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: P635987

Luminaire Tested: GWS-SA3E-830-U-AFL-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: | P635987 |
| | TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-46) |
| Test Lab: | COOPER LIGHTING SOLUTIONS |
| Issue Date: | 1/10/2023 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS |
| Product Line: | McGRAW-EDISON |
| Catalog Number: | GWS-SA3E-830-U-AFL-W-GRSBK |
| Description: | GALLEON WALL SLIM LUMINAIRE. (3) LIGHTSQUARES WITH 16 LEDS EACH AND AUTOMOTIVE FRONTLINE OPTICS W/ FACTORY INSTALLED GLARE SHIELD, BK |
| Light Source: | (48) 3000K CCT, 80 CRI LEDS |
| Ballast/Driver: | - |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 13157.3 lumens |
| Efficiency: | N/A |
| Efficacy: | 82.6 lumens/watt |
| Luminous Opening: | Rectangular (W 1.5' x L: 0.5' x H: 0') |
| IES Classification: | Type II - Short |
| BUG Rating: | B2 - U0 - G0 |

| | |
|---|---|
| Input Watts (W): | 159.2 |
| 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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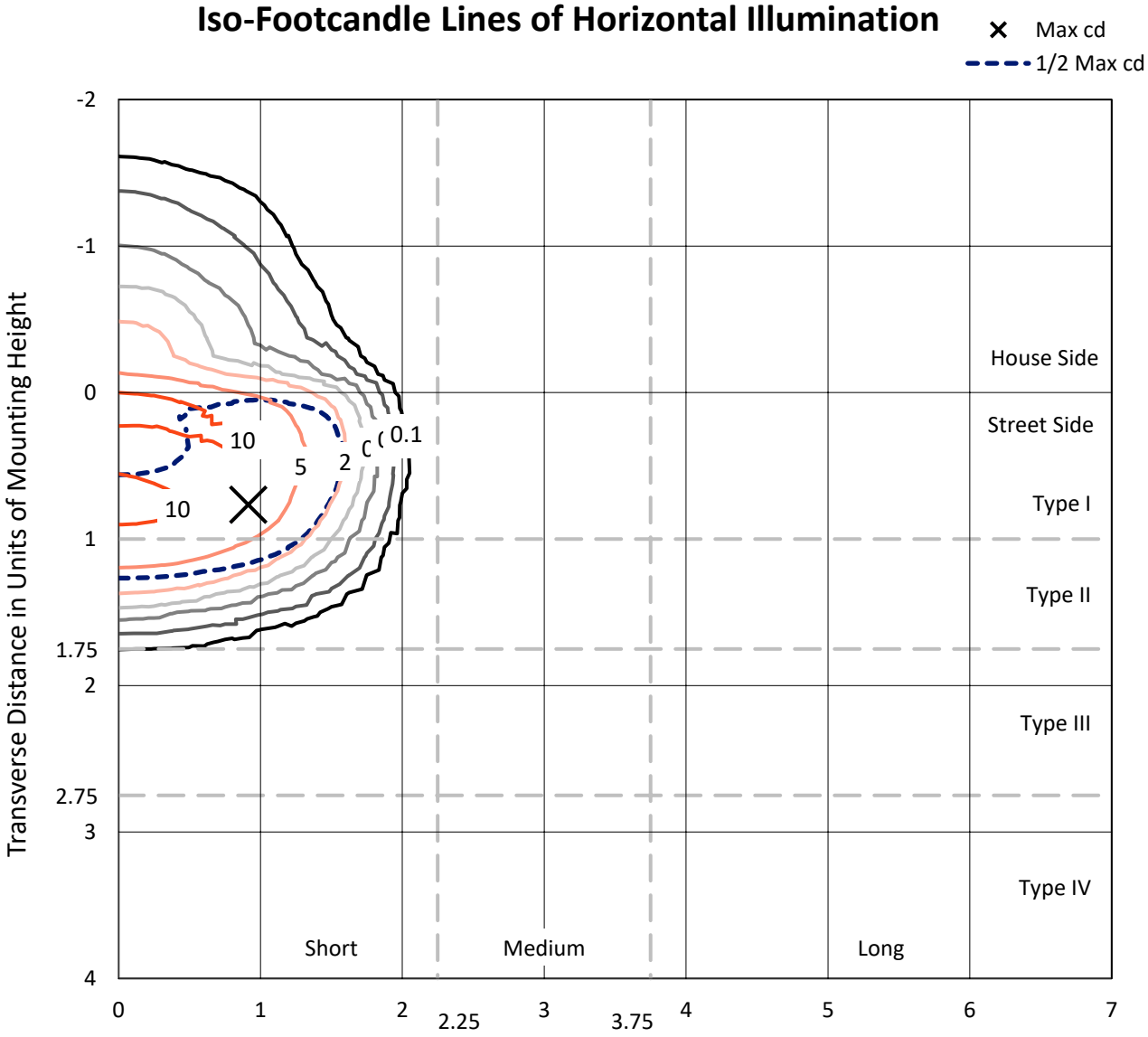
Scaled Data Report

REPORT NUMBER: P635987
CATALOG NUMBER: GWS-SA3E-830-U-AFL-W-GRSBK

## Iso-Footcandle Lines of Horizontal Illumination




Based on 20 foot mounting height. Maximum calculated value = 12.8 fc
Type II - Short - N/A

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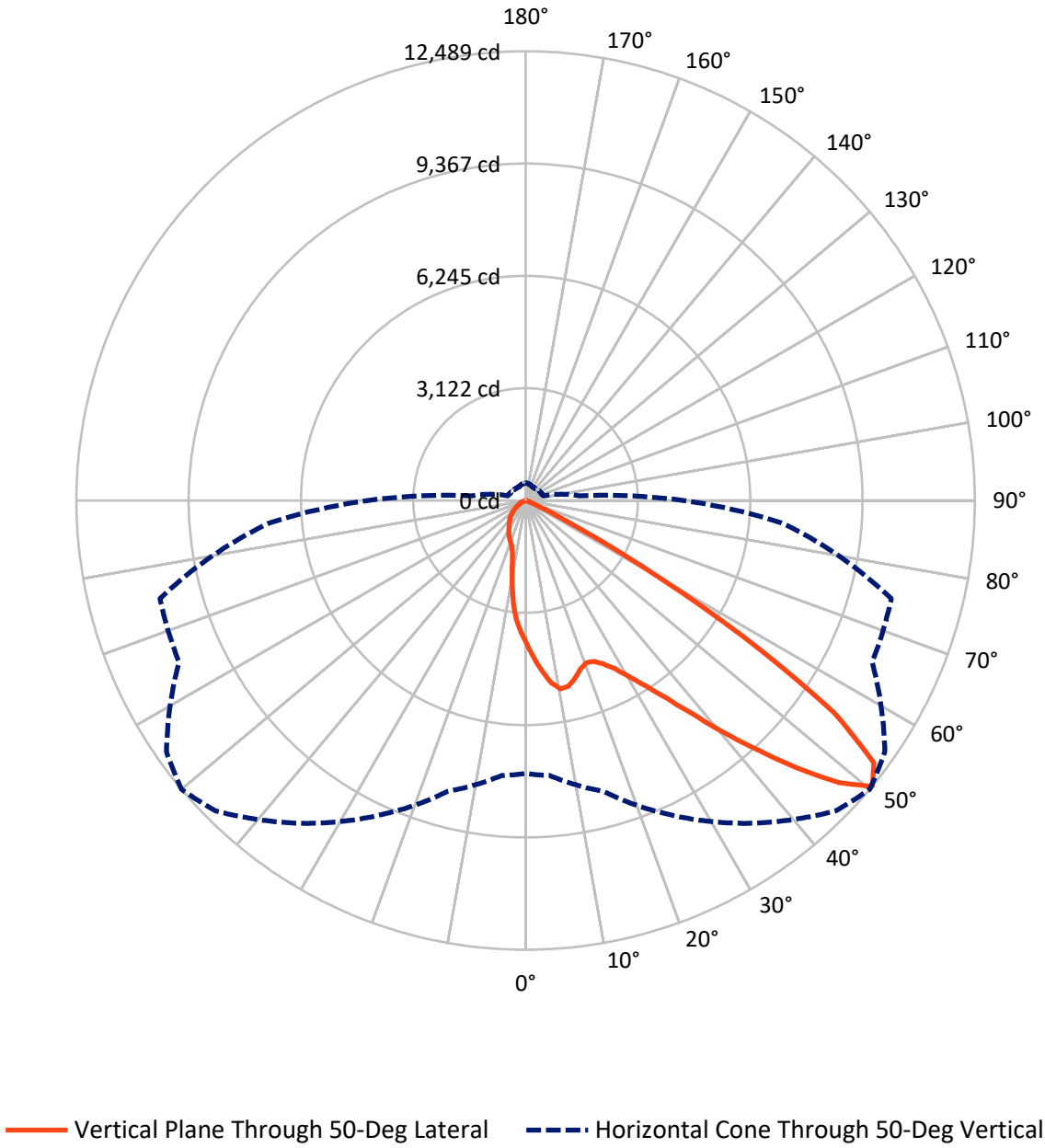
## Luminous Intensity Polar Plot



