## Indoor Distribution Test Report

# Spectrum Lighting Inc.

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## Spectrum Lighting Photometric Lab

**Luminaire**

CR2 835 15 xx xx RD2FL RB2BSA2 xx xx

Nom 2.5 inch dia cylinder with flood optic and 2 inch acrylic style bezel

**Test Number**

SP-01273_6

**Test Date**

9/23/2021

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

## Summary of Results

### Power

| | |
|---|---|
| **Input Watts** | 19.5 W |

### Lumen Output

| | |
|---|---|
| **Output Lumens** | 1681 |
| **Efficacy** | 86.22 lm/W |

### Luminous Dimensions

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

### Spacing Criterion

| | |
|---|---|
| **Two luminaires, plane 0°** | 0.48 |
| **Two luminaires, plane 90°** | 0.52 |
| **Four luminaires** | 0.46 |

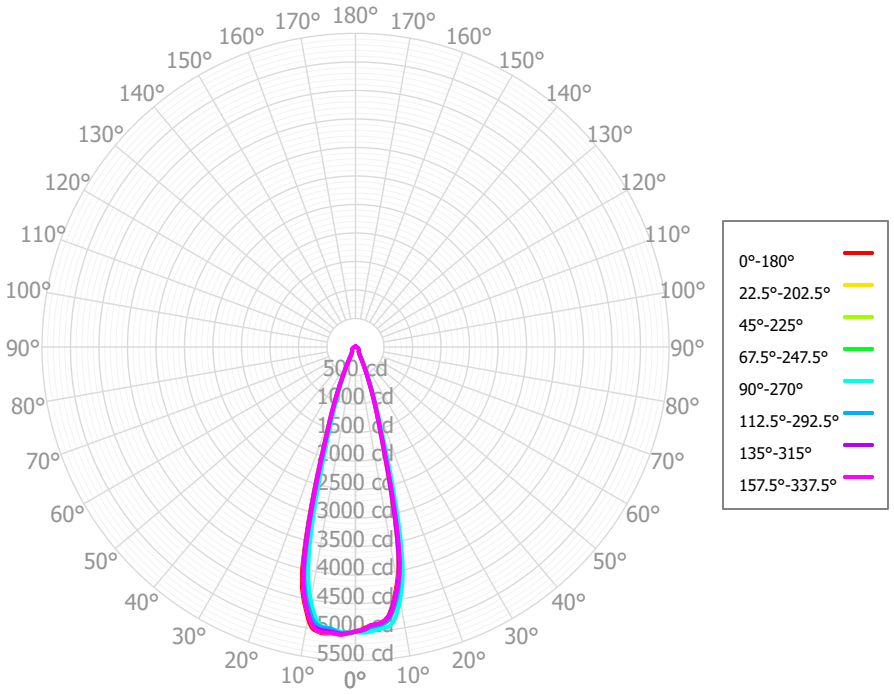
### Full Beam Angle

| | |
|---|---|
| **0° - 180°** | 30° |
| **90° - 270°** | 30° |

## IES File Header Contents

| Keyword | Value |
|---|---|
| TEST | SP-01273_6 |
| TESTLAB | Spectrum Lighting Photometric Lab, VLS-245-981 |
| MANUFAC | Spectrum Lighting |
| TESTDATE | 9/23/2021 |
| ISSUEDATE | 10/8/2021 |
| LUMCAT | CR2 835 15 xx xx RD2FL RB2BSA2 xx xx |
| LUMINAIRE | Nom 2.5 inch dia cylinder with flood optic and 2 inch acrylic style bezel |
| OTHER | Beam Angle: 30 deg |
| LAMPCAT | N/A |
| LAMP | N/A, 6mm LES |
| OTHER | 80 CRI, 3500K tested |
| OTHER | LER (luminaire efficacy) = 86 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° | 461.88 | 27.47% | 90.00° - 100.00° | 14.74 | 0.88% |
| 10.00° - 20.00° | 696.31 | 41.42% | 100.00° - 110.00° | 13.31 | 0.79% |
| 20.00° - 30.00° | 180.52 | 10.74% | 100.00° - 120.00° | 24.33 | 1.45% |
| 30.00° - 40.00° | 65.49 | 3.90% | 120.00° - 130.00° | 6.34 | 0.38% |
| 40.00° - 50.00° | 65.60 | 3.90% | 130.00° - 140.00° | 2.88 | 0.17% |
| 50.00° - 60.00° | 59.97 | 3.57% | 140.00° - 150.00° | 1.16 | 0.07% |
| 60.00° - 70.00° | 47.33 | 2.82% | 150.00° - 160.00° | 0.83 | 0.05% |
| 70.00° - 80.00° | 32.79 | 1.95% | 160.00° - 170.00° | 0.46 | 0.03% |
| 80.00° - 90.00° | 20.71 | 1.23% | 170.00° - 180.00° | 0.15 | 0.01% |
| 0.00° - 90.00° | 1630.60 | 96.99% | 0.00° - 180.00° | 1681.48 | 100.01% |

