

Report of Test

LLIA000676-002A

Catalog Number: ML3WL-D-HO-K40-4-X-LOH-X-X-UNV

Pendant mounted, extruded aluminum housing, white inner reflector, white plastic enclosure.

144 white LEDs, four Osram PrevaLED Bar boards with 36 LEDs each.

One Osram Optotronic OTi 30/120-277/1A0 DIM L LED driver.

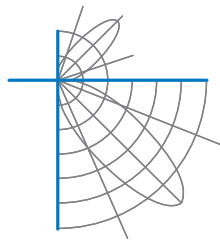
120.0Vac, 60.0Hz, 0.2366A, 28.31W, 0.997PF, 5.75%THD(i)



Performance Summary

Total Light Output	2683 lm
Luminaire Power	28.3 W
Luminous Efficacy	94.8 lm/W

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



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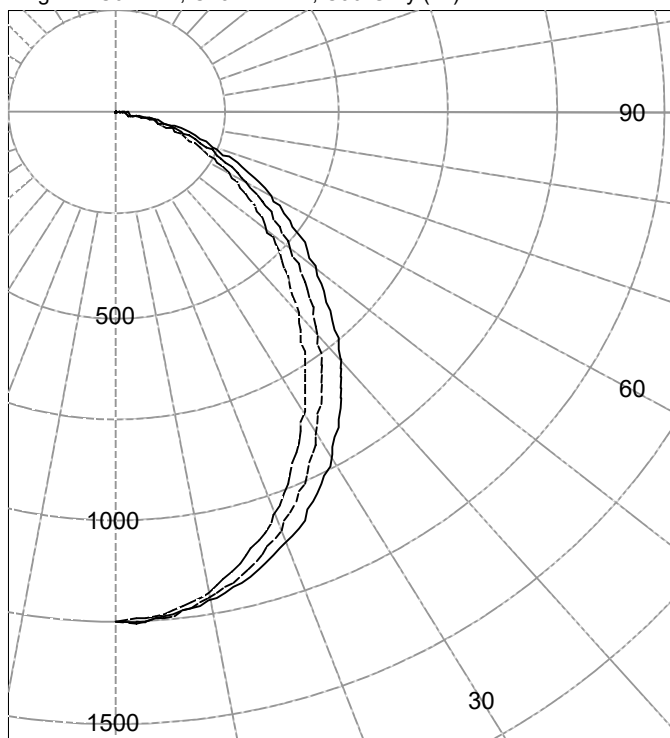
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Legend: C0-Solid, C45-Dashed, C90-Grey (cd)



AVERAGE LUMINANCE (cd / m²)

Gamma	C0	C45	C90
45.0	9809	8704	7736
55.0	8655	7474	6475
65.0	7463	6265	5233
75.0	5994	4814	3745
85.0	3879	2084	1096

INTENSITY SUMMARY (cd)

Gamma	C-Plane					Flux (lm)
	C0	C22.5	C45	C67.5	C90	
0.0	1250	1250	1250	1250	1250	117
5.0	1242	1236	1245	1240	1234	
10.0	1218	1209	1212	1202	1194	
15.0	1178	1165	1159	1141	1131	325
20.0	1123	1106	1088	1061	1048	460
25.0	1054	1033	1003	967	952	
30.0	974	948	909	866	848	
35.0	884	855	810	761	743	506
40.0	787	758	709	657	640	471
45.0	687	659	610	559	542	
50.0	588	563	515	467	451	
55.0	492	471	425	382	368	382
60.0	400	382	341	304	291	262
65.0	313	298	262	231	219	
70.0	230	218	190	163	154	
75.0	154	145	123	104	96	132
80.0	87	82	65	52	47	26
85.0	34	29	18	11	9	
90.0	0	0	0	0	0	

ZONAL FLUX AND PERCENTAGES

Zone	Flux (lm)	% Lamp	% Luminaire
0-30	902	N / A	33.6
0-40	1408	N / A	52.5
0-60	2262	N / A	84.3
0-90	2683	N / A	100.0
40-90	1274	N / A	47.5
60-90	421	N / A	15.7
90-180	0	N / A	0.0
0-180	2683	N / A	100.0

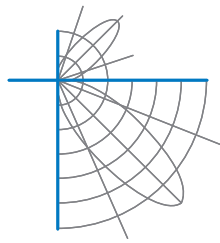
Total Light Output = 2,683 lm

Spacing Criterion: 0-180 1.2
Spacing Criterion: 90-270 1.1

Signed:

Michael L. Grather
Authorized Signatory

Date of test 23-Nov-2016
Date of report 30-Nov-2016



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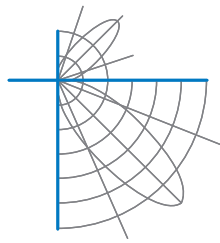
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One Osram Optotronic OTi 30/120-277/1A0 DIM L LED driver.

