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: P631572

Luminaire Tested: GWS-SA1F-830-U-T3R-W-HSS

Issue Date: 1/10/2023

Report Generated By 670246102 / DESKTOP-G35701P

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

Scaled Data Report

**Test Information**

| | |
|---|---|
| Test Method: | LM-79-2019 |
| Report Number: | P631572 |
| | TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-18) |
| Test Lab: | COOPER LIGHTING SOLUTIONS |
| Issue Date: | 1/10/2023 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS |
| Product Line: | McGRAW-EDISON |
| Catalog Number: | GWS-SA1F-830-U-T3R-W-HSS |
| Description: | GALLEON WALL SLIM LUMINAIRE. (1) LIGHTSQUARES WITH 16 LEDS EACH AND TYPE III ROADWAY OPTICS WITH HOUSE SIDE SHIELD |
| Light Source: | (16) 3000K CCT, 80 CRI LEDS |
| Ballast/Driver: | - |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 5239.2 lumens |
| Efficiency: | N/A |
| Efficacy: | 78.0 lumens/watt |
| Luminous Opening: | Rectangular (W 0.5' x L: 0.5' x H: 0') |
| IES Classification: | Type III - Medium |
| BUG Rating: | B1 - U0 - G2 |

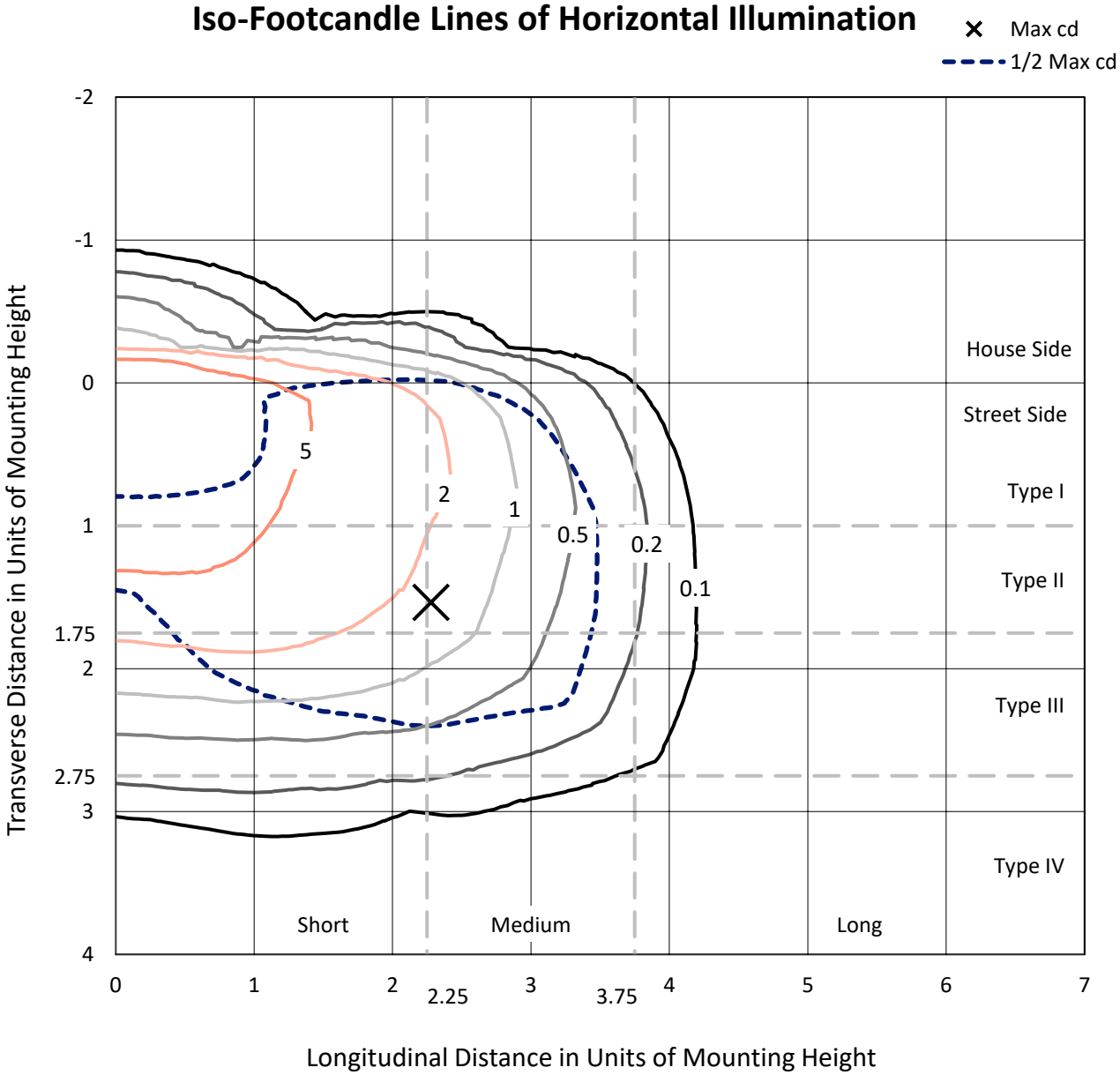
| | |
|---|---|
| Input Watts (W): | 67.2 |
| Input Voltage (V): | 120 |
| Input Current (Ain): | NR |
| Voltage Rise (V): | NR |
| Power Factor: | NR |
| Total Harmonic Distortion (THDi): | NR |
| Frequency (hertz): | 0 |
| Stabilization Time: | NR |
| Operation Time: | NR |
| Ambient Temperature (°C): | NR |
| Test Distance: | 28.75 FT |

