Indoor Distribution Test Report

Spectrum Lighting Inc.

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Spectrum Lighting Photometric Lab

Luminaire

CR2 835 05 xx xx RD2XS RB2BS xx xx

Nom 2.5 inch dia CR2 cylinder with black bezel and xtra narrow spot optic

Test Number

SP-01272

Test Date

9/21/2021

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

Summary of Results

Power

Input Watts	7 W

Lumen Output

Output Lumens	664
Efficacy	94.92 lm/W

Luminous Dimensions

0° - 180° Size	-0.21
90° - 270° Size	-0.21
Height	0

Spacing Criterion

Two luminaires, plane 0°	0.19
Two luminaires, plane 90°	0.19
Four luminaires	0.23

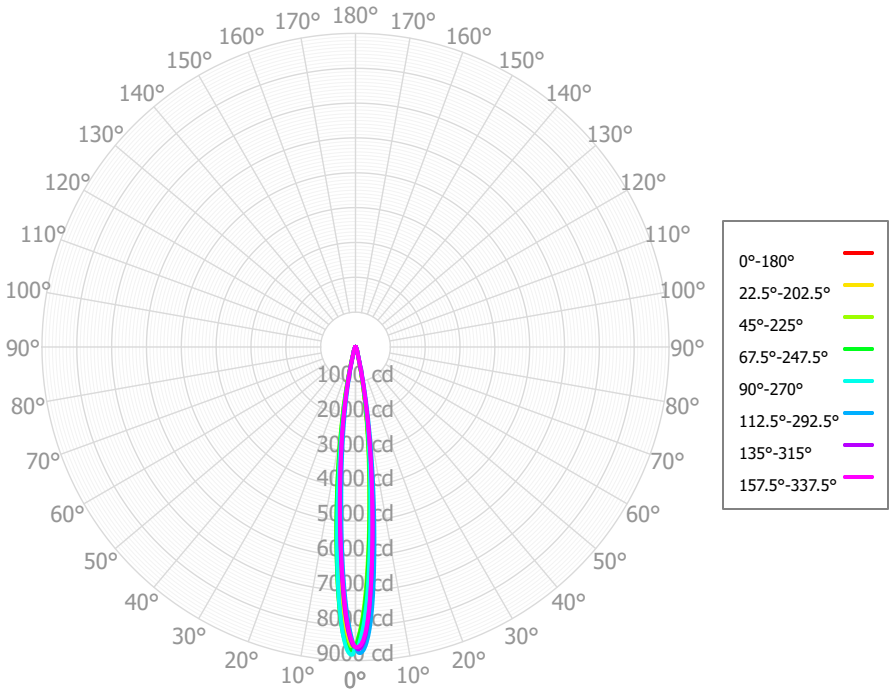
Full Beam Angle

0° - 180°	12°
90° - 270°	12°

IES File Header Contents

Keyword	Value
TEST	SP-01272
TESTLAB	Spectrum Lighting Photometric Lab, VLS-245-981
MANUFAC	Spectrum Lighting
TESTDATE	9/21/2021
ISSUEDATE	11/5/2021
LUMCAT	CR2 835 05 xx xx RD2XS RB2BS xx xx
LUMINAIRE	Nom 2.5 inch dia CR2 cylinder with black bezel and xtra narrow spot optic
OTHER	Beam Angle: 12 deg
LAMPCAT	N/A
LAMP	N/A, 6mm LES
OTHER	80 CRI, 35K tested
OTHER	CCT Output Multipliers: 822 x 0.75, 827 x 0.93, 830 x 1.0, 840 x 1.0
OTHER	CCT Output Multipliers: 927 x 0.81, 930 x 0.81, 935 x 0.81, 940 x 0.87
OTHER	Total luminaire wattage is approximate
OTHER	This report prepared by Spectrum Lighting

Candela Polar Plot



Zonal Lumen Summary

Zone	Lumens	% Fixture	Zone	Lumens	% Fixture
0.00° - 10.00°	393.64	59.24%	90.00° - 100.00°	1.20	0.18%
10.00° - 20.00°	151.64	22.82%	100.00° - 110.00°	1.09	0.16%
20.00° - 30.00°	49.52	7.45%	100.00° - 120.00°	2.08	0.31%
30.00° - 40.00°	31.41	4.73%	120.00° - 130.00°	0.94	0.14%
40.00° - 50.00°	18.70	2.81%	130.00° - 140.00°	0.93	0.14%
50.00° - 60.00°	7.90	1.19%	140.00° - 150.00°	0.71	0.11%
60.00° - 70.00°	2.37	0.36%	150.00° - 160.00°	0.55	0.08%
70.00° - 80.00°	1.30	0.20%	160.00° - 170.00°	0.32	0.05%
80.00° - 90.00°	1.11	0.17%	170.00° - 180.00°	0.11	0.02%
0.00° - 90.00°	657.59	98.97%	0.00° - 180.00°	664.43	100.00%

SPECTRUM LIGHTING INC.

