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: P629569

Luminaire Tested: GWS-SA1B-830-U-SL4-W-HSS

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: | P629569 |
| | TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-36) |
| Test Lab: | COOPER LIGHTING SOLUTIONS |
| Issue Date: | 1/10/2023 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS |
| Product Line: | McGRAW-EDISON |
| Catalog Number: | GWS-SA1B-830-U-SL4-W-HSS |
| Description: | GALLEON WALL SLIM LUMINAIRE. (1) LIGHTSQUARES WITH 16 LEDS EACH AND TYPE IV SPILL LIGHT ELIMINATOR OPTICS WITH HOUSE SIDE SHIELD |
| Light Source: | (16) 3000K CCT, 80 CRI LEDS |
| Ballast/Driver: | - |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 2243.3 lumens |
| Efficiency: | N/A |
| Efficacy: | 89.7 lumens/watt |
| Luminous Opening: | Rectangular (W 0.5' x L: 0.5' x H: 0') |
| IES Classification: | Type IV - Short |
| BUG Rating: | B0 - U0 - G1 |

| | |
|---|---|
| Input Watts (W): | 25 |
| 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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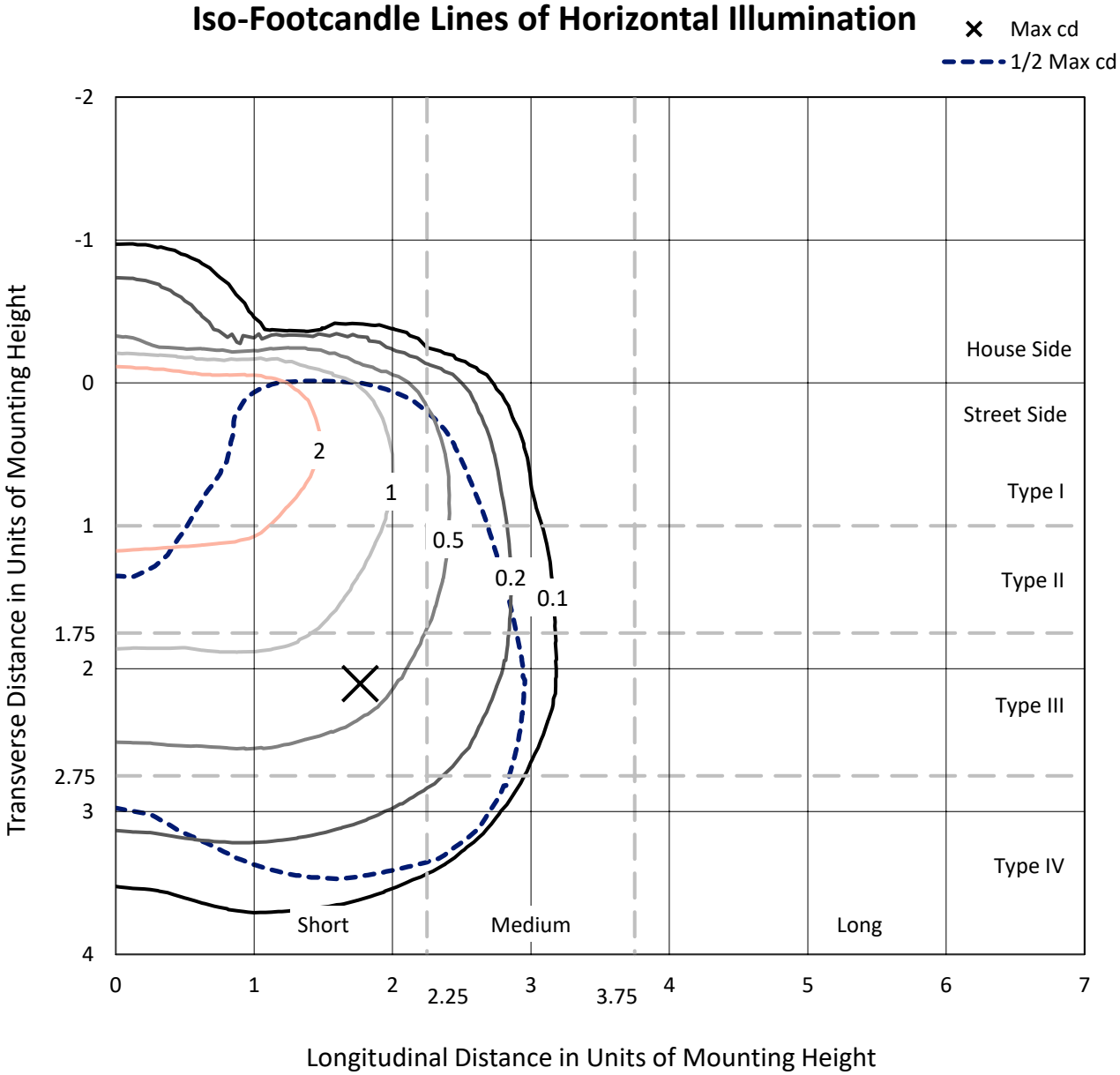
Scaled Data Report

REPORT NUMBER: P629569
CATALOG NUMBER: GWS-SA1B-830-U-SL4-W-HSS

## Iso-Footcandle Lines of Horizontal Illumination




Based on 10 foot mounting height. Maximum calculated value = 4.1 fc
Type IV - Short - N/A

