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: P386501

Luminaire Tested: **GPC-SA2A-830-U-SL4**

Issue Date: 3/3/2020

Report Generated By 670245982

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: | P386501 |
| | TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-24) |
| Test Lab: | INNOVATION CENTER |
| Issue Date: | 3/3/2020 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS (FORMERLY EATON) |
| Product Line: | McGRAW-EDISON |
| Catalog Number: | GPC-SA2A-830-U-SL4 |
| Description: | GALLEON PEDESTRIAN LUMINAIRE |
| | (2) 80 CRI, 3000K, 615mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE IV SPILL LIGHT ELIMINATOR OPTICS |
| Light Source: | - |
| Ballast/Driver: | ELECTRONIC DRIVER |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 7342 lumens |
| Efficiency: | N/A |
| Efficacy: | 111.2 lumens/watt |
| Luminous Opening: | Rectangular (W 1' x L: 0.5' x H: 0') |
| IES Classification: | Type IV - Short |
| BUG Rating: | B1 - U0 - G3 |

| | |
|---|---|
| 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: | 28.75 FT |

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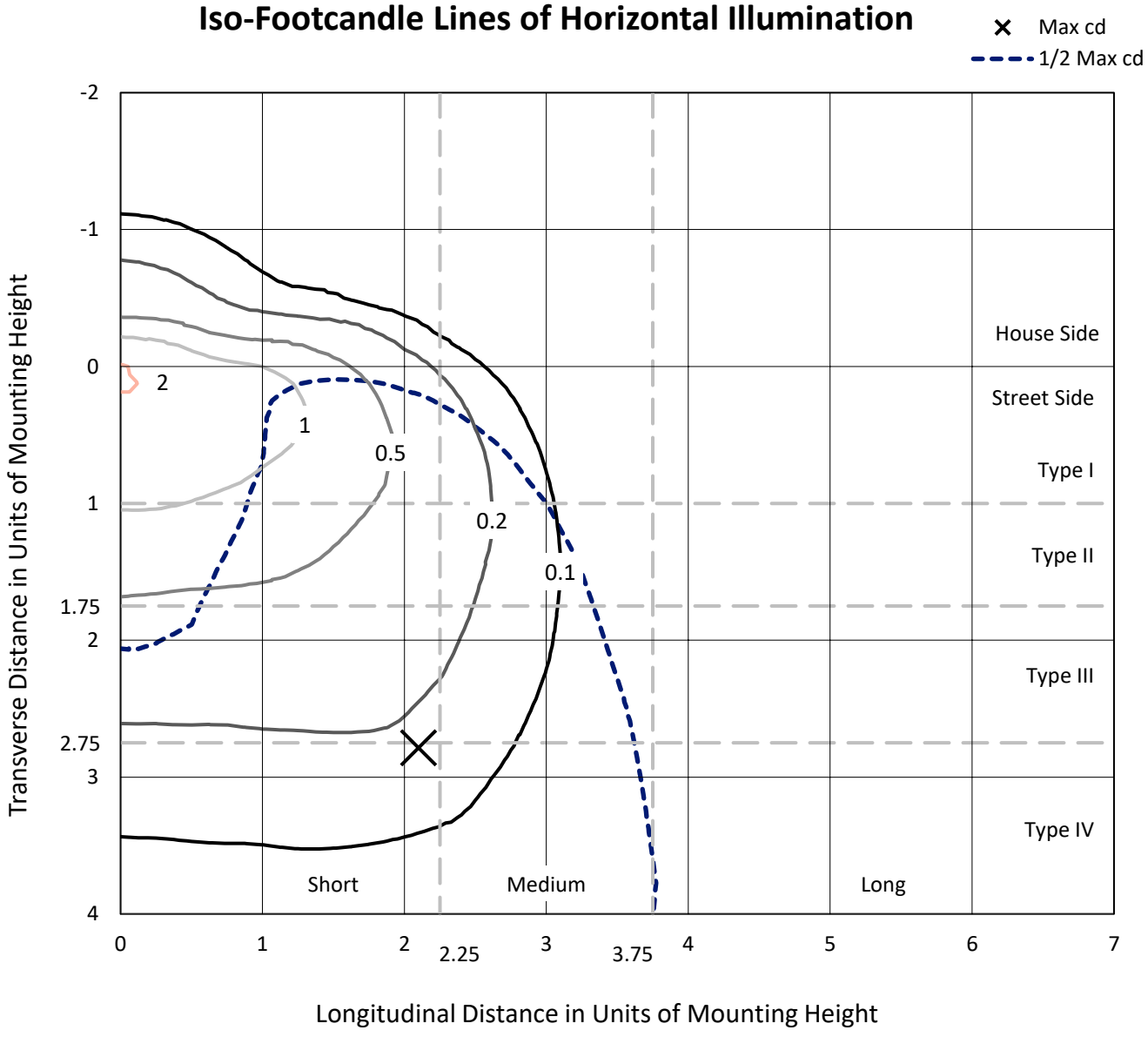
Scaled Data Report

REPORT NUMBER: P386501
CATALOG NUMBER: GPC-SA2A-830-U-SL4

## Iso-Footcandle Lines of Horizontal Illumination




Based on 25 foot mounting height. Maximum calculated value = 2.1 fc
Type IV - Short - N/A

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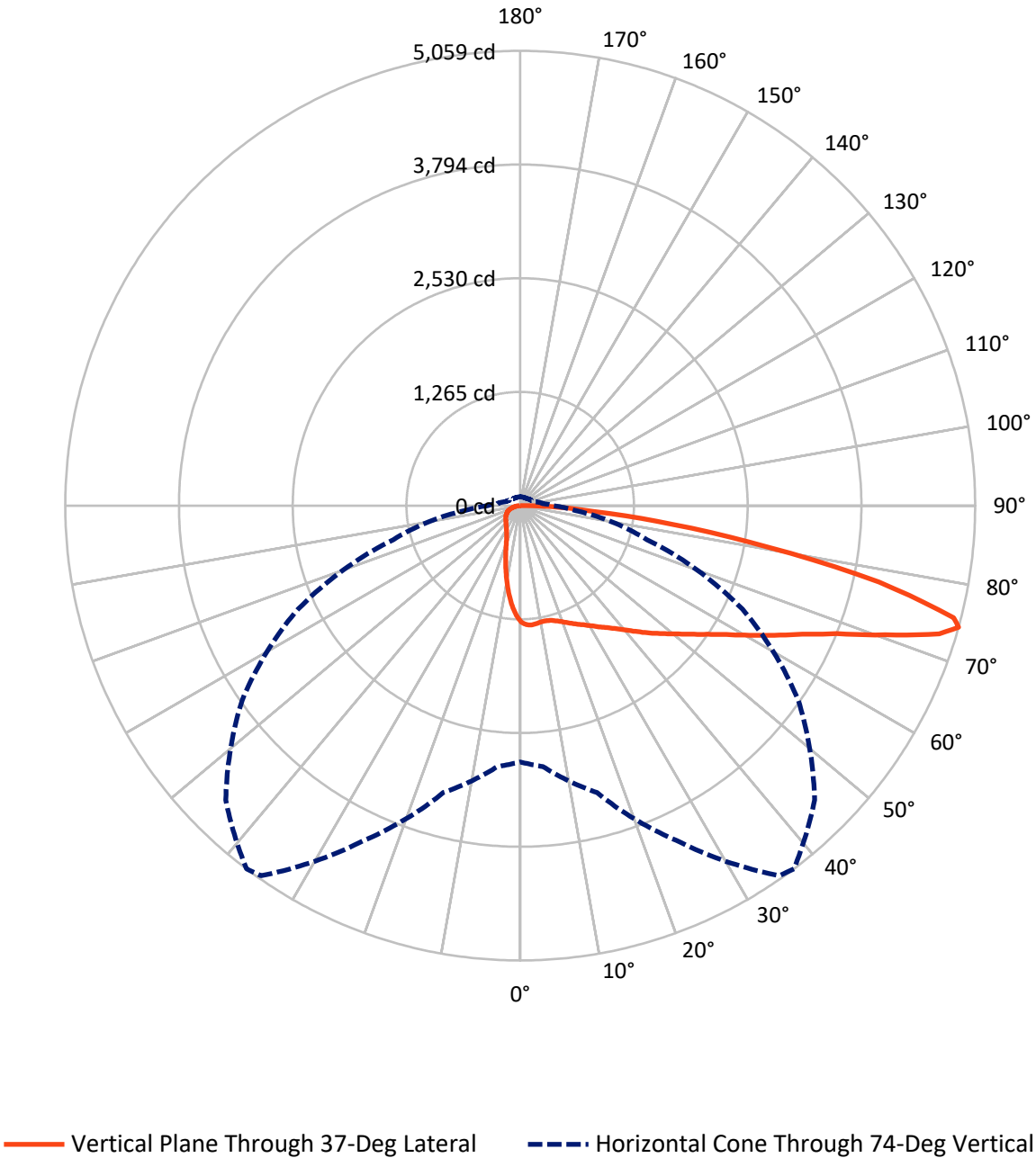
## Luminous Intensity Polar Plot



