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: P317937

Luminaire Tested: **GLEON-SA3D-830-U-T3R**

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: | P317937 |
| | TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-10) |
| Test Lab: | INNOVATION CENTER |
| Issue Date: | 3/3/2020 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS (FORMERLY EATON) |
| Product Line: | McGRAW-EDISON |
| Catalog Number: | GLEON-SA3D-830-U-T3R |
| Description: | GALLEON AREA AND ROADWAY LUMINAIRE |
| | (3) 80 CRI, 3000K, 1200mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE III ROADWAY OPTICS |
| Light Source: | - |
| Ballast/Driver: | ELECTRONIC DRIVER |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 19246 lumens |
| Efficiency: | N/A |
| Efficacy: | 100.8 lumens/watt |
| Luminous Opening: | Rectangular (W 1' x L: 1' x H: 0') |
| IES Classification: | Type IV - Medium |
| BUG Rating: | B2 - U0 - G3 |

| | |
|---|---|
| Input Watts (W): | 191 |
| 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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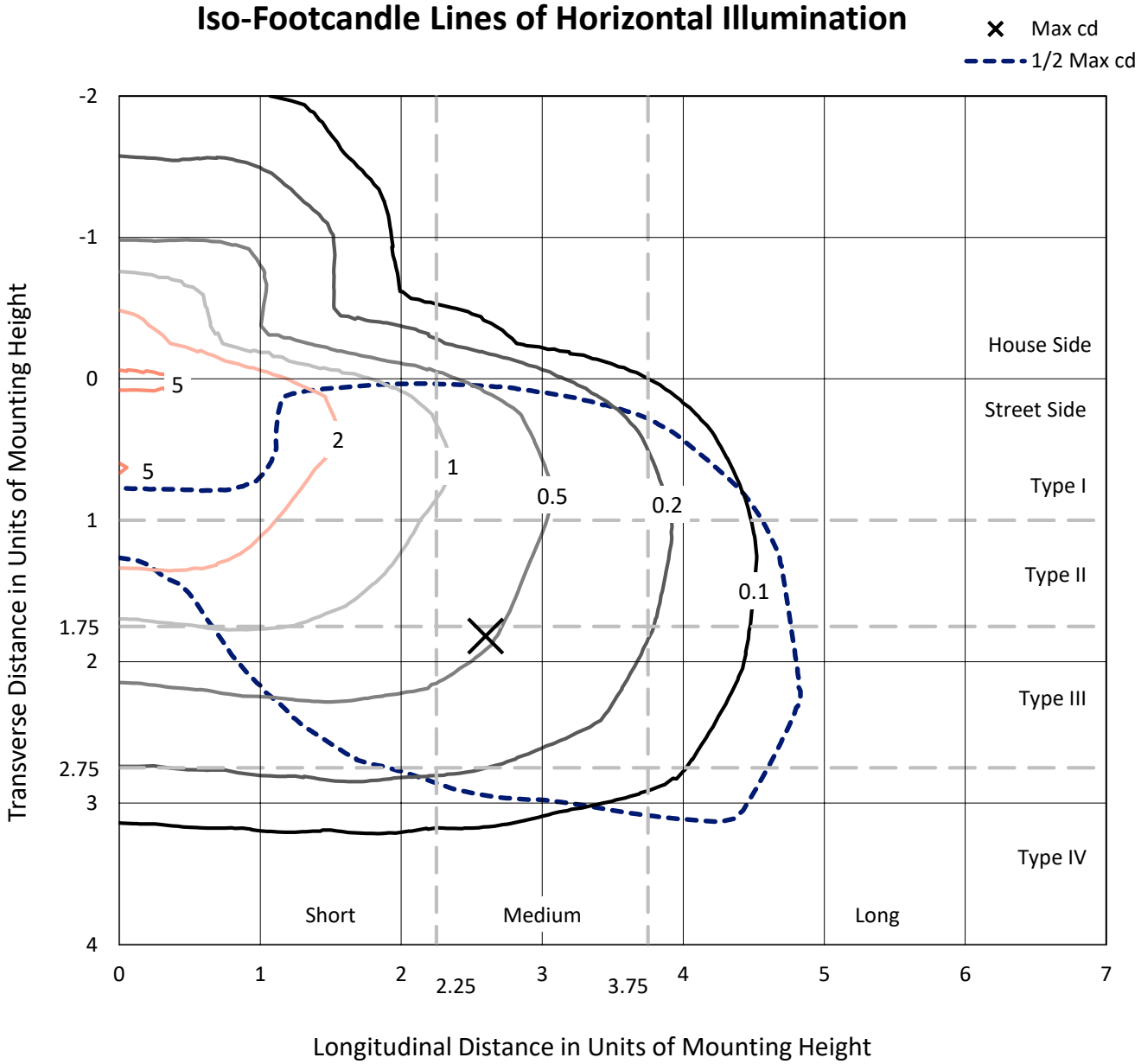
Scaled Data Report

REPORT NUMBER: P317937
CATALOG NUMBER: GLEON-SA3D-830-U-T3R

## Iso-Footcandle Lines of Horizontal Illumination




Based on 25 foot mounting height. Maximum calculated value = 5.5 fc
Type IV - Medium - N/A

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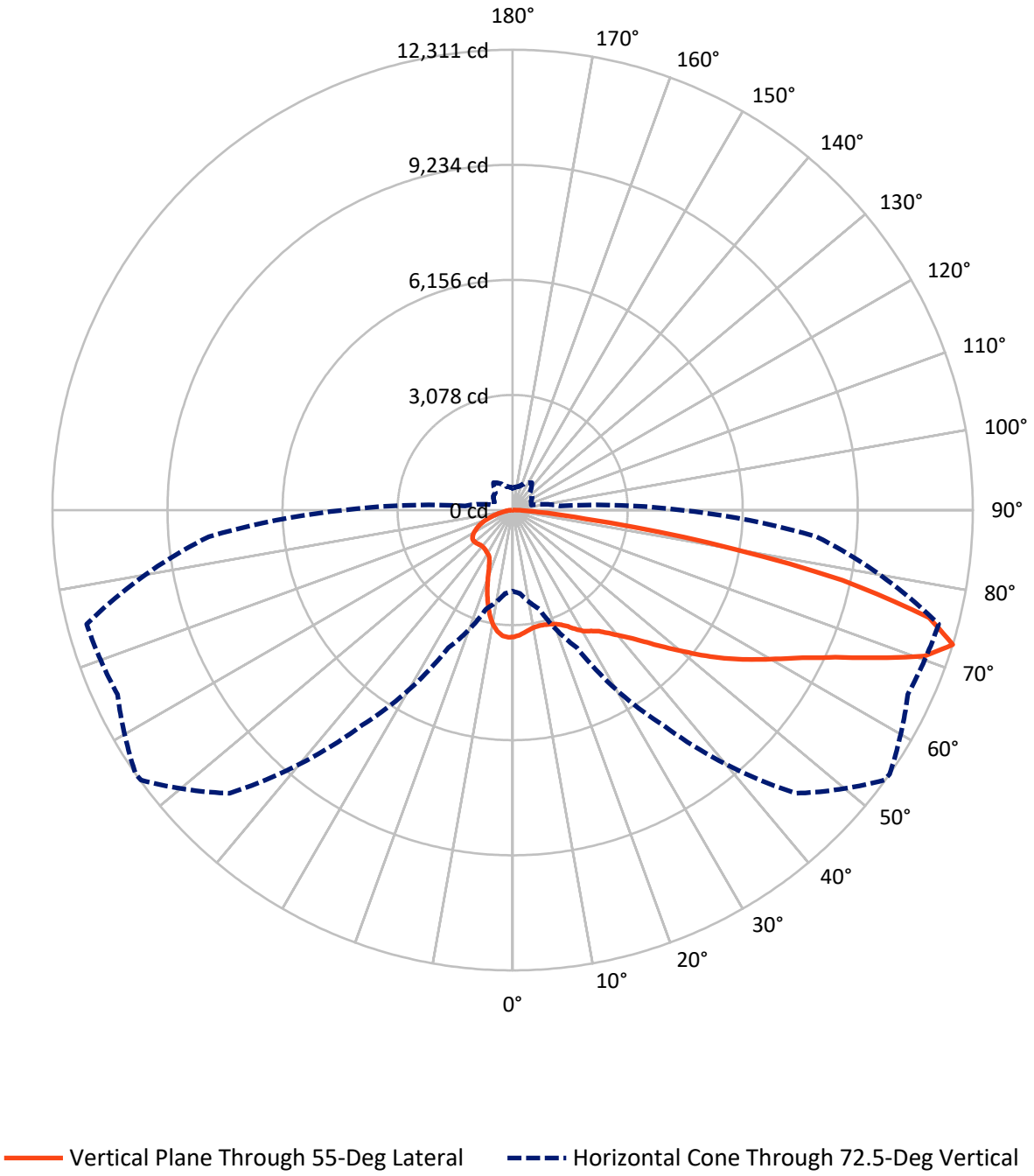
## Luminous Intensity Polar Plot



