

Scaled data based on original data using  
LM-79-08 Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Test Report Prepared for  
Cooper Lighting Solutions  
(formerly Eaton)

Brand: McGRAW-EDISON

Report Number: P386628

Luminaire Tested: **GWC-SA2B-735-U-T4W-HSS**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P386628  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-19)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GWC-SA2B-735-U-T4W-HSS  
Description: GALLEON WALL LUMINAIRE  
(2) 70 CRI, 3500K, 800mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE IV WIDE OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 8120.1 lumens  
Efficiency: N/A  
Efficacy: 94.4 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 0.5' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B1 - U0 - G2

Input Watts (W): 86  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT

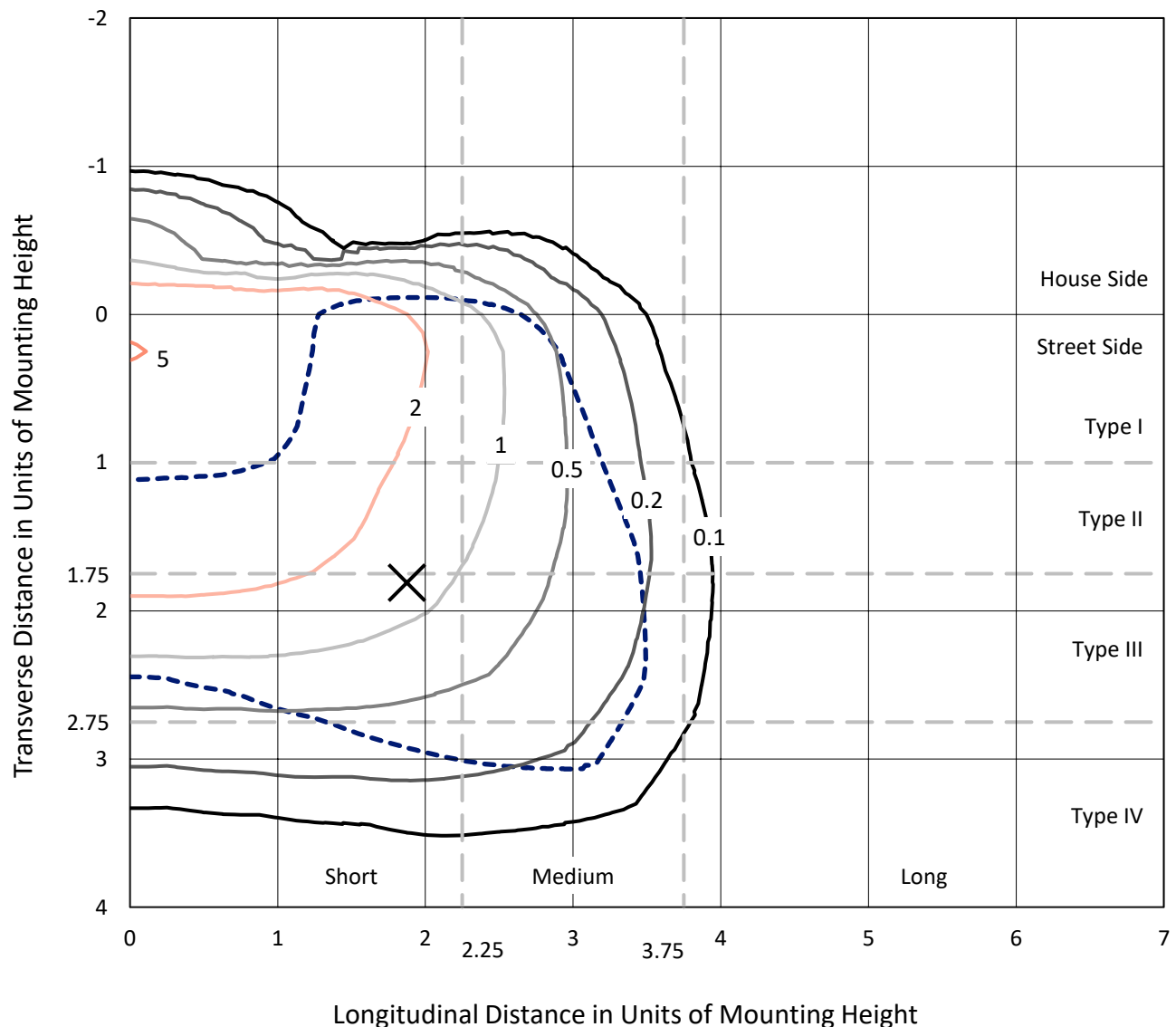


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## Iso-Footcandle Lines of Horizontal Illumination

✕ Max cd  
 - - - 1/2 Max cd

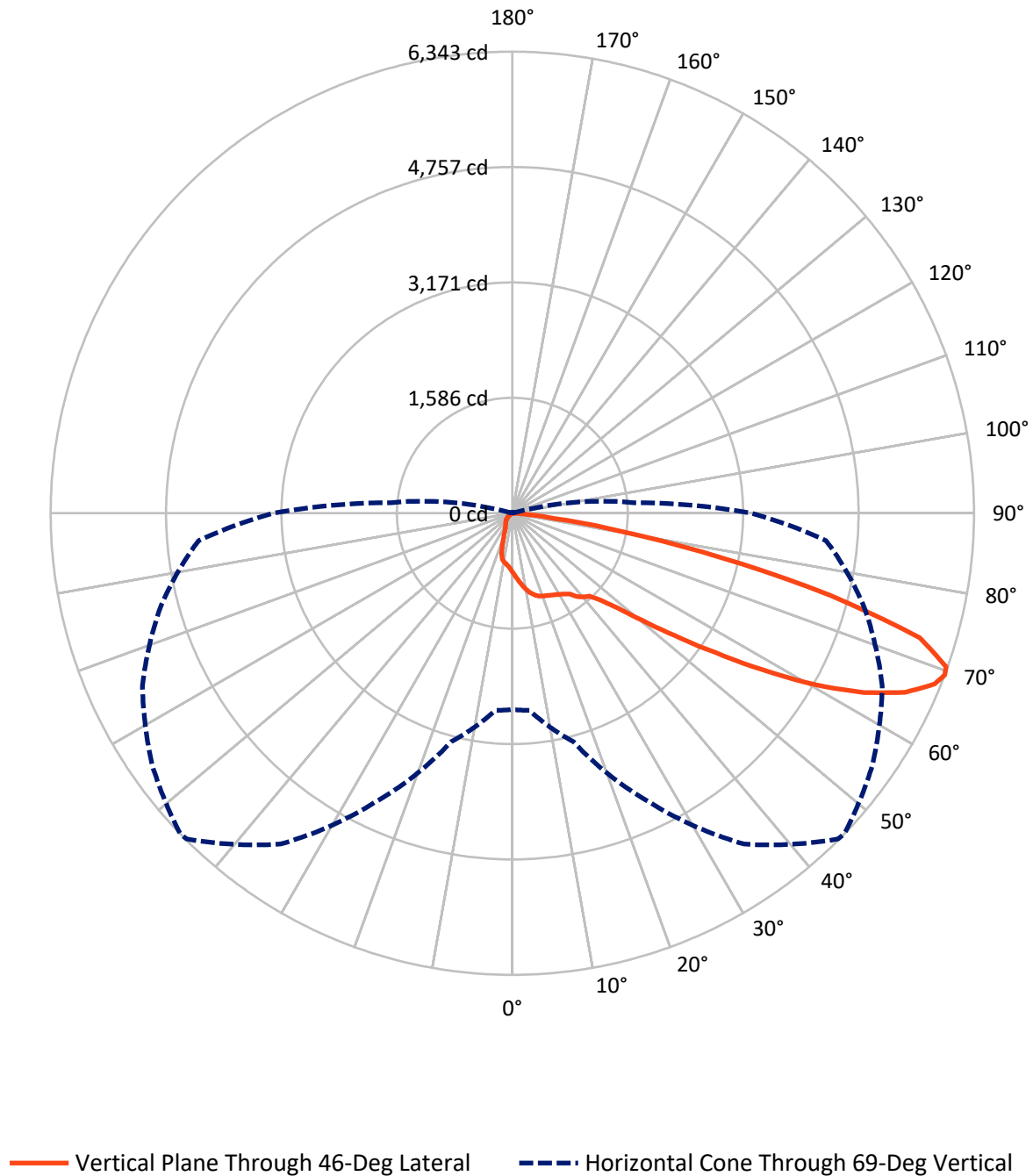


Based on 15 foot mounting height. Maximum calculated value = 5.3 fc  
 Type IV - Short - N/A

