

## Indoor Distribution Test Report

# Spectrum Lighting Inc.

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## Spectrum Lighting Photometric Lab

### Luminaire

SP4SQES 15L 35KDX SR4ES SGxF  
Nom 4 inch square recessed downlight

### Test Number

SP-00834\_M-15L

### Test Date

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

### Summary of Results

#### Power

Input Watts	15 W
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#### Lumen Output

Output Lumens	1126
Efficacy	75.07 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

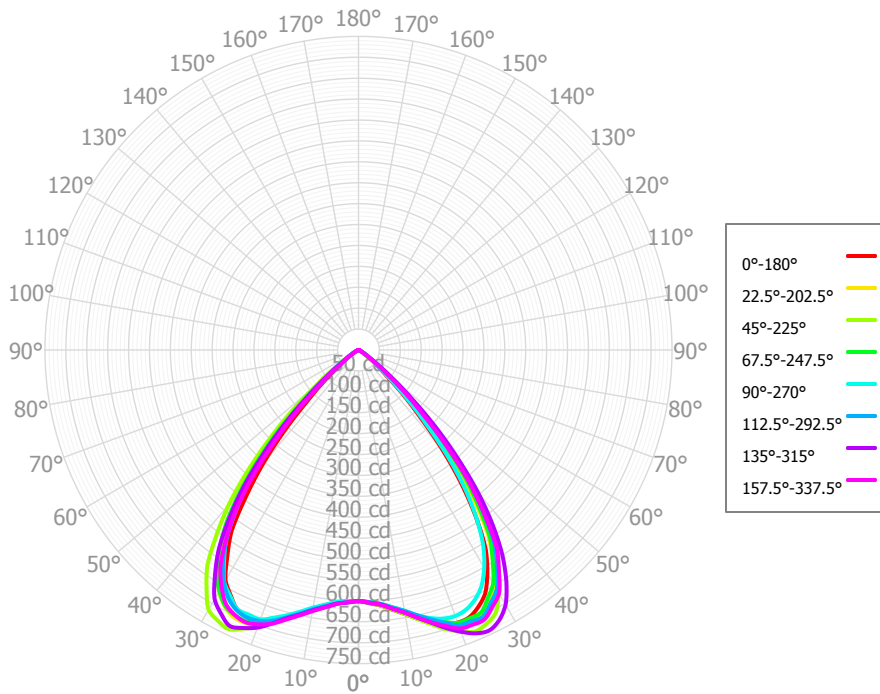
#### Full Beam Angle

0° - 180°	78°
90° - 270°	80°

### IES File Header Contents

Keyword	Value
TEST	SP-00834_M-15L
TESTLAB	Spectrum Lighting Photometric Lab, VLS-245-981
MANUFAC	Spectrum Lighting
ISSUEDATE	1/15/2019
UPDATE	9/18/2019
LUMCAT	SP4SQES 15L 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°	59.99	5.33%	90.00° - 100.00°	0.07	0.01%
10.00° - 20.00°	190.29	16.90%	100.00° - 110.00°	0.00	0.00%
20.00° - 30.00°	319.91	28.41%	100.00° - 120.00°	0.00	0.00%
30.00° - 40.00°	339.09	30.11%	120.00° - 130.00°	0.00	0.00%
40.00° - 50.00°	173.70	15.43%	130.00° - 140.00°	0.00	0.00%
50.00° - 60.00°	34.09	3.03%	140.00° - 150.00°	0.00	0.00%
60.00° - 70.00°	6.22	0.55%	150.00° - 160.00°	0.00	0.00%
70.00° - 80.00°	1.78	0.16%	160.00° - 170.00°	0.00	0.00%
80.00° - 90.00°	0.91	0.08%	170.00° - 180.00°	0.00	0.00%
0.00° - 90.00°	1,125.99	99.99%	0.00° - 180.00°	1,126.06	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°	600.88	600.88	600.88	600.88	600.88	600.88	600.88	600.88	600.88	600.88	600.88	600.88	600.88	600.88	600.88	600.88	600.88
2.50°	606.35	604.60	605.52	603.68	604.80	603.62	604.79	604.02	603.86	603.18	601.95	602.03	601.91	603.97	605.48	605.05	606.35
5.00°	613.91	610.82	613.76	609.79	610.82	608.80	609.44	610.11	608.48	608.06	606.38	606.89	605.19	609.93	611.17	612.15	613.91
7.50°	626.67	624.48	626.04	620.94	621.03	618.41	620.81	621.25	618.69	618.81	615.67	616.76	614.70	621.39	624.04	624.09	626.67
10.00°	641.51	639.26	641.72	634.01	633.42	630.03	632.53	634.50	631.32	631.27	628.22	628.91	625.74	634.04	638.01	638.21	641.51
12.50°	658.86	657.32	660.14	650.80	649.91	645.77	648.44	650.23	647.34	648.08	644.12	644.14	640.90	650.20	656.42	655.83	658.86
15.00°	674.60	675.67	679.99	668.65	663.78	661.92	664.64	667.50	664.50	665.59	661.87	661.35	656.74	666.89	675.64	674.67	674.60
17.50°	688.77	691.57	700.77	682.03	673.74	678.77	686.08	686.27	678.09	684.49	682.68	680.75	671.34	683.67	697.28	692.04	688.77
20.00°	694.05	707.07	716.18	694.48	677.12	689.87	706.67	698.34	690.77	699.06	704.82	694.18	685.79	700.45	717.32	709.03	694.05
22.50°	692.12	705.08	728.78	694.67	672.32	693.42	719.85	705.11	689.36	706.63	721.55	702.17	685.71	702.70	733.61	711.69	692.12
25.00°	678.22	701.62	723.20	693.13	658.94	687.67	728.44	699.53	685.44	705.26	736.45	699.97	684.79	704.00	740.24	711.66	678.22