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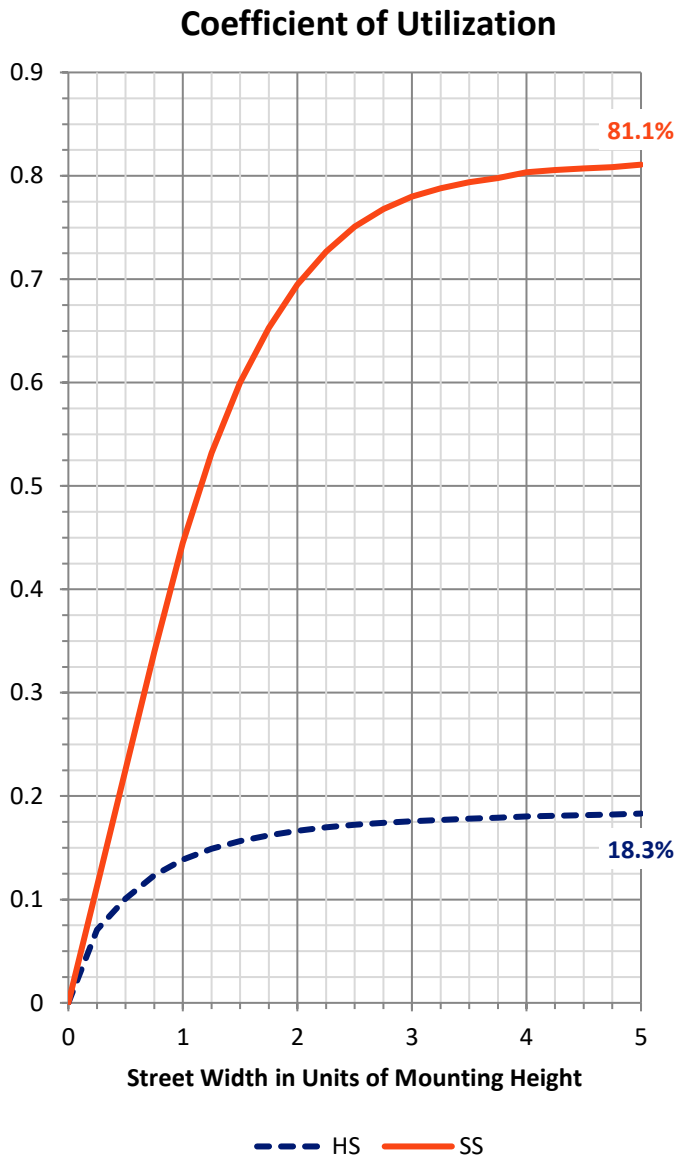
REPORT NUMBER: P317937
CATALOG NUMBER: GLEON-SA3D-830-U-T3R

**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 3577.2 | 0.0 | 3577.2 |
| | % Fixture | 18.6 | 0.0 | 18.6 |
| **Street Side** | Lumens | 15668.8 | 0.0 | 15668.8 |
| | % Fixture | 81.4 | 0.0 | 81.4 |
| **Total** | Lumens | 19246.0 | 0.0 | 19246.0 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 307.2 | 1.6 |
| 10°-20° | 817.8 | 4.2 |
| 20°-30° | 1348.3 | 7.0 |
| 30°-40° | 1994.5 | 10.4 |
| 40°-50° | 2784.0 | 14.5 |
| 50°-60° | 3624.8 | 18.8 |
| 60°-70° | 4454.8 | 23.1 |
| 70°-80° | 3492.0 | 18.1 |
| 80°-90° | 422.6 | 2.2 |
| 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° | 19246.0 | 100.0 |
| 0°-180° | 19246.0 | 100.0 |



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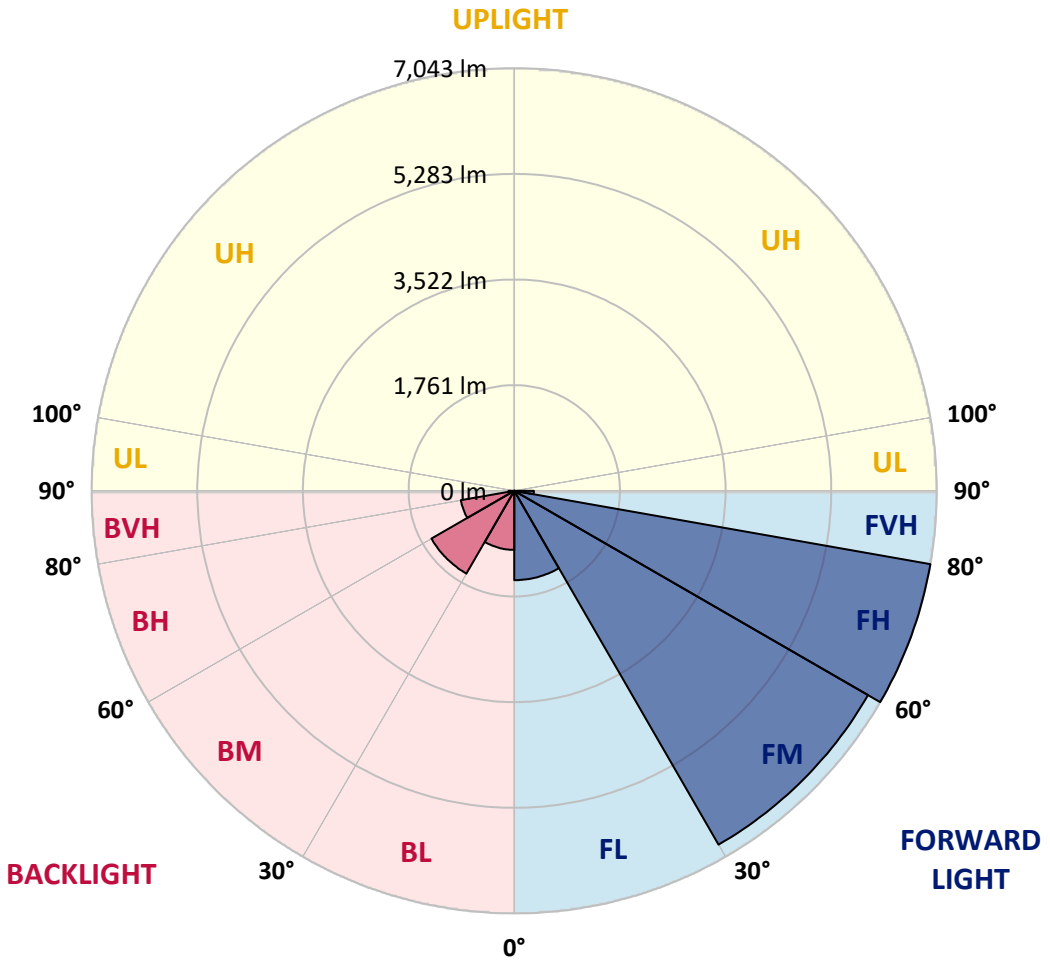
CATALOG NUMBER: GLEON-SA3D-830-U-T3R

## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 1489.1 | 7.7 | | | |
| FM | (30°-60°) | 6809.6 | 35.4 | | | |
| FH | (60°-80°) | 7043.4 | 36.6 | | | G3/7500 |
| FVH | (80°-90°) | 326.7 | 1.7 | | | G3/500 |
| BL | (0°-30°) | 984.2 | 5.1 | B2/1000 | | |
| BM | (30°-60°) | 1593.7 | 8.3 | B2/2500 | | |
| BH | (60°-80°) | 903.4 | 4.7 | B2/1000 | | G2/1000 |
| BVH | (80°-90°) | 95.9 | 0.5 | | | G1/100 |
| UL | (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH | (100°-180°) | 0.0 | 0.0 | | U0/0 | |

**BUG Rating: B2-U0-G3**
Type IV Medium



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Scaled Data Report

REPORT NUMBER: P317937
CATALOG NUMBER: GLEON-SA3D-830-U-T3R

**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 15° | 25° | 35° | 45° | 54° | 55° | 65° | 75° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 3394.6 | 3394.6 | 3394.6 | 3394.6 | 3394.6 | 3394.6 | 3394.6 | 3394.6 | 3394.6 | 3394.6 | 3394.6 |
| 2.5° | 3284.1 | 3276.3 | 3286.0 | 3299.7 | 3314.6 | 3334.8 | 3346.5 | 3351.7 | 3371.8 | 3379.6 | 3396.5 |
| 5° | 3132.0 | 3128.1 | 3144.3 | 3167.7 | 3200.9 | 3247.7 | 3285.4 | 3292.5 | 3345.8 | 3383.5 | 3418.0 |
| 7.5° | 3021.4 | 3021.4 | 3040.3 | 3068.3 | 3105.3 | 3168.4 | 3221.7 | 3231.4 | 3321.8 | 3403.0 | 3466.7 |
| 10° | 2933.7 | 2936.9 | 2959.0 | 2992.2 | 3035.8 | 3102.7 | 3173.6 | 3184.6 | 3315.3 | 3448.5 | 3549.9 |
| 12.5° | 2875.2 | 2883.0 | 2903.1 | 2933.0 | 2987.0 | 3068.3 | 3158.0 | 3172.9 | 3328.9 | 3513.5 | 3650.1 |
| 15° | 2912.2 | 2925.2 | 2927.2 | 2939.5 | 2969.4 | 3057.9 | 3167.1 | 3182.7 | 3358.2 | 3579.8 | 3763.8 |
| 17.5° | 3074.8 | 3079.3 | 3059.2 | 3033.2 | 3018.8 | 3075.4 | 3194.4 | 3210.6 | 3393.3 | 3645.5 | 3873.0 |
| 20° | 3321.8 | 3319.2 | 3275.6 | 3205.4 | 3132.6 | 3141.7 | 3239.2 | 3256.1 | 3440.7 | 3703.4 | 3982.2 |
| 22.5° | 3633.8 | 3624.7 | 3557.7 | 3428.4 | 3304.2 | 3252.2 | 3317.9 | 3332.2 | 3512.2 | 3785.9 | 4099.2 |
| 25° | 4012.1 | 3992.0 | 3903.6 | 3730.0 | 3547.3 | 3413.4 | 3436.2 | 3449.8 | 3616.2 | 3878.2 | 4206.5 |
| 27.5° | 4411.3 | 4391.1 | 4278.7 | 4068.7 | 3825.6 | 3616.9 | 3599.3 | 3611.0 | 3734.6 | 3946.5 | 4285.8 |
| 30° | 4828.6 | 4807.1 | 4704.4 | 4469.1 | 4120.7 | 3827.5 | 3751.5 | 3756.0 | 3817.8 | 3983.5 | 4350.8 |
| 32.5° | 5247.9 | 5227.7 | 5112.7 | 4839.6 | 4441.2 | 4053.7 | 3861.3 | 3855.5 | 3867.8 | 4021.9 | 4424.3 |
| 35° | 5673.0 | 5680.8 | 5546.3 | 5244.0 | 4796.1 | 4305.3 | 3991.3 | 3979.0 | 3951.7 | 4100.5 | 4528.3 |
| 37.5° | 6128.1 | 6122.9 | 5948.6 | 5632.7 | 5167.3 | 4578.3 | 4177.9 | 4175.9 | 4081.7 | 4249.4 | 4691.4 |
| 40° | 6432.3 | 6435.5 | 6329.6 | 6030.5 | 5542.4 | 4880.6 | 4417.1 | 4412.6 | 4289.1 | 4472.4 | 4905.3 |
| 42.5° | 6551.2 | 6572.7 | 6600.0 | 6410.2 | 5935.0 | 5231.0 | 4702.5 | 4696.0 | 4578.3 | 4792.2 | 5156.9 |
| 45° | 6559.7 | 6602.6 | 6771.6 | 6747.6 | 6332.8 | 5632.1 | 5067.2 | 5049.0 | 4964.5 | 5217.3 | 5457.2 |
| 47.5° | 6486.9 | 6531.1 | 6811.9 | 6948.4 | 6688.4 | 6055.3 | 5493.6 | 5479.3 | 5406.5 | 5749.1 | 5782.2 |
| 50° | 6327.6 | 6369.9 | 6728.7 | 7046.6 | 6980.9 | 6462.2 | 5985.0 | 5947.3 | 5908.3 | 6363.4 | 6154.1 |
| 52.5° | 6029.2 | 6110.5 | 6617.5 | 7070.0 | 7155.8 | 6823.6 | 6501.8 | 6477.1 | 6498.6 | 7011.5 | 6526.5 |
| 55° | 5322.6 | 5413.6 | 6330.9 | 7050.5 | 7285.2 | 7127.2 | 7018.6 | 7017.3 | 7128.5 | 7691.4 | 6926.3 |
| 57.5° | 4926.8 | 4991.1 | 5747.1 | 7017.3 | 7438.6 | 7428.8 | 7530.2 | 7542.6 | 7759.0 | 8431.8 | 7345.0 |
| 60° | 4703.1 | 4770.7 | 5451.4 | 6894.5 | 7676.5 | 7818.8 | 8052.2 | 8076.9 | 8400.0 | 9251.6 | 7848.7 |
| 62.5° | 4499.7 | 4573.8 | 5268.0 | 6644.2 | 7956.7 | 8376.6 | 8677.6 | 8699.7 | 9078.6 | 10094.0 | 8335.6 |
| 65° | 4151.9 | 4235.7 | 4999.6 | 6479.7 | 8211.5 | 9104.0 | 9472.6 | 9487.5 | 9858.1 | 10976.8 | 8708.1 |
| 67.5° | 3660.5 | 3737.2 | 4493.2 | 6116.4 | 8400.0 | 9987.4 | 10529.6 | 10538.0 | 10631.0 | 11600.2 | 8898.6 |
| 70° | 3086.5 | 3115.7 | 3771.6 | 5366.2 | 8177.0 | 10813.6 | 11688.0 | 11689.9 | 11335.6 | 11999.3 | 8867.4 |
| 72.5° | 2168.6 | 2237.5 | 2738.0 | 4062.2 | 7027.1 | 10712.9 | 12289.3 | 12311.4 | 11663.3 | 11797.8 | 8158.8 |
| 75° | 1330.0 | 1402.8 | 1717.4 | 2461.8 | 4458.1 | 8425.3 | 11354.5 | 11507.9 | 11049.0 | 10519.2 | 6665.0 |
| 77.5° | 889.3 | 916.6 | 1120.7 | 1435.3 | 2019.7 | 4847.5 | 8729.6 | 9018.2 | 9178.8 | 7671.3 | 4262.4 |
| 80° | 496.0 | 548.0 | 743.0 | 891.9 | 898.4 | 1926.1 | 5234.2 | 5301.8 | 5106.8 | 3054.6 | 1315.1 |
| 82.5° | 262.6 | 291.2 | 496.0 | 523.9 | 490.1 | 644.9 | 1950.8 | 1952.8 | 1631.6 | 819.1 | 390.7 |
| 85° | 203.5 | 227.5 | 340.0 | 319.8 | 250.3 | 286.0 | 643.6 | 678.7 | 555.1 | 335.4 | 127.4 |
| 87.5° | 101.4 | 126.1 | 230.8 | 202.8 | 98.2 | 81.9 | 230.1 | 245.7 | 219.1 | 131.3 | 46.2 |
| 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: P317937
CATALOG NUMBER: GLEON-SA3D-830-U-T3R

