



Report of Test

LLIA001159-001A

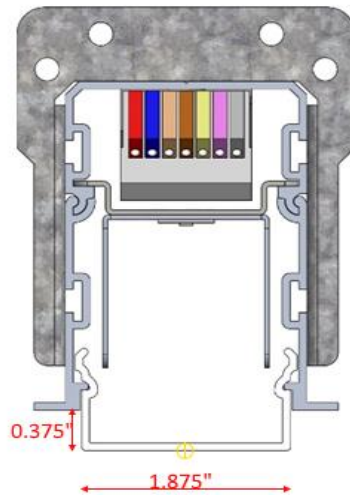
Indoor Distribution Photometry Test Report

Catalog Number: MLR2-HO-K35-80-4-XX-AL1-UNV

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

92 white LEDs, One PAL-Lighting FlexRad board.

One Osram Optotronic OTi 30/120-277/1A0 DIM-1 L G2 LED driver labeled as 720mA



Prepared For:

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

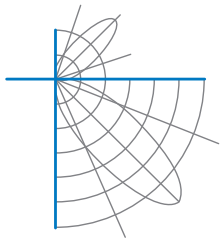
Performance Summary			
Input Voltage	120.0 V	Luminous Flux	2718.3 Lumens
Input Current	0.2317 A	Total Efficacy	99.0 Lm/W
Input Power	27.46 W	Downward Flux	2531.0 Lumens
Frequency	60.00 Hz	Downward Flux	93.1 % of Total
Power Factor	0.988		
Current THD	7.5 %		