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

Scaled Data Report

REPORT NUMBER: P631572
CATALOG NUMBER: GWS-SA1F-830-U-T3R-W-HSS

## Iso-Footcandle Lines of Horizontal Illumination



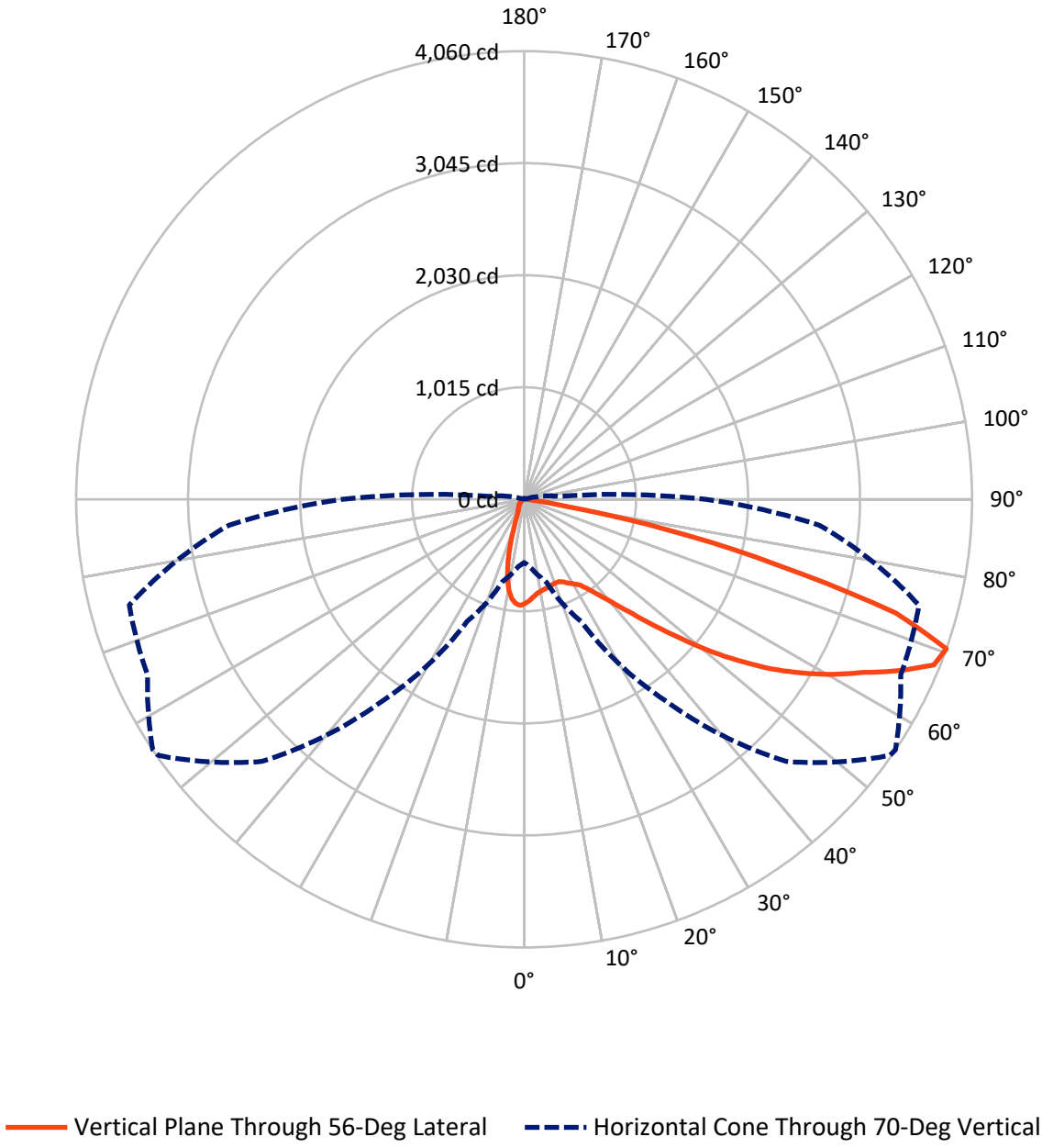

Based on 10 foot mounting height. Maximum calculated value = 10 fc
Type III - Medium - N/A

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

Scaled Data Report

REPORT NUMBER: P631572
CATALOG NUMBER: GWS-SA1F-830-U-T3R-W-HSS

## Luminous Intensity Polar Plot



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

Scaled Data Report

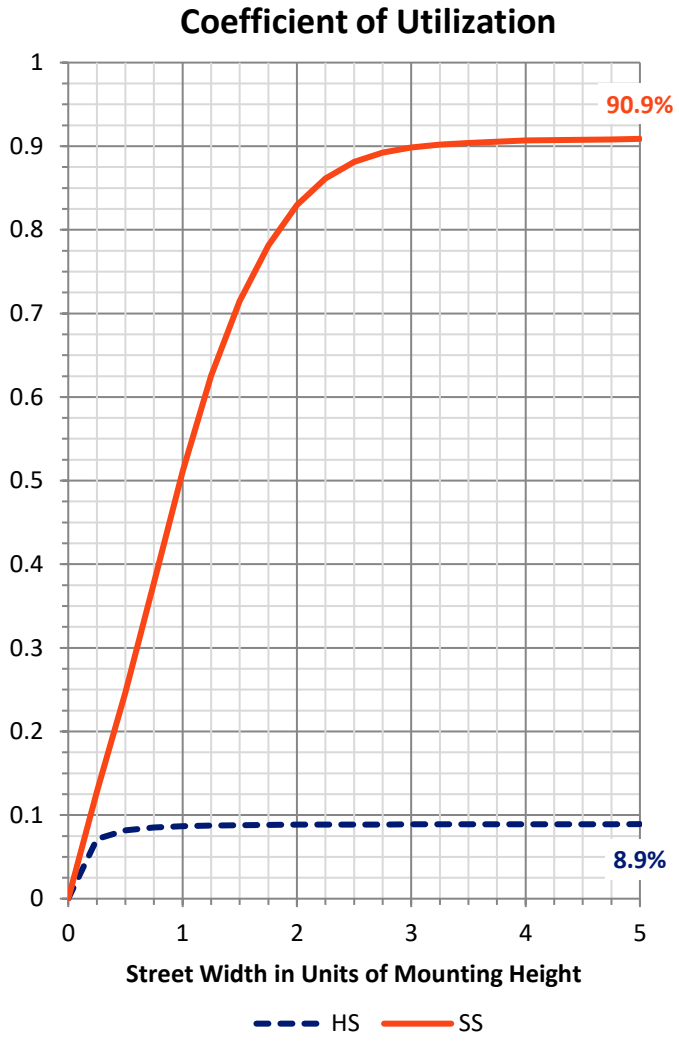
REPORT NUMBER: P631572
CATALOG NUMBER: GWS-SA1F-830-U-T3R-W-HSS

**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 470.6 | 0.0 | 470.6 |
| | % Fixture | 9.0 | 0.0 | 9.0 |
| **Street Side** | Lumens | 4768.6 | 0.0 | 4768.6 |
| | % Fixture | 91.0 | 0.0 | 91.0 |
| **Total** | Lumens | 5239.2 | 0.0 | 5239.2 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 81.1 | 1.5 |
| 10°-20° | 182.4 | 3.5 |
| 20°-30° | 289.0 | 5.5 |
| 30°-40° | 498.3 | 9.5 |
| 40°-50° | 841.5 | 16.1 |
| 50°-60° | 1236.4 | 23.6 |
| 60°-70° | 1465.8 | 28.0 |
| 70°-80° | 625.1 | 11.9 |
| 80°-90° | 19.6 | 0.4 |
| 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° | 5239.2 | 100.0 |
| 0°-180° | 5239.2 | 100.0 |



