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

Scaled data based on original data using

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

Test Report Prepared for

Cooper Lighting Solutions

Brand: McGRAW-EDISON

Report Number: P634516

Luminaire Tested: GWS-SA3B-830-U-SL3-W

Issue Date: 1/10/2023

Report Generated By 670246102 / DESKTOP-G35701P

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

Scaled Data Report

**Test Information**

| | |
|---|---|
| Test Method: | LM-79-2019 |
| Report Number: | P634516 |
| | TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-31) |
| Test Lab: | COOPER LIGHTING SOLUTIONS |
| Issue Date: | 1/10/2023 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS |
| Product Line: | McGRAW-EDISON |
| Catalog Number: | GWS-SA3B-830-U-SL3-W |
| Description: | GALLEON WALL SLIM LUMINAIRE. (3) LIGHTSQUARES WITH 16 LEDS EACH AND TYPE III SPILL LIGHT ELIMINATOR OPTICS |
| Light Source: | (48) 3000K CCT, 80 CRI LEDS |
| Ballast/Driver: | - |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 8096.1 lumens |
| Efficiency: | N/A |
| Efficacy: | 118.5 lumens/watt |
| Luminous Opening: | Rectangular (W 1.5' x L: 0.5' x H: 0') |
| IES Classification: | Type III - Medium |
| BUG Rating: | B1 - U0 - G2 |

| | |
|---|---|
| Input Watts (W): | 68.3 |
| Input Voltage (V): | 120 |
| Input Current (Ain): | NR |
| Voltage Rise (V): | NR |
| Power Factor: | NR |
| Total Harmonic Distortion (THDi): | NR |
| Frequency (hertz): | 0 |
| Stabilization Time: | NR |
| Operation Time: | NR |
| Ambient Temperature (°C): | NR |
| Test Distance: | 28.75 FT |

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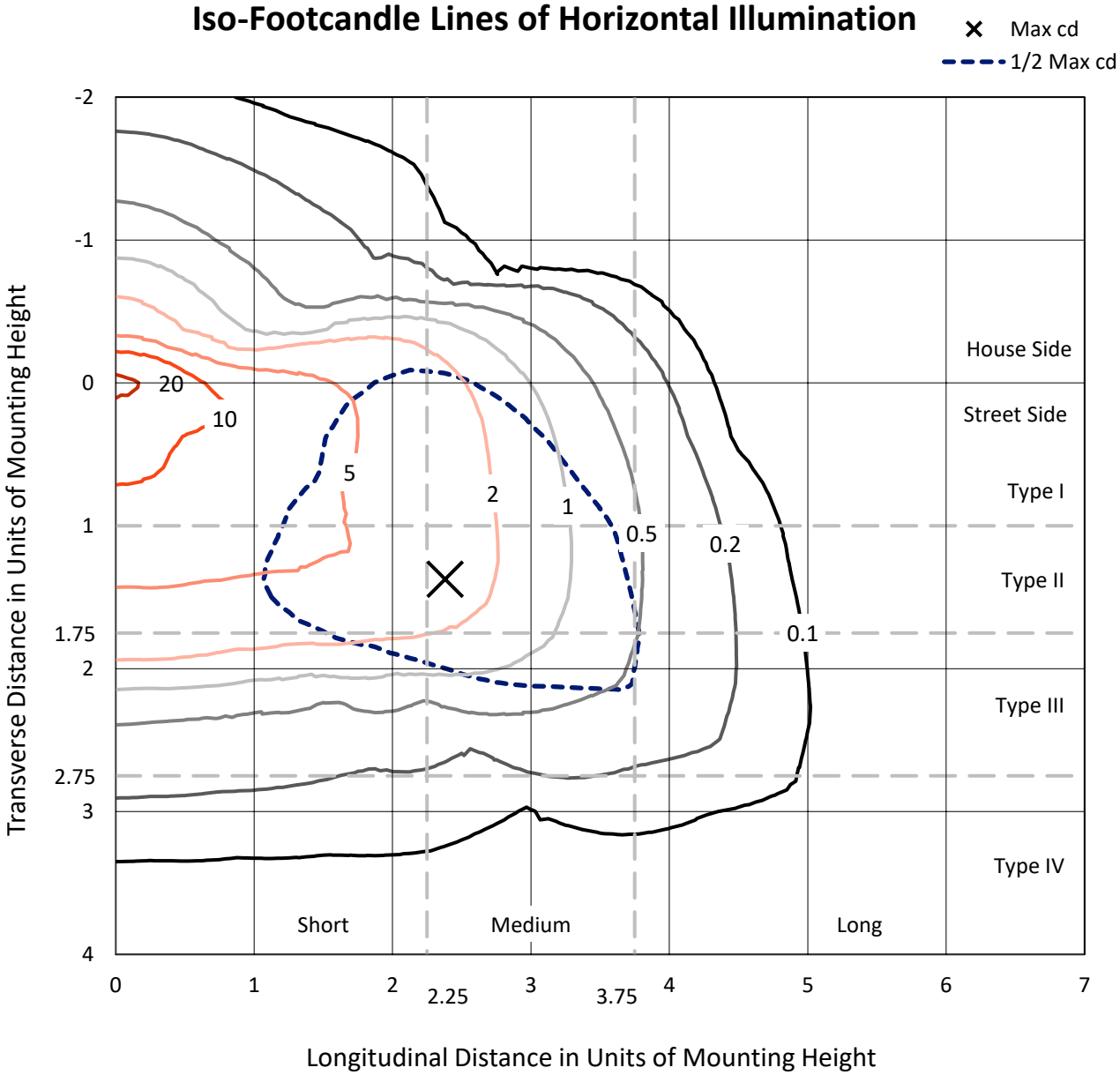
Scaled Data Report

REPORT NUMBER: P634516
CATALOG NUMBER: GWS-SA3B-830-U-SL3-W

## Iso-Footcandle Lines of Horizontal Illumination




Based on 10 foot mounting height. Maximum calculated value = 22.4 fc
Type III - Medium - N/A

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REPORT NUMBER: P634516
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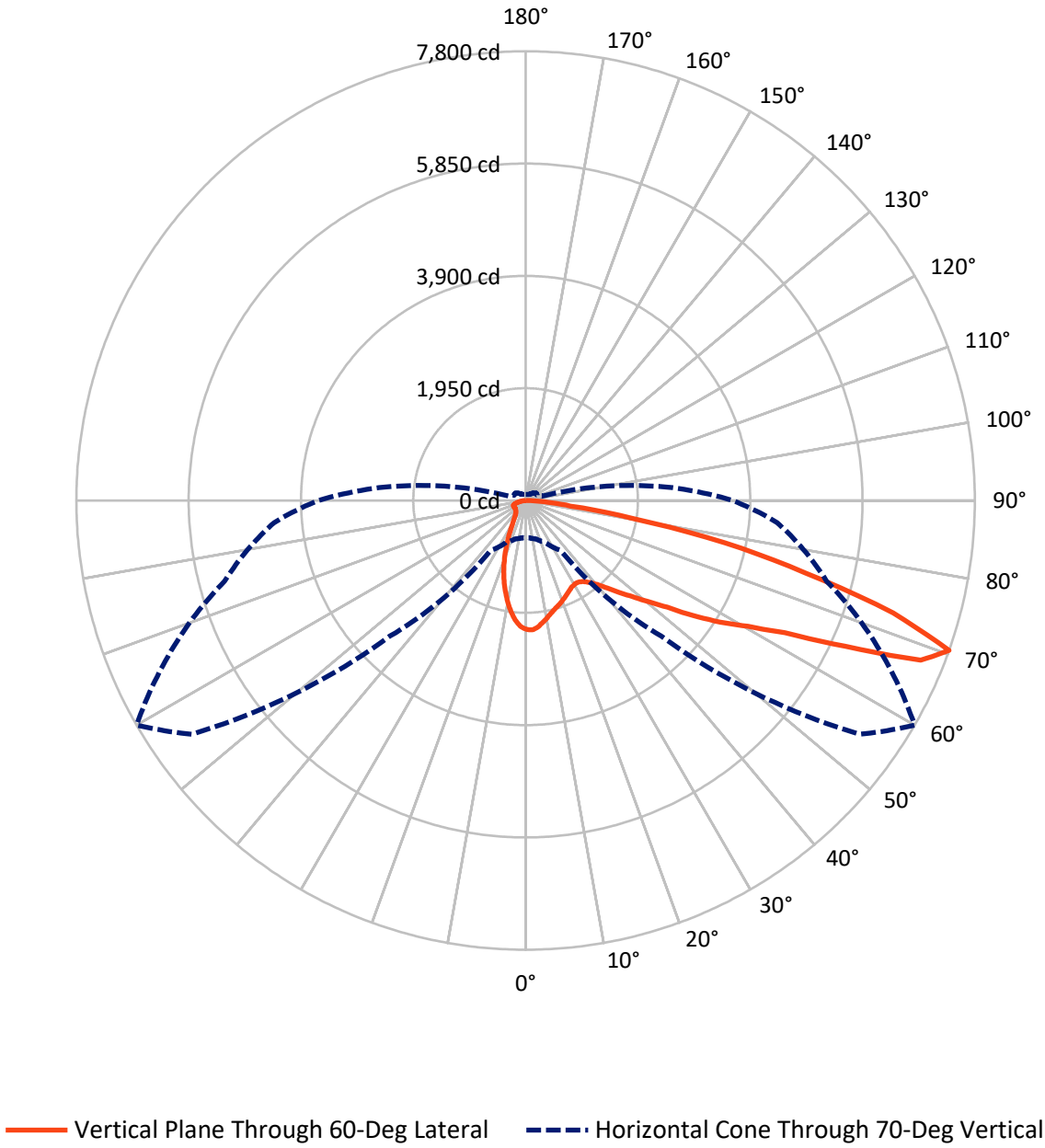
## Luminous Intensity Polar Plot



