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: P630548

Luminaire Tested: GWS-SA1D-830-U-RW-W

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: | P630548 |
| | TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-49) |
| Test Lab: | COOPER LIGHTING SOLUTIONS |
| Issue Date: | 1/10/2023 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS |
| Product Line: | McGRAW-EDISON |
| Catalog Number: | GWS-SA1D-830-U-RW-W |
| Description: | GALLEON WALL SLIM LUMINAIRE. (1) LIGHTSQUARES WITH 16 LEDS EACH AND RECTANGULAR WIDE OPTICS |
| Light Source: | (16) 3000K CCT, 80 CRI LEDS |
| Ballast/Driver: | - |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 4958.7 lumens |
| Efficiency: | N/A |
| Efficacy: | 111.9 lumens/watt |
| Luminous Opening: | Rectangular (W 0.5' x L: 0.5' x H: 0') |
| IES Classification: | Type III - Short |
| BUG Rating: | B2 - U0 - G2 |

| | |
|---|---|
| Input Watts (W): | 44.3 |
| 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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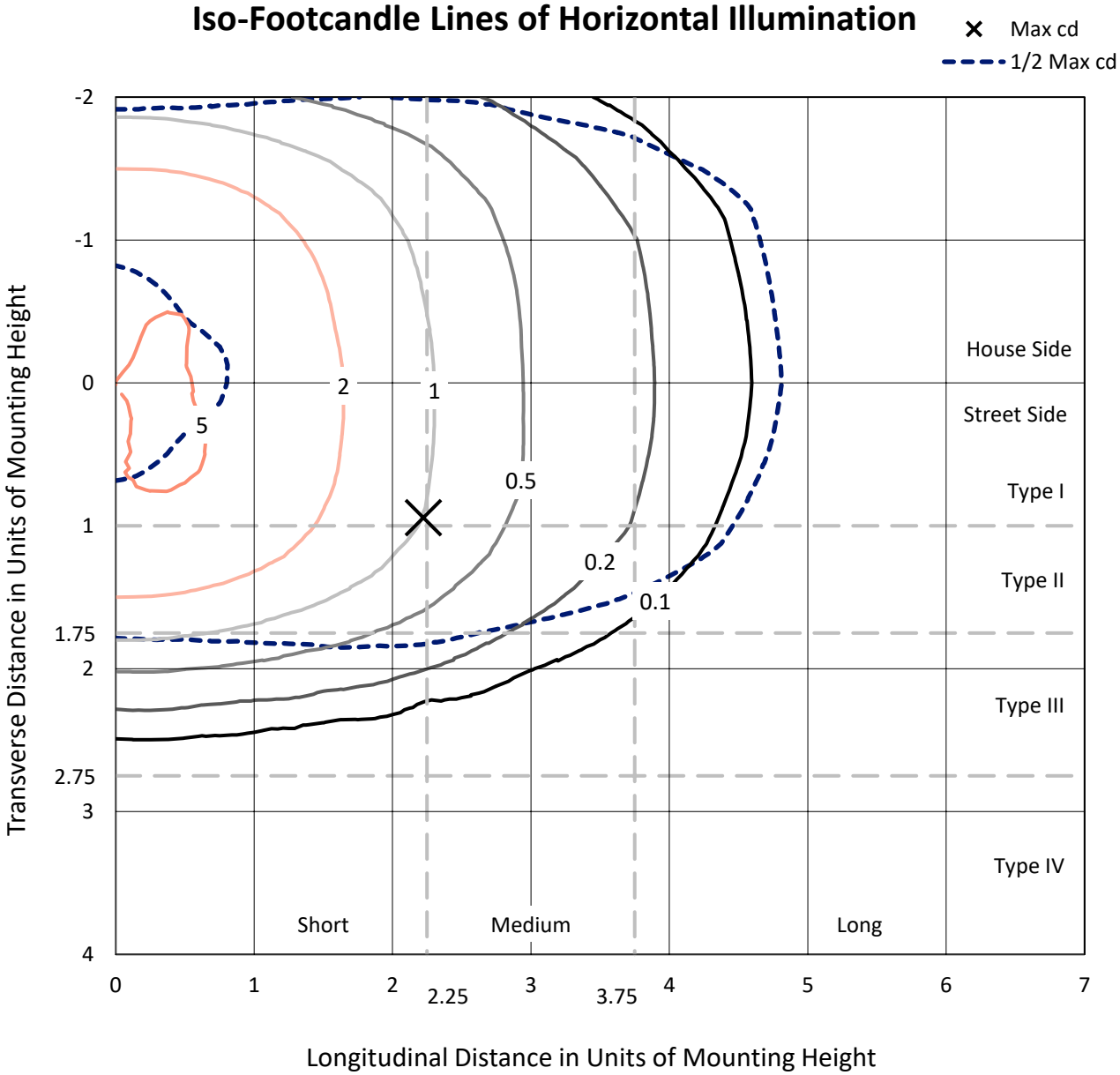
Scaled Data Report

REPORT NUMBER: P630548
CATALOG NUMBER: GWS-SA1D-830-U-RW-W

## Iso-Footcandle Lines of Horizontal Illumination




Based on 10 foot mounting height. Maximum calculated value = 5.8 fc
Type III - Short - N/A

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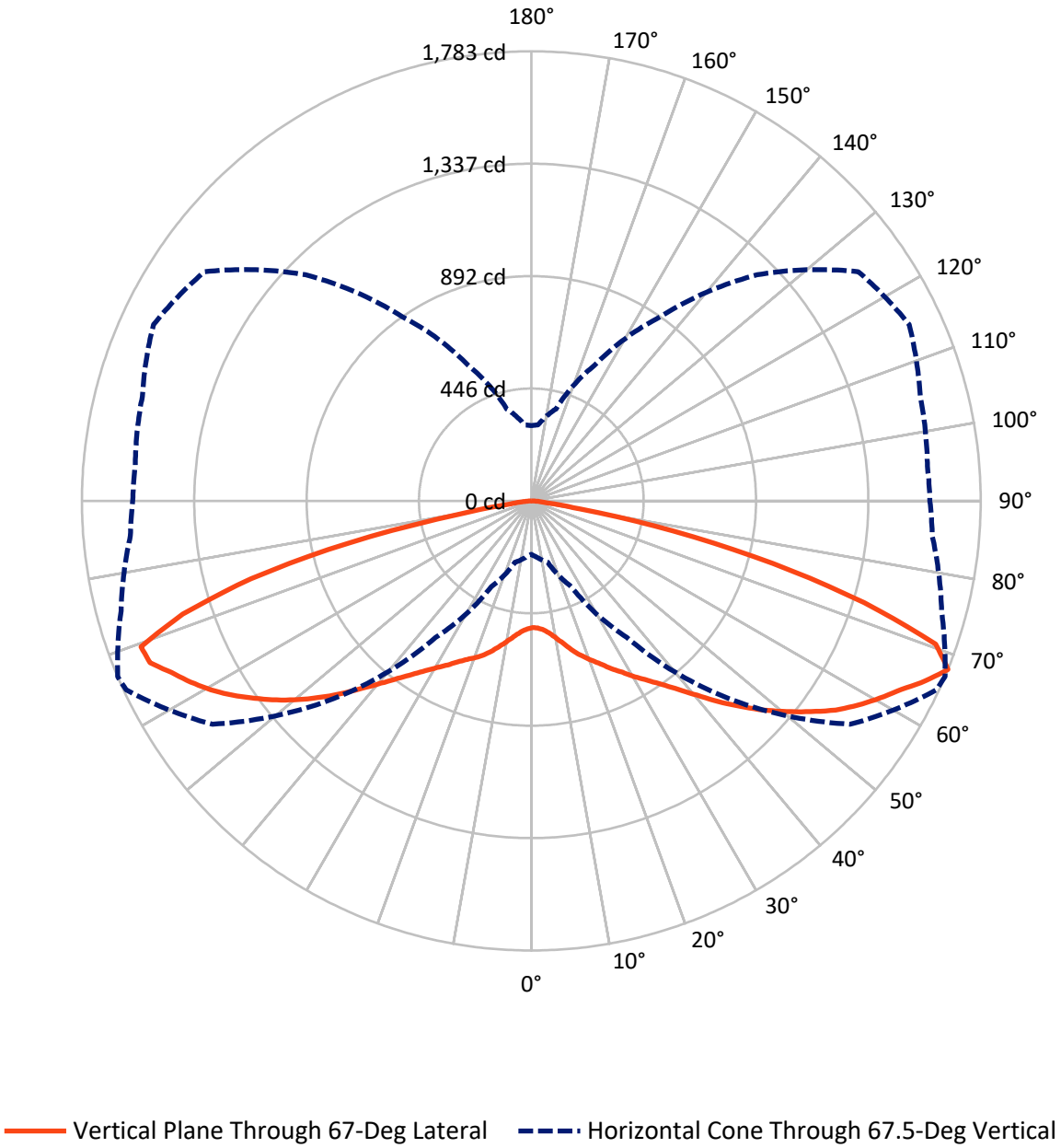
## Luminous Intensity Polar Plot



