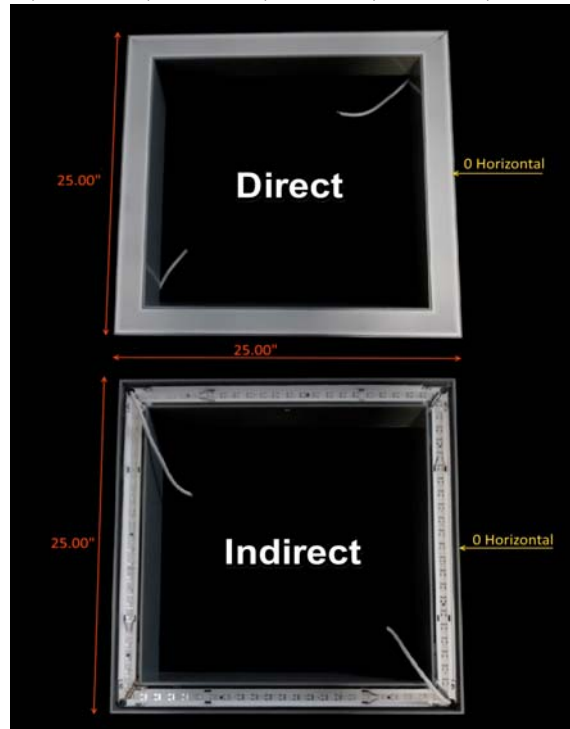


# Report of Test

## LLIA000833-004A

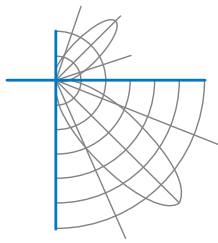
Catalog Number: MQS2-I/D-HO/HO-K35-80-2X2-XXX-OP/FL-XXXX-UNV  
Pendant mounted, extruded aluminum housing, formed white enamel aluminum reflectors, translucent white plastic lower enclosures, open top. 352 white LEDs, 4 PAL-Lighting LED upper boards with 44 LEDs each and 4 PAL-Lighting LED lower boards with 44 LEDs each.  
Two Osram Optotronic OT50W/PRG1400C/UNV/DIM/L LED drivers  
120.0Vac, 59.99Hz, 0.8234A, 98.15W, 0.993PF, 9.3%THD(i)



### Performance Summary

Total Light Output	11390 lm
Luminaire Power	98.1 W
Luminous Efficacy	116.1 lm/W

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



**Test Report No. LLIA000833-004A**

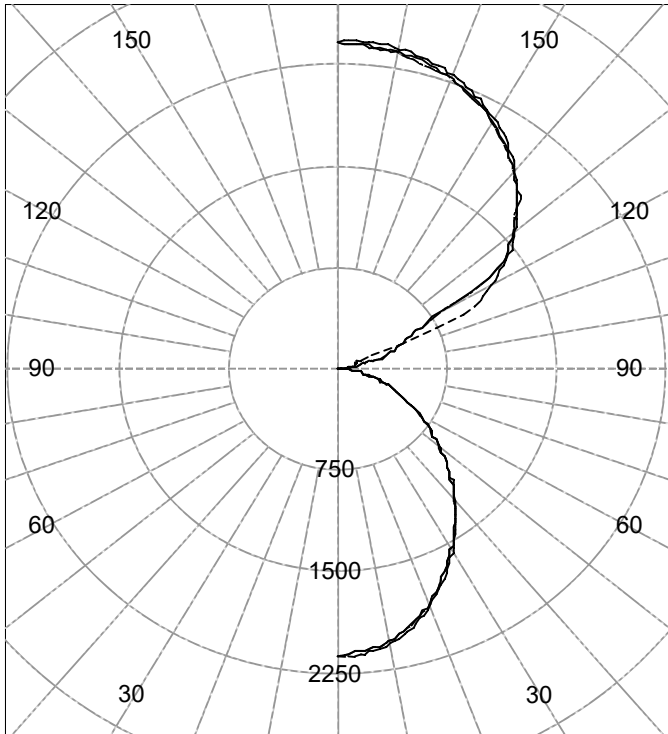
Catalog Number: MQS2-I/D-HO/HO-K35-80-2X2-XXX-OP/FL-XXXX-UNV

Pendant mounted, extruded aluminum housing, formed white enamel aluminum reflectors, translucent white plastic lower enclosures, open top. 352 white LEDs, 4 PAL-Lighting LED upper boards with 44 LEDs each and 4 PAL-Lighting LED lower boards with 44 LEDs each.