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REPORT NUMBER: P629569
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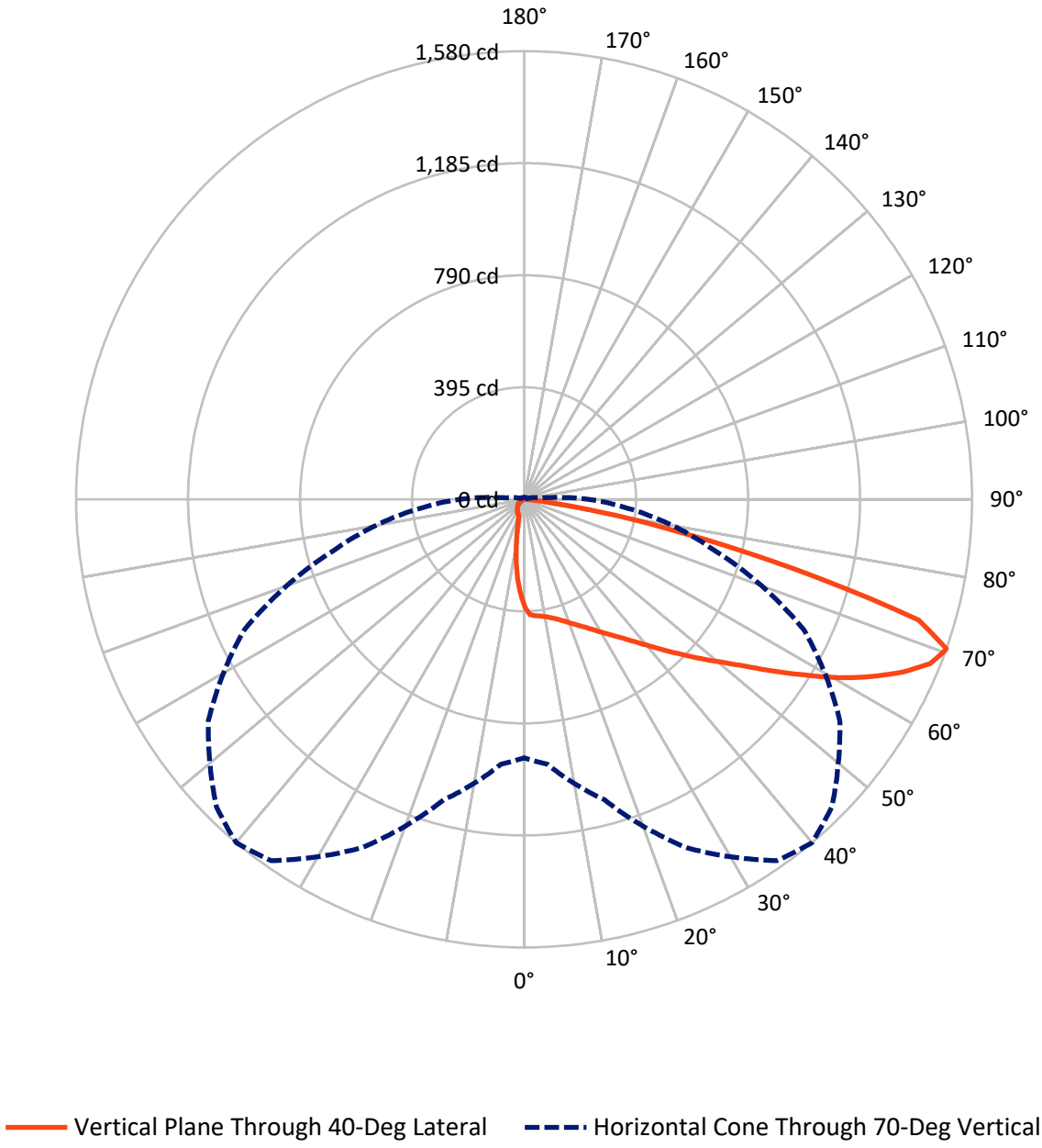
## Luminous Intensity Polar Plot



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REPORT NUMBER: P629569
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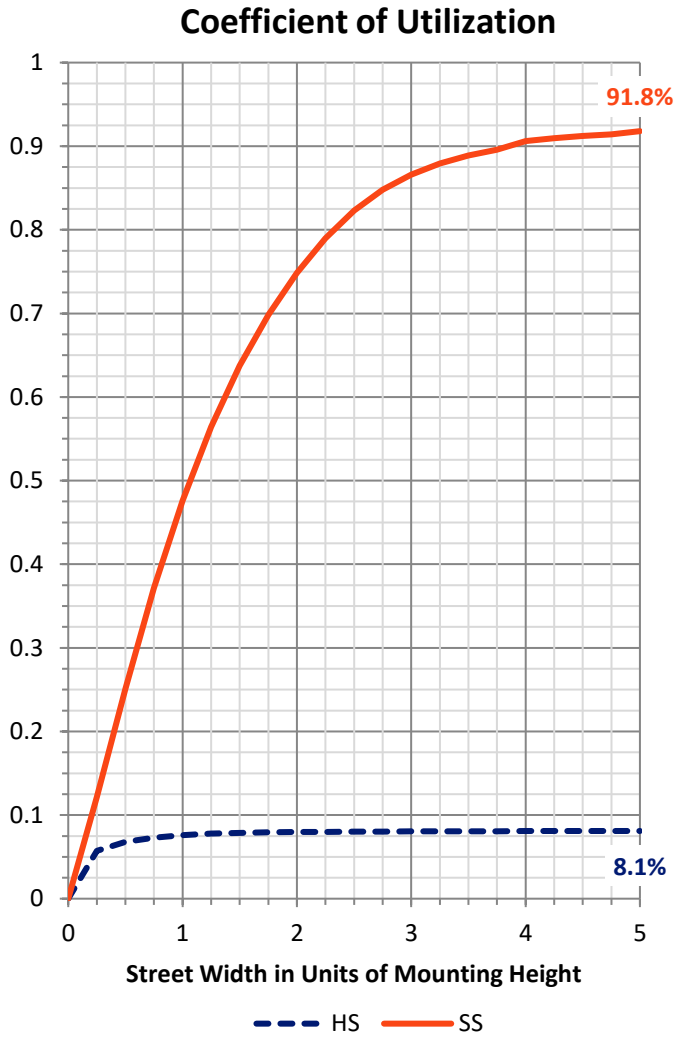
**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 183.4 | 0.0 | 183.4 |
| | % Fixture | 8.2 | 0.0 | 8.2 |
| **Street Side** | Lumens | 2059.9 | 0.0 | 2059.9 |
| | % Fixture | 91.8 | 0.0 | 91.8 |
| **Total** | Lumens | 2243.3 | 0.0 | 2243.3 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 32.2 | 1.4 |
| 10°-20° | 81.6 | 3.6 |
| 20°-30° | 136.6 | 6.1 |
| 30°-40° | 214.5 | 9.6 |
| 40°-50° | 339.3 | 15.1 |
| 50°-60° | 494.9 | 22.1 |
| 60°-70° | 613.5 | 27.4 |
| 70°-80° | 310.4 | 13.8 |
| 80°-90° | 20.3 | 0.9 |
| 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° | 2243.3 | 100.0 |
| 0°-180° | 2243.3 | 100.0 |



