2	28.6	28.9	29.3	29.8	30.0	30.1	30.2	30.5	30.6	30.6	30.7	30.9	31.0				
75	18.3	18.5	18.8	19.1	19.5	19.8	20.0	20.1	20.2	20.2	20.3	20.5	20.6	20.8	20.9				
80	10.6	10.7	10.9	11.2	11.4	11.7	11.8	11.9	12.0	12.1	12.2	12.3	12.4	12.5	12.6				
85	5.16	5.27	5.40	5.55	5.72	5.87	5.99	6.09	6.17	6.23	6.32	6.42	6.47	6.54	6.64				
90	1.79	1.85	1.92	2.00	2.09	2.17	2.25	2.32	2.38	2.43	2.51	2.58	2.61	2.65	2.70				
95	0.27	0.30	0.32	0.36	0.38	0.42	0.45	0.49	0.52	0.55	0.59	0.63	0.64	0.66	0.68				
100	0.03	0.03	0.04	0.04	0.05	0.06	0.07	0.08	0.09	0.10	0.10	0.11	0.11	0.11	0.11				
105	0.02	0.02	0.03	0.03	0.04	0.04	0.05	0.05	0.06	0.07	0.08	0.08	0.08	0.08	0.08				
110	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.05	0.05	0.06	0.06	0.06	0.06				
115	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04				
120	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.05				
125	0.10	0.10	0.10	0.10	0.10	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.08				
130	0.19	0.18	0.18	0.18	0.17	0.17	0.17	0.16	0.16	0.16	0.16	0.16	0.15	0.15	0.14				
135	0.32	0.32	0.31	0.31	0.31	0.30	0.30	0.30	0.29	0.29	0.28	0.28	0.28	0.26	0.23				
140	0.50	0.49	0.49	0.49	0.48	0.48	0.47	0.47	0.46	0.46	0.46	0.46	0.46	0.42	0.34				
145	0.70	0.70	0.69	0.69	0.69	0.68	0.68	0.68	0.67	0.67	0.67	0.68	0.66	0.59	0.47				
150	0.91	0.91	0.90	0.90	0.90	0.90	0.89	0.89	0.89	0.88	0.89	0.90	0.86	0.74	0.56				
155	1.09	1.09	1.09	1.09	1.09	1.08	1.08	1.08	1.08	1.07	1.09	1.10	1.02	0.84	0.66				
160	1.25	1.25	1.24	1.24	1.24	1.24	1.23	1.23	1.22	1.22	1.24	1.22	1.10	0.88	0.78				
165	1.36	1.35	1.35	1.35	1.34	1.33	1.33	1.32	1.32	1.34	1.33	1.25	1.06	0.88	0.88				
170	1.36	1.36	1.36	1.36	1.36	1.36	1.35	1.36	1.37	1.35	1.24	1.06	0.93	0.95	0.95				
175	1.24	1.24	1.25	1.26	1.26	1.22	1.16	1.06	0.96	0.95	0.97	0.97	0.97	0.97	0.98				
180	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12				

Table 13: Luminous Intensity Data

TEST RESULTS of Model 14PAR38DIM/9CCTS/BAS (5000K 25 °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)	0.110
Power Factor	0.9831
Test Power (W)	12.95
THD A%	11.33
Luminous Efficacy (lm/W)	117.0
Total Luminous Flux (lm)	1514.7
Color Rendering Index (CRI)	95.2
R9	71.4
Correlated Color Temperature (CCT)(K)	5091
Chromaticity Chroma x	0.3432
Chromaticity Chroma y	0.3586
Chromaticity Chroma u	0.2075
Chromaticity Chroma v	0.3252
Duv	0.0043
Chromaticity Chroma u'	0.2075
Chromaticity Chroma v'	0.4878

Special Color Rendering Indices	
R1	95.6
R2	97.9
R3	98.5
R4	95.2
R5	94.8
R6	95.3
R7	95
R8	88.9
R9	71.4
R10	94.4
R11	96.6
R12	75.3
R13	96.8
R14	99.4

