

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: McGRAW-EDISON

Report Number: P1047887

Luminaire Tested: **GALN-SA3C-827-U-T2BC**

Issue Date: 07/10/2025

**Test Information**

Test Method: LM-79-08  
Report Number: P1047887  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 07/10/2025  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: MCGRAW-EDISON  
Catalog Number: GALN-SA3C-827-U-T2BC  
Description: GALLEON II AREA AND ROADWAY LUMINAIRE 1050mA 3xLight Square PACKAGE  
80CRI 2700K FIXTURE w/ TYPE II ANGLED BACKLIGHT CONTROL  
Light Source: (42) 2700K CCT, 80 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 14554.3 lumens  
Efficiency: N/A  
Efficacy: 103.7 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 1' x H: 0')  
IES Classification: Type II - Short  
BUG Rating: B0 - U0 - G3

Input Watts (W): 140.4  
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



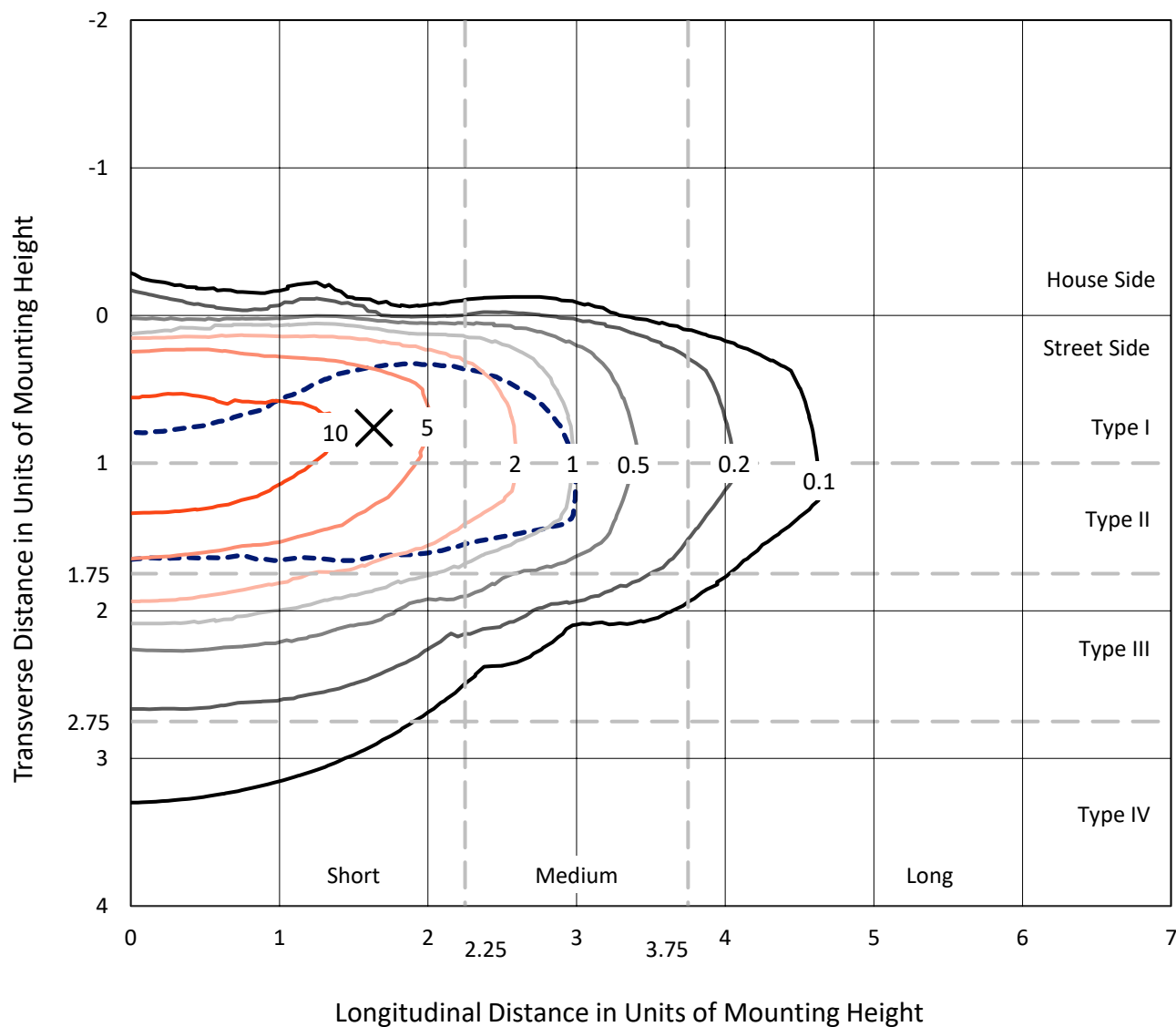
REPORT NUMBER: P1047887

CATALOG NUMBER: GALN-SA3C-827-U-T2BC

## Iso-Footcandle Lines of Horizontal Illumination

× Max cd

--- 1/2 Max cd

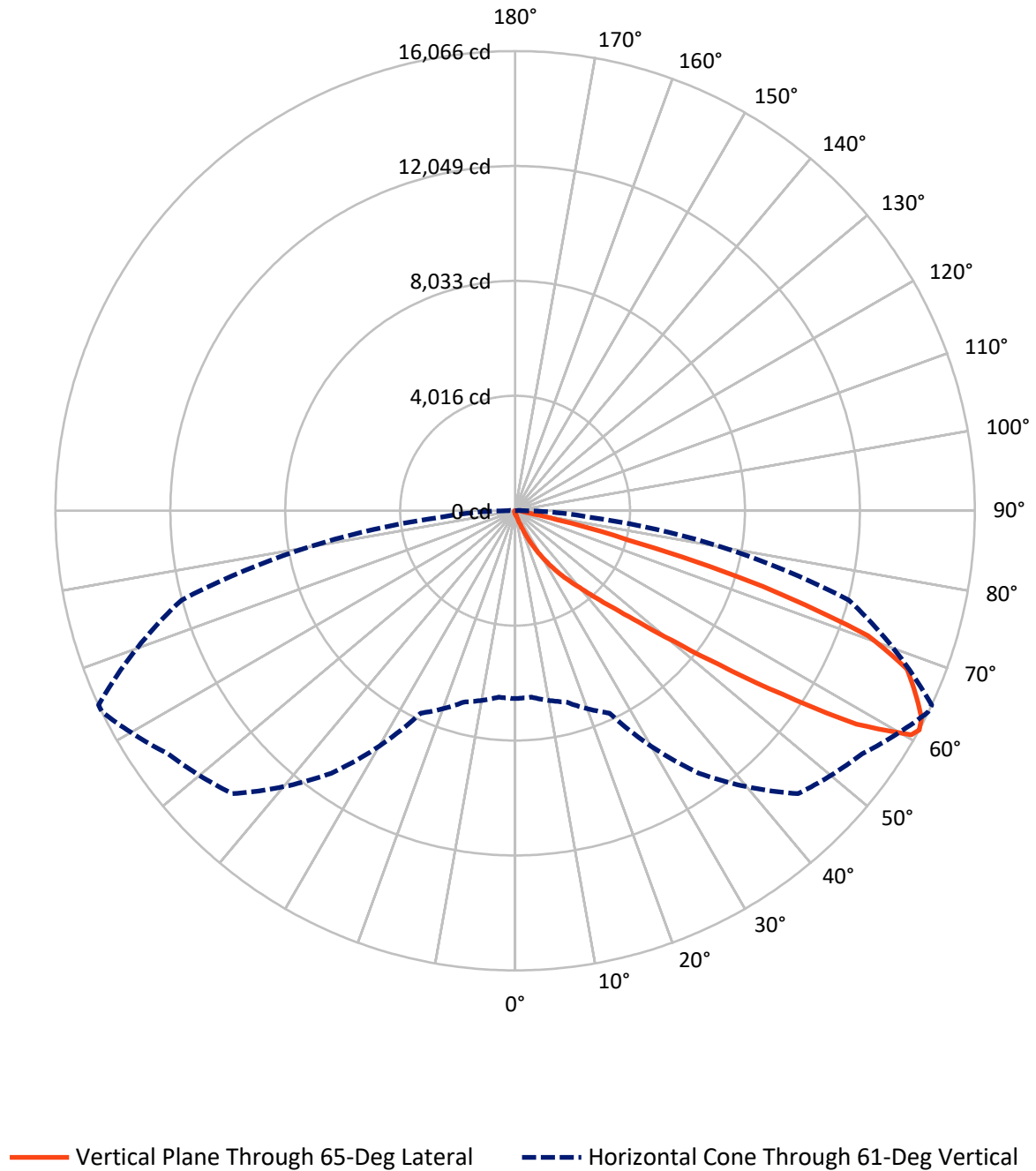


