

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: P1063525

Luminaire Tested: **GLAN-SA4A-827-U-T2BC**

Issue Date: 08/07/2025

**Test Information**

Test Method: LM-79-08  
Report Number: P1063525  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 08/07/2025  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: STREETWORKS  
Catalog Number: GLAN-SA4A-827-U-T2BC  
Description: GALLEON II AREA AND ROADWAY LUMINAIRE 615mA 4xLight Square PACKAGE  
80CRI 2700K FIXTURE w/ TYPE II ANGLED BACKLIGHT CONTROL  
Light Source: (56) 2700K CCT, 80 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 12504.6 lumens  
Efficiency: N/A  
Efficacy: 116.4 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 1' x H: 0')  
IES Classification: Type II - Short  
BUG Rating: B0 - U0 - G2

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



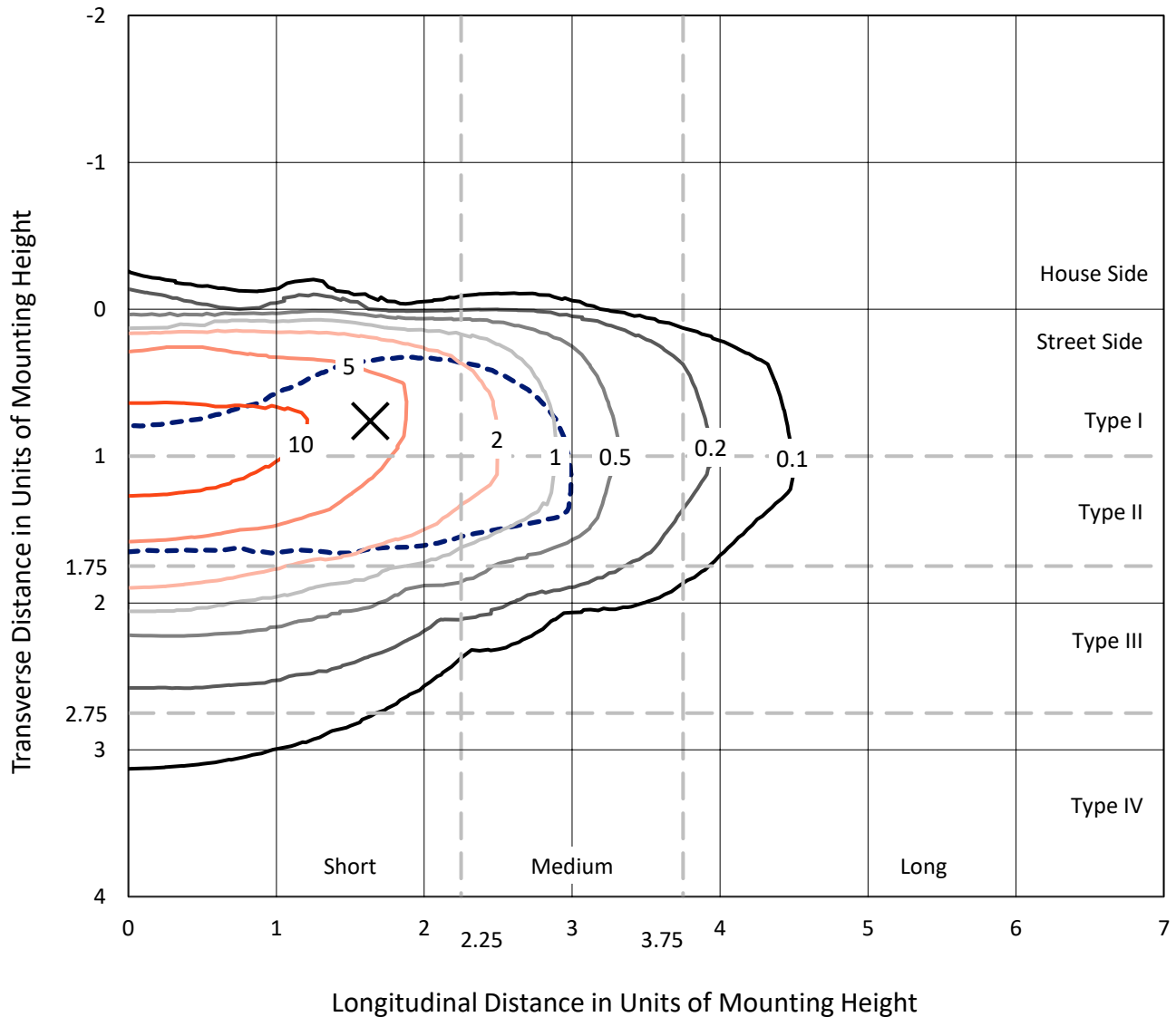
REPORT NUMBER: P1063525

CATALOG NUMBER: GLAN-SA4A-827-U-T2BC

## Iso-Footcandle Lines of Horizontal Illumination

× Max cd

--- 1/2 Max cd

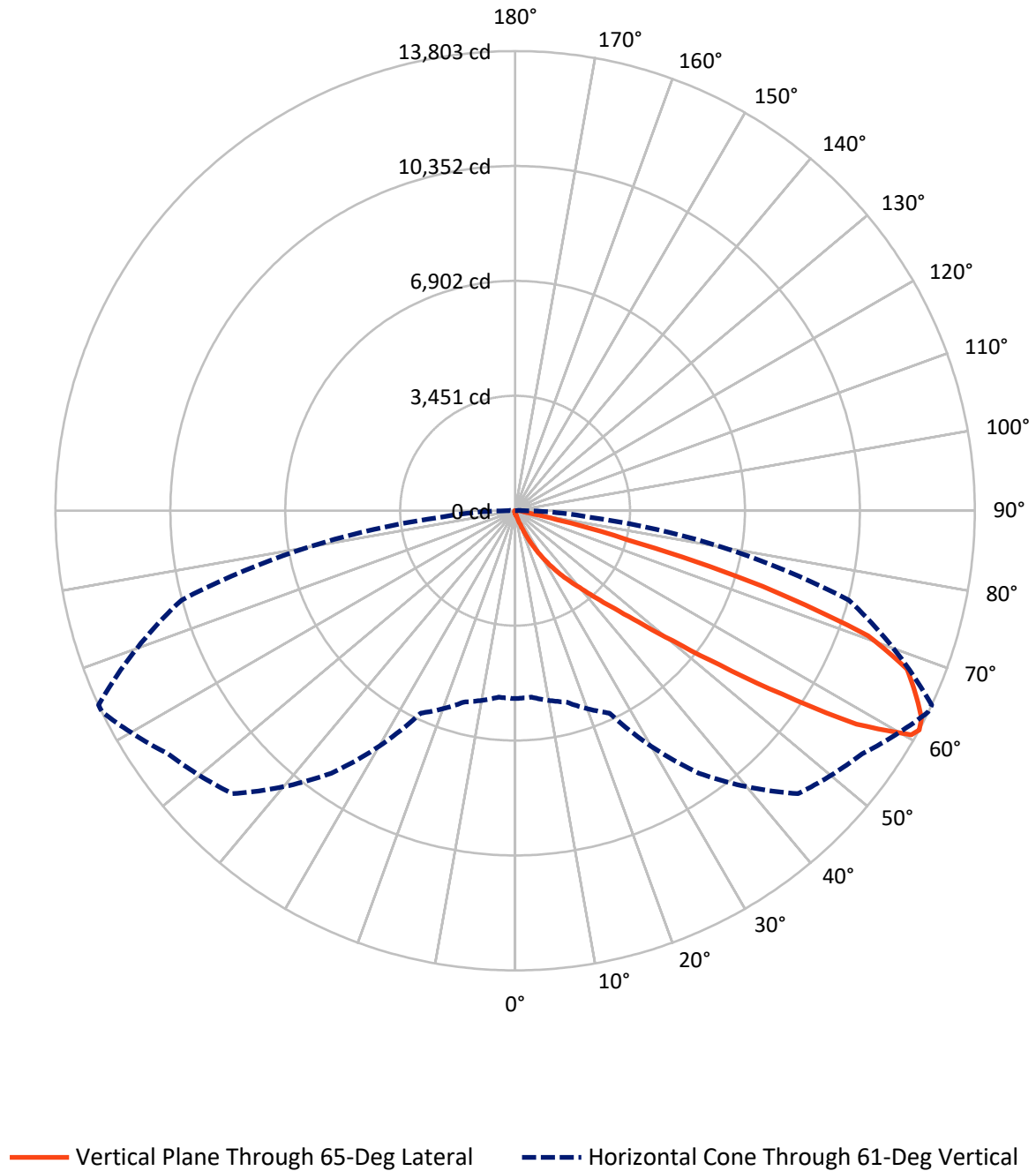


