

LM-79-19 TEST REPORT

for

RAB Lighting Inc

408 W 14th St, New York, NY 10014 United States

LED Panel Light

Model: SWISH[blank,AIR]2X2[blank,/PIR,/LCBS,/MVS,/LCBS/MVS][blank,/E]

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.: HZ25070031c

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

Review by:

Wei Fei

Approved by:



April Zou

Engineer: Wei Fei
Aug. 07, 2025

Manager: April Zou
Aug. 07, 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	SWISH2X2 35W 3500K Setting	SWISH2X2 35W 4000K Setting	SWISH2X2 35W 5000K Setting
Luminous Efficacy (Lumens /Watt)	128.5	139.9	132.8
Total Luminous Flux (Lumens)	4423.7	4702.9	4603.8
Power (Watts)	34.42	33.61	34.68
Power Factor	0.9957	0.9958	0.9961
CCT (K)	3414	4052	4863
CRI	82.6	83.6	82.1
Stabilization Time (Light & Power)	50 mins	50 mins	50 mins
Note	3500K	4000K	5000K

Table 1: Executive Data Summary

Note: The above results are recorded/ derived from measurements made using an Integrating Sphere.

Test specifications:

Date of Receipt	: Jul. 28, 2025
Date of Test	: Jul. 30, 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 for the Electrical and Photometric Measurements of Solid-State Lighting Products ANSI/IES TM-30-18 IES Method for Evaluating Light Source Color Rendition

TABLE OF CONTENT

LM-79-19 TEST REPORT.....	1
TEST SUMMARY	2
SAMPLE PHOTO	5
TEST RESULTS (35W 3500K Setting).....	6
Sphere-Spectroradiometer Method.....	6
Goniophotometer Method	7
Spectral Power Distribution - Sphere Spectroradiometer Method	8
Chromaticity Diagram - Sphere Spectroradiometer Method.....	9
Nominal CCT Quadrangles – Sphere Spectroradiometer Method	10
Color Rendition Report – Sphere Spectroradiometer Method	11
Zonal Lumen Tabulation- Goniophotometer Method	12
UGR Table (Corrected) - Goniophotometer Method	13
Illuminance Plots- Goniophotometer Method	14
Luminous Intensity Distribution Plots- Goniophotometer Method.....	15
Luminous Intensity Data- Goniophotometer Method	16
TEST RESULTS (35W 4000K Setting).....	18
Sphere-Spectroradiometer Method.....	18
Goniophotometer Method	19
Spectral Power Distribution - Sphere Spectroradiometer Method	20
Chromaticity Diagram - Sphere Spectroradiometer Method.....	21
Nominal CCT Quadrangles – Sphere Spectroradiometer Method	22
Color Rendition Report – Sphere Spectroradiometer Method	23
Zonal Lumen Tabulation- Goniophotometer Method	24
UGR Table (Corrected) - Goniophotometer Method	25
Illuminance Plots- Goniophotometer Method	26
Luminous Intensity Distribution Plots- Goniophotometer Method.....	27
Luminous Intensity Data- Goniophotometer Method	28

TEST RESULTS (35W 5000K Setting).....	30
Sphere-Spectroradiometer Method.....	30
Goniophotometer Method	31
Spectral Power Distribution - Sphere Spectroradiometer Method	32
Chromaticity Diagram - Sphere Spectroradiometer Method.....	33
Nominal CCT Quadrangles – Sphere Spectroradiometer Method	34
Color Rendition Report – Sphere Spectroradiometer Method	35
Zonal Lumen Tabulation- Goniophotometer Method	36
UGR Table (Corrected) - Goniophotometer Method	37
Illuminance Plots- Goniophotometer Method	38
Luminous Intensity Distribution Plots- Goniophotometer Method.....	39
Luminous Intensity Data- Goniophotometer Method	40
EQUIPMENT LIST	42
TEST METHODS	42
Seasoning of SSL Product.....	42
Sphere-Spectroradiometer Method- Photometric and Electrical Measurements.....	42
Goniophotometer Method	43
Photometric and Electrical Measurements	43
Color Characteristics Measurements.....	43

SAMPLE PHOTO



Figure 1- Overview of the sample

Equipment Under Test(EUT)

Name	: LED Panel Light
Model	: SWISH2X2
Electrical Ratings	: 120-277V, 50/60Hz
Product Description	: Field-Adjustable 18W/26W/35W Color- Tunable 3500K/4000K/5000K
Manufacturer	: RAB Lighting Inc
Address	: 408 W 14th St, New York, NY 10014 United States

TEST RESULTS (35W 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)	0.288	0.129
Power Factor	0.9957	0.9507
Test Power (W)	34.42	34.06
THD A%	6.94	12.95
Luminous Efficacy (lm/W)	128.5	129.3
Total Luminous Flux (lm)	4423.7	4405.6
Color Rendering Index (CRI)	82.6	
R9	5.8	
Correlated Color Temperature (CCT)(K)	3414	
Chromaticity Chroma x	0.4113	
Chromaticity Chroma y	0.3961	
Chromaticity Chroma u	0.2374	
Chromaticity Chroma v	0.3429	
Duv	0.0011	
Chromaticity Chroma u'	0.2374	
Chromaticity Chroma v'	0.5144	

Special Color Rendering Indices	
R1	80.8
R2	90.6
R3	96.4
R4	80.3
R5	80.9
R6	87.8
R7	83.9
R8	60.4
R9	5.8
R10	78.3
R11	79.5
R12	65.5
R13	83.2
R14	98.5

Table 2: Test data per Sphere-Spectroradiometer Method

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

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)	0.288
Power Factor	0.9958
Power (W)	34.44
Luminous Efficacy (lm/W)	129.0
Total Luminous Flux (lm)	4442.5
Beam Angle (°)	80.6 (0°-180°) / 87.4 (90°-270°)
Center Beam Candle Power (cd)	2187
Maximum Beam Candle Power (cd)	2189 (At: C=70.0, Gamma=0.5)
Spacing Criteria	1.17 (0°-180°) / 1.12 (90°-270°)
Zonal Lumens in the 0 °-60 °Zone	85.27%
Zonal Lumens in the 60 °-90 °Zone	14.38%
Zonal Lumens in the 90 °-120 °Zone	0.08%
Zonal Lumens in the 120 °-180 °Zone	0.26%

Table 3: Test data per Goniophotometer Method

Spectral Power Distribution - Sphere Spectroradiometer Method

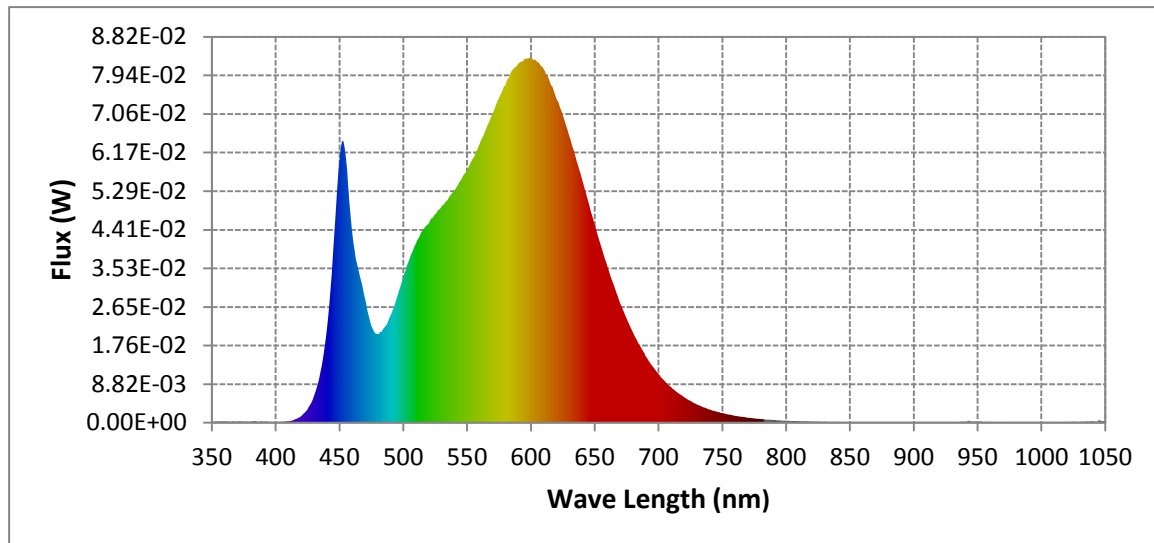
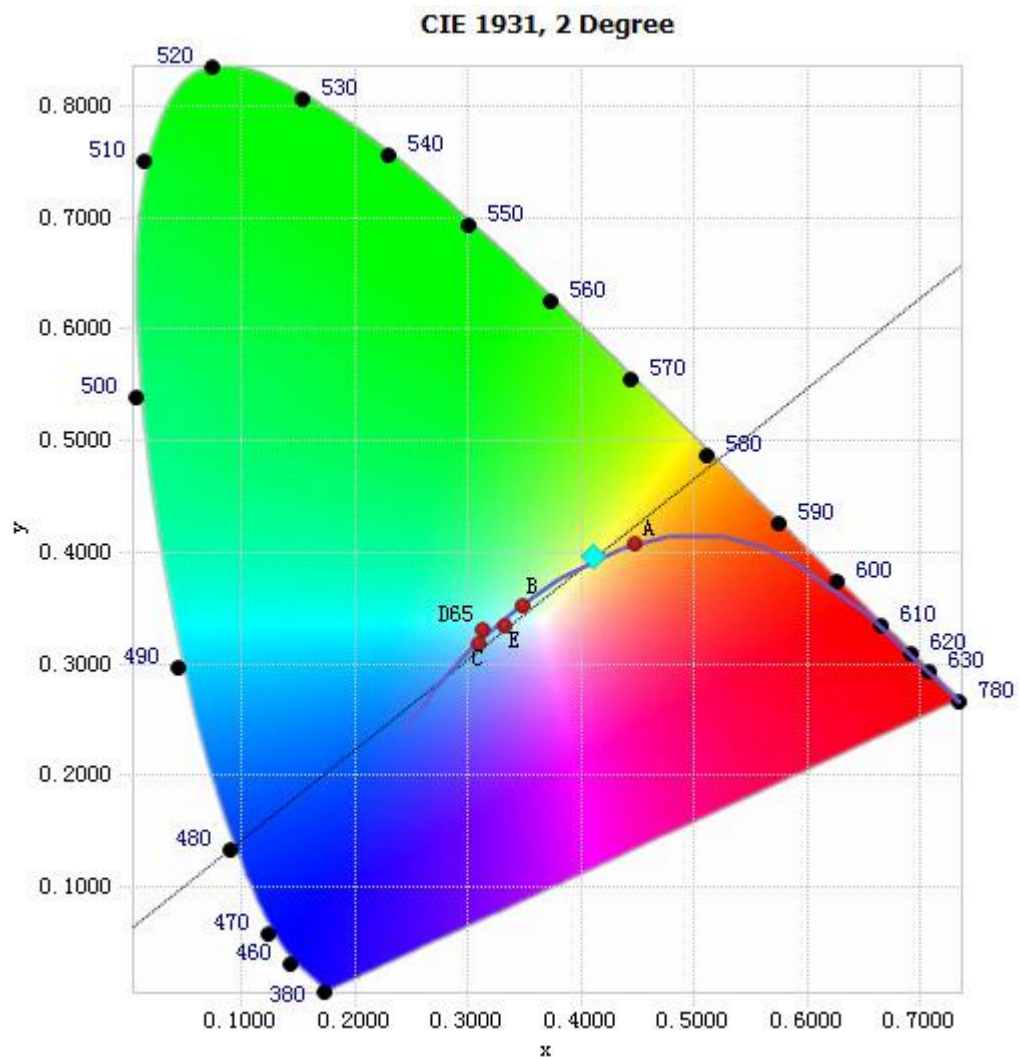


Chart 1: Spectral Power Distribution

Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	2.30E-04	485	2.16E-02	590	8.20E-02	695	1.31E-02
385	2.22E-04	490	2.44E-02	595	8.32E-02	700	1.12E-02
390	2.34E-04	495	2.85E-02	600	8.33E-02	705	9.55E-03
395	2.07E-04	500	3.33E-02	605	8.25E-02	710	8.12E-03
400	1.55E-04	505	3.75E-02	610	8.08E-02	715	6.90E-03
405	2.20E-04	510	4.10E-02	615	7.79E-02	720	5.87E-03
410	3.18E-04	515	4.38E-02	620	7.41E-02	725	4.98E-03
415	7.52E-04	520	4.55E-02	625	7.04E-02	730	4.20E-03
420	1.51E-03	525	4.77E-02	630	6.57E-02	735	3.57E-03
425	3.06E-03	530	4.95E-02	635	6.09E-02	740	3.04E-03
430	6.00E-03	535	5.09E-02	640	5.58E-02	745	2.57E-03
435	1.14E-02	540	5.30E-02	645	5.06E-02	750	2.20E-03
440	2.09E-02	545	5.53E-02	650	4.54E-02	755	1.85E-03
445	3.88E-02	550	5.76E-02	655	4.04E-02	760	1.59E-03
450	6.02E-02	555	6.05E-02	660	3.58E-02	765	1.33E-03
455	6.07E-02	560	6.37E-02	665	3.15E-02	770	1.17E-03
460	4.40E-02	565	6.71E-02	670	2.72E-02	775	9.92E-04
465	3.51E-02	570	7.07E-02	675	2.38E-02	780	8.44E-04
470	2.87E-02	575	7.41E-02	680	2.06E-02		
475	2.22E-02	580	7.70E-02	685	1.78E-02		
480	2.03E-02	585	8.04E-02	690	1.52E-02		

Table 4: Spectral Power Distribution Numerical Data per Sphere - Spectroradiometer Method

Chromaticity Diagram - Sphere Spectroradiometer Method



Tristimulus values(x, y): (0.4113, 0.3961)

