

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: P386440

Luminaire Tested: **GWC-SA2A-760-U-SL2-HSS**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P386440  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-21)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: MCGRAW-EDISON  
Catalog Number: GWC-SA2A-760-U-SL2-HSS  
Description: GALLEON WALL LUMINAIRE  
(2) 70 CRI, 5700K, 615mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE II SPILL  
LIGHT ELIMINATOR OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 8055 lumens  
Efficiency: N/A  
Efficacy: 122.0 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 0.5' x H: 0')  
IES Classification: Type III - Medium  
BUG Rating: B1 - U0 - G2

Input Watts (W): 66  
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

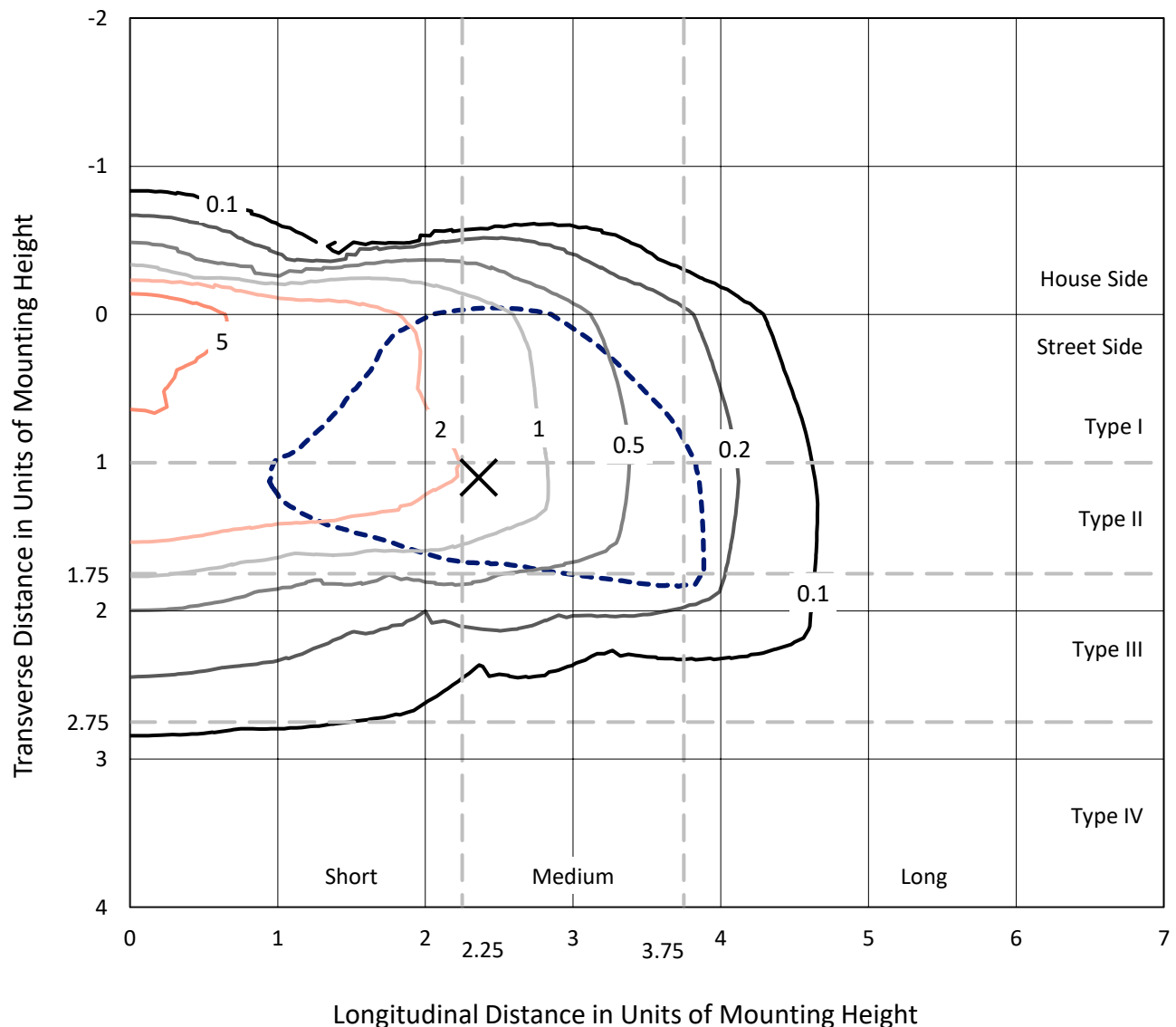


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## Iso-Footcandle Lines of Horizontal Illumination

