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: P385614

Luminaire Tested: **GPC-SA1A-830-U-T3-HSS**

Issue Date: 3/3/2020

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: | P385614 |
| | TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-15) |
| Test Lab: | INNOVATION CENTER |
| Issue Date: | 3/3/2020 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS (FORMERLY EATON) |
| Product Line: | McGRAW-EDISON |
| Catalog Number: | GPC-SA1A-830-U-T3-HSS |
| Description: | GALLEON PEDESTRIAN LUMINAIRE |
| | (1) 80 CRI, 3000K, 615mA LIGHTSQUARE WITH 16 LEDS AND TYPE III OPTICS WITH HOUSE SIDE SHIELD |
| Light Source: | - |
| Ballast/Driver: | ELECTRONIC DRIVER |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 2882 lumens |
| Efficiency: | N/A |
| Efficacy: | 84.8 lumens/watt |
| Luminous Opening: | Rectangular (W 0.5' x L: 0.5' x H: 0') |
| IES Classification: | Type III - Short |
| BUG Rating: | B0 - 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: | 28.75 FT |

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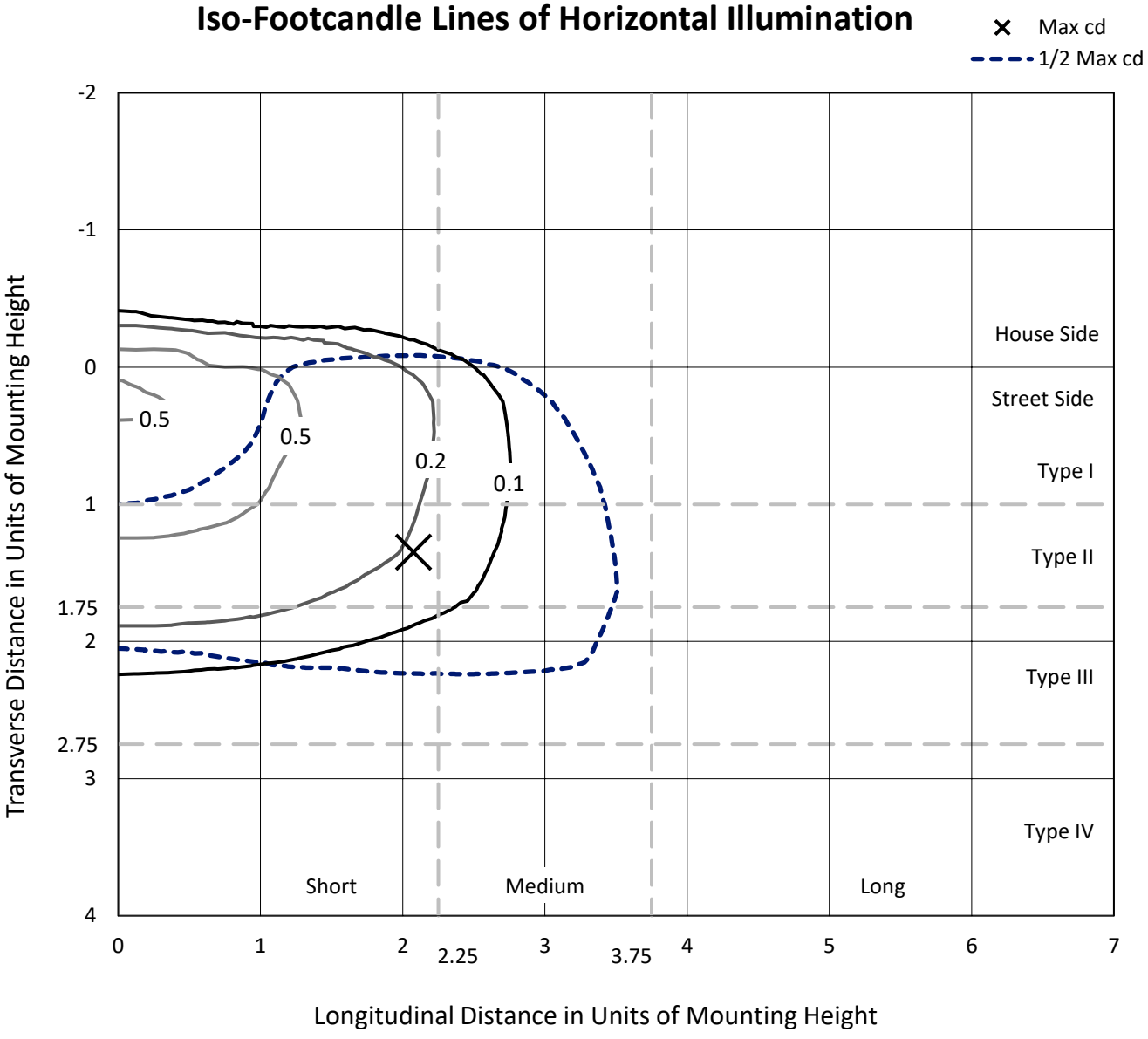
Scaled Data Report

REPORT NUMBER: P385614
CATALOG NUMBER: GPC-SA1A-830-U-T3-HSS

## Iso-Footcandle Lines of Horizontal Illumination




Based on 25 foot mounting height. Maximum calculated value = 0.7 fc
Type III - Short - N/A

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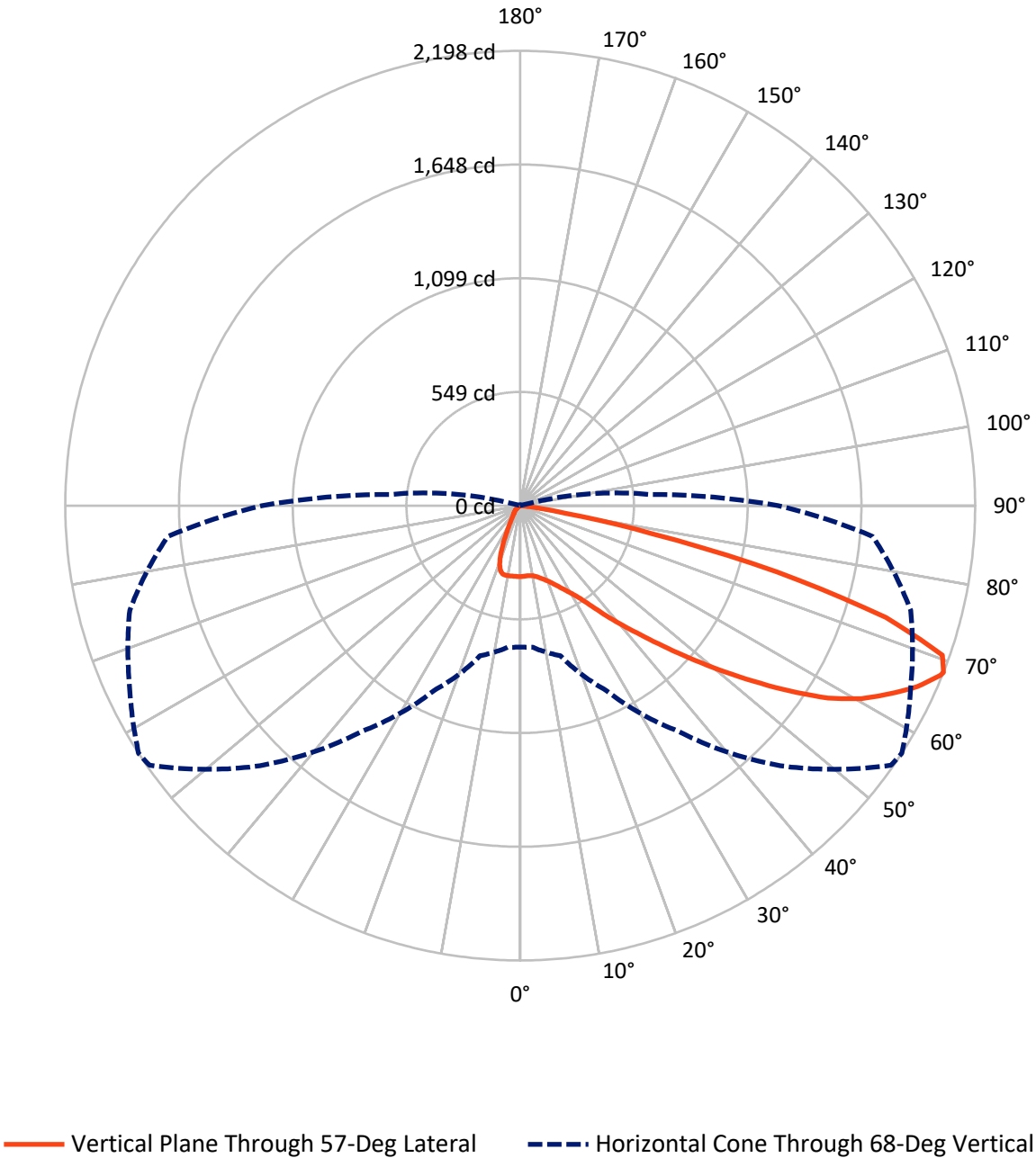
## Luminous Intensity Polar Plot



