Cooper Lighting Solutions Photometric Lab
1121 Highway 74 South
Peachtree City, GA 30269

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Peachtree City, GA 30269

Scaled data based on original data using

LM-79-2024 Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Test Report Prepared for

Cooper Lighting Solutions

Brand: McGRAW-EDISON

Report Number: P1500740

Luminaire Tested: GSS-SB4D-827-U-T4LG

Issue Date: 07/20/2026

Cooper Lighting Solutions Photometric Lab
1121 Highway 74 South
Peachtree City, GA 30269

Scaled Data Report

**Test Information**

| | |
|---|---|
| Test Method: | LM-79-2024 |
| Report Number: | P1500740 |
| Test Lab: | INNOVATION CENTER(G1) |
| Issue Date: | 7/20/2026 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS |
| Product Line: | McGRAW-EDISON |
| Catalog Number: | GSS-SB4D-827-U-T4LG |
| Description: | GALLEON II SLIM SITE HIGH DENSITY LED ARRAYS 4SQUARE 238W 80CRI 2700K FIXTURE w/ TYPE IV LOW GLARE DISTRIBUTION FIXTURE |
| Light Source: | (104) 2700K CCT, 80 CRI LEDS |
| Ballast/Driver: | ELECTRONIC DRIVER |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 27921.8 lumens |
| Efficiency: | N/A |
| Efficacy: | 117.3 lumens/watt |
| Luminous Opening: | Rectangular (W 1.5' x L: 1' x H: 0') |
| IES Classification: | Type III - Short |
| BUG Rating: | B3 - U0 - G3 |

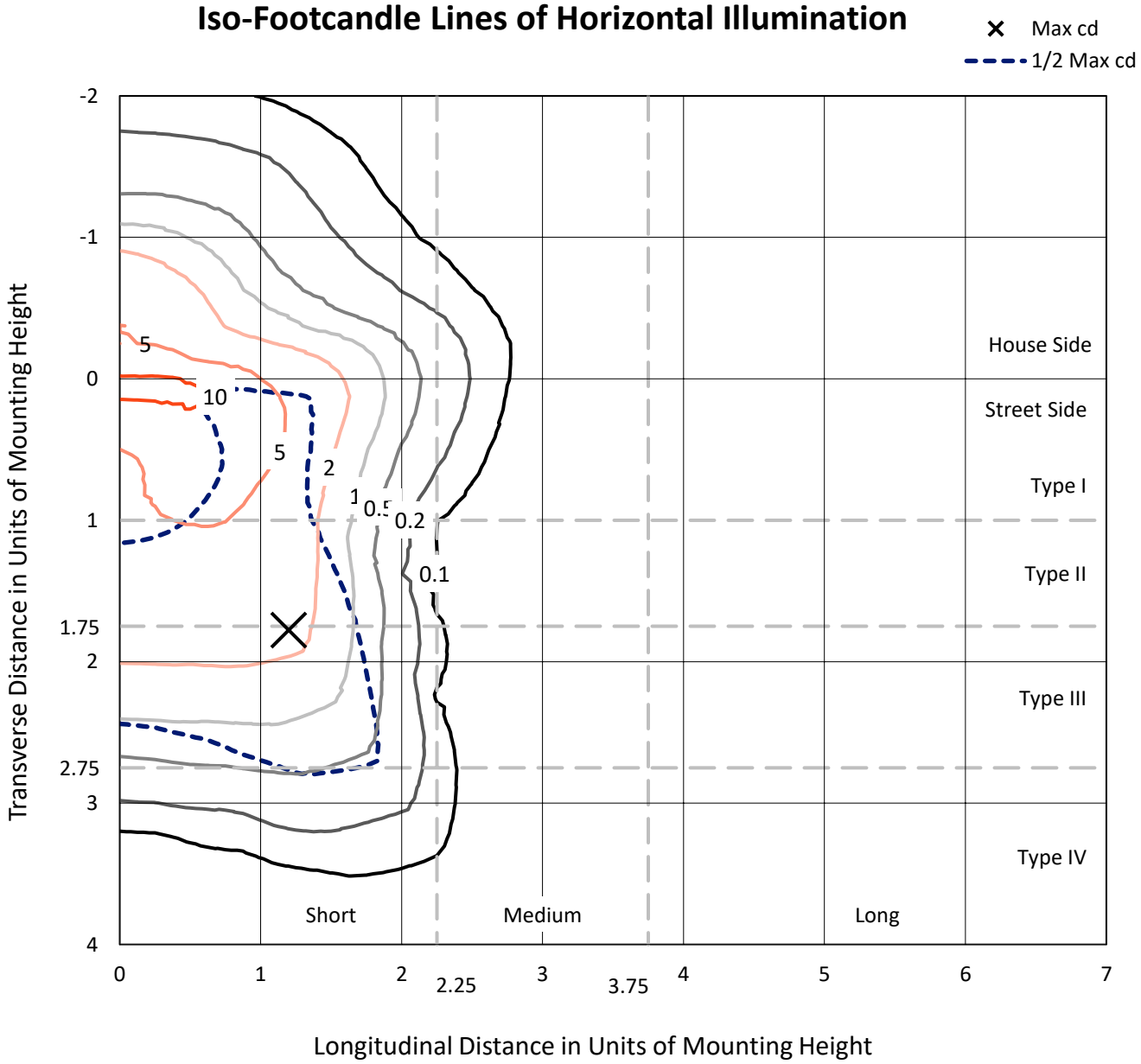
| | |
|---|---|
| Input Watts (W): | 238 |
| Input Voltage (V): | 120 |
| Input Current (Ain): | NR |
| Voltage Rise (V): | NR |
| Power Factor: | 0.98 |
| Total Harmonic Distortion (THDi): | -- |
| Frequency (hertz): | 60 |
| Stabilization Time: | NR |
| Operation Time: | NR |
| Ambient Temperature (°C): | NR |
| Test Distance: | 28.75 FT |

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Scaled Data Report

REPORT NUMBER: P1500740
CATALOG NUMBER: GSS-SB4D-827-U-T4LG

## Iso-Footcandle Lines of Horizontal Illumination



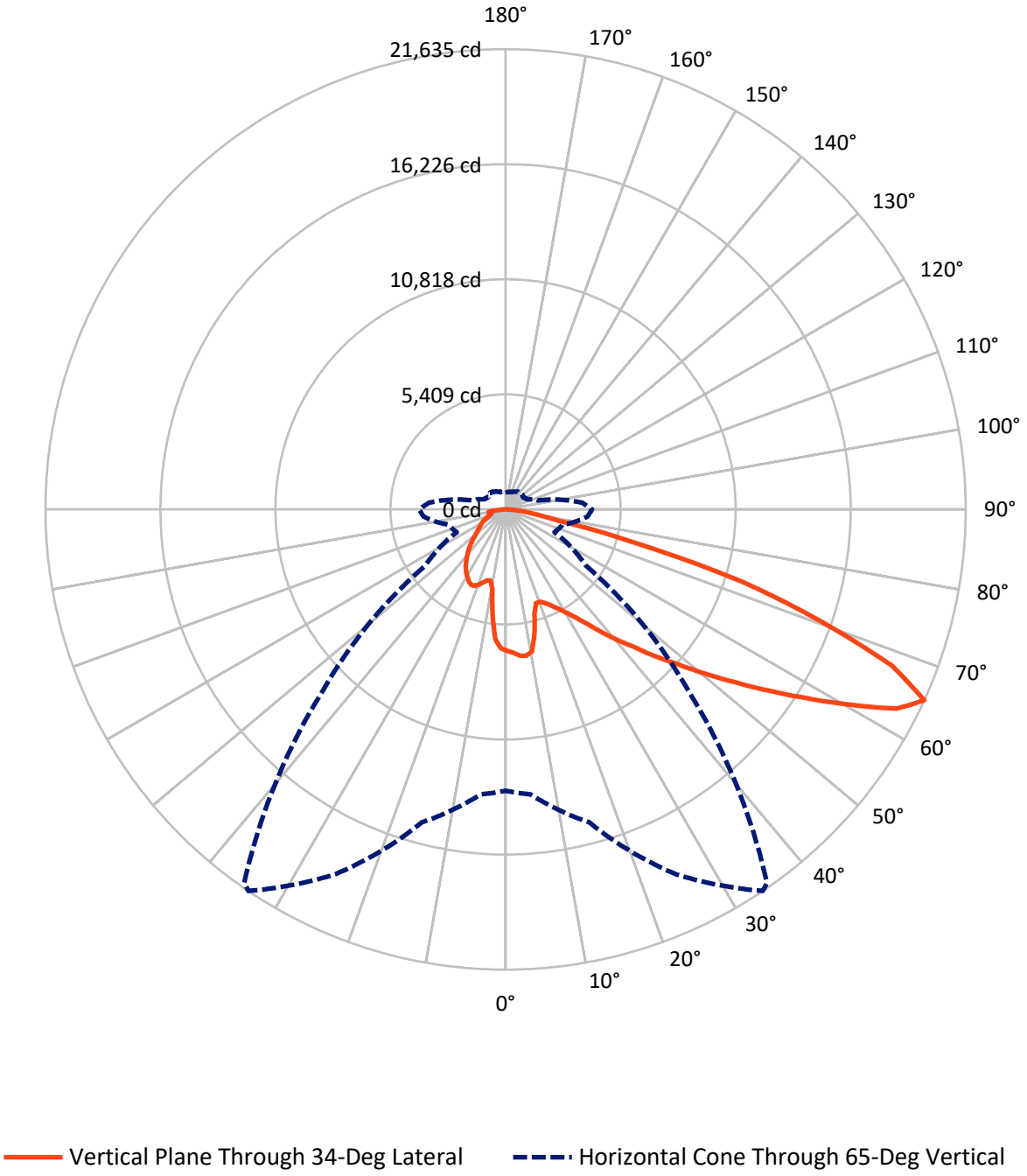

Based on 25 foot mounting height. Maximum calculated value = 11.3 fc
Type III - Short - N/A

