

Report of Test

LLIA000676-008A

Catalog Number: ML5WL-I/D-MO/HO-K40-4-X-LOH/LOH-X-X-UNV

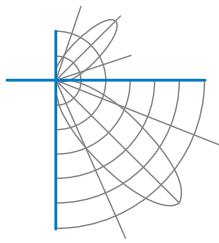
Direct/indirect luminaire, extruded brown aluminum housing, upper and lower white reflectors, translucent white plastic enclosures. 264 white LEDs, four lower Osram PrevaLED Bar boards with 36 LEDs each and four upper Osram PrevaLED Line boards with 30 LEDs each. Two Osram Optotronic OTi 30/120-277/1A0 DIM L LED drivers.
120.0Vac, 60.0Hz, 0.4421A, 52.86W, 0.997PF, 5.88%THD(i)



Performance Summary

Total Light Output	5196 lm
Luminaire Power	52.9 W
Luminous Efficacy	98.2 lm/W

PREPARED FOR : Precision Architectural Lighting, 4830 Timber Creek Drive, Houston, TX 77017,

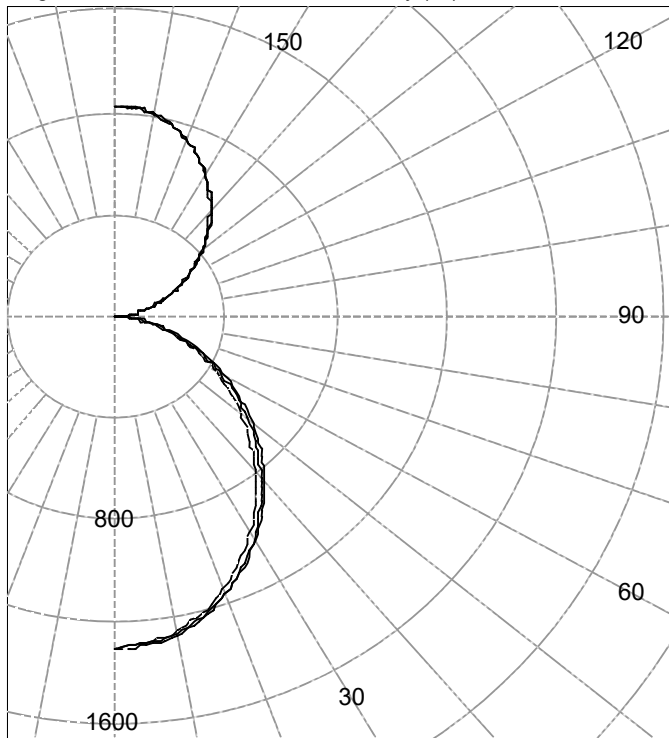


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Legend: C0-Solid, C45-Dashed, C90-Grey (cd)



(Two plane symmetry) C0-C90

AVERAGE LUMINANCE (cd / m²)

Gamma	C0	C45	C90
45.0	6267	6109	5815
55.0	5690	5512	5181
65.0	5065	4870	4526
75.0	4295	4084	3730
85.0	3224	2592	1994

INTENSITY SUMMARY (cd)

Gamma	C-Plane					Flux (lm)
	C0	C22.5	C45	C67.5	C90	
0.0	1305	1305	1305	1305	1305	
5.0	1290	1293	1301	1298	1290	123
10.0	1263	1266	1272	1269	1258	
15.0	1221	1222	1227	1220	1208	344
20.0	1164	1163	1166	1156	1142	
25.0	1095	1092	1091	1079	1063	499
30.0	1015	1011	1007	992	975	
35.0	928	923	915	899	882	569
40.0	836	830	820	802	785	
45.0	741	734	722	703	687	554
50.0	643	637	625	605	591	
55.0	546	541	528	510	497	470
60.0	450	448	435	417	406	
65.0	358	356	344	328	320	339
70.0	269	268	257	244	238	
75.0	186	185	177	166	161	186
80.0	110	110	103	95	92	
85.0	47	45	38	31	29	45
90.0	0	1	1	1	1	

