

Report of Test

LLIA001159-009A

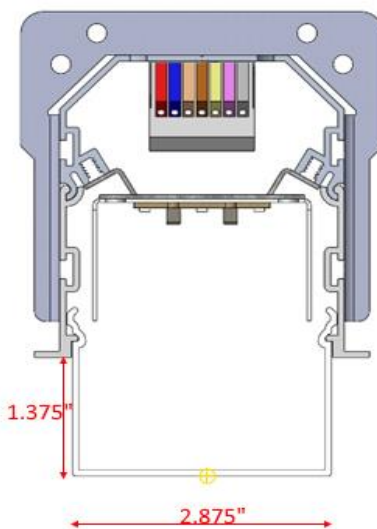
Indoor Distribution Photometry Test Report

Catalog Number: MLR3-HO-K35-80-4-XX-AL2-UNV

Recessed ceiling mounted, extruded aluminum housing with steel endcaps, formed white enamel aluminum reflector, translucent white plastic enclosure.

144 white LEDs, One Osram PrevaLED Bar LED board.

One Osram Optotronic OTi 30/120-277/1A0 DIM-L G2 LED driver labeled as 620mA



Prepared For:

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

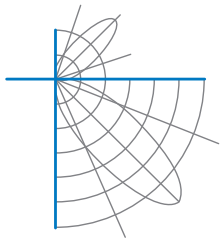
Performance Summary			
Input Voltage	120.0 V	Luminous Flux	4125.6 Lumens
Input Current	0.2941 A	Total Efficacy	118.0 Lm/W
Input Power	34.95 W	Downward Flux	3453.2 Lumens
Frequency	60.00 Hz	Downward Flux	83.7 % of Total
Power Factor	0.990		
Current THD	6.5 %		