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REPORT NUMBER: P1500740
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## Luminous Intensity Polar Plot



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Scaled Data Report

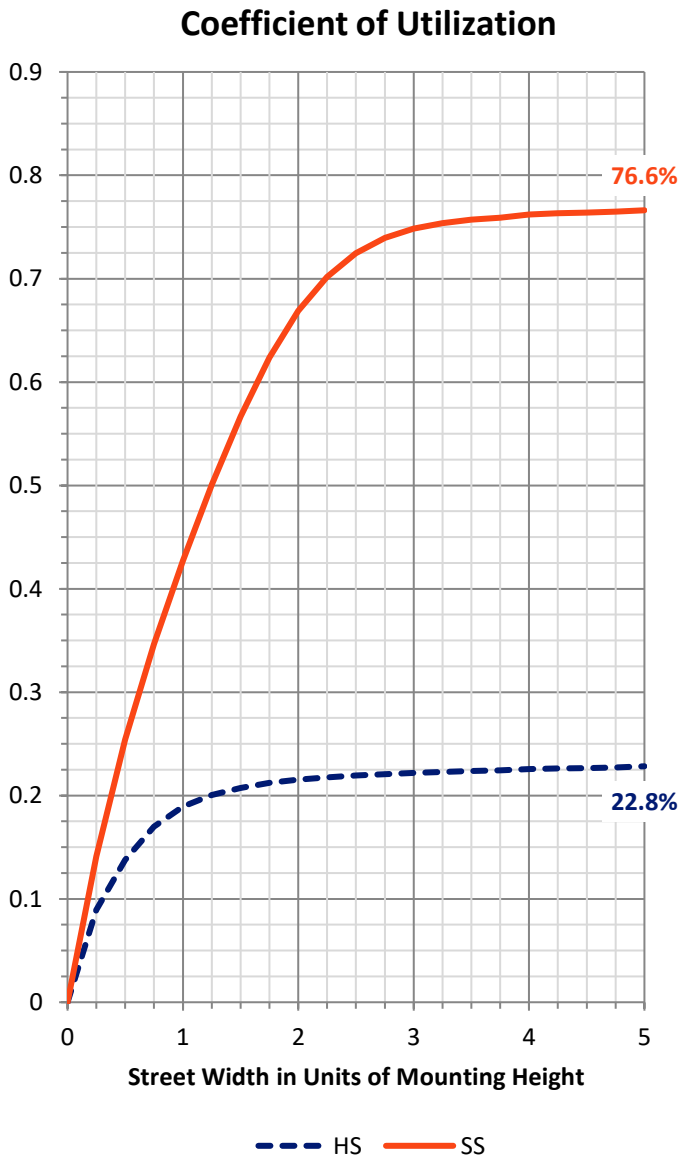
REPORT NUMBER: P1500740
CATALOG NUMBER: GSS-SB4D-827-U-T4LG

**FLUX DISTRIBUTION:**

| | | Downward | Upward | Total |
|---|---|---|---|---|
| **House Side** | Lumens | 6496.2 | 0.0 | 6496.2 |
| | % Fixture | 23.3 | 0.0 | 23.3 |
| **Street Side** | Lumens | 21425.6 | 0.0 | 21425.6 |
| | % Fixture | 76.7 | 0.0 | 76.7 |
| **Total** | Lumens | 27921.8 | 0.0 | 27921.8 |
| | % Fixture | 100.0 | 0.0 | 100.0 |

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 598.4 | 2.1 |
| 10°-20° | 1506.3 | 5.4 |
| 20°-30° | 2496.8 | 8.9 |
| 30°-40° | 3755.1 | 13.4 |
| 40°-50° | 5260.7 | 18.8 |
| 50°-60° | 6632.9 | 23.8 |
| 60°-70° | 5704.9 | 20.4 |
| 70°-80° | 1696.1 | 6.1 |
| 80°-90° | 270.6 | 1.0 |
| 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° | 27921.8 | 100.0 |
| 0°-180° | 27921.8 | 100.0 |



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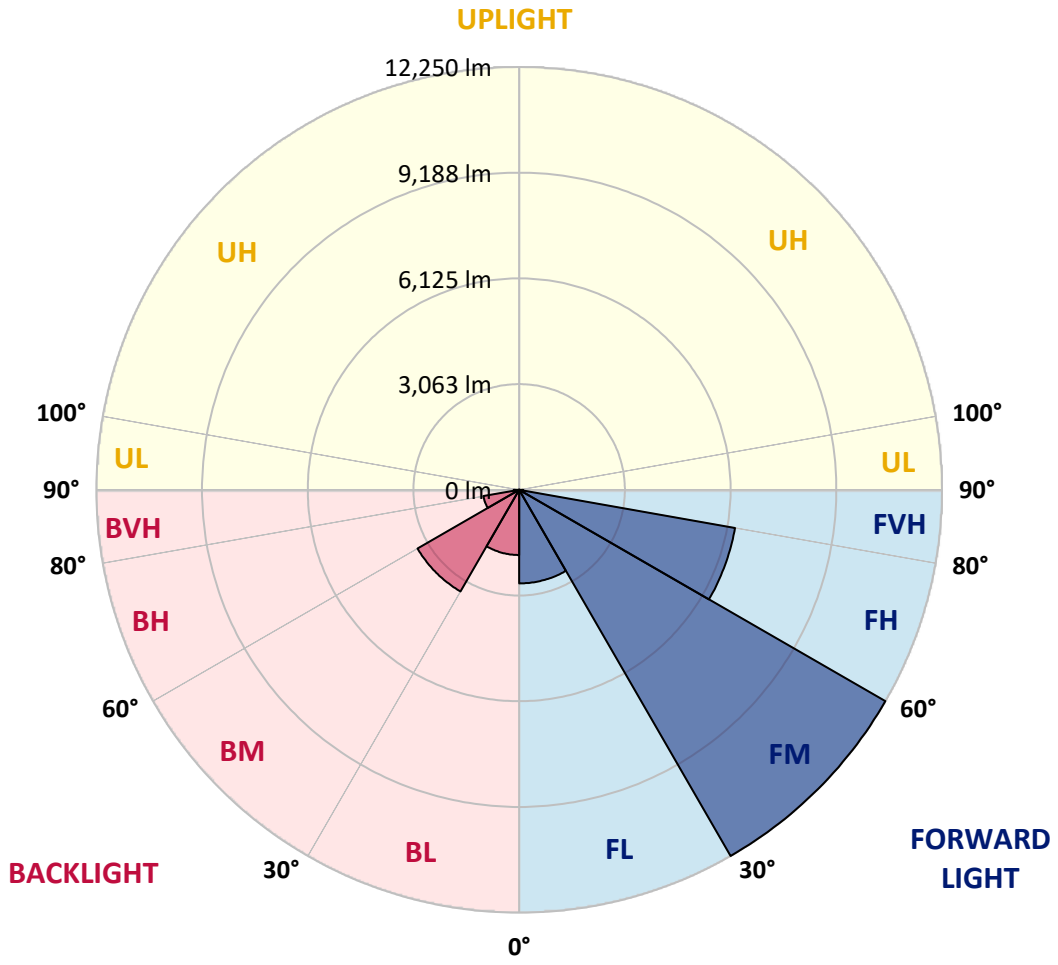
Scaled Data Report

REPORT NUMBER: P1500740
CATALOG NUMBER: GSS-SB4D-827-U-T4LG

## LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:

| Zone | | Lumens | % Fixture | Zone Rating/Lumen Limit B | U | G |
|---|---|---|---|---|---|---|
| FL | (0°-30°) | 2711.4 | 9.7 | | | |
| FM | (30°-60°) | 12250.1 | 43.9 | | | |
| FH | (60°-80°) | 6349.6 | 22.7 | | | G3/7500 |
| FVH | (80°-90°) | 114.5 | 0.4 | | | G2/225 |
| BL | (0°-30°) | 1890.1 | 6.8 | B3/2500 | | |
| BM | (30°-60°) | 3398.6 | 12.2 | B3/5000 | | |
| BH | (60°-80°) | 1051.4 | 3.8 | B3/2500 | | G3/2500 |
| BVH | (80°-90°) | 156.1 | 0.6 | | | G2/225 |
| UL | (90°-100°) | 0.0 | 0.0 | | U0/0 | |
| UH | (100°-180°) | 0.0 | 0.0 | | U0/0 | |

