Cooper Lighting Solutions Photometric Lab
1121 Highway 74 South
Peachtree City, GA 30269

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: P821508

Luminaire Tested: **TT-D5-735-12VDC-RW-HSS**

Issue Date: 12/2/2020

Report Generated By 670245763

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Scaled Data Report

**Test Information**

| | |
|---|---|
| Test Method: | LM-79-08 |
| Report Number: | P821508 |
| | TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2010-017-5) |
| Test Lab: | INNOVATION CENTER |
| Issue Date: | 12/2/2020 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS (FORMERLY EATON) |
| Product Line: | McGRAW-EDISON |
| Catalog Number: | TT-D5-735-12VDC-RW-HSS |
| Description: | TOPTIER LED PARKING GARAGE LUMINAIRE |
| | 3500K, 70 CRI LEDS AND RECTANGULAR DISTRIBUTION WITH HOUSE SIDE SHIELD |
| Light Source: | - |
| Ballast/Driver: | ELECTRONIC DRIVER |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 5683 lumens |
| Efficiency: | N/A |
| Efficacy: | 77.8 lumens/watt |
| Luminous Opening: | Circular (Dia: 1.12' x H: 0') |
| IES Classification: | Type IV - Short |
| BUG Rating: | B2 - U2 - G3 |

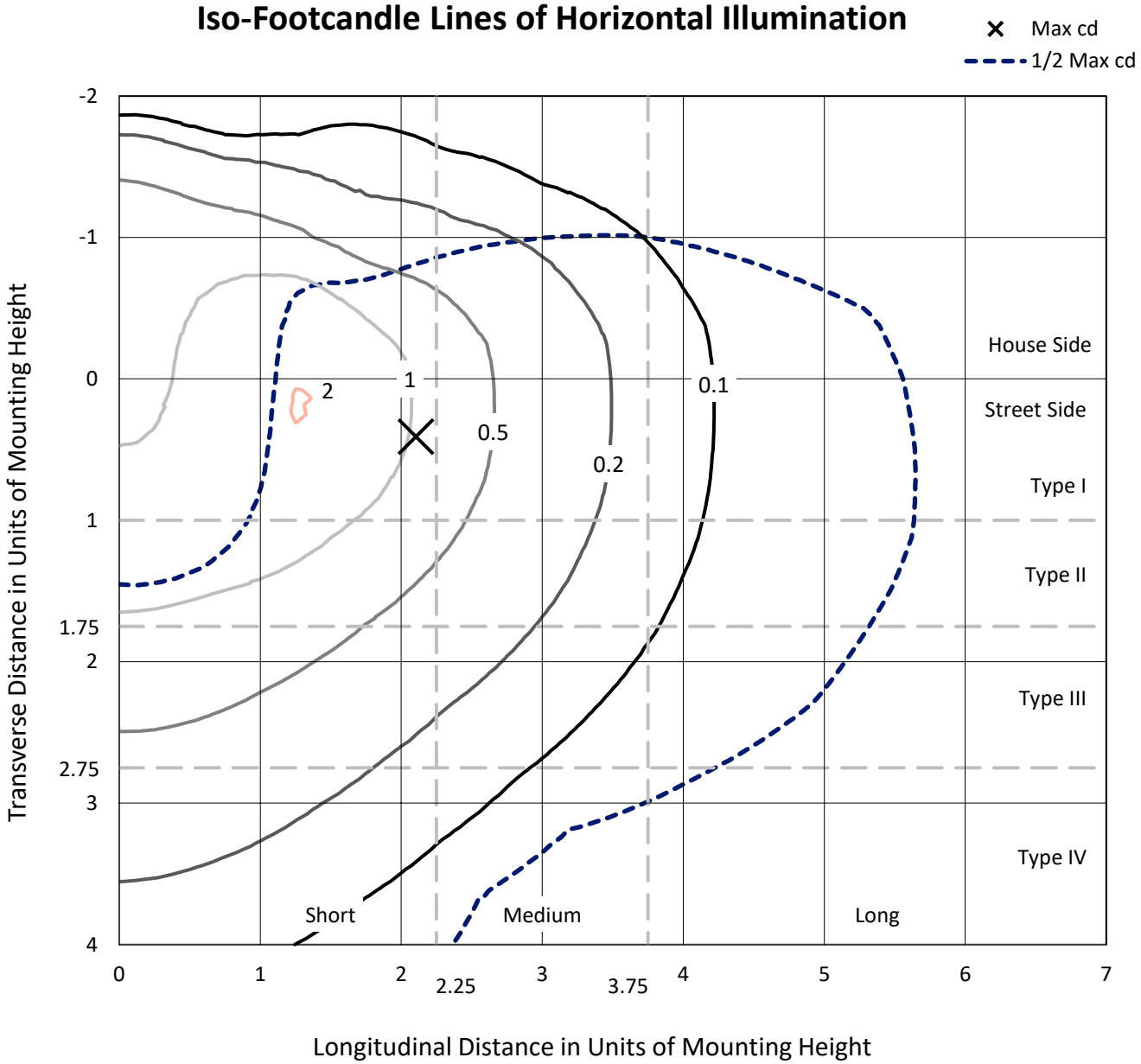
| | |
|---|---|
| Input Watts (W): | 73 |
| Input Voltage (V): | NR |
| Input Current (Ain): | NR |
| Voltage Rise (V): | NR |
| Power Factor: | NR |
| Total Harmonic Distortion (THDi): | NR |
| Frequency (hertz): | 60 |
| Stabilization Time: | NR |
| Operation Time: | NR |
| Ambient Temperature (°C): | NR |
| Test Distance: | 25 FT |

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## Iso-Footcandle Lines of Horizontal Illumination



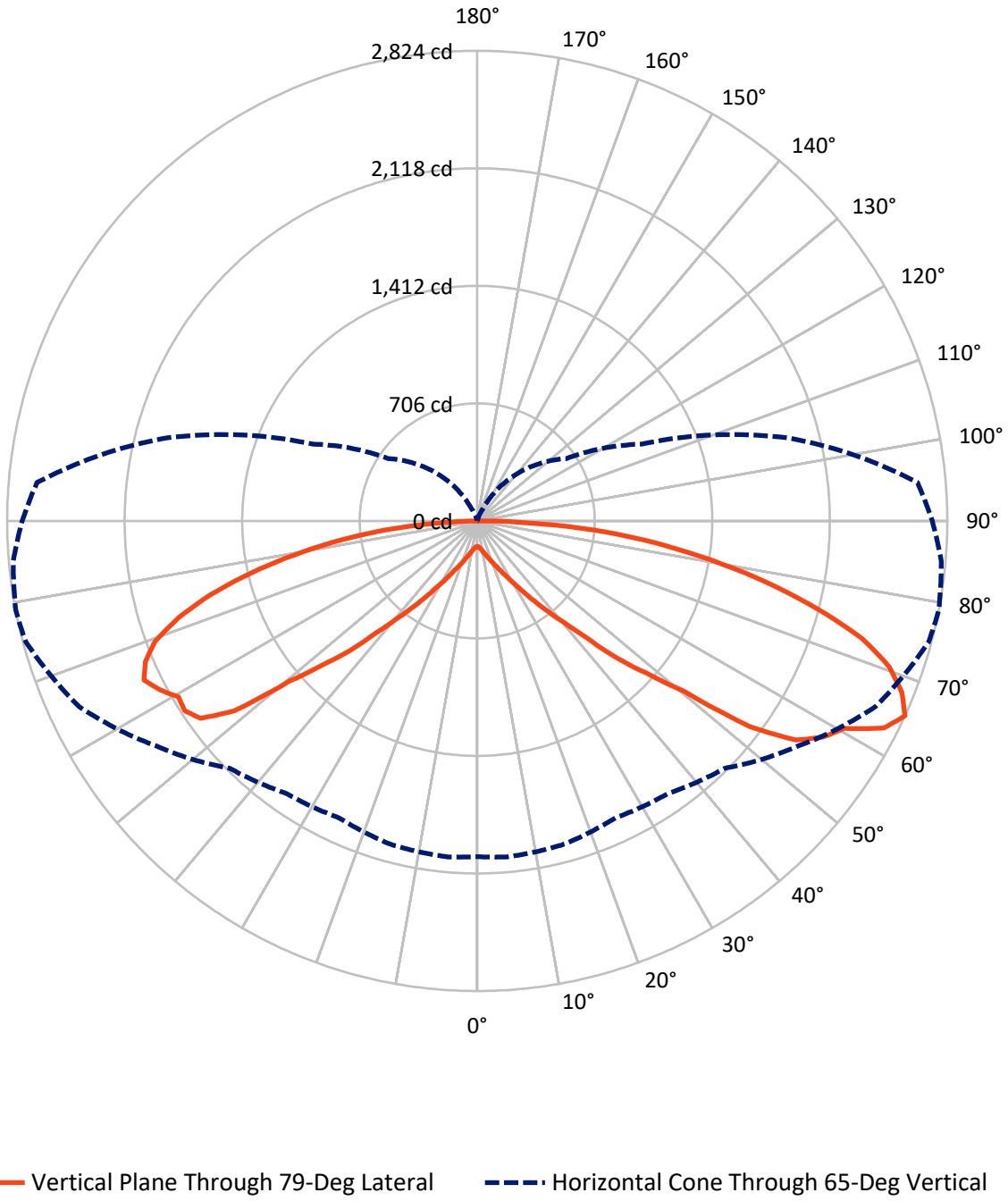

Based on 15 foot mounting height. Maximum calculated value = 2 fc
Type IV - Short - N/A

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## Luminous Intensity Polar Plot



