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: P642450

Luminaire Tested: GWS-SA6C-830-U-T2-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: | P642450 |
| | TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-22) |
| Test Lab: | COOPER LIGHTING SOLUTIONS |
| Issue Date: | 1/10/2023 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS |
| Product Line: | McGRAW-EDISON |
| Catalog Number: | GWS-SA6C-830-U-T2-W-HSS |
| Description: | GALLEON WALL SLIM LUMINAIRE. (6) LIGHTSQUARES WITH 16 LEDS EACH AND TYPE II OPTICS WITH HOUSE SIDE SHIELD |
| Light Source: | (96) 3000K CCT, 80 CRI LEDS |
| Ballast/Driver: | - |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 16896.1 lumens |
| Efficiency: | N/A |
| Efficacy: | 89.3 lumens/watt |
| Luminous Opening: | Rectangular (W 2' x L: 1' x H: 0') |
| IES Classification: | Type II - Short |
| BUG Rating: | B1 - U0 - G3 |

| | |
|---|---|
| Input Watts (W): | 189.2 |
| 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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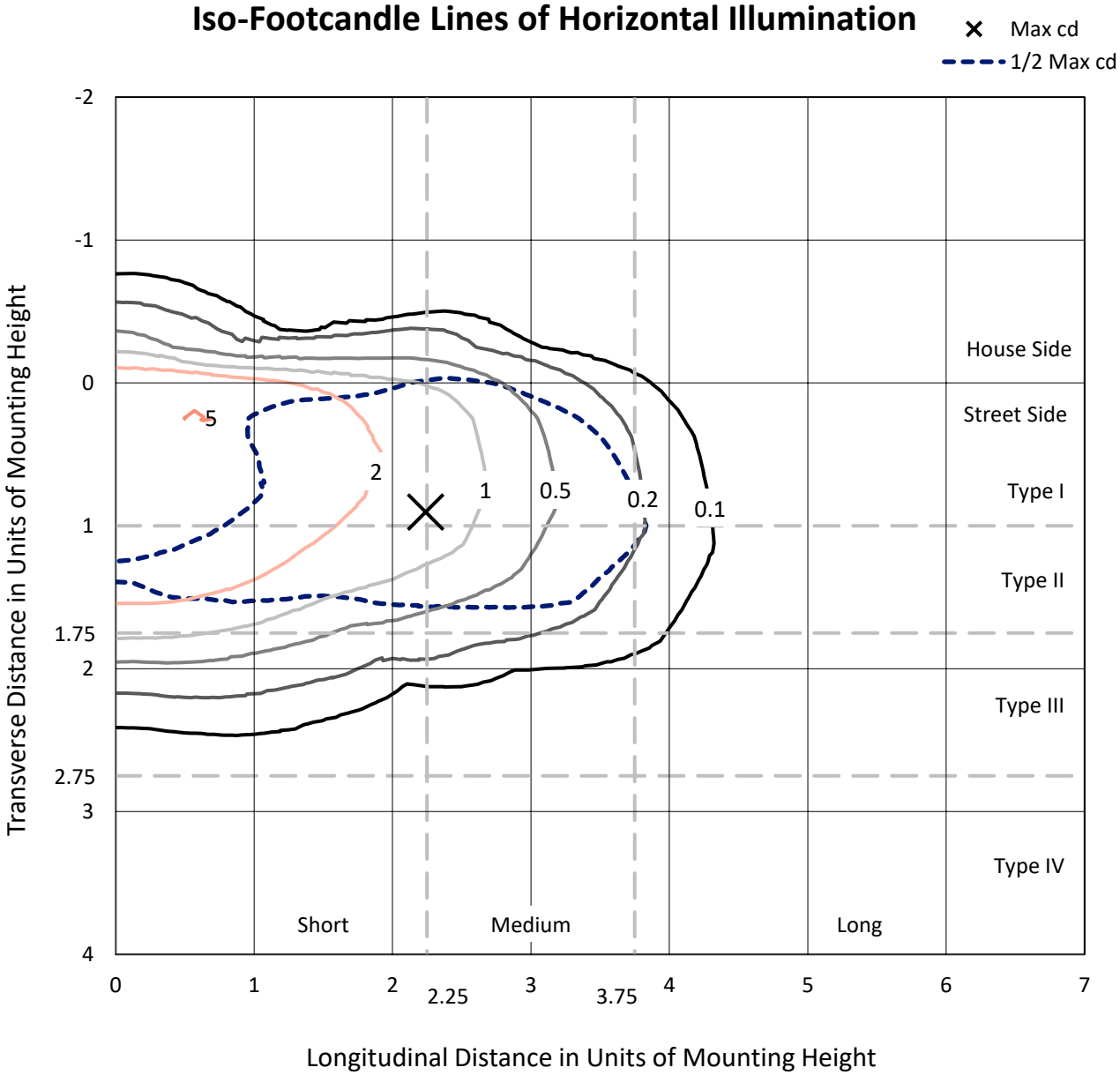
Scaled Data Report

REPORT NUMBER: P642450
CATALOG NUMBER: GWS-SA6C-830-U-T2-W-HSS

## Iso-Footcandle Lines of Horizontal Illumination




Based on 25 foot mounting height. Maximum calculated value = 5.1 fc
Type II - Short - N/A

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REPORT NUMBER: P642450
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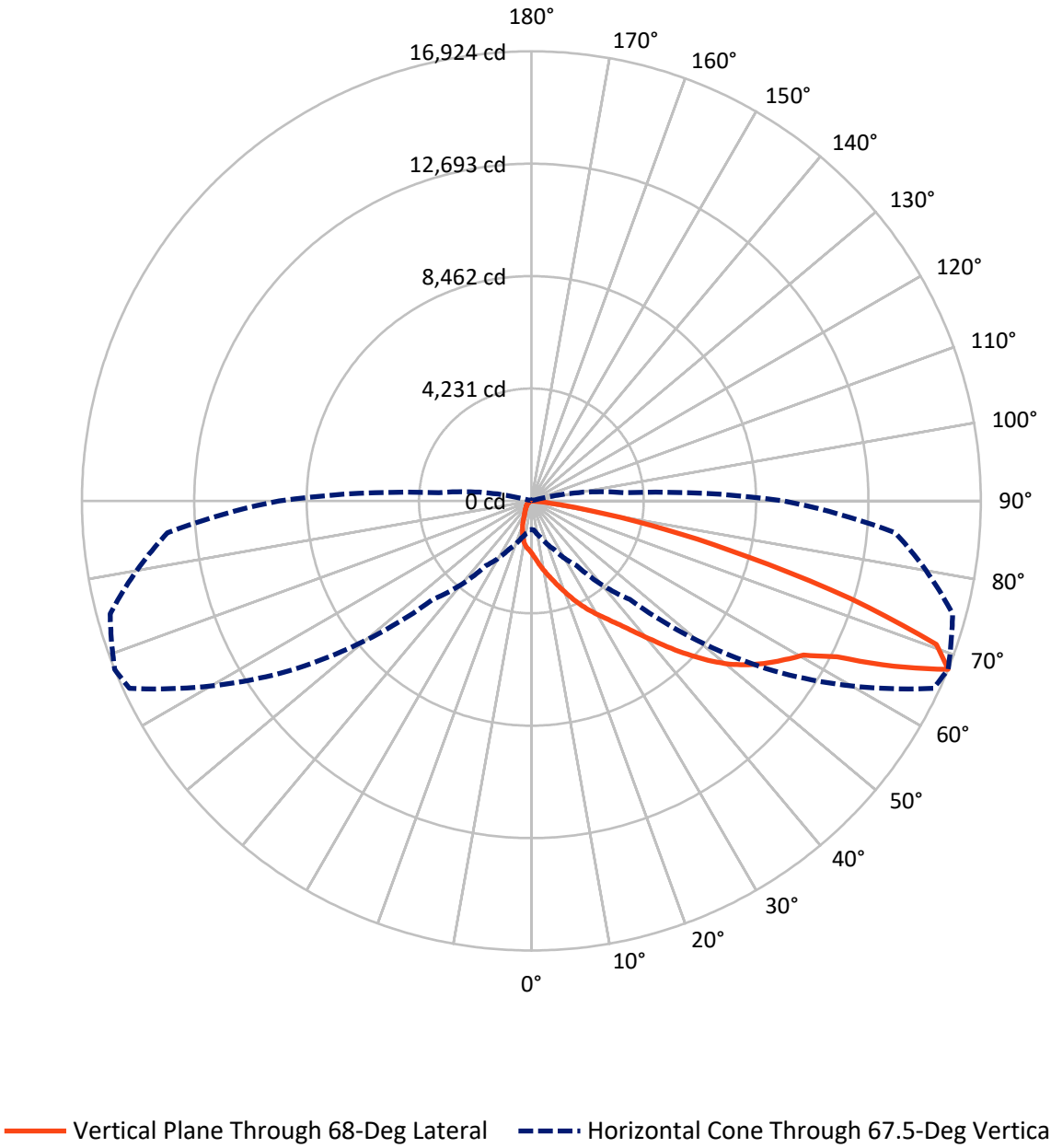
## Luminous Intensity Polar Plot



