

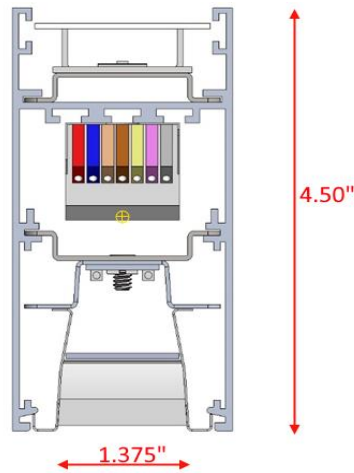
Report of Test

LLIA001418-003A

Indoor Distribution Photometry Test Report

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

Pendant mounted, extruded aluminum housing, white enamel aluminum reflectors, frosted plastic enclosure above LEDs, formed white enamel aluminum baffle with frosted plastic insert. 92 upper white LEDs, 128 white lower LEDs. One Osram Optotronic OTi 30/120-277/A0 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

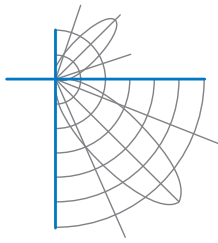
Performance Summary			
Input Voltage	120.0 V	Luminous Flux	6414.4 Lumens
Input Current	0.5088 A	Total Efficacy	107.1 Lm/W
Input Power	59.87 W	Downward Flux	2711.9 Lumens
Frequency	60.00 Hz	Downward Flux	42.3 % of Total
Power Factor	0.981		
Current THD	8.1 %		