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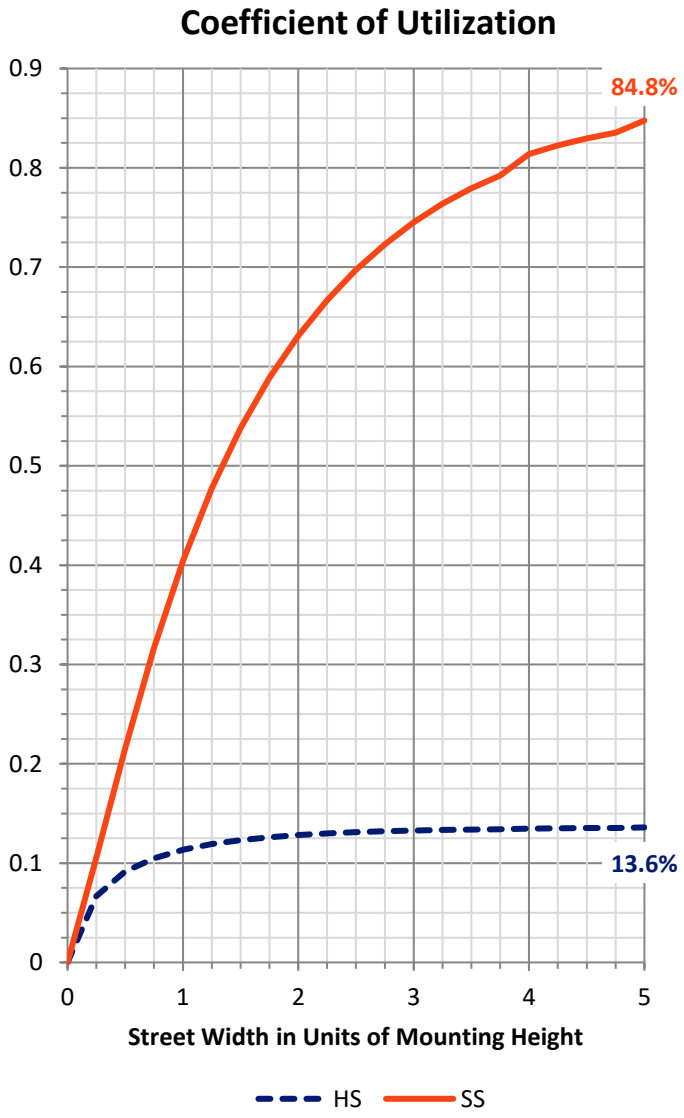
REPORT NUMBER: P386501
CATALOG NUMBER: GPC-SA2A-830-U-SL4

**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 1010.2 | 0.0 | 1010.2 |
| | % Fixture | 13.8 | 0.0 | 13.8 |
| **Street Side** | Lumens | 6331.8 | 0.0 | 6331.8 |
| | % Fixture | 86.2 | 0.0 | 86.2 |
| **Total** | Lumens | 7342.0 | 0.0 | 7342.0 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 113.9 | 1.6 |
| 10°-20° | 292.0 | 4.0 |
| 20°-30° | 449.9 | 6.1 |
| 30°-40° | 654.3 | 8.9 |
| 40°-50° | 963.0 | 13.1 |
| 50°-60° | 1352.3 | 18.4 |
| 60°-70° | 1711.6 | 23.3 |
| 70°-80° | 1507.1 | 20.5 |
| 80°-90° | 298.0 | 4.1 |
| 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° | 7342.0 | 100.0 |
| 0°-180° | 7342.0 | 100.0 |