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

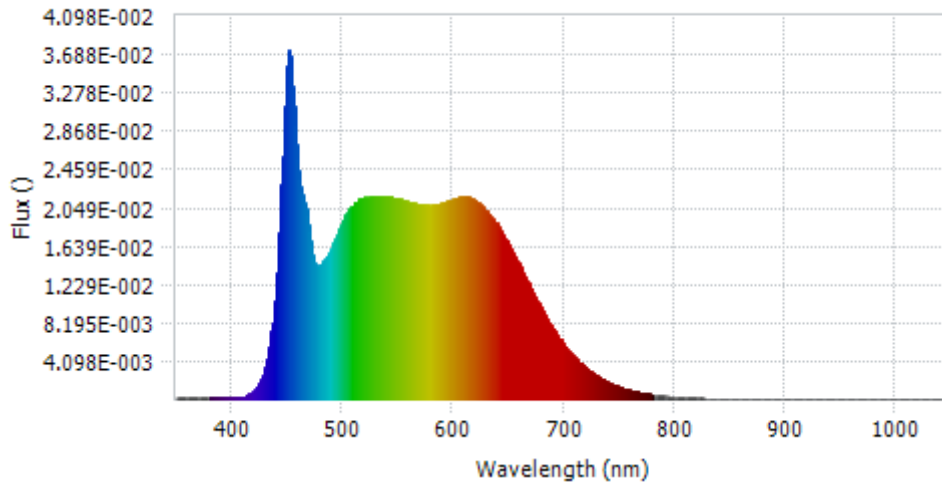
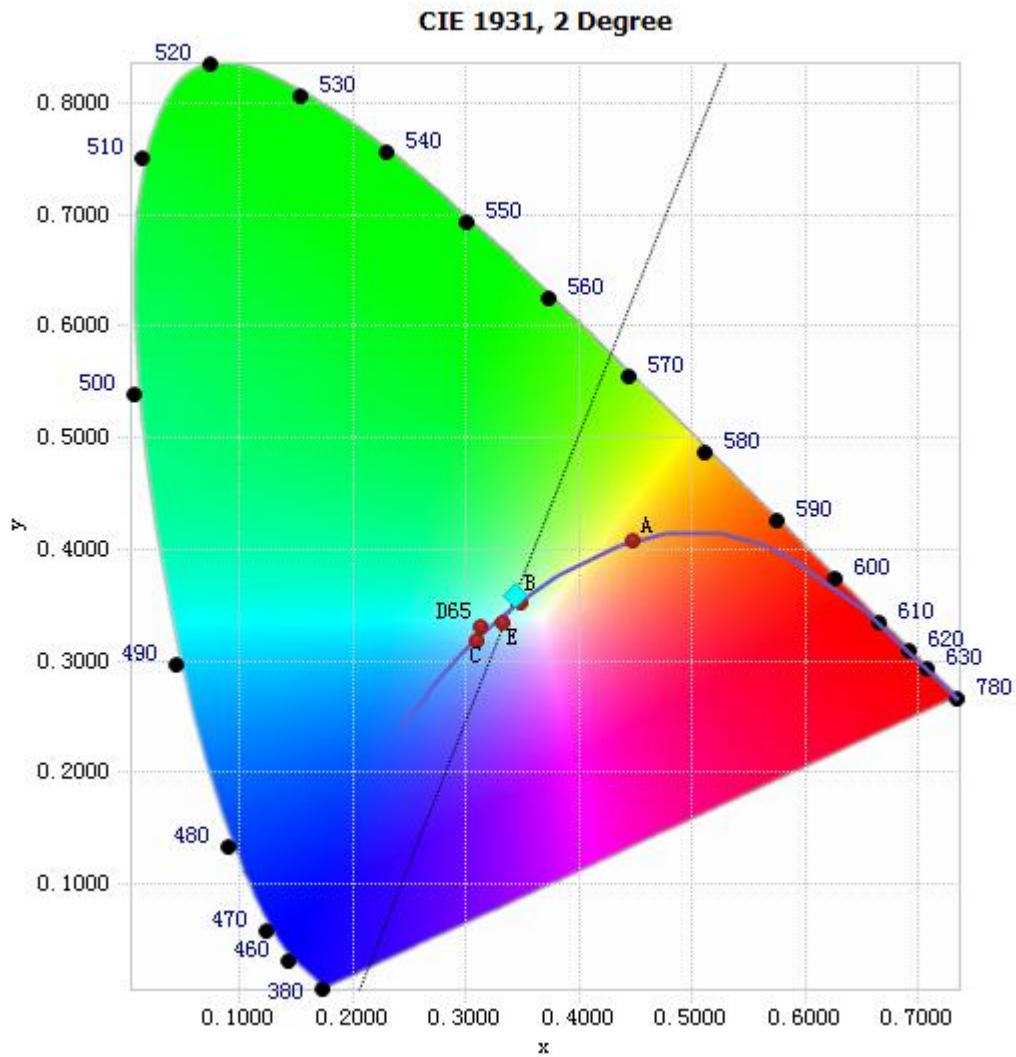


