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: P629586

Luminaire Tested: GWS-SA1B-830-U-T2R-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: | P629586 |
| | TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-14) |
| Test Lab: | COOPER LIGHTING SOLUTIONS |
| Issue Date: | 1/10/2023 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS |
| Product Line: | McGRAW-EDISON |
| Catalog Number: | GWS-SA1B-830-U-T2R-W-HSS |
| Description: | GALLEON WALL SLIM LUMINAIRE. (1) LIGHTSQUARES WITH 16 LEDS EACH AND TYPE II ROADWAY OPTICS WITH HOUSE SIDE SHIELD |
| Light Source: | (16) 3000K CCT, 80 CRI LEDS |
| Ballast/Driver: | - |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 2296.1 lumens |
| Efficiency: | N/A |
| Efficacy: | 91.8 lumens/watt |
| Luminous Opening: | Rectangular (W 0.5' x L: 0.5' x H: 0') |
| IES Classification: | Type II - Short |
| BUG Rating: | B0 - U0 - G0 |

| | |
|---|---|
| Input Watts (W): | 25 |
| 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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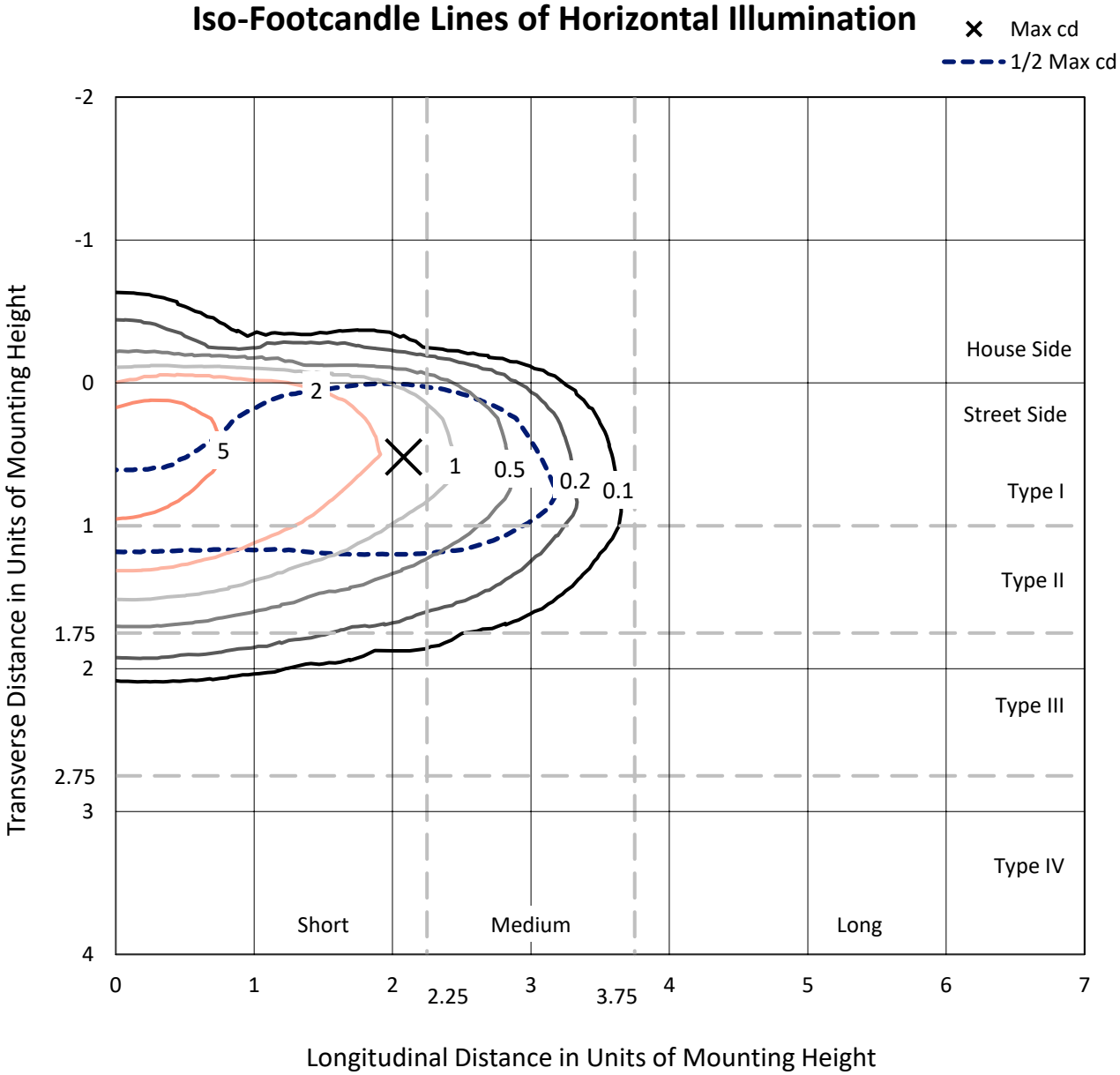
Scaled Data Report

REPORT NUMBER: P629586
CATALOG NUMBER: GWS-SA1B-830-U-T2R-W-HSS

## Iso-Footcandle Lines of Horizontal Illumination




Based on 10 foot mounting height. Maximum calculated value = 6.9 fc
Type II - Short - N/A

