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: P631558

Luminaire Tested: GWS-SA1F-830-U-T2-W-GRSBK

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: | P631558 |
| | TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-20) |
| Test Lab: | COOPER LIGHTING SOLUTIONS |
| Issue Date: | 1/10/2023 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS |
| Product Line: | McGRAW-EDISON |
| Catalog Number: | GWS-SA1F-830-U-T2-W-GRSBK |
| Description: | GALLEON WALL SLIM LUMINAIRE. (1) LIGHTSQUARES WITH 16 LEDS EACH AND TYPE II OPTICS W/ FACTORY INSTALLED GLARE SHIELD, BK |
| Light Source: | (16) 3000K CCT, 80 CRI LEDS |
| Ballast/Driver: | - |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 3975.4 lumens |
| Efficiency: | N/A |
| Efficacy: | 59.2 lumens/watt |
| Luminous Opening: | Rectangular (W 0.5' x L: 0.5' x H: 0') |
| IES Classification: | Type II - Short |
| BUG Rating: | B1 - U0 - G0 |

| | |
|---|---|
| Input Watts (W): | 67.2 |
| 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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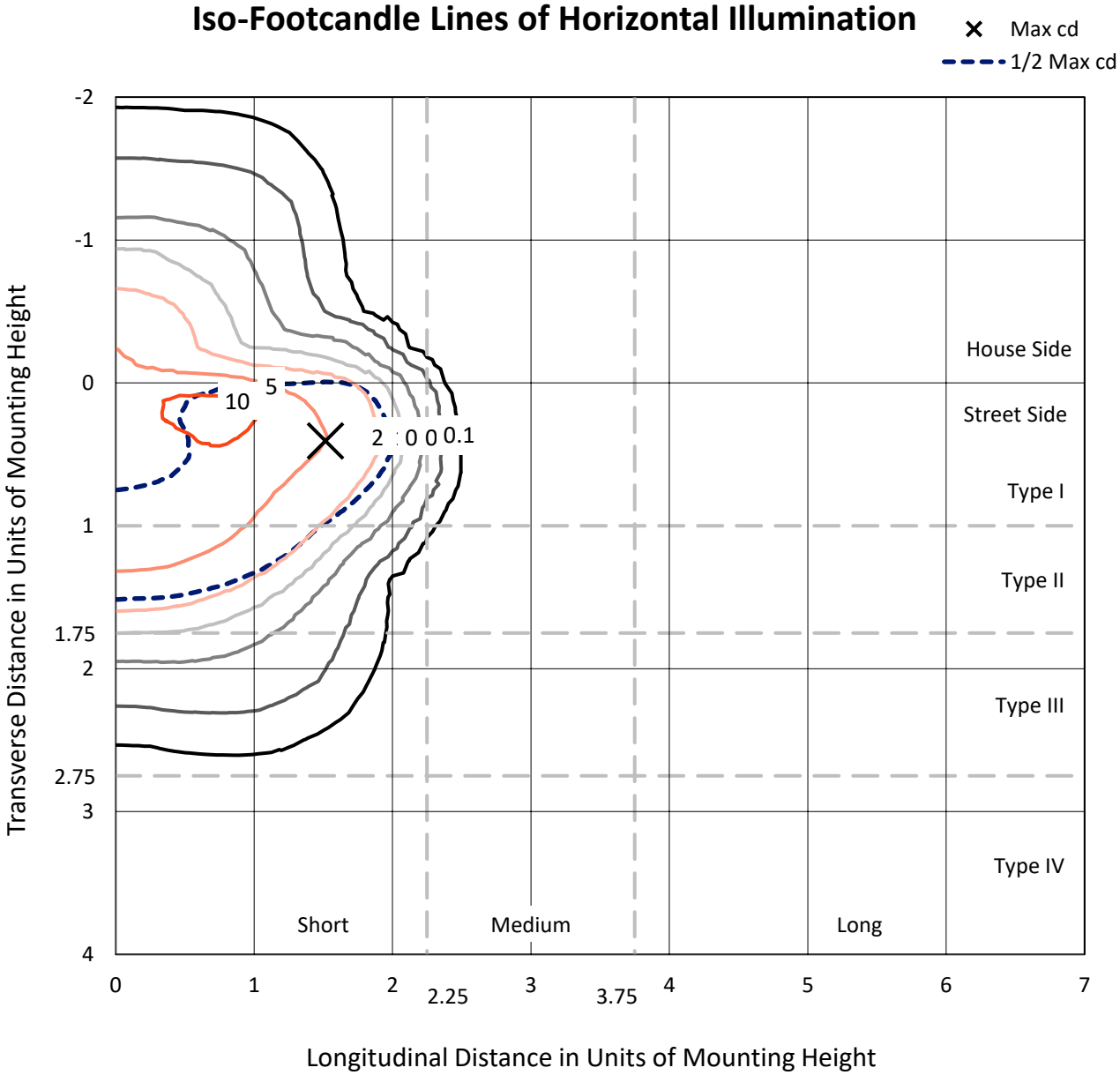
Scaled Data Report

REPORT NUMBER: P631558
CATALOG NUMBER: GWS-SA1F-830-U-T2-W-GRSBK

## Iso-Footcandle Lines of Horizontal Illumination




Based on 10 foot mounting height. Maximum calculated value = 12.4 fc
Type II - Short - N/A