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REPORT NUMBER: P385614
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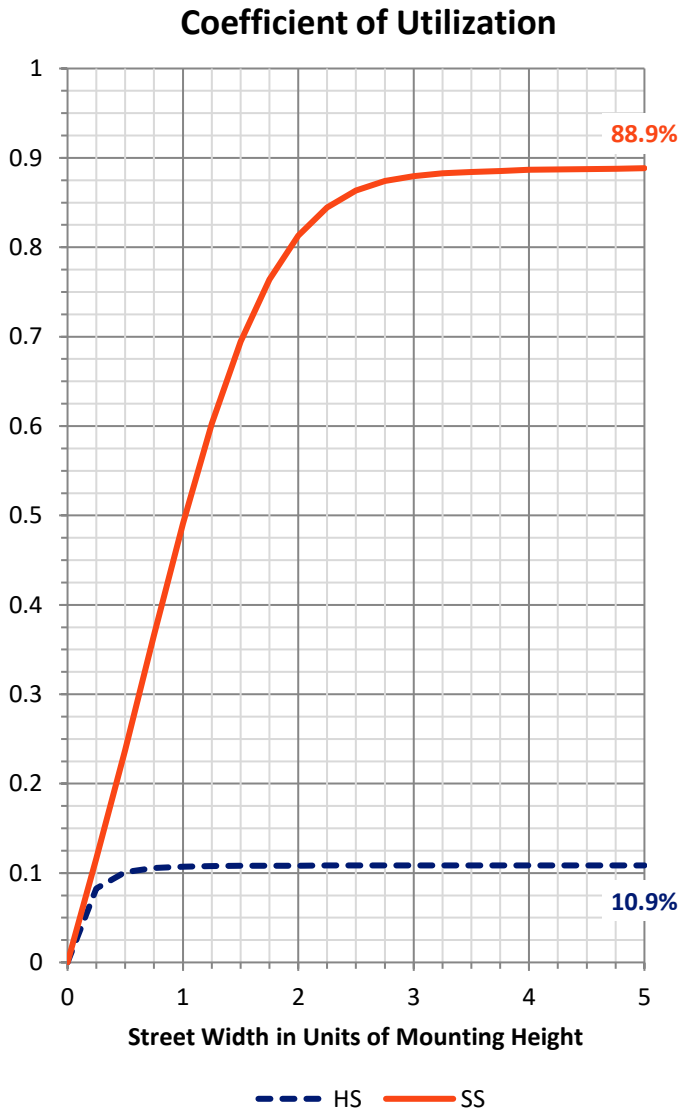
**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 316.0 | 0.0 | 316.0 |
| | % Fixture | 11.0 | 0.0 | 11.0 |
| **Street Side** | Lumens | 2566.0 | 0.0 | 2566.0 |
| | % Fixture | 89.0 | 0.0 | 89.0 |
| **Total** | Lumens | 2882.0 | 0.0 | 2882.0 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 32.0 | 1.1 |
| 10°-20° | 88.8 | 3.1 |
| 20°-30° | 153.2 | 5.3 |
| 30°-40° | 264.4 | 9.2 |
| 40°-50° | 452.3 | 15.7 |
| 50°-60° | 723.6 | 25.1 |
| 60°-70° | 836.1 | 29.0 |
| 70°-80° | 319.5 | 11.1 |
| 80°-90° | 12.0 | 0.4 |
| 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° | 2882.0 | 100.0 |
| 0°-180° | 2882.0 | 100.0 |



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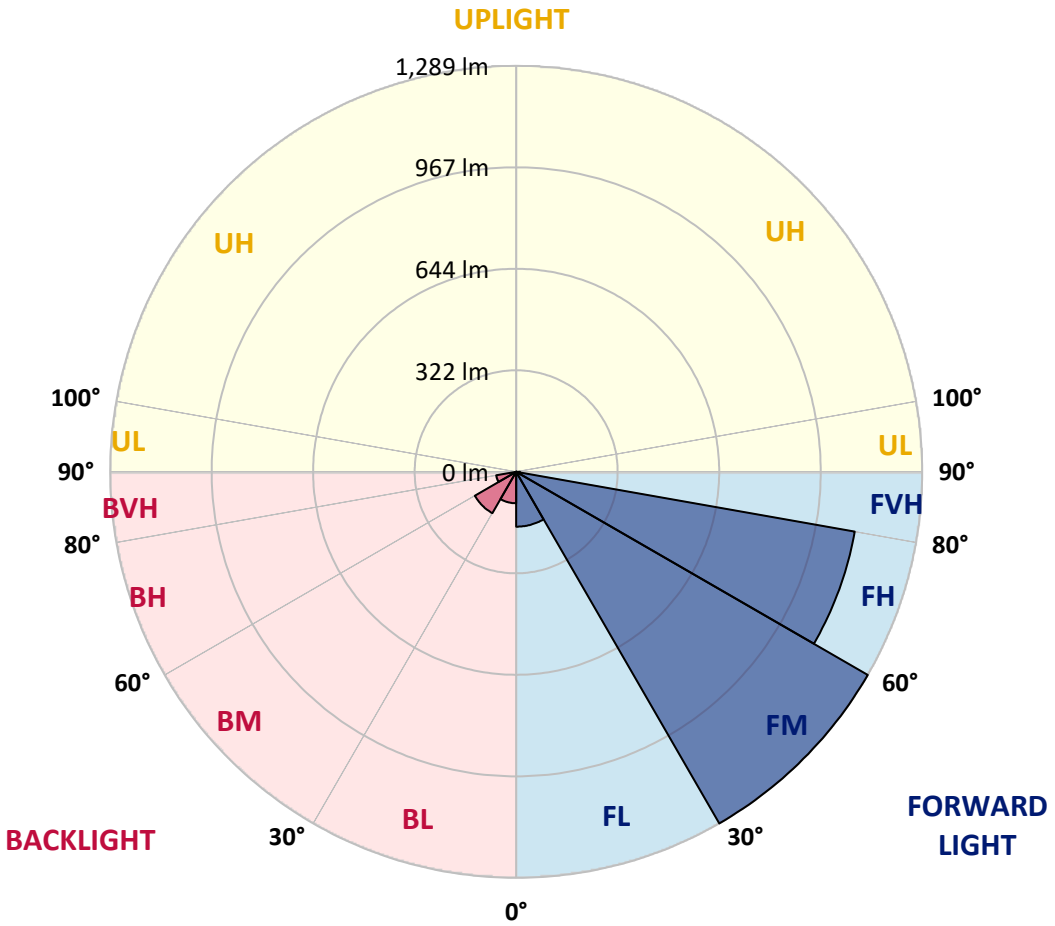
REPORT NUMBER: P385614
CATALOG NUMBER: GPC-SA1A-830-U-T3-HSS

## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 174.2 | 6.0 | | | |
| FM | (30°-60°) | 1288.8 | 44.7 | | | |
| FH | (60°-80°) | 1091.2 | 37.9 | | | G1/1800 |
| FVH | (80°-90°) | 11.8 | 0.4 | | | G1/100 |
| BL | (0°-30°) | 99.9 | 3.5 | B0/110 | | |
| BM | (30°-60°) | 151.6 | 5.3 | B0/220 | | |
| BH | (60°-80°) | 64.4 | 2.2 | B0/110 | | G0/110 |
| BVH | (80°-90°) | 0.2 | 0.0 | | | G0/10 |
| UL | (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH | (100°-180°) | 0.0 | 0.0 | | U0/0 | |

**BUG Rating: B0-U0-G1**
Type III Short



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REPORT NUMBER: P385614
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**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 15° | 25° | 35° | 45° | 55° | 57° | 65° | 75° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 342.5 | 342.5 | 342.5 | 342.5 | 342.5 | 342.5 | 342.5 | *342.5* | 342.5 | 342.5 | 342.5 |
| 2.5° | 334.4 | 335.9 | 337.0 | 337.7 | 338.5 | 340.3 | 340.8 | *341.6* | 342.0 | 342.0 | 343.0 |
| 5° | 321.2 | 322.8 | 325.2 | 327.1 | 330.9 | 335.8 | 339.3 | *340.7* | 343.1 | 345.3 | 346.5 |
| 7.5° | 308.9 | 310.8 | 313.6 | 318.1 | 324.6 | 332.5 | 339.9 | *341.8* | 346.5 | 351.2 | 353.5 |
| 10° | 301.0 | 302.5 | 306.1 | 312.5 | 321.1 | 332.1 | 342.5 | *344.8* | 353.0 | 360.7 | 365.1 |
| 12.5° | 298.3 | 299.7 | 303.3 | 310.6 | 321.2 | 334.1 | 348.5 | *351.9* | 363.9 | 375.2 | 381.3 |
| 15° | 302.3 | 302.5 | 306.5 | 313.3 | 323.8 | 339.2 | 358.4 | *362.5* | 377.6 | 392.3 | 400.0 |
| 17.5° | 317.5 | 316.3 | 318.3 | 321.3 | 329.6 | 345.9 | 368.9 | *375.0* | 395.2 | 412.5 | 419.7 |
| 20° | 355.7 | 355.7 | 351.0 | 342.9 | 343.0 | 356.2 | 383.1 | *390.0* | 414.7 | 434.7 | 441.3 |
| 22.5° | 421.0 | 419.7 | 410.5 | 390.4 | 372.0 | 374.1 | 400.4 | *409.4* | 438.1 | 459.5 | 461.7 |
| 25° | 499.4 | 497.9 | 483.6 | 455.4 | 423.5 | 403.0 | 423.8 | *434.2* | 466.1 | 485.0 | 480.5 |
| 27.5° | 582.6 | 581.3 | 567.2 | 532.2 | 486.8 | 449.0 | 451.7 | *461.6* | 494.5 | 513.2 | 498.9 |
| 30° | 663.1 | 663.5 | 649.5 | 613.5 | 562.1 | 507.8 | 487.2 | *492.9* | 522.2 | 541.1 | 520.7 |
| 32.5° | 739.7 | 740.2 | 728.1 | 687.9 | 639.9 | 576.0 | 536.2 | *534.7* | 554.4 | 573.0 | 549.6 |
| 35° | 808.0 | 809.3 | 801.0 | 769.8 | 719.0 | 652.1 | 599.9 | *596.3* | 600.0 | 621.1 | 593.9 |
| 37.5° | 873.8 | 874.6 | 868.3 | 842.0 | 799.5 | 735.6 | 680.3 | *675.2* | 667.3 | 683.6 | 652.3 |
| 40° | 945.9 | 943.8 | 936.6 | 912.8 | 876.2 | 827.9 | 766.7 | *758.0* | 744.2 | 758.6 | 729.2 |
| 42.5° | 1012.9 | 1010.6 | 1011.8 | 984.9 | 954.1 | 922.7 | 867.4 | *852.4* | 844.4 | 861.0 | 823.5 |
| 45° | 1096.7 | 1095.5 | 1099.6 | 1076.2 | 1051.2 | 1028.5 | 982.8 | *966.5* | 962.9 | 982.4 | 937.6 |
| 47.5° | 1179.5 | 1182.5 | 1195.1 | 1185.2 | 1175.1 | 1155.1 | 1105.0 | *1097.7* | 1099.9 | 1123.4 | 1057.9 |
| 50° | 1248.4 | 1252.0 | 1286.7 | 1298.1 | 1312.7 | 1301.0 | 1250.9 | *1246.4* | 1255.0 | 1276.2 | 1187.4 |
| 52.5° | 1298.3 | 1305.5 | 1348.7 | 1401.4 | 1454.6 | 1462.5 | 1412.5 | *1408.4* | 1420.0 | 1423.2 | 1287.4 |
| 55° | 1332.9 | 1339.3 | 1388.2 | 1484.7 | 1592.9 | 1627.0 | 1595.9 | *1580.1* | 1577.9 | 1545.6 | 1392.6 |
| 57.5° | 1339.0 | 1338.4 | 1408.7 | 1538.5 | 1701.4 | 1789.3 | 1769.7 | *1754.1* | 1709.4 | 1658.7 | 1513.2 |
| 60° | 1304.4 | 1308.4 | 1390.0 | 1557.2 | 1769.5 | 1912.1 | 1913.6 | *1893.4* | 1823.8 | 1768.7 | 1630.1 |
| 62.5° | 1197.9 | 1213.9 | 1296.4 | 1508.3 | 1768.7 | 1961.5 | 2019.0 | *2003.6* | 1920.4 | 1858.8 | 1748.7 |
| 65° | 1025.1 | 1030.8 | 1109.4 | 1340.7 | 1649.2 | 1940.8 | 2114.0 | *2108.3* | 2007.5 | 1946.3 | 1809.6 |
| 67.5° | 748.6 | 736.2 | 818.7 | 1055.7 | 1396.3 | 1820.1 | 2182.2 | *2189.4* | 2074.6 | 1964.3 | 1744.7 |
| 68° | *683.1* | *686.8* | *751.1* | *985.3* | *1330.0* | *1777.4* | *2186.7* | *2197.7* | *2081.3* | *1952.5* | *1709.3* |
| 70° | 407.2 | 414.3 | 471.6 | 678.4 | 1011.8 | 1536.1 | 2138.1 | *2163.4* | 2041.5 | 1831.7 | 1478.4 |
| 72.5° | 104.0 | 112.4 | 166.7 | 303.6 | 577.9 | 1082.3 | 1805.0 | *1847.6* | 1772.5 | 1485.9 | 998.1 |
| 75° | 42.8 | 45.0 | 59.6 | 100.0 | 215.3 | 487.6 | 1189.7 | *1281.0* | 1228.8 | 889.6 | 451.1 |
| 77.5° | 29.6 | 31.1 | 38.3 | 55.5 | 93.2 | 165.3 | 583.3 | *649.2* | 584.9 | 303.6 | 98.4 |
| 80° | 21.3 | 22.5 | 27.4 | 36.9 | 53.6 | 59.0 | 190.1 | *219.8* | 174.6 | 66.6 | 24.4 |
| 82.5° | 12.7 | 13.6 | 20.4 | 26.3 | 32.6 | 28.2 | 47.3 | *53.7* | 50.6 | 33.1 | 10.9 |
| 85° | 6.3 | 7.4 | 13.8 | 18.8 | 17.6 | 11.9 | 14.4 | *16.1* | 19.9 | 20.2 | 5.9 |
| 87.5° | 0.4 | 0.8 | 8.0 | 11.3 | 4.9 | 2.7 | 4.2 | *5.2* | 7.1 | 9.9 | 2.5 |
| 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: P385614
CATALOG NUMBER: GPC-SA1A-830-U-T3-HSS

