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: P323996

Luminaire Tested: **GLEON-SA2B-830-U-SL4-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: | P323996 |
| | TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-25) |
| Test Lab: | INNOVATION CENTER |
| Issue Date: | 3/3/2020 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS (FORMERLY EATON) |
| Product Line: | McGRAW-EDISON |
| Catalog Number: | GLEON-SA2B-830-U-SL4-HSS |
| Description: | GALLEON AREA AND ROADWAY LUMINAIRE |
| | (2) 80 CRI, 3000K, 800mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE IV SPILL LIGHT ELIMINATOR OPTICS WITH HOUSE SIDE SHIELD |
| Light Source: | - |
| Ballast/Driver: | ELECTRONIC DRIVER |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 7540 lumens |
| Efficiency: | N/A |
| Efficacy: | 88.7 lumens/watt |
| Luminous Opening: | Rectangular (W 0.5' x L: 1' x H: 0') |
| IES Classification: | Type IV - Short |
| BUG Rating: | B1 - U0 - G2 |

| | |
|---|---|
| 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: | 24 FT |

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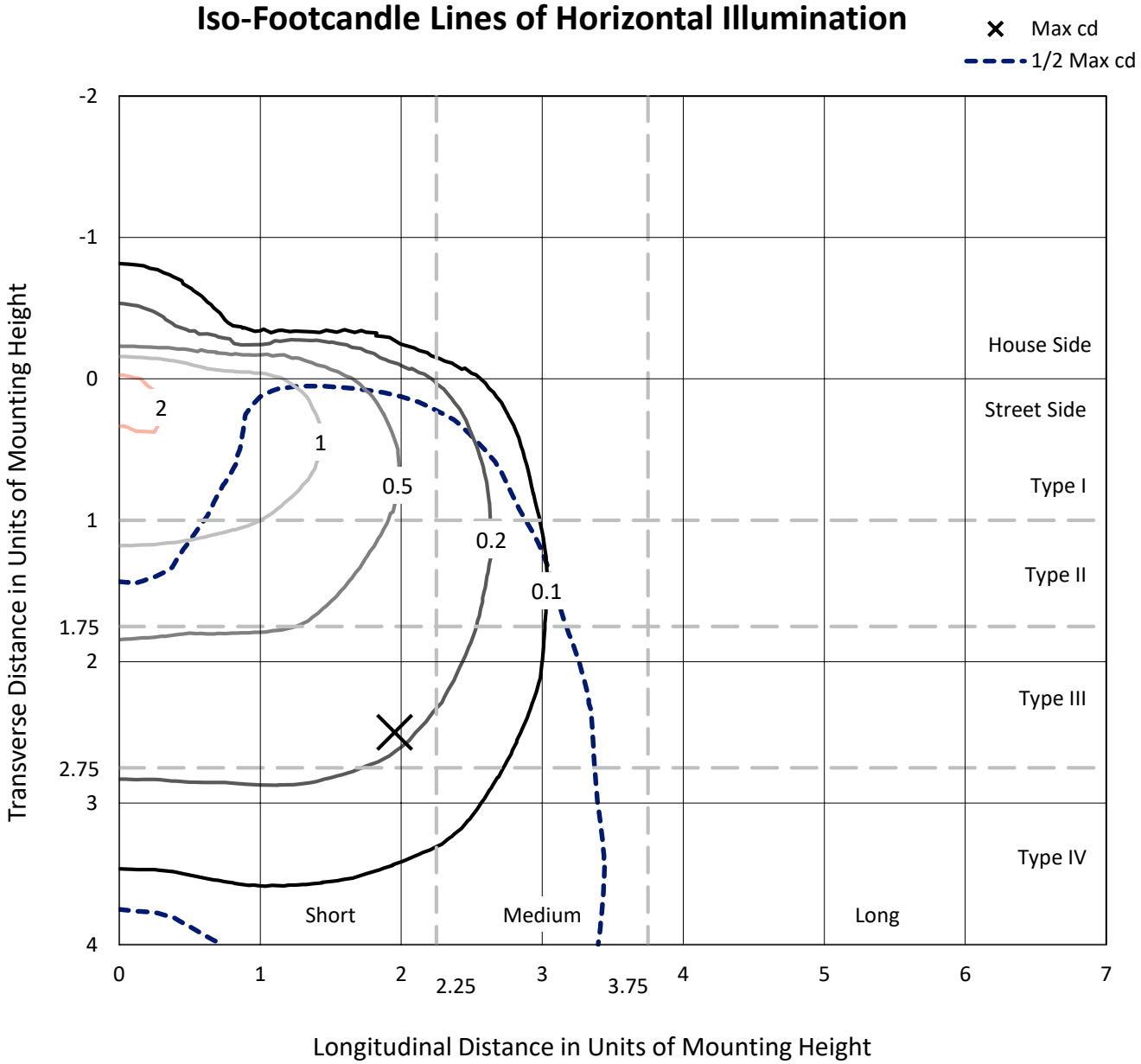
Scaled Data Report

REPORT NUMBER: P323996
CATALOG NUMBER: GLEON-SA2B-830-U-SL4-HSS

## Iso-Footcandle Lines of Horizontal Illumination




Based on 25 foot mounting height. Maximum calculated value = 2.3 fc
Type IV - Short - N/A

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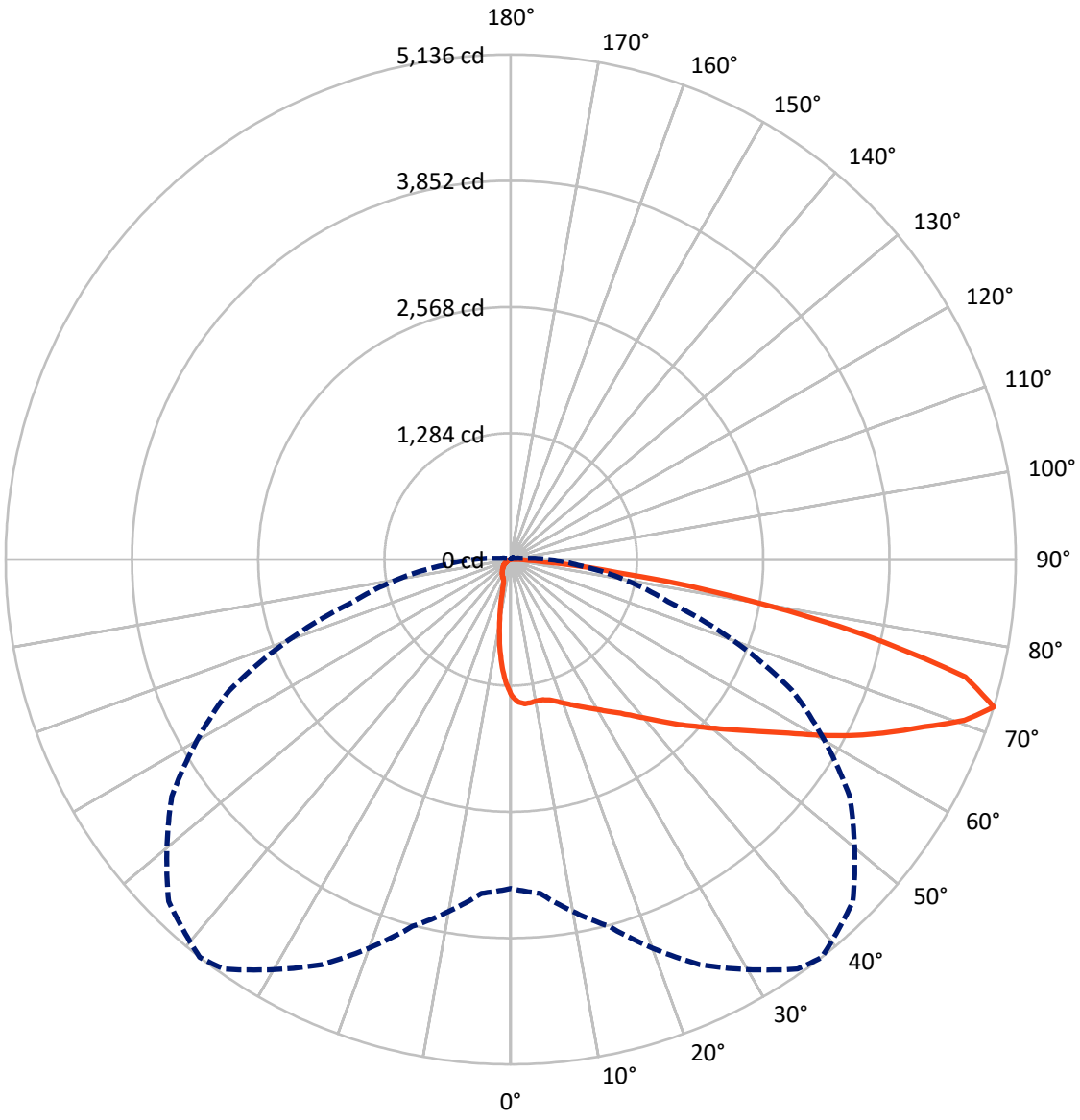
## Luminous Intensity Polar Plot



