

## Indoor Distribution Test Report

# Spectrum Lighting Inc.

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## Spectrum Lighting Photometric Lab

### Luminaire

CR2 835 15 xx xx RD2SP RB2BS xx RA2LL  
Nom 2.5 inch dia cylinder with spot optic and linear spread lens

### Test Number

SP-01274\_2

### Test Date

9/24/2021

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	1381
Efficacy	70.83 lm/W

#### Luminous Dimensions

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

#### Spacing Criterion

Two luminaires, plane 0°	0.6
Two luminaires, plane 90°	0.38
Four luminaires	0.5

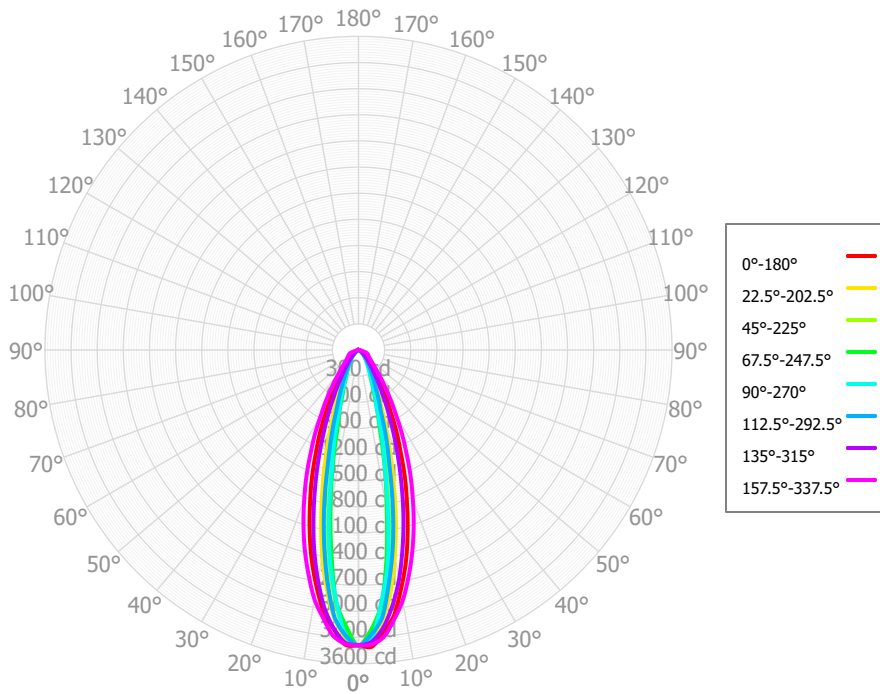
#### Full Beam Angle

0° - 180°	37°
90° - 270°	22°

### IES File Header Contents

Keyword	Value
TEST	SP-01274_2
TESTLAB	Spectrum Lighting Photometric Lab, VLS-245-981
MANUFAC	Spectrum Lighting
TESTDATE	9/24/2021
ISSUEDATE	10/8/2021
LUMCAT	CR2 835 15 xx xx RD2SP RB2BS xx RA2LL
LUMINAIRE	Nom 2.5 inch dia cylinder with spot optic and linear spread lens
OTHER	Beam Angle: 22 X 37 degrees
LAMPCAT	N/A
LAMP	N/A, 6mm LES
OTHER	80 CRI, 3500K tested
OTHER	LER (luminaire efficacy) = 71 lms / watt
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 wattages are approximate
OTHER	This report prepared by Spectrum Lighting
_CRI	80+
_CCTMULT	822 x 0.75, 827 x 0.93, 830 x 1.0, 840 x 1.0
_CCTMULTA	927 x 0.81, 930 x 0.81, 935 x 0.81, 940 x 0.87
_LAMPMULT	N/A