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

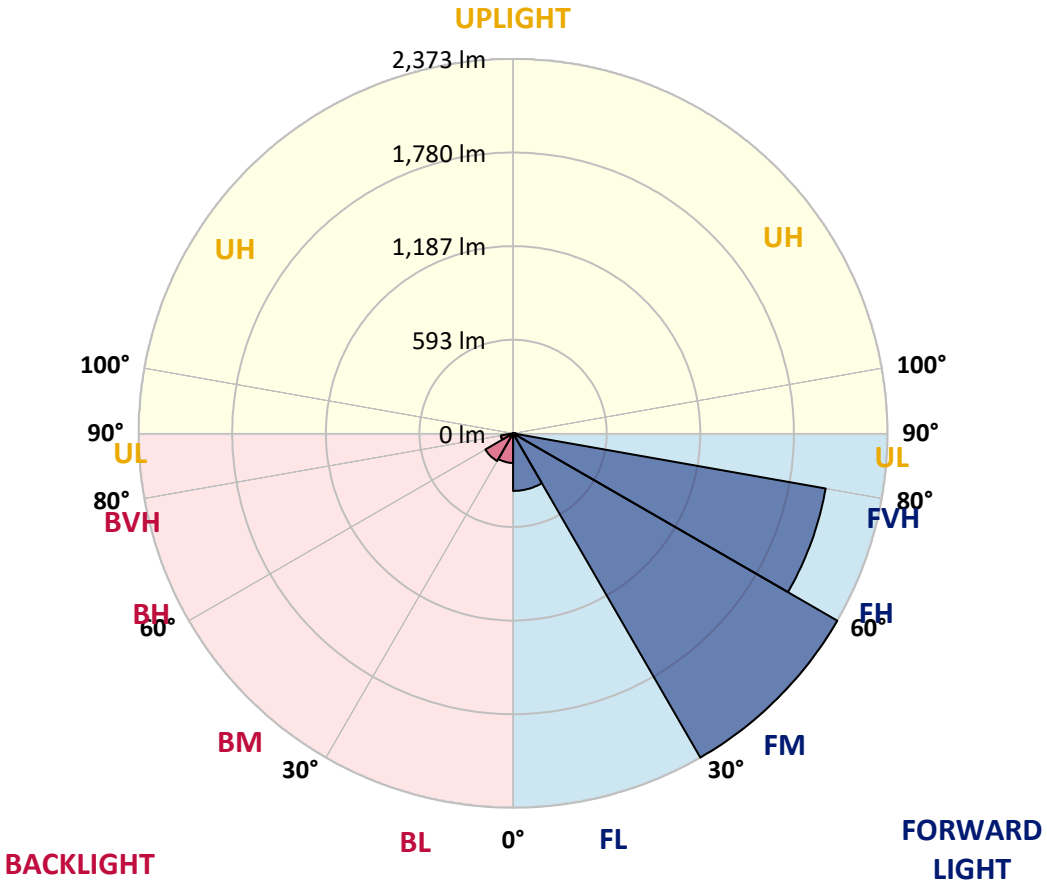
Scaled Data Report

REPORT NUMBER: P631572
CATALOG NUMBER: GWS-SA1F-830-U-T3R-W-HSS

## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 365.1 | 7.0 | | | |
| FM | (30°-60°) | 2373.5 | 45.3 | | | |
| FH | (60°-80°) | 2012.4 | 38.4 | | | G2/5000 |
| FVH | (80°-90°) | 17.6 | 0.3 | | | G1/100 |
| BL | (0°-30°) | 187.4 | 3.6 | B1/500 | | |
| BM | (30°-60°) | 202.7 | 3.9 | B0/220 | | |
| BH | (60°-80°) | 78.5 | 1.5 | B0/110 | | G0/110 |
| BVH | (80°-90°) | 2.0 | 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-G2**
Type III Medium



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

Scaled Data Report

REPORT NUMBER: P631572
CATALOG NUMBER: GWS-SA1F-830-U-T3R-W-HSS

**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 15° | 25° | 35° | 45° | 55° | 56° | 65° | 75° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 944.7 | 944.7 | 944.7 | 944.7 | 944.7 | 944.7 | 944.7 | 944.7 | 944.7 | 944.7 | 944.7 |
| 2.5° | 879.4 | 878.0 | 879.0 | 886.1 | 899.6 | 905.8 | 916.4 | 918.3 | 926.9 | 938.0 | 942.3 |
| 5° | 822.3 | 817.5 | 819.9 | 830.0 | 845.4 | 862.6 | 882.3 | 887.6 | 909.2 | 933.6 | 951.9 |
| 7.5° | 770.0 | 764.8 | 770.5 | 786.4 | 807.9 | 826.7 | 855.9 | 859.3 | 893.8 | 937.0 | 970.1 |
| 10° | 688.0 | 689.4 | 701.0 | 728.8 | 761.9 | 800.7 | 840.1 | 844.9 | 887.6 | 948.0 | 999.4 |
| 12.5° | 625.1 | 621.8 | 634.3 | 665.9 | 712.5 | 769.1 | 828.1 | 834.3 | 888.1 | 964.8 | 1036.8 |
| 15° | 595.9 | 594.9 | 600.2 | 623.2 | 668.3 | 735.0 | 817.1 | 825.2 | 894.3 | 980.2 | 1072.3 |
| 17.5° | 596.8 | 595.4 | 594.9 | 608.4 | 641.9 | 709.6 | 805.1 | 815.6 | 899.6 | 997.0 | 1109.7 |
| 20° | 638.6 | 631.9 | 619.9 | 613.6 | 633.8 | 693.3 | 796.9 | 808.9 | 907.3 | 1014.7 | 1149.5 |
| 22.5° | 725.9 | 728.3 | 696.2 | 662.6 | 653.0 | 695.2 | 795.9 | 809.9 | 924.1 | 1042.6 | 1198.5 |
| 25° | 900.5 | 896.7 | 837.2 | 761.9 | 709.6 | 717.3 | 812.7 | 829.5 | 957.2 | 1082.4 | 1244.5 |
| 27.5° | 1119.3 | 1122.7 | 1041.1 | 921.2 | 811.8 | 762.8 | 843.4 | 860.2 | 995.5 | 1107.3 | 1275.2 |
| 30° | 1357.8 | 1354.4 | 1267.1 | 1134.2 | 956.7 | 838.6 | 874.2 | 889.0 | 1014.7 | 1120.8 | 1306.9 |
| 32.5° | 1583.3 | 1575.6 | 1489.2 | 1350.1 | 1141.4 | 958.1 | 916.4 | 925.0 | 1040.2 | 1150.0 | 1349.6 |
| 35° | 1775.7 | 1775.2 | 1699.8 | 1551.6 | 1331.4 | 1107.8 | 988.8 | 996.0 | 1087.7 | 1196.6 | 1412.5 |
| 37.5° | 1974.3 | 1967.6 | 1883.1 | 1747.8 | 1526.6 | 1271.9 | 1099.6 | 1096.8 | 1162.5 | 1265.2 | 1489.7 |
| 40° | 2137.4 | 2133.1 | 2068.3 | 1938.3 | 1729.6 | 1453.2 | 1234.0 | 1225.3 | 1251.3 | 1360.2 | 1597.2 |
| 42.5° | 2258.3 | 2258.8 | 2238.6 | 2159.5 | 1944.5 | 1662.9 | 1402.9 | 1389.4 | 1389.0 | 1503.6 | 1739.2 |
| 45° | 2349.9 | 2356.2 | 2386.4 | 2374.4 | 2198.3 | 1907.1 | 1619.2 | 1605.3 | 1581.8 | 1689.8 | 1901.8 |
| 47.5° | 2392.6 | 2400.8 | 2492.0 | 2539.9 | 2420.5 | 2149.4 | 1876.9 | 1847.6 | 1801.6 | 1937.3 | 2083.7 |
| 50° | 2388.3 | 2402.7 | 2529.9 | 2675.7 | 2622.0 | 2395.0 | 2157.6 | 2143.6 | 2068.3 | 2199.3 | 2263.6 |
| 52.5° | 2290.5 | 2321.2 | 2532.3 | 2758.2 | 2776.9 | 2621.5 | 2447.8 | 2421.9 | 2385.5 | 2472.8 | 2432.5 |
| 55° | 2024.7 | 2062.1 | 2431.0 | 2784.6 | 2897.9 | 2819.2 | 2731.8 | 2710.7 | 2650.3 | 2730.9 | 2579.8 |
| 57.5° | 1880.2 | 1912.4 | 2218.0 | 2771.7 | 3000.5 | 3002.0 | 2984.7 | 2967.4 | 2917.5 | 2986.1 | 2752.5 |
| 60° | 1793.4 | 1825.6 | 2104.3 | 2724.2 | 3093.6 | 3194.8 | 3222.2 | 3220.3 | 3148.3 | 3276.4 | 2954.9 |
| 62.5° | 1666.3 | 1710.4 | 1985.8 | 2600.9 | 3159.8 | 3384.8 | 3467.3 | 3454.4 | 3374.3 | 3578.7 | 3155.5 |
| 65° | 1409.6 | 1448.0 | 1743.0 | 2397.4 | 3120.9 | 3542.2 | 3733.1 | 3739.9 | 3647.3 | 3863.2 | 3313.8 |
| 67.5° | 988.3 | 1016.6 | 1309.8 | 1970.4 | 2857.1 | 3594.0 | 4005.2 | 4004.7 | 3846.9 | 4009.0 | 3243.8 |
| 70° | 572.9 | 611.7 | 773.9 | 1218.2 | 2222.8 | 3358.4 | 4046.0 | 4059.9 | 3765.8 | 3704.4 | 2684.4 |
| 72.5° | 221.7 | 253.8 | 438.5 | 647.2 | 1159.1 | 2572.6 | 3480.3 | 3521.1 | 3151.7 | 2857.6 | 1868.3 |
| 75° | 66.2 | 73.9 | 206.3 | 344.5 | 465.4 | 1242.6 | 2356.2 | 2367.7 | 2161.9 | 1782.4 | 957.6 |
| 77.5° | 49.4 | 54.7 | 90.2 | 174.2 | 163.1 | 376.6 | 1219.1 | 1331.4 | 1147.6 | 636.7 | 263.9 |
| 80° | 33.6 | 39.8 | 64.3 | 84.9 | 60.5 | 100.3 | 342.6 | 376.1 | 350.2 | 143.0 | 66.2 |
| 82.5° | 14.9 | 19.2 | 45.6 | 42.7 | 22.1 | 28.8 | 105.6 | 112.3 | 72.4 | 43.2 | 23.0 |
| 85° | 1.4 | 1.9 | 17.3 | 18.7 | 8.2 | 6.7 | 22.1 | 22.1 | 15.8 | 14.9 | 9.6 |
| 87.5° | 0.0 | 0.0 | 0.5 | 1.0 | 1.0 | 1.4 | 1.9 | 2.4 | 2.9 | 3.8 | 4.8 |
| 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
1121 Highway 74 South
Peachtree City, GA 30269