Two Osram Optotronic OT50W/PRG1400C/UNV/DIM/L LED drivers

120.0Vac, 59.99Hz, 0.8234A, 98.15W, 0.993PF, 9.3%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	2121	2121	2121	2121	2121	
5.0	2087	2107	2112	2107	2086	199
10.0	2033	2053	2059	2054	2034	
15.0	1947	1966	1973	1970	1951	552
20.0	1831	1850	1857	1855	1836	
25.0	1694	1713	1717	1714	1697	786
30.0	1544	1562	1562	1560	1545	
35.0	1387	1402	1399	1399	1388	873
40.0	1229	1238	1234	1234	1229	
45.0	1072	1076	1072	1072	1072	828
50.0	911	918	914	916	915	
55.0	760	761	764	766	765	684
60.0	619	620	619	624	623	
65.0	485	486	484	488	488	482
70.0	362	362	361	362	361	
75.0	255	254	249	249	249	267
80.0	154	154	154	150	148	
85.0	69	69	68	65	63	77
90.0	12	10	9	8	7	

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

Gamma	C0	C45	C90
45.0	11486	11482	11480
55.0	10033	10096	10104
65.0	8687	8677	8743
75.0	7472	7293	7276
85.0	5992	5928	5511

**ZONAL FLUX AND PERCENTAGES**

Zone	Flux (lm)	% Lamp	% Luminaire
0-30	1538	N / A	13.5
0-40	2410	N / A	21.2
0-60	3922	N / A	34.4
0-90	4748	N / A	41.7
40-90	2337	N / A	20.5
60-90	826	N / A	7.2
90-180	6643	N / A	58.3
0-180	11390	N / A	100.0

Total Light Output = 11,390 lm

Signed:

Authorized Signatory

Date of test

7-Sep-2017

Date of report

7-Sep-2017



**Test Report No. LLIA000833-004A**

Catalog Number: MQS2-I/D-HO/HO-K35-80-2X2-XXX-OP/FL-XXXX-UNV

Pendant mounted, extruded aluminum housing, formed white enamel aluminum reflectors, translucent white plastic lower enclosures, open top. 352 white LEDs, 4 PAL-Lighting LED upper boards with 44 LEDs each and 4 PAL-Lighting LED lower boards with 44 LEDs each.

Two Osram Optotronic OT50W/PRG1400C/UNV/DIM/L LED drivers  
120.0Vac, 59.99Hz, 0.8234A, 98.15W, 0.993PF, 9.3%THD(i)

**Intensity data (cd)**

Gamma	C-Plane				
	C0	C22.5	C45	C67.5	C90
0.0	2121	2121	2121	2121	2121
2.5	2100	2121	2126	2121	2099
5.0	2087	2107	2112	2107	2086
7.5	2064	2085	2090	2085	2063
10.0	2033	2053	2059	2054	2034
12.5	1994	2014	2019	2017	1997
15.0	1947	1966	1973	1970	1951
17.5	1892	1911	1919	1916	1897
20.0	1831	1850	1857	1855	1836
22.5	1765	1783	1790	1787	1768
25.0	1694	1713	1717	1714	1697
27.5	1620	1639	1641	1638	1623
30.0	1544	1562	1562	1560	1545
32.5	1466	1483	1481	1480	1467
35.0	1387	1402	1399	1399	1388
37.5	1308	1320	1316	1316	1308
40.0	1229	1238	1234	1234	1229
42.5	1150	1157	1153	1153	1150
45.0	1072	1076	1072	1072	1072
47.5	992	997	992	993	993
50.0	911	918	914	916	915
52.5	833	838	838	840	839
55.0	760	761	764	766	765
57.5	688	690	692	694	693
60.0	619	620	619	624	623
62.5	551	552	550	555	555
65.0	485	486	484	488	488
67.5	421	423	421	424	423
70.0	362	362	361	362	361
72.5	310	307	303	304	304
75.0	255	254	249	249	249
77.5	203	202	200	198	196
80.0	154	154	154	150	148
82.5	109	109	109	105	104
85.0	69	69	68	65	63
87.5	33	32	31	29	28
90.0	12	10	9	8	7



