

Signify Classified - Internal  
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: P385993

Luminaire Tested: **GWC-SA1C-760-U-SL2**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P385993  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-20)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GWC-SA1C-760-U-SL2  
Description: GALLEON WALL LUMINAIRE  
(1) 70 CRI, 5700K, 1050mA LIGHTSQUARE WITH 16 LEDS AND TYPE II SPILL  
LIGHT ELIMINATOR OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 7399 lumens  
Efficiency: N/A  
Efficacy: 125.4 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 0.5' x H: 0')  
IES Classification: Type III - Medium  
BUG Rating: B1 - U0 - G2

Input Watts (W): 59  
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

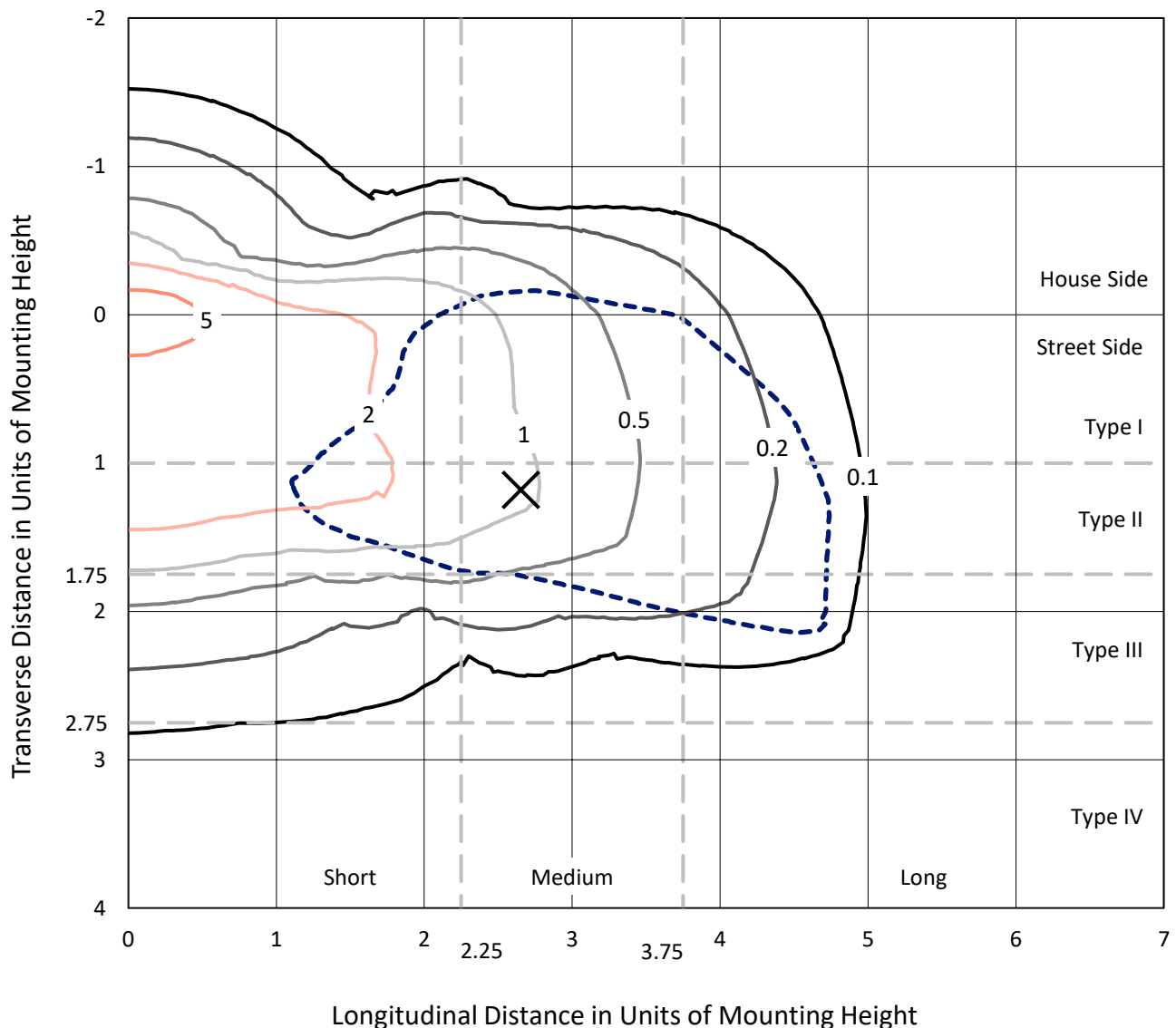


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## Iso-Footcandle Lines of Horizontal Illumination

× Max cd  
- - - 1/2 Max cd

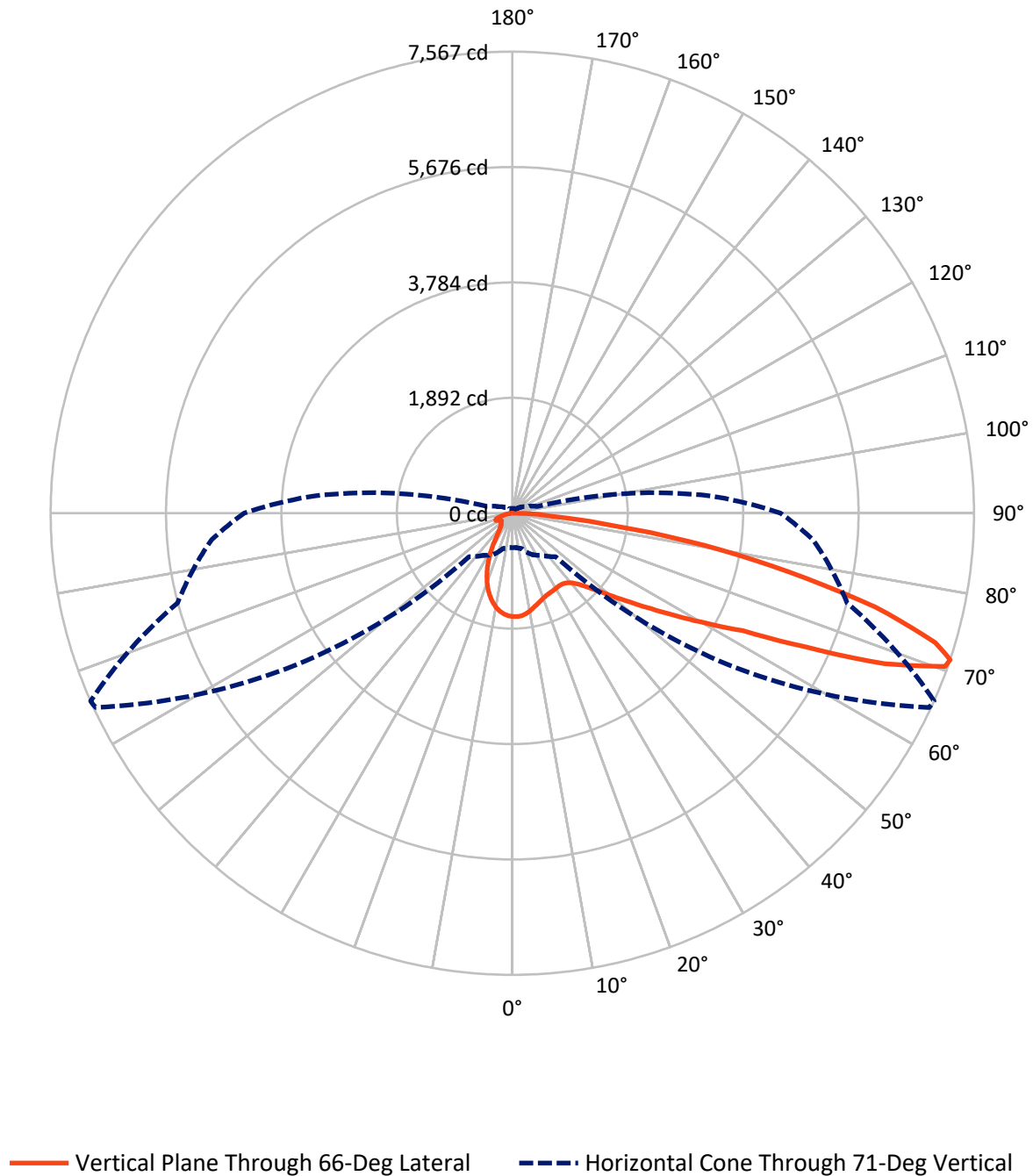


Based on 15 foot mounting height. Maximum calculated value = 7.5 fc  
Type III - Medium - N/A

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CATALOG NUMBER: GWC-SA1C-760-U-SL2