Scaled Data Report

REPORT NUMBER: P631572
CATALOG NUMBER: GWS-SA1F-830-U-T3R-W-HSS

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 944.7 | 944.7 | 944.7 | 944.7 | 944.7 | 944.7 | 944.7 | 944.7 | 944.7 | 944.7 | 944.7 |
| 2.5° | 953.3 | 947.6 | 954.8 | 960.5 | 962.0 | 951.4 | 945.2 | 936.0 | 934.1 | 934.6 | 932.2 |
| 5° | 966.3 | 963.4 | 968.7 | 962.4 | 946.1 | 915.4 | 889.0 | 859.8 | 843.9 | 834.8 | 833.9 |
| 7.5° | 990.3 | 988.8 | 983.1 | 954.8 | 903.9 | 835.8 | 770.0 | 705.8 | 665.9 | 651.5 | 649.1 |
| 10° | 1025.8 | 1022.9 | 999.4 | 932.2 | 823.8 | 692.8 | 582.4 | 490.3 | 434.2 | 417.9 | 397.7 |
| 12.5° | 1066.5 | 1060.8 | 1009.5 | 883.7 | 702.9 | 521.5 | 383.8 | 280.7 | 232.2 | 217.8 | 217.8 |
| 15° | 1105.9 | 1093.4 | 1003.7 | 803.6 | 554.1 | 339.2 | 214.5 | 162.2 | 147.3 | 143.5 | 143.5 |
| 17.5° | 1146.2 | 1122.2 | 981.1 | 694.2 | 382.9 | 200.5 | 143.0 | 132.9 | 131.0 | 131.5 | 131.9 |
| 20° | 1184.1 | 1146.7 | 941.3 | 562.8 | 244.2 | 140.1 | 128.1 | 125.7 | 124.7 | 125.7 | 125.2 |
| 22.5° | 1225.3 | 1169.2 | 880.9 | 419.3 | 158.8 | 126.2 | 121.9 | 119.9 | 119.0 | 120.4 | 120.4 |
| 25° | 1266.1 | 1185.5 | 800.7 | 282.1 | 126.2 | 117.5 | 115.1 | 113.2 | 112.3 | 112.7 | 112.7 |
| 27.5° | 1287.2 | 1179.3 | 695.7 | 179.9 | 113.2 | 108.9 | 106.5 | 104.1 | 102.7 | 102.2 | 102.7 |
| 30° | 1301.6 | 1160.1 | 567.1 | 128.1 | 102.7 | 97.4 | 95.0 | 93.1 | 89.2 | 86.8 | 87.8 |
| 32.5° | 1324.2 | 1140.9 | 427.5 | 107.5 | 94.0 | 85.9 | 82.0 | 77.2 | 72.0 | 69.6 | 69.6 |
| 35° | 1351.1 | 1114.5 | 299.9 | 96.9 | 84.9 | 76.3 | 69.1 | 60.9 | 54.7 | 52.8 | 52.8 |
| 37.5° | 1386.6 | 1089.6 | 199.6 | 89.7 | 77.2 | 68.1 | 58.1 | 48.5 | 41.7 | 40.8 | 40.3 |
| 40° | 1439.8 | 1068.5 | 140.6 | 84.4 | 70.5 | 59.5 | 47.5 | 37.4 | 32.6 | 31.2 | 31.2 |
| 42.5° | 1508.9 | 1046.9 | 111.3 | 79.2 | 64.8 | 51.3 | 37.9 | 29.7 | 25.9 | 24.9 | 24.5 |
| 45° | 1594.3 | 1021.4 | 96.9 | 74.4 | 59.0 | 42.7 | 30.2 | 24.9 | 22.1 | 21.1 | 21.1 |
| 47.5° | 1686.9 | 986.9 | 90.2 | 68.1 | 52.3 | 34.5 | 25.4 | 21.6 | 20.2 | 19.7 | 19.2 |
| 50° | 1778.1 | 940.4 | 84.4 | 62.4 | 44.6 | 28.3 | 22.1 | 19.7 | 18.7 | 18.2 | 18.2 |
| 52.5° | 1857.7 | 886.1 | 77.2 | 55.7 | 36.5 | 24.5 | 19.7 | 18.2 | 17.3 | 16.3 | 15.8 |
| 55° | 1925.8 | 827.1 | 68.1 | 48.0 | 29.7 | 21.6 | 18.2 | 16.8 | 15.8 | 14.9 | 14.4 |
| 57.5° | 2013.6 | 793.6 | 54.7 | 38.9 | 24.5 | 19.2 | 16.8 | 15.4 | 14.4 | 13.0 | 13.0 |
| 60° | 2111.0 | 769.1 | 40.8 | 30.7 | 21.1 | 17.8 | 15.4 | 13.9 | 13.0 | 11.5 | 11.5 |
| 62.5° | 2189.2 | 732.6 | 32.1 | 24.9 | 18.2 | 15.8 | 13.9 | 12.5 | 11.5 | 10.1 | 10.1 |
| 65° | 2219.0 | 657.3 | 26.4 | 19.7 | 14.9 | 13.9 | 12.5 | 11.5 | 10.1 | 8.6 | 8.6 |
| 67.5° | 2084.6 | 506.6 | 22.1 | 15.8 | 12.5 | 12.0 | 11.0 | 10.6 | 8.6 | 7.7 | 7.2 |
| 70° | *1650.9* | *309.0* | *18.2* | *13.0* | *10.6* | *10.1* | *10.1* | *9.1* | *7.7* | *7.2* | *6.7* |
| 72.5° | 1131.3 | 159.3 | 14.9 | 10.6 | 9.1 | 9.1 | 8.6 | 8.2 | 7.2 | 6.7 | 6.7 |
| 75° | 587.7 | 53.3 | 11.5 | 8.2 | 7.2 | 7.7 | 7.7 | 7.2 | 6.7 | 6.7 | 6.2 |
| 77.5° | 168.4 | 24.0 | 8.6 | 6.2 | 5.8 | 5.8 | 6.2 | 6.2 | 6.2 | 5.8 | 5.8 |
| 80° | 43.7 | 13.9 | 6.2 | 4.8 | 4.8 | 4.8 | 4.8 | 5.3 | 5.8 | 5.3 | 5.3 |
| 82.5° | 17.8 | 7.7 | 4.3 | 3.8 | 3.8 | 3.8 | 3.8 | 4.3 | 4.8 | 4.8 | 4.8 |
| 85° | 11.0 | 3.8 | 3.4 | 3.4 | 3.4 | 2.9 | 2.9 | 3.4 | 3.4 | 3.8 | 3.8 |
| 87.5° | 6.7 | 2.9 | 2.9 | 2.9 | 2.9 | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 |
| 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
1121 Highway 74 South
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

