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: P323346

Luminaire Tested: **GLEON-SA2A-830-U-SL2-HSS**

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: | P323346 |
| | TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-21) |
| Test Lab: | INNOVATION CENTER |
| Issue Date: | 3/3/2020 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS (FORMERLY EATON) |
| Product Line: | McGRAW-EDISON |
| Catalog Number: | GLEON-SA2A-830-U-SL2-HSS |
| Description: | GALLEON AREA AND ROADWAY LUMINAIRE |
| | (2) 80 CRI, 3000K, 615mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE II SPILL LIGHT ELIMINATOR OPTICS WITH HOUSE SIDE SHIELD |
| Light Source: | - |
| Ballast/Driver: | ELECTRONIC DRIVER |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 6276 lumens |
| Efficiency: | N/A |
| Efficacy: | 95.1 lumens/watt |
| Luminous Opening: | Rectangular (W 0.5' x L: 1' x H: 0') |
| IES Classification: | Type III - Medium |
| BUG Rating: | B1 - U0 - G2 |

| | |
|---|---|
| Input Watts (W): | 66 |
| Input Voltage (V): | NR |
| Input Current (Ain): | NR |
| Voltage Rise (V): | NR |
| Power Factor: | NR |
| Total Harmonic Distortion (THDi): | NR |
| Frequency (hertz): | 60 |
| Stabilization Time: | NR |
| Operation Time: | NR |
| Ambient Temperature (°C): | NR |
| Test Distance: | 24 FT |

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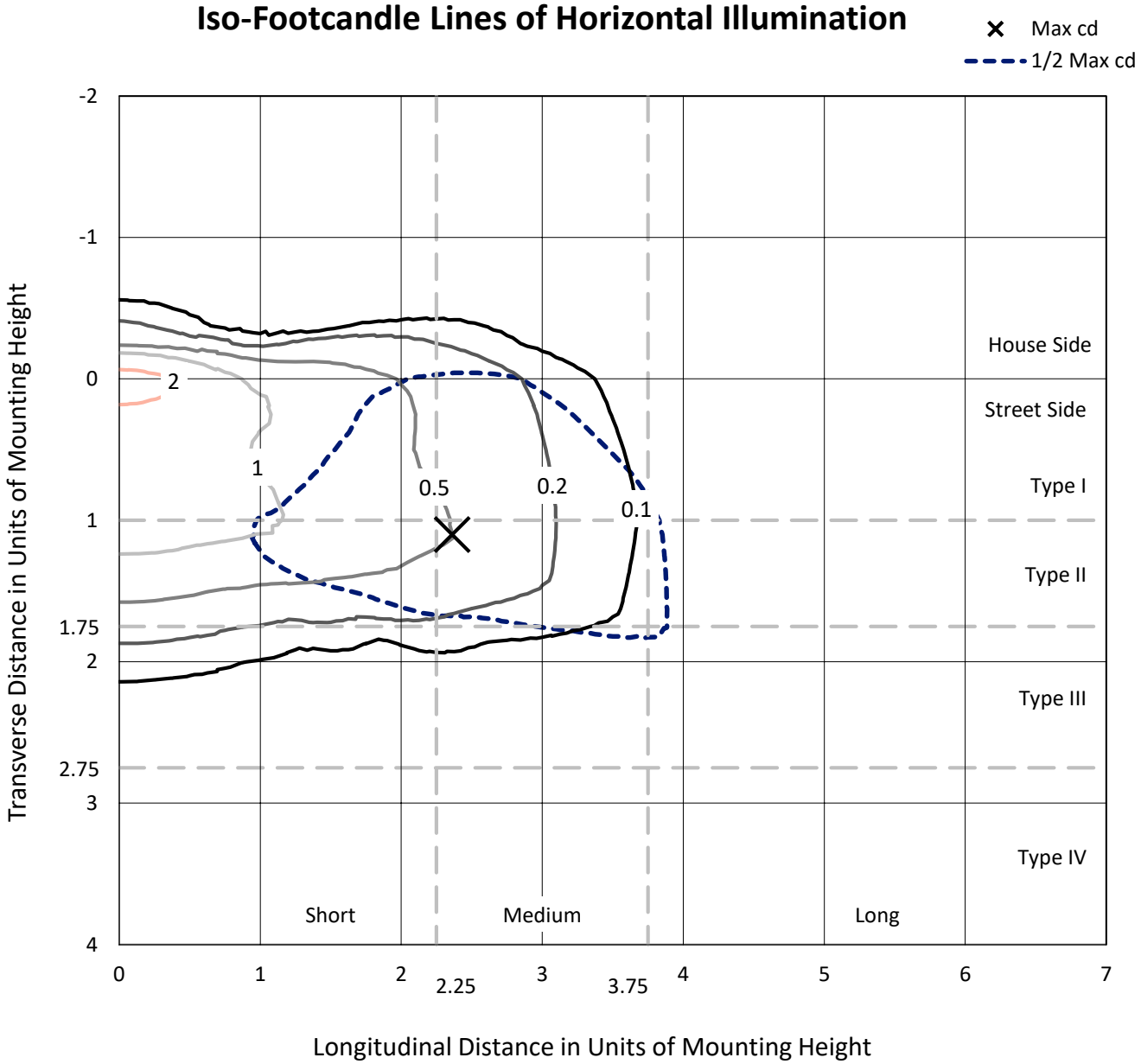
Scaled Data Report

REPORT NUMBER: P323346
CATALOG NUMBER: GLEON-SA2A-830-U-SL2-HSS

## Iso-Footcandle Lines of Horizontal Illumination




Based on 25 foot mounting height. Maximum calculated value = 2.5 fc
Type III - Medium - N/A

