

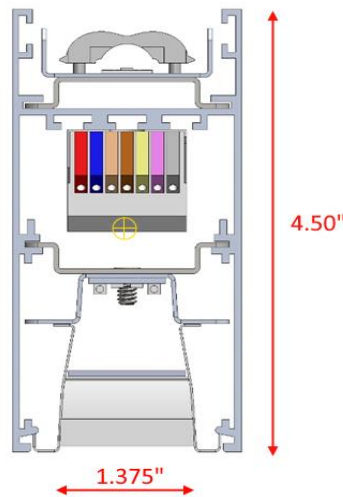
Report of Test

LLIA001418-002A

Indoor Distribution Photometry Test Report

Catalog Number: QS2-I/D-MO/MO-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 480mA and one OTi50/120-277/1A4 DIM-1 L G2 driver labeled 730mA



Prepared For:

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

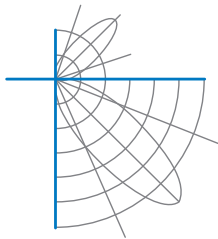
Performance Summary			
Input Voltage	120.0 V	Luminous Flux	4382.7 Lumens
Input Current	0.3271 A	Total Efficacy	117.4 Lm/W
Input Power	37.32 W	Downward Flux	1667.7 Lumens
Frequency	60.00 Hz	Downward Flux	38.1 % of Total
Power Factor	0.951		
Current THD	12.4 %		

