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: P321429

Luminaire Tested: **GLEON-SA5A-830-U-T2R-HSS**

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: | P321429 |
| | TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-9) |
| Test Lab: | INNOVATION CENTER |
| Issue Date: | 3/3/2020 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS (FORMERLY EATON) |
| Product Line: | McGRAW-EDISON |
| Catalog Number: | GLEON-SA5A-830-U-T2R-HSS |
| Description: | GALLEON AREA AND ROADWAY LUMINAIRE |
| | (5) 80 CRI, 3000K, 615mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE II ROADWAY OPTICS WITH HOUSE SIDE SHIELD |
| Light Source: | - |
| Ballast/Driver: | ELECTRONIC DRIVER |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 14940 lumens |
| Efficiency: | N/A |
| Efficacy: | 92.2 lumens/watt |
| Luminous Opening: | Rectangular (W 1.5' x L: 1' x H: 0') |
| IES Classification: | Type II - Medium |
| BUG Rating: | B1 - U0 - G2 |

| | |
|---|---|
| Input Watts (W): | 162 |
| 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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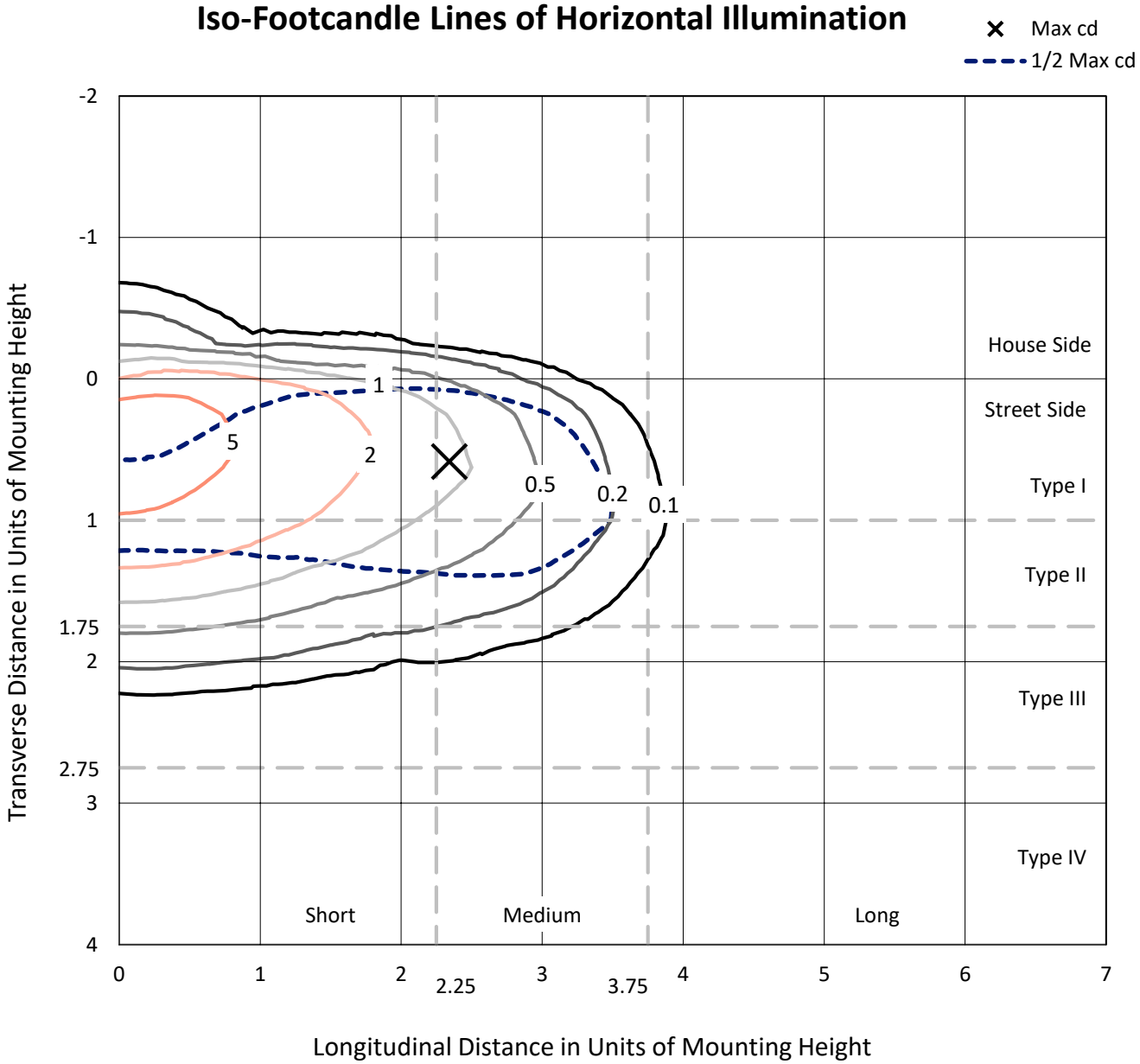
Scaled Data Report

REPORT NUMBER: P321429
CATALOG NUMBER: GLEON-SA5A-830-U-T2R-HSS

## Iso-Footcandle Lines of Horizontal Illumination




Based on 25 foot mounting height. Maximum calculated value = 7.1 fc
Type II - Medium - N/A

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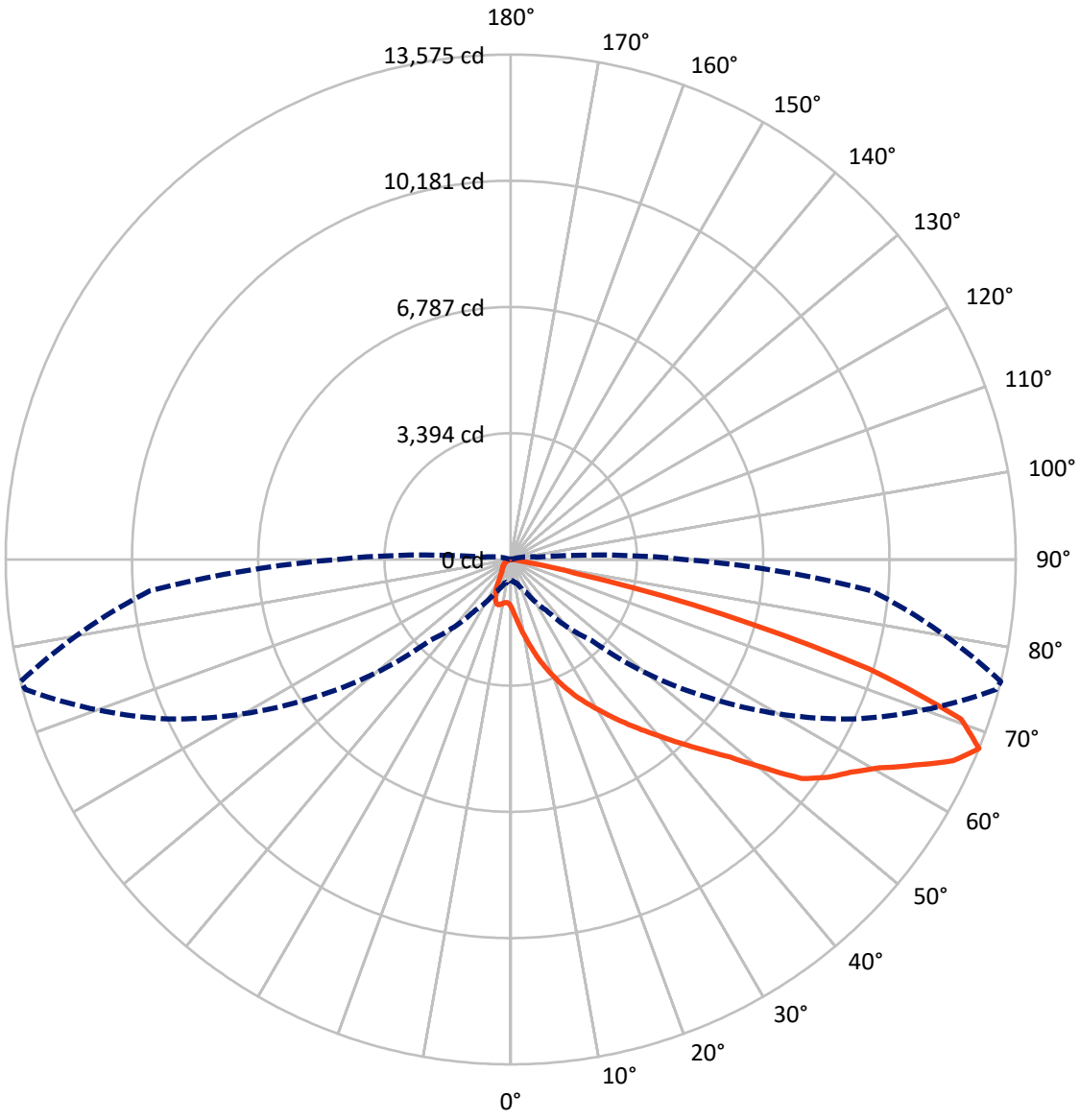
## Luminous Intensity Polar Plot