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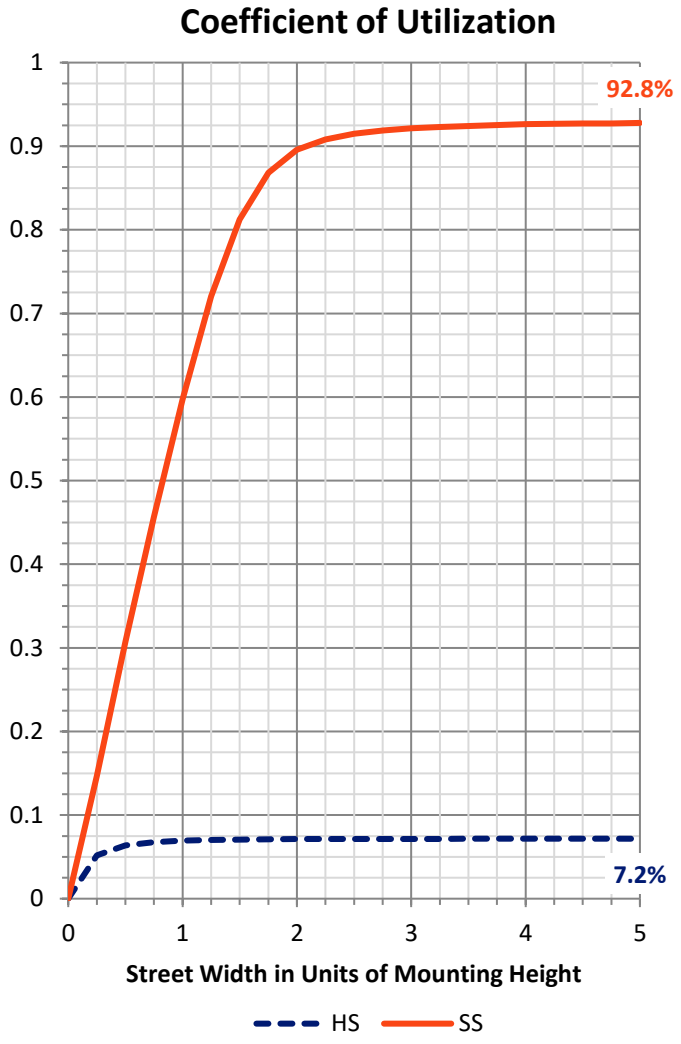
REPORT NUMBER: P642450
CATALOG NUMBER: GWS-SA6C-830-U-T2-W-HSS

**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 1220.1 | 0.0 | 1220.1 |
| | % Fixture | 7.2 | 0.0 | 7.2 |
| **Street Side** | Lumens | 15676.0 | 0.0 | 15676.0 |
| | % Fixture | 92.8 | 0.0 | 92.8 |
| **Total** | Lumens | 16896.1 | 0.0 | 16896.1 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 191.8 | 1.1 |
| 10°-20° | 550.7 | 3.3 |
| 20°-30° | 946.4 | 5.6 |
| 30°-40° | 1645.4 | 9.7 |
| 40°-50° | 2871.1 | 17.0 |
| 50°-60° | 4330.4 | 25.6 |
| 60°-70° | 4342.2 | 25.7 |
| 70°-80° | 1915.8 | 11.3 |
| 80°-90° | 102.3 | 0.6 |
| 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° | 16896.1 | 100.0 |
| 0°-180° | 16896.1 | 100.0 |



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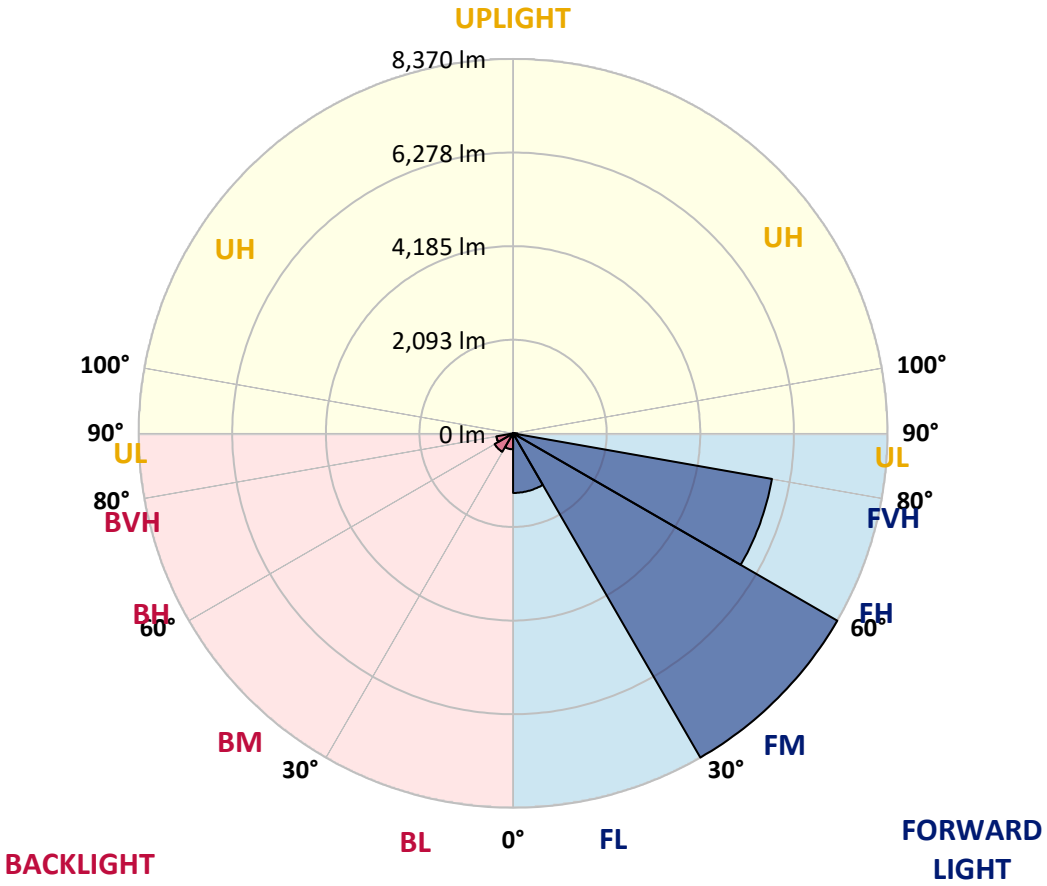
REPORT NUMBER: P642450
CATALOG NUMBER: GWS-SA6C-830-U-T2-W-HSS

## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 1331.9 | 7.9 | | | |
| FM | (30°-60°) | 8370.3 | 49.5 | | | |
| FH | (60°-80°) | 5877.2 | 34.8 | | | G3/7500 |
| FVH | (80°-90°) | 96.6 | 0.6 | | | G1/100 |
| BL | (0°-30°) | 356.9 | 2.1 | B1/500 | | |
| BM | (30°-60°) | 476.6 | 2.8 | B1/1000 | | |
| BH | (60°-80°) | 380.8 | 2.3 | B1/500 | | G1/500 |
| BVH | (80°-90°) | 5.8 | 0.0 | | | G0/10 |
| UL | (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH | (100°-180°) | 0.0 | 0.0 | | U0/0 | |

**BUG Rating: B1-U0-G3**
Type II Short



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REPORT NUMBER: P642450
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**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 15° | 25° | 35° | 45° | 55° | 65° | 68° | 75° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 1966.3 | 1966.3 | 1966.3 | 1966.3 | 1966.3 | 1966.3 | 1966.3 | 1966.3 | *1966.3* | 1966.3 | 1966.3 |
| 2.5° | 2289.7 | 2304.2 | 2289.7 | 2292.9 | 2250.9 | 2231.5 | 2189.4 | 2131.2 | *2116.7* | 2079.5 | 2022.9 |
| 5° | 2569.4 | 2582.4 | 2567.8 | 2564.6 | 2516.1 | 2480.5 | 2411.0 | 2310.7 | *2281.6* | 2208.8 | 2097.3 |
| 7.5° | 2721.4 | 2729.5 | 2734.4 | 2742.4 | 2724.7 | 2695.5 | 2632.5 | 2508.0 | *2477.2* | 2359.2 | 2202.4 |
| 10° | 2737.6 | 2744.1 | 2768.3 | 2816.8 | 2852.4 | 2870.2 | 2834.6 | 2719.8 | *2671.3* | 2556.5 | 2331.7 |
| 12.5° | 2692.3 | 2702.0 | 2740.8 | 2821.7 | 2920.3 | 3010.9 | 3033.5 | 2933.2 | *2889.6* | 2742.4 | 2483.7 |
| 15° | 2632.5 | 2640.6 | 2693.9 | 2803.9 | 2952.6 | 3119.2 | 3213.0 | 3169.3 | *3120.8* | 2967.2 | 2651.9 |
| 17.5° | 2540.3 | 2551.6 | 2626.0 | 2774.8 | 2967.2 | 3204.9 | 3407.0 | 3421.6 | *3387.6* | 3221.1 | 2837.8 |
| 20° | 2488.6 | 2496.7 | 2563.0 | 2716.6 | 2957.5 | 3268.0 | 3588.1 | 3725.6 | *3688.4* | 3513.7 | 3051.3 |
| 22.5° | 2532.2 | 2538.7 | 2582.4 | 2702.0 | 2925.2 | 3303.5 | 3756.3 | 4029.6 | *4008.6* | 3827.4 | 3276.0 |
| 25° | 2761.8 | 2782.9 | 2757.0 | 2778.0 | 2939.7 | 3322.9 | 3892.1 | 4333.6 | *4338.4* | 4155.7 | 3508.9 |
| 27.5° | 3227.5 | 3200.1 | 3138.6 | 3033.5 | 3052.9 | 3374.7 | 4008.6 | 4619.8 | *4661.8* | 4475.9 | 3715.9 |
| 30° | 3701.3 | 3685.2 | 3648.0 | 3484.6 | 3348.8 | 3489.5 | 4107.2 | 4912.5 | *4978.8* | 4791.2 | 3900.2 |
| 32.5° | 4233.3 | 4249.5 | 4183.2 | 3987.5 | 3756.3 | 3722.3 | 4209.1 | 5190.6 | *5315.1* | 5148.5 | 4116.9 |
| 35° | 4868.8 | 4873.6 | 4742.7 | 4526.0 | 4264.0 | 4107.2 | 4391.8 | 5497.8 | *5727.4* | 5604.5 | 4406.3 |
| 37.5° | 5488.1 | 5517.2 | 5446.1 | 5104.9 | 4872.0 | 4585.8 | 4694.2 | 5892.4 | *6215.8* | 6167.3 | 4770.2 |
| 40° | 6036.3 | 6081.6 | 6058.9 | 5729.0 | 5423.4 | 5182.5 | 5163.1 | 6354.8 | *6806.0* | 6860.9 | 5250.4 |
| 42.5° | 6472.9 | 6502.0 | 6519.8 | 6285.3 | 6015.3 | 5879.4 | 5742.0 | 6891.7 | *7502.9* | 7727.7 | 5839.0 |
| 45° | 6933.7 | 6943.4 | 6980.6 | 6822.1 | 6586.1 | 6597.4 | 6426.0 | 7543.3 | *8237.0* | 8688.2 | 6514.9 |
| 47.5° | 7520.7 | 7553.0 | 7535.2 | 7368.7 | 7155.2 | 7283.0 | 7132.6 | 8214.4 | *8961.4* | 9713.3 | 7207.0 |
| 50° | 8235.4 | 8269.4 | 8253.2 | 8059.1 | 7821.4 | 7874.8 | 7781.0 | 8866.0 | *9660.0* | 10680.3 | 7782.6 |
| 52.5° | 8604.1 | 8631.6 | 8832.1 | 8919.4 | 8794.9 | 8455.3 | 8334.0 | 9582.4 | *10250.2* | 11475.9 | 8311.4 |
| 55° | 8426.2 | 8445.6 | 8882.2 | 9250.9 | 9706.9 | 9367.3 | 8890.3 | 10135.4 | *10770.9* | 12096.8 | 8704.3 |
| 57.5° | 7688.9 | 7794.0 | 8387.4 | 9011.6 | 9970.4 | 10268.0 | 9792.6 | 10736.9 | *11272.1* | 12528.5 | 9090.8 |
| 60° | 6177.0 | 6172.1 | 7022.6 | 8143.2 | 9456.2 | 10515.4 | 11066.8 | 11550.3 | *11775.0* | 12860.0 | 9608.2 |
| 62.5° | 3413.5 | 3444.2 | 4576.1 | 6052.4 | 8026.8 | 9875.0 | 12022.4 | 12955.4 | *12921.5* | 13438.9 | 10418.4 |
| 65° | 1699.5 | 1760.9 | 2375.4 | 3466.9 | 5341.0 | 8161.0 | 12187.4 | 15099.6 | *15002.6* | 14802.1 | 12092.0 |
| 67.5° | *1078.5* | *1102.8* | *1442.4* | *2014.8* | *2968.8* | *5245.6* | *11160.6* | *16698.8* | *16923.6* | *16419.1* | *13752.6* |
| 70° | 698.5 | 739.0 | 1002.5 | 1377.7 | 1791.6 | 2703.6 | 8175.6 | 15662.3 | *16178.1* | 16241.2 | 12717.7 |
| 72.5° | 380.0 | 409.1 | 640.3 | 983.1 | 1293.6 | 1351.8 | 4592.3 | 11754.0 | *12583.5* | 13776.9 | 9949.4 |
| 75° | 216.7 | 237.7 | 350.9 | 667.8 | 949.2 | 823.1 | 2035.8 | 7868.3 | *8397.1* | 9845.9 | 7129.4 |
| 77.5° | 131.0 | 148.8 | 197.3 | 325.0 | 595.1 | 549.8 | 769.7 | 4789.6 | *5125.9* | 5874.6 | 3741.7 |
| 80° | 59.8 | 71.1 | 124.5 | 179.5 | 325.0 | 260.3 | 294.3 | 2233.1 | *2305.8* | 2411.0 | 1238.6 |
| 82.5° | 27.5 | 32.3 | 56.6 | 106.7 | 184.3 | 150.4 | 113.2 | 515.8 | *726.0* | 687.2 | 315.3 |
| 85° | 3.2 | 3.2 | 21.0 | 43.7 | 51.7 | 38.8 | 46.9 | 116.4 | *147.1* | 207.0 | 90.6 |
| 87.5° | 0.0 | 0.0 | 1.6 | 1.6 | 3.2 | 4.9 | 9.7 | 14.6 | *21.0* | 34.0 | 22.6 |
| 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: P642450
CATALOG NUMBER: GWS-SA6C-830-U-T2-W-HSS

