

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: P386525

Luminaire Tested: **GWC-SA2B-722-U-SL2**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P386525  
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-SA2B-722-U-SL2  
Description: GALLEON WALL LUMINAIRE  
(2) 70 CRI, 2200K, 800mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE II SPILL  
LIGHT ELIMINATOR OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 8589 lumens  
Efficiency: N/A  
Efficacy: 101.0 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 0.5' x H: 0')  
IES Classification: Type III - Medium  
BUG Rating: B2 - U0 - G3

Input Watts (W): 85  
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



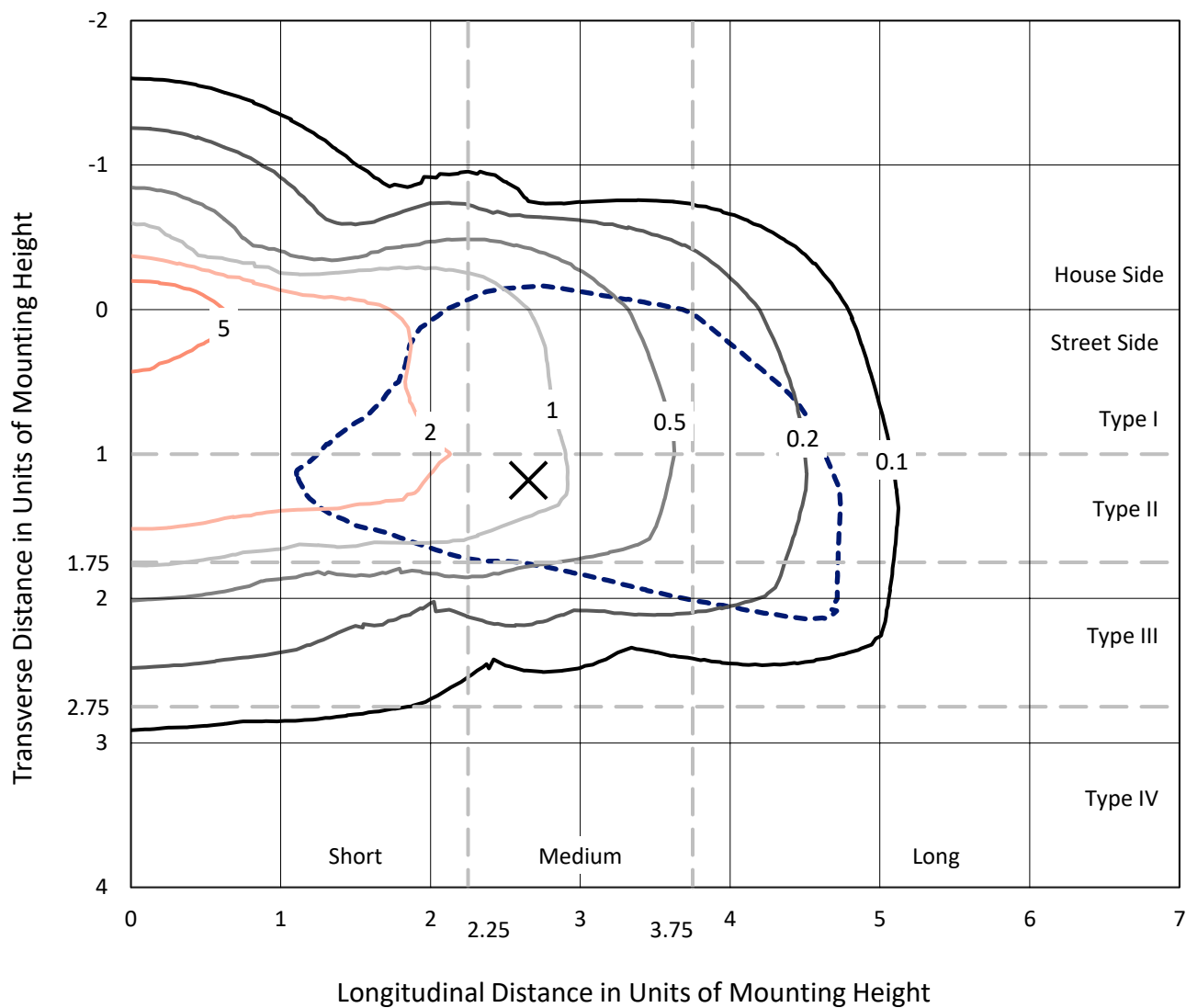
REPORT NUMBER: P386525

CATALOG NUMBER: GWC-SA2B-722-U-SL2

## Iso-Footcandle Lines of Horizontal Illumination

✕ Max cd

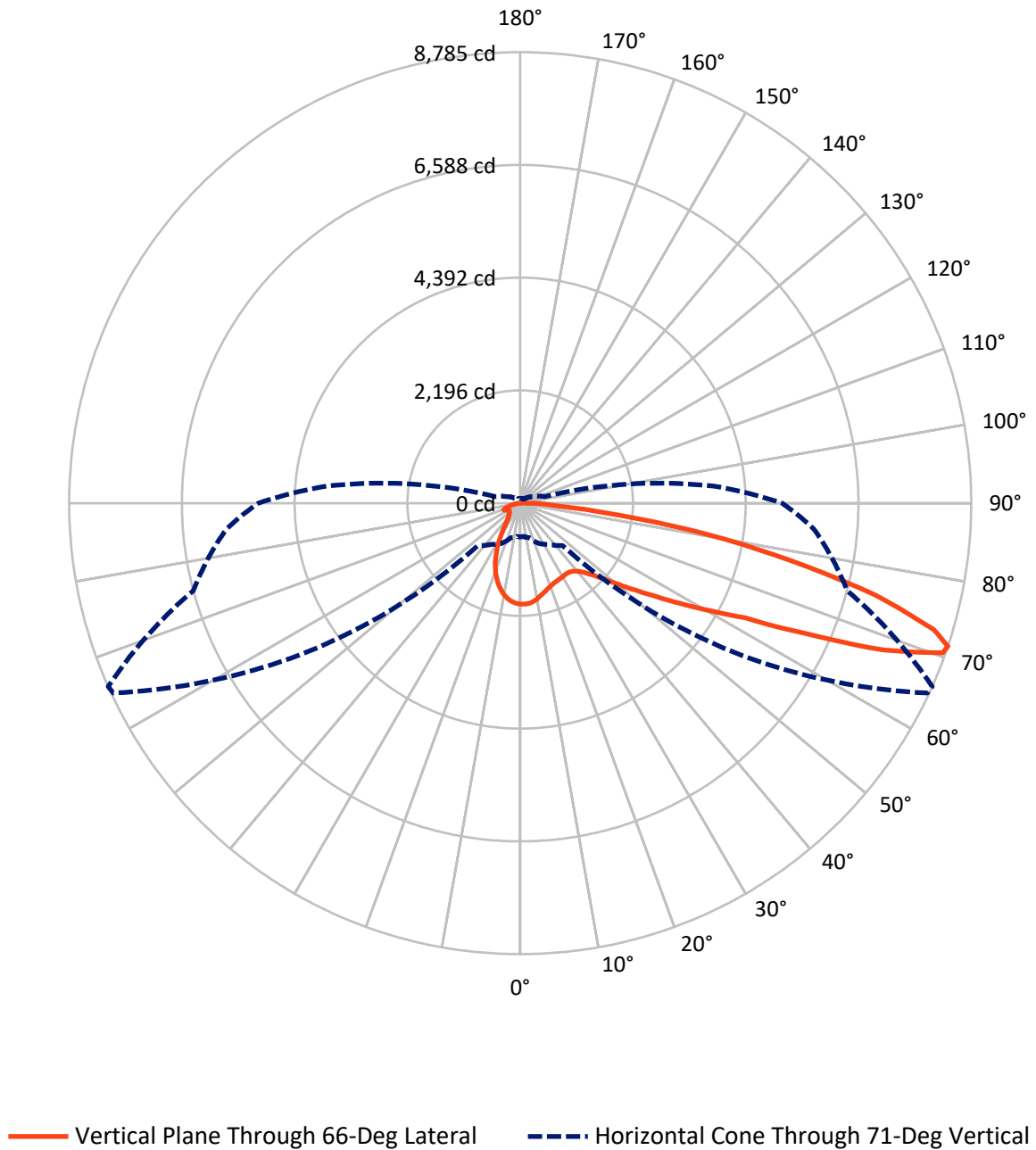
--- 1/2 Max cd



Based on 15 foot mounting height. Maximum calculated value = 8.7 fc  
 Type III - Medium - N/A

