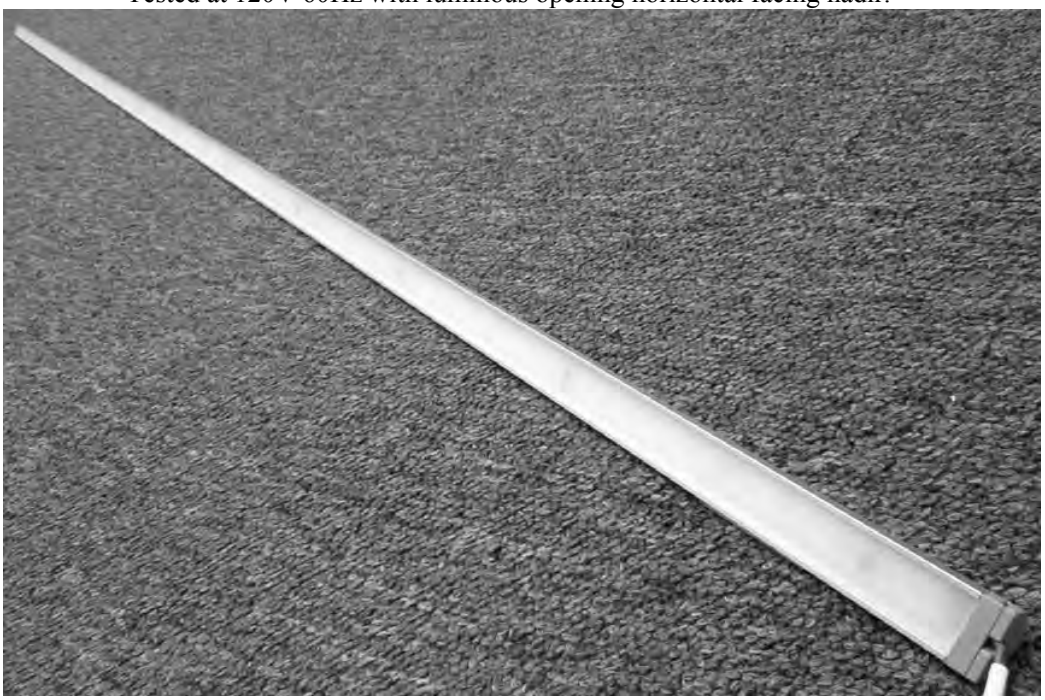
Report of Test

LLI-14272-11

OptoLum "EcoLine" Extruded Aluminum Luminaire. Cat No. EL-AL-S--358UOD-A072000
Triangular extruded housing with extents ~ 72.375" x 1.0" x 0.75".
Twelve white PCB sections marked "OptoLum EcoLine SLO R4.1" with five LEDs each on 1.187" centers.
Flat opal plastic lens. Luminous Opening ~ 72 x 0.75".
One remote "High Perfection Tech LP1090-24-GG-290 100-240Vac 47-63Hz" driver.
Tested at 120V 60Hz with luminous opening horizontal facing nadir.



Performance Summary

Total Light Output	897 lm	Min Power Factor	0.65 @ 277 V
Luminaire Power	25.0 W	Max THD(i)*	29.8 % @ 277 V
Luminous Efficacy	35.9 lm/W	SC along*, across*	1.24 , 1.22
CCT	3390 K	SC Diagonal*	1.34
CIE(x,y) 1931	(0.411, 0.391)		
CRI	85		
0-60° Zonal Flux %	81.1 %		

PREPARED FOR : OptoLum Inc., 1407 W 10th Place, Tempe, AZ

USA: LightLab International Inc.
24825 N. 16th Avenue
Suite 125
Phoenix, AZ, 85085

Ph : +1 623-434-1499
Fx : +1 623-434-1492
www.lightlabint.com
(Issuing laboratory)

Australasia & S.E.Asia: LightLab International
50 Recliffe Gardens Drive
Clontarf
Queensland, 4019, Australia

Ph : +61 7 3283 7862
Fx : +61 7 3283 8751
www.lightlab.com.au

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Lab Code 200989-0

This document is issued in accordance with the accreditation requirements of NVLAP. The laboratory is accredited for compliance with ISO/IEC 17025. The results of the tests, calibrations and/or measurements included in this document are traceable to the SI system of units.

