

Report of Test

LLI-21188-2

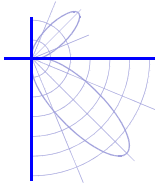
OptoLum Inc - Indoor recessed spot luminaire. Product ID: DL3----2530-----A
Cast aluminum housing with white interior and silver trim.
One COB LED with clear plastic focusing lens.
One Magnitude LED driver. Model: AFLEX-30W-1400-S-L set to 125ma
Operating at 120v AC and 60 Hz.



Performance Summary

Total Light Output	518 lm	Min Power Factor	0.45 @ 277 V
Luminaire Power	5.59 W	Max THD(i)*	39.0 % @ 277 V
Luminous Efficacy	92.7 lm/W		
CCT	3000 K		
CIE(x,y) 1931	(0.437, 0.405)		
CRI	93		

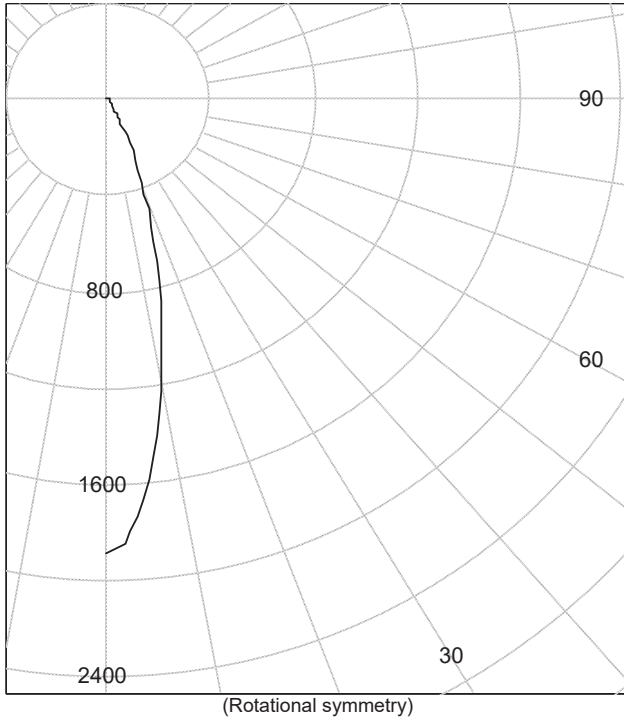
Prepared for : OptoLum Inc. 1407 W 10th Place, Tempe, AZ 85281



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Legend: All planes - Black (cd)



INTENSITY SUMMARY (cd)

Gamma	All Planes	Flux (lm)	Gamma	C0	Flux (lm)
0	1884		90	0	
5	1665	145	95	0	0
10	1228		100	0	
15	776	212	105	0	0
20	426		110	0	
25	203	98	115	0	0
30	94		120	0	
35	48	32	125	0	0
40	28		130	0	
45	18	15	135	0	0
50	13		140	0	
55	10	9	145	0	0
60	8		150	0	
65	5	5	155	0	0
70	3		160	0	
75	2	2	165	0	0
80	1		170	0	
85	0	0	175	0	0
90	0		180	0	

ZONAL FLUX AND PERCENTAGES

Zone	Flux (lm)	%Lamp	%Luminaire
0-30	455	N / A	87.8
0-40	487	N / A	93.9
0-60	510	N / A	98.5
0-90	518	N / A	100.0
40-90	31	N / A	6.1
60-90	8	N / A	1.5
90-180	0	N / A	0.0
0-180	518	N / A	100.0

Total Light Output = 518 lm

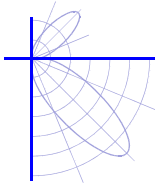
Signed:

Ryder Tunney

Ryder Tunney
Authorized Signatory

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

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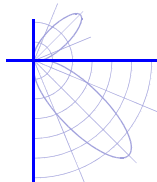


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Intensity (cd) and Flux (lm) data