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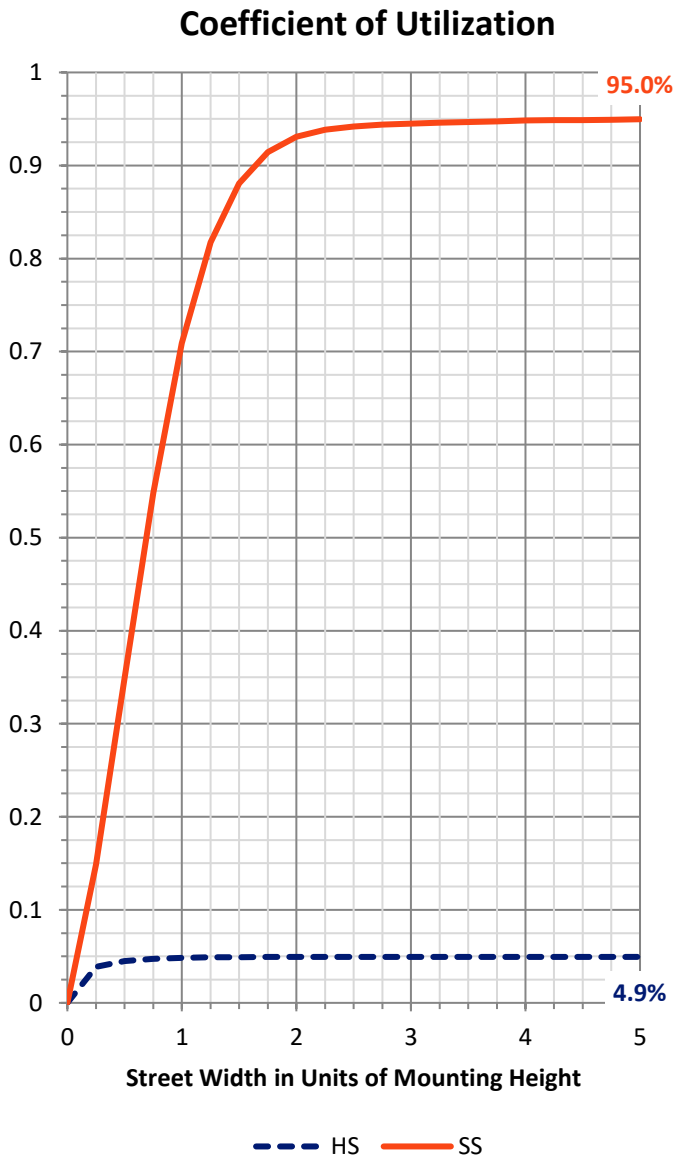
REPORT NUMBER: P321429
CATALOG NUMBER: GLEON-SA5A-830-U-T2R-HSS

**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 741.9 | 0.0 | 741.9 |
| | % Fixture | 5.0 | 0.0 | 5.0 |
| **Street Side** | Lumens | 14198.1 | 0.0 | 14198.1 |
| | % Fixture | 95.0 | 0.0 | 95.0 |
| **Total** | Lumens | 14940.0 | 0.0 | 14940.0 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 157.6 | 1.1 |
| 10°-20° | 624.7 | 4.2 |
| 20°-30° | 1271.1 | 8.5 |
| 30°-40° | 2206.2 | 14.8 |
| 40°-50° | 3117.1 | 20.9 |
| 50°-60° | 3534.9 | 23.7 |
| 60°-70° | 2931.9 | 19.6 |
| 70°-80° | 1062.0 | 7.1 |
| 80°-90° | 34.4 | 0.2 |
| 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° | 14940.0 | 100.0 |
| 0°-180° | 14940.0 | 100.0 |



