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: P386293

Luminaire Tested: **GPC-SA1D-830-U-T4W**

Issue Date: 3/3/2020

Report Generated By 670245982

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: | P386293 |
| | TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-18) |
| Test Lab: | INNOVATION CENTER |
| Issue Date: | 3/3/2020 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS (FORMERLY EATON) |
| Product Line: | McGRAW-EDISON |
| Catalog Number: | GPC-SA1D-830-U-T4W |
| Description: | GALLEON PEDESTRIAN LUMINAIRE |
| | (1) 80 CRI, 3000K, 1200mA LIGHTSQUARE WITH 16 LEDS AND TYPE IV WIDE OPTICS |
| Light Source: | - |
| Ballast/Driver: | ELECTRONIC DRIVER |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 6539 lumens |
| Efficiency: | N/A |
| Efficacy: | 99.1 lumens/watt |
| Luminous Opening: | Rectangular (W 0.5' x L: 0.5' x H: 0') |
| IES Classification: | Type IV - Short |
| BUG Rating: | B1 - U0 - G2 |

| | |
|---|---|
| Input Watts (W): | 66 |
| 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: | 28.75 FT |

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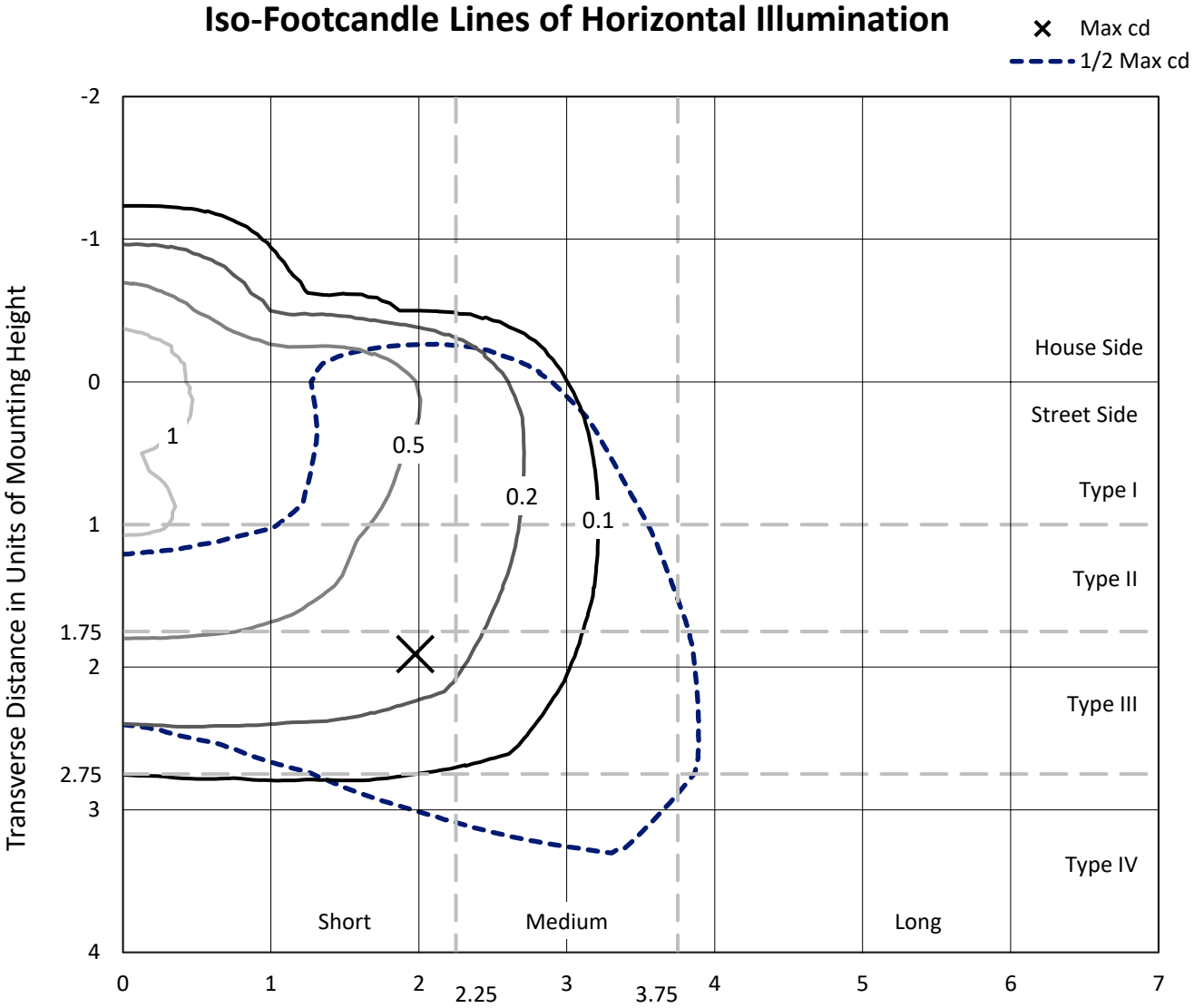
Scaled Data Report

REPORT NUMBER: P386293
CATALOG NUMBER: GPC-SA1D-830-U-T4W

## Iso-Footcandle Lines of Horizontal Illumination




Based on 25 foot mounting height. Maximum calculated value = 1.3 fc
Type IV - Short - N/A