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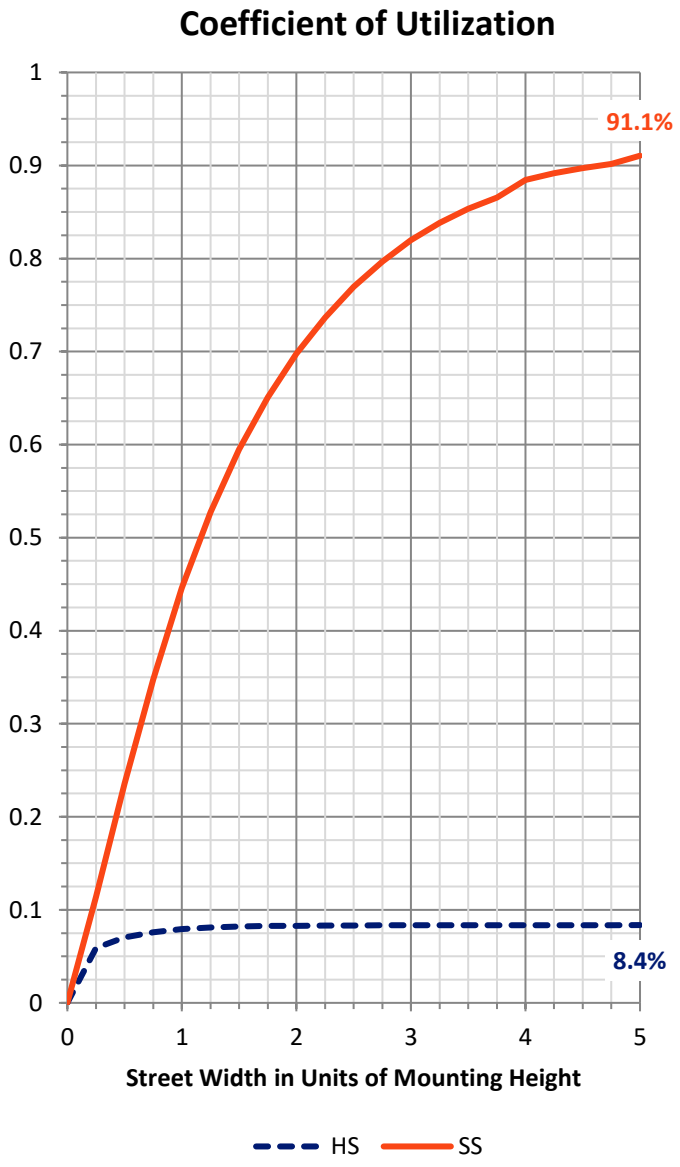
REPORT NUMBER: P323996
CATALOG NUMBER: GLEON-SA2B-830-U-SL4-HSS

**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 634.5 | 0.0 | 634.5 |
| | % Fixture | 8.4 | 0.0 | 8.4 |
| **Street Side** | Lumens | 6905.5 | 0.0 | 6905.5 |
| | % Fixture | 91.6 | 0.0 | 91.6 |
| **Total** | Lumens | 7540.0 | 0.0 | 7540.0 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 118.2 | 1.6 |
| 10°-20° | 288.9 | 3.8 |
| 20°-30° | 459.5 | 6.1 |
| 30°-40° | 690.9 | 9.2 |
| 40°-50° | 1054.0 | 14.0 |
| 50°-60° | 1489.6 | 19.8 |
| 60°-70° | 1868.5 | 24.8 |
| 70°-80° | 1397.1 | 18.5 |
| 80°-90° | 173.2 | 2.3 |
| 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° | 7540.0 | 100.0 |
| 0°-180° | 7540.0 | 100.0 |



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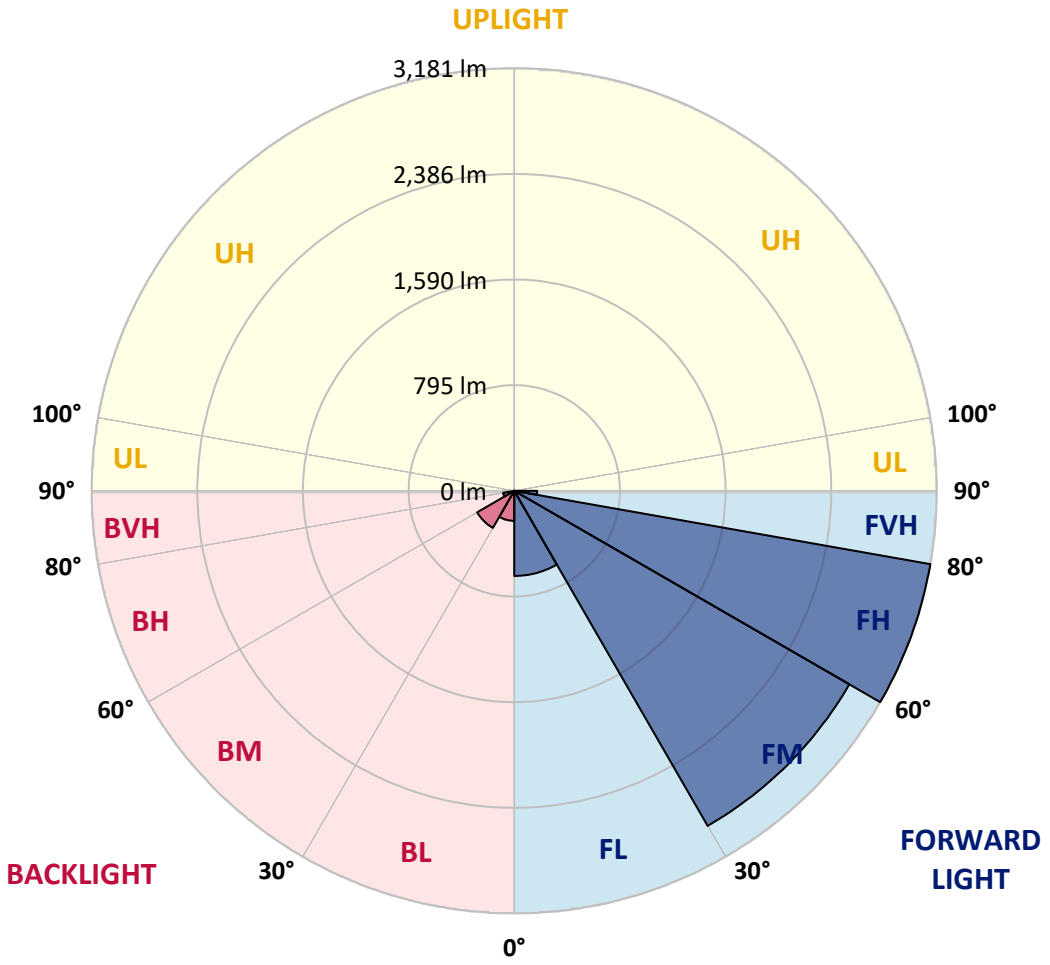
REPORT NUMBER: P323996
CATALOG NUMBER: GLEON-SA2B-830-U-SL4-HSS

## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 640.7 | 8.5 | | | |
| FM | (30°-60°) | 2912.3 | 38.6 | | | |
| FH | (60°-80°) | 3180.9 | 42.2 | | | G2/5000 |
| FVH | (80°-90°) | 171.6 | 2.3 | | | G2/225 |
| BL | (0°-30°) | 225.9 | 3.0 | B1/500 | | |
| BM | (30°-60°) | 322.2 | 4.3 | B1/1000 | | |
| BH | (60°-80°) | 84.8 | 1.1 | B0/110 | | G0/110 |
| BVH | (80°-90°) | 1.6 | 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 IV Short



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REPORT NUMBER: P323996
CATALOG NUMBER: GLEON-SA2B-830-U-SL4-HSS

**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 15° | 25° | 35° | 38° | 45° | 55° | 65° | 75° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 1386.6 | 1386.6 | 1386.6 | 1386.6 | 1386.6 | *1386.6* | 1386.6 | 1386.6 | 1386.6 | 1386.6 | 1386.6 |
| 2.5° | 1471.8 | 1472.1 | 1468.6 | 1463.0 | 1455.8 | *1452.0* | 1445.8 | 1435.7 | 1425.1 | 1406.0 | 1385.3 |
| 5° | 1501.8 | 1501.8 | 1497.4 | 1489.9 | 1478.3 | *1474.9* | 1463.0 | 1447.0 | 1425.1 | 1394.1 | 1359.3 |
| 7.5° | 1498.7 | 1499.3 | 1493.4 | 1485.5 | 1473.9 | *1470.8* | 1456.4 | 1438.6 | 1411.3 | 1373.7 | 1329.3 |
| 10° | 1482.4 | 1484.0 | 1479.3 | 1475.5 | 1464.9 | *1461.4* | 1448.0 | 1430.1 | 1402.9 | 1362.8 | 1311.7 |
| 12.5° | 1465.8 | 1467.4 | 1468.9 | 1472.4 | 1465.8 | *1464.6* | 1453.9 | 1438.9 | 1412.9 | 1371.2 | 1313.6 |
| 15° | 1455.2 | 1458.3 | 1469.6 | 1483.0 | 1484.6 | *1483.3* | 1476.5 | 1462.4 | 1436.1 | 1392.8 | 1327.1 |
| 17.5° | 1455.2 | 1460.2 | 1483.7 | 1509.3 | 1518.4 | *1519.4* | 1513.4 | 1493.7 | 1462.4 | 1416.0 | 1339.6 |
| 20° | 1467.4 | 1474.3 | 1510.9 | 1547.2 | 1562.3 | *1562.3* | 1550.7 | 1523.1 | 1486.5 | 1437.0 | 1348.1 |
| 22.5° | 1498.7 | 1507.8 | 1553.8 | 1595.8 | 1611.7 | *1608.3* | 1592.6 | 1552.5 | 1511.5 | 1460.8 | 1358.7 |
| 25° | 1560.4 | 1567.3 | 1615.2 | 1657.4 | 1667.2 | *1659.3* | 1639.6 | 1588.2 | 1543.5 | 1493.0 | 1378.1 |
| 27.5° | 1639.9 | 1640.9 | 1690.3 | 1726.0 | 1720.1 | *1714.8* | 1690.0 | 1633.0 | 1589.5 | 1539.1 | 1411.6 |
| 30° | 1727.3 | 1727.3 | 1770.8 | 1798.0 | 1779.9 | *1775.5* | 1750.8 | 1687.2 | 1648.4 | 1601.7 | 1459.2 |
| 32.5° | 1811.8 | 1815.6 | 1851.0 | 1868.2 | 1847.8 | *1843.5* | 1819.3 | 1755.8 | 1726.7 | 1697.2 | 1533.4 |
| 35° | 1893.6 | 1896.4 | 1929.9 | 1939.3 | 1919.9 | *1921.1* | 1903.9 | 1850.0 | 1839.1 | 1835.3 | 1645.2 |
| 37.5° | 1972.8 | 1973.4 | 2007.5 | 2013.5 | 2003.8 | *2014.4* | 2016.0 | 1968.4 | 1988.7 | 2019.1 | 1802.7 |
| 40° | 2045.1 | 2045.7 | 2079.6 | 2094.9 | 2111.5 | *2125.3* | 2137.5 | 2112.1 | 2179.5 | 2249.9 | 1990.3 |
| 42.5° | 2103.0 | 2109.6 | 2152.5 | 2181.6 | 2225.5 | *2251.8* | 2285.0 | 2283.7 | 2406.5 | 2512.3 | 2217.0 |
| 45° | 2154.1 | 2165.4 | 2225.2 | 2276.2 | 2351.4 | *2393.3* | 2445.3 | 2486.0 | 2662.0 | 2804.5 | 2446.6 |
| 47.5° | 2221.4 | 2232.1 | 2300.3 | 2383.9 | 2484.1 | *2539.2* | 2625.4 | 2713.4 | 2942.9 | 3091.3 | 2670.8 |
| 50° | 2316.3 | 2311.6 | 2378.9 | 2498.9 | 2627.6 | *2699.9* | 2822.6 | 2954.5 | 3221.6 | 3341.2 | 2802.6 |
| 52.5° | 2417.4 | 2415.6 | 2465.3 | 2623.8 | 2796.6 | *2881.2* | 3043.4 | 3203.7 | 3488.1 | 3513.4 | 2863.0 |
| 55° | 2542.7 | 2529.2 | 2571.2 | 2766.3 | 2997.4 | *3088.2* | 3279.2 | 3450.5 | 3700.4 | 3610.5 | 2893.4 |
| 57.5° | 2673.9 | 2651.7 | 2691.7 | 2925.0 | 3223.8 | *3331.2* | 3540.4 | 3691.0 | 3841.6 | 3676.9 | 2893.1 |
| 60° | 2809.5 | 2783.2 | 2830.8 | 3123.6 | 3505.0 | *3629.3* | 3823.4 | 3853.5 | 3973.4 | 3710.4 | 2871.8 |
| 62.5° | 2922.8 | 2907.2 | 2978.0 | 3335.9 | 3819.0 | *3941.2* | 4037.3 | 4001.3 | 4084.6 | 3736.4 | 2822.0 |
| 65° | 3042.8 | 3043.7 | 3158.0 | 3583.6 | 4152.9 | *4235.2* | 4243.4 | 4192.9 | 4177.6 | 3731.1 | 2653.5 |
| 67.5° | 3205.0 | 3220.0 | 3410.7 | 3919.9 | 4477.6 | *4541.1* | 4540.5 | 4400.5 | 4245.5 | 3519.4 | 2280.0 |
| 70° | 3376.6 | 3412.0 | 3701.9 | 4304.7 | 4832.1 | *4896.6* | 4863.4 | 4532.7 | 3997.5 | 2845.8 | 1613.6 |
| 72.5° | *3347.8* | *3409.1* | *3863.8* | *4547.4* | *5086.6* | *5135.8* | *4920.0* | *4208.0* | *3159.6* | *1654.0* | *687.0* |
| 75° | 2582.8 | 2653.9 | 3542.9 | 4306.9 | 4819.5 | *4775.4* | 4227.4 | 3274.5 | 1726.7 | 461.6 | 154.7 |
| 77.5° | 1364.3 | 1402.2 | 2340.4 | 3281.1 | 3758.0 | *3665.6* | 2978.0 | 1816.5 | 526.4 | 114.3 | 69.5 |
| 80° | 714.6 | 723.4 | 1019.9 | 1861.6 | 2319.4 | *2320.0* | 1764.9 | 797.9 | 217.0 | 58.6 | 46.7 |
| 82.5° | 382.7 | 390.2 | 538.9 | 860.2 | 1215.3 | *1101.6* | 675.8 | 439.0 | 126.2 | 33.2 | 44.8 |
| 85° | 92.1 | 93.6 | 305.6 | 393.0 | 477.9 | *341.3* | 200.7 | 368.6 | 34.1 | 19.4 | 36.3 |
| 87.5° | 35.4 | 36.0 | 113.4 | 170.0 | 121.8 | *78.9* | 93.9 | 137.5 | 4.4 | 7.5 | 5.6 |
| 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: P323996
CATALOG NUMBER: GLEON-SA2B-830-U-SL4-HSS

