

Indoor Distribution Test Report

Spectrum Lighting Inc.

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Spectrum Lighting Photometric Lab

Luminaire

ES03SMFxx 930 013 xxx DL SP GP MW
Nom 3 inch diam round recessed estimator downlight

Test Number

SP-00874

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	742
Efficacy	51.2 lm/W

Luminous Dimensions

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

Spacing Criterion

Two luminaires, plane 0°	0.4
Two luminaires, plane 90°	0.41
Four luminaires	0.48

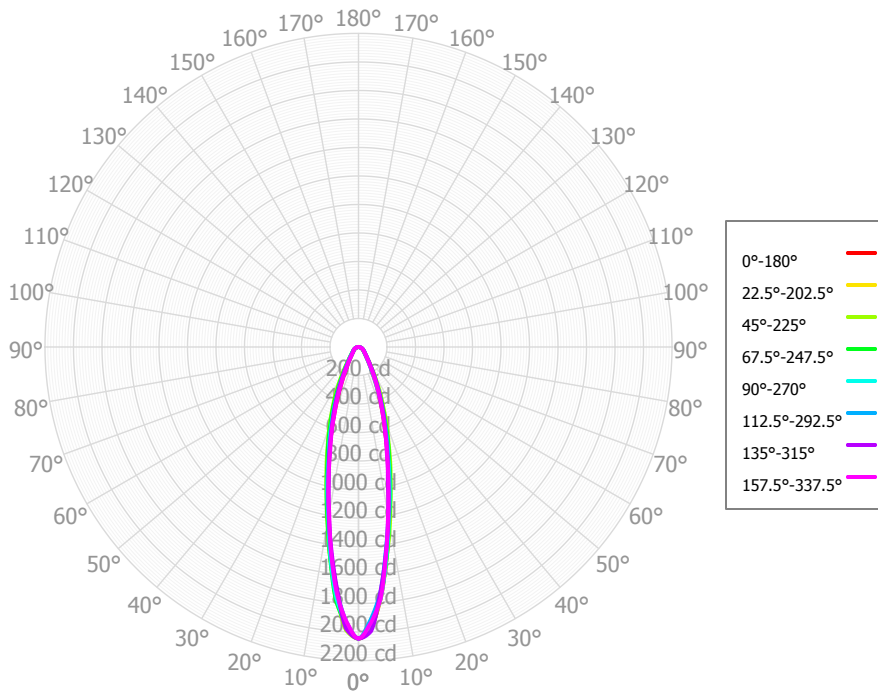
Full Beam Angle

0° - 180°	24°
90° - 270°	25°

IES File Header Contents

Keyword	Value
TEST	SP-00874
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 SP GP MW
LUMINAIRE	Nom 3 inch diam round recessed estimator downlight
LAMPCAT	N/A
LAMP	N/A; CRI: 90
OTHER	Beam Angle: 24.2 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°	150.54	20.28%	90.00° - 100.00°	0.08	0.01%
10.00° - 20.00°	225.25	30.34%	100.00° - 110.00°	0.00	0.00%
20.00° - 30.00°	151.95	20.47%	100.00° - 120.00°	0.00	0.00%
30.00° - 40.00°	78.74	10.61%	120.00° - 130.00°	0.00	0.00%
40.00° - 50.00°	49.73	6.70%	130.00° - 140.00°	0.00	0.00%
50.00° - 60.00°	38.64	5.20%	140.00° - 150.00°	0.00	0.00%
60.00° - 70.00°	28.82	3.88%	150.00° - 160.00°	0.00	0.00%
70.00° - 80.00°	15.69	2.11%	160.00° - 170.00°	0.00	0.00%
80.00° - 90.00°	2.96	0.40%	170.00° - 180.00°	0.00	0.00%
0.00° - 90.00°	742.31	99.99%	0.00° - 180.00°	742.39	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°	2,045.09	2,045.09	2,045.09	2,045.09	2,045.09	2,045.09	2,045.09	2,045.09	2,045.09	2,045.09	2,045.09	2,045.09	2,045.09	2,045.09	2,045.09	2,045.09	2,045.09
2.50°	1,976.28	1,951.12	1,979.35	1,942.11	1,939.83	1,935.26	1,979.23	1,929.47	1,959.61	1,958.85	1,988.94	1,950.04	1,947.61	1,919.30	1,996.82	1,941.11	1,976.28
5.00°	1,771.02	1,776.95	1,762.98	1,761.07	1,774.10	1,726.43	1,712.80	1,737.27	1,720.56	1,752.69	1,749.14	1,791.95	1,769.92	1,739.09	1,737.95	1,774.67	1,771.02
7.50°	1,482.00	1,499.04	1,502.15	1,502.95	1,491.91	1,472.33	1,448.68	1,464.84	1,471.58	1,503.74	1,505.75	1,509.63	1,499.00	1,458.28	1,467.56	1,474.97	1,482.00
10.00°	1,220.83	1,246.26	1,266.21	1,235.52	1,225.85	1,198.17	1,198.76	1,184.05	1,210.26	1,237.18	1,253.81	1,244.87	1,217.33	1,202.75	1,207.10	1,193.47	1,220.83
12.50°	971.52	1,025.67	1,034.62	1,032.60	1,008.09	986.76	964.09	976.04	985.34	1,028.71	1,031.57	1,031.51	1,011.01	977.63	952.19	969.24	971.52
15.00°	786.55	836.32	862.93	833.55	809.01	797.71	794.23	771.82	797.28	839.33	865.15	841.11	808.82	792.21	785.42	768.14	786.55
17.50°	623.51	679.52	697.71	682.88	653.15	652.65	636.72	628.70	636.11	690.98	716.15	704.54	671.91	645.64	624.72	623.95	623.51
20.00°	497.97	545.77	573.55	534.00	511.05	519.38	519.45	487.76	497.08	552.63	594.26	577.31	536.89	522.34	512.78	494.72	497.97
22.50°	381.96	431.56	451.70	422.96	394.93	414.17	411.55	385.95	383.51	441.93	485.86	467.38	431.94	417.56	405.92	394.96	381.96
