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: P437423

Luminaire Tested: **ISS-SA1C-830-U-SL4-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: | P437423 |
| | TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2011-074-19) |
| Test Lab: | INNOVATION CENTER |
| Issue Date: | 12/9/2020 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS (FORMERLY EATON) |
| Product Line: | McGRAW-EDISON |
| Catalog Number: | ISS-SA1C-830-U-SL4-HSS |
| Description: | IMPACT ELITE LED QUARTER SPHERE LUMINAIRE |
| | (1) 80 CRI, 3000K, 615mA LIGHTSQUARE WITH 16 LEDS AND TYPE IV SPILL LIGHT ELIMINATOR OPTICS WITH HOUSE SIDE SHIELD |
| Light Source: | - |
| Ballast/Driver: | ELECTRONIC DRIVER |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 2976 lumens |
| Efficiency: | N/A |
| Efficacy: | 87.0 lumens/watt |
| Luminous Opening: | Rectangular (W 0.5' x L: 0.5' x H: 0') |
| IES Classification: | Type IV - Short |
| BUG Rating: | B0 - U0 - G1 |

| | |
|---|---|
| Input Watts (W): | 34.2 |
| 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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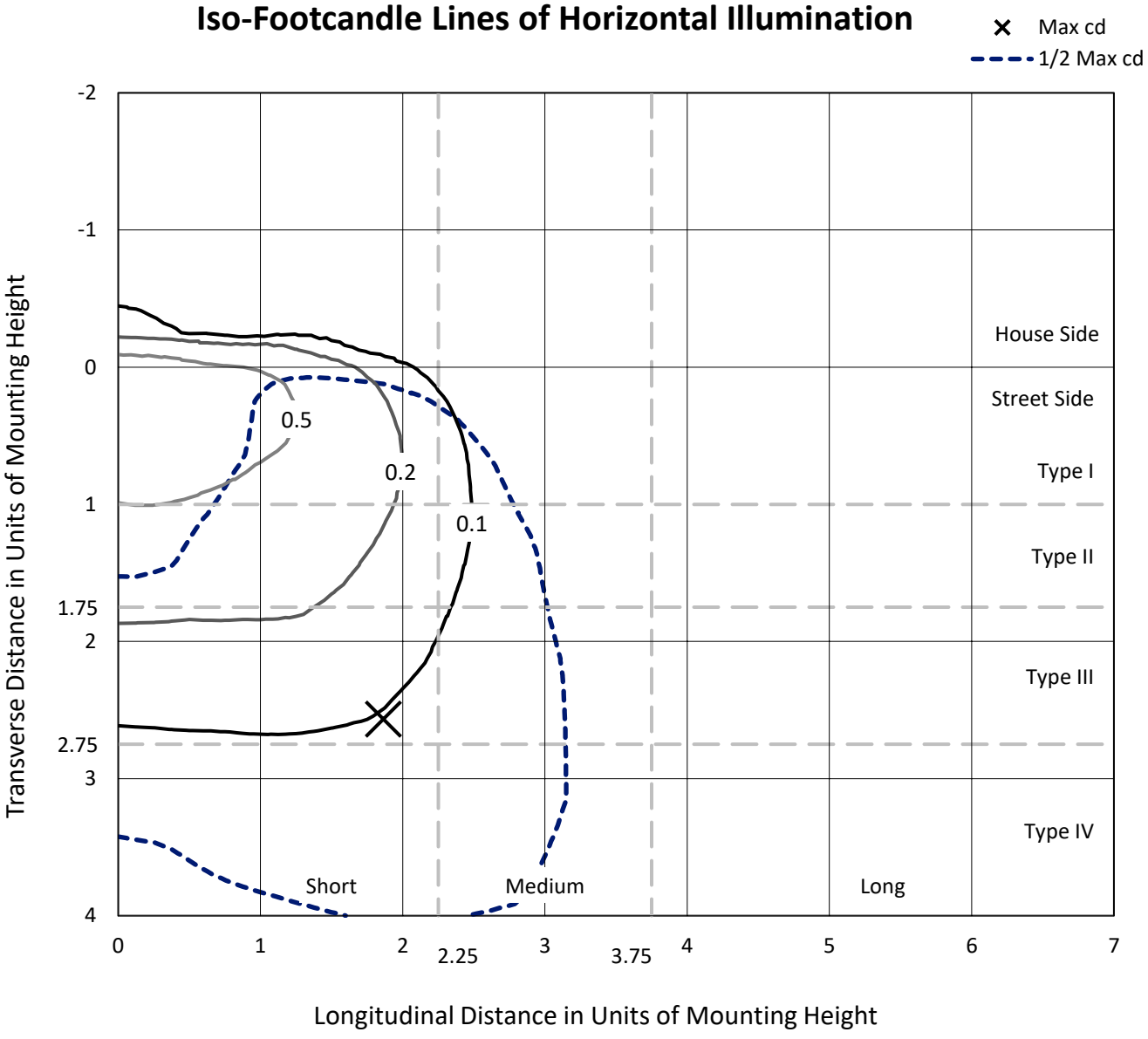
Scaled Data Report

REPORT NUMBER: P437423
CATALOG NUMBER: ISS-SA1C-830-U-SL4-HSS

## Iso-Footcandle Lines of Horizontal Illumination




Based on 25 foot mounting height. Maximum calculated value = 0.9 fc
Type IV - Short - N/A

