

Report of Test

LLI-14272-12

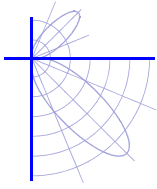
OptoLum "EcoLine" Extruded Aluminum Luminaire. Cat No. EL-LP-S--358USD-A072000
 Low profile extruded housing with extents ~ 72.375" x 1.0" x 0.375".
 Twelve white PCB sections marked "OptoLum EcoLine SLO R4.1" with five LEDs each on 1.187" centers.
 Curved clear plastic lens. Luminous Opening ~ 72 x 0.5 x 0.0625".
 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	1166 lm	Min Power Factor	0.65 @ 277 V
Luminaire Power	25.1 W	Max THD(i)*	29.6 % @ 277 V
Luminous Efficacy	46.5 lm/W	SC along*, across*	1.30 , 1.30
CCT	3420 K	SC Diagonal*	1.42
CIE(x,y) 1931	(0.408, 0.388)		
CRI	85		
0-60° Zonal Flux %	81.3 %		

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



Test Report No. LLI-14272-12

OptoLum "EcoLine" Extruded Aluminum Luminaire. Cat No. EL-LP-S--358USD-A072000

Low profile extruded housing with extents ~ 72.375" x 1.0" x 0.375".

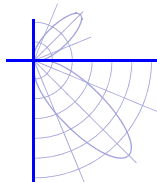
Twelve white PCB sections marked "OptoLum EcoLine SLO R4.1" with five LEDs each on 1.187" centers.

Curved clear plastic lens. Luminous Opening ~ 72 x 0.5 x 0.0625".

One remote "High Perfection Tech LP1090-24-GG-290 100-240Vac 47-63Hz" driver.

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





Test Report No. LLI-14272-12

OptoLum "EcoLine" Extruded Aluminum Luminaire. Cat No. EL-LP-S--358USD-A072000

Low profile extruded housing with extents ~ 72.375" x 1.0" x 0.375".

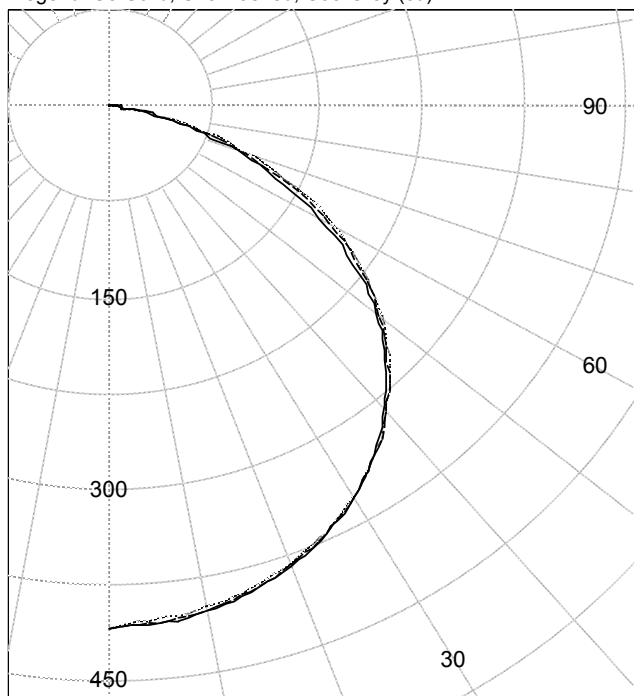
Twelve white PCB sections marked "OptoLum EcoLine SLO R4.1" with five LEDs each on 1.187" centers.

Curved clear plastic lens. Luminous Opening ~ 72 x 0.5 x 0.0625".

One remote "High Perfection Tech LP1090-24-GG-290 100-240Vac 47-63Hz" driver.