Gamma	Intensity	Flux	Gamma	Intensity	Flux
0.0	1884		90.0	0	
2.5	1821		92.5	0	
5.0	1665	145	95.0	0	0
7.5	1458		97.5	0	
10.0	1228		100.0	0	
12.5	994		102.5	0	
15.0	776	212	105.0	0	0
17.5	584		107.5	0	
20.0	426		110.0	0	
22.5	297		112.5	0	
25.0	203	98	115.0	0	0
27.5	138		117.5	0	
30.0	94		120.0	0	
32.5	66		122.5	0	
35.0	48	32	125.0	0	0
37.5	36		127.5	0	
40.0	28		130.0	0	
42.5	22		132.5	0	
45.0	18	15	135.0	0	0
47.5	15		137.5	0	
50.0	13		140.0	0	
52.5	11		142.5	0	
55.0	10	9	145.0	0	0
57.5	9		147.5	0	
60.0	8		150.0	0	
62.5	7		152.5	0	
65.0	5	5	155.0	0	0
67.5	4		157.5	0	
70.0	3		160.0	0	
72.5	2		162.5	0	
75.0	2	2	165.0	0	0
77.5	1		167.5	0	
80.0	1		170.0	0	
82.5	1		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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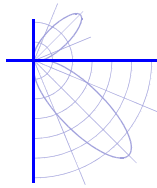
LM-79-08 Performance Data

Spectral	CIE 1931 (x, y) ⁽¹⁾	(0.437, 0.405)
	CIE 1976 (u', v') ⁽¹⁾	(0.250, 0.522)
	Correlated Color Temperature (CCT) ⁽¹⁾	3000 K
	Spatial Δ (u', v') Uniformity ⁽²⁾	1.62E-03
	Color Rendering Index (Ra) ⁽¹⁾	93.1
	Special CRI 9 (R ₉) ^{(1),(3)}	54.9
	Distance from Planckian Locus (Duv) ^{(1),(3)}	3.02E-04
	Scotopic/Photopic Ratio ^{(1),(3)}	1.42

Electrical	Voltage	120.0 V	(Setpoint 1)
	Frequency	60.0 Hz	
	Current	0.060 A	
	Power	5.59 W	
	Power Factor	0.78	
	Current THD	15 %	
	Voltage	277.0 V	(Setpoint 2)
	Frequency	60.0 Hz	
	Current	0.046 A	
	Power	5.72 W	
	Power Factor	0.45	
	Current THD	39 %	

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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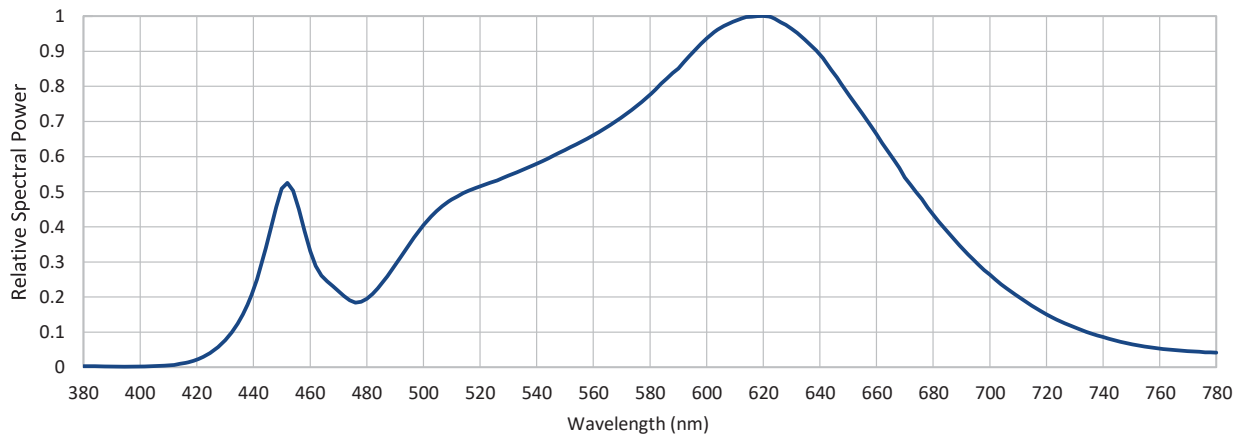
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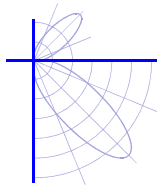
LM-79-08 Performance Data