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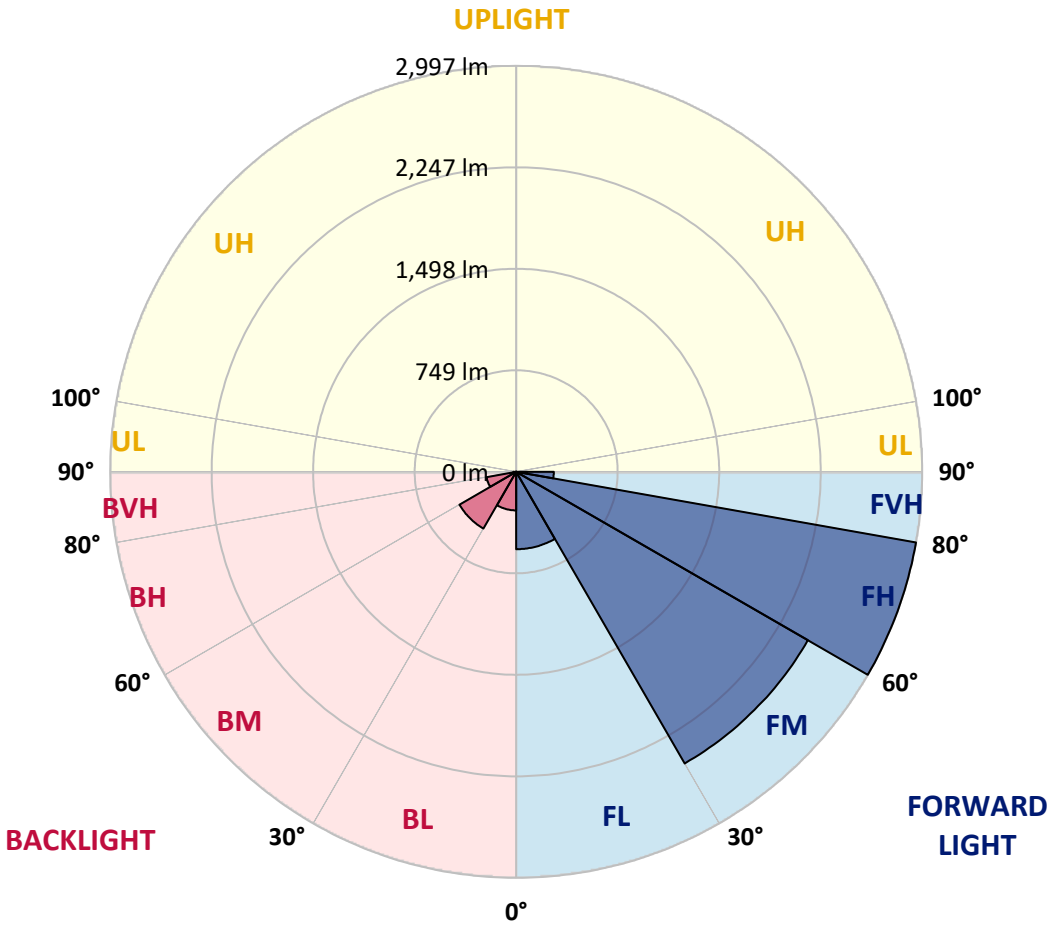
## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 571.3 | 7.8 | | | |
| FM | (30°-60°) | 2486.1 | 33.9 | | | |
| FH | (60°-80°) | 2996.6 | 40.8 | | | G2/5000 |
| FVH | (80°-90°) | 277.8 | 3.8 | | | G3/500 |
| BL | (0°-30°) | 284.6 | 3.9 | B1/500 | | |
| BM | (30°-60°) | 483.4 | 6.6 | B1/1000 | | |
| BH | (60°-80°) | 222.1 | 3.0 | B1/500 | | G1/500 |
| BVH | (80°-90°) | 20.2 | 0.3 | | | G1/100 |
| UL | (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH | (100°-180°) | 0.0 | 0.0 | | U0/0 | |

**BUG Rating: B1-U0-G3**
Type IV Short



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REPORT NUMBER: P386501
CATALOG NUMBER: GPC-SA2A-830-U-SL4

**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 15° | 25° | 35° | 37° | 45° | 55° | 65° | 75° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 1293.6 | 1293.6 | 1293.6 | 1293.6 | 1293.6 | *1293.6* | 1293.6 | 1293.6 | 1293.6 | 1293.6 | 1293.6 |
| 2.5° | 1337.9 | 1338.1 | 1337.9 | 1335.8 | 1330.9 | *1326.7* | 1323.4 | 1318.5 | 1307.6 | 1299.3 | 1286.9 |
| 5° | 1350.5 | 1349.0 | 1347.9 | 1344.1 | 1336.3 | *1331.6* | 1325.2 | 1315.9 | 1298.0 | 1281.5 | 1261.3 |
| 7.5° | 1344.6 | 1342.8 | 1340.4 | 1335.8 | 1327.0 | *1323.1* | 1314.1 | 1301.9 | 1280.4 | 1258.7 | 1229.8 |
| 10° | 1326.2 | 1325.7 | 1324.7 | 1323.6 | 1316.1 | *1313.0* | 1304.8 | 1291.8 | 1270.6 | 1244.2 | 1210.4 |
| 12.5° | 1305.8 | 1307.1 | 1311.2 | 1316.6 | 1313.3 | *1311.7* | 1306.6 | 1297.8 | 1276.0 | 1247.6 | 1206.7 |
| 15° | 1292.9 | 1296.5 | 1307.6 | 1321.8 | 1324.7 | *1324.1* | 1322.9 | 1317.2 | 1294.1 | 1262.6 | 1215.0 |
| 17.5° | 1288.5 | 1294.4 | 1315.6 | 1339.1 | 1347.4 | *1349.2* | 1349.8 | 1339.9 | 1314.3 | 1281.0 | 1223.5 |
| 20° | 1296.5 | 1304.0 | 1335.0 | 1367.3 | 1380.5 | *1381.6* | 1379.2 | 1362.2 | 1333.5 | 1296.7 | 1228.2 |
| 22.5° | 1320.8 | 1327.5 | 1366.3 | 1402.8 | 1417.8 | *1419.3* | 1412.3 | 1386.5 | 1353.6 | 1315.4 | 1234.7 |
| 25° | 1367.6 | 1375.9 | 1414.7 | 1451.1 | 1458.9 | *1459.2* | 1449.1 | 1417.0 | 1380.0 | 1341.5 | 1248.6 |
| 27.5° | 1428.6 | 1436.9 | 1471.8 | 1507.5 | 1503.4 | *1501.0* | 1487.3 | 1455.3 | 1414.4 | 1377.4 | 1273.5 |
| 30° | 1496.7 | 1505.7 | 1538.8 | 1564.2 | 1554.3 | *1549.7* | 1538.5 | 1497.2 | 1462.3 | 1426.6 | 1311.5 |
| 32.5° | 1567.0 | 1575.3 | 1604.2 | 1621.6 | 1609.2 | *1607.1* | 1590.3 | 1552.5 | 1524.6 | 1501.6 | 1373.0 |
| 35° | 1639.2 | 1645.1 | 1673.5 | 1683.4 | 1666.8 | *1666.3* | 1661.7 | 1627.0 | 1609.4 | 1620.3 | 1462.5 |
| 37.5° | 1712.9 | 1714.4 | 1738.7 | 1739.2 | 1734.3 | *1736.4* | 1741.3 | 1719.6 | 1724.5 | 1758.4 | 1578.9 |
| 40° | 1778.5 | 1782.7 | 1800.3 | 1805.7 | 1814.2 | *1821.5* | 1846.1 | 1831.8 | 1869.8 | 1929.8 | 1723.7 |
| 42.5° | 1827.2 | 1835.2 | 1863.4 | 1877.3 | 1905.0 | *1916.4* | 1951.1 | 1964.2 | 2040.8 | 2130.8 | 1896.0 |
| 45° | 1868.3 | 1880.7 | 1926.0 | 1954.7 | 2001.5 | *2021.4* | 2071.1 | 2115.3 | 2234.0 | 2348.8 | 2077.3 |
| 47.5° | 1912.8 | 1928.6 | 1985.2 | 2040.0 | 2103.6 | *2126.1* | 2216.4 | 2282.6 | 2440.1 | 2568.1 | 2248.2 |
| 50° | 1978.2 | 1990.4 | 2045.7 | 2131.8 | 2211.2 | *2240.2* | 2365.1 | 2460.0 | 2649.6 | 2777.1 | 2396.4 |
| 52.5° | 2069.5 | 2064.8 | 2111.7 | 2232.4 | 2339.0 | *2374.7* | 2523.9 | 2648.8 | 2861.9 | 2966.1 | 2521.6 |
| 55° | 2161.3 | 2153.6 | 2186.4 | 2337.7 | 2488.0 | *2525.5* | 2698.7 | 2838.4 | 3063.9 | 3136.3 | 2617.5 |
| 57.5° | 2263.5 | 2248.7 | 2276.4 | 2456.4 | 2657.6 | *2702.4* | 2894.5 | 3039.9 | 3262.5 | 3273.9 | 2678.6 |
| 60° | 2368.7 | 2348.8 | 2379.8 | 2603.6 | 2873.0 | *2925.8* | 3123.6 | 3236.4 | 3449.8 | 3384.1 | 2698.2 |
| 62.5° | 2460.8 | 2446.8 | 2494.7 | 2767.8 | 3115.9 | *3173.8* | 3348.6 | 3445.4 | 3634.4 | 3429.9 | 2627.4 |
| 65° | 2541.2 | 2543.6 | 2626.3 | 2952.4 | 3386.7 | *3448.5* | 3606.8 | 3703.0 | 3779.8 | 3402.7 | 2461.6 |
| 67.5° | 2637.2 | 2650.4 | 2791.6 | 3195.5 | 3727.5 | *3795.3* | 3982.3 | 3983.8 | 3861.0 | 3243.4 | 2135.2 |
| 70° | 2777.1 | 2804.2 | 3018.9 | 3532.8 | 4212.2 | *4305.3* | 4449.6 | 4148.8 | 3746.9 | 2811.5 | 1680.0 |
| 72.5° | 2901.2 | 2951.9 | 3260.7 | 3918.7 | 4802.9 | *4873.5* | 4723.0 | 4053.7 | 3270.3 | 2107.0 | 1046.6 |
| 74° | *2850.8* | *2913.6* | *3304.7* | *4108.7* | *5025.3* | *5059.2* | *4630.6* | *3775.9* | *2726.7* | *1459.2* | *608.3* |
| 75° | 2742.2 | 2810.5 | 3240.5 | 4106.9 | 4997.1 | *4978.2* | 4407.7 | 3458.6 | 2245.6 | 995.2 | 404.7 |
| 77.5° | 2213.0 | 2285.2 | 2730.5 | 3519.9 | 4097.4 | *4079.5* | 3385.9 | 2320.1 | 983.5 | 326.4 | 205.6 |
| 80° | 1286.6 | 1341.7 | 1695.0 | 2235.3 | 2762.9 | *2795.2* | 2226.7 | 1148.0 | 386.9 | 183.4 | 139.4 |
| 82.5° | 571.6 | 609.6 | 818.8 | 1141.0 | 1667.3 | *1709.0* | 1166.1 | 601.6 | 239.0 | 111.5 | 83.8 |
| 85° | 375.0 | 403.2 | 497.1 | 543.4 | 794.0 | *822.4* | 570.8 | 468.4 | 157.8 | 61.3 | 61.6 |
| 87.5° | 269.7 | 296.9 | 369.3 | 322.5 | 364.4 | *345.0* | 310.6 | 433.5 | 63.4 | 34.9 | 20.7 |
| 90° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | *0.0* | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