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

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



INTENSITY SUMMARY (cd)

Gamma	C-Plane					Flux (lm)
	C0	C22.5	C45	C67.5	C90	
0.0	408	408	408	408	408	
5.0	407	406	406	408	403	39
10.0	402	401	401	403	399	
15.0	394	393	393	396	391	111
20.0	384	383	382	385	381	
25.0	370	369	370	372	369	171
30.0	353	353	354	356	352	
35.0	332	333	333	337	334	209
40.0	308	309	311	315	311	
45.0	282	285	285	289	286	220
50.0	251	252	255	259	257	
55.0	215	218	222	227	224	197
60.0	174	178	184	189	188	
65.0	133	135	142	148	147	140
70.0	94	96	97	105	104	
75.0	60	59	60	63	64	65
80.0	27	28	30	28	29	
85.0	6	7	9	10	7	12
90.0	3	3	3	3	0	

ZONAL FLUX AND PERCENTAGES

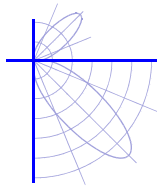
Zone	Flux (lm)	% Lamp	% Luminaire
0-30	321	N / A	27.5
0-40	530	N / A	45.5
0-60	947	N / A	81.3
0-90	1164	N / A	99.9
40-90	634	N / A	54.4
60-90	217	N / A	18.6
90-180	2	N / A	0.1
0-180	1166	N / A	100.0

Total Light Output = 1,166 lm

Signed: *E Southgate*

Eric Southgate
Authorized Signatory

Date of test 12-Oct-2014
Date of report 15-Oct-2014



Test Report No. LLI-14272-12

OptoLum "EcoLine" Extruded Aluminum Luminaire. Cat No. EL-LP-S--358USD-A072000

Low profile extruded housing with extents ~ 72.375" x 1.0" x 0.375".

Twelve white PCB sections marked "OptoLum EcoLine SLO R4.1" with five LEDs each on 1.187" centers.

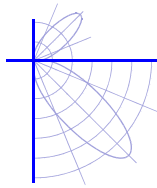
Curved clear plastic lens. Luminous Opening ~ 72 x 0.5 x 0.0625".

One remote "High Perfection Tech LP1090-24-GG-290 100-240Vac 47-63Hz" driver.

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

Intensity data (cd)

Gamma	C-Plane				
	C0	C22.5	C45	C67.5	C90
0.0	408	408	408	408	408
2.5	408	407	407	409	404
5.0	407	406	406	408	403
7.5	405	404	404	406	401
10.0	402	401	401	403	399
12.5	398	398	397	400	395
15.0	394	393	393	396	391
17.5	389	389	388	391	387
20.0	384	383	382	385	381
22.5	377	376	376	379	375
25.0	370	369	370	372	369
27.5	362	361	362	364	361
30.0	353	353	354	356	352
32.5	344	343	344	347	344
35.0	332	333	333	337	334
37.5	322	321	323	326	323
40.0	308	309	311	315	311
42.5	298	296	299	302	299
45.0	282	285	285	289	286
47.5	267	268	271	275	272
50.0	251	252	255	259	257
52.5	234	236	240	243	241
55.0	215	218	222	227	224
57.5	196	199	203	208	207
60.0	174	178	184	189	188
62.5	153	155	164	169	168
65.0	133	135	142	148	147
67.5	114	114	120	126	126
70.0	94	96	97	105	104
72.5	74	76	78	83	84
75.0	60	59	60	63	64
77.5	44	44	44	44	45
80.0	27	28	30	28	29
82.5	16	17	18	18	16
85.0	6	7	9	10	7
87.5	3	4	5	5	1
90.0	3	3	3	3	0



Test Report No. LLI-14272-12

OptoLum "EcoLine" Extruded Aluminum Luminaire. Cat No. EL-LP-S--358USD-A072000

Low profile extruded housing with extents ~ 72.375" x 1.0" x 0.375".

Twelve white PCB sections marked "OptoLum EcoLine SLO R4.1" with five LEDs each on 1.187" centers.

