

# Report of Test

## LLIA000802-023A

Catalog Number: 3-689-24 iO Ceiling Mount

Ceiling mounted, formed steel housing with white enamel steel reflector,  
translucent white plastic enclosure with decorative trim.

60 white LEDs, Two Harvard Engineering LEDENG152-930-NL LED boards with 30 LEDs each

Two LTF DA12W350C1834D010-0014 dimming LED drivers.

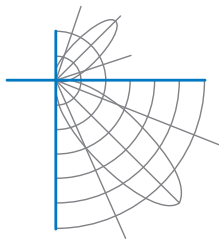
120.0Vac, 60.00Hz, 0.2190A, 25.58W, 0.973PF, 9.8%THD(i)



### Performance Summary

Total Light Output	1294 lm
Luminaire Power	25.6 W
Luminous Efficacy	50.5 lm/W

**PREPARED FOR : Oxygen Lighting, 201 Railhead Road, Fort Worth, TX 76106, USA**



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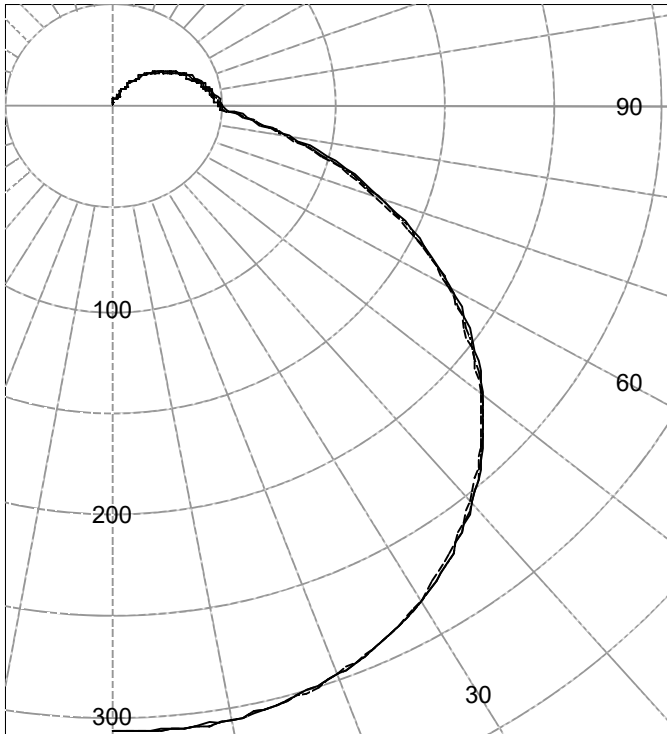
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Legend: C0-Solid, C45-Dashed, C90-Grey (cd)



(Two plane symmetry) C0-C90

**INTENSITY SUMMARY (cd)**

Gamma	C-Plane					Flux (lm)
	C0	C22.5	C45	C67.5	C90	
0.0	306	306	306	306	306	
5.0	306	306	306	306	306	29
10.0	305	305	305	305	305	
15.0	302	302	302	302	302	85
20.0	297	297	297	297	297	
25.0	290	289	289	289	290	134
30.0	280	279	279	279	280	
35.0	268	267	267	267	268	167
40.0	254	253	252	252	253	
45.0	237	236	236	236	237	182
50.0	219	218	217	217	218	
55.0	199	197	197	197	198	176
60.0	177	175	174	175	176	
65.0	153	152	151	151	152	150
70.0	129	127	126	126	128	
75.0	104	103	102	102	103	109
80.0	82	80	79	79	80	
85.0	62	60	59	59	61	67
90.0	50	48	48	48	49	

**AVERAGE LUMINANCE (cd / m<sup>2</sup>)**

Gamma	C0	C45	C90
45.0	2384	2369	2379
55.0	2276	2254	2267
65.0	2117	2085	2103
75.0	1891	1845	1870
85.0	1686	1617	1658

