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: P630077

Luminaire Tested: GWS-SA1C-830-U-T2R-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: | P630077 |
| | TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-12) |
| Test Lab: | COOPER LIGHTING SOLUTIONS |
| Issue Date: | 1/10/2023 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS |
| Product Line: | McGRAW-EDISON |
| Catalog Number: | GWS-SA1C-830-U-T2R-W-GRSBK |
| Description: | GALLEON WALL SLIM LUMINAIRE. (1) LIGHTSQUARES WITH 16 LEDS EACH AND TYPE II ROADWAY 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: | 2559.6 lumens |
| Efficiency: | N/A |
| Efficacy: | 75.1 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): | 34.1 |
| 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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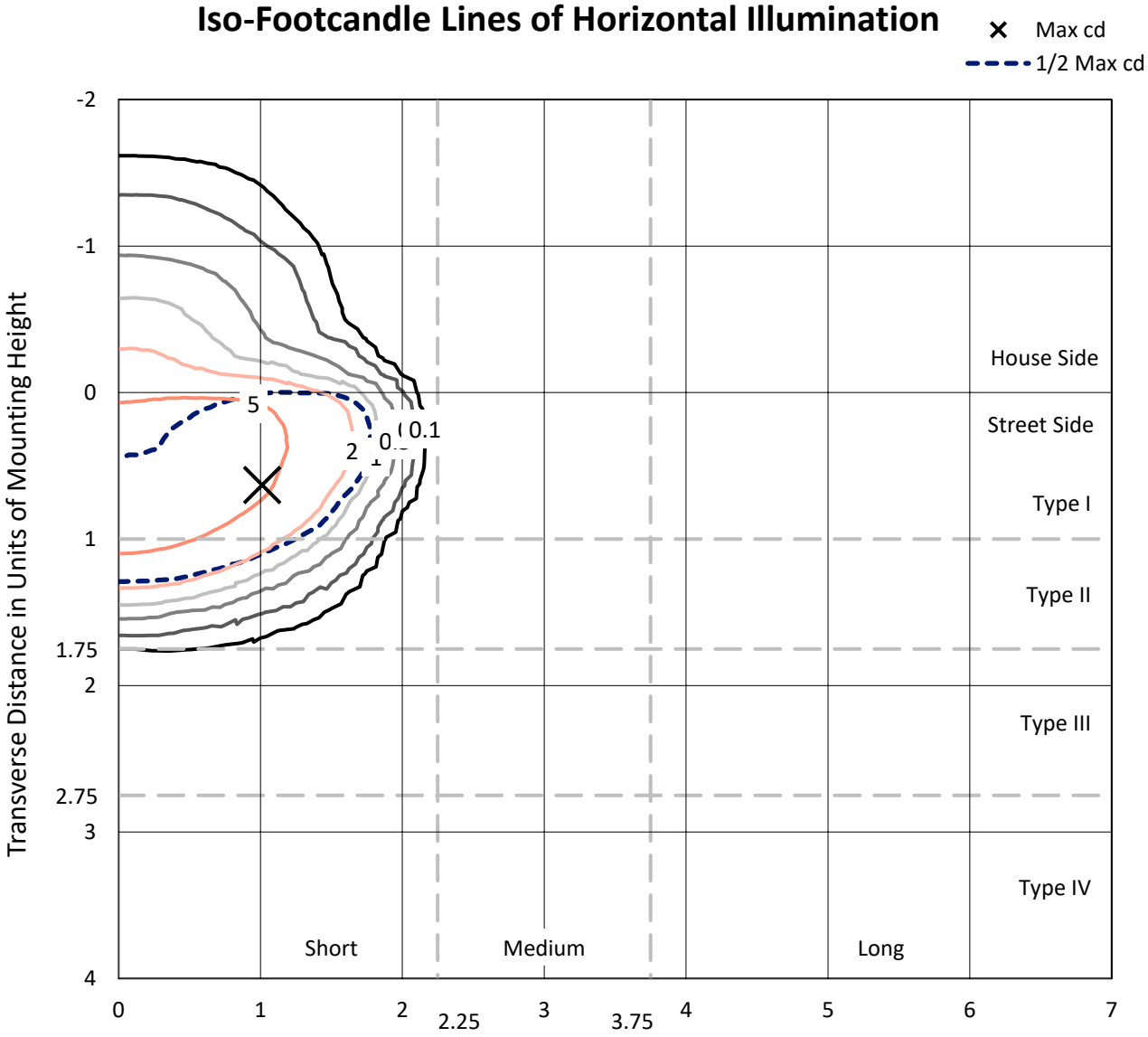
Scaled Data Report

REPORT NUMBER: P630077
CATALOG NUMBER: GWS-SA1C-830-U-T2R-W-GRSBK

## Iso-Footcandle Lines of Horizontal Illumination




Based on 10 foot mounting height. Maximum calculated value = 9.4 fc
Type II - Short - N/A

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Scaled Data Report

REPORT NUMBER: P630077
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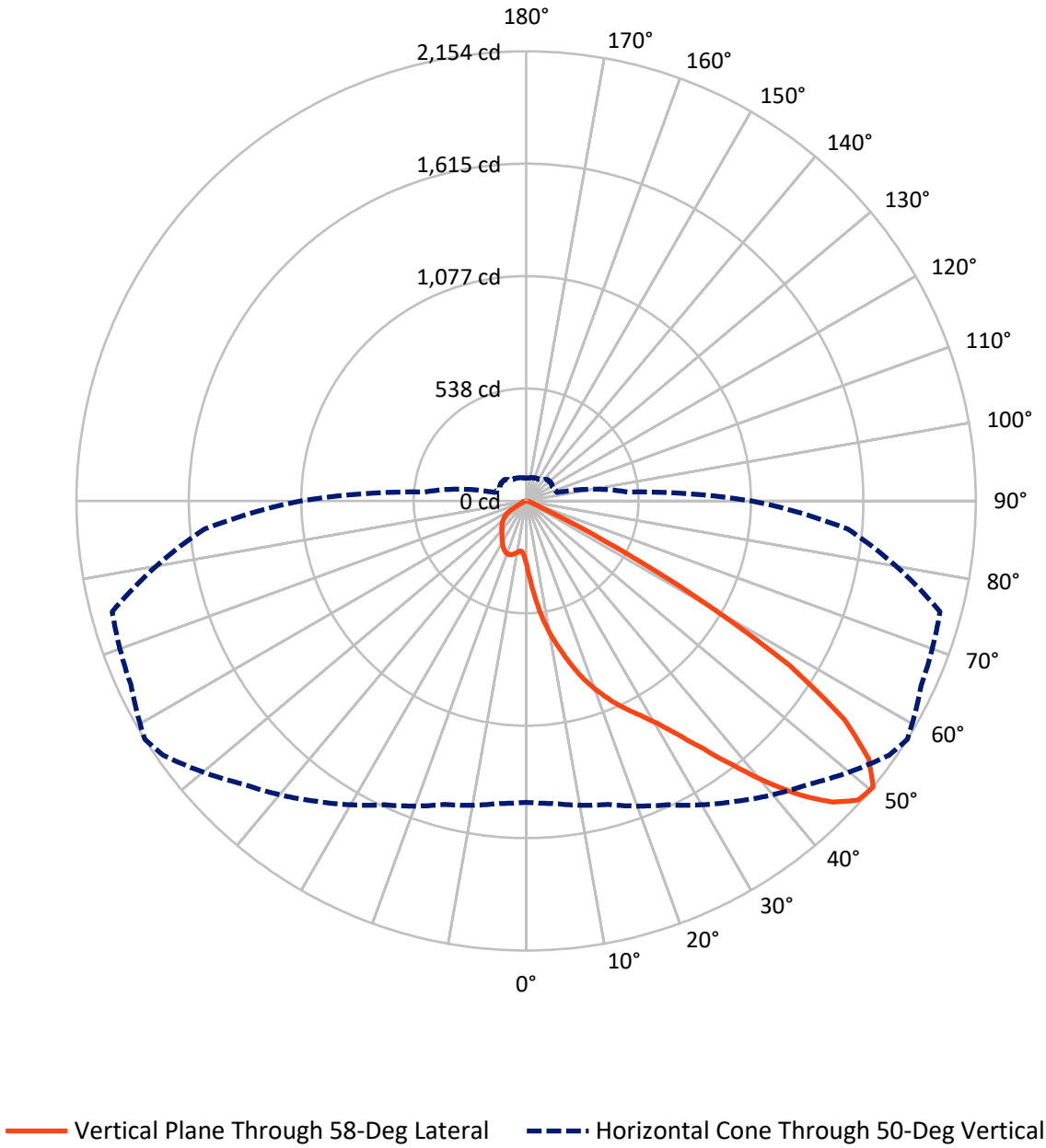
## Luminous Intensity Polar Plot



