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: P635492

Luminaire Tested: GWS-SA3D-830-U-AFL-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: | P635492 |
| | TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-46) |
| Test Lab: | COOPER LIGHTING SOLUTIONS |
| Issue Date: | 1/10/2023 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS |
| Product Line: | McGRAW-EDISON |
| Catalog Number: | GWS-SA3D-830-U-AFL-W-GRSBK |
| Description: | GALLEON WALL SLIM LUMINAIRE. (3) LIGHTSQUARES WITH 16 LEDS EACH AND AUTOMOTIVE FRONTLINE OPTICS W/ FACTORY INSTALLED GLARE SHIELD, BK |
| Light Source: | (48) 3000K CCT, 80 CRI LEDS |
| Ballast/Driver: | - |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 10528.8 lumens |
| Efficiency: | N/A |
| Efficacy: | 87.2 lumens/watt |
| Luminous Opening: | Rectangular (W 1.5' x L: 0.5' x H: 0') |
| IES Classification: | Type II - Short |
| BUG Rating: | B2 - U0 - G0 |

| | |
|---|---|
| Input Watts (W): | 120.8 |
| 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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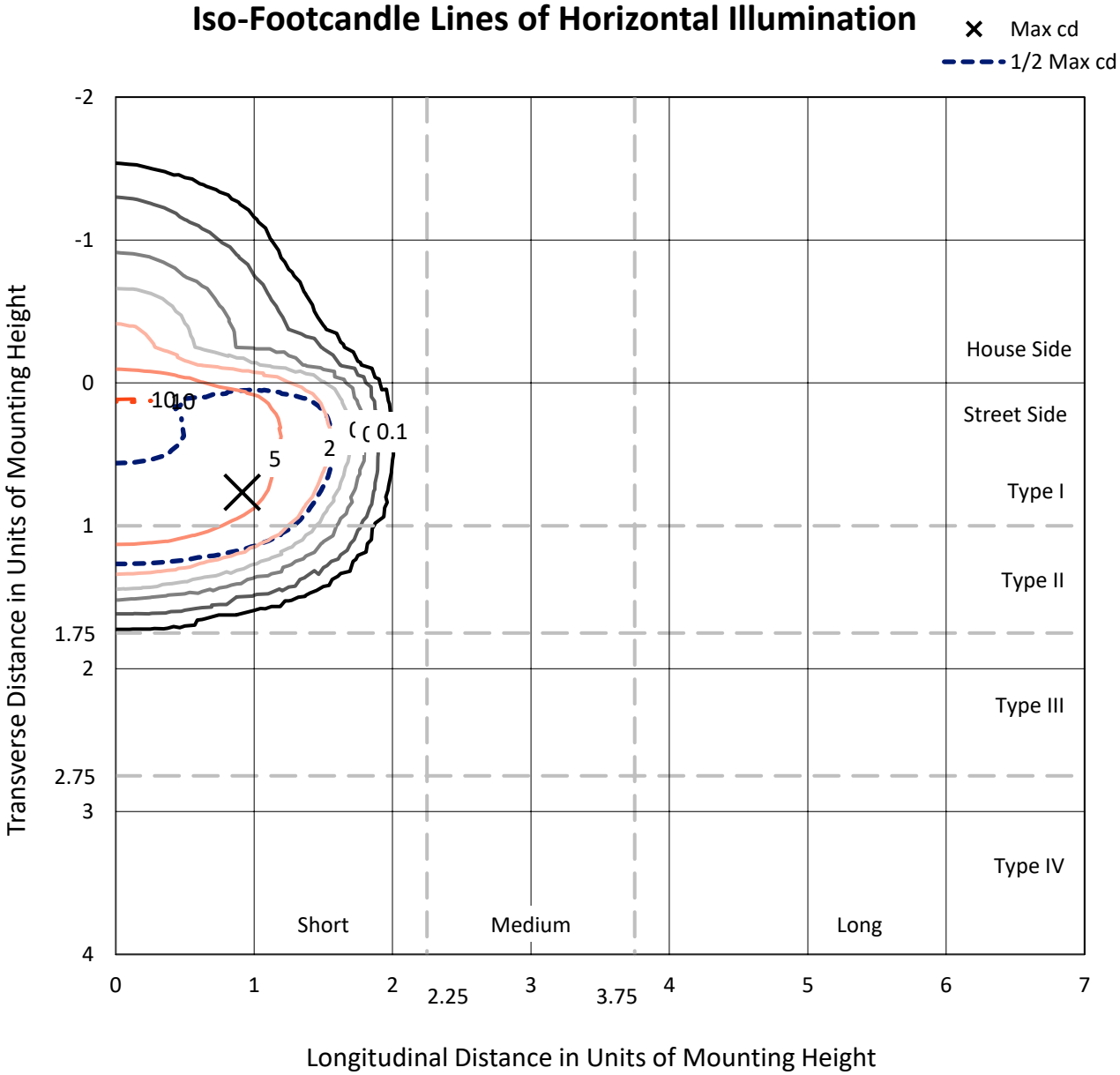
Scaled Data Report

REPORT NUMBER: P635492
CATALOG NUMBER: GWS-SA3D-830-U-AFL-W-GRSBK

## Iso-Footcandle Lines of Horizontal Illumination




Based on 20 foot mounting height. Maximum calculated value = 10.2 fc
Type II - Short - N/A

