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: P634998

Luminaire Tested: GWS-SA3C-830-U-AFL-W-GRSWH

Issue Date: 1/10/2023

Report Generated By 670246102 / DESKTOP-G35701P

Cooper Lighting Solutions Photometric Lab
1121 Highway 74 South
Peachtree City, GA 30269

Scaled Data Report

**Test Information**

| | |
|---|---|
| Test Method: | LM-79-2019 |
| Report Number: | P634998 |
| | TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-47) |
| Test Lab: | COOPER LIGHTING SOLUTIONS |
| Issue Date: | 1/10/2023 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS |
| Product Line: | McGRAW-EDISON |
| Catalog Number: | GWS-SA3C-830-U-AFL-W-GRSWH |
| Description: | GALLEON WALL SLIM LUMINAIRE. (3) LIGHTSQUARES WITH 16 LEDS EACH AND AUTOMOTIVE FRONTLINE OPTICS W/ FACTORY INSTALLED GLARE SHIELD, WH |
| Light Source: | (48) 3000K CCT, 80 CRI LEDS |
| Ballast/Driver: | - |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 10053 lumens |
| Efficiency: | N/A |
| Efficacy: | 108.1 lumens/watt |
| Luminous Opening: | Rectangular (W 1.5' x L: 0.5' x H: 0') |
| IES Classification: | Type II - Short |
| BUG Rating: | B2 - U0 - G1 |

| | |
|---|---|
| Input Watts (W): | 93 |
| 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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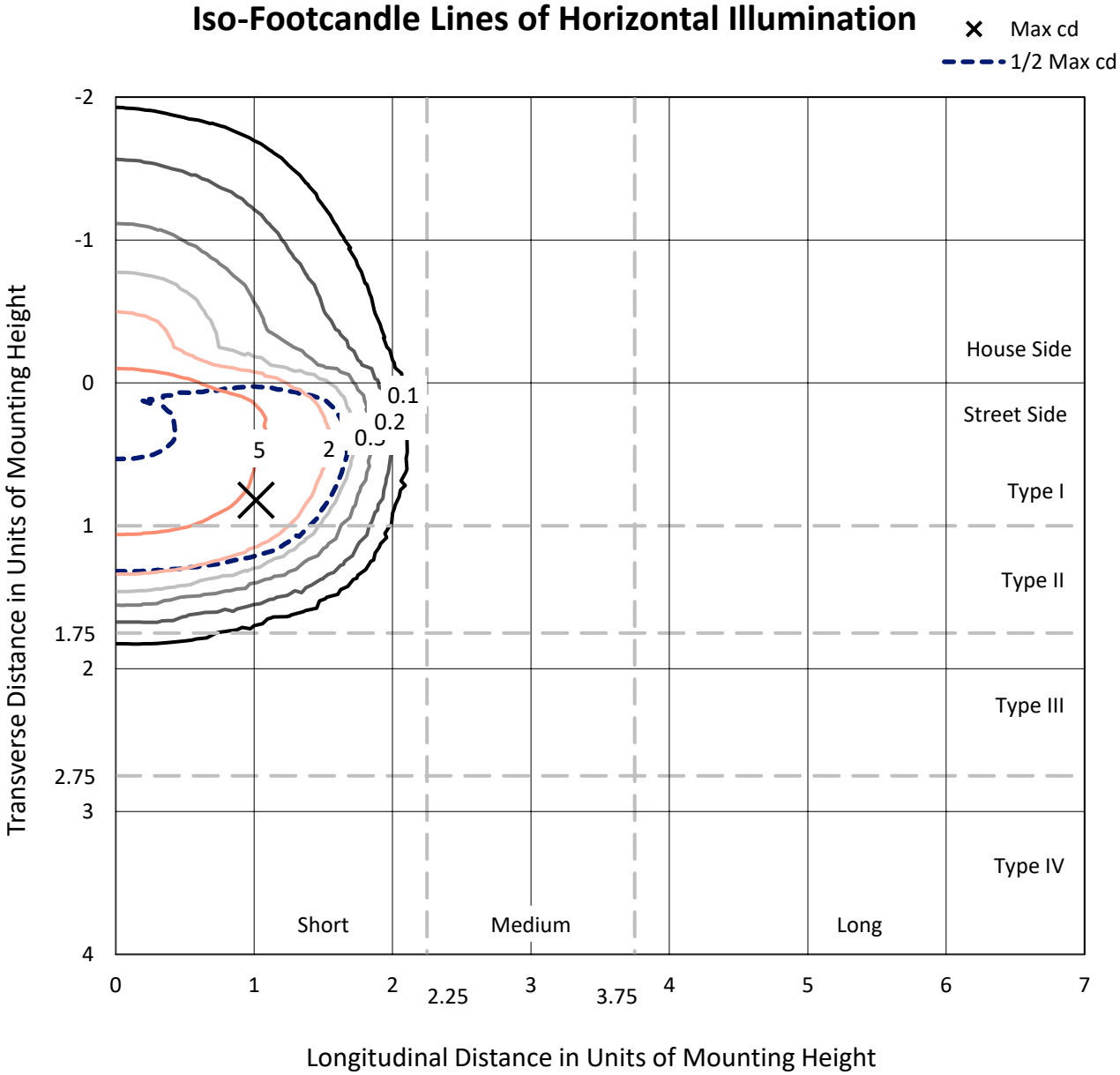
Scaled Data Report

REPORT NUMBER: P634998
CATALOG NUMBER: GWS-SA3C-830-U-AFL-W-GRSWH

## Iso-Footcandle Lines of Horizontal Illumination




Based on 20 foot mounting height. Maximum calculated value = 9.1 fc
Type II - Short - N/A