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	0.331	540	0.579	620	1.000	700	0.264
385	0.003	465	0.253	545	0.599	625	0.988	705	0.230
390	0.002	470	0.217	550	0.619	630	0.964	710	0.201
395	0.002	475	0.188	555	0.639	635	0.930	715	0.175
400	0.002	480	0.195	560	0.661	640	0.891	720	0.151
405	0.003	485	0.236	565	0.685	645	0.836	725	0.131
410	0.006	490	0.291	570	0.712	650	0.779	730	0.114
415	0.011	495	0.349	575	0.742	655	0.722	735	0.098
420	0.022	500	0.405	580	0.776	660	0.664	740	0.086
425	0.043	505	0.447	585	0.815	665	0.603	745	0.075
430	0.077	510	0.478	590	0.851	670	0.541	750	0.066
435	0.133	515	0.499	595	0.896	675	0.489	755	0.059
440	0.221	520	0.516	600	0.937	680	0.435	760	0.053
445	0.360	525	0.530	605	0.967	685	0.387	765	0.049
450	0.509	530	0.546	610	0.986	690	0.341	770	0.046
455	0.477	535	0.562	615	0.998	695	0.300	775	0.043
								780	0.042





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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	(0.251, 0.522)	(0.251, 0.522)
2.0	(0.251, 0.522)	(0.251, 0.522)
4.0	(0.251, 0.522)	(0.251, 0.522)
6.0	(0.251, 0.522)	(0.251, 0.522)
8.0	(0.251, 0.522)	(0.251, 0.522)
10.0	(0.251, 0.522)	(0.251, 0.522)
12.0	(0.251, 0.521)	(0.251, 0.522)
14.0	(0.250, 0.521)	(0.251, 0.522)
16.0	(0.250, 0.521)	(0.251, 0.522)
18.0	(0.249, 0.521)	(0.250, 0.522)

Spatial measurements

Vert. angle (°)	CIE 1976 (u',v') coordinates	
	Horiz. 0.0° plane	Horiz. ° plane
18.0	(0.249, 0.521)	(0.250, 0.522)
20.0	(0.249, 0.521)	(0.250, 0.522)
22.0	(0.249, 0.521)	(0.250, 0.522)
24.0	(0.249, 0.521)	(0.250, 0.522)
26.0	I <= 10% peak	(0.250, 0.523)
28.0	I <= 10% peak	I <= 10% peak
30.0	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 0.5 / 1.5 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.

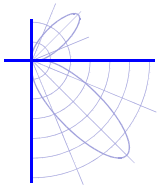
CIE (x, y) coordinates	± 0.003	CCT	± 100 K
CIE (u', v') coordinates	± 0.002	CRI (Ra)	± 2
Spatial Δ (u', v') uniformity	± 0.001	Scotopic / Photopic Ratio *	± 0.02
Rel. Spectral Irradiance *	± 2 %	R9 *	± 2
Duv *	± 5E-04		