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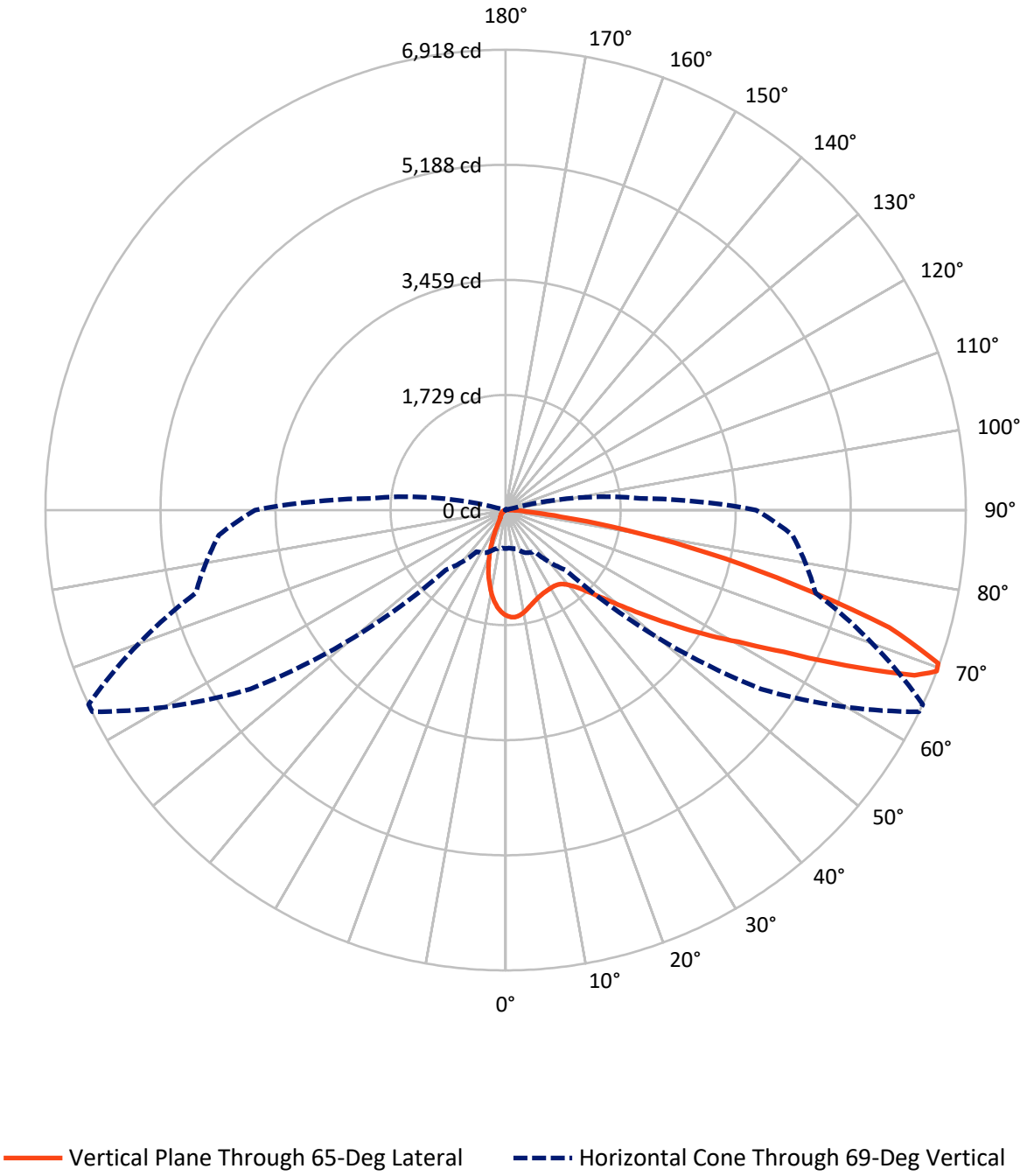
## Luminous Intensity Polar Plot



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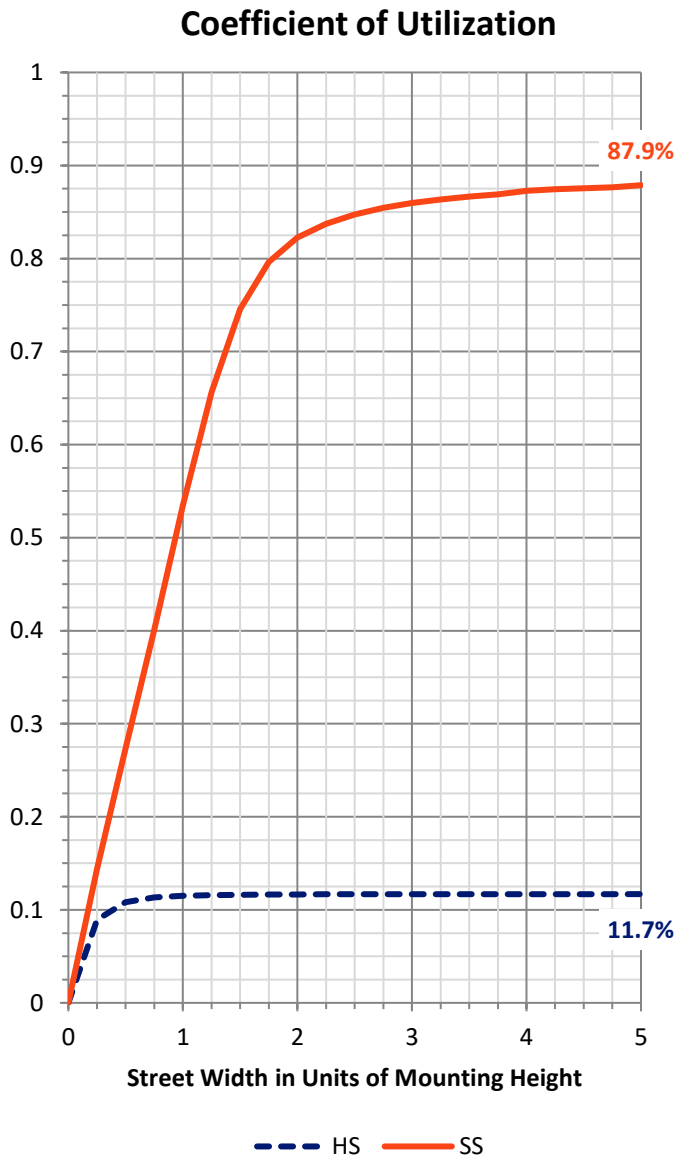
REPORT NUMBER: P323346
CATALOG NUMBER: GLEON-SA2A-830-U-SL2-HSS

**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 739.8 | 0.0 | 739.8 |
| | % Fixture | 11.8 | 0.0 | 11.8 |
| **Street Side** | Lumens | 5536.2 | 0.0 | 5536.2 |
| | % Fixture | 88.2 | 0.0 | 88.2 |
| **Total** | Lumens | 6276.0 | 0.0 | 6276.0 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 132.6 | 2.1 |
| 10°-20° | 290.3 | 4.6 |
| 20°-30° | 402.1 | 6.4 |
| 30°-40° | 560.6 | 8.9 |
| 40°-50° | 871.4 | 13.9 |
| 50°-60° | 1399.0 | 22.3 |
| 60°-70° | 1582.5 | 25.2 |
| 70°-80° | 929.4 | 14.8 |
| 80°-90° | 108.1 | 1.7 |
| 90°-100° | 0.0 | 0.0 |
| 100°-110° | 0.0 | 0.0 |
| 110°-120° | 0.0 | 0.0 |
| 120°-130° | 0.0 | 0.0 |
| 130°-140° | 0.0 | 0.0 |
| 140°-150° | 0.0 | 0.0 |
| 150°-160° | 0.0 | 0.0 |
| 160°-170° | 0.0 | 0.0 |
| 170°-180° | 0.0 | 0.0 |
| 0°-90° | 6276.0 | 100.0 |
| 0°-180° | 6276.0 | 100.0 |



