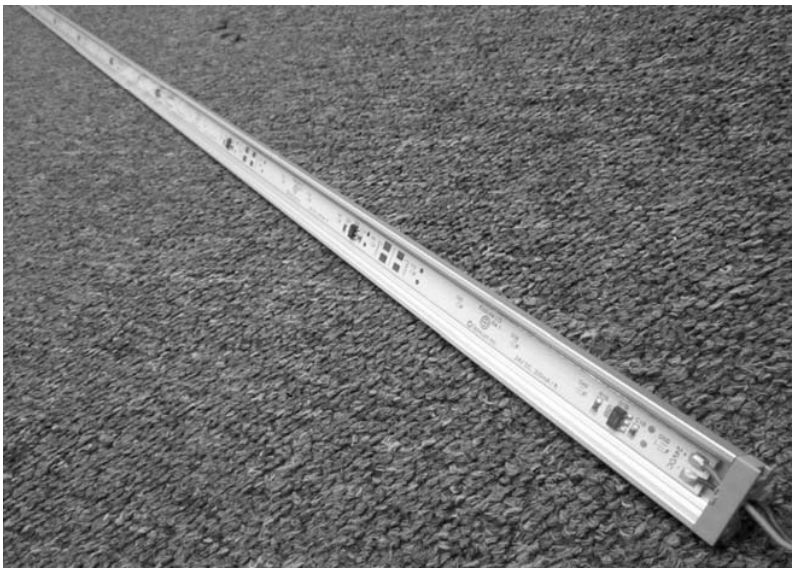
Report of Test

LLI-14272-4

OptoLum "EcoLine" Extruded Aluminum Luminaire. Cat No. EL-AL-L--358USD-A072000
Triangular extruded housing with extents ~ 72.375" x 1.0" x 0.75".
Twelve white PCB sections marked "OptoLum EcoLine LO R4.1" with five LEDs each on 1.187" centers.
Flat clear 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	1902 lm	Min Power Factor	0.81 @ 277 V
Luminaire Power	50.2 W	Max THD(i)*	15.8 % @ 277 V
Luminous Efficacy	37.9 lm/W	SC along*, across*	1.30 , 1.28
CCT	3470 K	SC Diagonal*	1.40
CIE(x,y) 1931	(0.404, 0.383)		
CRI	86		
0-60° Zonal Flux %	86.5 %		

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

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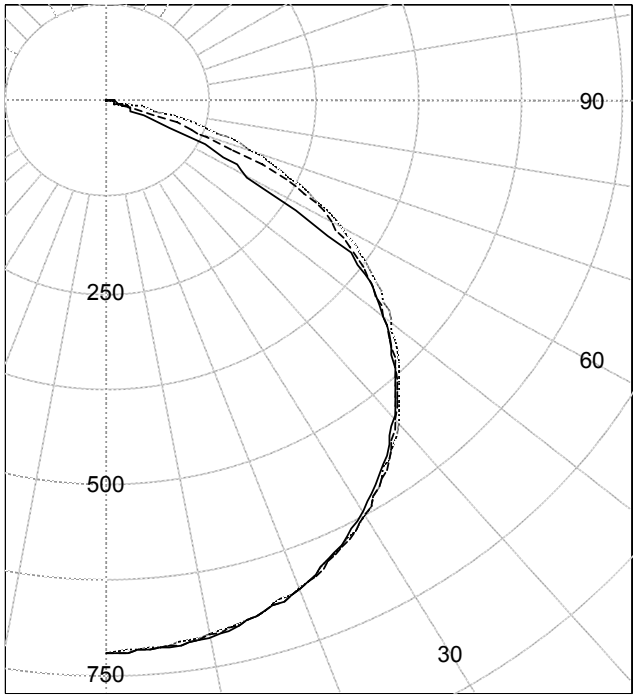
Legend: C0-Solid, C45-Dashed, C90-Grey (cd)



(Two plane symmetry) C0-C90

INTENSITY SUMMARY (cd)

