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: P635030

Luminaire Tested: GWS-SA3C-830-U-T2R-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: | P635030 |
| | TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-11) |
| Test Lab: | COOPER LIGHTING SOLUTIONS |
| Issue Date: | 1/10/2023 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS |
| Product Line: | McGRAW-EDISON |
| Catalog Number: | GWS-SA3C-830-U-T2R-W |
| Description: | GALLEON WALL SLIM LUMINAIRE. (3) LIGHTSQUARES WITH 16 LEDS EACH AND TYPE II ROADWAY OPTICS |
| Light Source: | (48) 3000K CCT, 80 CRI LEDS |
| Ballast/Driver: | - |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 11299.4 lumens |
| Efficiency: | N/A |
| Efficacy: | 121.5 lumens/watt |
| Luminous Opening: | Rectangular (W 1.5' x L: 0.5' x H: 0') |
| IES Classification: | Type II - Short |
| BUG Rating: | B2 - U0 - G2 |

| | |
|---|---|
| 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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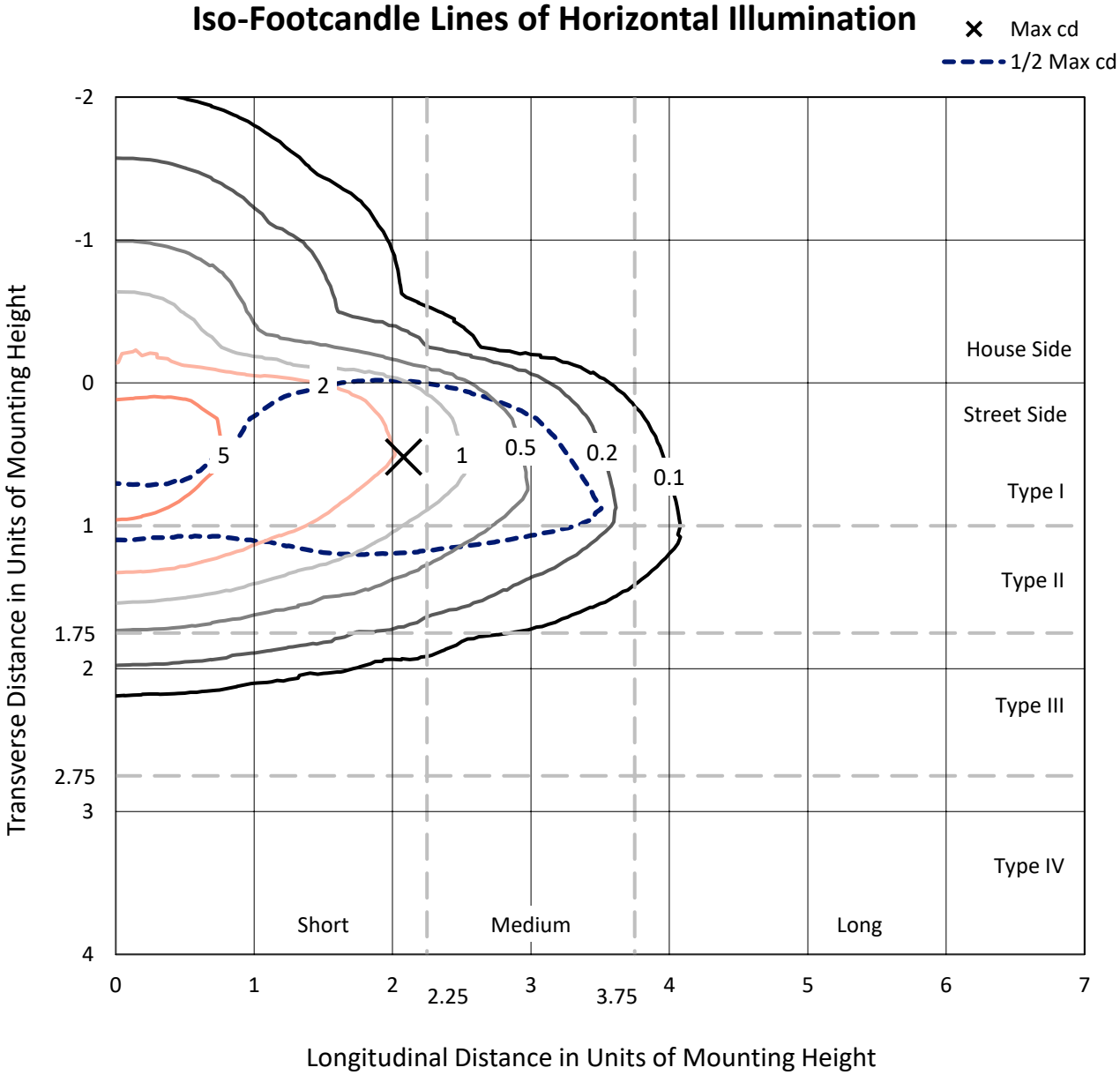
Scaled Data Report

REPORT NUMBER: P635030
CATALOG NUMBER: GWS-SA3C-830-U-T2R-W

## Iso-Footcandle Lines of Horizontal Illumination




Based on 20 foot mounting height. Maximum calculated value = 6.9 fc
Type II - Short - N/A

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REPORT NUMBER: P635030
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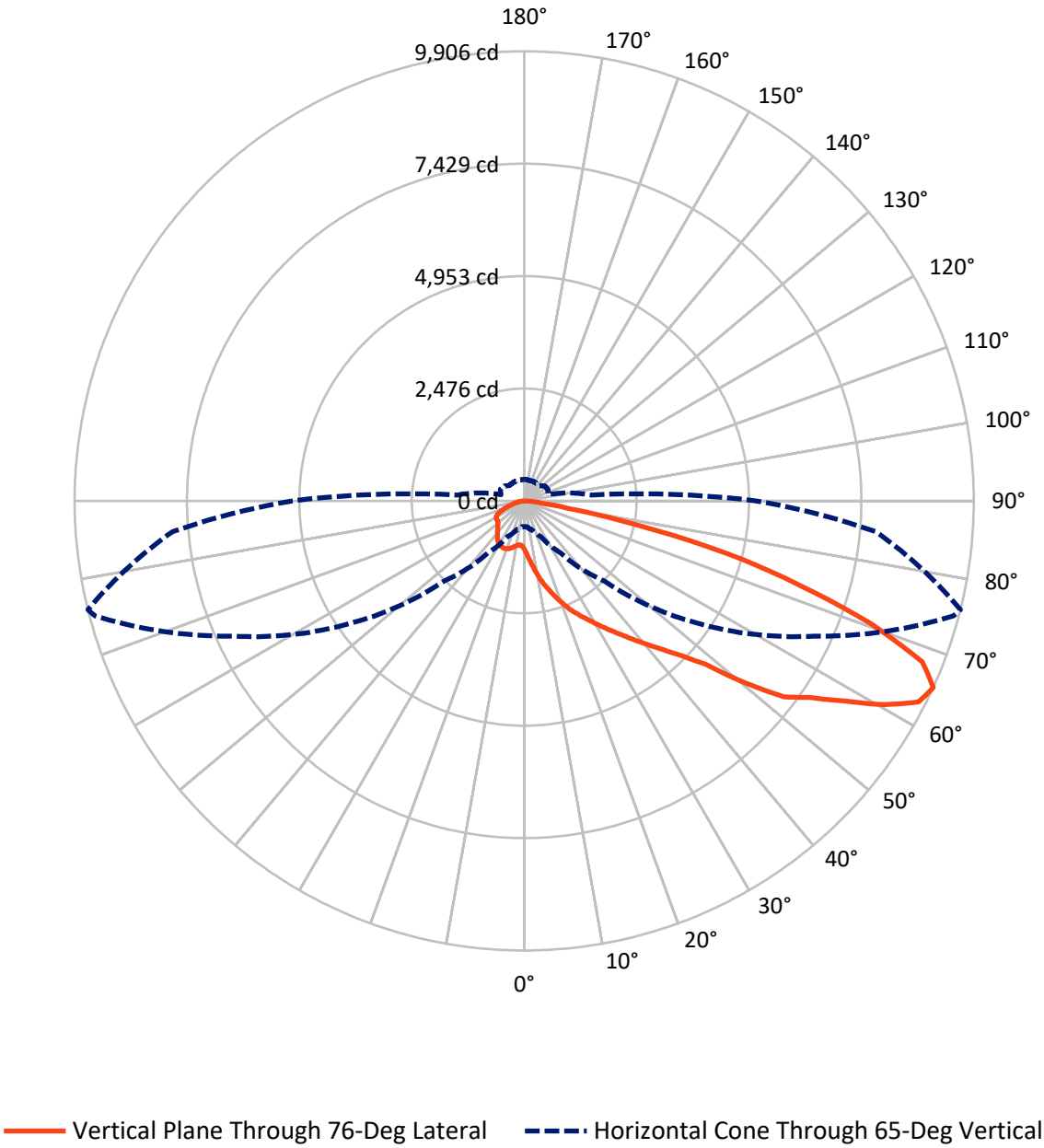
## Luminous Intensity Polar Plot



