

Indoor Distribution Test Report

Spectrum Lighting Inc.

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Spectrum Lighting Photometric Lab

Luminaire

SP4ES 20L 35K DX AR4WES SG
Nom. 4.5" Aperture, LED Wall Wash

Test Number

SP-00677_9

Test Date

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	1541
Efficacy	79.01 lm/W

Luminous Dimensions

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

Spacing Criterion

Two luminaires, plane 0°	1.02
Two luminaires, plane 90°	1.03
Four luminaires	0.89

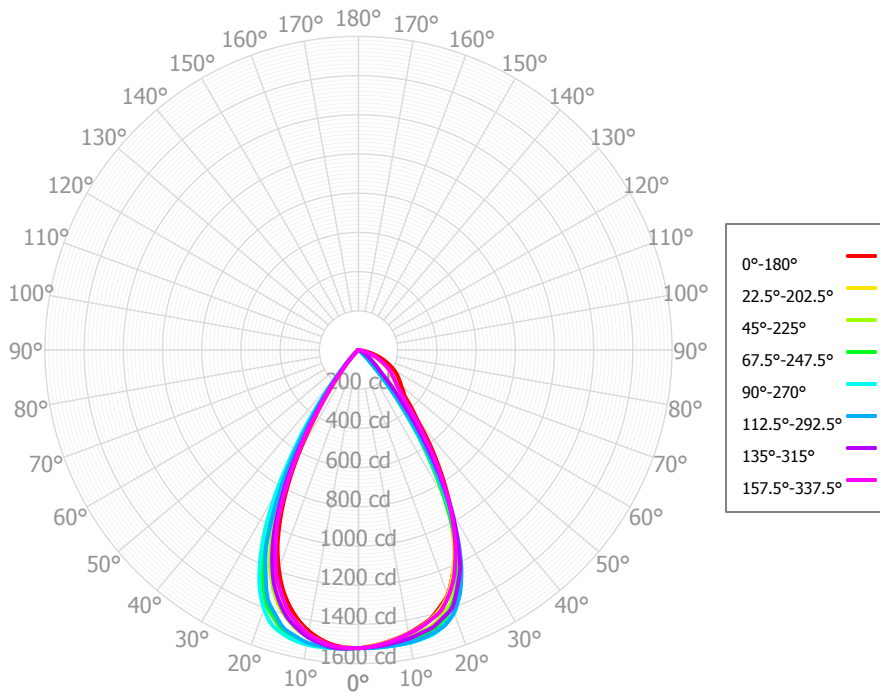
Full Beam Angle

0° - 180°	62°
90° - 270°	63°

IES File Header Contents

Keyword	Value
TEST	SP-00677_9
TESTLAB	Spectrum Lighting Photometric Lab, VLS-245-981
MANUFAC	Spectrum Lighting
ISSUEDATE	7/27/2018
UPDATE	9/19/2019
LUMCAT	SP4ES 20L 35K DX AR4WES SG
LUMINAIRE	Nom. 4.5" Aperture, LED Wall Wash
OTHER	Anodized alum (soft glow) trim, open aperture
OTHER	Peened 'kicker' reflector
OTHER	Any flange finish
LAMP	N/A
LAMPCAT	N/A, 3500K CCT
OTHER	Fully regressed lensed, light emitting surface
OTHER	Total Luminaire Watts is approximate
OTHER	This report prepared by Spectrum Lighting
_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°	146.04	9.48%	90.00° - 100.00°	0.11	0.01%
10.00° - 20.00°	402.48	26.12%	100.00° - 110.00°	0.00	0.00%
20.00° - 30.00°	503.31	32.67%	100.00° - 120.00°	0.00	0.00%
30.00° - 40.00°	303.98	19.73%	120.00° - 130.00°	0.00	0.00%
40.00° - 50.00°	94.60	6.14%	130.00° - 140.00°	0.00	0.00%
50.00° - 60.00°	46.90	3.04%	140.00° - 150.00°	0.00	0.00%
60.00° - 70.00°	28.76	1.87%	150.00° - 160.00°	0.00	0.00%
70.00° - 80.00°	12.40	0.81%	160.00° - 170.00°	0.00	0.00%
80.00° - 90.00°	2.23	0.14%	170.00° - 180.00°	0.00	0.00%
0.00° - 90.00°	1,540.70	100.00%	0.00° - 180.00°	1,540.70	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°	1,521.47	1,521.47	1,521.47	1,521.47	1,521.47	1,521.47	1,521.47	1,521.47	1,521.47	1,521.47	1,521.47	1,521.47	1,521.47	1,521.47	1,521.47	1,521.47	1,521.47
2.50°	1,512.27	1,511.21	1,516.51	1,517.53	1,520.46	1,524.99	1,525.04	1,520.90	1,518.95	1,519.93	1,522.47	1,524.90	1,523.15	1,522.71	1,517.58	1,514.58	1,512.27
5.00°	1,500.56	1,501.63	1,510.22	1,514.25	1,519.68	1,525.99	1,523.85	1,514.99	1,509.94	1,518.73	1,518.76	1,526.88	1,525.26	1,521.14	1,511.87	1,504.00	1,500.56
7.50°	1,485.27	1,487.52	1,500.87	1,512.28	1,518.58	1,521.78	1,508.03	1,497.26	1,488.27	1,496.57	1,508.97	1,524.30	1,528.14	1,518.88	1,503.41	1,489.24	1,485.27
10.00°	1,468.44	1,471.58	1,489.72	1,505.65	1,517.35	1,515.96	1,487.82	1,472.31	1,456.65	1,472.04	1,488.91	1,519.11	1,525.94	1,514.55	1,494.67	1,471.75	1,468.44
12.50°	1,445.20	1,450.11	1,473.71	1,494.58	1,508.90	1,494.88	1,453.85	1,431.03	1,412.78	1,428.50	1,459.32	1,503.02	1,517.38	1,506.87	1,479.86	1,451.79	1,445.20
15.00°	1,419.82	1,423.81	1,455.42	1,474.93	1,498.05	1,470.33	1,410.74	1,381.81	1,354.77	1,383.96	1,415.70	1,481.95	1,498.81	1,493.07	1,464.75	1,426.08	1,419.82
17.50°	1,376.91	1,385.88	1,418.96	1,448.42	1,465.94	1,414.72	1,345.39	1,307.73	1,282.34	1,308.47	1,361.34	1,434.31	1,469.92	1,471.21	1,433.18	1,396.10	1,376.91
20.00°	1,329.57	1,333.01	1,375.70	1,391.01	1,428.57	1,354.00	1,264.17	1,224.01	1,189.32	1,231.02	1,279.90	1,377.06	1,408.02	1,424.43	1,398.93	1,339.70	1,329.57