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 3394.6 | 3394.6 | 3394.6 | 3394.6 | 3394.6 | 3394.6 | 3394.6 | 3394.6 | 3394.6 | 3394.6 | 3394.6 |
| 2.5° | 3403.0 | 3408.9 | 3416.0 | 3408.2 | 3405.6 | 3395.2 | 3377.7 | 3373.8 | 3364.7 | 3365.3 | 3370.5 |
| 5° | 3432.9 | 3442.7 | 3438.8 | 3408.9 | 3373.1 | 3323.1 | 3271.1 | 3226.9 | 3197.6 | 3195.7 | 3193.7 |
| 7.5° | 3490.1 | 3496.6 | 3466.1 | 3380.9 | 3280.8 | 3165.1 | 3055.9 | 2960.3 | 2902.5 | 2888.2 | 2884.9 |
| 10° | 3579.8 | 3578.5 | 3494.7 | 3323.1 | 3123.5 | 2916.8 | 2741.3 | 2608.7 | 2531.3 | 2508.6 | 2502.7 |
| 12.5° | 3680.0 | 3665.0 | 3504.4 | 3217.8 | 2901.2 | 2614.5 | 2392.2 | 2244.6 | 2164.0 | 2138.0 | 2131.5 |
| 15° | 3783.3 | 3746.3 | 3480.4 | 3060.5 | 2628.2 | 2288.8 | 2055.5 | 1919.0 | 1875.4 | 1861.1 | 1858.5 |
| 17.5° | 3879.5 | 3808.0 | 3411.5 | 2847.2 | 2316.8 | 1964.5 | 1782.4 | 1727.8 | 1738.2 | 1757.1 | 1757.7 |
| 20° | 3973.8 | 3849.6 | 3301.0 | 2578.1 | 1988.5 | 1697.3 | 1635.5 | 1675.8 | 1725.2 | 1763.6 | 1768.8 |
| 22.5° | 4066.7 | 3878.9 | 3158.6 | 2267.4 | 1694.7 | 1547.1 | 1590.7 | 1664.1 | 1720.7 | 1762.3 | 1769.4 |
| 25° | 4144.7 | 3886.0 | 2962.3 | 1935.9 | 1490.6 | 1490.6 | 1569.2 | 1638.8 | 1694.7 | 1735.6 | 1742.8 |
| 27.5° | 4173.3 | 3837.9 | 2685.4 | 1629.0 | 1387.9 | 1464.6 | 1539.3 | 1597.2 | 1644.6 | 1688.2 | 1696.0 |
| 30° | 4184.4 | 3748.9 | 2365.5 | 1382.7 | 1345.6 | 1436.6 | 1499.0 | 1548.4 | 1593.3 | 1634.2 | 1641.4 |
| 32.5° | 4186.3 | 3641.6 | 2026.2 | 1242.9 | 1316.4 | 1407.4 | 1449.0 | 1492.5 | 1540.6 | 1556.9 | 1559.5 |
| 35° | 4198.7 | 3514.8 | 1668.7 | 1171.4 | 1289.1 | 1380.1 | 1413.2 | 1444.4 | 1366.4 | 1372.3 | 1377.5 |
| 37.5° | 4234.4 | 3389.4 | 1369.7 | 1131.1 | 1271.5 | 1365.8 | 1405.4 | 1292.3 | 1231.2 | 1216.9 | 1215.0 |
| 40° | 4301.4 | 3255.5 | 1148.0 | 1098.6 | 1265.0 | 1372.9 | 1355.4 | 1206.5 | 1101.2 | 1022.5 | 1010.8 |
| 42.5° | 4394.4 | 3111.2 | 1006.3 | 1077.1 | 1269.6 | 1407.4 | 1285.8 | 1123.9 | 949.1 | 898.4 | 891.9 |
| 45° | 4499.0 | 2959.7 | 929.6 | 1062.2 | 1285.2 | 1434.0 | 1271.5 | 1014.1 | 878.2 | 839.9 | 836.6 |
| 47.5° | 4600.4 | 2774.4 | 889.9 | 1055.7 | 1306.6 | 1412.6 | 1211.1 | 980.3 | 844.4 | 824.3 | 826.2 |
| 50° | 4716.8 | 2607.4 | 865.9 | 1048.5 | 1325.5 | 1398.9 | 1142.8 | 962.7 | 831.4 | 856.1 | 882.1 |
| 52.5° | 4814.9 | 2434.5 | 844.4 | 1034.2 | 1332.6 | 1374.9 | 1125.2 | 966.0 | 831.4 | 878.9 | 903.6 |
| 55° | 4931.3 | 2303.8 | 819.7 | 1004.3 | 1319.0 | 1306.6 | 1112.9 | 985.5 | 841.2 | 811.3 | 813.9 |
| 57.5° | 5081.5 | 2260.9 | 792.4 | 957.5 | 1273.5 | 1207.1 | 1107.0 | 1004.3 | 835.3 | 816.5 | 823.0 |
| 60° | 5289.5 | 2306.4 | 781.4 | 896.4 | 1202.6 | 1129.1 | 1107.7 | 994.6 | 794.4 | 761.9 | 762.5 |
| 62.5° | 5487.8 | 2357.1 | 780.7 | 858.1 | 1115.5 | 1059.6 | 1092.7 | 962.7 | 773.6 | 754.7 | 761.9 |
| 65° | 5552.8 | 2305.7 | 749.5 | 815.2 | 1017.3 | 976.4 | 1065.4 | 928.9 | 758.0 | 729.4 | 728.1 |
| 67.5° | 5465.7 | 2146.5 | 686.5 | 745.6 | 904.9 | 879.5 | 1029.7 | 888.6 | 733.3 | 709.9 | 706.0 |
| 70° | 5206.9 | 1790.9 | 608.5 | 654.0 | 776.8 | 770.3 | 973.1 | 841.8 | 700.1 | 680.0 | 663.1 |
| 72.5° | *4510.7* | *1276.1* | *512.9* | *544.1* | *632.5* | *653.3* | *895.1* | *780.7* | *653.3* | *609.8* | *583.7* |
| 75° | 3704.7 | 944.5 | 421.2 | 427.7 | 480.4 | 536.9 | 787.9 | 709.2 | 598.0 | 523.9 | 503.8 |
| 77.5° | 2268.7 | 577.9 | 335.4 | 338.0 | 344.5 | 428.4 | 648.8 | 629.3 | 527.8 | 436.8 | 422.5 |
| 80° | 734.6 | 315.3 | 242.5 | 254.8 | 235.3 | 314.0 | 501.8 | 535.6 | 453.1 | 365.3 | 349.7 |
| 82.5° | 279.5 | 184.0 | 163.8 | 172.3 | 163.2 | 210.6 | 366.0 | 429.0 | 371.2 | 300.3 | 244.4 |
| 85° | 135.2 | 104.0 | 96.9 | 108.6 | 100.8 | 107.9 | 234.0 | 315.9 | 281.5 | 195.7 | 182.0 |
| 87.5° | 48.1 | 46.2 | 37.1 | 50.1 | 42.9 | 38.4 | 71.5 | 159.3 | 185.9 | 134.6 | 120.3 |
| 90° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