Chart 15: Spectral Power Distribution

Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	1.71E-04	485	1.52E-02	590	2.10E-02	695	6.72E-03
385	1.71E-04	490	1.61E-02	595	2.12E-02	700	5.86E-03
390	1.63E-04	495	1.76E-02	600	2.14E-02	705	5.10E-03
395	1.57E-04	500	1.90E-02	605	2.15E-02	710	4.44E-03
400	1.37E-04	505	2.01E-02	610	2.16E-02	715	3.87E-03
405	1.56E-04	510	2.07E-02	615	2.15E-02	720	3.37E-03
410	2.61E-04	515	2.14E-02	620	2.12E-02	725	2.92E-03
415	4.94E-04	520	2.14E-02	625	2.07E-02	730	2.51E-03
420	9.42E-04	525	2.16E-02	630	2.01E-02	735	2.14E-03
425	1.80E-03	530	2.18E-02	635	1.94E-02	740	1.83E-03
430	3.44E-03	535	2.16E-02	640	1.86E-02	745	1.57E-03
435	6.41E-03	540	2.16E-02	645	1.76E-02	750	1.34E-03
440	1.20E-02	545	2.16E-02	650	1.66E-02	755	1.15E-03
445	2.29E-02	550	2.14E-02	655	1.55E-02	760	9.82E-04
450	3.57E-02	555	2.12E-02	660	1.44E-02	765	8.41E-04
455	3.34E-02	560	2.10E-02	665	1.32E-02	770	7.16E-04
460	2.44E-02	565	2.09E-02	670	1.19E-02	775	6.08E-04
465	2.14E-02	570	2.08E-02	675	1.08E-02	780	5.18E-04
470	1.79E-02	575	2.07E-02	680	9.66E-03		
475	1.46E-02	580	2.07E-02	685	8.61E-03		
480	1.43E-02	585	2.09E-02	690	7.63E-03		

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

Chromaticity Diagram - Sphere Spectroradiometer Method



Tristimulus values(x, y): (0.3432, 0.3586)

