

Report of Test

LLI-14188-7D

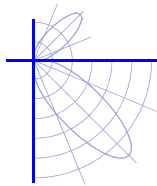
Optolum "FineLine" Extruded Aluminum Luminaire. Cat No. FL-LP-H--358UOD-A071982.
 Grey, circular arc section aluminum housing, grey plastic end-caps (extent: 72.2" x 1.0" x 0.4" high).
 Curved profile opal lens forms luminous opening of 72" x 0.5" x 0.1" high.
 53 x ~1.3" long white PCBs marked "Optolum FineLine Rev B1", each has six SMT LEDs at ~0.2" 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	1628 lm	Min Power Factor	0.75 @ 277 V
Luminaire Power	28.6 W	Max THD(i)*	20.3 % @ 277 V
Luminous Efficacy	56.9 lm/W	SC along*, across*	1.26 , 1.28
CCT	3300 K	SC Diagonal*	1.40
CIE(x,y)	(0.417, 0.397)		
CRI	83		
0-60° Zonal Flux %	75.8 %		

PREPARED FOR : Optolum Inc, Tempe AZ 85281



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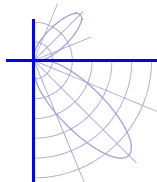
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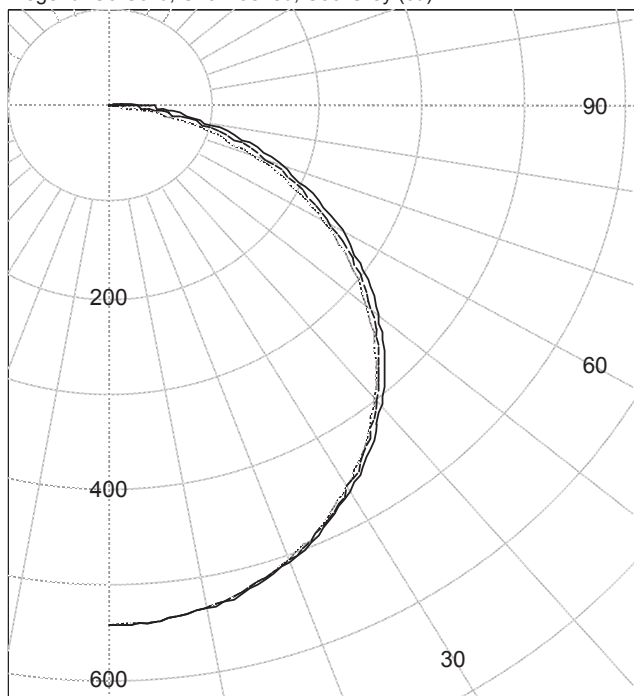
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Legend: C0-Solid, C45-Dashed, C90-Grey (cd)



INTENSITY SUMMARY (cd)

Gamma	C-Plane					Flux (lm)
	C0	C22.5	C45	C67.5	C90	
0.0	542	542	542	542	542	
5.0	540	540	539	540	540	51
10.0	533	533	532	532	532	
15.0	522	522	521	521	520	147
20.0	507	507	505	504	504	
25.0	487	487	485	483	483	224
30.0	464	463	460	458	458	
35.0	438	437	433	430	429	271
40.0	407	406	401	397	397	
45.0	373	372	367	362	361	283
50.0	338	336	330	323	323	
55.0	299	297	289	282	282	259
60.0	258	256	248	239	238	
65.0	215	213	204	194	192	201
70.0	173	169	160	149	146	
75.0	132	128	116	104	98	123
80.0	94	89	77	61	53	
85.0	62	57	44	27	17	48
90.0	38	33	21	8	0	

ZONAL FLUX AND PERCENTAGES

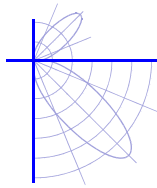
Zone	Flux (lm)	% Lamp	% Luminaire
0-30	422	N / A	25.9
0-40	693	N / A	42.6
0-60	1235	N / A	75.8
0-90	1607	N / A	98.7
40-90	914	N / A	56.1
60-90	372	N / A	22.8
90-180	22	N / A	1.3
0-180	1628	N / A	100.0

Total Light Output = 1,628 lm

Signed:

P. Lawrance
Authorized Signatory

Date of test 21-Jul-2014
Date of report 20-Aug-2014



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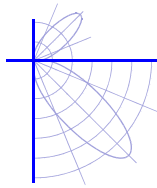
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Tested horizontally in free air at 120 V, 60 Hz with beam directed to nadir.