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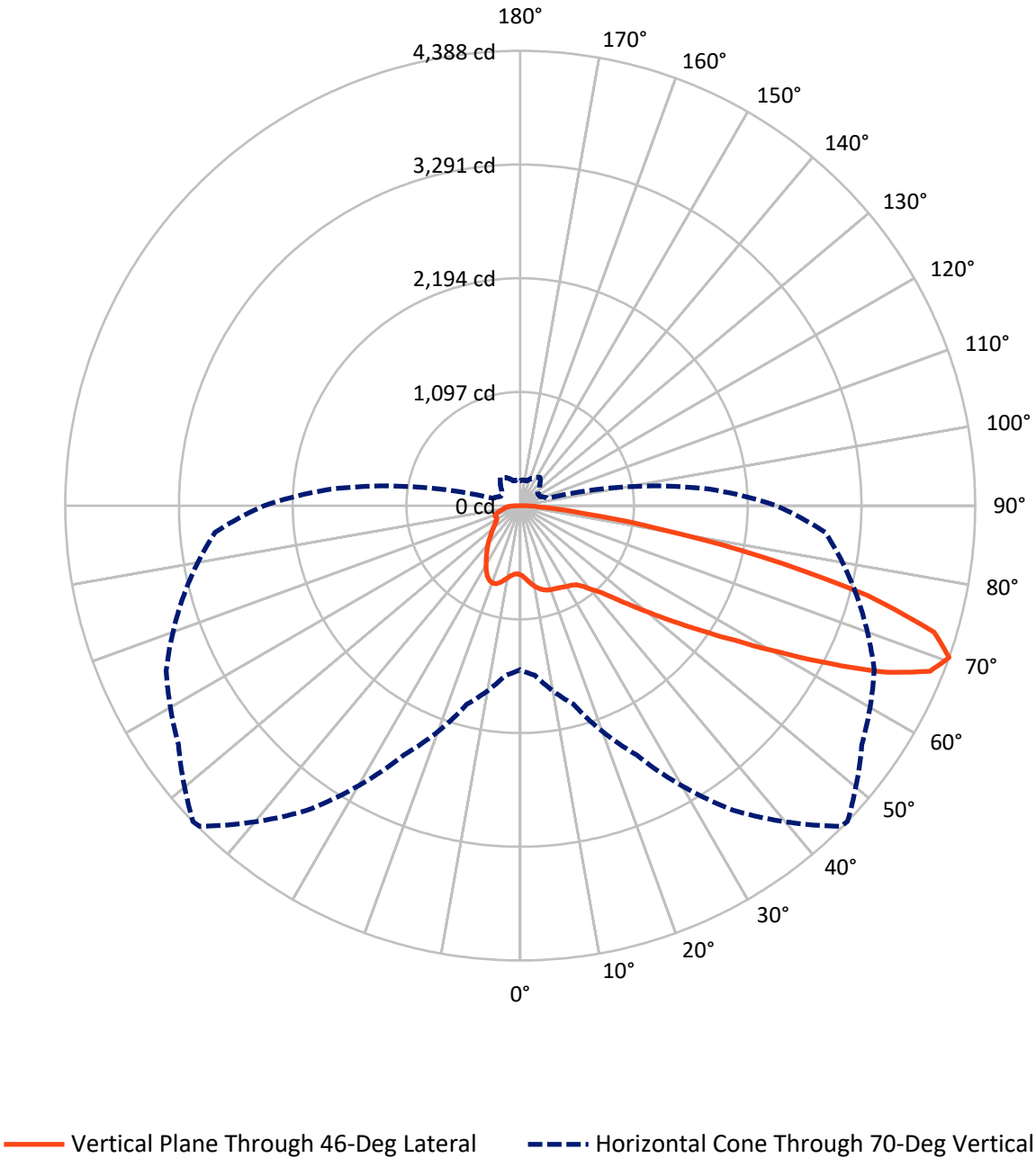
## Luminous Intensity Polar Plot



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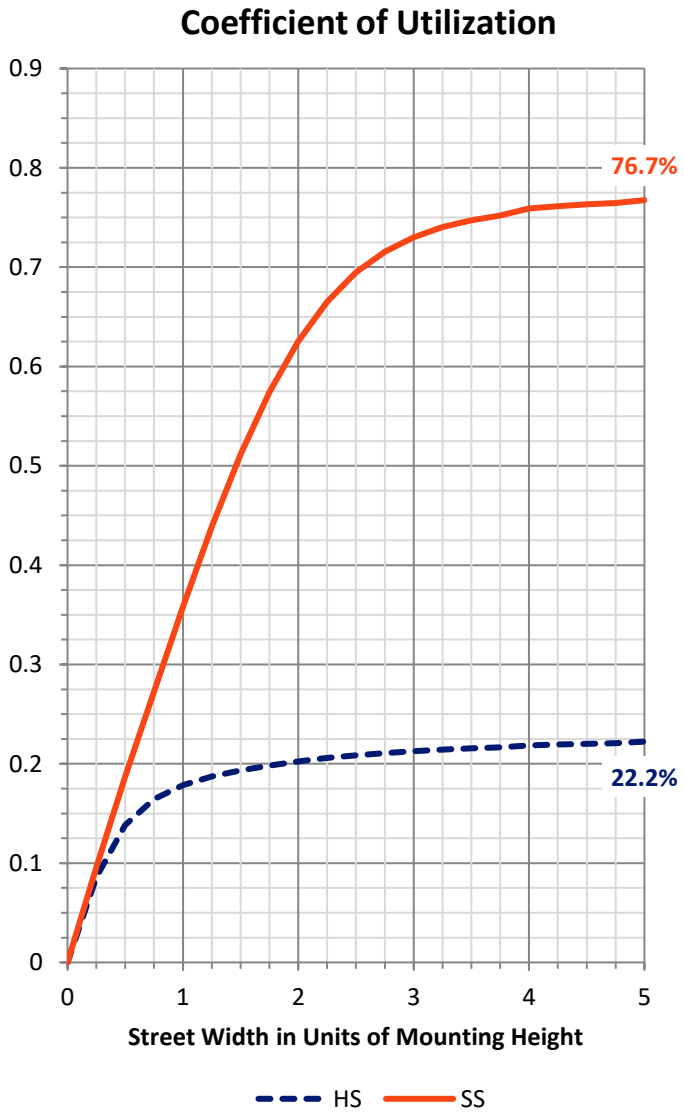
REPORT NUMBER: P386293
CATALOG NUMBER: GPC-SA1D-830-U-T4W

**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 1498.7 | 0.0 | 1498.7 |
| | % Fixture | 22.9 | 0.0 | 22.9 |
| **Street Side** | Lumens | 5040.3 | 0.0 | 5040.3 |
| | % Fixture | 77.1 | 0.0 | 77.1 |
| **Total** | Lumens | 6539.0 | 0.0 | 6539.0 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 67.9 | 1.0 |
| 10°-20° | 226.3 | 3.5 |
| 20°-30° | 377.3 | 5.8 |
| 30°-40° | 535.4 | 8.2 |
| 40°-50° | 787.5 | 12.0 |
| 50°-60° | 1333.6 | 20.4 |
| 60°-70° | 1893.1 | 29.0 |
| 70°-80° | 1150.1 | 17.6 |
| 80°-90° | 167.8 | 2.6 |
| 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° | 6539.0 | 100.0 |
| 0°-180° | 6539.0 | 100.0 |



