Photometric Test Report

Relevant Standards

☑ IES LM-79-2019

Prepared For

GREEN CREATIVE LTD

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Catalog Number

EXCYL3/SM/S/8CCT3S/DIM010UNV//*******/CC**

Project Number

4791741321

Report Number

4791741321-1a

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2024-09-12

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Revision Date

N/A

Prepared By	Approved By
Becky Fan	Susie Shao
Becky Fan	Susie Shao

1.0 Test List

Sample Received Date: 2024-09-02

Test No.	Test Item	Sample ID	Model Number	Test Conducted By
1	Integrating Sphere Test	7560632-3	EXCYL3/SM/S/8CCT3S/DIM010UNV/NR/BK/CC	James Tan
2	Integrating Sphere Test	7560632-1	EXCYL3/SM/S/8CCT3S/DIM010UNV/SP/BK/CC	James Tan
3	Integrating Sphere Test	7560632-2	EXCYL3/SM/S/8CCT3S/DIM010UNV/VN/BK/CC	James Tan
4	Integrating Sphere Test	7560632-4	EXCYL3/SM/S/8CCT3S/DIM010UNV/MD/BK/CC	James Tan
5	Goniophotometer Test	7560632-3	EXCYL3/SM/S/8CCT3S/DIM010UNV/NR/BK/CC	James Tan

Remark (if any)

[X] 1. UL test equipment information is recorded on Meter Use in UL's Aurora database.

2.0 Product Description

Luminaire Description: Downlight, Surface Mount

Model Number: EXCYL3/SM/S/8CCT3S/DIM010UNV/NR/BK/CC

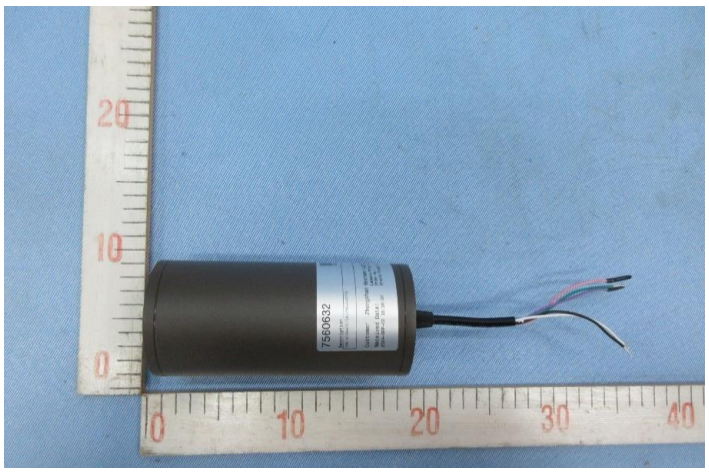
Electrical Ratings and CCT: 120-277V, 50/60Hz, 10W, 3000K/3500K/4000K color tunable

Driver Model Number: GIFBK010W

LED Package: BXCP-30E-11M-J19-3-A1 and BXCP-40E-11M-J19-3-A1 , Bridgelux

Family Model and Variation: EXCYL3/SM/S/8CCT3S/DIM010UNV/**/*******/CC, where "**" represents beam angle, can be SP=15°, VN=25°, NR=40°, MD=60° or blank. "*******" represents finish color, can be BK=Black, WH=White, BZ=Bronze, SV=Silver or RALxxxx=other colors.

Photos of Luminaire Characteristics



3.0 LM-79 Measurement and Test Results

3.1 Integrating Sphere Test at 3000K

Model No.	EXCYL3/SM/S/8CCT3S/DIM010UNV/NR/BK/CC	Sample ID.	7560632-3
Operate time (Min.)	55	Stabilization time (Min.)	50

Test Method

1.The sample was tested according to the IES LM-79-2019, and the product is assume to be brand new without seasoning.
2.Photometric paramters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25º C ± 0.9º C.The reference standard lamp is power 100W omni-directional Incandescent lamp and was calibrated by National Institute of Metrology, China.
3.The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. Coating reflectance of the integrating sphere was 90% to 98%.Photometric measurement conditions was using 4π geometry.The self-absorption factor is applied in the final test result.The sample was operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm.