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

Test date: 03/02/2021

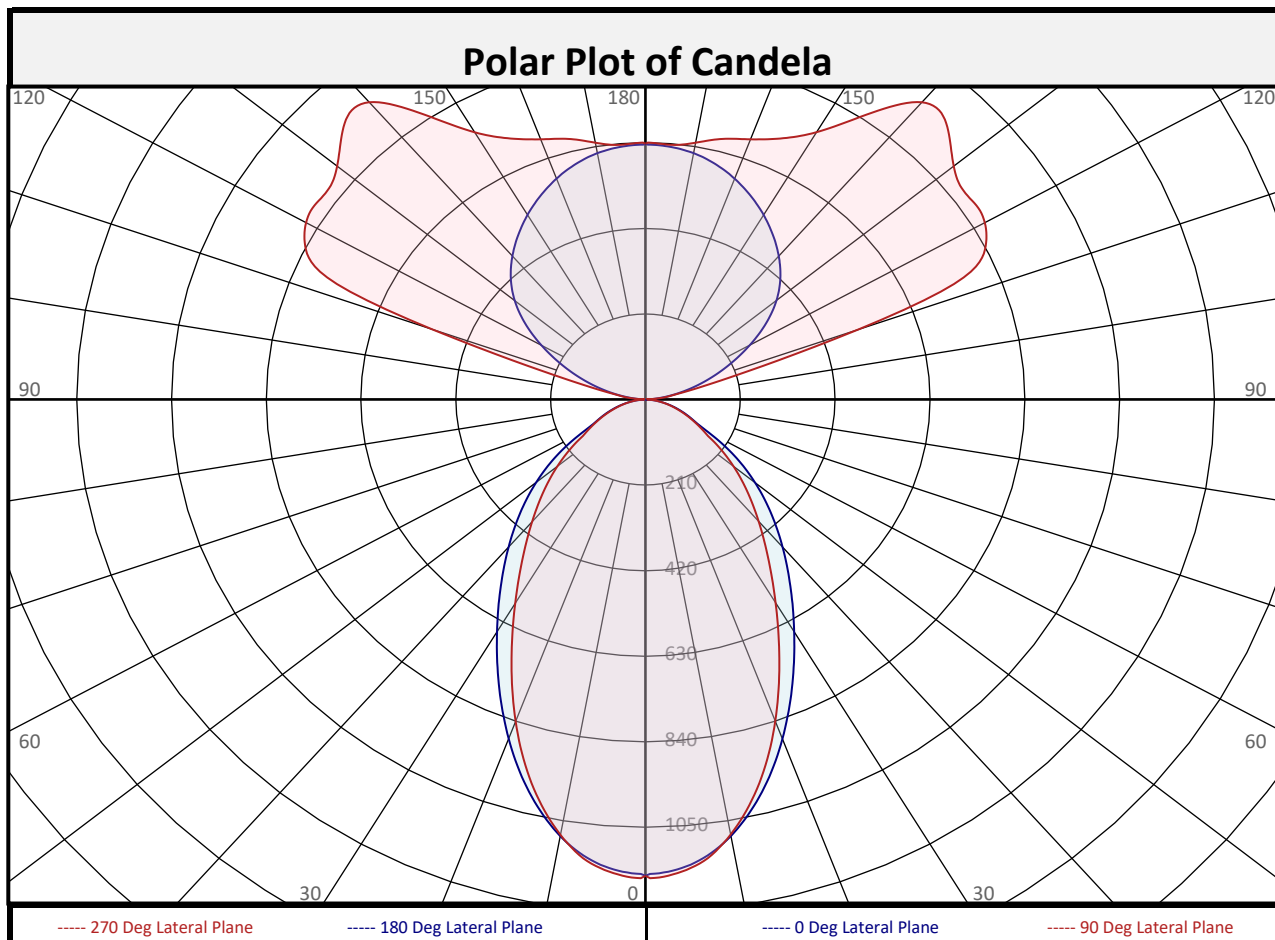
Report date: 03/08/2021

Signed: _____

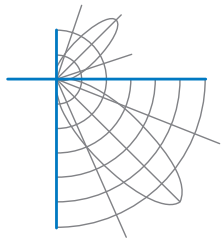


Report of Test

LLIA001418-002A



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	Zone (Deg Vert)	Flux (Lumens)	Percent of Total
0-10	107.8	2.5%	90-100	36.8	0.8%	0-20	382.8	8.7%	0-10	107.8	2.5%
10-20	275.0	6.3%	100-110	228.9	5.2%	0-30	718.5	16.4%	10-20	275.0	6.3%
20-30	335.7	7.7%	110-120	476.0	10.9%	0-40	1033	23.6%	20-30	335.7	7.7%
30-40	314.8	7.2%	120-130	521.9	11.9%	0-60	1480	33.8%	30-40	314.8	7.2%
40-50	260.5	5.9%	130-140	513.2	11.7%	0-80	1652	37.7%	40-50	260.5	5.9%
50-60	186.0	4.2%	140-150	409.8	9.4%	10-90	1560	35.6%	50-60	186.0	4.2%
60-70	111.4	2.5%	150-160	290.9	6.6%	20-50	911.1	20.8%	60-70	111.4	2.5%
70-80	60.3	1.4%	160-170	177.7	4.1%	40-90	634.3	14.5%	70-80	60.3	1.4%
80-90	16.1	0.4%	170-180	59.7	1.4%	60-90	187.8	4.3%	80-90	16.1	0.4%
0-90	1668	38.1%	90-180	2715	61.9%	0-180	4383	100.0%	0-90	1668	38.1%

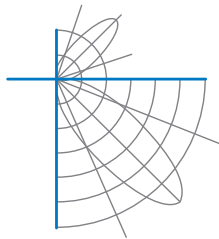


Report of Test

LLIA001418-002A

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	1169	1169	1169	1169	1169	1169	1169	1169	1169
	2.5	1161	1160	1163	1168	1170	1168	1163	1160	1161
	5	1147	1146	1148	1152	1154	1152	1148	1146	1147