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## Luminous Intensity Polar Plot



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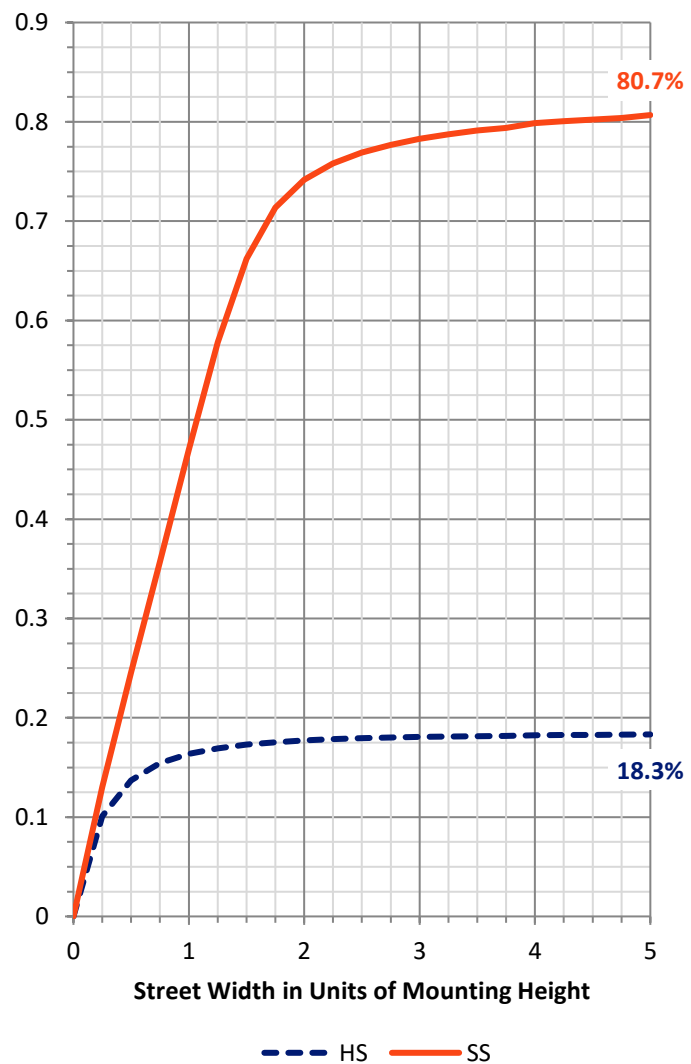
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 1591.8   | 0.0    | 1591.8 |
|                    | % Fixture | 18.5     | 0.0    | 18.5   |
| <b>Street Side</b> | Lumens    | 6997.2   | 0.0    | 6997.2 |
|                    | % Fixture | 81.5     | 0.0    | 81.5   |
| <b>Total</b>       | Lumens    | 8589.0   | 0.0    | 8589.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 173.2  | 2.0       |
| 10°-20°   | 415.4  | 4.8       |
| 20°-30°   | 558.0  | 6.5       |
| 30°-40°   | 734.0  | 8.5       |
| 40°-50°   | 1067.8 | 12.4      |
| 50°-60°   | 1668.0 | 19.4      |
| 60°-70°   | 2089.4 | 24.3      |
| 70°-80°   | 1593.8 | 18.6      |
| 80°-90°   | 289.4  | 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°    | 8589.0 | 100.0     |
| 0°-180°   | 8589.0 | 100.0     |

**Coefficient of Utilization**



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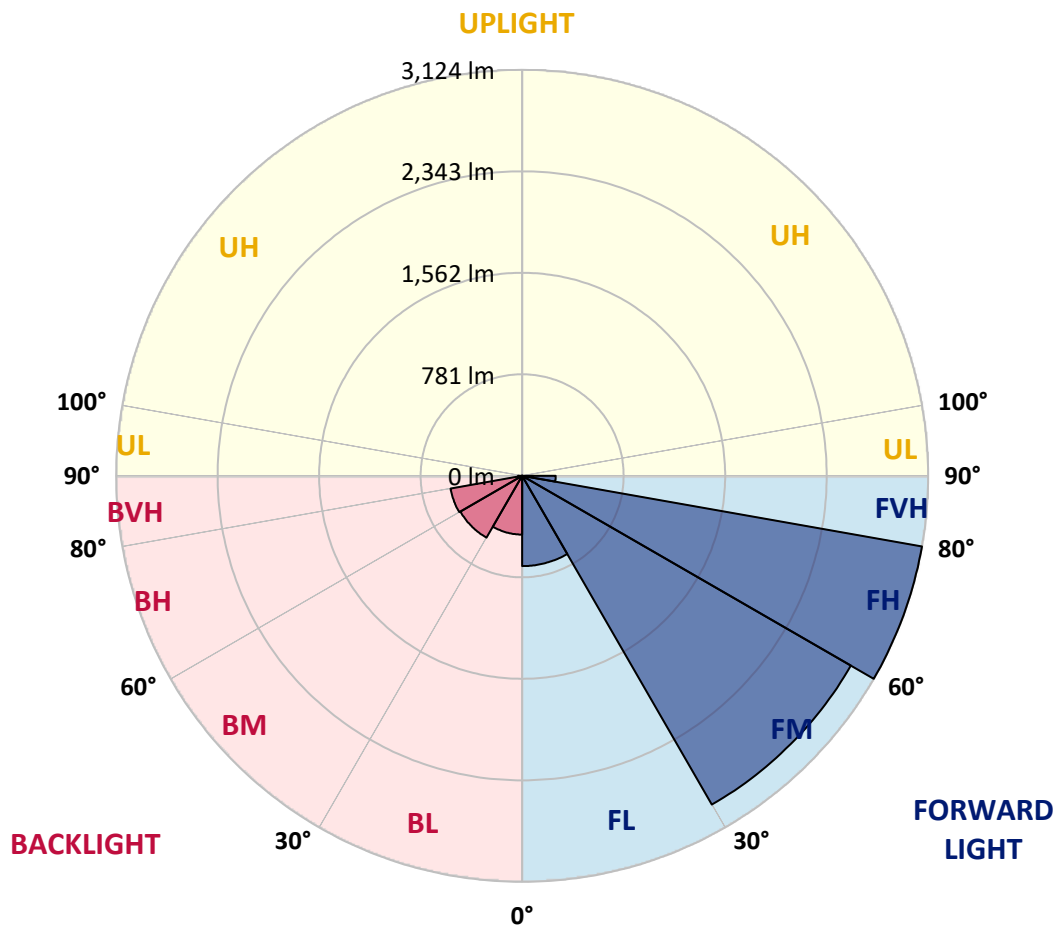
CATALOG NUMBER: GWC-SA2B-722-U-SL2

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 694.5  | 8.1       |                         |      |         |
| FM   | (30°-60°)   | 2920.7 | 34.0      |                         |      |         |
| FH   | (60°-80°)   | 3123.9 | 36.4      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 258.1  | 3.0       |                         |      | G3/500  |
| BL   | (0°-30°)    | 452.0  | 5.3       | B1/500                  |      |         |
| BM   | (30°-60°)   | 549.1  | 6.4       | B1/1000                 |      |         |
| BH   | (60°-80°)   | 559.3  | 6.5       | B2/1000                 |      | G2/1000 |
| BVH  | (80°-90°)   | 31.3   | 0.4       |                         |      | G1/100  |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B2-U0-G3**

