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

Scaled data based on original data using

LM-79-08 Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Test Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

Brand: McGRAW-EDISON

Report Number: P437946

Luminaire Tested: **ISS-SA1F-830-U-T4FT-HSS**

Issue Date: 12/9/2020

Report Generated By 670245982

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

Scaled Data Report

**Test Information**

| | |
|---|---|
| Test Method: | LM-79-08 |
| Report Number: | P437946 |
| | TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2011-074-11) |
| Test Lab: | INNOVATION CENTER |
| Issue Date: | 12/9/2020 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS (FORMERLY EATON) |
| Product Line: | McGRAW-EDISON |
| Catalog Number: | ISS-SA1F-830-U-T4FT-HSS |
| Description: | IMPACT ELITE LED QUARTER SPHERE LUMINAIRE |
| | (1) 80 CRI, 3000K, 1200mA LIGHTSQUARE WITH 16 LEDS AND TYPE IV FORWARD THROW OPTICS WITH HOUSE SIDE SHIELD |
| Light Source: | - |
| Ballast/Driver: | ELECTRONIC DRIVER |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 4422 lumens |
| Efficiency: | N/A |
| Efficacy: | 67.0 lumens/watt |
| Luminous Opening: | Rectangular (W 0.5' x L: 0.5' x H: 0') |
| IES Classification: | Type IV - Short |
| BUG Rating: | B1 - U0 - G2 |

| | |
|---|---|
| Input Watts (W): | 66 |
| Input Voltage (V): | NR |
| Input Current (Ain): | NR |
| Voltage Rise (V): | NR |
| Power Factor: | NR |
| Total Harmonic Distortion (THDi): | NR |
| Frequency (hertz): | 60 |
| Stabilization Time: | NR |
| Operation Time: | NR |
| Ambient Temperature (°C): | NR |
| Test Distance: | 28.75 FT |

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REPORT NUMBER: P437946
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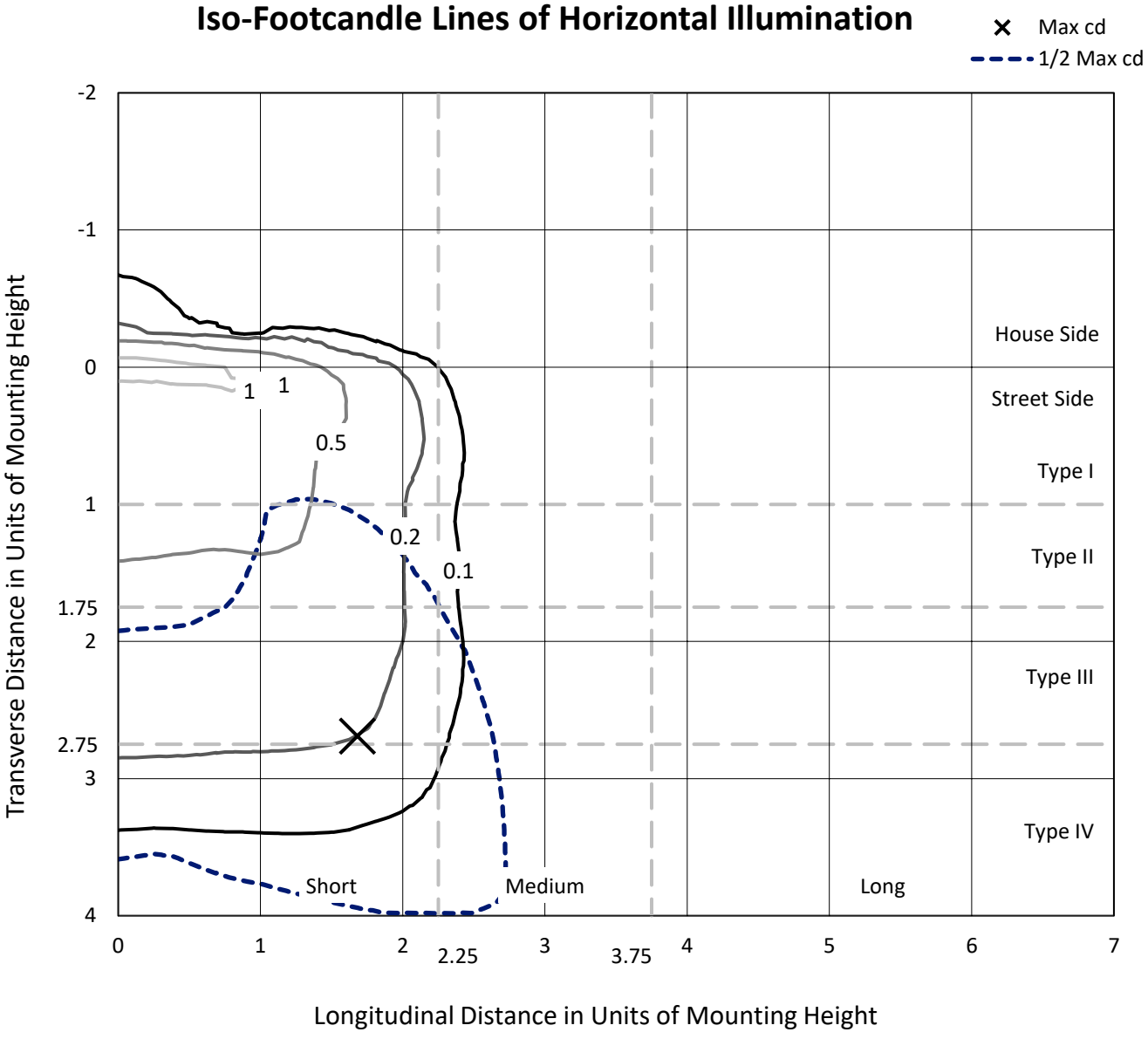
## Iso-Footcandle Lines of Horizontal Illumination




Based on 25 foot mounting height. Maximum calculated value = 1.2 fc
Type IV - Short - N/A

