

Indoor Distribution Test Report

Spectrum Lighting Inc.

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Spectrum Lighting Photometric Lab

Luminaire

SP4ES 20L 35K DX AR4ES SGxF
Nom. 4.5" Aperture, LED Downlight

Test Number

SP-00598_1

Test Date

Thu 9/21/2017

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

Summary of Results

Power

Input Watts	19.5 W
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Lumen Output

Output Lumens	1653
Efficacy	84.76 lm/W

Luminous Dimensions

0° - 180° Size	-0.38
90° - 270° Size	-0.38
Height	0

Spacing Criterion

Two luminaires, plane 0°	1.04
Two luminaires, plane 90°	1.04
Four luminaires	0.94

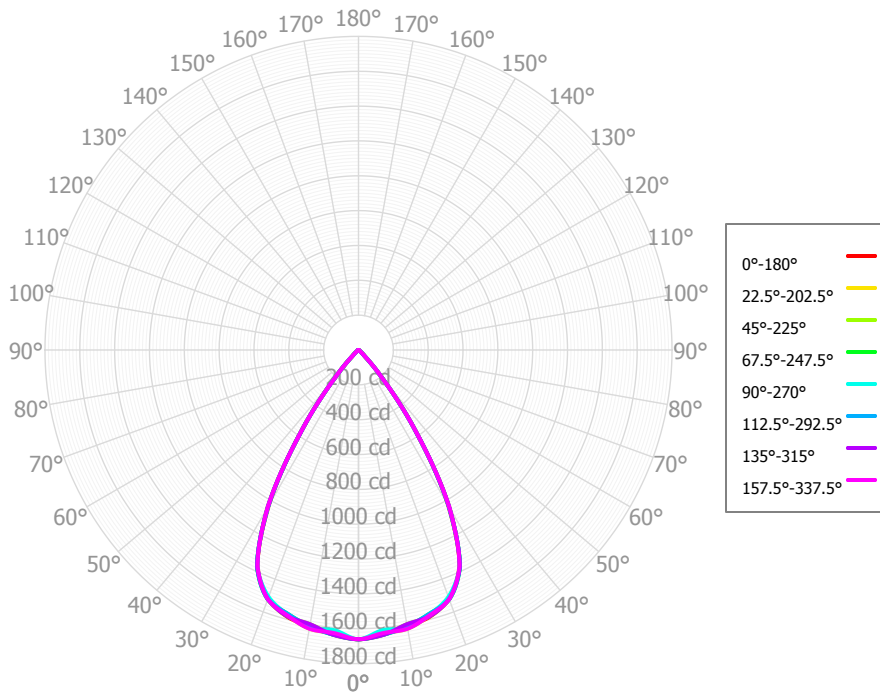
Full Beam Angle

0° - 180°	65°
90° - 270°	65°

IES File Header Contents

Keyword	Value
TESTLAB	Photopia 2017.2.1 see: www.ltiopics.com/ies
ISSUEDATE	
TESTDATE	Thu 9/21/2017
UPDATE	Mon 9/26/2017
TEST	SP-00598_1
MANUFAC	Spectrum Lighting
LUMCAT	SP4ES 20L 35K DX AR4ES SGxF
LUMINAIRE	Nom. 4.5" Aperture, LED Downlight
OTHER	Semi-Diffuse clear anodized, open aperture
OTHER	Any flange finish
OTHER	64.4 Deg. Beam Angle
LAMP	N/A
LAMPCAT	N/A, 3500K CCT
OTHER	Fully regressed lensed, light emitting surface
OTHER	Total Luminaire Watts is approximate
OTHER	CCT Output Multipliers: 4000K X 1.03, 3000K X 0.985
OTHER	This report prepared by Spectrum Lighting, Preliminary
_CRI	80+
_CCTMULT	30K x 0.985, 40K x 1.03
_LAMPMULT	11L x 0.55, 15L x 0.75

