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: P643914

Luminaire Tested: GWS-SA6F-830-U-SL2-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: | P643914 |
| | TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-28) |
| Test Lab: | COOPER LIGHTING SOLUTIONS |
| Issue Date: | 1/10/2023 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS |
| Product Line: | McGRAW-EDISON |
| Catalog Number: | GWS-SA6F-830-U-SL2-W-GRSBK |
| Description: | GALLEON WALL SLIM LUMINAIRE. (6) LIGHTSQUARES WITH 16 LEDS EACH AND TYPE II SPILL LIGHT ELIMINATOR OPTICS W/ FACTORY INSTALLED GLARE SHIELD, BK |
| Light Source: | (96) 3000K CCT, 80 CRI LEDS |
| Ballast/Driver: | - |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 23215.6 lumens |
| Efficiency: | N/A |
| Efficacy: | 62.3 lumens/watt |
| Luminous Opening: | Rectangular (W 2' x L: 1' x H: 0') |
| IES Classification: | Type II - Short |
| BUG Rating: | B3 - U0 - G2 |

| | |
|---|---|
| Input Watts (W): | 372.6 |
| 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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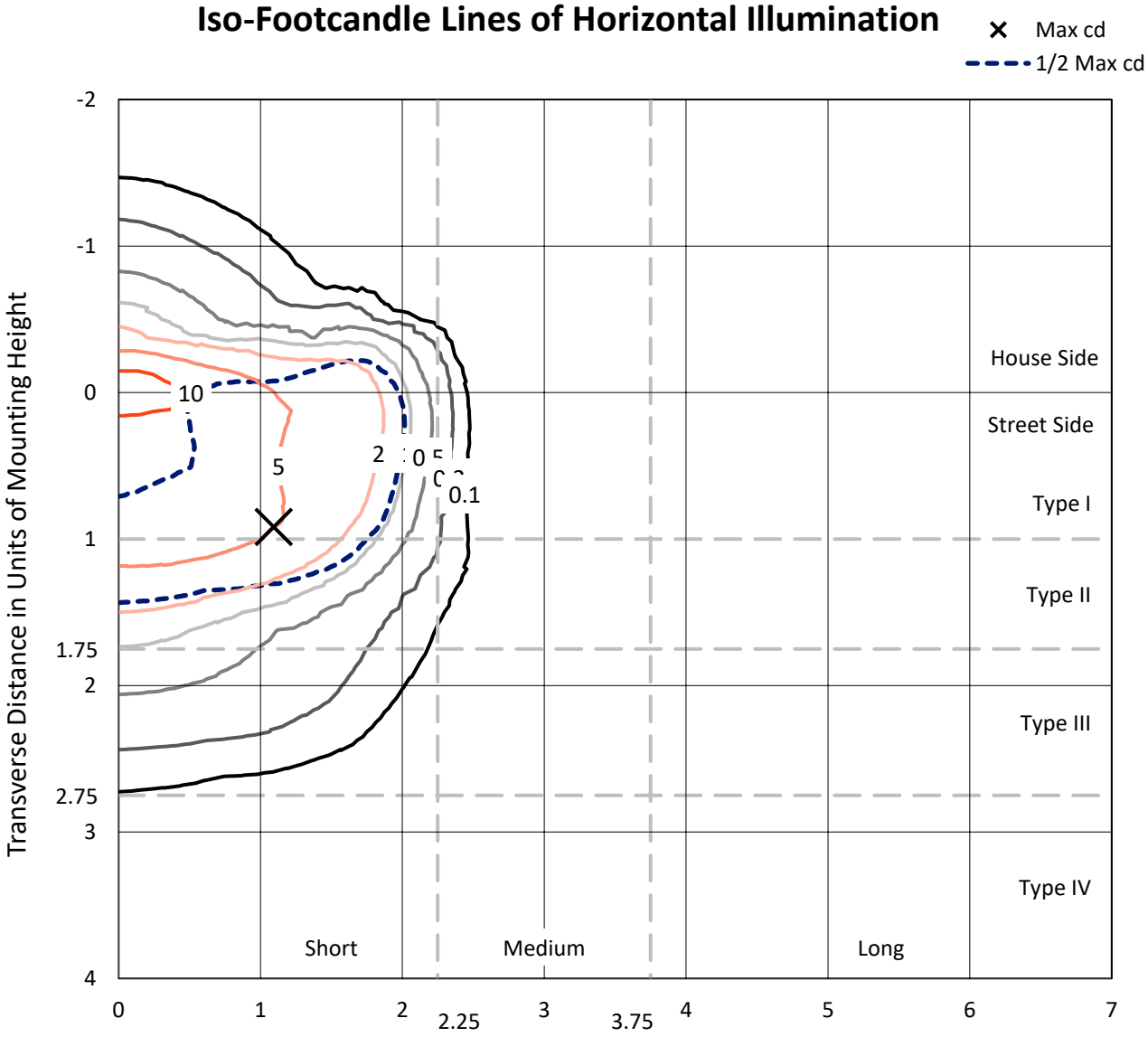
Scaled Data Report

REPORT NUMBER: P643914
CATALOG NUMBER: GWS-SA6F-830-U-SL2-W-GRSBK

## Iso-Footcandle Lines of Horizontal Illumination




Based on 25 foot mounting height. Maximum calculated value = 13 fc
Type II - Short - N/A

