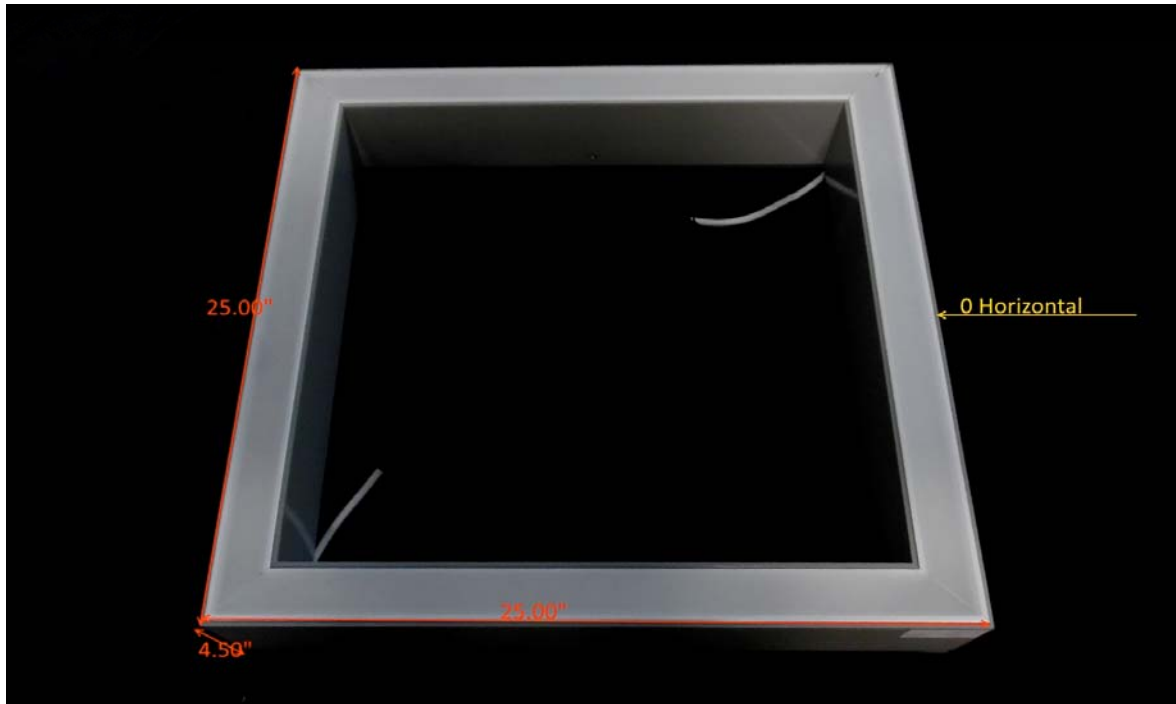


# Report of Test

## LLIA000833-002A

Catalog Number: MQS2-D-HO-K35-80-2X2-XXX-FL-XXXX-UNV  
Pendant mounted, extruded aluminum housing, formed white enamel aluminum reflectors,  
translucent white plastic enclosures.  
176 white LEDs, 4 PAL-Lighting LED boards with 44 LEDs each  
One Osram Optotronic OT50W/PRG1400C/UNV/DIM/L LED driver  
120.0Vac, 60.00Hz, 0.4096A, 49.03W, 0.995PF, 8.5%THD(i)