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

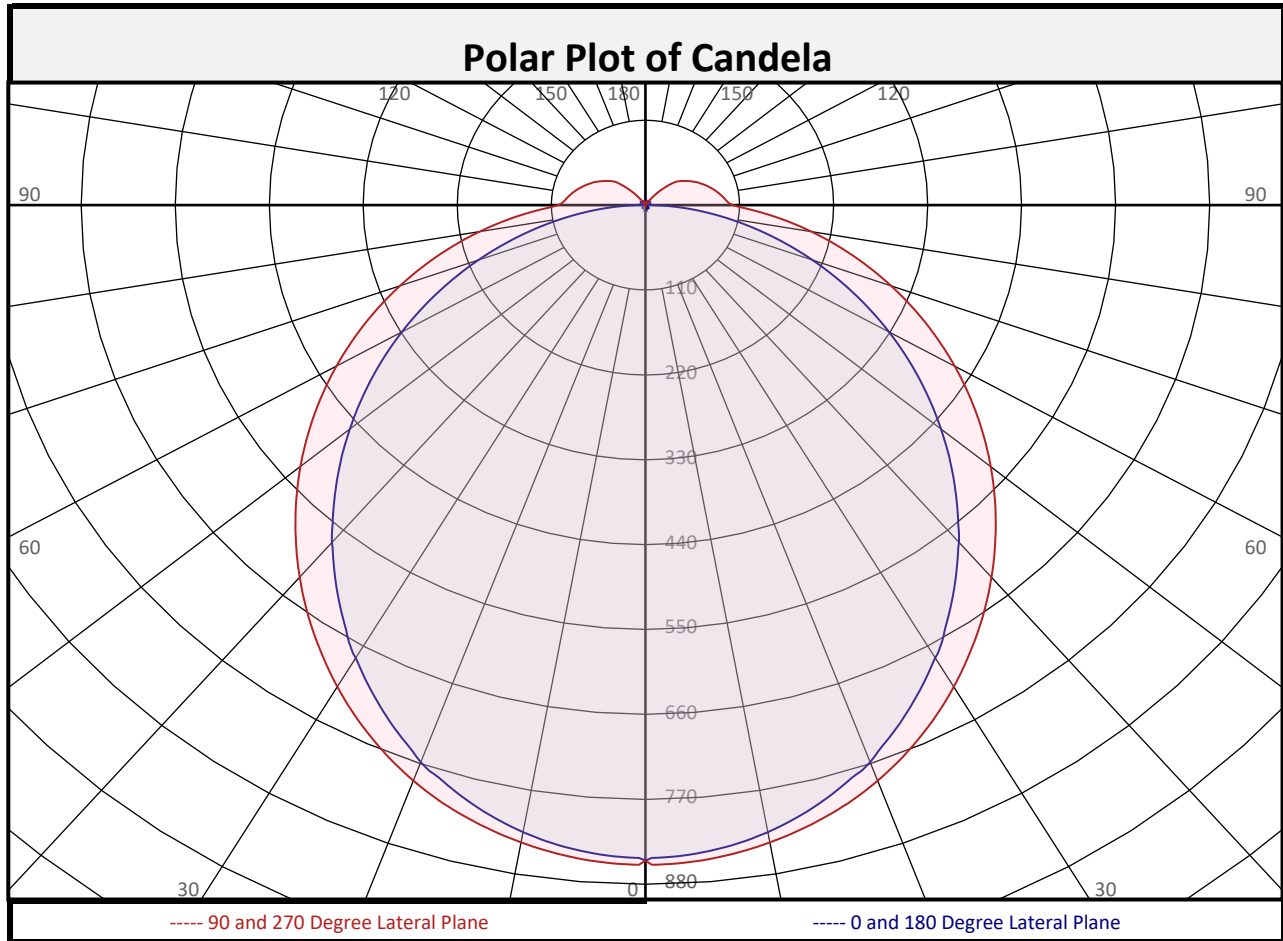
Test date: 09/05/2019

Report date: 09/06/2019

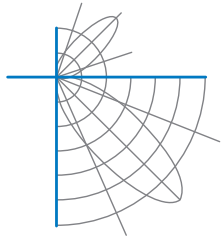
Signed: _____



Report of Test
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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	
0-10	80.2	3.0%		90-100	62.4	2.3%		0-20	308.4	11.3%	
10-20	228.1	8.4%		100-110	51.8	1.9%		0-30	650.7	23.9%	
20-30	342.3	12.6%		110-120	38.0	1.4%		0-40	1059	39.0%	
30-40	408.6	15.0%		120-130	24.3	0.9%		0-60	1874	68.9%	
40-50	423.9	15.6%		130-140	9.8	0.4%		0-80	2415	88.8%	
50-60	391.3	14.4%		140-150	1.0	0.0%		10-90	2451	90.2%	
60-70	319.1	11.7%		150-160	0.0	0.0%		20-50	1175	43.2%	
70-80	221.2	8.1%		160-170	0.0	0.0%		40-90	1472	54.2%	
80-90	116.3	4.3%		170-180	0.0	0.0%		60-90	656.5	24.2%	
0-90	2531	93.1%		90-180	187.2	6.9%		0-180	2718	100.0%	

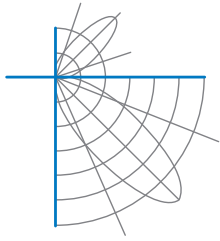


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Luminous Intensity (Candela) Table

		Lateral (C-Plane) Angles								
		0	22.5	45	67.5	90	112.5	135	157.5	180
Vertical (Gamma) Angles	0	850	850	850	850	850	850	850	850	850
	2.5	845	845	847	851	854	851	847	845	845
	5	841	841	844	848	851	848	844	841	841
	7.5	834	835	838	843	846	843	838	835	834
	10	825	826	830	835	839	835	830	826	825
	12.5	814	815	820	826	830	826	820	815	814
	15	800	802	808	816	820	816	808	802	800
	17.5	784	787	794	803	808	803	794	787	784
	20	768	770	779	789	794	789	779	770	768
	22.5	746	751	762	773	778	773	762	751	746
	25	725	730	743	756	760	756	743	730	725
	27.5	702	708	725	736	741	736	725	708	702
	30	678	684	701	716	721	716	701	684	678
	32.5	652	661	679	694	699	694	679	661	652
	35	625	635	655	671	677	671	655	635	625
	37.5	598	609	630	647	654	647	630	609	598
	40	570	582	604	623	629	623	604	582	570
	42.5	540	555	578	598	605	598	578	555	540
	45	511	527	552	572	579	572	552	527	511
	47.5	482	499	525	546	553	546	525	499	482
50	451	470	497	520	527	520	497	470	451	
52.5	421	441	469	493	500	493	469	441	421	
55	390	412	441	465	473	465	441	412	390	
57.5	360	382	413	438	446	438	413	382	360	
60	329	353	384	410	418	410	384	353	329	
62.5	298	323	355	382	390	382	355	323	298	
65	267	293	327	353	362	353	327	293	267	
67.5	237	264	299	325	334	325	299	264	237	
70	207	235	270	297	306	297	270	235	207	
72.5	178	207	242	269	278	269	242	207	178	
75	150	179	215	242	251	242	215	179	150	
77.5	122	152	188	215	224	215	188	152	122	
80	96	126	162	188	197	188	162	126	96	
82.5	71	102	137	163	171	163	137	102	71	
85	47	78	112	137	146	137	112	78	47	
87.5	24	55	88	113	122	113	88	55	24	
90	4	35	69	94	103	94	69	35	4	

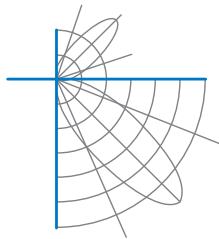


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Luminous Intensity (Candela) Table