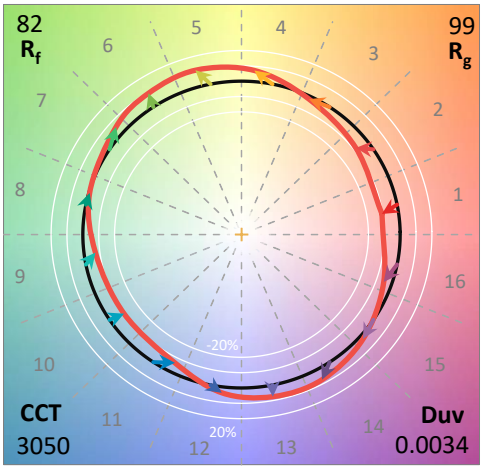
## Test Information

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

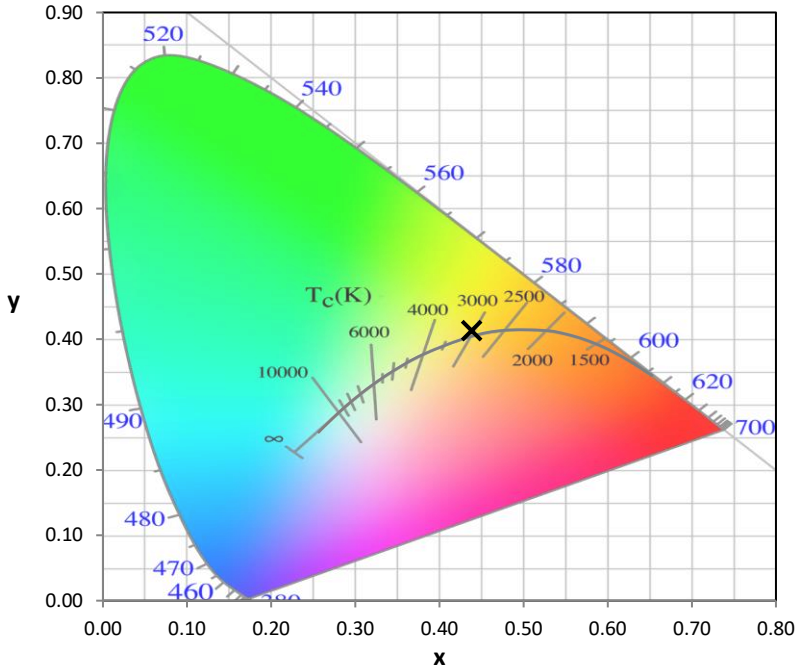
| | |
|---|---|
| Stabilization Time: | 20M |
| Operation Time: | 1H 20M |
| Sphere Temperature (°C): | 24.2 |

REPORT NUMBER: SP1-2408-195-9

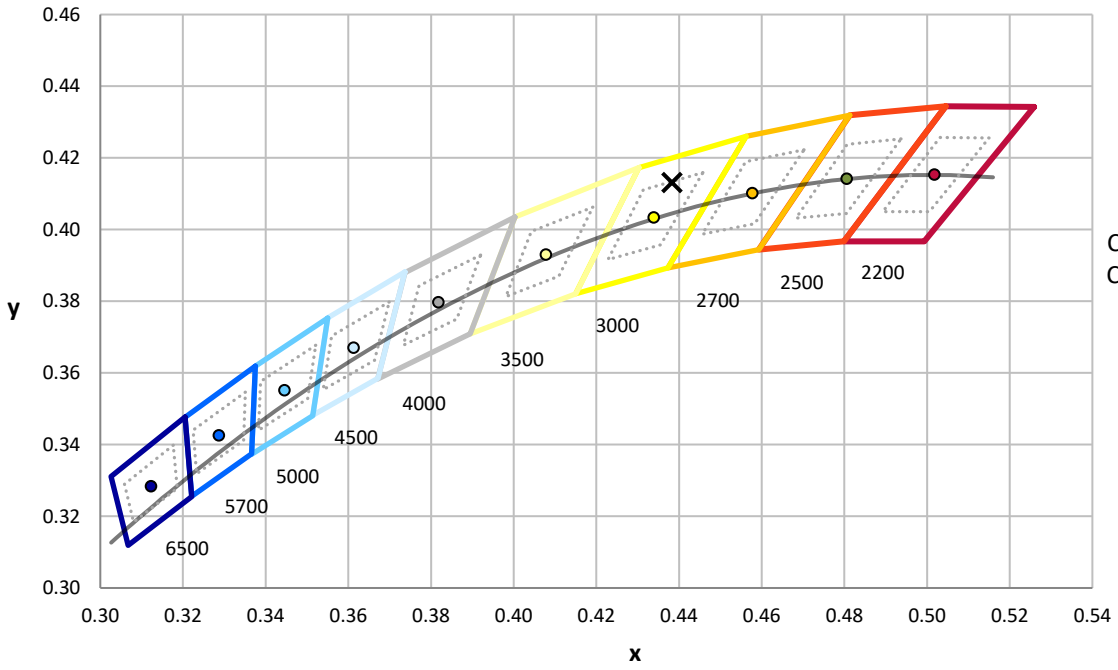
| Measurement and Test Equipment | | | |
|---|---|---|---|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 6/18/2024 | 12/18/2024 |
| Power Meter | INXT2011004 | 2/8/2024 | 2/8/2025 |
| AC Power Source | IN0063 | 10/24/2023 | 10/24/2024 |
| DC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