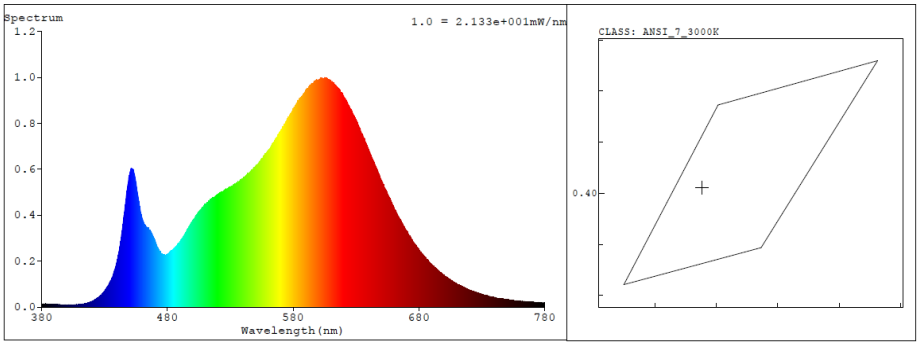
Integrating Sphere Test Conditions

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
24.9	120	60	0.085	9.683	0.9467	Horizontal

Test Results

CCT (K)	CRI (Ra)	R9	x	y	Luminous Flux (lm)	Luminous Efficacy (lm/W)
3139	84.2	11	0.4276	0.4011	1054.6	108.9

Spectrum



Colorimetric Parameters

Chromaticity Coordinate: x = 0.4276 y = 0.4011 / u' = 0.2458 v' = 0.5188 (duv=1.76e-04)
CCT= 3139K Prcp WL: Ld=582.2nm Purity=48.7%
Peak WL: Lp=605nm FWHM: =130.2nm Ratio:R=22.4% G=74.6% B=3.0%
Render Index: Ra = 84.2 TM30:Rf=86 Rg=95

R1 =83	R2 =93	R3 =95	R4 =83	R5 =84	R6 =92	R7 =83	
R8 =61	R9 =11	R10=84	R11=83	R12=75	R13=86	R14=98	R15=75

3.0 LM-79 Measurement and Test Results

3.1 Integrating Sphere Test at 3500K

Model No.	EXCYL3/SM/S/8CCT3S/DIM010UNV/NR/BK/CC	Sample ID.	7560632-3
Operate time (Min.)	55	Stabilization time (Min.)	50

Test Method

1.The sample was tested according to the IES LM-79-2019, and the product is assume to be brand new without seasoning.
2.Photometric paramters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25º C ± 0.9º C.The reference standard lamp is power 100W omni-directional Incandescent lamp and was calibrated by National Institute of Metrology, China.
3.The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. Coating reflectance of the integrating sphere was 90% to 98%.Photometric measurement conditions was using 4π geometry.The self-absorption factor is applied in the final test result.The sample was operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm.

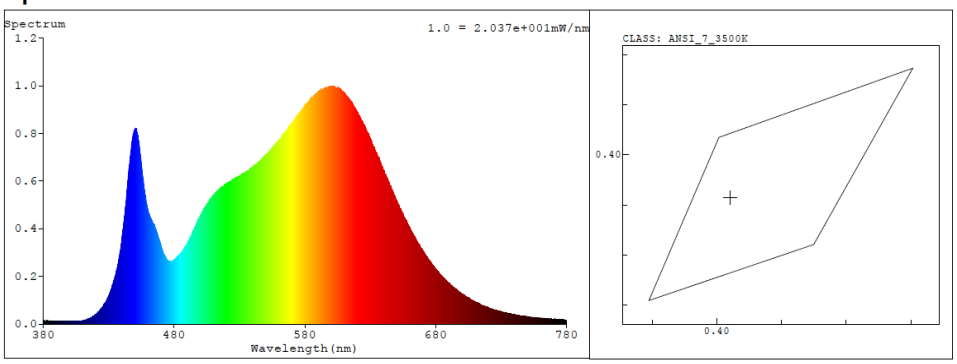
Integrating Sphere Test Conditions

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
25.1	120	60	0.086	9.735	0.9487	Horizontal

Test Results

CCT (K)	CRI (Ra)	R9	x	y	Luminous Flux (lm)	Luminous Efficacy (lm/W)
3580	84.1	9	0.402	0.3914	1098	112.8