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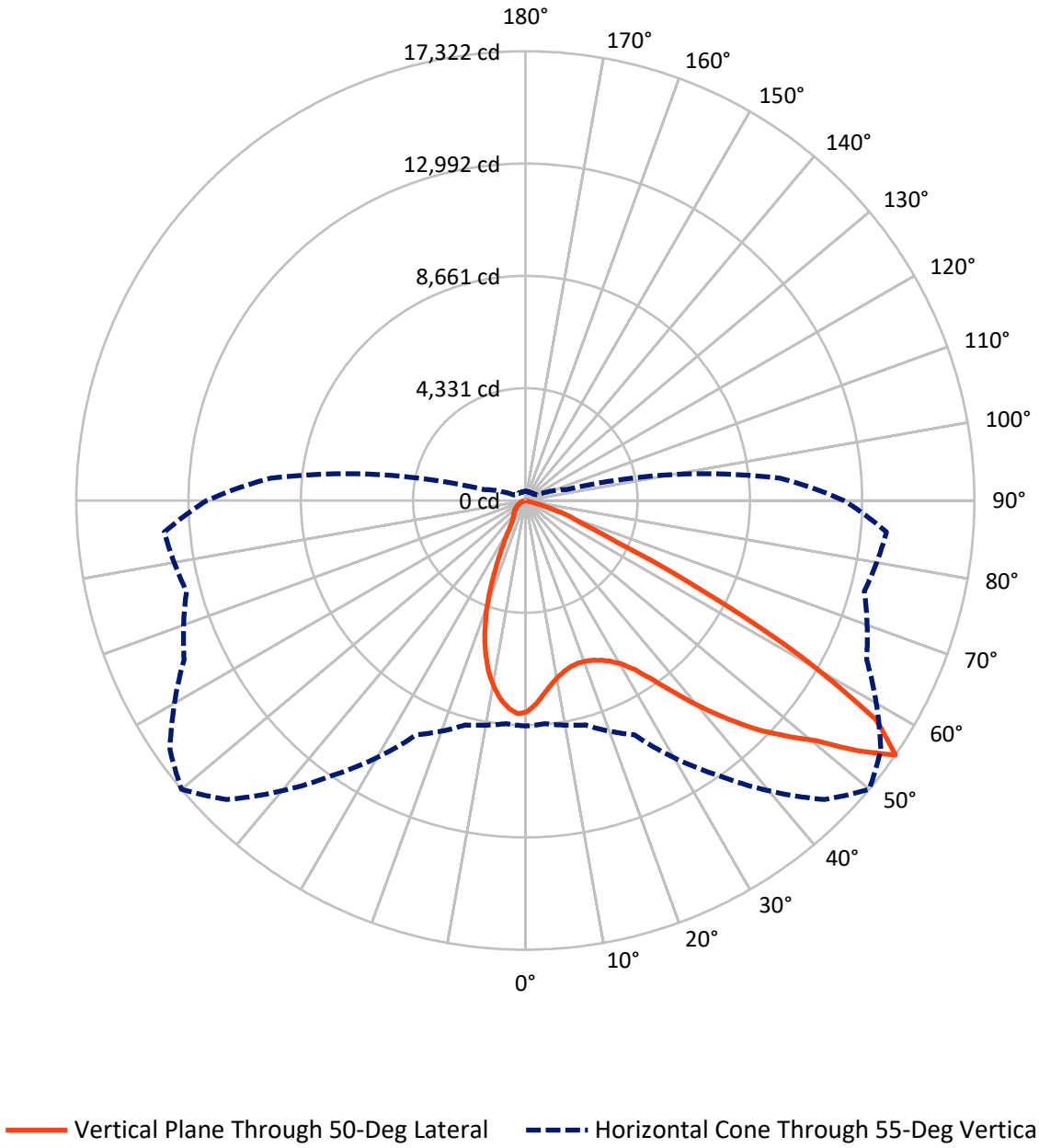
## Luminous Intensity Polar Plot



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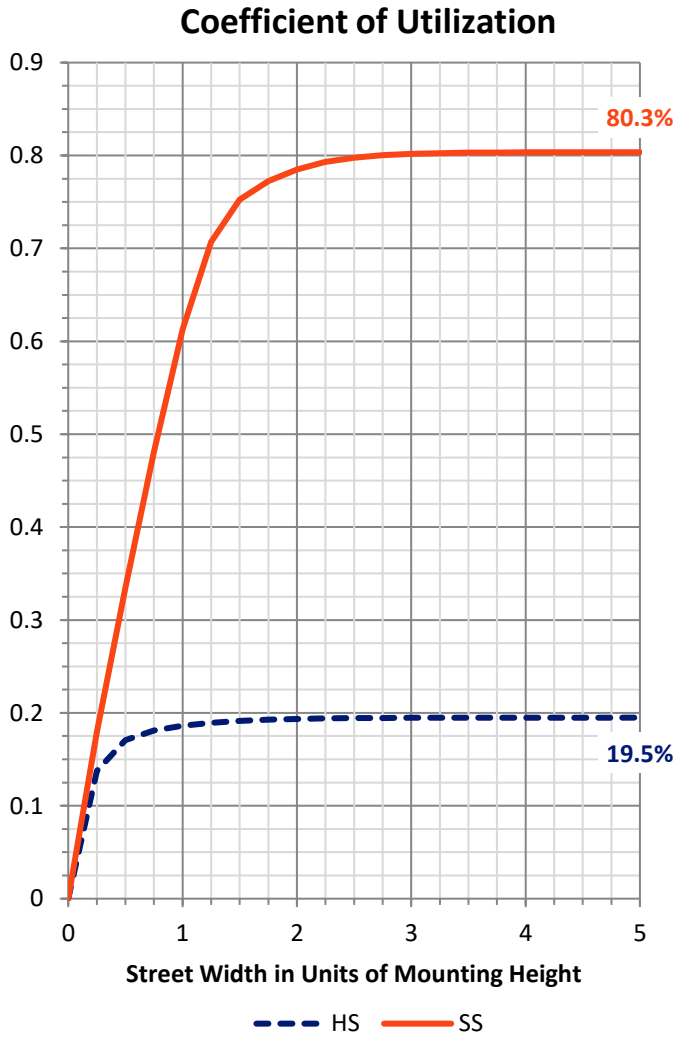
**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 4574.6 | 0.0 | 4574.6 |
| | % Fixture | 19.7 | 0.0 | 19.7 |
| **Street Side** | Lumens | 18641.0 | 0.0 | 18641.0 |
| | % Fixture | 80.3 | 0.0 | 80.3 |
| **Total** | Lumens | 23215.6 | 0.0 | 23215.6 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 715.3 | 3.1 |
| 10°-20° | 1760.3 | 7.6 |
| 20°-30° | 2483.0 | 10.7 |
| 30°-40° | 3674.3 | 15.8 |
| 40°-50° | 5300.8 | 22.8 |
| 50°-60° | 6252.7 | 26.9 |
| 60°-70° | 2789.2 | 12.0 |
| 70°-80° | 239.8 | 1.0 |
| 80°-90° | 0.1 | 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° | 23215.6 | 100.0 |
| 0°-180° | 23215.6 | 100.0 |



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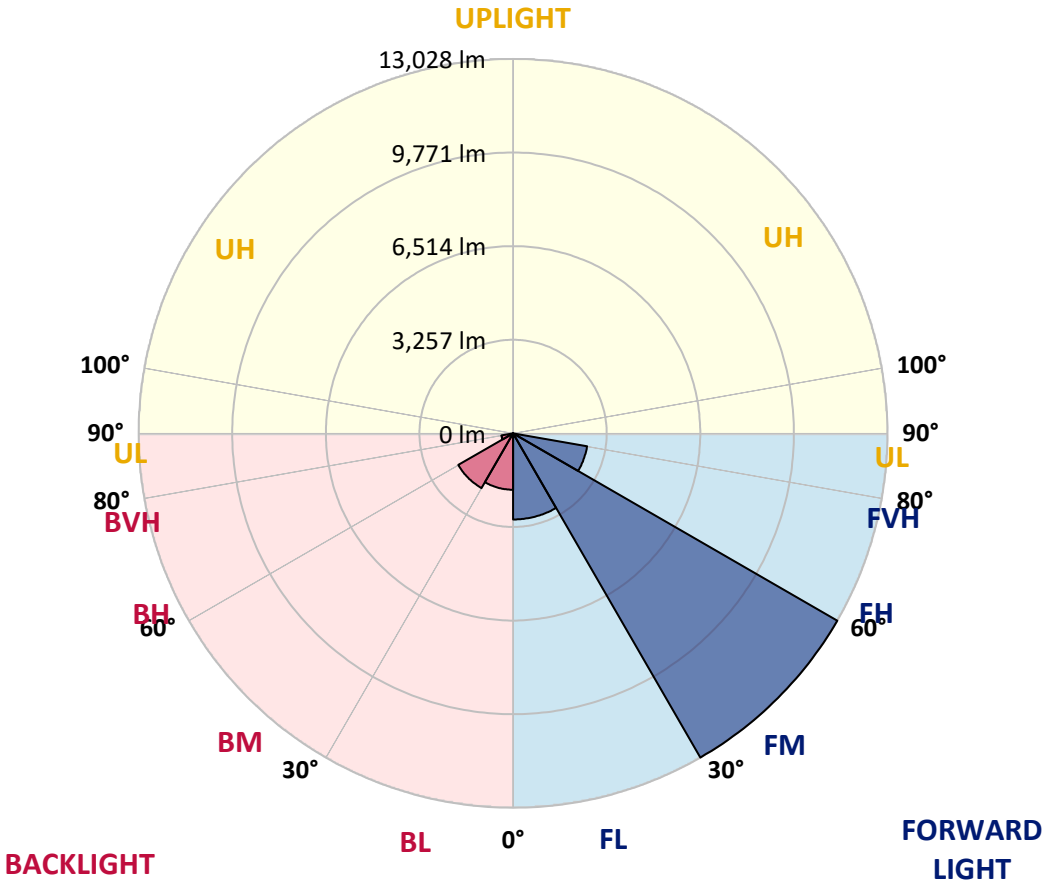
REPORT NUMBER: P643914
CATALOG NUMBER: GWS-SA6F-830-U-SL2-W-GRSBK

## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 2997.2 | 12.9 | | | |
| FM | (30°-60°) | 13027.8 | 56.1 | | | |
| FH | (60°-80°) | 2616.0 | 11.3 | | | G2/5000 |
| FVH | (80°-90°) | 0.0 | 0.0 | | | G0/10 |
| BL | (0°-30°) | 1961.4 | 8.4 | B3/2500 | | |
| BM | (30°-60°) | 2200.0 | 9.5 | B2/2500 | | |
| BH | (60°-80°) | 413.0 | 1.8 | B1/500 | | G1/500 |
| 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: B3-U0-G2**
Type II Short



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REPORT NUMBER: P643914
CATALOG NUMBER: GWS-SA6F-830-U-SL2-W-GRSBK

**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 15° | 25° | 35° | 45° | 50° | 55° | 65° | 75° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 8145.3 | 8145.3 | 8145.3 | 8145.3 | 8145.3 | 8145.3 | *8145.3* | 8145.3 | 8145.3 | 8145.3 | 8145.3 |
| 2.5° | 7567.2 | 7572.8 | 7575.7 | 7652.2 | 7680.5 | 7793.9 | *7853.4* | 7884.6 | 7966.8 | 8063.1 | 8142.5 |
| 5° | 7059.8 | 7051.3 | 7065.5 | 7161.9 | 7224.2 | 7391.4 | *7482.1* | 7544.5 | 7725.9 | 7952.6 | 8142.5 |
| 7.5° | 6617.7 | 6634.7 | 6651.7 | 6756.6 | 6850.1 | 7031.5 | *7161.9* | 7255.4 | 7507.6 | 7844.9 | 8165.2 |
| 10° | 6306.0 | 6306.0 | 6331.5 | 6450.5 | 6561.0 | 6784.9 | *6915.3* | 7034.3 | 7334.8 | 7748.5 | 8190.7 |
| 12.5° | 6076.4 | 6079.2 | 6110.4 | 6246.4 | 6374.0 | 6606.4 | *6742.4* | 6858.6 | 7190.2 | 7652.2 | 8196.3 |
| 15° | 5968.7 | 5960.2 | 5985.7 | 6130.2 | 6272.0 | 6490.2 | *6631.9* | 6745.3 | 7088.2 | 7598.3 | 8224.7 |
| 17.5° | 5940.4 | 5934.7 | 5954.5 | 6096.2 | 6240.8 | 6453.3 | *6592.2* | 6705.6 | 7074.0 | 7615.3 | 8309.7 |
| 20° | 6022.6 | 6011.2 | 6002.7 | 6124.6 | 6260.6 | 6470.3 | *6614.9* | 6742.4 | 7142.0 | 7708.9 | 8440.1 |
| 22.5° | 6218.1 | 6218.1 | 6198.3 | 6257.8 | 6348.5 | 6538.4 | *6688.6* | 6855.8 | 7320.6 | 7895.9 | 8632.8 |
| 25° | 6578.0 | 6549.7 | 6512.9 | 6538.4 | 6527.0 | 6646.1 | *6824.6* | 7057.0 | 7657.9 | 8204.8 | 8868.0 |
| 27.5° | 6989.0 | 7014.5 | 6952.1 | 6955.0 | 6855.8 | 6813.3 | *7020.2* | 7371.6 | 8159.5 | 8641.3 | 9216.6 |
| 30° | 7547.3 | 7527.5 | 7530.3 | 7521.8 | 7292.2 | 7091.0 | *7314.9* | 7782.6 | 8791.5 | 9307.3 | 9670.1 |
| 32.5° | 7983.8 | 8012.1 | 8105.6 | 8159.5 | 7859.1 | 7536.0 | *7774.1* | 8340.9 | 9511.4 | 10066.9 | 10225.6 |
| 35° | 8445.7 | 8496.8 | 8686.6 | 8862.4 | 8610.1 | 8238.8 | *8493.9* | 9080.6 | 10188.7 | 10817.9 | 10863.3 |
| 37.5° | 8933.2 | 9035.2 | 9262.0 | 9570.9 | 9531.2 | 9202.5 | *9434.9* | 9950.7 | 10721.6 | 11271.4 | 11390.4 |
| 40° | 9491.5 | 9590.7 | 9962.0 | 10407.0 | 10500.5 | 10426.8 | *10503.3* | 10803.7 | 11073.0 | 11291.2 | 11617.1 |
| 42.5° | 10103.7 | 10239.8 | 10710.2 | 11305.4 | 11656.8 | 11722.0 | *11543.5* | 11512.3 | 11226.0 | 11064.5 | 11569.0 |
| 45° | 10826.4 | 10985.1 | 11518.0 | 12288.8 | 12847.2 | 12935.0 | *12626.1* | 12226.5 | 11322.4 | 10897.3 | 11424.4 |
| 47.5° | 11637.0 | 11787.2 | 12317.2 | 13243.9 | 14074.3 | 14108.4 | *13569.9* | 12926.5 | 11608.6 | 11090.0 | 11535.0 |
| 50° | 11909.1 | 12002.6 | 12461.7 | 13550.0 | 15080.5 | 15341.2 | *14561.8* | 13714.4 | 12184.0 | 11656.8 | 12073.4 |
| 52.5° | 10973.8 | 11010.6 | 11410.3 | 12509.9 | 14876.4 | 16551.4 | *16010.1* | 14890.6 | 13207.1 | 12521.2 | 12903.8 |
| 55° | *8695.1* | *8635.6* | *8958.7* | *9967.7* | *12929.4* | *16304.8* | *17322.3* | *16738.4* | *14525.0* | *13535.9* | *13983.7* |
| 57.5° | 6082.1 | 6011.2 | 5937.5 | 6620.6 | 9647.4 | 13822.1 | *15961.9* | 16996.3 | 15780.5 | 14542.0 | 15148.5 |
| 60° | 4999.4 | 4931.4 | 4574.3 | 4259.7 | 5832.7 | 9925.2 | *12260.5* | 14207.6 | 15678.5 | 14491.0 | 15111.6 |
| 62.5° | 4319.2 | 4279.6 | 4135.0 | 3707.1 | 3432.1 | 5665.4 | *7677.7* | 9542.6 | 12030.9 | 11379.1 | 11413.1 |
| 65° | 3392.5 | 3381.1 | 3480.3 | 3525.7 | 3035.4 | 3134.6 | *3916.8* | 4959.7 | 6504.4 | 6133.1 | 5815.7 |
| 67.5° | 2318.3 | 2292.8 | 2479.9 | 3049.5 | 2919.2 | 2474.2 | *2292.8* | 2312.7 | 2814.3 | 1720.3 | 1366.1 |
| 70° | 1473.8 | 1414.2 | 1417.1 | 1890.4 | 2375.0 | 1952.7 | *1768.5* | 1555.9 | 1400.1 | 255.1 | 289.1 |
| 72.5° | 943.8 | 906.9 | 779.4 | 853.1 | 1099.6 | 952.3 | *960.8* | 827.6 | 552.7 | 136.0 | 158.7 |
| 75° | 396.8 | 365.6 | 280.6 | 223.9 | 221.1 | 138.9 | *121.9* | 113.4 | 76.5 | 76.5 | 82.2 |
| 77.5° | 2.8 | 0.0 | 0.0 | 2.8 | 5.7 | 2.8 | *2.8* | 5.7 | 11.3 | 17.0 | 19.8 |
| 80° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | *0.0* | 0.0 | 0.0 | 0.0 | 2.8 |
| 82.5° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | *0.0* | 0.0 | 0.0 | 0.0 | 0.0 |
| 85° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | *0.0* | 0.0 | 0.0 | 0.0 | 0.0 |
| 87.5° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | *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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Scaled Data Report