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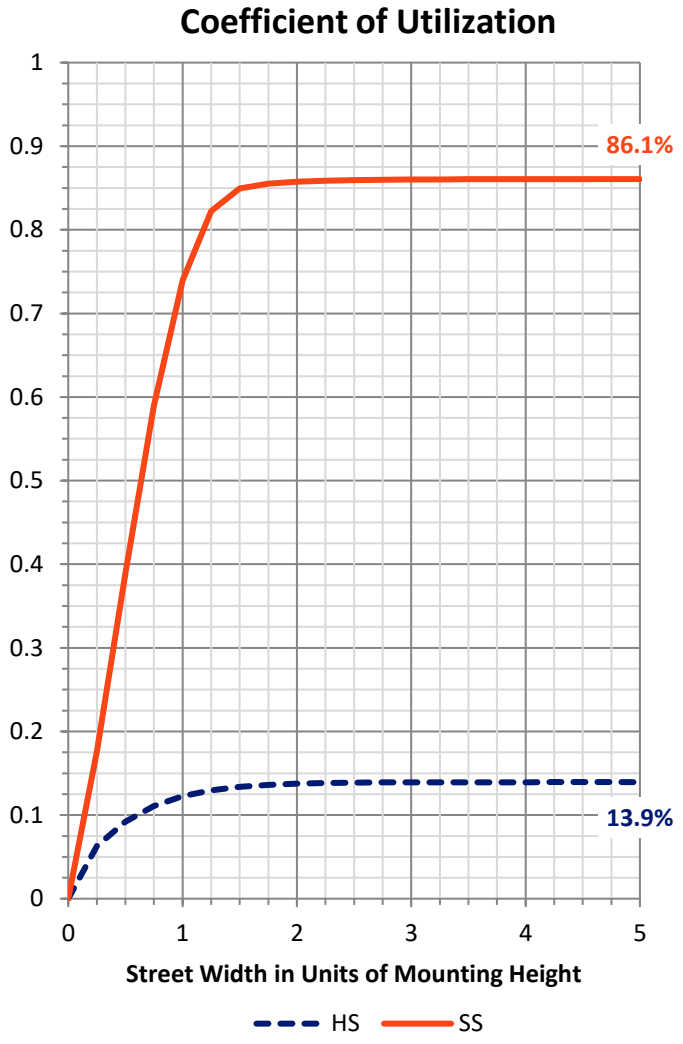
REPORT NUMBER: P630077
CATALOG NUMBER: GWS-SA1C-830-U-T2R-W-GRSBK

**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 358.5 | 0.0 | 358.5 |
| | % Fixture | 14.0 | 0.0 | 14.0 |
| **Street Side** | Lumens | 2201.1 | 0.0 | 2201.1 |
| | % Fixture | 86.0 | 0.0 | 86.0 |
| **Total** | Lumens | 2559.6 | 0.0 | 2559.6 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 37.9 | 1.5 |
| 10°-20° | 149.9 | 5.9 |
| 20°-30° | 303.4 | 11.9 |
| 30°-40° | 536.8 | 21.0 |
| 40°-50° | 782.5 | 30.6 |
| 50°-60° | 627.2 | 24.5 |
| 60°-70° | 113.0 | 4.4 |
| 70°-80° | 8.9 | 0.3 |
| 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° | 2559.6 | 100.0 |
| 0°-180° | 2559.6 | 100.0 |



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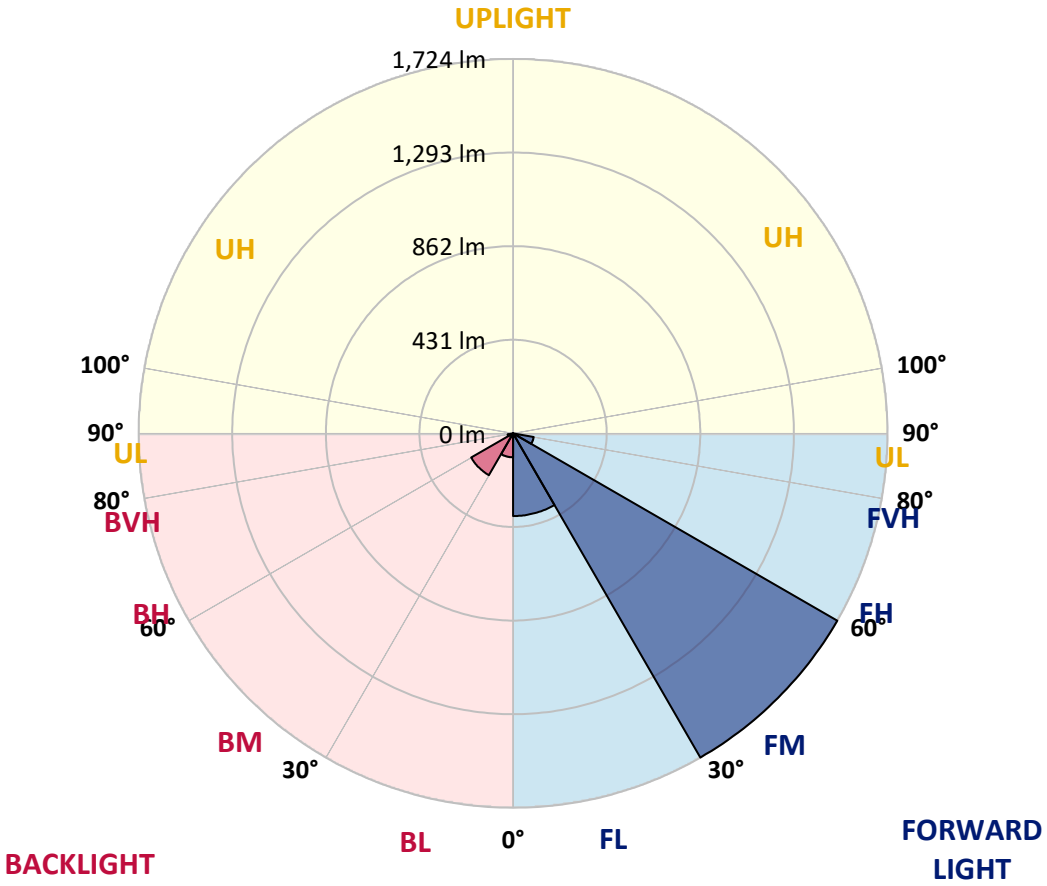
REPORT NUMBER: P630077
CATALOG NUMBER: GWS-SA1C-830-U-T2R-W-GRSBK

## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 380.9 | 14.9 | | | |
| FM | (30°-60°) | 1723.8 | 67.3 | | | |
| FH | (60°-80°) | 96.4 | 3.8 | | | G0/660 |
| FVH | (80°-90°) | 0.0 | 0.0 | | | G0/10 |
| BL | (0°-30°) | 110.4 | 4.3 | B1/500 | | |
| BM | (30°-60°) | 222.7 | 8.7 | B1/1000 | | |
| BH | (60°-80°) | 25.5 | 1.0 | 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: P630077
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**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 15° | 25° | 35° | 45° | 55° | 58° | 65° | 75° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 305.7 | 305.7 | 305.7 | 305.7 | 305.7 | 305.7 | 305.7 | *305.7* | 305.7 | 305.7 | 305.7 |
| 2.5° | 452.5 | 445.3 | 441.2 | 437.9 | 423.4 | 400.4 | 385.4 | *377.5* | 364.3 | 342.1 | 323.0 |
| 5° | 590.4 | 585.2 | 575.6 | 569.1 | 550.4 | 517.9 | 484.2 | *470.8* | 441.0 | 390.9 | 346.0 |
| 7.5° | 681.8 | 678.0 | 674.4 | 665.7 | 648.2 | 618.6 | 581.4 | *567.4* | 521.4 | 450.3 | 376.6 |
| 10° | 752.2 | 749.2 | 745.1 | 744.8 | 731.1 | 704.5 | 668.1 | *653.6* | 603.8 | 514.9 | 412.8 |
| 12.5° | 814.0 | 811.6 | 810.7 | 818.4 | 809.6 | 789.9 | 750.5 | *732.5* | 679.6 | 580.8 | 452.7 |
| 15° | 856.5 | 855.9 | 859.5 | 874.5 | 879.4 | 870.4 | 837.3 | *817.9* | 757.1 | 647.1 | 496.8 |
| 17.5° | 875.9 | 877.5 | 884.4 | 910.4 | 932.3 | 939.9 | 914.5 | *898.1* | 834.0 | 714.1 | 543.9 |
| 20° | 909.0 | 908.5 | 912.6 | 937.2 | 964.0 | 991.4 | 983.7 | *969.8* | 911.7 | 785.0 | 596.2 |
| 22.5° | 1002.3 | 994.4 | 985.6 | 989.5 | 999.1 | 1031.1 | 1045.3 | *1038.2* | 991.9 | 857.8 | 650.1 |
| 25° | 1145.8 | 1137.6 | 1109.4 | 1082.0 | 1063.9 | 1078.4 | 1097.9 | *1101.4* | 1071.6 | 932.5 | 706.5 |
| 27.5° | 1298.0 | 1290.6 | 1258.8 | 1217.8 | 1166.0 | 1140.8 | 1155.4 | *1162.5* | 1149.9 | 1021.5 | 766.4 |
| 30° | 1440.6 | 1430.7 | 1395.9 | 1345.0 | 1285.1 | 1246.5 | 1230.1 | *1235.0* | 1242.4 | 1126.9 | 836.7 |
| 32.5° | 1564.3 | 1556.9 | 1515.3 | 1461.6 | 1403.9 | 1363.6 | 1325.3 | *1333.5* | 1351.6 | 1255.8 | 926.8 |
| 35° | 1669.1 | 1665.3 | 1621.2 | 1567.8 | 1506.8 | 1486.3 | 1453.4 | *1455.1* | 1473.1 | 1411.5 | 1036.6 |
| 37.5° | 1760.3 | 1753.7 | 1713.7 | 1664.2 | 1615.7 | 1612.5 | 1603.4 | *1604.2* | 1613.6 | 1593.0 | 1162.7 |
| 40° | 1817.7 | 1811.7 | 1783.3 | 1752.6 | 1718.1 | 1718.7 | 1765.5 | *1769.0* | 1758.3 | 1771.2 | 1296.0 |
| 42.5° | 1839.4 | 1835.0 | 1819.7 | 1819.9 | 1816.4 | 1832.5 | 1920.4 | *1927.0* | 1888.6 | 1911.1 | 1409.9 |
| 45° | 1801.9 | 1800.0 | 1801.0 | 1840.5 | 1883.2 | 1933.0 | 2047.1 | *2058.6* | 2004.4 | 2003.9 | 1498.9 |
| 47.5° | 1680.9 | 1677.1 | 1709.1 | 1776.1 | 1874.9 | 1971.8 | 2123.8 | *2141.5* | 2085.4 | 2057.0 | 1554.7 |
| 50° | *1443.8* | *1454.8* | *1505.4* | *1606.2* | *1756.4* | *1918.5* | *2122.9* | *2153.9* | *2088.4* | *2052.3* | *1545.4* |
| 52.5° | 1045.9 | 1043.7 | 1154.5 | 1293.0 | 1475.9 | 1747.7 | 2010.2 | *2055.3* | 2015.4 | 2006.6 | 1524.6 |
| 55° | 569.1 | 589.0 | 663.8 | 847.1 | 1075.4 | 1424.4 | 1752.6 | *1851.1* | 1897.4 | 1989.9 | 1562.1 |
| 57.5° | 209.1 | 217.9 | 264.7 | 394.4 | 569.3 | 885.7 | 1338.7 | *1487.4* | 1630.2 | 1943.4 | 1555.8 |
| 60° | 84.3 | 85.9 | 104.6 | 145.1 | 239.2 | 450.8 | 803.1 | *935.0* | 1069.7 | 1487.6 | 1193.9 |
| 62.5° | 61.3 | 63.5 | 70.9 | 84.9 | 121.0 | 197.1 | 346.2 | *402.6* | 440.1 | 736.8 | 588.2 |
| 65° | 49.5 | 51.2 | 57.2 | 63.5 | 79.9 | 105.9 | 111.7 | *107.6* | 107.0 | 190.5 | 134.9 |
| 67.5° | 41.1 | 42.7 | 47.1 | 51.5 | 57.5 | 52.8 | 38.3 | *40.2* | 32.8 | 32.6 | 26.6 |
| 70° | 30.1 | 32.0 | 36.4 | 41.1 | 34.5 | 14.2 | 22.2 | *32.8* | 24.9 | 20.8 | 20.3 |
| 72.5° | 22.7 | 24.1 | 28.2 | 26.8 | 10.1 | 5.5 | 14.8 | *23.8* | 19.2 | 15.3 | 15.1 |
| 75° | 17.0 | 17.8 | 14.2 | 4.4 | 1.1 | 1.4 | 5.5 | *9.9* | 10.7 | 8.8 | 8.8 |
| 77.5° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.5 | *0.8* | 1.1 | 1.4 | 1.6 |
| 80° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 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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Scaled Data Report