× Max cd  
 - - - 1/2 Max cd

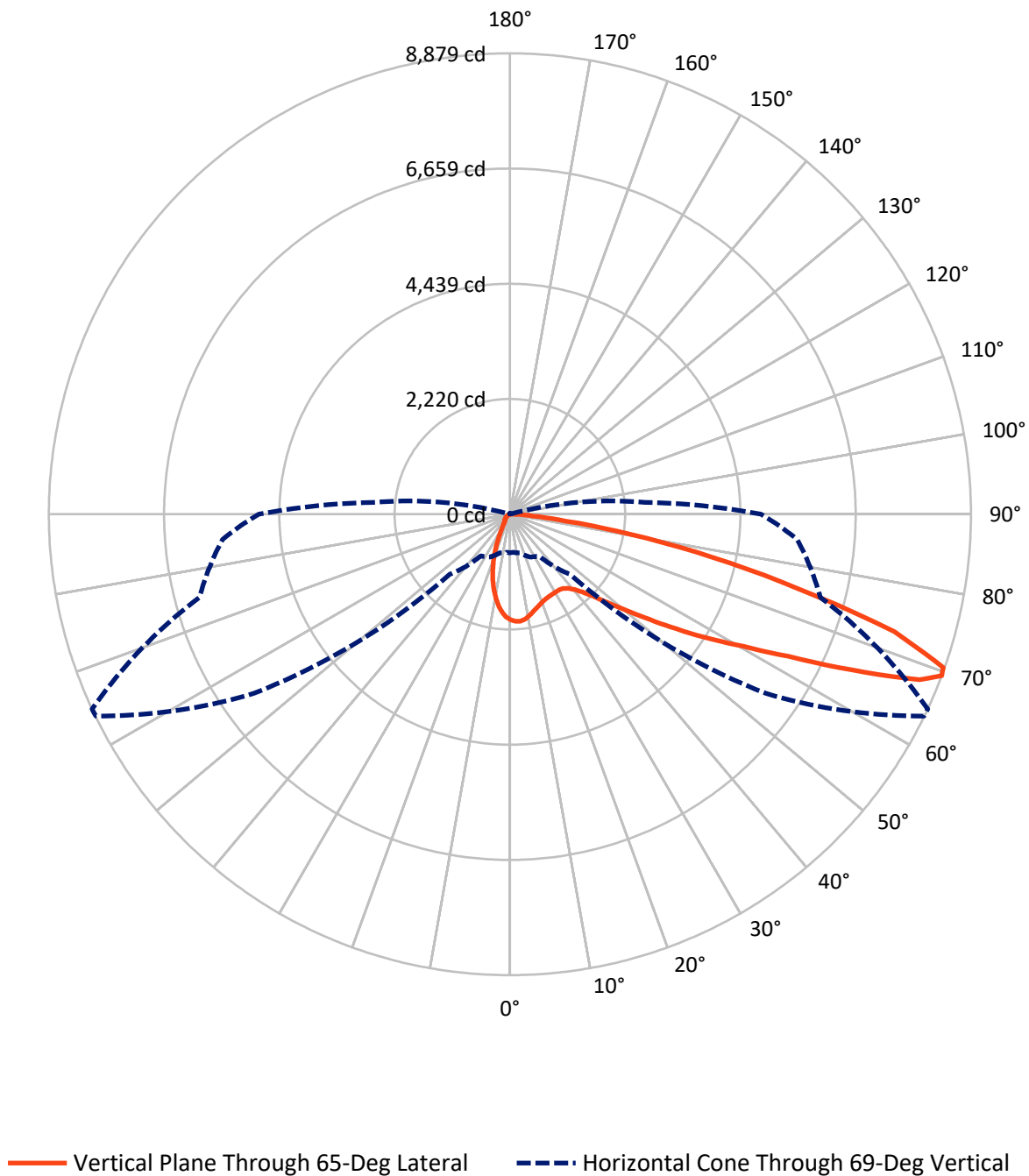


Based on 15 foot mounting height. Maximum calculated value = 9 fc  
 Type III - Medium - N/A

