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: P634512

Luminaire Tested: GWS-SA3B-830-U-SL2-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: | P634512 |
| | TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-27) |
| Test Lab: | COOPER LIGHTING SOLUTIONS |
| Issue Date: | 1/10/2023 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS |
| Product Line: | McGRAW-EDISON |
| Catalog Number: | GWS-SA3B-830-U-SL2-W |
| Description: | GALLEON WALL SLIM LUMINAIRE. (3) LIGHTSQUARES WITH 16 LEDS EACH AND TYPE II SPILL LIGHT ELIMINATOR OPTICS |
| Light Source: | (48) 3000K CCT, 80 CRI LEDS |
| Ballast/Driver: | - |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 8119.8 lumens |
| Efficiency: | N/A |
| Efficacy: | 118.9 lumens/watt |
| Luminous Opening: | Rectangular (W 1.5' x L: 0.5' x H: 0') |
| IES Classification: | Type II - Short |
| BUG Rating: | B2 - 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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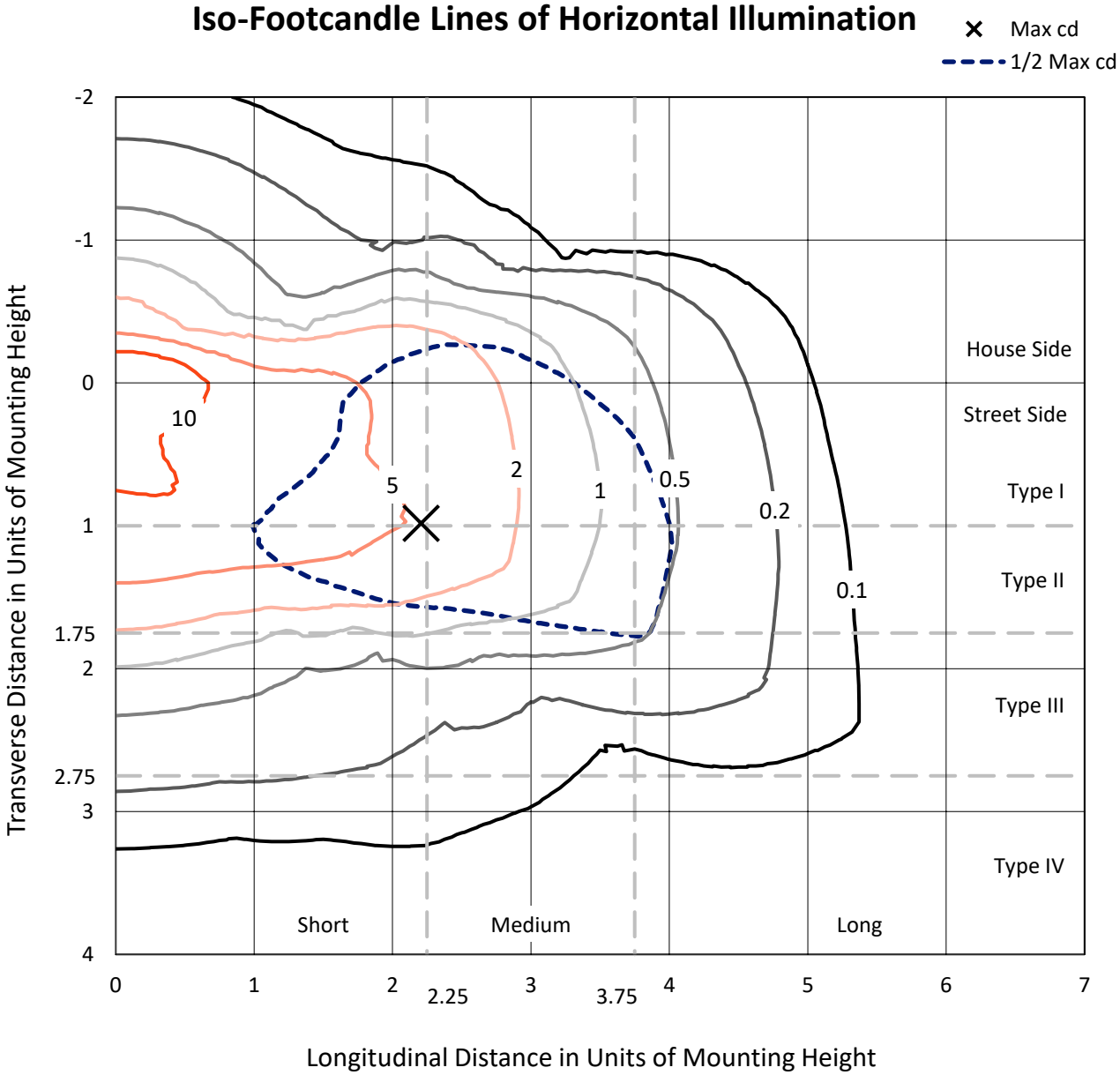
Scaled Data Report

REPORT NUMBER: P634512
CATALOG NUMBER: GWS-SA3B-830-U-SL2-W

## Iso-Footcandle Lines of Horizontal Illumination




Based on 10 foot mounting height. Maximum calculated value = 17.9 fc
Type II - Short - N/A

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REPORT NUMBER: P634512
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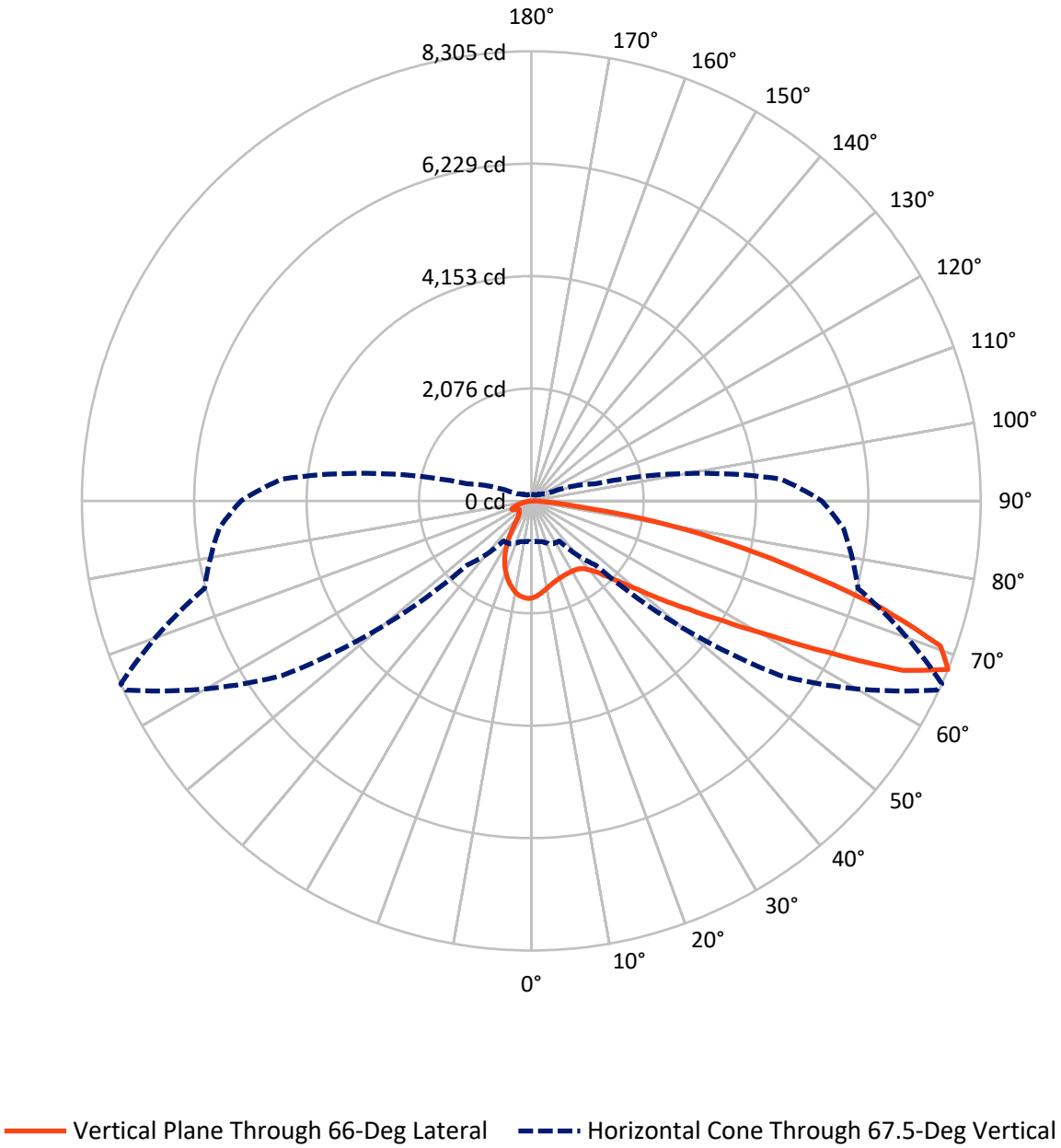
## Luminous Intensity Polar Plot