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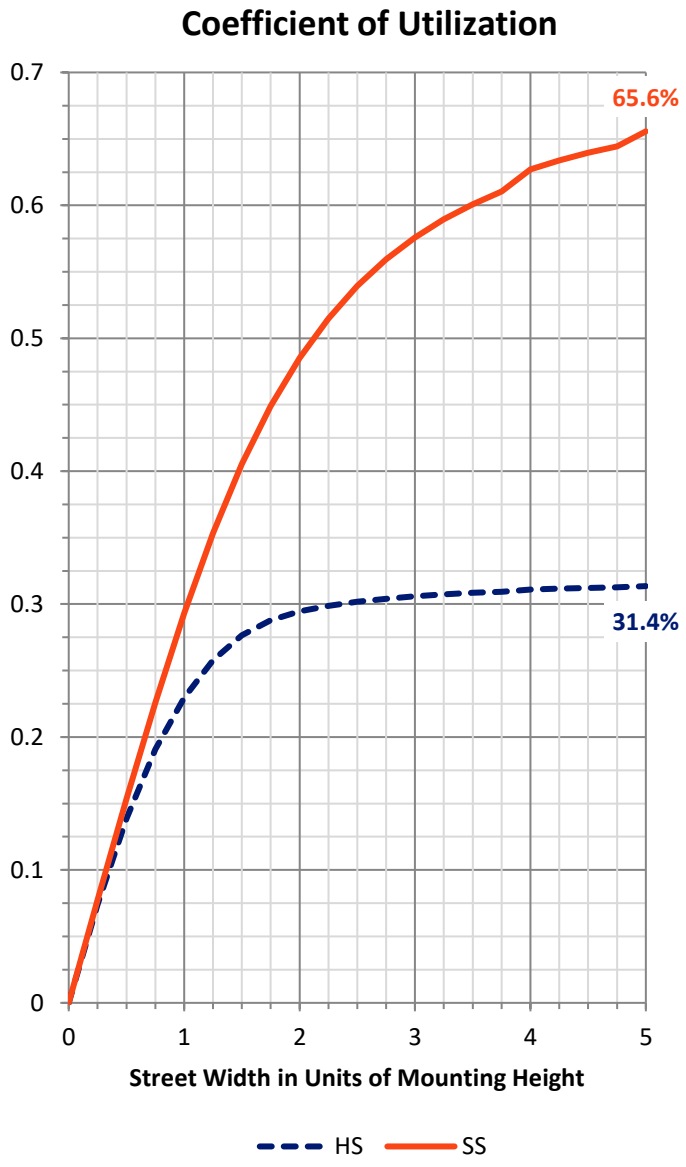
REPORT NUMBER: P821508
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**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 1794.6 | 2.3 | 1796.8 |
| | % Fixture | 31.6 | 0.0 | 31.6 |
| **Street Side** | Lumens | 3861.1 | 25.0 | 3886.1 |
| | % Fixture | 67.9 | 0.4 | 68.4 |
| **Total** | Lumens | 5655.7 | 27.3 | 5683.0 |
| | % Fixture | 99.5 | 0.5 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 16.2 | 0.3 |
| 10°-20° | 61.2 | 1.1 |
| 20°-30° | 141.2 | 2.5 |
| 30°-40° | 302.5 | 5.3 |
| 40°-50° | 647.9 | 11.4 |
| 50°-60° | 1223.7 | 21.5 |
| 60°-70° | 1520.7 | 26.8 |
| 70°-80° | 1301.9 | 22.9 |
| 80°-90° | 440.4 | 7.7 |
| 90°-100° | 19.0 | 0.3 |
| 100°-110° | 5.5 | 0.1 |
| 110°-120° | 1.2 | 0.0 |
| 120°-130° | 0.6 | 0.0 |
| 130°-140° | 0.4 | 0.0 |
| 140°-150° | 0.3 | 0.0 |
| 150°-160° | 0.1 | 0.0 |
| 160°-170° | 0.1 | 0.0 |
| 170°-180° | 0.0 | 0.0 |
| 0°-90° | 5655.7 | 99.5 |
| 0°-180° | 5683.0 | 100.0 |



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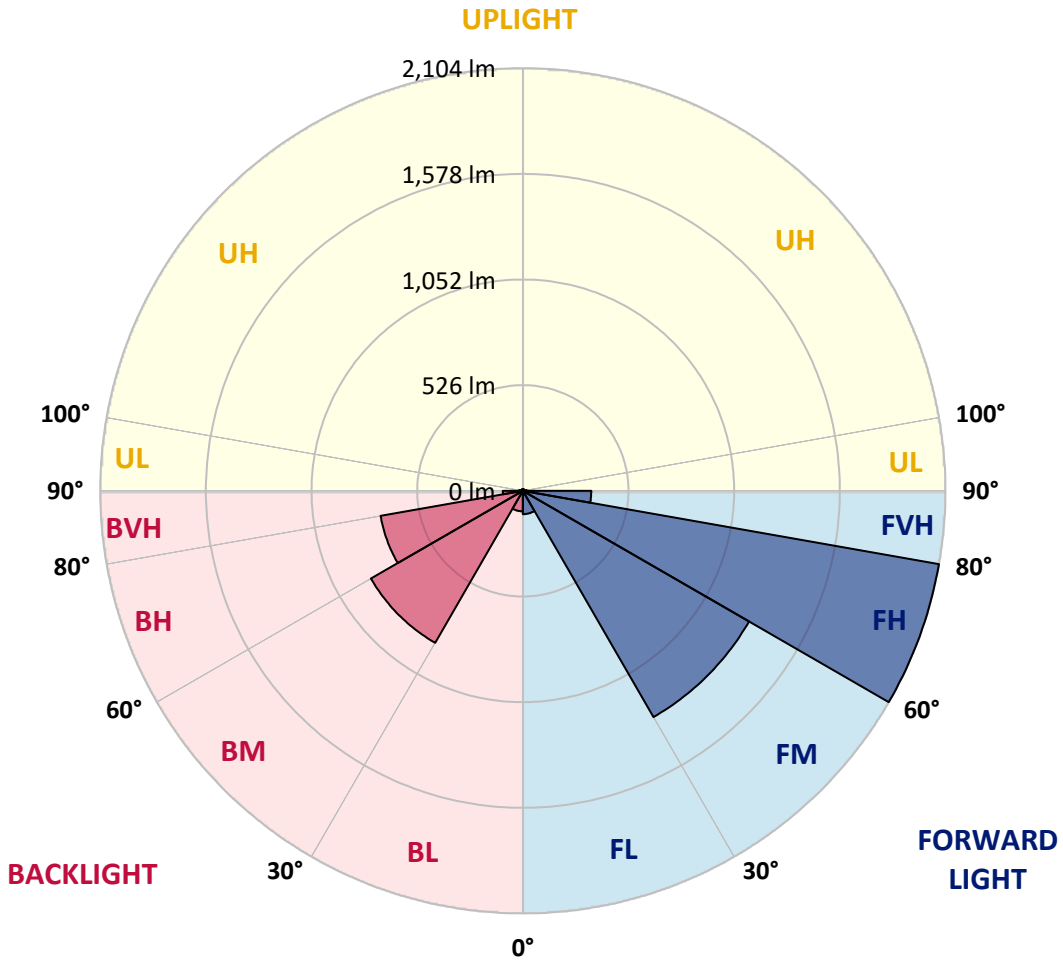
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## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 116.2 | 2.0 | | | |
| FM | (30°-60°) | 1300.5 | 22.9 | | | |
| FH | (60°-80°) | 2103.6 | 37.0 | | | G2/5000 |
| FVH | (80°-90°) | 340.7 | 6.0 | | | G3/500 |
| BL | (0°-30°) | 102.4 | 1.8 | B0/110 | | |
| BM | (30°-60°) | 873.5 | 15.4 | B1/1000 | | |
| BH | (60°-80°) | 719.0 | 12.7 | B2/1000 | | G2/1000 |
| BVH | (80°-90°) | 99.7 | 1.8 | | | G1/100 |
| UL | (90°-100°) | 19.0 | 0.3 | | U2/50 | |
| UH | (100°-180°) | 8.3 | 0.1 | | U1/10 | |