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REPORT NUMBER: P629569
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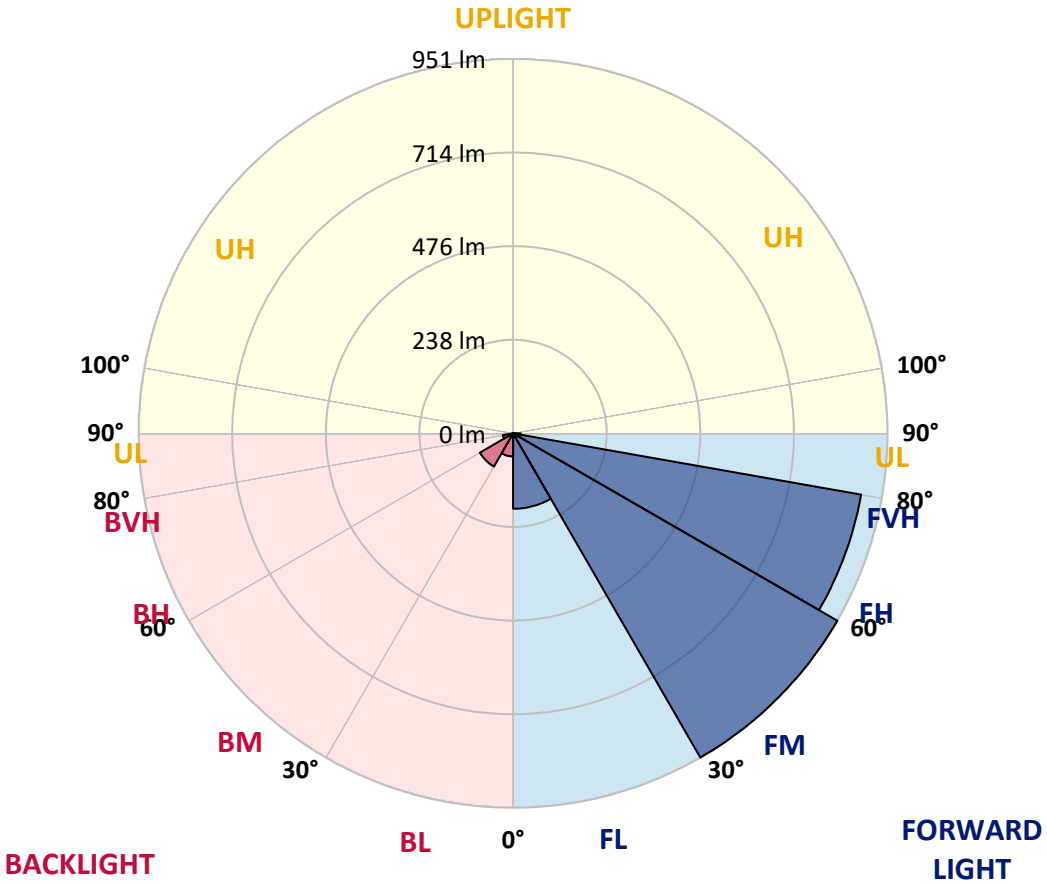
## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 191.8 | 8.5 | | | |
| FM | (30°-60°) | 951.4 | 42.4 | | | |
| FH | (60°-80°) | 897.8 | 40.0 | | | G1/1800 |
| FVH | (80°-90°) | 18.9 | 0.8 | | | G1/100 |
| BL | (0°-30°) | 58.6 | 2.6 | B0/110 | | |
| BM | (30°-60°) | 97.4 | 4.3 | B0/220 | | |
| BH | (60°-80°) | 26.2 | 1.2 | B0/110 | | G0/110 |
| BVH | (80°-90°) | 1.3 | 0.1 | | | G0/10 |
| UL | (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH | (100°-180°) | 0.0 | 0.0 | | U0/0 | |

**BUG Rating: B0-U0-G1**
Type IV Short



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REPORT NUMBER: P629569
CATALOG NUMBER: GWS-SA1B-830-U-SL4-W-HSS

**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 15° | 25° | 35° | 40° | 45° | 55° | 65° | 75° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 380.7 | 380.7 | 380.7 | 380.7 | 380.7 | 380.7 | 380.7 | 380.7 | 380.7 | 380.7 | 380.7 |
| 2.5° | 409.2 | 410.7 | 410.5 | 411.1 | 409.6 | 407.4 | 407.0 | 403.9 | 398.4 | 391.5 | 383.7 |
| 5° | 417.6 | 419.2 | 418.0 | 417.4 | 414.7 | 412.3 | 411.7 | 408.4 | 402.1 | 392.7 | 379.2 |
| 7.5° | 424.7 | 425.2 | 424.3 | 422.9 | 419.0 | 415.8 | 413.5 | 409.0 | 401.5 | 392.1 | 376.6 |
| 10° | 426.0 | 425.8 | 426.2 | 426.4 | 423.9 | 421.1 | 419.2 | 413.1 | 403.5 | 393.5 | 376.8 |
| 12.5° | 424.5 | 424.5 | 427.2 | 430.3 | 430.3 | 428.8 | 427.0 | 421.5 | 410.3 | 398.4 | 380.9 |
| 15° | 426.4 | 427.0 | 432.1 | 437.8 | 439.6 | 438.2 | 437.4 | 431.7 | 420.1 | 407.0 | 388.2 |
| 17.5° | 432.9 | 433.5 | 441.7 | 450.3 | 452.5 | 450.9 | 449.2 | 443.5 | 431.1 | 416.8 | 396.6 |
| 20° | 442.5 | 444.1 | 454.5 | 465.6 | 467.6 | 465.6 | 462.3 | 454.3 | 441.9 | 427.4 | 404.5 |
| 22.5° | 460.1 | 461.1 | 472.3 | 483.9 | 485.0 | 481.7 | 476.8 | 465.8 | 452.7 | 438.6 | 413.5 |
| 25° | 483.3 | 484.8 | 496.0 | 507.2 | 504.6 | 499.7 | 492.9 | 480.5 | 465.6 | 451.9 | 425.0 |
| 27.5° | 511.1 | 512.7 | 523.7 | 533.5 | 526.6 | 520.9 | 513.3 | 497.8 | 482.7 | 470.3 | 439.6 |
| 30° | 541.1 | 542.5 | 552.3 | 561.1 | 551.9 | 545.2 | 536.2 | 520.3 | 505.0 | 495.6 | 460.5 |
| 32.5° | 570.1 | 569.9 | 579.3 | 586.4 | 577.0 | 571.7 | 563.5 | 547.4 | 535.2 | 531.1 | 491.5 |
| 35° | 597.0 | 597.0 | 604.8 | 611.9 | 605.2 | 602.3 | 594.8 | 581.9 | 575.0 | 579.9 | 532.9 |
| 37.5° | 624.2 | 622.7 | 630.1 | 638.0 | 637.4 | 637.6 | 633.3 | 627.2 | 627.6 | 645.0 | 589.9 |
| 40° | 646.6 | 646.0 | 654.6 | 665.0 | 673.1 | 679.7 | 677.0 | 679.3 | 692.1 | 724.6 | 662.7 |
| 42.5° | 664.6 | 666.0 | 677.0 | 693.6 | 714.2 | 727.4 | 729.3 | 738.5 | 771.5 | 821.7 | 745.0 |
| 45° | 685.2 | 685.4 | 700.7 | 726.0 | 758.9 | 779.9 | 787.2 | 810.9 | 857.9 | 922.6 | 835.2 |
| 47.5° | 710.5 | 708.1 | 725.2 | 760.7 | 808.3 | 839.3 | 852.4 | 881.9 | 954.6 | 1020.9 | 908.7 |
| 50° | 738.5 | 734.0 | 753.4 | 801.7 | 863.6 | 902.4 | 928.9 | 972.2 | 1050.5 | 1101.8 | 963.4 |
| 52.5° | 770.9 | 766.6 | 788.7 | 848.9 | 929.9 | 977.1 | 1011.2 | 1054.8 | 1132.8 | 1163.4 | 996.0 |
| 55° | 812.1 | 807.9 | 831.1 | 905.4 | 1008.3 | 1069.5 | 1105.2 | 1142.0 | 1209.3 | 1208.9 | 1019.7 |
| 57.5° | 857.9 | 851.9 | 884.2 | 976.9 | 1106.1 | 1169.7 | 1206.1 | 1224.0 | 1267.5 | 1244.2 | 1035.6 |
| 60° | 910.3 | 905.0 | 949.7 | 1062.0 | 1218.9 | 1277.9 | 1300.8 | 1293.4 | 1315.3 | 1265.1 | 1030.1 |
| 62.5° | 957.7 | 955.2 | 1010.7 | 1152.2 | 1326.5 | 1376.3 | 1382.6 | 1350.6 | 1350.4 | 1265.5 | 993.0 |
| 65° | 1006.9 | 1011.6 | 1094.0 | 1256.1 | 1434.7 | 1468.1 | 1457.3 | 1407.3 | 1364.5 | 1215.5 | 883.2 |
| 67.5° | 1025.2 | 1038.9 | 1148.9 | 1350.0 | 1520.0 | 1546.1 | 1527.1 | 1435.7 | 1305.9 | 1047.3 | 672.5 |
| 70° | 911.7 | 937.5 | 1097.1 | 1355.3 | 1555.3 | 1580.2 | 1534.7 | 1359.4 | 1088.7 | 693.8 | 368.4 |
| 72.5° | 693.4 | 723.4 | 914.2 | 1109.7 | 1398.8 | 1455.5 | 1377.7 | 1107.5 | 701.7 | 303.9 | 123.7 |
| 75° | 388.0 | 420.5 | 680.9 | 835.6 | 939.1 | 990.9 | 962.4 | 710.5 | 310.9 | 79.4 | 36.9 |
| 77.5° | 131.2 | 142.1 | 316.8 | 517.0 | 619.9 | 573.3 | 485.4 | 352.9 | 114.3 | 30.2 | 19.6 |
| 80° | 77.8 | 81.8 | 118.0 | 257.4 | 326.2 | 270.4 | 213.5 | 130.4 | 58.2 | 16.1 | 13.7 |
| 82.5° | 23.3 | 27.6 | 65.1 | 95.5 | 127.8 | 79.6 | 67.4 | 74.5 | 30.2 | 8.8 | 11.4 |
| 85° | 0.0 | 0.0 | 13.9 | 29.6 | 33.5 | 13.1 | 13.1 | 42.3 | 5.5 | 3.7 | 8.4 |
| 87.5° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 1.0 | 0.6 | 0.8 | 1.8 |
| 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: P629569
CATALOG NUMBER: GWS-SA1B-830-U-SL4-W-HSS