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

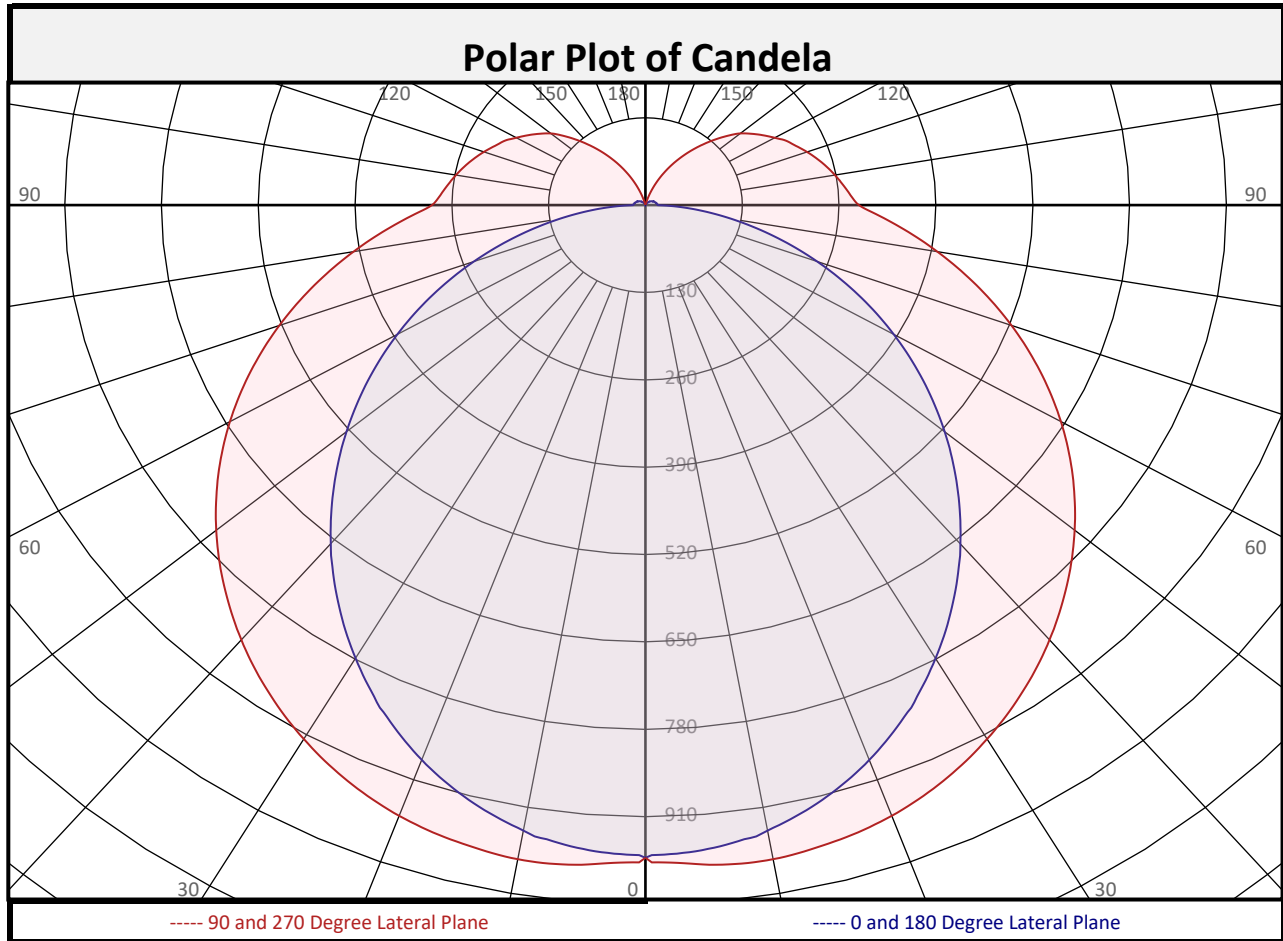
Test date: 08/30/2019

Report date: 09/04/2019

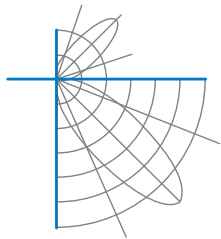
Signed: _____



Report of Test
LLIA001159-009A



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	92.7	2.2%	90-100	185.4	4.5%	0-20	361.6	8.8%
10-20	268.9	6.5%	100-110	162.3	3.9%	0-30	775.1	18.8%
20-30	413.5	10.0%	110-120	131.7	3.2%	0-40	1285	31.1%
30-40	509.6	12.4%	120-130	96.6	2.3%	0-60	2370	57.4%
40-50	550.3	13.3%	130-140	59.2	1.4%	0-80	3204	77.7%
50-60	534.9	13.0%	140-150	28.2	0.7%	10-90	3360	81.4%
60-70	468.7	11.4%	150-160	8.6	0.2%	20-50	1473	35.7%
70-80	365.3	8.9%	160-170	0.5	0.0%	40-90	2168	52.6%
80-90	249.3	6.0%	170-180	0.0	0.0%	60-90	1083	26.3%
0-90	3453	83.7%	90-180	672.4	16.3%	0-180	4126	100.0%

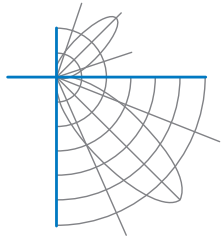


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Luminous Intensity (Candela) Table

		Lateral (C-Plane) Angles								
		0	22.5	45	67.5	90	112.5	135	157.5	180
Vertical (Gamma) Angles	0	971	971	971	971	971	971	971	971	971
	2.5	966	967	970	975	980	975	970	967	966
	5	962	964	971	980	985	980	971	964	962
	7.5	955	960	972	982	988	982	972	960	955
	10	945	955	969	982	988	982	969	955	945
	12.5	932	944	965	978	985	978	965	944	932
	15	916	933	955	972	980	972	955	933	916
	17.5	898	919	944	965	975	965	944	919	898
	20	878	903	931	956	967	956	931	903	878
	22.5	856	884	917	947	957	947	917	884	856
	25	833	863	901	934	946	934	901	863	833
	27.5	806	842	884	919	933	919	884	842	806
	30	779	816	864	903	917	903	864	816	779
	32.5	750	791	844	885	901	885	844	791	750
	35	720	764	822	867	883	867	822	764	720
	37.5	689	738	799	847	865	847	799	738	689
	40	658	709	775	826	844	826	775	709	658
	42.5	625	681	749	803	823	803	749	681	625
	45	592	651	723	780	800	780	723	651	592
	47.5	558	621	697	756	777	756	697	621	558
50	524	590	669	730	752	730	669	590	524	
52.5	490	558	640	704	727	704	640	558	490	
55	455	527	611	677	700	677	611	527	455	
57.5	420	494	581	649	673	649	581	494	420	
60	385	462	551	620	644	620	551	462	385	
62.5	350	428	519	590	615	590	519	428	350	
65	315	395	488	560	585	560	488	395	315	
67.5	280	362	457	529	554	529	457	362	280	
70	245	329	425	498	523	498	425	329	245	
72.5	211	297	394	467	492	467	394	297	211	
75	178	265	362	435	460	435	362	265	178	
77.5	147	234	332	404	429	404	332	234	147	
80	117	205	302	373	398	373	302	205	117	
82.5	88	177	273	344	367	344	273	177	88	
85	62	150	245	315	338	315	245	150	62	
87.5	38	125	219	287	310	287	219	125	38	
90	17	103	197	265	287	265	197	103	17	

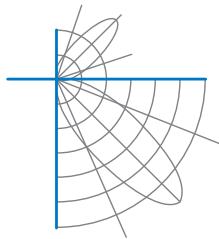


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Luminous Intensity (Candela) Table

