

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: P1047421

Luminaire Tested: **GALN-SA4A-850-U-T3BC**

Issue Date: 07/10/2025

**Test Information**

Test Method: LM-79-08  
Report Number: P1047421  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 07/10/2025  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: MCGRAW-EDISON  
Catalog Number: GALN-SA4A-850-U-T3BC  
Description: GALLEON II AREA AND ROADWAY LUMINAIRE 615mA 4xLight Square PACKAGE  
80CRI 5000K FIXTURE w/ TYPE III ANGLED BACKLIGHT CONTROL  
Light Source: (56) 5000K CCT, 80 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 13922.5 lumens  
Efficiency: N/A  
Efficacy: 129.6 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 1' x H: 0')  
IES Classification: Type III - Short  
BUG Rating: B0 - U0 - G3

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

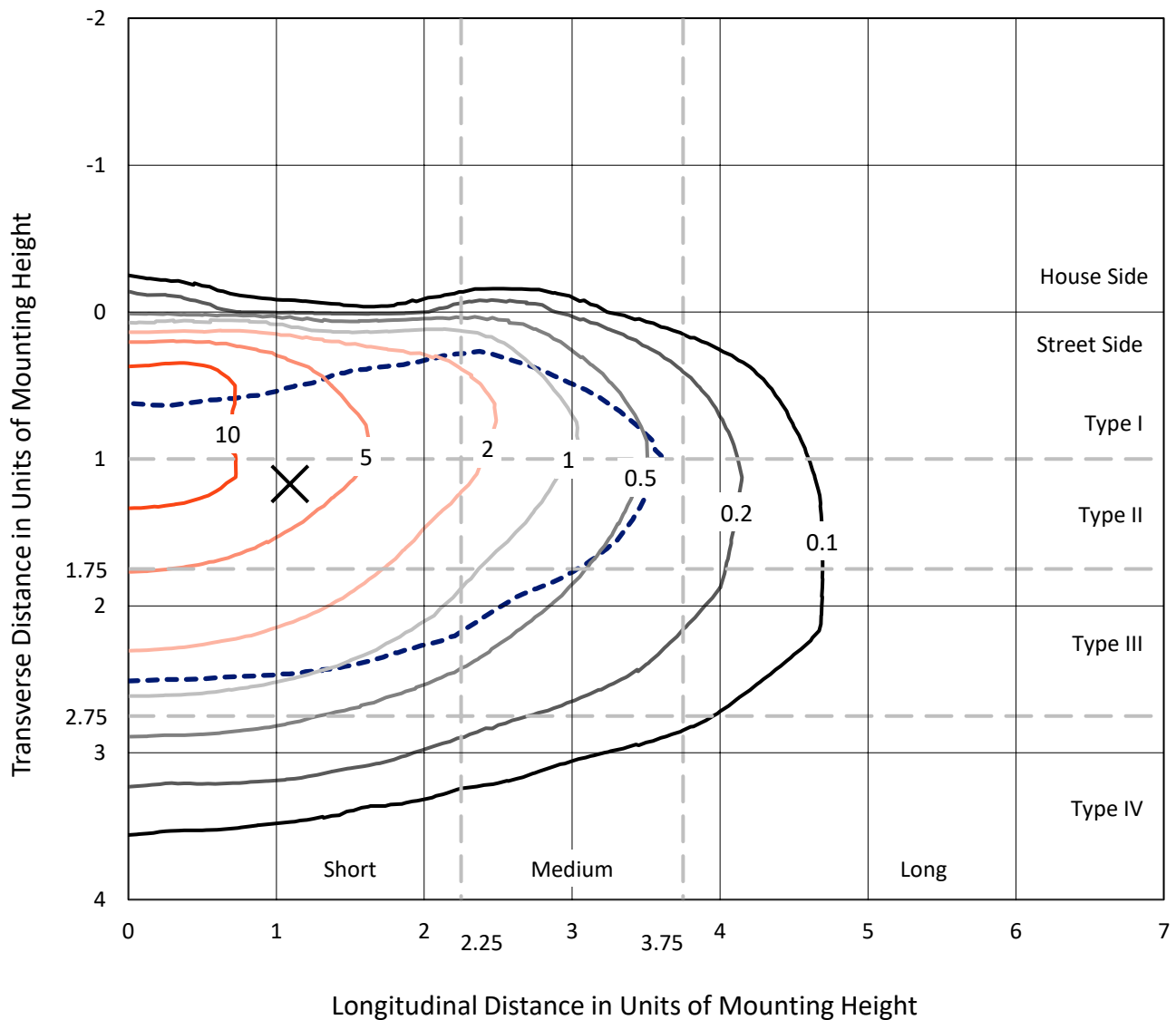


REPORT NUMBER: P1047421

CATALOG NUMBER: GALN-SA4A-850-U-T3BC

## Iso-Footcandle Lines of Horizontal Illumination

× Max cd  
 - - - 1/2 Max cd

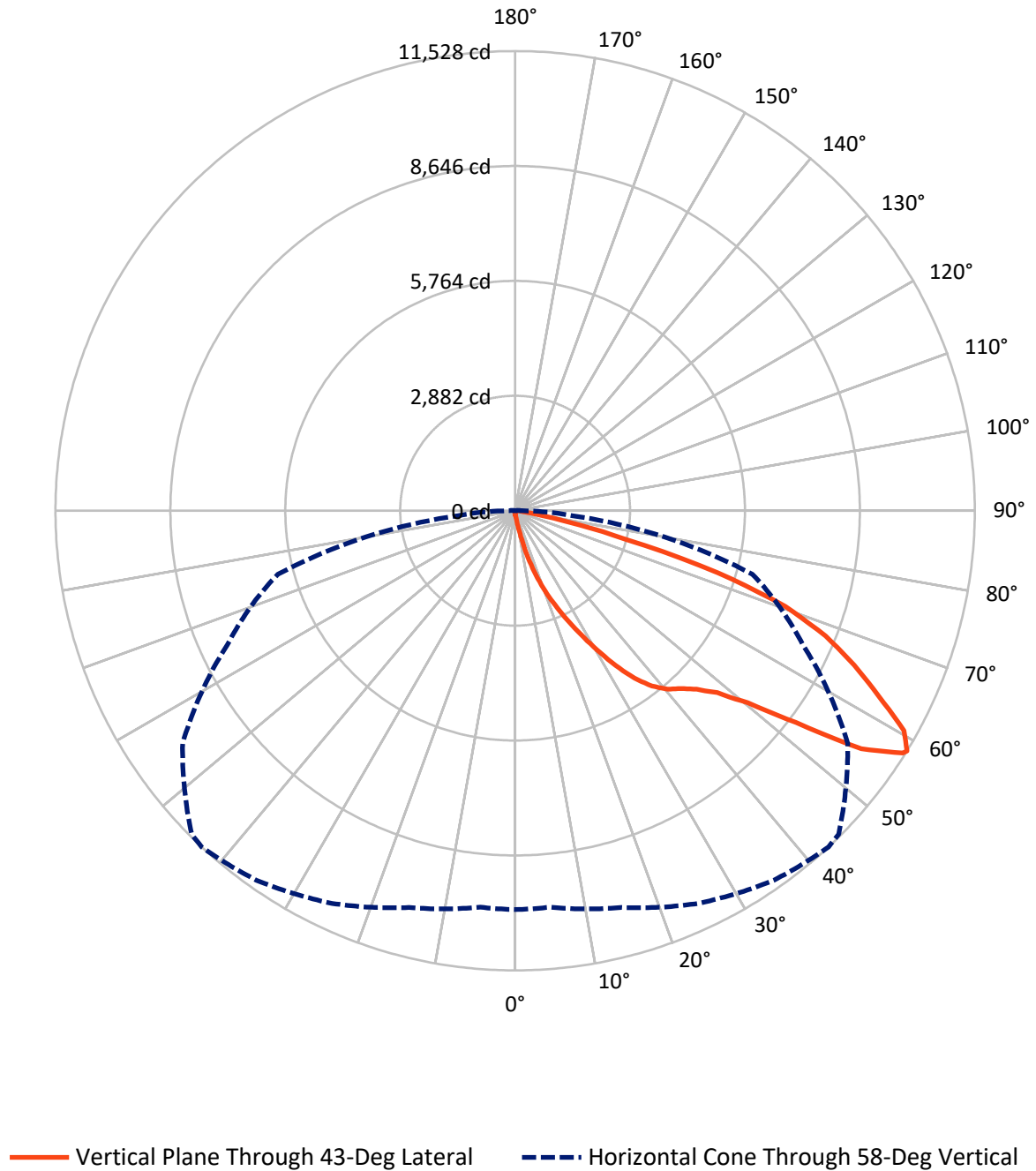


Based on 15 foot mounting height. Maximum calculated value = 15.6 fc  
 Type III - Short - N/A