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 1386.6 | 1386.6 | 1386.6 | 1386.6 | 1386.6 | 1386.6 | 1386.6 | 1386.6 | 1386.6 | 1386.6 | 1386.6 |
| 2.5° | 1372.8 | 1364.7 | 1344.6 | 1319.3 | 1296.7 | 1280.4 | 1256.0 | 1240.0 | 1229.4 | 1229.1 | 1225.0 |
| 5° | 1338.0 | 1321.4 | 1278.2 | 1226.9 | 1180.2 | 1138.3 | 1088.8 | 1049.6 | 1020.5 | 1015.8 | 1005.8 |
| 7.5° | 1300.8 | 1273.5 | 1207.2 | 1127.0 | 1048.7 | 969.2 | 876.8 | 819.5 | 770.3 | 746.8 | 744.3 |
| 10° | 1277.9 | 1239.7 | 1145.5 | 1029.6 | 906.9 | 777.5 | 656.7 | 573.0 | 512.6 | 495.4 | 482.5 |
| 12.5° | 1273.2 | 1222.8 | 1097.9 | 938.2 | 762.8 | 591.8 | 458.1 | 369.2 | 321.0 | 305.6 | 301.6 |
| 15° | 1277.9 | 1215.0 | 1057.8 | 847.7 | 616.9 | 419.9 | 307.5 | 255.8 | 237.7 | 233.3 | 233.0 |
| 17.5° | 1280.7 | 1205.6 | 1012.4 | 747.2 | 475.3 | 300.0 | 235.5 | 220.5 | 217.6 | 217.3 | 217.9 |
| 20° | 1280.4 | 1191.2 | 958.2 | 635.0 | 353.5 | 235.8 | 212.9 | 209.8 | 209.2 | 209.5 | 209.2 |
| 22.5° | 1278.2 | 1174.3 | 898.7 | 519.5 | 267.1 | 210.7 | 203.2 | 201.3 | 201.0 | 201.0 | 201.0 |
| 25° | 1282.3 | 1160.8 | 833.3 | 409.0 | 220.1 | 199.2 | 194.5 | 192.9 | 192.6 | 192.6 | 192.0 |
| 27.5° | 1297.0 | 1153.3 | 761.6 | 314.7 | 198.8 | 188.8 | 185.1 | 184.8 | 183.8 | 183.5 | 184.1 |
| 30° | 1320.8 | 1153.3 | 683.0 | 244.9 | 186.0 | 178.2 | 175.4 | 174.7 | 174.4 | 174.1 | 174.4 |
| 32.5° | 1362.8 | 1162.1 | 597.2 | 203.5 | 173.8 | 166.3 | 164.4 | 165.3 | 164.4 | 164.4 | 164.4 |
| 35° | 1438.6 | 1188.4 | 507.3 | 177.6 | 161.0 | 154.7 | 152.8 | 154.1 | 153.4 | 153.4 | 153.1 |
| 37.5° | 1549.1 | 1237.2 | 416.8 | 161.9 | 149.7 | 143.1 | 140.6 | 142.5 | 141.9 | 141.9 | 141.5 |
| 40° | 1683.8 | 1308.3 | 330.7 | 150.0 | 138.7 | 131.8 | 129.6 | 130.6 | 129.0 | 129.0 | 129.6 |
| 42.5° | 1850.0 | 1398.5 | 255.5 | 138.4 | 127.8 | 121.2 | 119.9 | 119.0 | 116.2 | 114.6 | 114.9 |
| 45° | 2034.8 | 1492.4 | 199.2 | 127.1 | 117.4 | 112.1 | 110.2 | 107.7 | 103.0 | 99.9 | 100.2 |
| 47.5° | 2199.8 | 1564.8 | 161.9 | 116.2 | 108.0 | 104.0 | 101.1 | 96.4 | 89.6 | 85.8 | 86.1 |
| 50° | 2286.5 | 1575.7 | 137.8 | 105.2 | 99.3 | 95.2 | 91.1 | 83.9 | 75.8 | 71.7 | 71.4 |
| 52.5° | 2308.8 | 1524.4 | 119.9 | 95.2 | 90.5 | 85.8 | 80.5 | 70.8 | 61.7 | 57.3 | 56.7 |
| 55° | 2316.9 | 1446.1 | 104.0 | 85.8 | 81.1 | 75.8 | 68.9 | 57.9 | 49.5 | 45.1 | 44.8 |
| 57.5° | 2290.0 | 1329.3 | 91.4 | 77.3 | 71.7 | 65.1 | 56.7 | 46.3 | 38.2 | 34.8 | 34.8 |
| 60° | 2230.2 | 1171.1 | 81.7 | 68.3 | 62.0 | 54.5 | 45.7 | 36.0 | 28.5 | 25.7 | 25.7 |
| 62.5° | 2110.9 | 966.3 | 72.6 | 58.9 | 52.9 | 45.1 | 37.0 | 27.2 | 20.0 | 18.5 | 18.8 |
| 65° | 1885.7 | 733.1 | 63.6 | 50.4 | 45.1 | 37.3 | 28.8 | 19.4 | 13.5 | 13.5 | 14.1 |
| 67.5° | 1537.8 | 509.2 | 54.2 | 42.9 | 38.8 | 30.4 | 21.9 | 13.5 | 9.4 | 10.6 | 11.9 |
| 70° | 1018.0 | 285.6 | 46.3 | 35.4 | 33.2 | 24.1 | 16.3 | 9.1 | 7.5 | 10.0 | 12.2 |
| 72.5° | *384.2* | *111.2* | *38.8* | *28.5* | *28.8* | *18.5* | *11.6* | *6.9* | *6.9* | *11.0* | *14.4* |
| 75° | 107.1 | 54.5 | 27.9 | 21.0 | 22.5 | 13.5 | 8.5 | 5.9 | 6.6 | 12.5 | 16.9 |
| 77.5° | 62.9 | 40.1 | 18.2 | 12.2 | 15.3 | 9.4 | 5.6 | 4.7 | 5.6 | 10.6 | 16.3 |
| 80° | 50.7 | 21.3 | 10.6 | 6.3 | 8.5 | 5.3 | 3.8 | 2.8 | 1.6 | 4.1 | 8.5 |
| 82.5° | 50.7 | 12.8 | 5.0 | 4.4 | 4.4 | 2.8 | 1.9 | 1.3 | 0.3 | 0.0 | 2.2 |
| 85° | 34.1 | 5.3 | 3.1 | 2.8 | 2.2 | 0.9 | 0.6 | 0.3 | 0.0 | 0.0 | 0.0 |
| 87.5° | 5.6 | 2.2 | 1.3 | 0.6 | 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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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

