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: P636491

Luminaire Tested: GWS-SA3F-830-U-SL2-W-HSS

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: | P636491 |
| | TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-30) |
| Test Lab: | COOPER LIGHTING SOLUTIONS |
| Issue Date: | 1/10/2023 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS |
| Product Line: | McGRAW-EDISON |
| Catalog Number: | GWS-SA3F-830-U-SL2-W-HSS |
| Description: | GALLEON WALL SLIM LUMINAIRE. (3) LIGHTSQUARES WITH 16 LEDS EACH AND TYPE II SPILL LIGHT ELIMINATOR OPTICS WITH HOUSE SIDE SHIELD |
| Light Source: | (48) 3000K CCT, 80 CRI LEDS |
| Ballast/Driver: | - |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 15397.1 lumens |
| Efficiency: | N/A |
| Efficacy: | 84.0 lumens/watt |
| Luminous Opening: | Rectangular (W 1.5' x L: 0.5' x H: 0') |
| IES Classification: | Type II - Short |
| BUG Rating: | B2 - U0 - G3 |

| | |
|---|---|
| Input Watts (W): | 183.2 |
| 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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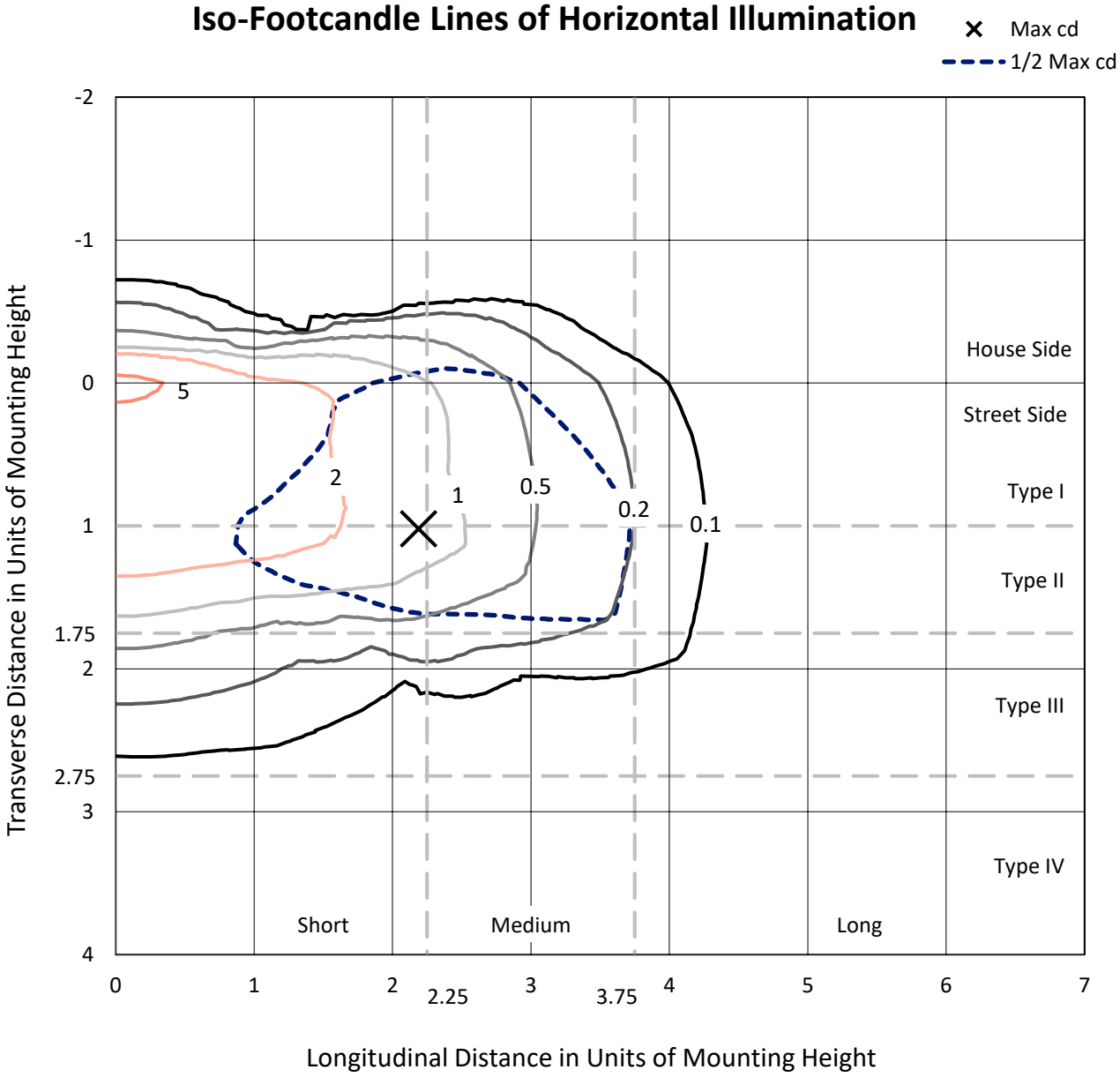
Scaled Data Report

REPORT NUMBER: P636491
CATALOG NUMBER: GWS-SA3F-830-U-SL2-W-HSS

## Iso-Footcandle Lines of Horizontal Illumination




Based on 25 foot mounting height. Maximum calculated value = 6 fc
Type II - Short - N/A

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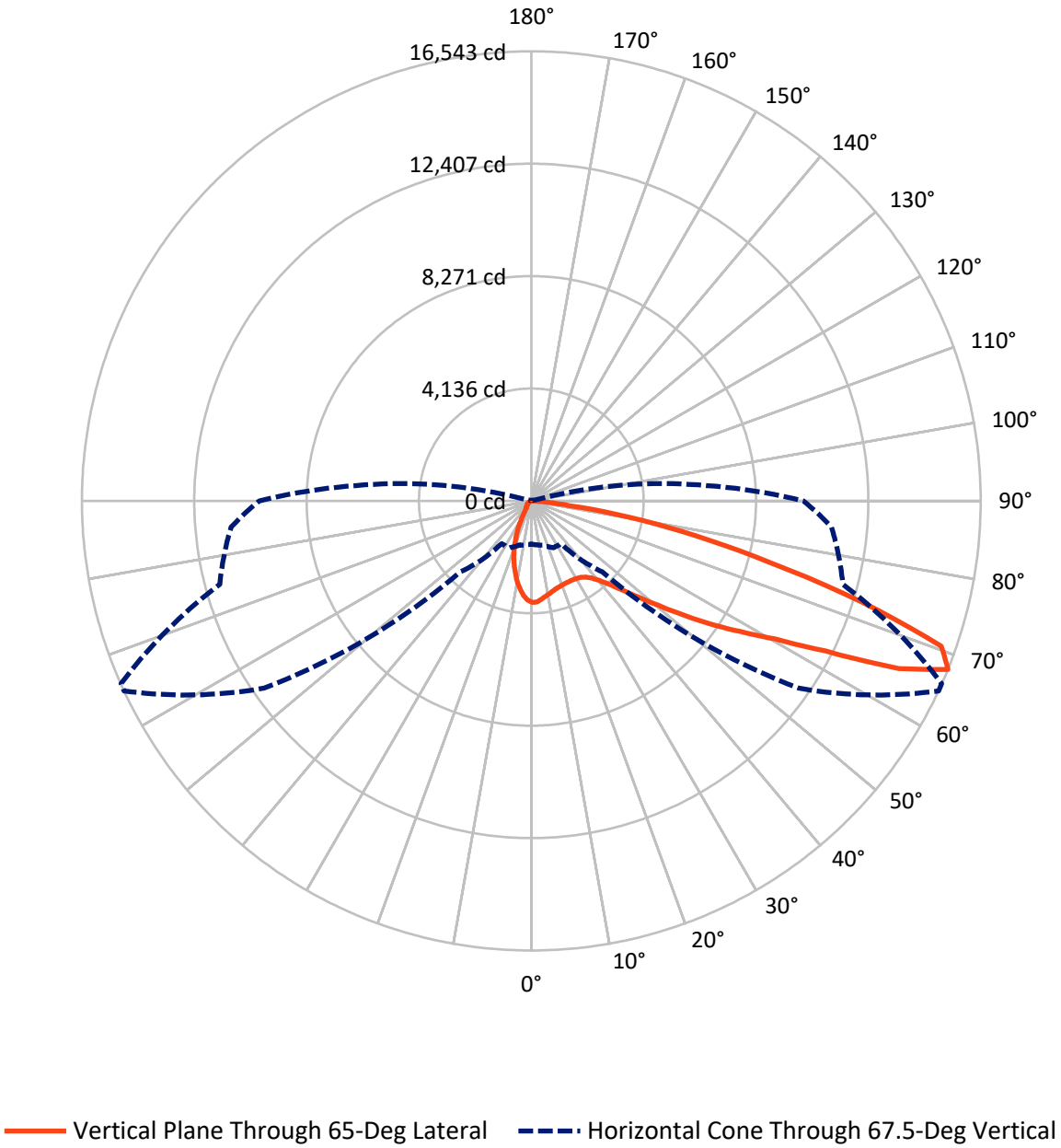
## Luminous Intensity Polar Plot



