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

Scaled data based on original data using

LM-79-08 Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Test Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

Brand: McGRAW-EDISON

Report Number: P318870

Luminaire Tested: **GLEON-SA6A-830-U-T4FT**

Issue Date: 3/3/2020

Report Generated By E0585644

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

Scaled Data Report

**Test Information**

| | |
|---|---|
| Test Method: | LM-79-08 |
| Report Number: | P318870 |
| | TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-16) |
| Test Lab: | INNOVATION CENTER |
| Issue Date: | 3/3/2020 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS (FORMERLY EATON) |
| Product Line: | McGRAW-EDISON |
| Catalog Number: | GLEON-SA6A-830-U-T4FT |
| Description: | GALLEON AREA AND ROADWAY LUMINAIRE |
| | (6) 80 CRI, 3000K, 615mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE IV FORWARD THROW OPTICS |
| Light Source: | - |
| Ballast/Driver: | ELECTRONIC DRIVER |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 22282 lumens |
| Efficiency: | N/A |
| Efficacy: | 115.5 lumens/watt |
| Luminous Opening: | Rectangular (W 1.5' x L: 1' x H: 0') |
| IES Classification: | Type IV - Short |
| BUG Rating: | B3 - U0 - G4 |

| | |
|---|---|
| Input Watts (W): | 193 |
| Input Voltage (V): | NR |
| Input Current (Ain): | NR |
| Voltage Rise (V): | NR |
| Power Factor: | NR |
| Total Harmonic Distortion (THDi): | NR |
| Frequency (hertz): | 60 |
| Stabilization Time: | NR |
| Operation Time: | NR |
| Ambient Temperature (°C): | NR |
| Test Distance: | 24 FT |

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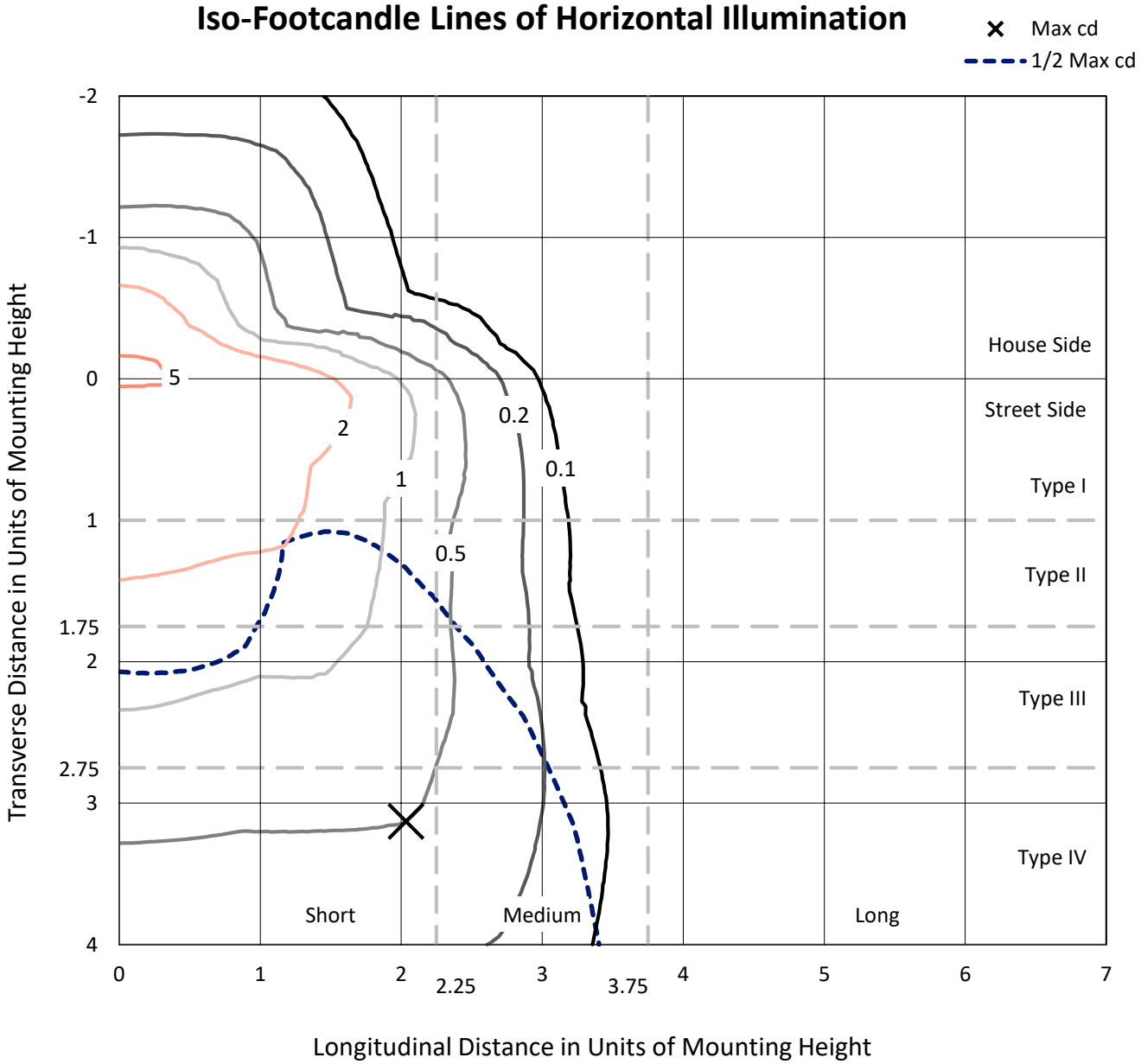
Scaled Data Report

REPORT NUMBER: P318870
CATALOG NUMBER: GLEON-SA6A-830-U-T4FT

## Iso-Footcandle Lines of Horizontal Illumination




Based on 25 foot mounting height. Maximum calculated value = 5.6 fc
Type IV - Short - N/A