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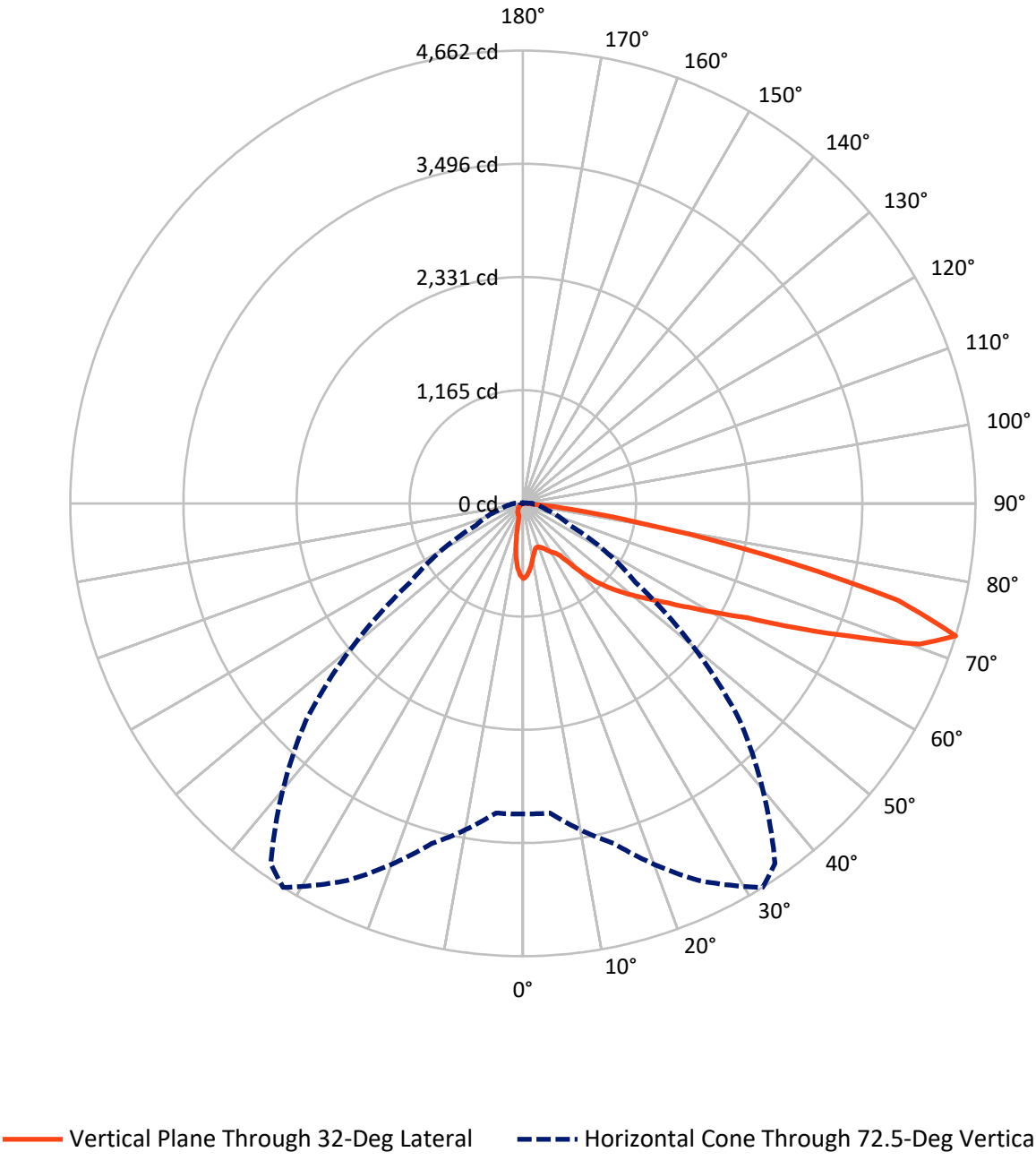
## Luminous Intensity Polar Plot



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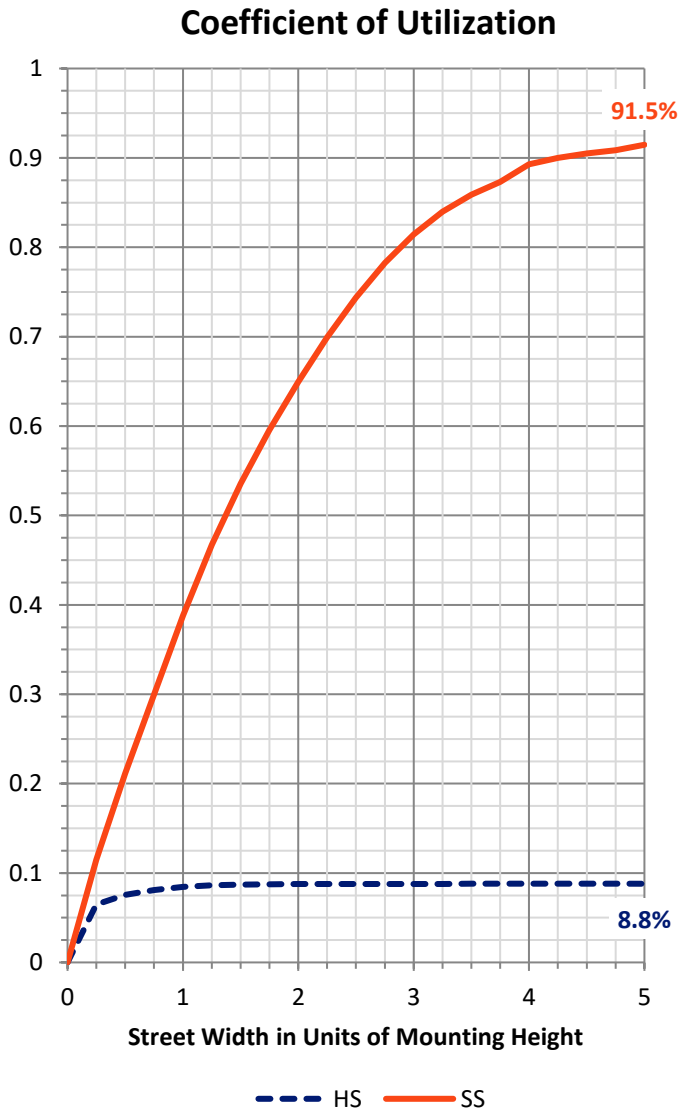
**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 391.4 | 0.0 | 391.4 |
| | % Fixture | 8.9 | 0.0 | 8.9 |
| **Street Side** | Lumens | 4030.6 | 0.0 | 4030.6 |
| | % Fixture | 91.1 | 0.0 | 91.1 |
| **Total** | Lumens | 4422.0 | 0.0 | 4422.0 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 64.3 | 1.5 |
| 10°-20° | 139.7 | 3.2 |
| 20°-30° | 211.4 | 4.8 |
| 30°-40° | 340.9 | 7.7 |
| 40°-50° | 603.7 | 13.7 |
| 50°-60° | 924.7 | 20.9 |
| 60°-70° | 1237.0 | 28.0 |
| 70°-80° | 854.0 | 19.3 |
| 80°-90° | 46.2 | 1.0 |
| 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° | 4422.0 | 100.0 |
| 0°-180° | 4422.0 | 100.0 |