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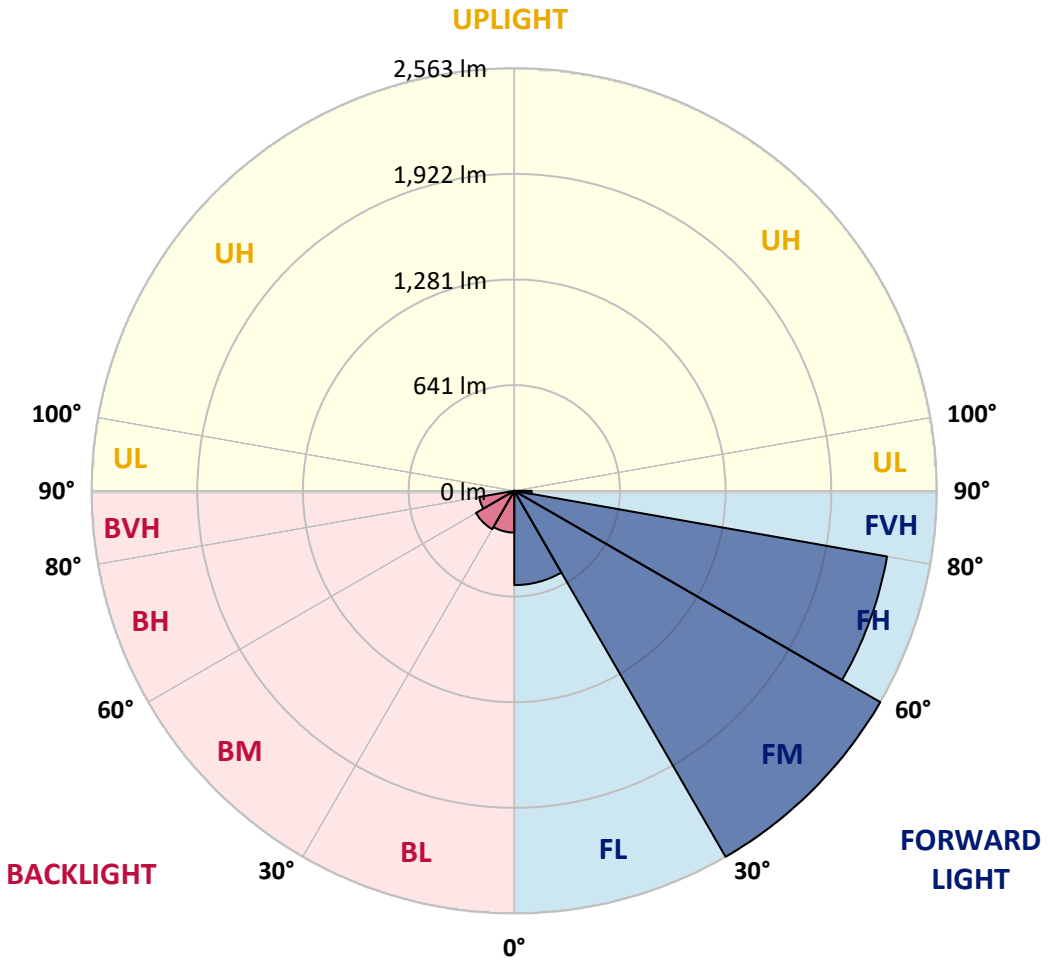
REPORT NUMBER: P323346
CATALOG NUMBER: GLEON-SA2A-830-U-SL2-HSS

## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 571.9 | 9.1 | | | |
| FM | (30°-60°) | 2562.9 | 40.8 | | | |
| FH | (60°-80°) | 2295.7 | 36.6 | | | G2/5000 |
| FVH | (80°-90°) | 105.7 | 1.7 | | | G2/225 |
| BL | (0°-30°) | 253.1 | 4.0 | B1/500 | | |
| BM | (30°-60°) | 268.1 | 4.3 | B1/1000 | | |
| BH | (60°-80°) | 216.2 | 3.4 | B1/500 | | G1/500 |
| BVH | (80°-90°) | 2.4 | 0.0 | | | G0/10 |
| UL | (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH | (100°-180°) | 0.0 | 0.0 | | U0/0 | |

**BUG Rating: B1-U0-G2**
Type III Medium



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REPORT NUMBER: P323346
CATALOG NUMBER: GLEON-SA2A-830-U-SL2-HSS

**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 15° | 25° | 35° | 45° | 55° | 64° | 65° | 75° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 1586.0 | 1586.0 | 1586.0 | 1586.0 | 1586.0 | 1586.0 | 1586.0 | 1586.0 | *1586.0* | 1586.0 | 1586.0 |
| 2.5° | 1600.0 | 1596.0 | 1599.2 | 1606.1 | 1609.6 | 1609.6 | 1612.2 | 1609.1 | *1610.1* | 1602.4 | 1591.3 |
| 5° | 1499.9 | 1493.8 | 1502.6 | 1522.0 | 1545.9 | 1566.3 | 1596.6 | 1612.5 | *1614.1* | 1614.4 | 1601.4 |
| 7.5° | 1392.1 | 1386.5 | 1399.5 | 1422.4 | 1453.2 | 1491.1 | 1544.0 | 1590.2 | *1592.9* | 1617.8 | 1608.3 |
| 10° | 1304.5 | 1300.5 | 1315.6 | 1340.0 | 1376.2 | 1418.7 | 1483.4 | 1547.7 | *1555.4* | 1610.7 | 1607.2 |
| 12.5° | 1234.9 | 1231.7 | 1246.0 | 1274.2 | 1311.1 | 1358.1 | 1425.8 | 1500.4 | *1510.8* | 1594.5 | 1601.9 |
| 15° | 1184.2 | 1183.6 | 1195.6 | 1222.7 | 1263.6 | 1307.4 | 1376.7 | 1456.6 | *1468.6* | 1576.9 | 1601.1 |
| 17.5° | 1157.6 | 1158.4 | 1167.2 | 1190.3 | 1225.3 | 1268.9 | 1335.3 | 1419.7 | *1432.7* | 1561.3 | 1605.1 |
| 20° | 1154.9 | 1155.7 | 1160.5 | 1173.5 | 1201.9 | 1240.5 | 1301.5 | 1388.6 | *1402.2* | 1549.6 | 1611.5 |
| 22.5° | 1178.3 | 1177.8 | 1179.1 | 1177.8 | 1193.7 | 1222.9 | 1279.2 | 1364.7 | *1380.4* | 1541.9 | 1616.5 |
| 25° | 1223.2 | 1222.4 | 1221.9 | 1212.0 | 1201.4 | 1217.1 | 1269.9 | 1351.2 | *1366.1* | 1536.3 | 1619.4 |
| 27.5° | 1285.6 | 1285.1 | 1284.3 | 1268.1 | 1236.2 | 1226.4 | 1271.0 | 1346.2 | *1358.6* | 1531.8 | 1618.9 |
| 30° | 1367.7 | 1371.4 | 1370.3 | 1347.7 | 1298.1 | 1254.8 | 1282.1 | 1343.5 | *1354.4* | 1523.0 | 1613.3 |
| 32.5° | 1464.1 | 1471.5 | 1477.3 | 1453.2 | 1391.0 | 1311.1 | 1307.9 | 1346.4 | *1354.4* | 1516.4 | 1603.2 |
| 35° | 1564.2 | 1573.7 | 1595.3 | 1586.8 | 1505.0 | 1395.8 | 1352.3 | 1363.9 | *1370.6* | 1520.1 | 1598.4 |
| 37.5° | 1662.7 | 1674.1 | 1720.9 | 1745.6 | 1654.2 | 1507.9 | 1421.3 | 1407.2 | *1410.7* | 1542.7 | 1603.7 |
| 40° | 1777.2 | 1794.4 | 1865.3 | 1905.2 | 1832.4 | 1657.9 | 1524.6 | 1481.6 | *1482.9* | 1592.3 | 1628.4 |
| 42.5° | 1927.5 | 1945.3 | 2022.0 | 2084.4 | 2033.2 | 1847.5 | 1664.8 | 1595.3 | *1593.9* | 1685.3 | 1686.6 |
| 45° | 2110.7 | 2129.3 | 2208.7 | 2278.0 | 2254.9 | 2072.2 | 1844.4 | 1761.2 | *1759.6* | 1831.9 | 1796.8 |
| 47.5° | 2318.4 | 2336.7 | 2407.6 | 2479.1 | 2504.0 | 2334.6 | 2073.0 | 1987.8 | *1984.0* | 2035.6 | 1967.0 |
| 50° | 2496.6 | 2508.5 | 2573.9 | 2670.0 | 2782.6 | 2657.0 | 2357.4 | 2275.4 | *2271.4* | 2306.2 | 2216.9 |
| 52.5° | 2561.4 | 2568.3 | 2634.7 | 2769.3 | 3050.3 | 3093.6 | 2731.1 | 2625.4 | *2622.5* | 2637.6 | 2549.7 |
| 55° | 2430.2 | 2442.7 | 2524.2 | 2723.9 | 3195.3 | 3587.0 | 3202.7 | 3058.8 | *3036.7* | 3004.1 | 2897.6 |
| 57.5° | 2072.7 | 2092.7 | 2180.3 | 2445.9 | 3127.6 | 3978.4 | 3895.8 | 3549.0 | *3516.6* | 3316.9 | 3180.4 |
| 60° | 1553.0 | 1577.5 | 1650.2 | 1936.8 | 2766.1 | 4117.9 | 4653.2 | 4095.3 | *4022.3* | 3566.0 | 3440.4 |
| 62.5° | 1065.7 | 1077.9 | 1127.3 | 1314.0 | 2037.2 | 3889.5 | 5286.9 | 4826.9 | *4693.6* | 3836.9 | 3721.6 |
| 65° | 814.0 | 818.2 | 838.4 | 902.7 | 1213.1 | 3159.4 | 5538.9 | 5792.2 | *5631.0* | 4160.9 | 4013.5 |
| 67.5° | 655.9 | 652.5 | 680.4 | 772.3 | 812.4 | 1927.5 | 5244.9 | 6705.5 | *6630.1* | 4594.0 | 4307.2 |
| 69° | *578.4* | *573.6* | *602.0* | *708.8* | *763.0* | *1274.2* | *4688.8* | *6912.9* | *6917.7* | *4822.7* | *4327.4* |
| 70° | 520.5 | 523.7 | 551.8 | 671.1 | 746.2 | 1000.1 | 4157.7 | 6860.1 | *6897.8* | 4908.2 | 4206.3 |
| 72.5° | 347.6 | 356.1 | 412.7 | 557.2 | 717.6 | 756.9 | 2510.4 | 5886.8 | *6031.8* | 4715.6 | 3608.8 |
| 75° | 196.0 | 202.4 | 269.5 | 420.1 | 676.1 | 720.7 | 1326.0 | 4336.9 | *4477.2* | 3943.4 | 2782.9 |
| 77.5° | 96.1 | 99.6 | 152.4 | 271.1 | 565.4 | 686.8 | 752.1 | 2945.9 | *3106.1* | 2573.9 | 1574.0 |
| 80° | 40.6 | 42.5 | 76.2 | 167.3 | 404.2 | 655.4 | 558.5 | 1813.0 | *1832.9* | 1008.4 | 419.3 |
| 82.5° | 15.7 | 16.2 | 32.1 | 104.4 | 256.8 | 510.9 | 467.1 | 859.6 | *838.9* | 189.9 | 95.6 |
| 85° | 1.9 | 2.1 | 11.7 | 62.7 | 142.9 | 262.9 | 379.5 | 370.5 | *342.8* | 37.7 | 49.1 |
| 87.5° | 0.0 | 0.0 | 0.8 | 19.1 | 42.5 | 123.2 | 197.3 | 153.8 | *138.6* | 12.2 | 25.5 |
| 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: P323346
CATALOG NUMBER: GLEON-SA2A-830-U-SL2-HSS