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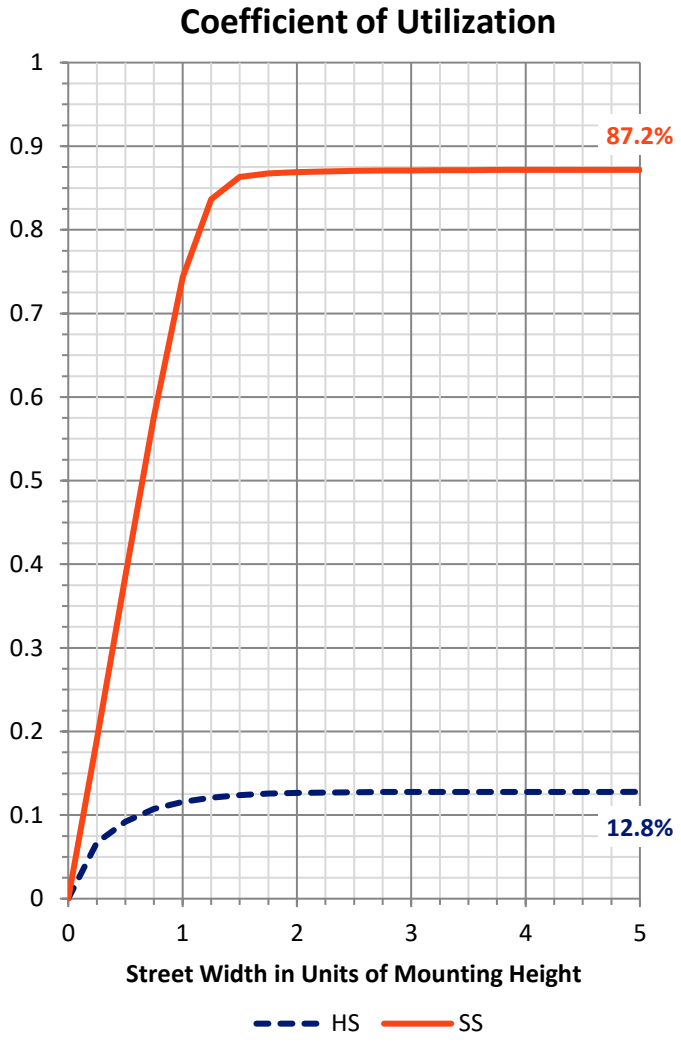
REPORT NUMBER: P635987
CATALOG NUMBER: GWS-SA3E-830-U-AFL-W-GRSBK

**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 1690.5 | 0.0 | 1690.5 |
| | % Fixture | 12.8 | 0.0 | 12.8 |
| **Street Side** | Lumens | 11466.8 | 0.0 | 11466.8 |
| | % Fixture | 87.2 | 0.0 | 87.2 |
| **Total** | Lumens | 13157.3 | 0.0 | 13157.3 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 369.8 | 2.8 |
| 10°-20° | 954.0 | 7.3 |
| 20°-30° | 1574.5 | 12.0 |
| 30°-40° | 2598.3 | 19.7 |
| 40°-50° | 4111.1 | 31.2 |
| 50°-60° | 3112.6 | 23.7 |
| 60°-70° | 389.6 | 3.0 |
| 70°-80° | 44.1 | 0.3 |
| 80°-90° | 3.4 | 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° | 13157.3 | 100.0 |
| 0°-180° | 13157.3 | 100.0 |



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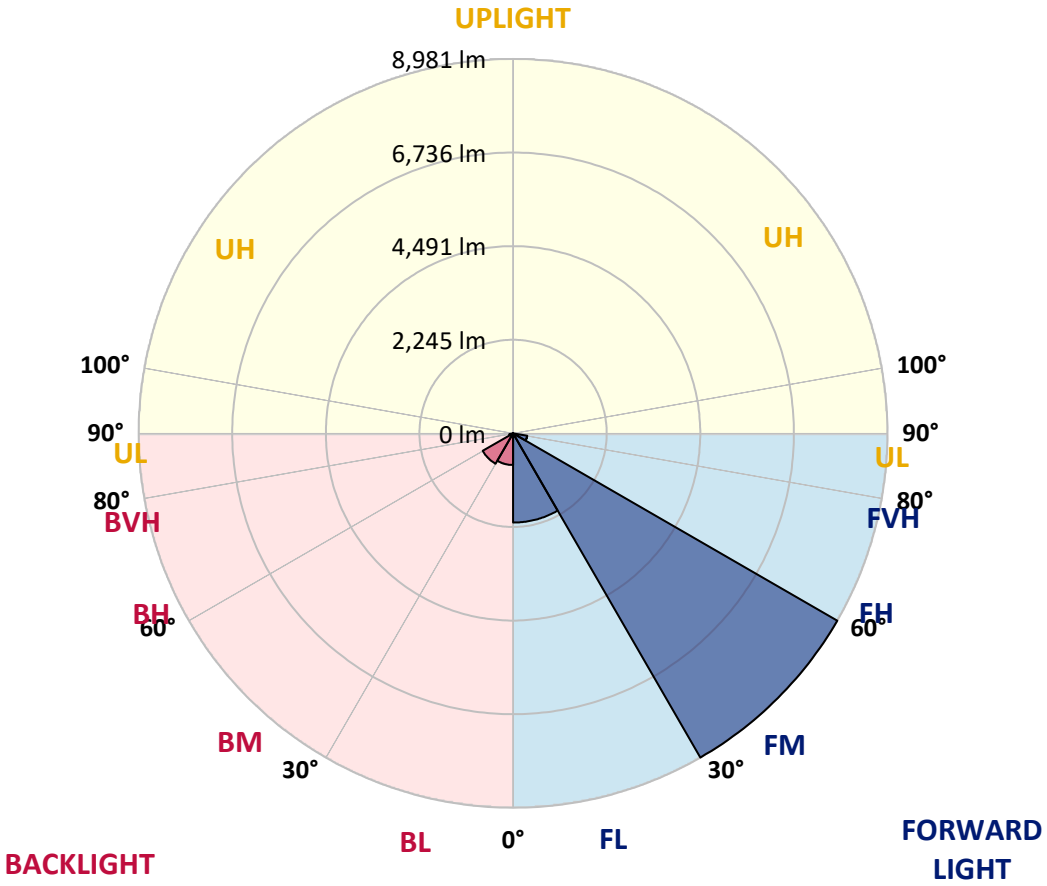
REPORT NUMBER: P635987
CATALOG NUMBER: GWS-SA3E-830-U-AFL-W-GRSBK

## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 2139.6 | 16.3 | | | |
| FM | (30°-60°) | 8981.2 | 68.3 | | | |
| FH | (60°-80°) | 344.4 | 2.6 | | | G0/660 |
| FVH | (80°-90°) | 1.6 | 0.0 | | | G0/10 |
| BL | (0°-30°) | 758.8 | 5.8 | B2/1000 | | |
| BM | (30°-60°) | 840.7 | 6.4 | B1/1000 | | |
| BH | (60°-80°) | 89.2 | 0.7 | B0/110 | | G0/110 |
| BVH | (80°-90°) | 1.8 | 0.0 | | | G0/10 |
| UL | (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH | (100°-180°) | 0.0 | 0.0 | | U0/0 | |

**BUG Rating: B2-U0-G0**
Type II Short



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REPORT NUMBER: P635987
CATALOG NUMBER: GWS-SA3E-830-U-AFL-W-GRSBK

**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 15° | 25° | 35° | 45° | 50° | 55° | 65° | 75° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 3986.1 | 3986.1 | 3986.1 | 3986.1 | 3986.1 | 3986.1 | *3986.1* | 3986.1 | 3986.1 | 3986.1 | 3986.1 |
| 2.5° | 4542.2 | 4578.5 | 4568.5 | 4520.9 | 4469.5 | 4433.2 | *4376.9* | 4359.3 | 4231.6 | 4142.7 | 4048.8 |
| 5° | 5090.7 | 5102.0 | 5089.4 | 5031.8 | 4941.7 | 4855.2 | *4762.6* | 4708.7 | 4494.6 | 4301.7 | 4105.1 |
| 7.5° | 5222.2 | 5208.4 | 5232.2 | 5261.0 | 5248.5 | 5210.9 | *5113.2* | 5054.4 | 4798.9 | 4484.6 | 4186.5 |
| 10° | 4811.4 | 4780.1 | 4869.0 | 5018.1 | 5174.6 | 5351.2 | *5326.1* | 5331.1 | 5095.7 | 4715.0 | 4293.0 |
| 12.5° | 4266.7 | 4254.1 | 4320.5 | 4493.3 | 4800.1 | 5200.9 | *5297.3* | 5458.9 | 5367.4 | 4964.2 | 4414.4 |
| 15° | 4027.5 | 4033.7 | 4073.8 | 4182.8 | 4403.2 | 4901.6 | *5133.3* | 5425.1 | 5610.4 | 5205.9 | 4548.4 |
| 17.5° | 4063.8 | 4086.3 | 4085.1 | 4121.4 | 4255.4 | 4654.9 | *4925.4* | 5318.6 | 5798.2 | 5483.9 | 4702.5 |
| 20° | 4310.5 | 4333.0 | 4299.2 | 4271.7 | 4316.8 | 4592.3 | *4816.4* | 5210.9 | 5924.7 | 5764.4 | 4865.3 |
| 22.5° | 4679.9 | 4706.2 | 4626.1 | 4547.2 | 4518.4 | 4695.0 | *4857.8* | 5167.1 | 6021.2 | 6021.2 | 5010.5 |
| 25° | 5127.0 | 5163.3 | 5039.3 | 4899.1 | 4818.9 | 4911.6 | *5034.3* | 5266.0 | 6120.1 | 6251.6 | 5109.5 |
| 27.5° | 5626.7 | 5627.9 | 5521.5 | 5363.7 | 5213.4 | 5224.7 | *5298.6* | 5488.9 | 6229.0 | 6499.5 | 5187.1 |
| 30° | 6189.0 | 6192.7 | 6051.2 | 5862.1 | 5673.0 | 5621.7 | *5684.3* | 5828.3 | 6455.7 | 6811.4 | 5294.8 |
| 32.5° | 6915.3 | 6932.9 | 6730.0 | 6452.0 | 6206.5 | 6110.1 | *6146.4* | 6297.9 | 6816.4 | 7202.1 | 5456.4 |
| 35° | 7897.1 | 7915.9 | 7616.6 | 7249.7 | 6859.0 | 6713.7 | *6750.0* | 6902.8 | 7338.6 | 7756.9 | 5714.3 |
| 37.5° | 8866.4 | 8891.5 | 8588.4 | 8246.5 | 7710.5 | 7470.1 | *7507.7* | 7652.9 | 8122.6 | 8523.3 | 6127.6 |
| 40° | 9536.4 | 9570.2 | 9476.3 | 9245.9 | 8748.7 | 8433.1 | *8478.2* | 8530.8 | 8985.4 | 9440.0 | 6663.6 |
| 42.5° | 9889.6 | 9937.2 | 9977.2 | 10095.0 | 9833.2 | 9569.0 | *9492.6* | 9496.4 | 9863.3 | 10374.2 | 7220.9 |
| 45° | 9910.9 | 9957.2 | 10162.6 | 10617.2 | 10816.3 | 10761.2 | *10622.2* | 10528.3 | 10533.3 | 10996.6 | 7569.0 |
| 47.5° | 9222.1 | 9308.5 | 9693.0 | 10583.4 | 11332.3 | 11789.4 | *11719.2* | 11496.3 | 10815.0 | 11038.0 | 7531.5 |
| 50° | *7590.3* | *7675.5* | *8374.3* | *9655.4* | *10956.6* | *12200.1* | *12489.4* | *12190.1* | *10631.0* | *10523.3* | *7144.5* |
| 52.5° | 5512.7 | 5521.5 | 5974.8 | 7471.3 | 9433.7 | 11442.5 | *12123.7* | 12094.9 | 10350.4 | 9899.6 | 6616.0 |
| 55° | 2618.6 | 2587.3 | 3097.0 | 4216.6 | 6524.6 | 9254.7 | *10403.0* | 10728.6 | 9952.2 | 9448.8 | 6206.5 |
| 57.5° | 762.7 | 777.7 | 1004.4 | 1645.6 | 3263.5 | 5914.7 | *7124.5* | 7730.6 | 8168.9 | 7768.1 | 4813.9 |
| 60° | 341.9 | 343.1 | 382.0 | 500.9 | 1087.0 | 2751.3 | *3683.1* | 4433.2 | 4884.1 | 4525.9 | 2388.2 |
| 62.5° | 248.0 | 249.2 | 264.2 | 283.0 | 369.4 | 931.7 | *1381.3* | 1840.9 | 1874.7 | 1227.3 | 604.9 |
| 65° | 206.6 | 206.6 | 209.1 | 209.1 | 221.7 | 333.1 | *419.5* | 541.0 | 455.8 | 338.1 | 236.7 |
| 67.5° | 166.6 | 167.8 | 170.3 | 170.3 | 166.6 | 166.6 | *180.3* | 197.9 | 211.6 | 261.7 | 217.9 |
| 70° | 130.2 | 129.0 | 129.0 | 130.2 | 126.5 | 107.7 | *116.5* | 132.7 | 145.3 | 204.1 | 189.1 |
| 72.5° | 101.4 | 102.7 | 101.4 | 96.4 | 87.7 | 63.9 | *68.9* | 86.4 | 92.7 | 127.7 | 127.7 |
| 75° | 76.4 | 77.6 | 72.6 | 55.1 | 36.3 | 20.0 | *26.3* | 42.6 | 53.8 | 62.6 | 46.3 |
| 77.5° | 10.0 | 10.0 | 7.5 | 7.5 | 6.3 | 7.5 | *7.5* | 10.0 | 15.0 | 15.0 | 11.3 |
| 80° | 1.3 | 1.3 | 1.3 | 2.5 | 3.8 | 5.0 | *5.0* | 5.0 | 5.0 | 6.3 | 6.3 |
| 82.5° | 1.3 | 1.3 | 1.3 | 1.3 | 3.8 | 3.8 | *5.0* | 5.0 | 5.0 | 5.0 | 5.0 |
| 85° | 0.0 | 0.0 | 0.0 | 1.3 | 2.5 | 3.8 | *3.8* | 5.0 | 5.0 | 5.0 | 5.0 |
| 87.5° | 0.0 | 0.0 | 0.0 | 1.3 | 2.5 | 3.8 | *3.8* | 3.8 | 5.0 | 5.0 | 5.0 |
| 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: P635987
CATALOG NUMBER: GWS-SA3E-830-U-AFL-W-GRSBK