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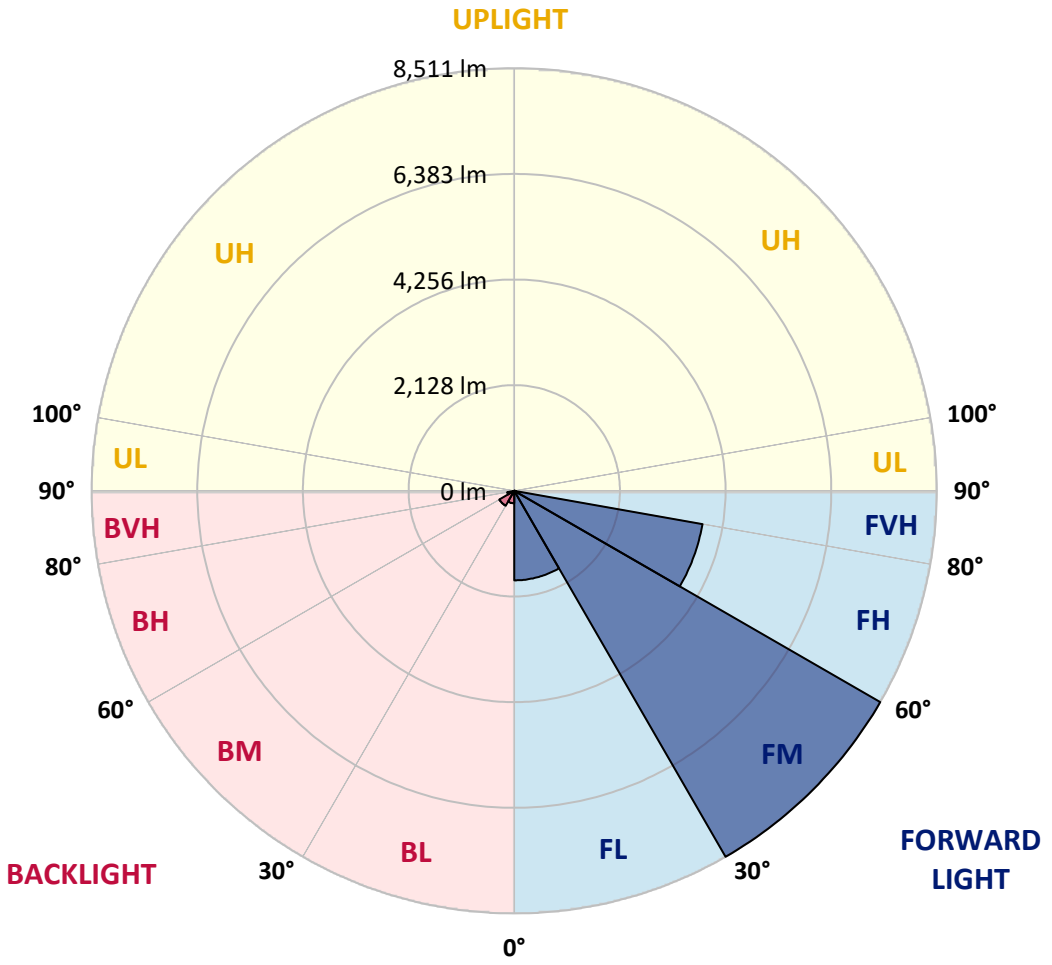
## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 1803.2 | 12.1 | | | |
| FM | (30°-60°) | 8511.0 | 57.0 | | | |
| FH | (60°-80°) | 3850.5 | 25.8 | | | G2/5000 |
| FVH | (80°-90°) | 33.4 | 0.2 | | | G1/100 |
| BL | (0°-30°) | 250.2 | 1.7 | B1/500 | | |
| BM | (30°-60°) | 347.2 | 2.3 | B1/1000 | | |
| BH | (60°-80°) | 143.4 | 1.0 | B1/500 | | G1/500 |
| BVH | (80°-90°) | 1.1 | 0.0 | | | G0/10 |
| UL | (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH | (100°-180°) | 0.0 | 0.0 | | U0/0 | |

**BUG Rating: B1-U0-G2**
Type II Medium



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REPORT NUMBER: P321429
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**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 15° | 25° | 35° | 45° | 55° | 65° | 75° | 76° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 1267.3 | 1267.3 | 1267.3 | 1267.3 | 1267.3 | 1267.3 | 1267.3 | 1267.3 | 1267.3 | *1267.3* | 1267.3 |
| 2.5° | 1891.9 | 1849.3 | 1859.1 | 1831.6 | 1781.9 | 1679.8 | 1592.7 | 1510.2 | 1414.0 | *1410.7* | 1331.5 |
| 5° | 2551.1 | 2515.1 | 2510.5 | 2454.8 | 2364.5 | 2191.0 | 2022.1 | 1829.7 | 1614.9 | *1599.2* | 1431.0 |
| 7.5° | 3149.4 | 3120.6 | 3110.1 | 3044.0 | 2875.7 | 2706.9 | 2486.9 | 2204.1 | 1868.3 | *1839.5* | 1565.2 |
| 10° | 3608.9 | 3595.2 | 3597.8 | 3550.7 | 3406.6 | 3249.5 | 2960.8 | 2600.2 | 2155.7 | *2111.2* | 1726.2 |
| 12.5° | 3957.2 | 3960.5 | 3984.0 | 3955.2 | 3874.7 | 3758.2 | 3449.8 | 3022.4 | 2473.8 | *2412.9* | 1910.2 |
| 15° | 4213.1 | 4229.5 | 4272.7 | 4308.7 | 4302.8 | 4202.0 | 3919.2 | 3451.2 | 2811.6 | *2744.2* | 2115.1 |
| 17.5° | 4378.8 | 4397.1 | 4459.9 | 4539.8 | 4613.1 | 4589.5 | 4372.2 | 3864.9 | 3153.3 | *3075.4* | 2334.4 |
| 20° | 4524.1 | 4545.7 | 4613.1 | 4718.5 | 4855.3 | 4884.8 | 4742.1 | 4266.2 | 3494.4 | *3399.4* | 2560.9 |
| 22.5° | 4839.0 | 4838.3 | 4879.5 | 4941.1 | 5071.3 | 5147.3 | 5056.9 | 4638.6 | 3831.5 | *3732.6* | 2792.0 |
| 25° | 5408.5 | 5386.9 | 5372.5 | 5324.0 | 5352.8 | 5400.0 | 5349.6 | 4986.9 | 4170.6 | *4070.4* | 3026.3 |
| 27.5° | 6085.3 | 6098.4 | 5981.9 | 5851.6 | 5750.8 | 5702.4 | 5619.9 | 5309.6 | 4496.6 | *4386.6* | 3255.4 |
| 30° | 6799.5 | 6803.5 | 6666.0 | 6499.7 | 6277.8 | 6093.9 | 5951.2 | 5618.0 | 4831.8 | *4712.0* | 3478.0 |
| 32.5° | 7443.7 | 7418.2 | 7282.0 | 7055.5 | 6775.3 | 6568.5 | 6271.9 | 5962.3 | 5186.6 | *5070.7* | 3725.4 |
| 35° | 7954.3 | 7924.2 | 7758.6 | 7552.4 | 7261.7 | 7053.5 | 6696.8 | 6306.0 | 5559.7 | *5446.4* | 3973.5 |
| 37.5° | 8327.4 | 8292.1 | 8121.9 | 7909.8 | 7659.1 | 7538.0 | 7189.7 | 6679.7 | 5966.9 | *5845.1* | 4234.7 |
| 40° | 8457.0 | 8426.3 | 8319.6 | 8164.4 | 7962.8 | 7935.3 | 7712.7 | 7109.8 | 6410.0 | *6280.4* | 4530.6 |
| 42.5° | 8379.8 | 8349.7 | 8311.7 | 8259.3 | 8175.6 | 8201.7 | 8206.3 | 7600.1 | 6902.3 | *6774.7* | 4857.3 |
| 45° | 8073.4 | 8046.6 | 8085.9 | 8162.5 | 8266.5 | 8396.2 | 8656.7 | 8127.1 | 7452.2 | *7316.0* | 5235.0 |
| 47.5° | 7622.4 | 7602.8 | 7711.4 | 7902.6 | 8207.0 | 8564.4 | 9068.5 | 8680.9 | 8069.5 | *7943.2* | 5706.3 |
| 50° | 6980.9 | 6977.6 | 7194.9 | 7543.8 | 8011.9 | 8645.6 | 9494.0 | 9310.7 | 8927.1 | *8794.2* | 6361.6 |
| 52.5° | 5981.9 | 5988.5 | 6415.9 | 6974.3 | 7669.5 | 8590.6 | 9767.6 | 10119.8 | 9924.7 | *9786.6* | 6929.2 |
| 55° | 5030.8 | 5070.0 | 5373.1 | 6178.3 | 7144.5 | 8386.3 | 9861.9 | 10497.5 | 10475.2 | *10344.3* | 7244.7 |
| 57.5° | 4099.2 | 4170.6 | 4462.5 | 5214.7 | 6378.0 | 7915.7 | 9810.1 | 10661.1 | 10885.0 | *10784.9* | 7661.0 |
| 60° | 3089.8 | 3122.5 | 3459.0 | 4162.1 | 5394.1 | 7056.8 | 9435.0 | 10750.2 | 11445.4 | *11376.0* | 8265.2 |
| 62.5° | 1965.8 | 2047.7 | 2346.2 | 3024.3 | 4200.0 | 5864.1 | 8802.7 | 10748.9 | 12146.5 | *12184.4* | 9044.9 |
| 65° | 1035.6 | 1131.2 | 1289.6 | 1874.2 | 2886.2 | 4531.9 | 7851.5 | 10648.1 | 13006.6 | *13059.7* | 9654.3 |
| 67.5° | *558.4* | *585.9* | *669.7* | *972.8* | *1673.9* | *3070.2* | *6453.9* | *10150.5* | *13504.8* | *13574.9* | *9739.4* |
| 70° | 408.5 | 423.5 | 455.0 | 538.1 | 842.5 | 1783.2 | 4709.3 | 9022.6 | 12862.6 | *12836.4* | 8653.4 |
| 72.5° | 313.6 | 337.1 | 360.7 | 394.1 | 484.4 | 951.8 | 2932.0 | 7065.3 | 10263.1 | *10090.3* | 6468.3 |
| 75° | 247.4 | 251.4 | 284.8 | 314.9 | 363.3 | 542.0 | 1302.0 | 4114.9 | 6264.1 | *5854.9* | 3354.3 |
| 77.5° | 197.7 | 200.3 | 220.0 | 246.1 | 292.0 | 356.1 | 403.2 | 1618.9 | 1999.9 | *1784.5* | 727.9 |
| 80° | 117.2 | 123.7 | 163.7 | 189.8 | 242.2 | 224.5 | 147.3 | 351.5 | 312.3 | *282.8* | 122.4 |
| 82.5° | 65.5 | 70.7 | 92.3 | 149.9 | 168.9 | 107.4 | 73.3 | 94.9 | 73.3 | *71.4* | 34.7 |
| 85° | 0.0 | 3.3 | 59.6 | 93.0 | 68.7 | 23.6 | 30.8 | 31.4 | 21.6 | *20.3* | 13.7 |
| 87.5° | 0.0 | 0.0 | 18.3 | 17.7 | 2.6 | 3.9 | 7.2 | 10.5 | 8.5 | *8.5* | 7.2 |
| 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: P321429
CATALOG NUMBER: GLEON-SA5A-830-U-T2R-HSS

