



Report of Test

LLIA001493-001A

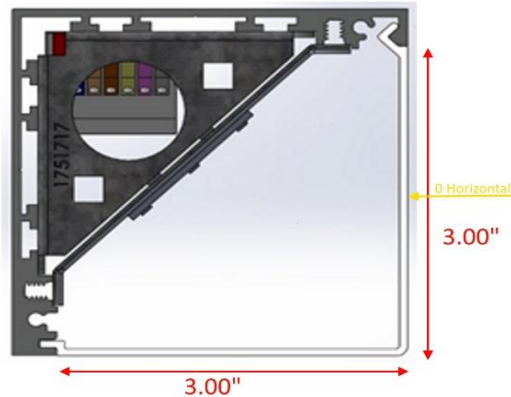
Indoor Distribution Photometry Test Report

Catalog Number: AS350-MO-K40-80-4-XX-LOH-FXXX-UNV-XX

Wall/ceiling mounted extruded aluminum housing, white enamel
aluminum reflector, translucent white plastic enclosure.

144 white LEDs, one Osram PrevaLED Bar board with 144 LEDs.

One Osram Optotronic OTi 30/120-277/1A0 DIM L LED driver programmed to 440mA.



Prepared For:

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

Performance Summary

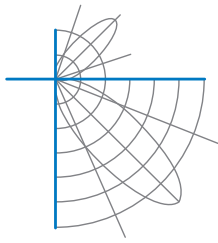
Input Voltage	120.0 V	Luminous Flux	2166.6 Lumens
Input Current	0.1418 A	Total Efficacy	128.1 Lm/W
Input Power	16.91 W	Downward Flux	1647.1 Lumens
Frequency	60.00 Hz	Downward Flux	76.0 % of Total
Power Factor	0.993		
Current THD	5.3 %		

