

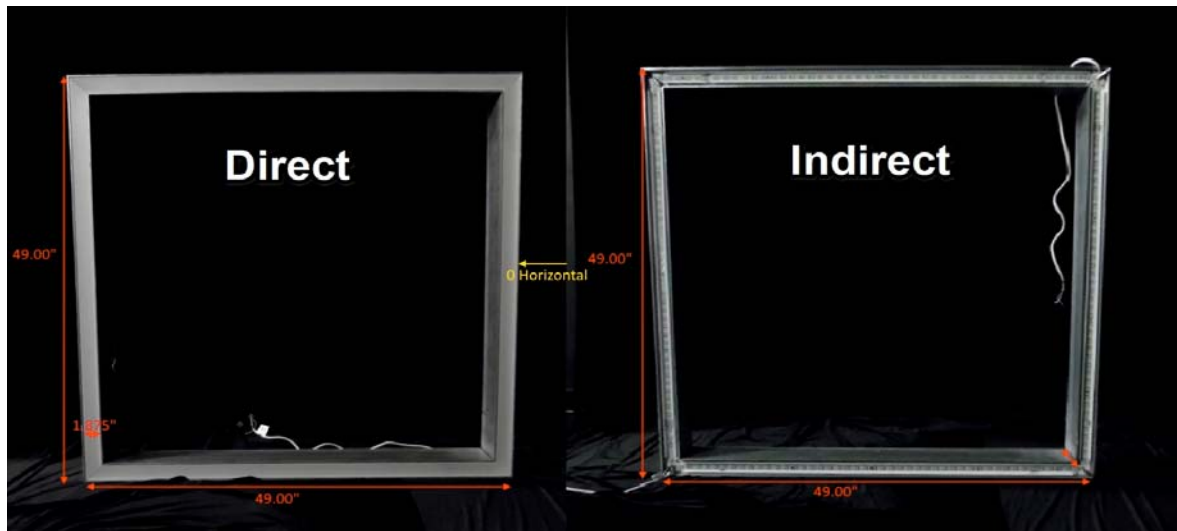
# Report of Test

## LLIA000833-012A

Catalog Number: MQS2-I/D-HO/HO-K35-80-4X4-XXX-OP/FL-XXXX-UNV

Pendant mounted, extruded aluminum housing, formed white enamel aluminum reflectors, translucent white plastic lower enclosures, open top. 736 white LEDs, 4 PAL-Lighting upper LED boards with 92 LEDs each and 4 PAL-Lighting lower LED boards with 92 LEDs each.

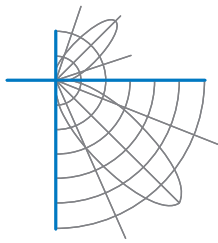
Two Osram Optotronic OTi 85/120-277/2A6 DIMLT2 L- LED drivers  
120.0Vac, 60.00Hz, 1.991A, 238.1W, 0.997PF, 3.5%THD(i)



### Performance Summary

Total Light Output	27027 lm
Luminaire Power	238.1 W
Luminous Efficacy	113.5 lm/W

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



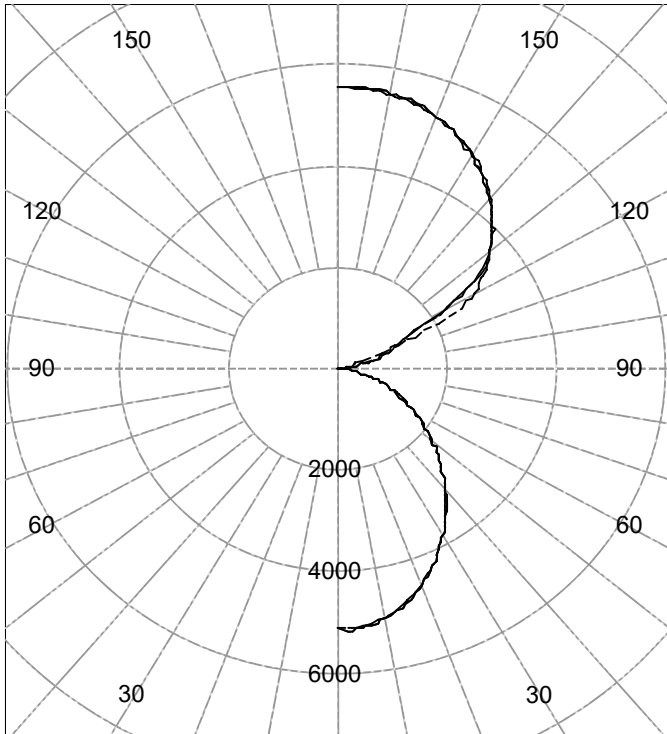
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120.0Vac, 60.00Hz, 1.991A, 238.1W, 0.997PF, 3.5%THD(i)