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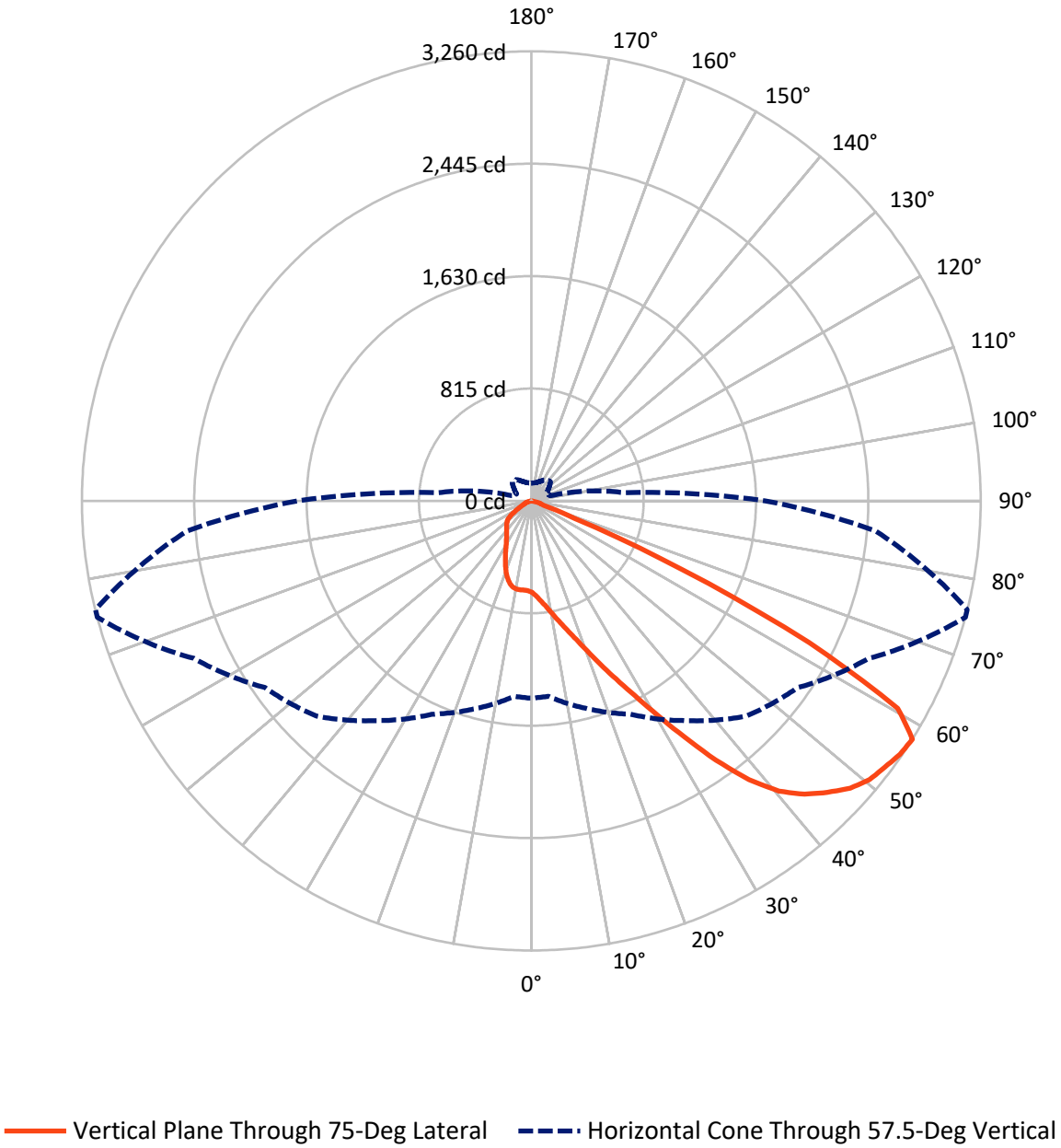
## Luminous Intensity Polar Plot



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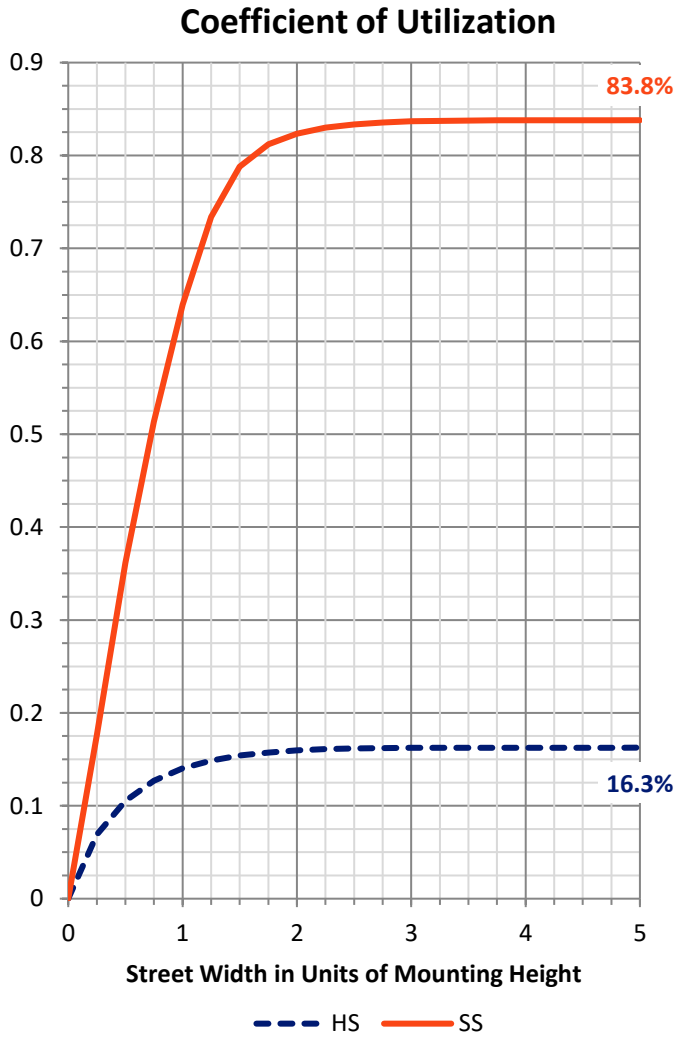
REPORT NUMBER: P631558
CATALOG NUMBER: GWS-SA1F-830-U-T2-W-GRSBK

**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 649.4 | 0.0 | 649.4 |
| | % Fixture | 16.3 | 0.0 | 16.3 |
| **Street Side** | Lumens | 3326.0 | 0.0 | 3326.0 |
| | % Fixture | 83.7 | 0.0 | 83.7 |
| **Total** | Lumens | 3975.4 | 0.0 | 3975.4 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 67.5 | 1.7 |
| 10°-20° | 219.2 | 5.5 |
| 20°-30° | 401.4 | 10.1 |
| 30°-40° | 665.9 | 16.8 |
| 40°-50° | 1017.0 | 25.6 |
| 50°-60° | 1142.7 | 28.7 |
| 60°-70° | 421.5 | 10.6 |
| 70°-80° | 40.3 | 1.0 |
| 80°-90° | 0.0 | 0.0 |
| 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° | 3975.4 | 100.0 |
| 0°-180° | 3975.4 | 100.0 |



