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: P629568

Luminaire Tested: GWS-SA1B-830-U-SL3-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: | P629568 |
| | TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-31) |
| Test Lab: | COOPER LIGHTING SOLUTIONS |
| Issue Date: | 1/10/2023 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS |
| Product Line: | McGRAW-EDISON |
| Catalog Number: | GWS-SA1B-830-U-SL3-W |
| Description: | GALLEON WALL SLIM LUMINAIRE. (1) LIGHTSQUARES WITH 16 LEDS EACH AND TYPE III SPILL LIGHT ELIMINATOR OPTICS |
| Light Source: | (16) 3000K CCT, 80 CRI LEDS |
| Ballast/Driver: | - |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 2789.6 lumens |
| Efficiency: | N/A |
| Efficacy: | 111.6 lumens/watt |
| Luminous Opening: | Rectangular (W 0.5' x L: 0.5' x H: 0') |
| IES Classification: | Type III - Medium |
| BUG Rating: | B1 - 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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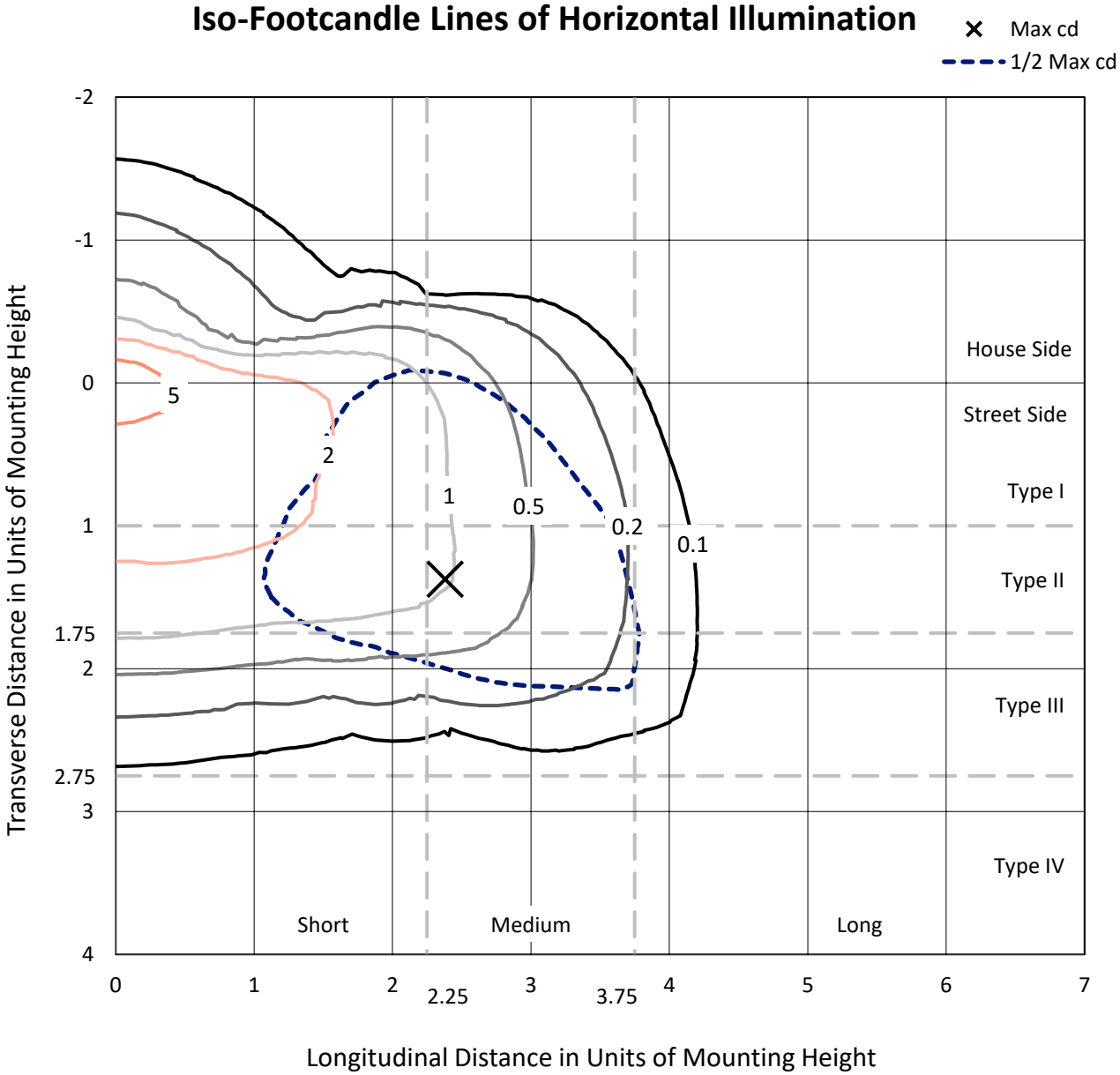
Scaled Data Report

REPORT NUMBER: P629568
CATALOG NUMBER: GWS-SA1B-830-U-SL3-W

## Iso-Footcandle Lines of Horizontal Illumination




Based on 10 foot mounting height. Maximum calculated value = 7.7 fc
Type III - Medium - N/A

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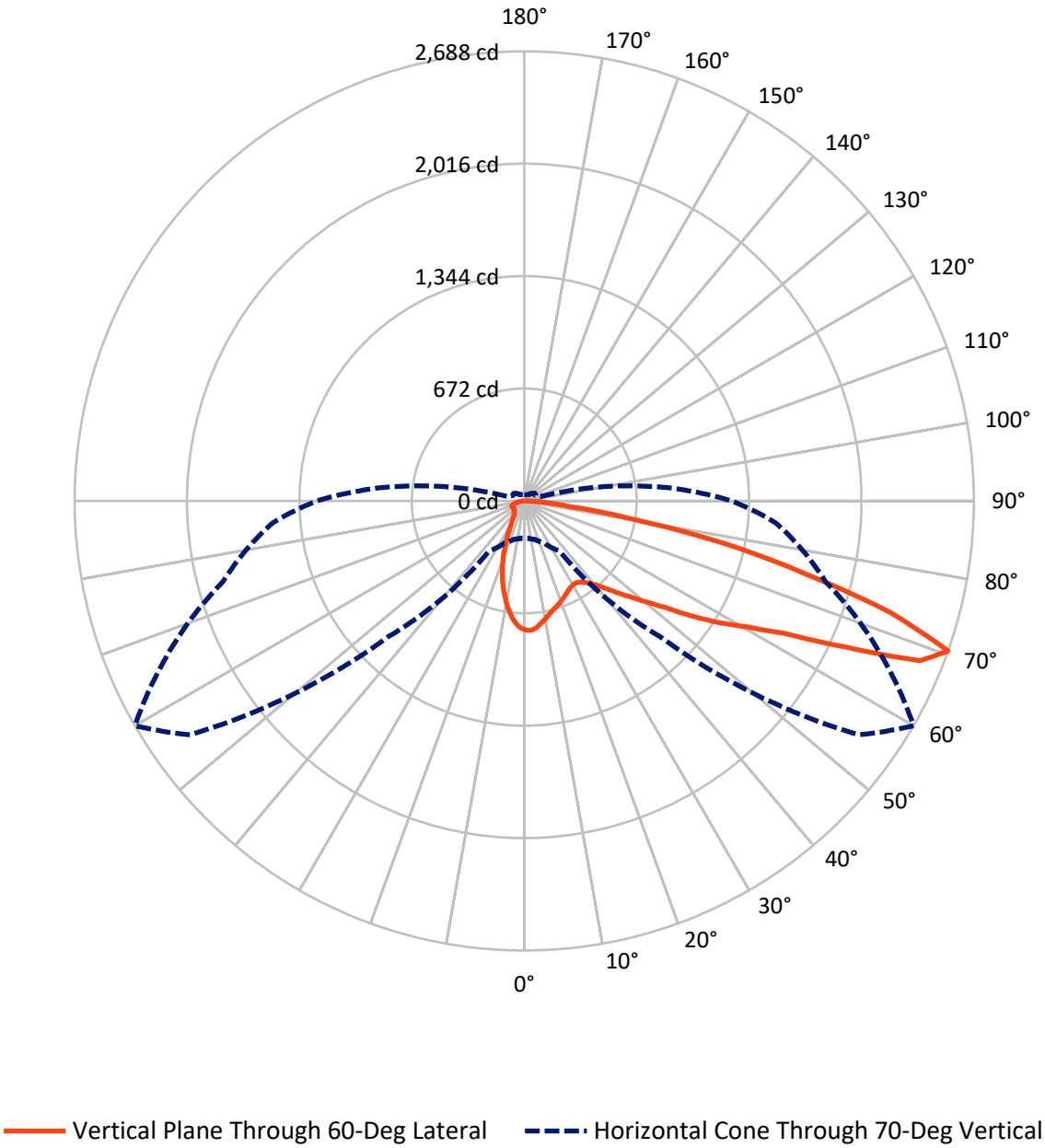
Scaled Data Report