Based on 15 foot mounting height. Maximum calculated value = 16.5 fc  
 Type II - Short - N/A

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CATALOG NUMBER: GLAN-SA4A-827-U-T2BC

## Luminous Intensity Polar Plot



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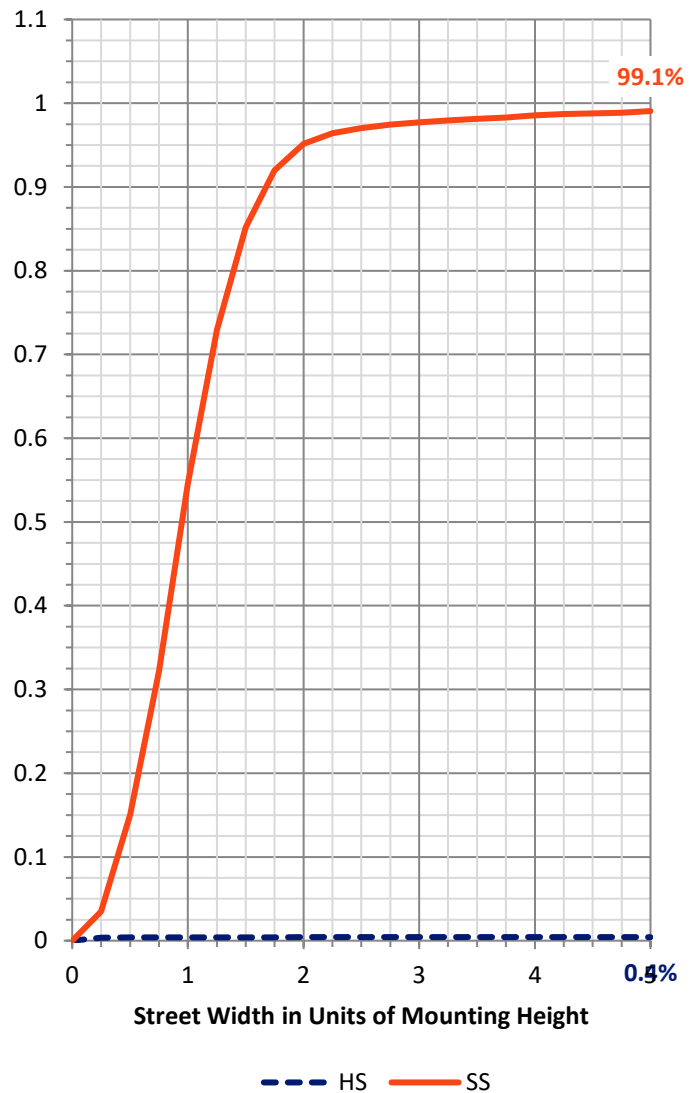
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 53.4     | 0.0    | 53.4    |
|                    | % Fixture | 0.4      | 0.0    | 0.4     |
| <b>Street Side</b> | Lumens    | 12451.2  | 0.0    | 12451.2 |
|                    | % Fixture | 99.6     | 0.0    | 99.6    |
| <b>Total</b>       | Lumens    | 12504.6  | 0.0    | 12504.6 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 9.7     | 0.1       |
| 10°-20°   | 102.8   | 0.8       |
| 20°-30°   | 369.0   | 3.0       |
| 30°-40°   | 982.5   | 7.9       |
| 40°-50°   | 2581.0  | 20.6      |
| 50°-60°   | 3998.5  | 32.0      |
| 60°-70°   | 3352.7  | 26.8      |
| 70°-80°   | 986.6   | 7.9       |
| 80°-90°   | 121.7   | 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°    | 12504.6 | 100.0     |
| 0°-180°   | 12504.6 | 100.0     |