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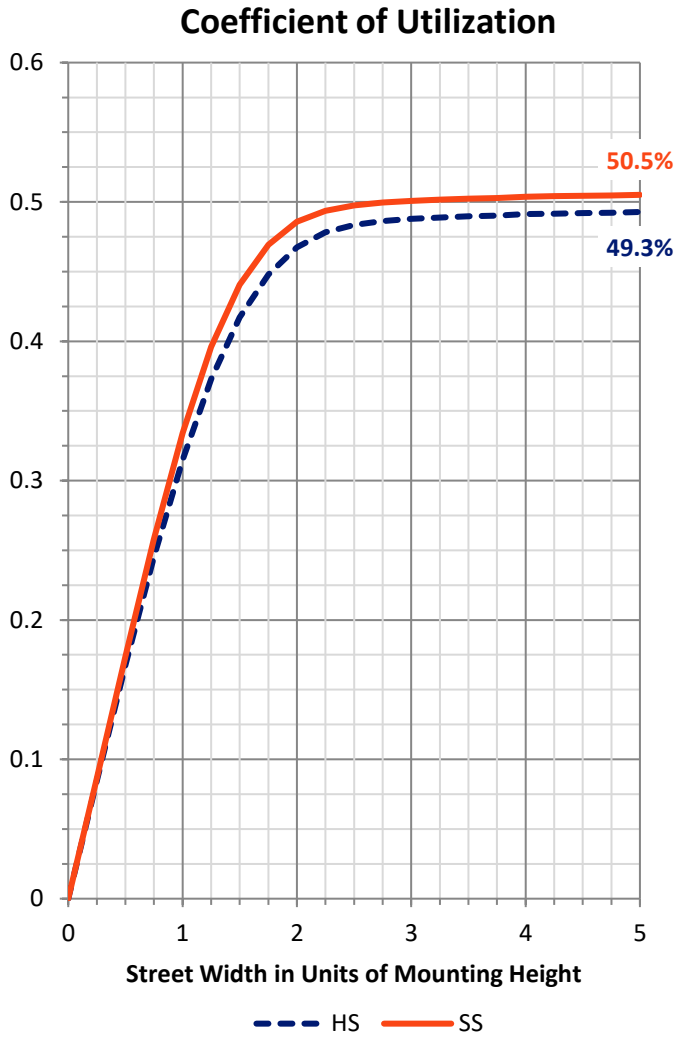
REPORT NUMBER: P630548
CATALOG NUMBER: GWS-SA1D-830-U-RW-W

**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 2452.0 | 0.0 | 2452.0 |
| | % Fixture | 49.4 | 0.0 | 49.4 |
| **Street Side** | Lumens | 2506.7 | 0.0 | 2506.7 |
| | % Fixture | 50.6 | 0.0 | 50.6 |
| **Total** | Lumens | 4958.7 | 0.0 | 4958.7 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 49.3 | 1.0 |
| 10°-20° | 166.4 | 3.4 |
| 20°-30° | 326.5 | 6.6 |
| 30°-40° | 556.3 | 11.2 |
| 40°-50° | 893.3 | 18.0 |
| 50°-60° | 1213.8 | 24.5 |
| 60°-70° | 1161.1 | 23.4 |
| 70°-80° | 552.0 | 11.1 |
| 80°-90° | 40.0 | 0.8 |
| 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° | 4958.7 | 100.0 |
| 0°-180° | 4958.7 | 100.0 |



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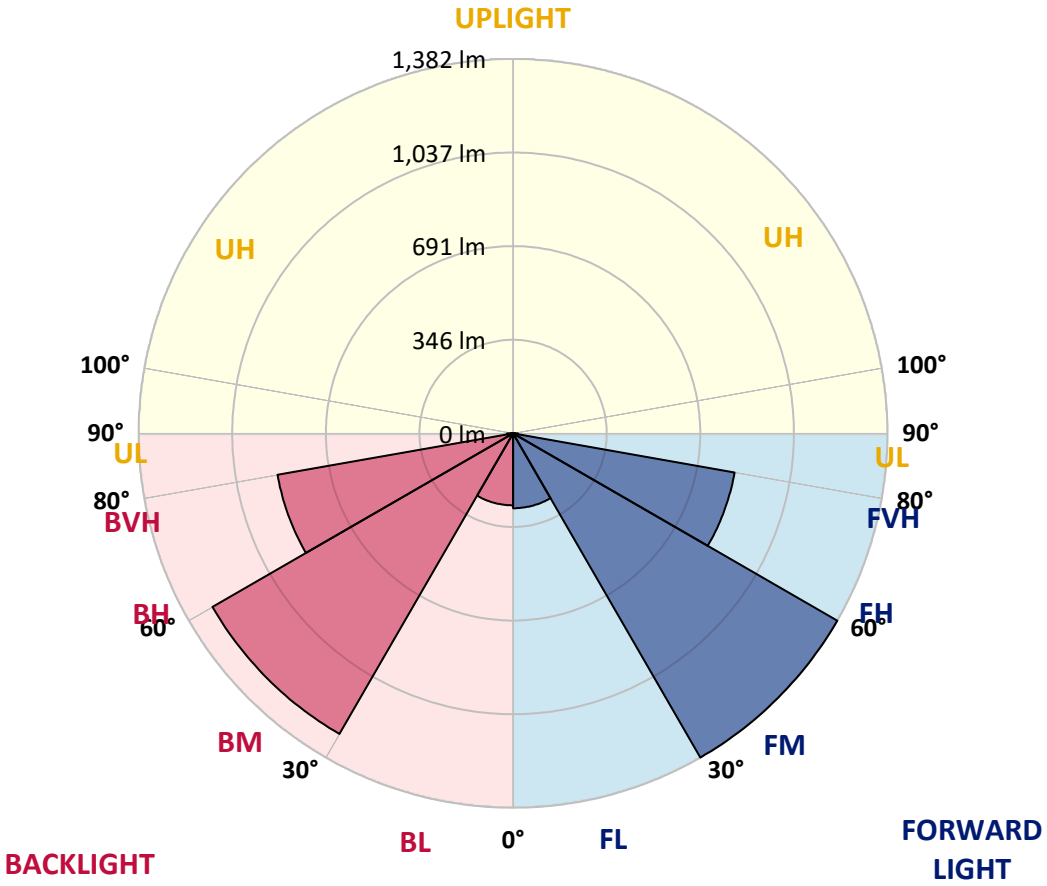
REPORT NUMBER: P630548
CATALOG NUMBER: GWS-SA1D-830-U-RW-W

## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 276.5 | 5.6 | | | |
| FM | (30°-60°) | 1382.0 | 27.9 | | | |
| FH | (60°-80°) | 830.2 | 16.7 | | | G1/1800 |
| FVH | (80°-90°) | 18.0 | 0.4 | | | G1/100 |
| BL | (0°-30°) | 265.7 | 5.4 | B1/500 | | |
| BM | (30°-60°) | 1281.3 | 25.8 | B2/2500 | | |
| BH | (60°-80°) | 882.9 | 17.8 | B2/1000 | | G2/1000 |
| BVH | (80°-90°) | 22.0 | 0.4 | | | G1/100 |
| UL | (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH | (100°-180°) | 0.0 | 0.0 | | U0/0 | |

**BUG Rating: B2-U0-G2**
Type III Short



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REPORT NUMBER: P630548
CATALOG NUMBER: GWS-SA1D-830-U-RW-W

**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 15° | 25° | 35° | 45° | 55° | 65° | 67° | 75° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 502.1 | 502.1 | 502.1 | 502.1 | 502.1 | 502.1 | 502.1 | 502.1 | *502.1* | 502.1 | 502.1 |
| 2.5° | 491.7 | 492.4 | 493.5 | 495.5 | 497.6 | 500.7 | 503.8 | 503.5 | *504.9* | 505.9 | 506.9 |
| 5° | 489.0 | 489.7 | 491.4 | 494.2 | 497.3 | 502.4 | 509.0 | 511.8 | *513.8* | 517.6 | 521.1 |
| 7.5° | 494.8 | 496.2 | 498.6 | 502.4 | 507.3 | 513.8 | 522.8 | 527.6 | *530.8* | 537.7 | 543.5 |
| 10° | 502.8 | 504.5 | 509.3 | 516.6 | 523.9 | 533.9 | 545.3 | 552.5 | *554.6* | 563.6 | 574.6 |
| 12.5° | 510.4 | 512.5 | 520.4 | 533.5 | 546.6 | 560.1 | 573.6 | 582.6 | *583.2* | 595.3 | 607.8 |
| 15° | 522.5 | 524.2 | 534.9 | 551.8 | 571.9 | 590.5 | 607.1 | 613.3 | *616.1* | 624.7 | 640.2 |
| 17.5° | 549.1 | 551.1 | 564.9 | 583.2 | 604.3 | 624.0 | 640.6 | 645.7 | *645.7* | 653.0 | 665.8 |
| 20° | 577.7 | 579.8 | 598.1 | 621.6 | 647.1 | 667.2 | 679.9 | 675.1 | *673.4* | 675.4 | 684.4 |
| 22.5° | 609.8 | 613.6 | 631.2 | 658.5 | 690.0 | 714.5 | 721.0 | 706.5 | *701.7* | 696.9 | 698.9 |
| 25° | 650.9 | 655.4 | 672.7 | 701.7 | 732.4 | 758.3 | 762.1 | 739.7 | *736.9* | 720.0 | 713.8 |
| 27.5° | 698.2 | 701.7 | 723.1 | 751.8 | 780.4 | 802.2 | 806.3 | 778.7 | *769.4* | 745.9 | 731.4 |
| 30° | 759.4 | 762.5 | 781.1 | 809.4 | 834.3 | 849.5 | 854.7 | 816.7 | *809.4* | 773.5 | 751.1 |
| 32.5° | 826.0 | 827.4 | 846.4 | 873.7 | 895.8 | 910.3 | 903.0 | 858.8 | *848.1* | 807.7 | 777.0 |
| 35° | 902.3 | 902.3 | 926.8 | 948.9 | 966.6 | 970.7 | 956.9 | 906.5 | *894.0* | 850.2 | 811.8 |
| 37.5° | 977.3 | 979.3 | 1002.1 | 1028.4 | 1043.9 | 1043.2 | 1018.0 | 962.8 | *948.6* | 900.9 | 858.5 |
| 40° | 1058.4 | 1062.9 | 1085.7 | 1115.0 | 1129.9 | 1127.8 | 1089.1 | 1027.7 | *1013.2* | 956.9 | 915.4 |
| 42.5° | 1133.0 | 1140.2 | 1166.8 | 1196.9 | 1213.1 | 1211.7 | 1171.3 | 1102.3 | *1088.1* | 1024.6 | 983.1 |
| 45° | 1192.4 | 1200.0 | 1233.1 | 1274.9 | 1300.8 | 1298.4 | 1257.7 | 1179.6 | *1162.3* | 1095.7 | 1050.1 |
| 47.5° | 1244.5 | 1252.5 | 1289.4 | 1333.6 | 1374.7 | 1378.9 | 1341.6 | 1257.7 | *1239.4* | 1172.0 | 1120.6 |
| 50° | 1284.6 | 1288.4 | 1329.8 | 1378.2 | 1425.8 | 1449.0 | 1416.5 | 1336.0 | *1313.9* | 1247.3 | 1189.3 |
| 52.5° | 1281.5 | 1286.7 | 1337.8 | 1403.4 | 1467.3 | 1505.3 | 1482.8 | 1409.9 | *1388.5* | 1316.0 | 1259.4 |
| 55° | 1218.3 | 1223.5 | 1284.2 | 1379.9 | 1490.4 | 1546.3 | 1543.9 | 1480.4 | *1464.8* | 1386.1 | 1332.2 |
| 57.5° | 1126.1 | 1137.5 | 1197.9 | 1301.2 | 1460.0 | 1579.2 | 1588.8 | 1544.6 | *1528.4* | 1454.8 | 1404.4 |
| 60° | 961.0 | 976.2 | 1046.0 | 1180.0 | 1362.6 | 1568.1 | 1636.8 | 1598.8 | *1588.8* | 1518.7 | 1469.7 |
| 62.5° | 698.2 | 709.3 | 802.2 | 977.9 | 1218.3 | 1489.4 | 1677.2 | 1654.8 | *1647.2* | 1576.0 | 1528.7 |
| 65° | 418.2 | 443.4 | 518.0 | 691.7 | 982.8 | 1340.9 | 1655.1 | 1728.0 | *1720.0* | 1635.1 | 1579.2 |
| 67.5° | *211.7* | *223.1* | *252.4* | *375.0* | *660.9* | *1109.5* | *1544.3* | *1773.6* | *1783.2* | *1685.5* | *1597.1* |
| 70° | 131.2 | 134.3 | 142.6 | 185.1 | 330.1 | 729.0 | 1262.8 | 1654.8 | *1702.1* | 1677.6 | 1550.5 |
| 72.5° | 105.3 | 106.0 | 107.4 | 115.3 | 158.5 | 340.8 | 798.4 | 1296.0 | *1381.3* | 1566.7 | 1483.8 |
| 75° | 87.4 | 87.7 | 88.1 | 90.5 | 98.8 | 139.2 | 388.5 | 890.6 | *990.4* | 1331.6 | 1375.8 |
| 77.5° | 70.1 | 68.4 | 69.8 | 70.8 | 72.9 | 77.7 | 134.0 | 475.2 | *576.3* | 874.0 | 1063.9 |
| 80° | 45.6 | 44.9 | 47.7 | 48.7 | 50.8 | 53.9 | 71.5 | 161.3 | *195.8* | 318.0 | 338.4 |
| 82.5° | 24.5 | 23.1 | 29.0 | 28.0 | 29.0 | 31.4 | 42.1 | 59.0 | *66.3* | 96.0 | 81.2 |
| 85° | 7.6 | 7.6 | 7.9 | 9.3 | 11.4 | 11.1 | 18.3 | 29.0 | *32.1* | 41.1 | 30.4 |
| 87.5° | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 1.7 | 3.8 | 5.9 | *7.9* | 14.2 | 10.7 |
| 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: P630548
CATALOG NUMBER: GWS-SA1D-830-U-RW-W

