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: P643909

Luminaire Tested: GWS-SA6F-830-U-AFL-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: | P643909 |
| | TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-48) |
| Test Lab: | COOPER LIGHTING SOLUTIONS |
| Issue Date: | 1/10/2023 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS |
| Product Line: | McGRAW-EDISON |
| Catalog Number: | GWS-SA6F-830-U-AFL-W-HSS |
| Description: | GALLEON WALL SLIM LUMINAIRE. (6) LIGHTSQUARES WITH 16 LEDS EACH AND AUTOMOTIVE FRONTLINE OPTICS WITH HOUSE SIDE SHIELD |
| Light Source: | (96) 3000K CCT, 80 CRI LEDS |
| Ballast/Driver: | - |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 33155.4 lumens |
| Efficiency: | N/A |
| Efficacy: | 89.0 lumens/watt |
| Luminous Opening: | Rectangular (W 2' x L: 1' x H: 0') |
| IES Classification: | Type II - Short |
| BUG Rating: | B2 - U0 - G2 |

| | |
|---|---|
| Input Watts (W): | 372.6 |
| 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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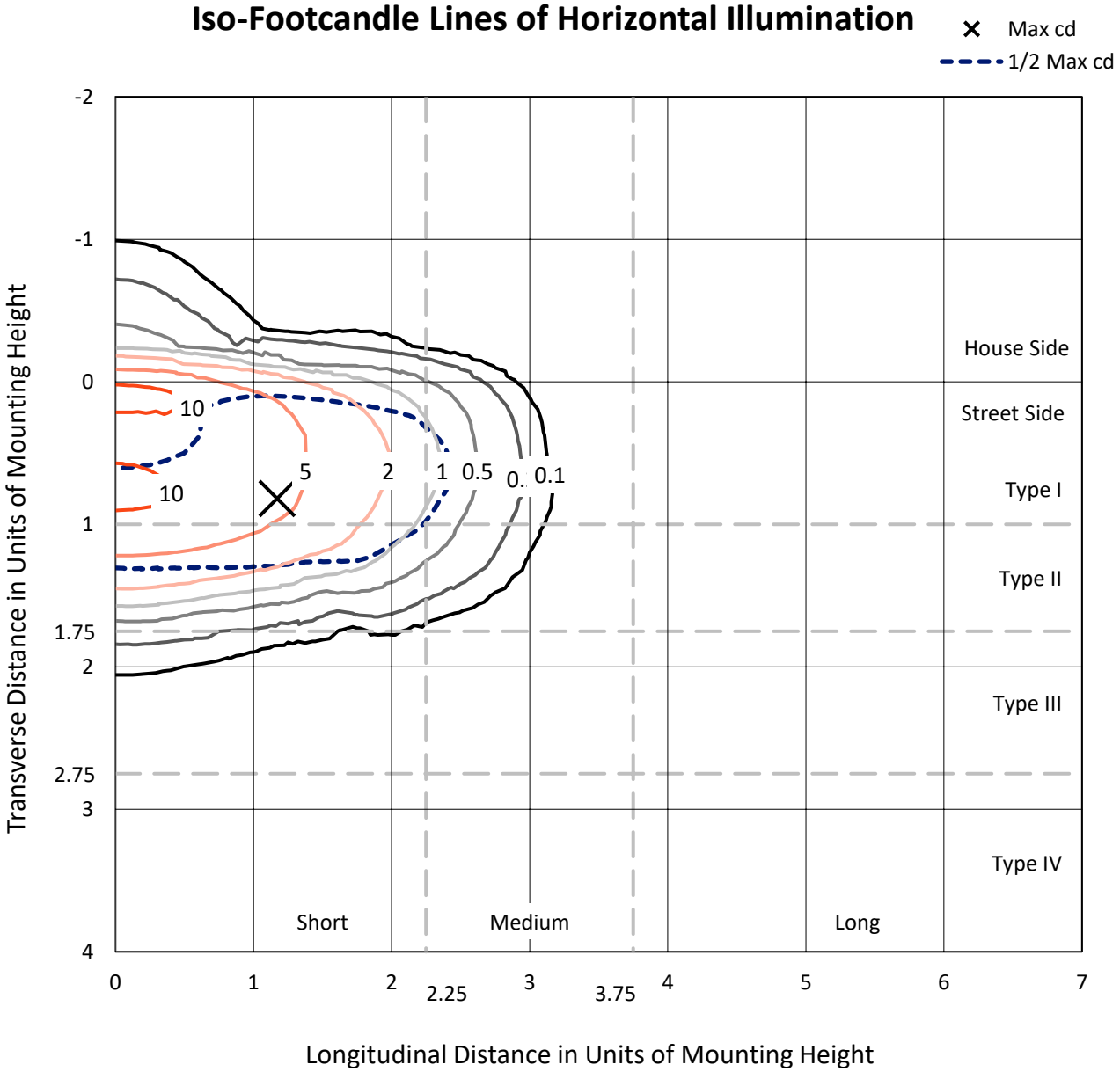
Scaled Data Report

REPORT NUMBER: P643909
CATALOG NUMBER: GWS-SA6F-830-U-AFL-W-HSS

## Iso-Footcandle Lines of Horizontal Illumination




Based on 30 foot mounting height. Maximum calculated value = 12.5 fc
Type II - Short - N/A

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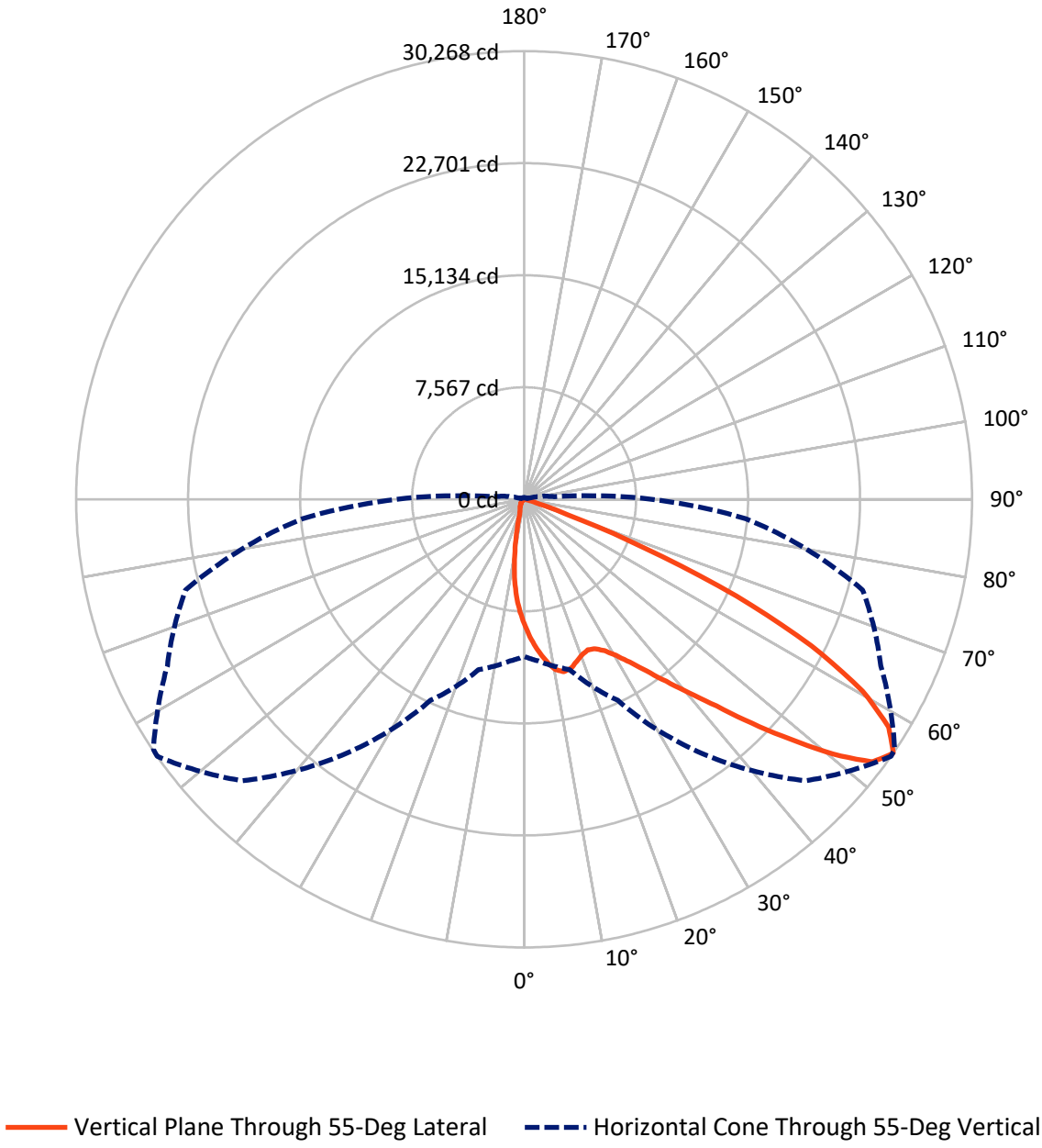
## Luminous Intensity Polar Plot