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 3986.1 | 3986.1 | 3986.1 | 3986.1 | 3986.1 | 3986.1 | 3986.1 | 3986.1 | 3986.1 | 3986.1 | 3986.1 |
| 2.5° | 3992.4 | 3919.8 | 3832.1 | 3772.0 | 3686.8 | 3630.5 | 3550.3 | 3496.5 | 3450.1 | 3413.8 | 3433.9 |
| 5° | 3993.7 | 3878.4 | 3699.4 | 3546.6 | 3380.0 | 3227.2 | 3063.2 | 2934.2 | 2817.7 | 2765.1 | 2793.9 |
| 7.5° | 4018.7 | 3853.4 | 3579.1 | 3307.4 | 2988.0 | 2672.5 | 2376.9 | 2136.5 | 2017.5 | 1961.1 | 1978.7 |
| 10° | 4067.5 | 3842.1 | 3445.1 | 2994.3 | 2475.8 | 2045.0 | 1758.3 | 1595.5 | 1529.1 | 1494.0 | 1500.3 |
| 12.5° | 4112.6 | 3834.6 | 3271.1 | 2582.3 | 1953.6 | 1586.7 | 1437.7 | 1415.1 | 1428.9 | 1430.2 | 1428.9 |
| 15° | 4174.0 | 3820.8 | 3055.7 | 2159.0 | 1562.9 | 1371.3 | 1375.0 | 1407.6 | 1440.2 | 1450.2 | 1447.7 |
| 17.5° | 4239.1 | 3799.5 | 2777.6 | 1753.2 | 1326.2 | 1308.7 | 1352.5 | 1396.3 | 1428.9 | 1433.9 | 1435.2 |
| 20° | 4306.7 | 3755.7 | 2460.8 | 1431.4 | 1216.0 | 1261.1 | 1309.9 | 1342.5 | 1366.3 | 1373.8 | 1376.3 |
| 22.5° | 4338.0 | 3663.0 | 2095.1 | 1201.0 | 1142.1 | 1202.2 | 1238.5 | 1281.1 | 1288.6 | 1261.1 | 1266.1 |
| 25° | 4321.8 | 3506.5 | 1738.2 | 1045.7 | 1068.2 | 1128.3 | 1182.2 | 1160.9 | 1129.6 | 1109.6 | 1115.8 |
| 27.5° | 4270.4 | 3298.6 | 1388.8 | 931.7 | 989.3 | 1065.7 | 1072.0 | 1048.2 | 1043.2 | 1026.9 | 1031.9 |
| 30° | 4215.3 | 3059.4 | 1117.1 | 840.3 | 909.2 | 989.3 | 970.5 | 979.3 | 980.6 | 961.8 | 968.0 |
| 32.5° | 4181.5 | 2809.0 | 889.1 | 778.9 | 857.8 | 872.9 | 910.4 | 928.0 | 929.2 | 885.4 | 892.9 |
| 35° | 4192.8 | 2562.2 | 752.6 | 728.9 | 810.3 | 806.5 | 859.1 | 869.1 | 796.5 | 736.4 | 742.6 |
| 37.5° | 4284.2 | 2334.3 | 675.0 | 690.0 | 727.6 | 756.4 | 796.5 | 730.1 | 713.8 | 686.3 | 690.0 |
| 40° | 4454.5 | 2140.2 | 628.7 | 666.2 | 671.2 | 717.6 | 656.2 | 665.0 | 666.2 | 648.7 | 652.5 |
| 42.5° | 4653.6 | 1978.7 | 601.1 | 652.5 | 639.9 | 647.5 | 586.1 | 603.6 | 622.4 | 614.9 | 616.1 |
| 45° | 4753.8 | 1820.9 | 577.3 | 604.9 | 608.6 | 537.2 | 523.5 | 542.3 | 566.0 | 569.8 | 571.1 |
| 47.5° | 4664.9 | 1670.6 | 552.3 | 536.0 | 561.0 | 489.7 | 473.4 | 479.6 | 507.2 | 522.2 | 524.7 |
| 50° | *4393.1* | *1497.8* | *514.7* | *474.6* | *460.9* | *439.6* | *424.5* | *425.8* | *457.1* | *483.4* | *488.4* |
| 52.5° | 4011.2 | 1317.4 | 453.3 | 402.0 | 370.7 | 387.0 | 390.7 | 383.2 | 412.0 | 438.3 | 443.3 |
| 55° | 3640.5 | 1092.0 | 359.4 | 326.9 | 298.1 | 333.1 | 343.1 | 333.1 | 341.9 | 359.4 | 360.7 |
| 57.5° | 2563.5 | 617.4 | 275.5 | 270.5 | 246.7 | 285.5 | 301.8 | 286.8 | 271.8 | 283.0 | 285.5 |
| 60° | 1188.5 | 323.1 | 211.6 | 211.6 | 205.4 | 245.5 | 273.0 | 251.7 | 222.9 | 227.9 | 231.7 |
| 62.5° | 371.9 | 204.1 | 155.3 | 146.5 | 167.8 | 209.1 | 231.7 | 210.4 | 176.6 | 176.6 | 181.6 |
| 65° | 210.4 | 175.3 | 122.7 | 112.7 | 136.5 | 167.8 | 181.6 | 159.0 | 129.0 | 126.5 | 126.5 |
| 67.5° | 195.4 | 166.6 | 109.0 | 91.4 | 96.4 | 107.7 | 112.7 | 97.7 | 88.9 | 87.7 | 88.9 |
| 70° | 161.5 | 139.0 | 87.7 | 62.6 | 58.9 | 57.6 | 60.1 | 56.4 | 53.8 | 55.1 | 58.9 |
| 72.5° | 100.2 | 83.9 | 55.1 | 37.6 | 32.6 | 31.3 | 31.3 | 31.3 | 30.1 | 30.1 | 30.1 |
| 75° | 36.3 | 31.3 | 25.0 | 18.8 | 16.3 | 15.0 | 15.0 | 16.3 | 15.0 | 13.8 | 12.5 |
| 77.5° | 11.3 | 10.0 | 10.0 | 10.0 | 8.8 | 7.5 | 6.3 | 6.3 | 5.0 | 3.8 | 3.8 |
| 80° | 6.3 | 6.3 | 6.3 | 6.3 | 5.0 | 5.0 | 3.8 | 2.5 | 1.3 | 1.3 | 0.0 |
| 82.5° | 6.3 | 6.3 | 6.3 | 5.0 | 5.0 | 5.0 | 3.8 | 2.5 | 1.3 | 0.0 | 0.0 |
| 85° | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 3.8 | 2.5 | 1.3 | 0.0 | 0.0 |
| 87.5° | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 3.8 | 2.5 | 1.3 | 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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# 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