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

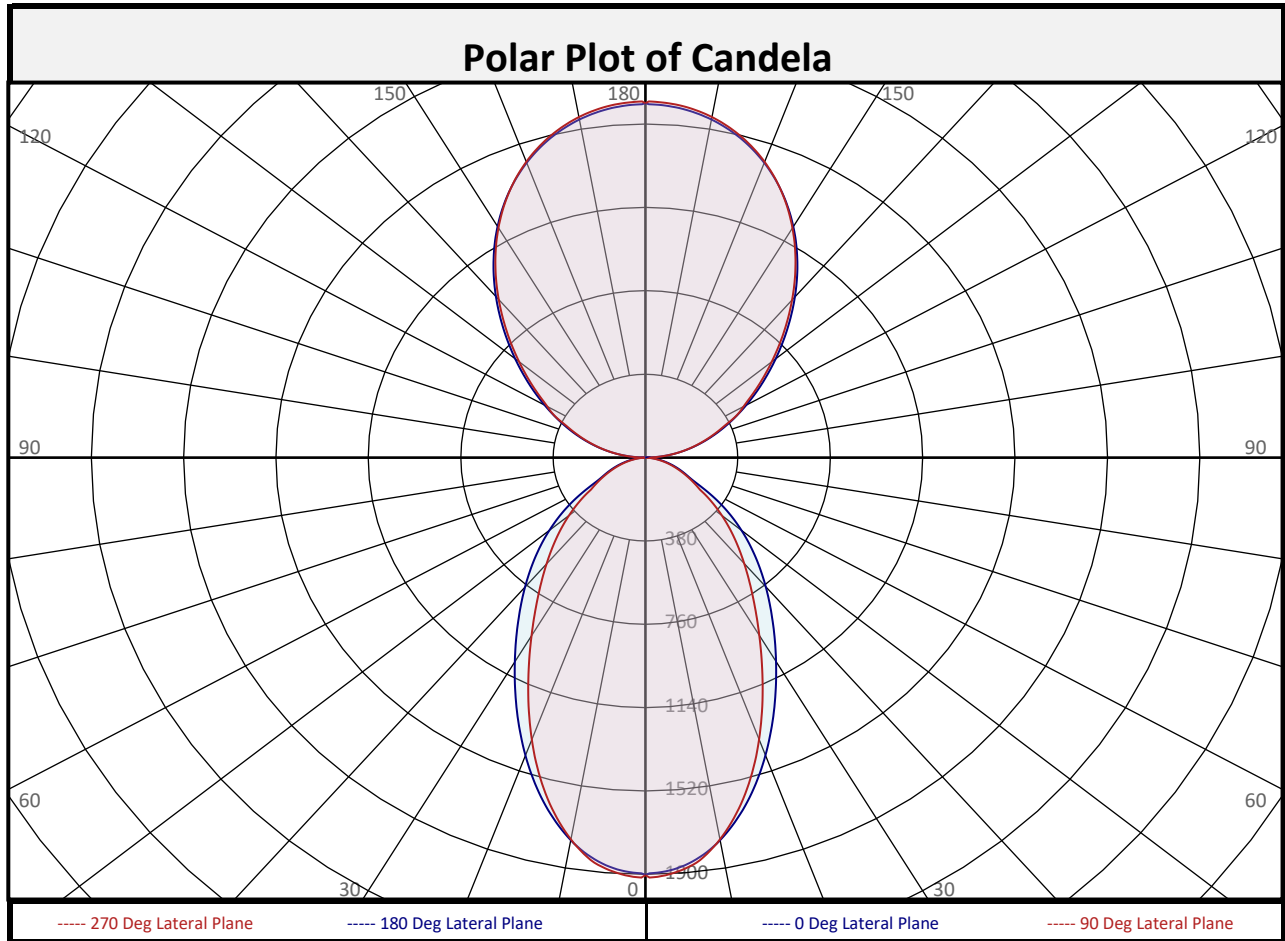
Test date: 03/02/2021

Report date: 03/08/2021

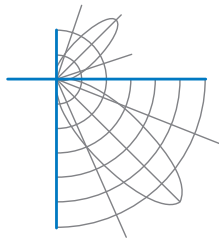
Signed: _____



Report of Test
LLIA001418-003A



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	175.4	2.7%	90-100	76.6	1.2%	0-20	622.9	9.7%	0-10	175.4	2.7%
10-20	447.4	7.0%	100-110	232.5	3.6%	0-30	1169	18.2%	10-20	447.4	7.0%
20-30	546.3	8.5%	110-120	380.2	5.9%	0-40	1682	26.2%	20-30	546.3	8.5%
30-40	512.5	8.0%	120-130	517.0	8.1%	0-60	2408	37.5%	30-40	512.5	8.0%
40-50	423.9	6.6%	130-140	630.2	9.8%	0-80	2686	41.9%	40-50	423.9	6.6%
50-60	302.1	4.7%	140-150	676.9	10.6%	10-90	2536	39.5%	50-60	302.1	4.7%
60-70	180.8	2.8%	150-160	611.6	9.5%	20-50	1483	23.1%	60-70	180.8	2.8%
70-80	97.7	1.5%	160-170	425.3	6.6%	40-90	1030	16.1%	70-80	97.7	1.5%
80-90	25.8	0.4%	170-180	152.1	2.4%	60-90	304.2	4.7%	80-90	25.8	0.4%
0-90	2712	42.3%	90-180	3702	57.7%	0-180	6414	100.0%	0-90	2712	42.3%

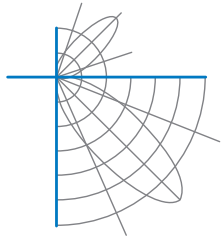


Report of Test

LLIA001418-003A

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	1903	1903	1903	1903	1903	1903	1903	1903	1903
	2.5	1888	1888	1893	1900	1905	1900	1893	1888	1888
	5	1866	1865	1868	1874	1880	1874	1868	1865	1866
	7.5	1826	1825	1828	1833	1836	1833	1828	1825	1826
	10	1771	1770	1772	1765	1766	1765	1772	1770	1771