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REPORT NUMBER: P629586
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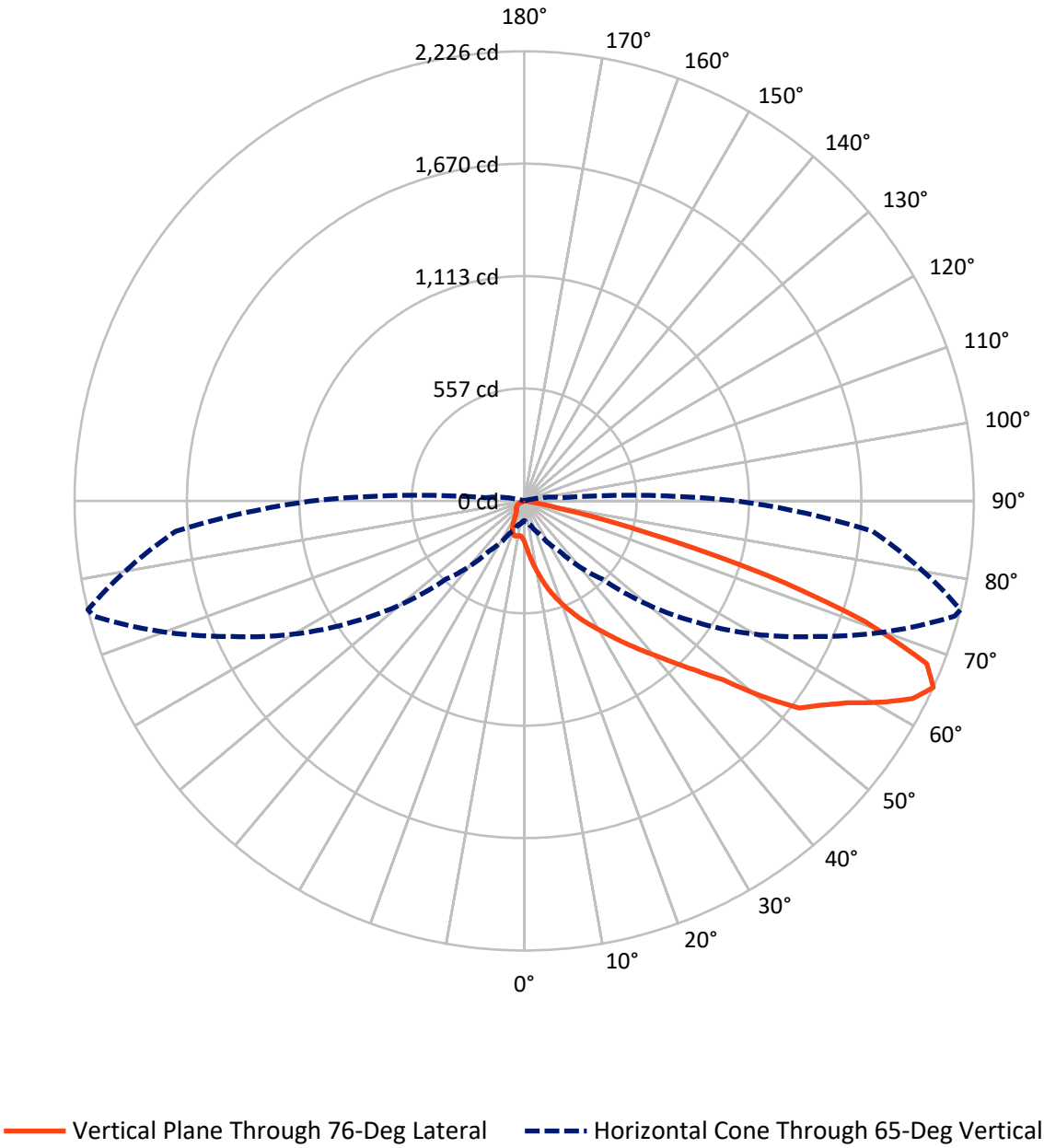
## Luminous Intensity Polar Plot



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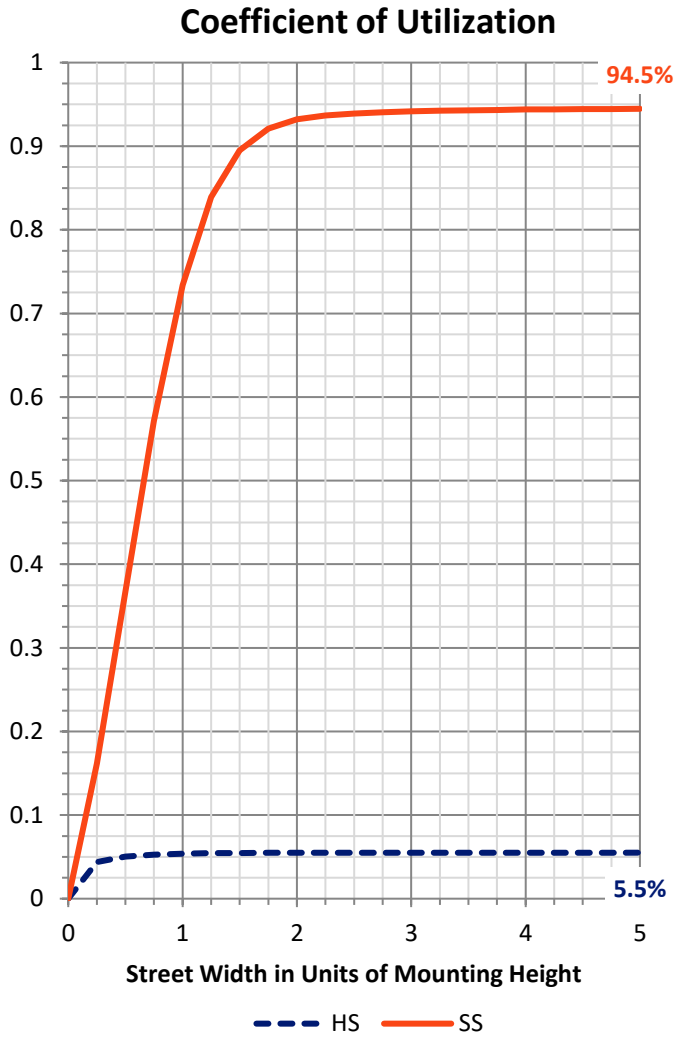
REPORT NUMBER: P629586
CATALOG NUMBER: GWS-SA1B-830-U-T2R-W-HSS

**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 127.0 | 0.0 | 127.0 |
| | % Fixture | 5.5 | 0.0 | 5.5 |
| **Street Side** | Lumens | 2169.1 | 0.0 | 2169.1 |
| | % Fixture | 94.5 | 0.0 | 94.5 |
| **Total** | Lumens | 2296.1 | 0.0 | 2296.1 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 24.7 | 1.1 |
| 10°-20° | 93.8 | 4.1 |
| 20°-30° | 191.5 | 8.3 |
| 30°-40° | 340.5 | 14.8 |
| 40°-50° | 503.3 | 21.9 |
| 50°-60° | 576.3 | 25.1 |
| 60°-70° | 439.7 | 19.1 |
| 70°-80° | 123.2 | 5.4 |
| 80°-90° | 3.1 | 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° | 2296.1 | 100.0 |
| 0°-180° | 2296.1 | 100.0 |