22.50°	1,250.81	1,251.66	1,289.49	1,313.60	1,338.23	1,238.70	1,151.75	1,106.50	1,078.96	1,113.91	1,181.47	1,274.49	1,318.37	1,350.56	1,316.25	1,267.21	1,250.81
25.00°	1,166.33	1,156.64	1,190.83	1,194.07	1,238.53	1,118.02	1,017.36	978.79	941.01	991.84	1,044.07	1,159.30	1,188.85	1,242.51	1,228.29	1,170.45	1,166.33
27.50°	1,057.40	1,040.76	1,057.18	1,052.71	1,083.18	942.54	848.36	813.01	784.24	823.52	887.11	990.59	1,031.35	1,104.21	1,094.75	1,061.88	1,057.40
30.00°	945.68	917.33	916.19	881.19	921.48	764.83	671.73	638.84	611.94	653.47	699.37	811.20	841.81	936.23	956.69	937.56	945.68
32.50°	823.48	784.31	756.20	696.92	728.63	578.05	485.22	471.21	430.86	473.22	499.06	613.80	634.16	746.63	792.64	807.01	823.48
35.00°	700.62	654.50	593.47	520.27	534.11	394.49	328.86	304.61	289.53	306.67	340.65	413.98	451.32	560.02	630.96	675.11	700.62
37.50°	583.71	528.03	450.87	346.11	373.11	263.95	204.64	202.17	166.03	197.65	195.37	274.54	279.61	375.20	478.81	542.80	583.71
40.00°	468.96	425.77	309.96	222.16	215.66	141.65	119.65	105.69	100.07	105.43	120.78	139.71	168.11	240.19	340.96	442.32	468.96
42.50°	399.75	343.91	228.78	110.33	132.07	86.97	68.70	68.92	54.15	65.36	62.49	86.98	78.38	128.89	245.85	348.84	399.75
45.00°	334.41	291.45	150.06	64.03	54.52	38.48	38.12	34.47	33.21	33.32	38.18	36.81	42.42	72.58	167.70	303.56	334.41
47.50°	308.92	259.70	117.40	29.30	33.87	24.26	22.11	22.27	19.07	21.14	19.55	23.70	21.11	37.45	130.07	265.86	308.92
50.00°	284.51	236.20	85.75	17.58	15.36	12.19	13.06	10.69	12.52	11.64	12.15	11.35	12.83	22.63	98.75	243.07	284.51
52.50°	266.72	217.39	67.69	8.39	9.94	8.49	8.09	8.51	7.44	7.34	5.89	8.08	7.09	13.77	79.31	221.67	266.72
55.00°	249.02	197.19	50.27	6.18	5.38	5.38	5.75	6.37	6.02	4.54	4.59	5.13	5.17	9.73	62.18	203.20	249.02
57.50°	231.70	176.36	37.54	4.32	4.42	3.97	4.63	4.57	5.06	4.06	3.51	4.38	3.78	6.72	48.57	184.80	231.70
60.00°	213.19	153.48	25.62	4.15	3.55	3.08	4.00	3.03	4.08	3.66	2.99	3.75	3.61	5.56	36.81	163.02	213.19
62.50°	190.82	129.85	17.81	3.96	2.93	3.40	3.55	2.85	3.10	3.36	2.52	3.65	3.53	4.68	27.39	141.26	190.82
65.00°	168.33	107.34	10.98	3.22	2.48	3.47	3.14	2.72	3.08	3.26	2.90	3.52	3.06	4.37	20.17	119.79	168.33
67.50°	145.57	85.15	7.42	2.58	2.40	3.08	2.74	2.82	3.08	3.34	3.15	3.27	2.61	4.09	15.15	98.54	145.57
70.00°	122.30	65.27	4.83	2.49	2.50	2.82	2.73	3.02	3.20	3.18	2.77	2.92	2.36	3.36	11.00	78.40	122.30
72.50°	98.43	46.49	3.74	2.20	2.81	2.70	2.74	3.39	3.11	2.89	2.65	2.45	2.24	2.80	7.32	59.55	98.43
75.00°	74.01	31.32	2.93	1.63	2.72	2.52	2.62	2.82	2.62	2.57	2.88	2.43	2.38	2.65	5.70	42.46	74.01
77.50°	51.23	18.77	2.25	1.69	2.34	2.13	2.27	2.00	2.00	2.08	2.44	2.38	2.19	2.33	3.97	28.40	51.23
80.00°	32.65	9.24	1.67	1.73	1.51	1.41	1.79	1.51	1.56	1.43	1.95	1.79	1.81	2.03	2.20	15.68	32.65
82.50°	15.09	3.81	1.43	1.39	1.27	1.10	1.31	1.68	1.36	1.35	1.34	1.12	1.33	1.72	1.79	6.08	15.09
85.00°	3.56	1.37	1.17	0.77	1.36	1.51	1.17	1.57	1.12	1.04	0.73	1.06	1.04	1.19	1.44	2.50	3.56
87.50°	1.29	1.09	1.35	1.26	0.98	1.15	1.12	1.34	1.19	1.33	1.31	1.10	0.90	1.26	1.22	1.25	1.29
90.00°	0.57	0.95	0.32	1.00	1.23	0.53	1.58	0.53	1.17	0.49	0.81	0.35	0.86	1.29	0.54	0.82	0.57