REPORT NUMBER: P1063525

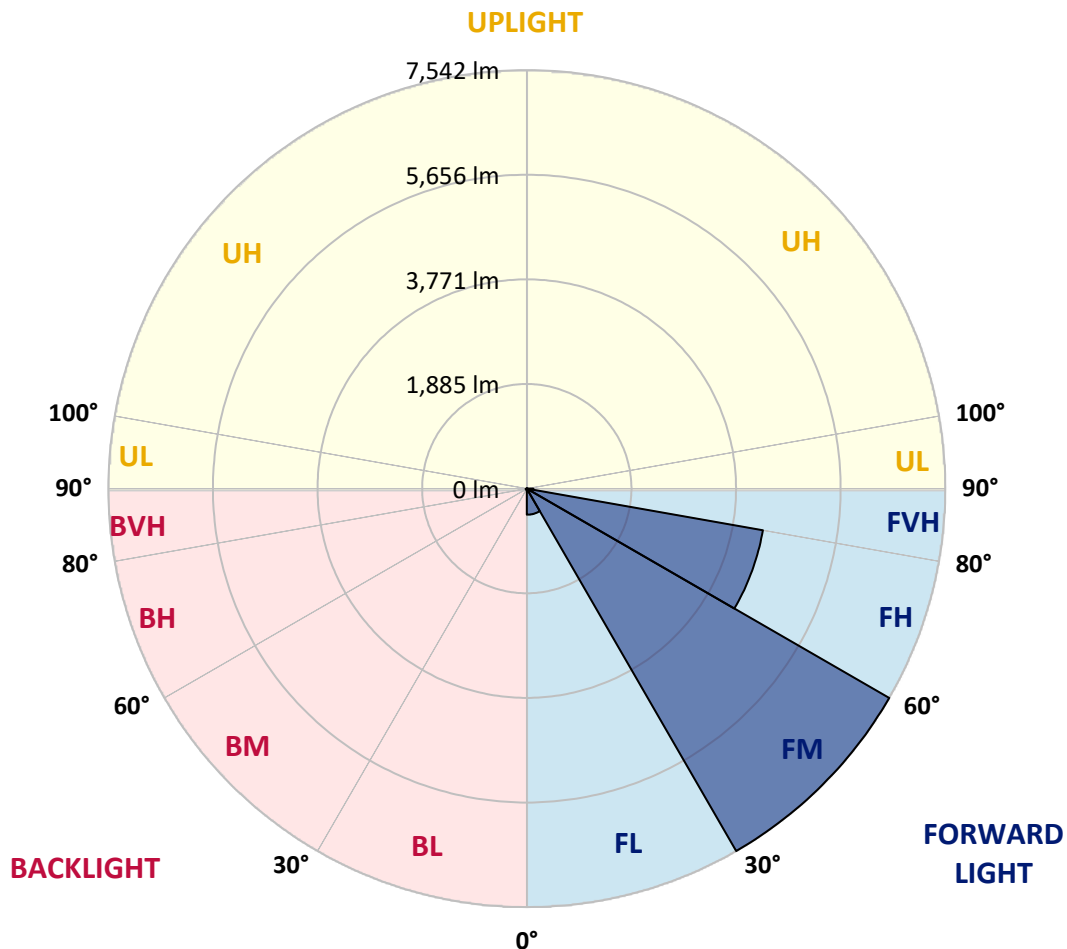
CATALOG NUMBER: GLAN-SA4A-827-U-T2BC

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 469.6  | 3.8       |                         |      |         |
| FM   | (30°-60°)   | 7541.7 | 60.3      |                         |      |         |
| FH   | (60°-80°)   | 4320.5 | 34.6      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 119.5  | 1.0       |                         |      | G2/225  |
| BL   | (0°-30°)    | 12.0   | 0.1       | B0/110                  |      |         |
| BM   | (30°-60°)   | 20.3   | 0.2       | B0/220                  |      |         |
| BH   | (60°-80°)   | 18.8   | 0.2       | B0/110                  |      | G0/110  |
| BVH  | (80°-90°)   | 2.3    | 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-G2**

Type II Short



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 55°     | 64°     | 65°     | 75°     | 85°    |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--------|
| 0°    | 76.6    | 76.6    | 76.6    | 76.6    | 76.6    | 76.6    | 76.6    | 76.6    | 76.6    | 76.6    | 76.6   |
| 2.5°  | 92.9    | 93.8    | 92.0    | 88.6    | 86.0    | 86.0    | 85.2    | 82.6    | 82.6    | 80.0    | 78.3   |
| 5°    | 129.9   | 128.2   | 124.7   | 117.8   | 111.8   | 105.8   | 99.8    | 93.8    | 92.9    | 85.2    | 80.0   |
| 7.5°  | 212.5   | 214.2   | 203.0   | 181.5   | 163.4   | 140.2   | 118.7   | 105.8   | 104.1   | 91.2    | 80.9   |
| 10°   | 466.2   | 453.3   | 427.5   | 344.1   | 283.0   | 213.3   | 158.3   | 123.0   | 121.3   | 98.1    | 82.6   |
| 12.5° | 849.9   | 839.5   | 792.2   | 706.2   | 548.8   | 381.9   | 231.4   | 152.3   | 147.1   | 104.1   | 83.4   |
| 15°   | 1224.9  | 1208.6  | 1182.7  | 1095.9  | 911.8   | 684.7   | 378.5   | 208.2   | 194.4   | 112.7   | 82.6   |
| 17.5° | 1464.0  | 1466.6  | 1443.4  | 1406.4  | 1287.7  | 1013.3  | 653.7   | 310.5   | 283.9   | 128.2   | 80.9   |
| 20°   | 1673.0  | 1667.0  | 1679.9  | 1660.1  | 1576.7  | 1377.1  | 951.4   | 492.0   | 446.4   | 153.1   | 81.7   |
| 22.5° | 1913.9  | 1928.5  | 1938.0  | 1933.7  | 1841.6  | 1671.3  | 1289.4  | 736.3   | 678.7   | 198.7   | 84.3   |
| 25°   | 2236.5  | 2234.7  | 2235.6  | 2224.4  | 2135.0  | 1945.7  | 1628.3  | 1040.0  | 981.5   | 272.7   | 90.3   |
| 27.5° | 2574.5  | 2584.8  | 2589.1  | 2548.7  | 2431.7  | 2245.9  | 1942.3  | 1372.0  | 1303.2  | 391.4   | 98.1   |
| 30°   | 3036.4  | 3027.8  | 3008.0  | 2925.5  | 2783.5  | 2553.0  | 2251.9  | 1720.4  | 1648.1  | 557.4   | 110.1  |
| 32.5° | 3659.2  | 3649.7  | 3550.0  | 3367.6  | 3155.1  | 2873.0  | 2563.3  | 2069.6  | 1981.9  | 764.7   | 126.4  |
| 35°   | 4685.4  | 4700.0  | 4454.9  | 3982.6  | 3601.6  | 3257.5  | 2908.3  | 2417.1  | 2339.7  | 1020.2  | 148.8  |
| 37.5° | 6256.9  | 6176.9  | 5844.1  | 5009.7  | 4189.1  | 3737.5  | 3237.7  | 2768.1  | 2701.0  | 1335.0  | 178.1  |
| 40°   | 7783.8  | 7704.6  | 7608.3  | 6817.8  | 5210.1  | 4266.5  | 3698.8  | 3180.1  | 3093.2  | 1690.3  | 221.1  |
| 42.5° | 9388.9  | 9345.0  | 9340.7  | 8744.6  | 7073.3  | 5098.3  | 4253.6  | 3662.6  | 3588.7  | 2079.9  | 291.6  |
| 45°   | 10526.0 | 10482.1 | 10574.2 | 10678.3 | 9610.8  | 6880.6  | 5219.6  | 4289.7  | 4182.2  | 2553.0  | 404.3  |
| 47.5° | 10679.1 | 10680.8 | 10926.9 | 11252.9 | 11496.3 | 9637.4  | 6506.4  | 5120.6  | 4989.9  | 3230.0  | 593.5  |
| 50°   | 10169.9 | 10189.7 | 10581.1 | 11164.3 | 11819.7 | 11950.5 | 8775.5  | 6326.6  | 6133.1  | 4032.5  | 861.9  |
| 52.5° | 9200.5  | 9222.8  | 9768.2  | 10727.3 | 11522.1 | 12506.1 | 11447.3 | 7904.2  | 7681.4  | 5033.8  | 1240.4 |
| 55°   | 8327.4  | 8341.2  | 8966.5  | 10178.5 | 11163.4 | 12204.2 | 13033.4 | 10010.8 | 9718.3  | 6265.5  | 1613.7 |
| 57.5° | 7462.9  | 7431.1  | 7837.9  | 9225.4  | 11102.3 | 11833.5 | 13267.4 | 12411.5 | 12089.0 | 7611.7  | 1904.4 |
| 60°   | 6306.8  | 6253.5  | 6580.4  | 7462.9  | 10298.9 | 12076.9 | 12829.6 | 13739.6 | 13666.5 | 9486.1  | 2128.9 |
| 61°   | 5641.9  | 5619.5  | 5948.1  | 6705.1  | 9622.8  | 12015.0 | 12724.6 | 13795.5 | 13803.3 | 10372.9 | 2229.6 |
| 62.5° | 4029.1  | 4092.7  | 4595.1  | 5579.1  | 8059.9  | 11613.3 | 12738.4 | 13622.7 | 13699.2 | 11551.3 | 2490.2 |
| 65°   | 1790.9  | 1893.3  | 2283.8  | 3084.6  | 4687.1  | 9660.7  | 12616.2 | 13243.3 | 13205.5 | 11874.8 | 3388.2 |
| 67.5° | 1062.3  | 1077.8  | 1272.2  | 1747.9  | 2482.5  | 5196.3  | 11133.3 | 12741.8 | 12691.1 | 10337.6 | 4215.7 |
| 70°   | 837.0   | 844.7   | 906.6   | 1096.7  | 1440.8  | 1990.5  | 6354.1  | 11024.1 | 11245.1 | 8382.4  | 4127.1 |
| 72.5° | 793.9   | 792.2   | 800.8   | 834.4   | 907.5   | 987.5   | 2460.1  | 7327.9  | 7777.7  | 6036.7  | 3460.5 |
| 75°   | 783.6   | 780.2   | 771.6   | 758.7   | 657.2   | 581.5   | 762.1   | 3241.2  | 3501.8  | 4124.6  | 2605.5 |
| 77.5° | 760.4   | 761.3   | 763.0   | 727.7   | 563.4   | 411.2   | 369.0   | 1040.0  | 1279.1  | 2617.5  | 1852.0 |
| 80°   | 514.4   | 522.1   | 535.0   | 521.3   | 506.6   | 297.6   | 260.6   | 369.9   | 375.0   | 1469.2  | 1223.2 |
| 82.5° | 260.6   | 260.6   | 254.6   | 227.1   | 196.1   | 193.5   | 207.3   | 268.4   | 271.8   | 743.2   | 575.5  |
| 85°   | 157.4   | 166.0   | 169.5   | 154.0   | 141.1   | 129.9   | 158.3   | 213.3   | 221.1   | 288.2   | 134.2  |
| 87.5° | 35.3    | 36.1    | 39.6    | 52.5    | 76.6    | 104.1   | 147.1   | 195.3   | 198.7   | 184.9   | 16.3   |
| 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: P1063525