		Lateral (C-Plane) Angles								
		0	22.5	45	67.5	90	112.5	135	157.5	180
Vertical (Gamma) Angles	90	17	103	197	265	287	265	197	103	17
	92.5	16	100	191	256	277	256	191	100	16
	95	16	98	187	250	271	250	187	98	16
	97.5	15	96	183	245	264	245	183	96	15
	100	15	93	179	239	258	239	179	93	15
	102.5	15	90	175	233	252	233	175	90	15
	105	14	88	170	227	245	227	170	88	14
	107.5	14	85	165	220	238	220	165	85	14
	110	13	80	160	213	231	213	160	80	13
	112.5	13	74	154	206	224	206	154	74	13
	115	12	68	149	199	216	199	149	68	12
	117.5	12	63	143	191	210	191	143	63	12
	120	11	57	137	185	200	185	137	57	11
	122.5	11	51	130	176	192	176	130	51	11
	125	10	46	120	167	183	167	120	46	10
	127.5	9	41	110	159	175	159	110	41	9
	130	9	35	100	148	166	148	100	35	9
	132.5	8	29	91	136	154	136	91	29	8
	135	7	24	81	124	141	124	81	24	7
	137.5	6	18	72	113	128	113	72	18	6
	140	6	13	63	101	116	101	63	13	6
	142.5	5	9	54	89	103	89	54	9	5
	145	4	4	45	78	91	78	45	4	4
	147.5	3	3	37	67	79	67	37	3	3
150	3	3	28	56	66	56	28	3	3	
152.5	2	2	20	45	54	45	20	2	2	
155	2	1	13	34	43	34	13	1	2	
157.5	1	0	6	24	31	24	6	0	1	
160	0	0	0	15	21	15	0	0	0	
162.5	0	0	0	6	11	6	0	0	0	
165	0	0	0	0	2	0	0	0	0	
167.5	0	0	0	0	0	0	0	0	0	
170	0	0	0	0	0	0	0	0	0	
172.5	0	0	0	0	0	0	0	0	0	
175	0	0	0	0	0	0	0	0	0	
177.5	0	0	0	0	0	0	0	0	0	
180	0	0	0	0	0	0	0	0	0	



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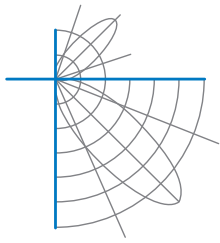
Coefficients of Utilization/Room Utilization - Zonal Cavity Method																						
Effective Floor Cavity Reflectance 0.20																						
RC	80					70					50				30				10			0
RW	70	50	30	10		70	50	30	10		50	30	10		50	30	10		50	30	10	0
RCR																						
0	115	115	115	115		111	111	111	111		102	102	102		94	94	94		87	87	87	84
1	103	97	92	87		98	93	89	84		86	82	79		79	76	73		73	71	68	65
2	92	83	76	69		88	80	73	67		74	68	63		68	63	59		63	59	56	52
3	84	72	64	57		80	70	62	55		64	57	52		59	54	49		55	50	46	43
4	76	64	54	47		73	61	53	46		57	49	44		52	46	41		48	43	39	36
5	70	57	47	40		67	54	46	39		50	43	37		47	40	35		43	38	34	31
6	64	51	41	35		61	49	40	34		45	38	32		42	36	31		39	34	29	27
7	60	46	37	30		57	44	36	30		41	34	28		38	32	27		36	30	26	24
8	55	42	33	27		53	40	32	26		38	30	25		35	29	24		33	27	23	21
9	52	38	30	24		49	37	29	24		34	28	23		32	26	22		30	25	21	19
10	48	35	27	22		46	34	26	21		32	25	20		30	24	20		28	23	19	17

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	27.0	7.18	8.40	
8.0	15.2	9.58	11.20	
10.0	9.7	11.97	14.00	
12.0	6.7	14.36	16.80	
14.0	5.0	16.76	19.61	
16.0	3.8	19.15	22.41	