		Lateral (C-Plane) Angles								
		0	22.5	45	67.5	90	112.5	135	157.5	180
Vertical (Gamma) Angles	90	4	35	69	94	103	94	69	35	4
	92.5	4	33	65	88	96	88	65	33	4
	95	4	31	63	86	93	86	63	31	4
	97.5	3	30	61	83	90	83	61	30	3
	100	3	28	58	80	88	80	58	28	3
	102.5	3	27	56	77	85	77	56	27	3
	105	3	25	54	75	82	75	54	25	3
	107.5	3	24	52	71	78	71	52	24	3
	110	3	20	49	68	75	68	49	20	3
	112.5	3	15	47	65	72	65	47	15	3
	115	3	11	44	62	69	62	44	11	3
	117.5	3	6	41	59	66	59	41	6	3
	120	3	3	39	56	62	56	39	3	3
	122.5	3	2	35	52	58	52	35	2	3
	125	2	2	28	49	55	49	28	2	2
	127.5	2	2	22	46	51	46	22	2	2
	130	2	2	16	40	48	40	16	2	2
	132.5	1	1	10	33	41	33	10	1	1
	135	1	1	4	26	33	26	4	1	1
	137.5	1	0	1	18	26	18	1	0	1
140	0	0	0	12	18	12	0	0	0	
142.5	0	0	0	5	11	5	0	0	0	
145	0	0	0	1	4	1	0	0	0	
147.5	0	0	0	0	1	0	0	0	0	
150	0	0	0	0	0	0	0	0	0	
152.5	0	0	0	0	0	0	0	0	0	
155	0	0	0	0	0	0	0	0	0	
157.5	0	0	0	0	0	0	0	0	0	
160	0	0	0	0	0	0	0	0	0	
162.5	0	0	0	0	0	0	0	0	0	
165	0	0	0	0	0	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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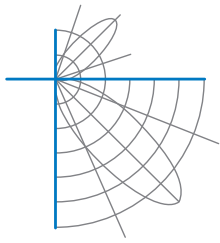
Coefficients of Utilization/Room Utilization - Zonal Cavity Method																						
Effective Floor Cavity Reflectance 0.20																						
RC	80					70					50				30				10			0
RW	70	50	30	10		70	50	30	10		50	30	10		50	30	10		50	30	10	0
RCR																						
0	117	117	117	117		114	114	114	114		107	107	107		101	101	101		96	96	96	93
1	106	101	96	92		102	98	93	89		92	89	85		87	84	81		82	80	78	75
2	96	87	80	74		93	85	78	72		80	74	70		75	71	67		71	68	64	62
3	87	76	68	61		84	74	66	60		70	63	58		66	61	56		63	58	54	52
4	80	67	58	51		77	65	57	51		62	55	49		59	53	48		56	51	46	44
5	73	60	51	44		71	58	50	43		56	48	42		53	46	41		50	45	40	38
6	68	54	45	38		65	53	44	38		50	43	37		48	41	36		46	40	35	33
7	63	49	40	34		60	48	39	33		46	38	33		43	37	32		42	36	31	29
8	58	45	36	30		56	44	35	30		42	34	29		40	33	29		38	32	28	26
9	54	41	33	27		53	40	32	27		38	31	26		37	30	26		35	29	25	23
10	51	38	30	24		49	37	29	24		35	29	24		34	28	23		33	27	23	21

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	23.6	7.16	7.57	
8.0	13.3	9.55	10.09	
10.0	8.5	11.93	12.61	
12.0	5.9	14.32	15.13	
14.0	4.3	16.71	17.65	
16.0	3.3	19.09	20.17	

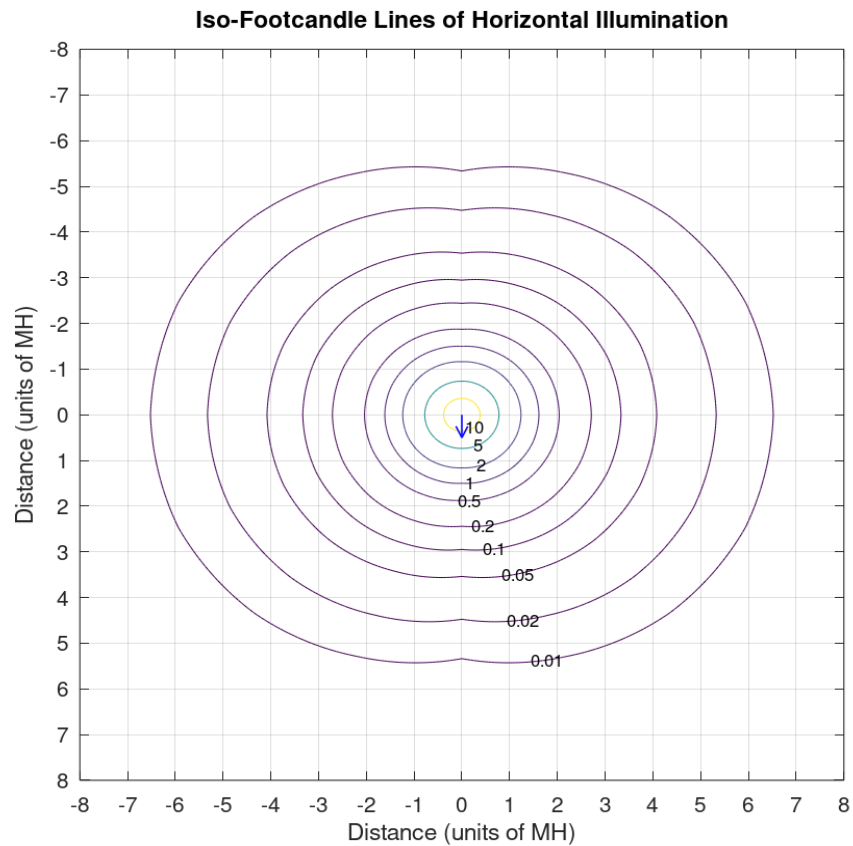
Average Luminance (cd/m ²)			
	0 deg Plane	45 deg Plane	90 deg Plane
0	14982	14982	14982
45	12645	11995	12040
55	11863	11208	11313
65	10972	10376	10568
75	9909	9458	9783
85	8685	8448	8988