CATALOG NUMBER: GLAN-SA4A-827-U-T2BC

**CANDELA DISTRIBUTION (continued):**

|       | 90°   | 95°   | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|-------|-------|-------|------|------|------|------|------|------|------|------|------|
| 0°    | 76.6  | 76.6  | 76.6 | 76.6 | 76.6 | 76.6 | 76.6 | 76.6 | 76.6 | 76.6 | 76.6 |
| 2.5°  | 77.4  | 75.7  | 74.8 | 72.3 | 69.7 | 67.1 | 65.4 | 64.5 | 65.4 | 66.2 | 66.2 |
| 5°    | 76.6  | 74.0  | 69.7 | 65.4 | 61.9 | 58.5 | 55.1 | 54.2 | 54.2 | 55.1 | 55.1 |
| 7.5°  | 76.6  | 72.3  | 66.2 | 61.1 | 55.9 | 50.8 | 48.2 | 46.4 | 47.3 | 47.3 | 47.3 |
| 10°   | 76.6  | 71.4  | 63.7 | 55.9 | 49.9 | 43.9 | 39.6 | 37.8 | 37.8 | 37.8 | 37.8 |
| 12.5° | 75.7  | 70.5  | 61.1 | 51.6 | 43.0 | 36.1 | 31.0 | 28.4 | 29.2 | 29.2 | 29.2 |
| 15°   | 74.0  | 68.0  | 57.6 | 43.9 | 34.4 | 27.5 | 22.4 | 19.8 | 20.6 | 22.4 | 23.2 |
| 17.5° | 71.4  | 65.4  | 51.6 | 37.0 | 27.5 | 20.6 | 15.5 | 13.8 | 14.6 | 17.2 | 17.2 |
| 20°   | 70.5  | 62.8  | 45.6 | 30.1 | 20.6 | 14.6 | 10.3 | 8.6  | 9.5  | 12.9 | 13.8 |
| 22.5° | 70.5  | 61.1  | 41.3 | 24.9 | 15.5 | 9.5  | 6.0  | 3.4  | 3.4  | 6.0  | 6.0  |
| 25°   | 71.4  | 60.2  | 37.8 | 20.6 | 11.2 | 6.9  | 3.4  | 1.7  | 3.4  | 9.5  | 11.2 |
| 27.5° | 73.1  | 59.4  | 36.1 | 17.2 | 8.6  | 6.0  | 2.6  | 6.0  | 10.3 | 10.3 | 10.3 |
| 30°   | 74.8  | 57.6  | 33.5 | 14.6 | 7.7  | 4.3  | 4.3  | 8.6  | 8.6  | 10.3 | 11.2 |
| 32.5° | 77.4  | 56.8  | 31.8 | 12.9 | 6.0  | 3.4  | 6.0  | 5.2  | 5.2  | 6.0  | 6.9  |
| 35°   | 82.6  | 57.6  | 30.1 | 12.9 | 6.0  | 4.3  | 5.2  | 2.6  | 1.7  | 1.7  | 1.7  |
| 37.5° | 89.5  | 58.5  | 27.5 | 11.2 | 5.2  | 5.2  | 2.6  | 0.0  | 0.0  | 0.0  | 0.0  |
| 40°   | 100.6 | 61.1  | 25.8 | 10.3 | 4.3  | 4.3  | 0.9  | 0.0  | 0.0  | 0.0  | 0.0  |
| 42.5° | 119.6 | 66.2  | 24.9 | 9.5  | 4.3  | 3.4  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 45°   | 157.4 | 78.3  | 23.2 | 8.6  | 4.3  | 1.7  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 47.5° | 226.2 | 106.7 | 22.4 | 6.9  | 2.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 50°   | 330.3 | 144.5 | 21.5 | 6.0  | 0.9  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 52.5° | 421.5 | 152.3 | 14.6 | 5.2  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 55°   | 431.8 | 104.9 | 11.2 | 3.4  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 57.5° | 344.1 | 68.0  | 9.5  | 2.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 60°   | 260.6 | 51.6  | 8.6  | 0.9  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 61°   | 250.3 | 46.4  | 8.6  | 0.9  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 62.5° | 276.1 | 40.4  | 7.7  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 65°   | 449.0 | 33.5  | 6.9  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 67.5° | 780.2 | 29.2  | 6.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 70°   | 985.8 | 27.5  | 5.2  | 0.9  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 72.5° | 859.3 | 24.9  | 5.2  | 1.7  | 0.9  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 75°   | 517.0 | 21.5  | 5.2  | 3.4  | 1.7  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 77.5° | 271.0 | 16.3  | 5.2  | 4.3  | 2.6  | 0.9  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 80°   | 131.6 | 14.6  | 6.0  | 4.3  | 3.4  | 1.7  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 82.5° | 51.6  | 12.0  | 6.9  | 6.0  | 4.3  | 2.6  | 0.9  | 0.0  | 0.0  | 0.0  | 0.0  |
| 85°   | 23.2  | 10.3  | 7.7  | 6.9  | 6.0  | 3.4  | 0.9  | 0.0  | 0.0  | 0.0  | 0.0  |
| 87.5° | 12.0  | 9.5   | 8.6  | 7.7  | 6.0  | 4.3  | 1.7  | 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  |