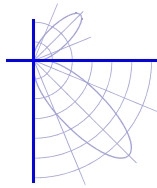
Curved clear plastic lens. Luminous Opening ~ 72 x 0.5 x 0.0625".

One remote "High Perfection Tech LP1090-24-GG-290 100-240Vac 47-63Hz" driver.

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

Intensity data (cd)

Gamma	C-Plane				
	C0	C22.5	C45	C67.5	C90
90.0	3	3	3	3	0
92.5	2	2	2	1	0
95.0	2	2	2	0	0
97.5	1	1	1	0	0
100.0	1	1	1	0	0
102.5	1	1	0	0	0
105.0	1	0	0	0	0
107.5	0	0	0	0	0
110.0	0	0	0	0	0
112.5	0	0	0	0	0
115.0	0	0	0	0	0
117.5	0	0	0	0	0
120.0	0	0	0	0	0
122.5	0	0	0	0	0
125.0	0	0	0	0	0
127.5	0	0	0	0	0
130.0	0	0	0	0	0
132.5	0	0	0	0	0
135.0	0	0	0	0	0
137.5	0	0	0	0	0
140.0	0	0	0	0	0
142.5	0	0	0	0	0
145.0	0	0	0	0	0
147.5	0	0	0	0	0
150.0	0	0	0	0	0
152.5	0	0	0	0	0
155.0	0	0	0	0	0
157.5	0	0	0	0	0
160.0	0	0	0	0	0
162.5	0	0	0	0	0
165.0	0	0	0	0	0
167.5	0	0	0	0	0
170.0	0	0	0	0	0
172.5	0	0	0	0	0
175.0	0	0	0	0	0
177.5	0	0	0	0	0
180.0	0	0	0	0	0



Test Report No. LLI-14272-12

OptoLum "EcoLine" Extruded Aluminum Luminaire. Cat No. EL-LP-S--358USD-A072000

Low profile extruded housing with extents ~ 72.375" x 1.0" x 0.375".

Twelve white PCB sections marked "OptoLum EcoLine SLO R4.1" with five LEDs each on 1.187" centers.

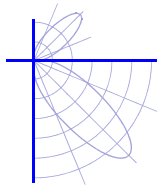
Curved clear plastic lens. Luminous Opening ~ 72 x 0.5 x 0.0625".

One remote "High Perfection Tech LP1090-24-GG-290 100-240Vac 47-63Hz" driver.

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

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	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		106	102	99	95		98	95	92		94	92	89		91	89	87	85
2	99	91	85	79		97	90	83	78		86	81	76		83	78	75		80	76	73	71
3	91	80	72	66		88	79	71	65		76	69	64		73	68	63		70	66	62	60
4	83	71	62	56		81	70	62	55		67	60	55		65	59	54		63	58	53	51
5	76	64	55	48		74	62	54	48		60	53	47		58	52	47		56	51	46	44
6	70	57	48	42		68	56	48	42		54	47	41		53	46	41		51	45	41	38
7	65	52	43	37		63	51	43	37		49	42	36		48	41	36		47	41	36	34
8	61	47	39	33		59	46	38	33		45	38	33		44	37	32		43	37	32	30
9	57	43	35	30		55	43	35	29		42	34	29		40	34	29		39	33	29	27
10	53	40	32	27		52	39	32	27		38	31	27		37	31	26		36	31	26	25



Test Report No. LLI-14272-12

OptoLum "EcoLine" Extruded Aluminum Luminaire. Cat No. EL-LP-S--358USD-A072000

Low profile extruded housing with extents ~ 72.375" x 1.0" x 0.375".

Twelve white PCB sections marked "OptoLum EcoLine SLO R4.1" with five LEDs each on 1.187" centers.

Curved clear plastic lens. Luminous Opening ~ 72 x 0.5 x 0.0625".

One remote "High Perfection Tech LP1090-24-GG-290 100-240Vac 47-63Hz" driver.

