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: P318225

Luminaire Tested: **GLEON-SA1A-830-U-T2**

Issue Date: 3/3/2020

Report Generated By E0585644

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: | P318225 |
| | TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-12) |
| Test Lab: | INNOVATION CENTER |
| Issue Date: | 3/3/2020 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS (FORMERLY EATON) |
| Product Line: | McGRAW-EDISON |
| Catalog Number: | GLEON-SA1A-830-U-T2 |
| Description: | GALLEON AREA AND ROADWAY LUMINAIRE |
| | (1) 80 CRI, 3000K, 615mA LIGHTSQUARE WITH 16 LEDS AND TYPE II OPTICS |
| Light Source: | - |
| Ballast/Driver: | ELECTRONIC DRIVER |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 3804 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 - Medium |
| BUG Rating: | B1 - U0 - G1 |

| | |
|---|---|
| Input Watts (W): | 34 |
| 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: | 24 FT |

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REPORT NUMBER: P318225
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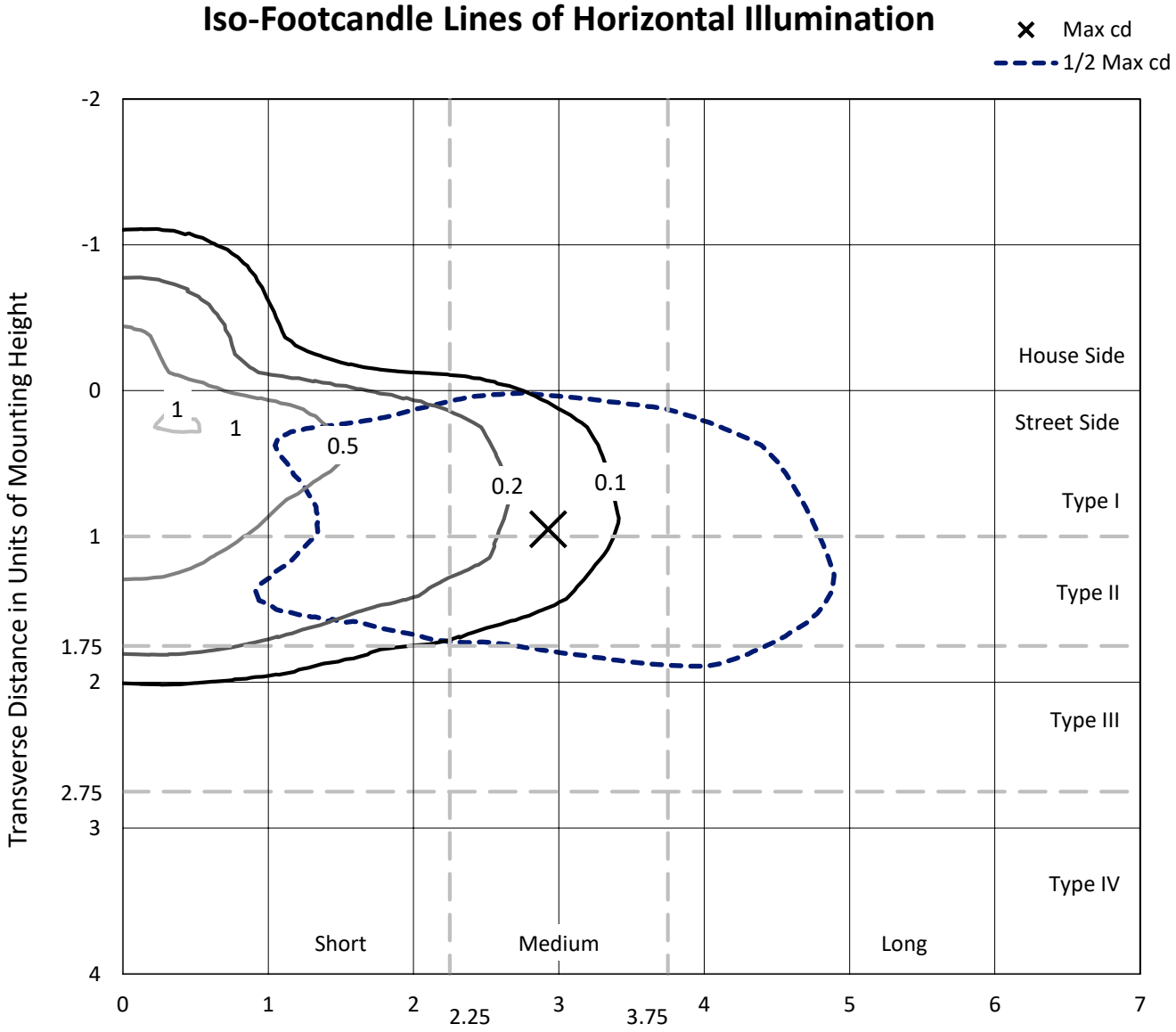
## Iso-Footcandle Lines of Horizontal Illumination




Based on 25 foot mounting height. Maximum calculated value = 1 fc
Type III - Medium - N/A

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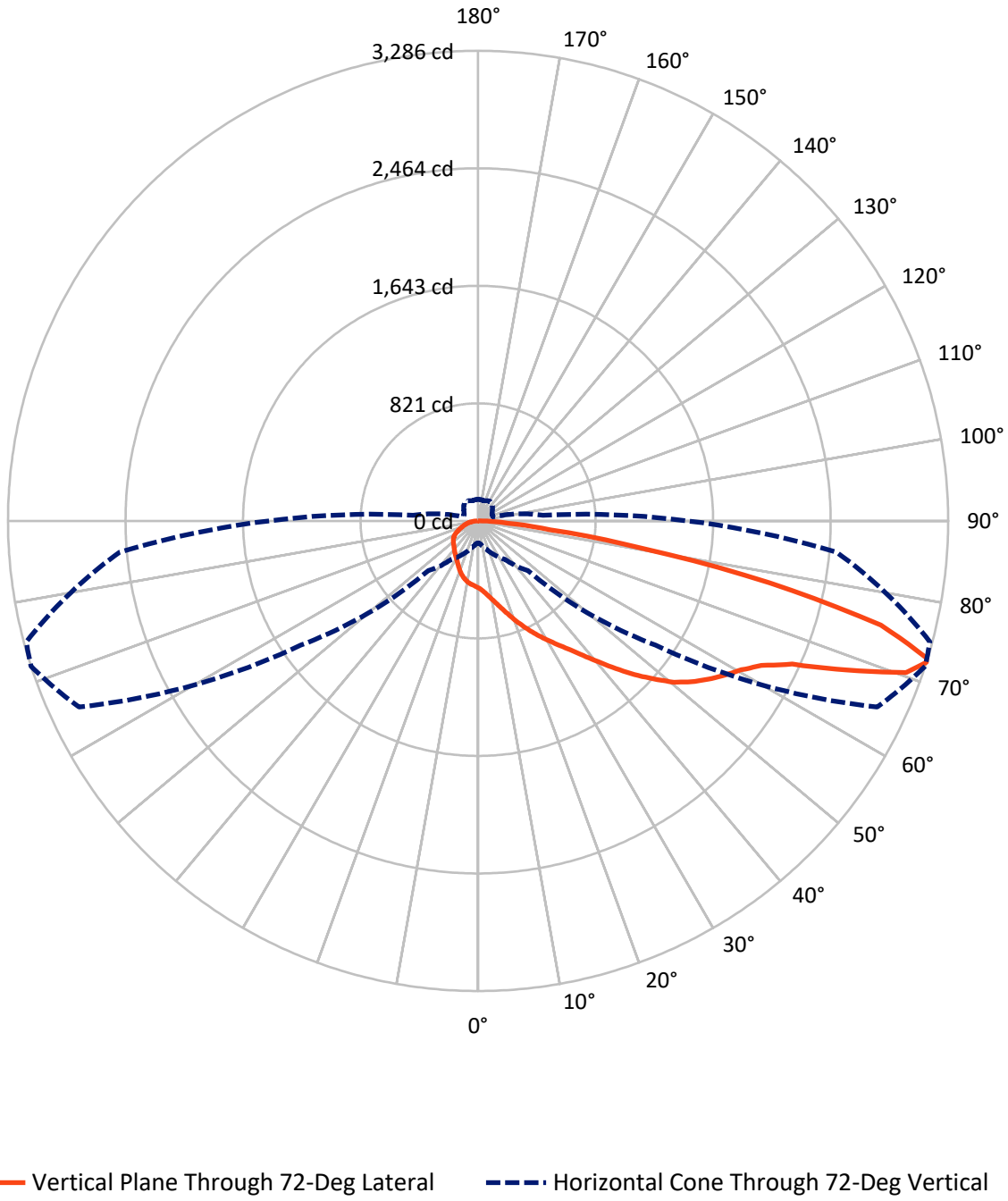
## Luminous Intensity Polar Plot