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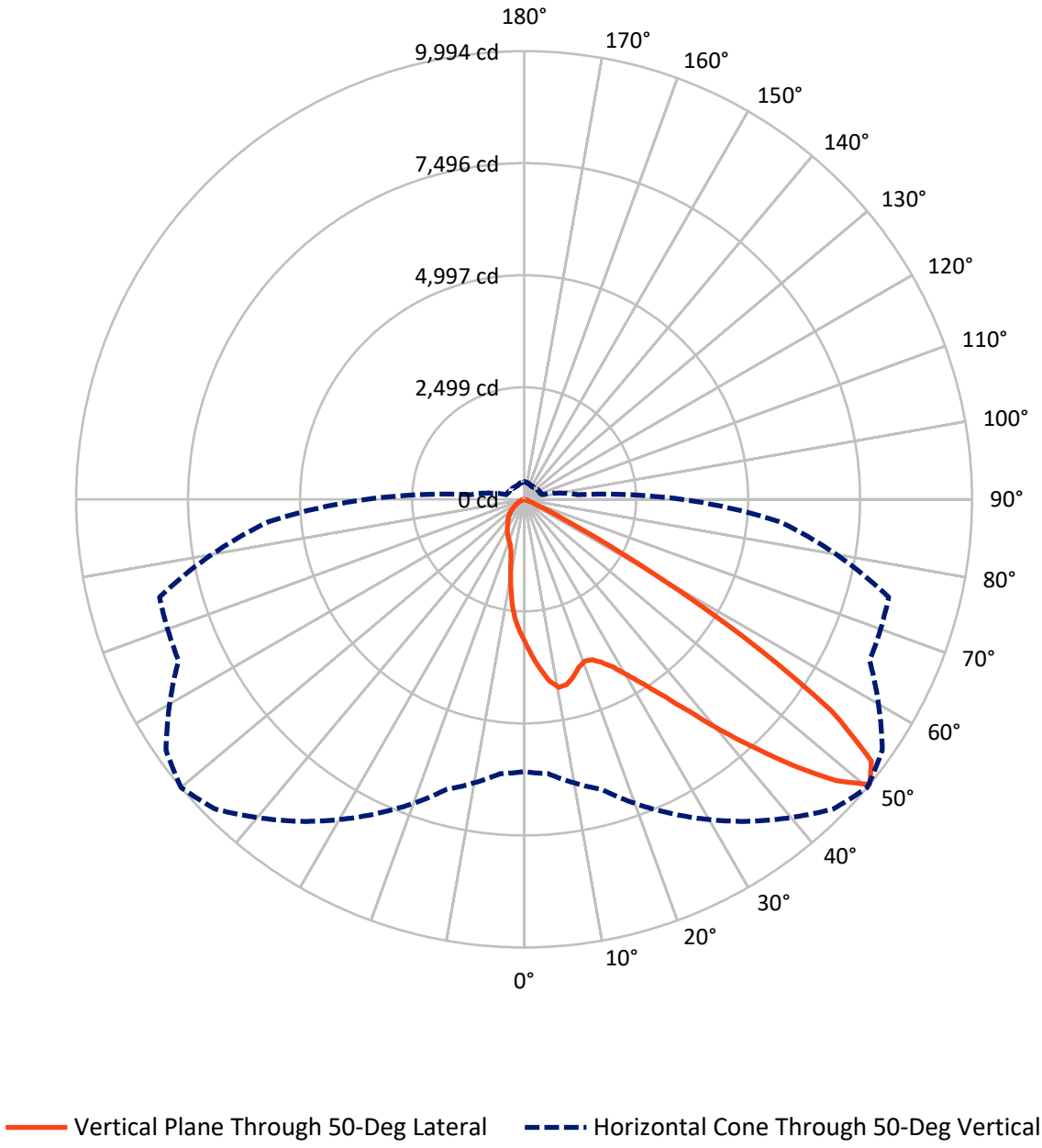
## Luminous Intensity Polar Plot



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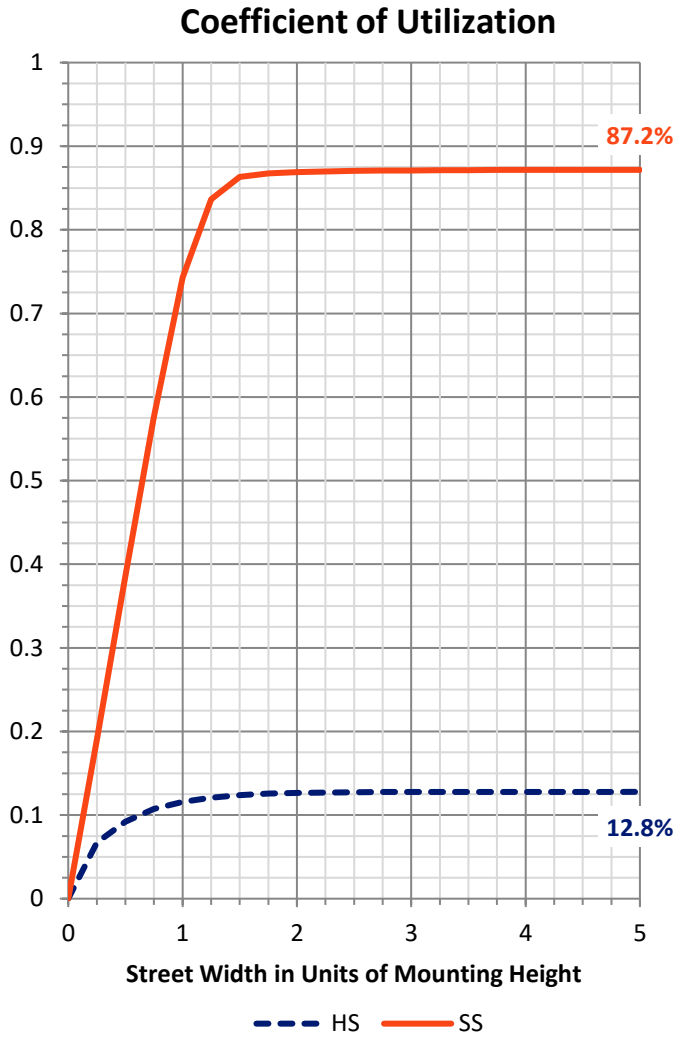
REPORT NUMBER: P635492
CATALOG NUMBER: GWS-SA3D-830-U-AFL-W-GRSBK

**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 1352.8 | 0.0 | 1352.8 |
| | % Fixture | 12.8 | 0.0 | 12.8 |
| **Street Side** | Lumens | 9176.0 | 0.0 | 9176.0 |
| | % Fixture | 87.2 | 0.0 | 87.2 |
| **Total** | Lumens | 10528.8 | 0.0 | 10528.8 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 295.9 | 2.8 |
| 10°-20° | 763.5 | 7.3 |
| 20°-30° | 1260.0 | 12.0 |
| 30°-40° | 2079.2 | 19.7 |
| 40°-50° | 3289.8 | 31.2 |
| 50°-60° | 2490.8 | 23.7 |
| 60°-70° | 311.7 | 3.0 |
| 70°-80° | 35.3 | 0.3 |
| 80°-90° | 2.7 | 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° | 10528.8 | 100.0 |
| 0°-180° | 10528.8 | 100.0 |



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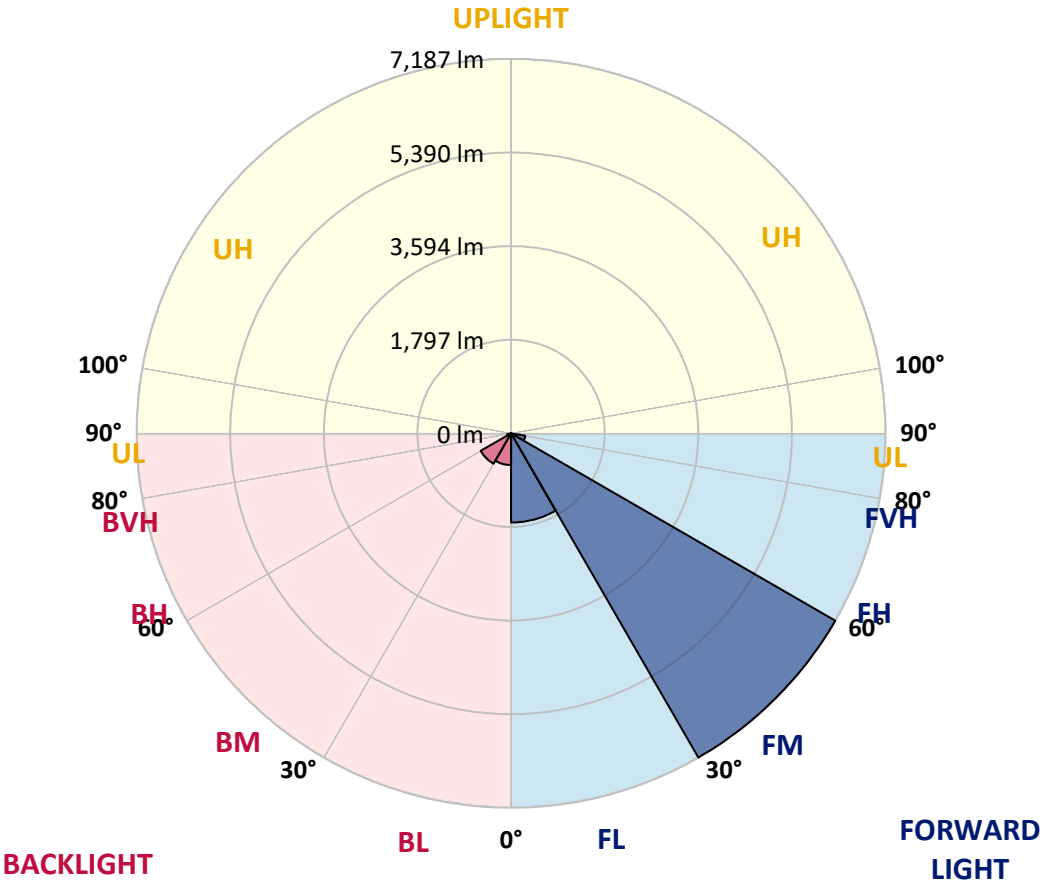
CATALOG NUMBER: GWS-SA3D-830-U-AFL-W-GRSBK

## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 1712.1 | 16.3 | | | |
| FM | (30°-60°) | 7187.0 | 68.3 | | | |
| FH | (60°-80°) | 275.6 | 2.6 | | | G0/660 |
| FVH | (80°-90°) | 1.3 | 0.0 | | | G0/10 |
| BL | (0°-30°) | 607.2 | 5.8 | B2/1000 | | |
| BM | (30°-60°) | 672.8 | 6.4 | B1/1000 | | |
| BH | (60°-80°) | 71.4 | 0.7 | B0/110 | | G0/110 |
| BVH | (80°-90°) | 1.4 | 0.0 | | | G0/10 |
| UL | (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH | (100°-180°) | 0.0 | 0.0 | | U0/0 | |

**BUG Rating: B2-U0-G0**
Type II Short



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REPORT NUMBER: P635492
CATALOG NUMBER: GWS-SA3D-830-U-AFL-W-GRSBK

**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 15° | 25° | 35° | 45° | 50° | 55° | 65° | 75° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 3189.8 | 3189.8 | 3189.8 | 3189.8 | 3189.8 | 3189.8 | *3189.8* | 3189.8 | 3189.8 | 3189.8 | 3189.8 |
| 2.5° | 3634.8 | 3663.8 | 3655.8 | 3617.7 | 3576.6 | 3547.6 | *3502.5* | 3488.4 | 3386.2 | 3315.1 | 3239.9 |
| 5° | 4073.7 | 4082.7 | 4072.7 | 4026.6 | 3954.4 | 3885.3 | *3811.1* | 3768.0 | 3596.7 | 3442.3 | 3285.0 |
| 7.5° | 4178.9 | 4167.9 | 4186.9 | 4210.0 | 4200.0 | 4169.9 | *4091.7* | 4044.6 | 3840.2 | 3588.7 | 3350.2 |
| 10° | 3850.2 | 3825.2 | 3896.3 | 4015.6 | 4140.8 | 4282.1 | *4262.1* | 4266.1 | 4077.7 | 3773.1 | 3435.3 |
| 12.5° | 3414.3 | 3404.3 | 3457.4 | 3595.7 | 3841.2 | 4161.9 | *4239.0* | 4368.3 | 4295.2 | 3972.5 | 3532.5 |
| 15° | 3222.9 | 3227.9 | 3260.0 | 3347.1 | 3523.5 | 3922.4 | *4107.8* | 4341.3 | 4489.6 | 4165.9 | 3639.8 |
| 17.5° | 3251.9 | 3270.0 | 3269.0 | 3298.0 | 3405.3 | 3724.9 | *3941.4* | 4256.1 | 4639.9 | 4388.4 | 3763.0 |
| 20° | 3449.4 | 3467.4 | 3440.3 | 3418.3 | 3454.4 | 3674.8 | *3854.2* | 4169.9 | 4741.1 | 4612.8 | 3893.3 |
| 22.5° | 3745.0 | 3766.0 | 3701.9 | 3638.8 | 3615.7 | 3757.0 | *3887.3* | 4134.8 | 4818.3 | 4818.3 | 4009.6 |
| 25° | 4102.8 | 4131.8 | 4032.6 | 3920.4 | 3856.2 | 3930.4 | *4028.6* | 4214.0 | 4897.5 | 5002.7 | 4088.7 |
| 27.5° | 4502.6 | 4503.6 | 4418.4 | 4292.2 | 4171.9 | 4180.9 | *4240.0* | 4392.4 | 4984.6 | 5201.1 | 4150.9 |
| 30° | 4952.6 | 4955.6 | 4842.3 | 4691.0 | 4539.7 | 4498.6 | *4548.7* | 4664.0 | 5166.0 | 5450.6 | 4237.0 |
| 32.5° | 5533.8 | 5547.8 | 5385.5 | 5163.0 | 4966.6 | 4889.4 | *4918.5* | 5039.8 | 5454.6 | 5763.3 | 4366.3 |
| 35° | 6319.5 | 6334.5 | 6095.0 | 5801.4 | 5488.7 | 5372.5 | *5401.5* | 5523.8 | 5872.5 | 6207.2 | 4572.8 |
| 37.5° | 7095.1 | 7115.2 | 6872.7 | 6599.1 | 6170.2 | 5977.8 | *6007.8* | 6124.1 | 6499.9 | 6820.6 | 4903.5 |
| 40° | 7631.3 | 7658.3 | 7583.2 | 7398.8 | 7000.9 | 6748.4 | *6784.5* | 6826.6 | 7190.3 | 7554.1 | 5332.4 |
| 42.5° | 7913.9 | 7952.0 | 7984.0 | 8078.2 | 7868.8 | 7657.3 | *7596.2* | 7599.2 | 7892.8 | 8301.7 | 5778.3 |
| 45° | 7930.9 | 7968.0 | 8132.4 | 8496.1 | 8655.5 | 8611.4 | *8500.1* | 8425.0 | 8429.0 | 8799.8 | 6056.9 |
| 47.5° | 7379.8 | 7448.9 | 7756.6 | 8469.1 | 9068.4 | 9434.1 | *9378.0* | 9199.6 | 8654.5 | 8832.9 | 6026.9 |
| 50° | *6074.0* | *6142.1* | *6701.3* | *7726.5* | *8767.7* | *9762.8* | *9994.3* | *9754.8* | *8507.2* | *8421.0* | *5717.2* |
| 52.5° | 4411.4 | 4418.4 | 4781.2 | 5978.8 | 7549.1 | 9156.5 | *9701.7* | 9678.7 | 8282.7 | 7921.9 | 5294.3 |
| 55° | 2095.5 | 2070.4 | 2478.3 | 3374.2 | 5221.1 | 7405.8 | *8324.8* | 8585.3 | 7964.0 | 7561.1 | 4966.6 |
| 57.5° | 610.3 | 622.3 | 803.7 | 1316.8 | 2611.6 | 4733.1 | *5701.2* | 6186.2 | 6537.0 | 6216.3 | 3852.2 |
| 60° | 273.6 | 274.6 | 305.7 | 400.9 | 869.9 | 2201.7 | *2947.3* | 3547.6 | 3908.3 | 3621.7 | 1911.1 |
| 62.5° | 198.4 | 199.4 | 211.5 | 226.5 | 295.6 | 745.6 | *1105.4* | 1473.1 | 1500.2 | 982.1 | 484.0 |
| 65° | 165.4 | 165.4 | 167.4 | 167.4 | 177.4 | 266.6 | *335.7* | 432.9 | 364.8 | 270.6 | 189.4 |
| 67.5° | 133.3 | 134.3 | 136.3 | 136.3 | 133.3 | 133.3 | *144.3* | 158.3 | 169.4 | 209.4 | 174.4 |
| 70° | 104.2 | 103.2 | 103.2 | 104.2 | 101.2 | 86.2 | *93.2* | 106.2 | 116.2 | 163.3 | 151.3 |
| 72.5° | 81.2 | 82.2 | 81.2 | 77.2 | 70.1 | 51.1 | *55.1* | 69.1 | 74.2 | 102.2 | 102.2 |
| 75° | 61.1 | 62.1 | 58.1 | 44.1 | 29.1 | 16.0 | *21.0* | 34.1 | 43.1 | 50.1 | 37.1 |
| 77.5° | 8.0 | 8.0 | 6.0 | 6.0 | 5.0 | 6.0 | *6.0* | 8.0 | 12.0 | 12.0 | 9.0 |
| 80° | 1.0 | 1.0 | 1.0 | 2.0 | 3.0 | 4.0 | *4.0* | 4.0 | 4.0 | 5.0 | 5.0 |
| 82.5° | 1.0 | 1.0 | 1.0 | 1.0 | 3.0 | 3.0 | *4.0* | 4.0 | 4.0 | 4.0 | 4.0 |
| 85° | 0.0 | 0.0 | 0.0 | 1.0 | 2.0 | 3.0 | *3.0* | 4.0 | 4.0 | 4.0 | 4.0 |
| 87.5° | 0.0 | 0.0 | 0.0 | 1.0 | 2.0 | 3.0 | *3.0* | 3.0 | 4.0 | 4.0 | 4.0 |
| 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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Scaled Data Report