REPORT NUMBER: P630077
CATALOG NUMBER: GWS-SA1C-830-U-T2R-W-GRSBK

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 305.7 | 305.7 | 305.7 | 305.7 | 305.7 | 305.7 | 305.7 | 305.7 | 305.7 | 305.7 | 305.7 |
| 2.5° | 312.0 | 300.5 | 284.1 | 270.4 | 260.0 | 249.9 | 242.2 | 234.6 | 234.3 | 230.5 | 229.6 |
| 5° | 325.2 | 304.4 | 274.3 | 252.6 | 239.5 | 231.6 | 226.1 | 223.4 | 222.0 | 220.6 | 220.1 |
| 7.5° | 344.1 | 314.2 | 272.6 | 249.6 | 238.7 | 233.5 | 229.6 | 228.0 | 227.2 | 226.1 | 225.8 |
| 10° | 367.3 | 328.5 | 278.6 | 255.4 | 245.8 | 240.9 | 236.8 | 234.3 | 232.9 | 231.0 | 230.5 |
| 12.5° | 395.2 | 346.0 | 288.2 | 265.0 | 254.8 | 248.3 | 242.8 | 239.2 | 237.3 | 234.8 | 234.3 |
| 15° | 425.4 | 364.9 | 298.9 | 273.7 | 261.7 | 253.2 | 246.3 | 240.9 | 237.3 | 234.3 | 233.5 |
| 17.5° | 456.6 | 384.0 | 308.5 | 279.7 | 265.0 | 254.8 | 245.0 | 237.6 | 233.2 | 229.4 | 228.3 |
| 20° | 491.6 | 403.7 | 314.8 | 280.8 | 263.9 | 250.4 | 239.0 | 229.6 | 225.3 | 220.1 | 219.0 |
| 22.5° | 528.3 | 422.1 | 317.5 | 278.4 | 257.8 | 242.2 | 229.9 | 220.3 | 214.0 | 208.6 | 206.9 |
| 25° | 563.9 | 438.5 | 316.1 | 271.5 | 248.8 | 230.7 | 218.2 | 208.3 | 201.5 | 196.0 | 194.6 |
| 27.5° | 601.6 | 452.2 | 311.2 | 261.4 | 236.5 | 218.2 | 206.1 | 197.6 | 191.3 | 185.3 | 183.9 |
| 30° | 644.1 | 464.8 | 303.3 | 249.1 | 222.0 | 205.3 | 196.0 | 190.2 | 183.4 | 177.1 | 175.2 |
| 32.5° | 695.2 | 476.0 | 291.8 | 234.3 | 209.1 | 194.1 | 188.9 | 184.5 | 176.5 | 170.0 | 168.6 |
| 35° | 753.8 | 485.3 | 277.3 | 219.0 | 196.5 | 186.9 | 185.9 | 180.1 | 169.7 | 162.0 | 160.4 |
| 37.5° | 821.7 | 494.3 | 260.0 | 203.9 | 187.2 | 183.7 | 183.9 | 174.1 | 161.5 | 152.2 | 151.1 |
| 40° | 894.8 | 503.4 | 240.9 | 190.8 | 178.7 | 181.7 | 179.3 | 165.3 | 144.8 | 135.8 | 134.7 |
| 42.5° | 970.9 | 513.2 | 221.4 | 178.5 | 171.6 | 174.4 | 170.8 | 147.8 | 133.0 | 128.4 | 127.8 |
| 45° | 1039.6 | 525.0 | 200.4 | 166.1 | 164.5 | 163.7 | 157.7 | 133.8 | 127.6 | 124.3 | 124.0 |
| 47.5° | 1089.1 | 523.1 | 177.9 | 154.4 | 156.8 | 154.1 | 135.8 | 127.3 | 122.1 | 117.7 | 116.6 |
| 50° | *1080.1* | *489.7* | *154.6* | *141.2* | *147.0* | *144.5* | *122.1* | *119.6* | *115.0* | *110.3* | *108.7* |
| 52.5° | 1057.1 | 444.2 | 134.4 | 127.3 | 136.3 | 130.6 | 112.8 | 110.3 | 106.2 | 100.2 | 98.3 |
| 55° | 1069.4 | 401.5 | 118.5 | 116.1 | 125.4 | 108.1 | 102.4 | 98.5 | 94.2 | 87.6 | 86.8 |
| 57.5° | 1029.7 | 327.6 | 95.3 | 96.9 | 110.9 | 92.2 | 89.8 | 83.8 | 76.4 | 72.0 | 71.4 |
| 60° | 712.8 | 176.0 | 59.7 | 61.6 | 80.2 | 77.5 | 80.5 | 75.0 | 66.0 | 61.9 | 61.0 |
| 62.5° | 327.4 | 70.6 | 32.6 | 31.2 | 42.2 | 52.6 | 69.0 | 68.4 | 57.2 | 50.6 | 50.1 |
| 65° | 79.4 | 32.3 | 23.3 | 21.9 | 23.8 | 31.5 | 44.9 | 53.9 | 46.3 | 38.6 | 37.8 |
| 67.5° | 25.7 | 26.3 | 21.3 | 20.0 | 21.1 | 23.5 | 26.8 | 29.8 | 29.6 | 27.1 | 26.6 |
| 70° | 20.5 | 23.8 | 19.7 | 18.1 | 18.1 | 18.9 | 18.1 | 14.5 | 12.6 | 13.7 | 14.2 |
| 72.5° | 15.3 | 18.1 | 15.6 | 14.0 | 13.4 | 13.1 | 11.2 | 8.2 | 5.7 | 5.2 | 4.9 |
| 75° | 9.0 | 10.1 | 9.6 | 8.2 | 7.7 | 6.8 | 5.5 | 3.6 | 1.9 | 1.4 | 0.8 |
| 77.5° | 1.6 | 1.9 | 2.2 | 1.6 | 1.4 | 1.1 | 0.8 | 0.3 | 0.0 | 0.0 | 0.0 |
| 80° | 0.0 | 0.3 | 0.3 | 0.3 | 0.0 | 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 |