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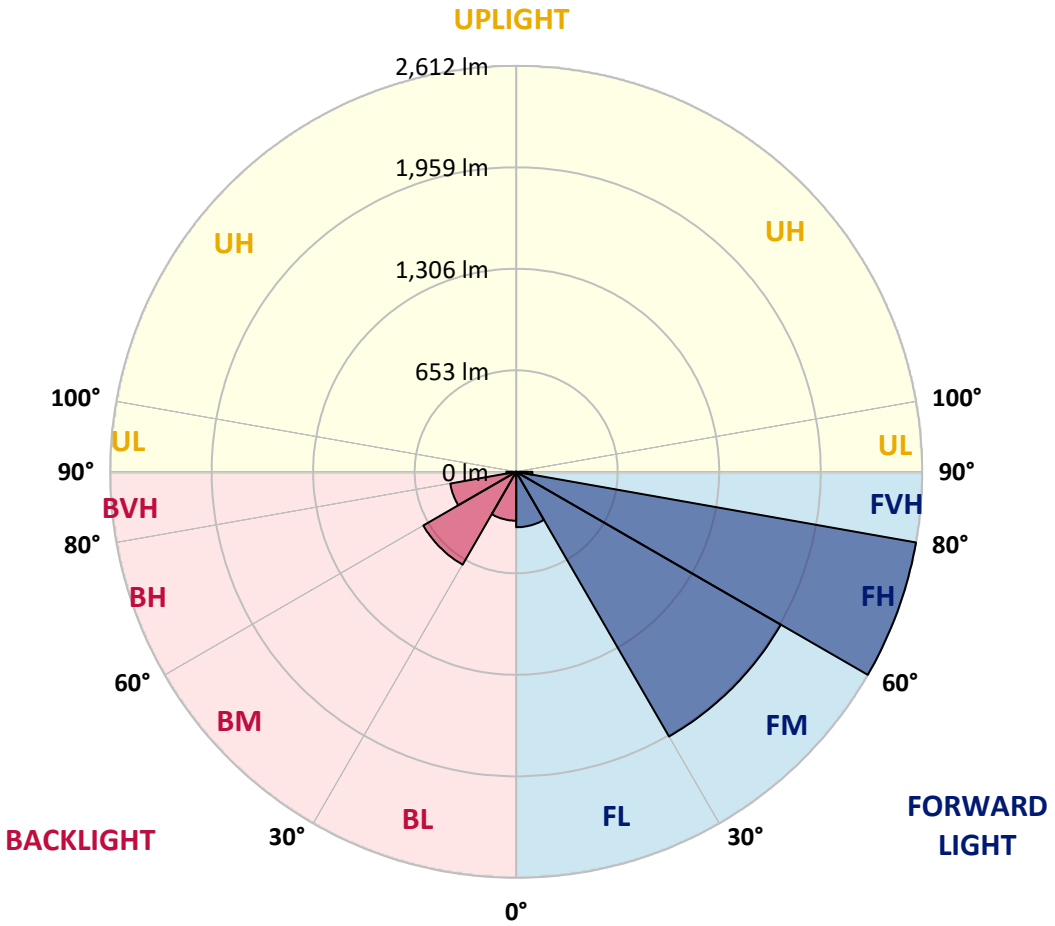
## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 356.8 | 5.5 | | | |
| FM | (30°-60°) | 1966.6 | 30.1 | | | |
| FH | (60°-80°) | 2612.3 | 39.9 | | | G2/5000 |
| FVH | (80°-90°) | 104.5 | 1.6 | | | G2/225 |
| BL | (0°-30°) | 314.7 | 4.8 | B1/500 | | |
| BM | (30°-60°) | 689.9 | 10.6 | B1/1000 | | |
| BH | (60°-80°) | 430.9 | 6.6 | B1/500 | | G1/500 |
| BVH | (80°-90°) | 63.3 | 1.0 | | | G1/100 |
| UL | (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH | (100°-180°) | 0.0 | 0.0 | | U0/0 | |

**BUG Rating: B1-U0-G2**
Type IV Short



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Scaled Data Report

REPORT NUMBER: P386293
CATALOG NUMBER: GPC-SA1D-830-U-T4W

**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 15° | 25° | 35° | 45° | 46° | 55° | 65° | 75° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 666.2 | 666.2 | 666.2 | 666.2 | 666.2 | 666.2 | *666.2* | 666.2 | 666.2 | 666.2 | 666.2 |
| 2.5° | 699.5 | 700.0 | 700.9 | 698.6 | 692.4 | 690.6 | *689.9* | 683.4 | 679.2 | 672.9 | 667.5 |
| 5° | 755.5 | 755.9 | 754.6 | 748.3 | 734.4 | 724.2 | *723.3* | 708.5 | 695.1 | 680.7 | 670.0 |
| 7.5° | 813.9 | 814.6 | 810.3 | 798.5 | 779.0 | 761.1 | *760.0* | 739.8 | 719.5 | 697.7 | 681.6 |
| 10° | 865.6 | 862.9 | 856.0 | 839.4 | 816.4 | 794.4 | *793.5* | 772.5 | 749.0 | 722.8 | 701.3 |
| 12.5° | 900.0 | 897.8 | 888.9 | 868.7 | 843.4 | 823.3 | *821.5* | 802.0 | 779.2 | 750.6 | 724.8 |
| 15° | 919.1 | 920.6 | 908.6 | 885.7 | 861.1 | 844.1 | *842.5* | 828.7 | 808.3 | 779.4 | 749.9 |
| 17.5° | 921.5 | 922.9 | 911.2 | 888.6 | 868.5 | 856.9 | *856.2* | 847.0 | 832.2 | 804.5 | 773.6 |
| 20° | 907.2 | 908.1 | 898.5 | 879.9 | 866.7 | 863.1 | *862.9* | 858.9 | 847.9 | 823.3 | 793.3 |
| 22.5° | 886.4 | 887.1 | 880.1 | 866.7 | 862.2 | 867.8 | *869.4* | 867.8 | 860.0 | 836.9 | 808.7 |
| 25° | 881.2 | 880.8 | 873.6 | 860.0 | 863.8 | 875.7 | *877.7* | 878.3 | 873.0 | 852.8 | 828.4 |
| 27.5° | 906.1 | 904.5 | 890.9 | 868.9 | 871.4 | 885.7 | *888.4* | 894.9 | 891.5 | 873.9 | 850.8 |
| 30° | 977.9 | 975.2 | 947.3 | 903.0 | 890.9 | 898.3 | *901.6* | 911.9 | 912.6 | 897.8 | 880.6 |
| 32.5° | 1099.2 | 1095.9 | 1045.7 | 966.5 | 923.8 | 911.0 | *914.1* | 929.6 | 937.9 | 926.5 | 907.9 |
| 35° | 1252.5 | 1248.7 | 1182.9 | 1074.6 | 978.8 | 935.4 | *937.6* | 950.0 | 966.5 | 950.4 | 925.8 |
| 37.5° | 1412.3 | 1403.1 | 1339.8 | 1201.7 | 1066.3 | 987.5 | *987.5* | 989.1 | 996.9 | 963.4 | 946.8 |
| 40° | 1571.2 | 1562.0 | 1504.7 | 1351.2 | 1179.5 | 1069.7 | *1064.5* | 1029.8 | 1023.6 | 994.7 | 989.1 |
| 42.5° | 1718.9 | 1716.2 | 1682.4 | 1520.1 | 1312.5 | 1150.5 | *1143.3* | 1084.4 | 1085.8 | 1067.9 | 1068.1 |
| 45° | 1876.0 | 1876.0 | 1848.4 | 1690.7 | 1467.3 | 1280.3 | *1273.1* | 1186.5 | 1199.9 | 1191.6 | 1211.6 |
| 47.5° | 2004.2 | 2008.2 | 2004.4 | 1868.3 | 1647.5 | 1445.2 | *1432.2* | 1327.9 | 1365.5 | 1393.9 | 1451.9 |
| 50° | 2135.1 | 2141.4 | 2142.0 | 2063.3 | 1865.2 | 1641.2 | *1626.4* | 1515.7 | 1599.6 | 1681.0 | 1794.9 |
| 52.5° | 2325.1 | 2339.2 | 2283.0 | 2257.7 | 2132.0 | 1873.9 | *1859.4* | 1757.1 | 1897.2 | 2011.6 | 2207.8 |
| 55° | 2501.2 | 2488.9 | 2448.8 | 2464.5 | 2417.5 | 2138.9 | *2127.9* | 2038.2 | 2228.9 | 2377.4 | 2632.3 |
| 57.5° | 2596.5 | 2595.6 | 2635.9 | 2703.1 | 2725.4 | 2465.6 | *2456.4* | 2369.2 | 2602.8 | 2714.5 | 3030.9 |
| 60° | 2708.4 | 2710.0 | 2809.8 | 2962.2 | 3054.4 | 2872.5 | *2868.4* | 2802.2 | 2966.0 | 3029.1 | 3343.5 |
| 62.5° | 2724.1 | 2752.3 | 2924.1 | 3186.4 | 3362.3 | 3347.8 | *3356.7* | 3192.2 | 3290.9 | 3280.2 | 3576.9 |
| 65° | 2543.9 | 2581.1 | 2892.1 | 3254.2 | 3668.4 | 3867.6 | *3875.9* | 3584.5 | 3547.2 | 3494.8 | 3660.4 |
| 67.5° | 2174.7 | 2229.8 | 2567.7 | 3106.8 | 3769.4 | 4251.8 | *4263.5* | 3888.6 | 3759.7 | 3567.5 | 3459.4 |
| 70° | *1582.6* | *1643.7* | *1983.8* | *2653.4* | *3589.4* | *4374.7* | *4387.9* | *4023.1* | *3767.8* | *3360.5* | *2953.2* |
| 72.5° | 956.0 | 1003.9 | 1284.3 | 1953.4 | 3029.5 | 4150.9 | *4174.4* | 3852.6 | 3440.0 | 2846.5 | 2180.7 |
| 75° | 419.8 | 451.1 | 621.0 | 1125.6 | 2168.9 | 3434.4 | *3463.7* | 3297.6 | 2795.0 | 2068.6 | 1289.0 |
| 77.5° | 178.8 | 187.8 | 254.7 | 489.0 | 1226.1 | 2346.8 | *2387.1* | 2409.5 | 1896.3 | 1125.6 | 544.7 |
| 80° | 111.4 | 115.0 | 144.1 | 221.3 | 573.8 | 1318.1 | *1361.5* | 1417.7 | 941.7 | 413.8 | 190.2 |
| 82.5° | 67.8 | 71.8 | 95.8 | 133.8 | 298.7 | 597.5 | *618.3* | 657.9 | 365.4 | 178.8 | 98.5 |
| 85° | 40.7 | 43.6 | 58.6 | 84.6 | 170.1 | 235.0 | *234.7* | 259.6 | 172.1 | 115.0 | 51.9 |
| 87.5° | 19.5 | 21.7 | 31.3 | 43.9 | 85.7 | 88.2 | *82.6* | 93.5 | 104.5 | 75.4 | 26.2 |
| 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: P386293
CATALOG NUMBER: GPC-SA1D-830-U-T4W