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CATALOG NUMBER: GWC-SA2A-760-U-SL2-HSS

## Luminous Intensity Polar Plot



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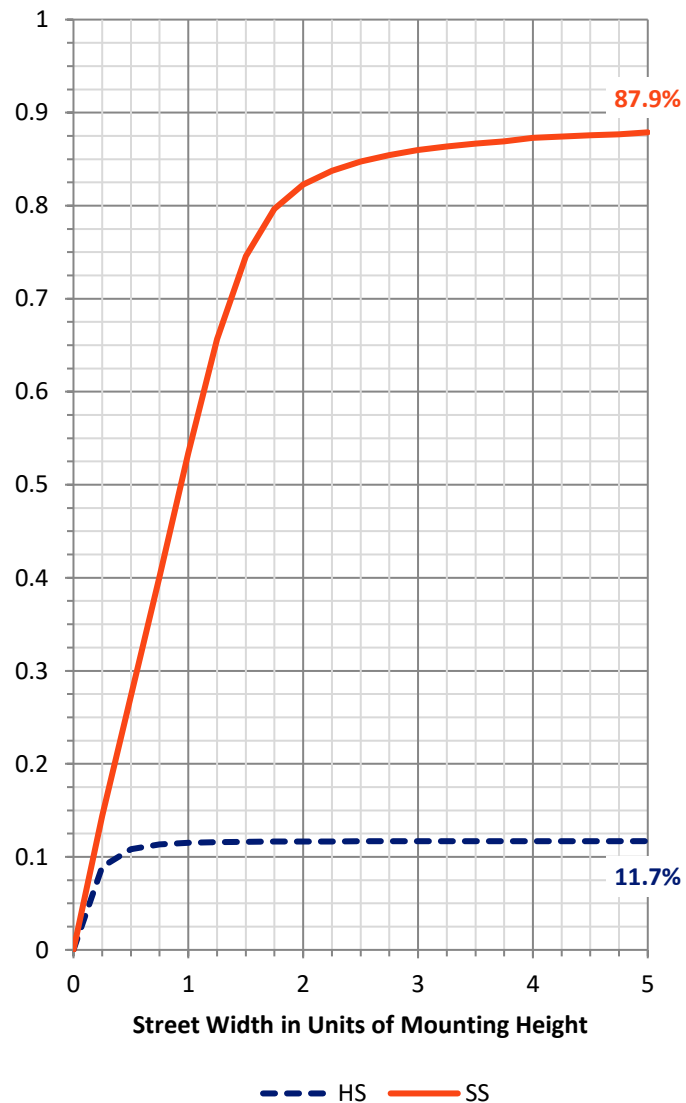
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 949.5    | 0.0    | 949.5  |
|                    | % Fixture | 11.8     | 0.0    | 11.8   |
| <b>Street Side</b> | Lumens    | 7105.5   | 0.0    | 7105.5 |
|                    | % Fixture | 88.2     | 0.0    | 88.2   |
| <b>Total</b>       | Lumens    | 8055.0   | 0.0    | 8055.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 170.2  | 2.1       |
| 10°-20°   | 372.6  | 4.6       |
| 20°-30°   | 516.1  | 6.4       |
| 30°-40°   | 719.6  | 8.9       |
| 40°-50°   | 1118.4 | 13.9      |
| 50°-60°   | 1795.5 | 22.3      |
| 60°-70°   | 2031.0 | 25.2      |
| 70°-80°   | 1192.8 | 14.8      |
| 80°-90°   | 138.8  | 1.7       |
| 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°    | 8055.0 | 100.0     |
| 0°-180°   | 8055.0 | 100.0     |