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 342.5 | 342.5 | 342.5 | 342.5 | 342.5 | 342.5 | 342.5 | 342.5 | 342.5 | 342.5 | 342.5 |
| 2.5° | 343.4 | 343.5 | 342.6 | 342.2 | 342.5 | 340.8 | 340.1 | 340.4 | 340.4 | 340.8 | 340.1 |
| 5° | 346.8 | 346.8 | 345.2 | 343.0 | 341.8 | 338.6 | 336.6 | 336.1 | 335.6 | 335.4 | 334.8 |
| 7.5° | 354.2 | 353.4 | 350.5 | 345.7 | 341.6 | 334.8 | 329.6 | 326.9 | 325.6 | 325.0 | 324.6 |
| 10° | 366.0 | 364.5 | 359.8 | 350.9 | 341.5 | 329.4 | 318.1 | 310.0 | 303.3 | 300.6 | 299.0 |
| 12.5° | 382.0 | 379.8 | 371.8 | 357.0 | 340.5 | 318.2 | 293.7 | 270.1 | 248.2 | 239.2 | 234.7 |
| 15° | 400.4 | 397.2 | 384.6 | 362.2 | 335.0 | 293.0 | 239.7 | 198.4 | 168.0 | 156.6 | 151.7 |
| 17.5° | 419.0 | 415.0 | 395.7 | 365.5 | 318.2 | 240.8 | 168.2 | 127.0 | 106.7 | 101.3 | 99.3 |
| 20° | 437.8 | 431.9 | 405.4 | 363.0 | 280.3 | 173.6 | 110.9 | 92.8 | 86.9 | 85.3 | 84.8 |
| 22.5° | 455.7 | 446.4 | 414.1 | 353.5 | 222.0 | 116.5 | 87.8 | 82.0 | 80.1 | 79.2 | 78.9 |
| 25° | 471.2 | 458.3 | 421.8 | 324.1 | 157.1 | 88.0 | 79.0 | 77.1 | 74.7 | 72.9 | 73.0 |
| 27.5° | 485.8 | 470.1 | 426.4 | 275.5 | 104.8 | 75.2 | 73.2 | 70.6 | 66.1 | 63.5 | 63.5 |
| 30° | 503.4 | 486.0 | 429.8 | 212.0 | 77.1 | 66.5 | 64.9 | 60.9 | 54.8 | 51.4 | 51.4 |
| 32.5° | 529.8 | 509.9 | 427.6 | 148.8 | 63.9 | 58.5 | 54.6 | 49.2 | 42.5 | 39.2 | 39.1 |
| 35° | 570.3 | 547.0 | 412.1 | 97.6 | 56.4 | 50.8 | 44.7 | 38.0 | 32.2 | 29.4 | 29.3 |
| 37.5° | 624.8 | 596.6 | 377.2 | 69.8 | 50.6 | 43.7 | 36.4 | 29.0 | 24.7 | 22.9 | 22.8 |
| 40° | 695.5 | 654.3 | 327.3 | 56.6 | 45.1 | 36.9 | 28.1 | 22.5 | 19.5 | 18.1 | 18.3 |
| 42.5° | 780.4 | 716.0 | 267.5 | 48.8 | 39.8 | 30.4 | 21.9 | 17.7 | 15.8 | 14.9 | 14.6 |
| 45° | 874.7 | 776.9 | 204.8 | 43.5 | 34.5 | 24.5 | 17.2 | 14.0 | 12.5 | 12.0 | 12.0 |
| 47.5° | 978.5 | 836.2 | 149.9 | 38.8 | 28.8 | 18.9 | 13.8 | 11.4 | 10.2 | 9.8 | 9.7 |
| 50° | 1072.6 | 877.3 | 108.1 | 33.9 | 23.6 | 15.0 | 11.2 | 9.5 | 8.7 | 8.2 | 8.2 |
| 52.5° | 1151.1 | 890.3 | 79.6 | 28.6 | 19.1 | 12.0 | 9.3 | 8.2 | 7.4 | 6.9 | 6.9 |
| 55° | 1220.2 | 885.0 | 59.1 | 23.6 | 15.4 | 9.8 | 7.9 | 6.9 | 6.3 | 5.9 | 5.9 |
| 57.5° | 1286.4 | 867.8 | 44.2 | 19.2 | 12.4 | 7.9 | 6.7 | 5.9 | 5.2 | 4.9 | 4.9 |
| 60° | 1340.5 | 839.2 | 32.8 | 15.5 | 9.9 | 6.4 | 5.6 | 4.8 | 4.2 | 3.8 | 3.8 |
| 62.5° | 1384.4 | 807.6 | 24.1 | 12.8 | 7.9 | 5.0 | 4.4 | 4.0 | 3.1 | 2.7 | 2.7 |
| 65° | 1384.7 | 755.1 | 18.1 | 10.6 | 6.1 | 4.0 | 3.3 | 3.1 | 2.0 | 1.6 | 1.5 |
| 67.5° | 1284.5 | 651.0 | 13.9 | 9.1 | 4.8 | 3.0 | 2.5 | 2.6 | 1.1 | 0.7 | 0.5 |
| 68° | *1248.1* | *624.5* | *13.1* | *9.0* | *4.5* | *2.9* | *2.3* | *2.6* | *1.0* | *0.5* | *0.4* |
| 70° | 1052.3 | 496.9 | 10.5 | 8.7 | 4.0 | 2.2 | 1.9 | 2.6 | 0.8 | 0.4 | 0.3 |
| 72.5° | 673.1 | 288.4 | 7.8 | 6.9 | 3.0 | 1.6 | 1.2 | 2.3 | 0.8 | 0.3 | 0.1 |
| 75° | 286.4 | 89.4 | 5.3 | 4.9 | 1.8 | 1.2 | 0.8 | 1.5 | 0.5 | 0.1 | 0.0 |
| 77.5° | 60.4 | 20.2 | 3.1 | 3.0 | 1.2 | 0.8 | 0.5 | 0.4 | 0.1 | 0.0 | 0.0 |
| 80° | 15.5 | 5.9 | 1.6 | 1.5 | 0.7 | 0.4 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 |
| 82.5° | 4.9 | 2.3 | 1.0 | 0.7 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 85° | 2.5 | 1.4 | 0.5 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 87.5° | 1.4 | 0.4 | 0.1 | 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 |