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

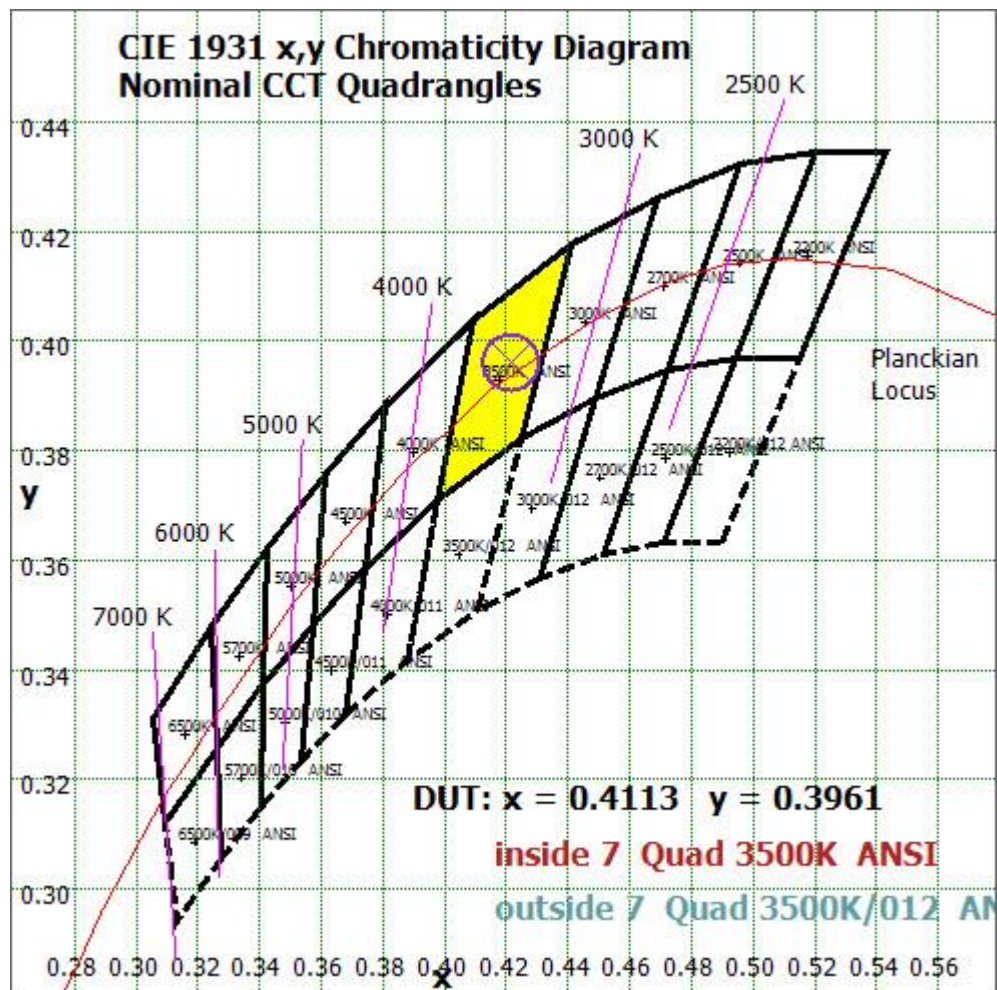


Chart 3: Plot of Lamp x/y coordinates on CIE 1931 Chromaticity Diagram

Color Rendition Report – Sphere Spectroradiometer Method

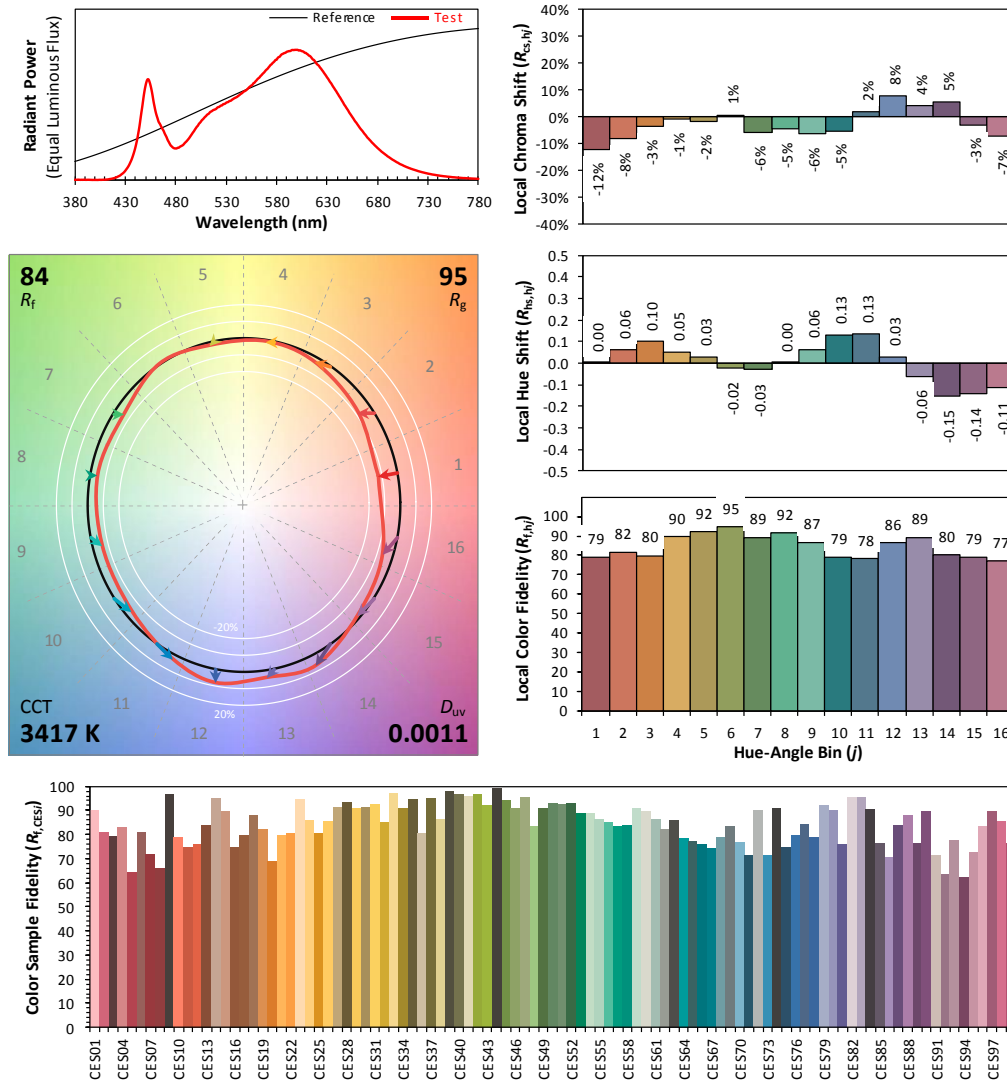
ANSI/IES TM-30-18 Color Rendition Report

Source: LED

Manufacturer: RAB Lighting Inc

Date: 2025/07/30

Model: SWISH2X2



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

x 0.4113
 y 0.3961
 u' 0.2374
 v' 0.5144

CIE 13.3-1995
(CRI)

R_a 83
 R_9 6

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.

Zonal Lumen Tabulation- Goniophotometer Method

$\gamma(^{\circ})$	Lumens	% Total
0- 10	205.996	4.64%
10- 20	578.911	13.03%
20- 30	832.578	18.74%
30- 40	895.82	20.16%
40- 50	742.393	16.71%
50- 60	532.426	11.98%
60- 70	366.073	8.24%
70- 80	216.17	4.87%
80- 90	56.725	1.28%
90-100	0.711	0.02%
100-110	1.204	0.03%
110-120	1.82	0.04%
120-130	2.45	0.06%
130-140	2.903	0.07%
140-150	2.592	0.06%
150-160	1.873	0.04%
160-170	1.323	0.03%
170-180	0.496	0.01%
Total	4442.5	100%

$\gamma(^{\circ})$	Lumens	% Total
0- 60	3788.124	85.27%
60- 90	638.968	14.38%
0-90	4427.092	99.65%
90- 180	15.372	0.35%
0- 180	4442.5	100%

Table 5: Zonal Lumen

UGR Table (Corrected) - Goniophotometer Method

Reflectances											
Ceiling Cavity		70	70	50	50	30	70	70	50	50	30
Walls		50	30	50	30	30	50	30	50	30	30
Floor Cavity		20	20	20	20	20	20	20	20	20	20
Room Size		UGR Viewed Crosswise					UGR Viewed Endwise				
X=2H	Y=2H	12.7	14.2	13.1	14.5	14.8	16.0	17.5	16.3	17.8	18.1
	3H	14.2	15.5	14.6	15.8	16.2	17.7	19.1	18.1	19.4	19.7
	4H	14.7	15.9	15.1	16.3	16.7	18.5	19.7	18.9	20.1	20.5
	6H	15.0	16.1	15.4	16.5	16.9	19.2	20.3	19.6	20.7	21.1
	8H	15.0	16.1	15.5	16.5	16.9	19.4	20.5	19.8	20.9	21.3
	12H	15.0	16.1	15.5	16.5	16.9	19.5	20.6	20.0	21.0	21.4
4H	2H	13.6	14.9	14.0	15.2	15.6	16.3	17.6	16.7	17.9	18.3
	3H	15.3	16.4	15.7	16.8	17.2	18.4	19.4	18.8	19.8	20.2
	4H	15.9	16.9	16.3	17.3	17.7	19.3	20.2	19.7	20.7	21.1
	6H	16.3	17.1	16.7	17.6	18.0	20.2	21.0	20.7	21.5	21.9
	8H	16.4	17.1	16.8	17.6	18.1	20.5	21.3	21.0	21.7	22.2
	12H	16.4	17.1	16.9	17.6	18.0	20.7	21.4	21.2	21.8	22.3
8H	4H	16.5	17.2	16.9	17.7	18.1	19.5	20.3	19.9	20.7	21.2
	6H	17.0	17.6	17.5	18.1	18.6	20.6	21.2	21.1	21.7	22.2
	8H	17.1	17.7	17.6	18.2	18.7	21.0	21.5	21.5	22.1	22.5
	12H	17.2	17.7	17.7	18.2	18.7	21.2	21.7	21.7	22.2	22.8
12H	4H	16.6	17.3	17.1	17.7	18.2	19.5	20.2	20.0	20.6	21.1
	6H	17.2	17.7	17.7	18.2	18.7	20.6	21.2	21.1	21.6	22.2
	8H	17.3	17.9	17.8	18.3	18.9	21.0	21.6	21.5	22.0	22.6

Chart 5: UGR Table (Corrected)

Illuminance Plots- Goniophotometer Method

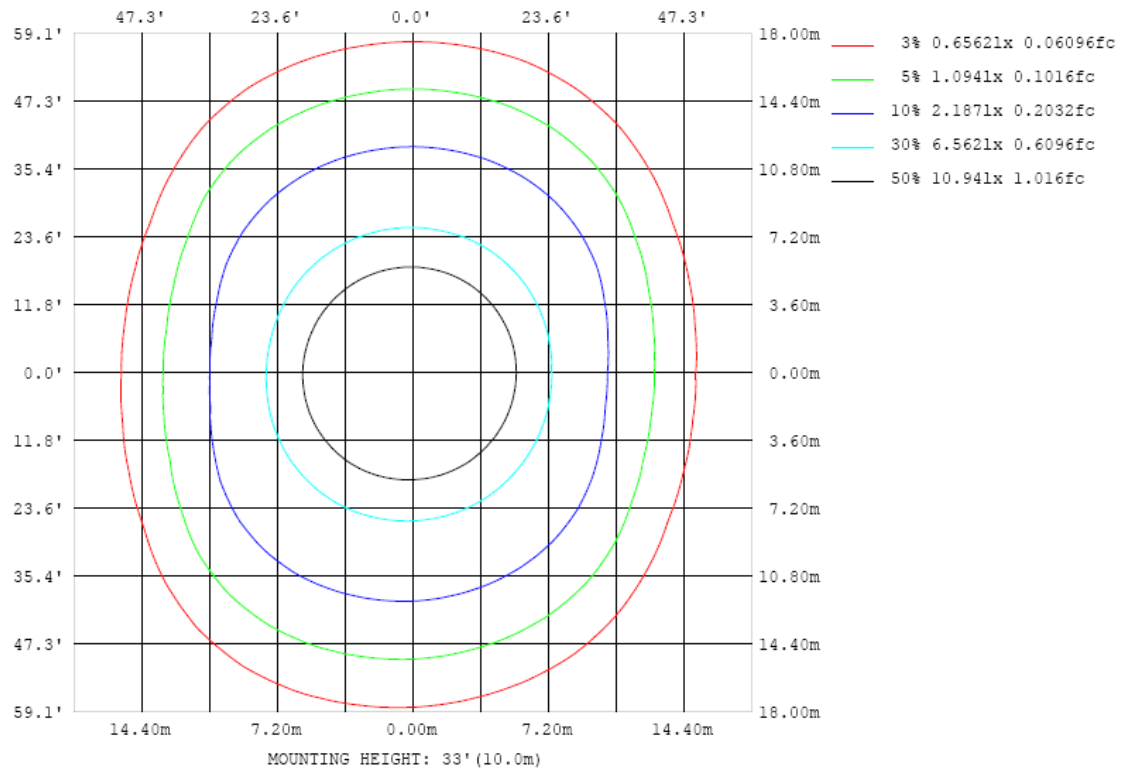


Chart 6: Illuminance Plot (Footcandles)