**Test Report No. LLIA000833-004A**

Catalog Number: MQS2-I/D-HO/HO-K35-80-2X2-XXX-OP/FL-XXXX-UNV

Pendant mounted, extruded aluminum housing, formed white enamel aluminum reflectors, translucent white plastic lower enclosures, open top. 352 white LEDs, 4 PAL-Lighting LED upper boards with 44 LEDs each and 4 PAL-Lighting LED lower boards with 44 LEDs each.

Two Osram Optotronic OT50W/PRG1400C/UNV/DIM/L LED drivers  
120.0Vac, 59.99Hz, 0.8234A, 98.15W, 0.993PF, 9.3%THD(i)

**Intensity data (cd)**

Gamma	C-Plane				
	C0	C22.5	C45	C67.5	C90
90.0	12	10	9	8	7
92.5	20	12	9	9	16
95.0	46	28	11	26	43
97.5	82	44	44	43	81
100.0	143	72	88	71	143
102.5	211	133	118	145	212
105.0	281	323	131	322	282
107.5	346	385	137	388	350
110.0	409	443	146	447	413
112.5	469	498	340	502	473
115.0	524	555	956	560	534
117.5	583	661	1110	651	597
120.0	747	1033	1210	1013	728
122.5	1165	1297	1309	1295	1165
125.0	1373	1400	1403	1397	1374
127.5	1472	1490	1491	1492	1469
130.0	1563	1578	1577	1581	1557
132.5	1649	1660	1663	1664	1643
135.0	1730	1738	1746	1744	1728
137.5	1808	1816	1821	1816	1803
140.0	1876	1890	1889	1885	1874
142.5	1940	1956	1959	1954	1936
145.0	2003	2016	2024	2019	1996
147.5	2061	2073	2080	2076	2052
150.0	2113	2127	2132	2127	2105
152.5	2160	2178	2178	2173	2153
155.0	2201	2225	2224	2220	2194
157.5	2239	2264	2267	2261	2232
160.0	2274	2299	2302	2295	2266
162.5	2307	2329	2331	2326	2295
165.0	2334	2356	2357	2354	2319
167.5	2355	2380	2380	2376	2342
170.0	2372	2397	2399	2394	2362
172.5	2384	2410	2412	2408	2377
175.0	2392	2418	2421	2417	2387
177.5	2396	2423	2426	2421	2392
180.0	2417	2417	2417	2417	2417



**Test Number: LLIA000833-004A**

Catalog Number: MQS2-I/D-HO/HO-K35-80-2X2-XXX-OP/FL-XXXX-UNV

Pendant mounted, extruded aluminum housing, formed white enamel aluminum reflectors, translucent white plastic lower enclosures, open top. 352 white LEDs, 4 PAL-Lighting LED upper boards with 44 LEDs each and 4 PAL-Lighting LED lower boards with 44 LEDs each.

Two Osram Optotronic OT50W/PRG1400C/UNV/DIM/L LED drivers  
120.0Vac, 59.99Hz, 0.8234A, 98.15W, 0.993PF, 9.3%THD(i)

**Coefficients Of Utilization - Zonal Cavity Method**

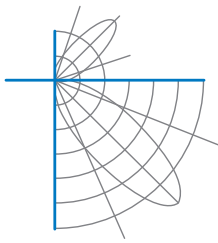
Effective Floor Cavity Reflectance 0.20

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	105	105	105	105	96	96	96	96	79	79	79	63	63	63	48	48	48	42
1	96	92	88	85	88	84	81	78	69	67	65	56	54	53	43	42	41	35
2	88	80	75	70	80	74	69	64	61	57	54	49	47	44	38	37	35	30
3	80	71	64	58	73	65	59	54	54	49	46	44	40	38	34	32	30	26
4	73	63	55	49	67	58	51	46	48	43	39	39	35	33	31	28	26	22
5	67	56	48	42	61	52	45	39	43	38	34	35	31	28	28	25	23	20
6	62	50	42	37	57	46	39	34	39	34	30	32	28	25	25	22	20	17
7	57	45	38	32	52	42	35	30	35	30	26	29	25	22	23	20	18	15
8	53	41	34	29	49	38	31	27	32	27	23	27	23	20	21	18	16	14
9	50	38	30	25	45	35	28	24	29	24	21	24	21	18	20	17	15	13
10	46	35	28	23	42	32	26	21	27	22	19	23	19	16	18	15	13	11