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°	8613.69	8613.69	8613.69	8613.69	8613.69	8613.69	8613.69	8613.69	8613.69	8613.69	8613.69	8613.69	8613.69	8613.69	8613.69	8613.69	8613.69
0.50°	8489.74	8477.28	8354.94	8393.59	8592.22	8481.54	8566.49	8501.95	8560.86	8563.11	8625.93	8681.62	8827.77	8770.40	8681.98	8611.94	8489.74
1.00°	8336.88	8317.80	8091.57	8149.43	8368.82	8212.20	8394.07	8321.81	8475.41	8486.43	8617.92	8708.07	8822.38	8783.19	8636.62	8552.61	8336.88
1.50°	8102.38	8081.24	7757.73	7845.02	8091.20	7883.41	8139.49	8053.32	8309.16	8330.29	8541.25	8646.00	8725.97	8707.93	8505.11	8421.35	8102.38
2.00°	7780.27	7762.57	7364.99	7479.78	7741.17	7498.98	7804.64	7698.63	8056.98	8090.53	8391.45	8488.93	8531.56	8553.28	8272.74	8202.29	7780.27
2.50°	7376.38	7369.55	6915.41	7050.33	7326.75	7073.33	7400.52	7278.64	7720.06	7772.89	8167.09	8246.21	8252.73	8320.65	7951.00	7892.92	7376.38
3.00°	6924.11	6912.60	6434.53	6564.51	6857.10	6608.33	6941.88	6829.68	7310.37	7383.03	7867.70	7926.04	7902.28	8012.99	7544.49	7501.48	6924.11
3.50°	6448.71	6430.51	5951.52	6062.08	6350.79	6118.01	6469.26	6374.26	6871.61	6951.10	7502.28	7533.16	7495.79	7626.75	7081.85	7042.81	6448.71
4.00°	5964.80	5946.45	5479.44	5566.39	5857.66	5627.95	6004.42	5926.55	6428.11	6504.37	7081.87	7093.64	7037.85	7178.81	6588.42	6544.47	5964.80
4.50°	5475.02	5461.64	5015.63	5083.28	5371.94	5142.84	5551.29	5493.52	5992.91	6043.52	6617.58	6629.78	6540.15	6685.31	6092.66	6046.98	5475.02
5.00°	4991.16	4985.98	4560.52	4630.52	4894.19	4686.16	5108.64	5069.19	5553.95	5587.88	6142.81	6164.66	6026.84	6170.52	5603.26	5558.29	4991.16
5.50°	4517.50	4520.05	4133.77	4215.76	4457.37	4260.57	4677.99	4649.96	5116.83	5131.59	5672.61	5706.00	5513.31	5656.90	5121.00	5082.13	4517.50
6.00°	4072.88	4084.10	3741.86	3842.93	4048.98	3877.94	4275.71	4261.11	4686.59	4694.93	5218.88	5251.29	5009.85	5153.83	4651.94	4632.04	4072.88
6.50°	3655.12	3683.30	3383.55	3491.58	3671.89	3521.61	3892.82	3890.71	4272.54	4275.86	4788.86	4804.07	4537.28	4674.27	4205.83	4202.08	3655.12
7.00°	3281.87	3310.72	3048.09	3160.07	3322.07	3181.01	3541.61	3542.35	3880.31	3873.70	4377.81	4371.66	4090.72	4220.01	3792.32	3790.64	3281.87
7.50°	2929.03	2959.30	2737.01	2849.13	3003.75	2862.35	3220.72	3214.33	3517.54	3494.21	3984.51	3962.23	3672.54	3800.38	3404.76	3408.31	2929.03
8.00°	2619.01	2636.66	2449.07	2559.15	2716.00	2561.53	2914.34	2904.92	3180.42	3128.42	3615.06	3574.03	3287.54	3399.57	3048.33	3053.28	2619.01
8.50°	2324.83	2351.89	2182.23	2283.79	2450.94	2287.50	2636.11	2620.14	2868.39	2795.68	3261.13	3214.50	2927.44	3020.86	2714.99	2715.80	2324.83
9.00°	2057.18	2091.32	1931.62	2025.26	2192.39	2034.91	2359.83	2347.43	2576.62	2504.81	2925.35	2875.13	2592.72	2675.21	2405.20	2404.54	2057.18
9.50°	1803.56	1837.84	1694.09	1790.21	1949.03	1795.81	2101.98	2088.32	2303.00	2232.29	2613.37	2562.03	2286.73	2355.94	2114.10	2116.72	1803.56
10.00°	1567.44	1605.06	1477.24	1577.66	1718.81	1580.55	1855.73	1846.35	2047.18	1983.02	2327.46	2270.18	2011.18	2071.79	1843.63	1852.59	1567.44
10.50°	1356.09	1394.83	1278.87	1378.06	1501.50	1382.05	1634.47	1624.84	1806.67	1756.73	2066.69	2001.85	1762.15	1815.77	1596.75	1608.51	1356.09