Type III Medium



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 66°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1967.6 | 1967.6 | 1967.6 | 1967.6 | 1967.6 | 1967.6 | 1967.6 | 1967.6 | 1967.6 | 1967.6 | 1967.6 |
| 2.5°  | 1931.1 | 1928.1 | 1937.0 | 1946.2 | 1949.8 | 1955.7 | 1964.6 | 1969.6 | 1969.4 | 1970.2 | 1967.3 |
| 5°    | 1803.0 | 1799.1 | 1816.9 | 1831.5 | 1859.3 | 1890.8 | 1929.0 | 1956.3 | 1956.9 | 1972.3 | 1976.5 |
| 7.5°  | 1681.7 | 1679.0 | 1699.5 | 1722.9 | 1755.2 | 1803.3 | 1865.3 | 1924.0 | 1927.5 | 1969.4 | 1983.9 |
| 10°   | 1584.4 | 1583.8 | 1603.7 | 1629.2 | 1666.9 | 1720.6 | 1791.7 | 1877.7 | 1883.1 | 1955.1 | 1985.1 |
| 12.5° | 1508.5 | 1509.7 | 1526.9 | 1556.0 | 1595.7 | 1651.8 | 1728.9 | 1825.8 | 1834.4 | 1932.6 | 1978.2 |
| 15°   | 1452.5 | 1457.2 | 1471.2 | 1500.5 | 1539.7 | 1596.6 | 1675.8 | 1777.8 | 1790.8 | 1907.4 | 1974.4 |
| 17.5° | 1420.4 | 1425.8 | 1435.6 | 1459.9 | 1496.7 | 1551.5 | 1626.5 | 1738.3 | 1750.2 | 1888.1 | 1974.7 |
| 20°   | 1411.0 | 1415.4 | 1421.0 | 1435.9 | 1467.0 | 1516.8 | 1587.7 | 1702.8 | 1715.5 | 1872.7 | 1977.7 |
| 22.5° | 1429.6 | 1432.9 | 1433.5 | 1432.3 | 1451.3 | 1491.9 | 1559.5 | 1676.7 | 1690.3 | 1862.6 | 1979.7 |
| 25°   | 1469.7 | 1474.1 | 1470.9 | 1459.9 | 1453.7 | 1478.6 | 1545.0 | 1659.5 | 1673.1 | 1855.2 | 1975.6 |
| 27.5° | 1529.9 | 1530.5 | 1527.8 | 1513.6 | 1484.2 | 1480.1 | 1540.5 | 1649.4 | 1662.4 | 1846.6 | 1967.0 |
| 30°   | 1611.7 | 1615.6 | 1610.8 | 1591.6 | 1543.5 | 1503.8 | 1545.9 | 1639.6 | 1651.5 | 1835.6 | 1953.0 |
| 32.5° | 1707.5 | 1717.0 | 1716.7 | 1696.5 | 1627.7 | 1556.9 | 1567.8 | 1633.7 | 1642.9 | 1824.0 | 1936.1 |
| 35°   | 1806.8 | 1819.9 | 1844.2 | 1835.6 | 1750.5 | 1640.8 | 1609.9 | 1643.2 | 1649.4 | 1822.6 | 1924.3 |
| 37.5° | 1910.0 | 1923.1 | 1973.2 | 1996.3 | 1896.7 | 1760.9 | 1676.4 | 1676.7 | 1679.6 | 1840.7 | 1923.4 |
| 40°   | 2018.0 | 2031.9 | 2107.2 | 2167.4 | 2086.2 | 1913.0 | 1783.4 | 1746.6 | 1743.4 | 1885.1 | 1940.9 |
| 42.5° | 2169.2 | 2181.7 | 2272.1 | 2348.9 | 2296.4 | 2107.8 | 1931.4 | 1854.6 | 1847.8 | 1972.3 | 1996.9 |
| 45°   | 2360.5 | 2371.2 | 2467.3 | 2549.4 | 2522.4 | 2330.2 | 2117.3 | 2003.2 | 2002.0 | 2117.6 | 2110.5 |
| 47.5° | 2587.9 | 2596.2 | 2682.5 | 2762.0 | 2771.8 | 2586.2 | 2351.0 | 2232.4 | 2213.1 | 2316.9 | 2286.4 |
| 50°   | 2824.9 | 2834.1 | 2892.8 | 2978.2 | 3050.9 | 2928.7 | 2651.7 | 2513.2 | 2487.4 | 2579.9 | 2535.5 |
| 52.5° | 2981.8 | 2993.9 | 3044.9 | 3153.2 | 3364.6 | 3304.1 | 3007.3 | 2853.6 | 2814.5 | 2898.7 | 2864.6 |
| 55°   | 2911.8 | 2939.1 | 3017.0 | 3190.5 | 3615.5 | 3877.6 | 3445.8 | 3250.7 | 3206.5 | 3276.5 | 3256.4 |
| 57.5° | 2593.6 | 2630.9 | 2737.4 | 3005.2 | 3650.8 | 4382.9 | 4108.9 | 3718.4 | 3687.2 | 3667.1 | 3676.3 |
| 60°   | 2012.1 | 2047.9 | 2179.9 | 2528.9 | 3404.9 | 4751.8 | 5106.8 | 4294.9 | 4249.8 | 4059.1 | 4067.4 |
| 62.5° | 1424.0 | 1405.9 | 1496.4 | 1751.7 | 2766.8 | 4795.1 | 6242.3 | 5065.9 | 4917.6 | 4473.1 | 4436.6 |
| 65°   | 1085.9 | 1081.8 | 1122.4 | 1203.7 | 1675.8 | 4277.1 | 6918.7 | 6361.8 | 6130.2 | 4960.0 | 4874.0 |
| 67.5° | 892.3  | 884.9  | 924.9  | 1043.2 | 1079.1 | 2759.3 | 6933.5 | 7865.3 | 7637.8 | 5566.1 | 5379.9 |
| 70°   | 733.7  | 725.3  | 762.7  | 915.4  | 997.3  | 1399.4 | 5835.4 | 8745.7 | 8733.5 | 6333.6 | 5761.9 |
| 71°   | 657.7  | 651.8  | 696.6  | 866.2  | 979.8  | 1166.3 | 5038.3 | 8748.1 | 8784.5 | 6593.4 | 5739.3 |
| 72.5° | 535.6  | 537.6  | 585.1  | 771.0  | 966.7  | 1029.9 | 3703.0 | 8340.3 | 8417.4 | 6841.0 | 5534.4 |
| 75°   | 355.9  | 357.6  | 419.9  | 593.1  | 937.4  | 1007.7 | 2035.2 | 6998.5 | 7140.2 | 6692.7 | 5050.2 |
| 77.5° | 239.0  | 238.4  | 280.8  | 406.9  | 816.7  | 1007.7 | 1193.3 | 5234.3 | 5390.0 | 5325.3 | 3893.3 |
| 80°   | 164.6  | 163.4  | 193.3  | 280.8  | 618.3  | 1019.8 | 922.6  | 3668.3 | 3715.4 | 2875.9 | 1582.4 |
| 82.5° | 100.8  | 101.7  | 126.3  | 198.4  | 420.8  | 917.8  | 871.0  | 2000.2 | 1948.9 | 806.6  | 395.3  |
| 85°   | 57.8   | 57.5   | 80.7   | 134.3  | 270.2  | 774.6  | 849.3  | 860.9  | 789.7  | 242.9  | 142.9  |
| 87.5° | 20.8   | 22.2   | 43.3   | 74.4   | 154.8  | 539.4  | 720.6  | 447.8  | 403.6  | 109.7  | 64.6   |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

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CATALOG NUMBER: GWC-SA2B-722-U-SL2