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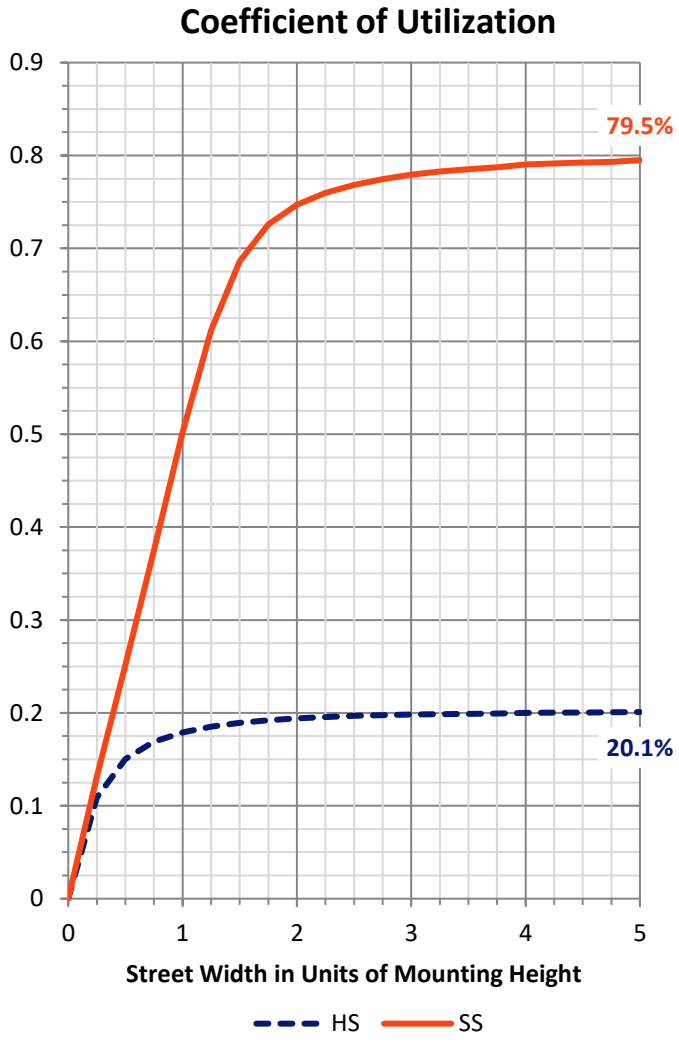
REPORT NUMBER: P634512
CATALOG NUMBER: GWS-SA3B-830-U-SL2-W

**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 1647.7 | 0.0 | 1647.7 |
| | % Fixture | 20.3 | 0.0 | 20.3 |
| **Street Side** | Lumens | 6472.1 | 0.0 | 6472.1 |
| | % Fixture | 79.7 | 0.0 | 79.7 |
| **Total** | Lumens | 8119.8 | 0.0 | 8119.8 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 157.5 | 1.9 |
| 10°-20° | 387.0 | 4.8 |
| 20°-30° | 531.9 | 6.6 |
| 30°-40° | 727.2 | 9.0 |
| 40°-50° | 1102.0 | 13.6 |
| 50°-60° | 1713.0 | 21.1 |
| 60°-70° | 2085.6 | 25.7 |
| 70°-80° | 1270.4 | 15.6 |
| 80°-90° | 145.1 | 1.8 |
| 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° | 8119.8 | 100.0 |
| 0°-180° | 8119.8 | 100.0 |



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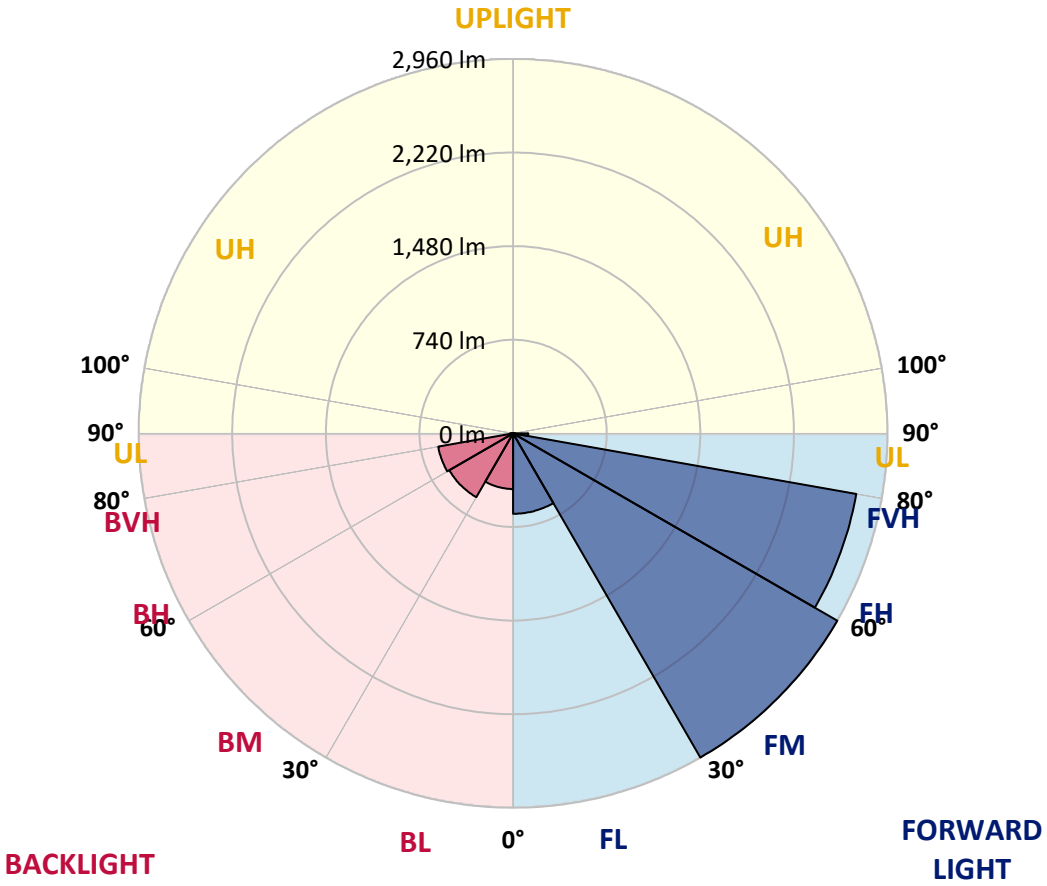
REPORT NUMBER: P634512
CATALOG NUMBER: GWS-SA3B-830-U-SL2-W

## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 636.2 | 7.8 | | | |
| FM | (30°-60°) | 2960.0 | 36.5 | | | |
| FH | (60°-80°) | 2755.3 | 33.9 | | | G2/5000 |
| FVH | (80°-90°) | 120.7 | 1.5 | | | G2/225 |
| BL | (0°-30°) | 440.2 | 5.4 | B1/500 | | |
| BM | (30°-60°) | 582.3 | 7.2 | B1/1000 | | |
| BH | (60°-80°) | 600.8 | 7.4 | B2/1000 | | G2/1000 |
| BVH | (80°-90°) | 24.5 | 0.3 | | | G1/100 |
| UL | (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH | (100°-180°) | 0.0 | 0.0 | | U0/0 | |

**BUG Rating: B2-U0-G2**
Type II Short



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REPORT NUMBER: P634512
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**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 15° | 25° | 35° | 45° | 55° | 65° | 66° | 75° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 1794.2 | 1794.2 | 1794.2 | 1794.2 | 1794.2 | 1794.2 | 1794.2 | 1794.2 | *1794.2* | 1794.2 | 1794.2 |
| 2.5° | 1680.5 | 1686.4 | 1682.9 | 1705.4 | 1706.6 | 1735.0 | 1751.0 | 1764.6 | *1765.8* | 1783.6 | 1795.4 |
| 5° | 1565.6 | 1569.2 | 1569.2 | 1590.5 | 1604.7 | 1642.6 | 1679.3 | 1718.4 | *1721.4* | 1764.0 | 1796.6 |
| 7.5° | 1472.6 | 1476.2 | 1473.8 | 1502.2 | 1520.6 | 1562.6 | 1609.4 | 1669.3 | *1675.2* | 1743.9 | 1800.8 |
| 10° | 1399.7 | 1398.6 | 1404.5 | 1430.5 | 1454.2 | 1504.6 | 1556.7 | 1624.8 | *1633.7* | 1720.8 | 1805.5 |
| 12.5° | 1350.0 | 1351.2 | 1354.7 | 1382.0 | 1407.4 | 1457.2 | 1511.1 | 1585.1 | *1594.6* | 1694.1 | 1803.1 |
| 15° | 1326.3 | 1323.9 | 1326.9 | 1351.8 | 1376.0 | 1419.9 | 1475.6 | 1552.0 | *1561.4* | 1670.4 | 1803.7 |
| 17.5° | 1321.0 | 1319.2 | 1318.6 | 1336.4 | 1354.7 | 1395.6 | 1448.9 | 1526.5 | *1536.6* | 1655.0 | 1807.3 |
| 20° | 1337.5 | 1335.2 | 1328.7 | 1336.4 | 1344.1 | 1378.4 | 1429.9 | 1508.1 | *1519.4* | 1645.0 | 1814.4 |
| 22.5° | 1383.2 | 1379.0 | 1368.9 | 1359.5 | 1349.4 | 1370.1 | 1418.1 | 1494.5 | *1505.8* | 1638.5 | 1821.5 |
| 25° | 1452.5 | 1448.9 | 1438.2 | 1416.9 | 1380.2 | 1376.6 | 1415.7 | 1488.6 | *1499.8* | 1633.7 | 1824.5 |
| 27.5° | 1547.8 | 1542.5 | 1531.8 | 1501.0 | 1441.2 | 1400.9 | 1424.6 | 1488.0 | *1498.7* | 1628.4 | 1821.5 |
| 30° | 1661.0 | 1657.4 | 1651.5 | 1614.2 | 1534.2 | 1452.5 | 1444.8 | 1492.7 | *1501.0* | 1625.4 | 1815.6 |
| 32.5° | 1775.9 | 1772.3 | 1777.1 | 1759.3 | 1661.0 | 1537.8 | 1488.6 | 1505.8 | *1511.7* | 1624.8 | 1810.2 |
| 35° | 1877.2 | 1881.3 | 1915.7 | 1918.6 | 1822.1 | 1653.3 | 1557.9 | 1536.0 | *1537.2* | 1636.7 | 1812.6 |
| 37.5° | 1983.2 | 1999.2 | 2044.2 | 2082.7 | 2002.2 | 1806.1 | 1661.0 | 1592.8 | *1591.7* | 1666.9 | 1827.4 |
| 40° | 2123.6 | 2130.7 | 2188.2 | 2260.4 | 2210.1 | 2015.8 | 1807.3 | 1685.8 | *1677.6* | 1728.5 | 1867.1 |
| 42.5° | 2260.4 | 2277.6 | 2369.4 | 2452.4 | 2435.8 | 2252.1 | 1991.5 | 1825.0 | *1810.2* | 1837.5 | 1948.9 |
| 45° | 2434.6 | 2451.2 | 2554.2 | 2660.9 | 2691.1 | 2519.3 | 2227.3 | 2022.9 | *2008.1* | 2001.6 | 2098.7 |
| 47.5° | 2608.7 | 2625.9 | 2718.3 | 2872.3 | 2978.4 | 2853.4 | 2534.1 | 2284.1 | *2259.8* | 2234.4 | 2325.0 |
| 50° | 2726.0 | 2746.2 | 2834.4 | 3019.2 | 3268.0 | 3270.4 | 2897.8 | 2626.5 | *2595.7* | 2555.4 | 2643.7 |
| 52.5° | 2721.9 | 2734.9 | 2819.0 | 3032.3 | 3476.5 | 3749.6 | 3384.7 | 3062.5 | *3037.6* | 2949.9 | 3026.9 |
| 55° | 2508.0 | 2527.6 | 2612.3 | 2878.8 | 3499.0 | 4203.9 | 4100.3 | 3576.6 | *3532.2* | 3375.2 | 3459.9 |
| 57.5° | 2078.6 | 2095.2 | 2180.5 | 2509.2 | 3299.4 | 4436.7 | 5009.0 | 4231.8 | *4170.8* | 3838.5 | 3936.2 |
| 60° | 1569.2 | 1549.0 | 1589.3 | 1877.2 | 2822.0 | 4442.7 | 5811.0 | 5120.3 | *5018.4* | 4333.7 | 4415.4 |
| 62.5° | 1177.6 | 1157.5 | 1166.3 | 1247.5 | 1913.3 | 4083.7 | 6268.3 | 6335.8 | *6167.6* | 4892.9 | 4876.9 |
| 65° | 930.6 | 919.3 | 944.8 | 1000.5 | 1115.4 | 3109.9 | 6271.9 | 7650.3 | *7544.2* | 5540.9 | 5350.2 |
| 67.5° | *758.2* | *751.1* | *777.2* | *880.2* | *904.5* | *1671.0* | *5623.8* | *8264.0* | *8305.4* | *6250.5* | *5789.1* |
| 70° | 610.7 | 600.1 | 640.9 | 776.6 | 841.1 | 1011.2 | 4028.6 | 7951.2 | *8018.1* | 6673.5 | 5665.3 |
| 72.5° | 421.8 | 422.3 | 443.1 | 629.1 | 812.1 | 873.1 | 2278.8 | 6620.8 | *6765.9* | 6290.2 | 4980.5 |
| 75° | 284.3 | 286.7 | 292.6 | 415.2 | 748.1 | 847.1 | 1214.3 | 5012.5 | *5115.0* | 5199.1 | 4116.9 |
| 77.5° | 171.8 | 173.0 | 186.6 | 251.2 | 515.9 | 790.8 | 822.8 | 3633.5 | *3714.1* | 3427.4 | 2551.9 |
| 80° | 99.5 | 103.7 | 116.1 | 168.2 | 348.3 | 594.1 | 636.8 | 2227.8 | *2319.1* | 1523.5 | 810.9 |
| 82.5° | 43.8 | 46.8 | 63.4 | 97.7 | 203.2 | 505.3 | 497.0 | 880.2 | *867.2* | 424.7 | 281.4 |
| 85° | 7.7 | 9.5 | 13.6 | 30.8 | 74.6 | 266.6 | 385.6 | 388.6 | *365.5* | 161.1 | 116.7 |
| 87.5° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.8 | 58.1 | 104.3 | *103.7* | 45.6 | 40.3 |
| 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: P634512
CATALOG NUMBER: GWS-SA3B-830-U-SL2-W