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## Luminous Intensity Polar Plot



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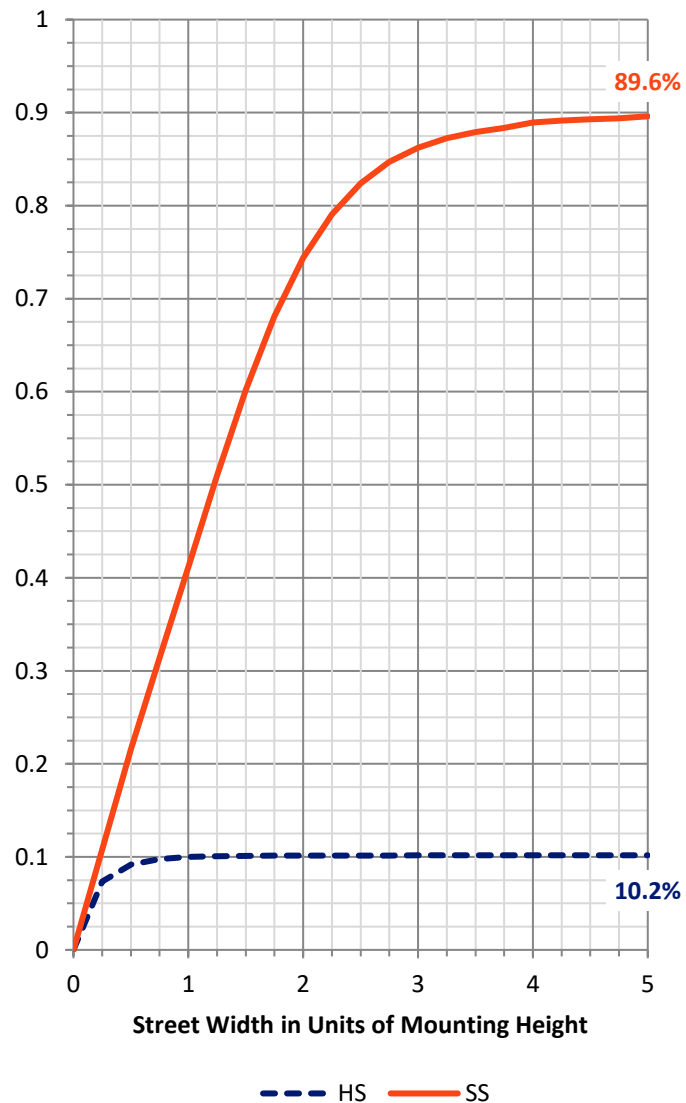
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 833.4    | 0.0    | 833.4  |
|                    | % Fixture | 10.3     | 0.0    | 10.3   |
| <b>Street Side</b> | Lumens    | 7286.8   | 0.0    | 7286.8 |
|                    | % Fixture | 89.7     | 0.0    | 89.7   |
| <b>Total</b>       | Lumens    | 8120.1   | 0.0    | 8120.1 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 81.0   | 1.0       |
| 10°-20°   | 245.7  | 3.0       |
| 20°-30°   | 386.4  | 4.8       |
| 30°-40°   | 554.1  | 6.8       |
| 40°-50°   | 957.6  | 11.8      |
| 50°-60°   | 1891.9 | 23.3      |
| 60°-70°   | 2644.1 | 32.6      |
| 70°-80°   | 1277.4 | 15.7      |
| 80°-90°   | 82.1   | 1.0       |
| 90°-100°  | 0.0    | 0.0       |
| 100°-110° | 0.0    | 0.0       |
| 110°-120° | 0.0    | 0.0       |
| 120°-130° | 0.0    | 0.0       |
| 130°-140° | 0.0    | 0.0       |
| 140°-150° | 0.0    | 0.0       |
| 150°-160° | 0.0    | 0.0       |
| 160°-170° | 0.0    | 0.0       |
| 170°-180° | 0.0    | 0.0       |
| 0°-90°    | 8120.1 | 100.0     |
| 0°-180°   | 8120.1 | 100.0     |

**Coefficient of Utilization**



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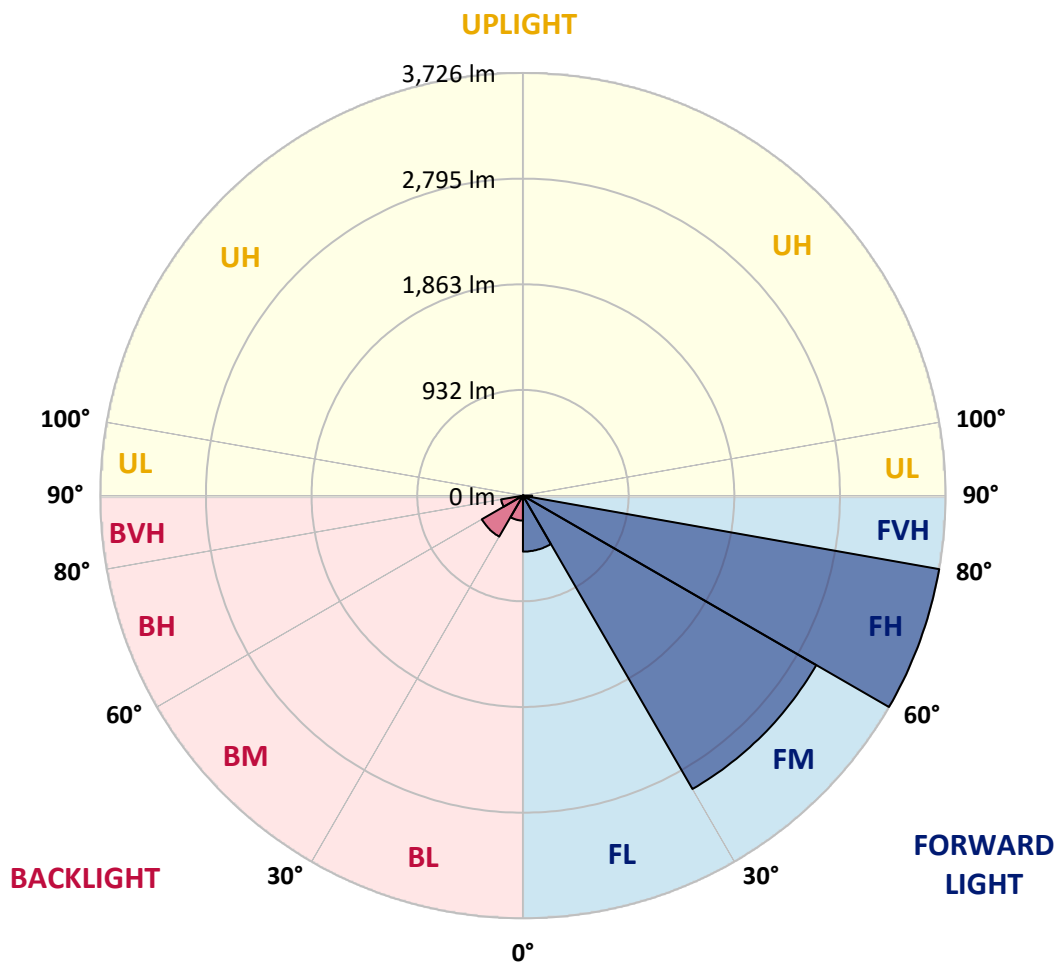
CATALOG NUMBER: GWC-SA2B-735-U-T4W-HSS