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

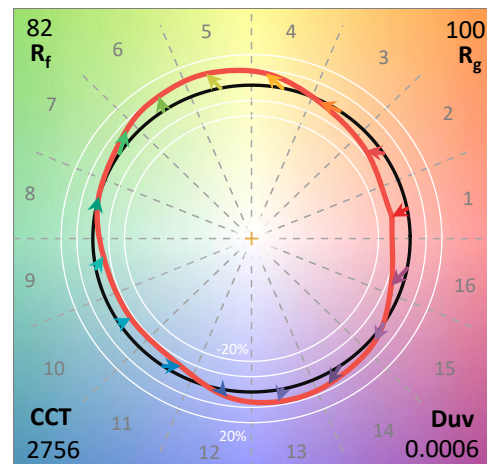
### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2407-184-8  
 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-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  
 R<sub>f</sub>: 82.2  
 R<sub>g</sub>: 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

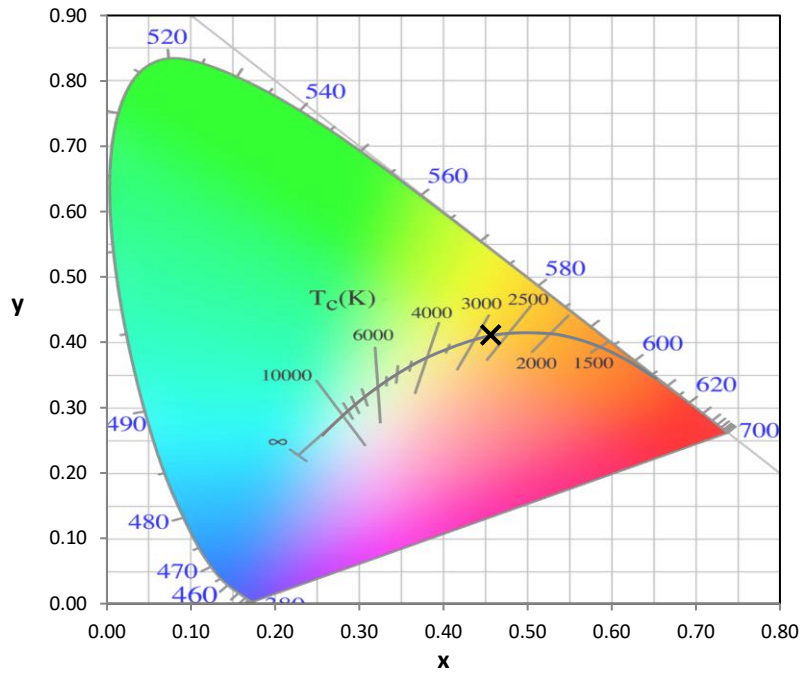
Stabilization Time: 29M  
 Operation Time: 1H 29M  
 Sphere Temperature (°C): 25.2

REPORT NUMBER: SP1-2407-184-8

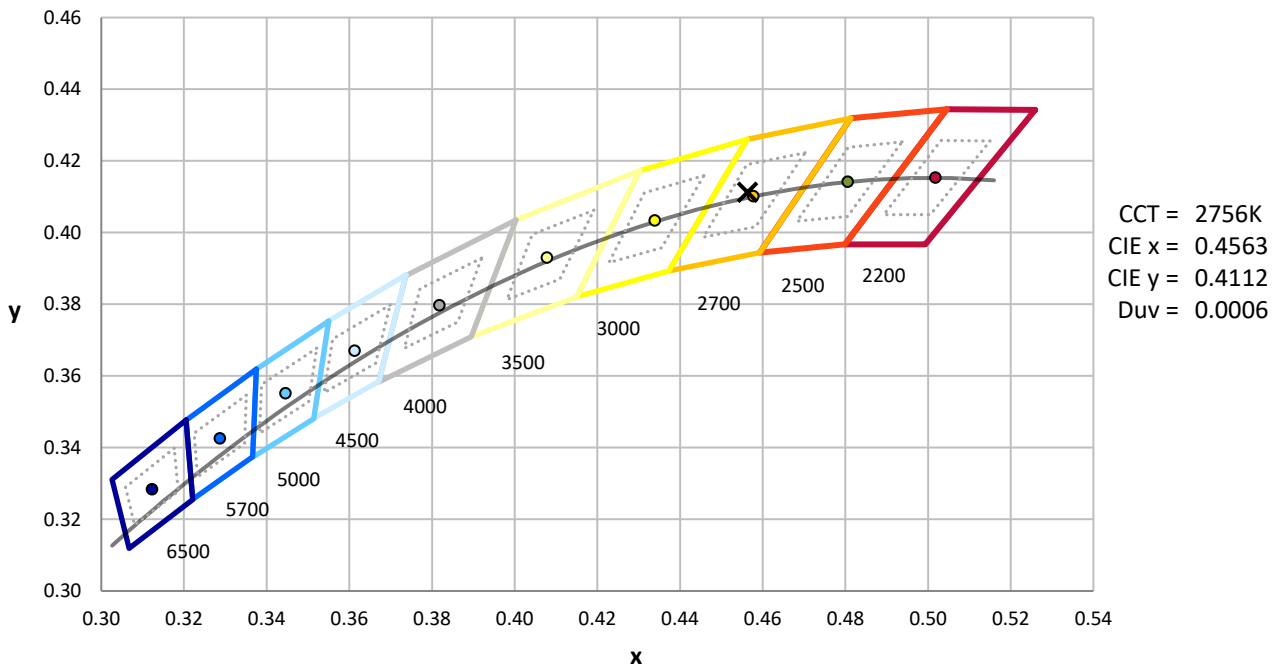
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date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