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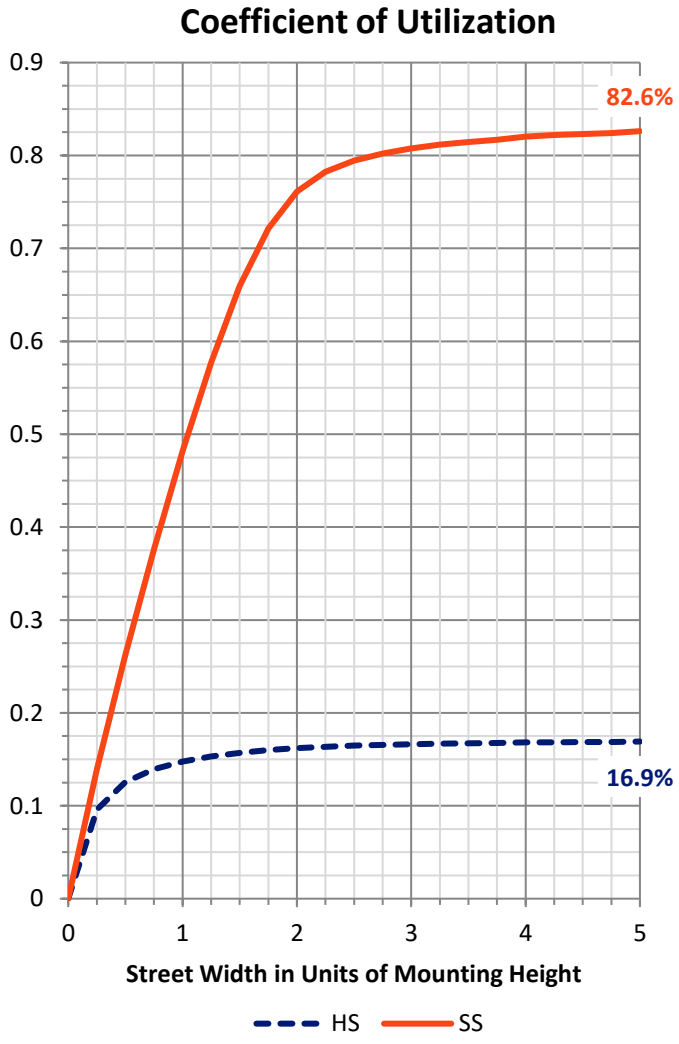
REPORT NUMBER: P634516
CATALOG NUMBER: GWS-SA3B-830-U-SL3-W

**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 1384.6 | 0.0 | 1384.6 |
| | % Fixture | 17.1 | 0.0 | 17.1 |
| **Street Side** | Lumens | 6711.5 | 0.0 | 6711.5 |
| | % Fixture | 82.9 | 0.0 | 82.9 |
| **Total** | Lumens | 8096.1 | 0.0 | 8096.1 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 193.1 | 2.4 |
| 10°-20° | 432.6 | 5.3 |
| 20°-30° | 554.0 | 6.8 |
| 30°-40° | 728.1 | 9.0 |
| 40°-50° | 1056.4 | 13.0 |
| 50°-60° | 1648.2 | 20.4 |
| 60°-70° | 2157.9 | 26.7 |
| 70°-80° | 1193.2 | 14.7 |
| 80°-90° | 132.4 | 1.6 |
| 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° | 8096.1 | 100.0 |
| 0°-180° | 8096.1 | 100.0 |



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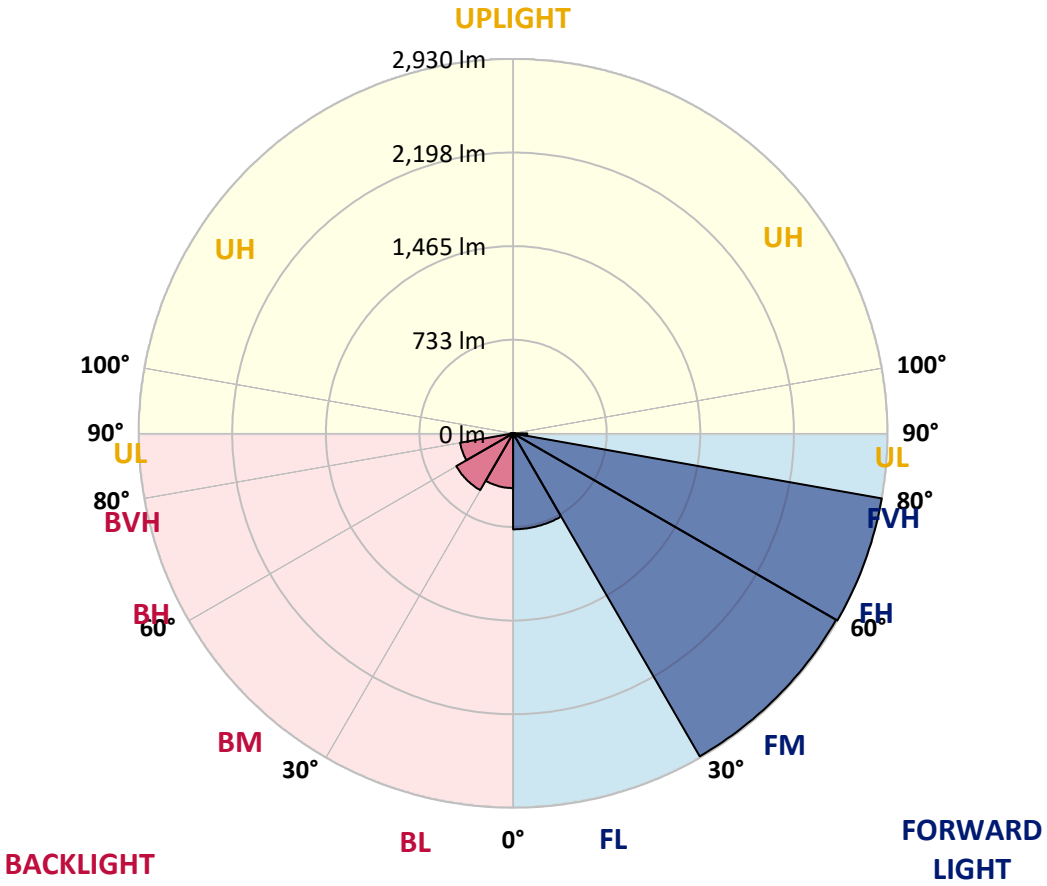
REPORT NUMBER: P634516
CATALOG NUMBER: GWS-SA3B-830-U-SL3-W

## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 751.4 | 9.3 | | | |
| FM | (30°-60°) | 2919.4 | 36.1 | | | |
| FH | (60°-80°) | 2930.3 | 36.2 | | | G2/5000 |
| FVH | (80°-90°) | 110.3 | 1.4 | | | G2/225 |
| BL | (0°-30°) | 428.4 | 5.3 | B1/500 | | |
| BM | (30°-60°) | 513.4 | 6.3 | B1/1000 | | |
| BH | (60°-80°) | 420.8 | 5.2 | B1/500 | | G1/500 |
| BVH | (80°-90°) | 22.1 | 0.3 | | | 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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Scaled Data Report