25.00°	299.94	336.62	362.73	315.76	297.51	314.29	327.02	288.11	287.45	335.90	394.45	368.64	330.24	329.94	326.76	307.27	299.94
27.50°	223.99	255.34	275.40	247.20	228.45	246.35	251.98	224.57	219.60	261.65	313.38	286.57	259.53	253.70	253.28	238.59	223.99
30.00°	179.37	196.46	218.22	183.53	174.64	182.44	195.56	166.30	167.36	190.94	242.89	219.17	193.58	197.72	201.66	183.55	179.37
32.50°	138.52	150.37	163.53	149.49	139.58	147.74	149.55	136.69	133.20	153.17	187.29	170.02	157.07	152.54	156.24	145.91	138.52
35.00°	115.28	120.75	132.89	118.24	112.66	115.05	120.37	109.50	106.96	117.14	144.47	133.54	123.83	123.48	128.69	117.37	115.28
37.50°	93.09	98.59	104.33	99.20	94.11	97.40	96.84	92.02	89.59	99.24	114.54	109.87	104.53	101.23	104.74	98.53	93.09
40.00°	80.51	83.11	88.12	82.02	79.58	80.18	80.69	76.31	75.36	81.73	93.58	91.91	87.26	86.68	89.08	83.92	80.51
42.50°	68.22	70.05	73.40	70.84	68.42	68.96	68.70	65.91	66.89	72.26	79.13	78.64	76.34	74.72	75.75	73.00	68.22
45.00°	61.59	62.10	64.81	61.27	60.24	58.34	61.13	57.00	59.96	63.03	68.32	68.26	66.62	66.71	66.66	64.16	61.59
47.50°	55.11	55.56	57.07	55.70	54.09	54.29	55.25	51.57	53.27	56.17	59.99	59.85	59.83	59.68	59.30	56.79	55.11
50.00°	50.07	50.53	52.03	50.31	49.91	50.22	50.89	47.10	46.64	49.86	52.80	53.73	53.75	55.16	54.50	51.45	50.07
52.50°	45.24	45.81	47.23	45.28	46.85	45.91	46.54	44.43	43.41	46.71	48.01	48.88	49.03	51.07	49.53	47.29	45.24
55.00°	41.61	43.01	43.04	40.81	43.75	41.78	42.20	41.92	40.63	43.37	44.08	44.85	44.44	45.39	44.35	42.97	41.61
57.50°	38.21	40.48	39.02	37.27	40.65	38.43	39.04	39.65	38.51	39.27	40.24	41.19	40.06	39.53	40.30	38.58	38.21
60.00°	35.88	36.00	35.33	33.89	36.55	35.24	36.57	36.87	36.43	35.26	36.42	36.90	36.51	36.41	37.38	35.64	35.88
62.50°	33.19	31.38	31.86	30.70	32.11	32.56	33.41	33.46	32.04	31.52	32.30	32.40	33.99	33.44	33.98	33.23	33.19
65.00°	29.34	28.71	28.76	27.61	29.36	29.56	29.91	29.75	27.63	28.04	28.13	28.35	30.71	30.15	30.17	30.00	29.34
67.50°	25.48	26.00	25.28	24.63	27.08	25.74	27.20	25.73	23.55	25.16	24.33	24.43	26.65	26.79	26.61	26.55	25.48
70.00°	21.61	22.96	21.41	20.97	22.76	22.38	24.77	22.51	19.74	22.34	20.73	21.67	22.87	22.97	23.19	22.77	21.61
72.50°	17.66	19.14	18.23	16.96	18.25	19.69	20.85	19.82	17.05	19.62	19.28	18.80	19.25	18.96	18.66	18.70	17.66
75.00°	13.65	14.29	15.20	13.11	13.94	16.55	16.56	15.75	13.87	15.67	16.97	14.72	14.99	14.73	14.98	13.96	13.65
77.50°	9.61	10.48	11.81	9.48	10.14	12.84	11.65	11.49	10.26	11.35	13.45	10.93	10.33	10.39	13.27	10.70	9.61
80.00°	6.40	6.73	7.10	6.10	6.67	7.24	8.11	7.27	7.14	7.71	9.34	7.22	5.99	6.45	8.70	6.98	6.40
82.50°	3.10	3.43	3.50	2.97	3.40	4.15	5.08	4.61	4.05	5.02	5.08	3.25	4.67	3.66	4.39	3.30	3.10
85.00°	1.63	1.30	1.56	1.32	1.86	1.84	2.41	2.01	1.76	2.80	2.06	1.72	1.06	1.67	1.64	1.61	1.63
87.50°	1.48	1.13	1.39	1.06	1.14	1.20	1.25	1.22	1.27	1.22	1.61	1.07	1.19	1.28	1.29	1.18	1.48
90.00°	0.00	0.00	0.00	0.00	1.29	1.24	1.45	1.17	1.10	1.13	1.23	1.22	0.00	0.00	0.00	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.