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 1586.0 | 1586.0 | 1586.0 | 1586.0 | 1586.0 | 1586.0 | 1586.0 | 1586.0 | 1586.0 | 1586.0 | 1586.0 |
| 2.5° | 1582.0 | 1579.3 | 1565.0 | 1544.3 | 1524.6 | 1500.2 | 1476.8 | 1462.7 | 1451.6 | 1444.1 | 1452.9 |
| 5° | 1586.2 | 1574.5 | 1531.0 | 1475.2 | 1420.5 | 1358.9 | 1301.5 | 1252.9 | 1233.8 | 1212.6 | 1222.1 |
| 7.5° | 1584.9 | 1562.9 | 1484.5 | 1385.2 | 1284.8 | 1181.0 | 1082.7 | 1007.0 | 967.7 | 929.2 | 939.0 |
| 10° | 1578.3 | 1541.1 | 1422.4 | 1275.2 | 1124.9 | 975.7 | 836.3 | 730.3 | 671.1 | 617.4 | 625.1 |
| 12.5° | 1563.6 | 1511.9 | 1349.1 | 1149.4 | 948.3 | 751.5 | 588.2 | 452.5 | 379.8 | 347.6 | 351.6 |
| 15° | 1554.9 | 1483.4 | 1271.5 | 1021.9 | 759.8 | 523.4 | 359.6 | 267.4 | 234.2 | 223.6 | 224.9 |
| 17.5° | 1550.6 | 1456.1 | 1191.3 | 876.1 | 567.0 | 333.3 | 232.4 | 205.0 | 197.8 | 196.0 | 196.5 |
| 20° | 1546.4 | 1428.5 | 1108.7 | 731.9 | 390.6 | 224.1 | 190.9 | 183.0 | 180.3 | 177.9 | 178.5 |
| 22.5° | 1539.2 | 1401.9 | 1020.0 | 585.8 | 263.4 | 181.9 | 172.1 | 164.4 | 158.8 | 155.9 | 156.4 |
| 25° | 1530.5 | 1374.0 | 929.5 | 436.3 | 192.3 | 162.3 | 153.0 | 142.1 | 135.4 | 130.1 | 130.4 |
| 27.5° | 1516.4 | 1339.8 | 836.0 | 317.6 | 161.5 | 145.3 | 132.8 | 120.8 | 109.7 | 103.6 | 103.6 |
| 30° | 1496.7 | 1301.0 | 732.2 | 227.3 | 144.7 | 128.5 | 113.4 | 98.5 | 86.6 | 81.0 | 80.5 |
| 32.5° | 1474.9 | 1260.6 | 627.3 | 172.4 | 131.5 | 112.9 | 95.6 | 79.9 | 69.3 | 64.8 | 64.5 |
| 35° | 1456.4 | 1217.1 | 522.6 | 144.5 | 118.2 | 97.7 | 78.9 | 65.6 | 57.1 | 53.4 | 53.1 |
| 37.5° | 1444.4 | 1173.5 | 420.7 | 129.1 | 106.2 | 83.7 | 66.1 | 54.2 | 48.1 | 45.1 | 44.9 |
| 40° | 1442.6 | 1141.1 | 327.4 | 117.4 | 95.1 | 71.2 | 55.2 | 45.9 | 40.4 | 37.2 | 36.9 |
| 42.5° | 1466.7 | 1122.5 | 251.2 | 107.6 | 83.7 | 60.3 | 47.0 | 39.3 | 33.5 | 30.3 | 30.0 |
| 45° | 1530.2 | 1128.4 | 193.3 | 98.8 | 72.2 | 51.0 | 39.8 | 32.7 | 27.4 | 25.0 | 24.4 |
| 47.5° | 1646.0 | 1168.8 | 153.8 | 90.0 | 61.3 | 43.3 | 34.0 | 27.1 | 22.6 | 20.2 | 19.9 |
| 50° | 1852.1 | 1263.6 | 128.5 | 80.5 | 51.3 | 36.9 | 28.1 | 22.0 | 18.3 | 16.2 | 15.9 |
| 52.5° | 2125.6 | 1432.5 | 114.7 | 71.2 | 42.5 | 31.3 | 23.1 | 17.5 | 14.3 | 12.7 | 12.5 |
| 55° | 2427.3 | 1636.9 | 105.7 | 61.1 | 34.8 | 26.0 | 18.3 | 13.8 | 11.2 | 9.8 | 9.3 |
| 57.5° | 2721.8 | 1814.1 | 97.2 | 51.3 | 28.9 | 21.2 | 14.6 | 10.9 | 8.8 | 7.4 | 7.2 |
| 60° | 2992.4 | 1976.9 | 87.4 | 41.2 | 23.6 | 16.7 | 11.4 | 8.5 | 6.9 | 5.6 | 5.6 |
| 62.5° | 3282.1 | 2102.7 | 73.8 | 32.1 | 19.4 | 12.7 | 9.3 | 7.7 | 5.6 | 4.8 | 4.5 |
| 65° | 3589.1 | 2196.2 | 57.9 | 25.0 | 15.1 | 9.6 | 7.7 | 8.0 | 4.5 | 3.5 | 3.2 |
| 67.5° | 3815.9 | 2177.6 | 42.8 | 19.7 | 11.7 | 7.4 | 7.4 | 8.5 | 4.0 | 2.7 | 2.4 |
| 69° | *3766.0* | *2026.5* | *35.9* | *17.0* | *10.1* | *6.4* | *6.9* | *8.5* | *3.7* | *2.4* | *2.1* |
| 70° | 3621.2 | 1859.2 | 31.6 | 15.1 | 9.0 | 5.8 | 6.6 | 8.2 | 3.5 | 2.4 | 2.1 |
| 72.5° | 3015.8 | 1400.3 | 24.7 | 11.4 | 7.2 | 4.8 | 5.6 | 7.2 | 3.5 | 2.4 | 1.9 |
| 75° | 2268.5 | 896.3 | 18.9 | 8.2 | 5.3 | 3.7 | 4.2 | 5.3 | 3.5 | 2.1 | 1.9 |
| 77.5° | 1234.3 | 323.2 | 13.5 | 5.6 | 3.7 | 2.9 | 2.9 | 4.0 | 3.2 | 1.6 | 1.1 |
| 80° | 317.4 | 81.3 | 8.5 | 3.7 | 2.9 | 2.1 | 1.9 | 2.7 | 1.9 | 0.3 | 0.0 |
| 82.5° | 78.3 | 18.3 | 4.5 | 2.7 | 2.1 | 0.8 | 0.8 | 1.3 | 0.8 | 0.0 | 0.0 |
| 85° | 43.0 | 9.0 | 2.9 | 1.9 | 1.1 | 0.0 | 0.0 | 0.3 | 0.0 | 0.0 | 0.0 |
| 87.5° | 22.0 | 2.7 | 0.8 | 0.5 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 90° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

