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: P632054

Luminaire Tested: GWS-SA2B-830-U-T2-W-GRSWH

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: | P632054 |
| | TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-21) |
| Test Lab: | COOPER LIGHTING SOLUTIONS |
| Issue Date: | 1/10/2023 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS |
| Product Line: | McGRAW-EDISON |
| Catalog Number: | GWS-SA2B-830-U-T2-W-GRSWH |
| Description: | GALLEON WALL SLIM LUMINAIRE. (2) LIGHTSQUARES WITH 16 LEDS EACH AND TYPE II OPTICS W/ FACTORY INSLLED GLARE SHIELD, WH |
| Light Source: | (32) 3000K CCT, 80 CRI LEDS |
| Ballast/Driver: | - |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 4570.7 lumens |
| Efficiency: | N/A |
| Efficacy: | 98.5 lumens/watt |
| Luminous Opening: | Rectangular (W 1' x L: 0.5' x H: 0') |
| IES Classification: | Type II - Short |
| BUG Rating: | B1 - U0 - G1 |

| | |
|---|---|
| Input Watts (W): | 46.4 |
| 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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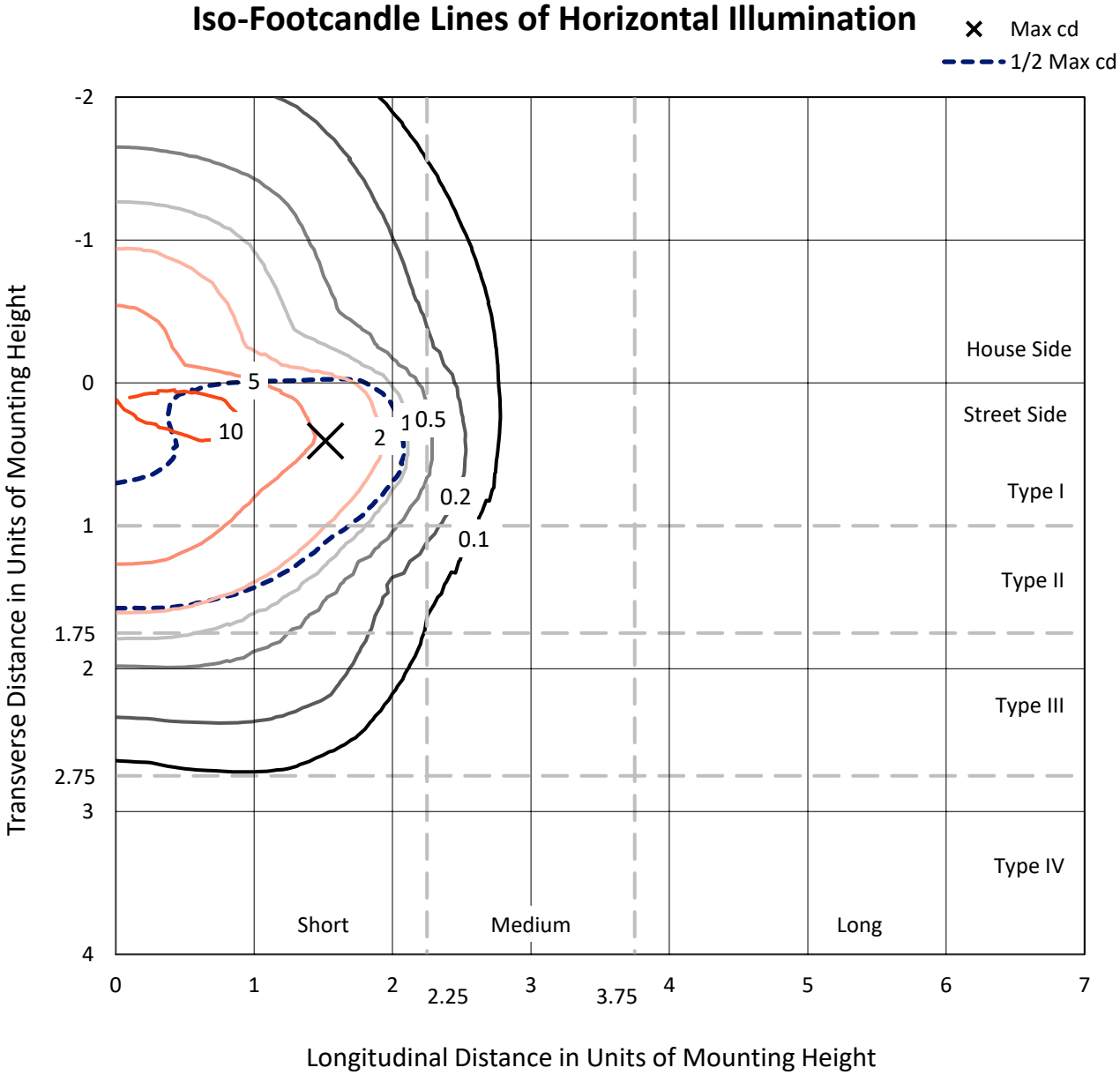
Scaled Data Report

REPORT NUMBER: P632054
CATALOG NUMBER: GWS-SA2B-830-U-T2-W-GRSWH

## Iso-Footcandle Lines of Horizontal Illumination




Based on 10 foot mounting height. Maximum calculated value = 12.1 fc
Type II - Short - N/A