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 1966.3 | 1966.3 | 1966.3 | 1966.3 | 1966.3 | 1966.3 | 1966.3 | 1966.3 | 1966.3 | 1966.3 | 1966.3 |
| 2.5° | 1997.0 | 1951.7 | 1911.3 | 1851.5 | 1811.0 | 1765.8 | 1735.0 | 1697.9 | 1683.3 | 1672.0 | 1655.8 |
| 5° | 2042.3 | 1969.5 | 1870.9 | 1760.9 | 1670.4 | 1584.7 | 1505.4 | 1453.7 | 1408.4 | 1401.9 | 1379.3 |
| 7.5° | 2116.7 | 2008.3 | 1841.8 | 1662.3 | 1508.7 | 1366.4 | 1254.8 | 1164.2 | 1119.0 | 1104.4 | 1078.5 |
| 10° | 2215.3 | 2066.5 | 1798.1 | 1523.2 | 1301.7 | 1131.9 | 1005.8 | 903.9 | 832.8 | 806.9 | 787.5 |
| 12.5° | 2325.3 | 2119.9 | 1728.6 | 1351.8 | 1099.6 | 905.5 | 745.4 | 637.1 | 591.8 | 575.7 | 561.1 |
| 15° | 2451.4 | 2170.0 | 1618.6 | 1180.4 | 902.3 | 666.2 | 553.0 | 506.1 | 486.7 | 481.9 | 477.0 |
| 17.5° | 2572.7 | 2202.4 | 1487.6 | 1002.5 | 693.7 | 517.4 | 464.1 | 446.3 | 441.4 | 436.6 | 433.4 |
| 20° | 2710.1 | 2225.0 | 1334.0 | 834.4 | 538.5 | 438.2 | 412.3 | 399.4 | 389.7 | 380.0 | 378.4 |
| 22.5° | 2850.8 | 2225.0 | 1167.5 | 669.4 | 451.1 | 392.9 | 363.8 | 339.6 | 321.8 | 312.1 | 308.8 |
| 25° | 2985.0 | 2194.3 | 1002.5 | 535.2 | 397.8 | 349.3 | 312.1 | 284.6 | 260.3 | 249.0 | 245.8 |
| 27.5° | 3080.4 | 2115.0 | 858.6 | 452.8 | 360.6 | 310.5 | 265.2 | 234.5 | 215.1 | 203.7 | 202.1 |
| 30° | 3140.2 | 1997.0 | 726.0 | 404.3 | 328.3 | 270.0 | 224.8 | 198.9 | 184.3 | 176.3 | 173.0 |
| 32.5° | 3185.5 | 1851.5 | 608.0 | 370.3 | 297.5 | 234.5 | 195.7 | 174.6 | 161.7 | 155.2 | 153.6 |
| 35° | 3276.0 | 1714.0 | 520.7 | 339.6 | 265.2 | 205.4 | 171.4 | 155.2 | 145.5 | 137.4 | 135.8 |
| 37.5° | 3402.2 | 1599.2 | 451.1 | 312.1 | 234.5 | 182.7 | 155.2 | 140.7 | 132.6 | 124.5 | 122.9 |
| 40° | 3588.1 | 1526.5 | 399.4 | 284.6 | 207.0 | 164.9 | 142.3 | 129.4 | 118.0 | 110.0 | 108.3 |
| 42.5° | 3874.3 | 1492.5 | 365.4 | 257.1 | 182.7 | 148.8 | 131.0 | 114.8 | 103.5 | 95.4 | 93.8 |
| 45° | 4215.5 | 1510.3 | 336.3 | 229.6 | 166.6 | 137.4 | 116.4 | 100.3 | 88.9 | 80.9 | 79.2 |
| 47.5° | 4581.0 | 1573.3 | 312.1 | 203.7 | 150.4 | 126.1 | 103.5 | 85.7 | 76.0 | 67.9 | 66.3 |
| 50° | 4962.6 | 1676.8 | 291.1 | 179.5 | 137.4 | 113.2 | 88.9 | 74.4 | 64.7 | 58.2 | 56.6 |
| 52.5° | 5294.1 | 1817.5 | 270.0 | 161.7 | 126.1 | 100.3 | 77.6 | 64.7 | 55.0 | 48.5 | 46.9 |
| 55° | 5611.0 | 1950.1 | 253.9 | 145.5 | 113.2 | 87.3 | 67.9 | 55.0 | 46.9 | 40.4 | 38.8 |
| 57.5° | 5955.4 | 2090.8 | 234.5 | 131.0 | 101.9 | 77.6 | 59.8 | 46.9 | 40.4 | 34.0 | 32.3 |
| 60° | 6456.7 | 2299.4 | 205.4 | 119.7 | 88.9 | 67.9 | 51.7 | 42.0 | 35.6 | 27.5 | 25.9 |
| 62.5° | 7179.5 | 2679.4 | 173.0 | 103.5 | 76.0 | 58.2 | 43.7 | 35.6 | 29.1 | 22.6 | 19.4 |
| 65° | 8531.3 | 3326.2 | 142.3 | 85.7 | 61.4 | 48.5 | 37.2 | 29.1 | 22.6 | 16.2 | 14.6 |
| 67.5° | *9504.7* | *3494.3* | *114.8* | *69.5* | *50.1* | *37.2* | *30.7* | *22.6* | *16.2* | *11.3* | *9.7* |
| 70° | 8309.8 | 2509.6 | 88.9 | 56.6 | 42.0 | 29.1 | 24.3 | 17.8 | 11.3 | 8.1 | 6.5 |
| 72.5° | 6261.0 | 1639.6 | 66.3 | 43.7 | 32.3 | 24.3 | 17.8 | 14.6 | 9.7 | 6.5 | 4.9 |
| 75° | 4412.8 | 947.6 | 48.5 | 32.3 | 22.6 | 17.8 | 14.6 | 11.3 | 8.1 | 4.9 | 4.9 |
| 77.5° | 2262.2 | 391.3 | 34.0 | 22.6 | 16.2 | 11.3 | 9.7 | 6.5 | 6.5 | 4.9 | 3.2 |
| 80° | 687.2 | 129.4 | 19.4 | 14.6 | 11.3 | 8.1 | 4.9 | 4.9 | 4.9 | 3.2 | 1.6 |
| 82.5° | 156.8 | 42.0 | 11.3 | 11.3 | 8.1 | 6.5 | 4.9 | 1.6 | 1.6 | 0.0 | 0.0 |
| 85° | 40.4 | 12.9 | 9.7 | 8.1 | 8.1 | 6.5 | 3.2 | 1.6 | 0.0 | 0.0 | 0.0 |
| 87.5° | 14.6 | 8.1 | 8.1 | 8.1 | 6.5 | 4.9 | 3.2 | 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

