

Signify Classified - Internal  
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: STREETWORKS

Report Number: P1063957

Luminaire Tested: **GLAN-SA4A-727-U-T4BC**

Issue Date: 08/07/2025

**Test Information**

Test Method: LM-79-08  
Report Number: P1063957  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 08/07/2025  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: STREETWORKS  
Catalog Number: GLAN-SA4A-727-U-T4BC  
Description: GALLEON II AREA AND ROADWAY LUMINAIRE 615mA 4xLight Square PACKAGE  
70CRI 2700K FIXTURE w/ TYPE IV ANGLED BACKLIGHT CONTROL  
Light Source: (56) 2700K CCT, 70 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 13424.9 lumens  
Efficiency: N/A  
Efficacy: 125.0 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 1' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B0 - U0 - G3

Input Watts (W): 107.4  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.97  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT



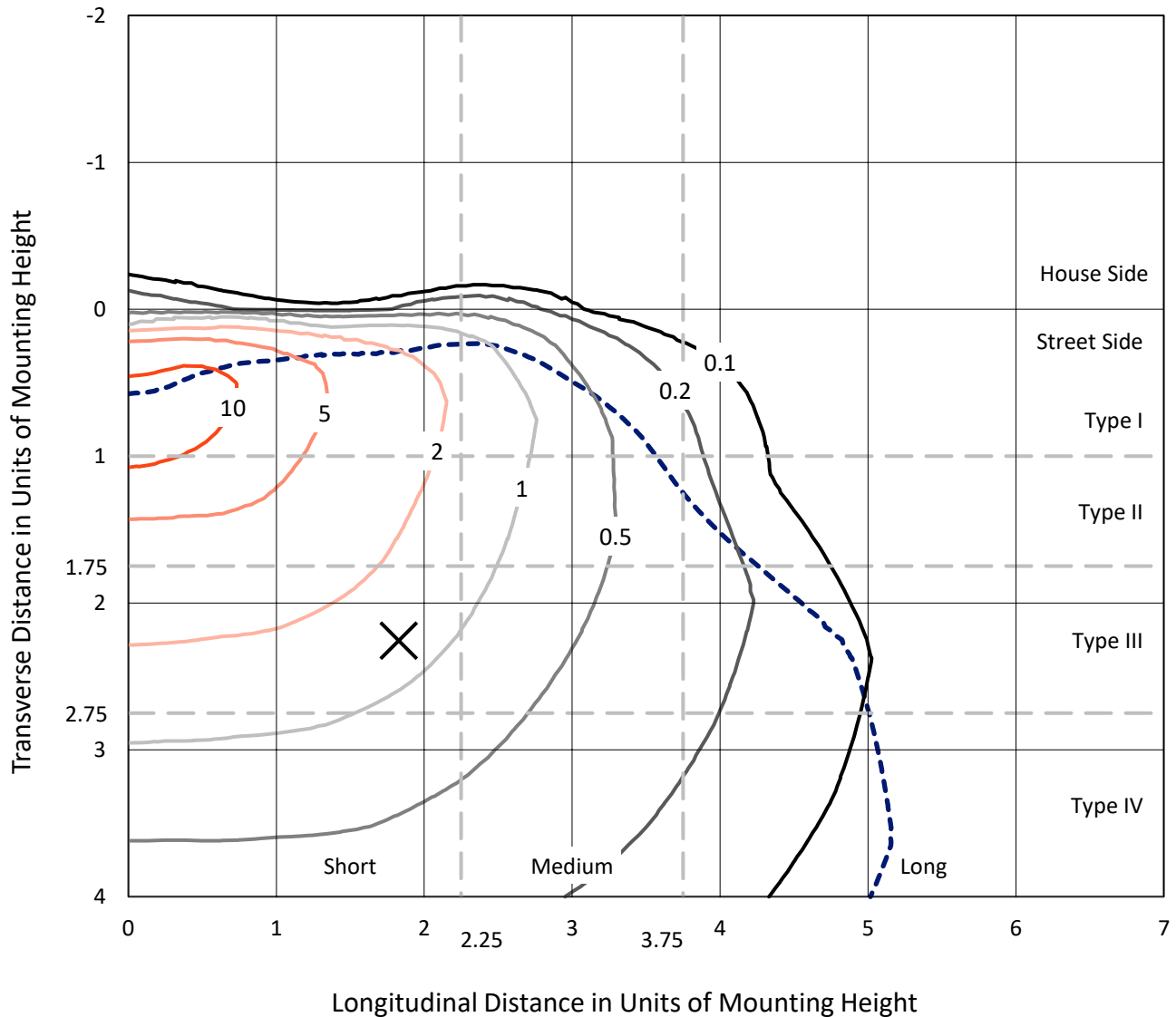
REPORT NUMBER: P1063957

CATALOG NUMBER: GLAN-SA4A-727-U-T4BC

## Iso-Footcandle Lines of Horizontal Illumination

× Max cd

--- 1/2 Max cd

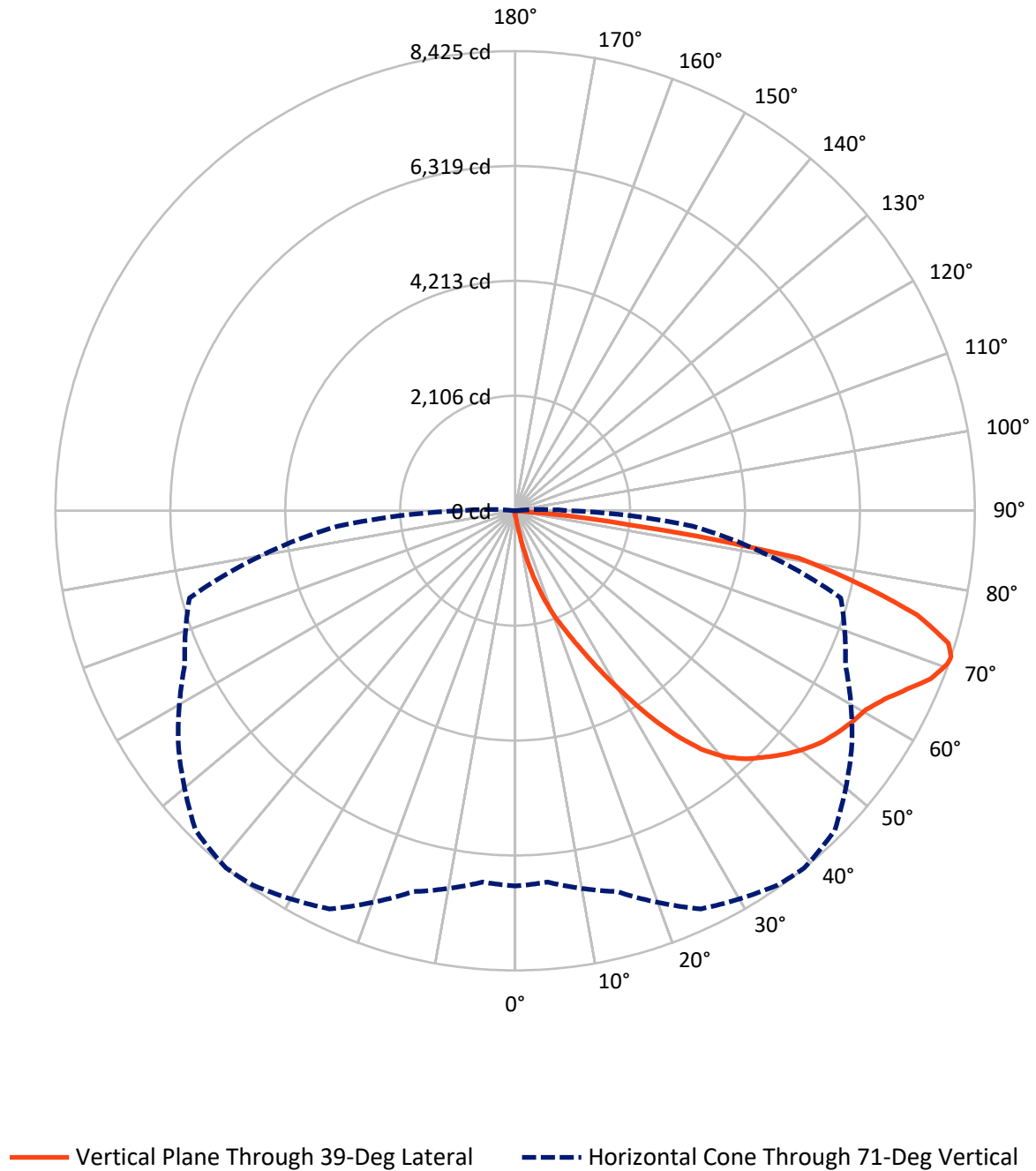


Based on 15 foot mounting height. Maximum calculated value = 13.8 fc  
 Type IV - Short - N/A

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CATALOG NUMBER: GLAN-SA4A-727-U-T4BC