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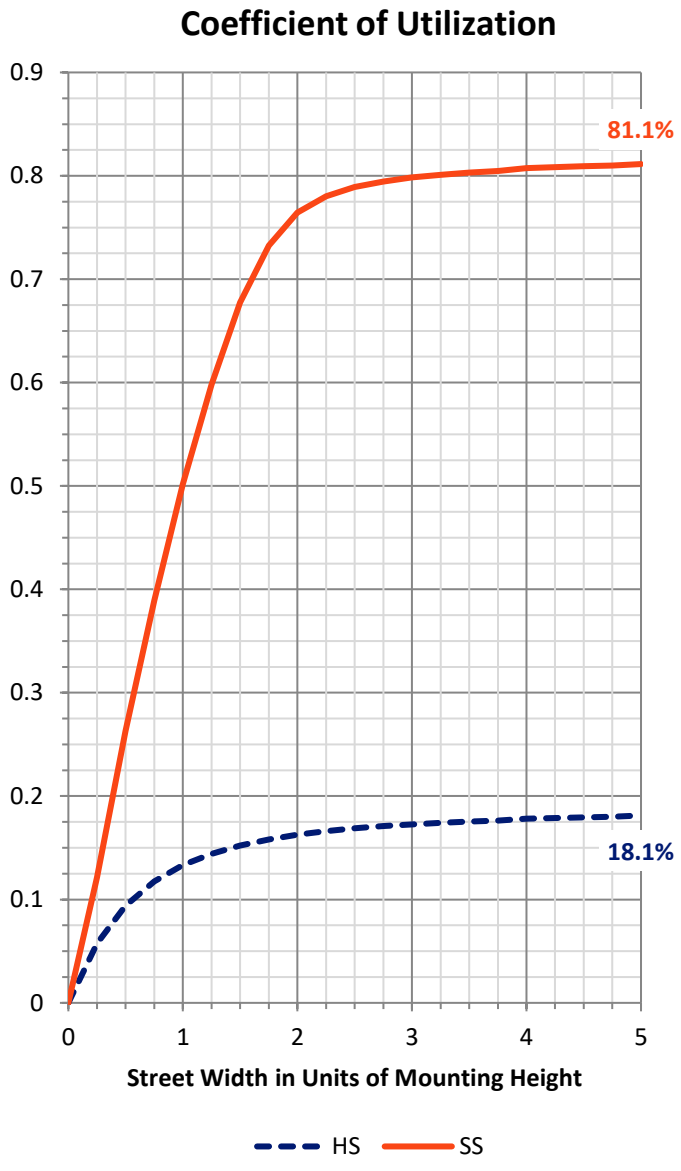
CATALOG NUMBER: GLEON-SA1A-830-U-T2

**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 705.7 | 0.0 | 705.7 |
| | % Fixture | 18.6 | 0.0 | 18.6 |
| **Street Side** | Lumens | 3098.3 | 0.0 | 3098.3 |
| | % Fixture | 81.4 | 0.0 | 81.4 |
| **Total** | Lumens | 3804.0 | 0.0 | 3804.0 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 46.9 | 1.2 |
| 10°-20° | 151.5 | 4.0 |
| 20°-30° | 265.5 | 7.0 |
| 30°-40° | 393.7 | 10.4 |
| 40°-50° | 575.8 | 15.1 |
| 50°-60° | 792.4 | 20.8 |
| 60°-70° | 882.1 | 23.2 |
| 70°-80° | 597.7 | 15.7 |
| 80°-90° | 98.2 | 2.6 |
| 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° | 3804.0 | 100.0 |
| 0°-180° | 3804.0 | 100.0 |



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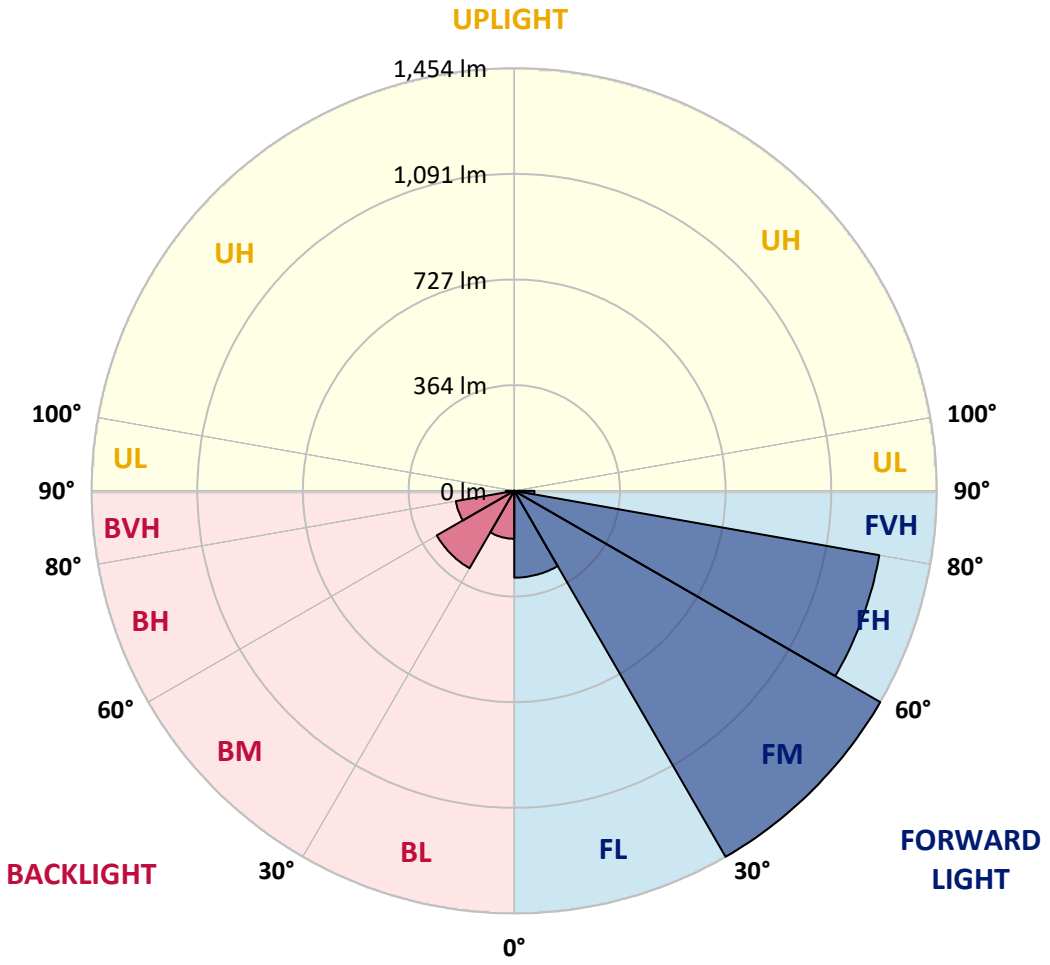
## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 299.0 | 7.9 | | | |
| FM | (30°-60°) | 1454.3 | 38.2 | | | |
| FH | (60°-80°) | 1275.7 | 33.5 | | | G1/1800 |
| FVH | (80°-90°) | 69.3 | 1.8 | | | G1/100 |
| BL | (0°-30°) | 165.0 | 4.3 | B1/500 | | |
| BM | (30°-60°) | 307.6 | 8.1 | B1/1000 | | |
| BH | (60°-80°) | 204.2 | 5.4 | B1/500 | | G1/500 |
| BVH | (80°-90°) | 28.9 | 0.8 | | | G1/100 |
| UL | (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH | (100°-180°) | 0.0 | 0.0 | | U0/0 | |