**BUG Rating: B3-U0-G3**
Type III Short



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**CANDELA DISTRIBUTION (FULL):**

| | 0° | 5° | 15° | 25° | 34° | 35° | 45° | 55° | 65° | 75° | 85° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 6638.5 | 6638.5 | 6638.5 | 6638.5 | 6638.5 | 6638.5 | 6638.5 | 6638.5 | 6638.5 | 6638.5 | 6638.5 |
| 2.5° | 6765.0 | 6802.9 | 6758.6 | 6739.7 | 6746.0 | 6752.3 | 6720.7 | 6727.0 | 6689.1 | 6689.1 | 6657.5 |
| 5° | 6910.4 | 6916.7 | 6891.4 | 6910.4 | 6904.1 | 6897.7 | 6897.7 | 6891.4 | 6809.2 | 6790.2 | 6758.6 |
| 7.5° | 6828.2 | 6853.5 | 6866.1 | 6935.7 | 6954.6 | 6992.6 | 7017.9 | 7030.5 | 6967.3 | 6916.7 | 6834.5 |
| 10° | 6075.8 | 6094.8 | 6240.2 | 6556.3 | 6796.6 | 6840.8 | 7074.8 | 7207.5 | 7163.3 | 7138.0 | 6998.9 |
| 12.5° | 4855.6 | 4887.2 | 5051.6 | 5462.5 | 6025.2 | 6145.4 | 6891.4 | 7340.3 | 7441.5 | 7447.8 | 7245.5 |
| 15° | 4330.8 | 4330.8 | 4381.4 | 4615.3 | 5070.6 | 5165.4 | 6265.5 | 7378.2 | 7738.6 | 7782.9 | 7536.3 |
| 17.5° | 4223.4 | 4217.0 | 4248.6 | 4387.7 | 4628.0 | 4684.9 | 5544.7 | 7182.2 | 8092.7 | 8168.5 | 7852.4 |
| 20° | 4217.0 | 4198.1 | 4261.3 | 4419.4 | 4628.0 | 4678.6 | 5209.7 | 6840.8 | 8370.8 | 8611.1 | 8168.5 |
| 22.5° | 4223.4 | 4223.4 | 4311.9 | 4539.5 | 4779.7 | 4824.0 | 5272.9 | 6556.3 | 8598.5 | 9072.6 | 8503.6 |
| 25° | 4292.9 | 4280.3 | 4406.7 | 4684.9 | 5013.7 | 5045.3 | 5532.1 | 6543.7 | 8794.4 | 9591.1 | 8908.3 |
| 27.5° | 4406.7 | 4413.0 | 4583.7 | 4918.8 | 5291.8 | 5355.1 | 5892.5 | 6815.5 | 9034.7 | 10160.1 | 9300.2 |
| 30° | 4647.0 | 4653.3 | 4855.6 | 5197.0 | 5626.9 | 5709.1 | 6309.7 | 7220.2 | 9376.1 | 10773.4 | 9723.8 |
| 32.5° | 4918.8 | 4950.4 | 5197.0 | 5595.3 | 6056.9 | 6101.1 | 6821.9 | 7827.1 | 9888.2 | 11386.6 | 10179.1 |
| 35° | 5374.0 | 5405.6 | 5683.8 | 6101.1 | 6613.2 | 6676.4 | 7447.8 | 8528.9 | 10514.1 | 12006.2 | 10533.1 |
| 37.5° | 5962.0 | 5987.3 | 6259.2 | 6765.0 | 7308.7 | 7371.9 | 8143.2 | 9275.0 | 11146.4 | 12499.4 | 10849.2 |
| 40° | 6663.8 | 6720.7 | 7011.5 | 7504.7 | 8054.7 | 8092.7 | 8901.9 | 9995.7 | 11829.2 | 12840.8 | 10975.7 |
| 42.5° | 7428.8 | 7485.7 | 7782.9 | 8326.6 | 8832.4 | 8946.2 | 9723.8 | 10760.7 | 12385.6 | 12992.5 | 10874.5 |
| 45° | 8408.8 | 8396.1 | 8674.3 | 9243.3 | 9837.6 | 9881.9 | 10602.7 | 11393.0 | 12720.7 | 12866.1 | 10773.4 |
| 47.5° | 9597.4 | 9610.0 | 9787.1 | 10248.6 | 10861.9 | 10963.0 | 11519.4 | 11936.7 | 12916.6 | 12764.9 | 10659.6 |
| 50° | 10937.7 | 10969.4 | 11121.1 | 11456.2 | 12113.7 | 12183.3 | 12347.6 | 12316.0 | 13036.8 | 12549.9 | 10703.8 |
| 52.5° | 12278.1 | 12297.1 | 12499.4 | 12853.4 | 13492.0 | 13542.6 | 13182.2 | 12606.9 | 12587.9 | 11683.8 | 10609.0 |
| 55° | 13378.2 | 13371.9 | 13732.2 | 14276.0 | 15053.6 | 15022.0 | 14004.1 | 12385.6 | 11184.3 | 10337.1 | 10185.4 |
| 57.5° | 14332.9 | 14370.8 | 14838.7 | 15780.7 | 16760.7 | 16735.4 | 14882.9 | 11215.9 | 9135.9 | 8743.9 | 9496.2 |
| 60° | 15192.7 | 15281.2 | 16160.0 | 17569.9 | 18651.1 | 18499.3 | 15041.0 | 9452.0 | 7106.4 | 6847.2 | 8130.6 |
| 62.5° | 14819.7 | 14984.1 | 16394.0 | 19144.2 | 20630.0 | 20294.9 | 14067.3 | 7321.3 | 4811.3 | 4577.4 | 5747.1 |
| 65° | 13226.4 | 13447.7 | 15237.0 | 18916.6 | 21635.2 | 21426.6 | 12297.1 | 4602.7 | 2535.3 | 2781.9 | 3869.3 |
| 67.5° | 11108.4 | 11374.0 | 13308.6 | 16994.6 | 19574.1 | 19125.2 | 9553.1 | 2421.5 | 1182.3 | 1833.5 | 2402.5 |
| 70° | 6088.5 | 6746.0 | 9622.7 | 14453.0 | 15679.5 | 15053.6 | 5525.8 | 1144.4 | 859.8 | 1144.4 | 1435.2 |
| 72.5° | 2288.7 | 2446.8 | 4172.8 | 9717.5 | 11614.2 | 10842.9 | 2099.0 | 739.7 | 720.8 | 847.2 | 1036.9 |
| 75° | 1100.1 | 1176.0 | 1814.5 | 4419.4 | 6341.4 | 5911.4 | 1030.6 | 550.0 | 619.6 | 663.9 | 752.4 |
| 77.5° | 657.5 | 708.1 | 1131.7 | 2566.9 | 2497.3 | 2295.0 | 632.2 | 423.6 | 499.5 | 474.2 | 442.6 |
| 80° | 392.0 | 436.2 | 689.1 | 1460.5 | 1504.7 | 1334.0 | 385.7 | 297.2 | 347.7 | 303.5 | 271.9 |
| 82.5° | 227.6 | 246.6 | 360.4 | 657.5 | 954.7 | 878.8 | 221.3 | 177.0 | 252.9 | 202.3 | 151.7 |
| 85° | 113.8 | 120.1 | 164.4 | 284.5 | 474.2 | 360.4 | 94.8 | 82.2 | 120.1 | 88.5 | 50.6 |
| 87.5° | 25.3 | 25.3 | 25.3 | 31.6 | 44.3 | 44.3 | 12.6 | 6.3 | 6.3 | 6.3 | 6.3 |
| 90° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