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 380.7 | 380.7 | 380.7 | 380.7 | 380.7 | 380.7 | 380.7 | 380.7 | 380.7 | 380.7 | 380.7 |
| 2.5° | 378.2 | 371.1 | 362.7 | 354.7 | 347.2 | 337.4 | 332.7 | 327.0 | 322.1 | 319.4 | 320.9 |
| 5° | 370.7 | 359.4 | 342.3 | 324.9 | 307.4 | 290.9 | 276.0 | 266.0 | 257.0 | 252.3 | 253.3 |
| 7.5° | 364.1 | 349.0 | 322.3 | 293.9 | 265.7 | 237.4 | 214.3 | 196.4 | 182.5 | 176.8 | 175.7 |
| 10° | 361.3 | 342.3 | 304.5 | 263.7 | 220.4 | 182.3 | 149.6 | 129.8 | 115.7 | 108.8 | 110.0 |
| 12.5° | 362.7 | 338.8 | 289.4 | 234.1 | 178.0 | 133.5 | 102.3 | 83.7 | 73.7 | 69.6 | 68.6 |
| 15° | 366.8 | 338.0 | 276.0 | 203.9 | 137.4 | 93.3 | 70.6 | 63.1 | 61.0 | 60.6 | 60.6 |
| 17.5° | 371.5 | 338.2 | 262.1 | 173.3 | 104.3 | 69.2 | 60.4 | 59.0 | 58.4 | 58.0 | 58.2 |
| 20° | 376.2 | 338.2 | 246.2 | 142.3 | 78.4 | 59.8 | 57.6 | 56.5 | 55.9 | 55.7 | 55.7 |
| 22.5° | 381.9 | 338.2 | 228.4 | 113.5 | 62.9 | 56.7 | 54.9 | 54.3 | 53.7 | 53.5 | 53.3 |
| 25° | 388.8 | 338.4 | 208.8 | 88.8 | 57.2 | 54.1 | 52.7 | 52.0 | 51.4 | 51.0 | 51.0 |
| 27.5° | 398.8 | 340.0 | 187.2 | 69.2 | 53.9 | 51.6 | 50.4 | 49.8 | 49.2 | 48.6 | 48.6 |
| 30° | 413.3 | 344.1 | 162.9 | 57.2 | 50.8 | 49.0 | 47.8 | 47.4 | 46.7 | 46.1 | 45.9 |
| 32.5° | 435.0 | 351.3 | 137.8 | 51.2 | 48.0 | 46.1 | 44.7 | 44.3 | 43.7 | 43.1 | 42.9 |
| 35° | 465.2 | 364.3 | 113.3 | 47.6 | 44.3 | 42.5 | 41.6 | 41.4 | 40.6 | 40.0 | 40.0 |
| 37.5° | 509.5 | 385.6 | 89.8 | 43.9 | 41.2 | 39.8 | 38.8 | 38.4 | 37.6 | 36.9 | 36.7 |
| 40° | 563.5 | 413.1 | 69.8 | 41.0 | 38.4 | 36.9 | 35.9 | 35.3 | 34.3 | 33.5 | 33.1 |
| 42.5° | 632.5 | 446.8 | 55.1 | 38.0 | 35.7 | 34.3 | 33.5 | 32.2 | 30.8 | 29.6 | 29.4 |
| 45° | 704.4 | 481.5 | 45.5 | 35.1 | 33.3 | 32.0 | 31.0 | 29.4 | 27.4 | 25.9 | 25.5 |
| 47.5° | 759.5 | 503.1 | 39.8 | 32.0 | 30.6 | 29.6 | 28.4 | 26.3 | 23.9 | 22.2 | 21.8 |
| 50° | 798.9 | 506.4 | 35.5 | 29.2 | 28.4 | 27.4 | 25.5 | 23.1 | 20.4 | 18.8 | 18.4 |
| 52.5° | 818.3 | 491.7 | 32.0 | 26.5 | 25.9 | 24.9 | 22.7 | 20.0 | 17.1 | 15.5 | 15.1 |
| 55° | 827.0 | 463.9 | 28.8 | 24.3 | 23.5 | 22.2 | 19.8 | 16.9 | 14.1 | 12.7 | 12.2 |
| 57.5° | 823.6 | 422.9 | 25.9 | 22.0 | 21.0 | 19.6 | 16.9 | 13.9 | 11.6 | 10.2 | 10.0 |
| 60° | 797.9 | 365.4 | 23.1 | 19.8 | 18.6 | 16.9 | 14.3 | 11.4 | 9.4 | 8.4 | 8.2 |
| 62.5° | 742.3 | 293.9 | 20.2 | 17.1 | 16.3 | 14.7 | 12.2 | 9.4 | 7.8 | 7.1 | 6.9 |
| 65° | 628.7 | 207.8 | 17.3 | 14.5 | 14.1 | 12.5 | 10.2 | 7.8 | 6.7 | 6.3 | 6.1 |
| 67.5° | 451.9 | 126.3 | 14.7 | 12.5 | 12.0 | 10.6 | 8.6 | 6.7 | 6.1 | 5.9 | 5.9 |
| 70° | *227.2* | *59.8* | *11.6* | *10.2* | *10.2* | *8.8* | *7.3* | *6.1* | *5.9* | *5.7* | *5.7* |
| 72.5° | 77.2 | 25.5 | 8.8 | 8.0 | 8.4 | 7.6 | 6.3 | 5.7 | 5.7 | 5.7 | 5.7 |
| 75° | 26.3 | 13.5 | 6.1 | 5.7 | 6.1 | 6.1 | 5.5 | 5.5 | 5.7 | 5.7 | 5.7 |
| 77.5° | 17.1 | 9.0 | 4.3 | 3.9 | 4.7 | 4.7 | 4.7 | 5.1 | 5.5 | 5.5 | 5.5 |
| 80° | 14.1 | 4.9 | 2.9 | 2.7 | 3.5 | 3.5 | 3.9 | 4.7 | 5.1 | 5.1 | 5.1 |
| 82.5° | 12.0 | 3.1 | 1.6 | 1.8 | 2.4 | 2.7 | 3.3 | 3.9 | 4.5 | 4.7 | 4.7 |
| 85° | 8.2 | 1.6 | 1.2 | 1.4 | 1.6 | 2.0 | 2.7 | 3.3 | 3.7 | 4.1 | 4.1 |
| 87.5° | 2.2 | 0.6 | 0.8 | 1.0 | 1.0 | 1.4 | 2.0 | 2.4 | 2.9 | 3.1 | 3.1 |
| 90° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