ZONAL FLUX AND PERCENTAGES

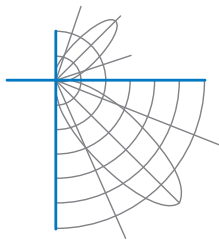
Zone	Flux (lm)	% Lamp	% Luminaire
0-30	966	N / A	18.6
0-40	1535	N / A	29.5
0-60	2559	N / A	49.2
0-90	3129	N / A	60.2
40-90	1594	N / A	30.7
60-90	570	N / A	11.0
90-180	2067	N / A	39.8
0-180	5196	N / A	100.0

Total Light Output = 5,196 lm

Signed:

Michael L. Grather
Authorized Signatory

Date of test 9-Dec-2016
Date of report 9-Dec-2016



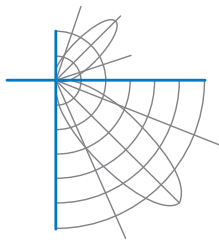
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120.0Vac, 60.0Hz, 0.4421A, 52.86W, 0.997PF, 5.88%THD(i)

Intensity data (cd)

Gamma	C-Plane				
	C0	C22.5	C45	C67.5	C90
0.0	1305	1305	1305	1305	1305
2.5	1297	1300	1308	1306	1298
5.0	1290	1293	1301	1298	1290
7.5	1279	1281	1289	1286	1276
10.0	1263	1266	1272	1269	1258
12.5	1244	1246	1252	1247	1235
15.0	1221	1222	1227	1220	1208
17.5	1194	1194	1198	1190	1177
20.0	1164	1163	1166	1156	1142
22.5	1131	1129	1130	1119	1104
25.0	1095	1092	1091	1079	1063
27.5	1056	1053	1050	1037	1020
30.0	1015	1011	1007	992	975
32.5	973	967	962	946	929
35.0	928	923	915	899	882
37.5	883	877	868	851	834
40.0	836	830	820	802	785
42.5	789	782	771	753	736
45.0	741	734	722	703	687
47.5	692	686	673	654	639
50.0	643	637	625	605	591
52.5	594	589	576	557	543
55.0	546	541	528	510	497
57.5	498	494	481	463	451
60.0	450	448	435	417	406
62.5	403	402	389	372	362
65.0	358	356	344	328	320
67.5	313	312	300	286	278
70.0	269	268	257	244	238
72.5	227	226	216	205	199
75.0	186	185	177	166	161
77.5	147	146	139	129	126
80.0	110	110	103	95	92
82.5	77	76	69	62	60
85.0	47	45	38	31	29
87.5	19	15	9	5	4
90.0	0	1	1	1	1



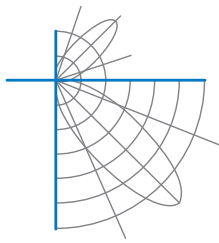
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Intensity data (cd)

Gamma	C-Plane				
	C0	C22.5	C45	C67.5	C90
90.0	0	1	1	1	1
92.5	16	16	16	16	16
95.0	35	35	35	35	35
97.5	55	56	56	55	55
100.0	77	77	77	77	76
102.5	100	101	100	99	98
105.0	125	125	124	123	122
107.5	151	152	150	148	147
110.0	178	179	176	174	172
112.5	207	207	204	200	199
115.0	236	236	232	228	227
117.5	265	265	261	256	255
120.0	295	295	291	285	284
122.5	325	326	321	314	314
125.0	355	356	352	344	344
127.5	385	386	382	375	375
130.0	416	417	413	405	406
132.5	447	447	443	436	437
135.0	477	477	474	467	468
137.5	508	508	504	497	498
140.0	538	537	535	528	529
142.5	567	567	564	558	559
145.0	596	595	593	588	589
147.5	624	623	622	617	617
150.0	650	650	649	645	645
152.5	675	675	675	672	672
155.0	699	699	700	697	697
157.5	721	721	723	720	720
160.0	742	742	745	742	742
162.5	760	760	764	762	761
165.0	777	777	781	780	778
167.5	791	791	796	795	793
170.0	803	803	808	807	805
172.5	812	812	818	817	814
175.0	819	819	825	824	821
177.5	823	823	829	828	824
180.0	827	827	827	827	827