Chart 16: 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

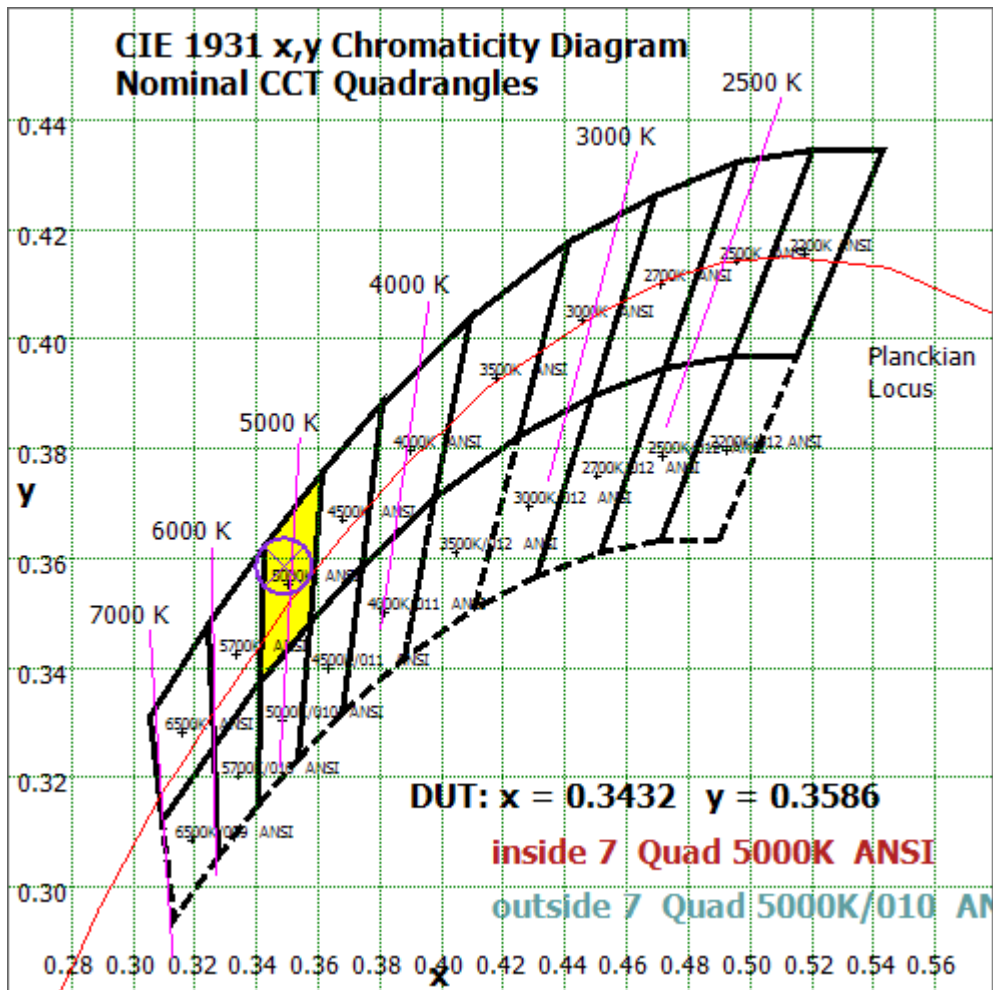


Chart17: Plot of Lamp x/y coordinates on CIE 1931 Chromaticity Diagram

Color Rendition Report – Sphere Spectroradiometer Method

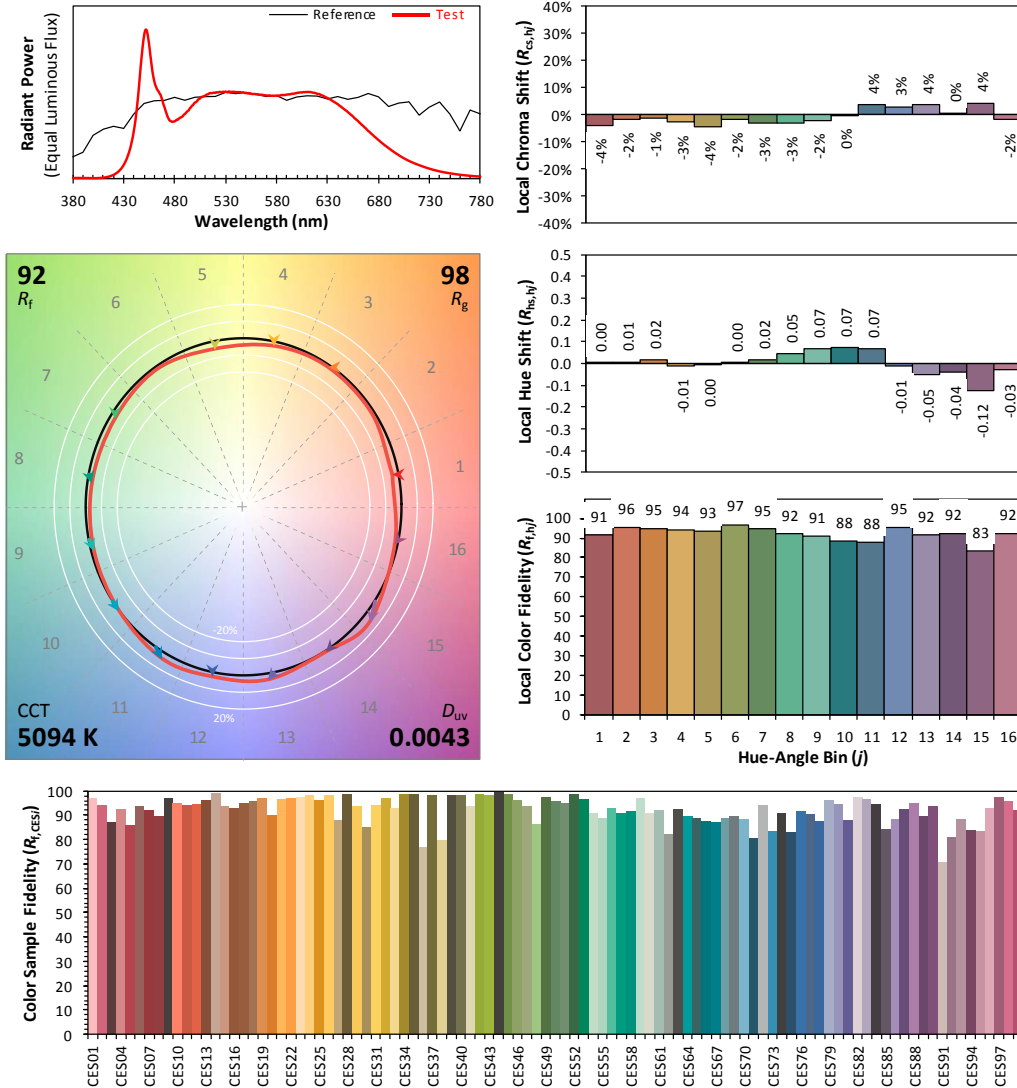
ANSI/IES TM-30-18 Color Rendition Report