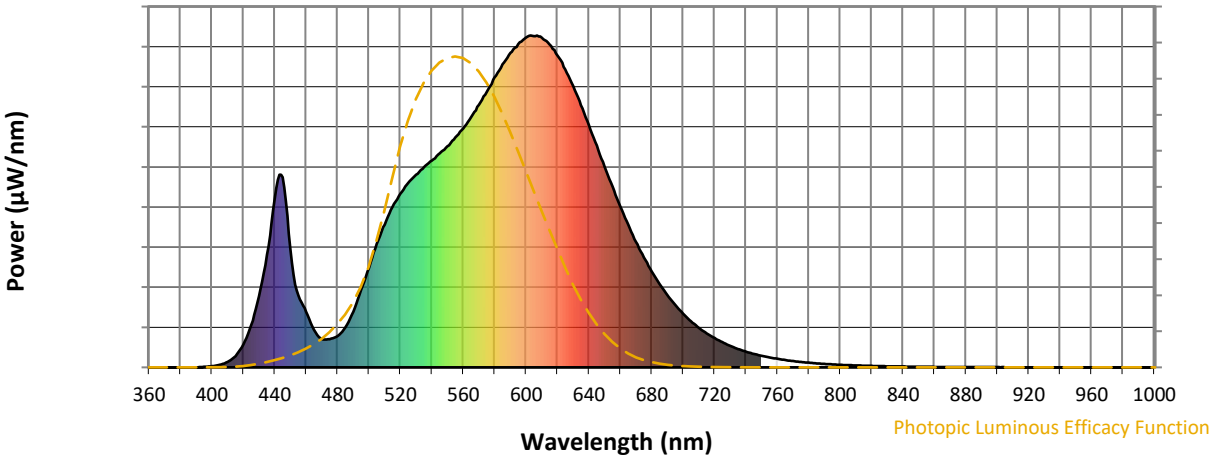



CCT = 3050K
CIE x = 0.4383
CIE y = 0.4131
Duv = 0.0034

Point lies inside the ANSI 3000K 4-step quadrangle

REPORT NUMBER: SP1-2408-195-9

## Photopic Flux vs. Wavelength

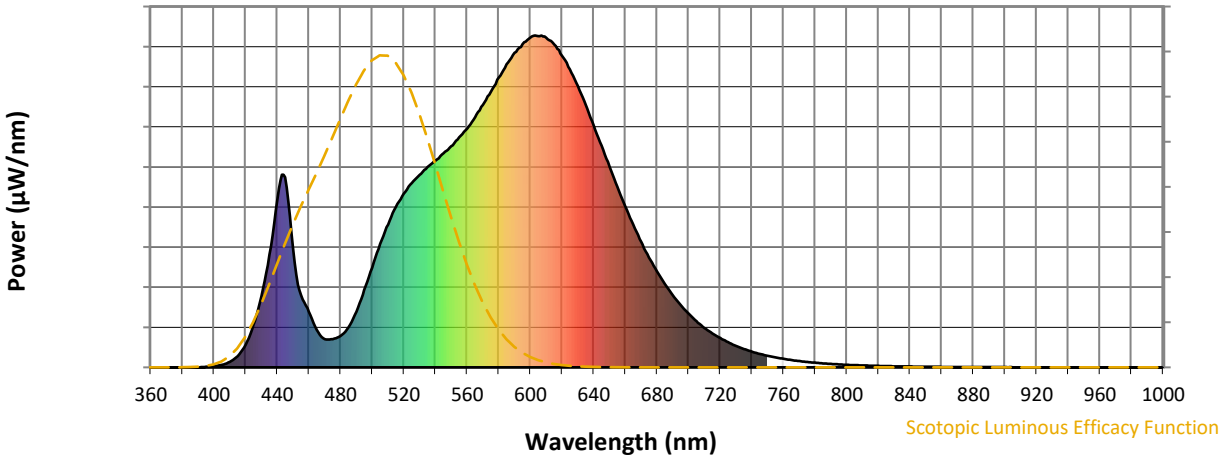



## Photopic Lumens: NR

| 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

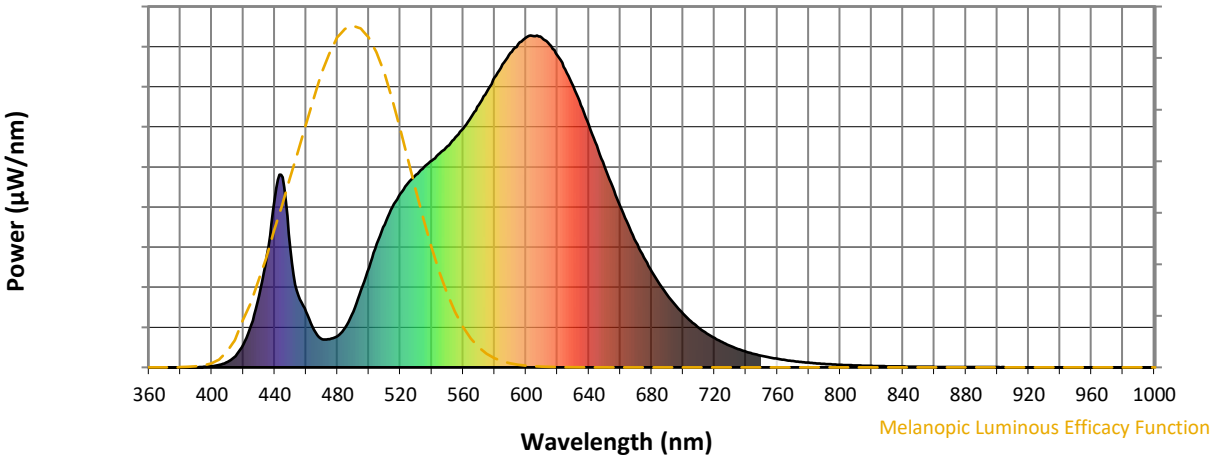



**Scotopic Lumens: NR** **S/P: 1.27**

| 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 | | | |

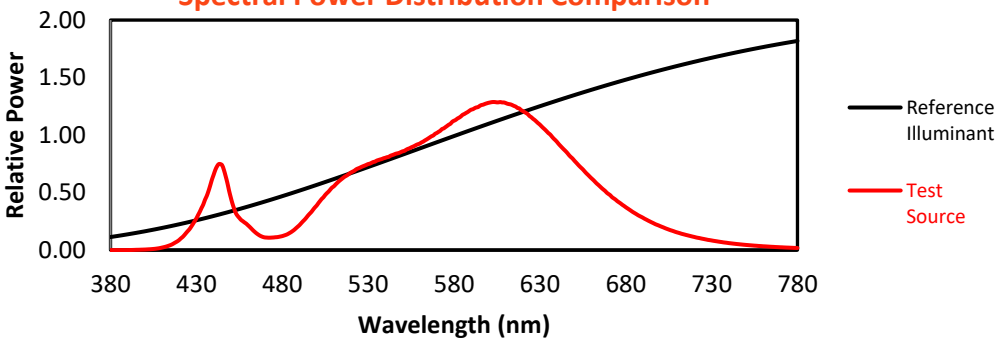
REPORT NUMBER: SP1-2408-195-9

# TM-30-18

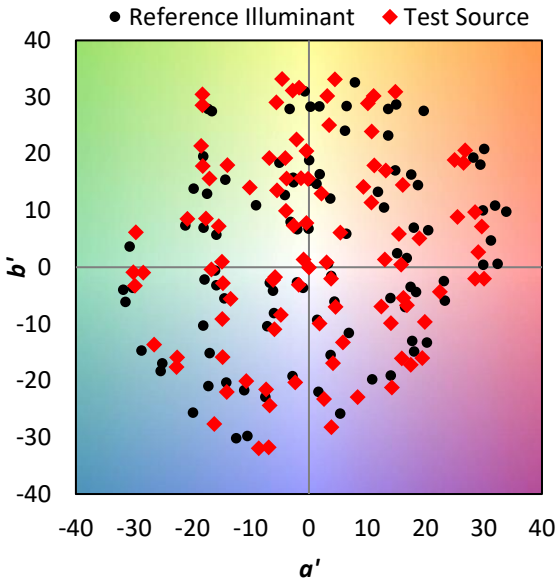
## Summary

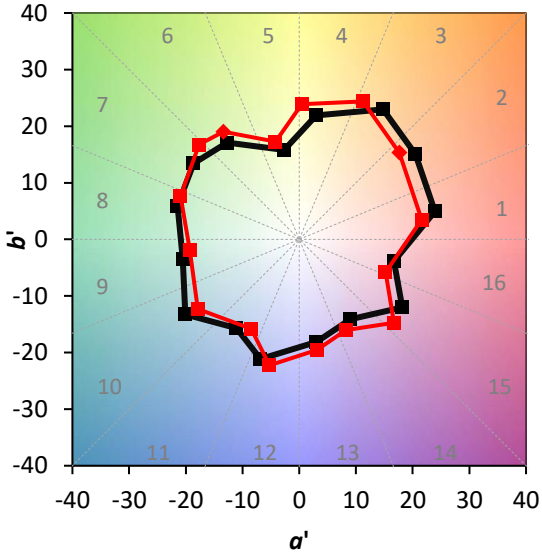
$R_f$ = 81.5
$R_g$ = 99.2
CIE $R_a$ = 81.0
