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: P629093

Luminaire Tested: GWS-SA1A-830-U-T3-W-GRSBK

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: | P629093 |
| | TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-24) |
| Test Lab: | COOPER LIGHTING SOLUTIONS |
| Issue Date: | 1/10/2023 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS |
| Product Line: | McGRAW-EDISON |
| Catalog Number: | GWS-SA1A-830-U-T3-W-GRSBK |
| Description: | GALLEON WALL SLIM LUMINAIRE. (1) LIGHTSQUARES WITH 16 LEDS EACH AND TYPE III OPTICS W/ FACTORY INSTALLED GLARE SHIELD, BK |
| Light Source: | (16) 3000K CCT, 80 CRI LEDS |
| Ballast/Driver: | - |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 1395 lumens |
| Efficiency: | N/A |
| Efficacy: | 70.8 lumens/watt |
| Luminous Opening: | Rectangular (W 0.5' x L: 0.5' x H: 0') |
| IES Classification: | Type II - Short |
| BUG Rating: | B0 - U0 - G0 |

| | |
|---|---|
| Input Watts (W): | 19.7 |
| 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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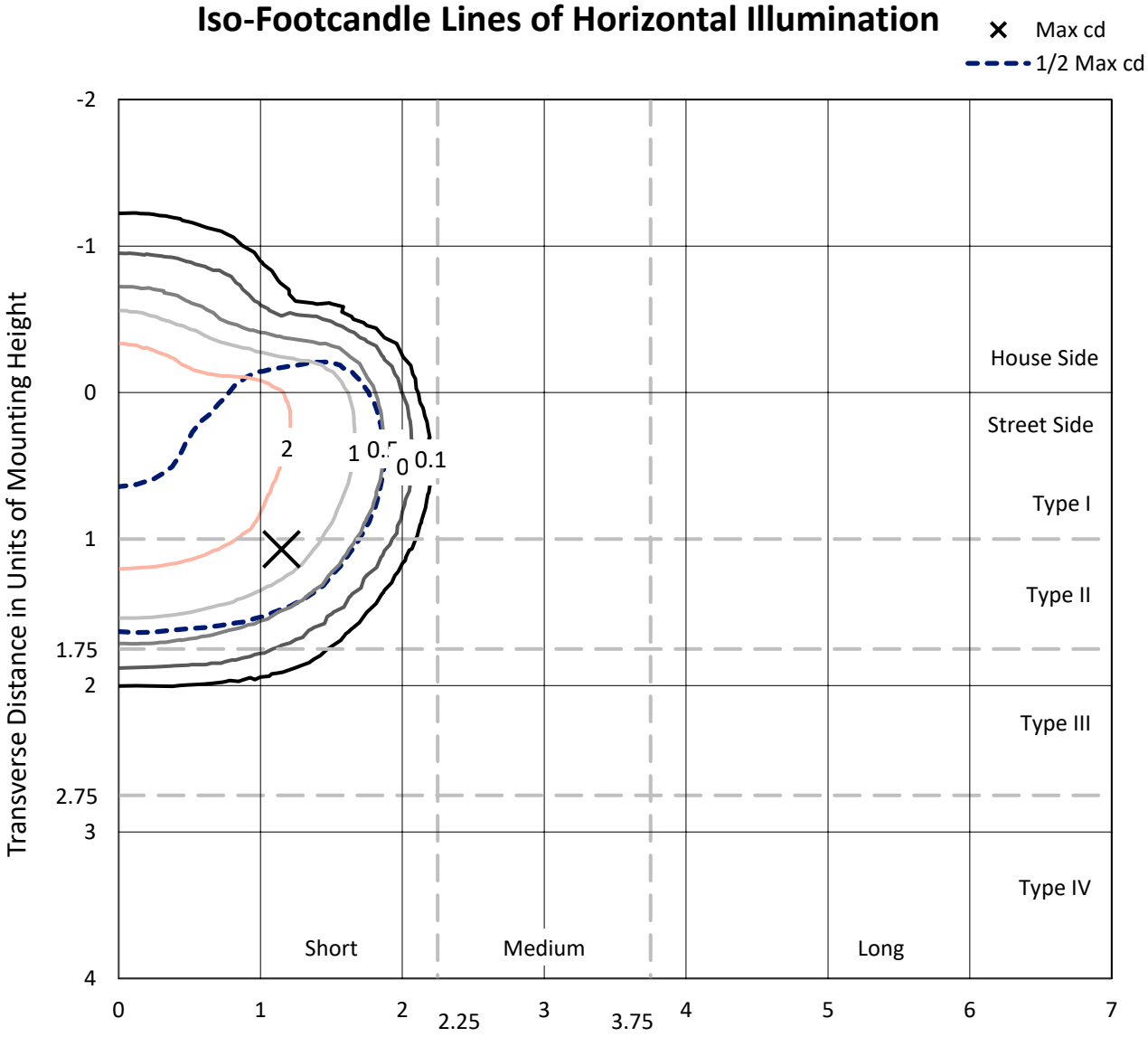
Scaled Data Report

REPORT NUMBER: P629093
CATALOG NUMBER: GWS-SA1A-830-U-T3-W-GRSBK

## Iso-Footcandle Lines of Horizontal Illumination




Based on 10 foot mounting height. Maximum calculated value = 3.3 fc
Type II - Short - N/A