**ZONAL FLUX AND PERCENTAGES**

Zone	Flux (lm)	% Lamp	% Luminaire
0-30	248	N / A	19.2
0-40	415	N / A	32.1
0-60	774	N / A	59.8
0-90	1099	N / A	84.9
40-90	684	N / A	52.8
60-90	325	N / A	25.1
90-180	195	N / A	15.1
0-180	1294	N / A	100.0

Total Light Output = 1,294 lm

Spacing Criterion: 0-180 1.4  
Spacing Criterion: 90-270 1.4

Signed:

Authorized Signatory

Date of test 15-Aug-2017  
Date of report 17-Aug-2017



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**Intensity data (cd)**

Gamma	C-Plane				
	C0	C22.5	C45	C67.5	C90
0.0	306	306	306	306	306
2.5	306	306	306	306	306
5.0	306	306	306	306	306
7.5	306	306	306	306	306
10.0	305	305	305	305	305
12.5	304	304	304	304	304
15.0	302	302	302	302	302
17.5	300	300	300	300	300
20.0	297	297	297	297	297
22.5	294	293	293	294	294
25.0	290	289	289	289	290
27.5	285	285	284	285	285
30.0	280	279	279	279	280
32.5	274	274	273	273	274
35.0	268	267	267	267	268
37.5	261	260	260	260	261
40.0	254	253	252	252	253
42.5	246	245	244	244	245
45.0	237	236	236	236	237
47.5	228	227	227	227	228
50.0	219	218	217	217	218
52.5	209	208	207	207	208
55.0	199	197	197	197	198
57.5	188	186	186	186	187
60.0	177	175	174	175	176
62.5	165	164	163	163	164
65.0	153	152	151	151	152
67.5	141	139	139	139	140
70.0	129	127	126	126	128
72.5	117	115	114	114	115
75.0	104	103	102	102	103
77.5	93	91	90	90	92
80.0	82	80	79	79	80
82.5	71	69	69	69	70
85.0	62	60	59	59	61
87.5	54	52	51	52	53
90.0	50	48	48	48	49



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120.0Vac, 60.00Hz, 0.2190A, 25.58W, 0.973PF, 9.8%THD(i)

**Intensity data (cd)**

Gamma	C-Plane				
	C0	C22.5	C45	C67.5	C90
90.0	50	48	48	48	49
92.5	49	47	47	47	48
95.0	48	46	46	46	47
97.5	47	45	45	45	46
100.0	46	44	43	44	45
102.5	44	43	42	43	43
105.0	43	42	41	41	42
107.5	42	41	40	40	41
110.0	40	39	39	39	40
112.5	39	38	37	37	38
115.0	37	36	36	36	37
117.5	36	35	34	35	36
120.0	35	34	33	34	34
122.5	33	32	32	32	33
125.0	31	31	30	31	31
127.5	30	29	29	29	30
130.0	28	28	27	28	28
132.5	26	26	25	26	26
135.0	25	24	24	24	25
137.5	23	22	22	23	22
140.0	21	21	20	21	21
142.5	19	19	19	19	19
145.0	17	17	17	18	17
147.5	15	15	15	15	15
150.0	13	14	13	14	13
152.5	12	12	11	12	12
155.0	10	10	10	10	10
157.5	9	9	8	8	9
160.0	7	7	7	7	8
162.5	7	6	6	6	7
165.0	6	5	6	6	7
167.5	6	6	6	6	6
170.0	5	5	5	5	5
172.5	5	5	4	5	5
175.0	4	4	4	4	4
177.5	3	3	3	3	4
180.0	2	2	2	2	2



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**Coefficients Of Utilization - Zonal Cavity Method**