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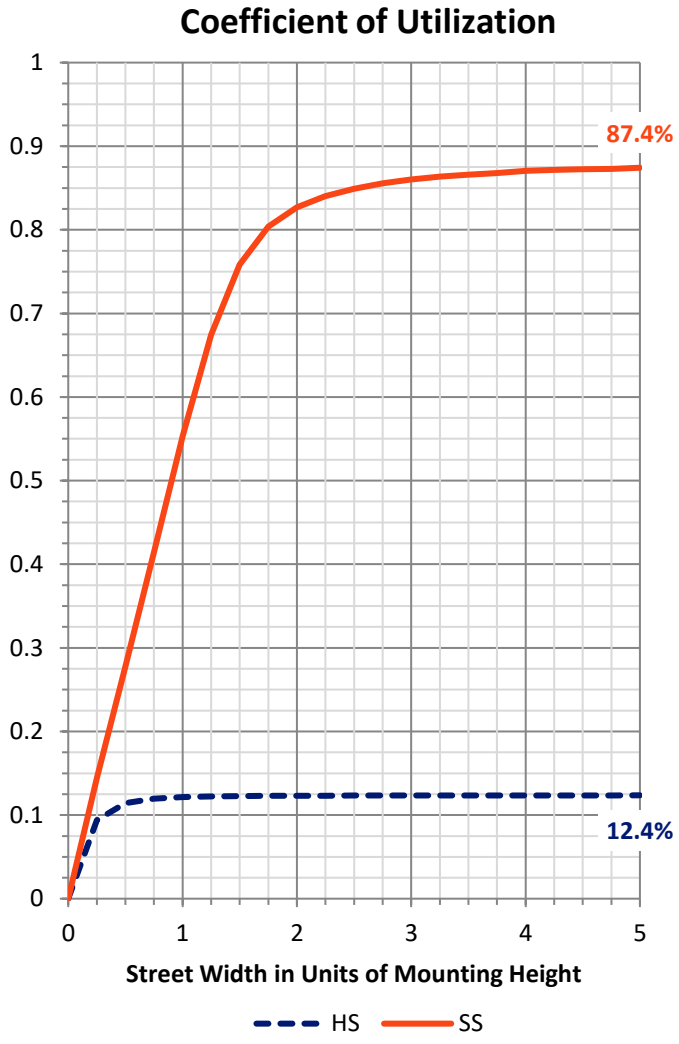
REPORT NUMBER: P636491
CATALOG NUMBER: GWS-SA3F-830-U-SL2-W-HSS

**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 1922.6 | 0.0 | 1922.6 |
| | % Fixture | 12.5 | 0.0 | 12.5 |
| **Street Side** | Lumens | 13474.5 | 0.0 | 13474.5 |
| | % Fixture | 87.5 | 0.0 | 87.5 |
| **Total** | Lumens | 15397.1 | 0.0 | 15397.1 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 310.2 | 2.0 |
| 10°-20° | 697.2 | 4.5 |
| 20°-30° | 996.3 | 6.5 |
| 30°-40° | 1449.4 | 9.4 |
| 40°-50° | 2270.1 | 14.7 |
| 50°-60° | 3541.4 | 23.0 |
| 60°-70° | 3890.0 | 25.3 |
| 70°-80° | 2070.2 | 13.4 |
| 80°-90° | 172.4 | 1.1 |
| 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° | 15397.1 | 100.0 |
| 0°-180° | 15397.1 | 100.0 |



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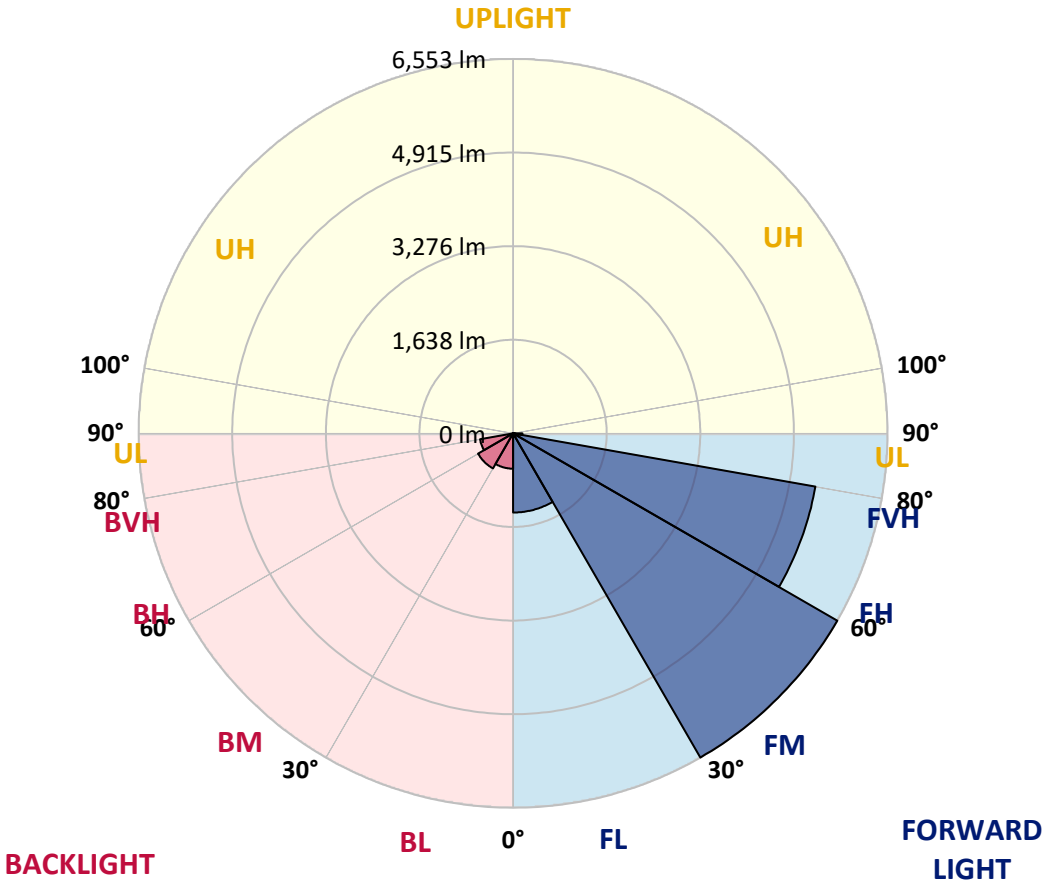
REPORT NUMBER: P636491
CATALOG NUMBER: GWS-SA3F-830-U-SL2-W-HSS

## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 1385.6 | 9.0 | | | |
| FM | (30°-60°) | 6552.7 | 42.6 | | | |
| FH | (60°-80°) | 5373.0 | 34.9 | | | G3/7500 |
| FVH | (80°-90°) | 163.1 | 1.1 | | | G2/225 |
| BL | (0°-30°) | 618.0 | 4.0 | B2/1000 | | |
| BM | (30°-60°) | 708.2 | 4.6 | B1/1000 | | |
| BH | (60°-80°) | 587.2 | 3.8 | B2/1000 | | G2/1000 |
| BVH | (80°-90°) | 9.2 | 0.1 | | | G0/10 |
| UL | (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH | (100°-180°) | 0.0 | 0.0 | | U0/0 | |

**BUG Rating: B2-U0-G3**
Type II Short



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Scaled Data Report

REPORT NUMBER: P636491
CATALOG NUMBER: GWS-SA3F-830-U-SL2-W-HSS

**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 15° | 25° | 35° | 45° | 55° | 65° | 66° | 75° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 3734.3 | 3734.3 | 3734.3 | 3734.3 | 3734.3 | 3734.3 | 3734.3 | 3734.3 | 3734.3 | 3734.3 | 3734.3 |
| 2.5° | 3604.8 | 3615.9 | 3600.6 | 3638.2 | 3645.2 | 3686.9 | 3710.6 | 3727.3 | 3725.9 | 3746.8 | 3746.8 |
| 5° | 3393.2 | 3404.3 | 3395.9 | 3436.3 | 3468.3 | 3533.8 | 3588.1 | 3650.7 | 3653.5 | 3717.6 | 3741.2 |
| 7.5° | 3213.5 | 3214.9 | 3214.9 | 3265.1 | 3306.8 | 3387.6 | 3468.3 | 3564.4 | 3575.6 | 3674.4 | 3737.1 |
| 10° | 3066.0 | 3070.1 | 3071.5 | 3128.6 | 3174.6 | 3272.0 | 3375.1 | 3490.6 | 3503.2 | 3636.8 | 3734.3 |
| 12.5° | 2964.3 | 2965.7 | 2971.3 | 3031.1 | 3081.3 | 3182.9 | 3287.3 | 3419.6 | 3436.3 | 3593.7 | 3721.8 |
| 15° | 2915.6 | 2912.8 | 2915.6 | 2965.7 | 3015.8 | 3113.3 | 3220.5 | 3362.5 | 3380.6 | 3557.5 | 3723.1 |
| 17.5° | 2912.8 | 2908.6 | 2905.8 | 2943.4 | 2975.5 | 3061.8 | 3170.4 | 3324.9 | 3344.4 | 3540.7 | 3738.5 |
| 20° | 2953.2 | 2950.4 | 2936.5 | 2953.2 | 2960.1 | 3031.1 | 3138.4 | 3295.7 | 3315.2 | 3538.0 | 3771.9 |
| 22.5° | 3059.0 | 3052.0 | 3031.1 | 3015.8 | 2978.2 | 3020.0 | 3116.1 | 3274.8 | 3297.1 | 3544.9 | 3815.0 |
| 25° | 3216.3 | 3213.5 | 3187.1 | 3149.5 | 3053.4 | 3036.7 | 3117.5 | 3274.8 | 3295.7 | 3553.3 | 3861.0 |
| 27.5° | 3453.0 | 3436.3 | 3402.9 | 3337.5 | 3199.6 | 3102.2 | 3145.3 | 3283.2 | 3304.0 | 3564.4 | 3898.6 |
| 30° | 3693.9 | 3692.5 | 3681.4 | 3614.5 | 3409.9 | 3227.5 | 3203.8 | 3305.4 | 3324.9 | 3574.2 | 3933.4 |
| 32.5° | 3943.1 | 3947.3 | 3975.2 | 3923.6 | 3699.5 | 3414.0 | 3309.6 | 3351.4 | 3365.3 | 3593.7 | 3964.0 |
| 35° | 4179.8 | 4188.2 | 4262.0 | 4280.1 | 4051.7 | 3696.7 | 3482.3 | 3443.3 | 3444.7 | 3636.8 | 4004.4 |
| 37.5° | 4406.8 | 4434.6 | 4553.0 | 4640.7 | 4490.3 | 4039.2 | 3731.5 | 3599.2 | 3588.1 | 3723.1 | 4065.7 |
| 40° | 4664.4 | 4717.3 | 4866.3 | 5015.2 | 4967.9 | 4491.7 | 4071.2 | 3838.7 | 3815.0 | 3881.9 | 4175.7 |
| 42.5° | 4949.8 | 5006.9 | 5204.6 | 5413.5 | 5435.7 | 5038.9 | 4495.9 | 4188.2 | 4147.8 | 4149.2 | 4381.7 |
| 45° | 5256.1 | 5332.7 | 5562.4 | 5863.2 | 5998.2 | 5648.8 | 5019.4 | 4660.2 | 4619.8 | 4559.9 | 4713.1 |
| 47.5° | 5658.5 | 5725.3 | 5946.7 | 6293.4 | 6552.4 | 6303.2 | 5705.8 | 5267.3 | 5193.5 | 5105.7 | 5228.3 |
| 50° | 6005.2 | 6063.7 | 6254.4 | 6688.8 | 7227.7 | 7146.9 | 6484.2 | 6026.1 | 5955.1 | 5806.1 | 5907.7 |
| 52.5° | 6081.8 | 6127.7 | 6303.2 | 6791.9 | 7744.2 | 8212.1 | 7437.9 | 6943.6 | 6893.5 | 6617.8 | 6656.8 |
| 55° | 5737.9 | 5807.5 | 5964.8 | 6507.8 | 7879.3 | 9253.6 | 8675.7 | 7978.2 | 7873.7 | 7433.8 | 7503.4 |
| 57.5° | 4869.0 | 4993.0 | 5140.6 | 5846.5 | 7513.1 | 9807.7 | 10405.0 | 9073.9 | 8979.3 | 8219.0 | 8220.4 |
| 60° | 3568.6 | 3668.8 | 3767.7 | 4413.7 | 6644.3 | 9770.1 | 11974.2 | 10304.8 | 10132.1 | 8860.9 | 8837.2 |
| 62.5° | 2595.3 | 2646.9 | 2645.5 | 2875.2 | 4562.7 | 9126.9 | 12798.5 | 12159.4 | 11757.0 | 9547.3 | 9412.3 |
| 65° | 2041.2 | 2039.8 | 2099.7 | 2174.9 | 2548.0 | 7045.3 | 12900.1 | 14867.5 | 14433.1 | 10467.7 | 10186.4 |
| 67.5° | 1588.7 | 1619.3 | 1679.2 | 1900.6 | 1914.5 | 3686.9 | 12006.2 | 16542.5 | 16534.2 | 11872.6 | 11092.8 |
| 70° | 1225.3 | 1267.0 | 1352.0 | 1675.0 | 1768.3 | 2063.5 | 8983.4 | 16012.0 | 16147.1 | 12500.5 | 10451.0 |
| 72.5° | 786.7 | 783.9 | 909.2 | 1353.4 | 1698.7 | 1719.6 | 4967.9 | 12719.1 | 12872.3 | 11322.6 | 8450.2 |
| 75° | 440.0 | 442.8 | 513.8 | 828.4 | 1583.1 | 1617.9 | 2460.3 | 9069.8 | 9190.9 | 8827.5 | 6492.5 |
| 77.5° | 172.7 | 178.2 | 240.9 | 435.8 | 1044.3 | 1445.3 | 1462.0 | 6184.8 | 6202.9 | 5470.5 | 3982.1 |
| 80° | 69.6 | 73.8 | 122.5 | 270.1 | 636.3 | 973.3 | 1044.3 | 3643.8 | 3570.0 | 2117.8 | 1158.4 |
| 82.5° | 20.9 | 22.3 | 48.7 | 153.2 | 332.8 | 692.0 | 704.5 | 1397.9 | 1319.9 | 455.3 | 295.2 |
| 85° | 1.4 | 1.4 | 11.1 | 47.3 | 118.3 | 174.0 | 469.2 | 455.3 | 403.8 | 114.2 | 130.9 |
| 87.5° | 0.0 | 0.0 | 1.4 | 1.4 | 2.8 | 5.6 | 50.1 | 83.5 | 84.9 | 20.9 | 58.5 |
| 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: P636491
CATALOG NUMBER: GWS-SA3F-830-U-SL2-W-HSS