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	5111	5111	5111	5111	5111	
5.0	5112	5090	5090	5086	5111	482
10.0	4991	4958	4962	4960	4978	
15.0	4790	4758	4758	4754	4780	1339
20.0	4509	4487	4486	4485	4511	
25.0	4179	4165	4171	4167	4176	1916
30.0	3804	3810	3810	3814	3810	
35.0	3415	3432	3431	3440	3426	2143
40.0	3032	3046	3040	3048	3028	
45.0	2647	2655	2646	2653	2646	2045
50.0	2279	2275	2266	2271	2277	
55.0	1904	1907	1899	1901	1900	1703
60.0	1546	1553	1552	1549	1544	
65.0	1210	1222	1221	1217	1207	1208
70.0	910	913	913	910	906	
75.0	627	631	630	630	626	668
80.0	370	374	373	374	370	
85.0	151	152	153	151	151	176
90.0	7	8	7	7	7	

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

Gamma	C0	C45	C90
45.0	16385	16377	16379
55.0	14532	14489	14500
65.0	12529	12646	12495
75.0	10597	10650	10588
85.0	7604	7684	7558

**ZONAL FLUX AND PERCENTAGES**

Zone	Flux (lm)	% Lamp	% Luminaire
0-30	3738	N / A	13.8
0-40	5881	N / A	21.8
0-60	9629	N / A	35.6
0-90	11681	N / A	43.2
40-90	5799	N / A	21.5
60-90	2051	N / A	7.6
90-180	15347	N / A	56.8
0-180	27027	N / A	100.0

Total Light Output = 27,027 lm

Signed:

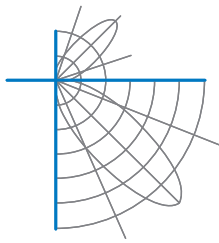
Authorized Signatory

Date of test

3-Oct-2017

Date of report

3-Oct-2017



**Test Report No. LLIA000833-012A**

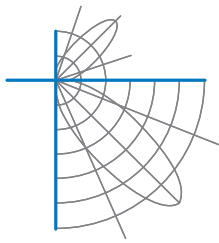
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120.0Vac, 60.00Hz, 1.991A, 238.1W, 0.997PF, 3.5%THD(i)

**Intensity data (cd)**

Gamma	C-Plane				
	C0	C22.5	C45	C67.5	C90
0.0	5111	5111	5111	5111	5111
2.5	5146	5122	5121	5121	5143
5.0	5112	5090	5090	5086	5111
7.5	5057	5034	5033	5036	5058
10.0	4991	4958	4962	4960	4978
12.5	4891	4865	4868	4866	4896
15.0	4790	4758	4758	4754	4780
17.5	4659	4625	4626	4631	4650
20.0	4509	4487	4486	4485	4511
22.5	4345	4330	4334	4333	4346
25.0	4179	4165	4171	4167	4176
27.5	3993	3989	3995	3994	3997
30.0	3804	3810	3810	3814	3810
32.5	3610	3621	3623	3628	3612
35.0	3415	3432	3431	3440	3426
37.5	3222	3239	3238	3245	3226
40.0	3032	3046	3040	3048	3028
42.5	2836	2849	2842	2850	2836
45.0	2647	2655	2646	2653	2646
47.5	2462	2463	2456	2461	2457
50.0	2279	2275	2266	2271	2277
52.5	2093	2091	2081	2085	2087
55.0	1904	1907	1899	1901	1900
57.5	1722	1729	1724	1722	1719
60.0	1546	1553	1552	1549	1544
62.5	1373	1385	1383	1380	1369
65.0	1210	1222	1221	1217	1207
67.5	1055	1065	1064	1060	1053
70.0	910	913	913	910	906
72.5	766	770	768	768	763
75.0	627	631	630	630	626
77.5	495	498	498	499	495
80.0	370	374	373	374	370
82.5	256	257	258	257	255
85.0	151	152	153	151	151
87.5	61	59	58	58	59
90.0	7	8	7	7	7