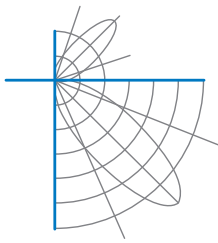
Effective Floor Cavity Reflectance 0.20

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	115	115	115	115	111	111	111	111	103	103	103	95	95	95	88	88	88	85
1	103	98	93	88	99	94	90	86	87	83	80	81	78	75	75	72	70	67
2	93	84	77	70	89	81	74	68	75	69	64	69	65	61	64	61	57	54
3	84	73	65	58	81	70	62	56	65	59	53	60	55	50	56	51	48	45
4	77	64	55	48	73	62	54	47	58	50	45	53	47	42	50	45	40	38
5	71	57	48	41	67	55	46	40	51	44	38	48	41	36	44	39	35	32
6	65	51	42	35	62	49	41	35	46	39	33	43	37	32	40	35	30	28
7	60	46	37	31	57	45	36	30	42	34	29	39	33	28	36	31	27	24
8	56	42	33	27	53	41	32	27	38	31	26	36	29	25	33	28	24	22
9	52	38	30	24	50	37	29	24	35	28	23	33	27	22	31	25	21	19
10	49	35	27	22	47	34	27	22	32	25	21	30	24	20	28	23	19	17

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	8.5	8.14	8.14
8.0	4.8	10.86	10.85
10.0	3.1	13.57	13.56
12.0	2.1	16.29	16.27
14.0	1.6	19.00	18.99
16.0	1.2	21.71	21.70



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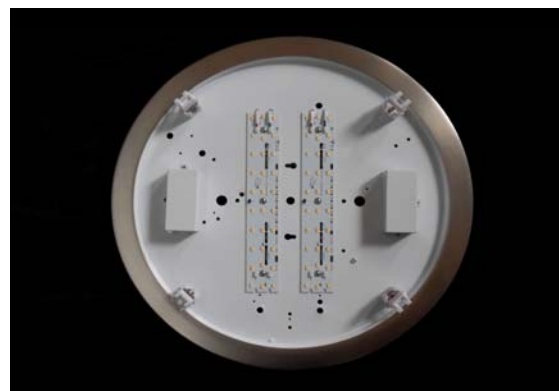
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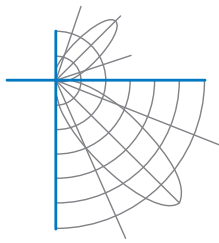
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**Test Distance**            9.5 m  
**Test Temperature**      24.9 °C

**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.

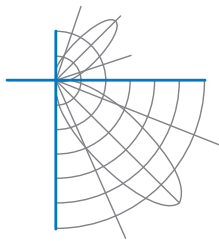
Prorating the performance of the sample for the use of other component combinations (such as lamp / LED / Ballast / driver), or for use in different environmental conditions than that tested, may produce erroneous results.

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

**LLIA000802-023B**

Integrating Sphere Report

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### Performance Summary

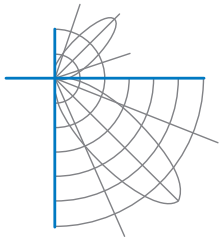
Voltage	120.0 Vac
Current	0.2190 A
Power	25.58 W
Frequency	60.00 Hz
Power Factor	0.974
Current THD	9.7 %

Total Luminous Flux	1305.9 lm
Efficacy	51.1 lm/W
Chromaticity (x,y)	(0.4319, 0.3978)
(u',v')	(0.2500, 0.5181)
Duv	-0.0018
CCT	3036 K
CRI (Ra)	95
R9	76

