

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

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Report No.: HZ25070031b

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

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Aug. 07, 2025

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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 26W 3500K Setting	SWISH2X2 26W 4000K Setting	SWISH2X2 26W 5000K Setting
Luminous Efficacy (Lumens /Watt)	135.3	145.9	138.9
Total Luminous Flux (Lumens)	3425.3	3620.1	3537.6
Power (Watts)	25.31	24.81	25.47
Power Factor	0.9922	0.9915	0.9923
CCT (K)	3412	4048	4861
CRI	82.7	83.6	82.5
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	: Aug. 01, 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

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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 (26W 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)	0.213	0.100
Power Factor	0.9922	0.9192
Test Power (W)	25.31	25.54
THD A%	7.68	12.56
Luminous Efficacy (lm/W)	135.3	134.1
Total Luminous Flux (lm)	3425.3	3423.8
Color Rendering Index (CRI)	82.7	
R9	5.7	
Correlated Color Temperature (CCT)(K)	3412	
Chromaticity Chroma x	0.4113	
Chromaticity Chroma y	0.3960	
Chromaticity Chroma u	0.2374	
Chromaticity Chroma v	0.3429	
Duv	0.0010	
Chromaticity Chroma u'	0.2374	
Chromaticity Chroma v'	0.5143	

Special Color Rendering Indices	
R1	80.8
R2	90.7
R3	96.4
R4	80.4
R5	81
R6	87.8
R7	83.8
R8	60.4
R9	5.7
R10	78.4
R11	79.6
R12	65.6
R13	83.3
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)	0.213
Power Factor	0.9920
Power (W)	25.33
Luminous Efficacy (lm/W)	135.9
Total Luminous Flux (lm)	3443.0
Beam Angle (°)	80.5 (0°-180°) / 87.1 (90°-270°)
Center Beam Candle Power (cd)	1699
Maximum Beam Candle Power (cd)	1703 (At: C=150.0, Gamma=1.5)
Spacing Criteria	1.18 (0°-180°) / 1.13 (90°-270°)
Zonal Lumens in the 0 °-60 °Zone	85.31%
Zonal Lumens in the 60 °-90 °Zone	14.36%
Zonal Lumens in the 90 °-120 °Zone	0.07%
Zonal Lumens in the 120 °-180 °Zone	0.25%

Table 3: Test data per Goniophotometer Method

Spectral Power Distribution - Sphere Spectroradiometer Method

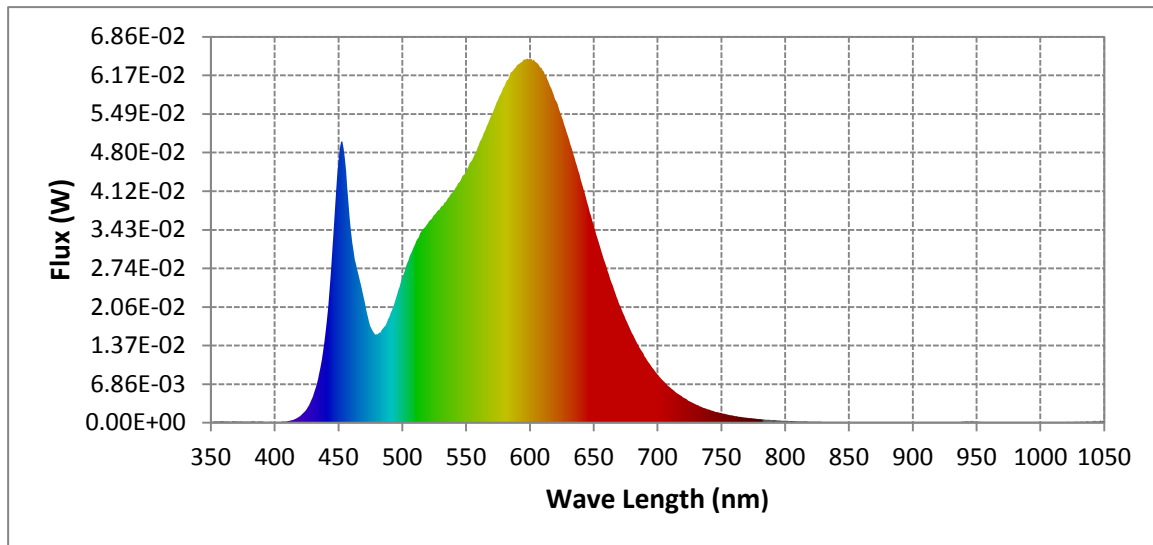
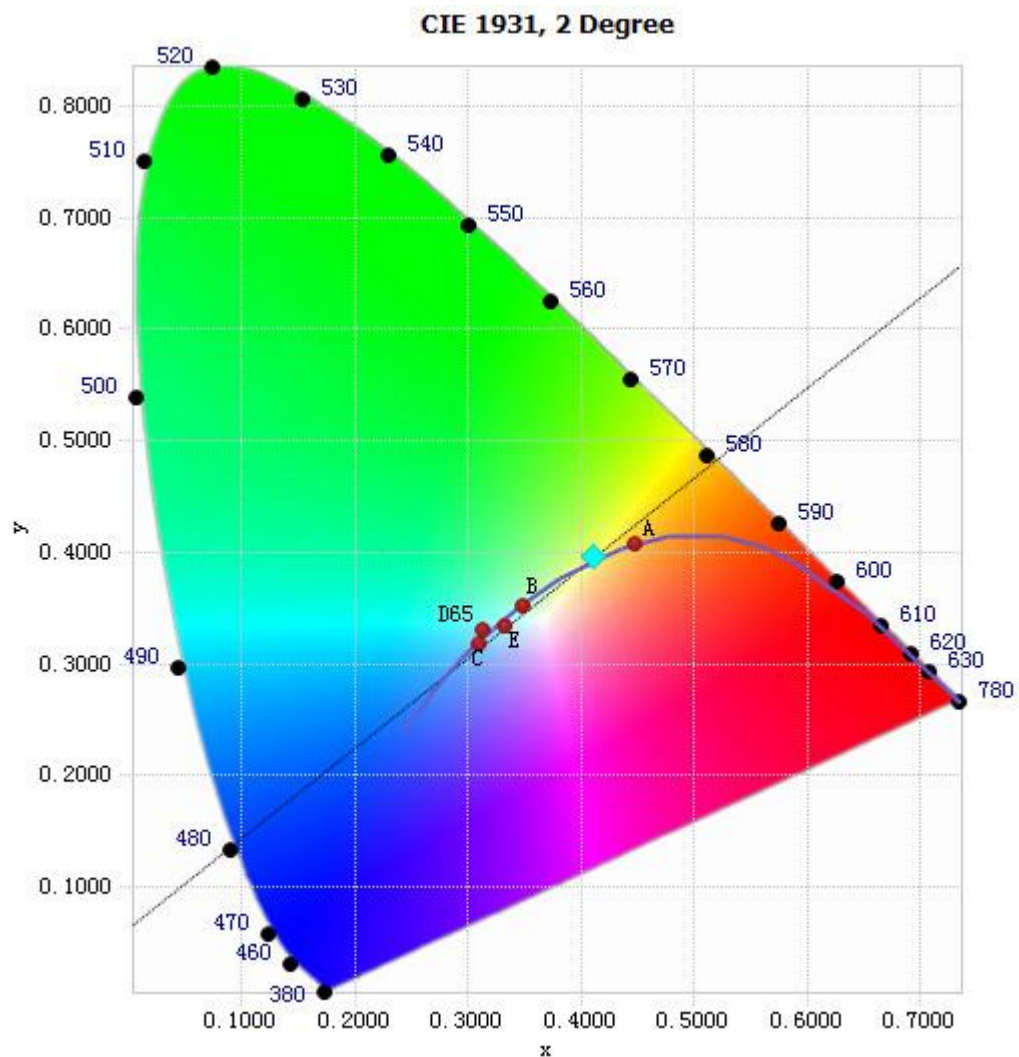


Chart 1: Spectral Power Distribution

Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	2.12E-04	485	1.68E-02	590	6.36E-02	695	1.01E-02
385	1.71E-04	490	1.88E-02	595	6.45E-02	700	8.67E-03
390	1.86E-04	495	2.20E-02	600	6.47E-02	705	7.36E-03
395	1.68E-04	500	2.57E-02	605	6.40E-02	710	6.26E-03
400	1.21E-04	505	2.90E-02	610	6.26E-02	715	5.32E-03
405	1.51E-04	510	3.17E-02	615	6.05E-02	720	4.55E-03
410	2.82E-04	515	3.40E-02	620	5.74E-02	725	3.85E-03
415	5.64E-04	520	3.54E-02	625	5.44E-02	730	3.27E-03
420	1.17E-03	525	3.69E-02	630	5.09E-02	735	2.78E-03
425	2.35E-03	530	3.83E-02	635	4.72E-02	740	2.36E-03
430	4.66E-03	535	3.95E-02	640	4.32E-02	745	1.98E-03
435	8.84E-03	540	4.10E-02	645	3.91E-02	750	1.71E-03
440	1.62E-02	545	4.28E-02	650	3.52E-02	755	1.44E-03
445	3.00E-02	550	4.45E-02	655	3.13E-02	760	1.24E-03
450	4.65E-02	555	4.67E-02	660	2.77E-02	765	1.06E-03
455	4.69E-02	560	4.93E-02	665	2.44E-02	770	8.93E-04
460	3.40E-02	565	5.19E-02	670	2.11E-02	775	7.66E-04
465	2.71E-02	570	5.47E-02	675	1.84E-02	780	6.55E-04
470	2.22E-02	575	5.73E-02	680	1.59E-02		
475	1.72E-02	580	5.98E-02	685	1.37E-02		
480	1.57E-02	585	6.22E-02	690	1.18E-02		

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

Chromaticity Diagram - Sphere Spectroradiometer Method



Tristimulus values(x, y): (0.4113, 0.3960)