Cooper Lighting Solutions Photometric Lab
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Peachtree City, GA 30269

# LM-79-2019: Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Report Prepared for

Cooper Lighting Solutions

MCGRAW EDISON

Report Number: SP1-2408-195-9

Test Date: 08/07/2024

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

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

Report Generated By FNC07603 / LDUCLS01DT446
Version: v7.04

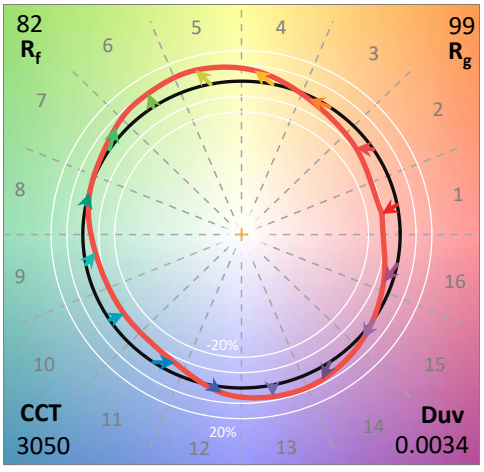
## Test Information

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

## Spectral Parameters

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

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




## Test Conditions

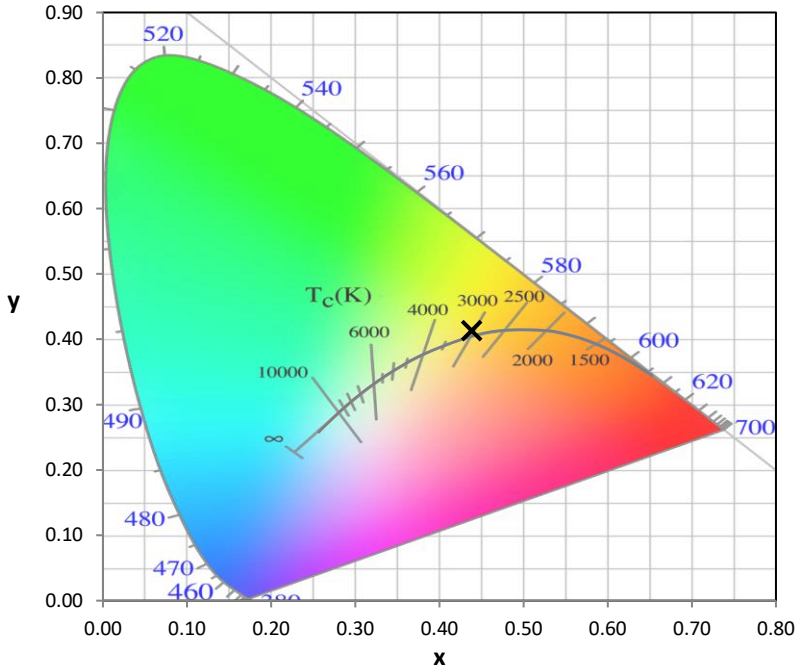
| | |
|---|---|
| Stabilization Time: | 20M |
| Operation Time: | 1H 20M |
| Sphere Temperature (°C): | 24.2 |

REPORT NUMBER: SP1-2408-195-9

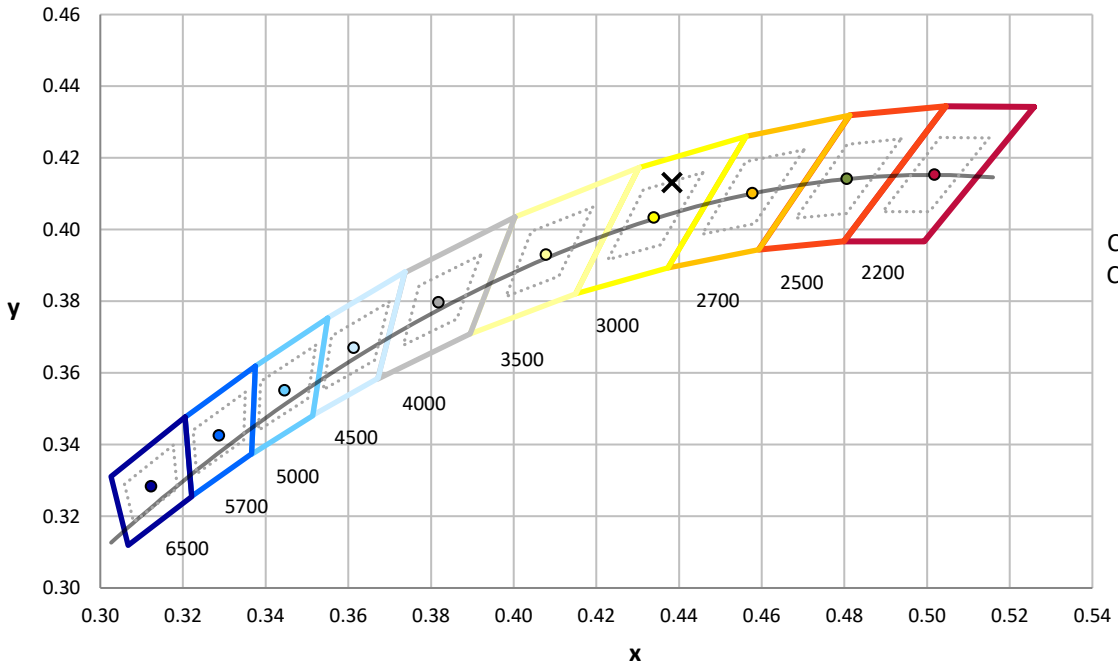
| Measurement and Test Equipment | | | |
|---|---|---|---|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 6/18/2024 | 12/18/2024 |
| Power Meter | INXT2011004 | 2/8/2024 | 2/8/2025 |
| AC Power Source | IN0063 | 10/24/2023 | 10/24/2024 |
| DC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