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 3734.3 | 3734.3 | 3734.3 | 3734.3 | 3734.3 | 3734.3 | 3734.3 | 3734.3 | 3734.3 | 3734.3 | 3734.3 |
| 2.5° | 3746.8 | 3696.7 | 3692.5 | 3653.5 | 3614.5 | 3565.8 | 3508.7 | 3467.0 | 3437.7 | 3386.2 | 3376.4 |
| 5° | 3741.2 | 3674.4 | 3611.8 | 3500.4 | 3376.4 | 3242.8 | 3125.8 | 3017.2 | 2949.0 | 2903.0 | 2883.6 |
| 7.5° | 3730.1 | 3645.2 | 3500.4 | 3290.1 | 3082.7 | 2848.7 | 2666.3 | 2499.3 | 2385.1 | 2318.3 | 2289.0 |
| 10° | 3721.8 | 3607.6 | 3372.3 | 3053.4 | 2731.8 | 2408.8 | 2131.7 | 1883.8 | 1746.0 | 1637.4 | 1619.3 |
| 12.5° | 3705.0 | 3553.3 | 3208.0 | 2776.3 | 2361.4 | 1932.6 | 1578.9 | 1275.4 | 1065.1 | 970.5 | 937.1 |
| 15° | 3688.3 | 3496.2 | 3043.7 | 2484.0 | 1957.6 | 1428.6 | 999.7 | 707.3 | 562.5 | 518.0 | 515.2 |
| 17.5° | 3685.5 | 3444.7 | 2865.5 | 2206.9 | 1534.4 | 935.7 | 569.5 | 458.1 | 427.5 | 416.3 | 416.3 |
| 20° | 3693.9 | 3401.5 | 2690.0 | 1888.0 | 1118.1 | 569.5 | 424.7 | 396.8 | 378.7 | 369.0 | 369.0 |
| 22.5° | 3702.3 | 3357.0 | 2521.5 | 1566.4 | 742.1 | 416.3 | 374.5 | 350.9 | 330.0 | 318.8 | 313.3 |
| 25° | 3707.8 | 3308.2 | 2335.0 | 1243.4 | 484.5 | 362.0 | 328.6 | 298.0 | 272.9 | 259.0 | 259.0 |
| 27.5° | 3706.4 | 3249.7 | 2147.0 | 927.3 | 375.9 | 321.6 | 281.3 | 249.2 | 224.2 | 208.9 | 210.2 |
| 30° | 3695.3 | 3185.7 | 1952.1 | 647.4 | 328.6 | 281.3 | 240.9 | 207.5 | 182.4 | 169.9 | 168.5 |
| 32.5° | 3686.9 | 3117.5 | 1726.5 | 455.3 | 295.2 | 246.4 | 204.7 | 172.7 | 151.8 | 142.0 | 140.6 |
| 35° | 3677.2 | 3050.6 | 1512.1 | 346.7 | 265.9 | 213.0 | 172.7 | 146.2 | 129.5 | 121.1 | 121.1 |
| 37.5° | 3680.0 | 2981.0 | 1279.6 | 298.0 | 236.7 | 185.2 | 147.6 | 125.3 | 111.4 | 103.0 | 101.6 |
| 40° | 3723.1 | 2939.3 | 1051.2 | 270.1 | 210.2 | 160.1 | 128.1 | 108.6 | 94.7 | 86.3 | 84.9 |
| 42.5° | 3830.4 | 2940.6 | 832.6 | 249.2 | 186.6 | 136.5 | 111.4 | 93.3 | 80.8 | 71.0 | 69.6 |
| 45° | 4044.8 | 2999.1 | 639.1 | 227.0 | 161.5 | 118.3 | 96.1 | 79.4 | 66.8 | 58.5 | 57.1 |
| 47.5° | 4395.6 | 3173.2 | 484.5 | 207.5 | 140.6 | 103.0 | 82.1 | 66.8 | 55.7 | 48.7 | 47.3 |
| 50° | 4954.0 | 3487.8 | 381.5 | 183.8 | 118.3 | 89.1 | 69.6 | 55.7 | 45.9 | 39.0 | 37.6 |
| 52.5° | 5625.1 | 3959.8 | 327.2 | 162.9 | 101.6 | 78.0 | 59.9 | 45.9 | 37.6 | 32.0 | 30.6 |
| 55° | 6396.5 | 4523.7 | 302.1 | 142.0 | 86.3 | 66.8 | 48.7 | 37.6 | 30.6 | 26.5 | 23.7 |
| 57.5° | 7103.8 | 5032.0 | 300.7 | 121.1 | 73.8 | 57.1 | 40.4 | 32.0 | 26.5 | 20.9 | 19.5 |
| 60° | 7793.0 | 5456.6 | 282.6 | 100.2 | 64.0 | 47.3 | 34.8 | 26.5 | 22.3 | 18.1 | 16.7 |
| 62.5° | 8418.1 | 5801.9 | 236.7 | 80.8 | 54.3 | 39.0 | 29.2 | 23.7 | 19.5 | 15.3 | 15.3 |
| 65° | 9203.4 | 6241.9 | 181.0 | 65.4 | 44.6 | 32.0 | 25.1 | 20.9 | 18.1 | 13.9 | 13.9 |
| 67.5° | *10015.2* | *6474.4* | *129.5* | *54.3* | *36.2* | *27.8* | *22.3* | *19.5* | *15.3* | *12.5* | *12.5* |
| 70° | 9071.2 | 5470.5 | 93.3 | 44.6 | 30.6 | 23.7 | 19.5 | 18.1 | 15.3 | 12.5 | 11.1 |
| 72.5° | 7084.3 | 3944.5 | 69.6 | 34.8 | 26.5 | 22.3 | 18.1 | 16.7 | 13.9 | 11.1 | 11.1 |
| 75° | 5253.3 | 2300.2 | 52.9 | 27.8 | 20.9 | 18.1 | 18.1 | 16.7 | 13.9 | 11.1 | 9.7 |
| 77.5° | 2855.7 | 802.0 | 40.4 | 22.3 | 16.7 | 13.9 | 15.3 | 15.3 | 12.5 | 9.7 | 8.4 |
| 80° | 756.0 | 220.0 | 27.8 | 16.7 | 13.9 | 11.1 | 11.1 | 13.9 | 11.1 | 8.4 | 8.4 |
| 82.5° | 220.0 | 64.0 | 19.5 | 13.9 | 11.1 | 9.7 | 9.7 | 9.7 | 8.4 | 7.0 | 5.6 |
| 85° | 107.2 | 23.7 | 13.9 | 11.1 | 9.7 | 8.4 | 7.0 | 7.0 | 5.6 | 4.2 | 4.2 |
| 87.5° | 47.3 | 9.7 | 11.1 | 9.7 | 9.7 | 7.0 | 5.6 | 4.2 | 4.2 | 2.8 | 1.4 |
| 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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# 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