## Luminous Intensity Polar Plot



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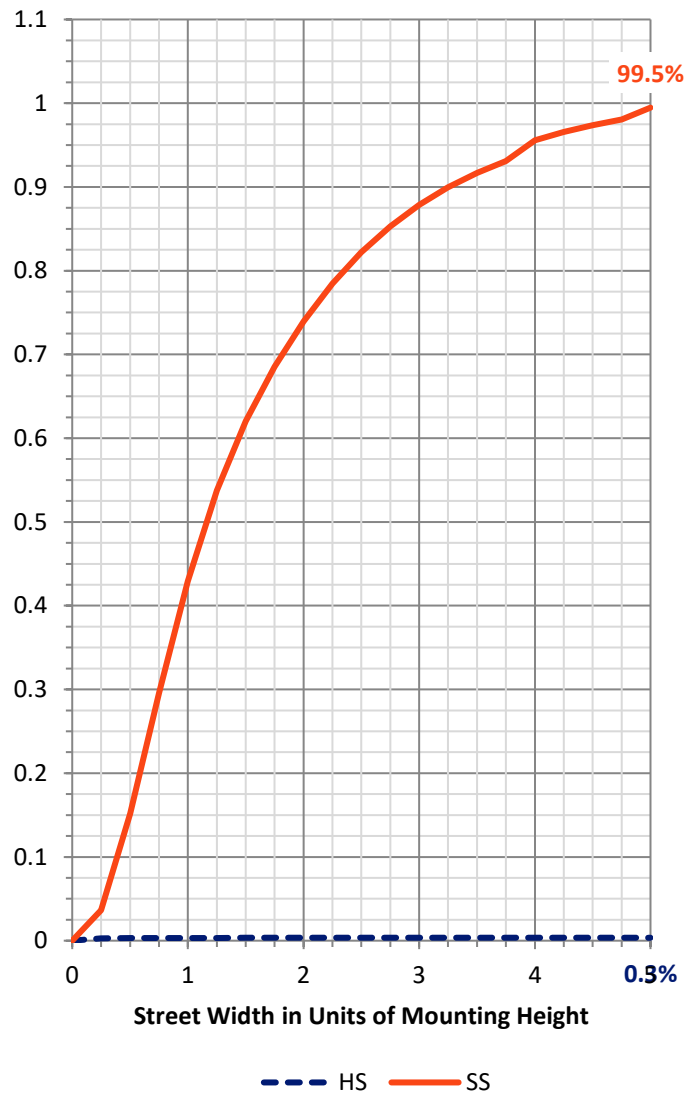
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 47.7     | 0.0    | 47.7    |
|                    | % Fixture | 0.4      | 0.0    | 0.4     |
| <b>Street Side</b> | Lumens    | 13377.2  | 0.0    | 13377.2 |
|                    | % Fixture | 99.6     | 0.0    | 99.6    |
| <b>Total</b>       | Lumens    | 13424.9  | 0.0    | 13424.9 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 11.2    | 0.1       |
| 10°-20°   | 143.5   | 1.1       |
| 20°-30°   | 511.0   | 3.8       |
| 30°-40°   | 1231.5  | 9.2       |
| 40°-50°   | 2061.0  | 15.4      |
| 50°-60°   | 2647.2  | 19.7      |
| 60°-70°   | 3350.0  | 25.0      |
| 70°-80°   | 2986.7  | 22.2      |
| 80°-90°   | 482.8   | 3.6       |
| 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°    | 13424.9 | 100.0     |
| 0°-180°   | 13424.9 | 100.0     |



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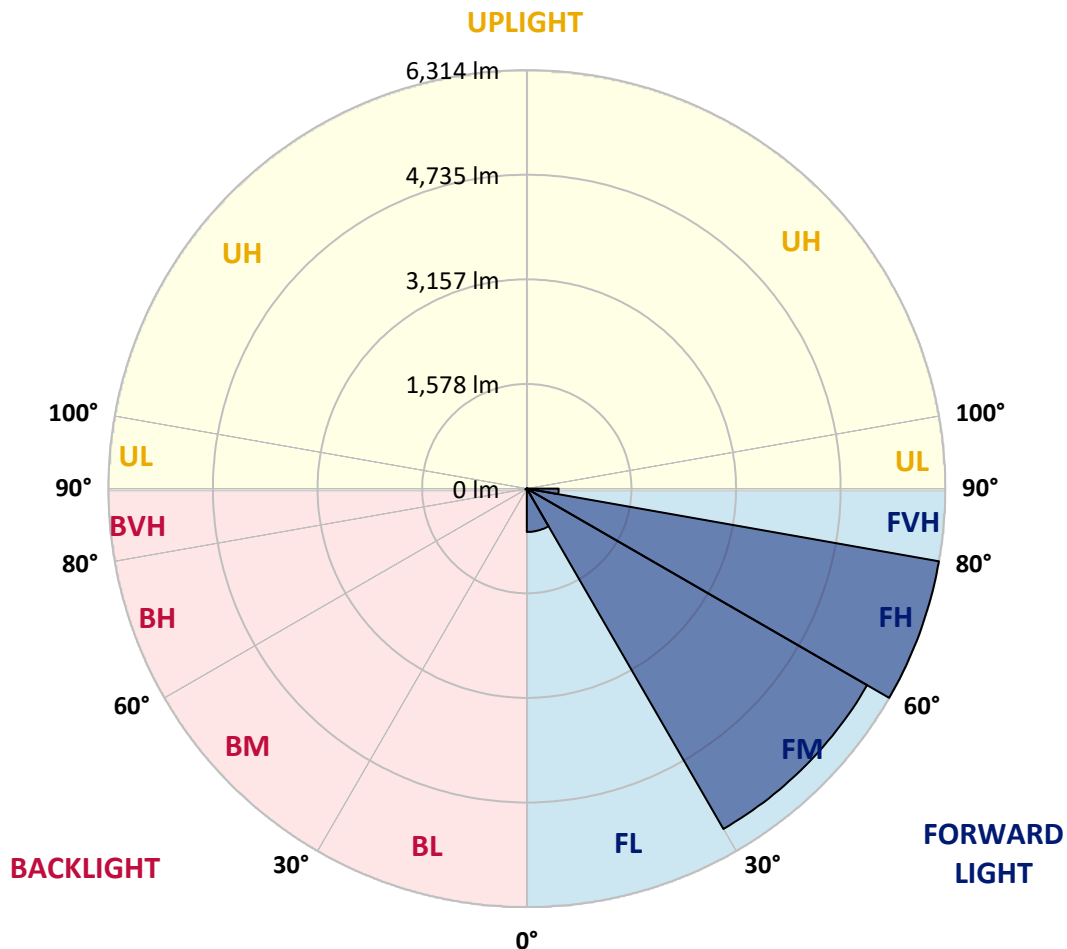
CATALOG NUMBER: GLAN-SA4A-727-U-T4BC

**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 654.2  | 4.9       |                         |      |         |
| FM   | (30°-60°)   | 5928.7 | 44.2      |                         |      |         |
| FH   | (60°-80°)   | 6313.7 | 47.0      |                         |      | G3/7500 |
| FVH  | (80°-90°)   | 480.6  | 3.6       |                         |      | G3/500  |
| BL   | (0°-30°)    | 11.5   | 0.1       | B0/110                  |      |         |
| BM   | (30°-60°)   | 11.0   | 0.1       | B0/220                  |      |         |
| BH   | (60°-80°)   | 22.9   | 0.2       | B0/110                  |      | G0/110  |
| BVH  | (80°-90°)   | 2.2    | 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-G3**