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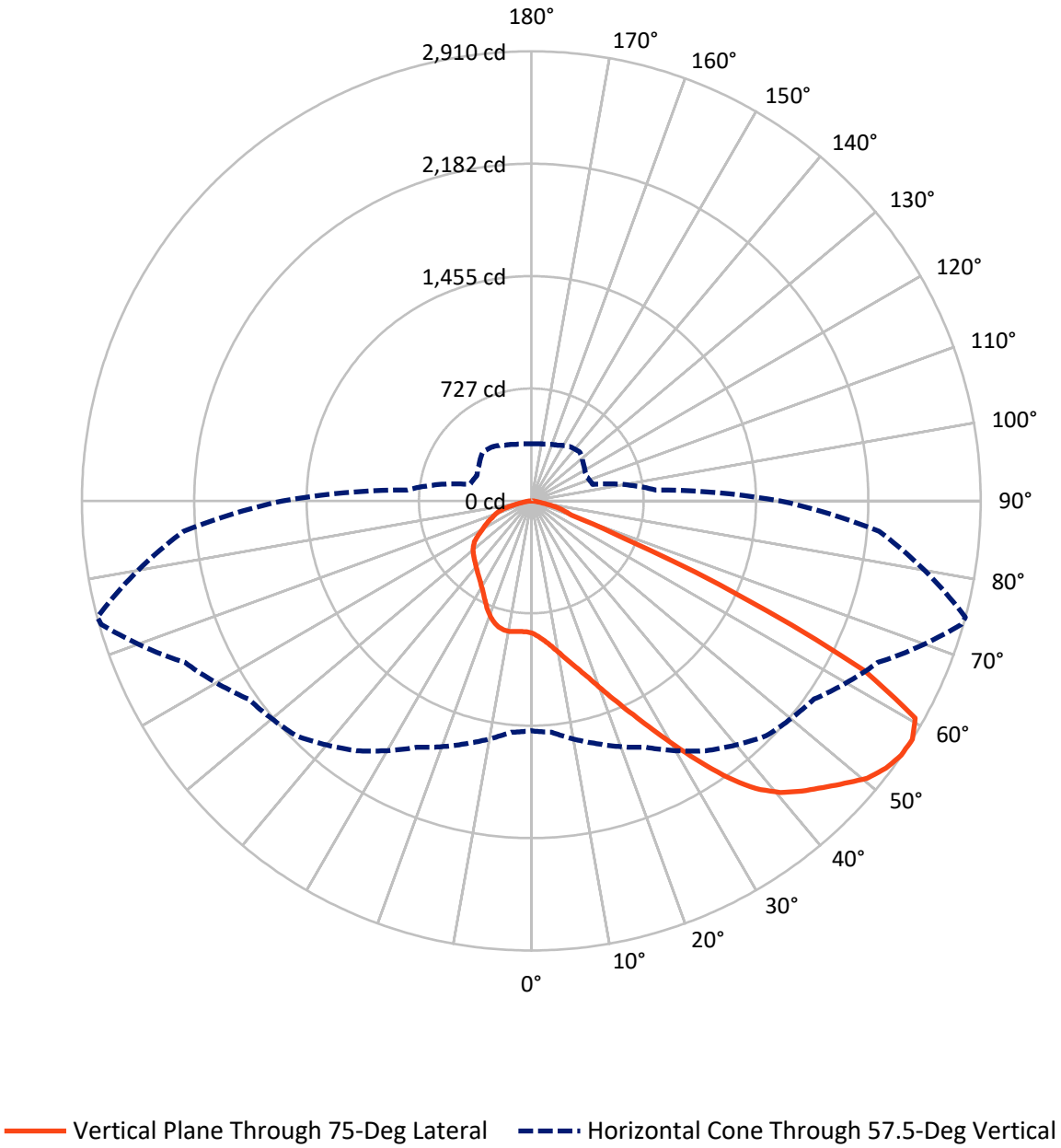
## Luminous Intensity Polar Plot



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Scaled Data Report

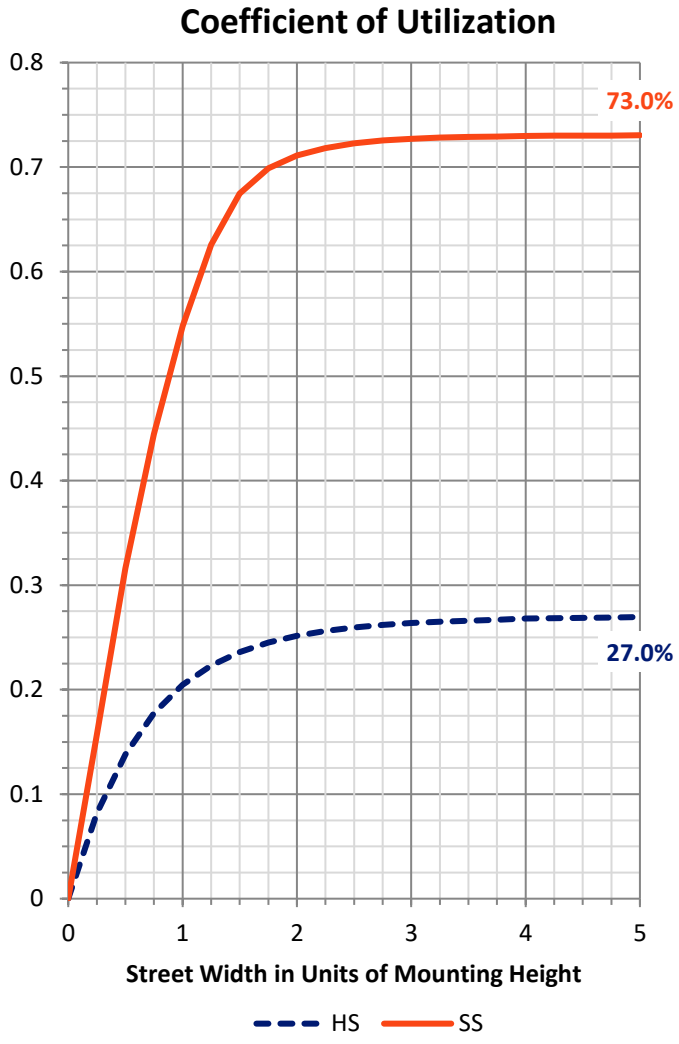
REPORT NUMBER: P632054
CATALOG NUMBER: GWS-SA2B-830-U-T2-W-GRSWH

**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 1236.5 | 0.0 | 1236.5 |
| | % Fixture | 27.1 | 0.0 | 27.1 |
| **Street Side** | Lumens | 3334.2 | 0.0 | 3334.2 |
| | % Fixture | 72.9 | 0.0 | 72.9 |
| **Total** | Lumens | 4570.7 | 0.0 | 4570.7 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 85.7 | 1.9 |
| 10°-20° | 272.7 | 6.0 |
| 20°-30° | 483.7 | 10.6 |
| 30°-40° | 740.4 | 16.2 |
| 40°-50° | 1030.9 | 22.6 |
| 50°-60° | 1181.3 | 25.8 |
| 60°-70° | 607.0 | 13.3 |
| 70°-80° | 152.8 | 3.3 |
| 80°-90° | 16.3 | 0.4 |
| 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° | 4570.7 | 100.0 |
| 0°-180° | 4570.7 | 100.0 |



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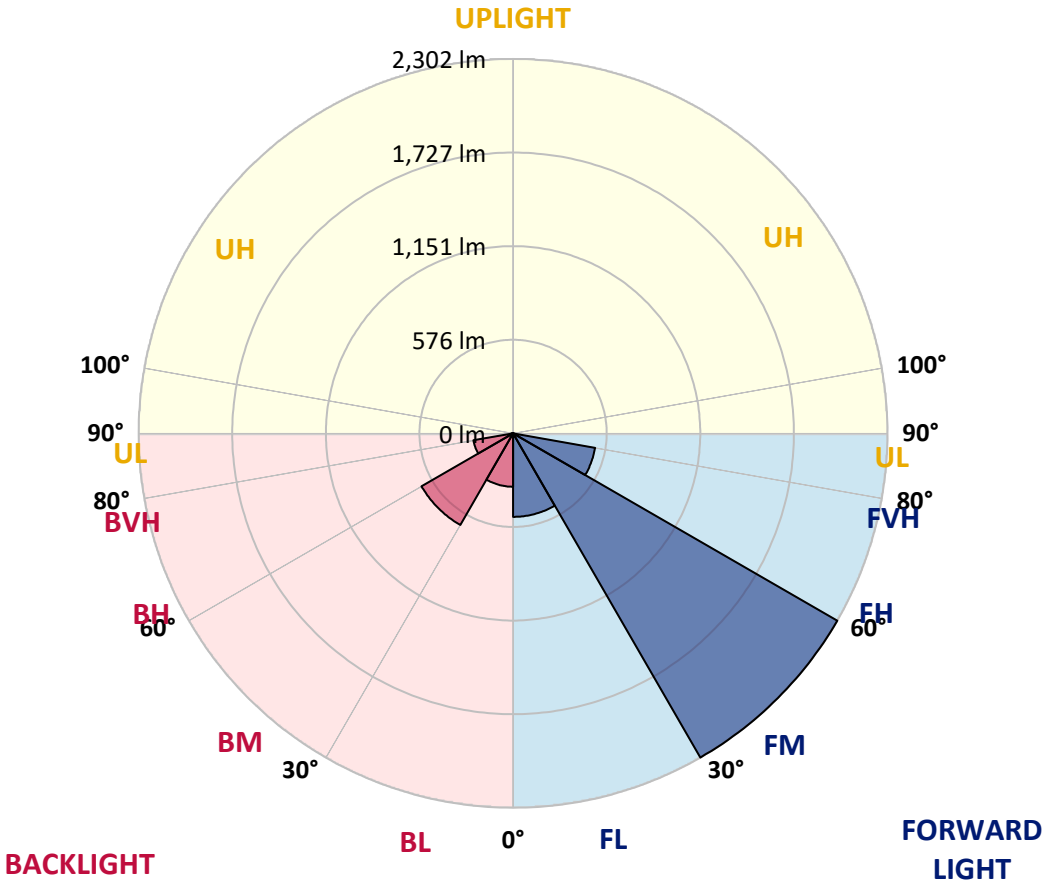
REPORT NUMBER: P632054
CATALOG NUMBER: GWS-SA2B-830-U-T2-W-GRSWH

## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 513.5 | 11.2 | | | |
| FM | (30°-60°) | 2302.3 | 50.4 | | | |
| FH | (60°-80°) | 512.3 | 11.2 | | | G0/660 |
| FVH | (80°-90°) | 6.0 | 0.1 | | | G0/10 |
| BL | (0°-30°) | 328.5 | 7.2 | B1/500 | | |
| BM | (30°-60°) | 650.3 | 14.2 | B1/1000 | | |
| BH | (60°-80°) | 247.4 | 5.4 | B1/500 | | G1/500 |
| BVH | (80°-90°) | 10.3 | 0.2 | | | G1/100 |
| UL | (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH | (100°-180°) | 0.0 | 0.0 | | U0/0 | |

**BUG Rating: B1-U0-G1**
Type II Short



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Scaled Data Report

REPORT NUMBER: P632054
CATALOG NUMBER: GWS-SA2B-830-U-T2-W-GRSWH

**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 15° | 25° | 35° | 45° | 55° | 65° | 74° | 75° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 856.0 | 856.0 | 856.0 | 856.0 | 856.0 | 856.0 | 856.0 | 856.0 | 856.0 | *856.0* | 856.0 |
| 2.5° | 919.7 | 922.0 | 919.7 | 923.6 | 915.7 | 912.2 | 903.5 | 890.6 | 880.3 | *878.8* | 867.4 |
| 5° | 991.2 | 996.3 | 993.1 | 991.6 | 981.0 | 973.1 | 960.1 | 934.2 | 913.0 | *909.8* | 887.4 |
| 7.5° | 1037.2 | 1040.7 | 1040.7 | 1041.9 | 1037.9 | 1028.9 | 1015.2 | 984.5 | 954.6 | *949.9* | 916.1 |
| 10° | 1052.5 | 1055.2 | 1060.3 | 1070.2 | 1078.0 | 1080.8 | 1071.7 | 1042.3 | 1005.7 | *1001.0* | 953.8 |
| 12.5° | 1056.0 | 1059.2 | 1067.0 | 1085.1 | 1106.7 | 1126.4 | 1127.9 | 1106.3 | 1065.5 | *1060.3* | 997.5 |
| 15° | 1062.7 | 1065.9 | 1076.5 | 1098.9 | 1130.7 | 1168.4 | 1191.6 | 1176.7 | 1131.5 | *1126.0* | 1047.0 |
| 17.5° | 1061.9 | 1065.5 | 1081.2 | 1111.0 | 1153.9 | 1208.5 | 1253.3 | 1259.6 | 1212.8 | *1203.4* | 1103.2 |
| 20° | 1060.0 | 1063.1 | 1080.0 | 1116.6 | 1169.6 | 1244.7 | 1325.6 | 1358.3 | 1307.9 | *1299.3* | 1168.8 |
| 22.5° | 1075.7 | 1079.2 | 1092.2 | 1122.4 | 1177.9 | 1272.6 | 1392.4 | 1471.0 | 1420.7 | *1408.6* | 1244.3 |
| 25° | 1111.0 | 1116.2 | 1124.0 | 1144.8 | 1192.8 | 1297.3 | 1460.8 | 1598.8 | 1547.3 | *1532.8* | 1326.4 |
| 27.5° | 1165.7 | 1172.0 | 1183.0 | 1192.8 | 1226.2 | 1328.8 | 1528.8 | 1741.8 | 1690.3 | *1675.0* | 1413.3 |
| 30° | 1232.5 | 1240.7 | 1254.9 | 1261.6 | 1284.4 | 1375.2 | 1602.7 | 1889.2 | 1859.3 | *1838.1* | 1511.1 |
| 32.5° | 1324.8 | 1336.2 | 1349.6 | 1351.6 | 1365.3 | 1445.5 | 1675.8 | 2035.4 | 2035.0 | *2020.1* | 1622.4 |
| 35° | 1445.1 | 1457.3 | 1460.0 | 1462.8 | 1469.5 | 1542.2 | 1764.2 | 2168.6 | 2220.1 | *2202.8* | 1743.4 |
| 37.5° | 1576.4 | 1594.1 | 1598.4 | 1586.2 | 1595.6 | 1658.5 | 1863.7 | 2275.5 | 2381.3 | *2362.8* | 1860.5 |
| 40° | 1716.7 | 1723.8 | 1735.5 | 1716.3 | 1728.1 | 1791.7 | 1961.1 | 2343.9 | 2501.5 | *2481.9* | 1952.9 |
| 42.5° | 1817.3 | 1830.3 | 1847.9 | 1840.9 | 1847.6 | 1905.7 | 2029.5 | 2376.9 | 2587.2 | *2567.6* | 2019.3 |
| 45° | 1926.5 | 1930.5 | 1941.9 | 1940.3 | 1944.2 | 1998.5 | 2078.6 | 2391.5 | 2663.8 | *2646.2* | 2075.9 |
| 47.5° | 2021.7 | 2027.6 | 2035.0 | 2026.4 | 2017.7 | 2053.1 | 2118.7 | 2404.1 | 2752.3 | *2731.0* | 2135.2 |
| 50° | 2113.2 | 2118.3 | 2127.4 | 2102.2 | 2070.0 | 2079.0 | 2138.4 | 2421.4 | 2835.2 | *2820.3* | 2182.0 |
| 52.5° | 2130.1 | 2135.6 | 2178.1 | 2183.2 | 2141.9 | 2110.1 | 2173.0 | 2459.5 | 2883.9 | *2874.5* | 2198.9 |
| 55° | 1917.5 | 1927.3 | 2011.8 | 2108.9 | 2210.7 | 2200.5 | 2228.4 | 2479.5 | 2903.2 | *2905.5* | 2229.2 |
| 57.5° | *1488.3* | *1502.5* | *1625.9* | *1759.1* | *1973.3* | *2150.6* | *2235.5* | *2474.4* | *2896.5* | *2909.5* | *2260.2* |
| 60° | 976.2 | 984.5 | 1130.7 | 1280.0 | 1502.1 | 1747.3 | 2000.8 | 2382.4 | 2837.2 | *2855.6* | 2252.4 |
| 62.5° | 589.5 | 599.0 | 716.5 | 829.7 | 960.5 | 1124.4 | 1357.1 | 1914.8 | 2378.1 | *2419.4* | 1803.9 |
| 65° | 411.5 | 424.1 | 527.0 | 620.2 | 665.4 | 631.6 | 687.4 | 1069.4 | 1481.7 | *1499.0* | 1102.4 |
| 67.5° | 298.3 | 306.9 | 391.4 | 502.3 | 552.2 | 446.1 | 340.0 | 473.6 | 645.3 | *651.6* | 454.7 |
| 70° | 195.3 | 205.2 | 281.8 | 382.4 | 450.8 | 361.6 | 254.3 | 256.2 | 271.6 | *274.7* | 264.1 |
| 72.5° | 107.3 | 113.2 | 174.1 | 253.9 | 266.5 | 216.2 | 198.5 | 213.0 | 223.6 | *223.6* | 226.4 |
| 75° | 55.4 | 60.5 | 71.1 | 83.7 | 101.0 | 118.3 | 143.1 | 164.7 | 176.1 | *176.9* | 175.7 |
| 77.5° | 28.3 | 30.3 | 38.1 | 41.3 | 45.2 | 52.7 | 68.4 | 87.6 | 97.9 | *101.8* | 101.0 |
| 80° | 13.4 | 14.1 | 16.1 | 18.9 | 23.2 | 29.5 | 36.9 | 44.0 | 50.3 | *51.1* | 55.4 |
| 82.5° | 7.1 | 7.9 | 8.6 | 10.2 | 12.6 | 15.7 | 21.6 | 25.9 | 29.9 | *30.7* | 34.2 |
| 85° | 2.8 | 3.1 | 3.5 | 3.9 | 5.5 | 6.7 | 9.0 | 12.2 | 14.9 | *14.9* | 17.7 |
| 87.5° | 0.0 | 0.0 | 0.0 | 0.0 | 0.4 | 0.8 | 1.6 | 2.0 | 2.8 | *2.8* | 4.7 |
| 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: P632054
CATALOG NUMBER: GWS-SA2B-830-U-T2-W-GRSWH