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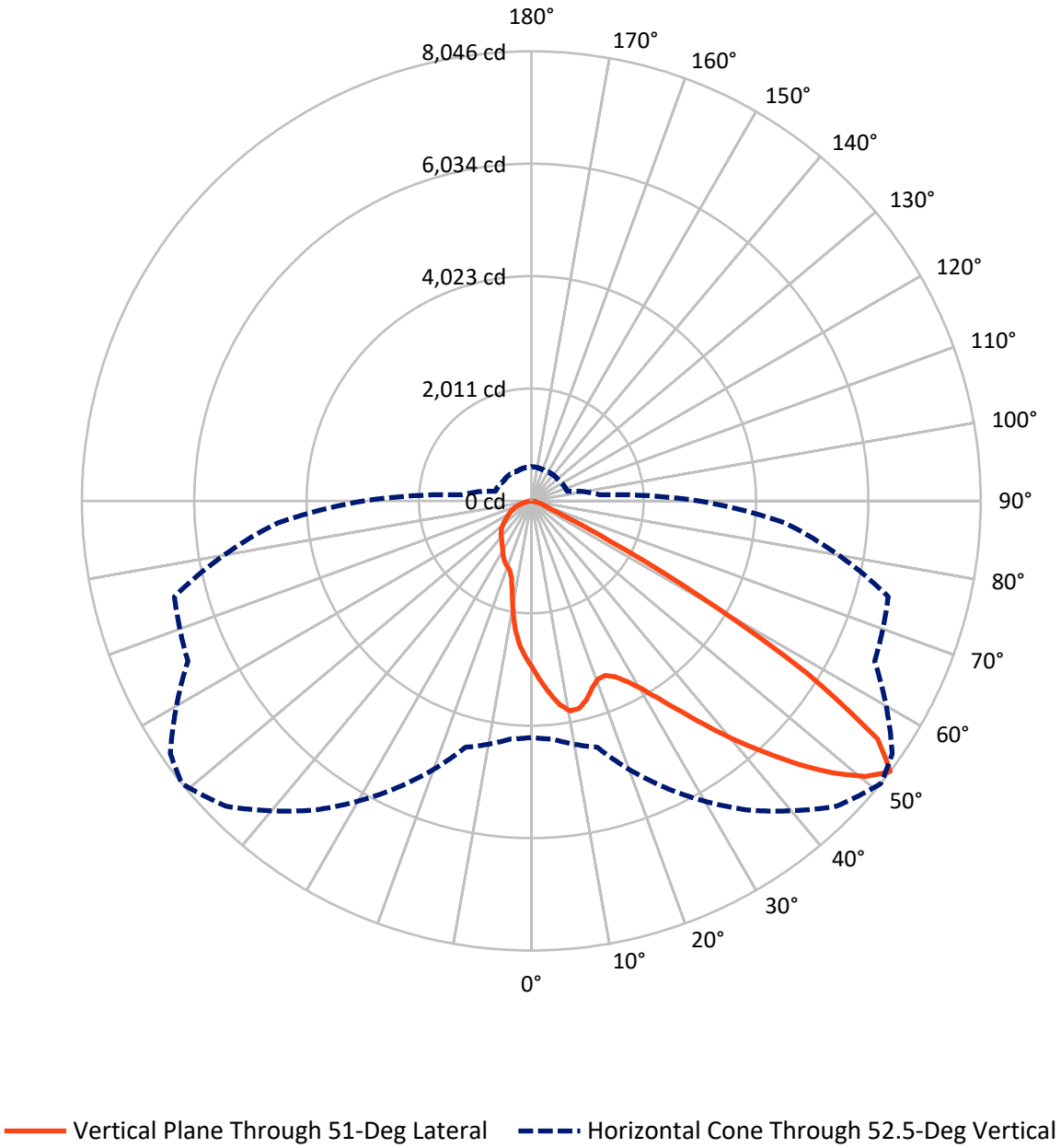
## Luminous Intensity Polar Plot



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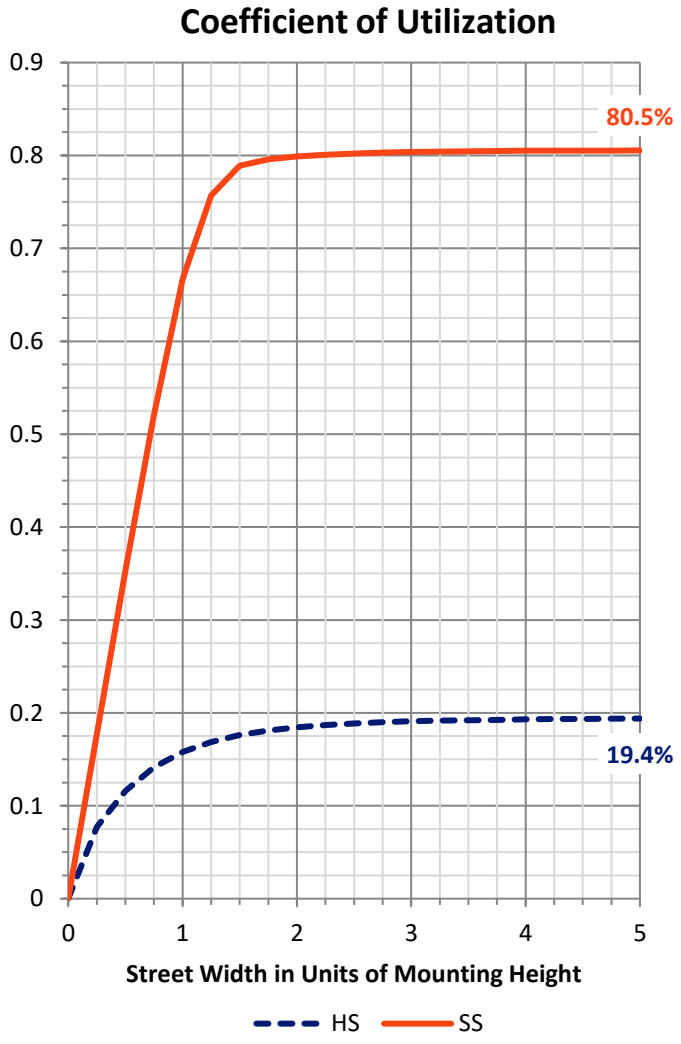
REPORT NUMBER: P634998
CATALOG NUMBER: GWS-SA3C-830-U-AFL-W-GRSWH

**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 1958.7 | 0.0 | 1958.7 |
| | % Fixture | 19.5 | 0.0 | 19.5 |
| **Street Side** | Lumens | 8094.3 | 0.0 | 8094.3 |
| | % Fixture | 80.5 | 0.0 | 80.5 |
| **Total** | Lumens | 10053.0 | 0.0 | 10053.0 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 279.3 | 2.8 |
| 10°-20° | 725.8 | 7.2 |
| 20°-30° | 1180.0 | 11.7 |
| 30°-40° | 1870.1 | 18.6 |
| 40°-50° | 2820.5 | 28.1 |
| 50°-60° | 2440.0 | 24.3 |
| 60°-70° | 553.2 | 5.5 |
| 70°-80° | 163.1 | 1.6 |
| 80°-90° | 21.0 | 0.2 |
| 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° | 10053.0 | 100.0 |
| 0°-180° | 10053.0 | 100.0 |



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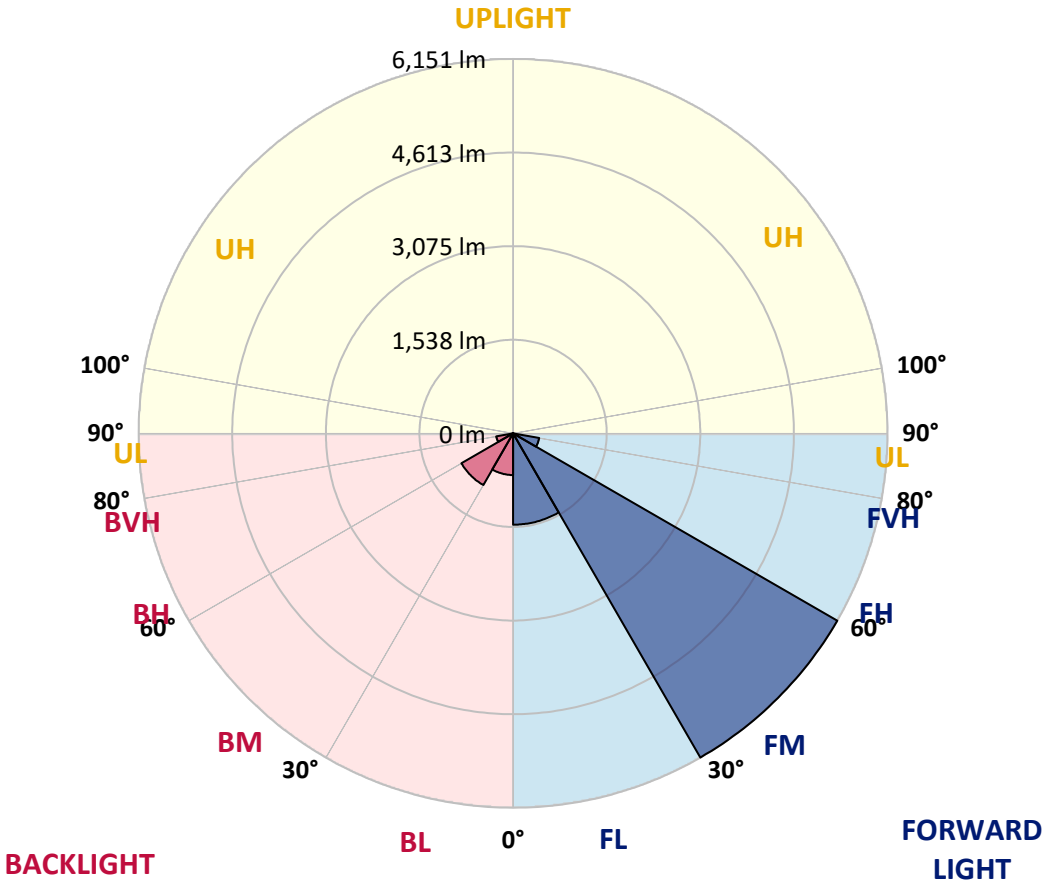
REPORT NUMBER: P634998
CATALOG NUMBER: GWS-SA3C-830-U-AFL-W-GRSWH

## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 1500.4 | 14.9 | | | |
| FM | (30°-60°) | 6150.6 | 61.2 | | | |
| FH | (60°-80°) | 435.3 | 4.3 | | | G0/660 |
| FVH | (80°-90°) | 7.9 | 0.1 | | | G0/10 |
| BL | (0°-30°) | 684.7 | 6.8 | B2/1000 | | |
| BM | (30°-60°) | 980.0 | 9.7 | B1/1000 | | |
| BH | (60°-80°) | 280.9 | 2.8 | B1/500 | | G1/500 |
| BVH | (80°-90°) | 13.1 | 0.1 | | | G1/100 |
| UL | (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH | (100°-180°) | 0.0 | 0.0 | | U0/0 | |

**BUG Rating: B2-U0-G1**
Type II Short



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REPORT NUMBER: P634998
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**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 15° | 25° | 35° | 45° | 51° | 55° | 65° | 75° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 2993.3 | 2993.3 | 2993.3 | 2993.3 | 2993.3 | 2993.3 | 2993.3 | 2993.3 | 2993.3 | 2993.3 | 2993.3 |
| 2.5° | 3335.7 | 3354.7 | 3325.3 | 3314.2 | 3295.9 | 3264.2 | 3227.6 | 3217.3 | 3138.7 | 3087.0 | 3029.0 |
| 5° | 3670.9 | 3681.2 | 3657.4 | 3633.6 | 3588.3 | 3531.9 | 3461.2 | 3446.1 | 3303.1 | 3184.7 | 3061.6 |
| 7.5° | 3745.6 | 3741.6 | 3762.3 | 3775.8 | 3770.2 | 3748.0 | 3685.2 | 3655.8 | 3485.0 | 3297.5 | 3115.6 |
| 10° | 3450.1 | 3427.8 | 3504.1 | 3594.6 | 3703.5 | 3829.0 | 3821.8 | 3819.5 | 3670.9 | 3449.3 | 3184.7 |
| 12.5° | 3058.4 | 3047.3 | 3109.3 | 3222.9 | 3428.6 | 3706.6 | 3810.7 | 3891.7 | 3838.5 | 3593.8 | 3261.8 |
| 15° | 2834.4 | 2830.4 | 2872.5 | 2954.4 | 3118.0 | 3469.1 | 3691.6 | 3852.0 | 3982.3 | 3748.7 | 3343.6 |
| 17.5° | 2793.9 | 2796.3 | 2810.6 | 2857.4 | 2975.0 | 3264.2 | 3521.6 | 3745.6 | 4094.3 | 3918.7 | 3446.1 |
| 20° | 2912.3 | 2928.1 | 2903.5 | 2910.7 | 2974.2 | 3190.3 | 3405.6 | 3638.3 | 4165.8 | 4089.5 | 3556.5 |
| 22.5° | 3175.2 | 3169.6 | 3115.6 | 3083.8 | 3084.6 | 3235.6 | 3392.9 | 3588.3 | 4212.7 | 4255.6 | 3656.6 |
| 25° | 3473.1 | 3466.7 | 3402.4 | 3331.7 | 3287.2 | 3358.7 | 3484.2 | 3641.5 | 4254.8 | 4407.3 | 3736.8 |
| 27.5° | 3825.0 | 3805.2 | 3733.7 | 3643.1 | 3544.6 | 3575.6 | 3660.6 | 3785.3 | 4319.9 | 4556.6 | 3790.1 |
| 30° | 4165.8 | 4188.8 | 4086.4 | 3979.1 | 3875.1 | 3856.0 | 3905.2 | 4018.0 | 4452.6 | 4731.4 | 3853.6 |
| 32.5° | 4617.8 | 4609.9 | 4496.3 | 4356.5 | 4207.9 | 4193.6 | 4232.5 | 4335.8 | 4690.9 | 4972.9 | 3950.5 |
| 35° | 5165.2 | 5166.7 | 5005.5 | 4816.4 | 4605.1 | 4567.0 | 4632.1 | 4732.2 | 5046.0 | 5300.2 | 4103.8 |
| 37.5° | 5733.9 | 5731.6 | 5591.0 | 5376.5 | 5088.1 | 5034.1 | 5108.8 | 5183.4 | 5490.1 | 5745.9 | 4342.2 |
| 40° | 6132.7 | 6148.6 | 6082.7 | 5969.9 | 5696.6 | 5564.7 | 5630.7 | 5682.3 | 5973.1 | 6270.2 | 4655.9 |
| 42.5° | 6359.1 | 6383.0 | 6397.3 | 6464.8 | 6321.0 | 6180.4 | 6156.6 | 6183.6 | 6404.4 | 6757.1 | 4950.7 |
| 45° | 6407.6 | 6439.4 | 6543.4 | 6793.7 | 6849.3 | 6809.6 | 6731.7 | 6666.6 | 6726.1 | 7102.7 | 5143.7 |
| 47.5° | 6193.9 | 6249.5 | 6471.9 | 6909.6 | 7234.6 | 7359.3 | 7272.7 | 7173.4 | 6912.0 | 7191.7 | 5123.8 |
| 50° | 5347.1 | 5412.2 | 5913.5 | 6672.9 | 7289.4 | 7743.8 | 7751.7 | 7604.7 | 6889.8 | 6935.1 | 4874.4 |
| 52.5° | 4233.3 | 4277.8 | 4564.6 | 5656.9 | 6751.6 | 7727.9 | 8045.6 | 7888.3 | 6782.5 | 6614.1 | 4562.2 |
| 55° | 2530.1 | 2601.6 | 2869.4 | 3732.1 | 5259.7 | 6849.3 | 7526.1 | 7602.4 | 6730.1 | 6344.8 | 4349.3 |
| 57.5° | 854.0 | 888.9 | 1144.7 | 1648.4 | 3099.7 | 5015.0 | 5815.0 | 6124.8 | 6109.7 | 5933.3 | 3933.8 |
| 60° | 406.7 | 414.7 | 466.3 | 625.2 | 1240.8 | 2620.7 | 3442.1 | 3799.6 | 4125.3 | 4157.9 | 2447.5 |
| 62.5° | 309.8 | 314.6 | 340.8 | 375.0 | 498.9 | 1104.2 | 1577.7 | 1850.9 | 1977.2 | 1696.8 | 891.3 |
| 65° | 259.0 | 262.9 | 282.8 | 304.3 | 339.2 | 478.2 | 605.3 | 698.3 | 629.2 | 490.1 | 425.0 |
| 67.5° | 216.1 | 219.3 | 234.3 | 257.4 | 281.2 | 320.1 | 336.0 | 345.6 | 362.2 | 406.7 | 390.8 |
| 70° | 169.2 | 172.4 | 188.3 | 208.1 | 231.2 | 240.7 | 255.8 | 265.3 | 298.7 | 355.9 | 354.3 |
| 72.5° | 130.3 | 134.3 | 143.0 | 155.7 | 174.8 | 184.3 | 201.0 | 212.1 | 231.2 | 277.2 | 296.3 |
| 75° | 95.3 | 97.7 | 105.7 | 109.6 | 112.0 | 109.6 | 126.3 | 139.0 | 164.4 | 181.9 | 186.7 |
| 77.5° | 38.9 | 43.7 | 42.1 | 42.1 | 50.0 | 60.4 | 69.1 | 77.1 | 94.5 | 104.9 | 105.7 |
| 80° | 15.9 | 17.5 | 20.7 | 23.0 | 27.8 | 35.7 | 41.3 | 44.5 | 52.4 | 58.8 | 63.6 |
| 82.5° | 9.5 | 10.3 | 11.9 | 12.7 | 15.9 | 20.7 | 23.8 | 26.2 | 32.6 | 38.9 | 41.3 |
| 85° | 4.8 | 4.8 | 5.6 | 6.4 | 7.9 | 9.5 | 11.1 | 12.7 | 16.7 | 20.7 | 23.0 |
| 87.5° | 0.8 | 0.8 | 0.8 | 1.6 | 2.4 | 3.2 | 4.0 | 4.8 | 5.6 | 6.4 | 7.9 |
| 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: P634998
CATALOG NUMBER: GWS-SA3C-830-U-AFL-W-GRSWH