**Coefficient of Utilization**



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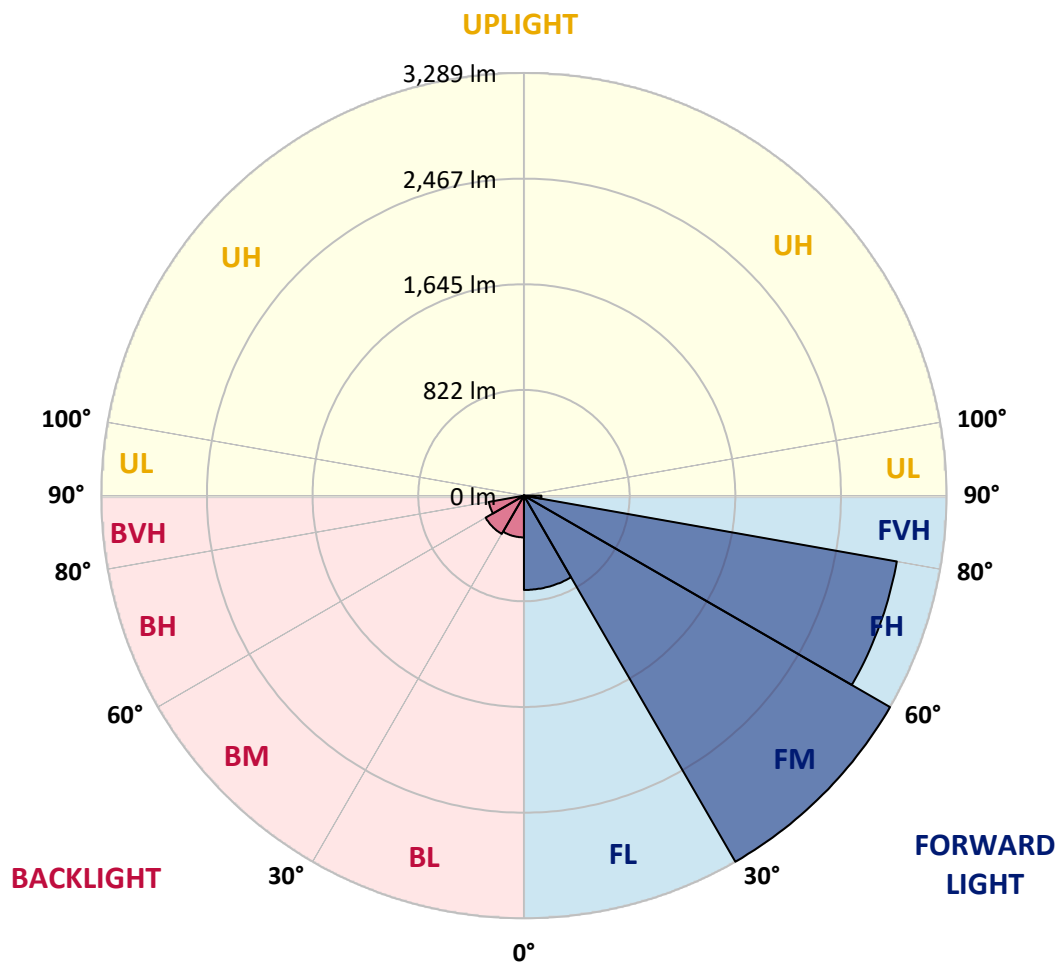
CATALOG NUMBER: GWC-SA2A-760-U-SL2-HSS

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 734.0  | 9.1       |                         |      |         |
| FM   | (30°-60°)   | 3289.4 | 40.8      |                         |      |         |
| FH   | (60°-80°)   | 2946.4 | 36.6      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 135.6  | 1.7       |                         |      | G2/225  |
| BL   | (0°-30°)    | 324.9  | 4.0       | B1/500                  |      |         |
| BM   | (30°-60°)   | 344.1  | 4.3       | B1/1000                 |      |         |
| BH   | (60°-80°)   | 277.4  | 3.4       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 3.1    | 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 III Medium



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CATALOG NUMBER: GWC-SA2A-760-U-SL2-HSS