## Candela Distribution

| | 0.00° | 22.50° | 45.00° | 67.50° | 90.00° | 112.50° | 135.00° | 157.50° | 180.00° |
|---|---|---|---|---|---|---|---|---|---|
| **0.00°** | 4992.43 | 4992.43 | 4992.43 | 4992.43 | 4992.43 | 4992.43 | 4992.43 | 4992.43 | 4992.43 |
| **0.50°** | 4975.62 | 4982.54 | 4978.04 | 4992.37 | 5009.30 | 5007.32 | 4997.02 | 5005.86 | 4997.30 |
| **1.00°** | 4964.41 | 4971.52 | 4976.50 | 4985.06 | 5010.83 | 5015.84 | 5013.86 | 5017.77 | 5007.72 |
| **1.50°** | 4945.54 | 4961.30 | 4961.63 | 4976.60 | 5012.68 | 5017.62 | 5022.67 | 5027.38 | 5017.50 |
| **2.00°** | 4925.51 | 4950.69 | 4945.76 | 4964.00 | 5014.31 | 5017.78 | 5031.02 | 5037.31 | 5029.22 |
| **2.50°** | 4909.51 | 4925.32 | 4917.62 | 4943.24 | 5008.87 | 5020.14 | 5035.86 | 5048.92 | 5046.03 |
| **3.00°** | 4893.88 | 4900.99 | 4891.94 | 4926.81 | 5003.06 | 5022.88 | 5038.51 | 5055.72 | 5056.04 |
| **3.50°** | 4889.38 | 4889.64 | 4884.07 | 4917.32 | 4992.65 | 5010.95 | 5030.03 | 5044.64 | 5051.91 |
| **4.00°** | 4885.28 | 4879.43 | 4877.25 | 4909.79 | 4982.33 | 4997.42 | 5022.11 | 5035.88 | 5047.76 |
| **4.50°** | 4876.14 | 4877.44 | 4875.56 | 4904.83 | 4972.69 | 4978.07 | 5016.33 | 5033.72 | 5043.56 |
| **5.00°** | 4866.36 | 4873.10 | 4870.85 | 4897.58 | 4963.56 | 4958.41 | 5010.95 | 5032.79 | 5043.77 |
| **5.50°** | 4846.23 | 4857.42 | 4855.20 | 4887.86 | 4956.88 | 4958.71 | 5006.72 | 5034.66 | 5050.07 |
| **6.00°** | 4824.54 | 4839.53 | 4834.92 | 4871.57 | 4950.52 | 4958.93 | 5003.85 | 5036.83 | 5054.32 |
| **6.50°** | 4789.87 | 4813.78 | 4801.80 | 4849.42 | 4945.31 | 4955.55 | 5004.07 | 5039.58 | 5056.25 |
| **7.00°** | 4749.24 | 4780.51 | 4757.73 | 4809.91 | 4931.98 | 4950.71 | 5000.22 | 5036.63 | 5051.66 |
| **7.50°** | 4675.50 | 4726.40 | 4689.42 | 4757.60 | 4896.55 | 4931.63 | 4989.00 | 5025.25 | 5040.92 |
| **8.00°** | 4597.32 | 4657.72 | 4613.99 | 4689.02 | 4849.95 | 4910.04 | 4973.72 | 5004.65 | 5025.99 |
| **8.50°** | 4501.58 | 4557.29 | 4525.93 | 4610.59 | 4778.99 | 4873.06 | 4952.39 | 4972.72 | 5007.82 |
| **9.00°** | 4403.78 | 4460.11 | 4434.87 | 4526.06 | 4700.42 | 4828.31 | 4910.62 | 4918.46 | 4964.25 |
| **9.50°** | 4299.81 | 4368.67 | 4339.45 | 4438.53 | 4608.53 | 4750.22 | 4843.88 | 4841.64 | 4904.34 |
| **10.00°** | 4192.91 | 4270.53 | 4235.55 | 4329.77 | 4510.58 | 4671.01 | 4769.92 | 4758.26 | 4821.64 |
| **10.50°** | 4079.03 | 4162.74 | 4121.51 | 4212.65 | 4403.89 | 4588.17 | 4688.72 | 4669.41 | 4727.09 |