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REPORT NUMBER: P631558
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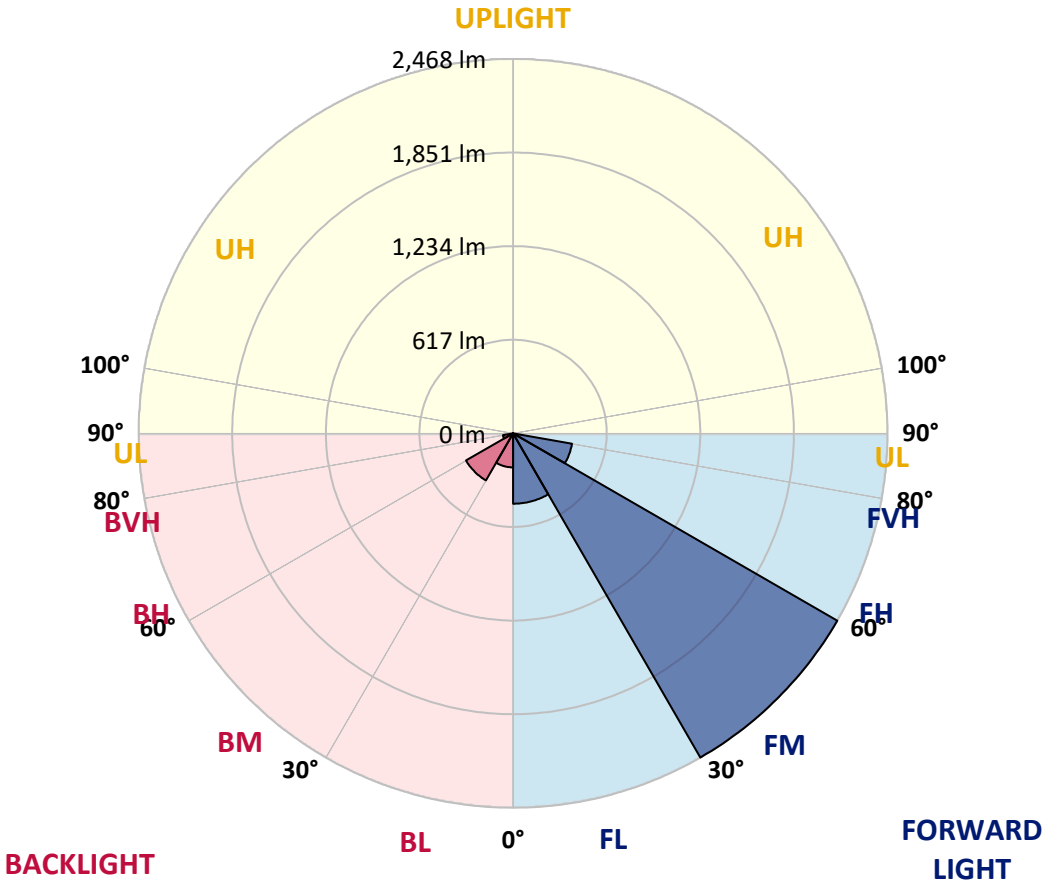
## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 463.9 | 11.7 | | | |
| FM | (30°-60°) | 2467.7 | 62.1 | | | |
| FH | (60°-80°) | 394.3 | 9.9 | | | G0/660 |
| FVH | (80°-90°) | 0.0 | 0.0 | | | G0/10 |
| BL | (0°-30°) | 224.1 | 5.6 | B1/500 | | |
| BM | (30°-60°) | 357.9 | 9.0 | B1/1000 | | |
| BH | (60°-80°) | 67.4 | 1.7 | B0/110 | | G0/110 |
| BVH | (80°-90°) | 0.0 | 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-G0**
Type II Short



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Scaled Data Report

REPORT NUMBER: P631558
CATALOG NUMBER: GWS-SA1F-830-U-T2-W-GRSBK

**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 15° | 25° | 35° | 45° | 55° | 65° | 75° | 76° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 663.0 | 663.0 | 663.0 | 663.0 | 663.0 | 663.0 | 663.0 | 663.0 | *663.0* | 663.0 | 663.0 |
| 2.5° | 740.8 | 748.4 | 746.0 | 741.2 | 738.4 | 728.3 | 722.1 | 703.8 | *690.9* | 689.4 | 677.4 |
| 5° | 834.3 | 832.9 | 831.0 | 825.2 | 820.4 | 804.6 | 785.9 | 755.2 | *727.8* | 724.5 | 699.0 |
| 7.5° | 885.7 | 886.6 | 887.6 | 886.6 | 883.3 | 871.3 | 850.6 | 814.6 | *772.9* | 770.0 | 729.7 |
| 10° | 906.8 | 908.7 | 913.5 | 922.6 | 930.8 | 929.8 | 917.8 | 880.9 | *829.5* | 824.7 | 770.5 |
| 12.5° | 916.8 | 919.2 | 926.9 | 944.2 | 966.3 | 983.5 | 985.4 | 952.3 | *895.7* | 888.1 | 819.0 |
| 15° | 930.8 | 933.2 | 942.7 | 965.3 | 997.4 | 1031.5 | 1053.6 | 1032.5 | *969.1* | 961.0 | 872.2 |
| 17.5° | 937.0 | 940.3 | 954.3 | 984.0 | 1025.7 | 1078.0 | 1127.9 | 1126.0 | *1056.0* | 1049.7 | 934.1 |
| 20° | 949.0 | 951.4 | 963.9 | 996.0 | 1046.4 | 1121.7 | 1205.7 | 1235.9 | *1162.0* | 1152.9 | 1009.0 |
| 22.5° | 986.9 | 987.8 | 993.6 | 1013.8 | 1060.8 | 1153.4 | 1284.8 | 1364.0 | *1287.2* | 1275.2 | 1092.9 |
| 25° | 1048.8 | 1048.3 | 1050.7 | 1054.1 | 1088.6 | 1185.5 | 1361.1 | 1508.4 | *1430.7* | 1417.7 | 1187.9 |
| 27.5° | 1127.5 | 1127.5 | 1133.2 | 1123.6 | 1137.5 | 1225.3 | 1436.4 | 1674.4 | *1597.6* | 1579.4 | 1292.0 |
| 30° | 1220.1 | 1219.6 | 1233.0 | 1217.7 | 1222.0 | 1288.2 | 1517.5 | 1855.3 | *1799.1* | 1776.6 | 1412.0 |
| 32.5° | 1345.8 | 1342.9 | 1358.2 | 1337.1 | 1322.7 | 1383.2 | 1616.3 | 2044.3 | *2040.5* | 2005.9 | 1562.6 |
| 35° | 1504.6 | 1499.8 | 1504.6 | 1483.9 | 1458.0 | 1516.1 | 1745.9 | 2232.8 | *2308.2* | 2271.7 | 1742.0 |
| 37.5° | 1662.4 | 1677.8 | 1683.0 | 1647.5 | 1626.4 | 1684.5 | 1901.8 | 2401.7 | *2563.9* | 2526.0 | 1928.7 |
| 40° | 1848.6 | 1843.8 | 1862.0 | 1822.2 | 1808.7 | 1873.0 | 2054.4 | 2527.4 | *2766.4* | 2730.4 | 2094.7 |
| 42.5° | 1985.8 | 1994.4 | 2017.0 | 1994.9 | 1984.3 | 2044.8 | 2182.5 | 2600.8 | *2906.9* | 2871.4 | 2213.2 |
| 45° | 2150.3 | 2156.6 | 2165.2 | 2147.0 | 2135.9 | 2195.4 | 2275.1 | 2633.0 | *3013.9* | 2975.5 | 2292.8 |
| 47.5° | 2328.3 | 2333.1 | 2333.1 | 2295.7 | 2260.2 | 2284.7 | 2337.0 | 2651.2 | *3112.3* | 3075.3 | 2351.8 |
| 50° | 2455.9 | 2458.3 | 2479.4 | 2453.1 | 2375.8 | 2337.9 | 2365.3 | 2669.0 | *3177.5* | 3143.0 | 2371.0 |
| 52.5° | 2342.7 | 2339.8 | 2409.4 | 2464.1 | 2484.7 | 2409.4 | 2414.2 | 2694.9 | *3209.2* | 3179.4 | 2386.4 |
| 55° | 1972.8 | 1968.0 | 2065.9 | 2198.8 | 2380.6 | 2477.0 | 2473.2 | 2710.2 | *3244.2* | 3226.0 | 2442.0 |
| 57.5° | *1430.2* | *1422.0* | *1558.3* | *1706.1* | *1944.5* | *2206.0* | *2359.5* | *2701.6* | *3259.6* | *3258.1* | *2506.8* |
| 60° | 859.7 | 853.0 | 981.6 | 1137.1 | 1321.3 | 1584.2 | 1839.0 | 2420.0 | *3054.2* | 3057.1 | 2338.4 |
| 62.5° | 529.2 | 535.4 | 651.5 | 730.7 | 799.3 | 878.5 | 1025.7 | 1627.9 | *2262.6* | 2281.3 | 1643.2 |
| 65° | 356.0 | 360.8 | 468.3 | 568.0 | 568.0 | 464.4 | 398.7 | 778.2 | *1207.1* | 1175.4 | 777.2 |
| 67.5° | 238.9 | 244.2 | 329.1 | 445.7 | 462.5 | 323.8 | 161.7 | 232.2 | *336.3* | 326.2 | 192.4 |
| 70° | 140.6 | 146.3 | 219.3 | 305.6 | 336.8 | 225.5 | 107.9 | 98.4 | *95.5* | 92.6 | 74.8 |
| 72.5° | 62.8 | 65.2 | 111.8 | 155.4 | 142.0 | 95.0 | 76.3 | 78.7 | *74.4* | 72.9 | 60.9 |
| 75° | 19.2 | 20.2 | 28.8 | 33.6 | 34.1 | 34.1 | 46.1 | 61.9 | *58.5* | 59.0 | 47.0 |
| 77.5° | 4.8 | 4.8 | 7.7 | 7.2 | 3.8 | 3.4 | 8.6 | 13.9 | *14.4* | 13.0 | 9.6 |
| 80° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.5 | 0.5 | 0.5 | *0.5* | 0.5 | 0.5 |
| 82.5° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | *0.0* | 0.0 | 0.0 |
| 85° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | *0.0* | 0.0 | 0.0 |
| 87.5° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 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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Scaled Data Report