	12.5	1702	1700	1694	1683	1682	1683	1694	1700	1702
	15	1623	1621	1604	1589	1586	1589	1604	1621	1623
	17.5	1536	1532	1505	1485	1480	1485	1505	1532	1536
	20	1444	1434	1401	1375	1367	1375	1401	1434	1444
	22.5	1349	1333	1293	1261	1253	1261	1293	1333	1349
	25	1255	1232	1186	1149	1142	1149	1186	1232	1255
	27.5	1163	1133	1081	1041	1035	1041	1081	1133	1163
	30	1074	1037	980	940	938	940	980	1037	1074
	32.5	991	948	886	849	849	849	886	948	991
	35	912	864	800	766	770	766	800	864	912
	37.5	839	786	721	691	699	691	721	786	839
	40	770	714	649	624	634	624	649	714	770
	42.5	703	646	585	563	574	563	585	646	703
	45	639	583	525	507	517	507	525	583	639
	47.5	577	524	471	455	464	455	471	524	577
	50	515	467	420	405	411	405	420	467	515
	52.5	453	413	373	357	360	357	373	413	453
	55	391	360	328	311	310	311	328	360	391
	57.5	326	309	287	267	261	267	287	309	326
	60	262	259	248	229	231	229	248	259	262
	62.5	213	214	211	202	203	202	211	214	213
	65	185	181	179	177	177	177	179	181	185
	67.5	162	157	154	153	153	153	154	157	162
	70	139	135	132	131	131	131	132	135	139
	72.5	118	114	111	110	109	110	111	114	118
75	97	94	91	90	89	90	91	94	97	
77.5	77	74	72	71	70	71	72	74	77	
80	58	56	54	53	53	53	54	56	58	
82.5	40	38	37	37	36	37	37	38	40	
85	22	22	22	22	22	22	22	22	22	
87.5	7	8	9	9	9	9	9	8	7	
90	2	2	3	4	4	4	3	2	2	