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

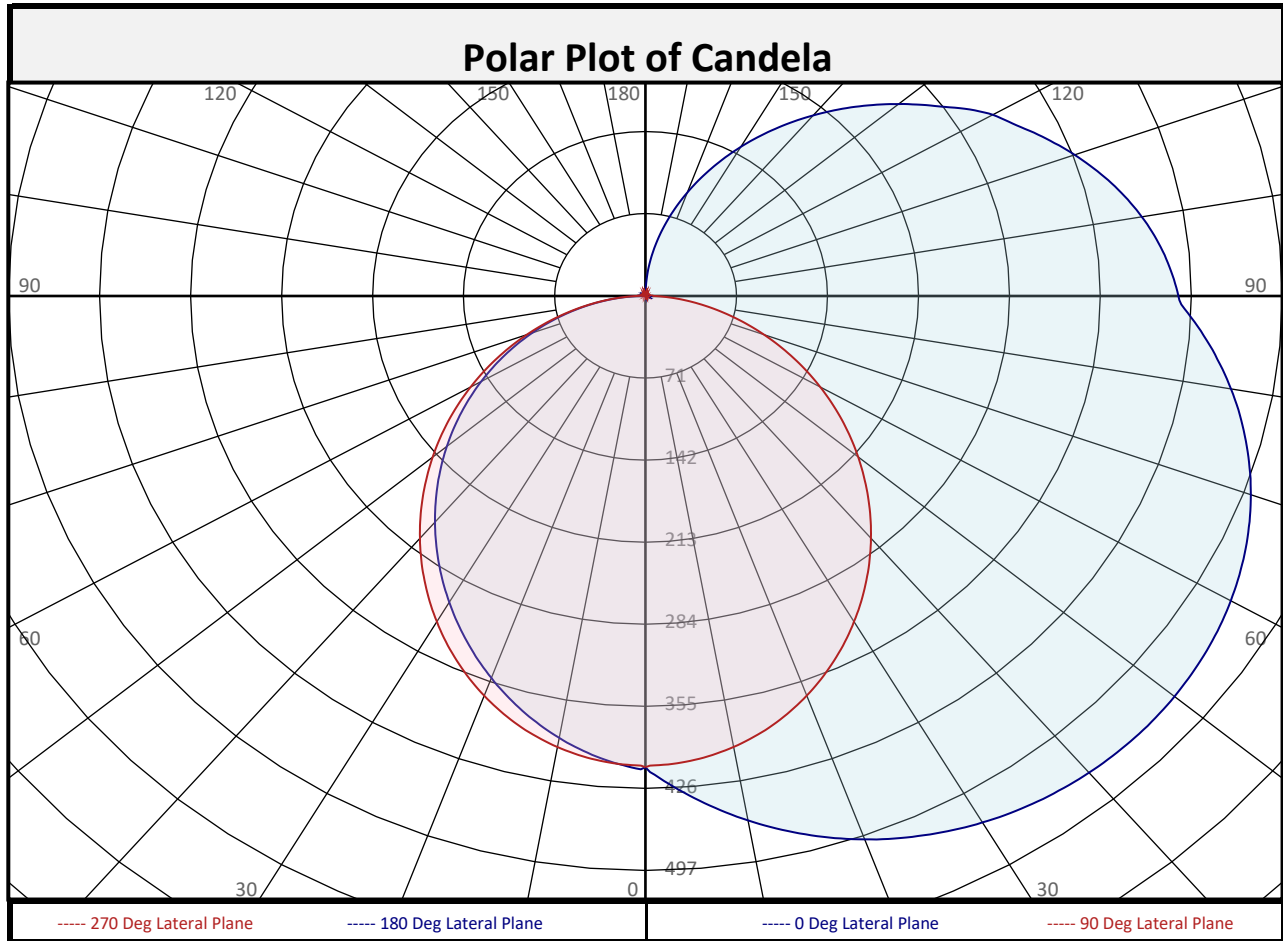
Test date: 07/09/2021

Report date: 07/09/2021

Signed: _____



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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	39.3	1.8%	90-100	125.4	5.8%	0-20	154.7	7.1%	10-20	115.4	5.3%	100-110	113.6	5.2%	0-30	335.0	15.5%			
20-30	180.3	8.3%	110-120	95.8	4.4%	0-40	561.6	25.9%	30-40	226.6	10.5%	120-130	75.0	3.5%	0-60	1065	49.2%	40-50	250.9	11.6%
50-60	252.5	11.7%	130-140	53.0	2.4%	0-80	1495	69.0%	60-70	233.2	10.8%	140-150	33.1	1.5%	0-80	1495	69.0%	70-80	197.2	9.1%
80-90	151.6	7.0%	150-160	17.0	0.8%	10-90	1608	74.2%	80-90	151.6	7.0%	160-170	6.0	0.3%	20-50	657.8	30.4%	90-90	1647	76.0%
			170-180	0.8	0.0%	40-90	1085	50.1%	0-90	1647	76.0%	180-180	0.8	0.0%	60-90	582.0	26.9%			
			90-180	519.5	24.0%	0-180	2167	100.0%												

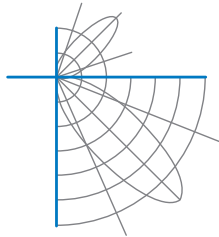


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Luminous Intensity (Candela) Table

		Lateral (C-Plane) Angles								
		0	22.5	45	67.5	90	112.5	135	157.5	180
Vertical (Gamma) Angles	0	408	408	408	408	408	408	408	408	408
	2.5	422	420	415	409	406	404	404	405	406
	5	436	432	424	413	404	401	400	400	401
	7.5	449	443	431	415	400	397	395	394	395