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 64°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 2035.5 | 2035.5 | 2035.5 | 2035.5 | 2035.5 | 2035.5 | 2035.5 | 2035.5 | 2035.5 | 2035.5 | 2035.5 |
| 2.5°  | 2053.6 | 2048.5 | 2052.6 | 2061.4 | 2065.8 | 2065.8 | 2069.3 | 2065.2 | 2066.5 | 2056.6 | 2042.3 |
| 5°    | 1925.1 | 1917.2 | 1928.5 | 1953.4 | 1984.0 | 2010.3 | 2049.1 | 2069.6 | 2071.6 | 2072.0 | 2055.3 |
| 7.5°  | 1786.7 | 1779.5 | 1796.2 | 1825.6 | 1865.1 | 1913.8 | 1981.7 | 2041.0 | 2044.4 | 2076.4 | 2064.1 |
| 10°   | 1674.2 | 1669.1 | 1688.5 | 1719.9 | 1766.2 | 1820.8 | 1903.9 | 1986.4 | 1996.3 | 2067.2 | 2062.8 |
| 12.5° | 1584.9 | 1580.8 | 1599.2 | 1635.4 | 1682.7 | 1743.1 | 1830.0 | 1925.8 | 1939.1 | 2046.4 | 2056.0 |
| 15°   | 1519.8 | 1519.1 | 1534.5 | 1569.2 | 1621.7 | 1678.0 | 1766.9 | 1869.5 | 1884.9 | 2023.9 | 2054.9 |
| 17.5° | 1485.7 | 1486.8 | 1498.0 | 1527.7 | 1572.6 | 1628.5 | 1713.8 | 1822.1 | 1838.8 | 2003.8 | 2060.1 |
| 20°   | 1482.3 | 1483.3 | 1489.5 | 1506.2 | 1542.7 | 1592.1 | 1670.5 | 1782.3 | 1799.6 | 1988.8 | 2068.2 |
| 22.5° | 1512.3 | 1511.6 | 1513.3 | 1511.6 | 1532.1 | 1569.6 | 1641.8 | 1751.6 | 1771.7 | 1978.9 | 2074.7 |
| 25°   | 1569.9 | 1568.9 | 1568.2 | 1555.6 | 1542.0 | 1562.1 | 1629.9 | 1734.2 | 1753.3 | 1971.8 | 2078.5 |
| 27.5° | 1650.0 | 1649.3 | 1648.3 | 1627.5 | 1586.6 | 1574.0 | 1631.3 | 1727.7 | 1743.8 | 1966.0 | 2077.8 |
| 30°   | 1755.3 | 1760.1 | 1758.7 | 1729.8 | 1666.0 | 1610.5 | 1645.6 | 1724.3 | 1738.3 | 1954.7 | 2070.6 |
| 32.5° | 1879.1 | 1888.6 | 1896.1 | 1865.1 | 1785.3 | 1682.7 | 1678.7 | 1728.1 | 1738.3 | 1946.2 | 2057.7 |
| 35°   | 2007.6 | 2019.8 | 2047.4 | 2036.5 | 1931.6 | 1791.5 | 1735.6 | 1750.6 | 1759.1 | 1951.0 | 2051.5 |
| 37.5° | 2134.0 | 2148.7 | 2208.7 | 2240.4 | 2123.1 | 1935.3 | 1824.2 | 1806.1 | 1810.6 | 1980.0 | 2058.3 |
| 40°   | 2280.9 | 2303.1 | 2394.1 | 2445.2 | 2351.8 | 2127.9 | 1956.8 | 1901.6 | 1903.3 | 2043.7 | 2090.0 |
| 42.5° | 2473.8 | 2496.7 | 2595.2 | 2675.3 | 2609.5 | 2371.2 | 2136.7 | 2047.4 | 2045.7 | 2163.0 | 2164.7 |
| 45°   | 2709.0 | 2732.9 | 2834.8 | 2923.7 | 2894.1 | 2659.6 | 2367.2 | 2260.5 | 2258.4 | 2351.1 | 2306.1 |
| 47.5° | 2975.6 | 2999.1 | 3090.1 | 3181.8 | 3213.8 | 2996.3 | 2660.6 | 2551.2 | 2546.4 | 2612.6 | 2524.6 |
| 50°   | 3204.3 | 3219.6 | 3303.4 | 3426.8 | 3571.3 | 3410.1 | 3025.7 | 2920.3 | 2915.2 | 2959.9 | 2845.4 |
| 52.5° | 3287.4 | 3296.3 | 3381.5 | 3554.3 | 3914.9 | 3970.5 | 3505.2 | 3369.6 | 3365.8 | 3385.2 | 3272.4 |
| 55°   | 3119.1 | 3135.1 | 3239.7 | 3496.0 | 4101.0 | 4603.8 | 4110.6 | 3925.8 | 3897.5 | 3855.6 | 3718.9 |
| 57.5° | 2660.3 | 2685.8 | 2798.3 | 3139.2 | 4014.1 | 5106.2 | 5000.2 | 4555.0 | 4513.4 | 4257.1 | 4081.9 |
| 60°   | 1993.2 | 2024.6 | 2118.0 | 2485.8 | 3550.2 | 5285.1 | 5972.2 | 5256.1 | 5162.4 | 4576.8 | 4415.6 |