REPORT NUMBER: P635492
CATALOG NUMBER: GWS-SA3D-830-U-AFL-W-GRSBK

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 3189.8 | 3189.8 | 3189.8 | 3189.8 | 3189.8 | 3189.8 | 3189.8 | 3189.8 | 3189.8 | 3189.8 | 3189.8 |
| 2.5° | 3194.8 | 3136.7 | 3066.5 | 3018.4 | 2950.3 | 2905.2 | 2841.1 | 2798.0 | 2760.9 | 2731.8 | 2747.9 |
| 5° | 3195.8 | 3103.6 | 2960.3 | 2838.1 | 2704.8 | 2582.5 | 2451.2 | 2348.0 | 2254.8 | 2212.7 | 2235.8 |
| 7.5° | 3215.9 | 3083.6 | 2864.1 | 2646.6 | 2391.1 | 2138.6 | 1902.1 | 1709.6 | 1614.4 | 1569.3 | 1583.4 |
| 10° | 3254.9 | 3074.6 | 2756.9 | 2396.1 | 1981.2 | 1636.5 | 1407.0 | 1276.7 | 1223.6 | 1195.6 | 1200.6 |
| 12.5° | 3291.0 | 3068.5 | 2617.6 | 2066.4 | 1563.3 | 1269.7 | 1150.5 | 1132.4 | 1143.4 | 1144.4 | 1143.4 |
| 15° | 3340.1 | 3057.5 | 2445.2 | 1727.7 | 1250.7 | 1097.3 | 1100.3 | 1126.4 | 1152.5 | 1160.5 | 1158.5 |
| 17.5° | 3392.2 | 3040.5 | 2222.7 | 1403.0 | 1061.3 | 1047.2 | 1082.3 | 1117.4 | 1143.4 | 1147.4 | 1148.5 |
| 20° | 3446.4 | 3005.4 | 1969.2 | 1145.4 | 973.1 | 1009.2 | 1048.2 | 1074.3 | 1093.3 | 1099.3 | 1101.4 |
| 22.5° | 3471.4 | 2931.3 | 1676.6 | 961.1 | 914.0 | 962.1 | 991.1 | 1025.2 | 1031.2 | 1009.2 | 1013.2 |
| 25° | 3458.4 | 2806.0 | 1391.0 | 836.8 | 854.8 | 902.9 | 946.0 | 929.0 | 903.9 | 887.9 | 892.9 |
| 27.5° | 3417.3 | 2639.6 | 1111.4 | 745.6 | 791.7 | 852.8 | 857.8 | 838.8 | 834.8 | 821.8 | 825.8 |
| 30° | 3373.2 | 2448.2 | 893.9 | 672.4 | 727.6 | 791.7 | 776.7 | 783.7 | 784.7 | 769.6 | 774.7 |
| 32.5° | 3346.1 | 2247.8 | 711.5 | 623.3 | 686.5 | 698.5 | 728.6 | 742.6 | 743.6 | 708.5 | 714.5 |
| 35° | 3355.2 | 2050.4 | 602.3 | 583.2 | 648.4 | 645.4 | 687.5 | 695.5 | 637.4 | 589.3 | 594.3 |
| 37.5° | 3428.3 | 1868.0 | 540.2 | 552.2 | 582.2 | 605.3 | 637.4 | 584.2 | 571.2 | 549.2 | 552.2 |
| 40° | 3564.6 | 1712.7 | 503.1 | 533.1 | 537.1 | 574.2 | 525.1 | 532.1 | 533.1 | 519.1 | 522.1 |
| 42.5° | 3723.9 | 1583.4 | 481.0 | 522.1 | 512.1 | 518.1 | 469.0 | 483.0 | 498.1 | 492.1 | 493.1 |
| 45° | 3804.1 | 1457.1 | 462.0 | 484.0 | 487.0 | 429.9 | 418.9 | 433.9 | 453.0 | 456.0 | 457.0 |
| 47.5° | 3733.0 | 1336.9 | 441.9 | 428.9 | 449.0 | 391.8 | 378.8 | 383.8 | 405.9 | 417.9 | 419.9 |
| 50° | *3515.5* | *1198.6* | *411.9* | *379.8* | *368.8* | *351.8* | *339.7* | *340.7* | *365.8* | *386.8* | *390.8* |
| 52.5° | 3209.9 | 1054.3 | 362.8 | 321.7 | 296.6 | 309.7 | 312.7 | 306.7 | 329.7 | 350.7 | 354.8 |
| 55° | 2913.2 | 873.9 | 287.6 | 261.6 | 238.5 | 266.6 | 274.6 | 266.6 | 273.6 | 287.6 | 288.6 |
| 57.5° | 2051.4 | 494.1 | 220.5 | 216.5 | 197.4 | 228.5 | 241.5 | 229.5 | 217.5 | 226.5 | 228.5 |
| 60° | 951.0 | 258.6 | 169.4 | 169.4 | 164.4 | 196.4 | 218.5 | 201.4 | 178.4 | 182.4 | 185.4 |
| 62.5° | 297.6 | 163.3 | 124.3 | 117.3 | 134.3 | 167.4 | 185.4 | 168.4 | 141.3 | 141.3 | 145.3 |
| 65° | 168.4 | 140.3 | 98.2 | 90.2 | 109.2 | 134.3 | 145.3 | 127.3 | 103.2 | 101.2 | 101.2 |
| 67.5° | 156.3 | 133.3 | 87.2 | 73.2 | 77.2 | 86.2 | 90.2 | 78.2 | 71.2 | 70.1 | 71.2 |
| 70° | 129.3 | 111.2 | 70.1 | 50.1 | 47.1 | 46.1 | 48.1 | 45.1 | 43.1 | 44.1 | 47.1 |
| 72.5° | 80.2 | 67.1 | 44.1 | 30.1 | 26.1 | 25.1 | 25.1 | 25.1 | 24.1 | 24.1 | 24.1 |
| 75° | 29.1 | 25.1 | 20.0 | 15.0 | 13.0 | 12.0 | 12.0 | 13.0 | 12.0 | 11.0 | 10.0 |
| 77.5° | 9.0 | 8.0 | 8.0 | 8.0 | 7.0 | 6.0 | 5.0 | 5.0 | 4.0 | 3.0 | 3.0 |
| 80° | 5.0 | 5.0 | 5.0 | 5.0 | 4.0 | 4.0 | 3.0 | 2.0 | 1.0 | 1.0 | 0.0 |
| 82.5° | 5.0 | 5.0 | 5.0 | 4.0 | 4.0 | 4.0 | 3.0 | 2.0 | 1.0 | 0.0 | 0.0 |
| 85° | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 3.0 | 2.0 | 1.0 | 0.0 | 0.0 |
| 87.5° | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 3.0 | 2.0 | 1.0 | 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