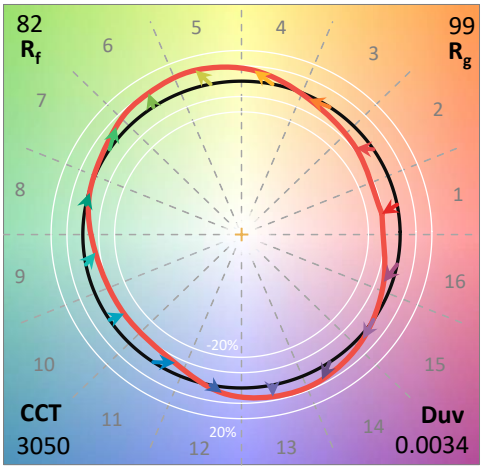
## Test Information

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

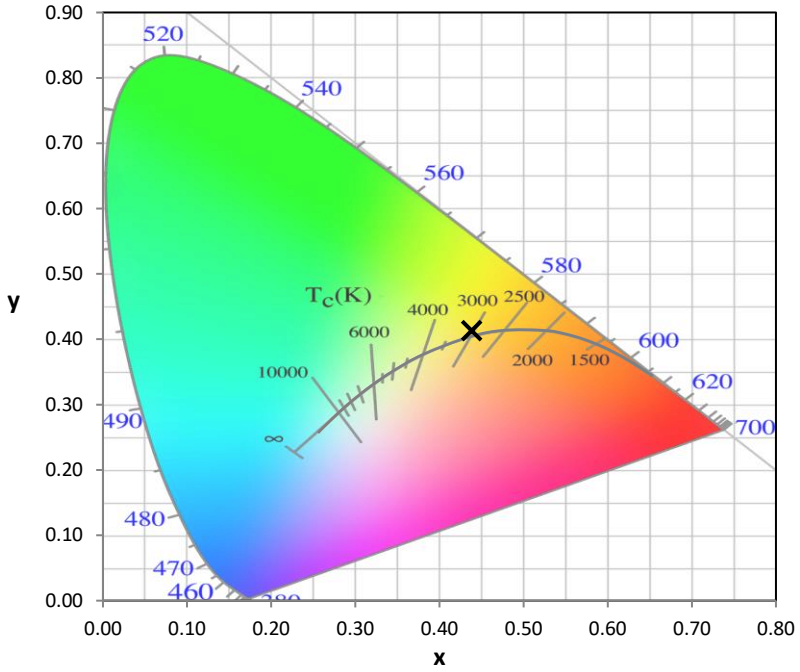
| | |
|---|---|
| Stabilization Time: | 20M |
| Operation Time: | 1H 20M |
| Sphere Temperature (°C): | 24.2 |

REPORT NUMBER: SP1-2408-195-9

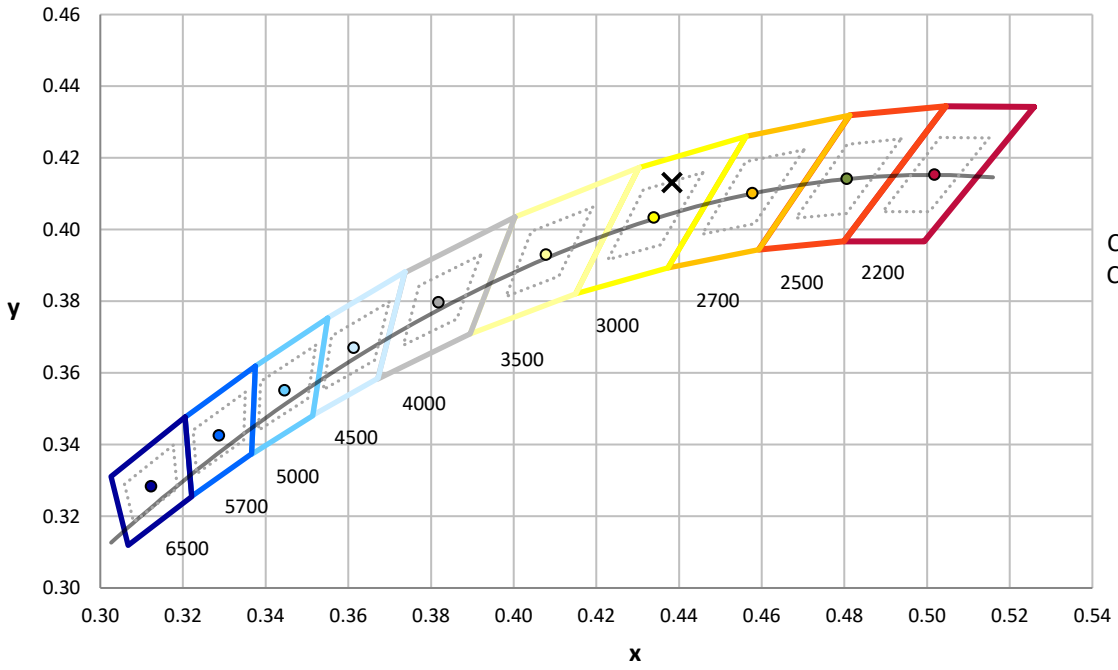
| Measurement and Test Equipment | | | |
|---|---|---|---|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 6/18/2024 | 12/18/2024 |
| Power Meter | INXT2011004 | 2/8/2024 | 2/8/2025 |
| AC Power Source | IN0063 | 10/24/2023 | 10/24/2024 |
| DC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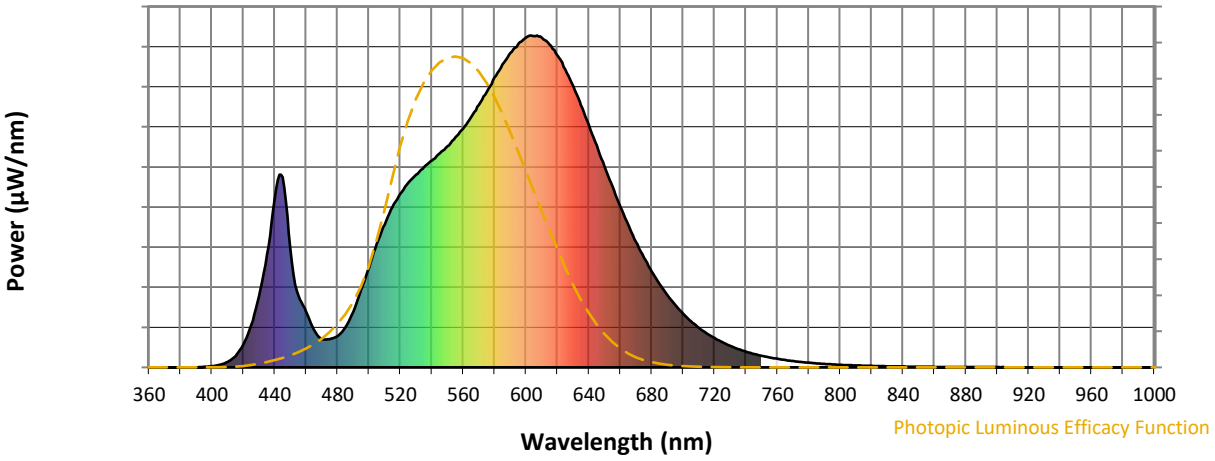
## Photopic Flux vs. Wavelength