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Peachtree City, GA 30269

# 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

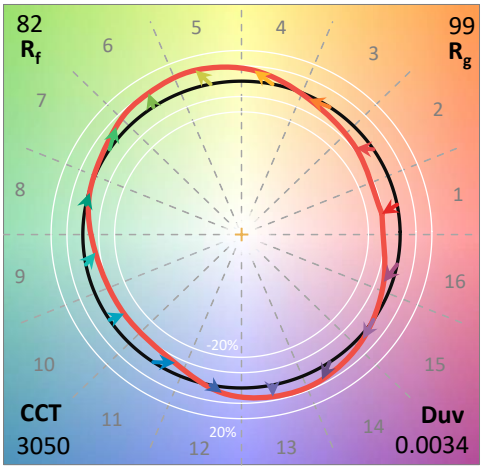
## Test Information

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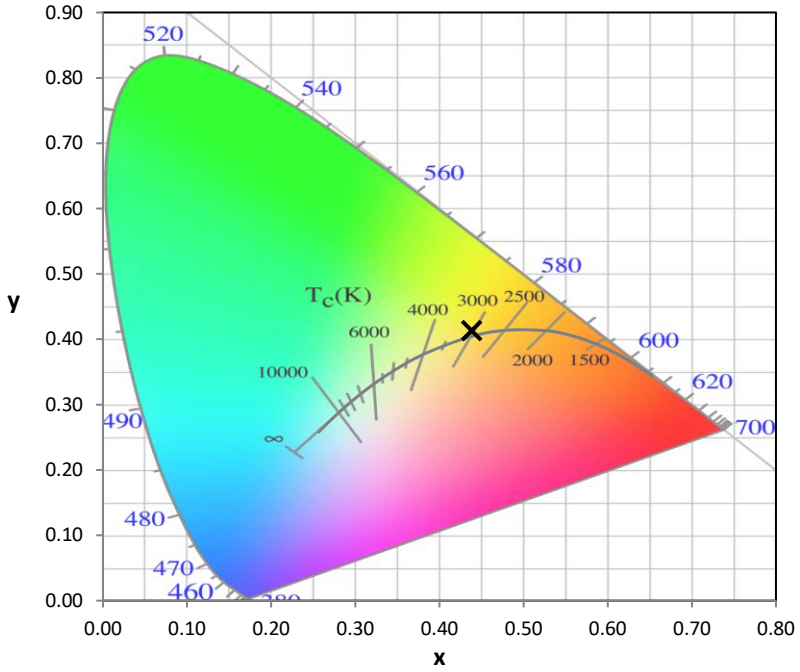
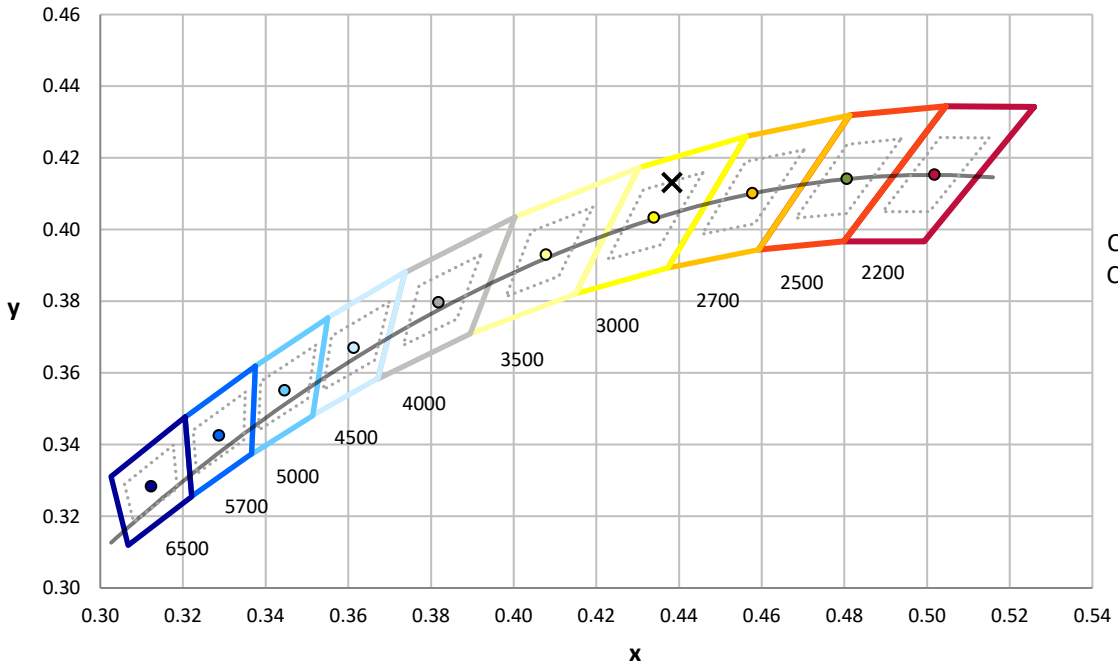
## CIE 1931 Chromaticity Diagram