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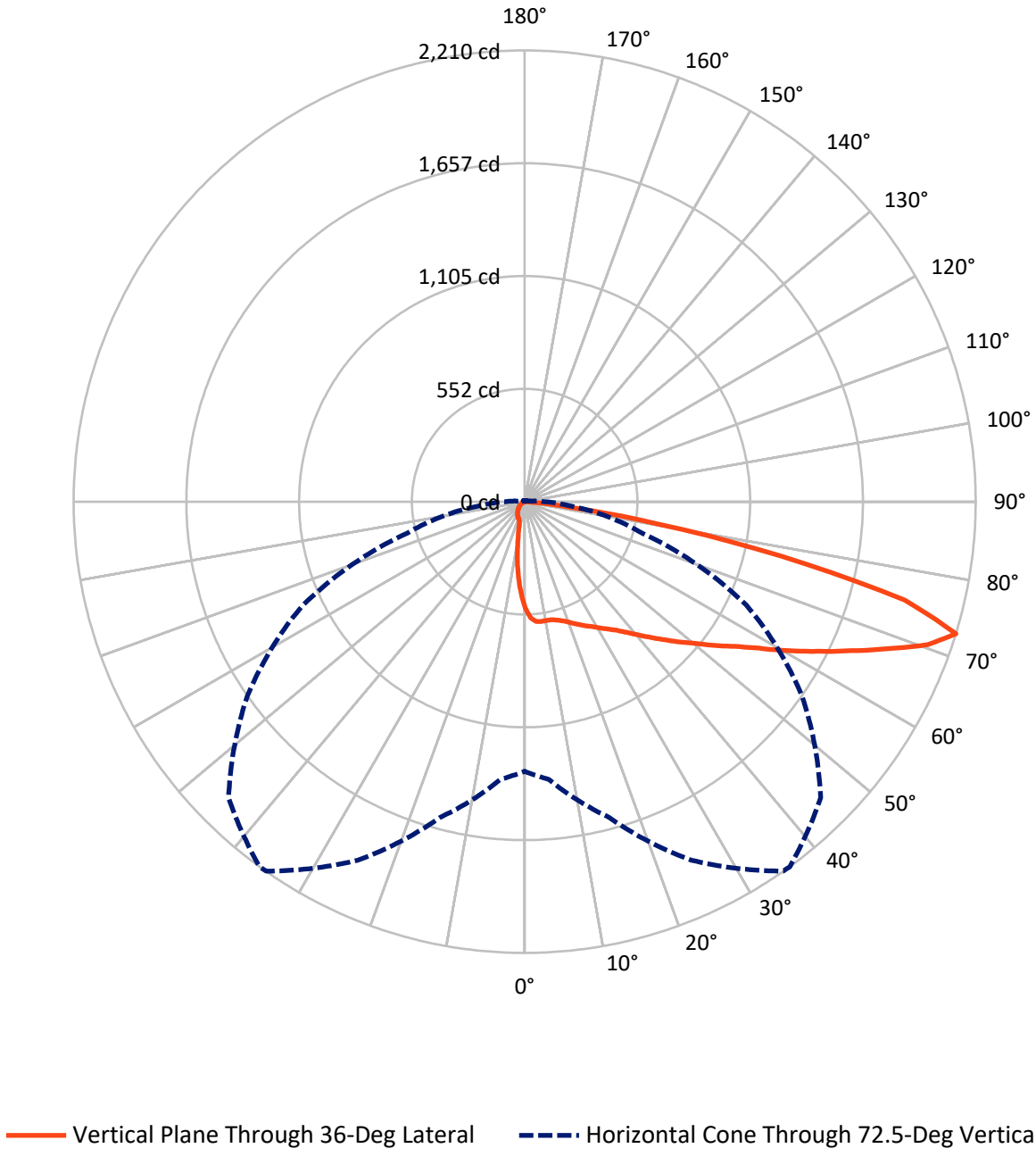
## Luminous Intensity Polar Plot



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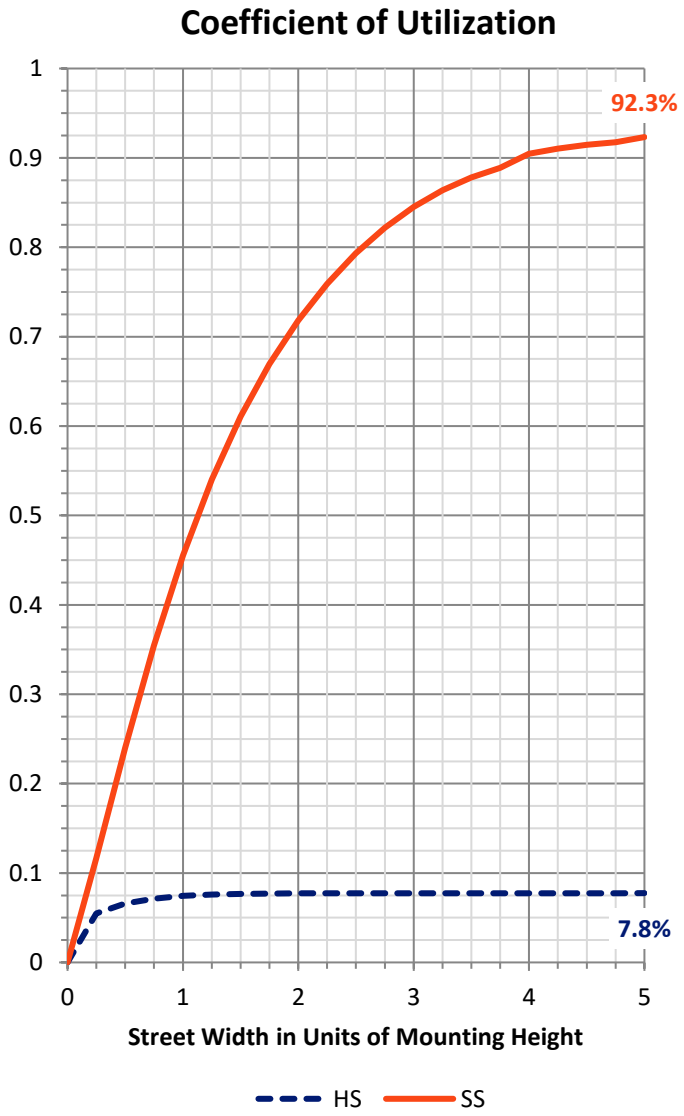
**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 232.2 | 0.0 | 232.2 |
| | % Fixture | 7.8 | 0.0 | 7.8 |
| **Street Side** | Lumens | 2743.8 | 0.0 | 2743.8 |
| | % Fixture | 92.2 | 0.0 | 92.2 |
| **Total** | Lumens | 2976.0 | 0.0 | 2976.0 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 44.6 | 1.5 |
| 10°-20° | 112.1 | 3.8 |
| 20°-30° | 183.0 | 6.1 |
| 30°-40° | 278.2 | 9.3 |
| 40°-50° | 425.5 | 14.3 |
| 50°-60° | 605.0 | 20.3 |
| 60°-70° | 767.2 | 25.8 |
| 70°-80° | 525.3 | 17.7 |
| 80°-90° | 35.2 | 1.2 |
| 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° | 2976.0 | 100.0 |
| 0°-180° | 2976.0 | 100.0 |