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	58.9	6.61	6.62
8.0	33.1	8.82	8.83
10.0	21.2	11.02	11.03
12.0	14.7	13.23	13.24
14.0	10.8	15.43	15.45
16.0	8.3	17.64	17.65

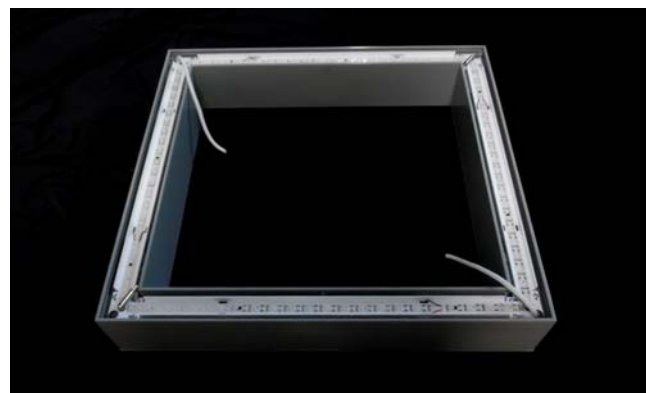
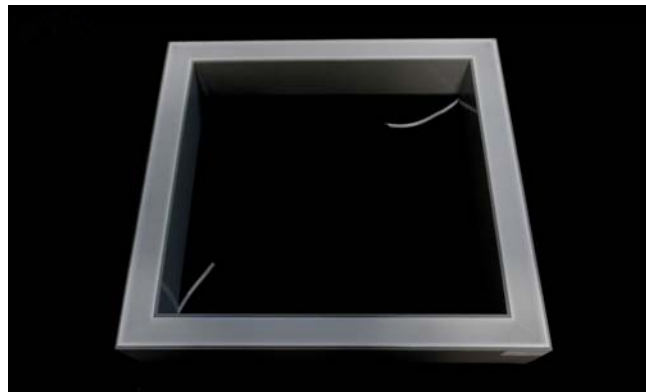
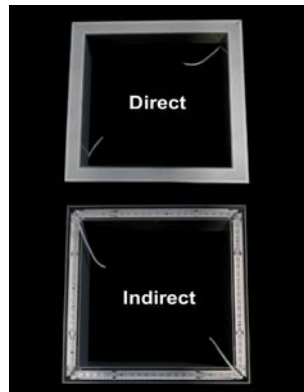


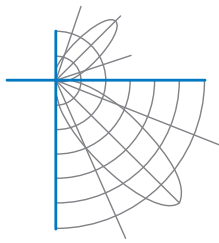
**Test Report No. LLIA000833-004A**

Catalog Number: MQS2-I/D-HO/HO-K35-80-2X2-XXX-OP/FL-XXXX-UNV

Pendant mounted, extruded aluminum housing, formed white enamel aluminum reflectors, translucent white plastic lower enclosures, open top. 352 white LEDs, 4 PAL-Lighting LED upper boards with 44 LEDs each and 4 PAL-Lighting LED lower boards with 44 LEDs each.

Two Osram Optotronic OT50W/PRG1400C/UNV/DIM/L LED drivers  
120.0Vac, 59.99Hz, 0.8234A, 98.15W, 0.993PF, 9.3%THD(i)





**Test Report No. LLIA000833-004A**

Catalog Number: MQS2-I/D-HO/HO-K35-80-2X2-XXX-OP/FL-XXXX-UNV

Pendant mounted, extruded aluminum housing, formed white enamel aluminum reflectors, translucent white plastic lower enclosures, open top. 352 white LEDs, 4 PAL-Lighting LED upper boards with 44 LEDs each and 4 PAL-Lighting LED lower boards with 44 LEDs each.