	10	460	454	438	416	396	391	388	387	388
	12.5	472	463	443	417	391	385	381	379	380
	15	482	472	448	416	384	378	373	371	371
	17.5	492	480	451	413	376	369	364	361	362
	20	500	487	454	410	368	360	354	351	352
	22.5	508	493	455	406	359	350	344	340	341
	25	515	498	456	401	348	339	333	329	330
	27.5	521	502	455	394	337	328	322	318	318
	30	526	506	454	388	325	316	310	306	306
	32.5	530	508	451	380	313	304	297	294	294
	35	534	510	448	371	301	291	285	281	281
	37.5	536	510	445	362	287	278	272	268	268
	40	538	511	440	353	274	265	259	255	255
	42.5	540	510	435	343	260	251	245	242	242
	45	540	508	429	332	246	237	232	229	229
	47.5	540	507	423	321	231	223	218	215	216
50	539	504	416	309	217	209	205	202	202	
52.5	537	500	409	298	202	195	191	188	189	
55	535	496	400	286	187	181	177	175	175	
57.5	531	491	392	273	172	167	163	161	162	
60	527	485	383	261	157	152	149	148	148	
62.5	522	479	373	248	142	138	135	134	134	
65	517	472	363	235	128	124	122	121	121	
67.5	510	464	352	222	113	110	108	107	108	
70	503	455	342	209	99	96	95	94	95	
72.5	494	446	330	196	84	82	82	81	82	
75	485	436	319	183	71	69	69	69	69	
77.5	475	426	307	171	57	56	56	56	56	
80	464	414	296	159	45	44	44	44	44	
82.5	452	402	284	147	32	32	32	33	33	
85	440	390	272	135	21	21	21	21	22	
87.5	426	377	259	124	10	10	10	11	11	
90	416	367	250	115	0	0	0	0	0	