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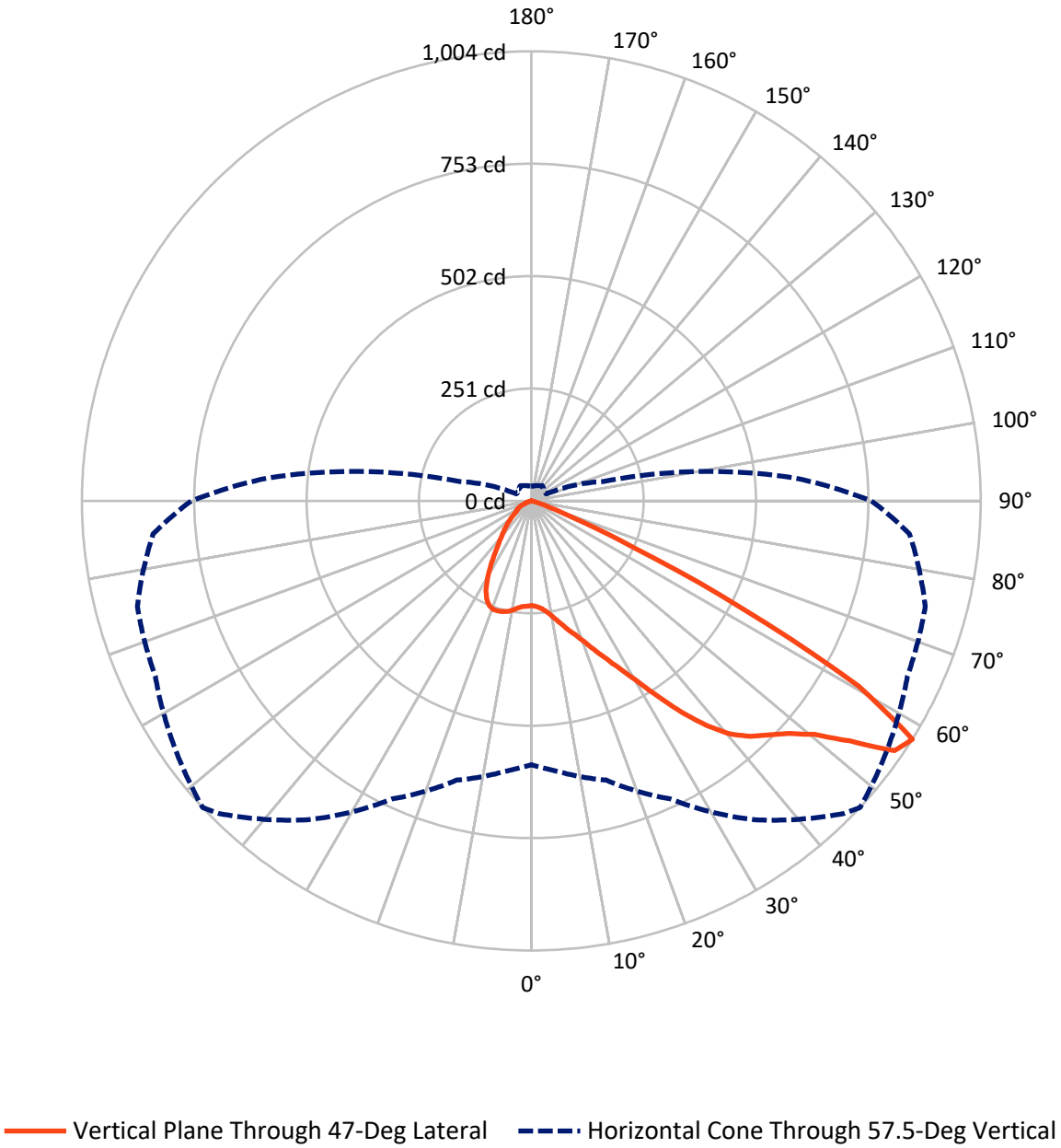
## Luminous Intensity Polar Plot



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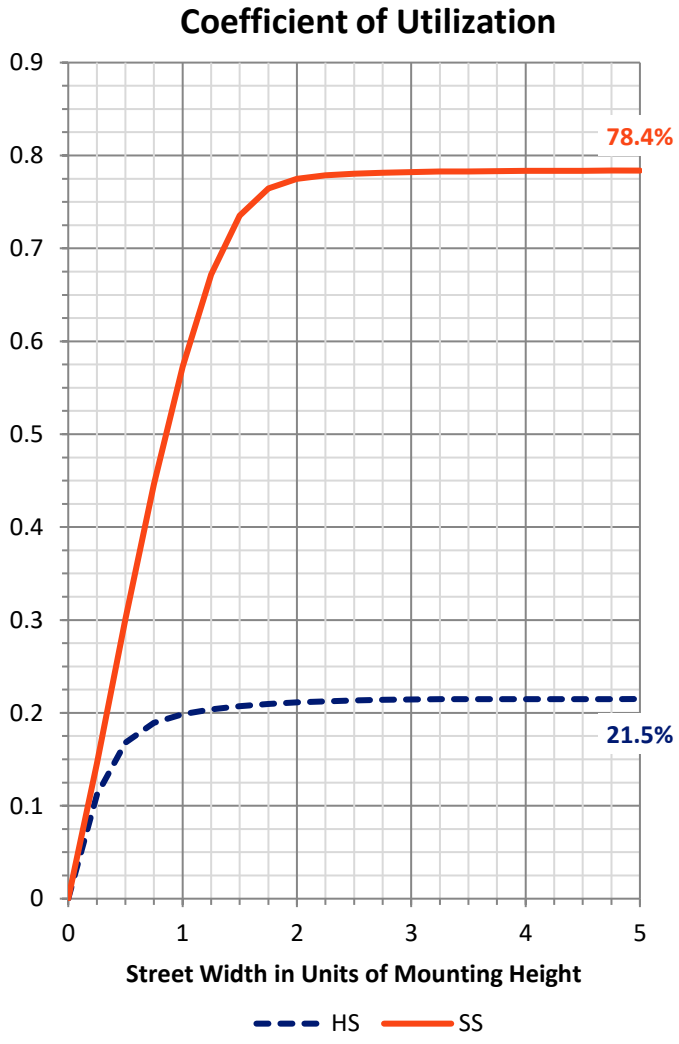
**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 302.7 | 0.0 | 302.7 |
| | % Fixture | 21.7 | 0.0 | 21.7 |
| **Street Side** | Lumens | 1092.4 | 0.0 | 1092.4 |
| | % Fixture | 78.3 | 0.0 | 78.3 |
| **Total** | Lumens | 1395.0 | 0.0 | 1395.0 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 23.2 | 1.7 |
| 10°-20° | 78.4 | 5.6 |
| 20°-30° | 145.6 | 10.4 |
| 30°-40° | 233.0 | 16.7 |
| 40°-50° | 340.6 | 24.4 |
| 50°-60° | 420.4 | 30.1 |
| 60°-70° | 140.5 | 10.1 |
| 70°-80° | 13.1 | 0.9 |
| 80°-90° | 0.3 | 0.0 |
| 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° | 1395.0 | 100.0 |
| 0°-180° | 1395.0 | 100.0 |



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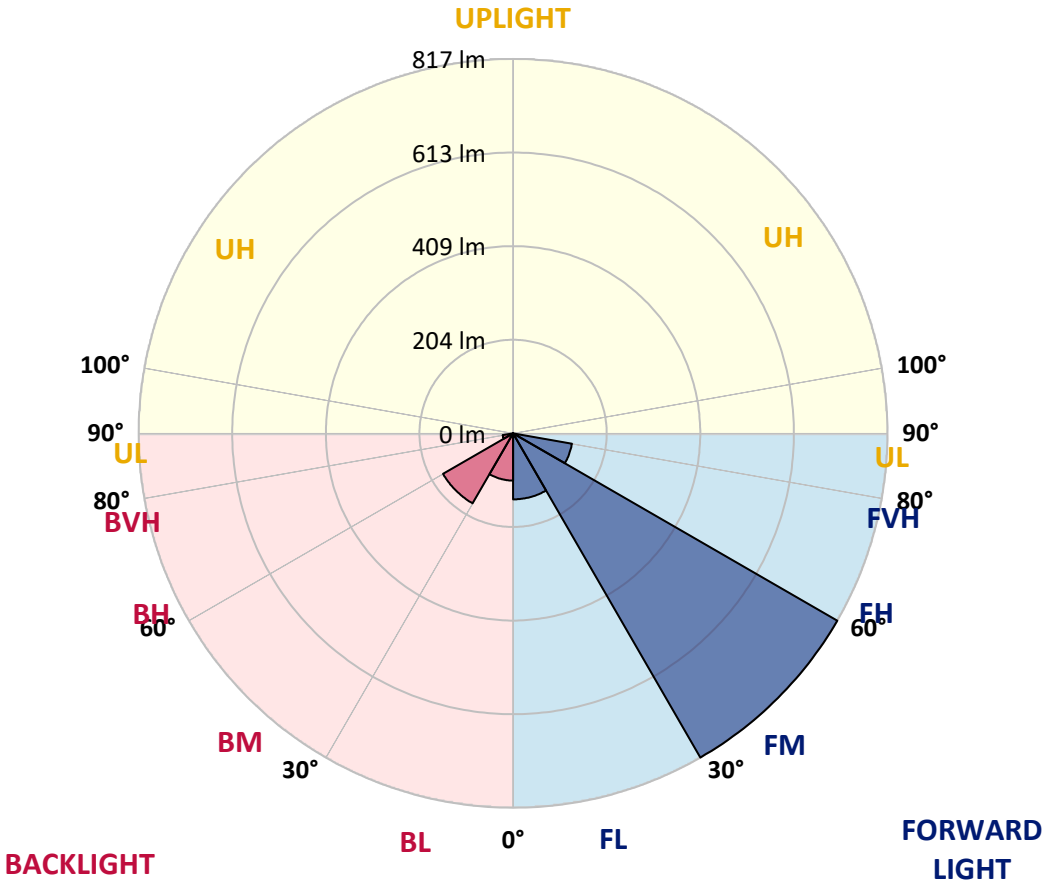
REPORT NUMBER: P629093
CATALOG NUMBER: GWS-SA1A-830-U-T3-W-GRSBK

## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 144.2 | 10.3 | | | |
| FM | (30°-60°) | 817.5 | 58.6 | | | |
| FH | (60°-80°) | 130.5 | 9.4 | | | G0/660 |
| FVH | (80°-90°) | 0.2 | 0.0 | | | G0/10 |
| BL | (0°-30°) | 103.0 | 7.4 | B0/110 | | |
| BM | (30°-60°) | 176.5 | 12.7 | B0/220 | | |
| BH | (60°-80°) | 23.0 | 1.6 | B0/110 | | G0/110 |
| BVH | (80°-90°) | 0.1 | 0.0 | | | G0/10 |
| UL | (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH | (100°-180°) | 0.0 | 0.0 | | U0/0 | |

**BUG Rating: B0-U0-G0**
Type II Short



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Scaled Data Report

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CATALOG NUMBER: GWS-SA1A-830-U-T3-W-GRSBK

**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 15° | 25° | 35° | 45° | 47° | 55° | 65° | 75° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 233.5 | 233.5 | 233.5 | 233.5 | 233.5 | 233.5 | 233.5 | 233.5 | 233.5 | 233.5 | 233.5 |
| 2.5° | 236.0 | 235.8 | 235.6 | 236.6 | 236.3 | 236.1 | 236.4 | 236.4 | 236.4 | 235.5 | 233.5 |
| 5° | 241.6 | 241.6 | 241.5 | 242.4 | 241.6 | 241.1 | 241.3 | 241.3 | 240.7 | 238.9 | 236.4 |
| 7.5° | 250.5 | 250.2 | 249.9 | 250.9 | 250.0 | 249.9 | 250.2 | 249.2 | 248.1 | 245.2 | 241.8 |
| 10° | 263.3 | 263.3 | 262.8 | 263.8 | 263.2 | 262.8 | 262.8 | 262.2 | 260.1 | 255.5 | 250.5 |
| 12.5° | 281.0 | 280.2 | 279.0 | 278.2 | 277.9 | 277.7 | 277.9 | 276.9 | 274.7 | 268.8 | 261.9 |
| 15° | 300.2 | 299.6 | 297.8 | 296.5 | 294.7 | 294.4 | 295.4 | 294.6 | 292.3 | 284.4 | 274.5 |
| 17.5° | 324.5 | 325.3 | 320.8 | 318.1 | 312.9 | 312.6 | 312.9 | 314.2 | 312.6 | 302.4 | 287.9 |
| 20° | 345.3 | 345.9 | 342.5 | 340.6 | 335.9 | 333.8 | 334.4 | 336.5 | 334.7 | 322.8 | 302.7 |
| 22.5° | 367.5 | 368.3 | 364.7 | 360.7 | 358.5 | 358.5 | 361.0 | 363.9 | 361.5 | 345.8 | 319.5 |
| 25° | 394.0 | 394.7 | 391.7 | 386.4 | 382.7 | 387.4 | 390.9 | 398.7 | 394.7 | 373.3 | 339.4 |
| 27.5° | 424.5 | 424.6 | 420.4 | 414.9 | 413.0 | 421.7 | 425.3 | 437.3 | 435.6 | 404.2 | 360.5 |
| 30° | 457.0 | 457.2 | 456.2 | 452.5 | 450.7 | 462.2 | 467.0 | 484.4 | 483.2 | 442.6 | 389.2 |
| 32.5° | 490.9 | 490.9 | 492.6 | 492.3 | 494.4 | 513.2 | 521.0 | 540.7 | 539.6 | 489.6 | 424.8 |
| 35° | 524.9 | 525.0 | 528.1 | 535.9 | 544.6 | 569.6 | 579.8 | 603.7 | 601.1 | 545.8 | 470.3 |
| 37.5° | 563.6 | 561.9 | 566.2 | 577.8 | 597.3 | 626.1 | 635.8 | 658.6 | 655.7 | 603.2 | 529.7 |
| 40° | 610.2 | 607.3 | 607.3 | 620.9 | 642.9 | 676.1 | 684.4 | 695.7 | 685.8 | 649.7 | 588.0 |
| 42.5° | 661.7 | 659.0 | 655.4 | 667.4 | 685.8 | 711.7 | 718.5 | 715.5 | 707.4 | 693.6 | 654.4 |
| 45° | 713.9 | 709.6 | 712.1 | 719.4 | 730.0 | 742.4 | 744.9 | 730.7 | 727.0 | 730.9 | 709.3 |
| 47.5° | 753.5 | 750.6 | 756.6 | 766.8 | 775.6 | 777.3 | 775.6 | 755.8 | 755.5 | 769.2 | 747.4 |
| 50° | 766.8 | 767.1 | 783.7 | 806.0 | 820.1 | 821.5 | 819.1 | 796.4 | 793.4 | 797.4 | 767.9 |
| 52.5° | 768.1 | 769.4 | 793.5 | 836.1 | 874.5 | 892.0 | 890.0 | 865.6 | 835.5 | 831.1 | 799.0 |
| 55° | 736.8 | 744.5 | 778.1 | 840.3 | 922.0 | 977.8 | 984.3 | 937.5 | 892.8 | 889.1 | 865.9 |
| 57.5° | 589.0 | 604.5 | 645.2 | 733.8 | 869.0 | 986.7 | 1003.6 | 969.9 | 926.6 | 910.8 | 847.9 |
| 60° | 352.1 | 371.3 | 410.4 | 519.0 | 661.4 | 811.0 | 840.0 | 844.7 | 824.8 | 779.0 | 650.5 |
| 62.5° | 151.1 | 149.5 | 197.6 | 280.8 | 393.4 | 515.5 | 528.6 | 549.0 | 566.3 | 518.4 | 394.8 |
| 65° | 51.8 | 56.4 | 78.4 | 126.6 | 196.9 | 239.4 | 251.0 | 269.3 | 293.9 | 242.6 | 144.6 |
| 67.5° | 32.1 | 34.0 | 45.2 | 74.8 | 106.2 | 104.6 | 99.4 | 96.5 | 93.9 | 64.3 | 39.7 |
| 70° | 23.3 | 24.9 | 31.7 | 51.5 | 71.4 | 50.2 | 43.6 | 35.3 | 39.2 | 36.1 | 28.2 |
| 72.5° | 15.7 | 17.0 | 21.9 | 31.3 | 36.6 | 24.5 | 22.7 | 25.7 | 31.1 | 29.6 | 23.0 |
| 75° | 9.4 | 10.2 | 12.5 | 15.2 | 14.9 | 12.6 | 12.8 | 18.1 | 23.8 | 22.2 | 16.4 |
| 77.5° | 6.5 | 6.8 | 8.3 | 9.9 | 7.3 | 3.9 | 3.6 | 5.0 | 8.1 | 8.1 | 5.5 |
| 80° | 1.6 | 2.1 | 2.1 | 1.3 | 1.1 | 1.0 | 1.0 | 1.5 | 2.3 | 1.6 | 0.8 |
| 82.5° | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 | 0.3 | 0.3 | 0.3 |
| 85° | 0.0 | 0.0 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 | 0.3 | 0.3 |
| 87.5° | 0.0 | 0.0 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 | 0.3 |
| 90° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