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

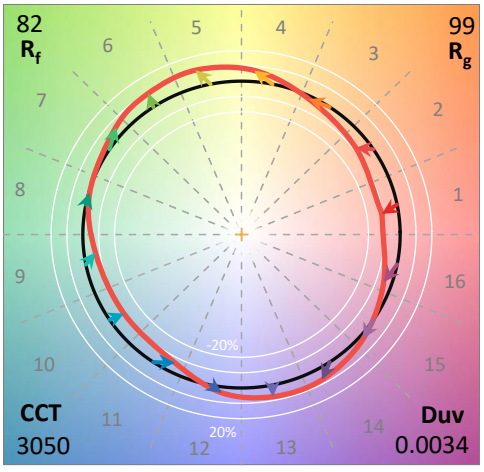
## Test Information

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

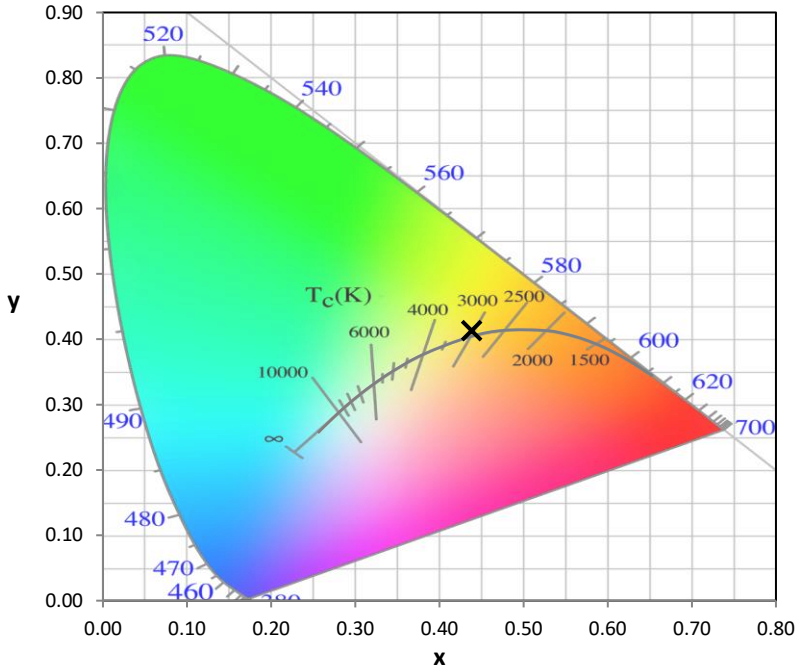
| | |
|---|---|
| Stabilization Time: | 20M |
| Operation Time: | 1H 20M |
| Sphere Temperature (°C): | 24.2 |

REPORT NUMBER: SP1-2408-195-9

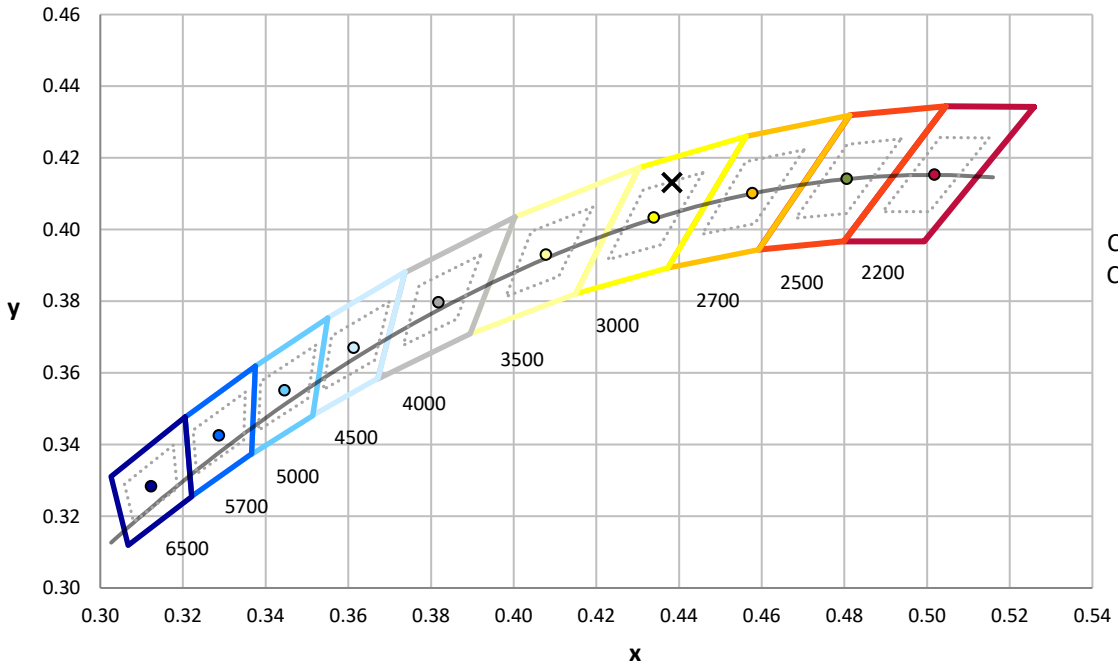
| Measurement and Test Equipment | | | |
|---|---|---|---|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 6/18/2024 | 12/18/2024 |
| Power Meter | INXT2011004 | 2/8/2024 | 2/8/2025 |
| AC Power Source | IN0063 | 10/24/2023 | 10/24/2024 |
| DC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