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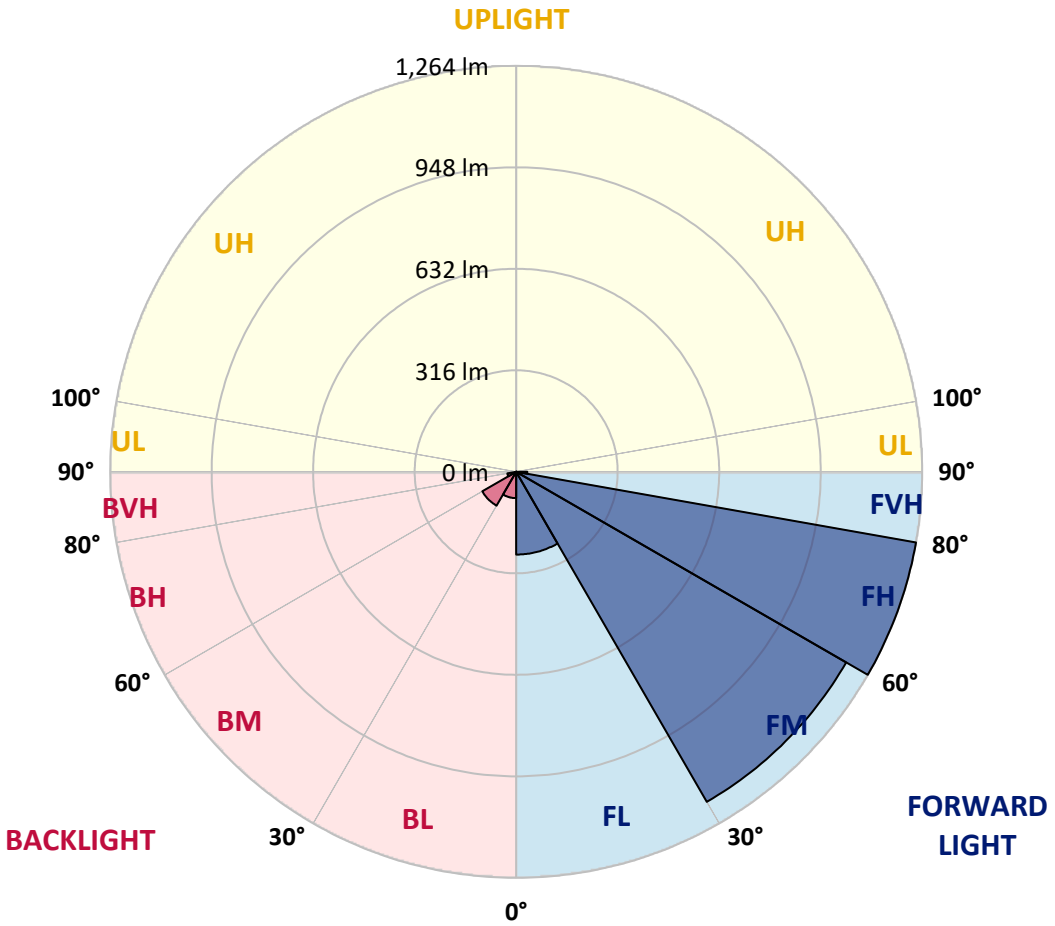
## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 257.8 | 8.7 | | | |
| FM | (30°-60°) | 1186.9 | 39.9 | | | |
| FH | (60°-80°) | 1264.5 | 42.5 | | | G1/1800 |
| FVH | (80°-90°) | 34.7 | 1.2 | | | G1/100 |
| BL | (0°-30°) | 81.9 | 2.8 | B0/110 | | |
| BM | (30°-60°) | 121.8 | 4.1 | B0/220 | | |
| BH | (60°-80°) | 28.0 | 0.9 | B0/110 | | G0/110 |
| BVH | (80°-90°) | 0.5 | 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-G1**
Type IV Short



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REPORT NUMBER: P437423
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**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 15° | 25° | 35° | 36° | 45° | 55° | 65° | 75° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 522.6 | 522.6 | 522.6 | 522.6 | 522.6 | 522.6 | 522.6 | 522.6 | 522.6 | 522.6 | 522.6 |
| 2.5° | 585.5 | 581.6 | 579.0 | 576.3 | 568.5 | 569.8 | 561.9 | 554.1 | 542.3 | 537.0 | 529.2 |
| 5° | 599.9 | 598.6 | 597.3 | 593.4 | 586.8 | 589.4 | 581.6 | 573.7 | 556.7 | 541.0 | 523.9 |
| 7.5° | 597.3 | 599.9 | 598.6 | 596.0 | 590.7 | 592.1 | 585.5 | 577.6 | 563.2 | 542.3 | 518.7 |
| 10° | 592.1 | 593.4 | 593.4 | 592.1 | 590.7 | 590.7 | 585.5 | 579.0 | 565.9 | 547.5 | 517.4 |
| 12.5° | 581.6 | 584.2 | 588.1 | 590.7 | 592.1 | 593.4 | 589.4 | 584.2 | 572.4 | 552.8 | 521.3 |
| 15° | 577.6 | 580.3 | 588.1 | 596.0 | 599.9 | 601.2 | 597.3 | 590.7 | 580.3 | 563.2 | 527.9 |
| 17.5° | 577.6 | 580.3 | 593.4 | 605.2 | 613.0 | 614.3 | 609.1 | 602.5 | 589.4 | 572.4 | 535.7 |
| 20° | 585.5 | 588.1 | 603.8 | 624.8 | 628.7 | 631.3 | 623.5 | 614.3 | 599.9 | 582.9 | 544.9 |
| 22.5° | 598.6 | 602.5 | 622.2 | 641.8 | 649.7 | 651.0 | 641.8 | 624.8 | 611.7 | 594.7 | 552.8 |
| 25° | 620.9 | 630.0 | 648.4 | 669.3 | 670.6 | 672.0 | 657.5 | 640.5 | 624.8 | 607.8 | 561.9 |
| 27.5° | 652.3 | 660.2 | 675.9 | 699.5 | 691.6 | 691.6 | 679.8 | 657.5 | 641.8 | 626.1 | 577.6 |
| 30° | 692.9 | 698.1 | 716.5 | 725.7 | 715.2 | 716.5 | 702.1 | 681.1 | 668.0 | 652.3 | 601.2 |
| 32.5° | 730.9 | 734.8 | 754.5 | 755.8 | 744.0 | 742.7 | 732.2 | 707.3 | 696.8 | 691.6 | 634.0 |
| 35° | 766.3 | 771.5 | 787.2 | 785.9 | 774.1 | 772.8 | 767.6 | 745.3 | 745.3 | 750.5 | 682.4 |
| 37.5° | 792.5 | 805.6 | 825.2 | 820.0 | 812.1 | 812.1 | 808.2 | 791.1 | 804.2 | 823.9 | 746.6 |
| 40° | 826.5 | 834.4 | 860.6 | 856.6 | 858.0 | 858.0 | 859.3 | 848.8 | 872.4 | 905.1 | 821.3 |
| 42.5° | 844.9 | 860.6 | 892.0 | 897.2 | 909.0 | 909.0 | 919.5 | 916.9 | 961.4 | 1003.3 | 907.7 |
| 45° | 873.7 | 890.7 | 924.8 | 944.4 | 958.8 | 965.4 | 983.7 | 998.1 | 1061.0 | 1113.4 | 999.4 |
| 47.5° | 910.3 | 924.8 | 953.6 | 990.2 | 1016.4 | 1026.9 | 1063.6 | 1087.2 | 1171.0 | 1224.7 | 1085.9 |
| 50° | 960.1 | 962.7 | 983.7 | 1038.7 | 1084.6 | 1091.1 | 1148.7 | 1188.0 | 1282.3 | 1332.1 | 1147.4 |
| 52.5° | 1013.8 | 1008.6 | 1020.4 | 1095.0 | 1159.2 | 1171.0 | 1236.5 | 1296.8 | 1391.1 | 1401.5 | 1172.3 |
| 55° | 1055.7 | 1055.7 | 1064.9 | 1156.6 | 1243.0 | 1249.6 | 1341.3 | 1405.5 | 1490.6 | 1442.1 | 1188.0 |
| 57.5° | 1109.4 | 1104.2 | 1118.6 | 1219.5 | 1347.8 | 1353.1 | 1459.2 | 1508.9 | 1545.6 | 1468.3 | 1185.4 |
| 60° | 1148.7 | 1155.3 | 1177.6 | 1300.7 | 1456.6 | 1480.1 | 1569.2 | 1584.9 | 1603.3 | 1477.5 | 1177.6 |
| 62.5° | 1203.8 | 1202.4 | 1245.7 | 1391.1 | 1598.0 | 1613.7 | 1675.3 | 1649.1 | 1647.8 | 1493.2 | 1167.1 |
| 65° | 1249.6 | 1260.1 | 1325.6 | 1499.8 | 1748.6 | 1759.1 | 1780.1 | 1746.0 | 1709.4 | 1510.3 | 1075.4 |
| 67.5° | 1320.3 | 1341.3 | 1423.8 | 1642.6 | 1909.8 | 1921.5 | 1939.9 | 1865.2 | 1726.4 | 1389.8 | 895.9 |
| 70° | 1400.2 | 1427.7 | 1561.3 | 1832.5 | 2082.7 | 2095.8 | 2099.7 | 1877.0 | 1564.0 | 1091.1 | 607.8 |
| 72.5° | 1320.3 | 1364.9 | 1600.6 | 1937.3 | 2208.4 | 2209.7 | 2051.2 | 1658.3 | 1198.5 | 596.0 | 214.8 |
| 75° | 850.1 | 906.4 | 1325.6 | 1718.5 | 1901.9 | 1922.9 | 1608.5 | 1159.2 | 559.3 | 133.6 | 60.3 |
| 77.5° | 288.2 | 307.8 | 651.0 | 1084.6 | 1275.8 | 1283.7 | 1058.4 | 586.8 | 176.8 | 53.7 | 32.7 |
| 80° | 166.4 | 165.0 | 227.9 | 474.2 | 636.6 | 661.5 | 533.1 | 234.5 | 82.5 | 27.5 | 22.3 |
| 82.5° | 39.3 | 40.6 | 119.2 | 172.9 | 252.8 | 227.9 | 112.6 | 141.5 | 38.0 | 15.7 | 19.6 |
| 85° | 0.0 | 0.0 | 19.6 | 41.9 | 30.1 | 35.4 | 10.5 | 43.2 | 6.5 | 6.5 | 13.1 |
| 87.5° | 0.0 | 0.0 | 0.0 | 0.0 | 1.3 | 1.3 | 1.3 | 1.3 | 1.3 | 1.3 | 1.3 |
| 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: P437423
CATALOG NUMBER: ISS-SA1C-830-U-SL4-HSS

