

Indoor Distribution Test Report

Spectrum Lighting Inc.

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Spectrum Lighting Photometric Lab

Luminaire

ES03RMFxx 930 013 xxx DL FL GP MW
Nom 3 inch diam round recessed estimator downlight

Test Number

SP-00867

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	1022
Efficacy	70.46 lm/W

Luminous Dimensions

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

Spacing Criterion

Two luminaires, plane 0°	0.55
Two luminaires, plane 90°	0.52
Four luminaires	0.57

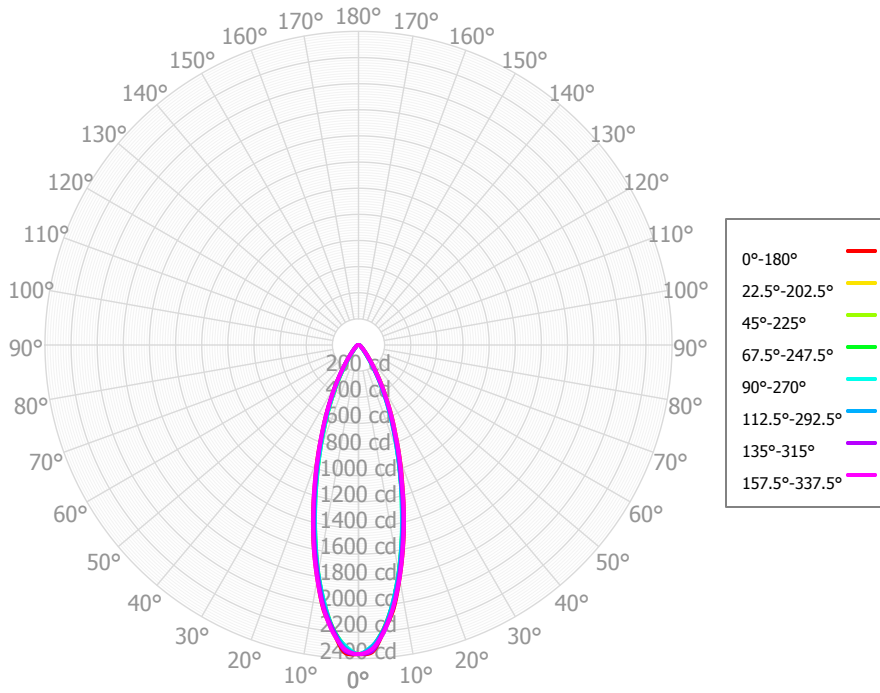
Full Beam Angle

0° - 180°	33°
90° - 270°	32°

IES File Header Contents

Keyword	Value
TEST	SP-00867
TESTLAB	Spectrum Lighting Photometric Lab, VLS-245-981
MANUFAC	Spectrum Lighting
ISSUEDATE	6/6/2019
UPDATE	7/25/2019
LUMCAT	ES03RMFxx 930 013 xxx DL FL GP MW
LUMINAIRE	Nom 3 inch diam round recessed estimator downlight
LAMPCAT	N/A
LAMP	N/A; CRI: 90, 9mm LES
OTHER	Beam Angle: 33.5 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°	198.74	19.45%	90.00° - 100.00°	0.09	0.01%
10.00° - 20.00°	358.70	35.11%	100.00° - 110.00°	0.00	0.00%
20.00° - 30.00°	260.02	25.45%	100.00° - 120.00°	0.00	0.00%
30.00° - 40.00°	113.47	11.11%	120.00° - 130.00°	0.00	0.00%
40.00° - 50.00°	43.25	4.23%	130.00° - 140.00°	0.00	0.00%
50.00° - 60.00°	23.04	2.26%	140.00° - 150.00°	0.00	0.00%
60.00° - 70.00°	15.33	1.50%	150.00° - 160.00°	0.00	0.00%
70.00° - 80.00°	7.36	0.72%	160.00° - 170.00°	0.00	0.00%
80.00° - 90.00°	1.68	0.16%	170.00° - 180.00°	0.00	0.00%
0.00° - 90.00°	1,021.59	99.99%	0.00° - 180.00°	1,021.68	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°	2,366.62	2,366.62	2,366.62	2,366.62	2,366.62	2,366.62	2,366.62	2,366.62	2,366.62	2,366.62	2,366.62	2,366.62	2,366.62	2,366.62	2,366.62	2,366.62	2,366.62
2.50°	2,355.05	2,316.60	2,321.81	2,314.04	2,309.63	2,320.43	2,346.18	2,334.48	2,358.99	2,319.85	2,325.89	2,309.28	2,306.27	2,314.88	2,347.10	2,331.24	2,355.05
5.00°	2,203.75	2,207.79	2,185.06	2,189.82	2,211.17	2,191.77	2,197.28	2,216.00	2,205.24	2,211.61	2,189.19	2,189.41	2,204.75	2,188.76	2,198.01	2,210.65	2,203.75
7.50°	2,043.43	2,012.94	2,003.45	1,998.55	1,995.37	2,008.88	2,029.86	2,042.00	2,046.61	2,025.15	2,015.43	1,996.43	1,995.68	1,999.17	2,031.25	2,027.85	2,043.43