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Scaled Data Report

REPORT NUMBER: P629093
CATALOG NUMBER: GWS-SA1A-830-U-T3-W-GRSBK

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 233.5 | 233.5 | 233.5 | 233.5 | 233.5 | 233.5 | 233.5 | 233.5 | 233.5 | 233.5 | 233.5 |
| 2.5° | 234.7 | 232.7 | 234.0 | 233.7 | 234.7 | 235.0 | 233.5 | 233.2 | 233.4 | 231.4 | 230.8 |
| 5° | 236.9 | 234.7 | 235.3 | 234.7 | 235.8 | 236.8 | 236.3 | 236.9 | 237.7 | 236.3 | 235.6 |
| 7.5° | 241.8 | 239.5 | 239.4 | 238.4 | 240.0 | 240.7 | 240.5 | 242.3 | 243.9 | 242.9 | 241.9 |
| 10° | 250.2 | 247.1 | 246.8 | 246.0 | 246.5 | 247.0 | 245.2 | 245.5 | 247.0 | 245.8 | 245.3 |
| 12.5° | 260.6 | 256.8 | 256.0 | 254.1 | 254.1 | 251.7 | 247.8 | 247.0 | 248.1 | 247.3 | 246.5 |
| 15° | 271.7 | 266.7 | 265.4 | 262.0 | 258.8 | 254.3 | 250.2 | 249.2 | 250.0 | 249.1 | 248.4 |
| 17.5° | 284.2 | 278.5 | 274.3 | 268.3 | 261.2 | 255.9 | 251.3 | 249.2 | 247.9 | 246.0 | 245.8 |
| 20° | 296.5 | 289.1 | 281.9 | 272.4 | 263.0 | 254.9 | 247.5 | 241.9 | 237.2 | 234.3 | 233.2 |
| 22.5° | 310.8 | 299.8 | 288.3 | 274.8 | 261.4 | 249.1 | 236.0 | 226.6 | 218.5 | 215.7 | 214.4 |
| 25° | 326.0 | 311.7 | 294.6 | 277.1 | 255.9 | 236.1 | 218.3 | 204.4 | 193.7 | 190.1 | 188.7 |
| 27.5° | 342.8 | 323.2 | 301.1 | 276.6 | 244.5 | 217.7 | 194.0 | 176.7 | 166.2 | 162.9 | 164.1 |
| 30° | 364.2 | 338.1 | 309.2 | 271.6 | 227.5 | 191.7 | 164.1 | 149.5 | 141.5 | 138.5 | 138.6 |
| 32.5° | 392.7 | 359.5 | 321.0 | 260.9 | 205.7 | 162.3 | 138.0 | 127.3 | 121.9 | 117.9 | 117.6 |
| 35° | 433.5 | 392.1 | 332.0 | 243.7 | 179.1 | 136.0 | 118.4 | 110.0 | 102.5 | 97.8 | 98.6 |
| 37.5° | 482.4 | 433.0 | 338.0 | 220.6 | 149.3 | 115.6 | 103.6 | 95.1 | 86.6 | 79.7 | 80.5 |
| 40° | 540.4 | 486.6 | 337.5 | 190.1 | 122.1 | 101.7 | 91.3 | 81.3 | 70.8 | 64.5 | 65.1 |
| 42.5° | 605.0 | 537.3 | 327.0 | 157.9 | 101.2 | 90.4 | 79.5 | 66.9 | 56.7 | 52.8 | 53.0 |
| 45° | 661.1 | 578.5 | 308.5 | 124.5 | 85.2 | 79.4 | 67.2 | 54.3 | 49.7 | 47.0 | 46.8 |
| 47.5° | 702.5 | 608.6 | 282.1 | 98.0 | 72.2 | 69.3 | 55.2 | 48.6 | 45.0 | 42.8 | 42.4 |
| 50° | 725.7 | 619.1 | 253.0 | 76.8 | 61.1 | 58.8 | 49.4 | 44.0 | 41.6 | 40.2 | 39.8 |
| 52.5° | 756.8 | 631.7 | 232.1 | 60.6 | 51.2 | 48.1 | 45.5 | 41.0 | 39.4 | 38.2 | 37.7 |
| 55° | 806.0 | 656.2 | 213.9 | 48.1 | 42.6 | 41.9 | 42.9 | 39.2 | 38.2 | 36.4 | 35.8 |
| 57.5° | *759.7* | *589.5* | *166.2* | *37.2* | *36.0* | *38.4* | *41.5* | *37.4* | *35.0* | *33.4* | *32.7* |
| 60° | 534.6 | 391.9 | 83.6 | 30.0 | 32.1 | 36.0 | 39.0 | 33.8 | 31.4 | 31.7 | 31.4 |
| 62.5° | 294.7 | 196.1 | 37.6 | 25.1 | 27.9 | 31.7 | 33.4 | 29.3 | 27.7 | 30.4 | 30.9 |
| 65° | 96.4 | 66.7 | 21.7 | 19.4 | 22.0 | 25.9 | 28.8 | 27.9 | 27.5 | 30.8 | 31.7 |
| 67.5° | 29.6 | 22.0 | 14.7 | 13.9 | 15.2 | 19.1 | 24.3 | 30.1 | 32.4 | 33.4 | 33.8 |
| 70° | 22.2 | 17.3 | 12.6 | 11.8 | 12.5 | 14.6 | 20.6 | 25.1 | 23.6 | 23.8 | 23.5 |
| 72.5° | 17.8 | 13.8 | 10.9 | 10.4 | 10.4 | 10.0 | 10.9 | 13.6 | 15.4 | 16.2 | 16.2 |
| 75° | 12.5 | 9.7 | 8.3 | 7.6 | 6.0 | 4.9 | 4.4 | 4.4 | 3.9 | 3.7 | 3.6 |
| 77.5° | 4.2 | 3.6 | 3.2 | 2.6 | 1.8 | 1.5 | 1.3 | 1.1 | 0.8 | 0.5 | 0.3 |
| 80° | 0.6 | 0.5 | 0.3 | 0.3 | 0.3 | 0.2 | 0.2 | 0.2 | 0.0 | 0.0 | 0.0 |
| 82.5° | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.2 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 |
| 85° | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.2 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 |
| 87.5° | 0.3 | 0.3 | 0.3 | 0.3 | 0.2 | 0.2 | 0.2 | 0.0 | 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 |

