

Report of Test

LLI-14188-11D

Optolum "FineLine" Extruded Aluminum Luminaire. Cat No. FL-AL-L--358USD-A072000.
Grey, triangular section aluminum housing, grey plastic end-caps (extent: 72.6" x 1.0" x 0.7" high).
Flat clear lens forms luminous opening of 72.1" x 0.75".

24 x 3" long white PCBs marked "Optolum FineLine LO Rev A1", each has six SMT LEDs at 0.5" centers.

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

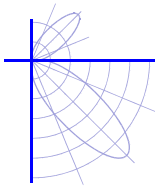
Tested horizontally in free air at 120 V, 60 Hz with beam directed to nadir.



Performance Summary

Total Light Output	674 lm	Min Power Factor	0.56 @ 277 V
Luminaire Power	15.2 W	Max THD(i)*	25.8 % @ 277 V
Luminous Efficacy	44.3 lm/W	SC along*, across*	1.30 , 1.28
CCT	3430 K	SC Diagonal*	1.40
CIE(x,y)	(0.409, 0.391)		
CRI	85		
0-60° Zonal Flux %	87.1 %		

PREPARED FOR : Optolum Inc, Tempe AZ 85281



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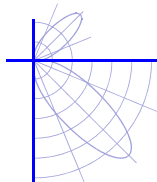
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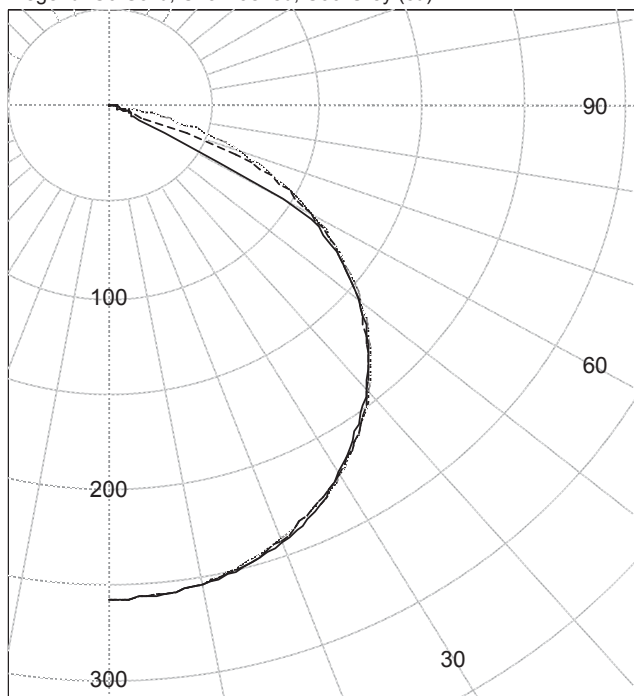
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Legend: C0-Solid, C45-Dashed, C90-Grey (cd)



INTENSITY SUMMARY (cd)

Gamma	C-Plane					Flux (lm)
	C0	C22.5	C45	C67.5	C90	
0.0	257	257	257	257	257	
5.0	256	256	256	256	256	24
10.0	254	254	254	253	253	
15.0	249	249	249	248	248	70
20.0	243	243	241	241	241	
25.0	233	233	232	232	233	107
30.0	221	221	221	222	222	
35.0	207	207	209	209	209	130
40.0	192	191	193	195	195	
45.0	176	174	175	177	178	135
50.0	156	154	156	158	158	
55.0	134	132	135	136	136	120
60.0	97	107	111	113	113	
65.0	11	13	85	87	88	64
70.0	9	9	17	62	64	
75.0	8	7	6	38	38	20
80.0	6	6	4	4	17	
85.0	4	4	3	2	3	4
90.0	0	0	0	0	0	

ZONAL FLUX AND PERCENTAGES

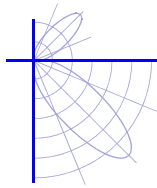
Zone	Flux (lm)	% Lamp	% Luminaire
0-30	202	N / A	29.9
0-40	332	N / A	49.2
0-60	587	N / A	87.1
0-90	674	N / A	100.0
40-90	342	N / A	50.8
60-90	87	N / A	12.9
90-180	0	N / A	0.0
0-180	674	N / A	100.0

Total Light Output = 674 lm

Signed:

P. Lawrance
Authorized Signatory

Date of test 13-Jul-2014
Date of report 20-Aug-2014



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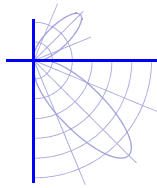
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Intensity data (cd)