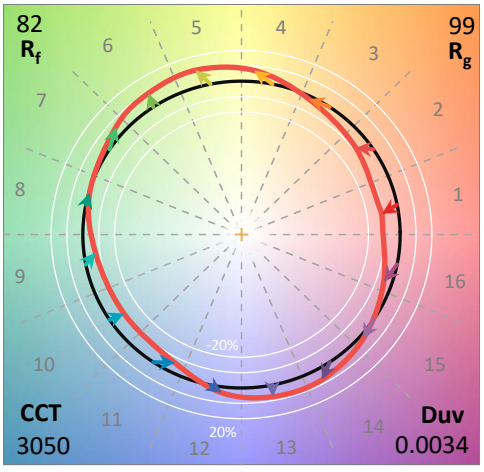
## Test Information

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

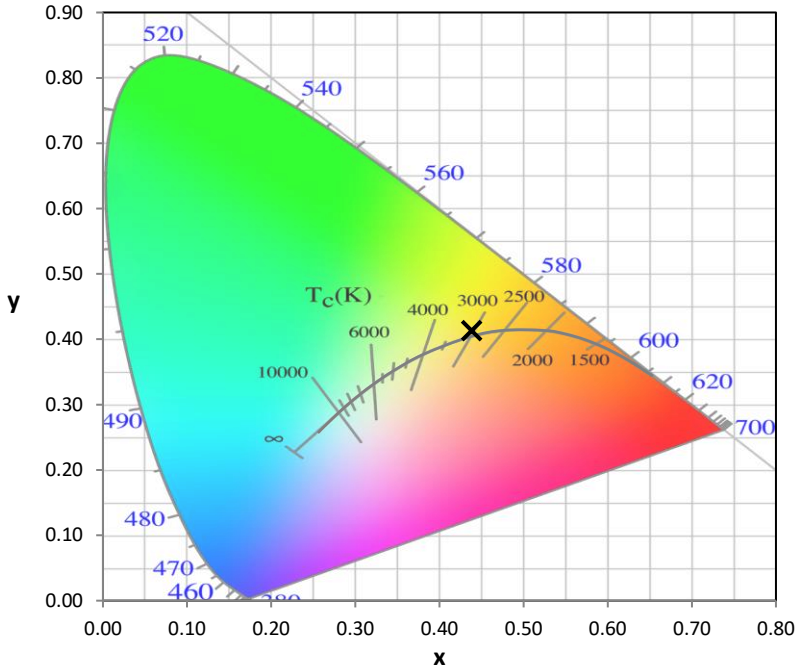
| | |
|---|---|
| Stabilization Time: | 20M |
| Operation Time: | 1H 20M |
| Sphere Temperature (°C): | 24.2 |

REPORT NUMBER: SP1-2408-195-9

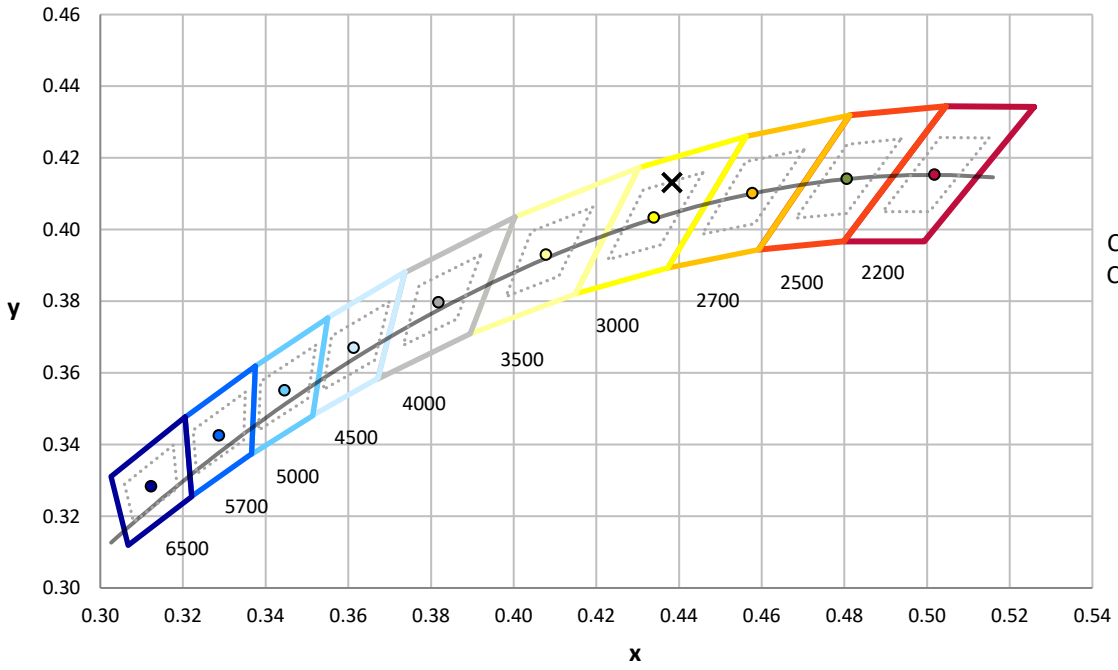
| Measurement and Test Equipment | | | |
|---|---|---|---|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 6/18/2024 | 12/18/2024 |
| Power Meter | INXT2011004 | 2/8/2024 | 2/8/2025 |
| AC Power Source | IN0063 | 10/24/2023 | 10/24/2024 |
| DC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