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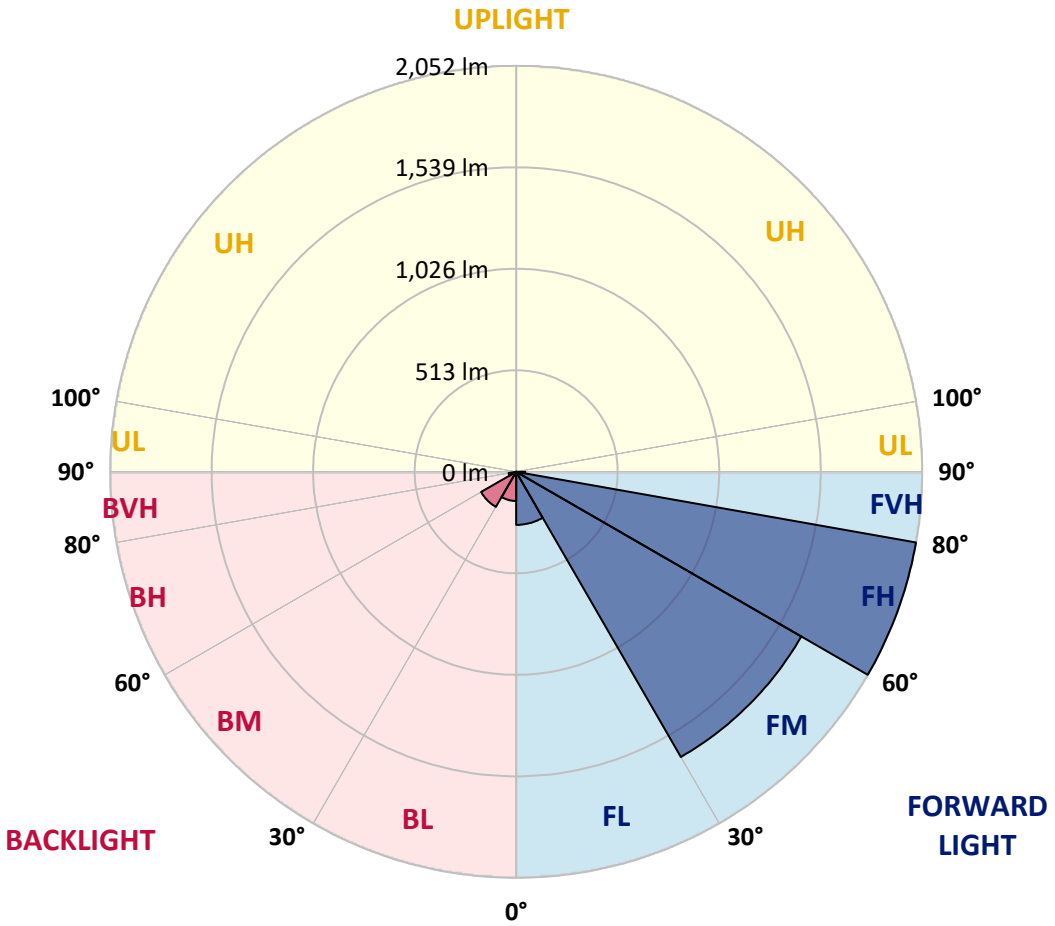
## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 268.1 | 6.1 | | | |
| FM | (30°-60°) | 1664.6 | 37.6 | | | |
| FH | (60°-80°) | 2052.2 | 46.4 | | | G2/5000 |
| FVH | (80°-90°) | 45.6 | 1.0 | | | G1/100 |
| BL | (0°-30°) | 147.3 | 3.3 | B1/500 | | |
| BM | (30°-60°) | 204.6 | 4.6 | B0/220 | | |
| BH | (60°-80°) | 38.8 | 0.9 | B0/110 | | G0/110 |
| BVH | (80°-90°) | 0.6 | 0.0 | | | G0/10 |
| UL | (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH | (100°-180°) | 0.0 | 0.0 | | U0/0 | |

**BUG Rating: B1-U0-G2**
Type IV Short



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**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 15° | 25° | 32° | 35° | 45° | 55° | 65° | 75° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 774.7 | 774.7 | 774.7 | 774.7 | *774.7* | 774.7 | 774.7 | 774.7 | 774.7 | 774.7 | 774.7 |
| 2.5° | 745.6 | 745.6 | 747.9 | 750.1 | *750.1* | 756.8 | 765.8 | 768.0 | 774.7 | 779.2 | 781.5 |
| 5° | 667.3 | 676.2 | 676.2 | 687.4 | *696.4* | 705.3 | 727.7 | 741.2 | 763.5 | 779.2 | 783.7 |
| 7.5° | 595.6 | 597.8 | 604.6 | 618.0 | *635.9* | 642.6 | 671.7 | 709.8 | 752.3 | 779.2 | 790.4 |
| 10° | 524.0 | 526.2 | 530.7 | 550.8 | *568.7* | 584.4 | 624.7 | 671.7 | 732.2 | 779.2 | 799.4 |
| 12.5° | 472.5 | 472.5 | 476.9 | 499.3 | *519.5* | 535.2 | 579.9 | 640.4 | 712.0 | 781.5 | 812.8 |
| 15° | 454.5 | 454.5 | 452.3 | 463.5 | *481.4* | 494.8 | 546.3 | 613.5 | 694.1 | 785.9 | 826.2 |
| 17.5° | 463.5 | 463.5 | 454.5 | 456.8 | *472.5* | 481.4 | 526.2 | 593.4 | 685.2 | 794.9 | 848.6 |
| 20° | 481.4 | 481.4 | 463.5 | 463.5 | *479.2* | 485.9 | 524.0 | 582.2 | 680.7 | 810.6 | 880.0 |
| 22.5° | 501.6 | 503.8 | 479.2 | 479.2 | *494.8* | 501.6 | 537.4 | 588.9 | 687.4 | 830.7 | 911.3 |
| 25° | 535.2 | 535.2 | 503.8 | 503.8 | *517.2* | 528.4 | 562.0 | 609.0 | 696.4 | 855.3 | 960.6 |
| 27.5° | 582.2 | 579.9 | 539.6 | 528.4 | *548.6* | 557.5 | 595.6 | 633.7 | 705.3 | 884.5 | 1005.4 |
| 30° | 638.2 | 627.0 | 586.7 | 564.3 | *582.2* | 588.9 | 627.0 | 667.3 | 732.2 | 927.0 | 1074.8 |
| 32.5° | 698.6 | 703.1 | 638.2 | 597.8 | *606.8* | 615.8 | 665.0 | 718.8 | 777.0 | 983.0 | 1168.8 |
| 35° | 817.3 | 817.3 | 750.1 | 674.0 | *658.3* | 662.8 | 716.5 | 785.9 | 833.0 | 1077.0 | 1276.3 |
| 37.5° | 965.1 | 969.5 | 906.8 | 826.2 | *777.0* | 756.8 | 794.9 | 866.5 | 913.6 | 1195.7 | 1395.0 |
| 40° | 1126.3 | 1119.6 | 1054.6 | 980.7 | *940.4* | 915.8 | 895.7 | 980.7 | 1023.3 | 1323.3 | 1513.7 |
| 42.5° | 1260.6 | 1247.2 | 1159.9 | 1121.8 | *1097.2* | 1065.8 | 1025.5 | 1124.0 | 1164.3 | 1484.5 | 1650.2 |
| 45° | 1348.0 | 1336.8 | 1249.4 | 1238.2 | *1229.3* | 1211.4 | 1220.3 | 1296.5 | 1334.5 | 1670.4 | 1793.5 |
| 47.5° | 1415.1 | 1399.5 | 1325.6 | 1341.2 | *1359.2* | 1377.1 | 1455.4 | 1511.4 | 1502.5 | 1840.6 | 1910.0 |
| 50° | 1506.9 | 1484.5 | 1415.1 | 1446.5 | *1493.5* | 1529.3 | 1708.5 | 1724.1 | 1654.7 | 1986.1 | 2015.2 |
| 52.5° | 1562.9 | 1536.0 | 1518.1 | 1569.6 | *1639.0* | 1683.8 | 1986.1 | 1925.7 | 1775.6 | 2091.3 | 2098.1 |
| 55° | 1609.9 | 1607.7 | 1639.0 | 1706.2 | *1807.0* | 1863.0 | 2214.5 | 2098.1 | 1854.0 | 2198.8 | 2142.8 |
| 57.5° | 1753.2 | 1744.3 | 1798.0 | 1851.8 | *2019.7* | 2113.7 | 2460.8 | 2223.5 | 1910.0 | 2257.0 | 2118.2 |
| 60° | 1957.0 | 1961.5 | 1963.7 | 2062.2 | *2277.2* | 2407.1 | 2655.6 | 2328.7 | 1952.5 | 2266.0 | 2046.6 |
| 62.5° | 2275.0 | 2306.3 | 2252.6 | 2328.7 | *2588.4* | 2751.9 | 2843.7 | 2404.8 | 1939.1 | 2201.1 | 1865.2 |
| 65° | 2736.2 | 2725.0 | 2648.9 | 2734.0 | *3081.0* | 3181.8 | 3038.5 | 2427.2 | 1860.7 | 1977.2 | 1524.8 |
| 67.5° | 3206.4 | 3210.9 | 3175.1 | 3309.4 | *3647.5* | 3629.6 | 3257.9 | 2351.1 | 1659.2 | 1493.5 | 956.1 |
| 70° | 3513.2 | 3519.9 | 3609.5 | 3972.2 | *4339.4* | 4216.3 | 3437.1 | 2082.4 | 1168.8 | 712.0 | 362.7 |
| 72.5° | *3197.5* | *3199.7* | *3625.2* | *4283.5* | *4661.9* | *4527.5* | *3159.4* | *1415.1* | *532.9* | *253.0* | *127.6* |
| 75° | 2024.2 | 1923.4 | 2693.7 | 3631.9 | *3992.4* | 3860.3 | 2252.6 | 660.5 | 235.1 | 127.6 | 53.7 |
| 77.5° | 705.3 | 716.5 | 1097.2 | 2091.3 | *2550.4* | 2604.1 | 1157.6 | 217.2 | 129.9 | 87.3 | 29.1 |
| 80° | 141.1 | 159.0 | 324.7 | 770.3 | *1209.1* | 1256.2 | 418.7 | 105.2 | 85.1 | 67.2 | 15.7 |
| 82.5° | 9.0 | 11.2 | 96.3 | 320.2 | *494.8* | 470.2 | 82.8 | 53.7 | 58.2 | 47.0 | 9.0 |
| 85° | 0.0 | 0.0 | 6.7 | 53.7 | *89.6* | 67.2 | 9.0 | 13.4 | 24.6 | 26.9 | 4.5 |
| 87.5° | 0.0 | 0.0 | 0.0 | 0.0 | *0.0* | 0.0 | 0.0 | 0.0 | 0.0 | 2.2 | 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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REPORT NUMBER: P437946
CATALOG NUMBER: ISS-SA1F-830-U-T4FT-HSS