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 1794.2 | 1794.2 | 1794.2 | 1794.2 | 1794.2 | 1794.2 | 1794.2 | 1794.2 | 1794.2 | 1794.2 | 1794.2 |
| 2.5° | 1803.1 | 1787.1 | 1801.4 | 1803.1 | 1800.2 | 1797.8 | 1780.0 | 1764.6 | 1762.9 | 1746.3 | 1746.3 |
| 5° | 1809.6 | 1794.8 | 1801.9 | 1788.3 | 1767.0 | 1745.1 | 1707.2 | 1681.1 | 1669.3 | 1647.9 | 1647.9 |
| 7.5° | 1818.5 | 1803.1 | 1794.8 | 1761.1 | 1711.3 | 1663.3 | 1602.3 | 1551.4 | 1530.6 | 1500.4 | 1499.3 |
| 10° | 1826.8 | 1807.3 | 1778.8 | 1713.1 | 1633.7 | 1557.3 | 1468.4 | 1396.2 | 1347.0 | 1310.9 | 1310.9 |
| 12.5° | 1826.2 | 1800.8 | 1744.5 | 1647.3 | 1537.8 | 1427.0 | 1308.5 | 1199.5 | 1134.4 | 1078.1 | 1074.5 |
| 15° | 1825.0 | 1790.1 | 1700.7 | 1570.9 | 1425.8 | 1272.4 | 1111.3 | 969.1 | 872.5 | 817.5 | 812.7 |
| 17.5° | 1823.9 | 1776.5 | 1651.5 | 1483.9 | 1289.6 | 1080.5 | 867.8 | 713.8 | 633.2 | 599.5 | 600.6 |
| 20° | 1823.9 | 1761.1 | 1598.8 | 1383.7 | 1132.6 | 850.6 | 636.8 | 524.8 | 504.7 | 506.5 | 508.2 |
| 22.5° | 1818.5 | 1742.1 | 1540.1 | 1274.7 | 957.8 | 625.5 | 469.7 | 431.8 | 442.5 | 459.1 | 461.4 |
| 25° | 1806.1 | 1710.7 | 1472.0 | 1153.9 | 749.9 | 455.5 | 383.3 | 376.1 | 395.7 | 416.4 | 422.3 |
| 27.5° | 1786.5 | 1674.6 | 1395.6 | 1012.3 | 552.1 | 366.1 | 337.1 | 336.5 | 351.9 | 367.3 | 372.6 |
| 30° | 1765.8 | 1634.3 | 1315.0 | 854.8 | 399.8 | 318.7 | 307.4 | 307.4 | 315.1 | 324.6 | 323.4 |
| 32.5° | 1741.5 | 1593.4 | 1228.5 | 690.7 | 325.8 | 292.0 | 288.5 | 286.7 | 287.9 | 291.4 | 291.4 |
| 35° | 1720.8 | 1557.3 | 1139.7 | 517.1 | 292.0 | 277.2 | 273.7 | 269.5 | 267.7 | 265.4 | 266.6 |
| 37.5° | 1713.1 | 1528.9 | 1047.9 | 389.8 | 275.4 | 266.6 | 260.6 | 254.7 | 250.6 | 249.4 | 248.8 |
| 40° | 1725.5 | 1517.0 | 956.1 | 321.1 | 263.6 | 255.3 | 248.8 | 241.1 | 237.5 | 237.5 | 237.5 |
| 42.5° | 1774.1 | 1525.9 | 862.5 | 290.3 | 255.3 | 245.8 | 236.3 | 229.2 | 228.1 | 229.2 | 229.8 |
| 45° | 1863.0 | 1560.3 | 765.3 | 274.9 | 248.2 | 236.3 | 225.1 | 219.8 | 219.8 | 220.9 | 220.9 |
| 47.5° | 2021.7 | 1650.3 | 669.4 | 265.4 | 241.1 | 228.6 | 216.8 | 211.5 | 210.9 | 212.1 | 212.1 |
| 50° | 2296.6 | 1812.6 | 582.9 | 258.9 | 235.8 | 222.7 | 210.9 | 203.8 | 202.0 | 201.4 | 201.4 |
| 52.5° | 2643.1 | 2094.0 | 527.8 | 254.1 | 229.2 | 216.2 | 204.4 | 194.9 | 191.3 | 189.6 | 189.6 |
| 55° | 3061.9 | 2468.9 | 527.8 | 250.6 | 220.9 | 208.5 | 194.9 | 185.4 | 180.1 | 177.7 | 177.7 |
| 57.5° | 3536.4 | 2905.5 | 619.0 | 247.6 | 214.4 | 199.6 | 184.8 | 175.3 | 169.4 | 165.9 | 165.9 |
| 60° | 4019.1 | 3366.9 | 844.7 | 243.5 | 208.5 | 188.4 | 173.6 | 164.7 | 157.0 | 152.8 | 152.2 |
| 62.5° | 4519.7 | 3875.2 | 1142.1 | 245.8 | 204.4 | 177.7 | 161.7 | 151.6 | 145.1 | 141.0 | 140.4 |
| 65° | 4978.2 | 4359.1 | 1402.1 | 264.2 | 205.0 | 168.2 | 148.1 | 139.2 | 133.9 | 128.5 | 127.9 |
| 67.5° | *5367.3* | *4626.3* | *1219.7* | *301.5* | *217.4* | *157.0* | *134.5* | *125.6* | *120.8* | *117.3* | *116.7* |
| 70° | 5094.9 | 4218.8 | 691.9 | 324.6 | 234.6 | 145.1 | 119.1 | 113.1 | 108.4 | 106.0 | 105.4 |
| 72.5° | 4356.8 | 3571.9 | 462.6 | 286.7 | 213.8 | 129.7 | 104.8 | 100.1 | 96.6 | 93.6 | 93.0 |
| 75° | 3529.3 | 2832.6 | 353.6 | 235.2 | 166.5 | 105.4 | 90.0 | 86.5 | 82.9 | 80.0 | 79.4 |
| 77.5° | 2088.1 | 1636.7 | 260.6 | 186.0 | 117.3 | 82.3 | 74.6 | 71.7 | 68.1 | 65.8 | 65.2 |
| 80° | 666.4 | 568.7 | 165.3 | 127.9 | 77.6 | 63.4 | 57.5 | 55.1 | 51.5 | 48.6 | 48.0 |
| 82.5° | 254.1 | 219.8 | 87.7 | 65.2 | 51.5 | 43.2 | 38.5 | 36.1 | 33.8 | 30.8 | 30.2 |
| 85° | 112.5 | 105.4 | 48.6 | 34.9 | 27.8 | 21.3 | 19.0 | 17.8 | 14.8 | 12.4 | 11.8 |
| 87.5° | 39.7 | 39.7 | 20.7 | 10.1 | 5.9 | 3.0 | 1.8 | 0.6 | 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