REPORT NUMBER: P1047421

CATALOG NUMBER: GALN-SA4A-850-U-T3BC

## Luminous Intensity Polar Plot



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CATALOG NUMBER: GALN-SA4A-850-U-T3BC

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 50.8     | 0.0    | 50.8    |
|                    | % Fixture | 0.4      | 0.0    | 0.4     |
| <b>Street Side</b> | Lumens    | 13871.7  | 0.0    | 13871.7 |
|                    | % Fixture | 99.6     | 0.0    | 99.6    |
| <b>Total</b>       | Lumens    | 13922.5  | 0.0    | 13922.5 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 13.3    | 0.1       |
| 10°-20°   | 160.0   | 1.1       |
| 20°-30°   | 576.8   | 4.1       |
| 30°-40°   | 1319.8  | 9.5       |
| 40°-50°   | 2225.9  | 16.0      |
| 50°-60°   | 3673.3  | 26.4      |
| 60°-70°   | 4105.4  | 29.5      |
| 70°-80°   | 1695.1  | 12.2      |
| 80°-90°   | 152.8   | 1.1       |
| 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°    | 13922.5 | 100.0     |
| 0°-180°   | 13922.5 | 100.0     |



REPORT NUMBER: P1047421

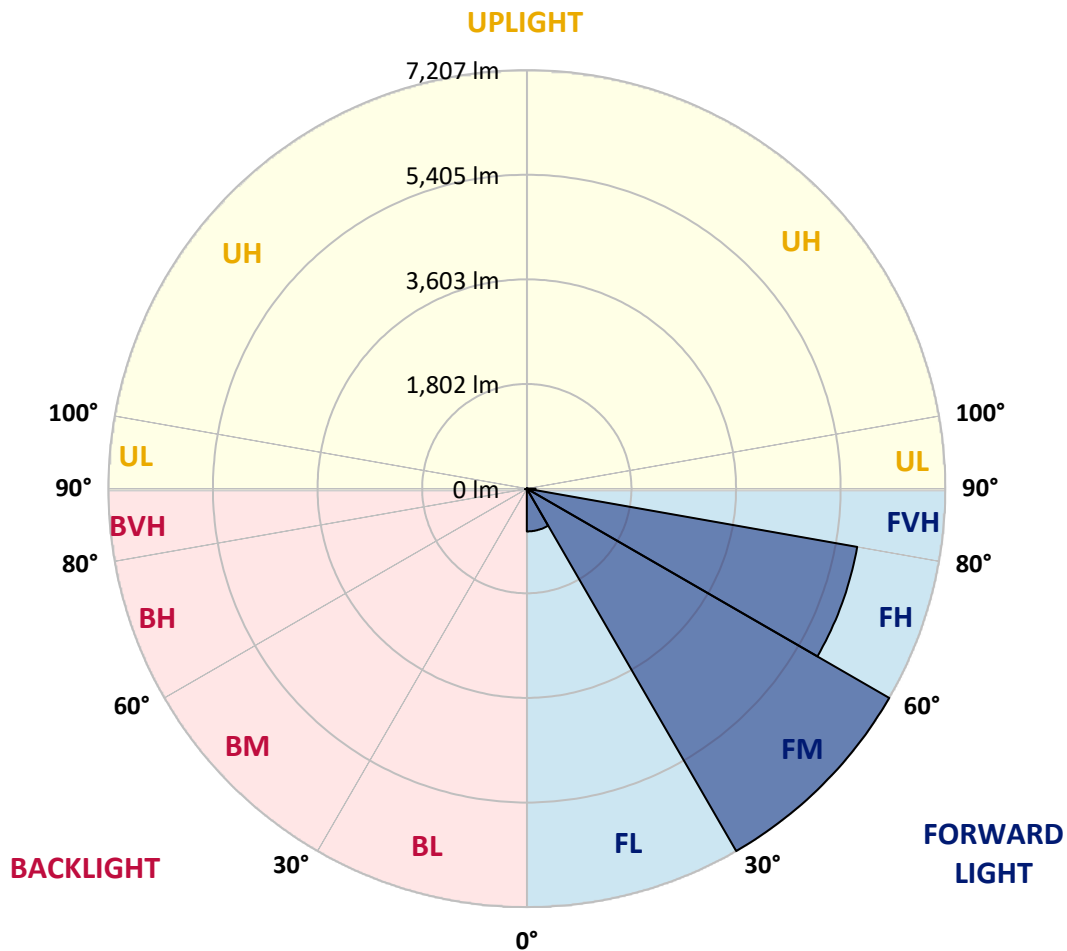
CATALOG NUMBER: GALN-SA4A-850-U-T3BC

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 736.9  | 5.3       |                         |      |         |
| FM   | (30°-60°)   | 7206.8 | 51.8      |                         |      |         |
| FH   | (60°-80°)   | 5777.2 | 41.5      |                         |      | G3/7500 |
| FVH  | (80°-90°)   | 150.7  | 1.1       |                         |      | G2/225  |
| BL   | (0°-30°)    | 13.3   | 0.1       | B0/110                  |      |         |
| BM   | (30°-60°)   | 12.2   | 0.1       | B0/220                  |      |         |
| BH   | (60°-80°)   | 23.3   | 0.2       | B0/110                  |      | G0/110  |
| BVH  | (80°-90°)   | 2.1    | 0.0       |                         |      | G0/10   |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B0-U0-G3**