| 62.5° | 1367.8 | 1383.5 | 1446.9 | 1686.5 | 2614.6 | 4992.0 | 6785.5 | 6195.2 | 6024.1 | 4924.5 | 4776.6 |
| 65°   | 1044.7 | 1050.1 | 1076.0 | 1158.5 | 1557.0 | 4055.0 | 7109.0 | 7434.1 | 7227.2 | 5340.3 | 5151.2 |
| 67.5° | 841.9  | 837.5  | 873.2  | 991.2  | 1042.6 | 2473.8 | 6731.6 | 8606.3 | 8509.5 | 5896.2 | 5528.1 |
| 69°   | 742.4  | 736.2  | 772.7  | 909.7  | 979.2  | 1635.4 | 6017.9 | 8872.5 | 8878.6 | 6189.7 | 5554.0 |
| 70°   | 668.1  | 672.1  | 708.3  | 861.3  | 957.8  | 1283.6 | 5336.2 | 8804.6 | 8853.0 | 6299.5 | 5398.6 |
| 72.5° | 446.2  | 457.1  | 529.7  | 715.1  | 921.0  | 971.4  | 3222.0 | 7555.5 | 7741.6 | 6052.3 | 4631.7 |
| 75°   | 251.5  | 259.7  | 346.0  | 539.2  | 867.8  | 925.0  | 1701.8 | 5566.3 | 5746.3 | 5061.2 | 3571.7 |
| 77.5° | 123.4  | 127.8  | 195.6  | 348.0  | 725.7  | 881.4  | 965.3  | 3781.0 | 3986.5 | 3303.4 | 2020.2 |
| 80°   | 52.1   | 54.5   | 97.8   | 214.7  | 518.8  | 841.2  | 716.8  | 2326.9 | 2352.5 | 1294.2 | 538.2  |
| 82.5° | 20.1   | 20.8   | 41.2   | 134.0  | 329.6  | 655.8  | 599.5  | 1103.3 | 1076.7 | 243.7  | 122.7  |
| 85°   | 2.4    | 2.7    | 15.0   | 80.4   | 183.4  | 337.4  | 487.1  | 475.5  | 440.0  | 48.4   | 63.1   |
| 87.5° | 0.0    | 0.0    | 1.0    | 24.5   | 54.5   | 158.2  | 253.2  | 197.3  | 177.9  | 15.7   | 32.7   |
| 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-SA2A-760-U-SL2-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 2035.5 | 2035.5 | 2035.5 | 2035.5 | 2035.5 | 2035.5 | 2035.5 | 2035.5 | 2035.5 | 2035.5 | 2035.5 |
| 2.5°  | 2030.4 | 2027.0 | 2008.6 | 1982.0 | 1956.8 | 1925.4 | 1895.4 | 1877.4 | 1863.0 | 1853.5 | 1864.8 |
| 5°    | 2035.9 | 2020.9 | 1965.0 | 1893.4 | 1823.2 | 1744.1 | 1670.5 | 1608.1 | 1583.6 | 1556.3 | 1568.6 |
| 7.5°  | 2034.1 | 2005.9 | 1905.3 | 1777.8 | 1649.0 | 1515.7 | 1389.6 | 1292.5 | 1242.0 | 1192.6 | 1205.2 |
| 10°   | 2025.6 | 1977.9 | 1825.6 | 1636.7 | 1443.8 | 1252.3 | 1073.3 | 937.3  | 861.3  | 792.5  | 802.3  |
| 12.5° | 2006.9 | 1940.4 | 1731.5 | 1475.2 | 1217.1 | 964.6  | 755.0  | 580.8  | 487.4  | 446.2  | 451.3  |
| 15°   | 1995.6 | 1903.9 | 1632.0 | 1311.6 | 975.2  | 671.8  | 461.5  | 343.2  | 300.6  | 287.0  | 288.7  |
| 17.5° | 1990.2 | 1868.8 | 1529.0 | 1124.4 | 727.7  | 427.8  | 298.2  | 263.1  | 253.9  | 251.5  | 252.2  |
| 20°   | 1984.7 | 1833.4 | 1423.0 | 939.4  | 501.4  | 287.7  | 245.1  | 234.8  | 231.4  | 228.4  | 229.0  |
| 22.5° | 1975.5 | 1799.3 | 1309.2 | 751.9  | 338.1  | 233.5  | 220.9  | 211.0  | 203.8  | 200.1  | 200.8  |
| 25°   | 1964.3 | 1763.5 | 1192.9 | 560.0  | 246.8  | 208.3  | 196.3  | 182.4  | 173.8  | 167.0  | 167.4  |
| 27.5° | 1946.2 | 1719.6 | 1073.0 | 407.6  | 207.2  | 186.4  | 170.4  | 155.1  | 140.8  | 132.9  | 132.9  |