REPORT NUMBER: SP1-2408-195-9

## CIE 1931 Chromaticity Diagram




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




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

Point lies inside the ANSI 3000K 4-step quadrangle

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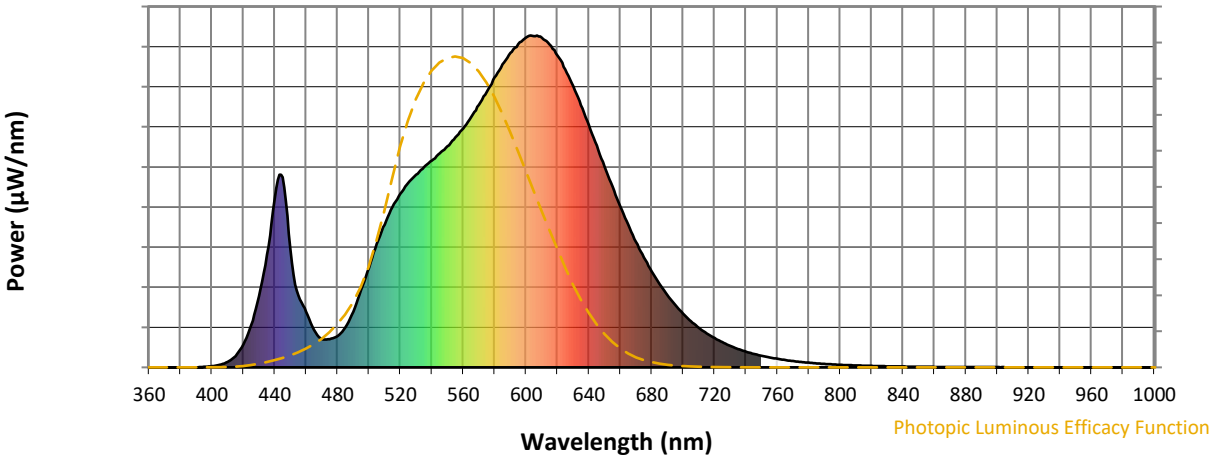
## Photopic Flux vs. Wavelength




## Photopic Lumens: NR

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

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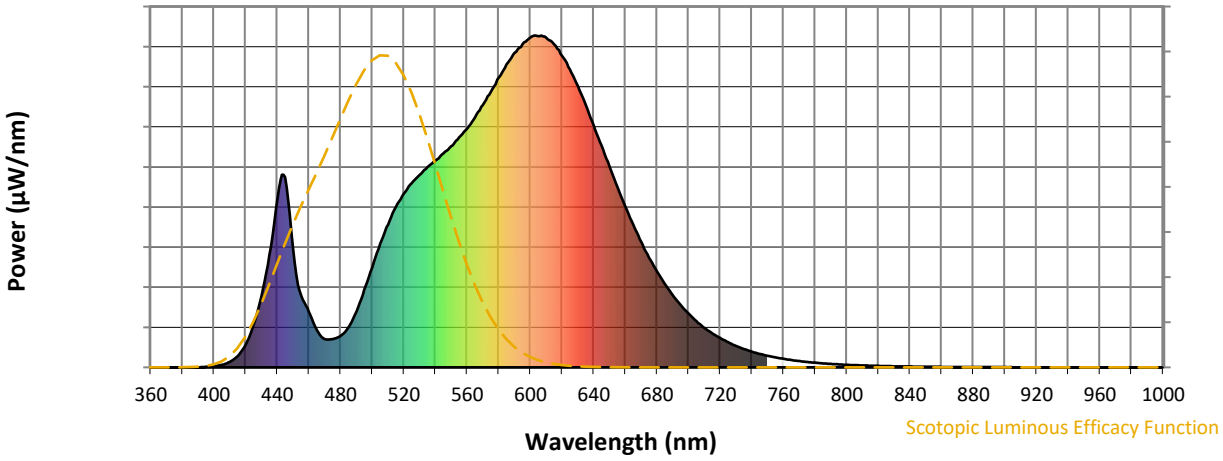
## Scotopic Flux vs. Wavelength




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

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

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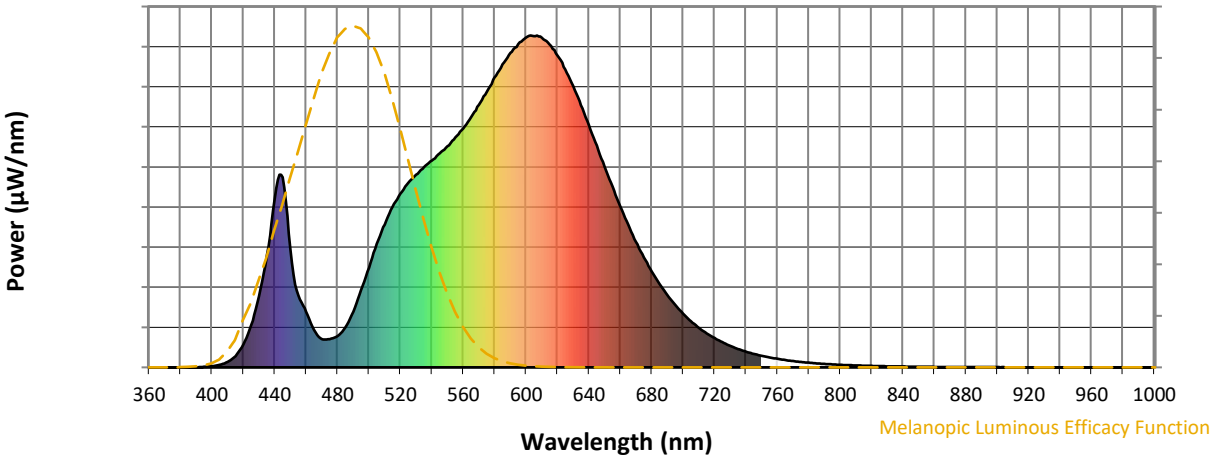
## Melanopic Flux vs. Wavelength




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

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

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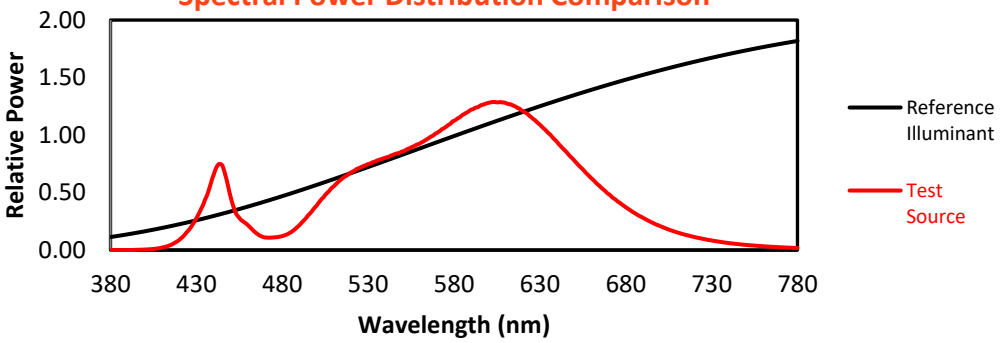
# TM-30-18