REPORT NUMBER: P629568
CATALOG NUMBER: GWS-SA1B-830-U-SL3-W

## Luminous Intensity Polar Plot



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Scaled Data Report

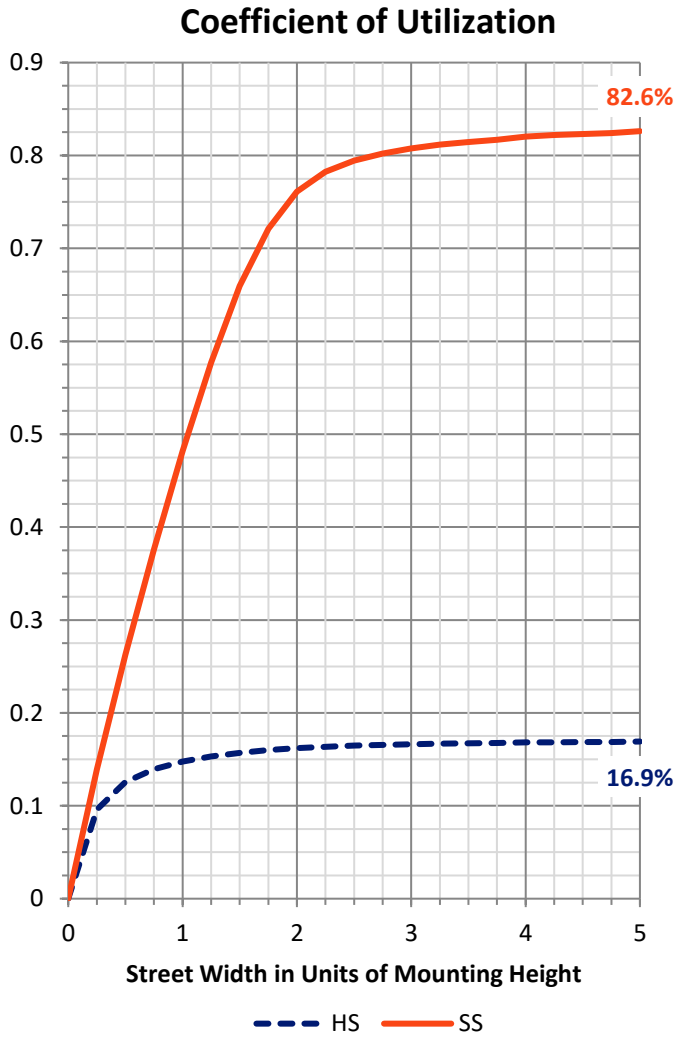
REPORT NUMBER: P629568
CATALOG NUMBER: GWS-SA1B-830-U-SL3-W

**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 477.1 | 0.0 | 477.1 |
| | % Fixture | 17.1 | 0.0 | 17.1 |
| **Street Side** | Lumens | 2312.5 | 0.0 | 2312.5 |
| | % Fixture | 82.9 | 0.0 | 82.9 |
| **Total** | Lumens | 2789.6 | 0.0 | 2789.6 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 66.5 | 2.4 |
| 10°-20° | 149.1 | 5.3 |
| 20°-30° | 190.9 | 6.8 |
| 30°-40° | 250.9 | 9.0 |
| 40°-50° | 364.0 | 13.0 |
| 50°-60° | 567.9 | 20.4 |
| 60°-70° | 743.5 | 26.7 |
| 70°-80° | 411.1 | 14.7 |
| 80°-90° | 45.6 | 1.6 |
| 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° | 2789.6 | 100.0 |
| 0°-180° | 2789.6 | 100.0 |



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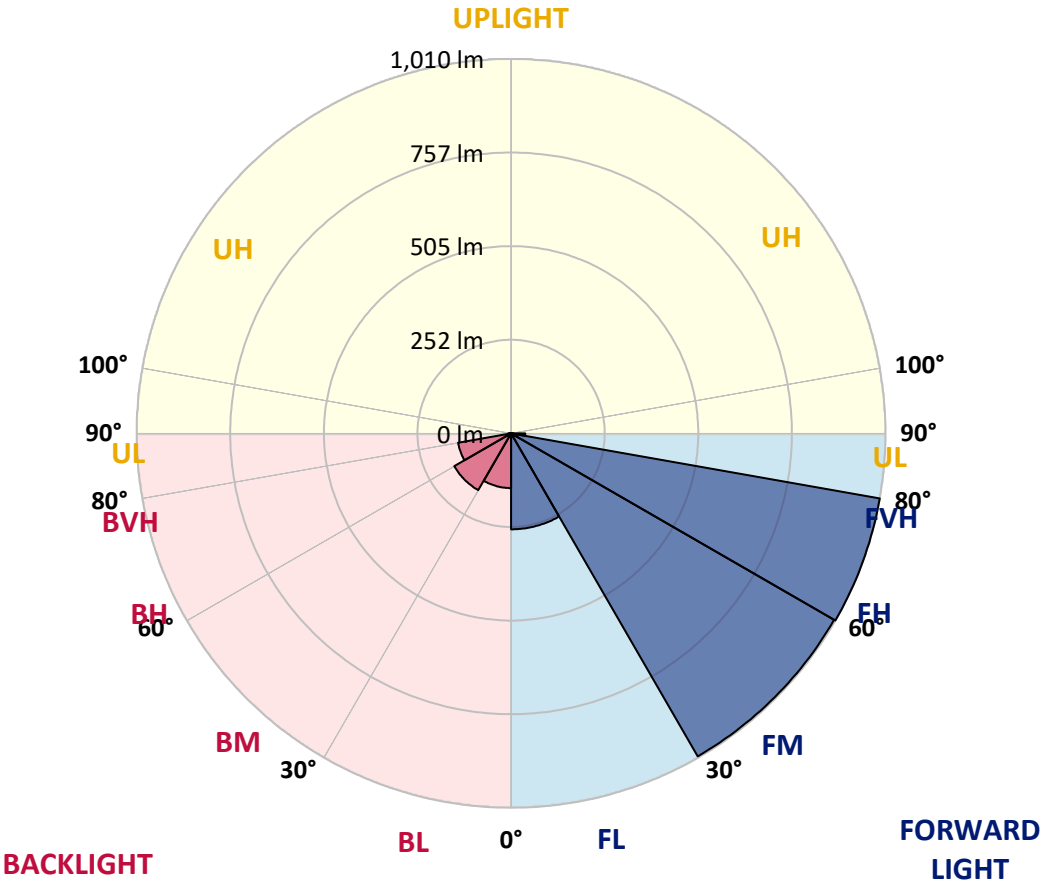
REPORT NUMBER: P629568
CATALOG NUMBER: GWS-SA1B-830-U-SL3-W

## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 258.9 | 9.3 | | | |
| FM | (30°-60°) | 1005.9 | 36.1 | | | |
| FH | (60°-80°) | 1009.7 | 36.2 | | | G1/1800 |
| FVH | (80°-90°) | 38.0 | 1.4 | | | G1/100 |
| BL | (0°-30°) | 147.6 | 5.3 | B1/500 | | |
| BM | (30°-60°) | 176.9 | 6.3 | B0/220 | | |
| BH | (60°-80°) | 145.0 | 5.2 | B1/500 | | G1/500 |
| BVH | (80°-90°) | 7.6 | 0.3 | | | G0/10 |
| UL | (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH | (100°-180°) | 0.0 | 0.0 | | U0/0 | |

**BUG Rating: B1-U0-G1**
Type III Medium



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Scaled Data Report

REPORT NUMBER: P629568
CATALOG NUMBER: GWS-SA1B-830-U-SL3-W

**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 15° | 25° | 35° | 45° | 55° | 60° | 65° | 75° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 771.9 | 771.9 | 771.9 | 771.9 | 771.9 | 771.9 | 771.9 | 771.9 | 771.9 | 771.9 | 771.9 |
| 2.5° | 761.1 | 761.9 | 764.2 | 767.4 | 770.7 | 772.3 | 776.4 | 775.2 | 774.4 | 772.7 | 770.7 |
| 5° | 727.4 | 729.1 | 731.1 | 737.4 | 744.6 | 750.3 | 759.5 | 760.5 | 760.9 | 761.7 | 758.4 |
| 7.5° | 684.6 | 685.0 | 689.9 | 698.2 | 707.6 | 717.4 | 732.7 | 737.0 | 740.7 | 744.8 | 742.1 |
| 10° | 637.2 | 638.2 | 641.9 | 653.9 | 670.1 | 684.6 | 705.2 | 712.3 | 720.1 | 729.1 | 725.4 |
| 12.5° | 598.4 | 598.6 | 604.6 | 617.4 | 635.0 | 654.6 | 680.3 | 688.8 | 699.1 | 713.1 | 709.9 |
| 15° | 567.6 | 567.6 | 573.1 | 584.1 | 604.3 | 627.4 | 658.0 | 669.1 | 682.9 | 701.9 | 696.2 |
| 17.5° | 543.1 | 543.3 | 546.8 | 558.4 | 576.4 | 601.9 | 638.2 | 653.1 | 668.4 | 693.5 | 685.0 |
| 20° | 530.3 | 529.2 | 529.9 | 537.0 | 552.3 | 577.0 | 618.4 | 635.8 | 656.4 | 687.8 | 674.8 |
| 22.5° | 529.6 | 527.8 | 525.2 | 525.8 | 534.8 | 555.2 | 597.2 | 618.2 | 644.1 | 683.1 | 664.4 |
| 25° | 540.1 | 538.0 | 533.3 | 528.0 | 527.2 | 539.4 | 577.2 | 601.1 | 631.5 | 681.1 | 654.4 |
| 27.5° | 557.6 | 556.2 | 550.1 | 542.1 | 533.7 | 533.3 | 562.1 | 587.0 | 622.3 | 683.1 | 647.2 |
| 30° | 580.9 | 578.4 | 574.6 | 564.3 | 551.7 | 538.6 | 556.2 | 579.4 | 616.2 | 689.7 | 644.1 |
| 32.5° | 607.2 | 605.8 | 602.1 | 591.9 | 578.4 | 557.6 | 560.9 | 581.1 | 616.2 | 701.1 | 644.8 |
| 35° | 635.2 | 635.0 | 635.0 | 628.2 | 613.3 | 587.4 | 579.4 | 595.0 | 625.6 | 719.5 | 651.3 |
| 37.5° | 662.3 | 662.1 | 668.6 | 671.1 | 654.2 | 626.2 | 611.1 | 622.7 | 646.2 | 746.6 | 667.4 |
| 40° | 684.4 | 685.2 | 699.5 | 711.7 | 702.3 | 676.4 | 655.2 | 661.1 | 679.7 | 785.2 | 695.6 |
| 42.5° | 706.6 | 708.9 | 730.3 | 751.9 | 755.6 | 733.1 | 711.7 | 715.2 | 727.6 | 836.2 | 737.6 |
| 45° | 730.9 | 731.9 | 761.9 | 792.1 | 809.9 | 796.6 | 779.1 | 783.8 | 786.6 | 899.3 | 800.3 |
| 47.5° | 754.4 | 757.0 | 795.8 | 837.2 | 870.9 | 869.7 | 859.9 | 858.5 | 859.1 | 976.0 | 874.4 |
| 50° | 786.4 | 790.3 | 835.8 | 885.8 | 935.2 | 957.9 | 960.7 | 949.9 | 945.4 | 1061.3 | 966.6 |
| 52.5° | 847.2 | 847.2 | 888.1 | 937.2 | 1003.6 | 1059.7 | 1078.9 | 1061.1 | 1046.8 | 1151.6 | 1064.6 |
| 55° | 923.4 | 926.6 | 959.1 | 998.9 | 1083.0 | 1166.9 | 1231.8 | 1212.2 | 1171.8 | 1249.7 | 1167.3 |
| 57.5° | 957.2 | 961.3 | 1012.8 | 1074.6 | 1186.9 | 1288.7 | 1378.7 | 1371.8 | 1312.8 | 1351.8 | 1273.8 |
| 60° | 896.0 | 904.6 | 975.4 | 1079.1 | 1281.0 | 1485.3 | 1548.7 | 1528.5 | 1444.2 | 1458.9 | 1389.3 |
| 62.5° | 747.4 | 756.8 | 835.4 | 980.1 | 1267.9 | 1697.7 | 1816.7 | 1742.2 | 1608.3 | 1594.3 | 1543.2 |
| 65° | 446.0 | 445.6 | 540.1 | 731.9 | 1106.9 | 1756.7 | 2240.8 | 2101.9 | 1861.8 | 1780.0 | 1701.6 |
| 67.5° | 283.5 | 282.9 | 302.7 | 387.8 | 736.6 | 1612.2 | 2513.5 | 2549.7 | 2206.2 | 1916.5 | 1714.7 |
| 70° | 223.7 | 223.5 | 237.8 | 276.6 | 364.3 | 1147.3 | 2437.6 | 2687.6 | 2414.1 | 1864.5 | 1509.8 |
| 72.5° | 163.1 | 163.5 | 185.5 | 231.7 | 281.1 | 576.0 | 1973.9 | 2299.6 | 2220.4 | 1645.9 | 1225.6 |
| 75° | 117.2 | 117.8 | 131.0 | 177.4 | 259.2 | 314.9 | 1312.6 | 1729.2 | 1689.4 | 1319.3 | 843.2 |
| 77.5° | 74.5 | 75.3 | 86.9 | 124.3 | 209.4 | 254.3 | 795.8 | 1220.7 | 1124.0 | 743.3 | 299.8 |
| 80° | 45.5 | 48.2 | 58.0 | 92.7 | 167.4 | 190.8 | 397.8 | 643.1 | 562.9 | 203.9 | 100.8 |
| 82.5° | 23.5 | 25.5 | 34.9 | 57.4 | 115.3 | 167.6 | 225.1 | 270.2 | 174.3 | 85.3 | 53.7 |
| 85° | 7.3 | 8.6 | 12.2 | 23.3 | 54.9 | 103.9 | 149.0 | 134.3 | 80.0 | 40.2 | 24.9 |
| 87.5° | 1.8 | 1.8 | 2.0 | 2.0 | 2.2 | 4.7 | 28.8 | 30.4 | 21.2 | 12.7 | 10.2 |
| 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