## Luminous Intensity Polar Plot



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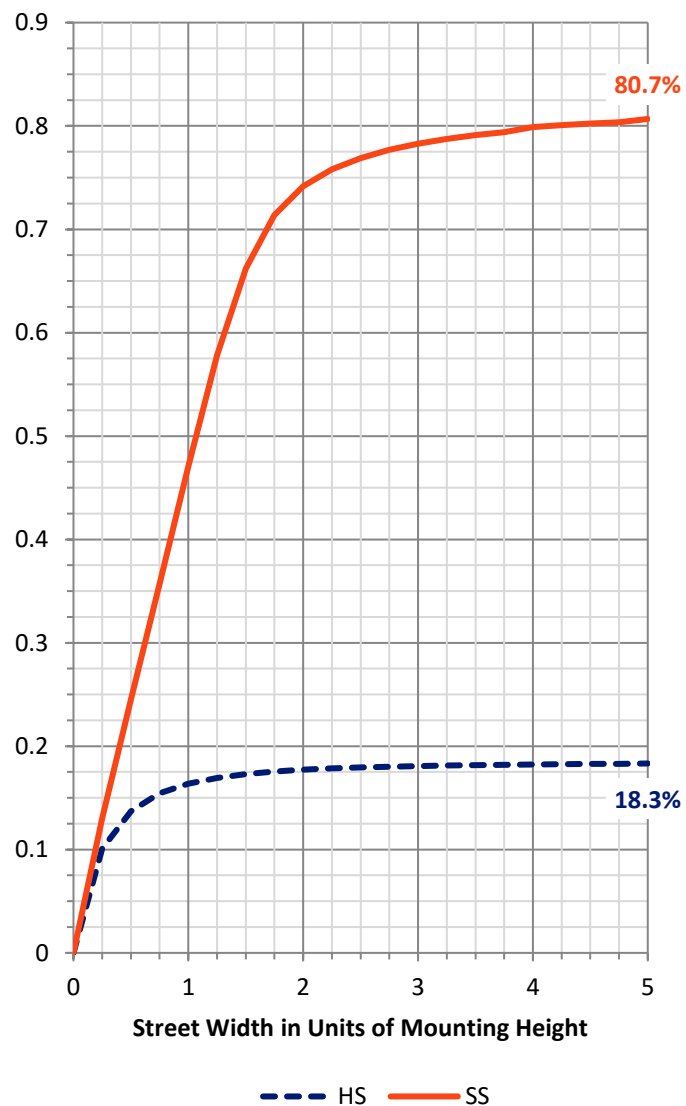
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 1371.2   | 0.0    | 1371.2 |
|                    | % Fixture | 18.5     | 0.0    | 18.5   |
| <b>Street Side</b> | Lumens    | 6027.8   | 0.0    | 6027.8 |
|                    | % Fixture | 81.5     | 0.0    | 81.5   |
| <b>Total</b>       | Lumens    | 7399.0   | 0.0    | 7399.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 149.2  | 2.0       |
| 10°-20°   | 357.8  | 4.8       |
| 20°-30°   | 480.7  | 6.5       |
| 30°-40°   | 632.3  | 8.5       |
| 40°-50°   | 919.9  | 12.4      |
| 50°-60°   | 1436.9 | 19.4      |
| 60°-70°   | 1800.0 | 24.3      |
| 70°-80°   | 1373.0 | 18.6      |
| 80°-90°   | 249.3  | 3.4       |
| 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°    | 7399.0 | 100.0     |
| 0°-180°   | 7399.0 | 100.0     |

**Coefficient of Utilization**



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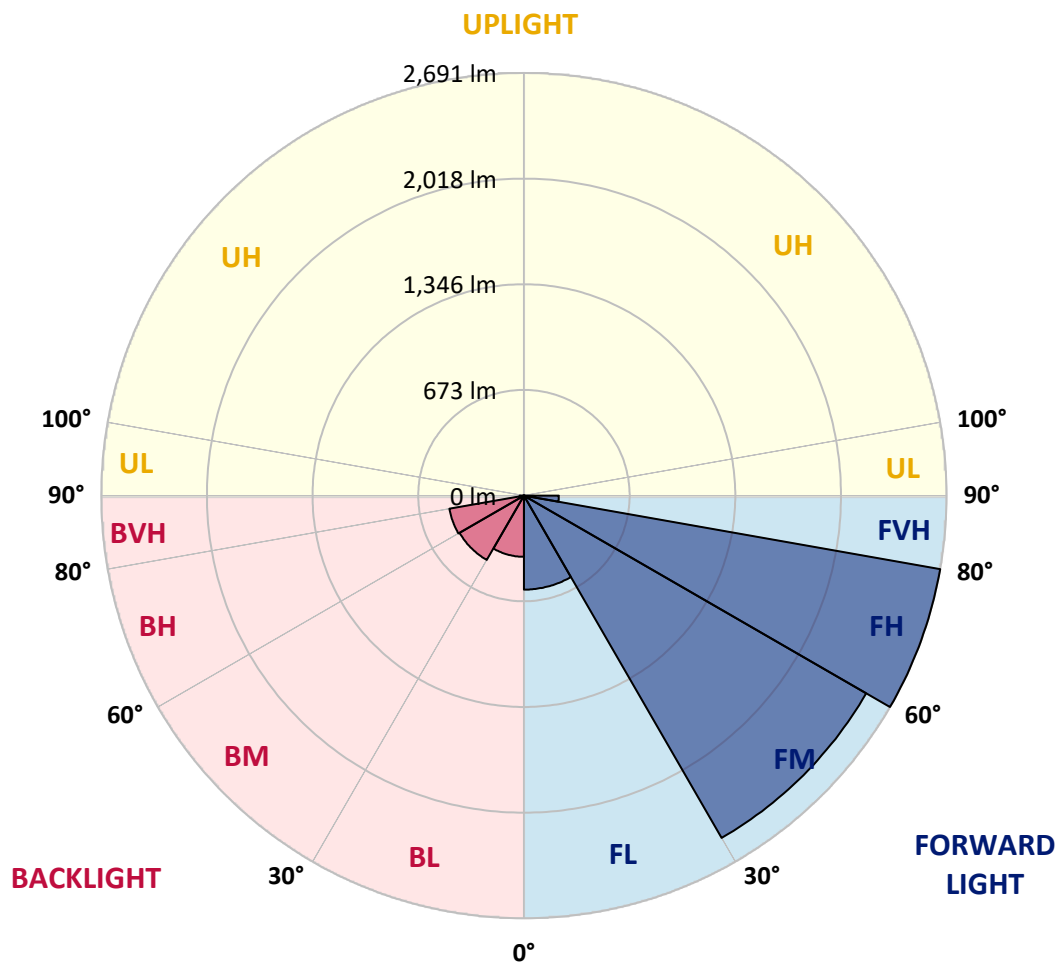
CATALOG NUMBER: GWC-SA1C-760-U-SL2

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 598.3  | 8.1       |                         |      |         |
| FM   | (30°-60°)   | 2516.0 | 34.0      |                         |      |         |
| FH   | (60°-80°)   | 2691.1 | 36.4      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 222.3  | 3.0       |                         |      | G2/225  |
| BL   | (0°-30°)    | 389.4  | 5.3       | B1/500                  |      |         |
| BM   | (30°-60°)   | 473.0  | 6.4       | B1/1000                 |      |         |
| BH   | (60°-80°)   | 481.8  | 6.5       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 27.0   | 0.4       |                         |      | G1/100  |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

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

Type III Medium



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CATALOG NUMBER: GWC-SA1C-760-U-SL2