**BUG Rating: B1-U0-G1**
Type III Medium



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REPORT NUMBER: P318225
CATALOG NUMBER: GLEON-SA1A-830-U-T2

**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 15° | 25° | 35° | 45° | 55° | 65° | 72° | 75° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 468.0 | 468.0 | 468.0 | 468.0 | 468.0 | 468.0 | 468.0 | 468.0 | *468.0* | 468.0 | 468.0 |
| 2.5° | 517.0 | 516.2 | 513.4 | 513.4 | 508.2 | 503.7 | 495.4 | 489.7 | *483.1* | 480.7 | 472.8 |
| 5° | 567.0 | 567.3 | 563.9 | 561.5 | 553.8 | 544.4 | 530.1 | 517.1 | *504.1* | 498.9 | 482.8 |
| 7.5° | 609.1 | 608.5 | 607.6 | 605.7 | 598.4 | 588.8 | 569.5 | 550.2 | *531.1* | 523.3 | 495.5 |
| 10° | 636.0 | 637.2 | 638.0 | 638.9 | 635.9 | 629.0 | 610.8 | 587.3 | *562.3* | 551.6 | 510.7 |
| 12.5° | 649.7 | 651.8 | 655.4 | 661.7 | 666.7 | 665.9 | 652.7 | 627.8 | *598.1* | 584.6 | 529.7 |
| 15° | 657.7 | 660.4 | 666.2 | 677.4 | 691.4 | 699.4 | 695.9 | 673.4 | *640.2* | 623.6 | 552.9 |
| 17.5° | 662.6 | 664.9 | 673.8 | 688.8 | 709.6 | 730.9 | 740.2 | 721.3 | *687.9* | 668.9 | 579.5 |
| 20° | 666.0 | 667.7 | 678.9 | 696.6 | 723.5 | 757.3 | 783.3 | 778.5 | *740.4* | 715.8 | 607.2 |
| 22.5° | 673.6 | 675.1 | 685.7 | 703.5 | 733.4 | 777.0 | 824.8 | 831.9 | *795.8* | 767.9 | 637.0 |
| 25° | 694.8 | 694.8 | 703.8 | 716.2 | 744.2 | 794.0 | 859.9 | 891.2 | *852.4* | 819.9 | 664.5 |
| 27.5° | 735.3 | 734.9 | 738.2 | 742.5 | 763.7 | 811.3 | 891.2 | 943.6 | *911.1* | 875.6 | 691.2 |
| 30° | 783.3 | 785.9 | 786.3 | 784.2 | 794.1 | 832.9 | 920.1 | 998.9 | *970.2* | 931.9 | 718.6 |
| 32.5° | 845.0 | 846.7 | 844.7 | 837.7 | 836.3 | 863.6 | 948.6 | 1056.7 | *1034.1* | 990.7 | 743.6 |
| 35° | 923.3 | 920.0 | 913.8 | 899.7 | 886.2 | 904.5 | 981.0 | 1114.6 | *1105.9* | 1061.9 | 778.0 |
| 37.5° | 1007.2 | 1007.4 | 999.8 | 967.7 | 949.1 | 956.9 | 1025.8 | 1180.3 | *1192.7* | 1146.5 | 822.2 |
| 40° | 1074.6 | 1078.1 | 1082.8 | 1040.6 | 1016.5 | 1027.4 | 1082.8 | 1256.4 | *1295.4* | 1246.8 | 879.7 |
| 42.5° | 1121.6 | 1125.6 | 1139.0 | 1112.5 | 1087.5 | 1107.7 | 1149.9 | 1337.6 | *1410.7* | 1362.6 | 947.0 |
| 45° | 1171.4 | 1173.6 | 1183.0 | 1171.6 | 1155.6 | 1201.1 | 1225.4 | 1421.7 | *1532.6* | 1486.0 | 1022.3 |
| 47.5° | 1223.7 | 1226.1 | 1235.8 | 1228.2 | 1219.8 | 1288.3 | 1304.3 | 1500.9 | *1649.4* | 1621.5 | 1102.7 |
| 50° | 1288.4 | 1290.0 | 1299.2 | 1285.4 | 1288.1 | 1354.1 | 1374.8 | 1573.6 | *1771.9* | 1743.3 | 1183.4 |
| 52.5° | 1376.7 | 1377.1 | 1389.8 | 1377.4 | 1365.1 | 1402.3 | 1435.4 | 1642.1 | *1867.9* | 1854.4 | 1264.1 |
| 55° | 1445.9 | 1450.1 | 1491.7 | 1489.1 | 1482.0 | 1446.0 | 1486.1 | 1707.3 | *1953.6* | 1960.0 | 1349.7 |
| 57.5° | 1401.7 | 1418.1 | 1502.5 | 1561.9 | 1619.8 | 1554.9 | 1554.6 | 1780.8 | *2033.2* | 2063.6 | 1443.9 |
| 60° | 1227.7 | 1249.9 | 1374.2 | 1506.1 | 1687.3 | 1744.3 | 1696.8 | 1870.5 | *2113.6* | 2166.3 | 1561.9 |
| 62.5° | 876.8 | 913.5 | 1081.9 | 1292.5 | 1594.8 | 1869.7 | 1986.3 | 2012.9 | *2223.0* | 2285.2 | 1715.3 |
| 65° | 443.2 | 471.0 | 612.2 | 865.9 | 1274.2 | 1787.7 | 2300.9 | 2324.6 | *2413.0* | 2468.3 | 1951.5 |
| 67.5° | 269.3 | 279.8 | 348.7 | 481.6 | 781.2 | 1392.6 | 2403.6 | 2844.2 | *2780.8* | 2810.2 | 2288.2 |
| 70° | 198.4 | 206.2 | 249.1 | 319.9 | 449.3 | 817.2 | 2088.5 | 3215.0 | *3173.4* | 3170.1 | 2537.1 |
| 72° | *154.6* | *160.2* | *198.2* | *258.4* | *328.5* | *490.3* | *1513.7* | *3078.2* | *3285.8* | *3269.3* | *2514.3* |
| 72.5° | 146.6 | 151.5 | 186.1 | 243.2 | 310.4 | 444.4 | 1361.0 | 2985.8 | *3277.6* | 3270.2 | 2484.8 |
| 75° | 115.4 | 118.9 | 137.8 | 188.1 | 243.0 | 252.1 | 745.8 | 2313.9 | *2907.6* | 3028.5 | 2234.9 |
| 77.5° | 95.5 | 96.0 | 106.0 | 136.9 | 189.4 | 178.3 | 366.4 | 1605.4 | *2082.1* | 2215.0 | 1583.2 |
| 80° | 77.8 | 78.5 | 83.2 | 96.0 | 143.3 | 131.9 | 173.9 | 923.1 | *1165.7* | 1167.2 | 752.9 |
| 82.5° | 62.0 | 62.1 | 67.3 | 70.2 | 103.0 | 94.3 | 99.7 | 433.4 | *509.4* | 490.0 | 270.6 |
| 85° | 43.6 | 42.7 | 65.8 | 57.6 | 67.3 | 60.5 | 55.0 | 171.6 | *210.6* | 201.4 | 84.7 |
| 87.5° | 14.5 | 15.1 | 29.2 | 37.3 | 39.3 | 34.3 | 24.5 | 65.8 | *79.5* | 78.8 | 26.9 |
| 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: P318225
CATALOG NUMBER: GLEON-SA1A-830-U-T2