Scaled Data Report

REPORT NUMBER: P629568
CATALOG NUMBER: GWS-SA1B-830-U-SL3-W

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 771.9 | 771.9 | 771.9 | 771.9 | 771.9 | 771.9 | 771.9 | 771.9 | 771.9 | 771.9 | 771.9 |
| 2.5° | 766.6 | 761.7 | 759.7 | 759.5 | 754.4 | 747.0 | 742.1 | 738.6 | 736.6 | 736.2 | 736.2 |
| 5° | 752.9 | 746.6 | 738.2 | 731.9 | 718.2 | 704.4 | 692.7 | 686.2 | 678.6 | 677.6 | 677.4 |
| 7.5° | 734.8 | 725.6 | 709.7 | 691.9 | 668.0 | 645.0 | 625.4 | 612.1 | 598.8 | 596.4 | 595.6 |
| 10° | 715.2 | 702.7 | 675.6 | 644.4 | 608.6 | 574.1 | 544.1 | 520.7 | 505.2 | 494.1 | 492.1 |
| 12.5° | 695.8 | 679.3 | 639.5 | 592.9 | 543.9 | 496.8 | 451.7 | 413.3 | 385.6 | 369.4 | 366.6 |
| 15° | 677.6 | 654.6 | 600.1 | 540.7 | 477.0 | 412.5 | 348.6 | 298.8 | 259.8 | 245.9 | 242.7 |
| 17.5° | 661.1 | 632.3 | 561.9 | 486.6 | 407.2 | 322.9 | 250.2 | 205.9 | 183.1 | 176.1 | 174.5 |
| 20° | 644.6 | 609.5 | 523.1 | 429.6 | 333.1 | 238.6 | 182.9 | 162.1 | 153.5 | 150.8 | 150.0 |
| 22.5° | 626.8 | 584.3 | 480.9 | 373.5 | 258.2 | 178.6 | 149.6 | 140.4 | 137.8 | 138.0 | 137.8 |
| 25° | 609.0 | 558.8 | 436.6 | 312.5 | 192.3 | 144.9 | 130.6 | 127.2 | 127.8 | 129.6 | 130.0 |
| 27.5° | 594.3 | 536.2 | 393.1 | 245.5 | 150.2 | 124.7 | 118.0 | 117.8 | 120.0 | 122.5 | 122.9 |
| 30° | 583.7 | 516.0 | 350.2 | 188.8 | 123.7 | 110.8 | 108.2 | 109.4 | 112.1 | 113.9 | 114.5 |
| 32.5° | 576.2 | 498.6 | 304.5 | 148.4 | 108.4 | 101.0 | 99.8 | 101.0 | 102.7 | 104.5 | 104.9 |
| 35° | 573.5 | 486.0 | 259.6 | 121.0 | 98.0 | 93.9 | 93.1 | 93.7 | 94.5 | 95.5 | 95.9 |
| 37.5° | 579.4 | 479.6 | 212.7 | 105.3 | 91.6 | 89.2 | 88.0 | 87.6 | 87.8 | 88.2 | 88.4 |
| 40° | 597.0 | 482.5 | 174.3 | 96.1 | 87.6 | 85.3 | 83.3 | 82.5 | 82.3 | 82.7 | 82.5 |
| 42.5° | 627.2 | 494.5 | 146.5 | 90.8 | 84.3 | 81.0 | 78.8 | 78.0 | 78.0 | 79.0 | 79.0 |
| 45° | 671.5 | 518.2 | 126.5 | 86.9 | 81.4 | 77.4 | 74.9 | 74.5 | 75.3 | 76.9 | 77.2 |
| 47.5° | 736.4 | 552.9 | 114.5 | 84.1 | 78.8 | 74.1 | 71.6 | 71.4 | 73.1 | 75.7 | 75.9 |
| 50° | 813.4 | 602.9 | 108.0 | 82.0 | 76.9 | 71.4 | 69.0 | 69.2 | 71.0 | 73.9 | 74.5 |
| 52.5° | 906.0 | 671.1 | 108.4 | 81.2 | 75.9 | 69.8 | 67.4 | 66.9 | 68.8 | 71.6 | 72.3 |
| 55° | 1001.7 | 754.0 | 116.3 | 81.4 | 74.5 | 69.0 | 65.7 | 64.3 | 65.9 | 68.0 | 68.2 |
| 57.5° | 1107.1 | 847.4 | 136.1 | 81.0 | 72.7 | 68.2 | 64.3 | 61.0 | 62.0 | 63.3 | 63.9 |
| 60° | 1225.8 | 957.4 | 178.8 | 81.8 | 71.8 | 66.3 | 61.4 | 57.1 | 56.9 | 57.8 | 58.0 |
| 62.5° | 1384.6 | 1107.1 | 226.8 | 83.3 | 73.7 | 64.1 | 57.1 | 52.7 | 51.8 | 52.3 | 52.5 |
| 65° | 1506.1 | 1178.5 | 211.7 | 82.0 | 77.6 | 62.5 | 53.1 | 48.4 | 46.7 | 46.3 | 46.3 |
| 67.5° | 1456.7 | 1084.0 | 147.4 | 78.8 | 79.4 | 62.7 | 49.8 | 43.9 | 41.8 | 40.8 | 40.6 |
| 70° | *1239.5* | *880.5* | *102.5* | *75.5* | *77.4* | *62.3* | *46.3* | *40.2* | *37.6* | *36.1* | *35.9* |
| 72.5° | 979.3 | 672.3 | 82.9 | 69.0 | 70.2 | 56.1 | 41.2 | 36.1 | 33.9 | 32.0 | 32.0 |
| 75° | 630.3 | 410.2 | 69.2 | 61.4 | 57.4 | 43.7 | 35.7 | 32.2 | 30.0 | 28.2 | 28.2 |
| 77.5° | 212.1 | 152.3 | 53.7 | 52.0 | 42.9 | 32.9 | 30.0 | 27.8 | 25.9 | 24.3 | 24.1 |
| 80° | 86.1 | 72.3 | 39.4 | 39.4 | 30.0 | 25.1 | 23.5 | 22.5 | 21.2 | 19.2 | 19.2 |
| 82.5° | 50.0 | 43.9 | 27.6 | 23.9 | 20.0 | 17.3 | 16.3 | 15.3 | 15.3 | 13.9 | 13.9 |
| 85° | 24.1 | 24.3 | 16.5 | 14.7 | 11.4 | 10.0 | 9.6 | 9.0 | 8.8 | 8.0 | 7.8 |
| 87.5° | 13.1 | 13.3 | 8.4 | 6.5 | 4.5 | 3.9 | 3.3 | 3.1 | 2.9 | 2.7 | 2.7 |
| 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
1121 Highway 74 South
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