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

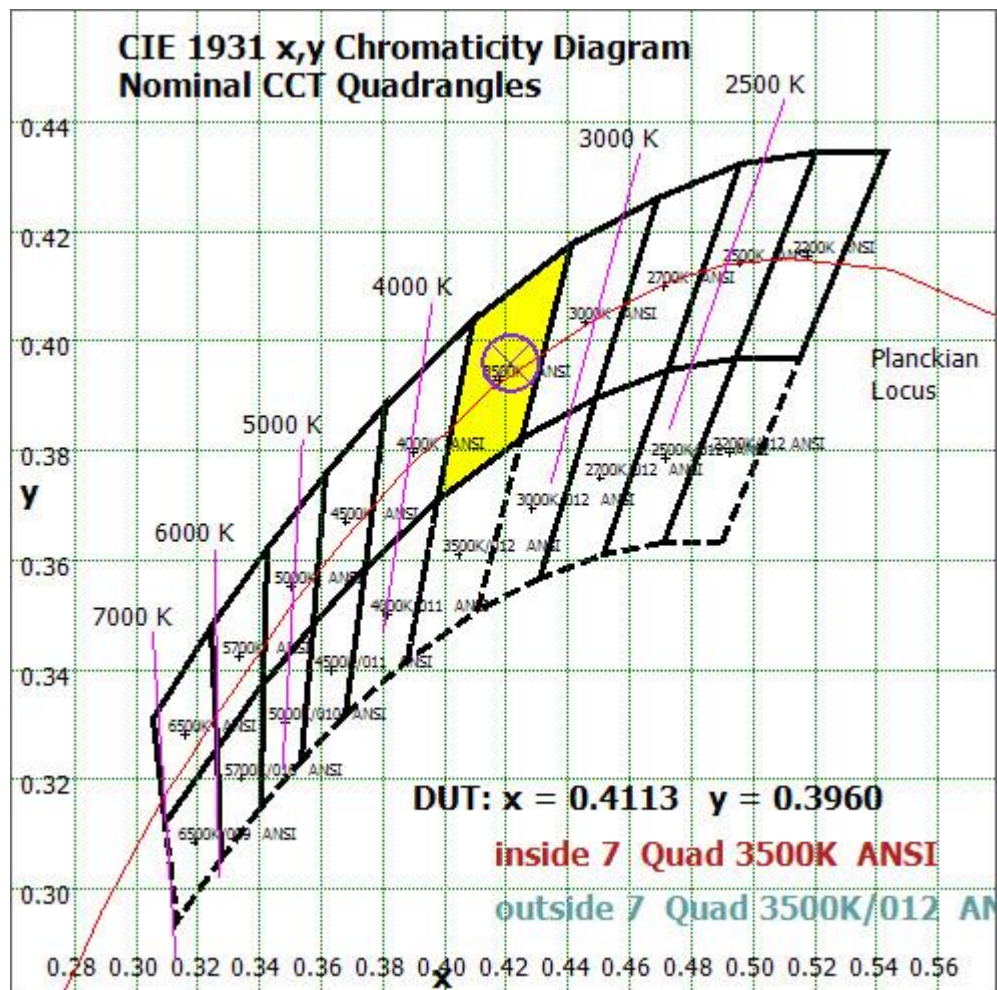


Chart 3: Plot of Lamp x/y coordinates on CIE 1931 Chromaticity Diagram

Color Rendition Report – Sphere Spectroradiometer Method

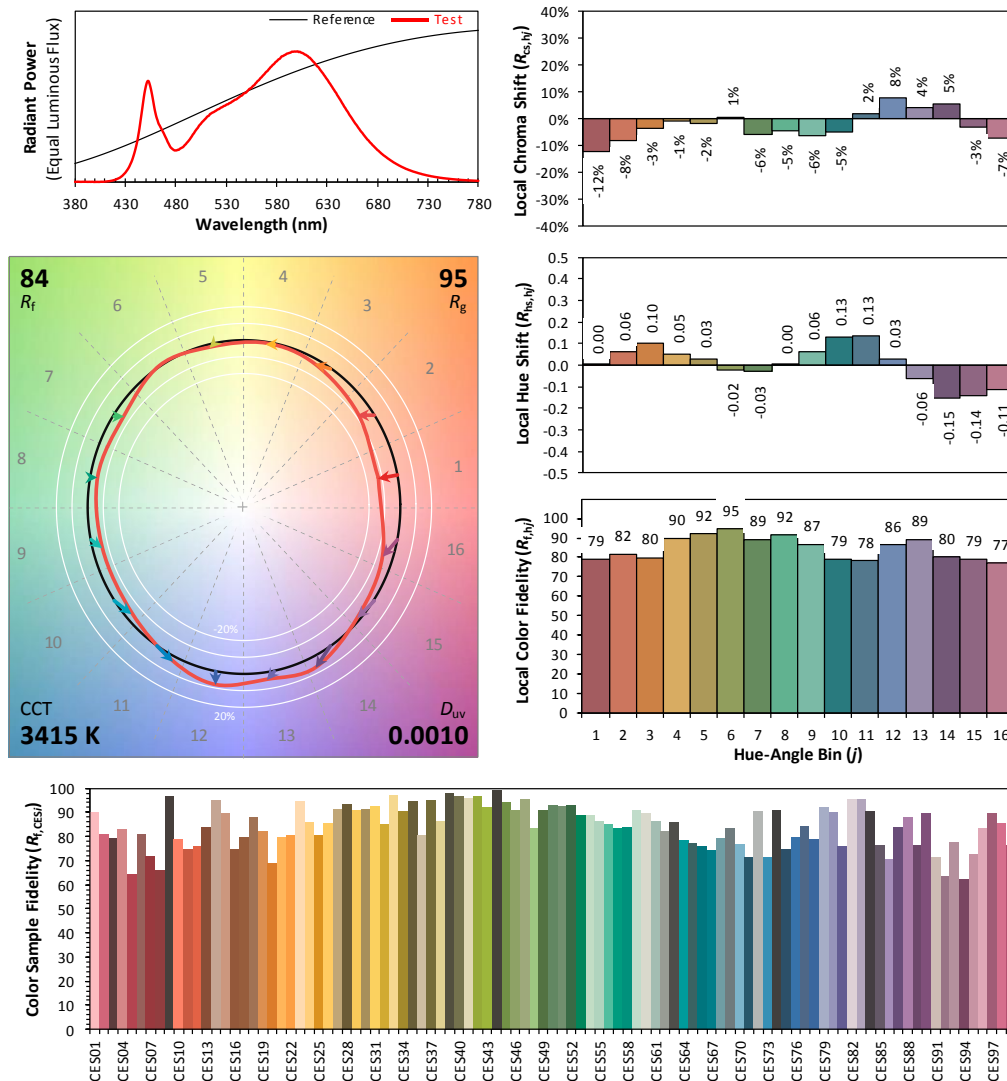
ANSI/IES TM-30-18 Color Rendition Report

Source: LED

Manufacturer: RAB Lighting Inc

Date: 2025/08/01

Model: SWISH2X2



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

x 0.4113
 y 0.3960
 u' 0.2374
 v' 0.5143

CIE 13.3-1995
(CRI)

R_a 83

R_g 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	160.179	4.65%
10- 20	450.16	13.07%
20- 30	647.277	18.80%
30- 40	693.771	20.15%
40- 50	574.492	16.69%
50- 60	411.396	11.95%
60- 70	283.524	8.23%
70- 80	167.28	4.86%
80- 90	43.73	1.27%
90-100	0.473	0.01%
100-110	0.803	0.02%
110-120	1.28	0.04%
120-130	1.784	0.05%
130-140	2.141	0.06%
140-150	1.922	0.06%
150-160	1.384	0.04%
160-170	0.99	0.03%
170-180	0.371	0.01%
Total	3443.0	100%

$\gamma(^{\circ})$	Lumens	% Total
0- 60	2937.275	85.31%
60- 90	494.534	14.36%
0-90	3431.809	99.68%
90- 180	11.148	0.32%
0- 180	3443.0	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	11.7	13.2	12.0	13.5	13.8	15.0	16.5	15.4	16.8	17.2
	3H	13.1	14.5	13.5	14.8	15.2	16.8	18.1	17.2	18.5	18.8
	4H	13.6	14.9	14.0	15.2	15.6	17.6	18.8	18.0	19.2	19.5
	6H	13.9	15.1	14.3	15.4	15.8	18.3	19.4	18.7	19.8	20.2
	8H	13.9	15.1	14.4	15.4	15.8	18.5	19.6	18.9	20.0	20.4
	12H	14.0	15.0	14.4	15.4	15.8	18.6	19.7	19.1	20.1	20.5
4H	2H	12.6	13.9	13.0	14.2	14.6	15.4	16.7	15.8	17.0	17.4
	3H	14.3	15.3	14.7	15.7	16.1	17.4	18.5	17.9	18.9	19.3
	4H	14.9	15.8	15.3	16.2	16.7	18.4	19.3	18.8	19.7	20.2
	6H	15.2	16.0	15.7	16.5	16.9	19.3	20.1	19.7	20.6	21.0
	8H	15.3	16.1	15.7	16.5	17.0	19.6	20.4	20.1	20.8	21.3
	12H	15.3	16.0	15.8	16.5	16.9	19.8	20.5	20.3	20.9	21.4
8H	4H	15.4	16.2	15.9	16.6	17.1	18.6	19.3	19.0	19.8	20.2
	6H	15.9	16.5	16.4	17.0	17.5	19.6	20.3	20.1	20.8	21.3
	8H	16.0	16.6	16.5	17.1	17.6	20.1	20.6	20.6	21.1	21.6
	12H	16.1	16.6	16.6	17.1	17.6	20.3	20.8	20.8	21.3	21.9
12H	4H	15.5	16.2	16.0	16.7	17.2	18.6	19.2	19.0	19.7	20.2
	6H	16.1	16.7	16.6	17.1	17.7	19.7	20.3	20.2	20.7	21.3
	8H	16.2	16.8	16.8	17.3	17.8	20.1	20.6	20.6	21.1	21.7

Chart 5: UGR Table (Corrected)

Illuminance Plots- Goniophotometer Method

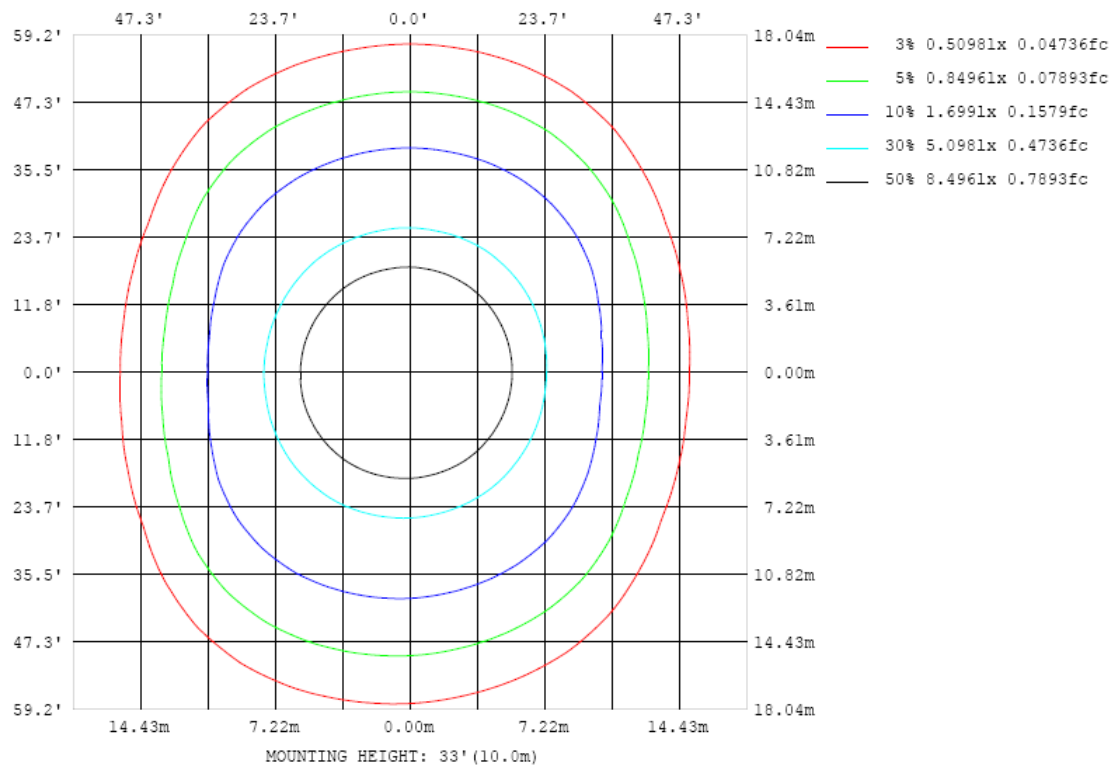


Chart 6: Illuminance Plot (Footcandles)