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 856.0 | 856.0 | 856.0 | 856.0 | 856.0 | 856.0 | 856.0 | 856.0 | 856.0 | 856.0 | 856.0 |
| 2.5° | 864.6 | 853.2 | 848.1 | 839.9 | 833.2 | 825.7 | 819.8 | 815.5 | 812.8 | 811.2 | 809.6 |
| 5° | 878.8 | 861.5 | 847.7 | 831.2 | 819.8 | 808.8 | 799.8 | 793.5 | 790.3 | 788.0 | 786.4 |
| 7.5° | 900.8 | 877.6 | 851.7 | 826.1 | 806.1 | 788.4 | 777.0 | 770.3 | 766.0 | 764.4 | 763.2 |
| 10° | 931.0 | 898.8 | 856.0 | 815.5 | 785.6 | 766.4 | 758.5 | 755.4 | 755.8 | 755.0 | 754.6 |
| 12.5° | 965.2 | 921.2 | 854.8 | 796.6 | 763.6 | 752.2 | 752.6 | 757.7 | 763.6 | 765.2 | 765.6 |
| 15° | 1002.2 | 943.2 | 843.4 | 772.3 | 746.3 | 747.5 | 757.7 | 769.9 | 780.9 | 785.2 | 786.0 |
| 17.5° | 1042.3 | 961.7 | 822.6 | 745.5 | 732.2 | 744.8 | 763.6 | 783.7 | 799.8 | 806.9 | 808.8 |
| 20° | 1087.1 | 977.4 | 793.1 | 719.2 | 718.8 | 739.7 | 767.2 | 793.5 | 813.9 | 823.4 | 824.9 |
| 22.5° | 1134.6 | 987.2 | 756.9 | 694.8 | 705.1 | 733.0 | 764.4 | 791.9 | 813.5 | 823.0 | 824.9 |
| 25° | 1182.6 | 990.4 | 717.2 | 672.4 | 690.9 | 722.4 | 751.0 | 773.1 | 793.5 | 801.7 | 803.3 |
| 27.5° | 1227.4 | 981.4 | 679.5 | 653.2 | 677.9 | 706.6 | 725.9 | 737.7 | 751.8 | 758.1 | 759.3 |
| 30° | 1273.0 | 963.3 | 647.7 | 637.9 | 663.4 | 685.0 | 693.7 | 694.5 | 700.0 | 700.0 | 700.7 |
| 32.5° | 1319.0 | 936.6 | 619.8 | 622.9 | 645.3 | 659.5 | 660.7 | 651.6 | 644.9 | 633.9 | 633.5 |
| 35° | 1372.0 | 909.4 | 597.0 | 606.0 | 624.1 | 632.8 | 629.2 | 611.9 | 595.8 | 577.7 | 576.9 |
| 37.5° | 1421.1 | 881.5 | 577.7 | 588.7 | 600.1 | 606.4 | 598.2 | 577.3 | 564.0 | 545.5 | 542.8 |
| 40° | 1461.6 | 856.4 | 559.3 | 570.7 | 576.2 | 581.7 | 568.3 | 551.4 | 553.4 | 543.1 | 542.8 |
| 42.5° | 1485.2 | 832.0 | 542.0 | 550.6 | 554.1 | 558.1 | 546.3 | 533.7 | 544.3 | 536.5 | 536.9 |
| 45° | 1502.5 | 810.8 | 526.2 | 529.4 | 538.0 | 543.9 | 532.9 | 518.8 | 521.1 | 490.9 | 483.8 |
| 47.5° | 1522.1 | 799.0 | 511.3 | 508.2 | 523.5 | 533.7 | 516.8 | 496.4 | 482.2 | 452.4 | 449.6 |
| 50° | 1543.0 | 794.7 | 495.6 | 486.9 | 505.4 | 515.2 | 495.6 | 470.0 | 451.6 | 435.5 | 433.9 |
| 52.5° | 1550.0 | 794.3 | 475.9 | 461.4 | 479.9 | 493.6 | 477.1 | 451.2 | 429.2 | 413.4 | 412.7 |
| 55° | 1577.9 | 805.7 | 450.8 | 426.4 | 443.7 | 472.0 | 459.8 | 422.5 | 404.8 | 397.7 | 396.9 |
| 57.5° | *1610.6* | *807.6* | *411.1* | *388.3* | *412.3* | *445.7* | *430.3* | *398.1* | *378.9* | *370.2* | *369.4* |
| 60° | 1597.2 | 759.3 | 368.6 | 359.2 | 385.5 | 420.9 | 406.8 | 378.9 | 356.5 | 348.2 | 347.4 |
| 62.5° | 1217.2 | 536.1 | 337.6 | 334.1 | 356.9 | 385.2 | 382.4 | 353.3 | 332.1 | 326.2 | 325.4 |
| 65° | 732.2 | 376.5 | 307.7 | 307.3 | 323.4 | 350.6 | 354.1 | 330.5 | 308.1 | 299.9 | 299.9 |
| 67.5° | 362.0 | 288.1 | 273.9 | 272.0 | 282.2 | 301.4 | 316.4 | 297.1 | 278.3 | 270.4 | 269.2 |
| 70° | 255.9 | 253.9 | 249.2 | 243.7 | 245.6 | 253.5 | 259.8 | 243.7 | 223.6 | 215.8 | 214.2 |
| 72.5° | 221.3 | 221.7 | 218.5 | 214.2 | 212.6 | 207.1 | 201.6 | 189.8 | 177.6 | 169.4 | 170.2 |
| 75° | 171.7 | 172.5 | 174.5 | 172.9 | 168.6 | 162.7 | 156.8 | 141.9 | 132.1 | 124.2 | 122.6 |
| 77.5° | 100.2 | 104.1 | 110.4 | 108.9 | 109.7 | 101.4 | 99.0 | 84.5 | 75.5 | 70.0 | 68.8 |
| 80° | 56.6 | 59.0 | 61.7 | 63.7 | 61.3 | 57.8 | 52.7 | 44.8 | 42.1 | 38.1 | 37.3 |
| 82.5° | 34.2 | 36.6 | 37.7 | 39.3 | 38.5 | 33.8 | 29.9 | 24.8 | 22.4 | 20.4 | 20.0 |
| 85° | 17.3 | 18.9 | 20.0 | 20.8 | 18.5 | 15.3 | 13.8 | 11.0 | 9.4 | 8.3 | 8.3 |
| 87.5° | 4.3 | 4.7 | 5.5 | 4.7 | 4.3 | 2.0 | 1.6 | 0.4 | 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