Type IV Short



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 39°    | 45°    | 55°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 73.6   | 73.6   | 73.6   | 73.6   | 73.6   | 73.6   | 73.6   | 73.6   | 73.6   | 73.6   | 73.6   |
| 2.5°  | 84.5   | 84.5   | 84.5   | 81.8   | 81.8   | 80.9   | 80.0   | 80.0   | 78.2   | 77.2   | 75.4   |
| 5°    | 128.1  | 125.4  | 119.1  | 115.4  | 108.1  | 103.6  | 99.1   | 92.7   | 86.3   | 81.8   | 76.3   |
| 7.5°  | 289.9  | 296.3  | 275.4  | 236.3  | 196.3  | 179.0  | 150.0  | 120.9  | 100.0  | 86.3   | 77.2   |
| 10°   | 738.8  | 735.2  | 664.3  | 586.2  | 452.6  | 399.0  | 312.6  | 197.2  | 129.0  | 94.5   | 78.2   |
| 12.5° | 1256.9 | 1253.2 | 1169.6 | 1063.3 | 887.0  | 775.2  | 611.6  | 368.1  | 185.4  | 107.2  | 78.2   |
| 15°   | 1692.2 | 1677.6 | 1651.3 | 1545.9 | 1339.6 | 1246.0 | 1029.7 | 650.7  | 299.9  | 129.0  | 80.0   |
| 17.5° | 1980.3 | 1967.5 | 1943.0 | 1904.8 | 1774.0 | 1663.1 | 1489.5 | 1022.4 | 485.3  | 167.2  | 83.6   |
| 20°   | 2244.7 | 2235.6 | 2215.6 | 2208.4 | 2123.9 | 2064.8 | 1921.2 | 1449.5 | 756.1  | 227.2  | 89.1   |
| 22.5° | 2608.2 | 2589.2 | 2597.3 | 2553.7 | 2471.0 | 2400.1 | 2312.0 | 1896.7 | 1086.9 | 327.2  | 99.1   |
| 25°   | 3053.5 | 3044.5 | 3021.7 | 2990.8 | 2876.3 | 2814.5 | 2679.1 | 2318.3 | 1456.8 | 458.0  | 110.0  |
| 27.5° | 3591.6 | 3581.6 | 3576.1 | 3505.2 | 3373.4 | 3306.2 | 3117.2 | 2716.4 | 1873.0 | 641.6  | 124.5  |
| 30°   | 4211.3 | 4215.9 | 4180.4 | 4089.6 | 3936.0 | 3841.5 | 3647.0 | 3133.5 | 2299.2 | 857.0  | 140.0  |
| 32.5° | 4853.0 | 4843.9 | 4789.3 | 4682.1 | 4544.9 | 4456.7 | 4209.5 | 3590.6 | 2746.4 | 1141.4 | 158.1  |
| 35°   | 5544.5 | 5527.3 | 5383.7 | 5261.0 | 5143.8 | 5032.9 | 4807.5 | 4121.4 | 3193.5 | 1460.4 | 182.7  |
| 37.5° | 6242.5 | 6161.6 | 5873.5 | 5718.1 | 5637.2 | 5546.4 | 5336.4 | 4687.6 | 3637.9 | 1816.7 | 212.7  |
| 40°   | 6769.6 | 6706.9 | 6365.2 | 6078.9 | 6014.4 | 5937.1 | 5780.8 | 5176.5 | 4110.5 | 2199.3 | 249.0  |
| 42.5° | 7061.3 | 7026.8 | 6719.6 | 6437.0 | 6285.2 | 6217.1 | 6083.5 | 5603.6 | 4577.6 | 2621.9 | 301.7  |
| 45°   | 7185.8 | 7132.2 | 6926.8 | 6795.0 | 6553.3 | 6440.6 | 6281.6 | 5926.2 | 5065.6 | 3101.7 | 375.3  |
| 47.5° | 7147.7 | 7116.8 | 6969.5 | 7017.7 | 6842.3 | 6666.9 | 6433.3 | 6173.4 | 5482.8 | 3652.4 | 476.2  |
| 50°   | 6907.7 | 6881.4 | 6835.9 | 7096.8 | 7075.0 | 6867.8 | 6629.6 | 6368.8 | 5823.5 | 4220.4 | 632.5  |
| 52.5° | 6451.5 | 6440.6 | 6556.9 | 7035.0 | 7206.7 | 7045.0 | 6818.7 | 6541.5 | 6141.6 | 4813.9 | 856.1  |
| 55°   | 5863.5 | 5908.1 | 6240.7 | 6938.6 | 7274.0 | 7175.8 | 6985.9 | 6703.3 | 6397.0 | 5344.6 | 1186.0 |
| 57.5° | 5621.8 | 5633.6 | 6048.9 | 6870.5 | 7304.0 | 7291.2 | 7148.6 | 6857.8 | 6631.5 | 5769.0 | 1689.4 |
| 60°   | 5904.4 | 5886.3 | 6105.3 | 6922.3 | 7364.0 | 7394.9 | 7293.1 | 7001.3 | 6835.0 | 6133.4 | 2360.1 |
| 62.5° | 6415.2 | 6405.2 | 6475.2 | 7143.1 | 7539.3 | 7602.1 | 7493.9 | 7104.9 | 7015.0 | 6373.4 | 3125.3 |
| 65°   | 6871.4 | 6850.5 | 6980.4 | 7534.8 | 7847.4 | 7892.0 | 7797.4 | 7282.2 | 7094.0 | 6547.9 | 3844.2 |
| 67.5° | 7068.6 | 7064.1 | 7273.1 | 7907.4 | 8171.0 | 8219.1 | 8136.4 | 7526.6 | 7075.9 | 6603.3 | 4161.4 |
| 70°   | 6978.6 | 6961.4 | 7295.8 | 8065.5 | 8353.6 | 8408.2 | 8328.2 | 7617.5 | 6878.7 | 6427.9 | 3691.5 |
| 71°   | 6879.6 | 6833.2 | 7227.6 | 8054.6 | 8379.1 | 8425.4 | 8285.5 | 7534.8 | 6680.5 | 6178.9 | 3265.3 |
| 72.5° | 6572.4 | 6580.6 | 7040.4 | 7941.0 | 8318.2 | 8304.6 | 8043.7 | 7238.5 | 6441.5 | 5613.6 | 2622.8 |
| 75°   | 5816.3 | 5864.4 | 6434.3 | 7463.9 | 7774.7 | 7601.1 | 7202.2 | 6672.4 | 5961.7 | 4025.0 | 1821.2 |
| 77.5° | 4753.0 | 4824.8 | 5450.9 | 6546.0 | 6457.9 | 6440.6 | 6424.3 | 5879.0 | 5091.1 | 2162.0 | 1266.9 |
| 80°   | 2269.3 | 2424.7 | 3288.0 | 4673.0 | 5076.5 | 5271.9 | 5149.2 | 4737.5 | 3936.9 | 1029.7 | 757.0  |
| 82.5° | 148.1  | 146.3  | 207.2  | 392.6  | 1654.9 | 2139.3 | 3398.9 | 3386.2 | 2744.6 | 501.7  | 309.0  |
| 85°   | 70.0   | 71.8   | 79.1   | 90.0   | 104.5  | 114.5  | 158.1  | 927.0  | 1313.2 | 239.0  | 67.3   |
| 87.5° | 40.9   | 41.8   | 49.1   | 62.7   | 81.8   | 90.9   | 108.1  | 139.0  | 170.9  | 131.8  | 14.5   |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |



REPORT NUMBER: P1063957

CATALOG NUMBER: GLAN-SA4A-727-U-T4BC

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°  | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|-------|--------|------|------|------|------|------|------|------|------|------|------|
| 0°    | 73.6   | 73.6 | 73.6 | 73.6 | 73.6 | 73.6 | 73.6 | 73.6 | 73.6 | 73.6 | 73.6 |
| 2.5°  | 74.5   | 73.6 | 70.9 | 68.2 | 65.4 | 63.6 | 62.7 | 63.6 | 63.6 | 64.5 | 64.5 |
| 5°    | 74.5   | 71.8 | 67.3 | 61.8 | 58.2 | 54.5 | 52.7 | 51.8 | 52.7 | 52.7 | 52.7 |
| 7.5°  | 73.6   | 69.1 | 62.7 | 56.3 | 51.8 | 47.3 | 45.4 | 44.5 | 44.5 | 45.4 | 45.4 |
| 10°   | 71.8   | 67.3 | 59.1 | 51.8 | 46.3 | 40.9 | 38.2 | 35.4 | 35.4 | 35.4 | 36.4 |
| 12.5° | 70.9   | 64.5 | 54.5 | 47.3 | 40.0 | 33.6 | 28.2 | 25.4 | 26.4 | 26.4 | 26.4 |
| 15°   | 69.1   | 61.8 | 51.8 | 42.7 | 33.6 | 25.4 | 20.9 | 18.2 | 19.1 | 20.0 | 19.1 |
| 17.5° | 69.1   | 60.9 | 48.2 | 37.3 | 26.4 | 19.1 | 15.4 | 13.6 | 13.6 | 14.5 | 14.5 |
| 20°   | 69.1   | 59.1 | 45.4 | 31.8 | 20.0 | 14.5 | 10.9 | 10.0 | 10.0 | 11.8 | 12.7 |
| 22.5° | 70.9   | 59.1 | 41.8 | 26.4 | 16.4 | 10.9 | 8.2  | 7.3  | 8.2  | 10.0 | 10.9 |
| 25°   | 73.6   | 58.2 | 38.2 | 23.6 | 13.6 | 8.2  | 6.4  | 4.5  | 5.5  | 7.3  | 8.2  |
| 27.5° | 76.3   | 57.3 | 34.5 | 20.9 | 10.9 | 6.4  | 4.5  | 3.6  | 2.7  | 3.6  | 3.6  |
| 30°   | 79.1   | 57.3 | 30.9 | 17.3 | 9.1  | 4.5  | 2.7  | 1.8  | 0.9  | 0.0  | 0.0  |
| 32.5° | 80.9   | 55.4 | 28.2 | 13.6 | 7.3  | 3.6  | 1.8  | 0.9  | 0.0  | 0.0  | 0.0  |
| 35°   | 82.7   | 53.6 | 24.5 | 10.9 | 5.5  | 2.7  | 0.9  | 0.0  | 0.0  | 0.0  | 0.0  |
| 37.5° | 84.5   | 50.9 | 20.9 | 9.1  | 4.5  | 1.8  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 40°   | 86.3   | 47.3 | 17.3 | 8.2  | 2.7  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 42.5° | 88.2   | 44.5 | 14.5 | 6.4  | 1.8  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 45°   | 92.7   | 42.7 | 11.8 | 5.5  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 47.5° | 100.9  | 40.9 | 10.9 | 3.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 50°   | 112.7  | 39.1 | 10.0 | 2.7  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 52.5° | 129.0  | 38.2 | 9.1  | 1.8  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 55°   | 158.1  | 37.3 | 8.2  | 1.8  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 57.5° | 208.1  | 36.4 | 8.2  | 1.8  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 60°   | 319.0  | 34.5 | 8.2  | 1.8  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 62.5° | 569.8  | 33.6 | 7.3  | 1.8  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 65°   | 993.3  | 34.5 | 7.3  | 1.8  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 67.5° | 1424.1 | 36.4 | 6.4  | 2.7  | 0.9  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 70°   | 1218.7 | 31.8 | 6.4  | 3.6  | 1.8  | 0.9  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 71°   | 993.3  | 28.2 | 6.4  | 3.6  | 1.8  | 0.9  | 0.9  | 0.0  | 0.0  | 0.0  | 0.0  |
| 72.5° | 638.9  | 21.8 | 5.5  | 3.6  | 1.8  | 1.8  | 0.9  | 0.0  | 0.0  | 0.0  | 0.0  |
| 75°   | 269.9  | 18.2 | 5.5  | 3.6  | 2.7  | 1.8  | 1.8  | 0.9  | 0.0  | 0.0  | 0.0  |
| 77.5° | 115.4  | 13.6 | 5.5  | 4.5  | 3.6  | 2.7  | 2.7  | 1.8  | 0.9  | 0.0  | 0.0  |
| 80°   | 43.6   | 10.9 | 6.4  | 5.5  | 4.5  | 4.5  | 3.6  | 1.8  | 0.9  | 0.0  | 0.0  |
| 82.5° | 20.0   | 9.1  | 6.4  | 5.5  | 5.5  | 4.5  | 3.6  | 2.7  | 1.8  | 0.0  | 0.0  |
| 85°   | 12.7   | 8.2  | 6.4  | 5.5  | 5.5  | 4.5  | 4.5  | 2.7  | 1.8  | 0.0  | 0.0  |
| 87.5° | 10.0   | 8.2  | 6.4  | 6.4  | 5.5  | 5.5  | 3.6  | 2.7  | 0.9  | 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  |