120.0Vac, 60.0Hz, 0.2366A, 28.31W, 0.997PF, 5.75%THD(i)

Intensity data (cd)

Gamma	C-Plane				
	C0	C22.5	C45	C67.5	C90
0.0	1250	1250	1250	1250	1250
2.5	1248	1242	1253	1250	1244
5.0	1242	1236	1245	1240	1234
7.5	1232	1225	1231	1224	1217
10.0	1218	1209	1212	1202	1194
12.5	1200	1189	1188	1174	1165
15.0	1178	1165	1159	1141	1131
17.5	1152	1138	1125	1103	1091
20.0	1123	1106	1088	1061	1048
22.5	1090	1071	1047	1015	1001
25.0	1054	1033	1003	967	952
27.5	1015	992	957	917	901
30.0	974	948	909	866	848
32.5	930	902	860	813	795
35.0	884	855	810	761	743
37.5	836	807	759	709	691
40.0	787	758	709	657	640
42.5	738	708	659	607	590
45.0	687	659	610	559	542
47.5	637	611	562	512	496
50.0	588	563	515	467	451
52.5	540	516	469	424	409
55.0	492	471	425	382	368
57.5	446	426	382	342	329
60.0	400	382	341	304	291
62.5	356	340	301	266	254
65.0	313	298	262	231	219
67.5	270	257	225	196	186
70.0	230	218	190	163	154
72.5	191	181	156	133	124
75.0	154	145	123	104	96
77.5	119	112	93	76	70
80.0	87	82	65	52	47
82.5	58	54	40	30	26
85.0	34	29	18	11	9
87.5	14	8	2	1	1
90.0	0	0	0	0	0



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Coefficients Of Utilization - Zonal Cavity Method

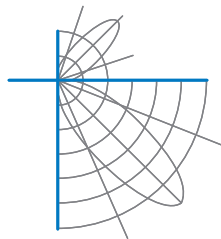
Effective Floor Cavity Reflectance 0.20

RC RW	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	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	100
1	110	106	102	98	107	103	100	97	99	96	94	95	93	91	92	90	88	86
2	101	93	87	82	98	91	86	81	88	83	79	85	81	77	82	78	75	73
3	92	83	75	69	90	81	74	69	78	72	67	76	70	66	73	69	65	63
4	85	74	66	59	83	73	65	59	70	64	58	68	62	58	66	61	57	55
5	79	67	58	52	77	66	58	52	63	56	51	62	55	51	60	54	50	48
6	73	60	52	46	71	59	51	46	58	51	45	56	50	45	55	49	45	43
7	68	55	47	41	66	54	46	41	53	46	40	51	45	40	50	44	40	38
8	63	51	42	37	62	50	42	37	49	42	37	47	41	36	46	40	36	34
9	59	47	39	33	58	46	38	33	45	38	33	44	38	33	43	37	33	31
10	56	43	36	31	55	43	35	30	42	35	30	41	35	30	40	34	30	28

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	34.7	7.00	6.27
8.0	19.5	9.33	8.37
10.0	12.5	11.66	10.46
12.0	8.7	13.99	12.55
14.0	6.4	16.32	14.64
16.0	4.9	18.65	16.73



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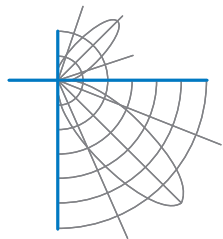
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120.0Vac, 60.0Hz, 0.2366A, 28.31W, 0.997PF, 5.75%THD(i)

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.

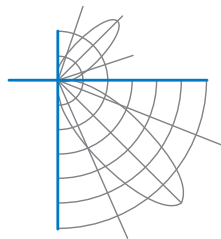
Prorating the performance of the sample for the use of other component combinations (such as lamp / LED / Ballast / driver), or for use in different environmental conditions than that tested, may produce erroneous results.

