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: P319197

Luminaire Tested: **GLEON-SA3B-830-U-T4W**

Issue Date: 3/3/2020

Report Generated By E0585644

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

Scaled Data Report

**Test Information**

| | |
|---|---|
| Test Method: | LM-79-08 |
| Report Number: | P319197 |
| | TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-18) |
| Test Lab: | INNOVATION CENTER |
| Issue Date: | 3/3/2020 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS (FORMERLY EATON) |
| Product Line: | McGRAW-EDISON |
| Catalog Number: | GLEON-SA3B-830-U-T4W |
| Description: | GALLEON AREA AND ROADWAY LUMINAIRE |
| | (3) 80 CRI, 3000K, 800mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE IV WIDE OPTICS |
| Light Source: | - |
| Ballast/Driver: | ELECTRONIC DRIVER |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 13766 lumens |
| Efficiency: | N/A |
| Efficacy: | 111.0 lumens/watt |
| Luminous Opening: | Rectangular (W 1' x L: 1' x H: 0') |
| IES Classification: | Type IV - Short |
| BUG Rating: | B2 - U0 - G3 |

| | |
|---|---|
| Input Watts (W): | 124 |
| 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: | 24 FT |

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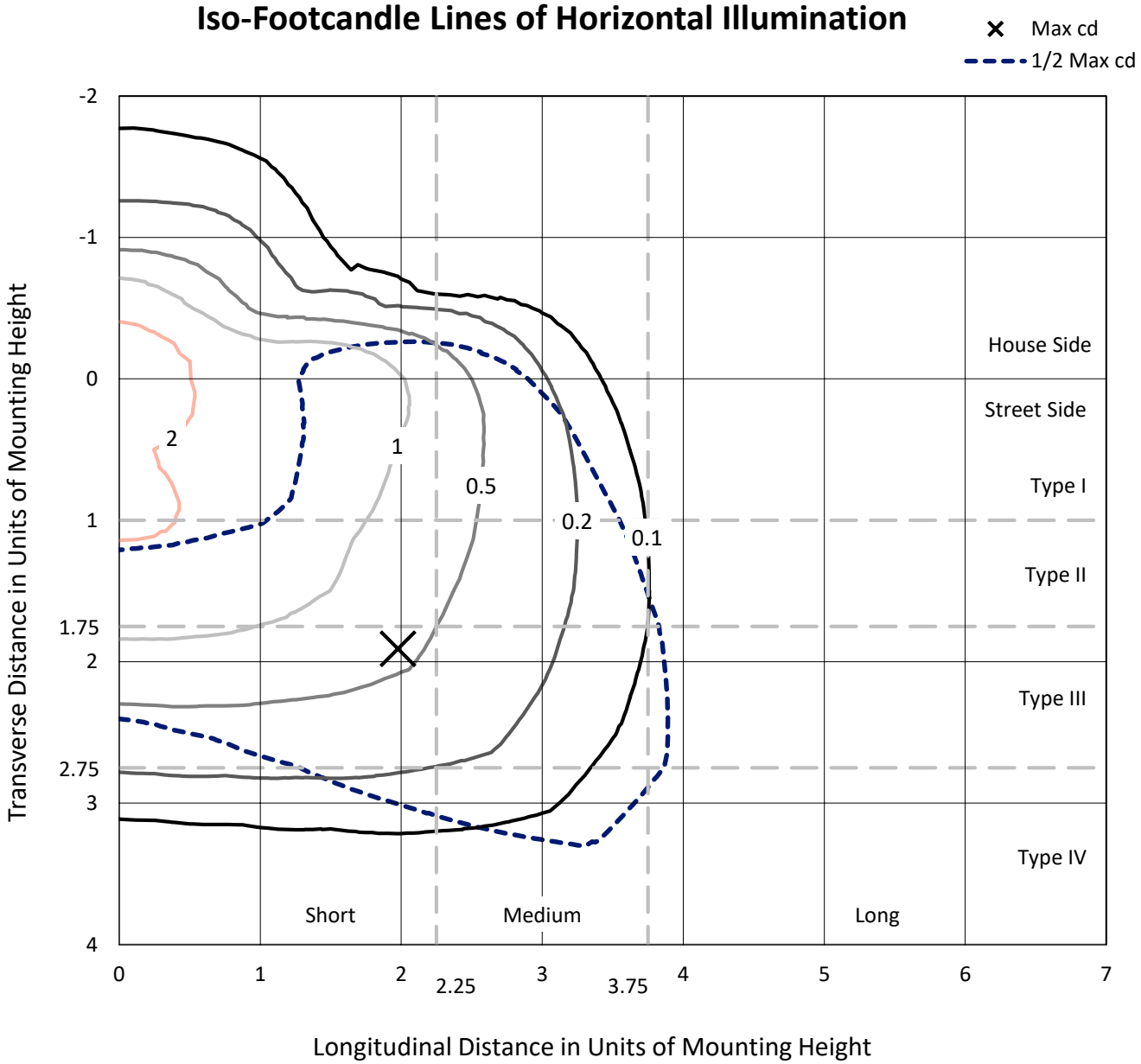
Scaled Data Report

REPORT NUMBER: P319197
CATALOG NUMBER: GLEON-SA3B-830-U-T4W

## Iso-Footcandle Lines of Horizontal Illumination




Based on 25 foot mounting height. Maximum calculated value = 2.8 fc
Type IV - Short - N/A

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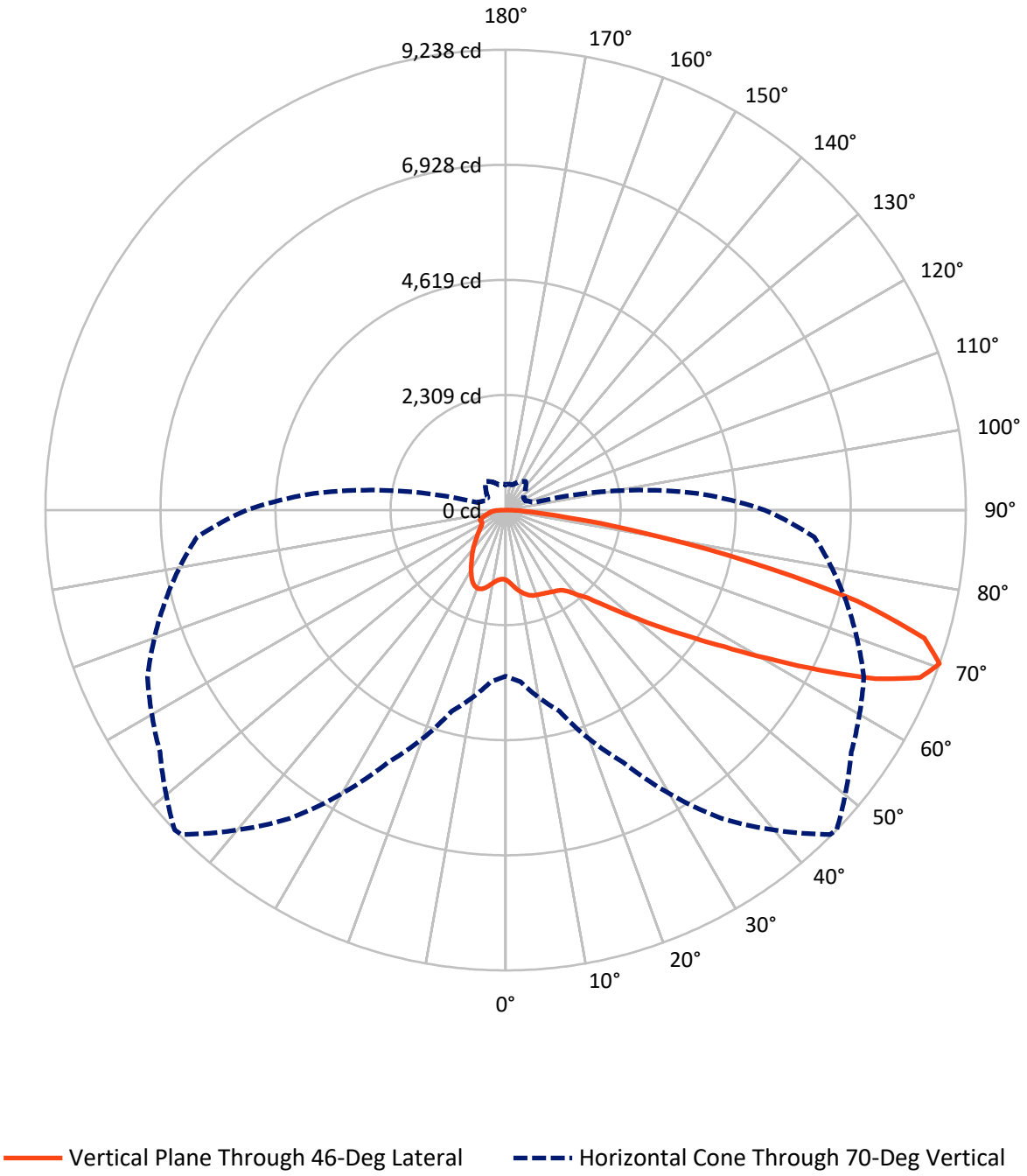
## Luminous Intensity Polar Plot