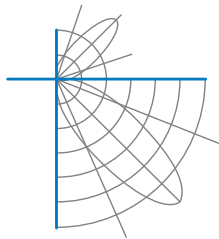


Report of Test

LLIA001418-003A

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	2	3	4	4	4	3	2	2
	92.5	31	33	33	33	33	33	33	33	31
	95	69	71	71	70	69	70	71	71	69
	97.5	107	108	108	107	106	107	108	108	107
	100	145	147	145	144	142	144	145	147	145
	102.5	183	185	182	180	178	180	182	185	183
	105	221	223	220	217	215	217	220	223	221
	107.5	260	262	260	255	252	255	260	262	260
	110	300	303	304	293	291	293	304	303	300
	112.5	342	344	341	334	331	334	341	344	342
	115	385	388	384	382	376	382	384	388	385
	117.5	431	433	428	424	428	424	428	433	431
	120	479	481	475	468	467	468	475	481	479
	122.5	530	532	525	517	512	517	525	532	530
	125	583	585	578	570	564	570	578	585	583
	127.5	639	640	633	625	619	625	633	640	639
	130	699	699	692	684	678	684	692	699	699
	132.5	760	761	753	746	740	746	753	761	760
	135	824	824	817	810	804	810	817	824	824
	137.5	889	889	882	876	871	876	882	889	889
140	956	956	949	944	939	944	949	956	956	
142.5	1023	1023	1016	1013	1008	1013	1016	1023	1023	
145	1089	1089	1083	1081	1077	1081	1083	1089	1089	
147.5	1154	1153	1149	1148	1144	1148	1149	1153	1154	
150	1216	1215	1213	1213	1210	1213	1213	1215	1216	
152.5	1276	1275	1273	1275	1272	1275	1273	1275	1276	
155	1331	1331	1330	1333	1331	1333	1330	1331	1331	
157.5	1383	1382	1383	1386	1386	1386	1383	1382	1383	
160	1429	1429	1431	1435	1435	1435	1431	1429	1429	
162.5	1471	1471	1473	1479	1478	1479	1473	1471	1471	
165	1508	1508	1511	1517	1517	1517	1511	1508	1508	
167.5	1539	1539	1542	1549	1549	1549	1542	1539	1539	
170	1565	1564	1568	1575	1576	1575	1568	1564	1565	
172.5	1585	1584	1588	1596	1597	1596	1588	1584	1585	
175	1599	1598	1603	1611	1612	1611	1603	1598	1599	
177.5	1608	1607	1612	1619	1620	1619	1612	1607	1608	
180	1616	1616	1616	1616	1616	1616	1616	1616	1616	



Report of Test

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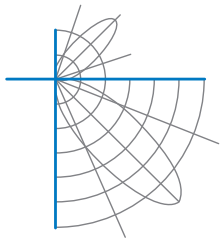
Coefficients of Utilization/Room Utilization - Zonal Cavity Method																						
Effective Floor Cavity Reflectance 0.20																						
RC	80				70				50				30				10				0	
RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	50	30	10	0	
RCR																						
0	105	105	105	105	96	96	96	96	79	79	79	63	63	63	49	49	49	42				
1	97	93	89	86	88	85	82	79	70	68	66	57	56	54	45	44	43	37				
2	89	82	76	72	81	75	71	66	63	59	56	51	49	47	40	39	37	33				
3	82	73	66	61	74	67	61	57	56	52	48	46	43	41	36	35	33	29				
4	75	65	58	52	69	60	54	49	50	46	42	42	38	36	33	31	29	25				
5	69	59	51	45	63	54	47	43	46	41	37	38	34	31	30	28	26	23				
6	64	53	45	40	59	49	42	38	42	37	33	35	31	28	28	26	24	21				
7	60	48	41	35	55	45	38	33	38	33	29	32	28	25	26	23	21	19				
8	55	44	37	32	51	41	34	30	35	30	26	29	26	23	24	21	19	17				
9	52	40	33	28	48	38	31	27	32	27	24	27	24	21	22	20	18	16				
10	49	37	30	26	45	35	29	24	30	25	22	25	22	19	21	18	17	15				

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	52.9	5.51	5.13	
8.0	29.7	7.35	6.84	
10.0	19.0	9.18	8.55	
12.0	13.2	11.02	10.26	
14.0	9.7	12.86	11.97	
16.0	7.4	14.69	13.68	

Average Luminance (cd/m ²)			
	0 deg Plane	45 deg Plane	90 deg Plane
0	46004	46004	46004
45	21865	17956	17692
55	16472	13842	13061
65	10591	10243	10146
75	9038	8498	8351
85	6218	6047	6021