Based on 15 foot mounting height. Maximum calculated value = 19.3 fc  
 Type II - Short - N/A

REPORT NUMBER: P1047887

CATALOG NUMBER: GALN-SA3C-827-U-T2BC

## Luminous Intensity Polar Plot



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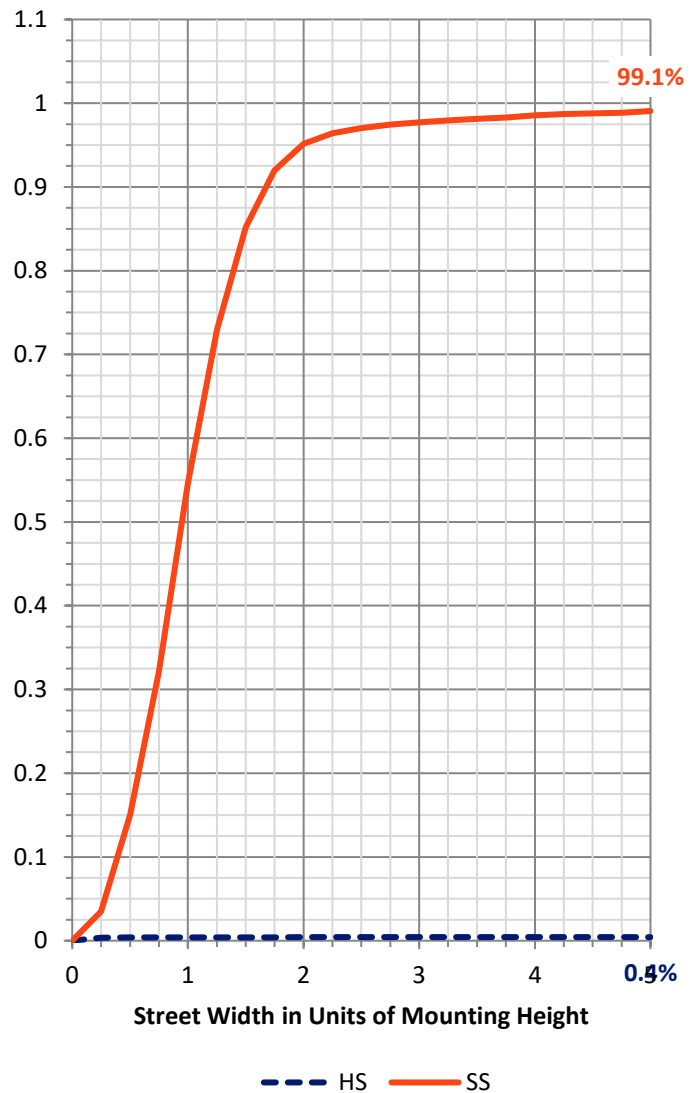
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 62.1     | 0.0    | 62.1    |
|                    | % Fixture | 0.4      | 0.0    | 0.4     |
| <b>Street Side</b> | Lumens    | 14492.1  | 0.0    | 14492.1 |
|                    | % Fixture | 99.6     | 0.0    | 99.6    |
| <b>Total</b>       | Lumens    | 14554.3  | 0.0    | 14554.3 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 11.3    | 0.1       |
| 10°-20°   | 119.7   | 0.8       |
| 20°-30°   | 429.5   | 3.0       |
| 30°-40°   | 1143.5  | 7.9       |
| 40°-50°   | 3004.1  | 20.6      |
| 50°-60°   | 4653.9  | 32.0      |
| 60°-70°   | 3902.2  | 26.8      |
| 70°-80°   | 1148.4  | 7.9       |
| 80°-90°   | 141.7   | 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°    | 14554.3 | 100.0     |
| 0°-180°   | 14554.3 | 100.0     |