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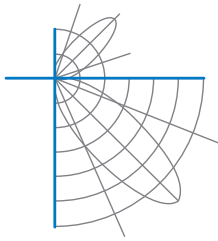
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Coefficients Of Utilization - Zonal Cavity Method																		
Effective Floor Cavity Reflectance 0.20																		
RC	80				70				50			30			10			0
	RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	
0	110	110	110	110	102	102	102	102	89	89	89	77	77	77	66	66	66	60
1	100	96	92	89	94	90	86	83	78	76	74	68	66	64	58	57	56	51
2	91	84	78	73	85	79	73	69	69	65	61	60	57	54	51	49	47	43
3	84	74	67	61	78	69	63	58	61	56	52	53	49	46	46	43	40	37
4	77	66	58	52	71	62	55	49	54	49	44	47	43	40	41	38	35	32
5	70	59	50	44	66	55	48	42	49	43	38	43	38	34	37	33	31	28
6	65	53	45	39	61	50	42	37	44	38	34	39	34	30	34	30	27	24
7	60	48	40	34	56	45	38	33	40	34	30	35	30	27	31	27	24	22
8	56	43	36	30	52	41	34	29	37	31	27	32	28	24	28	25	22	19
9	52	40	32	27	49	38	31	26	34	28	24	30	25	22	26	22	20	18
10	49	37	29	24	46	35	28	23	31	25	22	28	23	20	24	21	18	16

For absolute test reports, CUs are expressed as a percentage of total lumen output. Calculations were based on published IES procedures, and are based on the zonal cavity method. Basic assumptions: 1) Room surfaces are lambertian reflectors. 2) Incident flux on each surface is uniformly distributed. 3) The room is spectrally neutral. When luminaires are not evenly distributed throughout the room, or do not exhibit lateral symmetry, CU values may differ from actual performance.

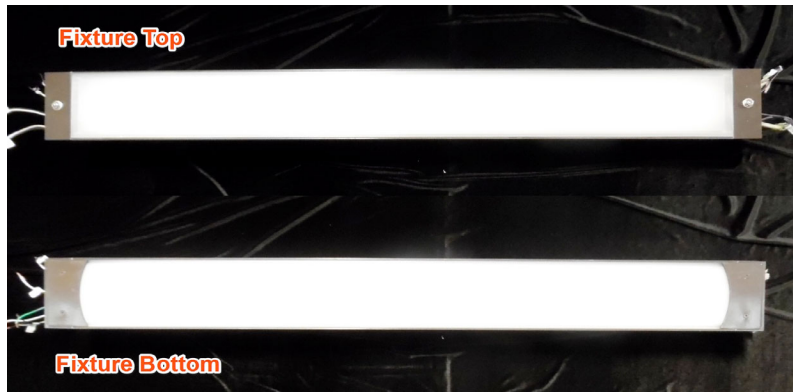
Circle of Light Plot			
Height(ft)	Illuminance at Nadir (fc)	Beam Width (across 50% Nadir Illum)	
		0-180	90-270
6.0	36.3	6.99	6.76
8.0	20.4	9.32	9.01
10.0	13.1	11.65	11.26
12.0	9.1	13.98	13.52
14.0	6.7	16.31	15.77
16.0	5.1	18.64	18.02

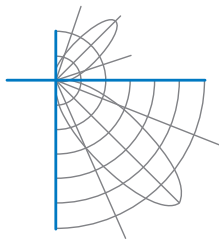


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120.0Vac, 60.0Hz, 0.4421A, 52.86W, 0.997PF, 5.88%THD(i)

Test Distance 9.5 m
Test Temperature 24.8 °C

Notes The laboratory has not participated in the selection of samples to be tested. All testing is performed on the understanding that the significance of the report is limited to the extent that the test sample is representative of production units.