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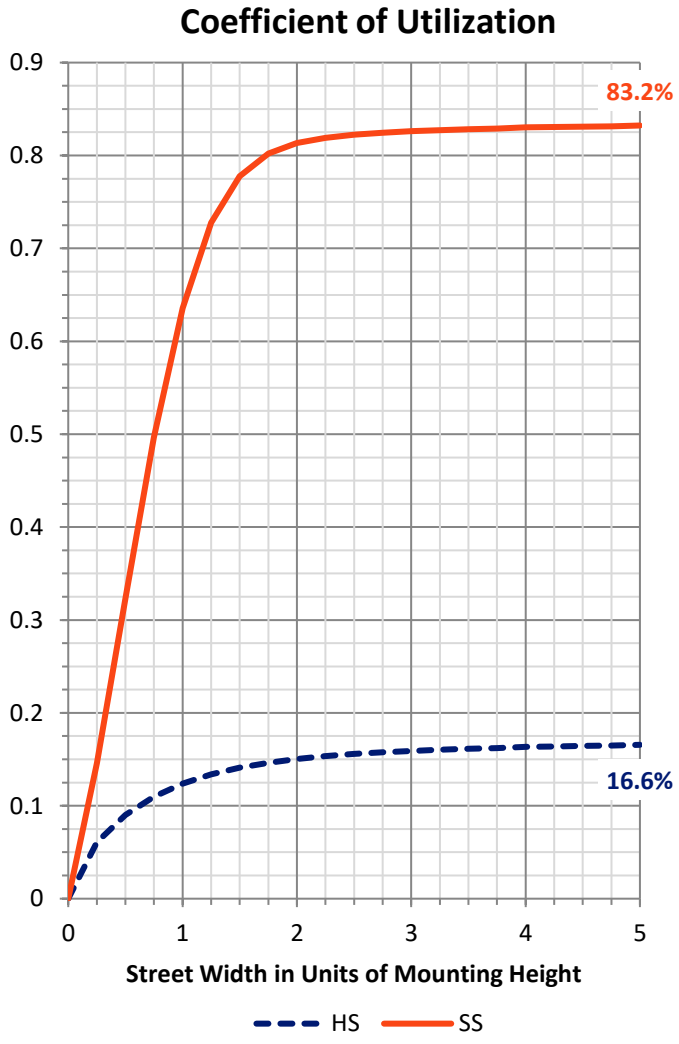
REPORT NUMBER: P635030
CATALOG NUMBER: GWS-SA3C-830-U-T2R-W

**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 1888.7 | 0.0 | 1888.7 |
| | % Fixture | 16.7 | 0.0 | 16.7 |
| **Street Side** | Lumens | 9410.7 | 0.0 | 9410.7 |
| | % Fixture | 83.3 | 0.0 | 83.3 |
| **Total** | Lumens | 11299.4 | 0.0 | 11299.4 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 127.1 | 1.1 |
| 10°-20° | 484.2 | 4.3 |
| 20°-30° | 943.6 | 8.4 |
| 30°-40° | 1578.2 | 14.0 |
| 40°-50° | 2259.6 | 20.0 |
| 50°-60° | 2675.1 | 23.7 |
| 60°-70° | 2224.4 | 19.7 |
| 70°-80° | 910.3 | 8.1 |
| 80°-90° | 96.9 | 0.9 |
| 90°-100° | 0.0 | 0.0 |
| 100°-110° | 0.0 | 0.0 |
| 110°-120° | 0.0 | 0.0 |
| 120°-130° | 0.0 | 0.0 |
| 130°-140° | 0.0 | 0.0 |
| 140°-150° | 0.0 | 0.0 |
| 150°-160° | 0.0 | 0.0 |
| 160°-170° | 0.0 | 0.0 |
| 170°-180° | 0.0 | 0.0 |
| 0°-90° | 11299.4 | 100.0 |
| 0°-180° | 11299.4 | 100.0 |