Prepared For:  
Oxygen Lighting  
201 Railhead Road  
Fort Worth, TX 76106, USA

Test date: 08/14/2017  
Report date: 08/17/2017



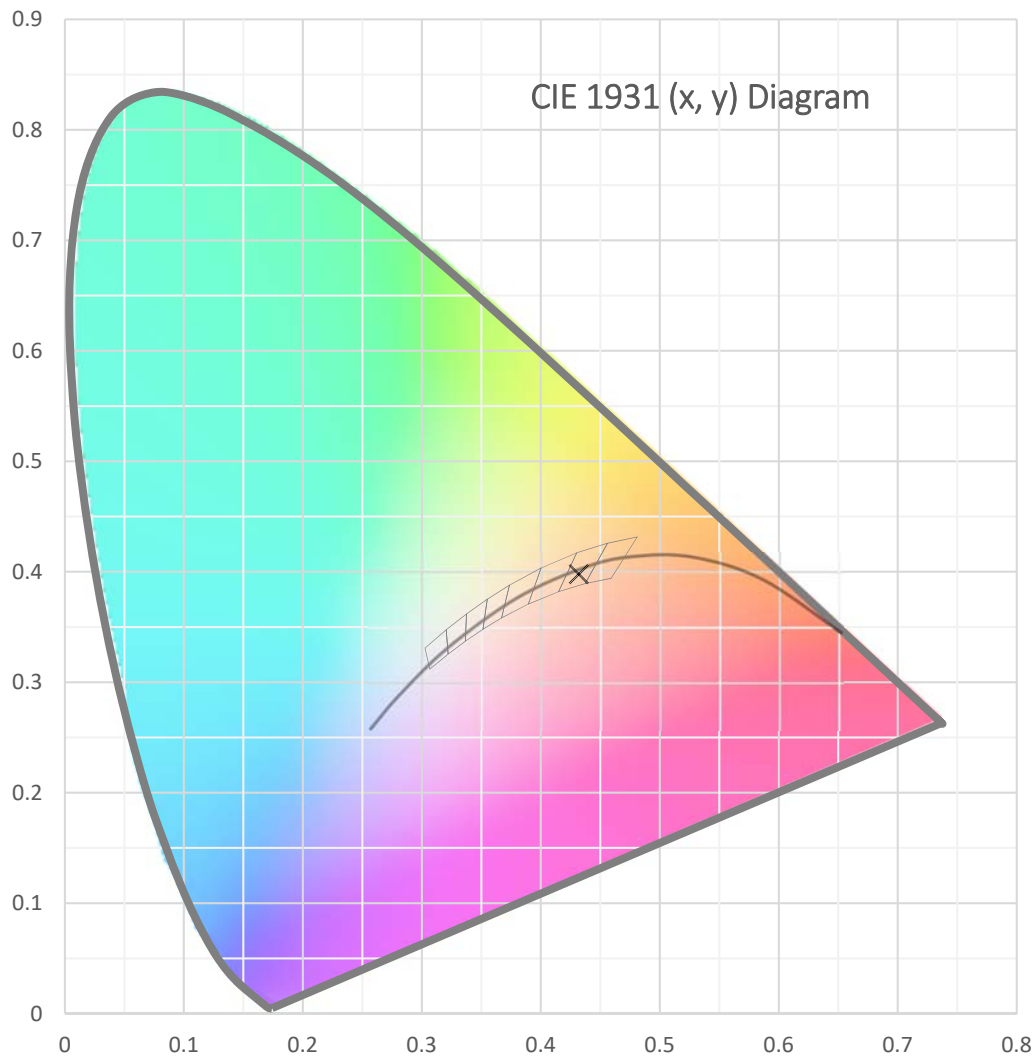


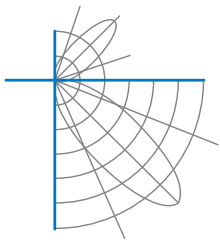
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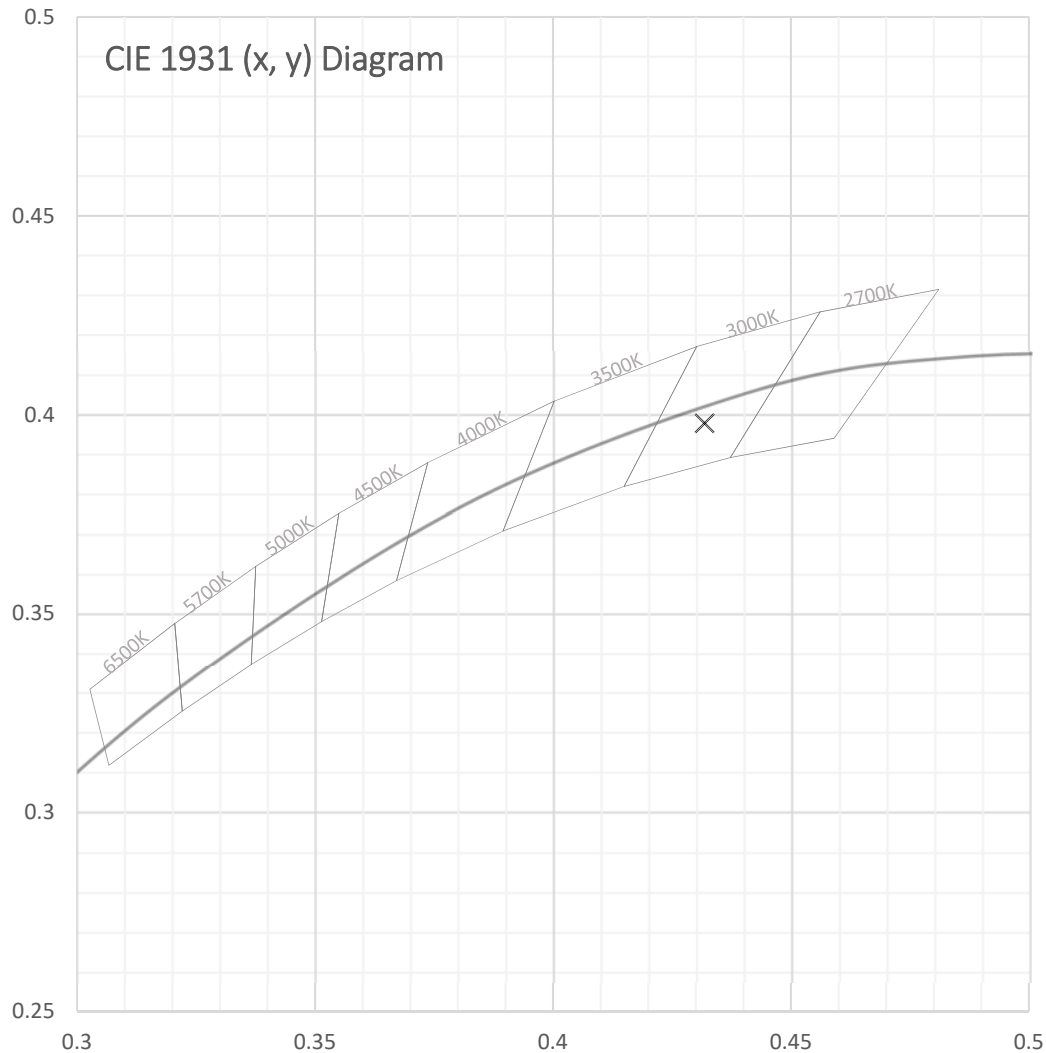
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**Spectral Data**

Total Radiant Flux	4.781 W
Total Luminous Flux	1305.9 Lm
Chromaticity CIE 1931 (x, y)	(0.4319, 0.3978)
Chromaticity CIE 1976 (u', v')	(0.2500, 0.5181)
Correlated Color Temperature (CCT)	3036 K
Color Rendering Index (Ra)	95
R1	97
R2	97
R3	96
R4	96
R5	96
R6	96
R7	95
R8	90
R9	76
R10	93
R11	96
R12	85
R13	97
R14	97
Distance from Planckian Locus (Duv)	-0.0018
Scotopic/Photopic Ratio *	1.449

**Electrical Data**

Voltage	120.0 Vac
Current	0.2190 A
Power	25.58 W
Frequency	60.00 Hz
Power Factor	0.974
Current THD	9.7 %