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 468.0 | 468.0 | 468.0 | 468.0 | 468.0 | 468.0 | 468.0 | 468.0 | 468.0 | 468.0 | 468.0 |
| 2.5° | 470.3 | 466.2 | 460.0 | 453.2 | 447.8 | 442.3 | 438.3 | 436.2 | 433.8 | 431.8 | 434.2 |
| 5° | 475.3 | 467.5 | 454.4 | 441.5 | 432.1 | 423.7 | 417.7 | 414.6 | 411.7 | 409.7 | 410.0 |
| 7.5° | 483.4 | 470.7 | 448.7 | 430.0 | 416.9 | 407.9 | 401.7 | 399.6 | 397.8 | 397.3 | 397.9 |
| 10° | 492.1 | 473.4 | 441.3 | 416.4 | 401.5 | 394.0 | 391.2 | 392.7 | 394.0 | 395.2 | 396.5 |
| 12.5° | 501.9 | 475.7 | 430.4 | 400.4 | 387.7 | 384.8 | 387.6 | 393.9 | 398.4 | 401.2 | 402.9 |
| 15° | 514.8 | 477.8 | 417.8 | 384.4 | 375.9 | 379.2 | 388.5 | 399.4 | 407.3 | 412.5 | 413.2 |
| 17.5° | 526.5 | 477.7 | 401.7 | 368.3 | 366.4 | 375.9 | 389.9 | 405.3 | 416.0 | 423.2 | 424.6 |
| 20° | 538.7 | 474.1 | 383.0 | 352.6 | 356.7 | 372.4 | 390.6 | 409.1 | 422.0 | 430.4 | 432.4 |
| 22.5° | 550.1 | 468.0 | 362.4 | 338.3 | 348.5 | 367.7 | 388.1 | 406.8 | 419.8 | 426.6 | 428.7 |
| 25° | 557.8 | 457.3 | 341.6 | 326.3 | 341.3 | 361.9 | 380.0 | 395.0 | 404.7 | 408.1 | 408.7 |
| 27.5° | 561.8 | 443.2 | 321.9 | 315.8 | 333.9 | 352.5 | 364.9 | 372.4 | 375.1 | 374.9 | 374.3 |
| 30° | 562.3 | 424.8 | 305.1 | 307.3 | 325.2 | 338.6 | 344.5 | 343.0 | 339.5 | 333.5 | 334.0 |
| 32.5° | 560.6 | 403.9 | 290.9 | 299.2 | 314.2 | 321.7 | 321.9 | 315.0 | 305.6 | 296.0 | 293.4 |
| 35° | 561.1 | 383.5 | 278.5 | 290.0 | 300.9 | 304.1 | 301.1 | 290.9 | 278.1 | 265.8 | 263.1 |
| 37.5° | 566.9 | 365.7 | 267.7 | 279.4 | 286.1 | 286.8 | 282.5 | 271.8 | 262.4 | 250.3 | 249.3 |
| 40° | 580.6 | 353.0 | 257.5 | 267.5 | 271.3 | 271.7 | 265.5 | 257.9 | 258.7 | 252.3 | 252.1 |
| 42.5° | 605.4 | 347.5 | 248.5 | 255.0 | 257.4 | 258.2 | 253.4 | 248.6 | 255.4 | 251.2 | 249.8 |
| 45° | 637.3 | 348.8 | 240.9 | 242.8 | 247.2 | 250.8 | 247.9 | 242.1 | 244.7 | 226.5 | 220.4 |
| 47.5° | 674.3 | 357.2 | 234.8 | 232.4 | 239.8 | 246.8 | 242.3 | 233.4 | 224.1 | 206.0 | 202.6 |
| 50° | 717.5 | 370.1 | 229.3 | 222.0 | 231.8 | 241.3 | 236.8 | 224.1 | 210.1 | 201.3 | 200.1 |
| 52.5° | 762.6 | 386.0 | 223.8 | 210.6 | 221.7 | 237.1 | 234.8 | 222.0 | 204.7 | 196.1 | 194.5 |
| 55° | 813.6 | 402.0 | 216.9 | 197.4 | 210.9 | 235.1 | 233.9 | 214.4 | 200.7 | 195.8 | 194.6 |
| 57.5° | 877.2 | 420.2 | 207.7 | 183.6 | 200.7 | 228.0 | 224.4 | 209.8 | 196.5 | 192.8 | 192.4 |
| 60° | 960.0 | 447.0 | 194.5 | 169.0 | 188.2 | 217.2 | 216.4 | 203.1 | 189.8 | 187.2 | 186.6 |
| 62.5° | 1084.1 | 491.4 | 176.3 | 154.3 | 174.3 | 198.7 | 205.9 | 194.1 | 182.7 | 182.6 | 182.8 |
| 65° | 1276.7 | 558.2 | 156.5 | 141.5 | 160.3 | 183.1 | 193.7 | 184.8 | 175.5 | 178.1 | 178.5 |
| 67.5° | 1499.9 | 613.6 | 137.1 | 128.9 | 146.0 | 168.3 | 182.7 | 175.5 | 166.0 | 172.8 | 172.9 |
| 70° | 1574.1 | 564.1 | 120.1 | 116.4 | 131.2 | 154.0 | 170.8 | 165.3 | 155.6 | 162.4 | 161.8 |
| 72° | *1464.9* | *455.4* | *109.1* | *107.0* | *120.1* | *142.2* | *160.2* | *155.7* | *146.2* | *150.8* | *149.1* |
| 72.5° | 1430.4 | 434.2 | 106.4 | 104.7 | 117.1 | 139.2 | 157.4 | 153.4 | 143.8 | 147.7 | 146.2 |
| 75° | 1276.0 | 377.1 | 91.4 | 91.8 | 102.2 | 124.6 | 142.0 | 140.7 | 130.8 | 131.2 | 130.7 |
| 77.5° | 925.5 | 276.5 | 77.0 | 79.6 | 87.0 | 109.5 | 126.4 | 125.6 | 114.9 | 112.9 | 112.5 |
| 80° | 429.5 | 141.1 | 62.7 | 63.9 | 71.5 | 91.6 | 107.8 | 106.7 | 98.1 | 95.6 | 94.2 |
| 82.5° | 147.1 | 67.1 | 47.2 | 47.9 | 55.4 | 73.7 | 93.5 | 92.9 | 85.7 | 80.8 | 77.8 |
| 85° | 52.5 | 33.4 | 33.0 | 32.2 | 39.6 | 58.0 | 81.5 | 77.9 | 67.3 | 57.4 | 57.1 |
| 87.5° | 17.0 | 14.3 | 17.0 | 16.9 | 23.1 | 39.3 | 59.2 | 50.4 | 48.9 | 40.6 | 39.8 |
| 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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# LM-79-2019: Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Report Prepared for

Cooper Lighting Solutions

MCGRAW EDISON

Report Number: SP1-2408-195-9

Test Date: 08/07/2024

Luminaire Tested: GALN-SB1A-830-U-5WQ

Data in this report applies to families of products including GALN-SB1A-830-U-5WQ.