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 1267.3 | 1267.3 | 1267.3 | 1267.3 | 1267.3 | 1267.3 | 1267.3 | 1267.3 | 1267.3 | 1267.3 | 1267.3 |
| 2.5° | 1292.2 | 1256.9 | 1190.1 | 1124.6 | 1069.6 | 1024.5 | 983.9 | 967.5 | 954.4 | 952.5 | 942.0 |
| 5° | 1349.8 | 1278.5 | 1150.8 | 1046.1 | 976.0 | 926.3 | 883.7 | 857.6 | 837.3 | 829.4 | 822.2 |
| 7.5° | 1436.9 | 1328.9 | 1145.6 | 1025.1 | 941.3 | 857.6 | 779.0 | 693.9 | 640.9 | 620.6 | 608.8 |
| 10° | 1542.9 | 1395.7 | 1165.2 | 1019.2 | 872.6 | 695.9 | 565.6 | 457.6 | 413.7 | 399.3 | 395.4 |
| 12.5° | 1666.7 | 1478.8 | 1199.3 | 982.6 | 726.0 | 494.2 | 390.2 | 353.5 | 343.7 | 339.1 | 339.1 |
| 15° | 1808.7 | 1569.8 | 1223.5 | 876.5 | 536.8 | 373.8 | 337.8 | 320.8 | 310.3 | 304.4 | 305.1 |
| 17.5° | 1954.0 | 1658.8 | 1211.7 | 722.7 | 396.0 | 332.5 | 305.7 | 287.4 | 273.0 | 267.1 | 265.8 |
| 20° | 2100.7 | 1741.3 | 1146.2 | 538.1 | 335.2 | 301.8 | 271.7 | 251.4 | 237.0 | 231.1 | 229.8 |
| 22.5° | 2252.5 | 1811.3 | 1031.0 | 394.7 | 301.1 | 267.7 | 238.3 | 218.0 | 204.2 | 199.0 | 196.4 |
| 25° | 2400.5 | 1868.3 | 870.0 | 319.5 | 269.0 | 235.7 | 207.5 | 188.5 | 176.1 | 170.9 | 170.2 |
| 27.5° | 2538.6 | 1904.3 | 683.4 | 282.1 | 240.9 | 206.9 | 181.3 | 164.3 | 153.8 | 149.9 | 149.3 |
| 30° | 2663.0 | 1907.6 | 505.4 | 254.6 | 216.0 | 182.0 | 158.4 | 143.4 | 134.2 | 130.3 | 129.0 |
| 32.5° | 2788.7 | 1880.1 | 367.9 | 229.8 | 193.1 | 160.4 | 137.5 | 125.7 | 119.1 | 115.9 | 115.9 |
| 35° | 2907.2 | 1816.6 | 286.7 | 208.2 | 170.9 | 139.4 | 121.1 | 112.6 | 108.7 | 105.4 | 105.4 |
| 37.5° | 3023.0 | 1725.6 | 243.5 | 189.2 | 149.9 | 121.8 | 106.7 | 101.5 | 98.2 | 94.9 | 94.9 |
| 40° | 3140.9 | 1611.0 | 221.3 | 171.5 | 132.9 | 108.0 | 94.9 | 90.3 | 87.1 | 84.4 | 83.8 |
| 42.5° | 3285.5 | 1478.8 | 206.9 | 155.1 | 117.8 | 95.6 | 83.8 | 78.6 | 75.9 | 73.3 | 72.0 |
| 45° | 3453.1 | 1364.9 | 195.1 | 138.8 | 105.4 | 85.1 | 72.7 | 67.4 | 63.5 | 60.2 | 59.6 |
| 47.5° | 3694.7 | 1282.4 | 179.4 | 121.1 | 93.6 | 74.0 | 62.8 | 57.0 | 51.1 | 47.8 | 47.1 |
| 50° | 4003.0 | 1214.3 | 159.1 | 105.4 | 81.8 | 62.8 | 52.4 | 45.2 | 39.9 | 36.7 | 36.7 |
| 52.5° | 4156.2 | 1125.3 | 140.7 | 91.6 | 68.7 | 53.0 | 42.6 | 34.0 | 31.4 | 28.1 | 28.1 |
| 55° | 4217.7 | 1057.2 | 122.4 | 77.9 | 57.0 | 43.9 | 33.4 | 26.2 | 24.2 | 22.3 | 21.6 |
| 57.5° | 4390.5 | 1037.6 | 106.7 | 66.1 | 47.1 | 34.7 | 25.5 | 19.6 | 18.3 | 15.7 | 15.7 |
| 60° | 4668.8 | 1047.4 | 92.3 | 56.3 | 38.0 | 26.8 | 19.0 | 15.1 | 13.7 | 11.1 | 11.1 |
| 62.5° | 4969.2 | 1035.0 | 77.9 | 48.4 | 29.5 | 19.6 | 13.1 | 11.1 | 11.1 | 6.5 | 5.9 |
| 65° | 5026.8 | 921.7 | 66.8 | 39.9 | 22.9 | 14.4 | 8.5 | 7.2 | 9.8 | 1.3 | 0.0 |
| 67.5° | *4665.5* | *714.8* | *57.6* | *30.8* | *17.0* | *11.1* | *6.5* | *3.3* | *8.5* | *0.0* | *0.0* |
| 70° | 3730.7 | 454.3 | 46.5 | 22.3 | 13.1 | 9.2 | 5.2 | 1.3 | 6.5 | 0.0 | 0.0 |
| 72.5° | 2638.1 | 263.8 | 36.7 | 15.7 | 11.1 | 7.2 | 3.9 | 0.0 | 3.9 | 0.0 | 0.0 |
| 75° | 1334.1 | 140.7 | 22.9 | 11.8 | 8.5 | 5.2 | 2.6 | 0.0 | 0.7 | 0.0 | 0.0 |
| 77.5° | 288.7 | 65.5 | 14.4 | 8.5 | 5.9 | 3.3 | 1.3 | 0.0 | 0.0 | 0.0 | 0.0 |
| 80° | 62.8 | 28.8 | 9.2 | 5.2 | 3.3 | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 82.5° | 22.9 | 15.1 | 4.6 | 2.6 | 1.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 85° | 12.4 | 7.9 | 2.6 | 1.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 87.5° | 6.5 | 2.6 | 0.7 | 0.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 90° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

