

Report of Test

LLIA000817-008A

Catalog Number: MQR2-HO-K35-80-2X2-XX-AL-PPNL/FO1M-UNV
Recessed or suspended, extruded aluminum housing, formed white enamel
aluminum reflectors, translucent white plastic enclosures.

160 white LEDs, 4 boards with 40 LEDs each.

One Osram Optotronic OTi 50/120-277/1A4 DIM L LED driver programmed to 1250mA
120.0Vac, 60.00Hz, 0.4101A, 49.03W, 0.997PF, 8.1%THD(i)



Performance Summary

Total Light Output	4880 lm
Luminaire Power	49.0 W
Luminous Efficacy	99.6 lm/W

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



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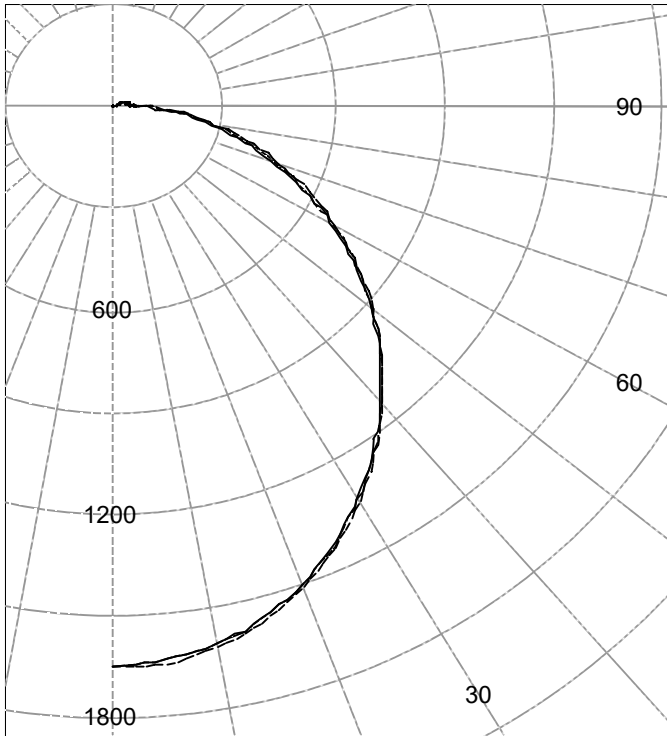
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Legend: C0-Solid, C45-Dashed, C90-Grey (cd)



(Two plane symmetry) C0-C90

AVERAGE LUMINANCE (cd / m²)

Gamma	C0	C45	C90
45.0	13905	13904	13979
55.0	13245	13290	13346
65.0	12618	12831	12757
75.0	12312	12943	12555
85.0	15423	16507	16117

INTENSITY SUMMARY (cd)

Gamma	C-Plane					Flux (lm)
	C0	C22.5	C45	C67.5	C90	
0.0	1652	1652	1652	1652	1652	
5.0	1636	1643	1647	1644	1635	156
10.0	1607	1615	1618	1615	1607	
15.0	1560	1568	1572	1569	1561	442
20.0	1499	1504	1508	1505	1500	
25.0	1419	1425	1430	1427	1421	657
30.0	1331	1337	1342	1338	1333	
35.0	1233	1239	1244	1242	1237	776
40.0	1131	1136	1141	1139	1137	
45.0	1026	1029	1033	1032	1031	795
50.0	915	918	923	922	921	
55.0	799	806	810	810	805	722
60.0	683	693	698	697	689	
65.0	568	580	587	584	574	575
70.0	456	470	479	475	462	
75.0	349	367	377	371	356	389
80.0	251	271	281	276	259	
85.0	167	184	192	188	175	196
90.0	51	59	64	62	55	

ZONAL FLUX AND PERCENTAGES

Zone	Flux (lm)	% Lamp	% Luminaire
0-30	1254	N / A	25.7
0-40	2030	N / A	41.6
0-60	3547	N / A	72.7
0-90	4707	N / A	96.5
40-90	2677	N / A	54.9
60-90	1160	N / A	23.8
90-180	173	N / A	3.5
0-180	4880	N / A	100.0

Total Light Output = 4,880 lm

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

Signed:

Authorized Signatory

Date of test 10-Jul-2017
Date of report 11-Jul-2017



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Intensity data (cd)