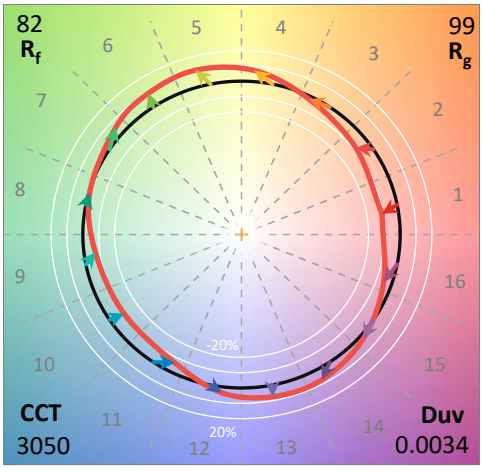
## Test Information

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

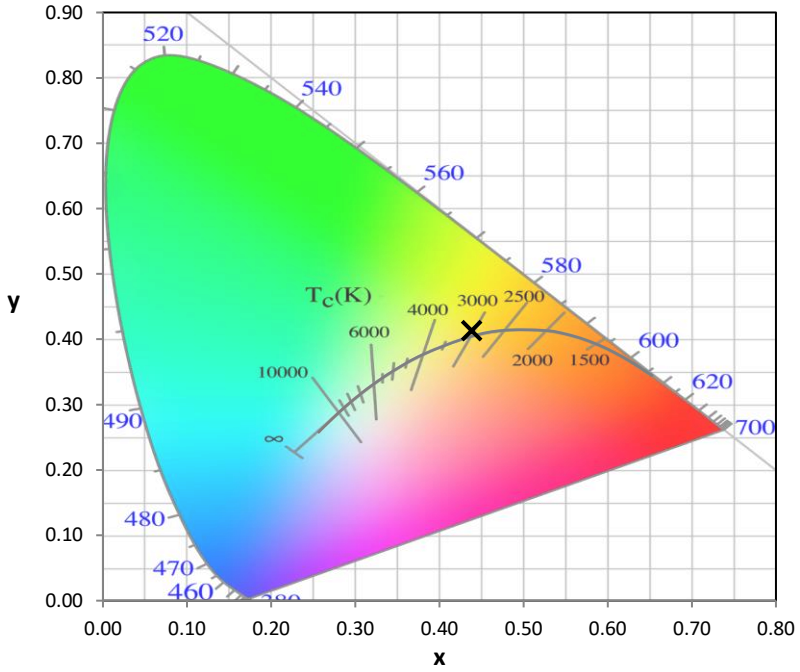
| | |
|---|---|
| Stabilization Time: | 20M |
| Operation Time: | 1H 20M |
| Sphere Temperature (°C): | 24.2 |

REPORT NUMBER: SP1-2408-195-9

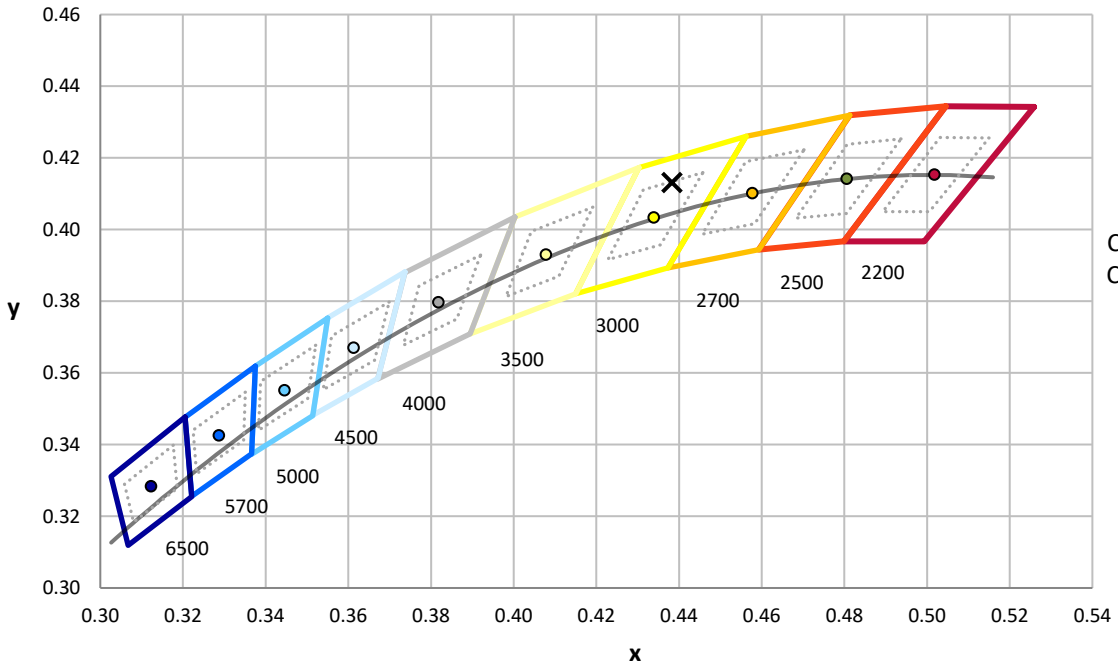
| Measurement and Test Equipment | | | |
|---|---|---|---|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 6/18/2024 | 12/18/2024 |
| Power Meter | INXT2011004 | 2/8/2024 | 2/8/2025 |
| AC Power Source | IN0063 | 10/24/2023 | 10/24/2024 |
| DC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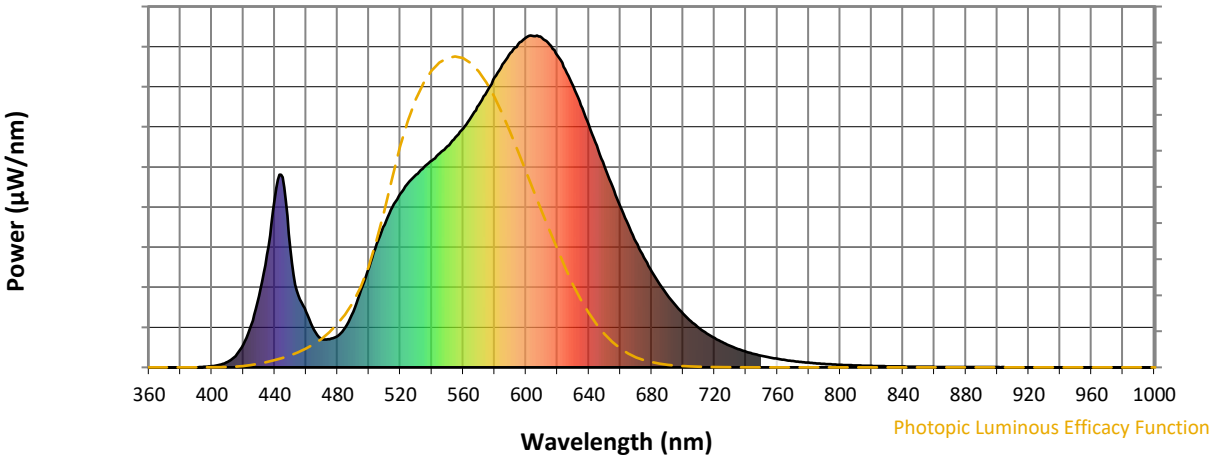
## Photopic Flux vs. Wavelength