	7.5	1122	1121	1124	1126	1128	1126	1124	1121	1122
	10	1088	1087	1089	1085	1085	1085	1089	1087	1088
	12.5	1046	1045	1041	1035	1034	1035	1041	1045	1046
	15	997	996	986	977	975	977	986	996	997
	17.5	944	941	925	913	910	913	925	941	944
	20	887	881	862	846	841	846	862	881	887
	22.5	828	819	795	776	770	776	795	819	828
	25	770	756	730	707	702	707	730	756	770
	27.5	713	695	665	641	637	641	665	695	713
	30	658	637	602	578	576	578	602	637	658
	32.5	608	582	545	522	522	522	545	582	608
	35	559	530	492	471	473	471	492	530	559
	37.5	515	483	443	425	430	425	443	483	515
	40	472	438	399	384	389	384	399	438	472
	42.5	431	397	359	346	353	346	359	397	431
	45	392	358	323	312	318	312	323	358	392
	47.5	354	322	289	280	286	280	289	322	354
50	316	287	258	249	254	249	258	287	316	
52.5	279	254	229	220	222	220	229	254	279	
55	240	221	202	192	191	192	202	221	240	
57.5	201	190	177	165	161	165	177	190	201	
60	161	160	153	141	143	141	153	160	161	
62.5	131	131	130	124	125	124	130	131	131	
65	114	111	110	109	109	109	110	111	114	
67.5	99	97	95	94	95	94	95	97	99	
70	86	83	81	81	80	81	81	83	86	
72.5	72	70	68	68	68	68	68	70	72	
75	60	58	56	56	55	56	56	58	60	
77.5	47	46	45	44	44	44	45	46	47	
80	36	35	34	33	33	33	34	35	36	
82.5	24	24	23	23	23	23	23	24	24	
85	14	13	14	14	14	14	14	13	14	
87.5	4	5	6	6	6	6	6	5	4	
90	1	1	2	2	2	2	2	1	1	