Spacing Criterion	
0 degree plane:	1.2
90 degree plane:	1.3
180 degree plane:	1.2
270 degree plane:	1.3

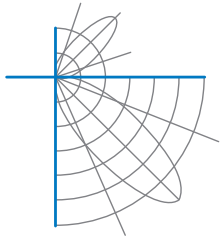


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Iso-Illuminance Plot

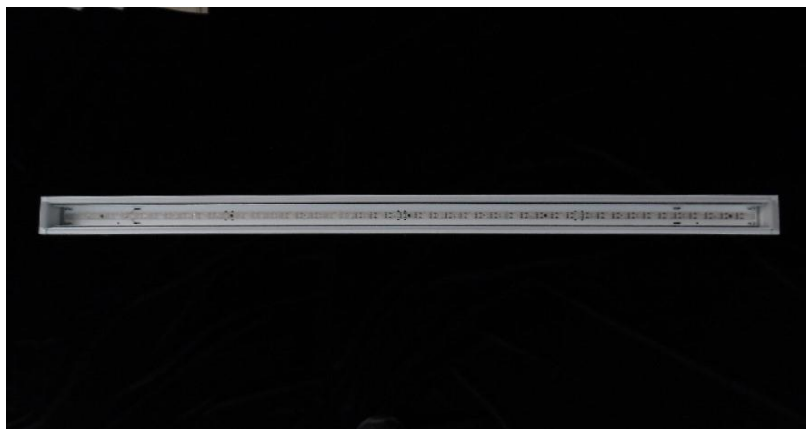


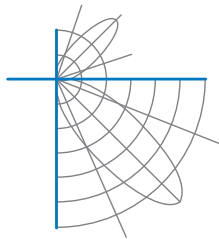
The isofootcandle values shown in the plot above are based on a mounting height of $h = 8.0$ feet. Grid values show multiples of mounting height. The isoilluminance contour lines are expressed in units of footcandles. The values expressed are based on the direct light from a single unit without the contribution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



Report of Test
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Additional Pictures of Test Subject





Report of Test

LLIA001159-001A

Test Distance 9.5 m
Ambient Temperature 25.6 °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.

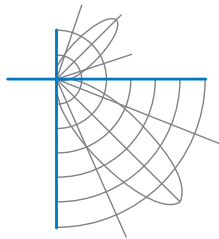
Prorating the performance of the sample for the use of other component combinations (such as lamp / LED / Ballast / driver), or for use in different environmental conditions than that tested, may produce erroneous results.

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

LLIA001159-001B

Integrating Sphere Report

Catalog Number: MLR2-HO-K35-80-4-XX-AL1-UNV

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

92 white LEDs, One PAL-Lighting FlexRad board.

One Osram Optotronic OTi 30/120-277/1A0 DIM-1 L G2 LED driver labeled as 720mA



Performance Summary

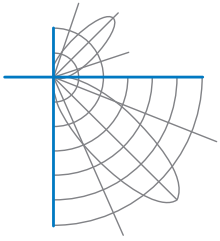
Voltage	120.0 Vac
Current	0.2319 A
Power	27.46 W
Frequency	60.00 Hz
Power Factor	0.986
Current THD	7.6 %
Total Luminous Flux	2732.3 lm
Efficacy	99.5 lm/W
Chromaticity (x,y)	(0.4097, 0.3911)
(u',v')	(0.2384, 0.5121)
Duv	-0.0008
CCT	3408 K
CRI (Ra)	83
R9	13
TM-30: Rf	83
TM-30: Rg	97

Prepared For:

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

Test date: 09/04/2019

Report date: 09/06/2019



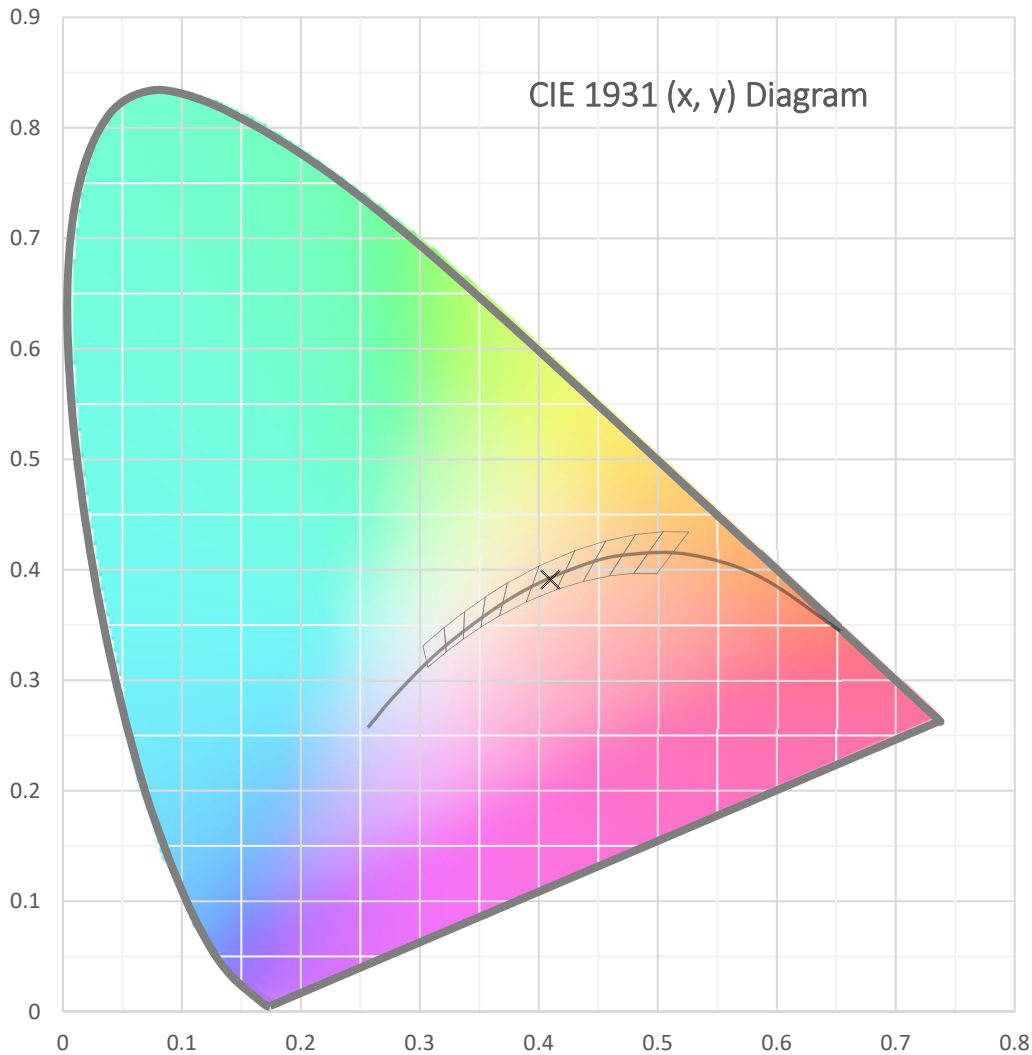
Test Report Number: LLIA001159-001B

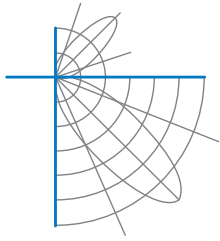
Catalog Number: MLR2-HO-K35-80-4-XX-AL1-UNV

Recessed ceiling mounted, extruded aluminum housing with steel endcaps,
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92 white LEDs, One PAL-Lighting FlexRad board.