## 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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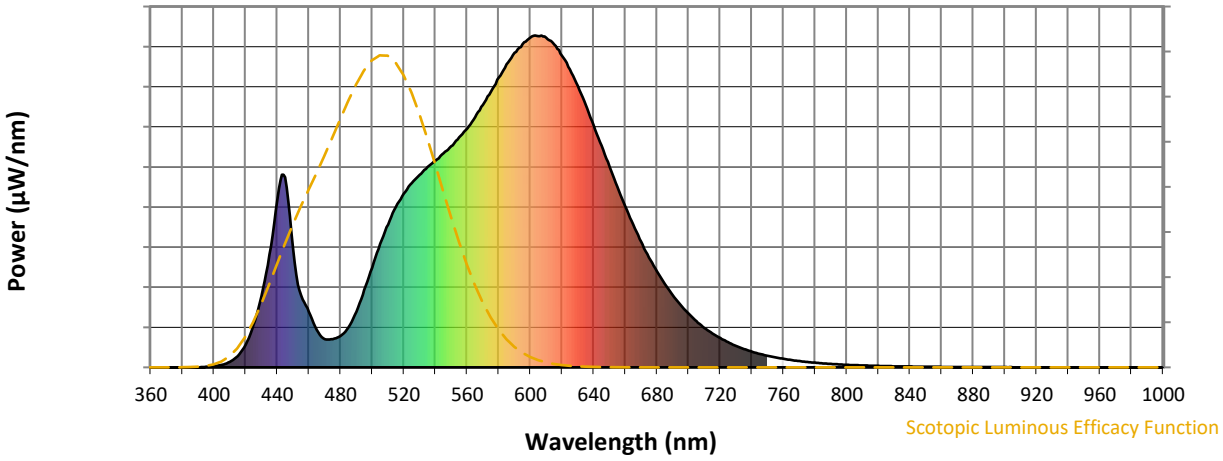
## Scotopic Flux vs. Wavelength




**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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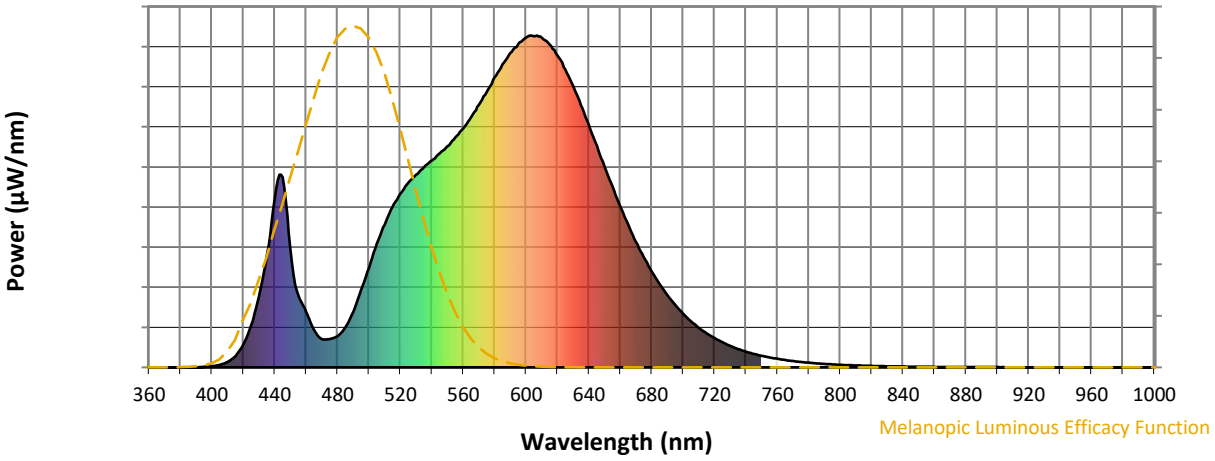
## Melanopic Flux vs. Wavelength




**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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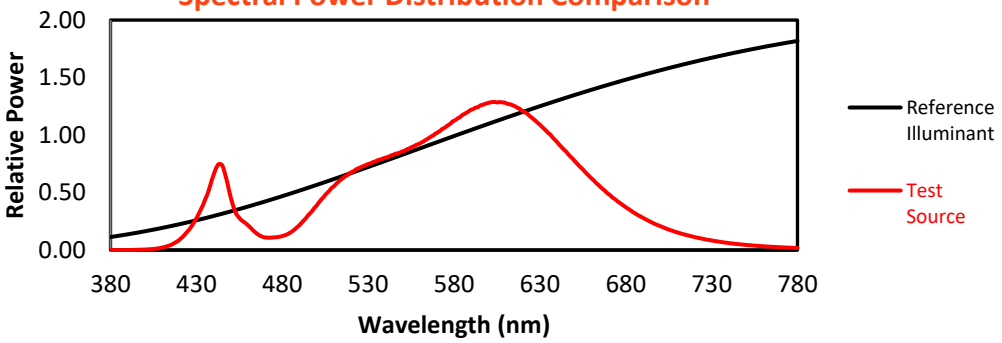
# TM-30-18