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

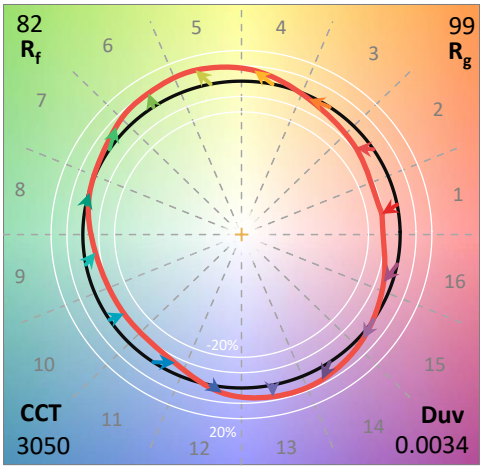
## Test Information

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

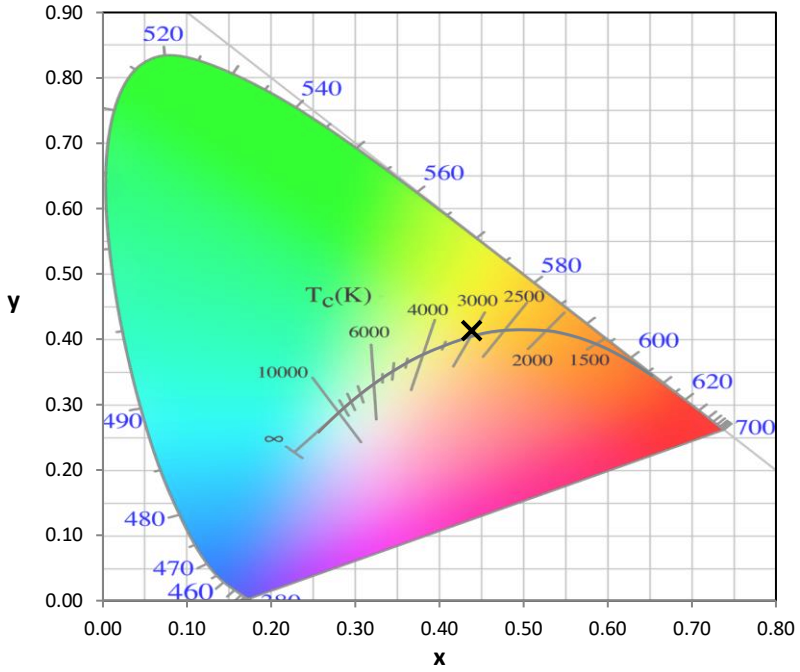
| | |
|---|---|
| Stabilization Time: | 20M |
| Operation Time: | 1H 20M |
| Sphere Temperature (°C): | 24.2 |

REPORT NUMBER: SP1-2408-195-9

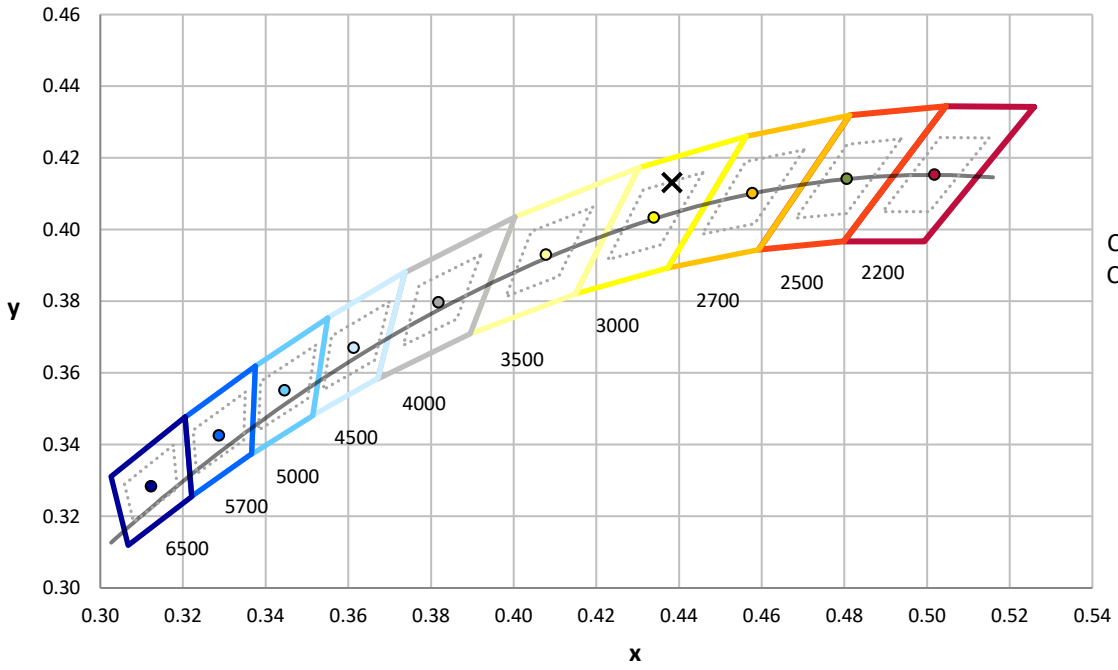
| Measurement and Test Equipment | | | |
|---|---|---|---|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 6/18/2024 | 12/18/2024 |
| Power Meter | INXT2011004 | 2/8/2024 | 2/8/2025 |
| AC Power Source | IN0063 | 10/24/2023 | 10/24/2024 |
| DC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