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Scaled Data Report

REPORT NUMBER: P1500740
CATALOG NUMBER: GSS-SB4D-827-U-T4LG

**CANDELA DISTRIBUTION (continued):**

| | 90° | 95° | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 6638.5 | 6638.5 | 6638.5 | 6638.5 | 6638.5 | 6638.5 | 6638.5 | 6638.5 | 6638.5 | 6638.5 | 6638.5 |
| 2.5° | 6651.2 | 6663.8 | 6619.5 | 6569.0 | 6556.3 | 6518.4 | 6531.0 | 6505.7 | 6467.8 | 6474.1 | 6480.5 |
| 5° | 6714.4 | 6689.1 | 6600.6 | 6486.8 | 6385.6 | 6271.8 | 6139.0 | 5987.3 | 5879.8 | 5835.6 | 5873.5 |
| 7.5° | 6771.3 | 6746.0 | 6594.3 | 6341.4 | 6000.0 | 5525.8 | 5032.6 | 4583.7 | 4273.9 | 4160.1 | 4185.4 |
| 10° | 6929.3 | 6828.2 | 6550.0 | 6000.0 | 5184.4 | 4286.6 | 3787.1 | 3508.9 | 3414.1 | 3363.5 | 3369.8 |
| 12.5° | 7138.0 | 6998.9 | 6467.8 | 5405.6 | 4172.8 | 3603.8 | 3426.7 | 3363.5 | 3331.9 | 3319.3 | 3331.9 |
| 15° | 7390.9 | 7175.9 | 6271.8 | 4659.6 | 3704.9 | 3483.6 | 3445.7 | 3452.0 | 3452.0 | 3458.3 | 3458.3 |
| 17.5° | 7612.2 | 7277.1 | 5917.8 | 4122.2 | 3610.1 | 3546.9 | 3584.8 | 3616.4 | 3616.4 | 3622.7 | 3616.4 |
| 20° | 7814.5 | 7327.7 | 5462.5 | 3894.6 | 3629.1 | 3660.7 | 3749.2 | 3780.8 | 3787.1 | 3780.8 | 3780.8 |
| 22.5° | 8029.4 | 7359.3 | 5007.3 | 3768.1 | 3673.3 | 3768.1 | 3863.0 | 3907.2 | 3919.9 | 3926.2 | 3932.5 |
| 25° | 8238.1 | 7296.0 | 4634.3 | 3667.0 | 3654.3 | 3787.1 | 3894.6 | 3951.5 | 3964.1 | 3964.1 | 3970.5 |
| 27.5° | 8446.7 | 7277.1 | 4381.4 | 3534.2 | 3565.8 | 3673.3 | 3799.8 | 3875.6 | 3926.2 | 3932.5 | 3938.9 |
| 30° | 8687.0 | 7220.2 | 4141.2 | 3357.2 | 3369.8 | 3502.6 | 3635.4 | 3768.1 | 3869.3 | 3913.6 | 3913.6 |
| 32.5° | 8851.4 | 7163.3 | 3926.2 | 3167.5 | 3167.5 | 3306.6 | 3471.0 | 3635.4 | 3780.8 | 3869.3 | 3888.3 |
| 35° | 9009.4 | 7112.7 | 3736.5 | 2977.8 | 2984.2 | 3116.9 | 3287.6 | 3464.7 | 3648.0 | 3755.5 | 3806.1 |
| 37.5° | 9091.6 | 7062.1 | 3603.8 | 2832.4 | 2807.1 | 2946.2 | 3060.0 | 3205.5 | 3401.4 | 3578.5 | 3622.7 |
| 40° | 9110.6 | 7062.1 | 3591.1 | 2731.3 | 2623.8 | 2781.9 | 2832.4 | 2933.6 | 3110.6 | 3300.3 | 3369.8 |
| 42.5° | 8984.1 | 6992.6 | 3654.3 | 2668.0 | 2434.1 | 2547.9 | 2604.8 | 2655.4 | 2769.2 | 2927.3 | 2984.2 |
| 45° | 8832.4 | 6897.7 | 3711.2 | 2579.5 | 2200.2 | 2288.7 | 2377.2 | 2383.5 | 2434.1 | 2472.1 | 2510.0 |
| 47.5° | 8705.9 | 6796.6 | 3610.1 | 2415.2 | 1959.9 | 2023.2 | 2118.0 | 2118.0 | 2092.7 | 2016.8 | 1991.6 |
| 50° | 8807.1 | 6828.2 | 3439.4 | 2181.2 | 1738.7 | 1782.9 | 1884.1 | 1827.2 | 1770.3 | 1612.2 | 1593.2 |
| 52.5° | 8895.6 | 6948.3 | 3237.1 | 1953.6 | 1549.0 | 1593.2 | 1694.4 | 1605.9 | 1492.1 | 1365.6 | 1346.7 |
| 55° | 8750.2 | 6954.6 | 2864.0 | 1700.7 | 1416.2 | 1454.2 | 1549.0 | 1441.5 | 1334.0 | 1258.2 | 1245.5 |
| 57.5° | 8313.9 | 6765.0 | 2472.1 | 1504.7 | 1302.4 | 1340.3 | 1428.9 | 1321.4 | 1220.2 | 1213.9 | 1245.5 |
| 60° | 7352.9 | 6101.1 | 2111.7 | 1378.3 | 1194.9 | 1239.2 | 1327.7 | 1213.9 | 1081.1 | 1024.2 | 1043.2 |
| 62.5° | 5551.1 | 4691.2 | 1808.2 | 1232.9 | 1093.8 | 1150.7 | 1213.9 | 1030.6 | 916.7 | 891.5 | 866.2 |
| 65° | *4059.0* | *3603.8* | *1624.9* | *1119.1* | *998.9* | *1068.5* | *1017.9* | *916.7* | *840.9* | *815.6* | *802.9* |
| 67.5° | 2623.8 | 2446.8 | 1397.2 | 1011.6 | 910.4 | 967.3 | 897.8 | 847.2 | 765.0 | 752.4 | 771.3 |
| 70° | 1605.9 | 1662.8 | 1169.6 | 891.5 | 821.9 | 809.3 | 821.9 | 771.3 | 682.8 | 701.8 | 727.1 |
| 72.5° | 1138.0 | 1226.5 | 1005.3 | 777.7 | 701.8 | 676.5 | 733.4 | 701.8 | 638.6 | 657.5 | 682.8 |
| 75° | 815.6 | 910.4 | 828.2 | 638.6 | 594.3 | 581.7 | 682.8 | 701.8 | 657.5 | 670.2 | 689.1 |
| 77.5° | 480.5 | 581.7 | 588.0 | 493.1 | 448.9 | 518.4 | 727.1 | 809.3 | 777.7 | 739.7 | 720.8 |
| 80° | 309.8 | 347.7 | 417.3 | 316.1 | 316.1 | 448.9 | 796.6 | 986.3 | 847.2 | 752.4 | 739.7 |
| 82.5° | 158.1 | 183.3 | 271.9 | 202.3 | 189.7 | 335.1 | 784.0 | 942.0 | 935.7 | 834.6 | 815.6 |
| 85° | 44.3 | 56.9 | 126.4 | 88.5 | 75.9 | 177.0 | 588.0 | 708.1 | 632.2 | 461.5 | 467.9 |
| 87.5° | 6.3 | 6.3 | 0.0 | 0.0 | 6.3 | 25.3 | 69.5 | 12.6 | 12.6 | 12.6 | 12.6 |
| 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: SP1-2407-184-8

Test Date: 10/10/2024

Luminaire Tested: GSS-SB1A-827-U-5WQ

Data in this report applies to families of products including GSS-SB1A-827-U-5WQ

Report Generated By FNC07603 / LDUCLS01DT446
Version: v7.04

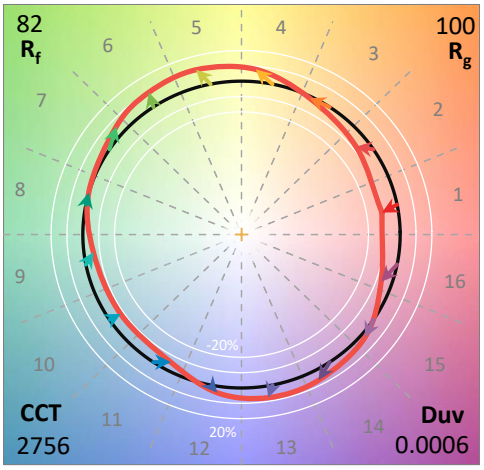
## Test Information

| | |
|---|---|
| Test Method: | LM-79-2019 |
| Report Number: | SP1-2407-184-8 |
| Test Lab: | COOPER LIGHTING SOLUTIONS |
| Photometer: | SP1 - 76IN SPHERE |
| Measurement Geometry: | 4π |
| Issue Date: | 10/15/2024 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS |
| Product Line: | McGraw-Edison |
| Catalog Number: | **GSS-SB1A-827-U-5WQ** |
| Description: | GALLEON II SITE SLIM 1SQ 350MA 5WQ HIGH DENSITY LIGHTSQUARE WITH 80 CRI 2700K CCT 26 LEDS |

## Spectral Parameters

| | |
|---|---|
| CCT (K): | 2756 |
| CIE u': | 0.2599 |
| CIE v': | 0.5271 |
| Duv: | 0.0006 |
| CIE x: | 0.4563 |
| CIE y: | 0.4112 |
| CIE z: | 0.1325 |
| Peak Wavelength (nm): | 609 |
| Dominant Wavelength (nm): | 583 |
| Purity: | 60.41121 |
| Rf: | 82.2 |
| Rg: | 99.9 |

| | |
|---|---|
| CRI (Ra): | 82.9 |
| R1: | 81.6 |
| R2: | 88.8 |
| R3: | 96.0 |
| R4: | 83.4 |
| R5: | 81.4 |
| R6: | 87.0 |
| R7: | 84.0 |
| R8: | 60.8 |
| R9: | 10.8 |
| R10: | 74.8 |
| R11: | 84.3 |
| R12: | 72.1 |
| R13: | 82.9 |
| R14: | 97.3 |
| R15: | 73.7 |




## Test Conditions

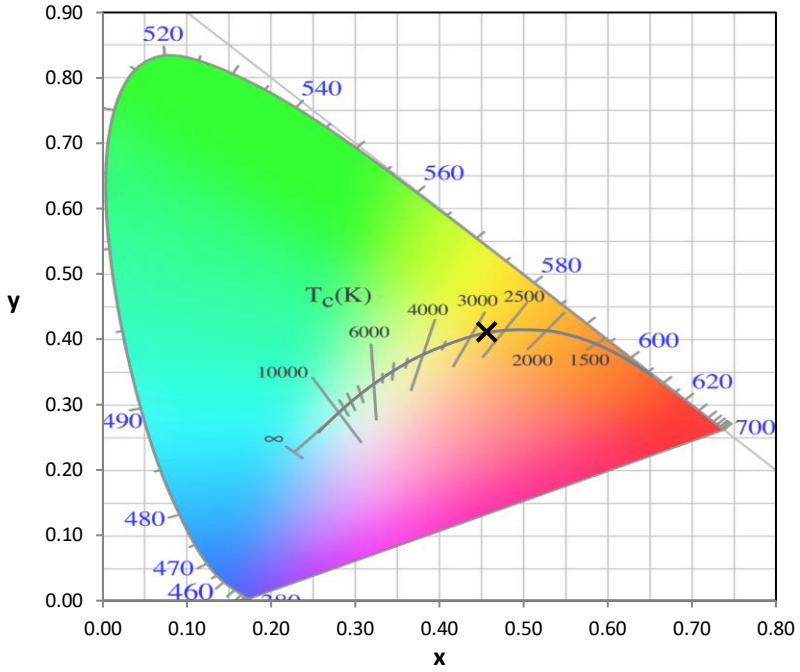
| | |
|---|---|
| Stabilization Time: | 29M |
| Operation Time: | 1H 29M |
| Sphere Temperature (°C): | 25.2 |