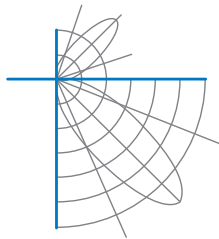


Report of Test

LLIA001418-002A

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	1	1	2	2	2	2	2	1	1
	92.5	6	13	12	11	10	11	12	13	6
	95	19	29	33	32	29	32	33	29	19
	97.5	36	51	62	49	48	49	62	51	36
	100	57	76	164	75	65	75	164	76	57
	102.5	79	103	242	143	99	143	242	103	79
	105	102	128	282	266	156	266	282	128	102
	107.5	127	155	312	483	273	483	312	155	127
	110	152	184	345	689	503	689	345	184	152
	112.5	179	215	384	756	740	756	384	215	179
	115	207	247	423	770	823	770	423	247	207
	117.5	236	280	454	774	851	774	454	280	236
	120	267	312	490	779	868	779	490	312	267
	122.5	297	342	528	784	874	784	528	342	297
	125	326	370	568	792	871	792	568	370	326
	127.5	353	396	604	808	874	808	604	396	353
	130	379	422	630	833	891	833	630	422	379
	132.5	402	446	642	861	917	861	642	446	402
	135	422	468	642	883	946	883	642	468	422
	137.5	441	487	636	884	963	884	636	487	441
	140	459	505	630	858	952	858	630	505	459
	142.5	476	520	625	814	909	814	625	520	476
	145	492	532	624	771	853	771	624	532	492
	147.5	508	543	624	737	799	737	624	543	508
150	523	553	625	713	757	713	625	553	523	
152.5	538	561	627	696	727	696	627	561	538	
155	552	570	628	683	706	683	628	570	552	
157.5	565	578	629	674	691	674	629	578	565	
160	577	586	630	666	679	666	630	586	577	
162.5	589	594	628	660	670	660	628	594	589	
165	599	601	626	652	662	652	626	601	599	
167.5	607	608	623	643	651	643	623	608	607	
170	614	614	622	635	640	635	622	614	614	
172.5	619	619	622	630	631	630	622	619	619	
175	623	622	624	629	627	629	624	622	623	
177.5	625	625	626	629	629	629	626	625	625	
180	627	627	627	627	627	627	627	627	627	



Report of Test

LLIA001418-002A

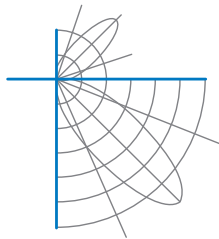
Coefficients of Utilization/Room Utilization - Zonal Cavity Method																						
Effective Floor Cavity Reflectance 0.20																						
RC	80					70					50				30				10			0
RW	70	50	30	10		70	50	30	10		50	30	10		50	30	10		50	30	10	0
RCR																						
0	104	104	104	104		95	95	95	95		77	77	77		60	60	60		45	45	45	38
1	96	92	88	85		87	84	81	78		68	66	64		54	53	51		41	40	39	33
2	88	81	75	71		80	74	69	65		61	57	54		48	46	44		37	36	34	29
3	81	72	65	60		73	66	60	55		54	50	47		43	41	38		34	32	30	26
4	74	64	57	51		67	59	53	48		49	44	41		39	36	34		31	28	27	23
5	68	58	50	45		62	53	46	41		44	39	35		36	32	30		28	26	24	21
6	63	52	44	39		57	48	41	36		40	35	31		33	29	26		26	23	22	19
7	59	47	40	35		53	44	37	32		36	32	28		30	26	24		24	21	20	17
8	55	43	36	31		50	40	33	29		33	29	25		28	24	21		22	20	18	15
9	51	39	32	28		46	37	30	26		31	26	23		26	22	20		21	18	16	14
10	48	36	30	25		44	34	28	24		29	24	21		24	20	18		19	17	15	13

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	32.5	5.50	5.13	
8.0	18.3	7.34	6.84	
10.0	11.7	9.17	8.56	
12.0	8.1	11.00	10.27	
14.0	6.0	12.84	11.98	
16.0	4.6	14.67	13.69	

Average Luminance (cd/m ²)			
	0 deg Plane	45 deg Plane	90 deg Plane
0	28271	28271	28271
45	13414	11030	10890
55	10122	8518	8068
65	6516	6318	6264
75	5576	5245	5172
85	3807	3773	3850