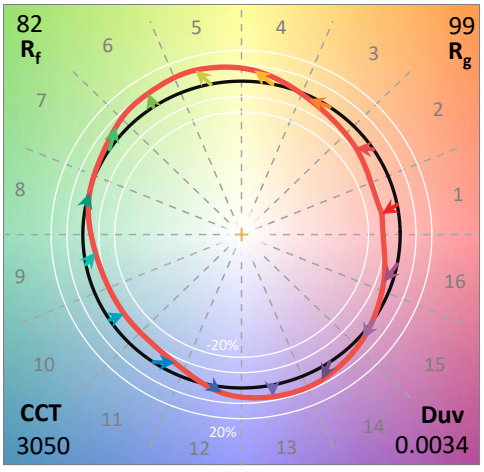
## Test Information

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

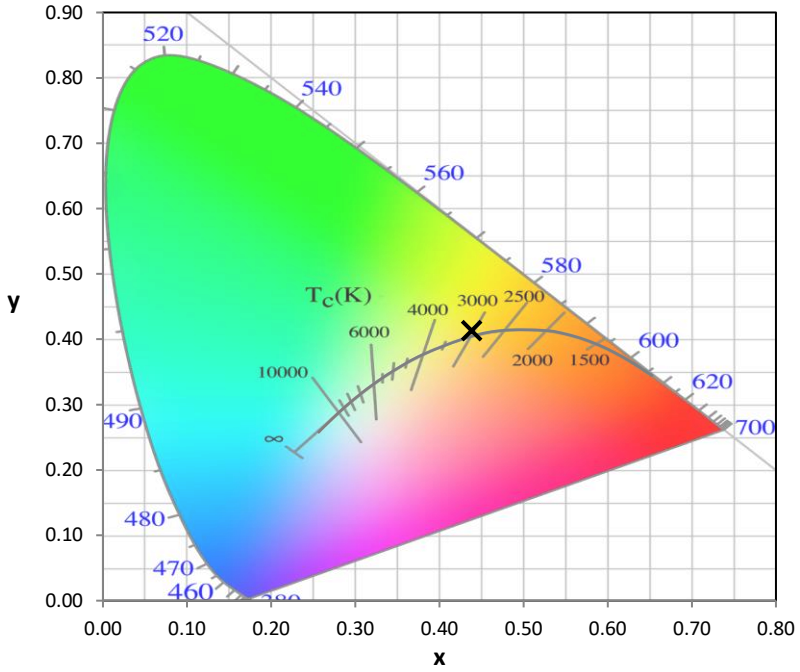
| | |
|---|---|
| Stabilization Time: | 20M |
| Operation Time: | 1H 20M |
| Sphere Temperature (°C): | 24.2 |

REPORT NUMBER: SP1-2408-195-9

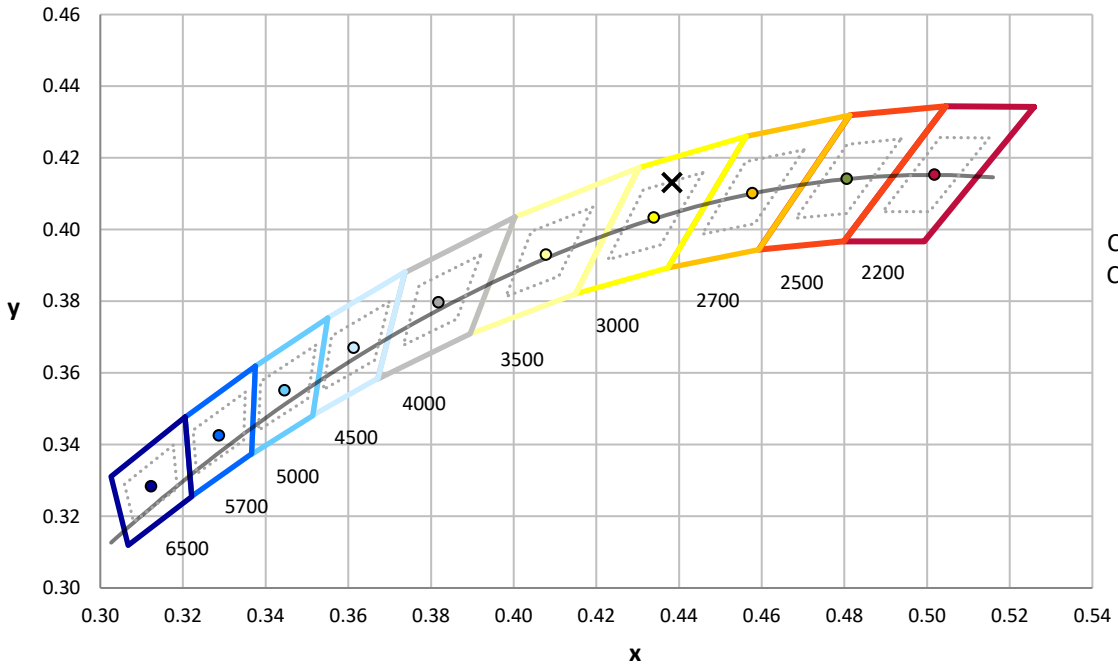
| Measurement and Test Equipment | | | |
|---|---|---|---|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 6/18/2024 | 12/18/2024 |
| Power Meter | INXT2011004 | 2/8/2024 | 2/8/2025 |
| AC Power Source | IN0063 | 10/24/2023 | 10/24/2024 |
| DC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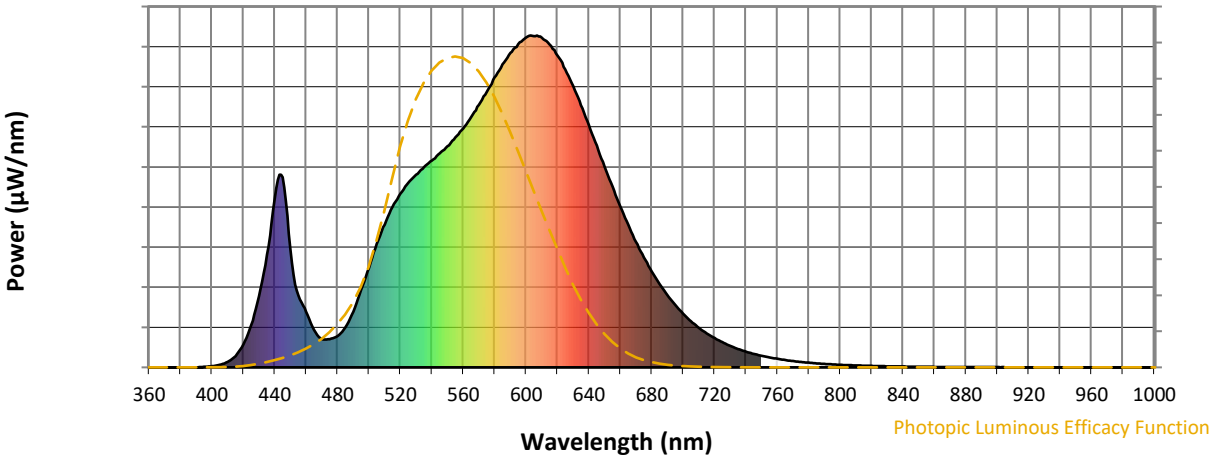
## Photopic Flux vs. Wavelength