REPORT NUMBER: P643914
CATALOG NUMBER: GWS-SA6F-830-U-SL2-W-GRSBK

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 8145.3 | 8145.3 | 8145.3 | 8145.3 | 8145.3 | 8145.3 | 8145.3 | 8145.3 | 8145.3 | 8145.3 | 8145.3 |
| 2.5° | 8190.7 | 8122.7 | 8199.2 | 8227.5 | 8224.7 | 8227.5 | 8145.3 | 8088.6 | 8085.8 | 8015.0 | 7980.9 |
| 5° | 8221.8 | 8168.0 | 8224.7 | 8187.8 | 8100.0 | 7989.4 | 7842.1 | 7714.5 | 7657.9 | 7575.7 | 7536.0 |
| 7.5° | 8281.4 | 8224.7 | 8216.2 | 8068.8 | 7850.6 | 7618.2 | 7357.4 | 7125.0 | 7000.3 | 6850.1 | 6858.6 |
| 10° | 8323.9 | 8258.7 | 8148.2 | 7847.7 | 7485.0 | 7113.7 | 6725.4 | 6379.7 | 6161.4 | 5960.2 | 5926.2 |
| 12.5° | 8340.9 | 8244.5 | 7986.6 | 7533.1 | 7023.0 | 6538.4 | 5968.7 | 5475.6 | 5135.5 | 4871.9 | 4835.0 |
| 15° | 8372.1 | 8216.2 | 7779.7 | 7153.4 | 6453.3 | 5767.5 | 5041.9 | 4367.4 | 3916.8 | 3613.5 | 3639.0 |
| 17.5° | 8420.2 | 8185.0 | 7547.3 | 6728.3 | 5841.2 | 4871.9 | 3891.3 | 3117.6 | 2703.8 | 2528.1 | 2530.9 |
| 20° | 8488.3 | 8148.2 | 7292.2 | 6260.6 | 5107.1 | 3860.1 | 2720.8 | 2136.9 | 2020.7 | 2015.1 | 2006.6 |
| 22.5° | 8578.9 | 8111.3 | 7020.2 | 5747.6 | 4237.0 | 2703.8 | 1811.0 | 1629.6 | 1677.8 | 1771.3 | 1788.3 |
| 25° | 8686.6 | 8066.0 | 6716.9 | 5169.5 | 3287.6 | 1774.2 | 1357.6 | 1329.2 | 1445.4 | 1570.1 | 1598.5 |
| 27.5° | 8853.9 | 8043.3 | 6371.2 | 4512.0 | 2307.0 | 1272.5 | 1111.0 | 1128.0 | 1232.9 | 1337.7 | 1363.2 |
| 30° | 9137.3 | 8085.8 | 5994.2 | 3775.1 | 1482.3 | 1014.6 | 963.6 | 989.1 | 1045.8 | 1099.6 | 1122.3 |
| 32.5° | 9522.7 | 8210.5 | 5628.6 | 2970.2 | 1057.1 | 881.4 | 870.1 | 884.3 | 906.9 | 938.1 | 946.6 |
| 35° | 9973.3 | 8425.9 | 5251.7 | 2125.6 | 872.9 | 804.9 | 793.6 | 793.6 | 804.9 | 810.6 | 813.4 |
| 37.5° | 10344.6 | 8652.6 | 4897.4 | 1414.2 | 782.2 | 745.4 | 728.4 | 719.9 | 717.0 | 722.7 | 725.5 |
| 40° | 10506.2 | 8746.2 | 4512.0 | 1028.8 | 717.0 | 691.5 | 666.0 | 640.5 | 640.5 | 660.4 | 663.2 |
| 42.5° | 10392.8 | 8641.3 | 4067.0 | 850.2 | 671.7 | 634.8 | 595.2 | 572.5 | 583.8 | 603.7 | 609.3 |
| 45° | 10151.9 | 8383.4 | 3576.7 | 751.0 | 626.3 | 578.2 | 532.8 | 518.6 | 530.0 | 555.5 | 561.2 |
| 47.5° | 10112.2 | 8213.3 | 2990.0 | 685.9 | 578.2 | 530.0 | 481.8 | 467.6 | 481.8 | 501.6 | 507.3 |
| 50° | 10506.2 | 8360.7 | 2338.2 | 629.2 | 532.8 | 479.0 | 439.3 | 425.1 | 433.6 | 445.0 | 450.6 |
| 52.5° | 11226.0 | 8907.7 | 1887.5 | 575.3 | 479.0 | 428.0 | 402.4 | 385.4 | 385.4 | 396.8 | 399.6 |
| 55° | *12288.8* | *9862.8* | *1629.6* | *513.0* | *416.6* | *388.3* | *365.6* | *348.6* | *348.6* | *354.3* | *357.1* |
| 57.5° | 13513.2 | 11019.1 | 1689.1 | 430.8 | 365.6 | 351.4 | 331.6 | 317.4 | 323.1 | 323.1 | 323.1 |
| 60° | 13343.1 | 10934.1 | 1808.2 | 362.8 | 323.1 | 317.4 | 300.4 | 294.8 | 308.9 | 297.6 | 291.9 |
| 62.5° | 9828.8 | 7553.0 | 946.6 | 297.6 | 277.7 | 272.1 | 260.7 | 272.1 | 291.9 | 260.7 | 249.4 |
| 65° | 4772.7 | 3656.0 | 379.8 | 243.7 | 235.2 | 229.6 | 223.9 | 240.9 | 252.2 | 204.1 | 192.7 |
| 67.5° | 1122.3 | 912.6 | 246.6 | 206.9 | 195.6 | 184.2 | 189.9 | 192.7 | 184.2 | 138.9 | 133.2 |
| 70° | 291.9 | 286.2 | 192.7 | 172.9 | 155.9 | 144.5 | 144.5 | 141.7 | 121.9 | 87.9 | 82.2 |
| 72.5° | 158.7 | 155.9 | 138.9 | 130.4 | 107.7 | 96.4 | 99.2 | 87.9 | 68.0 | 51.0 | 48.2 |
| 75° | 79.4 | 85.0 | 79.4 | 73.7 | 59.5 | 53.8 | 53.8 | 48.2 | 34.0 | 19.8 | 19.8 |
| 77.5° | 17.0 | 19.8 | 19.8 | 17.0 | 14.2 | 11.3 | 11.3 | 14.2 | 5.7 | 0.0 | 0.0 |
| 80° | 2.8 | 2.8 | 2.8 | 2.8 | 2.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 82.5° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 85° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 87.5° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 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