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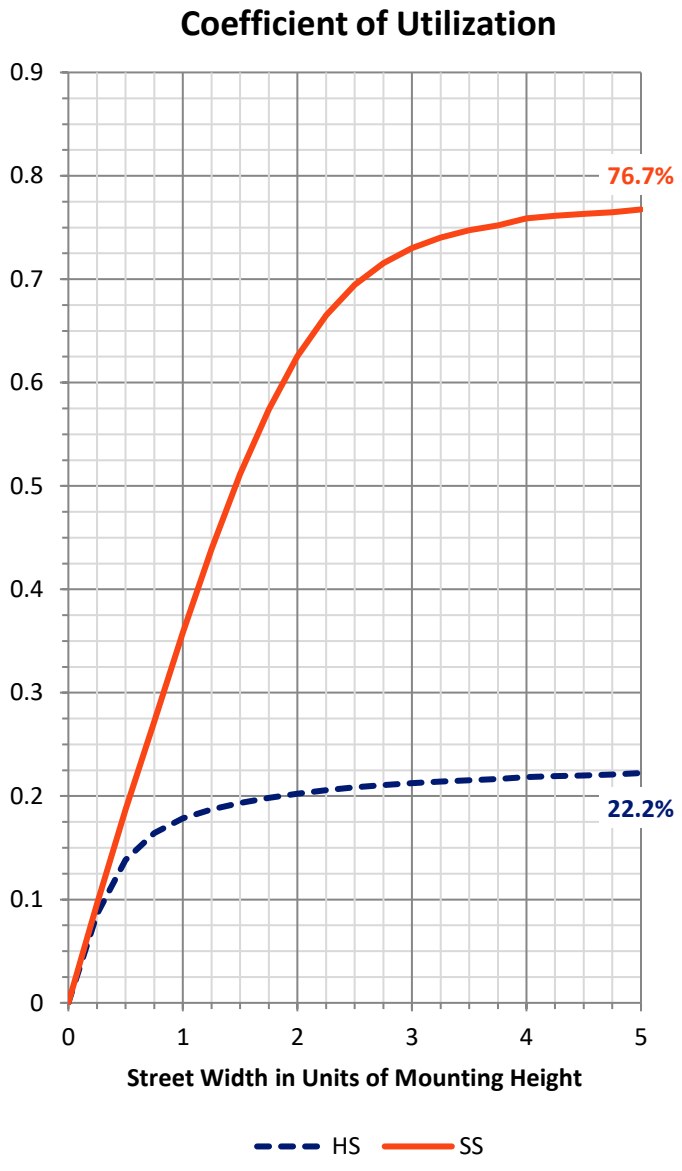
REPORT NUMBER: P319197
CATALOG NUMBER: GLEON-SA3B-830-U-T4W

**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 3155.1 | 0.0 | 3155.1 |
| | % Fixture | 22.9 | 0.0 | 22.9 |
| **Street Side** | Lumens | 10610.9 | 0.0 | 10610.9 |
| | % Fixture | 77.1 | 0.0 | 77.1 |
| **Total** | Lumens | 13766.0 | 0.0 | 13766.0 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 143.0 | 1.0 |
| 10°-20° | 476.3 | 3.5 |
| 20°-30° | 794.2 | 5.8 |
| 30°-40° | 1127.1 | 8.2 |
| 40°-50° | 1657.9 | 12.0 |
| 50°-60° | 2807.6 | 20.4 |
| 60°-70° | 3985.4 | 29.0 |
| 70°-80° | 2421.1 | 17.6 |
| 80°-90° | 353.3 | 2.6 |
| 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° | 13766.0 | 100.0 |
| 0°-180° | 13766.0 | 100.0 |



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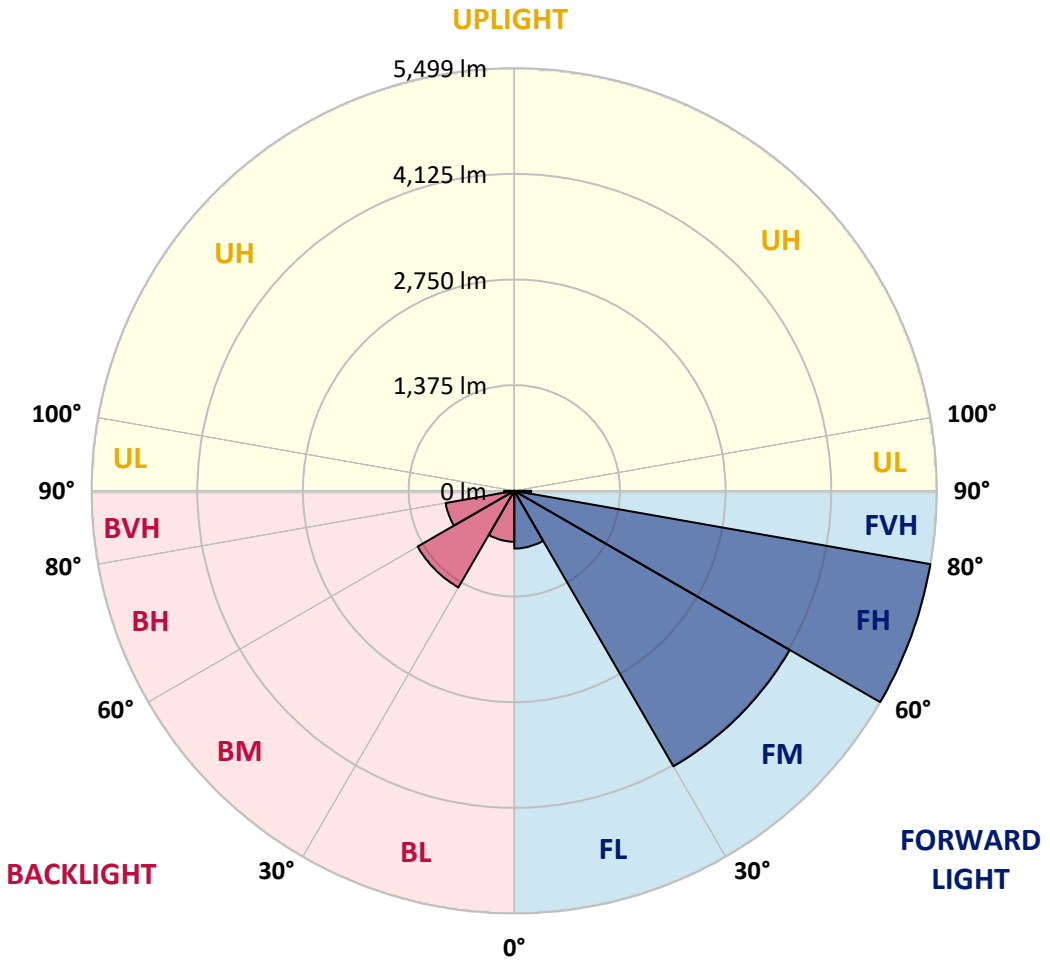
REPORT NUMBER: P319197
CATALOG NUMBER: GLEON-SA3B-830-U-T4W

## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 751.1 | 5.5 | | | |
| FM | (30°-60°) | 4140.2 | 30.1 | | | |
| FH | (60°-80°) | 5499.4 | 39.9 | | | G3/7500 |
| FVH | (80°-90°) | 220.1 | 1.6 | | | G2/225 |
| BL | (0°-30°) | 662.4 | 4.8 | B2/1000 | | |
| BM | (30°-60°) | 1452.4 | 10.6 | B2/2500 | | |
| BH | (60°-80°) | 907.1 | 6.6 | B2/1000 | | G2/1000 |
| BVH | (80°-90°) | 133.2 | 1.0 | | | G2/225 |
| UL | (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH | (100°-180°) | 0.0 | 0.0 | | U0/0 | |

**BUG Rating: B2-U0-G3**
Type IV Short



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**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 15° | 25° | 35° | 45° | 46° | 55° | 65° | 75° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 1402.5 | 1402.5 | 1402.5 | 1402.5 | 1402.5 | 1402.5 | *1402.5* | 1402.5 | 1402.5 | 1402.5 | 1402.5 |
| 2.5° | 1472.7 | 1473.6 | 1475.5 | 1470.8 | 1457.6 | 1453.8 | *1452.4* | 1438.8 | 1429.8 | 1416.6 | 1405.3 |
| 5° | 1590.5 | 1591.4 | 1588.6 | 1575.4 | 1546.2 | 1524.5 | *1522.6* | 1491.5 | 1463.3 | 1433.1 | 1410.5 |
| 7.5° | 1713.4 | 1714.8 | 1705.9 | 1680.9 | 1639.9 | 1602.2 | *1599.9* | 1557.5 | 1514.6 | 1468.9 | 1435.0 |
| 10° | 1822.2 | 1816.6 | 1802.0 | 1767.1 | 1718.6 | 1672.4 | *1670.5* | 1626.3 | 1576.8 | 1521.7 | 1476.4 |
| 12.5° | 1894.8 | 1890.1 | 1871.2 | 1828.8 | 1775.6 | 1733.2 | *1729.4* | 1688.4 | 1640.4 | 1580.1 | 1525.9 |
| 15° | 1934.8 | 1938.1 | 1912.7 | 1864.6 | 1812.8 | 1777.0 | *1773.7* | 1744.5 | 1701.6 | 1640.9 | 1578.7 |
| 17.5° | 1940.0 | 1942.8 | 1918.3 | 1870.8 | 1828.4 | 1803.9 | *1802.5* | 1783.1 | 1752.0 | 1693.6 | 1628.6 |
| 20° | 1909.9 | 1911.8 | 1891.5 | 1852.4 | 1824.6 | 1817.1 | *1816.6* | 1808.1 | 1785.0 | 1733.2 | 1670.1 |
| 22.5° | 1866.1 | 1867.5 | 1852.9 | 1824.6 | 1815.2 | 1827.0 | *1830.3* | 1827.0 | 1810.5 | 1761.9 | 1702.6 |
| 25° | 1855.2 | 1854.3 | 1839.2 | 1810.5 | 1818.5 | 1843.4 | *1847.7* | 1849.1 | 1837.8 | 1795.4 | 1744.0 |
| 27.5° | 1907.5 | 1904.2 | 1875.5 | 1829.3 | 1834.5 | 1864.6 | *1870.3* | 1884.0 | 1876.9 | 1839.7 | 1791.1 |
| 30° | 2058.7 | 2053.1 | 1994.2 | 1900.9 | 1875.5 | 1891.0 | *1898.1* | 1919.8 | 1921.2 | 1890.1 | 1853.8 |
| 32.5° | 2314.1 | 2307.0 | 2201.5 | 2034.7 | 1944.7 | 1917.9 | *1924.5* | 1957.0 | 1974.4 | 1950.4 | 1911.3 |
| 35° | 2636.8 | 2628.8 | 2490.3 | 2262.3 | 2060.6 | 1969.2 | *1973.9* | 1999.8 | 2034.7 | 2000.8 | 1949.0 |
| 37.5° | 2973.2 | 2953.8 | 2820.5 | 2529.8 | 2244.8 | 2079.0 | *2079.0* | 2082.3 | 2098.8 | 2028.1 | 1993.3 |
| 40° | 3307.6 | 3288.3 | 3167.7 | 2844.5 | 2483.2 | 2251.9 | *2241.1* | 2168.0 | 2154.8 | 2094.1 | 2082.3 |
| 42.5° | 3618.6 | 3612.9 | 3541.8 | 3200.2 | 2763.0 | 2422.0 | *2406.9* | 2283.0 | 2285.8 | 2248.1 | 2248.6 |
| 45° | 3949.3 | 3949.3 | 3891.3 | 3559.2 | 3089.0 | 2695.2 | *2680.1* | 2497.8 | 2526.1 | 2508.6 | 2550.6 |
| 47.5° | 4219.2 | 4227.7 | 4219.7 | 3933.3 | 3468.3 | 3042.4 | *3015.1* | 2795.5 | 2874.7 | 2934.5 | 3056.5 |
| 50° | 4494.8 | 4508.0 | 4509.4 | 4343.6 | 3926.7 | 3455.1 | *3424.0* | 3190.8 | 3367.5 | 3539.0 | 3778.8 |
| 52.5° | 4894.8 | 4924.5 | 4806.2 | 4753.0 | 4488.2 | 3945.1 | *3914.4* | 3699.1 | 3994.0 | 4234.8 | 4647.9 |
| 55° | 5265.6 | 5239.7 | 5155.3 | 5188.3 | 5089.4 | 4502.8 | *4479.8* | 4290.8 | 4692.2 | 5005.0 | 5541.6 |
| 57.5° | 5466.3 | 5464.4 | 5549.2 | 5690.5 | 5737.6 | 5190.7 | *5171.3* | 4987.6 | 5479.4 | 5714.5 | 6380.7 |
| 60° | 5701.8 | 5705.1 | 5915.2 | 6236.0 | 6430.1 | 6047.1 | *6038.7* | 5899.2 | 6244.1 | 6376.9 | 7038.8 |
| 62.5° | 5734.8 | 5794.1 | 6156.0 | 6708.1 | 7078.4 | 7047.8 | *7066.6* | 6720.3 | 6928.1 | 6905.5 | 7530.2 |
| 65° | 5355.5 | 5433.7 | 6088.6 | 6850.8 | 7722.9 | 8142.1 | *8159.6* | 7546.2 | 7467.5 | 7357.3 | 7705.9 |
| 67.5° | 4578.2 | 4694.1 | 5405.5 | 6540.4 | 7935.3 | 8951.0 | *8975.5* | 8186.4 | 7915.1 | 7510.4 | 7282.8 |
| 70° | *3331.7* | *3460.3* | *4176.4* | *5585.9* | *7556.6* | *9209.7* | *9237.5* | *8469.6* | *7932.0* | *7074.6* | *6217.2* |
| 72.5° | 2012.6 | 2113.4 | 2703.7 | 4112.3 | 6377.8 | 8738.6 | *8788.0* | 8110.6 | 7241.9 | 5992.5 | 4590.9 |
| 75° | 883.8 | 949.8 | 1307.3 | 2369.7 | 4566.0 | 7230.1 | *7291.8* | 6942.2 | 5884.1 | 4354.9 | 2713.6 |
| 77.5° | 376.4 | 395.3 | 536.1 | 1029.4 | 2581.2 | 4940.5 | *5025.3* | 5072.4 | 3992.2 | 2369.7 | 1146.7 |
| 80° | 234.6 | 242.1 | 303.4 | 465.9 | 1207.9 | 2774.8 | *2866.2* | 2984.5 | 1982.4 | 871.1 | 400.4 |
| 82.5° | 142.7 | 151.2 | 201.6 | 281.7 | 628.9 | 1257.9 | *1301.7* | 1385.1 | 769.3 | 376.4 | 207.3 |
| 85° | 85.7 | 91.9 | 123.4 | 178.1 | 358.0 | 494.7 | *494.2* | 546.5 | 362.3 | 242.1 | 109.3 |
| 87.5° | 41.0 | 45.7 | 66.0 | 92.3 | 180.4 | 185.6 | *173.8* | 196.9 | 220.0 | 158.8 | 55.1 |
| 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: P319197
CATALOG NUMBER: GLEON-SA3B-830-U-T4W

