

## **Indoor Distribution Test Report**

# **Spectrum Lighting Inc.**

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## **Spectrum Lighting Photometric Lab**

### **Luminaire**

SP4SQES 11L 35KDX SR4ES SGxF  
Nom 4 inch square recessed downlight

### **Test Number**

SP-00834\_M-11L

### **Test Date**

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

### Summary of Results

#### Power

Input Watts	11 W
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#### Lumen Output

Output Lumens	866
Efficacy	78.75 lm/W

#### Luminous Dimensions

0° - 180° Size	0.33
90° - 270° Size	0.33
Height	0

#### Spacing Criterion

Two luminaires, plane 0°	1.34
Two luminaires, plane 90°	1.34
Four luminaires	1.26

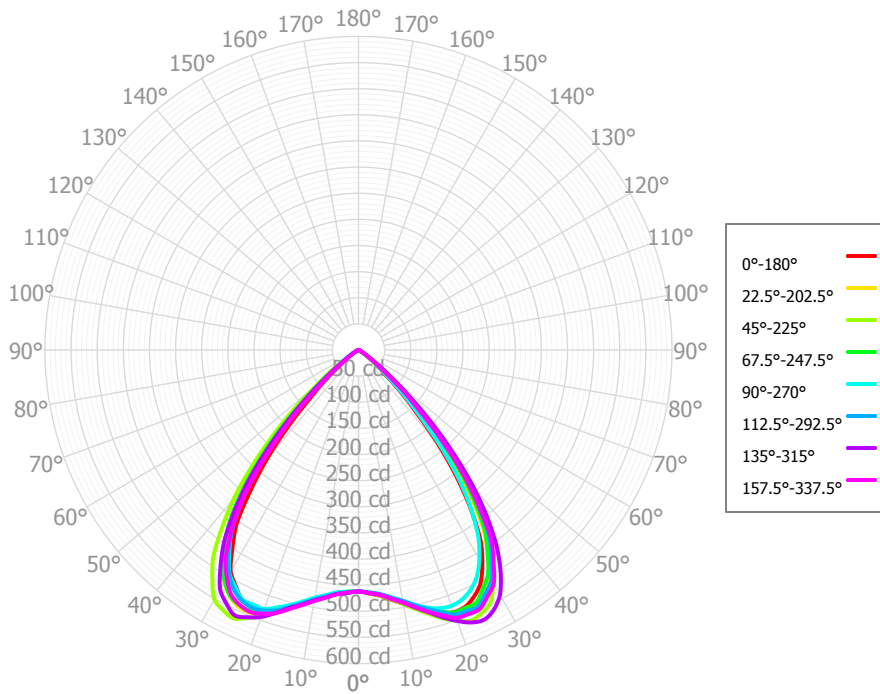
#### Full Beam Angle

0° - 180°	78°
90° - 270°	80°

### IES File Header Contents

Keyword	Value
TEST	SP-00834_M-11L
TESTLAB	Spectrum Lighting Photometric Lab, VLS-245-981
MANUFAC	Spectrum Lighting
ISSUEDATE	1/15/2019
UPDATE	9/18/2019
LUMCAT	SP4SQES 11L 35KDX SR4ES SGxF
LUMINAIRE	Nom 4 inch square recessed downlight
OTHER	Soft glow trim, semi-diffuse clear anodized, open aperture
OTHER	Beam angle: 77 degrees
LAMPCAT	N/A, 3500K CCT
LAMP	N/A
OTHER	CCT Output Multipliers: 30K x 0.985, 40K x 1.03
OTHER	Total luminaire watts is approximate
OTHER	This report prepared by Spectrum Lighting, scaled from 20L
_CRI	80+