Spectrum



Colorimetric Parameters

Chromaticity Coordinate: x = 0.4020 y = 0.3914 / u' = 0.2333 v' = 0.5111 (duv=1.06e-03)
CCT= 3580K Prcp WL: Ld=580.1nm Purity=38.1%
Peak WL: Lp=602nm FWHM: =147.2nm Ratio:R=20.0% G=76.6% B=3.4%
Render Index: Ra = 84.1 TM30:Rf=85 Rg=95

R1 =82	R2 =91	R3 =97	R4 =83	R5 =83	R6 =89	R7 =85	
R8 =63	R9 =9	R10=80	R11=83	R12=70	R13=85	R14=99	R15=75

3.0 LM-79 Measurement and Test Results

3.1 Integrating Sphere Test at 4000K

Model No.	EXCYL3/SM/S/8CCT3S/DIM010UNV/NR/BK/CC	Sample ID.	7560632-3
Operate time (Min.)	55	Stabilization time (Min.)	50

Test Method

1.The sample was tested according to the IES LM-79-2019, and the product is assume to be brand new without seasoning.
2.Photometric paramters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25º C ± 0.9º C.The reference standard lamp is power 100W omni-directional Incandescent lamp and was calibrated by National Institute of Metrology, China.
3.The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. Coating reflectance of the integrating sphere was 90% to 98%.Photometric measurement conditions was using 4π geometry.The self-absorption factor is applied in the final test result.The sample was operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm.

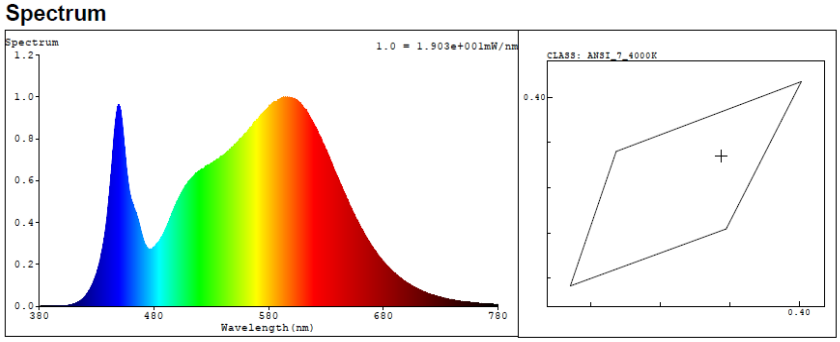
Integrating Sphere Test Conditions

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
25.1	120	60	0.086	9.858	0.9506	Horizontal

Test Results

CCT (K)	CRI (Ra)	R9	x	y	Luminous Flux (lm)	Luminous Efficacy (lm/W)
3858	83	4	0.3888	0.387	1074.8	109.0

Spectrum



Colorimetric Parameters

Chromaticity Coordinate: x = 0.3888 y = 0.3870 / u' = 0.2265 v' = 0.5073 (duv=2.37e-03)
CCT= 3858K Prcp WL: Ld=578.5nm Purity=32.8%
Peak WL: Lp=596nm FWHM: =149.7nm Ratio:R=18.6% G=77.9% B=3.5%
Render Index: Ra = 83.0 TM30:Rf=85 Rg=95
R1 =81 R2 =89 R3 =96 R4 =82 R5 =81 R6 =86 R7 =86
R8 =62 R9 =4 R10=75 R11=82 R12=66 R13=83 R14=98 R15=73

3.0 LM-79 Measurement and Test Results

3.2 Integrating Sphere Test at 3000K

Model No.	EXCYL3/SM/S/8CCT3S/DIM010UNV/SP/BK/CC	Sample ID.	7560632-1
Operate time (Min.)	55	Stabilization time (Min.)	50

Test Method

1.The sample was tested according to the IES LM-79-2019, and the product is assume to be brand new without seasoning.
2.Photometric paramters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25º C ± 0.9º C.The reference standard lamp is power 100W omni-directional Incandescent lamp and was calibrated by National Institute of Metrology, China.
3.The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. Coating reflectance of the integrating sphere was 90% to 98%.Photometric measurement conditions was using 4π geometry.The self-absorption factor is applied in the final test result.The sample was operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm.