Type III Short





REPORT NUMBER: P1047421

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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 43°     | 45°     | 55°     | 65°     | 75°    | 85°    |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--------|--------|
| 0°    | 91.0    | 91.0    | 91.0    | 91.0    | 91.0    | 91.0    | 91.0    | 91.0    | 91.0    | 91.0   | 91.0   |
| 2.5°  | 109.2   | 112.9   | 109.2   | 109.2   | 109.2   | 105.6   | 105.6   | 102.0   | 102.0   | 98.3   | 94.7   |
| 5°    | 160.2   | 160.2   | 149.3   | 142.0   | 134.7   | 131.1   | 127.4   | 120.2   | 112.9   | 105.6  | 98.3   |
| 7.5°  | 356.8   | 356.8   | 324.1   | 280.4   | 222.1   | 189.3   | 182.1   | 149.3   | 127.4   | 112.9  | 98.3   |
| 10°   | 852.1   | 852.1   | 779.2   | 659.1   | 509.8   | 378.7   | 338.6   | 214.8   | 152.9   | 120.2  | 102.0  |
| 12.5° | 1416.5  | 1434.7  | 1343.6  | 1190.7  | 968.6   | 739.2   | 659.1   | 393.3   | 203.9   | 131.1  | 102.0  |
| 15°   | 1922.6  | 1878.9  | 1853.4  | 1707.8  | 1496.6  | 1223.5  | 1121.5  | 662.7   | 294.9   | 149.3  | 102.0  |
| 17.5° | 2264.9  | 2264.9  | 2228.5  | 2130.2  | 1937.2  | 1696.9  | 1613.1  | 1070.5  | 477.0   | 171.1  | 105.6  |
| 20°   | 2665.4  | 2665.4  | 2599.9  | 2530.7  | 2359.6  | 2155.7  | 2075.5  | 1522.1  | 739.2   | 218.5  | 105.6  |
| 22.5° | 3149.7  | 3157.0  | 3084.2  | 2960.4  | 2796.5  | 2570.8  | 2501.6  | 1940.8  | 1070.5  | 291.3  | 109.2  |
| 25°   | 3739.6  | 3746.9  | 3641.3  | 3524.8  | 3273.5  | 3029.6  | 2924.0  | 2421.5  | 1474.7  | 407.8  | 109.2  |
| 27.5° | 4391.4  | 4442.4  | 4285.8  | 4085.5  | 3819.7  | 3513.9  | 3433.8  | 2854.8  | 1875.3  | 575.3  | 116.5  |
| 30°   | 5203.4  | 5203.4  | 4995.9  | 4715.5  | 4427.8  | 4049.1  | 3947.2  | 3310.0  | 2301.3  | 797.4  | 123.8  |
| 32.5° | 5902.6  | 5847.9  | 5582.1  | 5287.2  | 4981.3  | 4628.1  | 4518.9  | 3787.0  | 2738.3  | 1074.2 | 138.4  |
| 35°   | 6437.8  | 6390.5  | 6062.8  | 5746.0  | 5480.2  | 5156.1  | 5025.0  | 4304.0  | 3200.7  | 1387.3 | 160.2  |
| 37.5° | 6896.6  | 6878.4  | 6434.2  | 6037.3  | 5862.5  | 5578.5  | 5462.0  | 4792.0  | 3655.9  | 1726.0 | 185.7  |
| 40°   | 7399.1  | 7340.9  | 6867.5  | 6375.9  | 6113.8  | 5884.4  | 5778.8  | 5185.2  | 4092.8  | 2122.9 | 222.1  |
| 42.5° | 7828.8  | 7759.6  | 7333.6  | 6852.9  | 6405.1  | 6095.6  | 5993.6  | 5516.6  | 4518.9  | 2519.8 | 269.5  |
| 45°   | 8305.8  | 8269.4  | 7839.7  | 7475.6  | 6878.4  | 6383.2  | 6248.5  | 5782.4  | 4908.5  | 2993.2 | 331.4  |
| 47.5° | 9023.2  | 8957.6  | 8557.1  | 8258.5  | 7566.6  | 6820.2  | 6627.2  | 6055.5  | 5283.5  | 3459.2 | 426.0  |
| 50°   | 9857.0  | 9813.3  | 9576.6  | 9340.0  | 8651.8  | 7566.6  | 7337.2  | 6448.8  | 5702.3  | 4012.7 | 549.8  |
| 52.5° | 10537.9 | 10530.7 | 10559.8 | 10563.4 | 10042.7 | 8822.9  | 8480.6  | 7082.3  | 6182.9  | 4558.9 | 724.6  |
| 55°   | 10523.4 | 10556.2 | 10876.6 | 11244.4 | 11284.4 | 10537.9 | 10206.6 | 8149.3  | 6809.2  | 5232.6 | 968.6  |
| 57.5° | 10130.1 | 10104.6 | 10443.3 | 10996.8 | 11386.4 | 11466.5 | 11411.9 | 9806.0  | 7752.3  | 6044.6 | 1343.6 |
| 58°   | 10002.7 | 9980.8  | 10301.3 | 10865.7 | 11313.5 | 11528.4 | 11473.8 | 10181.1 | 7963.5  | 6161.1 | 1445.6 |
| 60°   | 9540.2  | 9543.9  | 9733.2  | 10246.6 | 10694.5 | 11204.3 | 11255.3 | 11251.6 | 9015.9  | 6940.3 | 1959.0 |
| 62.5° | 8928.5  | 8899.4  | 9074.1  | 9492.9  | 9886.2  | 10228.4 | 10315.8 | 11324.5 | 10556.2 | 7930.8 | 2938.5 |
| 65°   | 8083.7  | 8040.0  | 8225.7  | 8699.1  | 9121.5  | 9343.6  | 9347.2  | 10348.6 | 11280.8 | 8994.0 | 4336.8 |
| 67.5° | 6514.3  | 6477.9  | 6849.3  | 7457.4  | 8109.2  | 8400.5  | 8531.6  | 8979.5  | 10669.0 | 9715.0 | 5137.9 |
| 70°   | 3990.9  | 4067.3  | 4584.4  | 5538.4  | 6652.7  | 7187.9  | 7384.6  | 7522.9  | 9085.1  | 9605.8 | 4296.7 |
| 72.5° | 1842.5  | 1751.5  | 2192.1  | 2858.4  | 4129.2  | 5320.0  | 5523.9  | 6066.4  | 7202.5  | 8338.6 | 3204.4 |
| 75°   | 859.3   | 826.6   | 928.5   | 1249.0  | 1871.6  | 2873.0  | 3244.4  | 4842.9  | 5523.9  | 5800.6 | 2312.2 |
| 77.5° | 440.6   | 444.2   | 528.0   | 568.0   | 772.0   | 1329.1  | 1525.7  | 3186.1  | 4049.1  | 3237.1 | 1551.2 |
| 80°   | 193.0   | 200.3   | 203.9   | 222.1   | 313.2   | 513.4   | 579.0   | 1478.4  | 2767.4  | 1649.5 | 848.4  |
| 82.5° | 123.8   | 127.4   | 127.4   | 127.4   | 149.3   | 203.9   | 233.0   | 593.5   | 1380.1  | 819.3  | 262.2  |
| 85°   | 65.5    | 65.5    | 72.8    | 91.0    | 105.6   | 123.8   | 131.1   | 189.3   | 455.2   | 244.0  | 61.9   |
| 87.5° | 36.4    | 40.1    | 43.7    | 54.6    | 69.2    | 83.8    | 91.0    | 131.1   | 174.8   | 167.5  | 14.6   |
| 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: P1047421