Tested in accordance with the applicable sections of publications: IES LM-79-08 (Sec. 12), IES LM-16-93, IES LM-58-13, CIE 13.3:1995, CIE 15:2004, ANSI C78.377:2011, ANSI C82.77:2002.

The luminous intensity values, and other derived quantities, contained in this report are based on the absolute data, as measured.

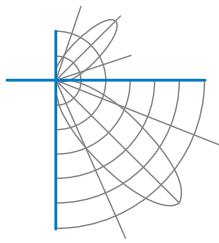
Prorating the performance of the sample for the use of other component combinations (such as lamp / LED / Ballast / driver), or for use in different environmental conditions than that tested, may produce erroneous results.

This report is free of erasures and corrections.

Photometric intensity values are reported using the CIE Gamma coordinate system as defined in CIE publication number 121.

This report may contain data that are not covered by the NVLAP accreditation. Quantities marked with * are not covered.

This report must not be used by the customer to claim product certification, approval or endorsement by NVLAP, NIST, or any agency of the Federal Government.



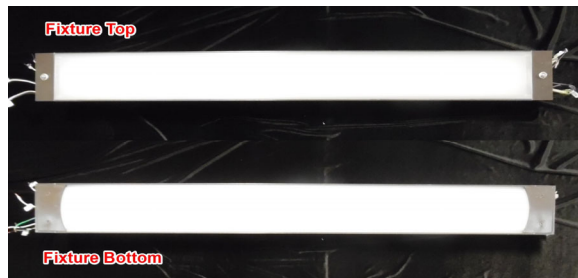
Report of Test

LLIA000676-008B

Integrating Sphere Report

Catalog Number: ML5WL-1/D-MO/HO-K40-4-X-LOH/LOH-X-X-UNV

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Performance Summary

Voltage	120.0 Vac
Current	0.4417 A
Power	52.84 W
Frequency	60.00 Hz
Power Factor	0.997
Current THD	5.9 %

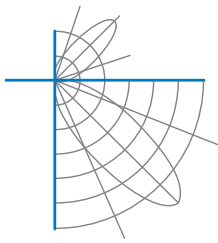
Total Luminous Flux	5606.1 lm
Efficacy	106.1 lm/W
Chromaticity (x,y)	(0.3813, 0.3794)
(u',v')	(0.2246, 0.5029)
Duv	0.0010
CCT	3997 K
CRI (Ra)	84
R9	16

Prepared For:

Precision Architectural Lighting
4830 Timber Creek Drive
Houston, TX 77017, USA

Test date: 12/05/2016

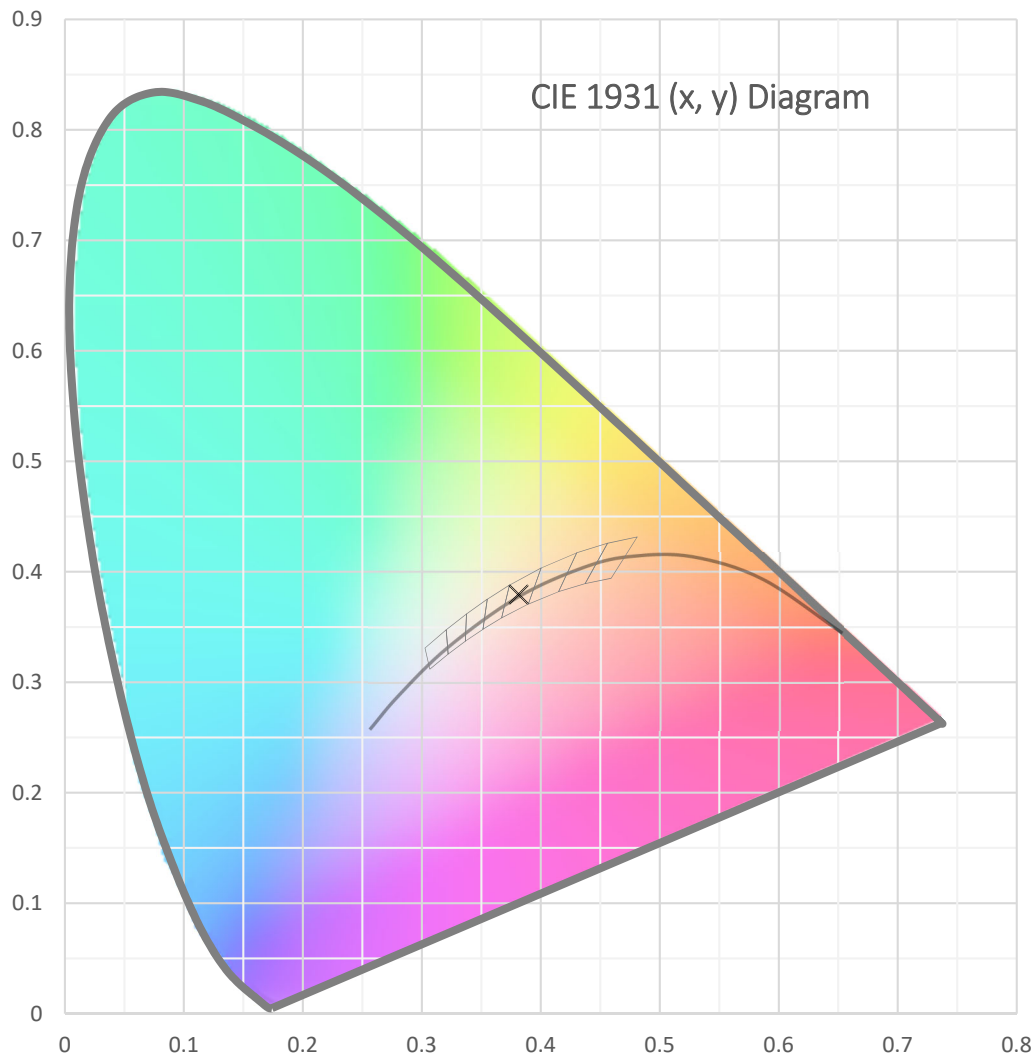
Report date: 12/09/2016

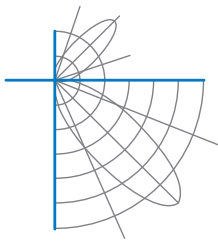


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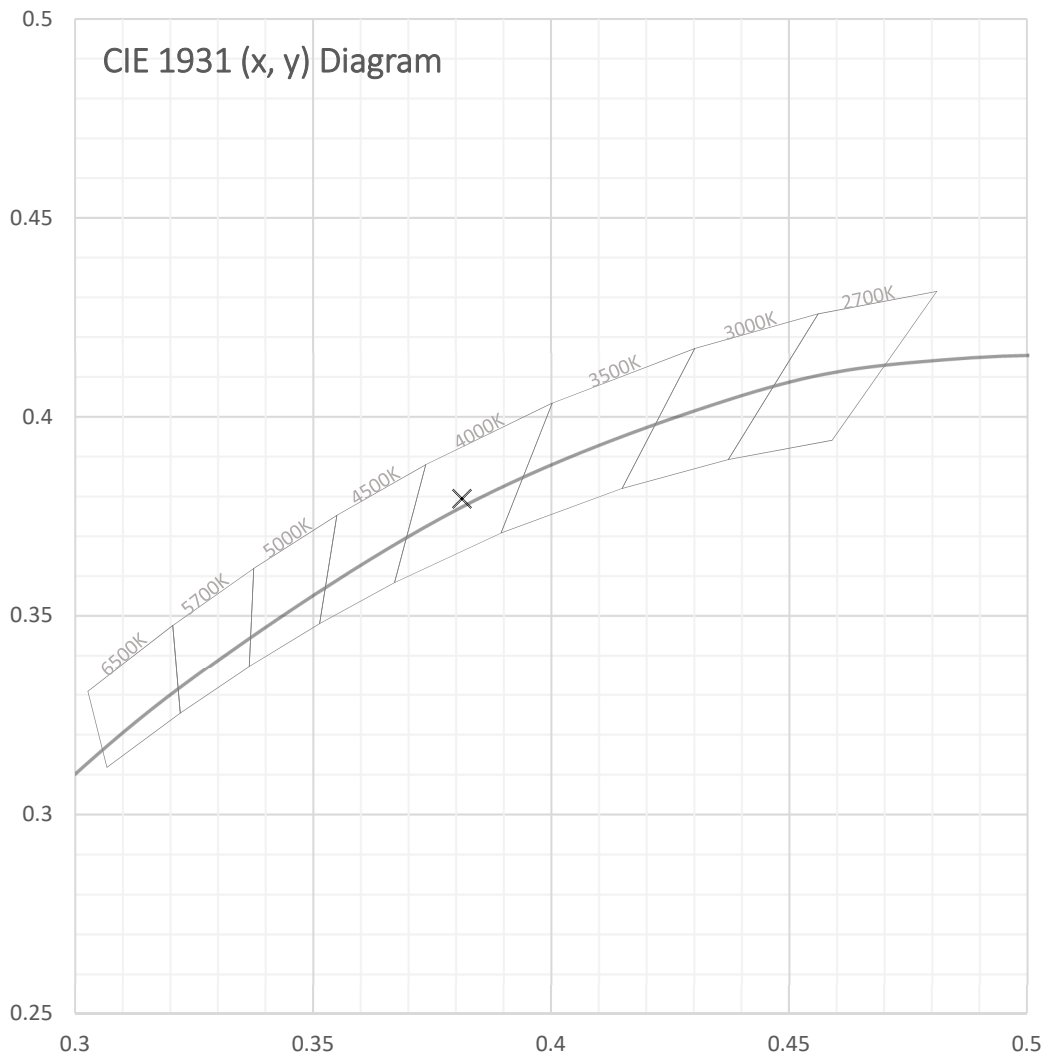


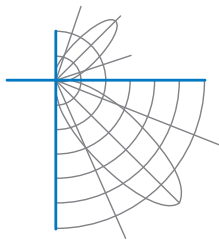


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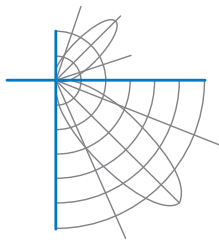
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Spectral Data	Total Radiant Flux	17.38 W
	Total Luminous Flux	5606.1 Lm
	Chromaticity CIE 1931 (x, y)	(0.3813, 0.3794)
	Chromaticity CIE 1976 (u', v')	(0.2246, 0.5029)
	Correlated Color Temperature (CCT)	3997 K
	Color Rendering Index (Ra)	84
	R1	82
	R2	90
	R3	95
	R4	82
	R5	82
	R6	85
	R7	87
	R8	67
	R9	16
	R10	75
	R11	80
	R12	59
	R13	84
	R14	97
	Distance from Planckian Locus (Duv)	0.0010
	Scotopic/Photopic Ratio *	1.692

Electrical Data

Voltage	120.0 Vac
Current	0.4417 A
Power	52.84 W
Frequency	60.00 Hz
Power Factor	0.997
Current THD	5.9 %