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 2993.3 | 2993.3 | 2993.3 | 2993.3 | 2993.3 | 2993.3 | 2993.3 | 2993.3 | 2993.3 | 2993.3 | 2993.3 |
| 2.5° | 2994.9 | 2952.0 | 2901.9 | 2862.2 | 2816.1 | 2782.0 | 2733.5 | 2703.3 | 2674.7 | 2650.9 | 2633.4 |
| 5° | 2998.0 | 2925.8 | 2821.7 | 2729.5 | 2634.2 | 2543.7 | 2450.7 | 2375.2 | 2307.7 | 2251.3 | 2246.5 |
| 7.5° | 3016.3 | 2912.3 | 2749.4 | 2588.1 | 2402.2 | 2222.7 | 2043.2 | 1897.0 | 1785.8 | 1727.8 | 1715.9 |
| 10° | 3047.3 | 2910.7 | 2675.5 | 2418.1 | 2101.2 | 1812.0 | 1599.1 | 1487.9 | 1423.6 | 1400.5 | 1392.6 |
| 12.5° | 3079.9 | 2906.7 | 2581.0 | 2178.2 | 1738.1 | 1484.7 | 1367.9 | 1354.4 | 1366.4 | 1367.9 | 1367.2 |
| 15° | 3119.6 | 2904.3 | 2461.8 | 1897.0 | 1472.8 | 1333.0 | 1340.9 | 1369.5 | 1397.3 | 1403.7 | 1403.7 |
| 17.5° | 3168.0 | 2898.7 | 2299.8 | 1622.2 | 1306.8 | 1303.6 | 1345.7 | 1383.8 | 1410.1 | 1414.8 | 1414.8 |
| 20° | 3218.9 | 2884.4 | 2100.4 | 1398.1 | 1239.3 | 1285.3 | 1330.6 | 1360.0 | 1378.3 | 1384.6 | 1385.4 |
| 22.5° | 3253.8 | 2846.3 | 1870.8 | 1232.1 | 1197.2 | 1250.4 | 1282.9 | 1313.1 | 1313.1 | 1297.2 | 1292.5 |
| 25° | 3261.0 | 2764.5 | 1622.2 | 1118.5 | 1147.1 | 1196.4 | 1229.7 | 1212.2 | 1179.7 | 1167.0 | 1166.2 |
| 27.5° | 3234.8 | 2645.3 | 1376.7 | 1037.5 | 1086.7 | 1136.0 | 1130.4 | 1105.0 | 1090.7 | 1078.0 | 1082.8 |
| 30° | 3203.0 | 2502.3 | 1163.8 | 970.8 | 1016.8 | 1065.3 | 1046.2 | 1037.5 | 1027.2 | 1012.9 | 1016.0 |
| 32.5° | 3181.6 | 2342.7 | 1000.1 | 919.1 | 970.0 | 977.9 | 991.4 | 990.6 | 981.1 | 954.1 | 952.5 |
| 35° | 3187.9 | 2181.4 | 890.5 | 877.0 | 931.0 | 927.9 | 953.3 | 948.5 | 882.6 | 845.2 | 842.9 |
| 37.5° | 3238.7 | 2026.5 | 826.2 | 843.6 | 869.1 | 888.9 | 911.2 | 854.0 | 830.9 | 807.1 | 808.7 |
| 40° | 3335.7 | 1882.7 | 791.2 | 825.4 | 831.7 | 861.1 | 809.5 | 808.7 | 798.4 | 776.9 | 776.1 |
| 42.5° | 3445.3 | 1761.2 | 767.4 | 816.6 | 807.9 | 813.5 | 758.6 | 765.0 | 764.2 | 750.7 | 746.7 |
| 45° | 3512.0 | 1649.2 | 748.3 | 784.1 | 786.5 | 730.8 | 714.2 | 721.3 | 725.3 | 718.1 | 717.3 |
| 47.5° | 3442.9 | 1520.5 | 728.5 | 734.0 | 754.7 | 693.5 | 672.9 | 673.6 | 680.8 | 681.6 | 678.4 |
| 50° | 3249.1 | 1376.7 | 704.6 | 691.1 | 677.6 | 654.6 | 635.5 | 631.5 | 638.7 | 645.8 | 648.2 |
| 52.5° | *2998.8* | *1239.3* | *664.9* | *644.3* | *612.5* | *612.5* | *603.7* | *591.0* | *600.6* | *610.1* | *613.3* |
| 55° | 2815.3 | 1137.6 | 608.5 | 585.5 | 550.5 | 562.4 | 560.8 | 549.7 | 562.4 | 569.6 | 572.0 |
| 57.5° | 2439.6 | 914.3 | 535.4 | 528.3 | 498.9 | 513.2 | 516.4 | 502.1 | 495.7 | 497.3 | 499.7 |
| 60° | 1448.2 | 590.2 | 483.0 | 482.2 | 456.0 | 472.7 | 482.2 | 467.9 | 448.8 | 451.2 | 454.4 |
| 62.5° | 649.8 | 451.2 | 417.1 | 413.9 | 413.1 | 434.5 | 444.9 | 431.4 | 404.3 | 406.7 | 409.9 |
| 65° | 409.1 | 390.0 | 362.2 | 362.2 | 375.0 | 393.2 | 401.2 | 390.0 | 359.1 | 355.1 | 358.3 |
| 67.5° | 379.7 | 363.0 | 334.4 | 328.9 | 335.2 | 350.3 | 351.1 | 329.7 | 311.4 | 308.2 | 308.2 |
| 70° | 340.8 | 328.1 | 300.3 | 289.2 | 286.8 | 286.0 | 283.6 | 278.0 | 266.1 | 262.9 | 264.5 |
| 72.5° | 282.0 | 273.3 | 255.8 | 243.9 | 237.5 | 236.7 | 227.2 | 222.4 | 212.1 | 210.5 | 209.7 |
| 75° | 186.7 | 189.1 | 189.1 | 187.5 | 181.9 | 179.5 | 169.2 | 164.4 | 152.5 | 147.8 | 147.0 |
| 77.5° | 110.4 | 112.8 | 116.0 | 116.8 | 116.0 | 116.0 | 106.4 | 100.9 | 89.0 | 82.6 | 81.0 |
| 80° | 67.5 | 69.1 | 70.7 | 73.1 | 69.9 | 67.5 | 58.8 | 53.2 | 47.7 | 43.7 | 42.9 |
| 82.5° | 43.7 | 45.3 | 46.1 | 47.7 | 46.1 | 42.9 | 35.7 | 32.6 | 28.6 | 25.4 | 24.6 |
| 85° | 24.6 | 25.4 | 27.0 | 27.0 | 24.6 | 22.2 | 18.3 | 15.9 | 13.5 | 11.9 | 11.9 |
| 87.5° | 8.7 | 8.7 | 8.7 | 9.5 | 7.9 | 7.1 | 4.8 | 3.2 | 2.4 | 2.4 | 2.4 |
| 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