Cooper Lighting Solutions Photometric Lab
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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

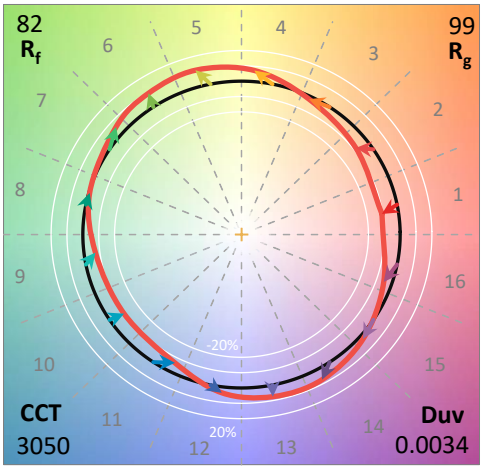
## Test Information

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

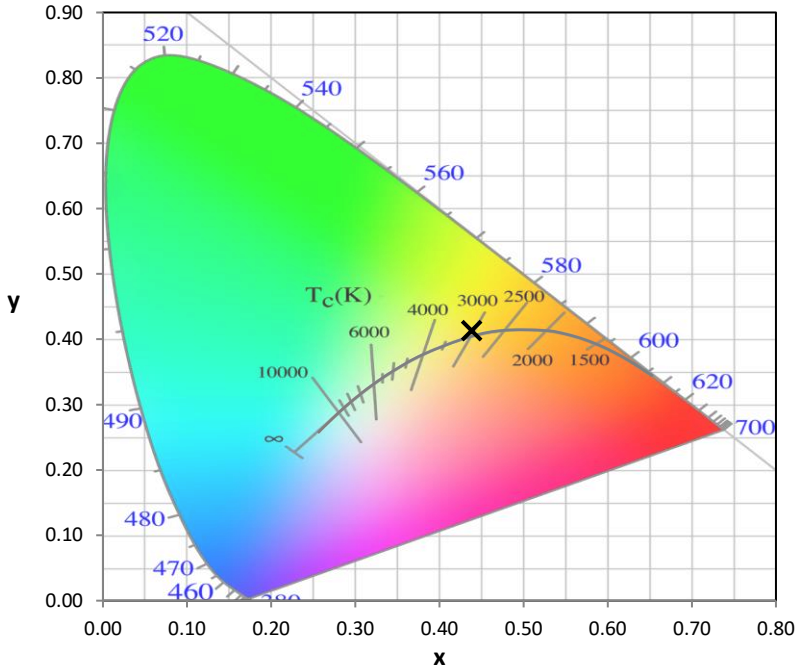
| | |
|---|---|
| Stabilization Time: | 20M |
| Operation Time: | 1H 20M |
| Sphere Temperature (°C): | 24.2 |

REPORT NUMBER: SP1-2408-195-9

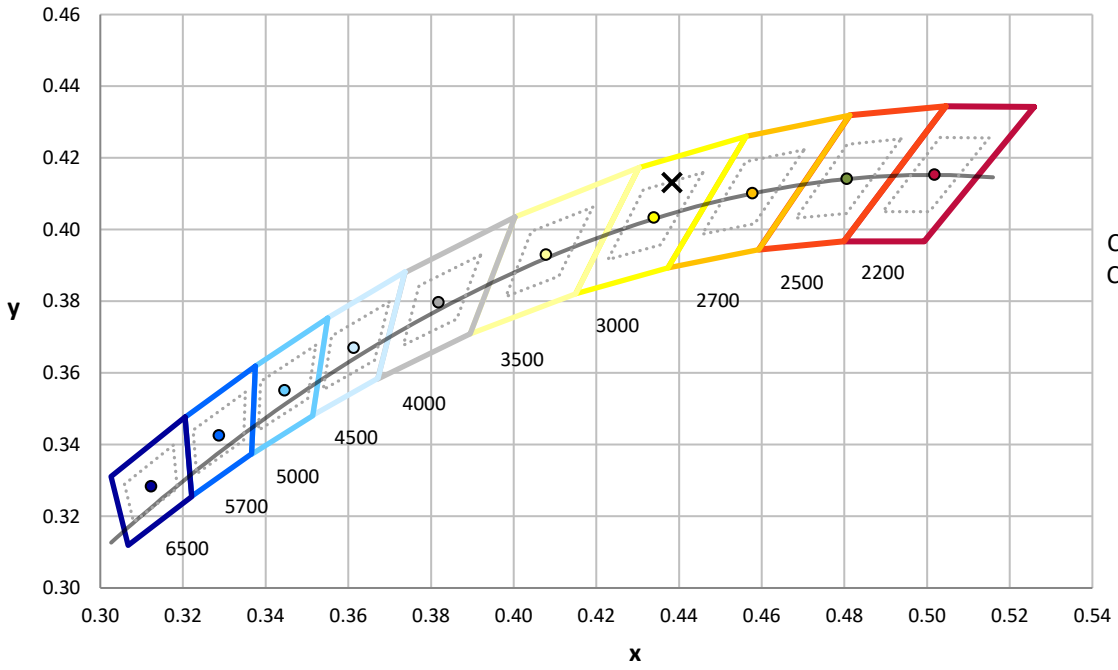
| Measurement and Test Equipment | | | |
|---|---|---|---|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 6/18/2024 | 12/18/2024 |
| Power Meter | INXT2011004 | 2/8/2024 | 2/8/2025 |
| AC Power Source | IN0063 | 10/24/2023 | 10/24/2024 |
| DC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