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Scaled Data Report

REPORT NUMBER: P386501
CATALOG NUMBER: GPC-SA2A-830-U-SL4

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 1293.6 | 1293.6 | 1293.6 | 1293.6 | 1293.6 | 1293.6 | 1293.6 | 1293.6 | 1293.6 | 1293.6 | 1293.6 |
| 2.5° | 1281.5 | 1277.3 | 1268.0 | 1250.4 | 1240.6 | 1232.3 | 1218.6 | 1210.6 | 1207.0 | 1206.7 | 1208.3 |
| 5° | 1249.7 | 1240.1 | 1216.0 | 1186.6 | 1163.0 | 1141.6 | 1114.9 | 1098.9 | 1087.5 | 1080.8 | 1082.6 |
| 7.5° | 1212.7 | 1197.7 | 1159.9 | 1112.9 | 1075.1 | 1033.5 | 992.3 | 967.8 | 948.6 | 934.4 | 937.0 |
| 10° | 1187.3 | 1166.6 | 1111.6 | 1043.8 | 981.0 | 920.4 | 863.8 | 829.9 | 803.0 | 782.3 | 783.9 |
| 12.5° | 1178.8 | 1150.9 | 1074.6 | 984.1 | 895.9 | 813.1 | 739.1 | 687.2 | 659.5 | 636.0 | 637.8 |
| 15° | 1180.1 | 1142.6 | 1043.5 | 930.3 | 819.3 | 715.1 | 625.4 | 564.6 | 527.1 | 510.8 | 511.0 |
| 17.5° | 1181.1 | 1133.0 | 1011.0 | 872.6 | 743.5 | 623.5 | 526.0 | 464.5 | 429.1 | 414.1 | 414.3 |
| 20° | 1177.8 | 1117.5 | 970.6 | 806.4 | 664.4 | 539.5 | 445.1 | 392.8 | 366.0 | 354.3 | 354.3 |
| 22.5° | 1173.4 | 1099.1 | 925.1 | 739.9 | 586.3 | 466.6 | 387.2 | 347.3 | 331.8 | 324.1 | 323.8 |
| 25° | 1175.4 | 1085.4 | 878.5 | 671.6 | 514.4 | 408.4 | 348.6 | 322.2 | 311.9 | 307.0 | 306.7 |
| 27.5° | 1186.6 | 1079.0 | 835.6 | 603.6 | 451.6 | 364.7 | 322.8 | 304.1 | 297.4 | 294.3 | 294.3 |
| 30° | 1206.7 | 1079.0 | 790.9 | 545.7 | 399.3 | 332.3 | 302.8 | 290.2 | 285.5 | 283.5 | 283.5 |
| 32.5° | 1241.9 | 1084.9 | 747.7 | 488.3 | 357.7 | 307.0 | 286.3 | 277.8 | 274.1 | 273.1 | 273.1 |
| 35° | 1302.4 | 1105.1 | 705.5 | 434.0 | 324.1 | 286.3 | 270.5 | 265.6 | 263.0 | 262.8 | 263.5 |
| 37.5° | 1387.5 | 1146.2 | 666.0 | 393.9 | 300.3 | 269.5 | 257.3 | 253.5 | 251.9 | 253.2 | 254.2 |
| 40° | 1494.6 | 1202.1 | 630.0 | 357.7 | 282.2 | 256.0 | 245.2 | 242.6 | 241.8 | 243.6 | 245.2 |
| 42.5° | 1623.9 | 1277.6 | 600.5 | 331.6 | 268.2 | 244.7 | 234.8 | 231.7 | 231.0 | 233.0 | 235.1 |
| 45° | 1763.8 | 1358.8 | 579.8 | 312.2 | 257.3 | 236.1 | 225.8 | 222.4 | 220.9 | 221.9 | 224.2 |
| 47.5° | 1891.1 | 1435.6 | 571.6 | 298.5 | 247.0 | 228.9 | 217.8 | 213.6 | 211.0 | 210.5 | 212.3 |
| 50° | 1998.4 | 1492.8 | 575.4 | 290.2 | 238.7 | 220.9 | 210.0 | 205.3 | 201.5 | 199.1 | 200.4 |
| 52.5° | 2076.5 | 1528.7 | 579.1 | 286.6 | 232.2 | 212.1 | 201.5 | 197.1 | 191.9 | 188.0 | 188.0 |
| 55° | 2133.1 | 1537.0 | 571.0 | 283.7 | 227.3 | 202.5 | 191.9 | 187.8 | 182.6 | 178.2 | 177.7 |
| 57.5° | 2155.4 | 1513.7 | 541.3 | 279.6 | 224.0 | 193.4 | 181.8 | 178.7 | 174.3 | 169.1 | 168.9 |
| 60° | 2125.4 | 1441.8 | 483.9 | 270.8 | 219.6 | 185.9 | 171.7 | 169.7 | 167.6 | 162.7 | 162.4 |
| 62.5° | 2004.8 | 1284.1 | 409.7 | 252.9 | 210.8 | 177.9 | 162.4 | 163.4 | 163.7 | 160.3 | 159.8 |
| 65° | 1786.3 | 1067.3 | 337.2 | 229.7 | 197.6 | 168.4 | 152.8 | 157.8 | 160.6 | 160.1 | 159.3 |
| 67.5° | 1468.7 | 830.7 | 285.8 | 205.1 | 180.3 | 155.2 | 142.5 | 148.2 | 150.5 | 152.3 | 151.8 |
| 70° | 1090.1 | 585.8 | 236.4 | 179.2 | 159.3 | 139.7 | 129.1 | 131.9 | 130.3 | 132.4 | 133.2 |
| 72.5° | 607.8 | 351.5 | 192.7 | 153.4 | 137.6 | 121.6 | 114.1 | 113.5 | 110.2 | 110.2 | 110.2 |
| 74° | *364.7* | *257.8* | *169.4* | *137.3* | *124.4* | *109.7* | *103.2* | *100.9* | *97.8* | *98.0* | *97.8* |
| 75° | 293.3 | 221.6 | 155.4 | 126.7 | 115.1 | 102.7 | 96.2 | 93.1 | 90.8 | 90.8 | 90.5 |
| 77.5° | 185.2 | 168.4 | 125.2 | 100.9 | 92.1 | 84.6 | 80.2 | 76.0 | 76.0 | 75.8 | 75.5 |
| 80° | 139.9 | 134.0 | 97.5 | 76.3 | 70.6 | 64.9 | 62.1 | 60.3 | 60.3 | 61.0 | 60.8 |
| 82.5° | 95.9 | 100.9 | 68.5 | 53.3 | 50.4 | 46.3 | 45.8 | 46.0 | 45.3 | 44.2 | 44.0 |
| 85° | 70.1 | 75.8 | 46.3 | 33.6 | 30.8 | 28.2 | 30.3 | 31.3 | 30.0 | 27.7 | 26.6 |
| 87.5° | 26.9 | 49.7 | 24.8 | 14.0 | 12.9 | 11.1 | 12.9 | 13.4 | 14.5 | 11.4 | 11.6 |
| 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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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