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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

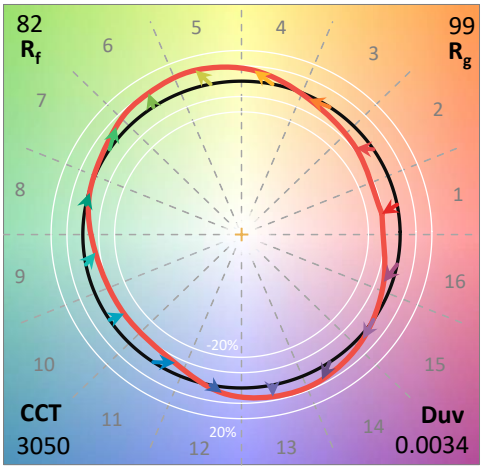
## Test Information

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

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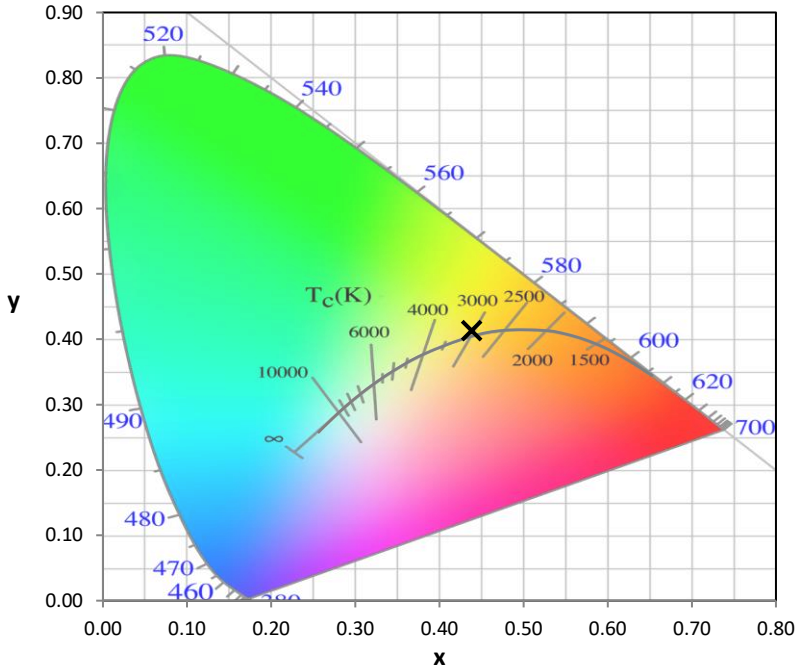
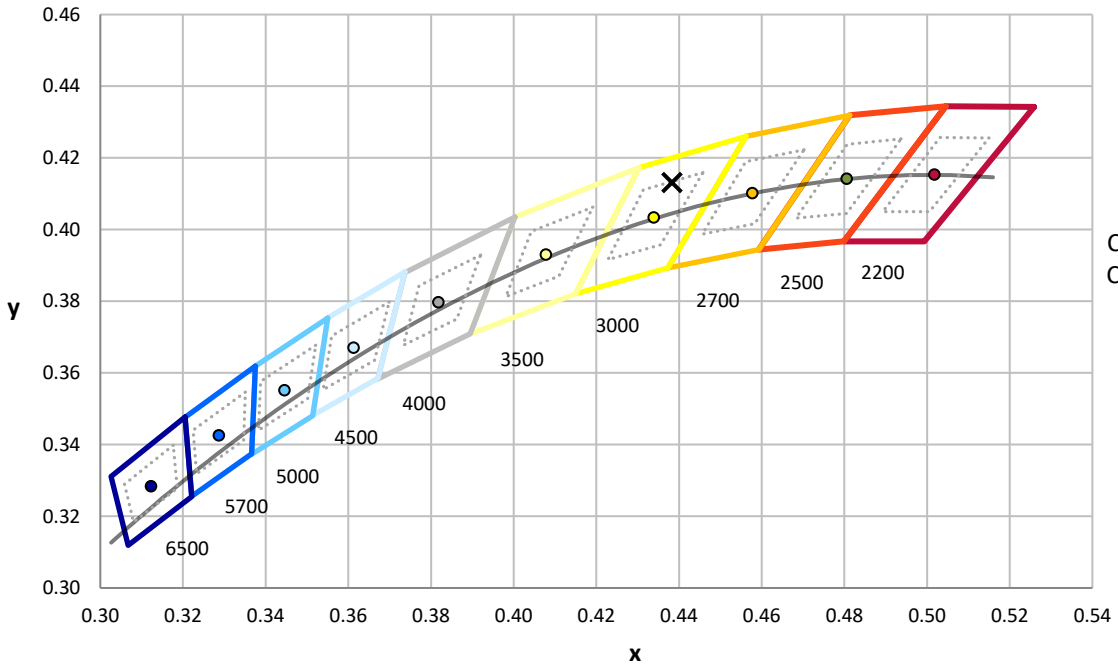
## CIE 1931 Chromaticity Diagram