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



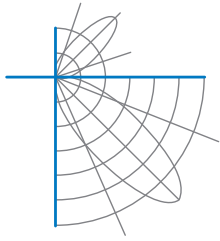
Report of Test

LLIA001418-003A

UGR TABLE - CORRECTED

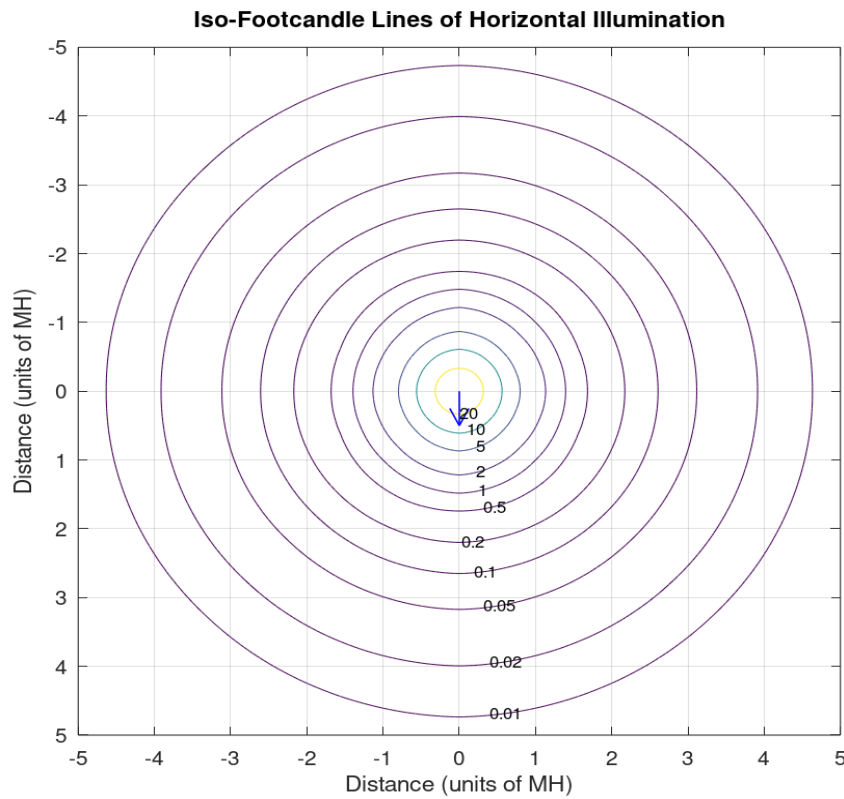
Reflectances											
Ceiling Cavity		70	70	50	50	30	70	70	50	50	30
Walls		50	30	50	30	30	50	30	50	30	30
Floor Cavity		20	20	20	20	20	20	20	20	20	20
Room Size		UGR Viewed Crosswise					UGR Viewed Endwise				
X=2H	Y=2H	15.6	16.3	16.6	17.3	18.7	14.5	15.2	15.5	16.2	17.6
	3H	16.7	17.4	17.7	18.4	19.8	15.9	16.5	16.9	17.6	19.0
	4H	17.1	17.8	18.2	18.8	20.2	16.4	17.0	17.4	18.0	19.4
	6H	17.5	18.0	18.5	19.1	20.5	16.7	17.3	17.8	18.3	19.8
	8H	17.5	18.1	18.6	19.2	20.6	16.8	17.3	17.9	18.4	19.8
	12H	17.6	18.1	18.7	19.2	20.6	16.9	17.4	17.9	18.4	19.9
4H	2H	15.8	16.4	16.9	17.5	18.9	14.9	15.5	15.9	16.5	18.0
	3H	17.2	17.7	18.2	18.8	20.2	16.5	17.0	17.6	18.1	19.5
	4H	17.7	18.2	18.8	19.3	20.7	17.1	17.6	18.2	18.7	20.1
	6H	18.2	18.6	19.3	19.7	21.1	17.6	18.0	18.7	19.1	20.5
	8H	18.3	18.7	19.4	19.8	21.2	17.7	18.1	18.8	19.2	20.6
8H	12H	18.4	18.7	19.5	19.8	21.3	17.8	18.1	18.9	19.2	20.7
	4H	17.9	18.3	19.0	19.3	20.8	17.3	17.7	18.4	18.8	20.2
	6H	18.4	18.8	19.6	19.9	21.3	17.9	18.2	19.0	19.3	20.8
	8H	18.7	18.9	19.8	20.0	21.5	18.1	18.4	19.2	19.5	21.0
12H	12H	18.8	19.0	19.9	20.1	21.6	18.3	18.5	19.4	19.6	21.1
	4H	17.9	18.2	19.0	19.3	20.7	17.3	17.6	18.4	18.7	20.2
	6H	18.5	18.7	19.6	19.8	21.3	17.9	18.2	19.1	19.3	20.8
	8H	18.7	18.9	19.8	20.0	21.6	18.2	18.4	19.3	19.5	21.0

Maximum UGR = 21.6

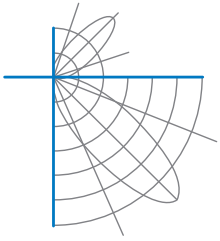


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LLIA001418-003A

Iso-Illuminance Plot

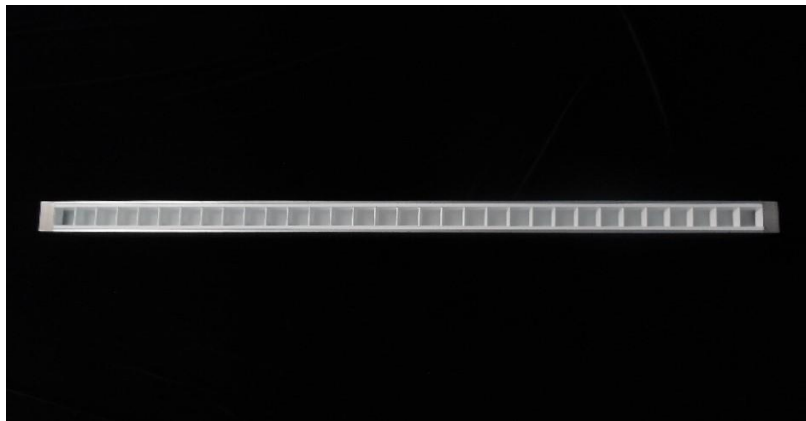


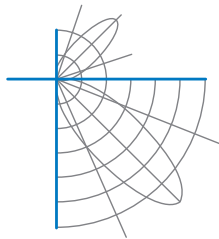
The isofootcandle values shown in the plot above are based on a mounting height of $h = 8.0$ feet. Grid values show multiples of mounting height. The isoilluminance contour lines are expressed in units of footcandles. The values expressed are based on the direct light from a single unit without the contribution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



Report of Test
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Additional Pictures of Test Subject





Report of Test

LLIA001418-003A

Test Distance 9.5 m
Ambient Temperature 24.7 °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.