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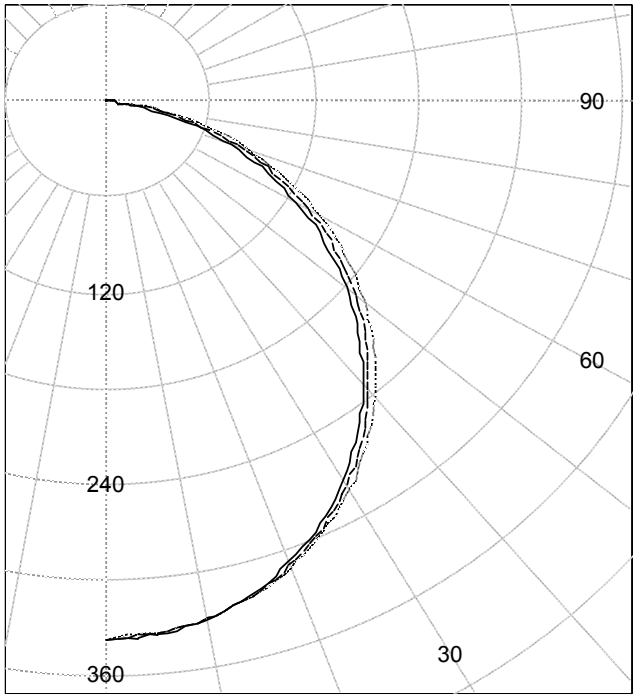
Legend: C0-Solid, C45-Dashed, C90-Grey (cd)



(Two plane symmetry) C0-C90

INTENSITY SUMMARY (cd)

	C-Plane					Flux
Gamma	C0	C22.5	C45	C67.5	C90	(lm)
0.0	337	337	337	337	337	
5.0	336	335	335	337	334	32
10.0	330	330	330	332	329	
15.0	321	321	322	324	322	91
20.0	308	308	310	313	311	
25.0	292	293	295	298	297	136
30.0	274	275	278	281	281	
35.0	253	254	258	262	262	161
40.0	230	232	236	241	242	
45.0	206	208	212	217	219	164
50.0	181	182	187	193	194	
55.0	154	156	161	167	169	144
60.0	127	129	134	140	142	
65.0	99	101	107	112	114	105
70.0	71	73	79	84	86	
75.0	42	45	52	57	59	54
80.0	17	19	26	31	32	
85.0	6	6	6	10	10	10
90.0	0	0	0	0	0	

ZONAL FLUX AND PERCENTAGES

Zone	Flux (lm)	% Lamp	% Luminaire
0-30	259	N / A	28.8
0-40	420	N / A	46.8
0-60	728	N / A	81.1
0-90	897	N / A	100.0
40-90	477	N / A	53.2
60-90	169	N / A	18.9
90-180	0	N / A	0.0
0-180	897	N / A	100.0

Total Light Output = 897 lm

Signed: E Southgate

Eric Southgate
Authorized Signatory

Date of test 11-Oct-2014
Date of report 14-Oct-2014

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Intensity data (cd)

	C-Plane				
Gamma	**C0**	**C22.5**	**C45**	**C67.5**	**C90**
0.0	337	337	337	337	337
2.5	337	336	336	338	335
5.0	336	335	335	337	334
7.5	333	333	333	334	332
10.0	330	330	330	332	329
12.5	326	325	326	328	326
15.0	321	321	322	324	322
17.5	315	315	316	319	317
20.0	308	308	310	313	311
22.5	301	301	303	306	305
25.0	292	293	295	298	297
27.5	284	284	287	290	290
30.0	274	275	278	281	281
32.5	264	265	268	272	272
35.0	253	254	258	262	262
37.5	242	243	247	251	252
40.0	230	232	236	241	242
42.5	218	220	224	229	230
45.0	206	208	212	217	219
47.5	193	195	200	205	207
50.0	181	182	187	193	194
52.5	167	169	174	180	182
55.0	154	156	161	167	169
57.5	140	143	148	153	155
60.0	127	129	134	140	142
62.5	113	115	121	126	128
65.0	99	101	107	112	114
67.5	85	87	93	98	100
70.0	71	73	79	84	86
72.5	57	59	66	70	72
75.0	42	45	52	57	59
77.5	29	31	39	43	45
80.0	17	19	26	31	32
82.5	11	11	13	20	20
85.0	6	6	6	10	10
87.5	2	2	2	2	3
90.0	0	0	0	0	0

