Indoor Distribution Test Report

Spectrum Lighting Inc.

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Spectrum Lighting Photometric Lab

Luminaire
AS01SQ IC 935 004 DL SP MW xx
Nom 1" square recessed downlight

Test Number
SP-00830_M-4L

Test Date
3/7/2019

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

Summary of Results

Power

Input Watts	4.3 W

Lumen Output

Output Lumens	294
Efficacy	68.29 lm/W

Luminous Dimensions

0° - 180° Size	0.07
90° - 270° Size	0.07
Height	0

Spacing Criterion

Two luminaires, plane 0°	0.39
Two luminaires, plane 90°	0.39
Four luminaires	0.41

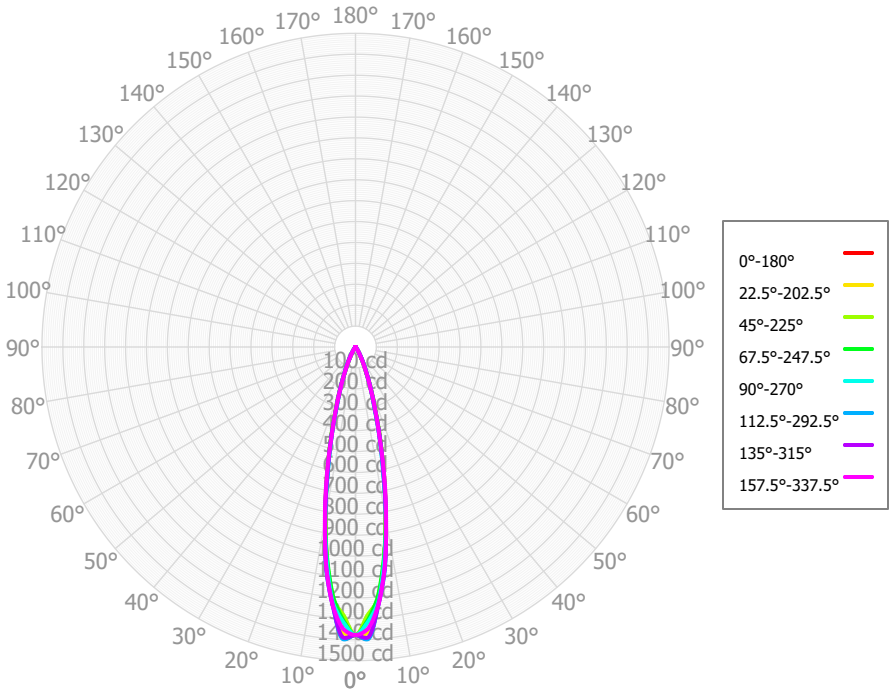
Full Beam Angle

0° - 180°	23°
90° - 270°	23°

IES File Header Contents

Keyword	Value
TEST	SP-00830_M-4L
TESTLAB	Spectrum Lighting Photometric Lab, VLS-245-981
MANUFAC	Spectrum Lighting
TESTDATE	3/7/2019
ISSUEDATE	2/5/2020
LUMCAT	AS01SQ IC 935 004 DL SP MW xx
LUMINAIRE	Nom 1" square recessed downlight
OTHER	Beam angle: 23.3 degrees
LAMP	N/A
LAMPCAT	N/A, CRI: 90 min
OTHER	CCT Multiplers: 927 x 0.96, 930 x 0.99, 940 x 1.02
OTHER	Total luminaire wattages is approximate
OTHER	This report prepared by Spectrum Lighting, scaled from 7L
_CRI	90+
_CCTMULT	927 x 0.96, 930 x 0.99, 940 x 1.02
_LAMPMULT	N/A