Luminous Intensity Distribution Plots- Goniophotometer Method

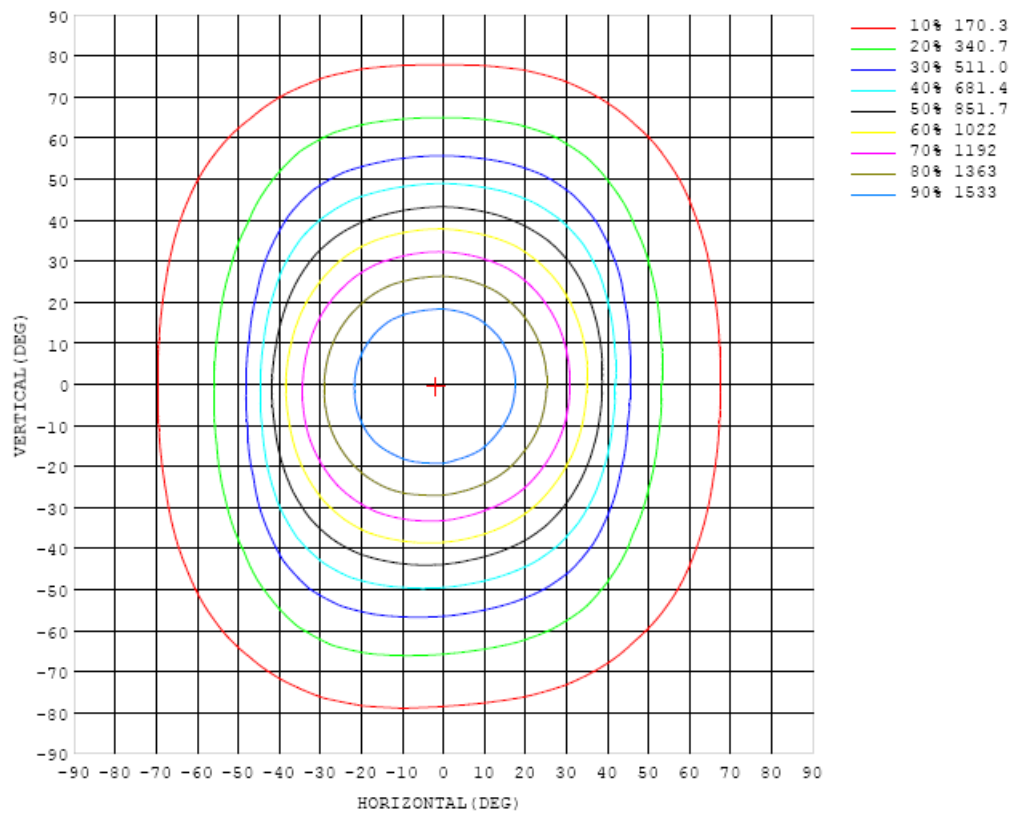


Chart 7: Isocandela Plot

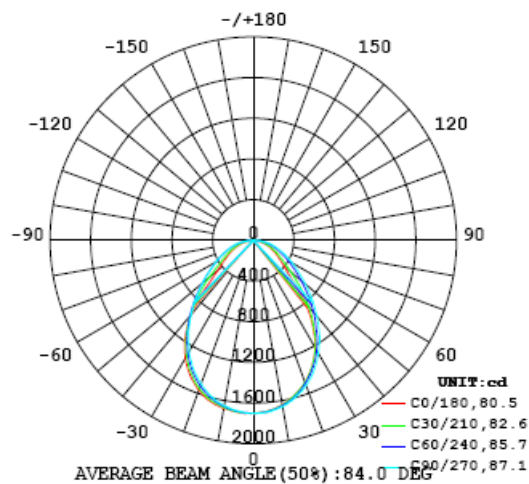


Chart 8: Polar Candela Distribution

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	1699	1699	1699	1699	1699	1699	1699	1699	1699	1699	1699	1699	1699	1699	1699	1699	1699	1699	1699
5	1682	1680	1684	1685	1683	1684	1688	1686	1687	1693	1691	1695	1695	1697	1697	1697	1696	1697	1698
10	1640	1642	1644	1645	1646	1649	1652	1649	1652	1660	1663	1666	1668	1671	1672	1672	1676	1679	1677
15	1573	1575	1577	1576	1577	1584	1590	1588	1593	1597	1607	1613	1617	1622	1626	1630	1638	1641	1640
20	1487	1488	1486	1486	1486	1491	1495	1504	1510	1518	1524	1534	1543	1552	1560	1567	1570	1570	1567
25	1366	1366	1370	1372	1371	1380	1384	1392	1402	1412	1422	1433	1448	1458	1465	1470	1471	1471	1469
30	1218	1218	1220	1222	1229	1241	1249	1255	1265	1281	1292	1310	1325	1335	1341	1344	1347	1344	1339
35	1018	1019	1029	1038	1049	1070	1085	1101	1117	1137	1157	1170	1185	1192	1196	1194	1192	1183	1170
40	782	790	818	847	875	904	926	941	954	974	989	1006	1022	1023	1016	1001	982	959	949
45	526	537	592	653	701	738	762	780	799	817	834	848	861	861	845	810	756	692	657
50	398	401	424	481	543	587	616	634	649	668	683	699	712	704	675	616	526	474	457
55	313	316	333	361	415	464	493	512	527	545	558	571	579	564	522	449	397	369	356
60	251	253	266	286	319	364	395	411	425	440	451	463	464	446	399	341	312	290	282
65	196	200	209	226	247	282	311	329	341	352	363	373	370	345	299	268	242	228	222
70	144	148	157	170	187	214	240	255	266	276	286	292	286	259	225	201	183	171	167
75	93.7	96.7	106	119	134	156	178	192	201	209	218	221	213	188	161	142	126	116	112
80	46.8	50.2	58.6	71.1	84.9	104	123	137	143	150	158	159	148	126	103	87.3	74.0	64.8	61.4
85	10.8	12.7	17.9	25.0	31.7	37.1	41.6	45.2	47.8	50.7	56.1	59.9	60.6	56.3	49.0	39.7	29.6	23.0	20.0
90	0.45	0.55	0.39	1.11	1.41	0.73	0.78	0.79	0.89	1.08	0.82	0.83	0.75	1.86	2.92	0.50	1.54	0.21	0.06
95	0.41	0.42	0.50	0.62	0.64	0.74	0.79	0.86	0.90	0.91	0.89	0.84	0.81	0.75	0.67	0.57	0.44	0.39	0.00
100	0.70	0.71	0.78	0.88	0.88	1.00	1.03	1.09	1.11	1.13	1.08	1.04	1.06	1.00	0.88	0.75	0.66	0.63	0.01
105	1.07	1.09	1.14	1.22	1.26	1.36	1.37	1.45	1.49	1.50	1.43	1.38	1.37	1.29	1.21	1.07	0.98	0.96	0.06
110	1.42	1.38	1.37	1.56	1.70	1.79	1.80	1.86	1.86	1.87	1.79	1.79	1.81	1.75	1.64	1.40	1.26	1.26	0.28
115	1.70	1.62	1.76	1.90	2.19	2.23	2.20	2.25	2.26	2.22	2.20	2.21	2.24	2.21	2.07	1.70	1.50	1.47	0.39
120	2.30	2.16	2.01	2.50	2.58	2.76	2.71	2.70	2.70	2.68	2.63	2.65	2.71	2.69	2.43	2.15	1.79	1.78	0.55
125	2.98	2.66	2.74	3.07	2.94	3.15	3.28	3.21	3.18	3.18	3.15	3.13	3.21	3.01	2.91	2.58	2.32	2.04	0.88
130	4.99	4.26	4.37	3.11	3.17	3.31	3.59	3.71	3.65	3.62	3.58	3.53	3.43	3.11	2.94	2.96	3.59	3.55	1.48
135	6.39	5.21	5.20	3.21	3.17	3.43	3.81	3.99	4.10	4.08	3.96	3.79	3.50	3.20	2.91	3.63	4.34	4.65	2.08
140	6.28	5.29	5.29	3.32	3.15	3.40	3.94	4.24	4.40	4.32	4.22	4.01	3.52	3.21	2.88	4.42	4.74	4.90	2.50
145	6.17	5.27	5.08	3.59	3.08	3.27	3.93	4.34	4.45	4.49	4.35	3.98	3.54	3.09	2.98	4.72	5.02	4.91	2.74
150	5.78	5.35	4.87	3.72	2.89	3.25	3.91	4.26	4.44	4.46	4.23	3.92	3.52	2.93	3.02	4.69	5.22	4.69	2.76
155	6.45	5.58	4.79	3.75	2.81	3.22	3.90	4.22	4.43	4.35	4.20	3.92	3.48	2.88	2.99	4.37	4.92	5.61	3.22
160	6.17	5.23	4.66	3.55	2.43	2.81	3.72	4.08	4.32	4.27	4.13	3.89	3.46	2.67	2.69	3.85	4.58	5.27	3.38
165	6.19	5.71	5.02	3.83	2.66	2.53	3.49	4.19	4.50	4.51	4.36	4.20	3.78	2.95	2.31	3.10	4.11	4.93	4.80
170	5.81	5.58	4.97	4.07	2.83	2.42	3.29	4.20	4.72	4.88	4.71	4.62	4.33	3.50	2.50	2.57	3.57	4.30	4.97
175	4.96	4.58	4.54	3.45	2.35	2.38	3.19	4.05	4.52	4.68	4.63	4.55	4.35	3.84	2.96	2.05	2.50	3.44	3.75
180	4.56	4.56	4.56	4.56	4.56	4.56	4.56	4.56	4.56	4.56	4.56	4.56	4.56	4.56	4.56	4.56	4.56	4.56	4.56

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	1699	1699	1699	1699	1699	1699	1699	1699	1699	1699	1699	1699	1699	1699	1699	1699	1699		
5	1698	1696	1695	1695	1693	1689	1686	1686	1684	1685	1686	1686	1685	1683	1682	1682	1683		
10	1677	1673	1667	1666	1663	1656	1654	1650	1650	1647	1646	1646	1647	1645	1641	1640	1640		
15	1636	1632	1624	1617	1611	1604	1596	1590	1588	1584	1583	1584	1581	1578	1575	1574	1574		
20	1564	1557	1550	1542	1535	1521	1508	1503	1500	1495	1495	1491	1489	1488	1487	1486	1487		
25	1464	1456	1444	1436	1430	1417	1405	1396	1395	1387	1385	1382	1376	1375	1371	1371	1369		
30	1331	1322	1313	1301	1294	1287	1274	1266	1262	1253	1252	1251	1242	1235	1229	1226	1221		
35	1162	1155	1148	1147	1139	1130	1118	1112	1110	1100	1100	1100	1089	1077	1066	1051	1039		
40	940	948	960	970	974	971	960	956	952	945	941	938	924	911	881	847	810		
45	671	715	757	787	801	805	800	797	795	788	787	781	764	738	694	624	560		
50	459	493	567	616	645	653	652	651	651	648	646	637	616	575	509	445	413		
55	359	377	411	470	507	525	525	525	526	523	520	509	483	440	385	351	325		
60	285	299	319	360	401	420	424	424	425	423	419	408	381	336	299	277	259		
65	226	236	252	275	312	334	341	341	340	340	336	322	293	257	235	213	202		
70	170	179	191	207	237	259	268	268	267	267	262	250	222	194	173	158	148		
75	115	123	134	148	171	190	200	202	201	201	197	183	160	137	120	106	96.7		
80	63.7	71.1	82.3	95.0	114	132	140	139	136	137	135	125	106	85.1	70.7	58.2	49.8		
85	21.9	27.3	35.0	40.4	43.6	45.0	43.8	41.5	39.4	39.1	38.9	37.3	34.2	29.6	23.9	17.2	12.3		
90	0.05	0.02	0.03	0.14	0.21	0.24	0.25	0.20	0.24	0.31	0.35	0.27	0.18	0.08	0.13	0.09	0.00		
95	0.00	0.00	0.00	0.07	0.19	0.23	0.20	0.16	0.21	0.23	0.31	0.25	0.14	0.05	0.07	0.05	0.00		
100	0.00	0.00	0.00	0.07	0.21	0.24	0.22	0.18	0.22	0.26	0.33	0.27	0.14	0.05	0.07	0.05	0.01		
105	0.09	0.02	0.02	0.19	0.27	0.37	0.37	0.37	0.42	0.46	0.50	0.49	0.31	0.20	0.21	0.10	0.14		
110	0.22	0.23	0.18	0.32	0.47	0.54	0.55	0.58	0.56	0.60	0.62	0.61	0.48	0.35	0.27	0.23	0.28		
115	0.34	0.32	0.33	0.54	0.65	0.75	0.78	0.78	0.72	0.79	0.82	0.79	0.67	0.52	0.42	0.35	0.39		
120	0.45	0.36	0.47	0.68	0.91	1.03	1.07	0.98	1.00	1.04	1.04	1.02	0.85	0.62	0.56	0.44	0.59		
125	0.77	0.74	0.84	0.81	1.09	1.27	1.31	1.33	1.36	1.36	1.36	1.26	1.05	0.80	0.80	0.87	0.89		
130	1.29	1.09	1.11	1.03	1.17	1.44	1.52	1.50	1.52	1.51	1.47	1.41	1.11	1.02	0.99	1.38	1.64		
135	1.73	1.53	1.45	1.11	1.38	1.64	1.72	1.77	1.77	1.73	1.61	1.43	1.14	1.10	1.20	1.70	2.19		
140	1.99	1.79	1.71	1.30	1.34	1.89	2.00	2.07	2.06	1.97	1.81	1.61	1.18	1.13	1.69	2.14	2.56		
145	2.26	1.90	1.96	1.56	1.31	1.94	2.16	2.17	2.22	2.03	1.94	1.62	1.17	1.12	1.81	2.27	2.97		
150	2.25	1.92	1.98	1.61	1.07	1.50	1.78	1.93	1.92	2.00	1.71	1.45	0.99	1.04	1.65	2.01	2.95		
155	2.23	1.95	1.95	1.60	1.01	1.36	1.67	1.87	1.81	1.91	1.71	1.42	0.98	1.14	1.72	1.75	3.05		
160	2.26	2.14	1.96	1.52	0.97	1.27	1.84	1.82	1.80	2.04	1.88	1.37	0.97	1.26	1.80	1.70	3.31		
165	4.36	4.01	3.18	2.19	1.85	2.75	3.59	3.80	3.84	3.64	3.28	2.36	1.68	2.48	3.68	4.21	5.13		
170	5.38	4.75	3.96	2.69	2.08	2.97	4.00	4.43	4.33	4.16	3.59	2.42	1.91	3.09	4.44	5.31	5.63		
175	4.79	5.16	4.66	3.57	2.19	2.45	3.82	4.43	4.42	4.22	3.29	2.00	2.46	4.03	5.06	5.44	5.09		
180	4.56	4.56	4.56	4.56	4.56	4.56	4.56	4.56	4.56	4.56	4.56	4.56	4.56	4.56	4.56	4.56	4.56		

Table 7: Luminous Intensity Data

TEST RESULTS (26W 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)	0.208	0.099
Power Factor	0.9915	0.9160
Test Power (W)	24.81	25.05
THD A%	7.63	12.43
Luminous Efficacy (lm/W)	145.9	143.0
Total Luminous Flux (lm)	3620.1	3580.9
Color Rendering Index (CRI)	83.6	
R9	10.4	
Correlated Color Temperature (CCT)(K)	4048	
Chromaticity Chroma x	0.3787	
Chromaticity Chroma y	0.3771	
Chromaticity Chroma u	0.2238	
Chromaticity Chroma v	0.3343	
Duv	0.0007	
Chromaticity Chroma u'	0.2238	
Chromaticity Chroma v'	0.5015	

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	64.8
R9	10.4
R10	77.4
R11	80.8
R12	60.8
R13	84.4
R14	98.1

Table 8: Test data per Sphere-Spectroradiometer Method

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

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)	0.209
Power Factor	0.9918
Power (W)	24.83
Luminous Efficacy (lm/W)	146.4
Total Luminous Flux (lm)	3635.1
Beam Angle (°)	80.5 (0°-180°) / 87.2 (90°-270°)
Center Beam Candle Power (cd)	1791
Maximum Beam Candle Power (cd)	1793 (At: C=140.0, Gamma=3.5)
Spacing Criteria	1.18 (0°-180°) / 1.12 (90°-270°)
Zonal Lumens in the 0 °-60 °Zone	85.24%
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