Luminous Intensity Distribution Plots- Goniophotometer Method

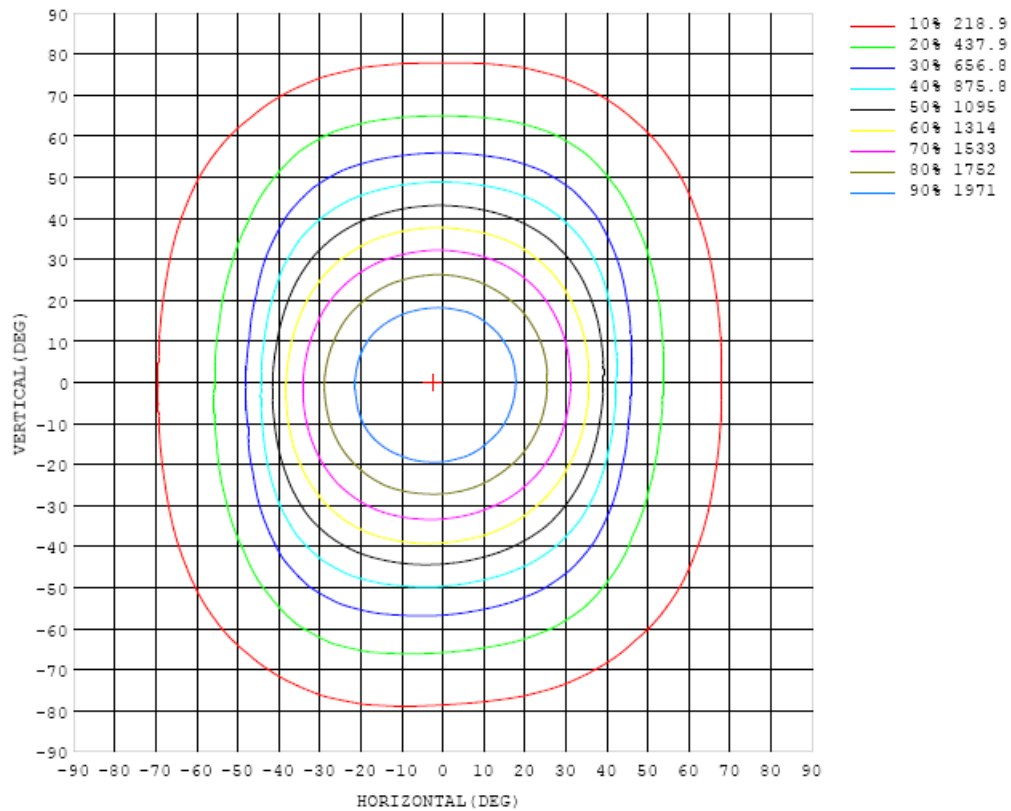


Chart 7: Isocandela Plot

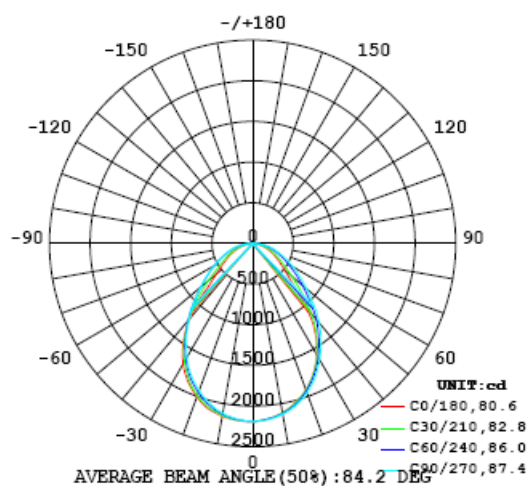


Chart 8: Polar Candela Distribution

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	2187	2187	2187	2187	2187	2187	2187	2187	2187	2187	2187	2187	2187	2187	2187	2187	2187	2187	2187
5	2165	2166	2165	2166	2166	2168	2166	2171	2174	2177	2178	2179	2176	2179	2181	2183	2180	2181	2182
10	2114	2112	2117	2117	2121	2122	2123	2126	2131	2131	2139	2144	2143	2146	2148	2151	2152	2150	2154
15	2027	2028	2029	2032	2038	2040	2047	2049	2054	2062	2066	2072	2078	2083	2091	2100	2103	2104	2104
20	1915	1914	1915	1919	1919	1923	1932	1941	1948	1956	1963	1974	1983	1994	2005	2012	2011	2009	2008
25	1767	1767	1767	1772	1776	1780	1788	1801	1810	1820	1832	1846	1860	1870	1880	1885	1884	1879	1878
30	1579	1578	1582	1588	1594	1607	1617	1626	1637	1651	1667	1686	1702	1713	1720	1725	1723	1717	1713
35	1344	1349	1357	1370	1386	1400	1421	1437	1453	1471	1487	1505	1521	1528	1534	1528	1518	1507	1493
40	1031	1035	1074	1120	1161	1193	1220	1239	1256	1278	1295	1316	1330	1330	1321	1300	1270	1234	1204
45	695	708	777	856	917	958	990	1014	1035	1060	1084	1104	1119	1116	1093	1036	959	872	827
50	523	525	555	632	710	765	800	825	843	865	882	900	912	901	864	785	670	603	589
55	411	415	436	474	544	604	643	666	686	706	720	735	742	723	669	576	508	472	453
60	329	333	349	374	420	475	515	536	552	569	583	598	597	571	513	439	399	371	360
65	259	263	275	297	324	368	405	428	442	456	469	480	476	443	385	344	310	292	284
70	191	196	207	225	246	279	312	333	345	357	368	376	367	333	289	258	234	219	211
75	125	129	141	158	177	203	232	251	262	271	282	284	272	241	206	181	161	147	141
80	64.5	68.7	79.6	95.4	113	137	161	178	185	192	201	204	190	161	132	111	93.7	81.5	76.0
85	16.6	19.3	26.6	36.6	45.3	52.5	58.4	62.7	65.3	67.5	72.6	76.1	75.6	70.0	60.6	48.9	36.2	27.5	23.4
90	0.49	0.41	0.94	1.27	0.99	0.89	1.08	1.11	1.10	1.13	1.22	1.10	1.88	1.00	0.79	0.59	0.57	0.53	0.11
95	0.77	0.66	0.76	0.88	0.89	1.07	1.23	1.23	1.24	1.24	1.28	1.19	1.16	1.09	0.94	0.79	0.74	0.71	0.08
100	1.17	1.07	1.13	1.21	1.23	1.42	1.56	1.54	1.55	1.55	1.58	1.49	1.48	1.40	1.23	1.10	1.08	1.05	0.09
105	1.63	1.55	1.60	1.65	1.71	1.89	2.02	2.00	1.98	2.02	2.04	1.92	1.91	1.86	1.63	1.51	1.46	1.48	0.26
110	2.16	1.99	1.98	2.15	2.26	2.46	2.54	2.51	2.48	2.54	2.56	2.44	2.46	2.39	2.17	1.97	1.88	1.91	0.54
115	2.47	2.28	2.38	2.56	2.92	3.02	3.07	3.01	2.96	2.99	3.03	2.99	3.00	2.96	2.75	2.35	2.20	2.16	0.67
120	3.28	2.96	2.87	3.31	3.47	3.70	3.68	3.57	3.51	3.53	3.60	3.54	3.57	3.62	3.21	2.96	2.64	2.57	0.89
125	4.10	3.62	3.52	4.10	3.95	4.30	4.40	4.24	4.14	4.20	4.23	4.19	4.26	4.02	3.76	3.41	3.21	2.87	1.28
130	6.43	5.71	5.72	4.45	4.36	4.47	4.86	4.83	4.74	4.79	4.81	4.71	4.53	4.16	3.93	3.83	4.82	4.73	2.10
135	8.42	7.05	7.00	4.60	4.53	4.64	5.10	5.30	5.35	5.38	5.33	5.03	4.59	4.25	3.75	4.64	5.73	6.16	2.90
140	8.47	7.52	7.37	4.73	4.47	4.65	5.38	5.54	5.75	5.77	5.63	5.19	4.62	4.26	3.70	5.46	6.16	6.32	3.38
145	8.40	7.53	7.17	4.87	4.42	4.65	5.41	5.70	5.81	5.90	5.72	5.23	4.65	4.09	3.71	5.81	6.44	6.45	3.71
150	7.91	7.48	6.74	5.07	4.30	4.66	5.43	5.67	5.83	5.85	5.68	5.21	4.62	3.84	3.74	5.73	6.62	6.14	3.66
155	8.80	7.80	6.69	5.27	4.21	4.63	5.40	5.66	5.84	5.79	5.58	5.19	4.65	3.80	3.67	5.29	6.25	7.12	4.16
160	8.32	7.35	6.40	5.01	3.83	4.21	5.13	5.49	5.68	5.63	5.53	5.15	4.59	3.54	3.33	4.63	5.72	6.66	4.36
165	8.17	7.55	6.64	5.18	3.86	3.87	4.78	5.48	5.82	5.84	5.63	5.36	4.85	3.82	2.94	3.68	5.12	6.16	6.12
170	8.11	7.36	6.62	5.41	4.02	3.78	4.66	5.57	6.10	6.38	6.29	6.04	5.69	4.73	3.35	3.05	4.32	5.27	6.28
175	6.44	6.25	5.79	4.40	3.34	3.60	4.56	5.45	5.99	6.22	6.22	6.08	5.78	5.21	4.20	2.87	2.87	3.92	4.62
180	6.01	6.01	6.01	6.01	6.01	6.01	6.01	6.01	6.01	6.01	6.01	6.01	6.01	6.01	6.01	6.01	6.01	6.01	6.01

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	2187	2187	2187	2187	2187	2187	2187	2187	2187	2187	2187	2187	2187	2187	2187	2187	2187		
5	2182	2182	2177	2174	2174	2172	2171	2170	2168	2165	2166	2167	2166	2164	2164	2164	2164		
10	2150	2149	2145	2139	2134	2130	2128	2126	2118	2122	2120	2116	2114	2114	2116	2115	2114		
15	2099	2093	2086	2078	2065	2056	2051	2047	2038	2037	2039	2037	2035	2033	2029	2029	2030		
20	2002	1998	1990	1977	1962	1950	1940	1932	1926	1922	1925	1916	1914	1917	1920	1917	1915		
25	1871	1860	1853	1837	1825	1818	1802	1793	1789	1784	1779	1775	1773	1774	1772	1776	1772		
30	1702	1689	1678	1665	1653	1646	1633	1625	1619	1610	1612	1606	1602	1598	1591	1589	1582		
35	1480	1471	1466	1461	1451	1445	1434	1427	1424	1415	1415	1414	1405	1395	1384	1369	1353		
40	1193	1201	1219	1233	1235	1236	1231	1225	1222	1215	1214	1211	1198	1181	1150	1111	1066		
45	840	899	959	999	1017	1026	1024	1023	1021	1015	1015	1008	990	962	912	826	741		
50	591	630	717	782	817	833	836	835	836	833	832	823	800	753	680	595	546		
55	457	478	522	604	652	676	681	681	685	681	679	669	639	585	507	460	427		
60	364	379	406	456	508	539	547	548	550	550	550	532	497	442	393	363	341		
65	287	299	320	348	394	425	436	437	436	436	433	417	382	337	308	281	267		
70	215	226	242	263	299	328	342	344	343	343	340	323	290	255	229	209	197		
75	144	154	169	188	216	242	256	259	258	260	255	238	210	180	159	142	129		
80	78.2	87.5	102	119	142	166	179	180	177	179	178	164	139	113	94.7	78.9	68.4		
85	25.5	31.8	41.3	47.9	52.4	54.5	54.2	52.7	50.9	52.0	53.6	52.5	48.8	42.6	34.8	25.3	18.8		
90	0.12	0.06	0.17	0.28	0.29	0.37	0.44	0.55	0.36	0.45	0.48	0.37	0.36	0.34	0.19	0.14	0.14		
95	0.09	0.04	0.14	0.24	0.25	0.34	0.40	0.46	0.36	0.41	0.44	0.38	0.32	0.30	0.20	0.09	0.12		
100	0.10	0.04	0.16	0.26	0.31	0.37	0.45	0.47	0.42	0.43	0.48	0.42	0.30	0.29	0.24	0.12	0.19		
105	0.22	0.22	0.27	0.44	0.50	0.59	0.69	0.77	0.77	0.79	0.75	0.67	0.60	0.51	0.39	0.26	0.33		
110	0.48	0.40	0.50	0.62	0.75	0.82	0.96	1.03	0.95	0.99	1.01	0.93	0.83	0.73	0.57	0.50	0.53		
115	0.54	0.57	0.63	0.88	0.98	1.07	1.20	1.27	1.15	1.20	1.23	1.15	1.04	0.94	0.75	0.59	0.67		
120	0.66	0.63	0.86	1.08	1.37	1.45	1.54	1.54	1.49	1.47	1.48	1.39	1.32	1.09	0.96	0.77	0.92		
125	1.09	1.09	1.31	1.32	1.61	1.80	1.94	1.96	1.96	1.92	1.89	1.76	1.49	1.32	1.22	1.21	1.24		
130	1.68	1.58	1.66	1.50	1.62	1.98	2.20	2.26	2.23	2.21	2.08	1.88	1.52	1.56	1.52	1.89	2.27		
135	2.28	2.12	2.03	1.64	1.85	2.18	2.49	2.61	2.54	2.46	2.28	1.95	1.64	1.65	1.93	2.23	2.93		
140	2.60	2.51	2.35	1.88	1.94	2.51	2.78	2.96	2.88	2.78	2.53	2.15	1.68	1.71	2.45	2.85	3.44		
145	2.85	2.60	2.66	2.29	1.94	2.53	2.90	3.04	3.05	2.83	2.54	2.14	1.65	1.76	2.66	3.07	4.03		
150	2.77	2.58	2.70	2.31	1.58	2.00	2.55	2.79	2.79	2.73	2.38	1.97	1.49	1.71	2.47	2.68	3.98		
155	2.68	2.60	2.64	2.17	1.52	1.88	2.38	2.68	2.57	2.66	2.36	1.95	1.49	1.89	2.57	2.40	4.25		
160	2.57	2.69	2.54	2.09	1.68	1.80	2.51	2.65	2.59	2.62	2.56	2.08	1.47	2.19	2.71	2.33	4.59		
165	5.59	5.33	4.36	3.15	2.67	3.69	4.78	5.20	5.22	4.96	4.36	3.06	2.27	3.46	4.92	5.44	6.77		
170	7.48	6.42	5.59	4.01	3.00	3.93	5.26	5.92	5.81	5.48	4.73	3.04	2.63	4.30	5.76	6.64	7.75		
175	5.59	7.42	6.38	5.44	3.56	3.24	4.89	5.84	5.83	5.53	4.20	2.40	3.76	5.46	6.53	6.99	7.24		
180	6.01	6.01	6.01	6.01	6.01	6.01	6.01	6.01	6.01	6.01	6.01	6.01	6.01	6.01	6.01	6.01	6.01		

Table 7: Luminous Intensity Data

TEST RESULTS (35W 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)	0.281	0.127
Power Factor	0.9958	0.9495
Test Power (W)	33.61	33.31
THD A%	7.03	12.70
Luminous Efficacy (lm/W)	139.9	140.4
Total Luminous Flux (lm)	4702.9	4676.3
Color Rendering Index (CRI)	83.6	
R9	10.6	
Correlated Color Temperature (CCT)(K)	4052	
Chromaticity Chroma x	0.3785	
Chromaticity Chroma y	0.3770	
Chromaticity Chroma u	0.2237	
Chromaticity Chroma v	0.3343	
Duv	0.0007	
Chromaticity Chroma u'	0.2237	
Chromaticity Chroma v'	0.5014	

Special Color Rendering Indices	
R1	82
R2	90.6
R3	95.7
R4	81.6
R5	81.9
R6	86.4
R7	85.9
R8	64.9
R9	10.6
R10	77.4
R11	80.8
R12	60.7
R13	84.4
R14	98.1

Table 8: Test data per Sphere-Spectroradiometer Method

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

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)	0.281
Power Factor	0.9958
Power (W)	33.63
Luminous Efficacy (lm/W)	140.3
Total Luminous Flux (lm)	4719.4
Beam Angle (°)	80.8 (0°-180°) / 87.5 (90°-270°)
Center Beam Candle Power (cd)	2320
Maximum Beam Candle Power (cd)	2325 (At: C=140.0, Gamma=3.0)
Spacing Criteria	1.18 (0°-180°) / 1.12 (90°-270°)
Zonal Lumens in the 0 °-60 °Zone	85.22%
Zonal Lumens in the 60 °-90 °Zone	14.44%
Zonal Lumens in the 90 °-120 °Zone	0.08%
Zonal Lumens in the 120 °-180 °Zone	0.25%