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 502.1 | 502.1 | 502.1 | 502.1 | 502.1 | 502.1 | 502.1 | 502.1 | 502.1 | 502.1 | 502.1 |
| 2.5° | 509.0 | 505.9 | 507.6 | 508.7 | 508.3 | 507.6 | 504.2 | 503.5 | 501.8 | 499.0 | 498.3 |
| 5° | 524.2 | 520.7 | 521.1 | 520.1 | 516.6 | 512.1 | 504.5 | 500.7 | 497.6 | 494.2 | 493.8 |
| 7.5° | 548.0 | 544.2 | 543.2 | 538.4 | 528.7 | 518.3 | 506.2 | 499.3 | 494.2 | 489.7 | 489.0 |
| 10° | 578.4 | 574.6 | 571.2 | 559.8 | 543.9 | 530.1 | 514.2 | 504.2 | 496.6 | 491.0 | 490.0 |
| 12.5° | 612.3 | 609.1 | 600.5 | 583.9 | 564.9 | 548.7 | 532.5 | 520.1 | 509.0 | 500.7 | 499.7 |
| 15° | 649.9 | 643.0 | 629.9 | 608.5 | 590.5 | 577.4 | 557.7 | 540.8 | 523.2 | 512.1 | 509.7 |
| 17.5° | 676.1 | 670.3 | 654.7 | 634.0 | 619.9 | 608.5 | 585.3 | 561.1 | 537.3 | 521.1 | 517.6 |
| 20° | 694.8 | 688.6 | 671.0 | 655.8 | 651.3 | 641.6 | 614.7 | 586.7 | 559.1 | 539.0 | 534.6 |
| 22.5° | 708.3 | 701.7 | 683.7 | 676.1 | 682.4 | 680.6 | 654.4 | 622.6 | 589.8 | 566.0 | 560.5 |
| 25° | 721.0 | 714.8 | 698.9 | 701.7 | 718.3 | 723.4 | 695.1 | 658.2 | 620.9 | 592.9 | 586.4 |
| 27.5° | 733.1 | 725.2 | 717.9 | 733.1 | 756.6 | 766.3 | 736.2 | 694.4 | 654.0 | 625.4 | 620.2 |
| 30° | 751.8 | 742.4 | 741.4 | 763.5 | 800.8 | 809.1 | 775.9 | 734.2 | 694.1 | 665.1 | 658.5 |
| 32.5° | 775.2 | 766.6 | 767.3 | 800.5 | 843.6 | 850.5 | 822.2 | 783.2 | 743.1 | 714.1 | 705.1 |
| 35° | 807.0 | 796.3 | 802.2 | 842.9 | 886.4 | 899.2 | 876.4 | 844.0 | 804.9 | 775.2 | 765.2 |
| 37.5° | 850.9 | 835.3 | 847.4 | 890.2 | 934.1 | 953.1 | 935.5 | 911.3 | 872.6 | 842.6 | 833.3 |
| 40° | 906.8 | 894.0 | 898.9 | 946.2 | 991.4 | 1014.2 | 1003.2 | 979.3 | 941.0 | 909.6 | 898.9 |
| 42.5° | 973.1 | 960.3 | 958.6 | 1009.0 | 1054.3 | 1088.8 | 1078.1 | 1056.3 | 1016.6 | 980.7 | 970.4 |
| 45° | 1038.0 | 1026.3 | 1028.7 | 1080.2 | 1130.9 | 1168.6 | 1157.9 | 1132.3 | 1089.1 | 1047.7 | 1039.4 |
| 47.5° | 1105.7 | 1096.0 | 1098.1 | 1152.7 | 1208.6 | 1246.3 | 1232.8 | 1201.7 | 1151.3 | 1107.1 | 1097.1 |
| 50° | 1175.1 | 1164.1 | 1167.2 | 1224.5 | 1284.9 | 1320.5 | 1299.8 | 1253.9 | 1198.3 | 1155.1 | 1146.5 |
| 52.5° | 1244.2 | 1231.1 | 1239.0 | 1293.2 | 1355.7 | 1384.0 | 1345.7 | 1290.1 | 1236.2 | 1193.4 | 1183.8 |
| 55° | 1323.6 | 1309.8 | 1301.2 | 1359.2 | 1421.0 | 1432.7 | 1380.2 | 1315.3 | 1251.4 | 1202.8 | 1196.9 |
| 57.5° | 1396.1 | 1384.4 | 1368.2 | 1426.2 | 1471.8 | 1463.1 | 1406.8 | 1308.4 | 1214.5 | 1152.0 | 1143.7 |
| 60° | 1461.1 | 1451.0 | 1436.9 | 1486.3 | 1507.0 | 1487.6 | 1385.4 | 1226.6 | 1123.3 | 1058.1 | 1054.3 |
| 62.5° | 1520.8 | 1510.1 | 1497.0 | 1539.1 | 1536.3 | 1491.4 | 1288.0 | 1100.9 | 962.8 | 892.7 | 886.4 |
| 65° | 1568.1 | 1558.4 | 1554.6 | 1587.8 | 1583.3 | 1417.2 | 1136.4 | 895.1 | 703.4 | 624.3 | 621.9 |
| 67.5° | *1581.6* | *1577.8* | *1598.1* | *1654.4* | *1584.3* | *1268.0* | *891.3* | *593.6* | *377.8* | *302.8* | *298.4* |
| 70° | 1531.2 | 1530.8 | 1589.2 | 1669.6 | 1440.7 | 968.6 | 525.9 | 267.6 | 189.9 | 168.5 | 165.8 |
| 72.5° | 1465.5 | 1464.5 | 1510.8 | 1440.3 | 1068.4 | 530.1 | 221.4 | 143.3 | 118.8 | 112.9 | 112.9 |
| 75° | 1357.8 | 1355.0 | 1389.9 | 1095.7 | 600.9 | 199.6 | 117.4 | 98.4 | 93.2 | 92.2 | 92.2 |
| 77.5° | 1106.8 | 1083.6 | 1028.7 | 677.2 | 209.6 | 98.1 | 77.7 | 77.4 | 74.2 | 73.9 | 73.9 |
| 80° | 364.0 | 364.0 | 423.0 | 258.3 | 92.5 | 60.4 | 54.9 | 57.7 | 54.6 | 52.5 | 52.1 |
| 82.5° | 59.4 | 81.8 | 116.4 | 73.9 | 50.1 | 37.6 | 33.8 | 35.9 | 37.6 | 30.0 | 30.0 |
| 85° | 23.5 | 30.7 | 44.9 | 34.5 | 23.1 | 15.2 | 16.2 | 18.0 | 15.9 | 13.8 | 13.5 |
| 87.5° | 9.0 | 11.1 | 15.9 | 8.3 | 4.8 | 2.8 | 1.7 | 1.7 | 1.4 | 1.4 | 1.4 |
| 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