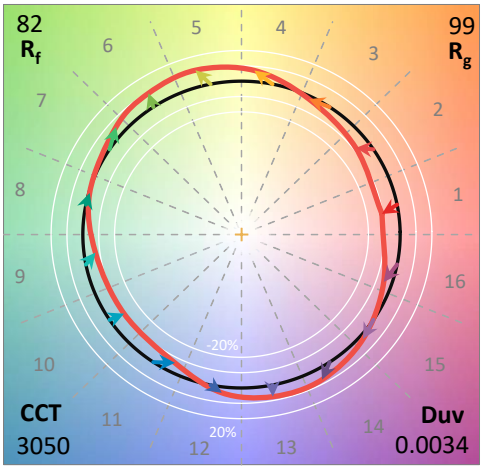
## Test Information

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

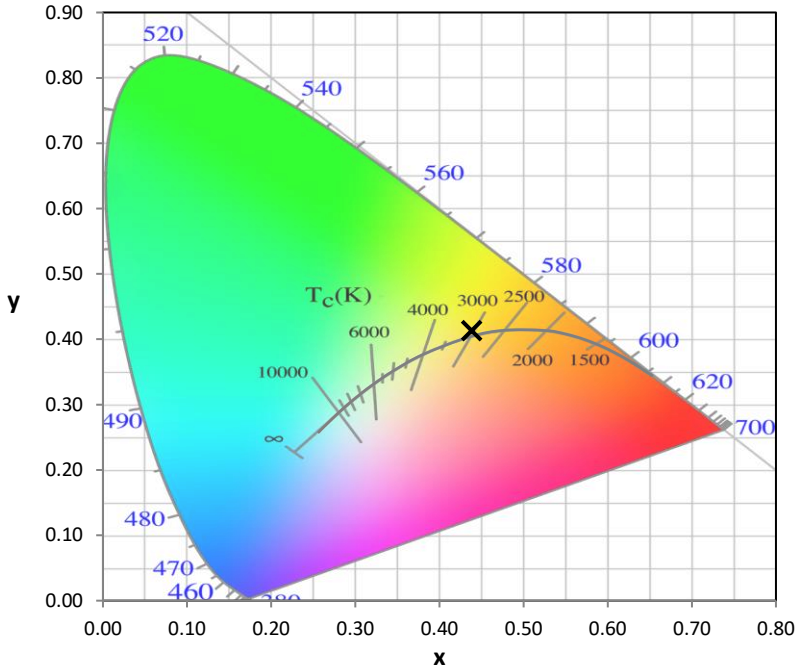
| | |
|---|---|
| Stabilization Time: | 20M |
| Operation Time: | 1H 20M |
| Sphere Temperature (°C): | 24.2 |

REPORT NUMBER: SP1-2408-195-9

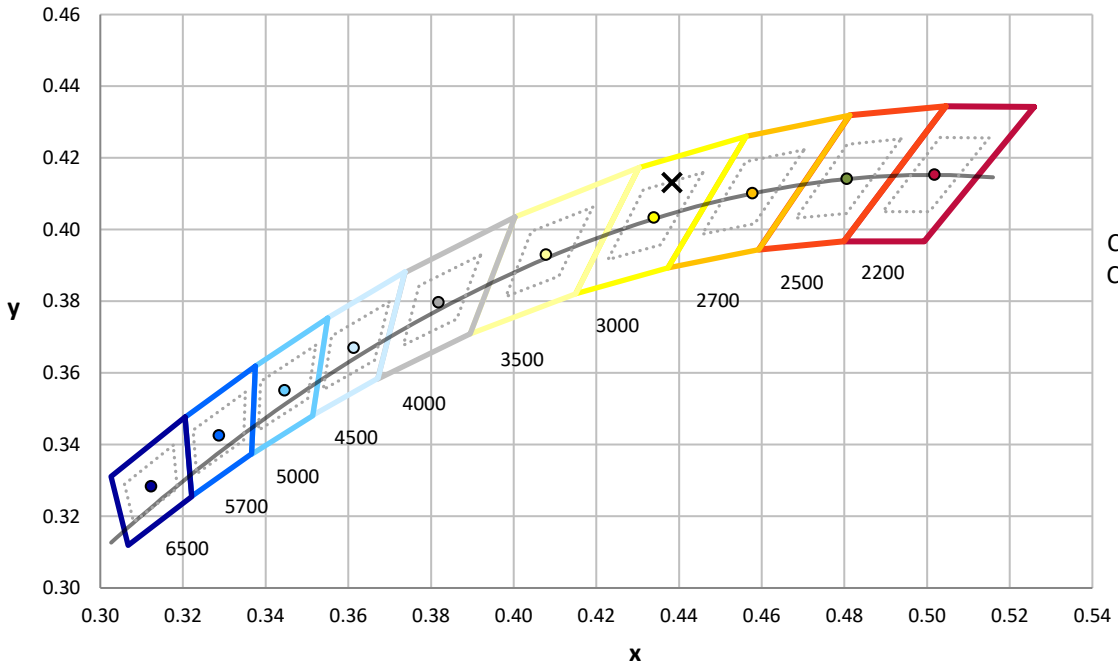
| Measurement and Test Equipment | | | |
|---|---|---|---|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 6/18/2024 | 12/18/2024 |
| Power Meter | INXT2011004 | 2/8/2024 | 2/8/2025 |
| AC Power Source | IN0063 | 10/24/2023 | 10/24/2024 |
| DC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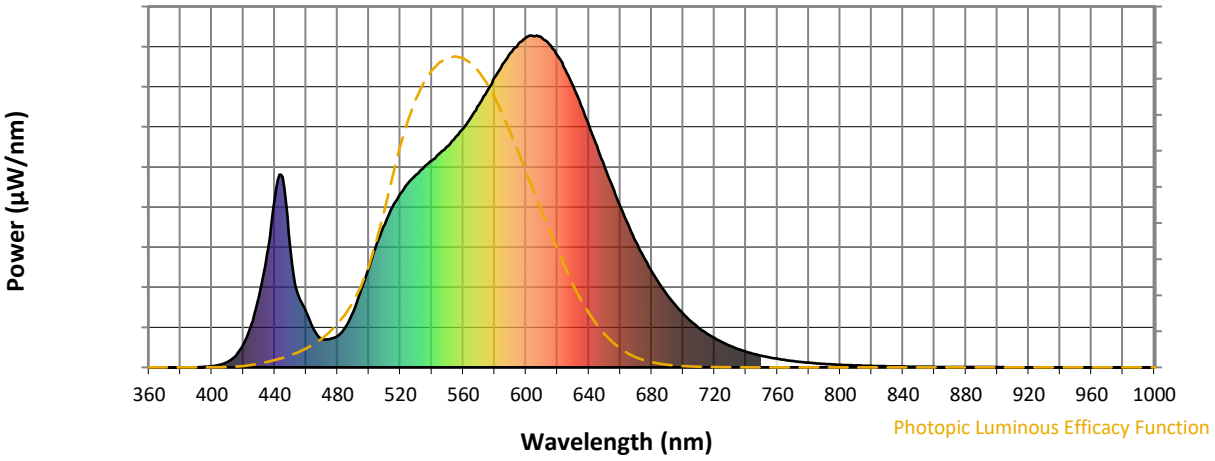
## Photopic Flux vs. Wavelength