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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	416	367	250	115	0	0	0	0	0
	92.5	412	363	248	114	0	0	0	0	0
	95	407	359	246	113	0	0	0	0	0
	97.5	400	354	243	111	0	0	0	0	0
	100	393	348	239	110	0	0	0	0	0
	102.5	385	342	235	108	0	0	0	0	0
	105	377	334	231	107	0	0	0	0	0
	107.5	367	326	226	105	0	0	0	0	0
	110	357	317	220	103	0	0	0	0	0
	112.5	345	308	215	100	0	0	0	0	0
	115	334	298	209	98	0	0	0	0	0
	117.5	323	288	202	95	0	0	0	0	0
	120	313	278	195	92	0	0	0	0	0
	122.5	300	268	188	89	0	0	0	0	0
	125	285	257	182	86	0	0	0	0	0
	127.5	272	245	176	83	0	0	0	0	0
	130	258	232	167	80	0	0	0	0	0
	132.5	245	220	158	77	0	0	0	0	0
	135	231	208	149	73	0	0	0	0	0
	137.5	218	196	141	69	0	0	0	0	0
140	204	183	132	65	0	0	0	0	0	
142.5	190	171	124	61	0	0	0	0	0	
145	176	159	115	57	0	0	0	0	0	
147.5	163	146	106	53	0	0	0	0	0	
150	149	134	98	48	0	0	0	0	0	
152.5	135	122	89	43	0	0	0	0	0	
155	122	110	80	38	0	0	0	0	0	
157.5	108	98	72	33	0	0	0	0	0	
160	95	86	63	29	0	0	0	0	0	
162.5	82	74	53	24	0	0	0	0	0	
165	69	62	43	20	0	0	0	0	0	
167.5	57	51	34	16	0	0	0	0	0	
170	44	40	26	13	0	0	0	0	0	
172.5	33	29	18	9	0	0	0	0	0	
175	21	19	11	6	0	0	0	0	0	
177.5	9	6	5	3	0	0	0	0	0	
180	0	0	0	0	0	0	0	0	0	



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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	113	113	113	113		108	108	108	108		98	98	98		89	89	89		80	80	80	76
1	100	95	89	84		95	90	85	81		81	77	74		73	70	67		66	63	61	57
2	90	81	73	66		85	77	70	64		69	64	59		62	58	54		56	52	49	46
3	82	70	61	54		77	67	58	52		60	53	48		54	49	44		49	44	40	37
4	74	61	52	45		70	58	50	43		53	46	40		48	42	37		43	38	34	31
5	68	54	45	38		64	52	43	37		47	40	34		42	36	32		38	33	29	26
6	62	49	39	33		59	46	38	32		42	35	30		38	32	27		35	29	25	23
7	58	44	35	29		55	42	34	28		38	31	26		35	29	24		31	26	22	20
8	54	40	31	25		51	38	30	24		35	28	23		32	26	21		29	24	20	18
9	50	36	28	22		47	35	27	22		32	25	20		29	23	19		27	21	18	16
10	47	33	25	20		44	32	25	20		29	23	18		27	21	17		25	20	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	11.3	9.13	7.16	
8.0	6.4	12.17	9.54	
10.0	4.1	15.21	11.93	
12.0	2.8	18.25	14.31	
14.0	2.1	21.29	16.70	
16.0	1.6	24.34	19.08	

Average Luminance (cd/m ²)			
	0 deg Plane	45 deg Plane	90 deg Plane
0	4387	4387	4387
45	4110	3829	3739
55	4132	3739	3513
65	4185	3673	3249
75	4263	3645	2938
85	4367	3695	2570

Spacing Criterion	
0 degree plane:	1.9
90 degree plane:	1.2
180 degree plane:	1.1
270 degree plane:	1.2