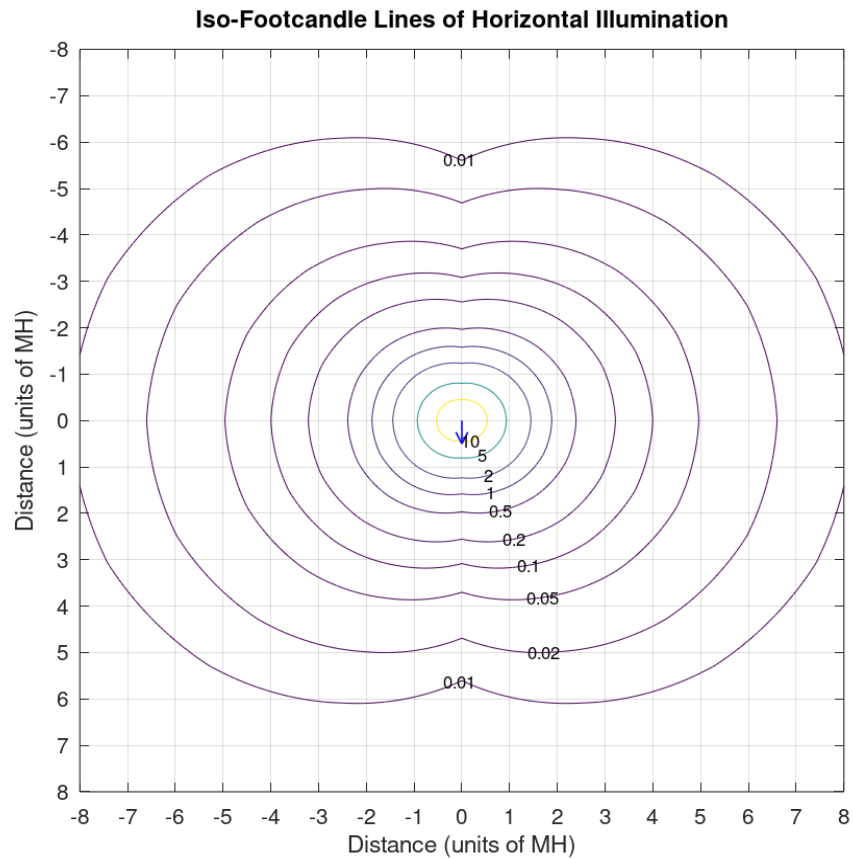
Average Luminance (cd/m ²)			
	0 deg Plane	45 deg Plane	90 deg Plane
0	17128	17128	17128
45	14640	15730	16633
55	13834	15521	16747
65	12907	15489	17074
75	11805	15939	17948
85	11540	18520	20808

Spacing Criterion	
0 degree plane:	1.2
90 degree plane:	1.4
180 degree plane:	1.2
270 degree plane:	1.4

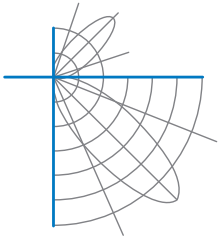


Report of Test LLIA001159-009A

Iso-Illuminance Plot



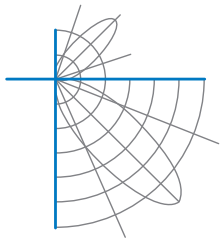
The isofootcandle values shown in the plot above are based on a mounting height of $h = 8.0$ feet. Grid values show multiples of mounting height. The isoilluminance contour lines are expressed in units of footcandles. The values expressed are based on the direct light from a single unit without the contribution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



Report of Test
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Additional Pictures of Test Subject





Report of Test

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Test Distance 9.5 m
Ambient Temperature 24.9 °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 and ANSI C82.77-10:2014. 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.

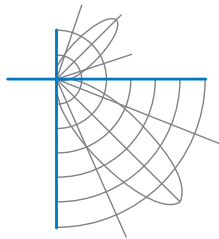
Prorating the performance of the sample for the use of other component combinations (such as lamp / LED / Ballast / driver), or for use in different environmental conditions than that tested, may produce erroneous results.

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

LLIA001159-009B

Integrating Sphere Report

Catalog Number: MLR3-HO-K35-80-4-XX-AL2-UNV

Recessed ceiling mounted, extruded aluminum housing with steel endcaps,
formed white enamel aluminum reflector, translucent white plastic enclosure.

144 white LEDs, One Osram PrevaLED Bar LED board.

One Osram Optotronic OTi 30/120-277/1A0 DIM-L G2 LED driver labeled as 620mA



Performance Summary

Voltage	120.0 Vac
Current	0.2949 A
Power	35.01 W
Frequency	60.00 Hz
Power Factor	0.990
Current THD	6.5 %
Total Luminous Flux	4146.1 lm
Efficacy	118.4 lm/W
Chromaticity (x,y)	(0.4061, 0.3932)
(u',v')	(0.2352, 0.5124)
Duv	0.0009
CCT	3502 K
CRI (Ra)	82
R9	6
TM-30: Rf	81
TM-30: Rg	97

Prepared For:

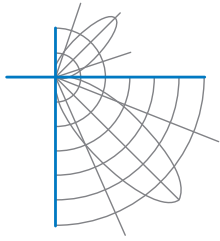
Precision Architectural Lighting

4830 Timber Creek Drive

Houston, TX 77017, USA

Test date: 08/30/2019

Report date: 09/04/2019



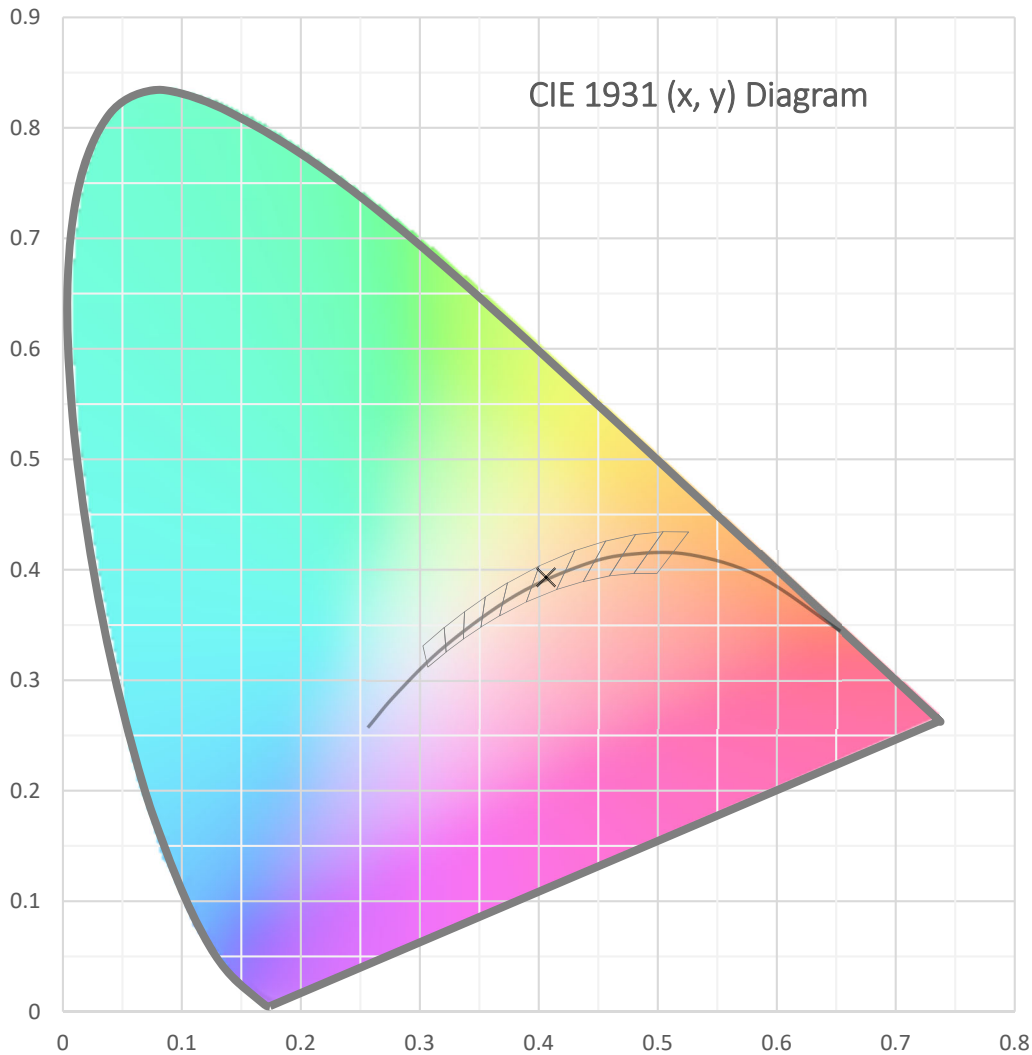
Test Report Number: LLIA001159-009B

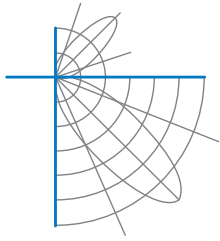
Catalog Number: MLR3-HO-K35-80-4-XX-AL2-UNV