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 774.7 | 774.7 | 774.7 | 774.7 | 774.7 | 774.7 | 774.7 | 774.7 | 774.7 | 774.7 | 774.7 |
| 2.5° | 781.5 | 781.5 | 770.3 | 765.8 | 759.1 | 750.1 | 741.2 | 736.7 | 727.7 | 730.0 | 730.0 |
| 5° | 783.7 | 779.2 | 765.8 | 745.6 | 723.2 | 700.8 | 674.0 | 656.1 | 635.9 | 640.4 | 638.2 |
| 7.5° | 788.2 | 785.9 | 754.6 | 718.8 | 678.5 | 629.2 | 582.2 | 541.9 | 506.0 | 497.1 | 490.4 |
| 10° | 797.1 | 790.4 | 745.6 | 687.4 | 606.8 | 526.2 | 445.6 | 376.2 | 347.1 | 315.7 | 309.0 |
| 12.5° | 806.1 | 794.9 | 730.0 | 642.6 | 519.5 | 400.8 | 295.6 | 232.9 | 194.8 | 183.6 | 179.1 |
| 15° | 819.5 | 801.6 | 709.8 | 579.9 | 416.5 | 270.9 | 185.8 | 152.3 | 145.5 | 143.3 | 143.3 |
| 17.5° | 837.4 | 806.1 | 689.7 | 508.3 | 306.8 | 174.7 | 136.6 | 136.6 | 138.8 | 141.1 | 141.1 |
| 20° | 864.3 | 817.3 | 660.5 | 421.0 | 206.0 | 132.1 | 129.9 | 132.1 | 134.3 | 136.6 | 136.6 |
| 22.5° | 893.4 | 835.2 | 627.0 | 329.2 | 145.5 | 123.2 | 123.2 | 125.4 | 127.6 | 129.9 | 129.9 |
| 25° | 927.0 | 848.6 | 582.2 | 235.1 | 120.9 | 116.4 | 116.4 | 118.7 | 120.9 | 123.2 | 123.2 |
| 27.5° | 962.8 | 864.3 | 521.7 | 161.2 | 109.7 | 109.7 | 112.0 | 114.2 | 116.4 | 116.4 | 118.7 |
| 30° | 1016.6 | 888.9 | 459.0 | 118.7 | 100.8 | 100.8 | 105.2 | 109.7 | 112.0 | 112.0 | 114.2 |
| 32.5° | 1086.0 | 909.1 | 373.9 | 100.8 | 94.0 | 91.8 | 96.3 | 103.0 | 107.5 | 109.7 | 109.7 |
| 35° | 1162.1 | 938.2 | 279.9 | 91.8 | 87.3 | 85.1 | 87.3 | 94.0 | 103.0 | 107.5 | 107.5 |
| 37.5° | 1240.5 | 965.1 | 208.2 | 87.3 | 80.6 | 78.4 | 80.6 | 85.1 | 94.0 | 103.0 | 105.2 |
| 40° | 1318.8 | 969.5 | 150.0 | 80.6 | 76.1 | 73.9 | 73.9 | 78.4 | 87.3 | 96.3 | 98.5 |
| 42.5° | 1399.5 | 987.5 | 114.2 | 76.1 | 69.4 | 69.4 | 69.4 | 71.7 | 78.4 | 85.1 | 87.3 |
| 45° | 1491.3 | 998.7 | 91.8 | 69.4 | 64.9 | 64.9 | 64.9 | 64.9 | 69.4 | 71.7 | 71.7 |
| 47.5° | 1569.6 | 983.0 | 73.9 | 62.7 | 60.5 | 60.5 | 60.5 | 58.2 | 58.2 | 56.0 | 56.0 |
| 50° | 1625.6 | 947.2 | 60.5 | 56.0 | 56.0 | 58.2 | 53.7 | 49.3 | 49.3 | 44.8 | 44.8 |
| 52.5° | 1659.2 | 893.4 | 51.5 | 49.3 | 53.7 | 53.7 | 47.0 | 44.8 | 40.3 | 35.8 | 33.6 |
| 55° | 1657.0 | 803.8 | 44.8 | 42.5 | 47.0 | 47.0 | 40.3 | 35.8 | 31.3 | 26.9 | 26.9 |
| 57.5° | 1592.0 | 705.3 | 40.3 | 35.8 | 40.3 | 38.1 | 33.6 | 26.9 | 22.4 | 17.9 | 17.9 |
| 60° | 1491.3 | 600.1 | 35.8 | 29.1 | 31.3 | 29.1 | 26.9 | 20.2 | 15.7 | 11.2 | 11.2 |
| 62.5° | 1354.7 | 501.6 | 29.1 | 24.6 | 22.4 | 22.4 | 20.2 | 15.7 | 9.0 | 6.7 | 6.7 |
| 65° | 1094.9 | 371.7 | 22.4 | 17.9 | 15.7 | 17.9 | 13.4 | 9.0 | 4.5 | 2.2 | 2.2 |
| 67.5° | 676.2 | 212.7 | 17.9 | 13.4 | 11.2 | 13.4 | 9.0 | 6.7 | 2.2 | 0.0 | 0.0 |
| 70° | 266.5 | 91.8 | 13.4 | 9.0 | 9.0 | 9.0 | 6.7 | 4.5 | 0.0 | 0.0 | 0.0 |
| 72.5° | *91.8* | *40.3* | *11.2* | *6.7* | *6.7* | *4.5* | *4.5* | *2.2* | *0.0* | *0.0* | *0.0* |
| 75° | 40.3 | 24.6 | 9.0 | 6.7 | 4.5 | 4.5 | 2.2 | 2.2 | 0.0 | 0.0 | 0.0 |
| 77.5° | 22.4 | 15.7 | 6.7 | 4.5 | 4.5 | 2.2 | 2.2 | 2.2 | 0.0 | 0.0 | 0.0 |
| 80° | 13.4 | 9.0 | 4.5 | 4.5 | 4.5 | 2.2 | 2.2 | 2.2 | 0.0 | 0.0 | 0.0 |
| 82.5° | 9.0 | 4.5 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 | 0.0 | 0.0 | 0.0 |
| 85° | 4.5 | 2.2 | 0.0 | 2.2 | 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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# 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