**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 493.4  | 6.1       |                         |      |         |
| FM   | (30°-60°)   | 2985.9 | 36.8      |                         |      |         |
| FH   | (60°-80°)   | 3726.0 | 45.9      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 81.4   | 1.0       |                         |      | G1/100  |
| BL   | (0°-30°)    | 219.6  | 2.7       | B1/500                  |      |         |
| BM   | (30°-60°)   | 417.6  | 5.1       | B1/1000                 |      |         |
| BH   | (60°-80°)   | 195.4  | 2.4       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 0.7    | 0.0       |                         |      | G0/10   |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B1-U0-G2**

Type IV Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 46°    | 55°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 813.6  | 813.6  | 813.6  | 813.6  | 813.6  | 813.6  | 813.6  | 813.6  | 813.6  | 813.6  | 813.6  |
| 2.5°  | 903.8  | 902.7  | 897.4  | 895.1  | 882.1  | 874.5  | 871.5  | 862.0  | 848.3  | 834.6  | 819.3  |
| 5°    | 1006.7 | 1006.3 | 996.3  | 986.8  | 962.5  | 939.6  | 935.4  | 913.4  | 882.6  | 853.6  | 824.6  |
| 7.5°  | 1111.7 | 1106.8 | 1096.8 | 1078.6 | 1043.2 | 1006.7 | 1003.2 | 972.0  | 928.2  | 886.3  | 844.8  |
| 10°   | 1200.8 | 1197.7 | 1184.9 | 1157.1 | 1115.5 | 1074.0 | 1069.9 | 1031.4 | 981.9  | 930.5  | 877.6  |
| 12.5° | 1270.1 | 1267.8 | 1250.7 | 1216.0 | 1171.9 | 1128.9 | 1123.1 | 1088.9 | 1036.0 | 978.5  | 916.0  |
| 15°   | 1312.3 | 1311.2 | 1290.3 | 1253.3 | 1209.9 | 1172.6 | 1167.7 | 1137.6 | 1088.5 | 1028.4 | 957.9  |
| 17.5° | 1322.3 | 1322.7 | 1301.0 | 1263.6 | 1227.8 | 1201.2 | 1197.4 | 1174.5 | 1133.4 | 1073.6 | 999.8  |
| 20°   | 1300.2 | 1304.7 | 1285.3 | 1253.0 | 1230.9 | 1216.8 | 1213.8 | 1200.1 | 1165.4 | 1109.0 | 1033.2 |
| 22.5° | 1268.9 | 1271.3 | 1257.9 | 1236.2 | 1227.0 | 1229.8 | 1228.3 | 1220.6 | 1191.2 | 1139.5 | 1066.4 |
| 25°   | 1250.0 | 1250.0 | 1241.9 | 1223.7 | 1229.8 | 1246.1 | 1246.5 | 1245.0 | 1221.8 | 1176.8 | 1106.8 |
| 27.5° | 1249.1 | 1246.9 | 1237.7 | 1224.0 | 1240.8 | 1265.9 | 1267.4 | 1277.7 | 1263.2 | 1222.2 | 1157.1 |
| 30°   | 1279.6 | 1276.9 | 1257.6 | 1239.6 | 1260.9 | 1288.0 | 1291.8 | 1314.2 | 1307.0 | 1271.3 | 1212.9 |
| 32.5° | 1350.8 | 1341.3 | 1298.2 | 1268.9 | 1284.9 | 1317.3 | 1322.3 | 1358.1 | 1369.4 | 1331.8 | 1267.1 |
| 35°   | 1448.3 | 1418.2 | 1356.1 | 1324.5 | 1326.0 | 1360.0 | 1364.5 | 1417.1 | 1450.9 | 1387.4 | 1309.0 |
| 37.5° | 1582.7 | 1567.8 | 1467.0 | 1382.4 | 1389.3 | 1440.7 | 1454.0 | 1511.1 | 1501.5 | 1417.8 | 1356.5 |
| 40°   | 1877.4 | 1854.1 | 1746.8 | 1544.6 | 1449.8 | 1506.1 | 1510.4 | 1540.8 | 1541.5 | 1486.7 | 1455.5 |
| 42.5° | 2278.6 | 2269.1 | 2156.0 | 1838.9 | 1569.0 | 1549.9 | 1557.5 | 1608.9 | 1666.4 | 1632.2 | 1630.6 |
| 45°   | 2722.9 | 2717.9 | 2598.1 | 2229.6 | 1809.9 | 1693.4 | 1702.9 | 1771.9 | 1881.9 | 1889.5 | 1937.9 |
| 47.5° | 3080.5 | 3078.1 | 3009.3 | 2665.4 | 2178.9 | 1936.7 | 1939.8 | 2012.8 | 2206.3 | 2301.9 | 2379.1 |
| 50°   | 3406.3 | 3417.3 | 3362.9 | 3137.2 | 2681.4 | 2317.9 | 2310.6 | 2359.4 | 2670.0 | 2826.4 | 2922.5 |
| 52.5° | 3859.4 | 3875.0 | 3722.3 | 3577.3 | 3208.8 | 2790.7 | 2785.0 | 2836.0 | 3227.4 | 3344.6 | 3361.8 |
| 55°   | 4259.5 | 4232.9 | 4112.2 | 4070.3 | 3851.8 | 3374.8 | 3373.2 | 3418.2 | 3766.5 | 3816.4 | 3847.9 |
| 57.5° | 4436.2 | 4426.0 | 4484.2 | 4580.1 | 4525.2 | 4064.9 | 4061.6 | 4027.3 | 4248.9 | 4254.2 | 4351.3 |
| 60°   | 4547.7 | 4560.3 | 4738.9 | 5034.7 | 5171.4 | 4807.8 | 4785.6 | 4576.6 | 4709.6 | 4697.7 | 4801.7 |
| 62.5° | 4464.0 | 4488.7 | 4810.1 | 5303.1 | 5654.9 | 5456.2 | 5424.9 | 5080.0 | 5103.3 | 5062.5 | 5159.2 |
| 65°   | 4019.3 | 4057.7 | 4584.3 | 5252.4 | 5894.7 | 5962.9 | 5931.3 | 5524.3 | 5415.8 | 5348.8 | 5295.1 |
| 67.5° | 3263.5 | 3286.4 | 3836.2 | 4812.0 | 5786.6 | 6265.2 | 6258.7 | 5913.8 | 5651.9 | 5300.4 | 4883.9 |
| 69°   | 2697.0 | 2719.5 | 3248.7 | 4348.3 | 5548.6 | 6329.9 | 6342.5 | 6038.6 | 5606.9 | 5006.5 | 4327.3 |
| 70°   | 2284.3 | 2308.3 | 2801.4 | 3950.8 | 5272.6 | 6299.9 | 6322.3 | 6026.9 | 5478.3 | 4666.2 | 3838.8 |
| 72.5° | 1198.1 | 1218.7 | 1724.6 | 2721.8 | 4298.4 | 5784.7 | 5852.9 | 5517.4 | 4643.7 | 3388.9 | 2269.9 |
| 75°   | 376.5  | 388.3  | 673.5  | 1422.8 | 2943.0 | 4497.9 | 4513.5 | 4328.1 | 3297.5 | 1864.0 | 945.3  |
| 77.5° | 143.5  | 140.1  | 224.2  | 524.3  | 1487.9 | 2832.2 | 2927.8 | 2704.7 | 1730.4 | 659.1  | 218.1  |
| 80°   | 77.3   | 77.7   | 116.5  | 217.0  | 636.5  | 1455.5 | 1536.2 | 1310.8 | 614.8  | 205.6  | 50.3   |
| 82.5° | 33.5   | 35.0   | 65.5   | 115.0  | 292.4  | 536.9  | 577.2  | 480.5  | 234.9  | 138.2  | 18.7   |
| 85°   | 7.2    | 8.0    | 31.6   | 62.5   | 119.2  | 150.8  | 158.0  | 155.8  | 149.6  | 107.4  | 7.2    |
| 87.5° | 0.0    | 0.0    | 14.1   | 22.5   | 30.1   | 34.3   | 30.1   | 39.2   | 82.6   | 72.3   | 3.9    |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