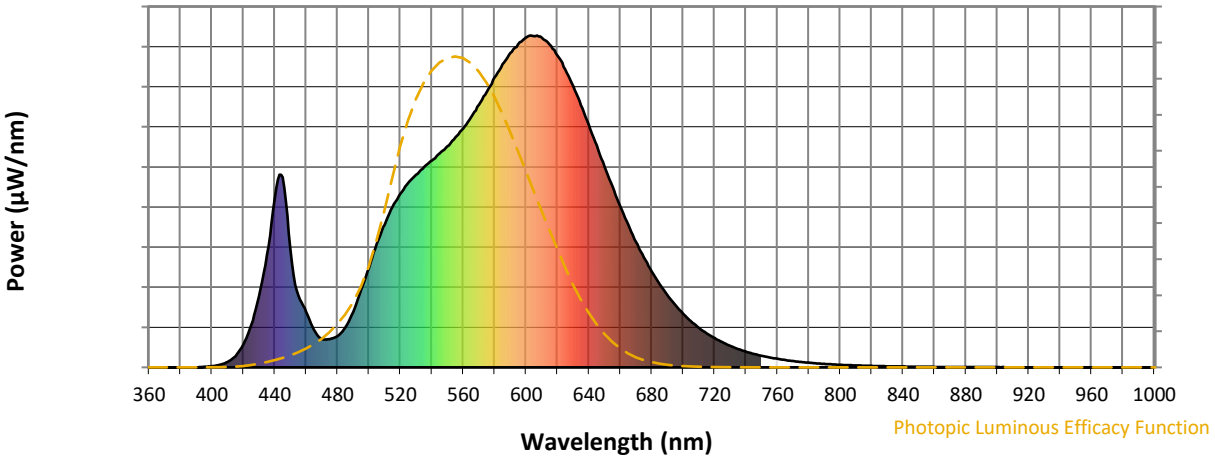



CCT = 3050K
CIE x = 0.4383
CIE y = 0.4131
Duv = 0.0034

Point lies inside the ANSI 3000K 4-step quadrangle

REPORT NUMBER: SP1-2408-195-9

## 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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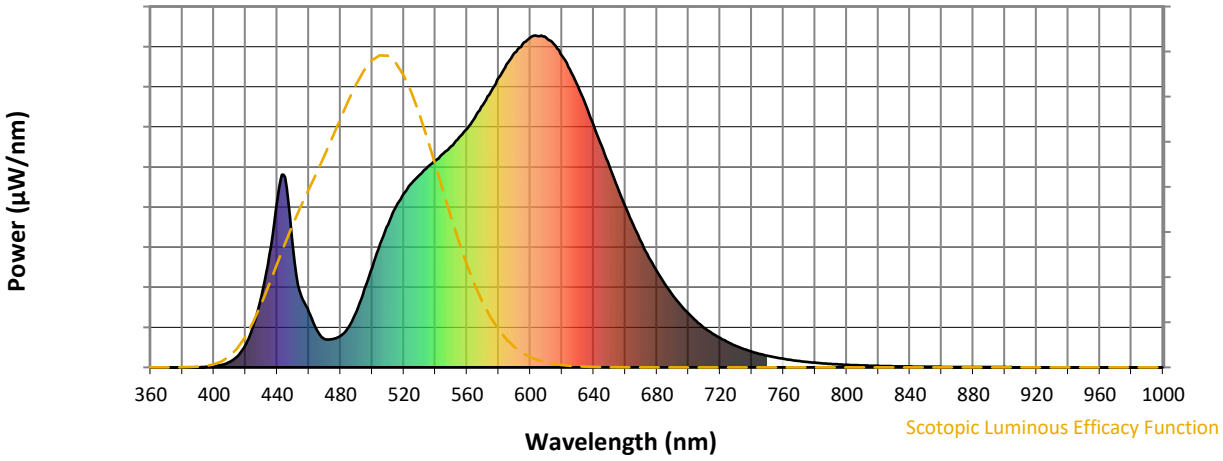
## Scotopic Flux vs. Wavelength




**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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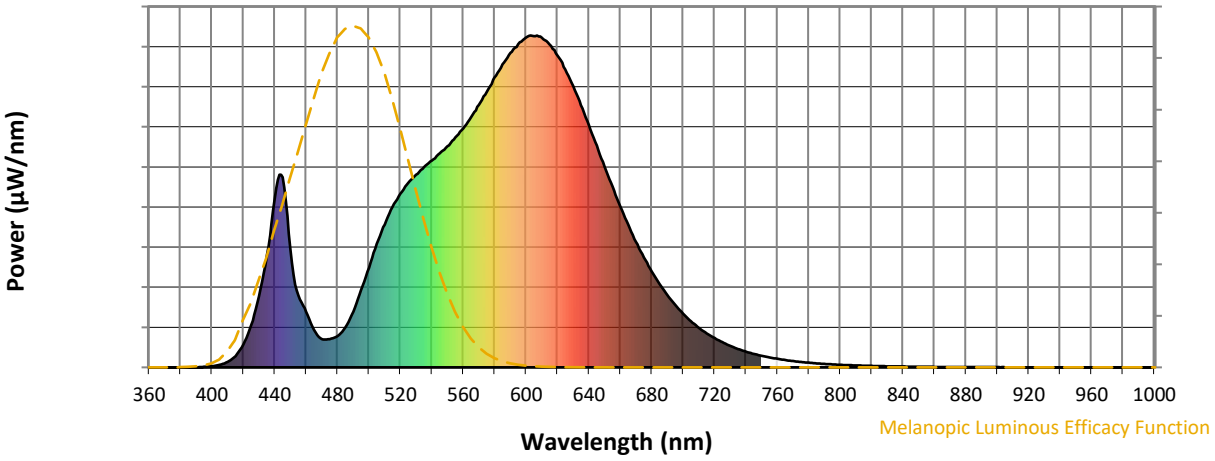
## Melanopic Flux vs. Wavelength




**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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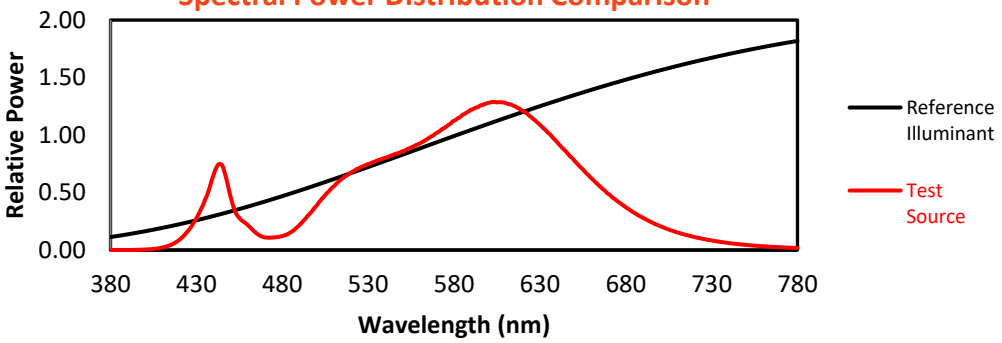
# TM-30-18

