

## **Indoor Distribution Test Report**

# **Spectrum Lighting Inc.**

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## **Spectrum Lighting Photometric Lab**

### **Luminaire**

ES03SMFxx 930 013 xxx DL FL GP MW  
Nom 3 inch square recessed estimator downlight

### **Test Number**

SP-00872

### **Test Date**

The results contained in this report pertain only to this IES file.

### Summary of Results

#### Power

Input Watts	14.5 W
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#### Lumen Output

Output Lumens	740
Efficacy	51.01 lm/W

#### Luminous Dimensions

0° - 180° Size	0.22
90° - 270° Size	0.22
Height	0

#### Spacing Criterion

Two luminaires, plane 0°	0.57
Two luminaires, plane 90°	0.58
Four luminaires	0.63

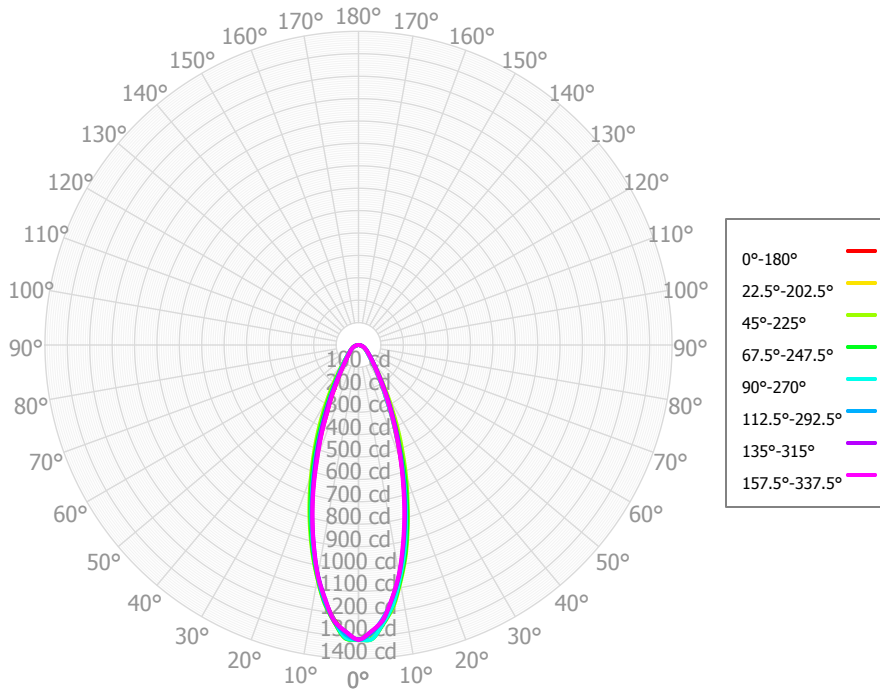
#### Full Beam Angle

0° - 180°	36°
90° - 270°	36°

### IES File Header Contents

Keyword	Value
TEST	SP-00872
TESTLAB	Spectrum Lighting Photometric Lab, VLS-245-981
MANUFAC	Spectrum Lighting
ISSUEDATE	6/6/2019
UPDATE	7/26/2019
LUMCAT	ES03SMFxx 930 013 xxx DL FL GP MW
LUMINAIRE	Nom 3 inch square recessed estimator downlight
LAMPCAT	N/A
LAMP	N/A; CRI: 90
OTHER	Beam Angle: 35.7 degrees
OTHER	CCT Output Multipliers: 27HK x 0.97
OTHER	This report prepared by Spectrum Lighting
_CRI	90
_CCTMULT	27HK x 0.97
_LAMPMULT	7L x 0.49

### Candela Polar Plot



### Zonal Lumen Summary

Zone	Lumens	% Fixture	Zone	Lumens	% Fixture
0.00° - 10.00°	113.63	15.36%	90.00° - 100.00°	0.07	0.01%
10.00° - 20.00°	222.55	30.09%	100.00° - 110.00°	0.00	0.00%
20.00° - 30.00°	171.34	23.16%	100.00° - 120.00°	0.00	0.00%
30.00° - 40.00°	91.67	12.39%	120.00° - 130.00°	0.00	0.00%
40.00° - 50.00°	54.78	7.41%	130.00° - 140.00°	0.00	0.00%
50.00° - 60.00°	39.16	5.29%	140.00° - 150.00°	0.00	0.00%
60.00° - 70.00°	28.14	3.80%	150.00° - 160.00°	0.00	0.00%
70.00° - 80.00°	15.52	2.10%	160.00° - 170.00°	0.00	0.00%
80.00° - 90.00°	2.85	0.39%	170.00° - 180.00°	0.00	0.00%
0.00° - 90.00°	739.64	99.99%	0.00° - 180.00°	739.72	100.00%

