

Report of Test LLI-21188-1

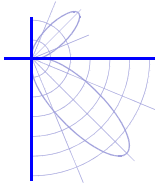
OptoLum Inc - Indoor recessed spot luminaire. Product ID: DL1----1927-----A
Cast aluminum housing with white interior and silver trim.
One COB LED with clear plastic focusing lens.
One Magnitude LED driver. Model: AFLEX-30W-1400-S-L set to 105ma
Operating at 120v AC and 60 Hz.



Performance Summary

Total Light Output	383 lm	Min Power Factor	0.42 @ 277 V
Luminaire Power	4.87 W	Max THD(i)*	40.0 % @ 277 V
Luminous Efficacy	78.6 lm/W		
CCT	2720 K		
CIE(x,y) 1931	(0.461, 0.414)		
CRI	93		

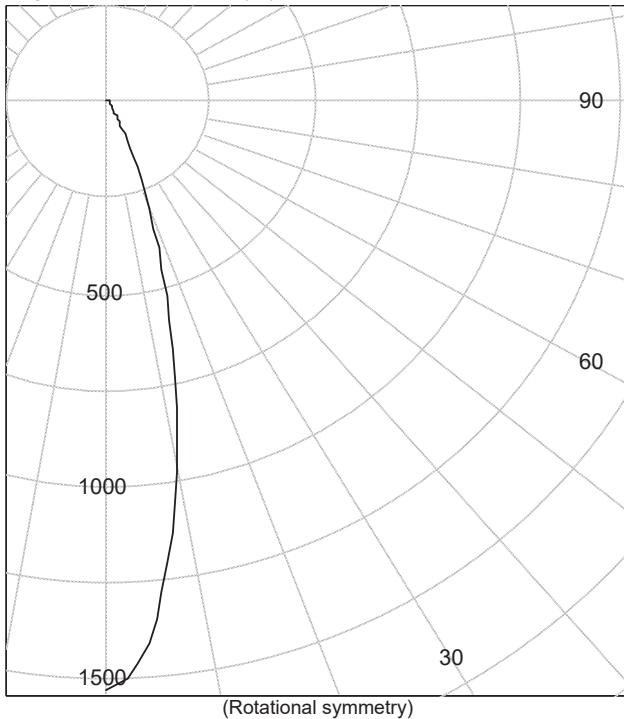
Prepared for : OptoLum Inc. 1407 W 10th Place, Tempe, AZ 85281



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Legend: All planes - Black (cd)



INTENSITY SUMMARY (cd)

Gamma	All Planes	Flux (lm)	Gamma	C0	Flux (lm)
0	1532		90	0	
5	1350	116	95	0	0
10	973		100	0	0
15	589	161	105	0	0
20	300		110	0	0
25	132	65	115	0	0
30	59		120	0	0
35	30	20	125	0	0
40	17		130	0	0
45	12	9	135	0	0
50	8		140	0	0
55	6	6	145	0	0
60	5		150	0	0
65	4	4	155	0	0
70	2		160	0	0
75	1	1	165	0	0
80	1		170	0	0
85	0	0	175	0	0
90	0		180	0	0

ZONAL FLUX AND PERCENTAGES

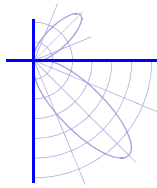
Zone	Flux (lm)	%Lamp	%Luminaire
0-30	343	N / A	89.5
0-40	362	N / A	94.7
0-60	378	N / A	98.6
0-90	383	N / A	100.0
40-90	20	N / A	5.3
60-90	5	N / A	1.4
90-180	0	N / A	0.0
0-180	383	N / A	100.0

Total Light Output = 383 lm

Signed:

Ryder Tunney
Ryder Tunney
Authorized Signatory

Date of test 8-Jul-2021
Date of report 8-Jul-2021

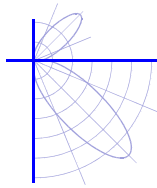


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Intensity (cd) and Flux (lm) data

Gamma	Intensity	Flux	Gamma	Intensity	Flux
0.0	1532		90.0	0	
2.5	1480		92.5	0	
5.0	1350	116	95.0	0	0
7.5	1170		97.5	0	
10.0	973		100.0	0	
12.5	774		102.5	0	
15.0	589	161	105.0	0	0
17.5	430		107.5	0	
20.0	300		110.0	0	
22.5	201		112.5	0	
25.0	132	65	115.0	0	0
27.5	87		117.5	0	
30.0	59		120.0	0	
32.5	41		122.5	0	
35.0	30	20	125.0	0	0
37.5	22		127.5	0	
40.0	17		130.0	0	
42.5	14		132.5	0	
45.0	12	9	135.0	0	0
47.5	10		137.5	0	
50.0	8		140.0	0	
52.5	7		142.5	0	
55.0	6	6	145.0	0	0
57.5	6		147.5	0	
60.0	5		150.0	0	
62.5	5		152.5	0	
65.0	4	4	155.0	0	0
67.5	3		157.5	0	
70.0	2		160.0	0	
72.5	2		162.5	0	
75.0	1	1	165.0	0	0
77.5	1		167.5	0	
80.0	1		170.0	0	
82.5	0		172.5	0	
85.0	0	0	175.0	0	0
87.5	0		177.5	0	
90.0	0		180.0	0	