REPORT NUMBER: P634516
CATALOG NUMBER: GWS-SA3B-830-U-SL3-W

**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 15° | 25° | 35° | 45° | 55° | 60° | 65° | 75° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 2240.3 | 2240.3 | 2240.3 | 2240.3 | 2240.3 | 2240.3 | 2240.3 | 2240.3 | 2240.3 | 2240.3 | 2240.3 |
| 2.5° | 2208.9 | 2211.3 | 2217.8 | 2227.3 | 2236.7 | 2241.5 | 2253.3 | 2249.8 | 2247.4 | 2242.7 | 2236.7 |
| 5° | 2111.2 | 2115.9 | 2121.8 | 2140.2 | 2160.9 | 2177.5 | 2204.2 | 2207.1 | 2208.3 | 2210.7 | 2201.2 |
| 7.5° | 1986.8 | 1988.0 | 2002.2 | 2026.5 | 2053.7 | 2082.1 | 2126.6 | 2139.0 | 2149.7 | 2161.5 | 2153.8 |
| 10° | 1849.3 | 1852.3 | 1863.0 | 1897.9 | 1944.7 | 1986.8 | 2046.6 | 2067.3 | 2089.8 | 2115.9 | 2105.2 |
| 12.5° | 1736.8 | 1737.4 | 1754.6 | 1791.9 | 1842.8 | 1899.7 | 1974.3 | 1999.2 | 2028.8 | 2069.7 | 2060.2 |
| 15° | 1647.3 | 1647.3 | 1663.3 | 1695.3 | 1754.0 | 1820.9 | 1909.8 | 1941.7 | 1982.0 | 2037.1 | 2020.5 |
| 17.5° | 1576.3 | 1576.9 | 1586.9 | 1620.7 | 1672.8 | 1746.9 | 1852.3 | 1895.5 | 1940.0 | 2012.8 | 1988.0 |
| 20° | 1538.9 | 1536.0 | 1537.8 | 1558.5 | 1602.9 | 1674.6 | 1794.8 | 1845.2 | 1905.0 | 1996.2 | 1958.3 |
| 22.5° | 1537.2 | 1531.8 | 1524.1 | 1525.9 | 1552.0 | 1611.2 | 1733.2 | 1794.3 | 1869.5 | 1982.6 | 1928.1 |
| 25° | 1567.4 | 1561.5 | 1547.8 | 1532.4 | 1530.1 | 1565.6 | 1675.2 | 1744.5 | 1832.8 | 1976.7 | 1899.1 |
| 27.5° | 1618.3 | 1614.2 | 1596.4 | 1573.3 | 1549.0 | 1547.8 | 1631.4 | 1703.6 | 1806.1 | 1982.6 | 1878.4 |
| 30° | 1685.8 | 1678.7 | 1667.5 | 1637.9 | 1601.1 | 1563.2 | 1614.2 | 1681.7 | 1788.3 | 2001.6 | 1869.5 |
| 32.5° | 1762.3 | 1758.1 | 1747.5 | 1717.8 | 1678.7 | 1618.3 | 1627.8 | 1686.4 | 1788.3 | 2034.7 | 1871.3 |
| 35° | 1843.4 | 1842.8 | 1842.8 | 1823.3 | 1780.0 | 1704.8 | 1681.7 | 1726.7 | 1815.6 | 2088.1 | 1890.2 |
| 37.5° | 1922.2 | 1921.6 | 1940.6 | 1947.7 | 1898.5 | 1817.4 | 1773.5 | 1807.3 | 1875.4 | 2166.8 | 1937.0 |
| 40° | 1986.2 | 1988.5 | 2030.0 | 2065.6 | 2038.3 | 1963.1 | 1901.5 | 1918.6 | 1972.6 | 2278.8 | 2018.8 |
| 42.5° | 2050.7 | 2057.3 | 2119.5 | 2182.2 | 2192.9 | 2127.7 | 2065.6 | 2075.6 | 2111.8 | 2426.9 | 2140.8 |
| 45° | 2121.2 | 2124.2 | 2211.3 | 2298.9 | 2350.5 | 2312.0 | 2261.0 | 2274.7 | 2282.9 | 2609.9 | 2322.6 |
| 47.5° | 2189.4 | 2197.1 | 2309.6 | 2429.9 | 2527.6 | 2524.0 | 2495.6 | 2491.5 | 2493.2 | 2832.7 | 2537.7 |
| 50° | 2282.4 | 2293.6 | 2425.7 | 2570.8 | 2714.2 | 2779.9 | 2788.2 | 2756.8 | 2743.8 | 3080.3 | 2805.4 |
| 52.5° | 2458.9 | 2458.9 | 2577.3 | 2720.1 | 2912.6 | 3075.5 | 3131.2 | 3079.7 | 3038.2 | 3342.1 | 3089.7 |
| 55° | 2679.8 | 2689.3 | 2783.5 | 2899.0 | 3143.0 | 3386.5 | 3574.9 | 3518.0 | 3400.7 | 3627.0 | 3387.7 |
| 57.5° | 2778.2 | 2790.0 | 2939.3 | 3118.8 | 3444.6 | 3740.1 | 4001.4 | 3981.2 | 3810.0 | 3923.2 | 3696.9 |
| 60° | 2600.4 | 2625.3 | 2830.9 | 3131.8 | 3717.6 | 4310.6 | 4494.8 | 4436.2 | 4191.5 | 4234.2 | 4032.2 |
| 62.5° | 2169.2 | 2196.5 | 2424.5 | 2844.5 | 3679.7 | 4927.2 | 5272.6 | 5056.4 | 4667.8 | 4626.9 | 4478.8 |
| 65° | 1294.3 | 1293.1 | 1567.4 | 2124.2 | 3212.4 | 5098.4 | 6503.5 | 6100.1 | 5403.5 | 5165.9 | 4938.5 |
| 67.5° | 822.8 | 821.0 | 878.5 | 1125.5 | 2137.8 | 4679.0 | 7294.9 | 7399.7 | 6402.8 | 5562.2 | 4976.4 |
| 70° | 649.2 | 648.6 | 690.1 | 802.6 | 1057.4 | 3329.6 | 7074.5 | 7800.2 | 7006.4 | 5411.2 | 4381.7 |
| 72.5° | 473.3 | 474.5 | 538.5 | 672.3 | 815.7 | 1671.6 | 5728.7 | 6674.1 | 6444.3 | 4776.8 | 3557.1 |
| 75° | 340.0 | 341.8 | 380.3 | 514.8 | 752.3 | 914.0 | 3809.5 | 5018.5 | 4902.9 | 3829.0 | 2447.0 |
| 77.5° | 216.2 | 218.6 | 252.3 | 360.7 | 607.8 | 738.1 | 2309.6 | 3542.9 | 3262.1 | 2157.4 | 870.2 |
| 80° | 132.1 | 139.8 | 168.2 | 268.9 | 485.7 | 553.9 | 1154.5 | 1866.5 | 1633.7 | 591.8 | 292.6 |
| 82.5° | 68.1 | 74.0 | 101.3 | 166.5 | 334.7 | 486.3 | 653.4 | 784.3 | 505.9 | 247.6 | 155.8 |
| 85° | 21.3 | 24.9 | 35.5 | 67.5 | 159.3 | 301.5 | 432.4 | 389.8 | 232.2 | 116.7 | 72.3 |
| 87.5° | 5.3 | 5.3 | 5.9 | 5.9 | 6.5 | 13.6 | 83.5 | 88.3 | 61.6 | 36.7 | 29.6 |
| 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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Scaled Data Report