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CATALOG NUMBER: GWC-SA2B-735-U-T4W-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 813.6  | 813.6  | 813.6 | 813.6 | 813.6 | 813.6 | 813.6 | 813.6 | 813.6 | 813.6 | 813.6 |
| 2.5°  | 814.4  | 807.5  | 795.7 | 782.8 | 773.6 | 764.1 | 756.5 | 753.1 | 749.3 | 746.6 | 750.0 |
| 5°    | 812.9  | 799.5  | 776.7 | 754.6 | 738.6 | 725.7 | 715.0 | 710.8 | 706.6 | 703.6 | 703.2 |
| 7.5°  | 826.2  | 807.5  | 772.5 | 740.1 | 715.3 | 697.9 | 683.4 | 677.3 | 672.3 | 670.1 | 668.2 |
| 10°   | 851.7  | 827.7  | 780.8 | 738.6 | 706.6 | 676.9 | 645.7 | 621.7 | 606.1 | 598.9 | 596.2 |
| 12.5° | 884.8  | 854.8  | 796.9 | 746.6 | 700.1 | 643.0 | 576.8 | 519.7 | 482.8 | 470.5 | 463.3 |
| 15°   | 923.6  | 886.3  | 817.8 | 756.9 | 676.6 | 572.2 | 459.9 | 385.2 | 351.1 | 344.2 | 336.6 |
| 17.5° | 960.9  | 919.9  | 842.9 | 758.7 | 624.8 | 457.2 | 337.0 | 286.3 | 273.0 | 277.6 | 278.7 |
| 20°   | 993.7  | 952.9  | 867.6 | 742.0 | 530.8 | 343.1 | 260.8 | 248.2 | 253.2 | 261.9 | 263.5 |
| 22.5° | 1026.9 | 985.0  | 890.5 | 697.9 | 410.4 | 260.4 | 234.9 | 237.9 | 242.9 | 251.7 | 253.2 |
| 25°   | 1067.2 | 1023.8 | 911.9 | 616.8 | 308.0 | 221.6 | 223.1 | 227.7 | 232.6 | 240.6 | 241.4 |
| 27.5° | 1113.7 | 1072.9 | 926.0 | 511.3 | 228.5 | 203.7 | 208.6 | 215.5 | 220.5 | 228.1 | 229.6 |
| 30°   | 1175.3 | 1137.6 | 930.5 | 402.1 | 191.5 | 187.7 | 189.9 | 198.4 | 205.6 | 212.4 | 213.6 |
| 32.5° | 1233.1 | 1201.6 | 915.3 | 303.4 | 177.5 | 172.8 | 172.8 | 177.8 | 186.2 | 192.7 | 194.2 |
| 35°   | 1286.5 | 1265.9 | 866.5 | 222.0 | 166.7 | 159.1 | 155.4 | 155.4 | 160.6 | 166.0 | 167.5 |
| 37.5° | 1356.9 | 1356.1 | 787.7 | 177.1 | 156.5 | 147.8 | 139.7 | 133.7 | 131.7 | 132.8 | 133.7 |
| 40°   | 1477.6 | 1478.7 | 684.9 | 158.8 | 147.8 | 135.9 | 123.7 | 112.7 | 102.4 | 99.0  | 98.6  |
| 42.5° | 1666.0 | 1648.9 | 577.2 | 150.0 | 140.1 | 123.7 | 105.5 | 90.7  | 74.6  | 69.7  | 69.3  |
| 45°   | 1965.3 | 1863.7 | 462.9 | 142.0 | 132.1 | 110.0 | 87.2  | 67.0  | 54.1  | 50.3  | 50.3  |
| 47.5° | 2401.2 | 2145.8 | 358.7 | 133.3 | 121.5 | 94.4  | 65.9  | 48.4  | 39.5  | 37.7  | 38.0  |
| 50°   | 2852.0 | 2422.1 | 274.9 | 122.2 | 108.5 | 78.1  | 48.8  | 35.0  | 30.1  | 30.1  | 30.4  |
| 52.5° | 3251.7 | 2624.7 | 214.4 | 110.4 | 92.5  | 61.3  | 36.9  | 27.4  | 25.1  | 24.7  | 25.1  |
| 55°   | 3626.0 | 2755.3 | 164.1 | 96.7  | 73.5  | 45.7  | 28.2  | 22.5  | 20.9  | 20.2  | 19.8  |
| 57.5° | 3987.0 | 2820.1 | 123.0 | 78.1  | 53.3  | 33.2  | 22.5  | 19.1  | 17.5  | 16.3  | 16.0  |
| 60°   | 4227.2 | 2767.5 | 84.5  | 57.5  | 36.9  | 24.0  | 18.7  | 16.3  | 14.5  | 13.3  | 13.0  |
| 62.5° | 4362.7 | 2623.9 | 54.5  | 41.5  | 26.3  | 17.8  | 14.8  | 13.7  | 11.1  | 9.9   | 9.9   |
| 65°   | 4307.9 | 2387.1 | 38.0  | 29.7  | 19.1  | 13.3  | 11.1  | 11.1  | 8.0   | 6.5   | 6.1   |
| 67.5° | 3817.5 | 2016.7 | 28.9  | 22.1  | 13.7  | 9.9   | 8.4   | 9.5   | 5.0   | 3.0   | 3.0   |
| 69°   | 3284.5 | 1671.4 | 24.7  | 18.3  | 11.5  | 8.0   | 7.2   | 8.7   | 3.4   | 2.3   | 1.9   |
| 70°   | 2854.6 | 1441.8 | 22.5  | 16.0  | 9.5   | 6.9   | 6.5   | 8.4   | 3.4   | 1.9   | 1.5   |
| 72.5° | 1707.9 | 804.1  | 17.1  | 11.5  | 6.1   | 5.4   | 5.4   | 9.5   | 3.4   | 1.9   | 1.5   |
| 75°   | 690.3  | 283.2  | 12.6  | 8.0   | 4.6   | 4.6   | 6.5   | 12.2  | 3.0   | 1.5   | 1.1   |
| 77.5° | 156.5  | 62.1   | 7.2   | 5.0   | 3.0   | 4.6   | 7.6   | 9.5   | 1.9   | 0.8   | 0.0   |
| 80°   | 38.0   | 15.2   | 4.6   | 3.0   | 1.9   | 3.4   | 5.7   | 5.4   | 0.4   | 0.0   | 0.0   |
| 82.5° | 12.6   | 5.4    | 1.9   | 1.5   | 0.4   | 1.1   | 2.6   | 1.5   | 0.0   | 0.0   | 0.0   |
| 85°   | 5.4    | 3.0    | 0.8   | 0.4   | 0.0   | 0.0   | 0.4   | 0.0   | 0.0   | 0.0   | 0.0   |
| 87.5° | 3.4    | 1.1    | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 90°   | 0.0    | 0.0    | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |



Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

INVUE

Report Number: SP1-2104-224-2

Luminaire Tested: CCW-SA-2A-735-U-SL4

Test Date: 04/26/2021

### Test Information

Test Method: LM-79-08  
 Report Number: SP1-2104-224-2  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1  
 Measurement Geometry:  $4\pi$   
 Issue Date: 04/26/2021  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: INVUE  
 Catalog Number: **CCW-SA-2A-735-U-SL4**  
 Description: INVUE WALL PACK ClearCurve Light Square