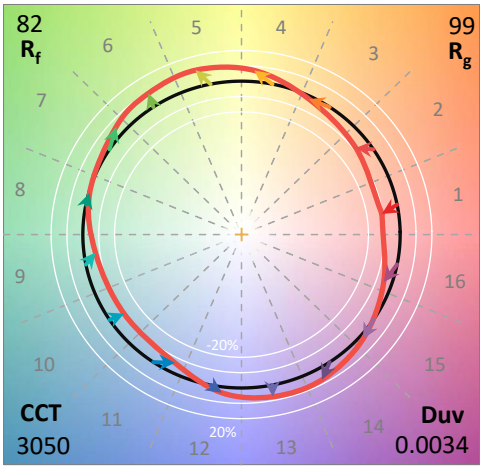
## Test Information

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

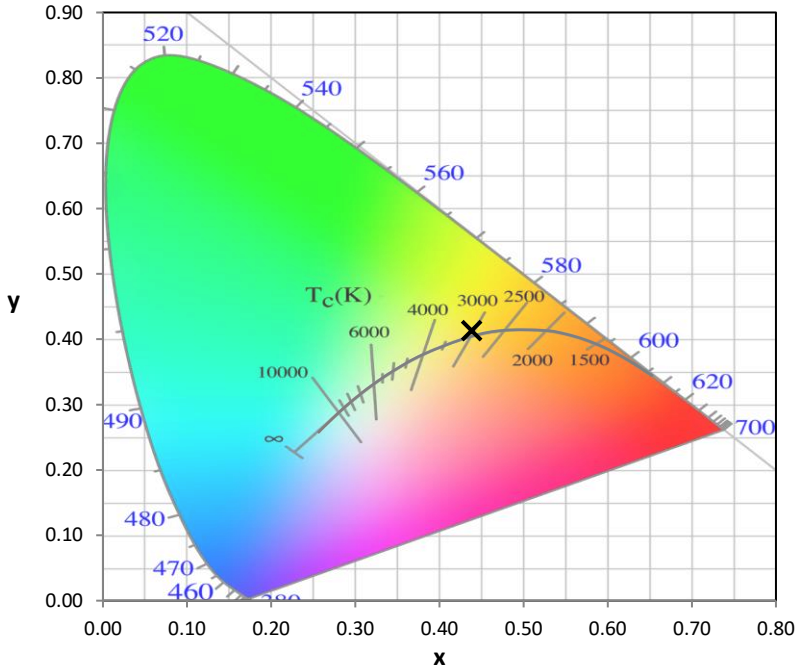
| | |
|---|---|
| Stabilization Time: | 20M |
| Operation Time: | 1H 20M |
| Sphere Temperature (°C): | 24.2 |

REPORT NUMBER: SP1-2408-195-9

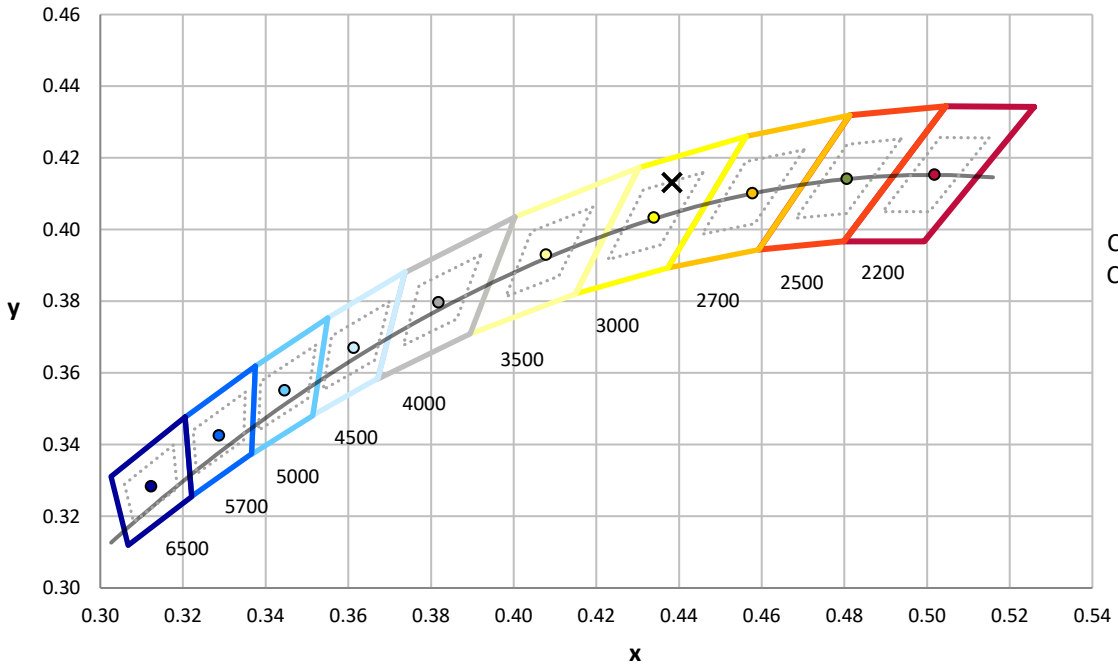
| Measurement and Test Equipment | | | |
|---|---|---|---|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 6/18/2024 | 12/18/2024 |
| Power Meter | INXT2011004 | 2/8/2024 | 2/8/2025 |
| AC Power Source | IN0063 | 10/24/2023 | 10/24/2024 |
| DC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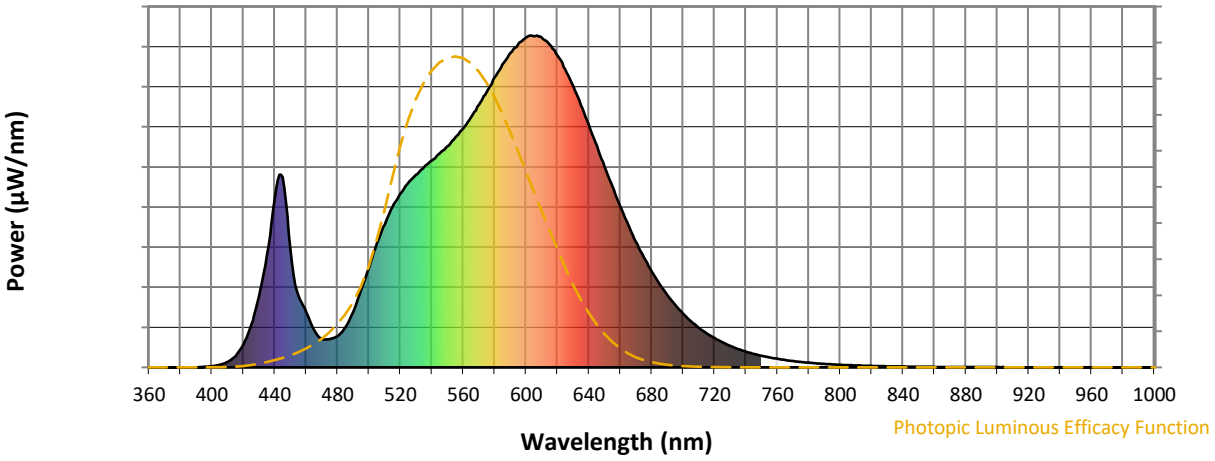
## Photopic Flux vs. Wavelength