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

Report Prepared for

Cooper Lighting Solutions

MCGRAW EDISON

Report Number: SP1-2408-195-9

Test Date: 08/07/2024

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

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

Report Generated By FNC07603 / LDUCLS01DT446
Version: v7.04

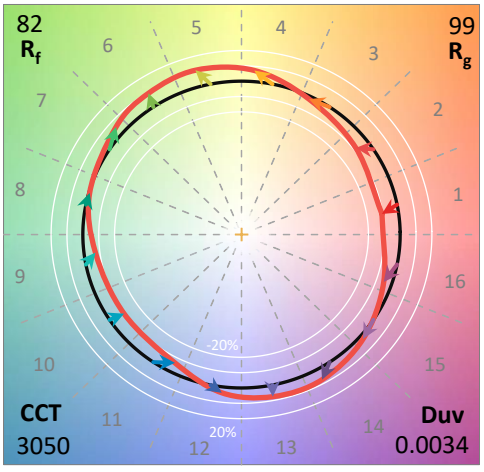
## Test Information

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

## Spectral Parameters

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

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




## Test Conditions

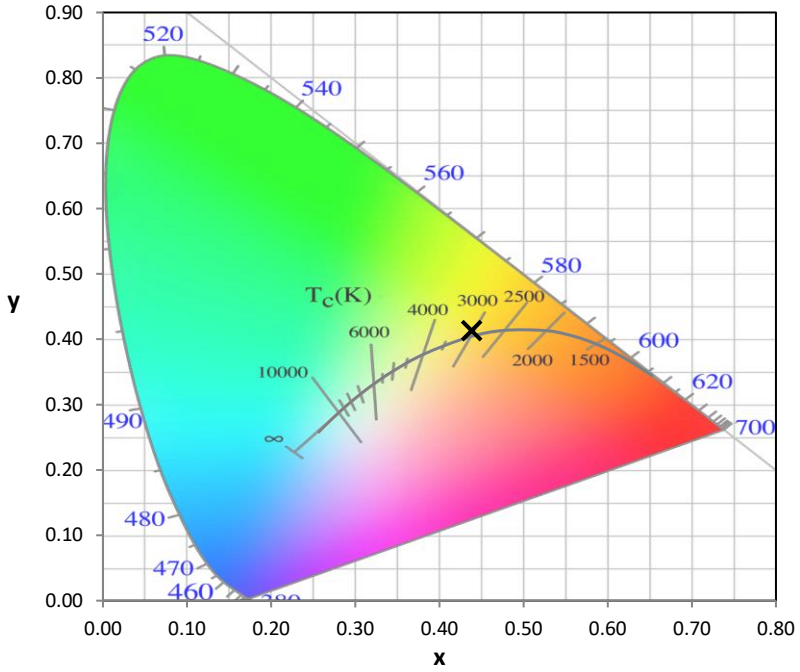
| | |
|---|---|
| Stabilization Time: | 20M |
| Operation Time: | 1H 20M |
| Sphere Temperature (°C): | 24.2 |

REPORT NUMBER: SP1-2408-195-9

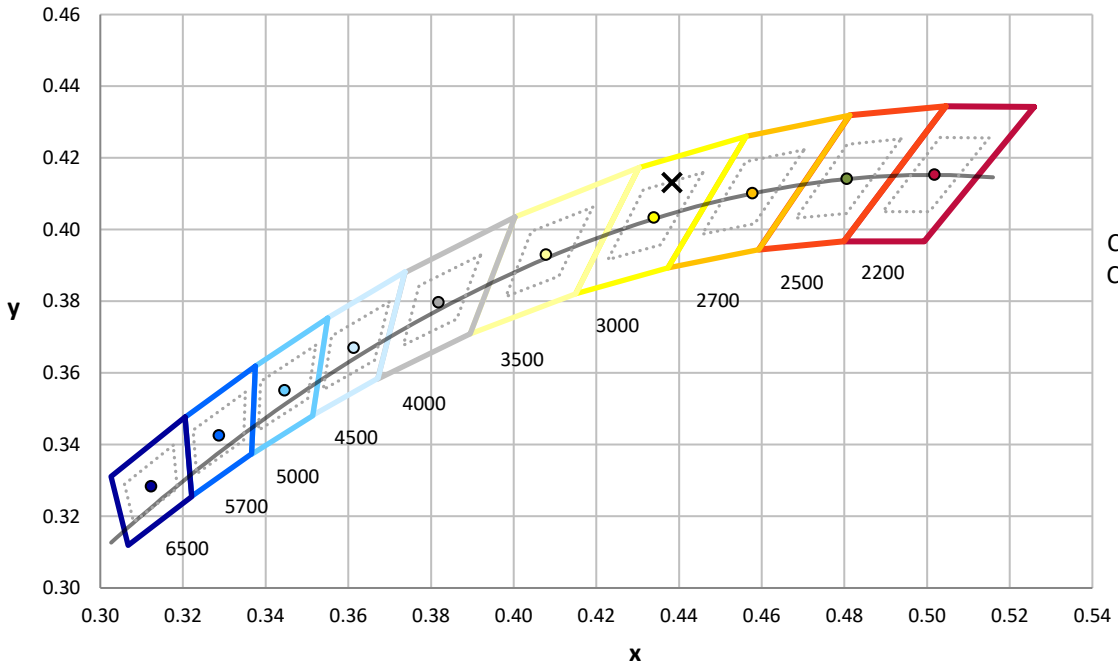
| Measurement and Test Equipment | | | |
|---|---|---|---|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 6/18/2024 | 12/18/2024 |
| Power Meter | INXT2011004 | 2/8/2024 | 2/8/2025 |
| AC Power Source | IN0063 | 10/24/2023 | 10/24/2024 |
| DC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