# 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

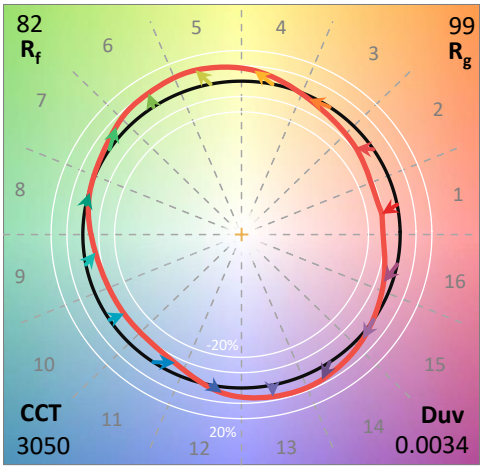
## Test Information

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

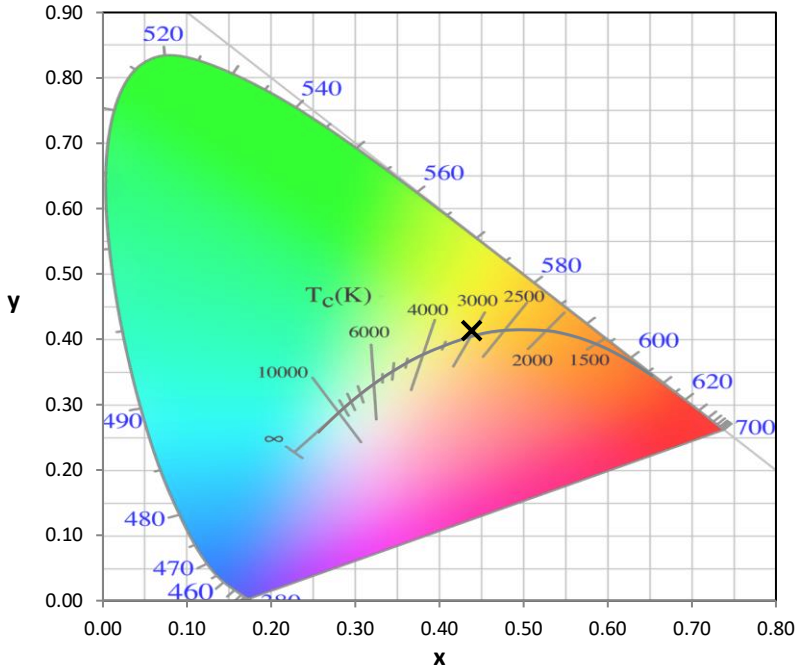
| | |
|---|---|
| Stabilization Time: | 20M |
| Operation Time: | 1H 20M |
| Sphere Temperature (°C): | 24.2 |

REPORT NUMBER: SP1-2408-195-9

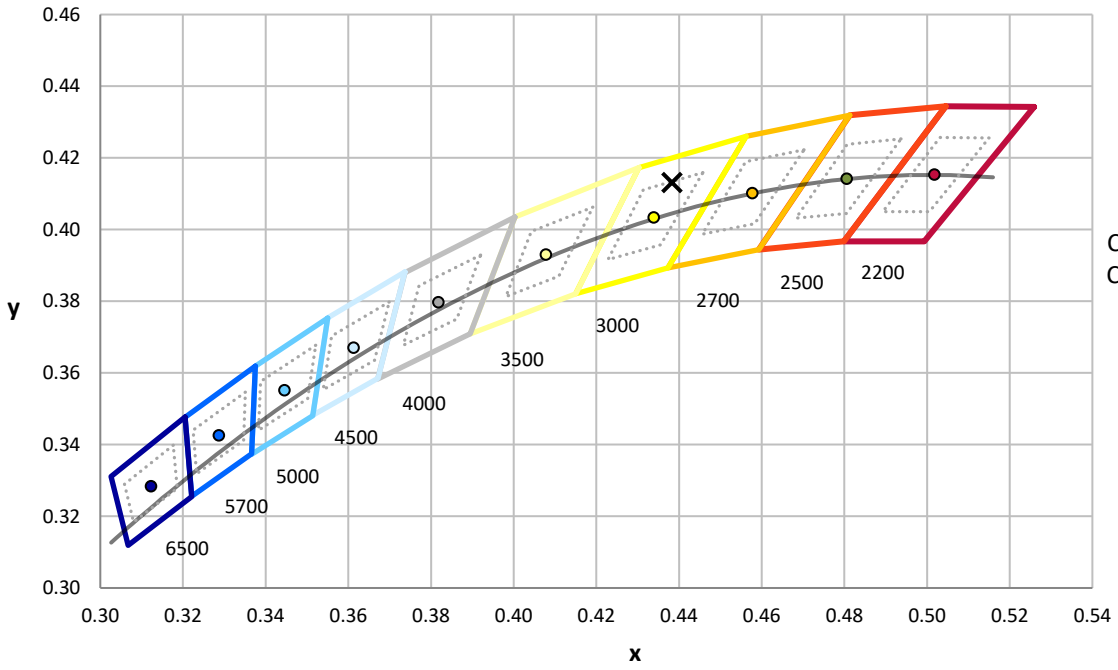
| Measurement and Test Equipment | | | |
|---|---|---|---|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 6/18/2024 | 12/18/2024 |
| Power Meter | INXT2011004 | 2/8/2024 | 2/8/2025 |
| AC Power Source | IN0063 | 10/24/2023 | 10/24/2024 |
| DC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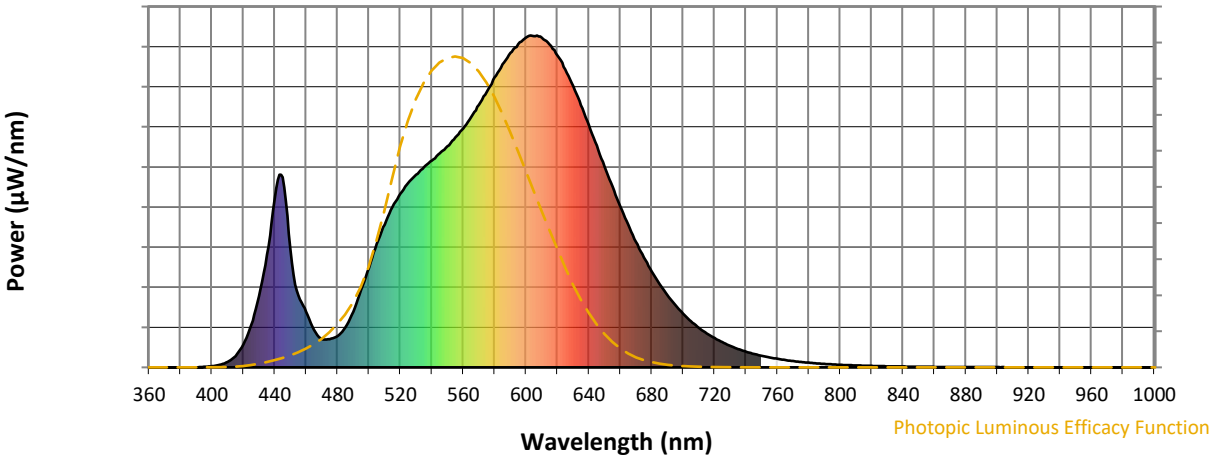
## Photopic Flux vs. Wavelength