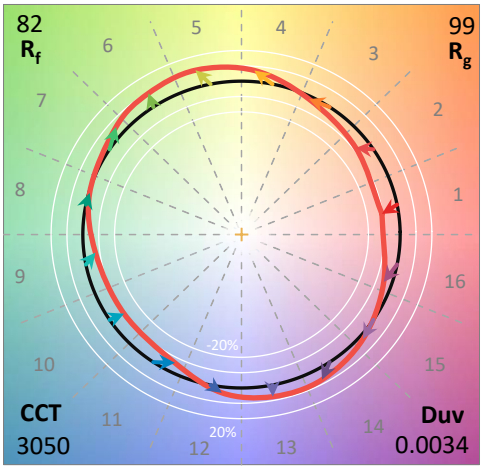
## Test Information

| | |
|---|---|
| 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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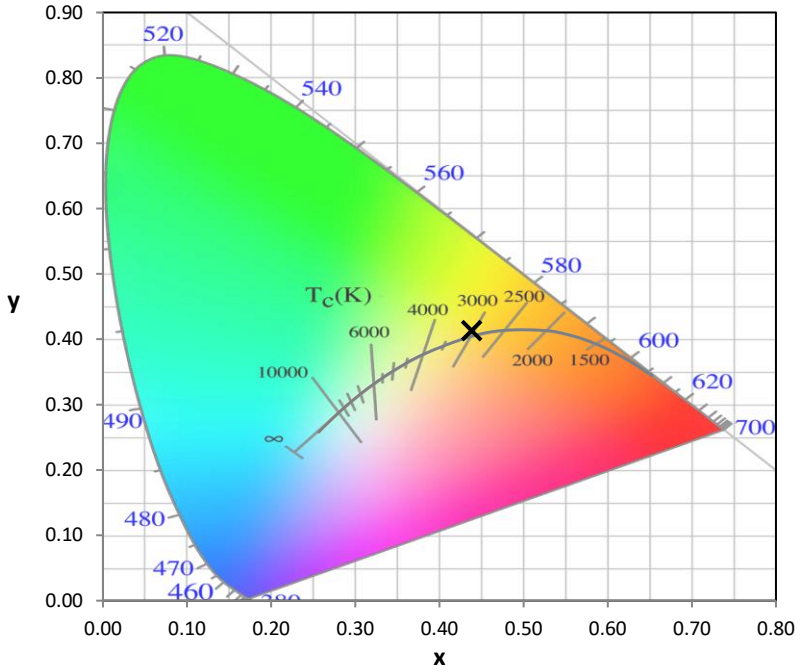
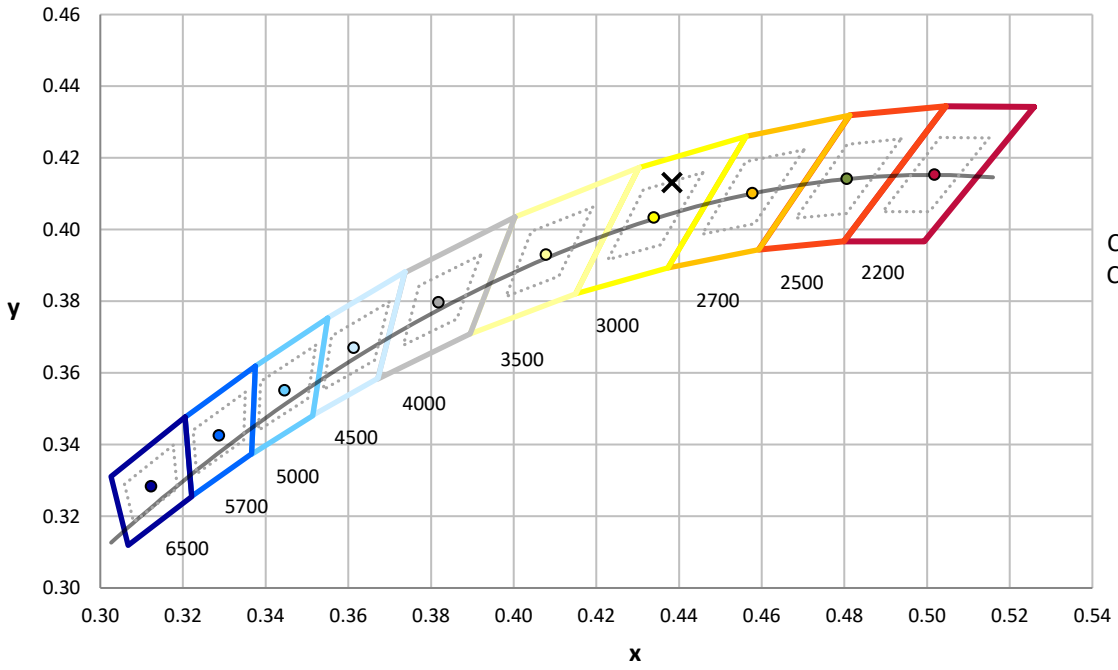
## CIE 1931 Chromaticity Diagram