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 666.2 | 666.2 | 666.2 | 666.2 | 666.2 | 666.2 | 666.2 | 666.2 | 666.2 | 666.2 | 666.2 |
| 2.5° | 665.7 | 664.9 | 661.9 | 659.7 | 659.3 | 657.9 | 656.8 | 657.5 | 658.4 | 658.6 | 658.6 |
| 5° | 665.5 | 663.1 | 659.3 | 657.7 | 659.7 | 662.4 | 665.7 | 670.2 | 672.9 | 674.9 | 676.3 |
| 7.5° | 676.3 | 671.6 | 667.3 | 666.4 | 670.4 | 677.6 | 685.2 | 694.6 | 701.1 | 705.6 | 706.5 |
| 10° | 694.2 | 688.4 | 684.1 | 685.0 | 692.2 | 702.4 | 713.2 | 725.3 | 735.1 | 741.2 | 741.6 |
| 12.5° | 714.8 | 709.2 | 705.1 | 708.9 | 720.8 | 733.3 | 744.5 | 755.0 | 764.0 | 770.0 | 770.0 |
| 15° | 738.5 | 734.4 | 729.7 | 738.5 | 754.6 | 765.8 | 770.5 | 775.6 | 780.5 | 785.0 | 784.1 |
| 17.5° | 761.3 | 757.5 | 755.0 | 765.3 | 782.1 | 787.3 | 784.1 | 780.3 | 780.3 | 782.8 | 783.2 |
| 20° | 781.0 | 777.6 | 779.2 | 789.3 | 798.0 | 792.6 | 781.0 | 768.9 | 764.0 | 765.3 | 766.7 |
| 22.5° | 798.2 | 796.7 | 801.4 | 806.1 | 799.8 | 781.0 | 759.5 | 743.2 | 737.1 | 736.7 | 737.1 |
| 25° | 818.4 | 818.1 | 824.0 | 815.5 | 787.7 | 753.0 | 724.2 | 708.3 | 704.9 | 707.6 | 712.1 |
| 27.5° | 843.4 | 845.9 | 848.8 | 817.7 | 763.1 | 710.7 | 681.4 | 670.4 | 673.8 | 680.3 | 684.5 |
| 30° | 875.4 | 882.1 | 875.9 | 812.1 | 727.7 | 662.4 | 634.4 | 631.3 | 640.5 | 649.6 | 654.1 |
| 32.5° | 906.5 | 917.1 | 901.8 | 797.6 | 682.1 | 611.1 | 589.4 | 588.5 | 599.7 | 608.7 | 615.0 |
| 35° | 931.6 | 952.4 | 921.3 | 768.7 | 629.3 | 563.9 | 548.0 | 542.0 | 546.0 | 556.5 | 563.7 |
| 37.5° | 964.3 | 999.0 | 934.7 | 724.6 | 572.0 | 525.0 | 506.4 | 492.5 | 489.0 | 493.2 | 496.8 |
| 40° | 1024.0 | 1069.9 | 941.0 | 663.1 | 516.0 | 486.1 | 467.3 | 446.9 | 432.8 | 422.5 | 422.7 |
| 42.5° | 1121.6 | 1162.3 | 937.0 | 588.3 | 464.3 | 448.0 | 426.8 | 403.3 | 380.4 | 357.2 | 355.4 |
| 45° | 1280.0 | 1299.7 | 924.9 | 509.1 | 418.9 | 408.2 | 388.3 | 364.8 | 334.3 | 307.9 | 305.5 |
| 47.5° | 1533.6 | 1489.9 | 906.1 | 440.0 | 378.9 | 374.4 | 356.0 | 329.0 | 296.7 | 275.5 | 273.7 |
| 50° | 1879.3 | 1764.5 | 896.9 | 384.9 | 343.5 | 344.8 | 329.9 | 301.2 | 270.8 | 255.1 | 253.3 |
| 52.5° | 2292.9 | 2084.3 | 914.6 | 342.4 | 315.1 | 319.8 | 308.6 | 281.7 | 256.2 | 243.9 | 242.1 |
| 55° | 2721.8 | 2415.5 | 933.6 | 311.5 | 288.2 | 297.4 | 293.6 | 271.4 | 248.4 | 237.0 | 235.4 |
| 57.5° | 3089.1 | 2662.8 | 895.6 | 286.4 | 264.3 | 278.6 | 282.0 | 265.0 | 244.4 | 234.1 | 232.3 |
| 60° | 3320.2 | 2762.4 | 795.8 | 262.9 | 245.3 | 263.6 | 275.3 | 263.2 | 245.9 | 245.0 | 243.7 |
| 62.5° | 3429.9 | 2753.6 | 646.1 | 244.4 | 233.4 | 257.1 | 280.2 | 273.2 | 263.8 | 271.9 | 272.6 |
| 65° | 3380.7 | 2622.0 | 481.1 | 232.1 | 224.9 | 259.6 | 294.9 | 292.3 | 269.0 | 277.0 | 278.2 |
| 67.5° | 3056.6 | 2308.1 | 356.3 | 221.3 | 215.5 | 266.5 | 321.8 | 298.5 | 258.9 | 264.7 | 261.2 |
| 70° | *2470.5* | *1829.9* | *274.8* | *209.2* | *205.9* | *265.6* | *333.9* | *294.7* | *247.9* | *249.3* | *239.7* |
| 72.5° | 1703.6 | 1247.8 | 223.6 | 198.0 | 192.0 | 242.1 | 325.4 | 285.3 | 238.8 | 228.5 | 215.7 |
| 75° | 926.5 | 669.8 | 190.0 | 186.4 | 167.6 | 212.6 | 309.7 | 278.6 | 230.5 | 216.8 | 209.7 |
| 77.5° | 364.5 | 277.9 | 164.9 | 170.5 | 146.6 | 187.8 | 292.3 | 265.9 | 219.1 | 201.2 | 197.6 |
| 80° | 148.8 | 141.9 | 136.7 | 147.5 | 126.0 | 164.3 | 271.2 | 250.9 | 205.4 | 186.6 | 179.5 |
| 82.5° | 84.4 | 88.2 | 106.3 | 116.4 | 102.3 | 151.3 | 261.2 | 238.8 | 189.1 | 167.2 | 158.7 |
| 85° | 43.2 | 51.7 | 74.1 | 83.5 | 75.2 | 128.7 | 240.6 | 209.0 | 151.7 | 128.0 | 128.7 |
| 87.5° | 20.8 | 28.9 | 46.8 | 52.4 | 48.8 | 93.1 | 179.7 | 151.5 | 118.2 | 93.5 | 90.6 |
| 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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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