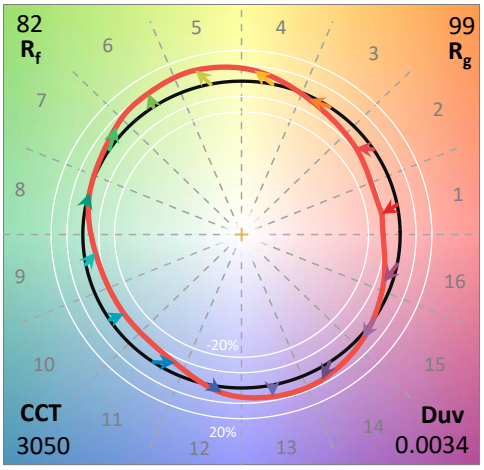
## Test Information

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

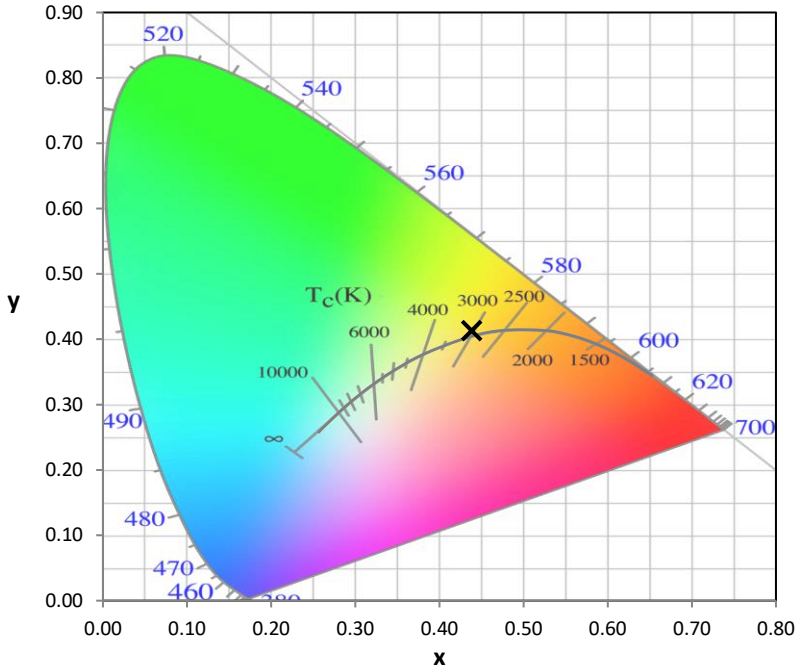
| | |
|---|---|
| Stabilization Time: | 20M |
| Operation Time: | 1H 20M |
| Sphere Temperature (°C): | 24.2 |

REPORT NUMBER: SP1-2408-195-9

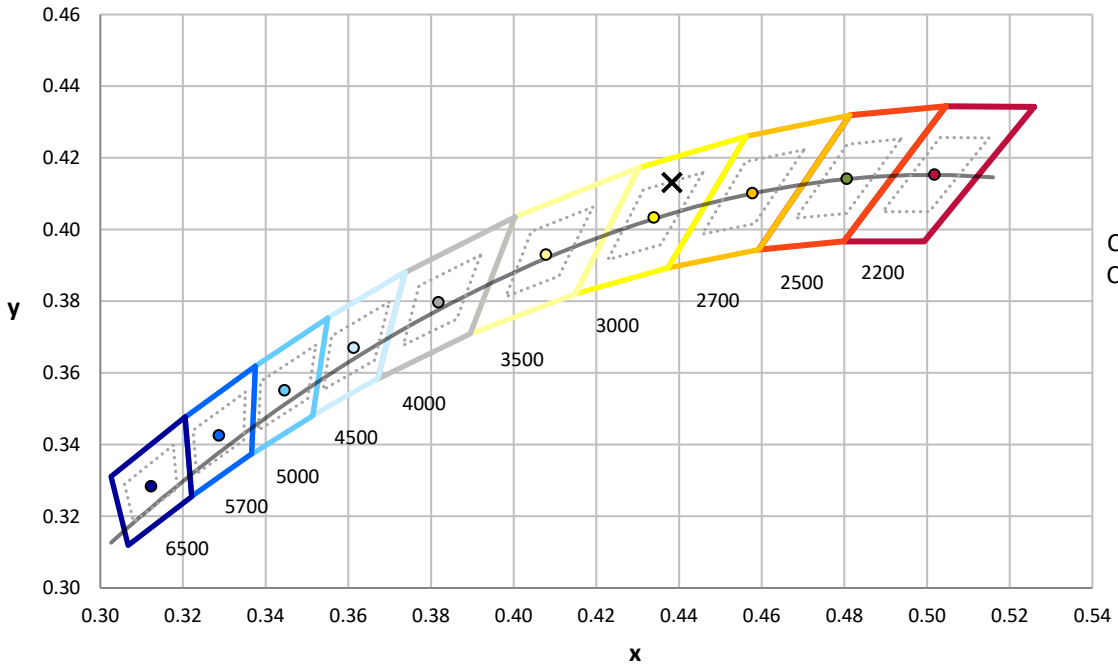
| Measurement and Test Equipment | | | |
|---|---|---|---|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 6/18/2024 | 12/18/2024 |
| Power Meter | INXT2011004 | 2/8/2024 | 2/8/2025 |
| AC Power Source | IN0063 | 10/24/2023 | 10/24/2024 |
| DC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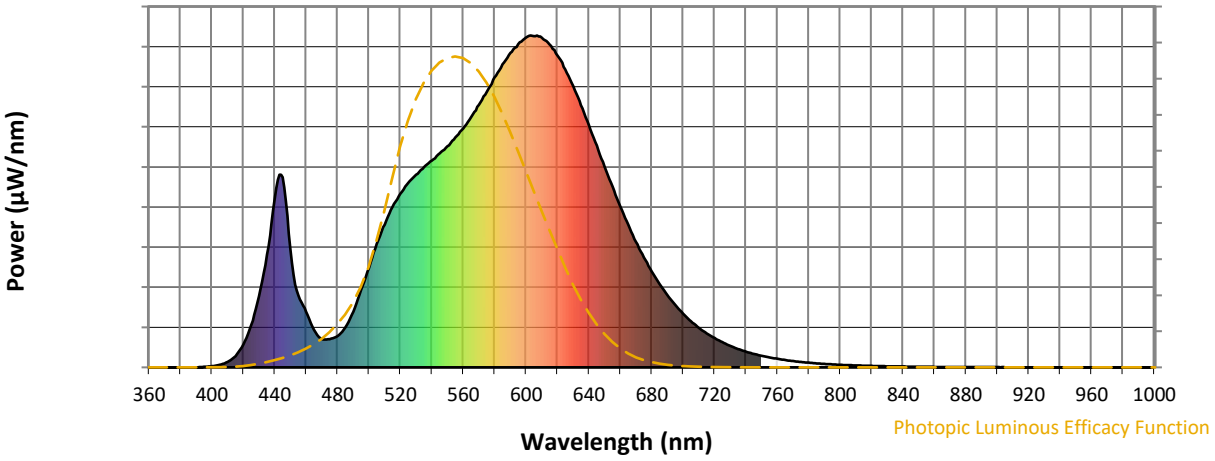
## Photopic Flux vs. Wavelength




