

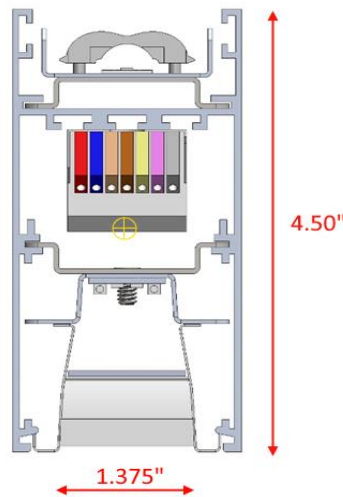
## Report of Test

LLIA001418-001A

Indoor Distribution Photometry Test Report

Catalog Number: QS2-I/D-HO/HO-K40-80-4-XX-WS/PBF01M-FXXX-UNV-DIM1

Pendant mounted, extruded aluminum housing, white enamel aluminum reflectors, clear plastic optics above upper LEDs, open top, formed white enamel aluminum baffle with frosted plastic insert. 92 upper white LEDs, 128 white lower LEDs. One Osram Optotronic OTi 30/120-277/1A0 L G2 LED driver labeled as 720mA and one OTi50/120-277/1A4 DIM-1 L G2 driver labeled as 1240mA.



Prepared For:

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

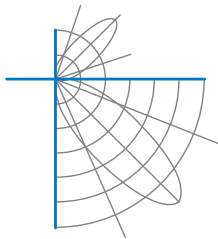
Performance Summary			
Input Voltage	120.0 V	Luminous Flux	6675.3 Lumens
Input Current	0.5093 A	Total Efficacy	111.4 Lm/W
Input Power	59.94 W	Downward Flux	2693.2 Lumens
Frequency	60.01 Hz	Downward Flux	40.3 % of Total
Power Factor	0.981		
Current THD	8.0 %		

This test report was issued by LightLab International Allentown, LLC without alterations or erasures.