## 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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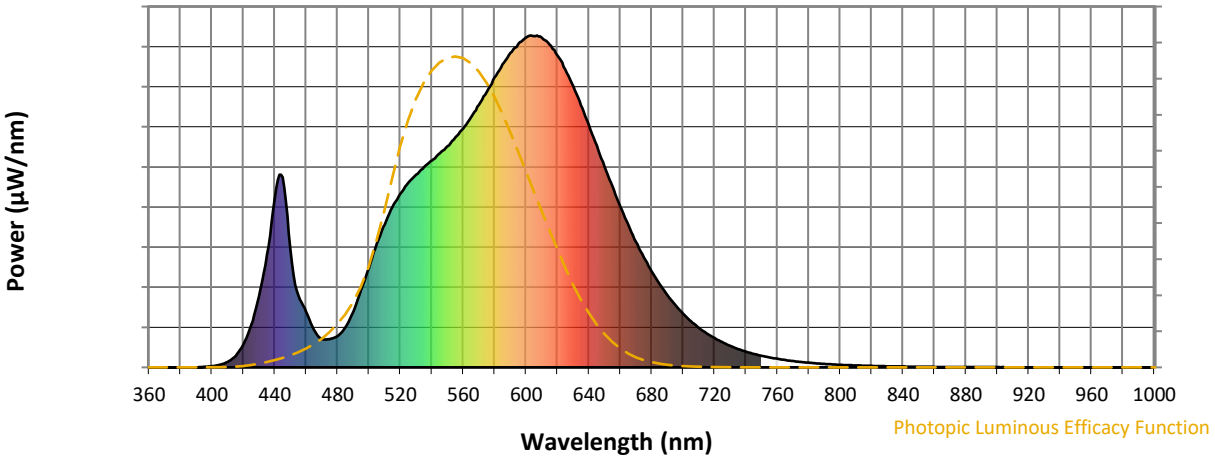
## Photopic Flux vs. Wavelength




## 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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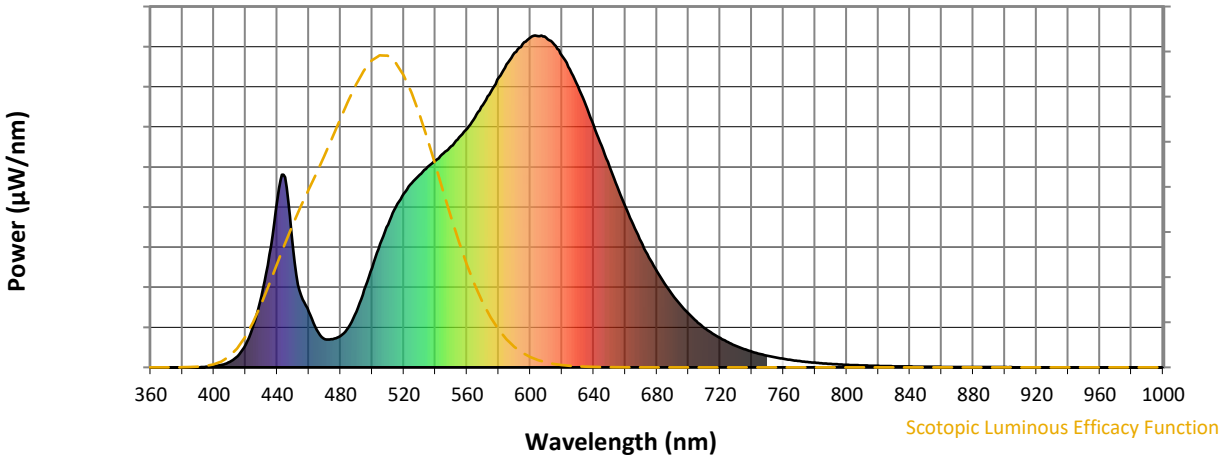
## Scotopic Flux vs. Wavelength




**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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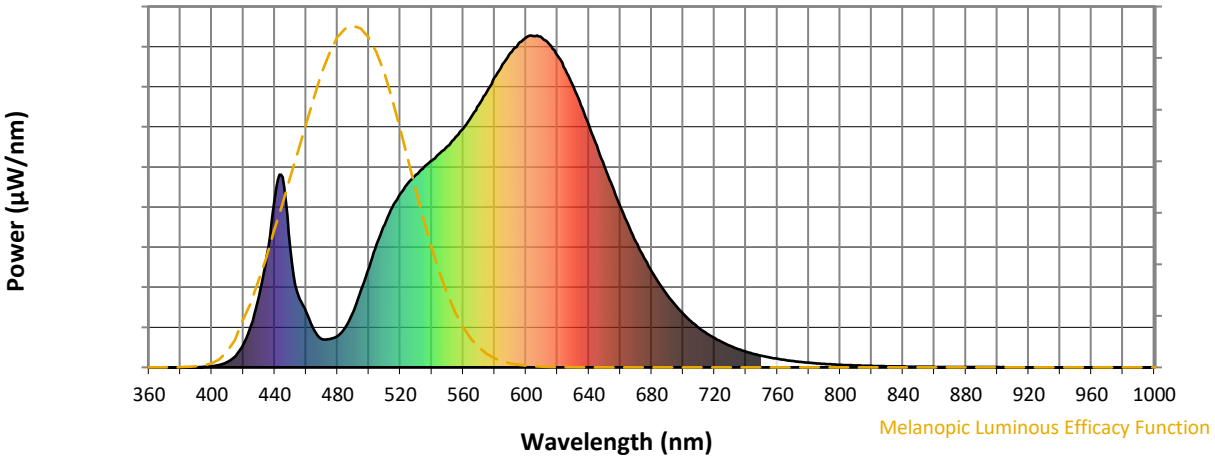
## Melanopic Flux vs. Wavelength




**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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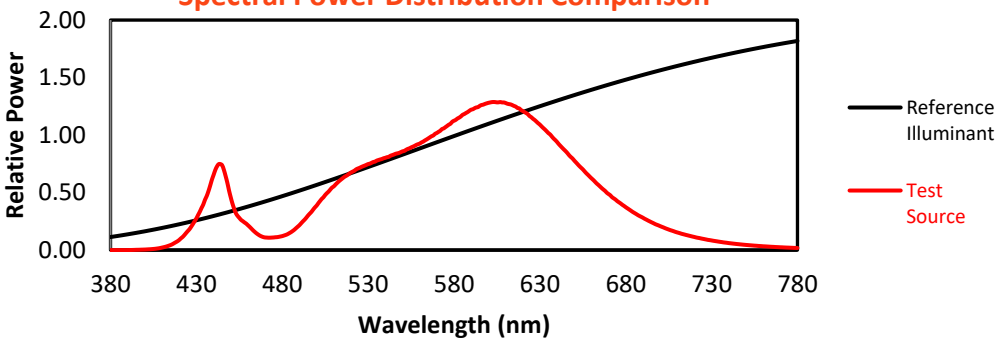
# TM-30-18