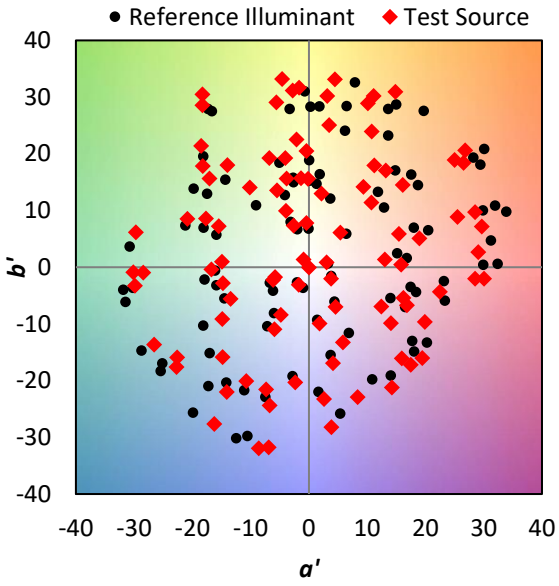
## Summary

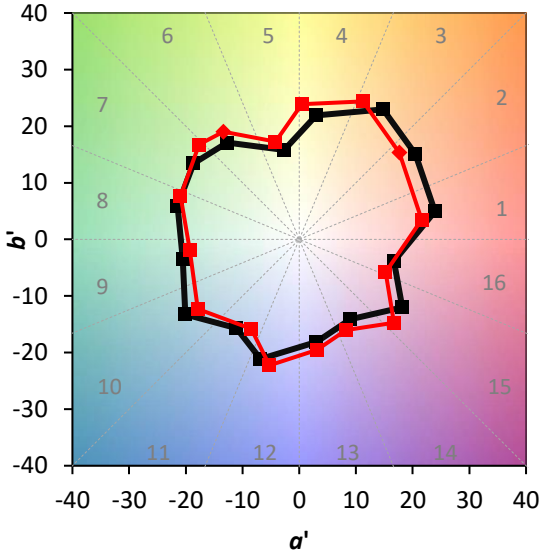
$R_f$ = 81.5
$R_g$ = 99.2
CIE $R_a$ = 81.0
$R_9$ = 7.1

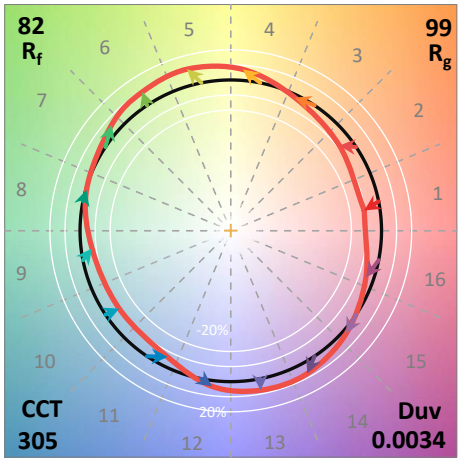
## Spectral Power Distribution Comparison

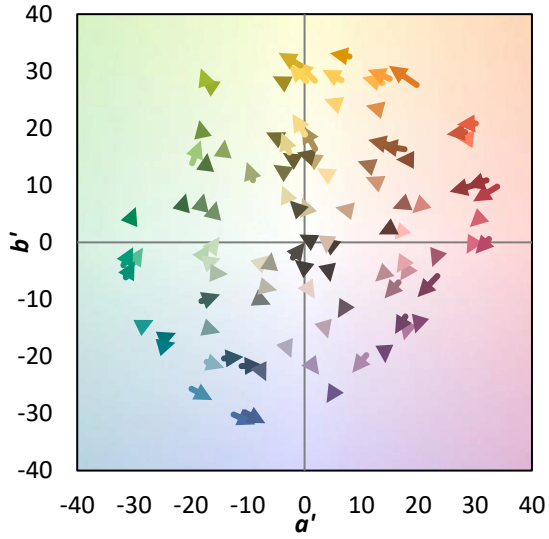



## Color Vector Graphics



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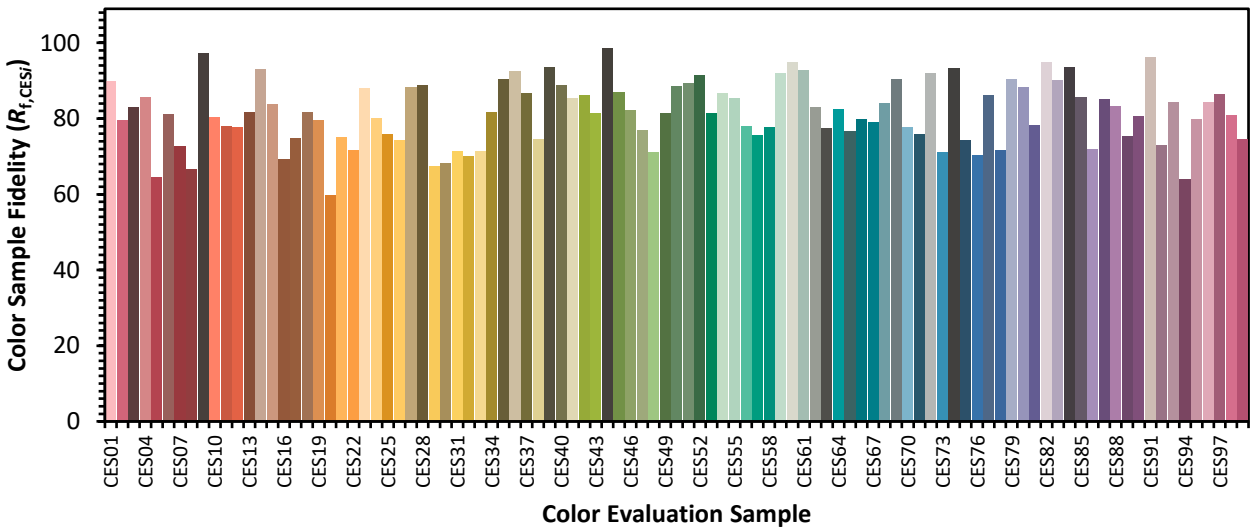
## Individual Sample Fidelity Index ($R_{f,i}$)