**BUG Rating: B2-U2-G3**
Type IV Short



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**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 15° | 25° | 35° | 45° | 55° | 65° | 75° | 79° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 154.4 | 154.4 | 154.4 | 154.4 | 154.4 | 154.4 | 154.4 | 154.4 | 154.4 | *154.4* | 154.4 |
| 2.5° | 162.9 | 162.9 | 162.9 | 161.4 | 161.4 | 161.4 | 160.0 | 158.6 | 157.2 | *157.2* | 157.2 |
| 5° | 171.3 | 171.3 | 171.3 | 171.3 | 169.9 | 168.5 | 167.1 | 165.7 | 164.3 | *164.3* | 162.9 |
| 7.5° | 182.7 | 181.3 | 182.7 | 181.3 | 181.3 | 179.8 | 178.4 | 177.0 | 174.2 | *174.2* | 172.8 |
| 10° | 194.0 | 194.0 | 194.0 | 194.0 | 194.0 | 192.6 | 191.2 | 189.8 | 188.3 | *186.9* | 185.5 |
| 12.5° | 208.2 | 208.2 | 208.2 | 206.8 | 208.2 | 206.8 | 205.3 | 205.3 | 203.9 | *201.1* | 201.1 |
| 15° | 222.3 | 222.3 | 222.3 | 222.3 | 223.7 | 223.7 | 223.7 | 222.3 | 222.3 | *220.9* | 219.5 |
| 17.5° | 239.3 | 237.9 | 239.3 | 239.3 | 240.7 | 242.2 | 243.6 | 245.0 | 245.0 | *243.6* | 243.6 |
| 20° | 257.7 | 256.3 | 257.7 | 257.7 | 260.6 | 263.4 | 267.6 | 270.5 | 271.9 | *269.1* | 269.1 |
| 22.5° | 277.6 | 276.1 | 279.0 | 279.0 | 283.2 | 287.5 | 294.5 | 297.4 | 301.6 | *300.2* | 300.2 |
| 25° | 301.6 | 300.2 | 301.6 | 303.0 | 308.7 | 315.8 | 324.3 | 331.4 | 335.6 | *335.6* | 337.0 |
| 27.5° | 328.5 | 328.5 | 330.0 | 331.4 | 337.0 | 348.4 | 361.1 | 373.8 | 383.8 | *382.3* | 383.8 |
| 30° | 365.4 | 365.4 | 368.2 | 369.6 | 376.7 | 389.4 | 406.4 | 423.4 | 437.6 | *437.6* | 440.4 |
| 32.5° | 406.4 | 405.0 | 409.3 | 410.7 | 417.7 | 434.7 | 458.8 | 485.7 | 504.1 | *504.1* | 507.0 |
| 35° | 456.0 | 454.6 | 458.8 | 458.8 | 467.3 | 491.4 | 522.5 | 559.4 | 590.5 | *591.9* | 596.2 |
| 37.5° | 518.3 | 515.5 | 515.5 | 519.7 | 529.6 | 560.8 | 603.3 | 654.2 | 686.8 | *689.6* | 696.7 |
| 40° | 591.9 | 590.5 | 593.3 | 591.9 | 604.7 | 642.9 | 696.7 | 756.2 | 794.4 | *801.5* | 810.0 |
| 42.5° | 682.6 | 685.4 | 681.1 | 681.1 | 696.7 | 740.6 | 804.3 | 873.7 | 943.1 | *951.6* | 955.9 |
| 45° | 793.0 | 798.7 | 793.0 | 791.6 | 805.8 | 856.7 | 944.5 | 1066.3 | 1147.0 | *1175.4* | 1183.9 |
| 47.5° | 926.1 | 929.0 | 921.9 | 919.0 | 934.6 | 999.8 | 1113.1 | 1249.0 | 1343.9 | *1365.1* | 1387.8 |
| 50° | 1074.8 | 1070.6 | 1064.9 | 1060.7 | 1090.4 | 1171.1 | 1302.8 | 1443.0 | 1605.9 | *1608.7* | 1617.2 |
| 52.5° | 1227.8 | 1215.0 | 1216.4 | 1215.0 | 1256.1 | 1343.9 | 1519.5 | 1757.4 | 2005.2 | *2056.2* | 2061.8 |
| 55° | 1380.7 | 1365.1 | 1363.7 | 1377.9 | 1435.9 | 1562.0 | 1782.9 | 2091.6 | 2292.7 | *2323.8* | 2319.6 |
| 57.5° | 1533.6 | 1526.6 | 1523.7 | 1536.5 | 1621.4 | 1771.5 | 2020.8 | 2281.3 | 2452.7 | *2449.8* | 2420.1 |
| 60° | 1692.2 | 1697.9 | 1688.0 | 1712.1 | 1799.9 | 1950.0 | 2131.2 | 2384.7 | 2543.3 | *2530.6* | 2500.8 |
| 62.5° | 1855.1 | 1869.2 | 1859.3 | 1862.2 | 1918.8 | 2029.3 | 2207.7 | 2502.2 | 2721.7 | *2740.1* | 2706.2 |
| 65° | *2016.5* | *2026.4* | *2010.9* | *1967.0* | *1998.1* | *2101.5* | *2356.4* | *2639.6* | *2806.7* | *2823.7* | *2798.2* |
| 67.5° | 2152.5 | 2162.4 | 2108.6 | 2039.2 | 2043.4 | 2118.5 | 2342.2 | 2612.7 | 2761.4 | *2750.1* | 2709.0 |
| 70° | 2268.6 | 2250.2 | 2162.4 | 2043.4 | 1993.9 | 2029.3 | 2240.3 | 2479.6 | 2631.1 | *2625.4* | 2577.3 |
| 72.5° | 2306.8 | 2282.8 | 2134.1 | 1950.0 | 1852.3 | 1865.0 | 2070.3 | 2284.2 | 2407.4 | *2417.3* | 2359.2 |
| 75° | 2245.9 | 2204.9 | 2000.9 | 1770.1 | 1644.1 | 1652.6 | 1828.2 | 2025.0 | 2124.1 | *2112.8* | 2067.5 |
| 77.5° | 2026.4 | 1985.4 | 1764.5 | 1518.1 | 1394.9 | 1407.6 | 1546.4 | 1700.7 | 1782.9 | *1778.6* | 1747.5 |
| 80° | 1682.3 | 1645.5 | 1451.5 | 1222.1 | 1110.2 | 1117.3 | 1223.5 | 1345.3 | 1409.0 | *1423.2* | 1406.2 |
| 82.5° | 1243.3 | 1217.8 | 1080.5 | 895.0 | 804.3 | 802.9 | 883.6 | 977.1 | 1039.4 | *1069.2* | 1057.8 |
| 85° | 768.9 | 756.2 | 679.7 | 559.4 | 495.6 | 494.2 | 542.4 | 611.8 | 668.4 | *708.0* | 682.6 |
| 87.5° | 305.9 | 301.6 | 279.0 | 225.2 | 196.8 | 186.9 | 175.6 | 219.5 | 223.7 | *264.8* | 263.4 |
| 90° | 75.1 | 73.6 | 72.2 | 68.0 | 60.9 | 52.4 | 42.5 | 31.2 | 19.8 | *15.6* | 8.5 |
| 92.5° | 66.6 | 66.6 | 65.1 | 60.9 | 55.2 | 46.7 | 38.2 | 28.3 | 18.4 | *14.2* | 7.1 |
| 95° | 53.8 | 53.8 | 52.4 | 49.6 | 43.9 | 38.2 | 29.7 | 22.7 | 14.2 | *11.3* | 5.7 |
| 97.5° | 41.1 | 39.7 | 39.7 | 36.8 | 34.0 | 28.3 | 22.7 | 17.0 | 11.3 | *8.5* | 4.2 |
| 100° | 29.7 | 29.7 | 28.3 | 26.9 | 24.1 | 21.2 | 17.0 | 12.7 | 7.1 | *5.7* | 2.8 |
| 102.5° | 21.2 | 19.8 | 19.8 | 19.8 | 17.0 | 14.2 | 11.3 | 8.5 | 5.7 | *4.2* | 1.4 |
| 105° | 14.2 | 12.7 | 12.7 | 12.7 | 11.3 | 9.9 | 7.1 | 5.7 | 2.8 | *2.8* | 1.4 |
| 107.5° | 8.5 | 8.5 | 8.5 | 8.5 | 7.1 | 5.7 | 4.2 | 2.8 | 1.4 | *1.4* | 1.4 |
| 110° | 4.2 | 4.2 | 4.2 | 5.7 | 4.2 | 4.2 | 2.8 | 1.4 | 1.4 | *1.4* | 1.4 |

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**CANDELA DISTRIBUTION (continued):**

