

Indoor Distribution Test Report

Spectrum Lighting Inc.

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Spectrum Lighting Photometric Lab

Luminaire

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

Test Number

SP-00873

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	723
Efficacy	49.88 lm/W

Luminous Dimensions

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

Spacing Criterion

Two luminaires, plane 0°	0.49
Two luminaires, plane 90°	0.49
Four luminaires	0.55

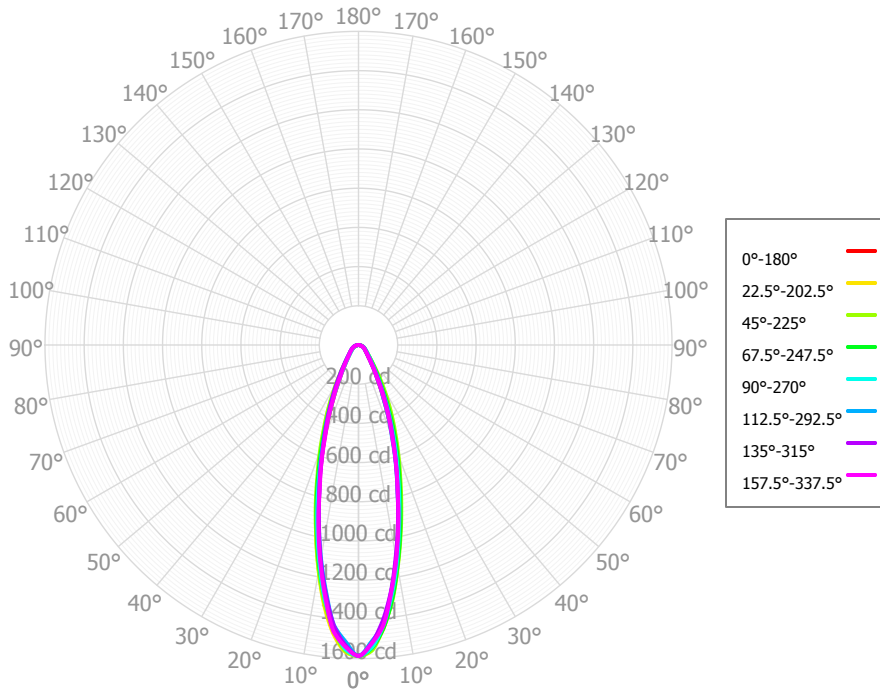
Full Beam Angle

0° - 180°	30°
90° - 270°	30°

IES File Header Contents

Keyword	Value
TEST	SP-00873
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 NF GP MW
LUMINAIRE	Nom 3 inch diam round recessed estimator downlight
LAMPCAT	N/A
LAMP	N/A; CRI: 90
OTHER	Beam Angle: 29.9 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°	128.90	17.82%	90.00° - 100.00°	0.08	0.01%
10.00° - 20.00°	219.89	30.40%	100.00° - 110.00°	0.00	0.00%
20.00° - 30.00°	155.93	21.56%	100.00° - 120.00°	0.00	0.00%
30.00° - 40.00°	82.57	11.42%	120.00° - 130.00°	0.00	0.00%
40.00° - 50.00°	50.88	7.03%	130.00° - 140.00°	0.00	0.00%
50.00° - 60.00°	38.03	5.26%	140.00° - 150.00°	0.00	0.00%
60.00° - 70.00°	28.30	3.91%	150.00° - 160.00°	0.00	0.00%
70.00° - 80.00°	15.76	2.18%	160.00° - 170.00°	0.00	0.00%
80.00° - 90.00°	2.95	0.41%	170.00° - 180.00°	0.00	0.00%
0.00° - 90.00°	723.21	99.99%	0.00° - 180.00°	723.29	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°	1,586.23	1,586.23	1,586.23	1,586.23	1,586.23	1,586.23	1,586.23	1,586.23	1,586.23	1,586.23	1,586.23	1,586.23	1,586.23	1,586.23	1,586.23	1,586.23	1,586.23
2.50°	1,549.68	1,547.36	1,561.07	1,548.72	1,545.19	1,515.66	1,533.63	1,541.66	1,560.53	1,566.18	1,561.72	1,546.54	1,553.28	1,516.12	1,524.85	1,525.92	1,549.68
5.00°	1,441.70	1,453.99	1,449.33	1,452.17	1,439.11	1,436.16	1,439.17	1,466.77	1,467.18	1,477.95	1,462.45	1,458.61	1,445.88	1,435.68	1,414.51	1,439.13	1,441.70
7.50°	1,299.17	1,303.64	1,317.97	1,312.06	1,291.76	1,270.27	1,280.34	1,298.55	1,314.73	1,339.85	1,328.00	1,310.36	1,312.68	1,273.40	1,268.74	1,274.79	1,299.17
10.00°	1,124.62	1,145.31	1,151.35	1,143.60	1,126.89	1,104.10	1,111.52	1,123.10	1,143.32	1,169.81	1,167.40	1,151.98	1,139.91	1,107.41	1,095.73	1,109.42	1,124.62
12.50°	954.34	977.59	991.36	981.99	953.56	935.89	932.83	943.77	956.36	998.51	996.17	981.86	969.69	937.44	930.55	937.70	954.34
15.00°	787.63	823.23	842.05	824.38	802.09	773.02	773.20	764.21	788.74	826.50	841.73	822.93	803.01	767.37	770.80	771.86	787.63
17.50°	641.20	683.09	707.32	691.16	660.36	643.77	631.09	630.45	635.42	680.89	693.53	675.74	650.98	633.04	636.43	635.62	641.20
20.00°	510.54	559.23	593.74	571.12	541.79	520.13	513.16	498.03	506.75	549.32	572.42	544.79	517.21	499.59	517.89	506.42	510.54
22.50°	401.03	451.49	491.68	466.48	432.34	425.36	415.30	402.33	394.99	440.38	460.13	429.67	402.85	400.11	418.67	407.06	401.03
25.00°	306.36	357.11	405.12	369.28	344.20	335.91	334.82	307.24	307.07	342.18	371.33	334.99	311.00	302.27	330.43	313.69	306.36
27.50°	237.19	274.67	327.28	293.41	263.45	269.49	267.36	245.05	233.87	267.09	289.17	258.34	238.18	240.86	258.74	242.53	237.19
30.00°	184.11	211.77	260.04	226.69	208.52	208.22	213.51	184.08	183.03	201.74	228.13	200.18	185.27	181.28	195.60	179.94	184.11