## 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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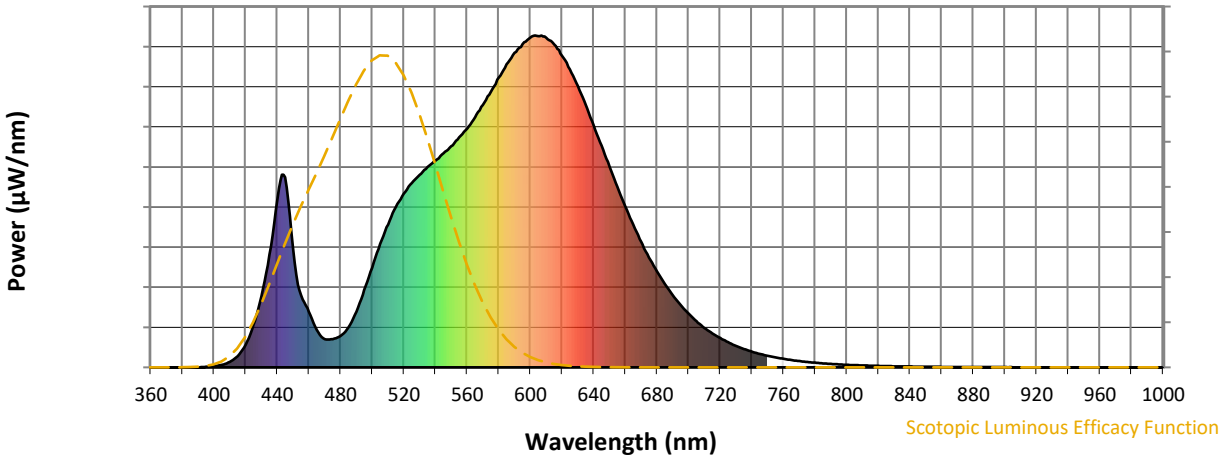
## Scotopic Flux vs. Wavelength




**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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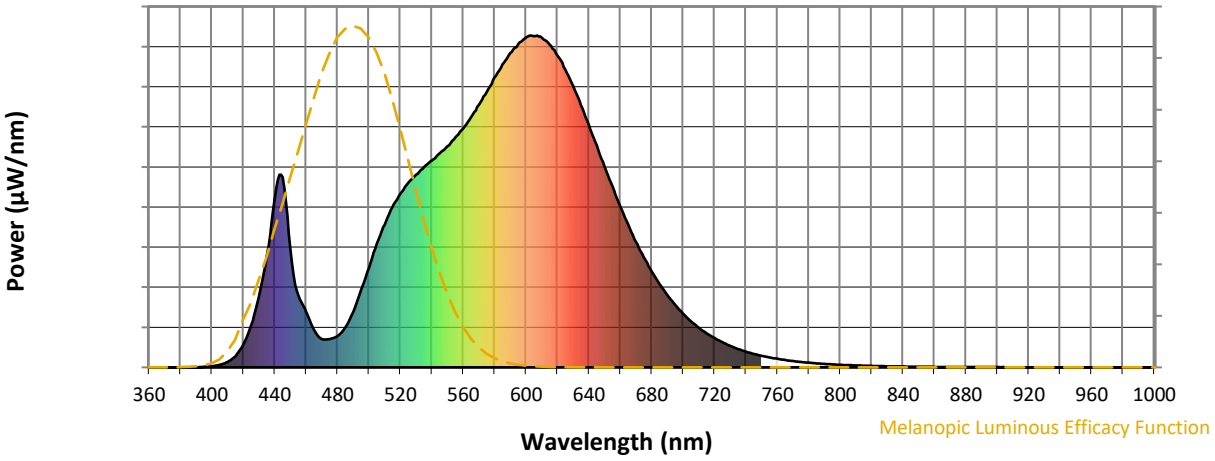
## Melanopic Flux vs. Wavelength




**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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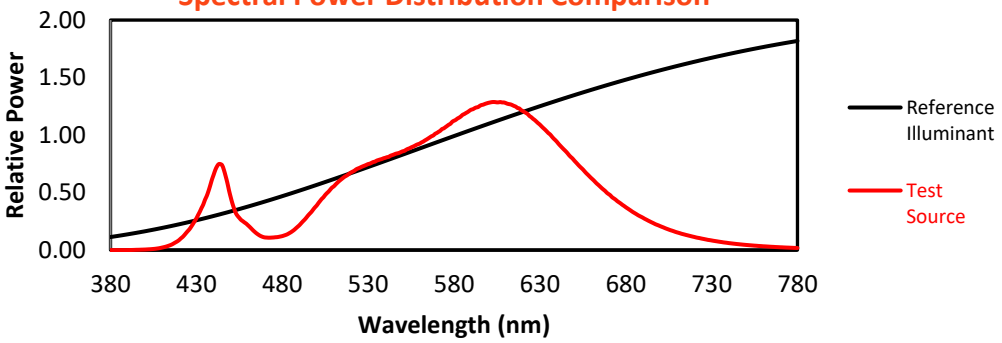
# TM-30-18