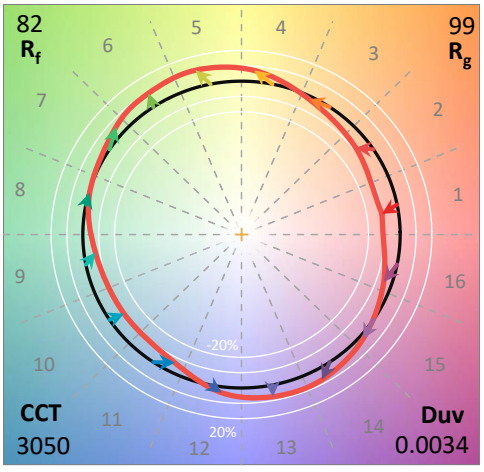
## Test Information

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

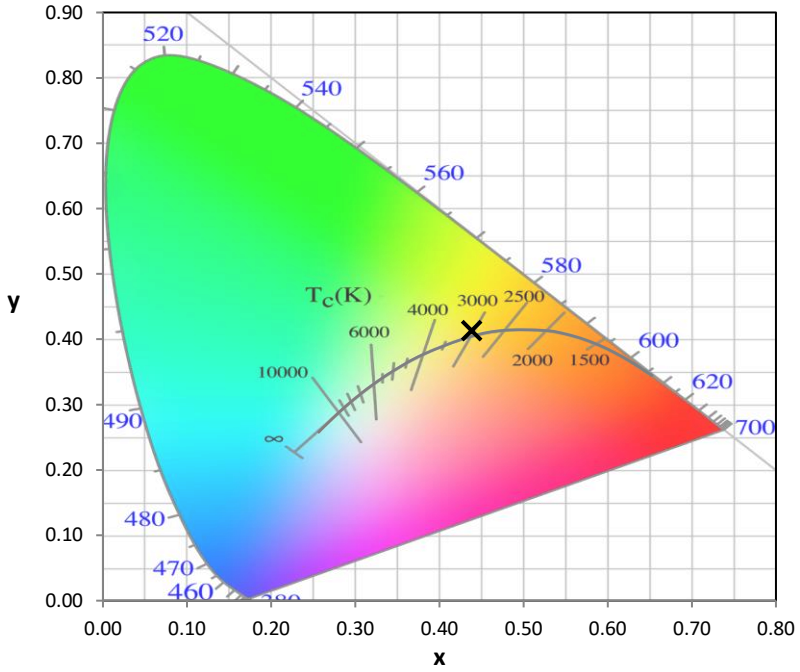
| | |
|---|---|
| Stabilization Time: | 20M |
| Operation Time: | 1H 20M |
| Sphere Temperature (°C): | 24.2 |

REPORT NUMBER: SP1-2408-195-9

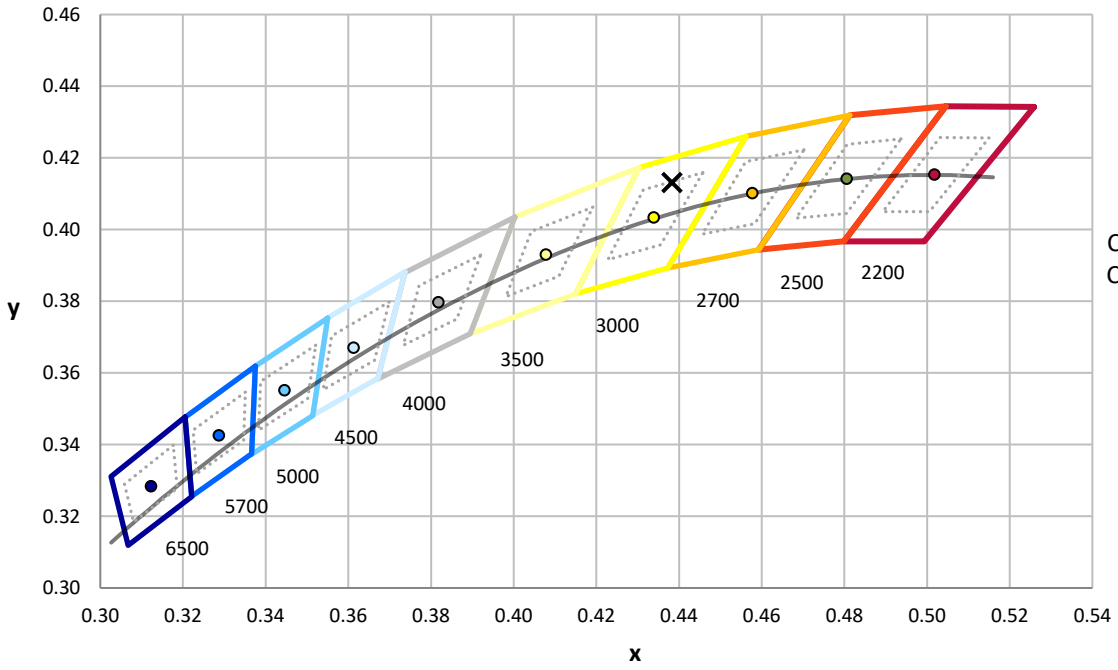
| Measurement and Test Equipment | | | |
|---|---|---|---|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 6/18/2024 | 12/18/2024 |
| Power Meter | INXT2011004 | 2/8/2024 | 2/8/2025 |
| AC Power Source | IN0063 | 10/24/2023 | 10/24/2024 |
| DC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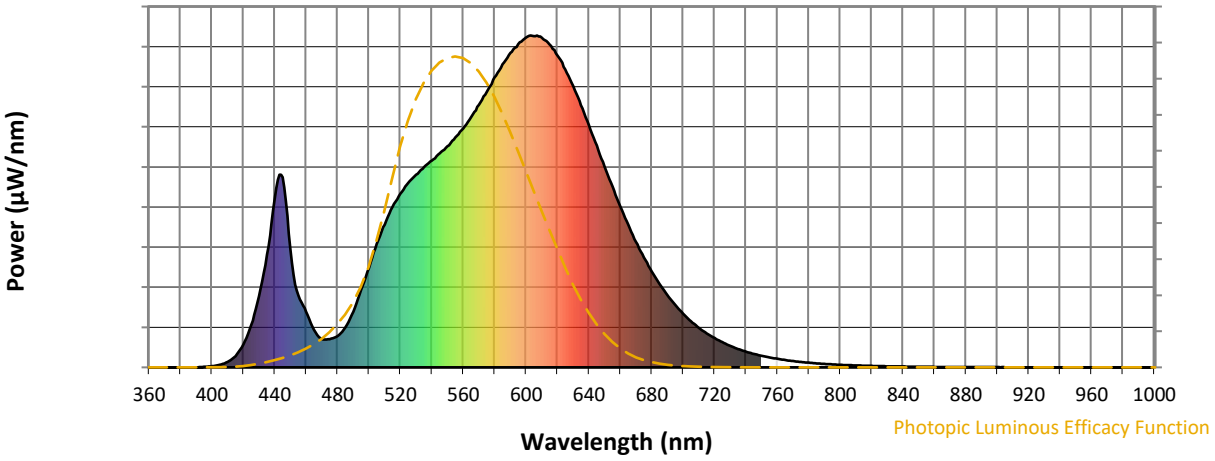
## Photopic Flux vs. Wavelength