## 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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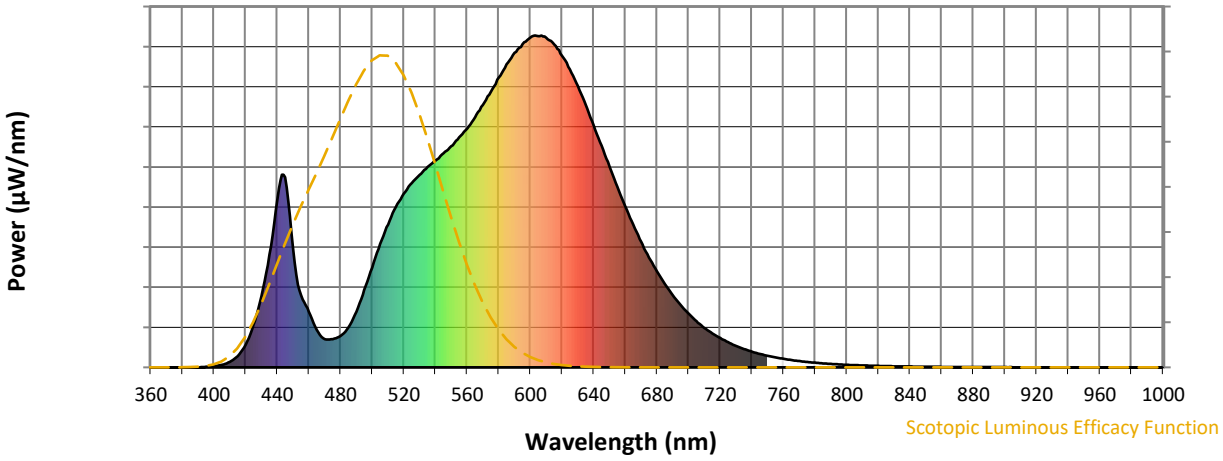
## Scotopic Flux vs. Wavelength




**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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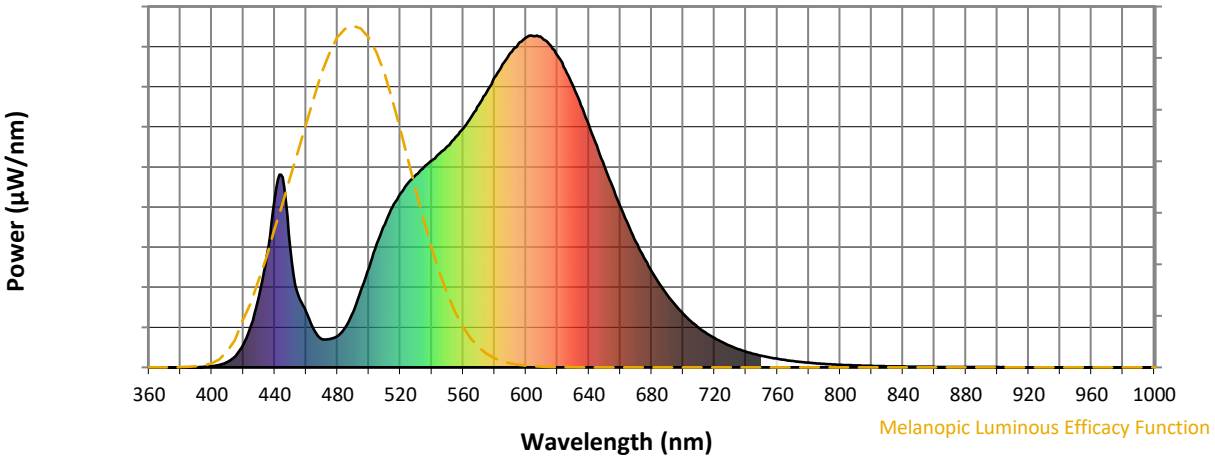
## Melanopic Flux vs. Wavelength




**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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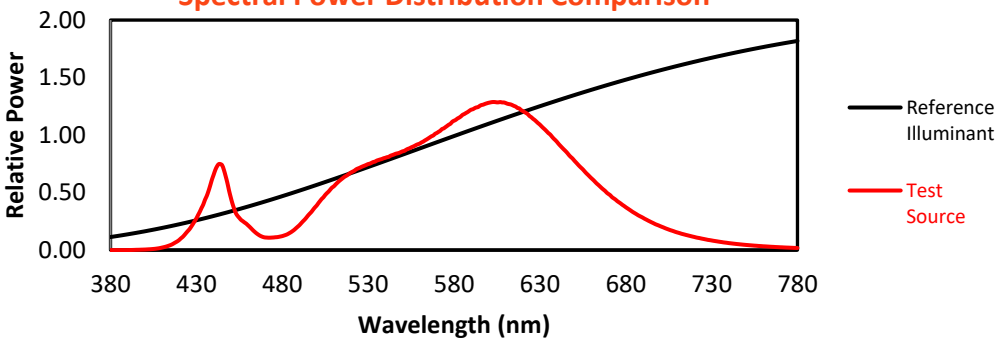
# TM-30-18