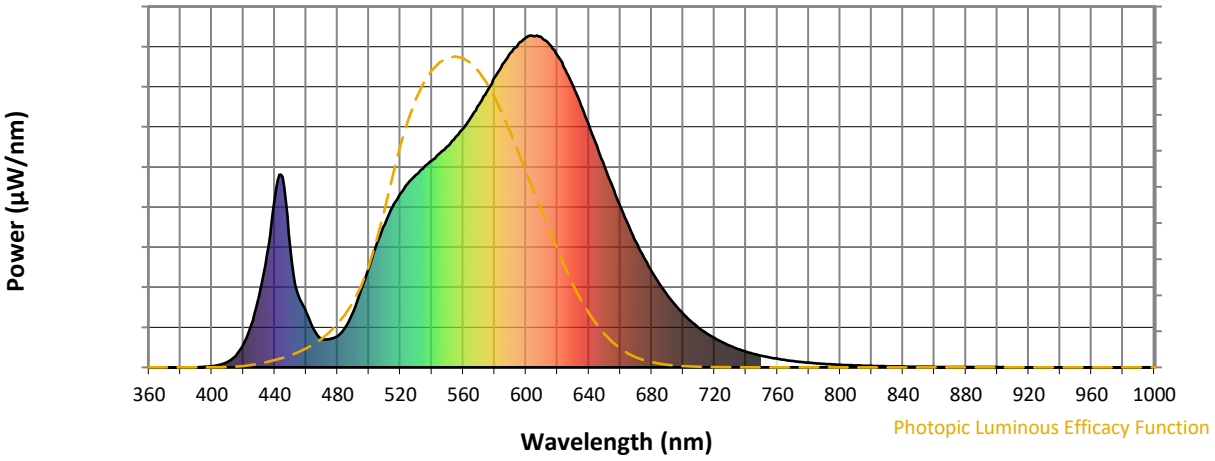



CCT = 3050K
CIE x = 0.4383
CIE y = 0.4131
Duv = 0.0034

Point lies inside the ANSI 3000K 4-step quadrangle

REPORT NUMBER: SP1-2408-195-9

## Photopic Flux vs. Wavelength

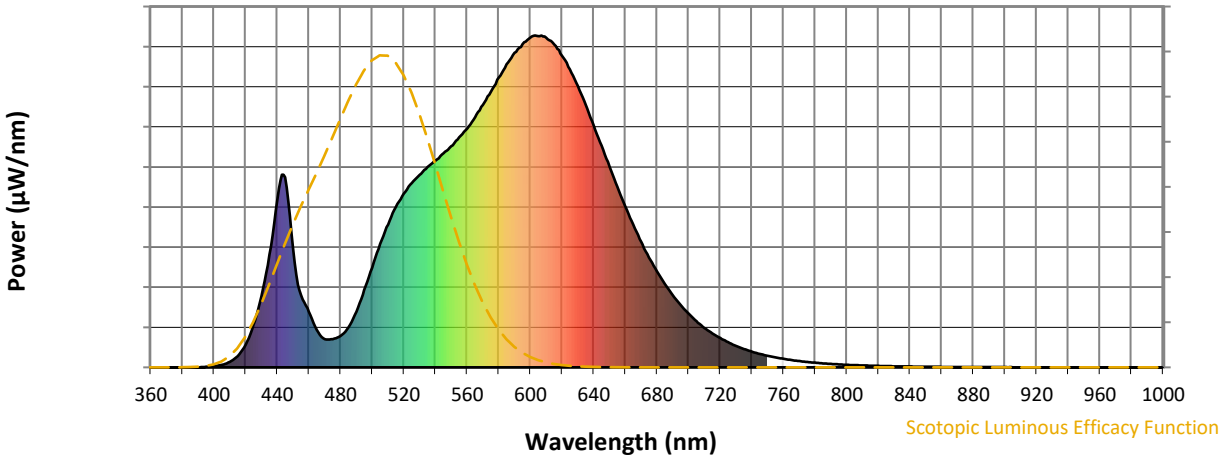



## Photopic Lumens: NR

| 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

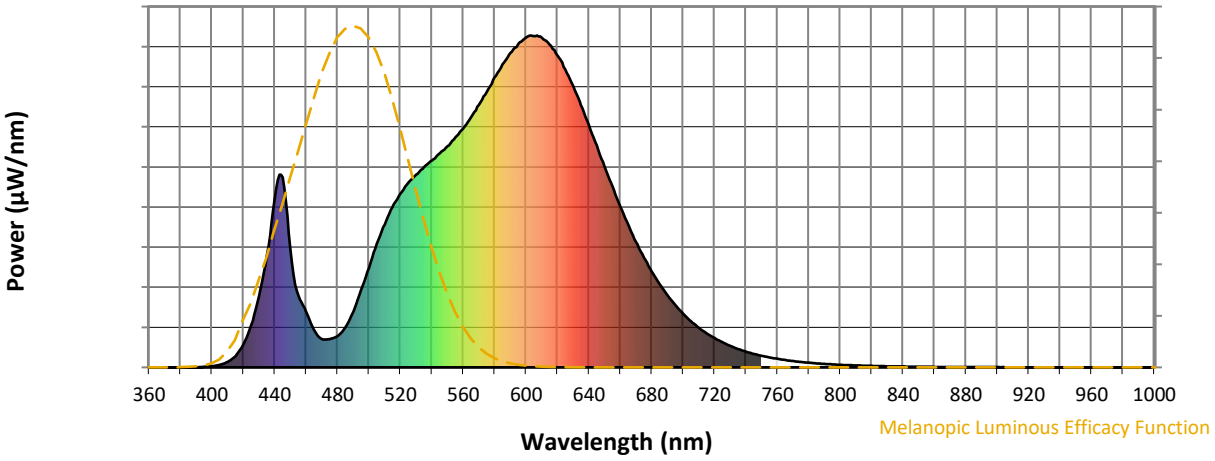



**Scotopic Lumens: NR** **S/P: 1.27**

| 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 | | | |

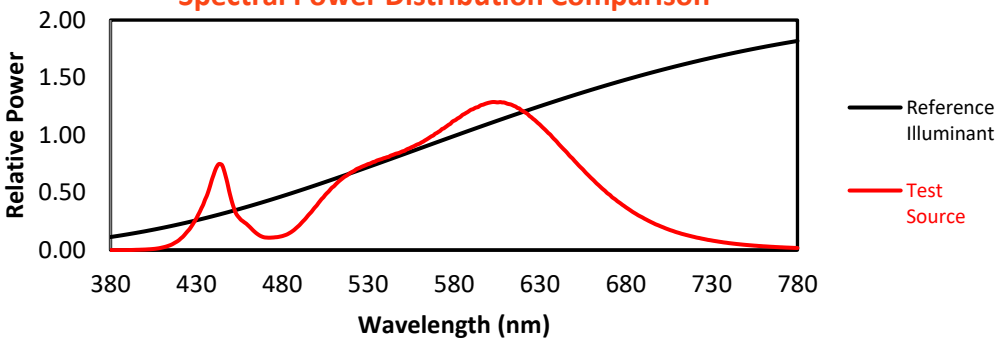
REPORT NUMBER: SP1-2408-195-9

# TM-30-18

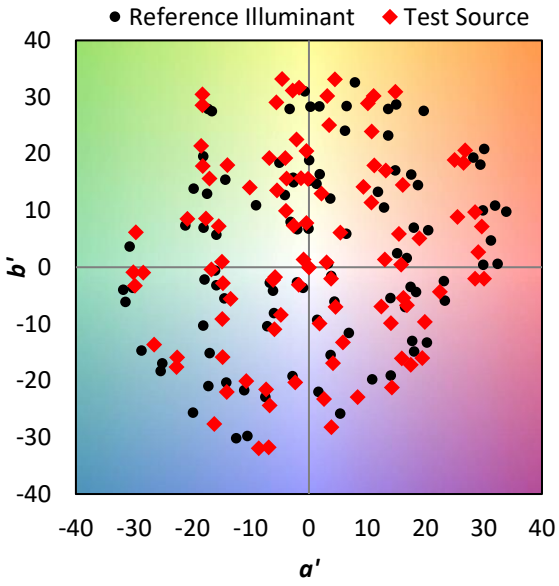
## Summary

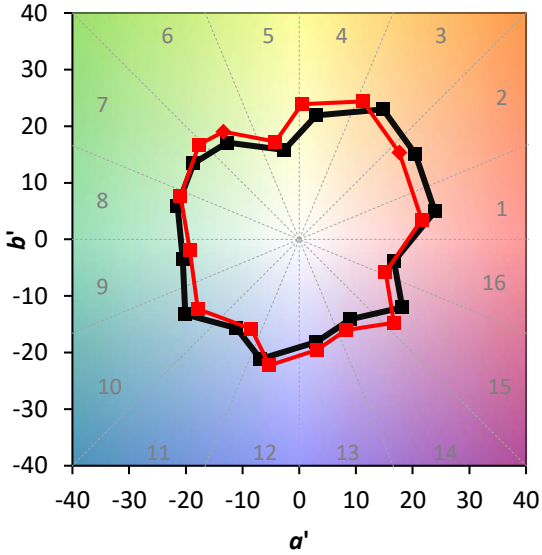
$R_f$ = 81.5
$R_g$ = 99.2
CIE $R_a$ = 81.0