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REPORT NUMBER: P629586
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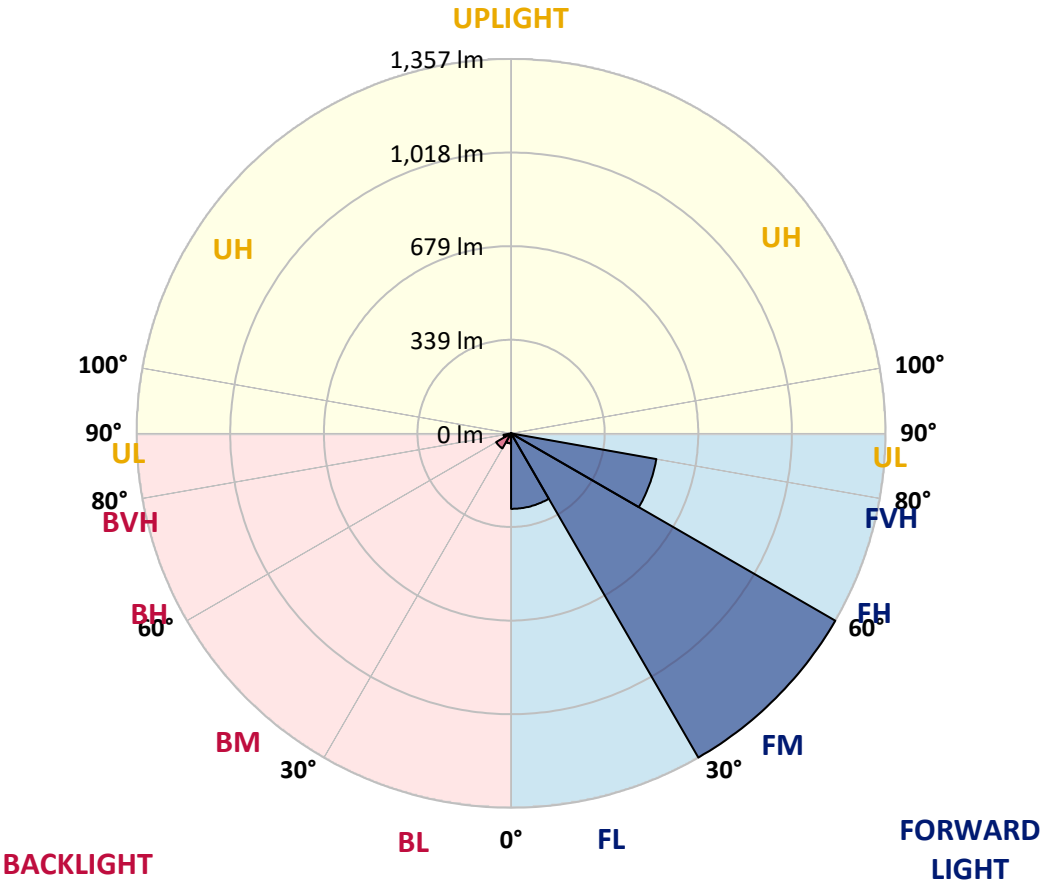
## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 273.8 | 11.9 | | | |
| FM | (30°-60°) | 1357.5 | 59.1 | | | |
| FH | (60°-80°) | 534.9 | 23.3 | | | G0/660 |
| FVH | (80°-90°) | 2.9 | 0.1 | | | G0/10 |
| BL | (0°-30°) | 36.2 | 1.6 | B0/110 | | |
| BM | (30°-60°) | 62.6 | 2.7 | B0/220 | | |
| BH | (60°-80°) | 27.9 | 1.2 | B0/110 | | G0/110 |
| BVH | (80°-90°) | 0.2 | 0.0 | | | G0/10 |
| UL | (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH | (100°-180°) | 0.0 | 0.0 | | U0/0 | |

**BUG Rating: B0-U0-G0**
Type II Short



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REPORT NUMBER: P629586
CATALOG NUMBER: GWS-SA1B-830-U-T2R-W-HSS

**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 15° | 25° | 35° | 45° | 55° | 65° | 75° | 76° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 203.3 | 203.3 | 203.3 | 203.3 | 203.3 | 203.3 | 203.3 | 203.3 | 203.3 | *203.3* | 203.3 |
| 2.5° | 313.3 | 318.0 | 314.3 | 308.2 | 296.4 | 284.9 | 270.2 | 250.0 | 233.9 | *231.9* | 216.8 |
| 5° | 423.1 | 422.7 | 414.7 | 406.8 | 394.3 | 374.7 | 345.1 | 307.6 | 271.5 | *268.4* | 234.5 |
| 7.5° | 488.4 | 489.0 | 484.5 | 478.4 | 466.2 | 446.0 | 415.1 | 369.8 | 317.0 | *310.9* | 258.8 |
| 10° | 543.3 | 543.1 | 539.9 | 537.0 | 526.0 | 512.5 | 479.4 | 429.6 | 366.0 | *356.4* | 286.0 |
| 12.5° | 584.6 | 586.0 | 587.6 | 590.5 | 585.8 | 572.5 | 541.3 | 487.0 | 415.6 | *404.9* | 317.0 |
| 15° | 617.2 | 617.6 | 623.7 | 634.8 | 638.6 | 631.7 | 603.3 | 542.5 | 464.5 | *455.4* | 352.7 |
| 17.5° | 627.0 | 627.8 | 638.2 | 658.4 | 678.9 | 682.7 | 661.3 | 598.4 | 512.7 | *502.9* | 387.4 |
| 20° | 647.6 | 649.5 | 657.2 | 675.0 | 700.7 | 721.5 | 713.1 | 655.0 | 560.9 | *548.0* | 422.9 |
| 22.5° | 712.5 | 713.6 | 710.9 | 713.1 | 726.4 | 750.5 | 755.6 | 709.7 | 610.3 | *596.6* | 461.3 |
| 25° | 824.2 | 824.6 | 806.0 | 788.5 | 778.5 | 782.9 | 794.2 | 760.1 | 659.3 | *645.8* | 497.0 |
| 27.5° | 940.1 | 941.5 | 919.3 | 889.5 | 853.8 | 833.4 | 830.1 | 806.2 | 708.7 | *693.8* | 532.3 |
| 30° | 1049.3 | 1049.3 | 1025.8 | 989.5 | 941.7 | 901.9 | 878.5 | 852.8 | 761.5 | *745.2* | 568.4 |
| 32.5° | 1147.5 | 1146.7 | 1116.7 | 1077.3 | 1030.1 | 986.4 | 937.0 | 901.3 | 820.3 | *802.1* | 610.1 |
| 35° | 1228.5 | 1226.5 | 1192.4 | 1154.6 | 1104.2 | 1071.8 | 1016.6 | 953.6 | 884.0 | *865.8* | 652.9 |
| 37.5° | 1289.7 | 1287.5 | 1256.3 | 1216.3 | 1169.5 | 1148.5 | 1102.4 | 1016.2 | 951.1 | *934.6* | 700.5 |
| 40° | 1323.0 | 1318.5 | 1296.9 | 1267.1 | 1227.9 | 1209.5 | 1190.3 | 1094.0 | 1030.1 | *1009.5* | 756.6 |
| 42.5° | 1332.8 | 1327.5 | 1313.2 | 1299.3 | 1275.7 | 1261.2 | 1281.8 | 1181.8 | 1116.9 | *1099.1* | 820.7 |
| 45° | 1303.8 | 1300.8 | 1299.5 | 1309.5 | 1313.8 | 1317.9 | 1368.7 | 1278.9 | 1212.6 | *1199.1* | 901.3 |
| 47.5° | 1234.0 | 1233.2 | 1244.0 | 1285.7 | 1331.0 | 1374.0 | 1463.2 | 1398.7 | 1336.7 | *1322.2* | 1014.0 |
| 50° | 1105.0 | 1113.4 | 1143.6 | 1216.7 | 1307.3 | 1405.9 | 1551.6 | 1564.9 | 1537.5 | *1516.3* | 1160.9 |
| 52.5° | 903.4 | 919.5 | 987.3 | 1098.3 | 1228.5 | 1396.9 | 1592.4 | 1697.9 | 1725.9 | *1703.9* | 1266.3 |
| 55° | 708.9 | 724.0 | 784.4 | 925.2 | 1098.9 | 1328.5 | 1594.3 | 1743.9 | 1804.9 | *1784.5* | 1337.5 |
| 57.5° | 528.0 | 541.9 | 596.8 | 731.5 | 922.6 | 1194.0 | 1550.6 | 1769.4 | 1898.6 | *1885.5* | 1450.0 |
| 60° | 345.1 | 358.8 | 408.4 | 526.2 | 715.6 | 998.1 | 1443.0 | 1764.1 | 2026.2 | *2024.9* | 1588.1 |
| 62.5° | 191.5 | 202.3 | 238.2 | 330.0 | 499.4 | 772.9 | 1274.0 | 1710.8 | 2149.6 | *2157.4* | 1702.0 |
| 65° | *98.0* | *104.9* | *126.7* | *181.4* | *302.3* | *548.0* | *1051.8* | *1588.8* | *2206.8* | *2226.4* | *1732.0* |
| 67.5° | 64.1 | 66.3 | 71.6 | 94.3 | 161.9 | 344.7 | 791.5 | 1393.0 | 2126.4 | *2149.2* | 1631.4 |
| 70° | 52.0 | 53.9 | 56.9 | 62.9 | 83.5 | 183.1 | 519.9 | 1112.6 | 1776.7 | *1792.2* | 1299.1 |
| 72.5° | 38.2 | 40.6 | 46.5 | 50.4 | 60.2 | 100.4 | 270.4 | 730.3 | 1220.1 | *1247.5* | 816.4 |
| 75° | 28.2 | 29.6 | 34.5 | 39.8 | 49.2 | 63.5 | 103.5 | 383.9 | 630.1 | *614.2* | 342.9 |
| 77.5° | 16.9 | 18.0 | 22.0 | 25.5 | 35.1 | 39.6 | 36.1 | 141.9 | 191.7 | *180.2* | 82.9 |
| 80° | 8.4 | 9.4 | 14.5 | 19.2 | 22.5 | 15.9 | 15.1 | 39.6 | 42.7 | *42.7* | 20.8 |
| 82.5° | 2.9 | 3.7 | 7.8 | 12.7 | 11.0 | 6.1 | 7.1 | 10.2 | 11.4 | *12.0* | 6.1 |
| 85° | 0.0 | 0.0 | 1.8 | 3.7 | 1.6 | 0.8 | 1.8 | 2.2 | 2.9 | *3.1* | 2.0 |
| 87.5° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.6 | *0.8* | 0.8 |
| 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: P629586
CATALOG NUMBER: GWS-SA1B-830-U-T2R-W-HSS