REPORT NUMBER: P1047887

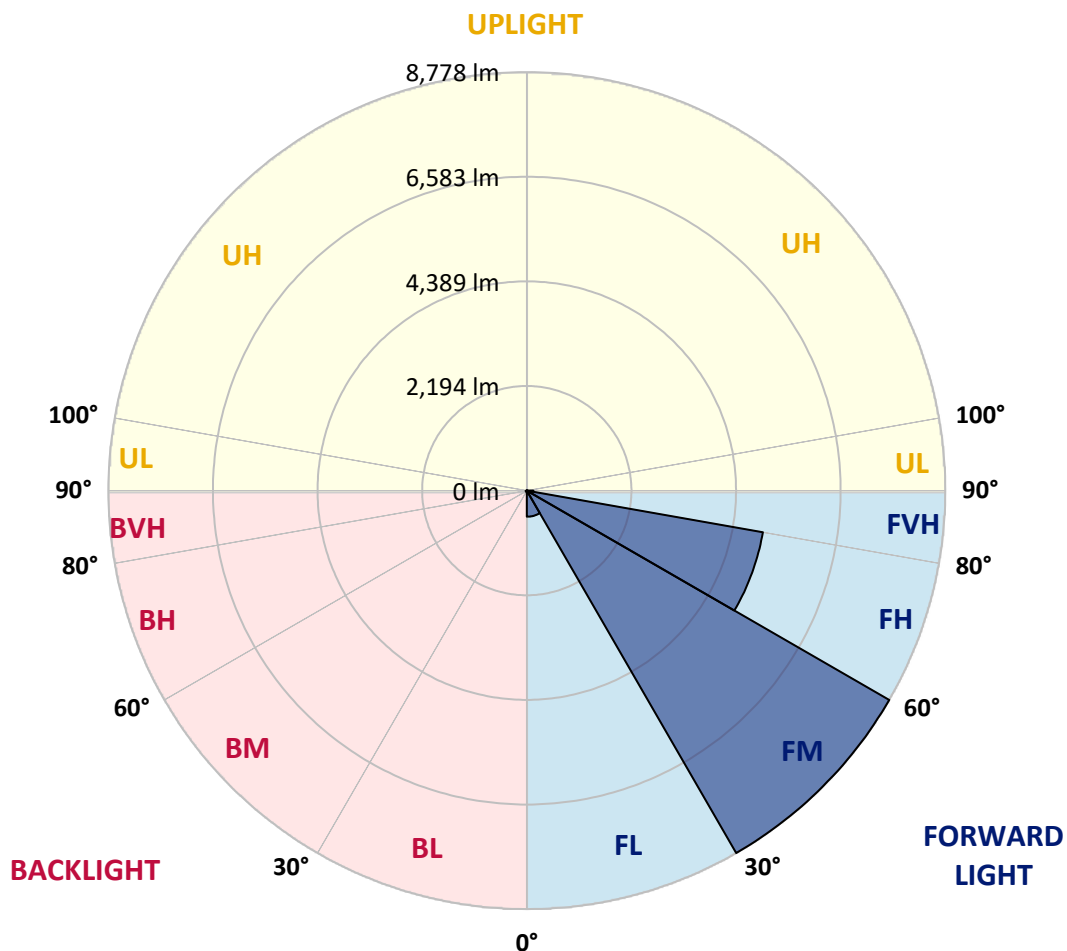
CATALOG NUMBER: GALN-SA3C-827-U-T2BC

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 546.6  | 3.8       |                         |      |         |
| FM   | (30°-60°)   | 8777.9 | 60.3      |                         |      |         |
| FH   | (60°-80°)   | 5028.6 | 34.6      |                         |      | G3/7500 |
| FVH  | (80°-90°)   | 139.0  | 1.0       |                         |      | G2/225  |
| BL   | (0°-30°)    | 13.9   | 0.1       | B0/110                  |      |         |
| BM   | (30°-60°)   | 23.6   | 0.2       | B0/220                  |      |         |
| BH   | (60°-80°)   | 21.9   | 0.2       | B0/110                  |      | G0/110  |
| BVH  | (80°-90°)   | 2.6    | 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 II Short



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 45°     | 55°     | 64°     | 65°     | 75°     | 85°    |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--------|
| 0°    | 89.1    | 89.1    | 89.1    | 89.1    | 89.1    | 89.1    | 89.1    | 89.1    | 89.1    | 89.1    | 89.1   |
| 2.5°  | 108.1   | 109.1   | 107.1   | 103.1   | 100.1   | 100.1   | 99.1    | 96.1    | 96.1    | 93.1    | 91.1   |
| 5°    | 151.2   | 149.2   | 145.2   | 137.2   | 130.2   | 123.1   | 116.1   | 109.1   | 108.1   | 99.1    | 93.1   |
| 7.5°  | 247.3   | 249.3   | 236.3   | 211.2   | 190.2   | 163.2   | 138.2   | 123.1   | 121.1   | 106.1   | 94.1   |
| 10°   | 542.6   | 527.6   | 497.6   | 400.5   | 329.4   | 248.3   | 184.2   | 143.2   | 141.2   | 114.1   | 96.1   |
| 12.5° | 989.2   | 977.1   | 922.1   | 822.0   | 638.8   | 444.5   | 269.3   | 177.2   | 171.2   | 121.1   | 97.1   |
| 15°   | 1425.7  | 1406.7  | 1376.6  | 1275.5  | 1061.2  | 796.9   | 440.5   | 242.3   | 226.3   | 131.2   | 96.1   |
| 17.5° | 1704.0  | 1707.0  | 1680.0  | 1636.9  | 1498.8  | 1179.4  | 760.9   | 361.4   | 330.4   | 149.2   | 94.1   |
| 20°   | 1947.3  | 1940.3  | 1955.3  | 1932.3  | 1835.2  | 1602.9  | 1107.3  | 572.7   | 519.6   | 178.2   | 95.1   |
| 22.5° | 2227.6  | 2244.6  | 2255.7  | 2250.6  | 2143.5  | 1945.3  | 1500.8  | 857.0   | 789.9   | 231.3   | 98.1   |
| 25°   | 2603.1  | 2601.1  | 2602.1  | 2589.0  | 2484.9  | 2264.7  | 1895.2  | 1210.4  | 1142.3  | 317.4   | 105.1  |
| 27.5° | 2996.5  | 3008.5  | 3013.5  | 2966.5  | 2830.3  | 2614.1  | 2260.7  | 1596.9  | 1516.8  | 455.5   | 114.1  |
| 30°   | 3534.2  | 3524.1  | 3501.1  | 3405.0  | 3239.8  | 2971.5  | 2621.1  | 2002.4  | 1918.3  | 648.8   | 128.2  |
| 32.5° | 4259.0  | 4248.0  | 4131.9  | 3919.6  | 3672.3  | 3343.9  | 2983.5  | 2408.8  | 2306.7  | 890.0   | 147.2  |
| 35°   | 5453.4  | 5470.4  | 5185.1  | 4635.4  | 4191.9  | 3791.5  | 3385.0  | 2813.3  | 2723.2  | 1187.4  | 173.2  |
| 37.5° | 7282.6  | 7189.5  | 6802.0  | 5830.9  | 4875.7  | 4350.1  | 3768.4  | 3221.8  | 3143.7  | 1553.8  | 207.2  |
| 40°   | 9059.7  | 8967.5  | 8855.4  | 7935.3  | 6064.1  | 4965.8  | 4305.1  | 3701.4  | 3600.2  | 1967.3  | 257.3  |
| 42.5° | 10927.8 | 10876.8 | 10871.8 | 10178.0 | 8232.7  | 5934.0  | 4950.8  | 4263.0  | 4176.9  | 2420.8  | 339.4  |
| 45°   | 12251.4 | 12200.3 | 12307.5 | 12428.6 | 11186.1 | 8008.4  | 6075.1  | 4992.9  | 4867.7  | 2971.5  | 470.6  |
| 47.5° | 12429.6 | 12431.6 | 12718.0 | 13097.4 | 13380.7 | 11217.2 | 7572.9  | 5960.0  | 5807.8  | 3759.4  | 690.8  |
| 50°   | 11836.9 | 11859.9 | 12315.5 | 12994.3 | 13757.2 | 13909.4 | 10214.0 | 7363.7  | 7138.4  | 4693.5  | 1003.2 |
| 52.5° | 10708.6 | 10734.6 | 11369.4 | 12485.7 | 13410.8 | 14556.1 | 13323.7 | 9199.8  | 8940.5  | 5858.9  | 1443.7 |
| 55°   | 9692.4  | 9708.4  | 10436.3 | 11846.9 | 12993.3 | 14204.7 | 15169.8 | 11651.7 | 11311.3 | 7292.6  | 1878.2 |
| 57.5° | 8686.2  | 8649.2  | 9122.7  | 10737.6 | 12922.2 | 13773.2 | 15442.2 | 14446.0 | 14070.5 | 8859.4  | 2216.6 |
| 60°   | 7340.6  | 7278.6  | 7659.0  | 8686.2  | 11987.1 | 14056.5 | 14932.6 | 15991.8 | 15906.7 | 11041.0 | 2477.9 |
| 61°   | 6566.7  | 6540.7  | 6923.1  | 7804.2  | 11200.2 | 13984.4 | 14810.4 | 16056.9 | 16065.9 | 12073.2 | 2595.1 |
| 62.5° | 4689.5  | 4763.6  | 5348.3  | 6493.6  | 9381.0  | 13516.9 | 14826.4 | 15855.6 | 15944.7 | 13444.8 | 2898.4 |
| 65°   | 2084.5  | 2203.6  | 2658.1  | 3590.2  | 5455.4  | 11244.2 | 14684.3 | 15414.1 | 15370.1 | 13821.2 | 3943.6 |
| 67.5° | 1236.5  | 1254.5  | 1480.7  | 2034.4  | 2889.4  | 6048.1  | 12958.2 | 14830.4 | 14771.4 | 12032.1 | 4906.8 |
| 70°   | 974.1   | 983.2   | 1055.2  | 1276.5  | 1677.0  | 2316.7  | 7395.7  | 12831.1 | 13088.4 | 9756.5  | 4803.6 |
| 72.5° | 924.1   | 922.1   | 932.1   | 971.1   | 1056.2  | 1149.4  | 2863.4  | 8529.0  | 9052.6  | 7026.3  | 4027.7 |
| 75°   | 912.1   | 908.1   | 898.1   | 883.0   | 764.9   | 676.8   | 887.0   | 3772.4  | 4075.8  | 4800.6  | 3032.6 |
| 77.5° | 885.0   | 886.0   | 888.0   | 847.0   | 655.8   | 478.6   | 429.5   | 1210.4  | 1488.8  | 3046.6  | 2155.5 |
| 80°   | 598.7   | 607.7   | 622.7   | 606.7   | 589.7   | 346.4   | 303.4   | 430.5   | 436.5   | 1710.0  | 1423.7 |
| 82.5° | 303.4   | 303.4   | 296.3   | 264.3   | 228.3   | 225.3   | 241.3   | 312.4   | 316.4   | 865.0   | 669.8  |
| 85°   | 183.2   | 193.2   | 197.2   | 179.2   | 164.2   | 151.2   | 184.2   | 248.3   | 257.3   | 335.4   | 156.2  |
| 87.5° | 41.0    | 42.0    | 46.1    | 61.1    | 89.1    | 121.1   | 171.2   | 227.3   | 231.3   | 215.3   | 19.0   |
| 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: P1047887