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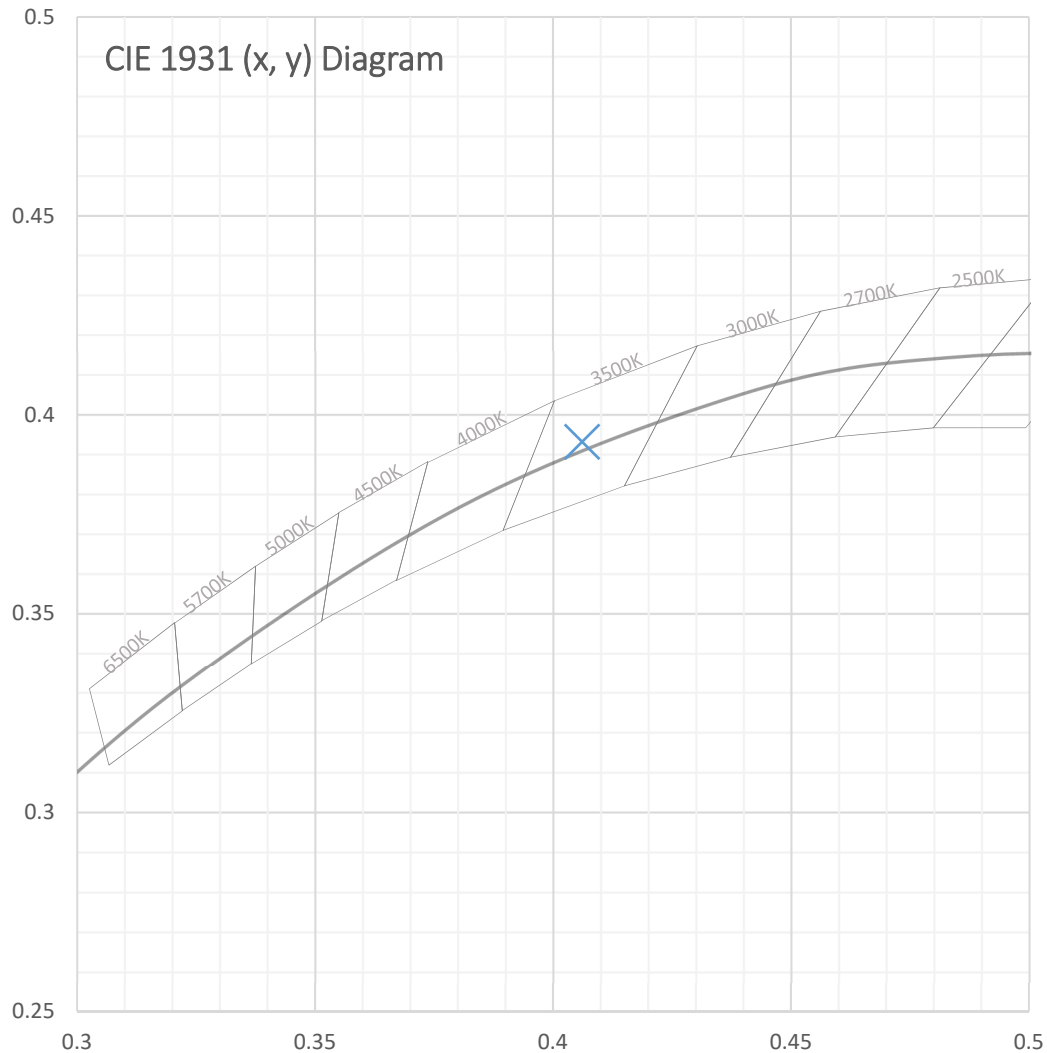
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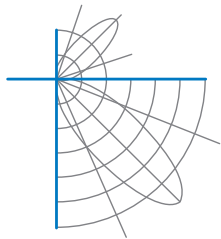
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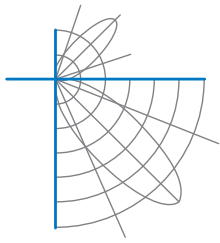
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One Osram Optotronic OTi 30/120-277/1A0 DIM-L G2 LED driver labeled as 620mA

Spectral Data	Total Radiant Flux	12.40 W
	Total Luminous Flux	4146.1 Lm
	Chromaticity CIE 1931 (x, y)	(0.4061, 0.3932)
	Chromaticity CIE 1976 (u', v')	(0.2352, 0.5124)
	Correlated Color Temperature (CCT)	3502 K
	Color Rendering Index (Ra)	82
	R1	81
	R2	88
	R3	94
	R4	83
	R5	81
	R6	84
	R7	86
	R8	63
	R9	6
	R10	71
	R11	83
	R12	60
	R13	83
	R14	96
	TM-30: Rf	81
	TM-30: Rg	97
	Distance from Planckian Locus (Duv)	0.0009
	Scotopic/Photopic Ratio *	1.489

Electrical Data

Voltage	120.0 Vac
Current	0.2949 A
Power	35.01 W
Frequency	60.00 Hz
Power Factor	0.990
Current THD	6.5 %