One Osram Optotronic OTi 30/120-277/1A0 DIM-1 L G2 LED driver labeled as 720mA





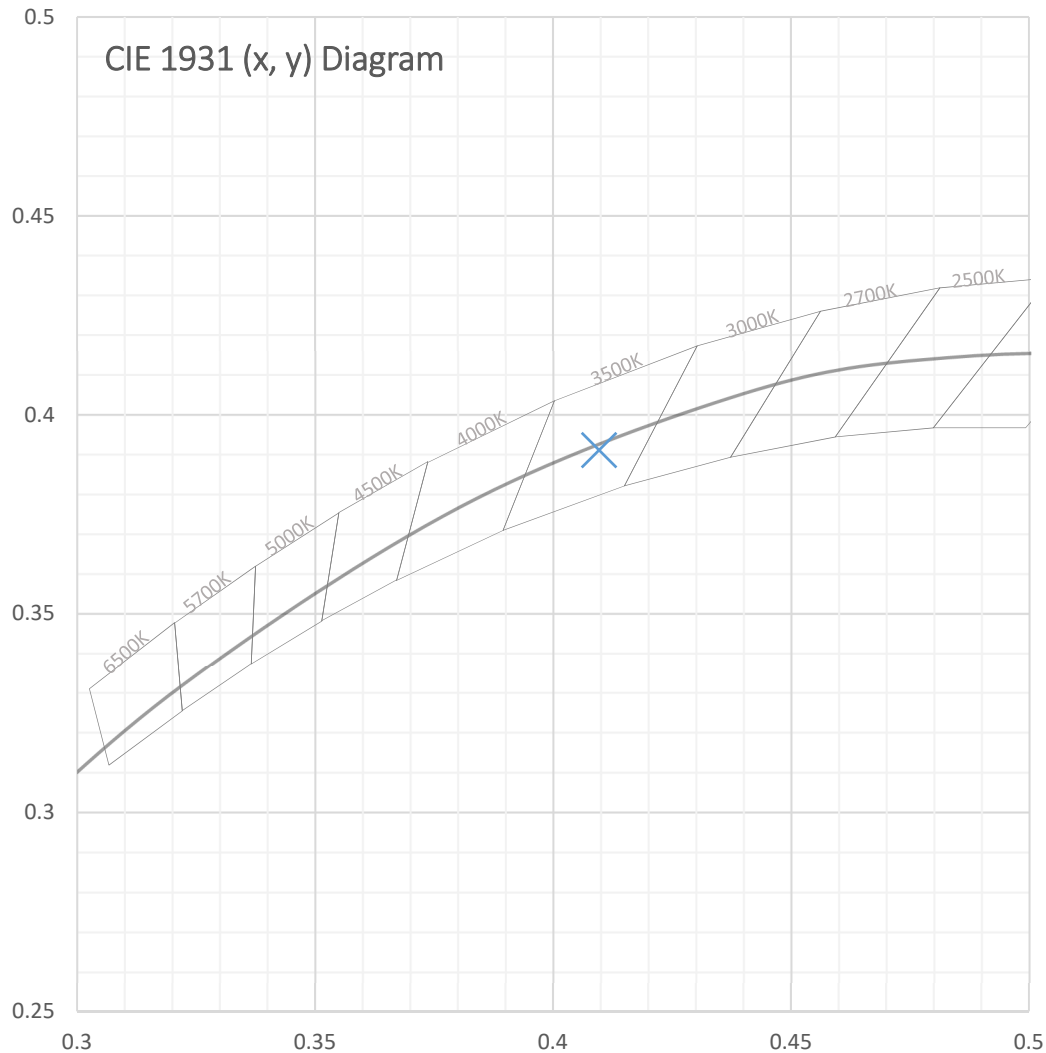
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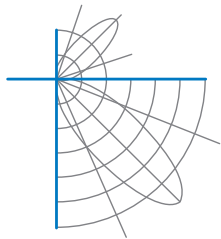
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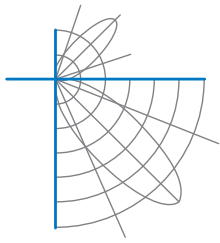
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One Osram Optotronic OTi 30/120-277/1A0 DIM-1 L G2 LED driver labeled as 720mA

Spectral Data	Total Radiant Flux	8.450 W
	Total Luminous Flux	2732.3 Lm
	Chromaticity CIE 1931 (x, y)	(0.4097, 0.3911)
	Chromaticity CIE 1976 (u', v')	(0.2384, 0.5121)
	Correlated Color Temperature (CCT)	3408 K
	Color Rendering Index (Ra)	83
	R1	82
	R2	90
	R3	96
	R4	82
	R5	82
	R6	86
	R7	85
	R8	64
	R9	13
	R10	76
	R11	80
	R12	66
	R13	84
	R14	98
	TM-30: Rf	83
	TM-30: Rg	97
	Distance from Planckian Locus (Duv)	-0.0008
	Scotopic/Photopic Ratio *	1.492

Electrical Data

Voltage	120.0 Vac
Current	0.2319 A
Power	27.46 W
Frequency	60.00 Hz
Power Factor	0.986
Current THD	7.6 %