$R_9$ = 7.1

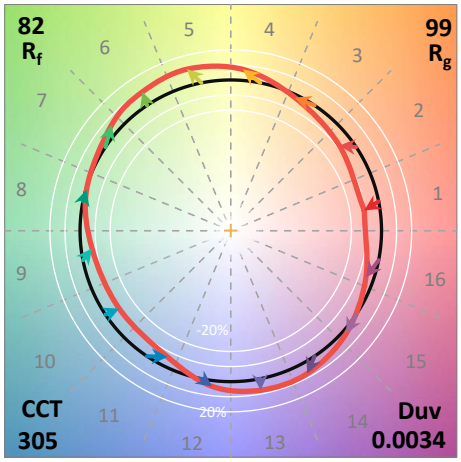
## Spectral Power Distribution Comparison

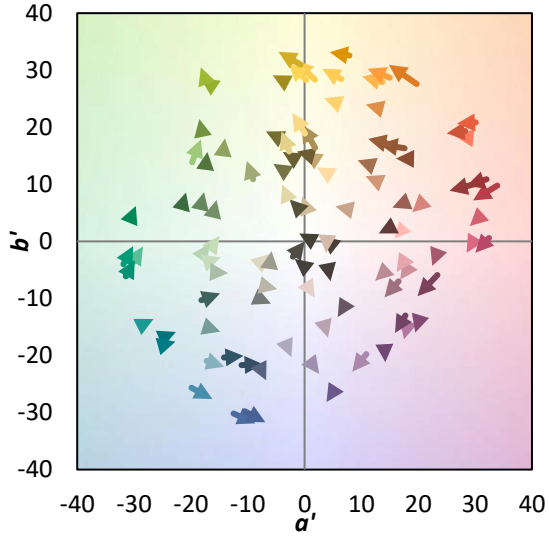



## Color Vector Graphics



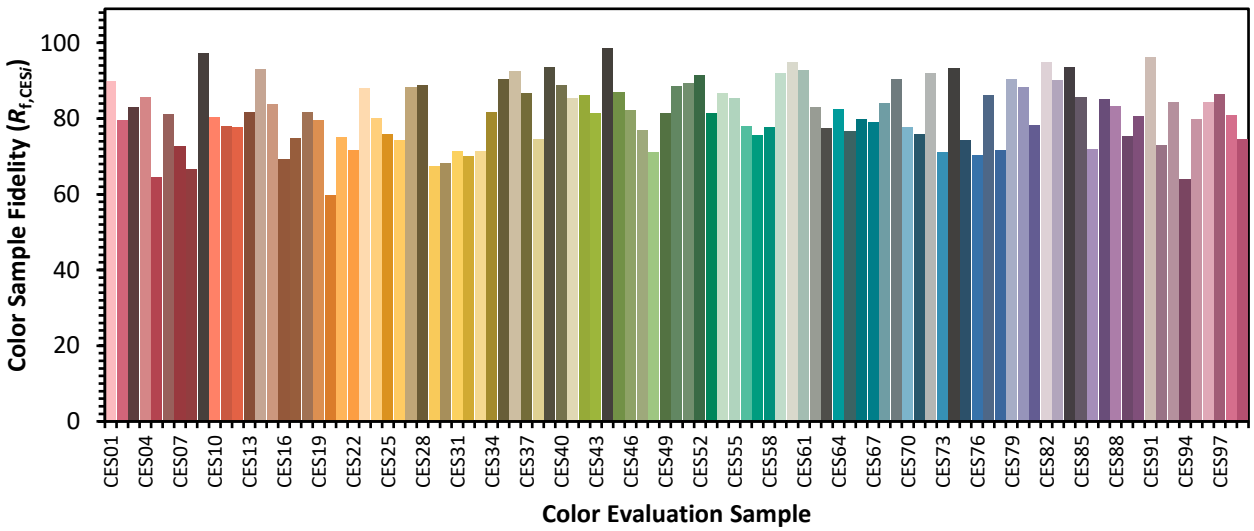



REPORT NUMBER: SP1-2408-195-9

# TM-30-18

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

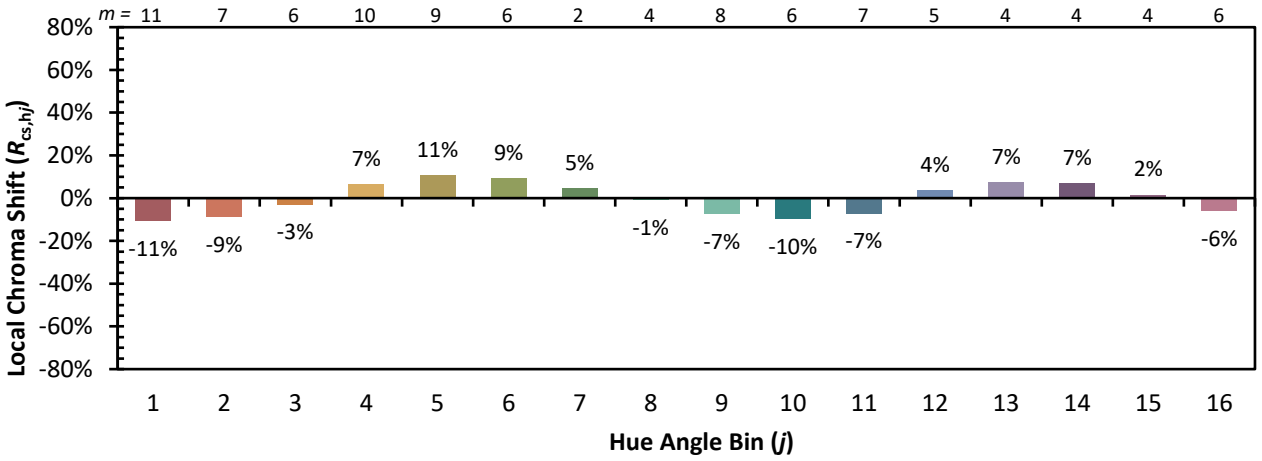
| | | | |
|---|---|---|---|
| CES01 = 86 | CES26 = 74 | CES51 = 89 | CES76 = 70 |
| CES02 = 63 | CES27 = 88 | CES52 = 92 | CES77 = 86 |
| CES03 = 31 | CES28 = 89 | CES53 = 81 | CES78 = 72 |
| CES04 = 70 | CES29 = 67 | CES54 = 87 | CES79 = 90 |
| CES05 = 50 | CES30 = 68 | CES55 = 85 | CES80 = 88 |
| CES06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