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1967.6 | 1967.6 | 1967.6 | 1967.6 | 1967.6 | 1967.6 | 1967.6 | 1967.6 | 1967.6 | 1967.6 | 1967.6 |
| 2.5°  | 1965.2 | 1967.0 | 1964.9 | 1953.0 | 1943.0 | 1926.7 | 1917.5 | 1904.7 | 1900.9 | 1899.1 | 1903.8 |
| 5°    | 1972.6 | 1973.2 | 1955.7 | 1924.6 | 1889.6 | 1848.4 | 1818.7 | 1782.2 | 1765.0 | 1757.6 | 1762.4 |
| 7.5°  | 1979.4 | 1976.8 | 1938.5 | 1878.9 | 1814.3 | 1742.5 | 1678.7 | 1620.3 | 1586.2 | 1572.3 | 1573.5 |
| 10°   | 1980.3 | 1969.1 | 1907.7 | 1815.4 | 1715.2 | 1609.9 | 1512.1 | 1421.9 | 1365.0 | 1327.9 | 1339.2 |
| 12.5° | 1971.1 | 1952.2 | 1862.3 | 1733.3 | 1594.2 | 1450.7 | 1318.4 | 1183.2 | 1102.0 | 1064.3 | 1065.5 |
| 15°   | 1964.0 | 1929.6 | 1806.5 | 1636.6 | 1449.8 | 1259.7 | 1079.1 | 920.2  | 833.6  | 795.0  | 776.9  |
| 17.5° | 1958.1 | 1905.3 | 1741.9 | 1527.8 | 1279.3 | 1038.2 | 821.1  | 679.4  | 631.9  | 620.7  | 615.9  |
| 20°   | 1949.8 | 1879.5 | 1669.8 | 1401.8 | 1085.1 | 790.3  | 599.6  | 529.6  | 529.9  | 543.0  | 544.8  |
| 22.5° | 1938.2 | 1850.1 | 1593.0 | 1260.3 | 876.6  | 575.6  | 470.0  | 449.9  | 470.3  | 495.2  | 499.7  |
| 25°   | 1921.0 | 1815.4 | 1507.6 | 1104.0 | 668.4  | 442.4  | 401.5  | 400.6  | 425.5  | 451.6  | 455.5  |
| 27.5° | 1896.7 | 1770.1 | 1412.7 | 936.2  | 492.6  | 376.0  | 359.7  | 365.9  | 384.3  | 403.3  | 404.8  |
| 30°   | 1864.1 | 1717.3 | 1308.1 | 759.2  | 386.1  | 334.8  | 333.0  | 338.7  | 349.9  | 363.3  | 364.5  |
| 32.5° | 1828.2 | 1663.6 | 1196.3 | 587.8  | 330.6  | 312.6  | 314.3  | 317.0  | 322.3  | 327.7  | 328.9  |
| 35°   | 1795.6 | 1608.8 | 1081.8 | 446.6  | 304.3  | 298.0  | 296.8  | 296.2  | 296.8  | 295.1  | 295.4  |
| 37.5° | 1774.5 | 1563.4 | 962.6  | 355.6  | 289.1  | 285.3  | 281.7  | 277.3  | 272.2  | 269.3  | 269.9  |
| 40°   | 1766.8 | 1529.6 | 841.9  | 307.2  | 276.7  | 274.0  | 267.2  | 257.7  | 251.8  | 250.0  | 250.0  |
| 42.5° | 1787.6 | 1512.1 | 725.3  | 282.9  | 266.3  | 261.8  | 250.6  | 239.6  | 235.2  | 234.9  | 234.6  |
| 45°   | 1851.0 | 1519.2 | 614.4  | 269.6  | 256.8  | 248.2  | 233.4  | 224.2  | 221.2  | 221.8  | 221.5  |
| 47.5° | 1964.9 | 1564.0 | 519.5  | 260.7  | 247.3  | 236.0  | 219.4  | 212.0  | 208.5  | 208.5  | 208.8  |
| 50°   | 2158.5 | 1668.7 | 443.9  | 253.2  | 239.3  | 224.8  | 209.4  | 200.2  | 195.4  | 195.1  | 195.1  |
| 52.5° | 2440.6 | 1856.1 | 396.8  | 247.0  | 230.4  | 214.7  | 199.3  | 187.7  | 182.1  | 180.9  | 180.3  |
| 55°   | 2794.0 | 2124.7 | 383.7  | 242.9  | 218.6  | 203.7  | 187.1  | 175.6  | 169.3  | 166.7  | 166.4  |
| 57.5° | 3189.3 | 2451.5 | 409.5  | 237.8  | 206.4  | 190.7  | 173.8  | 162.8  | 156.3  | 153.0  | 152.7  |
| 60°   | 3589.4 | 2808.3 | 514.8  | 230.7  | 196.3  | 176.4  | 160.1  | 150.1  | 143.5  | 140.0  | 139.4  |
| 62.5° | 3990.0 | 3184.3 | 729.8  | 230.1  | 189.2  | 162.8  | 146.2  | 137.6  | 131.4  | 127.5  | 126.6  |
| 65°   | 4441.9 | 3595.9 | 974.1  | 245.8  | 186.8  | 150.3  | 132.0  | 125.1  | 119.8  | 116.2  | 115.9  |
| 67.5° | 4960.9 | 4060.6 | 950.7  | 278.2  | 194.8  | 139.1  | 118.6  | 113.3  | 109.4  | 106.5  | 106.2  |
| 70°   | 5204.4 | 3987.9 | 591.0  | 301.0  | 206.1  | 128.1  | 105.9  | 102.0  | 99.0   | 97.0   | 96.1   |
| 71°   | 5102.3 | 3786.6 | 495.5  | 298.3  | 204.9  | 123.4  | 100.8  | 97.9   | 94.9   | 93.1   | 92.2   |
| 72.5° | 4824.2 | 3453.3 | 413.4  | 277.6  | 191.6  | 114.8  | 94.3   | 91.3   | 88.7   | 86.6   | 86.0   |
| 75°   | 4329.0 | 3084.1 | 330.9  | 221.8  | 152.7  | 97.0   | 82.7   | 79.5   | 77.4   | 76.2   | 75.0   |
| 77.5° | 3182.2 | 2201.0 | 255.9  | 175.3  | 112.4  | 79.2   | 70.6   | 68.2   | 66.1   | 64.4   | 63.5   |
| 80°   | 1219.1 | 852.6  | 172.3  | 130.8  | 82.4   | 62.6   | 56.9   | 55.8   | 53.7   | 52.5   | 52.5   |
| 82.5° | 328.3  | 254.7  | 91.9   | 79.2   | 55.2   | 45.7   | 43.6   | 43.0   | 41.2   | 38.8   | 39.1   |
| 85°   | 132.9  | 112.4  | 51.6   | 43.6   | 33.8   | 27.0   | 29.4   | 29.7   | 27.6   | 24.6   | 24.9   |
| 87.5° | 58.4   | 47.7   | 28.8   | 19.3   | 14.8   | 10.4   | 13.3   | 13.3   | 12.2   | 10.1   | 9.2    |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

LM-79-08: Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

STREETWORKS

Report Number: SP1-2101-121-4

Luminaire Tested: IFLD-S-SA2B-722-U-T3R

Test Date: 03/03/2021

### Test Information

Test Method: LM-79-08  
 Report Number: SP1-2101-121-4  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1  
 Measurement Geometry:  $4\pi$   
 Issue Date: 03/03/2021  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: STREETWORKS  
 Catalog Number: **IFLD-S-SA2B-722-U-T3R**  
 Description: STREETWORKS INF FLOOD

PROGRAMMED @ 800mA.

### Spectral Parameters

|                           |         |           |      |      |       |
|---------------------------|---------|-----------|------|------|-------|
| CCT (K):                  | 2218    | CRI (Ra): | 72.2 |      |       |
| CIE u':                   | 0.2889  | R1:       | 69.1 | R9:  | -16.8 |
| CIE v':                   | 0.5350  | R2:       | 83.2 | R10: | 61.9  |
| Duv:                      | -0.0005 | R3:       | 95.4 | R11: | 60.1  |
| CIE x:                    | 0.5026  | R4:       | 66.4 | R12: | 51.2  |
| CIE y:                    | 0.4136  | R5:       | 66.2 | R13: | 71.3  |
| CIE z:                    | 0.0839  | R6:       | 76.7 | R14: | 97.1  |
| Peak Wavelength (nm):     | 606     | R7:       | 76.7 |      |       |
| Dominant Wavelength (nm): | 587     | R8:       | 43.9 |      |       |
| Purity:                   | 75.3    |           |      |      |       |
| Rf:                       | 70      |           |      |      |       |
| Rg:                       | 99.3    |           |      |      |       |



### Test Conditions

Stabilization Time: 95M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.3/31%  
 Sphere Temperature (°C): 24.8

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

REPORT NUMBER: SP1-2101-121-4

**CIE 1931 Chromaticity Diagram**



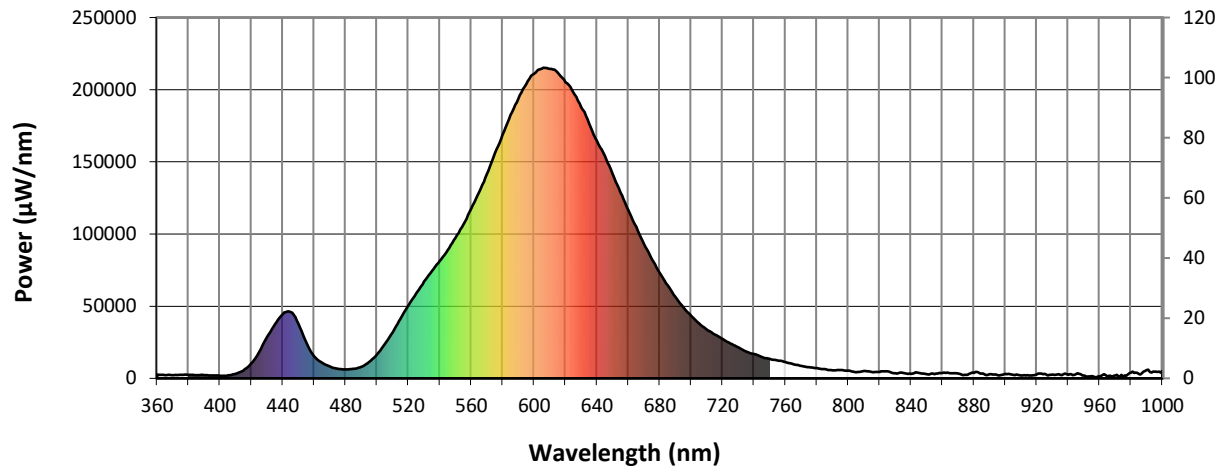
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 2200K 4-step quadrangle