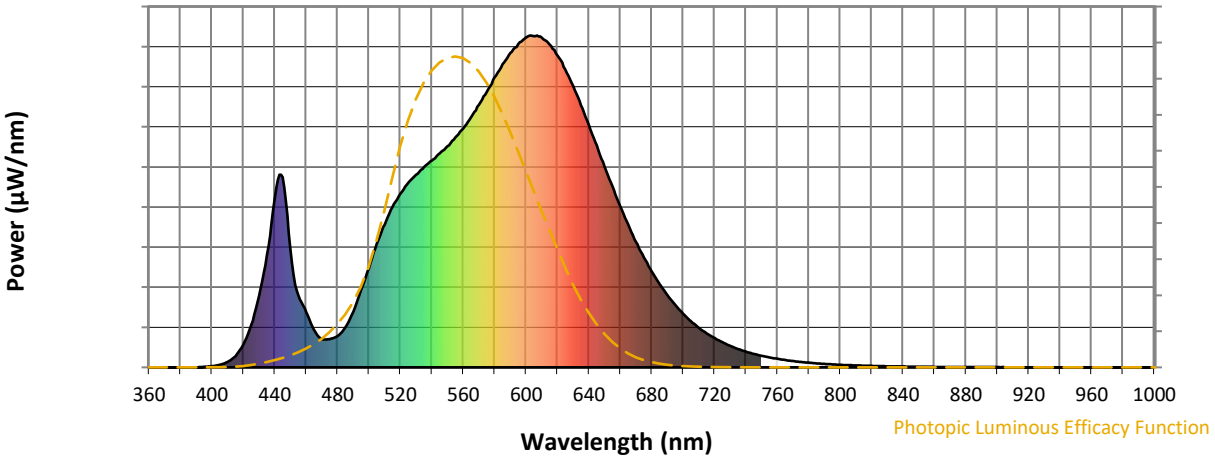



CCT = 3050K
CIE x = 0.4383
CIE y = 0.4131
Duv = 0.0034

Point lies inside the ANSI 3000K 4-step quadrangle

REPORT NUMBER: SP1-2408-195-9

## Photopic Flux vs. Wavelength

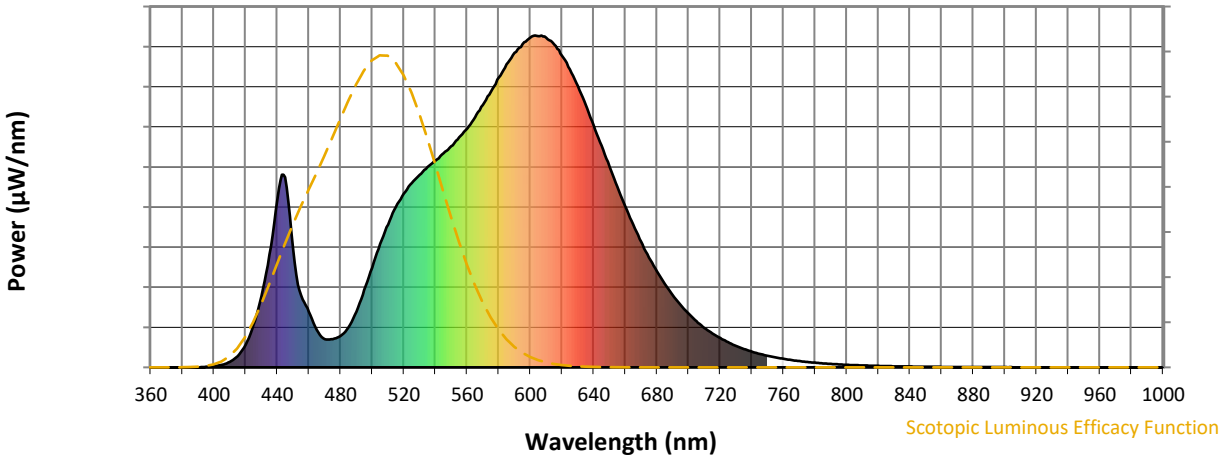



## Photopic Lumens: NR

| 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

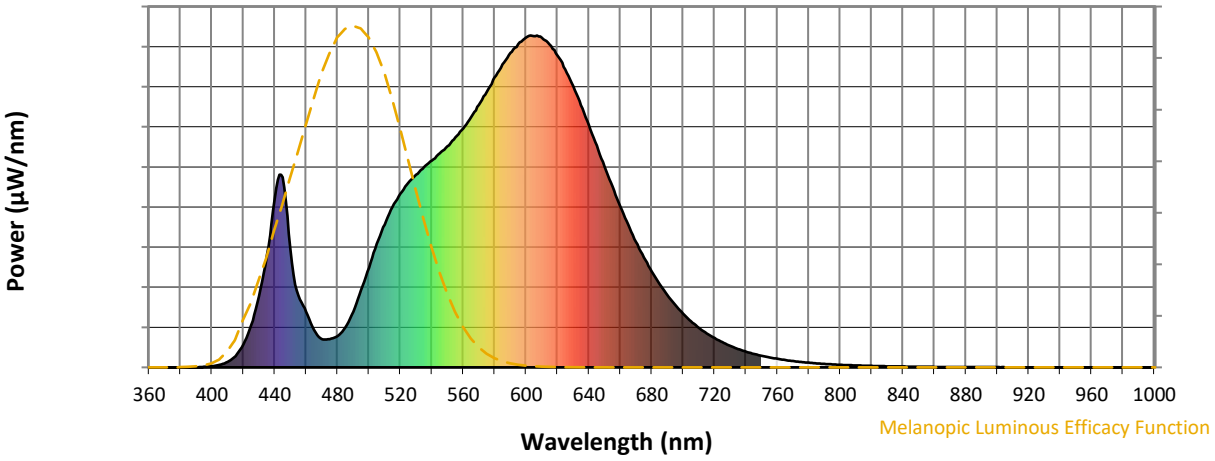



**Scotopic Lumens: NR** **S/P: 1.27**

| 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 | | | |

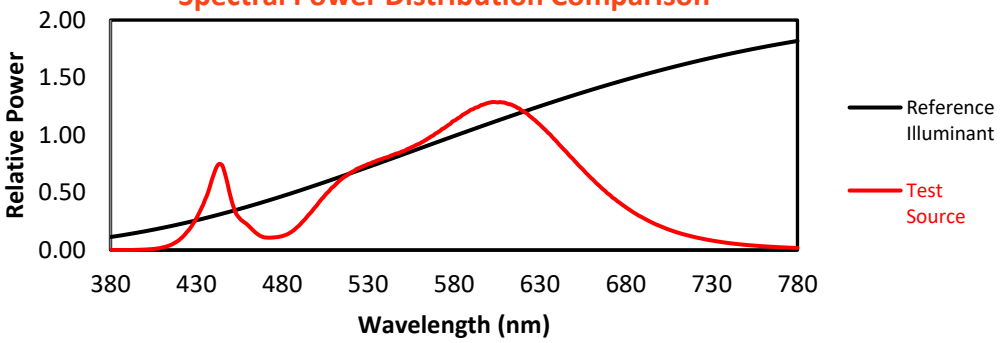
REPORT NUMBER: SP1-2408-195-9

# TM-30-18

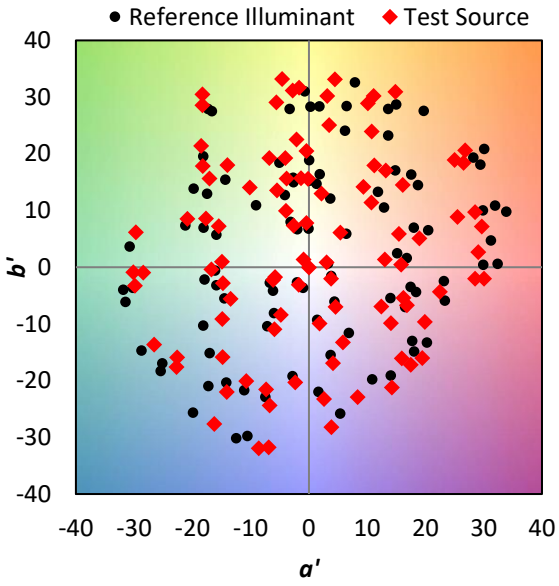
## Summary

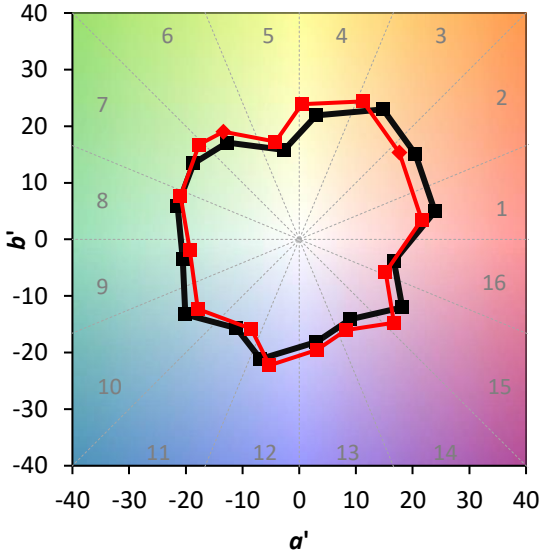
$R_f$ = 81.5
$R_g$ = 99.2
CIE $R_a$ = 81.0
$R_9$ = 7.1