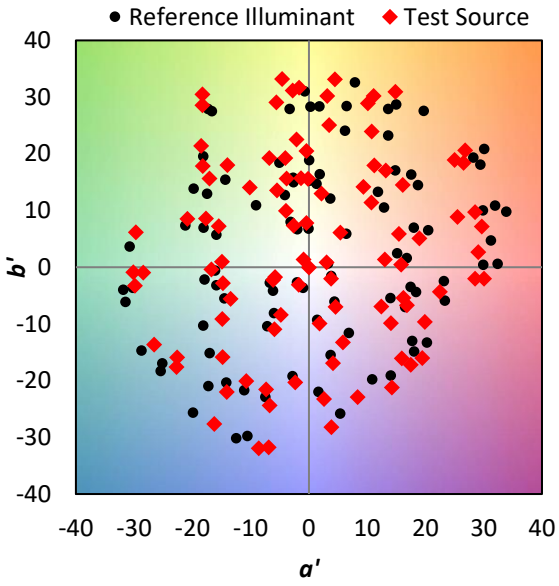
## Summary

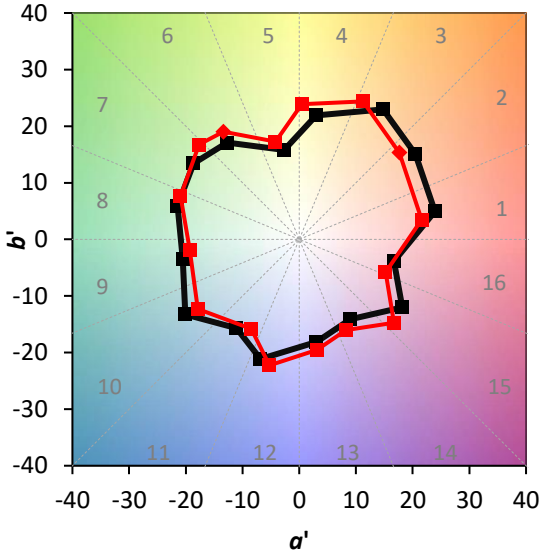
$R_f$ = 81.5
$R_g$ = 99.2
CIE $R_a$ = 81.0
$R_9$ = 7.1

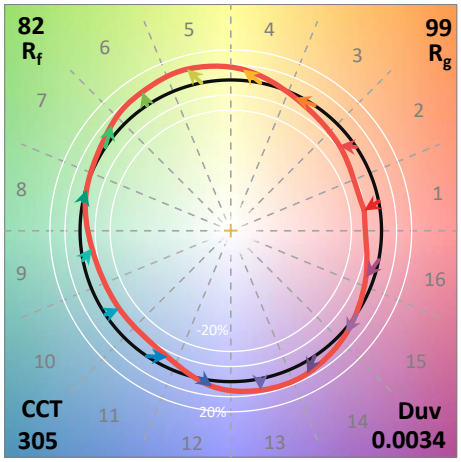
## Spectral Power Distribution Comparison

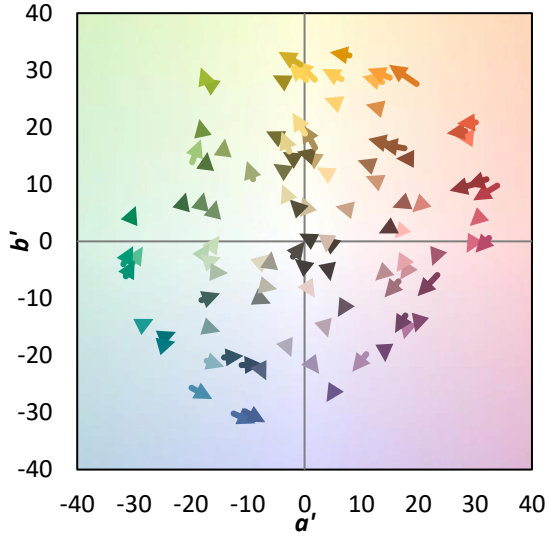



## Color Vector Graphics



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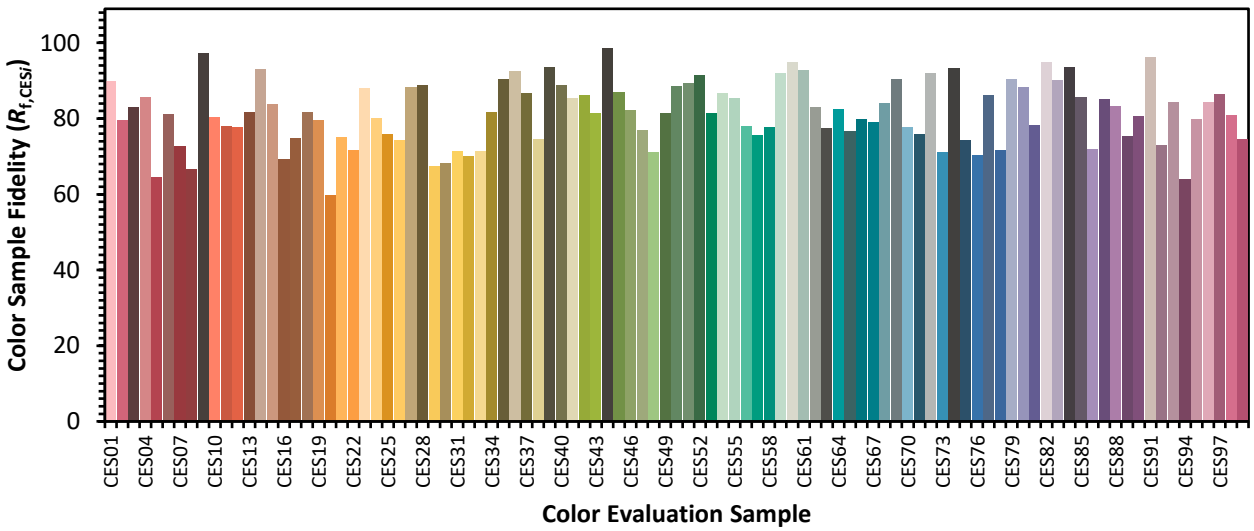
# TM-30-18