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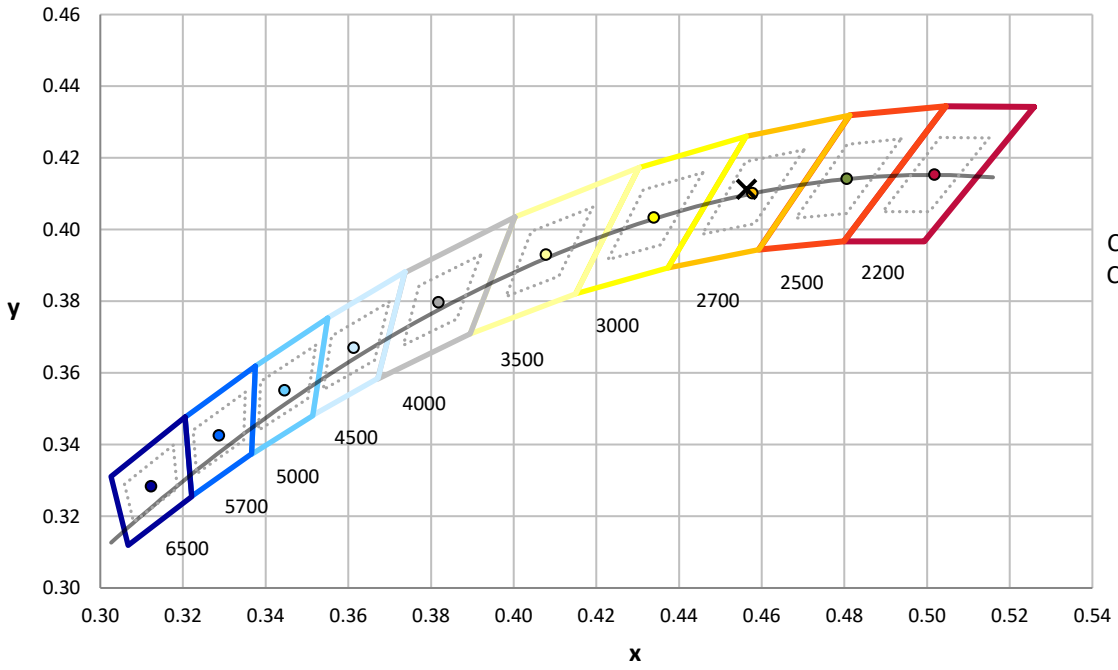
| Measurement and Test Equipment | | | |
|---|---|---|---|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | IN0058 | 6/18/2024 | 12/18/2024 |
| Power Meter | INXT2011004 | 2/8/2024 | 2/8/2025 |
| AC Power Source | IN0063 | 10/24/2023 | 10/24/2024 |
| DC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

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## CIE 1931 Chromaticity Diagram




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

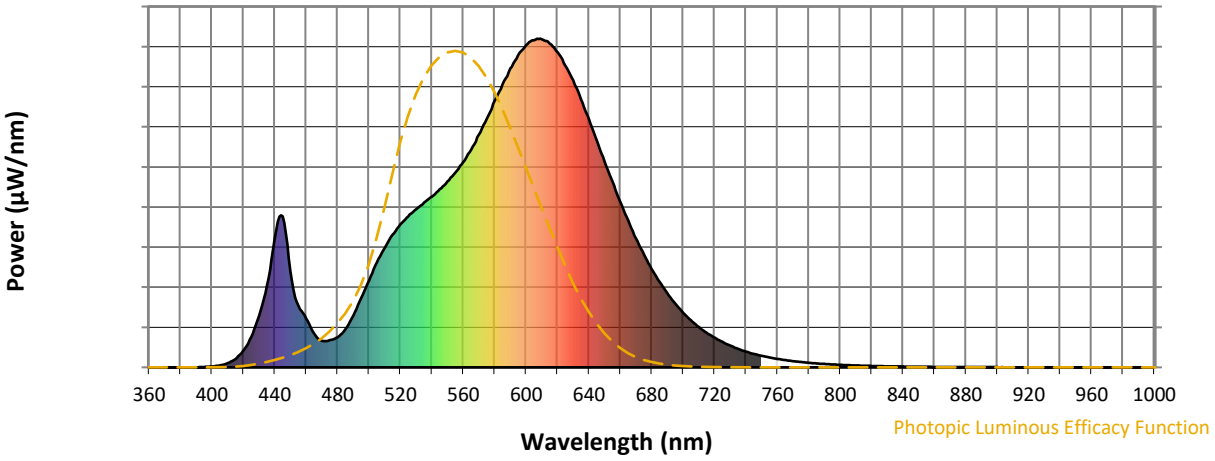



CCT = 2756K
CIE x = 0.4563
CIE y = 0.4112
Duv = 0.0006

Point lies inside the ANSI 2700K 4-step quadrangle

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## Photopic Flux vs. Wavelength

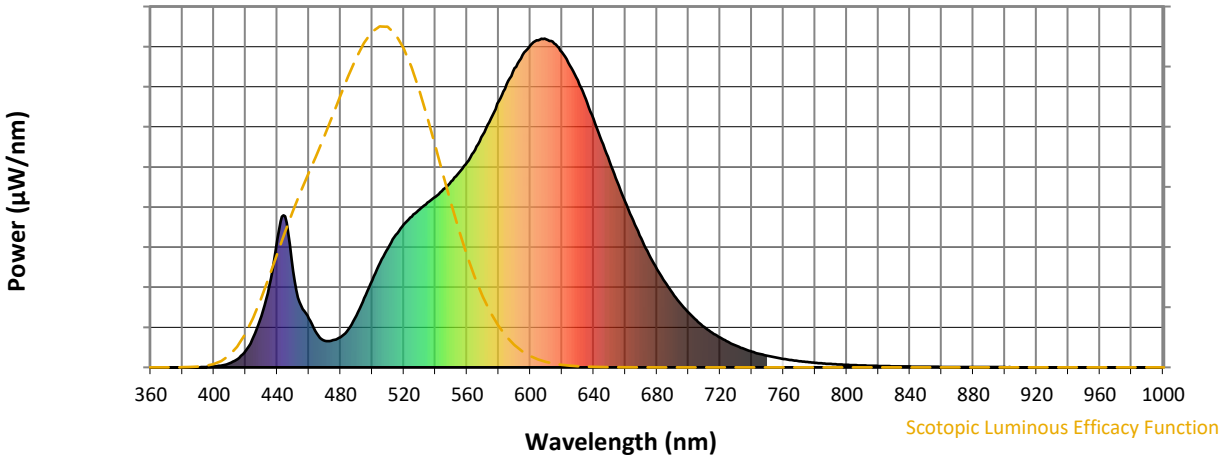



## Photopic Lumens: NR

| 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 | 158 | NR | 620 | 959 | NR | 750 | 35 | NR | 880 | 1 | NR |
| 365 | 0 | NR | 495 | 211 | NR | 625 | 918 | NR | 755 | 30 | NR | 885 | 1 | NR |
| 370 | 0 | NR | 500 | 264 | NR | 630 | 873 | NR | 760 | 26 | NR | 890 | 1 | NR |
| 375 | 0 | NR | 505 | 318 | NR | 635 | 816 | NR | 765 | 22 | NR | 895 | 1 | NR |
| 380 | 0 | NR | 510 | 363 | NR | 640 | 755 | NR | 770 | 19 | NR | 900 | 1 | NR |
| 385 | 0 | NR | 515 | 403 | NR | 645 | 689 | NR | 775 | 16 | NR | 905 | 1 | NR |
| 390 | 0 | NR | 520 | 435 | NR | 650 | 626 | NR | 780 | 14 | NR | 910 | 0 | NR |
| 395 | 1 | NR | 525 | 459 | NR | 655 | 564 | NR | 785 | 12 | NR | 915 | 0 | NR |
| 400 | 3 | NR | 530 | 481 | NR | 660 | 503 | NR | 790 | 10 | NR | 920 | 0 | NR |
| 405 | 6 | NR | 535 | 501 | NR | 665 | 447 | NR | 795 | 9 | NR | 925 | 0 | NR |
| 410 | 13 | NR | 540 | 519 | NR | 670 | 392 | NR | 800 | 8 | NR | 930 | 0 | NR |
| 415 | 26 | NR | 545 | 542 | NR | 675 | 343 | NR | 805 | 7 | NR | 935 | 0 | NR |
| 420 | 51 | NR | 550 | 565 | NR | 680 | 299 | NR | 810 | 6 | NR | 940 | 0 | NR |
| 425 | 93 | NR | 555 | 593 | NR | 685 | 260 | NR | 815 | 5 | NR | 945 | 0 | NR |
| 430 | 156 | NR | 560 | 624 | NR | 690 | 225 | NR | 820 | 4 | NR | 950 | 0 | NR |
| 435 | 250 | NR | 565 | 662 | NR | 695 | 194 | NR | 825 | 4 | NR | 955 | 0 | NR |
| 440 | 391 | NR | 570 | 707 | NR | 700 | 166 | NR | 830 | 3 | NR | 960 | 0 | NR |
| 445 | 460 | NR | 575 | 756 | NR | 705 | 143 | NR | 835 | 3 | NR | 965 | 0 | NR |
| 450 | 293 | NR | 580 | 810 | NR | 710 | 122 | NR | 840 | 2 | NR | 970 | 0 | NR |
| 455 | 188 | NR | 585 | 860 | NR | 715 | 105 | NR | 845 | 2 | NR | 975 | 0 | NR |
| 460 | 149 | NR | 590 | 910 | NR | 720 | 90 | NR | 850 | 2 | NR | 980 | 0 | NR |
| 465 | 103 | NR | 595 | 950 | NR | 725 | 77 | NR | 855 | 2 | NR | 985 | 0 | NR |
| 470 | 80 | NR | 600 | 980 | NR | 730 | 66 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 82 | NR | 605 | 995 | NR | 735 | 56 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 92 | NR | 610 | 998 | NR | 740 | 48 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 116 | NR | 615 | 985 | NR | 745 | 41 | NR | 875 | 1 | NR | | | |