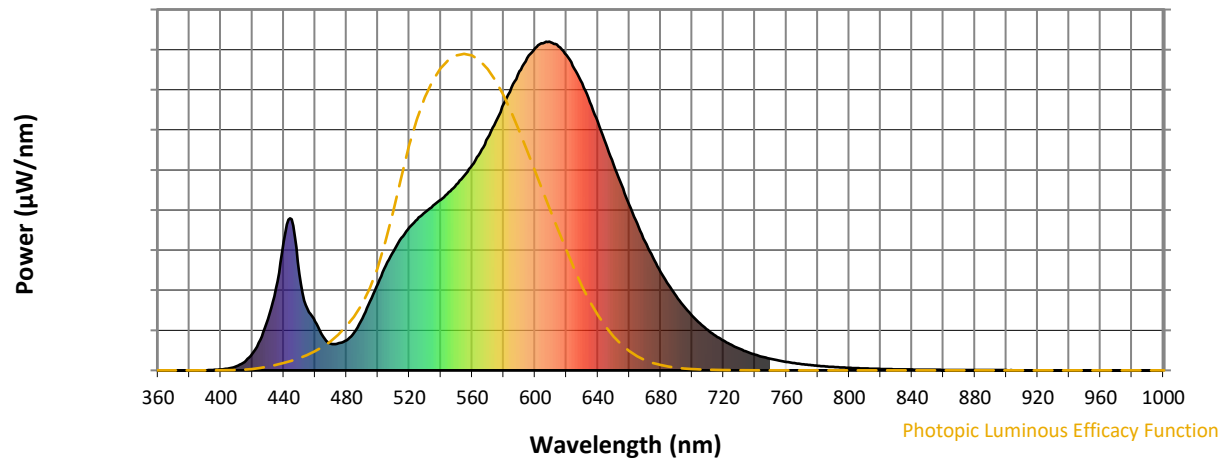
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 2700K 4-step quadrangle

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### Photopic Flux vs. Wavelength

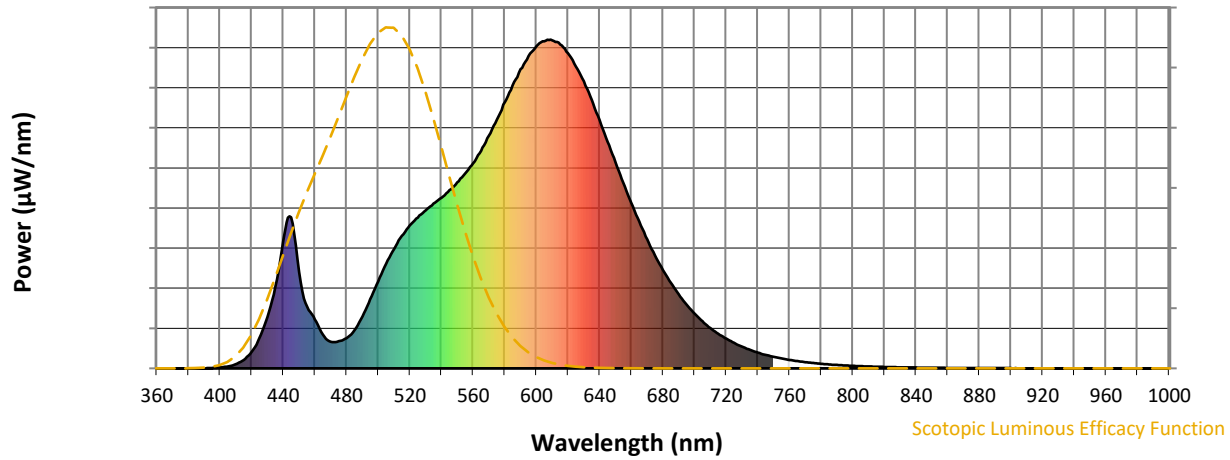


### Photopic Lumens: NR

| $\lambda$<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               | 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



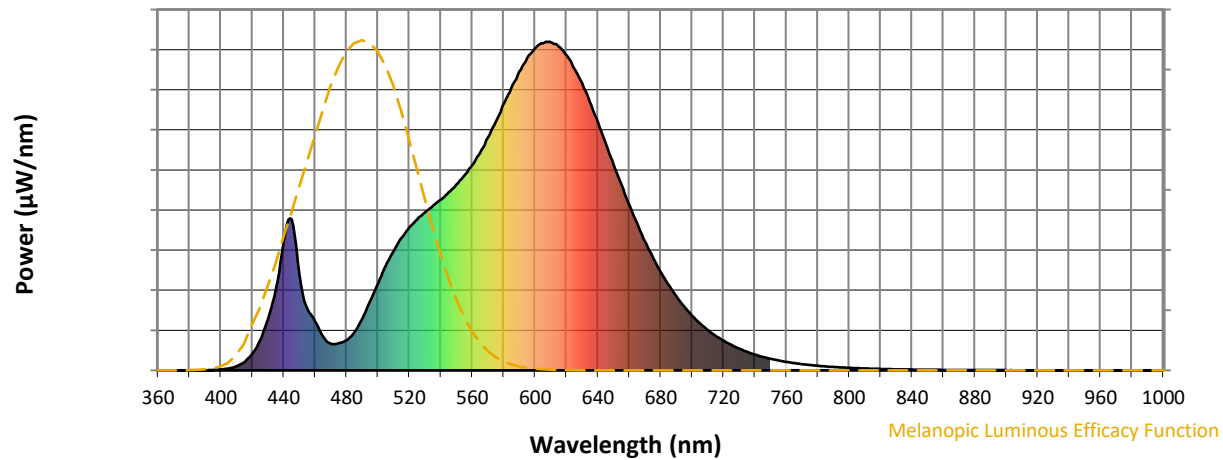
Scotopic Lumens: NR

S/P: 1.2

| λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(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**