REPORT NUMBER: SP1-2101-121-4

### 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       | 2623             | 0.0              | 490       | 7941             | 1.1              | 620       | 205150           | 53.4             | 750       | 13431            | 0.0              | 880       | 3867             | 0.0              |
| 365       | 2260             | 0.0              | 495       | 11299            | 2.0              | 625       | 198277           | 43.7             | 755       | 12426            | 0.0              | 885       | 3345             | 0.0              |
| 370       | 2306             | 0.0              | 500       | 16633            | 3.7              | 630       | 187878           | 34.0             | 760       | 11385            | 0.0              | 890       | 2956             | 0.0              |
| 375       | 2437             | 0.0              | 505       | 23672            | 6.6              | 635       | 176836           | 26.6             | 765       | 9797             | 0.0              | 895       | 2272             | 0.0              |
| 380       | 2473             | 0.0              | 510       | 32025            | 11.0             | 640       | 164455           | 19.7             | 770       | 8562             | 0.0              | 900       | 3003             | 0.0              |
| 385       | 2203             | 0.0              | 515       | 41295            | 17.1             | 645       | 154086           | 14.8             | 775       | 7810             | 0.0              | 905       | 2480             | 0.0              |
| 390       | 2262             | 0.0              | 520       | 50628            | 24.6             | 650       | 141592           | 10.3             | 780       | 7052             | 0.0              | 910       | 2068             | 0.0              |
| 395       | 2028             | 0.0              | 525       | 58836            | 31.6             | 655       | 128604           | 7.4              | 785       | 6345             | 0.0              | 915       | 2064             | 0.0              |
| 400       | 1806             | 0.0              | 530       | 67109            | 39.5             | 660       | 116713           | 4.9              | 790       | 5524             | 0.0              | 920       | 2581             | 0.0              |
| 405       | 1945             | 0.0              | 535       | 74404            | 46.1             | 665       | 104993           | 3.3              | 795       | 5788             | 0.0              | 925       | 3137             | 0.0              |
| 410       | 3199             | 0.0              | 540       | 81280            | 53.0             | 670       | 93149            | 2.0              | 800       | 5282             | 0.0              | 930       | 2747             | 0.0              |
| 415       | 5572             | 0.0              | 545       | 88806            | 59.1             | 675       | 82543            | 1.4              | 805       | 4258             | 0.0              | 935       | 2471             | 0.0              |
| 420       | 10322            | 0.0              | 550       | 97367            | 66.2             | 680       | 73089            | 0.8              | 810       | 5156             | 0.0              | 940       | 2339             | 0.0              |
| 425       | 18494            | 0.1              | 555       | 106598           | 72.8             | 685       | 64438            | 0.6              | 815       | 4391             | 0.0              | 945       | 2917             | 0.0              |
| 430       | 28541            | 0.2              | 560       | 117615           | 79.9             | 690       | 56546            | 0.3              | 820       | 4383             | 0.0              | 950       | 1966             | 0.0              |
| 435       | 37453            | 0.4              | 565       | 129103           | 85.8             | 695       | 49328            | 0.2              | 825       | 4881             | 0.0              | 955       | 1580             | 0.0              |
| 440       | 44455            | 0.7              | 570       | 141415           | 92.0             | 700       | 43493            | 0.1              | 830       | 3588             | 0.0              | 960       | 1318             | 0.0              |
| 445       | 45934            | 1.0              | 575       | 155854           | 97.0             | 705       | 38035            | 0.1              | 835       | 3835             | 0.0              | 965       | 1419             | 0.0              |
| 450       | 37926            | 1.0              | 580       | 168613           | 100.2            | 710       | 33716            | 0.0              | 840       | 3014             | 0.0              | 970       | 1917             | 0.0              |
| 455       | 24793            | 0.8              | 585       | 182390           | 101.3            | 715       | 30449            | 0.0              | 845       | 3765             | 0.0              | 975       | 1210             | 0.0              |
| 460       | 15340            | 0.6              | 590       | 194054           | 100.3            | 720       | 27240            | 0.0              | 850       | 2906             | 0.0              | 980       | 3915             | 0.0              |
| 465       | 10883            | 0.6              | 595       | 203639           | 96.5             | 725       | 24231            | 0.0              | 855       | 2947             | 0.0              | 985       | 3180             | 0.0              |
| 470       | 8138             | 0.5              | 600       | 211043           | 91.0             | 730       | 21490            | 0.0              | 860       | 3864             | 0.0              | 990       | 5676             | 0.0              |
| 475       | 6653             | 0.5              | 605       | 214591           | 83.1             | 735       | 18548            | 0.0              | 865       | 3546             | 0.0              | 995       | 4736             | 0.0              |
| 480       | 6220             | 0.6              | 610       | 214337           | 73.6             | 740       | 16963            | 0.0              | 870       | 3253             | 0.0              | 1000      | 5113             | 0.0              |
| 485       | 6613             | 0.8              | 615       | 211915           | 64.0             | 745       | 14922            | 0.0              | 875       | 2450             | 0.0              |           |                  |                  |

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### Scotopic Flux vs. Wavelength