Test date: 03/02/2021

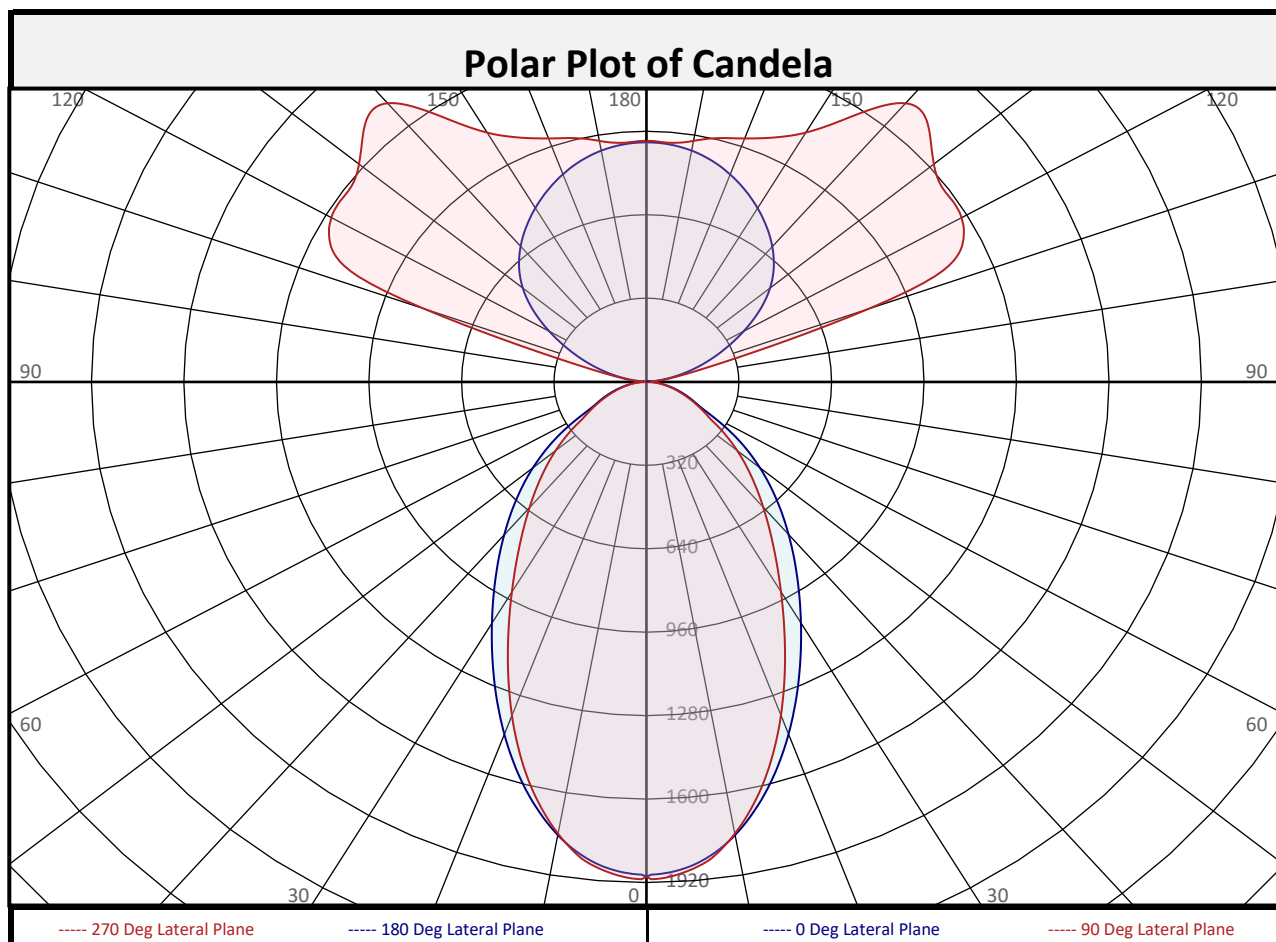
Report date: 03/08/2021

Signed: \_\_\_\_\_



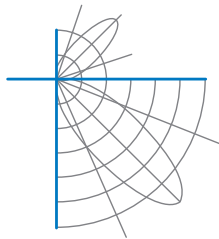
## Report of Test

### LLIA001418-001A



### Zonal Flux Summary

Zone (Deg Vert)	Flux (Lumens)	Percent of Total	Zone (Deg Vert)	Flux (Lumens)	Percent of Total	Zone (Deg Vert)	Flux (Lumens)	Percent of Total
0-10	174.8	2.6%	90-100	56.8	0.9%	0-20	620.3	9.3%
10-20	445.5	6.7%	100-110	350.6	5.3%	0-30	1163	17.4%
20-30	543.0	8.1%	110-120	694.9	10.4%	0-40	1672	25.0%
30-40	508.6	7.6%	120-130	759.0	11.4%	0-60	2391	35.8%
40-50	420.3	6.3%	130-140	749.3	11.2%	0-80	2667	40.0%
50-60	299.2	4.5%	140-150	599.0	9.0%	10-90	2518	37.7%
60-70	178.8	2.7%	150-160	425.3	6.4%	20-50	1472	22.1%
70-80	96.9	1.5%	160-170	259.8	3.9%	40-90	1021	15.3%
80-90	26.0	0.4%	170-180	87.2	1.3%	60-90	301.7	4.5%
0-90	2693	40.3%	90-180	3982	59.7%	0-180	6675	100.0%

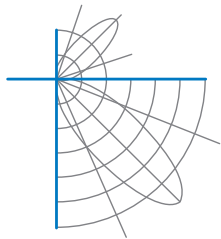


## Report of Test

### LLIA001418-001A

Luminous Intensity (Candela) Table

		Lateral (C-Plane) Angles								
		0	22.5	45	67.5	90	112.5	135	157.5	180
Vertical (Gamma) Angles	0	1897	1897	1897	1897	1897	1897	1897	1897	1897
	2.5	1882	1882	1887	1894	1899	1894	1887	1882	1882
	5	1860	1859	1862	1868	1873	1868	1862	1859	1860
	7.5	1820	1819	1821	1827	1830	1827	1821	1819	1820
	10	1765	1763	1766	1759	1760	1759	1766	1763	1765
	12.5	1695	1694	1687	1676	1676	1676	1687	1694	1695
	15	1616	1614	1597	1582	1580	1582	1597	1614	1616
	17.5	1529	1525	1498	1478	1473	1478	1498	1525	1529
	20	1437	1427	1394	1367	1361	1367	1394	1427	1437
	22.5	1343	1326	1286	1253	1246	1253	1286	1326	1343
	25	1248	1225	1179	1141	1135	1141	1179	1225	1248
	27.5	1156	1126	1074	1033	1029	1033	1074	1126	1156
	30	1068	1031	973	933	931	933	973	1031	1068
	32.5	985	942	880	841	843	841	880	942	985
	35	907	858	794	759	764	759	794	858	907
	37.5	834	780	715	685	694	685	715	780	834
	40	764	708	644	618	629	618	644	708	764
	42.5	698	641	579	558	569	558	579	641	698
	45	634	578	520	502	514	502	520	578	634
	47.5	572	519	467	450	461	450	467	519	572
	50	511	463	416	401	409	401	416	463	511
	52.5	449	409	369	354	358	354	369	409	449
	55	387	356	325	308	307	308	325	356	387
	57.5	323	306	284	265	258	265	284	306	323
	60	259	256	245	227	228	227	245	256	259
	62.5	211	211	209	200	200	200	209	211	211
	65	183	179	177	175	175	175	177	179	183
	67.5	160	156	152	152	151	152	152	156	160
	70	138	134	130	130	128	130	130	134	138
	72.5	116	113	110	109	108	109	110	113	116
75	96	93	90	90	89	90	90	93	96	
77.5	76	74	71	71	71	71	71	74	76	
80	57	55	54	53	54	53	54	55	57	
82.5	39	38	37	37	37	37	37	38	39	
85	22	22	22	22	23	22	22	22	22	
87.5	7	9	9	9	9	9	9	9	7	
90	2	3	3	3	4	3	3	3	2	