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

LM-79 Performance Data

Spectral	CIE 1931 (x, y) ⁽¹⁾	(0.408, 0.388)	
	CIE 1976 (u', v') ⁽¹⁾	(0.239, 0.511)	
	Correlated Color Temperature (CCT) ⁽¹⁾	3420 K	
	Color Spatial Uniformity ⁽²⁾	0.0081	
	Color Rendering Index (Ra) ⁽¹⁾	85	
	Special CRI 9 (R _g) ^{(1),(3)}	27	
	Distance from Planckian Locus (Duv) ^{(1),(3)}	-0.0017	
	Scotopic/Photopic Ratio ^{(1),(3)}	1.52	
Electrical	Voltage	120 V	(Setpoint 1)
	Frequency	60 Hz	
	Current	0.2198 A	
	Power	25.056 W	
	Power Factor	0.949	
	Current THD	9.36 %	
	Voltage	277 V	(Setpoint 2)
	Frequency	60 Hz	
	Current	0.1690 A	
	Power	30.41 W	
	Power Factor	0.650	
	Current THD	29.55 %	

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



Test Report No. LLI-14272-12

OptoLum "EcoLine" Extruded Aluminum Luminaire. Cat No. EL-LP-S--358USD-A072000

Low profile extruded housing with extents ~ 72.375" x 1.0" x 0.375".

Twelve white PCB sections marked "OptoLum EcoLine SLO R4.1" with five LEDs each on 1.187" centers.

Curved clear plastic lens. Luminous Opening ~ 72 x 0.5 x 0.0625".

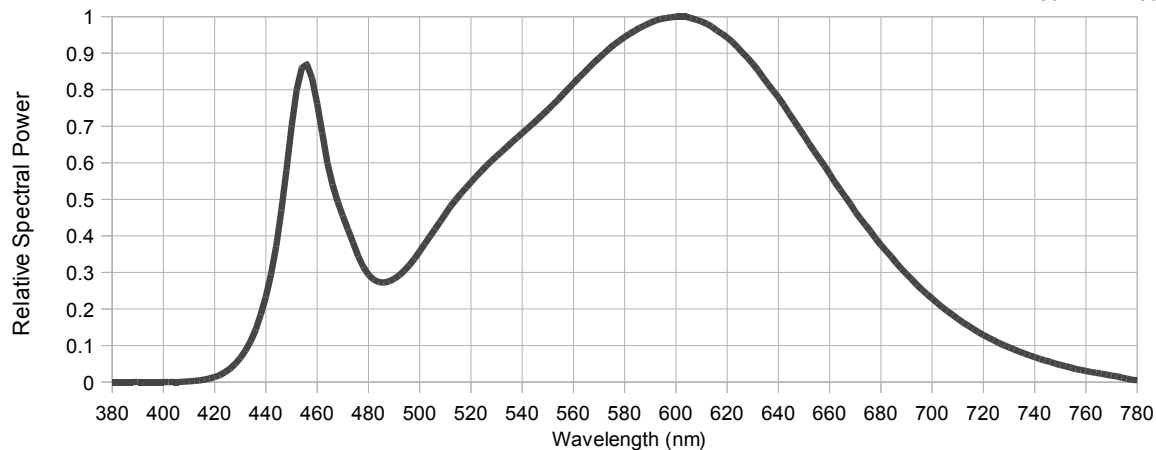
One remote "High Perfection Tech LP1090-24-GG-290 100-240Vac 47-63Hz" driver.