	C-Plane					Flux
Gamma	C0	C22.5	C45	C67.5	C90	(lm)
0.0	719	719	719	719	719	
5.0	718	716	717	719	715	68
10.0	710	709	710	712	708	
15.0	697	695	696	699	695	197
20.0	677	675	678	680	676	
25.0	650	650	654	656	651	301
30.0	618	617	623	627	623	
35.0	580	579	586	590	585	366
40.0	537	536	542	549	548	
45.0	489	486	492	503	499	380
50.0	435	429	437	448	447	
55.0	371	366	376	386	387	333
60.0	195	247	311	321	325	
65.0	85	138	237	250	255	188
70.0	27	26	107	176	183	
75.0	23	21	18	106	109	58
80.0	18	17	13	28	49	
85.0	9	9	8	6	12	10
90.0	0	0	0	0	0	

ZONAL FLUX AND PERCENTAGES

Zone	Flux (lm)	% Lamp	% Luminaire
0-30	566	N / A	29.8
0-40	932	N / A	49.0
0-60	1645	N / A	86.5
0-90	1902	N / A	100.0
40-90	970	N / A	51.0
60-90	257	N / A	13.5
90-180	0	N / A	0.0
0-180	1902	N / A	100.0

Total Light Output = 1,902 lm

Signed: E Southgate

Eric Southgate
Authorized Signatory

Date of test 8-Oct-2014
Date of report 13-Oct-2014

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Intensity data (cd)

	C-Plane				
Gamma	**C0**	**C22.5**	**C45**	**C67.5**	**C90**
0.0	719	719	719	719	719
2.5	719	718	719	721	717
5.0	718	716	717	719	715
7.5	715	713	714	716	712
10.0	710	709	710	712	708
12.5	704	703	704	707	702
15.0	697	695	696	699	695
17.5	688	686	688	690	686
20.0	677	675	678	680	676
22.5	665	663	666	669	664
25.0	650	650	654	656	651
27.5	635	634	639	642	638
30.0	618	617	623	627	623
32.5	599	599	605	610	606
35.0	580	579	586	590	585
37.5	559	558	564	569	566
40.0	537	536	542	549	548
42.5	514	512	518	527	524
45.0	489	486	492	503	499
47.5	463	458	466	476	473
50.0	435	429	437	448	447
52.5	404	399	407	417	419
55.0	371	366	376	386	387
57.5	295	331	344	354	358
60.0	195	247	311	321	325
62.5	167	168	276	285	291
65.0	85	138	237	250	255
67.5	31	51	142	213	219
70.0	27	26	107	176	183
72.5	25	23	43	141	145
75.0	23	21	18	106	109
77.5	20	18	15	59	75
80.0	18	17	13	28	49
82.5	14	13	11	8	27
85.0	9	9	8	6	12
87.5	6	6	4	3	3
90.0	0	0	0	0	0

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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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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		110	106	102	99		107	104	100	97		99	97	94		96	93	91		92	90	89		86
2		101	93	87	82		98	91	86	81		88	83	79		85	81	77		82	79	76		74
3		92	83	75	69		90	81	74	68		78	72	67		75	70	66		73	69	65		63
4		85	73	65	59		83	72	64	58		70	63	58		67	62	57		65	60	56		54
5		78	66	57	51		76	65	57	51		63	55	50		61	54	49		59	53	49		47
6		72	59	51	44		70	58	50	44		57	49	44		55	48	43		53	48	43		41
7		67	54	45	39		65	53	45	39		51	44	39		50	43	39		49	43	38		36
8		62	49	41	35		61	48	40	35		47	40	35		46	39	34		45	39	34		32
9		58	45	37	31		57	44	37	31		43	36	31		42	36	31		41	35	31		29
10		54	41	34	29		53	41	33	28		40	33	28		39	33	28		38	32	28		26

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LM-79 Performance Data

Spectral	CIE 1931 (x, y) (1)	(0.404, 0.383)	
	CIE 1976 (u', v') (1)	(0.238, 0.508)	
	Correlated Color Temperature (CCT) (1)	3470	K
	Color Spatial Uniformity (2)	0.0022	
	Color Rendering Index (Ra) (1)	86	
	Special CRI 9 (R_9) (1),(3)	30	
	Distance from Planckian Locus (Duv) (1),(3)	-0.0031	
	Scotopic/Photopic Ratio (1),(3)	1.56	

Electrical	Voltage	120	V	(Setpoint 1)
	Frequency	60	Hz	
	Current	0.427	A	
	Power	50.23	W	
	Power Factor	0.980		
	Current THD	11.28	%	
	Voltage	277	V	(Setpoint 2)
	Frequency	60	Hz	
	Current	0.242	A	
	Power	54.08	W	
	Power Factor	0.808		
	Current THD	15.79	%	