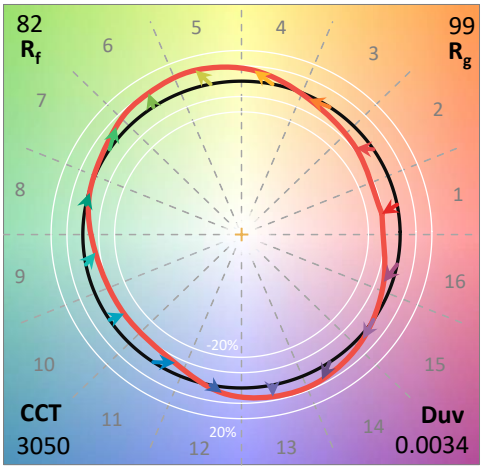
## Test Information

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

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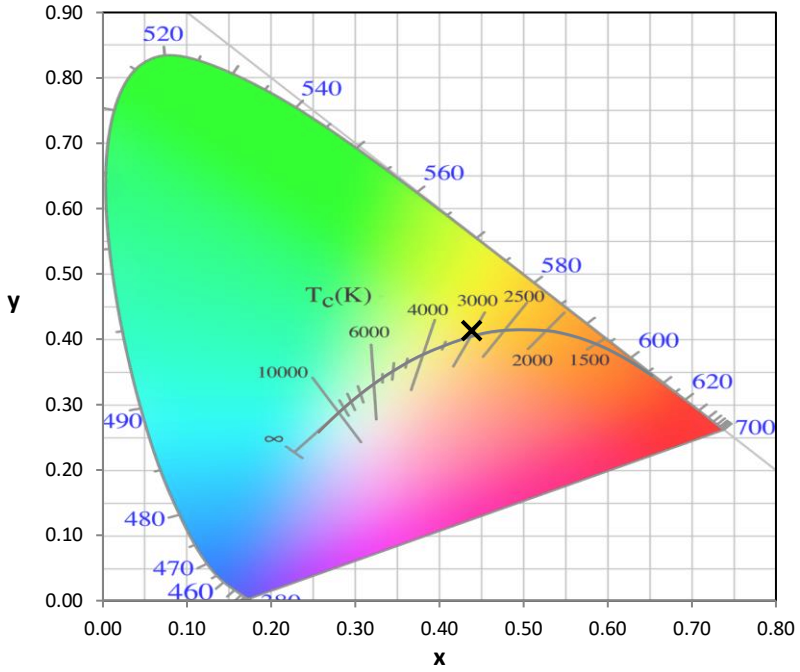
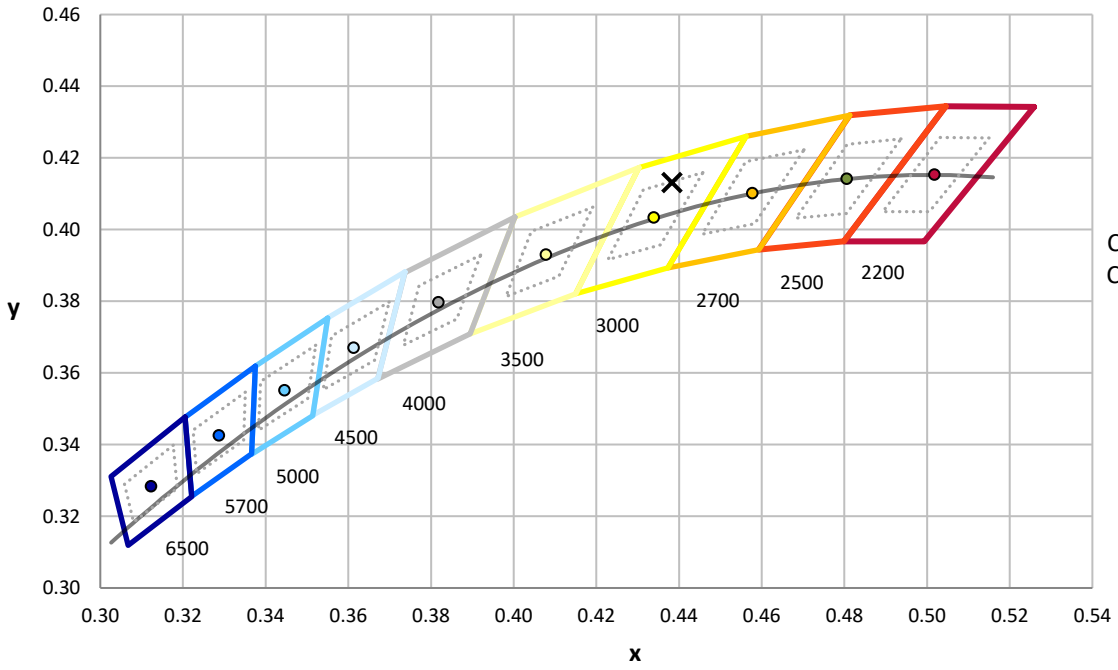
## CIE 1931 Chromaticity Diagram