Candela Polar Plot



Zonal Lumen Summary

Zone	Lumens	% Fixture	Zone	Lumens	% Fixture
0.00° - 10.00°	164.78	9.97%	90.00° - 100.00°	0.00	0.00%
10.00° - 20.00°	442.93	26.80%	100.00° - 110.00°	0.00	0.00%
20.00° - 30.00°	603.39	36.51%	100.00° - 120.00°	0.00	0.00%
30.00° - 40.00°	364.05	22.03%	120.00° - 130.00°	0.00	0.00%
40.00° - 50.00°	62.71	3.79%	130.00° - 140.00°	0.00	0.00%
50.00° - 60.00°	9.84	0.60%	140.00° - 150.00°	0.00	0.00%
60.00° - 70.00°	3.52	0.21%	150.00° - 160.00°	0.00	0.00%
70.00° - 80.00°	1.32	0.08%	160.00° - 170.00°	0.00	0.00%
80.00° - 90.00°	0.27	0.02%	170.00° - 180.00°	0.00	0.00%
0.00° - 90.00°	1,652.80	100.00%	0.00° - 180.00°	1,652.80	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°	1,660.66	1,660.66	1,660.66	1,660.66	1,660.66	1,660.66	1,660.66	1,660.66	1,660.66	1,660.66	1,660.66	1,660.66	1,660.66	1,660.66	1,660.66	1,660.66	1,660.66
5.00°	1,636.57	1,631.24	1,641.77	1,640.87	1,614.67	1,640.87	1,641.77	1,631.24	1,636.57	1,631.24	1,641.77	1,640.87	1,614.67	1,640.87	1,641.77	1,631.24	1,636.57
10.00°	1,609.55	1,624.67	1,598.88	1,611.09	1,621.37	1,611.09	1,598.88	1,624.67	1,609.55	1,624.67	1,598.88	1,611.09	1,621.37	1,611.09	1,598.88	1,624.67	1,609.55
15.00°	1,584.79	1,577.40	1,582.08	1,568.79	1,573.32	1,568.79	1,582.08	1,577.40	1,584.79	1,577.40	1,582.08	1,568.79	1,573.32	1,568.79	1,582.08	1,577.40	1,584.79
20.00°	1,517.16	1,522.36	1,521.29	1,523.32	1,508.98	1,523.32	1,521.29	1,522.36	1,517.16	1,522.36	1,521.29	1,523.32	1,508.98	1,523.32	1,521.29	1,522.36	1,517.16
25.00°	1,374.70	1,371.51	1,375.18	1,377.51	1,375.17	1,377.51	1,375.18	1,371.51	1,374.70	1,371.51	1,375.18	1,377.51	1,375.17	1,377.51	1,375.18	1,371.51	1,374.70
30.00°	1,031.81	1,043.38	1,040.80	1,037.42	1,040.52	1,037.42	1,040.80	1,043.38	1,031.81	1,043.38	1,040.80	1,037.42	1,040.52	1,037.42	1,040.80	1,043.38	1,031.81
35.00°	584.58	583.40	581.01	579.72	583.04	579.72	581.01	583.40	584.58	583.40	581.01	579.72	583.04	579.72	581.01	583.40	584.58
40.00°	221.84	219.31	218.62	219.23	218.11	219.23	218.62	219.31	221.84	219.31	218.62	219.23	218.11	219.23	218.62	219.31	221.84
45.00°	52.12	51.63	51.21	51.72	51.57	51.72	51.21	51.63	52.12	51.63	51.21	51.72	51.57	51.72	51.21	51.63	52.12
50.00°	19.30	18.76	19.98	19.69	19.22	19.69	19.98	18.76	19.30	18.76	19.98	19.69	19.22	19.69	19.98	18.76	19.30
55.00°	9.31	9.73	10.18	10.03	9.85	10.03	10.18	9.73	9.31	9.73	10.18	10.03	9.85	10.03	10.18	9.73	9.31
60.00°	5.60	5.55	5.69	5.55	5.60	5.55	5.69	5.55	5.60	5.55	5.69	5.55	5.60	5.55	5.69	5.55	5.60
65.00°	3.42	3.20	3.33	3.36	3.58	3.36	3.33	3.20	3.42	3.20	3.33	3.36	3.58	3.36	3.33	3.20	3.42
70.00°	1.92	2.28	1.98	1.97	1.92	1.97	1.98	2.28	1.92	2.28	1.98	1.97	1.92	1.97	1.98	2.28	1.92
75.00°	1.22	1.25	1.13	1.19	1.15	1.19	1.13	1.25	1.22	1.25	1.13	1.19	1.15	1.19	1.13	1.25	1.22
80.00°	0.62	0.65	0.60	0.66	0.57	0.66	0.60	0.65	0.62	0.65	0.60	0.66	0.57	0.66	0.60	0.65	0.62
85.00°	0.16	0.17	0.22	0.16	0.20	0.16	0.22	0.17	0.16	0.17	0.22	0.16	0.20	0.16	0.22	0.17	0.16
90.00°	0.00	0.02	0.00	0.01	0.02	0.01	0.00	0.02	0.00	0.02	0.00	0.01	0.02	0.01	0.00	0.02	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	1,968	1,968	1,968	1,968	1,922	1,922	1,922	1,922	1,836	1,836	1,836	1,758	1,758	1,758	1,687	1,687	1,653
	1	1,877	1,832	1,792	1,755	1,837	1,797	1,760	1,727	1,730	1,701	1,674	1,668	1,645	1,624	1,612	1,594	1,577
	2	1,786	1,707	1,641	1,586	1,750	1,678	1,619	1,568	1,625	1,576	1,534	1,576	1,536	1,501	1,530	1,498	1,470
	3	1,698	1,593	1,512	1,448	1,665	1,570	1,496	1,436	1,527	1,464	1,413	1,487	1,435	1,391	1,450	1,406	1,379
	4	1,613	1,490	1,399	1,331	1,583	1,471	1,387	1,323	1,435	1,364	1,307	1,402	1,341	1,292	1,372	1,320	1,277
	5	1,532	1,395	1,300	1,230	1,505	1,380	1,291	1,224	1,350	1,273	1,213	1,323	1,256	1,203	1,297	1,239	1,192
	6	1,455	1,310	1,212	1,142	1,431	1,297	1,205	1,138	1,272	1,191	1,130	1,249	1,177	1,122	1,227	1,164	1,115
	7	1,383	1,231	1,133	1,064	1,362	1,220	1,127	1,061	1,199	1,116	1,055	1,180	1,105	1,050	1,161	1,095	1,044
	8	1,316	1,160	1,062	994	1,296	1,151	1,057	992	1,133	1,048	988	1,116	1,040	984	1,100	1,031	980
	9	1,253	1,095	998	932	1,235	1,086	994	930	1,071	986	927	1,056	979	924	1,043	972	921
	10	1,194	1,035	939	876	1,178	1,028	936	874	1,014	930	872	1,001	924	870	989	918	867