Report Generated By FNC07603 / LDUCLS01DT446
Version: v7.04

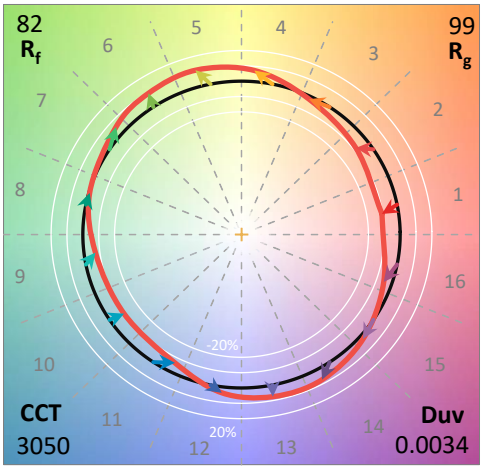
## Test Information

| | |
|---|---|
| Test Method: | LM-79-2019 |
| Report Number: | SP1-2408-195-9 |
| Test Lab: | COOPER LIGHTING SOLUTIONS |
| Photometer: | SP1 - 76IN SPHERE |
| Measurement Geometry: | 4π |
| Issue Date: | 08/07/2024 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS |
| Product Line: | MCGRAW EDISON |
| Catalog Number: | **GALN-SB1A-830-U-5WQ** |
| Description: | GALLEON AREA AND ROADWAY LUMINAIRE. (1) 80 CRI, 3000K, 350MA HIGH DENSITY LIGHTSQUARE WITH 26 LEDS AND TYPE V WIDE OPTICS |

## Spectral Parameters

| | | | | | |
|---|---|---|---|---|---|
| CCT (K): | 3050 | CRI (Ra): | 81.0 | | |
| CIE u': | 0.2476 | R1: | 79.6 | R9: | 7.1 |
| CIE v': | 0.5251 | R2: | 85.6 | R10: | 67.0 |
| Duv: | 0.0034 | R3: | 92.0 | R11: | 82.7 |
| CIE x: | 0.4383 | R4: | 82.6 | R12: | 63.2 |
| CIE y: | 0.4131 | R5: | 78.9 | R13: | 80.3 |
| CIE z: | 0.1487 | R6: | 81.7 | R14: | 95.0 |
| Peak Wavelength (nm): | 603 | R7: | 85.2 | R15: | 71.7 |
| Dominant Wavelength (nm): | 581 | R8: | 62.0 | | |
| Purity: | 55.55201 | | | | |

| | |
|---|---|
| Rf: | 81.5 |
| Rg: | 99.2 |




## Test Conditions

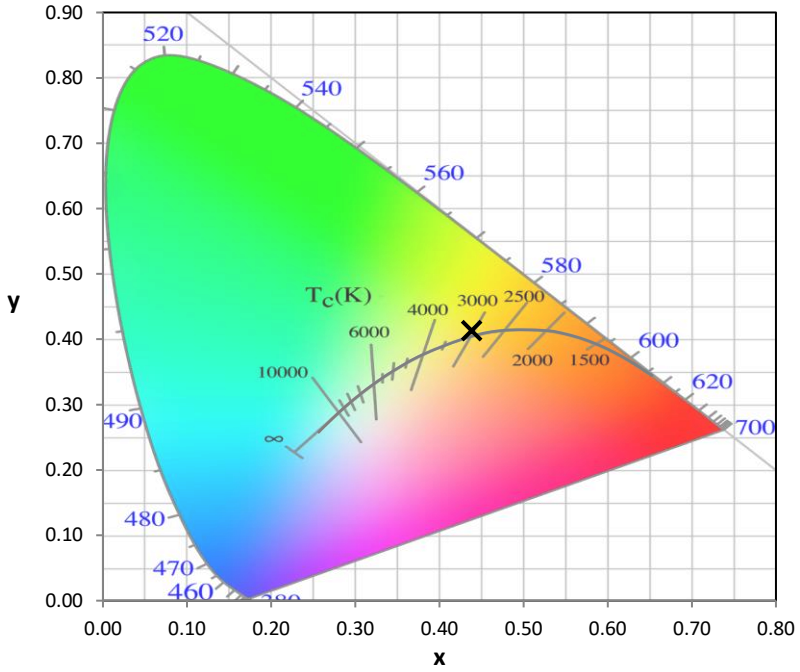
| | |
|---|---|
| Stabilization Time: | 20M |
| Operation Time: | 1H 20M |
| Sphere Temperature (°C): | 24.2 |

REPORT NUMBER: SP1-2408-195-9

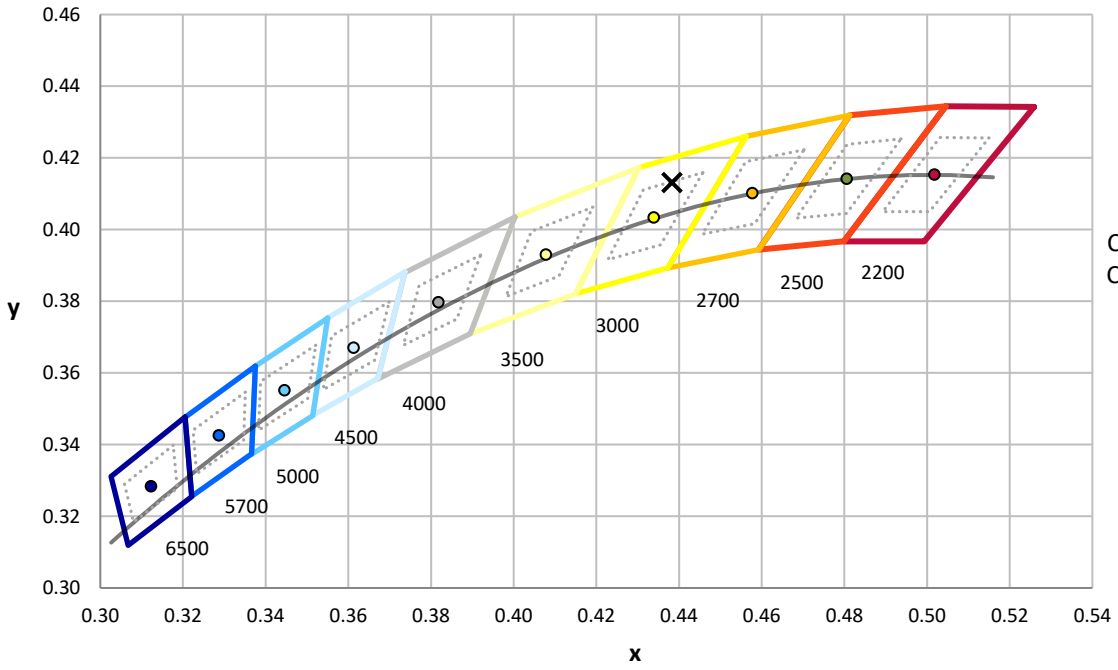
| Measurement and Test Equipment | | | |
|---|---|---|---|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 6/18/2024 | 12/18/2024 |
| Power Meter | INXT2011004 | 2/8/2024 | 2/8/2025 |
| AC Power Source | IN0063 | 10/24/2023 | 10/24/2024 |
| DC Power Source | IN0208 | 10/24/2023 | 10/24/2024 |
| Sphere Thermometer | IN0085 | 10/24/2023 | 10/24/2024 |
| Room Thermometer | IN0046 | 10/24/2023 | 10/24/2024 |