## 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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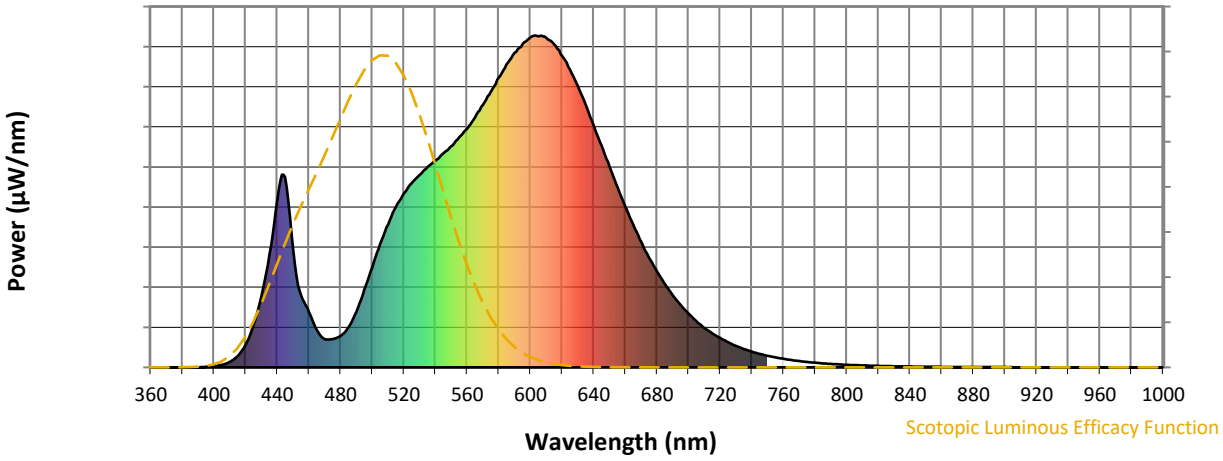
## Scotopic Flux vs. Wavelength




**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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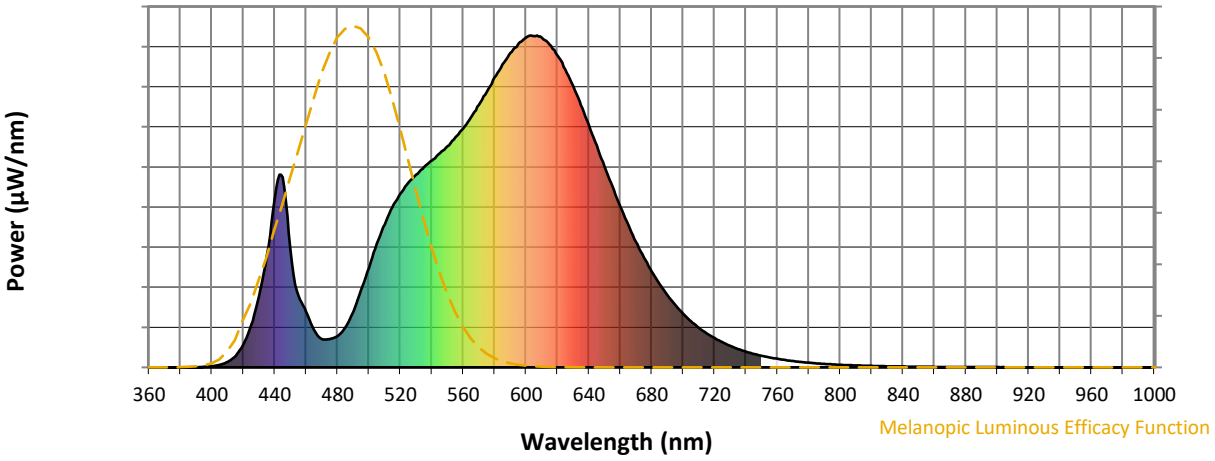
## Melanopic Flux vs. Wavelength




**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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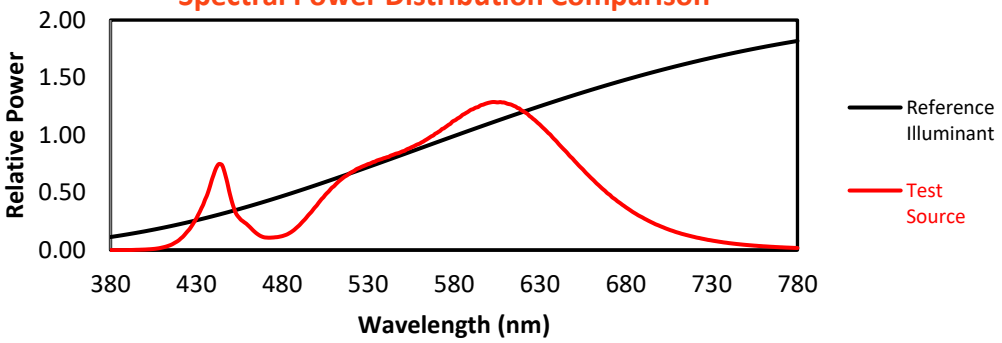
# TM-30-18