### Candela Polar Plot



### Zonal Lumen Summary

Zone	Lumens	% Fixture	Zone	Lumens	% Fixture
0.00° - 10.00°	274.07	19.84%	90.00° - 100.00°	1.80	0.13%
10.00° - 20.00°	434.61	31.47%	100.00° - 110.00°	1.71	0.12%
20.00° - 30.00°	300.34	21.75%	100.00° - 120.00°	3.37	0.24%
30.00° - 40.00°	171.50	12.42%	120.00° - 130.00°	1.54	0.11%
40.00° - 50.00°	94.88	6.87%	130.00° - 140.00°	1.38	0.10%
50.00° - 60.00°	52.40	3.79%	140.00° - 150.00°	1.21	0.09%
60.00° - 70.00°	29.23	2.12%	150.00° - 160.00°	0.93	0.07%
70.00° - 80.00°	11.10	0.80%	160.00° - 170.00°	0.55	0.04%
80.00° - 90.00°	2.01	0.15%	170.00° - 180.00°	0.18	0.01%
0.00° - 90.00°	1370.13	99.21%	0.00° - 180.00°	1381.09	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°	3391.06	3391.06	3391.06	3391.06	3391.06	3391.06	3391.06	3391.06	3391.06	3391.06	3391.06	3391.06	3391.06	3391.06	3391.06	3391.06	3391.06
2.50°	3412.09	3329.12	3353.18	3223.67	3330.17	3287.15	3367.87	3378.32	3389.28	3308.90	3316.51	3183.91	3293.32	3276.41	3357.11	3386.45	3412.09
5.00°	3252.51	3125.16	2971.18	2956.60	2934.92	3095.15	3215.40	3298.16	3223.38	3109.94	2932.65	2914.70	2903.31	3092.54	3208.68	3309.47	3252.51
7.50°	3086.88	2815.10	2585.32	2450.22	2534.12	2707.27	2991.74	3105.78	3042.83	2774.91	2543.66	2375.50	2483.71	2687.29	2968.32	3123.69	3086.88
10.00°	2797.26	2401.35	2043.17	1871.75	1969.81	2268.23	2681.67	2908.89	2765.97	2400.53	2026.35	1846.66	1956.62	2274.16	2678.72	2922.25	2797.26
12.50°	2506.63	1978.61	1496.31	1395.36	1408.28	1814.07	2351.97	2644.89	2477.27	1974.32	1504.59	1368.94	1417.66	1814.30	2336.15	2660.66	2506.63
15.00°	2179.48	1546.36	1126.50	953.88	1056.21	1355.37	1996.48	2380.25	2166.03	1575.70	1143.56	930.61	1068.38	1372.02	1994.21	2388.82	2179.48
17.50°	1852.44	1179.27	766.55	698.04	704.15	1028.50	1658.60	2100.15	1851.34	1217.11	791.59	717.57	744.77	1053.38	1653.01	2107.28	1852.44
20.00°	1556.58	886.79	595.31	512.49	555.84	745.64	1345.84	1820.39	1562.99	915.15	620.04	519.24	579.53	751.30	1341.92	1823.82	1556.58
22.50°	1260.71	657.68	438.81	399.12	408.90	570.20	1064.34	1557.16	1279.38	702.39	463.48	423.44	440.63	596.40	1069.36	1558.69	1260.71
25.00°	1028.06	508.30	356.36	316.40	335.90	435.24	832.00	1293.94	1044.63	528.16	380.26	332.67	361.15	447.59	833.70	1297.81	1028.06
27.50°	796.46	389.69	281.43	260.37	265.18	345.42	632.93	1076.40	820.32	419.98	304.88	284.46	293.19	367.62	649.23	1075.39	796.46
30.00°	635.12	313.04	235.25	216.77	224.10	274.35	490.78	859.03	654.27	327.92	257.05	237.85	249.29	289.69	494.93	863.10	635.12
32.50°	476.42	248.93	192.83	184.23	184.56	224.46	370.56	703.80	502.40	266.44	212.86	208.21	210.75	242.95	386.04	701.57	476.42
35.00°	378.98	203.66	166.02	157.33	158.38	184.24	291.20	550.06	397.18	212.67	183.12	178.94	181.78	196.82	295.45	555.05	378.98
37.50°	285.42	164.31	141.67	135.84	133.19	152.39	223.50	452.16	304.78	174.90	155.73	155.13	155.30	166.35	235.23	450.21	285.42
40.00°	231.15	134.64	122.26	117.41	116.05	124.78	179.90	356.99	243.25	140.75	131.80	131.49	132.83	136.02	184.48	359.39	231.15
