

Report of Test

LLIA000676-007A

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

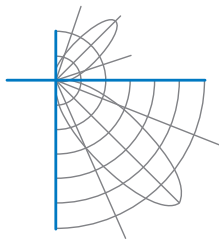
Direct/indirect luminaire, extruded brown aluminum housing, upper and lower white reflectors, translucent white plastic enclosures. 264 white LEDs, four lower Osram PrevaLED Bar boards with 36 LEDs each and four upper Osram PrevaLED Line boards with 30 LEDs each. Two Osram Optotronic OTi 30/120-277/1A0 DIM L LED drivers.
120.0Vac, 60.0Hz, 0.3206A, 38.28W, 0.995PF, 5.13%THD(i)



Performance Summary

Total Light Output	3934 lm
Luminaire Power	38.3 W
Luminous Efficacy	102.7 lm/W

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

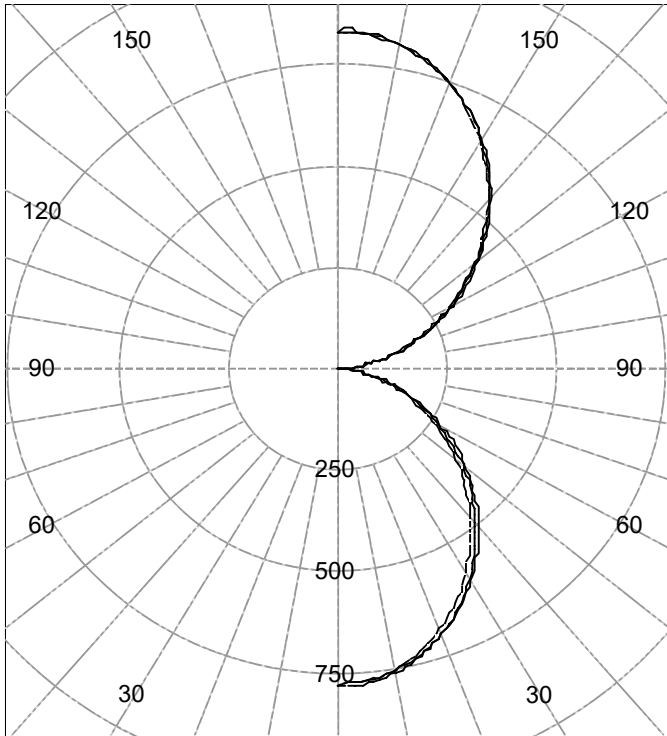


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Legend: C0-Solid, C45-Dashed, C90-Grey (cd)



(Two plane symmetry) C0-C90

AVERAGE LUMINANCE (cd / m²)

Gamma	C0	C45	C90
45.0	3730	3631	3454
55.0	3381	3271	3074
65.0	3008	2887	2685
75.0	2546	2430	2219
85.0	1913	1562	1202

INTENSITY SUMMARY (cd)

Gamma	C-Plane					Flux (lm)
	C0	C22.5	C45	C67.5	C90	
0.0	778	778	778	778	778	
5.0	769	771	775	774	769	73
10.0	753	754	758	756	750	
15.0	728	728	731	727	720	205
20.0	694	693	694	689	680	
25.0	652	651	650	643	633	297
30.0	605	602	600	591	581	
35.0	553	549	545	535	525	339
40.0	498	494	488	477	467	
45.0	441	437	429	418	408	329
50.0	383	379	371	359	351	
55.0	324	322	314	302	295	279
60.0	267	266	258	247	241	
65.0	213	212	204	195	190	201
70.0	160	159	153	145	141	
75.0	110	110	105	99	96	111
80.0	65	65	61	57	55	
85.0	28	27	23	19	18	27
90.0	0	1	1	1	1	

ZONAL FLUX AND PERCENTAGES

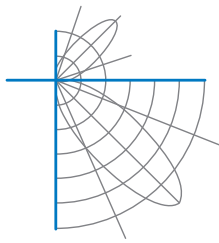
Zone	Flux (lm)	% Lamp	% Luminaire
0-30	575	N / A	14.6
0-40	914	N / A	23.2
0-60	1522	N / A	38.7
0-90	1861	N / A	47.3
40-90	947	N / A	24.1
60-90	339	N / A	8.6
90-180	2073	N / A	52.7
0-180	3934	N / A	100.0