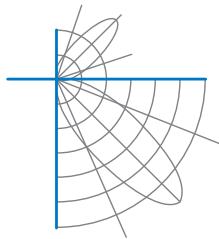


## Report of Test

### LLIA001418-001A

Luminous Intensity (Candela) Table

		Lateral (C-Plane) Angles								
		0	22.5	45	67.5	90	112.5	135	157.5	180
Vertical (Gamma) Angles	90	2	3	3	3	4	3	3	3	2
	92.5	9	20	18	15	12	15	18	20	9
	95	28	44	48	48	45	48	48	44	28
	97.5	53	76	115	71	69	71	115	76	53
	100	83	111	266	121	98	121	266	111	83
	102.5	115	149	356	233	152	233	356	149	115
	105	149	185	401	449	246	449	401	185	149
	107.5	185	224	441	800	453	800	441	224	185
	110	222	267	491	1046	827	1046	491	267	222
	112.5	262	312	548	1110	1109	1110	548	312	262
	115	303	359	605	1123	1200	1123	605	359	303
	117.5	345	407	653	1126	1238	1126	653	407	345
	120	390	455	705	1132	1258	1132	705	455	390
	122.5	435	499	763	1140	1265	1140	763	499	435
	125	479	540	822	1153	1264	1153	822	540	479
	127.5	520	579	875	1178	1272	1178	875	579	520
	130	558	617	914	1214	1298	1214	914	617	558
	132.5	592	653	933	1255	1337	1255	933	653	592
	135	623	686	934	1287	1380	1287	934	686	623
	137.5	651	716	926	1289	1407	1289	926	716	651
140	676	742	917	1252	1393	1252	917	742	676	
142.5	701	764	911	1188	1329	1188	911	764	701	
145	724	782	910	1125	1242	1125	910	782	724	
147.5	747	798	911	1075	1161	1075	911	798	747	
150	768	811	913	1039	1102	1039	913	811	768	
152.5	789	823	916	1015	1061	1015	916	823	789	
155	809	834	920	996	1032	996	920	834	809	
157.5	828	845	922	983	1009	983	922	845	828	
160	845	856	922	973	992	973	922	856	845	
162.5	862	867	919	965	978	965	919	867	862	
165	876	878	915	955	966	955	915	878	876	
167.5	889	888	910	942	953	942	910	888	889	
170	899	897	908	928	937	928	908	897	899	
172.5	907	905	908	919	924	919	908	905	907	
175	912	911	912	918	919	918	912	911	912	
177.5	916	914	917	920	921	920	917	914	916	
180	919	919	919	919	919	919	919	919	919	



## Report of Test

### LLIA001418-001A

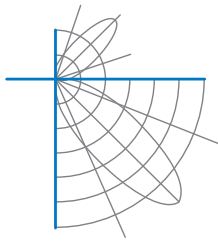
Coefficients of Utilization/Room Utilization - Zonal Cavity Method																					
Effective Floor Cavity Reflectance 0.20																					
RC	80				70				50				30				10				0
RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	50	30	10	0
RCR																					
0	105	105	105	105	95	95	95	95	78	78	78	62	62	62	47	47	47	40			
1	96	92	89	86	88	84	81	79	69	67	65	56	54	53	43	42	41	35			
2	88	82	76	71	80	75	70	66	62	58	55	50	48	46	39	37	36	31			
3	81	72	66	60	74	67	61	56	55	51	48	45	42	40	35	33	32	27			
4	75	65	57	52	68	60	53	48	50	45	41	41	37	35	32	30	28	24			
5	69	58	51	45	63	54	47	42	45	40	36	37	33	31	29	27	25	22			
6	64	53	45	40	58	48	42	37	41	36	32	34	30	27	27	25	23	20			
7	59	48	40	35	54	44	38	33	37	32	29	31	27	25	25	22	21	18			
8	55	44	36	31	50	40	34	29	34	29	26	29	25	22	23	21	19	16			
9	51	40	33	28	47	37	31	27	32	27	23	26	23	20	22	19	17	15			
10	48	37	30	25	44	34	28	24	29	25	21	25	21	19	20	18	16	14			

For absolute test reports, RUs are expressed as a percentage of total lumen output. For relative test reports, CUs are expressed as a percentage of total lamp 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)	Ground-level distance to half-of-nadir illuminance (ft)		
		0-180 deg	90-270 deg	
6.0	52.7	5.50	5.12	
8.0	29.6	7.33	6.83	
10.0	19.0	9.17	8.53	
12.0	13.2	11.00	10.24	
14.0	9.7	12.83	11.95	
16.0	7.4	14.67	13.65	

Average Luminance (cd/m <sup>2</sup> )			
	0 deg Plane	45 deg Plane	90 deg Plane
0	45865	45865	45865
45	21683	17795	17563
55	16301	13711	12951
65	10479	10138	10008
75	8948	8407	8348
85	6087	6047	6309

Spacing Criterion	
0 degree plane:	0.9
90 degree plane:	0.9
180 degree plane:	0.9
270 degree plane:	0.9