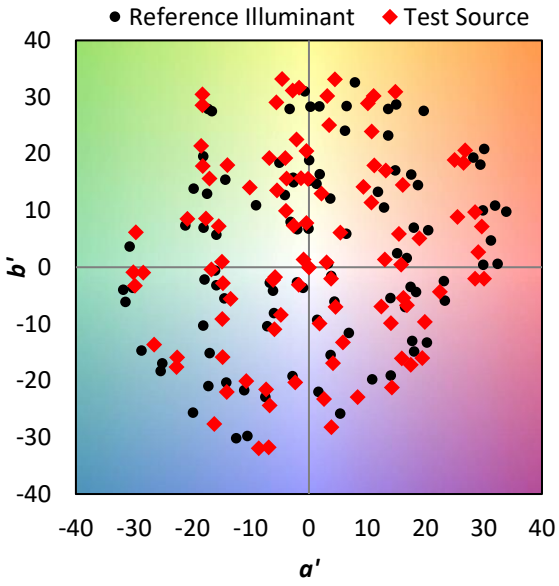
## Summary

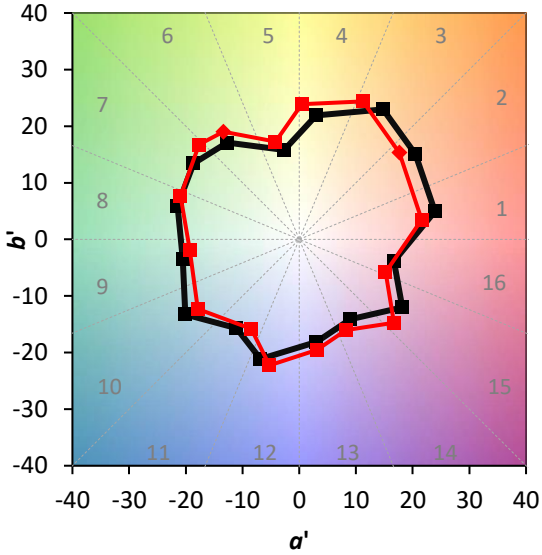
$R_f$ = 81.5
$R_g$ = 99.2
CIE $R_a$ = 81.0
$R_9$ = 7.1

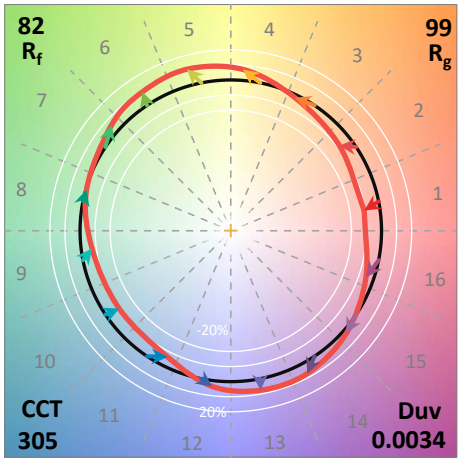
## Spectral Power Distribution Comparison

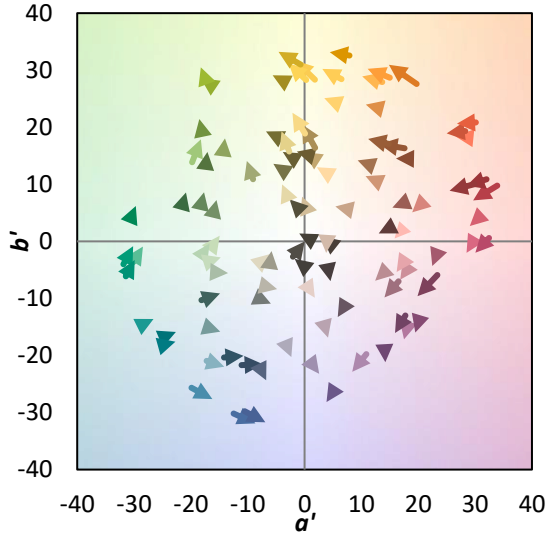



## Color Vector Graphics



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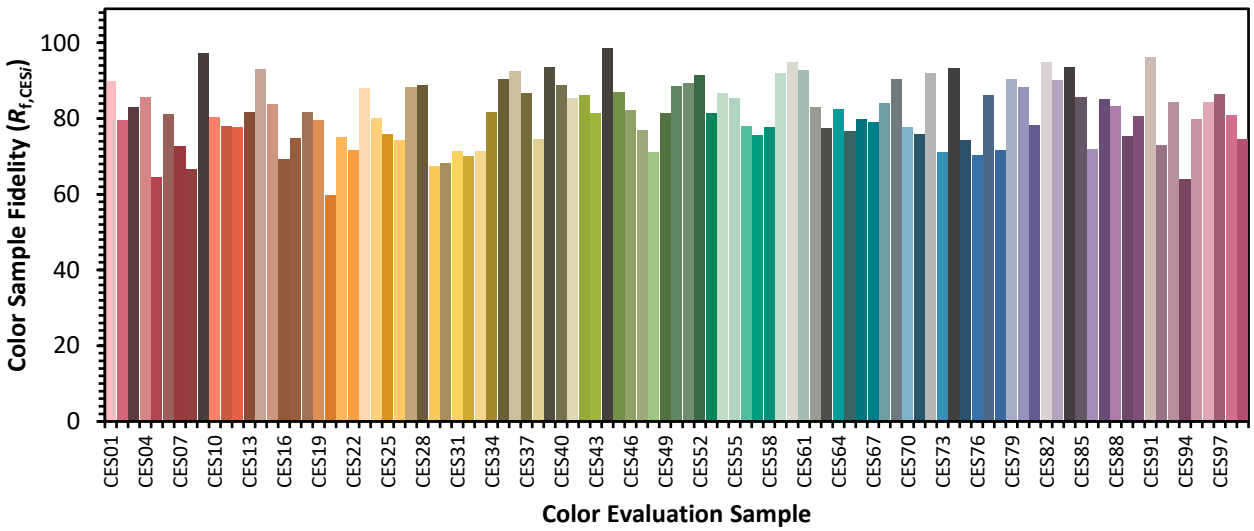
**Individual Sample Fidelity Index ($R_{f,i}$)**