42.50°	180.28	108.89	103.79	101.59	99.73	101.85	141.56	301.07	191.40	114.97	108.52	111.64	111.52	112.87	150.85	297.19	180.28
45.00°	149.22	90.10	87.12	87.37	83.56	81.50	115.14	247.94	157.77	91.91	90.41	91.87	92.53	89.71	121.57	245.67	149.22
47.50°	120.43	73.15	70.84	73.94	67.40	65.19	91.86	215.80	130.48	75.75	73.42	76.40	74.30	73.50	100.84	212.46	120.43
50.00°	101.99	59.84	57.57	61.06	55.80	51.31	76.43	185.64	110.45	60.55	58.73	60.93	59.01	57.34	82.24	186.91	101.99
52.50°	85.00	47.58	45.03	48.48	44.89	40.61	62.52	169.96	93.22	48.08	44.61	45.81	44.81	45.62	68.31	168.12	85.00
55.00°	74.69	37.60	34.74	36.14	34.22	32.02	52.85	156.07	80.88	36.87	33.49	30.69	33.40	34.02	55.80	152.43	74.69
57.50°	65.48	28.56	25.10	26.62	23.60	24.51	43.61	145.60	70.64	29.67	23.22	22.79	23.12	26.47	46.69	140.88	65.48
60.00°	56.61	21.78	18.45	19.34	17.27	17.79	35.69	135.63	61.70	22.56	16.48	15.03	16.49	19.11	38.31	131.44	56.61
62.50°	47.81	15.83	12.76	13.45	11.86	13.06	28.20	128.13	53.38	15.82	10.89	11.84	11.52	13.72	31.89	124.53	47.81
65.00°	40.49	12.09	9.09	8.74	8.22	9.90	22.27	121.05	45.60	10.04	7.92	8.86	8.23	8.46	25.66	119.03	40.49
67.50°	33.52	8.77	6.13	5.84	5.01	7.25	16.60	111.08	38.11	8.21	5.90	7.28	5.77	6.19	19.95	110.46	33.52
70.00°	26.42	6.70	4.72	4.65	3.65	5.02	11.99	100.51	28.65	6.40	4.34	5.79	4.35	4.21	14.44	100.03	26.42
72.50°	19.29	4.75	3.92	3.67	2.80	3.55	7.72	73.26	18.05	4.66	2.96	4.21	3.51	3.50	9.55	79.29	19.29
75.00°	12.66	3.22	3.17	2.91	2.13	2.78	4.99	42.04	10.47	3.04	2.10	2.62	2.75	2.94	5.32	51.64	12.66
77.50°	6.18	2.02	2.44	2.37	1.51	2.19	2.62	22.24	4.77	2.12	1.46	2.16	2.06	2.43	3.62	29.24	6.18
80.00°	3.64	2.09	2.00	2.07	1.42	1.79	2.15	5.51	2.34	1.35	1.28	1.83	1.67	1.92	2.23	10.65	3.64
82.50°	2.39	2.08	1.70	1.82	1.51	1.52	1.75	1.55	2.16	1.49	1.31	1.94	1.49	1.77	2.15	2.24	2.39
85.00°	1.94	1.79	1.67	1.63	1.52	1.41	1.75	1.53	1.88	1.60	1.46	2.11	1.47	1.68	2.06	1.82	1.94
87.50°	1.78	1.55	1.77	1.53	1.51	1.47	1.80	1.49	1.53	1.41	1.67	1.91	1.56	1.91	1.93	1.63	1.78
90.00°	1.84	1.59	1.62	1.55	1.44	1.77	2.16	1.45	1.58	1.25	1.82	1.64	1.54	2.21	1.81	1.64	1.84
92.50°	1.99	1.64	1.31	1.52	1.36	1.78	2.45	1.51	1.95	1.50	1.93	1.57	1.44	1.92	1.76	1.51	1.99
95.00°	1.81	1.76	1.55	1.43	1.65	1.41	1.99	1.62	1.98	1.71	1.79	1.55	1.50	1.50	1.70	1.24	1.81
97.50°	1.48	1.86	2.14	1.47	2.12	1.35	1.56	1.56	1.71	1.48	1.49	1.66	1.69	1.48	1.64	1.19	1.48
100.00°	1.40	1.88	2.22	1.70	2.14	1.73	1.39	1.44	1.63	1.27	1.47	1.80	1.75	1.58	1.60	1.37	1.40
102.50°	1.44	1.84	1.94	1.79	1.93	1.96	1.25	1.44	1.74	1.49	1.64	1.72	1.68	1.51	1.74	1.37	1.44
105.00°	1.42	1.44	1.71	1.62	1.69	1.97	1.52	1.50	1.67	1.71	1.79	1.59	1.71	1.39	1.85	1.18	1.42
107.50°	1.38	1.12	1.51	1.58	1.43	1.84	1.78	1.61	1.44	2.02	1.92	1.42	1.84	1.45	1.70	0.97	1.38
110.00°	1.87	1.71	1.41	1.77	1.32	1.51	1.44	1.76	1.49	2.32	1.90	1.25	1.87	1.57	1.55	0.75	1.87
112.50°	2.70	2.25	1.39	1.89	1.29	1.40	1.11	1.73	1.85	1.90	1.74	1.46	1.80	1.68	1.59	0.83	2.70