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 66°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1695.0 | 1695.0 | 1695.0 | 1695.0 | 1695.0 | 1695.0 | 1695.0 | 1695.0 | 1695.0 | 1695.0 | 1695.0 |
| 2.5°  | 1663.5 | 1661.0 | 1668.7 | 1676.6 | 1679.6 | 1684.7 | 1692.4 | 1696.8 | 1696.5 | 1697.3 | 1694.7 |
| 5°    | 1553.2 | 1549.9 | 1565.2 | 1577.7 | 1601.7 | 1628.8 | 1661.8 | 1685.3 | 1685.8 | 1699.1 | 1702.6 |
| 7.5°  | 1448.7 | 1446.4 | 1464.0 | 1484.2 | 1512.1 | 1553.4 | 1606.8 | 1657.4 | 1660.5 | 1696.5 | 1709.0 |
| 10°   | 1364.9 | 1364.4 | 1381.5 | 1403.5 | 1435.9 | 1482.2 | 1543.5 | 1617.6 | 1622.2 | 1684.2 | 1710.0 |
| 12.5° | 1299.5 | 1300.5 | 1315.4 | 1340.4 | 1374.6 | 1422.9 | 1489.3 | 1572.9 | 1580.3 | 1664.8 | 1704.2 |
| 15°   | 1251.2 | 1255.3 | 1267.3 | 1292.6 | 1326.3 | 1375.4 | 1443.6 | 1531.5 | 1542.7 | 1643.1 | 1700.8 |
| 17.5° | 1223.6 | 1228.2 | 1236.7 | 1257.6 | 1289.3 | 1336.6 | 1401.2 | 1497.5 | 1507.7 | 1626.5 | 1701.1 |
| 20°   | 1215.5 | 1219.3 | 1224.2 | 1236.9 | 1263.8 | 1306.7 | 1367.7 | 1466.8 | 1477.8 | 1613.2 | 1703.7 |
| 22.5° | 1231.6 | 1234.4 | 1234.9 | 1233.9 | 1250.2 | 1285.2 | 1343.5 | 1444.4 | 1456.1 | 1604.5 | 1705.4 |
| 25°   | 1266.1 | 1269.9 | 1267.1 | 1257.6 | 1252.3 | 1273.7 | 1330.9 | 1429.5 | 1441.3 | 1598.1 | 1701.9 |
| 27.5° | 1317.9 | 1318.4 | 1316.1 | 1303.9 | 1278.6 | 1275.0 | 1327.1 | 1420.9 | 1432.1 | 1590.7 | 1694.5 |
| 30°   | 1388.4 | 1391.7 | 1387.7 | 1371.0 | 1329.7 | 1295.4 | 1331.7 | 1412.4 | 1422.6 | 1581.3 | 1682.5 |
| 32.5° | 1470.9 | 1479.1 | 1478.8 | 1461.5 | 1402.2 | 1341.2 | 1350.6 | 1407.3 | 1415.2 | 1571.3 | 1667.9 |
| 35°   | 1556.5 | 1567.7 | 1588.7 | 1581.3 | 1508.0 | 1413.5 | 1386.9 | 1415.5 | 1420.9 | 1570.0 | 1657.7 |
| 37.5° | 1645.4 | 1656.6 | 1699.8 | 1719.7 | 1633.9 | 1516.9 | 1444.1 | 1444.4 | 1446.9 | 1585.6 | 1656.9 |
| 40°   | 1738.4 | 1750.4 | 1815.3 | 1867.1 | 1797.2 | 1648.0 | 1536.3 | 1504.7 | 1501.8 | 1624.0 | 1672.0 |
| 42.5° | 1868.7 | 1879.4 | 1957.3 | 2023.5 | 1978.3 | 1815.8 | 1663.8 | 1597.6 | 1591.8 | 1699.1 | 1720.3 |
| 45°   | 2033.5 | 2042.6 | 2125.4 | 2196.2 | 2172.9 | 2007.4 | 1824.0 | 1725.6 | 1724.6 | 1824.2 | 1818.1 |
| 47.5° | 2229.4 | 2236.5 | 2310.9 | 2379.3 | 2387.8 | 2227.9 | 2025.3 | 1923.1 | 1906.5 | 1995.9 | 1969.6 |
| 50°   | 2433.5 | 2441.4 | 2492.0 | 2565.6 | 2628.2 | 2522.9 | 2284.3 | 2165.0 | 2142.8 | 2222.5 | 2184.2 |
| 52.5° | 2568.6 | 2579.1 | 2623.0 | 2716.3 | 2898.4 | 2846.3 | 2590.6 | 2458.3 | 2424.6 | 2497.1 | 2467.7 |
| 55°   | 2508.3 | 2531.8 | 2599.0 | 2748.5 | 3114.6 | 3340.4 | 2968.4 | 2800.3 | 2762.3 | 2822.6 | 2805.2 |
| 57.5° | 2234.2 | 2266.4 | 2358.1 | 2588.8 | 3145.0 | 3775.7 | 3539.6 | 3203.2 | 3176.4 | 3159.0 | 3166.9 |
| 60°   | 1733.3 | 1764.2 | 1877.9 | 2178.6 | 2933.2 | 4093.5 | 4399.3 | 3699.8 | 3661.0 | 3496.7 | 3503.9 |
| 62.5° | 1226.7 | 1211.1 | 1289.0 | 1509.0 | 2383.4 | 4130.8 | 5377.4 | 4364.0 | 4236.3 | 3853.3 | 3821.9 |
| 65°   | 935.5  | 931.9  | 966.9  | 1036.9 | 1443.6 | 3684.5 | 5960.1 | 5480.4 | 5280.8 | 4272.8 | 4198.7 |
| 67.5° | 768.7  | 762.3  | 796.8  | 898.7  | 929.6  | 2377.0 | 5972.9 | 6775.5 | 6579.6 | 4795.0 | 4634.5 |
| 70°   | 632.0  | 624.9  | 657.0  | 788.6  | 859.1  | 1205.5 | 5026.9 | 7534.0 | 7523.5 | 5456.1 | 4963.6 |
| 71°   | 566.6  | 561.5  | 600.1  | 746.2  | 844.0  | 1004.7 | 4340.2 | 7536.0 | 7567.4 | 5679.9 | 4944.1 |
| 72.5° | 461.4  | 463.1  | 504.0  | 664.2  | 832.8  | 887.2  | 3189.9 | 7184.8 | 7251.2 | 5893.2 | 4767.6 |
| 75°   | 306.6  | 308.1  | 361.7  | 510.9  | 807.5  | 868.0  | 1753.2 | 6028.8 | 6150.9 | 5765.4 | 4350.5 |
| 77.5° | 205.9  | 205.4  | 241.9  | 350.5  | 703.5  | 868.0  | 1028.0 | 4509.1 | 4643.2 | 4587.5 | 3353.9 |
| 80°   | 141.8  | 140.8  | 166.6  | 241.9  | 532.6  | 878.5  | 794.7  | 3160.0 | 3200.6 | 2477.4 | 1363.1 |
| 82.5° | 86.9   | 87.6   | 108.8  | 170.9  | 362.5  | 790.6  | 750.3  | 1723.1 | 1678.9 | 694.8  | 340.5  |
| 85°   | 49.8   | 49.6   | 69.5   | 115.7  | 232.7  | 667.3  | 731.6  | 741.6  | 680.3  | 209.2  | 123.1  |
| 87.5° | 17.9   | 19.2   | 37.3   | 64.1   | 133.3  | 464.7  | 620.8  | 385.7  | 347.7  | 94.5   | 55.7   |
| 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-SA1C-760-U-SL2

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1695.0 | 1695.0 | 1695.0 | 1695.0 | 1695.0 | 1695.0 | 1695.0 | 1695.0 | 1695.0 | 1695.0 | 1695.0 |
| 2.5°  | 1692.9 | 1694.5 | 1692.7 | 1682.5 | 1673.8 | 1659.7 | 1651.8 | 1640.8 | 1637.5 | 1636.0 | 1640.0 |
| 5°    | 1699.3 | 1699.8 | 1684.7 | 1657.9 | 1627.8 | 1592.3 | 1566.7 | 1535.3 | 1520.5 | 1514.1 | 1518.2 |
| 7.5°  | 1705.2 | 1702.9 | 1669.9 | 1618.6 | 1562.9 | 1501.1 | 1446.2 | 1395.8 | 1366.4 | 1354.4 | 1355.5 |
| 10°   | 1706.0 | 1696.2 | 1643.4 | 1563.9 | 1477.6 | 1386.9 | 1302.6 | 1224.9 | 1175.9 | 1143.9 | 1153.7 |
| 12.5° | 1698.0 | 1681.7 | 1604.3 | 1493.2 | 1373.3 | 1249.7 | 1135.8 | 1019.3 | 949.3  | 916.8  | 917.9  |
| 15°   | 1691.9 | 1662.3 | 1556.3 | 1409.9 | 1248.9 | 1085.2 | 929.6  | 792.7  | 718.1  | 684.9  | 669.3  |
| 17.5° | 1686.8 | 1641.3 | 1500.6 | 1316.1 | 1102.0 | 894.4  | 707.4  | 585.3  | 544.4  | 534.7  | 530.6  |
| 20°   | 1679.6 | 1619.1 | 1438.5 | 1207.6 | 934.7  | 680.8  | 516.5  | 456.2  | 456.5  | 467.7  | 469.3  |
| 22.5° | 1669.7 | 1593.8 | 1372.3 | 1085.7 | 755.1  | 495.8  | 404.9  | 387.5  | 405.2  | 426.6  | 430.4  |
| 25°   | 1654.9 | 1563.9 | 1298.8 | 951.1  | 575.8  | 381.1  | 345.9  | 345.1  | 366.6  | 389.1  | 392.4  |
| 27.5° | 1633.9 | 1524.8 | 1217.0 | 806.5  | 424.3  | 323.9  | 309.9  | 315.2  | 331.1  | 347.4  | 348.7  |
| 30°   | 1605.8 | 1479.4 | 1126.8 | 654.0  | 332.6  | 288.4  | 286.9  | 291.7  | 301.4  | 312.9  | 314.0  |
| 32.5° | 1574.9 | 1433.1 | 1030.5 | 506.3  | 284.8  | 269.3  | 270.8  | 273.1  | 277.7  | 282.3  | 283.3  |
| 35°   | 1546.8 | 1385.9 | 931.9  | 384.7  | 262.1  | 256.7  | 255.7  | 255.2  | 255.7  | 254.2  | 254.4  |
| 37.5° | 1528.7 | 1346.8 | 829.2  | 306.3  | 249.1  | 245.8  | 242.7  | 238.9  | 234.5  | 232.0  | 232.5  |
| 40°   | 1522.0 | 1317.7 | 725.2  | 264.7  | 238.3  | 236.0  | 230.2  | 222.0  | 216.9  | 215.4  | 215.4  |
| 42.5° | 1539.9 | 1302.6 | 624.9  | 243.7  | 229.4  | 225.6  | 215.9  | 206.4  | 202.6  | 202.3  | 202.1  |
| 45°   | 1594.6 | 1308.7 | 529.3  | 232.2  | 221.2  | 213.8  | 201.0  | 193.1  | 190.6  | 191.1  | 190.8  |
| 47.5° | 1692.7 | 1347.3 | 447.6  | 224.5  | 213.1  | 203.3  | 189.0  | 182.7  | 179.6  | 179.6  | 179.8  |
| 50°   | 1859.5 | 1437.5 | 382.4  | 218.2  | 206.2  | 193.6  | 180.4  | 172.4  | 168.3  | 168.1  | 168.1  |
| 52.5° | 2102.4 | 1598.9 | 341.8  | 212.8  | 198.5  | 185.0  | 171.7  | 161.7  | 156.9  | 155.8  | 155.3  |
| 55°   | 2406.9 | 1830.4 | 330.6  | 209.2  | 188.3  | 175.5  | 161.2  | 151.2  | 145.9  | 143.6  | 143.3  |
| 57.5° | 2747.5 | 2111.9 | 352.8  | 204.9  | 177.8  | 164.3  | 149.7  | 140.2  | 134.6  | 131.8  | 131.6  |
| 60°   | 3092.1 | 2419.2 | 443.5  | 198.7  | 169.1  | 152.0  | 137.9  | 129.3  | 123.6  | 120.6  | 120.1  |
| 62.5° | 3437.2 | 2743.1 | 628.7  | 198.2  | 163.0  | 140.2  | 125.9  | 118.5  | 113.2  | 109.8  | 109.1  |
| 65°   | 3826.5 | 3097.7 | 839.2  | 211.8  | 160.9  | 129.5  | 113.7  | 107.8  | 103.2  | 100.1  | 99.9   |
| 67.5° | 4273.6 | 3498.0 | 819.0  | 239.6  | 167.8  | 119.8  | 102.2  | 97.6   | 94.3   | 91.7   | 91.5   |
| 70°   | 4483.3 | 3435.4 | 509.1  | 259.3  | 177.5  | 110.4  | 91.2   | 87.9   | 85.3   | 83.5   | 82.8   |
| 71°   | 4395.4 | 3262.0 | 426.9  | 257.0  | 176.5  | 106.3  | 86.9   | 84.3   | 81.7   | 80.2   | 79.4   |
| 72.5° | 4155.8 | 2974.8 | 356.1  | 239.1  | 165.0  | 98.9   | 81.2   | 78.7   | 76.4   | 74.6   | 74.1   |
| 75°   | 3729.2 | 2656.8 | 285.1  | 191.1  | 131.6  | 83.5   | 71.3   | 68.5   | 66.7   | 65.7   | 64.6   |
| 77.5° | 2741.3 | 1896.0 | 220.5  | 151.0  | 96.8   | 68.2   | 60.8   | 58.8   | 57.0   | 55.4   | 54.7   |
| 80°   | 1050.2 | 734.4  | 148.4  | 112.7  | 71.0   | 53.9   | 49.0   | 48.0   | 46.2   | 45.2   | 45.2   |
| 82.5° | 282.8  | 219.4  | 79.2   | 68.2   | 47.5   | 39.3   | 37.6   | 37.0   | 35.5   | 33.5   | 33.7   |
| 85°   | 114.4  | 96.8   | 44.4   | 37.6   | 29.1   | 23.2   | 25.3   | 25.5   | 23.8   | 21.2   | 21.5   |
| 87.5° | 50.3   | 41.1   | 24.8   | 16.6   | 12.8   | 8.9    | 11.5   | 11.5   | 10.5   | 8.7    | 7.9    |
| 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: SP1-2012-088-5-R3