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

LLIA000676-002B

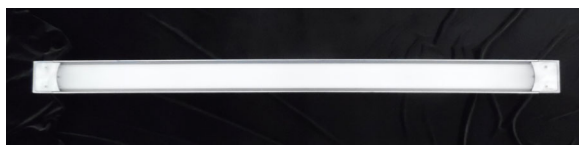
Integrating Sphere Report

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Performance Summary

Voltage	120.0 Vac
Current	0.2365 A
Power	28.29 W
Frequency	60.00 Hz
Power Factor	0.997
Current THD	5.8 %
Total Luminous Flux	2805.3 lm
Efficacy	99.2 lm/W
Chromaticity (x,y)	(0.3809, 0.3789)
(u',v')	(0.2246, 0.5026)
Duv	0.0009
CCT	4003 K
CRI (Ra)	83
R9	13

Prepared For:

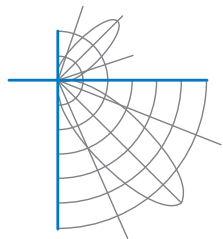
Precision Architectural Lighting

4830 Timber Creek Drive

Houston, TX 77017, USA

Test date: 11/28/2016

Report date: 11/30/2016



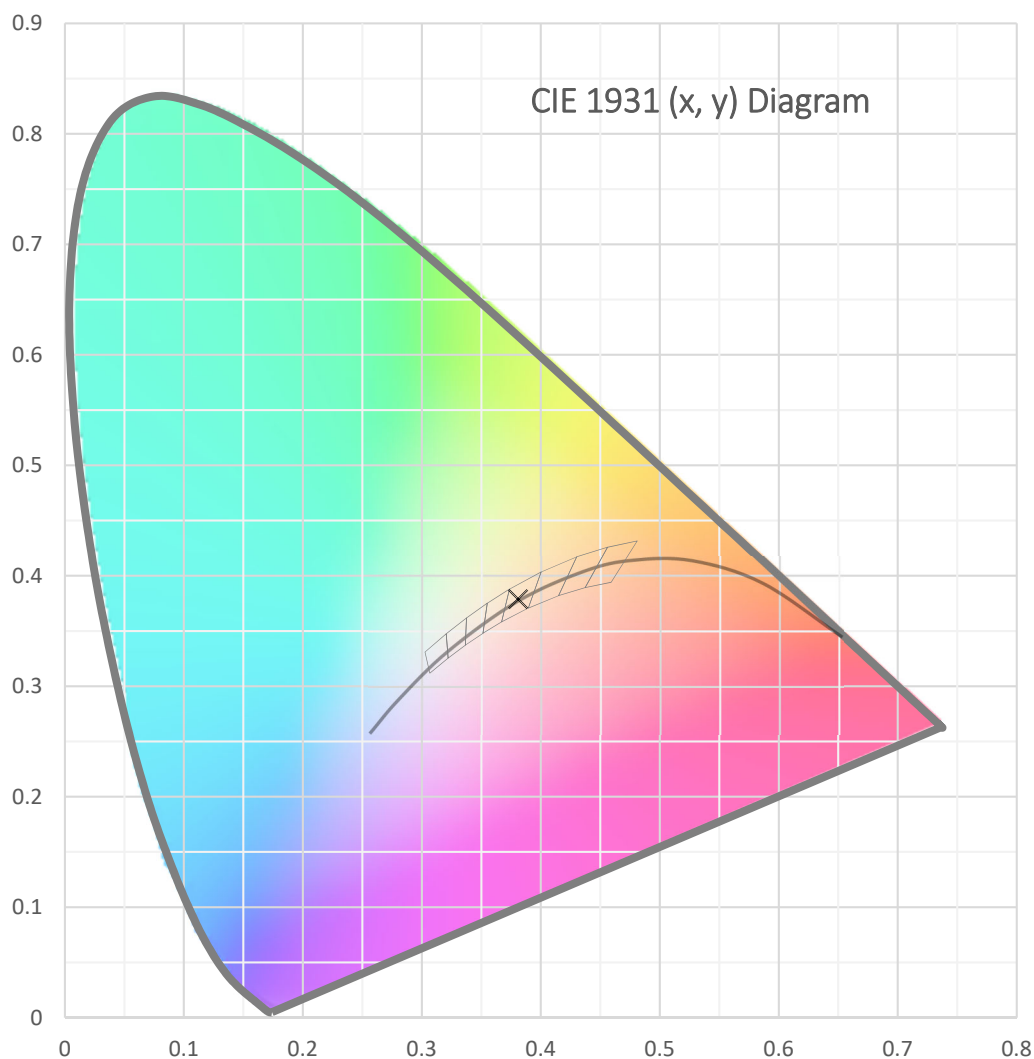
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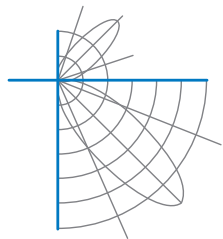