### Performance Summary

Total Light Output	4697 lm
Luminaire Power	49.0 W
Luminous Efficacy	95.9 lm/W

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



**Test Report No. LLIA000833-002A**

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

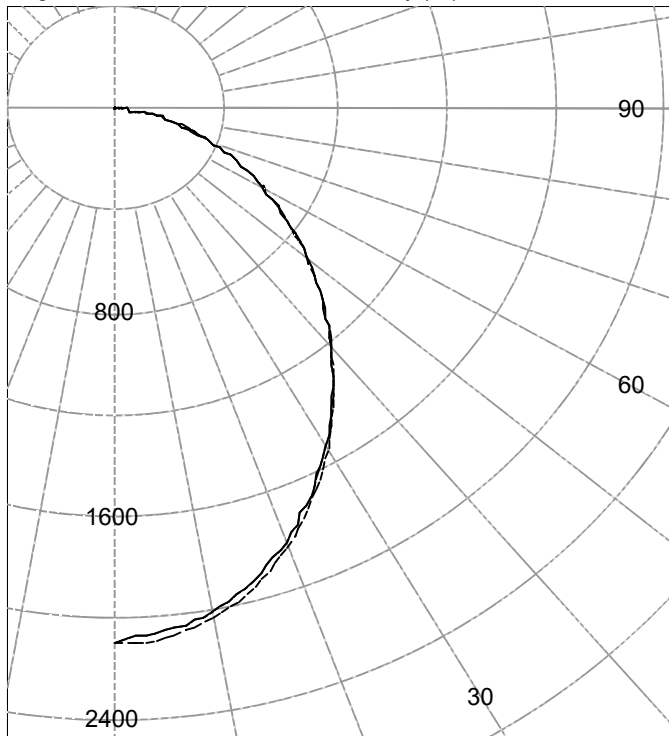
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176 white LEDs, 4 PAL-Lighting LED boards with 44 LEDs each

One Osram Optotronic OT50W/PRG1400C/UNV/DIM/L LED driver

120.0Vac, 60.00Hz, 0.4096A, 49.03W, 0.995PF, 8.5%THD(i)

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



(Two plane symmetry) C0-C90

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

Gamma	C0	C45	C90
45.0	11355	11368	11369
55.0	10025	9984	10041
65.0	8648	8655	8662
75.0	7264	7331	7273
85.0	5608	5768	5613

**INTENSITY SUMMARY (cd)**

Gamma	C-Plane					Flux (lm)
	C0	C22.5	C45	C67.5	C90	
0.0	2096	2096	2096	2096	2096	
5.0	2060	2081	2087	2082	2060	197
10.0	2006	2027	2032	2027	2006	
15.0	1920	1941	1944	1941	1921	545
20.0	1808	1826	1828	1827	1809	
25.0	1675	1691	1691	1691	1677	776
30.0	1529	1541	1540	1541	1531	
35.0	1374	1383	1381	1383	1376	863
40.0	1216	1222	1220	1223	1217	
45.0	1060	1062	1061	1063	1061	819
50.0	908	907	906	907	909	
55.0	759	757	756	758	760	678
60.0	615	617	615	617	617	
65.0	482	484	483	484	483	480
70.0	359	361	361	361	360	
75.0	248	250	250	250	248	266
80.0	149	151	152	151	149	
85.0	65	66	66	66	65	74
90.0	0	0	0	0	0	

**ZONAL FLUX AND PERCENTAGES**

Zone	Flux (lm)	% Lamp	% Luminaire
0-30	1517	N / A	32.3
0-40	2380	N / A	50.7
0-60	3877	N / A	82.6
0-90	4697	N / A	100.0
40-90	2317	N / A	49.3
60-90	820	N / A	17.4
90-180	0	N / A	0.0
0-180	4697	N / A	100.0

Total Light Output = 4,697 lm

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

Signed:

Authorized Signatory

Date of test 5-Sep-2017  
Date of report 7-Sep-2017



**Test Report No. LLIA000833-002A**

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

Pendant mounted, extruded aluminum housing, formed white enamel aluminum reflectors,  
translucent white plastic enclosures.

176 white LEDs, 4 PAL-Lighting LED boards with 44 LEDs each

One Osram Optotronic OT50W/PRG1400C/UNV/DIM/L LED driver

120.0Vac, 60.00Hz, 0.4096A, 49.03W, 0.995PF, 8.5%THD(i)