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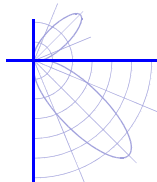
LM-79-08 Performance Data

Spectral	CIE 1931 (x, y) ⁽¹⁾	(0.461, 0.414)
	CIE 1976 (u', v') ⁽¹⁾	(0.261, 0.529)
	Correlated Color Temperature (CCT) ⁽¹⁾	2720 K
	Spatial Δ (u', v') Uniformity ⁽²⁾	3.21E-03
	Color Rendering Index (Ra) ⁽¹⁾	93.0
	Special CRI 9 (R ₉) ^{(1),(3)}	58.3
	Distance from Planckian Locus (Duv) ^{(1),(3)}	1.36E-03
	Scotopic/Photopic Ratio ^{(1),(3)}	1.28

Electrical	Voltage	120.0 V	(Setpoint 1)
	Frequency	60.0 Hz	
	Current	0.058 A	
	Power	4.87 W	
	Power Factor	0.70	
	Current THD	16 %	
	Voltage	277.0 V	(Setpoint 2)
	Frequency	60.0 Hz	
	Current	0.043 A	
	Power	4.99 W	
	Power Factor	0.42	
	Current THD	40 %	

Performance data in accordance with IESNA LM-79-08. Spectral calculations are for a CIE 2° observer
Photometric and spectral values were measured at Setpoint 1

- (1) Value is computed from the weighted average of the spatial measurements
- (2) Value is the maximum deviation of the spatial u' and v' measurements from the weighted average
- (3) Quantity is in addition to the scope of IESNA LM-79-08



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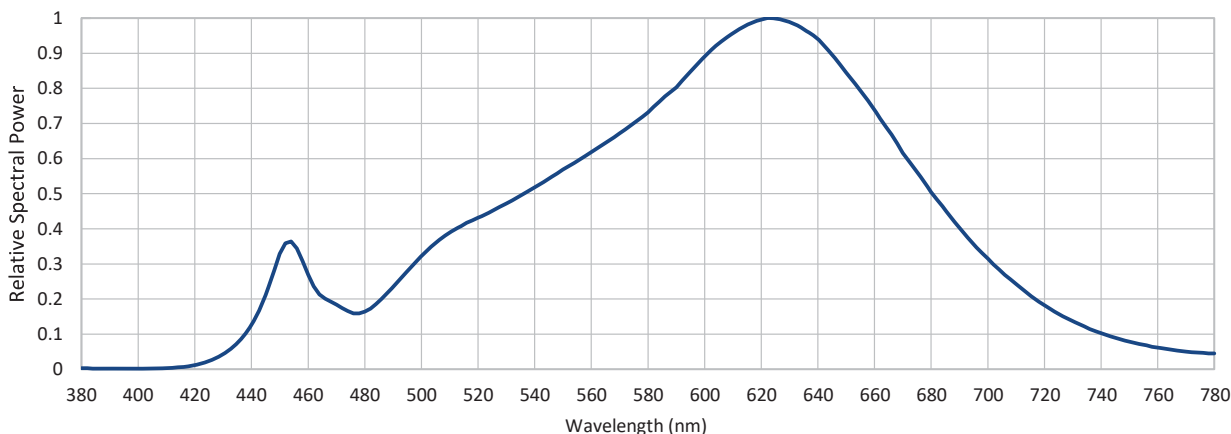
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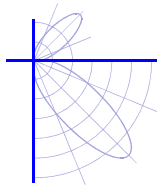
LM-79-08 Performance Data

Relative spectral power distribution

(Relative to peak = 1, weighted average of spatial measurements)