## 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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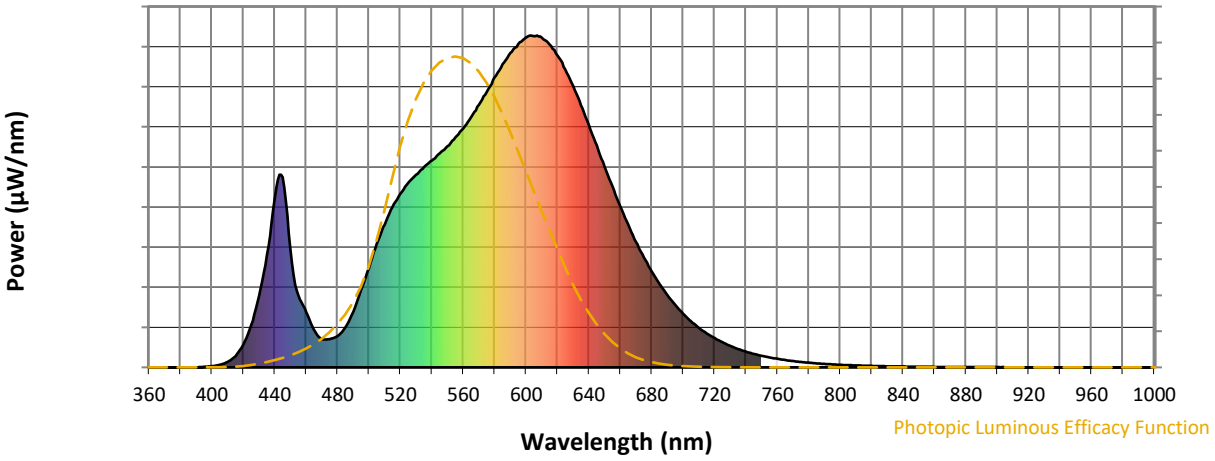
## Photopic Flux vs. Wavelength




## 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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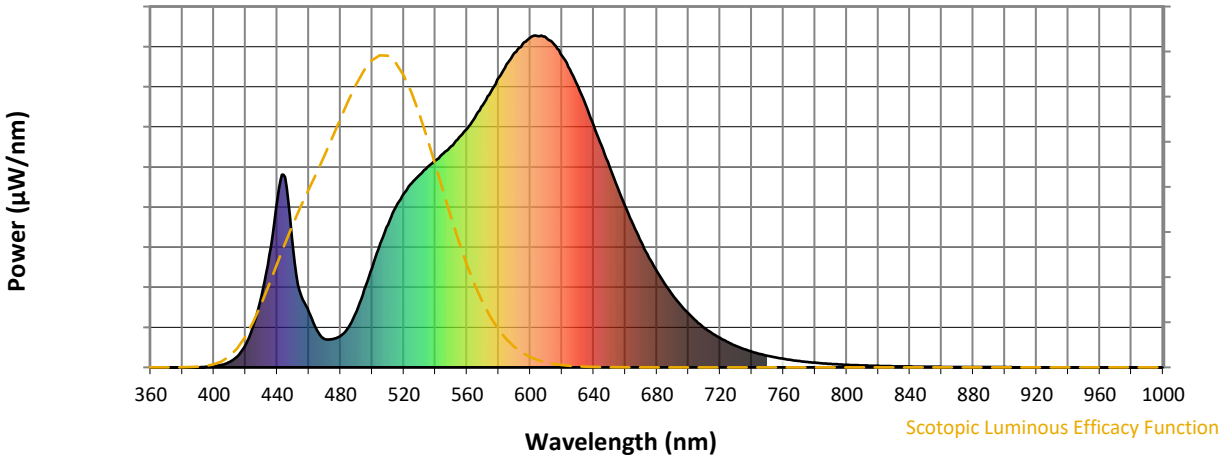
## Scotopic Flux vs. Wavelength




**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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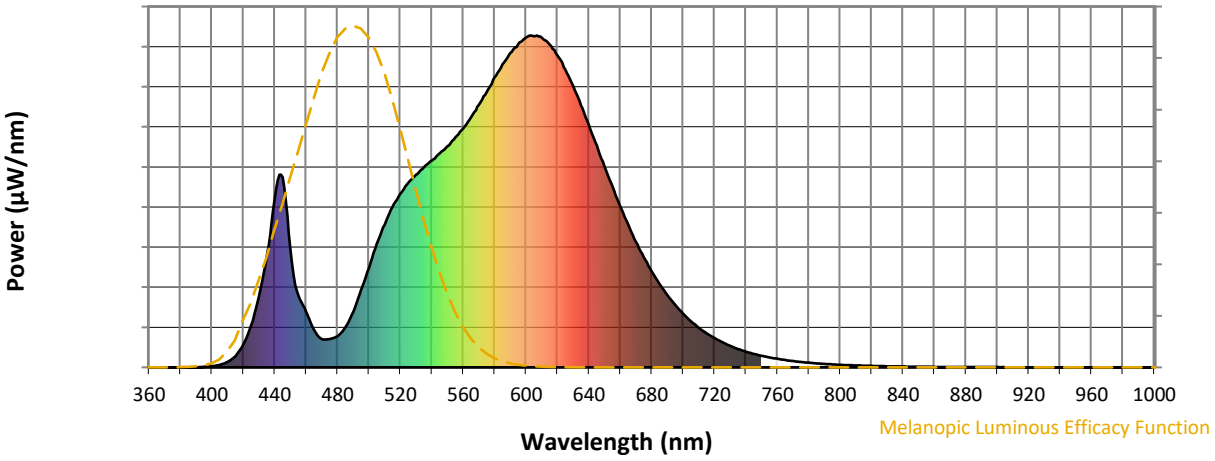
## Melanopic Flux vs. Wavelength




**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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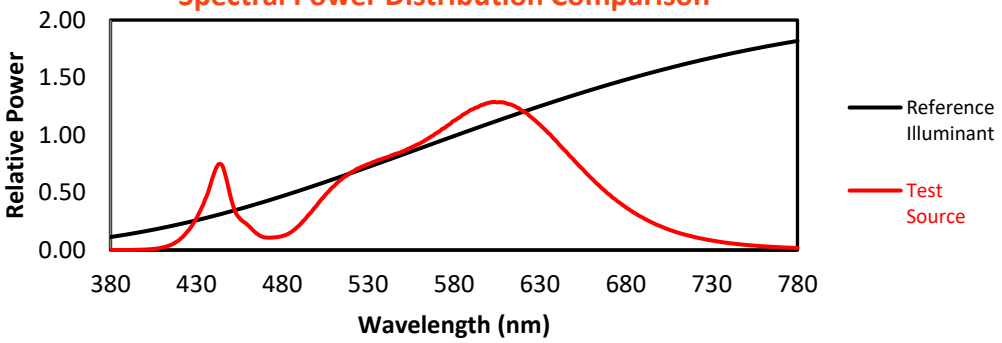
# TM-30-18