Gamma	C-Plane				
	C0	C22.5	C45	C67.5	C90
0.0	1652	1652	1652	1652	1652
2.5	1643	1650	1654	1651	1642
5.0	1636	1643	1647	1644	1635
7.5	1624	1631	1635	1632	1624
10.0	1607	1615	1618	1615	1607
12.5	1586	1593	1597	1594	1587
15.0	1560	1568	1572	1569	1561
17.5	1531	1537	1542	1539	1532
20.0	1499	1504	1508	1505	1500
22.5	1459	1466	1471	1468	1461
25.0	1419	1425	1430	1427	1421
27.5	1376	1382	1387	1384	1378
30.0	1331	1337	1342	1338	1333
32.5	1282	1289	1294	1291	1286
35.0	1233	1239	1244	1242	1237
37.5	1183	1188	1193	1191	1187
40.0	1131	1136	1141	1139	1137
42.5	1079	1083	1088	1086	1084
45.0	1026	1029	1033	1032	1031
47.5	971	974	978	977	977
50.0	915	918	923	922	921
52.5	858	863	867	866	863
55.0	799	806	810	810	805
57.5	741	750	754	753	747
60.0	683	693	698	697	689
62.5	625	636	642	640	631
65.0	568	580	587	584	574
67.5	511	525	532	529	518
70.0	456	470	479	475	462
72.5	402	418	428	422	408
75.0	349	367	377	371	356
77.5	299	318	328	322	306
80.0	251	271	281	276	259
82.5	208	227	236	231	215
85.0	167	184	192	188	175
87.5	128	138	144	143	135
90.0	51	59	64	62	55



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Intensity data (cd)

Gamma	C-Plane				
	C0	C22.5	C45	C67.5	C90
90.0	51	59	64	62	55
92.5	47	55	59	57	50
95.0	45	52	57	54	48
97.5	43	50	55	52	46
100.0	41	48	53	50	44
102.5	40	46	50	48	43
105.0	39	44	48	45	41
107.5	37	41	46	43	39
110.0	36	38	44	40	38
112.5	34	35	42	36	36
115.0	33	31	40	33	35
117.5	31	28	38	30	33
120.0	30	27	35	28	32
122.5	29	25	29	27	30
125.0	27	24	24	25	29
127.5	26	22	18	23	27
130.0	23	19	13	20	25
132.5	19	15	8	16	21
135.0	16	12	3	13	17
137.5	12	9	3	10	13
140.0	9	6	3	6	9
142.5	5	2	3	3	6
145.0	2	2	2	2	2
147.5	2	2	2	2	2
150.0	2	2	2	2	2
152.5	2	2	2	2	2
155.0	2	2	2	2	2
157.5	0	0	0	0	0
160.0	0	0	0	0	0
162.5	0	0	0	0	0
165.0	0	0	0	0	0
167.5	0	0	0	0	0
170.0	0	0	0	0	0
172.5	0	0	0	0	0
175.0	0	0	0	0	0
177.5	0	0	0	0	0
180.0	0	0	0	0	0



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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	118	118	118	118	115	115	115	115	109	109	109	104	104	104	99	99	99	96
1	107	102	97	93	104	99	95	91	94	91	87	90	87	84	85	83	81	79
2	97	88	81	75	94	86	79	74	82	76	72	78	73	69	74	71	67	65
3	88	77	69	62	85	75	68	61	72	65	60	69	63	58	66	61	57	54
4	81	68	59	52	78	67	58	52	64	57	51	61	55	50	58	53	49	46
5	74	61	52	45	72	60	51	45	57	50	44	55	48	43	53	47	42	40
6	69	55	46	39	66	54	45	39	52	44	38	50	43	38	48	42	37	35
7	64	50	41	35	62	49	40	35	47	39	34	45	39	34	44	38	33	31
8	59	45	37	31	57	45	36	31	43	36	30	41	35	30	40	34	30	28
9	55	42	33	28	54	41	33	28	40	32	27	38	32	27	37	31	27	25
10	52	39	31	25	50	38	30	25	37	30	25	35	29	25	34	29	24	23

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	45.9	7.21	7.23
8.0	25.8	9.61	9.64
10.0	16.5	12.02	12.05
12.0	11.5	14.42	14.46
14.0	8.4	16.82	16.87
16.0	6.5	19.23	19.28



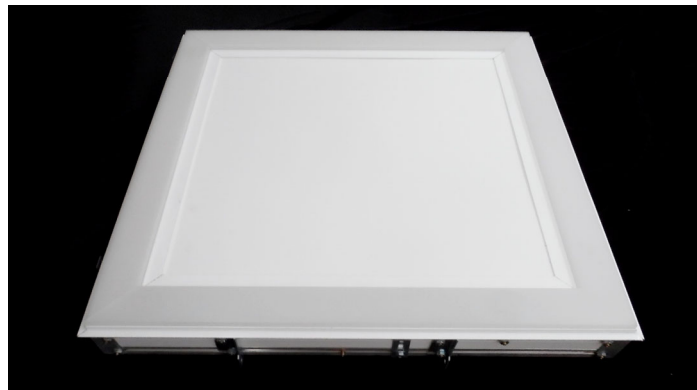
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Test Distance 9.5 m
Test Temperature 24.9 °C

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 C78.377:2015, ANSI C82.77-10:2014.