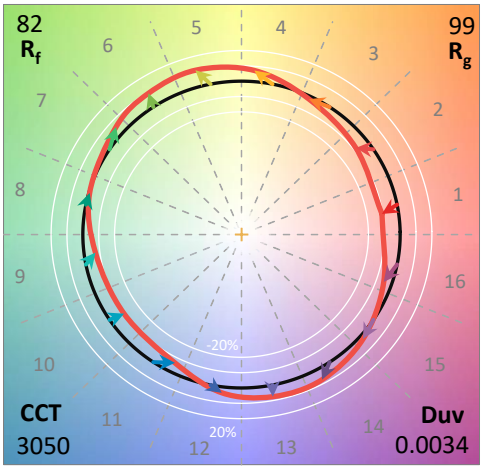
## Test Information

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

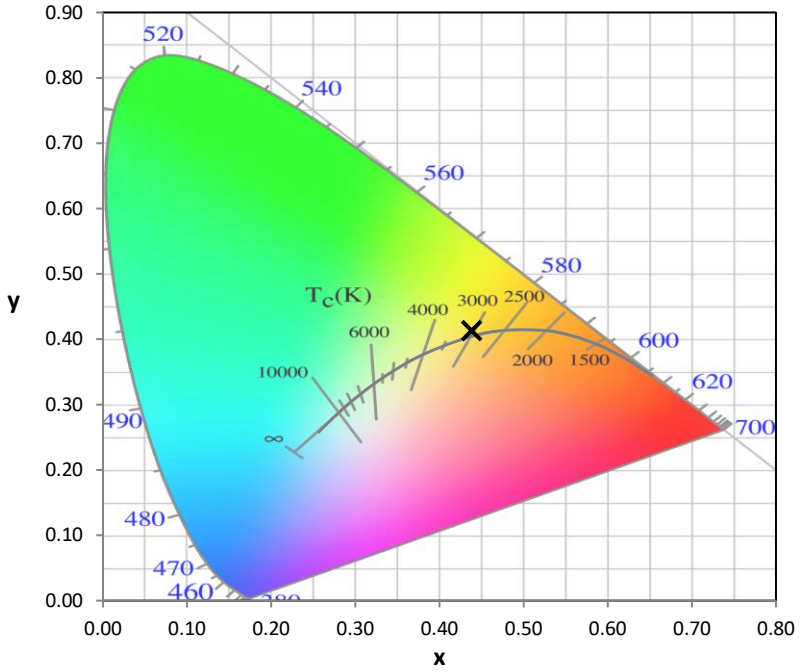
| | |
|---|---|
| Stabilization Time: | 20M |
| Operation Time: | 1H 20M |
| Sphere Temperature (°C): | 24.2 |

REPORT NUMBER: SP1-2408-195-9

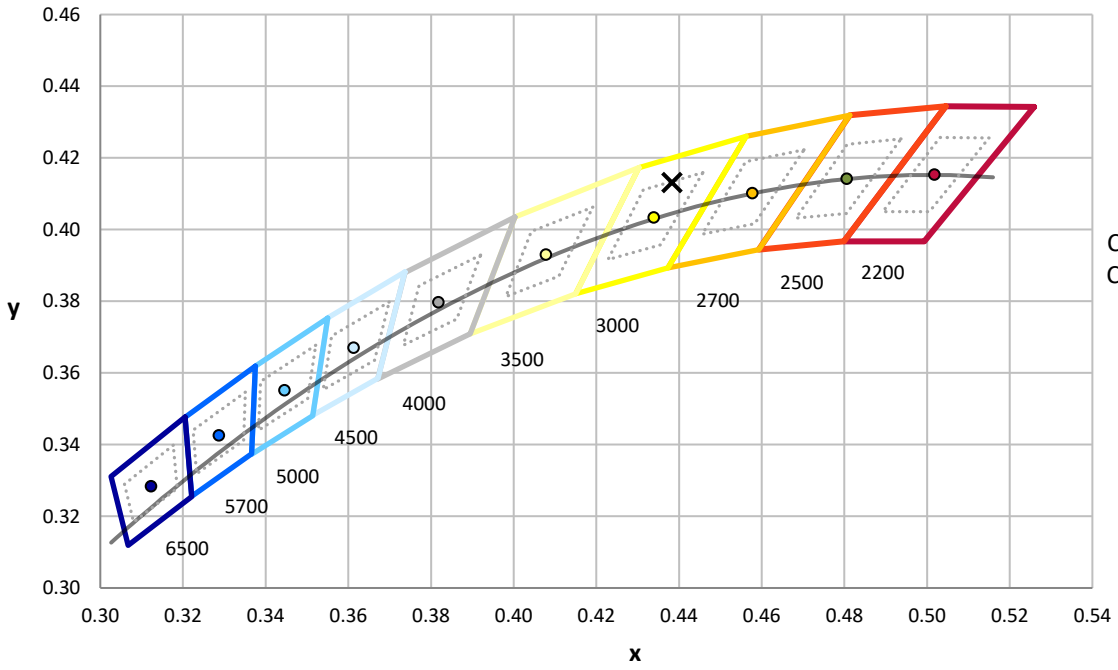
| Measurement and Test Equipment | | | |
|---|---|---|---|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 6/18/2024 | 12/18/2024 |
| Power Meter | INXT2011004 | 2/8/2024 | 2/8/2025 |
| AC Power Source | IN0063 | 10/24/2023 | 10/24/2024 |
| DC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