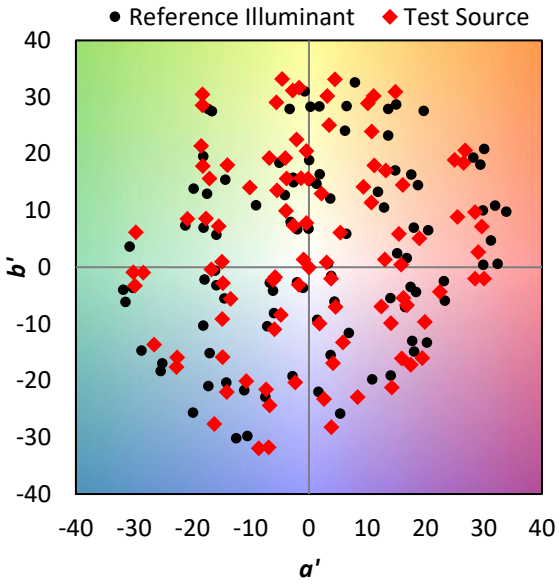
## Summary

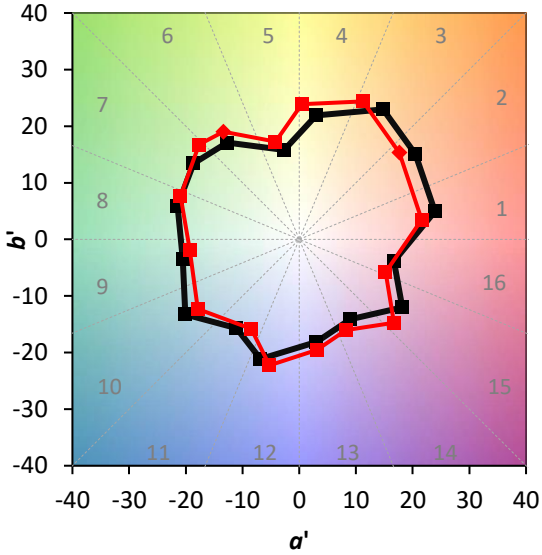
$R_f$ = 81.5
$R_g$ = 99.2
CIE $R_a$ = 81.0
$R_9$ = 7.1

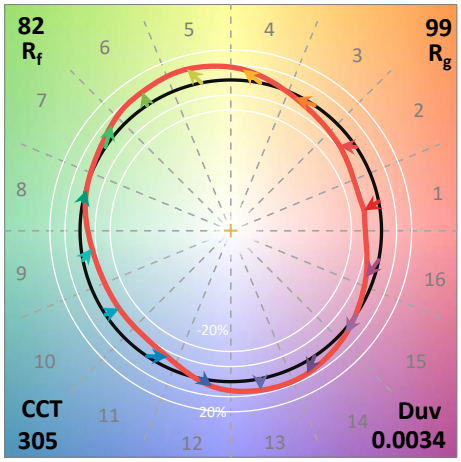
## Spectral Power Distribution Comparison

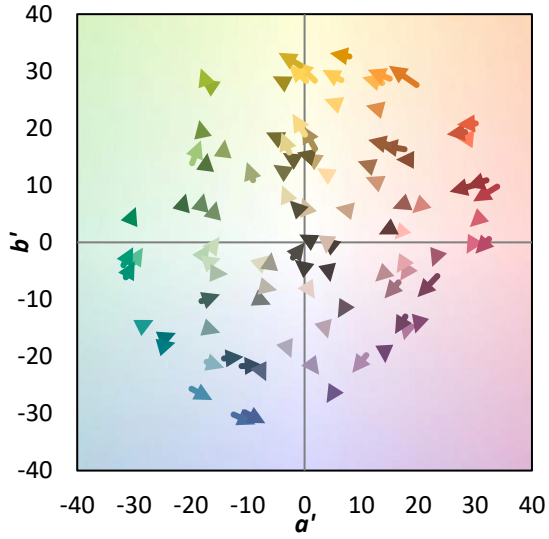



## Color Vector Graphics



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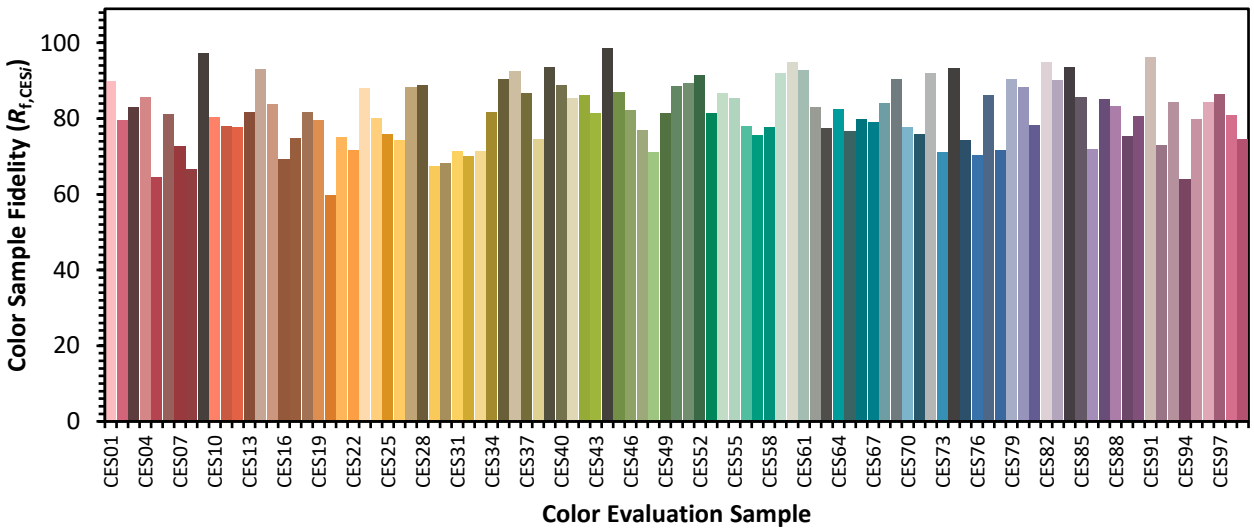
**Individual Sample Fidelity Index ($R_{f,i}$)**

