

## **Indoor Distribution Test Report**

# **Spectrum Lighting Inc.**

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## **Spectrum Lighting Photometric Lab**

### **Luminaire**

ES03SMFxx 930 007 xxx DL FL GP MW  
Nom 3 inch square recessed estimator downlight

### **Test Number**

SP-00872\_M-007L

### **Test Date**

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

### Summary of Results

#### Power

Input Watts	8.8 W
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#### Lumen Output

Output Lumens	362
Efficacy	41.19 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

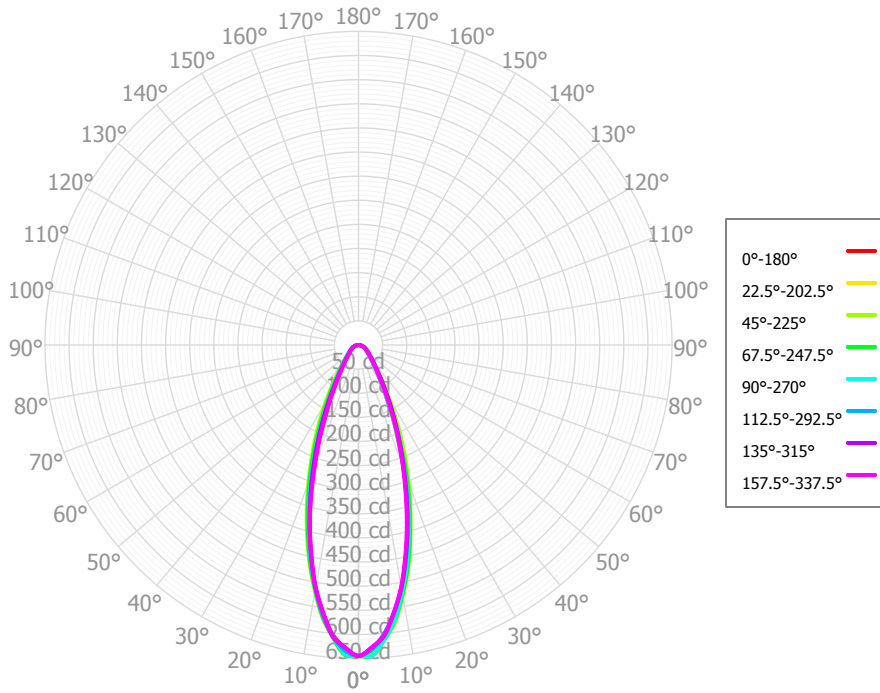
#### Full Beam Angle

0° - 180°	36°
90° - 270°	36°

### IES File Header Contents

Keyword	Value
TEST	SP-00872_M-007L
TESTLAB	Spectrum Lighting Photometric Lab, VLS-245-981
MANUFAC	Spectrum Lighting
ISSUEDATE	6/6/2019
UPDATE	7/26/2019
LUMCAT	ES03SMFxx 930 007 xxx DL FL GP MW
LUMINAIRE	Nom 3 inch square recessed estimator downlight
LAMPCAT	N/A
LAMP	N/A; CRI: 90, 9mm LES
OTHER	Beam Angle: 35.7 degrees
OTHER	CCT Output Multipliers: 27HK x 0.97
OTHER	This report prepared by Spectrum Lighting, scaled from 13L
_CCTMULT	27HK x 0.97