### Spectral Parameters

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 3367   | CRI (Ra): | 73.3 |      |       |
| CIE u':                   | 0.2376 | R1:       | 69.1 | R9:  | -34.3 |
| CIE v':                   | 0.5184 | R2:       | 81.3 | R10: | 58.3  |
| Duv:                      | 0.0034 | R3:       | 93.4 | R11: | 69.1  |
| CIE x:                    | 0.4168 | R4:       | 71.8 | R12: | 54.2  |
| CIE y:                    | 0.4041 | R5:       | 69.6 | R13: | 71.1  |
| CIE z:                    | 0.1791 | R6:       | 75.4 | R14: | 96.4  |
| Peak Wavelength (nm):     | 590    | R7:       | 79.5 |      |       |
| Dominant Wavelength (nm): | 580    | R8:       | 46.4 |      |       |
| Purity:                   | 46.5   |           |      |      |       |
| Rf:                       | 77.2   |           |      |      |       |
| Rg:                       | 94.4   |           |      |      |       |



### Test Conditions

Stabilization Time: 71M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.9/38%  
 Sphere Temperature (°C): 24.2

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| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 1/31/2021        | 7/31/2021            |
| Power Meter                    | IN0071                | 12/1/2020        | 12/1/2021            |
| AC Power Source                | IN0063                | 12/1/2020        | 12/1/2021            |
| DC Power Source                | IN0208                | 12/1/2020        | 12/1/2021            |
| Sphere Thermometer             | IN0085                | 12/1/2020        | 12/1/2021            |
| Room Thermometer               | IN0046                | 12/1/2020        | 12/1/2021            |

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**CIE 1931 Chromaticity Diagram**



**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 3500K 4-step quadrangle

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### Photopic Flux vs. Wavelength

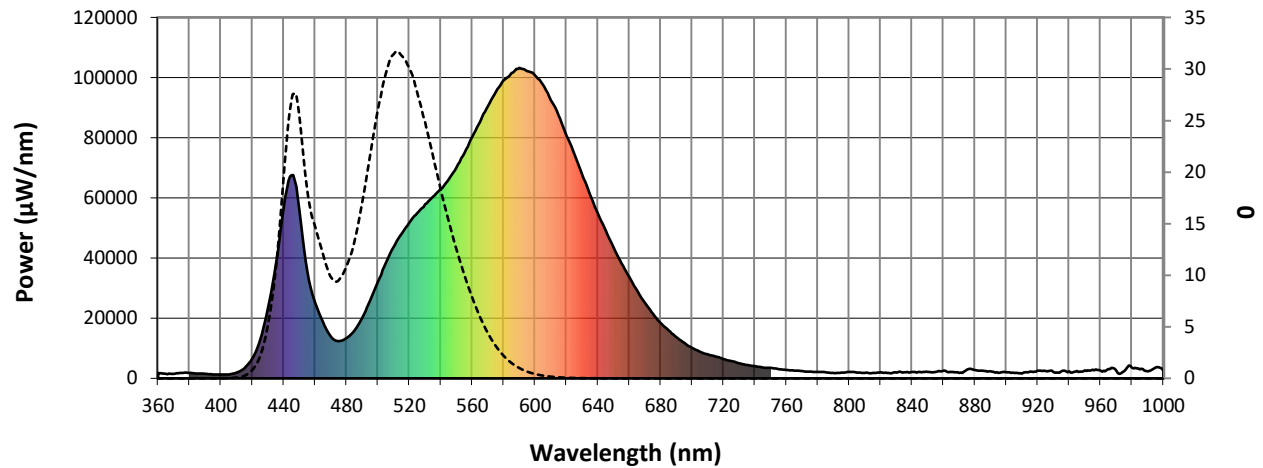


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| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 1840             | 0.0              | 490       | 20271            | 2.9              | 620       | 80709            | 21.0             | 750       | 3465             | 0.0              | 880       | 2800             | 0.0              |
| 365       | 1514             | 0.0              | 495       | 25910            | 4.7              | 625       | 74695            | 16.5             | 755       | 3075             | 0.0              | 885       | 2582             | 0.0              |
| 370       | 1514             | 0.0              | 500       | 32216            | 7.1              | 630       | 67709            | 12.3             | 760       | 2794             | 0.0              | 890       | 2353             | 0.0              |
| 375       | 1843             | 0.0              | 505       | 38336            | 10.7             | 635       | 61156            | 9.2              | 765       | 2593             | 0.0              | 895       | 1819             | 0.0              |
| 380       | 1796             | 0.0              | 510       | 43738            | 15.0             | 640       | 54795            | 6.5              | 770       | 2401             | 0.0              | 900       | 2024             | 0.0              |
| 385       | 1575             | 0.0              | 515       | 47977            | 19.9             | 645       | 49111            | 4.7              | 775       | 2233             | 0.0              | 905       | 1851             | 0.0              |
| 390       | 1527             | 0.0              | 520       | 51818            | 25.1             | 650       | 43533            | 3.2              | 780       | 2166             | 0.0              | 910       | 1602             | 0.0              |
| 395       | 1326             | 0.0              | 525       | 54890            | 29.5             | 655       | 38234            | 2.2              | 785       | 2051             | 0.0              | 915       | 2200             | 0.0              |
| 400       | 1233             | 0.0              | 530       | 57872            | 34.1             | 660       | 33754            | 1.4              | 790       | 1765             | 0.0              | 920       | 2530             | 0.0              |
| 405       | 1329             | 0.0              | 535       | 60410            | 37.5             | 665       | 29162            | 0.9              | 795       | 1903             | 0.0              | 925       | 2487             | 0.0              |
| 410       | 1902             | 0.0              | 540       | 62857            | 41.0             | 670       | 25117            | 0.5              | 800       | 2127             | 0.0              | 930       | 2089             | 0.0              |
| 415       | 3436             | 0.0              | 545       | 66165            | 44.0             | 675       | 21511            | 0.4              | 805       | 1867             | 0.0              | 935       | 2293             | 0.0              |
| 420       | 6571             | 0.0              | 550       | 70124            | 47.7             | 680       | 18435            | 0.2              | 810       | 1775             | 0.0              | 940       | 2315             | 0.0              |
| 425       | 12957            | 0.1              | 555       | 74973            | 51.2             | 685       | 16004            | 0.1              | 815       | 1812             | 0.0              | 945       | 2481             | 0.0              |
| 430       | 23376            | 0.2              | 560       | 80227            | 54.5             | 690       | 13701            | 0.1              | 820       | 1973             | 0.0              | 950       | 2701             | 0.0              |
| 435       | 38205            | 0.5              | 565       | 85358            | 56.8             | 695       | 11765            | 0.0              | 825       | 1773             | 0.0              | 955       | 2892             | 0.0              |
| 440       | 56691            | 0.9              | 570       | 90422            | 58.8             | 700       | 10145            | 0.0              | 830       | 1925             | 0.0              | 960       | 2609             | 0.0              |
| 445       | 67585            | 1.4              | 575       | 95259            | 59.3             | 705       | 8865             | 0.0              | 835       | 2001             | 0.0              | 965       | 3066             | 0.0              |
| 450       | 55963            | 1.5              | 580       | 99033            | 58.8             | 710       | 7954             | 0.0              | 840       | 2142             | 0.0              | 970       | 2566             | 0.0              |
| 455       | 35549            | 1.2              | 585       | 101572           | 56.4             | 715       | 7285             | 0.0              | 845       | 2101             | 0.0              | 975       | 2375             | 0.0              |
| 460       | 25268            | 1.0              | 590       | 103264           | 53.4             | 720       | 6412             | 0.0              | 850       | 2097             | 0.0              | 980       | 3526             | 0.0              |
| 465       | 18712            | 1.0              | 595       | 102194           | 48.4             | 725       | 5721             | 0.0              | 855       | 2090             | 0.0              | 985       | 2982             | 0.0              |
| 470       | 13835            | 0.9              | 600       | 100645           | 43.4             | 730       | 5017             | 0.0              | 860       | 2535             | 0.0              | 990       | 2305             | 0.0              |
| 475       | 12398            | 1.0              | 605       | 97644            | 37.8             | 735       | 4459             | 0.0              | 865       | 2101             | 0.0              | 995       | 3671             | 0.0              |
| 480       | 13406            | 1.3              | 610       | 92487            | 31.8             | 740       | 4062             | 0.0              | 870       | 1798             | 0.0              | 1000      | 2560             | 0.0              |
| 485       | 15865            | 1.9              | 615       | 87436            | 26.4             | 745       | 3636             | 0.0              | 875       | 2857             | 0.0              |           |                  |                  |

