



# Report of Test

## LLIA000833-001A

Catalog Number: MQS2-D-HO-K35-80-2X2-XXX-AL-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, 0.4105A, 49.04W, 0.995PF, 8.5%THD(i)



### Performance Summary

Total Light Output	4129 lm
Luminaire Power	49.0 W
Luminous Efficacy	84.3 lm/W

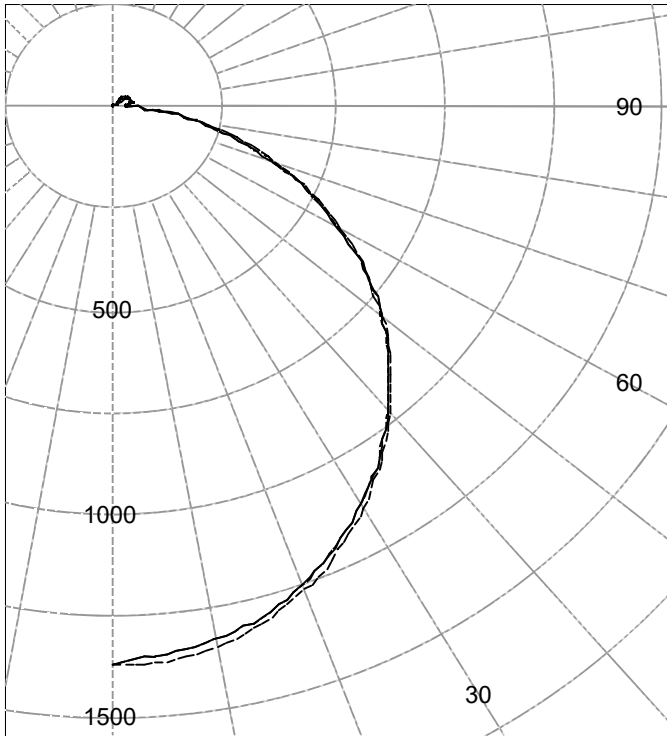
**PREPARED FOR : Precision Architectural Lighting, 4830 Timber Creek Drive, Houston, TX 77017**



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120.0Vac, 60.00Hz, 0.4105A, 49.04W, 0.995PF, 8.5%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	1368	1368	1368	1368	1368	
5.0	1350	1363	1367	1363	1350	129
10.0	1329	1343	1346	1343	1329	
15.0	1298	1308	1312	1308	1298	368
20.0	1248	1262	1264	1261	1249	
25.0	1192	1203	1205	1204	1191	553
30.0	1125	1137	1137	1135	1124	
35.0	1050	1059	1061	1060	1050	662
40.0	969	977	978	977	969	
45.0	884	891	891	890	883	686
50.0	794	797	798	797	793	
55.0	695	699	699	698	695	624
60.0	591	596	597	596	590	
65.0	485	491	493	491	485	485
70.0	380	386	389	386	379	
75.0	277	284	287	284	276	300
80.0	182	190	193	189	181	
85.0	104	111	114	111	103	122
90.0	28	32	34	32	28	

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

Gamma	C0	C45	C90
45.0	9065	8977	9056
55.0	8634	8475	8627
65.0	7942	7796	7931
75.0	6959	6809	6936
85.0	6018	5784	5962

**ZONAL FLUX AND PERCENTAGES**

Zone	Flux (lm)	% Lamp	% Luminaire
0-30	1051	N / A	25.5
0-40	1713	N / A	41.5
0-60	3022	N / A	73.2
0-90	3928	N / A	95.1
40-90	2215	N / A	53.7
60-90	906	N / A	22.0
90-180	201	N / A	4.9
0-180	4129	N / A	100.0

Total Light Output = 4,129 lm

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

Signed:

Authorized Signatory

Date of test 1-Sep-2017  
Date of report 7-Sep-2017



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120.0Vac, 60.00Hz, 0.4105A, 49.04W, 0.995PF, 8.5%THD(i)