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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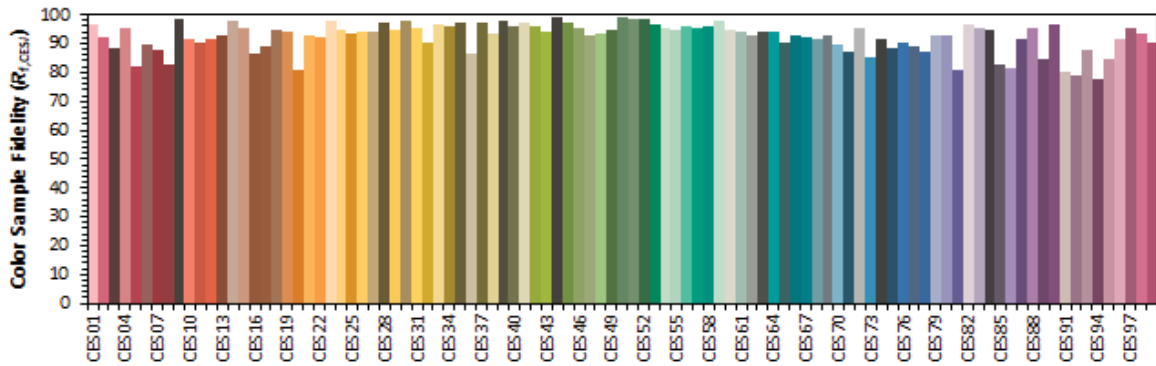
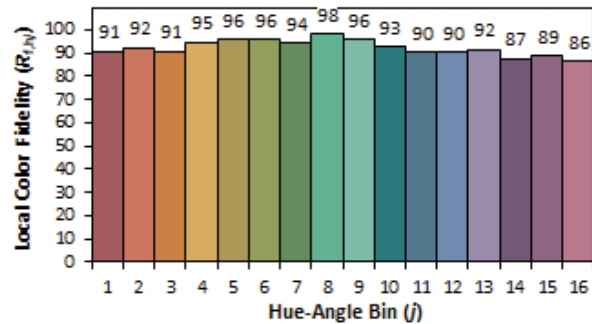
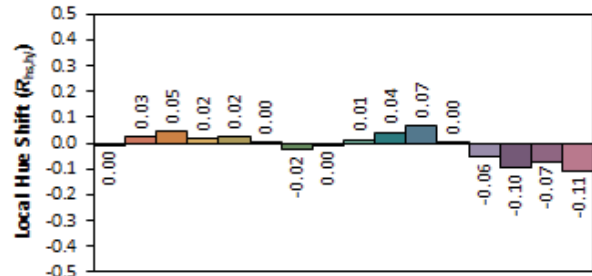
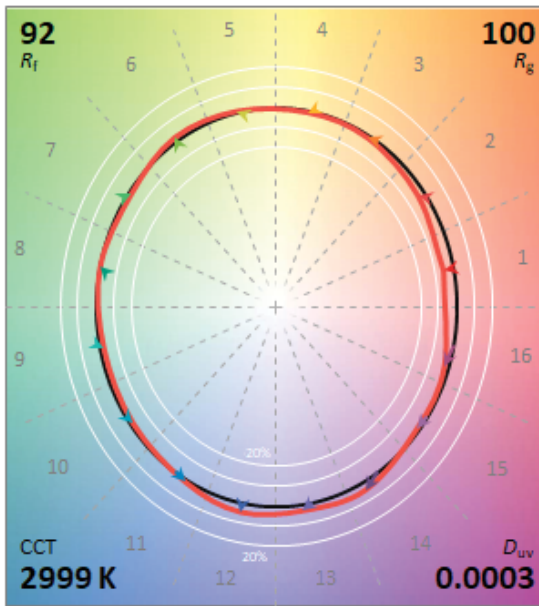
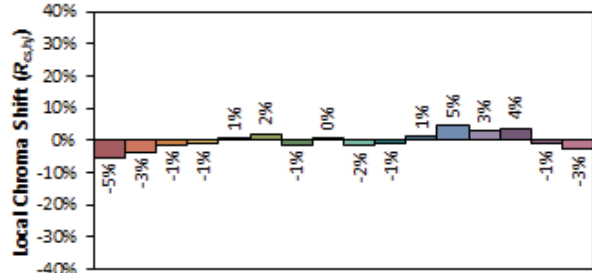
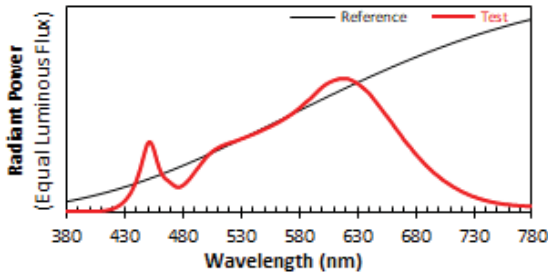
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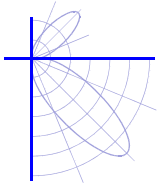
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Test Distance 8.0 m
Test Temperature 25.4 °C

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

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.