Table 9: Test data per Goniophotometer Method

Spectral Power Distribution - Sphere Spectroradiometer Method

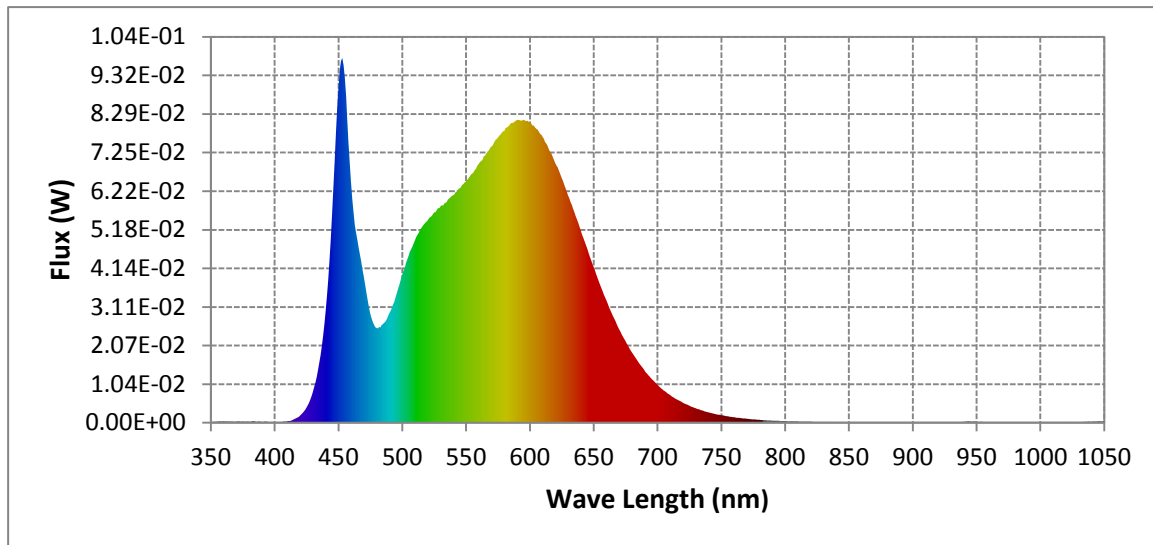
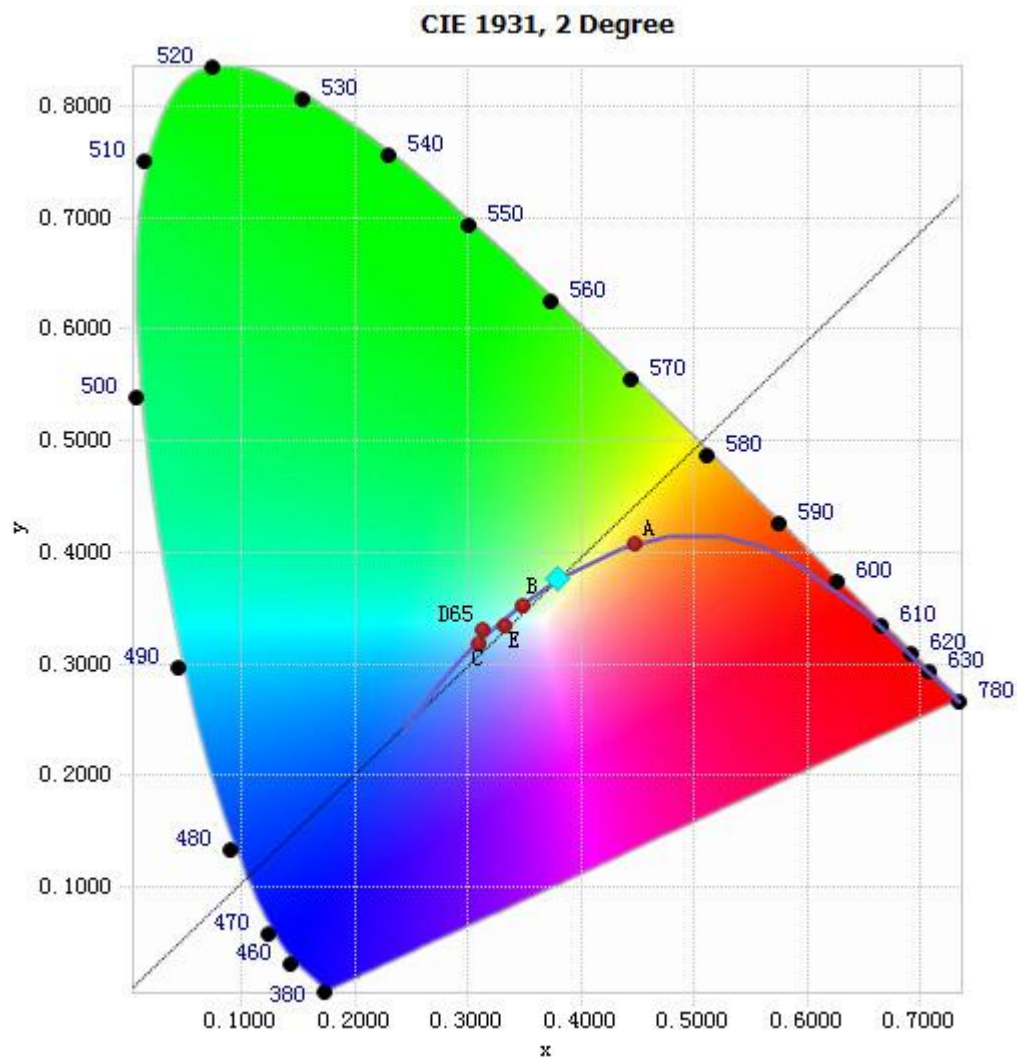


Chart 9: Spectral Power Distribution

Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	2.71E-04	485	2.65E-02	590	8.13E-02	695	1.20E-02
385	2.87E-04	490	2.94E-02	595	8.14E-02	700	1.02E-02
390	2.43E-04	495	3.39E-02	600	8.06E-02	705	8.66E-03
395	2.08E-04	500	3.97E-02	605	7.89E-02	710	7.41E-03
400	1.80E-04	505	4.48E-02	610	7.67E-02	715	6.32E-03
405	1.97E-04	510	4.90E-02	615	7.34E-02	720	5.37E-03
410	3.64E-04	515	5.23E-02	620	6.97E-02	725	4.56E-03
415	8.81E-04	520	5.44E-02	625	6.57E-02	730	3.92E-03
420	1.96E-03	525	5.65E-02	630	6.10E-02	735	3.29E-03
425	4.08E-03	530	5.81E-02	635	5.65E-02	740	2.81E-03
430	8.29E-03	535	5.92E-02	640	5.16E-02	745	2.39E-03
435	1.61E-02	540	6.10E-02	645	4.67E-02	750	2.02E-03
440	3.00E-02	545	6.29E-02	650	4.18E-02	755	1.73E-03
445	5.59E-02	550	6.48E-02	655	3.71E-02	760	1.47E-03
450	8.99E-02	555	6.69E-02	660	3.29E-02	765	1.27E-03
455	9.25E-02	560	6.95E-02	665	2.88E-02	770	1.10E-03
460	6.47E-02	565	7.17E-02	670	2.50E-02	775	9.39E-04
465	4.91E-02	570	7.41E-02	675	2.18E-02	780	7.82E-04
470	3.93E-02	575	7.65E-02	680	1.89E-02		
475	2.94E-02	580	7.83E-02	685	1.63E-02		
480	2.55E-02	585	8.04E-02	690	1.41E-02		

Table10: Spectral Power Distribution Numerical Data per Sphere - Spectroradiometer Method

Chromaticity Diagram - Sphere Spectroradiometer Method



Tristimulus values(x, y): (0.3785, 0.3770)

Chart 10: 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

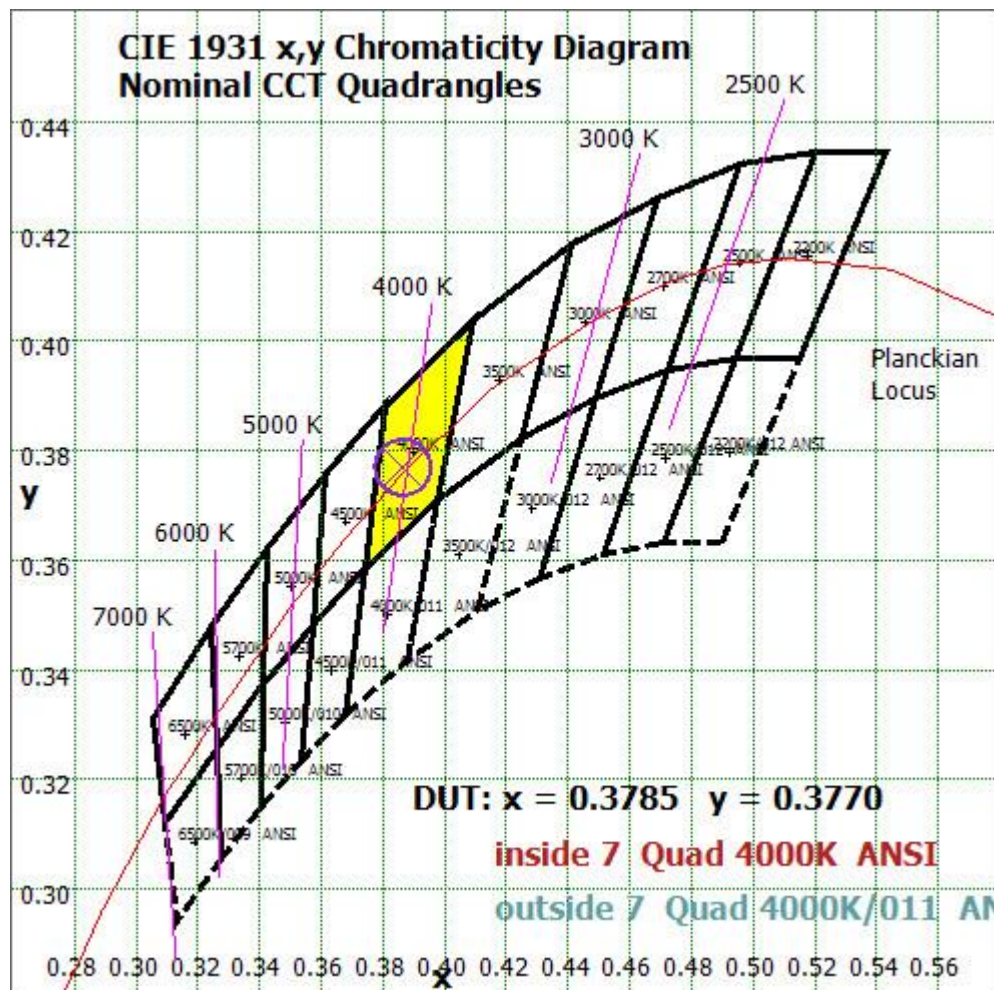


Chart 11: Plot of Lamp x/y coordinates on CIE 1931 Chromaticity Diagram

Color Rendition Report – Sphere Spectroradiometer Method

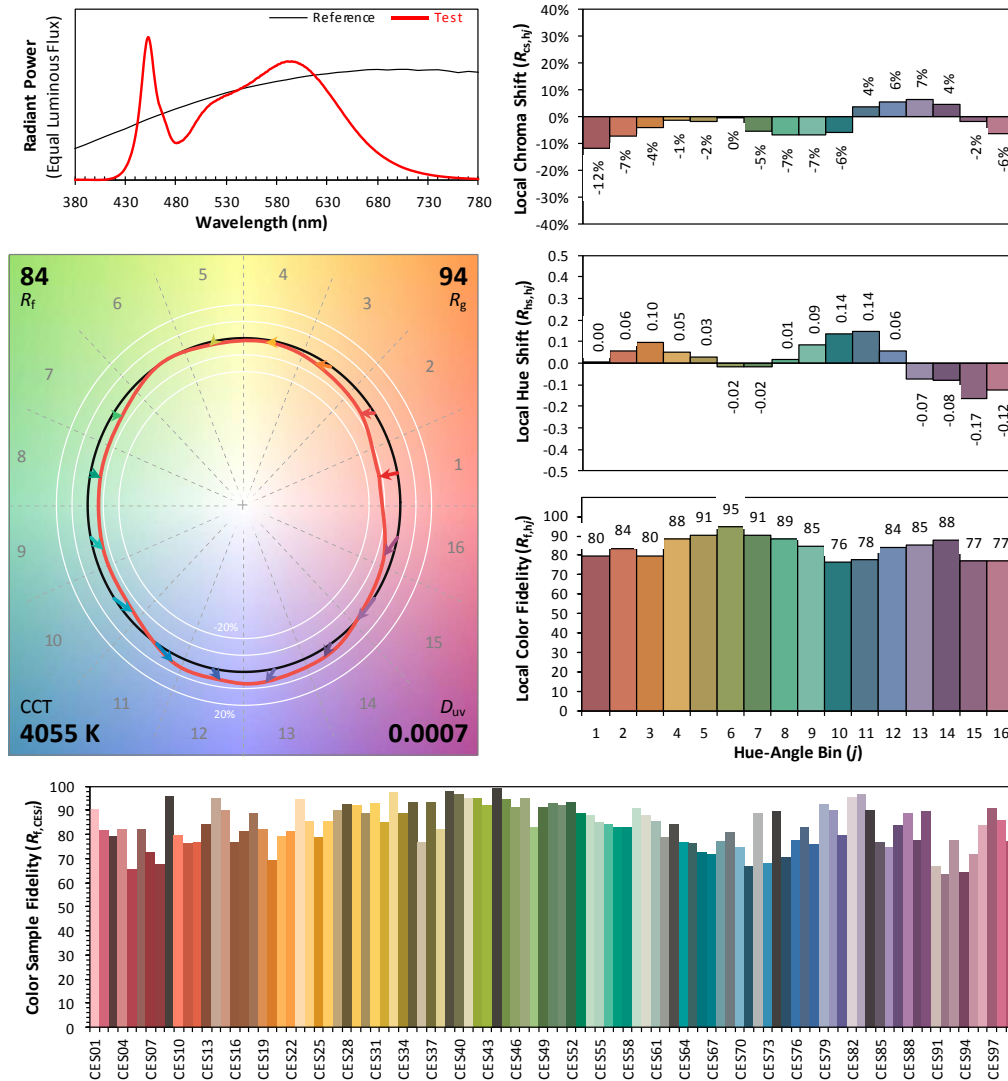
ANSI/IES TM-30-18 Color Rendition Report

Source: LED

Manufacturer: RAB Lighting Inc

Date: 2025/07/30

Model: SWISH2X2



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

x 0.3785
 y 0.3770
 u' 0.2237
 v' 0.5014

CIE 13.3-1995
(CRI)

R_a 84
 R_g 11

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

Chart 12: 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.