REPORT NUMBER: SP1-2408-195-9

## CIE 1931 Chromaticity Diagram




## CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles




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

Point lies inside the ANSI 3000K 4-step quadrangle

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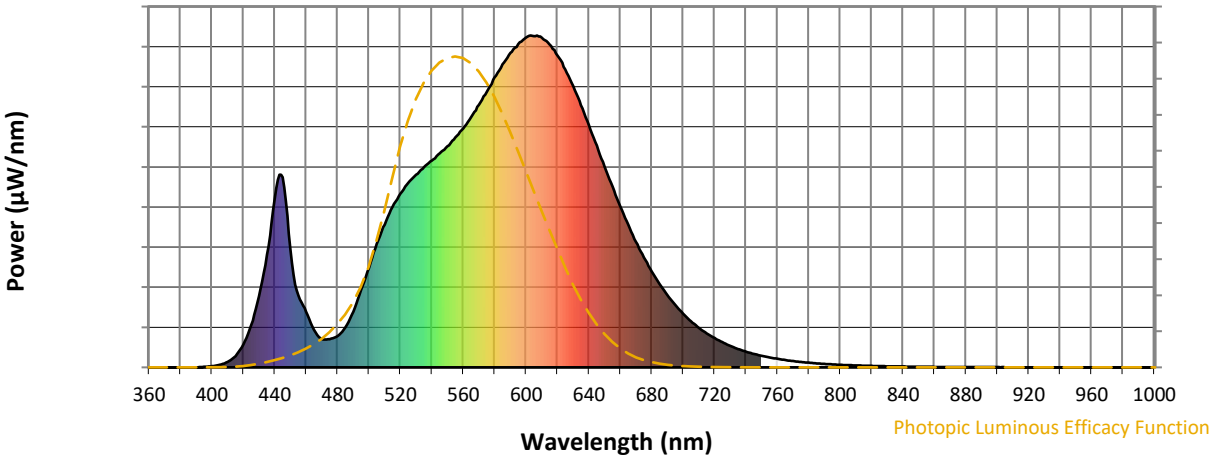
## Photopic Flux vs. Wavelength




## Photopic Lumens: NR

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

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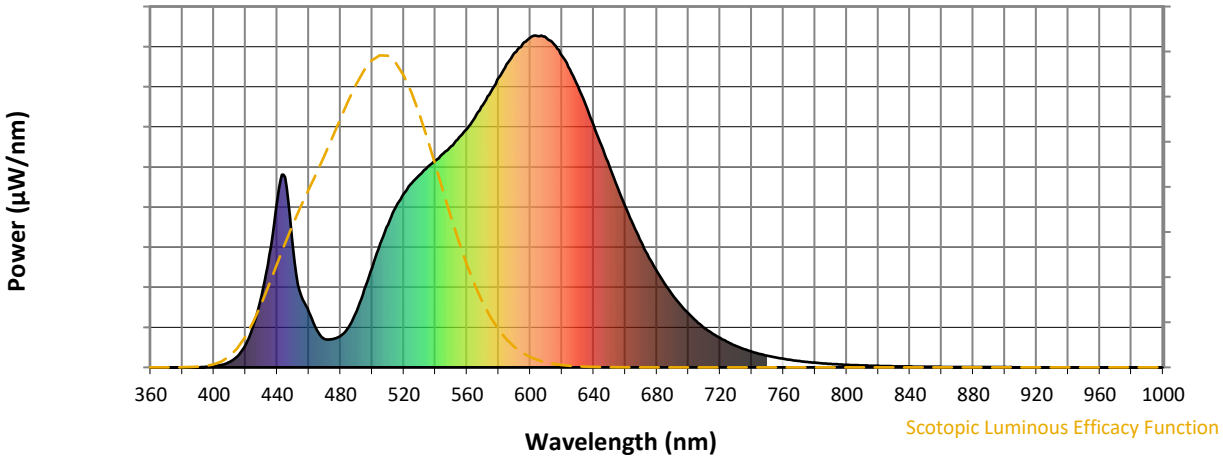
## Scotopic Flux vs. Wavelength




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

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

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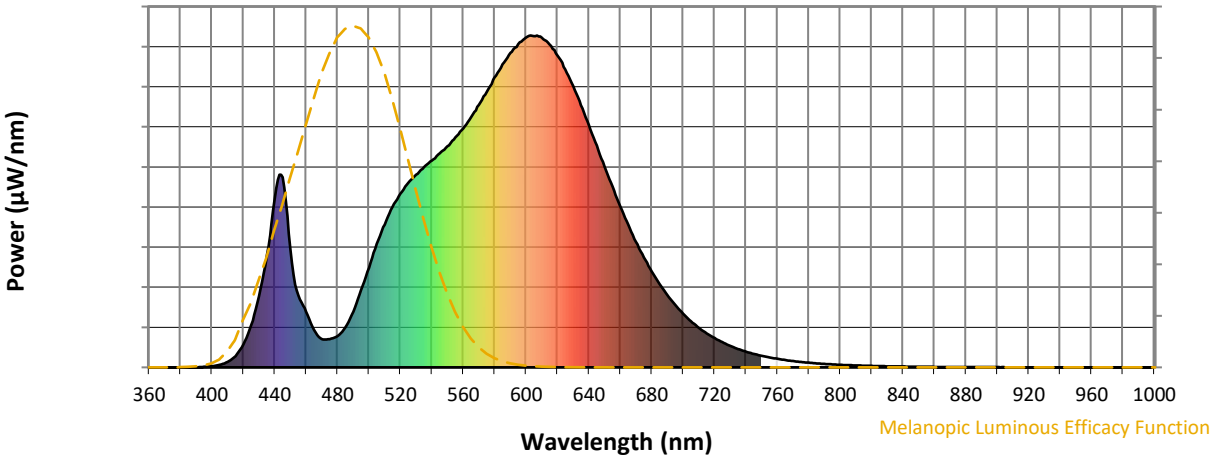
## Melanopic Flux vs. Wavelength




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

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

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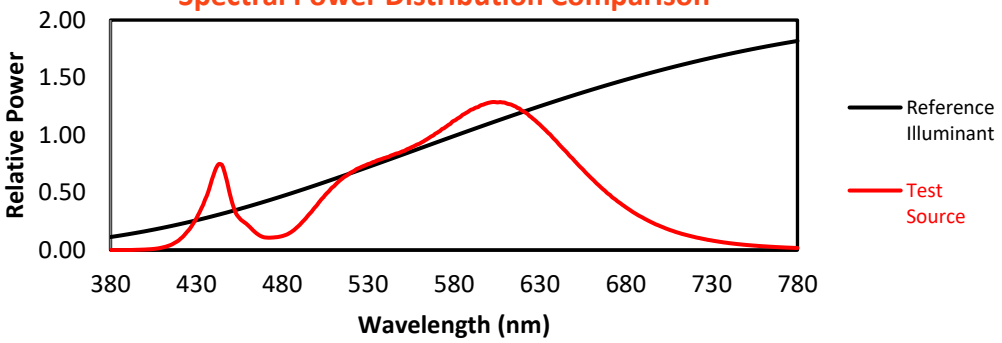
# TM-30-18