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



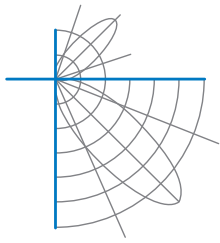
Report of Test

LLIA001418-002A

UGR TABLE - CORRECTED

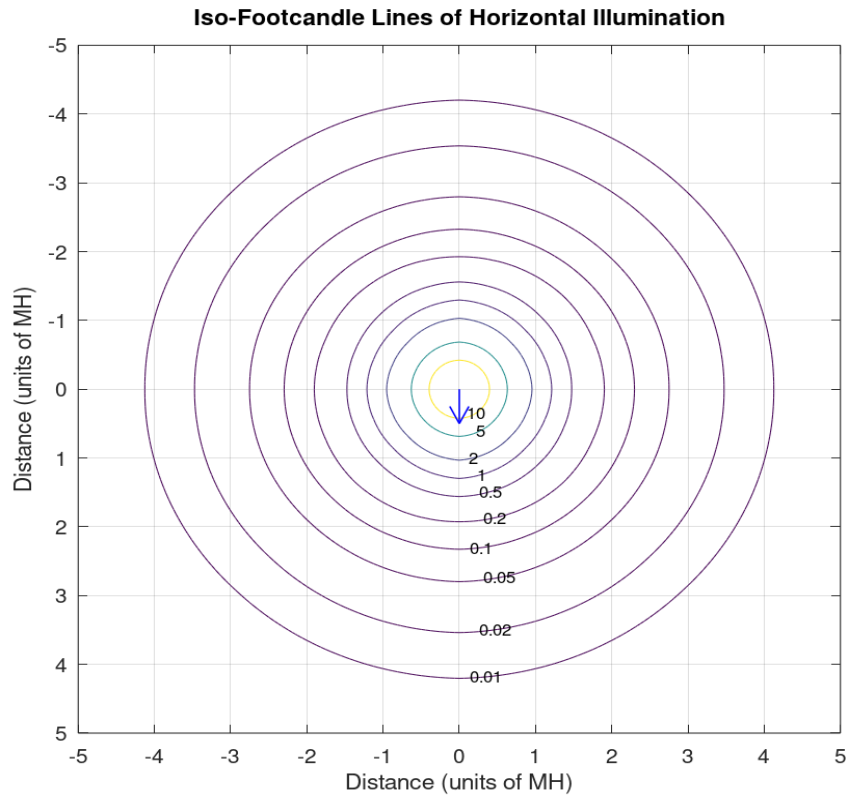
Reflectances											
Ceiling Cavity		70	70	50	50	30	70	70	50	50	30
Walls		50	30	50	30	30	50	30	50	30	30
Floor Cavity		20	20	20	20	20	20	20	20	20	20
Room Size		UGR Viewed Crosswise					UGR Viewed Endwise				
X=2H	Y=2H	13.4	14.1	14.4	15.1	16.6	12.3	13.0	13.3	14.0	15.5
	3H	14.5	15.1	15.6	16.2	17.6	13.7	14.3	14.7	15.4	16.8
	4H	14.9	15.5	16.0	16.6	18.1	14.2	14.8	15.3	15.8	17.3
	6H	15.2	15.8	16.3	16.9	18.3	14.5	15.1	15.6	16.2	17.6
	8H	15.3	15.9	16.4	16.9	18.4	14.6	15.2	15.7	16.2	17.7
	12H	15.4	15.9	16.5	17.0	18.4	14.7	15.2	15.8	16.3	17.8
4H	2H	13.6	14.2	14.7	15.3	16.7	12.7	13.3	13.8	14.4	15.8
	3H	14.9	15.4	16.0	16.5	18.0	14.3	14.8	15.4	15.9	17.4
	4H	15.5	16.0	16.6	17.1	18.6	14.9	15.4	16.0	16.5	18.0
	6H	16.0	16.4	17.1	17.5	19.0	15.4	15.8	16.5	16.9	18.4
	8H	16.1	16.5	17.2	17.6	19.1	15.6	15.9	16.7	17.0	18.5
	12H	16.2	16.5	17.3	17.6	19.1	15.6	16.0	16.8	17.1	18.6
8H	4H	15.7	16.0	16.8	17.1	18.6	15.1	15.5	16.2	16.6	18.1
	6H	16.2	16.5	17.4	17.7	19.2	15.7	16.0	16.9	17.2	18.7
	8H	16.4	16.7	17.6	17.8	19.4	16.0	16.2	17.1	17.3	18.9
	12H	16.6	16.8	17.7	17.9	19.5	16.1	16.3	17.2	17.5	19.0
12H	4H	15.6	16.0	16.8	17.1	18.6	15.1	15.4	16.2	16.6	18.1
	6H	16.2	16.5	17.4	17.6	19.2	15.8	16.0	16.9	17.2	18.7
	8H	16.5	16.7	17.6	17.8	19.4	16.0	16.2	17.2	17.4	18.9

Maximum UGR = 19.5

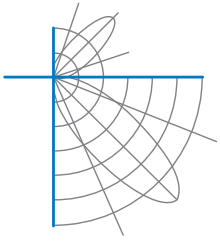


Report of Test
LLIA001418-002A

Iso-Illuminance Plot

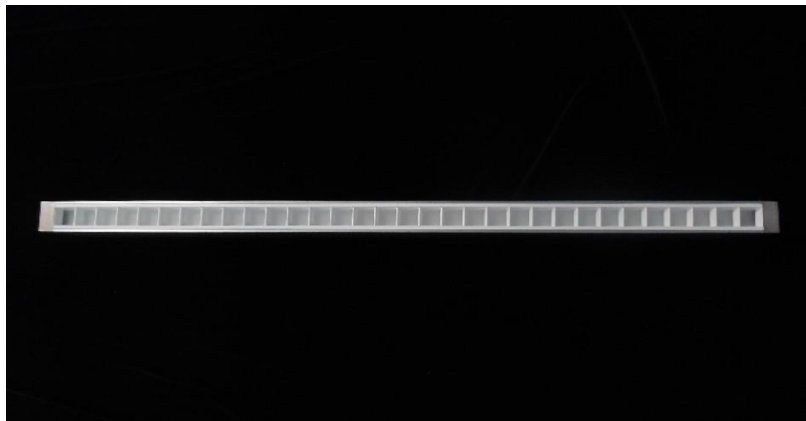


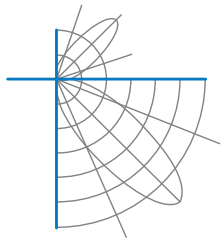
The isofootcandle values shown in the plot above are based on a mounting height of $h = 8.0$ feet. Grid values show multiples of mounting height. The isoilluminance contour lines are expressed in units of footcandles. The values expressed are based on the direct light from a single unit without the contribution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



Report of Test
LLIA001418-002A

Additional Pictures of Test Subject





Report of Test

LLIA001418-002A

Test Distance 9.5 m
Ambient Temperature 25.2 °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.