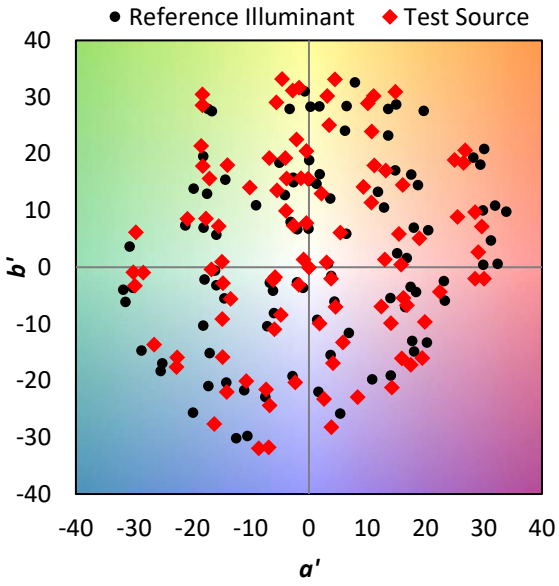
## Summary

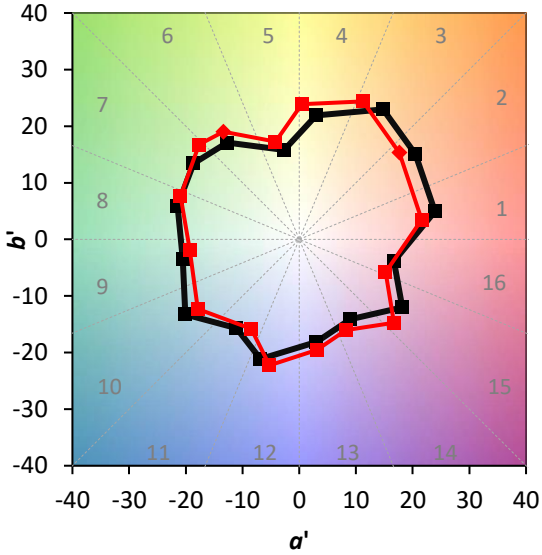
$R_f$ = 81.5
$R_g$ = 99.2
CIE $R_a$ = 81.0
$R_9$ = 7.1

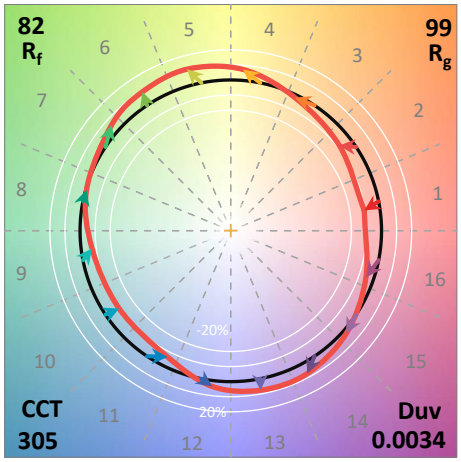
## Spectral Power Distribution Comparison

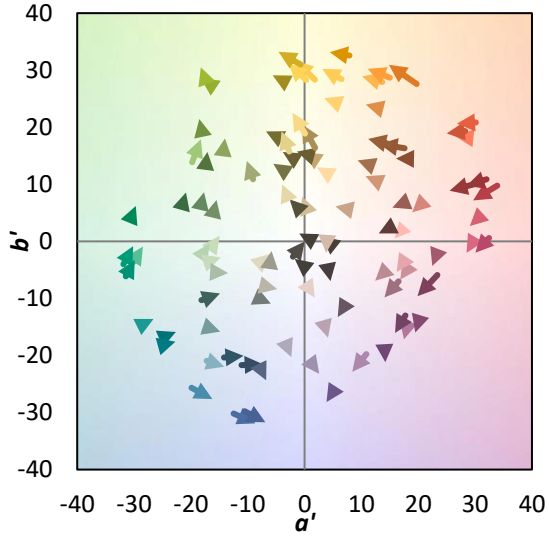



## Color Vector Graphics



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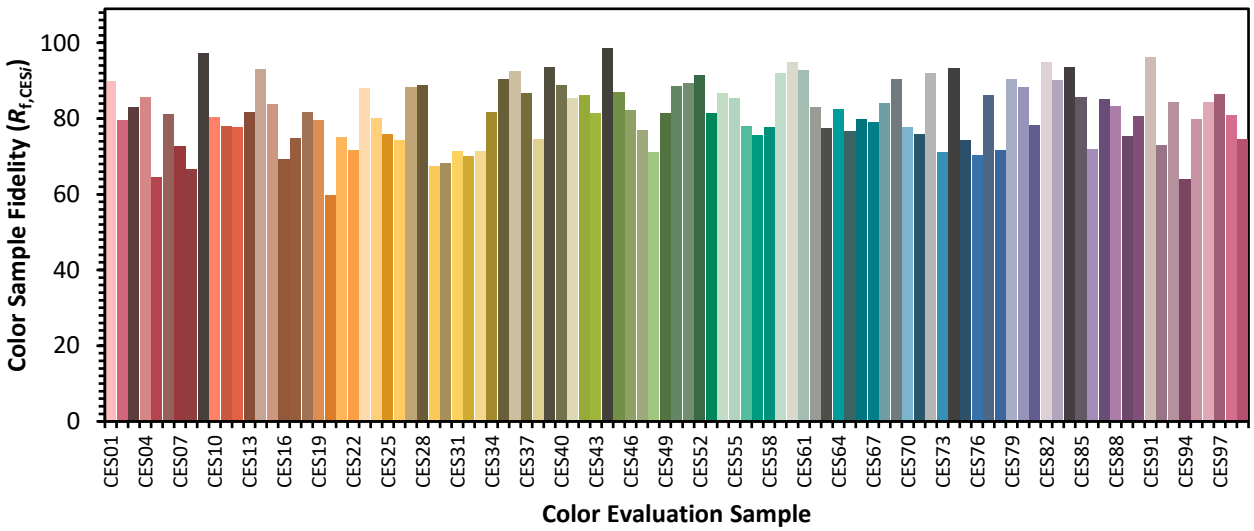
**Individual Sample Fidelity Index ($R_{f,i}$)**