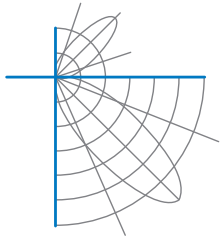
## Report of Test

### LLIA001418-001A

#### UGR TABLE - CORRECTED

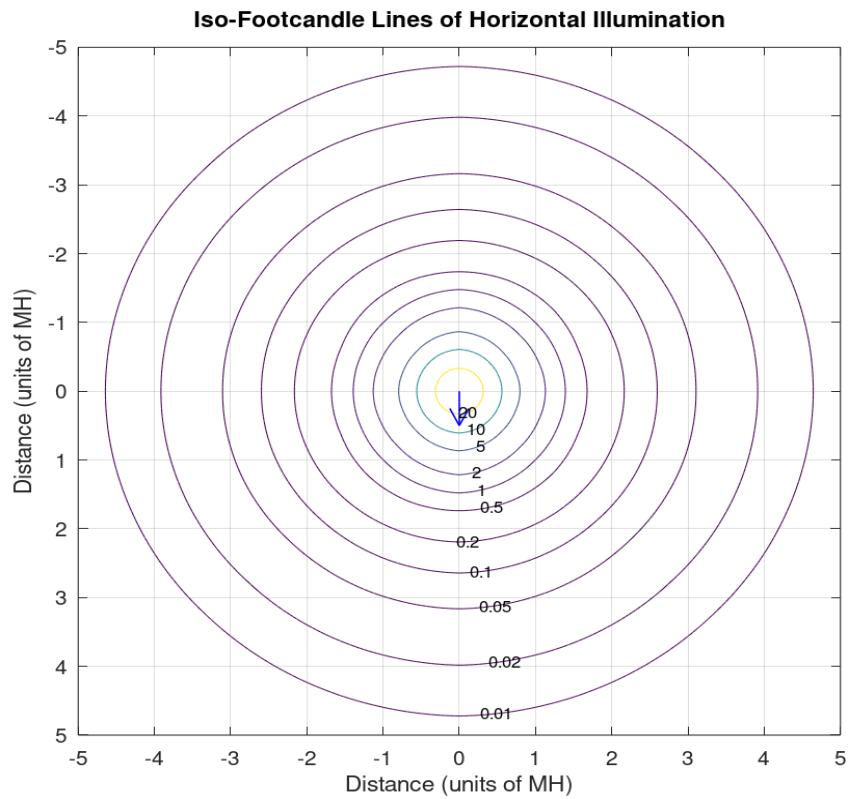
Reflectances											
Ceiling Cavity		70	70	50	50	30	70	70	50	50	30
Walls		50	30	50	30	30	50	30	50	30	30
Floor Cavity		20	20	20	20	20	20	20	20	20	20
Room Size		UGR Viewed Crosswise					UGR Viewed Endwise				
X=2H	Y=2H	15.3	16.0	16.3	17.1	18.5	14.2	14.9	15.2	16.0	17.4
	3H	16.4	17.1	17.5	18.1	19.5	15.6	16.2	16.6	17.3	18.7
	4H	16.8	17.5	17.9	18.5	20.0	16.1	16.7	17.2	17.8	19.2
	6H	17.2	17.7	18.2	18.8	20.2	16.4	17.0	17.5	18.1	19.5
	8H	17.3	17.8	18.3	18.9	20.3	16.6	17.1	17.6	18.2	19.6
	12H	17.3	17.8	18.4	18.9	20.3	16.6	17.1	17.7	18.2	19.7
4H	2H	15.5	16.1	16.6	17.2	18.6	14.6	15.2	15.7	16.3	17.7
	3H	16.9	17.4	18.0	18.5	19.9	16.2	16.7	17.3	17.8	19.3
	4H	17.5	17.9	18.5	19.0	20.5	16.8	17.3	17.9	18.4	19.9
	6H	17.9	18.3	19.0	19.4	20.9	17.3	17.7	18.4	18.8	20.3
	8H	18.0	18.4	19.1	19.5	21.0	17.5	17.9	18.6	18.9	20.4
	12H	18.1	18.4	19.2	19.5	21.0	17.6	17.9	18.7	19.0	20.5
8H	4H	17.6	18.0	18.7	19.1	20.5	17.0	17.4	18.1	18.5	20.0
	6H	18.2	18.5	19.3	19.6	21.1	17.6	18.0	18.8	19.1	20.6
	8H	18.4	18.6	19.5	19.8	21.3	17.9	18.1	19.0	19.3	20.8
	12H	18.5	18.7	19.6	19.8	21.4	18.0	18.3	19.2	19.4	20.9
12H	4H	17.6	17.9	18.7	19.0	20.5	17.0	17.4	18.1	18.5	20.0
	6H	18.2	18.4	19.3	19.6	21.1	17.7	17.9	18.8	19.1	20.6
	8H	18.4	18.6	19.5	19.8	21.3	17.9	18.2	19.1	19.3	20.8

Maximum UGR = 21.4

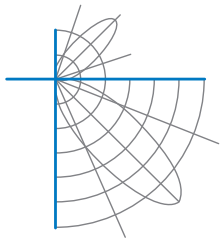


Report of Test  
LLIA001418-001A

**Iso-Illuminance Plot**

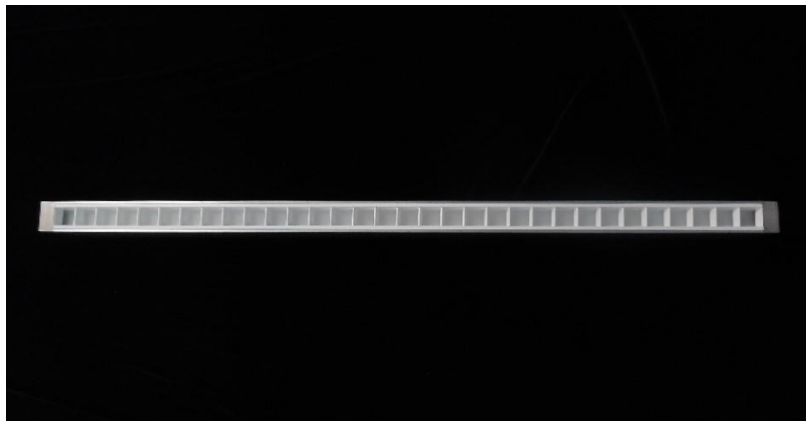


The isofootcandle values shown in the plot above are based on a mounting height of  $h = 8.0$  feet. Grid values show multiples of mounting height. The isoilluminance contour lines are expressed in units of footcandles. The values expressed are based on the direct light from a single unit without the contribution of room reflections.