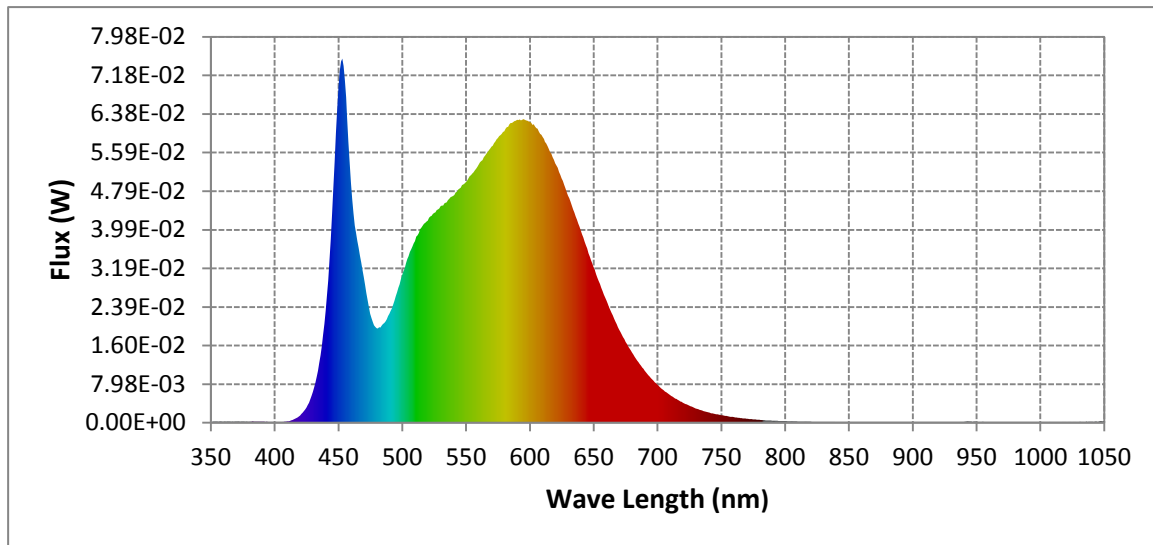
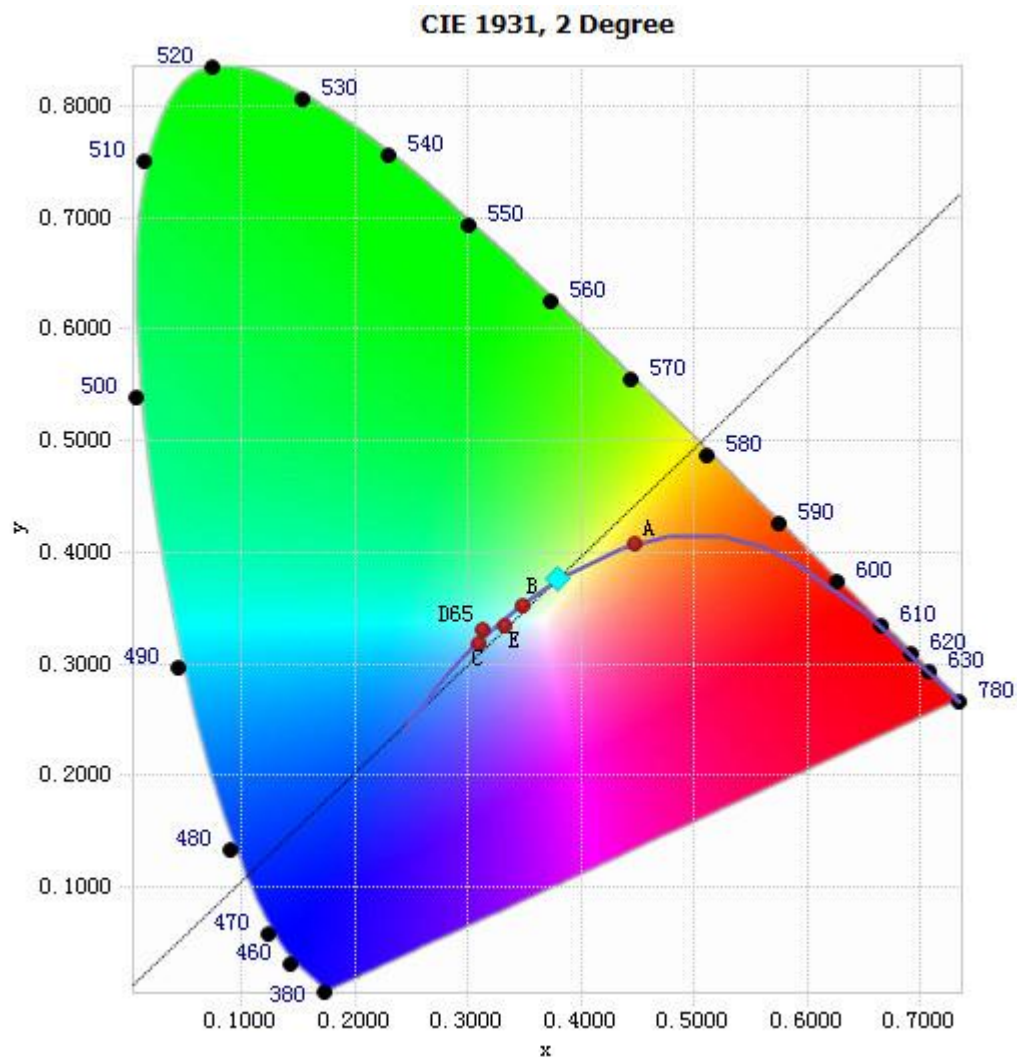


Chart 9: Spectral Power Distribution

Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	2.28E-04	485	2.04E-02	590	6.26E-02	695	9.24E-03
385	2.26E-04	490	2.25E-02	595	6.28E-02	700	7.88E-03
390	2.26E-04	495	2.62E-02	600	6.22E-02	705	6.69E-03
395	1.89E-04	500	3.05E-02	605	6.09E-02	710	5.70E-03
400	1.42E-04	505	3.44E-02	610	5.91E-02	715	4.90E-03
405	9.96E-05	510	3.76E-02	615	5.66E-02	720	4.13E-03
410	2.68E-04	515	4.03E-02	620	5.36E-02	725	3.54E-03
415	6.72E-04	520	4.18E-02	625	5.05E-02	730	2.97E-03
420	1.50E-03	525	4.34E-02	630	4.70E-02	735	2.53E-03
425	3.14E-03	530	4.47E-02	635	4.34E-02	740	2.16E-03
430	6.39E-03	535	4.56E-02	640	3.97E-02	745	1.83E-03
435	1.24E-02	540	4.69E-02	645	3.60E-02	750	1.56E-03
440	2.31E-02	545	4.84E-02	650	3.21E-02	755	1.35E-03
445	4.31E-02	550	4.97E-02	655	2.87E-02	760	1.14E-03
450	6.94E-02	555	5.15E-02	660	2.53E-02	765	9.92E-04
455	7.09E-02	560	5.34E-02	665	2.22E-02	770	8.32E-04
460	4.96E-02	565	5.52E-02	670	1.92E-02	775	7.05E-04
465	3.76E-02	570	5.70E-02	675	1.67E-02	780	6.13E-04
470	3.01E-02	575	5.88E-02	680	1.45E-02		
475	2.25E-02	580	6.03E-02	685	1.26E-02		
480	1.96E-02	585	6.19E-02	690	1.08E-02		

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

Chromaticity Diagram - Sphere Spectroradiometer Method



Tristimulus values(x, y): (0.3787, 0.3771)

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

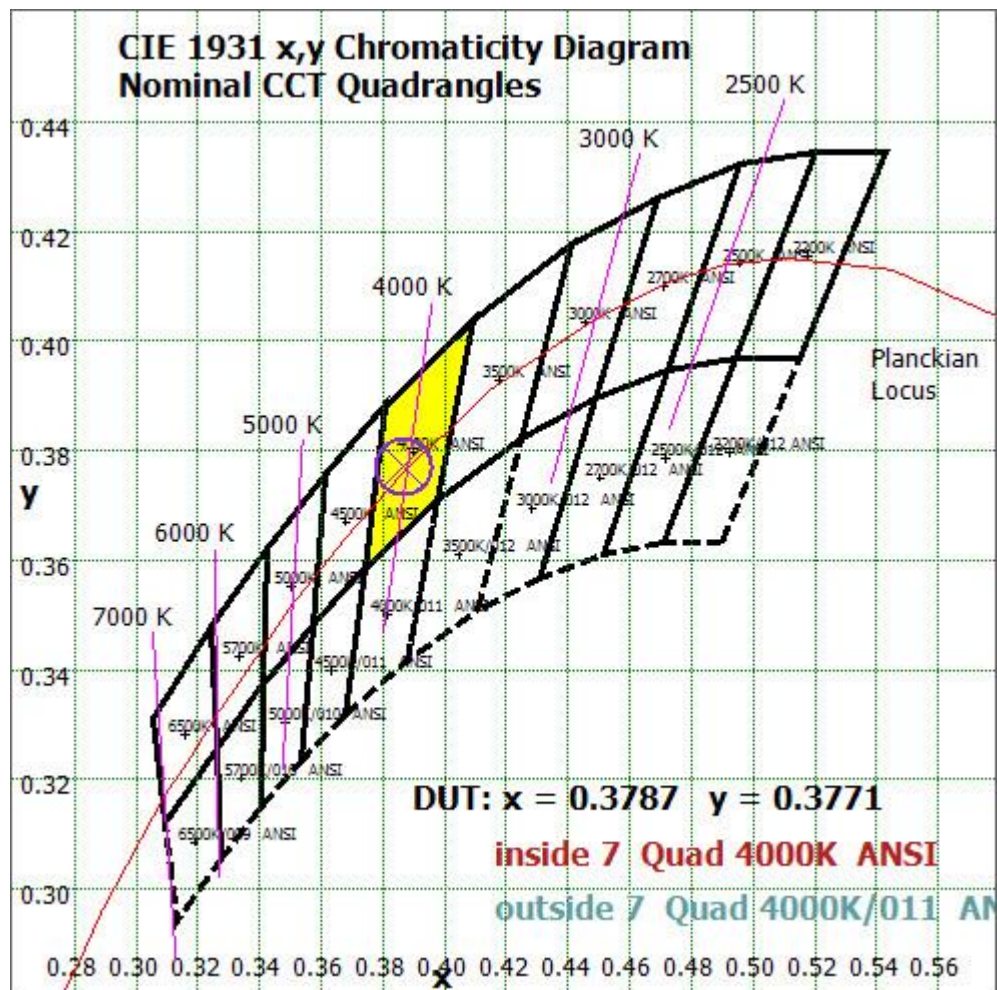


Chart 11: Plot of Lamp x/y coordinates on CIE 1931 Chromaticity Diagram

Color Rendition Report – Sphere Spectroradiometer Method

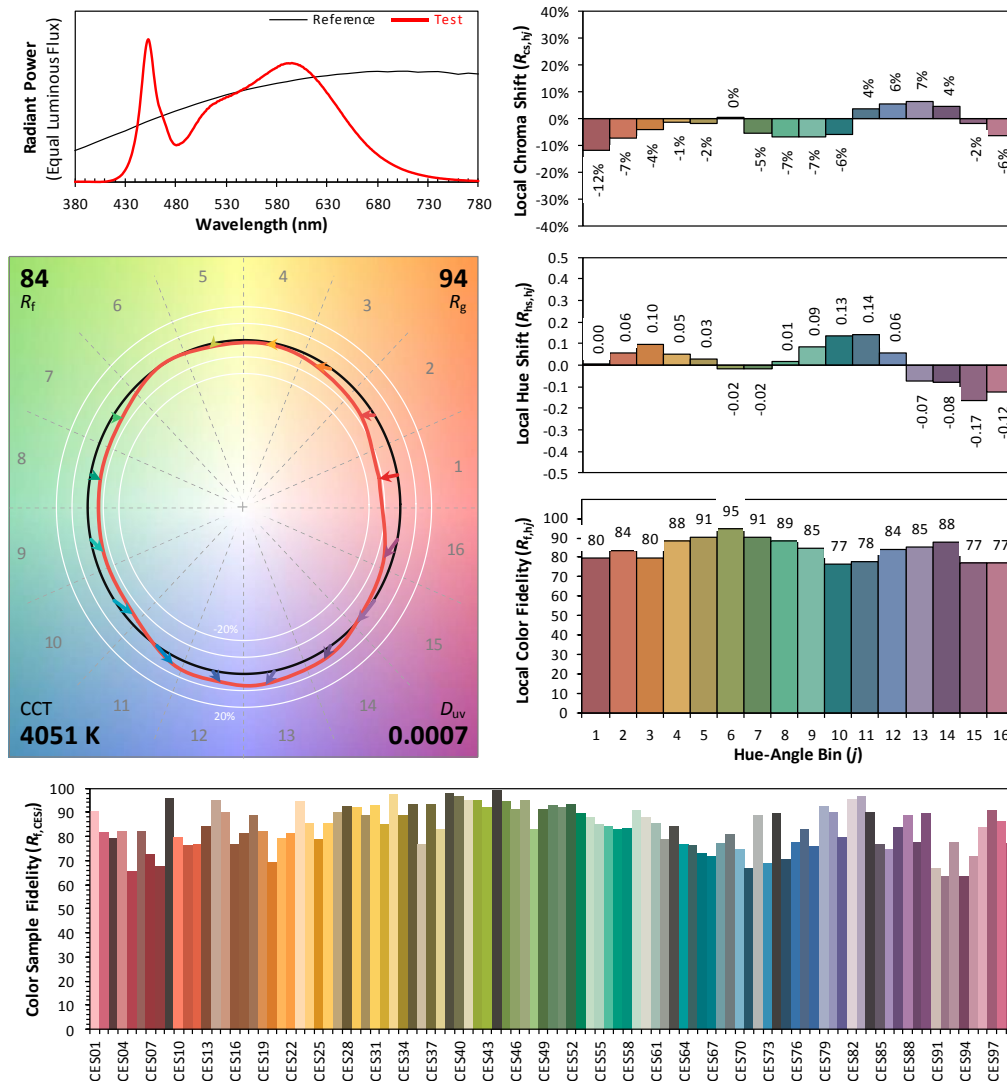
ANSI/IES TM-30-18 Color Rendition Report

Source: LED

Manufacturer: RAB Lighting Inc

Date: 2025/08/01

Model: SWISH2X2



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

x 0.3787
 y 0.3771
 u' 0.2238
 v' 0.5015

CIE 13.3-1995
(CRI)

R_a 84
 R_9 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	168.743	4.64%
10- 20	474.047	13.04%
20- 30	681.859	18.76%
30- 40	731.631	20.13%
40- 50	606.433	16.68%
50- 60	435.675	11.99%
60- 70	300.524	8.27%
70- 80	177.67	4.89%
80- 90	46.67	1.28%
90-100	0.501	0.01%
100-110	0.864	0.02%
110-120	1.367	0.04%
120-130	1.888	0.05%
130-140	2.259	0.06%
140-150	2.028	0.06%
150-160	1.46	0.04%
160-170	1.047	0.03%
170-180	0.392	0.01%
Total	3635.1	100%

$\gamma(^{\circ})$	Lumens	% Total
0- 60	3098.388	85.24%
60- 90	524.864	14.44%
0-90	3623.252	99.68%
90- 180	11.806	0.32%
0- 180	3635.1	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	11.9	13.4	12.2	13.7	14.0	15.3	16.8	15.7	17.1	17.4
3H	13.3	14.7	13.7	15.0	15.3	17.1	18.4	17.5	18.8	19.1
4H	13.8	15.0	14.2	15.4	15.8	17.9	19.1	18.3	19.5	19.8
6H	14.1	15.2	14.5	15.6	16.0	18.6	19.7	19.0	20.1	20.5
8H	14.1	15.2	14.5	15.6	16.0	18.8	19.9	19.2	20.3	20.7
12H	14.1	15.2	14.5	15.5	16.0	19.0	20.0	19.4	20.4	20.8
4H	2H	12.8	14.1	13.2	14.4	14.8	15.7	16.9	16.1	17.3
	3H	14.4	15.5	14.8	15.9	16.3	17.8	18.8	18.2	19.2
	4H	15.0	16.0	15.5	16.4	16.8	18.7	19.6	19.1	20.1
	6H	15.4	16.2	15.8	16.6	17.1	19.6	20.4	20.1	20.9
	8H	15.4	16.2	15.9	16.6	17.1	19.9	20.7	20.4	21.1
	12H	15.4	16.1	15.9	16.6	17.1	20.1	20.8	20.6	21.3
8H	4H	15.6	16.3	16.0	16.8	17.2	18.9	19.6	19.3	20.1
	6H	16.1	16.7	16.5	17.2	17.7	20.0	20.6	20.5	21.1
	8H	16.2	16.7	16.7	17.2	17.7	20.4	21.0	20.9	21.5
	12H	16.2	16.7	16.7	17.2	17.8	20.7	21.2	21.2	21.7
12H	4H	15.7	16.4	16.2	16.9	17.3	18.9	19.6	19.4	20.0
	6H	16.2	16.8	16.8	17.3	17.8	20.0	20.6	20.5	21.0
	8H	16.4	16.9	16.9	17.4	18.0	20.5	21.0	21.0	21.5