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

LLIA000817-008B

Integrating Sphere Report

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Performance Summary

Voltage	120.0 Vac
Current	0.4098 A
Power	49.02 W
Frequency	60.00 Hz
Power Factor	0.997
Current THD	8.0 %

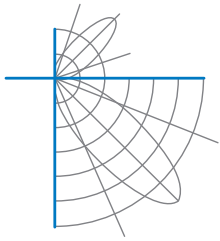
Total Luminous Flux	5015.8 lm
Efficacy	102.3 lm/W
Chromaticity (x,y)	(0.4065, 0.3871)
(u',v')	(0.2380, 0.5099)
Duv	-0.0018
CCT	3444 K
CRI (Ra)	84
R9	16

Prepared For:

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

Test date: 07/07/2017

Report date: 07/11/2017



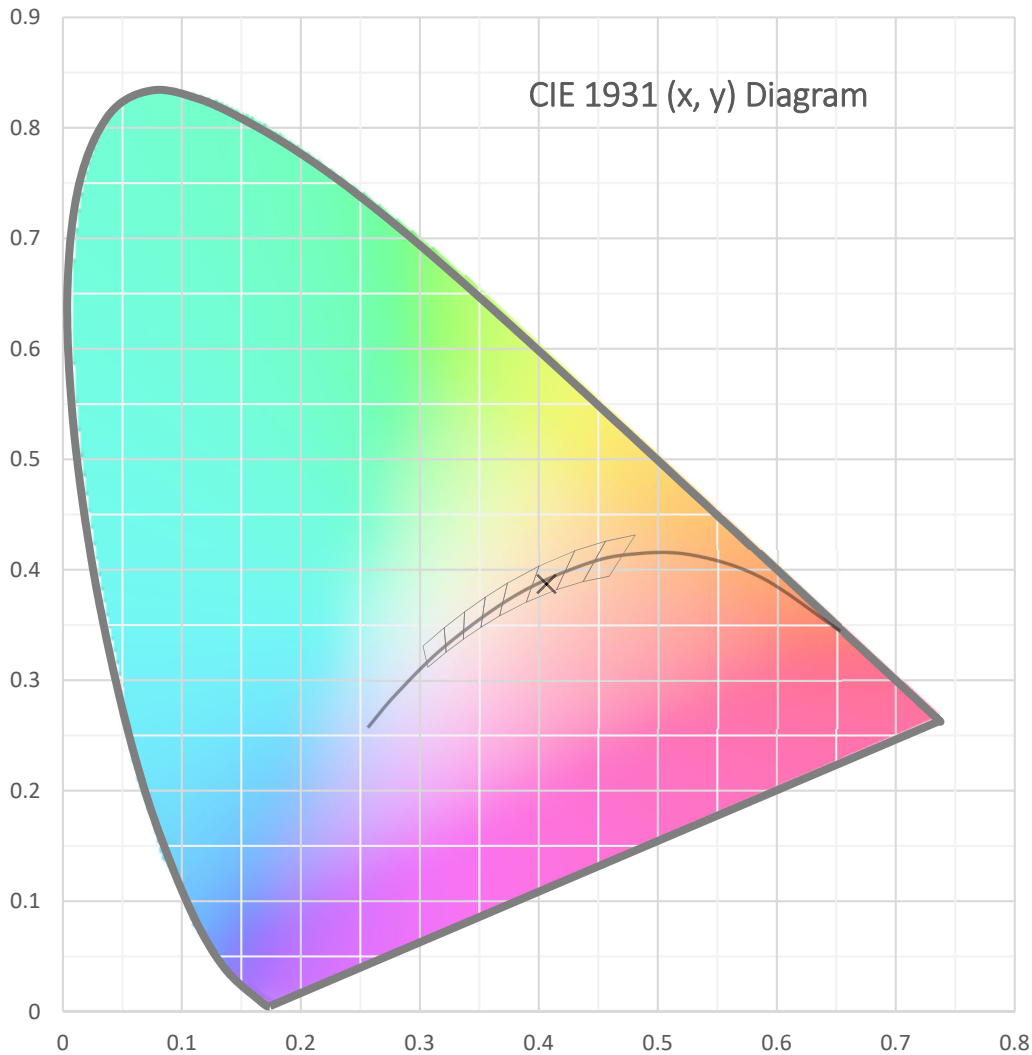