11.00°	1163.34	1203.54	1098.51	1187.78	1309.11	1201.03	1431.70	1424.40	1587.72	1547.18	1827.03	1751.73	1532.47	1580.07	1377.29	1385.28	1163.34
11.50°	995.34	1029.38	939.86	1015.88	1132.81	1036.48	1246.23	1239.92	1390.50	1350.79	1604.49	1523.40	1330.00	1361.93	1181.87	1194.14	995.34
12.00°	846.94	878.81	800.88	865.40	973.62	885.98	1077.06	1071.22	1211.55	1172.61	1403.85	1320.06	1148.07	1173.50	1008.18	1019.81	846.94
12.50°	721.69	746.84	676.01	734.14	830.96	754.70	925.65	921.66	1048.40	1010.94	1216.92	1137.10	984.51	1004.57	860.24	869.74	721.69
13.00°	613.69	634.85	577.55	625.99	703.93	645.04	788.40	786.56	901.87	866.46	1043.62	976.72	839.91	857.87	731.11	738.19	613.69
13.50°	519.19	544.03	496.54	535.51	595.32	551.53	667.84	668.40	773.45	739.10	887.53	829.42	712.02	728.75	618.63	625.78	519.19
14.00°	447.29	468.89	423.98	460.08	506.77	473.42	564.54	565.69	657.17	631.29	747.97	702.51	606.80	618.63	523.30	532.98	447.29
14.50°	388.28	405.37	371.88	398.88	435.89	408.32	482.85	483.71	558.51	540.15	632.87	596.81	517.83	525.62	446.37	455.63	388.28
15.00°	342.91	355.89	328.25	351.98	379.53	359.50	418.37	417.27	480.11	464.83	542.55	509.10	445.98	452.68	389.05	394.67	342.91
15.50°	303.39	314.48	295.07	312.52	335.46	317.60	365.11	362.08	415.22	402.60	461.42	437.35	389.39	392.88	342.17	345.53	303.39
16.00°	273.45	282.57	270.48	283.64	300.19	282.47	321.61	320.14	360.66	351.53	401.19	379.07	341.67	343.32	304.88	306.67	273.45
16.50°	251.70	256.74	249.80	258.85	271.04	255.75	287.92	287.39	320.34	311.21	351.93	333.31	302.41	305.69	275.01	276.80	251.70
17.00°	229.49	237.01	230.32	237.30	245.68	234.24	261.59	258.63	286.26	276.51	308.25	296.10	271.93	275.48	248.46	252.37	229.49
17.50°	212.88	218.74	211.57	220.12	226.20	214.12	236.53	236.53	254.73	249.73	274.55	267.70	245.98	250.60	223.88	230.59	212.88
18.00°	198.00	201.70	198.30	204.18	205.00	197.70	217.02	215.95	230.17	232.01	247.16	243.33	225.90	230.69	207.61	210.04	198.00
18.50°	182.65	188.16	186.76	192.61	194.72	186.84	201.52	200.62	213.30	211.18	227.49	221.03	209.88	211.40	194.34	195.00	182.65
19.00°	174.09	177.46	174.23	179.71	181.25	177.39	189.91	189.71	196.52	196.79	207.46	204.49	194.13	195.36	180.96	184.23	174.09
19.50°	165.28	165.88	166.81	171.13	169.70	162.63	178.81	176.64	183.17	186.79	193.74	188.43	180.42	183.66	171.26	172.22	165.28
20.00°	156.01	156.38	158.60	164.93	165.06	157.89	167.85	167.74	175.96	173.12	183.82	179.49	167.93	171.55	163.07	163.47	156.01
20.50°	148.44	153.17	151.51	153.92	154.38	150.88	160.82	160.11	167.82	165.86	172.77	170.14	161.33	163.28	157.69	154.93	148.44
21.00°	142.35	146.15	146.21	148.04	150.54	145.17	152.44	154.97	157.58	154.90	165.12	162.58	154.09	156.47	149.10	151.00	142.35
21.50°	137.01	139.73	142.49	143.49	141.75	139.10	146.64	147.63	149.78	146.69	157.35	155.69	147.41	150.05	142.44	145.22	137.01
22.00°	131.94	133.40	137.92	139.19	132.54	132.98	141.92	139.39	142.69	140.72	148.77	149.02	141.40	143.84	136.33	138.85	131.94
22.50°	126.76	127.74	130.95	133.44	129.78	127.63	136.21	132.90	136.59	135.26	139.98	141.64	135.29	137.91	130.42	132.38	126.76