REPORT NUMBER: P634516
CATALOG NUMBER: GWS-SA3B-830-U-SL3-W

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 2240.3 | 2240.3 | 2240.3 | 2240.3 | 2240.3 | 2240.3 | 2240.3 | 2240.3 | 2240.3 | 2240.3 | 2240.3 |
| 2.5° | 2224.9 | 2210.7 | 2204.8 | 2204.2 | 2189.4 | 2168.0 | 2153.8 | 2143.7 | 2137.8 | 2136.6 | 2136.6 |
| 5° | 2185.2 | 2166.8 | 2142.6 | 2124.2 | 2084.5 | 2044.2 | 2010.5 | 1991.5 | 1969.6 | 1966.6 | 1966.0 |
| 7.5° | 2132.5 | 2105.8 | 2059.6 | 2008.1 | 1938.8 | 1871.8 | 1815.0 | 1776.5 | 1738.0 | 1730.9 | 1728.5 |
| 10° | 2075.6 | 2039.5 | 1960.7 | 1870.1 | 1766.4 | 1666.3 | 1579.2 | 1511.1 | 1466.1 | 1434.1 | 1428.2 |
| 12.5° | 2019.3 | 1971.4 | 1855.9 | 1720.8 | 1578.6 | 1441.8 | 1310.9 | 1199.5 | 1119.0 | 1072.2 | 1063.9 |
| 15° | 1966.6 | 1899.7 | 1741.5 | 1569.2 | 1384.3 | 1197.2 | 1011.7 | 867.2 | 754.1 | 713.8 | 704.3 |
| 17.5° | 1918.6 | 1835.1 | 1630.8 | 1412.2 | 1181.8 | 937.1 | 726.2 | 597.7 | 531.3 | 511.2 | 506.5 |
| 20° | 1870.7 | 1768.8 | 1518.2 | 1246.9 | 966.7 | 692.5 | 530.8 | 470.3 | 445.5 | 437.8 | 435.4 |
| 22.5° | 1819.1 | 1695.9 | 1395.6 | 1084.0 | 749.3 | 518.3 | 434.2 | 407.5 | 399.8 | 400.4 | 399.8 |
| 25° | 1767.6 | 1621.9 | 1267.1 | 906.9 | 558.0 | 420.6 | 379.1 | 369.0 | 370.8 | 376.1 | 377.3 |
| 27.5° | 1724.9 | 1556.1 | 1140.9 | 712.6 | 436.0 | 361.9 | 342.4 | 341.8 | 348.3 | 355.4 | 356.6 |
| 30° | 1694.1 | 1497.5 | 1016.5 | 547.9 | 359.0 | 321.7 | 313.9 | 317.5 | 325.2 | 330.5 | 332.3 |
| 32.5° | 1672.2 | 1447.1 | 883.8 | 430.6 | 314.5 | 293.2 | 289.7 | 293.2 | 298.0 | 303.3 | 304.5 |
| 35° | 1664.5 | 1410.4 | 753.5 | 351.3 | 284.3 | 272.5 | 270.1 | 271.9 | 274.3 | 277.2 | 278.4 |
| 37.5° | 1681.7 | 1392.0 | 617.2 | 305.7 | 266.0 | 258.9 | 255.3 | 254.1 | 254.7 | 255.9 | 256.5 |
| 40° | 1732.6 | 1400.3 | 505.9 | 279.0 | 254.1 | 247.6 | 241.7 | 239.3 | 238.7 | 239.9 | 239.3 |
| 42.5° | 1820.3 | 1435.3 | 425.3 | 263.6 | 244.6 | 235.2 | 228.6 | 226.3 | 226.3 | 229.2 | 229.2 |
| 45° | 1948.9 | 1504.0 | 367.3 | 252.3 | 236.4 | 224.5 | 217.4 | 216.2 | 218.6 | 223.3 | 223.9 |
| 47.5° | 2137.2 | 1604.7 | 332.3 | 244.1 | 228.6 | 215.0 | 207.9 | 207.3 | 212.1 | 219.8 | 220.4 |
| 50° | 2360.5 | 1749.8 | 313.4 | 238.1 | 223.3 | 207.3 | 200.2 | 200.8 | 206.1 | 214.4 | 216.2 |
| 52.5° | 2629.5 | 1947.7 | 314.5 | 235.8 | 220.4 | 202.6 | 195.5 | 194.3 | 199.6 | 207.9 | 209.7 |
| 55° | 2907.3 | 2188.2 | 337.6 | 236.4 | 216.2 | 200.2 | 190.7 | 186.6 | 191.3 | 197.3 | 197.8 |
| 57.5° | 3212.9 | 2459.5 | 395.1 | 235.2 | 210.9 | 197.8 | 186.6 | 177.1 | 180.1 | 183.6 | 185.4 |
| 60° | 3557.7 | 2778.7 | 518.9 | 237.5 | 208.5 | 192.5 | 178.3 | 165.9 | 165.3 | 167.6 | 168.2 |
| 62.5° | 4018.6 | 3212.9 | 658.1 | 241.7 | 213.8 | 186.0 | 165.9 | 152.8 | 150.5 | 151.6 | 152.2 |
| 65° | 4371.0 | 3420.3 | 614.3 | 238.1 | 225.1 | 181.3 | 154.0 | 140.4 | 135.6 | 134.5 | 134.5 |
| 67.5° | 4227.7 | 3146.0 | 427.7 | 228.6 | 230.4 | 181.9 | 144.5 | 127.4 | 121.4 | 118.5 | 117.9 |
| 70° | *3597.4* | *2555.4* | *297.4* | *219.2* | *224.5* | *180.7* | *134.5* | *116.7* | *109.0* | *104.8* | *104.3* |
| 72.5° | 2842.1 | 1951.2 | 240.5 | 200.2 | 203.8 | 162.9 | 119.7 | 104.8 | 98.3 | 93.0 | 93.0 |
| 75° | 1829.2 | 1190.6 | 200.8 | 178.3 | 166.5 | 126.8 | 103.7 | 93.6 | 87.1 | 81.7 | 81.7 |
| 77.5° | 615.5 | 441.9 | 155.8 | 151.1 | 124.4 | 95.4 | 87.1 | 80.6 | 75.2 | 70.5 | 69.9 |
| 80° | 250.0 | 209.7 | 114.3 | 114.3 | 87.1 | 72.9 | 68.1 | 65.2 | 61.6 | 55.7 | 55.7 |
| 82.5° | 145.1 | 127.4 | 80.0 | 69.3 | 58.1 | 50.4 | 47.4 | 44.4 | 44.4 | 40.3 | 40.3 |
| 85° | 69.9 | 70.5 | 48.0 | 42.6 | 33.2 | 29.0 | 27.8 | 26.1 | 25.5 | 23.1 | 22.5 |
| 87.5° | 37.9 | 38.5 | 24.3 | 19.0 | 13.0 | 11.3 | 9.5 | 8.9 | 8.3 | 7.7 | 7.7 |
| 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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Peachtree City, GA 30269

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

Report Prepared for

Cooper Lighting Solutions

MCGRAW EDISON

Report Number: SP1-2408-195-9

Test Date: 08/07/2024

Luminaire Tested: GALN-SB1A-830-U-5WQ

Data in this report applies to families of products including GALN-SB1A-830-U-5WQ.

Report Generated By FNC07603 / LDUCLS01DT446
Version: v7.04

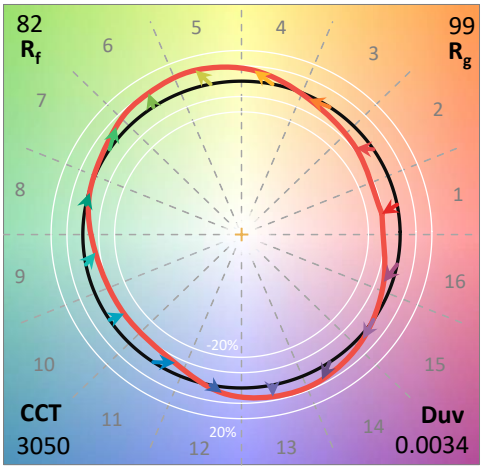
## Test Information

| | |
|---|---|
| Test Method: | LM-79-2019 |
| Report Number: | SP1-2408-195-9 |
| Test Lab: | COOPER LIGHTING SOLUTIONS |
| Photometer: | SP1 - 76IN SPHERE |
| Measurement Geometry: | 4π |
| Issue Date: | 08/07/2024 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS |
| Product Line: | MCGRAW EDISON |
| Catalog Number: | **GALN-SB1A-830-U-5WQ** |
| Description: | GALLEON AREA AND ROADWAY LUMINAIRE. (1) 80 CRI, 3000K, 350MA HIGH DENSITY LIGHTSQUARE WITH 26 LEDS AND TYPE V WIDE OPTICS |

## Spectral Parameters

| | | | | | |
|---|---|---|---|---|---|
| CCT (K): | 3050 | CRI (Ra): | 81.0 | | |
| CIE u': | 0.2476 | R1: | 79.6 | R9: | 7.1 |
| CIE v': | 0.5251 | R2: | 85.6 | R10: | 67.0 |
| Duv: | 0.0034 | R3: | 92.0 | R11: | 82.7 |
| CIE x: | 0.4383 | R4: | 82.6 | R12: | 63.2 |
| CIE y: | 0.4131 | R5: | 78.9 | R13: | 80.3 |
| CIE z: | 0.1487 | R6: | 81.7 | R14: | 95.0 |
| Peak Wavelength (nm): | 603 | R7: | 85.2 | R15: | 71.7 |
| Dominant Wavelength (nm): | 581 | R8: | 62.0 | | |
| Purity: | 55.55201 | | | | |

| | |
|---|---|
| Rf: | 81.5 |
| Rg: | 99.2 |




## Test Conditions

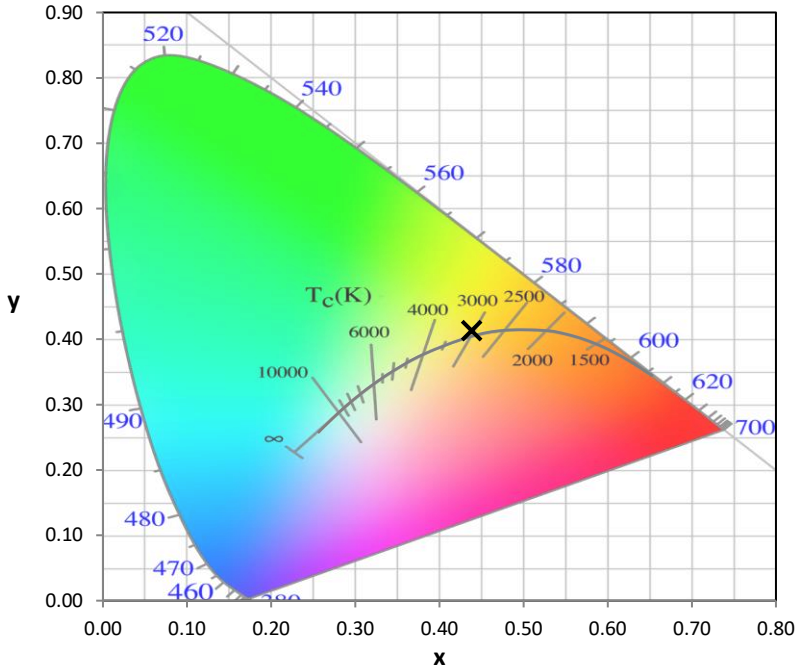
| | |
|---|---|
| Stabilization Time: | 20M |
| Operation Time: | 1H 20M |
| Sphere Temperature (°C): | 24.2 |