32.50°	145.24	164.64	203.12	180.30	161.72	166.86	169.11	152.27	144.59	159.24	172.44	156.75	144.88	146.52	152.57	145.34	145.24
35.00°	114.66	130.08	157.52	141.89	131.78	130.59	136.64	121.32	118.46	125.56	138.36	125.23	116.32	113.37	118.80	114.52	114.66
37.50°	93.39	104.98	122.37	116.77	106.42	111.27	111.62	102.85	98.63	104.34	108.92	102.53	95.45	95.77	96.84	94.52	93.39
40.00°	77.00	86.66	97.90	96.23	90.43	93.45	93.89	85.07	84.40	87.34	91.29	85.90	81.34	79.03	79.71	77.60	77.00
42.50°	66.37	72.93	80.52	81.64	76.62	80.02	80.25	74.83	72.71	75.79	75.76	73.33	69.64	69.18	69.11	68.45	66.37
45.00°	58.44	63.23	69.67	68.85	67.60	68.43	70.16	65.13	65.17	65.85	66.51	63.71	59.85	59.75	60.96	59.63	58.44
47.50°	52.65	55.97	60.98	61.05	59.56	61.70	61.90	59.79	59.31	58.63	58.22	55.86	52.97	52.88	54.51	51.57	52.65
50.00°	47.77	50.03	54.09	54.59	53.87	55.57	55.79	54.44	53.07	52.12	52.54	49.73	48.15	46.43	48.63	45.13	47.77
52.50°	43.64	44.82	48.20	49.16	48.60	50.83	50.66	48.93	46.69	47.13	47.17	44.57	43.71	42.16	44.59	42.00	43.64
55.00°	39.78	41.10	43.10	43.96	44.60	46.52	46.37	43.78	42.54	42.49	42.10	40.32	39.50	38.22	41.08	38.76	39.78
57.50°	35.96	38.13	38.65	40.36	40.77	43.08	42.42	40.67	39.11	38.89	37.07	36.51	36.00	35.83	37.57	35.35	35.96
60.00°	32.15	34.79	34.67	37.07	36.29	39.44	38.94	37.53	35.95	35.48	34.23	33.02	32.93	33.07	34.06	32.20	32.15
62.50°	29.63	31.28	31.85	33.80	31.74	35.39	35.64	34.29	32.87	31.72	31.54	29.68	29.63	28.88	30.58	29.51	29.63
65.00°	27.46	27.96	29.77	30.52	30.19	31.61	31.68	31.05	29.75	27.89	27.78	26.84	26.21	25.16	27.10	26.60	27.46
67.50°	24.17	24.70	26.72	27.34	28.77	28.27	27.50	27.82	26.61	25.06	24.01	24.20	22.92	22.70	23.29	23.45	24.17
70.00°	20.67	21.70	23.28	24.15	23.96	25.59	24.44	24.45	23.05	22.35	21.27	20.52	19.68	19.97	19.61	20.37	20.67
72.50°	16.85	18.43	19.74	20.86	19.75	23.58	21.66	20.71	19.45	18.88	18.46	16.58	16.13	16.93	16.88	17.21	16.85
75.00°	12.76	14.59	16.22	17.10	17.00	19.42	19.57	16.74	15.96	15.17	15.45	12.42	12.18	12.22	13.00	12.22	12.76
77.50°	9.08	10.39	12.74	12.87	12.76	14.48	15.96	12.60	12.49	10.85	11.75	8.86	7.41	7.89	8.72	7.87	9.08
80.00°	7.13	6.80	9.03	8.26	8.28	9.13	10.80	8.75	9.01	7.36	7.69	5.85	4.58	4.60	6.22	4.90	7.13
82.50°	2.56	3.64	5.04	4.90	4.59	6.04	6.94	5.70	4.58	4.29	3.64	2.64	2.47	1.68	1.94	2.87	2.56
85.00°	1.13	1.02	1.63	1.87	2.43	3.51	2.79	3.15	1.95	1.86	1.59	1.14	1.26	1.16	1.10	1.11	1.13
87.50°	1.22	1.03	0.70	1.21	1.07	1.48	1.51	1.46	0.90	1.08	0.81	0.88	0.93	0.93	1.38	1.10	1.22
90.00°	0.00	0.00	0.00	0.00	1.28	1.37	1.37	0.91	1.02	1.00	1.15	1.02	0.19	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	861	861	861	861	841	841	841	841	804	804	804	769	769	769	738	738	723
	1	816	793	773	755	798	778	760	743	748	734	720	721	709	699	696	687	673
	2	771	733	701	674	755	720	691	666	696	672	652	675	655	638	654	638	624
	3	731	681	642	611	716	671	635	606	651	621	597	633	608	587	617	596	584
	4	694	636	594	562	680	628	589	558	612	578	552	597	568	545	583	559	548
	5	660	597	554	521	648	590	549	519	577	541	514	565	534	510	554	527	517
	6	629	563	519	487	618	557	516	486	546	510	482	536	504	479	527	498	489
	7	601	533	489	459	591	528	487	457	519	482	455	510	477	452	502	473	465
	8	575	506	463	434	566	502	461	433	494	457	431	487	453	429	480	450	443
	9	551	482	440	412	543	479	438	411	472	435	410	466	432	408	460	429	423
	10	529	461	420	392	522	458	418	392	452	416	391	446	413	389	441	410	404