Total Light Output = 3,934 lm

Signed:

Michael L. Grather
Authorized Signatory

Date of test 8-Dec-2016
Date of report 9-Dec-2016



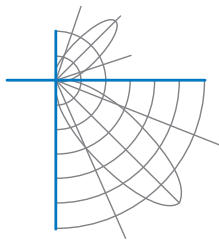
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120.0Vac, 60.0Hz, 0.3206A, 38.28W, 0.995PF, 5.13%THD(i)

Intensity data (cd)

Gamma	C-Plane				
	C0	C22.5	C45	C67.5	C90
0.0	778	778	778	778	778
2.5	773	775	779	778	774
5.0	769	771	775	774	769
7.5	762	764	768	766	761
10.0	753	754	758	756	750
12.5	742	742	746	743	736
15.0	728	728	731	727	720
17.5	712	712	714	709	701
20.0	694	693	694	689	680
22.5	674	673	673	667	658
25.0	652	651	650	643	633
27.5	629	627	625	617	607
30.0	605	602	600	591	581
32.5	579	576	573	563	553
35.0	553	549	545	535	525
37.5	526	522	516	506	496
40.0	498	494	488	477	467
42.5	469	465	458	447	437
45.0	441	437	429	418	408
47.5	412	408	400	388	379
50.0	383	379	371	359	351
52.5	353	350	342	331	322
55.0	324	322	314	302	295
57.5	296	294	286	275	268
60.0	267	266	258	247	241
62.5	240	239	231	221	215
65.0	213	212	204	195	190
67.5	186	185	178	170	165
70.0	160	159	153	145	141
72.5	135	134	129	122	118
75.0	110	110	105	99	96
77.5	87	87	82	77	75
80.0	65	65	61	57	55
82.5	46	46	41	37	36
85.0	28	27	23	19	18
87.5	12	9	5	3	3
90.0	0	1	1	1	1



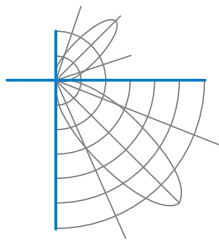
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Intensity data (cd)

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	34	35	35	35	35
97.5	55	55	55	55	55
100.0	76	77	77	76	76
102.5	100	100	100	99	98
105.0	125	125	124	123	122
107.5	151	151	149	148	147
110.0	178	178	176	173	173
112.5	207	207	204	200	199
115.0	236	236	232	228	227
117.5	266	266	261	256	255
120.0	296	296	291	285	285
122.5	326	326	321	315	314
125.0	357	357	352	345	345
127.5	387	387	383	375	376
130.0	418	418	414	406	407
132.5	449	448	445	437	438
135.0	480	479	475	468	469
137.5	511	509	506	499	500
140.0	541	539	536	529	531
142.5	571	569	566	560	561
145.0	599	598	596	590	591
147.5	627	626	624	619	620
150.0	654	653	652	647	648
152.5	679	678	678	674	675
155.0	704	703	703	700	701
157.5	726	725	726	724	724
160.0	747	746	748	746	746
162.5	765	765	768	766	765
165.0	782	782	785	783	783
167.5	796	796	800	799	797
170.0	808	808	812	811	809
172.5	817	817	822	821	819
175.0	824	824	829	828	825
177.5	828	828	833	832	829
180.0	832	832	832	832	832



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Coefficients Of Utilization - Zonal Cavity Method