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 522.6 | 522.6 | 522.6 | 522.6 | 522.6 | 522.6 | 522.6 | 522.6 | 522.6 | 522.6 | 522.6 |
| 2.5° | 521.3 | 514.8 | 501.7 | 491.2 | 476.8 | 465.0 | 453.2 | 448.0 | 438.8 | 436.2 | 437.5 |
| 5° | 513.5 | 503.0 | 478.1 | 453.2 | 425.7 | 399.5 | 372.0 | 356.3 | 349.7 | 337.9 | 335.3 |
| 7.5° | 504.3 | 488.6 | 453.2 | 412.6 | 365.4 | 327.5 | 289.5 | 263.3 | 239.7 | 230.5 | 226.6 |
| 10° | 500.4 | 480.7 | 430.9 | 369.4 | 305.2 | 243.6 | 196.5 | 162.4 | 141.5 | 133.6 | 131.0 |
| 12.5° | 500.4 | 476.8 | 410.0 | 327.5 | 242.3 | 171.6 | 128.4 | 108.7 | 102.2 | 100.9 | 99.5 |
| 15° | 505.6 | 475.5 | 390.3 | 282.9 | 183.4 | 119.2 | 98.2 | 95.6 | 94.3 | 94.3 | 95.6 |
| 17.5° | 508.2 | 472.9 | 369.4 | 239.7 | 134.9 | 95.6 | 91.7 | 91.7 | 91.7 | 91.7 | 91.7 |
| 20° | 514.8 | 471.5 | 345.8 | 193.9 | 102.2 | 89.1 | 87.8 | 87.8 | 87.8 | 87.8 | 89.1 |
| 22.5° | 516.1 | 471.5 | 317.0 | 149.3 | 90.4 | 85.1 | 83.8 | 83.8 | 83.8 | 85.1 | 85.1 |
| 25° | 523.9 | 468.9 | 289.5 | 114.0 | 85.1 | 79.9 | 79.9 | 78.6 | 79.9 | 79.9 | 79.9 |
| 27.5° | 534.4 | 470.2 | 255.4 | 94.3 | 79.9 | 76.0 | 74.7 | 74.7 | 74.7 | 74.7 | 74.7 |
| 30° | 546.2 | 472.9 | 220.1 | 83.8 | 74.7 | 72.0 | 70.7 | 69.4 | 69.4 | 69.4 | 69.4 |
| 32.5° | 568.5 | 475.5 | 182.1 | 76.0 | 69.4 | 66.8 | 65.5 | 64.2 | 64.2 | 64.2 | 64.2 |
| 35° | 602.5 | 489.9 | 149.3 | 70.7 | 64.2 | 61.6 | 60.3 | 58.9 | 58.9 | 58.9 | 57.6 |
| 37.5° | 648.4 | 512.2 | 117.9 | 65.5 | 58.9 | 56.3 | 55.0 | 53.7 | 52.4 | 52.4 | 52.4 |
| 40° | 703.4 | 535.7 | 98.2 | 58.9 | 53.7 | 51.1 | 49.8 | 48.5 | 47.2 | 45.8 | 45.8 |
| 42.5° | 768.9 | 564.5 | 78.6 | 53.7 | 48.5 | 45.8 | 44.5 | 43.2 | 40.6 | 39.3 | 40.6 |
| 45° | 842.2 | 592.1 | 66.8 | 49.8 | 44.5 | 41.9 | 40.6 | 38.0 | 35.4 | 34.1 | 34.1 |
| 47.5° | 906.4 | 598.6 | 58.9 | 44.5 | 40.6 | 38.0 | 36.7 | 32.7 | 30.1 | 27.5 | 27.5 |
| 50° | 949.6 | 586.8 | 52.4 | 40.6 | 36.7 | 35.4 | 32.7 | 27.5 | 23.6 | 22.3 | 21.0 |
| 52.5° | 954.9 | 555.4 | 45.8 | 36.7 | 34.1 | 31.4 | 27.5 | 23.6 | 19.6 | 17.0 | 17.0 |
| 55° | 949.6 | 503.0 | 40.6 | 34.1 | 30.1 | 27.5 | 23.6 | 18.3 | 14.4 | 13.1 | 11.8 |
| 57.5° | 932.6 | 448.0 | 36.7 | 30.1 | 27.5 | 23.6 | 18.3 | 14.4 | 10.5 | 9.2 | 7.9 |
| 60° | 901.2 | 381.2 | 32.7 | 27.5 | 23.6 | 19.6 | 14.4 | 10.5 | 6.5 | 5.2 | 5.2 |
| 62.5° | 842.2 | 307.8 | 28.8 | 23.6 | 19.6 | 15.7 | 11.8 | 6.5 | 3.9 | 2.6 | 2.6 |
| 65° | 725.7 | 230.5 | 24.9 | 19.6 | 15.7 | 13.1 | 7.9 | 3.9 | 1.3 | 0.0 | 0.0 |
| 67.5° | 564.5 | 155.9 | 19.6 | 15.7 | 13.1 | 10.5 | 6.5 | 1.3 | 0.0 | 0.0 | 0.0 |
| 70° | 332.7 | 82.5 | 15.7 | 11.8 | 10.5 | 7.9 | 3.9 | 1.3 | 0.0 | 0.0 | 0.0 |
| 72.5° | *95.6* | *32.7* | *11.8* | *9.2* | *7.9* | *5.2* | *2.6* | *1.3* | *0.0* | *0.0* | *0.0* |
| 75° | 39.3 | 19.6 | 7.9 | 6.5 | 6.5 | 3.9 | 1.3 | 1.3 | 0.0 | 0.0 | 0.0 |
| 77.5° | 26.2 | 14.4 | 5.2 | 3.9 | 3.9 | 2.6 | 1.3 | 0.0 | 0.0 | 0.0 | 0.0 |
| 80° | 21.0 | 7.9 | 2.6 | 2.6 | 2.6 | 1.3 | 1.3 | 0.0 | 0.0 | 0.0 | 0.0 |
| 82.5° | 18.3 | 5.2 | 1.3 | 1.3 | 1.3 | 1.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 85° | 9.2 | 2.6 | 1.3 | 1.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 87.5° | 1.3 | 1.3 | 1.3 | 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