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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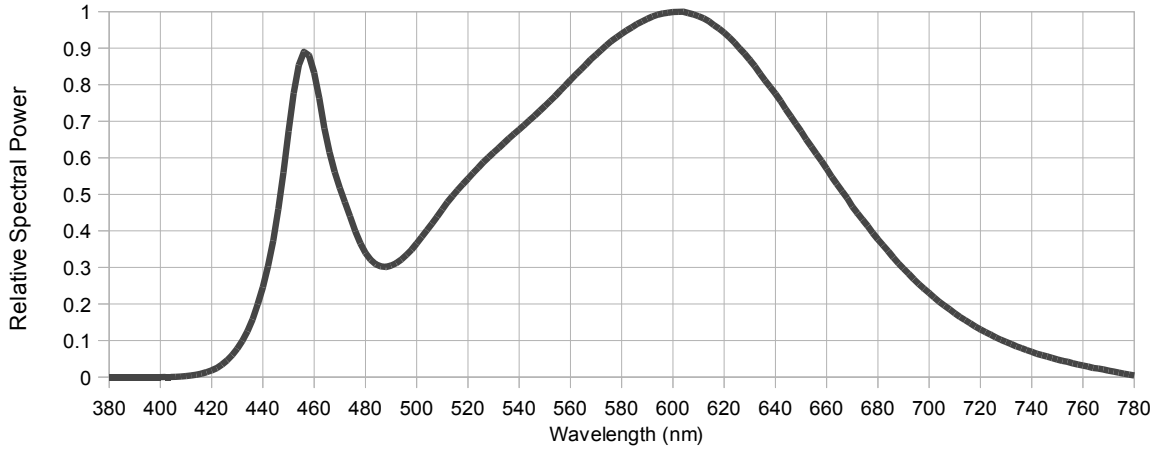
LM-79 Performance Data

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

380	0.00E+00	480	3.40E-01	580	9.39E-01	680	3.77E-01
385	0.00E+00	485	3.06E-01	585	9.61E-01	685	3.36E-01
390	0.00E+00	490	3.05E-01	590	9.80E-01	690	2.97E-01
395	0.00E+00	495	3.28E-01	595	9.93E-01	695	2.61E-01
400	0.00E+00	500	3.66E-01	600	9.99E-01	700	2.30E-01
405	3.07E-04	505	4.11E-01	605	9.98E-01	705	2.00E-01
410	2.52E-03	510	4.58E-01	610	9.88E-01	710	1.74E-01
415	7.73E-03	515	5.03E-01	615	9.68E-01	715	1.51E-01
420	1.82E-02	520	5.43E-01	620	9.43E-01	720	1.30E-01
425	3.98E-02	525	5.80E-01	625	9.08E-01	725	1.12E-01
430	7.75E-02	530	6.14E-01	630	8.68E-01	730	9.61E-02
435	1.41E-01	535	6.46E-01	635	8.21E-01	735	8.15E-02
440	2.46E-01	540	6.77E-01	640	7.75E-01	740	6.91E-02
445	4.16E-01	545	7.09E-01	645	7.23E-01	745	5.78E-02
450	6.73E-01	550	7.42E-01	650	6.73E-01	750	4.77E-02
455	8.72E-01	555	7.76E-01	655	6.21E-01	755	3.97E-02
460	8.32E-01	560	8.13E-01	660	5.70E-01	760	3.13E-02
465	6.48E-01	565	8.48E-01	665	5.18E-01	765	2.41E-02
470	5.18E-01	570	8.82E-01	670	4.67E-01	770	1.73E-02
475	4.20E-01	575	9.14E-01	675	4.22E-01	775	1.08E-02
						780	4.19E-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	(0.238, 0.506)	(0.238, 0.506)
10	(0.238, 0.506)	(0.000, 0.000)
20	(0.238, 0.507)	(0.000, 0.000)
30	(0.238, 0.507)	(0.000, 0.000)
40	(0.238, 0.508)	(0.000, 0.000)
50	(0.238, 0.509)	(0.000, 0.000)
60	(0.239, 0.510)	(0.000, 0.000)
70	I <= 10 %	(0.000, 0.000)
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	1 hour
Sample Orientation	Horizontal	Total Operation Time	17.5 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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