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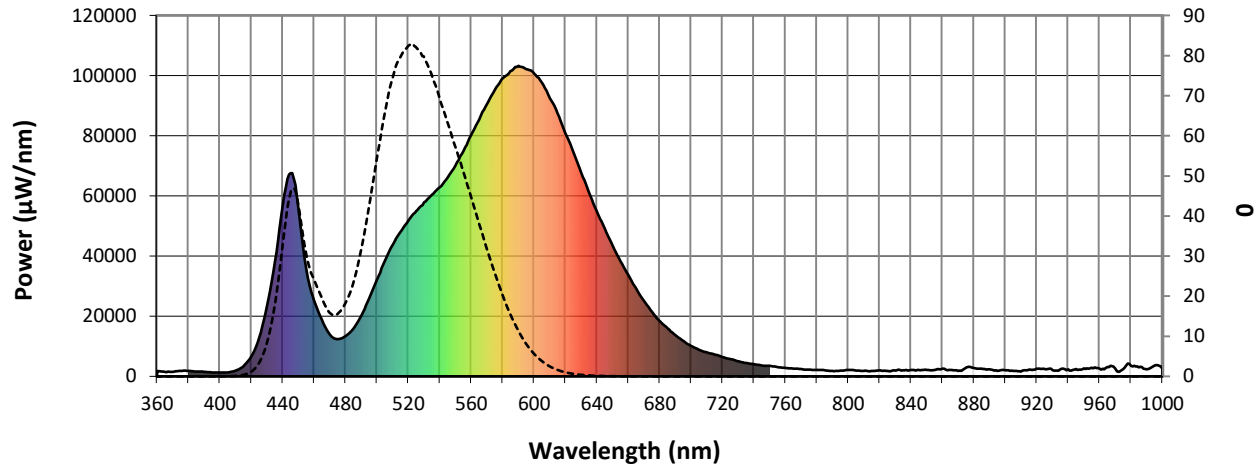
### Scotopic Flux vs. Wavelength


**Scotopic Lumens: 7088.7**
**S/P: 1.35**

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 1840             | 0.0              | 490       | 20271            | 31.2             | 620       | 80709            | 1.0              | 750       | 3465             | 0.0              | 880       | 2800             | 0.0              |
| 365       | 1514             | 0.0              | 495       | 25910            | 41.9             | 625       | 74695            | 0.6              | 755       | 3075             | 0.0              | 885       | 2582             | 0.0              |
| 370       | 1514             | 0.0              | 500       | 32216            | 53.9             | 630       | 67709            | 0.4              | 760       | 2794             | 0.0              | 890       | 2353             | 0.0              |
| 375       | 1843             | 0.0              | 505       | 38336            | 65.2             | 635       | 61156            | 0.2              | 765       | 2593             | 0.0              | 895       | 1819             | 0.0              |
| 380       | 1796             | 0.0              | 510       | 43738            | 74.1             | 640       | 54795            | 0.1              | 770       | 2401             | 0.0              | 900       | 2024             | 0.0              |
| 385       | 1575             | 0.0              | 515       | 47977            | 79.5             | 645       | 49111            | 0.1              | 775       | 2233             | 0.0              | 905       | 1851             | 0.0              |
| 390       | 1527             | 0.0              | 520       | 51818            | 82.4             | 650       | 43533            | 0.1              | 780       | 2166             | 0.0              | 910       | 1602             | 0.0              |
| 395       | 1326             | 0.0              | 525       | 54890            | 82.1             | 655       | 38234            | 0.0              | 785       | 2051             | 0.0              | 915       | 2200             | 0.0              |
| 400       | 1233             | 0.0              | 530       | 57872            | 79.8             | 660       | 33754            | 0.0              | 790       | 1765             | 0.0              | 920       | 2530             | 0.0              |
| 405       | 1329             | 0.0              | 535       | 60410            | 75.3             | 665       | 29162            | 0.0              | 795       | 1903             | 0.0              | 925       | 2487             | 0.0              |
| 410       | 1902             | 0.1              | 540       | 62857            | 69.5             | 670       | 25117            | 0.0              | 800       | 2127             | 0.0              | 930       | 2089             | 0.0              |
| 415       | 3436             | 0.4              | 545       | 66165            | 63.4             | 675       | 21511            | 0.0              | 805       | 1867             | 0.0              | 935       | 2293             | 0.0              |
| 420       | 6571             | 1.1              | 550       | 70124            | 57.3             | 680       | 18435            | 0.0              | 810       | 1775             | 0.0              | 940       | 2315             | 0.0              |
| 425       | 12957            | 3.2              | 555       | 74973            | 51.2             | 685       | 16004            | 0.0              | 815       | 1812             | 0.0              | 945       | 2481             | 0.0              |
| 430       | 23376            | 8.0              | 560       | 80227            | 44.8             | 690       | 13701            | 0.0              | 820       | 1973             | 0.0              | 950       | 2701             | 0.0              |
| 435       | 38205            | 17.1             | 565       | 85358            | 38.3             | 695       | 11765            | 0.0              | 825       | 1773             | 0.0              | 955       | 2892             | 0.0              |
| 440       | 56691            | 31.7             | 570       | 90422            | 31.9             | 700       | 10145            | 0.0              | 830       | 1925             | 0.0              | 960       | 2609             | 0.0              |
| 445       | 67585            | 45.3             | 575       | 95259            | 25.9             | 705       | 8865             | 0.0              | 835       | 2001             | 0.0              | 965       | 3066             | 0.0              |
| 450       | 55963            | 43.4             | 580       | 99033            | 20.4             | 710       | 7954             | 0.0              | 840       | 2142             | 0.0              | 970       | 2566             | 0.0              |
| 455       | 35549            | 31.1             | 585       | 101572           | 15.5             | 715       | 7285             | 0.0              | 845       | 2101             | 0.0              | 975       | 2375             | 0.0              |
| 460       | 25268            | 24.4             | 590       | 103264           | 11.5             | 720       | 6412             | 0.0              | 850       | 2097             | 0.0              | 980       | 3526             | 0.0              |
| 465       | 18712            | 19.8             | 595       | 102194           | 8.1              | 725       | 5721             | 0.0              | 855       | 2090             | 0.0              | 985       | 2982             | 0.0              |
| 470       | 13835            | 15.9             | 600       | 100645           | 5.7              | 730       | 5017             | 0.0              | 860       | 2535             | 0.0              | 990       | 2305             | 0.0              |
| 475       | 12398            | 15.5             | 605       | 97644            | 3.8              | 735       | 4459             | 0.0              | 865       | 2101             | 0.0              | 995       | 3671             | 0.0              |
| 480       | 13406            | 18.1             | 610       | 92487            | 2.5              | 740       | 4062             | 0.0              | 870       | 1798             | 0.0              | 1000      | 2560             | 0.0              |
| 485       | 15865            | 23.0             | 615       | 87436            | 1.6              | 745       | 3636             | 0.0              | 875       | 2857             | 0.0              |           |                  |                  |