**Test Report Number: LLIA000802-023B**

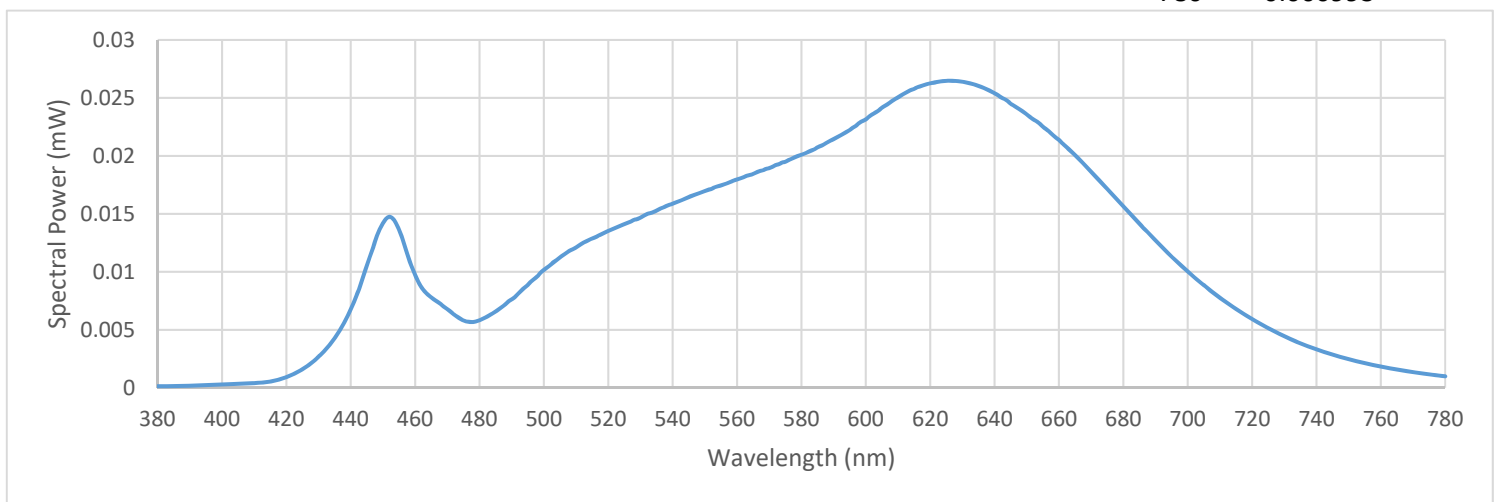
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Summary Spectral Power Distribution (wavelength - nm, spectral power - mW)

380	0.000133	480	0.005824	580	0.020100	680	0.015647
385	0.000144	485	0.006577	585	0.020742	685	0.014178
390	0.000182	490	0.007631	590	0.021442	690	0.012712
395	0.000225	495	0.008873	595	0.022225	695	0.011298
400	0.000283	500	0.010167	600	0.023137	700	0.010045
405	0.000344	505	0.011250	605	0.024154	705	0.008857
410	0.000406	510	0.012110	610	0.025042	710	0.007757
415	0.000541	515	0.012881	615	0.025771	715	0.006800
420	0.000922	520	0.013526	620	0.026268	720	0.005919
425	0.001609	525	0.014126	625	0.026466	725	0.005135
430	0.002693	530	0.014680	630	0.026378	730	0.004458
435	0.004281	535	0.015278	635	0.026054	735	0.003842
440	0.006763	540	0.015870	640	0.025398	740	0.003308
445	0.010543	545	0.016450	645	0.024493	745	0.002861
450	0.014196	550	0.016965	650	0.023567	750	0.002465
455	0.013606	555	0.017445	655	0.022517	755	0.002121
460	0.009760	560	0.017959	660	0.021381	760	0.001833
465	0.007788	565	0.018434	665	0.020060	765	0.001574
470	0.006788	570	0.018945	670	0.018611	770	0.001349
475	0.005793	575	0.019491	675	0.017153	775	0.001159
						780	0.000993





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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 $\pi$  geometry

**Test Temperature:** 24.3 °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  
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