**Intensity data (cd)**

Gamma	C-Plane				
	C0	C22.5	C45	C67.5	C90
0.0	1368	1368	1368	1368	1368
2.5	1355	1368	1372	1369	1355
5.0	1350	1363	1367	1363	1350
7.5	1341	1355	1358	1355	1341
10.0	1329	1343	1346	1343	1329
12.5	1314	1330	1332	1330	1314
15.0	1298	1308	1312	1308	1298
17.5	1276	1286	1289	1286	1275
20.0	1248	1262	1264	1261	1249
22.5	1221	1234	1235	1234	1221
25.0	1192	1203	1205	1204	1191
27.5	1159	1172	1171	1171	1160
30.0	1125	1137	1137	1135	1124
32.5	1088	1098	1099	1098	1089
35.0	1050	1059	1061	1060	1050
37.5	1011	1019	1020	1019	1011
40.0	969	977	978	977	969
42.5	927	935	935	934	927
45.0	884	891	891	890	883
47.5	840	844	845	843	839
50.0	794	797	798	797	793
52.5	746	748	749	748	745
55.0	695	699	699	698	695
57.5	644	648	649	648	643
60.0	591	596	597	596	590
62.5	538	544	546	544	538
65.0	485	491	493	491	485
67.5	432	438	441	438	432
70.0	380	386	389	386	379
72.5	328	334	337	334	327
75.0	277	284	287	284	276
77.5	228	236	239	235	227
80.0	182	190	193	189	181
82.5	141	148	151	148	140
85.0	104	111	114	111	103
87.5	73	79	81	78	72
90.0	28	32	34	32	28



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**Intensity data (cd)**

Gamma	C-Plane				
	C0	C22.5	C45	C67.5	C90
90.0	28	32	34	32	28
92.5	27	31	32	30	26
95.0	27	30	32	30	26
97.5	27	30	32	30	26
100.0	27	30	32	30	26
102.5	27	30	36	30	26
105.0	44	41	39	42	45
107.5	44	44	42	42	44
110.0	44	44	43	43	43
112.5	43	44	44	42	42
115.0	42	44	44	42	41
117.5	41	43	44	42	40
120.0	41	43	43	42	39
122.5	39	42	37	41	38
125.0	38	41	35	40	37
127.5	37	39	39	39	36
130.0	34	27	38	37	34
132.5	20	26	36	35	32
135.0	19	32	34	33	30
137.5	28	31	33	32	28
140.0	26	30	31	30	27
142.5	24	28	29	28	25
145.0	23	26	27	26	23
147.5	22	24	26	24	21
150.0	20	22	23	22	20
152.5	18	19	21	19	18
155.0	15	18	19	17	15
157.5	13	15	16	15	13
160.0	11	13	14	13	10
162.5	9	11	12	11	9
165.0	8	9	10	9	8
167.5	7	8	9	8	6
170.0	6	7	7	6	6
172.5	5	6	6	6	5
175.0	4	4	5	4	4
177.5	4	4	3	3	3
180.0	3	3	3	3	3



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**Coefficients Of Utilization - Zonal Cavity Method**

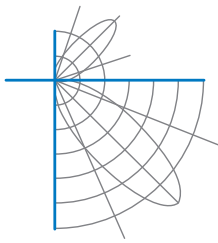
Effective Floor Cavity Reflectance 0.20

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	108	108	108	103	103	103	98	98	98	95
1	107	102	98	94	104	99	95	92	94	91	88	89	87	84	85	83	81	78
2	97	89	82	76	94	86	80	74	82	77	72	78	74	70	74	71	67	65
3	88	78	69	63	86	76	68	62	72	66	60	69	63	59	65	61	57	54
4	81	69	60	53	78	67	59	52	64	57	51	61	55	50	58	53	49	46
5	74	61	52	46	72	60	51	45	57	50	44	55	48	43	52	47	42	40
6	69	55	46	40	66	54	46	39	52	44	39	50	43	38	48	42	37	35
7	64	50	41	35	62	49	41	35	47	40	34	45	39	34	43	37	33	31
8	59	46	37	31	57	45	37	31	43	36	30	41	35	30	40	34	30	28
9	55	42	34	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	28	24	22

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.