### Candela Polar Plot



### Zonal Lumen Summary

Zone	Lumens	% Fixture	Zone	Lumens	% Fixture
0.00° - 10.00°	55.68	15.36%	90.00° - 100.00°	0.04	0.01%
10.00° - 20.00°	109.05	30.09%	100.00° - 110.00°	0.00	0.00%
20.00° - 30.00°	83.96	23.16%	100.00° - 120.00°	0.00	0.00%
30.00° - 40.00°	44.92	12.39%	120.00° - 130.00°	0.00	0.00%
40.00° - 50.00°	26.84	7.41%	130.00° - 140.00°	0.00	0.00%
50.00° - 60.00°	19.19	5.29%	140.00° - 150.00°	0.00	0.00%
60.00° - 70.00°	13.79	3.80%	150.00° - 160.00°	0.00	0.00%
70.00° - 80.00°	7.60	2.10%	160.00° - 170.00°	0.00	0.00%
80.00° - 90.00°	1.40	0.39%	170.00° - 180.00°	0.00	0.00%
0.00° - 90.00°	362.42	99.99%	0.00° - 180.00°	362.46	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°	644.60	644.60	644.60	644.60	644.60	644.60	644.60	644.60	644.60	644.60	644.60	644.60	644.60	644.60	644.60	644.60	644.60
2.50°	634.09	642.46	644.91	644.59	644.74	634.64	627.85	628.47	631.55	639.52	642.99	642.85	641.36	631.95	627.72	627.88	634.09
5.00°	607.70	611.06	613.71	613.45	612.18	606.04	607.37	606.11	603.90	606.09	608.48	608.31	605.46	601.89	606.09	604.51	607.70
7.50°	566.52	576.43	579.52	575.90	574.43	566.20	559.63	561.42	563.36	568.53	570.12	568.27	564.82	562.05	560.47	559.88	566.52
10.00°	514.41	523.59	527.60	524.55	519.89	513.24	510.95	512.64	513.10	516.70	518.66	516.50	511.68	510.93	511.92	509.45	514.41
12.50°	455.75	469.93	474.84	471.25	463.92	455.44	450.17	451.83	455.21	462.92	466.08	462.50	456.28	454.76	451.64	448.20	455.75
15.00°	393.88	407.84	415.41	411.36	401.48	395.56	389.66	389.78	392.98	404.42	410.80	404.97	396.53	394.02	391.39	387.03	393.88
17.50°	330.54	346.34	356.59	351.09	339.02	335.16	331.00	326.11	330.45	346.59	356.28	348.95	337.97	335.04	331.20	325.98	330.54
20.00°	272.84	290.30	302.98	291.98	277.87	279.28	273.96	262.88	267.80	289.96	303.18	294.82	281.20	277.27	274.87	270.19	272.84
22.50°	216.99	235.82	250.54	233.66	218.46	224.11	223.79	210.75	213.52	236.58	253.82	243.66	228.66	227.20	226.44	219.99	216.99
25.00°	172.28	189.15	204.11	185.72	172.38	178.55	176.68	160.52	161.79	187.68	209.58	195.30	180.91	181.08	182.93	176.06	172.28
27.50°	130.01	145.96	160.63	140.51	129.96	133.75	138.40	127.15	127.25	146.30	169.66	154.98	141.72	143.99	146.94	137.37	130.01
30.00°	103.76	114.75	127.03	112.20	103.83	106.99	105.06	96.27	96.15	112.84	134.24	120.43	109.90	110.41	116.54	107.91	103.76
32.50°	79.69	87.81	97.46	86.28	80.58	81.05	82.03	77.74	78.33	87.99	105.36	95.05	86.86	88.70	92.64	84.30	79.69
35.00°	65.91	71.17	77.38	70.01	66.24	66.04	63.63	61.21	61.98	70.05	81.83	74.78	69.74	70.19	74.13	68.30	65.91
37.50°	52.77	57.20	60.76	55.74	53.48	51.95	52.63	51.20	52.11	56.99	64.80	60.94	57.48	58.86	60.53	55.89	52.77
40.00°	44.93	47.97	50.36	47.00	44.22	44.44	43.71	42.60	42.60	46.98	51.81	49.73	47.69	48.75	50.52	47.11	44.93
42.50°	37.35	40.32	41.75	39.44	36.58	37.44	37.30	37.36	36.63	39.68	42.74	42.10	41.14	41.95	42.99	39.60	37.35