Luminaire Tested: CCW-SA1A-760-U-SL2-HSS

Test Date: 01/19/2021

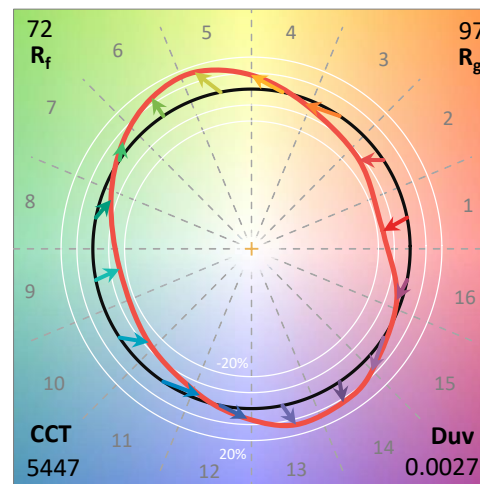
### Test Information

Test Method: LM-79-08  
 Report Number: SP1-2012-088-5-R3  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1  
 Measurement Geometry:  $4\pi$   
 Issue Date: 01/19/2021  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: INVUE  
 Catalog Number: **CCW-SA1A-760-U-SL2-HSS**  
 Description: INVUE WALL PACK

\*\*\*THIS IS A REVISION OF SP1-2012-088-5-R2. TO UPDATE THE CATALOG  
 INFORMATION.\*\*\*TESTED IN SITU. INVUE WALL PACK LIGHT SQUARE T2 OPTICS 1-SQUARE WITH  
 HOUSE SIDE SHIELD

### Spectral Parameters

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 5447   | CRI (Ra): | 71.9 |      |       |
| CIE u':                   | 0.2053 | R1:       | 70.7 | R9:  | -27.5 |
| CIE v':                   | 0.4809 | R2:       | 74.8 | R10: | 41.5  |
| Duv:                      | 0.0027 | R3:       | 78.7 | R11: | 74.9  |
| CIE x:                    | 0.3337 | R4:       | 74.0 | R12: | 49.9  |
| CIE y:                    | 0.3473 | R5:       | 72.5 | R13: | 70.2  |
| CIE z:                    | 0.3190 | R6:       | 67.7 | R14: | 88.1  |
| Peak Wavelength (nm):     | 443    | R7:       | 77.7 |      |       |
| Dominant Wavelength (nm): | 556    | R8:       | 58.8 |      |       |
| Purity:                   | 4.5    |           |      |      |       |
| Rf:                       | 72.3   |           |      |      |       |
| Rg:                       | 97.2   |           |      |      |       |



### Test Conditions

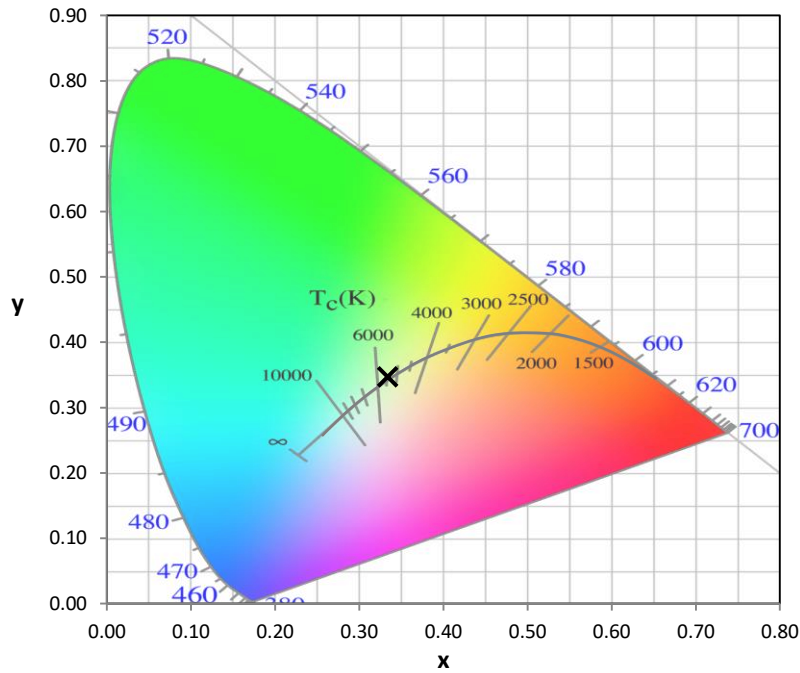
Stabilization Time: 75M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.4/18%  
 Sphere Temperature (°C): 25.3

REPORT NUMBER: SP1-2012-088-5-R3

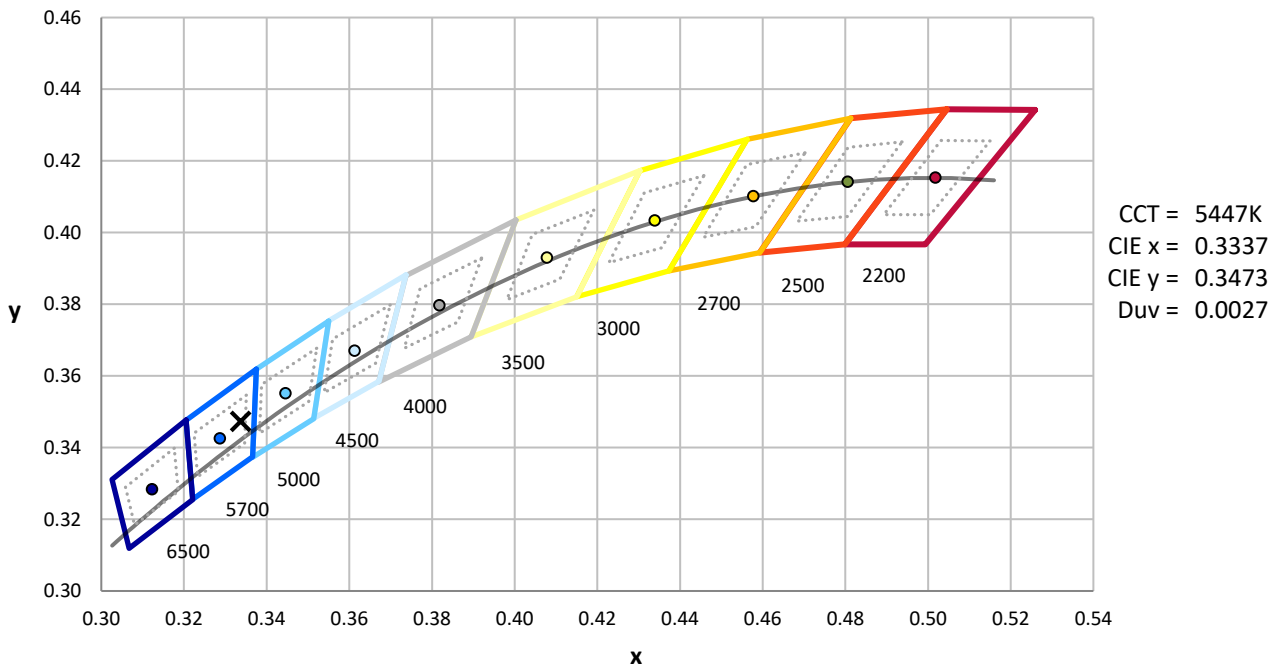
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 7/29/2020        | 1/29/2021            |
| 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**