Zonal Lumen Tabulation- Goniophotometer Method

$\gamma(^{\circ})$	Lumens	% Total
0- 10	218.577	4.63%
10- 20	614.051	13.01%
20- 30	883.224	18.71%
30- 40	950.101	20.13%
40- 50	789.226	16.72%
50- 60	566.891	12.01%
60- 70	390.361	8.27%
70- 80	230.539	4.88%
80- 90	60.722	1.29%
90-100	0.685	0.01%
100-110	1.185	0.03%
110-120	1.834	0.04%
120-130	2.509	0.05%
130-140	2.977	0.06%
140-150	2.653	0.06%
150-160	1.931	0.04%
160-170	1.388	0.03%
170-180	0.523	0.01%
Total	4719.4	100%

$\gamma(^{\circ})$	Lumens	% Total
0- 60	4022.07	85.22%
60- 90	681.622	14.44%
0-90	4703.692	99.67%
90- 180	15.685	0.33%
0- 180	4719.4	100%

Table 11: Zonal Lumen

UGR Table (Corrected) - Goniophotometer Method

Reflectances											
Ceiling Cavity		70	70	50	50	30	70	70	50	50	30
Walls		50	30	50	30	30	50	30	50	30	30
Floor Cavity		20	20	20	20	20	20	20	20	20	20
Room Size		UGR Viewed Crosswise					UGR Viewed Endwise				
X=2H	Y=2H	12.8	14.3	13.1	14.6	14.9	16.2	17.7	16.6	18.0	18.3
	3H	14.2	15.6	14.6	15.9	16.3	18.0	19.3	18.4	19.7	20.0
	4H	14.7	16.0	15.1	16.3	16.7	18.8	20.0	19.2	20.4	20.7
	6H	15.0	16.1	15.4	16.5	16.9	19.5	20.6	19.9	21.0	21.4
	8H	15.0	16.1	15.4	16.5	16.9	19.7	20.8	20.2	21.2	21.6
	12H	15.0	16.1	15.5	16.5	16.9	19.9	20.9	20.3	21.3	21.7
4H	2H	13.7	15.0	14.1	15.3	15.7	16.6	17.8	17.0	18.2	18.6
	3H	15.3	16.4	15.7	16.8	17.2	18.7	19.7	19.1	20.1	20.5
	4H	15.9	16.9	16.4	17.3	17.7	19.6	20.5	20.0	21.0	21.4
	6H	16.3	17.1	16.7	17.5	18.0	20.5	21.4	21.0	21.8	22.3
	8H	16.3	17.1	16.8	17.6	18.0	20.9	21.6	21.3	22.1	22.5
	12H	16.4	17.0	16.8	17.5	18.0	21.1	21.7	21.5	22.2	22.7
8H	4H	16.5	17.2	16.9	17.7	18.2	19.8	20.6	20.3	21.0	21.5
	6H	17.0	17.6	17.5	18.1	18.6	20.9	21.5	21.4	22.0	22.5
	8H	17.1	17.6	17.6	18.2	18.6	21.3	21.9	21.8	22.4	22.9
	12H	17.1	17.6	17.6	18.1	18.7	21.6	22.1	22.1	22.6	23.2
12H	4H	16.6	17.3	17.1	17.8	18.2	19.8	20.5	20.3	21.0	21.4
	6H	17.1	17.7	17.7	18.2	18.7	20.9	21.5	21.4	22.0	22.5
	8H	17.3	17.8	17.8	18.3	18.9	21.4	21.9	21.9	22.4	23.0

Chart 13: UGR Table (Corrected)

Illuminance Plots- Goniophotometer Method

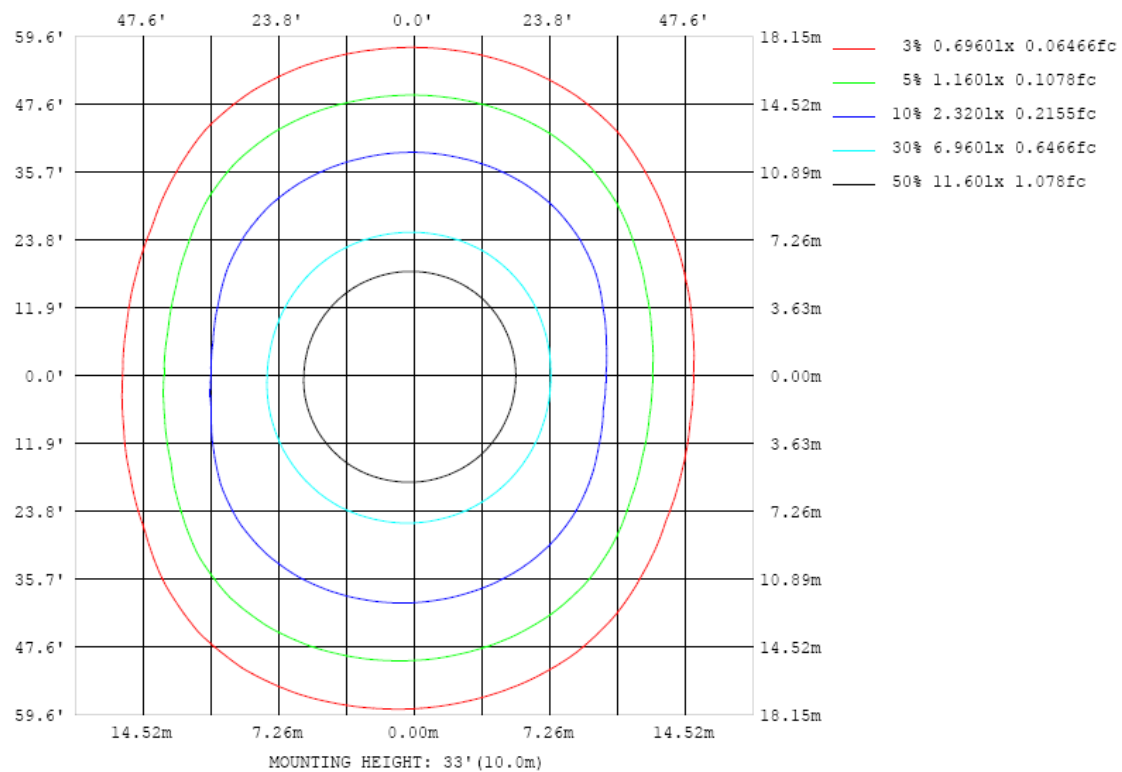


Chart 14: Illuminance Plot (Footcandles)

Luminous Intensity Distribution Plots- Goniophotometer Method

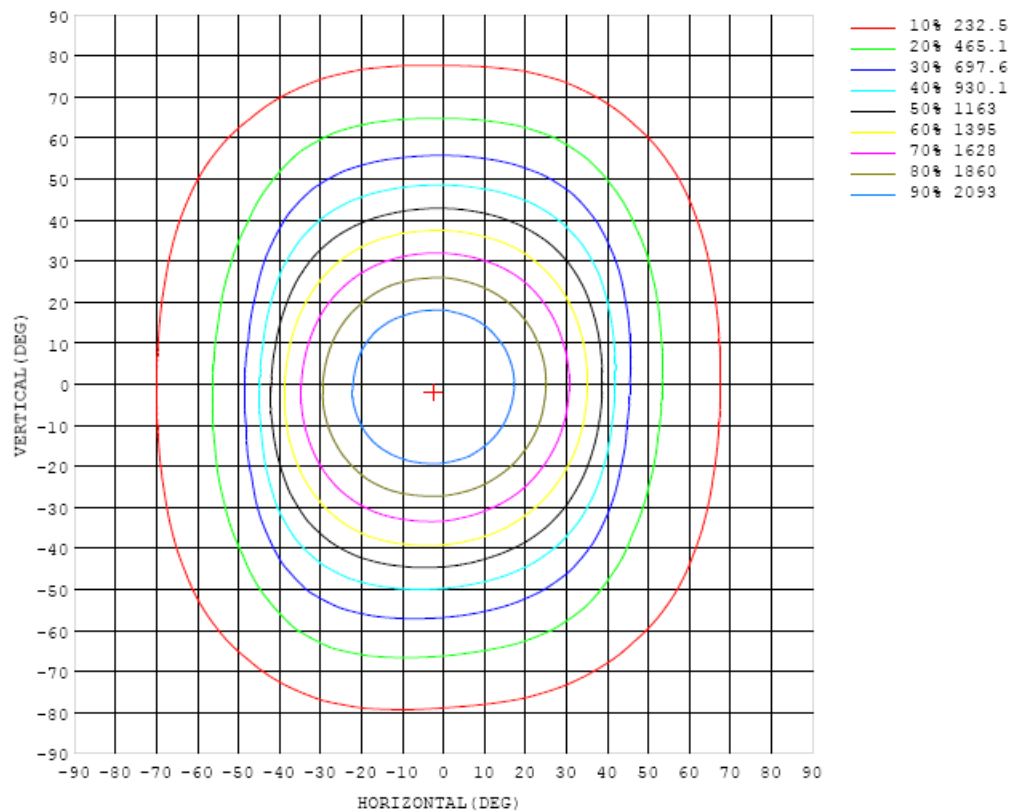


Chart 15: Isocandela Plot

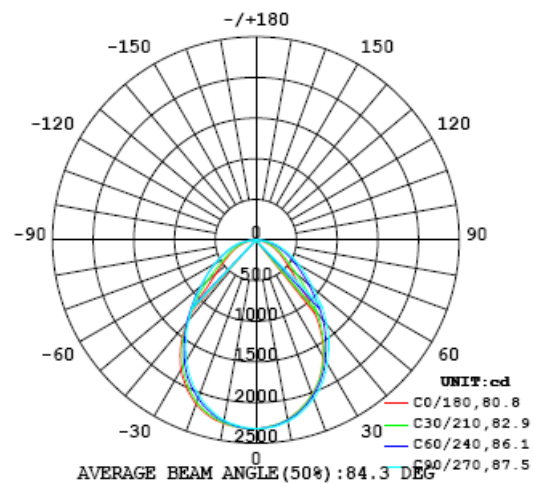


Chart 16: Polar Candela Distribution

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	2320	2320	2320	2320	2320	2320	2320	2320	2320	2320	2320	2320	2320	2320	2320	2320	2320	2320	2320
5	2295	2295	2291	2295	2297	2297	2302	2304	2305	2309	2311	2311	2312	2316	2318	2321	2319	2311	2314
10	2239	2233	2234	2245	2244	2248	2249	2258	2258	2268	2269	2271	2276	2279	2286	2289	2296	2295	2290
15	2143	2141	2142	2148	2154	2162	2167	2173	2180	2185	2192	2200	2209	2220	2228	2235	2242	2245	2238
20	2020	2016	2021	2027	2028	2036	2044	2058	2064	2076	2083	2096	2110	2123	2140	2146	2149	2156	2147
25	1860	1857	1863	1869	1872	1884	1893	1908	1916	1933	1946	1966	1985	2002	2011	2020	2019	2023	2013
30	1655	1654	1662	1667	1678	1696	1708	1722	1736	1755	1771	1794	1819	1838	1848	1853	1857	1853	1839
35	1398	1403	1417	1434	1453	1474	1498	1519	1539	1565	1582	1602	1627	1641	1651	1653	1643	1635	1615
40	1063	1071	1115	1168	1213	1251	1285	1309	1332	1357	1381	1406	1429	1433	1426	1412	1385	1352	1313
45	717	725	799	885	955	1005	1041	1079	1110	1139	1166	1189	1207	1212	1196	1147	1065	973	917
50	545	547	576	651	737	801	843	873	896	921	945	967	985	979	945	870	743	661	641
55	429	432	453	491	565	633	677	708	731	754	773	793	805	789	736	635	554	516	495
60	343	346	363	389	435	497	543	570	590	610	628	646	650	628	565	481	436	406	391
65	268	272	284	308	335	384	428	456	474	492	507	522	520	490	424	375	341	320	309
70	196	201	213	232	255	292	330	354	370	387	401	410	404	370	318	284	258	240	232
75	127	132	144	162	183	212	244	269	281	292	305	311	302	269	230	201	179	164	157
80	63.5	68.2	79.8	96.9	116	142	170	193	203	212	224	226	213	182	150	127	107	93.8	87.0
85	14.4	17.0	24.2	34.4	44.4	53.2	61.4	67.8	72.2	76.6	84.3	90.0	91.3	85.6	74.2	60.3	44.8	34.5	29.3
90	0.82	0.76	0.56	0.84	0.71	0.94	1.08	1.07	1.07	1.13	1.22	1.29	1.49	0.95	2.01	0.95	0.52	0.44	0.12
95	0.66	0.71	0.80	0.84	0.91	1.11	1.25	1.23	1.15	1.20	1.29	1.27	1.15	1.08	0.93	0.85	0.66	0.61	0.04
100	1.10	1.13	1.21	1.22	1.28	1.48	1.60	1.54	1.50	1.53	1.60	1.55	1.44	1.36	1.24	1.12	0.95	0.93	0.06
105	1.66	1.64	1.68	1.68	1.77	2.00	2.09	2.04	1.97	2.03	2.06	2.00	1.87	1.81	1.65	1.51	1.35	1.36	0.25
110	2.15	2.10	2.06	2.17	2.43	2.60	2.68	2.60	2.52	2.56	2.61	2.54	2.44	2.39	2.22	1.93	1.74	1.76	0.44
115	2.56	2.44	2.57	2.64	3.13	3.21	3.23	3.13	3.05	3.05	3.12	3.11	3.01	2.97	2.79	2.30	2.02	2.00	0.65
120	3.53	3.18	3.01	3.49	3.64	3.98	3.90	3.75	3.65	3.69	3.74	3.69	3.66	3.66	3.26	2.93	2.41	2.40	0.83
125	4.50	3.95	3.98	4.31	4.25	4.54	4.70	4.47	4.33	4.38	4.43	4.40	4.38	4.11	3.78	3.41	2.99	2.71	1.29
130	7.33	6.23	6.37	4.76	4.74	4.74	5.10	5.15	5.03	5.03	5.05	4.94	4.67	4.22	3.88	3.52	4.48	4.56	2.09
135	9.27	7.61	7.90	5.05	4.91	4.97	5.40	5.55	5.62	5.64	5.60	5.29	4.92	4.34	3.76	4.29	5.07	5.62	2.79
140	9.45	8.20	8.38	5.43	4.89	5.01	5.58	5.81	6.02	6.04	5.94	5.62	4.95	4.24	3.51	5.04	5.54	5.88	3.37
145	9.55	8.35	8.04	5.73	4.86	5.03	5.60	5.99	6.10	6.23	6.08	5.63	4.98	4.02	3.38	5.38	5.78	5.82	3.53
150	9.12	8.47	7.93	5.98	4.83	5.04	5.58	5.95	6.11	6.20	6.09	5.60	4.98	3.70	3.26	5.21	5.90	5.40	3.49
155	10.3	9.03	7.95	6.22	4.75	5.01	5.57	5.95	6.12	6.07	5.99	5.57	4.97	3.62	3.04	4.71	5.55	6.45	4.24
160	9.86	8.48	7.65	6.00	4.57	4.64	5.33	5.80	6.02	6.01	5.90	5.51	4.85	3.63	2.79	3.88	4.95	6.06	4.43
165	9.03	8.37	7.64	6.18	4.77	4.28	4.93	5.83	6.13	6.22	6.08	5.76	5.18	4.15	2.74	2.87	4.25	5.71	6.24
170	9.10	8.51	7.55	6.23	4.76	4.12	4.73	5.84	6.46	6.67	6.66	6.43	6.07	5.06	3.36	2.56	3.64	4.87	6.45
175	7.36	7.09	6.62	5.23	4.00	3.88	4.72	5.64	6.22	6.47	6.53	6.42	6.11	5.49	4.47	2.89	2.51	3.22	4.05
180	6.33	6.33	6.33	6.33	6.33	6.33	6.33	6.33	6.33	6.33	6.33	6.33	6.33	6.33	6.33	6.33	6.33	6.33	6.33