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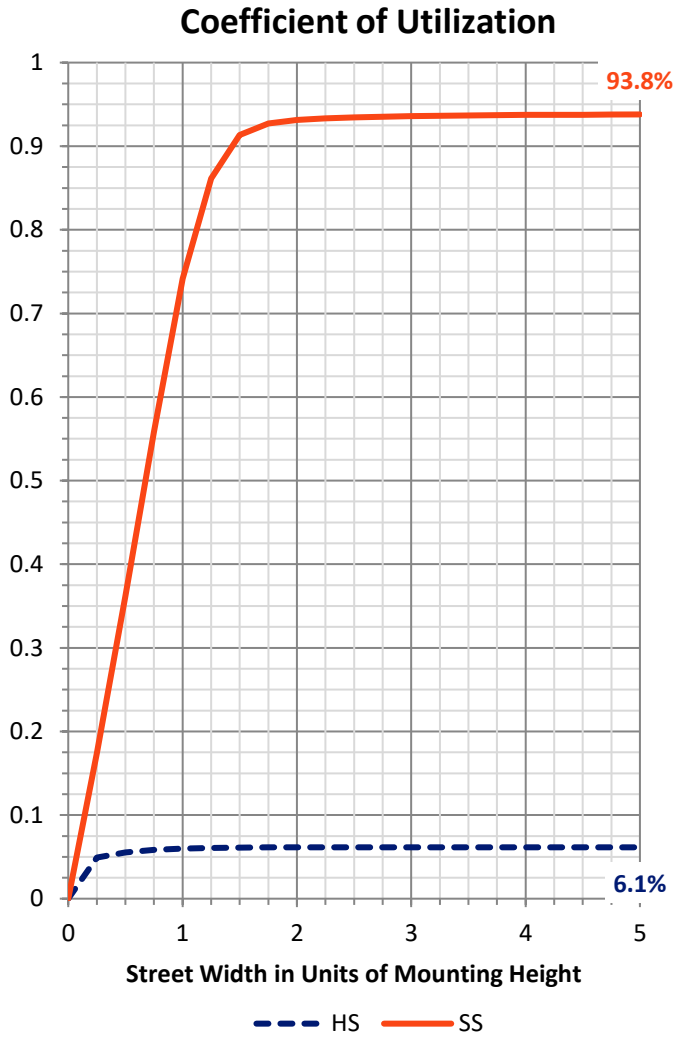
REPORT NUMBER: P643909
CATALOG NUMBER: GWS-SA6F-830-U-AFL-W-HSS

**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 2045.8 | 0.0 | 2045.8 |
| | % Fixture | 6.2 | 0.0 | 6.2 |
| **Street Side** | Lumens | 31109.6 | 0.0 | 31109.6 |
| | % Fixture | 93.8 | 0.0 | 93.8 |
| **Total** | Lumens | 33155.4 | 0.0 | 33155.4 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 757.0 | 2.3 |
| 10°-20° | 1825.0 | 5.5 |
| 20°-30° | 3039.3 | 9.2 |
| 30°-40° | 5179.1 | 15.6 |
| 40°-50° | 8454.2 | 25.5 |
| 50°-60° | 8851.1 | 26.7 |
| 60°-70° | 4464.3 | 13.5 |
| 70°-80° | 563.9 | 1.7 |
| 80°-90° | 21.4 | 0.1 |
| 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° | 33155.4 | 100.0 |
| 0°-180° | 33155.4 | 100.0 |



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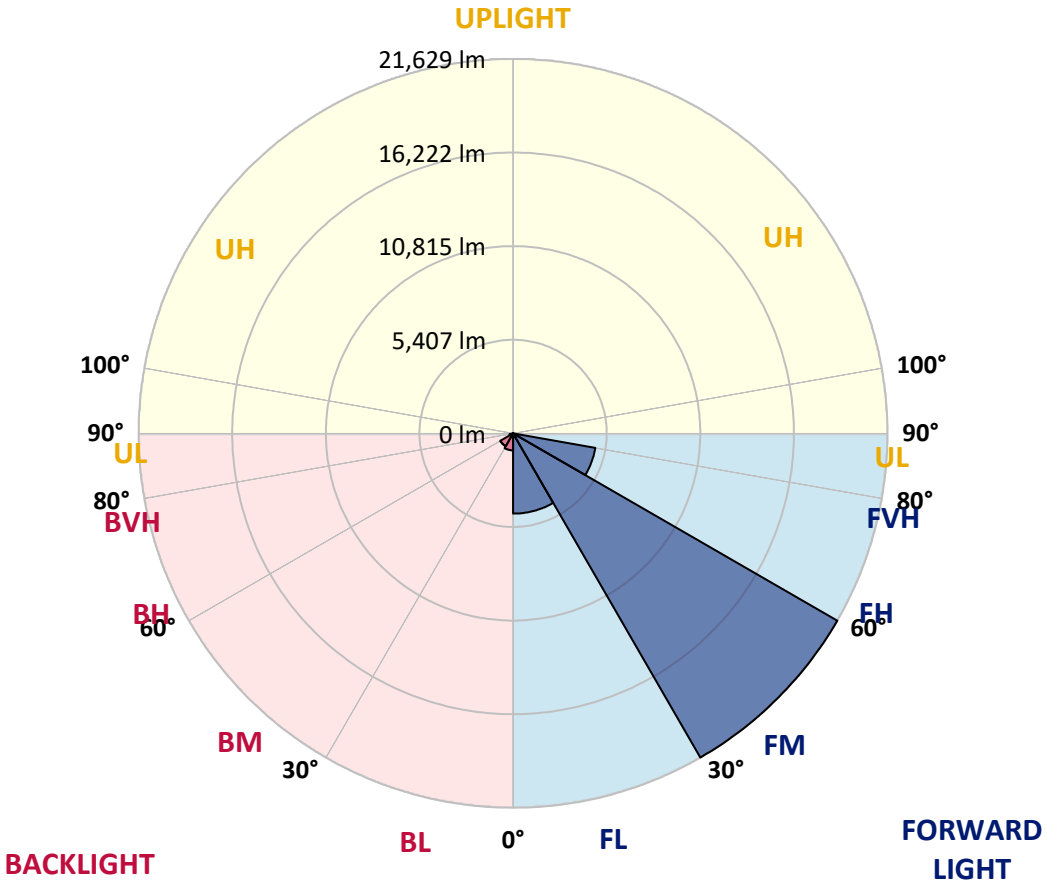
REPORT NUMBER: P643909
CATALOG NUMBER: GWS-SA6F-830-U-AFL-W-HSS

## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 4638.0 | 14.0 | | | |
| FM | (30°-60°) | 21629.1 | 65.2 | | | |
| FH | (60°-80°) | 4823.0 | 14.5 | | | G2/5000 |
| FVH | (80°-90°) | 19.5 | 0.1 | | | G1/100 |
| BL | (0°-30°) | 983.3 | 3.0 | B2/1000 | | |
| BM | (30°-60°) | 855.4 | 2.6 | B1/1000 | | |
| BH | (60°-80°) | 205.2 | 0.6 | B1/500 | | G1/500 |
| BVH | (80°-90°) | 1.9 | 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-G2**
Type II Short