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 1402.5 | 1402.5 | 1402.5 | 1402.5 | 1402.5 | 1402.5 | 1402.5 | 1402.5 | 1402.5 | 1402.5 | 1402.5 |
| 2.5° | 1401.5 | 1399.7 | 1393.5 | 1388.8 | 1387.9 | 1385.1 | 1382.7 | 1384.1 | 1386.0 | 1386.5 | 1386.5 |
| 5° | 1401.1 | 1395.9 | 1387.9 | 1384.6 | 1388.8 | 1394.5 | 1401.5 | 1411.0 | 1416.6 | 1420.9 | 1423.7 |
| 7.5° | 1423.7 | 1413.8 | 1404.8 | 1403.0 | 1411.4 | 1426.5 | 1442.5 | 1462.3 | 1476.0 | 1485.4 | 1487.3 |
| 10° | 1461.4 | 1449.1 | 1440.2 | 1442.1 | 1457.1 | 1478.8 | 1501.4 | 1526.9 | 1547.6 | 1560.3 | 1561.2 |
| 12.5° | 1504.7 | 1492.9 | 1484.5 | 1492.5 | 1517.4 | 1543.8 | 1567.4 | 1589.5 | 1608.4 | 1621.1 | 1621.1 |
| 15° | 1554.7 | 1546.2 | 1536.3 | 1554.7 | 1588.6 | 1612.1 | 1622.0 | 1632.9 | 1643.2 | 1652.6 | 1650.8 |
| 17.5° | 1602.7 | 1594.7 | 1589.5 | 1611.2 | 1646.5 | 1657.4 | 1650.8 | 1642.8 | 1642.8 | 1647.9 | 1648.9 |
| 20° | 1644.2 | 1637.1 | 1640.4 | 1661.6 | 1680.0 | 1668.7 | 1644.2 | 1618.7 | 1608.4 | 1611.2 | 1614.0 |
| 22.5° | 1680.4 | 1677.1 | 1687.0 | 1696.9 | 1683.7 | 1644.2 | 1598.9 | 1564.5 | 1551.8 | 1550.9 | 1551.8 |
| 25° | 1722.8 | 1722.4 | 1734.6 | 1716.7 | 1658.3 | 1585.3 | 1524.5 | 1491.1 | 1484.0 | 1489.6 | 1499.1 |
| 27.5° | 1775.6 | 1780.8 | 1786.9 | 1721.4 | 1606.5 | 1496.2 | 1434.5 | 1411.4 | 1418.5 | 1432.2 | 1441.1 |
| 30° | 1843.0 | 1857.1 | 1843.9 | 1709.6 | 1532.0 | 1394.5 | 1335.6 | 1329.0 | 1348.3 | 1367.6 | 1377.0 |
| 32.5° | 1908.5 | 1930.6 | 1898.6 | 1679.0 | 1435.9 | 1286.6 | 1240.9 | 1239.0 | 1262.6 | 1281.4 | 1294.6 |
| 35° | 1961.2 | 2005.0 | 1939.5 | 1618.3 | 1324.8 | 1187.2 | 1153.7 | 1141.0 | 1149.5 | 1171.6 | 1186.7 |
| 37.5° | 2030.0 | 2103.0 | 1967.8 | 1525.4 | 1204.1 | 1105.2 | 1066.1 | 1036.9 | 1029.4 | 1038.3 | 1045.9 |
| 40° | 2155.8 | 2252.4 | 1981.0 | 1395.9 | 1086.4 | 1023.2 | 983.7 | 940.8 | 911.1 | 889.5 | 889.9 |
| 42.5° | 2361.2 | 2446.9 | 1972.5 | 1238.5 | 977.5 | 943.2 | 898.4 | 848.9 | 800.9 | 751.9 | 748.1 |
| 45° | 2694.7 | 2736.2 | 1947.1 | 1071.8 | 881.9 | 859.3 | 817.4 | 767.9 | 703.8 | 648.2 | 643.1 |
| 47.5° | 3228.5 | 3136.6 | 1907.5 | 926.2 | 797.6 | 788.2 | 749.5 | 692.5 | 624.7 | 579.9 | 576.2 |
| 50° | 3956.4 | 3714.7 | 1888.2 | 810.3 | 723.1 | 726.0 | 694.4 | 634.1 | 570.0 | 537.1 | 533.3 |
| 52.5° | 4827.0 | 4387.9 | 1925.4 | 720.8 | 663.3 | 673.2 | 649.7 | 593.1 | 539.4 | 513.5 | 509.7 |
| 55° | 5730.1 | 5085.1 | 1965.5 | 655.8 | 606.8 | 626.1 | 618.1 | 571.5 | 522.9 | 498.9 | 495.6 |
| 57.5° | 6503.2 | 5605.7 | 1885.4 | 603.0 | 556.4 | 586.5 | 593.6 | 557.8 | 514.4 | 492.8 | 489.0 |
| 60° | 6989.8 | 5815.3 | 1675.3 | 553.6 | 516.3 | 555.0 | 579.5 | 554.0 | 517.7 | 515.9 | 513.0 |
| 62.5° | 7220.7 | 5797.0 | 1360.1 | 514.4 | 491.4 | 541.3 | 589.8 | 575.2 | 555.4 | 572.4 | 573.8 |
| 65° | 7117.0 | 5520.0 | 1012.9 | 488.5 | 473.5 | 546.5 | 620.9 | 615.3 | 566.3 | 583.2 | 585.6 |
| 67.5° | 6434.9 | 4859.0 | 750.0 | 465.9 | 453.7 | 561.1 | 677.5 | 628.5 | 545.1 | 557.3 | 549.8 |
| 70° | *5201.0* | *3852.2* | *578.5* | *440.5* | *433.4* | *559.2* | *702.9* | *620.4* | *522.0* | *524.8* | *504.6* |
| 72.5° | 3586.5 | 2626.9 | 470.6 | 416.9 | 404.2 | 509.7 | 685.0 | 600.7 | 502.7 | 481.0 | 454.1 |
| 75° | 1950.4 | 1410.0 | 400.0 | 392.4 | 352.9 | 447.6 | 652.0 | 586.5 | 485.2 | 456.5 | 441.4 |
| 77.5° | 767.4 | 585.1 | 347.2 | 359.0 | 308.6 | 395.3 | 615.3 | 559.7 | 461.2 | 423.5 | 416.0 |
| 80° | 313.3 | 298.7 | 287.8 | 310.5 | 265.2 | 345.8 | 571.0 | 528.1 | 432.5 | 392.9 | 377.8 |
| 82.5° | 177.6 | 185.6 | 223.8 | 245.0 | 215.3 | 318.5 | 549.8 | 502.7 | 398.1 | 351.9 | 334.0 |
| 85° | 90.9 | 108.8 | 155.9 | 175.7 | 158.3 | 270.9 | 506.4 | 440.0 | 319.4 | 269.5 | 270.9 |
| 87.5° | 43.8 | 60.8 | 98.5 | 110.2 | 102.7 | 196.0 | 378.3 | 318.9 | 248.7 | 196.9 | 190.8 |
| 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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# 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