Table 12: 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	2320	2320	2320	2320	2320	2320	2320	2320	2320	2320	2320	2320	2320	2320	2320	2320	2320		
5	2319	2316	2314	2313	2309	2310	2306	2301	2297	2298	2296	2293	2293	2291	2292	2294	2296		
10	2286	2287	2278	2272	2266	2262	2260	2253	2250	2246	2241	2239	2236	2235	2238	2240	2236		
15	2236	2229	2218	2209	2197	2184	2176	2169	2163	2156	2153	2153	2150	2144	2142	2141	2142		
20	2139	2134	2122	2107	2092	2074	2059	2045	2039	2031	2029	2024	2021	2019	2022	2020	2020		
25	2005	1996	1980	1962	1946	1932	1914	1900	1892	1880	1875	1869	1866	1863	1862	1858	1860		
30	1826	1815	1797	1781	1768	1750	1731	1719	1706	1695	1691	1689	1684	1674	1666	1659	1657		
35	1599	1588	1576	1564	1552	1537	1523	1509	1500	1487	1482	1482	1469	1456	1443	1421	1407		
40	1298	1305	1314	1321	1325	1319	1305	1293	1284	1276	1269	1266	1250	1228	1193	1145	1098		
45	925	983	1040	1077	1090	1094	1086	1078	1074	1064	1061	1049	1030	999	940	848	763		
50	641	684	777	841	878	889	888	882	879	871	869	858	834	783	703	619	572		
55	496	519	569	650	701	722	723	721	718	715	709	696	664	608	530	479	446		
60	395	412	438	491	552	579	586	585	583	579	573	556	520	459	409	379	356		
65	312	324	345	375	425	455	465	463	460	458	453	435	398	350	320	291	277		
70	235	245	262	284	322	352	365	364	361	360	354	336	301	263	236	215	203		
75	159	169	184	202	232	259	273	274	272	270	265	247	216	185	162	144	131		
80	88.9	98.5	113	130	154	177	186	185	180	180	178	166	141	114	94.8	78.2	67.7		
85	31.1	38.1	48.2	54.8	57.8	57.3	54.2	50.6	47.5	46.8	47.1	45.3	42.0	37.0	30.2	21.7	16.0		
90	0.03	0.09	0.16	0.26	0.21	0.28	0.36	0.44	0.41	0.36	0.45	0.43	0.29	0.22	0.22	0.16	0.09		
95	0.00	0.02	0.12	0.22	0.16	0.25	0.30	0.39	0.38	0.39	0.38	0.40	0.30	0.18	0.21	0.18	0.08		
100	0.00	0.02	0.12	0.21	0.20	0.25	0.32	0.43	0.43	0.41	0.40	0.45	0.32	0.21	0.22	0.21	0.11		
105	0.13	0.18	0.23	0.32	0.38	0.49	0.56	0.65	0.71	0.69	0.73	0.75	0.60	0.45	0.38	0.30	0.38		
110	0.29	0.31	0.40	0.54	0.60	0.72	0.83	0.89	0.91	0.91	0.94	0.93	0.83	0.68	0.57	0.48	0.58		
115	0.51	0.47	0.54	0.79	0.86	0.93	1.05	1.14	1.13	1.11	1.16	1.14	1.09	0.92	0.76	0.72	0.74		
120	0.59	0.54	0.78	0.95	1.19	1.36	1.43	1.46	1.51	1.42	1.47	1.48	1.35	1.09	0.97	0.81	1.04		
125	1.00	0.94	1.15	1.14	1.35	1.65	1.75	1.87	1.97	1.84	1.87	1.83	1.57	1.33	1.29	1.42	1.49		
130	1.58	1.38	1.45	1.39	1.46	1.84	2.00	2.13	2.26	2.09	2.08	1.98	1.63	1.55	1.56	2.12	2.65		
135	2.15	1.93	1.79	1.42	1.64	2.04	2.28	2.49	2.53	2.38	2.23	2.00	1.69	1.66	2.01	2.53	3.41		
140	2.57	2.30	2.13	1.70	1.72	2.40	2.70	2.87	2.90	2.68	2.51	2.17	1.72	1.69	2.55	2.99	3.99		
145	2.67	2.35	2.38	1.96	1.71	2.40	2.76	2.93	3.05	2.81	2.49	2.23	1.71	1.74	2.69	3.15	4.55		
150	2.65	2.26	2.37	1.90	1.35	1.79	2.36	2.65	2.72	2.57	2.28	1.89	1.53	1.72	2.56	2.78	4.58		
155	2.71	2.39	2.32	1.72	1.20	1.68	2.17	2.55	2.53	2.46	2.24	1.94	1.62	1.94	2.65	2.64	5.32		
160	2.42	2.48	2.22	1.61	1.40	1.86	2.39	2.47	2.81	2.55	2.31	1.90	1.59	2.16	2.81	2.83	5.96		
165	5.65	5.40	4.49	3.15	2.75	3.73	4.88	5.38	5.50	5.14	4.60	3.25	2.20	3.29	5.04	5.77	7.78		
170	8.50	7.33	6.26	4.49	3.29	4.02	5.38	6.09	6.12	5.78	5.00	3.26	2.45	3.97	5.78	6.44	8.63		
175	5.50	8.29	7.14	6.20	4.03	3.49	4.95	6.04	6.19	5.80	4.41	2.47	3.33	5.39	6.34	7.58	8.18		
180	6.33	6.33	6.33	6.33	6.33	6.33	6.33	6.33	6.33	6.33	6.33	6.33	6.33	6.33	6.33	6.33	6.33		

Table 13: Luminous Intensity Data

TEST RESULTS (35W 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)	0.290	0.130
Power Factor	0.9961	0.9525
Test Power (W)	34.68	34.33
THD A%	6.98	13.01
Luminous Efficacy (lm/W)	132.8	133.6
Total Luminous Flux (lm)	4603.8	4586.4
Color Rendering Index (CRI)	82.1	
R9	4.4	
Correlated Color Temperature (CCT)(K)	4863	
Chromaticity Chroma x	0.3497	
Chromaticity Chroma y	0.3614	
Chromaticity Chroma u	0.2108	
Chromaticity Chroma v	0.3267	
Duv	0.0030	
Chromaticity Chroma u'	0.2108	
Chromaticity Chroma v'	0.4900	

Special Color Rendering Indices	
R1	79.8
R2	87.5
R3	92.9
R4	80.9
R5	79.9
R6	82.1
R7	87.4
R8	66.1
R9	4.4
R10	70.1
R11	79.7
R12	54.7
R13	81.8
R14	96.3

Table 14: Test data per Sphere-Spectroradiometer Method

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

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)	0.290
Power Factor	0.9959
Power (W)	34.71
Luminous Efficacy (lm/W)	133.3
Total Luminous Flux (lm)	4625.6
Beam Angle (°)	80.8 (0°-180°) / 87.4 (90°-270°)
Center Beam Candle Power (cd)	2272
Maximum Beam Candle Power (cd)	2276 (At: C=210.0, Gamma=2.5)
Spacing Criteria	1.19 (0°-180°) / 1.12 (90°-270°)
Zonal Lumens in the 0 °-60 °Zone	85.17%
Zonal Lumens in the 60 °-90 °Zone	14.50%
Zonal Lumens in the 90 °-120 °Zone	0.08%
Zonal Lumens in the 120 °-180 °Zone	0.25%

Table 15: Test data per Goniophotometer Method

Spectral Power Distribution - Sphere Spectroradiometer Method

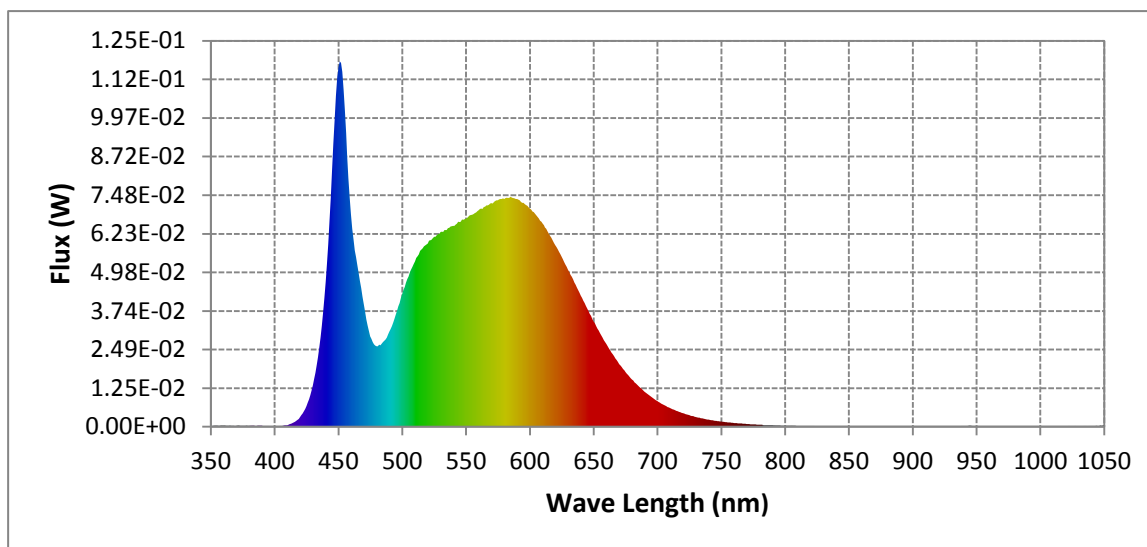
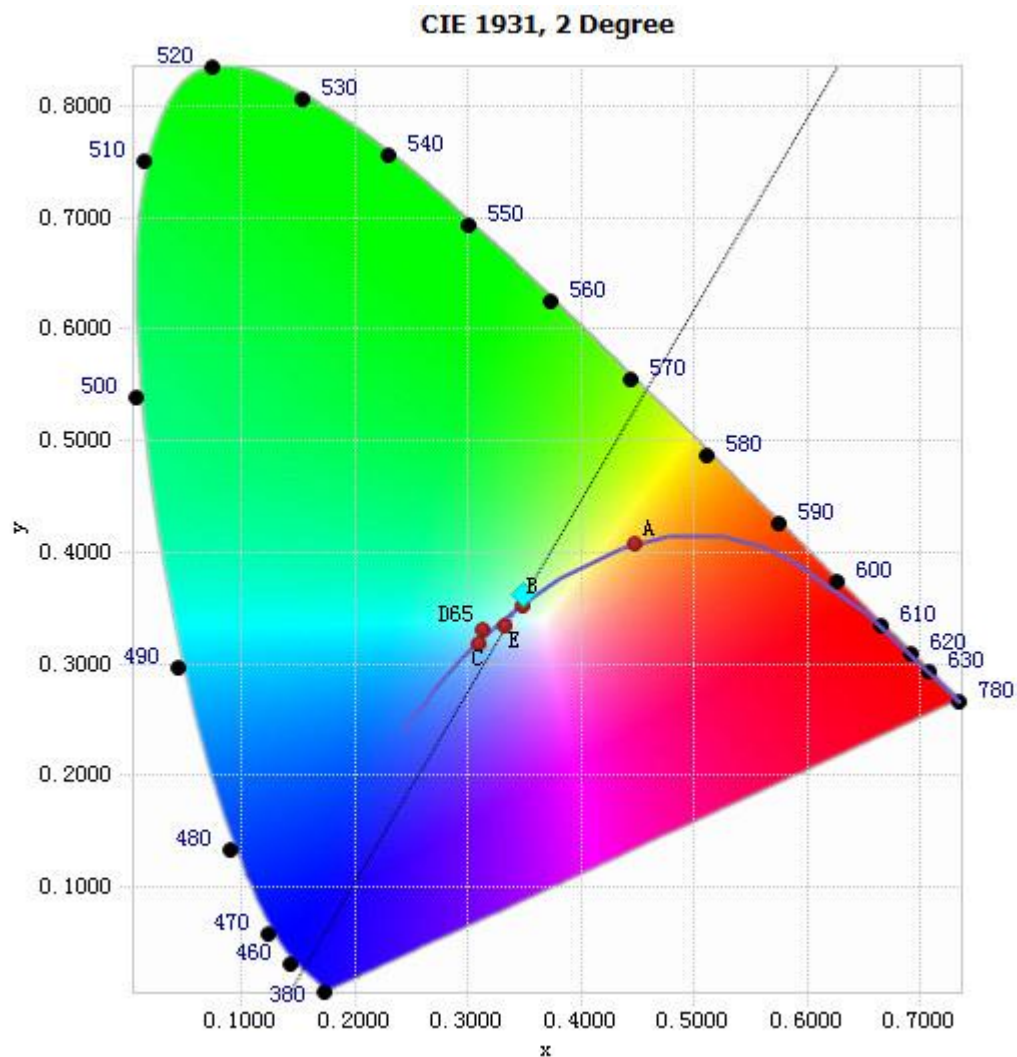


Chart 17: Spectral Power Distribution

Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	3.55E-04	485	2.74E-02	590	7.35E-02	695	9.74E-03
385	2.92E-04	490	3.07E-02	595	7.23E-02	700	8.32E-03
390	3.36E-04	495	3.62E-02	600	7.05E-02	705	7.08E-03
395	2.79E-04	500	4.28E-02	605	6.82E-02	710	6.04E-03
400	1.87E-04	505	4.85E-02	610	6.55E-02	715	5.15E-03
405	2.09E-04	510	5.33E-02	615	6.24E-02	720	4.38E-03
410	4.98E-04	515	5.72E-02	620	5.86E-02	725	3.73E-03
415	1.38E-03	520	5.91E-02	625	5.49E-02	730	3.18E-03
420	3.14E-03	525	6.13E-02	630	5.07E-02	735	2.69E-03
425	6.71E-03	530	6.28E-02	635	4.65E-02	740	2.29E-03
430	1.34E-02	535	6.35E-02	640	4.23E-02	745	1.95E-03
435	2.55E-02	540	6.48E-02	645	3.82E-02	750	1.68E-03
440	4.67E-02	545	6.61E-02	650	3.40E-02	755	1.43E-03
445	8.29E-02	550	6.71E-02	655	3.02E-02	760	1.24E-03
450	1.16E-01	555	6.85E-02	660	2.67E-02	765	1.06E-03
455	1.02E-01	560	6.99E-02	665	2.34E-02	770	9.07E-04
460	6.86E-02	565	7.10E-02	670	2.02E-02	775	7.79E-04
465	5.22E-02	570	7.22E-02	675	1.76E-02	780	6.51E-04
470	3.97E-02	575	7.31E-02	680	1.52E-02		
475	2.92E-02	580	7.35E-02	685	1.32E-02		
480	2.60E-02	585	7.42E-02	690	1.13E-02		