**Test Report No. LLIA000833-012A**

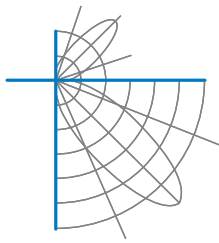
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Two Osram Optotronic OTi 85/120-277/2A6 DIMLT2 L- LED drivers  
120.0Vac, 60.00Hz, 1.991A, 238.1W, 0.997PF, 3.5%THD(i)

**Intensity data (cd)**

Gamma	C-Plane				
	C0	C22.5	C45	C67.5	C90
90.0	7	8	7	7	7
92.5	41	20	15	19	42
95.0	122	64	42	63	120
97.5	223	118	126	118	226
100.0	362	202	212	200	369
102.5	516	437	265	434	522
105.0	666	579	290	598	673
107.5	812	870	306	864	820
110.0	955	1019	509	1026	963
112.5	1097	1152	1331	1154	1101
115.0	1232	1312	1753	1325	1237
117.5	1448	1874	2416	1932	1459
120.0	2096	2360	2803	2351	2159
122.5	2565	2820	3025	2795	2537
125.0	3021	3197	3233	3218	3027
127.5	3391	3435	3436	3441	3412
130.0	3612	3633	3627	3634	3619
132.5	3813	3820	3818	3821	3819
135.0	4002	4003	3998	4004	4001
137.5	4155	4167	4176	4170	4160
140.0	4310	4331	4339	4330	4310
142.5	4449	4485	4493	4482	4458
145.0	4588	4622	4633	4625	4594
147.5	4724	4756	4764	4759	4740
150.0	4851	4882	4882	4883	4864
152.5	4970	4998	5000	4991	4983
155.0	5075	5088	5099	5094	5093
157.5	5182	5179	5187	5182	5178
160.0	5269	5262	5263	5263	5267
162.5	5356	5327	5332	5330	5353
165.0	5419	5388	5389	5392	5421
167.5	5474	5436	5439	5440	5481
170.0	5507	5483	5480	5480	5516
172.5	5540	5507	5508	5513	5546
175.0	5562	5534	5532	5531	5562
177.5	5572	5541	5544	5541	5579
180.0	5554	5554	5554	5554	5554



**Test Number: LLIA000833-012A**

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Two Osram Optotronic OTi 85/120-277/2A6 DIMLT2 L- LED drivers  
120.0Vac, 60.00Hz, 1.991A, 238.1W, 0.997PF, 3.5%THD(i)

**Coefficients Of Utilization - Zonal Cavity Method**

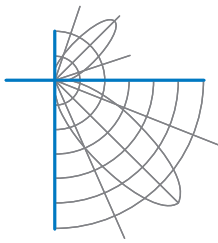
Effective Floor Cavity Reflectance 0.20

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	106	106	106	106	96	96	96	96	80	80	80	64	64	64	50	50	50	43
1	96	92	88	85	88	85	81	78	70	68	66	57	55	54	44	43	42	37
2	88	81	75	70	80	74	69	65	62	58	55	50	47	45	39	38	36	31
3	80	71	64	58	73	65	59	54	54	50	46	44	41	38	35	33	31	27
4	74	63	55	49	67	58	51	46	48	43	39	40	36	33	31	29	27	23
5	68	56	48	42	62	52	45	40	43	38	34	36	32	29	28	26	23	20
6	62	50	43	37	57	47	40	35	39	34	30	32	28	25	26	23	21	18
7	58	46	38	32	53	42	35	30	36	30	26	29	25	22	24	21	19	16
8	53	41	34	29	49	38	32	27	32	27	23	27	23	20	22	19	17	14
9	50	38	30	26	46	35	29	24	30	25	21	25	21	18	20	17	15	13
10	47	35	28	23	43	32	26	22	27	22	19	23	19	16	19	16	14	12