Chart 13: UGR Table (Corrected)

Illuminance Plots- Goniophotometer Method

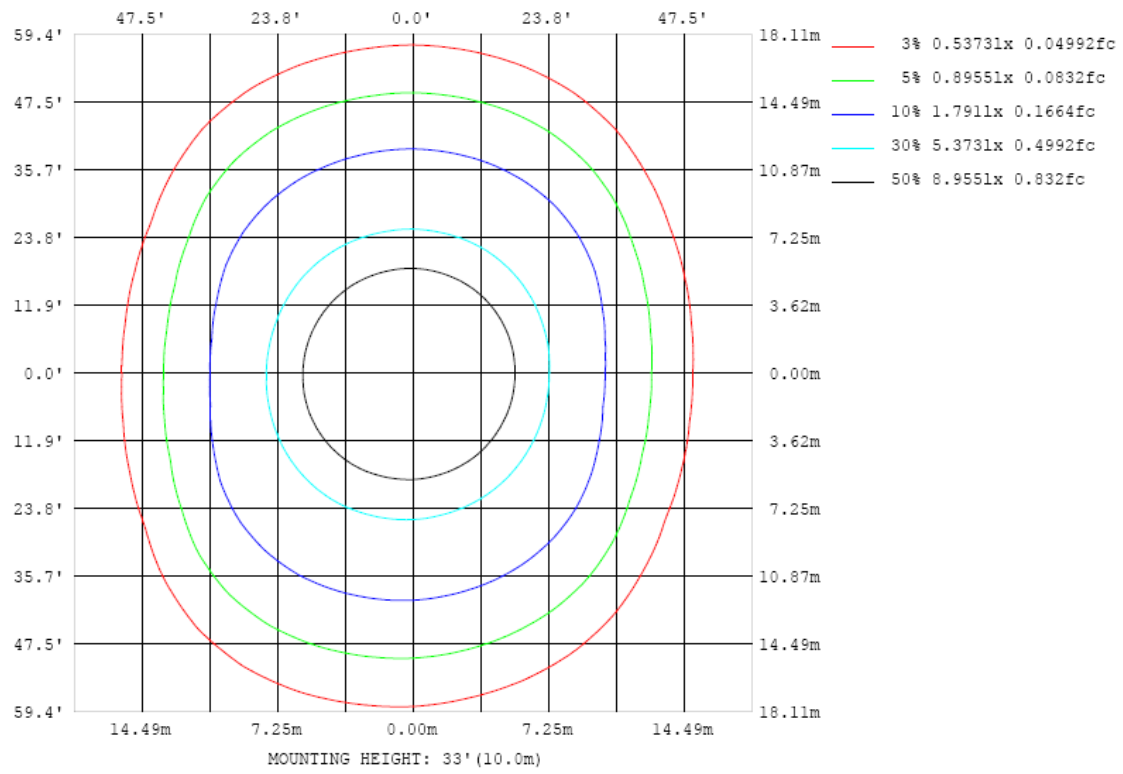


Chart 14: Illuminance Plot (Footcandles)

Luminous Intensity Distribution Plots- Goniophotometer Method

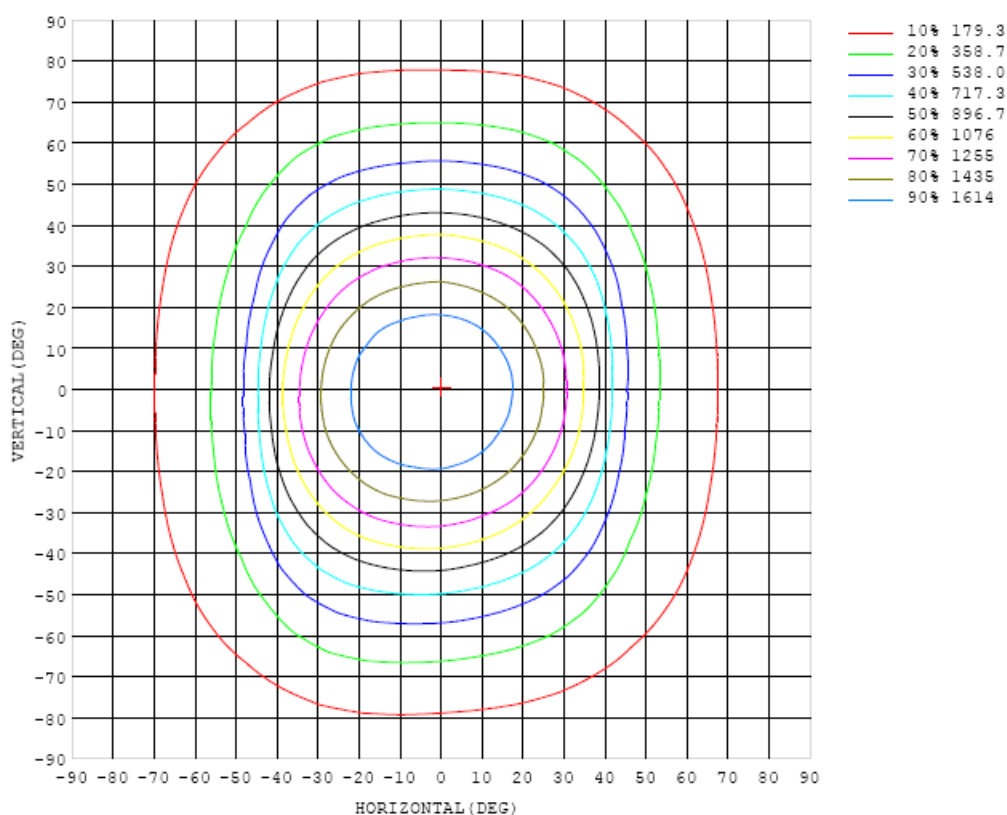


Chart 15: Isocandela Plot

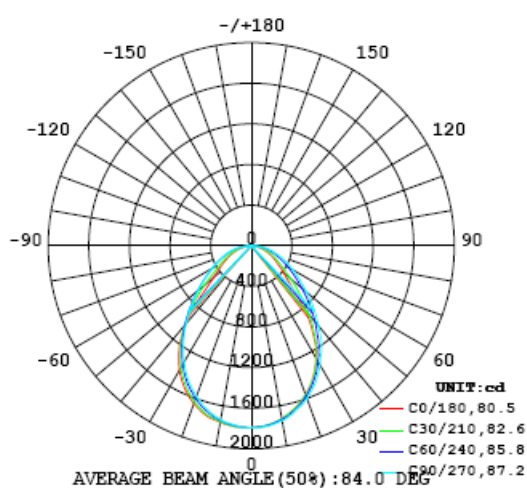


Chart 16: Polar Candela Distribution

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	1791	1791	1791	1791	1791	1791	1791	1791	1791	1791	1791	1791	1791	1791	1791	1791	1791	1791	1791
5	1775	1770	1771	1774	1771	1777	1777	1774	1777	1783	1782	1784	1782	1786	1790	1790	1788	1789	1789
10	1728	1728	1731	1731	1732	1736	1737	1739	1742	1749	1751	1752	1758	1760	1761	1765	1770	1772	1764
15	1655	1656	1658	1659	1662	1670	1671	1675	1680	1683	1690	1695	1704	1711	1717	1724	1729	1728	1727
20	1561	1561	1563	1563	1567	1572	1576	1586	1589	1601	1608	1615	1628	1638	1648	1655	1659	1658	1655
25	1435	1435	1440	1442	1446	1456	1460	1469	1478	1490	1501	1514	1528	1542	1550	1555	1558	1554	1552
30	1276	1278	1284	1287	1297	1310	1317	1325	1337	1354	1365	1381	1401	1414	1421	1427	1430	1423	1415
35	1064	1068	1081	1092	1110	1133	1155	1174	1187	1209	1221	1234	1252	1262	1271	1268	1266	1257	1241
40	816	826	856	890	924	952	977	994	1010	1032	1047	1063	1083	1090	1083	1067	1047	1022	1009
45	551	563	621	686	739	777	805	828	847	868	886	901	914	917	901	866	808	738	699
50	418	423	447	506	573	620	652	673	691	712	728	745	758	751	721	660	562	503	484
55	330	334	351	381	440	491	524	545	564	582	597	609	619	604	560	478	422	393	379
60	264	268	281	300	338	386	420	440	455	472	484	497	500	479	428	363	332	309	300
65	207	210	220	238	261	298	331	351	366	378	390	401	398	372	319	285	258	243	237
70	151	155	165	179	198	227	256	273	286	298	308	314	309	280	241	214	195	183	178
75	97.7	102	112	125	142	165	189	206	217	225	235	238	229	204	173	153	136	125	120
80	48.6	52.6	61.9	74.9	90.2	110	132	147	155	162	171	173	162	138	113	95.1	80.8	70.7	66.7
85	10.8	13.1	18.6	26.5	33.6	39.9	45.4	49.6	52.8	55.9	61.4	66.1	67.4	63.2	55.0	44.6	33.4	25.8	22.4
90	0.39	0.67	0.64	0.48	0.66	0.75	0.98	0.89	0.88	0.84	0.80	1.08	0.86	0.78	0.54	0.57	0.40	0.36	0.14
95	0.43	0.49	0.56	0.59	0.63	0.76	0.89	0.96	1.00	0.93	0.89	0.92	0.92	0.86	0.69	0.56	0.55	0.50	0.02
100	0.76	0.80	0.84	0.84	0.89	1.00	1.14	1.20	1.18	1.16	1.10	1.16	1.13	1.08	0.91	0.80	0.80	0.77	0.04
105	1.14	1.15	1.19	1.18	1.29	1.41	1.52	1.58	1.57	1.54	1.47	1.51	1.51	1.43	1.23	1.13	1.12	1.12	0.15
110	1.47	1.46	1.44	1.56	1.70	1.86	1.94	1.98	1.96	1.91	1.90	1.95	1.94	1.86	1.69	1.47	1.43	1.45	0.31
115	1.76	1.71	1.81	1.90	2.25	2.32	2.38	2.39	2.33	2.28	2.29	2.36	2.38	2.34	2.16	1.77	1.72	1.68	0.52
120	2.35	2.21	2.09	2.46	2.62	2.88	2.86	2.84	2.80	2.79	2.76	2.86	2.87	2.86	2.52	2.28	2.05	2.03	0.65
125	3.02	2.72	2.77	3.05	2.97	3.26	3.44	3.40	3.32	3.31	3.30	3.37	3.43	3.22	3.03	2.73	2.59	2.30	1.02
130	5.00	4.30	4.36	3.10	3.23	3.43	3.74	3.90	3.80	3.78	3.73	3.77	3.67	3.34	3.13	3.14	3.96	3.95	1.68
135	6.40	5.23	5.16	3.22	3.24	3.51	3.98	4.19	4.27	4.24	4.18	4.06	3.83	3.51	3.06	3.86	4.79	5.12	2.34
140	6.32	5.37	5.32	3.35	3.22	3.50	4.12	4.45	4.58	4.52	4.47	4.18	3.84	3.51	3.01	4.73	5.24	5.36	2.78
145	6.20	5.36	5.09	3.62	3.16	3.39	4.13	4.51	4.71	4.70	4.52	4.21	3.84	3.33	3.06	5.09	5.52	5.45	3.06
150	5.85	5.39	4.92	3.78	2.98	3.38	4.13	4.50	4.69	4.69	4.49	4.17	3.79	3.11	3.12	5.02	5.73	5.16	3.09
155	6.47	5.65	4.82	3.76	2.87	3.34	4.13	4.43	4.66	4.53	4.42	4.17	3.73	3.04	3.08	4.64	5.43	6.08	3.60
160	6.17	5.28	4.71	3.58	2.53	2.97	3.91	4.34	4.47	4.45	4.37	4.17	3.74	2.85	2.79	4.06	5.02	5.77	3.89
165	6.25	5.77	5.06	3.88	2.78	2.75	3.69	4.39	4.66	4.71	4.62	4.45	4.06	3.15	2.42	3.25	4.45	5.33	5.17
170	5.93	5.70	5.04	4.21	3.02	2.63	3.51	4.42	4.99	5.08	5.03	4.93	4.66	3.78	2.64	2.64	3.82	4.66	5.30
175	5.04	4.73	4.56	3.55	2.43	2.56	3.42	4.27	4.76	5.00	4.96	4.87	4.70	4.20	3.16	2.17	2.61	3.67	4.15
180	4.78	4.78	4.78	4.78	4.78	4.78	4.78	4.78	4.78	4.78	4.78	4.78	4.78	4.78	4.78	4.78	4.78	4.78	4.78