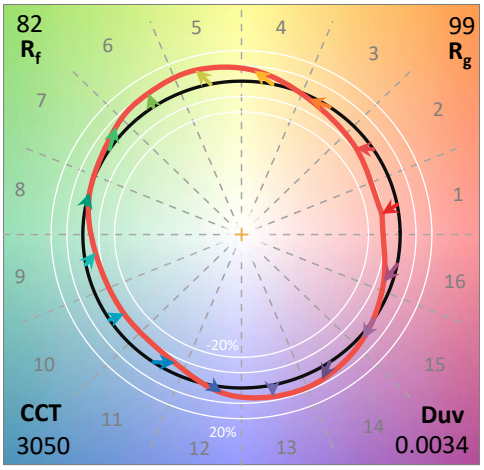
## Test Information

| | |
|---|---|
| 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

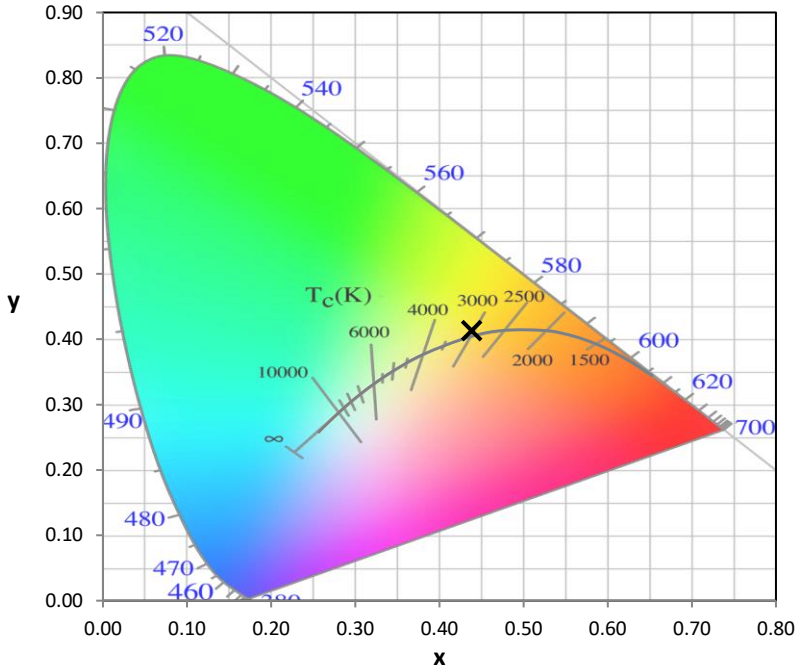
| | |
|---|---|
| Stabilization Time: | 20M |
| Operation Time: | 1H 20M |
| Sphere Temperature (°C): | 24.2 |

REPORT NUMBER: SP1-2408-195-9

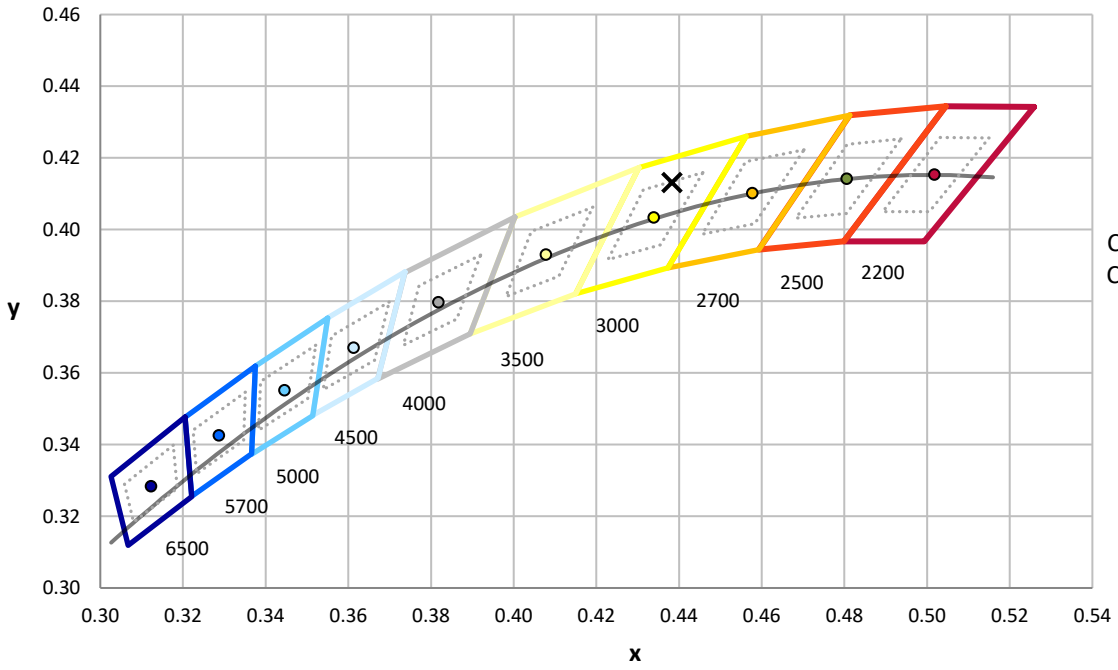
| Measurement and Test Equipment | | | |
|---|---|---|---|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 6/18/2024 | 12/18/2024 |
| Power Meter | INXT2011004 | 2/8/2024 | 2/8/2025 |
| AC Power Source | IN0063 | 10/24/2023 | 10/24/2024 |
| DC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