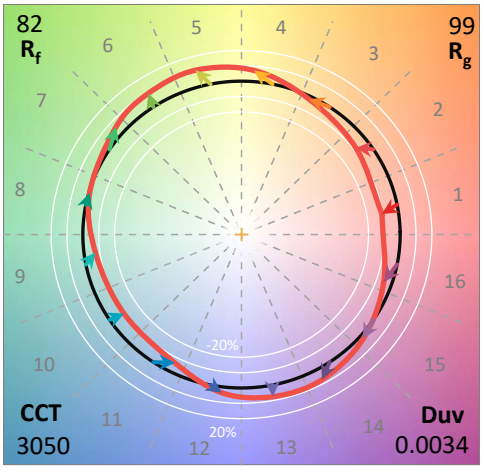
## Test Information

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

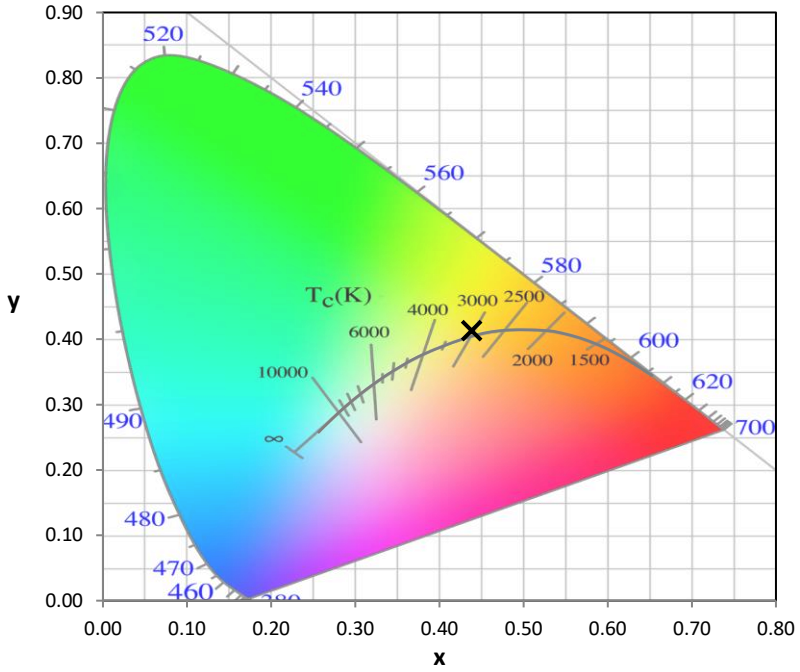
| | |
|---|---|
| Stabilization Time: | 20M |
| Operation Time: | 1H 20M |
| Sphere Temperature (°C): | 24.2 |

REPORT NUMBER: SP1-2408-195-9

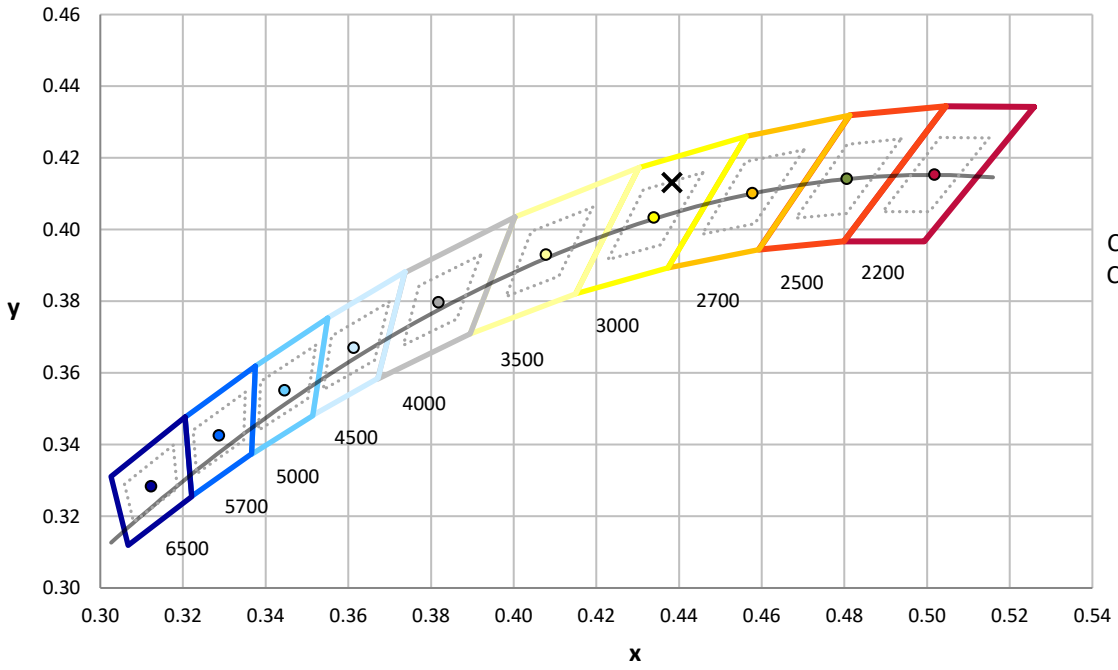
| Measurement and Test Equipment | | | |
|---|---|---|---|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 6/18/2024 | 12/18/2024 |
| Power Meter | INXT2011004 | 2/8/2024 | 2/8/2025 |
| AC Power Source | IN0063 | 10/24/2023 | 10/24/2024 |
| DC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