| | 0° | 5° | 15° | 25° | 35° | 45° | 55° | 65° | 75° | 79° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 112.5° | 2.8 | 2.8 | 2.8 | 2.8 | 2.8 | 2.8 | 1.4 | 1.4 | 1.4 | *1.4* | 1.4 |
| 115° | 1.4 | 1.4 | 1.4 | 2.8 | 2.8 | 1.4 | 1.4 | 0.0 | 0.0 | *1.4* | 1.4 |
| 117.5° | 0.0 | 0.0 | 1.4 | 1.4 | 1.4 | 1.4 | 0.0 | 0.0 | 0.0 | *0.0* | 1.4 |
| 120° | 0.0 | 0.0 | 1.4 | 1.4 | 1.4 | 1.4 | 0.0 | 0.0 | 0.0 | *0.0* | 1.4 |
| 122.5° | 0.0 | 0.0 | 1.4 | 1.4 | 1.4 | 1.4 | 0.0 | 0.0 | 0.0 | *0.0* | 1.4 |
| 125° | 0.0 | 0.0 | 0.0 | 1.4 | 1.4 | 1.4 | 0.0 | 0.0 | 0.0 | *0.0* | 1.4 |
| 127.5° | 0.0 | 0.0 | 0.0 | 1.4 | 1.4 | 1.4 | 0.0 | 0.0 | 0.0 | *0.0* | 1.4 |
| 130° | 0.0 | 0.0 | 0.0 | 1.4 | 1.4 | 1.4 | 0.0 | 0.0 | 0.0 | *0.0* | 1.4 |
| 132.5° | 0.0 | 0.0 | 0.0 | 1.4 | 1.4 | 1.4 | 0.0 | 0.0 | 0.0 | *0.0* | 1.4 |
| 135° | 0.0 | 0.0 | 0.0 | 1.4 | 1.4 | 0.0 | 0.0 | 0.0 | 0.0 | *0.0* | 0.0 |
| 137.5° | 0.0 | 0.0 | 0.0 | 0.0 | 1.4 | 0.0 | 0.0 | 0.0 | 0.0 | *0.0* | 0.0 |
| 140° | 0.0 | 0.0 | 0.0 | 0.0 | 1.4 | 0.0 | 0.0 | 0.0 | 0.0 | *0.0* | 0.0 |
| 142.5° | 0.0 | 0.0 | 0.0 | 0.0 | 1.4 | 1.4 | 0.0 | 0.0 | 0.0 | *0.0* | 0.0 |
| 145° | 0.0 | 0.0 | 0.0 | 1.4 | 1.4 | 1.4 | 1.4 | 0.0 | 0.0 | *0.0* | 0.0 |
| 147.5° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.4 | 0.0 | 0.0 | 0.0 | *0.0* | 0.0 |
| 150° | 0.0 | 0.0 | 0.0 | 0.0 | 1.4 | 0.0 | 0.0 | 0.0 | 0.0 | *0.0* | 0.0 |
| 152.5° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | *0.0* | 0.0 |
| 155° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | *0.0* | 0.0 |
| 157.5° | 0.0 | 0.0 | 0.0 | 0.0 | 1.4 | 0.0 | 0.0 | 0.0 | 0.0 | *0.0* | 0.0 |
| 160° | 0.0 | 0.0 | 0.0 | 0.0 | 1.4 | 0.0 | 0.0 | 0.0 | 0.0 | *0.0* | 0.0 |
| 162.5° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | *0.0* | 0.0 |
| 165° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | *0.0* | 0.0 |
| 167.5° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | *0.0* | 0.0 |
| 170° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | *0.0* | 0.0 |
| 172.5° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | *0.0* | 0.0 |
| 175° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | *0.0* | 0.0 |
| 177.5° | 0.0 | 0.0 | 0.0 | 1.4 | 0.0 | 1.4 | 0.0 | 0.0 | 0.0 | *0.0* | 0.0 |
| 180° | 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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**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 154.4 | 154.4 | 154.4 | 154.4 | 154.4 | 154.4 | 154.4 | 154.4 | 154.4 | 154.4 | 154.4 |
| 2.5° | 155.8 | 155.8 | 155.8 | 154.4 | 154.4 | 154.4 | 152.9 | 152.9 | 151.5 | 151.5 | 151.5 |
| 5° | 161.4 | 161.4 | 160.0 | 160.0 | 158.6 | 157.2 | 157.2 | 155.8 | 155.8 | 154.4 | 154.4 |
| 7.5° | 171.3 | 171.3 | 169.9 | 168.5 | 165.7 | 164.3 | 162.9 | 161.4 | 161.4 | 160.0 | 160.0 |
| 10° | 184.1 | 184.1 | 181.3 | 178.4 | 175.6 | 172.8 | 171.3 | 168.5 | 167.1 | 167.1 | 167.1 |
| 12.5° | 199.7 | 198.3 | 195.4 | 191.2 | 188.3 | 184.1 | 181.3 | 178.4 | 175.6 | 175.6 | 175.6 |
| 15° | 218.1 | 218.1 | 212.4 | 208.2 | 202.5 | 196.8 | 192.6 | 188.3 | 185.5 | 184.1 | 184.1 |
| 17.5° | 240.7 | 240.7 | 233.7 | 226.6 | 219.5 | 212.4 | 206.8 | 201.1 | 198.3 | 196.8 | 196.8 |
| 20° | 266.2 | 266.2 | 259.1 | 250.6 | 240.7 | 230.8 | 222.3 | 215.2 | 211.0 | 209.6 | 209.6 |
| 22.5° | 297.4 | 297.4 | 287.5 | 276.1 | 263.4 | 249.2 | 237.9 | 229.4 | 225.2 | 222.3 | 222.3 |
| 25° | 332.8 | 330.0 | 320.0 | 305.9 | 287.5 | 270.5 | 254.9 | 246.4 | 240.7 | 236.5 | 237.9 |
| 27.5° | 380.9 | 376.7 | 363.9 | 339.9 | 317.2 | 294.5 | 276.1 | 264.8 | 257.7 | 254.9 | 256.3 |
| 30° | 436.2 | 431.9 | 413.5 | 386.6 | 352.6 | 322.9 | 300.2 | 287.5 | 280.4 | 276.1 | 277.6 |
| 32.5° | 502.7 | 497.1 | 474.4 | 437.6 | 397.9 | 355.4 | 327.1 | 311.5 | 304.5 | 300.2 | 298.8 |
| 35° | 590.5 | 583.4 | 555.1 | 504.1 | 448.9 | 397.9 | 358.3 | 338.4 | 331.4 | 327.1 | 328.5 |
| 37.5° | 689.6 | 679.7 | 641.5 | 579.2 | 509.8 | 444.7 | 399.3 | 373.8 | 365.4 | 358.3 | 358.3 |
| 40° | 802.9 | 791.6 | 742.0 | 659.9 | 576.4 | 495.6 | 437.6 | 409.3 | 399.3 | 399.3 | 399.3 |
| 42.5° | 944.5 | 933.2 | 876.6 | 756.2 | 645.7 | 550.9 | 481.5 | 448.9 | 439.0 | 441.8 | 441.8 |
| 45° | 1164.0 | 1148.5 | 1057.8 | 899.2 | 736.4 | 607.5 | 526.8 | 490.0 | 482.9 | 490.0 | 490.0 |
| 47.5° | 1365.1 | 1345.3 | 1212.2 | 1032.3 | 825.6 | 664.1 | 572.1 | 529.6 | 526.8 | 542.4 | 542.4 |
| 50° | 1590.3 | 1564.8 | 1424.6 | 1140.0 | 897.8 | 726.5 | 613.2 | 562.2 | 563.6 | 586.3 | 593.3 |
| 52.5° | 2026.4 | 1999.5 | 1757.4 | 1335.4 | 975.7 | 749.1 | 630.2 | 569.3 | 569.3 | 594.8 | 604.7 |
| 55° | 2285.6 | 2230.4 | 1914.6 | 1462.8 | 1008.3 | 776.0 | 623.1 | 540.9 | 538.1 | 566.4 | 574.9 |
| 57.5° | 2370.5 | 2313.9 | 1947.1 | 1426.0 | 987.0 | 742.0 | 582.0 | 464.5 | 458.8 | 495.6 | 492.8 |
| 60° | 2439.9 | 2364.9 | 1894.7 | 1302.8 | 866.7 | 669.8 | 502.7 | 345.5 | 321.5 | 354.0 | 352.6 |
| 62.5° | 2635.4 | 2554.6 | 1897.6 | 1158.4 | 725.0 | 559.4 | 378.1 | 194.0 | 144.4 | 169.9 | 158.6 |
| 65° | *2733.1* | *2653.8* | *1927.3* | *1090.4* | *652.8* | *463.1* | *270.5* | *79.3* | *5.7* | *5.7* | *2.8* |
| 67.5° | 2649.5 | 2578.7 | 1889.1 | 1073.4 | 642.9 | 460.2 | 274.7 | 77.9 | 0.0 | 0.0 | 0.0 |
| 70° | 2527.7 | 2459.8 | 1801.3 | 1013.9 | 610.3 | 443.2 | 269.1 | 77.9 | 0.0 | 0.0 | 0.0 |
| 72.5° | 2313.9 | 2244.5 | 1649.8 | 929.0 | 560.8 | 406.4 | 249.2 | 73.6 | 0.0 | 0.0 | 0.0 |
| 75° | 2032.1 | 1979.7 | 1457.2 | 818.5 | 494.2 | 358.3 | 220.9 | 65.1 | 0.0 | 0.0 | 0.0 |
| 77.5° | 1720.6 | 1658.3 | 1222.1 | 681.1 | 413.5 | 297.4 | 186.9 | 53.8 | 0.0 | 0.0 | 0.0 |
| 80° | 1380.7 | 1335.4 | 962.9 | 533.9 | 320.0 | 232.2 | 145.9 | 41.1 | 0.0 | 0.0 | 0.0 |
| 82.5° | 1026.7 | 988.4 | 712.3 | 382.3 | 228.0 | 161.4 | 100.5 | 26.9 | 0.0 | 0.0 | 0.0 |
| 85° | 674.1 | 664.1 | 457.4 | 232.2 | 135.9 | 89.2 | 53.8 | 12.7 | 0.0 | 0.0 | 0.0 |
| 87.5° | 243.6 | 252.1 | 167.1 | 66.6 | 36.8 | 15.6 | 7.1 | 1.4 | 0.0 | 0.0 | 0.0 |
| 90° | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 92.5° | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 95° | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 97.5° | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 100° | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 102.5° | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 105° | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 107.5° | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 110° | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

Cooper Lighting Solutions Photometric Lab
1121 Highway 74 South
Peachtree City, GA 30269

Scaled Data Report

REPORT NUMBER: P821508
CATALOG NUMBER: TT-D5-735-12VDC-RW-HSS

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 112.5° | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 115° | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 117.5° | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 120° | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 122.5° | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 125° | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 127.5° | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 130° | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 132.5° | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 135° | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 137.5° | 0.0 | 1.4 | 1.4 | 1.4 | 1.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 140° | 0.0 | 1.4 | 1.4 | 1.4 | 1.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 142.5° | 0.0 | 0.0 | 1.4 | 1.4 | 1.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 145° | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 147.5° | 0.0 | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 150° | 0.0 | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 152.5° | 0.0 | 0.0 | 1.4 | 1.4 | 1.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 155° | 0.0 | 0.0 | 1.4 | 1.4 | 1.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 157.5° | 0.0 | 0.0 | 1.4 | 1.4 | 1.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 160° | 0.0 | 0.0 | 1.4 | 1.4 | 1.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 162.5° | 0.0 | 0.0 | 1.4 | 1.4 | 1.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 165° | 0.0 | 0.0 | 1.4 | 1.4 | 1.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 167.5° | 0.0 | 0.0 | 1.4 | 1.4 | 1.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 170° | 0.0 | 0.0 | 1.4 | 1.4 | 1.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 172.5° | 0.0 | 0.0 | 1.4 | 1.4 | 1.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 175° | 0.0 | 0.0 | 1.4 | 1.4 | 1.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 177.5° | 0.0 | 0.0 | 1.4 | 1.4 | 1.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 180° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

Cooper Lighting Solutions Photometric Lab
1121 Highway 74 South
Peachtree City, GA 30269

# LM-79-2019: Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Report Prepared for

Cooper Lighting Solutions

Streetworks

Report Number: SP1-2407-176-4

Test Date: 09/24/2024

Luminaire Tested: MEM2-HTN-VA-30-735-U-WQ

Data in this report applies to families of products including MEM2-HTN-VA-30-735-U-WQ

Report Generated By FNC07603 / LDUCLS01DT446
Version: v7.04

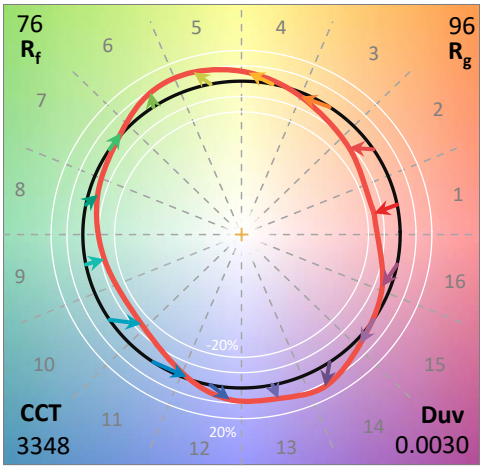
## Test Information

| | |
|---|---|
| Test Method: | LM-79-2019 |
| Report Number: | SP1-2407-176-4 |
| Test Lab: | COOPER LIGHTING SOLUTIONS |
| Photometer: | SP1 - 76IN SPHERE |
| Measurement Geometry: | 4π |
| Issue Date: | 09/27/2024 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS |
| Product Line: | Streetworks |
| Catalog Number: | **MEM2-HTN-VA-30-735-U-WQ** |
| Description: | EPIC MODERN VISUAL COMFORT 30W WAVESTREAM WIDE |