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	C0	C22.5	C45	C67.5	C90
0.0	257	257	257	257	257
2.5	257	257	257	257	257
5.0	256	256	256	256	256
7.5	255	255	255	255	255
10.0	254	254	254	253	253
12.5	252	252	251	251	251
15.0	249	249	249	248	248
17.5	246	246	245	245	244
20.0	243	243	241	241	241
22.5	239	238	237	237	237
25.0	233	233	232	232	233
27.5	228	228	227	228	228
30.0	221	221	221	222	222
32.5	214	214	216	216	216
35.0	207	207	209	209	209
37.5	200	199	201	202	202
40.0	192	191	193	195	195
42.5	184	182	184	186	186
45.0	176	174	175	177	178
47.5	166	164	166	168	168
50.0	156	154	156	158	158
52.5	146	143	146	147	147
55.0	134	132	135	136	136
57.5	121	120	123	125	125
60.0	97	107	111	113	113
62.5	21	71	99	100	101
65.0	11	13	85	87	88
67.5	10	10	71	74	76
70.0	9	9	17	62	64
72.5	8	8	7	50	51
75.0	8	7	6	38	38
77.5	7	7	5	26	27
80.0	6	6	4	4	17
82.5	6	5	4	3	9
85.0	4	4	3	2	3
87.5	1	2	2	1	1
90.0	0	0	0	0	0



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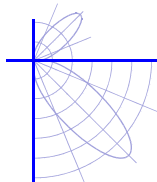
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Coefficients Of Utilization * - Zonal Cavity Method
Effective Floor Cavity Reflectance 0.20

RC RW	80				70				50				30				10				0
	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	50	30	10	0
0	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	100	100	100	100
1	110	106	102	99	108	104	100	97	100	97	94	96	94	91	92	90	89	87	87	87	87
2	101	94	87	82	99	92	86	81	88	83	79	85	81	78	82	79	76	74	74	74	74
3	93	83	75	69	90	81	74	69	78	72	67	76	71	66	73	69	65	63	63	63	63
4	85	74	65	59	83	72	65	59	70	63	58	68	62	57	65	60	56	54	54	54	54
5	78	66	57	51	76	65	57	51	63	56	50	61	55	50	59	54	49	47	47	47	47
6	72	59	51	45	70	59	50	44	57	49	44	55	49	44	54	48	43	41	41	41	41
7	67	54	45	39	65	53	45	39	52	44	39	50	44	39	49	43	38	37	37	37	37
8	62	49	41	35	61	49	41	35	47	40	35	46	39	35	45	39	34	33	33	33	33
9	58	45	37	32	57	45	37	32	43	36	31	42	36	31	41	35	31	29	29	29	29
10	55	42	34	29	53	41	34	29	40	33	29	39	33	28	38	32	28	27	27	27	27



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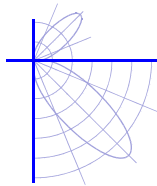
LM-79 Performance Data

Spectral	CIE 1931 (x, y) ⁽¹⁾	(0.409, 0.391)
	CIE 1976 (u', v') ⁽¹⁾	(0.238, 0.512)
	Correlated Color Temperature (CCT) ⁽¹⁾	3430 K
	Color Spatial Uniformity ⁽²⁾	0.0039
	Color Rendering Index (Ra) ⁽¹⁾	85
	Special CRI 9 (R _g) ^{(1),(3)}	28
	Distance from Planckian Locus (Duv) ^{(1),(3)}	-0.0008
	Scotopic/Photopic Ratio ^{(1),(3)}	1.53
Electrical	Voltage	120 V (Setpoint 1)
	Frequency	60 Hz
	Current	0.143 A
	Power	15.2 W
	Power Factor	0.89
	Current THD	10.9 %
	Voltage	240 V (Setpoint 2)
	Frequency	60 Hz
	Current	0.123 A
	Power	16.6 W
Power Factor	0.56	
Current THD	25.8 %	