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Scaled Data Report

REPORT NUMBER: P643909
CATALOG NUMBER: GWS-SA6F-830-U-AFL-W-HSS

**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 15° | 25° | 35° | 45° | 55° | 56° | 65° | 75° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 8565.4 | 8565.4 | 8565.4 | 8565.4 | 8565.4 | 8565.4 | 8565.4 | 8565.4 | 8565.4 | 8565.4 | 8565.4 |
| 2.5° | 9985.4 | 9937.2 | 10010.9 | 9925.9 | 9781.4 | 9659.5 | 9500.7 | 9444.1 | 9189.0 | 8948.1 | 8715.6 |
| 5° | 11198.5 | 11212.7 | 11190.0 | 11071.0 | 10866.9 | 10640.2 | 10319.9 | 10249.0 | 9804.0 | 9344.9 | 8848.8 |
| 7.5° | 11499.0 | 11490.5 | 11538.6 | 11584.0 | 11550.0 | 11436.6 | 11088.0 | 11017.1 | 10464.4 | 9775.7 | 9052.9 |
| 10° | 10572.1 | 10577.8 | 10677.0 | 10983.1 | 11362.9 | 11756.9 | 11703.0 | 11663.4 | 11122.0 | 10263.2 | 9279.7 |
| 12.5° | 9262.7 | 9313.7 | 9418.6 | 9855.0 | 10498.4 | 11394.1 | 11949.6 | 11989.3 | 11725.7 | 10798.9 | 9546.1 |
| 15° | 8695.8 | 8707.1 | 8792.2 | 9055.8 | 9534.8 | 10640.2 | 11844.8 | 11955.3 | 12230.2 | 11337.4 | 9835.2 |
| 17.5° | 8681.6 | 8695.8 | 8732.6 | 8848.8 | 9160.6 | 10047.8 | 11507.5 | 11700.2 | 12610.0 | 11915.6 | 10181.0 |
| 20° | 9214.5 | 9206.0 | 9180.5 | 9118.1 | 9254.2 | 9852.2 | 11195.7 | 11408.3 | 12816.9 | 12479.7 | 10529.6 |
| 22.5° | 10181.0 | 10169.7 | 10056.3 | 9798.4 | 9687.8 | 10030.8 | 11042.6 | 11235.4 | 12941.7 | 12981.3 | 10815.9 |
| 25° | 11294.9 | 11374.3 | 11161.7 | 10770.5 | 10498.4 | 10487.1 | 11178.7 | 11314.7 | 13049.4 | 13426.3 | 11011.5 |
| 27.5° | 12516.5 | 12542.0 | 12360.6 | 11921.3 | 11527.3 | 11218.4 | 11572.7 | 11674.7 | 13168.4 | 13823.1 | 11122.0 |
| 30° | 13857.1 | 13848.6 | 13641.7 | 13131.6 | 12652.5 | 12207.6 | 12235.9 | 12275.6 | 13446.2 | 14276.6 | 11243.9 |
| 32.5° | 15532.3 | 15569.1 | 15200.6 | 14506.2 | 13930.8 | 13315.8 | 13103.2 | 13108.9 | 13947.8 | 14860.5 | 11428.1 |
| 35° | 17808.2 | 17717.5 | 17230.0 | 16240.8 | 15260.2 | 14596.9 | 14234.1 | 14202.9 | 14721.6 | 15645.6 | 11748.4 |
| 37.5° | 19976.5 | 19985.0 | 19474.8 | 18386.4 | 17147.8 | 16102.0 | 15588.9 | 15503.9 | 15810.0 | 16734.0 | 12281.2 |
| 40° | 21481.6 | 21509.9 | 21297.3 | 20727.6 | 19415.3 | 17935.8 | 17181.8 | 17094.0 | 17221.5 | 18111.5 | 12978.5 |
| 42.5° | 22278.0 | 22357.4 | 22416.9 | 22550.1 | 21555.3 | 20225.9 | 19066.7 | 19058.2 | 18925.0 | 19681.7 | 13786.3 |
| 45° | 22309.2 | 22428.2 | 22791.0 | 23700.9 | 23814.2 | 22839.2 | 21577.9 | 21388.0 | 20875.0 | 21362.5 | 14509.1 |
| 47.5° | 21076.2 | 21351.2 | 22122.1 | 23924.8 | 25115.2 | 25438.3 | 24188.4 | 24072.2 | 22632.3 | 22691.8 | 15050.4 |
| 50° | 18202.2 | 18488.5 | 19908.5 | 22776.9 | 25444.0 | 27501.7 | 27053.9 | 26813.0 | 24100.5 | 23570.5 | 15311.2 |
| 52.5° | 15254.5 | 15515.2 | 16478.9 | 20044.5 | 24080.7 | 28150.8 | 29468.8 | 29182.5 | 25418.5 | 23876.6 | 15203.5 |
| 55° | 10614.7 | 10963.3 | 11904.3 | 14982.4 | 20940.2 | 26886.7 | 30268.1 | 30208.5 | 26594.7 | 23683.8 | 15036.2 |
| 57.5° | 5203.9 | 5549.7 | 6487.8 | 9237.2 | 15512.4 | 23474.1 | 29046.4 | 29361.1 | 27297.6 | 23476.9 | 14900.2 |
| 60° | 2173.9 | 2315.7 | 2638.8 | 4053.1 | 8678.8 | 17740.2 | 26288.6 | 26725.1 | 26866.8 | 23196.3 | 14886.0 |
| 62.5° | 1261.3 | 1284.0 | 1318.0 | 1680.8 | 3375.7 | 10169.7 | 21807.5 | 22428.2 | 24602.2 | 22825.0 | 14662.1 |
| 65° | 952.3 | 960.8 | 946.7 | 1031.7 | 1394.5 | 3857.6 | 15756.2 | 16600.8 | 20534.9 | 21373.9 | 13777.8 |
| 67.5° | 782.3 | 782.3 | 745.4 | 762.4 | 875.8 | 1445.5 | 8698.6 | 9877.7 | 15195.0 | 17567.3 | 11377.1 |
| 70° | 623.6 | 637.7 | 620.7 | 598.0 | 626.4 | 799.3 | 3095.1 | 3837.7 | 8848.8 | 10373.7 | 6635.2 |
| 72.5° | 473.3 | 473.3 | 501.7 | 484.7 | 464.8 | 501.7 | 1079.9 | 1213.1 | 3551.4 | 4325.2 | 2395.0 |
| 75° | 365.6 | 377.0 | 396.8 | 379.8 | 351.5 | 297.6 | 518.7 | 549.9 | 1071.4 | 1006.2 | 535.7 |
| 77.5° | 187.1 | 189.9 | 252.3 | 277.8 | 260.8 | 181.4 | 226.7 | 249.4 | 348.6 | 311.8 | 198.4 |
| 80° | 113.4 | 119.0 | 141.7 | 218.2 | 172.9 | 96.4 | 93.5 | 99.2 | 164.4 | 141.7 | 82.2 |
| 82.5° | 48.2 | 51.0 | 79.4 | 79.4 | 70.9 | 36.8 | 36.8 | 36.8 | 79.4 | 73.7 | 34.0 |
| 85° | 0.0 | 0.0 | 14.2 | 11.3 | 11.3 | 14.2 | 14.2 | 14.2 | 19.8 | 28.3 | 17.0 |
| 87.5° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.8 | 8.5 | 8.5 |
| 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: P643909
CATALOG NUMBER: GWS-SA6F-830-U-AFL-W-HSS