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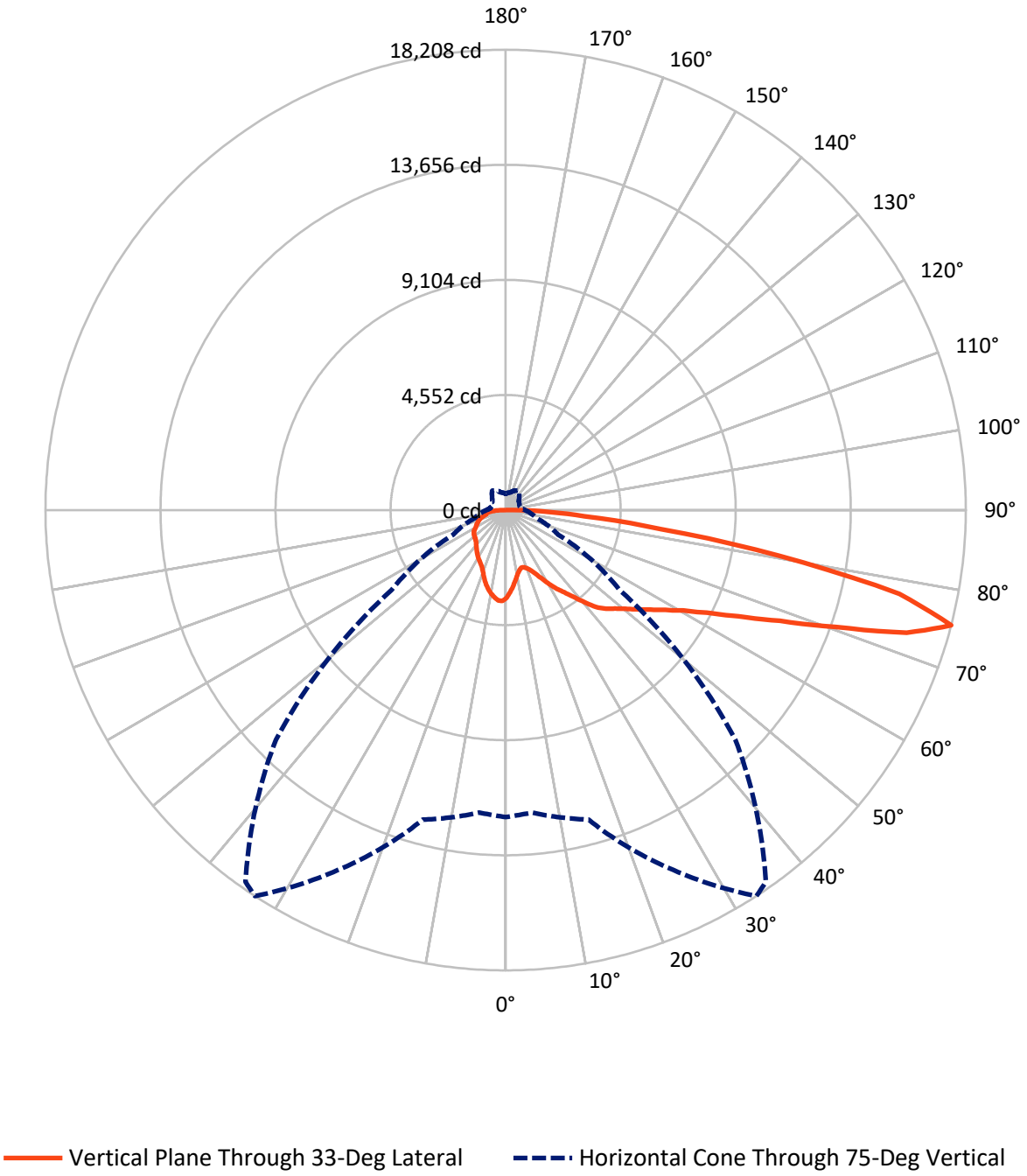
## Luminous Intensity Polar Plot



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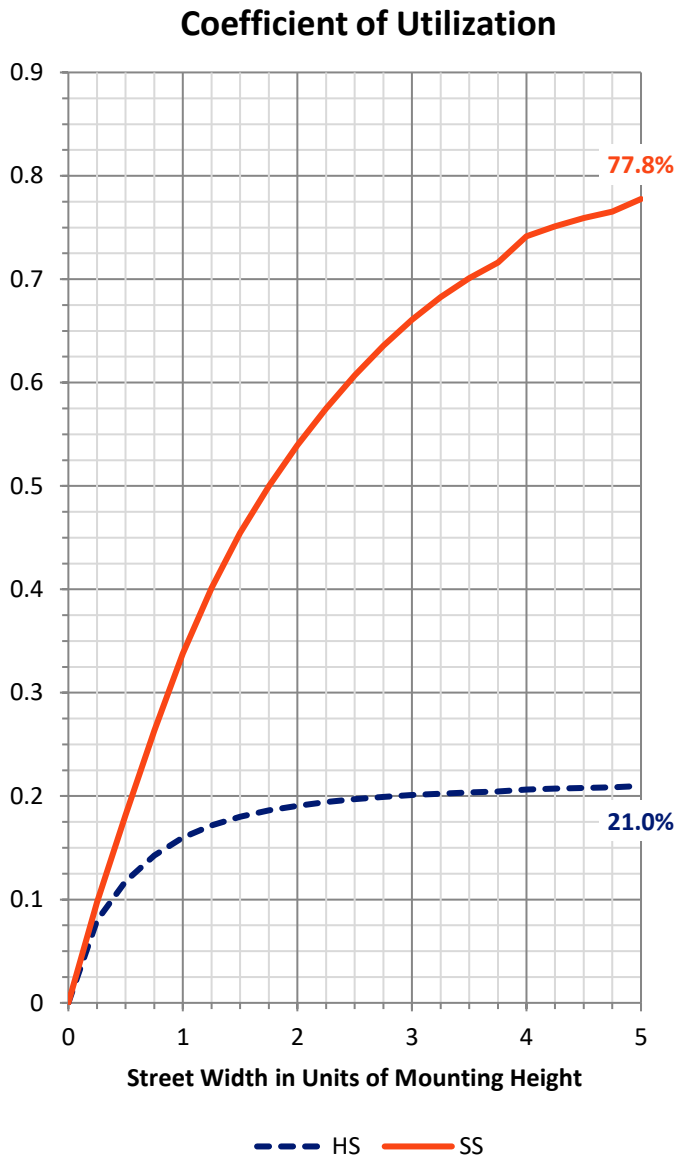
REPORT NUMBER: P318870
CATALOG NUMBER: GLEON-SA6A-830-U-T4FT

**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 4784.5 | 0.0 | 4784.5 |
| | % Fixture | 21.5 | 0.0 | 21.5 |
| **Street Side** | Lumens | 17497.5 | 0.0 | 17497.5 |
| | % Fixture | 78.5 | 0.0 | 78.5 |
| **Total** | Lumens | 22282.0 | 0.0 | 22282.0 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 315.0 | 1.4 |
| 10°-20° | 853.1 | 3.8 |
| 20°-30° | 1393.2 | 6.3 |
| 30°-40° | 2074.8 | 9.3 |
| 40°-50° | 2975.9 | 13.4 |
| 50°-60° | 4085.4 | 18.3 |
| 60°-70° | 5114.7 | 23.0 |
| 70°-80° | 4627.1 | 20.8 |
| 80°-90° | 842.8 | 3.8 |
| 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° | 22282.0 | 100.0 |
| 0°-180° | 22282.0 | 100.0 |