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UGR TABLE - CORRECTED

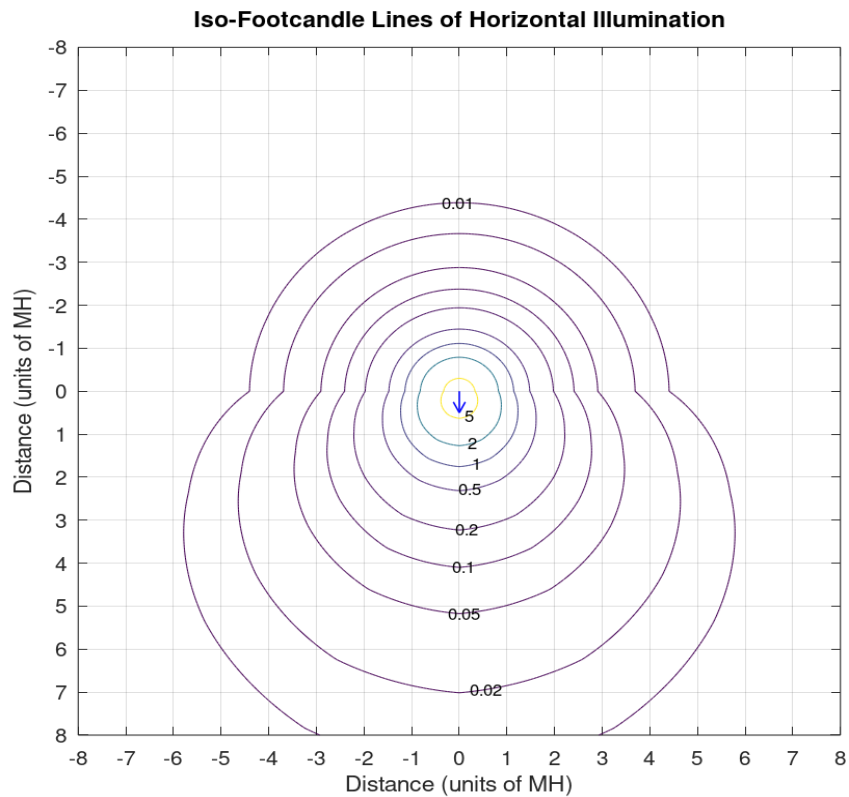
Reflectances											
Ceiling Cavity		70	70	50	50	30	70	70	50	50	30
Walls		50	30	50	30	30	50	30	50	30	30
Floor Cavity		20	20	20	20	20	20	20	20	20	20
Room Size		UGR Viewed Crosswise					UGR Viewed Endwise				
X=2H	Y=2H	18.9	20.2	19.6	20.9	21.7	11.4	12.7	12.1	13.4	14.3
	3H	22.2	23.4	22.9	24.1	25.0	12.8	14.0	13.5	14.7	15.6
	4H	24.0	25.1	24.7	25.8	26.7	13.3	14.4	14.0	15.1	16.0
	6H	25.8	26.8	26.5	27.6	28.5	13.5	14.6	14.3	15.3	16.2
	8H	26.7	27.7	27.5	28.5	29.4	13.6	14.6	14.3	15.4	16.3
	12H	27.8	28.7	28.5	29.5	30.4	13.6	14.6	14.4	15.3	16.3
4H	2H	19.1	20.3	19.9	21.0	21.9	13.1	14.2	13.8	15.0	15.8
	3H	22.7	23.7	23.4	24.4	25.3	14.8	15.7	15.5	16.5	17.4
	4H	24.6	25.5	25.3	26.3	27.2	15.4	16.3	16.1	17.0	18.0
	6H	26.6	27.4	27.4	28.2	29.1	15.8	16.6	16.6	17.4	18.3
	8H	27.7	28.4	28.5	29.2	30.2	15.9	16.7	16.7	17.5	18.4
	12H	28.9	29.5	29.6	30.3	31.3	16.0	16.7	16.8	17.5	18.4
8H	4H	24.7	25.5	25.5	26.3	27.2	16.8	17.6	17.6	18.4	19.3
	6H	26.9	27.5	27.7	28.4	29.3	17.5	18.2	18.3	19.0	19.9
	8H	28.1	28.7	28.9	29.5	30.5	17.8	18.3	18.6	19.2	20.1
	12H	29.5	30.0	30.3	30.8	31.8	17.9	18.4	18.8	19.3	20.3
12H	4H	24.7	25.4	25.5	26.2	27.2	17.3	18.0	18.1	18.8	19.8
	6H	26.9	27.5	27.7	28.3	29.3	18.2	18.8	19.0	19.6	20.6
	8H	28.2	28.7	29.0	29.5	30.5	18.6	19.1	19.4	19.9	20.9

Maximum UGR = 31.8

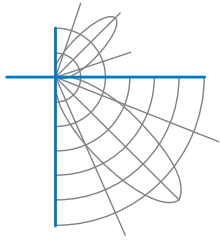


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Iso-Illuminance Plot

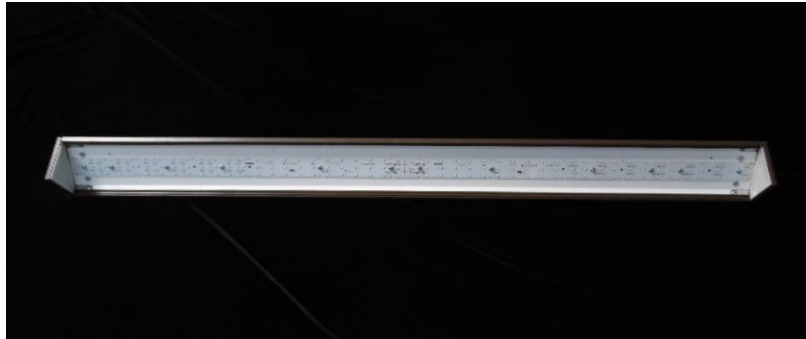


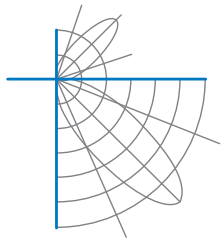
The isofootcandle values shown in the plot above are based on a mounting height of $h = 8.0$ feet. Grid values show multiples of mounting height. The isoilluminance contour lines are expressed in units of footcandles. The values expressed are based on the direct light from a single unit without the contribution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



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Additional Pictures of Test Subject





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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.

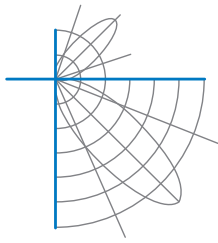
Prorating the performance of the sample for the use of other component combinations (such as lamp / LED / Ballast / driver), or for use in different environmental conditions than that tested, may produce erroneous results.