Table 12: Luminous Intensity Data

Table--2		UNIT: cd																	
γ	C (DEG)	190	200	210	220	230	240	250	260	270	280	290	300	310	320	330	340	350	
0		1791	1791	1791	1791	1791	1791	1791	1791	1791	1791	1791	1791	1791	1791	1791	1791	1791	
5		1788	1786	1786	1785	1781	1779	1778	1777	1775	1774	1771	1772	1774	1770	1773	1771	1774	
10		1767	1766	1760	1756	1750	1747	1744	1739	1739	1736	1731	1729	1730	1730	1729	1732	1731	
15		1724	1721	1714	1707	1698	1685	1679	1674	1670	1665	1662	1663	1661	1658	1656	1655	1657	
20		1652	1645	1636	1629	1615	1600	1588	1583	1580	1572	1568	1565	1561	1564	1564	1561	1561	
25		1546	1539	1525	1517	1505	1491	1476	1468	1464	1455	1451	1446	1444	1442	1439	1436	1438	
30		1407	1397	1386	1377	1365	1354	1337	1327	1322	1313	1307	1308	1303	1296	1289	1284	1280	
35		1230	1222	1215	1210	1201	1189	1175	1166	1162	1153	1148	1148	1138	1127	1113	1101	1087	
40		999	1005	1015	1022	1025	1019	1009	1000	998	990	984	980	969	950	918	885	845	
45		712	759	803	834	844	847	841	836	833	826	824	814	796	770	723	651	585	
50		487	524	603	654	679	689	687	684	685	678	675	664	643	601	535	467	435	
55		381	400	436	500	538	556	557	555	556	550	545	532	505	459	403	368	342	
60		304	318	339	383	426	445	449	447	447	443	439	426	397	350	312	290	271	
65		240	251	266	292	331	354	360	359	358	356	351	336	305	268	245	224	212	
70		181	190	203	220	251	274	283	283	281	280	275	259	230	202	181	164	155	
75		123	131	143	158	182	203	212	214	212	211	205	190	166	141	124	110	100	
80		69.0	76.7	88.6	102	122	140	147	146	143	142	140	128	109	87.2	72.1	59.6	51.3	
85		24.5	30.3	38.5	44.2	46.7	46.8	44.4	41.6	39.1	38.4	38.4	36.5	33.7	29.0	23.2	16.6	12.1	
90		0.03	0.02	0.10	0.21	0.28	0.22	0.23	0.26	0.35	0.35	0.30	0.27	0.22	0.22	0.22	0.06	0.00	
95		0.00	0.00	0.04	0.13	0.22	0.20	0.17	0.25	0.30	0.32	0.25	0.21	0.20	0.18	0.17	0.05	0.00	
100		0.00	0.00	0.04	0.13	0.22	0.24	0.24	0.26	0.31	0.36	0.29	0.25	0.24	0.18	0.15	0.05	0.01	
105		0.05	0.03	0.15	0.20	0.33	0.37	0.38	0.50	0.50	0.55	0.48	0.40	0.33	0.29	0.26	0.19	0.13	
110		0.24	0.22	0.26	0.40	0.53	0.55	0.60	0.66	0.70	0.77	0.65	0.58	0.52	0.53	0.35	0.25	0.30	
115		0.35	0.31	0.43	0.61	0.77	0.79	0.83	0.86	0.85	0.92	0.84	0.80	0.74	0.65	0.51	0.45	0.40	
120		0.47	0.40	0.56	0.81	1.04	1.11	1.12	1.12	1.13	1.18	1.08	1.00	0.90	0.80	0.68	0.53	0.63	
125		0.83	0.80	0.93	0.94	1.16	1.37	1.41	1.43	1.50	1.48	1.41	1.28	1.09	0.93	0.87	0.95	0.90	
130		1.37	1.17	1.26	1.11	1.31	1.53	1.66	1.67	1.71	1.70	1.59	1.43	1.15	1.11	1.12	1.47	1.72	
135		1.86	1.64	1.66	1.18	1.44	1.73	1.81	1.98	1.99	1.91	1.70	1.43	1.21	1.17	1.39	1.83	2.26	
140		2.12	1.93	1.88	1.43	1.49	1.94	2.11	2.27	2.28	2.14	1.95	1.64	1.24	1.22	1.86	2.26	2.67	
145		2.37	2.05	2.12	1.76	1.46	1.91	2.24	2.31	2.38	2.27	2.01	1.63	1.20	1.26	2.03	2.49	3.09	
150		2.40	2.07	2.17	1.83	1.19	1.54	1.91	2.02	2.16	2.17	1.80	1.43	1.07	1.20	1.81	2.14	3.10	
155		2.43	2.12	2.15	1.75	1.11	1.47	1.79	1.96	2.01	2.04	1.81	1.41	1.08	1.24	1.78	1.84	3.16	
160		2.38	2.27	2.15	1.72	1.10	1.53	1.81	1.95	1.98	2.00	1.82	1.53	1.10	1.35	1.92	1.85	3.57	
165		4.49	4.13	3.37	2.37	1.95	2.86	3.74	4.04	4.14	3.94	3.52	2.45	1.75	2.71	4.06	4.56	5.40	
170		5.54	4.90	4.16	2.96	2.20	3.07	4.20	4.68	4.66	4.46	3.82	2.52	2.13	3.44	4.91	5.73	5.84	
175		4.84	5.35	4.84	3.90	2.47	2.53	4.02	4.65	4.72	4.52	3.43	2.03	2.85	4.54	5.60	5.63	5.30	
180		4.78	4.78	4.78	4.78	4.78	4.78	4.78	4.78	4.78	4.78	4.78	4.78	4.78	4.78	4.78	4.78	4.78	

Table 13: Luminous Intensity Data

TEST RESULTS (26W 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)	0.214	0.101
Power Factor	0.9923	0.9170
Test Power (W)	25.47	25.71
THD A%	7.76	12.66
Luminous Efficacy (lm/W)	138.9	137.6
Total Luminous Flux (lm)	3537.6	3536.8
Color Rendering Index (CRI)	82.5	
R9	5.8	
Correlated Color Temperature (CCT)(K)	4861	
Chromaticity Chroma x	0.3498	
Chromaticity Chroma y	0.3616	
Chromaticity Chroma u	0.2107	
Chromaticity Chroma v	0.3268	
Duv	0.0031	
Chromaticity Chroma u'	0.2107	
Chromaticity Chroma v'	0.4902	

Special Color Rendering Indices	
R1	80.3
R2	88.3
R3	93.7
R4	80.8
R5	80.2
R6	83
R7	87.4
R8	66.2
R9	5.8
R10	72
R11	79.6
R12	54.3
R13	82.5
R14	96.8

Table 14: Test data per Sphere-Spectroradiometer Method

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

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)	0.251
Power Factor	0.9921
Power (W)	25.49
Luminous Efficacy (lm/W)	139.3
Total Luminous Flux (lm)	3550.8
Beam Angle (°)	80.6 (0°-180°) / 87.1 (90°-270°)
Center Beam Candle Power (cd)	1744
Maximum Beam Candle Power (cd)	1750 (At: C=160.0, Gamma=2.5)
Spacing Criteria	1.19 (0°-180°) / 1.12 (90°-270°)
Zonal Lumens in the 0 °-60 °Zone	85.15%
Zonal Lumens in the 60 °-90 °Zone	14.51%
Zonal Lumens in the 90 °-120 °Zone	0.08%
Zonal Lumens in the 120 °-180 °Zone	0.26%

Table 15: Test data per Goniophotometer Method

Spectral Power Distribution - Sphere Spectroradiometer Method

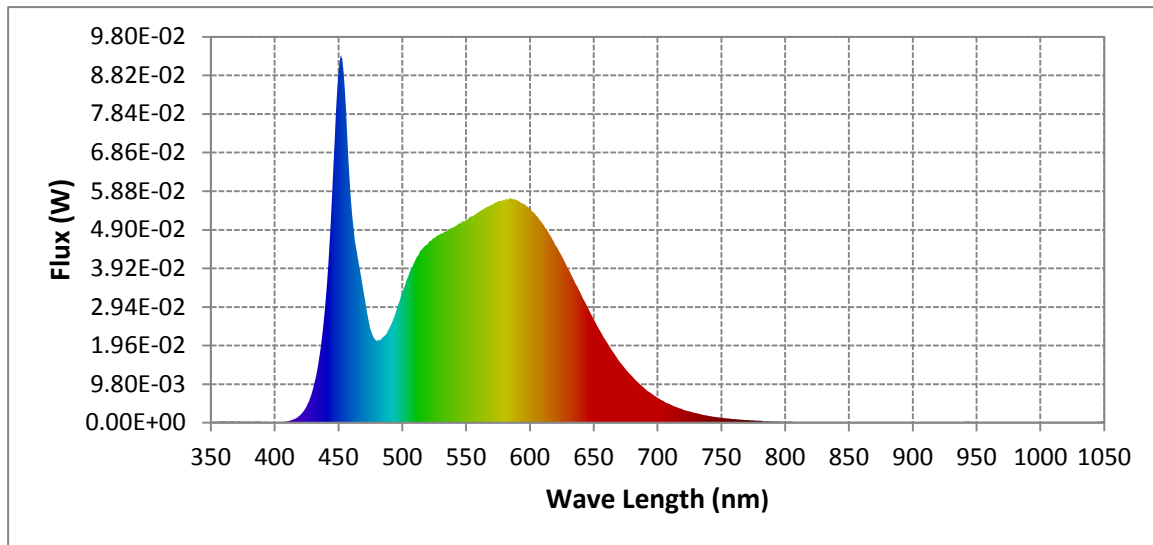


Chart 17: Spectral Power Distribution

Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	3.59E-04	485	2.17E-02	590	5.65E-02	695	7.49E-03
385	2.51E-04	490	2.40E-02	595	5.56E-02	700	6.38E-03
390	2.16E-04	495	2.81E-02	600	5.44E-02	705	5.44E-03
395	1.89E-04	500	3.31E-02	605	5.25E-02	710	4.65E-03
400	1.63E-04	505	3.74E-02	610	5.05E-02	715	3.97E-03
405	1.87E-04	510	4.10E-02	615	4.81E-02	720	3.37E-03
410	3.42E-04	515	4.38E-02	620	4.52E-02	725	2.86E-03
415	8.65E-04	520	4.54E-02	625	4.24E-02	730	2.45E-03
420	1.95E-03	525	4.70E-02	630	3.92E-02	735	2.06E-03
425	4.11E-03	530	4.80E-02	635	3.59E-02	740	1.77E-03
430	8.49E-03	535	4.86E-02	640	3.27E-02	745	1.50E-03
435	1.66E-02	540	4.95E-02	645	2.96E-02	750	1.30E-03
440	3.11E-02	545	5.06E-02	650	2.63E-02	755	1.10E-03
445	5.78E-02	550	5.14E-02	655	2.34E-02	760	9.41E-04
450	8.88E-02	555	5.24E-02	660	2.06E-02	765	8.03E-04
455	8.45E-02	560	5.34E-02	665	1.80E-02	770	6.91E-04
460	5.65E-02	565	5.44E-02	670	1.56E-02	775	5.90E-04
465	4.25E-02	570	5.53E-02	675	1.36E-02	780	5.16E-04
470	3.30E-02	575	5.61E-02	680	1.18E-02		
475	2.40E-02	580	5.64E-02	685	1.02E-02		
480	2.09E-02	585	5.70E-02	690	8.74E-03		