### Candela Distribution

	0.00°	22.50°	45.00°	67.50°	90.00°	112.50°	135.00°	157.50°	180.00°	202.50°	225.00°	247.50°	270.00°	292.50°	315.00°	337.50°	360.00°
0.00°	1,315.52	1,315.52	1,315.52	1,315.52	1,315.52	1,315.52	1,315.52	1,315.52	1,315.52	1,315.52	1,315.52	1,315.52	1,315.52	1,315.52	1,315.52	1,315.52	1,315.52
2.50°	1,294.06	1,311.15	1,316.14	1,315.48	1,315.80	1,295.19	1,281.33	1,282.59	1,288.88	1,305.14	1,312.22	1,311.93	1,308.91	1,289.70	1,281.06	1,281.38	1,294.06
5.00°	1,240.20	1,247.06	1,252.47	1,251.94	1,249.36	1,236.81	1,239.53	1,236.97	1,232.46	1,236.92	1,241.80	1,241.44	1,235.63	1,228.35	1,236.91	1,233.69	1,240.20
7.50°	1,156.16	1,176.38	1,182.70	1,175.31	1,172.30	1,155.52	1,142.11	1,145.74	1,149.71	1,160.26	1,163.51	1,159.74	1,152.70	1,147.04	1,143.82	1,142.62	1,156.16
10.00°	1,049.82	1,068.56	1,076.73	1,070.51	1,061.01	1,047.43	1,042.76	1,046.21	1,047.14	1,054.49	1,058.48	1,054.08	1,044.25	1,042.72	1,044.73	1,039.69	1,049.82
12.50°	930.10	959.05	969.06	961.74	946.78	929.48	918.72	922.11	928.99	944.73	951.19	943.88	931.18	928.08	921.72	914.69	930.10
15.00°	803.84	832.33	847.79	839.52	819.34	807.27	795.23	795.47	801.99	825.34	838.36	826.47	809.24	804.12	798.75	789.86	803.84
17.50°	674.57	706.82	727.73	716.50	691.88	683.99	675.52	665.54	674.39	707.33	727.11	712.15	689.74	683.76	675.92	665.27	674.57
20.00°	556.81	592.46	618.32	595.87	567.07	569.96	559.09	536.49	546.54	591.77	618.73	601.67	573.87	565.87	560.96	551.40	556.81
22.50°	442.85	481.26	511.30	476.86	445.84	457.36	456.72	430.10	435.75	482.82	518.00	497.26	466.65	463.66	462.12	448.97	442.85
25.00°	351.59	386.01	416.55	379.03	351.80	364.38	360.58	327.59	330.19	383.02	427.71	398.57	369.21	369.55	373.33	359.31	351.59
27.50°	265.32	297.89	327.82	286.76	265.22	272.97	282.44	259.48	259.70	298.58	346.25	316.28	289.22	293.86	299.87	280.34	265.32
30.00°	211.76	234.19	259.25	228.97	211.89	218.34	214.41	196.48	196.23	230.28	273.96	245.79	224.28	225.34	237.84	220.22	211.76
32.50°	162.64	179.21	198.90	176.08	164.44	165.40	167.42	158.65	159.87	179.58	215.03	193.99	177.26	181.03	189.06	172.05	162.64
35.00°	134.50	145.24	157.91	142.87	135.18	134.78	129.87	124.92	126.50	142.96	166.99	152.62	142.32	143.25	151.29	139.40	134.50
37.50°	107.69	116.73	124.00	113.76	109.15	106.02	107.41	104.48	106.35	116.31	132.25	124.37	117.31	120.13	123.53	114.06	107.69
40.00°	91.69	97.90	102.77	95.91	90.25	90.70	89.20	86.93	86.94	95.89	105.73	101.50	97.32	99.49	103.10	96.14	91.69
42.50°	76.23	82.29	85.21	80.49	74.64	76.40	76.13	76.24	74.75	80.99	87.22	85.92	83.96	85.61	87.72	80.82	76.23
45.00°	67.40	71.10	72.60	69.90	64.45	66.45	65.70	66.21	63.02	68.65	72.39	72.44	73.02	72.35	76.12	70.00	67.40
47.50°	59.01	61.64	62.78	60.54	56.28	57.59	57.71	57.32	55.62	60.24	63.48	63.08	63.43	64.62	66.46	60.24	59.01
50.00°	53.30	54.01	55.84	53.10	50.72	51.94	51.71	50.41	48.81	53.13	56.60	54.52	54.18	57.06	59.02	54.41	53.30
52.50°	47.87	47.90	49.70	47.30	45.76	46.90	47.15	46.11	45.14	47.43	50.60	49.02	49.25	50.90	52.44	49.13	47.87
55.00°	43.44	43.01	44.21	43.42	41.37	43.22	43.02	42.39	41.47	42.05	44.80	43.85	45.02	44.93	47.12	43.74	43.44
57.50°	39.03	38.70	39.28	39.30	37.77	39.05	39.13	39.26	37.80	37.92	40.12	39.60	39.67	40.52	42.15	38.34	39.03
60.00°	34.68	34.76	34.71	34.96	34.73	34.12	35.20	35.27	34.38	33.97	35.60	35.40	34.22	36.40	37.92	35.46	34.68
62.50°	30.68	31.79	31.16	30.37	31.49	30.56	31.25	30.59	31.59	30.97	32.28	31.83	31.77	33.54	33.81	32.59	30.68
65.00°	27.37	29.25	28.06	25.60	28.14	28.67	28.39	26.84	28.48	28.03	29.04	28.39	29.28	30.30	30.04	29.83	27.37
67.50°	24.06	25.35	24.38	23.58	24.68	25.32	25.85	23.66	24.78	25.45	26.17	26.02	25.49	25.90	26.31	26.77	24.06
70.00°	20.76	21.20	20.61	22.52	21.18	20.77	22.62	20.28	21.32	22.76	23.20	23.42	21.56	22.08	23.01	22.43	20.76
72.50°	17.03	17.99	17.42	18.61	17.54	17.79	19.35	16.84	18.11	19.33	19.60	19.95	17.00	19.15	19.70	18.62	17.03
75.00°	13.11	14.26	14.25	14.72	13.93	14.72	16.19	14.14	14.71	15.55	16.01	16.22	13.10	15.47	16.40	15.37	13.11
77.50°	9.09	10.18	11.07	10.63	10.35	10.02	12.70	11.13	11.27	11.29	12.44	12.17	9.89	11.41	13.11	11.27	9.09
80.00°	6.10	6.46	7.84	5.39	6.79	5.58	8.69	7.78	7.92	7.79	8.13	7.68	6.25	7.15	9.17	7.13	6.10
82.50°	3.39	4.34	3.63	2.27	3.29	2.95	4.48	4.45	4.37	4.66	4.33	4.16	3.19	4.01	4.39	3.76	3.39
85.00°	1.48	1.44	1.51	1.26	1.13	1.54	2.05	1.86	1.86	2.17	1.95	1.94	1.46	1.66	1.92	1.78	1.48
87.50°	1.22	1.00	0.89	1.04	0.90	0.94	1.21	1.12	1.16	1.10	1.29	0.96	1.13	1.02	1.14	1.09	1.22
90.00°	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.21	0.98	0.92	0.83	1.17	0.98	1.06	1.38	0.00	0.00
92.50°	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
95.00°	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
97.50°	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00°	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
102.50°	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
105.00°	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
107.50°	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
110.00°	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
112.50°	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