| | | | |
|---|---|---|---|
| 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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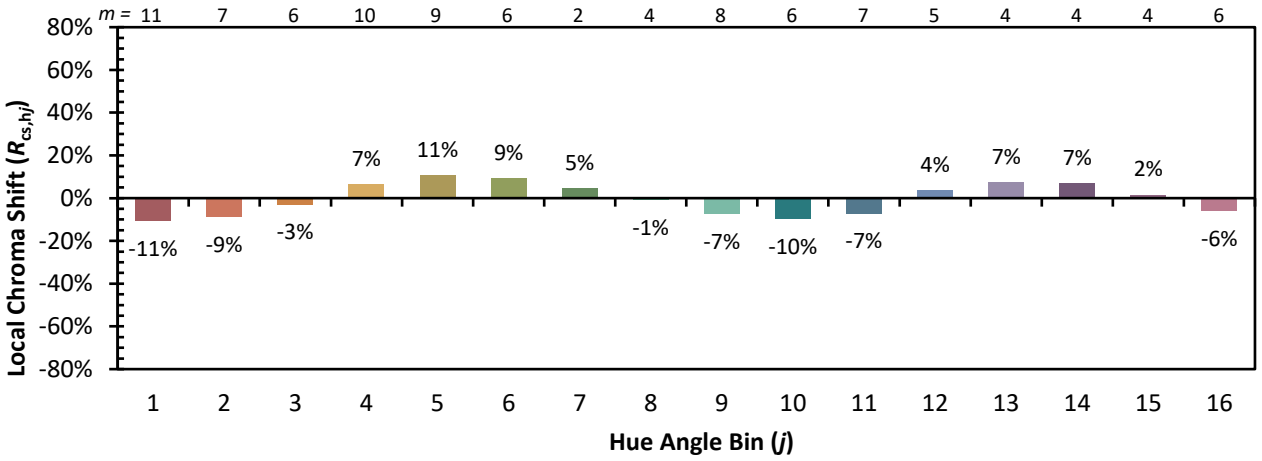
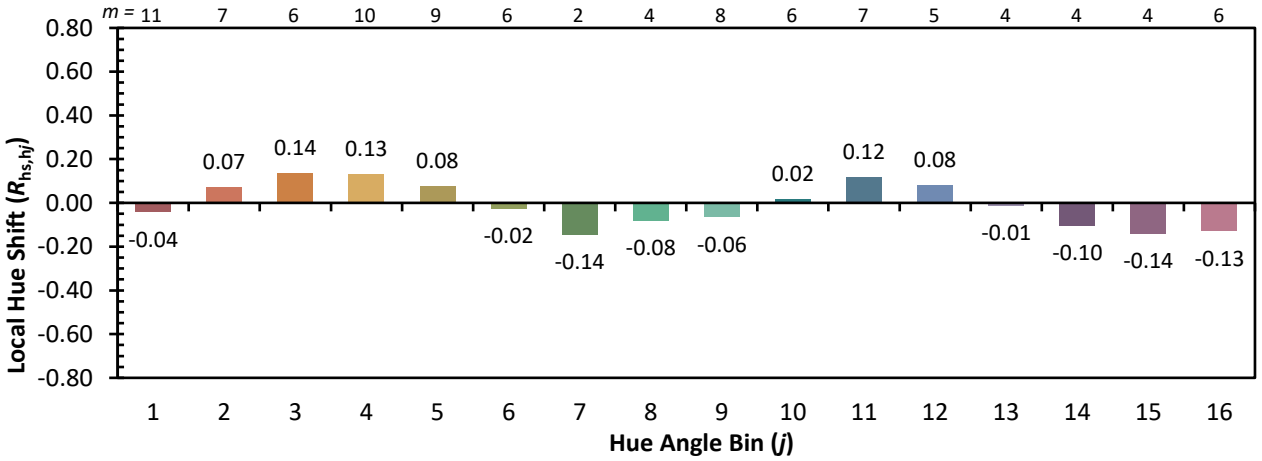
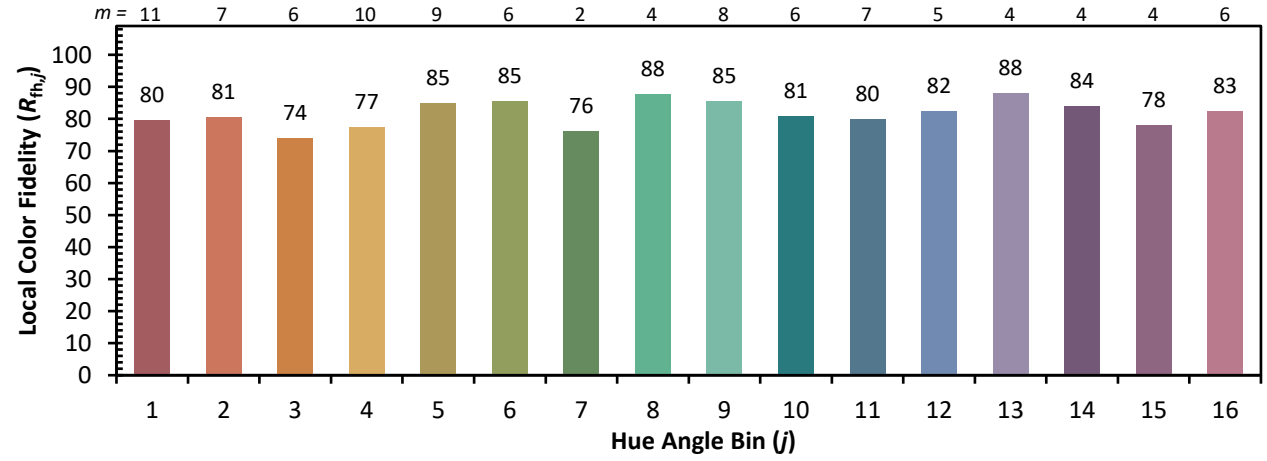
## Color Rendition by Hue-Angle Bin



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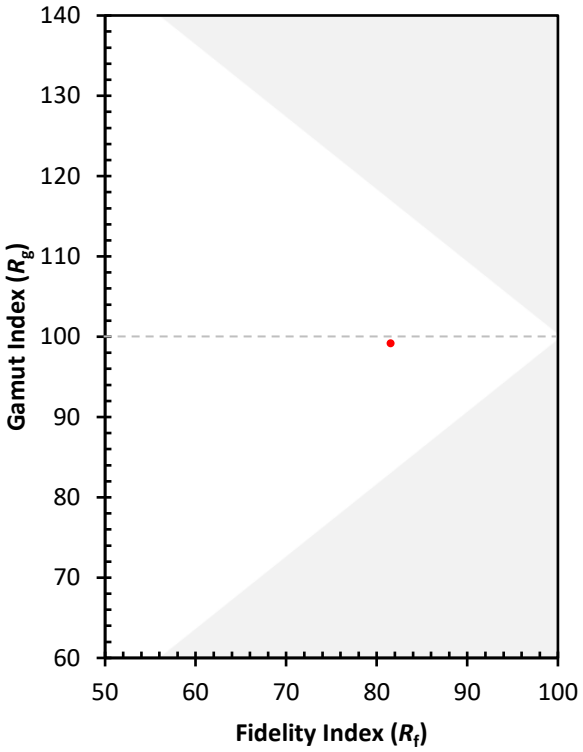
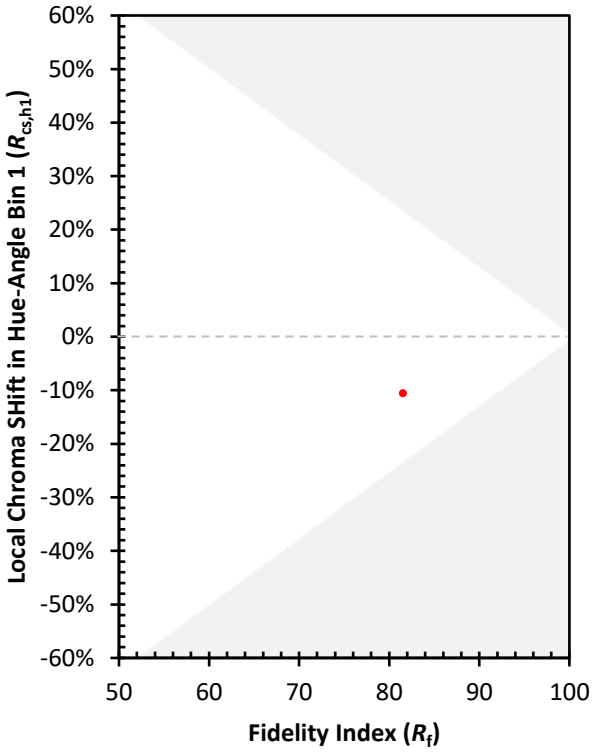
### Measure Comparisons

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