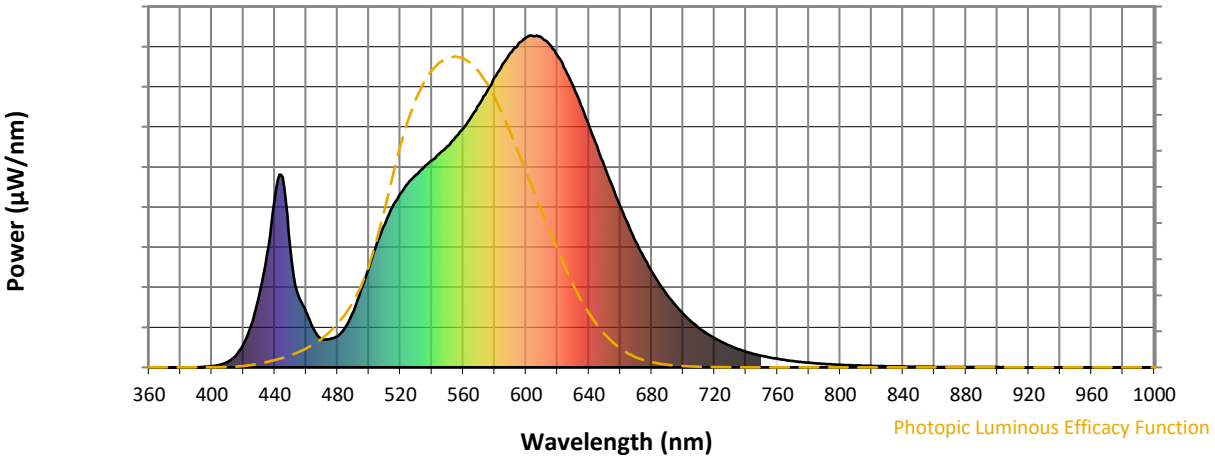



CCT = 3050K
CIE x = 0.4383
CIE y = 0.4131
Duv = 0.0034

Point lies inside the ANSI 3000K 4-step quadrangle

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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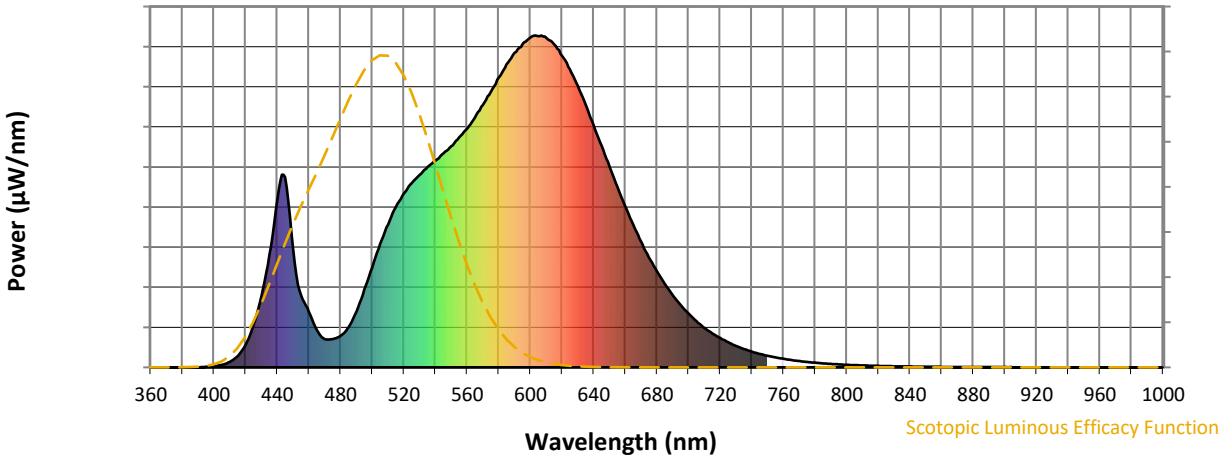
## Scotopic Flux vs. Wavelength




**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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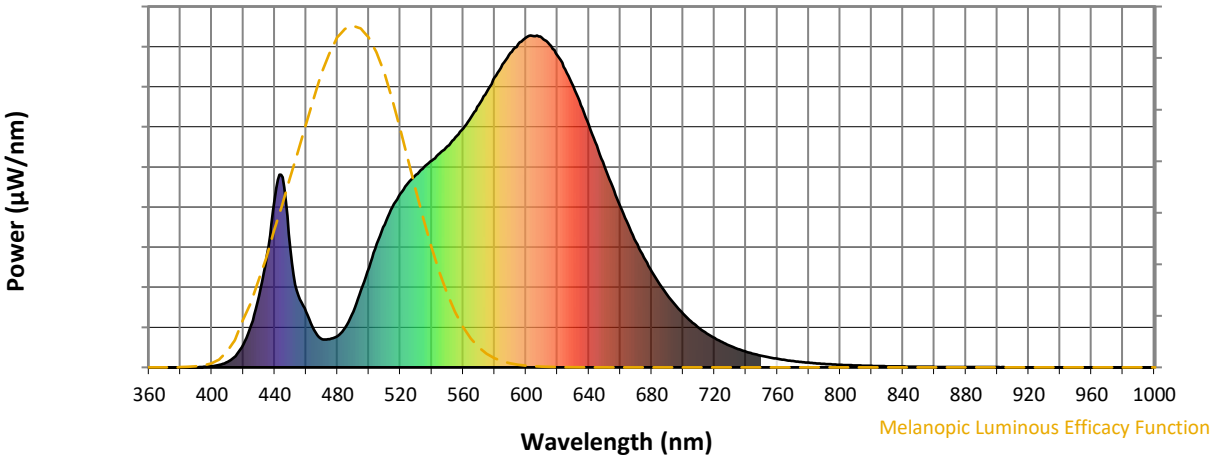
## Melanopic Flux vs. Wavelength




**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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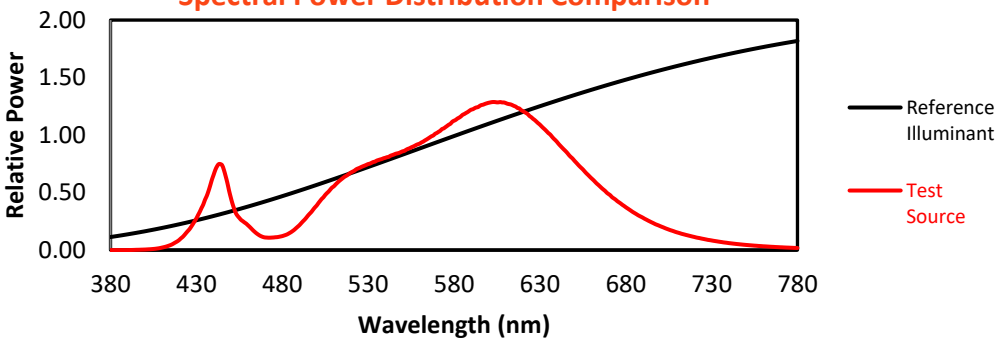
# TM-30-18