$R_9$ = 7.1

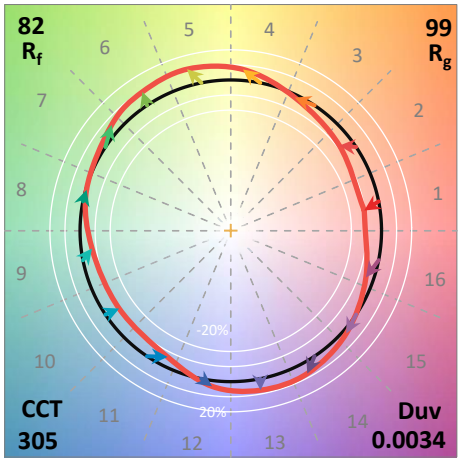
## Spectral Power Distribution Comparison

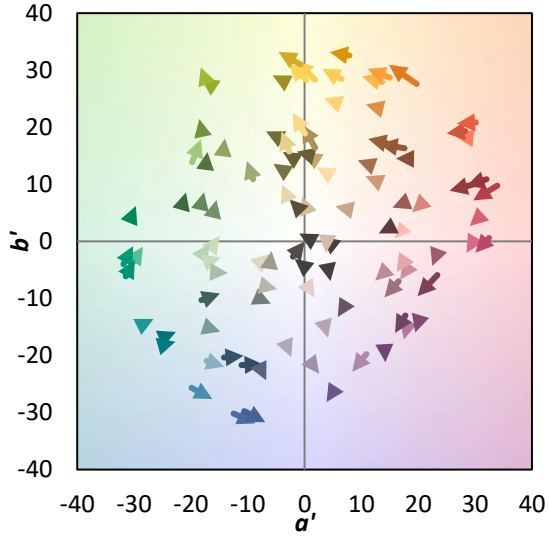



## Color Vector Graphics



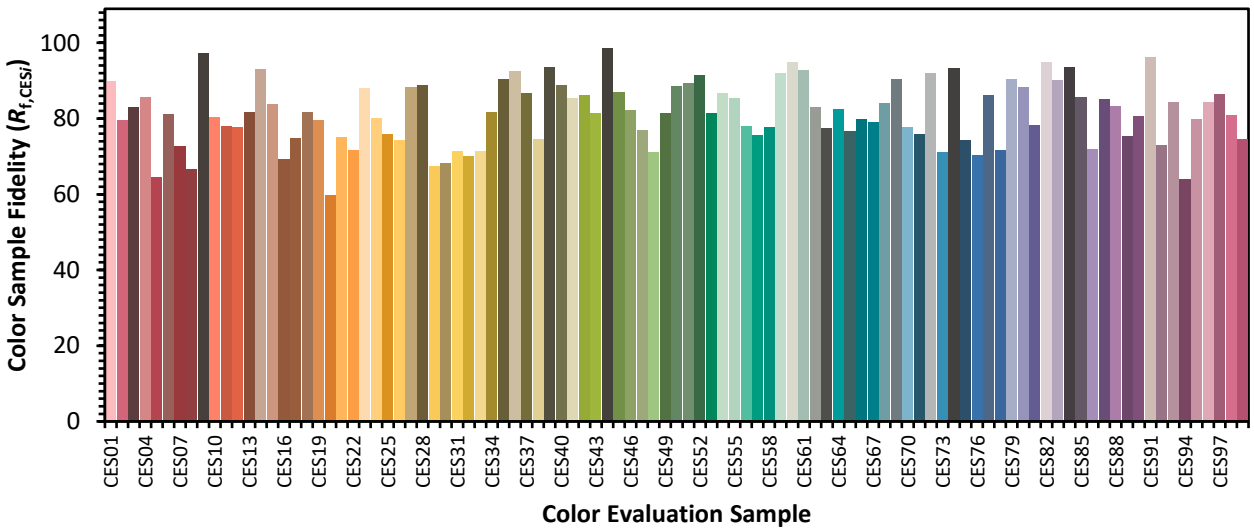



REPORT NUMBER: SP1-2408-195-9

# TM-30-18

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

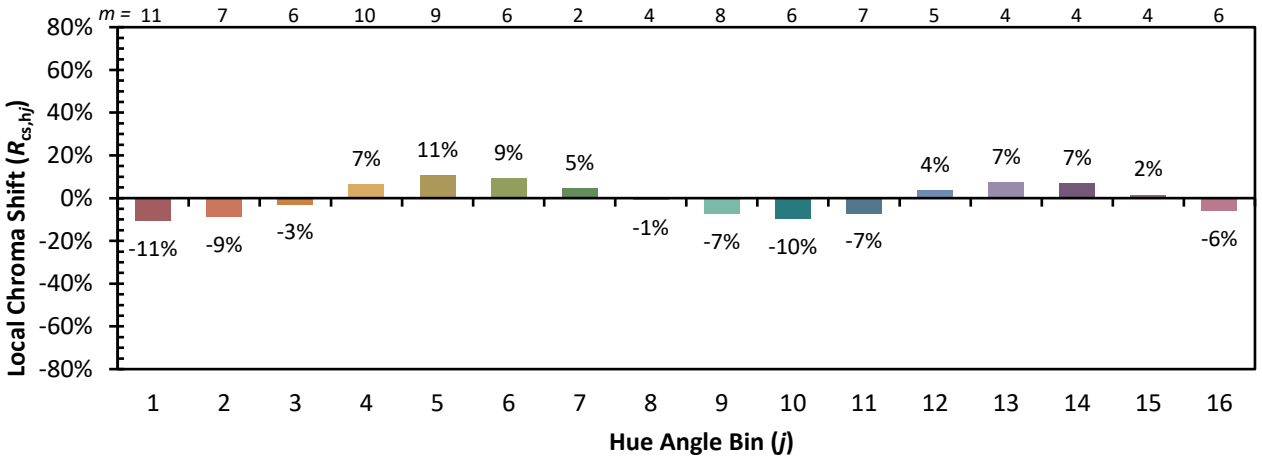
| | | | |
|---|---|---|---|
| CES01 = 86 | CES26 = 74 | CES51 = 89 | CES76 = 70 |
| CES02 = 63 | CES27 = 88 | CES52 = 92 | CES77 = 86 |
| CES03 = 31 | CES28 = 89 | CES53 = 81 | CES78 = 72 |
| CES04 = 70 | CES29 = 67 | CES54 = 87 | CES79 = 90 |
| CES05 = 50 | CES30 = 68 | CES55 = 85 | CES80 = 88 |
| CES06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