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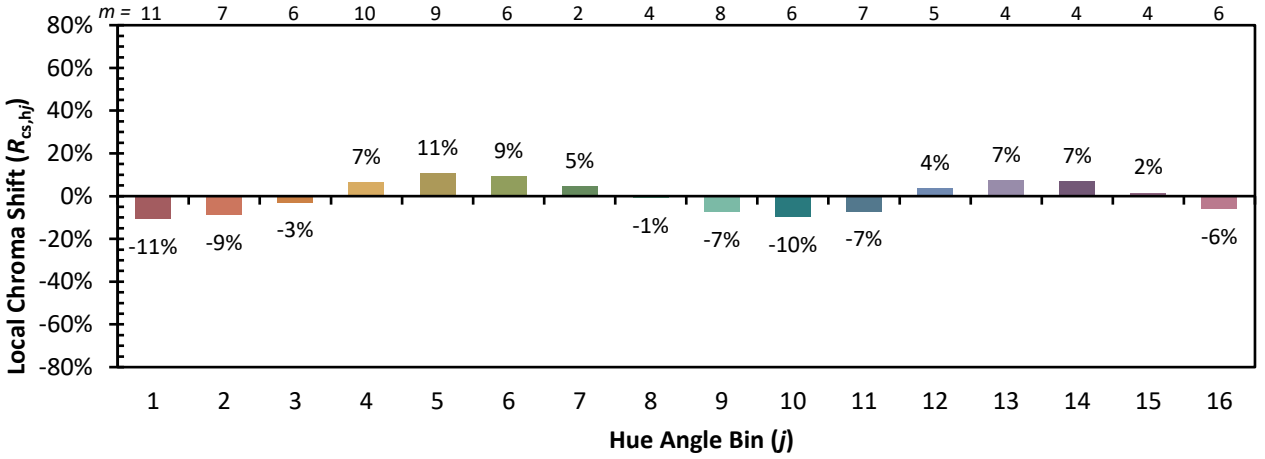
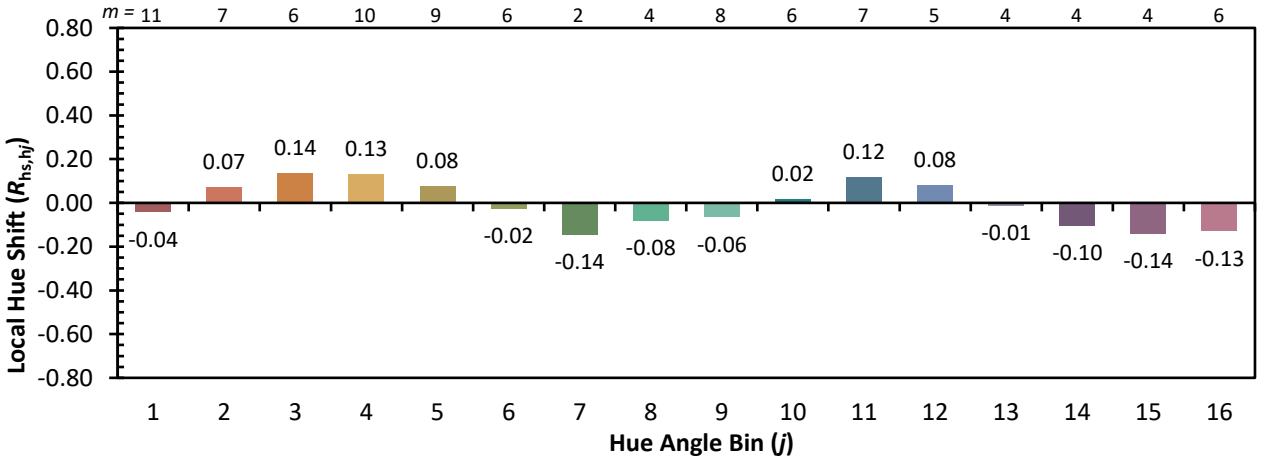
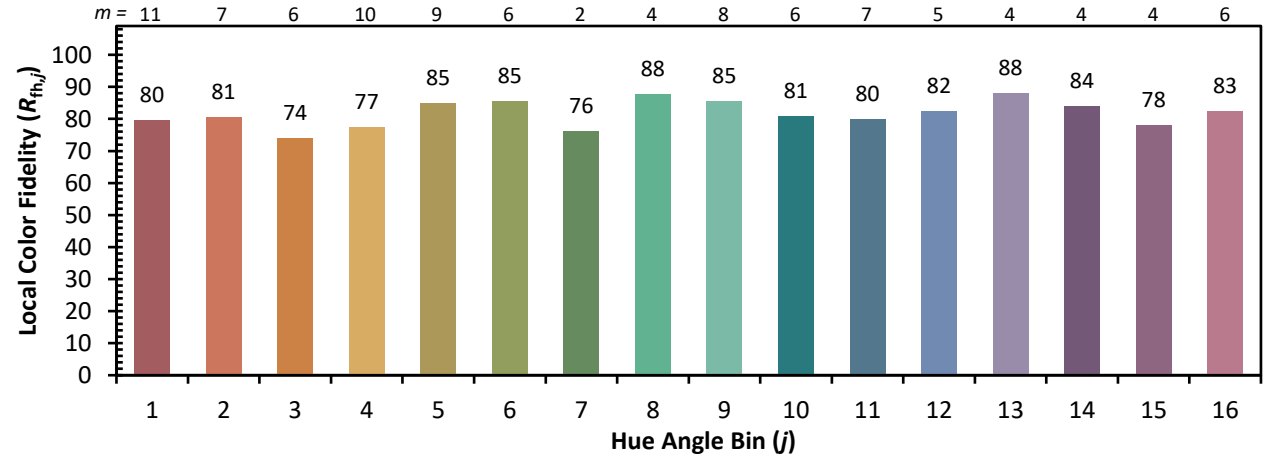
## Color Rendition by Hue-Angle Bin



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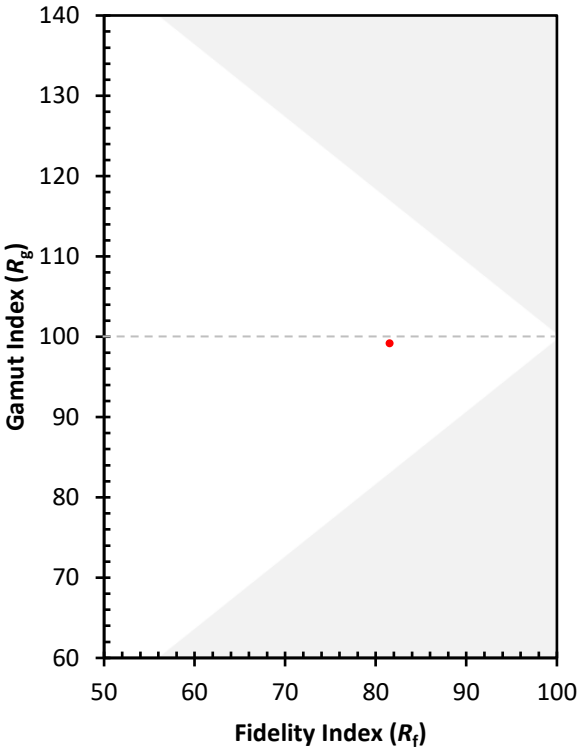
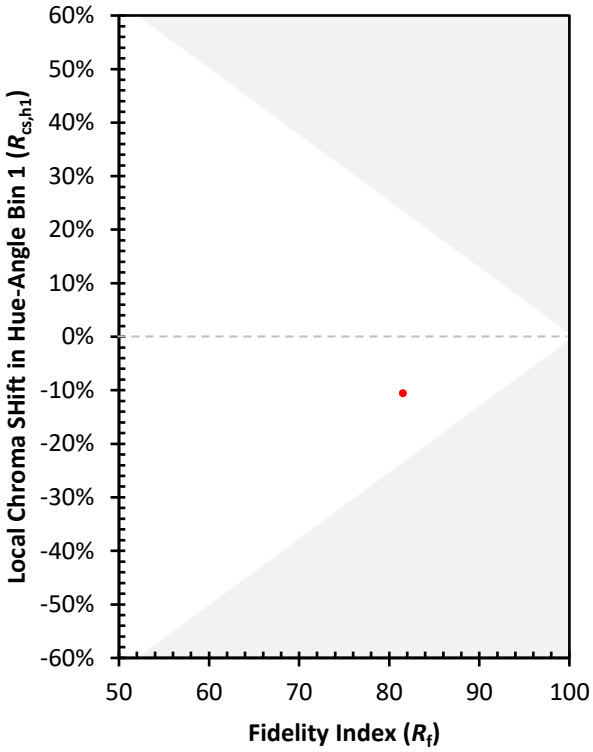
## Measure Comparisons

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