## 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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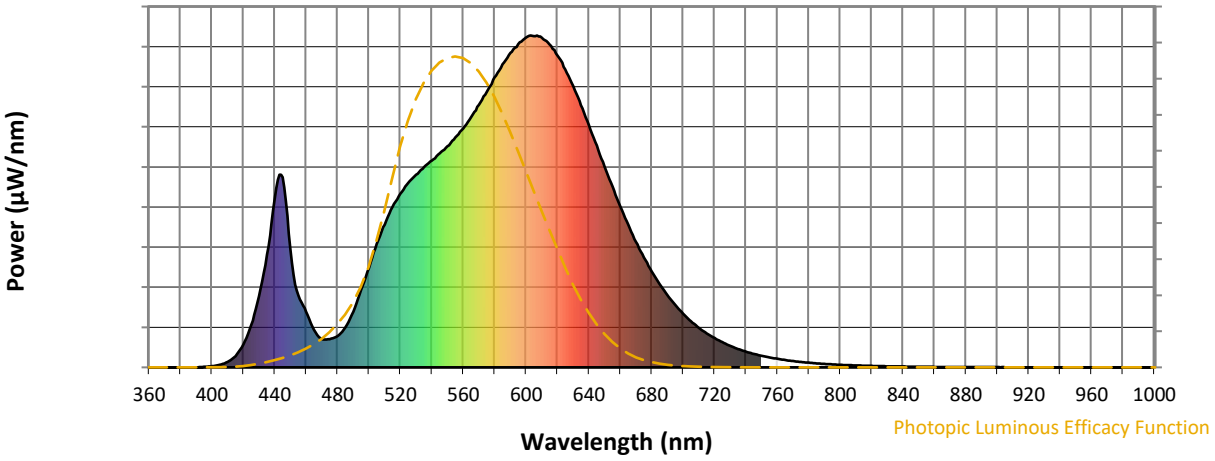
## Photopic Flux vs. Wavelength




## 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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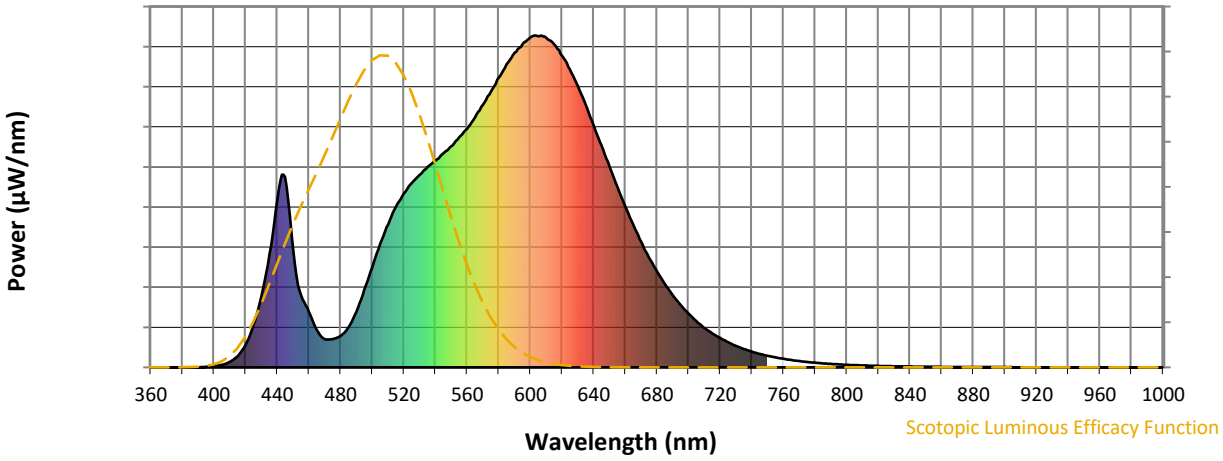
## Scotopic Flux vs. Wavelength




**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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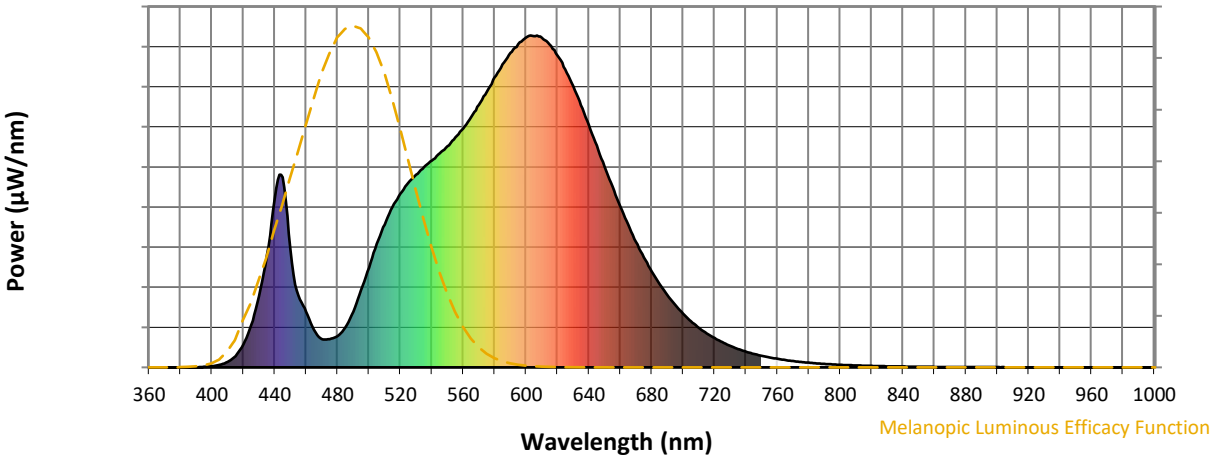
## Melanopic Flux vs. Wavelength




**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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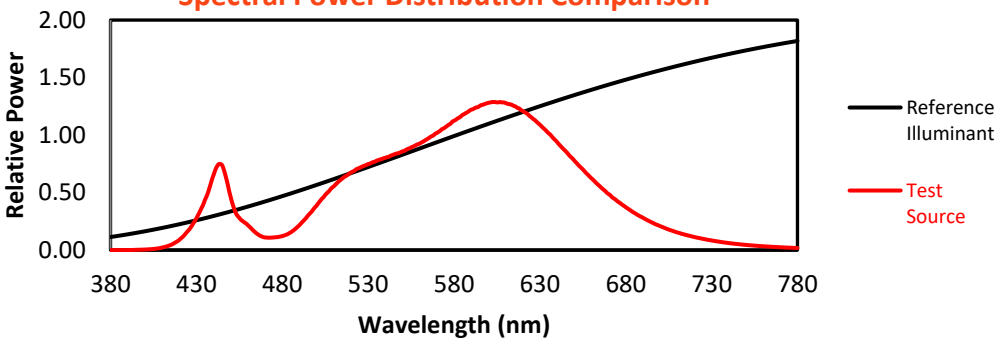
# TM-30-18