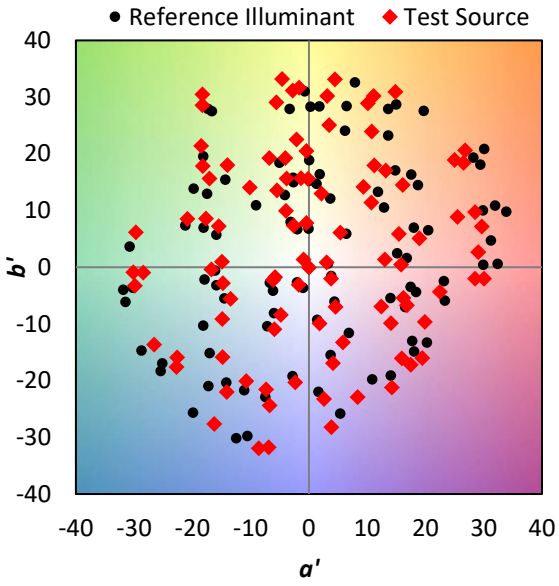
## Summary

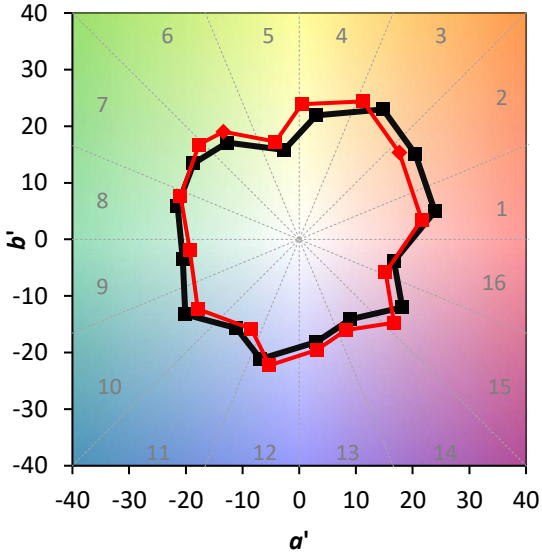
$R_f$ = 81.5
$R_g$ = 99.2
CIE $R_a$ = 81.0
$R_9$ = 7.1

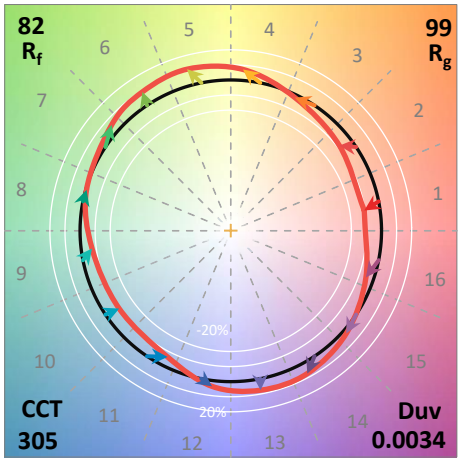
## Spectral Power Distribution Comparison

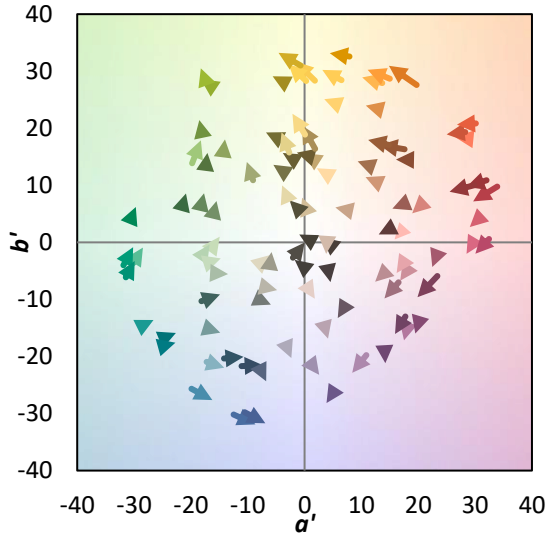



## Color Vector Graphics



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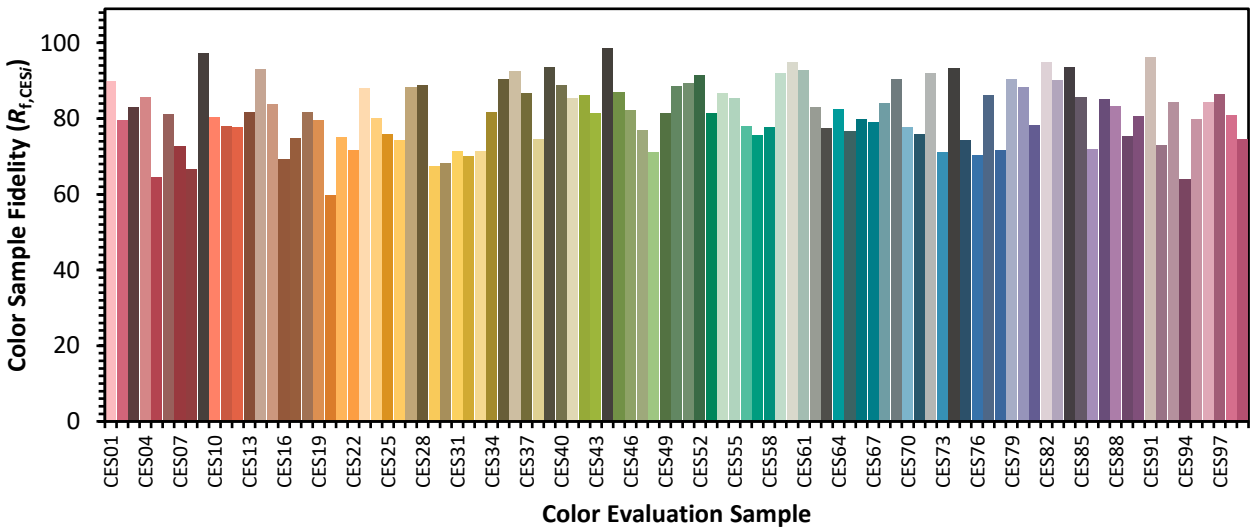
**Individual Sample Fidelity Index ($R_{f,i}$)**