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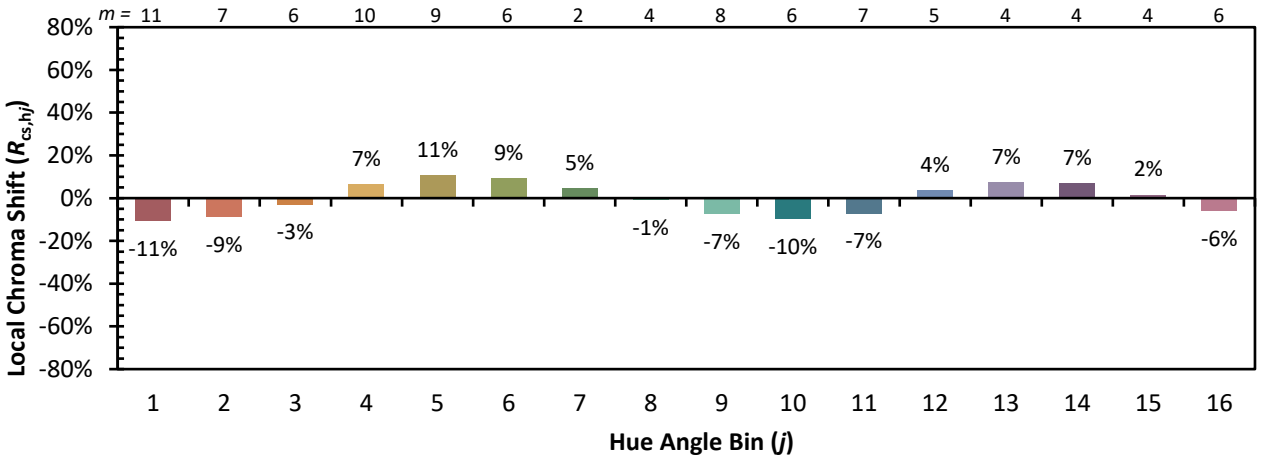
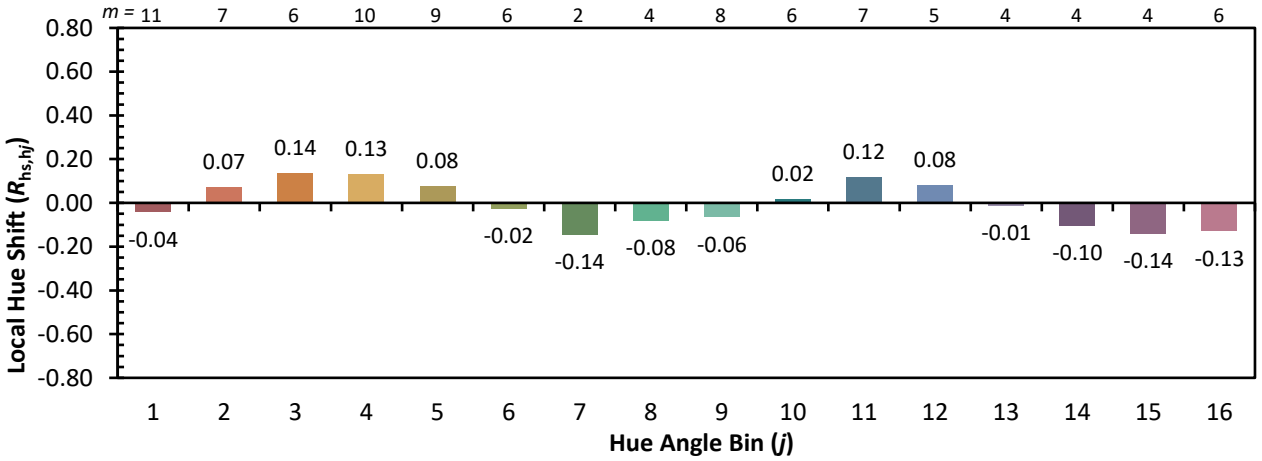
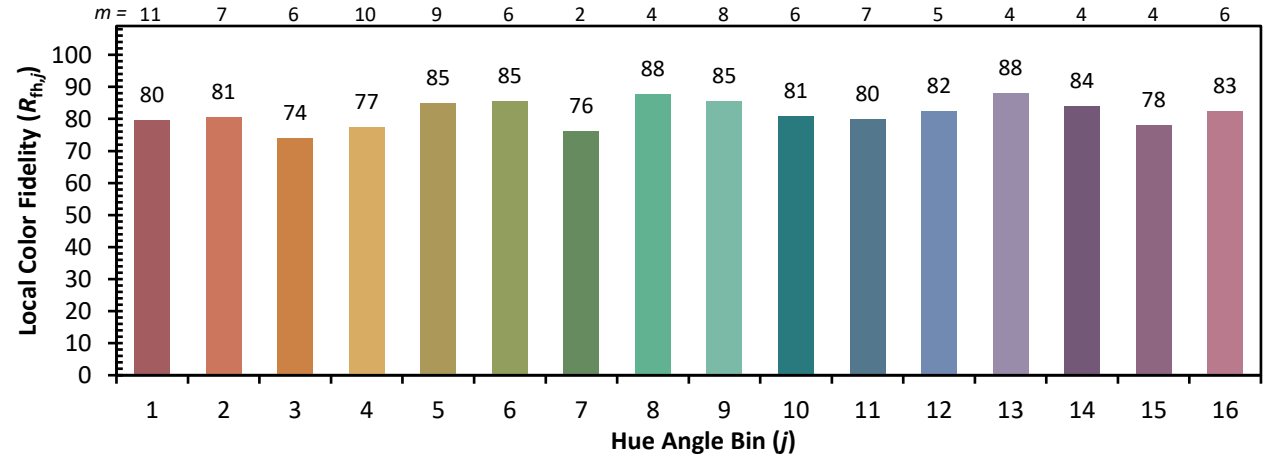
## Color Rendition by Hue-Angle Bin



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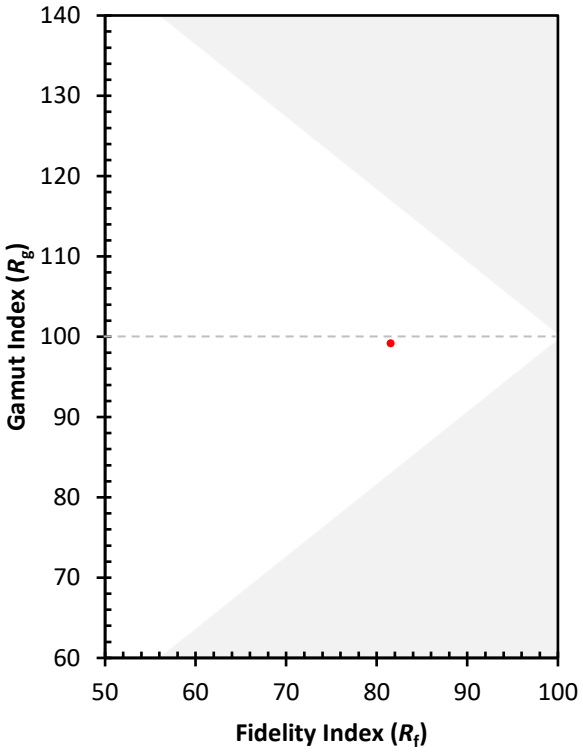
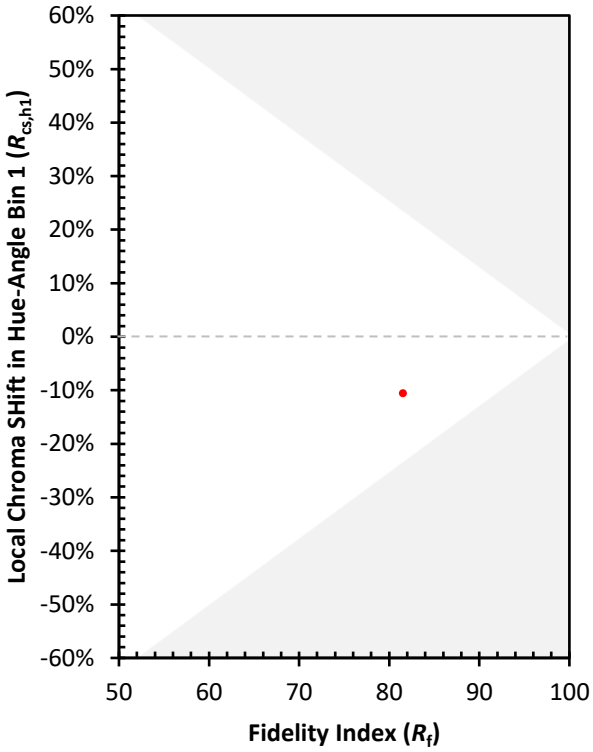
## TM-30-18

### Measure Comparisons




(END OF REPORT)