45.00°	33.02	34.84	35.57	34.25	31.58	32.56	32.19	32.44	30.88	33.64	35.47	35.50	35.78	35.45	37.30	34.30	33.02
47.50°	28.91	30.21	30.76	29.67	27.58	28.22	28.28	28.09	27.26	29.52	31.11	30.91	31.08	31.66	32.57	29.52	28.91
50.00°	26.12	26.46	27.36	26.02	24.85	25.45	25.34	24.70	23.92	26.04	27.73	26.71	26.55	27.96	28.92	26.66	26.12
52.50°	23.46	23.47	24.35	23.18	22.42	22.98	23.10	22.60	22.12	23.24	24.79	24.02	24.13	24.94	25.69	24.07	23.46
55.00°	21.29	21.07	21.66	21.28	20.27	21.18	21.08	20.77	20.32	20.60	21.95	21.48	22.06	22.02	23.09	21.43	21.29
57.50°	19.13	18.97	19.25	19.26	18.51	19.14	19.18	19.24	18.52	18.58	19.66	19.40	19.44	19.86	20.65	18.79	19.13
60.00°	17.00	17.03	17.01	17.13	17.02	16.72	17.25	17.28	16.85	16.65	17.44	17.35	16.77	17.83	18.58	17.37	17.00
62.50°	15.04	15.58	15.27	14.88	15.43	14.97	15.31	14.99	15.48	15.18	15.82	15.60	15.57	16.44	16.57	15.97	15.04
65.00°	13.41	14.33	13.75	12.54	13.79	14.05	13.91	13.15	13.95	13.73	14.23	13.91	14.35	14.85	14.72	14.62	13.41
67.50°	11.79	12.42	11.95	11.55	12.09	12.40	12.66	11.59	12.14	12.47	12.83	12.75	12.49	12.69	12.89	13.12	11.79
70.00°	10.17	10.39	10.10	11.04	10.38	10.18	11.08	9.94	10.45	11.15	11.37	11.47	10.56	10.82	11.27	10.99	10.17
72.50°	8.34	8.81	8.54	9.12	8.59	8.72	9.48	8.25	8.87	9.47	9.60	9.78	8.33	9.39	9.65	9.12	8.34
75.00°	6.42	6.99	6.98	7.21	6.82	7.21	7.93	6.93	7.21	7.62	7.85	7.95	6.42	7.58	8.04	7.53	6.42
77.50°	4.46	4.99	5.42	5.21	5.07	4.91	6.22	5.45	5.52	5.53	6.09	5.96	4.85	5.59	6.42	5.52	4.46
80.00°	2.99	3.17	3.84	2.64	3.33	2.73	4.26	3.81	3.88	3.82	3.99	3.76	3.06	3.50	4.49	3.49	2.99
82.50°	1.66	2.12	1.78	1.11	1.61	1.44	2.19	2.18	2.14	2.28	2.12	2.04	1.56	1.97	2.15	1.84	1.66
85.00°	0.72	0.70	0.74	0.62	0.56	0.75	1.00	0.91	0.91	1.07	0.96	0.95	0.72	0.81	0.94	0.87	0.72
87.50°	0.60	0.49	0.44	0.51	0.44	0.46	0.59	0.55	0.57	0.54	0.63	0.47	0.55	0.50	0.56	0.53	0.60
90.00°	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.59	0.48	0.45	0.41	0.57	0.48	0.52	0.68	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>	431	431	431	431	421	421	421	421	403	403	403	386	386	386	370	370	362
	<b>1</b>	408	397	387	378	399	389	380	372	374	367	360	361	355	350	348	344	339
	<b>2</b>	386	366	350	336	378	360	345	333	348	336	325	337	327	318	327	319	312
	<b>3</b>	365	340	320	304	358	335	316	302	325	310	297	316	303	292	308	297	288
	<b>4</b>	346	317	295	279	339	312	292	277	304	287	274	297	282	270	290	278	272
	<b>5</b>	329	297	274	258	322	293	272	257	287	268	254	280	264	252	275	261	256
	<b>6</b>	313	279	256	240	307	276	255	239	271	252	238	265	249	236	261	246	242
	<b>7</b>	298	263	241	225	293	261	240	225	256	237	223	252	235	222	248	233	229
	<b>8</b>	285	250	227	212	280	247	226	212	243	224	211	240	223	210	236	221	217
	<b>9</b>	272	237	215	201	268	235	215	201	232	213	200	229	211	199	226	210	207
	<b>10</b>	261	226	205	191	257	224	204	190	221	203	190	218	201	189	216	200	197