Candela Polar Plot



Zonal Lumen Summary

Zone	Lumens	% Fixture	Zone	Lumens	% Fixture
0.00° - 10.00°	105.17	35.82%	90.00° - 100.00°	0.04	0.01%
10.00° - 20.00°	123.54	42.07%	100.00° - 110.00°	0.00	0.00%
20.00° - 30.00°	46.17	15.72%	100.00° - 120.00°	0.00	0.00%
30.00° - 40.00°	10.72	3.65%	120.00° - 130.00°	0.00	0.00%
40.00° - 50.00°	3.65	1.24%	130.00° - 140.00°	0.00	0.00%
50.00° - 60.00°	1.97	0.67%	140.00° - 150.00°	0.00	0.00%
60.00° - 70.00°	0.96	0.33%	150.00° - 160.00°	0.00	0.00%
70.00° - 80.00°	0.78	0.26%	160.00° - 170.00°	0.00	0.00%
80.00° - 90.00°	0.63	0.22%	170.00° - 180.00°	0.00	0.00%
0.00° - 90.00°	293.59	99.99%	0.00° - 180.00°	293.63	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°	1,378.02	1,378.02	1,378.02	1,378.02	1,378.02	1,378.02	1,378.02	1,378.02	1,378.02	1,378.02	1,378.02	1,378.02	1,378.02	1,378.02	1,378.02	1,378.02	1,378.02
2.50°	1,395.63	1,366.98	1,286.31	1,310.95	1,319.82	1,398.69	1,390.75	1,350.38	1,395.63	1,366.98	1,286.31	1,310.95	1,319.82	1,398.69	1,390.75	1,350.38	1,395.63
5.00°	1,235.00	1,211.50	1,216.93	1,206.18	1,231.03	1,243.68	1,243.15	1,243.37	1,235.00	1,211.50	1,216.93	1,206.18	1,231.03	1,243.68	1,243.15	1,243.37	1,235.00
7.50°	1,063.68	1,043.24	1,036.59	1,030.68	1,045.36	1,075.24	1,068.72	1,068.20	1,063.68	1,043.24	1,036.59	1,030.68	1,045.36	1,075.24	1,068.72	1,068.20	1,063.68
10.00°	836.10	825.74	829.72	832.58	839.28	834.04	835.66	843.33	836.10	825.74	829.72	832.58	839.28	834.04	835.66	843.33	836.10
12.50°	620.38	620.36	634.36	621.92	614.65	607.83	623.40	636.64	620.38	620.36	634.36	621.92	614.65	607.83	623.40	636.64	620.38
15.00°	450.55	451.04	440.88	455.82	439.91	438.47	448.19	440.76	450.55	451.04	440.88	455.82	439.91	438.47	448.19	440.76	450.55
17.50°	301.52	306.52	318.76	309.25	301.81	291.83	307.27	308.28	301.52	306.52	318.76	309.25	301.81	291.83	307.27	308.28	301.52
20.00°	212.26	218.65	203.49	216.10	209.70	211.80	215.24	206.12	212.26	218.65	203.49	216.10	209.70	211.80	215.24	206.12	212.26
22.50°	136.90	144.83	144.73	140.94	144.68	143.13	143.95	141.44	136.90	144.83	144.73	140.94	144.68	143.13	143.95	141.44	136.90
25.00°	92.35	96.29	88.75	95.58	99.85	100.07	96.54	90.68	92.35	96.29	88.75	95.58	99.85	100.07	96.54	90.68	92.35
27.50°	56.35	58.17	60.85	57.98	64.76	64.43	61.95	60.40	56.35	58.17	60.85	57.98	64.76	64.43	61.95	60.40	56.35
30.00°	35.78	35.48	34.03	38.87	43.01	42.00	39.65	35.83	35.78	35.48	34.03	38.87	43.01	42.00	39.65	35.83	35.78
32.50°	20.68	20.01	23.17	23.12	26.28	25.15	24.87	23.94	20.68	20.01	23.17	23.12	26.28	25.15	24.87	23.94	20.68
35.00°	13.50	13.16	13.14	16.01	17.38	16.50	15.93	14.68	13.50	13.16	13.14	16.01	17.38	16.50	15.93	14.68	13.50
37.50°	8.53	8.70	9.95	9.88	10.69	10.50	10.81	10.66	8.53	8.70	9.95	9.88	10.69	10.50	10.81	10.66	8.53
40.00°	6.14	6.55	7.11	7.63	7.63	7.63	8.07	7.34	6.14	6.55	7.11	7.63	7.63	7.63	8.07	7.34	6.14
42.50°	4.62	5.09	6.06	5.61	5.34	5.66	6.27	5.89	4.62	5.09	6.06	5.61	5.34	5.66	6.27	5.89	4.62
45.00°	3.94	4.17	5.07	4.75	4.22	4.55	4.95	4.57	3.94	4.17	5.07	4.75	4.22	4.55	4.95	4.57	3.94
47.50°	3.28	3.46	4.30	3.91	3.25	3.86	4.40	3.64	3.28	3.46	4.30	3.91	3.25	3.86	4.40	3.64	3.28
50.00°	2.63	2.88	3.68	3.38	2.81	3.51	4.16	2.74	2.63	2.88	3.68	3.38	2.81	3.51	4.16	2.74	2.63
52.50°	2.13	2.29	3.44	2.83	2.41	2.90	3.61	2.25	2.13	2.29	3.44	2.83	2.41	2.90	3.61	2.25	2.13
55.00°	1.72	1.71	3.08	2.18	1.94	2.13	2.98	1.78	1.72	1.71	3.08	2.18	1.94	2.13	2.98	1.78	1.72
57.50°	1.47	1.38	2.44	1.58	1.47	1.58	2.21	1.46	1.47	1.38	2.44	1.58	1.47	1.58	2.21	1.46	1.47
60.00°	1.31	1.15	1.82	1.29	1.15	1.14	1.42	1.17	1.31	1.15	1.82	1.29	1.15	1.14	1.42	1.17	1.31
62.50°	1.07	1.00	1.24	1.03	0.84	0.99	1.20	1.04	1.07	1.00	1.24	1.03	0.84	0.99	1.20	1.04	1.07
65.00°	0.80	0.88	0.90	0.93	0.78	0.95	1.07	0.96	0.80	0.88	0.90	0.93	0.78	0.95	1.07	0.96	0.80
67.50°	0.75	0.84	0.90	0.82	0.72	0.94	0.93	1.02	0.75	0.84	0.90	0.82	0.72	0.94	0.93	1.02	0.75
70.00°	0.77	0.81	0.87	0.71	0.71	0.92	0.79	0.99	0.77	0.81	0.87	0.71	0.71	0.92	0.79	0.99	0.77
72.50°	0.67	0.77	0.79	0.70	0.66	0.82	0.80	0.87	0.67	0.77	0.79	0.70	0.66	0.82	0.80	0.87	0.67
75.00°	0.57	0.70	0.75	0.74	0.57	0.83	0.78	0.80	0.57	0.70	0.75	0.74	0.57	0.83	0.78	0.80	0.57
77.50°	0.62	0.66	0.72	0.68	0.55	0.90	0.68	0.82	0.62	0.66	0.72	0.68	0.55	0.90	0.68	0.82	0.62
80.00°	0.63	0.75	0.69	0.64	0.54	0.82	0.67	0.79	0.63	0.75	0.69	0.64	0.54	0.82	0.67	0.79	0.63
82.50°	0.60	0.87	0.68	0.69	0.53	0.64	0.69	0.67	0.60	0.87	0.68	0.69	0.53	0.64	0.69	0.67	0.60
85.00°	0.56	0.81	0.61	0.77	0.49	0.61	0.65	0.67	0.56	0.81	0.61	0.77	0.49	0.61	0.65	0.67	0.56
87.50°	0.33	0.71	0.55	0.52	0.54	0.72	0.39	0.30	0.33	0.71	0.55	0.52	0.54	0.72	0.39	0.30	0.33
90.00°	0.39	0.32	0.25	0.33	0.22	0.35	0.31	0.29	0.39	0.32	0.25	0.33	0.22	0.35	0.31	0.29	0.39
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.