## 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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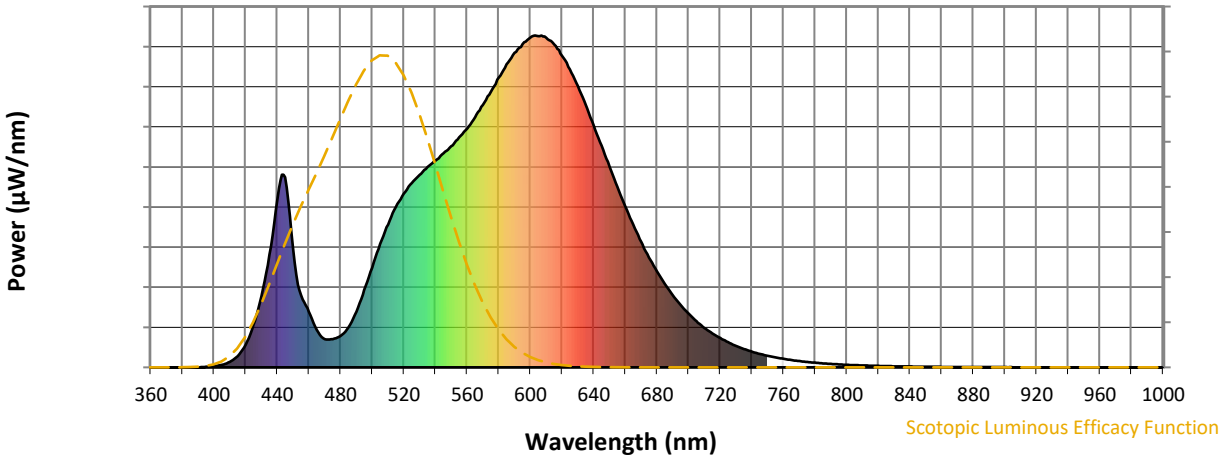
## Scotopic Flux vs. Wavelength




**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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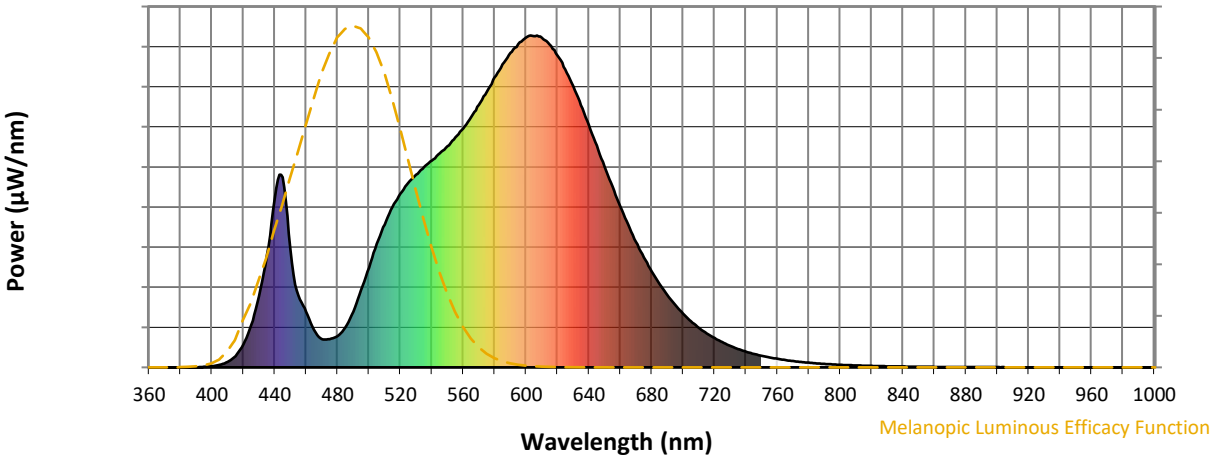
## Melanopic Flux vs. Wavelength




**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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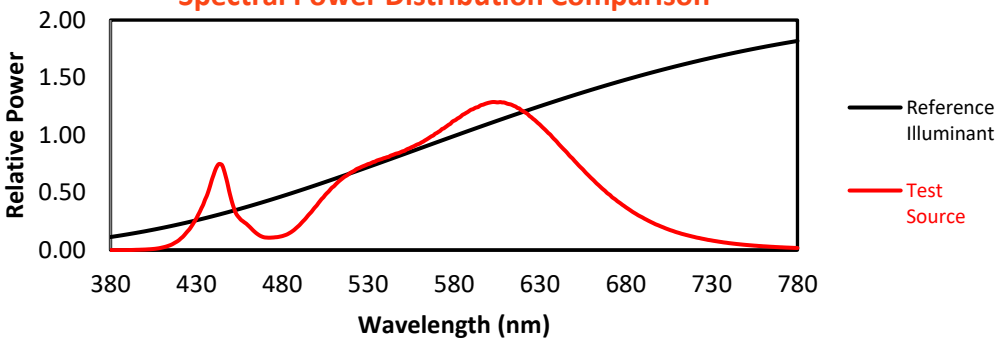
# TM-30-18