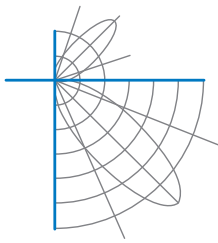
Effective Floor Cavity Reflectance 0.20

RC	80				70				50			30			10			0
	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
0	107	107	107	107	98	98	98	98	82	82	82	67	67	67	54	54	54	47
1	97	93	89	86	89	86	82	80	72	70	68	59	58	56	48	47	46	40
2	89	81	75	70	81	75	70	65	63	59	56	52	50	47	42	40	39	34
3	81	72	64	59	74	66	60	55	56	51	47	46	43	40	37	35	33	29
4	74	64	56	50	68	59	52	47	50	45	40	41	38	34	34	31	29	25
5	68	57	49	43	62	52	45	40	45	39	35	37	33	30	30	27	25	22
6	63	51	43	37	58	47	40	35	40	35	31	34	29	26	28	24	22	19
7	58	46	38	33	53	43	36	31	36	31	27	31	26	23	25	22	20	17
8	54	42	34	29	50	39	32	27	33	28	24	28	24	21	23	20	18	15
9	50	38	31	26	46	35	29	24	31	25	21	26	22	19	21	18	16	14
10	47	35	28	23	43	33	26	22	28	23	19	24	20	17	20	17	15	13

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

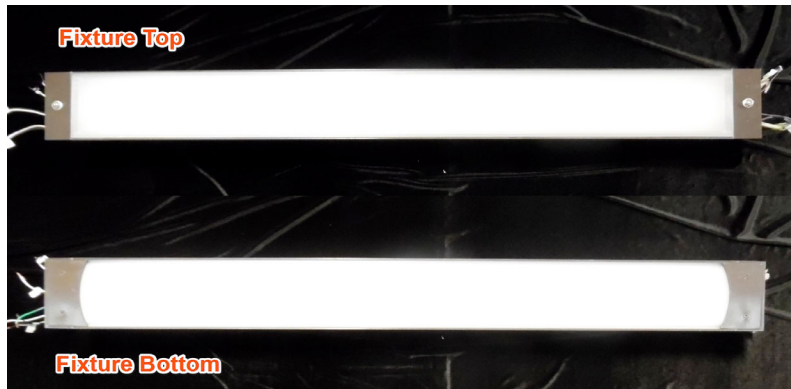
Height(ft)	Illuminance at Nadir (fc)	Beam Width (across 50% Nadir Illum)	
		0-180	90-270
6.0	21.6	6.99	6.75
8.0	12.2	9.32	9.00
10.0	7.8	11.65	11.25
12.0	5.4	13.98	13.50
14.0	4.0	16.31	15.75
16.0	3.0	18.64	18.00

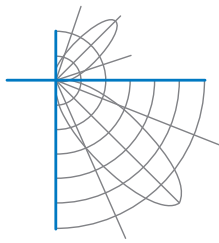


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120.0Vac, 60.0Hz, 0.3206A, 38.28W, 0.995PF, 5.13%THD(i)

Test Distance 9.5 m
Test Temperature 24.5 °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.

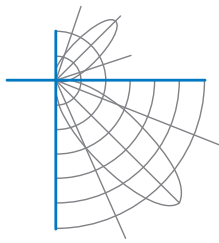
Prorating the performance of the sample for the use of other component combinations (such as lamp / LED / Ballast / driver), or for use in different environmental conditions than that tested, may produce erroneous results.

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

LLIA000676-007B

Integrating Sphere Report

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

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Performance Summary

Voltage	120.0 Vac
Current	0.3202 A
Power	38.23 W
Frequency	60.00 Hz
Power Factor	0.995
Current THD	5.2 %

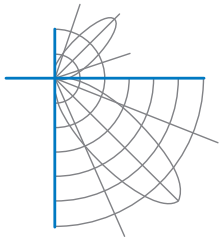
Total Luminous Flux	4209.0 lm
Efficacy	110.1 lm/W
Chromaticity (x,y)	(0.3813, 0.3791)
(u',v')	(0.2247, 0.5027)
Duv	0.0008
CCT	3994 K
CRI (Ra)	84
R9	16

Prepared For:

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

Test date: 12/05/2016

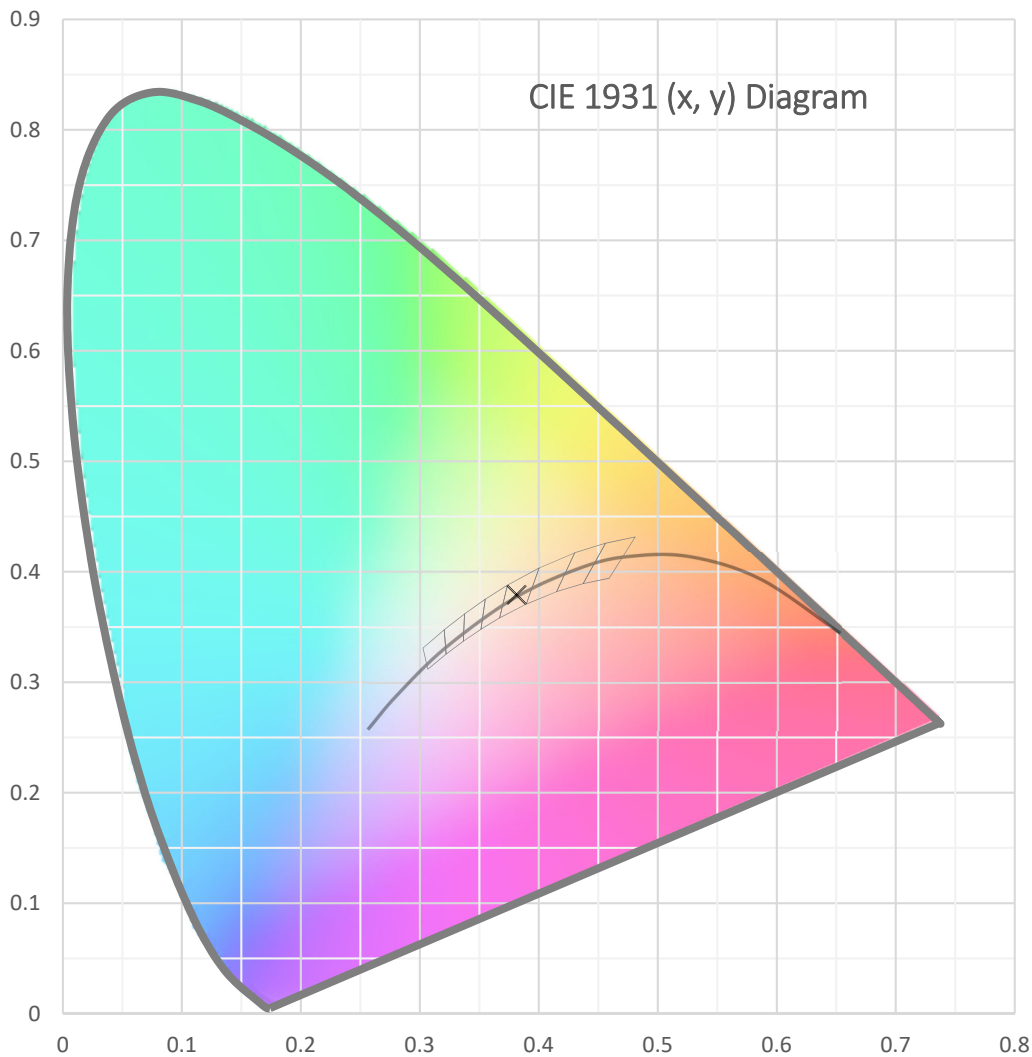
Report date: 12/09/2016

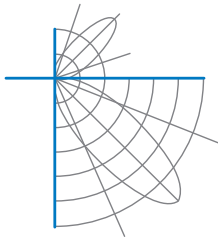


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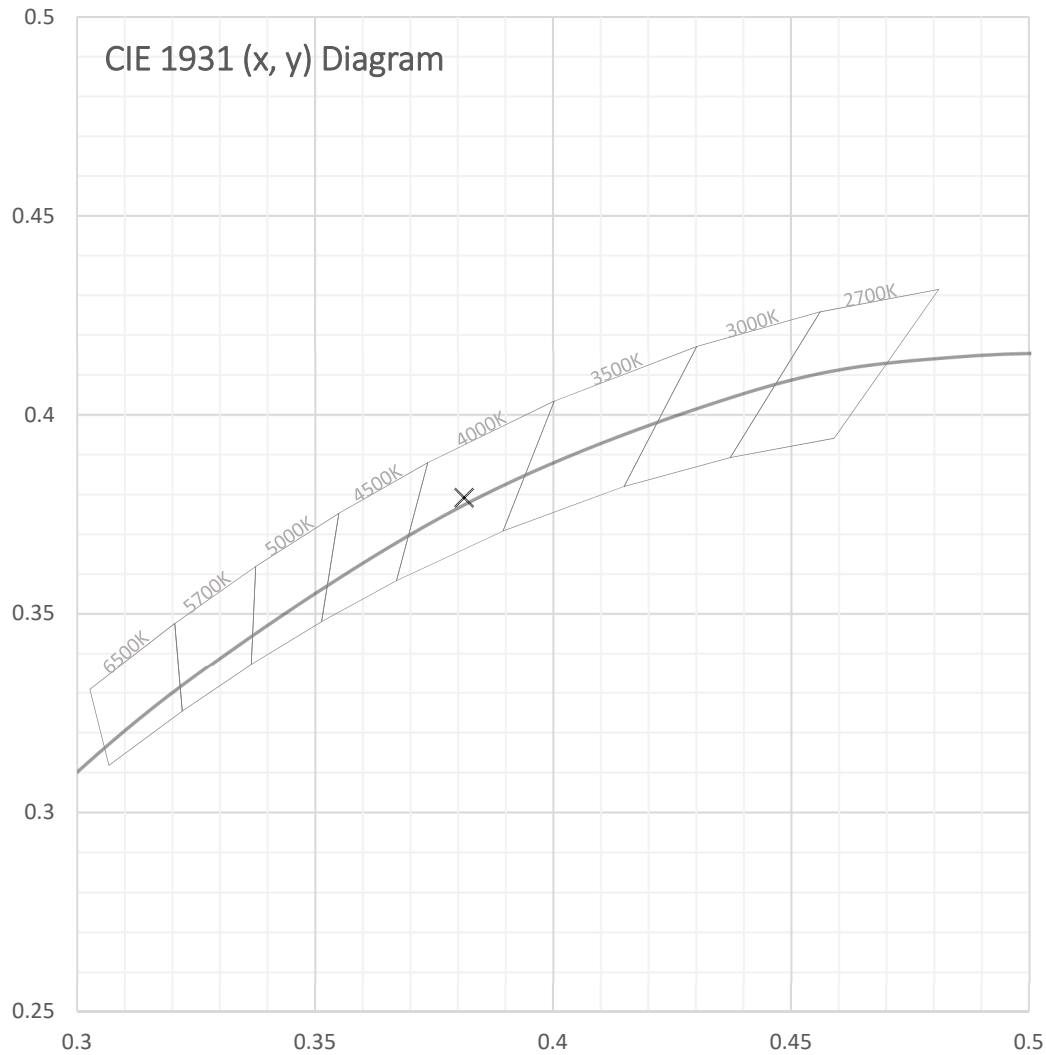


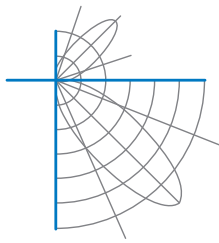


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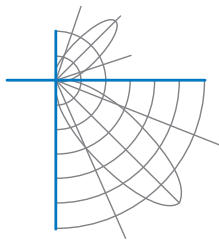
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Spectral Data	Total Radiant Flux	13.06 W
	Total Luminous Flux	4209.0 Lm
	Chromaticity CIE 1931 (x, y)	(0.3813, 0.3791)
	Chromaticity CIE 1976 (u', v')	(0.2247, 0.5027)
	Correlated Color Temperature (CCT)	3994 K
	Color Rendering Index (Ra)	84
	R1	82
	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)	0.0008
	Scotopic/Photopic Ratio *	1.687

Electrical Data

Voltage	120.0 Vac
Current	0.3202 A
Power	38.23 W
Frequency	60.00 Hz
Power Factor	0.995
Current THD	5.2 %