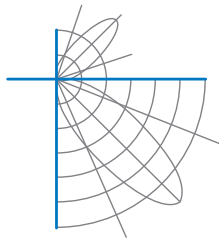
Prorating the performance of the sample for the use of other component combinations (such as lamp / LED / Ballast / driver), or for use in different environmental conditions than that tested, may produce erroneous results.

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.



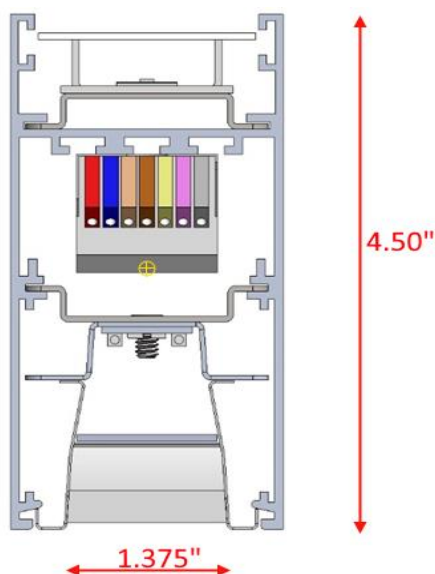
Report of Test

LLIA001418-003B

Integrating Sphere Report

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

Pendant mounted, extruded aluminum housing, white enamel aluminum reflectors, frosted plastic enclosure above LEDs, 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

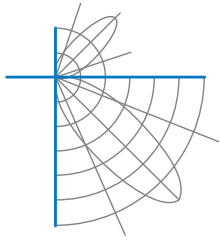
Voltage	120.0 Vac
Current	0.5051 A
Power	59.81 W
Frequency	59.99 Hz
Power Factor	0.987
Current THD	8.1 %
Total Luminous Flux	6395.8 lm
Efficacy	106.9 lm/W
Chromaticity (x,y)	(0.3820, 0.3811)
(u',v')	(0.2244, 0.5037)
Duv	0.0016
CCT	3991 K
CRI (Ra)	83
R9	5
TM-30: Rf	81
TM-30: Rg	93
TM-30: Rcs,h1	-12

Prepared For:

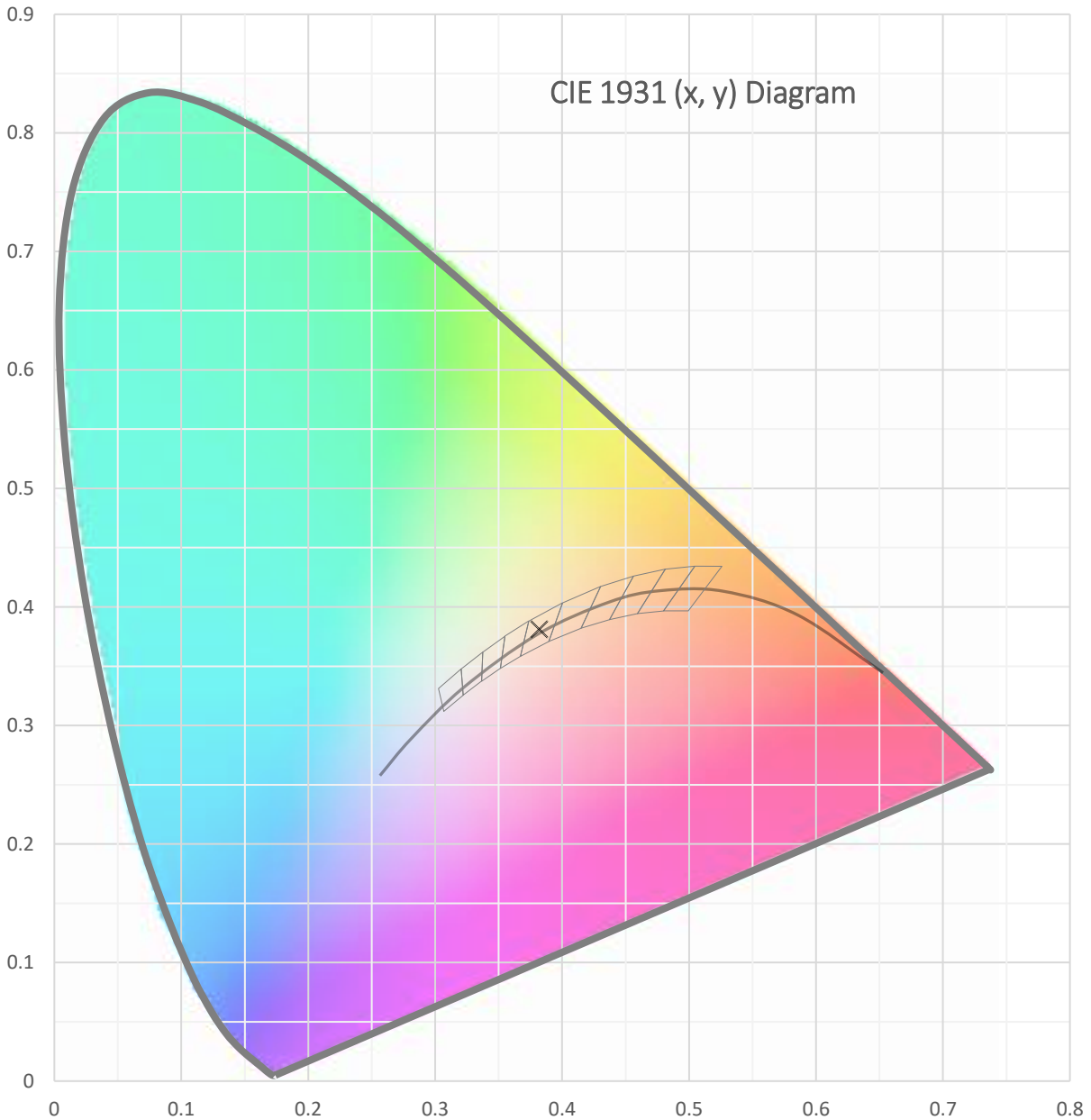
Precision Architectural Lighting
4830 Timber Creek Drive
Houston, TX 77017, USA