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

Report Prepared for

Cooper Lighting Solutions

McGraw-Edison

Report Number: SP1-2407-184-3

Test Date: 10/09/2024

Luminaire Tested: GSS-SB1A-727-U-5WQ

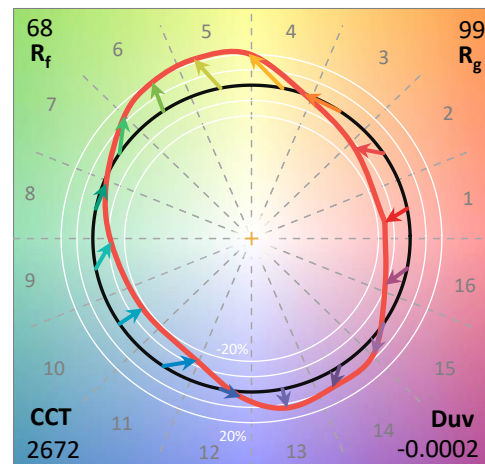
Data in this report applies to families of products including GSS-SB1A-727-U-5WQ

### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2407-184-3  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry:  $4\pi$   
 Issue Date: 10/15/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: McGraw-Edison  
 Catalog Number: **GSS-SB1A-727-U-5WQ**  
 Description: GALLEON II SITE SLIM 1SQ 350MA 5WQ HIGH DENSITY LIGHTSQUARE WITH 70 CRI  
 2700K CCT 26 LEDS

### Spectral Parameters

|                           |          |           |      |      |       |
|---------------------------|----------|-----------|------|------|-------|
| CCT (K):                  | 2672     | CRI (Ra): | 71.1 |      |       |
| CIE u':                   | 0.2638   | R1:       | 68.3 | R9:  | -27.8 |
| CIE v':                   | 0.5276   | R2:       | 79.8 | R10: | 54.4  |
| Duv:                      | -0.0002  | R3:       | 91.2 | R11: | 65.8  |
| CIE x:                    | 0.4619   | R4:       | 69.4 | R12: | 45.6  |
| CIE y:                    | 0.4106   | R5:       | 66.5 | R13: | 69.8  |
| CIE z:                    | 0.1275   | R6:       | 72.6 | R14: | 94.5  |
| Peak Wavelength (nm):     | 601      | R7:       | 77.0 | R15: | 60.1  |
| Dominant Wavelength (nm): | 584      | R8:       | 44.1 |      |       |
| Purity:                   | 61.88407 |           |      |      |       |
| Rf:                       | 67.9     |           |      |      |       |
| Rg:                       | 98.6     |           |      |      |       |



### Test Conditions

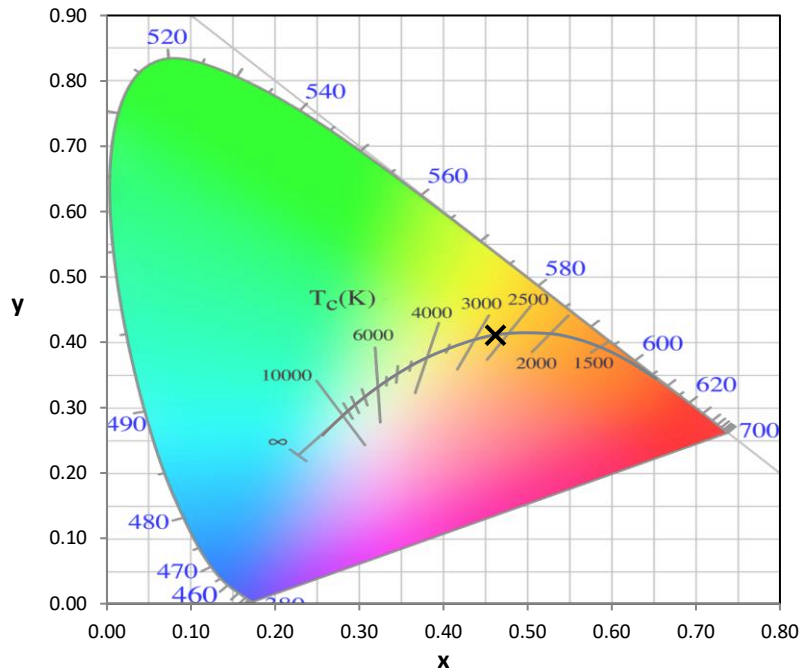
Stabilization Time: 21M  
 Operation Time: 1H 21M  
 Sphere Temperature (°C): 25.2

REPORT NUMBER: SP1-2407-184-3

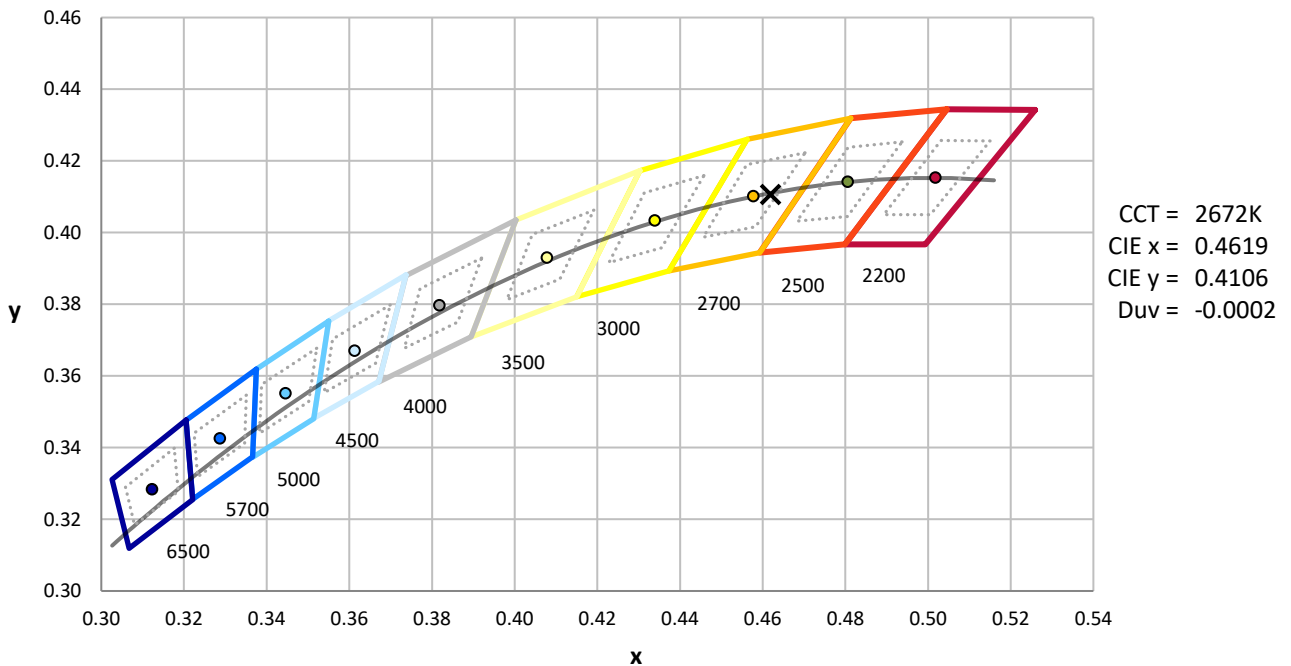
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| 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**



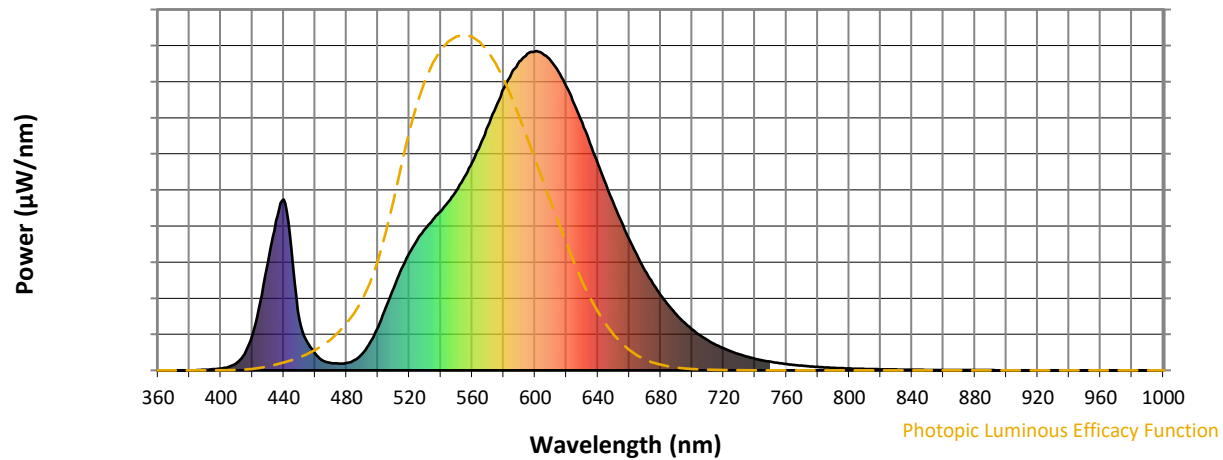
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 2700K 4-step quadrangle