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

LLIA001493-001B

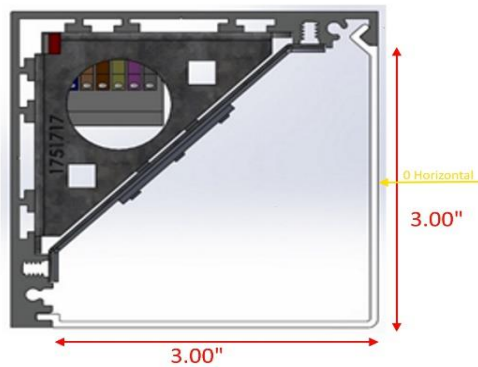
Integrating Sphere Report

Catalog Number: AS350-MO-K40-80-4-XX-LOH-FXXX-UNV-XX

Wall/ceiling mounted extruded aluminum housing, white enamel
aluminum reflector, translucent white plastic enclosure.

144 white LEDs, one Osram PrevaLED Bar board with 144 LEDs.

One Osram Optotronic OTi 30/120-277/1A0 DIM L LED driver programmed to 440mA.



Performance Summary

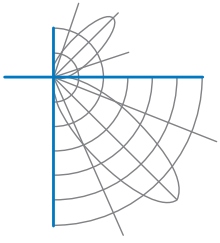
Voltage	120.0 Vac
Current	0.1418 A
Power	16.90 W
Frequency	59.99 Hz
Power Factor	0.993
Current THD	5.3 %
Total Luminous Flux	2230.9 lm
Efficacy	132.0 lm/W
Chromaticity (x,y)	(0.3793, 0.3743)
(u',v')	(0.2253, 0.5003)
Duv	-0.0008
CCT	4014 K
CRI (Ra)	85
R9	19
TM-30: Rf	83
TM-30: Rg	95
TM-30: Rcs,h1	-11

Prepared For:

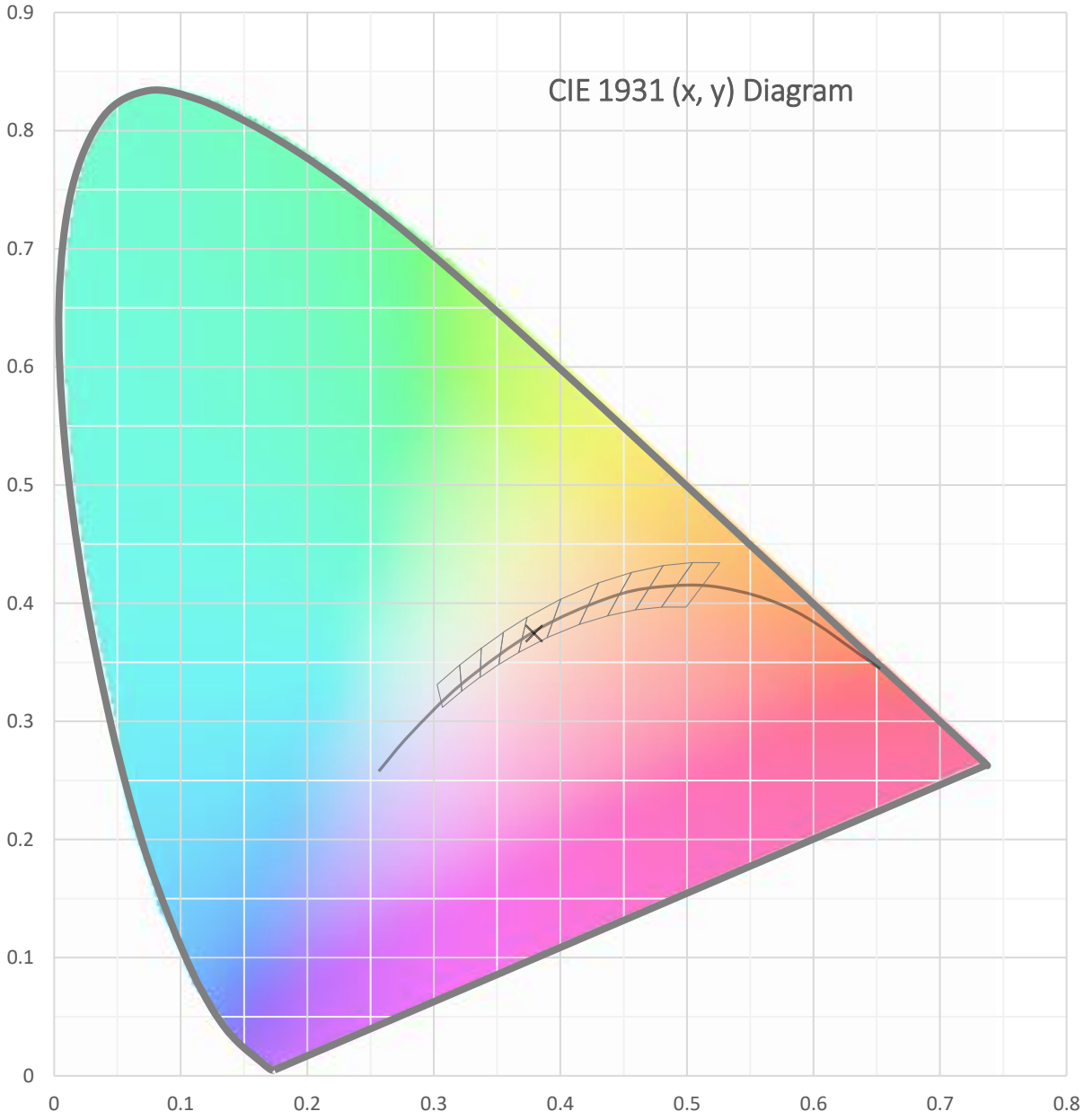
Precision Architectural Lighting
4830 Timber Creek Drive
Houston, TX 77017, USA