## 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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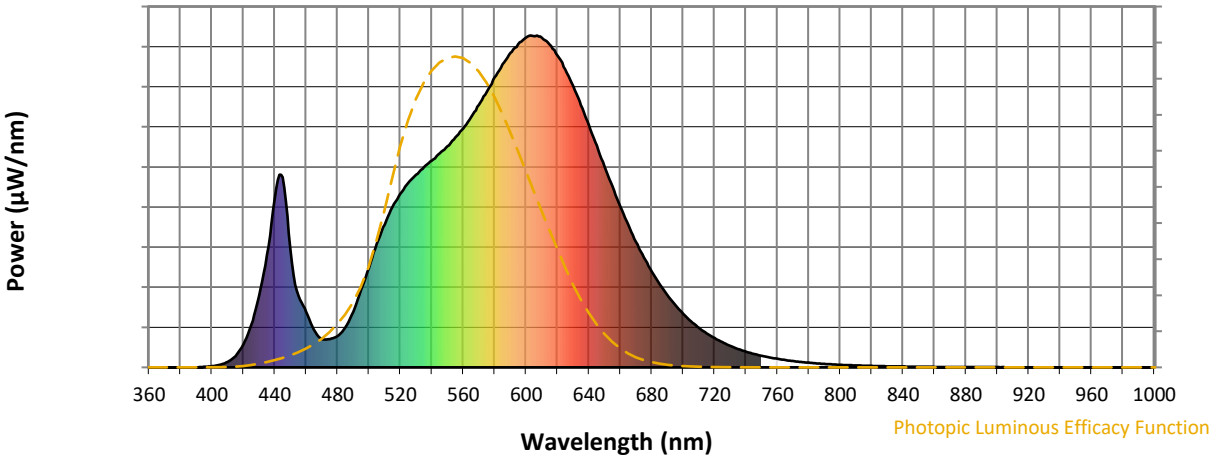
## Photopic Flux vs. Wavelength




## 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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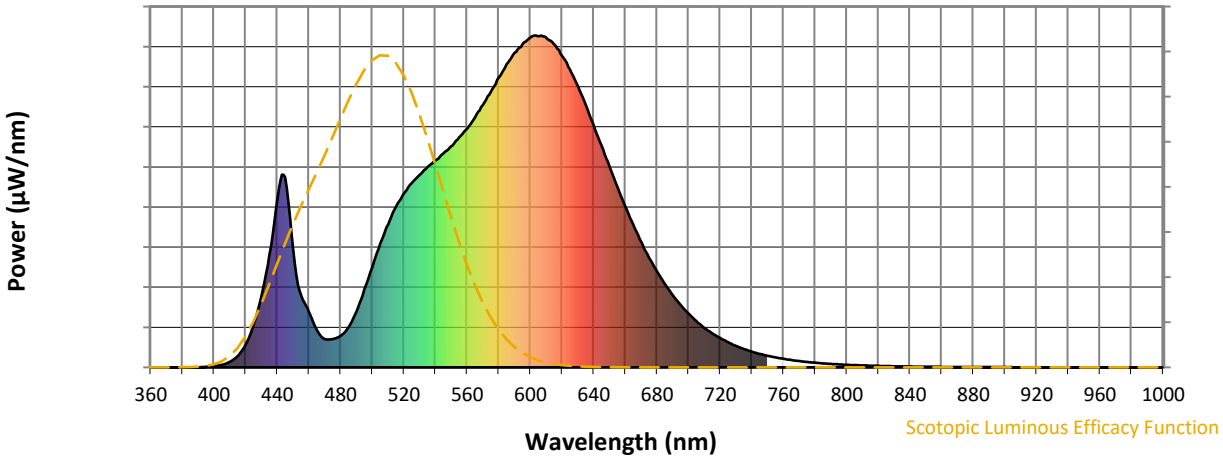
## Scotopic Flux vs. Wavelength




**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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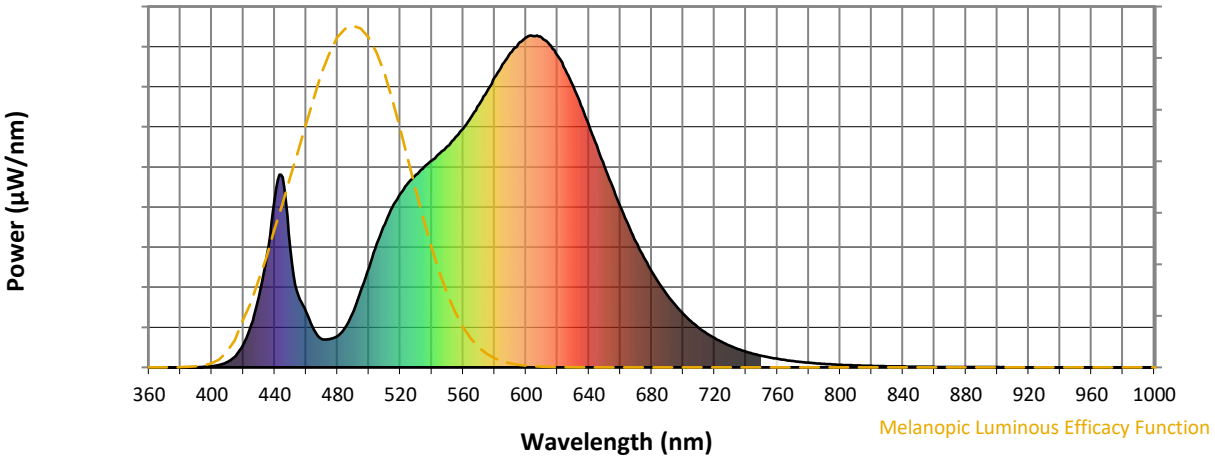
## Melanopic Flux vs. Wavelength




**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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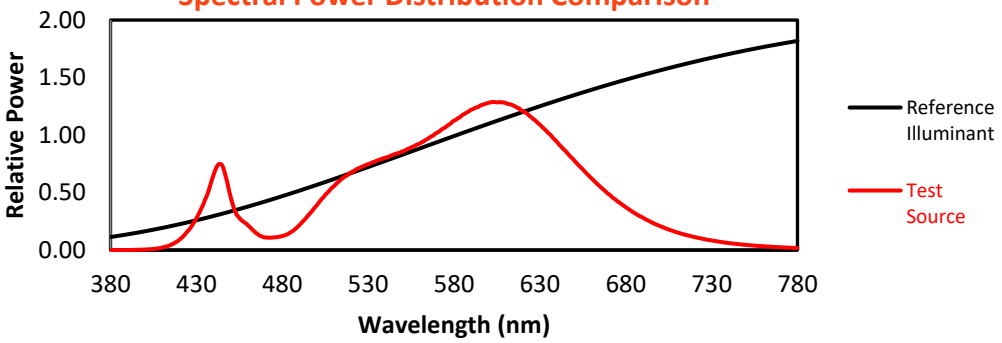
# TM-30-18