CATALOG NUMBER: GALN-SA4A-850-U-T3BC

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°  | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|-------|--------|------|------|------|------|------|------|------|------|------|------|
| 0°    | 91.0   | 91.0 | 91.0 | 91.0 | 91.0 | 91.0 | 91.0 | 91.0 | 91.0 | 91.0 | 91.0 |
| 2.5°  | 94.7   | 91.0 | 87.4 | 83.8 | 80.1 | 76.5 | 76.5 | 76.5 | 76.5 | 76.5 | 76.5 |
| 5°    | 91.0   | 87.4 | 83.8 | 76.5 | 69.2 | 65.5 | 61.9 | 58.3 | 58.3 | 58.3 | 58.3 |
| 7.5°  | 91.0   | 87.4 | 76.5 | 69.2 | 61.9 | 54.6 | 47.3 | 47.3 | 47.3 | 47.3 | 47.3 |
| 10°   | 91.0   | 83.8 | 72.8 | 61.9 | 51.0 | 43.7 | 40.1 | 36.4 | 36.4 | 36.4 | 36.4 |
| 12.5° | 91.0   | 80.1 | 69.2 | 54.6 | 43.7 | 36.4 | 32.8 | 29.1 | 29.1 | 29.1 | 29.1 |
| 15°   | 91.0   | 80.1 | 65.5 | 51.0 | 40.1 | 29.1 | 25.5 | 21.8 | 21.8 | 21.8 | 21.8 |
| 17.5° | 87.4   | 76.5 | 61.9 | 43.7 | 32.8 | 21.8 | 18.2 | 14.6 | 14.6 | 18.2 | 18.2 |
| 20°   | 83.8   | 72.8 | 54.6 | 36.4 | 25.5 | 18.2 | 10.9 | 10.9 | 10.9 | 10.9 | 10.9 |
| 22.5° | 83.8   | 72.8 | 51.0 | 32.8 | 21.8 | 10.9 | 7.3  | 7.3  | 7.3  | 7.3  | 10.9 |
| 25°   | 83.8   | 69.2 | 43.7 | 25.5 | 14.6 | 7.3  | 3.6  | 3.6  | 3.6  | 3.6  | 3.6  |
| 27.5° | 83.8   | 69.2 | 40.1 | 21.8 | 10.9 | 7.3  | 3.6  | 0.0  | 0.0  | 0.0  | 0.0  |
| 30°   | 80.1   | 65.5 | 36.4 | 18.2 | 7.3  | 3.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 32.5° | 80.1   | 61.9 | 29.1 | 14.6 | 7.3  | 3.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 35°   | 83.8   | 58.3 | 25.5 | 10.9 | 3.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 3.6  |
| 37.5° | 87.4   | 54.6 | 21.8 | 7.3  | 3.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 40°   | 91.0   | 51.0 | 21.8 | 7.3  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 42.5° | 98.3   | 51.0 | 18.2 | 7.3  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 45°   | 105.6  | 51.0 | 14.6 | 3.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 47.5° | 120.2  | 54.6 | 14.6 | 3.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 50°   | 131.1  | 58.3 | 10.9 | 3.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 52.5° | 145.7  | 54.6 | 10.9 | 3.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 55°   | 163.9  | 54.6 | 10.9 | 3.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 57.5° | 178.4  | 51.0 | 10.9 | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 58°   | 185.7  | 47.3 | 7.3  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 60°   | 222.1  | 43.7 | 7.3  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 62.5° | 345.9  | 36.4 | 7.3  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 65°   | 702.8  | 32.8 | 7.3  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 67.5° | 1310.9 | 29.1 | 7.3  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 70°   | 1467.4 | 32.8 | 3.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 72.5° | 924.9  | 25.5 | 3.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 75°   | 487.9  | 25.5 | 3.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 77.5° | 244.0  | 25.5 | 3.6  | 3.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 80°   | 112.9  | 18.2 | 3.6  | 3.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 82.5° | 47.3   | 10.9 | 7.3  | 3.6  | 3.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 85°   | 21.8   | 10.9 | 7.3  | 7.3  | 3.6  | 3.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 87.5° | 10.9   | 10.9 | 10.9 | 7.3  | 7.3  | 3.6  | 3.6  | 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: SP1-2407-184-12

Test Date: 10/11/2024

Luminaire Tested: GSS-SB1A-850-U-5WQ

Data in this report applies to families of products including GSS-SB1A-850-U-5WQ

### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2407-184-12  
 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-850-U-5WQ**  
 Description: GALLEON II SITE SLIM 1SQ 350MA 5WQ HIGH DENSITY LIGHTSQUARE WITH 80 CRI  
 5000K CCT 26 LEDS

### Spectral Parameters

CCT (K): 4760  
 CIE  $u'$ : 0.2107  
 CIE  $v'$ : 0.4939  
 Duv: 0.0050  
 CIE x: 0.3537  
 CIE y: 0.3685  
 CIE z: 0.2779  
 Peak Wavelength (nm): 443  
 Dominant Wavelength (nm): 571  
 Purity: 16.69598  
 R<sub>f</sub>: 82  
 R<sub>g</sub>: 99.4

CRI (Ra): 81.1  
 R1: 79.8  
 R2: 83.5  
 R3: 87.9  
 R4: 83.1  
 R5: 80.5  
 R6: 79.1  
 R7: 86.1  
 R8: 69.0  
 R9: 8.7  
 R10: 62.4  
 R11: 83.8  
 R12: 63.0  
 R13: 79.9  
 R14: 93.3  
 R15: 72.7



### Test Conditions

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

REPORT NUMBER: SP1-2407-184-12

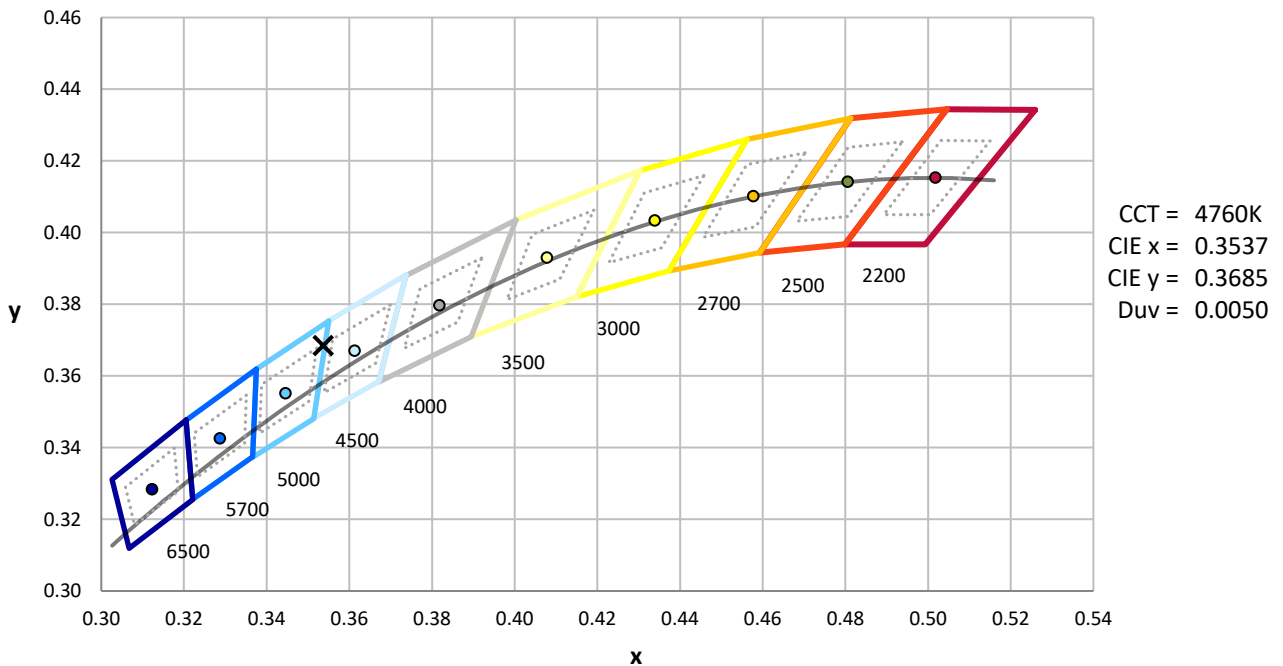
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date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