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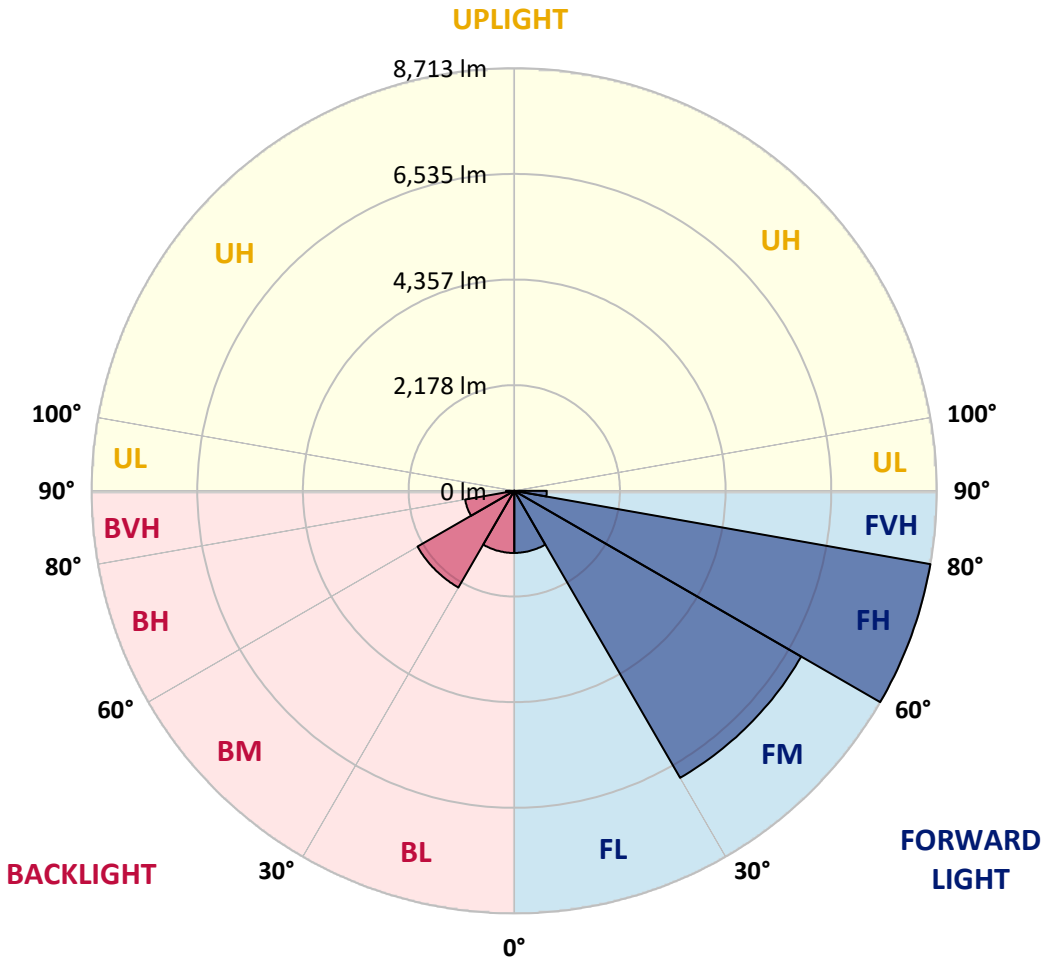
REPORT NUMBER: P318870
CATALOG NUMBER: GLEON-SA6A-830-U-T4FT

## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 1279.8 | 5.7 | | | |
| FM | (30°-60°) | 6833.4 | 30.7 | | | |
| FH | (60°-80°) | 8713.0 | 39.1 | | | G4/12000 |
| FVH | (80°-90°) | 671.3 | 3.0 | | | G4/750 |
| BL | (0°-30°) | 1281.5 | 5.8 | B3/2500 | | |
| BM | (30°-60°) | 2302.7 | 10.3 | B2/2500 | | |
| BH | (60°-80°) | 1028.8 | 4.6 | B3/2500 | | G3/2500 |
| BVH | (80°-90°) | 171.6 | 0.8 | | | G2/225 |
| UL | (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH | (100°-180°) | 0.0 | 0.0 | | U0/0 | |

**BUG Rating: B3-U0-G4**
Type IV Short



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REPORT NUMBER: P318870
CATALOG NUMBER: GLEON-SA6A-830-U-T4FT

**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 15° | 25° | 33° | 35° | 45° | 55° | 65° | 75° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 3482.8 | 3482.8 | 3482.8 | 3482.8 | *3482.8* | 3482.8 | 3482.8 | 3482.8 | 3482.8 | 3482.8 | 3482.8 |
| 2.5° | 3234.2 | 3221.9 | 3245.0 | 3248.0 | *3268.1* | 3275.8 | 3303.5 | 3346.6 | 3382.0 | 3422.8 | 3459.7 |
| 5° | 2940.9 | 2932.5 | 2964.8 | 2987.9 | *3031.8* | 3050.2 | 3115.7 | 3207.3 | 3288.8 | 3381.2 | 3465.1 |
| 7.5° | 2662.3 | 2657.7 | 2693.9 | 2746.2 | *2797.0* | 2822.4 | 2935.6 | 3068.7 | 3204.9 | 3354.3 | 3482.8 |
| 10° | 2427.6 | 2426.0 | 2460.7 | 2512.2 | *2586.9* | 2615.4 | 2761.6 | 2937.1 | 3128.0 | 3333.5 | 3512.8 |
| 12.5° | 2296.0 | 2301.3 | 2317.5 | 2360.6 | *2429.9* | 2458.4 | 2620.8 | 2827.0 | 3063.3 | 3326.6 | 3556.7 |
| 15° | 2328.3 | 2336.7 | 2309.0 | 2307.5 | *2356.8* | 2379.1 | 2531.5 | 2748.5 | 3017.1 | 3338.1 | 3620.6 |
| 17.5° | 2466.1 | 2467.6 | 2394.5 | 2348.3 | *2378.3* | 2389.9 | 2503.8 | 2703.9 | 2990.2 | 3364.3 | 3700.6 |
| 20° | 2660.0 | 2656.2 | 2526.9 | 2449.9 | *2466.1* | 2469.1 | 2543.0 | 2704.7 | 2987.9 | 3409.7 | 3804.5 |
| 22.5° | 2917.1 | 2888.6 | 2714.7 | 2610.0 | *2606.1* | 2601.5 | 2643.9 | 2761.6 | 3021.8 | 3483.6 | 3928.4 |
| 25° | 3252.7 | 3225.7 | 2986.4 | 2843.2 | *2812.4* | 2800.9 | 2807.0 | 2883.2 | 3088.7 | 3562.8 | 4067.0 |
| 27.5° | 3626.0 | 3579.0 | 3348.1 | 3145.7 | *3081.8* | 3065.6 | 3028.7 | 3054.9 | 3161.8 | 3639.0 | 4231.7 |
| 30° | 3938.5 | 3913.1 | 3711.4 | 3471.3 | *3395.8* | 3372.7 | 3275.8 | 3247.3 | 3267.3 | 3743.0 | 4439.5 |
| 32.5° | 4113.2 | 4096.2 | 3973.9 | 3779.9 | *3709.9* | 3677.5 | 3540.5 | 3483.6 | 3436.6 | 3906.9 | 4721.2 |
| 35° | 4324.8 | 4314.1 | 4240.2 | 4099.3 | *3995.4* | 3961.5 | 3855.3 | 3796.1 | 3675.2 | 4132.4 | 5085.3 |
| 37.5° | 4594.2 | 4582.7 | 4584.2 | 4470.3 | *4346.4* | 4314.8 | 4244.8 | 4182.4 | 3984.6 | 4428.7 | 5480.9 |
| 40° | 4899.0 | 4876.7 | 4868.2 | 4862.8 | *4784.3* | 4766.6 | 4729.7 | 4645.0 | 4372.6 | 4782.8 | 5871.1 |
| 42.5° | 5357.7 | 5278.5 | 5109.1 | 5173.0 | *5250.8* | 5241.5 | 5271.5 | 5149.9 | 4803.6 | 5201.5 | 6252.1 |
| 45° | 5800.3 | 5670.2 | 5377.8 | 5391.6 | *5561.7* | 5613.3 | 5838.0 | 5751.8 | 5270.8 | 5660.2 | 6646.2 |
| 47.5° | 6002.0 | 5903.4 | 5654.8 | 5655.6 | *5824.2* | 5931.2 | 6423.7 | 6362.2 | 5761.8 | 6181.3 | 7127.2 |
| 50° | 6227.5 | 6129.0 | 5905.8 | 5989.6 | *6136.7* | 6250.6 | 6989.5 | 6957.9 | 6229.0 | 6751.6 | 7703.7 |
| 52.5° | 6473.8 | 6306.8 | 6165.1 | 6315.2 | *6521.5* | 6653.9 | 7555.9 | 7469.7 | 6657.7 | 7325.8 | 8366.4 |
| 55° | 6476.9 | 6431.4 | 6539.2 | 6649.3 | *6957.9* | 7120.3 | 8149.4 | 7921.5 | 7007.2 | 7890.0 | 8906.0 |
| 57.5° | 6845.5 | 6771.6 | 7000.2 | 7051.0 | *7454.3* | 7637.5 | 8739.7 | 8314.9 | 7362.8 | 8322.5 | 9196.9 |
| 60° | 7333.5 | 7270.4 | 7457.4 | 7591.4 | *8068.6* | 8313.3 | 9370.1 | 8718.9 | 7642.2 | 8648.9 | 9183.1 |
| 62.5° | 8176.3 | 8104.7 | 8102.4 | 8290.2 | *8932.9* | 9217.7 | 10077.4 | 9115.3 | 7753.0 | 8713.5 | 8791.3 |
| 65° | 9410.1 | 9296.2 | 9081.5 | 9170.7 | *10126.7* | 10410.7 | 10867.9 | 9402.4 | 7606.7 | 8367.2 | 7782.2 |
| 67.5° | 10610.8 | 10607.0 | 10343.0 | 10526.1 | *11703.0* | 11930.8 | 11768.4 | 9430.9 | 7150.3 | 7161.1 | 5992.0 |
| 70° | 11807.7 | 11823.1 | 11778.4 | 12415.7 | *13832.7* | 14069.7 | 12727.4 | 9048.4 | 6124.3 | 5171.5 | 3589.8 |
| 72.5° | 12755.9 | 12752.1 | 12976.8 | 14620.1 | *16596.6* | 16543.5 | 13535.6 | 7889.2 | 4397.2 | 2791.6 | 1715.6 |
| 75° | *12141.7* | *12007.8* | *12677.4* | *15711.5* | *18207.5* | *17948.2* | *12848.3* | *5503.2* | *2282.1* | *1270.7* | *923.6* |
| 77.5° | 7919.2 | 8046.2 | 9029.1 | 12979.1 | *15926.2* | 15610.6 | 9426.3 | 2567.7 | 1075.2 | 833.6 | 669.6 |
| 80° | 2867.8 | 3001.8 | 4227.9 | 7352.0 | *10972.6* | 10921.0 | 4641.9 | 1055.2 | 727.3 | 629.6 | 488.0 |
| 82.5° | 986.7 | 1036.0 | 1667.9 | 3265.0 | *6195.2* | 6426.1 | 1746.4 | 599.6 | 528.8 | 446.4 | 334.0 |
| 85° | 387.1 | 443.3 | 762.8 | 1570.9 | *3124.9* | 3148.0 | 707.3 | 358.7 | 367.9 | 292.5 | 183.2 |
| 87.5° | 147.0 | 178.6 | 364.8 | 729.7 | *1427.0* | 1310.8 | 253.2 | 170.9 | 209.4 | 173.9 | 87.0 |
| 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: P318870
CATALOG NUMBER: GLEON-SA6A-830-U-T4FT