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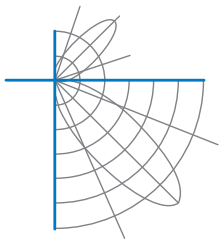
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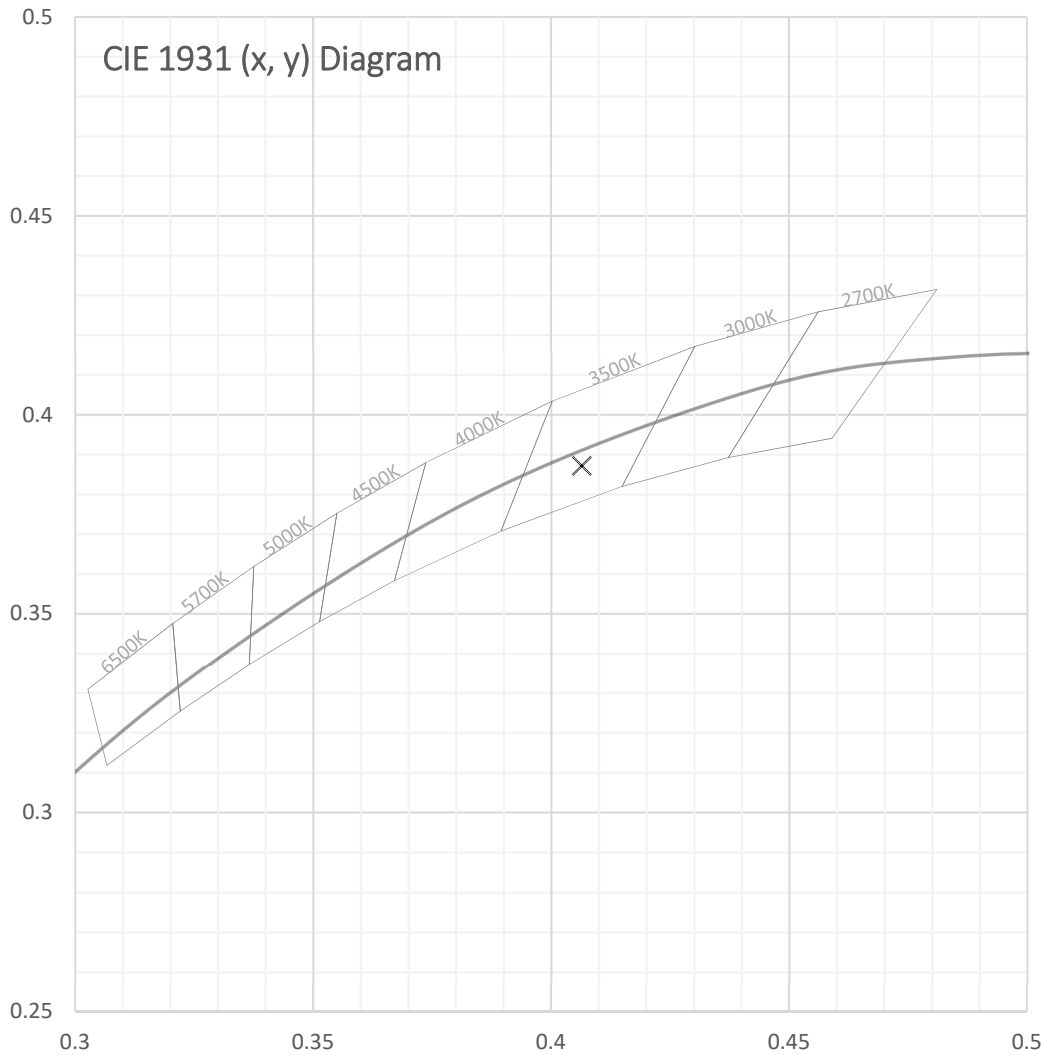
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Spectral Data	Total Radiant Flux	15.65 W
	Total Luminous Flux	5015.8 Lm
	Chromaticity CIE 1931 (x, y)	(0.4065, 0.3871)
	Chromaticity CIE 1976 (u', v')	(0.2380, 0.5099)
	Correlated Color Temperature (CCT)	3444 K
	Color Rendering Index (Ra)	84
	R1	83
	R2	92
	R3	96
	R4	82
	R5	83
	R6	88
	R7	85
	R8	65
	R9	16
	R10	80
	R11	80
	R12	67
	R13	85
	R14	98
	Distance from Planckian Locus (Duv)	-0.0018
	Scotopic/Photopic Ratio *	1.531