## 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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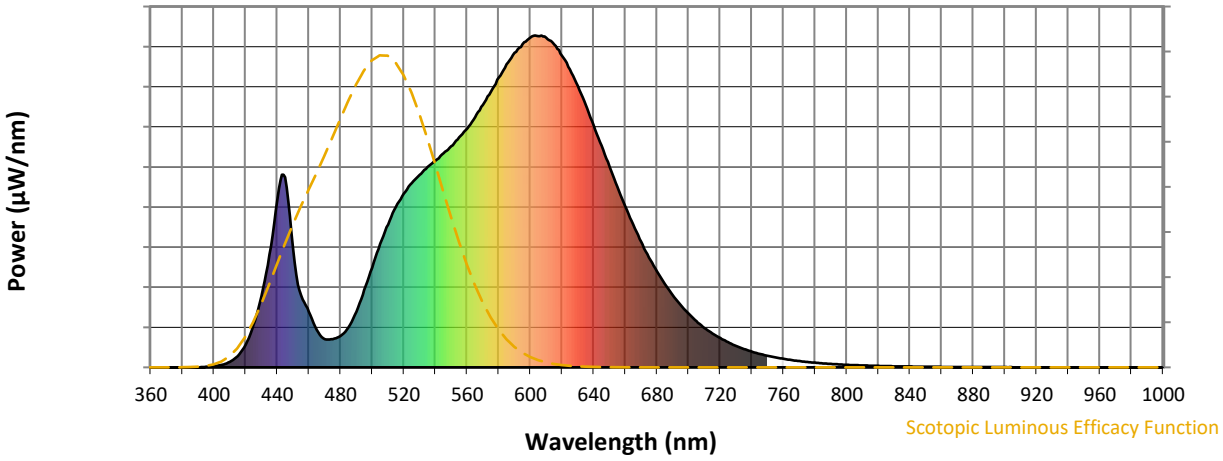
## Scotopic Flux vs. Wavelength




**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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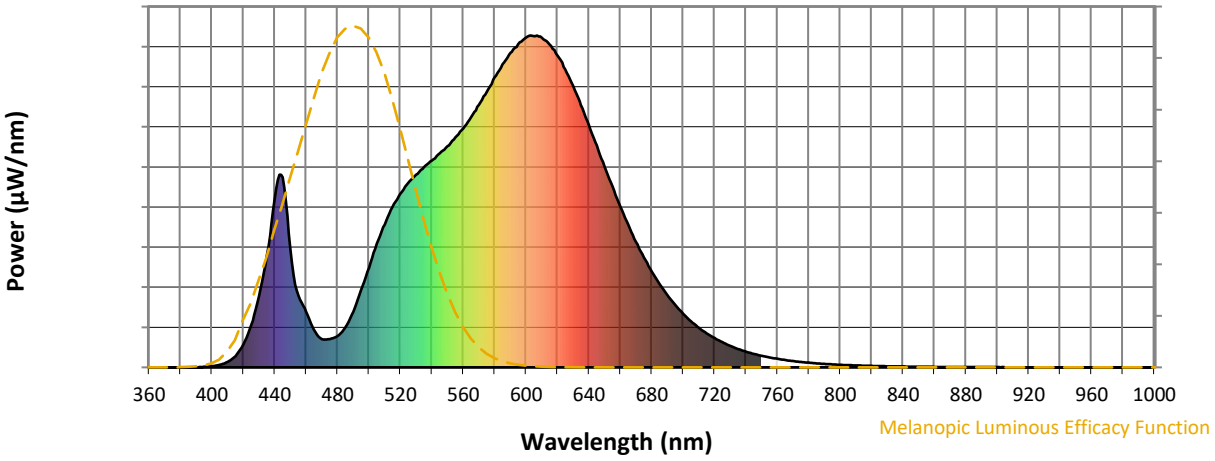
## Melanopic Flux vs. Wavelength




**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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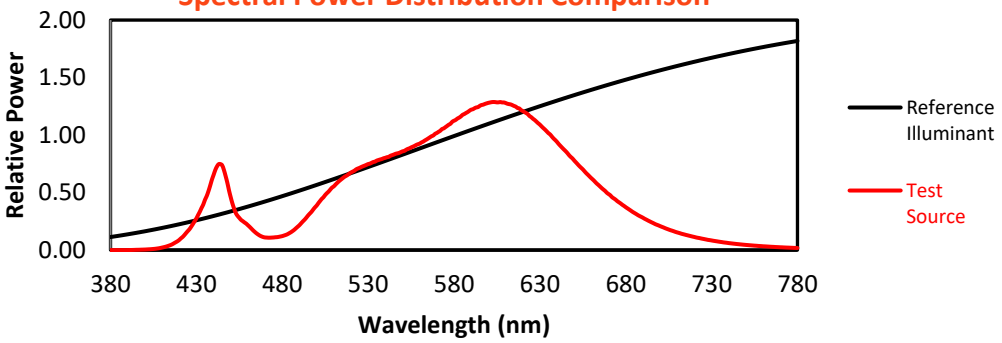
# TM-30-18