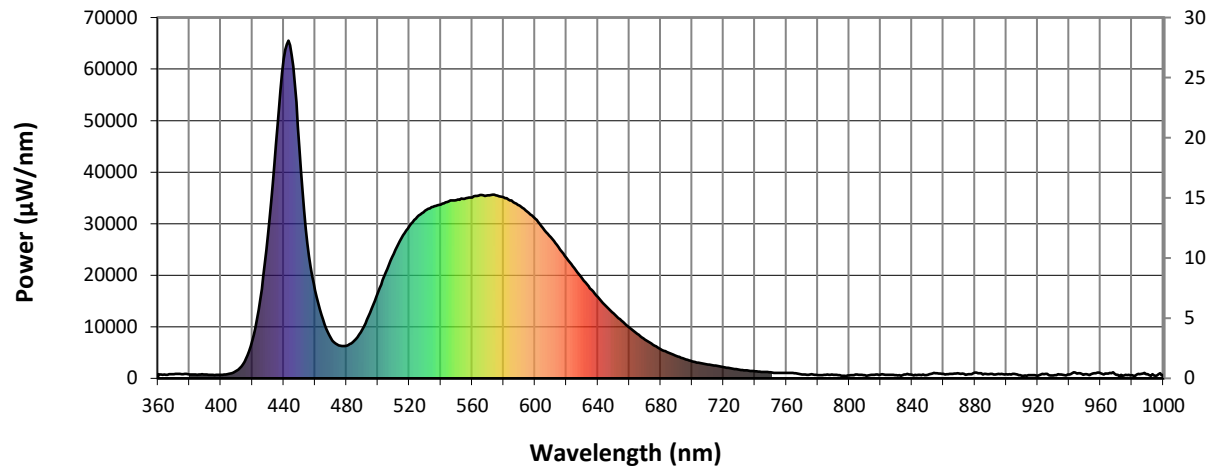
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 5700K 4-step quadrangle

REPORT NUMBER: SP1-2012-088-5-R3

### Photopic Flux vs. Wavelength

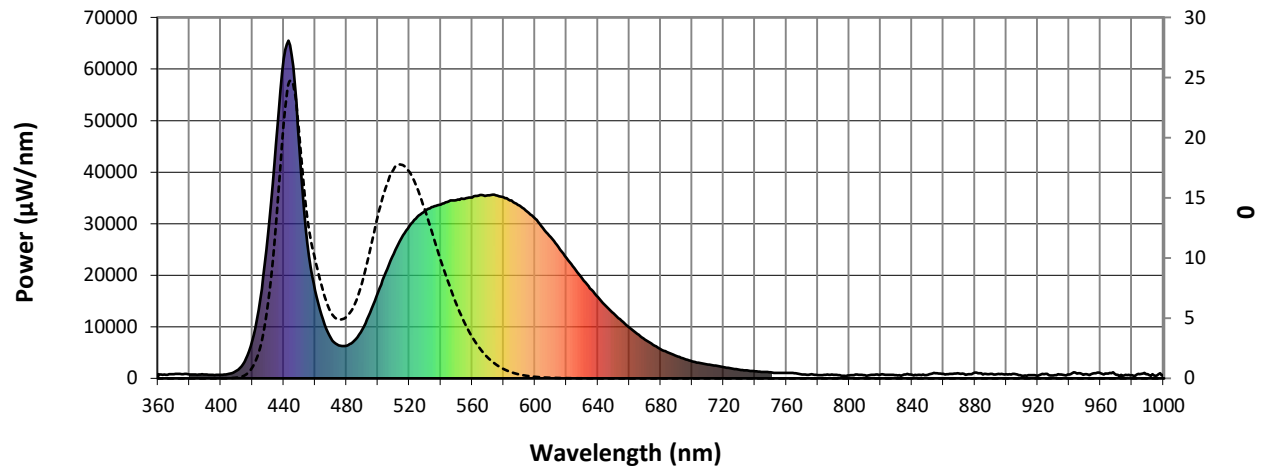


#####

| 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       | 828              | 0.0              | 490       | 9471             | 1.3              | 620       | 23317            | 6.1              | 750       | 1157             | 0.0              | 880       | 1136             | 0.0              |
| 365       | 696              | 0.0              | 495       | 12752            | 2.3              | 625       | 21413            | 4.7              | 755       | 1067             | 0.0              | 885       | 773              | 0.0              |
| 370       | 807              | 0.0              | 500       | 16685            | 3.7              | 630       | 19344            | 3.5              | 760       | 1059             | 0.0              | 890       | 872              | 0.0              |
| 375       | 837              | 0.0              | 505       | 20565            | 5.8              | 635       | 17464            | 2.6              | 765       | 1009             | 0.0              | 895       | 891              | 0.0              |
| 380       | 757              | 0.0              | 510       | 24119            | 8.3              | 640       | 15745            | 1.9              | 770       | 774              | 0.0              | 900       | 807              | 0.0              |
| 385       | 706              | 0.0              | 515       | 27181            | 11.3             | 645       | 14060            | 1.4              | 775       | 761              | 0.0              | 905       | 899              | 0.0              |
| 390       | 746              | 0.0              | 520       | 29555            | 14.3             | 650       | 12579            | 0.9              | 780       | 653              | 0.0              | 910       | 506              | 0.0              |
| 395       | 660              | 0.0              | 525       | 31307            | 16.8             | 655       | 11181            | 0.6              | 785       | 704              | 0.0              | 915       | 598              | 0.0              |
| 400       | 671              | 0.0              | 530       | 32558            | 19.2             | 660       | 9847             | 0.4              | 790       | 663              | 0.0              | 920       | 510              | 0.0              |
| 405       | 848              | 0.0              | 535       | 33301            | 20.7             | 665       | 8641             | 0.3              | 795       | 493              | 0.0              | 925       | 874              | 0.0              |
| 410       | 1490             | 0.0              | 540       | 33727            | 22.0             | 670       | 7535             | 0.2              | 800       | 584              | 0.0              | 930       | 549              | 0.0              |
| 415       | 3203             | 0.0              | 545       | 34356            | 22.9             | 675       | 6542             | 0.1              | 805       | 739              | 0.0              | 935       | 720              | 0.0              |
| 420       | 7298             | 0.0              | 550       | 34589            | 23.5             | 680       | 5664             | 0.1              | 810       | 601              | 0.0              | 940       | 754              | 0.0              |
| 425       | 15315            | 0.1              | 555       | 34855            | 23.8             | 685       | 4962             | 0.0              | 815       | 677              | 0.0              | 945       | 931              | 0.0              |
| 430       | 27886            | 0.2              | 560       | 35083            | 23.8             | 690       | 4369             | 0.0              | 820       | 726              | 0.0              | 950       | 811              | 0.0              |
| 435       | 45485            | 0.5              | 565       | 35553            | 23.6             | 695       | 3785             | 0.0              | 825       | 693              | 0.0              | 955       | 955              | 0.0              |
| 440       | 61965            | 1.0              | 570       | 35511            | 23.1             | 700       | 3318             | 0.0              | 830       | 619              | 0.0              | 960       | 1025             | 0.0              |
| 445       | 62721            | 1.3              | 575       | 35515            | 22.1             | 705       | 2962             | 0.0              | 835       | 738              | 0.0              | 965       | 916              | 0.0              |
| 450       | 44754            | 1.2              | 580       | 35114            | 20.9             | 710       | 2689             | 0.0              | 840       | 681              | 0.0              | 970       | 695              | 0.0              |
| 455       | 26152            | 0.9              | 585       | 34546            | 19.2             | 715       | 2476             | 0.0              | 845       | 691              | 0.0              | 975       | 568              | 0.0              |
| 460       | 17101            | 0.7              | 590       | 33522            | 17.3             | 720       | 2192             | 0.0              | 850       | 710              | 0.0              | 980       | 643              | 0.0              |
| 465       | 11400            | 0.6              | 595       | 32326            | 15.3             | 725       | 1939             | 0.0              | 855       | 1025             | 0.0              | 985       | 804              | 0.0              |
| 470       | 7763             | 0.5              | 600       | 30973            | 13.3             | 730       | 1698             | 0.0              | 860       | 889              | 0.0              | 990       | 812              | 0.0              |
| 475       | 6419             | 0.5              | 605       | 29160            | 11.3             | 735       | 1533             | 0.0              | 865       | 885              | 0.0              | 995       | 496              | 0.0              |
| 480       | 6330             | 0.6              | 610       | 27373            | 9.4              | 740       | 1375             | 0.0              | 870       | 905              | 0.0              | 1000      | 659              | 0.0              |
| 485       | 7299             | 0.9              | 615       | 25423            | 7.7              | 745       | 1254             | 0.0              | 875       | 739              | 0.0              |           |                  |                  |

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### Scotopic Flux vs. Wavelength