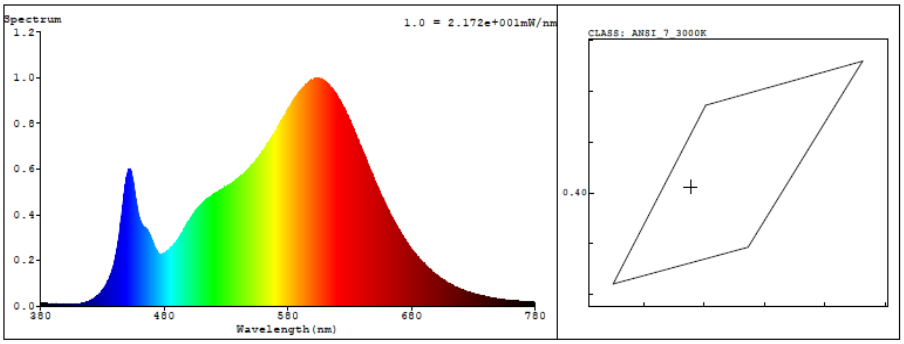
Integrating Sphere Test Conditions

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
24.9	120	60	0.085	9.683	0.9460	Horizontal

Test Results

CCT (K)	CRI (Ra)	R9	x	y	Luminous Flux (lm)	Luminous Efficacy (lm/W)
3137	84.2	11	0.4278	0.4012	1073.4	110.9

Spectrum



Colorimetric Parameters

Chromaticity Coordinate: x = 0.4278 y = 0.4012 / u' = 0.2459 v' = 0.5189 (duv=1.81e-04)
CCT= 3137K Prcp WL: Ld=582.2nm Purity=48.8%
Peak WL: Lp=605nm FWHM: =132.3nm Ratio:R=22.4% G=74.6% B=3.0%
Render Index: Ra = 84.2 TM30:Rf=86 Rg=95
R1 =83 R2 =93 R3 =95 R4 =83 R5 =84 R6 =92 R7 =83
R8 =61 R9 =11 R10=84 R11=83 R12=75 R13=86 R14=98 R15=75

3.0 LM-79 Measurement and Test Results

3.3 Integrating Sphere Test at 3000K

Model No.	EXCYL3/SM/S/8CCT3S/DIM010UNV/VN/BK/CC	Sample ID.	7560632-2
Operate time (Min.)	55	Stabilization time (Min.)	50

Test Method

1.The sample was tested according to the IES LM-79-2019, and the product is assume to be brand new without seasoning.
2.Photometric paramters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25º C ± 0.9º C.The reference standard lamp is power 100W omni-directional Incandescent lamp and was calibrated by National Institute of Metrology, China.
3.The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. Coating reflectance of the integrating sphere was 90% to 98%.Photometric measurement conditions was using 4π geometry.The self-absorption factor is applied in the final test result.The sample was operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm.

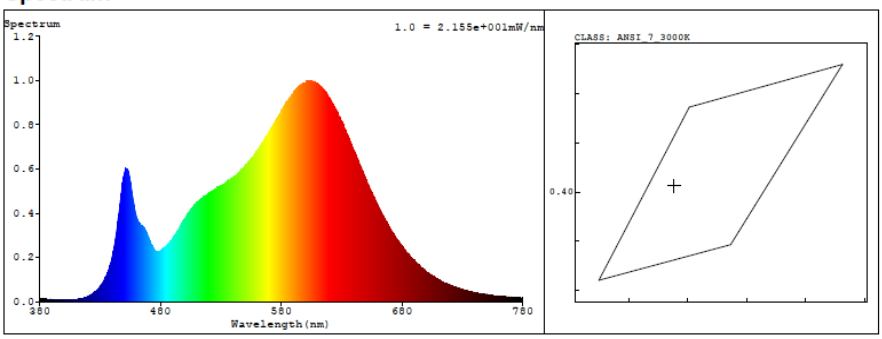
Integrating Sphere Test Conditions

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
24.9	120	60	0.085	9.682	0.9462	Horizontal

Test Results

CCT (K)	CRI (Ra)	R9	x	y	Luminous Flux (lm)	Luminous Efficacy (lm/W)
3138	84.2	11	0.4277	0.4012	1066	110.1