CATALOG NUMBER: GALN-SA3C-827-U-T2BC

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°   | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|-------|--------|-------|------|------|------|------|------|------|------|------|------|
| 0°    | 89.1   | 89.1  | 89.1 | 89.1 | 89.1 | 89.1 | 89.1 | 89.1 | 89.1 | 89.1 | 89.1 |
| 2.5°  | 90.1   | 88.1  | 87.1 | 84.1 | 81.1 | 78.1 | 76.1 | 75.1 | 76.1 | 77.1 | 77.1 |
| 5°    | 89.1   | 86.1  | 81.1 | 76.1 | 72.1 | 68.1 | 64.1 | 63.1 | 63.1 | 64.1 | 64.1 |
| 7.5°  | 89.1   | 84.1  | 77.1 | 71.1 | 65.1 | 59.1 | 56.1 | 54.1 | 55.1 | 55.1 | 55.1 |
| 10°   | 89.1   | 83.1  | 74.1 | 65.1 | 58.1 | 51.1 | 46.1 | 44.1 | 44.1 | 44.1 | 44.1 |
| 12.5° | 88.1   | 82.1  | 71.1 | 60.1 | 50.1 | 42.0 | 36.0 | 33.0 | 34.0 | 34.0 | 34.0 |
| 15°   | 86.1   | 79.1  | 67.1 | 51.1 | 40.0 | 32.0 | 26.0 | 23.0 | 24.0 | 26.0 | 27.0 |
| 17.5° | 83.1   | 76.1  | 60.1 | 43.1 | 32.0 | 24.0 | 18.0 | 16.0 | 17.0 | 20.0 | 20.0 |
| 20°   | 82.1   | 73.1  | 53.1 | 35.0 | 24.0 | 17.0 | 12.0 | 10.0 | 11.0 | 15.0 | 16.0 |
| 22.5° | 82.1   | 71.1  | 48.1 | 29.0 | 18.0 | 11.0 | 7.0  | 4.0  | 4.0  | 7.0  | 7.0  |
| 25°   | 83.1   | 70.1  | 44.1 | 24.0 | 13.0 | 8.0  | 4.0  | 2.0  | 4.0  | 11.0 | 13.0 |
| 27.5° | 85.1   | 69.1  | 42.0 | 20.0 | 10.0 | 7.0  | 3.0  | 7.0  | 12.0 | 12.0 | 12.0 |
| 30°   | 87.1   | 67.1  | 39.0 | 17.0 | 9.0  | 5.0  | 5.0  | 10.0 | 10.0 | 12.0 | 13.0 |
| 32.5° | 90.1   | 66.1  | 37.0 | 15.0 | 7.0  | 4.0  | 7.0  | 6.0  | 6.0  | 7.0  | 8.0  |
| 35°   | 96.1   | 67.1  | 35.0 | 15.0 | 7.0  | 5.0  | 6.0  | 3.0  | 2.0  | 2.0  | 2.0  |
| 37.5° | 104.1  | 68.1  | 32.0 | 13.0 | 6.0  | 6.0  | 3.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 40°   | 117.1  | 71.1  | 30.0 | 12.0 | 5.0  | 5.0  | 1.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 42.5° | 139.2  | 77.1  | 29.0 | 11.0 | 5.0  | 4.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 45°   | 183.2  | 91.1  | 27.0 | 10.0 | 5.0  | 2.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 47.5° | 263.3  | 124.1 | 26.0 | 8.0  | 3.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 50°   | 384.5  | 168.2 | 25.0 | 7.0  | 1.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 52.5° | 490.6  | 177.2 | 17.0 | 6.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 55°   | 502.6  | 122.1 | 13.0 | 4.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 57.5° | 400.5  | 79.1  | 11.0 | 3.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 60°   | 303.4  | 60.1  | 10.0 | 1.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 61°   | 291.3  | 54.1  | 10.0 | 1.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 62.5° | 321.4  | 47.1  | 9.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 65°   | 522.6  | 39.0  | 8.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 67.5° | 908.1  | 34.0  | 7.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 70°   | 1147.3 | 32.0  | 6.0  | 1.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 72.5° | 1000.2 | 29.0  | 6.0  | 2.0  | 1.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 75°   | 601.7  | 25.0  | 6.0  | 4.0  | 2.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 77.5° | 315.4  | 19.0  | 6.0  | 5.0  | 3.0  | 1.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 80°   | 153.2  | 17.0  | 7.0  | 5.0  | 4.0  | 2.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 82.5° | 60.1   | 14.0  | 8.0  | 7.0  | 5.0  | 3.0  | 1.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 85°   | 27.0   | 12.0  | 9.0  | 8.0  | 7.0  | 4.0  | 1.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 87.5° | 14.0   | 11.0  | 10.0 | 9.0  | 7.0  | 5.0  | 2.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 90°   | 0.0    | 0.0   | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |



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

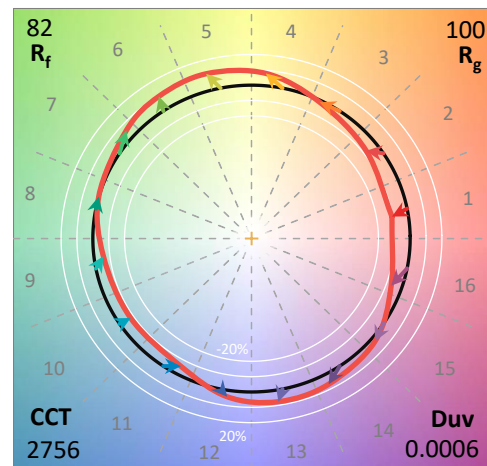
### Test Information

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

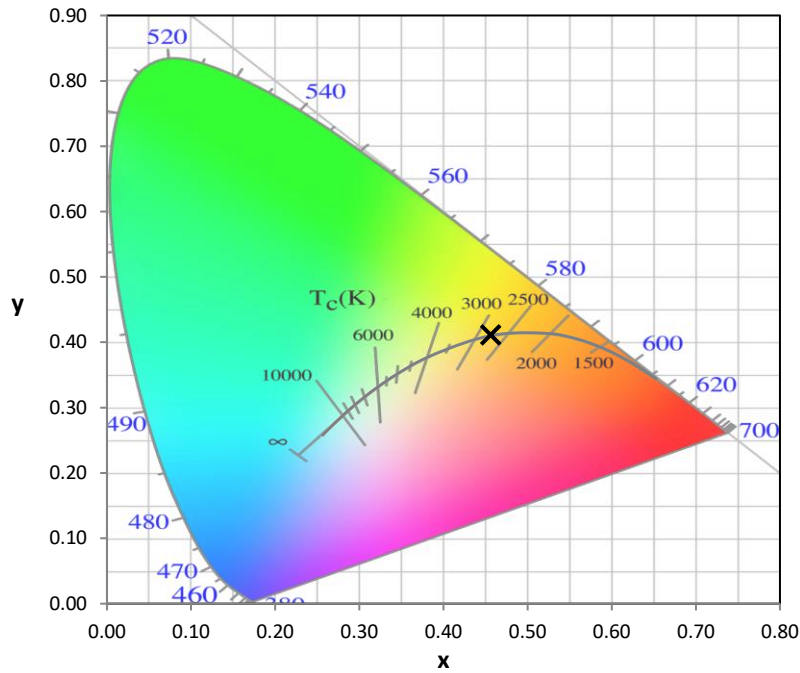
Stabilization Time: 29M  
 Operation Time: 1H 29M  
 Sphere Temperature (°C): 25.2

REPORT NUMBER: SP1-2407-184-8

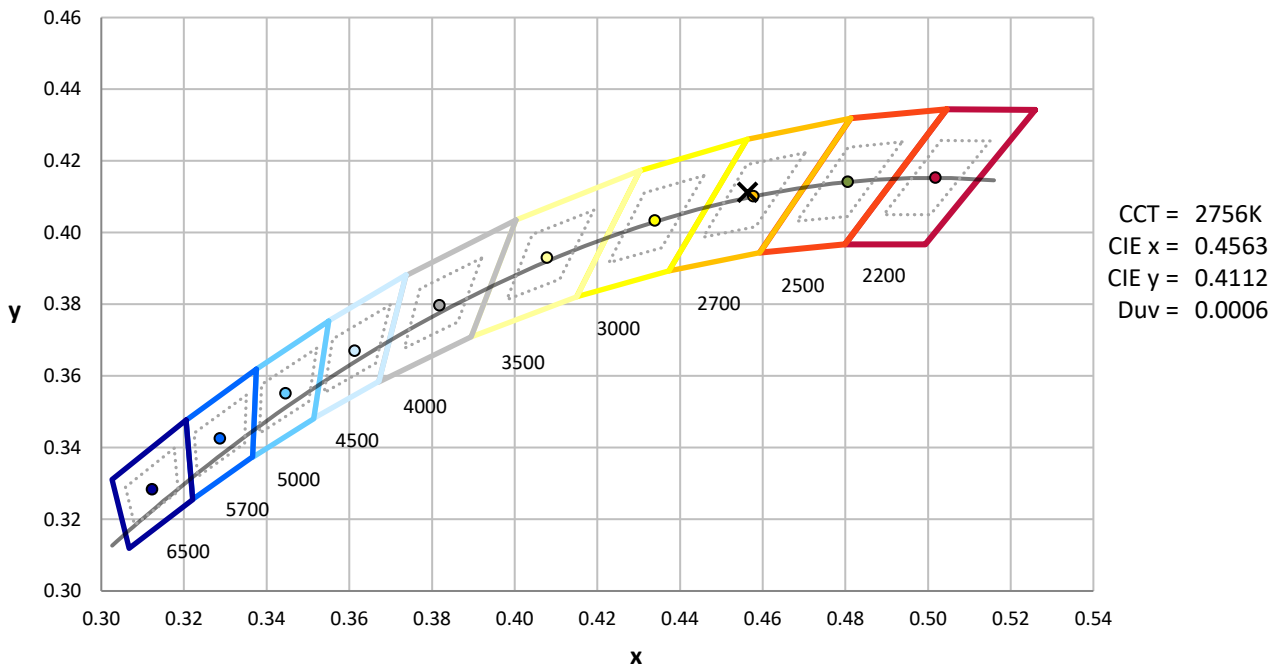
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date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