10.00°	1,811.49	1,798.19	1,774.25	1,767.41	1,771.49	1,779.17	1,795.85	1,819.24	1,815.23	1,809.31	1,784.80	1,772.88	1,777.60	1,776.04	1,797.72	1,811.54	1,811.49
12.50°	1,578.83	1,555.94	1,529.38	1,527.55	1,523.67	1,540.84	1,560.26	1,584.03	1,583.21	1,569.46	1,548.15	1,521.09	1,525.85	1,531.48	1,559.11	1,574.20	1,578.83
15.00°	1,342.36	1,322.24	1,296.91	1,283.43	1,276.90	1,296.47	1,320.24	1,339.95	1,344.13	1,322.76	1,304.02	1,282.36	1,281.81	1,294.82	1,319.83	1,340.79	1,342.36
17.50°	1,115.00	1,098.41	1,067.60	1,070.19	1,067.61	1,079.99	1,093.79	1,117.30	1,110.63	1,102.22	1,079.60	1,053.42	1,059.43	1,062.26	1,082.25	1,109.41	1,115.00
20.00°	921.67	902.06	884.78	868.81	862.53	879.23	897.07	906.98	913.19	887.04	875.09	856.57	854.05	868.76	896.37	914.91	921.67
22.50°	741.07	731.52	710.29	708.48	704.23	712.07	719.73	732.39	725.46	718.53	699.37	679.16	687.05	691.53	714.13	735.45	741.07
25.00°	596.26	585.07	574.25	560.13	551.53	560.46	576.16	574.66	580.40	556.73	548.03	533.94	536.47	549.69	576.01	591.04	596.26
27.50°	463.18	457.01	442.52	440.68	435.05	438.04	447.25	449.46	444.49	435.55	419.82	404.80	415.32	419.20	442.21	457.60	463.18
30.00°	356.59	349.28	339.95	327.65	324.26	326.14	339.54	336.24	339.22	317.64	307.50	302.38	308.28	317.48	337.91	351.78	356.59
32.50°	263.41	254.49	239.12	242.20	238.43	243.28	249.99	252.46	245.25	238.19	223.16	210.42	221.59	222.57	241.37	252.61	263.41
35.00°	194.24	186.24	177.93	160.88	162.45	168.31	181.74	176.88	180.17	160.49	154.28	152.08	154.99	164.36	180.38	191.15	194.24
37.50°	139.44	131.51	118.51	119.40	119.56	125.39	131.19	132.08	126.17	121.69	112.05	103.79	112.57	112.47	126.72	135.98	139.44
40.00°	105.36	97.60	91.22	81.33	83.64	89.00	97.55	93.76	94.43	84.44	81.88	78.33	81.25	87.12	98.02	105.52	105.36
42.50°	78.64	72.03	65.21	64.80	65.59	70.08	73.69	74.15	69.44	67.13	62.21	58.08	60.80	64.58	72.94	77.55	78.64
45.00°	60.77	56.87	52.02	49.17	50.05	53.50	57.63	57.16	55.59	50.74	46.23	46.42	46.86	52.55	57.42	61.47	60.77
47.50°	47.21	45.03	39.85	40.67	39.59	44.05	46.57	46.14	44.33	40.90	38.01	36.10	38.10	41.00	44.63	46.02	47.21
50.00°	37.88	37.55	33.81	32.46	31.47	35.10	38.73	35.58	36.53	32.13	31.84	30.68	31.71	33.56	37.47	39.12	37.88
52.50°	31.42	31.10	28.38	28.10	27.24	30.30	32.39	29.55	30.48	28.62	27.50	25.72	26.89	26.38	31.00	32.28	31.42
55.00°	27.25	26.45	25.49	24.07	24.00	25.65	26.82	23.73	26.32	25.06	23.53	22.94	23.13	24.04	25.67	26.73	27.25