REPORT NUMBER: P631558
CATALOG NUMBER: GWS-SA1F-830-U-T2-W-GRSBK

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 663.0 | 663.0 | 663.0 | 663.0 | 663.0 | 663.0 | 663.0 | 663.0 | 663.0 | 663.0 | 663.0 |
| 2.5° | 672.2 | 659.7 | 651.5 | 640.0 | 631.9 | 623.2 | 615.5 | 609.3 | 605.9 | 605.0 | 605.5 |
| 5° | 687.5 | 667.8 | 648.6 | 626.6 | 611.2 | 596.8 | 585.3 | 576.2 | 571.9 | 570.4 | 570.4 |
| 7.5° | 711.0 | 683.7 | 649.6 | 615.1 | 589.2 | 566.6 | 553.2 | 543.1 | 539.3 | 538.3 | 535.4 |
| 10° | 741.7 | 704.3 | 648.2 | 594.4 | 558.0 | 534.5 | 524.9 | 522.0 | 523.4 | 523.9 | 523.4 |
| 12.5° | 778.7 | 725.9 | 639.1 | 564.2 | 524.9 | 510.5 | 511.4 | 519.1 | 527.7 | 532.1 | 533.0 |
| 15° | 818.0 | 745.6 | 618.4 | 528.2 | 496.6 | 496.1 | 510.0 | 527.7 | 544.5 | 551.7 | 553.7 |
| 17.5° | 862.1 | 761.4 | 586.8 | 489.8 | 472.1 | 486.0 | 511.0 | 538.3 | 560.9 | 572.8 | 575.2 |
| 20° | 910.6 | 774.3 | 546.5 | 453.9 | 450.5 | 475.5 | 510.0 | 543.6 | 571.4 | 584.8 | 587.2 |
| 22.5° | 961.0 | 783.5 | 499.9 | 420.8 | 430.8 | 463.5 | 500.9 | 533.5 | 559.9 | 575.2 | 577.2 |
| 25° | 1018.6 | 784.4 | 452.4 | 392.9 | 412.6 | 447.1 | 478.8 | 505.7 | 527.7 | 541.2 | 542.6 |
| 27.5° | 1068.9 | 772.9 | 410.2 | 370.4 | 395.8 | 427.0 | 448.1 | 463.0 | 478.3 | 486.0 | 486.5 |
| 30° | 1127.0 | 752.8 | 370.4 | 352.2 | 378.5 | 402.0 | 412.6 | 416.0 | 417.4 | 418.8 | 416.9 |
| 32.5° | 1196.1 | 728.3 | 340.6 | 334.4 | 358.9 | 374.7 | 377.6 | 370.9 | 362.7 | 351.2 | 348.3 |
| 35° | 1281.0 | 706.2 | 316.2 | 317.1 | 337.3 | 346.9 | 344.5 | 330.1 | 314.2 | 300.3 | 297.9 |
| 37.5° | 1373.1 | 687.5 | 297.5 | 300.3 | 313.8 | 320.5 | 313.3 | 297.5 | 290.3 | 278.3 | 278.7 |
| 40° | 1454.7 | 672.2 | 280.7 | 283.5 | 289.8 | 296.0 | 284.5 | 273.9 | 287.4 | 286.4 | 287.4 |
| 42.5° | 1512.7 | 659.2 | 266.3 | 264.8 | 269.2 | 273.5 | 264.8 | 259.6 | 282.1 | 275.9 | 279.2 |
| 45° | 1546.8 | 647.2 | 254.3 | 245.6 | 252.4 | 260.0 | 254.3 | 247.6 | 255.2 | 226.5 | 224.1 |
| 47.5° | 1569.8 | 640.5 | 243.7 | 226.9 | 238.9 | 252.4 | 240.4 | 224.1 | 213.0 | 188.1 | 186.2 |
| 50° | 1572.2 | 637.1 | 231.2 | 207.7 | 223.1 | 237.5 | 223.6 | 201.0 | 185.2 | 174.2 | 172.7 |
| 52.5° | 1584.7 | 643.9 | 214.0 | 183.3 | 200.1 | 223.1 | 213.5 | 190.9 | 169.4 | 159.8 | 157.8 |
| 55° | 1640.3 | 672.2 | 185.2 | 149.7 | 174.2 | 212.1 | 205.3 | 170.3 | 149.7 | 143.9 | 142.5 |
| 57.5° | *1697.9* | *677.9* | *145.8* | *118.5* | *151.6* | *196.2* | *187.6* | *156.9* | *136.7* | *130.0* | *128.6* |
| 60° | 1552.5 | 558.5 | 109.4 | 97.9 | 133.9 | 181.4 | 173.7 | 148.7 | 125.2 | 117.1 | 115.6 |
| 62.5° | 1020.0 | 301.8 | 86.8 | 83.0 | 112.7 | 153.5 | 158.3 | 134.3 | 111.8 | 103.2 | 102.7 |
| 65° | 470.2 | 140.1 | 66.7 | 65.7 | 88.3 | 122.3 | 136.3 | 117.5 | 94.5 | 86.8 | 86.8 |
| 67.5° | 128.1 | 69.6 | 52.3 | 48.5 | 60.0 | 82.0 | 99.3 | 87.8 | 67.2 | 58.1 | 57.6 |
| 70° | 63.8 | 56.1 | 47.0 | 41.7 | 43.2 | 50.9 | 58.5 | 48.9 | 34.1 | 27.8 | 27.3 |
| 72.5° | 52.3 | 46.1 | 39.8 | 35.5 | 32.6 | 31.2 | 30.2 | 24.5 | 15.8 | 12.0 | 11.5 |
| 75° | 38.9 | 33.1 | 28.3 | 23.0 | 19.7 | 18.2 | 16.3 | 12.0 | 6.7 | 3.8 | 3.4 |
| 77.5° | 8.6 | 8.2 | 7.7 | 5.8 | 5.3 | 4.3 | 3.4 | 2.4 | 1.0 | 0.0 | 0.0 |
| 80° | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 82.5° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 85° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 87.5° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 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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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