Test Report Number: LLIA001159-001B

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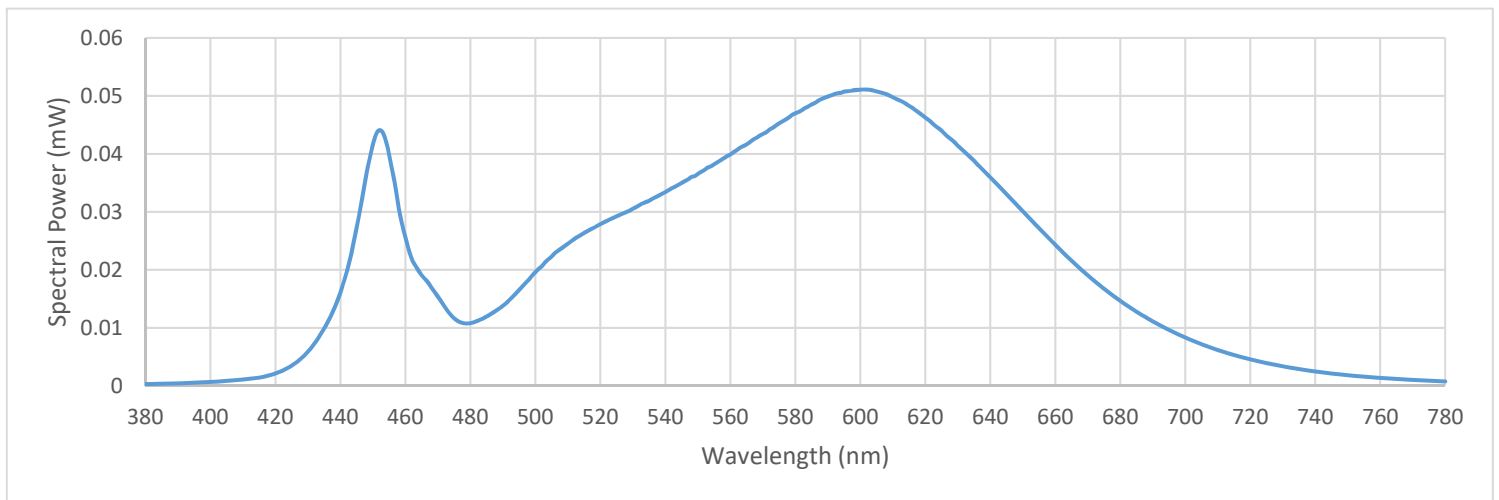
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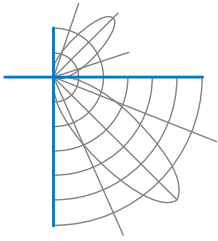
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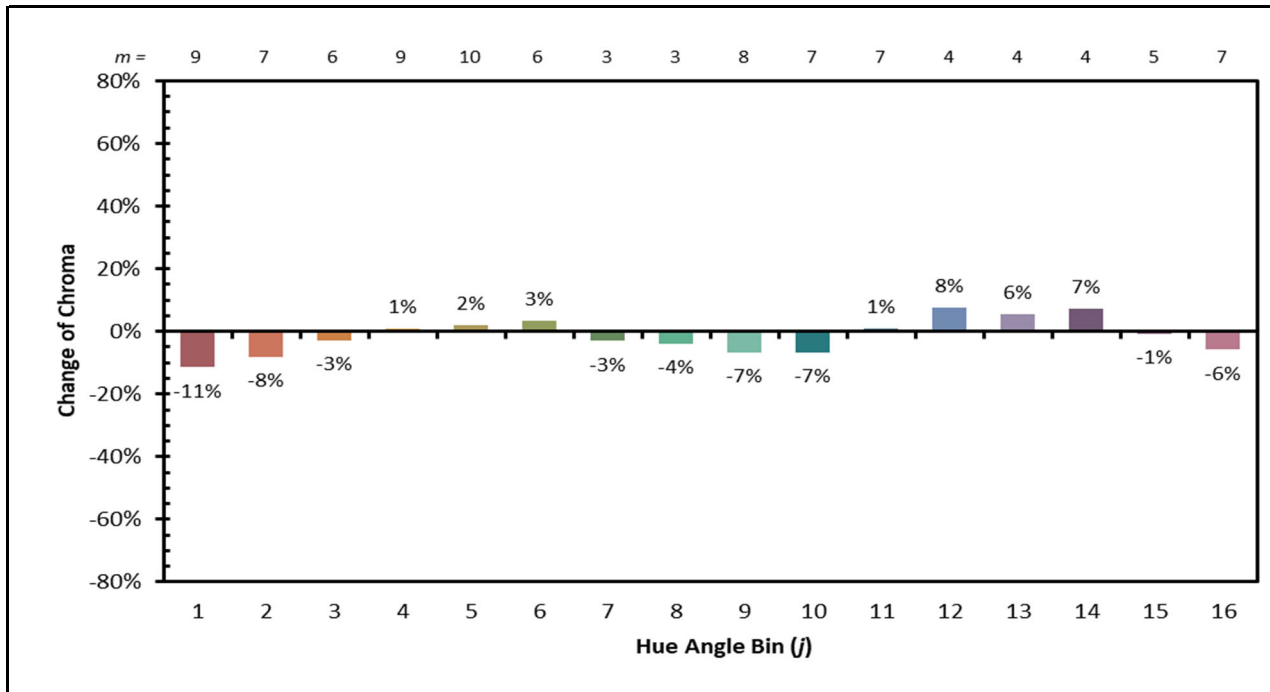
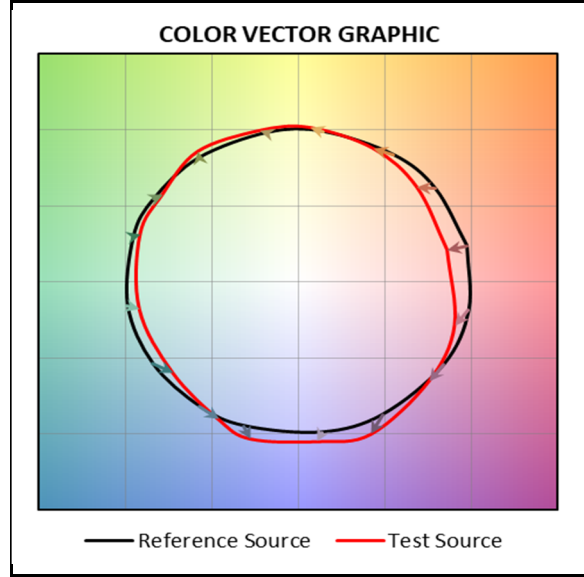
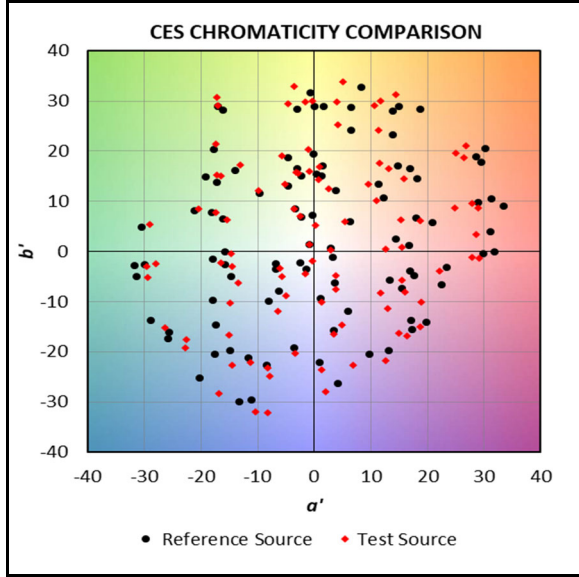
Summary Spectral Power Distribution (wavelength - nm, spectral power - mW)