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 3482.8 | 3482.8 | 3482.8 | 3482.8 | 3482.8 | 3482.8 | 3482.8 | 3482.8 | 3482.8 | 3482.8 | 3482.8 |
| 2.5° | 3488.2 | 3504.4 | 3538.2 | 3561.3 | 3585.9 | 3592.9 | 3595.9 | 3602.1 | 3608.3 | 3606.0 | 3606.7 |
| 5° | 3509.7 | 3541.3 | 3595.9 | 3619.0 | 3629.8 | 3617.5 | 3593.6 | 3574.4 | 3560.5 | 3552.8 | 3550.5 |
| 7.5° | 3545.1 | 3589.8 | 3648.3 | 3644.4 | 3619.8 | 3565.2 | 3503.6 | 3457.4 | 3418.9 | 3405.1 | 3397.4 |
| 10° | 3592.1 | 3644.4 | 3685.2 | 3641.4 | 3569.8 | 3475.1 | 3382.7 | 3311.2 | 3253.4 | 3231.1 | 3227.3 |
| 12.5° | 3652.1 | 3705.2 | 3712.9 | 3619.8 | 3501.3 | 3372.0 | 3246.5 | 3151.8 | 3065.6 | 3037.9 | 3031.8 |
| 15° | 3729.9 | 3779.9 | 3732.2 | 3582.1 | 3416.6 | 3242.7 | 3080.3 | 2951.7 | 2860.9 | 2827.0 | 2814.7 |
| 17.5° | 3811.5 | 3859.2 | 3736.0 | 3519.7 | 3305.8 | 3089.5 | 2885.5 | 2753.9 | 2650.0 | 2610.8 | 2606.1 |
| 20° | 3909.2 | 3930.8 | 3719.9 | 3430.5 | 3153.4 | 2890.9 | 2676.2 | 2552.3 | 2496.8 | 2469.1 | 2466.1 |
| 22.5° | 4030.0 | 4007.0 | 3682.9 | 3309.6 | 2960.2 | 2661.6 | 2486.8 | 2429.1 | 2415.3 | 2409.1 | 2411.4 |
| 25° | 4157.8 | 4087.0 | 3628.3 | 3151.8 | 2716.2 | 2432.2 | 2348.3 | 2364.5 | 2382.9 | 2380.6 | 2380.6 |
| 27.5° | 4298.7 | 4168.6 | 3544.4 | 2942.5 | 2446.0 | 2244.4 | 2254.4 | 2313.7 | 2341.4 | 2340.6 | 2339.8 |
| 30° | 4479.5 | 4260.9 | 3437.4 | 2690.8 | 2193.6 | 2112.0 | 2172.8 | 2245.2 | 2282.9 | 2281.3 | 2282.1 |
| 32.5° | 4702.0 | 4362.5 | 3291.9 | 2409.9 | 2011.2 | 2014.3 | 2084.3 | 2155.9 | 2199.7 | 2195.9 | 2196.7 |
| 35° | 4962.1 | 4476.5 | 3094.9 | 2132.8 | 1890.3 | 1936.5 | 1991.9 | 2042.0 | 2083.5 | 2078.1 | 2072.7 |
| 37.5° | 5245.4 | 4588.1 | 2833.2 | 1884.9 | 1791.8 | 1864.2 | 1910.3 | 1918.8 | 1938.1 | 1924.2 | 1914.2 |
| 40° | 5514.8 | 4673.5 | 2496.1 | 1681.8 | 1692.5 | 1802.6 | 1832.6 | 1798.7 | 1764.1 | 1759.5 | 1745.6 |
| 42.5° | 5749.5 | 4702.0 | 2155.1 | 1519.3 | 1587.8 | 1737.9 | 1756.4 | 1685.6 | 1623.3 | 1594.0 | 1581.7 |
| 45° | 5997.3 | 4712.0 | 1837.2 | 1383.1 | 1487.0 | 1680.2 | 1700.2 | 1605.6 | 1517.8 | 1454.7 | 1433.9 |
| 47.5° | 6321.4 | 4784.3 | 1590.2 | 1282.3 | 1410.1 | 1641.7 | 1670.2 | 1541.7 | 1427.8 | 1337.7 | 1318.5 |
| 50° | 6745.5 | 4927.5 | 1389.3 | 1205.3 | 1360.0 | 1616.3 | 1648.7 | 1479.3 | 1353.9 | 1245.3 | 1226.1 |
| 52.5° | 7216.5 | 5059.1 | 1226.9 | 1143.0 | 1311.5 | 1571.7 | 1620.9 | 1434.7 | 1284.6 | 1159.9 | 1139.1 |
| 55° | 7545.9 | 4958.3 | 1096.0 | 1078.3 | 1248.4 | 1507.8 | 1582.5 | 1397.0 | 1185.3 | 1076.8 | 1058.3 |
| 57.5° | 7609.1 | 4613.5 | 996.7 | 1011.4 | 1172.2 | 1427.8 | 1523.2 | 1313.1 | 1131.4 | 1040.6 | 1021.4 |
| 60° | 7436.6 | 4133.2 | 922.8 | 949.8 | 1090.6 | 1326.9 | 1412.4 | 1253.8 | 1079.9 | 1002.1 | 986.0 |
| 62.5° | 7003.3 | 3641.4 | 868.2 | 894.4 | 1014.4 | 1224.6 | 1343.1 | 1191.5 | 1027.5 | 958.3 | 942.1 |
| 65° | 6128.2 | 3057.2 | 815.9 | 845.1 | 943.6 | 1136.0 | 1280.7 | 1133.7 | 976.0 | 922.8 | 907.5 |
| 67.5° | 4625.8 | 2289.8 | 766.6 | 792.8 | 880.5 | 1059.1 | 1213.0 | 1076.8 | 925.9 | 892.1 | 873.6 |
| 70° | 2723.9 | 1433.9 | 710.4 | 738.1 | 814.3 | 979.0 | 1140.7 | 1014.4 | 863.6 | 848.2 | 824.3 |
| 72.5° | 1267.7 | 862.8 | 646.5 | 673.5 | 731.2 | 872.0 | 1047.5 | 932.9 | 789.7 | 755.8 | 723.5 |
| 75° | *756.6* | *631.1* | *571.1* | *595.0* | *635.8* | *758.1* | *930.5* | *849.7* | *719.7* | *675.0* | *641.1* |
| 77.5° | 565.7 | 482.6 | 488.0 | 513.4 | 546.5 | 663.5 | 824.3 | 784.3 | 665.8 | 631.1 | 608.0 |
| 80° | 407.2 | 366.4 | 397.9 | 425.6 | 460.3 | 603.4 | 789.7 | 725.0 | 601.9 | 555.7 | 534.2 |
| 82.5° | 271.7 | 263.2 | 299.4 | 327.9 | 361.7 | 528.0 | 742.0 | 635.0 | 514.1 | 455.7 | 407.9 |
| 85° | 150.1 | 158.6 | 201.7 | 214.0 | 243.2 | 371.8 | 608.0 | 510.3 | 387.1 | 311.7 | 297.9 |
| 87.5° | 62.3 | 73.1 | 108.5 | 104.7 | 129.3 | 221.7 | 400.2 | 307.9 | 246.3 | 184.0 | 143.2 |
| 90° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