## 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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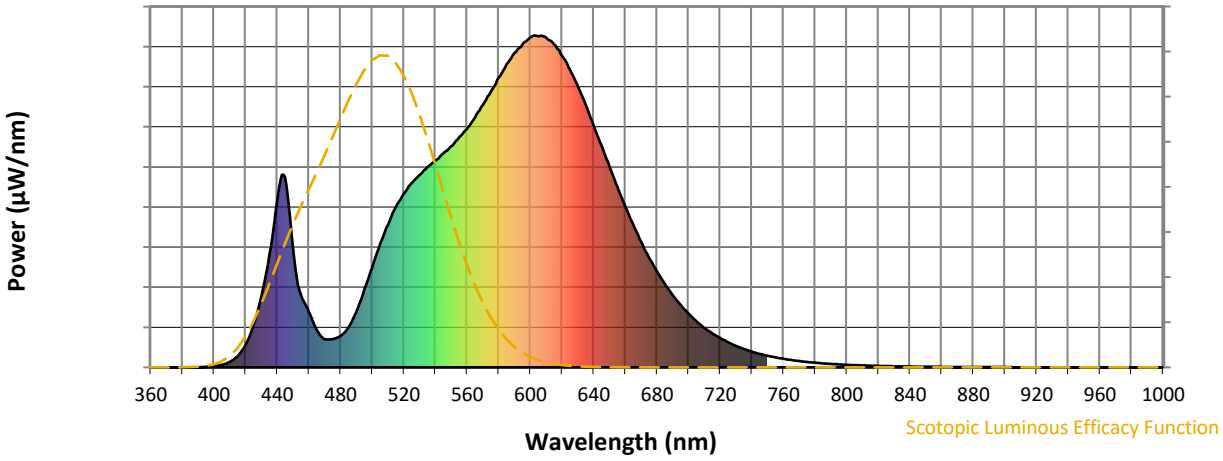
## Scotopic Flux vs. Wavelength




**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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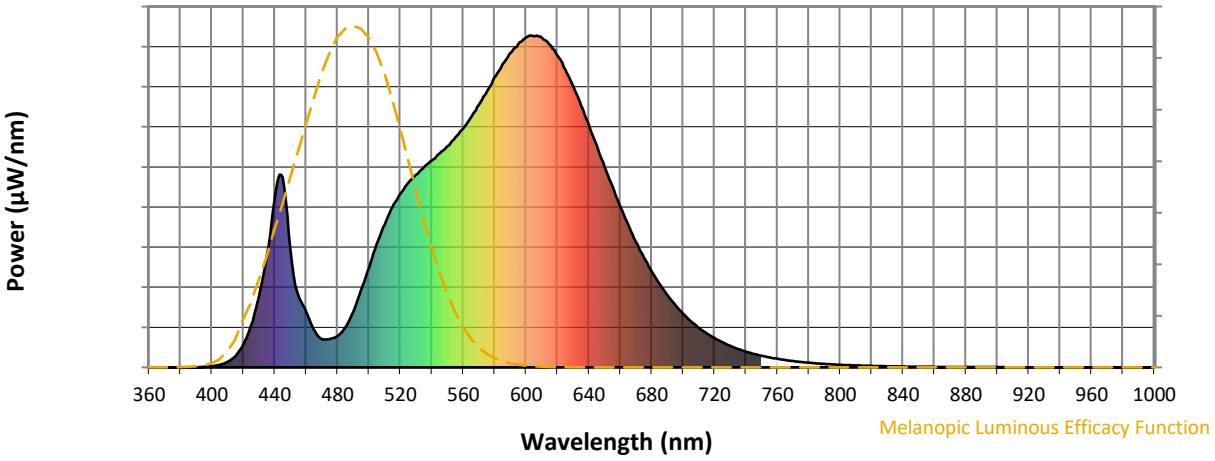
## Melanopic Flux vs. Wavelength




**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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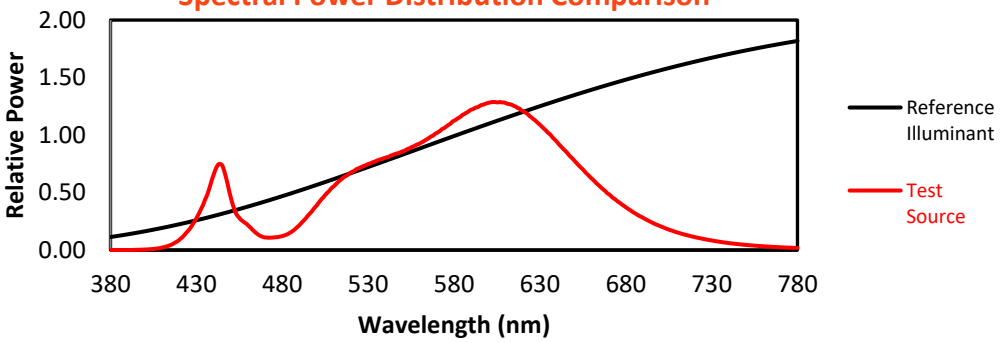
# TM-30-18