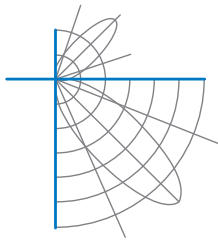
Prorating the performance of the sample for the use of other component combinations (such as lamp / LED / Ballast / driver), or for use in different environmental conditions than that tested, may produce erroneous results.

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.



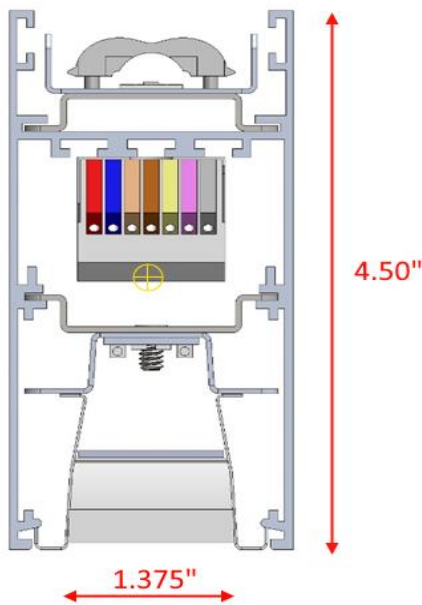
Report of Test

LLIA001418-002B

Integrating Sphere Report

Catalog Number: QS2-I/D-MO/MO-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 480mA and one OTi50/120-277/1A4 DIM-1 L G2 driver labeled as 730mA.



Performance Summary

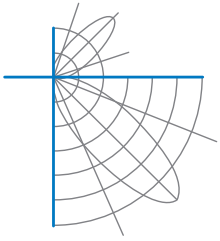
Voltage	120.0 Vac
Current	0.3211 A
Power	37.31 W
Frequency	59.99 Hz
Power Factor	0.968
Current THD	12.8 %
Total Luminous Flux	4397.2 lm
Efficacy	117.9 lm/W
Chromaticity (x,y)	(0.3813, 0.3803)
(u',v')	(0.2243, 0.5033)
Duv	0.0014
CCT	4003 K
CRI (Ra)	83
R9	6
TM-30: Rf	81
TM-30: Rg	93
TM-30: Rcs,h1	-12

Prepared For:

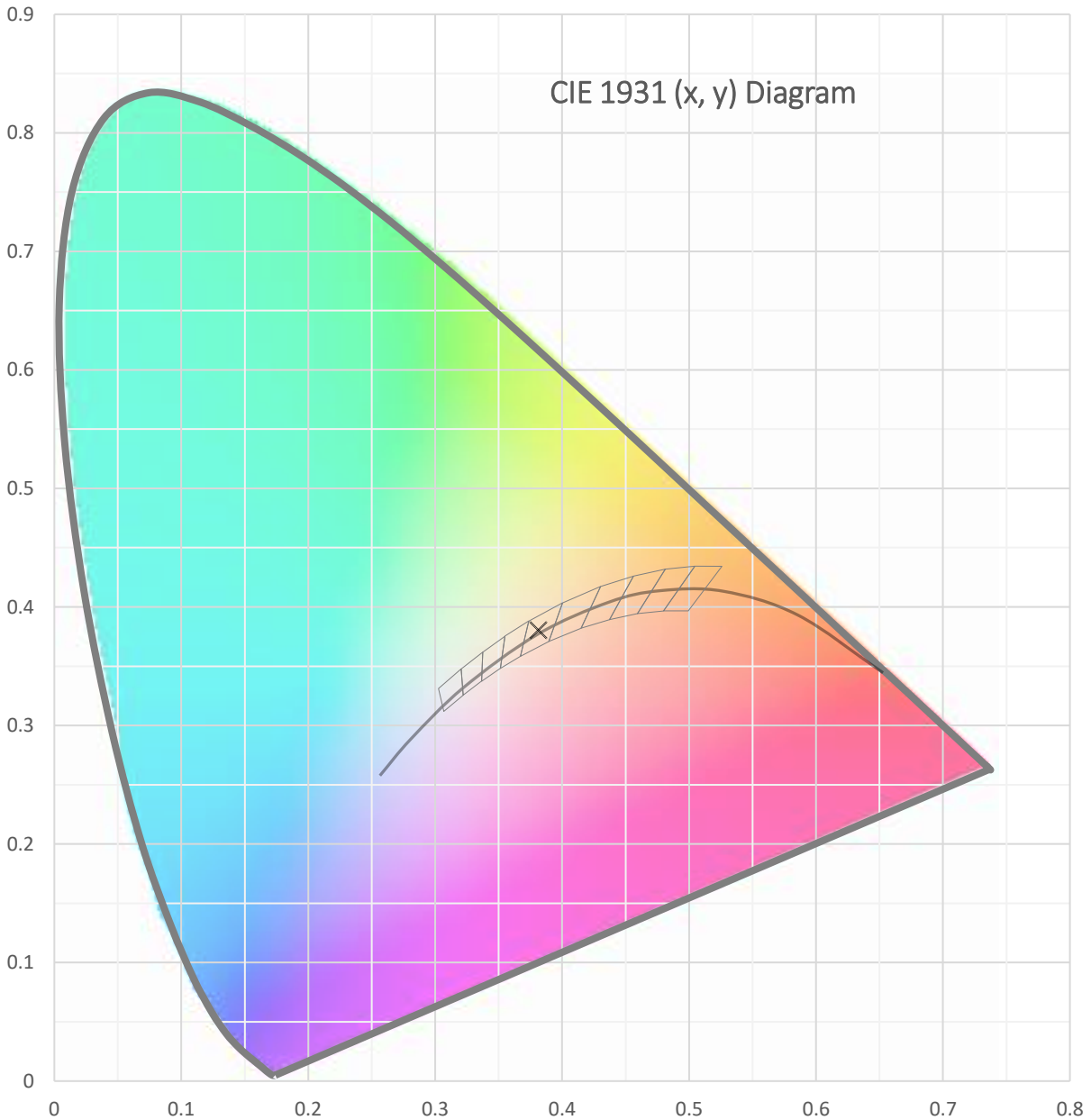
Precision Architectural Lighting
4830 Timber Creek Drive
Houston, TX 77017, USA