57.50°	23.80	22.09	22.56	22.56	22.10	23.21	24.21	21.30	23.06	21.37	20.60	20.25	19.94	21.69	21.67	21.54	23.80
60.00°	20.84	20.19	19.52	20.88	19.97	20.77	22.86	18.98	20.60	18.28	17.81	17.72	17.86	19.19	19.48	19.66	20.84
62.50°	18.44	18.55	16.89	18.27	17.60	18.27	20.14	18.07	18.63	16.85	15.65	15.24	16.25	16.90	17.37	17.75	18.44
65.00°	16.34	16.19	15.22	15.72	15.47	15.85	16.98	17.02	17.01	15.17	13.53	13.39	14.31	15.75	15.34	15.74	16.34
67.50°	15.03	13.81	13.50	13.42	13.56	14.02	14.24	14.89	14.66	12.98	11.00	11.50	12.26	14.02	13.07	13.72	15.03
70.00°	13.90	11.47	11.69	11.20	11.23	12.21	11.59	12.96	11.89	10.74	8.60	9.42	9.67	10.95	10.63	11.71	13.90
72.50°	9.78	8.90	9.35	9.11	8.67	10.49	9.26	11.69	10.40	8.45	6.82	7.41	7.31	8.57	8.31	8.91	9.78
75.00°	6.80	6.03	6.80	7.53	7.41	8.27	7.20	9.43	9.04	6.10	5.35	5.49	5.82	6.53	6.20	6.07	6.80
77.50°	5.06	4.14	5.32	5.89	5.93	5.58	5.89	6.15	6.20	3.92	4.14	3.73	4.13	4.08	4.44	5.12	5.06
80.00°	2.85	2.57	3.21	3.41	3.84	3.99	4.02	3.58	3.87	2.64	2.51	2.59	2.40	2.47	2.41	2.61	2.85
82.50°	1.35	1.27	1.65	2.08	1.97	2.43	2.49	2.06	2.15	1.69	1.49	1.89	1.24	1.25	1.48	1.53	1.35
85.00°	1.44	1.10	1.14	1.23	1.26	1.51	1.69	1.46	1.34	1.31	1.02	1.27	1.07	1.01	1.84	1.61	1.44
87.50°	1.07	0.97	1.31	1.29	1.57	1.42	1.30	1.18	1.44	1.04	1.28	1.25	1.13	1.03	1.25	1.17	1.07
90.00°	0.00	0.00	0.00	1.41	1.61	1.69	1.13	1.06	1.25	1.11	0.99	0.00	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	1,216	1,216	1,216	1,216	1,188	1,188	1,188	1,188	1,135	1,135	1,135	1,087	1,087	1,087	1,042	1,042	1,022
	1	1,162	1,135	1,110	1,088	1,137	1,113	1,091	1,071	1,072	1,054	1,038	1,034	1,020	1,007	999	988	978
	2	1,109	1,062	1,023	990	1,087	1,044	1,009	979	1,012	983	958	981	958	937	953	935	918
	3	1,059	998	950	913	1,039	984	940	905	957	921	891	933	902	877	910	885	868
	4	1,012	941	889	849	995	930	881	844	908	867	834	888	853	824	870	840	824
	5	969	891	836	796	953	881	830	792	863	819	785	847	809	778	831	798	784
	6	928	845	790	750	914	838	785	747	823	777	742	809	768	737	796	760	747
	7	890	804	749	710	877	798	745	708	785	739	704	774	732	701	763	726	714
	8	855	767	712	675	843	762	710	673	751	704	670	741	699	668	732	694	683
	9	822	734	680	643	812	729	677	642	720	673	640	711	669	638	703	664	654
	10	791	703	650	614	782	699	648	614	691	644	612	683	641	610	676	637	628