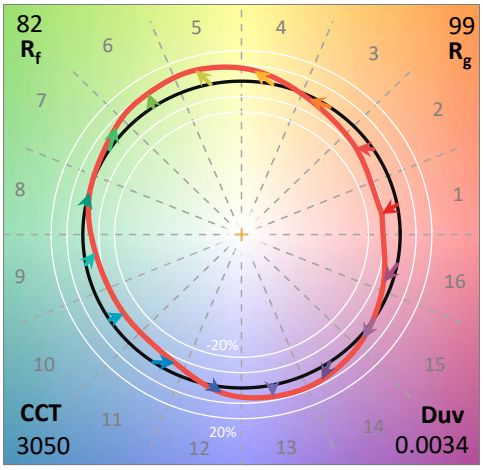
## Test Information

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

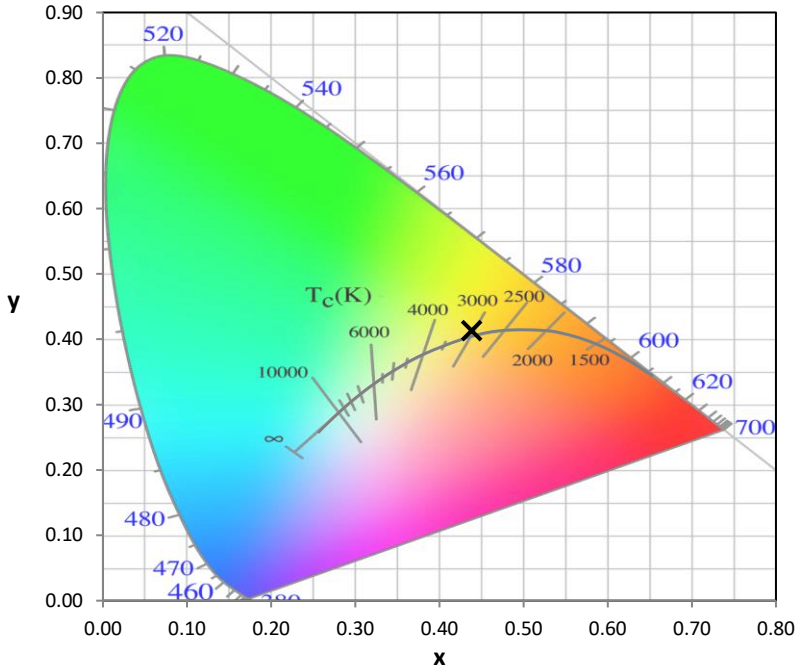
| | |
|---|---|
| Stabilization Time: | 20M |
| Operation Time: | 1H 20M |
| Sphere Temperature (°C): | 24.2 |

REPORT NUMBER: SP1-2408-195-9

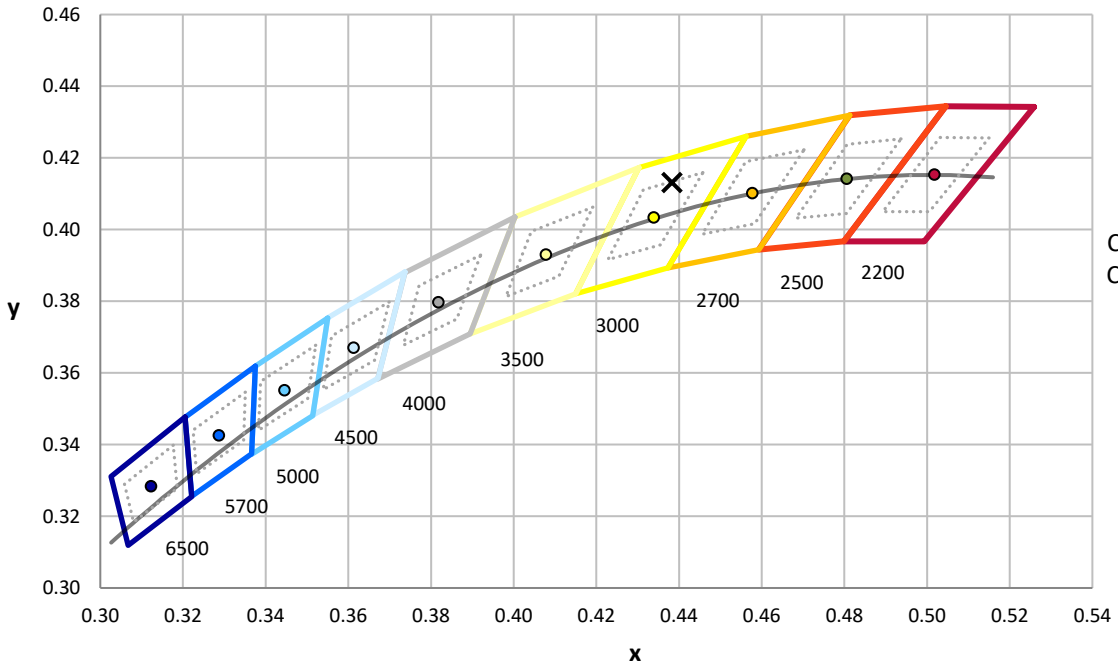
| Measurement and Test Equipment | | | |
|---|---|---|---|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 6/18/2024 | 12/18/2024 |
| Power Meter | INXT2011004 | 2/8/2024 | 2/8/2025 |
| AC Power Source | IN0063 | 10/24/2023 | 10/24/2024 |
| DC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