### Coefficients of Utilization – Zonal Cavity Method

Values are lumens delivered to the workplane.

<b>RCR</b>	<b>pfc</b>	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	0%
	<b>pcc</b>	80%	80%	80%	80%	70%	70%	70%	70%	50%	50%	50%	30%	30%	30%	10%	10%	0%
	<b>pw</b>	70%	50%	30%	10%	70%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	30%
	<b>0</b>	881	881	881	881	860	860	860	860	822	822	822	787	787	787	755	755	740
	<b>1</b>	834	811	790	771	815	794	776	759	764	749	736	736	725	714	711	702	687
	<b>2</b>	788	748	714	687	771	735	704	679	710	685	664	688	667	649	667	651	638
	<b>3</b>	745	693	653	621	730	683	646	616	663	632	606	645	618	596	628	606	594
	<b>4</b>	706	646	602	569	692	638	597	565	621	586	559	606	576	552	592	567	556
	<b>5</b>	671	605	560	526	658	598	556	524	585	548	519	572	540	514	560	532	523
	<b>6</b>	638	569	523	490	627	563	520	489	552	514	485	542	508	482	532	502	493
	<b>7</b>	608	538	492	460	598	533	489	458	523	484	456	514	479	454	506	475	467
	<b>8</b>	581	509	464	433	572	505	462	432	497	458	430	489	454	429	482	450	443
	<b>9</b>	556	484	440	410	547	480	438	409	473	435	408	467	431	406	460	428	422
	<b>10</b>	532	461	418	389	525	458	416	389	452	414	388	446	411	387	440	408	402