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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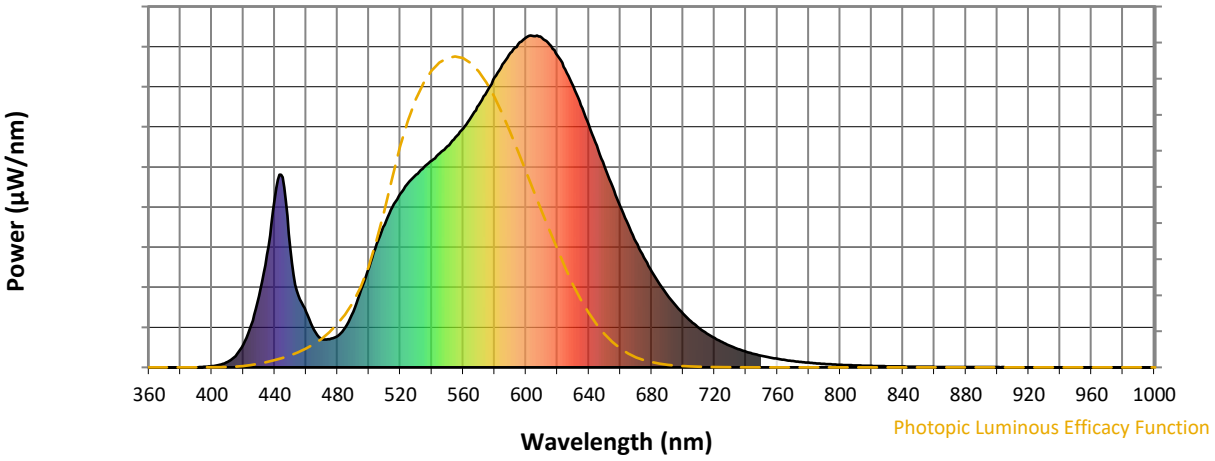
## Photopic Flux vs. Wavelength




## 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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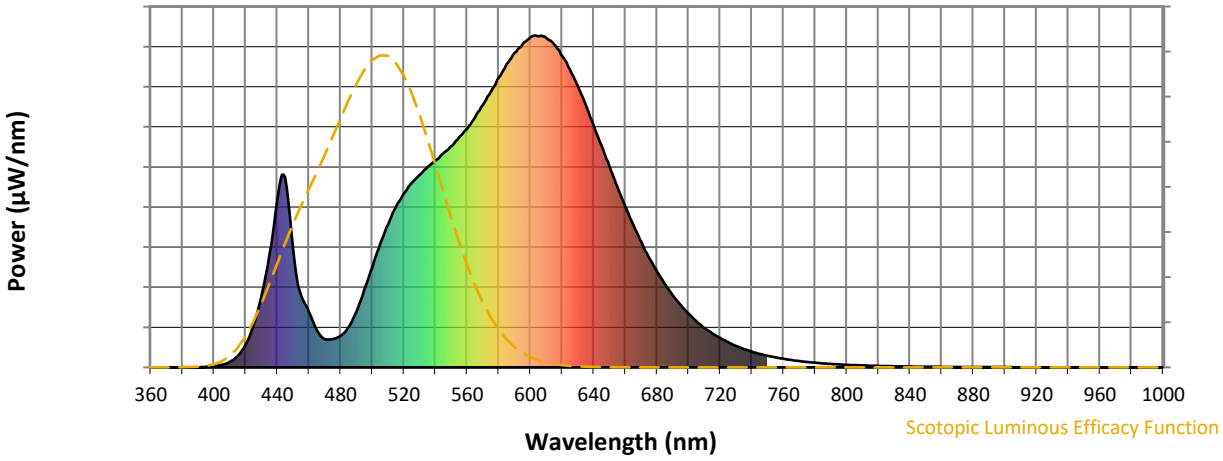
## Scotopic Flux vs. Wavelength




**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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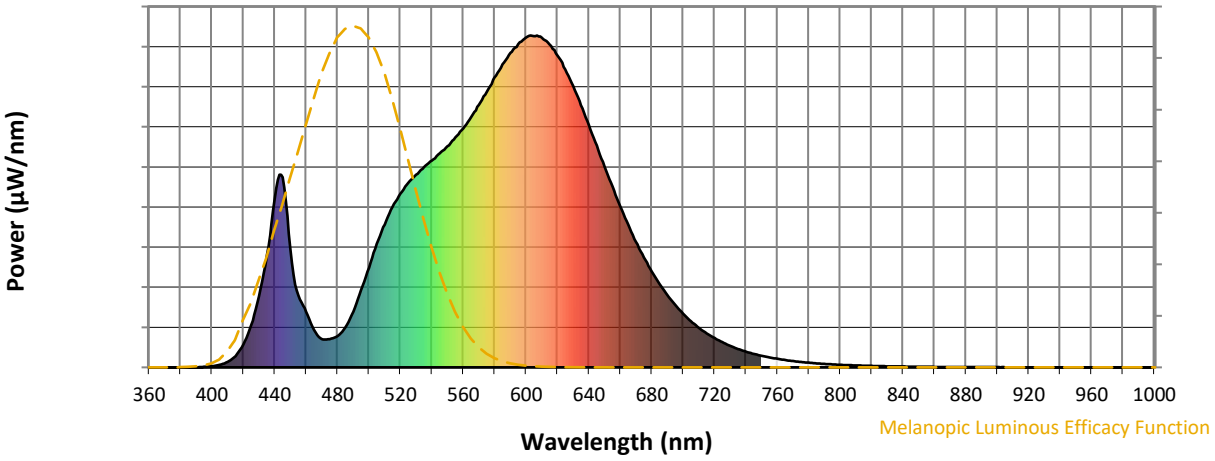
## Melanopic Flux vs. Wavelength




**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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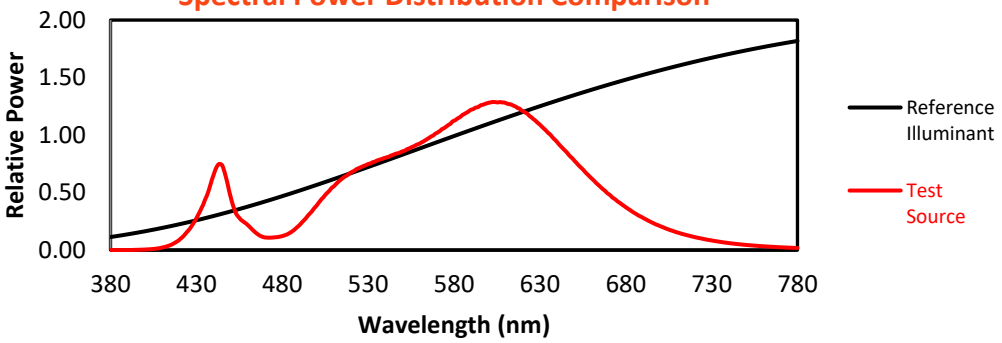
# TM-30-18