REPORT NUMBER: SP1-2408-195-9

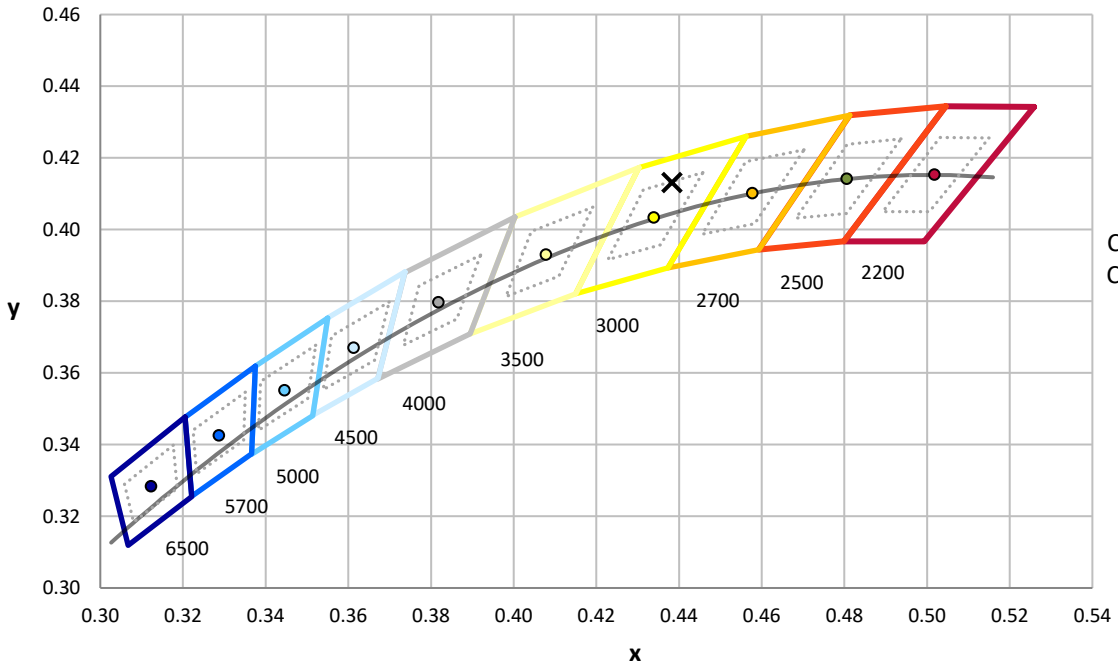
| Measurement and Test Equipment | | | |
|---|---|---|---|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 6/18/2024 | 12/18/2024 |
| Power Meter | INXT2011004 | 2/8/2024 | 2/8/2025 |
| AC Power Source | IN0063 | 10/24/2023 | 10/24/2024 |
| DC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

REPORT NUMBER: SP1-2408-195-9

## CIE 1931 Chromaticity Diagram




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




CCT = 3050K
CIE x = 0.4383
CIE y = 0.4131
Duv = 0.0034

Point lies inside the ANSI 3000K 4-step quadrangle

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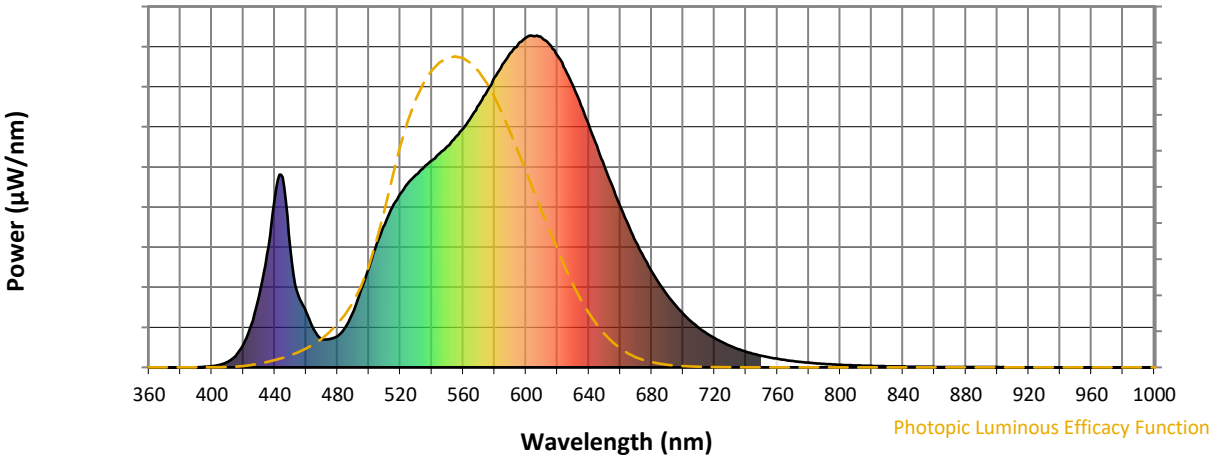
## Photopic Flux vs. Wavelength




## Photopic Lumens: NR

| λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 360 | 0 | NR | 490 | 168 | NR | 620 | 940 | NR | 750 | 35 | NR | 880 | 1 | NR |
| 365 | 0 | NR | 495 | 233 | NR | 625 | 897 | NR | 755 | 30 | NR | 885 | 1 | NR |
| 370 | 0 | NR | 500 | 300 | NR | 630 | 847 | NR | 760 | 26 | NR | 890 | 1 | NR |
| 375 | 0 | NR | 505 | 372 | NR | 635 | 790 | NR | 765 | 22 | NR | 895 | 1 | NR |
| 380 | 0 | NR | 510 | 430 | NR | 640 | 730 | NR | 770 | 19 | NR | 900 | 1 | NR |
| 385 | 0 | NR | 515 | 483 | NR | 645 | 668 | NR | 775 | 16 | NR | 905 | 1 | NR |
| 390 | 0 | NR | 520 | 524 | NR | 650 | 605 | NR | 780 | 14 | NR | 910 | 0 | NR |
| 395 | 2 | NR | 525 | 555 | NR | 655 | 545 | NR | 785 | 12 | NR | 915 | 0 | NR |
| 400 | 4 | NR | 530 | 581 | NR | 660 | 485 | NR | 790 | 10 | NR | 920 | 0 | NR |
| 405 | 7 | NR | 535 | 604 | NR | 665 | 430 | NR | 795 | 9 | NR | 925 | 0 | NR |
| 410 | 17 | NR | 540 | 623 | NR | 670 | 378 | NR | 800 | 8 | NR | 930 | 0 | NR |
| 415 | 34 | NR | 545 | 645 | NR | 675 | 331 | NR | 805 | 7 | NR | 935 | 0 | NR |
| 420 | 68 | NR | 550 | 667 | NR | 680 | 290 | NR | 810 | 6 | NR | 940 | 0 | NR |
| 425 | 128 | NR | 555 | 693 | NR | 685 | 251 | NR | 815 | 5 | NR | 945 | 0 | NR |
| 430 | 214 | NR | 560 | 719 | NR | 690 | 218 | NR | 820 | 4 | NR | 950 | 0 | NR |
| 435 | 339 | NR | 565 | 754 | NR | 695 | 188 | NR | 825 | 4 | NR | 955 | 0 | NR |
| 440 | 507 | NR | 570 | 791 | NR | 700 | 162 | NR | 830 | 3 | NR | 960 | 0 | NR |
| 445 | 573 | NR | 575 | 830 | NR | 705 | 139 | NR | 835 | 3 | NR | 965 | 0 | NR |
| 450 | 356 | NR | 580 | 873 | NR | 710 | 119 | NR | 840 | 3 | NR | 970 | 0 | NR |
| 455 | 217 | NR | 585 | 913 | NR | 715 | 102 | NR | 845 | 2 | NR | 975 | 0 | NR |
| 460 | 168 | NR | 590 | 948 | NR | 720 | 88 | NR | 850 | 2 | NR | 980 | 0 | NR |
| 465 | 113 | NR | 595 | 974 | NR | 725 | 76 | NR | 855 | 2 | NR | 985 | 0 | NR |
| 470 | 85 | NR | 600 | 994 | NR | 730 | 65 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 85 | NR | 605 | 998 | NR | 735 | 55 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 94 | NR | 610 | 994 | NR | 740 | 47 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 120 | NR | 615 | 973 | NR | 745 | 41 | NR | 875 | 1 | NR | | | |

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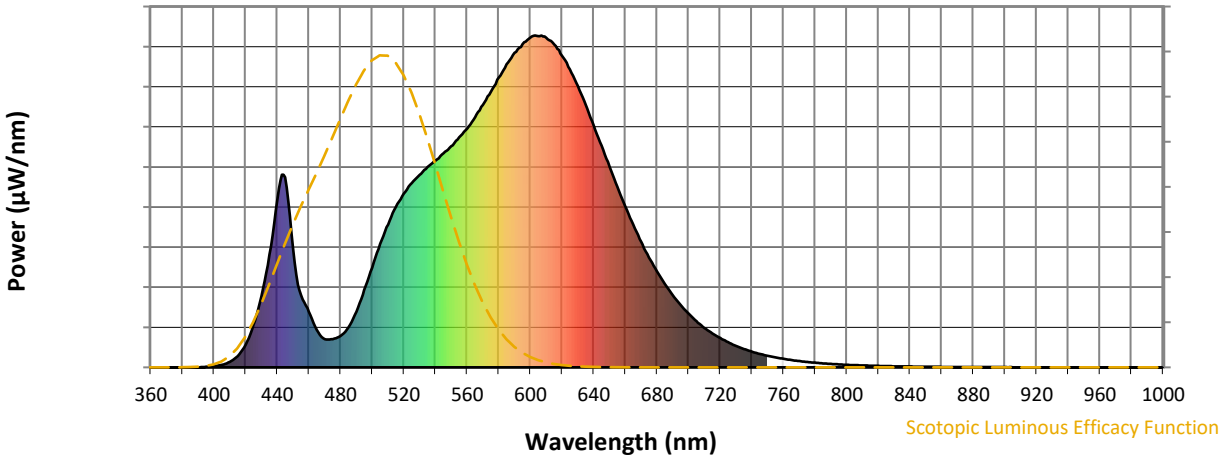
## Scotopic Flux vs. Wavelength