## Spectral Parameters

| | | | | | |
|---|---|---|---|---|---|
| CCT (K): | 3348 | CRI (Ra): | 73.4 | | |
| CIE u': | 0.2384 | R1: | 70.8 | R9: | -19.2 |
| CIE v': | 0.5184 | R2: | 79.9 | R10: | 52.5 |
| Duv: | 0.0030 | R3: | 87.6 | R11: | 68.0 |
| CIE x: | 0.4177 | R4: | 72.6 | R12: | 42.6 |
| CIE y: | 0.4036 | R5: | 69.3 | R13: | 72.0 |
| CIE z: | 0.1787 | R6: | 71.3 | R14: | 92.6 |
| Peak Wavelength (nm): | 593 | R7: | 82.1 | R15: | 63.8 |
| Dominant Wavelength (nm): | 580 | R8: | 53.3 | | |
| Purity: | 46.5223 | | | | |

| | |
|---|---|
| Rf: | 75.8 |
| Rg: | 95.8 |




## Test Conditions

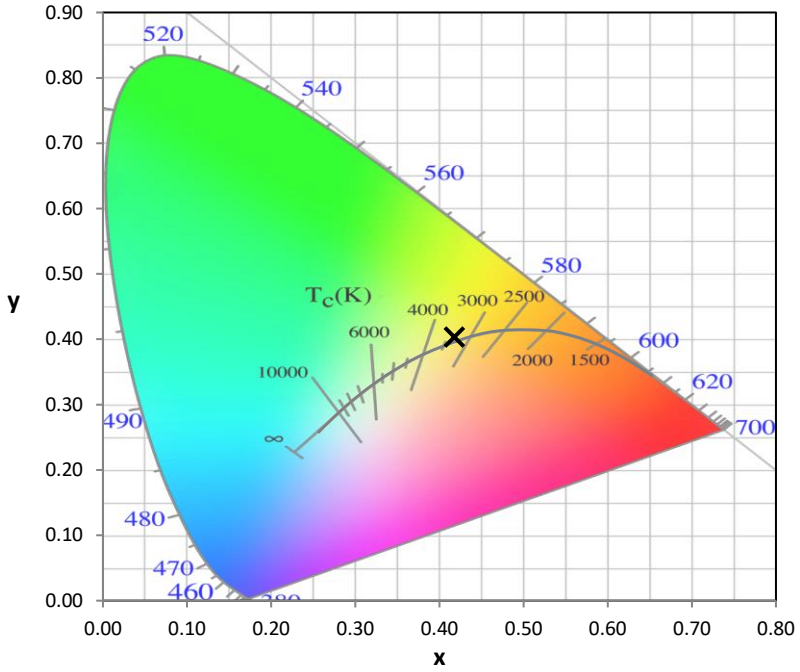
| | |
|---|---|
| Stabilization Time: | 30M |
| Operation Time: | 1H 30M |
| Sphere Temperature (°C): | 25.2 |

REPORT NUMBER: SP1-2407-176-4

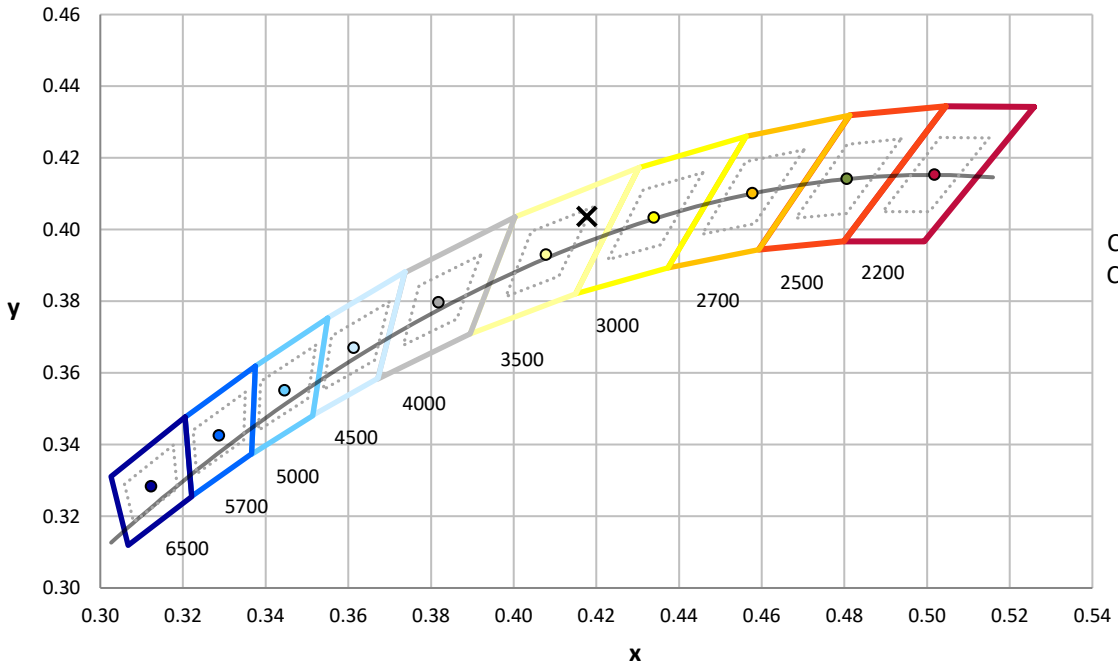
| Measurement and Test Equipment | | | |
|---|---|---|---|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 6/18/2024 | 12/18/2024 |
| Power Meter | INXT2011004 | 2/8/2024 | 2/8/2025 |
| AC Power Source | IN0063 | 10/24/2023 | 10/24/2024 |
| DC Power Source | IN0208 | 10/24/2023 | 10/24/2024 |
| Sphere Thermometer | IN0085 | 10/24/2023 | 10/24/2024 |
| Room Thermometer | IN0046 | 10/24/2023 | 10/24/2024 |