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 203.3 | 203.3 | 203.3 | 203.3 | 203.3 | 203.3 | 203.3 | 203.3 | 203.3 | 203.3 | 203.3 |
| 2.5° | 208.6 | 199.0 | 184.5 | 171.4 | 161.4 | 152.1 | 144.9 | 139.2 | 138.2 | 134.9 | 135.3 |
| 5° | 218.0 | 200.6 | 173.9 | 153.3 | 138.8 | 129.0 | 120.8 | 114.7 | 112.1 | 109.4 | 107.4 |
| 7.5° | 232.5 | 207.4 | 169.8 | 144.7 | 127.8 | 112.7 | 100.0 | 89.8 | 84.9 | 81.8 | 79.8 |
| 10° | 250.2 | 216.8 | 170.0 | 139.6 | 114.5 | 91.4 | 74.1 | 62.9 | 57.6 | 55.9 | 55.7 |
| 12.5° | 271.5 | 228.6 | 171.7 | 131.2 | 95.3 | 68.0 | 54.9 | 49.8 | 48.2 | 46.7 | 46.7 |
| 15° | 293.9 | 241.9 | 171.7 | 115.9 | 72.7 | 53.1 | 47.6 | 44.3 | 42.2 | 41.4 | 41.0 |
| 17.5° | 317.6 | 254.3 | 167.6 | 94.9 | 55.7 | 46.7 | 42.2 | 39.2 | 37.6 | 36.3 | 35.9 |
| 20° | 342.9 | 266.2 | 157.4 | 72.7 | 47.8 | 41.8 | 37.6 | 34.5 | 32.9 | 31.6 | 31.6 |
| 22.5° | 368.6 | 277.2 | 140.8 | 55.9 | 42.2 | 37.1 | 33.1 | 30.2 | 28.6 | 27.4 | 27.4 |
| 25° | 392.5 | 284.5 | 119.6 | 46.1 | 38.2 | 33.1 | 29.4 | 26.5 | 24.7 | 23.9 | 23.5 |
| 27.5° | 414.7 | 289.2 | 96.1 | 40.6 | 34.3 | 29.6 | 25.7 | 23.1 | 21.6 | 21.0 | 20.6 |
| 30° | 437.8 | 290.4 | 73.5 | 36.9 | 31.0 | 26.1 | 22.5 | 20.4 | 19.2 | 18.4 | 18.4 |
| 32.5° | 460.3 | 289.0 | 56.1 | 33.9 | 28.2 | 23.1 | 20.0 | 18.2 | 17.1 | 16.5 | 16.3 |
| 35° | 483.1 | 282.5 | 45.5 | 31.2 | 25.3 | 20.2 | 17.8 | 16.3 | 15.7 | 14.9 | 14.9 |
| 37.5° | 508.0 | 273.7 | 39.6 | 28.6 | 22.5 | 18.2 | 15.9 | 14.9 | 14.1 | 13.5 | 13.3 |
| 40° | 539.0 | 263.5 | 36.3 | 26.3 | 19.8 | 16.3 | 14.3 | 13.3 | 12.7 | 12.0 | 11.8 |
| 42.5° | 575.8 | 253.5 | 34.7 | 23.9 | 17.8 | 14.5 | 12.9 | 11.6 | 11.0 | 10.2 | 10.0 |
| 45° | 627.8 | 251.3 | 32.9 | 21.2 | 15.9 | 13.1 | 11.2 | 10.0 | 9.2 | 8.6 | 8.4 |
| 47.5° | 711.5 | 257.6 | 29.8 | 18.4 | 14.1 | 11.4 | 9.6 | 8.6 | 7.6 | 6.9 | 6.5 |
| 50° | 794.6 | 255.9 | 26.7 | 15.9 | 12.5 | 9.8 | 8.2 | 7.1 | 6.1 | 5.5 | 5.3 |
| 52.5° | 839.9 | 248.2 | 23.9 | 14.1 | 10.8 | 8.4 | 6.9 | 5.7 | 5.1 | 4.5 | 4.3 |
| 55° | 880.9 | 245.1 | 21.0 | 12.2 | 9.2 | 7.3 | 5.7 | 4.7 | 4.3 | 3.7 | 3.5 |
| 57.5° | 961.3 | 252.3 | 18.6 | 10.6 | 8.0 | 6.3 | 4.9 | 3.9 | 3.5 | 2.9 | 2.7 |
| 60° | 1045.4 | 253.1 | 15.9 | 9.2 | 6.9 | 5.3 | 3.9 | 3.1 | 2.7 | 2.0 | 1.8 |
| 62.5° | 1089.3 | 232.5 | 13.1 | 7.8 | 5.7 | 4.5 | 3.3 | 2.4 | 2.0 | 1.2 | 1.2 |
| 65° | *1052.6* | *188.0* | *11.0* | *6.3* | *4.5* | *3.5* | *2.4* | *1.8* | *1.2* | *0.6* | *0.2* |
| 67.5° | 931.5 | 133.7 | 9.2 | 5.1 | 3.3 | 2.4 | 1.8 | 1.2 | 0.2 | 0.0 | 0.0 |
| 70° | 682.1 | 76.3 | 7.1 | 3.7 | 2.4 | 1.6 | 1.2 | 0.6 | 0.0 | 0.0 | 0.0 |
| 72.5° | 419.2 | 40.8 | 5.3 | 2.4 | 1.8 | 1.2 | 1.0 | 0.4 | 0.0 | 0.0 | 0.0 |
| 75° | 159.0 | 19.6 | 3.3 | 1.6 | 1.4 | 1.0 | 0.6 | 0.2 | 0.0 | 0.0 | 0.0 |
| 77.5° | 43.1 | 9.6 | 1.8 | 1.2 | 1.0 | 0.6 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 |
| 80° | 11.2 | 4.5 | 1.2 | 0.8 | 0.6 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 82.5° | 3.9 | 2.0 | 0.6 | 0.6 | 0.4 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 85° | 1.6 | 0.8 | 0.4 | 0.4 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 87.5° | 0.6 | 0.2 | 0.2 | 0.2 | 0.2 | 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