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REPORT NUMBER: P635030
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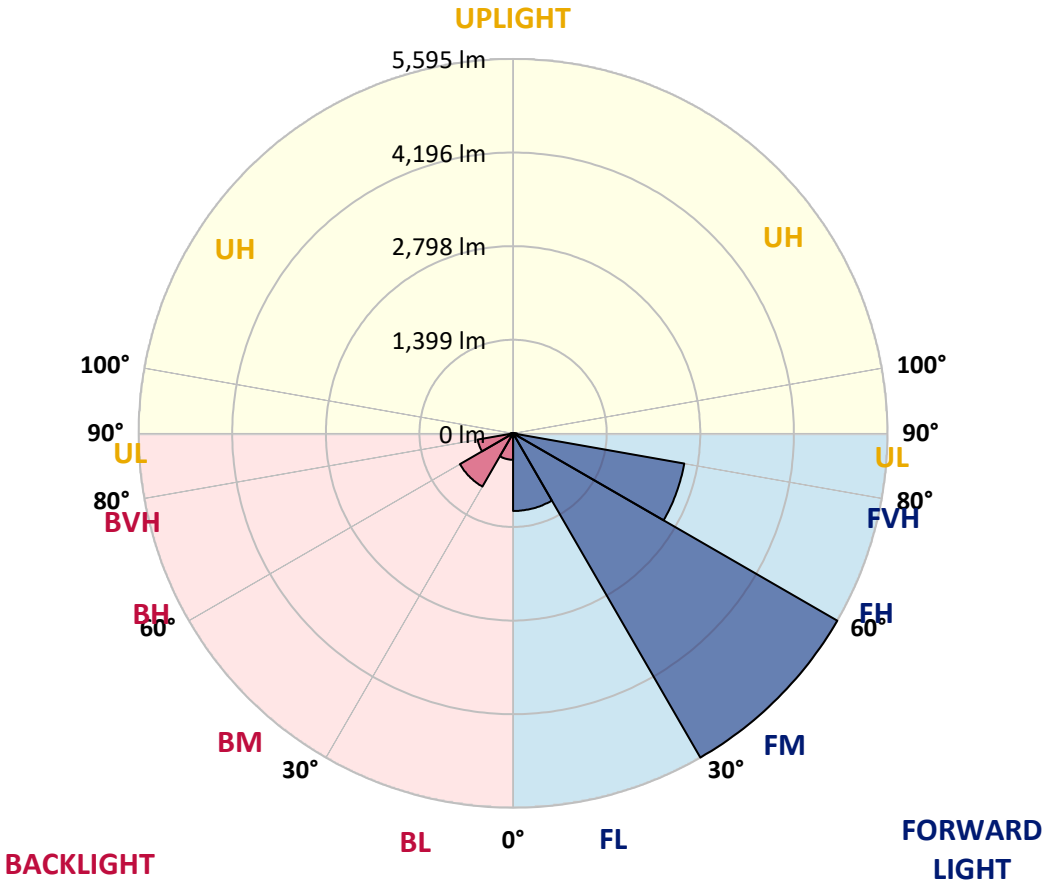
## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 1159.8 | 10.3 | | | |
| FM | (30°-60°) | 5595.0 | 49.5 | | | |
| FH | (60°-80°) | 2598.0 | 23.0 | | | G2/5000 |
| FVH | (80°-90°) | 57.8 | 0.5 | | | G1/100 |
| BL | (0°-30°) | 395.1 | 3.5 | B1/500 | | |
| BM | (30°-60°) | 917.9 | 8.1 | B1/1000 | | |
| BH | (60°-80°) | 536.6 | 4.7 | B2/1000 | | G2/1000 |
| BVH | (80°-90°) | 39.1 | 0.3 | | | G1/100 |
| UL | (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH | (100°-180°) | 0.0 | 0.0 | | U0/0 | |

**BUG Rating: B2-U0-G2**
Type II Short



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REPORT NUMBER: P635030
CATALOG NUMBER: GWS-SA3C-830-U-T2R-W

**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 15° | 25° | 35° | 45° | 55° | 65° | 75° | 76° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 1070.0 | 1070.0 | 1070.0 | 1070.0 | 1070.0 | 1070.0 | 1070.0 | 1070.0 | 1070.0 | *1070.0* | 1070.0 |
| 2.5° | 1499.8 | 1505.3 | 1487.1 | 1480.7 | 1437.8 | 1379.8 | 1331.4 | 1258.3 | 1190.8 | *1180.4* | 1120.1 |
| 5° | 1904.9 | 1881.1 | 1860.4 | 1846.9 | 1787.3 | 1721.4 | 1618.9 | 1481.5 | 1337.7 | *1320.2* | 1190.0 |
| 7.5° | 2145.6 | 2141.6 | 2116.2 | 2108.2 | 2062.2 | 1996.2 | 1890.6 | 1719.8 | 1510.9 | *1482.3* | 1284.5 |
| 10° | 2338.6 | 2336.2 | 2323.5 | 2330.7 | 2288.6 | 2224.2 | 2121.8 | 1945.4 | 1700.7 | *1672.1* | 1390.1 |
| 12.5° | 2507.0 | 2511.0 | 2508.6 | 2534.8 | 2513.4 | 2463.3 | 2356.9 | 2163.1 | 1890.6 | *1859.6* | 1518.8 |
| 15° | 2630.1 | 2633.3 | 2645.2 | 2702.4 | 2714.3 | 2704.0 | 2596.0 | 2376.7 | 2078.1 | *2033.6* | 1651.5 |
| 17.5° | 2665.1 | 2671.5 | 2700.1 | 2792.2 | 2856.5 | 2899.4 | 2819.2 | 2594.4 | 2262.4 | *2213.9* | 1786.5 |
| 20° | 2712.0 | 2719.1 | 2747.7 | 2843.8 | 2938.4 | 3036.1 | 3021.8 | 2815.2 | 2448.2 | *2408.5* | 1923.2 |
| 22.5° | 2928.8 | 2923.3 | 2910.6 | 2956.6 | 3024.2 | 3145.7 | 3181.4 | 3027.3 | 2640.5 | *2602.3* | 2074.1 |
| 25° | 3346.7 | 3336.3 | 3255.3 | 3213.2 | 3191.0 | 3264.8 | 3328.4 | 3220.4 | 2827.9 | *2770.7* | 2214.7 |
| 27.5° | 3807.4 | 3801.8 | 3698.6 | 3598.5 | 3461.8 | 3430.1 | 3467.4 | 3388.8 | 3009.9 | *2951.9* | 2337.0 |
| 30° | 4243.5 | 4226.8 | 4118.8 | 3993.3 | 3810.6 | 3673.9 | 3619.1 | 3554.0 | 3209.2 | *3148.9* | 2480.0 |
| 32.5° | 4633.5 | 4612.1 | 4485.0 | 4346.0 | 4154.5 | 3993.3 | 3829.6 | 3729.5 | 3434.8 | *3364.9* | 2626.2 |
| 35° | 4953.7 | 4932.2 | 4801.9 | 4654.2 | 4443.7 | 4324.5 | 4100.5 | 3920.2 | 3664.4 | *3593.7* | 2798.6 |
| 37.5° | 5201.5 | 5181.7 | 5045.8 | 4900.4 | 4716.9 | 4622.4 | 4427.8 | 4134.7 | 3928.9 | *3855.1* | 2981.3 |
| 40° | 5340.5 | 5326.2 | 5217.4 | 5102.2 | 4948.1 | 4866.3 | 4778.9 | 4405.6 | 4225.2 | *4151.4* | 3196.5 |
| 42.5° | 5382.6 | 5373.1 | 5296.8 | 5237.3 | 5133.2 | 5071.2 | 5121.3 | 4724.1 | 4541.4 | *4477.0* | 3438.8 |
| 45° | 5277.0 | 5277.0 | 5254.7 | 5284.9 | 5289.7 | 5288.9 | 5464.4 | 5083.9 | 4929.8 | *4859.1* | 3780.4 |
| 47.5° | 5006.9 | 5024.4 | 5056.9 | 5205.5 | 5362.0 | 5493.0 | 5865.6 | 5563.7 | 5429.5 | *5371.5* | 4264.2 |
| 50° | 4512.8 | 4560.5 | 4671.7 | 4961.6 | 5294.5 | 5628.1 | 6245.3 | 6273.1 | 6401.0 | *6298.5* | 4975.9 |
| 52.5° | 3789.1 | 3782.0 | 4065.6 | 4478.6 | 4986.2 | 5633.6 | 6454.2 | 6899.1 | 7243.0 | *7172.3* | 5505.0 |
| 55° | 3011.4 | 2999.5 | 3264.1 | 3833.6 | 4513.6 | 5420.8 | 6579.7 | 7185.8 | 7710.1 | *7646.6* | 5980.8 |
| 57.5° | 2306.0 | 2291.0 | 2526.1 | 3040.0 | 3846.3 | 4968.8 | 6555.9 | 7527.4 | 8352.8 | *8320.2* | 6627.4 |
| 60° | 1587.1 | 1568.9 | 1788.9 | 2238.5 | 3056.7 | 4277.7 | 6292.2 | 7703.0 | 9105.0 | *9116.1* | 7319.3 |
| 62.5° | 953.2 | 942.9 | 1102.6 | 1451.3 | 2198.8 | 3421.3 | 5675.0 | 7596.5 | 9704.0 | *9754.0* | 7764.1 |
| 65° | *575.1* | *568.0* | *661.7* | *865.9* | *1394.9* | *2496.7* | *4723.3* | *7052.4* | *9790.6* | *9905.7* | *7774.5* |
| 67.5° | 418.6 | 419.4 | 446.4 | 527.5 | 813.4 | 1612.6 | 3544.5 | 6076.9 | 9339.4 | *9458.5* | 7284.3 |
| 70° | 363.8 | 365.4 | 379.7 | 398.0 | 491.7 | 923.1 | 2304.5 | 4797.2 | 8005.6 | *8097.8* | 6109.5 |
| 72.5° | 323.3 | 323.3 | 332.8 | 342.4 | 384.5 | 562.4 | 1234.4 | 3353.0 | 6318.4 | *6343.0* | 4662.9 |
| 75° | 284.4 | 282.0 | 286.8 | 291.5 | 333.6 | 393.2 | 600.5 | 2336.2 | 4666.9 | *4609.7* | 3013.8 |
| 77.5° | 226.4 | 224.0 | 224.8 | 229.6 | 267.7 | 281.2 | 304.2 | 1459.3 | 2630.1 | *2482.4* | 1331.4 |
| 80° | 161.3 | 159.7 | 168.4 | 180.3 | 197.8 | 172.4 | 190.6 | 706.2 | 1043.0 | *970.7* | 516.3 |
| 82.5° | 96.1 | 99.3 | 112.8 | 122.3 | 136.6 | 108.0 | 123.1 | 235.9 | 369.4 | *359.8* | 209.7 |
| 85° | 13.5 | 14.3 | 40.5 | 46.9 | 58.8 | 42.1 | 65.1 | 106.4 | 147.8 | *158.1* | 73.9 |
| 87.5° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 5.6 | 19.1 | 42.1 | *42.9* | 18.3 |
| 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: P635030
CATALOG NUMBER: GWS-SA3C-830-U-T2R-W