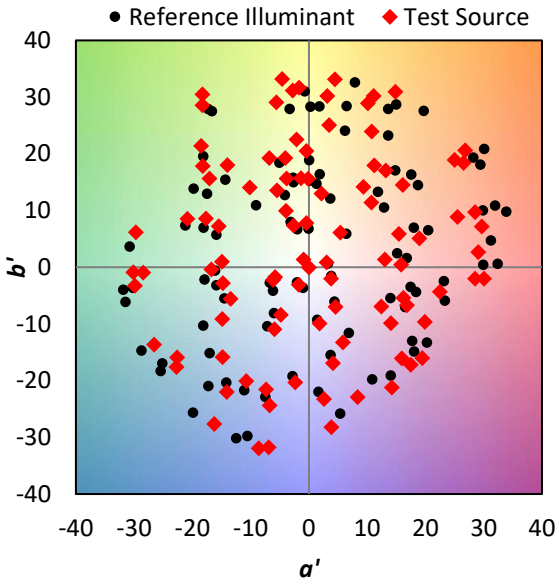
## Summary

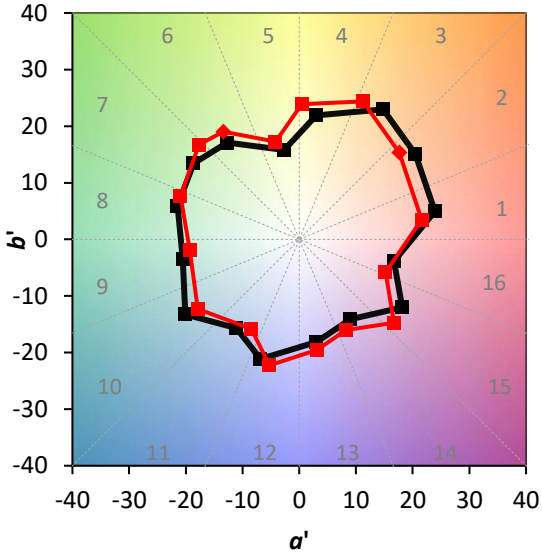
$R_f$ = 81.5
$R_g$ = 99.2
CIE $R_a$ = 81.0
$R_9$ = 7.1

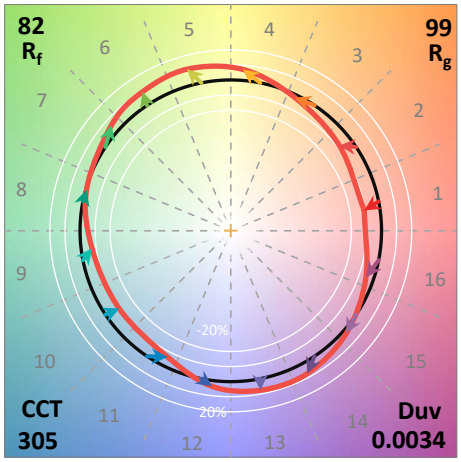
## Spectral Power Distribution Comparison

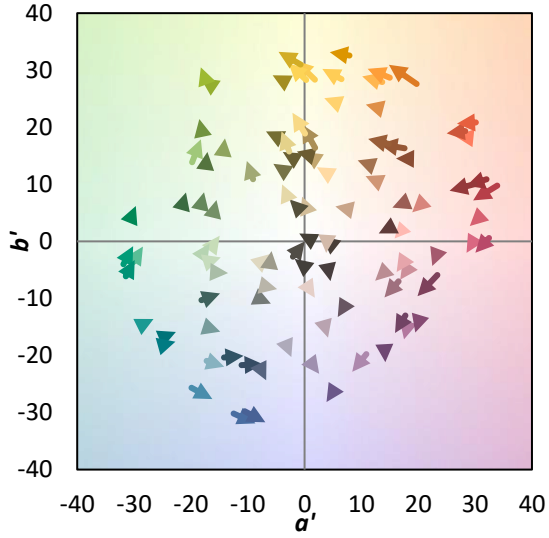



## Color Vector Graphics



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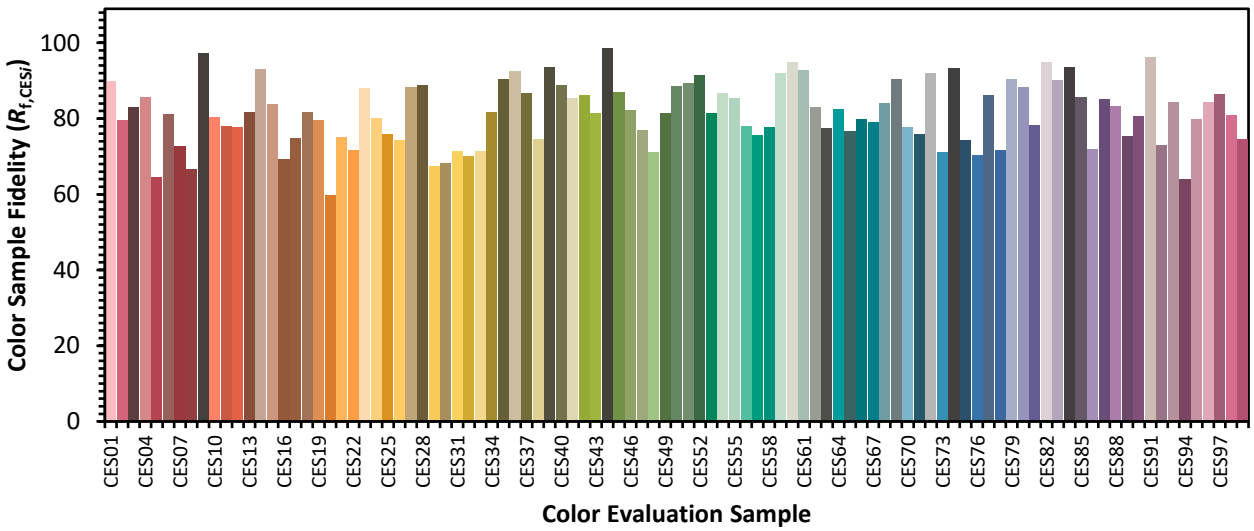
# TM-30-18