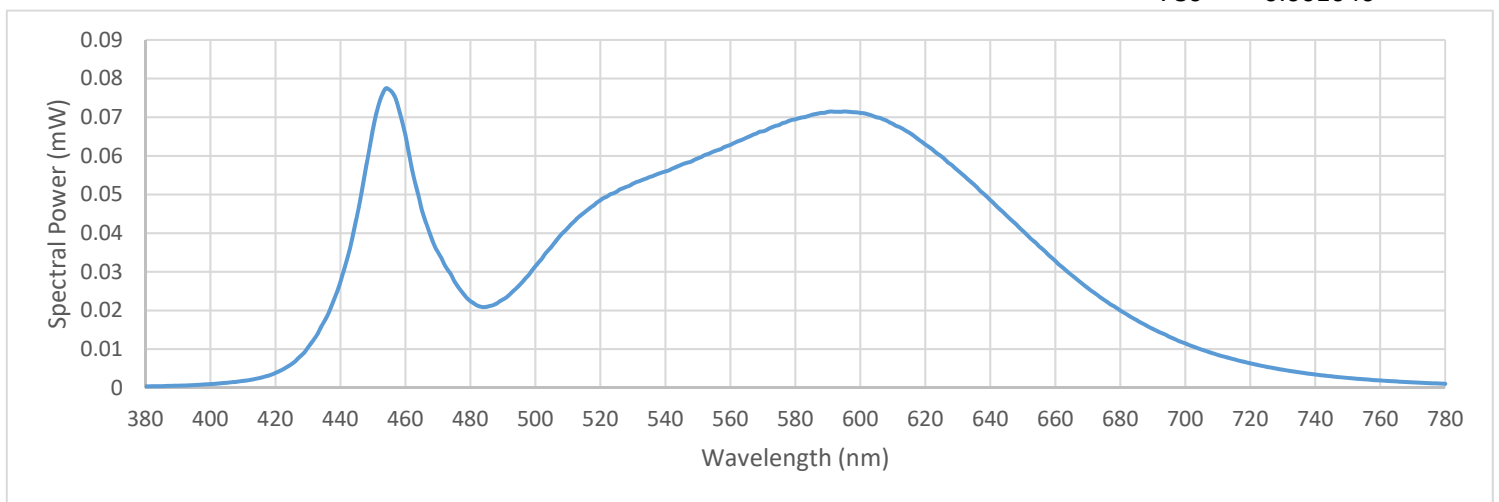
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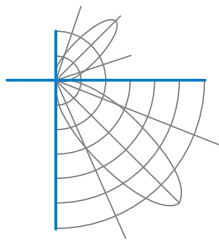
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Summary Spectral Power Distribution (wavelength - nm, spectral power - mW)

380	0.000376	480	0.022422	580	0.069452	680	0.019992
385	0.000427	485	0.020947	585	0.070599	685	0.017515
390	0.000544	490	0.022845	590	0.071389	690	0.015244
395	0.000715	495	0.026472	595	0.071486	695	0.013242
400	0.000966	500	0.031434	600	0.071103	700	0.011492
405	0.001293	505	0.036552	605	0.069965	705	0.009886
410	0.001791	510	0.041375	610	0.068272	710	0.008515
415	0.002502	515	0.045314	615	0.066059	715	0.007371
420	0.003838	520	0.048499	620	0.062944	720	0.006325
425	0.006164	525	0.050723	625	0.059847	725	0.005427
430	0.010403	530	0.052808	630	0.056215	730	0.004672
435	0.017156	535	0.054489	635	0.052576	735	0.004004
440	0.027362	540	0.055966	640	0.048555	740	0.003433
445	0.044067	545	0.057739	645	0.044558	745	0.002960
450	0.066900	550	0.059374	650	0.040615	750	0.002545
455	0.077134	555	0.061177	655	0.036613	755	0.002193
460	0.065351	560	0.062849	660	0.032834	760	0.001902
465	0.046186	565	0.064712	665	0.029183	765	0.001636
470	0.035117	570	0.066341	670	0.025815	770	0.001403
475	0.027673	575	0.067985	675	0.022747	775	0.001214
						780	0.001046





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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: 25.5 °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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