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## Scotopic Flux vs. Wavelength

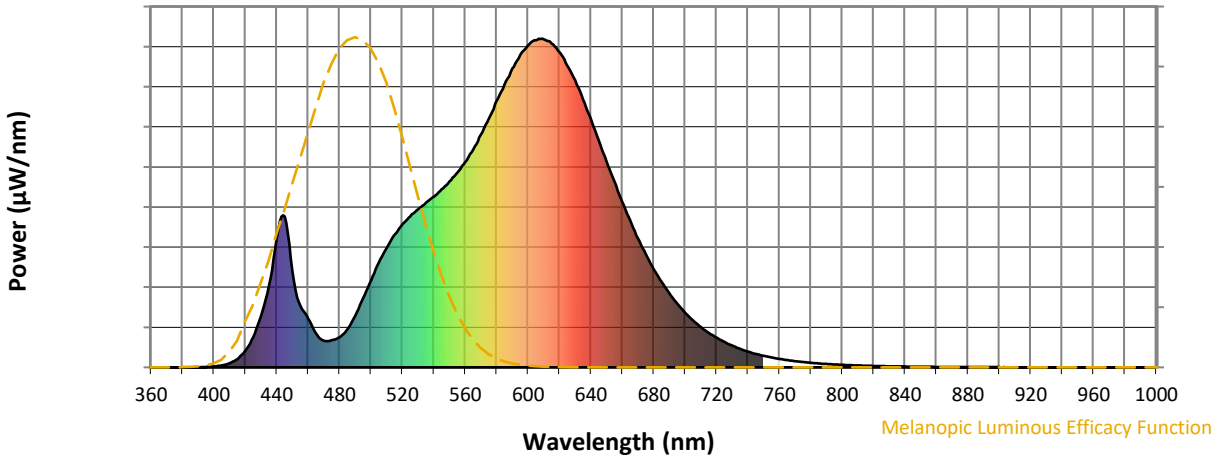



**Scotopic Lumens: NR** **S/P: 1.2**

| 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 | 158 | NR | 620 | 959 | NR | 750 | 35 | NR | 880 | 1 | NR |
| 365 | 0 | NR | 495 | 211 | NR | 625 | 918 | NR | 755 | 30 | NR | 885 | 1 | NR |
| 370 | 0 | NR | 500 | 264 | NR | 630 | 873 | NR | 760 | 26 | NR | 890 | 1 | NR |
| 375 | 0 | NR | 505 | 318 | NR | 635 | 816 | NR | 765 | 22 | NR | 895 | 1 | NR |
| 380 | 0 | NR | 510 | 363 | NR | 640 | 755 | NR | 770 | 19 | NR | 900 | 1 | NR |
| 385 | 0 | NR | 515 | 403 | NR | 645 | 689 | NR | 775 | 16 | NR | 905 | 1 | NR |
| 390 | 0 | NR | 520 | 435 | NR | 650 | 626 | NR | 780 | 14 | NR | 910 | 0 | NR |
| 395 | 1 | NR | 525 | 459 | NR | 655 | 564 | NR | 785 | 12 | NR | 915 | 0 | NR |
| 400 | 3 | NR | 530 | 481 | NR | 660 | 503 | NR | 790 | 10 | NR | 920 | 0 | NR |
| 405 | 6 | NR | 535 | 501 | NR | 665 | 447 | NR | 795 | 9 | NR | 925 | 0 | NR |
| 410 | 13 | NR | 540 | 519 | NR | 670 | 392 | NR | 800 | 8 | NR | 930 | 0 | NR |
| 415 | 26 | NR | 545 | 542 | NR | 675 | 343 | NR | 805 | 7 | NR | 935 | 0 | NR |
| 420 | 51 | NR | 550 | 565 | NR | 680 | 299 | NR | 810 | 6 | NR | 940 | 0 | NR |
| 425 | 93 | NR | 555 | 593 | NR | 685 | 260 | NR | 815 | 5 | NR | 945 | 0 | NR |
| 430 | 156 | NR | 560 | 624 | NR | 690 | 225 | NR | 820 | 4 | NR | 950 | 0 | NR |
| 435 | 250 | NR | 565 | 662 | NR | 695 | 194 | NR | 825 | 4 | NR | 955 | 0 | NR |
| 440 | 391 | NR | 570 | 707 | NR | 700 | 166 | NR | 830 | 3 | NR | 960 | 0 | NR |
| 445 | 460 | NR | 575 | 756 | NR | 705 | 143 | NR | 835 | 3 | NR | 965 | 0 | NR |
| 450 | 293 | NR | 580 | 810 | NR | 710 | 122 | NR | 840 | 2 | NR | 970 | 0 | NR |
| 455 | 188 | NR | 585 | 860 | NR | 715 | 105 | NR | 845 | 2 | NR | 975 | 0 | NR |
| 460 | 149 | NR | 590 | 910 | NR | 720 | 90 | NR | 850 | 2 | NR | 980 | 0 | NR |
| 465 | 103 | NR | 595 | 950 | NR | 725 | 77 | NR | 855 | 2 | NR | 985 | 0 | NR |
| 470 | 80 | NR | 600 | 980 | NR | 730 | 66 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 82 | NR | 605 | 995 | NR | 735 | 56 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 92 | NR | 610 | 998 | NR | 740 | 48 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 116 | NR | 615 | 985 | NR | 745 | 41 | NR | 875 | 1 | NR | | | |

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## Melanopic Flux vs. Wavelength




**Melanopic Lumens: NR** **M/P: 2.16**

| 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 | 158 | NR | 620 | 959 | NR | 750 | 35 | NR | 880 | 1 | NR |
| 365 | 0 | NR | 495 | 211 | NR | 625 | 918 | NR | 755 | 30 | NR | 885 | 1 | NR |
| 370 | 0 | NR | 500 | 264 | NR | 630 | 873 | NR | 760 | 26 | NR | 890 | 1 | NR |
| 375 | 0 | NR | 505 | 318 | NR | 635 | 816 | NR | 765 | 22 | NR | 895 | 1 | NR |
| 380 | 0 | NR | 510 | 363 | NR | 640 | 755 | NR | 770 | 19 | NR | 900 | 1 | NR |
| 385 | 0 | NR | 515 | 403 | NR | 645 | 689 | NR | 775 | 16 | NR | 905 | 1 | NR |
| 390 | 0 | NR | 520 | 435 | NR | 650 | 626 | NR | 780 | 14 | NR | 910 | 0 | NR |
| 395 | 1 | NR | 525 | 459 | NR | 655 | 564 | NR | 785 | 12 | NR | 915 | 0 | NR |
| 400 | 3 | NR | 530 | 481 | NR | 660 | 503 | NR | 790 | 10 | NR | 920 | 0 | NR |
| 405 | 6 | NR | 535 | 501 | NR | 665 | 447 | NR | 795 | 9 | NR | 925 | 0 | NR |
| 410 | 13 | NR | 540 | 519 | NR | 670 | 392 | NR | 800 | 8 | NR | 930 | 0 | NR |
| 415 | 26 | NR | 545 | 542 | NR | 675 | 343 | NR | 805 | 7 | NR | 935 | 0 | NR |
| 420 | 51 | NR | 550 | 565 | NR | 680 | 299 | NR | 810 | 6 | NR | 940 | 0 | NR |
| 425 | 93 | NR | 555 | 593 | NR | 685 | 260 | NR | 815 | 5 | NR | 945 | 0 | NR |
| 430 | 156 | NR | 560 | 624 | NR | 690 | 225 | NR | 820 | 4 | NR | 950 | 0 | NR |
| 435 | 250 | NR | 565 | 662 | NR | 695 | 194 | NR | 825 | 4 | NR | 955 | 0 | NR |
| 440 | 391 | NR | 570 | 707 | NR | 700 | 166 | NR | 830 | 3 | NR | 960 | 0 | NR |
| 445 | 460 | NR | 575 | 756 | NR | 705 | 143 | NR | 835 | 3 | NR | 965 | 0 | NR |
| 450 | 293 | NR | 580 | 810 | NR | 710 | 122 | NR | 840 | 2 | NR | 970 | 0 | NR |
| 455 | 188 | NR | 585 | 860 | NR | 715 | 105 | NR | 845 | 2 | NR | 975 | 0 | NR |
| 460 | 149 | NR | 590 | 910 | NR | 720 | 90 | NR | 850 | 2 | NR | 980 | 0 | NR |
| 465 | 103 | NR | 595 | 950 | NR | 725 | 77 | NR | 855 | 2 | NR | 985 | 0 | NR |
| 470 | 80 | NR | 600 | 980 | NR | 730 | 66 | NR | 860 | 1 | NR | 990 | 0 | NR |
| 475 | 82 | NR | 605 | 995 | NR | 735 | 56 | NR | 865 | 1 | NR | 995 | 0 | NR |
| 480 | 92 | NR | 610 | 998 | NR | 740 | 48 | NR | 870 | 1 | NR | 1000 | 0 | NR |
| 485 | 116 | NR | 615 | 985 | NR | 745 | 41 | NR | 875 | 1 | NR | | | |