### Cone of Light

Mtg Height	Light Level	Beam Diameter
5.5 ft	21.3 fc	3.6 ft
6.5 ft	15.3 fc	4.2 ft
7.5 ft	11.5 fc	4.9 ft
8.0 ft	10.1 fc	5.2 ft
10.0 ft	6.4 fc	6.5 ft
12.0 ft	4.5 fc	7.8 ft
14.0 ft	3.3 fc	9.1 ft
16.0 ft	2.5 fc	10.4 ft
20.0 ft	1.6 fc	13.0 ft
24.0 ft	1.1 fc	15.6 ft
28.0 ft	0.8 fc	18.2 ft

### Average Luminaire Luminance [cd/m²]

	0.00°	45.00°	90.00°
<b>0.00°</b>	143,356	143,356	143,356
<b>45.00°</b>	10,387	11,188	9,932
<b>55.00°</b>	8,254	8,399	7,861
<b>65.00°</b>	7,057	7,236	7,256
<b>75.00°</b>	5,520	5,998	5,864
<b>85.00°</b>	1,848	1,883	1,419

### 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>	15.9	17.1	16.3	17.4	17.7	16.0	17.2	16.4	17.5	17.8
	<b>3H</b>	17.6	18.7	18.0	19.0	19.3	17.7	18.8	18.1	19.1	19.5
	<b>4H</b>	18.2	19.1	18.6	19.5	19.9	18.3	19.2	18.7	19.6	20.0
	<b>6H</b>	18.4	19.3	18.8	19.6	20.0	18.6	19.4	19.0	19.8	20.2
	<b>8H</b>	18.4	19.3	18.9	19.6	20.1	18.6	19.4	19.0	19.8	20.2
	<b>12H</b>	18.4	19.2	18.8	19.6	20.0	18.5	19.3	19.0	19.7	20.2
<b>4H</b>	<b>2H</b>	16.5	17.5	16.9	17.8	18.2	16.6	17.5	17.0	17.9	18.3
	<b>3H</b>	18.4	19.2	18.8	19.6	20.0	18.5	19.3	18.9	19.7	20.1
	<b>4H</b>	19.1	19.8	19.5	20.2	20.6	19.2	19.9	19.6	20.3	20.8
	<b>6H</b>	19.4	20.0	19.9	20.4	20.9	19.5	20.1	20.0	20.6	21.1
	<b>8H</b>	19.4	20.0	19.9	20.4	20.9	19.6	20.1	20.0	20.6	21.1
	<b>12H</b>	19.4	19.9	19.9	20.4	20.9	19.6	20.0	20.0	20.5	21.0
<b>8H</b>	<b>4H</b>	19.3	19.9	19.8	20.3	20.8	19.4	20.0	19.9	20.4	20.9
	<b>6H</b>	19.7	20.2	20.2	20.7	21.2	19.9	20.3	20.4	20.8	21.3
	<b>8H</b>	19.8	20.2	20.3	20.7	21.2	19.9	20.3	20.5	20.9	21.3
	<b>12H</b>	19.8	20.2	20.3	20.7	21.2	19.9	20.3	20.5	20.8	21.4
<b>12H</b>	<b>4H</b>	19.3	19.8	19.8	20.3	20.7	19.4	19.9	19.9	20.4	20.9
	<b>6H</b>	19.7	20.1	20.3	20.6	21.1	19.9	20.3	20.4	20.8	21.3
	<b>8H</b>	19.8	20.2	20.3	20.7	21.3	20.0	20.3	20.5	20.8	21.4

Corrected UGR values based on total output lumens

SHR = 1.0