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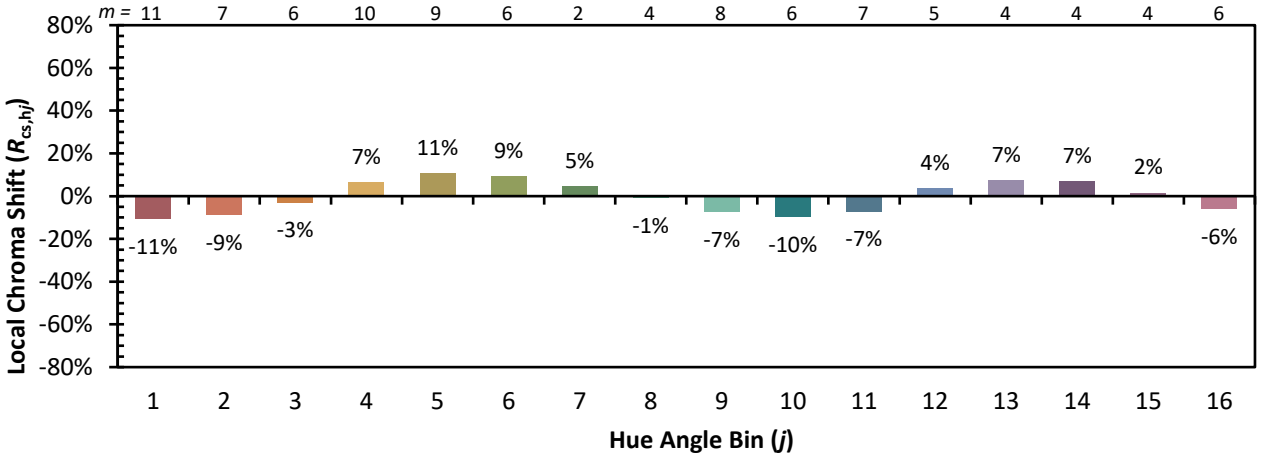
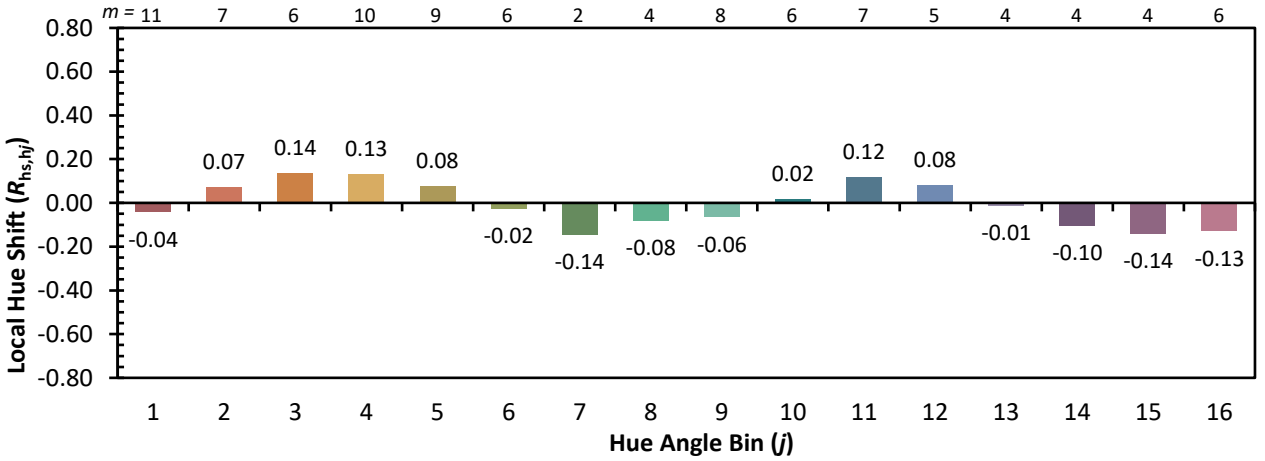
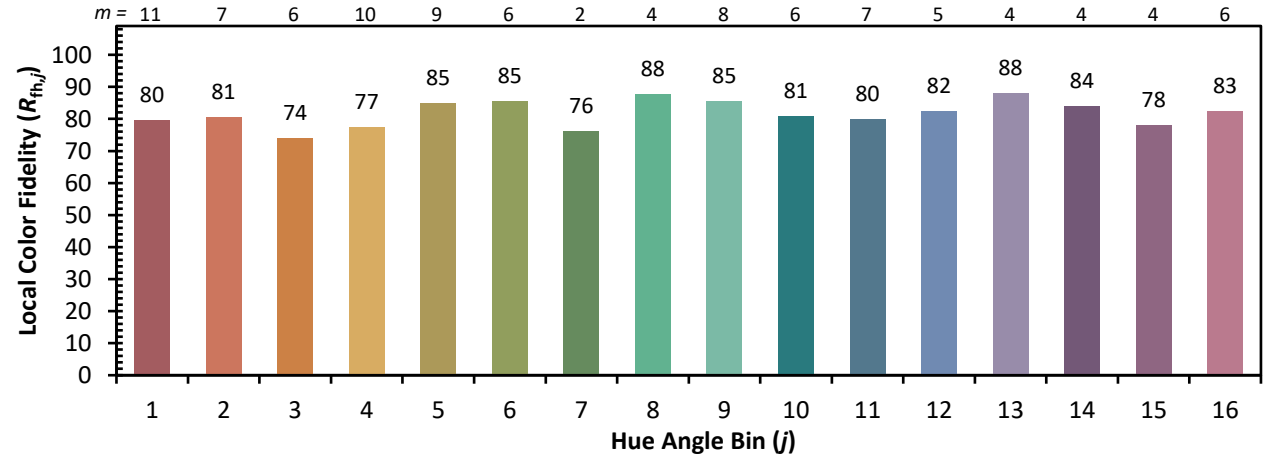
## Color Rendition by Hue-Angle Bin



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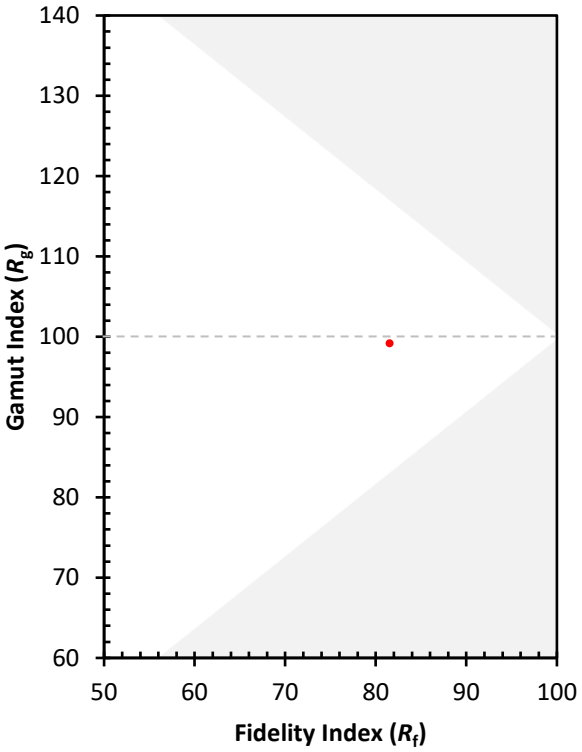
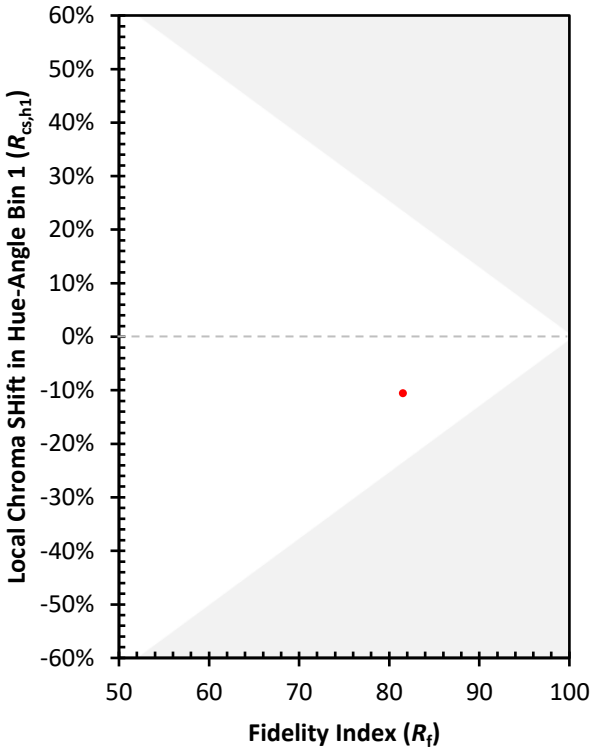
## Measure Comparisons




(END OF REPORT)