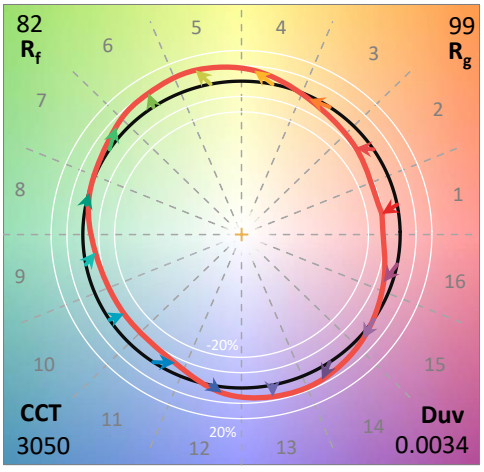
## Test Information

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

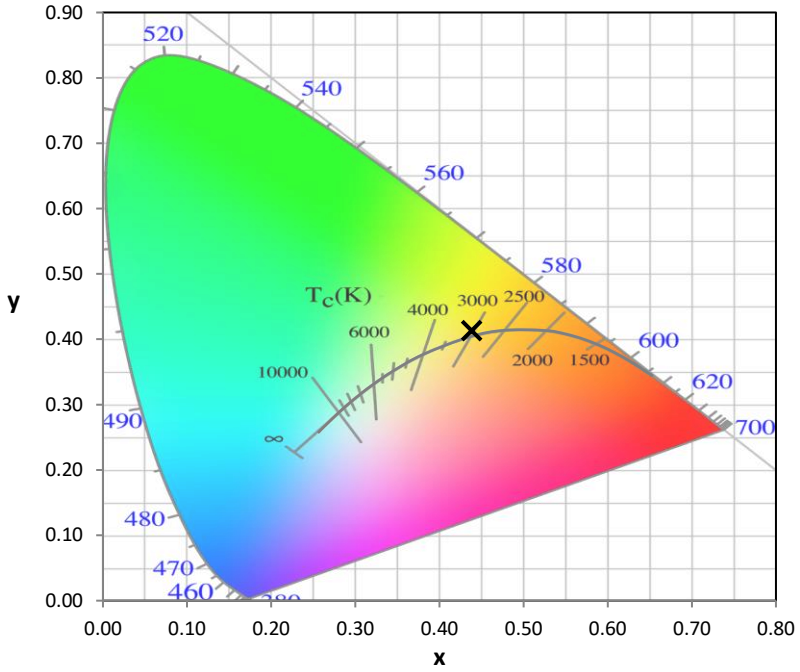
| | |
|---|---|
| Stabilization Time: | 20M |
| Operation Time: | 1H 20M |
| Sphere Temperature (°C): | 24.2 |

REPORT NUMBER: SP1-2408-195-9

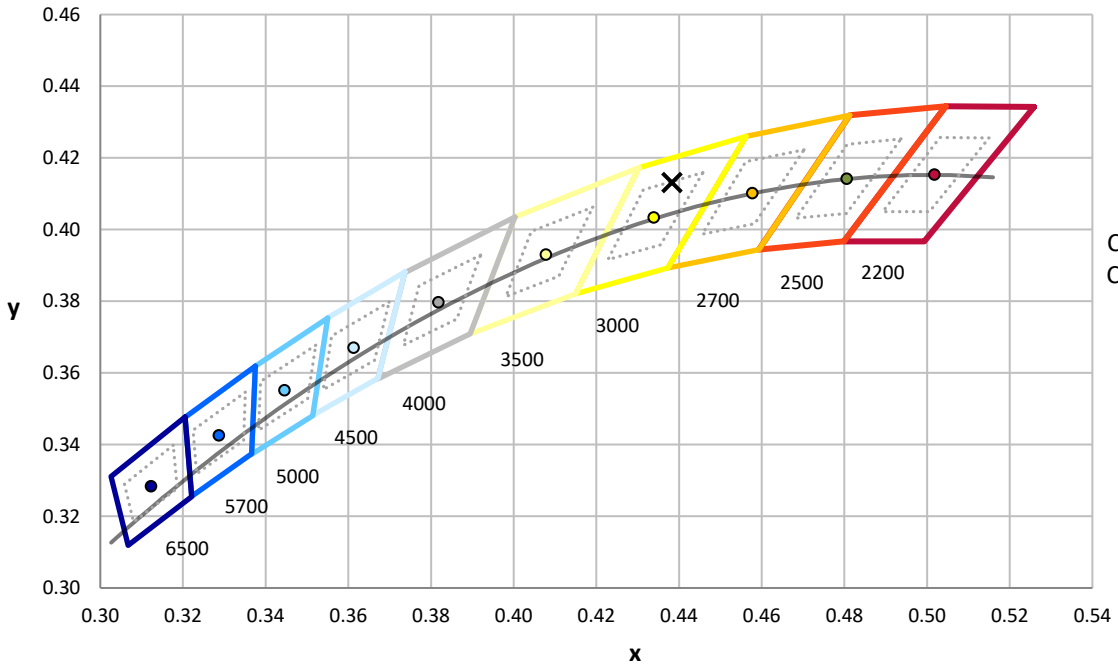
| Measurement and Test Equipment | | | |
|---|---|---|---|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 6/18/2024 | 12/18/2024 |
| Power Meter | INXT2011004 | 2/8/2024 | 2/8/2025 |
| AC Power Source | IN0063 | 10/24/2023 | 10/24/2024 |
| DC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