27.50°	656.50	679.02	709.99	669.67	636.92	671.87	711.67	686.12	661.96	692.27	729.69	690.29	664.12	683.58	728.84	693.17	656.50
30.00°	616.40	652.66	671.28	644.54	601.68	643.50	688.33	655.13	636.25	667.34	717.31	665.64	642.23	661.32	703.83	672.49	616.40
32.50°	566.73	599.87	624.38	597.46	555.66	603.97	639.04	614.98	583.79	629.47	676.53	632.03	598.52	616.34	658.56	625.25	566.73
35.00°	492.06	541.87	554.62	549.12	493.24	549.33	583.08	552.14	529.81	574.16	630.61	579.37	551.75	567.93	600.71	576.51	492.06
37.50°	406.83	458.44	479.36	473.46	419.72	483.87	507.67	480.02	442.84	503.54	558.06	517.52	479.16	494.45	527.34	493.47	406.83
40.00°	314.69	372.73	389.92	396.18	332.47	401.94	427.17	390.91	355.56	418.89	482.55	437.55	403.84	417.62	444.07	409.55	314.69
42.50°	220.32	279.08	298.09	300.34	237.81	310.40	335.03	296.51	262.96	324.29	392.38	350.80	313.66	324.76	350.89	312.68	220.32
45.00°	151.84	193.30	213.66	207.77	164.49	224.25	246.66	213.14	173.83	236.41	301.37	264.30	227.34	235.97	261.49	218.44	151.84
47.50°	89.49	128.28	129.98	137.23	100.25	140.63	165.19	132.38	116.78	152.46	216.52	177.88	156.08	161.17	175.14	148.58	89.49
50.00°	60.17	74.82	83.54	74.75	66.97	90.16	99.93	85.41	65.35	96.07	133.52	117.50	94.91	96.62	111.08	84.39	60.17
52.50°	36.48	45.83	38.96	49.39	44.16	51.73	58.37	43.89	45.67	52.45	84.87	62.62	62.95	59.66	61.98	54.14	36.48
55.00°	25.67	24.81	25.83	27.92	31.15	33.78	30.21	29.44	28.30	32.39	39.43	40.36	37.27	31.50	33.99	28.06	25.67
57.50°	16.17	17.16	13.25	19.40	20.58	21.52	18.10	17.53	20.22	20.77	24.25	22.63	25.84	21.74	17.31	19.11	16.17
60.00°	11.65	11.18	9.53	12.29	14.41	14.39	10.29	12.28	13.20	13.90	10.87	15.53	16.56	13.94	10.03	11.54	11.65
62.50°	7.36	7.47	6.04	8.85	9.01	8.30	6.69	7.34	9.37	8.35	7.83	9.31	11.17	9.37	6.71	8.17	7.36
65.00°	5.58	4.99	4.34	5.91	6.24	5.92	4.68	5.21	6.15	5.97	5.13	6.92	7.01	5.91	4.61	5.42	5.58
67.50°	3.86	3.87	2.89	3.95	3.79	4.01	3.90	3.25	4.29	4.21	3.70	4.70	4.57	3.91	2.91	4.06	3.86
70.00°	2.57	2.99	2.35	2.64	2.95	2.84	2.85	2.45	2.95	2.97	2.58	3.21	3.20	2.61	2.04	2.96	2.57
72.50°	1.72	2.26	1.81	1.99	2.16	1.89	1.70	1.82	2.22	1.97	1.95	2.11	2.65	1.82	1.40	2.15	1.72
75.00°	1.57	1.55	1.29	1.53	1.53	1.50	1.61	1.49	2.00	1.68	1.50	1.74	2.01	1.53	1.32	1.60	1.57
77.50°	1.38	1.09	1.11	1.26	1.14	1.30	1.24	1.46	1.74	1.34	1.17	1.34	1.52	1.22	1.12	1.28	1.38
80.00°	1.17	0.97	0.93	1.28	0.98	1.19	0.68	1.39	1.07	1.04	0.98	1.08	1.26	0.84	0.92	1.31	1.17
82.50°	1.03	0.75	0.79	1.12	0.99	1.13	0.59	1.15	0.83	0.85	0.89	0.99	0.94	0.97	0.84	1.39	1.03
85.00°	1.02	0.56	0.79	0.92	0.75	1.01	0.92	0.84	0.88	0.74	1.10	0.81	0.90	1.22	0.67	1.02	1.02
87.50°	0.78	0.68	0.83	0.70	0.49	0.70	0.77	0.67	0.68	0.70	0.69	0.75	0.84	0.85	0.78	0.74	0.78
90.00°	0.52	0.43	0.40	0.30	0.50	0.49	0.28	0.65	0.35	0.69	0.32	0.57	0.93	0.28	0.64	0.31	0.52
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.