λ (nm)	Relative Power	λ (nm)	Relative Power	λ (nm)	Relative Power	λ (nm)	Relative Power	λ (nm)	Relative Power
380	0.003	460	0.269	540	0.518	620	0.996	700	0.315
385	0.002	465	0.207	545	0.543	625	0.999	705	0.277
390	0.002	470	0.184	550	0.569	630	0.989	710	0.243
395	0.002	475	0.163	555	0.593	635	0.968	715	0.211
400	0.002	480	0.164	560	0.619	640	0.941	720	0.182
405	0.002	485	0.193	565	0.645	645	0.895	725	0.158
410	0.003	490	0.235	570	0.672	650	0.845	730	0.137
415	0.006	495	0.279	575	0.701	655	0.794	735	0.118
420	0.012	500	0.323	580	0.732	660	0.739	740	0.103
425	0.024	505	0.360	585	0.769	665	0.679	745	0.090
430	0.043	510	0.389	590	0.803	670	0.616	750	0.078
435	0.075	515	0.412	595	0.848	675	0.563	755	0.070
440	0.127	520	0.432	600	0.891	680	0.505	760	0.062
445	0.213	525	0.451	605	0.928	685	0.453	765	0.055
450	0.329	530	0.472	610	0.957	690	0.403	770	0.050
455	0.354	535	0.495	615	0.980	695	0.356	775	0.047
								780	0.045





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LM-79-08 Performance Data

Spatial measurements

Vert. angle (°)	CIE 1976 (u',v') coordinates	
	Horiz. 0.0° plane	Horiz. ° plane
0.0	(0.260, 0.529)	(0.260, 0.529)
2.0	(0.260, 0.529)	(0.260, 0.529)
4.0	(0.260, 0.529)	(0.260, 0.529)
6.0	(0.260, 0.529)	(0.260, 0.529)
8.0	(0.260, 0.529)	(0.260, 0.529)
10.0	(0.260, 0.529)	(0.260, 0.529)
12.0	(0.261, 0.529)	(0.261, 0.529)
14.0	(0.261, 0.529)	(0.261, 0.529)
16.0	(0.262, 0.529)	(0.262, 0.529)
18.0	(0.262, 0.529)	(0.262, 0.529)

Spatial measurements

Vert. angle (°)	CIE 1976 (u',v') coordinates	
	Horiz. 0.0° plane	Horiz. ° plane
18.0	(0.262, 0.529)	(0.262, 0.529)
20.0	(0.263, 0.529)	(0.263, 0.529)
22.0	(0.264, 0.530)	(0.264, 0.529)
24.0	I <= 10% peak	I <= 10% peak
26.0	I <= 10% peak	I <= 10% peak
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-

Test procedure

All measurements were performed in an environmentally controlled laboratory employing suitable baffling to minimize stray light. The sample was mounted in its normal operating orientation on a rotating mirror goniophotometer and operated from a stabilized supply. The photometric output was monitored and measurements were performed once stability was achieved.

The goniophotometer was used to measure the spatial distribution of both luminous intensity and, in conjunction with a spectroradiometer, spectral irradiance. The distribution locus comprises points in two or more planes (as indicated in the table above) at no more than 10° vertical intervals. The CIE (x,y) coordinates and other derived metrics (CIE (u', v'), CCT and CRI) are calculated from the weighted sum (weighted for intensity and represented solid angle) of the measured spectral irradiances.

Sample Orientation Vertical Stabilization & total operation time 0.75 / 1.75 hours

Equipment and uncertainties

LightLab International R80A C-gamma rotating mirror goniophotometer with a test distance of 8 m.

Luminous Intensity	± 4 %	Temperature	± 1 °C
Luminous Flux	± 4 %	Luminous Efficacy	± 4.5 %
Horiz., Vert. Angles	± 0.25°		

PhotoResearch PR-670 spectroradiometer (grating with 380 - 780 nm range, 2 nm / pixel, 5 nm bandwidth, incandescent/halogen calibration source). Measured at a distance from the sample deemed >5 times the maximum observed luminous opening dimension.

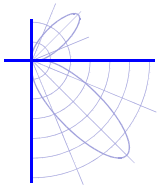
CIE (x, y) coordinates	± 0.003	CCT	± 100 K
CIE (u', v') coordinates	± 0.002	CRI (Ra)	± 2
Spatial Δ (u', v') uniformity	± 0.001	Scotopic / Photopic Ratio *	± 0.02
Rel. Spectral Irradiance *	± 2 %	R9 *	± 2
Duv *	± 5E-04		

Yokogawa WT210 power meter connected in circuit to the sample electrical supply

Voltage	± 0.5 %	Frequency *	± 0.1 Hz
Current	± 0.5 %	Power	± 0.5 %
Current THD	± 3 %	Power Factor	± 0.02