| **11.00°** | 3945.01 | 4038.22 | 3972.36 | 4063.86 | 4283.67 | 4498.59 | 4596.91 | 4574.32 | 4636.29 |
| **11.50°** | 3772.79 | 3893.75 | 3788.42 | 3905.35 | 4147.45 | 4391.96 | 4496.24 | 4474.96 | 4547.08 |
| **12.00°** | 3568.17 | 3704.15 | 3566.16 | 3679.63 | 3981.80 | 4276.01 | 4384.58 | 4359.17 | 4443.10 |
| **12.50°** | 3313.08 | 3470.07 | 3312.73 | 3438.57 | 3787.56 | 4141.06 | 4265.42 | 4234.14 | 4334.28 |
| **13.00°** | 3048.79 | 3216.47 | 3046.75 | 3172.25 | 3564.06 | 3973.79 | 4106.10 | 4047.19 | 4174.58 |
| **13.50°** | 2772.80 | 2946.96 | 2772.36 | 2901.87 | 3316.88 | 3753.38 | 3924.31 | 3832.25 | 4002.29 |
| **14.00°** | 2504.32 | 2676.13 | 2511.07 | 2640.24 | 3052.31 | 3511.68 | 3687.26 | 3571.69 | 3752.59 |
| **14.50°** | 2243.78 | 2404.42 | 2256.96 | 2379.50 | 2776.24 | 3241.25 | 3425.19 | 3294.77 | 3488.93 |
| **15.00°** | 2011.64 | 2160.01 | 2036.43 | 2150.51 | 2512.66 | 2967.27 | 3154.10 | 3015.30 | 3206.10 |
| **15.50°** | 1804.19 | 1930.46 | 1830.73 | 1923.11 | 2255.87 | 2689.31 | 2879.77 | 2735.12 | 2921.06 |
| **16.00°** | 1632.99 | 1745.09 | 1668.07 | 1750.54 | 2028.92 | 2426.46 | 2613.44 | 2472.25 | 2649.06 |
| **16.50°** | 1487.63 | 1579.10 | 1520.46 | 1580.38 | 1814.95 | 2177.43 | 2349.31 | 2212.91 | 2377.86 |
| **17.00°** | 1365.90 | 1450.66 | 1400.59 | 1453.34 | 1642.07 | 1957.64 | 2117.15 | 1997.71 | 2143.77 |
| **17.50°** | 1258.10 | 1335.25 | 1288.18 | 1328.55 | 1483.47 | 1759.95 | 1891.44 | 1788.54 | 1912.27 |
| **18.00°** | 1159.06 | 1232.97 | 1188.62 | 1224.31 | 1356.61 | 1594.28 | 1717.21 | 1633.07 | 1739.80 |
| **18.50°** | 1064.18 | 1134.15 | 1091.59 | 1121.44 | 1238.13 | 1448.50 | 1550.04 | 1481.91 | 1571.94 |
| **19.00°** | 972.50 | 1040.28 | 1001.00 | 1026.50 | 1136.98 | 1327.13 | 1428.05 | 1367.61 | 1453.16 |
| **19.50°** | 882.02 | 947.37 | 911.25 | 933.35 | 1039.12 | 1218.09 | 1309.64 | 1254.48 | 1335.34 |
| **20.00°** | 799.80 | 862.49 | 829.30 | 847.58 | 948.58 | 1116.94 | 1202.06 | 1150.58 | 1223.66 |
| **20.50°** | 720.00 | 778.65 | 747.92 | 765.03 | 858.97 | 1018.97 | 1094.99 | 1047.12 | 1114.35 |
| **21.00°** | 651.91 | 705.88 | 677.65 | 692.58 | 780.23 | 924.88 | 999.17 | 949.67 | 1015.85 |
| **21.50°** | 586.36 | 633.93 | 608.04 | 623.86 | 702.24 | 832.02 | 903.99 | 853.39 | 918.83 |
| **22.00°** | 528.06 | 573.38 | 552.71 | 564.22 | 633.98 | 751.05 | 817.27 | 765.96 | 826.78 |
| **22.50°** | 470.86 | 513.39 | 498.02 | 507.63 | 566.20 | 672.90 | 732.19 | 681.04 | 737.02 |