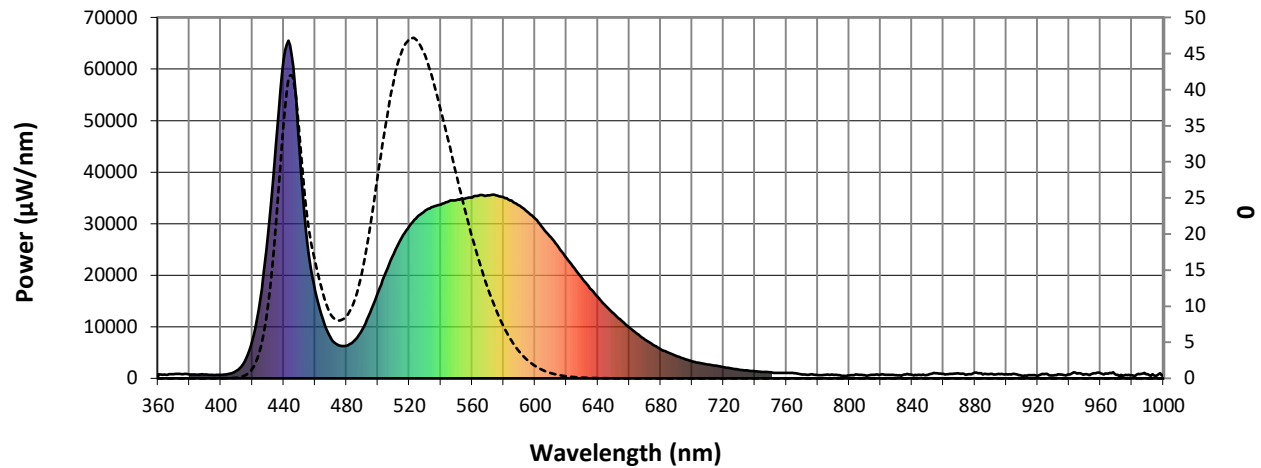
Scotopic Lumens: 1610.2

S/P: 0.74

| 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       | 828              | 0.0              | 490       | 9471             | 14.6             | 620       | 23317            | 0.3              | 750       | 1157             | 0.0              | 880       | 1136             | 0.0              |
| 365       | 696              | 0.0              | 495       | 12752            | 20.6             | 625       | 21413            | 0.2              | 755       | 1067             | 0.0              | 885       | 773              | 0.0              |
| 370       | 807              | 0.0              | 500       | 16685            | 27.9             | 630       | 19344            | 0.1              | 760       | 1059             | 0.0              | 890       | 872              | 0.0              |
| 375       | 837              | 0.0              | 505       | 20565            | 35.0             | 635       | 17464            | 0.1              | 765       | 1009             | 0.0              | 895       | 891              | 0.0              |
| 380       | 757              | 0.0              | 510       | 24119            | 40.9             | 640       | 15745            | 0.0              | 770       | 774              | 0.0              | 900       | 807              | 0.0              |
| 385       | 706              | 0.0              | 515       | 27181            | 45.1             | 645       | 14060            | 0.0              | 775       | 761              | 0.0              | 905       | 899              | 0.0              |
| 390       | 746              | 0.0              | 520       | 29555            | 47.0             | 650       | 12579            | 0.0              | 780       | 653              | 0.0              | 910       | 506              | 0.0              |
| 395       | 660              | 0.0              | 525       | 31307            | 46.8             | 655       | 11181            | 0.0              | 785       | 704              | 0.0              | 915       | 598              | 0.0              |
| 400       | 671              | 0.0              | 530       | 32558            | 44.9             | 660       | 9847             | 0.0              | 790       | 663              | 0.0              | 920       | 510              | 0.0              |
| 405       | 848              | 0.0              | 535       | 33301            | 41.5             | 665       | 8641             | 0.0              | 795       | 493              | 0.0              | 925       | 874              | 0.0              |
| 410       | 1490             | 0.1              | 540       | 33727            | 37.3             | 670       | 7535             | 0.0              | 800       | 584              | 0.0              | 930       | 549              | 0.0              |
| 415       | 3203             | 0.3              | 545       | 34356            | 32.9             | 675       | 6542             | 0.0              | 805       | 739              | 0.0              | 935       | 720              | 0.0              |
| 420       | 7298             | 1.2              | 550       | 34589            | 28.3             | 680       | 5664             | 0.0              | 810       | 601              | 0.0              | 940       | 754              | 0.0              |
| 425       | 15315            | 3.7              | 555       | 34855            | 23.8             | 685       | 4962             | 0.0              | 815       | 677              | 0.0              | 945       | 931              | 0.0              |
| 430       | 27886            | 9.5              | 560       | 35083            | 19.6             | 690       | 4369             | 0.0              | 820       | 726              | 0.0              | 950       | 811              | 0.0              |
| 435       | 45485            | 20.3             | 565       | 35553            | 16.0             | 695       | 3785             | 0.0              | 825       | 693              | 0.0              | 955       | 955              | 0.0              |
| 440       | 61965            | 34.6             | 570       | 35511            | 12.5             | 700       | 3318             | 0.0              | 830       | 619              | 0.0              | 960       | 1025             | 0.0              |
| 445       | 62721            | 42.0             | 575       | 35515            | 9.7              | 705       | 2962             | 0.0              | 835       | 738              | 0.0              | 965       | 916              | 0.0              |
| 450       | 44754            | 34.7             | 580       | 35114            | 7.2              | 710       | 2689             | 0.0              | 840       | 681              | 0.0              | 970       | 695              | 0.0              |
| 455       | 26152            | 22.9             | 585       | 34546            | 5.3              | 715       | 2476             | 0.0              | 845       | 691              | 0.0              | 975       | 568              | 0.0              |
| 460       | 17101            | 16.5             | 590       | 33522            | 3.7              | 720       | 2192             | 0.0              | 850       | 710              | 0.0              | 980       | 643              | 0.0              |
| 465       | 11400            | 12.0             | 595       | 32326            | 2.6              | 725       | 1939             | 0.0              | 855       | 1025             | 0.0              | 985       | 804              | 0.0              |
| 470       | 7763             | 8.9              | 600       | 30973            | 1.7              | 730       | 1698             | 0.0              | 860       | 889              | 0.0              | 990       | 812              | 0.0              |
| 475       | 6419             | 8.0              | 605       | 29160            | 1.1              | 735       | 1533             | 0.0              | 865       | 885              | 0.0              | 995       | 496              | 0.0              |
| 480       | 6330             | 8.5              | 610       | 27373            | 0.7              | 740       | 1375             | 0.0              | 870       | 905              | 0.0              | 1000      | 659              | 0.0              |
| 485       | 7299             | 10.6             | 615       | 25423            | 0.5              | 745       | 1254             | 0.0              | 875       | 739              | 0.0              |           |                  |                  |

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### Melanopic Flux vs. Wavelength

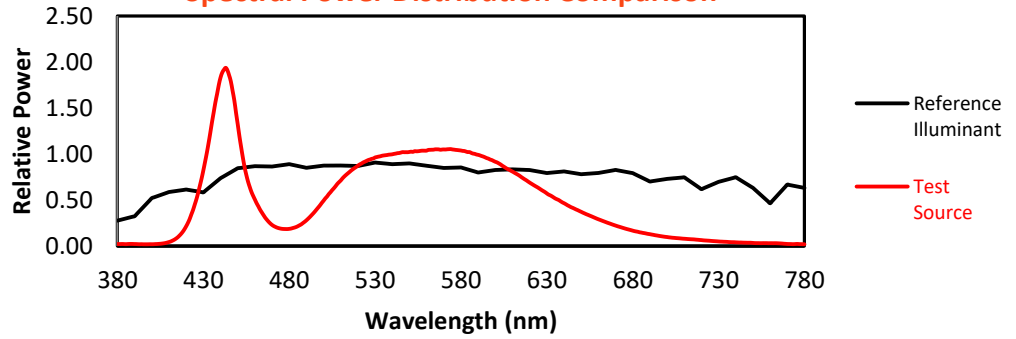

**Melanopic Lumens: 4010.3      S/P: 1.85**

| 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       | 828              | 0.0              | 490       | 9471             | 7.9              | 620       | 23317            | 0.0              | 750       | 1157             | 0.0              | 880       | 1136             | 0.0              |
| 365       | 696              | 0.0              | 495       | 12752            | 10.5             | 625       | 21413            | 0.0              | 755       | 1067             | 0.0              | 885       | 773              | 0.0              |
| 370       | 807              | 0.0              | 500       | 16685            | 13.4             | 630       | 19344            | 0.0              | 760       | 1059             | 0.0              | 890       | 872              | 0.0              |
| 375       | 837              | 0.0              | 505       | 20565            | 15.8             | 635       | 17464            | 0.0              | 765       | 1009             | 0.0              | 895       | 891              | 0.0              |
| 380       | 757              | 0.0              | 510       | 24119            | 17.3             | 640       | 15745            | 0.0              | 770       | 774              | 0.0              | 900       | 807              | 0.0              |
| 385       | 706              | 0.0              | 515       | 27181            | 17.8             | 645       | 14060            | 0.0              | 775       | 761              | 0.0              | 905       | 899              | 0.0              |
| 390       | 746              | 0.0              | 520       | 29555            | 17.2             | 650       | 12579            | 0.0              | 780       | 653              | 0.0              | 910       | 506              | 0.0              |
| 395       | 660              | 0.0              | 525       | 31307            | 15.9             | 655       | 11181            | 0.0              | 785       | 704              | 0.0              | 915       | 598              | 0.0              |
| 400       | 671              | 0.0              | 530       | 32558            | 14.1             | 660       | 9847             | 0.0              | 790       | 663              | 0.0              | 920       | 510              | 0.0              |
| 405       | 848              | 0.0              | 535       | 33301            | 12.0             | 665       | 8641             | 0.0              | 795       | 493              | 0.0              | 925       | 874              | 0.0              |
| 410       | 1490             | 0.1              | 540       | 33727            | 9.9              | 670       | 7535             | 0.0              | 800       | 584              | 0.0              | 930       | 549              | 0.0              |
| 415       | 3203             | 0.2              | 545       | 34356            | 8.0              | 675       | 6542             | 0.0              | 805       | 739              | 0.0              | 935       | 720              | 0.0              |
| 420       | 7298             | 0.8              | 550       | 34589            | 6.2              | 680       | 5664             | 0.0              | 810       | 601              | 0.0              | 940       | 754              | 0.0              |
| 425       | 15315            | 2.4              | 555       | 34855            | 4.7              | 685       | 4962             | 0.0              | 815       | 677              | 0.0              | 945       | 931              | 0.0              |
| 430       | 27886            | 5.9              | 560       | 35083            | 3.5              | 690       | 4369             | 0.0              | 820       | 726              | 0.0              | 950       | 811              | 0.0              |
| 435       | 45485            | 12.1             | 565       | 35553            | 2.5              | 695       | 3785             | 0.0              | 825       | 693              | 0.0              | 955       | 955              | 0.0              |
| 440       | 61965            | 20.7             | 570       | 35511            | 1.7              | 700       | 3318             | 0.0              | 830       | 619              | 0.0              | 960       | 1025             | 0.0              |
| 445       | 62721            | 24.7             | 575       | 35515            | 1.2              | 705       | 2962             | 0.0              | 835       | 738              | 0.0              | 965       | 916              | 0.0              |
| 450       | 44754            | 20.6             | 580       | 35114            | 0.8              | 710       | 2689             | 0.0              | 840       | 681              | 0.0              | 970       | 695              | 0.0              |
| 455       | 26152            | 13.7             | 585       | 34546            | 0.5              | 715       | 2476             | 0.0              | 845       | 691              | 0.0              | 975       | 568              | 0.0              |
| 460       | 17101            | 10.1             | 590       | 33522            | 0.3              | 720       | 2192             | 0.0              | 850       | 710              | 0.0              | 980       | 643              | 0.0              |
| 465       | 11400            | 7.4              | 595       | 32326            | 0.2              | 725       | 1939             | 0.0              | 855       | 1025             | 0.0              | 985       | 804              | 0.0              |
| 470       | 7763             | 5.6              | 600       | 30973            | 0.1              | 730       | 1698             | 0.0              | 860       | 889              | 0.0              | 990       | 812              | 0.0              |
| 475       | 6419             | 4.9              | 605       | 29160            | 0.1              | 735       | 1533             | 0.0              | 865       | 885              | 0.0              | 995       | 496              | 0.0              |
| 480       | 6330             | 5.1              | 610       | 27373            | 0.0              | 740       | 1375             | 0.0              | 870       | 905              | 0.0              | 1000      | 659              | 0.0              |
| 485       | 7299             | 6.0              | 615       | 25423            | 0.0              | 745       | 1254             | 0.0              | 875       | 739              | 0.0              |           |                  |                  |