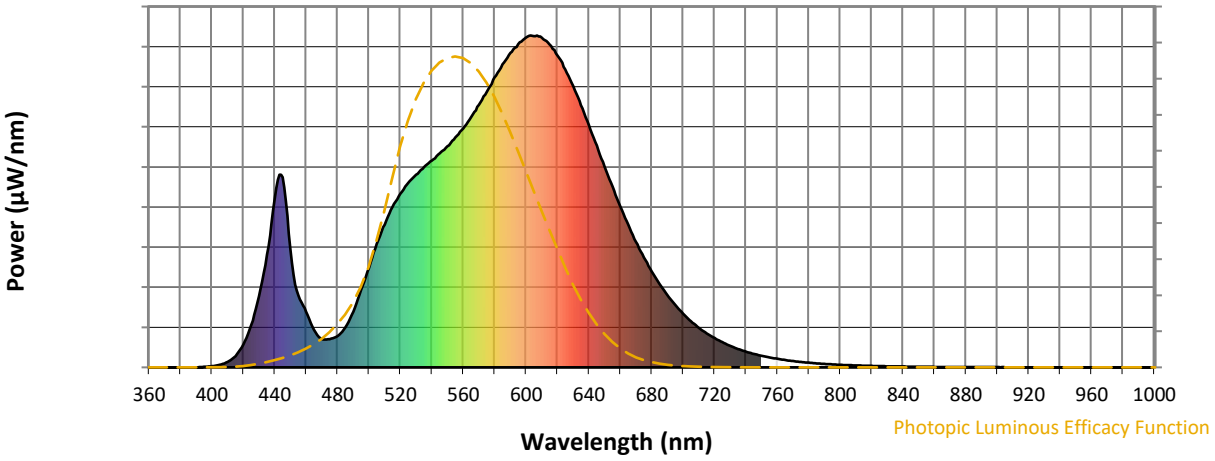



CCT = 3050K
CIE x = 0.4383
CIE y = 0.4131
Duv = 0.0034

Point lies inside the ANSI 3000K 4-step quadrangle

REPORT NUMBER: SP1-2408-195-9

## Photopic Flux vs. Wavelength

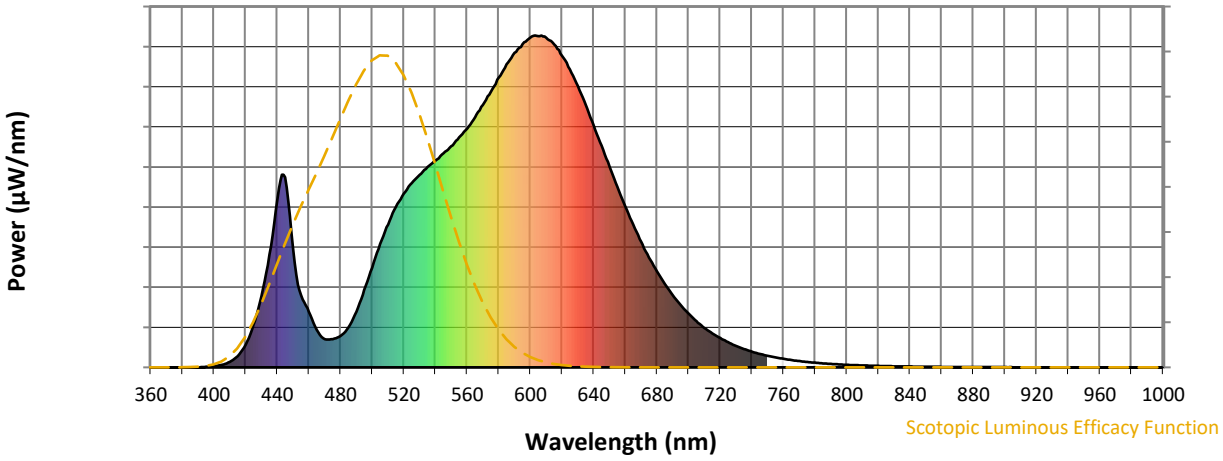



## Photopic Lumens: NR

| 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 | | | |

REPORT NUMBER: SP1-2408-195-9

## Scotopic Flux vs. Wavelength

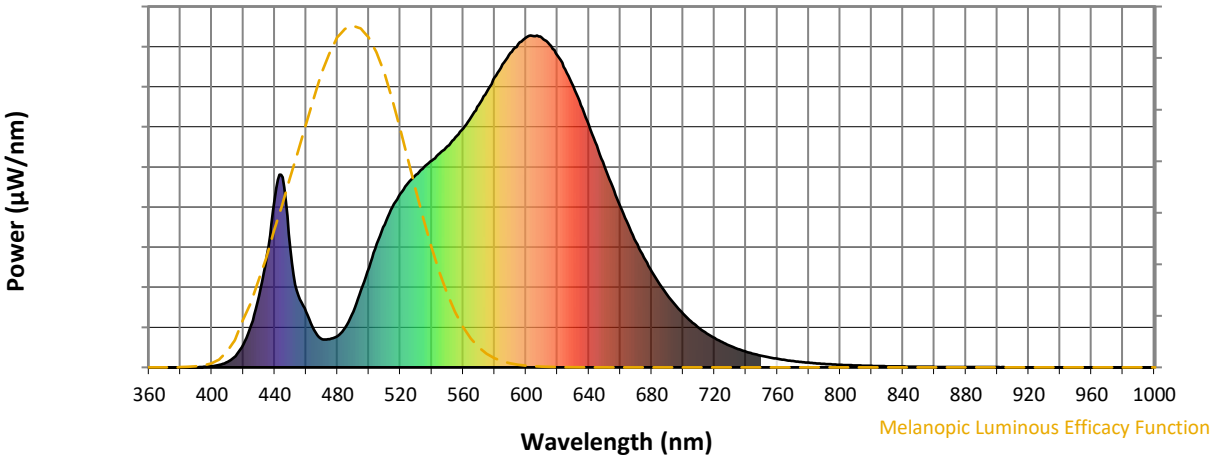



**Scotopic Lumens: NR** **S/P: 1.27**

| 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 | | | |

REPORT NUMBER: SP1-2408-195-9

## 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 | | | |

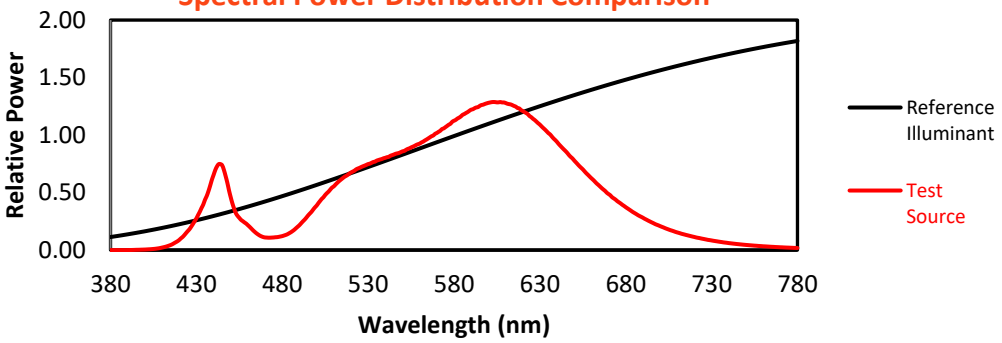
REPORT NUMBER: SP1-2408-195-9

# TM-30-18

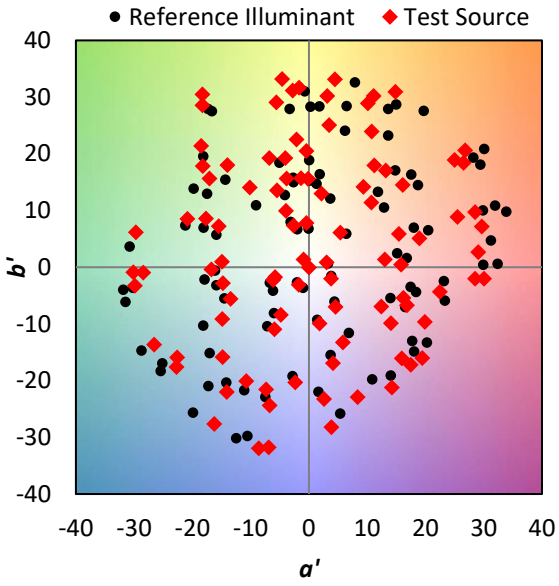
## Summary

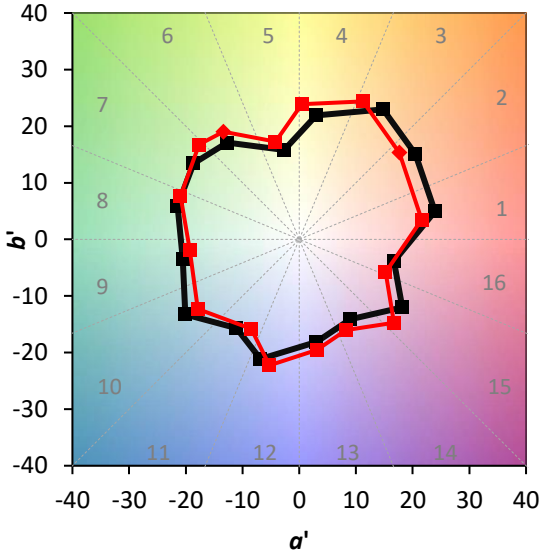
$R_f$ = 81.5
$R_g$ = 99.2
CIE $R_a$ = 81.0
$R_9$ = 7.1