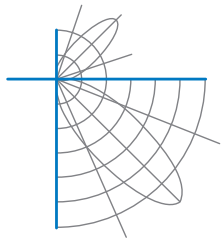


Report of Test  
LLIA001418-001A

**Additional Pictures of Test Subject**







## Report of Test

### LLIA001418-001A

Test Distance                    9.5 m  
Ambient Temperature        25.0 °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 IES LM-79-19. Format of reports and angular increments based on IES LM-41-14 and LM-46-04.

The luminous intensity values, and other derived quantities, contained in this report are based on the absolute data, as measured.

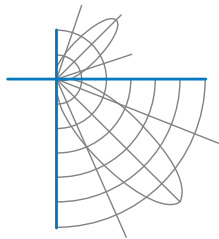
Prorating the performance of the sample for the use of other component combinations (such as lamp / LED / Ballast / driver), or for use in different environmental conditions than that tested, may produce erroneous results.

This report is free of erasures and corrections.

Photometric intensity values are reported using the CIE C-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.



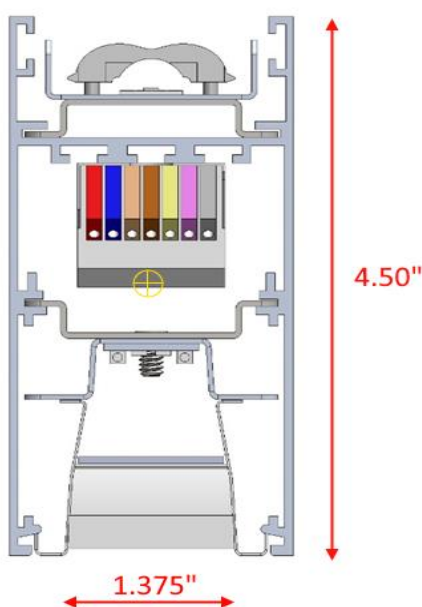
## Report of Test

**LLIA001418-001B**

Integrating Sphere Report

Catalog Number: QS2-I/D-HO/HO-K40-80-4-XX-WS/PBF01M-FXXX-UNV-DIM1

Pendant mounted, extruded aluminum housing, white enamel aluminum reflectors, clear plastic optics above upper LEDs, open top, formed white enamel aluminum baffle with frosted plastic insert. 92 upper white LEDs, 128 white lower LEDs. One Osram Optotronic OTi 30/120-277/1A0 L G2 LED driver labeled as 720mA and one OTi50/120-277/1A4 DIM-1 L G2 driver labeled as 1240mA



### Performance Summary

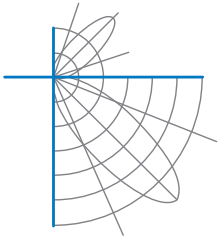
Voltage	120.0 Vac
Current	0.5056 A
Power	59.87 W
Frequency	59.99 Hz
Power Factor	0.987
Current THD	8.1 %
Total Luminous Flux	6674.1 lm
Efficacy	111.5 lm/W
Chromaticity (x,y)	(0.3806, 0.3799)
(u',v')	(0.2239, 0.5030)
Duv	0.0014
CCT	4020 K
CRI (Ra)	83
R9	5
TM-30: Rf	81
TM-30: Rg	93
TM-30: Rcs,h1	-12

Prepared For:

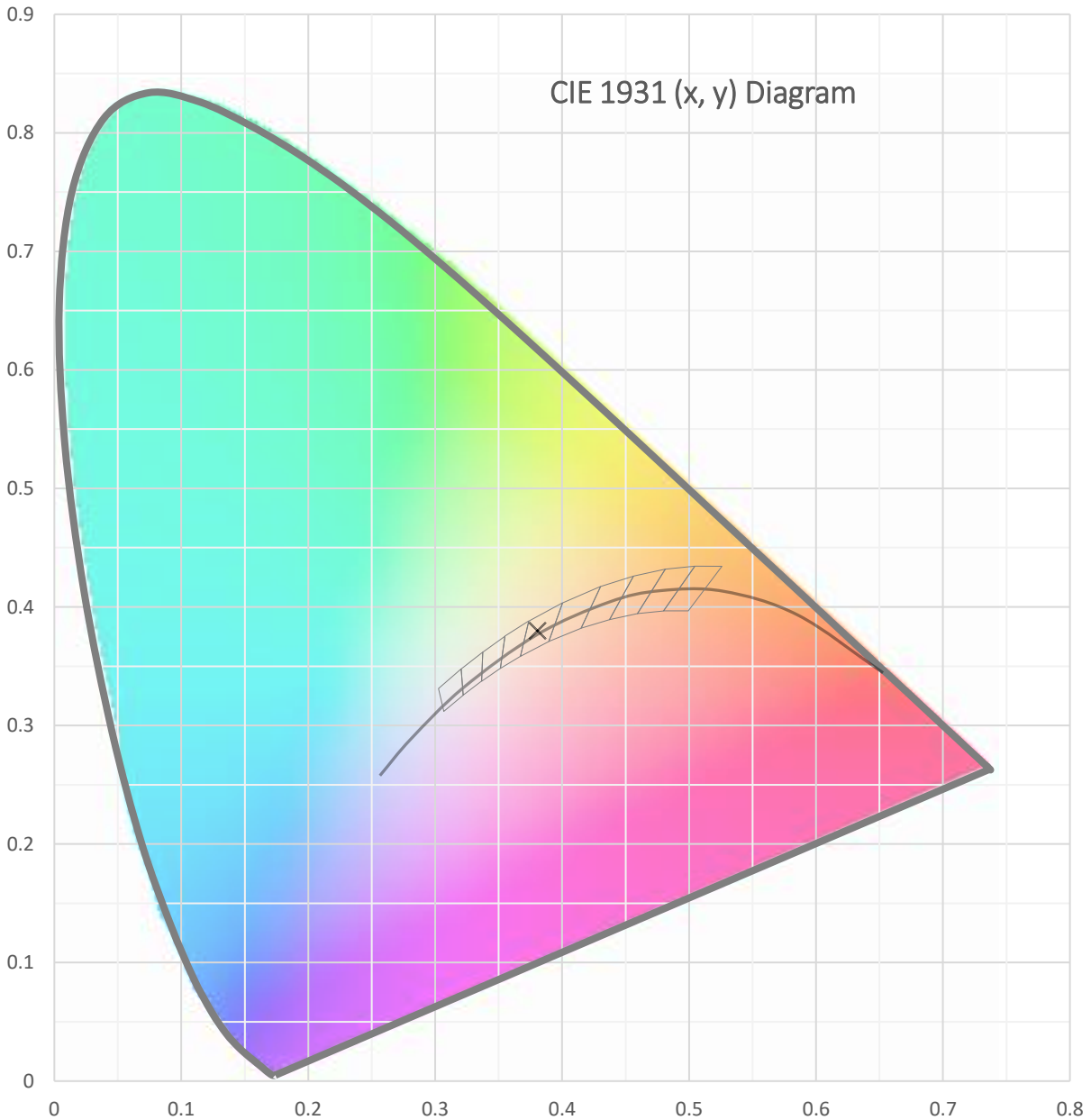
Precision Architectural Lighting  
4830 Timber Creek Drive  
Houston, TX 77017, USA