### Coefficients of Utilization – Zonal Cavity Method

Values are lumens delivered to the workplane.

<b>RCR</b>	<b>pfc</b>	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	0%
	<b>pcc</b>	80%	80%	80%	80%	70%	70%	70%	70%	50%	50%	50%	30%	30%	30%	10%	10%	0%
	<b>pw</b>	70%	50%	30%	10%	70%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	30%
	<b>0</b>	1642	1642	1642	1642	1602	1602	1602	1602	1528	1528	1528	1461	1461	1461	1399	1399	1370
	<b>1</b>	1564	1526	1491	1460	1529	1495	1464	1436	1437	1412	1389	1384	1364	1346	1335	1319	1292
	<b>2</b>	1487	1420	1365	1318	1456	1396	1345	1302	1349	1308	1272	1306	1273	1243	1267	1240	1215
	<b>3</b>	1415	1328	1260	1206	1387	1308	1245	1195	1270	1218	1175	1235	1192	1155	1203	1167	1144
	<b>4</b>	1348	1246	1172	1115	1323	1230	1161	1108	1199	1140	1093	1170	1120	1080	1144	1101	1080
	<b>5</b>	1286	1175	1097	1039	1263	1161	1089	1034	1136	1072	1024	1112	1057	1014	1089	1042	1023
	<b>6</b>	1229	1111	1032	975	1208	1100	1026	972	1078	1013	964	1058	1001	957	1040	989	972
	<b>7</b>	1176	1054	976	920	1158	1045	970	917	1027	960	912	1010	951	906	994	941	925
	<b>8</b>	1127	1004	926	872	1111	995	921	870	980	913	866	965	905	862	952	898	883
	<b>9</b>	1082	958	881	830	1067	951	878	828	937	871	825	925	865	821	913	858	845
	<b>10</b>	1041	916	841	792	1027	910	839	790	898	833	788	887	828	785	877	822	810

### Cone of Light

Mtg Height	Light Level	Beam Diameter
5.5 ft	112.1 fc	3.0 ft
6.5 ft	80.3 fc	3.5 ft
7.5 ft	60.3 fc	4.0 ft
8.0 ft	53.0 fc	4.3 ft
10.0 ft	33.9 fc	5.4 ft
12.0 ft	23.5 fc	6.4 ft
14.0 ft	17.3 fc	7.5 ft
16.0 ft	13.2 fc	8.6 ft
20.0 ft	8.5 fc	10.7 ft
24.0 ft	5.9 fc	12.9 ft
28.0 ft	4.3 fc	15.0 ft