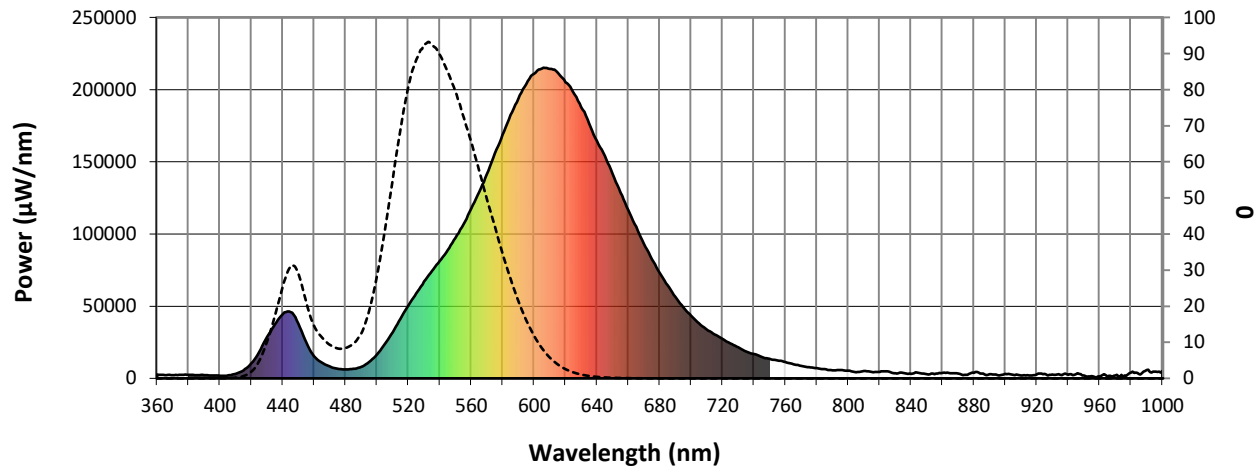
Scotopic Lumens: 7290.1

S/P: 0.84

| 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       | 2623             | 0.0              | 490       | 7941             | 12.2             | 620       | 205150           | 2.6              | 750       | 13431            | 0.0              | 880       | 3867             | 0.0              |
| 365       | 2260             | 0.0              | 495       | 11299            | 18.3             | 625       | 198277           | 1.7              | 755       | 12426            | 0.0              | 885       | 3345             | 0.0              |
| 370       | 2306             | 0.0              | 500       | 16633            | 27.8             | 630       | 187878           | 1.1              | 760       | 11385            | 0.0              | 890       | 2956             | 0.0              |
| 375       | 2437             | 0.0              | 505       | 23672            | 40.2             | 635       | 176836           | 0.7              | 765       | 9797             | 0.0              | 895       | 2272             | 0.0              |
| 380       | 2473             | 0.0              | 510       | 32025            | 54.3             | 640       | 164455           | 0.4              | 770       | 8562             | 0.0              | 900       | 3003             | 0.0              |
| 385       | 2203             | 0.0              | 515       | 41295            | 68.4             | 645       | 154086           | 0.3              | 775       | 7810             | 0.0              | 905       | 2480             | 0.0              |
| 390       | 2262             | 0.0              | 520       | 50628            | 80.5             | 650       | 141592           | 0.2              | 780       | 7052             | 0.0              | 910       | 2068             | 0.0              |
| 395       | 2028             | 0.0              | 525       | 58836            | 88.0             | 655       | 128604           | 0.1              | 785       | 6345             | 0.0              | 915       | 2064             | 0.0              |
| 400       | 1806             | 0.0              | 530       | 67109            | 92.5             | 660       | 116713           | 0.1              | 790       | 5524             | 0.0              | 920       | 2581             | 0.0              |
| 405       | 1945             | 0.1              | 535       | 74404            | 92.7             | 665       | 104993           | 0.0              | 795       | 5788             | 0.0              | 925       | 3137             | 0.0              |
| 410       | 3199             | 0.2              | 540       | 81280            | 89.8             | 670       | 93149            | 0.0              | 800       | 5282             | 0.0              | 930       | 2747             | 0.0              |
| 415       | 5572             | 0.6              | 545       | 88806            | 85.1             | 675       | 82543            | 0.0              | 805       | 4258             | 0.0              | 935       | 2471             | 0.0              |
| 420       | 10322            | 1.7              | 550       | 97367            | 79.6             | 680       | 73089            | 0.0              | 810       | 5156             | 0.0              | 940       | 2339             | 0.0              |
| 425       | 18494            | 4.5              | 555       | 106598           | 72.8             | 685       | 64438            | 0.0              | 815       | 4391             | 0.0              | 945       | 2917             | 0.0              |
| 430       | 28541            | 9.7              | 560       | 117615           | 65.7             | 690       | 56546            | 0.0              | 820       | 4383             | 0.0              | 950       | 1966             | 0.0              |
| 435       | 37453            | 16.7             | 565       | 129103           | 57.9             | 695       | 49328            | 0.0              | 825       | 4881             | 0.0              | 955       | 1580             | 0.0              |
| 440       | 44455            | 24.8             | 570       | 141415           | 49.9             | 700       | 43493            | 0.0              | 830       | 3588             | 0.0              | 960       | 1318             | 0.0              |
| 445       | 45934            | 30.8             | 575       | 155854           | 42.4             | 705       | 38035            | 0.0              | 835       | 3835             | 0.0              | 965       | 1419             | 0.0              |
| 450       | 37926            | 29.4             | 580       | 168613           | 34.7             | 710       | 33716            | 0.0              | 840       | 3014             | 0.0              | 970       | 1917             | 0.0              |
| 455       | 24793            | 21.7             | 585       | 182390           | 27.9             | 715       | 30449            | 0.0              | 845       | 3765             | 0.0              | 975       | 1210             | 0.0              |
| 460       | 15340            | 14.8             | 590       | 194054           | 21.6             | 720       | 27240            | 0.0              | 850       | 2906             | 0.0              | 980       | 3915             | 0.0              |
| 465       | 10883            | 11.5             | 595       | 203639           | 16.2             | 725       | 24231            | 0.0              | 855       | 2947             | 0.0              | 985       | 3180             | 0.0              |
| 470       | 8138             | 9.4              | 600       | 211043           | 11.9             | 730       | 21490            | 0.0              | 860       | 3864             | 0.0              | 990       | 5676             | 0.0              |
| 475       | 6653             | 8.3              | 605       | 214591           | 8.4              | 735       | 18548            | 0.0              | 865       | 3546             | 0.0              | 995       | 4736             | 0.0              |
| 480       | 6220             | 8.4              | 610       | 214337           | 5.8              | 740       | 16963            | 0.0              | 870       | 3253             | 0.0              | 1000      | 5113             | 0.0              |
| 485       | 6613             | 9.6              | 615       | 211915           | 3.9              | 745       | 14922            | 0.0              | 875       | 2450             | 0.0              |           |                  |                  |

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### Melanopic Flux vs. Wavelength



**Melanopic Lumens: 2276.7**

**M/P: 0.26**

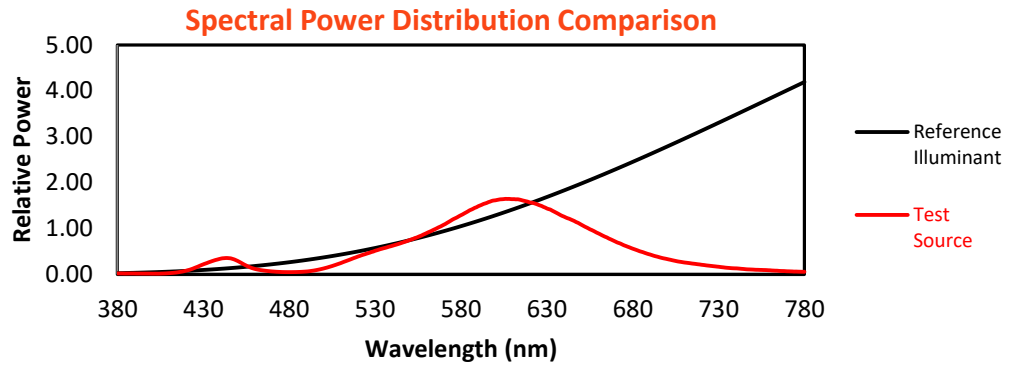
| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 2623             | 0.0              | 490       | 7941             | 6.6              | 620       | 205150           | 0.2              | 750       | 13431            | 0.0              | 880       | 3867             | 0.0              |
| 365       | 2260             | 0.0              | 495       | 11299            | 9.3              | 625       | 198277           | 0.1              | 755       | 12426            | 0.0              | 885       | 3345             | 0.0              |
| 370       | 2306             | 0.0              | 500       | 16633            | 13.4             | 630       | 187878           | 0.1              | 760       | 11385            | 0.0              | 890       | 2956             | 0.0              |
| 375       | 2437             | 0.0              | 505       | 23672            | 18.2             | 635       | 176836           | 0.0              | 765       | 9797             | 0.0              | 895       | 2272             | 0.0              |
| 380       | 2473             | 0.0              | 510       | 32025            | 23.0             | 640       | 164455           | 0.0              | 770       | 8562             | 0.0              | 900       | 3003             | 0.0              |
| 385       | 2203             | 0.0              | 515       | 41295            | 27.0             | 645       | 154086           | 0.0              | 775       | 7810             | 0.0              | 905       | 2480             | 0.0              |
| 390       | 2262             | 0.0              | 520       | 50628            | 29.5             | 650       | 141592           | 0.0              | 780       | 7052             | 0.0              | 910       | 2068             | 0.0              |
| 395       | 2028             | 0.0              | 525       | 58836            | 29.8             | 655       | 128604           | 0.0              | 785       | 6345             | 0.0              | 915       | 2064             | 0.0              |
| 400       | 1806             | 0.0              | 530       | 67109            | 29.0             | 660       | 116713           | 0.0              | 790       | 5524             | 0.0              | 920       | 2581             | 0.0              |
| 405       | 1945             | 0.0              | 535       | 74404            | 26.8             | 665       | 104993           | 0.0              | 795       | 5788             | 0.0              | 925       | 3137             | 0.0              |
| 410       | 3199             | 0.1              | 540       | 81280            | 23.8             | 670       | 93149            | 0.0              | 800       | 5282             | 0.0              | 930       | 2747             | 0.0              |
| 415       | 5572             | 0.4              | 545       | 88806            | 20.6             | 675       | 82543            | 0.0              | 805       | 4258             | 0.0              | 935       | 2471             | 0.0              |
| 420       | 10322            | 1.2              | 550       | 97367            | 17.5             | 680       | 73089            | 0.0              | 810       | 5156             | 0.0              | 940       | 2339             | 0.0              |
| 425       | 18494            | 2.9              | 555       | 106598           | 14.4             | 685       | 64438            | 0.0              | 815       | 4391             | 0.0              | 945       | 2917             | 0.0              |
| 430       | 28541            | 6.0              | 560       | 117615           | 11.6             | 690       | 56546            | 0.0              | 820       | 4383             | 0.0              | 950       | 1966             | 0.0              |
| 435       | 37453            | 10.0             | 565       | 129103           | 9.1              | 695       | 49328            | 0.0              | 825       | 4881             | 0.0              | 955       | 1580             | 0.0              |
| 440       | 44455            | 14.9             | 570       | 141415           | 6.9              | 700       | 43493            | 0.0              | 830       | 3588             | 0.0              | 960       | 1318             | 0.0              |
| 445       | 45934            | 18.1             | 575       | 155854           | 5.2              | 705       | 38035            | 0.0              | 835       | 3835             | 0.0              | 965       | 1419             | 0.0              |
| 450       | 37926            | 17.5             | 580       | 168613           | 3.8              | 710       | 33716            | 0.0              | 840       | 3014             | 0.0              | 970       | 1917             | 0.0              |
| 455       | 24793            | 13.0             | 585       | 182390           | 2.7              | 715       | 30449            | 0.0              | 845       | 3765             | 0.0              | 975       | 1210             | 0.0              |
| 460       | 15340            | 9.0              | 590       | 194054           | 1.9              | 720       | 27240            | 0.0              | 850       | 2906             | 0.0              | 980       | 3915             | 0.0              |
| 465       | 10883            | 7.1              | 595       | 203639           | 1.3              | 725       | 24231            | 0.0              | 855       | 2947             | 0.0              | 985       | 3180             | 0.0              |
| 470       | 8138             | 5.8              | 600       | 211043           | 0.9              | 730       | 21490            | 0.0              | 860       | 3864             | 0.0              | 990       | 5676             | 0.0              |
| 475       | 6653             | 5.1              | 605       | 214591           | 0.6              | 735       | 18548            | 0.0              | 865       | 3546             | 0.0              | 995       | 4736             | 0.0              |
| 480       | 6220             | 5.0              | 610       | 214337           | 0.4              | 740       | 16963            | 0.0              | 870       | 3253             | 0.0              | 1000      | 5113             | 0.0              |
| 485       | 6613             | 5.5              | 615       | 211915           | 0.3              | 745       | 14922            | 0.0              | 875       | 2450             | 0.0              |           |                  |                  |