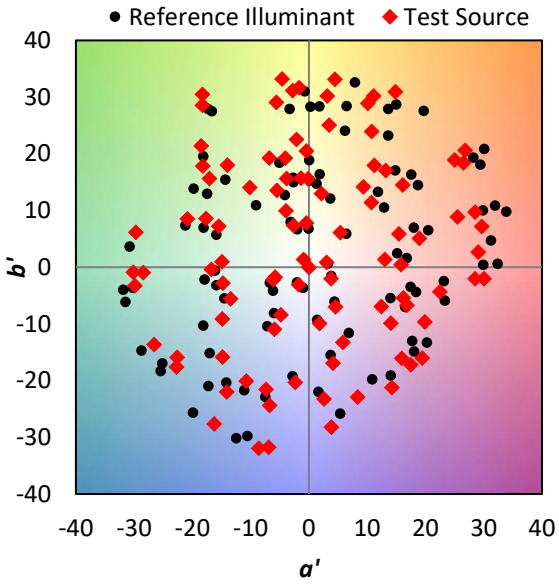
## Summary

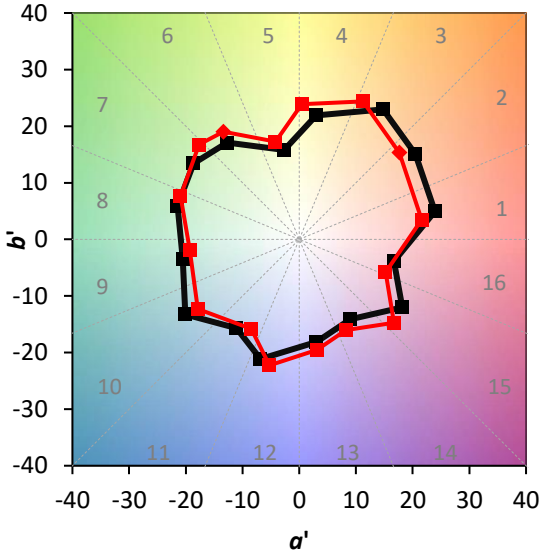
$R_f$ = 81.5
$R_g$ = 99.2
CIE $R_a$ = 81.0
$R_9$ = 7.1

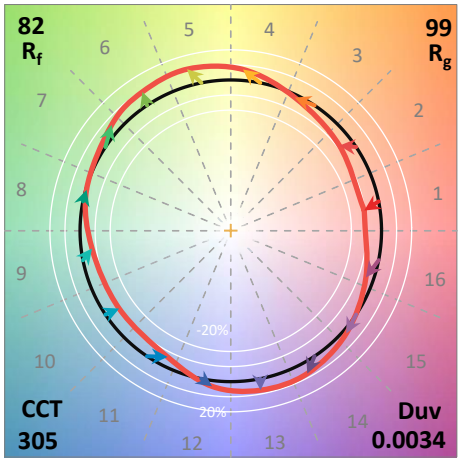
## Spectral Power Distribution Comparison

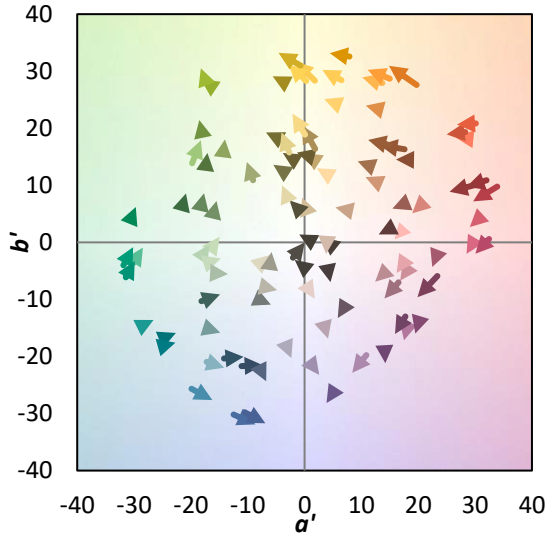



## Color Vector Graphics



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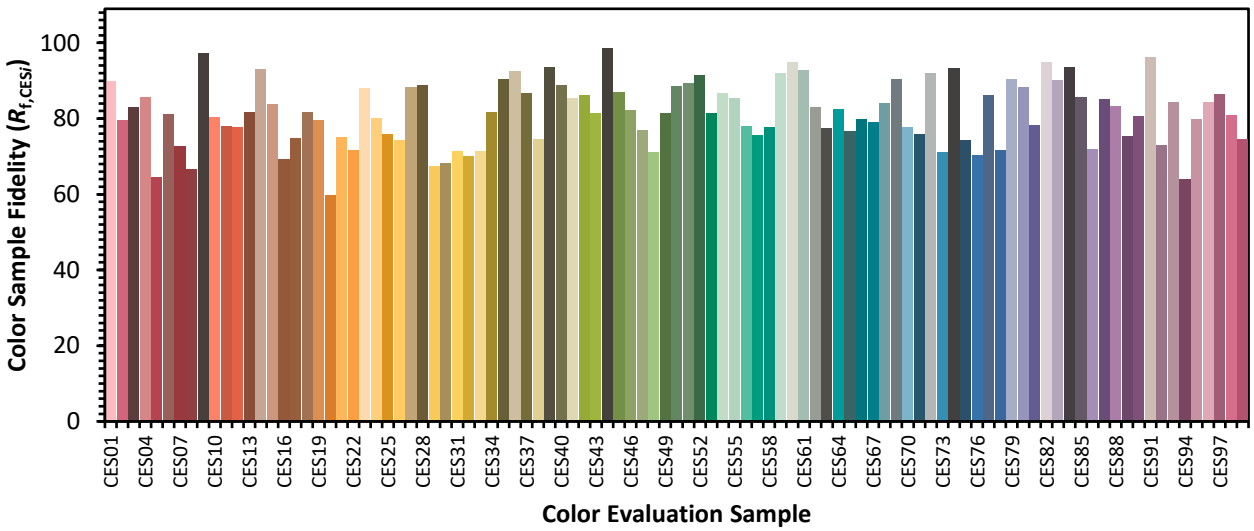
## Individual Sample Fidelity Index ($R_{f,i}$)