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### Photopic Flux vs. Wavelength

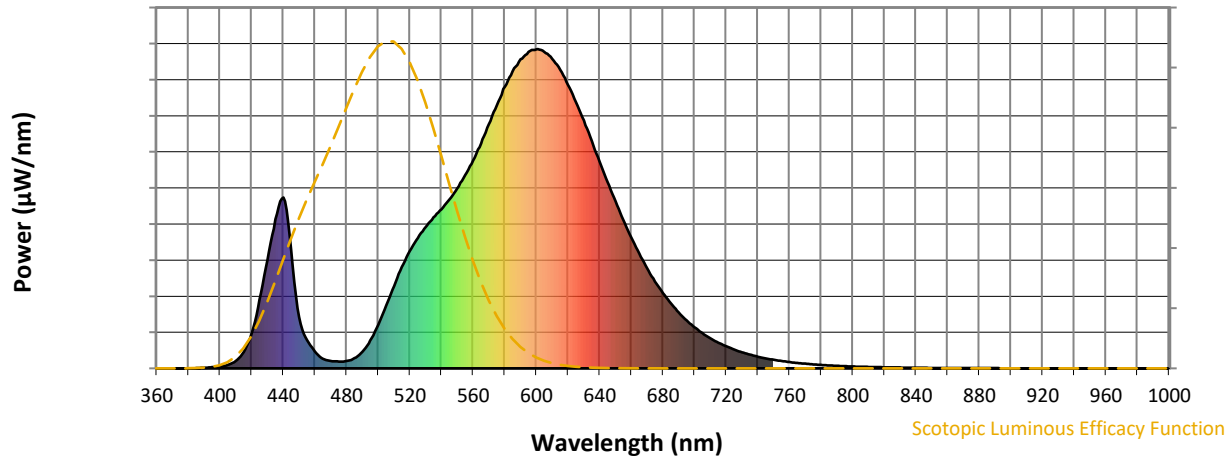


### Photopic Lumens: NR

| $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) |
|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|
| 360               | 0                                    | NR                             | 490               | 52                                   | NR                             | 620               | 888                                  | NR                             | 750               | 27                                   | NR                             | 880               | 1                                    | NR                             |
| 365               | 0                                    | NR                             | 495               | 87                                   | NR                             | 625               | 834                                  | NR                             | 755               | 23                                   | NR                             | 885               | 1                                    | NR                             |
| 370               | 0                                    | NR                             | 500               | 135                                  | NR                             | 630               | 776                                  | NR                             | 760               | 20                                   | NR                             | 890               | 1                                    | NR                             |
| 375               | 0                                    | NR                             | 505               | 196                                  | NR                             | 635               | 712                                  | NR                             | 765               | 17                                   | NR                             | 895               | 0                                    | NR                             |
| 380               | 0                                    | NR                             | 510               | 258                                  | NR                             | 640               | 648                                  | NR                             | 770               | 15                                   | NR                             | 900               | 0                                    | NR                             |
| 385               | 1                                    | NR                             | 515               | 317                                  | NR                             | 645               | 583                                  | NR                             | 775               | 12                                   | NR                             | 905               | 0                                    | NR                             |
| 390               | 2                                    | NR                             | 520               | 368                                  | NR                             | 650               | 523                                  | NR                             | 780               | 11                                   | NR                             | 910               | 0                                    | NR                             |
| 395               | 4                                    | NR                             | 525               | 408                                  | NR                             | 655               | 465                                  | NR                             | 785               | 9                                    | NR                             | 915               | 0                                    | NR                             |
| 400               | 6                                    | NR                             | 530               | 443                                  | NR                             | 660               | 410                                  | NR                             | 790               | 8                                    | NR                             | 920               | 0                                    | NR                             |
| 405               | 11                                   | NR                             | 535               | 473                                  | NR                             | 665               | 360                                  | NR                             | 795               | 7                                    | NR                             | 925               | 0                                    | NR                             |
| 410               | 23                                   | NR                             | 540               | 498                                  | NR                             | 670               | 313                                  | NR                             | 800               | 6                                    | NR                             | 930               | 0                                    | NR                             |
| 415               | 51                                   | NR                             | 545               | 530                                  | NR                             | 675               | 272                                  | NR                             | 805               | 5                                    | NR                             | 935               | 0                                    | NR                             |
| 420               | 111                                  | NR                             | 550               | 563                                  | NR                             | 680               | 236                                  | NR                             | 810               | 4                                    | NR                             | 940               | 0                                    | NR                             |
| 425               | 214                                  | NR                             | 555               | 605                                  | NR                             | 685               | 203                                  | NR                             | 815               | 4                                    | NR                             | 945               | 0                                    | NR                             |
| 430               | 339                                  | NR                             | 560               | 651                                  | NR                             | 690               | 175                                  | NR                             | 820               | 3                                    | NR                             | 950               | 0                                    | NR                             |
| 435               | 467                                  | NR                             | 565               | 705                                  | NR                             | 695               | 150                                  | NR                             | 825               | 3                                    | NR                             | 955               | 0                                    | NR                             |
| 440               | 535                                  | NR                             | 570               | 765                                  | NR                             | 700               | 128                                  | NR                             | 830               | 3                                    | NR                             | 960               | 0                                    | NR                             |
| 445               | 372                                  | NR                             | 575               | 824                                  | NR                             | 705               | 110                                  | NR                             | 835               | 2                                    | NR                             | 965               | 0                                    | NR                             |
| 450               | 160                                  | NR                             | 580               | 882                                  | NR                             | 710               | 94                                   | NR                             | 840               | 2                                    | NR                             | 970               | 0                                    | NR                             |
| 455               | 89                                   | NR                             | 585               | 930                                  | NR                             | 715               | 80                                   | NR                             | 845               | 2                                    | NR                             | 975               | 0                                    | NR                             |
| 460               | 53                                   | NR                             | 590               | 968                                  | NR                             | 720               | 69                                   | NR                             | 850               | 1                                    | NR                             | 980               | 0                                    | NR                             |
| 465               | 31                                   | NR                             | 595               | 991                                  | NR                             | 725               | 59                                   | NR                             | 855               | 1                                    | NR                             | 985               | 0                                    | NR                             |
| 470               | 23                                   | NR                             | 600               | 999                                  | NR                             | 730               | 50                                   | NR                             | 860               | 1                                    | NR                             | 990               | 0                                    | NR                             |
| 475               | 21                                   | NR                             | 605               | 992                                  | NR                             | 735               | 43                                   | NR                             | 865               | 1                                    | NR                             | 995               | 0                                    | NR                             |
| 480               | 23                                   | NR                             | 610               | 969                                  | NR                             | 740               | 36                                   | NR                             | 870               | 1                                    | NR                             | 1000              | 0                                    | NR                             |
| 485               | 32                                   | NR                             | 615               | 935                                  | NR                             | 745               | 31                                   | NR                             | 875               | 1                                    | NR                             |                   |                                      |                                |

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### Scotopic Flux vs. Wavelength