## 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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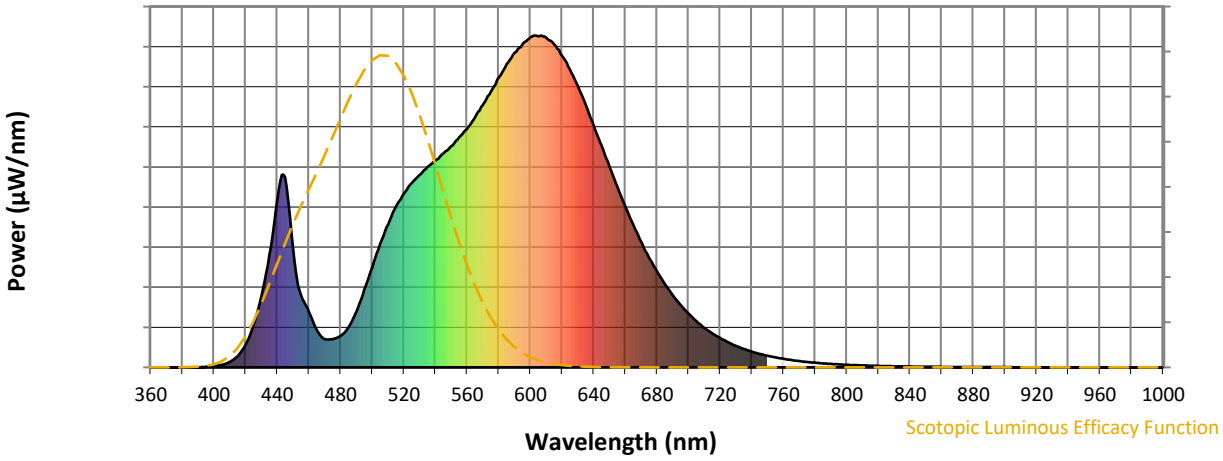
## Scotopic Flux vs. Wavelength




**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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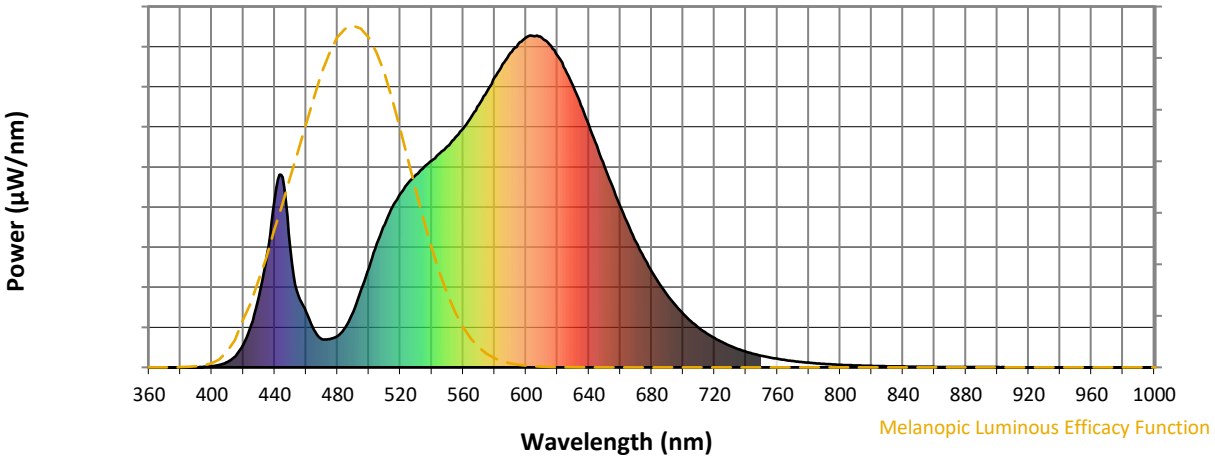
## Melanopic Flux vs. Wavelength




**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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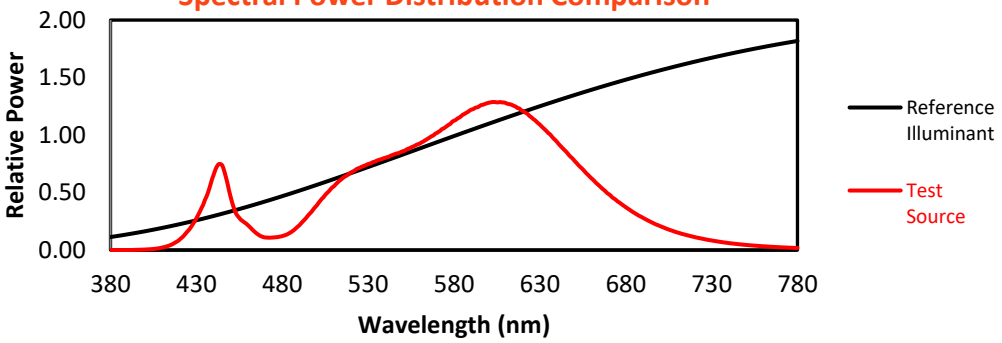
# TM-30-18