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

Chromaticity Diagram - Sphere Spectroradiometer Method

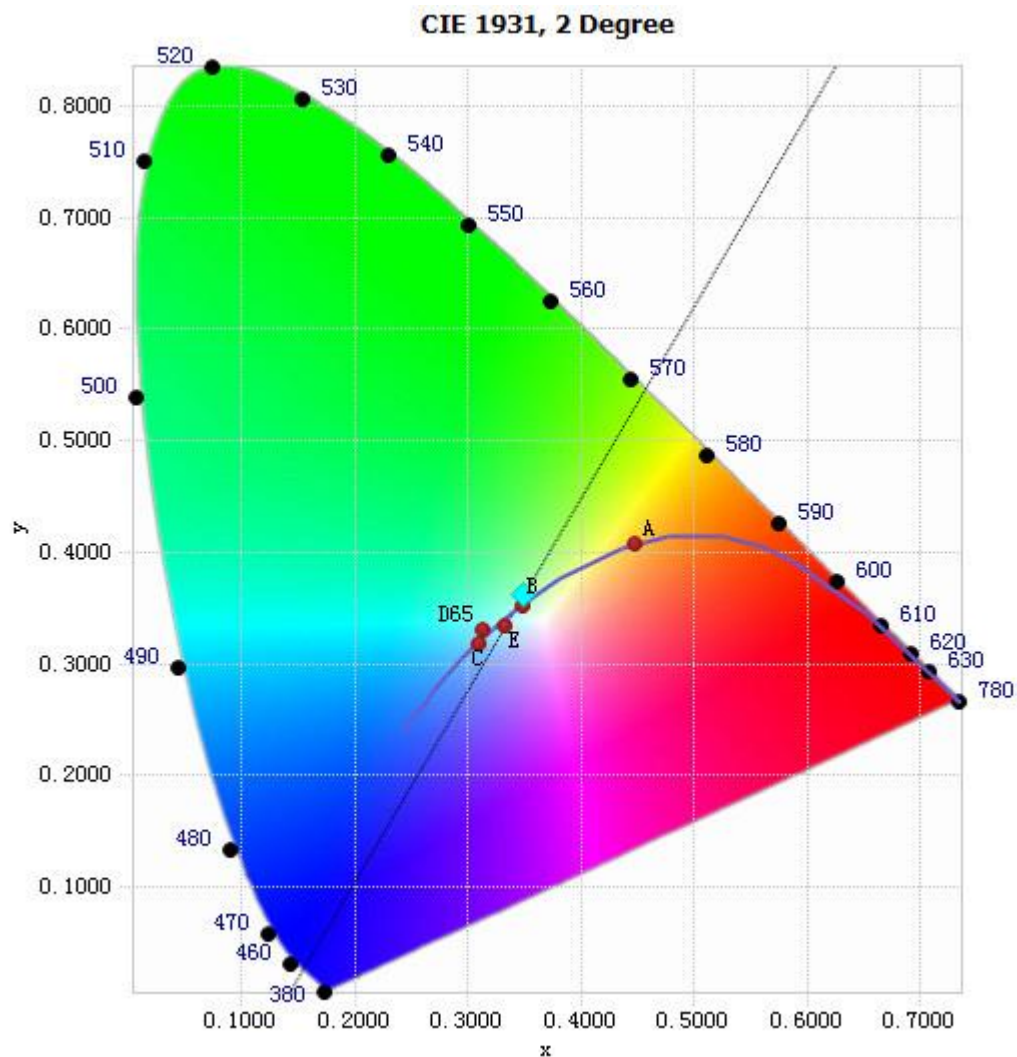


Chart 18: Chromaticity Diagram per Sphere - Spectroradiometer Method

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

Nominal CCT Quadrangles – Sphere Spectroradiometer Method

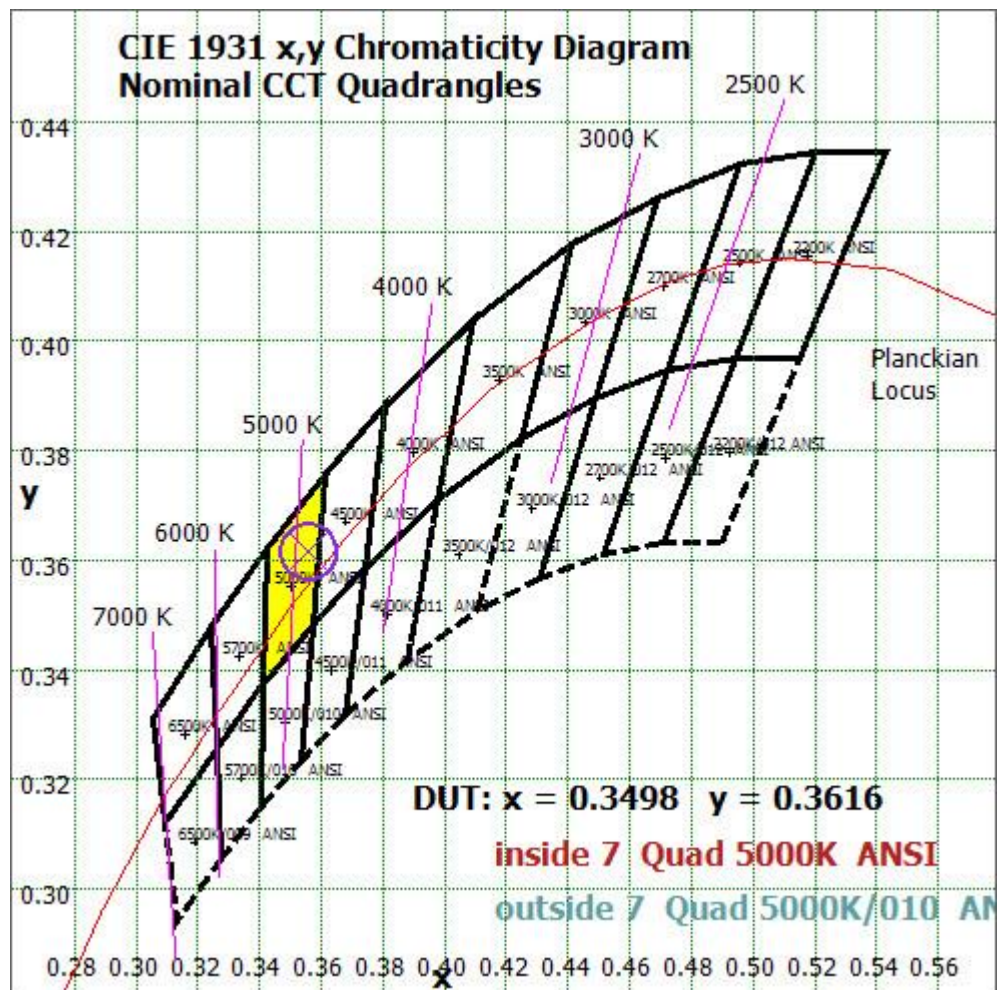


Chart 19: Plot of Lamp x/y coordinates on CIE 1931 Chromaticity Diagram

Color Rendition Report – Sphere Spectroradiometer Method

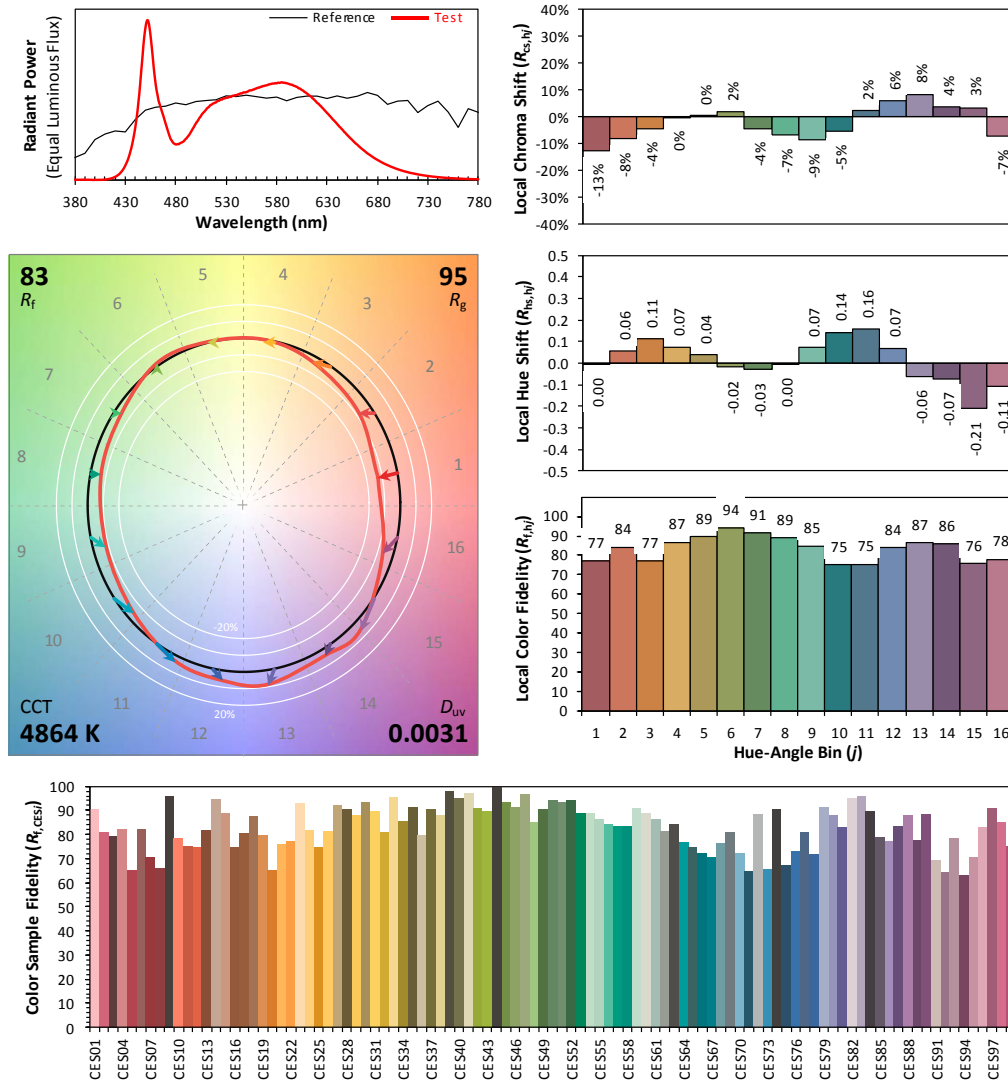
ANSI/IES TM-30-18 Color Rendition Report

Source: LED

Manufacturer: RAB Lighting Inc

Date: 2025/08/01

Model: SWISH2X2



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

x 0.3498
 y 0.3616
 u' 0.2107
 v' 0.4902

CIE 13.3-1995
(CRI)
 R_a 83
 R_g 6

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	164.474	4.63%
10- 20	461.885	13.01%
20- 30	664.617	18.72%
30- 40	713.284	20.09%
40- 50	592.464	16.69%
50- 60	426.683	12.02%
60- 70	294.766	8.30%
70- 80	174.504	4.91%
80- 90	46.046	1.30%
90-100	0.583	0.02%
100-110	0.945	0.03%
110-120	1.429	0.04%
120-130	1.922	0.05%
130-140	2.251	0.06%
140-150	2.009	0.06%
150-160	1.46	0.04%
160-170	1.04	0.03%
170-180	0.392	0.01%
Total	3550.8	100%

$\gamma(^{\circ})$	Lumens	% Total
0- 60	3023.407	85.15%
60- 90	515.316	14.51%
0-90	3538.723	99.66%
90- 180	12.031	0.34%
0- 180	3550.8	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	11.7	13.2	12.1	13.5	13.9	15.2	16.7	15.6	17.1	17.4
3H	13.2	14.5	13.5	14.8	15.2	17.0	18.4	17.4	18.7	19.1
4H	13.6	14.9	14.0	15.3	15.6	17.8	19.1	18.2	19.4	19.8
6H	13.9	15.1	14.3	15.4	15.8	18.5	19.7	18.9	20.1	20.4
8H	14.0	15.1	14.4	15.5	15.9	18.8	19.9	19.2	20.3	20.7
12H	14.0	15.0	14.4	15.4	15.8	18.9	19.9	19.3	20.3	20.8
4H 2H	12.7	13.9	13.1	14.3	14.6	15.6	16.9	16.0	17.2	17.6
3H	14.3	15.3	14.7	15.7	16.1	17.7	18.7	18.1	19.1	19.5
4H	14.9	15.8	15.3	16.2	16.7	18.6	19.6	19.1	20.0	20.4
6H	15.2	16.0	15.7	16.5	16.9	19.6	20.4	20.0	20.8	21.3
8H	15.3	16.1	15.7	16.5	17.0	19.9	20.6	20.3	21.1	21.6
12H	15.3	16.0	15.8	16.5	16.9	20.1	20.7	20.5	21.2	21.7
8H 4H	15.4	16.2	15.9	16.6	17.1	18.8	19.6	19.3	20.0	20.5
6H	15.9	16.5	16.4	17.0	17.5	19.9	20.6	20.4	21.1	21.5
8H	16.0	16.6	16.5	17.1	17.6	20.3	20.9	20.9	21.4	21.9
12H	16.0	16.5	16.5	17.0	17.6	20.6	21.1	21.1	21.6	22.2
12H 4H	15.5	16.2	16.0	16.7	17.2	18.8	19.5	19.3	20.0	20.5
6H	16.1	16.7	16.6	17.1	17.7	20.0	20.5	20.5	21.0	21.5
8H	16.2	16.7	16.7	17.2	17.8	20.4	20.9	20.9	21.4	22.0

Chart 21: UGR Table (Corrected)

Illuminance Plots- Goniophotometer Method

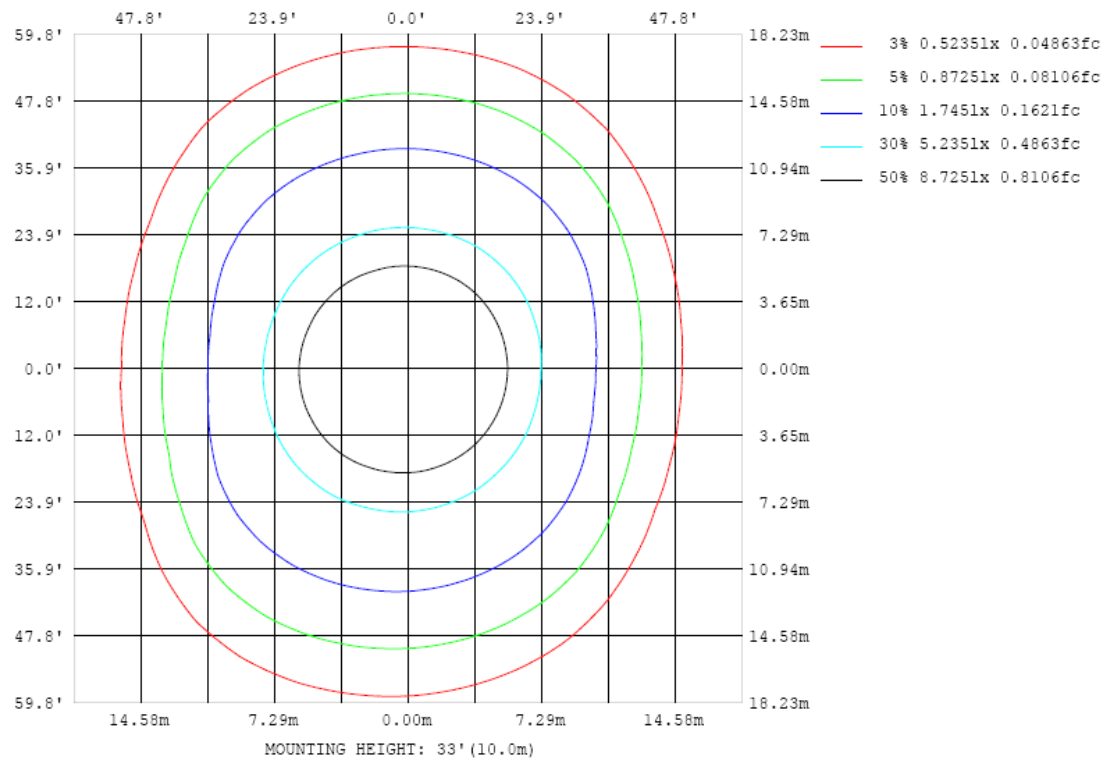


Chart 22: Illuminance Plot (Footcandles)