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 8565.4 | 8565.4 | 8565.4 | 8565.4 | 8565.4 | 8565.4 | 8565.4 | 8565.4 | 8565.4 | 8565.4 | 8565.4 |
| 2.5° | 8565.4 | 8384.0 | 8140.3 | 7919.2 | 7621.6 | 7454.3 | 7221.9 | 7032.0 | 6870.5 | 6819.5 | 6796.8 |
| 5° | 8568.2 | 8256.5 | 7734.9 | 7213.4 | 6572.9 | 6068.3 | 5549.7 | 5138.7 | 4801.4 | 4693.7 | 4665.3 |
| 7.5° | 8624.9 | 8165.8 | 7321.1 | 6374.5 | 5303.1 | 4418.8 | 3628.0 | 2919.4 | 2590.6 | 2480.1 | 2457.4 |
| 10° | 8701.5 | 8089.2 | 6842.1 | 5368.3 | 3829.2 | 2692.6 | 1907.5 | 1454.0 | 1238.6 | 1119.6 | 1136.6 |
| 12.5° | 8800.7 | 8026.9 | 6312.1 | 4279.9 | 2533.9 | 1479.5 | 1048.7 | 878.6 | 833.3 | 810.6 | 799.3 |
| 15° | 8933.9 | 7953.2 | 5654.5 | 3200.0 | 1553.2 | 952.3 | 807.8 | 762.4 | 745.4 | 734.1 | 731.3 |
| 17.5° | 9069.9 | 7868.2 | 4985.6 | 2250.5 | 1031.7 | 790.8 | 725.6 | 702.9 | 691.6 | 683.1 | 680.2 |
| 20° | 9214.5 | 7723.6 | 4200.5 | 1550.4 | 813.5 | 711.4 | 668.9 | 643.4 | 629.2 | 615.1 | 612.2 |
| 22.5° | 9276.8 | 7491.2 | 3449.4 | 1085.6 | 722.8 | 654.7 | 600.9 | 569.7 | 552.7 | 541.4 | 541.4 |
| 25° | 9217.3 | 7114.2 | 2672.8 | 824.8 | 657.6 | 592.4 | 538.5 | 504.5 | 490.3 | 479.0 | 479.0 |
| 27.5° | 9058.6 | 6629.6 | 1950.0 | 683.1 | 586.7 | 527.2 | 476.2 | 445.0 | 433.7 | 428.0 | 428.0 |
| 30° | 8882.9 | 6017.3 | 1374.7 | 586.7 | 507.3 | 459.2 | 416.6 | 396.8 | 394.0 | 388.3 | 388.3 |
| 32.5° | 8732.6 | 5444.8 | 946.7 | 515.9 | 447.8 | 399.6 | 371.3 | 362.8 | 365.6 | 360.0 | 362.8 |
| 35° | 8650.4 | 4883.6 | 702.9 | 459.2 | 399.6 | 354.3 | 340.1 | 340.1 | 340.1 | 337.3 | 337.3 |
| 37.5° | 8684.5 | 4330.9 | 572.5 | 419.5 | 357.1 | 323.1 | 308.9 | 314.6 | 320.3 | 320.3 | 320.3 |
| 40° | 8854.5 | 3840.5 | 507.3 | 382.6 | 320.3 | 294.8 | 283.4 | 291.9 | 300.4 | 306.1 | 306.1 |
| 42.5° | 9069.9 | 3443.7 | 459.2 | 351.5 | 294.8 | 266.4 | 260.8 | 269.3 | 277.8 | 283.4 | 283.4 |
| 45° | 9206.0 | 3044.1 | 411.0 | 311.8 | 269.3 | 235.3 | 235.3 | 246.6 | 243.8 | 246.6 | 246.6 |
| 47.5° | 9268.3 | 2726.6 | 362.8 | 269.3 | 229.6 | 204.1 | 206.9 | 212.6 | 206.9 | 212.6 | 212.6 |
| 50° | 9115.3 | 2406.4 | 320.3 | 223.9 | 189.9 | 178.6 | 184.2 | 181.4 | 181.4 | 192.7 | 192.7 |
| 52.5° | 8834.7 | 2168.3 | 283.4 | 189.9 | 161.6 | 158.7 | 164.4 | 153.1 | 155.9 | 155.9 | 153.1 |
| 55° | *8627.8* | *2032.2* | *252.3* | *164.4* | *138.9* | *141.7* | *138.9* | *119.0* | *107.7* | *96.4* | *93.5* |
| 57.5° | 8525.7 | 1978.4 | 229.6 | 147.4 | 124.7 | 124.7 | 113.4 | 82.2 | 62.4 | 48.2 | 42.5 |
| 60° | 8503.1 | 1913.2 | 206.9 | 127.5 | 110.5 | 104.9 | 82.2 | 48.2 | 31.2 | 22.7 | 19.8 |
| 62.5° | 8287.6 | 1754.5 | 187.1 | 102.0 | 96.4 | 85.0 | 51.0 | 28.3 | 17.0 | 11.3 | 8.5 |
| 65° | 7581.9 | 1442.7 | 167.2 | 79.4 | 73.7 | 62.4 | 31.2 | 17.0 | 8.5 | 2.8 | 0.0 |
| 67.5° | 6031.5 | 1023.2 | 147.4 | 59.5 | 51.0 | 39.7 | 19.8 | 11.3 | 2.8 | 0.0 | 0.0 |
| 70° | 3477.8 | 552.7 | 121.9 | 42.5 | 34.0 | 25.5 | 14.2 | 5.7 | 0.0 | 0.0 | 0.0 |
| 72.5° | 1162.1 | 257.9 | 93.5 | 28.3 | 25.5 | 19.8 | 8.5 | 2.8 | 0.0 | 0.0 | 0.0 |
| 75° | 255.1 | 153.1 | 62.4 | 19.8 | 17.0 | 14.2 | 5.7 | 0.0 | 0.0 | 0.0 | 0.0 |
| 77.5° | 96.4 | 107.7 | 31.2 | 14.2 | 11.3 | 8.5 | 2.8 | 0.0 | 0.0 | 0.0 | 0.0 |
| 80° | 36.8 | 70.9 | 14.2 | 8.5 | 8.5 | 2.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 82.5° | 19.8 | 28.3 | 8.5 | 5.7 | 5.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 85° | 11.3 | 14.2 | 5.7 | 2.8 | 2.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 87.5° | 5.7 | 2.8 | 2.8 | 2.8 | 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

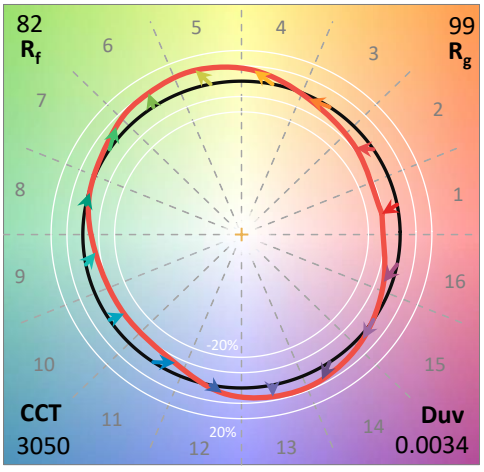
## Test Information

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

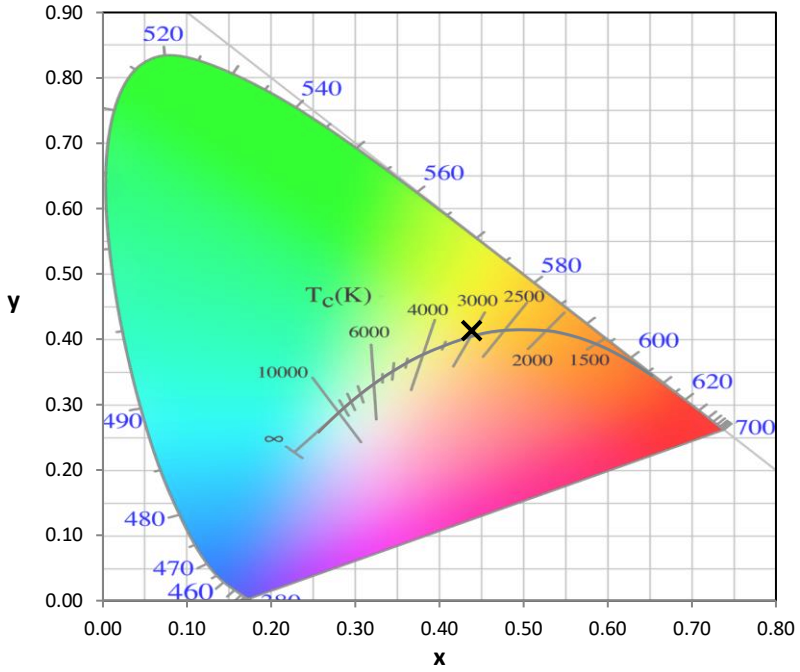
| | |
|---|---|
| Stabilization Time: | 20M |
| Operation Time: | 1H 20M |
| Sphere Temperature (°C): | 24.2 |

REPORT NUMBER: SP1-2408-195-9

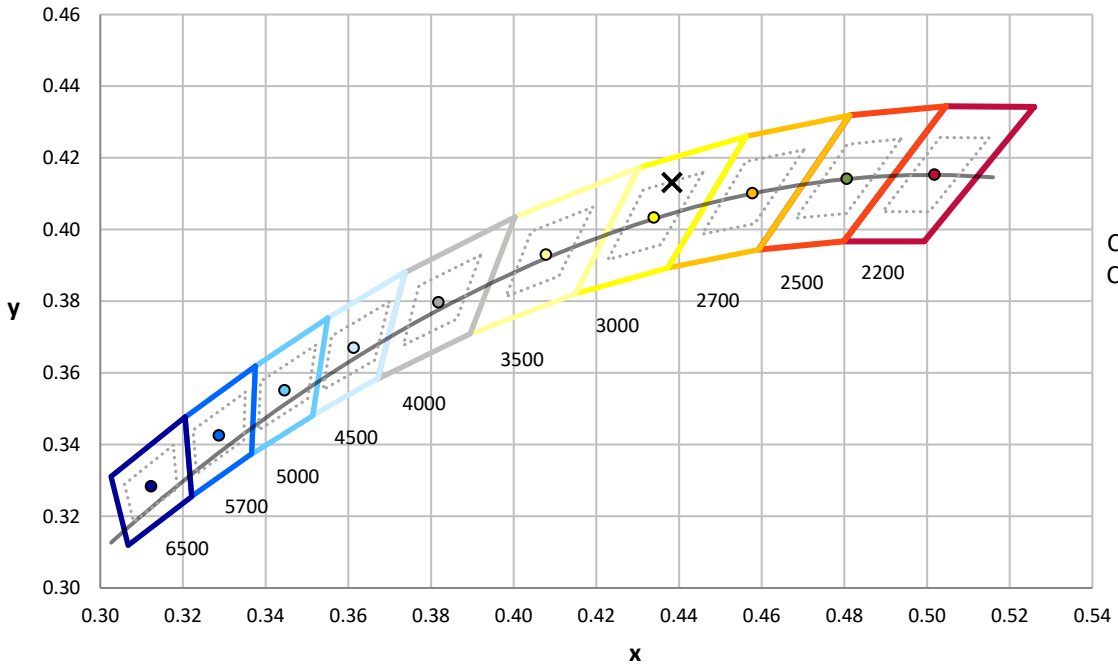
| Measurement and Test Equipment | | | |
|---|---|---|---|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 6/18/2024 | 12/18/2024 |
| Power Meter | INXT2011004 | 2/8/2024 | 2/8/2025 |
| AC Power Source | IN0063 | 10/24/2023 | 10/24/2024 |
| DC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