Source: LED

Manufacturer: GREEN CREATIVE LTD

Date: 2024/01/16

Model: 14PAR38DIM/9CCTS/BAS



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.	x	0.3432	CIE 13.3-1995 (CRI) R_a 95 R_g 71
	y	0.3586	
	u'	0.2075	
	v'	0.4878	

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

Chart 18: 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.

TEST RESULTS of Model 14PAR38DIM/9CCTS/BAS (5000K 40 °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)	0.110
Power Factor	0.9831
Test Power (W)	12.96
THD A%	11.27
Luminous Efficacy (lm/W)	117.9
Total Luminous Flux (lm)	1527.6
Color Rendering Index (CRI)	94.9
R9	70.2
Correlated Color Temperature (CCT)(K)	5100
Chromaticity Chroma x	0.3429
Chromaticity Chroma y	0.3584
Chromaticity Chroma u	0.2073
Chromaticity Chroma v	0.3251
Duv	0.0043
Chromaticity Chroma u'	0.2073
Chromaticity Chroma v'	0.4876

Special Color Rendering Indices	
R1	95.3
R2	97.5
R3	98.3
R4	95.1
R5	94.5
R6	95
R7	95.1
R8	88.6
R9	70.2
R10	93.6
R11	96.3
R12	75.3
R13	96.4
R14	99.2