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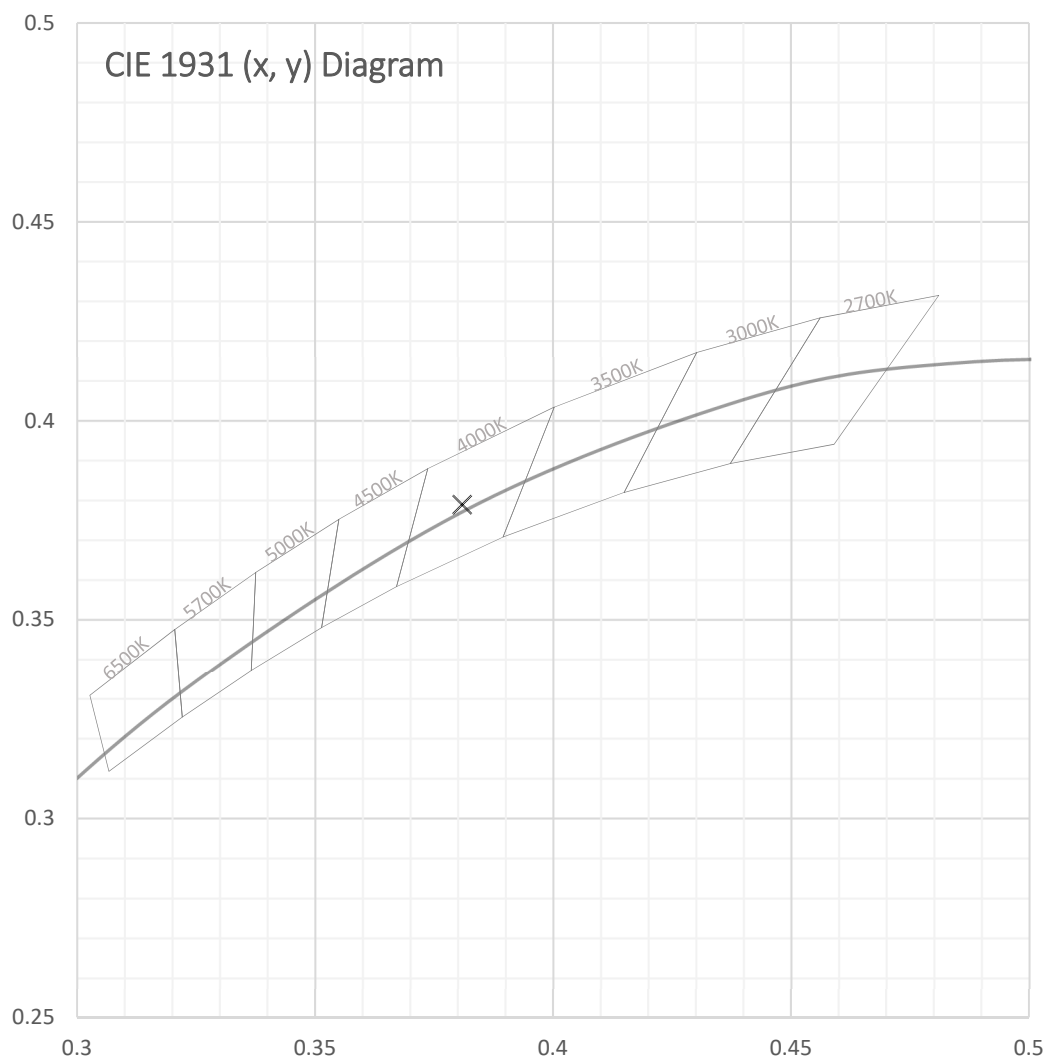
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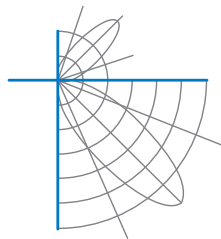
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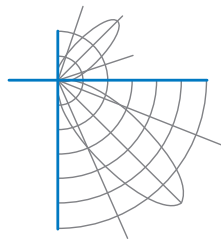
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Spectral Data

Total Radiant Flux	8.657 W
Total Luminous Flux	2805.3 Lm
Chromaticity CIE 1931 (x, y)	(0.3809, 0.3789)
Chromaticity CIE 1976 (u', v')	(0.2246, 0.5026)
Correlated Color Temperature (CCT)	4003 K
Color Rendering Index (Ra)	83
R1	81
R2	89
R3	94
R4	81
R5	81
R6	84
R7	87
R8	66
R9	13
R10	73
R11	79
R12	58
R13	83
R14	97
Distance from Planckian Locus (Duv)	0.0009
Scotopic/Photopic Ratio *	1.676