REPORT NUMBER: SP1-2407-176-4

## CIE 1931 Chromaticity Diagram




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

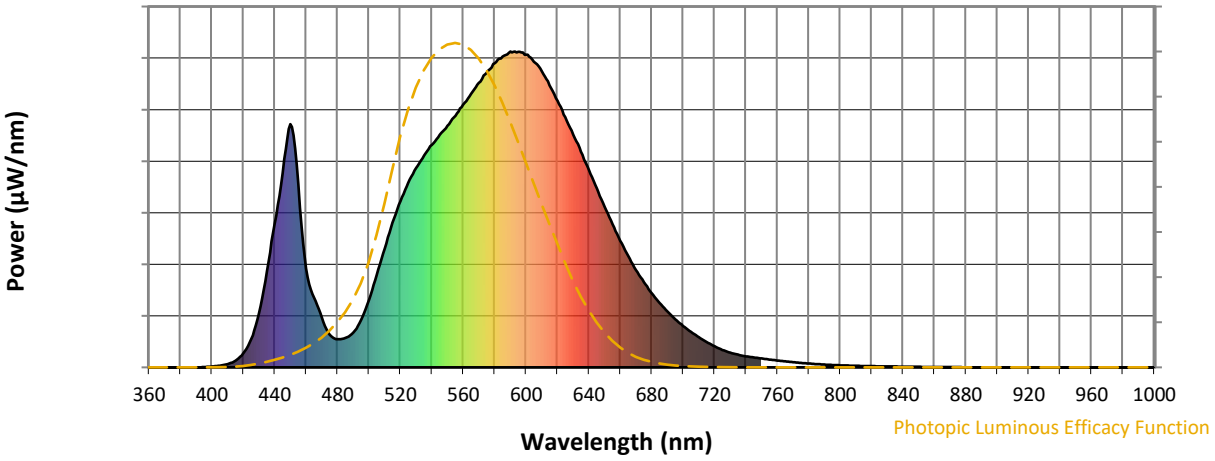



CCT = 3348K
CIE x = 0.4177
CIE y = 0.4036
Duv = 0.0030

Point lies inside the ANSI 3500K 4-step quadrangle

REPORT NUMBER: SP1-2407-176-4

## Photopic Flux vs. Wavelength

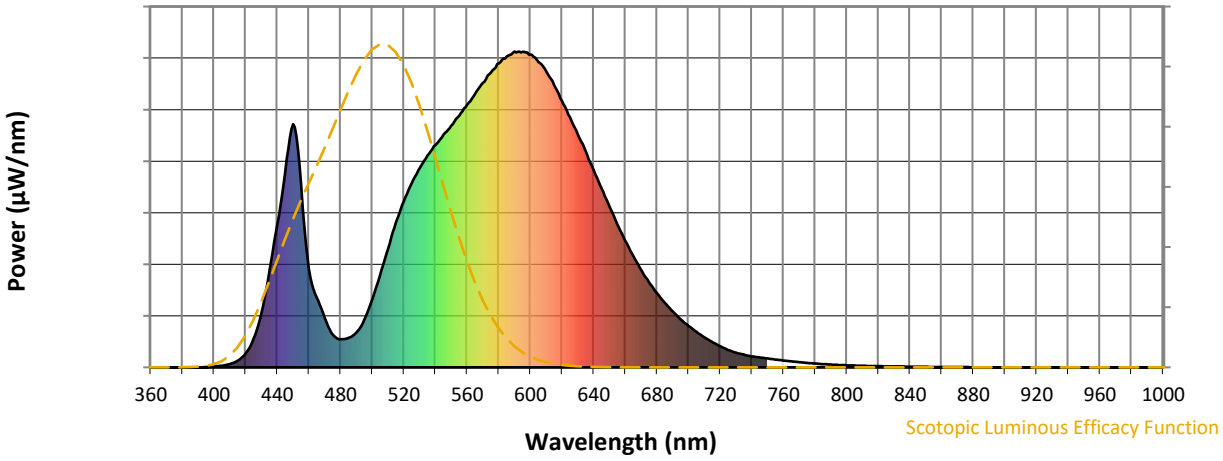



## Photopic Lumens: NR

| λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 360 | 0 | NR | 490 | 110 | NR | 620 | 844 | NR | 750 | 28 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 150 | NR | 625 | 792 | NR | 755 | 25 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 214 | NR | 630 | 737 | NR | 760 | 22 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 293 | NR | 635 | 683 | NR | 765 | 19 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 376 | NR | 640 | 625 | NR | 770 | 16 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 458 | NR | 645 | 566 | NR | 775 | 14 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 526 | NR | 650 | 509 | NR | 780 | 12 | NR | 910 | 0 | NR |
| 395 | 1 | NR | 525 | 584 | NR | 655 | 453 | NR | 785 | 10 | NR | 915 | 0 | NR |
| 400 | 3 | NR | 530 | 631 | NR | 660 | 401 | NR | 790 | 9 | NR | 920 | 0 | NR |
| 405 | 5 | NR | 535 | 671 | NR | 665 | 353 | NR | 795 | 8 | NR | 925 | 0 | NR |
| 410 | 10 | NR | 540 | 704 | NR | 670 | 308 | NR | 800 | 7 | NR | 930 | 0 | NR |
| 415 | 21 | NR | 545 | 737 | NR | 675 | 269 | NR | 805 | 6 | NR | 935 | 0 | NR |
| 420 | 44 | NR | 550 | 766 | NR | 680 | 235 | NR | 810 | 5 | NR | 940 | 0 | NR |
| 425 | 90 | NR | 555 | 797 | NR | 685 | 204 | NR | 815 | 4 | NR | 945 | 0 | NR |
| 430 | 171 | NR | 560 | 832 | NR | 690 | 177 | NR | 820 | 4 | NR | 950 | 0 | NR |
| 435 | 305 | NR | 565 | 866 | NR | 695 | 152 | NR | 825 | 3 | NR | 955 | 0 | NR |
| 440 | 455 | NR | 570 | 901 | NR | 700 | 131 | NR | 830 | 3 | NR | 960 | 0 | NR |
| 445 | 615 | NR | 575 | 933 | NR | 705 | 112 | NR | 835 | 3 | NR | 965 | 0 | NR |
| 450 | 771 | NR | 580 | 963 | NR | 710 | 96 | NR | 840 | 2 | NR | 970 | 0 | NR |
| 455 | 579 | NR | 585 | 984 | NR | 715 | 80 | NR | 845 | 2 | NR | 975 | 0 | NR |
| 460 | 313 | NR | 590 | 1000 | NR | 720 | 67 | NR | 850 | 2 | NR | 980 | 0 | NR |
| 465 | 221 | NR | 595 | 999 | NR | 725 | 55 | NR | 855 | 1 | NR | 985 | 0 | NR |
| 470 | 156 | NR | 600 | 990 | NR | 730 | 46 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 103 | NR | 605 | 968 | NR | 735 | 40 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 89 | NR | 610 | 937 | NR | 740 | 35 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 93 | NR | 615 | 893 | NR | 745 | 31 | NR | 875 | 1 | NR | | | |

REPORT NUMBER: SP1-2407-176-4

## Scotopic Flux vs. Wavelength

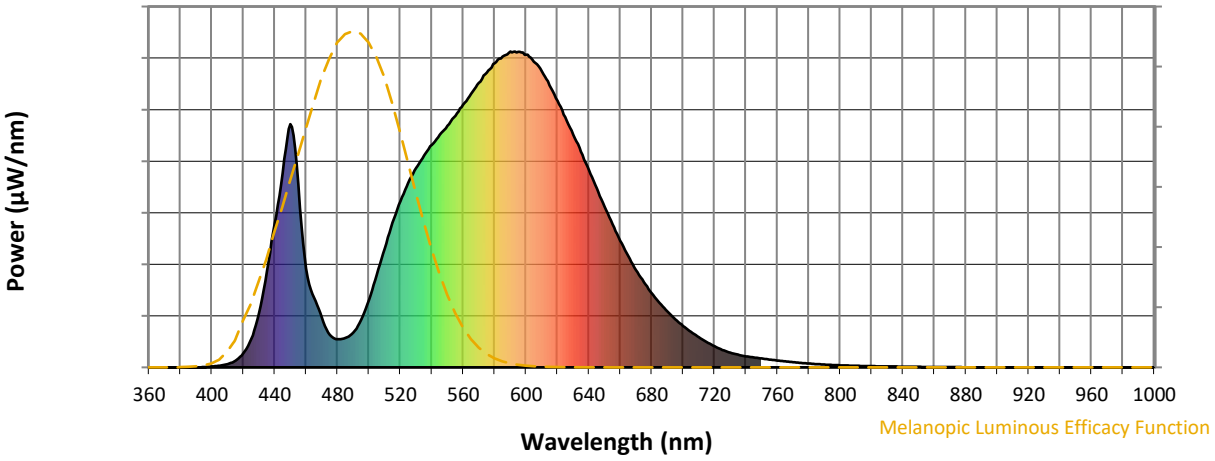



**Scotopic Lumens: NR** **S/P: 1.31**

| λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 360 | 0 | NR | 490 | 110 | NR | 620 | 844 | NR | 750 | 28 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 150 | NR | 625 | 792 | NR | 755 | 25 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 214 | NR | 630 | 737 | NR | 760 | 22 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 293 | NR | 635 | 683 | NR | 765 | 19 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 376 | NR | 640 | 625 | NR | 770 | 16 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 458 | NR | 645 | 566 | NR | 775 | 14 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 526 | NR | 650 | 509 | NR | 780 | 12 | NR | 910 | 0 | NR |
| 395 | 1 | NR | 525 | 584 | NR | 655 | 453 | NR | 785 | 10 | NR | 915 | 0 | NR |
| 400 | 3 | NR | 530 | 631 | NR | 660 | 401 | NR | 790 | 9 | NR | 920 | 0 | NR |
| 405 | 5 | NR | 535 | 671 | NR | 665 | 353 | NR | 795 | 8 | NR | 925 | 0 | NR |
| 410 | 10 | NR | 540 | 704 | NR | 670 | 308 | NR | 800 | 7 | NR | 930 | 0 | NR |
| 415 | 21 | NR | 545 | 737 | NR | 675 | 269 | NR | 805 | 6 | NR | 935 | 0 | NR |
| 420 | 44 | NR | 550 | 766 | NR | 680 | 235 | NR | 810 | 5 | NR | 940 | 0 | NR |
| 425 | 90 | NR | 555 | 797 | NR | 685 | 204 | NR | 815 | 4 | NR | 945 | 0 | NR |
| 430 | 171 | NR | 560 | 832 | NR | 690 | 177 | NR | 820 | 4 | NR | 950 | 0 | NR |
| 435 | 305 | NR | 565 | 866 | NR | 695 | 152 | NR | 825 | 3 | NR | 955 | 0 | NR |
| 440 | 455 | NR | 570 | 901 | NR | 700 | 131 | NR | 830 | 3 | NR | 960 | 0 | NR |
| 445 | 615 | NR | 575 | 933 | NR | 705 | 112 | NR | 835 | 3 | NR | 965 | 0 | NR |
| 450 | 771 | NR | 580 | 963 | NR | 710 | 96 | NR | 840 | 2 | NR | 970 | 0 | NR |
| 455 | 579 | NR | 585 | 984 | NR | 715 | 80 | NR | 845 | 2 | NR | 975 | 0 | NR |
| 460 | 313 | NR | 590 | 1000 | NR | 720 | 67 | NR | 850 | 2 | NR | 980 | 0 | NR |
| 465 | 221 | NR | 595 | 999 | NR | 725 | 55 | NR | 855 | 1 | NR | 985 | 0 | NR |
| 470 | 156 | NR | 600 | 990 | NR | 730 | 46 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 103 | NR | 605 | 968 | NR | 735 | 40 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 89 | NR | 610 | 937 | NR | 740 | 35 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 93 | NR | 615 | 893 | NR | 745 | 31 | NR | 875 | 1 | NR | | | |

REPORT NUMBER: SP1-2407-176-4

## Melanopic Flux vs. Wavelength




**Melanopic Lumens: NR** **M/P: 2.4**

| λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 360 | 0 | NR | 490 | 110 | NR | 620 | 844 | NR | 750 | 28 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 150 | NR | 625 | 792 | NR | 755 | 25 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 214 | NR | 630 | 737 | NR | 760 | 22 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 293 | NR | 635 | 683 | NR | 765 | 19 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 376 | NR | 640 | 625 | NR | 770 | 16 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 458 | NR | 645 | 566 | NR | 775 | 14 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 526 | NR | 650 | 509 | NR | 780 | 12 | NR | 910 | 0 | NR |
| 395 | 1 | NR | 525 | 584 | NR | 655 | 453 | NR | 785 | 10 | NR | 915 | 0 | NR |
| 400 | 3 | NR | 530 | 631 | NR | 660 | 401 | NR | 790 | 9 | NR | 920 | 0 | NR |
| 405 | 5 | NR | 535 | 671 | NR | 665 | 353 | NR | 795 | 8 | NR | 925 | 0 | NR |
| 410 | 10 | NR | 540 | 704 | NR | 670 | 308 | NR | 800 | 7 | NR | 930 | 0 | NR |
| 415 | 21 | NR | 545 | 737 | NR | 675 | 269 | NR | 805 | 6 | NR | 935 | 0 | NR |
| 420 | 44 | NR | 550 | 766 | NR | 680 | 235 | NR | 810 | 5 | NR | 940 | 0 | NR |
| 425 | 90 | NR | 555 | 797 | NR | 685 | 204 | NR | 815 | 4 | NR | 945 | 0 | NR |
| 430 | 171 | NR | 560 | 832 | NR | 690 | 177 | NR | 820 | 4 | NR | 950 | 0 | NR |
| 435 | 305 | NR | 565 | 866 | NR | 695 | 152 | NR | 825 | 3 | NR | 955 | 0 | NR |
| 440 | 455 | NR | 570 | 901 | NR | 700 | 131 | NR | 830 | 3 | NR | 960 | 0 | NR |
| 445 | 615 | NR | 575 | 933 | NR | 705 | 112 | NR | 835 | 3 | NR | 965 | 0 | NR |
| 450 | 771 | NR | 580 | 963 | NR | 710 | 96 | NR | 840 | 2 | NR | 970 | 0 | NR |
| 455 | 579 | NR | 585 | 984 | NR | 715 | 80 | NR | 845 | 2 | NR | 975 | 0 | NR |
| 460 | 313 | NR | 590 | 1000 | NR | 720 | 67 | NR | 850 | 2 | NR | 980 | 0 | NR |
| 465 | 221 | NR | 595 | 999 | NR | 725 | 55 | NR | 855 | 1 | NR | 985 | 0 | NR |
| 470 | 156 | NR | 600 | 990 | NR | 730 | 46 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 103 | NR | 605 | 968 | NR | 735 | 40 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 89 | NR | 610 | 937 | NR | 740 | 35 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 93 | NR | 615 | 893 | NR | 745 | 31 | NR | 875 | 1 | NR | | | |