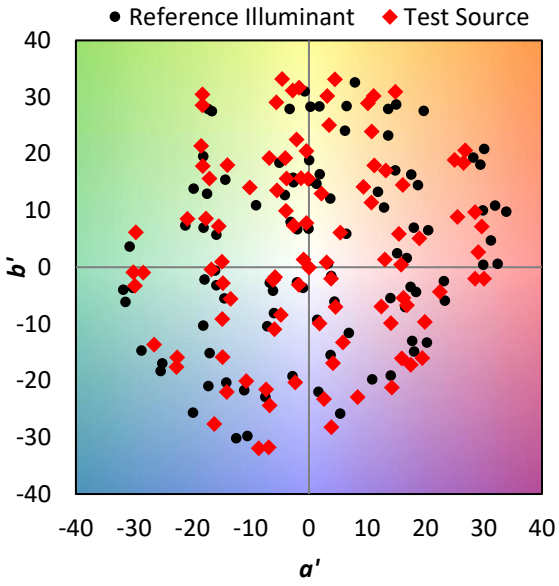
## Summary

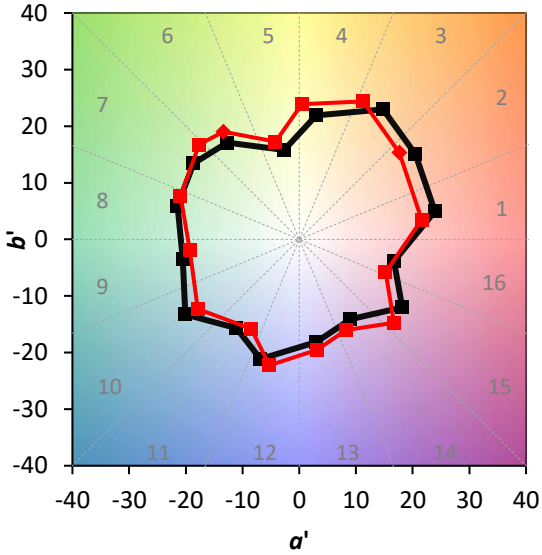
$R_f$ = 81.5
$R_g$ = 99.2
CIE $R_a$ = 81.0
$R_9$ = 7.1

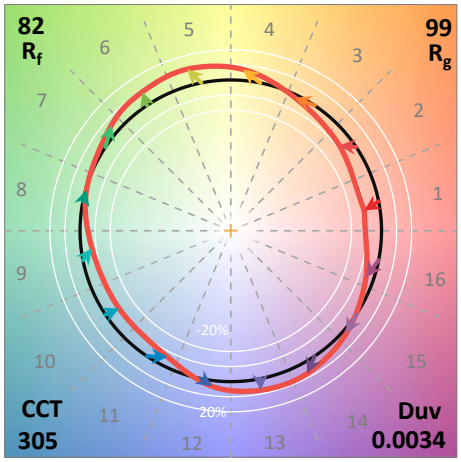
## Spectral Power Distribution Comparison

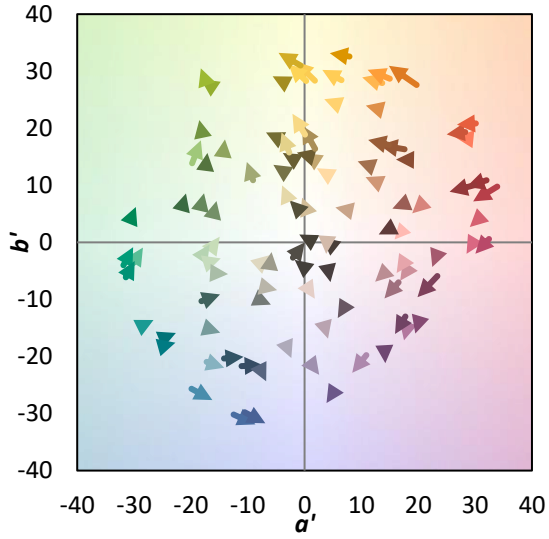



## Color Vector Graphics



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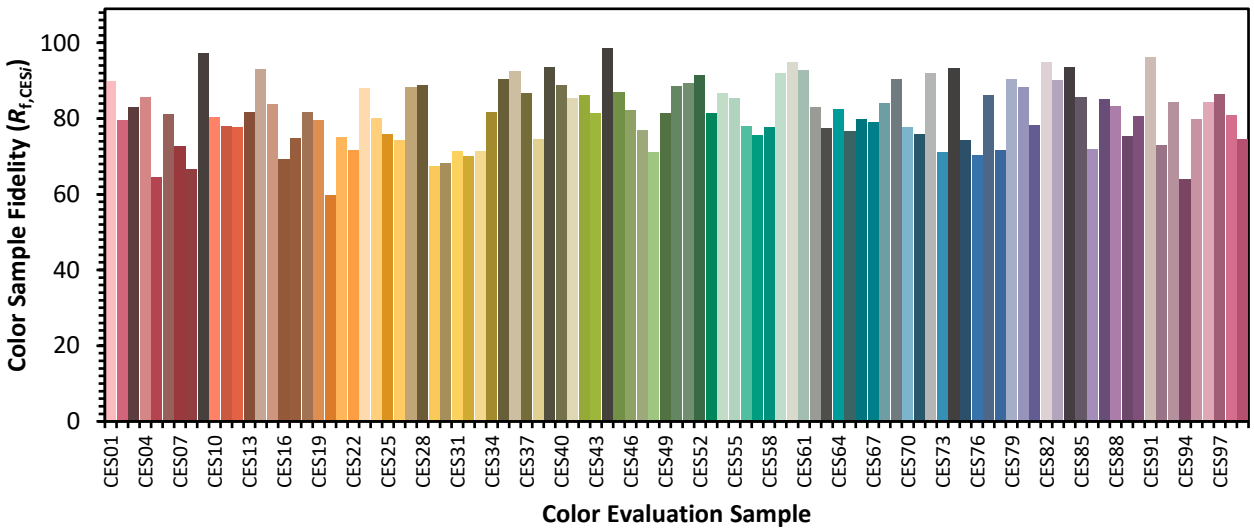
**Individual Sample Fidelity Index ($R_{f,i}$)**