### Average Luminaire Luminance [cd/m²]

	0.00°	45.00°	90.00°
<b>0.00°</b>	1053845	1053845	1053845
<b>45.00°</b>	65582	38289	36722
<b>55.00°</b>	40466	18825	18543
<b>65.00°</b>	29777	6681	6044
<b>75.00°</b>	15200	3802	2554
<b>85.00°</b>	6914	5937	5434

### UGR CIE 190:2010

<b>Ceiling reflectance</b>		<b>0.7</b>	<b>0.7</b>	<b>0.5</b>	<b>0.5</b>	<b>0.3</b>	<b>0.7</b>	<b>0.7</b>	<b>0.5</b>	<b>0.5</b>	<b>0.3</b>
<b>Wall reflectance</b>		<b>0.5</b>	<b>0.3</b>	<b>0.5</b>	<b>0.3</b>	<b>0.3</b>	<b>0.5</b>	<b>0.3</b>	<b>0.5</b>	<b>0.3</b>	<b>0.3</b>
<b>Plane reflectance</b>		<b>0.2</b>	<b>0.2</b>	<b>0.2</b>	<b>0.2</b>	<b>0.2</b>	<b>0.2</b>	<b>0.2</b>	<b>0.2</b>	<b>0.2</b>	<b>0.2</b>
<b>Room dimensions</b>		<b>Viewed crosswise</b>					<b>Viewed endwise</b>				
<b>2H</b>	<b>2H</b>	22.8	23.8	23.1	24.2	24.5	13.1	14.2	13.5	14.5	14.8
	<b>3H</b>	24.1	25.1	24.5	25.4	25.8	13.3	14.2	13.7	14.6	15.0
	<b>4H</b>	24.3	25.2	24.7	25.6	26.0	13.3	14.2	13.7	14.5	14.9
	<b>6H</b>	24.3	25.1	24.7	25.5	25.9	13.3	14.1	13.7	14.5	14.9
	<b>8H</b>	24.2	25.0	24.7	25.4	25.8	13.3	14.0	13.7	14.4	14.8
	<b>12H</b>	24.2	24.9	24.6	25.3	25.8	13.3	14.0	13.7	14.4	14.9
<b>4H</b>	<b>2H</b>	22.5	23.4	23.0	23.8	24.2	13.6	14.5	14.0	14.8	15.3
	<b>3H</b>	24.4	25.1	24.8	25.5	26.0	13.9	14.6	14.3	15.0	15.5
	<b>4H</b>	24.9	25.6	25.4	26.0	26.5	13.9	14.5	14.4	15.0	15.4
	<b>6H</b>	24.9	25.5	25.4	26.0	26.5	13.9	14.5	14.4	14.9	15.4
	<b>8H</b>	24.9	25.4	25.4	25.9	26.4	13.9	14.4	14.4	14.9	15.4
	<b>12H</b>	24.8	25.3	25.3	25.8	26.3	14.0	14.4	14.5	14.9	15.4
<b>8H</b>	<b>4H</b>	24.8	25.3	25.3	25.7	26.2	15.5	16.0	15.9	16.4	16.9
	<b>6H</b>	24.8	25.2	25.3	25.7	26.3	15.4	15.9	16.0	16.4	16.9
	<b>8H</b>	24.8	25.1	25.3	25.7	26.2	15.5	15.8	16.0	16.4	16.9
	<b>12H</b>	24.7	25.1	25.3	25.6	26.2	15.6	15.9	16.1	16.4	17.0
<b>12H</b>	<b>4H</b>	24.7	25.2	25.2	25.7	26.2	15.5	15.9	16.0	16.4	16.9
	<b>6H</b>	24.8	25.1	25.3	25.6	26.2	15.5	15.8	16.0	16.3	16.9
	<b>8H</b>	24.7	25.0	25.3	25.6	26.1	15.5	15.8	16.0	16.3	16.9

Corrected UGR values based on total output energy  
 SHR = 1.0

Corrected UGR values based on total output lumens

SHR = 1.0