	ρfc	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	0%
	ρcc	80%	80%	80%	80%	70%	70%	70%	70%	50%	50%	50%	30%	30%	30%	10%	10%	10%	0%
	ρw	70%	50%	30%	10%	70%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	30%
	0	350	350	350	350	341	341	341	341	326	326	326	312	312	312	300	300	300	294
	1	337	331	325	320	330	324	319	315	313	309	305	302	299	296	292	290	287	284
	2	326	315	306	298	320	310	302	295	301	294	288	292	287	282	284	280	277	275
	3	315	301	290	281	310	297	287	279	290	282	275	283	276	271	277	271	267	266
	4	305	289	277	268	300	286	275	266	280	271	263	275	267	261	269	263	258	258
RCR	5	296	278	266	257	292	276	264	256	271	261	253	266	258	251	262	255	249	251
	6	287	268	256	247	284	266	255	246	263	252	245	259	250	243	255	248	242	244
	7	279	260	247	238	276	258	246	238	255	244	237	252	242	236	249	241	235	237
	8	271	252	239	231	268	250	239	230	248	237	230	245	236	229	243	234	228	231
	9	264	244	232	224	262	243	231	224	241	230	223	239	229	222	237	228	222	225
	10	257	237	226	218	255	236	225	217	234	224	217	233	223	216	231	222	216	219