Table 16: Spectral Power Distribution Numerical Data per Sphere - Spectroradiometer Method

Chromaticity Diagram - Sphere Spectroradiometer Method



Tristimulus values(x, y): (0.3497, 0.3614)

Chart 18: 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

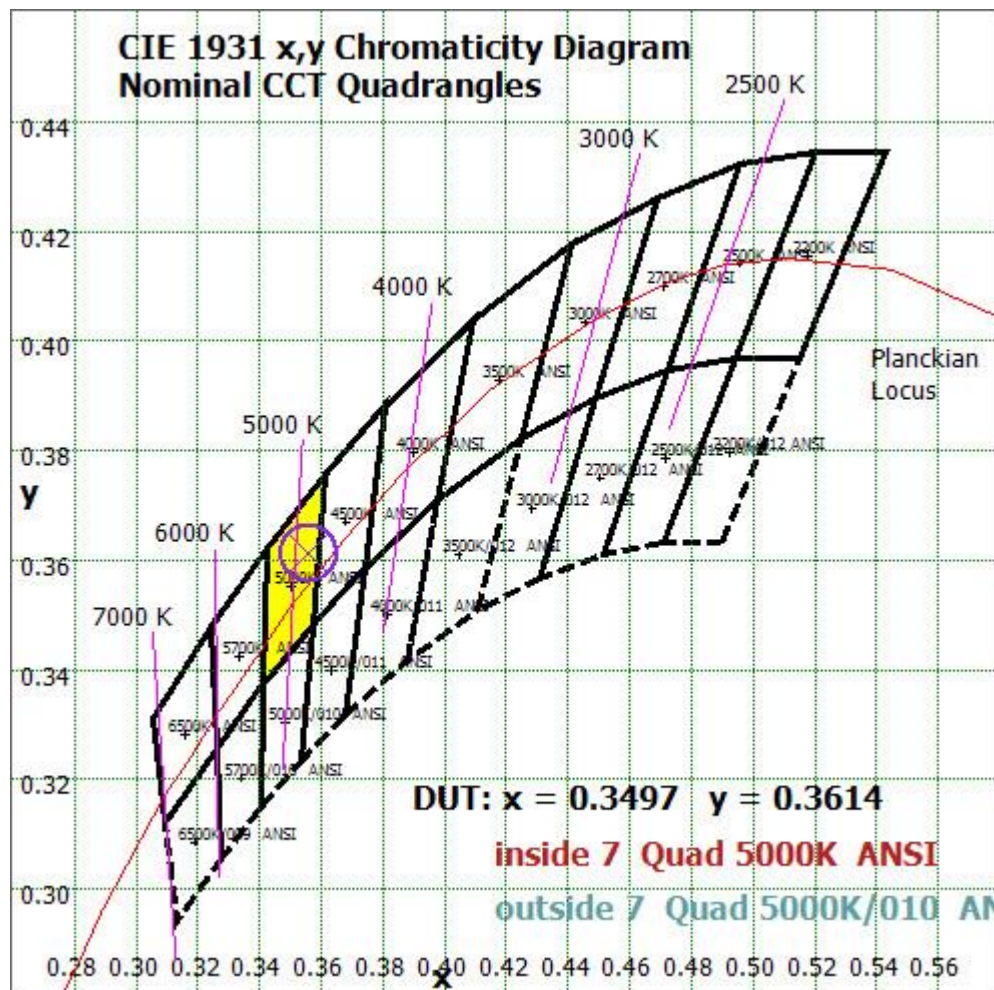


Chart 19: Plot of Lamp x/y coordinates on CIE 1931 Chromaticity Diagram

Color Rendition Report – Sphere Spectroradiometer Method

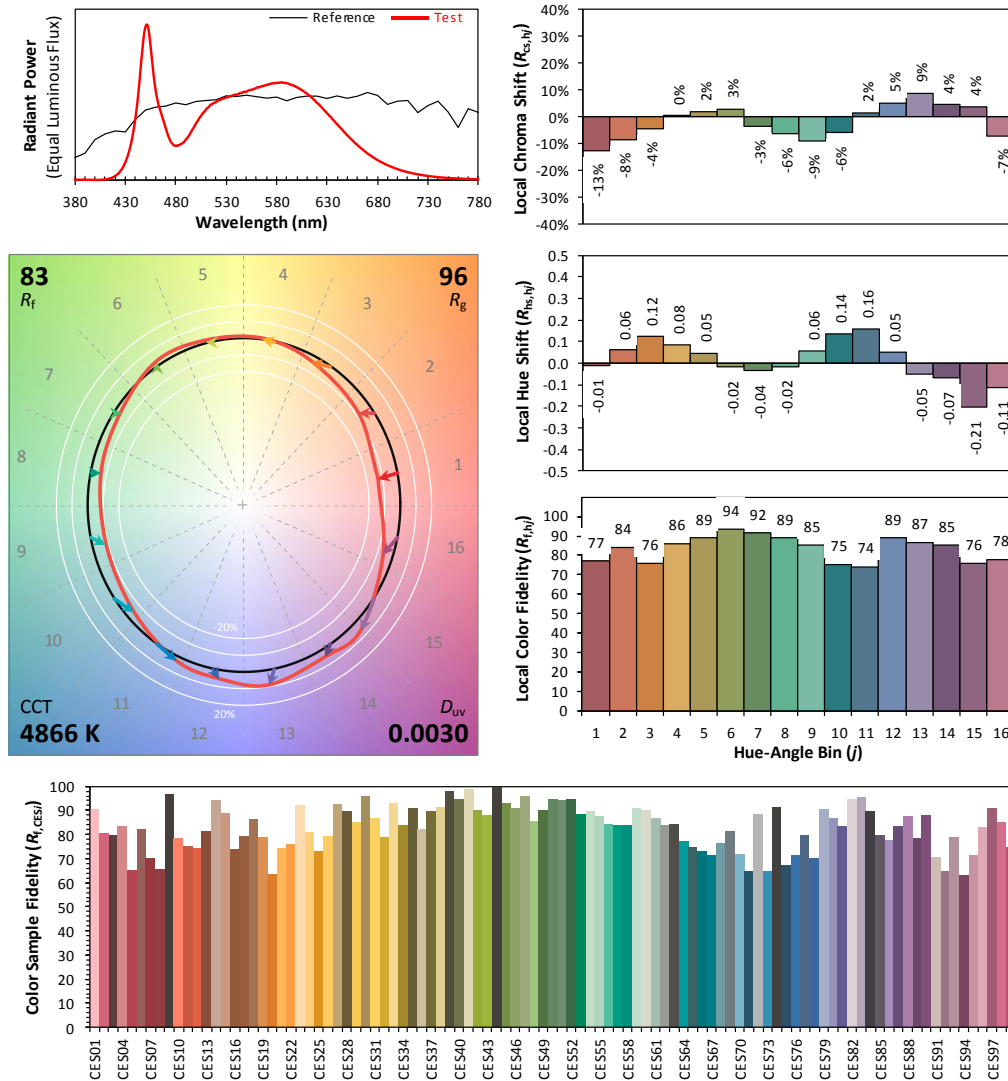
ANSI/IES TM-30-18 Color Rendition Report

Source: LED

Manufacturer: RAB Lighting Inc

Date: 2025/07/30

Model: SWISH2X2



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

x 0.3497
 y 0.3614
 u' 0.2108
 v' 0.4900

CIE 13.3-1995
(CRI)

R_a 82
 R_g 4

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

Chart 20: 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.

Zonal Lumen Tabulation- Goniophotometer Method

$\gamma(^{\circ})$	Lumens	% Total
0- 10	213.893	4.62%
10- 20	600.875	12.99%
20- 30	864.57	18.69%
30- 40	930.174	20.11%
40- 50	773.267	16.72%
50- 60	556.751	12.04%
60- 70	383.903	8.30%
70- 80	227.069	4.91%
80- 90	59.795	1.29%
90-100	0.69	0.01%
100-110	1.169	0.03%
110-120	1.803	0.04%
120-130	2.454	0.05%
130-140	2.897	0.06%
140-150	2.585	0.06%
150-160	1.877	0.04%
160-170	1.342	0.03%
170-180	0.507	0.01%
Total	4625.6	100%

$\gamma(^{\circ})$	Lumens	% Total
0- 60	3939.53	85.17%
60- 90	670.767	14.50%
0-90	4610.297	99.67%
90- 180	15.324	0.33%
0- 180	4625.6	100%

Table 17: Zonal Lumen

UGR Table (Corrected) - Goniophotometer Method

Reflectances											
Ceiling Cavity		70	70	50	50	30	70	70	50	50	30
Walls		50	30	50	30	30	50	30	50	30	30
Floor Cavity		20	20	20	20	20	20	20	20	20	20
Room Size		UGR Viewed Crosswise					UGR Viewed Endwise				
X=2H	Y=2H	12.7	14.1	13.0	14.5	14.8	16.1	17.6	16.4	17.9	18.2
	3H	14.1	15.4	14.5	15.8	16.1	17.9	19.2	18.2	19.5	19.9
	4H	14.6	15.8	15.0	16.2	16.6	18.6	19.9	19.0	20.2	20.6
	6H	14.8	16.0	15.3	16.4	16.8	19.3	20.5	19.8	20.9	21.3
	8H	14.9	16.0	15.3	16.4	16.8	19.6	20.7	20.0	21.1	21.5
	12H	14.9	15.9	15.3	16.3	16.8	19.7	20.8	20.1	21.1	21.6
4H	2H	13.6	14.8	14.0	15.2	15.6	16.5	17.7	16.9	18.1	18.4
	3H	15.2	16.3	15.6	16.7	17.1	18.5	19.6	18.9	20.0	20.4
	4H	15.8	16.7	16.2	17.2	17.6	19.5	20.4	19.9	20.8	21.3
	6H	16.1	17.0	16.6	17.4	17.9	20.4	21.2	20.8	21.6	22.1
	8H	16.2	17.0	16.7	17.4	17.9	20.7	21.5	21.2	21.9	22.4
	12H	16.2	16.9	16.7	17.4	17.9	20.9	21.5	21.3	22.0	22.5
8H	4H	16.3	17.1	16.8	17.6	18.0	19.7	20.4	20.1	20.9	21.3
	6H	16.8	17.5	17.3	17.9	18.4	20.7	21.4	21.2	21.9	22.4
	8H	16.9	17.5	17.4	18.0	18.5	21.2	21.7	21.7	22.2	22.7
	12H	17.0	17.5	17.5	18.0	18.5	21.4	21.9	21.9	22.4	23.0
12H	4H	16.5	17.2	16.9	17.6	18.1	19.7	20.3	20.1	20.8	21.3
	6H	17.0	17.6	17.5	18.0	18.6	20.8	21.4	21.3	21.8	22.4
	8H	17.1	17.7	17.7	18.2	18.7	21.2	21.7	21.7	22.2	22.8

Chart 21: UGR Table (Corrected)

Illuminance Plots- Goniophotometer Method

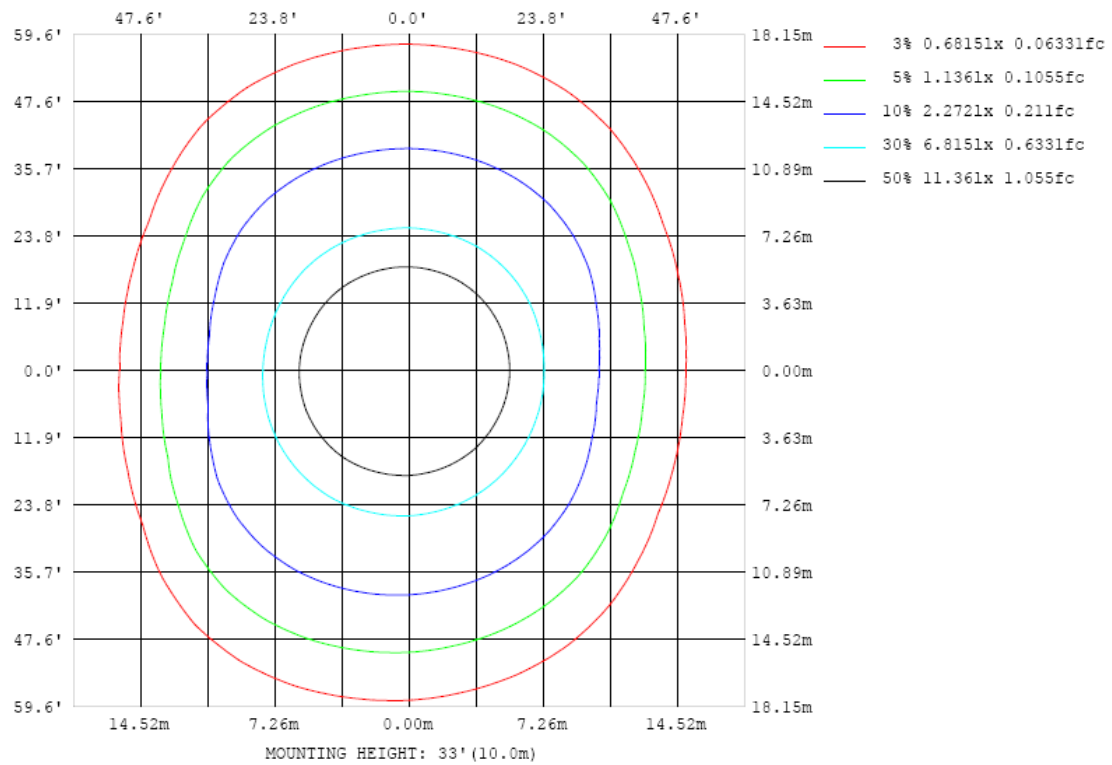


Chart 22: Illuminance Plot (Footcandles)