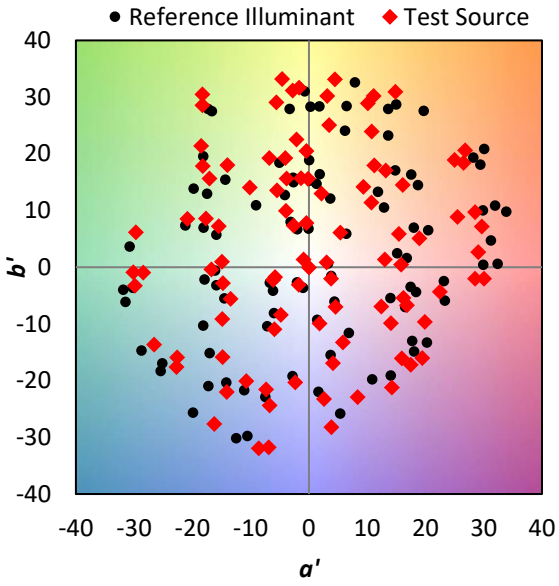
## Summary

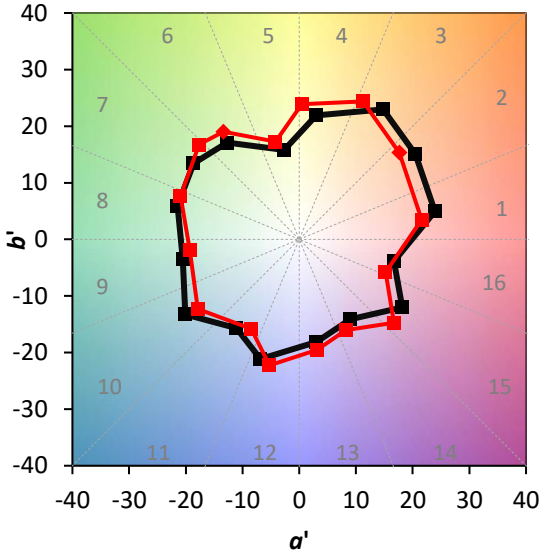
$R_f$ = 81.5
$R_g$ = 99.2
CIE $R_a$ = 81.0
$R_9$ = 7.1

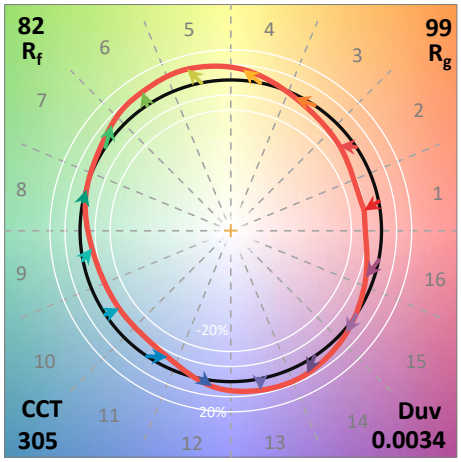
## Spectral Power Distribution Comparison

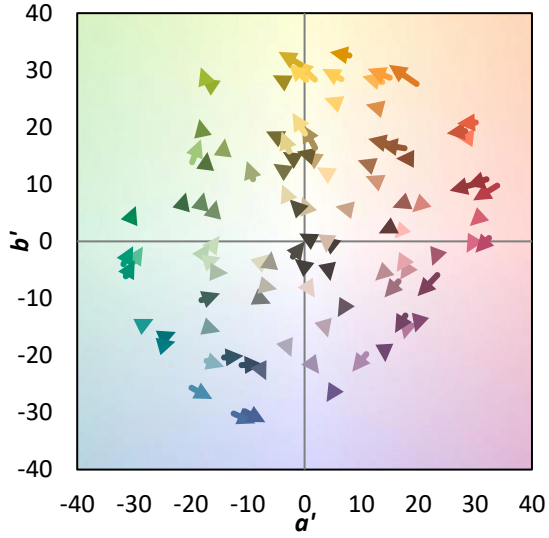



## Color Vector Graphics



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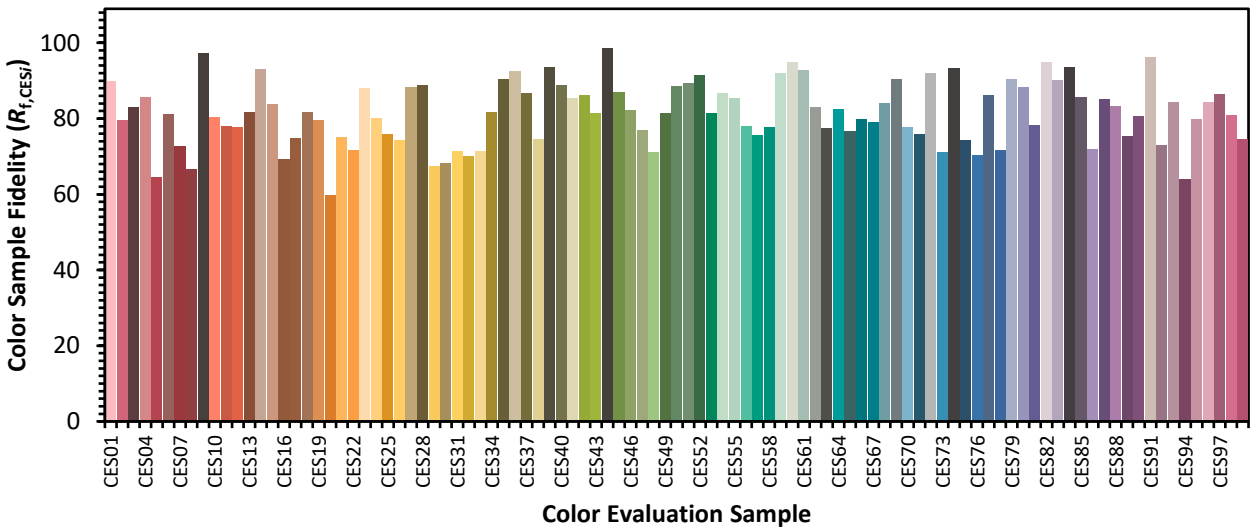
# TM-30-18