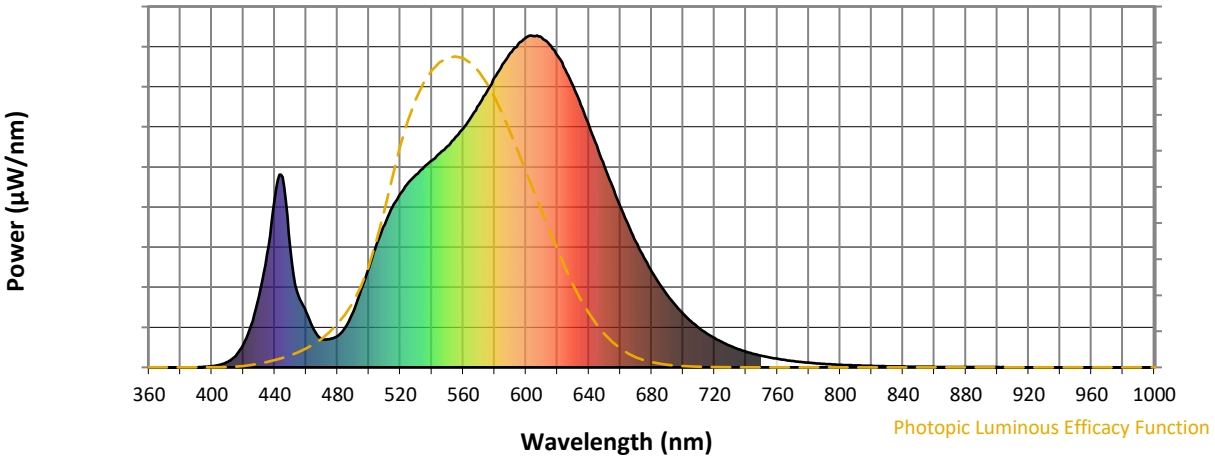



CCT = 3050K
CIE x = 0.4383
CIE y = 0.4131
Duv = 0.0034

Point lies inside the ANSI 3000K 4-step quadrangle

REPORT NUMBER: SP1-2408-195-9

## Photopic Flux vs. Wavelength

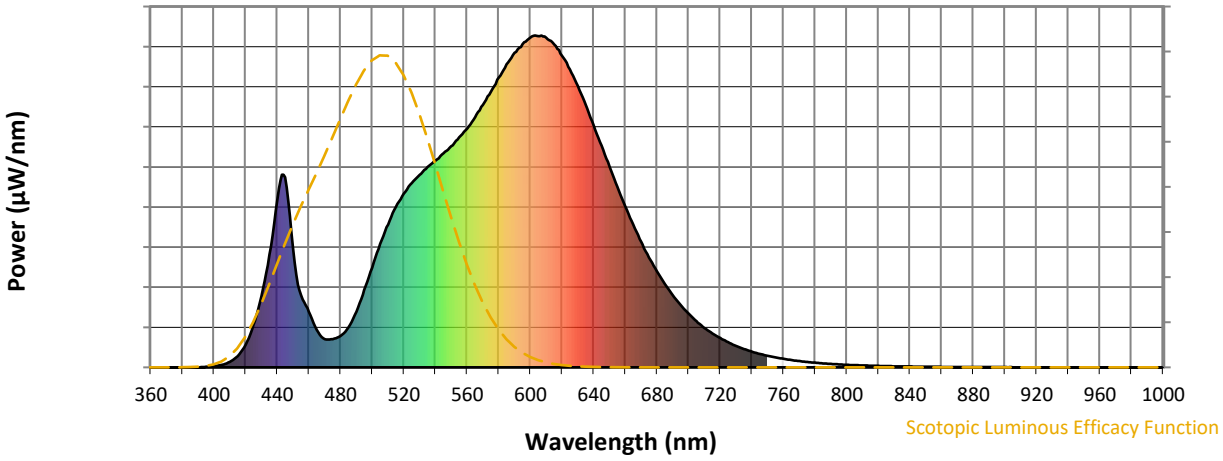



## Photopic Lumens: NR

| 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 | | | |

REPORT NUMBER: SP1-2408-195-9

## Scotopic Flux vs. Wavelength

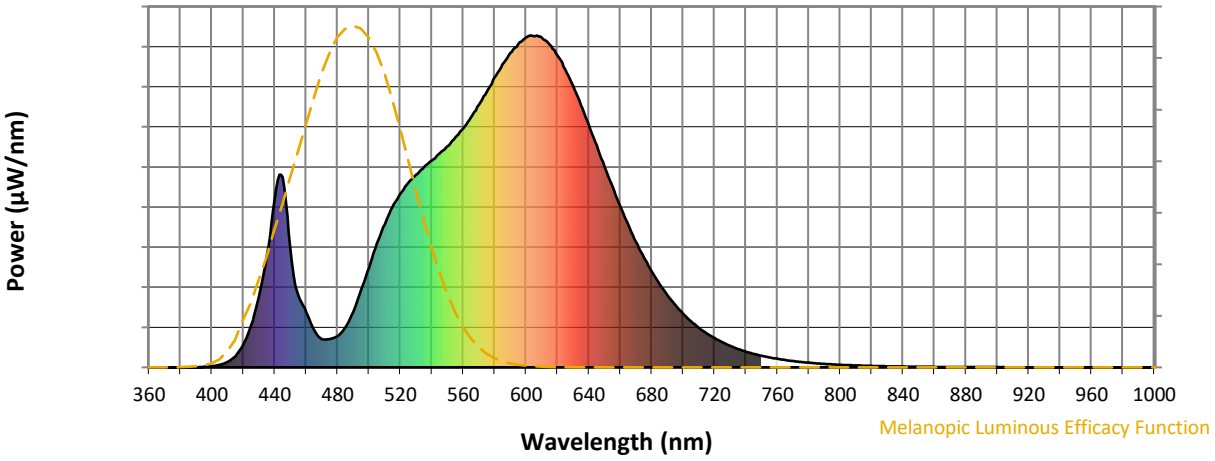



**Scotopic Lumens: NR** **S/P: 1.27**

| 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 | | | |

REPORT NUMBER: SP1-2408-195-9

## 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 | | | |

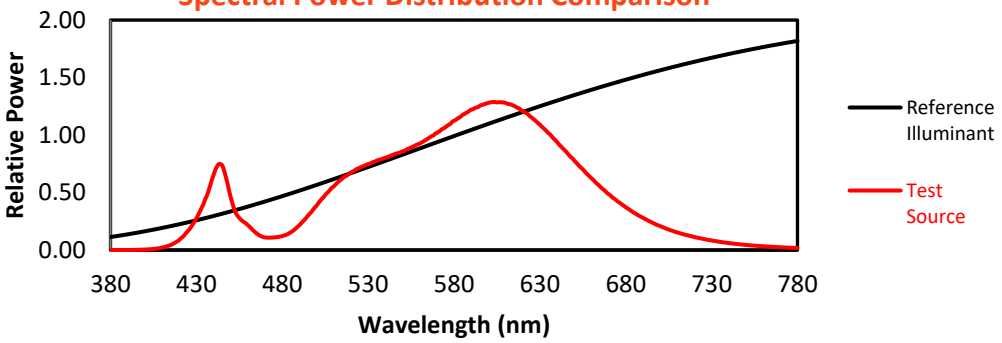
REPORT NUMBER: SP1-2408-195-9

# TM-30-18

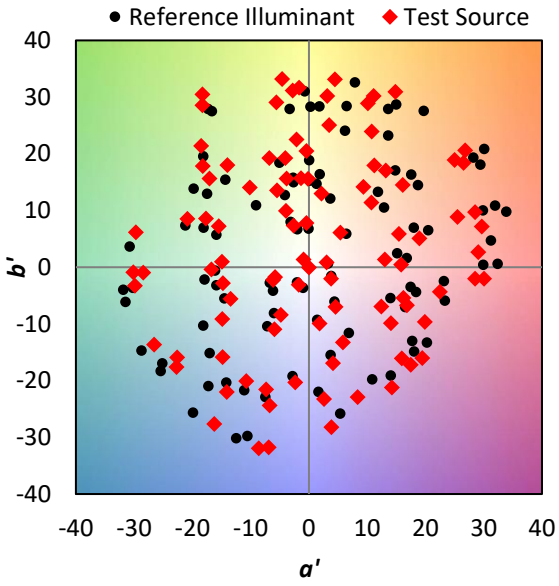