REPORT NUMBER: SP1-2408-195-9

## CIE 1931 Chromaticity Diagram




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




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

Point lies inside the ANSI 3000K 4-step quadrangle

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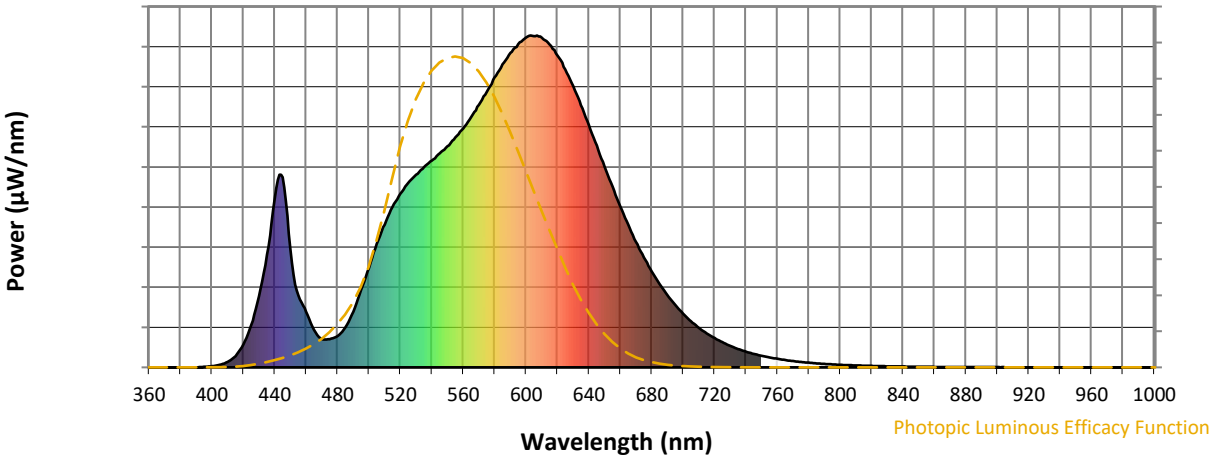
## Photopic Flux vs. Wavelength




## Photopic Lumens: NR

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

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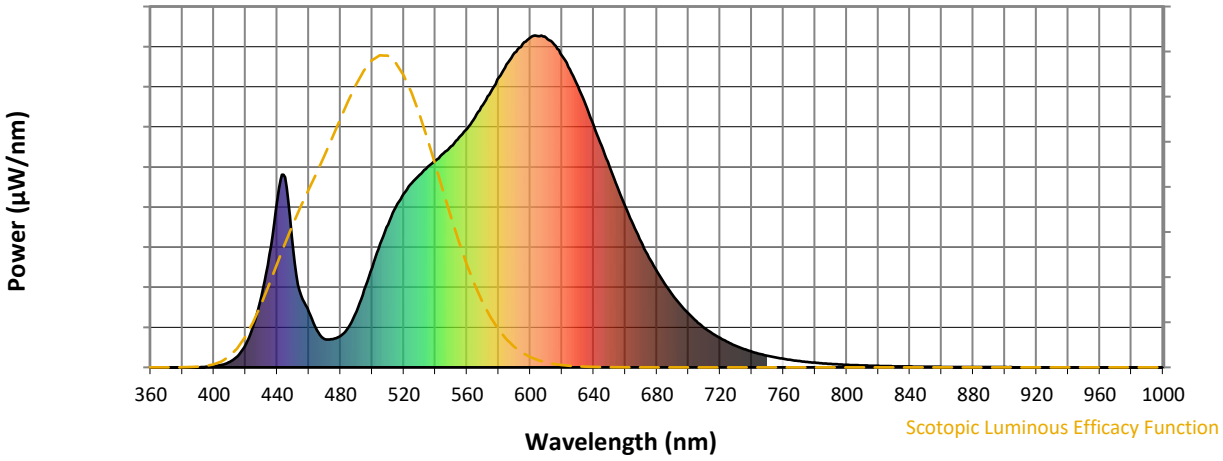
## Scotopic Flux vs. Wavelength




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

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

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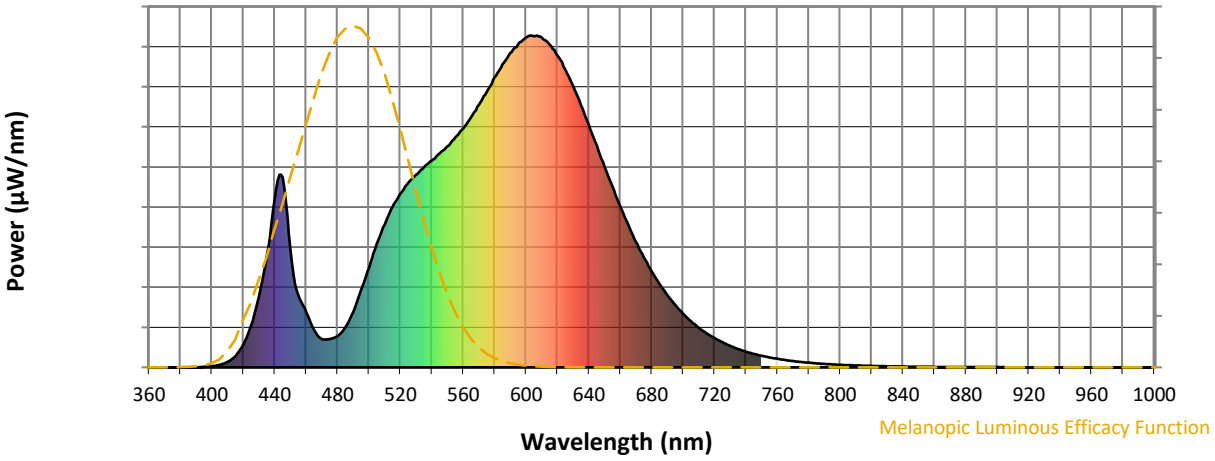
## Melanopic Flux vs. Wavelength




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

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

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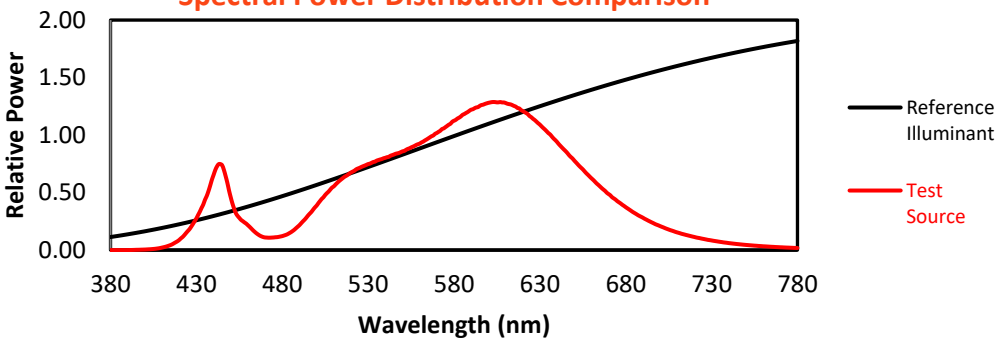
# TM-30-18