REPORT NUMBER: SP1-2407-184-12

**CIE 1931 Chromaticity Diagram**



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



Point lies inside the ANSI 5000K 7-step quadrangle

REPORT NUMBER: SP1-2407-184-12

### Photopic Flux vs. Wavelength

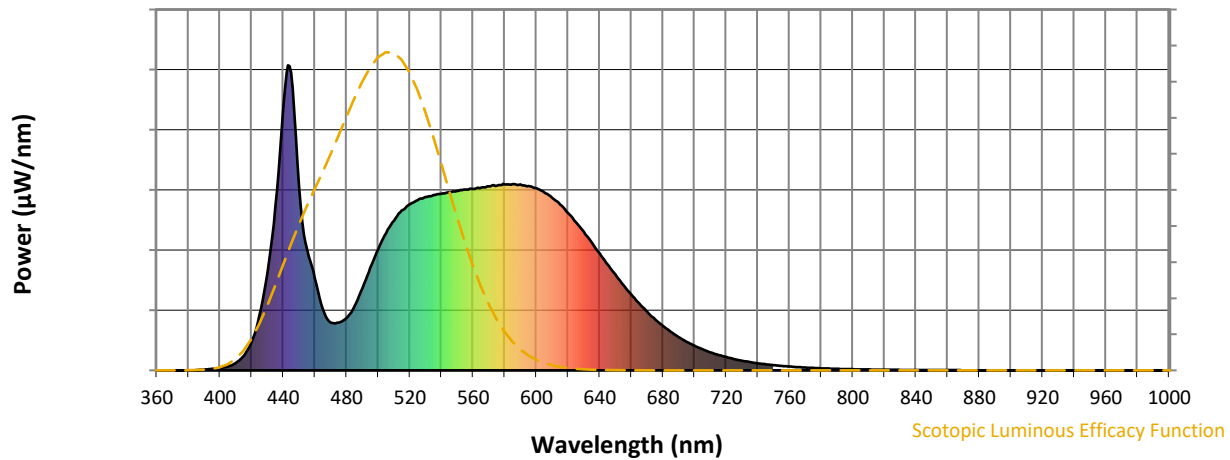


### Photopic Lumens: NR

| λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 360    | 0                        | NR            | 490    | 270                      | NR            | 620    | 517                      | NR            | 750    | 17                       | NR            | 880    | 0                        | NR            |
| 365    | 0                        | NR            | 495    | 335                      | NR            | 625    | 486                      | NR            | 755    | 15                       | NR            | 885    | 0                        | NR            |
| 370    | 0                        | NR            | 500    | 397                      | NR            | 630    | 454                      | NR            | 760    | 12                       | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 451                      | NR            | 635    | 419                      | NR            | 765    | 11                       | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 492                      | NR            | 640    | 384                      | NR            | 770    | 9                        | NR            | 900    | 0                        | NR            |
| 385    | 1                        | NR            | 515    | 524                      | NR            | 645    | 347                      | NR            | 775    | 8                        | NR            | 905    | 0                        | NR            |
| 390    | 3                        | NR            | 520    | 545                      | NR            | 650    | 313                      | NR            | 780    | 7                        | NR            | 910    | 0                        | NR            |
| 395    | 5                        | NR            | 525    | 558                      | NR            | 655    | 280                      | NR            | 785    | 6                        | NR            | 915    | 0                        | NR            |
| 400    | 7                        | NR            | 530    | 568                      | NR            | 660    | 248                      | NR            | 790    | 5                        | NR            | 920    | 0                        | NR            |
| 405    | 13                       | NR            | 535    | 575                      | NR            | 665    | 219                      | NR            | 795    | 4                        | NR            | 925    | 0                        | NR            |
| 410    | 24                       | NR            | 540    | 579                      | NR            | 670    | 192                      | NR            | 800    | 4                        | NR            | 930    | 0                        | NR            |
| 415    | 47                       | NR            | 545    | 585                      | NR            | 675    | 167                      | NR            | 805    | 3                        | NR            | 935    | 0                        | NR            |
| 420    | 95                       | NR            | 550    | 588                      | NR            | 680    | 146                      | NR            | 810    | 3                        | NR            | 940    | 0                        | NR            |
| 425    | 181                      | NR            | 555    | 593                      | NR            | 685    | 126                      | NR            | 815    | 2                        | NR            | 945    | 0                        | NR            |
| 430    | 319                      | NR            | 560    | 595                      | NR            | 690    | 109                      | NR            | 820    | 2                        | NR            | 950    | 0                        | NR            |
| 435    | 539                      | NR            | 565    | 600                      | NR            | 695    | 94                       | NR            | 825    | 2                        | NR            | 955    | 0                        | NR            |
| 440    | 868                      | NR            | 570    | 603                      | NR            | 700    | 80                       | NR            | 830    | 2                        | NR            | 960    | 0                        | NR            |
| 445    | 977                      | NR            | 575    | 606                      | NR            | 705    | 69                       | NR            | 835    | 1                        | NR            | 965    | 0                        | NR            |
| 450    | 601                      | NR            | 580    | 609                      | NR            | 710    | 59                       | NR            | 840    | 1                        | NR            | 970    | 0                        | NR            |
| 455    | 397                      | NR            | 585    | 611                      | NR            | 715    | 51                       | NR            | 845    | 1                        | NR            | 975    | 0                        | NR            |
| 460    | 302                      | NR            | 590    | 610                      | NR            | 720    | 44                       | NR            | 850    | 1                        | NR            | 980    | 0                        | NR            |
| 465    | 201                      | NR            | 595    | 604                      | NR            | 725    | 37                       | NR            | 855    | 1                        | NR            | 985    | 0                        | NR            |
| 470    | 157                      | NR            | 600    | 596                      | NR            | 730    | 32                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 157                      | NR            | 605    | 583                      | NR            | 735    | 27                       | NR            | 865    | 1                        | NR            | 995    | 0                        | NR            |
| 480    | 171                      | NR            | 610    | 566                      | NR            | 740    | 23                       | NR            | 870    | 1                        | NR            | 1000   | 0                        | NR            |
| 485    | 210                      | NR            | 615    | 543                      | NR            | 745    | 20                       | NR            | 875    | 0                        | NR            |        |                          |               |