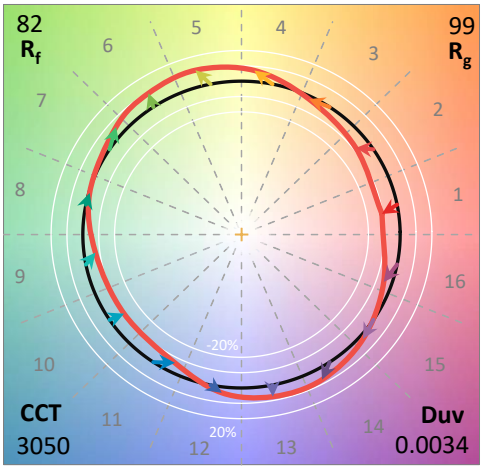
## Test Information

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

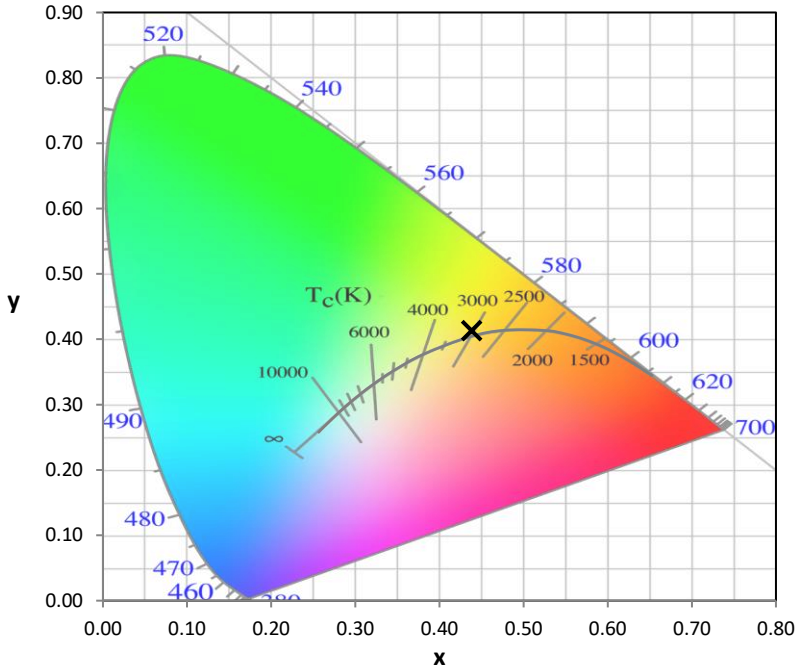
| | |
|---|---|
| Stabilization Time: | 20M |
| Operation Time: | 1H 20M |
| Sphere Temperature (°C): | 24.2 |

REPORT NUMBER: SP1-2408-195-9

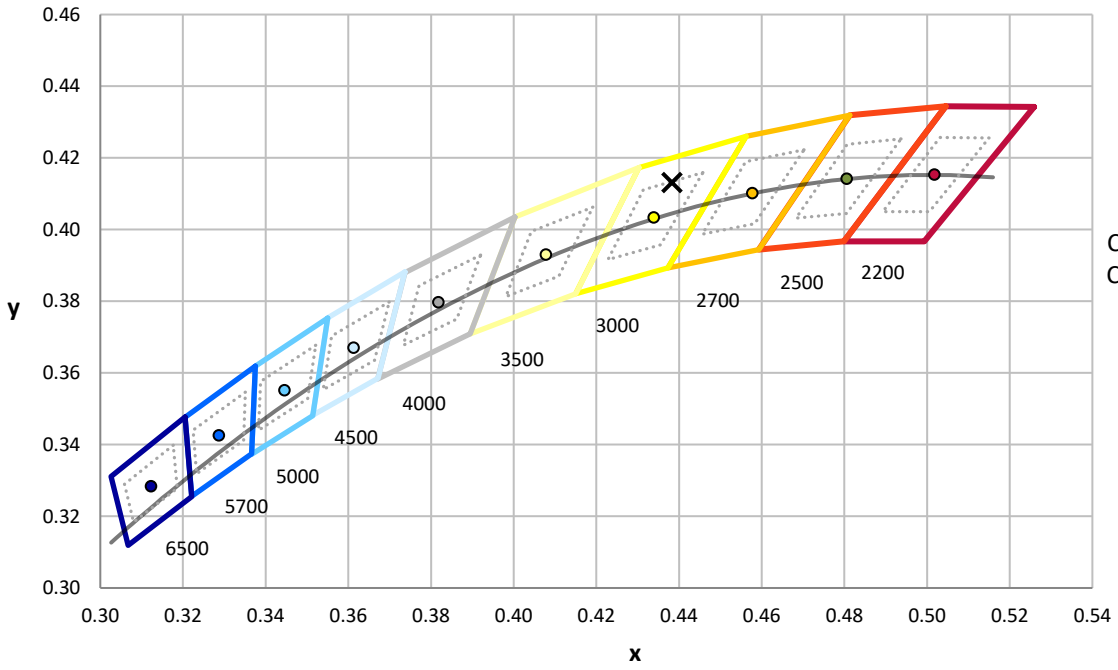
| Measurement and Test Equipment | | | |
|---|---|---|---|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 6/18/2024 | 12/18/2024 |
| Power Meter | INXT2011004 | 2/8/2024 | 2/8/2025 |
| AC Power Source | IN0063 | 10/24/2023 | 10/24/2024 |
| DC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