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	142.0	6.74	6.75
8.0	79.9	8.99	8.99
10.0	51.1	11.23	11.24
12.0	35.5	13.48	13.49
14.0	26.1	15.73	15.74
16.0	20.0	17.98	17.99

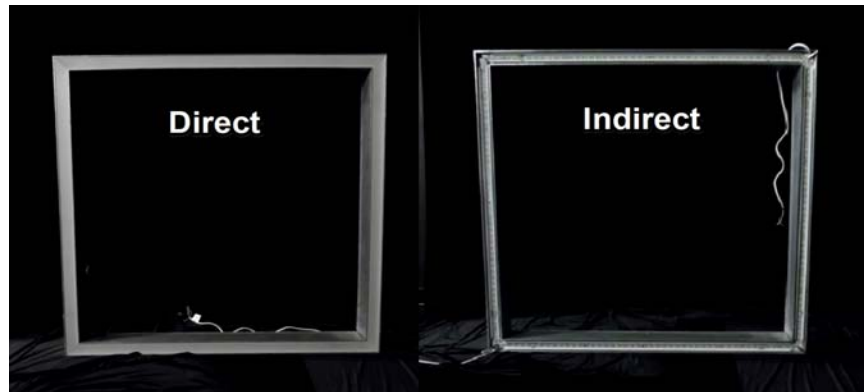


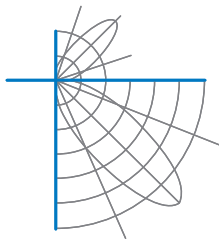
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120.0Vac, 60.00Hz, 1.991A, 238.1W, 0.997PF, 3.5%THD(i)

**Test Distance** 9.5 m  
**Test Temperature** 25.1 °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.

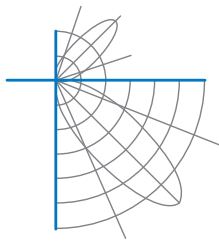
Prorating the performance of the sample for the use of other component combinations (such as lamp / LED / Ballast / driver), or for use in different environmental conditions than that tested, may produce erroneous results.

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

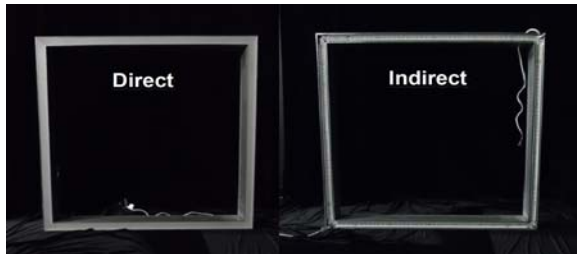
**LLIA000833-012B**

Integrating Sphere Report

Catalog Number: MQS2-I/D-HO/HO-K35-80-4X4-XXX-OP/FL-XXXX-UNV

Pendant mounted, extruded aluminum housing, formed white enamel aluminum reflectors, translucent white plastic lower enclosures, open top. 736 white LEDs, 4 PAL-Lighting upper LED boards with 92 LEDs each and 4 PAL-Lighting lower LED boards with 92 LEDs each.

Two Osram Optotronic OTi 85/120-277/2A6 DIMLT2 L- LED drivers



### Performance Summary

Voltage	120.0 Vac
Current	1.994 A
Power	238.6 W
Frequency	60.00 Hz
Power Factor	0.997
Current THD	3.5 %

Chromaticity (x,y)	(0.4084, 0.3921)
(u',v')	(0.2371, 0.5123)

Duv	-0.0001
CCT	3445 K
CRI (Ra)	82
R9	12

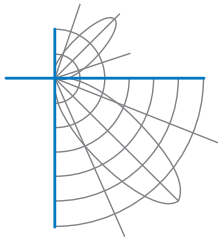
Prepared For:

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

Test date: 10/02/2017

Report date: 10/04/2017



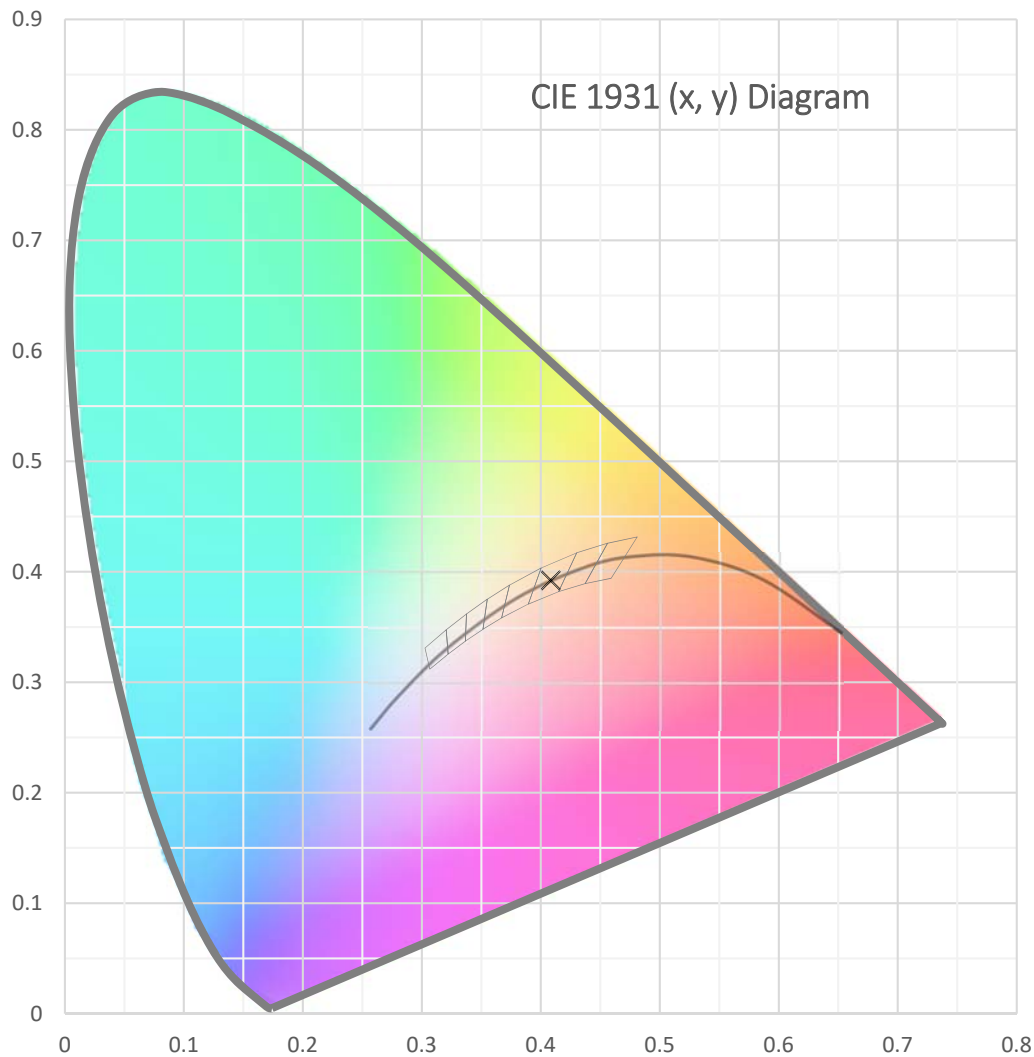


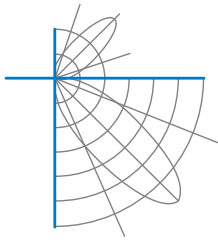
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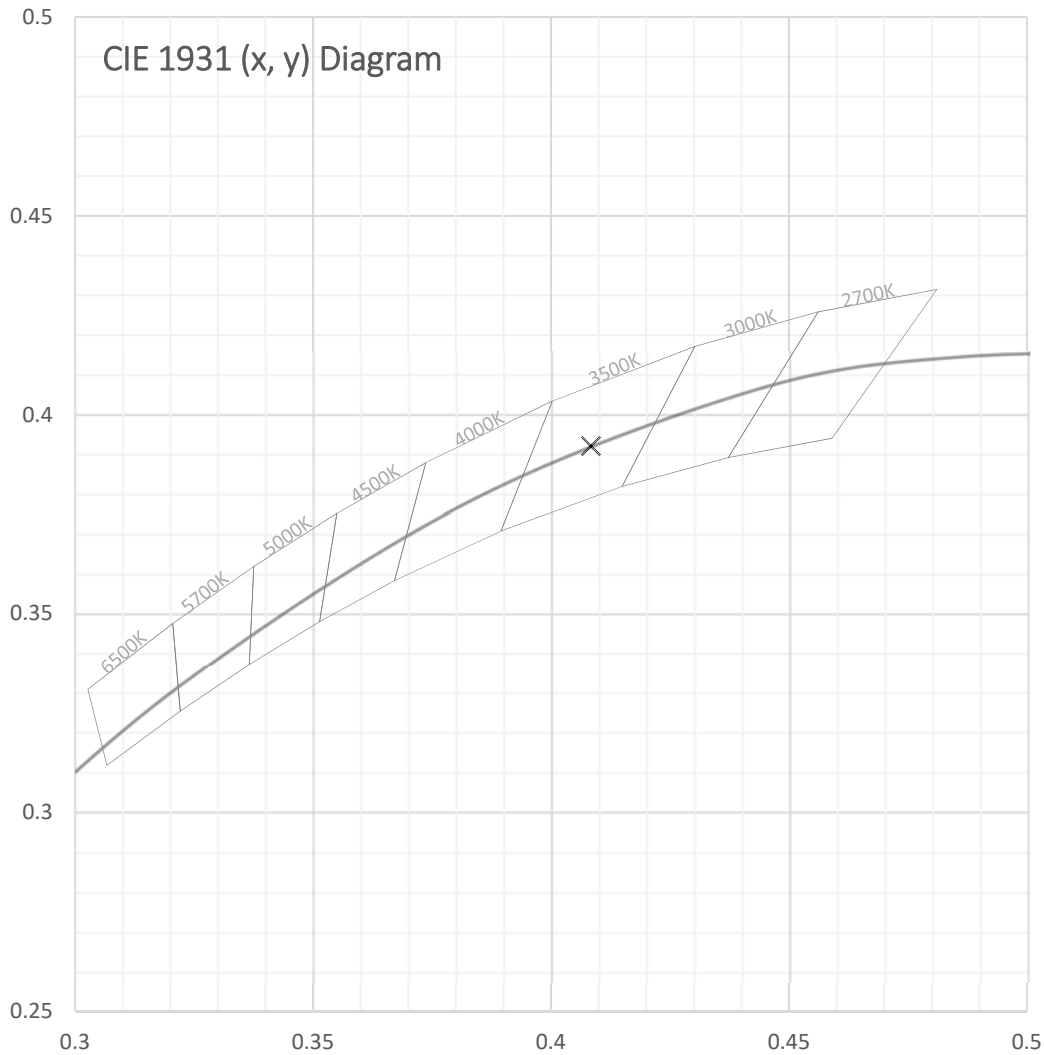


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Two Osram Optotronic OTi 85/120-277/2A6 DIMLT2 L- LED drivers

**Spectral Data**

Chromaticity CIE 1931 (x, y)	(0.4084, 0.3921)
Chromaticity CIE 1976 (u', v')	(0.2371, 0.5123)
Correlated Color Temperature (CCT)	3445 K
Color Rendering Index (Ra)	82
R1	81
R2	89
R3	95
R4	80
R5	80
R6	84
R7	86
R8	64
R9	12
R10	73
R11	78
R12	61
R13	82
R14	97
Distance from Planckian Locus (Duv)	-0.0001
Scotopic/Photopic Ratio *	1.482

**Electrical Data**

Voltage	120.0 Vac
Current	1.994 A
Power	238.6 W
Frequency	60.00 Hz
Power Factor	0.997
Current THD	3.5 %