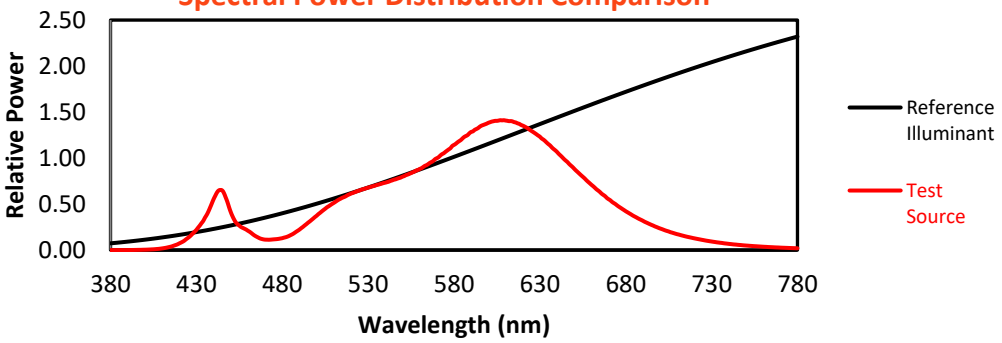
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**TM-30-18**

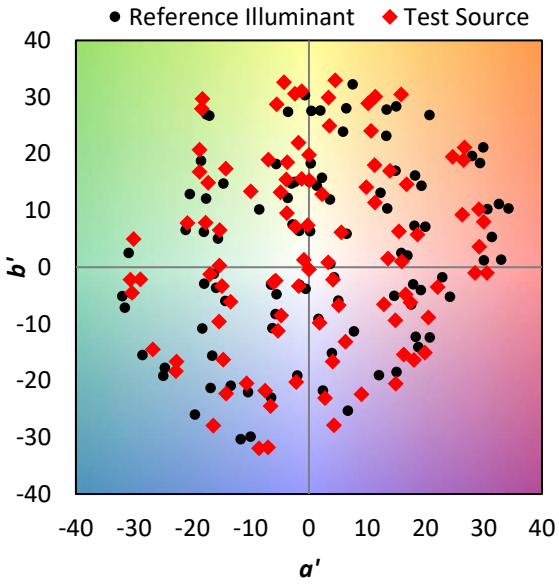
## Summary

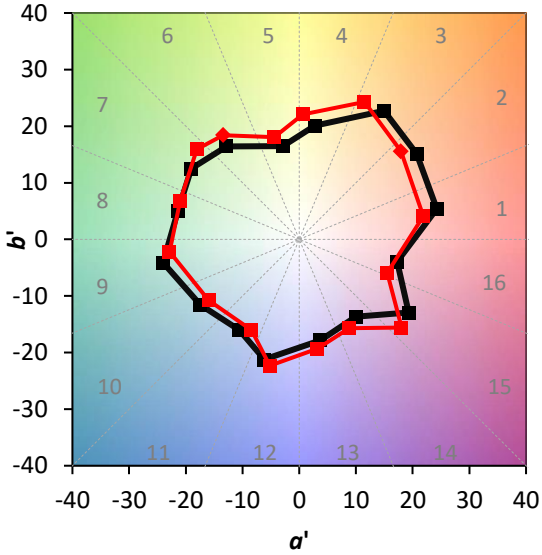
$R_f$ = 82.2
$R_g$ = 99.9
CIE $R_a$ = 82.9
$R_9$ = 10.8

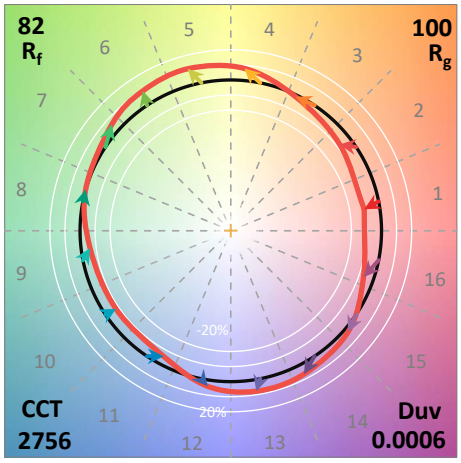
## Spectral Power Distribution Comparison

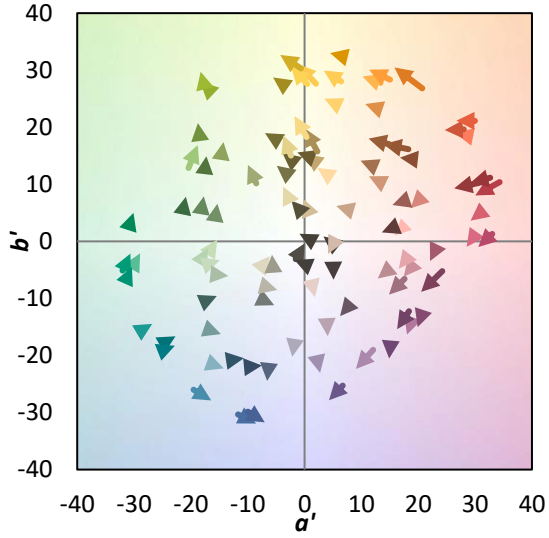



## Color Vector Graphics



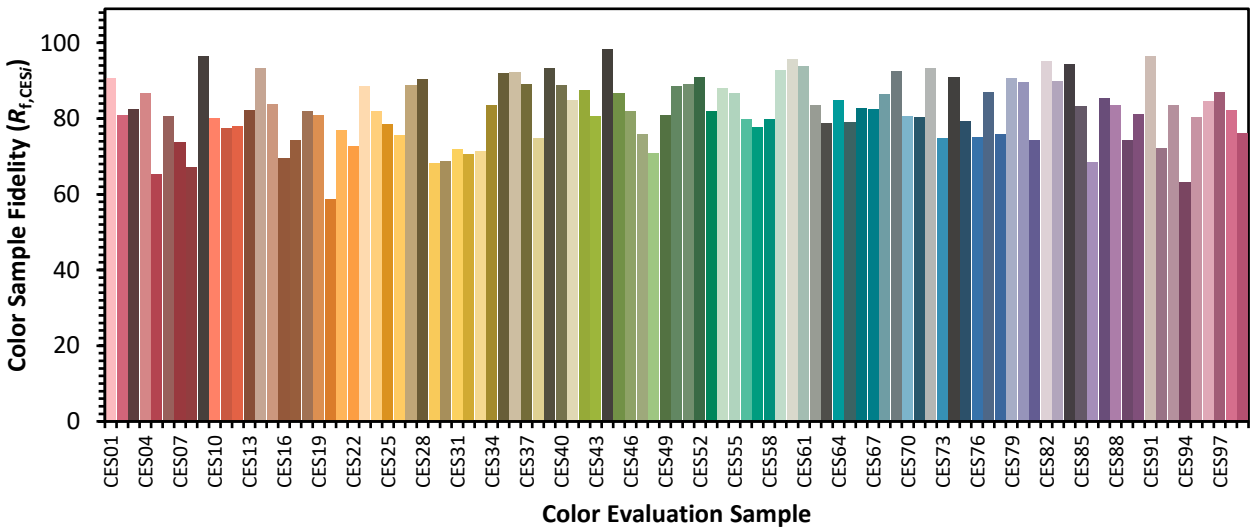



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**Individual Sample Fidelity Index ($R_{f,i}$)**