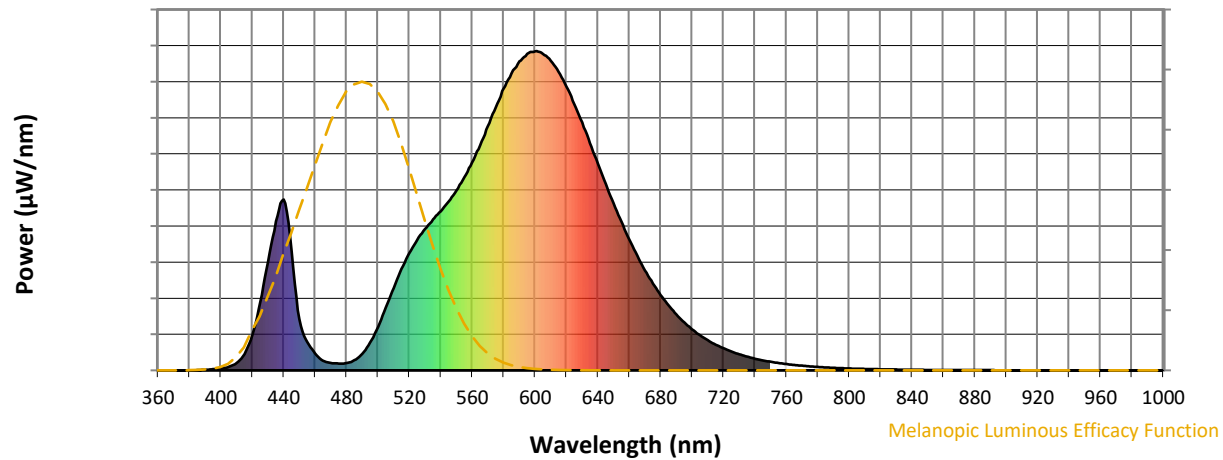
Scotopic Lumens: NR

S/P: 1.02

| $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) |
|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|
| 360               | 0                                    | NR                             | 490               | 52                                   | NR                             | 620               | 888                                  | NR                             | 750               | 27                                   | NR                             | 880               | 1                                    | NR                             |
| 365               | 0                                    | NR                             | 495               | 87                                   | NR                             | 625               | 834                                  | NR                             | 755               | 23                                   | NR                             | 885               | 1                                    | NR                             |
| 370               | 0                                    | NR                             | 500               | 135                                  | NR                             | 630               | 776                                  | NR                             | 760               | 20                                   | NR                             | 890               | 1                                    | NR                             |
| 375               | 0                                    | NR                             | 505               | 196                                  | NR                             | 635               | 712                                  | NR                             | 765               | 17                                   | NR                             | 895               | 0                                    | NR                             |
| 380               | 0                                    | NR                             | 510               | 258                                  | NR                             | 640               | 648                                  | NR                             | 770               | 15                                   | NR                             | 900               | 0                                    | NR                             |
| 385               | 1                                    | NR                             | 515               | 317                                  | NR                             | 645               | 583                                  | NR                             | 775               | 12                                   | NR                             | 905               | 0                                    | NR                             |
| 390               | 2                                    | NR                             | 520               | 368                                  | NR                             | 650               | 523                                  | NR                             | 780               | 11                                   | NR                             | 910               | 0                                    | NR                             |
| 395               | 4                                    | NR                             | 525               | 408                                  | NR                             | 655               | 465                                  | NR                             | 785               | 9                                    | NR                             | 915               | 0                                    | NR                             |
| 400               | 6                                    | NR                             | 530               | 443                                  | NR                             | 660               | 410                                  | NR                             | 790               | 8                                    | NR                             | 920               | 0                                    | NR                             |
| 405               | 11                                   | NR                             | 535               | 473                                  | NR                             | 665               | 360                                  | NR                             | 795               | 7                                    | NR                             | 925               | 0                                    | NR                             |
| 410               | 23                                   | NR                             | 540               | 498                                  | NR                             | 670               | 313                                  | NR                             | 800               | 6                                    | NR                             | 930               | 0                                    | NR                             |
| 415               | 51                                   | NR                             | 545               | 530                                  | NR                             | 675               | 272                                  | NR                             | 805               | 5                                    | NR                             | 935               | 0                                    | NR                             |
| 420               | 111                                  | NR                             | 550               | 563                                  | NR                             | 680               | 236                                  | NR                             | 810               | 4                                    | NR                             | 940               | 0                                    | NR                             |
| 425               | 214                                  | NR                             | 555               | 605                                  | NR                             | 685               | 203                                  | NR                             | 815               | 4                                    | NR                             | 945               | 0                                    | NR                             |
| 430               | 339                                  | NR                             | 560               | 651                                  | NR                             | 690               | 175                                  | NR                             | 820               | 3                                    | NR                             | 950               | 0                                    | NR                             |
| 435               | 467                                  | NR                             | 565               | 705                                  | NR                             | 695               | 150                                  | NR                             | 825               | 3                                    | NR                             | 955               | 0                                    | NR                             |
| 440               | 535                                  | NR                             | 570               | 765                                  | NR                             | 700               | 128                                  | NR                             | 830               | 3                                    | NR                             | 960               | 0                                    | NR                             |
| 445               | 372                                  | NR                             | 575               | 824                                  | NR                             | 705               | 110                                  | NR                             | 835               | 2                                    | NR                             | 965               | 0                                    | NR                             |
| 450               | 160                                  | NR                             | 580               | 882                                  | NR                             | 710               | 94                                   | NR                             | 840               | 2                                    | NR                             | 970               | 0                                    | NR                             |
| 455               | 89                                   | NR                             | 585               | 930                                  | NR                             | 715               | 80                                   | NR                             | 845               | 2                                    | NR                             | 975               | 0                                    | NR                             |
| 460               | 53                                   | NR                             | 590               | 968                                  | NR                             | 720               | 69                                   | NR                             | 850               | 1                                    | NR                             | 980               | 0                                    | NR                             |
| 465               | 31                                   | NR                             | 595               | 991                                  | NR                             | 725               | 59                                   | NR                             | 855               | 1                                    | NR                             | 985               | 0                                    | NR                             |
| 470               | 23                                   | NR                             | 600               | 999                                  | NR                             | 730               | 50                                   | NR                             | 860               | 1                                    | NR                             | 990               | 0                                    | NR                             |
| 475               | 21                                   | NR                             | 605               | 992                                  | NR                             | 735               | 43                                   | NR                             | 865               | 1                                    | NR                             | 995               | 0                                    | NR                             |
| 480               | 23                                   | NR                             | 610               | 969                                  | NR                             | 740               | 36                                   | NR                             | 870               | 1                                    | NR                             | 1000              | 0                                    | NR                             |
| 485               | 32                                   | NR                             | 615               | 935                                  | NR                             | 745               | 31                                   | NR                             | 875               | 1                                    | NR                             |                   |                                      |                                |

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### Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 1.71

| $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) |
|-------------------|----------------------------------------|--------------------------------|-------------------|----------------------------------------|--------------------------------|-------------------|----------------------------------------|--------------------------------|-------------------|----------------------------------------|--------------------------------|-------------------|----------------------------------------|--------------------------------|
| 360               | 0                                      | NR                             | 490               | 52                                     | NR                             | 620               | 888                                    | NR                             | 750               | 27                                     | NR                             | 880               | 1                                      | NR                             |
| 365               | 0                                      | NR                             | 495               | 87                                     | NR                             | 625               | 834                                    | NR                             | 755               | 23                                     | NR                             | 885               | 1                                      | NR                             |
| 370               | 0                                      | NR                             | 500               | 135                                    | NR                             | 630               | 776                                    | NR                             | 760               | 20                                     | NR                             | 890               | 1                                      | NR                             |
| 375               | 0                                      | NR                             | 505               | 196                                    | NR                             | 635               | 712                                    | NR                             | 765               | 17                                     | NR                             | 895               | 0                                      | NR                             |
| 380               | 0                                      | NR                             | 510               | 258                                    | NR                             | 640               | 648                                    | NR                             | 770               | 15                                     | NR                             | 900               | 0                                      | NR                             |
| 385               | 1                                      | NR                             | 515               | 317                                    | NR                             | 645               | 583                                    | NR                             | 775               | 12                                     | NR                             | 905               | 0                                      | NR                             |
| 390               | 2                                      | NR                             | 520               | 368                                    | NR                             | 650               | 523                                    | NR                             | 780               | 11                                     | NR                             | 910               | 0                                      | NR                             |
| 395               | 4                                      | NR                             | 525               | 408                                    | NR                             | 655               | 465                                    | NR                             | 785               | 9                                      | NR                             | 915               | 0                                      | NR                             |
| 400               | 6                                      | NR                             | 530               | 443                                    | NR                             | 660               | 410                                    | NR                             | 790               | 8                                      | NR                             | 920               | 0                                      | NR                             |
| 405               | 11                                     | NR                             | 535               | 473                                    | NR                             | 665               | 360                                    | NR                             | 795               | 7                                      | NR                             | 925               | 0                                      | NR                             |
| 410               | 23                                     | NR                             | 540               | 498                                    | NR                             | 670               | 313                                    | NR                             | 800               | 6                                      | NR                             | 930               | 0                                      | NR                             |
| 415               | 51                                     | NR                             | 545               | 530                                    | NR                             | 675               | 272                                    | NR                             | 805               | 5                                      | NR                             | 935               | 0                                      | NR                             |
| 420               | 111                                    | NR                             | 550               | 563                                    | NR                             | 680               | 236                                    | NR                             | 810               | 4                                      | NR                             | 940               | 0                                      | NR                             |
| 425               | 214                                    | NR                             | 555               | 605                                    | NR                             | 685               | 203                                    | NR                             | 815               | 4                                      | NR                             | 945               | 0                                      | NR                             |
| 430               | 339                                    | NR                             | 560               | 651                                    | NR                             | 690               | 175                                    | NR                             | 820               | 3                                      | NR                             | 950               | 0                                      | NR                             |
| 435               | 467                                    | NR                             | 565               | 705                                    | NR                             | 695               | 150                                    | NR                             | 825               | 3                                      | NR                             | 955               | 0                                      | NR                             |
| 440               | 535                                    | NR                             | 570               | 765                                    | NR                             | 700               | 128                                    | NR                             | 830               | 3                                      | NR                             | 960               | 0                                      | NR                             |
| 445               | 372                                    | NR                             | 575               | 824                                    | NR                             | 705               | 110                                    | NR                             | 835               | 2                                      | NR                             | 965               | 0                                      | NR                             |
| 450               | 160                                    | NR                             | 580               | 882                                    | NR                             | 710               | 94                                     | NR                             | 840               | 2                                      | NR                             | 970               | 0                                      | NR                             |
| 455               | 89                                     | NR                             | 585               | 930                                    | NR                             | 715               | 80                                     | NR                             | 845               | 2                                      | NR                             | 975               | 0                                      | NR                             |
| 460               | 53                                     | NR                             | 590               | 968                                    | NR                             | 720               | 69                                     | NR                             | 850               | 1                                      | NR                             | 980               | 0                                      | NR                             |
| 465               | 31                                     | NR                             | 595               | 991                                    | NR                             | 725               | 59                                     | NR                             | 855               | 1                                      | NR                             | 985               | 0                                      | NR                             |
| 470               | 23                                     | NR                             | 600               | 999                                    | NR                             | 730               | 50                                     | NR                             | 860               | 1                                      | NR                             | 990               | 0                                      | NR                             |
| 475               | 21                                     | NR                             | 605               | 992                                    | NR                             | 735               | 43                                     | NR                             | 865               | 1                                      | NR                             | 995               | 0                                      | NR                             |
| 480               | 23                                     | NR                             | 610               | 969                                    | NR                             | 740               | 36                                     | NR                             | 870               | 1                                      | NR                             | 1000              | 0                                      | NR                             |
| 485               | 32                                     | NR                             | 615               | 935                                    | NR                             | 745               | 31                                     | NR                             | 875               | 1                                      | NR                             |                   |                                        |                                |