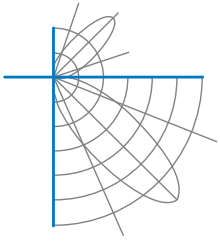
Test date: 03/05/2021

Report date: 03/08/2021

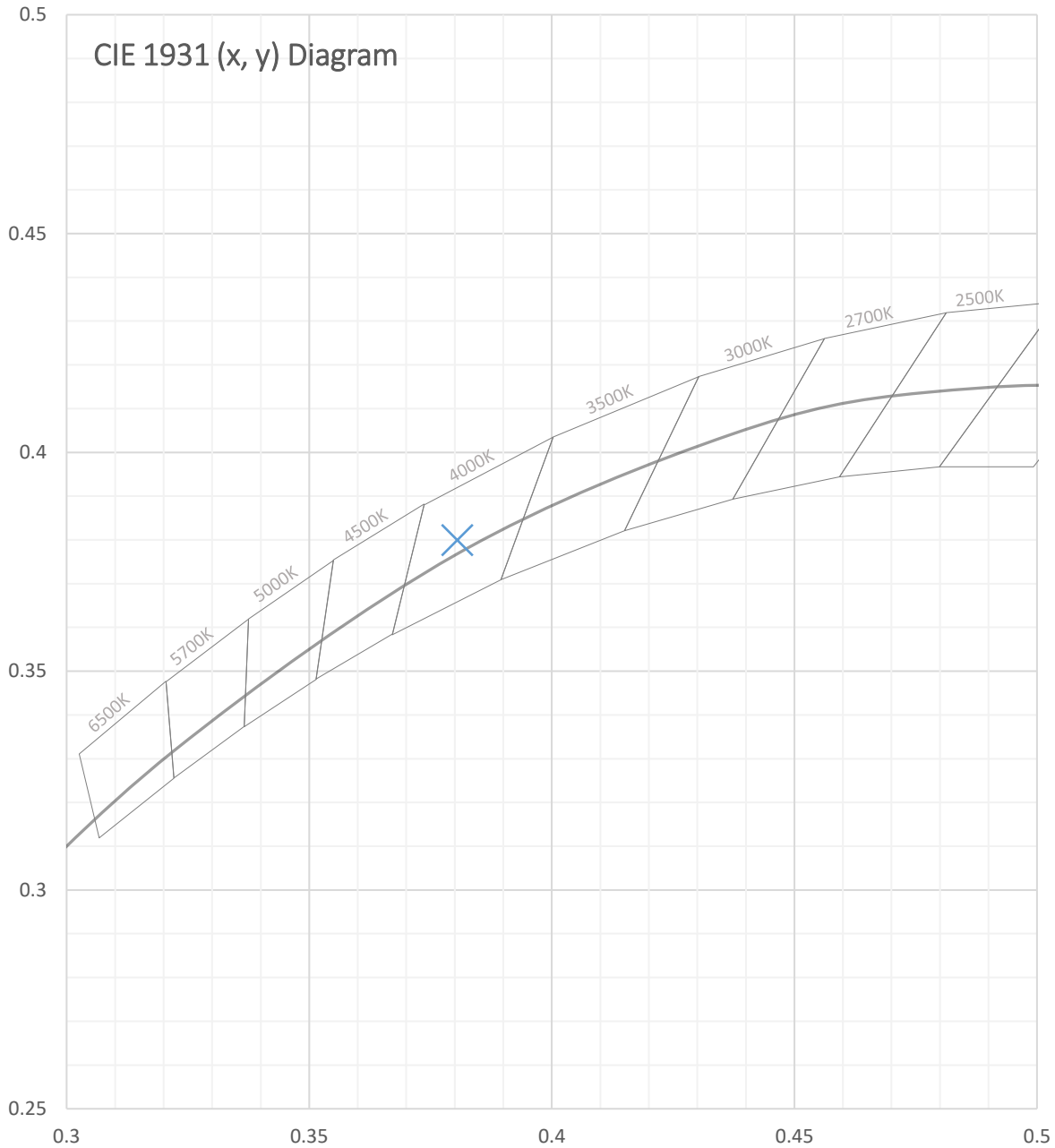


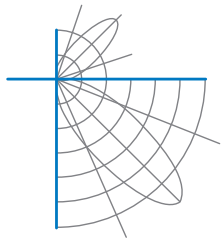
Test Report Number: LLIA001418-001B





Test Report Number: LLIA001418-001B



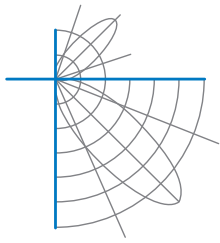


**Test Report Number: LLIA001418-001B**

Total Radiant Flux	20.22 W
Total Luminous Flux	6674.1 Lm
Chromaticity CIE 1931 (x, y)	(0.3806, 0.3799)
Chromaticity CIE 1976 (u', v')	(0.2239, 0.5030)
Correlated Color Temperature (CCT)	4020 K
Color Rendering Index (Ra)	83
R1	81
R2	90
R3	96
R4	80
R5	81
R6	86
R7	85
R8	63
R9	5
R10	76
R11	79
R12	60
R13	83
R14	98
TM-30: Rf	81
TM-30: Rg	93
TM-30: Rcs,h1	-12
Distance from Planckian Locus (Duv)	0.0014
Scotopic/Photopic Ratio ‡	1.707

**Electrical Data**

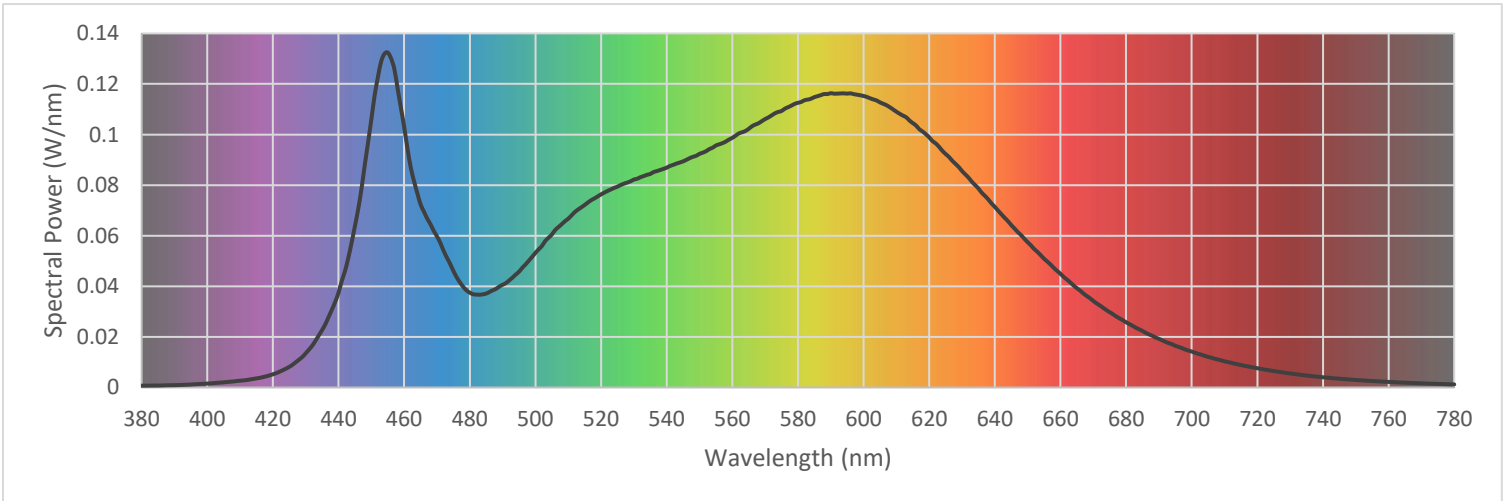
Voltage	120.0 Vac
Current	0.5056 A
Power	59.87 W
Frequency	59.99 Hz
Power Factor	0.987
Current THD	8.1 %