Spectrum



Colorimetric Parameters

Chromaticity Coordinate: x = 0.4277 y = 0.4012 / u' = 0.2458 v' = 0.5189 (duv=2.20e-04)
CCT= 3138K Prcp WL: Ld=582.2nm Purity=48.8%
Peak WL: Lp=604nm FWHM: =132.8nm Ratio:R=22.4% G=74.7% B=3.0%
Render Index: Ra = 84.2 TM30:Rf=86 Rg=95
R1 =83 R2 =93 R3 =95 R4 =83 R5 =84 R6 =92 R7 =83
R8 =61 R9 =11 R10=84 R11=83 R12=75 R13=86 R14=98 R15=75

3.0 LM-79 Measurement and Test Results

3.4 Integrating Sphere Test at 3000K

Model No.	EXCYL3/SM/S/8CCT3S/DIM010UNV/MD/BK/CC	Sample ID.	7560632-4
Operate time (Min.)	55	Stabilization time (Min.)	50

Test Method

1.The sample was tested according to the IES LM-79-2019, and the product is assume to be brand new without seasoning.
2.Photometric paramters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25º C ± 0.9º C.The reference standard lamp is power 100W omni-directional Incandescent lamp and was calibrated by National Institute of Metrology, China.
3.The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. Coating reflectance of the integrating sphere was 90% to 98%.Photometric measurement conditions was using 4π geometry.The self-absorption factor is applied in the final test result.The sample was operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm.

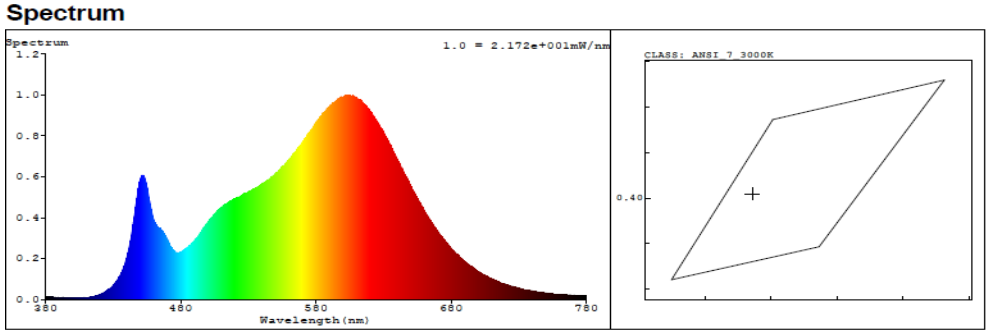
Integrating Sphere Test Conditions

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
24.9	120	60	0.085	9.683	0.9469	Horizontal

Test Results

CCT (K)	CRI (Ra)	R9	x	y	Luminous Flux (lm)	Luminous Efficacy (lm/W)
3146	84.3	11	0.4272	0.4009	1076.4	111.2

Spectrum



Colorimetric Parameters

Chromaticity Coordinate: x = 0.4272 y = 0.4009 / u' = 0.2456 v' = 0.5187 (duv=1.82e-04)
CCT= 3146K Prcp WL: Ld=582.2nm Purity=48.6%
Peak WL: Lp=603nm FWHM: =131.1nm Ratio:R=22.3% G=74.7% B=3.0%
Render Index: Ra = 84.3 TM30:Rf=86 Rg=95

R1 =83	R2 =93	R3 =95	R4 =83	R5 =84	R6 =92	R7 =83	
R8 =61	R9 =11	R10=84	R11=83	R12=75	R13=86	R14=98	R15=75

3.0 LM-79 Measurement and Test Results

3.5 Goniophotometer Test at 4000K

Model No.	EXCYL3/SM/S/8CCT3S/DIM010UNV/NR/BK/CC	Sample ID.	7560632-3
Operate time (Min.)	60	Stabilization time (Min.)	50

Test Method

1.The sample was tested according to the IES LM-79-2019, and the product is assume to be brand new without seasoning.
2.Photometric paramters were measured using a type C goniophotometer and software.
3.The ambient temperature shall be maintained at 25° C ± 0.9° C, measured at a point not more than 1.5 m from the sample and at the same height as the sample. The reference standard lamp is power 400W omni-directional Incandescent lamp and was calibrated by National Institute of Metrology, China.
4.The samples were operated at rated voltage and was stabilized before measurement. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 1° vertical intervals and 22.5° horizontal intervals. Photometric distance was more than five times of the largest dimension of the test SSL product.