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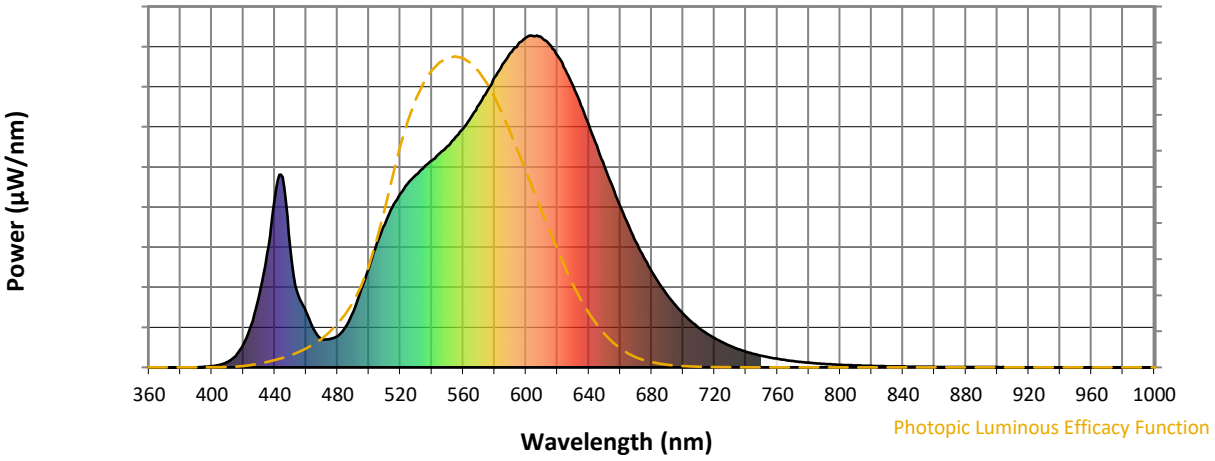
## Photopic Flux vs. Wavelength




## Photopic Lumens: NR

| λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 360 | 0 | NR | 490 | 168 | NR | 620 | 940 | NR | 750 | 35 | NR | 880 | 1 | NR |
| 365 | 0 | NR | 495 | 233 | NR | 625 | 897 | NR | 755 | 30 | NR | 885 | 1 | NR |
| 370 | 0 | NR | 500 | 300 | NR | 630 | 847 | NR | 760 | 26 | NR | 890 | 1 | NR |
| 375 | 0 | NR | 505 | 372 | NR | 635 | 790 | NR | 765 | 22 | NR | 895 | 1 | NR |
| 380 | 0 | NR | 510 | 430 | NR | 640 | 730 | NR | 770 | 19 | NR | 900 | 1 | NR |
| 385 | 0 | NR | 515 | 483 | NR | 645 | 668 | NR | 775 | 16 | NR | 905 | 1 | NR |
| 390 | 0 | NR | 520 | 524 | NR | 650 | 605 | NR | 780 | 14 | NR | 910 | 0 | NR |
| 395 | 2 | NR | 525 | 555 | NR | 655 | 545 | NR | 785 | 12 | NR | 915 | 0 | NR |
| 400 | 4 | NR | 530 | 581 | NR | 660 | 485 | NR | 790 | 10 | NR | 920 | 0 | NR |
| 405 | 7 | NR | 535 | 604 | NR | 665 | 430 | NR | 795 | 9 | NR | 925 | 0 | NR |
| 410 | 17 | NR | 540 | 623 | NR | 670 | 378 | NR | 800 | 8 | NR | 930 | 0 | NR |
| 415 | 34 | NR | 545 | 645 | NR | 675 | 331 | NR | 805 | 7 | NR | 935 | 0 | NR |
| 420 | 68 | NR | 550 | 667 | NR | 680 | 290 | NR | 810 | 6 | NR | 940 | 0 | NR |
| 425 | 128 | NR | 555 | 693 | NR | 685 | 251 | NR | 815 | 5 | NR | 945 | 0 | NR |
| 430 | 214 | NR | 560 | 719 | NR | 690 | 218 | NR | 820 | 4 | NR | 950 | 0 | NR |
| 435 | 339 | NR | 565 | 754 | NR | 695 | 188 | NR | 825 | 4 | NR | 955 | 0 | NR |
| 440 | 507 | NR | 570 | 791 | NR | 700 | 162 | NR | 830 | 3 | NR | 960 | 0 | NR |
| 445 | 573 | NR | 575 | 830 | NR | 705 | 139 | NR | 835 | 3 | NR | 965 | 0 | NR |
| 450 | 356 | NR | 580 | 873 | NR | 710 | 119 | NR | 840 | 3 | NR | 970 | 0 | NR |
| 455 | 217 | NR | 585 | 913 | NR | 715 | 102 | NR | 845 | 2 | NR | 975 | 0 | NR |
| 460 | 168 | NR | 590 | 948 | NR | 720 | 88 | NR | 850 | 2 | NR | 980 | 0 | NR |
| 465 | 113 | NR | 595 | 974 | NR | 725 | 76 | NR | 855 | 2 | NR | 985 | 0 | NR |
| 470 | 85 | NR | 600 | 994 | NR | 730 | 65 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 85 | NR | 605 | 998 | NR | 735 | 55 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 94 | NR | 610 | 994 | NR | 740 | 47 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 120 | NR | 615 | 973 | NR | 745 | 41 | NR | 875 | 1 | NR | | | |

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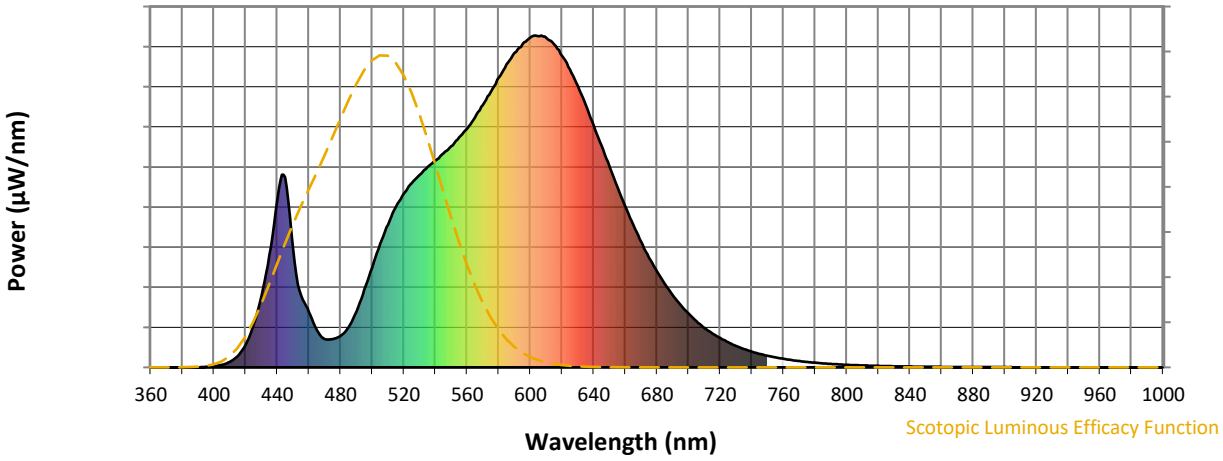
## Scotopic Flux vs. Wavelength