Cooper Lighting Solutions Photometric Lab
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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

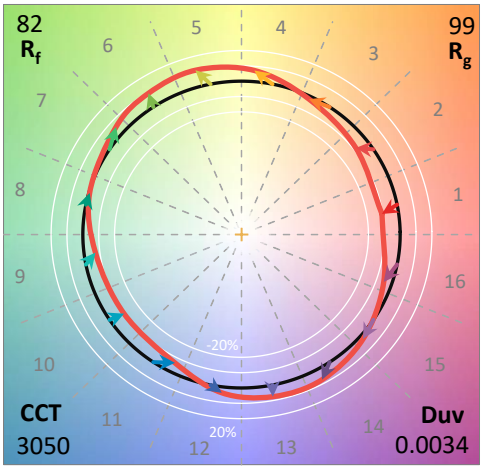
## Test Information

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

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| 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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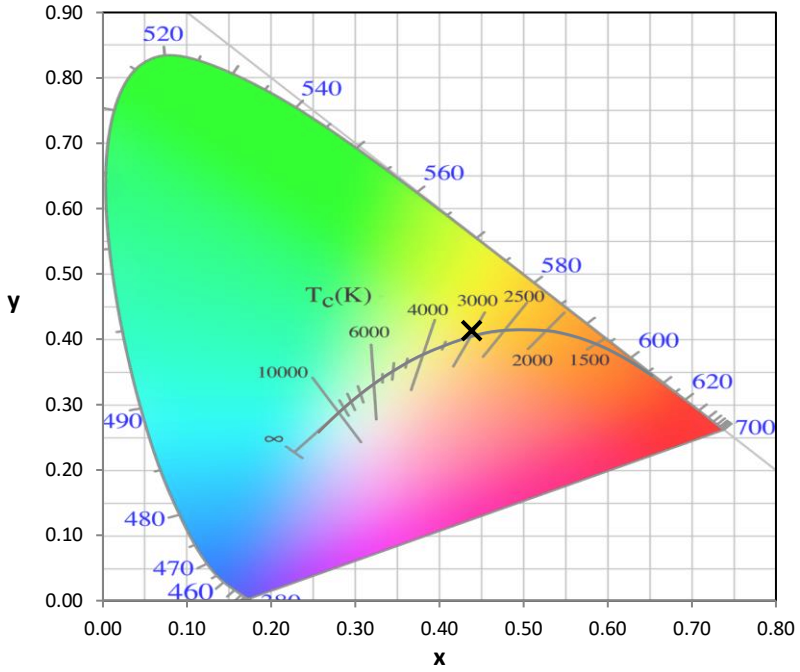
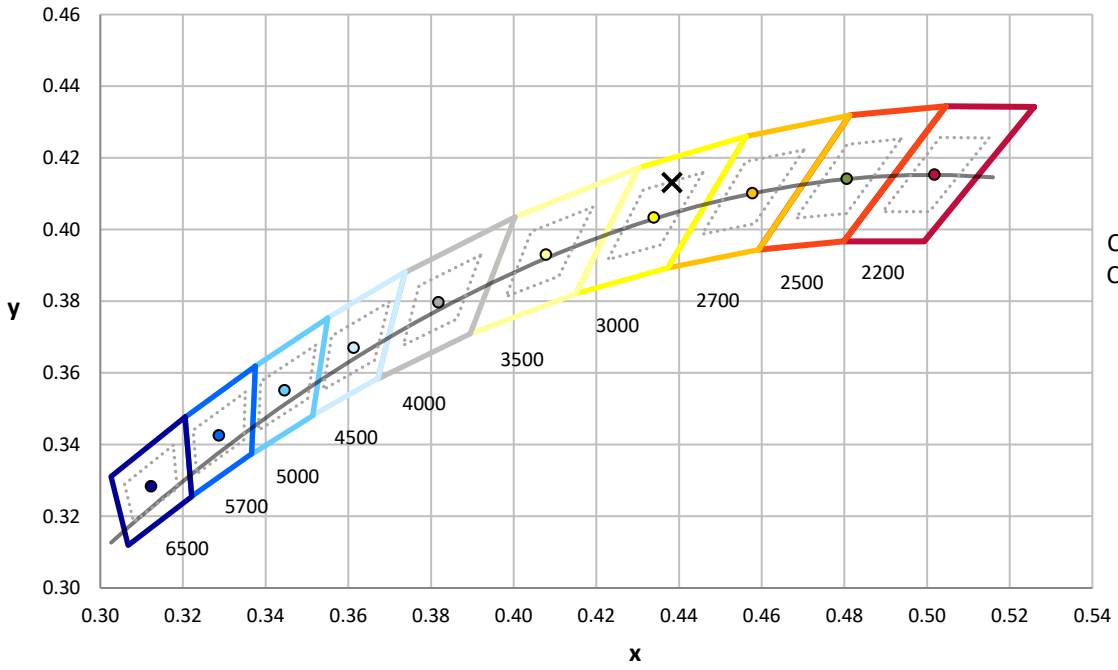
## CIE 1931 Chromaticity Diagram