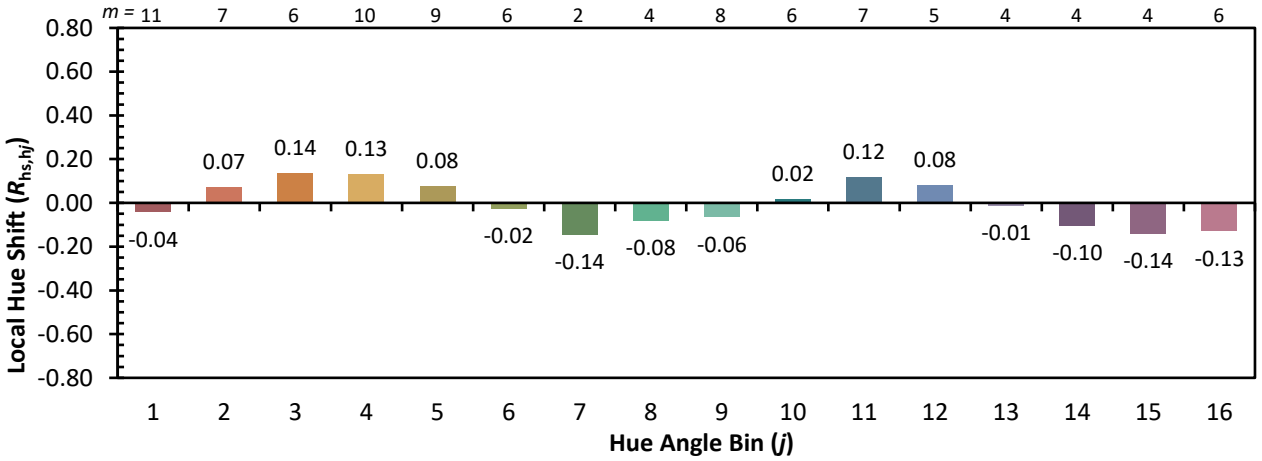


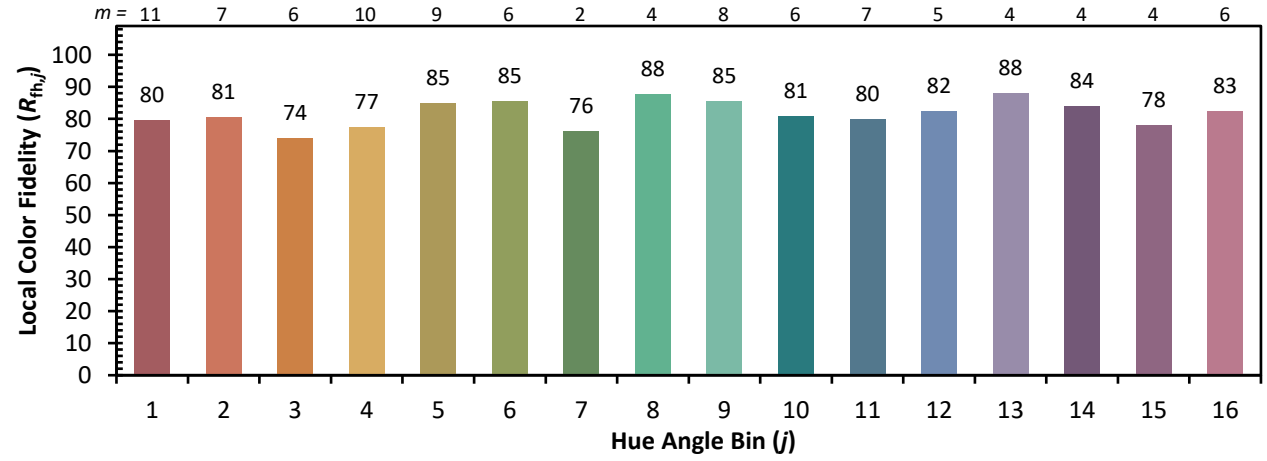
REPORT NUMBER: SP1-2408-195-9

# TM-30-18

## Color Rendition by Hue-Angle Bin



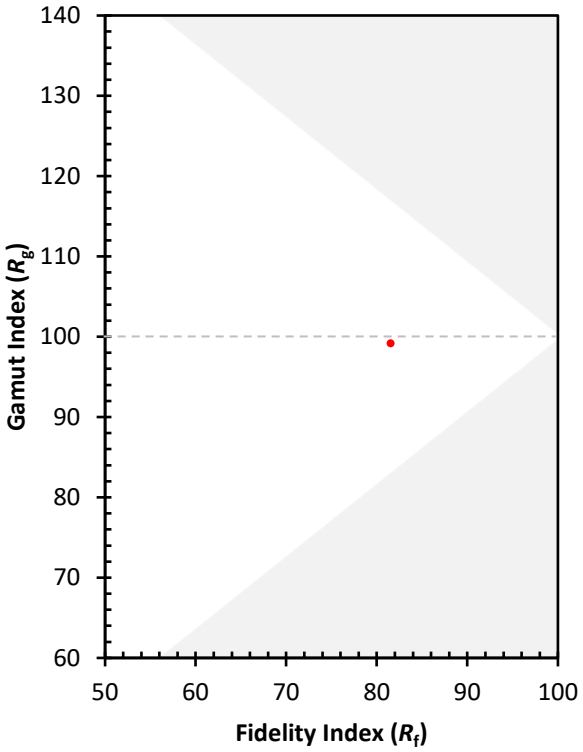



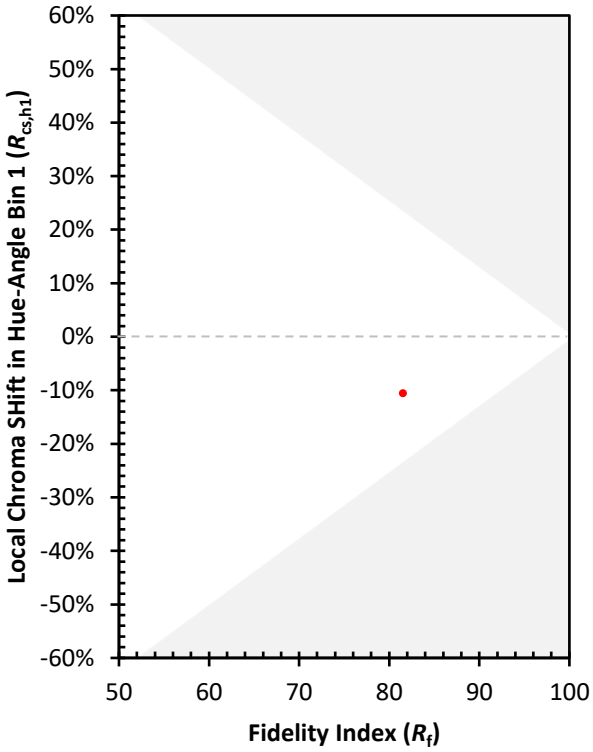



REPORT NUMBER: SP1-2408-195-9

## TM-30-18

### Measure Comparisons




(END OF REPORT)