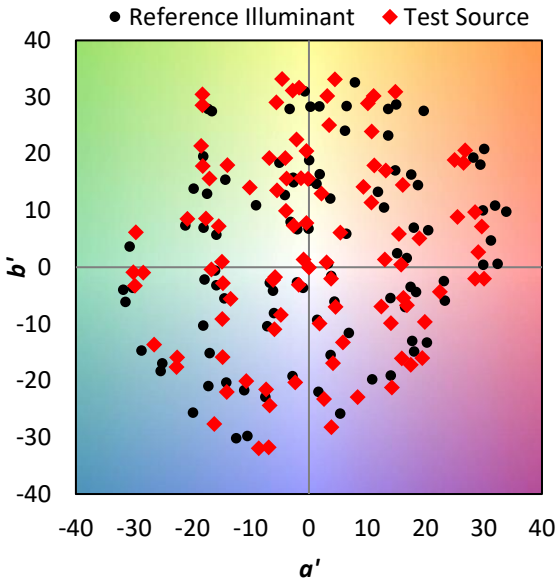
## Summary

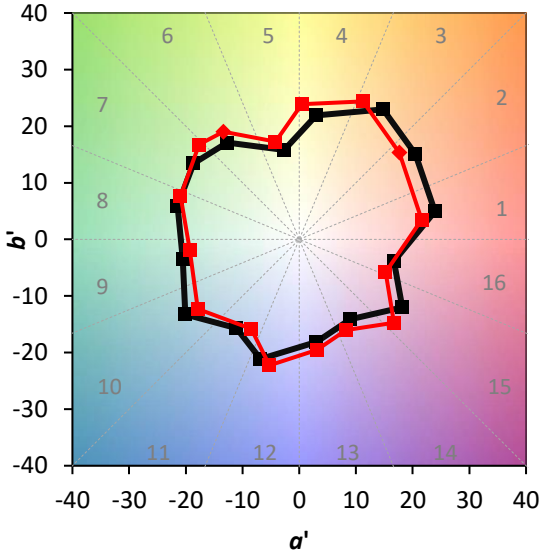
$R_f$ = 81.5
$R_g$ = 99.2
CIE $R_a$ = 81.0
$R_9$ = 7.1

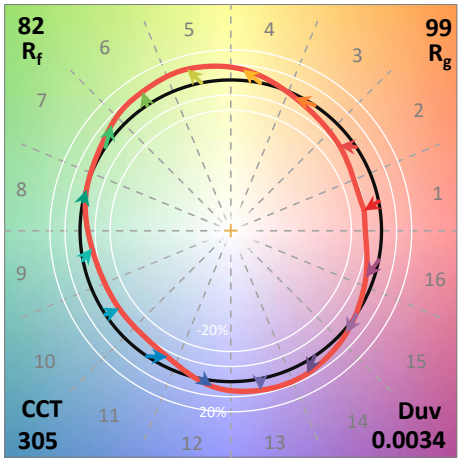
## Spectral Power Distribution Comparison

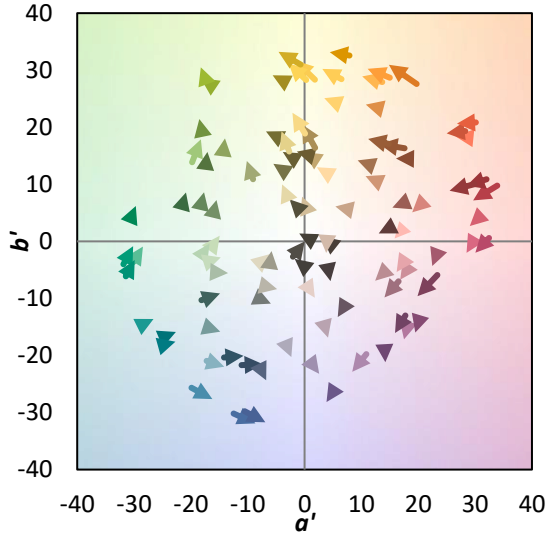



## Color Vector Graphics



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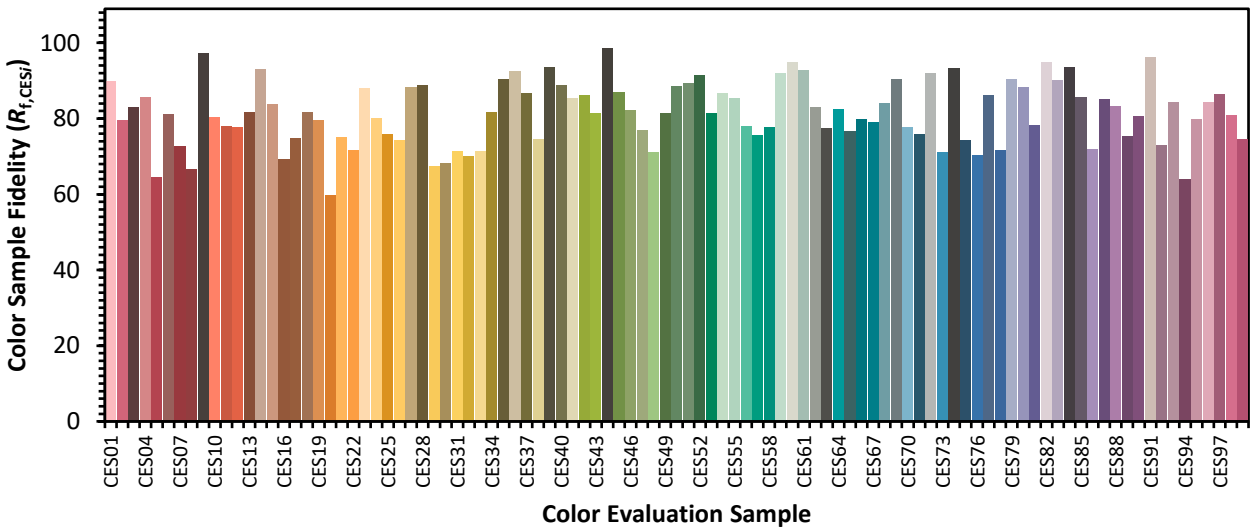
# TM-30-18