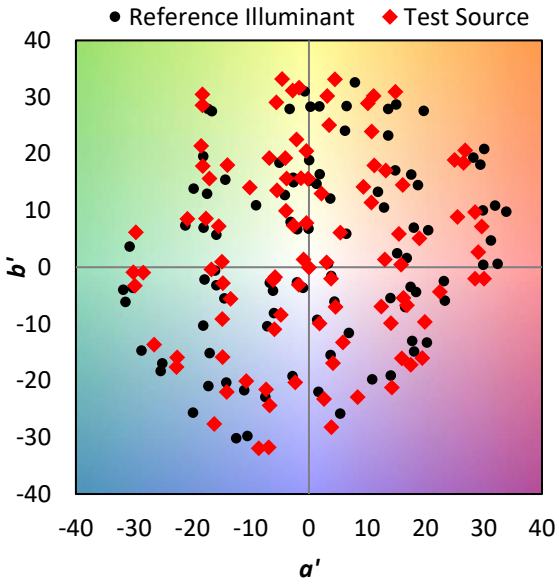
## Summary

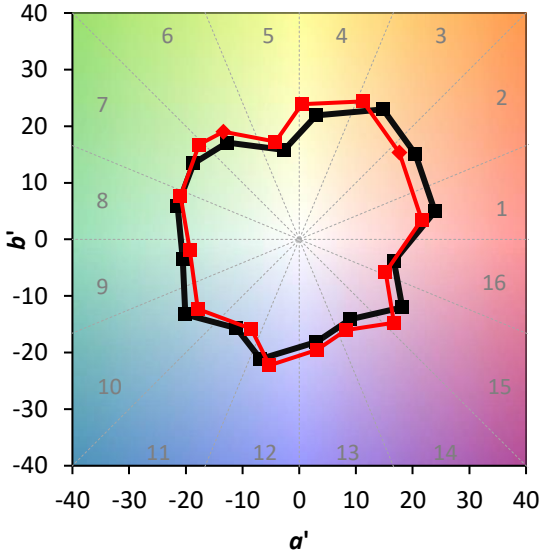
$R_f$ = 81.5
$R_g$ = 99.2
CIE $R_a$ = 81.0
$R_9$ = 7.1

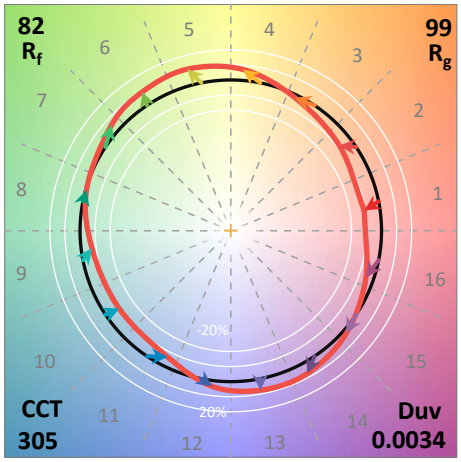
## Spectral Power Distribution Comparison

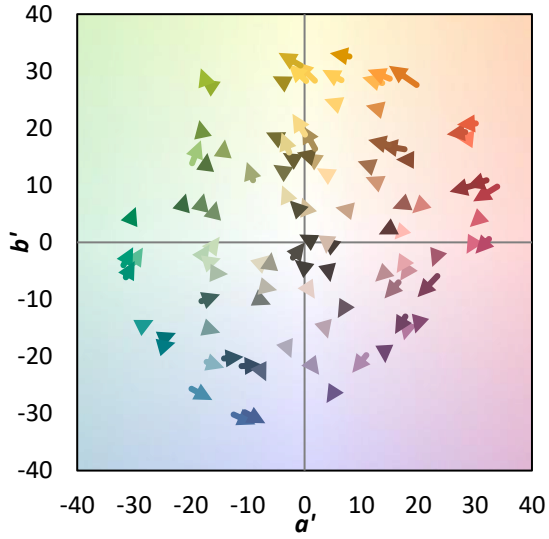



## Color Vector Graphics



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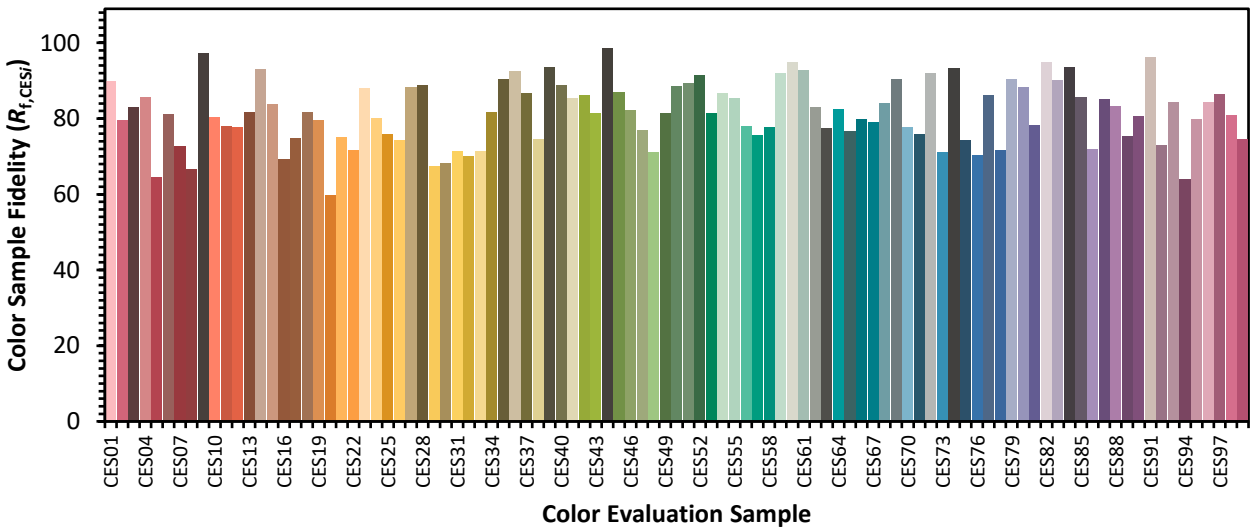
## Individual Sample Fidelity Index ($R_{f,i}$)