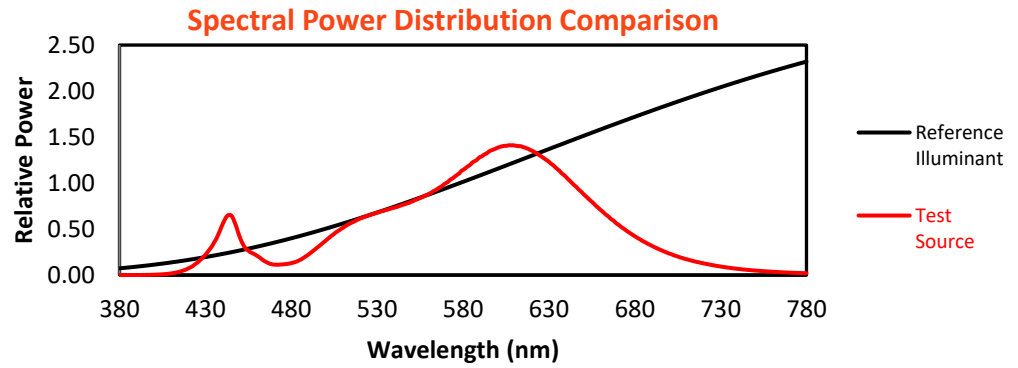
| $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<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               | 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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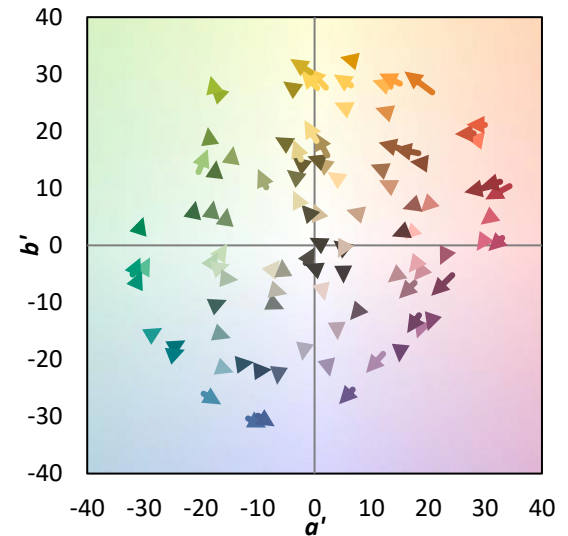
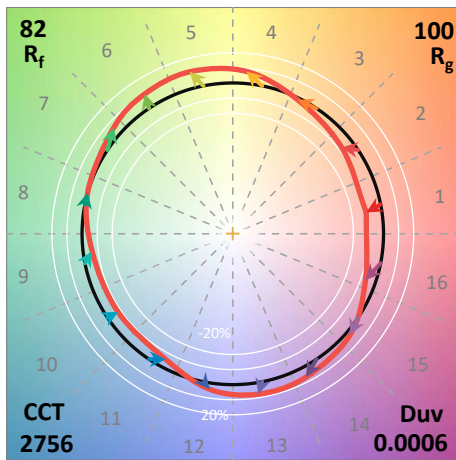
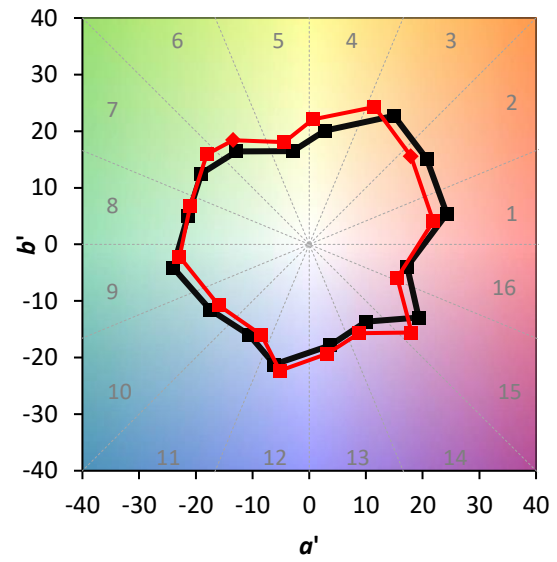
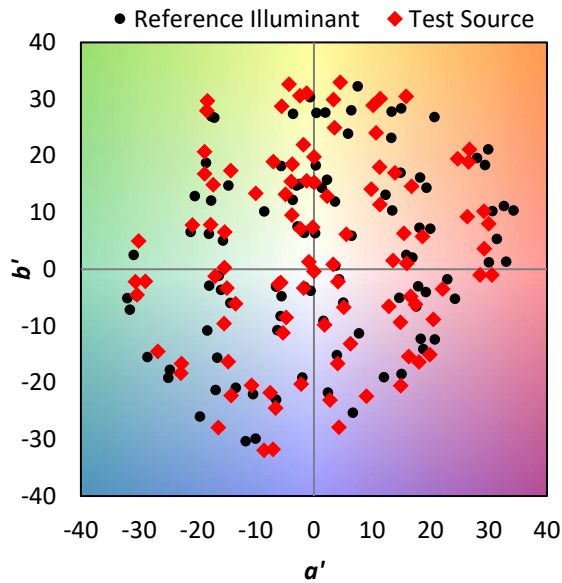
TM-30-18