**Scotopic Lumens: NR** **S/P: 1.27**

| λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 360 | 0 | NR | 490 | 168 | NR | 620 | 940 | NR | 750 | 35 | NR | 880 | 1 | NR |
| 365 | 0 | NR | 495 | 233 | NR | 625 | 897 | NR | 755 | 30 | NR | 885 | 1 | NR |
| 370 | 0 | NR | 500 | 300 | NR | 630 | 847 | NR | 760 | 26 | NR | 890 | 1 | NR |
| 375 | 0 | NR | 505 | 372 | NR | 635 | 790 | NR | 765 | 22 | NR | 895 | 1 | NR |
| 380 | 0 | NR | 510 | 430 | NR | 640 | 730 | NR | 770 | 19 | NR | 900 | 1 | NR |
| 385 | 0 | NR | 515 | 483 | NR | 645 | 668 | NR | 775 | 16 | NR | 905 | 1 | NR |
| 390 | 0 | NR | 520 | 524 | NR | 650 | 605 | NR | 780 | 14 | NR | 910 | 0 | NR |
| 395 | 2 | NR | 525 | 555 | NR | 655 | 545 | NR | 785 | 12 | NR | 915 | 0 | NR |
| 400 | 4 | NR | 530 | 581 | NR | 660 | 485 | NR | 790 | 10 | NR | 920 | 0 | NR |
| 405 | 7 | NR | 535 | 604 | NR | 665 | 430 | NR | 795 | 9 | NR | 925 | 0 | NR |
| 410 | 17 | NR | 540 | 623 | NR | 670 | 378 | NR | 800 | 8 | NR | 930 | 0 | NR |
| 415 | 34 | NR | 545 | 645 | NR | 675 | 331 | NR | 805 | 7 | NR | 935 | 0 | NR |
| 420 | 68 | NR | 550 | 667 | NR | 680 | 290 | NR | 810 | 6 | NR | 940 | 0 | NR |
| 425 | 128 | NR | 555 | 693 | NR | 685 | 251 | NR | 815 | 5 | NR | 945 | 0 | NR |
| 430 | 214 | NR | 560 | 719 | NR | 690 | 218 | NR | 820 | 4 | NR | 950 | 0 | NR |
| 435 | 339 | NR | 565 | 754 | NR | 695 | 188 | NR | 825 | 4 | NR | 955 | 0 | NR |
| 440 | 507 | NR | 570 | 791 | NR | 700 | 162 | NR | 830 | 3 | NR | 960 | 0 | NR |
| 445 | 573 | NR | 575 | 830 | NR | 705 | 139 | NR | 835 | 3 | NR | 965 | 0 | NR |
| 450 | 356 | NR | 580 | 873 | NR | 710 | 119 | NR | 840 | 3 | NR | 970 | 0 | NR |
| 455 | 217 | NR | 585 | 913 | NR | 715 | 102 | NR | 845 | 2 | NR | 975 | 0 | NR |
| 460 | 168 | NR | 590 | 948 | NR | 720 | 88 | NR | 850 | 2 | NR | 980 | 0 | NR |
| 465 | 113 | NR | 595 | 974 | NR | 725 | 76 | NR | 855 | 2 | NR | 985 | 0 | NR |
| 470 | 85 | NR | 600 | 994 | NR | 730 | 65 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 85 | NR | 605 | 998 | NR | 735 | 55 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 94 | NR | 610 | 994 | NR | 740 | 47 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 120 | NR | 615 | 973 | NR | 745 | 41 | NR | 875 | 1 | NR | | | |

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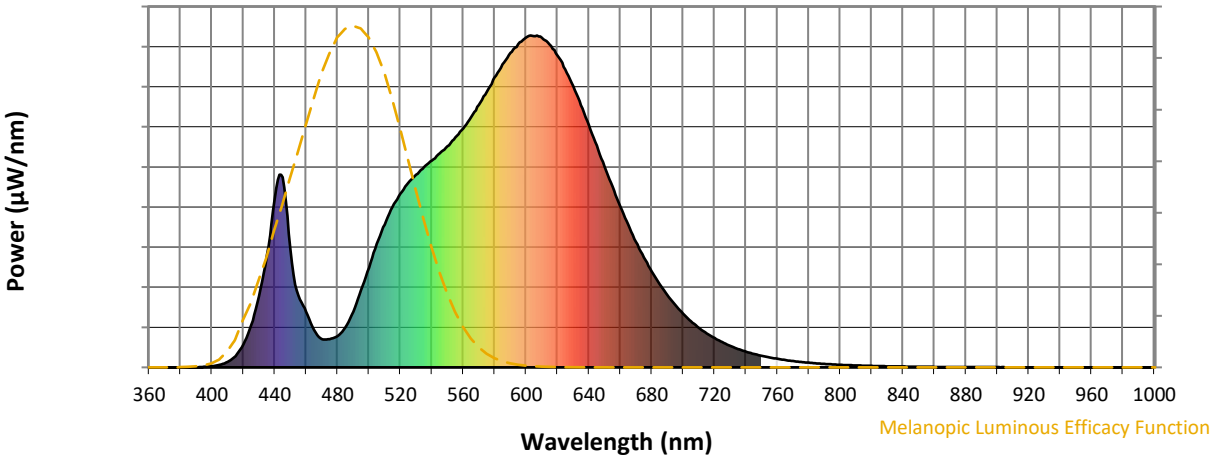
## Melanopic Flux vs. Wavelength




**Melanopic Lumens: NR** **M/P: 2.32**

| λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 360 | 0 | NR | 490 | 168 | NR | 620 | 940 | NR | 750 | 35 | NR | 880 | 1 | NR |
| 365 | 0 | NR | 495 | 233 | NR | 625 | 897 | NR | 755 | 30 | NR | 885 | 1 | NR |
| 370 | 0 | NR | 500 | 300 | NR | 630 | 847 | NR | 760 | 26 | NR | 890 | 1 | NR |
| 375 | 0 | NR | 505 | 372 | NR | 635 | 790 | NR | 765 | 22 | NR | 895 | 1 | NR |
| 380 | 0 | NR | 510 | 430 | NR | 640 | 730 | NR | 770 | 19 | NR | 900 | 1 | NR |
| 385 | 0 | NR | 515 | 483 | NR | 645 | 668 | NR | 775 | 16 | NR | 905 | 1 | NR |
| 390 | 0 | NR | 520 | 524 | NR | 650 | 605 | NR | 780 | 14 | NR | 910 | 0 | NR |
| 395 | 2 | NR | 525 | 555 | NR | 655 | 545 | NR | 785 | 12 | NR | 915 | 0 | NR |
| 400 | 4 | NR | 530 | 581 | NR | 660 | 485 | NR | 790 | 10 | NR | 920 | 0 | NR |
| 405 | 7 | NR | 535 | 604 | NR | 665 | 430 | NR | 795 | 9 | NR | 925 | 0 | NR |
| 410 | 17 | NR | 540 | 623 | NR | 670 | 378 | NR | 800 | 8 | NR | 930 | 0 | NR |
| 415 | 34 | NR | 545 | 645 | NR | 675 | 331 | NR | 805 | 7 | NR | 935 | 0 | NR |
| 420 | 68 | NR | 550 | 667 | NR | 680 | 290 | NR | 810 | 6 | NR | 940 | 0 | NR |
| 425 | 128 | NR | 555 | 693 | NR | 685 | 251 | NR | 815 | 5 | NR | 945 | 0 | NR |
| 430 | 214 | NR | 560 | 719 | NR | 690 | 218 | NR | 820 | 4 | NR | 950 | 0 | NR |
| 435 | 339 | NR | 565 | 754 | NR | 695 | 188 | NR | 825 | 4 | NR | 955 | 0 | NR |
| 440 | 507 | NR | 570 | 791 | NR | 700 | 162 | NR | 830 | 3 | NR | 960 | 0 | NR |
| 445 | 573 | NR | 575 | 830 | NR | 705 | 139 | NR | 835 | 3 | NR | 965 | 0 | NR |
| 450 | 356 | NR | 580 | 873 | NR | 710 | 119 | NR | 840 | 3 | NR | 970 | 0 | NR |
| 455 | 217 | NR | 585 | 913 | NR | 715 | 102 | NR | 845 | 2 | NR | 975 | 0 | NR |
| 460 | 168 | NR | 590 | 948 | NR | 720 | 88 | NR | 850 | 2 | NR | 980 | 0 | NR |
| 465 | 113 | NR | 595 | 974 | NR | 725 | 76 | NR | 855 | 2 | NR | 985 | 0 | NR |
| 470 | 85 | NR | 600 | 994 | NR | 730 | 65 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 85 | NR | 605 | 998 | NR | 735 | 55 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 94 | NR | 610 | 994 | NR | 740 | 47 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 120 | NR | 615 | 973 | NR | 745 | 41 | NR | 875 | 1 | NR | | | |