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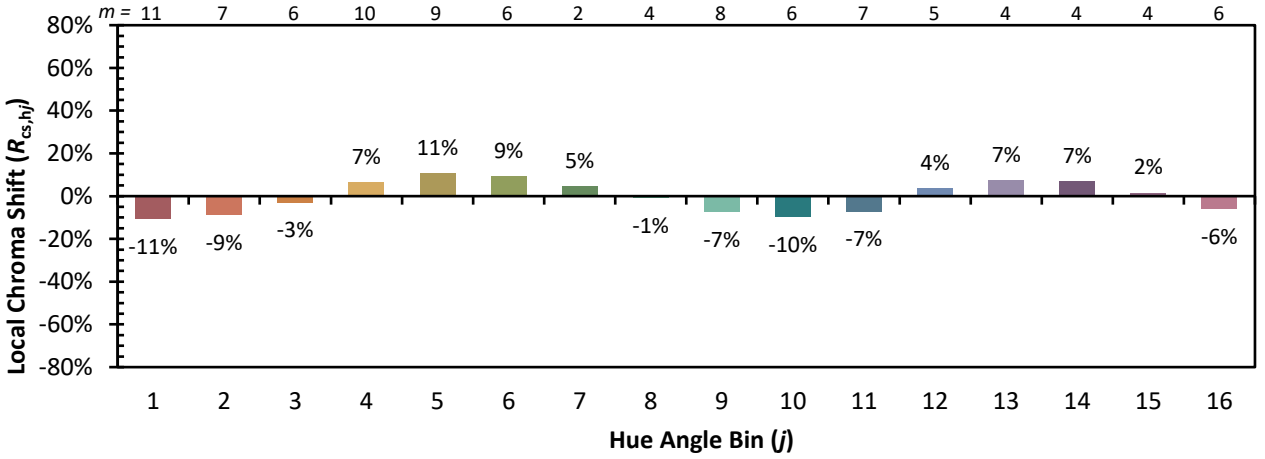
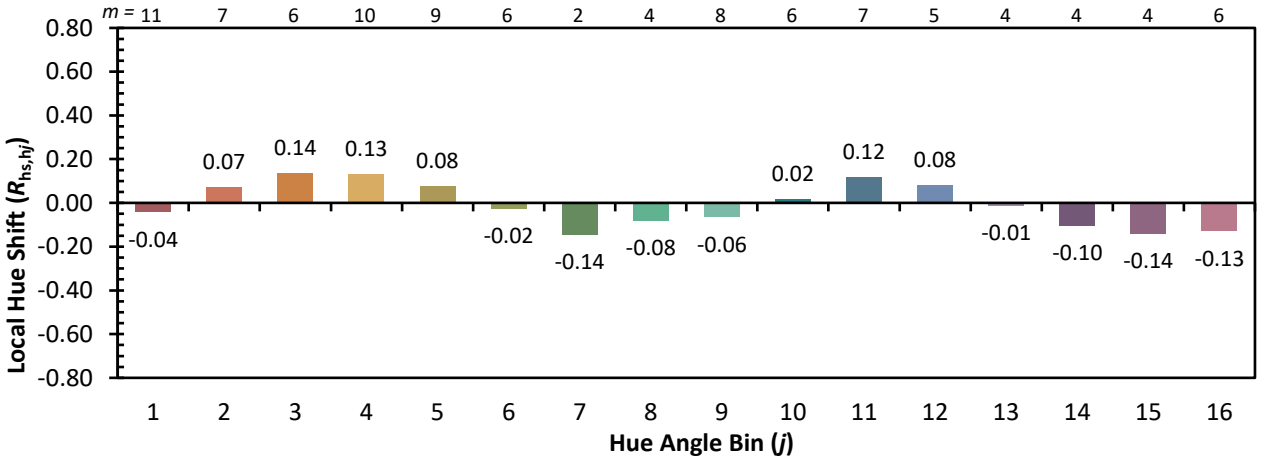
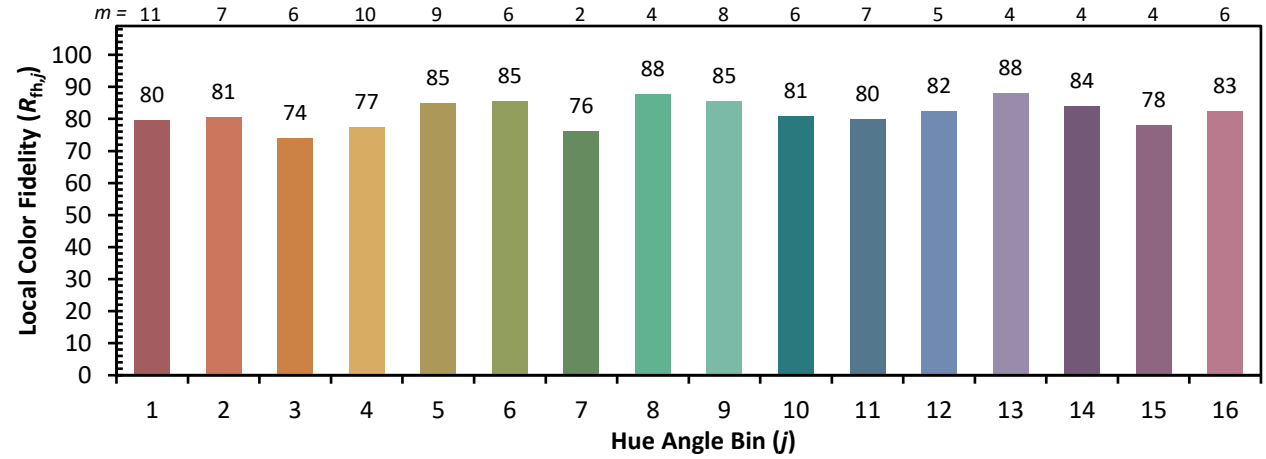
## Color Rendition by Hue-Angle Bin



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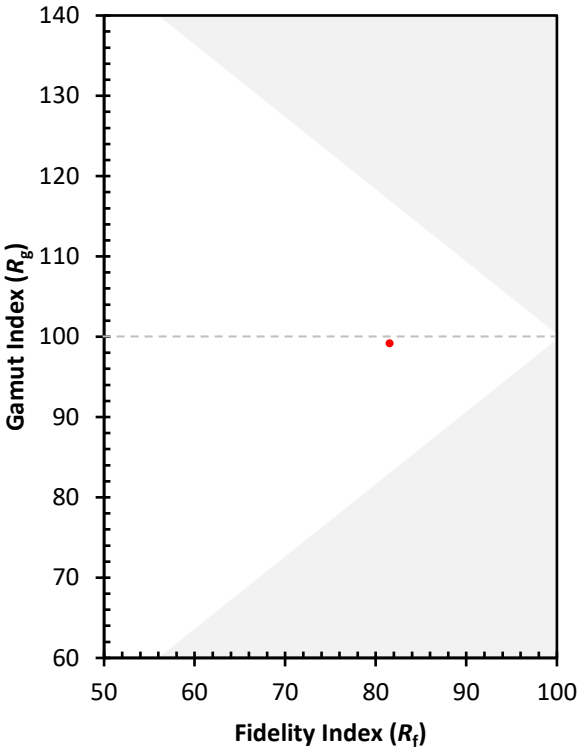
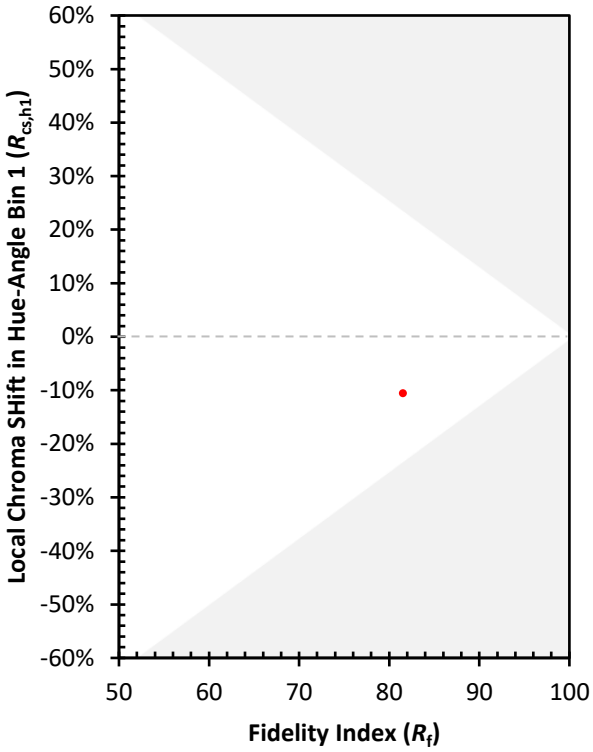
## Measure Comparisons




(END OF REPORT)