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Coefficients Of Utilization * - Zonal Cavity Method
Effective Floor Cavity Reflectance 0.20

RC			80	80			70	70			50	50		30	30		10	10	0
RW	70	50	30	10	10	70	50	30	10	10	50	30	10	10	50	30	10	10	50	30	10	10	0	0
0		119	119	119	119		116	116	116	116		111	111	111		106	106	106		102	102	102		100
1		109	105	101	97		107	102	99	95		98	95	92		94	92	90		91	89	87		85
2		100	92	85	79		97	90	84	78		86	81	77		83	79	75		80	76	73		71
3		91	81	73	66		88	79	72	66		76	70	64		73	68	63		71	66	62		60
4		83	72	63	56		81	70	62	56		68	61	55		65	59	54		63	58	54		52
5		77	64	55	49		75	63	55	48		61	53	48		59	52	47		57	51	47		45
6		71	58	49	42		69	57	48	42		55	47	42		53	47	42		52	46	41		39
7		66	52	44	38		64	52	43	37		50	43	37		49	42	37		47	41	37		35
8		61	48	39	34		60	47	39	33		46	38	33		45	38	33		43	37	33		31
9		57	44	36	30		56	43	35	30		42	35	30		41	35	30		40	34	30		28
10		54	41	33	27		52	40	32	27		39	32	27		38	32	27		37	31	27		25

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LM-79 Performance Data

Spectral	CIE 1931 (x, y) (1)	(0.411, 0.391)	
	CIE 1976 (u', v') (1)	(0.239, 0.512)	
	Correlated Color Temperature (CCT) (1)	3390	K
	Color Spatial Uniformity (2)	0.0009	
	Color Rendering Index (Ra) (1)	85	
	Special CRI 9 (R_9) (1),(3)	25	
	Distance from Planckian Locus (Duv) (1),(3)	-0.0011	
	Scotopic/Photopic Ratio (1),(3)	1.5	

Electrical	Voltage	120	V	(Setpoint 1)
	Frequency	60	Hz	
	Current	0.2193	A	
	Power	24.99	W	
	Power Factor	0.949		
	Current THD	9.36	%	
	Voltage	277	V	(Setpoint 2)
	Frequency	60	Hz	
	Current	0.1689	A	
	Power	30.36	W	
	Power Factor	0.649		
	Current THD	29.76	%	

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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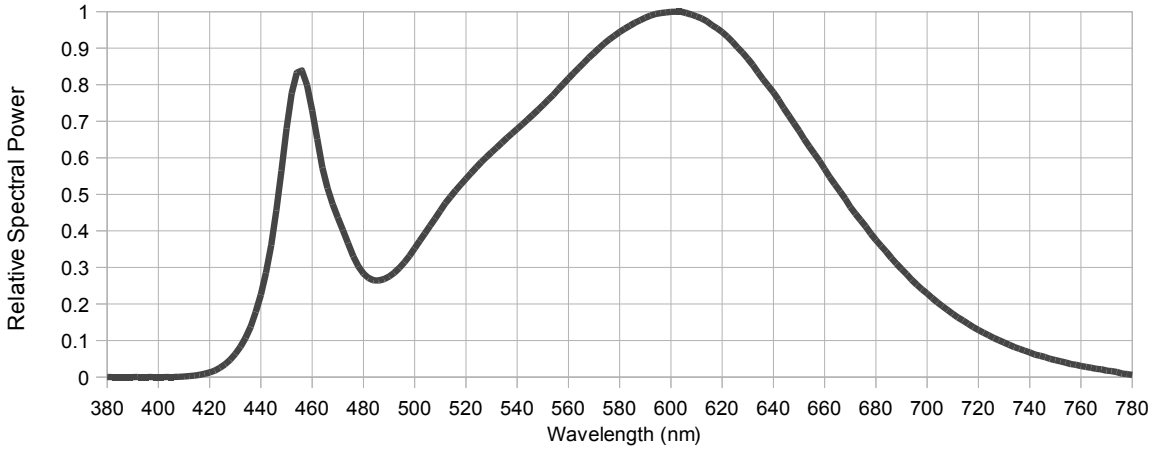
LM-79 Performance Data