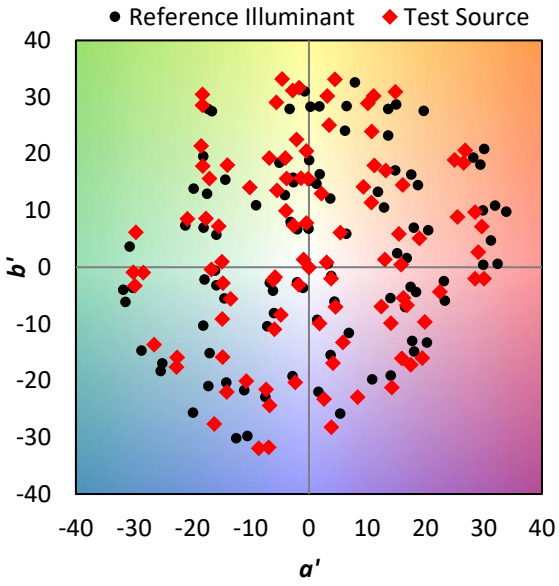
## Summary

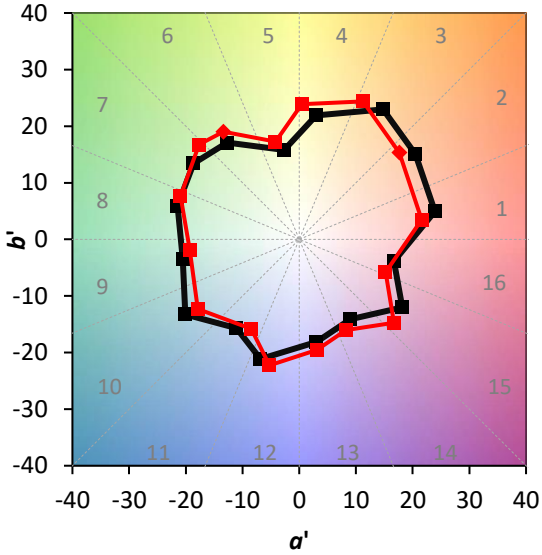
$R_f$ = 81.5
$R_g$ = 99.2
CIE $R_a$ = 81.0
$R_9$ = 7.1

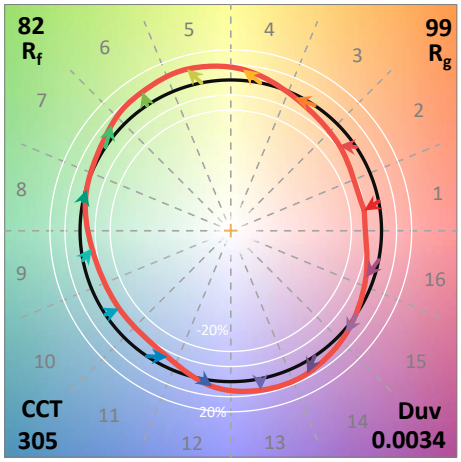
## Spectral Power Distribution Comparison

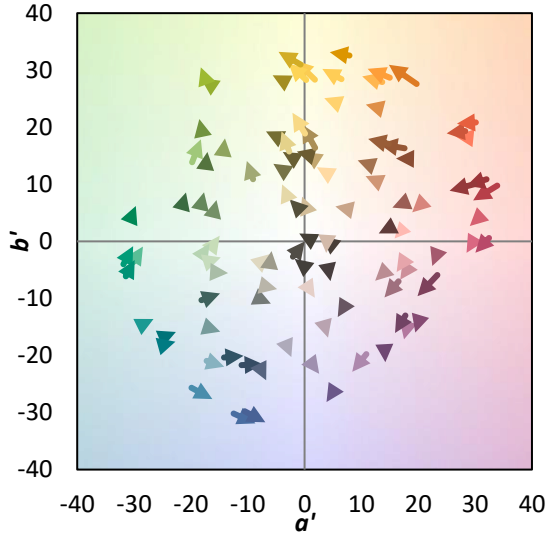



## Color Vector Graphics



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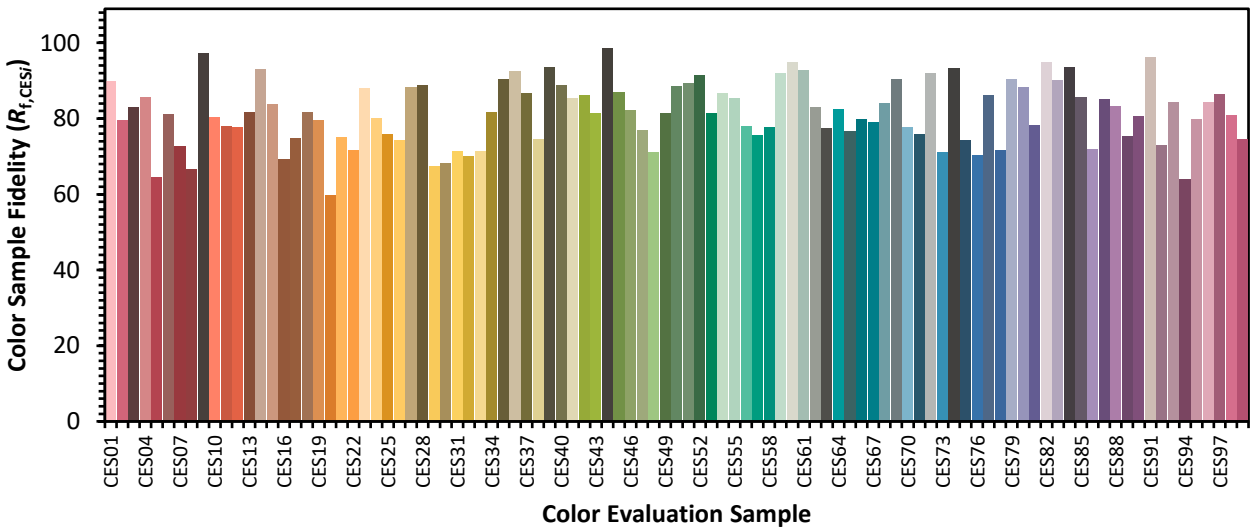
# TM-30-18