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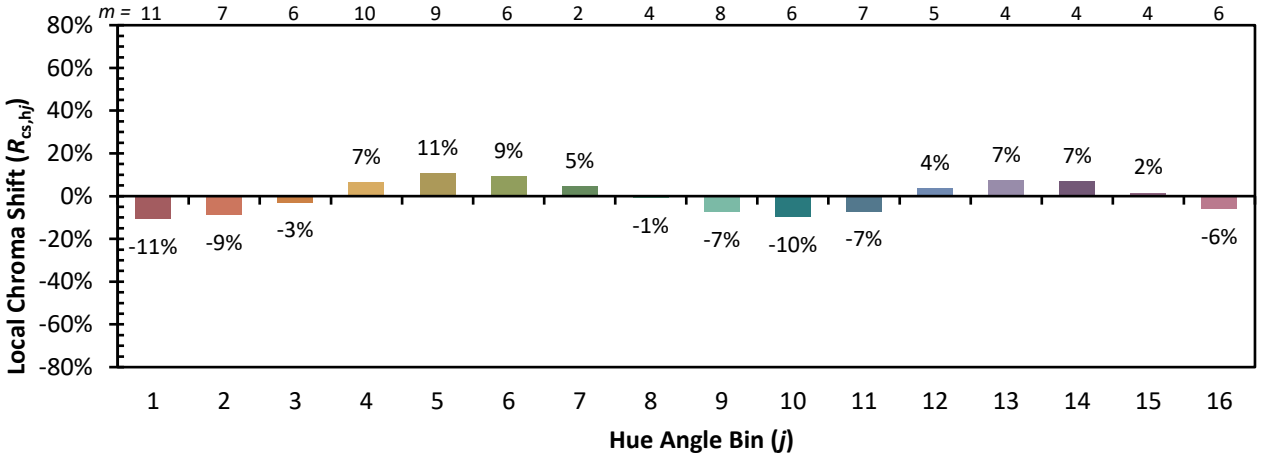
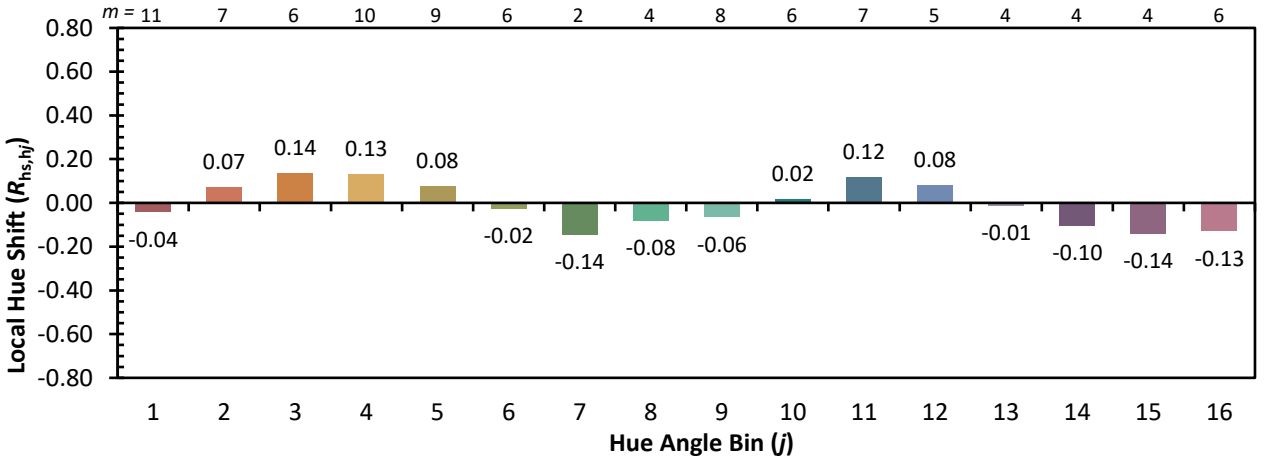
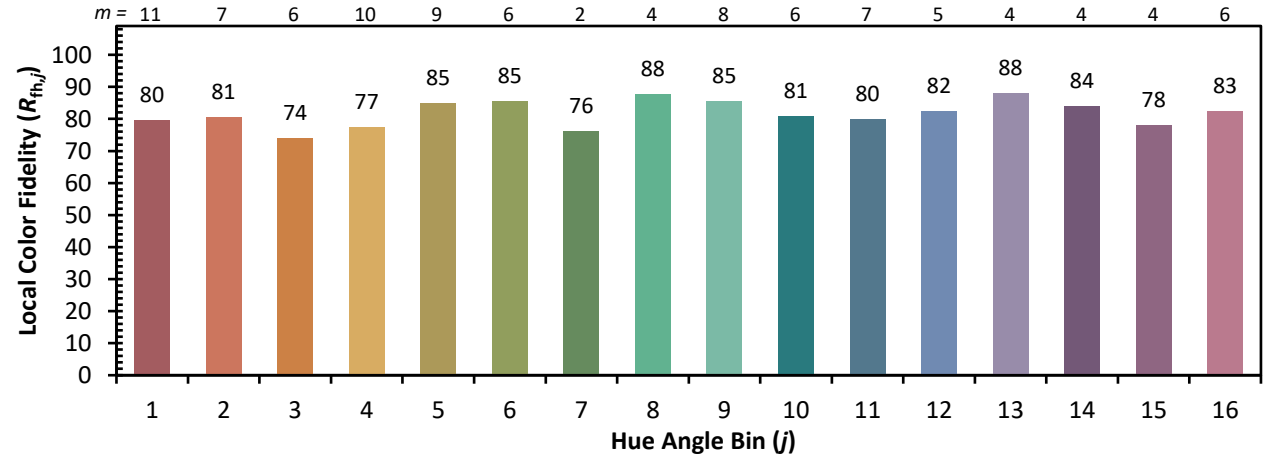
## Color Rendition by Hue-Angle Bin



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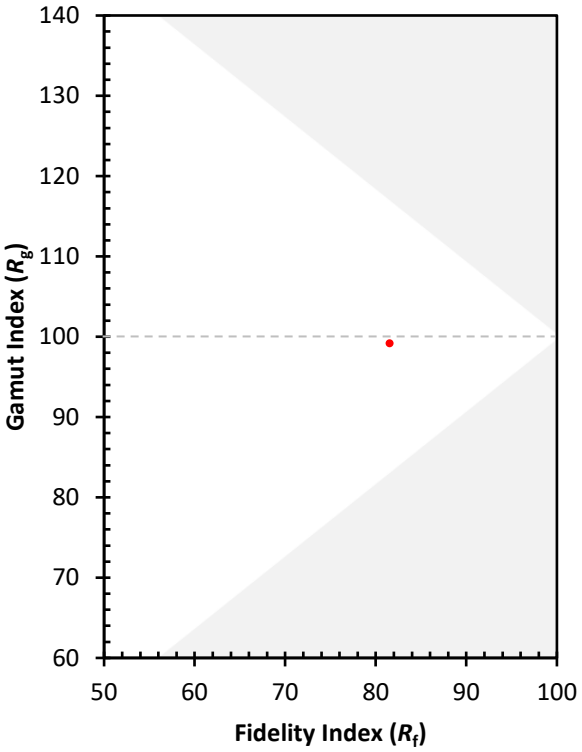
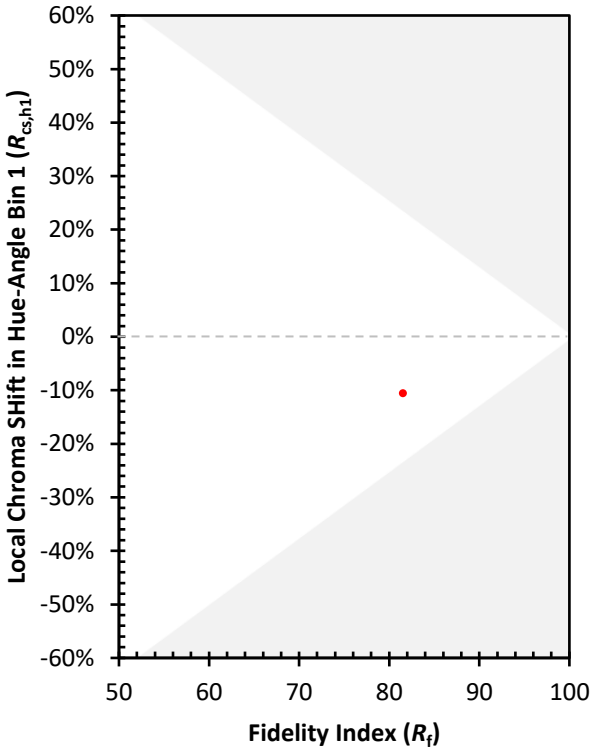
## Measure Comparisons

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