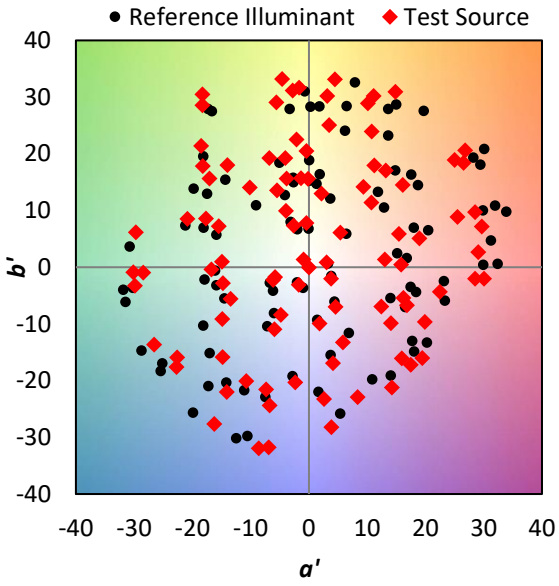
## Summary

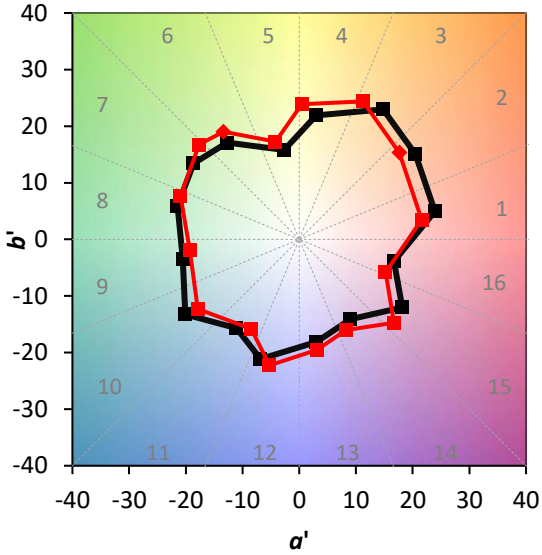
$R_f$ = 81.5
$R_g$ = 99.2
CIE $R_a$ = 81.0
$R_9$ = 7.1

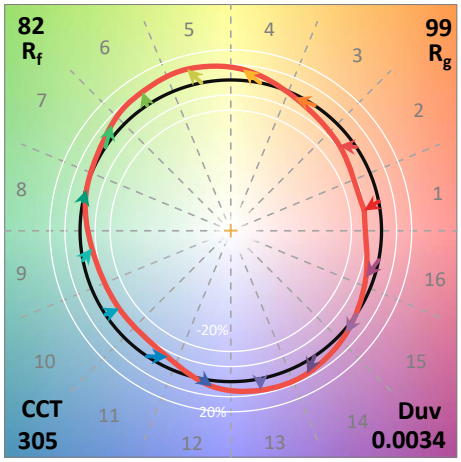
## Spectral Power Distribution Comparison

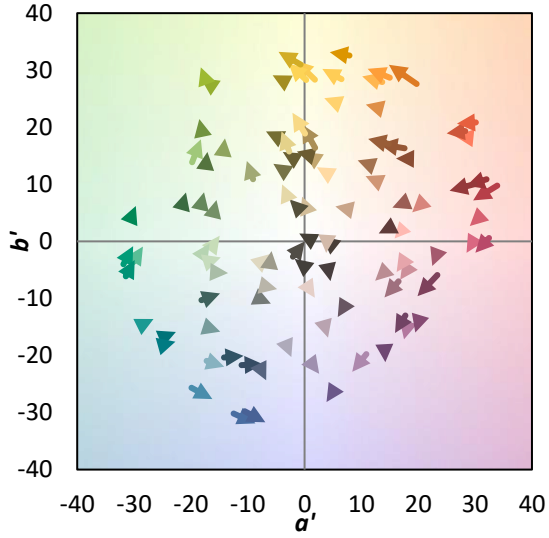



## Color Vector Graphics



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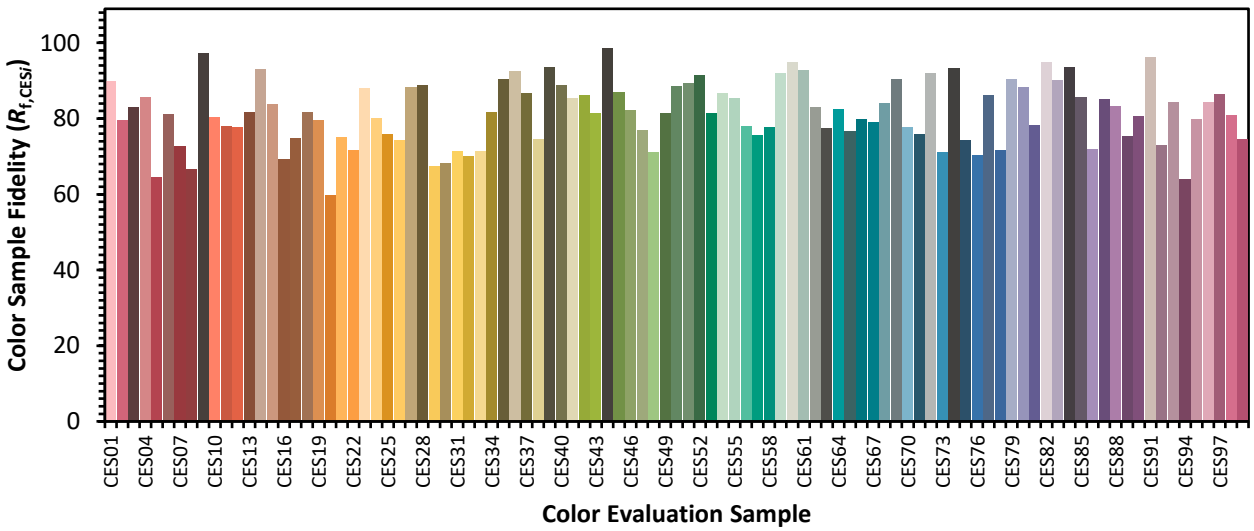
# TM-30-18