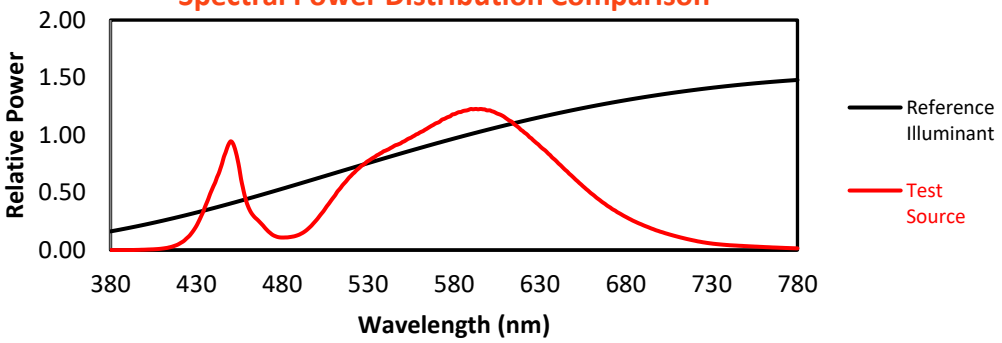
REPORT NUMBER: SP1-2407-176-4

# TM-30-18

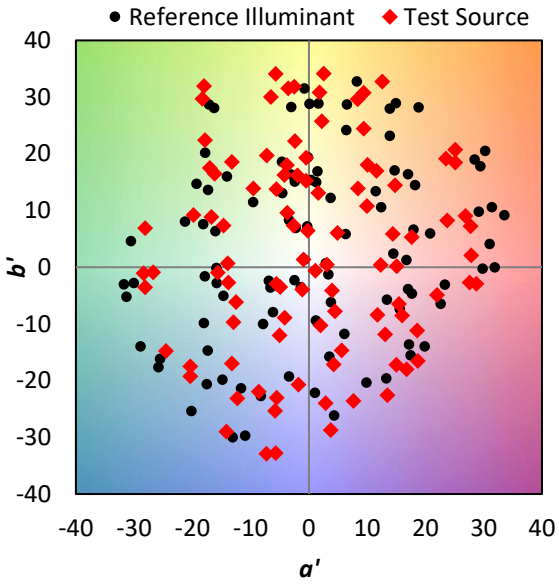
## Summary

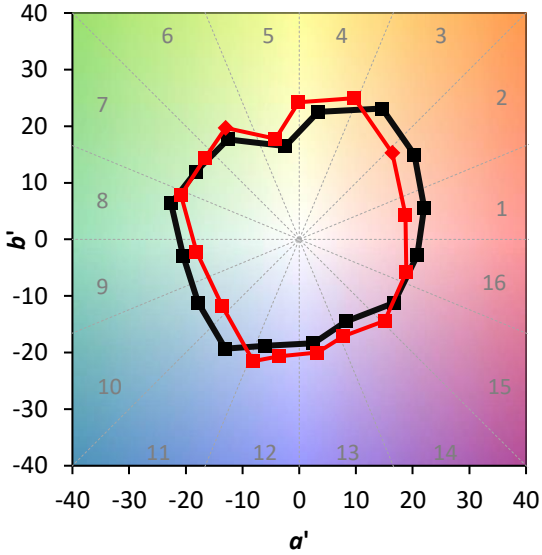
$R_f$ = 75.8
$R_g$ = 95.8
CIE $R_a$ = 73.4
$R_9$ = -19.2

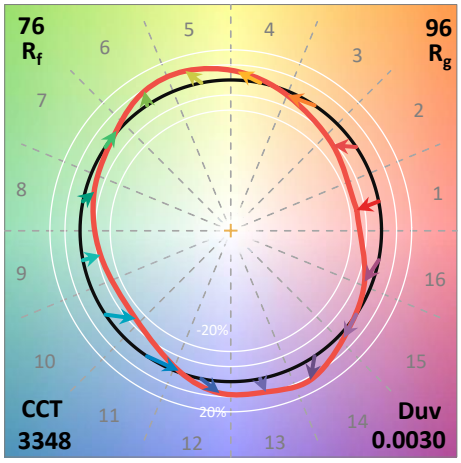
## Spectral Power Distribution Comparison