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

| λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 360 | 0 | NR | 490 | 168 | NR | 620 | 940 | NR | 750 | 35 | NR | 880 | 1 | NR |
| 365 | 0 | NR | 495 | 233 | NR | 625 | 897 | NR | 755 | 30 | NR | 885 | 1 | NR |
| 370 | 0 | NR | 500 | 300 | NR | 630 | 847 | NR | 760 | 26 | NR | 890 | 1 | NR |
| 375 | 0 | NR | 505 | 372 | NR | 635 | 790 | NR | 765 | 22 | NR | 895 | 1 | NR |
| 380 | 0 | NR | 510 | 430 | NR | 640 | 730 | NR | 770 | 19 | NR | 900 | 1 | NR |
| 385 | 0 | NR | 515 | 483 | NR | 645 | 668 | NR | 775 | 16 | NR | 905 | 1 | NR |
| 390 | 0 | NR | 520 | 524 | NR | 650 | 605 | NR | 780 | 14 | NR | 910 | 0 | NR |
| 395 | 2 | NR | 525 | 555 | NR | 655 | 545 | NR | 785 | 12 | NR | 915 | 0 | NR |
| 400 | 4 | NR | 530 | 581 | NR | 660 | 485 | NR | 790 | 10 | NR | 920 | 0 | NR |
| 405 | 7 | NR | 535 | 604 | NR | 665 | 430 | NR | 795 | 9 | NR | 925 | 0 | NR |
| 410 | 17 | NR | 540 | 623 | NR | 670 | 378 | NR | 800 | 8 | NR | 930 | 0 | NR |
| 415 | 34 | NR | 545 | 645 | NR | 675 | 331 | NR | 805 | 7 | NR | 935 | 0 | NR |
| 420 | 68 | NR | 550 | 667 | NR | 680 | 290 | NR | 810 | 6 | NR | 940 | 0 | NR |
| 425 | 128 | NR | 555 | 693 | NR | 685 | 251 | NR | 815 | 5 | NR | 945 | 0 | NR |
| 430 | 214 | NR | 560 | 719 | NR | 690 | 218 | NR | 820 | 4 | NR | 950 | 0 | NR |
| 435 | 339 | NR | 565 | 754 | NR | 695 | 188 | NR | 825 | 4 | NR | 955 | 0 | NR |
| 440 | 507 | NR | 570 | 791 | NR | 700 | 162 | NR | 830 | 3 | NR | 960 | 0 | NR |
| 445 | 573 | NR | 575 | 830 | NR | 705 | 139 | NR | 835 | 3 | NR | 965 | 0 | NR |
| 450 | 356 | NR | 580 | 873 | NR | 710 | 119 | NR | 840 | 3 | NR | 970 | 0 | NR |
| 455 | 217 | NR | 585 | 913 | NR | 715 | 102 | NR | 845 | 2 | NR | 975 | 0 | NR |
| 460 | 168 | NR | 590 | 948 | NR | 720 | 88 | NR | 850 | 2 | NR | 980 | 0 | NR |
| 465 | 113 | NR | 595 | 974 | NR | 725 | 76 | NR | 855 | 2 | NR | 985 | 0 | NR |
| 470 | 85 | NR | 600 | 994 | NR | 730 | 65 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 85 | NR | 605 | 998 | NR | 735 | 55 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 94 | NR | 610 | 994 | NR | 740 | 47 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 120 | NR | 615 | 973 | NR | 745 | 41 | NR | 875 | 1 | NR | | | |

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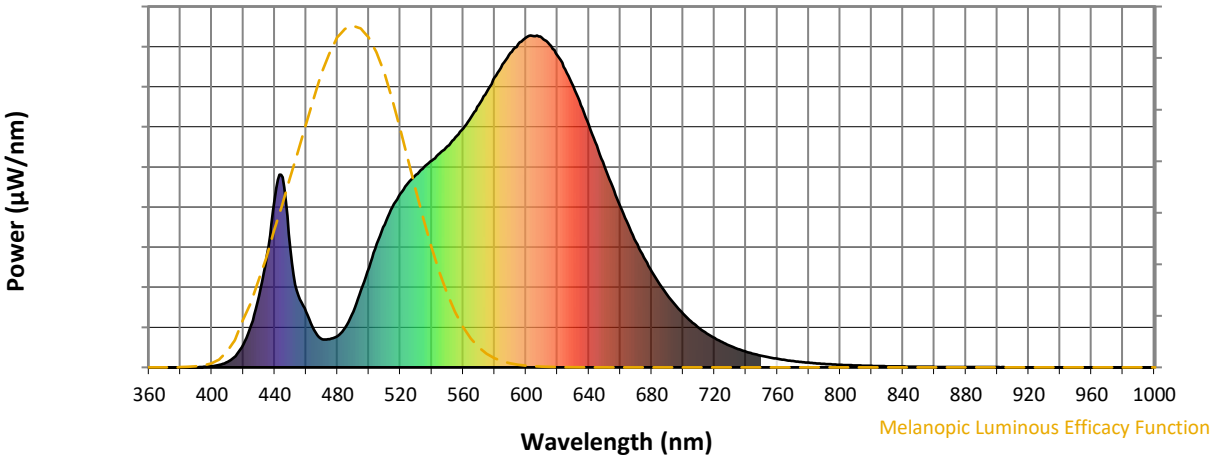
## Melanopic Flux vs. Wavelength




**Melanopic Lumens: NR** **M/P: 2.32**

| λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 360 | 0 | NR | 490 | 168 | NR | 620 | 940 | NR | 750 | 35 | NR | 880 | 1 | NR |
| 365 | 0 | NR | 495 | 233 | NR | 625 | 897 | NR | 755 | 30 | NR | 885 | 1 | NR |
| 370 | 0 | NR | 500 | 300 | NR | 630 | 847 | NR | 760 | 26 | NR | 890 | 1 | NR |
| 375 | 0 | NR | 505 | 372 | NR | 635 | 790 | NR | 765 | 22 | NR | 895 | 1 | NR |
| 380 | 0 | NR | 510 | 430 | NR | 640 | 730 | NR | 770 | 19 | NR | 900 | 1 | NR |
| 385 | 0 | NR | 515 | 483 | NR | 645 | 668 | NR | 775 | 16 | NR | 905 | 1 | NR |
| 390 | 0 | NR | 520 | 524 | NR | 650 | 605 | NR | 780 | 14 | NR | 910 | 0 | NR |
| 395 | 2 | NR | 525 | 555 | NR | 655 | 545 | NR | 785 | 12 | NR | 915 | 0 | NR |
| 400 | 4 | NR | 530 | 581 | NR | 660 | 485 | NR | 790 | 10 | NR | 920 | 0 | NR |
| 405 | 7 | NR | 535 | 604 | NR | 665 | 430 | NR | 795 | 9 | NR | 925 | 0 | NR |
| 410 | 17 | NR | 540 | 623 | NR | 670 | 378 | NR | 800 | 8 | NR | 930 | 0 | NR |
| 415 | 34 | NR | 545 | 645 | NR | 675 | 331 | NR | 805 | 7 | NR | 935 | 0 | NR |
| 420 | 68 | NR | 550 | 667 | NR | 680 | 290 | NR | 810 | 6 | NR | 940 | 0 | NR |
| 425 | 128 | NR | 555 | 693 | NR | 685 | 251 | NR | 815 | 5 | NR | 945 | 0 | NR |
| 430 | 214 | NR | 560 | 719 | NR | 690 | 218 | NR | 820 | 4 | NR | 950 | 0 | NR |
| 435 | 339 | NR | 565 | 754 | NR | 695 | 188 | NR | 825 | 4 | NR | 955 | 0 | NR |
| 440 | 507 | NR | 570 | 791 | NR | 700 | 162 | NR | 830 | 3 | NR | 960 | 0 | NR |
| 445 | 573 | NR | 575 | 830 | NR | 705 | 139 | NR | 835 | 3 | NR | 965 | 0 | NR |
| 450 | 356 | NR | 580 | 873 | NR | 710 | 119 | NR | 840 | 3 | NR | 970 | 0 | NR |
| 455 | 217 | NR | 585 | 913 | NR | 715 | 102 | NR | 845 | 2 | NR | 975 | 0 | NR |
| 460 | 168 | NR | 590 | 948 | NR | 720 | 88 | NR | 850 | 2 | NR | 980 | 0 | NR |
| 465 | 113 | NR | 595 | 974 | NR | 725 | 76 | NR | 855 | 2 | NR | 985 | 0 | NR |
| 470 | 85 | NR | 600 | 994 | NR | 730 | 65 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 85 | NR | 605 | 998 | NR | 735 | 55 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 94 | NR | 610 | 994 | NR | 740 | 47 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 120 | NR | 615 | 973 | NR | 745 | 41 | NR | 875 | 1 | NR | | | |

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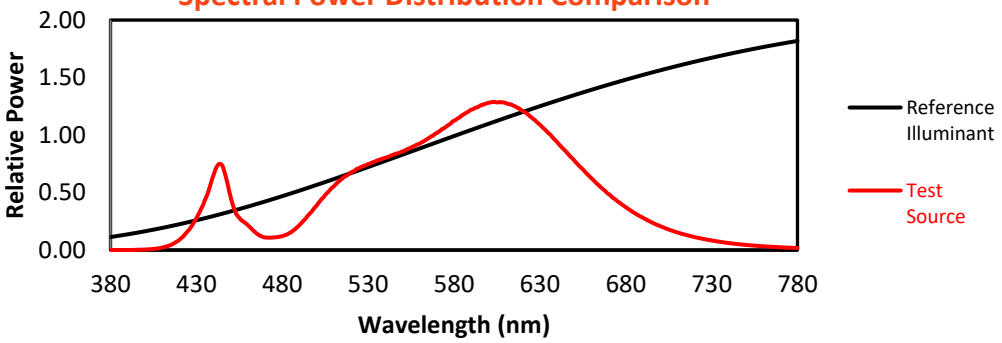
# TM-30-18