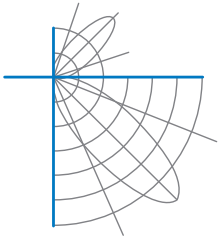
Test date: 03/05/2021

Report date: 03/08/2021

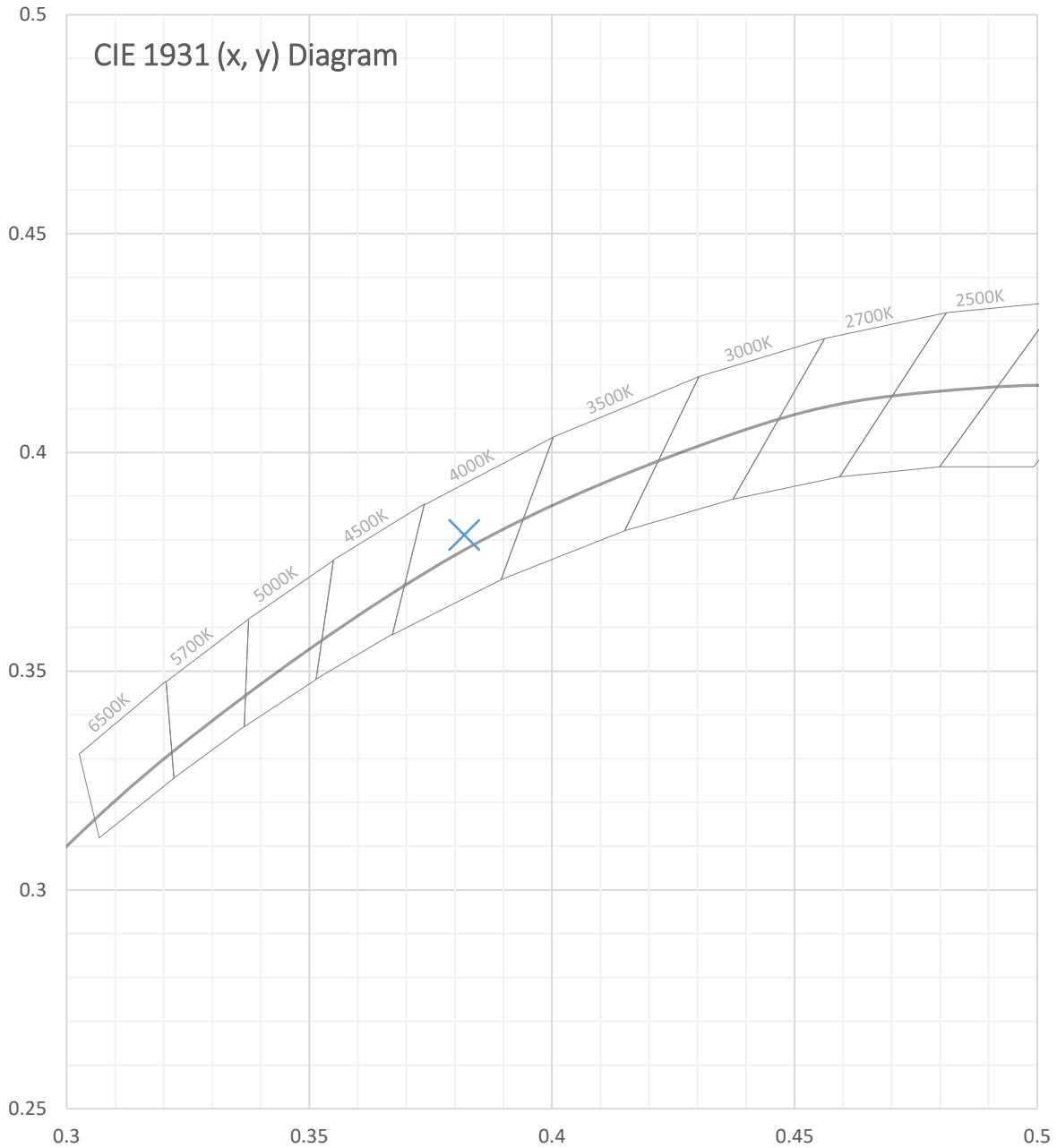


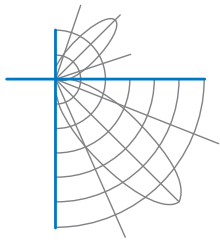
Test Report Number: LLIA001418-003B





Test Report Number: LLIA001418-003B



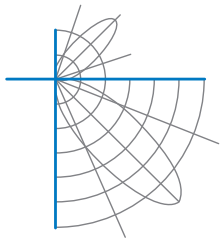


Test Report Number: LLIA001418-003B

Total Radiant Flux	19.35 W
Total Luminous Flux	6395.8 Lm
Chromaticity CIE 1931 (x, y)	(0.3820, 0.3811)
Chromaticity CIE 1976 (u', v')	(0.2244, 0.5037)
Correlated Color Temperature (CCT)	3991 K
Color Rendering Index (Ra)	83
R1	81
R2	90
R3	96
R4	80
R5	80
R6	86
R7	85
R8	63
R9	5
R10	76
R11	78
R12	60
R13	83
R14	98
TM-30: Rf	81
TM-30: Rg	93
TM-30: Rcs,h1	-12
Distance from Planckian Locus (Duv)	0.0016
Scotopic/Photopic Ratio ‡	1.697

Electrical Data

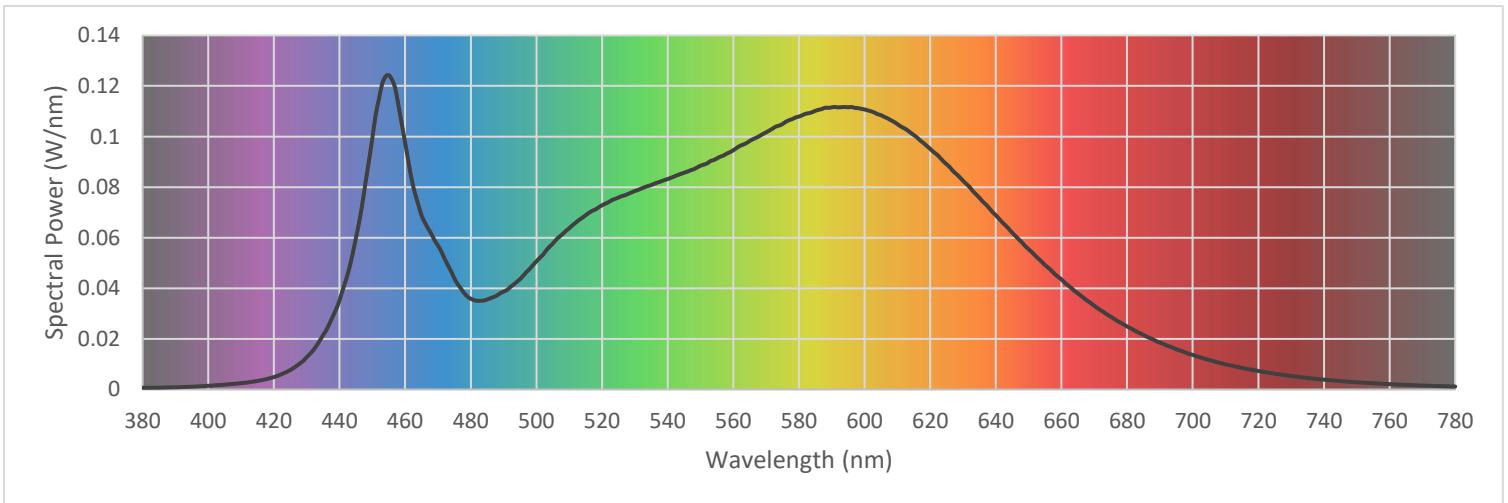
Voltage	120.0 Vac
Current	0.5051 A
Power	59.81 W
Frequency	59.99 Hz
Power Factor	0.987
Current THD	8.1 %