**Intensity data (cd)**

Gamma	C-Plane				
	C0	C22.5	C45	C67.5	C90
0.0	2096	2096	2096	2096	2096
2.5	2073	2095	2101	2095	2074
5.0	2060	2081	2087	2082	2060
7.5	2037	2059	2063	2059	2038
10.0	2006	2027	2032	2027	2006
12.5	1967	1988	1992	1988	1967
15.0	1920	1941	1944	1941	1921
17.5	1867	1886	1889	1887	1868
20.0	1808	1826	1828	1827	1809
22.5	1744	1761	1762	1761	1745
25.0	1675	1691	1691	1691	1677
27.5	1604	1617	1617	1618	1605
30.0	1529	1541	1540	1541	1531
32.5	1452	1462	1461	1463	1454
35.0	1374	1383	1381	1383	1376
37.5	1295	1302	1301	1303	1297
40.0	1216	1222	1220	1223	1217
42.5	1137	1142	1140	1143	1139
45.0	1060	1062	1061	1063	1061
47.5	983	984	983	985	985
50.0	908	907	906	907	909
52.5	833	831	830	832	834
55.0	759	757	756	758	760
57.5	686	686	684	687	687
60.0	615	617	615	617	617
62.5	548	549	547	550	548
65.0	482	484	483	484	483
67.5	420	421	420	422	420
70.0	359	361	361	361	360
72.5	302	304	304	305	303
75.0	248	250	250	250	248
77.5	197	199	200	199	197
80.0	149	151	152	151	149
82.5	105	107	108	107	105
85.0	65	66	66	66	65
87.5	28	28	28	28	28
90.0	0	0	0	0	0



**Test Number: LLIA000833-002A**

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

Pendant mounted, extruded aluminum housing, formed white enamel aluminum reflectors,  
translucent white plastic enclosures.

176 white LEDs, 4 PAL-Lighting LED boards with 44 LEDs each

One Osram Optotronic OT50W/PRG1400C/UNV/DIM/L LED driver

120.0Vac, 60.00Hz, 0.4096A, 49.03W, 0.995PF, 8.5%THD(i)

**Coefficients Of Utilization - Zonal Cavity Method**

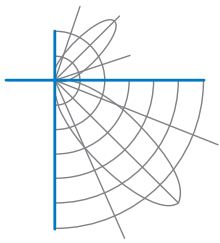
Effective Floor Cavity Reflectance 0.20

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	118	118	118	118	115	115	115	115	109	109	109	103	103	103	98	98	98	96
1	108	104	100	96	105	101	98	94	96	93	91	92	89	87	88	86	84	82
2	99	91	85	80	96	89	83	78	85	80	76	81	77	74	78	74	71	69
3	91	81	73	67	88	79	72	66	76	70	65	72	67	63	69	65	61	59
4	84	72	64	58	81	71	63	57	68	61	56	65	59	55	62	57	53	51
5	77	65	56	50	75	64	56	50	61	54	49	59	53	48	57	51	47	45
6	72	59	50	44	69	58	50	44	55	48	43	53	47	42	52	46	42	40
7	67	54	45	39	65	53	45	39	51	44	38	49	43	38	47	42	37	35
8	62	49	41	35	60	48	40	35	47	40	35	45	39	34	44	38	34	32
9	58	45	37	32	57	44	37	32	43	36	31	42	35	31	40	35	31	29
10	55	42	34	29	53	41	34	29	40	33	29	39	33	28	38	32	28	26

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	58.2	6.63	6.63
8.0	32.8	8.83	8.84
10.0	21.0	11.04	11.05
12.0	14.6	13.25	13.26
14.0	10.7	15.46	15.47
16.0	8.2	17.67	17.68