**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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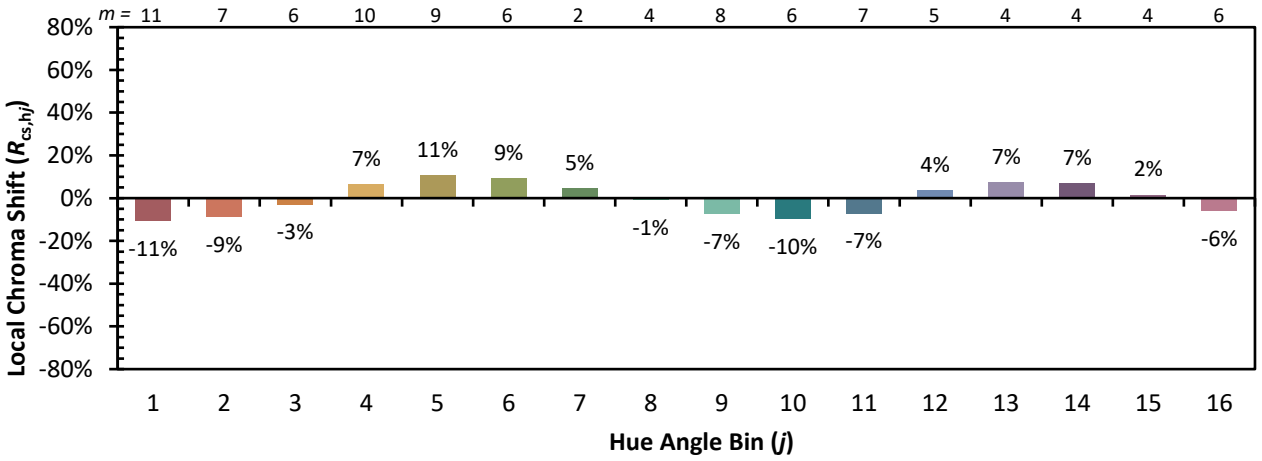
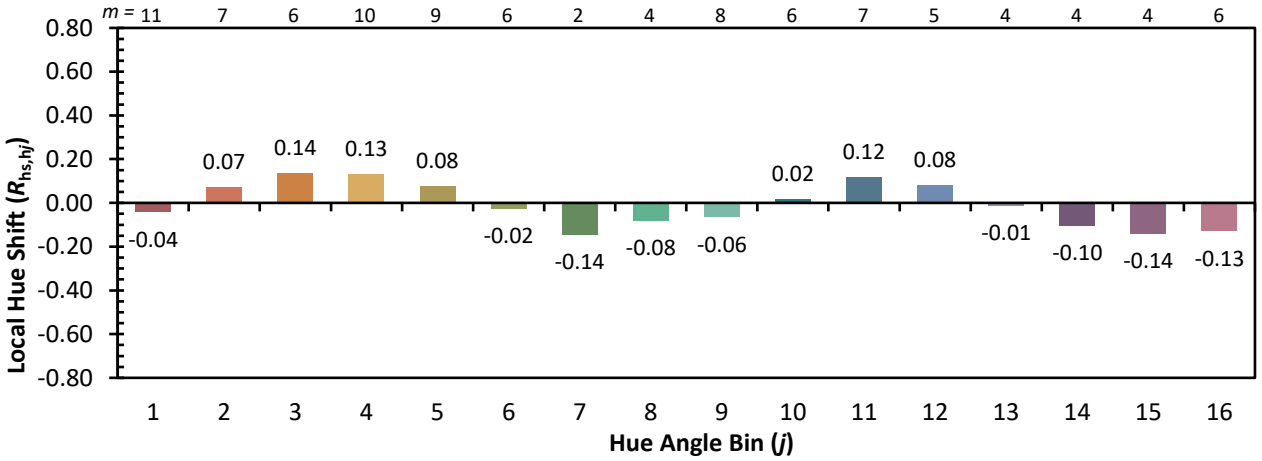
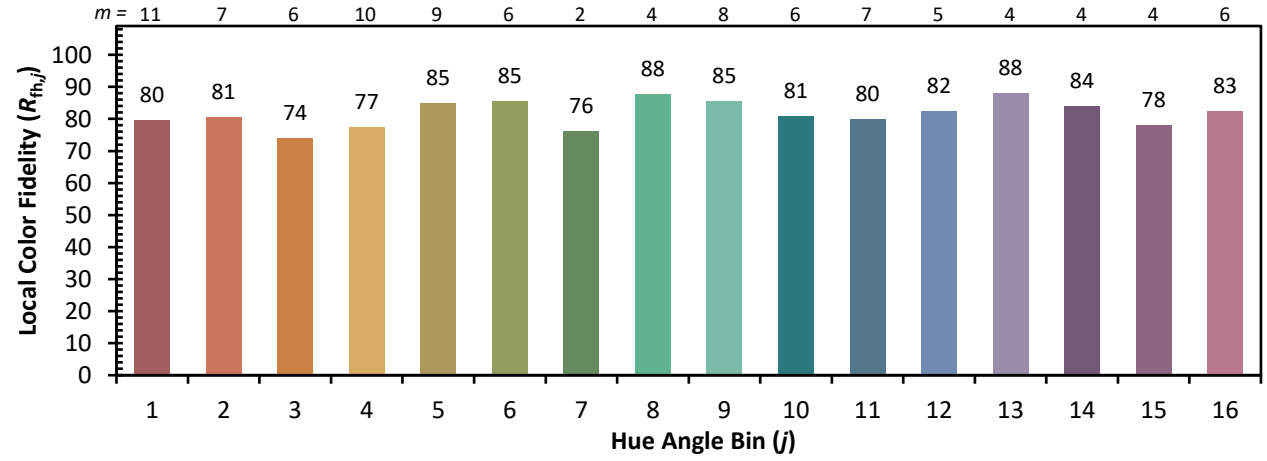
## Color Rendition by Hue-Angle Bin



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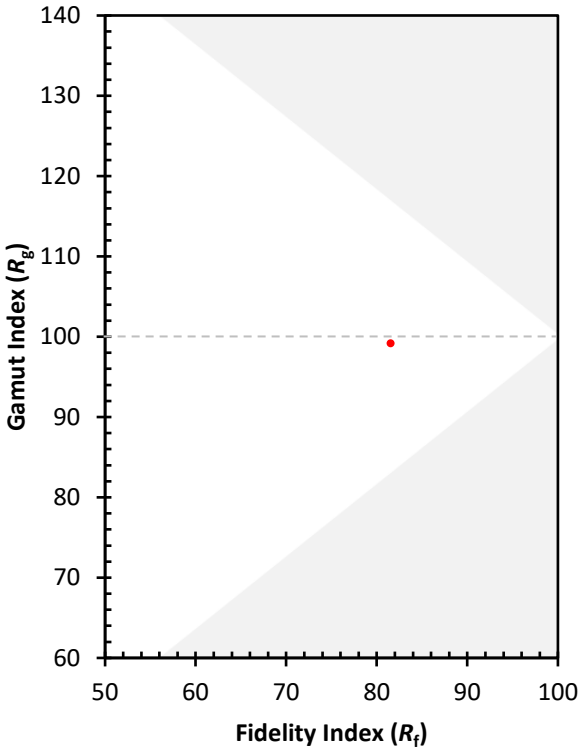
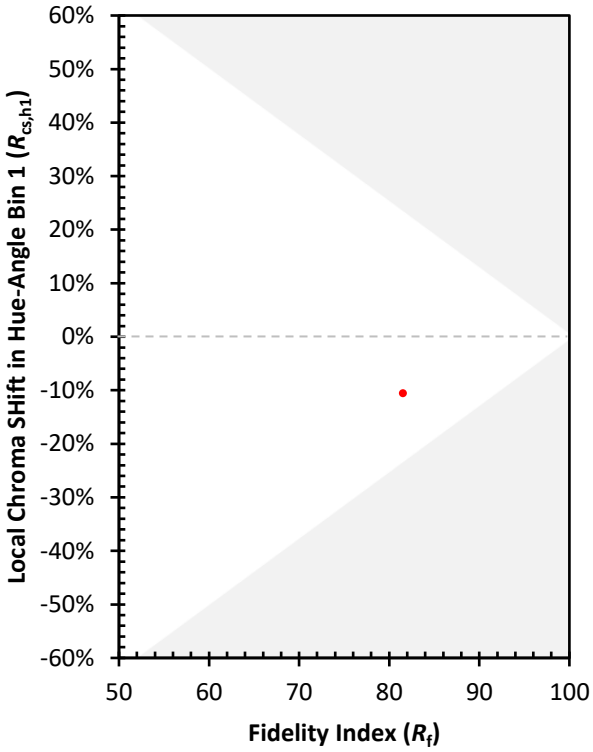
## TM-30-18

### Measure Comparisons




(END OF REPORT)