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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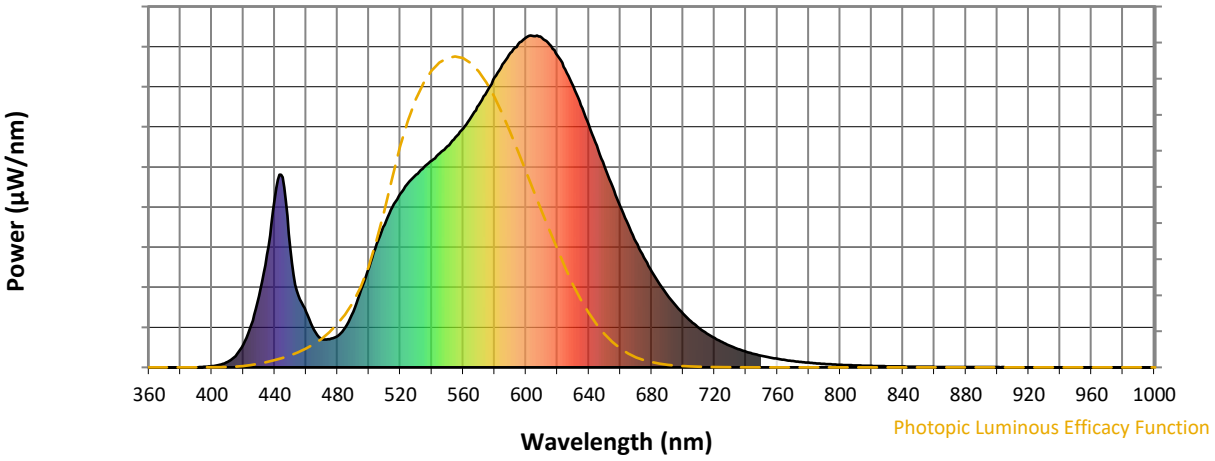
## Photopic Flux vs. Wavelength




## 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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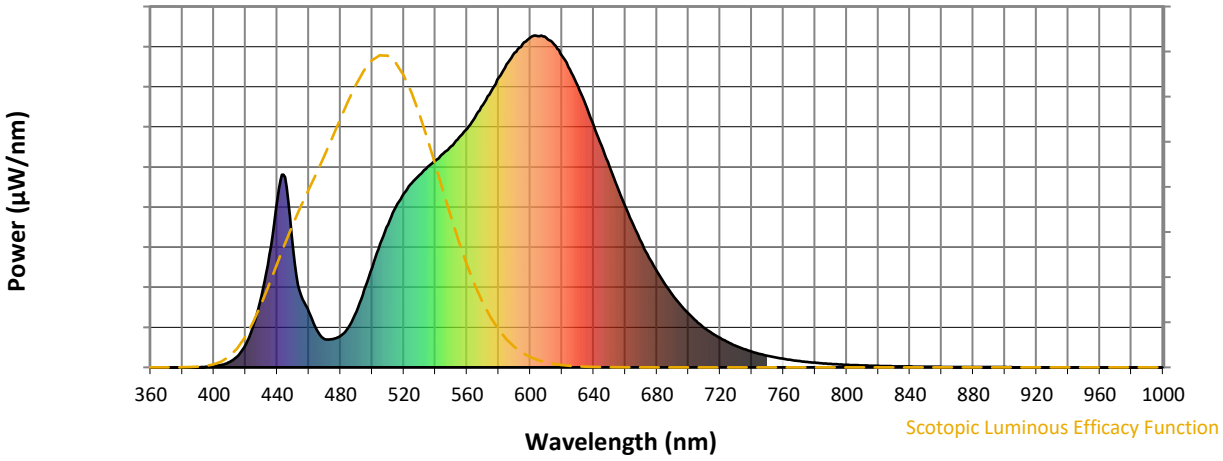
## Scotopic Flux vs. Wavelength




**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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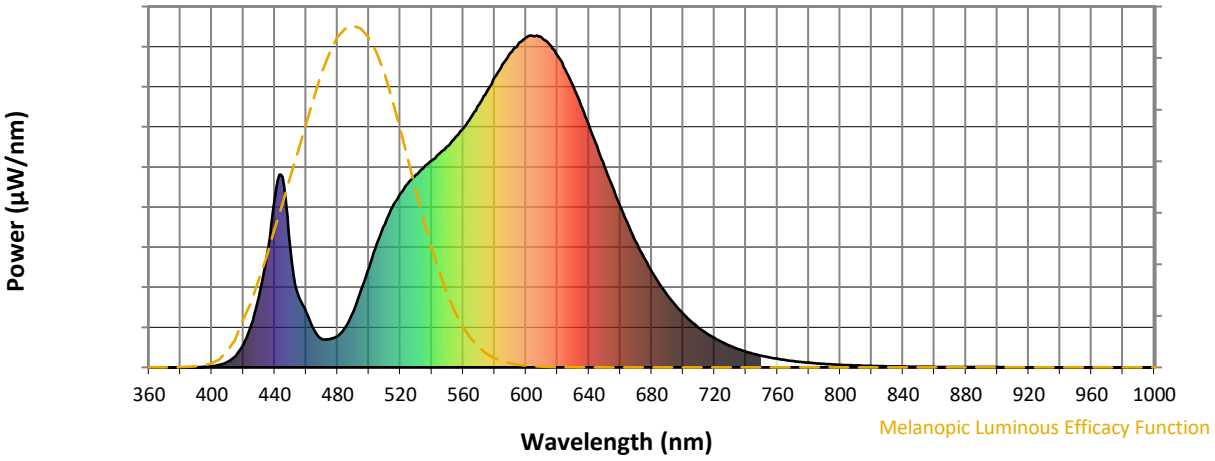
## Melanopic Flux vs. Wavelength




**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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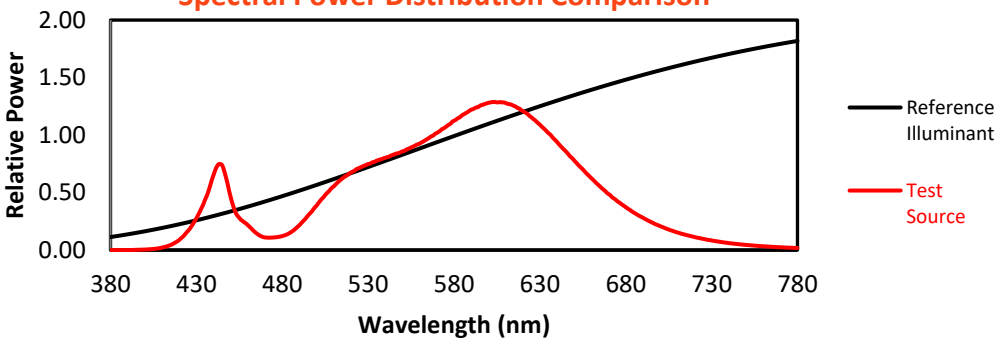
# TM-30-18