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%	0%
	pw	70%	50%	30%	10%	70%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	30%
	0	884	884	884	884	863	863	863	863	825	825	825	790	790	790	757	757	742
	1	838	816	795	777	820	799	781	765	769	755	741	741	730	719	716	707	692
	2	794	755	723	696	777	742	713	688	718	693	673	695	675	658	674	658	645
	3	753	703	664	633	738	692	656	628	672	642	618	654	629	608	637	616	604
	4	716	658	616	583	702	649	610	580	633	599	573	618	589	566	604	580	569
	5	682	619	575	543	670	612	571	540	599	563	535	586	555	531	575	548	538
	6	651	585	541	509	640	579	538	507	568	531	504	558	525	500	548	519	510
	7	623	555	511	480	613	550	509	479	541	504	477	532	499	474	524	494	486
	8	597	529	485	456	589	524	483	455	516	479	453	509	475	451	502	472	464
	9	574	505	462	434	566	501	461	433	494	458	432	488	454	430	482	451	444
	10	552	483	442	415	545	480	441	414	474	438	413	469	435	412	463	433	426

Cone of Light

Mtg Height	Light Level	Beam Diameter
5.5 ft	67.6 fc	2.4 ft
6.5 ft	48.4 fc	2.8 ft
7.5 ft	36.4 fc	3.2 ft
8.0 ft	32.0 fc	3.4 ft
10.0 ft	20.5 fc	4.3 ft
12.0 ft	14.2 fc	5.2 ft
14.0 ft	10.4 fc	6.0 ft
16.0 ft	8.0 fc	6.9 ft
20.0 ft	5.1 fc	8.6 ft
24.0 ft	3.6 fc	10.3 ft
28.0 ft	2.6 fc	12.1 ft

Average Luminaire Luminance [cd/m²]

	0.00°	45.00°	90.00°
0.00°	454,816	454,816	454,816
45.00°	19,371	20,384	18,946
55.00°	16,132	16,689	16,965
65.00°	15,438	15,135	15,452
75.00°	11,732	13,060	11,977
85.00°	4,154	3,974	4,749

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	18.5	19.7	18.9	20.0	20.3	18.6	19.8	19.0	20.1	20.4
	3H	20.3	21.3	20.7	21.6	22.0	20.3	21.4	20.7	21.7	22.1
	4H	20.8	21.8	21.2	22.1	22.5	20.9	21.9	21.3	22.2	22.6
	6H	21.0	21.9	21.5	22.3	22.7	21.2	22.1	21.6	22.5	22.9
	8H	21.1	21.9	21.5	22.3	22.7	21.2	22.1	21.7	22.5	22.9
	12H	21.0	21.8	21.5	22.2	22.6	21.2	22.0	21.7	22.4	22.8
4H	2H	19.1	20.0	19.5	20.4	20.8	19.2	20.1	19.6	20.5	20.8
	3H	21.0	21.8	21.5	22.2	22.6	21.1	21.9	21.5	22.3	22.7
	4H	21.7	22.4	22.1	22.8	23.2	21.8	22.5	22.2	22.9	23.4
	6H	22.0	22.6	22.5	23.0	23.5	22.2	22.8	22.6	23.2	23.7
	8H	22.0	22.6	22.5	23.0	23.5	22.2	22.8	22.7	23.2	23.7
	12H	22.0	22.5	22.5	23.0	23.5	22.2	22.7	22.7	23.2	23.7
8H	4H	21.9	22.4	22.4	22.9	23.4	22.1	22.6	22.5	23.1	23.6
	6H	22.3	22.7	22.8	23.2	23.7	22.5	23.0	23.0	23.5	24.0
	8H	22.3	22.7	22.9	23.3	23.8	22.6	23.0	23.1	23.5	24.0
	12H	22.3	22.7	22.9	23.2	23.8	22.6	23.0	23.1	23.5	24.0
12H	4H	21.9	22.4	22.3	22.8	23.3	22.1	22.5	22.5	23.0	23.5
	6H	22.3	22.7	22.8	23.2	23.7	22.5	22.9	23.1	23.4	24.0
	8H	22.4	22.7	22.9	23.2	23.8	22.6	23.0	23.2	23.5	24.1

Corrected UGR values based on total output lumens

SHR = 1.0