Summary Relative Spectral Irradiance Distribution (wavelength – nm, irradiance – relative to peak = 1)

380	3.73E-05	480	2.83E-01	580	9.44E-01	680	3.75E-01
385	0.00E+00	485	2.65E-01	585	9.66E-01	685	3.35E-01
390	0.00E+00	490	2.75E-01	590	9.84E-01	690	2.96E-01
395	0.00E+00	495	3.06E-01	595	9.95E-01	695	2.59E-01
400	0.00E+00	500	3.52E-01	600	1.00E+00	700	2.29E-01
405	1.06E-04	505	4.03E-01	605	9.98E-01	705	1.99E-01
410	1.53E-03	510	4.55E-01	610	9.87E-01	710	1.73E-01
415	4.92E-03	515	5.02E-01	615	9.69E-01	715	1.50E-01
420	1.26E-02	520	5.43E-01	620	9.44E-01	720	1.29E-01
425	3.02E-02	525	5.81E-01	625	9.10E-01	725	1.11E-01
430	6.30E-02	530	6.15E-01	630	8.71E-01	730	9.46E-02
435	1.22E-01	535	6.48E-01	635	8.24E-01	735	7.95E-02
440	2.25E-01	540	6.79E-01	640	7.79E-01	740	6.74E-02
445	4.09E-01	545	7.11E-01	645	7.26E-01	745	5.63E-02
450	6.80E-01	550	7.44E-01	650	6.74E-01	750	4.63E-02
455	8.36E-01	555	7.79E-01	655	6.21E-01	755	3.78E-02
460	7.30E-01	560	8.17E-01	660	5.70E-01	760	3.01E-02
465	5.45E-01	565	8.53E-01	665	5.17E-01	765	2.39E-02
470	4.37E-01	570	8.87E-01	670	4.65E-01	770	1.74E-02
475	3.49E-01	575	9.18E-01	675	4.21E-01	775	1.17E-02
						780	5.86E-03



* The spectral power distribution combines the weighted spectral power distributions of all spatial measurements.

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LM-79 Performance Data

Spatial measurements

Vertical angle (deg)	CIE 1976 (u',v') coordinates Horizontal 0 plane	Horizontal 90 plane
0	(0.239, 0.512)	(0.239, 0.512)
10	(0.239, 0.512)	(0.239, 0.512)
20	(0.239, 0.512)	(0.239, 0.512)
30	(0.239, 0.512)	(0.239, 0.512)
40	(0.239, 0.512)	(0.239, 0.512)
50	(0.239, 0.512)	(0.239, 0.512)
60	(0.239, 0.512)	(0.240, 0.513)
70	(0.239, 0.512)	(0.240, 0.513)
80	I <= 10 %	I <= 10 %
90	I <= 10 %	I <= 10 %

Spatial measurements

Vertical angle (deg)	CIE 1976 (u',v') coordinates Horizontal 0 plane	Horizontal 90 plane
90	I <= 10 %	I <= 10 %
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-

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 10º 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.

		Stabilization Time	2 hour
Sample Orientation	Horizontal	Total Operation Time	20 hour

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 %
Horizontal, Vertical Angles	± 0.25º		

PhotoResearch PR-670 spectroradiometer (380 - 780 nm., 2 nm. per pixel) measuring at a distance from the sample deemed greater than five 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
Δ (u', v') Color difference	± 0.001	Scotopic / Photopic Ratio *	± 0.02
Relative Spectral Irradiance *	± 2 %	R9 *	± 2

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.
IESNA LM-79-08 Calculator v4.9 (23rd Sep 2014)

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Tested at 120V 60Hz with luminous opening horizontal facing nadir.

Test Distance: 8.0 metres

Test Temperature: 24.7 degrees Celsius

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.

Test Procedure: Tested in accordance with the applicable sections of IESNA publication LM-79-08.

Notes: 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.

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