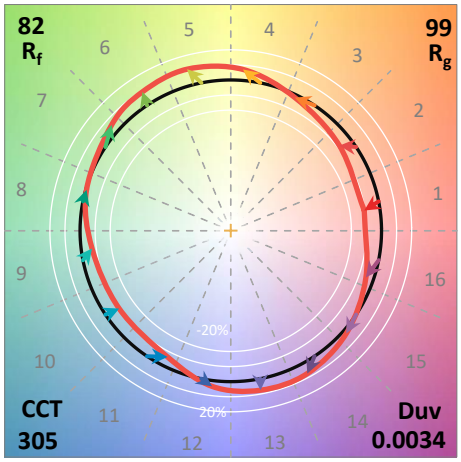
## Spectral Power Distribution Comparison

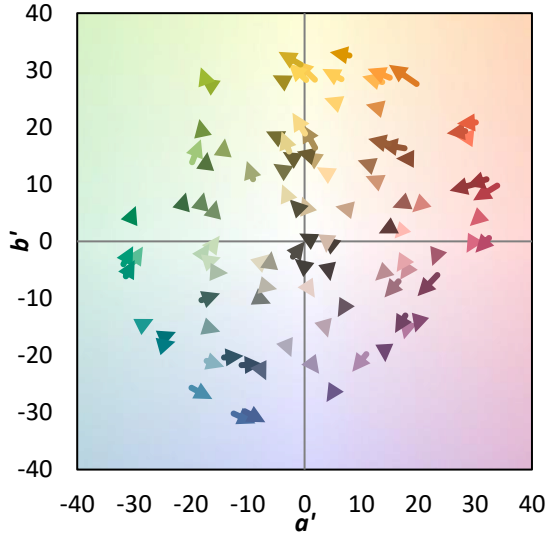



## Color Vector Graphics



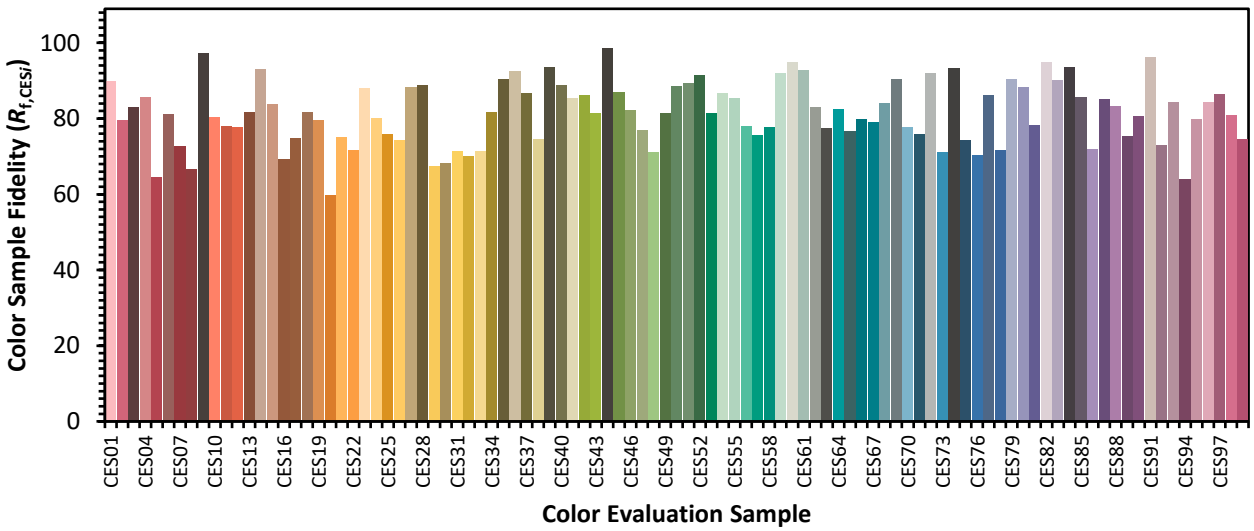



REPORT NUMBER: SP1-2408-195-9

# TM-30-18

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

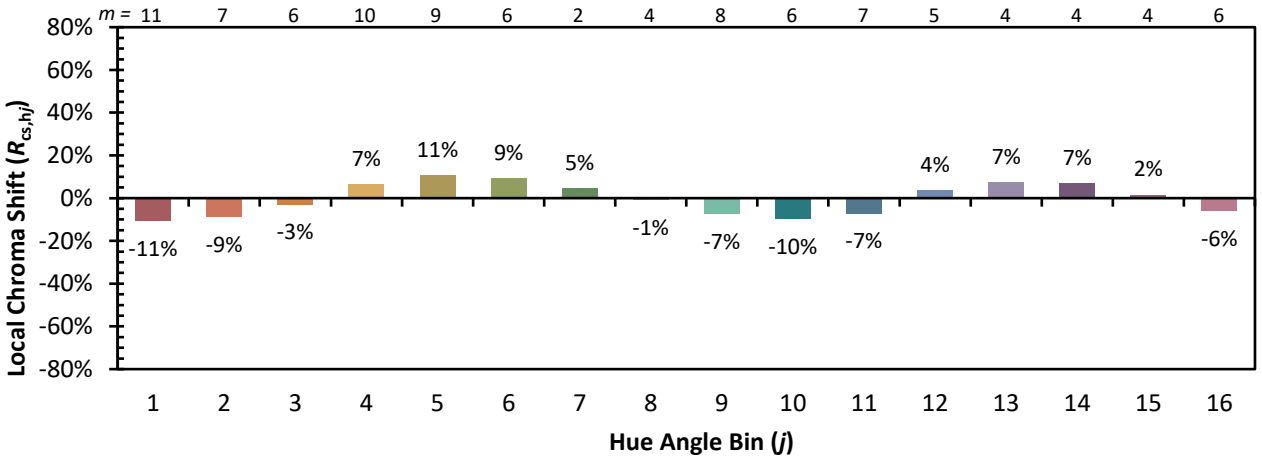
| | | | |
|---|---|---|---|
| CES01 = 86 | CES26 = 74 | CES51 = 89 | CES76 = 70 |
| CES02 = 63 | CES27 = 88 | CES52 = 92 | CES77 = 86 |
| CES03 = 31 | CES28 = 89 | CES53 = 81 | CES78 = 72 |
| CES04 = 70 | CES29 = 67 | CES54 = 87 | CES79 = 90 |
| CES05 = 50 | CES30 = 68 | CES55 = 85 | CES80 = 88 |
| CES06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