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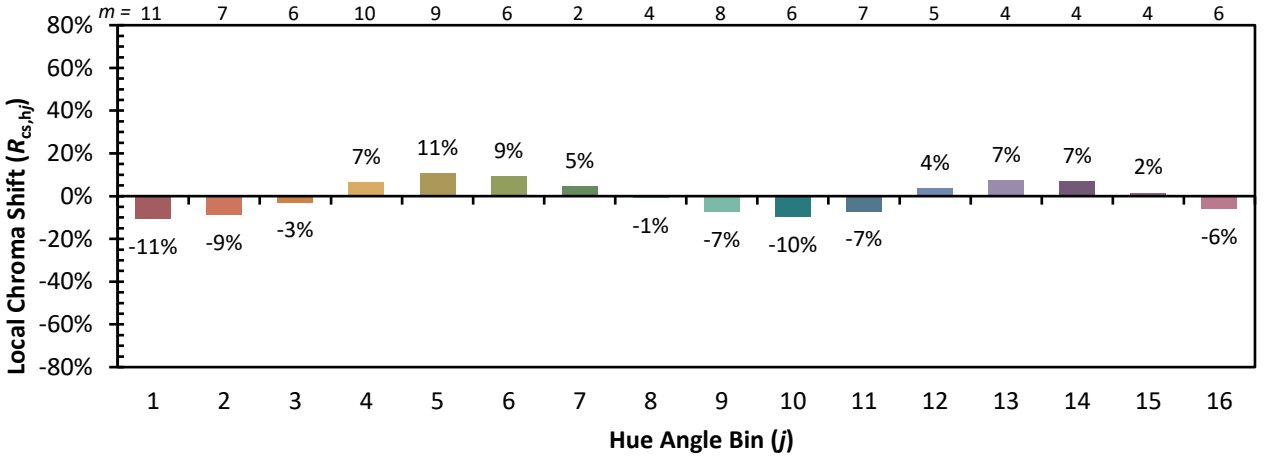
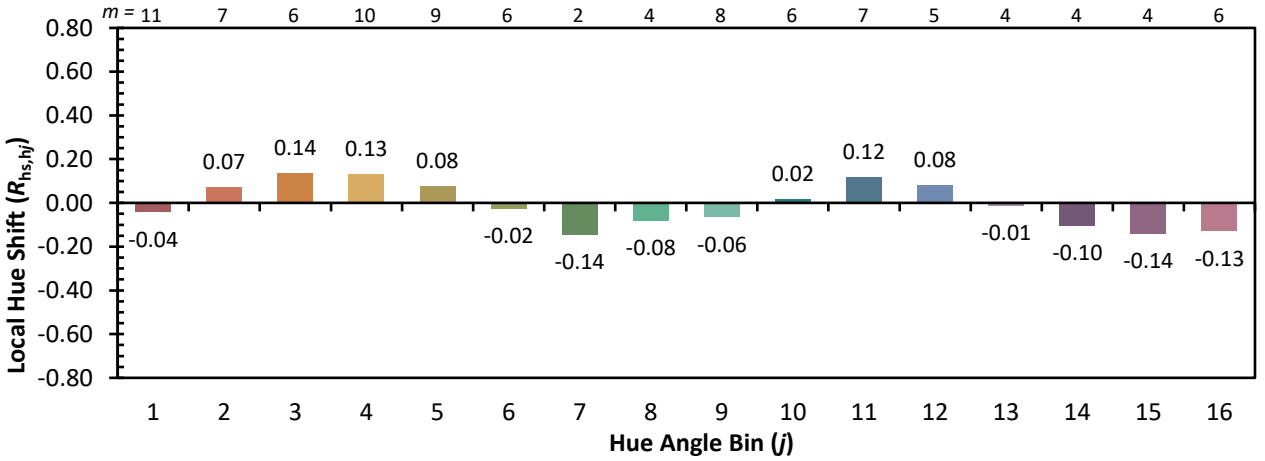
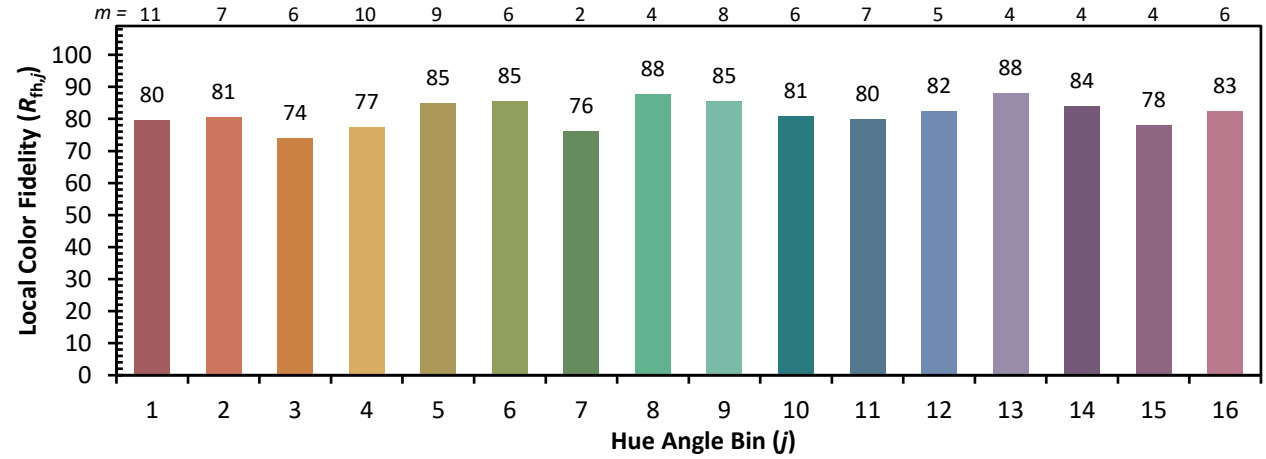
## Color Rendition by Hue-Angle Bin



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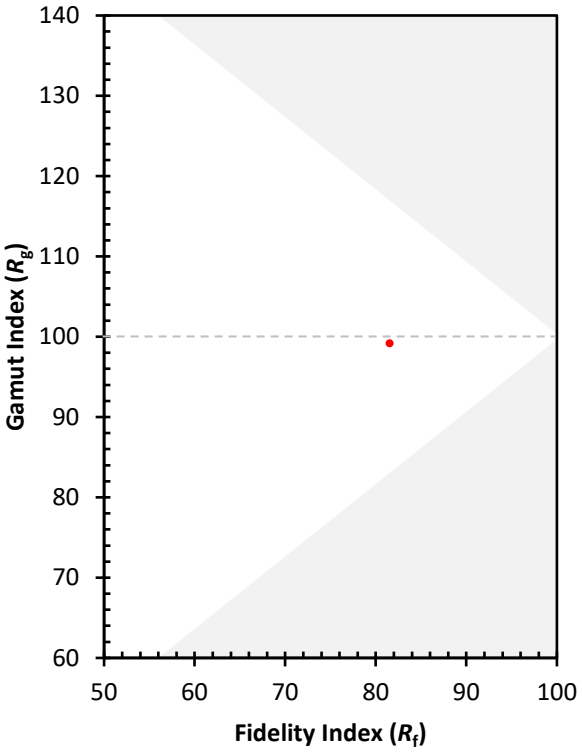
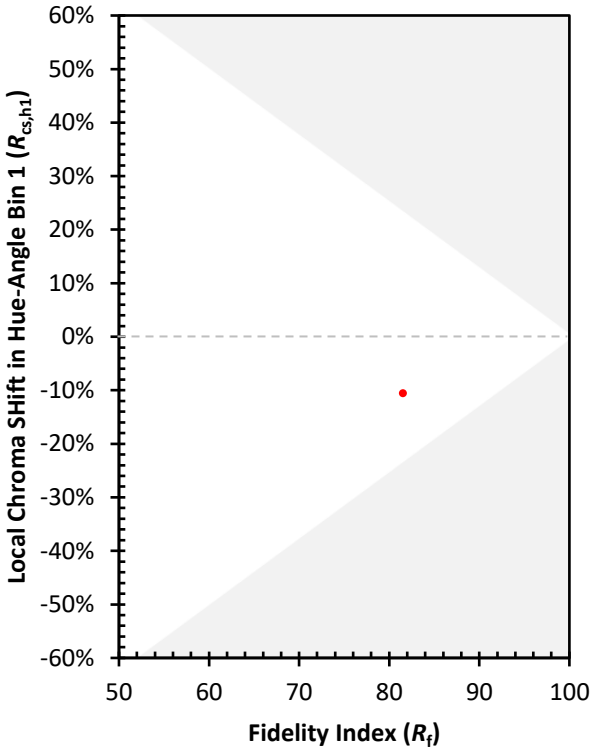
## Measure Comparisons




(END OF REPORT)