## Summary

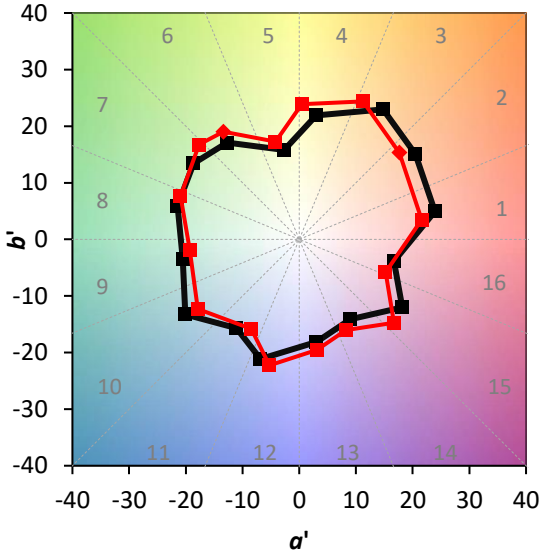
$R_f$ = 81.5
$R_g$ = 99.2
CIE $R_a$ = 81.0
$R_9$ = 7.1

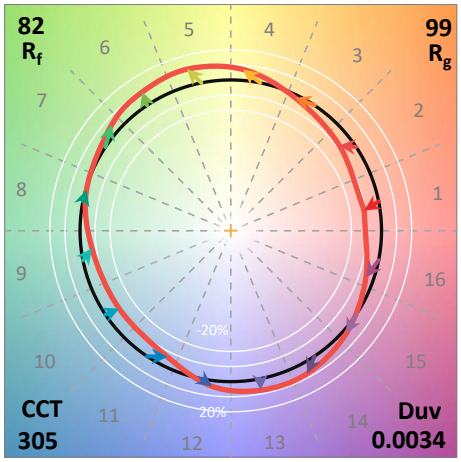
## Spectral Power Distribution Comparison

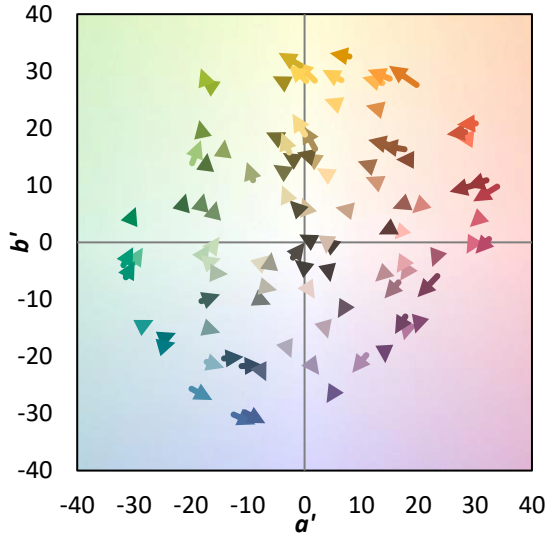



## Color Vector Graphics



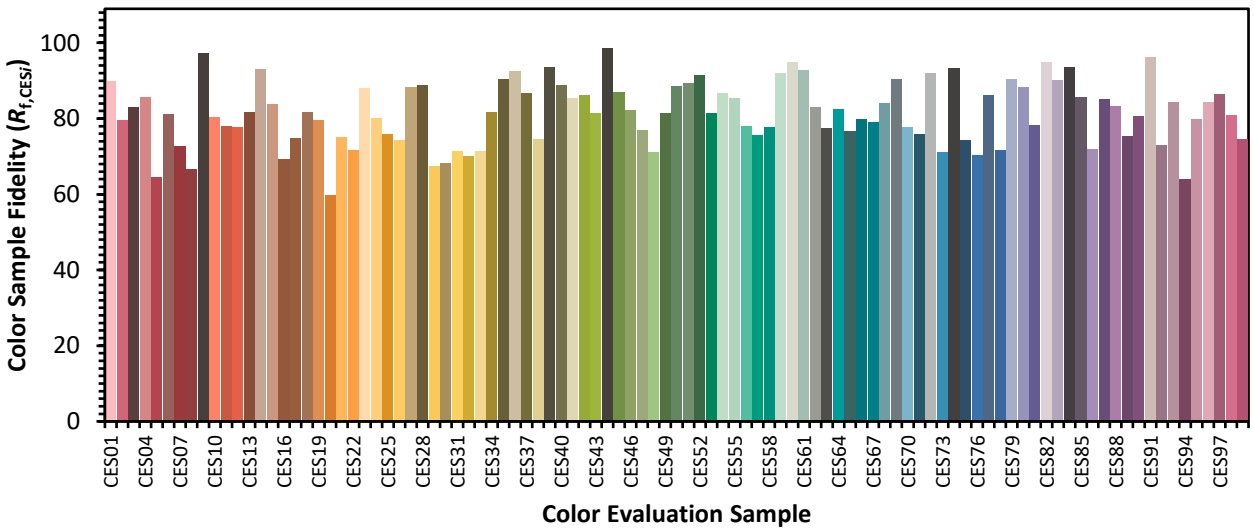



REPORT NUMBER: SP1-2408-195-9

# TM-30-18

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

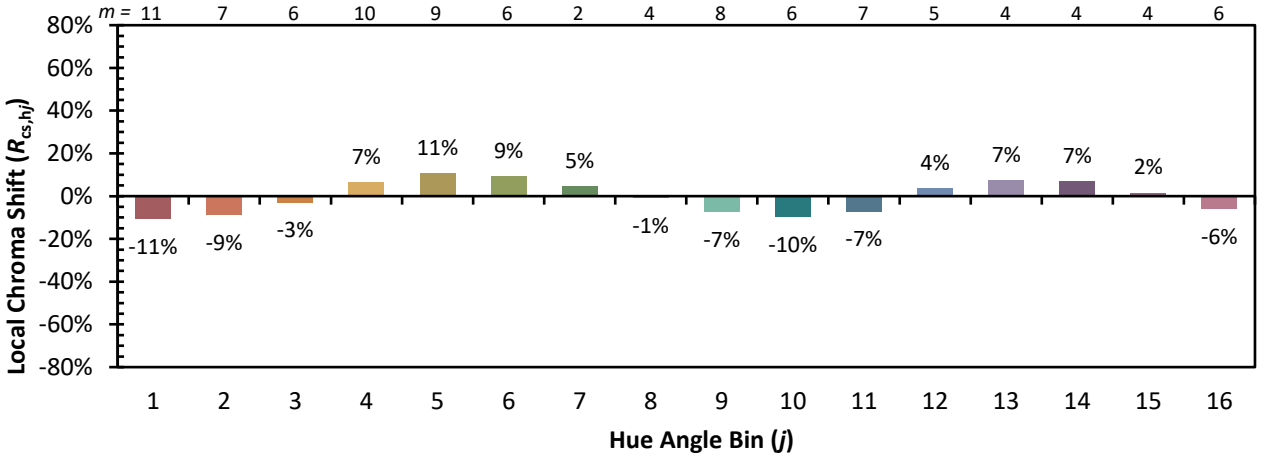
| | | | |
|---|---|---|---|
| CES01 = 86 | CES26 = 74 | CES51 = 89 | CES76 = 70 |
| CES02 = 63 | CES27 = 88 | CES52 = 92 | CES77 = 86 |
| CES03 = 31 | CES28 = 89 | CES53 = 81 | CES78 = 72 |
| CES04 = 70 | CES29 = 67 | CES54 = 87 | CES79 = 90 |
| CES05 = 50 | CES30 = 68 | CES55 = 85 | CES80 = 88 |
| CES06 = 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 | |