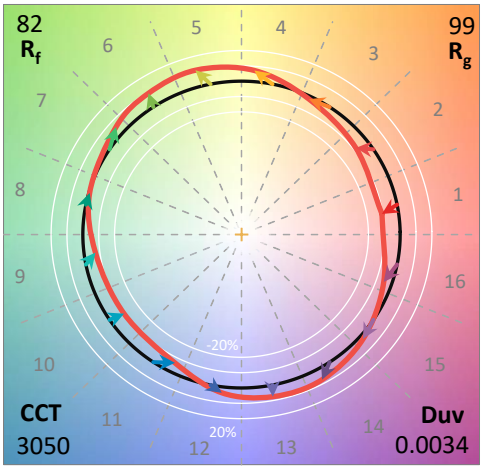
## Test Information

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

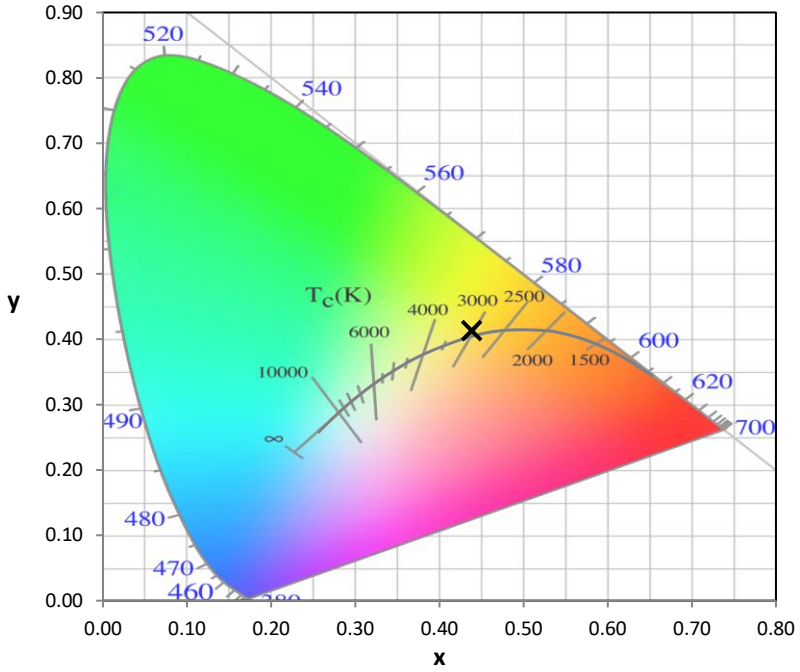
| | |
|---|---|
| Stabilization Time: | 20M |
| Operation Time: | 1H 20M |
| Sphere Temperature (°C): | 24.2 |

REPORT NUMBER: SP1-2408-195-9

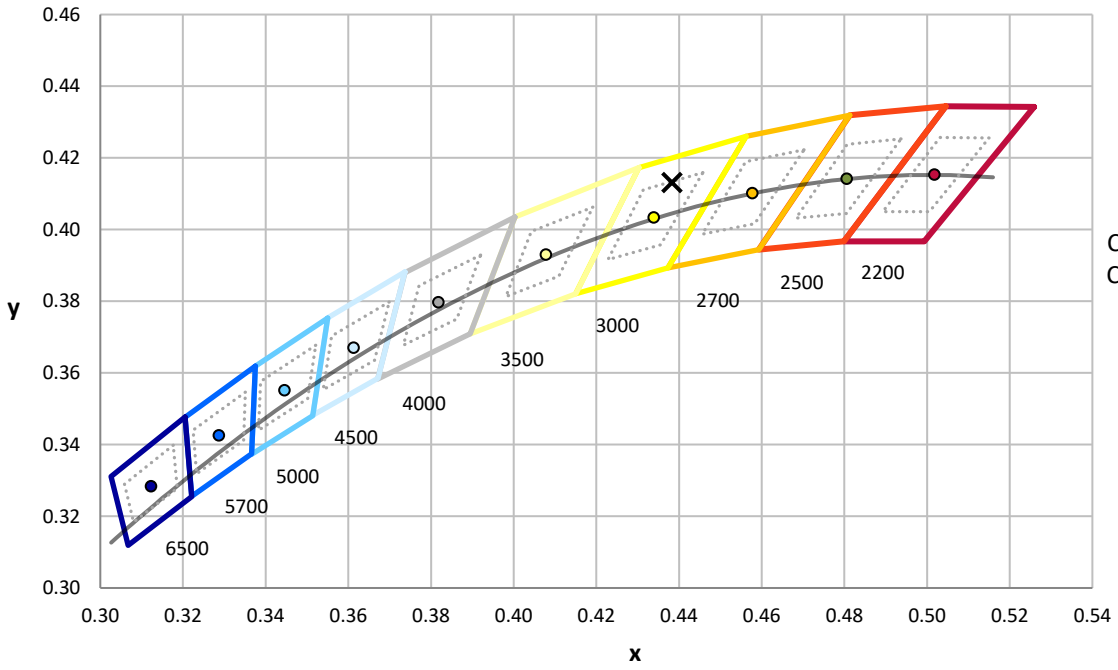
| Measurement and Test Equipment | | | |
|---|---|---|---|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 6/18/2024 | 12/18/2024 |
| Power Meter | INXT2011004 | 2/8/2024 | 2/8/2025 |
| AC Power Source | IN0063 | 10/24/2023 | 10/24/2024 |
| DC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