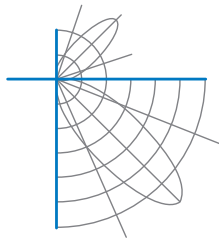
380	0.000309	480	0.010801	580	0.047012	680	0.014646
385	0.000333	485	0.011959	585	0.048537	685	0.012783
390	0.000409	490	0.013805	590	0.049871	690	0.011110
395	0.000517	495	0.016498	595	0.050744	695	0.009622
400	0.000674	500	0.019610	600	0.051081	700	0.008314
405	0.000846	505	0.022294	605	0.050764	705	0.007172
410	0.001070	510	0.024477	610	0.049761	710	0.006157
415	0.001404	515	0.026386	615	0.048275	715	0.005318
420	0.002125	520	0.027899	620	0.046237	720	0.004574
425	0.003467	525	0.029240	625	0.043999	725	0.003914
430	0.005900	530	0.030556	630	0.041382	730	0.003358
435	0.009878	535	0.031913	635	0.038815	735	0.002879
440	0.016027	540	0.033448	640	0.035940	740	0.002464
445	0.027279	545	0.034969	645	0.033024	745	0.002123
450	0.041607	550	0.036538	650	0.030116	750	0.001830
455	0.039800	555	0.038216	655	0.027183	755	0.001573
460	0.025615	560	0.039892	660	0.024338	760	0.001364
465	0.019047	565	0.041628	665	0.021578	765	0.001171
470	0.015346	570	0.043432	670	0.019025	770	0.001008
475	0.011617	575	0.045244	675	0.016741	775	0.000871
						780	0.000754





IES TM-30 Details





Test Report Number: LLIA001159-001B

Catalog Number: MLR2-HO-K35-80-4-XX-AL1-UNV

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

92 white LEDs, One PAL-Lighting FlexRad board.

One Osram Optotronic OTi 30/120-277/1A0 DIM-1 L G2 LED driver labeled as 720mA

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: 25.0 °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

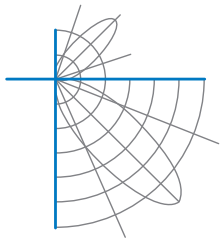
Significance: The laboratory has not participated in the selection of samples to be tested.
All testing is performed on the understanding that the significance of the report
is limited to the extent that the test sample is representative of production units.

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.



Report of Test

LLIA001159-001C

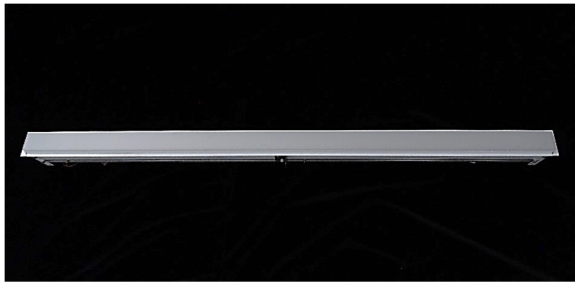
Electrical Test Report

Catalog Number: MLR2-HO-K35-80-4-XX-AL1-UNV

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

92 white LEDs, One PAL-Lighting FlexRad board.

One Osram Optotronic OTi 30/120-277/1A0 DIM-1 L G2 LED driver labeled as 720mA



Performance Summary

Voltage	277.0 Vac
Current	0.1112 A
Power	28.19 W
Frequency	60.00 Hz
Power Factor	0.915
Current THD	15.6 %

Ambient Temperature: 25.6 °C

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

Tested in accordance with the applicable sections of C82.77-10-2014. 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. 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.

Test date: 09/05/2019

Report date: 09/06/2019

Electrical Report Template V1-2