Table 16: 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

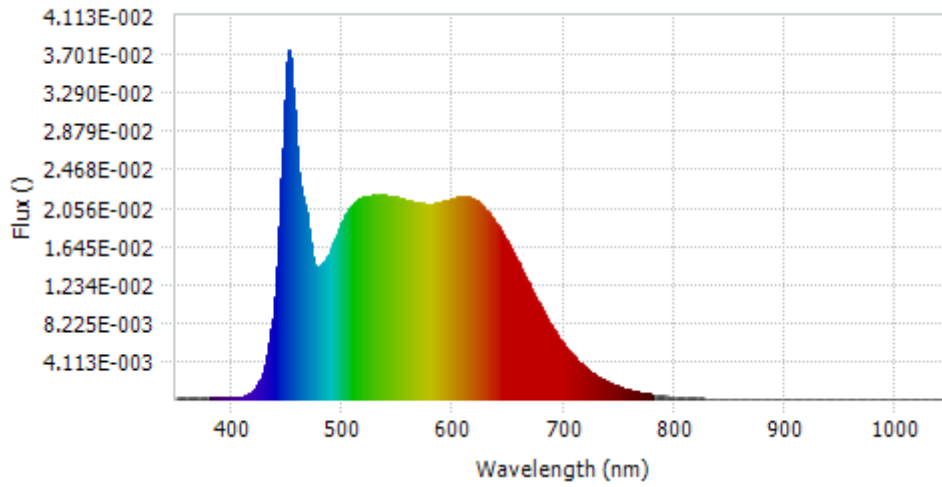
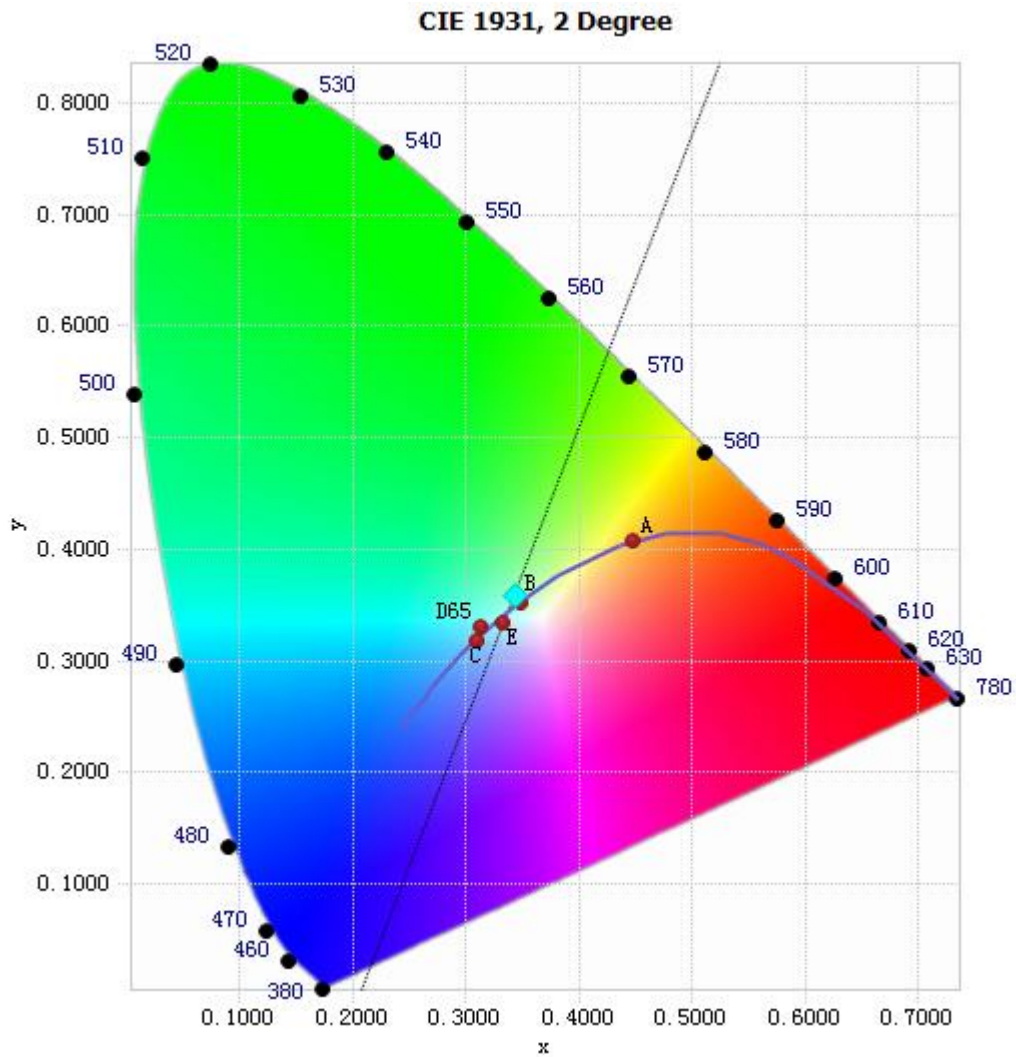


Chart 19: Spectral Power Distribution

Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	1.78E-04	485	1.51E-02	590	2.12E-02	695	6.70E-03
385	1.57E-04	490	1.61E-02	595	2.14E-02	700	5.86E-03
390	1.63E-04	495	1.77E-02	600	2.16E-02	705	5.09E-03
395	1.57E-04	500	1.91E-02	605	2.17E-02	710	4.44E-03
400	1.31E-04	505	2.02E-02	610	2.17E-02	715	3.86E-03
405	1.58E-04	510	2.09E-02	615	2.16E-02	720	3.37E-03
410	2.65E-04	515	2.16E-02	620	2.13E-02	725	2.92E-03
415	5.27E-04	520	2.16E-02	625	2.08E-02	730	2.50E-03
420	1.01E-03	525	2.18E-02	630	2.02E-02	735	2.14E-03
425	1.92E-03	530	2.20E-02	635	1.95E-02	740	1.83E-03
430	3.66E-03	535	2.18E-02	640	1.87E-02	745	1.57E-03
435	6.80E-03	540	2.19E-02	645	1.77E-02	750	1.35E-03
440	1.27E-02	545	2.18E-02	650	1.66E-02	755	1.15E-03
445	2.38E-02	550	2.16E-02	655	1.55E-02	760	9.80E-04
450	3.61E-02	555	2.15E-02	660	1.44E-02	765	8.40E-04
455	3.33E-02	560	2.13E-02	665	1.32E-02	770	7.13E-04
460	2.44E-02	565	2.12E-02	670	1.19E-02	775	6.08E-04
465	2.13E-02	570	2.10E-02	675	1.08E-02	780	5.16E-04
470	1.77E-02	575	2.09E-02	680	9.65E-03		
475	1.45E-02	580	2.09E-02	685	8.61E-03		
480	1.43E-02	585	2.11E-02	690	7.63E-03		