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 1070.0 | 1070.0 | 1070.0 | 1070.0 | 1070.0 | 1070.0 | 1070.0 | 1070.0 | 1070.0 | 1070.0 | 1070.0 |
| 2.5° | 1089.1 | 1051.7 | 998.5 | 954.0 | 916.7 | 886.5 | 861.1 | 842.0 | 836.5 | 828.5 | 828.5 |
| 5° | 1128.8 | 1061.3 | 965.9 | 898.4 | 859.5 | 836.5 | 820.6 | 812.6 | 808.7 | 803.9 | 801.5 |
| 7.5° | 1183.6 | 1089.1 | 960.4 | 892.1 | 861.9 | 847.6 | 837.3 | 832.5 | 829.3 | 824.6 | 824.6 |
| 10° | 1259.1 | 1130.4 | 977.9 | 914.3 | 890.5 | 876.2 | 864.3 | 856.3 | 849.2 | 842.0 | 840.4 |
| 12.5° | 1340.9 | 1184.4 | 1009.6 | 944.5 | 919.1 | 901.6 | 884.9 | 873.0 | 864.3 | 855.5 | 853.1 |
| 15° | 1431.4 | 1240.0 | 1043.8 | 973.9 | 942.1 | 918.3 | 898.4 | 880.2 | 868.2 | 855.5 | 853.9 |
| 17.5° | 1520.4 | 1296.4 | 1072.4 | 993.8 | 953.2 | 923.8 | 895.3 | 871.4 | 856.3 | 842.0 | 838.1 |
| 20° | 1626.9 | 1352.8 | 1092.3 | 999.3 | 950.9 | 911.9 | 877.8 | 847.6 | 830.9 | 814.2 | 811.8 |
| 22.5° | 1724.6 | 1405.2 | 1101.8 | 991.4 | 932.6 | 886.5 | 846.8 | 814.2 | 796.0 | 779.3 | 776.1 |
| 25° | 1819.1 | 1451.3 | 1097.8 | 972.3 | 904.8 | 851.6 | 810.3 | 777.7 | 760.2 | 742.7 | 738.0 |
| 27.5° | 1910.5 | 1482.3 | 1081.9 | 942.9 | 869.8 | 812.6 | 772.9 | 743.5 | 728.4 | 713.3 | 707.0 |
| 30° | 2000.2 | 1510.9 | 1057.3 | 904.8 | 825.3 | 772.1 | 739.6 | 718.9 | 703.8 | 687.9 | 683.2 |
| 32.5° | 2090.8 | 1531.5 | 1020.0 | 860.3 | 780.1 | 736.4 | 716.5 | 701.4 | 685.5 | 669.7 | 664.9 |
| 35° | 2182.1 | 1540.3 | 974.7 | 809.5 | 741.9 | 713.3 | 706.2 | 688.7 | 667.3 | 648.2 | 641.8 |
| 37.5° | 2291.0 | 1548.2 | 918.3 | 759.4 | 708.6 | 702.2 | 700.6 | 674.4 | 649.0 | 622.8 | 615.6 |
| 40° | 2422.0 | 1558.5 | 860.3 | 714.1 | 681.6 | 698.2 | 691.9 | 656.1 | 605.3 | 579.9 | 571.9 |
| 42.5° | 2582.5 | 1577.6 | 799.9 | 672.8 | 661.7 | 683.2 | 676.0 | 611.7 | 577.5 | 563.2 | 559.2 |
| 45° | 2818.4 | 1647.5 | 739.6 | 640.3 | 646.6 | 661.7 | 650.6 | 585.4 | 571.9 | 562.4 | 557.6 |
| 47.5° | 3238.6 | 1754.8 | 687.1 | 615.6 | 634.7 | 642.6 | 599.7 | 578.3 | 568.0 | 555.3 | 549.7 |
| 50° | 3675.5 | 1801.6 | 645.0 | 600.5 | 621.2 | 625.2 | 571.9 | 568.8 | 561.6 | 548.1 | 542.6 |
| 52.5° | 3971.0 | 1795.3 | 619.6 | 595.0 | 610.1 | 595.0 | 559.2 | 558.4 | 553.7 | 537.8 | 531.4 |
| 55° | 4304.7 | 1806.4 | 608.5 | 596.6 | 605.3 | 544.1 | 543.3 | 545.7 | 543.3 | 525.9 | 522.7 |
| 57.5° | 4755.1 | 1840.5 | 602.9 | 602.1 | 602.1 | 519.5 | 528.3 | 531.4 | 526.7 | 518.7 | 516.3 |
| 60° | 5188.0 | 1842.9 | 592.6 | 608.5 | 599.7 | 504.4 | 510.8 | 514.0 | 508.4 | 506.8 | 506.0 |
| 62.5° | 5350.9 | 1728.5 | 569.6 | 603.7 | 590.2 | 487.7 | 492.5 | 494.1 | 488.5 | 492.5 | 491.7 |
| 65° | *5108.6* | *1485.5* | *531.4* | *580.7* | *560.8* | *472.6* | *469.5* | *473.4* | *463.9* | *474.2* | *475.0* |
| 67.5° | 4535.8 | 1180.4 | 473.4 | 537.0 | 519.5 | 456.0 | 449.6 | 449.6 | 433.7 | 449.6 | 448.8 |
| 70° | 3657.3 | 834.1 | 388.4 | 467.1 | 474.2 | 436.1 | 432.9 | 414.7 | 389.2 | 413.1 | 410.7 |
| 72.5° | 2772.3 | 599.0 | 305.8 | 369.4 | 408.3 | 408.3 | 409.1 | 378.1 | 348.7 | 359.8 | 350.3 |
| 75° | 1756.3 | 421.8 | 244.7 | 282.8 | 320.1 | 358.3 | 376.5 | 319.3 | 293.1 | 288.4 | 283.6 |
| 77.5° | 791.2 | 277.2 | 190.6 | 216.9 | 227.2 | 282.8 | 344.0 | 274.9 | 239.1 | 228.8 | 225.6 |
| 80° | 331.3 | 172.4 | 135.8 | 153.3 | 139.8 | 237.5 | 303.4 | 213.7 | 175.6 | 161.3 | 150.9 |
| 82.5° | 145.4 | 102.5 | 86.6 | 82.6 | 87.4 | 176.3 | 226.4 | 142.2 | 109.6 | 148.5 | 150.1 |
| 85° | 61.2 | 54.0 | 44.5 | 40.5 | 35.7 | 67.5 | 106.4 | 55.6 | 68.3 | 38.9 | 31.8 |
| 87.5° | 14.3 | 15.9 | 11.9 | 7.9 | 4.8 | 0.8 | 0.0 | 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 |