REPORT NUMBER: SP1-2407-184-12

### Scotopic Flux vs. Wavelength



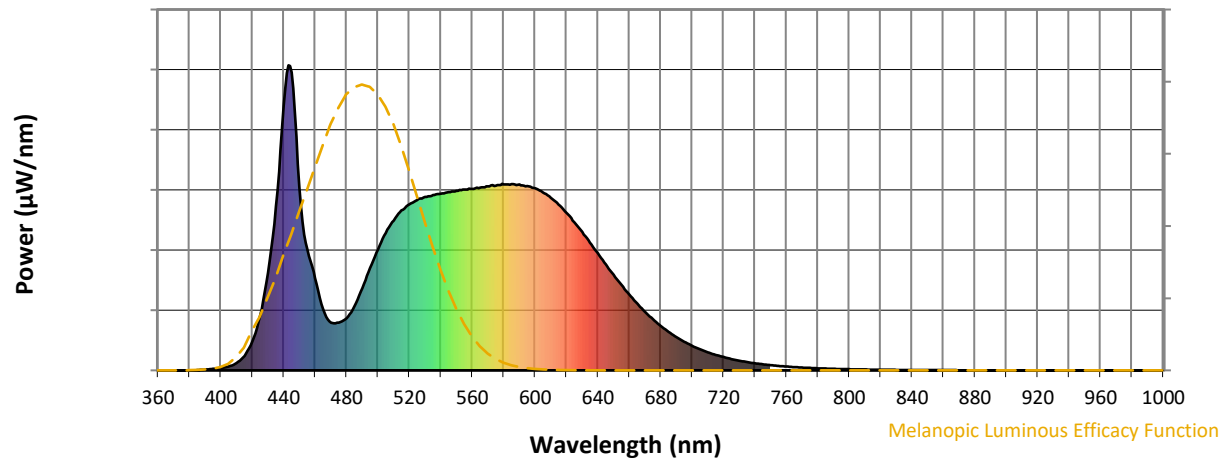
Scotopic Lumens: NR

S/P: 1.83

| 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       | 270                         | NR               | 620       | 517                         | NR               | 750       | 17                          | NR               | 880       | 0                           | NR               |
| 365       | 0                           | NR               | 495       | 335                         | NR               | 625       | 486                         | NR               | 755       | 15                          | NR               | 885       | 0                           | NR               |
| 370       | 0                           | NR               | 500       | 397                         | NR               | 630       | 454                         | NR               | 760       | 12                          | NR               | 890       | 0                           | NR               |
| 375       | 0                           | NR               | 505       | 451                         | NR               | 635       | 419                         | NR               | 765       | 11                          | NR               | 895       | 0                           | NR               |
| 380       | 0                           | NR               | 510       | 492                         | NR               | 640       | 384                         | NR               | 770       | 9                           | NR               | 900       | 0                           | NR               |
| 385       | 1                           | NR               | 515       | 524                         | NR               | 645       | 347                         | NR               | 775       | 8                           | NR               | 905       | 0                           | NR               |
| 390       | 3                           | NR               | 520       | 545                         | NR               | 650       | 313                         | NR               | 780       | 7                           | NR               | 910       | 0                           | NR               |
| 395       | 5                           | NR               | 525       | 558                         | NR               | 655       | 280                         | NR               | 785       | 6                           | NR               | 915       | 0                           | NR               |
| 400       | 7                           | NR               | 530       | 568                         | NR               | 660       | 248                         | NR               | 790       | 5                           | NR               | 920       | 0                           | NR               |
| 405       | 13                          | NR               | 535       | 575                         | NR               | 665       | 219                         | NR               | 795       | 4                           | NR               | 925       | 0                           | NR               |
| 410       | 24                          | NR               | 540       | 579                         | NR               | 670       | 192                         | NR               | 800       | 4                           | NR               | 930       | 0                           | NR               |
| 415       | 47                          | NR               | 545       | 585                         | NR               | 675       | 167                         | NR               | 805       | 3                           | NR               | 935       | 0                           | NR               |
| 420       | 95                          | NR               | 550       | 588                         | NR               | 680       | 146                         | NR               | 810       | 3                           | NR               | 940       | 0                           | NR               |
| 425       | 181                         | NR               | 555       | 593                         | NR               | 685       | 126                         | NR               | 815       | 2                           | NR               | 945       | 0                           | NR               |
| 430       | 319                         | NR               | 560       | 595                         | NR               | 690       | 109                         | NR               | 820       | 2                           | NR               | 950       | 0                           | NR               |
| 435       | 539                         | NR               | 565       | 600                         | NR               | 695       | 94                          | NR               | 825       | 2                           | NR               | 955       | 0                           | NR               |
| 440       | 868                         | NR               | 570       | 603                         | NR               | 700       | 80                          | NR               | 830       | 2                           | NR               | 960       | 0                           | NR               |
| 445       | 977                         | NR               | 575       | 606                         | NR               | 705       | 69                          | NR               | 835       | 1                           | NR               | 965       | 0                           | NR               |
| 450       | 601                         | NR               | 580       | 609                         | NR               | 710       | 59                          | NR               | 840       | 1                           | NR               | 970       | 0                           | NR               |
| 455       | 397                         | NR               | 585       | 611                         | NR               | 715       | 51                          | NR               | 845       | 1                           | NR               | 975       | 0                           | NR               |
| 460       | 302                         | NR               | 590       | 610                         | NR               | 720       | 44                          | NR               | 850       | 1                           | NR               | 980       | 0                           | NR               |
| 465       | 201                         | NR               | 595       | 604                         | NR               | 725       | 37                          | NR               | 855       | 1                           | NR               | 985       | 0                           | NR               |
| 470       | 157                         | NR               | 600       | 596                         | NR               | 730       | 32                          | NR               | 860       | 1                           | NR               | 990       | 0                           | NR               |
| 475       | 157                         | NR               | 605       | 583                         | NR               | 735       | 27                          | NR               | 865       | 1                           | NR               | 995       | 0                           | NR               |
| 480       | 171                         | NR               | 610       | 566                         | NR               | 740       | 23                          | NR               | 870       | 1                           | NR               | 1000      | 0                           | NR               |
| 485       | 210                         | NR               | 615       | 543                         | NR               | 745       | 20                          | NR               | 875       | 0                           | NR               |           |                             |                  |

REPORT NUMBER: SP1-2407-184-12

### Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 3.74

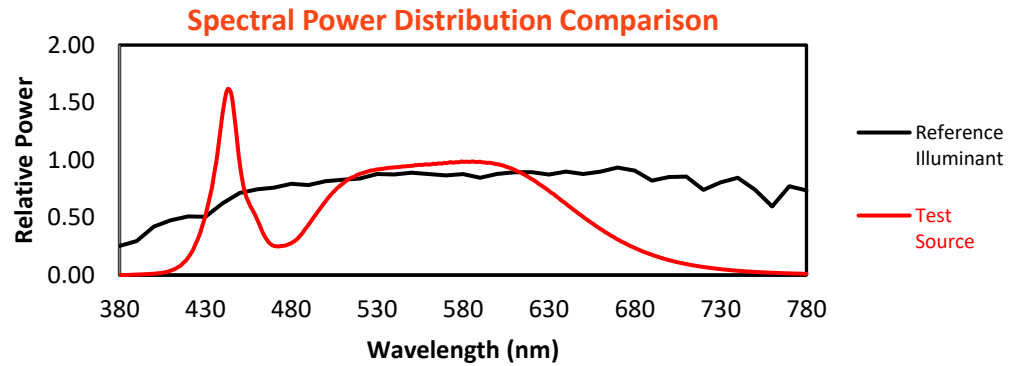
| $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<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               | 270                                  | NR                             | 620               | 517                                  | NR                             | 750               | 17                                   | NR                             | 880               | 0                                    | NR                             |
| 365               | 0                                    | NR                             | 495               | 335                                  | NR                             | 625               | 486                                  | NR                             | 755               | 15                                   | NR                             | 885               | 0                                    | NR                             |
| 370               | 0                                    | NR                             | 500               | 397                                  | NR                             | 630               | 454                                  | NR                             | 760               | 12                                   | NR                             | 890               | 0                                    | NR                             |
| 375               | 0                                    | NR                             | 505               | 451                                  | NR                             | 635               | 419                                  | NR                             | 765               | 11                                   | NR                             | 895               | 0                                    | NR                             |
| 380               | 0                                    | NR                             | 510               | 492                                  | NR                             | 640               | 384                                  | NR                             | 770               | 9                                    | NR                             | 900               | 0                                    | NR                             |
| 385               | 1                                    | NR                             | 515               | 524                                  | NR                             | 645               | 347                                  | NR                             | 775               | 8                                    | NR                             | 905               | 0                                    | NR                             |
| 390               | 3                                    | NR                             | 520               | 545                                  | NR                             | 650               | 313                                  | NR                             | 780               | 7                                    | NR                             | 910               | 0                                    | NR                             |
| 395               | 5                                    | NR                             | 525               | 558                                  | NR                             | 655               | 280                                  | NR                             | 785               | 6                                    | NR                             | 915               | 0                                    | NR                             |
| 400               | 7                                    | NR                             | 530               | 568                                  | NR                             | 660               | 248                                  | NR                             | 790               | 5                                    | NR                             | 920               | 0                                    | NR                             |
| 405               | 13                                   | NR                             | 535               | 575                                  | NR                             | 665               | 219                                  | NR                             | 795               | 4                                    | NR                             | 925               | 0                                    | NR                             |
| 410               | 24                                   | NR                             | 540               | 579                                  | NR                             | 670               | 192                                  | NR                             | 800               | 4                                    | NR                             | 930               | 0                                    | NR                             |
| 415               | 47                                   | NR                             | 545               | 585                                  | NR                             | 675               | 167                                  | NR                             | 805               | 3                                    | NR                             | 935               | 0                                    | NR                             |
| 420               | 95                                   | NR                             | 550               | 588                                  | NR                             | 680               | 146                                  | NR                             | 810               | 3                                    | NR                             | 940               | 0                                    | NR                             |
| 425               | 181                                  | NR                             | 555               | 593                                  | NR                             | 685               | 126                                  | NR                             | 815               | 2                                    | NR                             | 945               | 0                                    | NR                             |
| 430               | 319                                  | NR                             | 560               | 595                                  | NR                             | 690               | 109                                  | NR                             | 820               | 2                                    | NR                             | 950               | 0                                    | NR                             |
| 435               | 539                                  | NR                             | 565               | 600                                  | NR                             | 695               | 94                                   | NR                             | 825               | 2                                    | NR                             | 955               | 0                                    | NR                             |
| 440               | 868                                  | NR                             | 570               | 603                                  | NR                             | 700               | 80                                   | NR                             | 830               | 2                                    | NR                             | 960               | 0                                    | NR                             |
| 445               | 977                                  | NR                             | 575               | 606                                  | NR                             | 705               | 69                                   | NR                             | 835               | 1                                    | NR                             | 965               | 0                                    | NR                             |
| 450               | 601                                  | NR                             | 580               | 609                                  | NR                             | 710               | 59                                   | NR                             | 840               | 1                                    | NR                             | 970               | 0                                    | NR                             |
| 455               | 397                                  | NR                             | 585               | 611                                  | NR                             | 715               | 51                                   | NR                             | 845               | 1                                    | NR                             | 975               | 0                                    | NR                             |
| 460               | 302                                  | NR                             | 590               | 610                                  | NR                             | 720               | 44                                   | NR                             | 850               | 1                                    | NR                             | 980               | 0                                    | NR                             |
| 465               | 201                                  | NR                             | 595               | 604                                  | NR                             | 725               | 37                                   | NR                             | 855               | 1                                    | NR                             | 985               | 0                                    | NR                             |
| 470               | 157                                  | NR                             | 600               | 596                                  | NR                             | 730               | 32                                   | NR                             | 860               | 1                                    | NR                             | 990               | 0                                    | NR                             |
| 475               | 157                                  | NR                             | 605               | 583                                  | NR                             | 735               | 27                                   | NR                             | 865               | 1                                    | NR                             | 995               | 0                                    | NR                             |
| 480               | 171                                  | NR                             | 610               | 566                                  | NR                             | 740               | 23                                   | NR                             | 870               | 1                                    | NR                             | 1000              | 0                                    | NR                             |
| 485               | 210                                  | NR                             | 615               | 543                                  | NR                             | 745               | 20                                   | NR                             | 875               | 0                                    | NR                             |                   |                                      |                                |