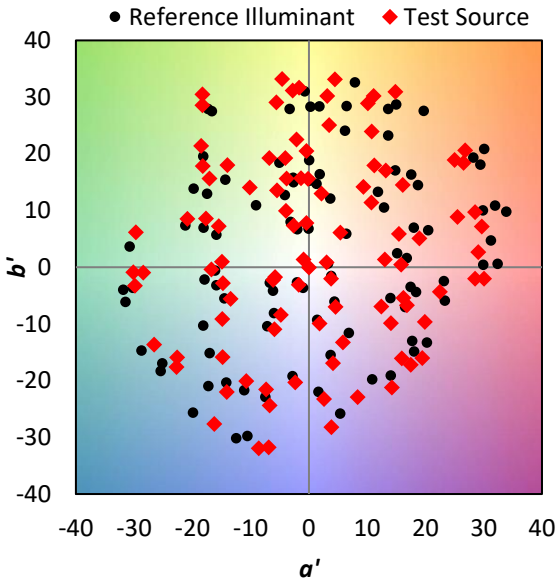
## Summary

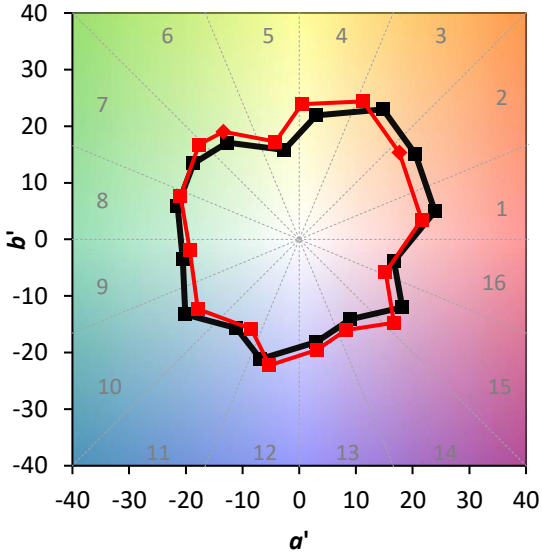
$R_f$ = 81.5
$R_g$ = 99.2
CIE $R_a$ = 81.0
$R_9$ = 7.1

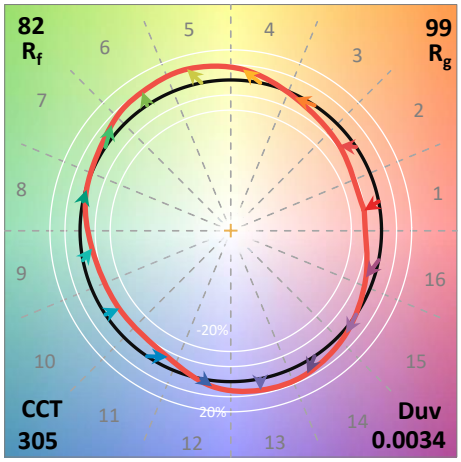
## Spectral Power Distribution Comparison

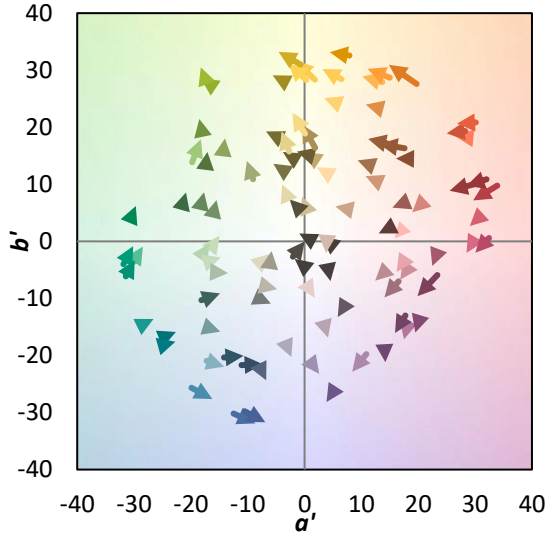



## Color Vector Graphics



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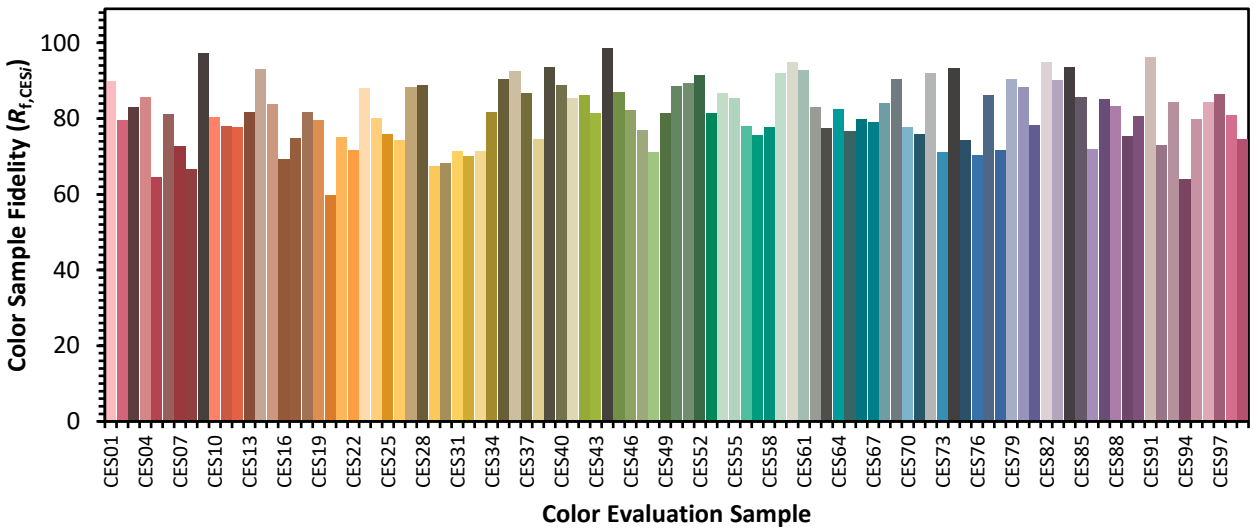
# TM-30-18