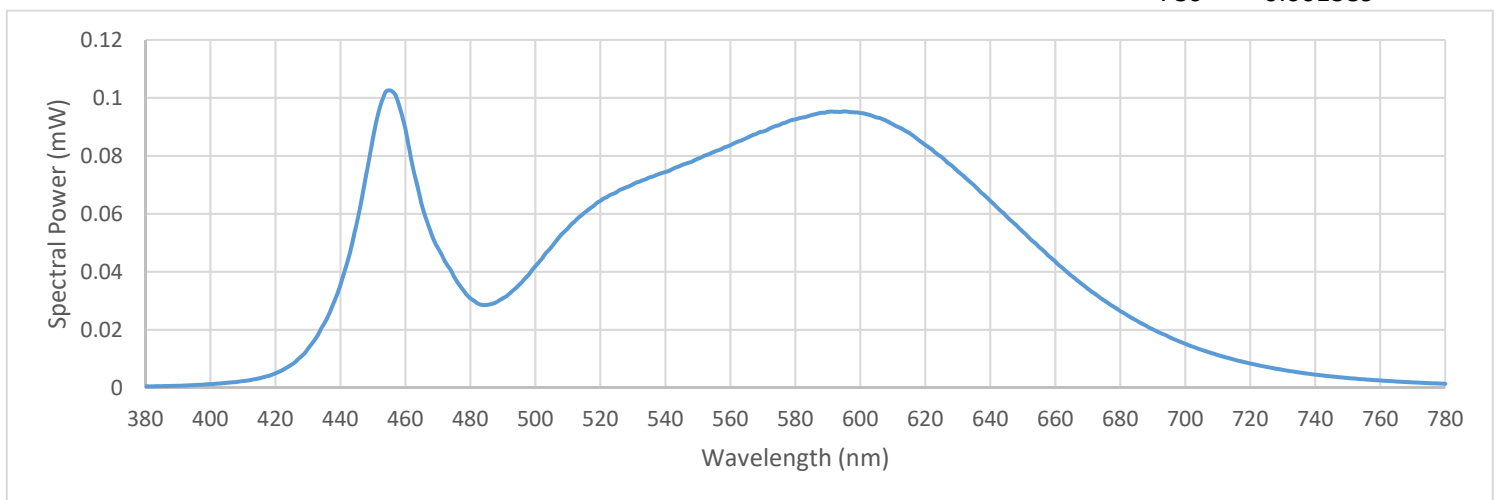
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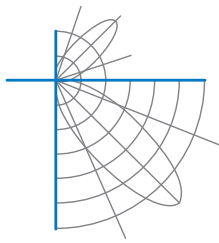
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Summary Spectral Power Distribution (wavelength - nm, spectral power - mW)

380	0.000500	480	0.030859	580	0.092572	680	0.026469
385	0.000552	485	0.028583	585	0.094051	685	0.023176
390	0.000709	490	0.030871	590	0.095190	690	0.020167
395	0.000932	495	0.035517	595	0.095344	695	0.017537
400	0.001245	500	0.041956	600	0.094786	700	0.015192
405	0.001686	505	0.048654	605	0.093252	705	0.013085
410	0.002340	510	0.055030	610	0.090940	710	0.011271
415	0.003247	515	0.060274	615	0.087953	715	0.009753
420	0.004989	520	0.064468	620	0.083739	720	0.008372
425	0.008004	525	0.067485	625	0.079598	725	0.007187
430	0.013441	530	0.070198	630	0.074713	730	0.006191
435	0.022180	535	0.072525	635	0.069848	735	0.005304
440	0.035472	540	0.074443	640	0.064459	740	0.004540
445	0.056684	545	0.076804	645	0.059128	745	0.003922
450	0.086097	550	0.079016	650	0.053850	750	0.003372
455	0.102587	555	0.081431	655	0.048567	755	0.002898
460	0.089248	560	0.083685	660	0.043534	760	0.002520
465	0.063215	565	0.086154	665	0.038634	765	0.002166
470	0.048235	570	0.088377	670	0.034198	770	0.001865
475	0.038266	575	0.090596	675	0.030158	775	0.001607
						780	0.001389





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Test Equipment Configuration: LightLab International Allentown 2m Integrating Sphere
Measurements acquired using a Labsphere CDS 2600 spectroradiometer
Testing was performed using 4 π geometry

Test Temperature: 24.9 °C

Test Procedure: Tested in accordance with the applicable sections of:
LM-79-08, LM-78-07, LM-58-13, ANSI_ANSLG C78.377-2015, ANSI C82-77-10:2014

Significance: The laboratory has not participated in the selection of samples to be tested.
All testing is performed on the understanding that the significance of the report is limited to the extent that the test sample is representative of production units.

Notes: The measurements and other derived quantities contained in this report are based on the absolute data as measured.

Prorating the performance of the sample for the use of other component combinations (such as lamp / LED / Ballast / driver), or for use in different environmental conditions than that tested, may produce erroneous results.

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