Test Report Number: LLIA001159-009B

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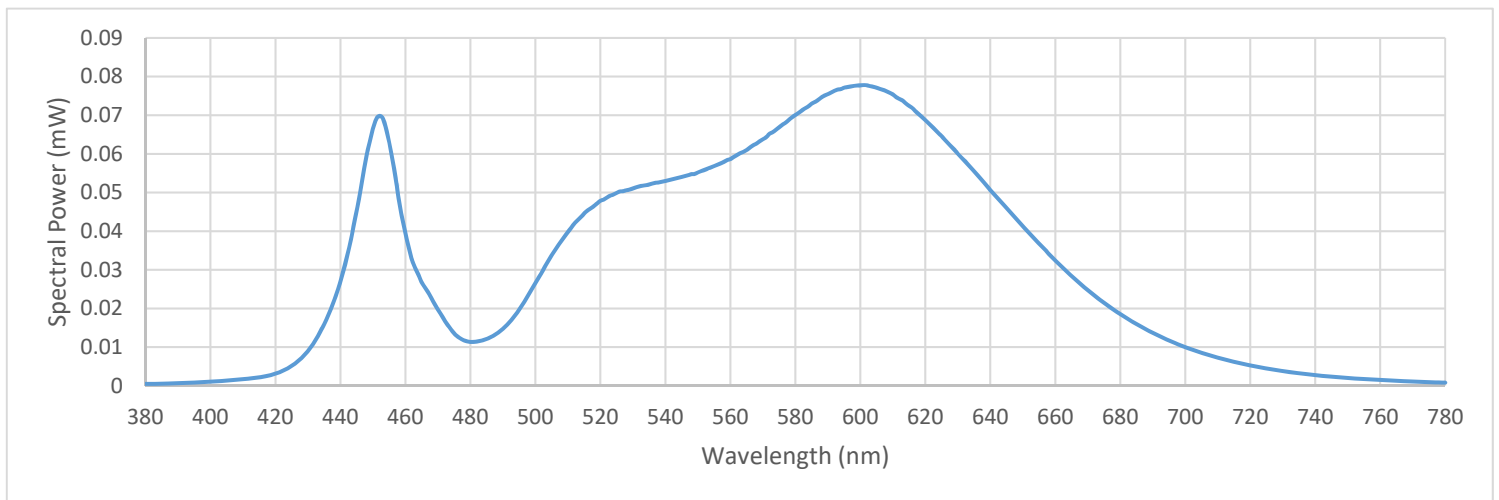
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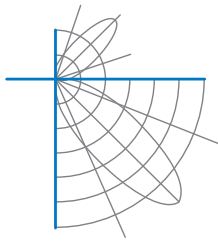
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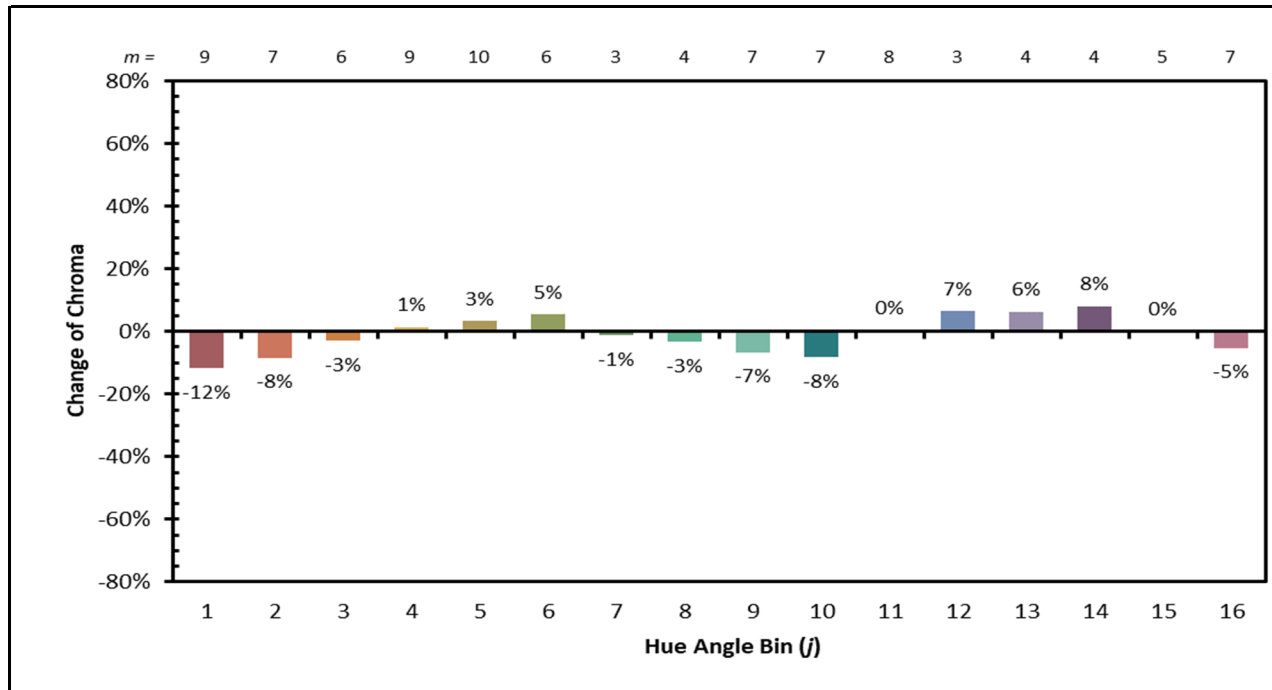
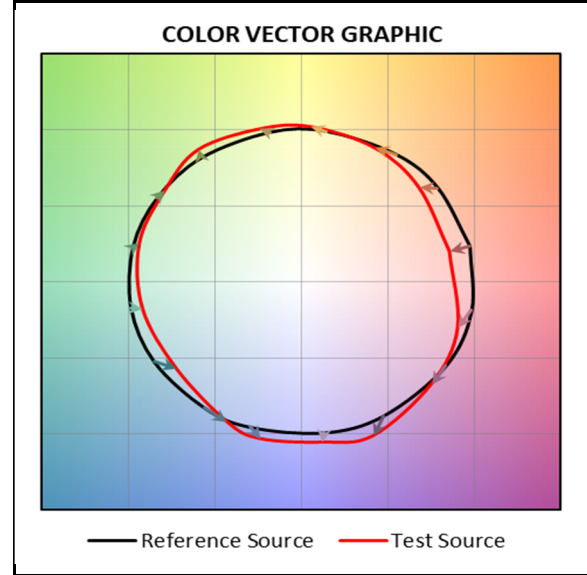
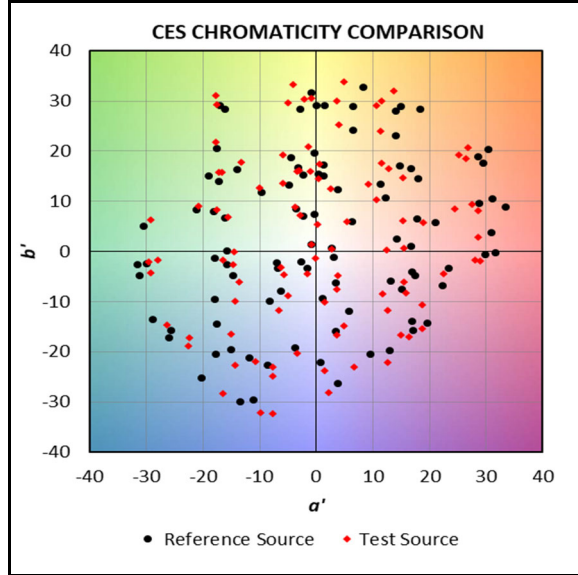
Summary Spectral Power Distribution (wavelength - nm, spectral power - mW)