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	1,834	1,834	1,834	1,834	1,792	1,792	1,792	1,792	1,712	1,712	1,712	1,639	1,639	1,639	1,572	1,572	1,541
	1	1,742	1,696	1,655	1,618	1,703	1,663	1,626	1,592	1,600	1,570	1,543	1,542	1,519	1,497	1,489	1,471	1,454
	2	1,649	1,568	1,502	1,446	1,614	1,542	1,481	1,430	1,491	1,441	1,398	1,445	1,404	1,368	1,402	1,369	1,339
	3	1,560	1,454	1,373	1,308	1,528	1,433	1,358	1,297	1,392	1,328	1,276	1,354	1,301	1,256	1,319	1,274	1,237
	4	1,476	1,353	1,263	1,194	1,447	1,335	1,251	1,187	1,301	1,229	1,172	1,270	1,208	1,159	1,241	1,188	1,145
	5	1,398	1,262	1,168	1,098	1,372	1,247	1,159	1,093	1,219	1,142	1,083	1,193	1,126	1,073	1,169	1,110	1,063
	6	1,325	1,181	1,084	1,015	1,301	1,168	1,077	1,011	1,145	1,064	1,004	1,123	1,052	997	1,102	1,039	990
	7	1,257	1,107	1,011	943	1,236	1,097	1,005	940	1,077	995	935	1,058	985	930	1,040	975	925
	8	1,194	1,041	945	879	1,175	1,032	941	877	1,015	932	873	999	924	870	984	916	866
	9	1,135	981	887	823	1,118	973	883	821	959	876	818	945	869	816	931	863	813
	10	1,081	927	834	772	1,065	920	831	771	907	825	769	895	820	767	883	814	765