Intensity data (cd)

Gamma	C-Plane				
	C0	C22.5	C45	C67.5	C90
0.0	542	542	542	542	542
2.5	542	542	542	541	542
5.0	540	540	539	540	540
7.5	537	537	537	537	536
10.0	533	533	532	532	532
12.5	528	528	527	527	527
15.0	522	522	521	521	520
17.5	515	515	513	513	512
20.0	507	507	505	504	504
22.5	497	497	496	494	494
25.0	487	487	485	483	483
27.5	476	475	473	471	471
30.0	464	463	460	458	458
32.5	451	451	447	444	444
35.0	438	437	433	430	429
37.5	423	422	417	414	414
40.0	407	406	401	397	397
42.5	391	389	385	380	380
45.0	373	372	367	362	361
47.5	356	354	349	343	343
50.0	338	336	330	323	323
52.5	319	317	310	303	303
55.0	299	297	289	282	282
57.5	278	277	269	261	260
60.0	258	256	248	239	238
62.5	237	234	226	216	215
65.0	215	213	204	194	192
67.5	194	191	182	171	168
70.0	173	169	160	149	146
72.5	152	148	138	126	122
75.0	132	128	116	104	98
77.5	112	108	96	82	75
80.0	94	89	77	61	53
82.5	77	72	59	43	34
85.0	62	57	44	27	17
87.5	49	44	31	15	5
90.0	38	33	21	8	0



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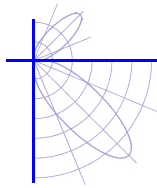
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Intensity data (cd)

Gamma	C-Plane				
	C0	C22.5	C45	C67.5	C90
90.0	38	33	21	8	0
92.5	28	25	14	4	0
95.0	21	18	10	2	0
97.5	16	13	7	2	0
100.0	12	10	5	2	0
102.5	9	8	4	1	0
105.0	8	7	4	1	0
107.5	7	6	4	1	0
110.0	6	5	3	1	0
112.5	6	5	3	1	0
115.0	6	5	3	1	0
117.5	5	5	3	1	0
120.0	5	4	3	1	0
122.5	4	3	2	0	0
125.0	4	3	2	0	0
127.5	4	3	1	0	0
130.0	3	3	1	0	0
132.5	3	2	1	0	0
135.0	3	2	1	0	0
137.5	2	2	0	0	0
140.0	2	1	0	0	0
142.5	1	1	0	0	0
145.0	1	1	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



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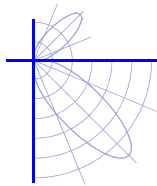
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Coefficients Of Utilization * - Zonal Cavity Method
Effective Floor Cavity Reflectance 0.20

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	110	110	110	105	105	105	101	101	101	99			99
1	108	103	98	94	105	100	96	93	96	92	89	92	89	86	88	86	84	81			81
2	98	89	82	76	95	87	81	75	83	78	73	80	75	71	77	73	70	67			67
3	89	78	70	63	86	76	69	62	73	67	61	70	65	60	68	63	59	56			56
4	81	69	60	53	79	68	59	53	65	58	52	62	56	51	60	55	50	48			48
5	75	62	52	46	73	60	52	45	58	51	45	56	49	44	54	48	44	41			41
6	69	55	46	40	67	54	46	40	52	45	39	51	44	39	49	43	38	36			36
7	64	50	41	35	62	49	41	35	48	40	35	46	39	34	45	38	34	32			32
8	59	46	37	31	58	45	37	31	44	36	31	42	35	31	41	35	30	28			28
9	56	42	34	28	54	41	33	28	40	33	28	39	32	28	38	32	27	25			25
10	52	39	31	25	51	38	30	25	37	30	25	36	30	25	35	29	25	23			23





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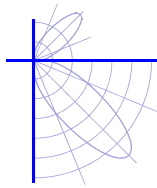
LM-79 Performance Data

Spectral	CIE 1931 (x, y) ⁽¹⁾	(0.417, 0.397)
	CIE 1976 (u', v') ⁽¹⁾	(0.241, 0.516)
	Correlated Color Temperature (CCT) ⁽¹⁾	3300 K
	Color Spatial Uniformity ⁽²⁾	0.0011
	Color Rendering Index (Ra) ⁽¹⁾	83
	Special CRI 9 (R ₉) ^{(1),(3)}	20
	Distance from Planckian Locus (Duv) ^{(1),(3)}	0.0002
	Scotopic/Photopic Ratio ^{(1),(3)}	1.43
Electrical	Voltage	120 V (Setpoint 1)
	Frequency	60 Hz
	Current	0.249 A
	Power	28.6 W
	Power Factor	0.96
	Current THD	9.6 %
	Voltage	240 V (Setpoint 2)
	Frequency	60 Hz
	Current	0.179 A
	Power	32.3 W
Power Factor	0.75	
Current THD	20.3 %	