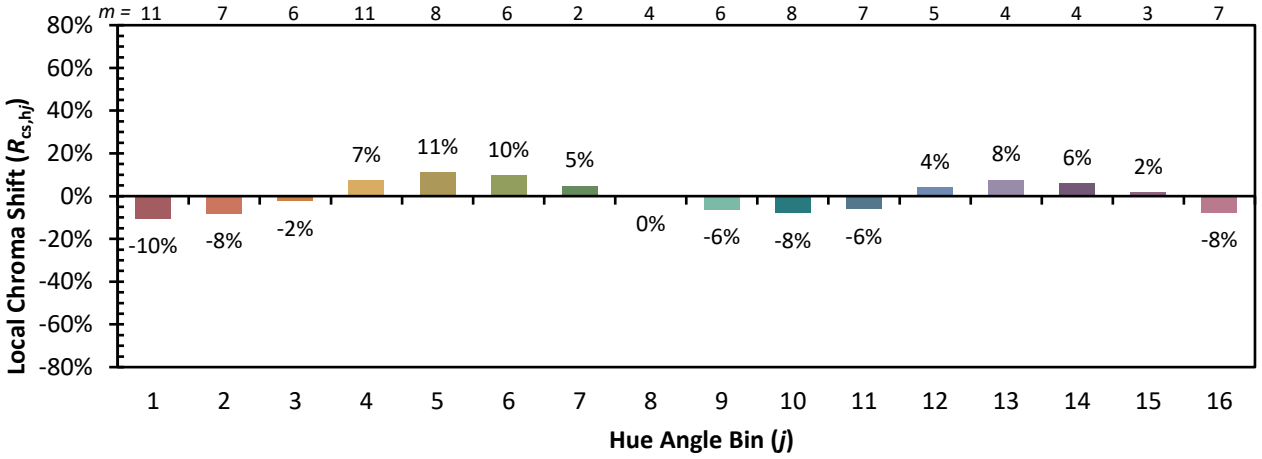
| | | | |
|---|---|---|---|
| CES01 = 86 | CES26 = 76 | CES51 = 89 | CES76 = 75 |
| CES02 = 63 | CES27 = 89 | CES52 = 91 | CES77 = 87 |
| CES03 = 31 | CES28 = 90 | CES53 = 82 | CES78 = 76 |
| CES04 = 71 | CES29 = 68 | CES54 = 88 | CES79 = 91 |
| CES05 = 50 | CES30 = 69 | CES55 = 87 | CES80 = 90 |
| CES06 = 52 | CES31 = 72 | CES56 = 80 | CES81 = 74 |
| CES07 = 43 | CES32 = 71 | CES57 = 78 | CES82 = 95 |
| CES08 = 42 | CES33 = 71 | CES58 = 80 | CES83 = 90 |
| CES09 = 29 | CES34 = 84 | CES59 = 93 | CES84 = 94 |
| CES10 = 77 | CES35 = 92 | CES60 = 96 | CES85 = 83 |
| CES11 = 59 | CES36 = 92 | CES61 = 94 | CES86 = 69 |
| CES12 = 66 | CES37 = 89 | CES62 = 84 | CES87 = 85 |
| CES13 = 44 | CES38 = 75 | CES63 = 79 | CES88 = 84 |
| CES14 = 74 | CES39 = 93 | CES64 = 85 | CES89 = 74 |
| CES15 = 72 | CES40 = 89 | CES65 = 79 | CES90 = 81 |
| CES16 = 48 | CES41 = 85 | CES66 = 83 | CES91 = 96 |
| CES17 = 50 | CES42 = 88 | CES67 = 82 | CES92 = 72 |
| CES18 = 57 | CES43 = 81 | CES68 = 86 | CES93 = 84 |
| CES19 = 73 | CES44 = 98 | CES69 = 92 | CES94 = 63 |
| CES20 = 67 | CES45 = 87 | CES70 = 81 | CES95 = 80 |
| CES21 = 87 | CES46 = 82 | CES71 = 81 | CES96 = 85 |
| CES22 = 79 | CES47 = 76 | CES72 = 93 | CES97 = 87 |
| CES23 = 92 | CES48 = 71 | CES73 = 75 | CES98 = 82 |
| CES24 = 91 | CES49 = 81 | CES74 = 91 | CES99 = 76 |
| CES25 = 72 | CES50 = 88 | CES75 = 79 | |

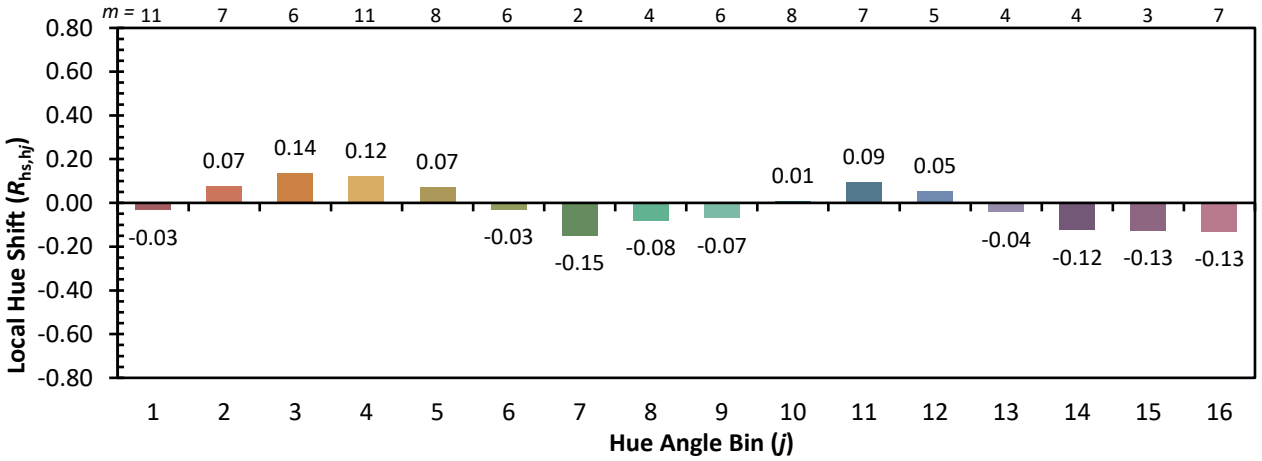


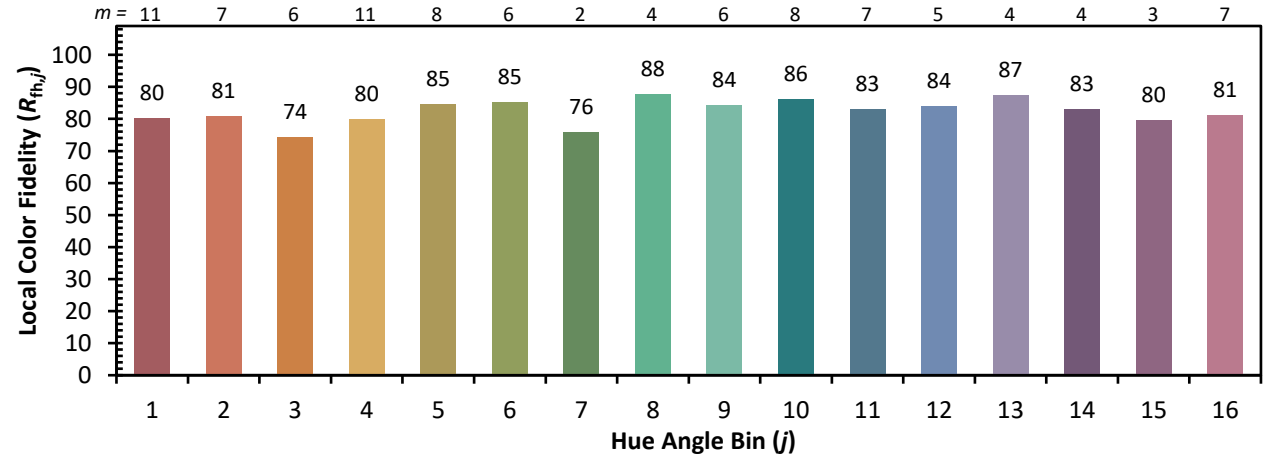
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## Color Rendition by Hue-Angle Bin



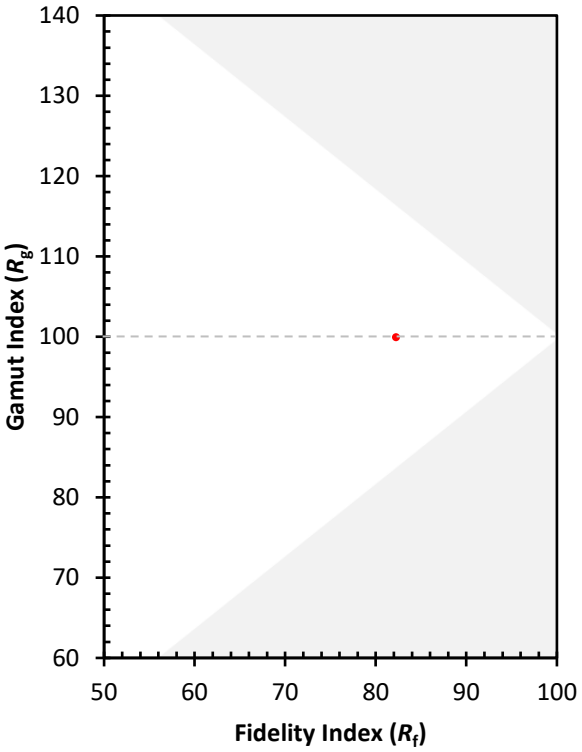



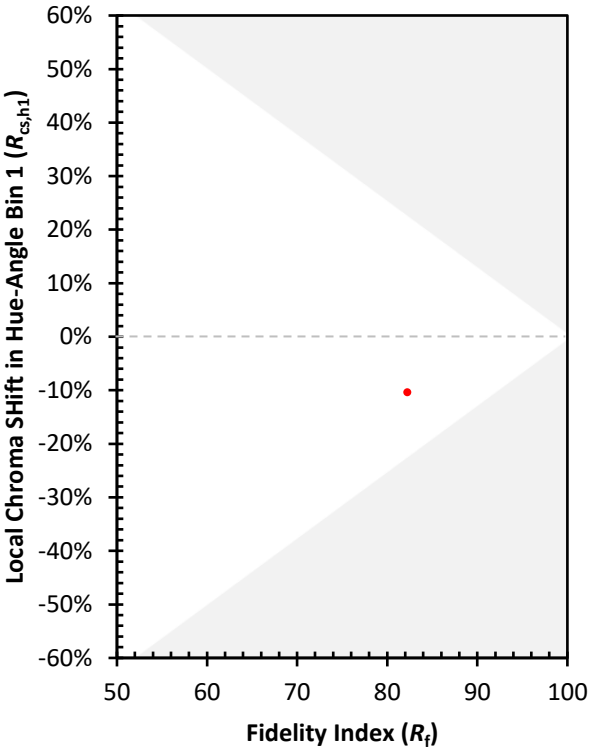



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## Measure Comparisons




(END OF REPORT)