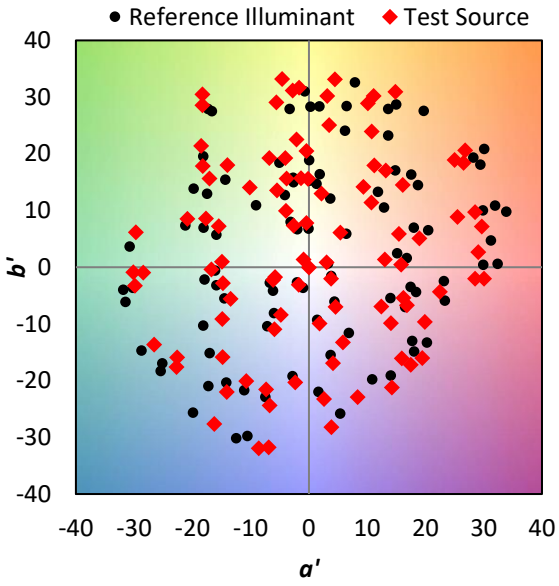
## Summary

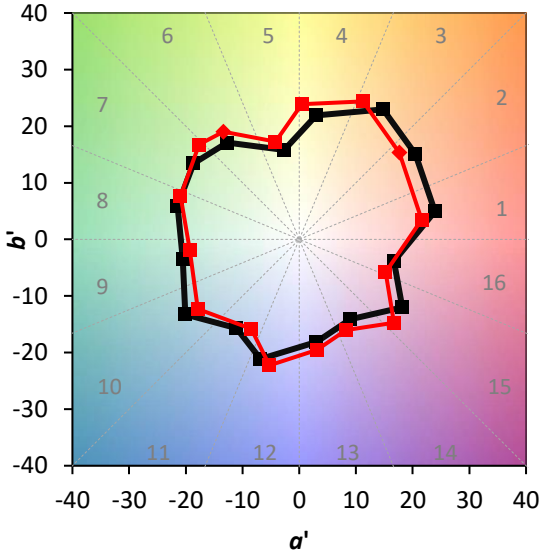
$R_f$ = 81.5
$R_g$ = 99.2
CIE $R_a$ = 81.0
$R_9$ = 7.1

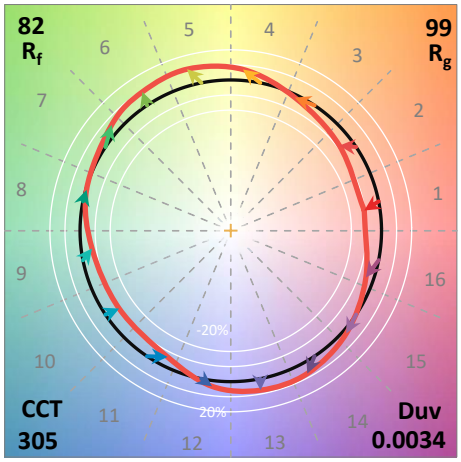
## Spectral Power Distribution Comparison

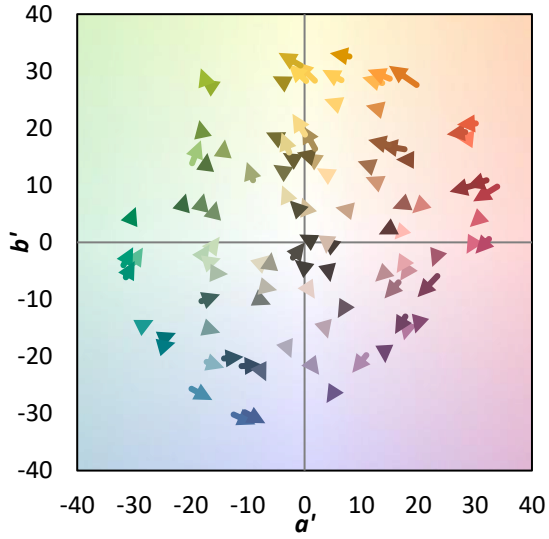



## Color Vector Graphics



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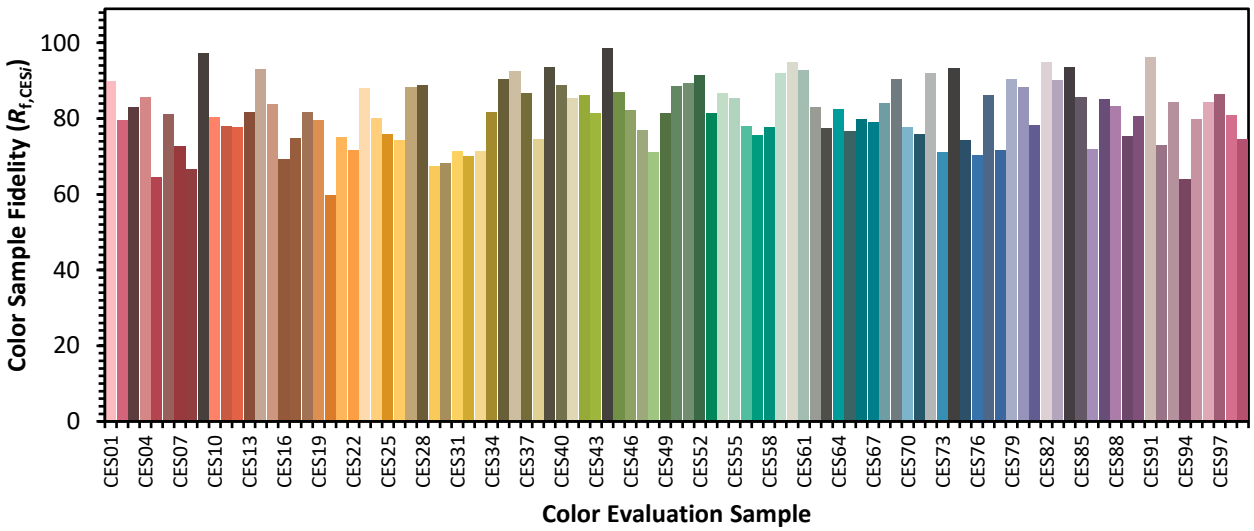
## Individual Sample Fidelity Index ($R_{f,i}$)