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

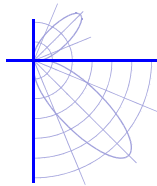
LM-79 Performance Data

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

380	0.00E+00	480	2.94E-01	580	9.44E-01	680	3.75E-01
385	0.00E+00	485	2.73E-01	585	9.66E-01	685	3.35E-01
390	0.00E+00	490	2.82E-01	590	9.83E-01	690	2.95E-01
395	0.00E+00	495	3.13E-01	595	9.95E-01	695	2.60E-01
400	0.00E+00	500	3.58E-01	600	1.00E+00	700	2.29E-01
405	1.98E-04	505	4.08E-01	605	9.98E-01	705	1.99E-01
410	1.67E-03	510	4.60E-01	610	9.87E-01	710	1.73E-01
415	5.49E-03	515	5.06E-01	615	9.67E-01	715	1.50E-01
420	1.35E-02	520	5.47E-01	620	9.43E-01	720	1.29E-01
425	3.17E-02	525	5.84E-01	625	9.09E-01	725	1.11E-01
430	6.58E-02	530	6.18E-01	630	8.71E-01	730	9.50E-02
435	1.27E-01	535	6.50E-01	635	8.24E-01	735	8.05E-02
440	2.33E-01	540	6.81E-01	640	7.79E-01	740	6.81E-02
445	4.21E-01	545	7.12E-01	645	7.26E-01	745	5.69E-02
450	6.99E-01	550	7.46E-01	650	6.75E-01	750	4.66E-02
455	8.64E-01	555	7.80E-01	655	6.21E-01	755	3.78E-02
460	7.62E-01	560	8.17E-01	660	5.70E-01	760	3.03E-02
465	5.70E-01	565	8.53E-01	665	5.18E-01	765	2.39E-02
470	4.55E-01	570	8.87E-01	670	4.65E-01	770	1.73E-02
475	3.63E-01	575	9.18E-01	675	4.21E-01	775	1.06E-02
						780	4.89E-03



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



Test Report No. LLI-14272-12

OptoLum "EcoLine" Extruded Aluminum Luminaire. Cat No. EL-LP-S--358USD-A072000

Low profile extruded housing with extents ~ 72.375" x 1.0" x 0.375".

Twelve white PCB sections marked "OptoLum EcoLine SLO R4.1" with five LEDs each on 1.187" centers.

Curved clear plastic lens. Luminous Opening ~ 72 x 0.5 x 0.0625".

One remote "High Perfection Tech LP1090-24-GG-290 100-240Vac 47-63Hz" driver.

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

LM-79 Performance Data

Spatial measurements

Vertical angle (deg)	CIE 1976 (u',v') coordinates	
	Horizontal 0 plane	Horizontal 90 plane
0	(0.238, 0.508)	(0.238, 0.508)
10	(0.238, 0.509)	(0.238, 0.509)
20	(0.238, 0.508)	(0.238, 0.509)
30	(0.238, 0.510)	(0.238, 0.510)
40	(0.238, 0.511)	(0.239, 0.510)
50	(0.238, 0.511)	(0.239, 0.511)
60	(0.239, 0.512)	(0.239, 0.512)
70	(0.240, 0.514)	(0.240, 0.513)
80	(0.242, 0.518)	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 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	Horizontal	Stabilization Time	1.5 hour
		Total Operation Time	16.25 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	± 0.25°		

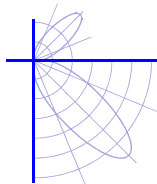
PhotoResearch PR-670 spectroradiometer (380 - 780 nm., 2 nm. per pixel) measuring at a distance from the sample deemed greater than five times the maximum observed luminous opening dimension.

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)



Test Report No. LLI-14272-12

OptoLum "EcoLine" Extruded Aluminum Luminaire. Cat No. EL-LP-S--358USD-A072000

Low profile extruded housing with extents ~ 72.375" x 1.0" x 0.375".

Twelve white PCB sections marked "OptoLum EcoLine SLO R4.1" with five LEDs each on 1.187" centers.

Curved clear plastic lens. Luminous Opening ~ 72 x 0.5 x 0.0625".

One remote "High Perfection Tech LP1090-24-GG-290 100-240Vac 47-63Hz" driver.

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.

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