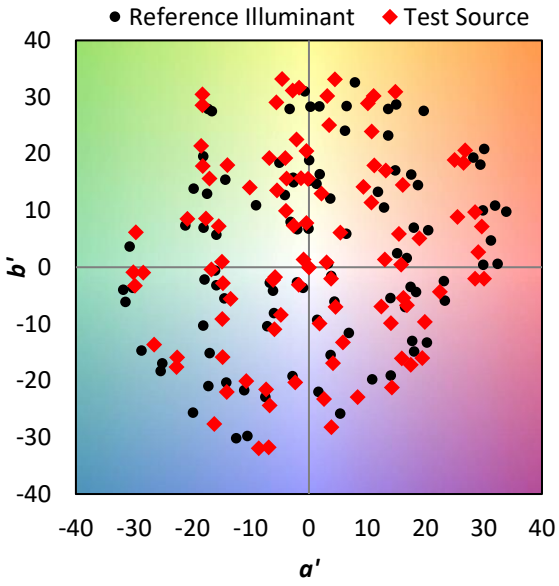
## Summary

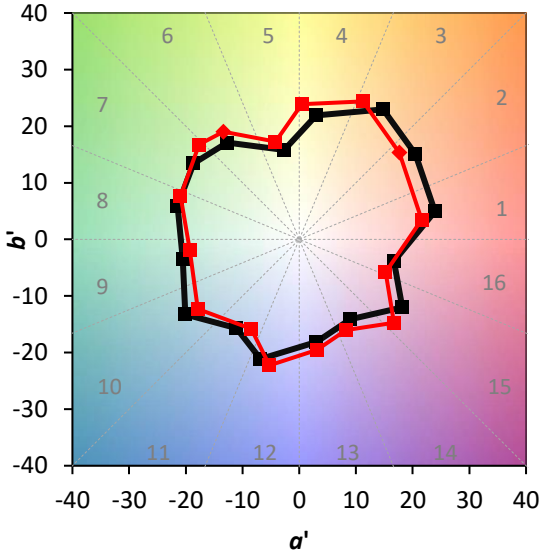
$R_f$ = 81.5
$R_g$ = 99.2
CIE $R_a$ = 81.0
$R_9$ = 7.1

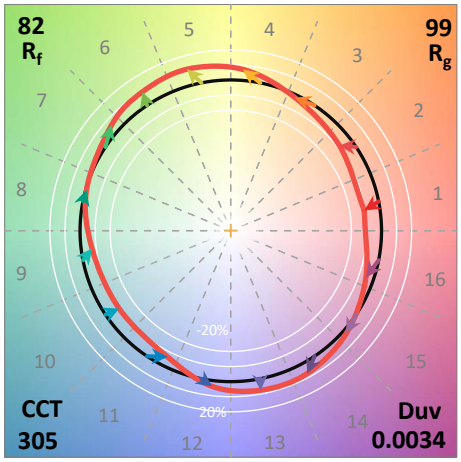
## Spectral Power Distribution Comparison

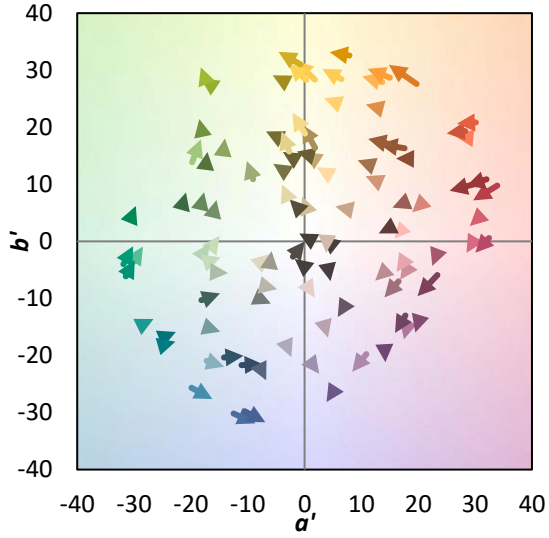



## Color Vector Graphics



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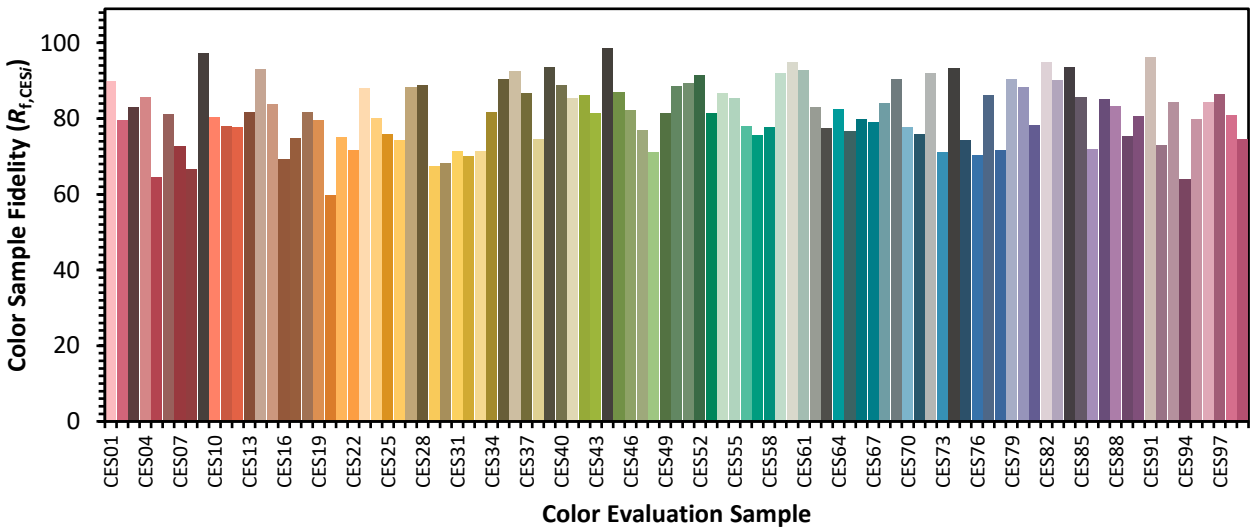
# TM-30-18

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

| | | | |
|---|---|---|---|
| CES01 = 86 | CES26 = 74 | CES51 = 89 | CES76 = 70 |
| CES02 = 63 | CES27 = 88 | CES52 = 92 | CES77 = 86 |
| CES03 = 31 | CES28 = 89 | CES53 = 81 | CES78 = 72 |
| CES04 = 70 | CES29 = 67 | CES54 = 87 | CES79 = 90 |
| CES05 = 50 | CES30 = 68 | CES55 = 85 | CES80 = 88 |
| CES06 = 51 | CES31 = 71 | CES56 = 78 | CES81 = 78 |
| CES07 = 42 | CES32 = 70 | CES57 = 76 | CES82 = 95 |
| CES08 = 41 | CES33 = 71 | CES58 = 78 | CES83 = 90 |
| CES09 = 29 | CES34 = 82 | CES59 = 92 | CES84 = 94 |
| CES10 = 76 | CES35 = 90 | CES60 = 95 | CES85 = 86 |
| CES11 = 59 | CES36 = 93 | CES61 = 93 | CES86 = 72 |
| CES12 = 65 | CES37 = 87 | CES62 = 83 | CES87 = 85 |
| CES13 = 43 | CES38 = 75 | CES63 = 77 | CES88 = 83 |
| CES14 = 74 | CES39 = 94 | CES64 = 83 | CES89 = 75 |
| CES15 = 71 | CES40 = 89 | CES65 = 77 | CES90 = 81 |
| CES16 = 47 | CES41 = 85 | CES66 = 80 | CES91 = 96 |
| CES17 = 50 | CES42 = 86 | CES67 = 79 | CES92 = 73 |
| CES18 = 56 | CES43 = 81 | CES68 = 84 | CES93 = 84 |
| CES19 = 72 | CES44 = 99 | CES69 = 91 | CES94 = 64 |
| CES20 = 66 | CES45 = 87 | CES70 = 78 | CES95 = 80 |
| CES21 = 87 | CES46 = 82 | CES71 = 76 | CES96 = 84 |
| CES22 = 79 | CES47 = 77 | CES72 = 92 | CES97 = 87 |
| CES23 = 92 | CES48 = 71 | CES73 = 71 | CES98 = 81 |
| CES24 = 91 | CES49 = 81 | CES74 = 93 | CES99 = 74 |
| CES25 = 72 | CES50 = 89 | CES75 = 74 | |