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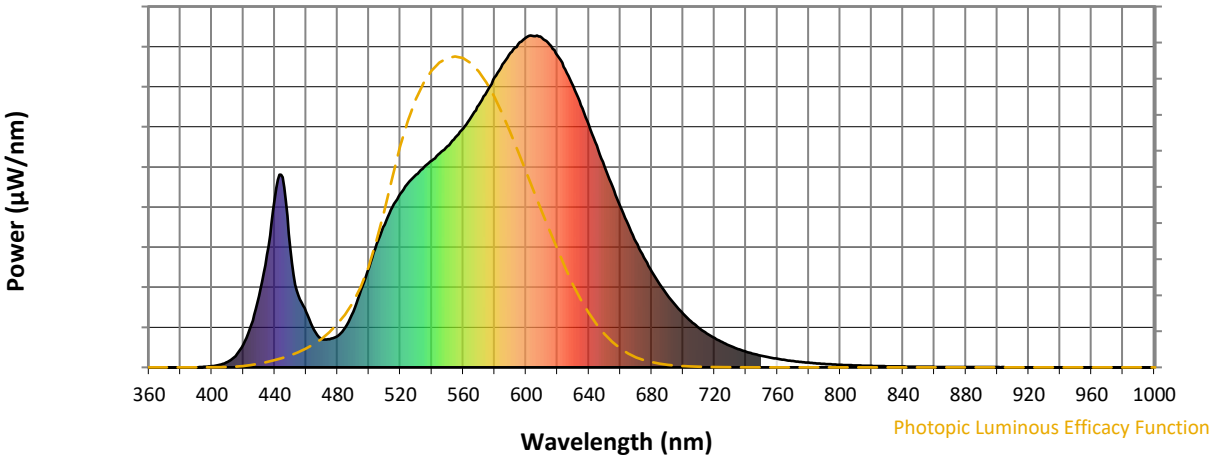
## Photopic Flux vs. Wavelength




## 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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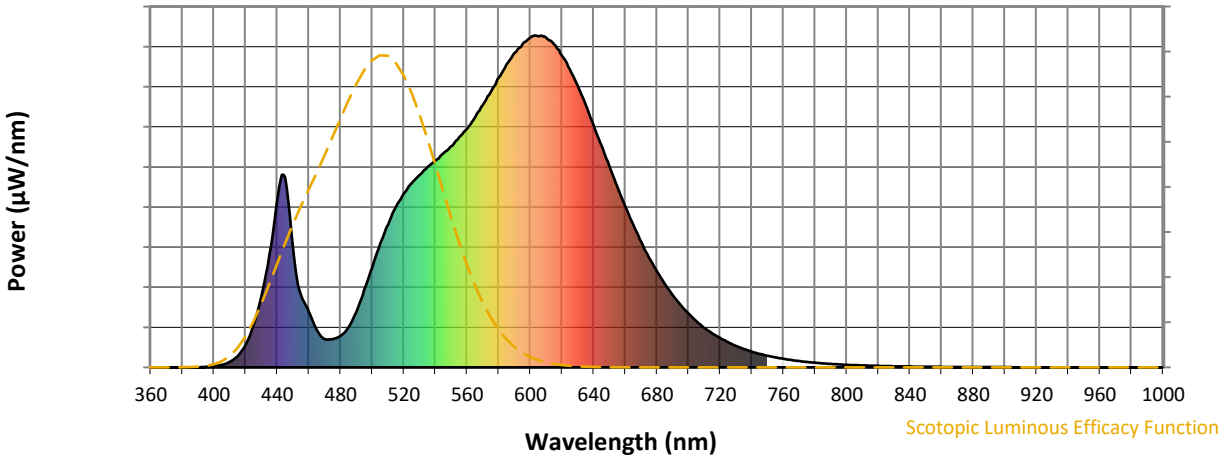
## Scotopic Flux vs. Wavelength




**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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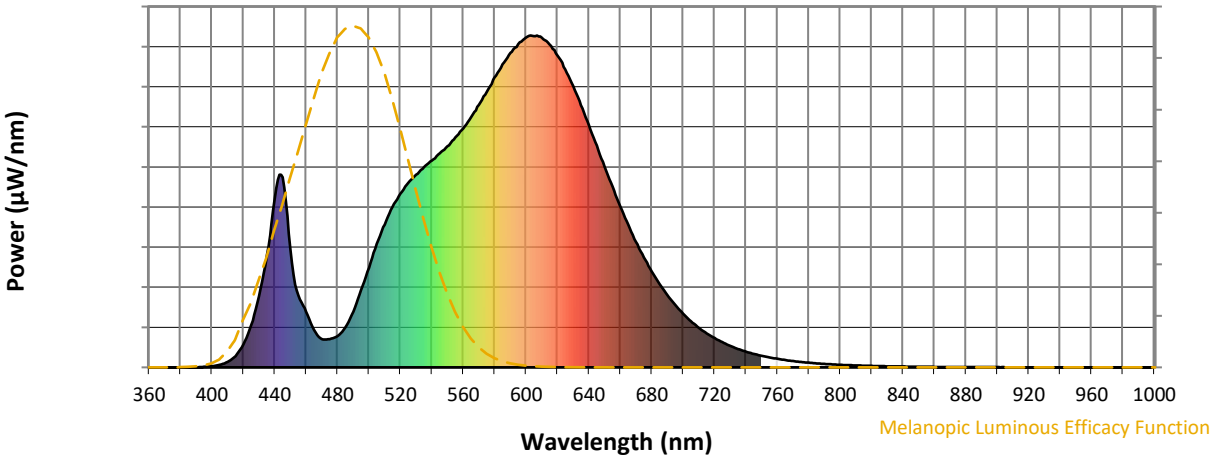
## Melanopic Flux vs. Wavelength




**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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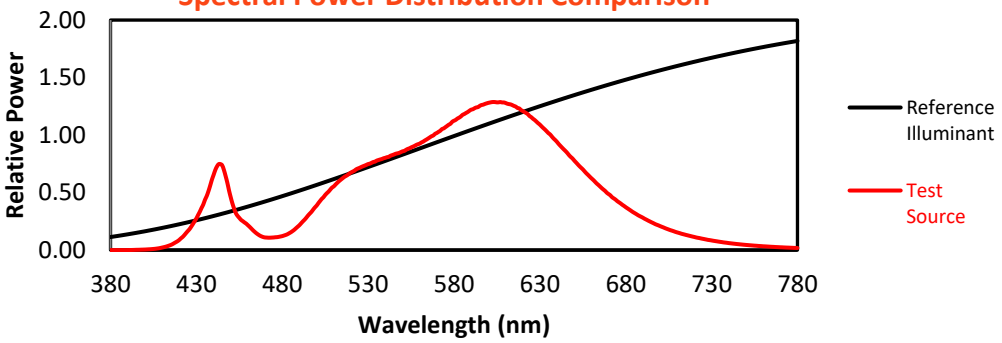
# TM-30-18