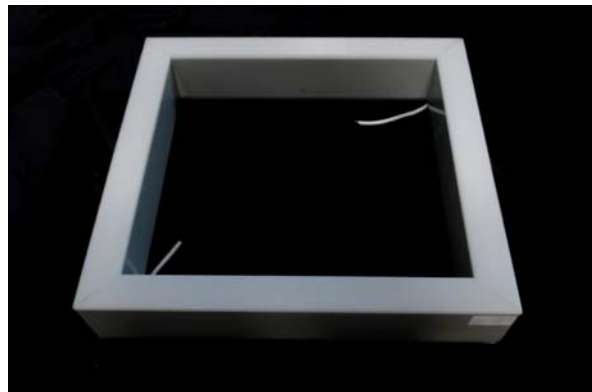
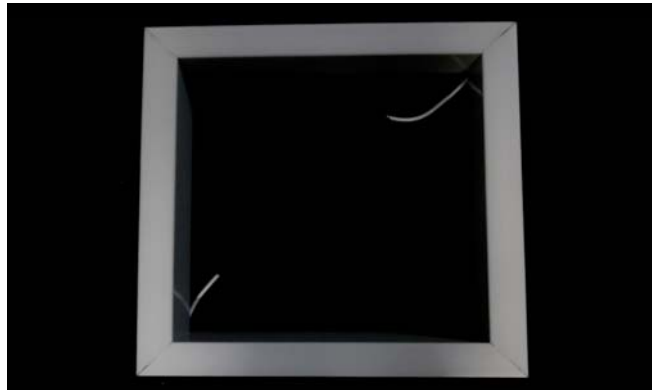
**Circle of Light Plot**

Height(ft)	Illuminance at Nadir (fc)	Beam Width (across 50% Nadir Illum)	
		0-180	90-270
6.0	38.0	7.35	7.36
8.0	21.4	9.80	9.81
10.0	13.7	12.25	12.26
12.0	9.5	14.70	14.72
14.0	7.0	17.15	17.17
16.0	5.3	19.60	19.62



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120.0Vac, 60.00Hz, 0.4105A, 49.04W, 0.995PF, 8.5%THD(i)

**Test Distance** 9.5 m  
**Test Temperature** 24.6 °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

**LLIA000833-001B**

Integrating Sphere Report

Catalog Number: MQS2-D-HO-K35-80-2X2-XXX-AL-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



### Performance Summary

Voltage	120.0 Vac
Current	0.4104 A
Power	49.00 W
Frequency	60.00 Hz
Power Factor	0.995
Current THD	8.6 %

Total Luminous Flux	4325.3 lm
Efficacy	88.3 lm/W
Chromaticity (x,y)	(0.4108, 0.3968)
(u',v')	(0.2368, 0.5146)
Duv	0.0015
CCT	3432 K
CRI (Ra)	82
R9	11

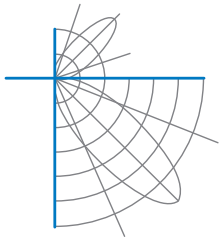
Prepared For:

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

Test date: 09/06/2017

Report date: 09/07/2017





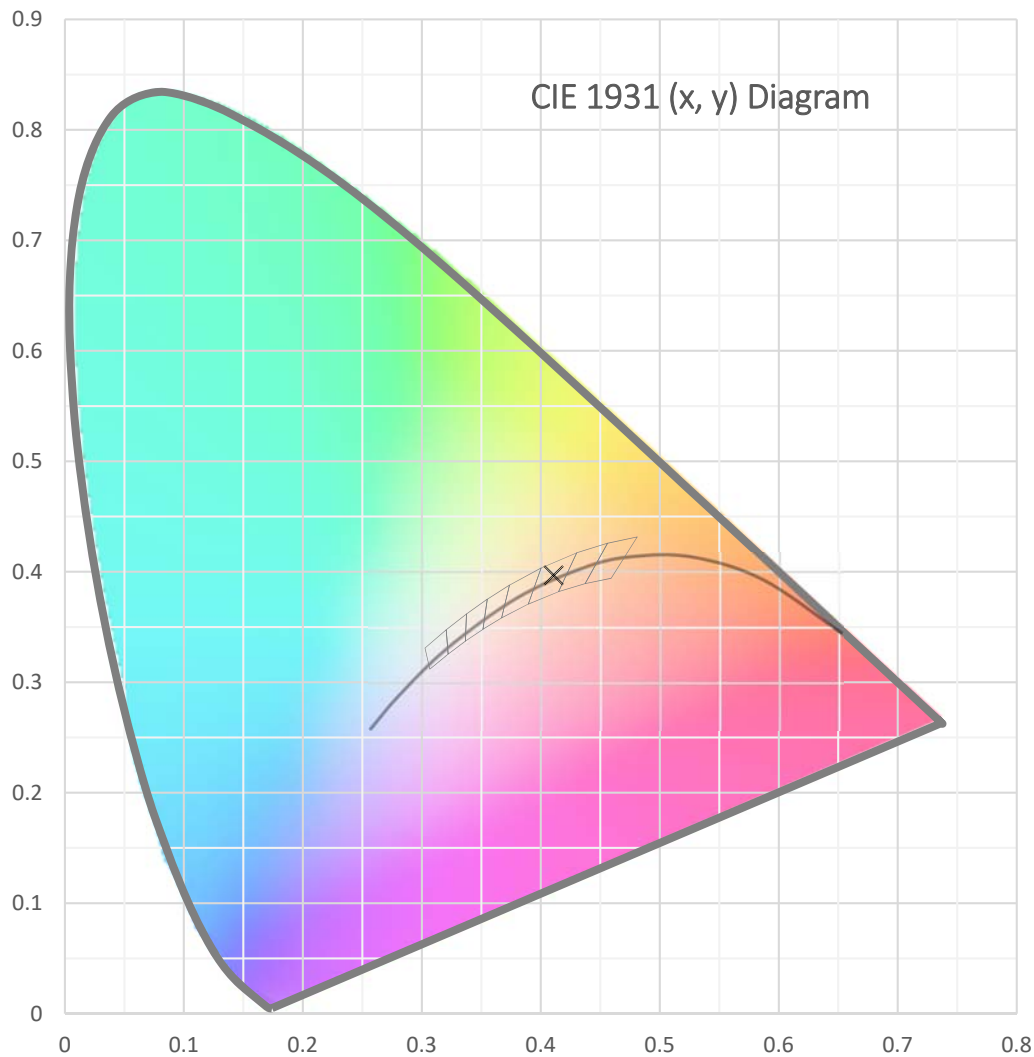
**Test Report Number: LLIA000833-001B**

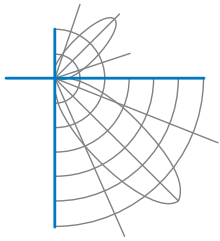
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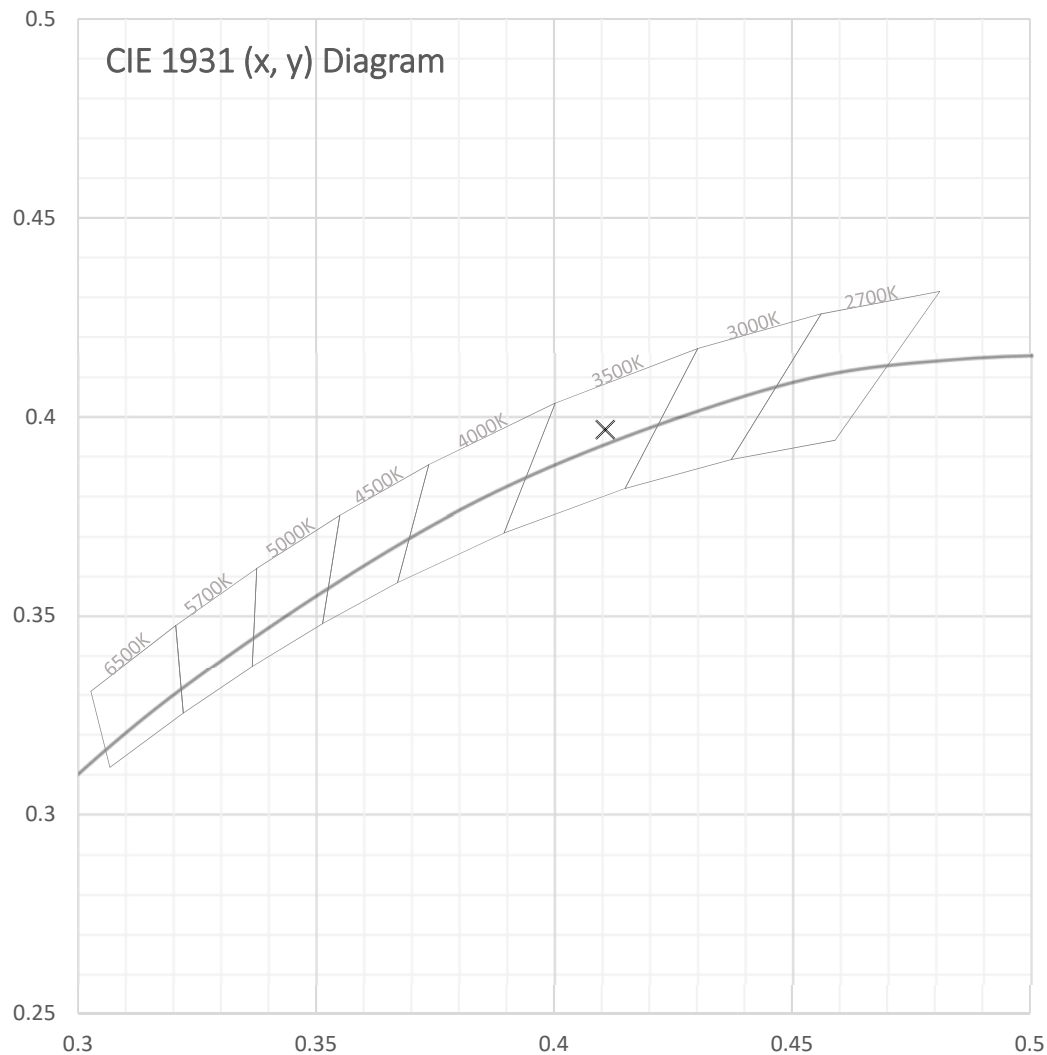
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<b>Spectral Data</b>	Total Radiant Flux	13.20 W
	Total Luminous Flux	4325.3 Lm
	Chromaticity CIE 1931 (x, y)	(0.4108, 0.3968)
	Chromaticity CIE 1976 (u', v')	(0.2368, 0.5146)
	Correlated Color Temperature (CCT)	3432 K
	Color Rendering Index (Ra)	82
	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 *	1.474

**Electrical Data**

Voltage	120.0 Vac
Current	0.4104 A
Power	49.00 W
Frequency	60.00 Hz
Power Factor	0.995
Current THD	8.6 %