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

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



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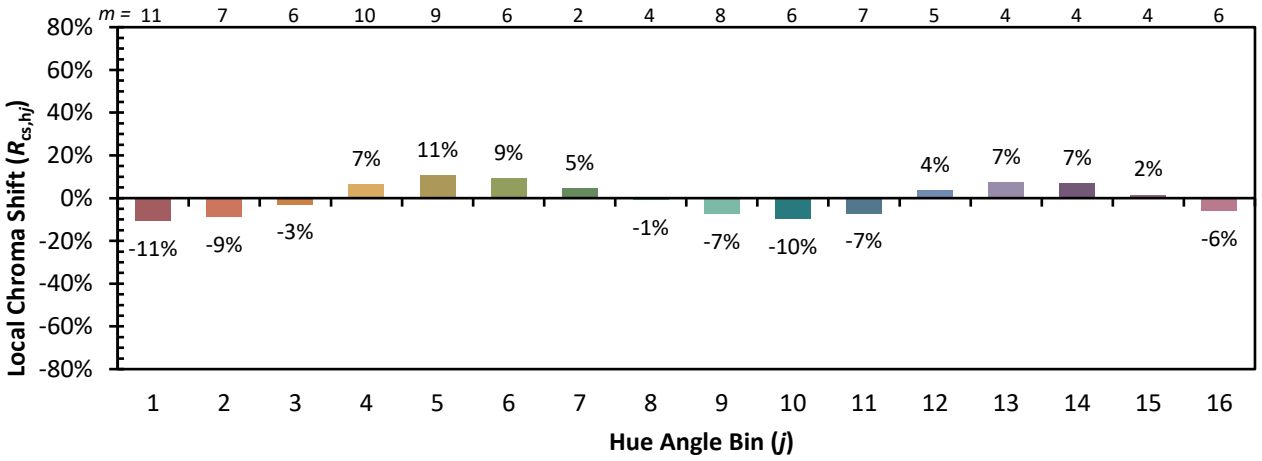
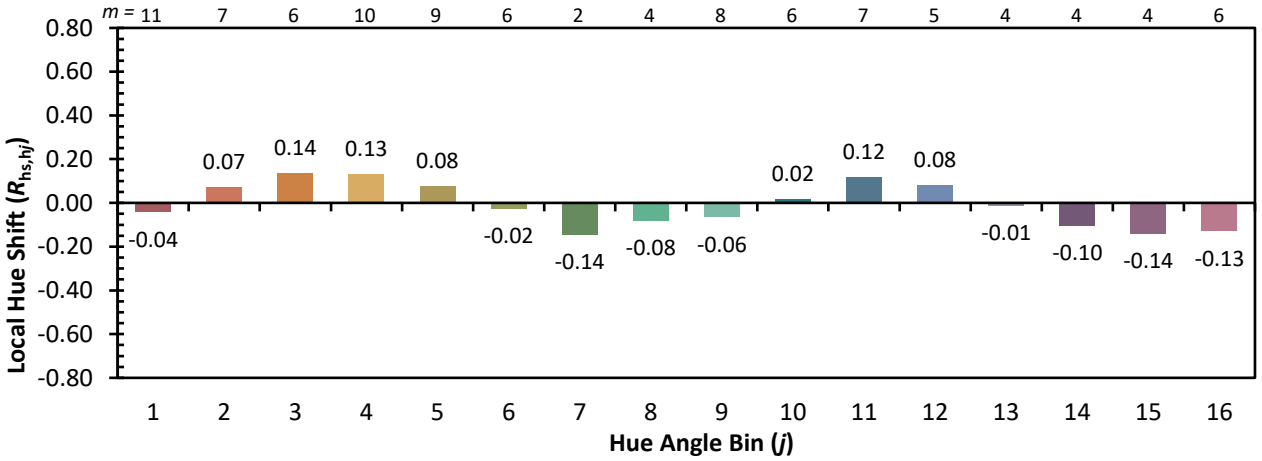
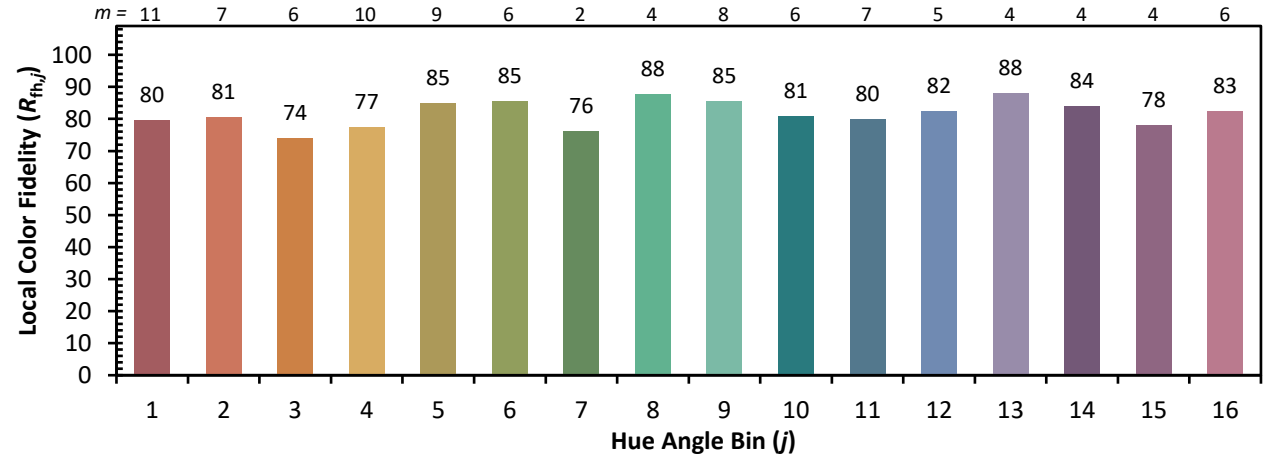
## Color Rendition by Hue-Angle Bin



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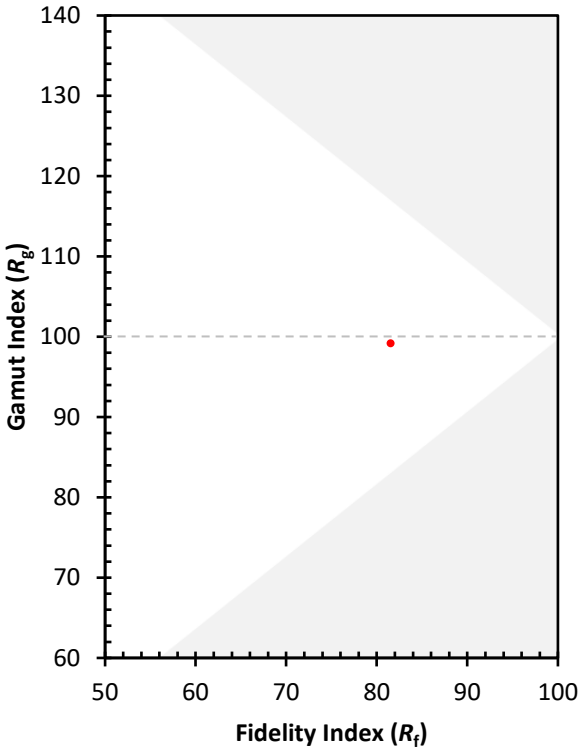
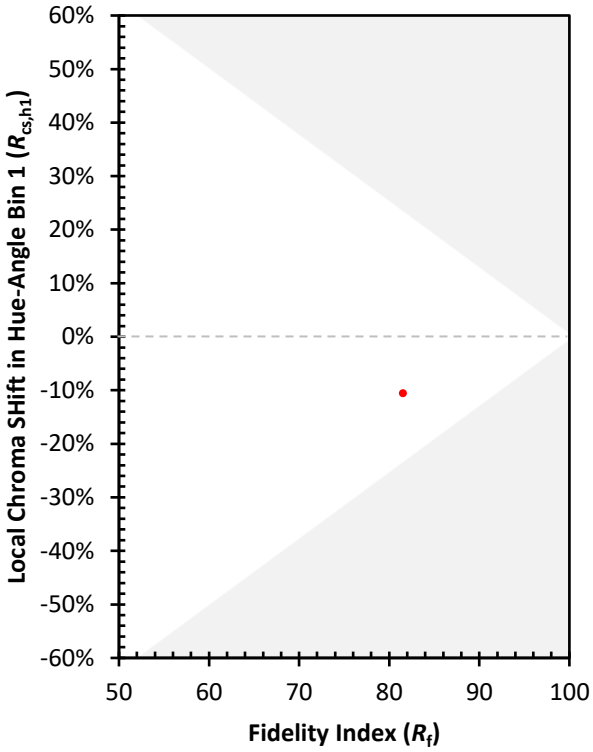
## TM-30-18

### Measure Comparisons




(END OF REPORT)