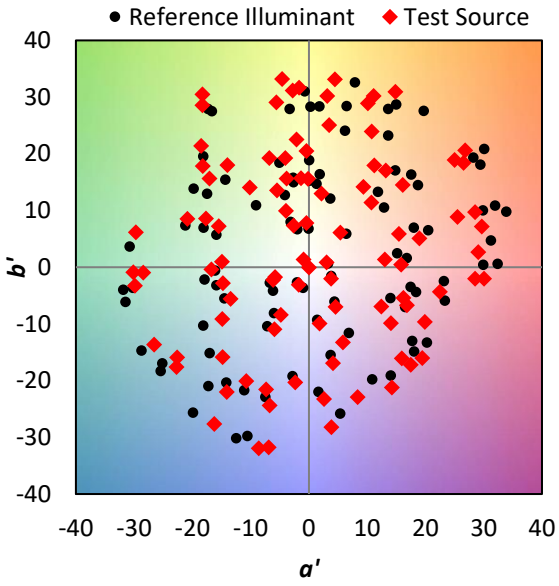
## Summary

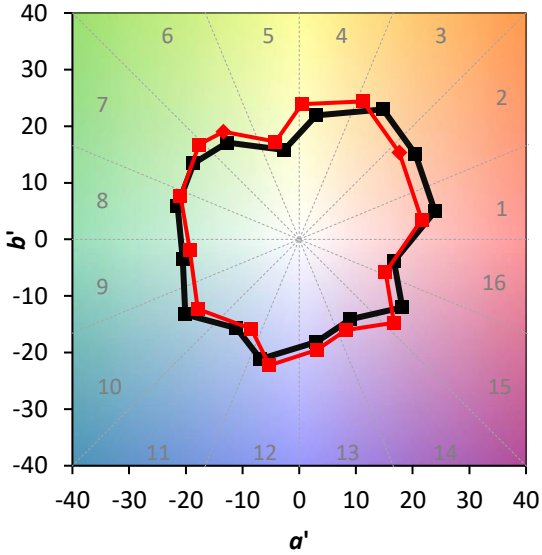
$R_f$ = 81.5
$R_g$ = 99.2
CIE $R_a$ = 81.0
$R_9$ = 7.1

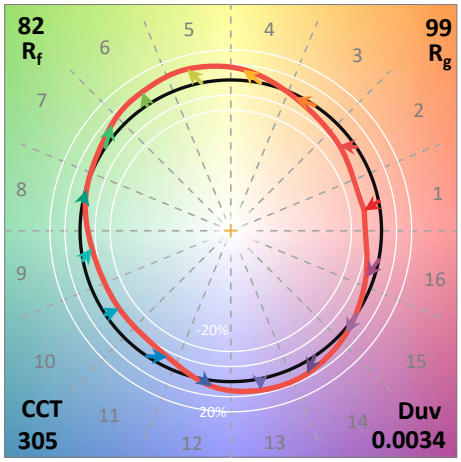
## Spectral Power Distribution Comparison

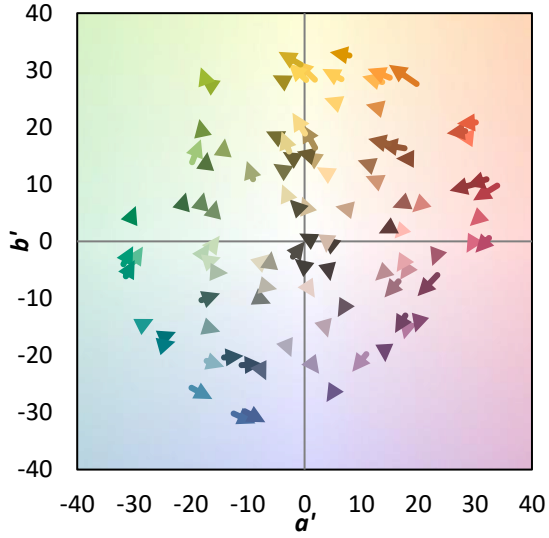



## Color Vector Graphics



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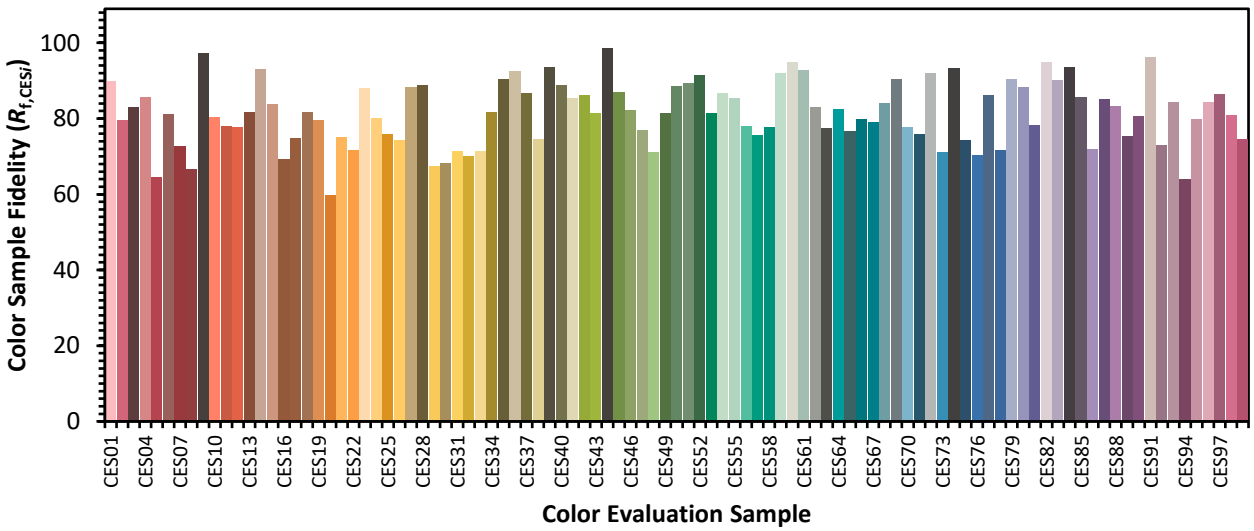
# TM-30-18