RCR	pfc	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	0%
	pcc	80%	80%	80%	80%	70%	70%	70%	70%	50%	50%	50%	30%	30%	30%	10%	10%	10%
	pw	70%	50%	30%	10%	70%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	30%
	0	1,341	1,341	1,341	1,341	1,309	1,309	1,309	1,309	1,251	1,251	1,251	1,198	1,198	1,198	1,149	1,149	1,149
	1	1,269	1,233	1,202	1,173	1,240	1,209	1,180	1,155	1,163	1,140	1,119	1,121	1,102	1,085	1,082	1,067	1,054
	2	1,194	1,131	1,079	1,035	1,168	1,111	1,063	1,023	1,074	1,034	1,001	1,039	1,007	979	1,008	981	958
	3	1,120	1,037	972	921	1,097	1,021	961	913	990	940	898	962	920	884	936	900	870
	4	1,051	952	880	825	1,029	939	872	820	913	856	810	890	840	800	868	826	791
	5	985	876	800	744	965	865	793	740	844	781	733	824	769	726	805	758	720
	6	924	808	730	674	906	798	725	671	780	715	666	763	705	661	748	696	656
	7	867	746	668	613	851	738	664	611	723	656	607	708	649	604	695	641	600
	8	815	691	614	560	800	684	610	559	671	604	556	659	598	553	647	592	551
	9	767	642	565	514	754	636	563	513	625	558	511	614	553	509	604	548	507
	10	723	598	523	473	711	593	521	472	583	516	471	573	512	469	564	508	467