Table 17: Spectral Power Distribution Numerical Data per Sphere - Spectroradiometer Method

Chromaticity Diagram - Sphere Spectroradiometer Method



Tristimulus values(x, y): (0.3429, 0.3584)

Chart 20: 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

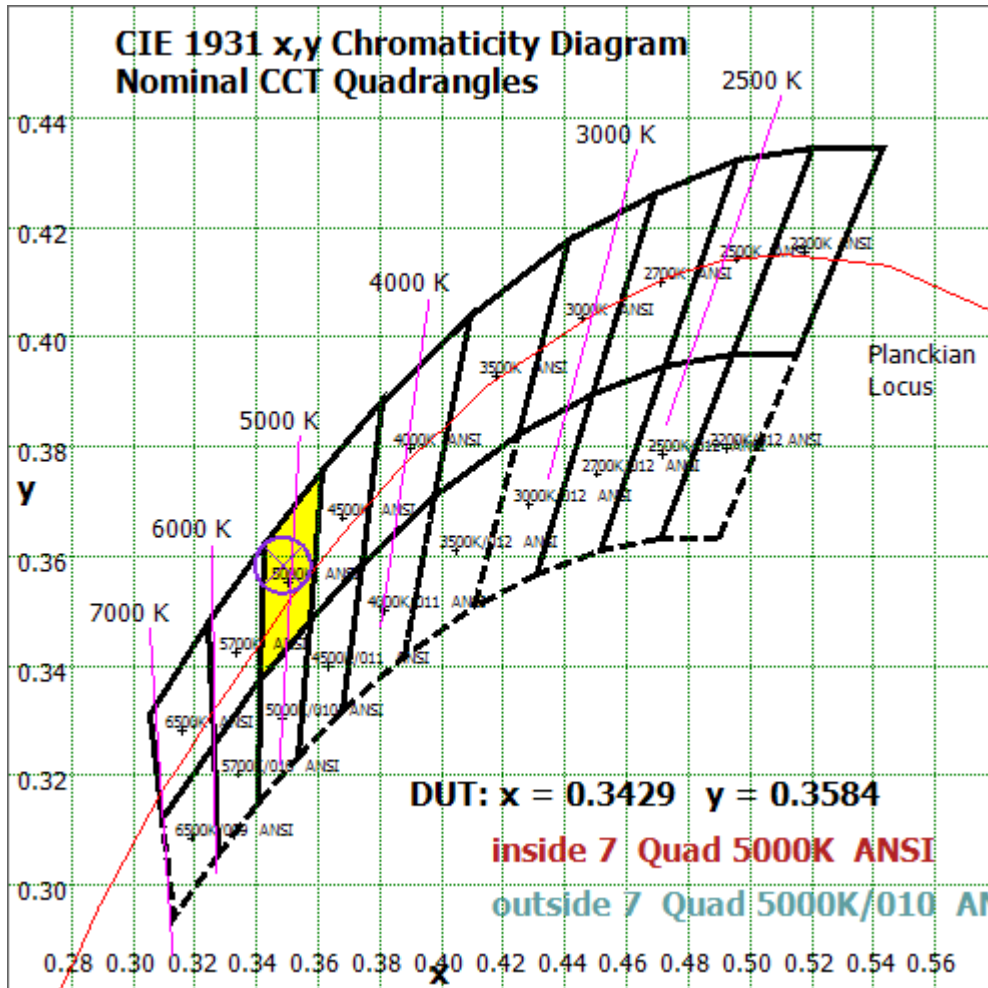


Chart 21: Plot of Lamp x/y coordinates on CIE 1931 Chromaticity Diagram

Color Rendition Report – Sphere Spectroradiometer Method

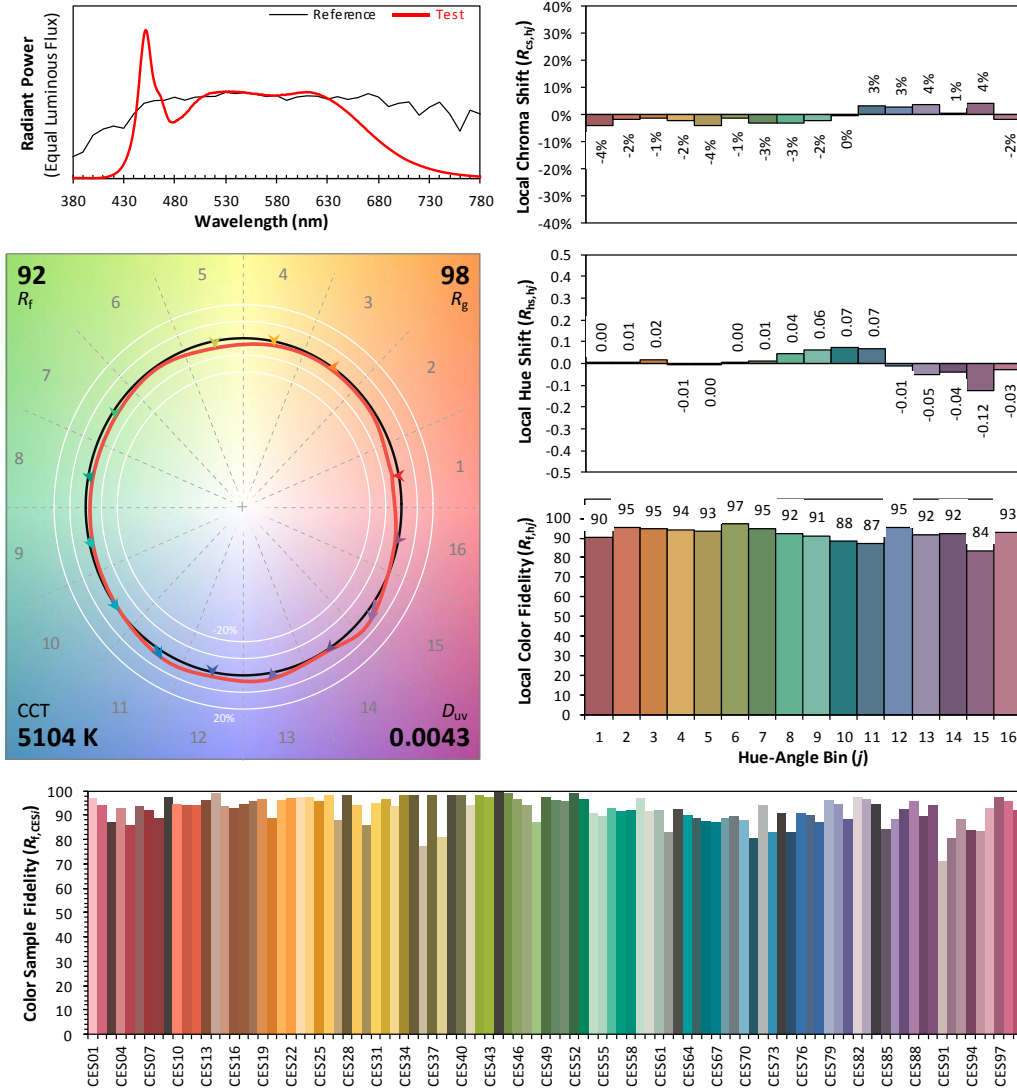
ANSI/IES TM-30-18 Color Rendition Report

Source: LED

Manufacturer: GREEN CREATIVE LTD

Date: 2024/01/16

Model: 14PAR38DIM/9CCTS/BAS



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.	x	0.3429	CIE 13.3-1995 (CRI) R_a 95 R_g 70
	y	0.3584	
	u'	0.2073	
	v'	0.4876	

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

Chart 22: 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 16 due to rounding.

EQUIPMENT LIST

Test Equipment	Model	Equipment No.	Calibration Date	Calibration Due date
Goniophotometer system	GO-R5000	HZTE011-01	Jun. 05, 2023	-
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	Jul. 24, 2023	-
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
Multi-Meter	FLUKE15B	HZTE020-01	Aug. 01, 2023	Jul. 31, 2024

Table 26: 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 ***

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.