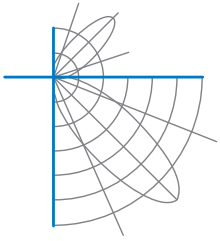
Test date: 07/08/2021

Report date: 07/09/2021

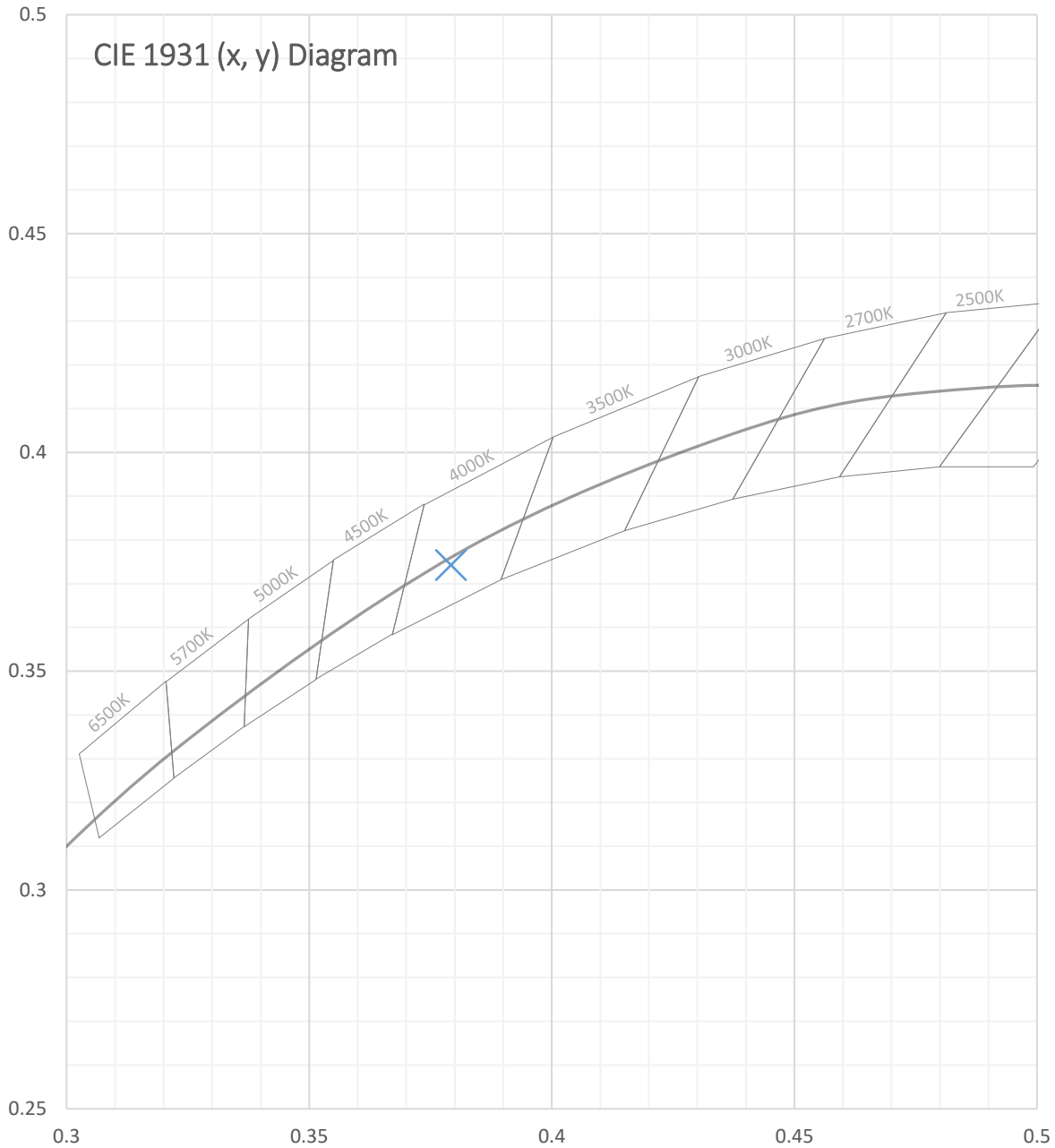


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Total Radiant Flux	6.969 W
Total Luminous Flux	2230.9 Lm
Chromaticity CIE 1931 (x, y)	(0.3793, 0.3743)
Chromaticity CIE 1976 (u', v')	(0.2253, 0.5003)
Correlated Color Temperature (CCT)	4014 K
Color Rendering Index (Ra)	85
R1	84
R2	92
R3	96
R4	83
R5	84
R6	88
R7	86
R8	68
R9	19
R10	80
R11	82
R12	62
R13	86
R14	98
TM-30: Rf	83
TM-30: Rg	95
TM-30: Rcs,h1	-11
Distance from Planckian Locus (Duv)	-0.0008
Scotopic/Photopic Ratio ‡	1.729

Electrical Data

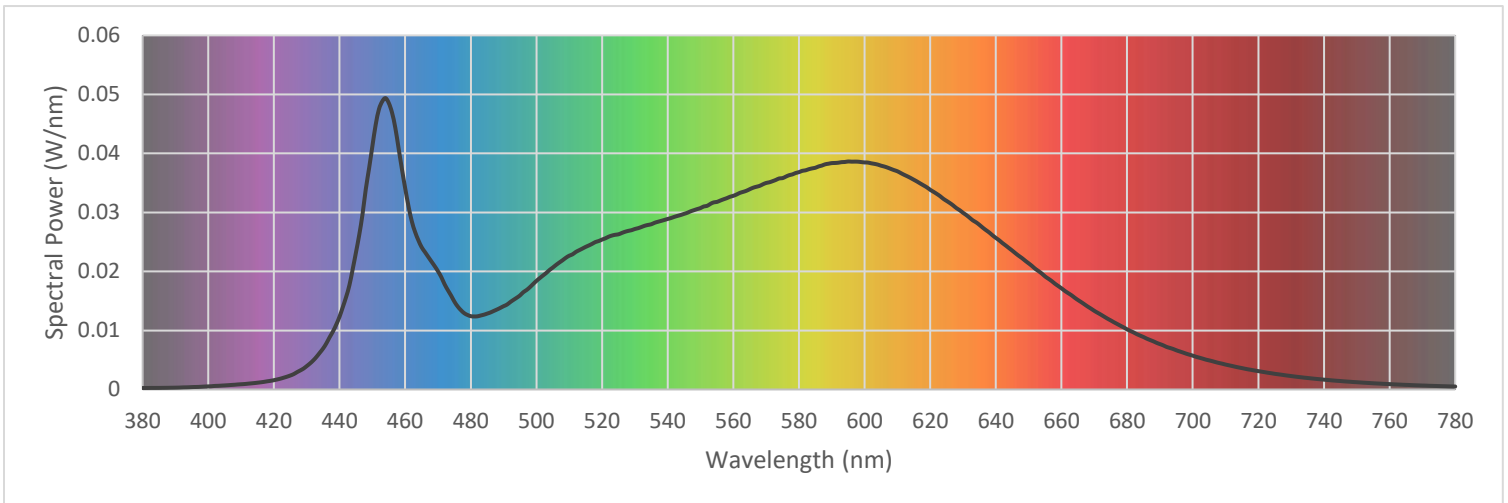
Voltage	120.0 Vac
Current	0.1418 A
Power	16.90 W
Frequency	59.99 Hz
Power Factor	0.993
Current THD	5.3 %