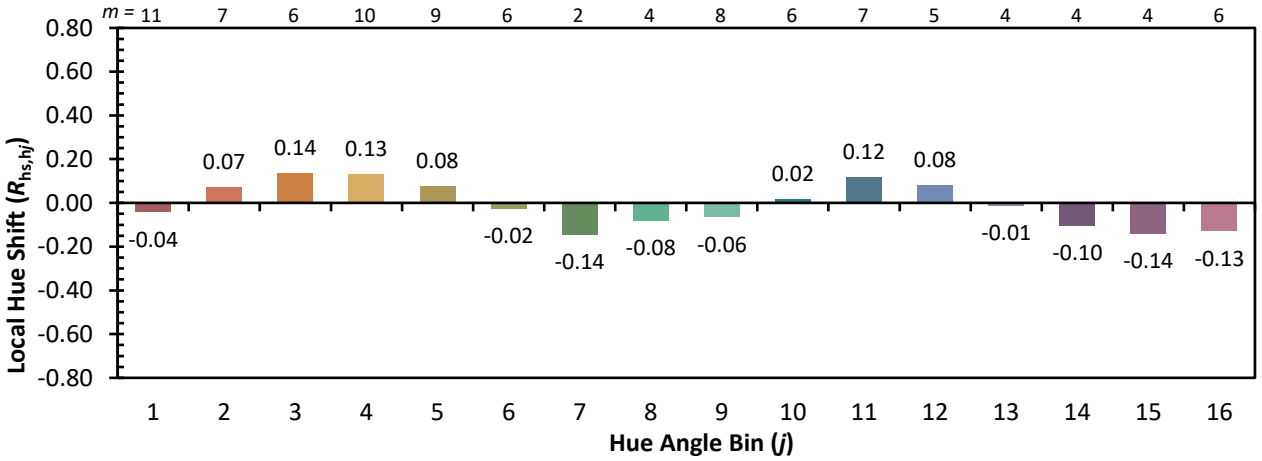


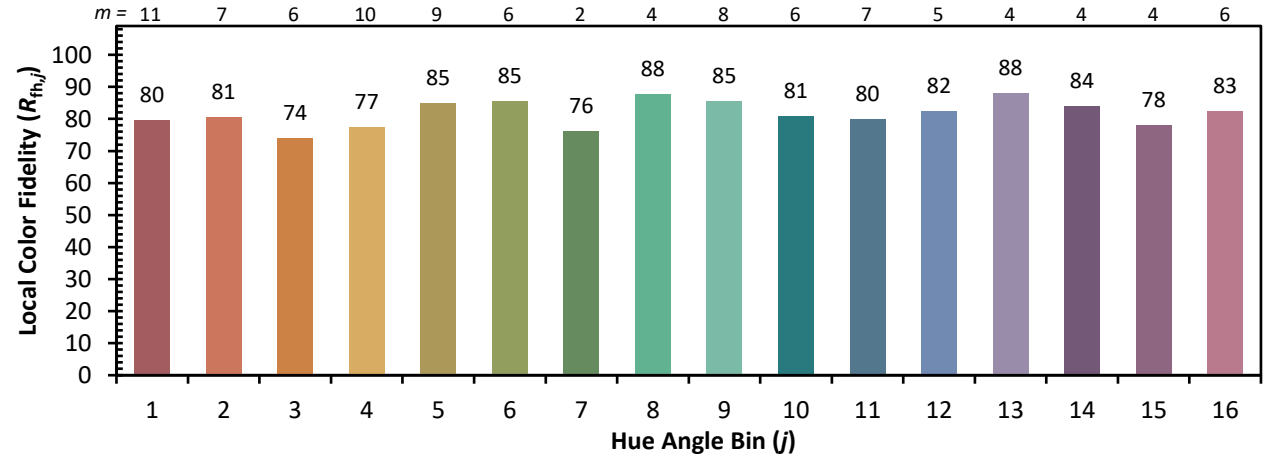
REPORT NUMBER: SP1-2408-195-9

# TM-30-18

## Color Rendition by Hue-Angle Bin



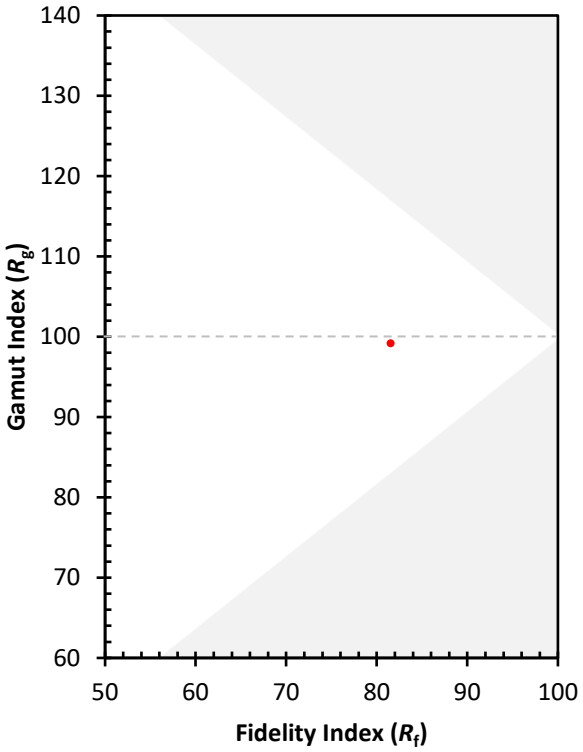



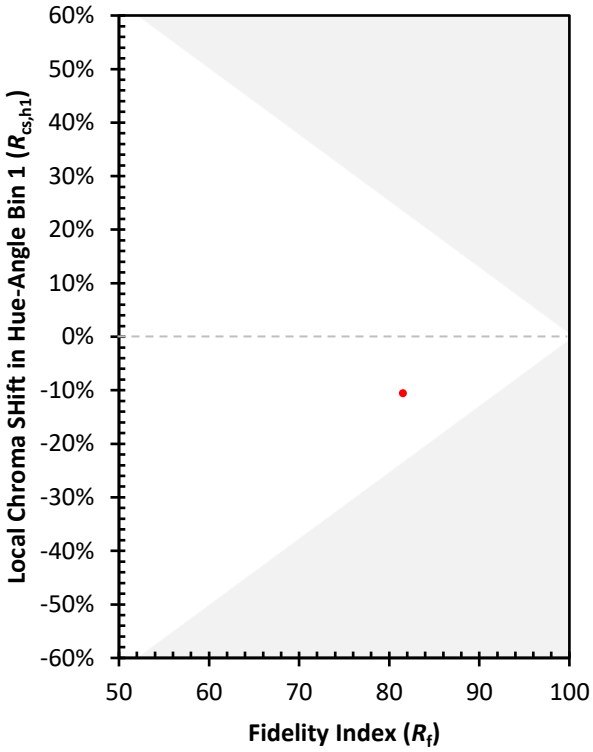



REPORT NUMBER: SP1-2408-195-9

## TM-30-18

### Measure Comparisons

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