## 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% |
| RCR | 0 | 1990 | 1990 | 1990 | 1990 | 1937 | 1937 | 1937 | 1937 | 1840 | 1840 | 1840 | 1751 | 1751 | 1751 | 1669 | 1669 | 1669 | 1631 |
| | 1 | 1892 | 1844 | 1801 | 1762 | 1845 | 1803 | 1764 | 1729 | 1725 | 1694 | 1666 | 1654 | 1630 | 1608 | 1588 | 1570 | 1553 | 1534 |
| | 2 | 1806 | 1725 | 1659 | 1603 | 1764 | 1692 | 1632 | 1581 | 1629 | 1581 | 1539 | 1572 | 1533 | 1498 | 1519 | 1488 | 1460 | 1455 |
| | 3 | 1728 | 1626 | 1547 | 1484 | 1691 | 1599 | 1527 | 1469 | 1548 | 1488 | 1439 | 1501 | 1452 | 1411 | 1458 | 1417 | 1383 | 1387 |
| | 4 | 1658 | 1542 | 1457 | 1392 | 1625 | 1520 | 1441 | 1381 | 1478 | 1412 | 1359 | 1439 | 1384 | 1339 | 1403 | 1357 | 1318 | 1329 |
| | 5 | 1595 | 1469 | 1382 | 1317 | 1565 | 1451 | 1370 | 1309 | 1416 | 1347 | 1293 | 1384 | 1325 | 1278 | 1354 | 1303 | 1262 | 1278 |
| | 6 | 1537 | 1406 | 1318 | 1255 | 1511 | 1391 | 1309 | 1249 | 1362 | 1290 | 1237 | 1335 | 1273 | 1225 | 1309 | 1256 | 1214 | 1232 |
| | 7 | 1484 | 1350 | 1263 | 1203 | 1461 | 1337 | 1256 | 1198 | 1313 | 1241 | 1188 | 1290 | 1226 | 1179 | 1268 | 1212 | 1170 | 1191 |
| | 8 | 1435 | 1300 | 1215 | 1157 | 1414 | 1289 | 1209 | 1153 | 1268 | 1196 | 1145 | 1248 | 1185 | 1138 | 1230 | 1173 | 1131 | 1153 |
| | 9 | 1390 | 1255 | 1172 | 1116 | 1371 | 1245 | 1167 | 1113 | 1227 | 1156 | 1107 | 1210 | 1147 | 1101 | 1194 | 1137 | 1095 | 1119 |
| | 10 | 1349 | 1214 | 1133 | 1079 | 1331 | 1206 | 1129 | 1077 | 1190 | 1120 | 1072 | 1175 | 1112 | 1067 | 1161 | 1104 | 1062 | 1087 |

## Cone of Light

| Mtg Height | Light Level | Beam Diameter |
|---|---|---|
| 5.5 ft | 165.0 fc | 2.8 ft |
| 6.5 ft | 118.2 fc | 3.4 ft |
| 7.5 ft | 88.8 fc | 3.9 ft |
| 8.0 ft | 78.0 fc | 4.1 ft |
| 10.0 ft | 49.9 fc | 5.2 ft |
| 12.0 ft | 34.7 fc | 6.2 ft |
| 14.0 ft | 25.5 fc | 7.2 ft |
| 16.0 ft | 19.5 fc | 8.3 ft |
| 20.0 ft | 12.5 fc | 10.3 ft |
| 24.0 ft | 8.7 fc | 12.4 ft |
| 28.0 ft | 6.4 fc | 14.4 ft |