Two Osram Optotronic OT50W/PRG1400C/UNV/DIM/L LED drivers  
120.0Vac, 59.99Hz, 0.8234A, 98.15W, 0.993PF, 9.3%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 C78.377:2015, 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.

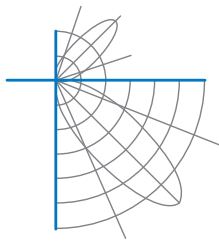
Prorating the performance of the sample for the use of other component combinations (such as lamp / LED / Ballast / driver), or for use in different environmental conditions than that tested, may produce erroneous results.

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

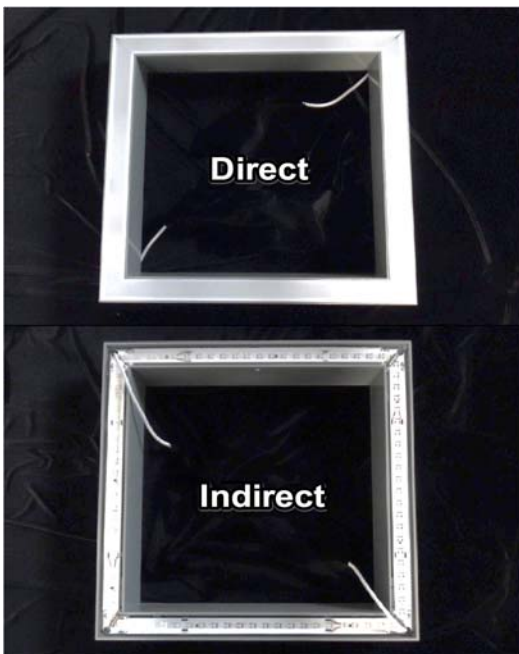
**LLIA000833-004B**

Integrating Sphere Report

Catalog Number: MQS2-I/D-HO/HO-K35-80-2X2-XXX-OP/FL-XXXX-UNV

Pendant mounted, extruded aluminum housing, formed white enamel aluminum reflectors, translucent white plastic lower enclosures, open top. 352 white LEDs, 4 PAL-Lighting LED upper boards with 44 LEDs each and 4 PAL-Lighting LED lower boards with 44 LEDs each.

Two Osram Optotronic OT50W/PRG1400C/UNV/DIM/L LED drivers



### Performance Summary

Voltage	120.0 Vac
Current	0.8204 A
Power	97.96 W
Frequency	60.00 Hz
Power Factor	0.994
Current THD	9.3 %

Total Luminous Flux	11577.1 lm
Efficacy	118.2 lm/W
Chromaticity (x,y)	(0.4075, 0.3937)
(u',v')	(0.2359, 0.5128)
Duv	0.0008
CCT	3476 K
CRI (Ra)	82
R9	11

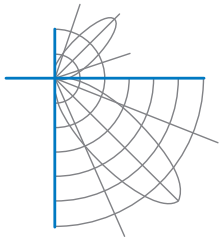
Prepared For:

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

Test date: 09/05/2017

Report date: 09/07/2017



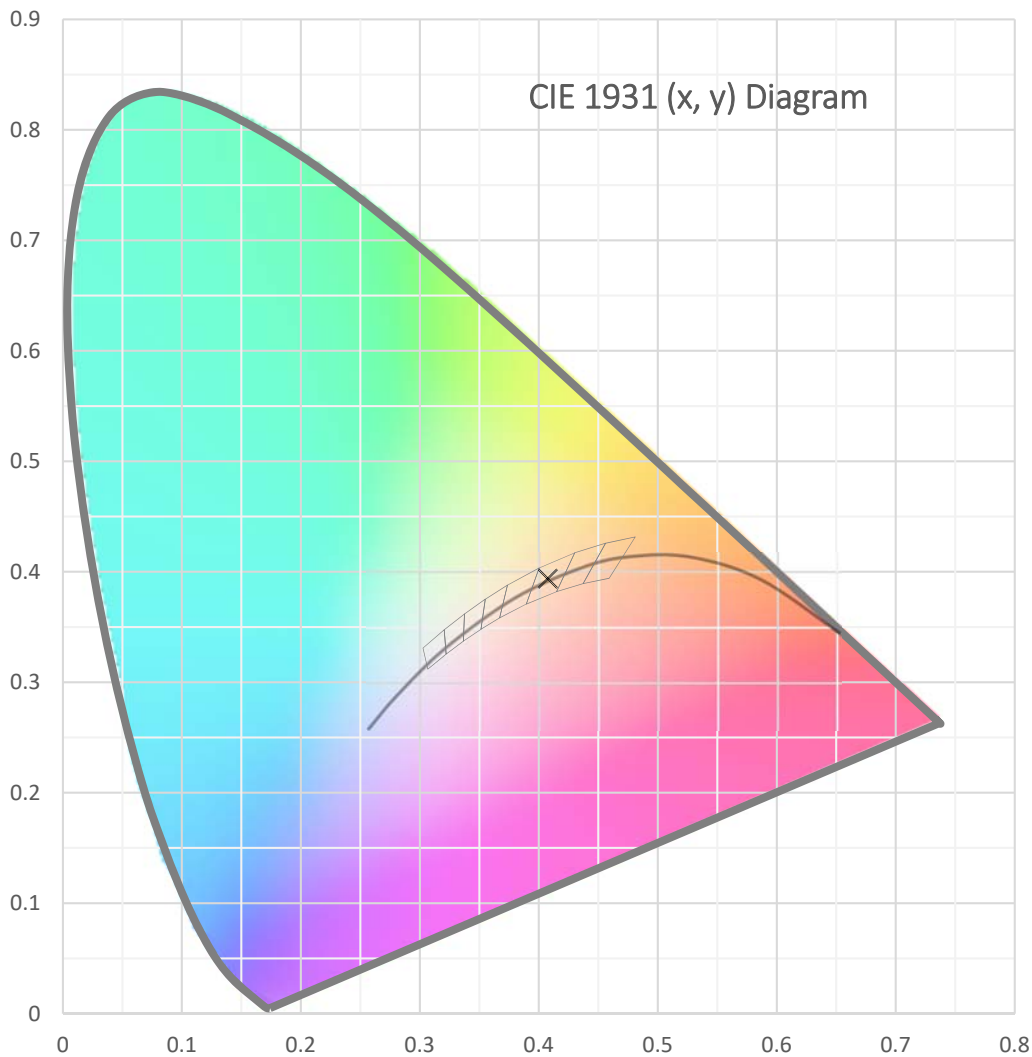


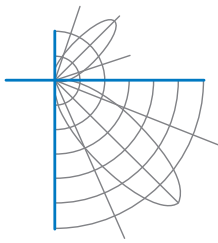
**Test Report Number: LLIA000833-004B**

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Two Osram Optotronic OT50W/PRG1400C/UNV/DIM/L LED drivers