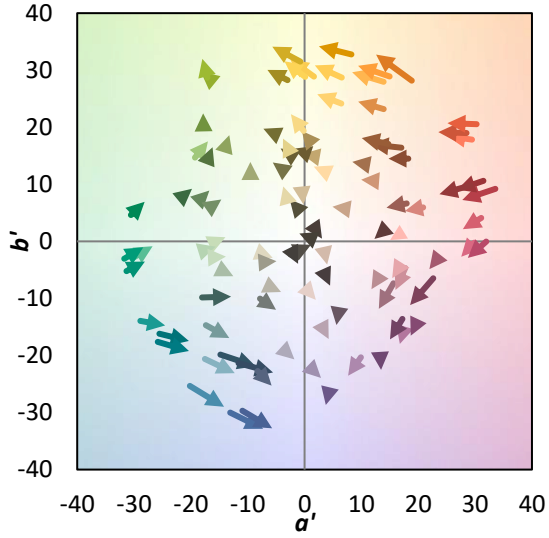



## Color Vector Graphics



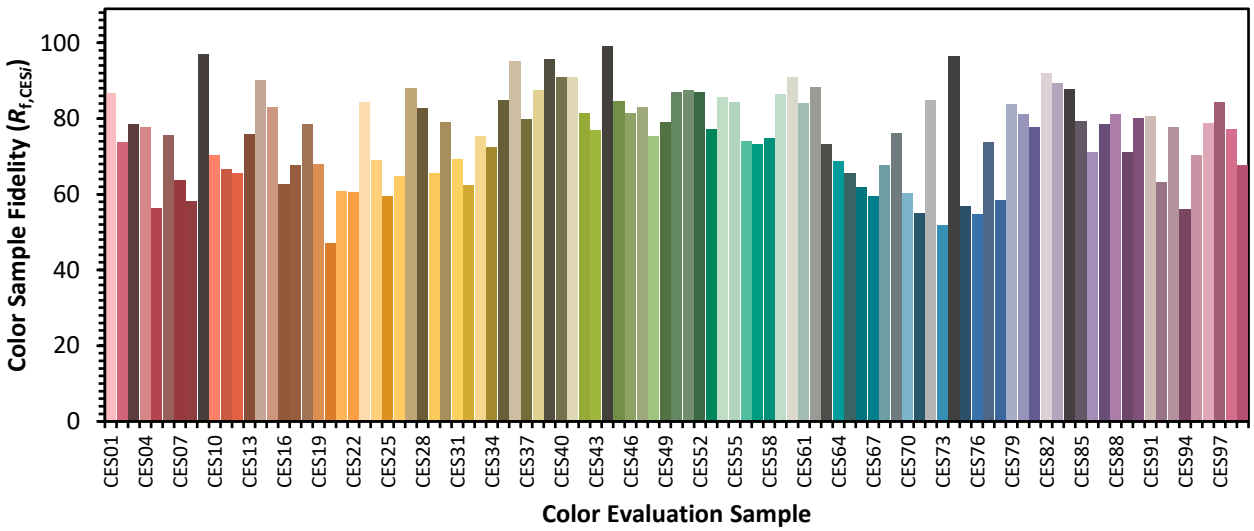



REPORT NUMBER: SP1-2407-176-4

# TM-30-18

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

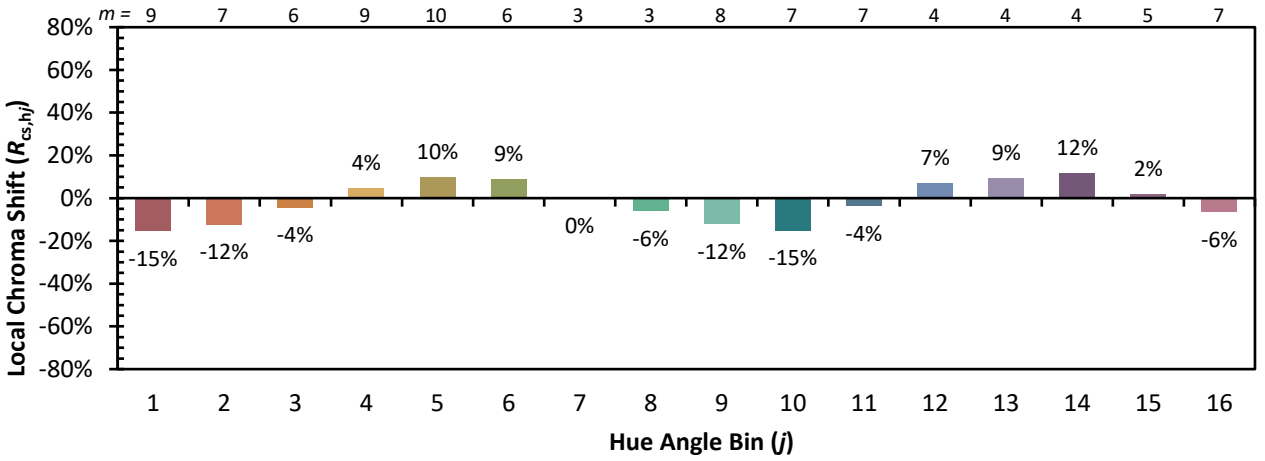
| | | | |
|---|---|---|---|
| CES01 = 86 | CES26 = 65 | CES51 = 88 | CES76 = 55 |
| CES02 = 62 | CES27 = 88 | CES52 = 87 | CES77 = 74 |
| CES03 = 31 | CES28 = 83 | CES53 = 77 | CES78 = 58 |
| CES04 = 70 | CES29 = 66 | CES54 = 86 | CES79 = 84 |
| CES05 = 48 | CES30 = 79 | CES55 = 84 | CES80 = 81 |
| CES06 = 51 | CES31 = 69 | CES56 = 74 | CES81 = 78 |
| CES07 = 41 | CES32 = 62 | CES57 = 73 | CES82 = 92 |
| CES08 = 40 | CES33 = 75 | CES58 = 75 | CES83 = 89 |
| CES09 = 29 | CES34 = 73 | CES59 = 87 | CES84 = 88 |
| CES10 = 75 | CES35 = 85 | CES60 = 91 | CES85 = 79 |
| CES11 = 58 | CES36 = 95 | CES61 = 84 | CES86 = 71 |
| CES12 = 64 | CES37 = 80 | CES62 = 88 | CES87 = 79 |
| CES13 = 43 | CES38 = 88 | CES63 = 73 | CES88 = 81 |
| CES14 = 74 | CES39 = 96 | CES64 = 69 | CES89 = 71 |
| CES15 = 71 | CES40 = 91 | CES65 = 66 | CES90 = 80 |
| CES16 = 47 | CES41 = 91 | CES66 = 62 | CES91 = 81 |
| CES17 = 50 | CES42 = 81 | CES67 = 60 | CES92 = 63 |
| CES18 = 56 | CES43 = 77 | CES68 = 68 | CES93 = 78 |
| CES19 = 72 | CES44 = 99 | CES69 = 76 | CES94 = 56 |
| CES20 = 65 | CES45 = 85 | CES70 = 60 | CES95 = 70 |
| CES21 = 87 | CES46 = 82 | CES71 = 55 | CES96 = 79 |
| CES22 = 79 | CES47 = 83 | CES72 = 85 | CES97 = 84 |
| CES23 = 92 | CES48 = 75 | CES73 = 52 | CES98 = 77 |
| CES24 = 91 | CES49 = 79 | CES74 = 96 | CES99 = 68 |
| CES25 = 72 | CES50 = 87 | CES75 = 57 | |

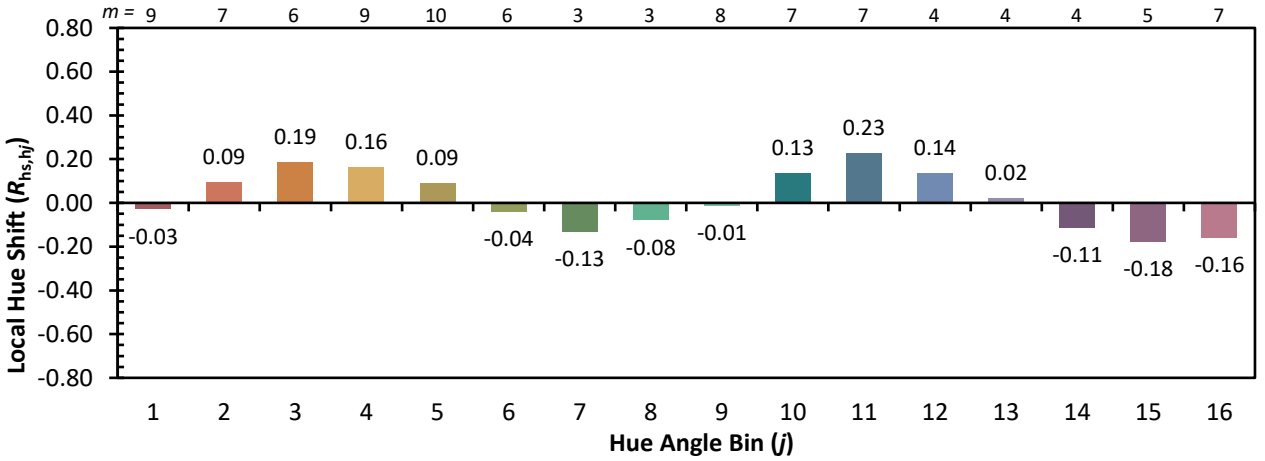


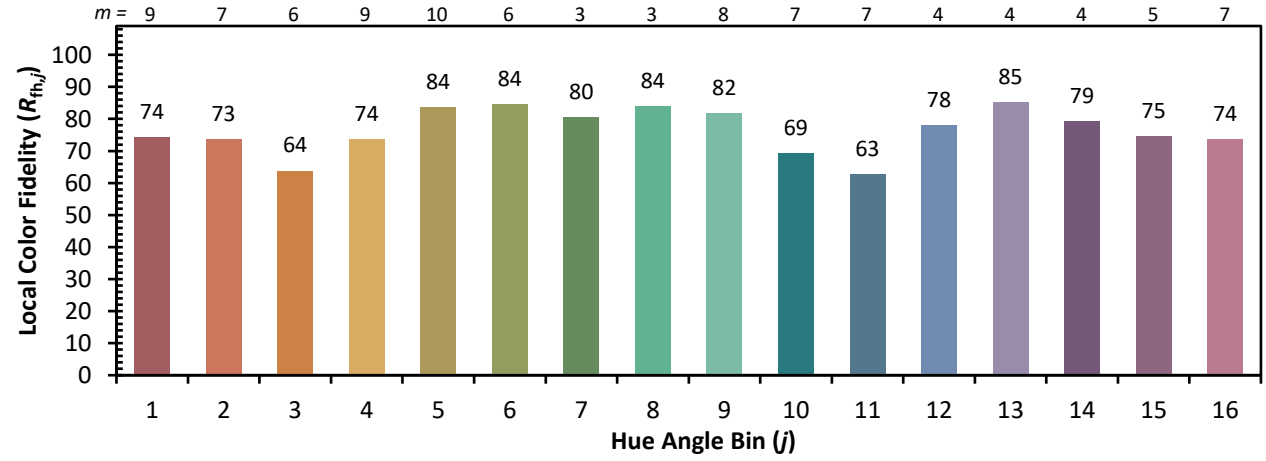
REPORT NUMBER: SP1-2407-176-4

**TM-30-18**

## Color Rendition by Hue-Angle Bin



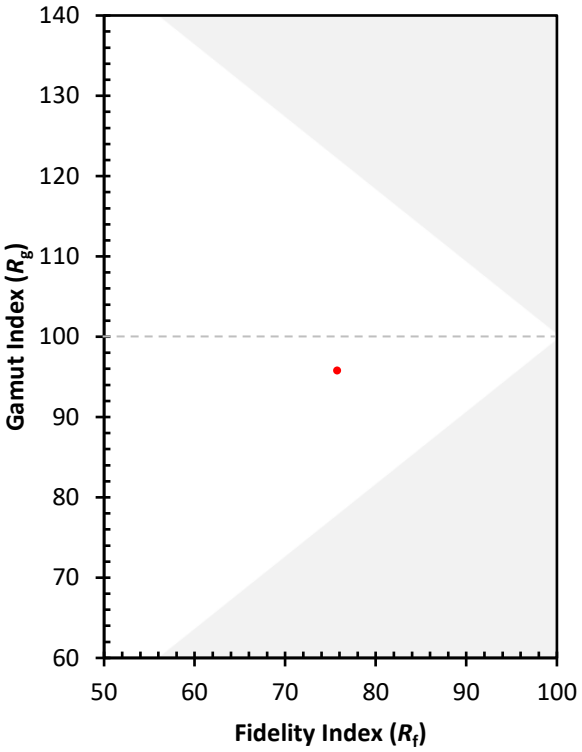



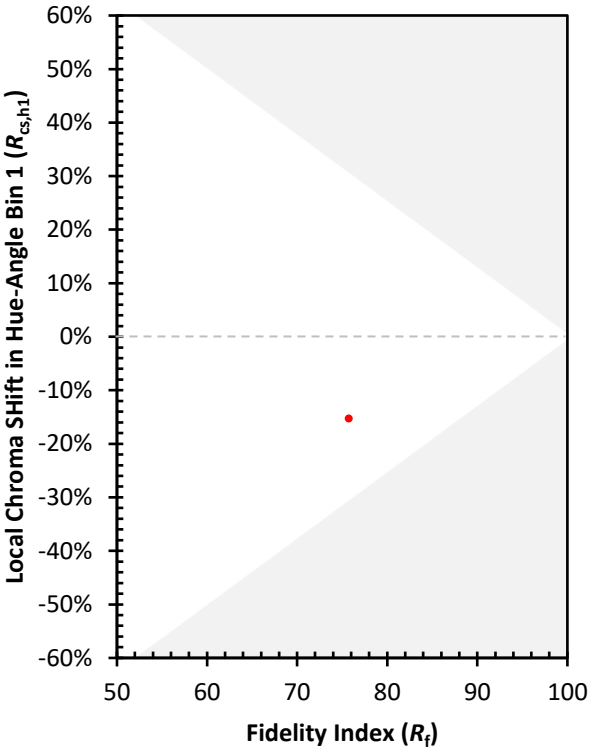



REPORT NUMBER: SP1-2407-176-4

# TM-30-18

## Measure Comparisons




(END OF REPORT)