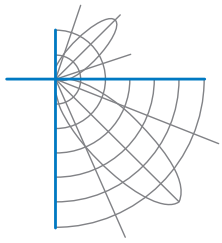


Test Report Number: LLIA001493-001B

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

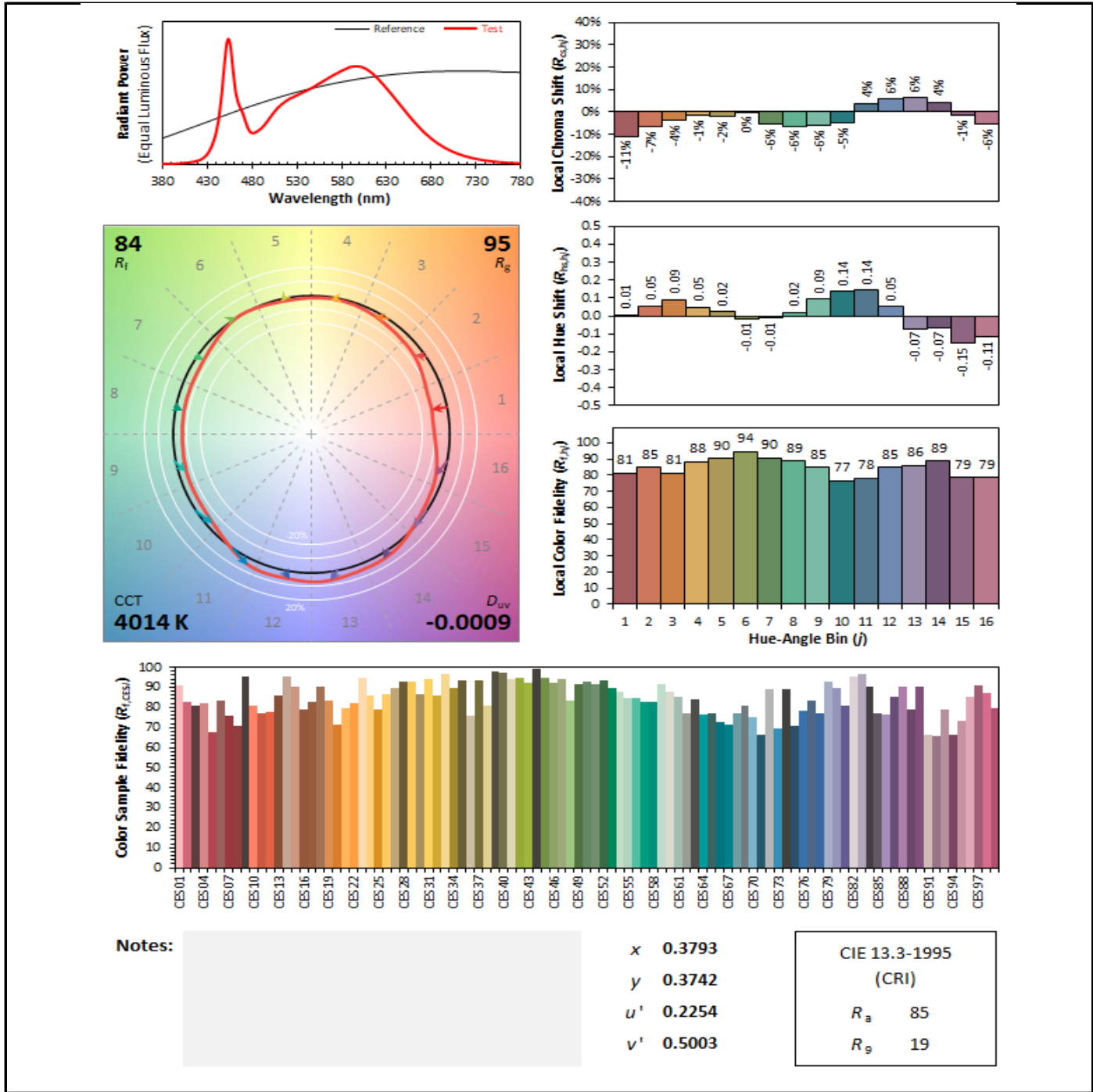
380	0.000253	480	0.012417	580	0.036822	680	0.010189
385	0.000265	485	0.012856	585	0.037567	685	0.008885
390	0.000304	490	0.014113	590	0.038358	690	0.007690
395	0.000402	495	0.015942	595	0.038631	695	0.006640
400	0.000522	500	0.018398	600	0.038470	700	0.005734
405	0.000685	505	0.020661	605	0.037924	705	0.004928
410	0.000884	510	0.022666	610	0.036974	710	0.004221
415	0.001147	515	0.024161	615	0.035535	715	0.003621
420	0.001572	520	0.025401	620	0.033834	720	0.003109
425	0.002367	525	0.026291	625	0.031948	725	0.002651
430	0.003961	530	0.027191	630	0.029937	730	0.002276
435	0.006952	535	0.027994	635	0.027889	735	0.001943
440	0.012350	540	0.028892	640	0.025684	740	0.001661
445	0.023226	545	0.029755	645	0.023532	745	0.001430
450	0.041207	550	0.030738	650	0.021374	750	0.001227
455	0.048540	555	0.031779	655	0.019150	755	0.001051
460	0.034083	560	0.032810	660	0.017146	760	0.000907
465	0.024117	565	0.033931	665	0.015166	765	0.000777
470	0.020024	570	0.034990	670	0.013329	770	0.000669
475	0.014882	575	0.035808	675	0.011708	775	0.000576
						780	0.000498

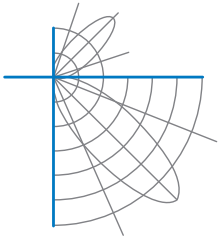




Test Report Number: LLIA001493-001B

IES TM-30 Details





Test Report Number: LLIA001493-001B

Additional Pictures of Test Subject





Test Report Number: LLIA001493-001B

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: 25.1 °C

Test Procedure: Tested in accordance with the applicable sections of:
LM-79-19, LM-78-07, LM-58-13, ANSI_ANSI 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.