### Cone of Light

Mtg Height	Light Level	Beam Diameter
5.5 ft	19.9 fc	8.9 ft
6.5 ft	14.2 fc	10.5 ft
7.5 ft	10.7 fc	12.2 ft
8.0 ft	9.4 fc	13.0 ft
10.0 ft	6.0 fc	16.2 ft
12.0 ft	4.2 fc	19.5 ft
14.0 ft	3.1 fc	22.7 ft
16.0 ft	2.3 fc	26.0 ft
20.0 ft	1.5 fc	32.4 ft
24.0 ft	1.0 fc	38.9 ft
28.0 ft	0.8 fc	45.4 ft

### Average Luminaire Luminance [cd/m²]

	0.00°	45.00°	90.00°
<b>0.00°</b>	59,392	59,392	59,392
<b>45.00°</b>	21,225	29,866	22,994
<b>55.00°</b>	4,423	4,451	5,368
<b>65.00°</b>	1,305	1,016	1,459
<b>75.00°</b>	600	492	586
<b>85.00°</b>	1,154	891	847

### 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>	8.6	9.8	9.0	10.1	10.4	10.2	11.3	10.6	11.7	12.0
	<b>3H</b>	8.7	9.7	9.1	10.0	10.4	10.2	11.2	10.6	11.6	11.9
	<b>4H</b>	8.7	9.6	9.1	10.0	10.3	10.2	11.1	10.6	11.5	11.9
	<b>6H</b>	8.7	9.5	9.1	9.9	10.3	10.2	11.0	10.6	11.4	11.8
	<b>8H</b>	8.7	9.5	9.1	9.8	10.3	10.1	10.9	10.6	11.3	11.7
	<b>12H</b>	8.7	9.4	9.1	9.8	10.2	10.1	10.9	10.5	11.3	11.7
<b>4H</b>	<b>2H</b>	8.5	9.4	8.9	9.8	10.1	10.0	11.0	10.5	11.3	11.7
	<b>3H</b>	8.6	9.4	9.0	9.8	10.2	10.1	10.8	10.5	11.3	11.7
	<b>4H</b>	8.6	9.3	9.1	9.7	10.1	10.1	10.7	10.5	11.2	11.6
	<b>6H</b>	8.6	9.2	9.1	9.7	10.1	10.1	10.6	10.5	11.1	11.5
	<b>8H</b>	8.7	9.2	9.1	9.6	10.1	10.0	10.6	10.5	11.0	11.5
	<b>12H</b>	8.7	9.2	9.2	9.7	10.1	10.0	10.5	10.5	11.0	11.5
<b>8H</b>	<b>4H</b>	8.5	9.0	9.0	9.5	9.9	9.9	10.5	10.4	10.9	11.4
	<b>6H</b>	8.5	9.0	9.1	9.5	10.0	9.9	10.4	10.4	10.9	11.4
	<b>8H</b>	8.6	9.0	9.1	9.5	10.0	9.9	10.3	10.5	10.9	11.3
	<b>12H</b>	8.7	9.1	9.3	9.6	10.1	10.0	10.3	10.5	10.8	11.4
<b>12H</b>	<b>4H</b>	8.4	8.9	8.9	9.4	9.9	9.9	10.4	10.4	10.8	11.3
	<b>6H</b>	8.5	8.9	9.0	9.4	9.9	9.9	10.3	10.4	10.7	11.3
	<b>8H</b>	8.6	8.9	9.1	9.4	10.0	9.9	10.3	10.4	10.8	11.3

Corrected UGR values based on total output lumens

SHR = 1.0