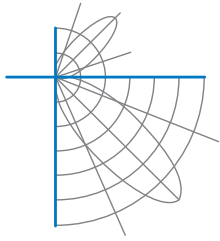
Test date: 03/05/2021

Report date: 03/08/2021

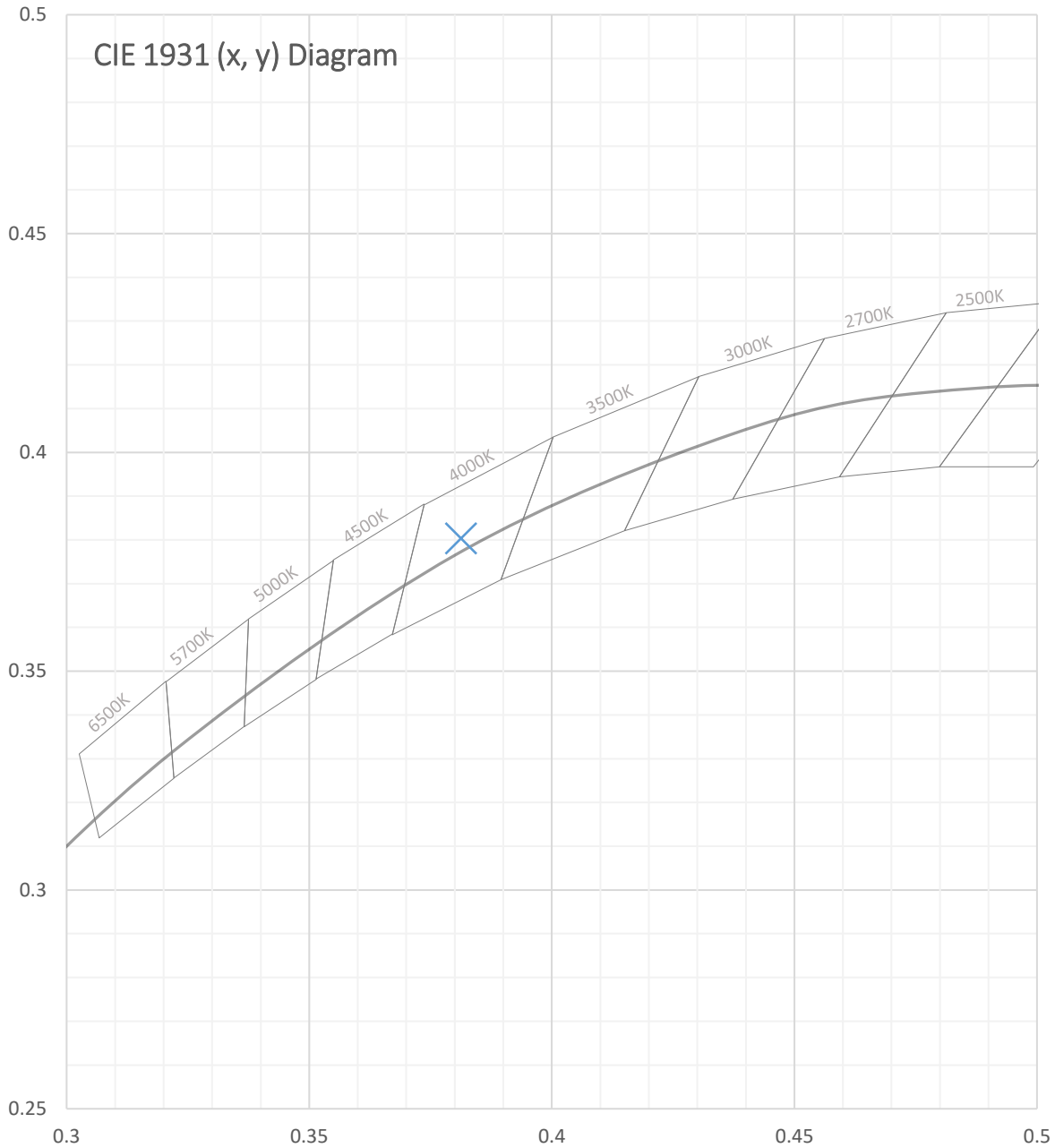


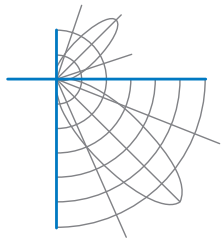
Test Report Number: LLIA001418-002B





Test Report Number: LLIA001418-002B



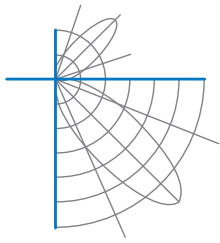


Test Report Number: LLIA001418-002B

Total Radiant Flux	13.31 W
Total Luminous Flux	4397.2 Lm
Chromaticity CIE 1931 (x, y)	(0.3813, 0.3803)
Chromaticity CIE 1976 (u', v')	(0.2243, 0.5033)
Correlated Color Temperature (CCT)	4003 K
Color Rendering Index (Ra)	83
R1	81
R2	90
R3	96
R4	80
R5	81
R6	86
R7	85
R8	63
R9	6
R10	77
R11	79
R12	59
R13	84
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 ‡	1.703

Electrical Data

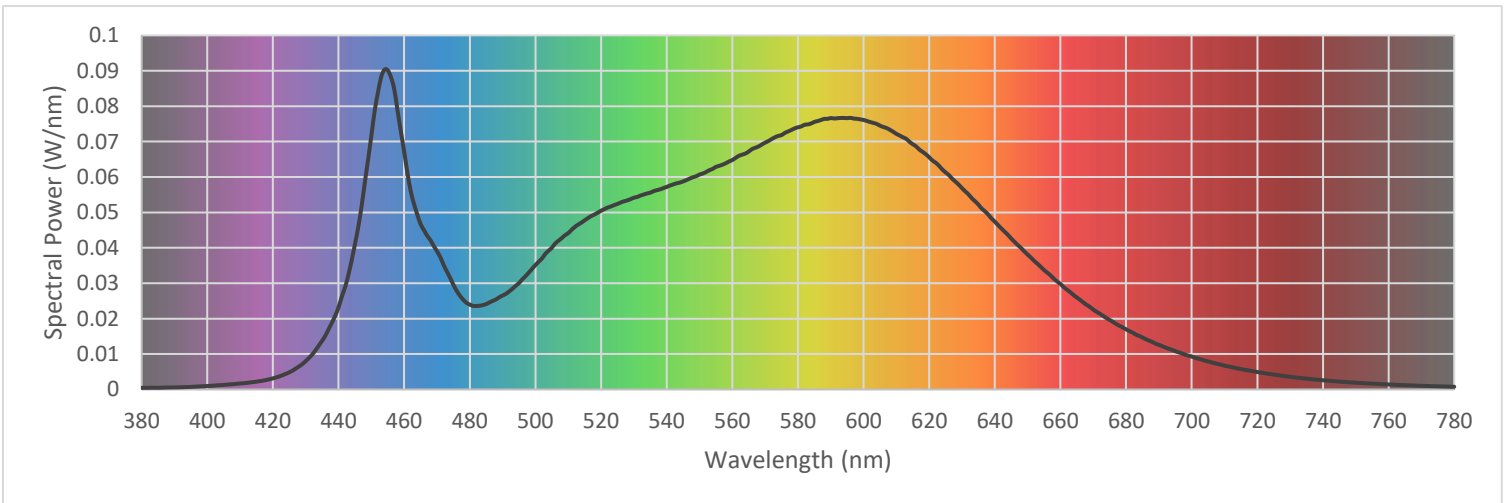
Voltage	120.0 Vac
Current	0.3211 A
Power	37.31 W
Frequency	59.99 Hz
Power Factor	0.968
Current THD	12.8 %