| 30°   | 1921.0 | 1669.8 | 939.7  | 291.8  | 185.8  | 165.0  | 145.5  | 126.5  | 111.1  | 104.0  | 103.3  |
| 32.5° | 1893.0 | 1618.0 | 805.1  | 221.2  | 168.7  | 144.9  | 122.7  | 102.6  | 89.0   | 83.2   | 82.8   |
| 35°   | 1869.2 | 1562.1 | 670.8  | 185.4  | 151.7  | 125.4  | 101.2  | 84.2   | 73.3   | 68.5   | 68.2   |
| 37.5° | 1853.8 | 1506.2 | 539.9  | 165.6  | 136.3  | 107.4  | 84.9   | 69.5   | 61.7   | 57.9   | 57.6   |
| 40°   | 1851.5 | 1464.6 | 420.3  | 150.7  | 122.0  | 91.3   | 70.9   | 59.0   | 51.8   | 47.7   | 47.4   |
| 42.5° | 1882.5 | 1440.7 | 322.4  | 138.0  | 107.4  | 77.4   | 60.3   | 50.4   | 42.9   | 38.9   | 38.5   |
| 45°   | 1963.9 | 1448.2 | 248.1  | 126.8  | 92.7   | 65.4   | 51.1   | 41.9   | 35.1   | 32.0   | 31.4   |
| 47.5° | 2112.5 | 1500.0 | 197.3  | 115.5  | 78.7   | 55.6   | 43.6   | 34.8   | 29.0   | 25.9   | 25.6   |
| 50°   | 2377.0 | 1621.7 | 165.0  | 103.3  | 65.8   | 47.4   | 36.1   | 28.3   | 23.5   | 20.8   | 20.5   |
| 52.5° | 2728.1 | 1838.5 | 147.2  | 91.3   | 54.5   | 40.2   | 29.7   | 22.5   | 18.4   | 16.4   | 16.0   |
| 55°   | 3115.3 | 2101.0 | 135.7  | 78.4   | 44.7   | 33.4   | 23.5   | 17.7   | 14.3   | 12.6   | 11.9   |
| 57.5° | 3493.3 | 2328.3 | 124.7  | 65.8   | 37.2   | 27.3   | 18.7   | 14.0   | 11.2   | 9.5    | 9.2    |
| 60°   | 3840.6 | 2537.2 | 112.1  | 52.8   | 30.3   | 21.5   | 14.7   | 10.9   | 8.9    | 7.2    | 7.2    |
| 62.5° | 4212.5 | 2698.8 | 94.8   | 41.2   | 24.9   | 16.4   | 11.9   | 9.9    | 7.2    | 6.1    | 5.8    |
| 65°   | 4606.5 | 2818.8 | 74.3   | 32.0   | 19.4   | 12.3   | 9.9    | 10.2   | 5.8    | 4.4    | 4.1    |
| 67.5° | 4897.6 | 2794.9 | 54.9   | 25.2   | 15.0   | 9.5    | 9.5    | 10.9   | 5.1    | 3.4    | 3.1    |
| 69°   | 4833.5 | 2601.0 | 46.0   | 21.8   | 13.0   | 8.2    | 8.9    | 10.9   | 4.8    | 3.1    | 2.7    |
| 70°   | 4647.7 | 2386.2 | 40.6   | 19.4   | 11.6   | 7.5    | 8.5    | 10.6   | 4.4    | 3.1    | 2.7    |
| 72.5° | 3870.6 | 1797.3 | 31.7   | 14.7   | 9.2    | 6.1    | 7.2    | 9.2    | 4.4    | 3.1    | 2.4    |
| 75°   | 2911.5 | 1150.3 | 24.2   | 10.6   | 6.8    | 4.8    | 5.5    | 6.8    | 4.4    | 2.7    | 2.4    |
| 77.5° | 1584.2 | 414.8  | 17.4   | 7.2    | 4.8    | 3.7    | 3.7    | 5.1    | 4.1    | 2.0    | 1.4    |
| 80°   | 407.3  | 104.3  | 10.9   | 4.8    | 3.7    | 2.7    | 2.4    | 3.4    | 2.4    | 0.3    | 0.0    |
| 82.5° | 100.5  | 23.5   | 5.8    | 3.4    | 2.7    | 1.0    | 1.0    | 1.7    | 1.0    | 0.0    | 0.0    |
| 85°   | 55.2   | 11.6   | 3.7    | 2.4    | 1.4    | 0.0    | 0.0    | 0.3    | 0.0    | 0.0    | 0.0    |
| 87.5° | 28.3   | 3.4    | 1.0    | 0.7    | 0.3    | 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: SP1-2012-088-5-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