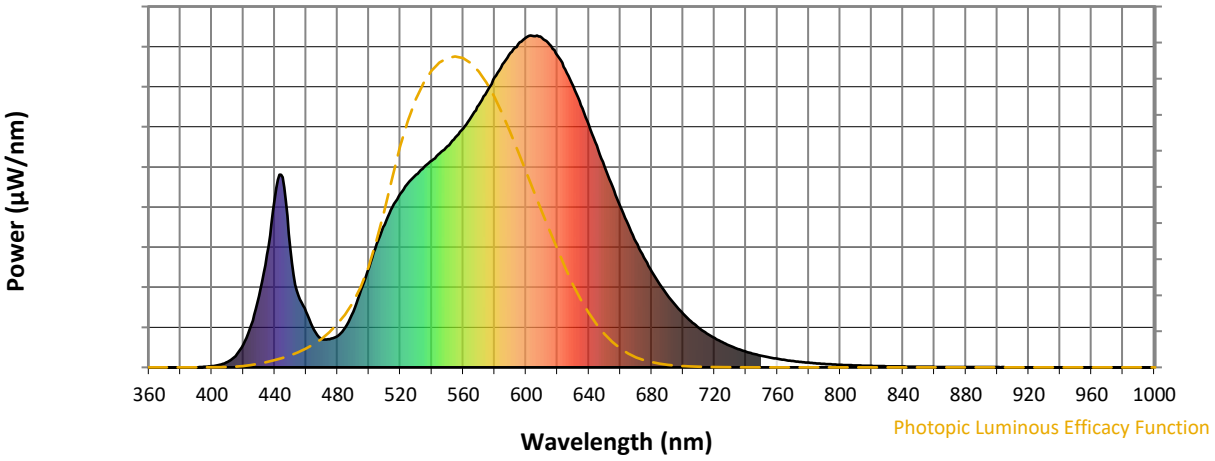



CCT = 3050K
CIE x = 0.4383
CIE y = 0.4131
Duv = 0.0034

Point lies inside the ANSI 3000K 4-step quadrangle

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 | | | |

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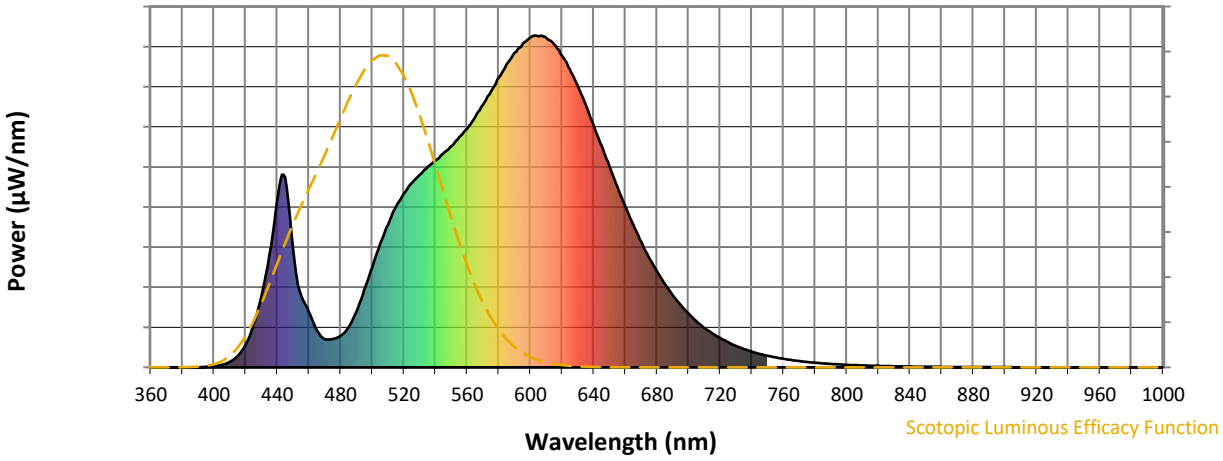
## Scotopic Flux vs. Wavelength




**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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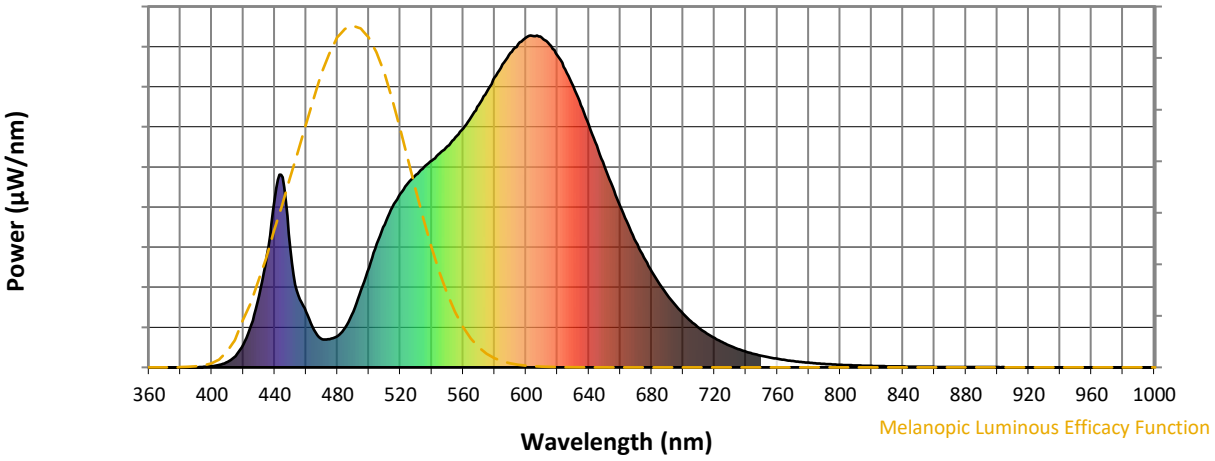
## Melanopic Flux vs. Wavelength




**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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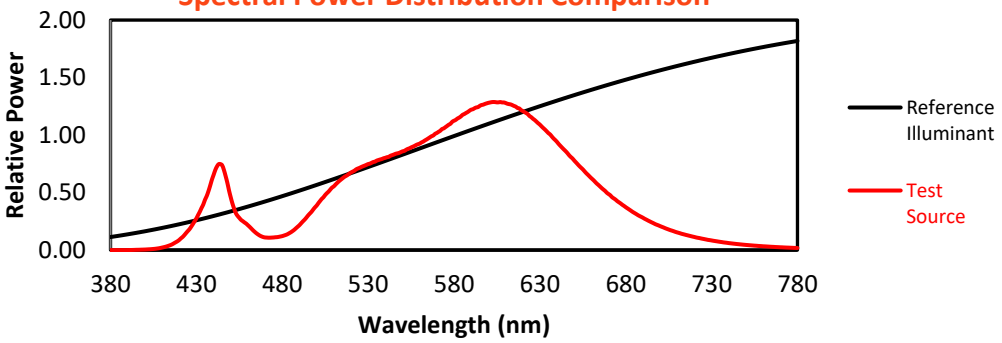
# TM-30-18