### Summary

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



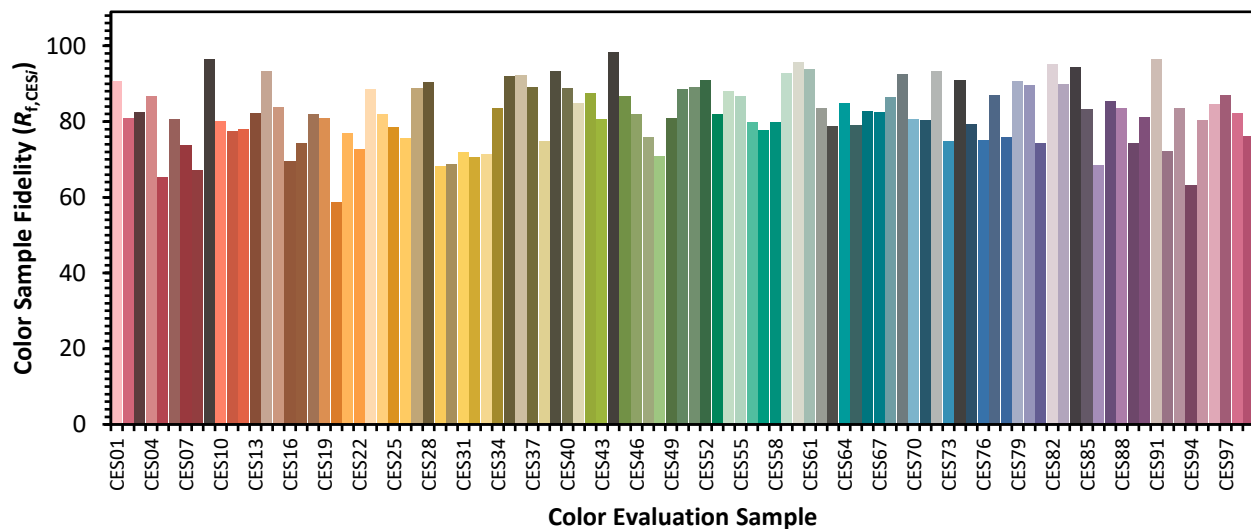
### Color Vector Graphics



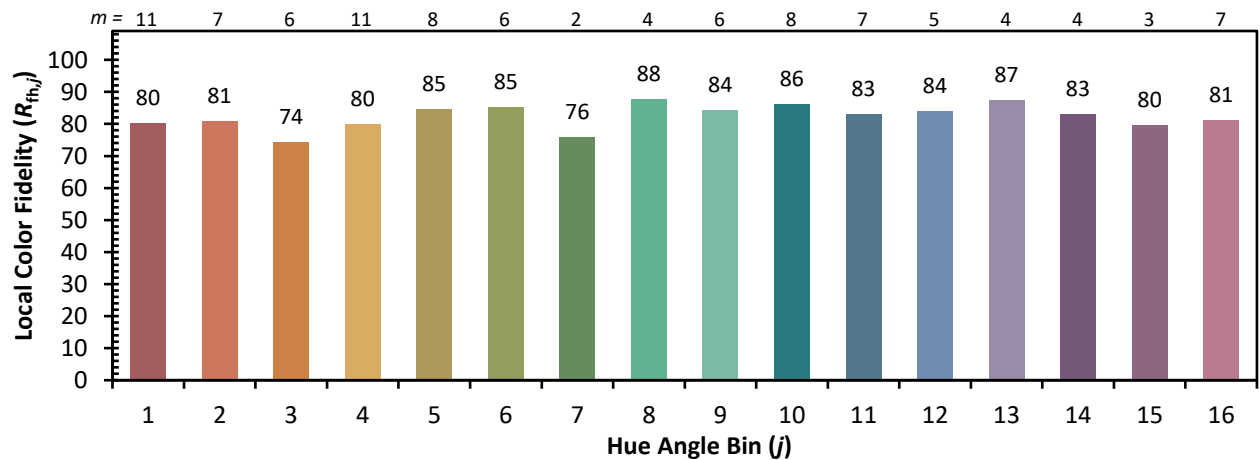
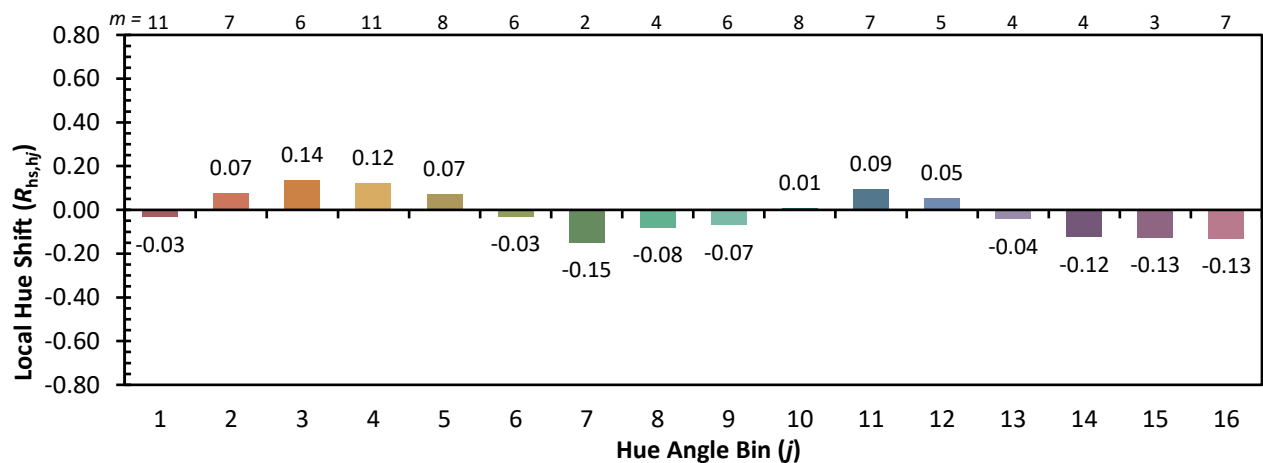
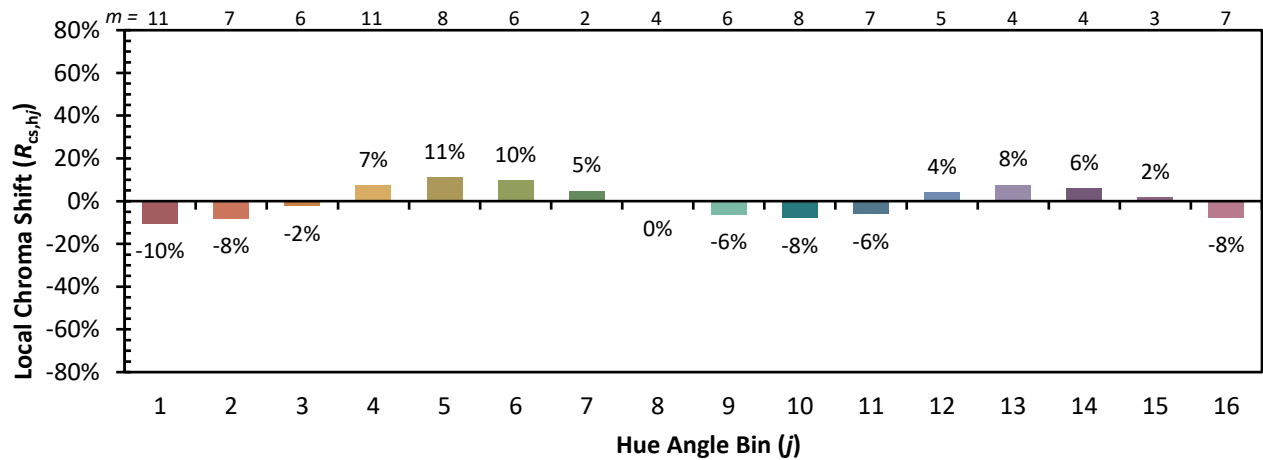


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

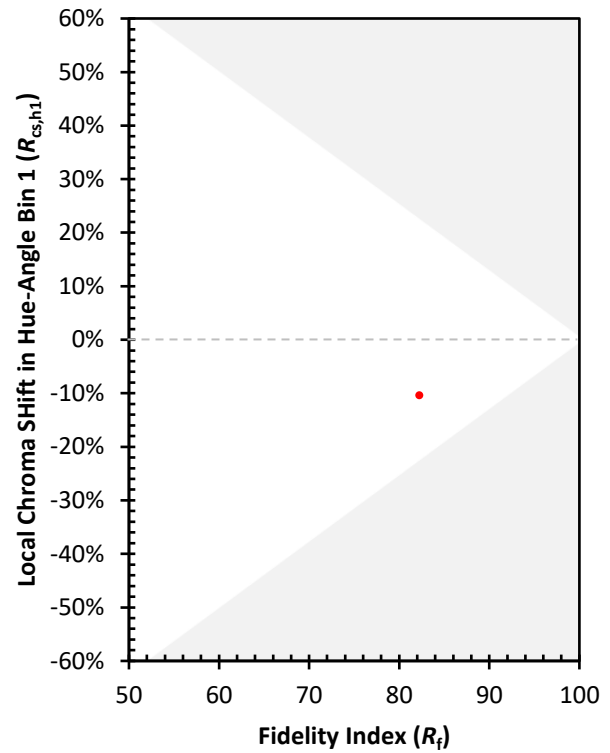
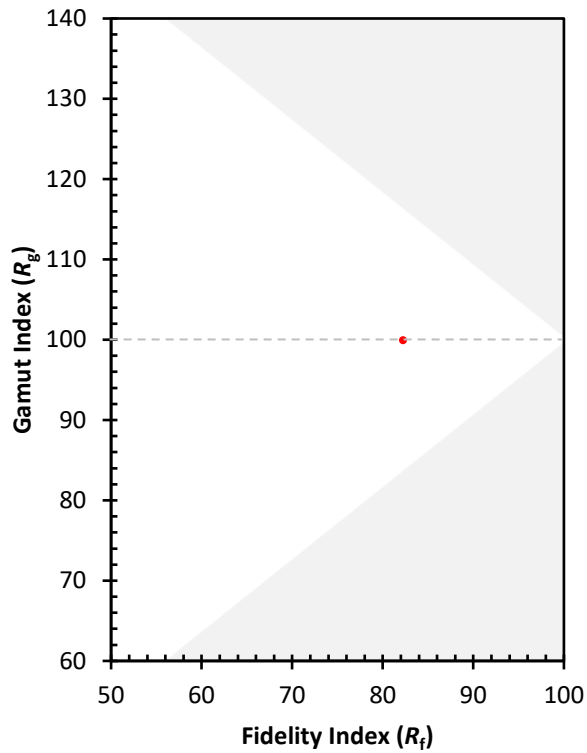
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 76 | CES51 = 89 | CES76 = 75 |
| CES02 = 63 | CES27 = 89 | CES52 = 91 | CES77 = 87 |
| CES03 = 31 | CES28 = 90 | CES53 = 82 | CES78 = 76 |
| CES04 = 71 | CES29 = 68 | CES54 = 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 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)