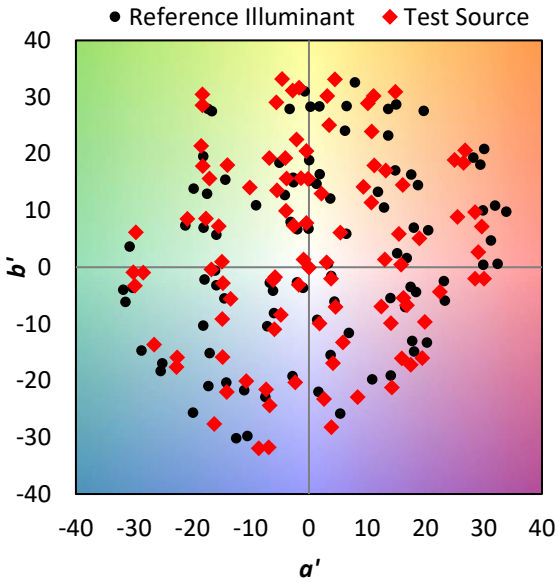
## Summary

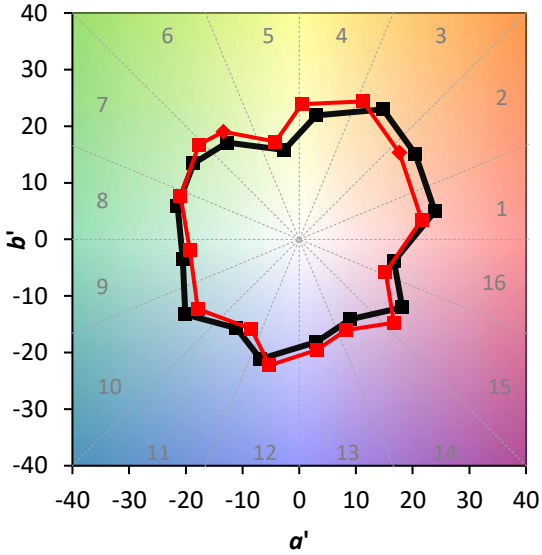
$R_f$ = 81.5
$R_g$ = 99.2
CIE $R_a$ = 81.0
$R_9$ = 7.1

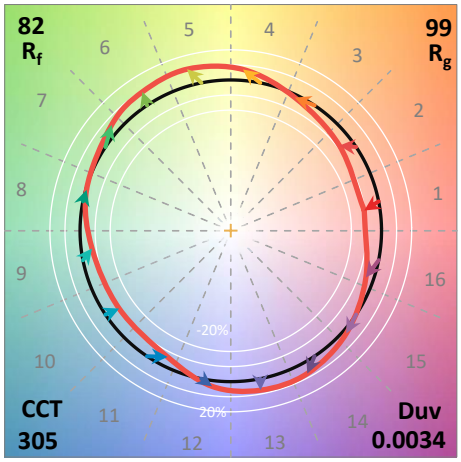
## Spectral Power Distribution Comparison

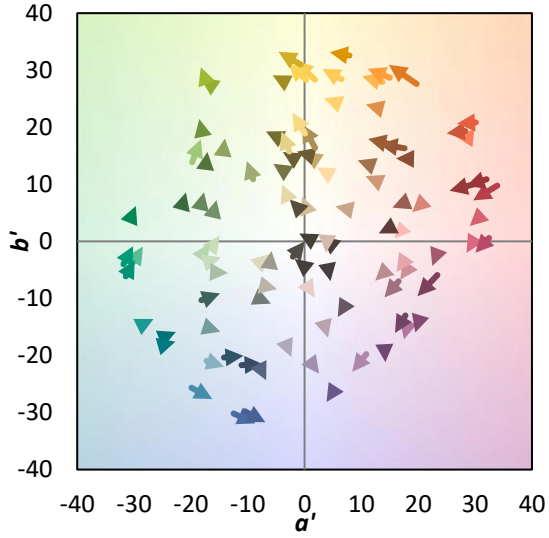



## Color Vector Graphics



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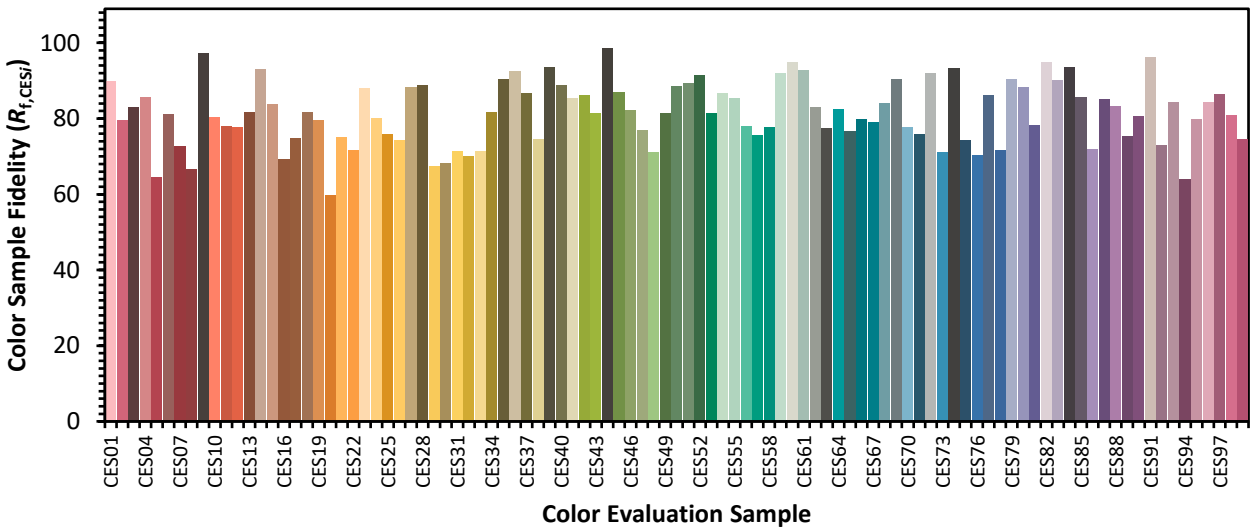
# TM-30-18