## 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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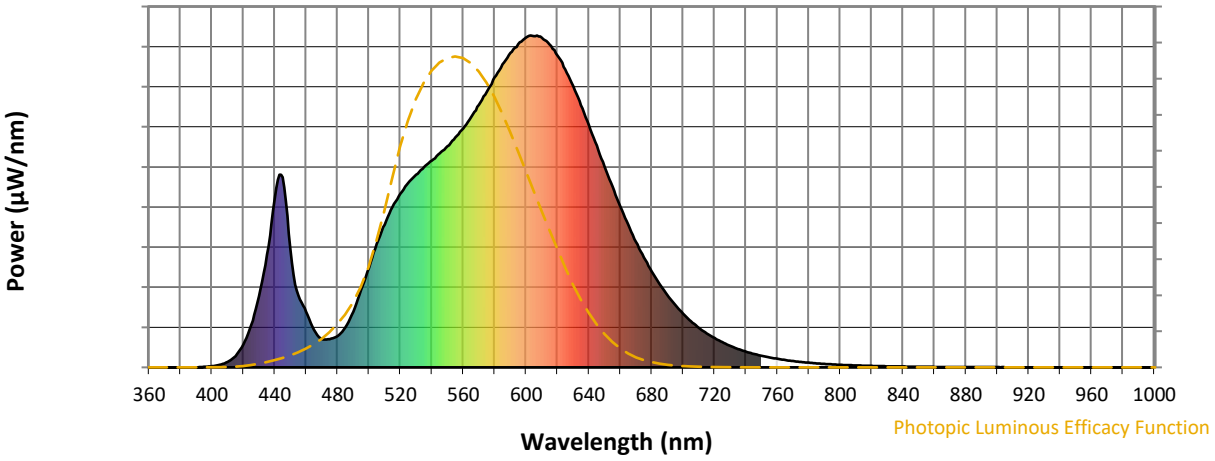
## Photopic Flux vs. Wavelength




## 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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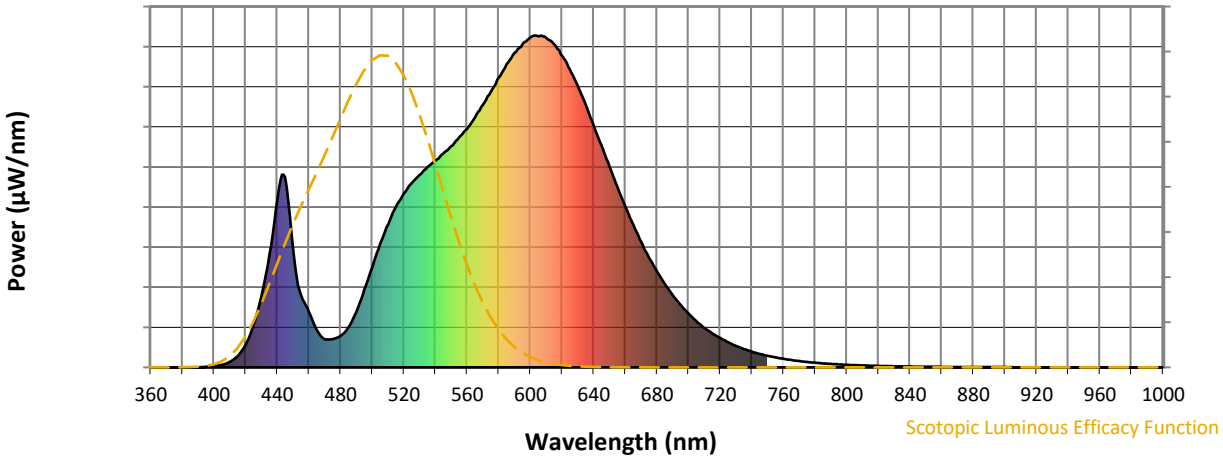
## Scotopic Flux vs. Wavelength




**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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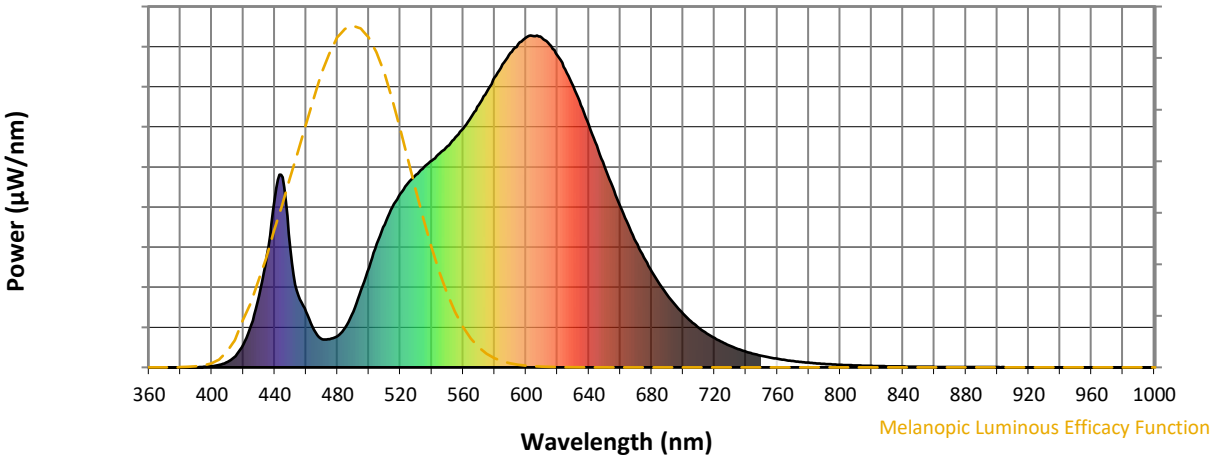
## Melanopic Flux vs. Wavelength




**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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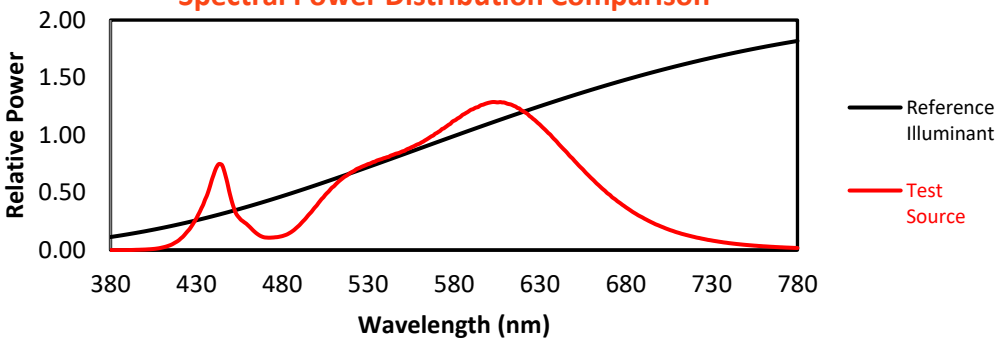
# TM-30-18