Cone of Light

Mtg Height	Light Level	Beam Diameter
5.5 ft	78.2 fc	3.2 ft
6.5 ft	56.0 fc	3.8 ft
7.5 ft	42.1 fc	4.4 ft
8.0 ft	37.0 fc	4.7 ft
10.0 ft	23.7 fc	5.9 ft
12.0 ft	16.4 fc	7.1 ft
14.0 ft	12.1 fc	8.3 ft
16.0 ft	9.2 fc	9.4 ft
20.0 ft	5.9 fc	11.8 ft
24.0 ft	4.1 fc	14.2 ft
28.0 ft	3.0 fc	16.5 ft

Average Luminaire Luminance [cd/m²]

	0.00°	45.00°	90.00°
0.00°	670,135	670,135	670,135
45.00°	24,335	20,832	20,044
55.00°	13,452	12,582	11,849
65.00°	10,948	10,199	10,368
75.00°	7,443	7,442	8,106
85.00°	4,683	3,692	4,082

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	13.6	14.6	14.0	14.9	15.2	13.4	14.4	13.8	14.8	15.1
	3H	15.3	16.2	15.7	16.6	16.9	14.9	15.7	15.2	16.1	16.4
	4H	15.7	16.5	16.1	16.9	17.3	15.3	16.1	15.7	16.5	16.8
	6H	15.9	16.6	16.3	17.0	17.4	15.5	16.2	15.9	16.6	17.0
	8H	15.9	16.6	16.3	17.0	17.4	15.5	16.2	15.9	16.6	17.0
	12H	15.8	16.5	16.3	16.9	17.3	15.5	16.2	15.9	16.6	17.0
4H	2H	14.0	14.9	14.4	15.2	15.6	13.9	14.7	14.3	15.1	15.5
	3H	15.9	16.6	16.3	17.0	17.4	15.5	16.2	15.9	16.6	17.0
	4H	16.3	16.9	16.8	17.3	17.8	16.0	16.6	16.4	17.0	17.5
	6H	16.5	17.0	17.0	17.5	18.0	16.3	16.8	16.8	17.3	17.7
	8H	16.5	17.0	17.0	17.4	17.9	16.3	16.8	16.8	17.2	17.7
	12H	16.5	16.9	17.0	17.4	17.9	16.3	16.7	16.8	17.2	17.7
8H	4H	16.4	16.9	16.9	17.3	17.8	16.1	16.6	16.6	17.1	17.5
	6H	16.6	17.0	17.2	17.5	18.0	16.5	16.9	17.0	17.4	17.9
	8H	16.7	17.0	17.2	17.5	18.0	16.6	16.9	17.1	17.4	17.9
	12H	16.7	17.0	17.2	17.5	18.1	16.6	16.9	17.1	17.4	18.0
12H	4H	16.4	16.8	16.9	17.3	17.7	16.1	16.5	16.6	17.0	17.5
	6H	16.6	17.0	17.2	17.4	18.0	16.5	16.8	17.0	17.3	17.8
	8H	16.7	16.9	17.2	17.4	18.0	16.6	16.9	17.1	17.4	17.9

Corrected UGR values based on total output lumens

SHR = 1.0