Luminous Intensity Distribution Plots- Goniophotometer Method

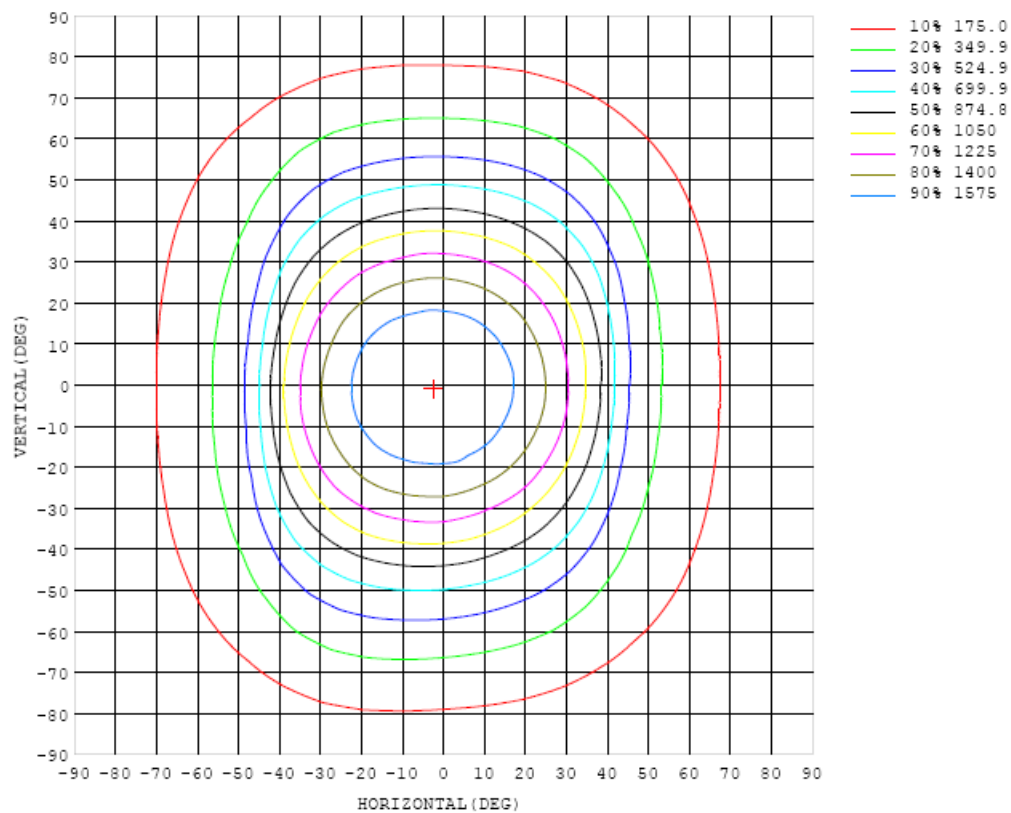


Chart 23: Isocandela Plot

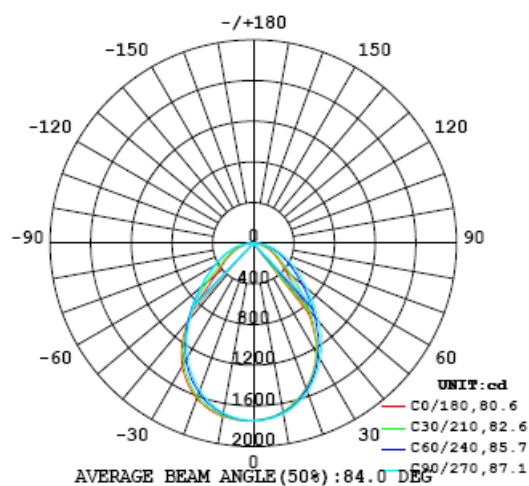


Chart 24: Polar Candela Distribution

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	1744	1744	1744	1744	1744	1744	1744	1744	1744	1744	1744	1744	1744	1744	1744	1744	1744	1744	1744
5	1725	1726	1728	1726	1726	1728	1731	1733	1733	1734	1738	1738	1743	1743	1744	1744	1746	1747	1745
10	1682	1682	1685	1684	1688	1690	1691	1693	1696	1700	1706	1709	1713	1717	1717	1719	1724	1726	1727
15	1608	1612	1610	1611	1616	1622	1628	1627	1636	1640	1647	1653	1658	1667	1675	1678	1685	1689	1689
20	1515	1515	1516	1522	1522	1528	1534	1543	1555	1557	1563	1574	1583	1596	1612	1615	1619	1623	1625
25	1396	1399	1399	1401	1408	1414	1420	1427	1445	1447	1463	1475	1490	1507	1512	1520	1524	1525	1526
30	1240	1242	1245	1249	1255	1271	1278	1287	1301	1314	1328	1347	1368	1384	1393	1396	1401	1398	1395
35	1032	1034	1041	1056	1070	1094	1116	1134	1156	1176	1188	1201	1222	1235	1247	1247	1241	1237	1225
40	788	795	826	858	892	921	946	962	985	1002	1018	1040	1059	1068	1066	1052	1033	1012	999
45	537	544	596	660	713	751	780	802	825	843	863	879	895	900	891	858	803	736	696
50	408	412	431	487	552	600	632	654	673	694	711	728	742	740	717	658	560	498	480
55	322	324	340	367	422	473	508	531	551	569	585	599	609	597	558	479	418	390	375
60	257	260	271	290	325	372	408	430	446	463	476	488	493	477	427	361	328	306	297
65	201	204	212	230	250	286	322	343	359	372	385	396	395	371	320	282	256	241	235
70	146	150	159	173	190	217	248	267	280	292	304	312	307	281	240	213	194	182	176
75	94.8	98.2	108	121	136	158	183	201	213	222	231	236	229	204	174	152	136	125	119
80	47.1	50.5	59.0	71.5	86.1	105	127	144	152	159	169	172	162	139	114	96.5	81.9	71.8	67.1
85	10.3	12.2	17.3	24.7	31.7	37.6	42.8	47.3	50.5	53.8	59.1	64.7	67.1	64.0	56.4	46.2	34.6	26.8	23.2
90	0.45	0.44	0.42	0.62	1.08	0.74	0.97	0.90	0.92	0.98	0.92	0.93	1.21	0.86	0.60	0.59	0.99	0.38	0.13
95	0.64	0.53	0.59	0.69	0.80	0.87	0.92	1.02	1.06	1.06	1.00	1.01	0.98	0.92	0.71	0.58	0.57	0.54	0.06
100	0.93	0.84	0.91	0.96	1.09	1.15	1.20	1.26	1.29	1.28	1.20	1.23	1.19	1.15	0.94	0.81	0.79	0.79	0.07
105	1.32	1.25	1.23	1.30	1.46	1.53	1.56	1.63	1.66	1.69	1.58	1.57	1.57	1.50	1.27	1.11	1.08	1.10	0.21
110	1.69	1.54	1.53	1.70	1.92	1.97	1.98	2.05	2.08	2.08	1.99	2.00	1.99	1.92	1.71	1.45	1.40	1.43	0.33
115	1.96	1.79	1.88	2.01	2.45	2.44	2.41	2.45	2.49	2.44	2.39	2.42	2.39	2.41	2.13	1.76	1.65	1.62	0.51
120	2.62	2.30	2.20	2.65	2.79	2.99	2.95	2.93	2.94	2.91	2.85	2.90	2.92	2.90	2.52	2.22	1.91	1.91	0.62
125	3.33	2.86	2.90	3.24	3.21	3.34	3.53	3.49	3.45	3.44	3.38	3.41	3.45	3.26	2.89	2.59	2.38	2.16	0.94
130	5.33	4.48	4.62	3.59	3.56	3.52	3.82	3.97	3.95	3.89	3.84	3.85	3.69	3.34	2.95	2.69	3.54	3.57	1.53
135	6.58	5.46	5.73	3.83	3.70	3.69	4.03	4.26	4.41	4.34	4.22	4.11	3.77	3.34	2.81	3.29	3.98	4.38	2.05
140	6.74	5.82	6.00	4.15	3.70	3.75	4.12	4.48	4.70	4.62	4.50	4.32	3.81	3.28	2.63	3.88	4.33	4.55	2.44
145	6.82	5.94	5.77	4.38	3.68	3.75	4.13	4.60	4.80	4.80	4.63	4.35	3.84	3.12	2.54	4.10	4.49	4.51	2.62
150	6.55	6.05	5.77	4.61	3.65	3.76	4.13	4.61	4.80	4.78	4.58	4.29	3.79	2.91	2.50	3.98	4.56	4.14	2.56
155	7.35	6.42	5.87	4.82	3.60	3.69	4.12	4.54	4.79	4.64	4.50	4.26	3.83	2.76	2.26	3.61	4.28	4.90	3.05
160	7.02	6.03	5.61	4.56	3.44	3.36	3.93	4.40	4.65	4.59	4.44	4.21	3.77	2.83	2.05	2.96	3.80	4.70	3.26
165	6.50	6.08	5.72	4.79	3.67	3.17	3.63	4.40	4.81	4.82	4.62	4.48	4.08	3.25	2.02	2.20	3.29	4.47	4.63
170	6.48	6.16	5.67	4.78	3.61	3.03	3.52	4.47	4.99	5.14	4.91	4.83	4.59	3.88	2.54	1.96	2.82	3.83	5.04
175	5.49	5.18	5.10	4.13	3.02	2.80	3.47	4.29	4.77	4.91	4.93	4.88	4.66	4.14	3.28	1.97	1.92	2.61	3.22
180	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80

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		1744	1744	1744	1744	1744	1744	1744	1744	1744	1744	1744	1744	1744	1744	1744	1744	1744	
5		1745	1746	1741	1739	1737	1733	1733	1734	1728	1729	1728	1728	1728	1725	1728	1724	1724	
10		1722	1721	1718	1713	1709	1703	1697	1697	1691	1690	1689	1686	1685	1686	1684	1683	1685	
15		1686	1681	1674	1663	1654	1645	1636	1634	1627	1621	1621	1621	1618	1613	1609	1610	1610	
20		1618	1608	1603	1591	1578	1561	1549	1543	1537	1529	1529	1523	1520	1519	1518	1516	1518	
25		1518	1505	1497	1482	1472	1456	1438	1432	1424	1416	1412	1408	1403	1403	1397	1395	1394	
30		1383	1369	1362	1349	1338	1322	1302	1294	1286	1278	1273	1272	1265	1259	1250	1242	1240	
35		1214	1201	1194	1187	1174	1159	1147	1139	1130	1122	1117	1117	1106	1095	1079	1065	1052	
40		987	988	1000	1002	1006	998	986	980	972	964	957	952	940	923	893	855	819	
45		704	748	793	819	828	831	823	819	813	806	803	791	776	752	705	632	572	
50		482	518	592	643	669	677	673	671	668	662	658	649	628	587	522	458	424	
55		376	392	427	490	528	546	547	545	540	537	530	518	492	449	395	359	334	
60		300	312	333	375	419	436	440	440	438	433	429	415	388	344	305	283	265	
65		238	246	262	285	325	348	353	353	350	348	343	328	299	262	239	218	206	
70		179	186	199	216	247	270	279	279	276	273	268	253	226	196	177	161	151	
75		122	129	141	155	178	199	209	210	207	206	201	186	162	138	120	107	97.5	
80		68.9	76.3	88.3	101	120	138	145	144	140	139	138	126	106	85.1	70.0	57.7	49.8	
85		25.0	30.9	39.3	44.5	47.4	47.0	44.1	41.1	38.5	38.2	38.2	36.1	32.9	28.0	22.2	15.7	11.4	
90		0.16	0.18	0.15	0.21	0.29	0.38	0.34	0.30	0.34	0.44	0.39	0.33	0.27	0.27	0.24	0.13	0.08	
95		0.09	0.13	0.09	0.18	0.26	0.33	0.29	0.26	0.36	0.38	0.38	0.30	0.28	0.25	0.24	0.09	0.04	
100		0.09	0.13	0.09	0.18	0.25	0.34	0.31	0.27	0.37	0.41	0.41	0.31	0.30	0.26	0.24	0.12	0.05	
105		0.21	0.24	0.19	0.23	0.32	0.48	0.47	0.48	0.55	0.58	0.59	0.51	0.47	0.37	0.31	0.21	0.25	
110		0.30	0.34	0.29	0.37	0.51	0.63	0.67	0.70	0.78	0.79	0.82	0.71	0.62	0.56	0.47	0.35	0.38	
115		0.46	0.52	0.47	0.58	0.72	0.83	0.87	0.85	0.89	0.96	0.95	0.84	0.84	0.75	0.60	0.50	0.52	
120		0.54	0.56	0.57	0.73	0.95	1.09	1.13	1.12	1.15	1.17	1.19	1.09	1.01	0.83	0.80	0.57	0.69	
125		0.81	0.81	0.87	0.81	1.06	1.34	1.40	1.42	1.47	1.47	1.47	1.36	1.15	1.09	0.99	1.06	1.00	
130		1.25	1.15	1.12	1.03	1.15	1.48	1.64	1.61	1.67	1.67	1.64	1.41	1.20	1.19	1.19	1.60	1.81	
135		1.68	1.54	1.41	1.12	1.33	1.67	1.80	1.89	1.94	1.91	1.73	1.46	1.28	1.25	1.49	1.88	2.29	
140		1.98	1.82	1.66	1.22	1.37	1.93	2.13	2.20	2.22	2.11	1.93	1.62	1.32	1.29	1.91	2.24	2.77	
145		2.07	1.96	1.87	1.49	1.35	1.95	2.25	2.20	2.26	2.23	1.90	1.65	1.26	1.32	2.10	2.43	3.15	
150		2.05	1.88	1.84	1.43	1.09	1.54	1.92	2.05	2.10	2.08	1.80	1.45	1.11	1.34	1.96	2.09	3.16	
155		2.07	1.88	1.83	1.28	1.02	1.48	1.80	1.94	1.96	2.01	1.89	1.46	1.16	1.54	2.05	1.97	3.56	
160		2.05	1.90	1.73	1.22	1.12	1.38	1.97	1.91	2.11	2.00	2.01	1.65	1.17	1.58	2.15	2.17	4.03	
165		4.11	3.96	3.29	2.23	2.03	2.87	3.73	4.03	4.09	3.92	3.53	2.48	1.60	2.39	3.76	4.35	5.49	
170		6.00	5.29	4.61	3.21	2.42	3.13	4.16	4.65	4.61	4.46	3.91	2.55	1.79	2.83	4.26	4.76	6.02	
175		4.65	5.64	5.18	4.32	2.73	2.65	3.92	4.65	4.66	4.51	3.56	1.88	2.28	3.90	4.74	5.32	5.89	
180		4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	

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 ***

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