**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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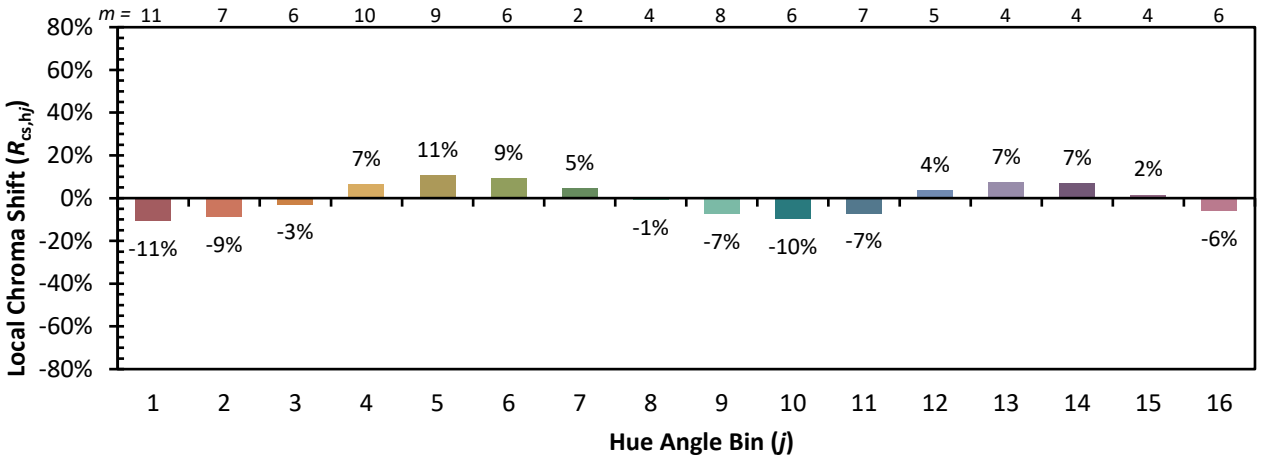
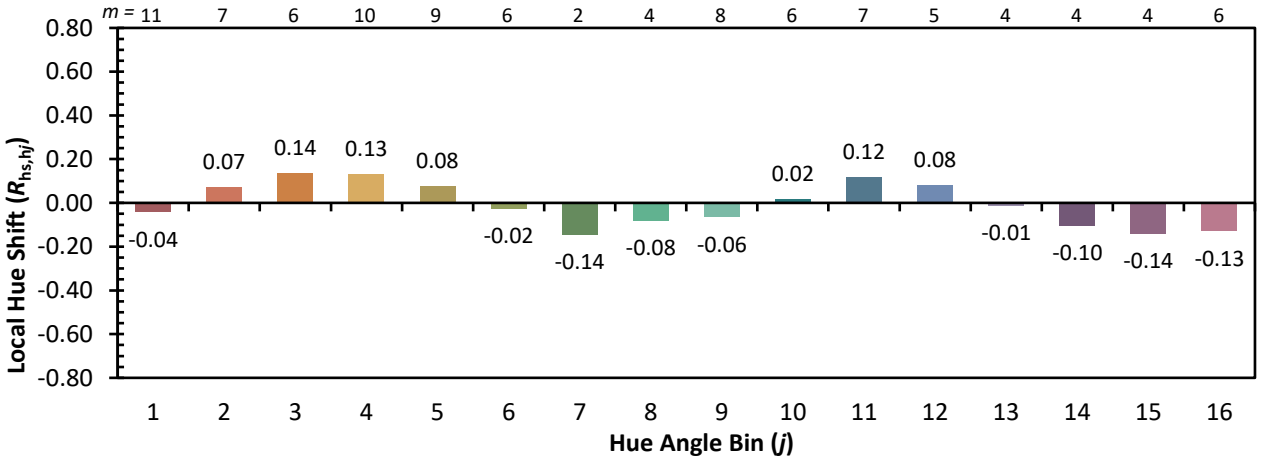
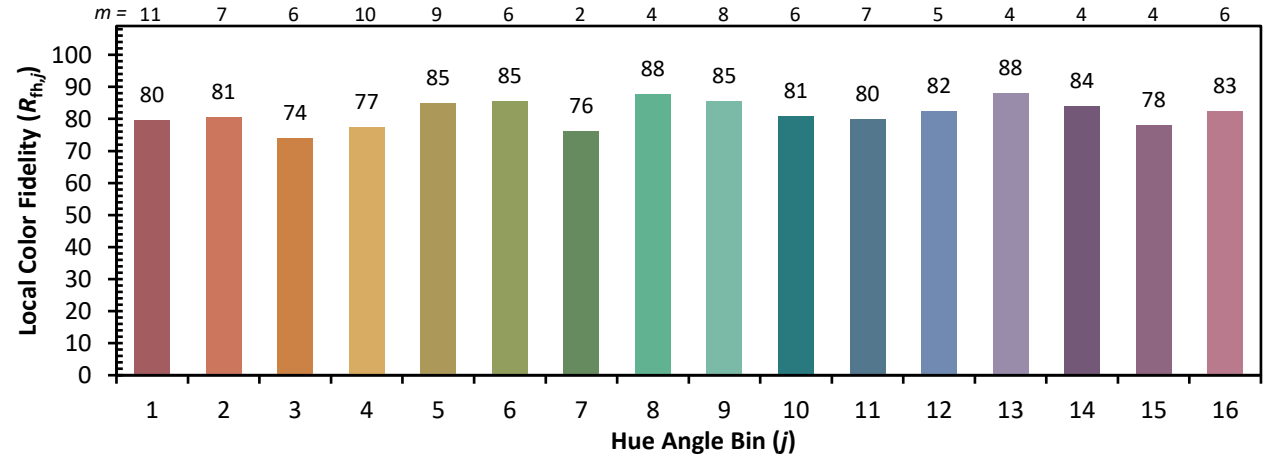
## Color Rendition by Hue-Angle Bin



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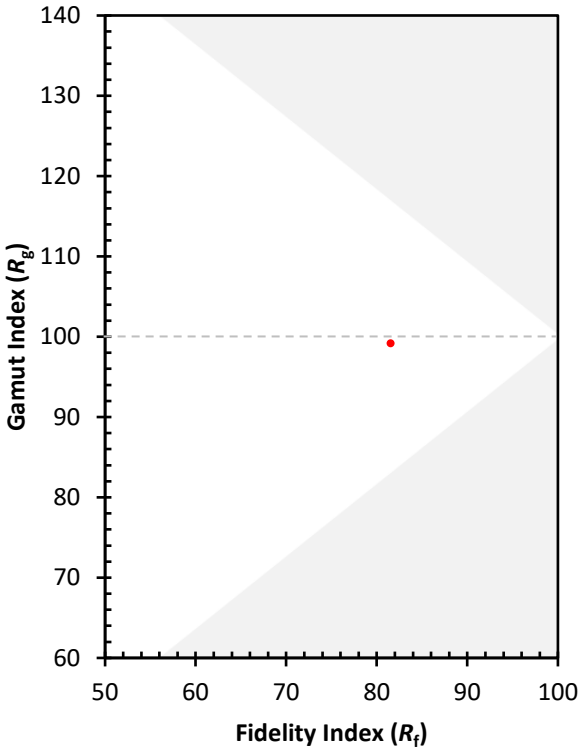
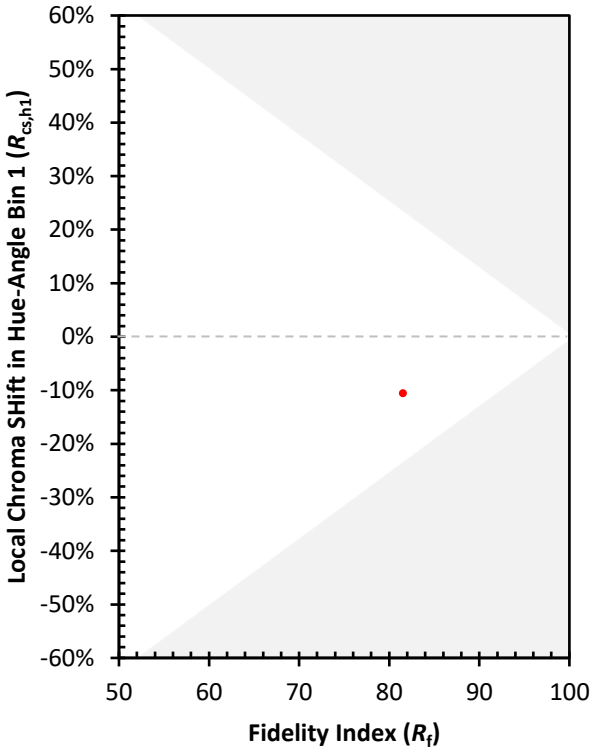
## TM-30-18

### Measure Comparisons

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