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| 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



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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       | 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



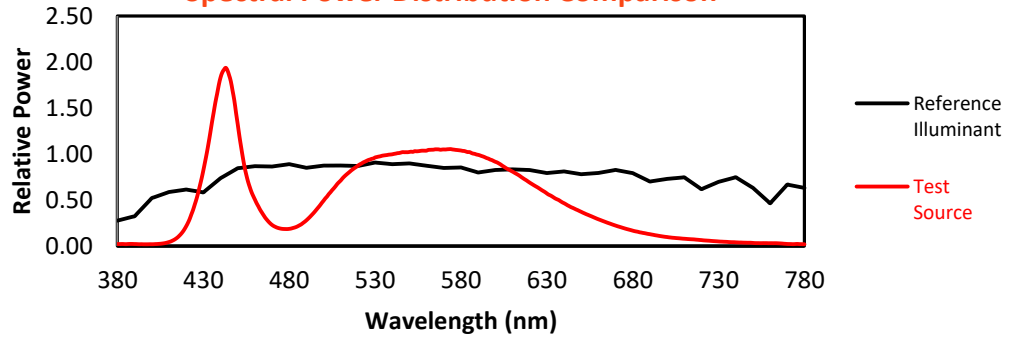
**Melanopic Lumens: 4010.3**      **S/P: 1.85**

| 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

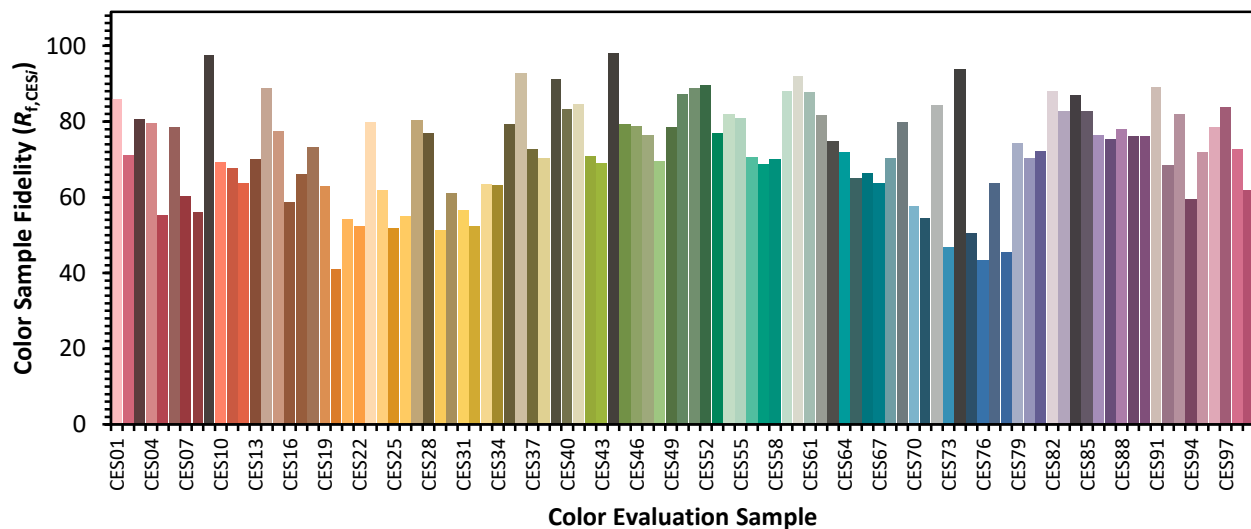


### Color Vector Graphics



**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)