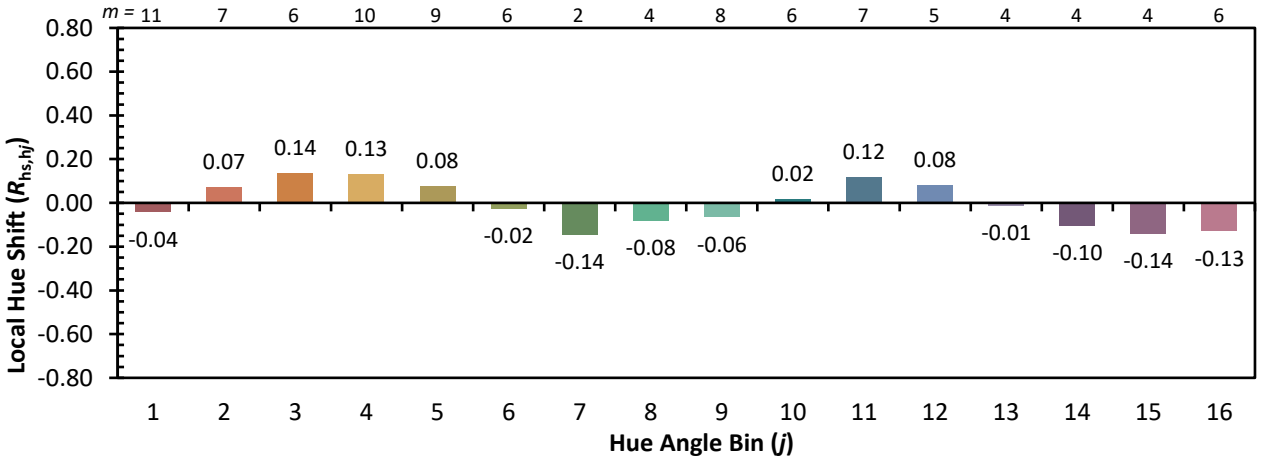


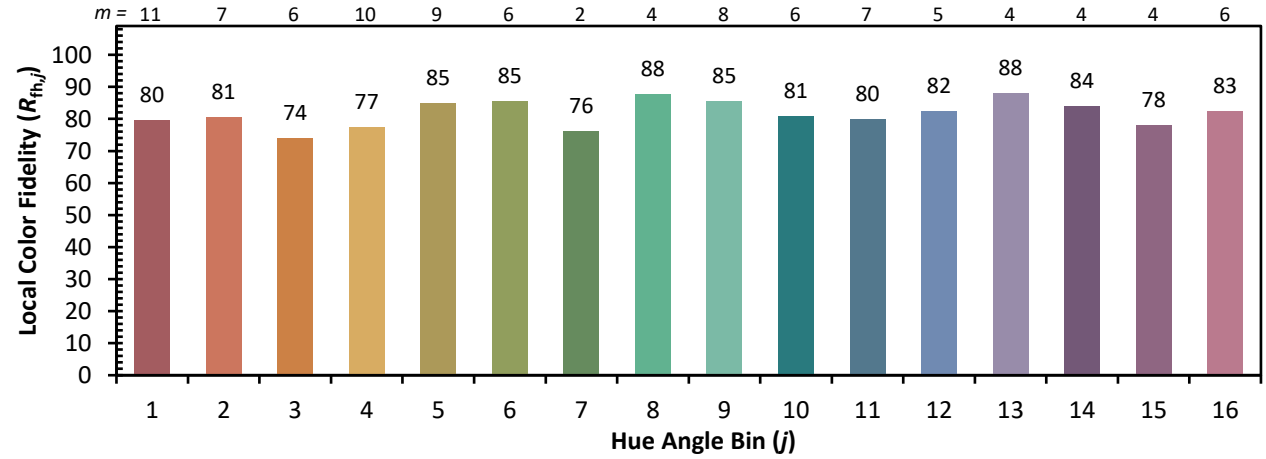
REPORT NUMBER: SP1-2408-195-9

# TM-30-18

## Color Rendition by Hue-Angle Bin



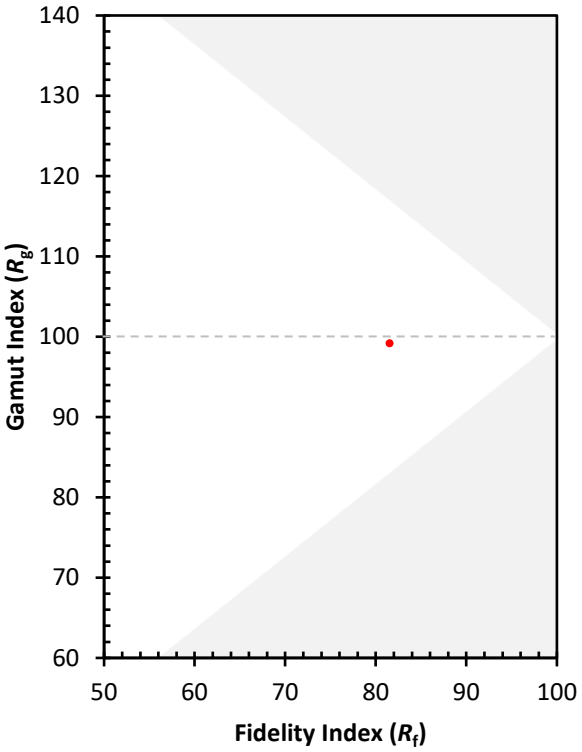



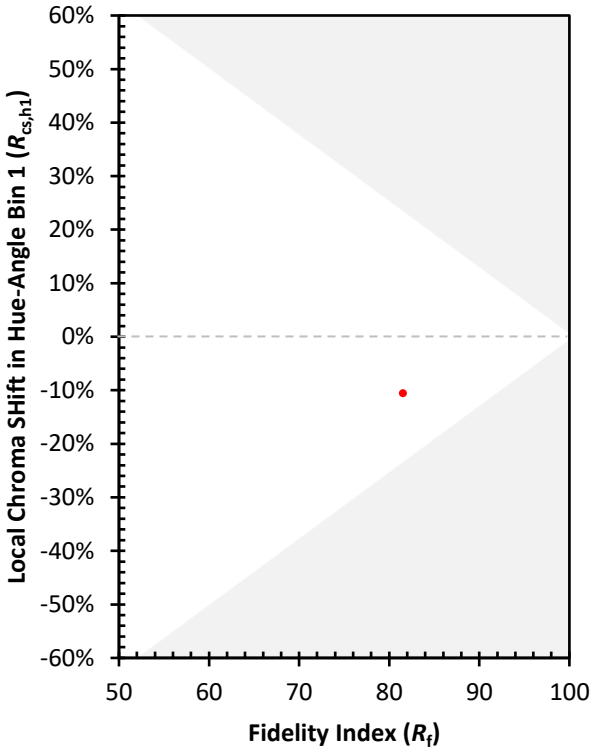



REPORT NUMBER: SP1-2408-195-9

# TM-30-18

## Measure Comparisons




(END OF REPORT)