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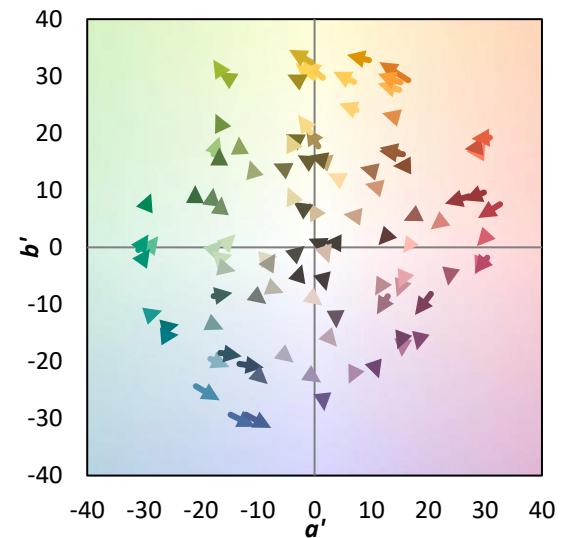
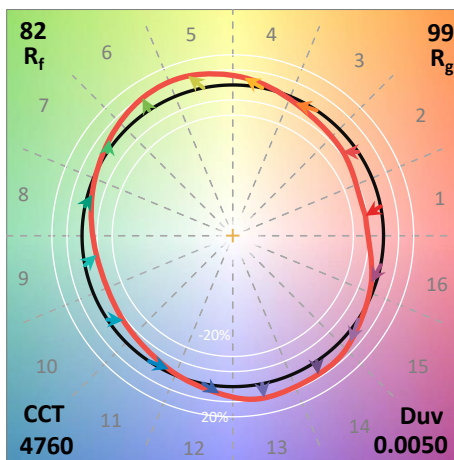
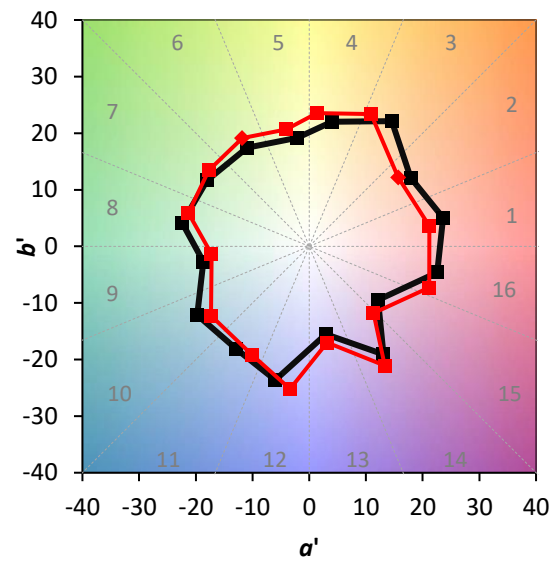
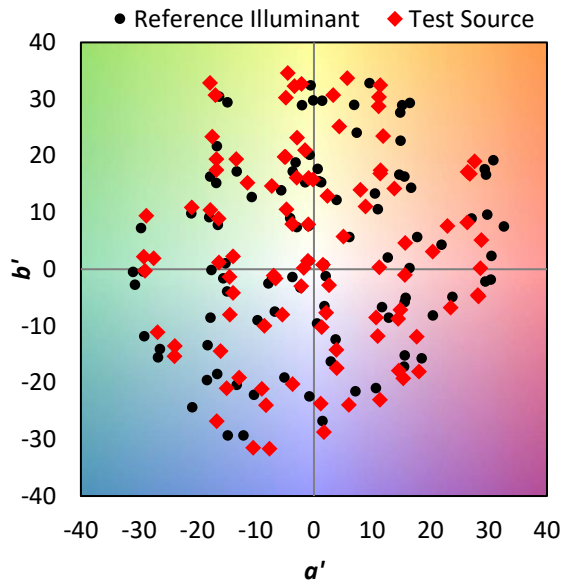
TM-30-18