**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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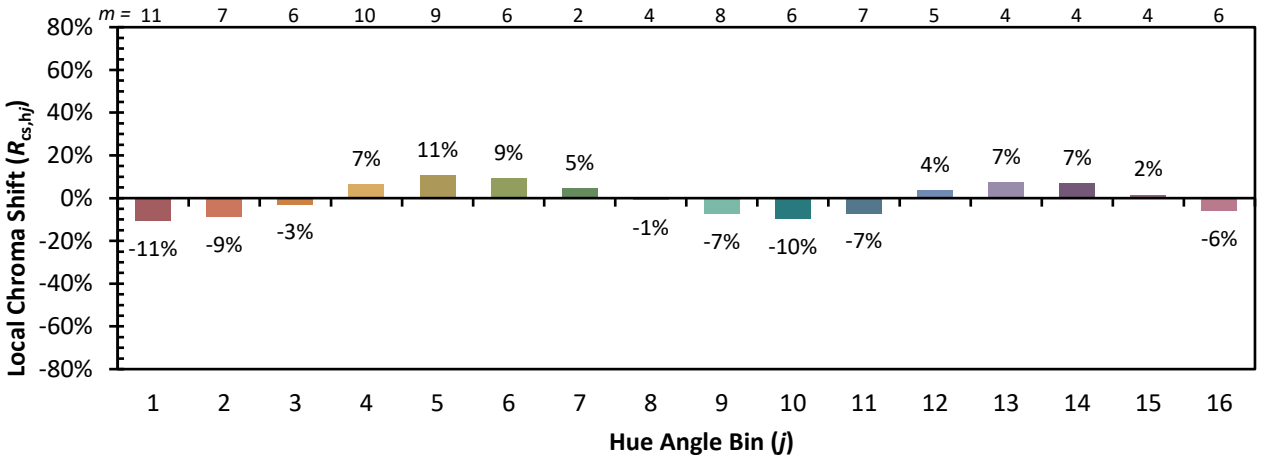
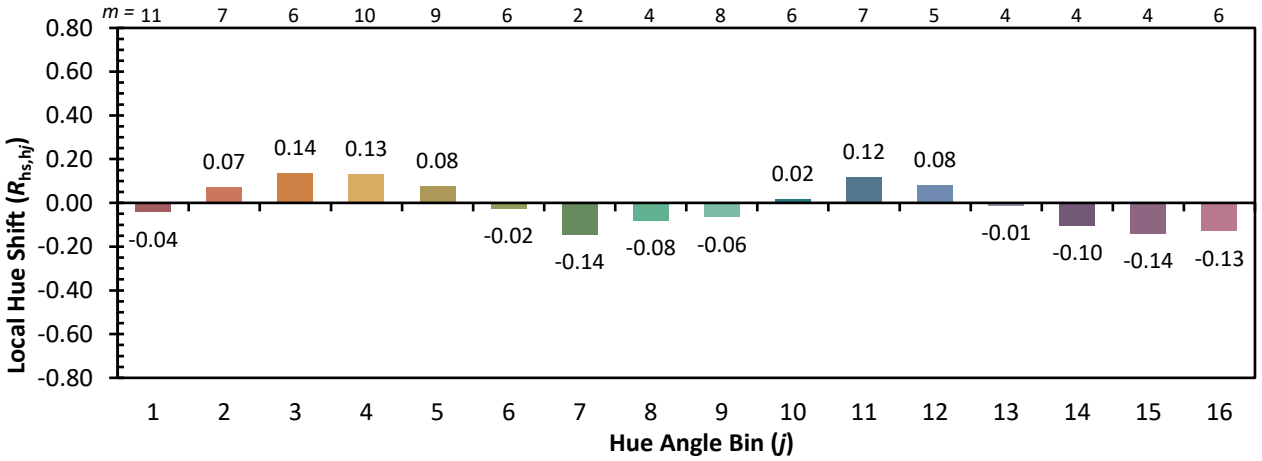
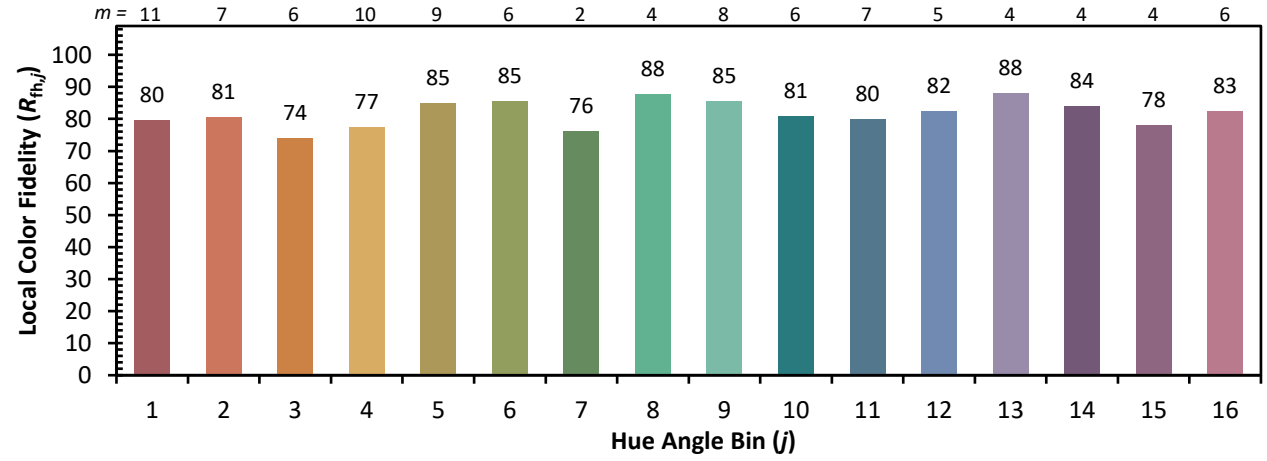
## Color Rendition by Hue-Angle Bin



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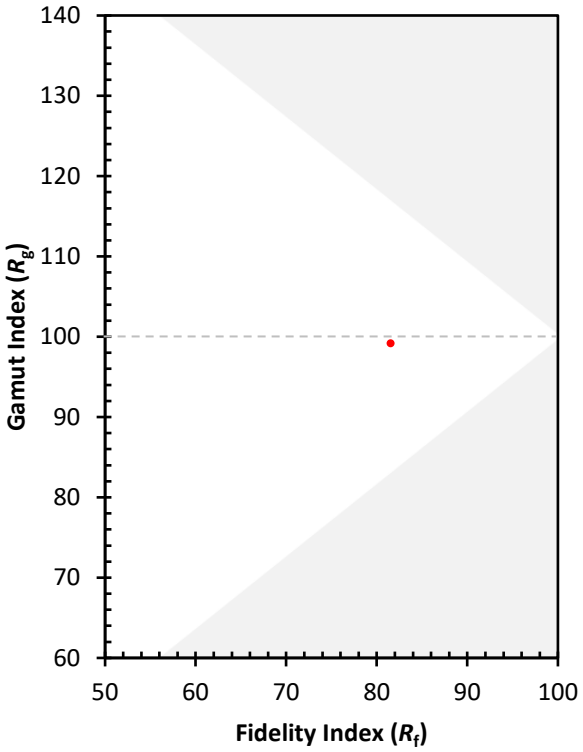
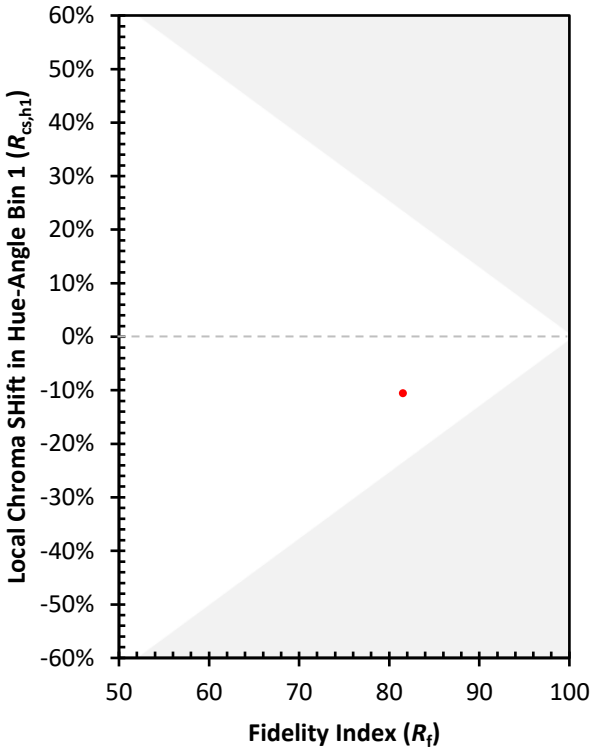
## TM-30-18

### Measure Comparisons

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