**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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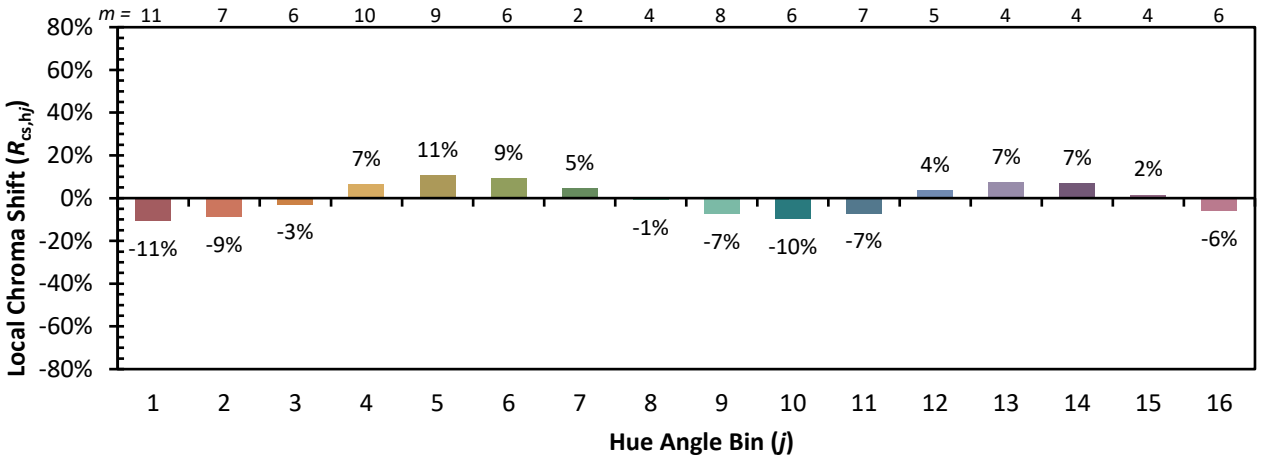
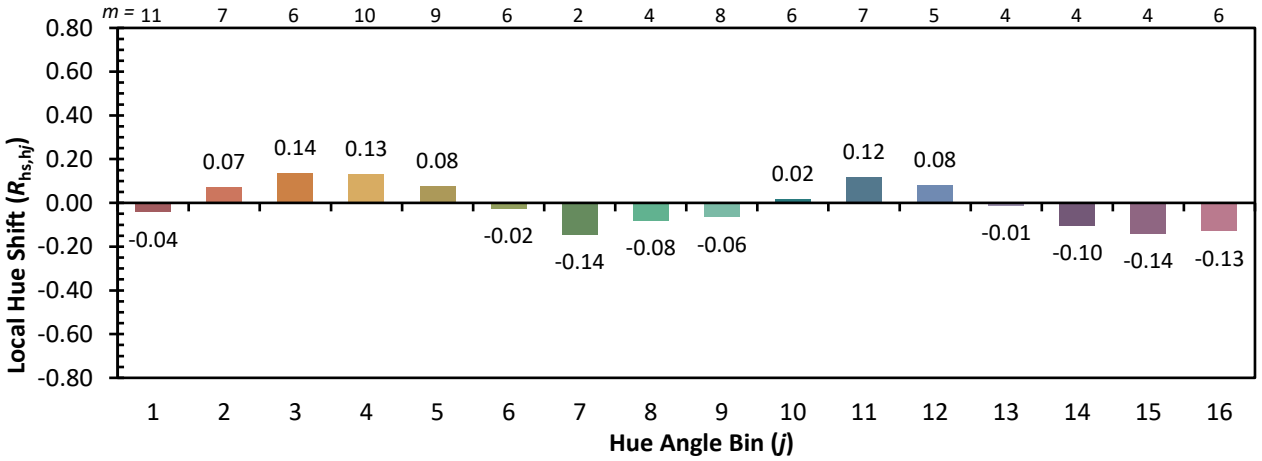
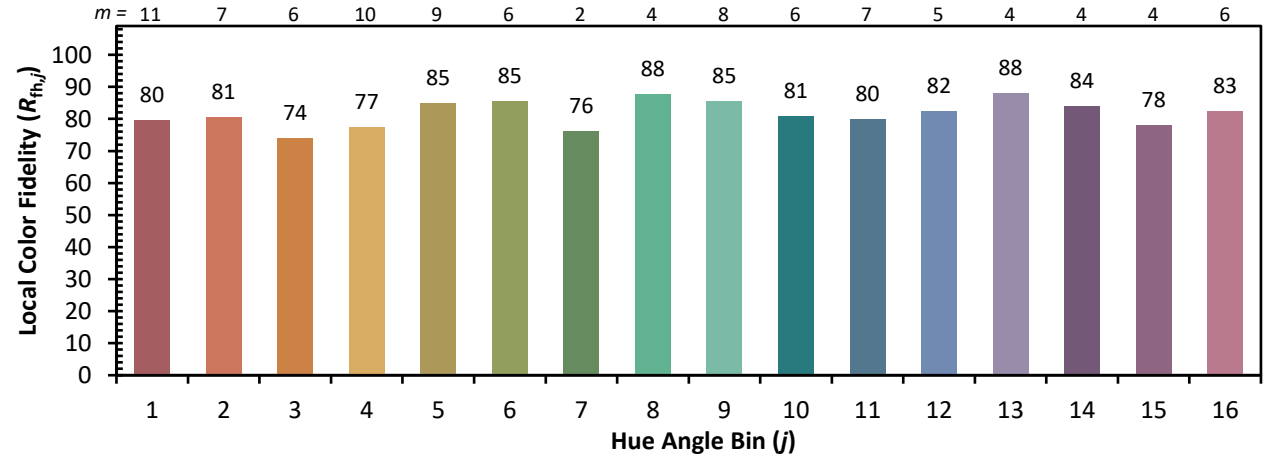
## Color Rendition by Hue-Angle Bin



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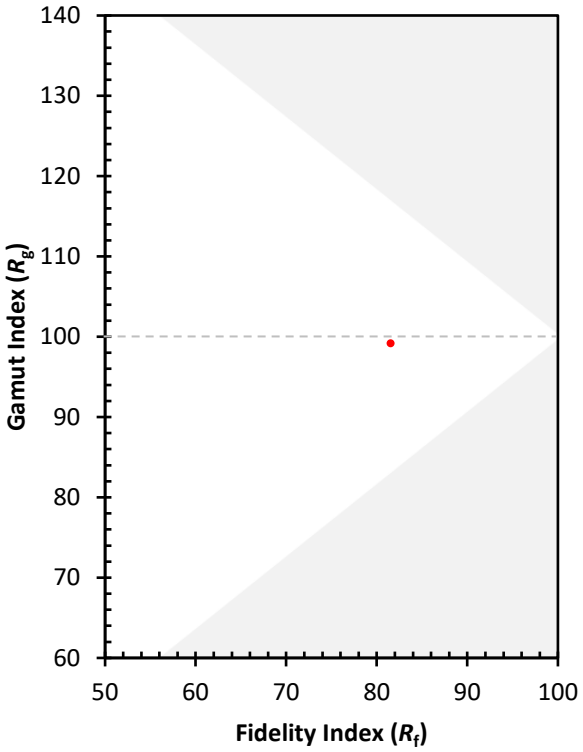
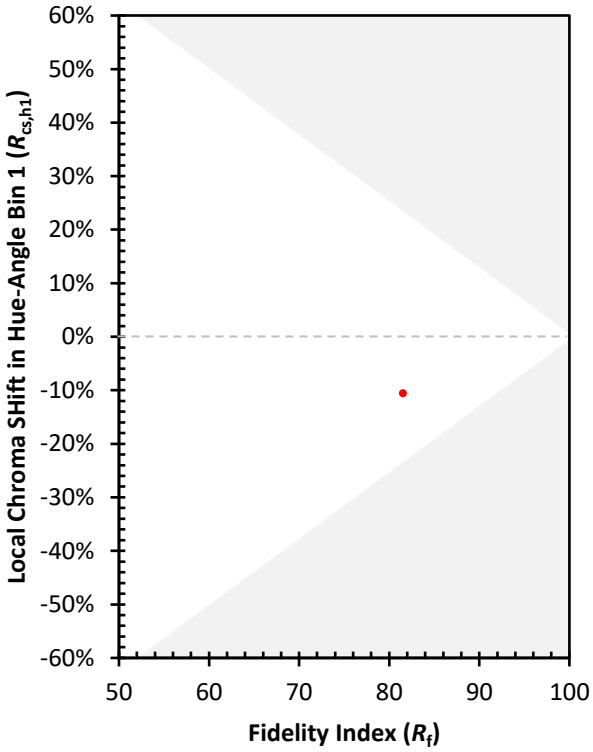
## TM-30-18

### Measure Comparisons

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