Goniophotometer Test Conditions

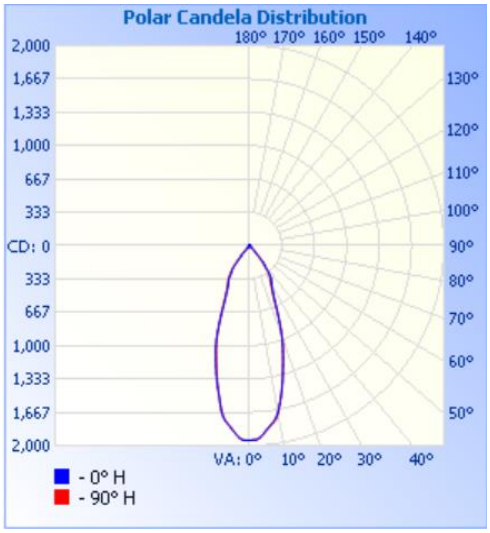
Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
24.4	120	60	0.082	9.79	0.9966	face down

Test Results

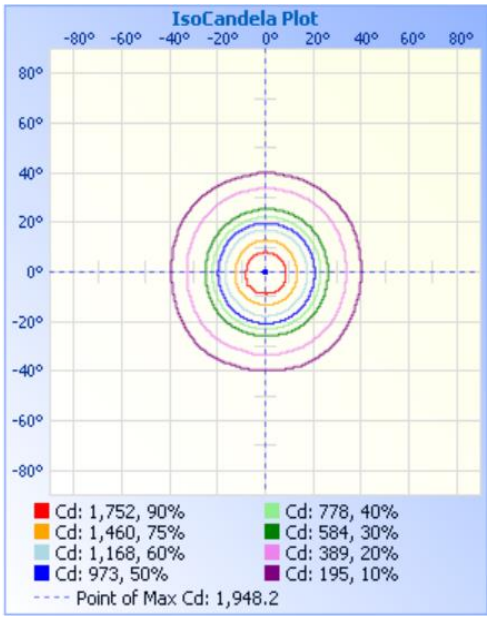
Flux (lm)	Zonal Lumen % (0-60°)	Field Angle (10%)		Beam Angle (50%)		Luminous Efficacy (lm/W)
		Horizontal Spread	Vertical Spread	Horizontal Spread	Vertical Spread	
1105.1	99.7	79.3	79.3	40.4	40.3	112.9

3.5 Goniophotometer Test (Cont'd)

Light Distribution Curve



IsoCandela Plot



3.5 Goniophotometer Test (Cont'd)

Zonal Lumen Summary

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	831.8	75.3%
0-40	1,040.6	94.2%
0-60	1,097.3	99.3%
60-90	4.8	0.4%
70-100	1.7	0.2%
90-120	0.5	0%
0-90	1,102.1	99.7%
90-180	3.0	0.3%
0-180	1,105.1	100%

Lumens Per Zone

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	172.8	15.6%	90-100	0.1	0%
10-20	365.3	33.1%	100-110	0.2	0%
20-30	293.8	26.6%	110-120	0.1	0%
30-40	208.8	18.9%	120-130	0.2	0%
40-50	49.1	4.4%	130-140	0.2	0%
50-60	7.6	0.7%	140-150	0.5	0%
60-70	3.2	0.3%	150-160	0.7	0.1%
70-80	1.2	0.1%	160-170	0.7	0.1%
80-90	0.3	0.0%	170-180	0.3	0%

3.5 Goniophotometer Test (Cont'd)

Intensity Data(cd)