**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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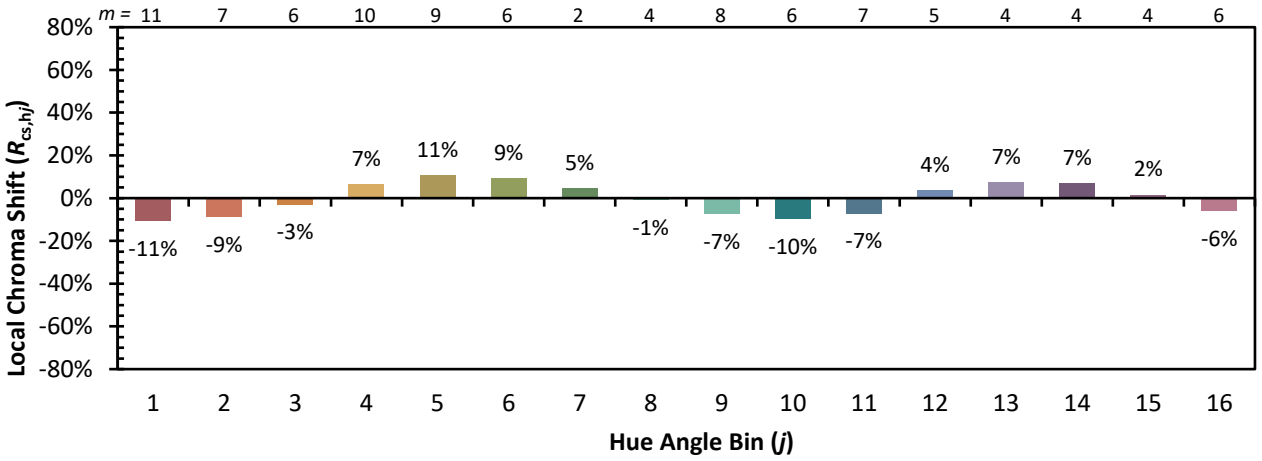
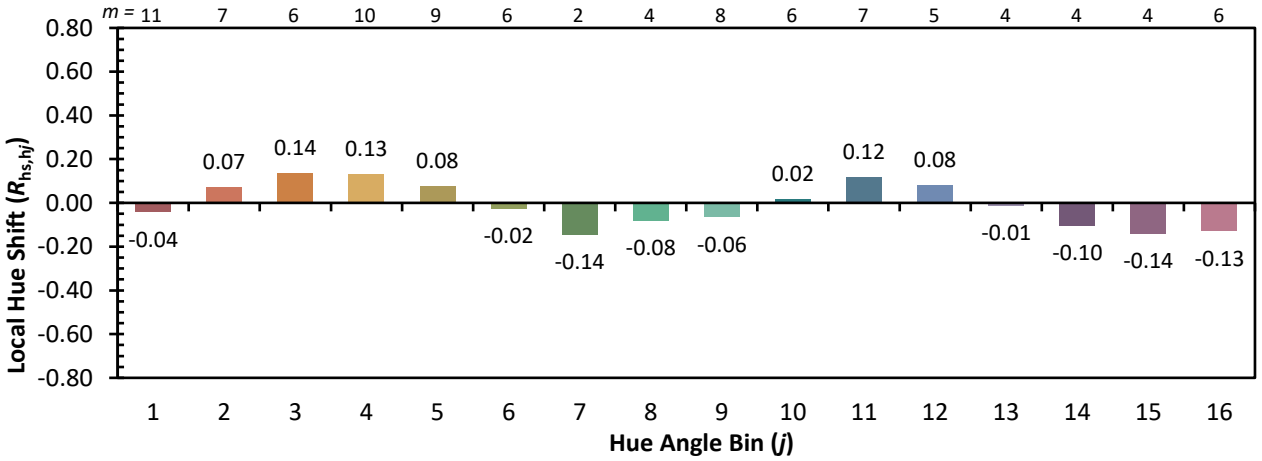
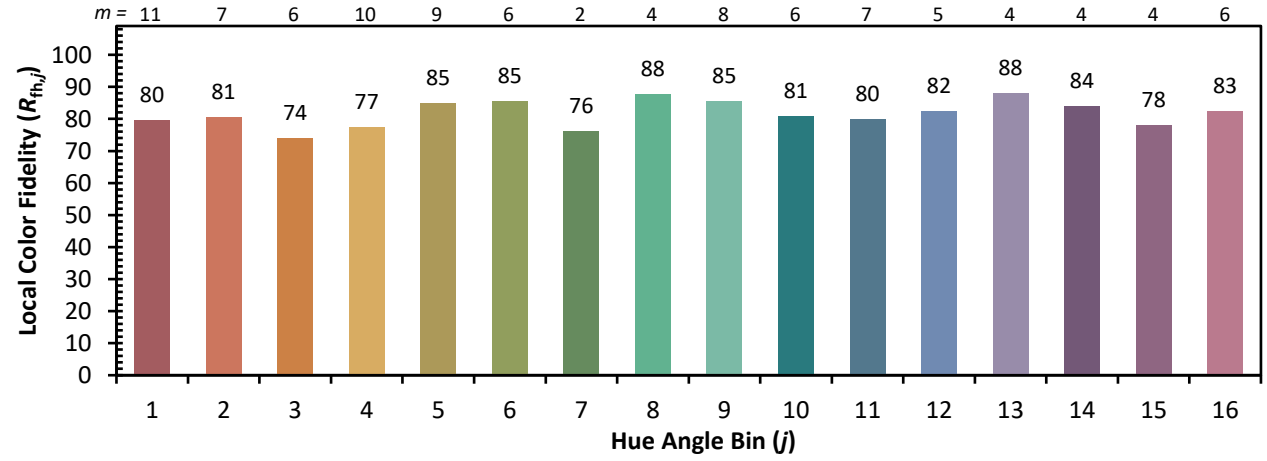
# TM-30-18

## Color Rendition by Hue-Angle Bin



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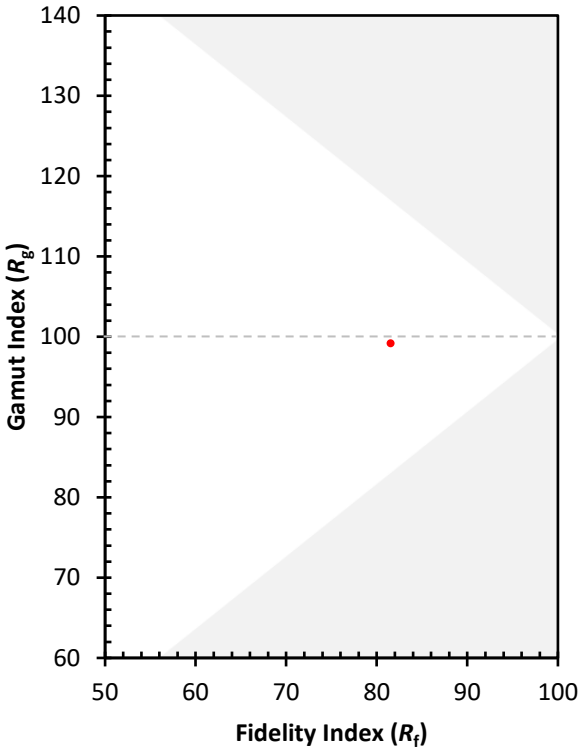
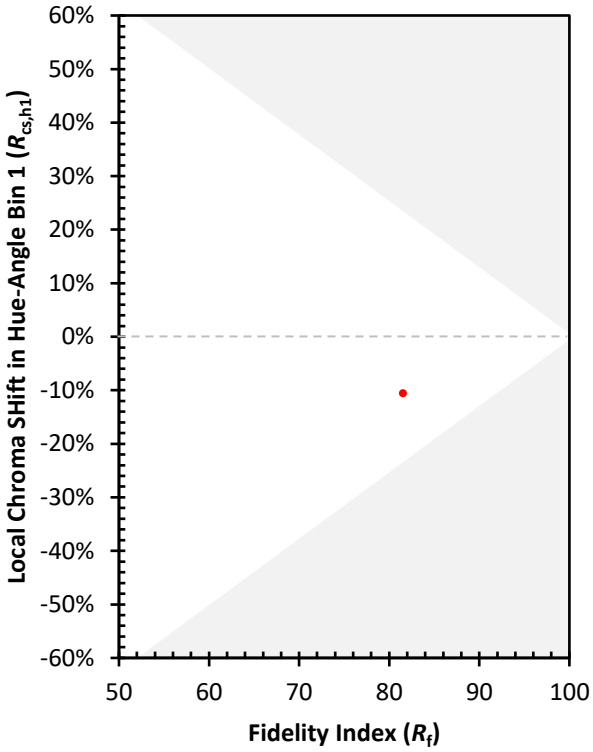
## TM-30-18

### Measure Comparisons

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