**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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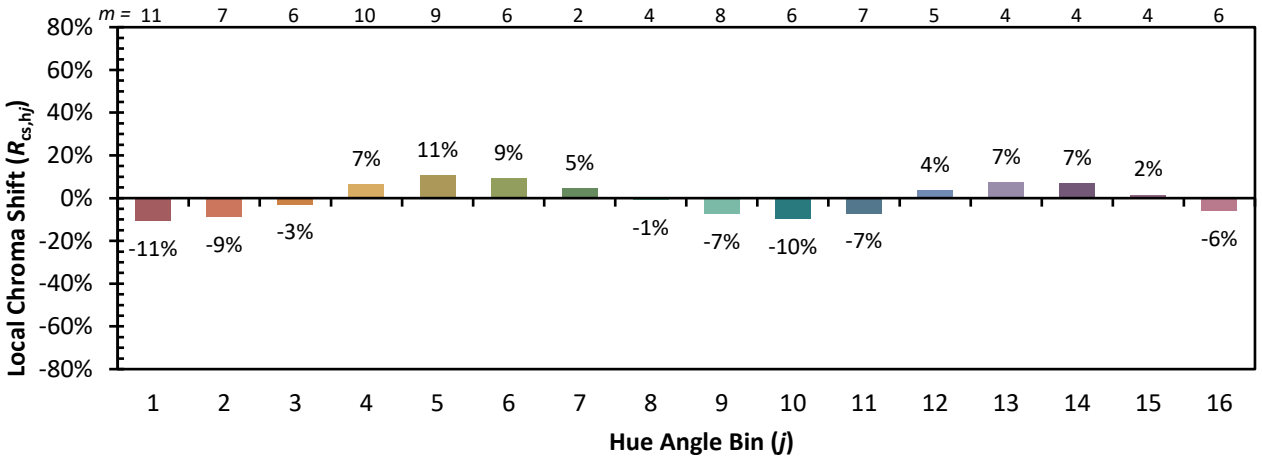
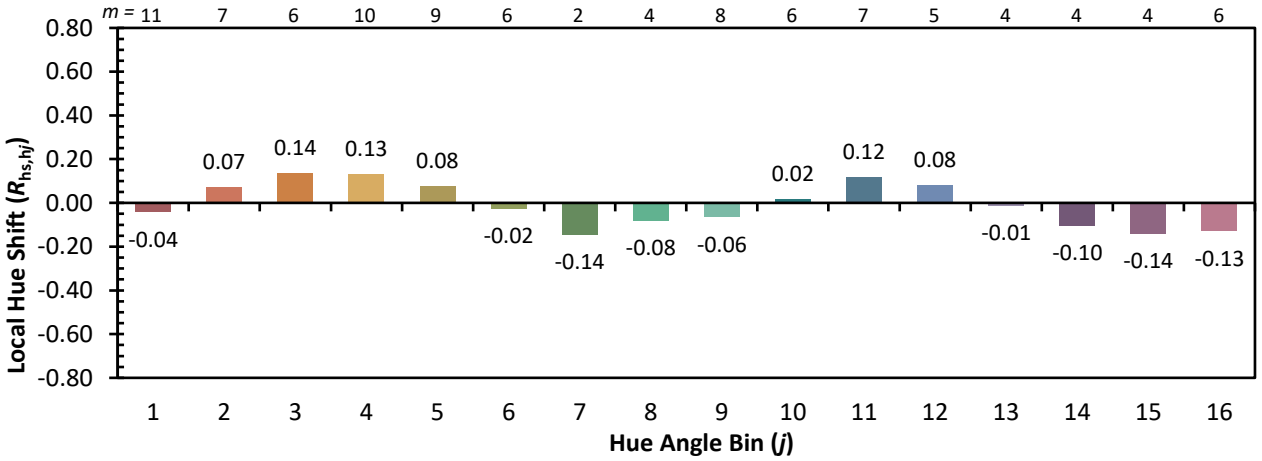
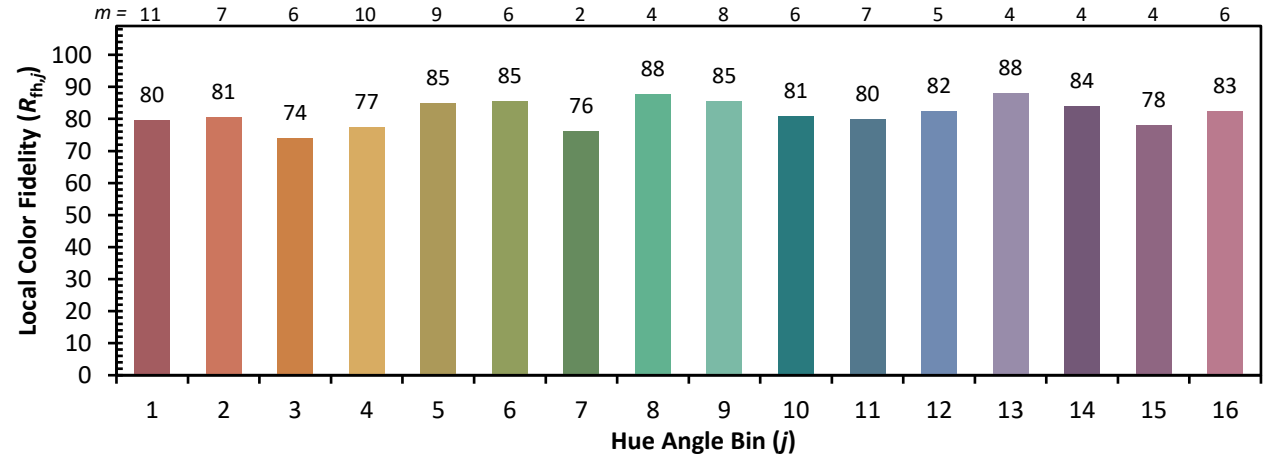
## Color Rendition by Hue-Angle Bin



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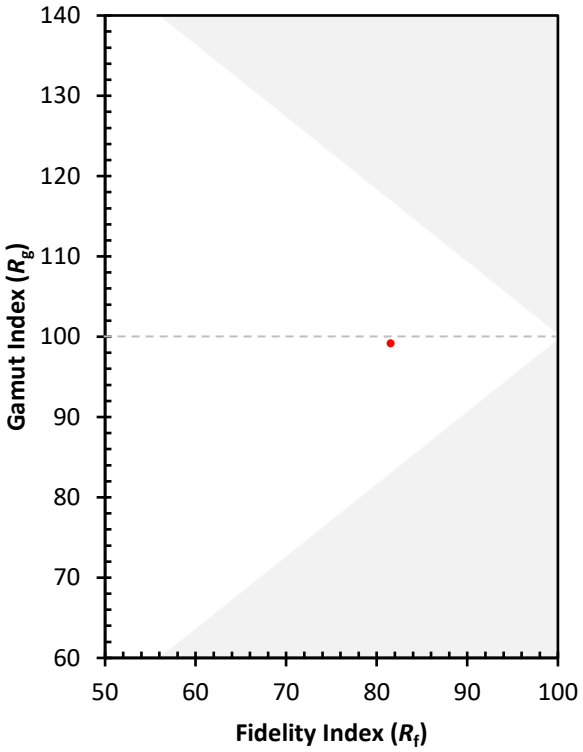
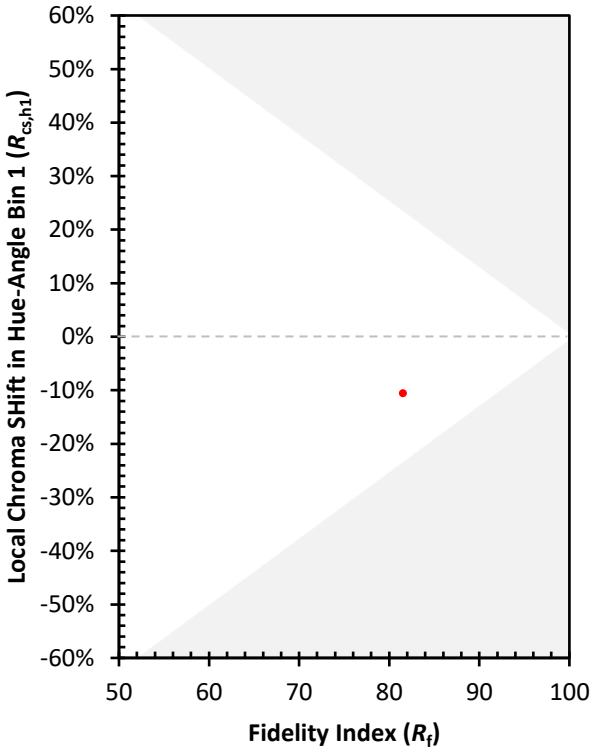
## TM-30-18

### Measure Comparisons

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