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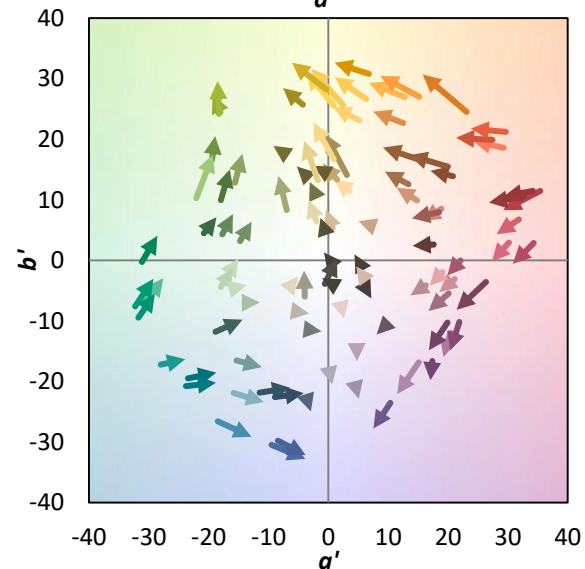
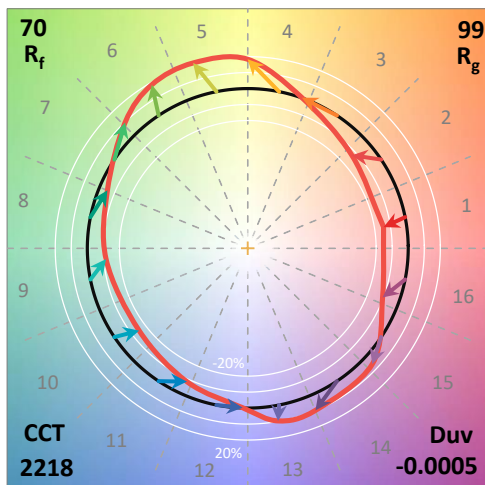
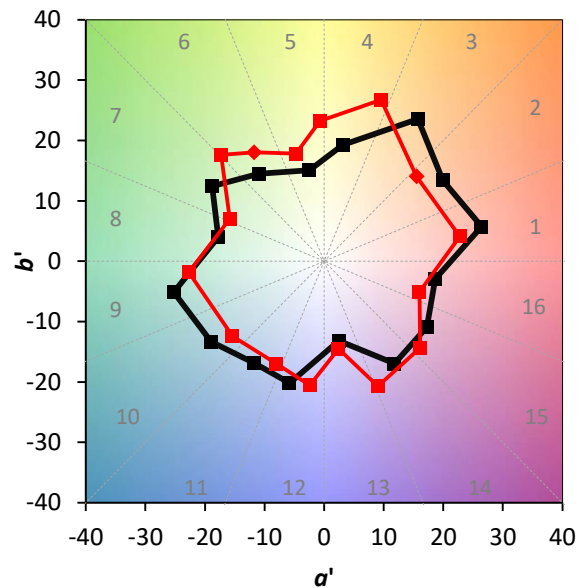
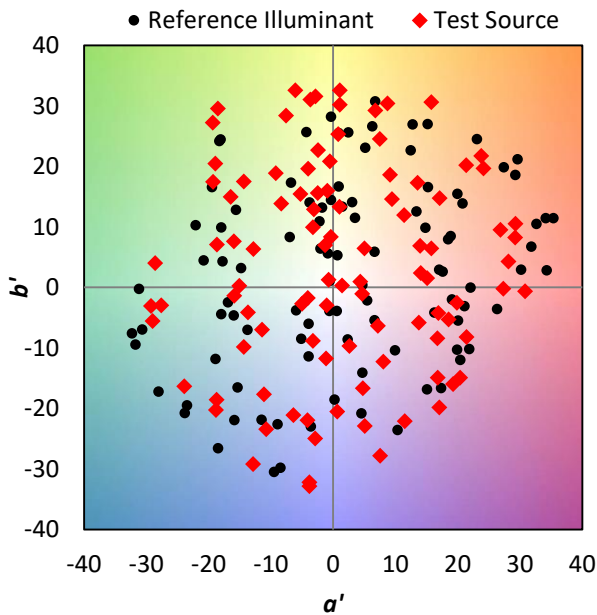
TM-30-18