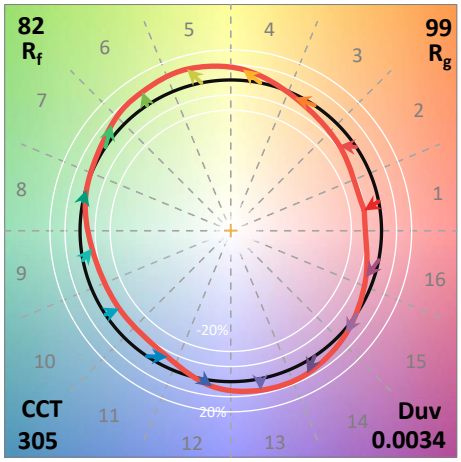
## Spectral Power Distribution Comparison

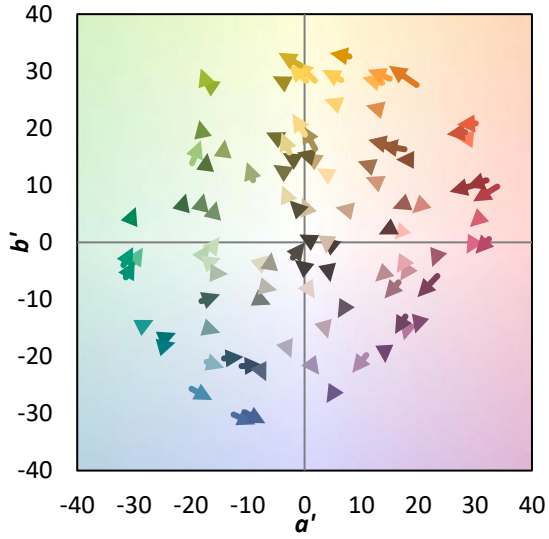



## Color Vector Graphics



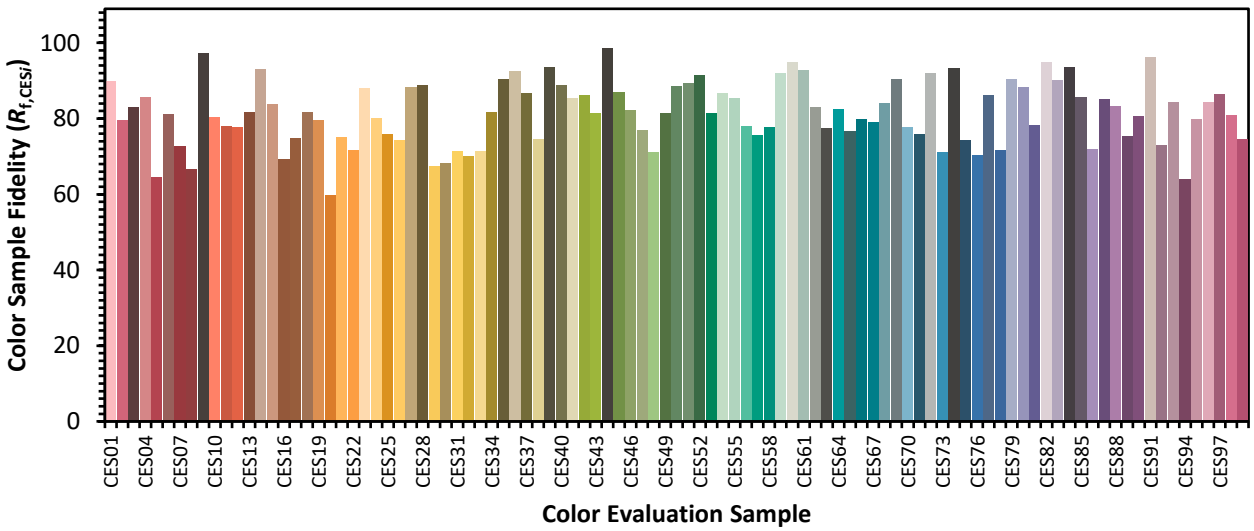



REPORT NUMBER: SP1-2408-195-9

# TM-30-18

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

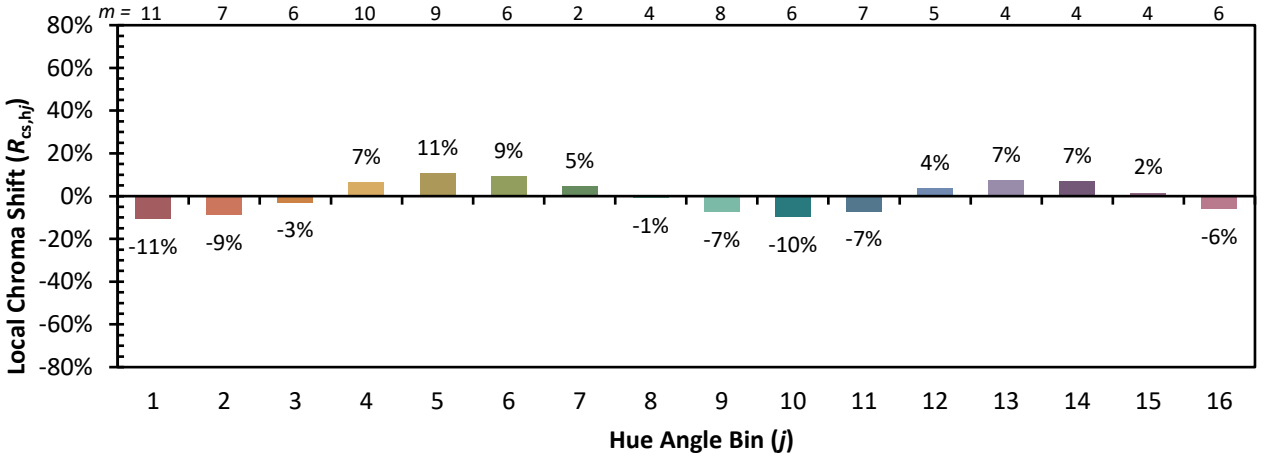
| | | | |
|---|---|---|---|
| CES01 = 86 | CES26 = 74 | CES51 = 89 | CES76 = 70 |
| CES02 = 63 | CES27 = 88 | CES52 = 92 | CES77 = 86 |
| CES03 = 31 | CES28 = 89 | CES53 = 81 | CES78 = 72 |
| CES04 = 70 | CES29 = 67 | CES54 = 87 | CES79 = 90 |
| CES05 = 50 | CES30 = 68 | CES55 = 85 | CES80 = 88 |
| CES06 = 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 | |