**Test Report No. LLIA000833-002A**

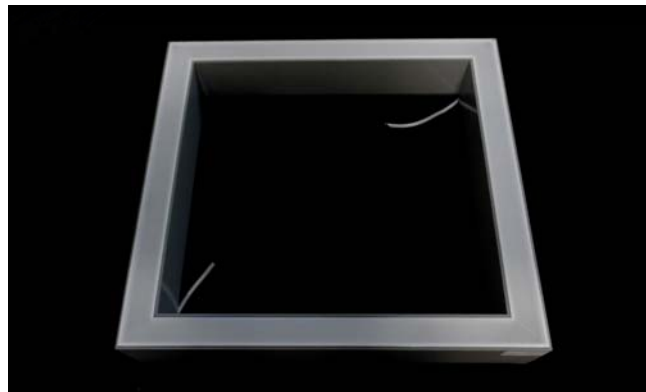
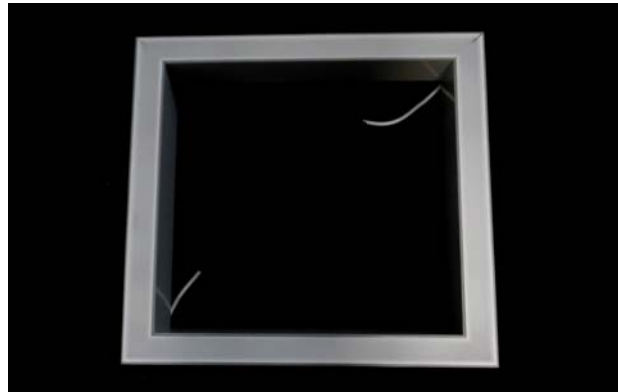
Catalog Number: MQS2-D-HO-K35-80-2X2-XXX-FL-XXXX-UNV

Pendant mounted, extruded aluminum housing, formed white enamel aluminum reflectors,  
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176 white LEDs, 4 PAL-Lighting LED boards with 44 LEDs each

One Osram Optotronic OT50W/PRG1400C/UNV/DIM/L LED driver

120.0Vac, 60.00Hz, 0.4096A, 49.03W, 0.995PF, 8.5%THD(i)





**Test Report No. LLIA000833-002A**

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

Pendant mounted, extruded aluminum housing, formed white enamel aluminum reflectors,  
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176 white LEDs, 4 PAL-Lighting LED boards with 44 LEDs each  
One Osram Optotronic OT50W/PRG1400C/UNV/DIM/L LED driver  
120.0Vac, 60.00Hz, 0.4096A, 49.03W, 0.995PF, 8.5%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 C78.377:2015, 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

**LLIA000833-002B**

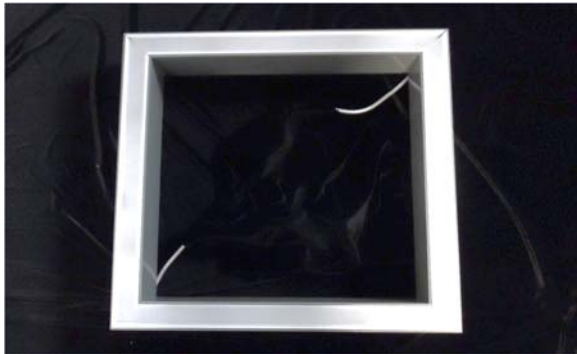
Integrating Sphere Report

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

Pendant mounted, extruded aluminum housing, formed white enamel  
aluminum reflectors, translucent white plastic enclosures.

176 white LEDs, 4 PAL-Lighting LED boards with 44 LEDs each

One Osram Optotronic OT50W/PRG1400C/UNV/DIM/L LED driver



### Performance Summary

Voltage	120.0 Vac
Current	0.4105 A
Power	49.00 W
Frequency	60.00 Hz
Power Factor	0.995
Current THD	8.6 %

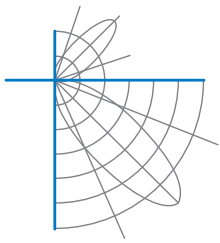
Total Luminous Flux	4889.1 lm
Efficacy	99.8 lm/W
Chromaticity (x,y)	(0.4097, 0.3964)
(u',v')	(0.2362, 0.5143)
Duv	0.0015
CCT	3453 K
CRI (Ra)	82
R9	11

Prepared For:

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

Test date: 09/06/2017

Report date: 09/07/2017



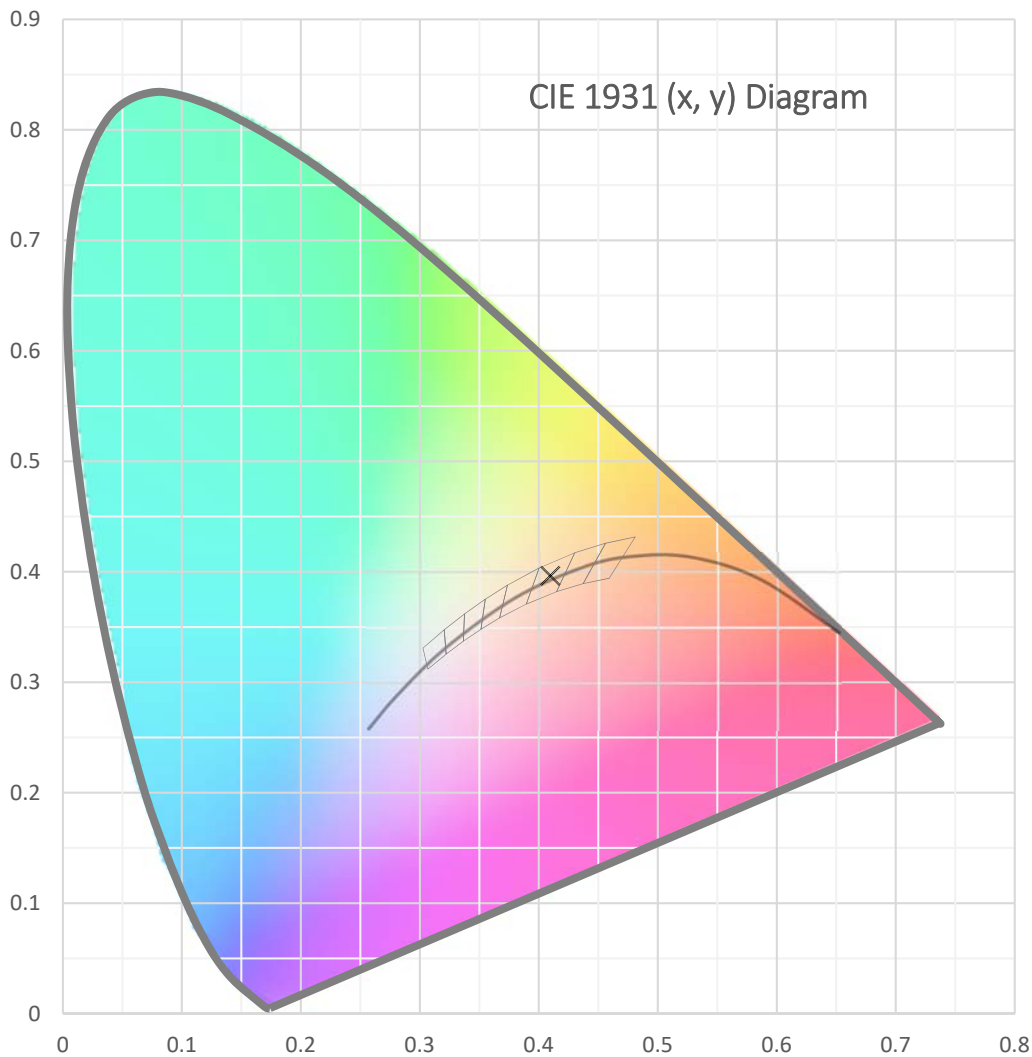
**Test Report Number: LLIA000833-002B**

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

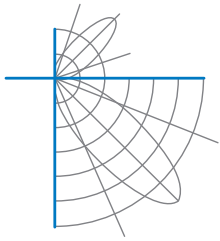
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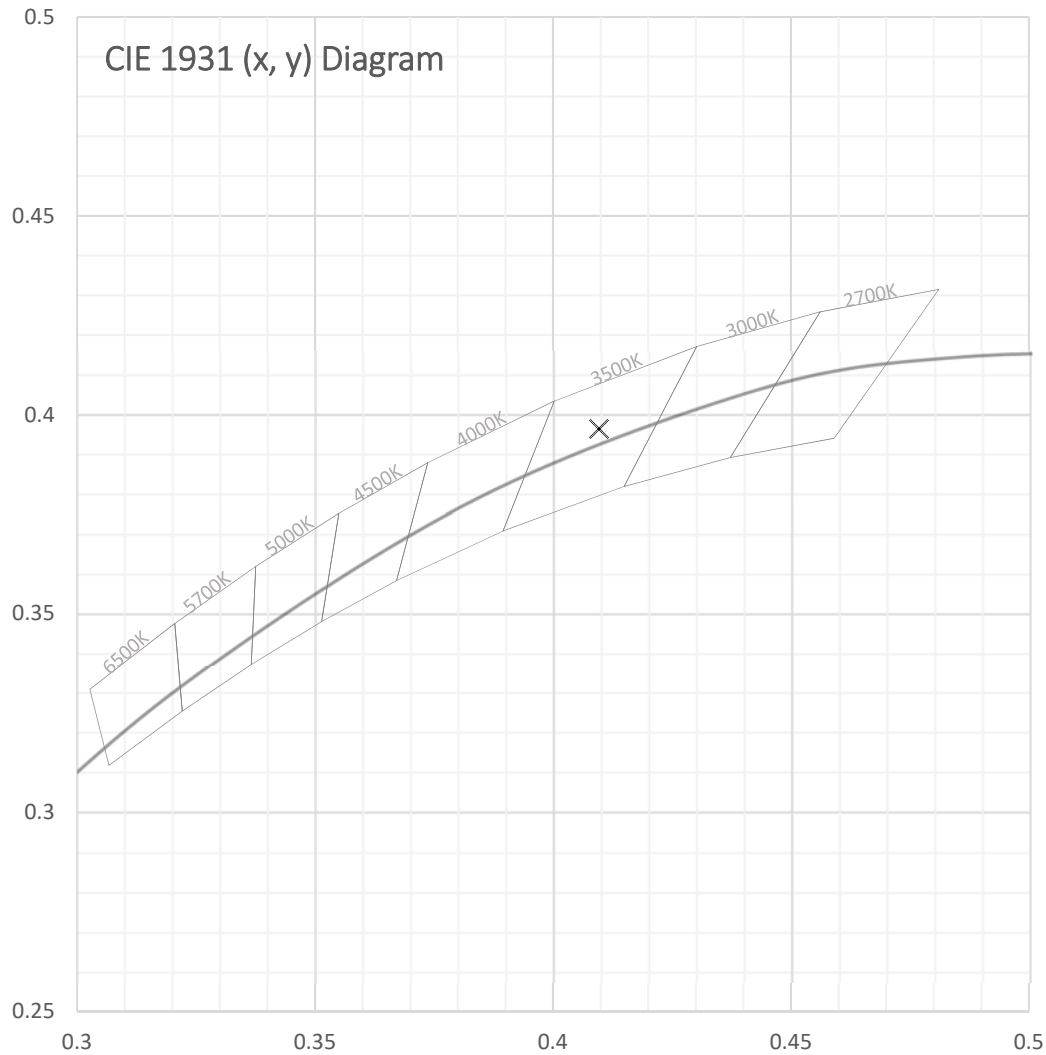
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**Spectral Data**

Total Radiant Flux	14.92 W
Total Luminous Flux	4889.1 Lm
Chromaticity CIE 1931 (x, y)	(0.4097, 0.3964)
Chromaticity CIE 1976 (u', v')	(0.2362, 0.5143)
Correlated Color Temperature (CCT)	3453 K
Color Rendering Index (Ra)	82
R1	80
R2	88
R3	95
R4	81
R5	80
R6	84
R7	86
R8	64
R9	11
R10	72
R11	79
R12	61
R13	82
R14	97
Distance from Planckian Locus (Duv)	0.0015
Scotopic/Photopic Ratio *	1.481

**Electrical Data**

Voltage	120.0 Vac
Current	0.4105 A
Power	49.00 W
Frequency	60.00 Hz
Power Factor	0.995
Current THD	8.6 %