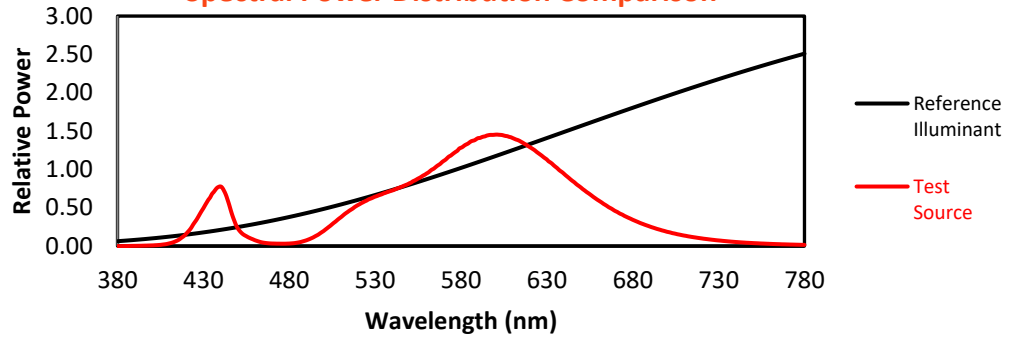
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TM-30-18

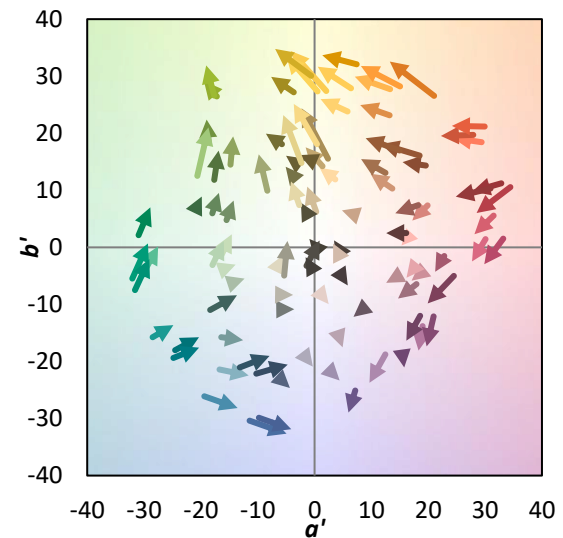
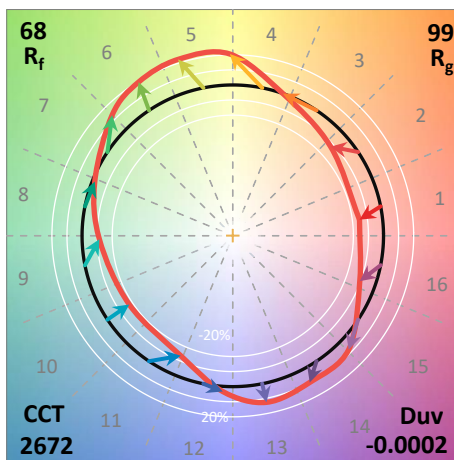
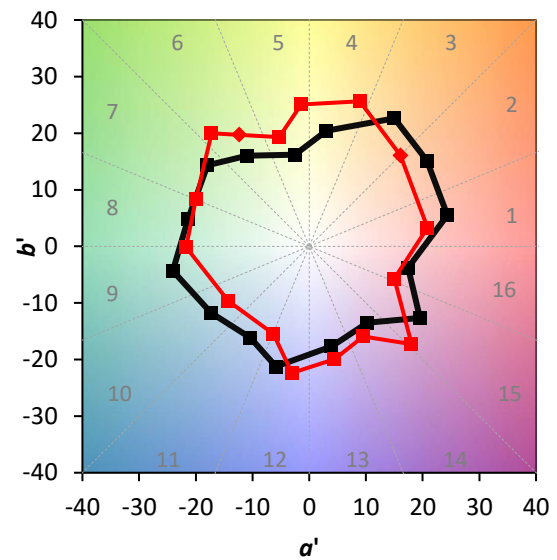
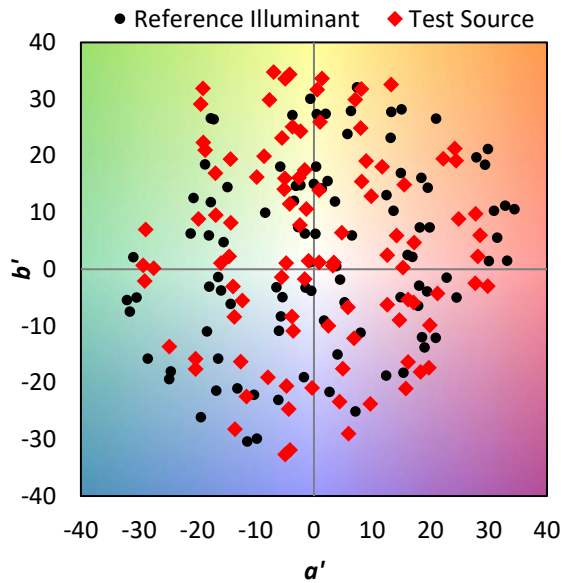
### Summary