Luminous Intensity Distribution Plots- Goniophotometer Method

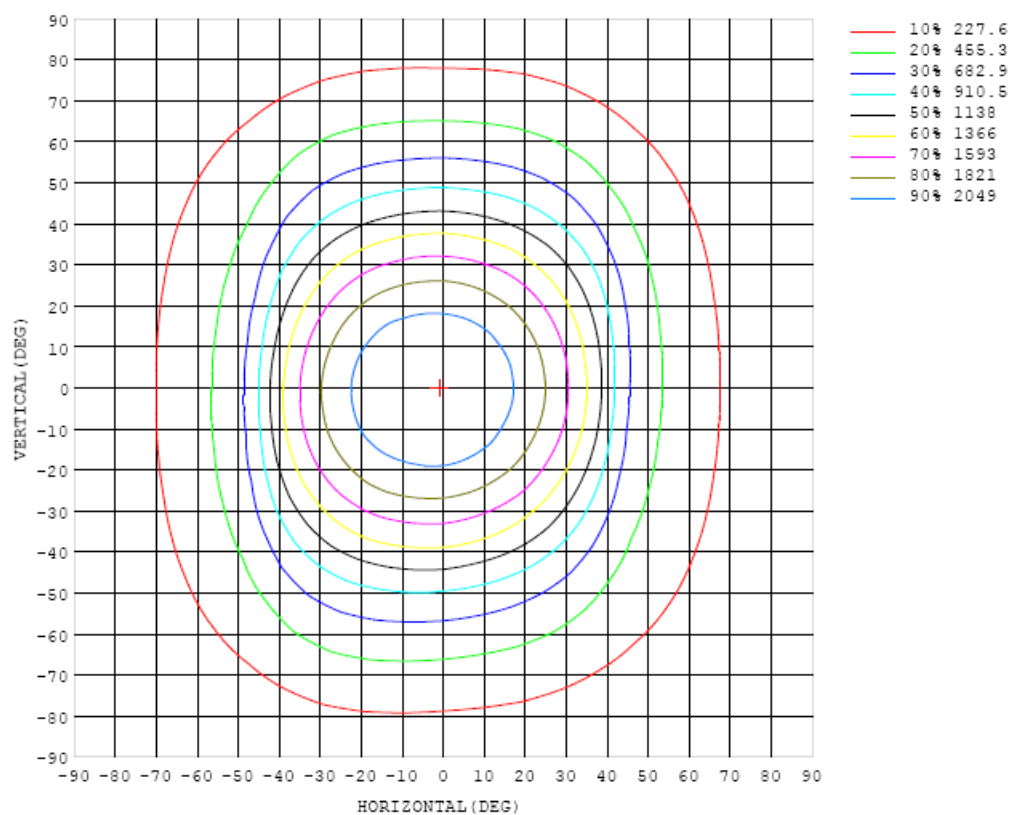


Chart 23: Isocandela Plot

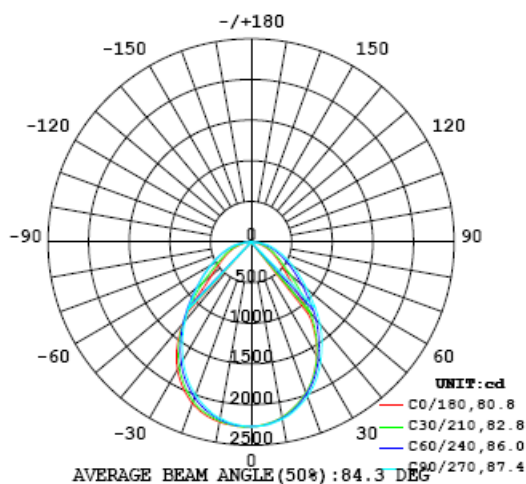


Chart 24: Polar Candela Distribution

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	2272	2272	2272	2272	2272	2272	2272	2272	2272	2272	2272	2272	2272	2272	2272	2272	2272	2272	2272
5	2246	2244	2245	2245	2243	2246	2256	2251	2250	2257	2260	2259	2264	2264	2268	2271	2271	2274	2268
10	2190	2189	2189	2190	2192	2199	2201	2201	2204	2211	2212	2219	2224	2230	2236	2241	2245	2248	2246
15	2094	2097	2096	2094	2100	2110	2114	2118	2124	2133	2136	2144	2154	2168	2177	2187	2195	2197	2199
20	1975	1974	1974	1974	1978	1989	1990	2006	2012	2023	2033	2043	2057	2075	2092	2104	2108	2112	2114
25	1815	1817	1816	1820	1828	1837	1842	1854	1866	1883	1896	1913	1934	1955	1966	1979	1984	1982	1983
30	1616	1616	1618	1621	1634	1651	1657	1670	1685	1707	1722	1746	1773	1798	1808	1817	1823	1817	1816
35	1364	1369	1377	1390	1410	1434	1452	1472	1494	1521	1537	1559	1585	1602	1617	1621	1618	1608	1596
40	1032	1040	1079	1126	1173	1214	1244	1267	1289	1318	1340	1365	1393	1401	1398	1389	1366	1334	1303
45	700	709	775	856	926	975	1008	1039	1066	1100	1127	1153	1176	1187	1171	1128	1052	961	910
50	533	536	562	632	715	777	816	846	869	894	919	942	959	957	927	857	732	650	635
55	421	424	443	477	549	614	657	687	710	733	753	773	787	774	723	624	546	508	489
60	336	340	355	378	422	482	527	555	575	596	613	632	637	617	555	471	428	400	388
65	262	266	278	298	325	372	415	444	462	479	495	511	510	482	416	368	335	315	307
70	192	196	207	225	247	282	319	345	360	376	391	402	395	364	312	278	254	237	230
75	124	128	140	157	177	205	236	261	274	285	298	304	296	265	225	198	178	163	156
80	61.5	65.9	76.5	92.7	111	136	163	184	194	204	216	220	208	180	147	126	107	93.5	87.9
85	13.4	15.8	22.1	31.2	40.0	47.5	53.9	59.3	63.3	67.3	74.6	81.6	85.1	81.5	72.2	59.6	44.9	34.9	30.2
90	0.44	0.51	0.45	0.60	0.79	0.97	0.97	1.08	1.39	1.60	1.15	1.47	1.14	2.46	2.05	3.01	0.49	0.45	0.10
95	0.72	0.68	0.66	0.81	0.93	1.12	1.15	1.24	1.28	1.32	1.25	1.25	1.22	1.12	0.89	0.73	0.69	0.62	0.01
100	1.16	1.06	1.06	1.16	1.29	1.49	1.49	1.58	1.60	1.61	1.56	1.56	1.53	1.40	1.19	1.04	0.99	0.94	0.02
105	1.62	1.56	1.51	1.61	1.77	1.98	1.97	2.05	2.10	2.09	2.00	2.02	1.97	1.86	1.61	1.43	1.38	1.36	0.16
110	2.09	1.94	1.85	2.07	2.40	2.55	2.52	2.61	2.61	2.62	2.54	2.56	2.53	2.43	2.18	1.91	1.78	1.77	0.34
115	2.47	2.25	2.32	2.53	3.07	3.12	3.08	3.12	3.10	3.08	3.06	3.09	3.10	3.04	2.73	2.28	2.09	2.04	0.57
120	3.33	2.94	2.76	3.33	3.54	3.87	3.72	3.73	3.72	3.67	3.63	3.72	3.73	3.71	3.21	2.90	2.44	2.43	0.71
125	4.24	3.67	3.68	4.11	4.09	4.35	4.49	4.45	4.41	4.39	4.34	4.40	4.46	4.16	3.73	3.38	3.07	2.74	1.16
130	6.87	5.79	5.92	4.56	4.57	4.53	4.87	5.09	5.05	5.03	4.95	4.92	4.76	4.25	3.81	3.46	4.56	4.58	1.89
135	8.69	7.00	7.33	4.91	4.80	4.76	5.13	5.49	5.67	5.61	5.46	5.29	5.00	4.39	3.63	4.26	5.16	5.64	2.58
140	8.79	7.52	7.83	5.32	4.79	4.86	5.30	5.77	6.04	5.96	5.84	5.48	5.01	4.26	3.46	5.04	5.60	5.92	3.12
145	8.89	7.69	7.50	5.64	4.77	4.89	5.32	5.91	6.13	6.15	6.03	5.52	5.01	4.01	3.36	5.41	5.81	5.84	3.34
150	8.48	7.79	7.39	5.91	4.75	4.93	5.34	5.88	6.14	6.15	5.92	5.54	5.00	3.69	3.20	5.23	5.91	5.31	3.27
155	9.64	8.46	7.52	6.16	4.68	4.81	5.33	5.86	6.14	6.05	5.87	5.52	5.02	3.56	2.95	4.74	5.57	6.43	3.81
160	9.21	7.83	7.23	5.90	4.54	4.41	5.08	5.70	6.02	5.91	5.80	5.48	4.87	3.58	2.63	3.90	4.95	6.16	3.95
165	8.45	7.83	7.39	6.20	4.82	4.10	4.72	5.73	6.19	6.22	6.05	5.82	5.27	4.13	2.52	2.89	4.34	5.88	5.98
170	8.50	8.05	7.32	6.19	4.77	3.95	4.49	5.73	6.38	6.65	6.56	6.42	6.01	4.90	3.11	2.60	3.75	5.06	6.64
175	7.22	6.61	6.64	5.47	4.06	3.66	4.44	5.52	6.18	6.40	6.42	6.32	6.03	5.34	4.10	2.46	2.56	3.54	4.23
180	6.21	6.21	6.21	6.21	6.21	6.21	6.21	6.21	6.21	6.21	6.21	6.21	6.21	6.21	6.21	6.21	6.21	6.21	6.21

Table 18: 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		2272	2272	2272	2272	2272	2272	2272	2272	2272	2272	2272	2272	2272	2272	2272	2272	2272		
5		2265	2267	2266	2268	2263	2260	2256	2250	2247	2248	2246	2245	2246	2246	2245	2246	2247		
10		2241	2238	2235	2231	2225	2217	2212	2205	2203	2199	2195	2193	2191	2189	2190	2192	2191		
15		2195	2186	2176	2170	2158	2143	2133	2124	2116	2114	2112	2110	2107	2101	2097	2096	2093		
20		2105	2095	2082	2074	2059	2036	2021	2009	2000	1993	1991	1985	1980	1977	1979	1978	1973		
25		1974	1960	1946	1935	1918	1896	1878	1864	1856	1847	1840	1833	1831	1825	1822	1818	1815		
30		1802	1786	1772	1760	1745	1724	1701	1688	1677	1667	1661	1657	1650	1640	1631	1624	1617		
35		1580	1567	1555	1548	1535	1516	1496	1482	1474	1465	1456	1455	1442	1429	1410	1391	1370		
40		1288	1290	1303	1310	1311	1301	1285	1274	1267	1256	1248	1243	1227	1202	1166	1117	1068		
45		920	975	1032	1069	1081	1081	1074	1065	1060	1050	1048	1032	1012	979	919	827	742		
50		636	679	772	838	872	881	878	872	870	862	855	843	820	765	689	606	557		
55		491	514	565	650	699	717	719	714	712	706	700	685	654	595	518	470	435		
60		393	409	434	490	550	577	583	580	578	572	565	545	507	450	401	371	347		
65		311	322	342	374	425	455	462	461	457	454	448	429	392	343	314	285	270		
70		234	244	260	283	323	352	365	364	360	358	351	331	297	258	231	210	197		
75		160	169	185	204	234	260	274	274	271	269	263	243	212	181	158	140	128		
80		90.5	100	116	132	157	181	191	189	184	183	181	166	139	112	92.2	75.8	65.5		
85		32.7	40.7	51.9	59.2	63.1	63.0	59.9	55.7	52.5	51.8	52.0	49.0	44.3	37.3	29.5	20.6	14.9		
90		0.10	0.14	0.13	0.13	0.25	0.39	0.38	0.34	0.40	0.44	0.44	0.37	0.33	0.27	0.22	0.08	0.07		
95		0.02	0.07	0.07	0.07	0.23	0.33	0.30	0.28	0.39	0.40	0.41	0.36	0.30	0.23	0.21	0.05	0.06		
100		0.02	0.07	0.07	0.07	0.25	0.33	0.32	0.34	0.40	0.44	0.40	0.39	0.29	0.27	0.22	0.05	0.07		
105		0.18	0.20	0.20	0.22	0.37	0.51	0.55	0.60	0.73	0.78	0.77	0.64	0.54	0.49	0.39	0.24	0.30		
110		0.32	0.35	0.39	0.47	0.56	0.82	0.83	0.86	0.93	0.95	0.95	0.87	0.81	0.77	0.57	0.43	0.57		
115		0.50	0.51	0.54	0.71	0.85	1.03	1.08	1.11	1.14	1.21	1.19	1.08	1.05	0.95	0.82	0.61	0.65		
120		0.54	0.56	0.77	0.86	1.17	1.40	1.45	1.42	1.48	1.47	1.50	1.39	1.32	1.10	0.96	0.70	0.91		
125		0.98	1.00	1.13	1.06	1.37	1.71	1.78	1.83	1.91	1.87	1.92	1.72	1.50	1.36	1.22	1.32	1.30		
130		1.58	1.43	1.47	1.28	1.43	1.95	2.06	2.06	2.16	2.12	2.11	1.79	1.53	1.61	1.51	2.01	2.34		
135		2.12	1.92	1.81	1.37	1.63	2.08	2.30	2.42	2.49	2.40	2.29	1.91	1.63	1.68	1.95	2.44	2.98		
140		2.50	2.28	2.16	1.58	1.65	2.44	2.74	2.84	2.84	2.72	2.50	2.05	1.67	1.69	2.43	2.86	3.53		
145		2.64	2.34	2.40	1.93	1.64	2.43	2.83	2.88	2.95	2.81	2.57	1.97	1.68	1.70	2.51	3.06	4.00		
150		2.62	2.32	2.39	1.79	1.32	1.91	2.45	2.59	2.70	2.63	2.30	1.81	1.46	1.72	2.45	2.64	3.97		
155		2.69	2.34	2.35	1.63	1.16	1.81	2.24	2.46	2.47	2.54	2.30	1.88	1.46	1.91	2.59	2.51	4.47		
160		2.46	2.35	2.17	1.54	1.42	1.74	2.22	2.62	2.47	2.61	2.55	2.06	1.43	2.15	2.75	2.58	4.98		
165		5.31	5.08	4.23	2.89	2.63	3.75	4.83	5.20	5.29	5.04	4.60	3.26	2.07	3.11	4.80	5.61	7.03		
170		7.68	6.71	5.84	4.13	3.20	4.09	5.44	6.05	6.01	5.79	5.09	3.38	2.35	3.58	5.40	6.15	7.79		
175		6.46	7.10	6.59	5.46	3.47	3.60	5.12	6.02	6.09	5.88	4.70	2.56	2.75	4.75	6.10	6.77	7.67		
180		6.21	6.21	6.21	6.21	6.21	6.21	6.21	6.21	6.21	6.21	6.21	6.21	6.21	6.21	6.21	6.21	6.21		

Table 19: Luminous Intensity Data

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 20: 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.