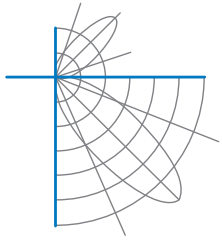


Test Report Number: LLIA001418-001B

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

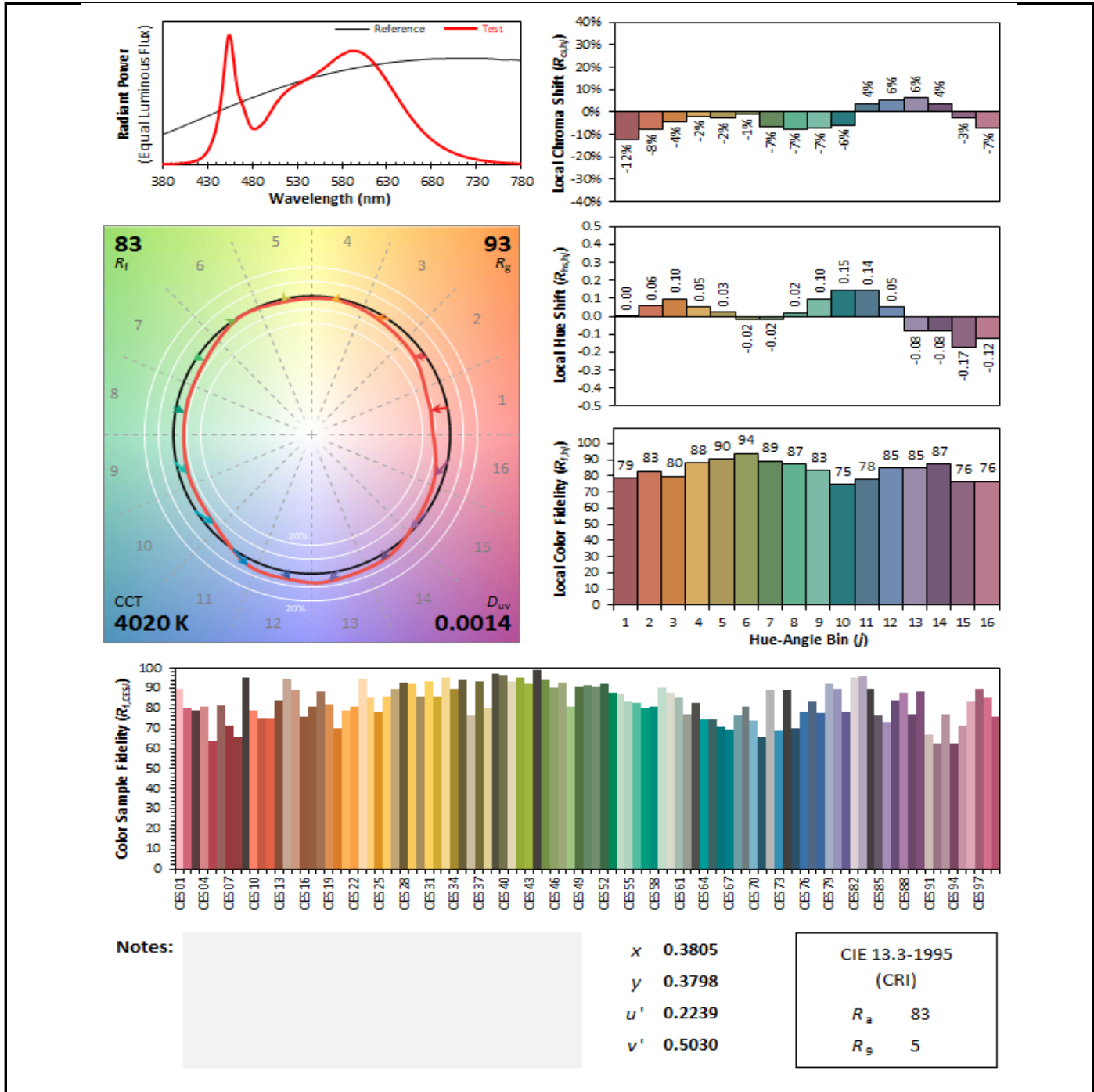
380	0.000711	480	0.037482	580	0.112545	680	0.025773
385	0.000765	485	0.037136	585	0.114796	685	0.022362
390	0.000908	490	0.040609	590	0.116347	690	0.019226
395	0.001161	495	0.045768	595	0.116176	695	0.016487
400	0.001542	500	0.053226	600	0.115246	700	0.014207
405	0.002028	505	0.060463	605	0.112711	705	0.012105
410	0.002675	510	0.066723	610	0.109030	710	0.010344
415	0.003595	515	0.072151	615	0.104517	715	0.008886
420	0.005207	520	0.076344	620	0.098880	720	0.007606
425	0.008165	525	0.079393	625	0.092318	725	0.006489
430	0.013526	530	0.082204	630	0.085589	730	0.005548
435	0.022711	535	0.084431	635	0.078666	735	0.004730
440	0.037562	540	0.086908	640	0.071405	740	0.004024
445	0.063907	545	0.089407	645	0.064218	745	0.003461
450	0.106061	550	0.092363	650	0.057449	750	0.002968
455	0.132408	555	0.095680	655	0.050912	755	0.002540
460	0.102976	560	0.098687	660	0.044955	760	0.002200
465	0.072364	565	0.102270	665	0.039250	765	0.001886
470	0.059721	570	0.106113	670	0.034228	770	0.001621
475	0.046065	575	0.109294	675	0.029765	775	0.001399
						780	0.001210





Test Report Number: LLIA001418-001B

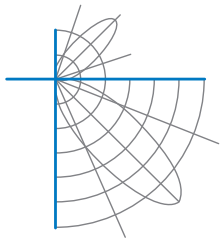
IES TM-30 Details



Notes:

x 0.3805  
y 0.3798  
u' 0.2239  
v' 0.5030

CIE 13.3-1995  
(CRI)  
R<sub>a</sub> 83  
R<sub>s</sub> 5



## Test Report Number: LLIA001418-001B

**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-79-19, LM-78-07, LM-58-13, ANSI\_ANSLG C78.377-2017, TM-30-18

**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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