Electrical Data

Voltage	120.0 Vac
Current	0.4098 A
Power	49.02 W
Frequency	60.00 Hz
Power Factor	0.997
Current THD	8.0 %



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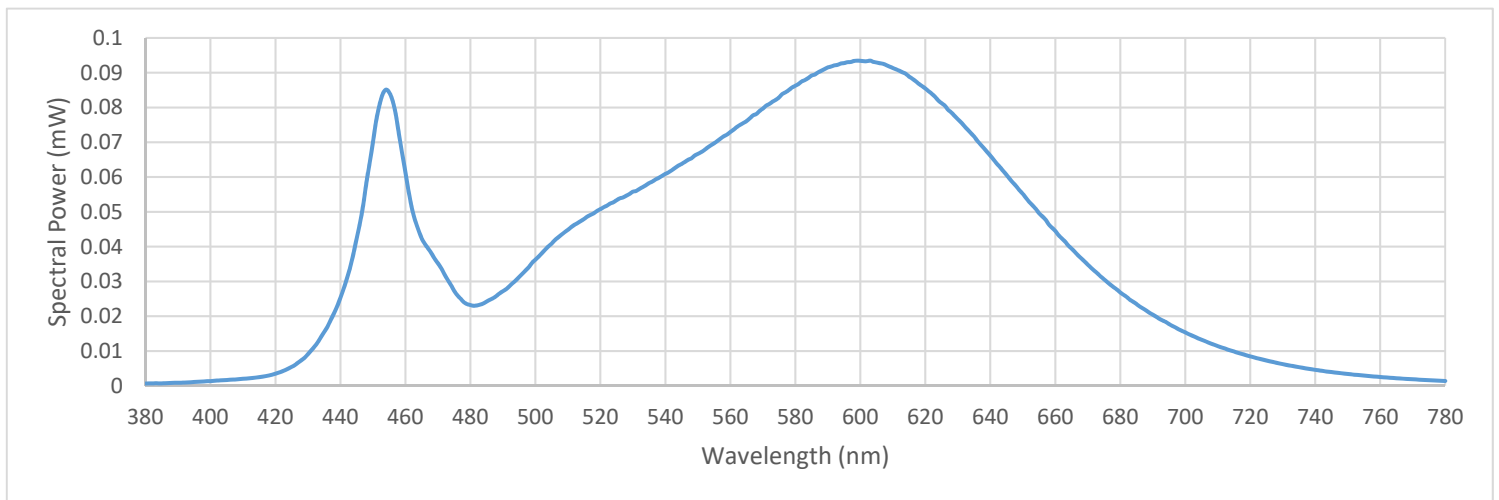
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Summary Spectral Power Distribution (wavelength - nm, spectral power - mW)

380	0.000657	480	0.023202	580	0.086245	680	0.026812
385	0.000703	485	0.024213	585	0.089187	685	0.023492
390	0.000871	490	0.027192	590	0.091520	690	0.020431
395	0.001079	495	0.031281	595	0.092756	695	0.017740
400	0.001351	500	0.036252	600	0.093419	700	0.015349
405	0.001661	505	0.040874	605	0.092936	705	0.013230
410	0.002001	510	0.044824	610	0.091353	710	0.011394
415	0.002480	515	0.047970	615	0.088890	715	0.009847
420	0.003485	520	0.050772	620	0.085469	720	0.008450
425	0.005444	525	0.053359	625	0.081229	725	0.007264
430	0.009102	530	0.055799	630	0.076630	730	0.006237
435	0.015444	535	0.058278	635	0.071674	735	0.005349
440	0.025327	540	0.060906	640	0.066186	740	0.004573
445	0.042379	545	0.063784	645	0.060622	745	0.003939
450	0.070031	550	0.066675	650	0.055170	750	0.003389
455	0.084344	555	0.069702	655	0.049611	755	0.002927
460	0.061342	560	0.072966	660	0.044502	760	0.002536
465	0.042388	565	0.076118	665	0.039449	765	0.002179
470	0.035237	570	0.079693	670	0.034824	770	0.001872
475	0.027293	575	0.082927	675	0.030598	775	0.001621
						780	0.001395





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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:	25.0 °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.