Electrical Data

Voltage	120.0 Vac
Current	0.2365 A
Power	28.29 W
Frequency	60.00 Hz
Power Factor	0.997
Current THD	5.8 %



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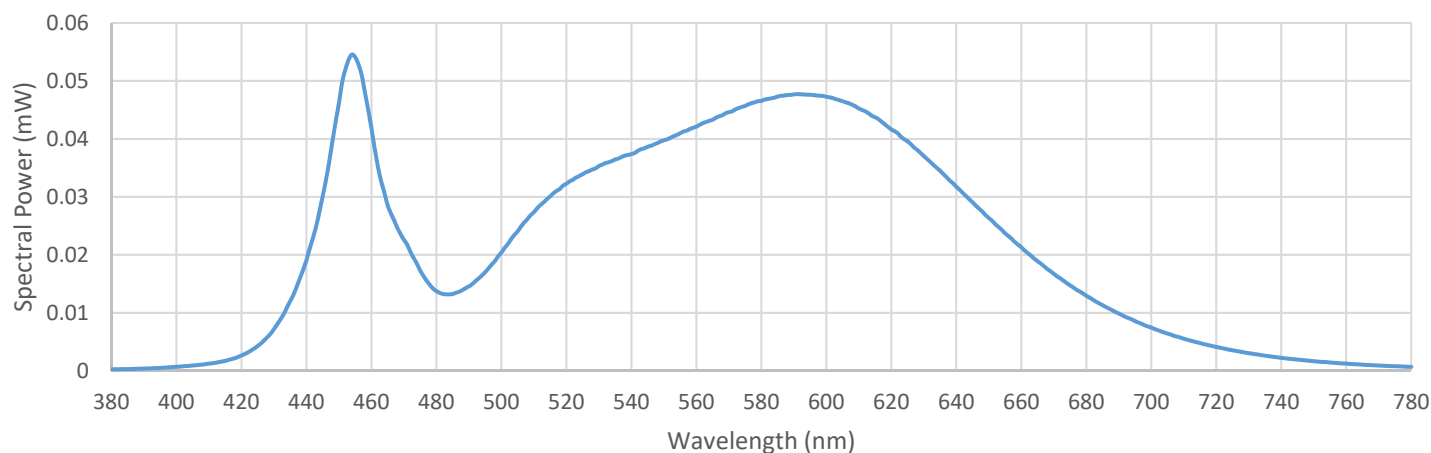
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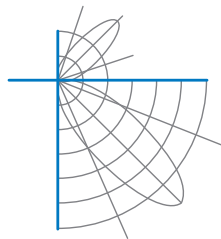
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Summary Spectral Power Distribution (wavelength - nm, spectral power - mW)

380	0.000259	480	0.013752	580	0.046555	680	0.012949
385	0.000295	485	0.013251	585	0.047284	685	0.011327
390	0.000380	490	0.014565	590	0.047671	690	0.009876
395	0.000501	495	0.017003	595	0.047595	695	0.008576
400	0.000684	500	0.020408	600	0.047259	700	0.007448
405	0.000905	505	0.024044	605	0.046496	705	0.006407
410	0.001230	510	0.027349	610	0.045241	710	0.005533
415	0.001704	515	0.030082	615	0.043727	715	0.004777
420	0.002639	520	0.032263	620	0.041626	720	0.004115
425	0.004266	525	0.033913	625	0.039571	725	0.003533
430	0.007186	530	0.035322	630	0.037021	730	0.003042
435	0.012026	535	0.036446	635	0.034519	735	0.002605
440	0.019061	540	0.037376	640	0.031752	740	0.002231
445	0.030110	545	0.038628	645	0.029062	745	0.001927
450	0.046171	550	0.039754	650	0.026360	750	0.001654
455	0.054088	555	0.040962	655	0.023717	755	0.001426
460	0.041818	560	0.042106	660	0.021304	760	0.001237
465	0.028551	565	0.043307	665	0.018904	765	0.001060
470	0.022606	570	0.044608	670	0.016722	770	0.000912
475	0.017310	575	0.045686	675	0.014741	775	0.000787
						780	0.000680





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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:	24.5 °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. This report is free of erasures and corrections This report may contain data that are not covered by the NVLAP accreditation. Quantities marked with * are not covered.

Sphere Report Template V2-7