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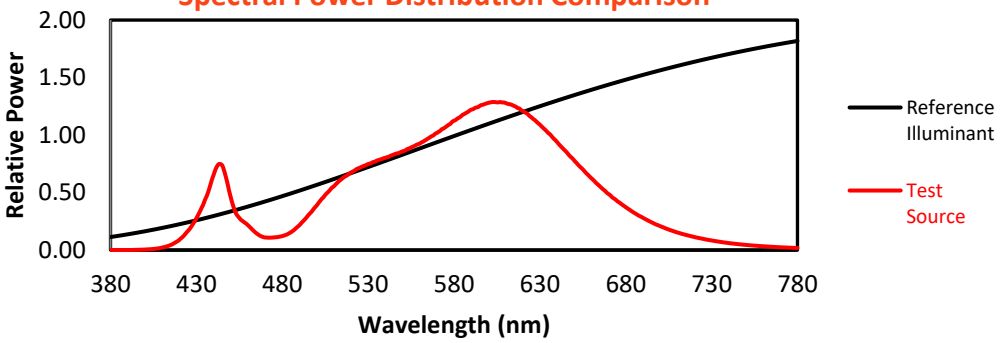
# TM-30-18

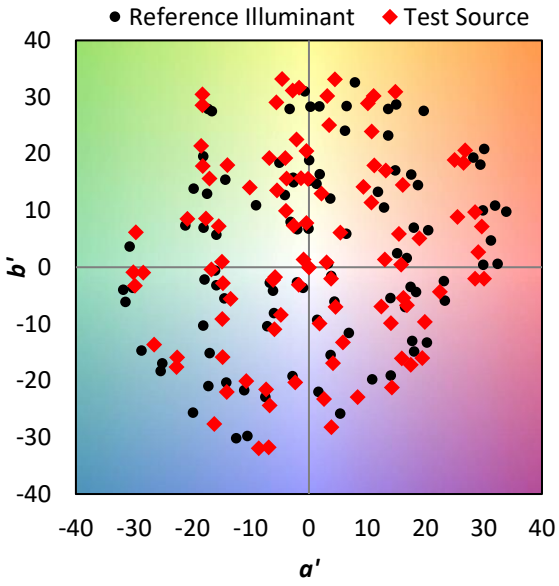
## Summary

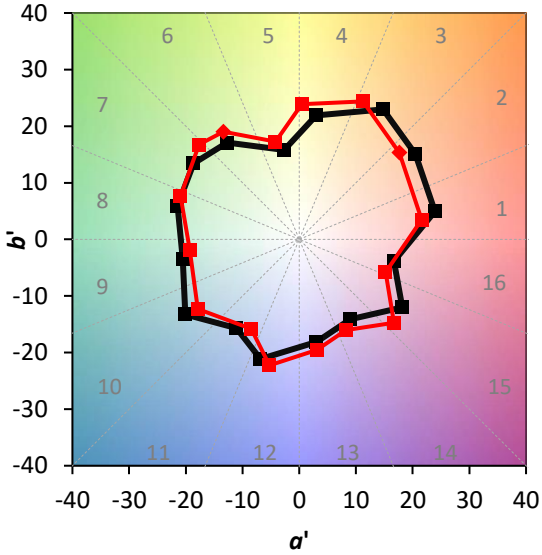
$R_f$ = 81.5
$R_g$ = 99.2
CIE $R_a$ = 81.0
$R_9$ = 7.1

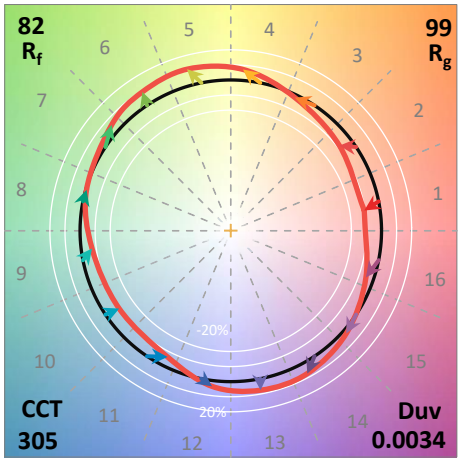
## Spectral Power Distribution Comparison

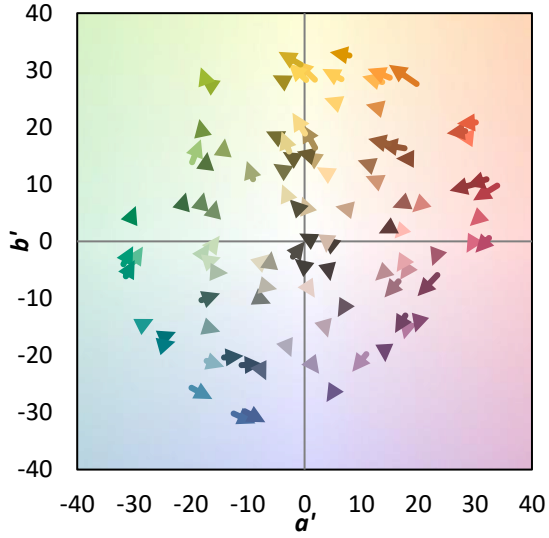



## Color Vector Graphics



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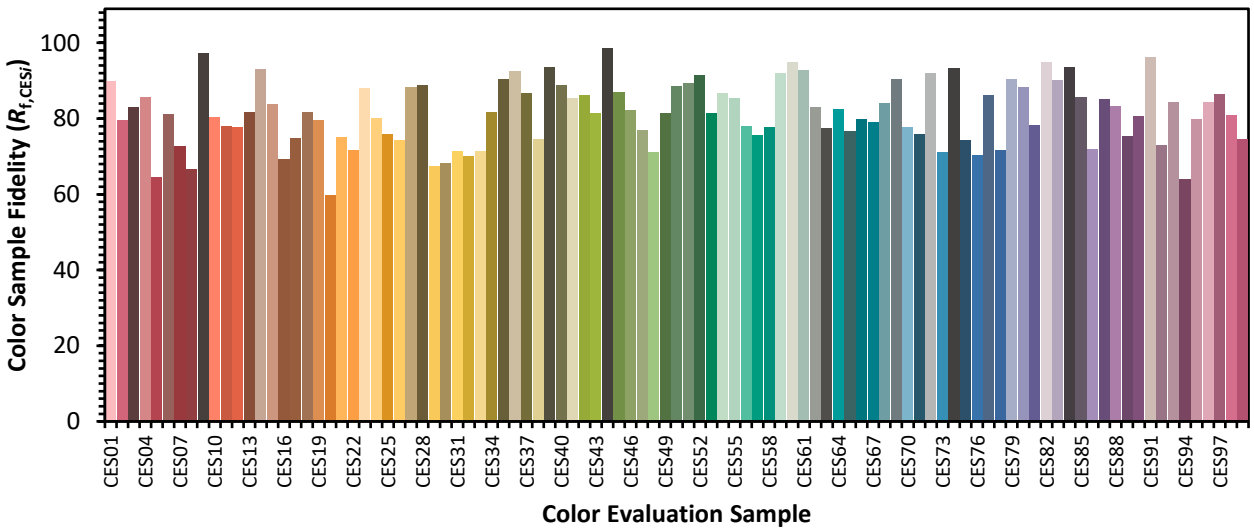
# TM-30-18

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

| | | | |
|---|---|---|---|
| CES01 = 86 | CES26 = 74 | CES51 = 89 | CES76 = 70 |
| CES02 = 63 | CES27 = 88 | CES52 = 92 | CES77 = 86 |
| CES03 = 31 | CES28 = 89 | CES53 = 81 | CES78 = 72 |
| CES04 = 70 | CES29 = 67 | CES54 = 87 | CES79 = 90 |
| CES05 = 50 | CES30 = 68 | CES55 = 85 | CES80 = 88 |
| CES06 = 51 | CES31 = 71 | CES56 = 78 | CES81 = 78 |
| CES07 = 42 | CES32 = 70 | CES57 = 76 | CES82 = 95 |
| CES08 = 41 | CES33 = 71 | CES58 = 78 | CES83 = 90 |
| CES09 = 29 | CES34 = 82 | CES59 = 92 | CES84 = 94 |
| CES10 = 76 | CES35 = 90 | CES60 = 95 | CES85 = 86 |
| CES11 = 59 | CES36 = 93 | CES61 = 93 | CES86 = 72 |
| CES12 = 65 | CES37 = 87 | CES62 = 83 | CES87 = 85 |
| CES13 = 43 | CES38 = 75 | CES63 = 77 | CES88 = 83 |
| CES14 = 74 | CES39 = 94 | CES64 = 83 | CES89 = 75 |
| CES15 = 71 | CES40 = 89 | CES65 = 77 | CES90 = 81 |
| CES16 = 47 | CES41 = 85 | CES66 = 80 | CES91 = 96 |
| CES17 = 50 | CES42 = 86 | CES67 = 79 | CES92 = 73 |
| CES18 = 56 | CES43 = 81 | CES68 = 84 | CES93 = 84 |
| CES19 = 72 | CES44 = 99 | CES69 = 91 | CES94 = 64 |
| CES20 = 66 | CES45 = 87 | CES70 = 78 | CES95 = 80 |
| CES21 = 87 | CES46 = 82 | CES71 = 76 | CES96 = 84 |
| CES22 = 79 | CES47 = 77 | CES72 = 92 | CES97 = 87 |
| CES23 = 92 | CES48 = 71 | CES73 = 71 | CES98 = 81 |
| CES24 = 91 | CES49 = 81 | CES74 = 93 | CES99 = 74 |
| CES25 = 72 | CES50 = 89 | CES75 = 74 | |