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

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



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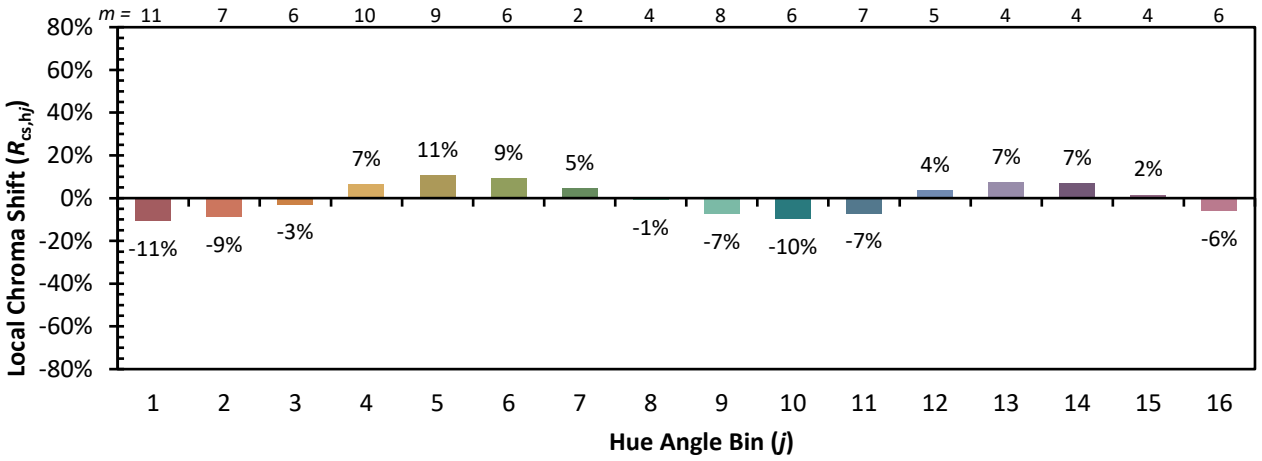
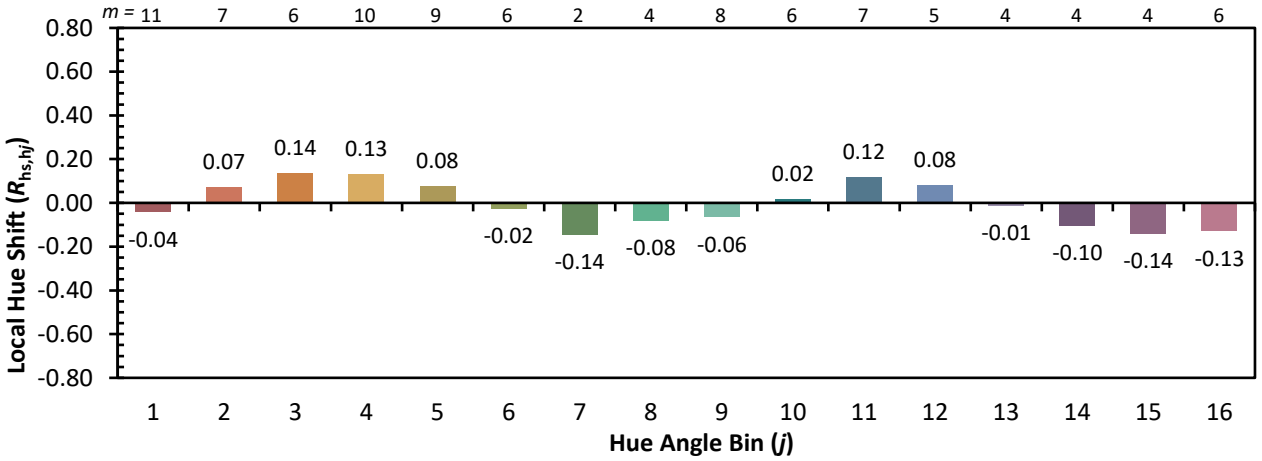
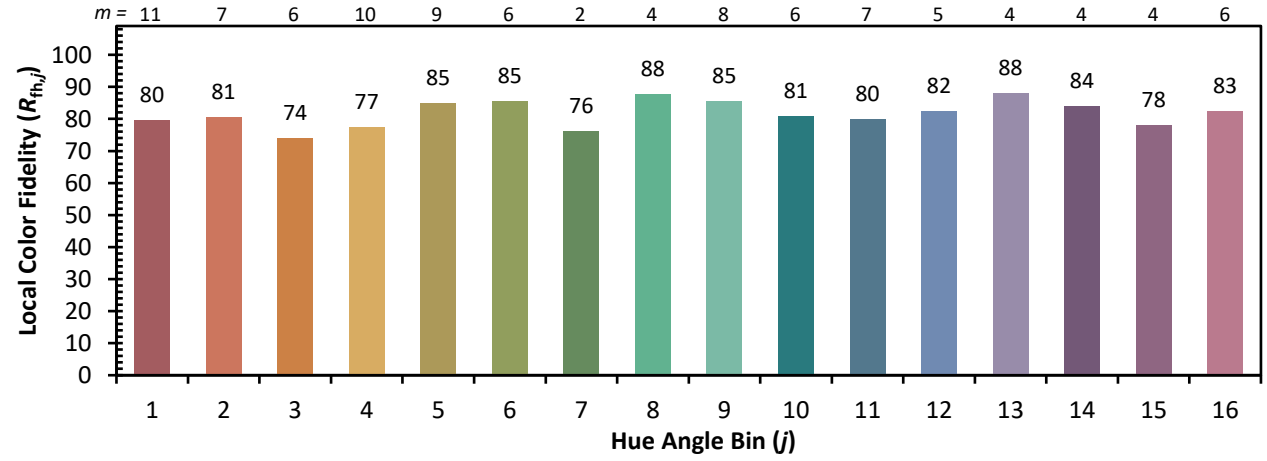
## Color Rendition by Hue-Angle Bin



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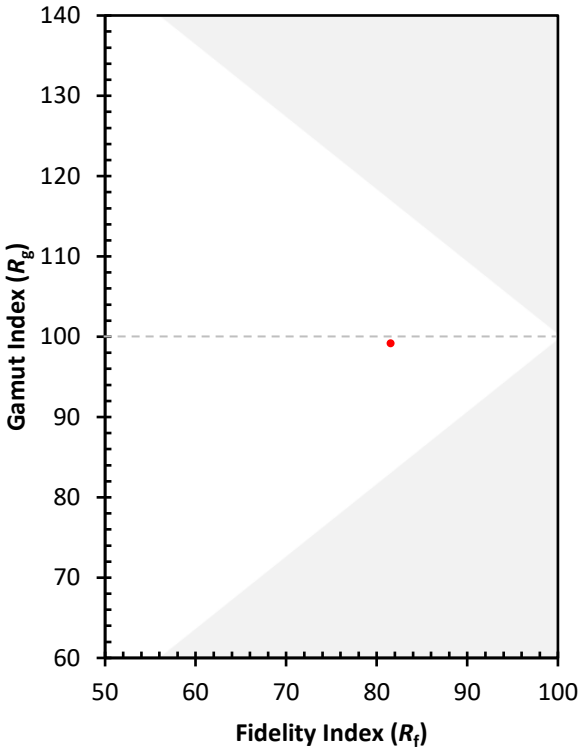
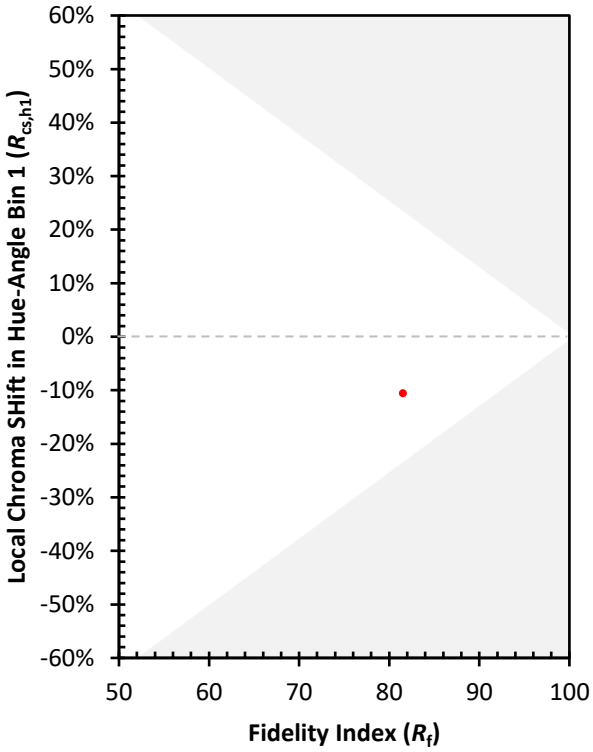
## TM-30-18

### Measure Comparisons

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