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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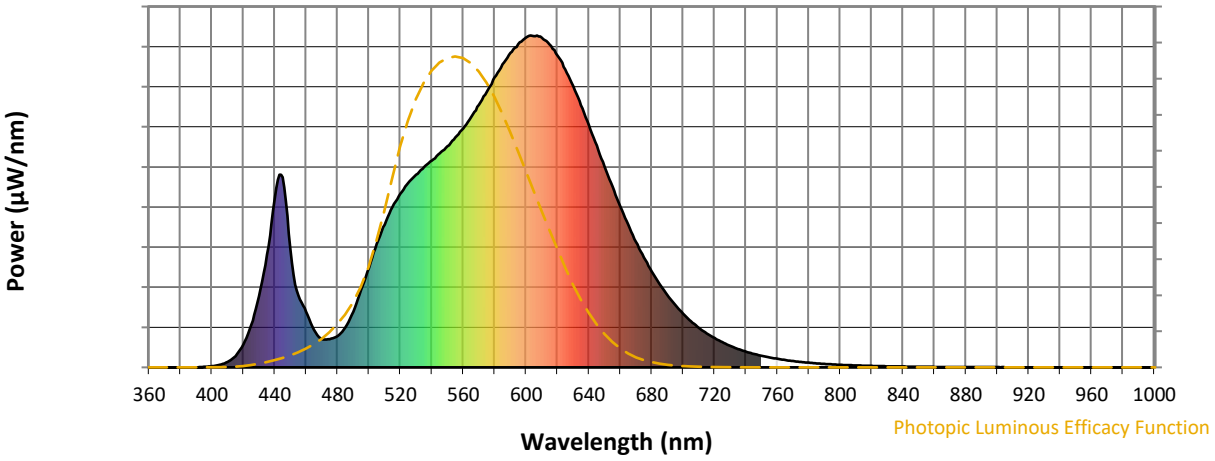
## Photopic Flux vs. Wavelength




## 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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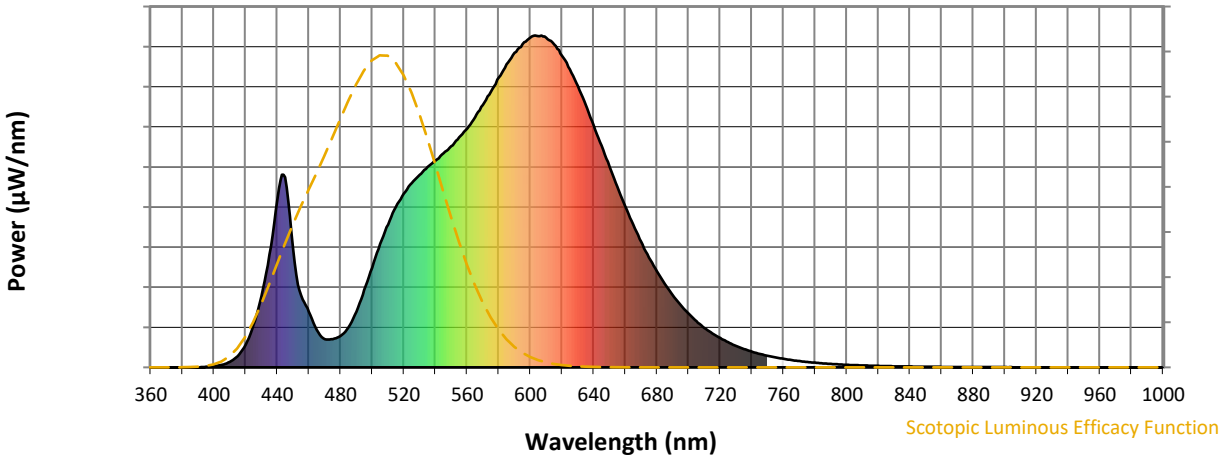
## Scotopic Flux vs. Wavelength




**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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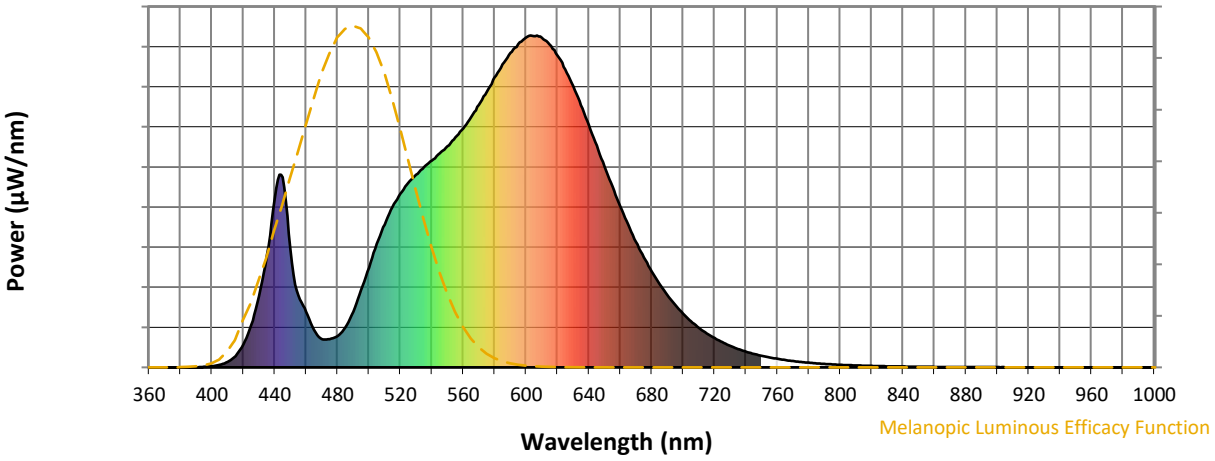
## Melanopic Flux vs. Wavelength




**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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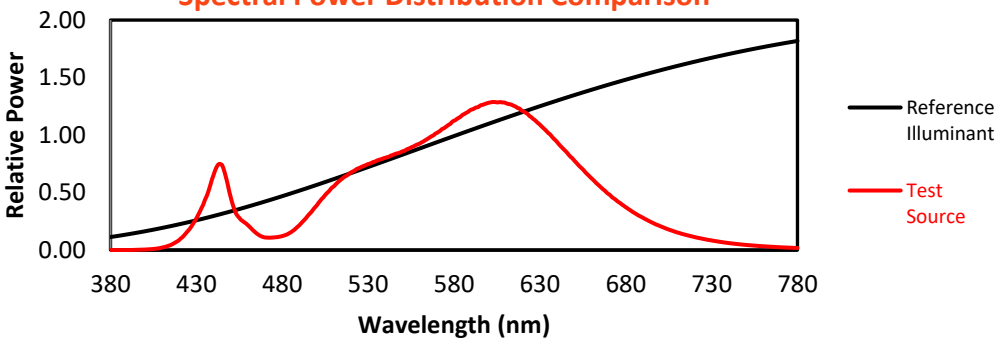
# TM-30-18