### Candela Polar Plot



### Zonal Lumen Summary

Zone	Lumens	% Fixture	Zone	Lumens	% Fixture
0.00° - 10.00°	46.15	5.33%	90.00° - 100.00°	0.05	0.01%
10.00° - 20.00°	146.38	16.90%	100.00° - 110.00°	0.00	0.00%
20.00° - 30.00°	246.08	28.41%	100.00° - 120.00°	0.00	0.00%
30.00° - 40.00°	260.84	30.11%	120.00° - 130.00°	0.00	0.00%
40.00° - 50.00°	133.61	15.43%	130.00° - 140.00°	0.00	0.00%
50.00° - 60.00°	26.22	3.03%	140.00° - 150.00°	0.00	0.00%
60.00° - 70.00°	4.79	0.55%	150.00° - 160.00°	0.00	0.00%
70.00° - 80.00°	1.37	0.16%	160.00° - 170.00°	0.00	0.00%
80.00° - 90.00°	0.70	0.08%	170.00° - 180.00°	0.00	0.00%
0.00° - 90.00°	866.15	99.99%	0.00° - 180.00°	866.20	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°	462.21	462.21	462.21	462.21	462.21	462.21	462.21	462.21	462.21	462.21	462.21	462.21	462.21	462.21	462.21	462.21	462.21
2.50°	466.42	465.08	465.79	464.37	465.23	464.32	465.22	464.63	464.50	463.98	463.04	463.10	463.01	464.59	465.75	465.42	466.42
5.00°	472.24	469.86	472.12	469.07	469.86	468.31	468.80	469.32	468.06	467.74	466.45	466.84	465.53	469.18	470.13	470.88	472.24
7.50°	482.05	480.37	481.57	477.65	477.72	475.70	477.55	477.88	475.92	476.00	473.59	474.43	472.85	477.99	480.03	480.07	482.05
10.00°	493.47	491.74	493.63	487.70	487.24	484.64	486.56	488.08	485.63	485.59	483.25	483.77	481.34	487.72	490.78	490.93	493.47
12.50°	506.82	505.63	507.80	500.61	499.93	496.75	498.80	500.18	497.95	498.53	495.48	495.49	493.00	500.15	504.94	504.49	506.82
15.00°	518.93	519.74	523.07	514.35	510.60	509.17	511.26	513.46	511.15	511.99	509.13	508.73	505.19	512.99	519.72	518.97	518.93
17.50°	529.83	531.97	539.05	524.64	518.26	522.13	527.76	527.90	521.61	526.53	525.14	523.66	516.41	525.90	536.37	532.34	529.83
20.00°	533.89	543.90	550.91	534.22	520.86	530.67	543.59	537.18	531.36	537.74	542.17	533.98	527.53	538.81	551.78	545.41	533.89
22.50°	532.40	542.37	560.60	534.36	517.17	533.40	553.73	542.39	530.28	543.56	555.04	540.13	527.47	540.54	564.32	547.46	532.40
25.00°	521.71	539.71	556.31	533.18	506.88	528.98	560.34	538.10	527.26	542.51	566.50	538.44	526.76	541.54	569.42	547.43	521.71
27.50°	505.00	522.32	546.15	515.13	489.94	516.82	547.44	527.78	509.20	532.52	561.30	531.00	510.86	525.83	560.65	533.21	505.00
30.00°	474.15	502.05	516.37	495.80	462.83	495.00	529.48	503.94	489.42	513.34	551.78	512.03	494.03	508.71	541.41	517.30	474.15
32.50°	435.94	461.44	480.30	459.59	427.43	464.59	491.57	473.07	449.07	484.20	520.40	486.18	460.40	474.11	506.58	480.96	435.94
35.00°	378.51	416.82	426.63	422.40	379.42	422.56	448.53	424.72	407.55	441.66	485.09	445.67	424.42	436.87	462.09	443.47	378.51
37.50°	312.95	352.64	368.74	364.20	322.86	372.21	390.52	369.25	340.64	387.34	429.28	398.09	368.58	380.35	405.65	379.59	312.95
40.00°	242.07	286.72	299.94	304.76	255.75	309.18	328.59	300.70	273.51	322.22	371.19	336.58	310.64	321.25	341.59	315.04	242.07
42.50°	169.48	214.67	229.30	231.03	182.93	238.77	257.71	228.09	202.28	249.45	301.83	269.85	241.28	249.81	269.91	240.52	169.48