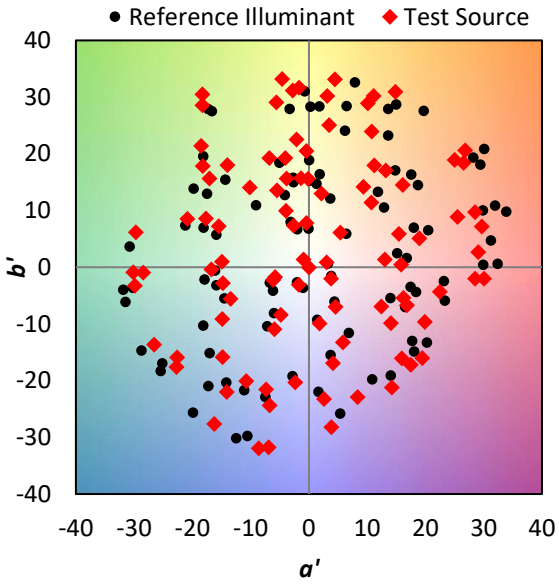
## Summary

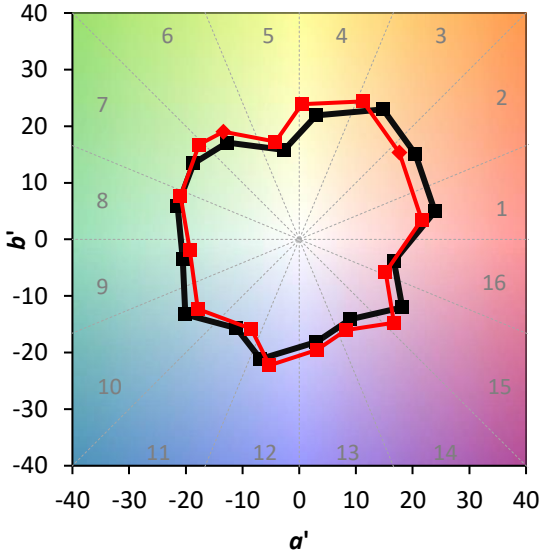
$R_f$ = 81.5
$R_g$ = 99.2
CIE $R_a$ = 81.0
$R_9$ = 7.1

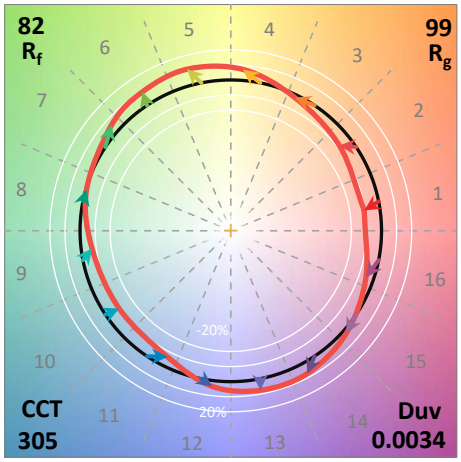
## Spectral Power Distribution Comparison

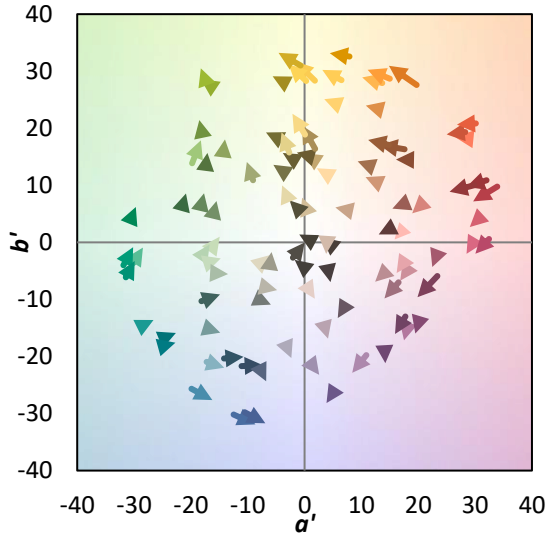



## Color Vector Graphics



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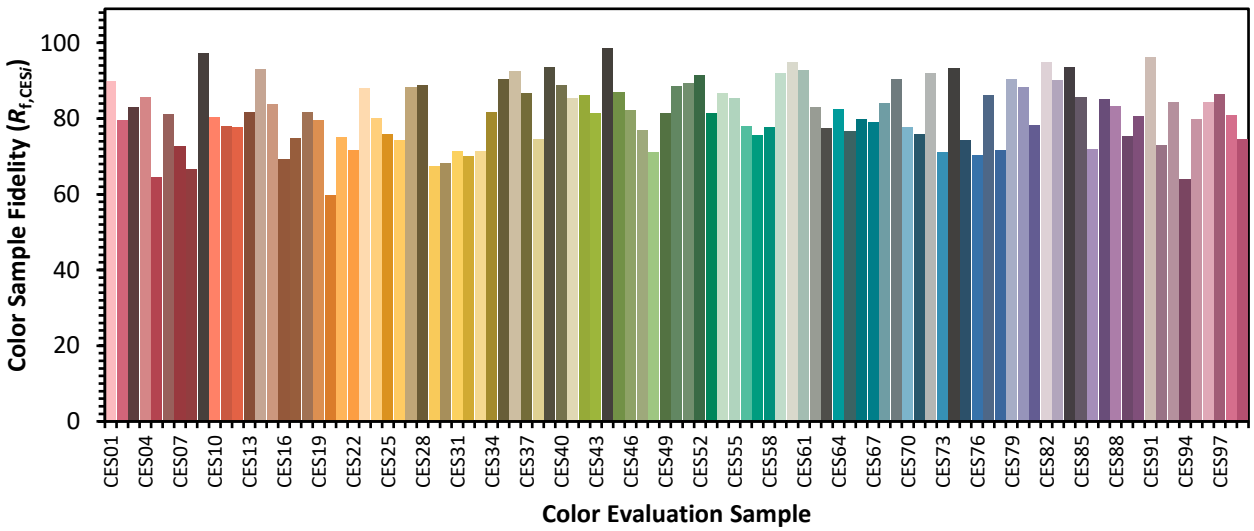
## Individual Sample Fidelity Index ($R_{f,i}$)