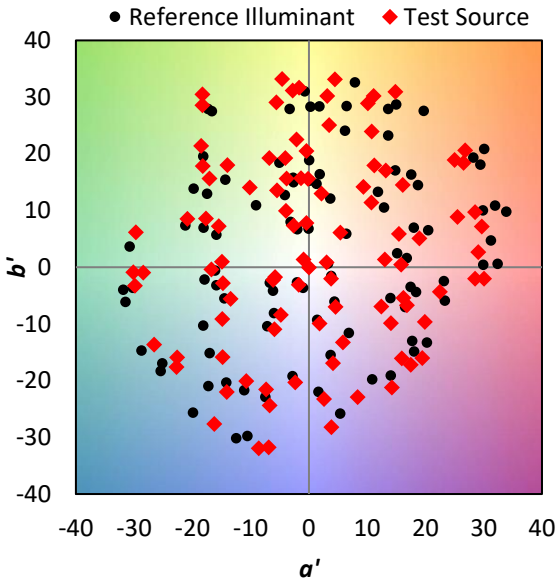
## Summary

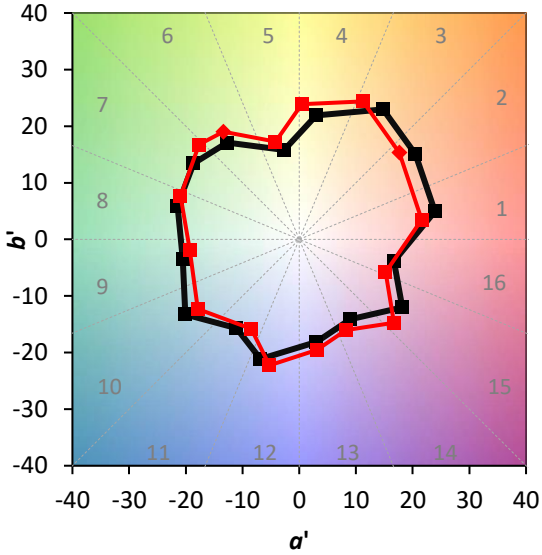
$R_f$ = 81.5
$R_g$ = 99.2
CIE $R_a$ = 81.0
$R_9$ = 7.1

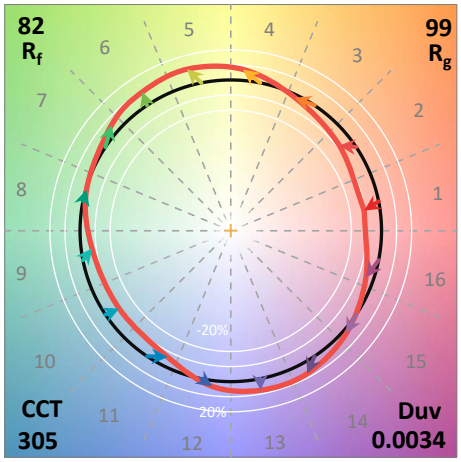
## Spectral Power Distribution Comparison

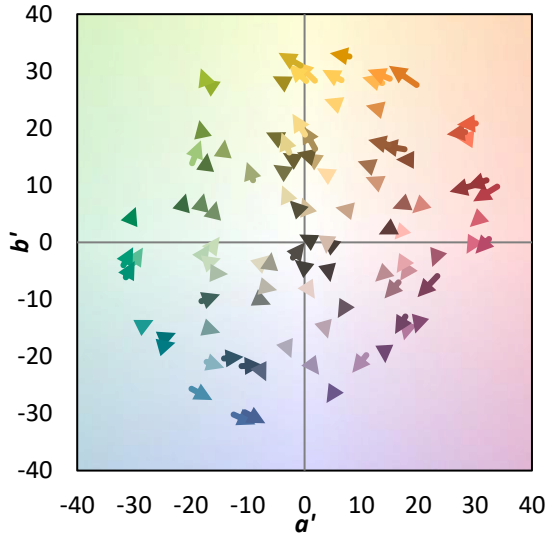



## Color Vector Graphics



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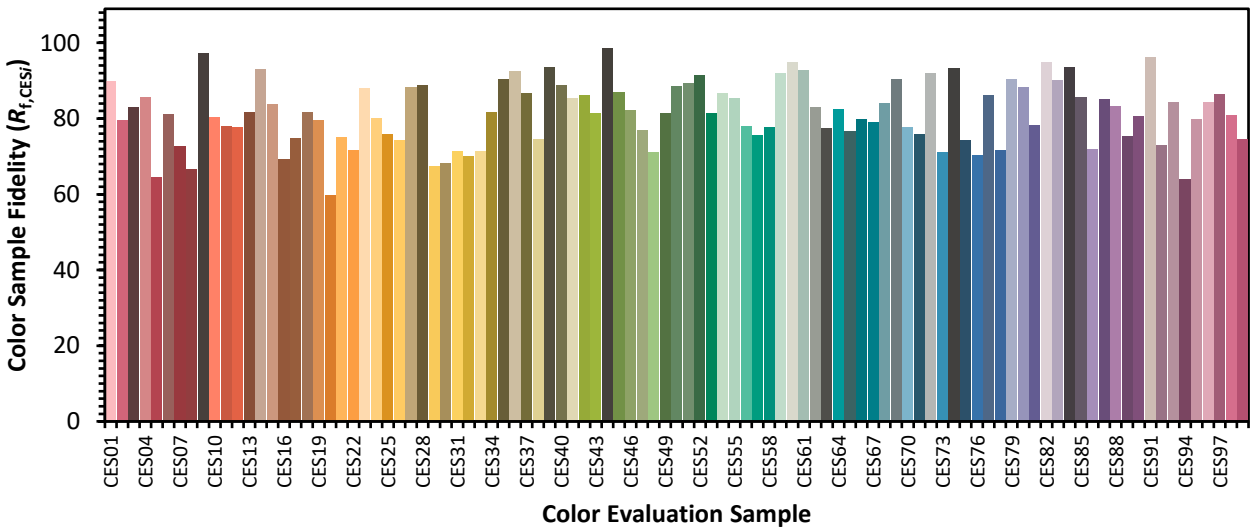
## Individual Sample Fidelity Index ($R_{f,i}$)