	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5	360
0	1946	1946	1946	1946	1946	1946	1946	1946	1946	1946	1946	1946	1946	1946	1946	1946	1946
1	1942	1941	1942	1944	1943	1944	1947	1946	1948	1948	1948	1947	1945	1945	1942	1941	1944
2	1940	1941	1942	1943	1945	1946	1947	1946	1945	1946	1946	1944	1942	1942	1939	1940	1940
3	1924	1928	1927	1927	1930	1932	1933	1934	1931	1928	1927	1925	1925	1923	1920	1919	1922
4	1897	1899	1897	1896	1900	1904	1900	1901	1898	1898	1896	1897	1897	1896	1892	1890	1894
5	1860	1867	1866	1864	1871	1874	1871	1869	1866	1863	1864	1861	1863	1857	1860	1862	1863
6	1831	1835	1833	1831	1835	1843	1840	1837	1834	1835	1833	1829	1827	1823	1827	1831	1832
7	1801	1807	1805	1805	1808	1813	1812	1806	1802	1806	1807	1804	1799	1795	1795	1798	1803
8	1775	1781	1779	1776	1785	1791	1785	1779	1774	1777	1779	1775	1770	1766	1769	1766	1772
9	1737	1742	1741	1739	1752	1761	1758	1745	1738	1745	1746	1739	1727	1727	1733	1735	1738
10	1687	1688	1682	1677	1695	1702	1699	1680	1676	1677	1688	1681	1668	1669	1674	1681	1685
11	1618	1621	1609	1604	1619	1631	1621	1604	1596	1600	1610	1609	1598	1599	1608	1617	1618
12	1549	1553	1536	1530	1546	1558	1544	1527	1522	1529	1541	1539	1526	1523	1539	1546	1548
13	1476	1482	1463	1456	1470	1473	1461	1457	1458	1446	1459	1461	1451	1450	1476	1477	1477
14	1401	1416	1394	1387	1395	1398	1383	1389	1397	1378	1385	1393	1380	1381	1405	1402	1401
15	1325	1344	1325	1313	1320	1329	1310	1321	1328	1308	1309	1321	1309	1315	1341	1329	1323
16	1244	1275	1254	1244	1249	1256	1238	1256	1261	1243	1239	1252	1245	1251	1271	1253	1244
17	1177	1195	1184	1171	1178	1183	1170	1188	1195	1174	1170	1180	1174	1182	1203	1185	1175
18	1107	1125	1122	1114	1114	1116	1106	1126	1133	1113	1105	1116	1116	1118	1131	1112	1108
19	1043	1051	1055	1051	1050	1050	1052	1068	1073	1055	1047	1052	1054	1057	1062	1049	1045
20	971	981	989	985	984	982	987	1000	1002	993	982	989	991	995	996	979	972
25	620	605	598	603	604	605	606	600	600	608	610	617	624	621	620	624	620
30	456	453	446	444	441	440	439	439	437	441	443	447	452	452	455	459	456
35	382	371	364	351	353	350	345	328	322	337	341	357	358	355	366	374	382
40	217	188	194	194	178	185	196	155	137	189	181	166	183	197	184	201	219
45	61	48	41	56	46	33	36	31	30	35	36	40	47	43	37	54	60
50	13	14	14	16	14	16	15	18	16	16	13	13	13	14	13	13	13
55	9	9	8	8	8	8	8	8	8	8	7	7	8	8	9	8	8
60	6	5	5	5	5	5	5	5	5	5	5	5	5	6	5	5	6
65	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4	4
70	2	2	2	2	2	1	1	1	2	2	1	2	2	2	2	2	2
75	1	1	1	1	2	1	1	1	1	1	1	1	1	1	2	1	1
80	1	1	0	1	0	1	1	1	0	1	1	0	1	1	0	0	1
85	0	0	0	0	0	1	0	1	0	0	1	0	0	0	0	0	0
90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
95	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0
100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
105	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
115	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
120	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
125	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
130	0	1	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0
135	0	1	0	1	1	0	0	0	0	0	1	0	0	0	1	1	0
140	0	0	1	1	0	0	1	1	1	1	1	0	1	0	0	0	1
145	1	0	1	1	1	1	1	1	1	1	0	1	1	0	0	0	1
150	2	1	1	1	2	1	1	1	1	1	1	1	1	2	2	1	1
155	1	1	2	1	1	2	2	2	2	2	2	1	2	1	1	1	2
160	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
165	2	3	3	2	2	3	3	3	3	3	2	2	2	2	2	2	2
170	2	3	3	3	2	3	3	3	3	3	3	2	2	3	3	2	3
175	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3
180	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3

TESTING
NVLAP LAB CODE 200952-0

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