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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

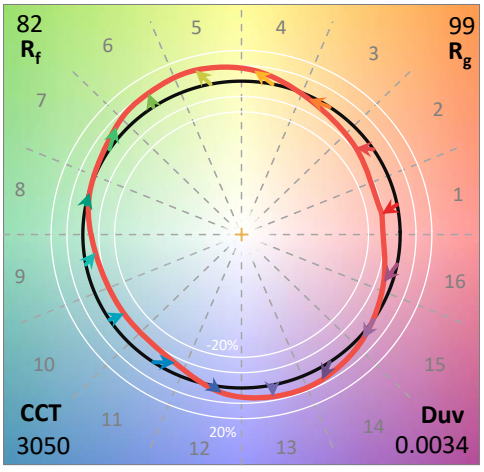
## Test Information

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

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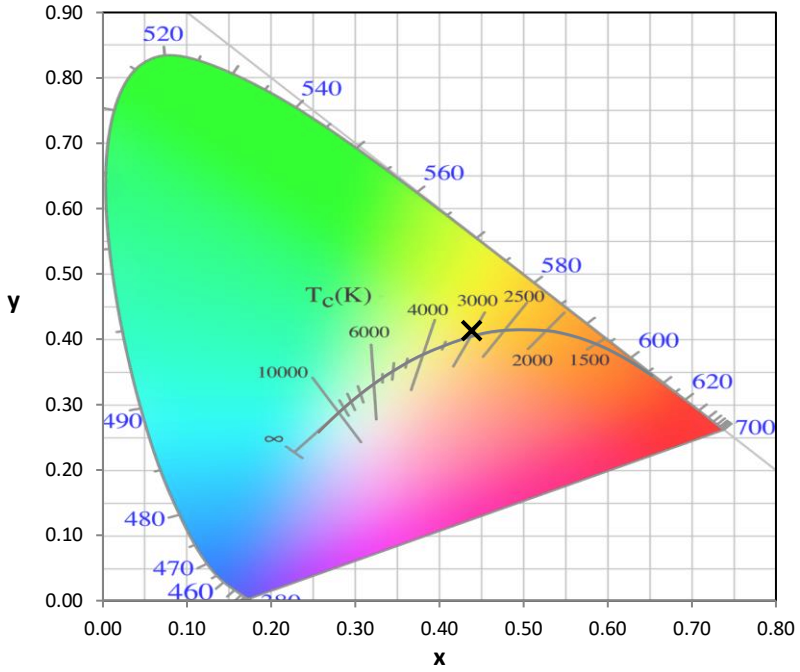
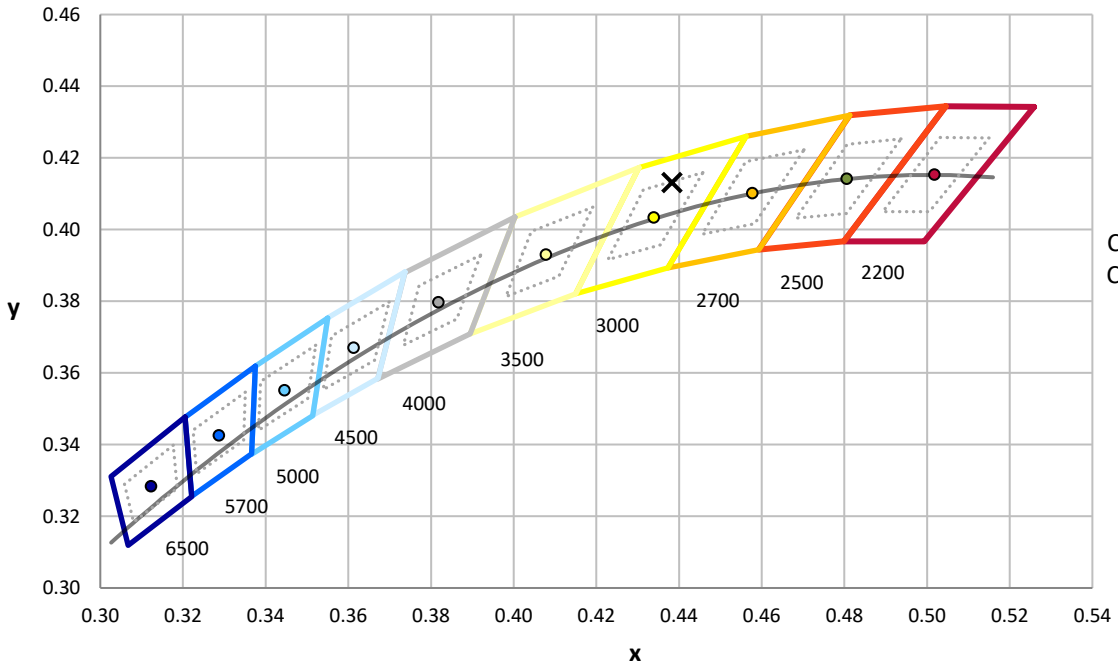
## CIE 1931 Chromaticity Diagram