Cone of Light

Mtg Height	Light Level	Beam Diameter
5.5 ft	45.6 fc	2.3 ft
6.5 ft	32.6 fc	2.7 ft
7.5 ft	24.5 fc	3.1 ft
8.0 ft	21.5 fc	3.3 ft
10.0 ft	13.8 fc	4.1 ft
12.0 ft	9.6 fc	4.9 ft
14.0 ft	7.0 fc	5.7 ft
16.0 ft	5.4 fc	6.6 ft
20.0 ft	3.4 fc	8.2 ft
24.0 ft	2.4 fc	9.8 ft
28.0 ft	1.8 fc	11.5 ft

Average Luminaire Luminance [cd/m²]

	0.00°	45.00°	90.00°
0.00°	3,027,129	3,027,129	3,027,129
45.00°	12,242	15,744	13,099
55.00°	6,579	11,778	7,426
65.00°	4,147	4,656	4,043
75.00°	4,853	6,401	4,864
85.00°	14,107	15,256	12,266

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	6.9	7.8	7.3	8.1	8.5	7.5	8.4	7.9	8.7	9.0
	3H	8.5	9.3	8.9	9.7	10.0	8.7	9.5	9.1	9.8	10.2
	4H	9.3	10.0	9.7	10.4	10.8	9.5	10.2	9.9	10.6	11.0
	6H	10.5	11.2	10.9	11.5	11.9	10.4	11.1	10.8	11.5	11.9
	8H	11.2	11.9	11.7	12.3	12.7	11.0	11.6	11.4	12.0	12.5
	12H	12.1	12.7	12.5	13.1	13.5	11.7	12.3	12.1	12.7	13.1
4H	2H	7.3	8.1	7.8	8.4	8.8	7.8	8.6	8.2	8.9	9.3
	3H	9.3	9.9	9.7	10.4	10.8	9.4	10.0	9.8	10.4	10.8
	4H	10.4	11.0	10.8	11.4	11.8	10.5	11.1	11.0	11.5	11.9
	6H	11.9	12.4	12.4	12.8	13.3	11.8	12.3	12.3	12.8	13.2
	8H	12.8	13.2	13.3	13.7	14.2	12.6	13.0	13.0	13.4	13.9
	12H	13.8	14.2	14.3	14.6	15.1	13.4	13.8	13.9	14.3	14.7
8H	4H	10.9	11.4	11.4	11.8	12.3	11.0	11.5	11.5	11.9	12.4
	6H	12.8	13.1	13.3	13.6	14.1	12.7	13.1	13.2	13.6	14.0
	8H	14.0	14.3	14.5	14.8	15.3	13.7	14.0	14.2	14.5	15.0
	12H	15.3	15.5	15.8	16.0	16.6	14.8	15.1	15.4	15.6	16.2
12H	4H	11.1	11.4	11.6	11.9	12.4	11.2	11.5	11.7	12.0	12.5
	6H	13.0	13.3	13.6	13.8	14.4	13.0	13.3	13.5	13.8	14.3
	8H	14.4	14.6	14.9	15.1	15.7	14.1	14.3	14.6	14.8	15.4

Corrected UGR values based on total output lumens

SHR = 1.0