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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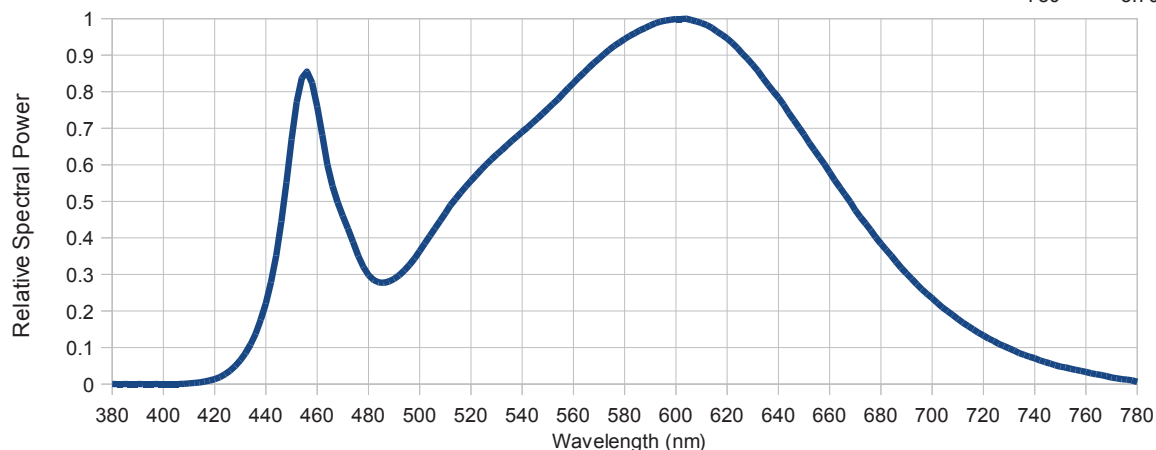
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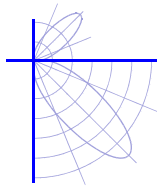
LM-79 Performance Data

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

380	3.24E-05	480	2.98E-01	580	9.44E-01	680	3.84E-01
385	1.28E-05	485	2.77E-01	585	9.64E-01	685	3.43E-01
390	3.64E-05	490	2.88E-01	590	9.82E-01	690	3.02E-01
395	0.00E+00	495	3.18E-01	595	9.93E-01	695	2.66E-01
400	0.00E+00	500	3.64E-01	600	9.99E-01	700	2.35E-01
405	1.46E-04	505	4.16E-01	605	9.98E-01	705	2.05E-01
410	1.57E-03	510	4.68E-01	610	9.88E-01	710	1.78E-01
415	5.27E-03	515	5.15E-01	615	9.70E-01	715	1.54E-01
420	1.35E-02	520	5.56E-01	620	9.46E-01	720	1.33E-01
425	3.16E-02	525	5.94E-01	625	9.12E-01	725	1.14E-01
430	6.49E-02	530	6.28E-01	630	8.74E-01	730	9.77E-02
435	1.23E-01	535	6.59E-01	635	8.28E-01	735	8.22E-02
440	2.21E-01	540	6.90E-01	640	7.84E-01	740	7.05E-02
445	3.98E-01	545	7.21E-01	645	7.33E-01	745	5.83E-02
450	6.69E-01	550	7.53E-01	650	6.83E-01	750	4.75E-02
455	8.46E-01	555	7.88E-01	655	6.31E-01	755	4.04E-02
460	7.60E-01	560	8.24E-01	660	5.80E-01	760	3.29E-02
465	5.71E-01	565	8.58E-01	665	5.28E-01	765	2.57E-02
470	4.60E-01	570	8.91E-01	670	4.75E-01	770	1.79E-02
475	3.70E-01	575	9.20E-01	675	4.30E-01	775	1.26E-02
						780	5.79E-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 (lower hemisphere)

Vertical angle (deg)	CIE 1976 (u',v') coordinates	
	Horizontal 0 plane	Horizontal 90 plane
0	(0.237, 0.509)	(0.237, 0.509)
10	(0.238, 0.509)	(0.238, 0.509)
20	(0.238, 0.510)	(0.238, 0.510)
30	(0.238, 0.510)	(0.238, 0.511)
40	(0.238, 0.511)	(0.238, 0.512)
50	(0.238, 0.512)	(0.238, 0.513)
60	(0.238, 0.514)	(0.239, 0.514)
70	I <= 10 %	(0.239, 0.515)
80	I <= 10 %	I <= 10 %
-	-	-

Spatial measurements (upper hemisphere)

Vertical angle (deg)	CIE 1976 (u',v') coordinates	
	Horizontal 0 plane	Horizontal 90 plane
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-

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	Beam to nadir	Stabilization Time	1.5 hour
		Total Operation Time	4.75 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.

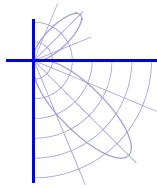
CIE (x, y) coordinates	± 0.003	CCT	± 100 K
CIE (u', v') coordinates	± 0.002	CRI (Ra)	± 3
Δ (u', v') Color difference	± 0.001	Scotopic / Photopic Ratio *	± 0.02
Relative Spectral Irradiance *	± 2 %	R9 *	± 3

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 v4.7 (13th Sep 2013)





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Test Distance: 8.0 metres

Test Temperature: 24.6 degrees Celsius

Significance: This laboratory has no control over 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 tested.

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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Corrections have been applied to the photometric data to account for the sample luminous opening length exceeding 20% of the test distance.