## 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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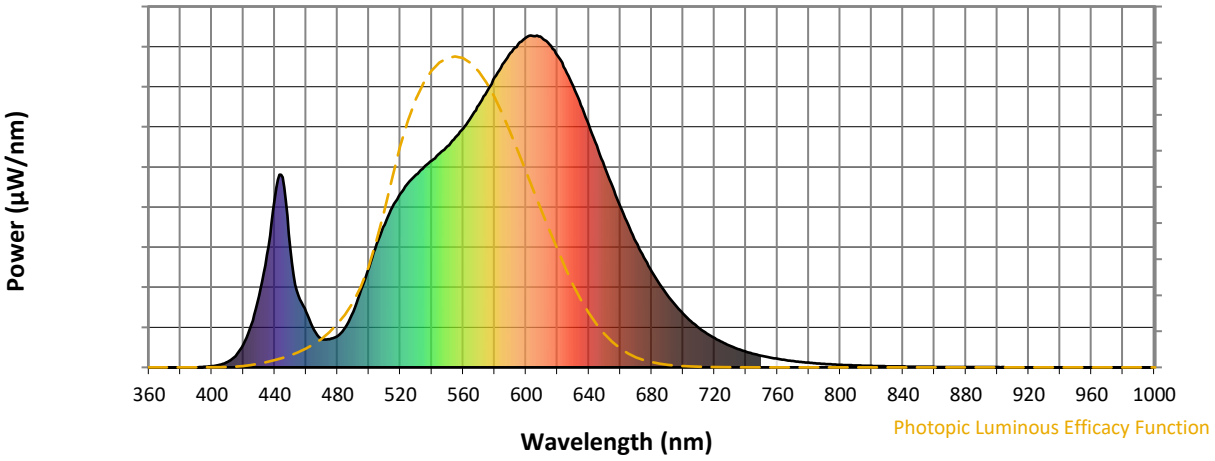
## Photopic Flux vs. Wavelength




## 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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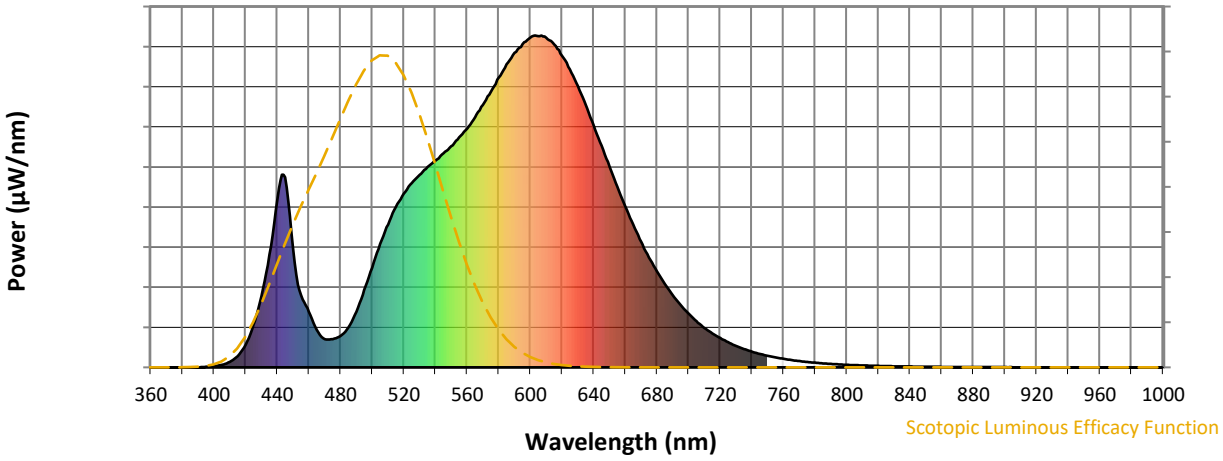
## Scotopic Flux vs. Wavelength




**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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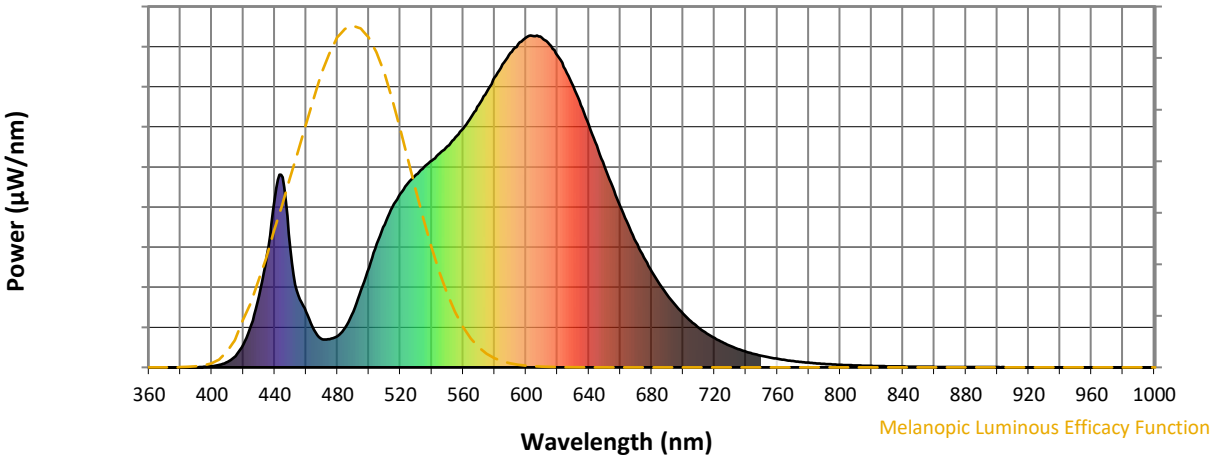
## Melanopic Flux vs. Wavelength




**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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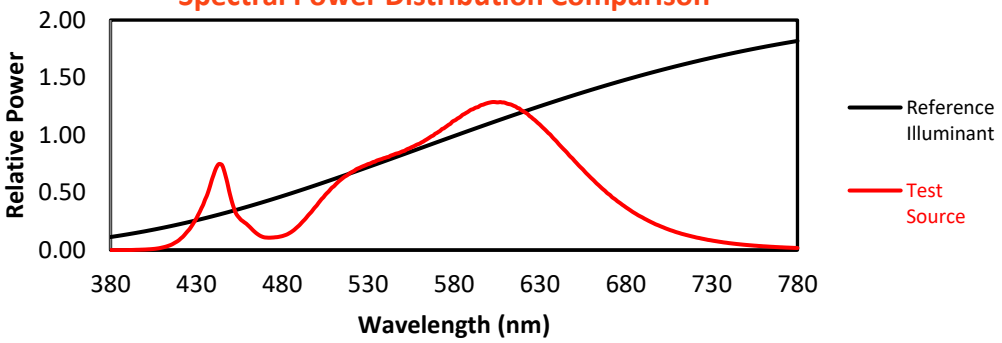
# TM-30-18