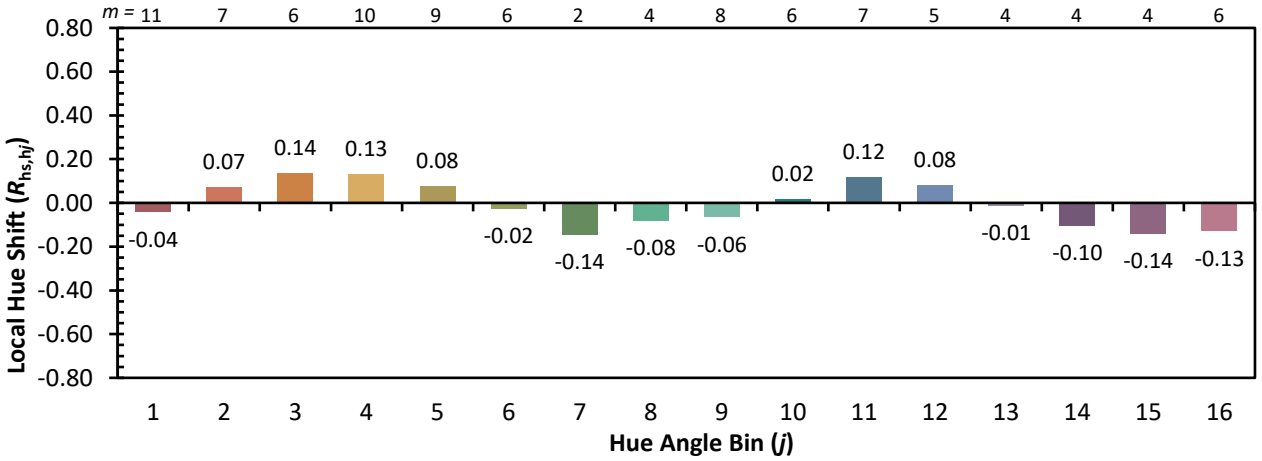


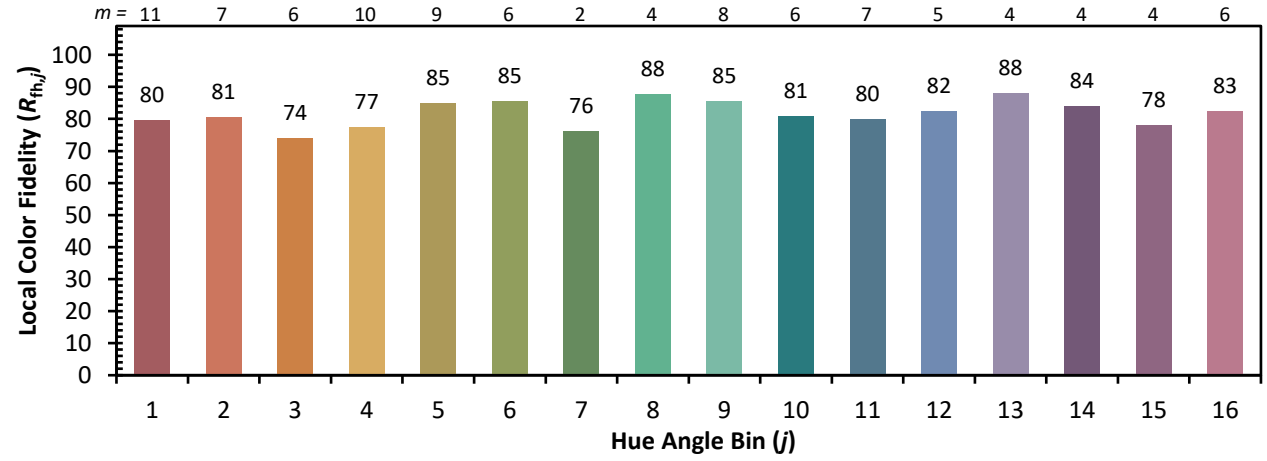
REPORT NUMBER: SP1-2408-195-9

# TM-30-18

## Color Rendition by Hue-Angle Bin



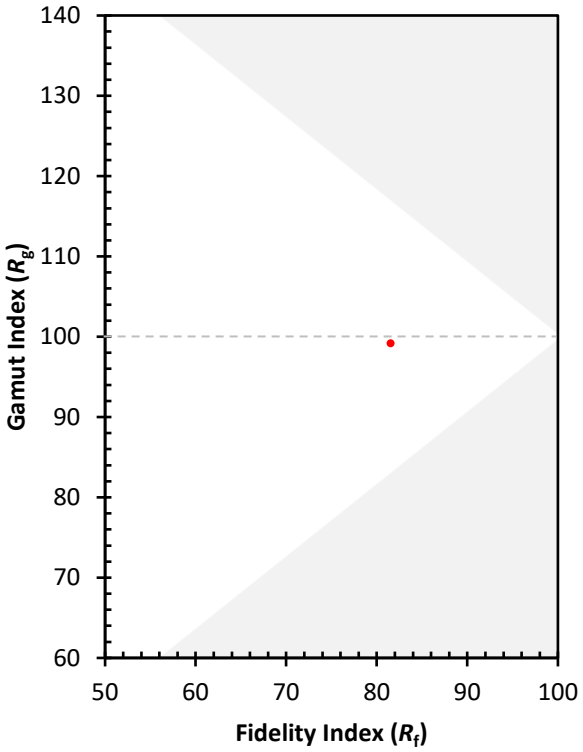



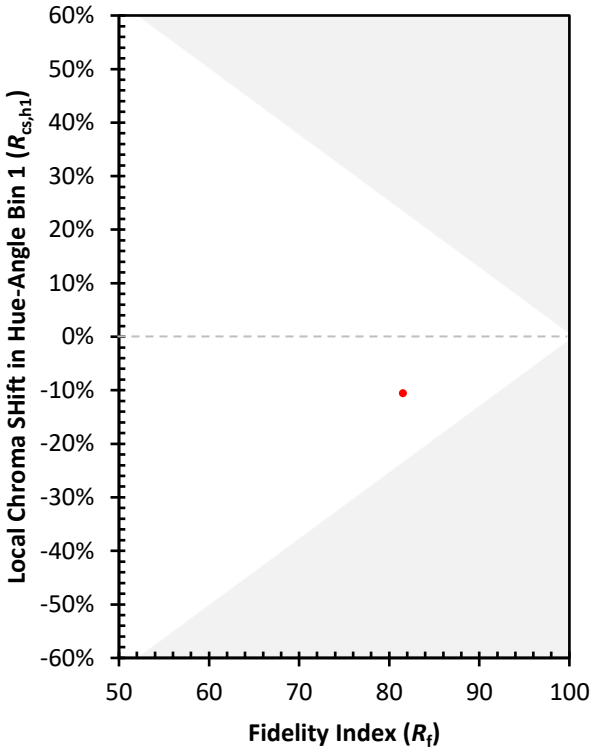



REPORT NUMBER: SP1-2408-195-9

## TM-30-18

### Measure Comparisons

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