Cone of Light

Mtg Height	Light Level	Beam Diameter
5.5 ft	54.9 fc	6.9 ft
6.5 ft	39.3 fc	8.2 ft
7.5 ft	29.5 fc	9.5 ft
8.0 ft	25.9 fc	10.1 ft
10.0 ft	16.6 fc	12.6 ft
12.0 ft	11.5 fc	15.1 ft
14.0 ft	8.5 fc	17.7 ft
16.0 ft	6.5 fc	20.2 ft
20.0 ft	4.2 fc	25.2 ft
24.0 ft	2.9 fc	30.3 ft
28.0 ft	2.1 fc	35.3 ft

Average Luminaire Luminance [cd/m²]

	0.00°	45.00°	90.00°
0.00°	157,614	157,614	157,614
45.00°	6,996	6,874	6,922
55.00°	1,541	1,684	1,630
65.00°	768	748	804
75.00°	447	414	422
85.00°	174	240	218

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	0.7	1.6	1.1	1.9	2.3	0.8	1.8	1.2	2.1	2.4
	3H	1.1	2.0	1.5	2.3	2.7	1.2	2.1	1.6	2.4	2.8
	4H	1.2	2.0	1.7	2.4	2.8	1.3	2.1	1.7	2.4	2.8
	6H	1.3	2.0	1.7	2.3	2.7	1.3	2.0	1.7	2.4	2.8
	8H	1.3	1.9	1.7	2.3	2.7	1.3	2.0	1.7	2.3	2.8
	12H	1.2	1.8	1.6	2.2	2.6	1.3	1.9	1.7	2.3	2.7
4H	2H	0.7	1.5	1.1	1.8	2.2	0.9	1.6	1.3	2.0	2.4
	3H	1.3	1.9	1.7	2.3	2.7	1.4	2.0	1.8	2.4	2.8
	4H	1.5	2.0	1.9	2.4	2.9	1.5	2.0	1.9	2.5	2.9
	6H	1.6	2.0	2.0	2.5	3.0	1.6	2.0	2.0	2.5	3.0
	8H	1.5	2.0	2.0	2.4	2.9	1.5	2.0	2.0	2.4	2.9
	12H	1.5	1.9	2.0	2.4	2.8	1.5	1.9	2.0	2.4	2.8
8H	4H	1.4	1.8	1.9	2.3	2.8	1.4	1.9	1.9	2.3	2.8
	6H	1.5	1.9	2.1	2.4	2.9	1.5	1.9	2.1	2.4	2.9
	8H	1.6	1.9	2.1	2.4	2.9	1.6	1.9	2.1	2.4	2.9
	12H	1.5	1.8	2.1	2.3	2.9	1.6	1.8	2.1	2.3	2.9
12H	4H	1.4	1.7	1.8	2.2	2.7	1.4	1.8	1.9	2.2	2.7
	6H	1.5	1.8	2.0	2.3	2.8	1.5	1.8	2.0	2.3	2.8
	8H	1.5	1.8	2.1	2.3	2.9	1.5	1.8	2.1	2.3	2.9

Corrected UGR values based on total output lumens

SHR = 1.0