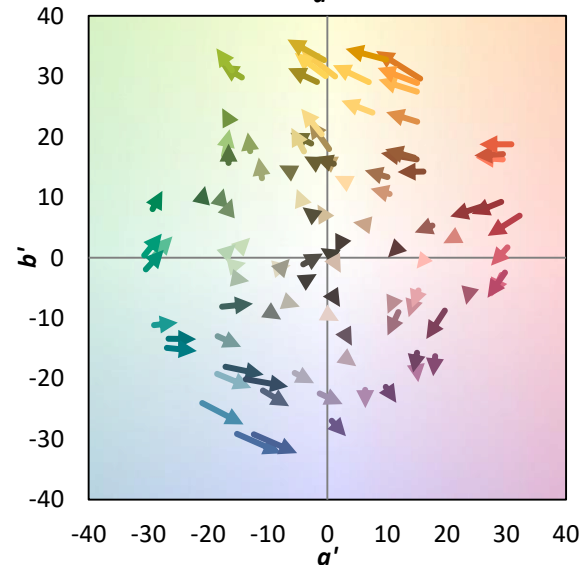
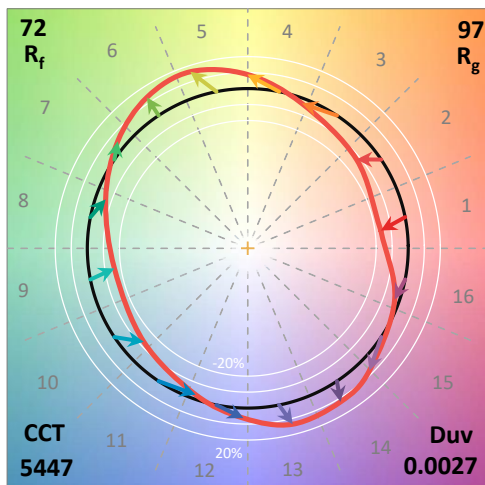
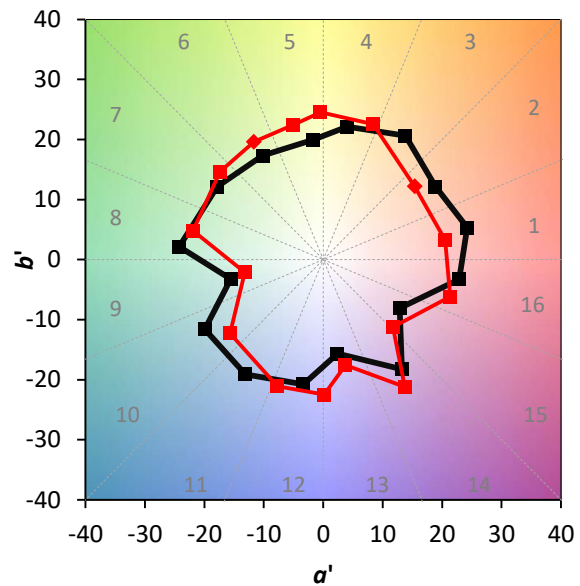
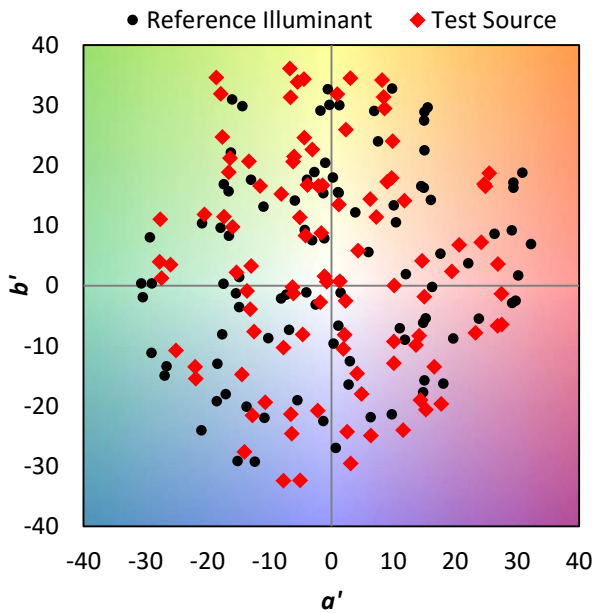
### Summary