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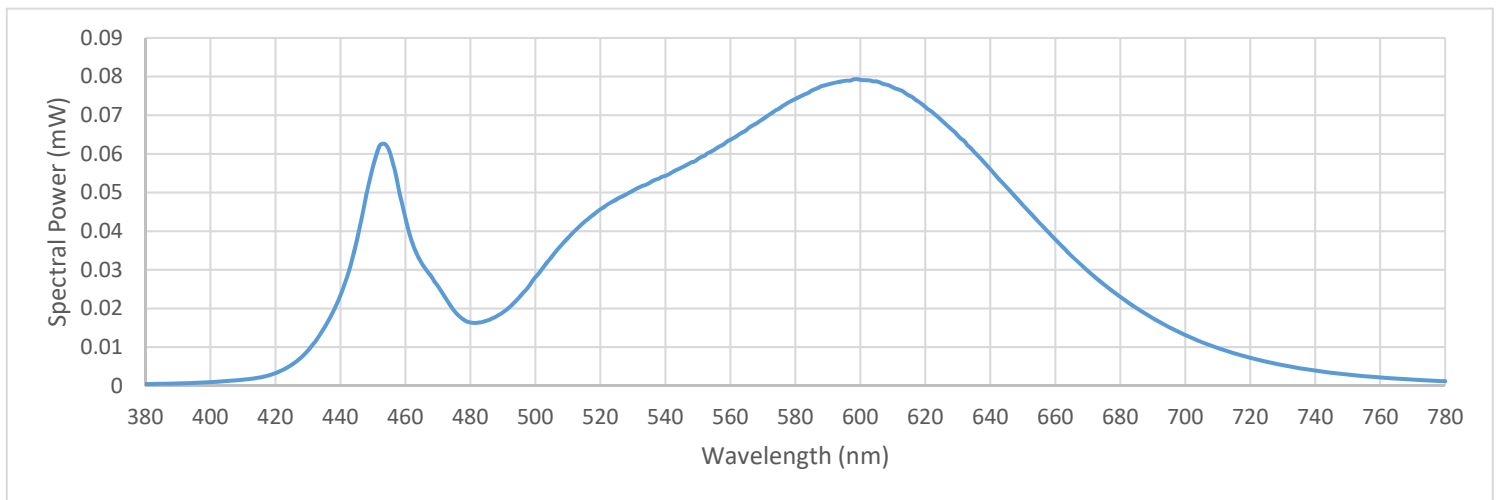
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Summary Spectral Power Distribution (wavelength - nm, spectral power - mW)

380	0.000450	480	0.016363	580	0.074225	680	0.022971
385	0.000490	485	0.016821	585	0.076383	685	0.020137
390	0.000594	490	0.018996	590	0.077973	690	0.017510
395	0.000745	495	0.022869	595	0.078882	695	0.015145
400	0.000952	500	0.028096	600	0.079171	700	0.013146
405	0.001215	505	0.033344	605	0.078772	705	0.011350
410	0.001555	510	0.038179	610	0.077206	710	0.009757
415	0.002130	515	0.042413	615	0.075106	715	0.008418
420	0.003300	520	0.045638	620	0.072138	720	0.007232
425	0.005406	525	0.048235	625	0.068688	725	0.006207
430	0.009213	530	0.050468	630	0.064755	730	0.005346
435	0.014995	535	0.052430	635	0.060535	735	0.004559
440	0.023346	540	0.054287	640	0.055999	740	0.003911
445	0.037568	545	0.056434	645	0.051343	745	0.003365
450	0.056671	550	0.058656	650	0.046745	750	0.002893
455	0.060894	555	0.061032	655	0.042171	755	0.002486
460	0.043418	560	0.063664	660	0.037930	760	0.002156
465	0.031681	565	0.066213	665	0.033638	765	0.001850
470	0.025744	570	0.068995	670	0.029672	770	0.001592
475	0.019354	575	0.071699	675	0.026203	775	0.001369
						780	0.001178





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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:** 24.2 °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.

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