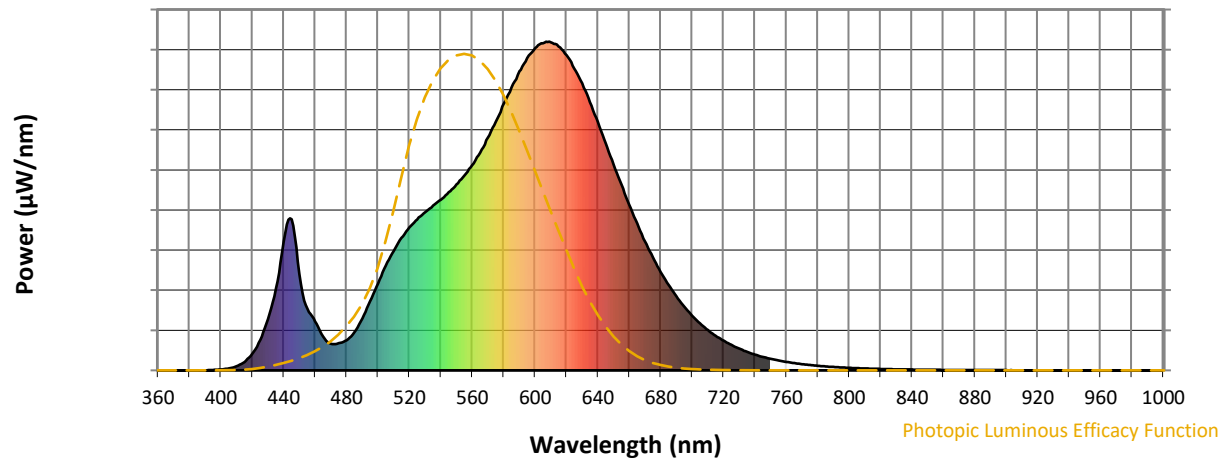


**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



REPORT NUMBER: SP1-2407-184-8

### Photopic Flux vs. Wavelength

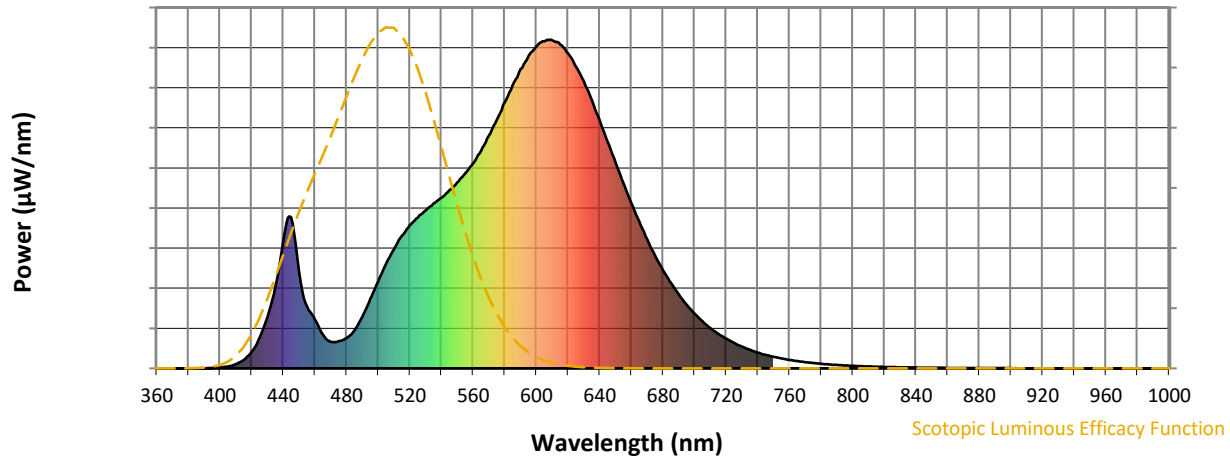


### Photopic Lumens: NR

| λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</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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### Scotopic Flux vs. Wavelength