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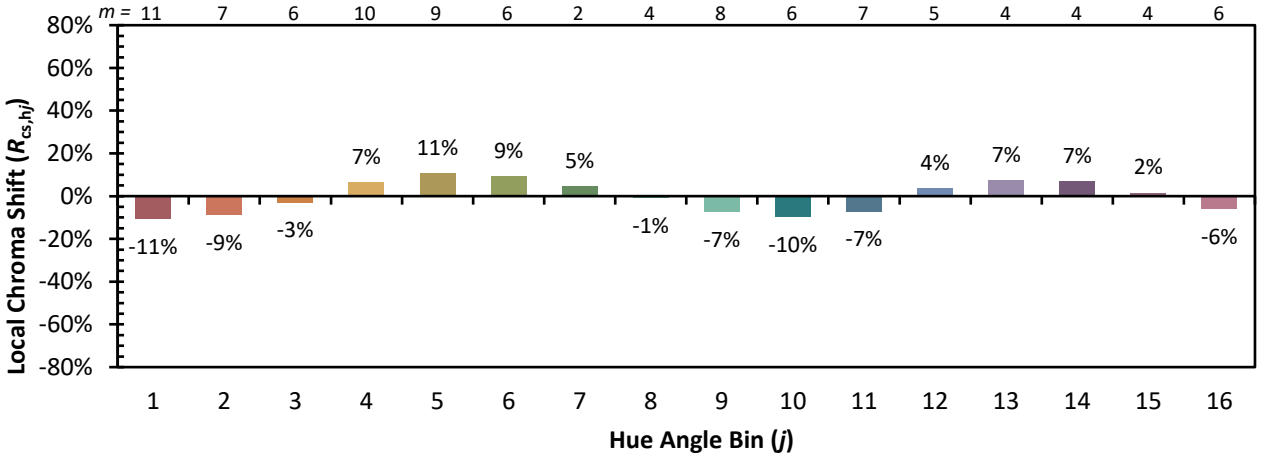
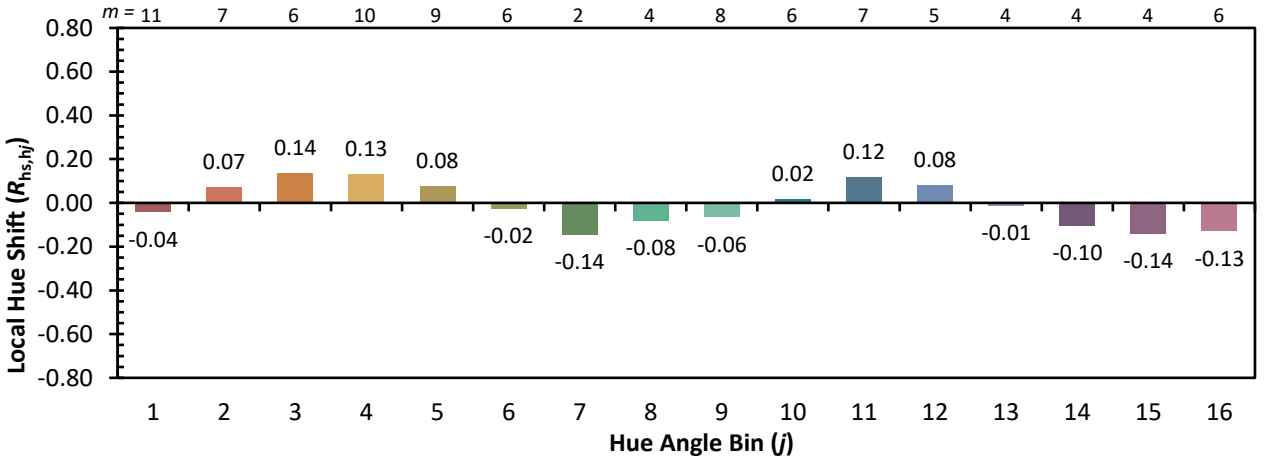
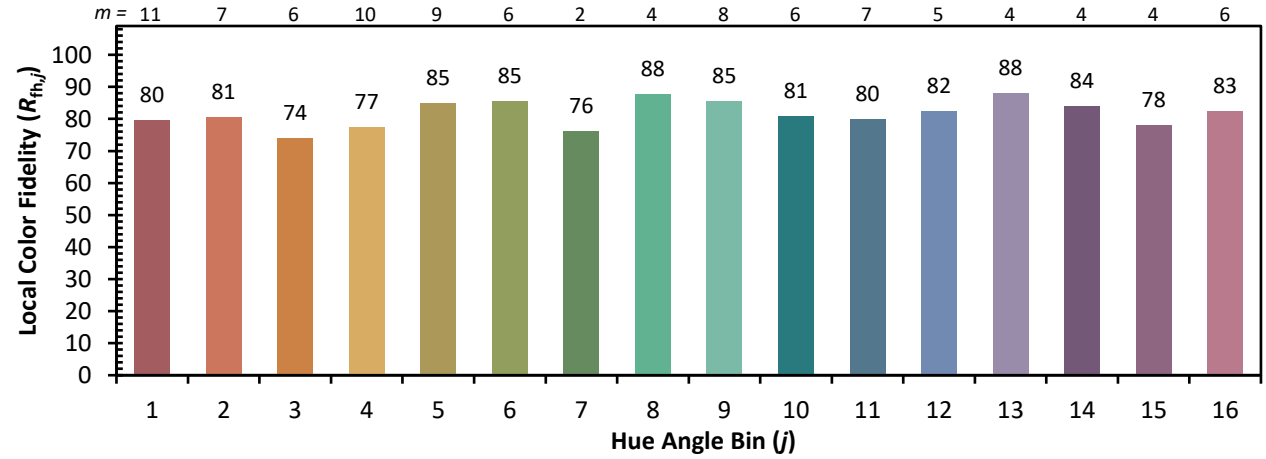
## Color Rendition by Hue-Angle Bin



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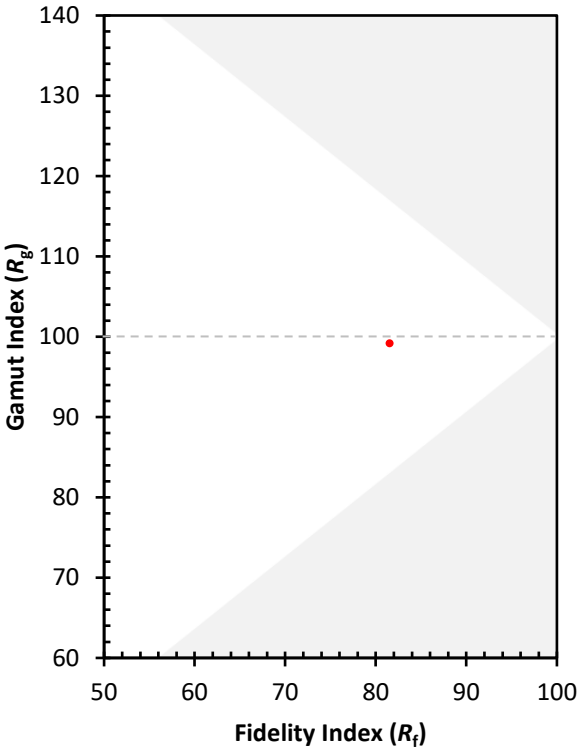
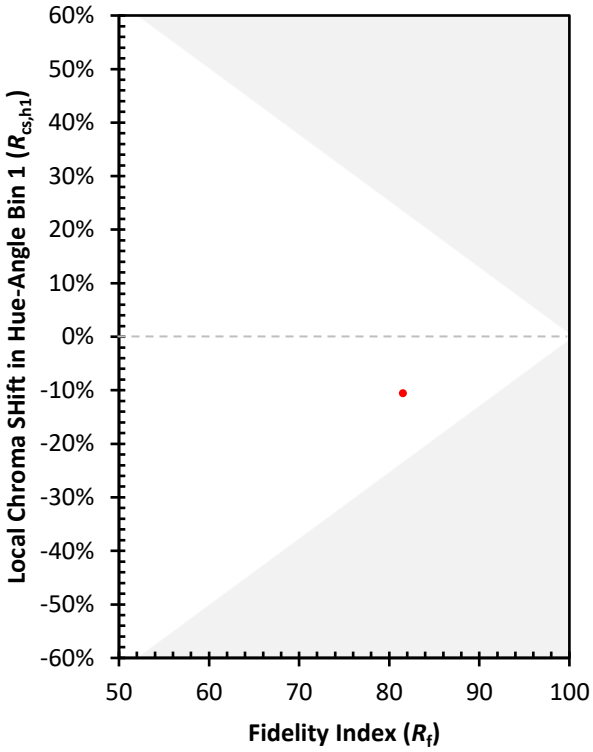
## Measure Comparisons

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