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### Melanopic Flux vs. Wavelength



**Melanopic Lumens: 2621**

**M/P: 0.5**

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 1840             | 0.0              | 490       | 20271            | 16.9             | 620       | 80709            | 0.1              | 750       | 3465             | 0.0              | 880       | 2800             | 0.0              |
| 365       | 1514             | 0.0              | 495       | 25910            | 21.4             | 625       | 74695            | 0.0              | 755       | 3075             | 0.0              | 885       | 2582             | 0.0              |
| 370       | 1514             | 0.0              | 500       | 32216            | 25.9             | 630       | 67709            | 0.0              | 760       | 2794             | 0.0              | 890       | 2353             | 0.0              |
| 375       | 1843             | 0.0              | 505       | 38336            | 29.4             | 635       | 61156            | 0.0              | 765       | 2593             | 0.0              | 895       | 1819             | 0.0              |
| 380       | 1796             | 0.0              | 510       | 43738            | 31.4             | 640       | 54795            | 0.0              | 770       | 2401             | 0.0              | 900       | 2024             | 0.0              |
| 385       | 1575             | 0.0              | 515       | 47977            | 31.3             | 645       | 49111            | 0.0              | 775       | 2233             | 0.0              | 905       | 1851             | 0.0              |
| 390       | 1527             | 0.0              | 520       | 51818            | 30.2             | 650       | 43533            | 0.0              | 780       | 2166             | 0.0              | 910       | 1602             | 0.0              |
| 395       | 1326             | 0.0              | 525       | 54890            | 27.8             | 655       | 38234            | 0.0              | 785       | 2051             | 0.0              | 915       | 2200             | 0.0              |
| 400       | 1233             | 0.0              | 530       | 57872            | 25.0             | 660       | 33754            | 0.0              | 790       | 1765             | 0.0              | 920       | 2530             | 0.0              |
| 405       | 1329             | 0.0              | 535       | 60410            | 21.7             | 665       | 29162            | 0.0              | 795       | 1903             | 0.0              | 925       | 2487             | 0.0              |
| 410       | 1902             | 0.1              | 540       | 62857            | 18.4             | 670       | 25117            | 0.0              | 800       | 2127             | 0.0              | 930       | 2089             | 0.0              |
| 415       | 3436             | 0.2              | 545       | 66165            | 15.4             | 675       | 21511            | 0.0              | 805       | 1867             | 0.0              | 935       | 2293             | 0.0              |
| 420       | 6571             | 0.8              | 550       | 70124            | 12.6             | 680       | 18435            | 0.0              | 810       | 1775             | 0.0              | 940       | 2315             | 0.0              |
| 425       | 12957            | 2.0              | 555       | 74973            | 10.1             | 685       | 16004            | 0.0              | 815       | 1812             | 0.0              | 945       | 2481             | 0.0              |
| 430       | 23376            | 4.9              | 560       | 80227            | 7.9              | 690       | 13701            | 0.0              | 820       | 1973             | 0.0              | 950       | 2701             | 0.0              |
| 435       | 38205            | 10.2             | 565       | 85358            | 6.0              | 695       | 11765            | 0.0              | 825       | 1773             | 0.0              | 955       | 2892             | 0.0              |
| 440       | 56691            | 18.9             | 570       | 90422            | 4.4              | 700       | 10145            | 0.0              | 830       | 1925             | 0.0              | 960       | 2609             | 0.0              |
| 445       | 67585            | 26.7             | 575       | 95259            | 3.2              | 705       | 8865             | 0.0              | 835       | 2001             | 0.0              | 965       | 3066             | 0.0              |
| 450       | 55963            | 25.8             | 580       | 99033            | 2.2              | 710       | 7954             | 0.0              | 840       | 2142             | 0.0              | 970       | 2566             | 0.0              |
| 455       | 35549            | 18.6             | 585       | 101572           | 1.5              | 715       | 7285             | 0.0              | 845       | 2101             | 0.0              | 975       | 2375             | 0.0              |
| 460       | 25268            | 14.9             | 590       | 103264           | 1.0              | 720       | 6412             | 0.0              | 850       | 2097             | 0.0              | 980       | 3526             | 0.0              |
| 465       | 18712            | 12.2             | 595       | 102194           | 0.7              | 725       | 5721             | 0.0              | 855       | 2090             | 0.0              | 985       | 2982             | 0.0              |
| 470       | 13835            | 9.9              | 600       | 100645           | 0.4              | 730       | 5017             | 0.0              | 860       | 2535             | 0.0              | 990       | 2305             | 0.0              |
| 475       | 12398            | 9.5              | 605       | 97644            | 0.3              | 735       | 4459             | 0.0              | 865       | 2101             | 0.0              | 995       | 3671             | 0.0              |
| 480       | 13406            | 10.8             | 610       | 92487            | 0.2              | 740       | 4062             | 0.0              | 870       | 1798             | 0.0              | 1000      | 2560             | 0.0              |
| 485       | 15865            | 13.1             | 615       | 87436            | 0.1              | 745       | 3636             | 0.0              | 875       | 2857             | 0.0              |           |                  |                  |

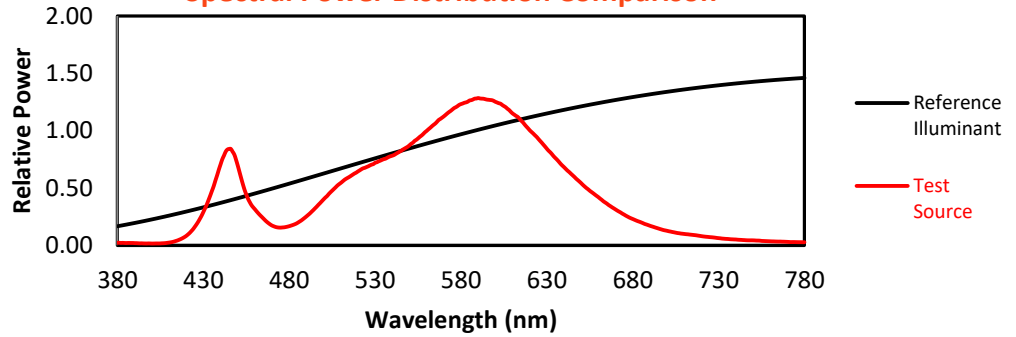
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TM-30-18