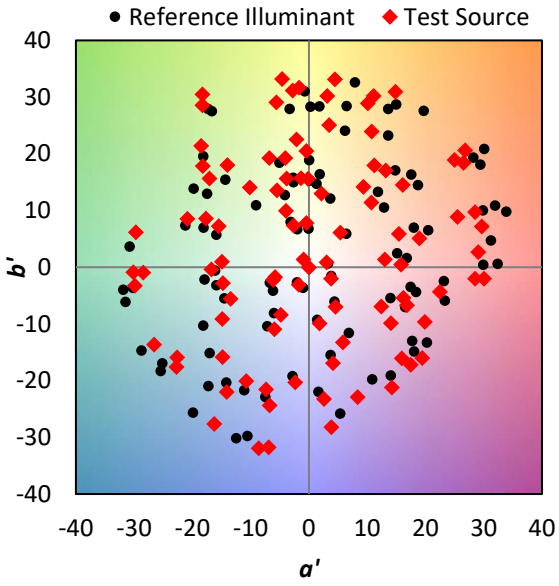
## Summary

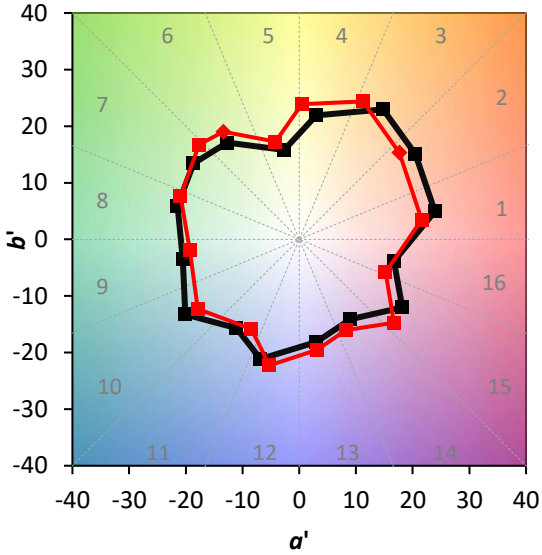
$R_f$ = 81.5
$R_g$ = 99.2
CIE $R_a$ = 81.0
$R_9$ = 7.1

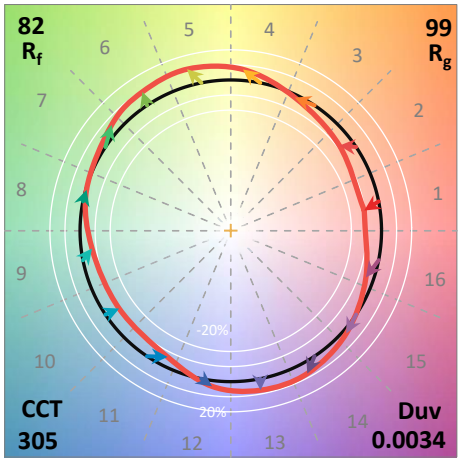
## Spectral Power Distribution Comparison

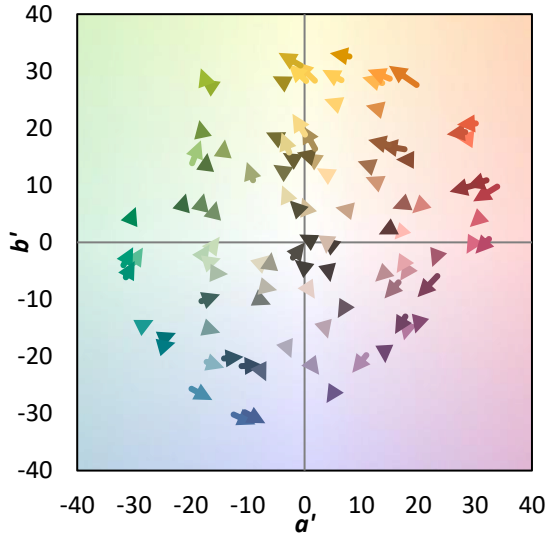



## Color Vector Graphics



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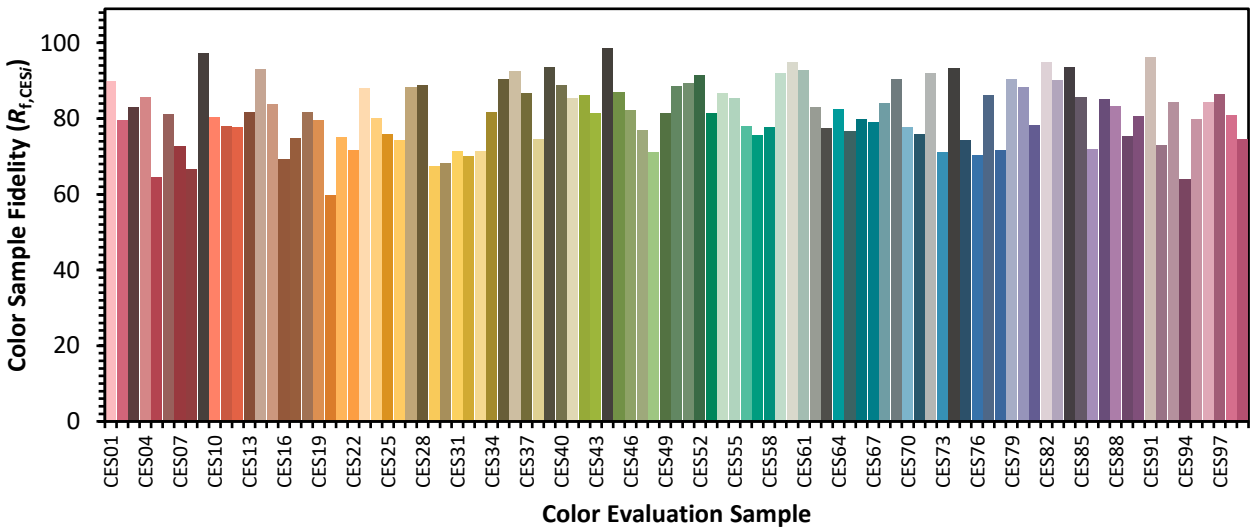
# TM-30-18