45.00°	116.80	148.69	164.35	159.82	126.53	172.50	189.74	163.96	133.71	181.85	231.82	203.31	174.88	181.51	201.14	168.03	116.80
47.50°	68.84	98.68	99.98	105.56	77.11	108.18	127.07	101.83	89.83	117.27	166.56	136.83	120.06	123.98	134.73	114.29	68.84
50.00°	46.28	57.55	64.26	57.50	51.52	69.35	76.87	65.70	50.27	73.90	102.71	90.38	73.01	74.32	85.45	64.91	46.28
52.50°	28.06	35.25	29.97	37.99	33.97	39.79	44.90	33.76	35.13	40.35	65.28	48.17	48.42	45.89	47.68	41.65	28.06
55.00°	19.74	19.09	19.87	21.48	23.96	25.98	23.24	22.64	21.77	24.91	30.33	31.05	28.67	24.23	26.14	21.59	19.74
57.50°	12.44	13.20	10.19	14.93	15.83	16.56	13.93	13.49	15.55	15.97	18.65	17.41	19.88	16.72	13.31	14.70	12.44
60.00°	8.96	8.60	7.33	9.46	11.09	11.07	7.91	9.44	10.15	10.69	8.36	11.95	12.74	10.72	7.72	8.88	8.96
62.50°	5.66	5.75	4.64	6.81	6.93	6.39	5.15	5.64	7.20	6.42	6.02	7.16	8.59	7.21	5.17	6.29	5.66
65.00°	4.29	3.84	3.34	4.55	4.80	4.55	3.60	4.01	4.73	4.59	3.95	5.32	5.39	4.55	3.55	4.17	4.29
67.50°	2.97	2.98	2.23	3.04	2.91	3.09	3.00	2.50	3.30	3.24	2.85	3.61	3.52	3.01	2.24	3.13	2.97
70.00°	1.98	2.30	1.81	2.03	2.27	2.19	2.20	1.88	2.27	2.28	1.98	2.47	2.46	2.01	1.57	2.28	1.98
72.50°	1.32	1.74	1.40	1.53	1.67	1.46	1.31	1.40	1.71	1.51	1.50	1.62	2.04	1.40	1.08	1.66	1.32
75.00°	1.21	1.19	0.99	1.18	1.18	1.16	1.24	1.14	1.54	1.29	1.15	1.34	1.55	1.17	1.01	1.23	1.21
77.50°	1.06	0.84	0.85	0.97	0.88	1.00	0.96	1.13	1.34	1.03	0.90	1.03	1.17	0.94	0.86	0.98	1.06
80.00°	0.90	0.75	0.71	0.99	0.75	0.92	0.53	1.07	0.82	0.80	0.76	0.83	0.97	0.65	0.71	1.01	0.90
82.50°	0.80	0.58	0.61	0.86	0.76	0.87	0.45	0.88	0.64	0.66	0.68	0.76	0.72	0.75	0.65	1.07	0.80
85.00°	0.78	0.43	0.60	0.71	0.57	0.78	0.71	0.65	0.68	0.57	0.85	0.62	0.69	0.94	0.52	0.78	0.78
87.50°	0.60	0.52	0.64	0.54	0.38	0.54	0.59	0.52	0.52	0.54	0.53	0.57	0.65	0.65	0.60	0.57	0.60
90.00°	0.40	0.33	0.31	0.23	0.39	0.37	0.22	0.50	0.27	0.53	0.25	0.44	0.71	0.22	0.49	0.24	0.40
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%	20%	0%
	<b>pcc</b>	80%	80%	80%	80%	70%	70%	70%	70%	50%	50%	50%	30%	30%	30%	10%	10%	10%	0%
	<b>pw</b>	70%	50%	30%	10%	70%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	30%
	<b>0</b>	1,031	1,031	1,031	1,031	1,007	1,007	1,007	1,007	962	962	962	921	921	921	884	884	884	866
	<b>1</b>	976	949	924	903	954	930	908	888	894	877	861	862	848	835	832	821	811	804
	<b>2</b>	918	870	830	796	898	855	818	787	826	796	770	800	775	753	775	755	737	740
	<b>3</b>	862	798	748	708	844	785	739	703	762	723	691	740	707	680	720	693	669	679
	<b>4</b>	808	732	677	635	791	722	671	631	703	658	623	685	646	615	668	635	608	623
	<b>5</b>	758	674	615	572	742	665	610	569	649	601	564	634	592	559	619	583	553	572
	<b>6</b>	711	621	561	518	697	614	557	516	600	550	512	587	543	509	575	536	505	526
	<b>7</b>	667	574	514	471	654	568	511	470	556	505	467	545	499	465	535	493	462	485
	<b>8</b>	627	532	472	431	616	527	469	430	516	465	428	507	460	426	498	455	424	448
	<b>9</b>	590	494	435	395	580	489	433	394	481	429	393	472	425	391	464	421	390	414
	<b>10</b>	557	460	402	364	547	456	401	363	448	397	362	441	394	361	434	391	360	385