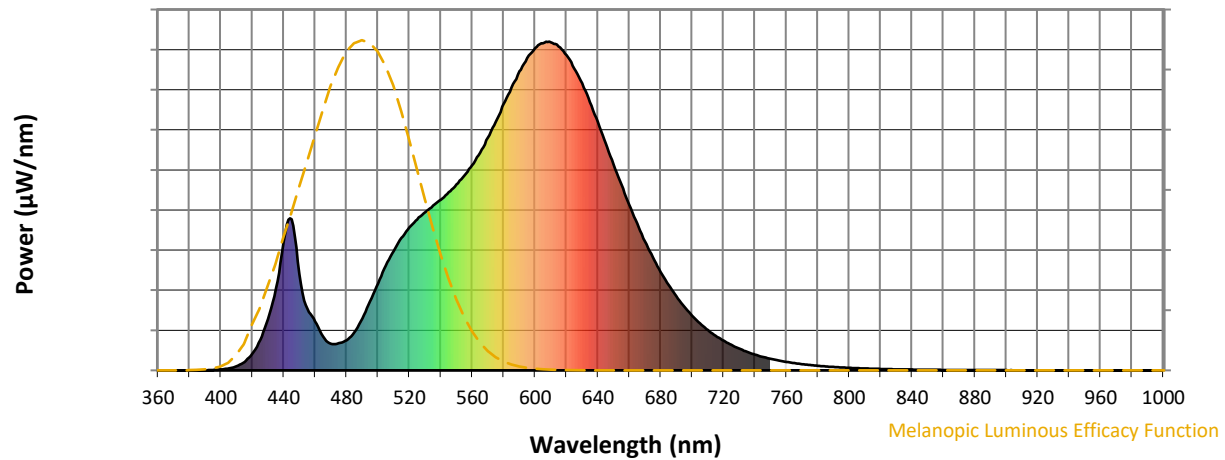
Scotopic Lumens: NR

S/P: 1.2

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

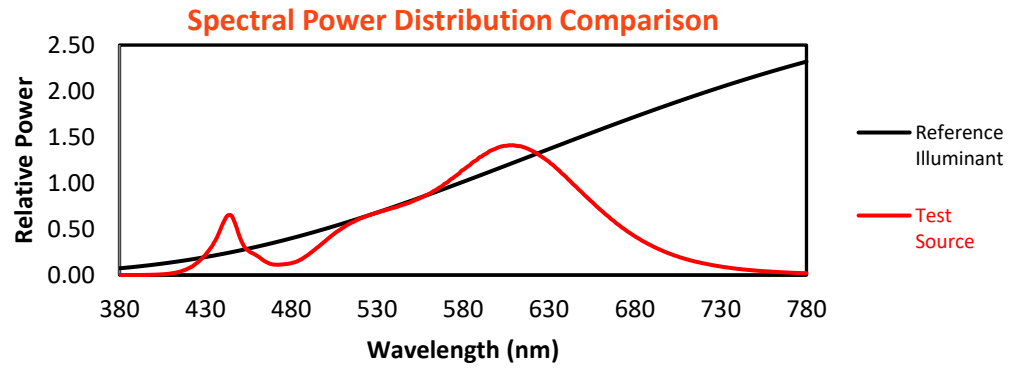
| $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power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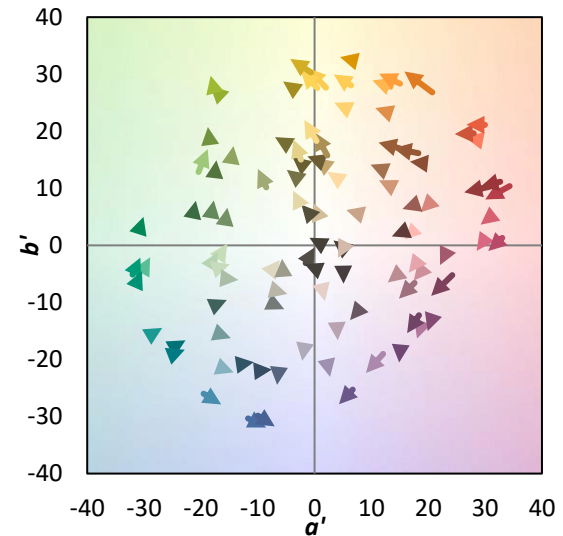
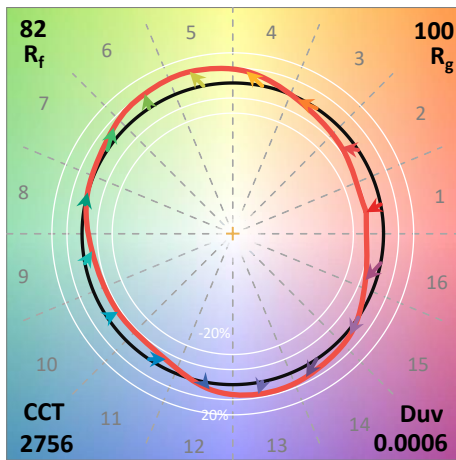
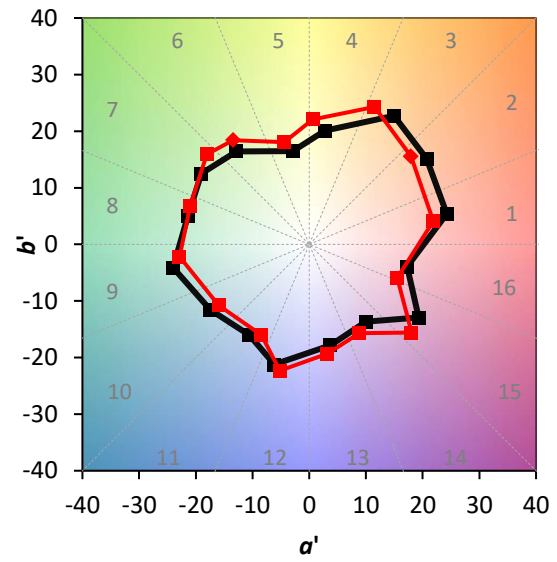
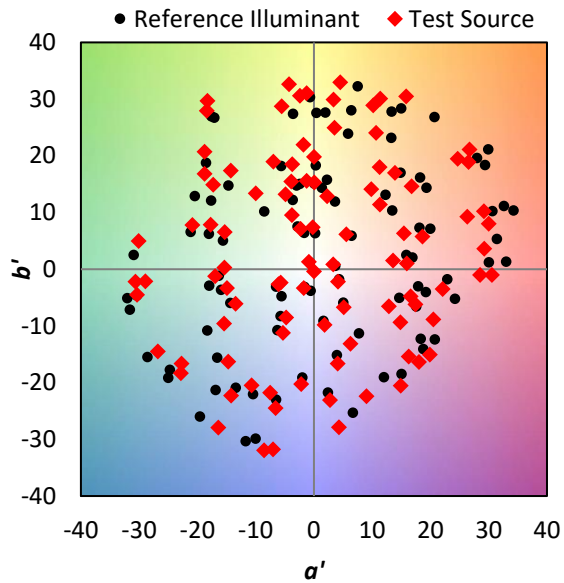
TM-30-18