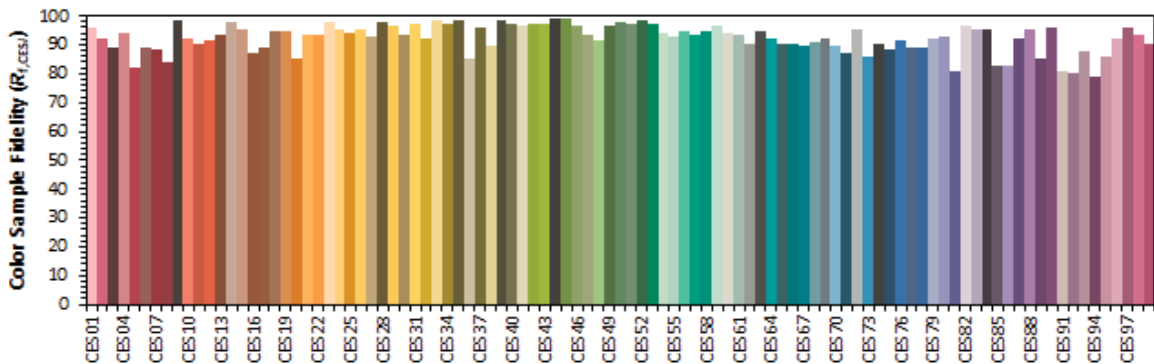
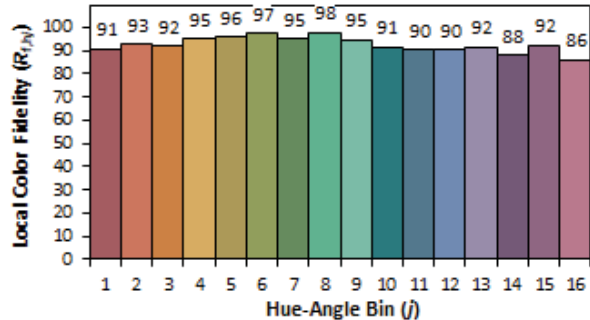
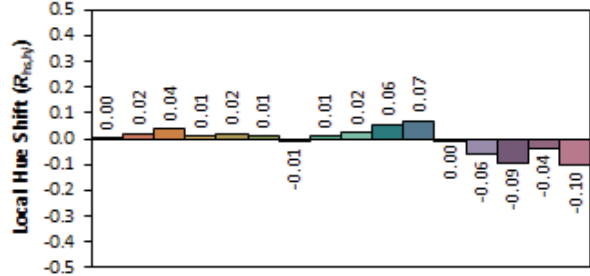
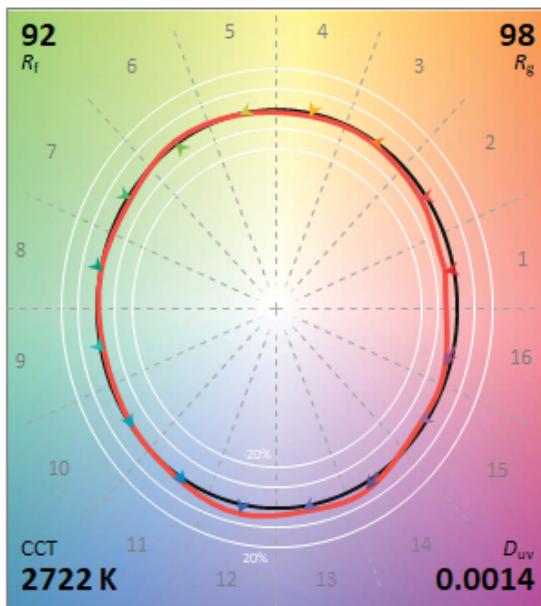
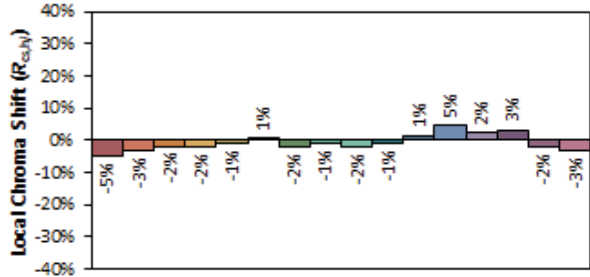
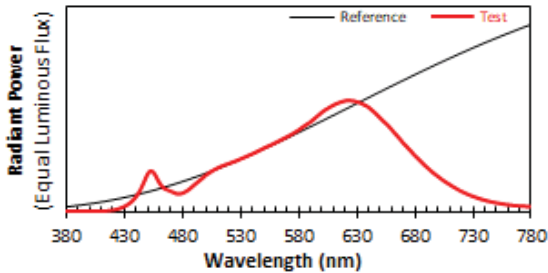
This report contains data that are not covered by the NVLAP accreditation. Quantities marked with * are not covered.

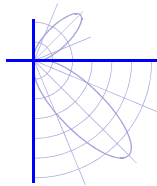
Calculator / report version 1.0.10 / 5.9 (14th Dec 2017)



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Test Distance 8.0 m
Test Temperature 25.5 °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 (Sec. 12), IES LM-16-93, IES LM-58-13, CIE 13.3:1995, CIE 15:2004, ANSI C78.377:2015, ANSI C82.77-10:2014.

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 Gamma coordinate system as defined in CIE publication number 121.

Customer supplied information is identified in this report by enclosing it in double quotes

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