Cone of Light

Mtg Height	Light Level	Beam Diameter
5.5 ft	50.3 fc	6.6 ft
6.5 ft	36.0 fc	7.8 ft
7.5 ft	27.0 fc	9.0 ft
8.0 ft	23.8 fc	9.6 ft
10.0 ft	15.2 fc	11.9 ft
12.0 ft	10.6 fc	14.3 ft
14.0 ft	7.8 fc	16.7 ft
16.0 ft	5.9 fc	19.1 ft
20.0 ft	3.8 fc	23.9 ft
24.0 ft	2.6 fc	28.7 ft
28.0 ft	1.9 fc	33.4 ft

Average Luminaire Luminance [cd/m²]

	0.00°	45.00°	90.00°
0.00°	144,403	144,403	144,403
45.00°	44,886	20,142	7,317
55.00°	41,206	8,318	890
65.00°	37,804	2,465	557
75.00°	27,139	1,073	997
85.00°	3,872	1,274	1,476

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	23.2	24.3	23.6	24.6	24.9	-3.3	-2.3	-3.0	-2.0	-1.7
	3H	24.8	25.7	25.2	26.0	26.4	-1.4	-0.4	-1.0	-0.1	0.3
	4H	25.2	26.1	25.7	26.5	26.9	-0.1	0.7	0.3	1.1	1.5
	6H	25.4	26.2	25.9	26.6	27.0	0.9	1.7	1.3	2.1	2.5
	8H	25.5	26.2	25.9	26.6	27.0	1.2	2.0	1.7	2.4	2.8
	12H	25.4	26.1	25.8	26.5	26.9	1.6	2.4	2.1	2.7	3.2
4H	2H	23.0	23.8	23.4	24.2	24.6	-2.8	-2.0	-2.4	-1.6	-1.2
	3H	24.6	25.3	25.0	25.7	26.1	-0.4	0.3	0.0	0.7	1.1
	4H	25.1	25.8	25.6	26.2	26.6	1.0	1.6	1.4	2.0	2.5
	6H	25.4	25.9	25.9	26.4	26.9	2.2	2.7	2.6	3.1	3.6
	8H	25.4	25.9	25.9	26.4	26.8	2.5	3.0	3.0	3.5	3.9
	12H	25.4	25.8	25.9	26.3	26.8	3.0	3.4	3.5	3.9	4.4
8H	4H	25.0	25.5	25.5	25.9	26.4	1.5	2.0	2.0	2.5	3.0
	6H	25.2	25.6	25.8	26.1	26.6	2.8	3.2	3.4	3.7	4.2
	8H	25.3	25.6	25.8	26.1	26.6	3.3	3.6	3.8	4.2	4.7
	12H	25.2	25.5	25.8	26.0	26.6	4.0	4.3	4.5	4.8	5.4
12H	4H	24.9	25.3	25.4	25.8	26.3	1.6	2.0	2.1	2.5	3.0
	6H	25.2	25.5	25.7	26.0	26.6	3.0	3.3	3.5	3.8	4.3
	8H	25.2	25.5	25.7	26.0	26.6	3.5	3.8	4.0	4.3	4.9

Corrected UGR values based on total output lumens

SHR = 1.0