**Test Report Number: LLIA000833-002B**

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

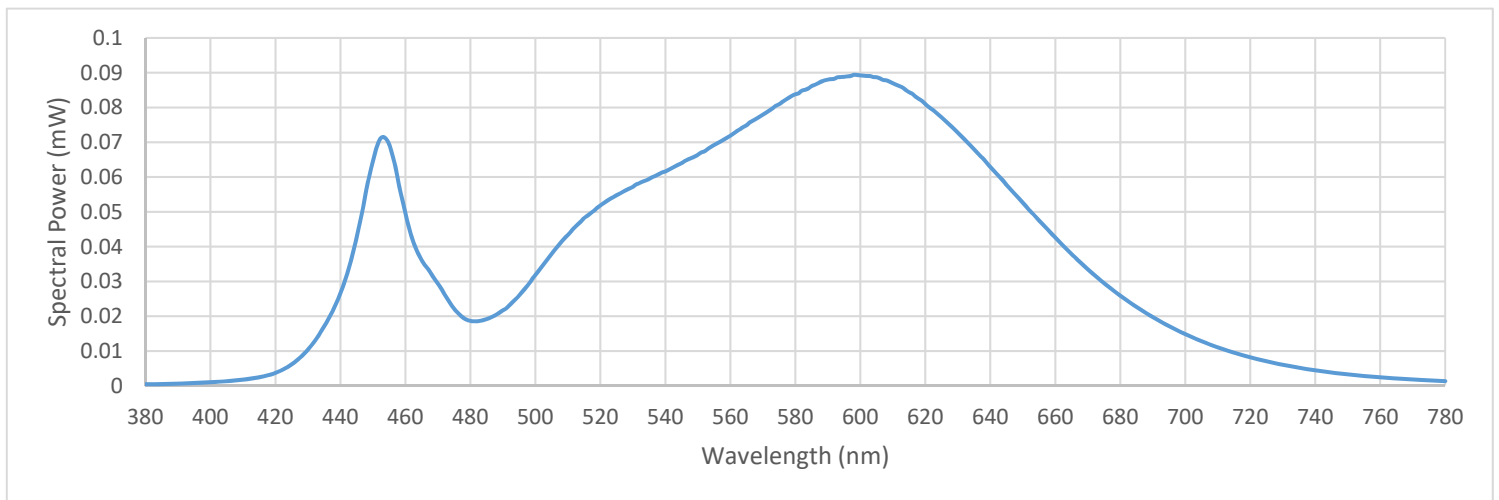
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Summary Spectral Power Distribution (wavelength - nm, spectral power - mW)

380	0.000439	480	0.018655	580	0.083791	680	0.025897
385	0.000478	485	0.019165	585	0.086155	685	0.022683
390	0.000601	490	0.021698	590	0.088026	690	0.019782
395	0.000771	495	0.025937	595	0.088830	695	0.017103
400	0.001012	500	0.031869	600	0.089242	700	0.014851
405	0.001330	505	0.037856	605	0.088716	705	0.012836
410	0.001757	510	0.043341	610	0.086980	710	0.011012
415	0.002420	515	0.048250	615	0.084410	715	0.009524
420	0.003757	520	0.051842	620	0.081002	720	0.008172
425	0.006143	525	0.054791	625	0.077096	725	0.007021
430	0.010453	530	0.057200	630	0.072689	730	0.006050
435	0.017097	535	0.059454	635	0.068087	735	0.005176
440	0.026576	540	0.061613	640	0.062928	740	0.004435
445	0.042855	545	0.064024	645	0.057694	745	0.003810
450	0.064637	550	0.066408	650	0.052614	750	0.003271
455	0.069431	555	0.069173	655	0.047468	755	0.002813
460	0.049624	560	0.071897	660	0.042696	760	0.002431
465	0.036026	565	0.074895	665	0.037842	765	0.002092
470	0.029379	570	0.077884	670	0.033451	770	0.001798
475	0.022076	575	0.080916	675	0.029497	775	0.001547
						780	0.001332





**Test Report Number: LLIA000833-002B**

Catalog Number: MQS2-D-HO-K35-80-2X2-XXX-FL-XXXX-UNV  
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176 white LEDs, 4 PAL-Lighting LED boards with 44 LEDs each  
One Osram Optotronic OT50W/PRG1400C/UNV/DIM/L LED driver

**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:** 24.4 °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  
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Prorating the performance of the sample for the use of other component  
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