| | | | |
|---|---|---|---|
| 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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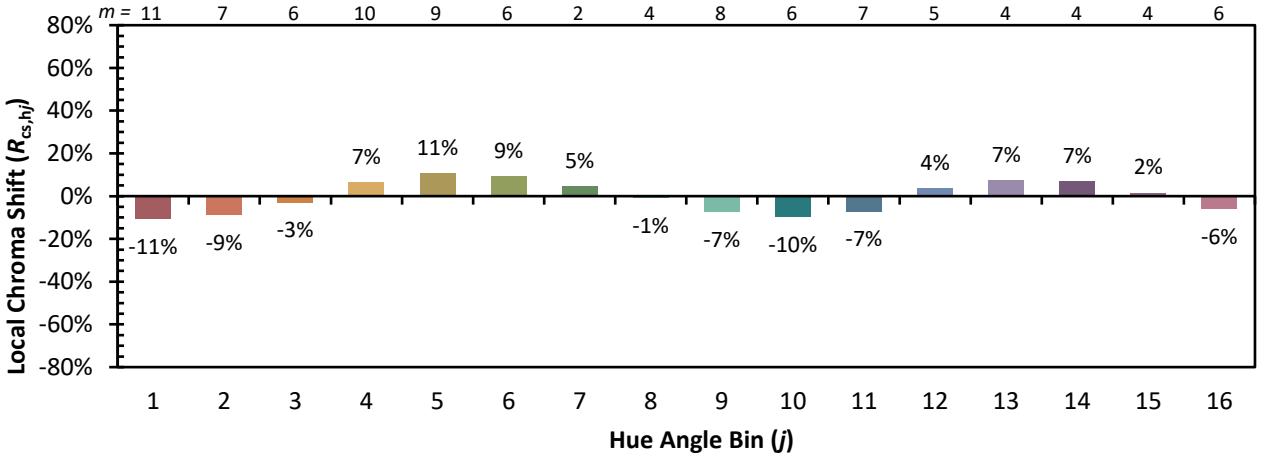
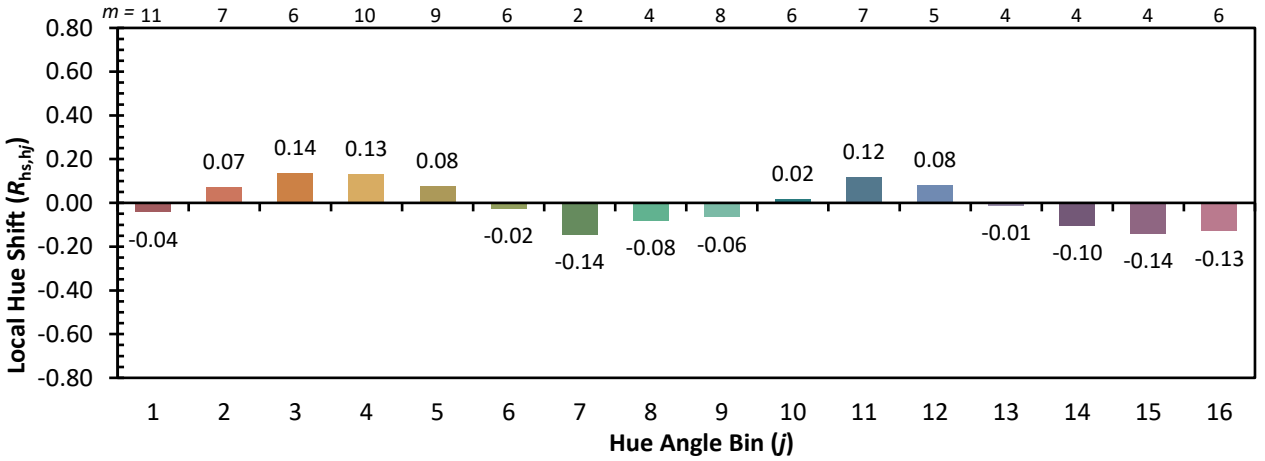
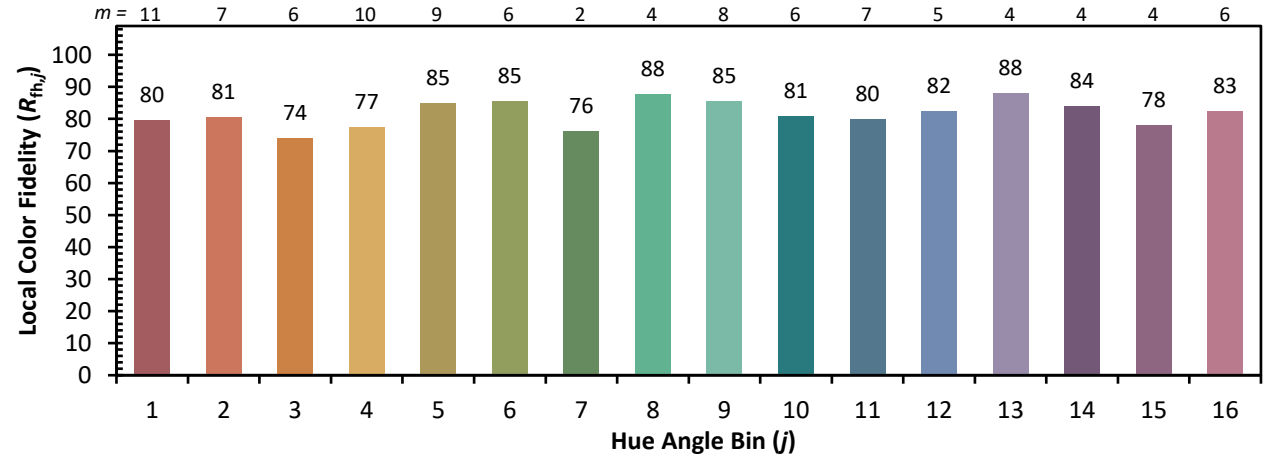
# TM-30-18

## Color Rendition by Hue-Angle Bin



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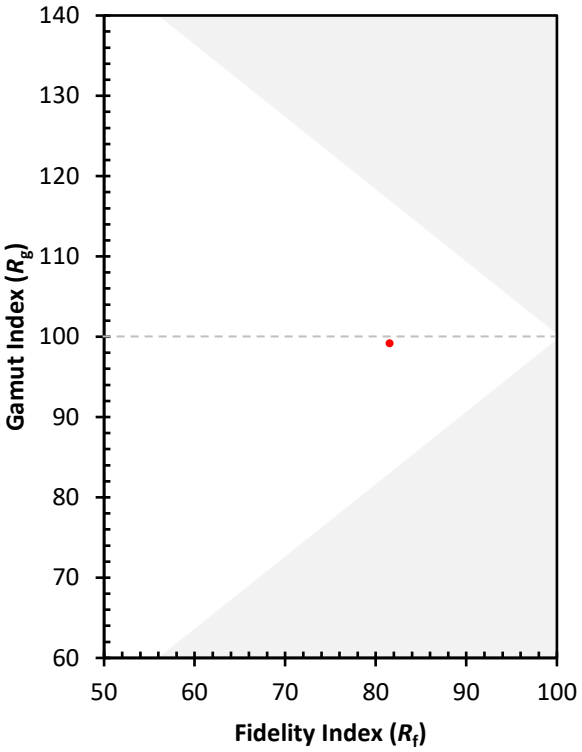
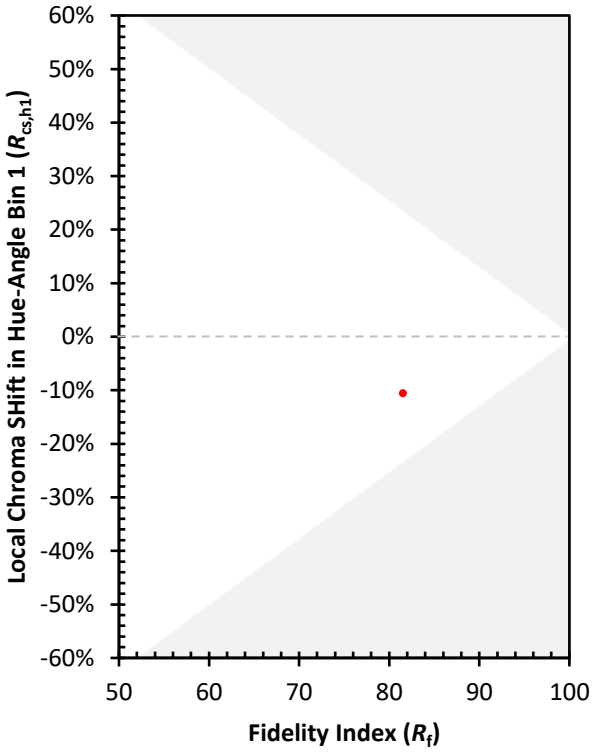
## Measure Comparisons




(END OF REPORT)