| | | | |
|---|---|---|---|
| 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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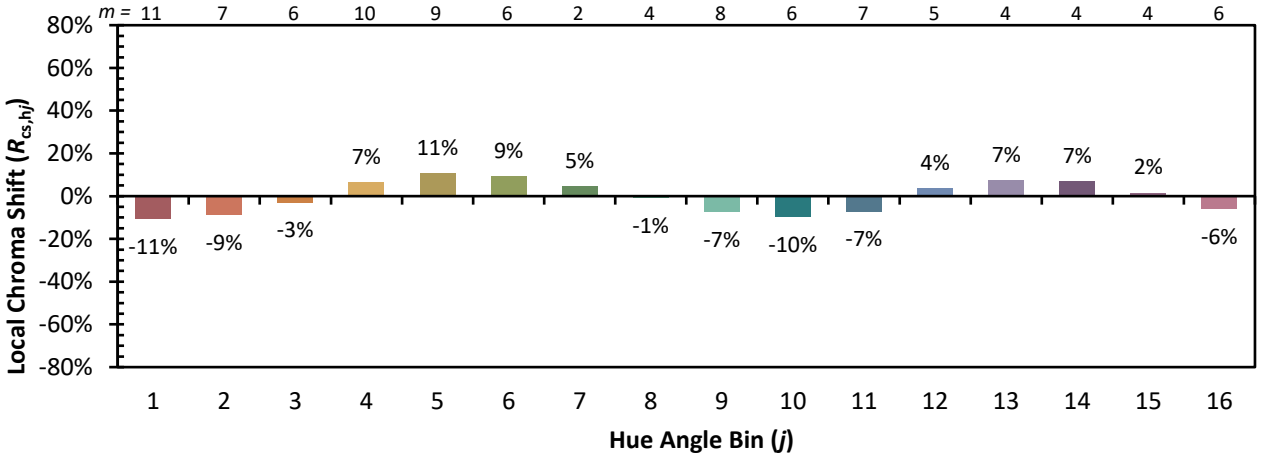
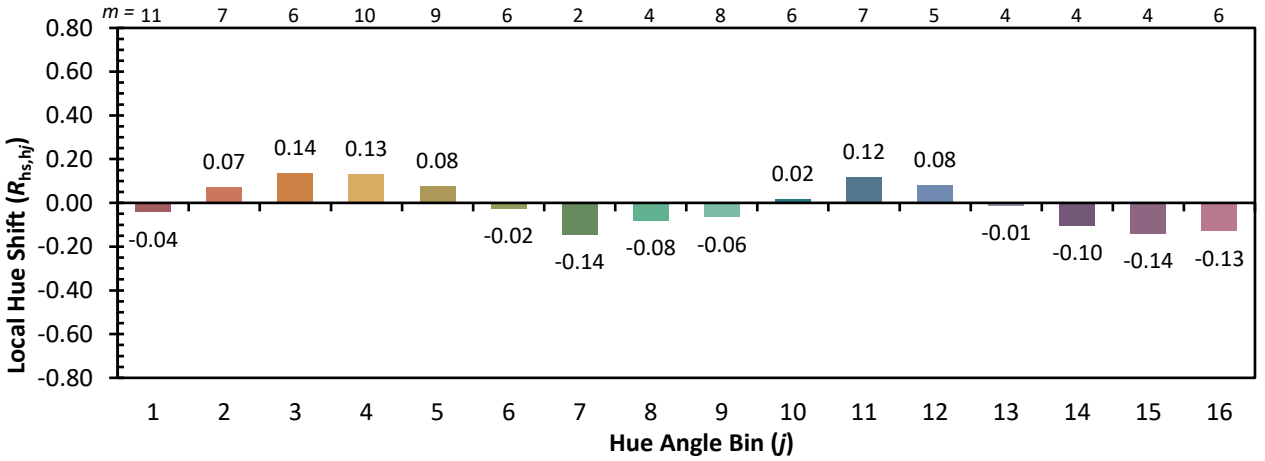
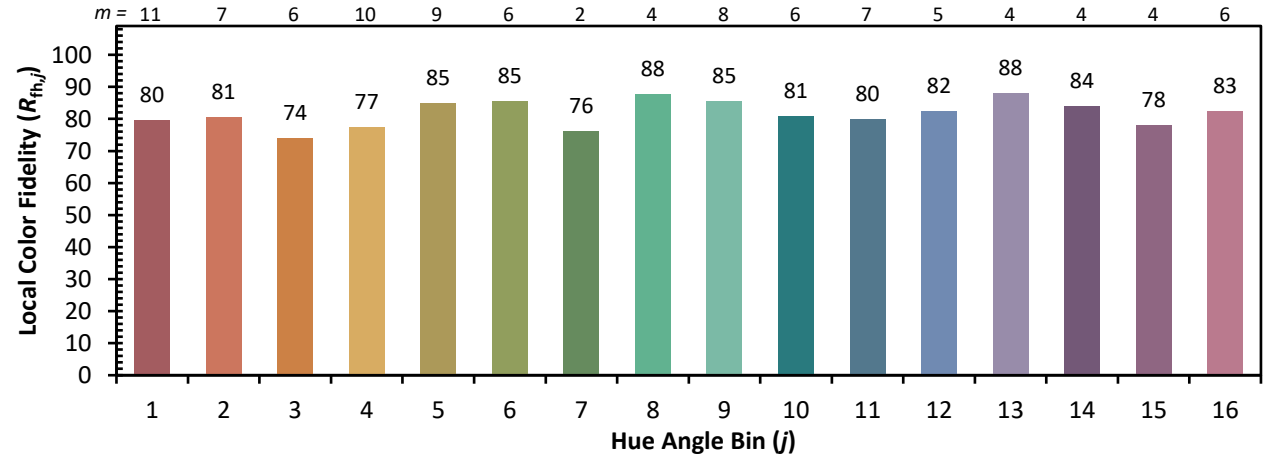
## Color Rendition by Hue-Angle Bin



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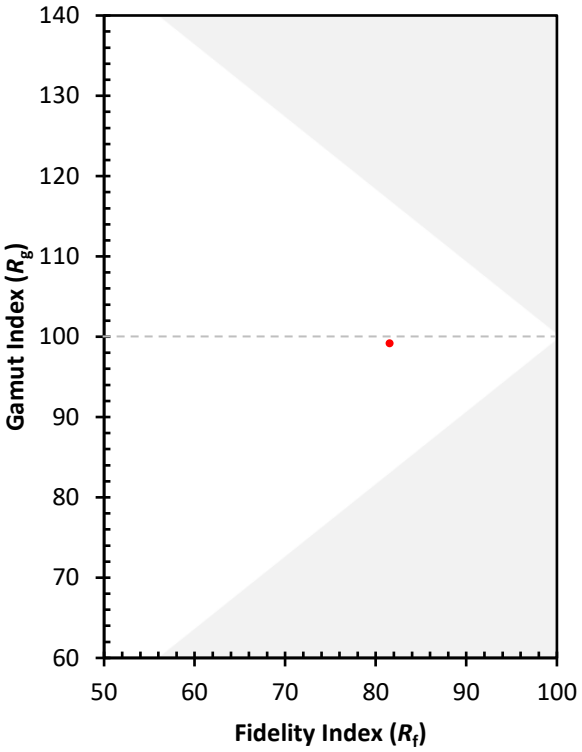
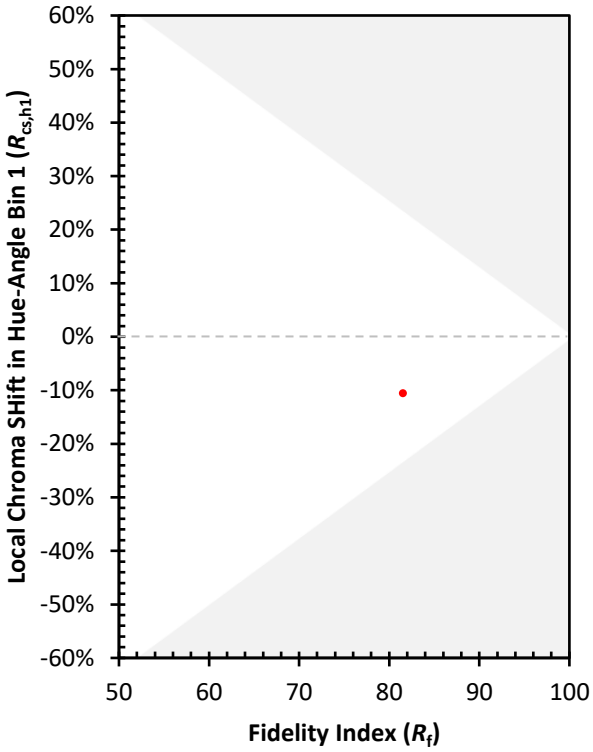
## Measure Comparisons




(END OF REPORT)