**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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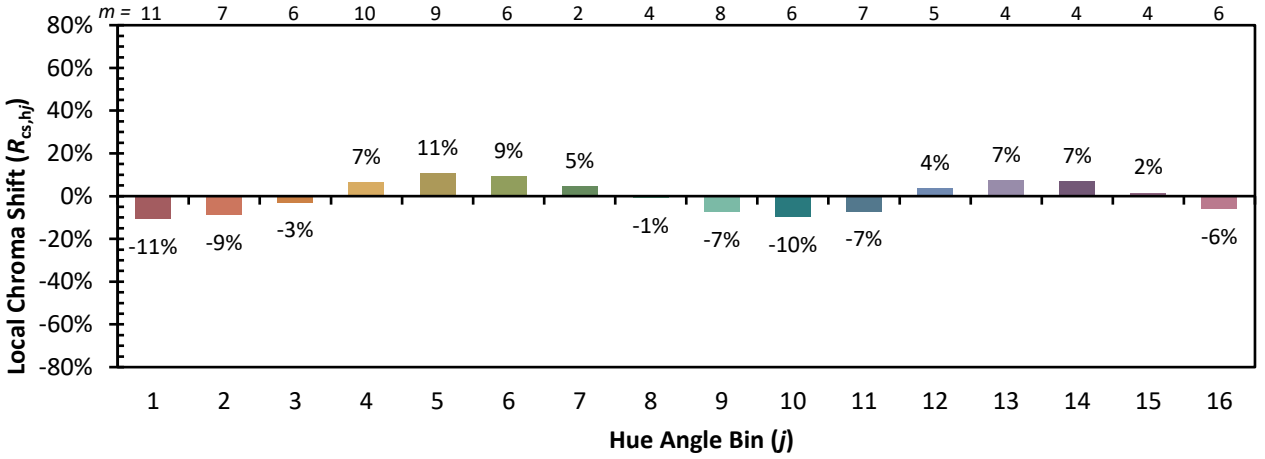
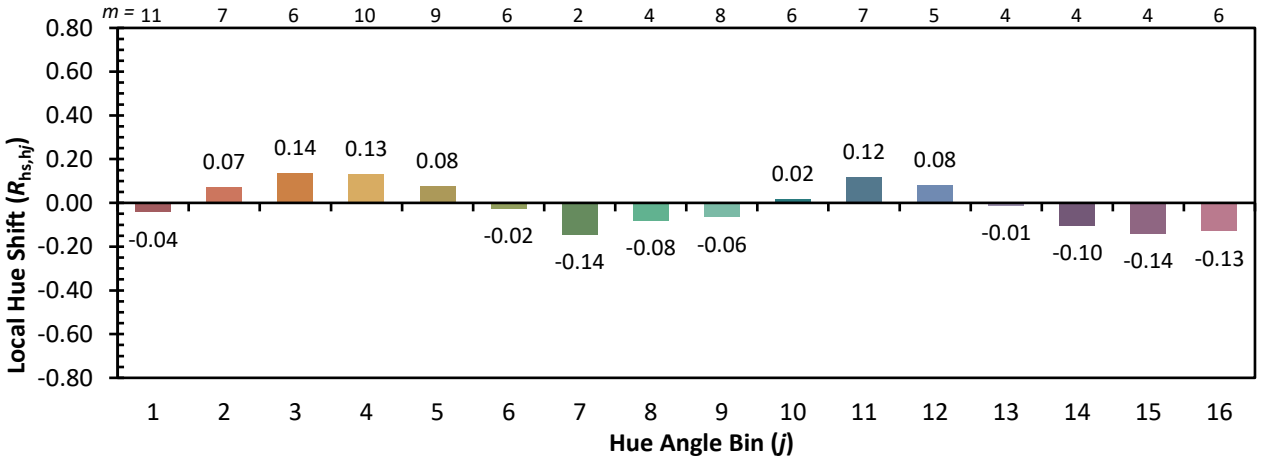
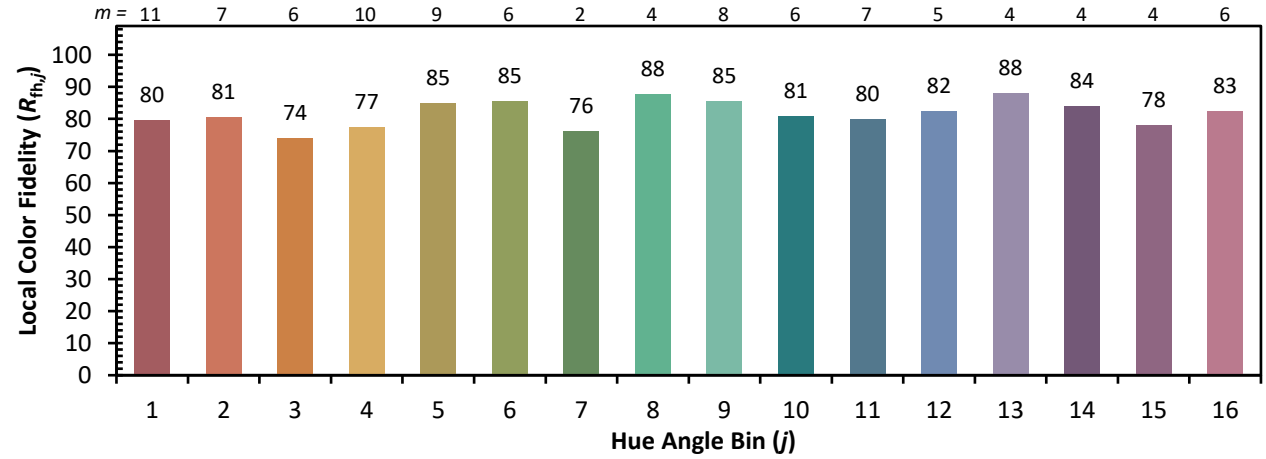
## Color Rendition by Hue-Angle Bin



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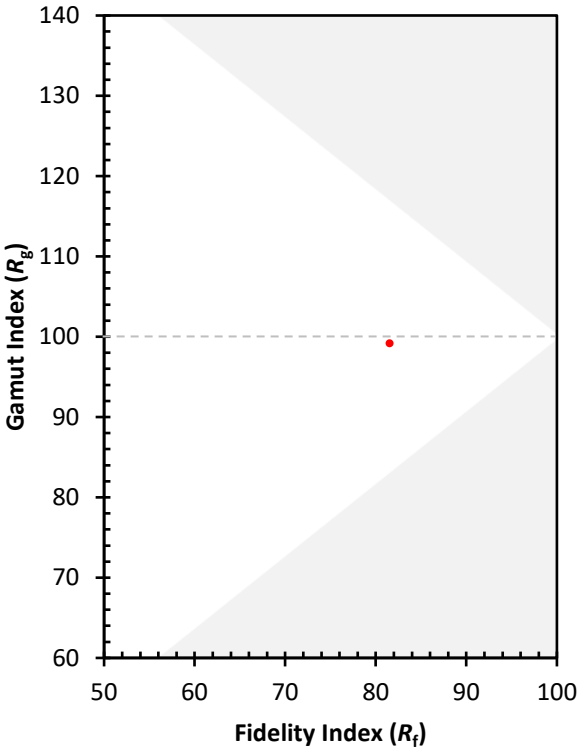
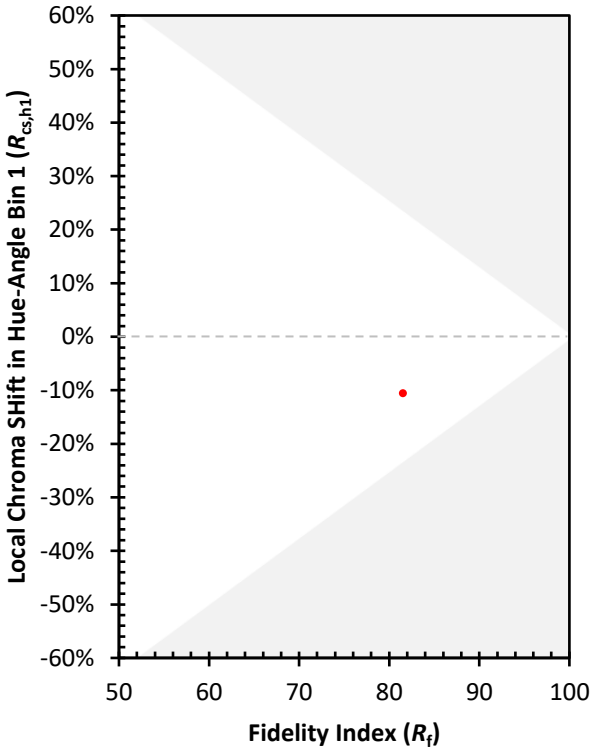
## Measure Comparisons

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