**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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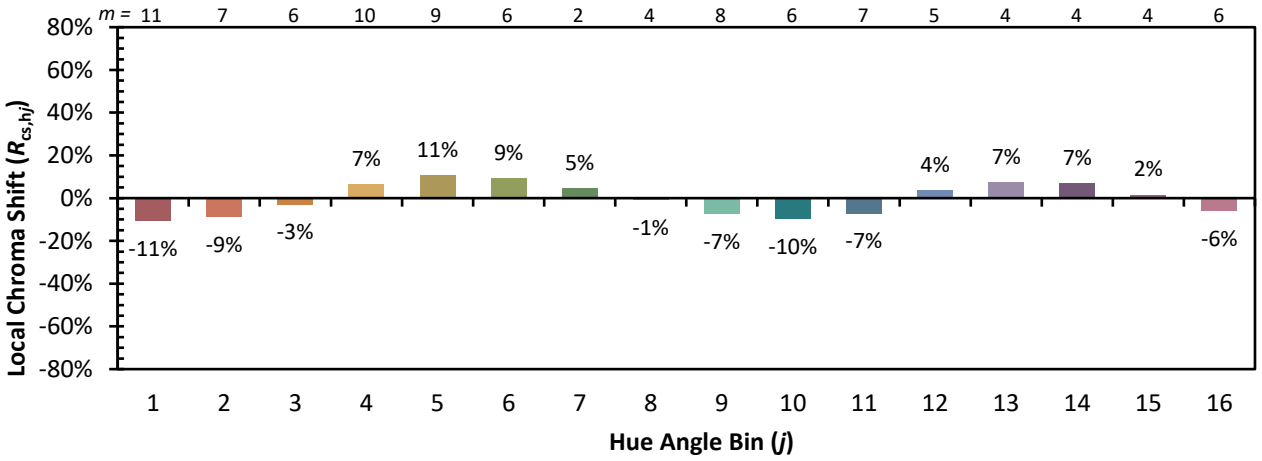
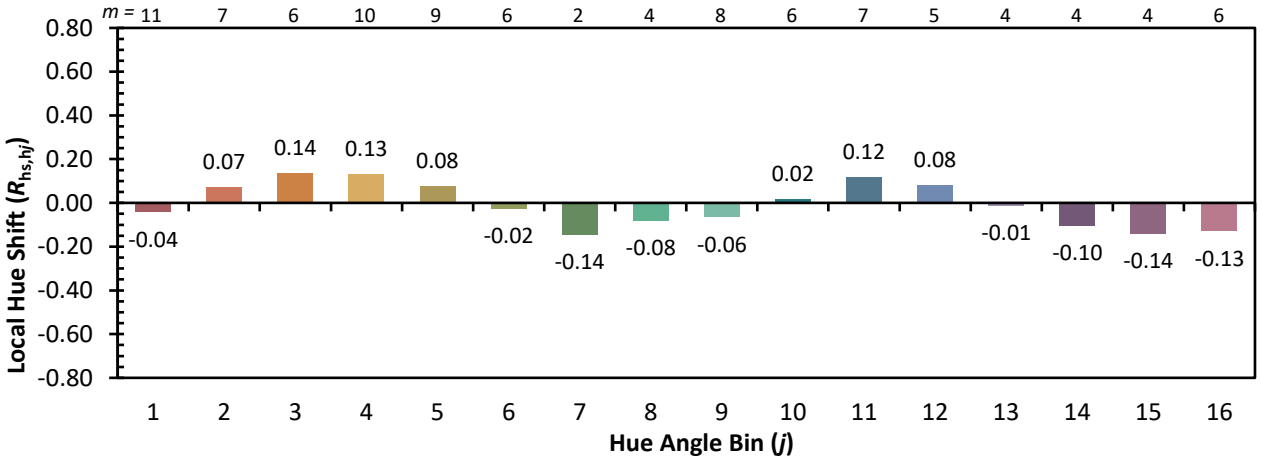
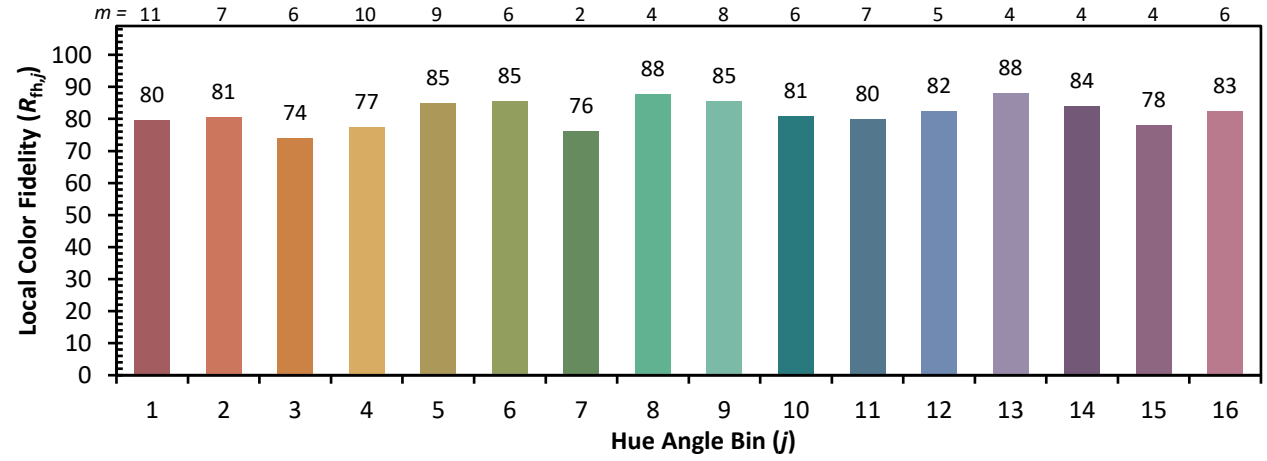
## Color Rendition by Hue-Angle Bin



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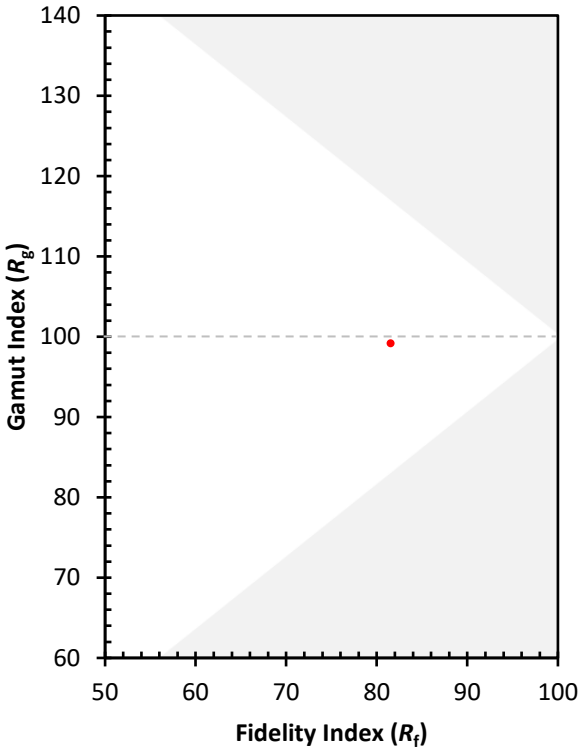
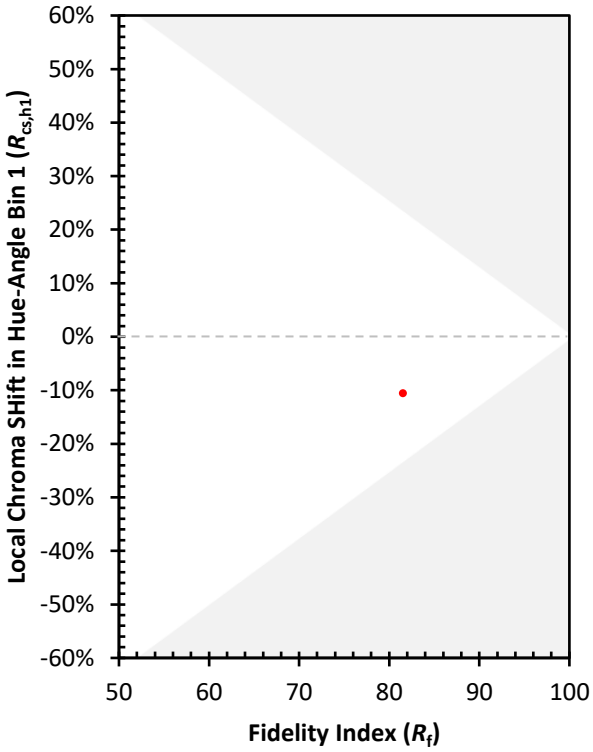
### Measure Comparisons




(END OF REPORT)