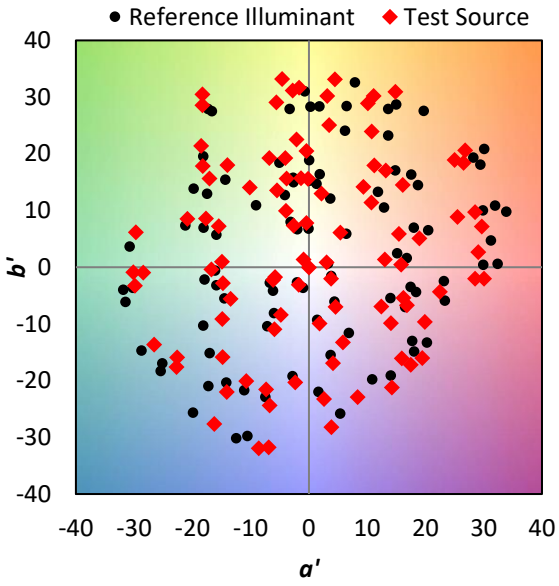
## Summary

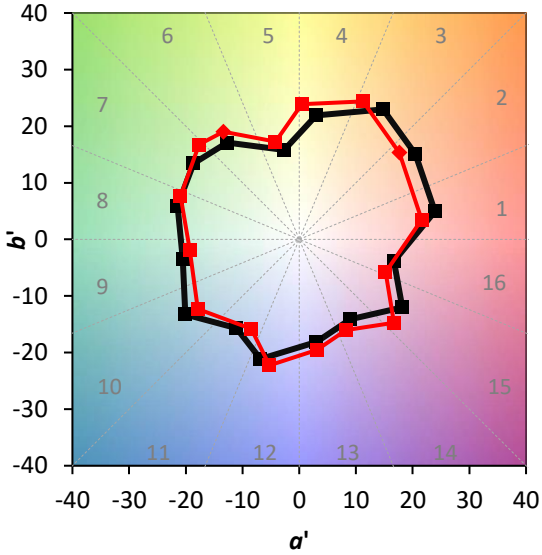
$R_f$ = 81.5
$R_g$ = 99.2
CIE $R_a$ = 81.0
$R_9$ = 7.1

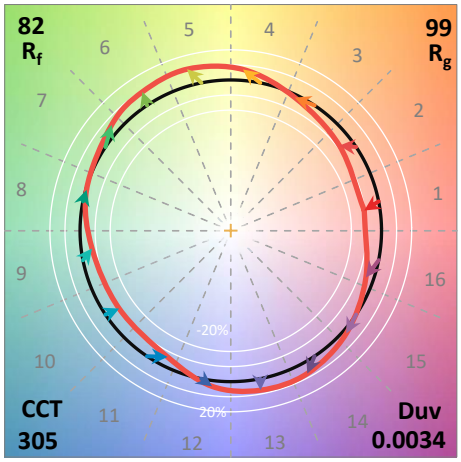
## Spectral Power Distribution Comparison

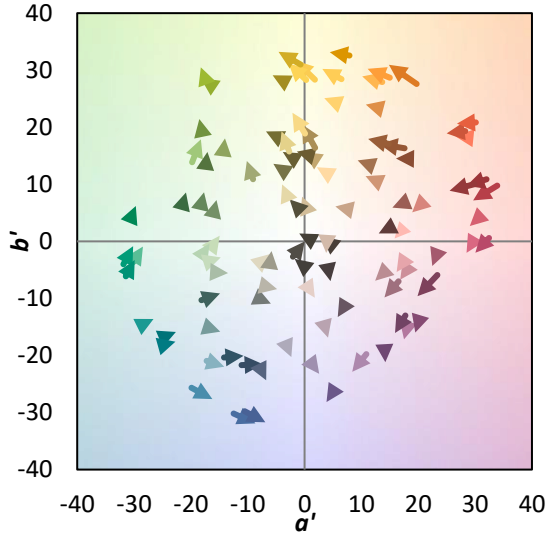



## Color Vector Graphics



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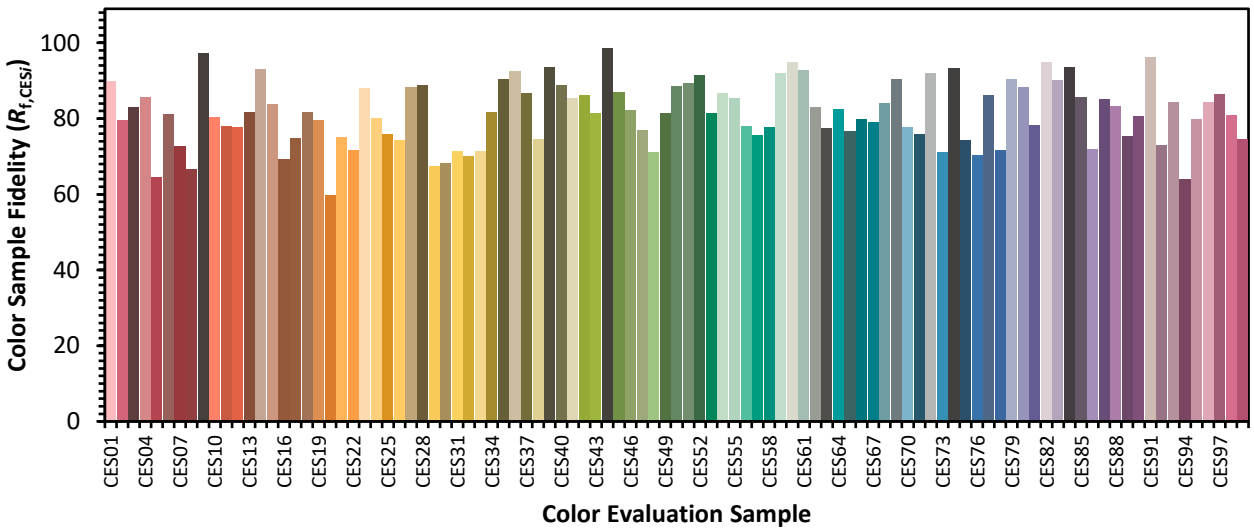
# TM-30-18