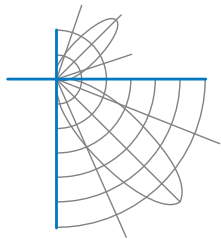
380	0.000476	480	0.011355	580	0.070014	680	0.018509
385	0.000517	485	0.012131	585	0.072977	685	0.015968
390	0.000656	490	0.014755	590	0.075483	690	0.013684
395	0.000831	495	0.019668	595	0.077117	695	0.011711
400	0.001082	500	0.026534	600	0.077703	700	0.010007
405	0.001354	505	0.033679	605	0.077111	705	0.008531
410	0.001681	510	0.039818	610	0.075393	710	0.007254
415	0.002148	515	0.044548	615	0.072435	715	0.006195
420	0.003140	520	0.047858	620	0.068703	720	0.005280
425	0.005106	525	0.049894	625	0.064598	725	0.004474
430	0.009014	530	0.051055	630	0.060005	730	0.003818
435	0.015940	535	0.052036	635	0.055593	735	0.003246
440	0.026939	540	0.053029	640	0.050619	740	0.002757
445	0.045305	545	0.054014	645	0.045982	745	0.002356
450	0.066449	550	0.055224	650	0.041329	750	0.002010
455	0.062839	555	0.056864	655	0.036759	755	0.001724
460	0.039580	560	0.058647	660	0.032488	760	0.001486
465	0.026753	565	0.060993	665	0.028416	765	0.001272
470	0.019716	570	0.063772	670	0.024697	770	0.001090
475	0.013522	575	0.066884	675	0.021469	775	0.000934
						780	0.000807





IES TM-30 Details





Test Report Number: LLIA001159-009B

Catalog Number: MLR3-HO-K35-80-4-XX-AL2-UNV

Recessed ceiling mounted, extruded aluminum housing with steel endcaps,
formed white enamel aluminum reflector, translucent white plastic enclosure.

144 white LEDs, One Osram PrevaLED Bar LED board.

One Osram Optotronic OTi 30/120-277/1A0 DIM-L G2 LED driver labeled as 620mA

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: 25.2 °C

Test Procedure: Tested in accordance with the applicable sections of:
LM-79-08, LM-78-07, LM-58-13, ANSI_ANSLG C78.377-2017,
ANSI C82-77-10:2014, TM-30-15

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.