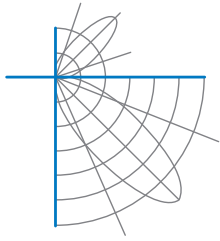


Test Report Number: LLIA001418-003B

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

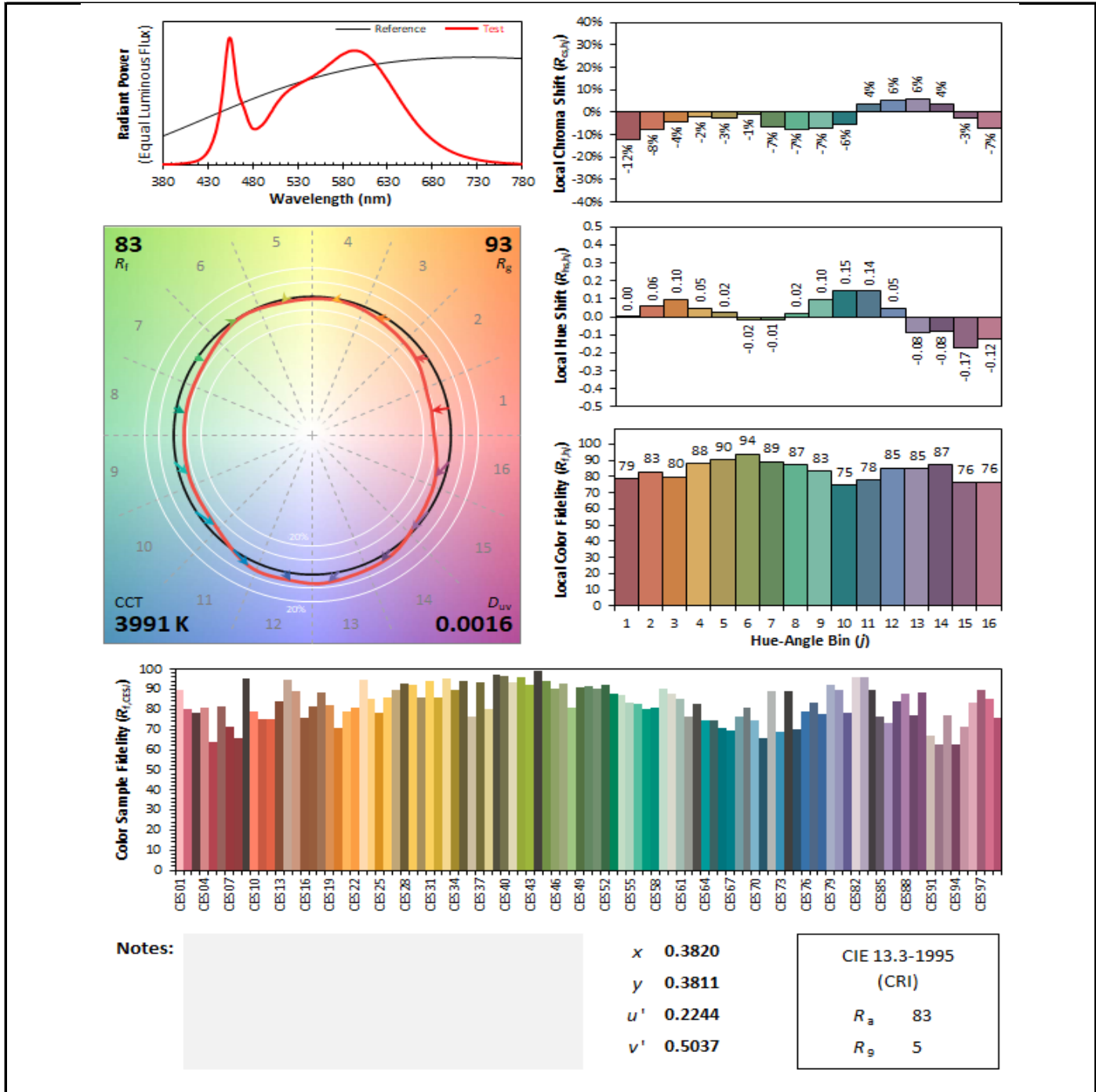
380	0.000674	480	0.035860	580	0.107889	680	0.024907
385	0.000709	485	0.035579	585	0.110169	685	0.021560
390	0.000870	490	0.038710	590	0.111545	690	0.018524
395	0.001094	495	0.043617	595	0.111553	695	0.015879
400	0.001446	500	0.050650	600	0.110708	700	0.013675
405	0.001891	505	0.057690	605	0.108445	705	0.011658
410	0.002508	510	0.063735	610	0.104913	710	0.009921
415	0.003367	515	0.068870	615	0.100600	715	0.008540
420	0.004895	520	0.072817	620	0.095130	720	0.007318
425	0.007719	525	0.075879	625	0.089020	725	0.006247
430	0.012818	530	0.078460	630	0.082514	730	0.005341
435	0.021482	535	0.080818	635	0.075756	735	0.004555
440	0.035315	540	0.083198	640	0.068879	740	0.003880
445	0.060001	545	0.085690	645	0.061962	745	0.003317
450	0.099417	550	0.088476	650	0.055459	750	0.002841
455	0.124242	555	0.091363	655	0.049162	755	0.002439
460	0.097418	560	0.094585	660	0.043522	760	0.002112
465	0.068762	565	0.098245	665	0.037971	765	0.001814
470	0.056887	570	0.101677	670	0.033071	770	0.001551
475	0.043889	575	0.104932	675	0.028784	775	0.001338
						780	0.001154

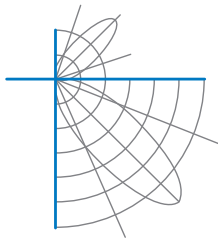




Test Report Number: LLIA001418-003B

IES TM-30 Details





Test Report Number: LLIA001418-003B

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

Test Temperature: 25.8 °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.