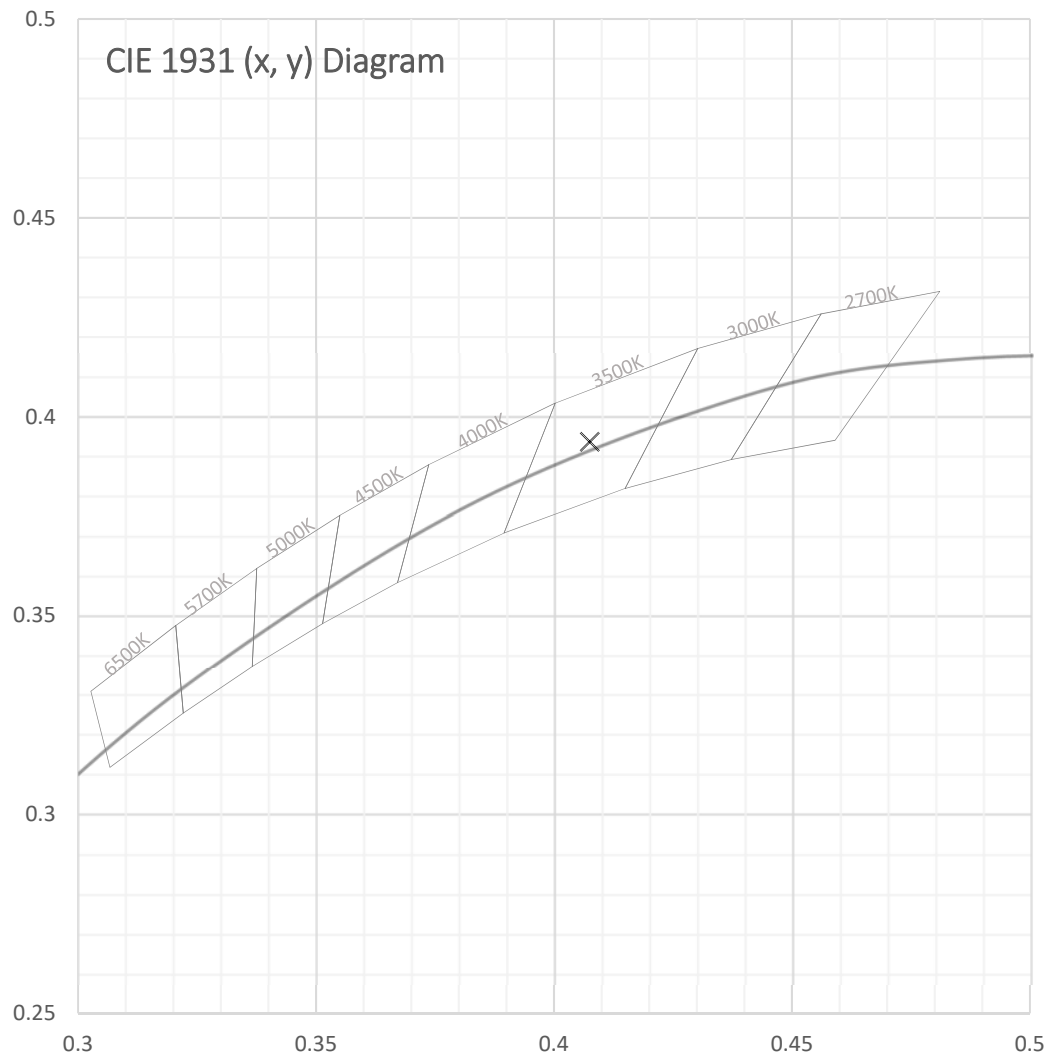


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Two Osram Optotronic OT50W/PRG1400C/UNV/DIM/L LED drivers





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Pendant mounted, extruded aluminum housing, formed white enamel aluminum reflectors, translucent white plastic lower enclosures, open top. 352 white LEDs, 4 PAL-Lighting LED upper boards with 44 LEDs each and 4 PAL-Lighting LED lower boards with 44 LEDs each.

Two Osram Optotronic OT50W/PRG1400C/UNV/DIM/L LED drivers

<b>Spectral Data</b>	Total Radiant Flux	35.45 W
	Total Luminous Flux	11577.1 Lm
	Chromaticity CIE 1931 (x, y)	(0.4075, 0.3937)
	Chromaticity CIE 1976 (u', v')	(0.2359, 0.5128)
	Correlated Color Temperature (CCT)	3476 K
	Color Rendering Index (Ra)	82
	R1	81
	R2	89
	R3	95
	R4	81
	R5	80
	R6	84
	R7	86
	R8	64
	R9	11
	R10	73
	R11	79
	R12	61
	R13	83
	R14	97
	Distance from Planckian Locus (Duv)	0.0008
	Scotopic/Photopic Ratio *	1.495

**Electrical Data**

Voltage	120.0 Vac
Current	0.8204 A
Power	97.96 W
Frequency	60.00 Hz
Power Factor	0.994
Current THD	9.3 %