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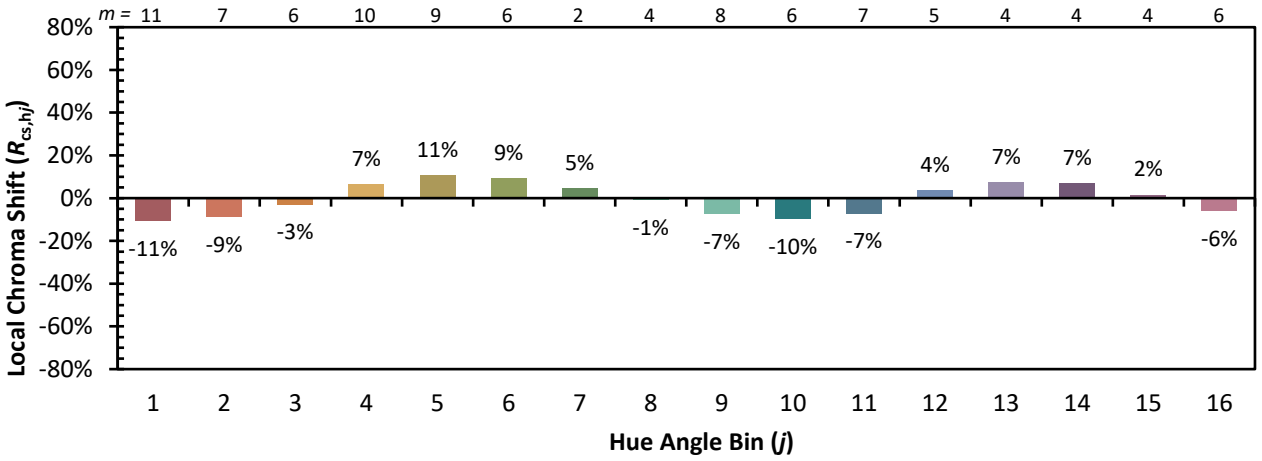
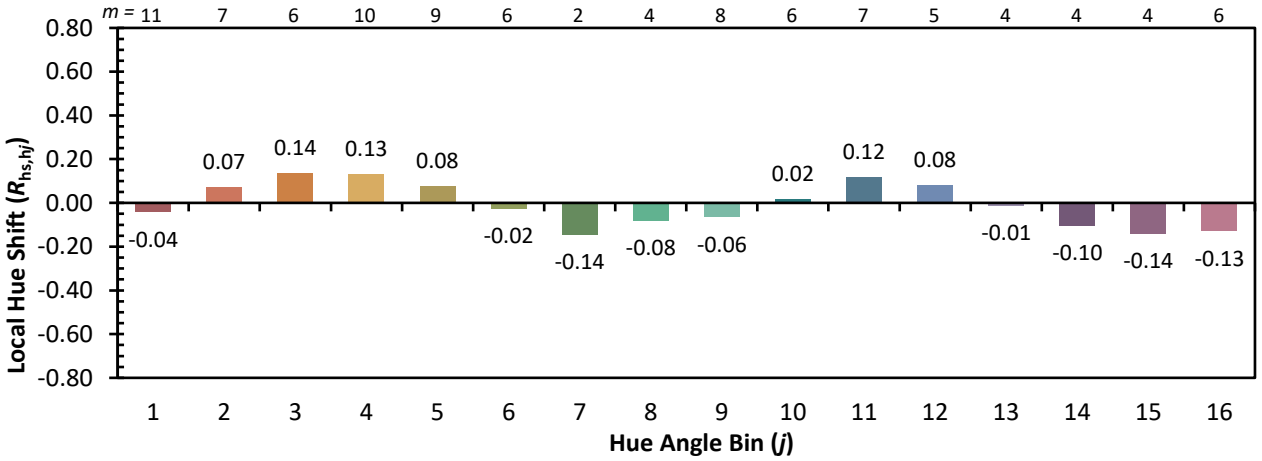
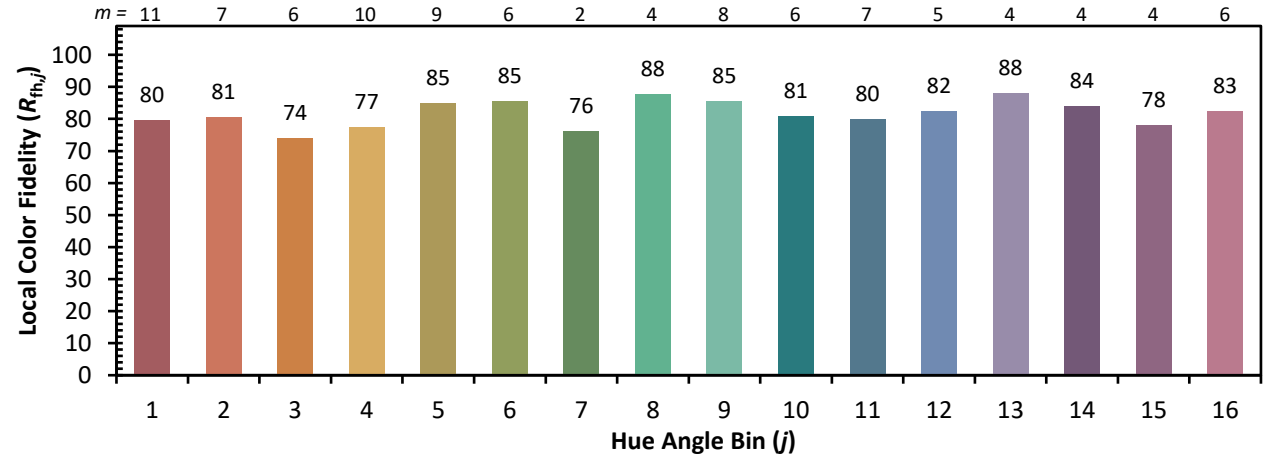
## Color Rendition by Hue-Angle Bin



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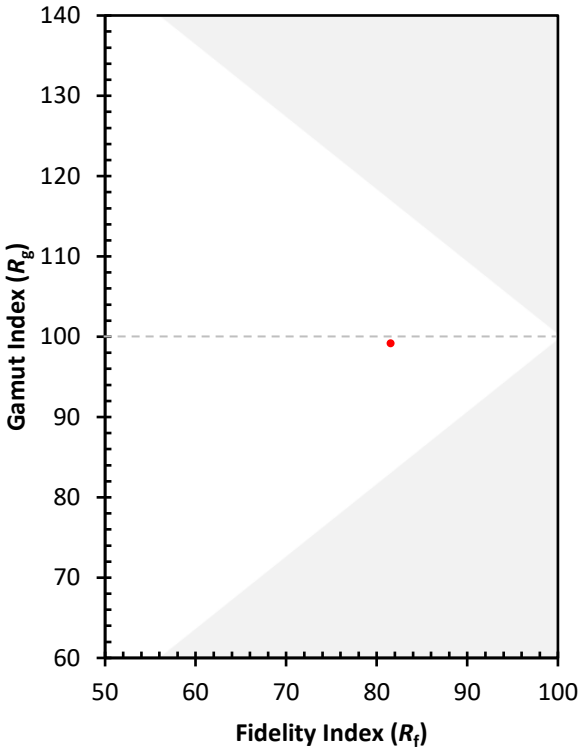
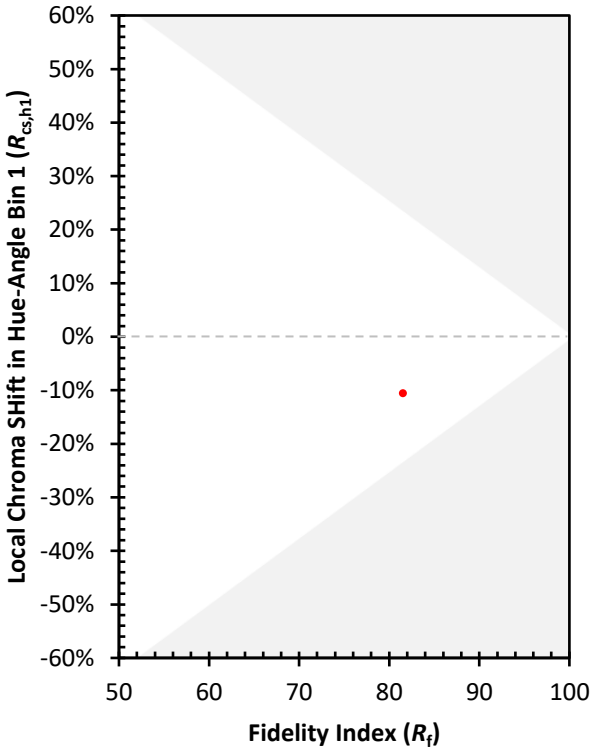
## TM-30-18

### Measure Comparisons

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