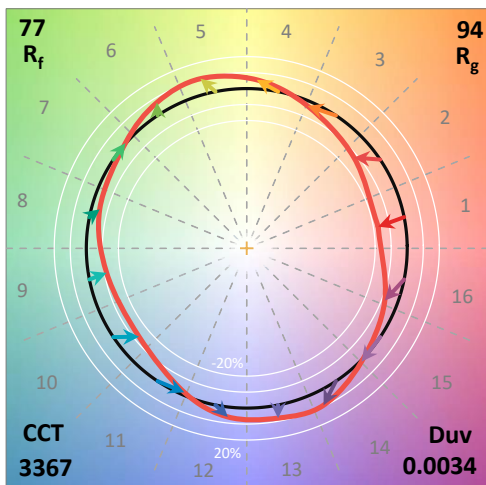
### Summary

$R_f = 77.2$   
 $R_g = 94.4$   
 CIE  $R_a = 73.3$   
 $R_g = -34.3$

### Spectral Power Distribution Comparison



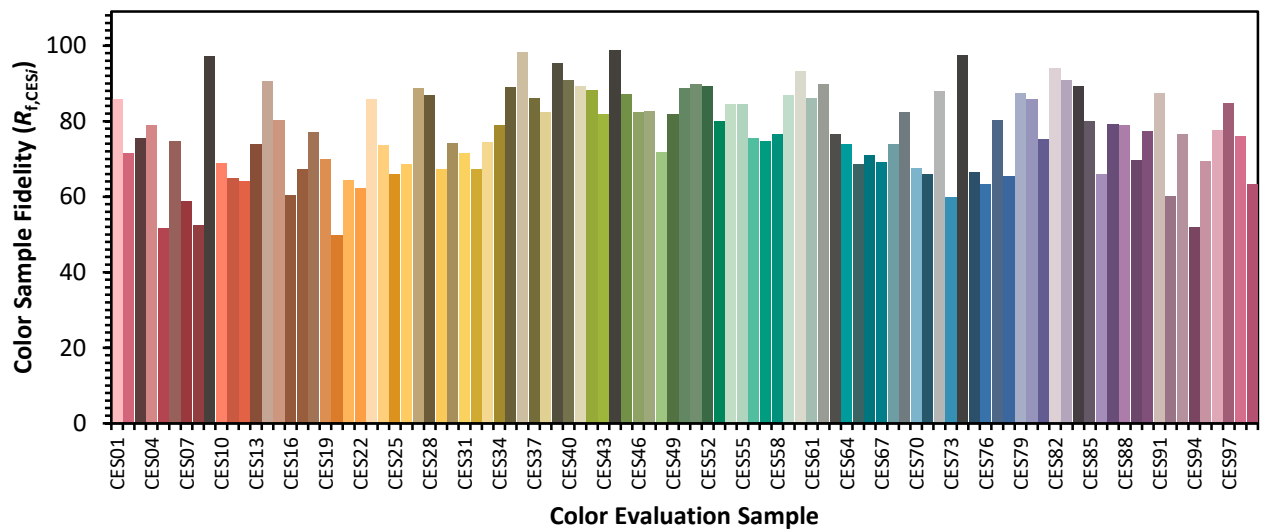
### Color Vector Graphics



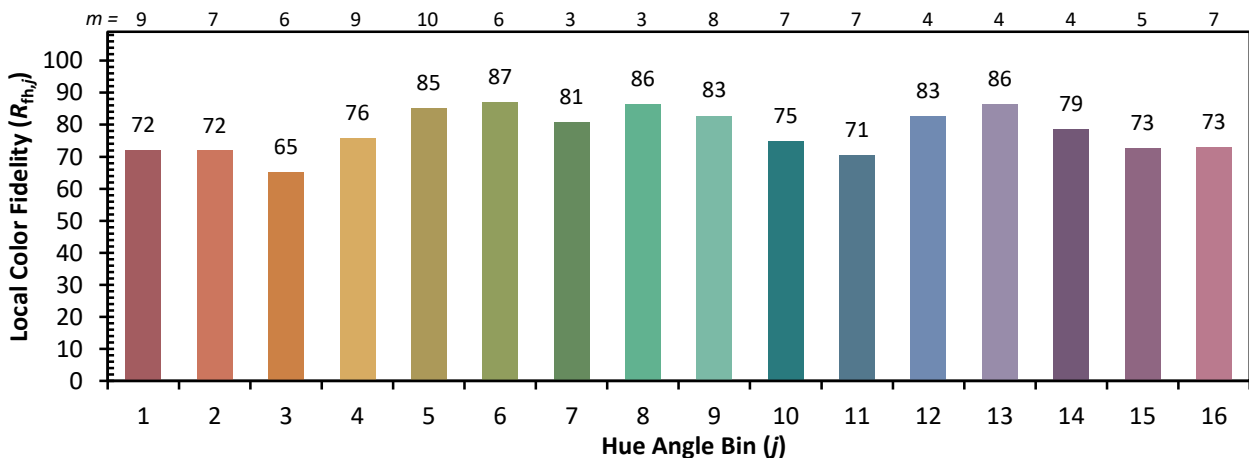
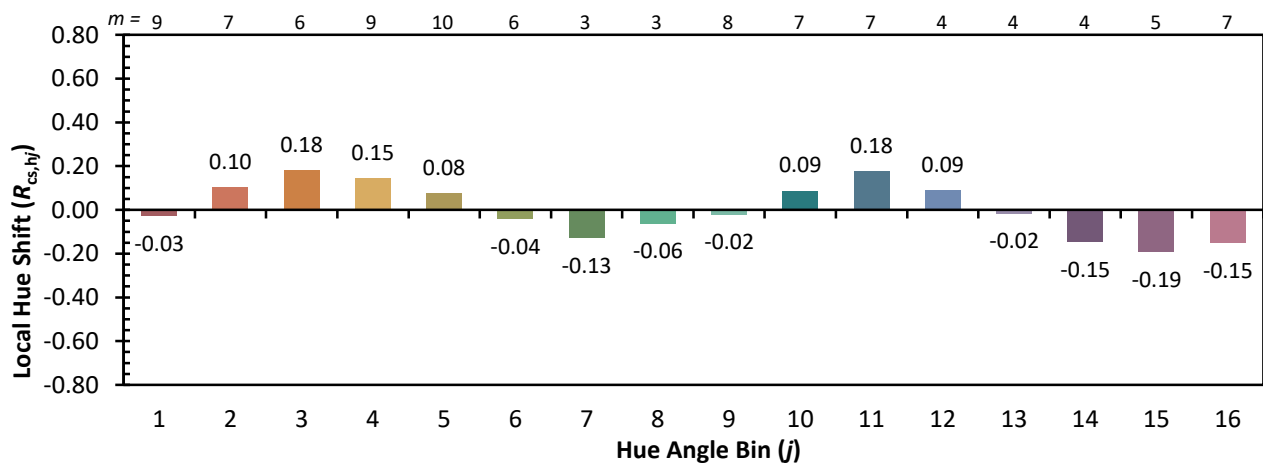


Individual Sample Fidelity Index ( $R_{f,i}$ )

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 69 | CES51 = 90 | CES76 = 63 |
| CES02 = 62 | CES27 = 89 | CES52 = 89 | CES77 = 80 |
| CES03 = 31 | CES28 = 87 | CES53 = 80 | CES78 = 65 |
| CES04 = 70 | CES29 = 67 | CES54 = 85 | CES79 = 87 |
| CES05 = 48 | CES30 = 74 | CES55 = 84 | CES80 = 86 |
| CES06 = 51 | CES31 = 71 | CES56 = 76 | CES81 = 75 |
| CES07 = 41 | CES32 = 67 | CES57 = 75 | CES82 = 94 |
| CES08 = 39 | CES33 = 75 | CES58 = 77 | CES83 = 91 |
| CES09 = 29 | CES34 = 79 | CES59 = 87 | CES84 = 89 |
| CES10 = 75 | CES35 = 89 | CES60 = 93 | CES85 = 80 |
| CES11 = 58 | CES36 = 98 | CES61 = 86 | CES86 = 66 |
| CES12 = 64 | CES37 = 86 | CES62 = 90 | CES87 = 79 |
| CES13 = 43 | CES38 = 82 | CES63 = 77 | CES88 = 79 |
| CES14 = 74 | CES39 = 95 | CES64 = 74 | CES89 = 70 |
| CES15 = 71 | CES40 = 91 | CES65 = 69 | CES90 = 77 |
| CES16 = 47 | CES41 = 89 | CES66 = 71 | CES91 = 87 |
| CES17 = 50 | CES42 = 88 | CES67 = 69 | CES92 = 60 |
| CES18 = 56 | CES43 = 82 | CES68 = 74 | CES93 = 76 |
| CES19 = 72 | CES44 = 99 | CES69 = 82 | CES94 = 52 |
| CES20 = 65 | CES45 = 87 | CES70 = 67 | CES95 = 69 |
| CES21 = 86 | CES46 = 82 | CES71 = 66 | CES96 = 78 |
| CES22 = 79 | CES47 = 83 | CES72 = 88 | CES97 = 85 |
| CES23 = 92 | CES48 = 72 | CES73 = 60 | CES98 = 76 |
| CES24 = 91 | CES49 = 82 | CES74 = 97 | CES99 = 63 |
| CES25 = 72 | CES50 = 89 | CES75 = 67 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)