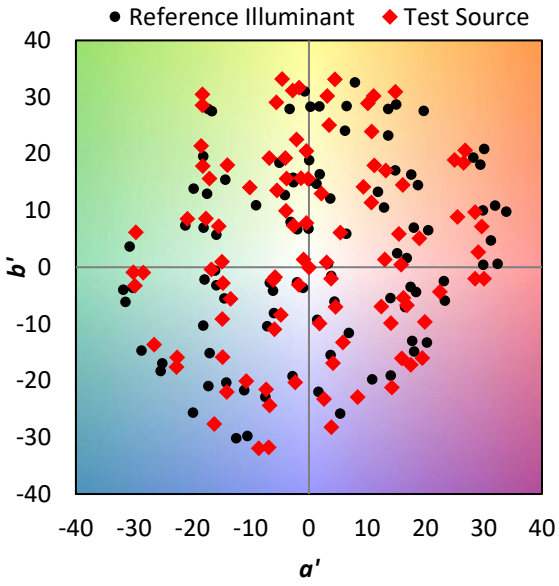
## Summary

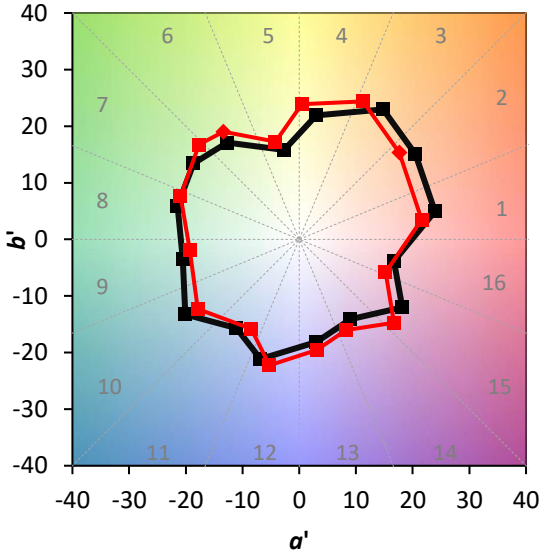
$R_f$ = 81.5
$R_g$ = 99.2
CIE $R_a$ = 81.0
$R_9$ = 7.1

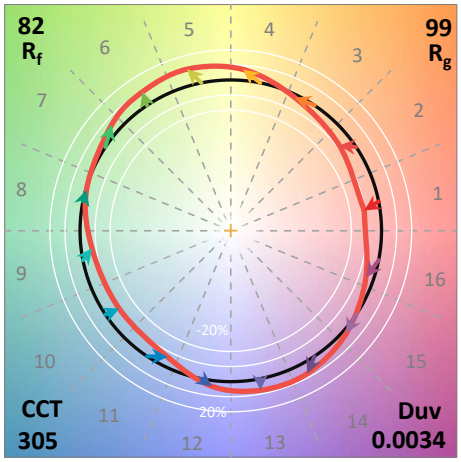
## Spectral Power Distribution Comparison

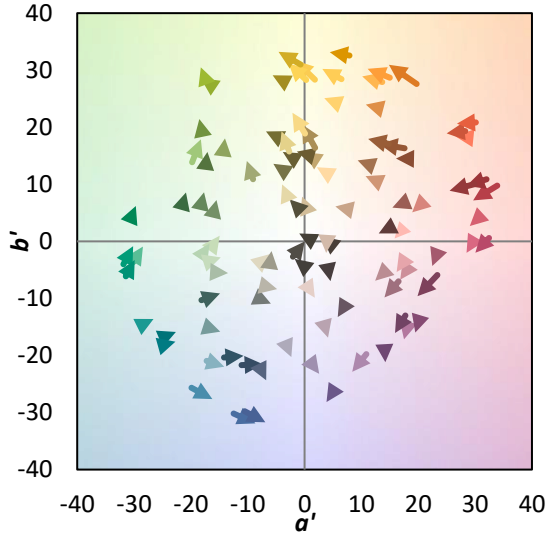



## Color Vector Graphics



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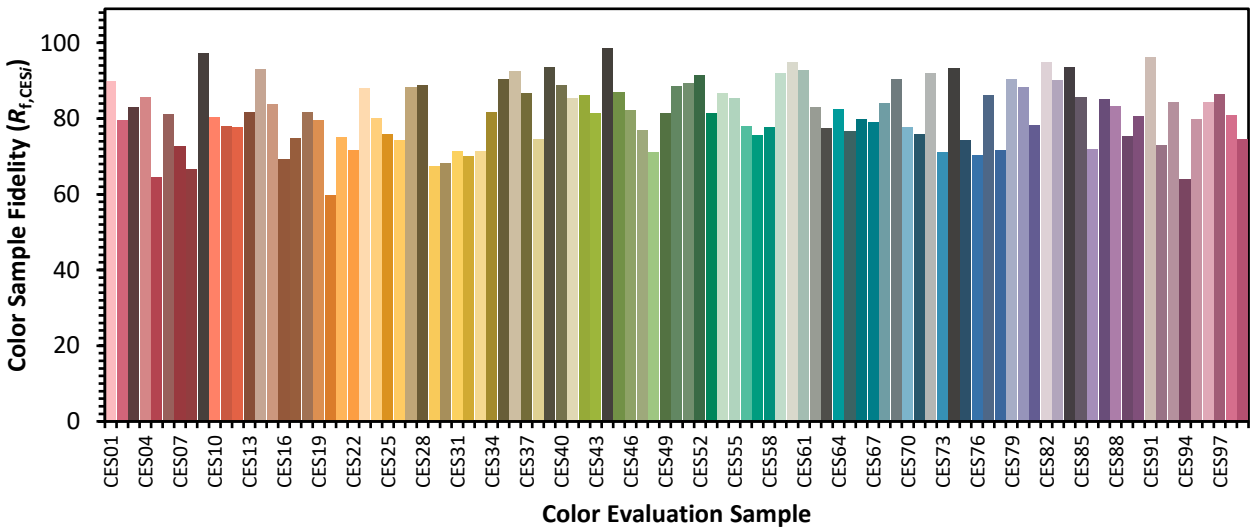
# TM-30-18