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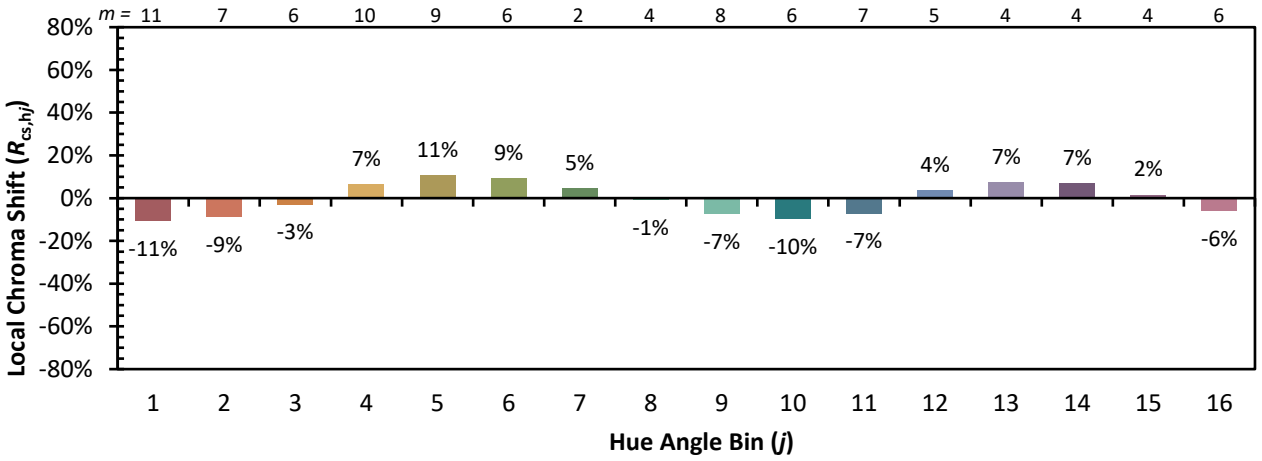
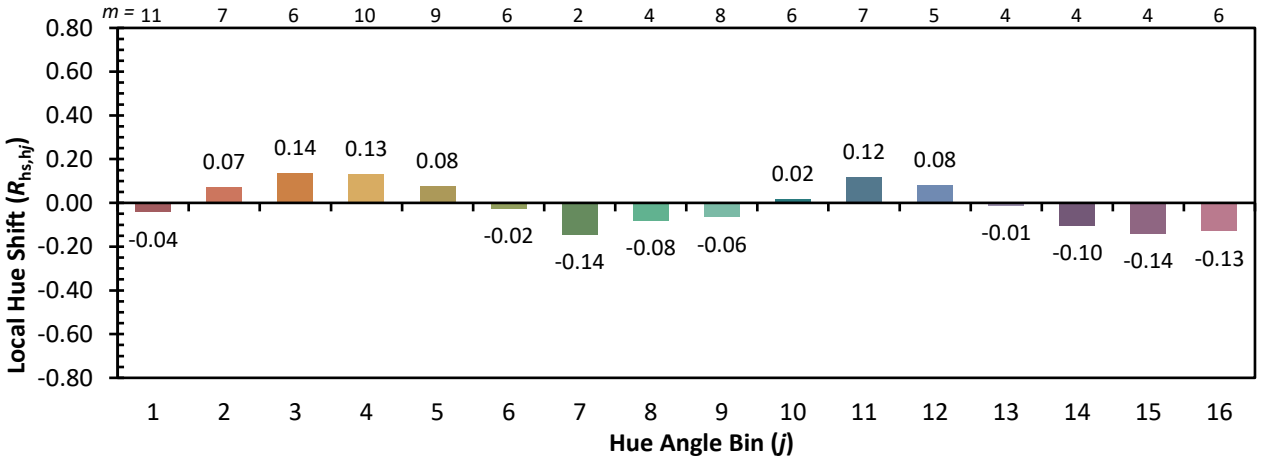
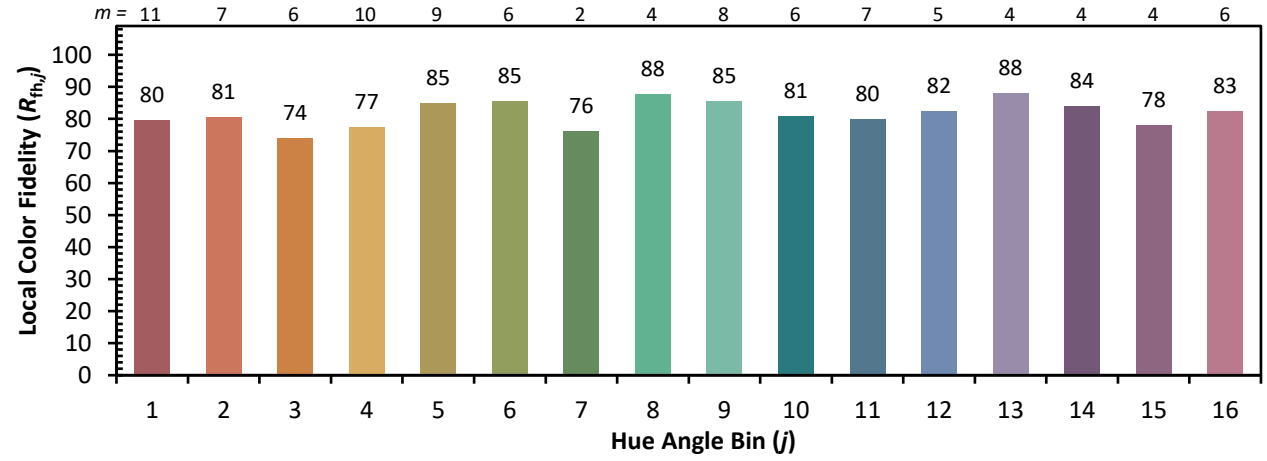
# TM-30-18

## Color Rendition by Hue-Angle Bin



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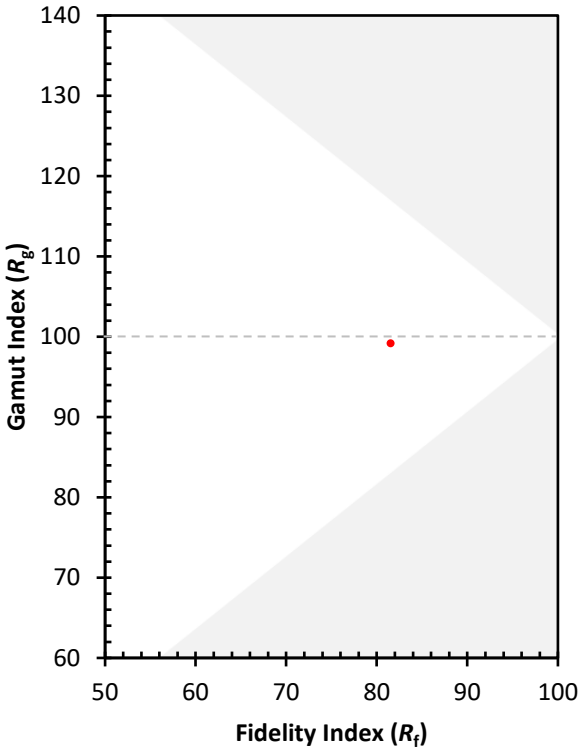
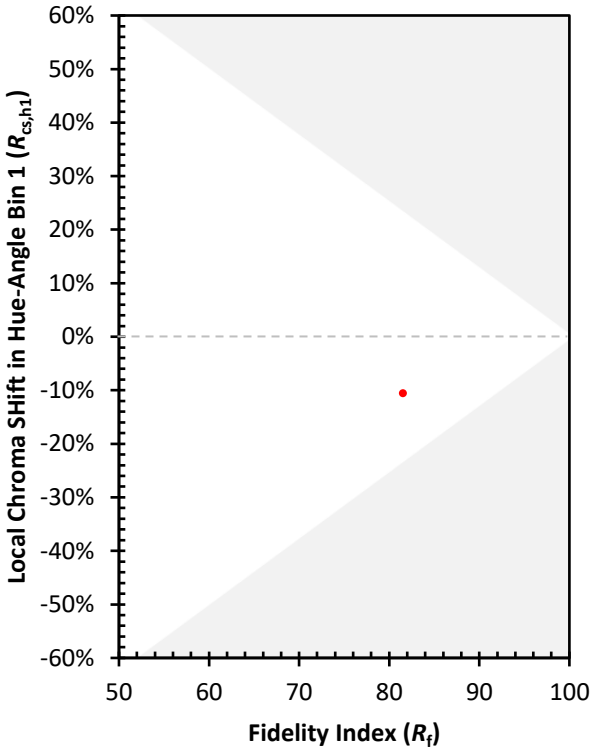
## TM-30-18

### Measure Comparisons

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