### Summary

$R_f = 70$   
 $R_g = 99.3$   
 CIE  $R_a = 72.2$   
 $R_g = -16.8$

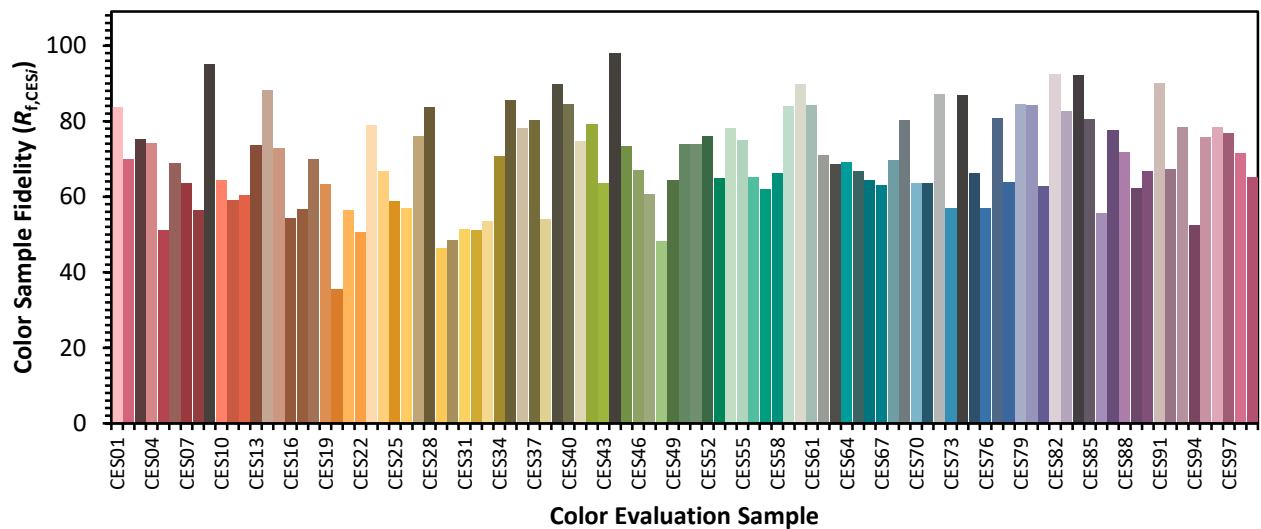


### Color Vector Graphics

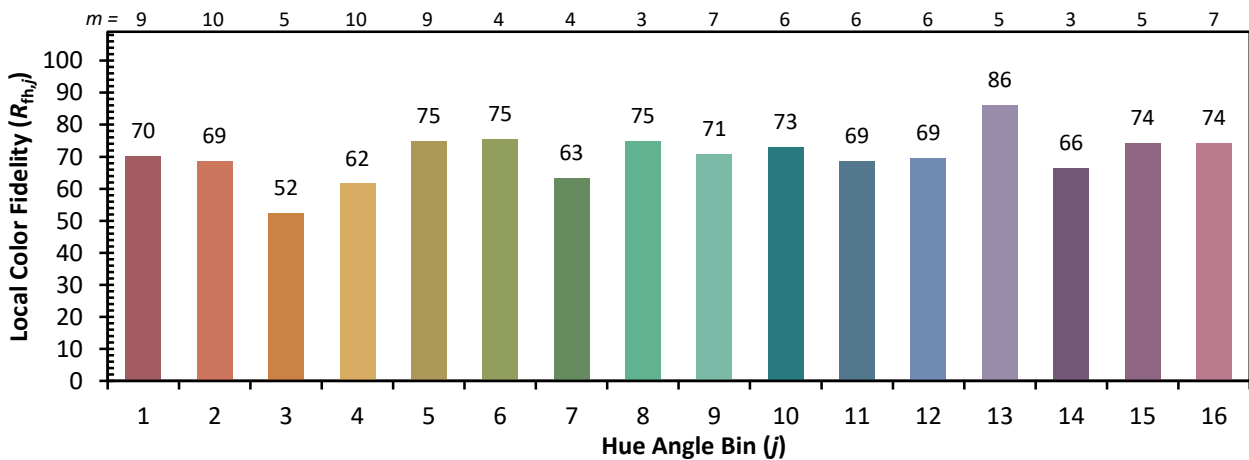
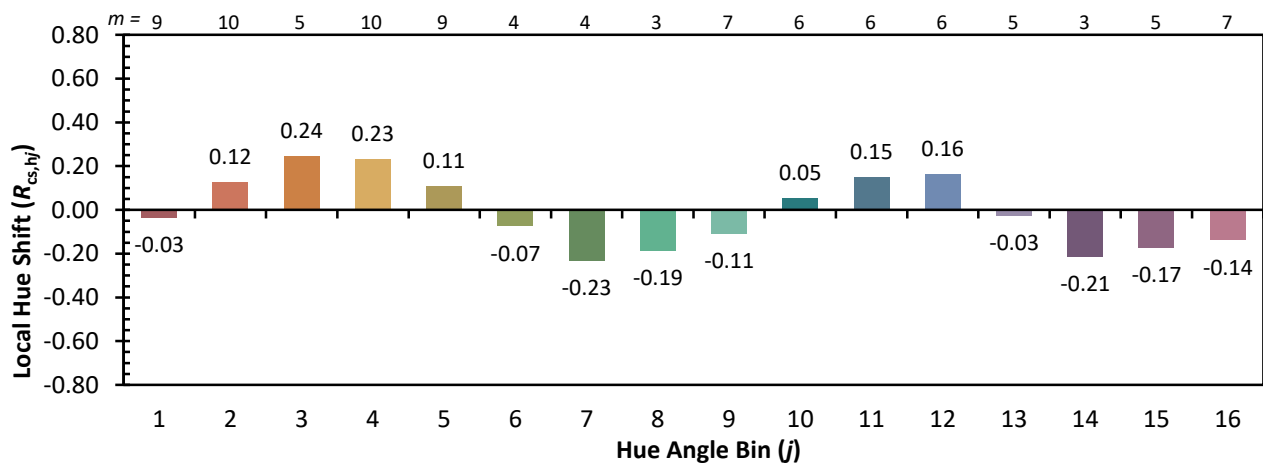
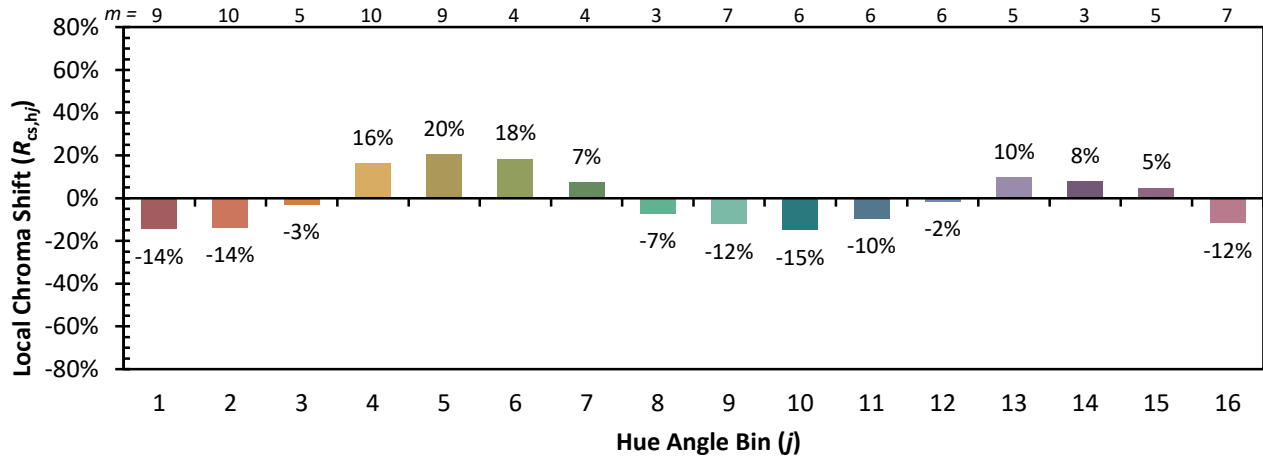


Individual Sample Fidelity Index ( $R_{f,i}$ )

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 87 | CES26 = 57 | CES51 = 74 | CES76 = 57 |
| CES02 = 65 | CES27 = 76 | CES52 = 76 | CES77 = 81 |
| CES03 = 32 | CES28 = 84 | CES53 = 65 | CES78 = 64 |
| CES04 = 72 | CES29 = 46 | CES54 = 78 | CES79 = 85 |
| CES05 = 52 | CES30 = 48 | CES55 = 75 | CES80 = 84 |
| CES06 = 52 | CES31 = 52 | CES56 = 65 | CES81 = 63 |
| CES07 = 44 | CES32 = 51 | CES57 = 62 | CES82 = 92 |
| CES08 = 43 | CES33 = 54 | CES58 = 66 | CES83 = 83 |
| CES09 = 29 | CES34 = 71 | CES59 = 84 | CES84 = 92 |
| CES10 = 79 | CES35 = 86 | CES60 = 90 | CES85 = 81 |
| CES11 = 62 | CES36 = 78 | CES61 = 84 | CES86 = 56 |
| CES12 = 68 | CES37 = 80 | CES62 = 71 | CES87 = 78 |
| CES13 = 45 | CES38 = 54 | CES63 = 68 | CES88 = 72 |
| CES14 = 75 | CES39 = 90 | CES64 = 69 | CES89 = 62 |
| CES15 = 72 | CES40 = 85 | CES65 = 67 | CES90 = 67 |
| CES16 = 49 | CES41 = 75 | CES66 = 64 | CES91 = 90 |
| CES17 = 51 | CES42 = 79 | CES67 = 63 | CES92 = 67 |
| CES18 = 57 | CES43 = 64 | CES68 = 70 | CES93 = 78 |
| CES19 = 74 | CES44 = 98 | CES69 = 80 | CES94 = 52 |
| CES20 = 68 | CES45 = 73 | CES70 = 64 | CES95 = 76 |
| CES21 = 89 | CES46 = 67 | CES71 = 64 | CES96 = 78 |
| CES22 = 81 | CES47 = 61 | CES72 = 87 | CES97 = 77 |
| CES23 = 92 | CES48 = 48 | CES73 = 57 | CES98 = 72 |
| CES24 = 92 | CES49 = 64 | CES74 = 87 | CES99 = 65 |
| CES25 = 74 | CES50 = 74 | CES75 = 66 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)