## Average Luminaire Luminance [cd/m²]

| | 0.00° | 45.00° | 90.00° |
|---|---|---|---|
| 0.00° | 1551507 | 1551507 | 1551507 |
| 45.00° | 38311 | 36950 | 37745 |
| 55.00° | 36289 | 34903 | 36050 |
| 65.00° | 33508 | 33080 | 36063 |
| 75.00° | 35732 | 35011 | 36741 |
| 85.00° | 64200 | 64520 | 67927 |

## 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 | 19.0 | 20.1 | 19.4 | 20.4 | 20.8 | 19.4 | 20.4 | 19.8 | 20.8 | 21.2 |
| | 3H | 20.9 | 21.8 | 21.3 | 22.2 | 22.6 | 21.3 | 22.2 | 21.7 | 22.6 | 23.1 |
| | 4H | 21.7 | 22.6 | 22.2 | 23.0 | 23.5 | 22.1 | 23.0 | 22.6 | 23.4 | 23.9 |
| | 6H | 22.6 | 23.4 | 23.0 | 23.8 | 24.3 | 23.0 | 23.8 | 23.4 | 24.2 | 24.7 |
| | 8H | 23.0 | 23.8 | 23.5 | 24.2 | 24.7 | 23.4 | 24.2 | 23.9 | 24.6 | 25.1 |
| | 12H | 23.5 | 24.2 | 24.0 | 24.7 | 25.2 | 23.9 | 24.6 | 24.4 | 25.1 | 25.6 |
| 4H | 2H | 19.5 | 20.4 | 20.0 | 20.8 | 21.3 | 19.9 | 20.8 | 20.4 | 21.2 | 21.7 |
| | 3H | 21.6 | 22.4 | 22.1 | 22.8 | 23.3 | 22.1 | 22.8 | 22.6 | 23.3 | 23.8 |
| | 4H | 22.7 | 23.4 | 23.2 | 23.8 | 24.4 | 23.1 | 23.8 | 23.6 | 24.3 | 24.8 |
| | 6H | 23.7 | 24.3 | 24.2 | 24.8 | 25.3 | 24.2 | 24.7 | 24.7 | 25.2 | 25.8 |
| | 8H | 24.2 | 24.8 | 24.8 | 25.3 | 25.8 | 24.7 | 25.2 | 25.2 | 25.7 | 26.3 |
| | 12H | 24.9 | 25.3 | 25.4 | 25.9 | 26.4 | 25.3 | 25.8 | 25.9 | 26.3 | 26.9 |
| 8H | 4H | 23.1 | 23.6 | 23.6 | 24.1 | 24.6 | 23.5 | 24.1 | 24.1 | 24.6 | 25.1 |
| | 6H | 24.3 | 24.7 | 24.8 | 25.3 | 25.8 | 24.8 | 25.2 | 25.4 | 25.8 | 26.3 |
| | 8H | 25.0 | 25.4 | 25.6 | 26.0 | 26.5 | 25.5 | 25.9 | 26.1 | 26.5 | 27.0 |
| | 12H | 25.9 | 26.2 | 26.5 | 26.8 | 27.4 | 26.3 | 26.7 | 26.9 | 27.2 | 27.9 |
| 12H | 4H | 23.1 | 23.6 | 23.6 | 24.1 | 24.7 | 23.6 | 24.1 | 24.2 | 24.6 | 25.2 |
| | 6H | 24.4 | 24.8 | 25.0 | 25.3 | 25.9 | 25.0 | 25.3 | 25.5 | 25.9 | 26.5 |
| | 8H | 25.3 | 25.6 | 25.8 | 26.1 | 26.8 | 25.8 | 26.1 | 26.3 | 26.7 | 27.3 |

Corrected UGR values based on total output energy
SHR = 1.0

Corrected UGR values based on total output lumens

SHR = 1.0