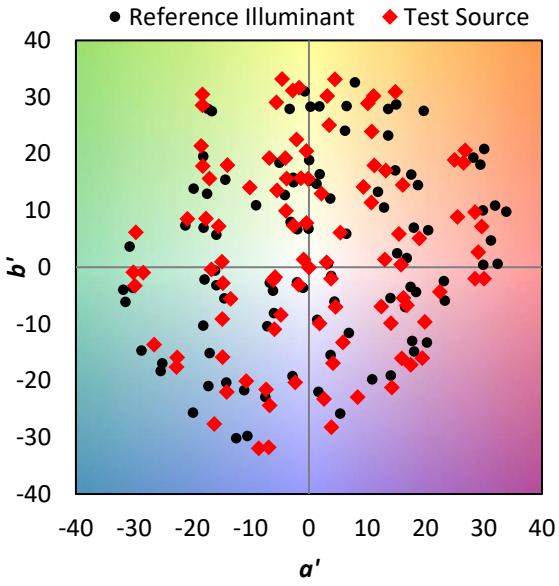
## Summary

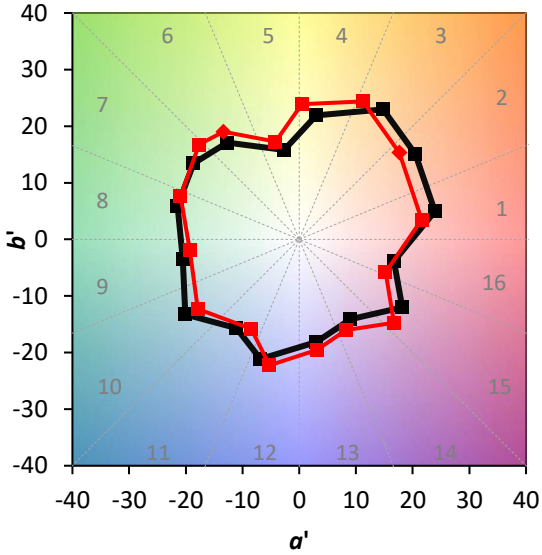
$R_f$ = 81.5
$R_g$ = 99.2
CIE $R_a$ = 81.0
$R_9$ = 7.1

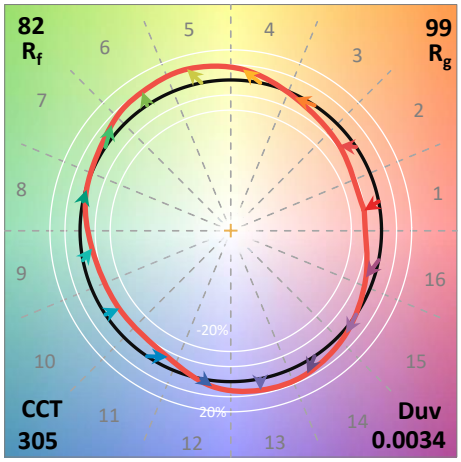
## Spectral Power Distribution Comparison

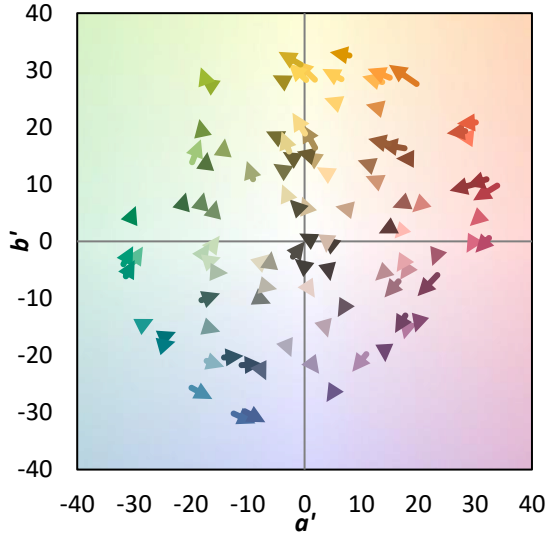



## Color Vector Graphics



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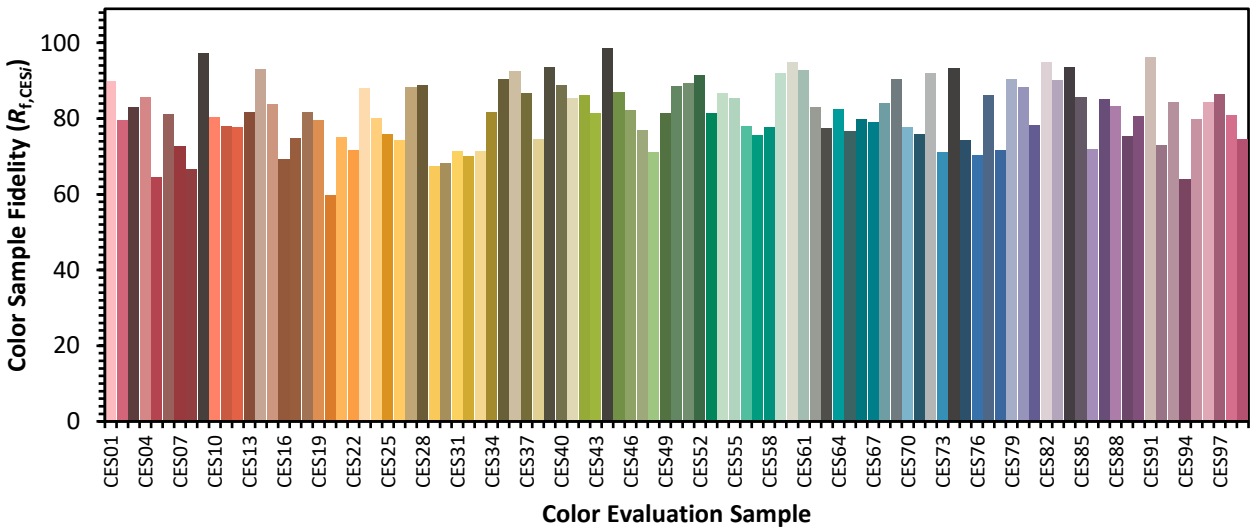
# TM-30-18