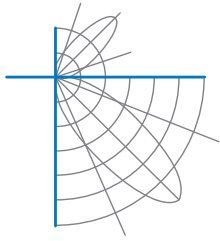


Test Report Number: LLIA001418-002B

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

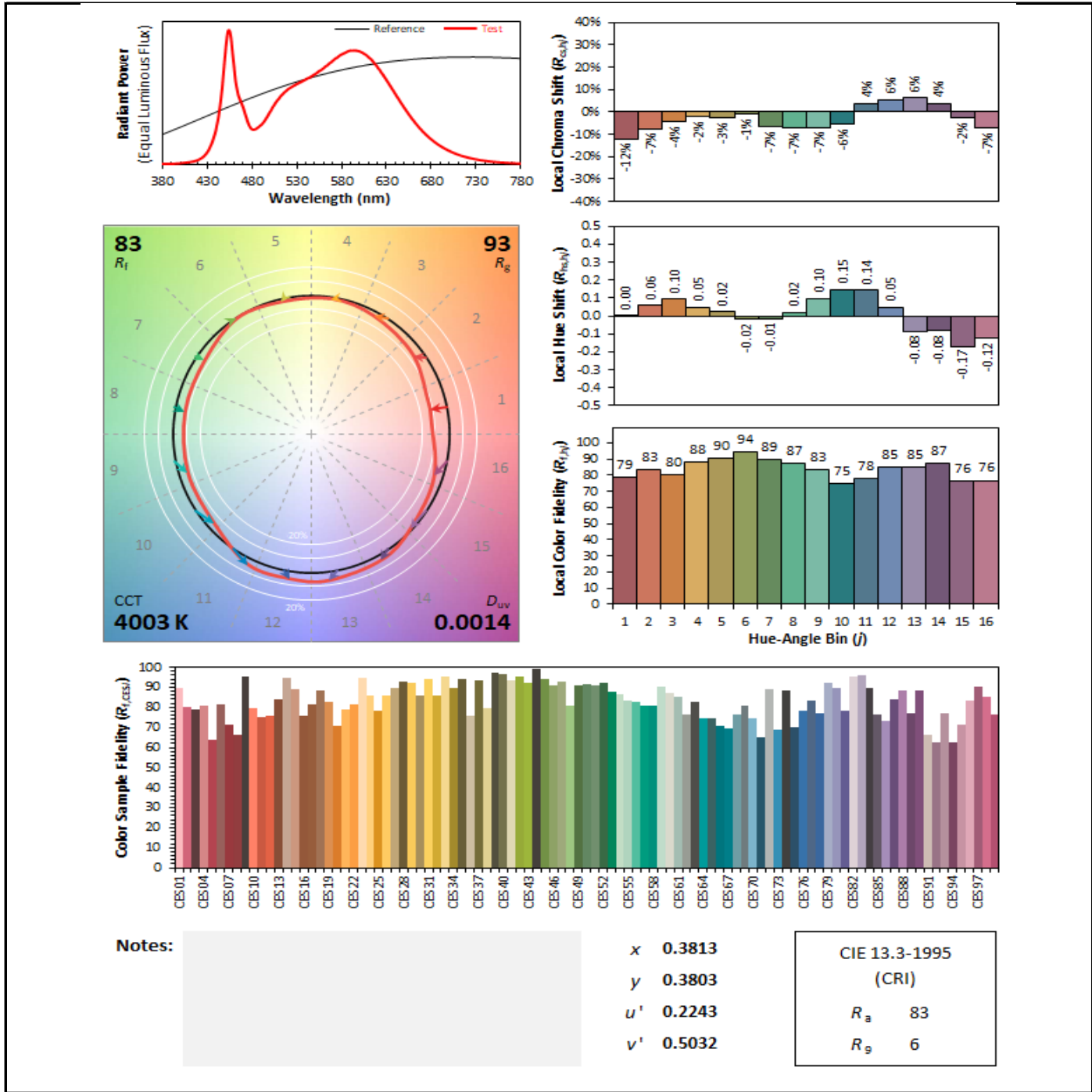
380	0.000457	480	0.023972	580	0.074040	680	0.016968
385	0.000480	485	0.024120	585	0.075557	685	0.014685
390	0.000575	490	0.026534	590	0.076648	690	0.012599
395	0.000732	495	0.030055	595	0.076627	695	0.010799
400	0.000971	500	0.035139	600	0.076106	700	0.009294
405	0.001292	505	0.040021	605	0.074505	705	0.007911
410	0.001686	510	0.044162	610	0.072180	710	0.006724
415	0.002206	515	0.047762	615	0.069244	715	0.005764
420	0.003134	520	0.050488	620	0.065574	720	0.004926
425	0.004851	525	0.052394	625	0.061288	725	0.004204
430	0.008034	530	0.054155	630	0.056846	730	0.003591
435	0.013742	535	0.055582	635	0.052199	735	0.003054
440	0.023229	540	0.057199	640	0.047392	740	0.002593
445	0.041068	545	0.058756	645	0.042621	745	0.002219
450	0.071662	550	0.060698	650	0.038098	750	0.001905
455	0.090109	555	0.062858	655	0.033727	755	0.001636
460	0.067131	560	0.064787	660	0.029792	760	0.001410
465	0.046690	565	0.067191	665	0.025962	765	0.001210
470	0.039040	570	0.069707	670	0.022561	770	0.001036
475	0.029569	575	0.071836	675	0.019634	775	0.000891
						780	0.000766

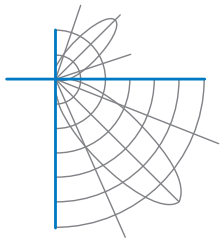




Test Report Number: LLIA001418-002B

IES TM-30 Details





Test Report Number: LLIA001418-002B

Test Equipment Configuration: LightLab International Allentown 2m Integrating Sphere
Measurements acquired using a Labsphere CDS 2600 spectroradiometer
Testing was performed using 4π geometry

Test Temperature: 24.8 °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

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.