**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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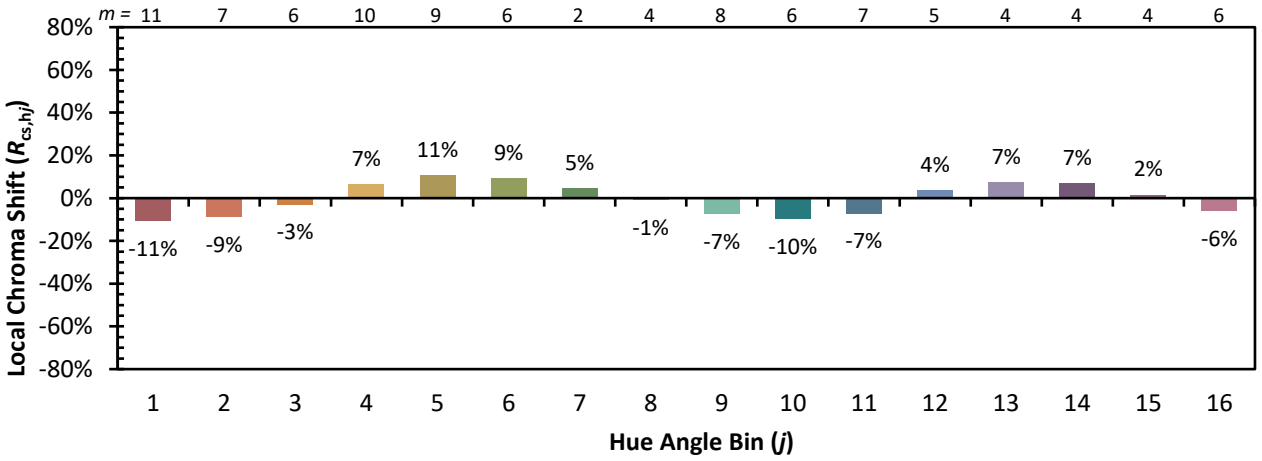
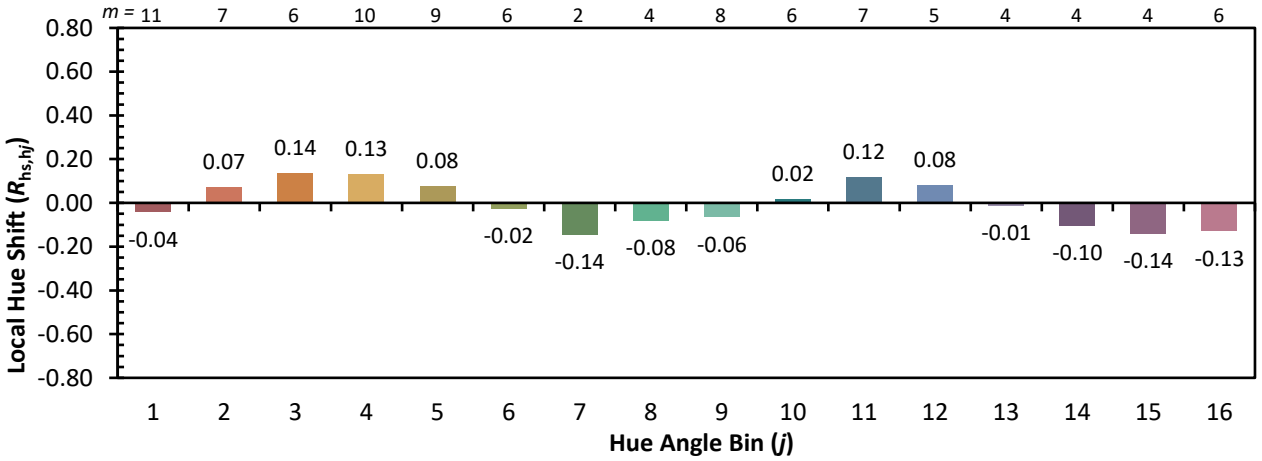
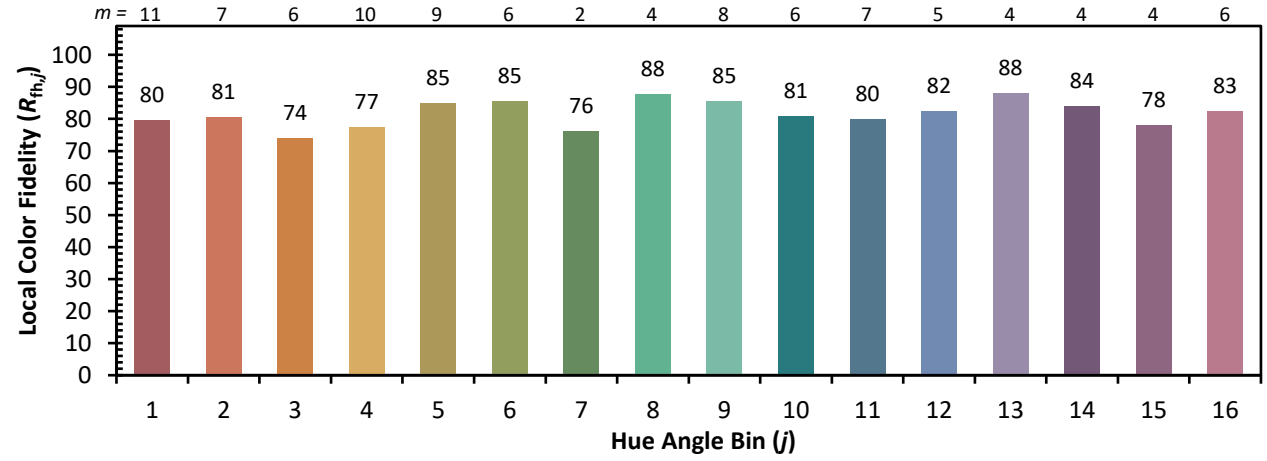
# TM-30-18

## Color Rendition by Hue-Angle Bin



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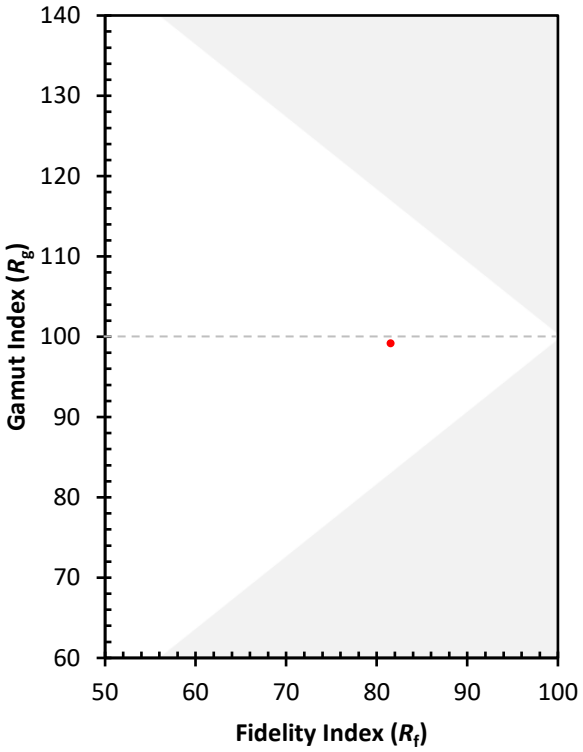
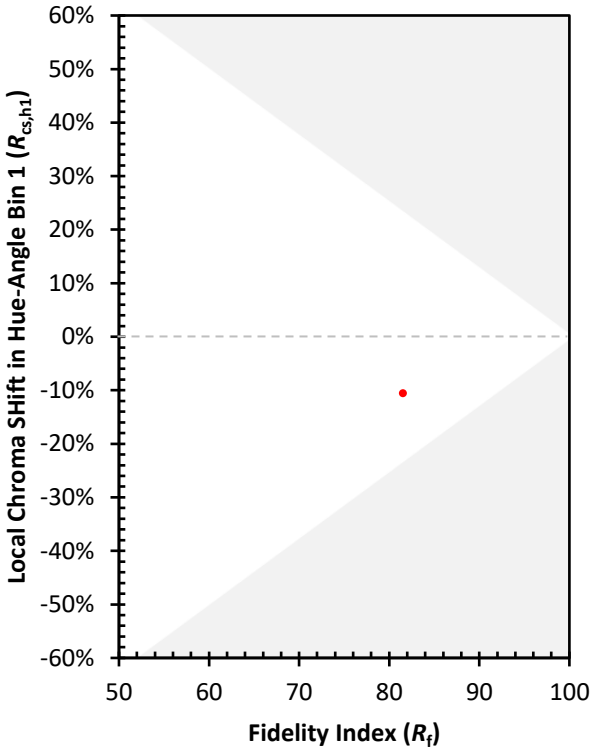
## TM-30-18

### Measure Comparisons

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