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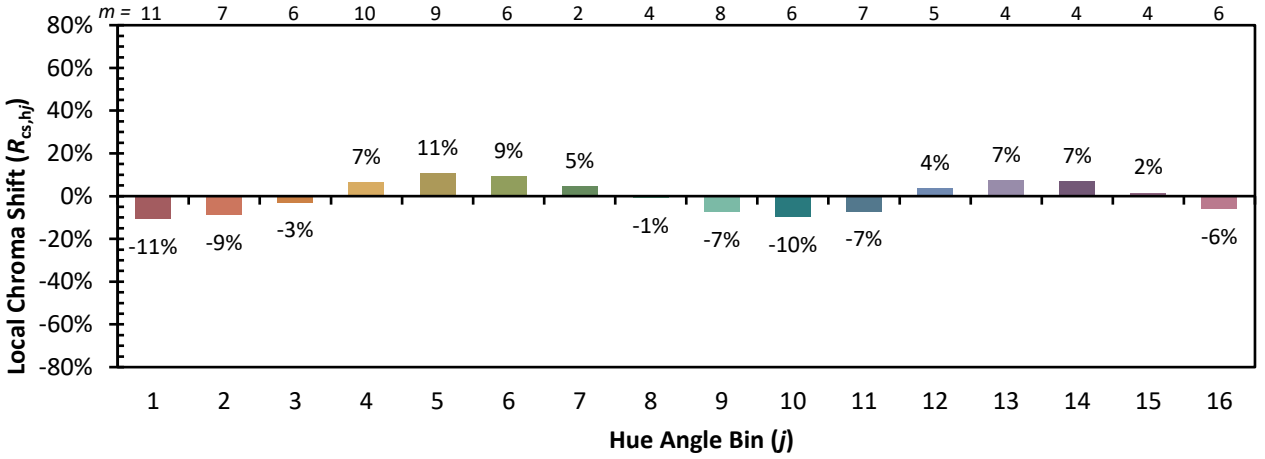
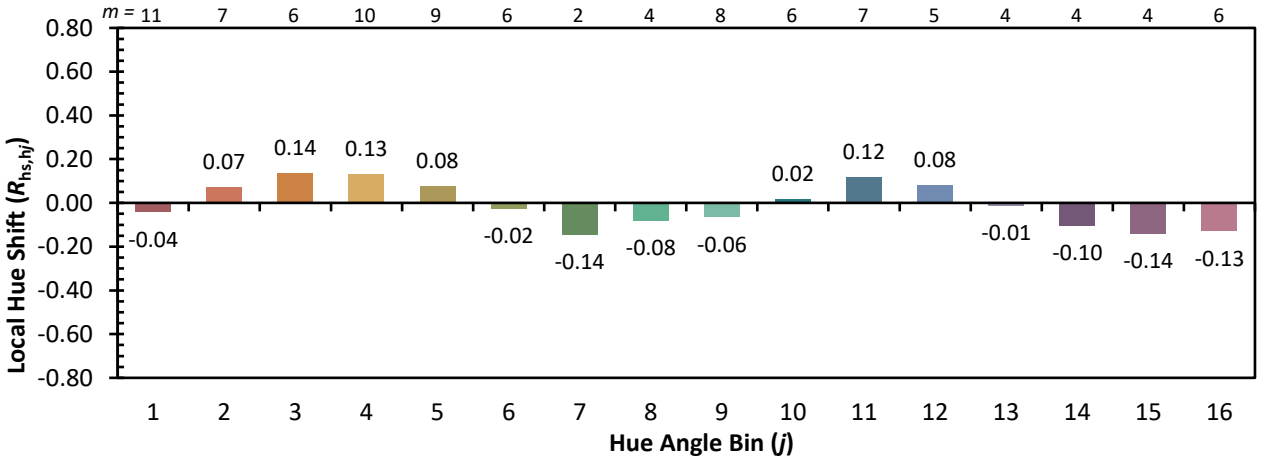
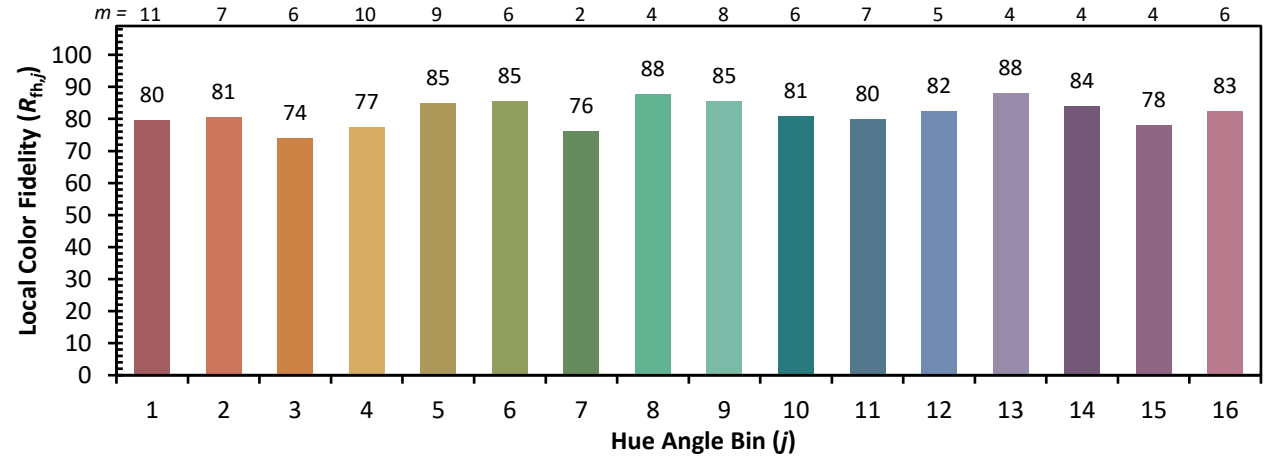
## Color Rendition by Hue-Angle Bin



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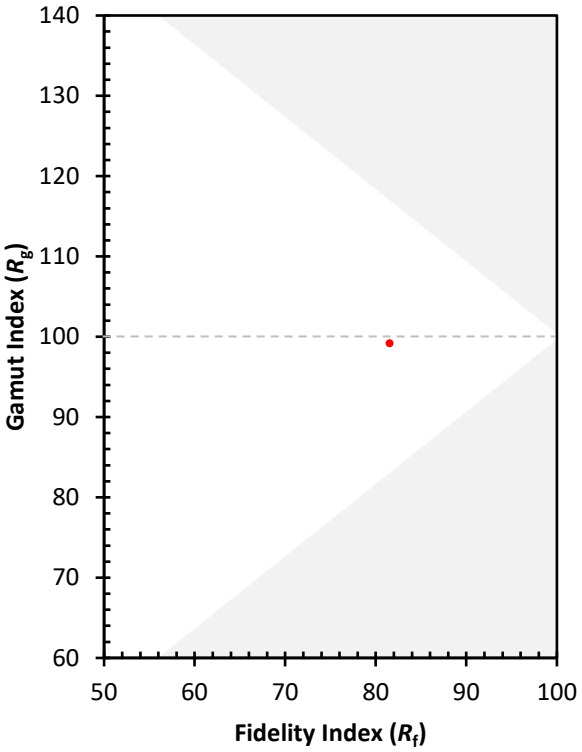
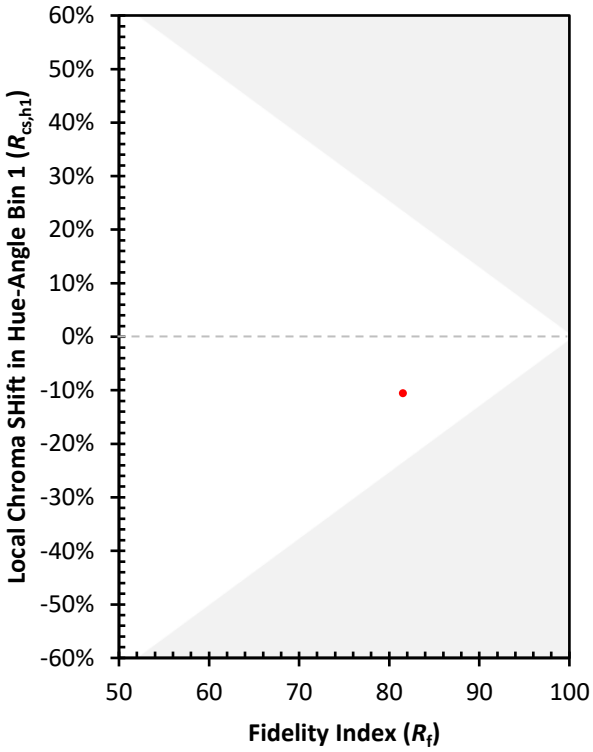
## Measure Comparisons

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