### Cone of Light

Mtg Height	Light Level	Beam Diameter
5.5 ft	43.5 fc	3.6 ft
6.5 ft	31.1 fc	4.2 ft
7.5 ft	23.4 fc	4.9 ft
8.0 ft	20.6 fc	5.2 ft
10.0 ft	13.2 fc	6.5 ft
12.0 ft	9.1 fc	7.8 ft
14.0 ft	6.7 fc	9.1 ft
16.0 ft	5.1 fc	10.4 ft
20.0 ft	3.3 fc	13.0 ft
24.0 ft	2.3 fc	15.6 ft
28.0 ft	1.7 fc	18.2 ft

### Average Luminaire Luminance [cd/m²]

	0.00°	45.00°	90.00°
<b>0.00°</b>	292,564	292,564	292,564
<b>45.00°</b>	21,197	22,834	20,269
<b>55.00°</b>	16,844	17,140	16,042
<b>65.00°</b>	14,401	14,767	14,809
<b>75.00°</b>	11,265	12,241	11,966
<b>85.00°</b>	3,771	3,844	2,896

### UGR CIE 190:2010

<b>Ceiling reflectance</b>		<b>0.7</b>	<b>0.7</b>	<b>0.5</b>	<b>0.5</b>	<b>0.3</b>	<b>0.7</b>	<b>0.7</b>	<b>0.5</b>	<b>0.5</b>	<b>0.3</b>
<b>Wall reflectance</b>		<b>0.5</b>	<b>0.3</b>	<b>0.5</b>	<b>0.3</b>	<b>0.3</b>	<b>0.5</b>	<b>0.3</b>	<b>0.5</b>	<b>0.3</b>	<b>0.3</b>
<b>Plane reflectance</b>		<b>0.2</b>	<b>0.2</b>	<b>0.2</b>	<b>0.2</b>	<b>0.2</b>	<b>0.2</b>	<b>0.2</b>	<b>0.2</b>	<b>0.2</b>	<b>0.2</b>
<b>Room dimensions</b>		<b>Viewed crosswise</b>					<b>Viewed endwise</b>				
<b>2H</b>	<b>2H</b>	18.4	19.6	18.8	19.9	20.2	18.5	19.7	18.9	20.0	20.3
	<b>3H</b>	20.1	21.1	20.5	21.5	21.8	20.2	21.2	20.6	21.6	21.9
	<b>4H</b>	20.6	21.6	21.0	21.9	22.3	20.8	21.7	21.2	22.1	22.5
	<b>6H</b>	20.9	21.8	21.3	22.1	22.5	21.0	21.9	21.4	22.3	22.7
	<b>8H</b>	20.9	21.7	21.3	22.1	22.5	21.1	21.9	21.5	22.3	22.7
	<b>12H</b>	20.9	21.7	21.3	22.1	22.5	21.0	21.8	21.5	22.2	22.6
<b>4H</b>	<b>2H</b>	19.0	19.9	19.4	20.3	20.7	19.0	20.0	19.4	20.3	20.7
	<b>3H</b>	20.9	21.7	21.3	22.1	22.5	21.0	21.8	21.4	22.2	22.6
	<b>4H</b>	21.5	22.2	22.0	22.7	23.1	21.7	22.4	22.1	22.8	23.2
	<b>6H</b>	21.9	22.5	22.3	22.9	23.4	22.0	22.6	22.5	23.1	23.5
	<b>8H</b>	21.9	22.5	22.4	22.9	23.4	22.0	22.6	22.5	23.1	23.5
	<b>12H</b>	21.9	22.4	22.4	22.9	23.3	22.0	22.5	22.5	23.0	23.5
<b>8H</b>	<b>4H</b>	21.8	22.3	22.3	22.8	23.3	21.9	22.5	22.4	22.9	23.4
	<b>6H</b>	22.2	22.7	22.7	23.2	23.6	22.3	22.8	22.9	23.3	23.8
	<b>8H</b>	22.3	22.7	22.8	23.2	23.7	22.4	22.8	22.9	23.3	23.8
	<b>12H</b>	22.3	22.6	22.8	23.1	23.7	22.4	22.8	22.9	23.3	23.8
<b>12H</b>	<b>4H</b>	21.8	22.3	22.3	22.7	23.2	21.9	22.4	22.4	22.9	23.4
	<b>6H</b>	22.2	22.6	22.7	23.1	23.6	22.4	22.8	22.9	23.2	23.8
	<b>8H</b>	22.3	22.7	22.8	23.2	23.7	22.4	22.8	23.0	23.3	23.9

Corrected UGR values based on total output lumens

SHR = 1.0