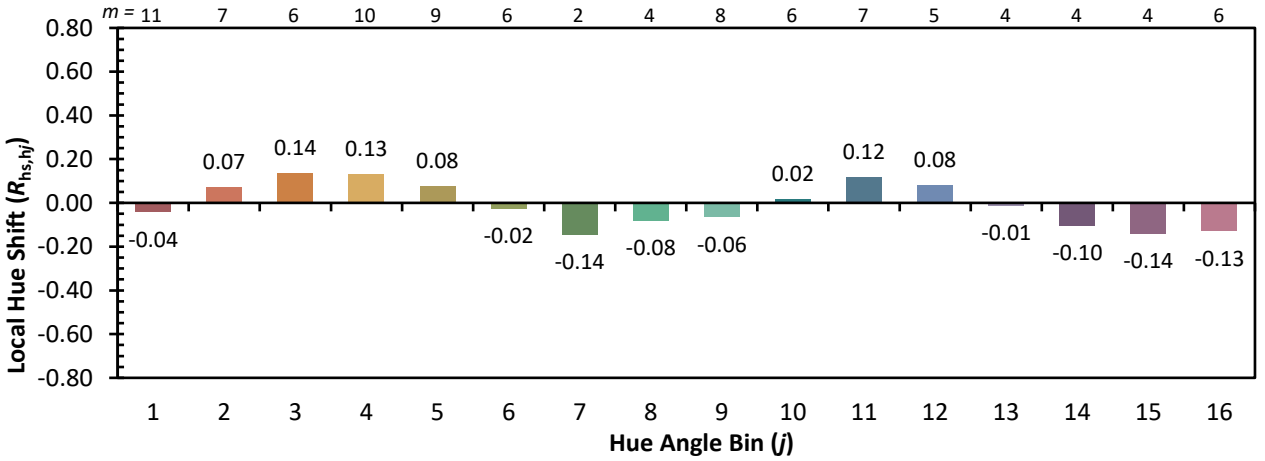


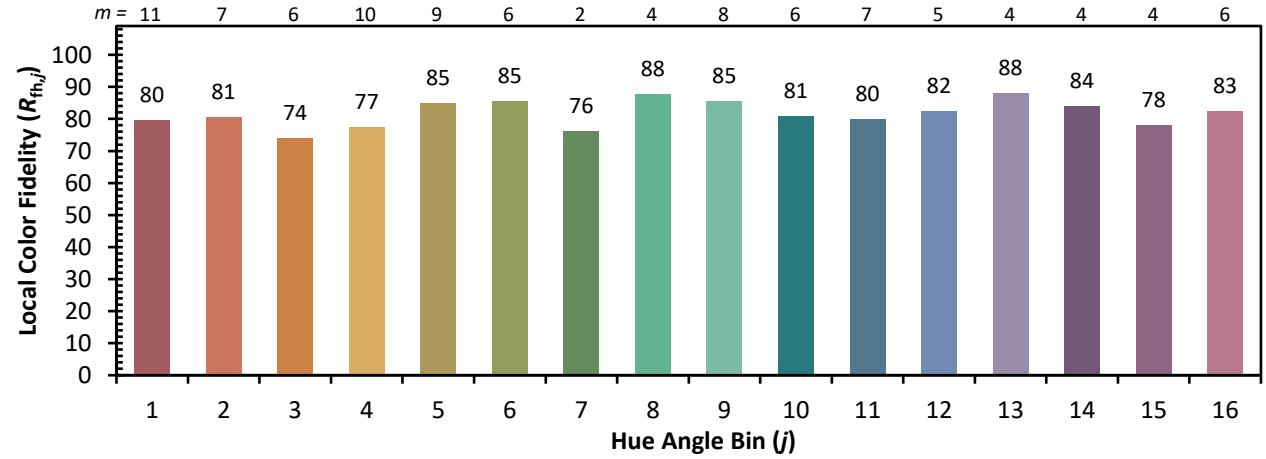
REPORT NUMBER: SP1-2408-195-9

# TM-30-18

## Color Rendition by Hue-Angle Bin



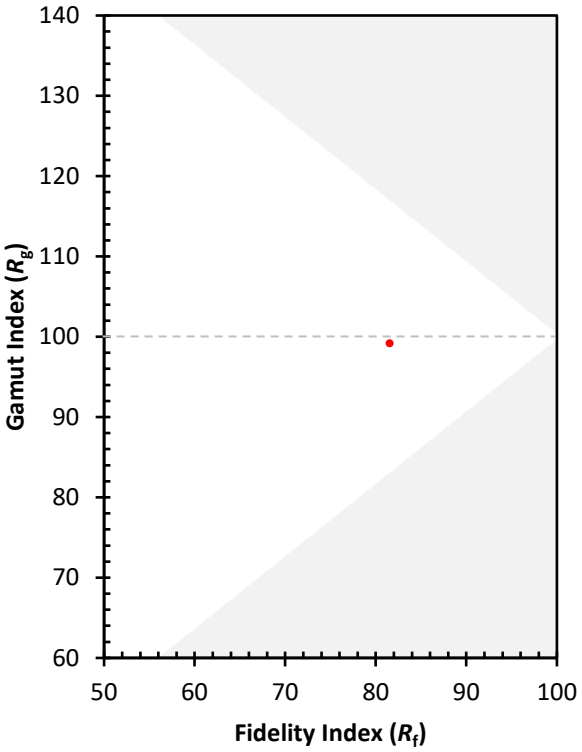



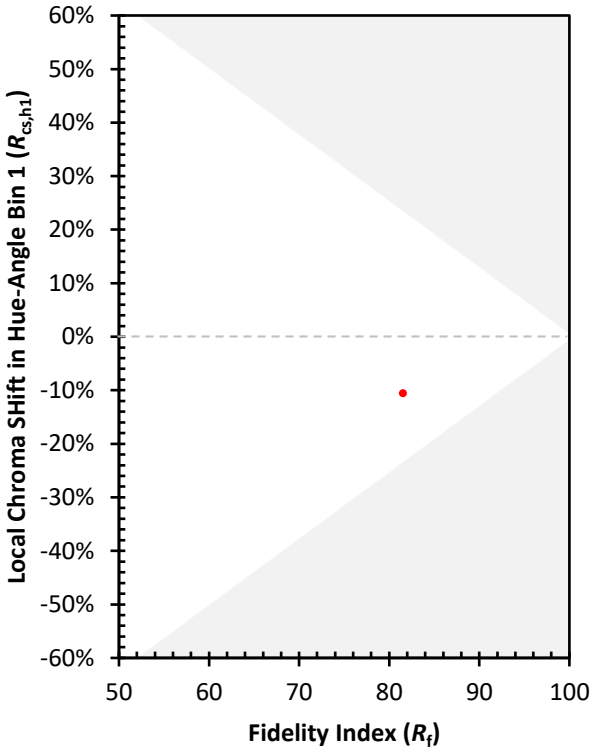



REPORT NUMBER: SP1-2408-195-9

# TM-30-18

## Measure Comparisons

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