### Summary

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



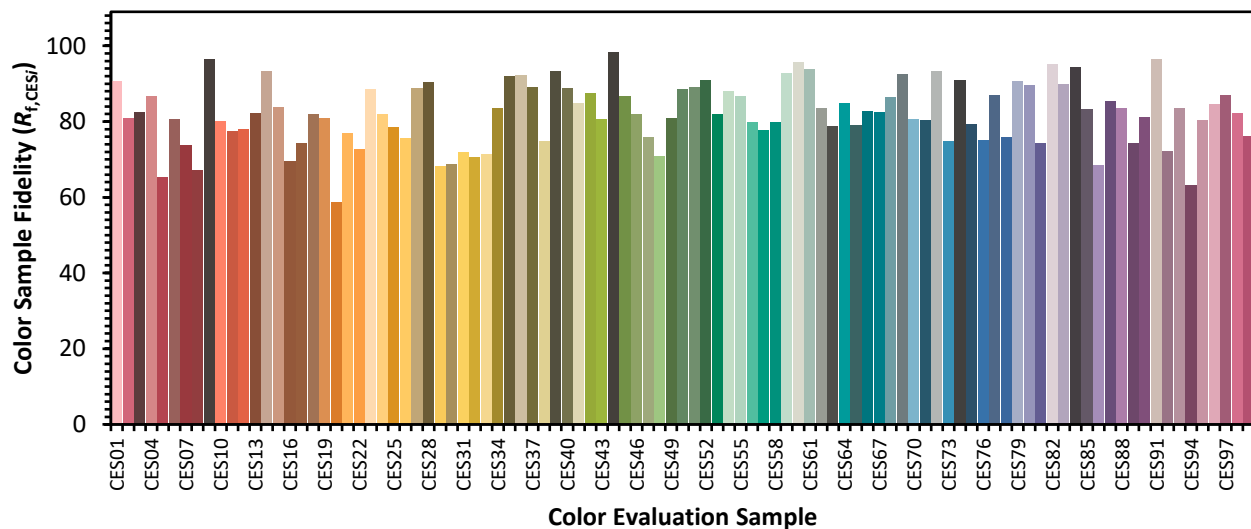
### Color Vector Graphics



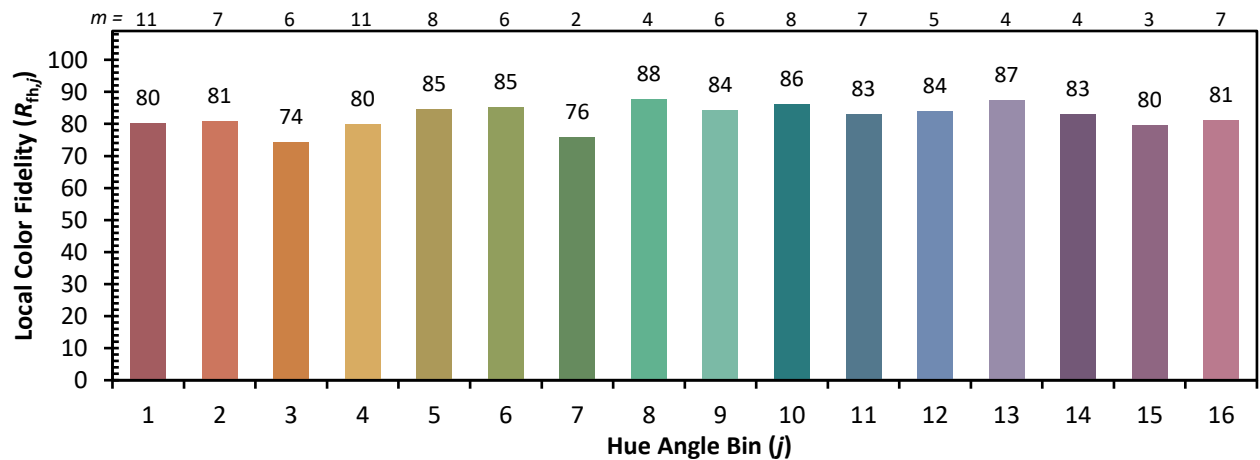
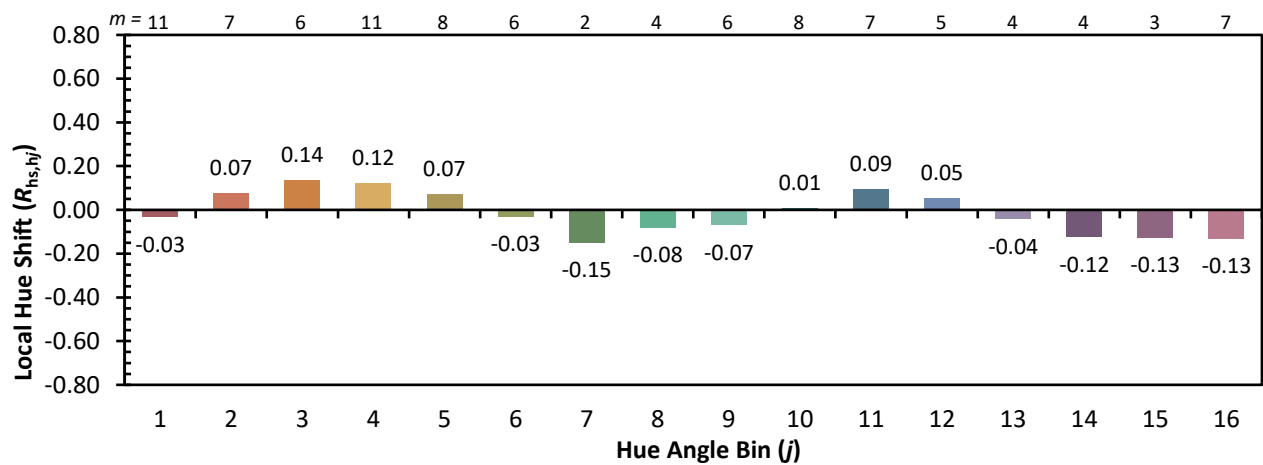
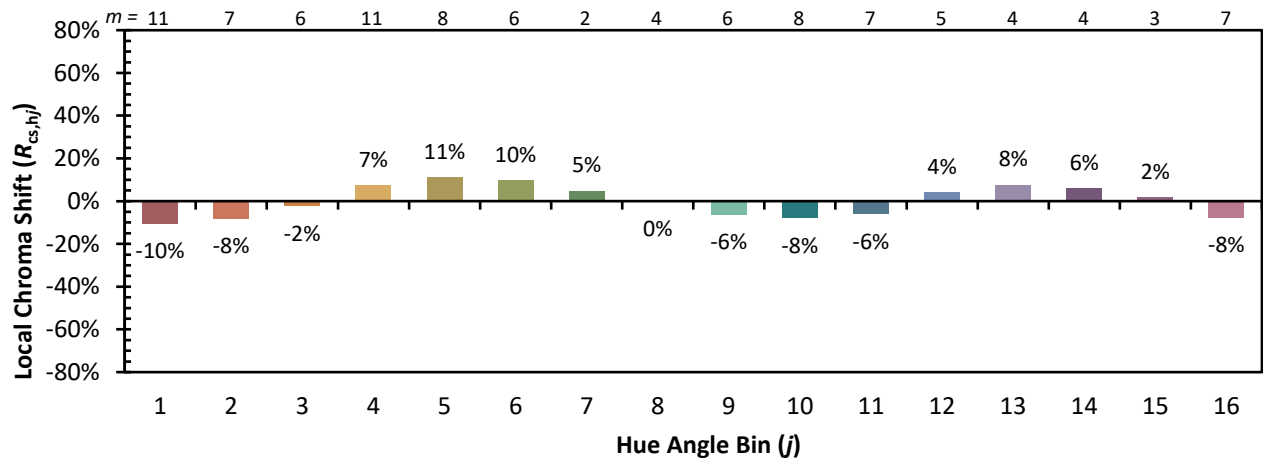


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

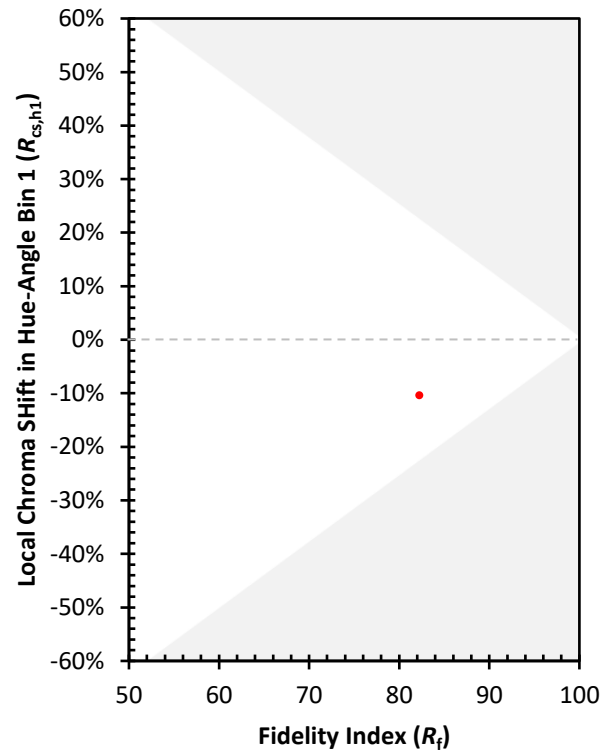
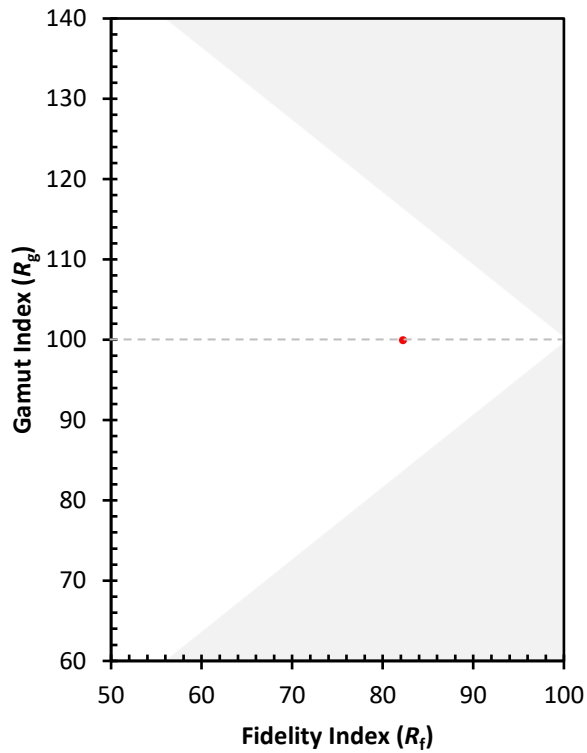
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 76 | CES51 = 89 | CES76 = 75 |
| CES02 = 63 | CES27 = 89 | CES52 = 91 | CES77 = 87 |
| CES03 = 31 | CES28 = 90 | CES53 = 82 | CES78 = 76 |
| CES04 = 71 | CES29 = 68 | CES54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