**Test Report Number: LLIA000833-004B**

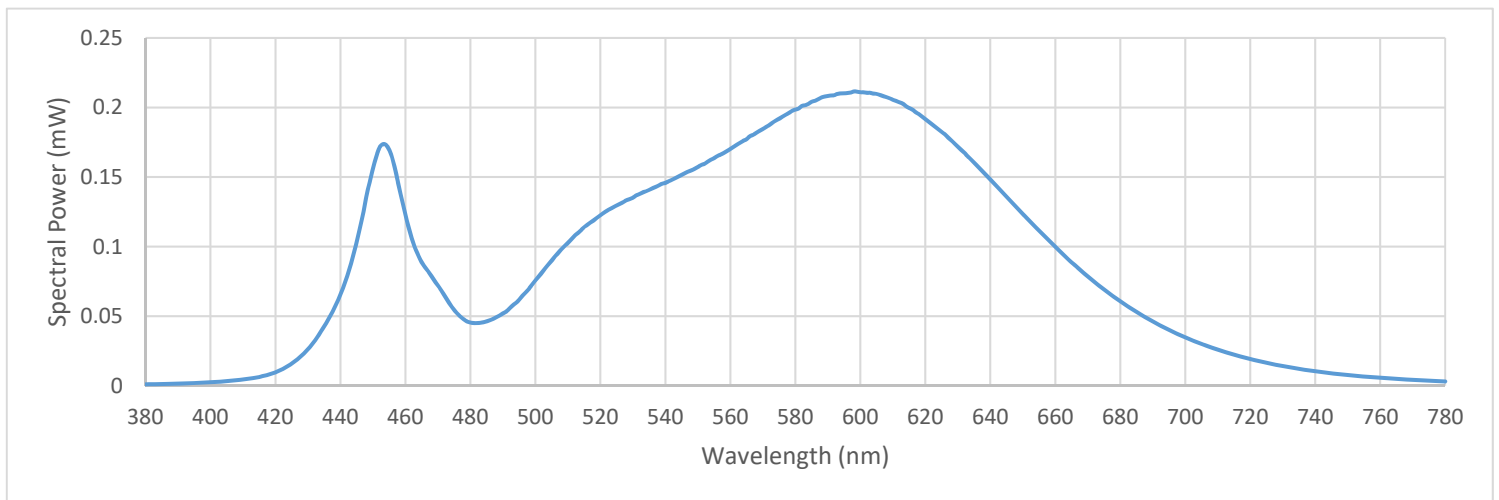
Catalog Number: MQS2-I/D-HO/HO-K35-80-2X2-XXX-OP/FL-XXXX-UNV

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Two Osram Optotronic OT50W/PRG1400C/UNV/DIM/L LED drivers

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

380	0.001061	480	0.045430	580	0.198513	680	0.060670
385	0.001186	485	0.046278	585	0.204099	685	0.053096
390	0.001508	490	0.052050	590	0.208319	690	0.046301
395	0.001920	495	0.061828	595	0.210160	695	0.040058
400	0.002533	500	0.075714	600	0.210965	700	0.034771
405	0.003325	505	0.089813	605	0.209850	705	0.030055
410	0.004482	510	0.102595	610	0.205557	710	0.025848
415	0.006286	515	0.114181	615	0.199686	715	0.022299
420	0.009822	520	0.122652	620	0.191634	720	0.019177
425	0.015864	525	0.129585	625	0.182364	725	0.016525
430	0.026440	530	0.135206	630	0.171807	730	0.014212
435	0.042688	535	0.140680	635	0.160614	735	0.012152
440	0.065564	540	0.145775	640	0.148186	740	0.010424
445	0.103830	545	0.151486	645	0.135718	745	0.008958
450	0.155944	550	0.157223	650	0.123473	750	0.007678
455	0.169885	555	0.163592	655	0.111311	755	0.006608
460	0.123219	560	0.170095	660	0.100077	760	0.005716
465	0.088741	565	0.177238	665	0.088721	765	0.004914
470	0.072137	570	0.184517	670	0.078421	770	0.004217
475	0.054316	575	0.191797	675	0.069210	775	0.003634
						780	0.003146





**Test Report Number: LLIA000833-004B**

Catalog Number: MQS2-I/D-HO/HO-K35-80-2X2-XXX-OP/FL-XXXX-UNV

Pendant mounted, extruded aluminum housing, formed white enamel aluminum reflectors, translucent white plastic lower enclosures, open top. 352 white LEDs, 4 PAL-Lighting LED upper boards with 44 LEDs each and 4 PAL-Lighting LED lower boards with 44 LEDs each.

Two Osram Optotronic OT50W/PRG1400C/UNV/DIM/L LED drivers

**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:** 25.1 °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

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Quantities marked with \* are not covered.