Coefficients of Utilization – Zonal Cavity Method

Values are lumens delivered to the workplane.

	ρfc	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	0%
	ρcc	80%	80%	80%	80%	70%	70%	70%	70%	50%	50%	50%	30%	30%	30%	10%	10%	10%	0%
	ρw	70%	50%	30%	10%	70%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	30%
	0	789	789	789	789	770	770	770	770	734	734	734	702	702	702	672	672	672	658
	1	764	751	739	728	748	736	725	716	708	700	693	683	677	671	660	655	651	642
	2	741	719	700	684	727	707	690	676	685	672	661	665	655	646	647	639	632	626
	3	720	691	669	651	708	682	662	646	665	649	635	649	636	625	635	624	615	612
	4	701	668	644	626	691	661	639	622	647	629	614	634	619	607	623	610	600	599
RCR	5	684	648	623	605	675	642	619	602	631	612	597	621	604	591	611	597	586	587
	6	668	631	606	588	660	626	603	586	617	597	582	608	591	578	600	585	574	576
	7	653	615	591	574	646	611	588	572	604	584	569	597	579	566	590	575	563	565
	8	640	602	578	561	634	598	576	560	592	572	557	586	568	555	581	565	553	556
	9	628	590	566	550	622	587	564	549	581	561	547	576	558	545	572	555	544	547
	10	617	578	556	540	612	576	554	540	571	552	538	567	549	537	563	547	535	539

Cone of Light

Mtg Height	Light Level	Beam Diameter
5.5 ft	284.8 fc	1.1 ft
6.5 ft	203.9 fc	1.3 ft
7.5 ft	153.1 fc	1.5 ft
8.0 ft	134.6 fc	1.6 ft
10.0 ft	86.1 fc	2.0 ft
12.0 ft	59.8 fc	2.3 ft
14.0 ft	43.9 fc	2.7 ft
16.0 ft	33.6 fc	3.1 ft
20.0 ft	21.5 fc	3.9 ft
24.0 ft	15.0 fc	4.7 ft
28.0 ft	11.0 fc	5.5 ft

Average Luminaire Luminance [cd/m²]

	0.00°	45.00°	90.00°
0.00°	2676891	2676891	2676891
45.00°	10445	9860	11037
55.00°	3999	3654	5428
65.00°	1471	1690	2048
75.00°	1138	1233	1930
85.00°	2720	4228	3950

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	4.5	5.5	4.9	5.8	6.1	5.5	6.5	5.9	6.8	7.2
	3H	5.1	5.9	5.5	6.3	6.7	6.1	6.9	6.5	7.2	7.6
	4H	5.3	6.1	5.7	6.4	6.9	6.4	7.1	6.8	7.5	7.9
	6H	5.8	6.5	6.2	6.9	7.3	6.7	7.4	7.2	7.8	8.3
	8H	6.1	6.7	6.6	7.2	7.6	6.9	7.6	7.4	8.0	8.4
	12H	6.4	7.1	6.9	7.5	7.9	7.3	7.9	7.8	8.3	8.8
4H	2H	4.5	5.3	5.0	5.7	6.1	5.6	6.3	6.0	6.7	7.1
	3H	5.3	6.0	5.8	6.4	6.8	6.3	6.9	6.7	7.3	7.8
	4H	5.7	6.3	6.2	6.7	7.2	6.7	7.3	7.2	7.7	8.2
	6H	6.4	6.9	6.9	7.4	7.9	7.3	7.7	7.8	8.2	8.7
	8H	6.9	7.3	7.4	7.8	8.3	7.6	8.0	8.1	8.5	9.0
	12H	7.4	7.8	7.9	8.3	8.8	8.1	8.5	8.7	9.0	9.5
8H	4H	5.9	6.3	6.4	6.8	7.3	6.8	7.2	7.3	7.7	8.2
	6H	6.8	7.2	7.4	7.7	8.2	7.5	7.9	8.0	8.4	8.9
	8H	7.4	7.8	8.0	8.3	8.8	8.0	8.3	8.6	8.9	9.4
	12H	8.3	8.5	8.8	9.0	9.6	8.9	9.1	9.4	9.6	10.3
12H	4H	5.9	6.3	6.4	6.8	7.3	6.8	7.1	7.3	7.7	8.2
	6H	7.0	7.3	7.5	7.8	8.4	7.6	7.9	8.1	8.4	9.0
	8H	7.7	8.0	8.2	8.5	9.1	8.2	8.5	8.8	9.0	9.6

Corrected UGR values based on total output energy
SHR = 1.0

Corrected UGR values based on total output lumens

SHR = 1.0