$R_f = 67.9$   
 $R_g = 98.6$   
 $CIE\ R_a = 71.1$   
 $R_g = -27.8$

### Spectral Power Distribution Comparison



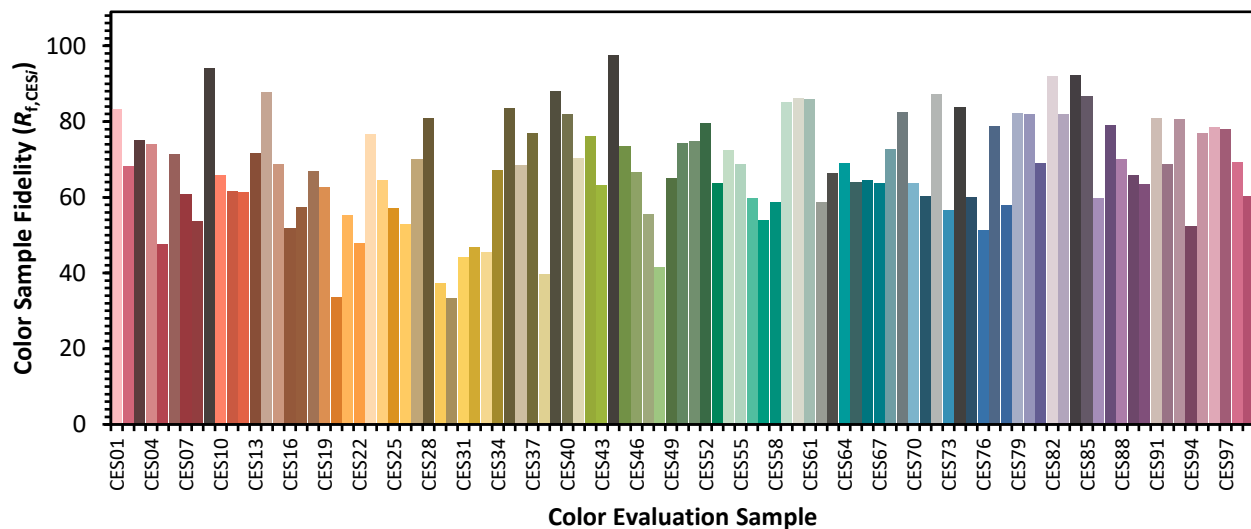
### Color Vector Graphics



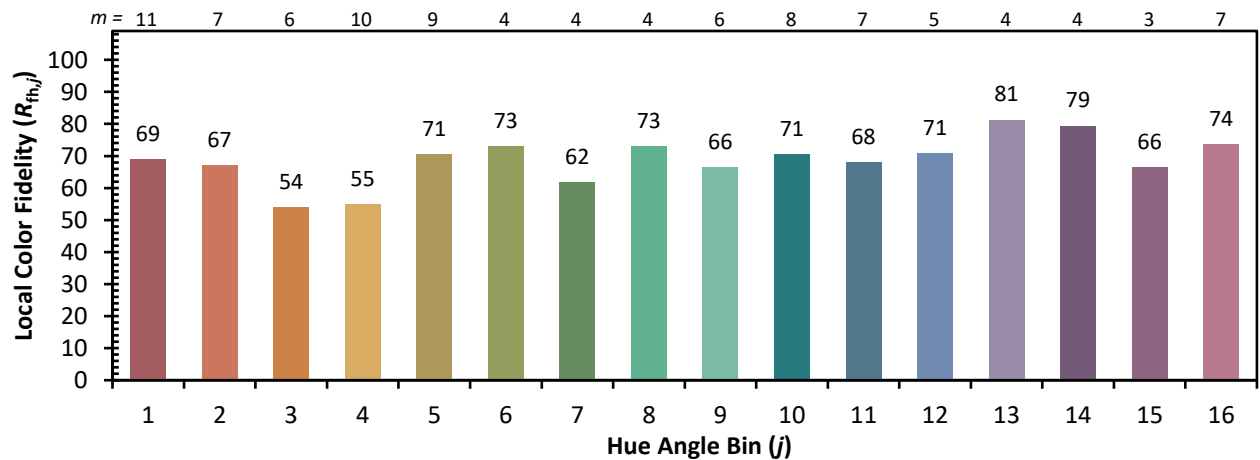
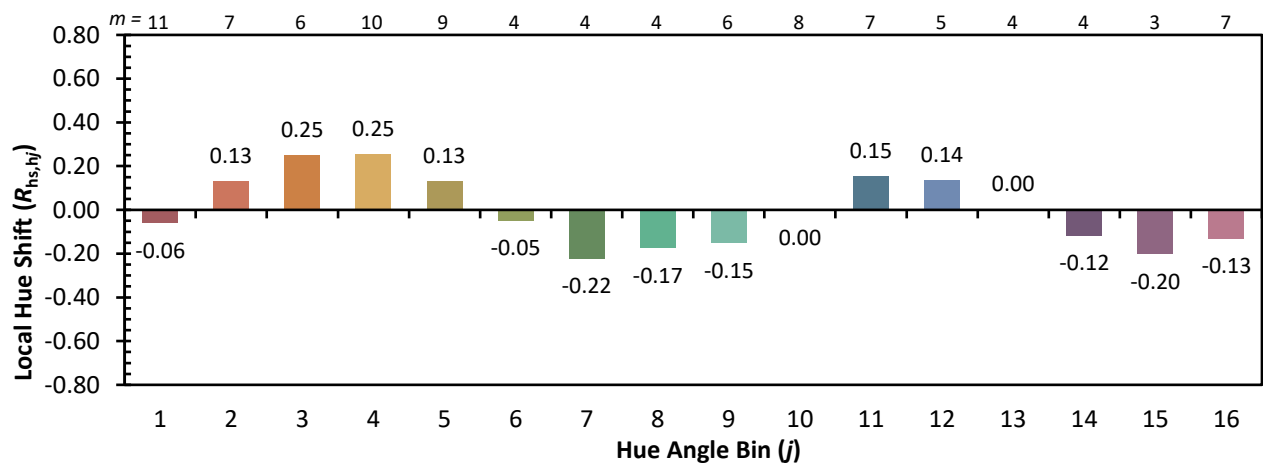
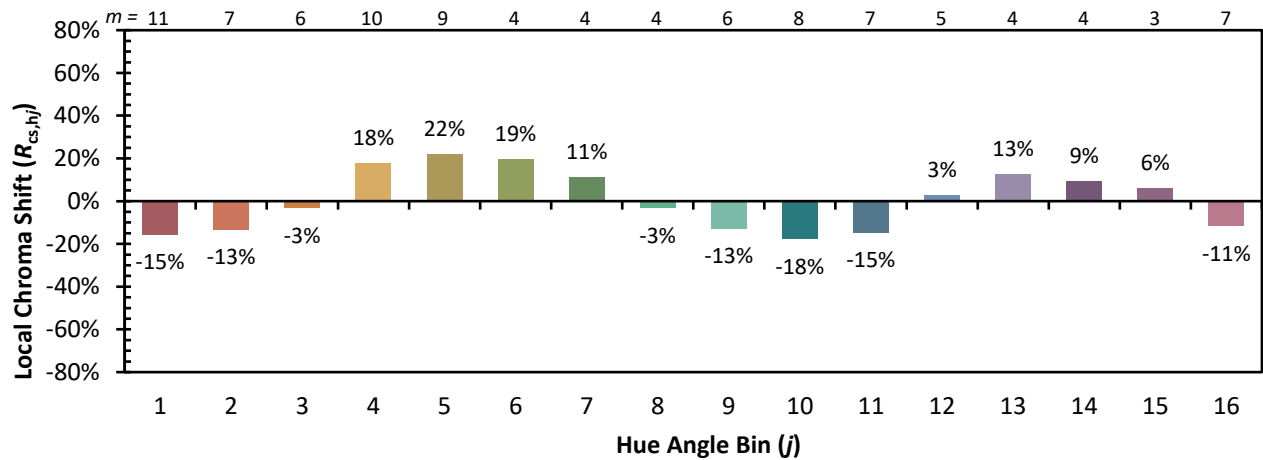


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

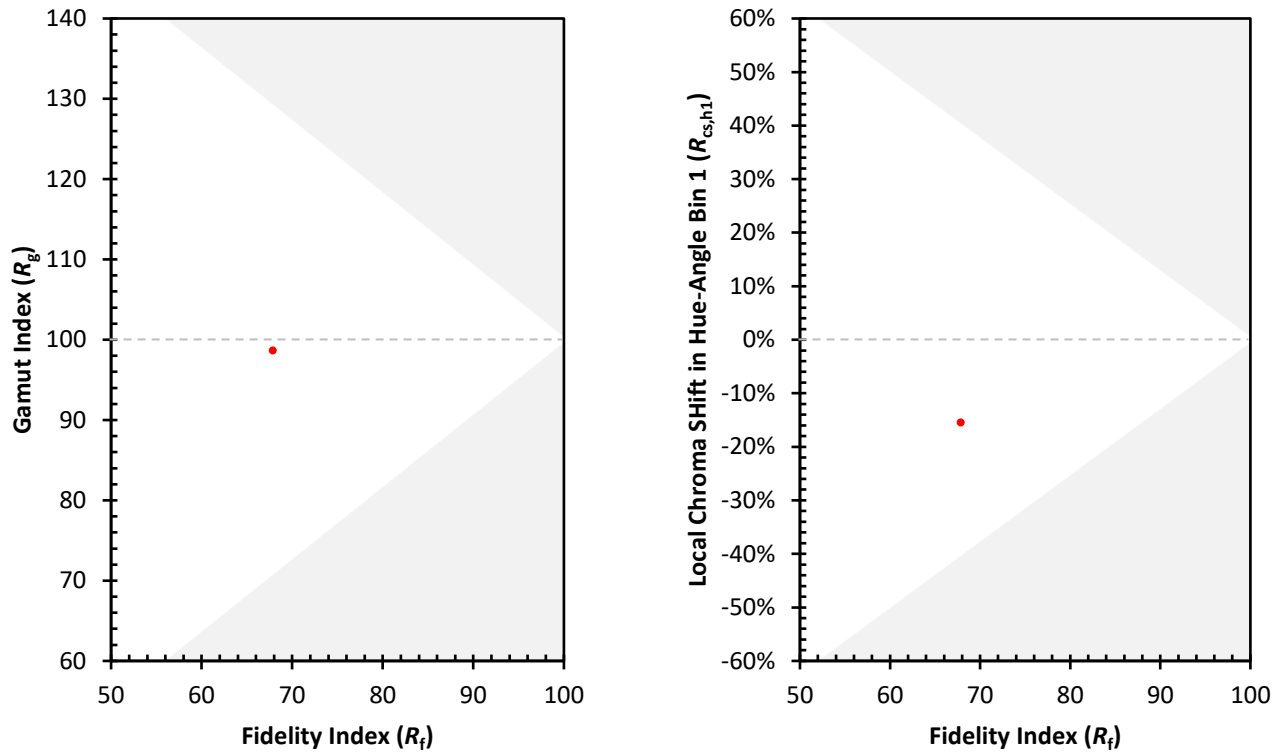
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 53 | CES51 = 75 | CES76 = 51 |
| CES02 = 63 | CES27 = 70 | CES52 = 80 | CES77 = 79 |
| CES03 = 31 | CES28 = 81 | CES53 = 64 | CES78 = 58 |
| CES04 = 71 | CES29 = 37 | CES54 = 73 | CES79 = 82 |
| CES05 = 50 | CES30 = 33 | CES55 = 69 | CES80 = 82 |
| CES06 = 52 | CES31 = 44 | CES56 = 60 | CES81 = 69 |
| CES07 = 42 | CES32 = 47 | CES57 = 54 | CES82 = 92 |
| CES08 = 41 | CES33 = 45 | CES58 = 59 | CES83 = 82 |
| CES09 = 29 | CES34 = 67 | CES59 = 85 | CES84 = 92 |
| CES10 = 77 | CES35 = 84 | CES60 = 86 | CES85 = 87 |
| CES11 = 60 | CES36 = 68 | CES61 = 86 | CES86 = 60 |
| CES12 = 66 | CES37 = 77 | CES62 = 59 | CES87 = 79 |
| CES13 = 44 | CES38 = 40 | CES63 = 66 | CES88 = 70 |
| CES14 = 74 | CES39 = 88 | CES64 = 69 | CES89 = 66 |
| CES15 = 72 | CES40 = 82 | CES65 = 64 | CES90 = 64 |
| CES16 = 48 | CES41 = 70 | CES66 = 65 | CES91 = 81 |
| CES17 = 51 | CES42 = 76 | CES67 = 64 | CES92 = 69 |
| CES18 = 57 | CES43 = 63 | CES68 = 73 | CES93 = 81 |
| CES19 = 73 | CES44 = 97 | CES69 = 83 | CES94 = 53 |
| CES20 = 67 | CES45 = 74 | CES70 = 64 | CES95 = 77 |
| CES21 = 88 | CES46 = 67 | CES71 = 60 | CES96 = 79 |
| CES22 = 80 | CES47 = 55 | CES72 = 87 | CES97 = 78 |
| CES23 = 92 | CES48 = 42 | CES73 = 57 | CES98 = 69 |
| CES24 = 92 | CES49 = 65 | CES74 = 84 | CES99 = 60 |
| CES25 = 73 | CES50 = 74 | CES75 = 60 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)