**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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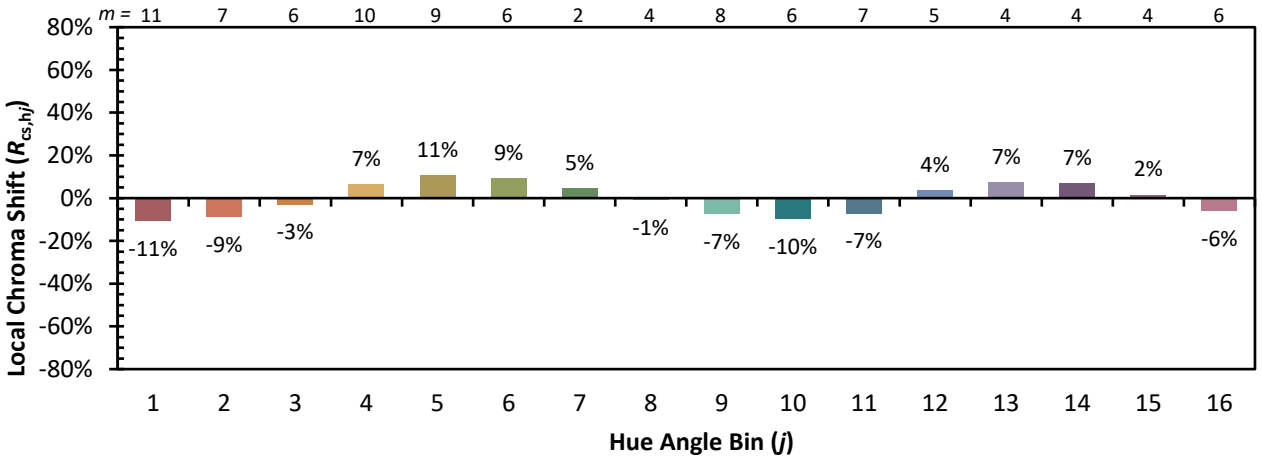
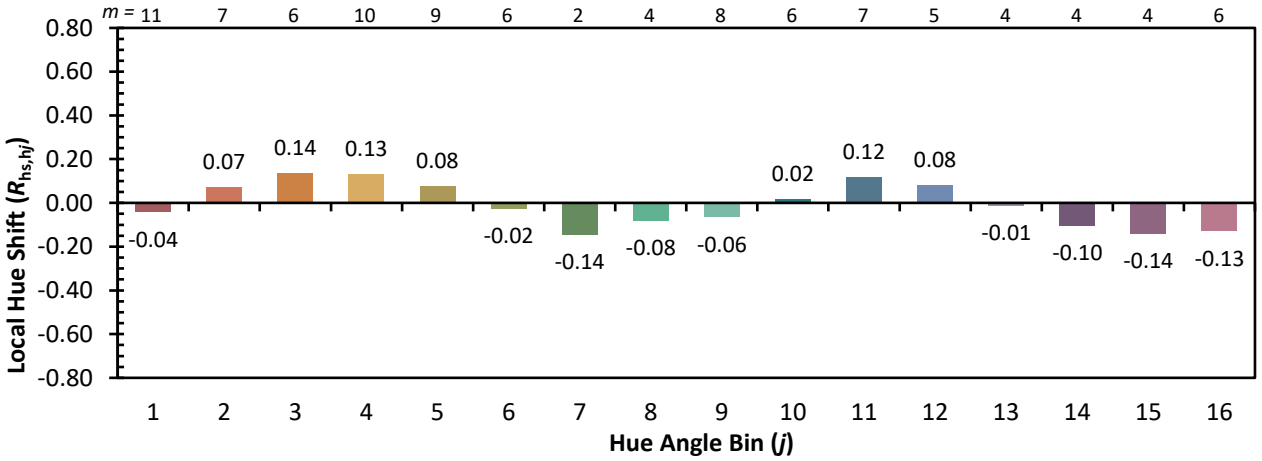
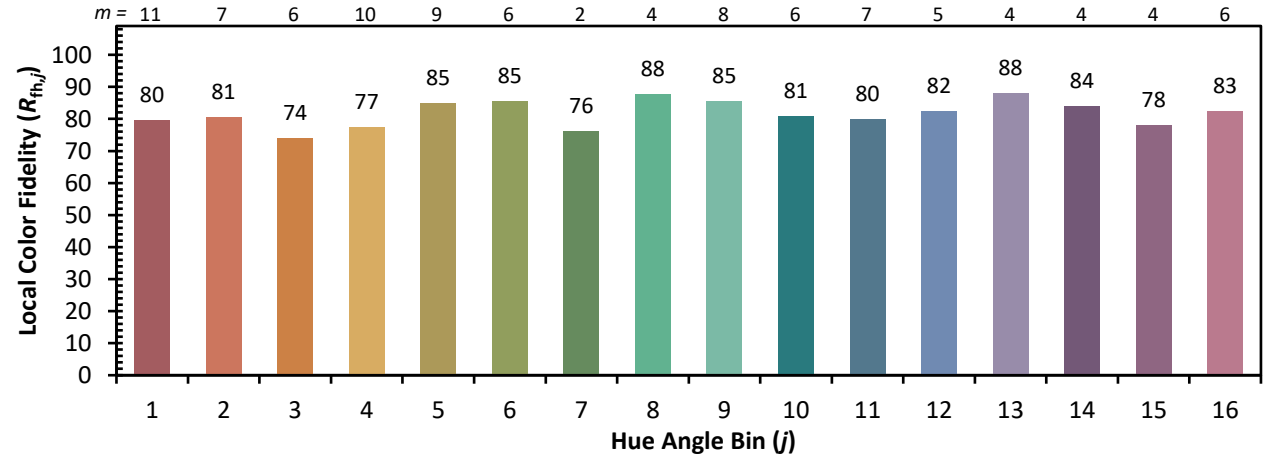
## Color Rendition by Hue-Angle Bin



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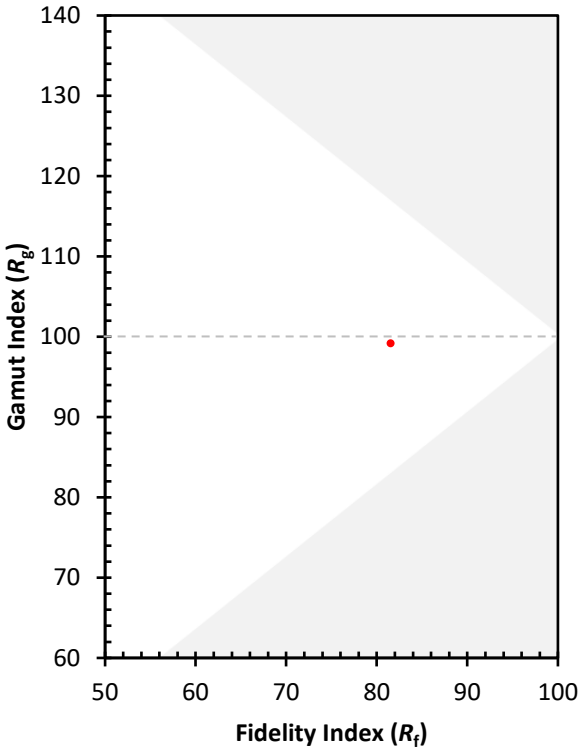
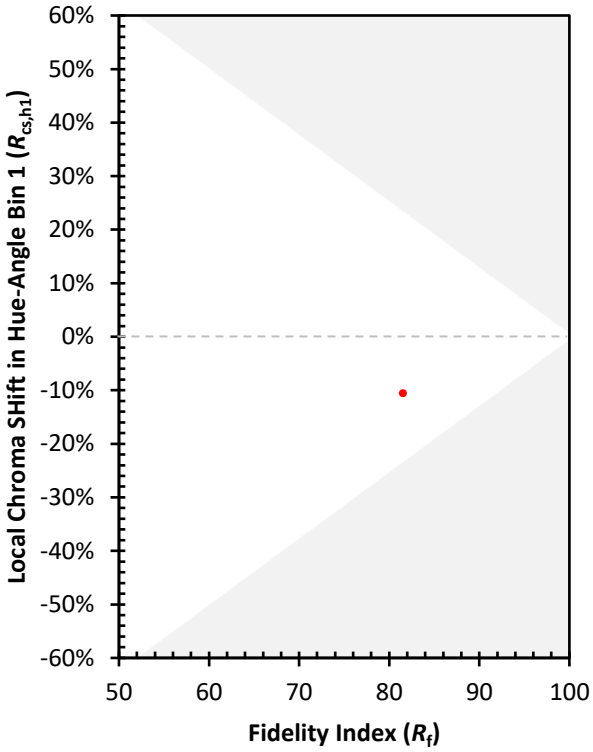
## TM-30-18

### Measure Comparisons

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