### Cone of Light

Mtg Height	Light Level	Beam Diameter
5.5 ft	15.3 fc	8.9 ft
6.5 ft	10.9 fc	10.5 ft
7.5 ft	8.2 fc	12.2 ft
8.0 ft	7.2 fc	13.0 ft
10.0 ft	4.6 fc	16.2 ft
12.0 ft	3.2 fc	19.5 ft
14.0 ft	2.4 fc	22.7 ft
16.0 ft	1.8 fc	26.0 ft
20.0 ft	1.2 fc	32.4 ft
24.0 ft	0.8 fc	38.9 ft
28.0 ft	0.6 fc	45.4 ft

### Average Luminaire Luminance [cd/m²]

	0.00°	45.00°	90.00°
<b>0.00°</b>	45,686	45,686	45,686
<b>45.00°</b>	16,327	22,974	17,688
<b>55.00°</b>	3,402	3,424	4,129
<b>65.00°</b>	1,004	782	1,122
<b>75.00°</b>	462	378	451
<b>85.00°</b>	888	685	652

### UGR CIE 190:2010

Ceiling reflectance		0.7	0.7	0.5	0.5	0.3	0.7	0.7	0.5	0.5	0.3
Wall reflectance		0.5	0.3	0.5	0.3	0.3	0.5	0.3	0.5	0.3	0.3
Plane reflectance		0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Room dimensions		Viewed crosswise					Viewed endwise				
2H	2H	7.7	8.9	8.1	9.2	9.5	9.3	10.4	9.7	10.7	11.1
	3H	7.8	8.8	8.2	9.1	9.5	9.3	10.3	9.7	10.7	11.0
	4H	7.8	8.7	8.2	9.0	9.4	9.3	10.2	9.7	10.6	11.0
	6H	7.8	8.6	8.2	9.0	9.4	9.2	10.1	9.7	10.5	10.9
	8H	7.8	8.5	8.2	8.9	9.3	9.2	10.0	9.7	10.4	10.8
	12H	7.8	8.5	8.2	8.9	9.3	9.2	10.0	9.6	10.3	10.8
4H	2H	7.6	8.5	8.0	8.8	9.2	9.1	10.1	9.5	10.4	10.8
	3H	7.7	8.5	8.1	8.9	9.3	9.2	9.9	9.6	10.3	10.7
	4H	7.7	8.4	8.1	8.8	9.2	9.2	9.8	9.6	10.2	10.7
	6H	7.7	8.3	8.2	8.7	9.2	9.1	9.7	9.6	10.2	10.6
	8H	7.7	8.3	8.2	8.7	9.2	9.1	9.7	9.6	10.1	10.6
	12H	7.8	8.3	8.3	8.7	9.2	9.1	9.6	9.6	10.1	10.6
8H	4H	7.6	8.1	8.1	8.6	9.0	9.0	9.6	9.5	10.0	10.5
	6H	7.6	8.1	8.1	8.6	9.0	9.0	9.5	9.5	10.0	10.4
	8H	7.7	8.1	8.2	8.6	9.1	9.0	9.4	9.6	9.9	10.4
	12H	7.8	8.2	8.3	8.7	9.2	9.1	9.4	9.6	9.9	10.5
12H	4H	7.5	8.0	8.0	8.5	9.0	9.0	9.4	9.5	9.9	10.4
	6H	7.6	8.0	8.1	8.4	9.0	9.0	9.4	9.5	9.8	10.4
	8H	7.7	8.0	8.2	8.5	9.1	9.0	9.3	9.5	9.8	10.4

Corrected UGR values based on total output lumens

SHR = 1.0