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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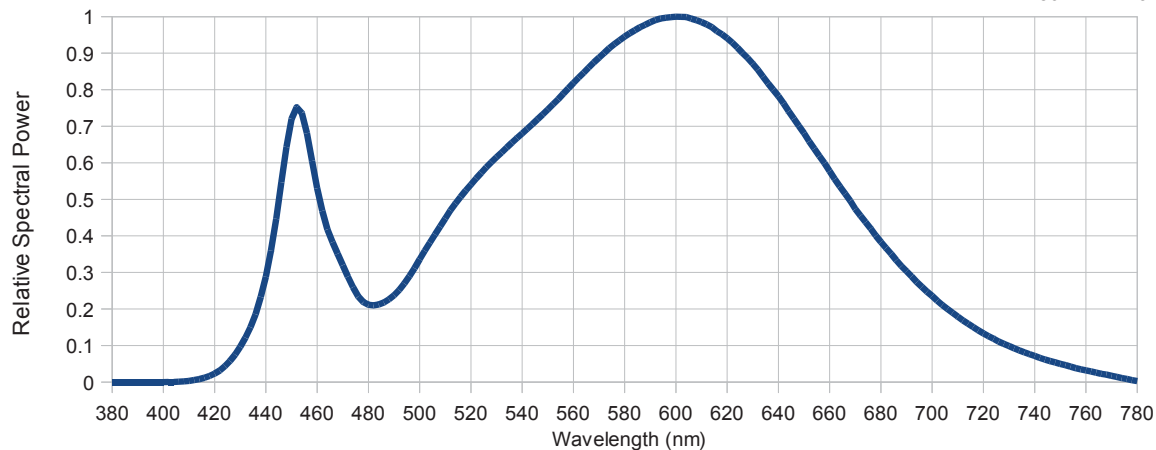
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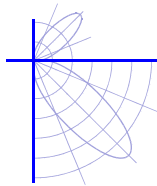
LM-79 Performance Data

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

380	0.00E+00	480	2.11E-01	580	9.45E-01	680	3.83E-01
385	0.00E+00	485	2.15E-01	585	9.67E-01	685	3.42E-01
390	0.00E+00	490	2.38E-01	590	9.85E-01	690	3.03E-01
395	0.00E+00	495	2.80E-01	595	9.96E-01	695	2.67E-01
400	0.00E+00	500	3.36E-01	600	1.00E+00	700	2.35E-01
405	5.63E-04	505	3.93E-01	605	9.97E-01	705	2.05E-01
410	3.28E-03	510	4.47E-01	610	9.85E-01	710	1.79E-01
415	9.94E-03	515	4.98E-01	615	9.66E-01	715	1.55E-01
420	2.32E-02	520	5.41E-01	620	9.41E-01	720	1.33E-01
425	5.05E-02	525	5.80E-01	625	9.08E-01	725	1.15E-01
430	9.64E-02	530	6.15E-01	630	8.71E-01	730	9.86E-02
435	1.68E-01	535	6.48E-01	635	8.27E-01	735	8.41E-02
440	2.88E-01	540	6.80E-01	640	7.82E-01	740	7.14E-02
445	4.97E-01	545	7.13E-01	645	7.31E-01	745	5.96E-02
450	7.20E-01	550	7.46E-01	650	6.81E-01	750	4.96E-02
455	7.09E-01	555	7.81E-01	655	6.29E-01	755	4.03E-02
460	5.30E-01	560	8.18E-01	660	5.77E-01	760	3.18E-02
465	4.00E-01	565	8.54E-01	665	5.25E-01	765	2.42E-02
470	3.20E-01	570	8.88E-01	670	4.74E-01	770	1.68E-02
475	2.47E-01	575	9.19E-01	675	4.29E-01	775	9.73E-03
						780	2.57E-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	(0.241, 0.515)	(0.241, 0.515)
10	(0.241, 0.515)	(0.241, 0.515)
20	(0.241, 0.515)	(0.241, 0.515)
30	(0.241, 0.515)	(0.241, 0.515)
40	(0.241, 0.515)	(0.241, 0.516)
50	(0.241, 0.516)	(0.241, 0.516)
60	(0.241, 0.516)	(0.241, 0.516)
70	(0.241, 0.516)	(0.241, 0.516)
80	(0.241, 0.517)	l <= 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	2.5 hour
		Total Operation Time	5.75 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.

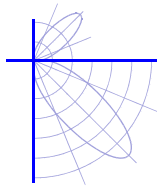
CIE (x, y) coordinates	± 0.003	CCT	± 100 K
CIE (u', v') coordinates	± 0.002	CRI (Ra)	± 3
Δ (u', v') Color difference	± 0.001	Scotopic / Photopic Ratio *	± 0.02
Relative Spectral Irradiance *	± 2 %	R9 *	± 3

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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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.

Test Distance: 8.0 metres

Test Temperature: 24.7 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.