Cone of Light

Mtg Height	Light Level	Beam Diameter
5.5 ft	52.4 fc	3.0 ft
6.5 ft	37.5 fc	3.5 ft
7.5 ft	28.2 fc	4.0 ft
8.0 ft	24.8 fc	4.3 ft
10.0 ft	15.9 fc	5.4 ft
12.0 ft	11.0 fc	6.4 ft
14.0 ft	8.1 fc	7.5 ft
16.0 ft	6.2 fc	8.6 ft
20.0 ft	4.0 fc	10.7 ft
24.0 ft	2.8 fc	12.9 ft
28.0 ft	2.0 fc	15.0 ft

Average Luminaire Luminance [cd/m²]

	0.00°	45.00°	90.00°
0.00°	352,770	352,770	352,770
45.00°	18,380	21,912	21,260
55.00°	15,425	16,709	17,292
65.00°	14,452	15,665	15,888
75.00°	10,963	13,940	14,611
85.00°	2,871	4,171	6,210

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	18.1	19.3	18.5	19.6	19.9	18.7	19.8	19.0	20.1	20.5
	3H	19.9	20.9	20.3	21.2	21.6	20.4	21.5	20.8	21.8	22.2
	4H	20.4	21.4	20.8	21.7	22.1	21.0	22.0	21.4	22.4	22.7
	6H	20.7	21.6	21.1	21.9	22.3	21.3	22.2	21.7	22.6	23.0
	8H	20.7	21.5	21.1	21.9	22.3	21.4	22.2	21.8	22.6	23.0
	12H	20.7	21.5	21.1	21.8	22.3	21.4	22.1	21.8	22.5	23.0
4H	2H	18.7	19.7	19.1	20.0	20.4	19.2	20.2	19.6	20.6	20.9
	3H	20.7	21.5	21.1	21.9	22.3	21.2	22.0	21.6	22.4	22.8
	4H	21.3	22.0	21.7	22.4	22.9	22.0	22.7	22.4	23.1	23.5
	6H	21.6	22.2	22.1	22.7	23.2	22.4	23.0	22.8	23.4	23.9
	8H	21.7	22.2	22.1	22.7	23.2	22.4	23.0	22.9	23.4	23.9
	12H	21.6	22.1	22.1	22.6	23.1	22.4	22.9	22.9	23.4	23.9
8H	4H	21.5	22.1	22.0	22.6	23.0	22.3	22.8	22.7	23.3	23.8
	6H	21.9	22.4	22.4	22.9	23.4	22.7	23.2	23.2	23.7	24.2
	8H	22.0	22.4	22.5	22.9	23.4	22.8	23.2	23.4	23.8	24.3
	12H	22.0	22.3	22.5	22.8	23.4	22.9	23.2	23.4	23.7	24.3
12H	4H	21.5	22.0	22.0	22.5	23.0	22.3	22.8	22.7	23.2	23.7
	6H	21.9	22.4	22.5	22.8	23.4	22.8	23.2	23.3	23.6	24.2
	8H	22.0	22.4	22.5	22.9	23.4	22.9	23.2	23.4	23.7	24.3

Corrected UGR values based on total output lumens

SHR = 1.0