**Test Report Number: LLIA000833-012B**

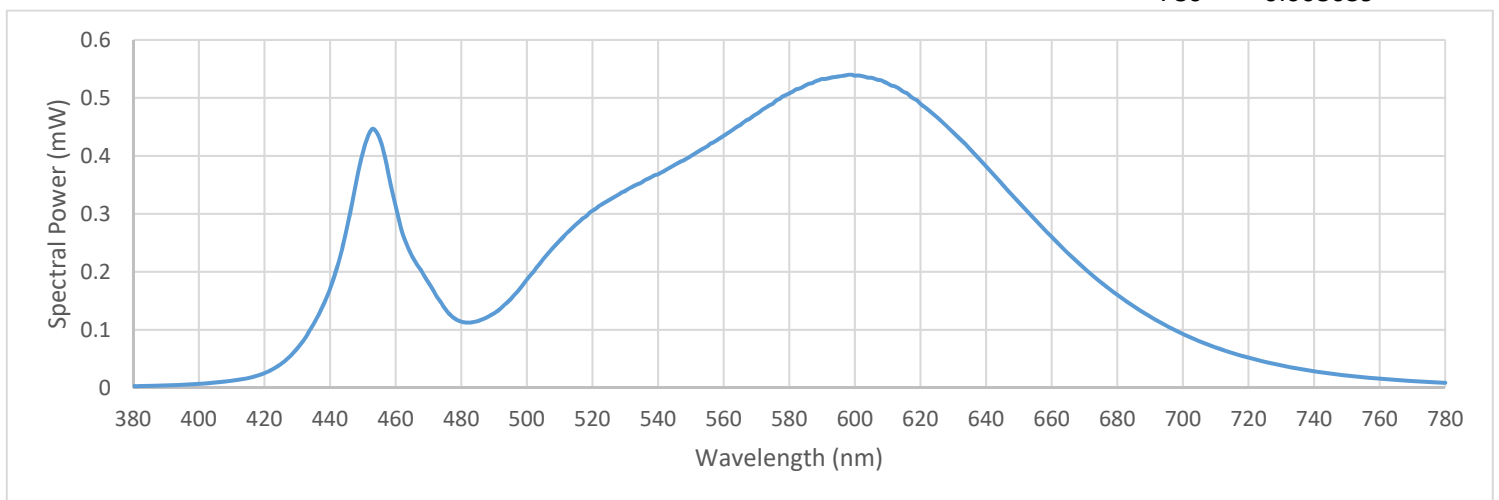
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**Summary Spectral Power Distribution (wavelength - nm, spectral power - mW)**

380	0.002898	480	0.113981	580	0.507780	680	0.160262
385	0.003126	485	0.115038	585	0.521784	685	0.140680
390	0.003986	490	0.128473	590	0.532649	690	0.122863
395	0.005144	495	0.152448	595	0.537045	695	0.106782
400	0.006809	500	0.186734	600	0.538349	700	0.092887
405	0.009069	505	0.222032	605	0.534701	705	0.080514
410	0.012121	510	0.253781	610	0.524965	710	0.069395
415	0.016683	515	0.282055	615	0.509993	715	0.060204
420	0.025335	520	0.305393	620	0.489879	720	0.051850
425	0.040759	525	0.323392	625	0.467007	725	0.044730
430	0.068411	530	0.339394	630	0.440010	730	0.038576
435	0.110349	535	0.354205	635	0.412089	735	0.033094
440	0.170493	540	0.368272	640	0.381883	740	0.028418
445	0.272409	545	0.383958	645	0.350689	745	0.024460
450	0.406713	550	0.399924	650	0.319633	750	0.021081
455	0.431783	555	0.416599	655	0.289519	755	0.018096
460	0.313446	560	0.434502	660	0.260909	760	0.015652
465	0.226663	565	0.452963	665	0.231941	765	0.013527
470	0.181393	570	0.472165	670	0.205787	770	0.011568
475	0.136273	575	0.490049	675	0.182028	775	0.010043
						780	0.008639





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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:** 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  
Note: Luminaire was oriented vertically during testing.

**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.