$R_f = 72.3$   
 $R_g = 97.2$   
 CIE  $R_a = 71.9$   
 $R_g = -27.5$

### Spectral Power Distribution Comparison



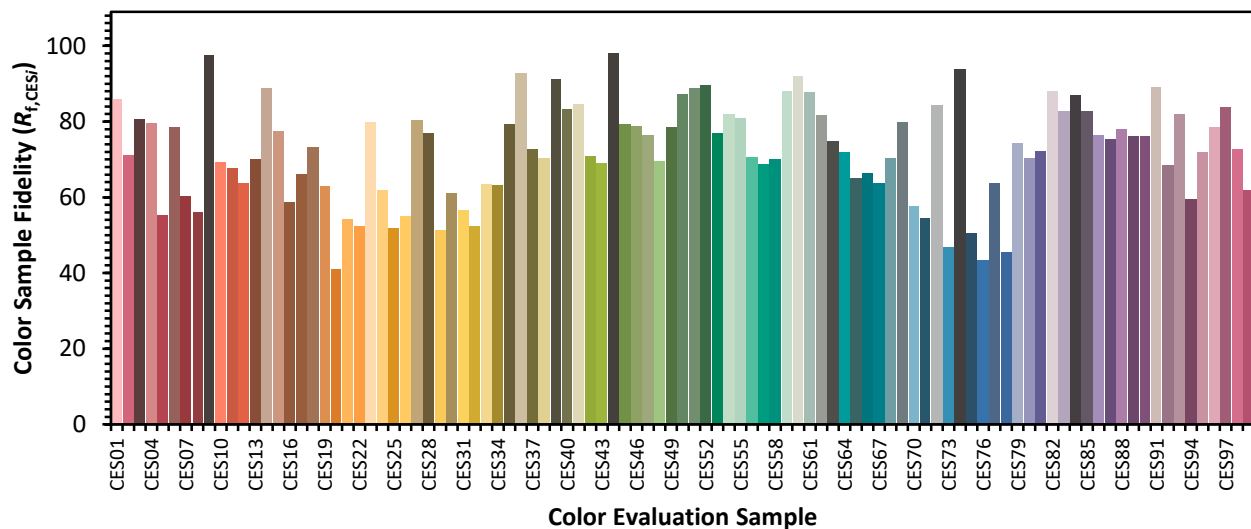
### Color Vector Graphics



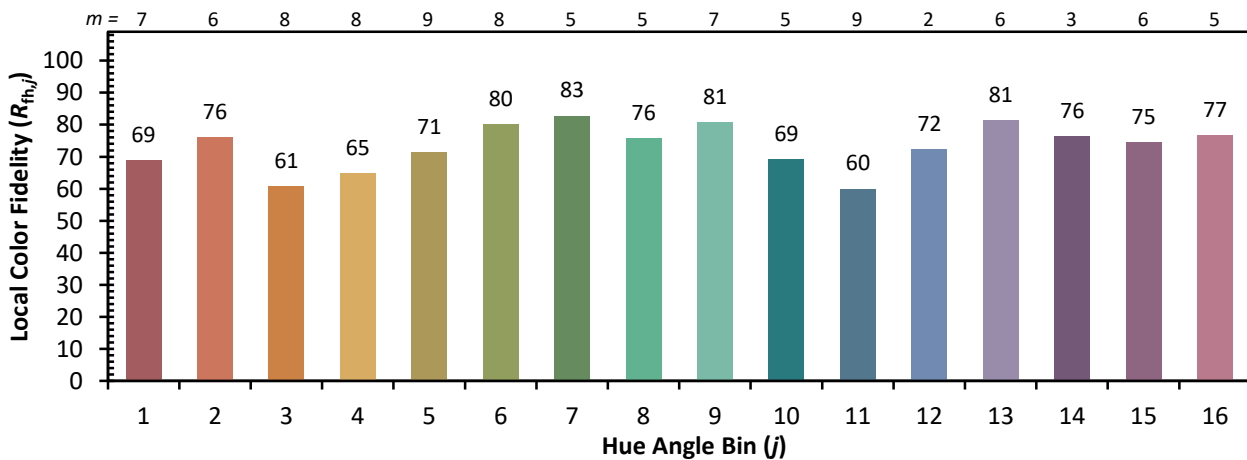
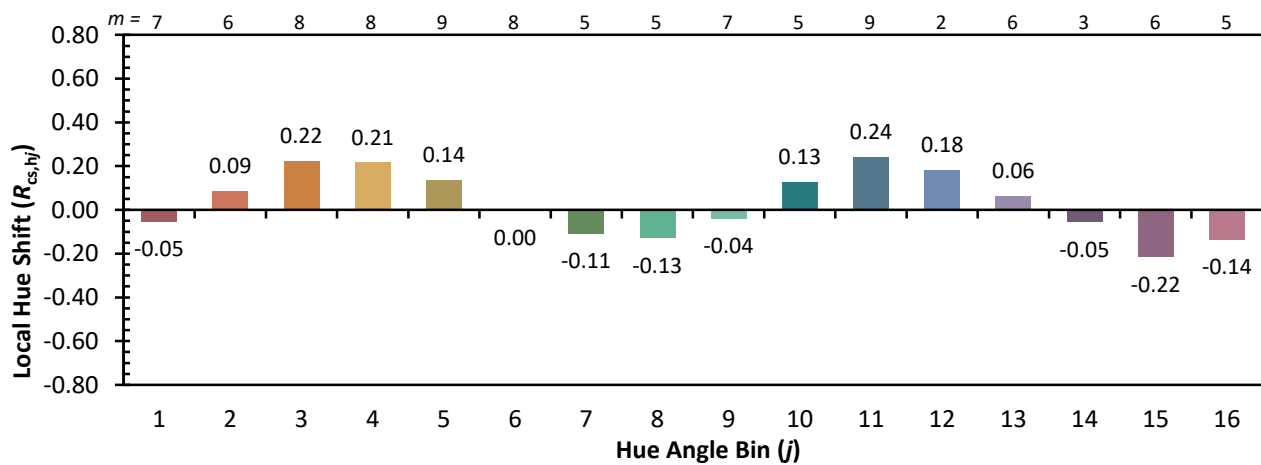
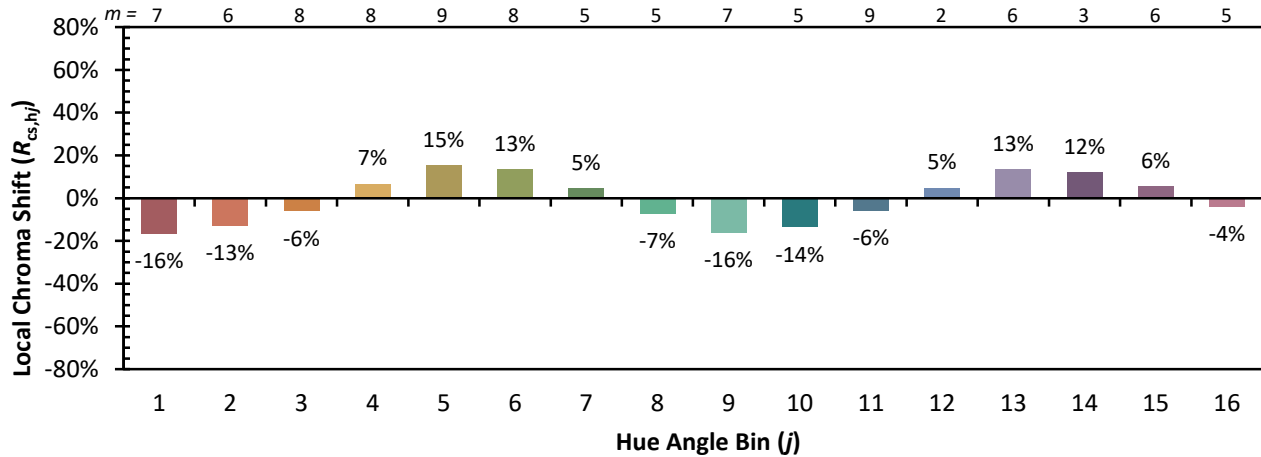


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

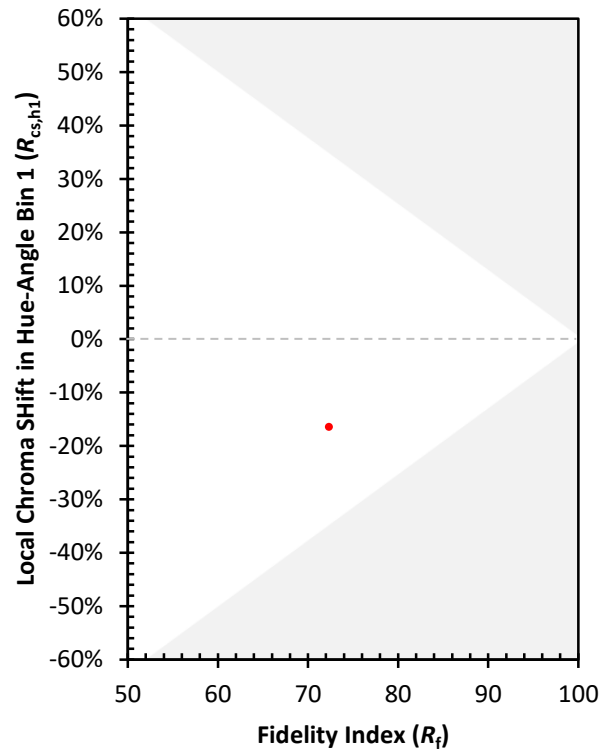
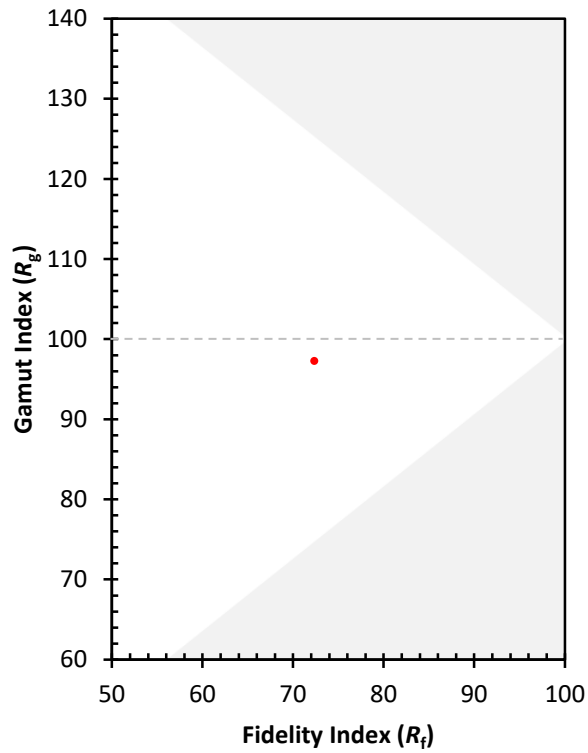
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 55 | CES51 = 89 | CES76 = 43 |
| CES02 = 59 | CES27 = 80 | CES52 = 90 | CES77 = 64 |
| CES03 = 30 | CES28 = 77 | CES53 = 77 | CES78 = 46 |
| CES04 = 69 | CES29 = 51 | CES54 = 82 | CES79 = 74 |
| CES05 = 46 | CES30 = 61 | CES55 = 81 | CES80 = 70 |
| CES06 = 50 | CES31 = 56 | CES56 = 71 | CES81 = 72 |
| CES07 = 38 | CES32 = 52 | CES57 = 69 | CES82 = 88 |
| CES08 = 38 | CES33 = 63 | CES58 = 70 | CES83 = 83 |
| CES09 = 29 | CES34 = 63 | CES59 = 88 | CES84 = 87 |
| CES10 = 72 | CES35 = 79 | CES60 = 92 | CES85 = 83 |
| CES11 = 55 | CES36 = 93 | CES61 = 88 | CES86 = 76 |
| CES12 = 61 | CES37 = 73 | CES62 = 82 | CES87 = 75 |
| CES13 = 41 | CES38 = 70 | CES63 = 75 | CES88 = 78 |
| CES14 = 74 | CES39 = 91 | CES64 = 72 | CES89 = 76 |
| CES15 = 70 | CES40 = 83 | CES65 = 65 | CES90 = 76 |
| CES16 = 46 | CES41 = 85 | CES66 = 66 | CES91 = 89 |
| CES17 = 48 | CES42 = 71 | CES67 = 64 | CES92 = 69 |
| CES18 = 55 | CES43 = 69 | CES68 = 70 | CES93 = 82 |
| CES19 = 71 | CES44 = 98 | CES69 = 80 | CES94 = 60 |
| CES20 = 64 | CES45 = 79 | CES70 = 58 | CES95 = 72 |
| CES21 = 85 | CES46 = 79 | CES71 = 54 | CES96 = 79 |
| CES22 = 77 | CES47 = 76 | CES72 = 84 | CES97 = 84 |
| CES23 = 91 | CES48 = 69 | CES73 = 47 | CES98 = 73 |
| CES24 = 90 | CES49 = 79 | CES74 = 94 | CES99 = 62 |
| CES25 = 71 | CES50 = 87 | CES75 = 50 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)