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

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



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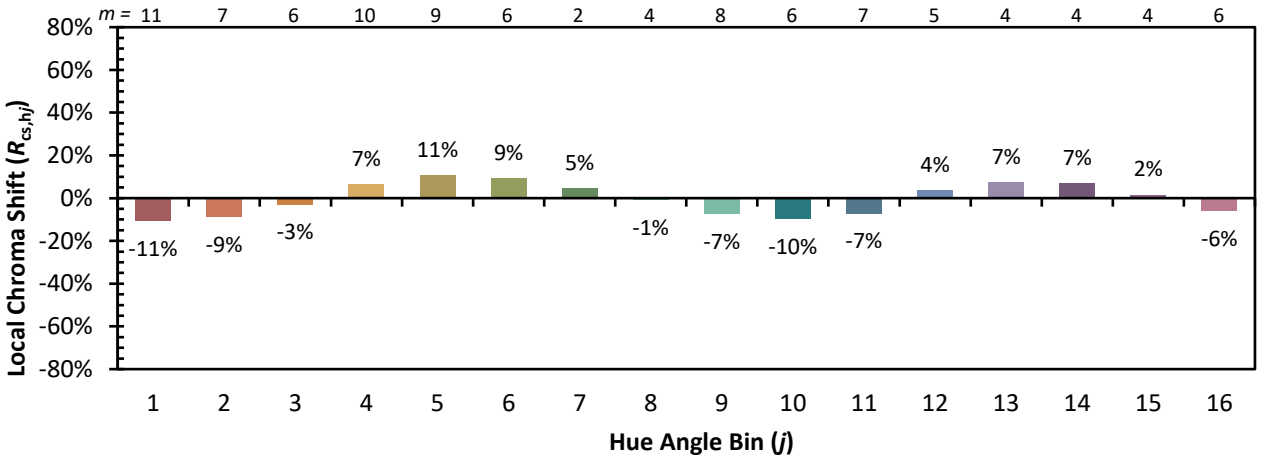
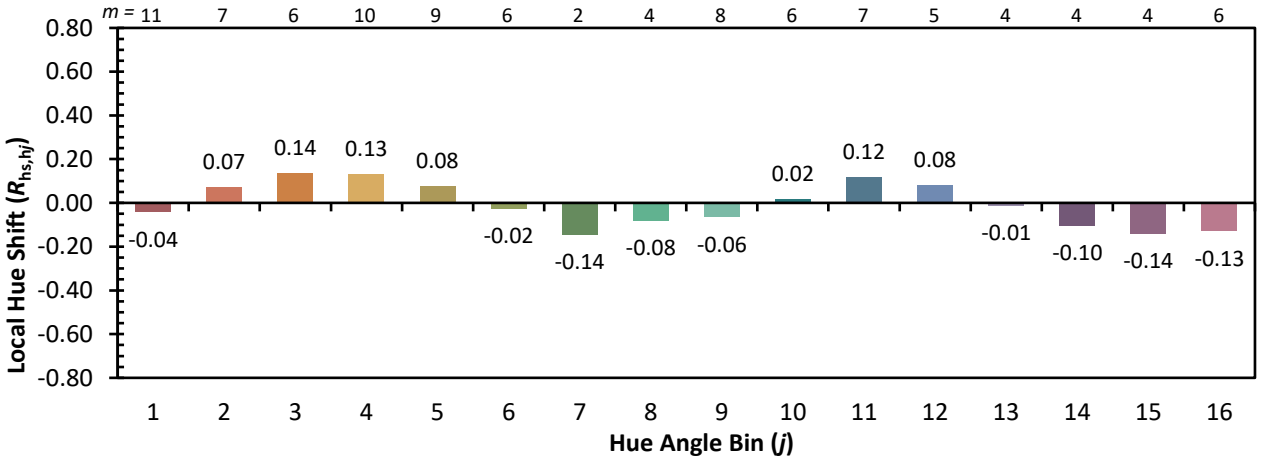
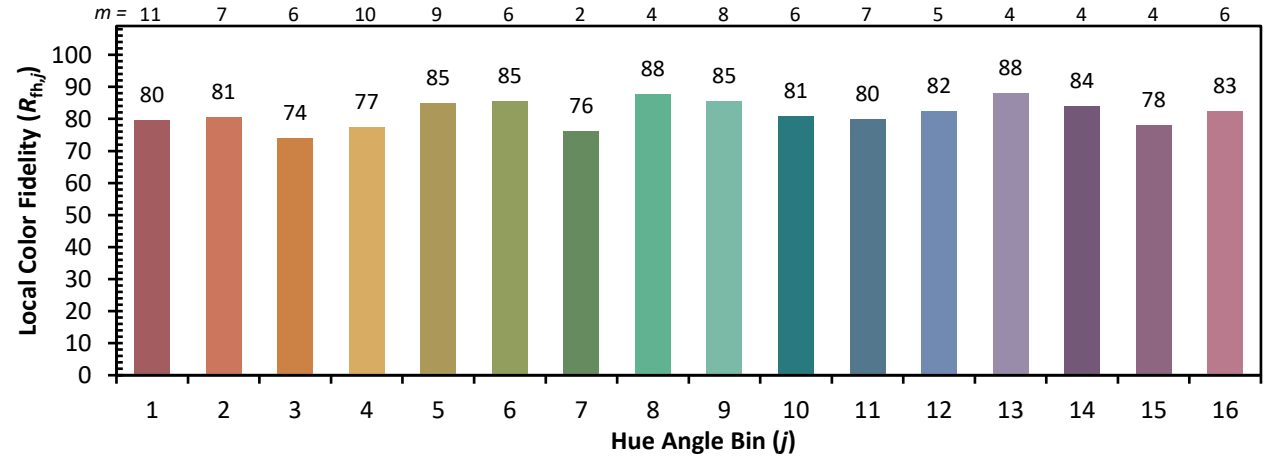
# TM-30-18

## Color Rendition by Hue-Angle Bin



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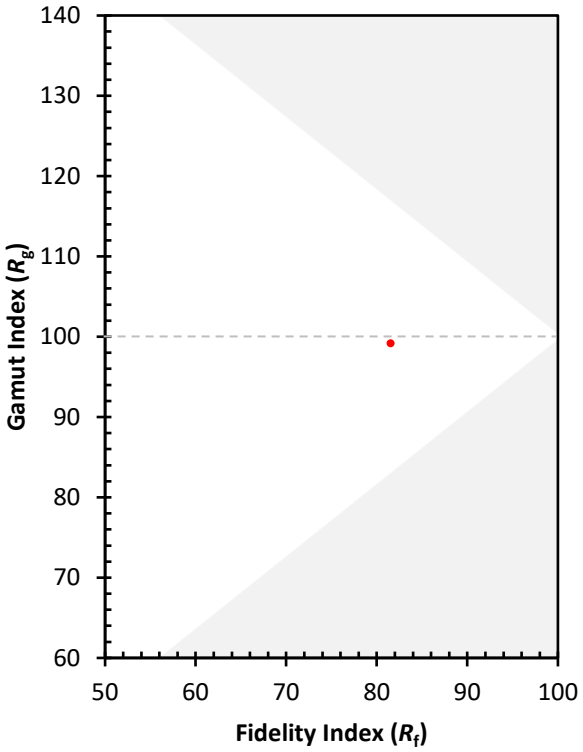
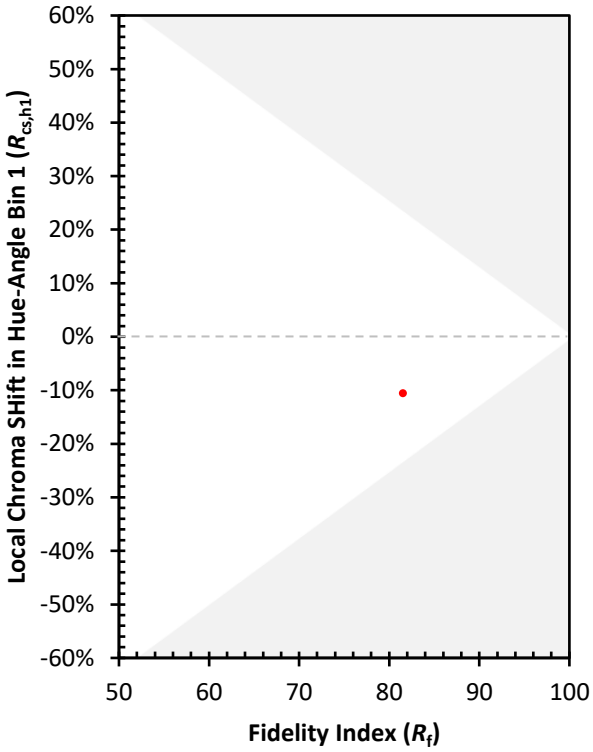
### Measure Comparisons




(END OF REPORT)