### Summary

$R_f = 82$   
 $R_g = 99.4$   
 $CIE R_a = 81.1$   
 $R_9 = 8.7$



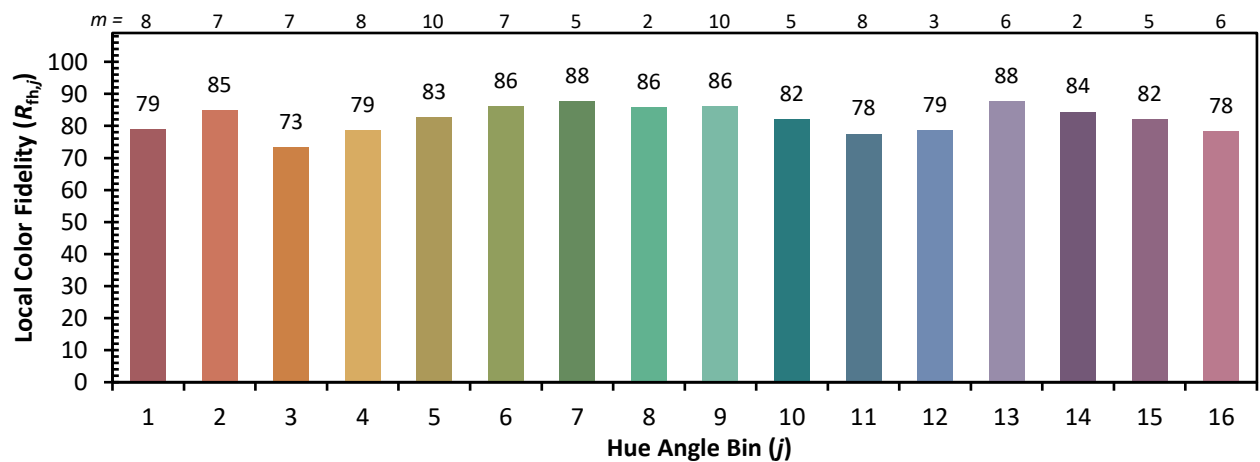
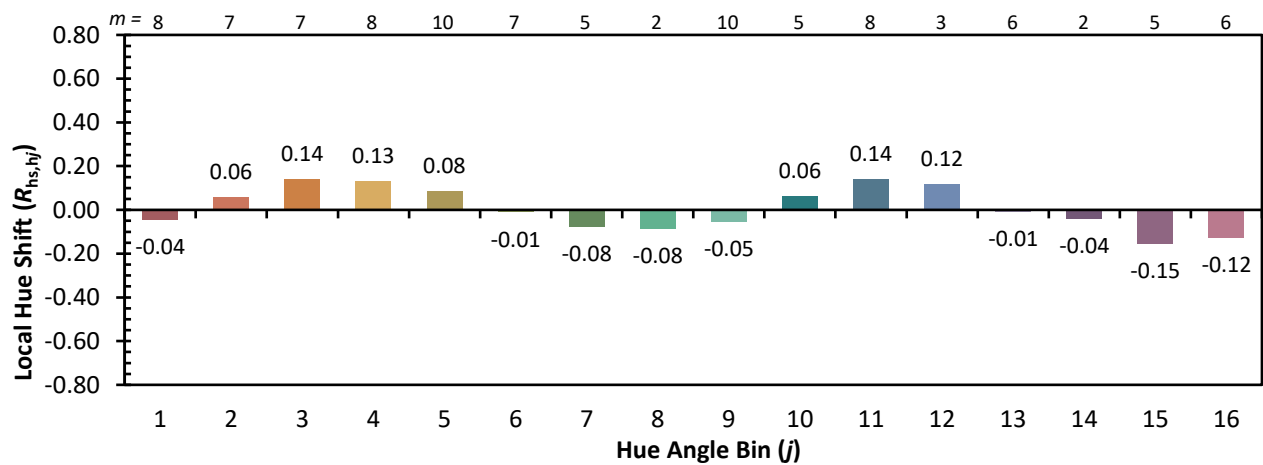
### Color Vector Graphics



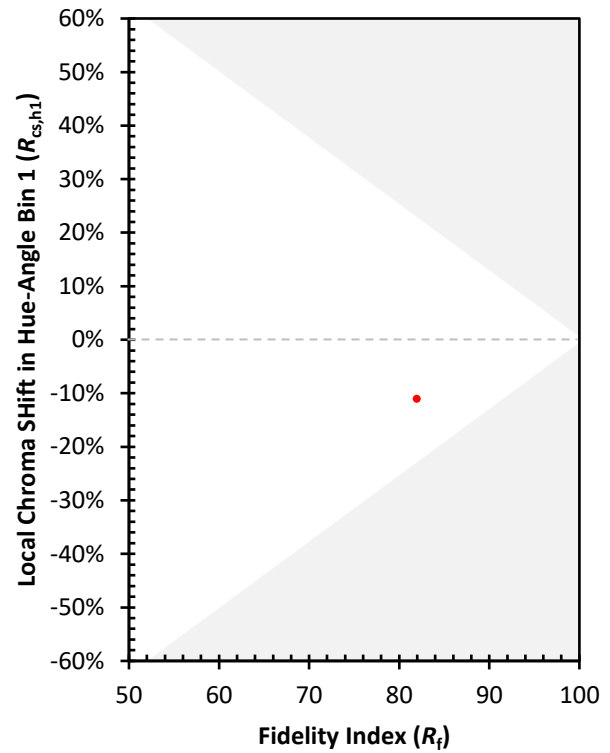
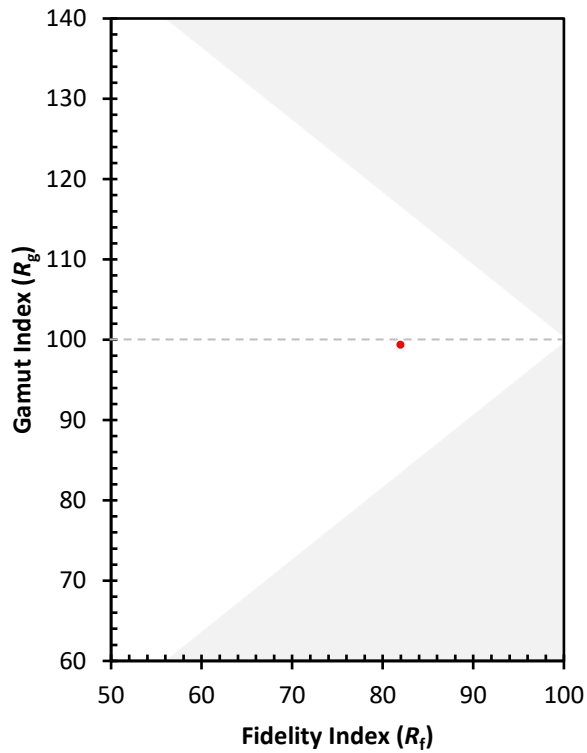
**Individual Sample Fidelity Index ( $R_{f,i}$ )**

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 73 | CES51 = 92 | CES76 = 66 |
| CES02 = 60 | CES27 = 90 | CES52 = 93 | CES77 = 80 |
| CES03 = 30 | CES28 = 87 | CES53 = 84 | CES78 = 65 |
| CES04 = 69 | CES29 = 69 | CES54 = 88 | CES79 = 87 |
| CES05 = 47 | CES30 = 73 | CES55 = 88 | CES80 = 83 |
| CES06 = 50 | CES31 = 72 | CES56 = 80 | CES81 = 84 |
| CES07 = 40 | CES32 = 69 | CES57 = 78 | CES82 = 93 |
| CES08 = 39 | CES33 = 75 | CES58 = 80 | CES83 = 90 |
| CES09 = 29 | CES34 = 78 | CES59 = 93 | CES84 = 92 |
| CES10 = 73 | CES35 = 88 | CES60 = 95 | CES85 = 87 |
| CES11 = 56 | CES36 = 98 | CES61 = 93 | CES86 = 80 |
| CES12 = 62 | CES37 = 85 | CES62 = 88 | CES87 = 84 |
| CES13 = 42 | CES38 = 81 | CES63 = 83 | CES88 = 85 |
| CES14 = 74 | CES39 = 93 | CES64 = 83 | CES89 = 80 |
| CES15 = 71 | CES40 = 88 | CES65 = 77 | CES90 = 83 |
| CES16 = 46 | CES41 = 89 | CES66 = 81 | CES91 = 89 |
| CES17 = 48 | CES42 = 82 | CES67 = 80 | CES92 = 73 |
| CES18 = 55 | CES43 = 80 | CES68 = 83 | CES93 = 85 |
| CES19 = 70 | CES44 = 99 | CES69 = 89 | CES94 = 67 |
| CES20 = 64 | CES45 = 87 | CES70 = 75 | CES95 = 78 |
| CES21 = 85 | CES46 = 85 | CES71 = 73 | CES96 = 84 |
| CES22 = 77 | CES47 = 82 | CES72 = 91 | CES97 = 87 |
| CES23 = 91 | CES48 = 78 | CES73 = 67 | CES98 = 81 |
| CES24 = 90 | CES49 = 84 | CES74 = 98 | CES99 = 74 |
| CES25 = 71 | CES50 = 91 | CES75 = 70 |            |



**Color Rendition by Hue-Angle Bin**


**Measure Comparisons**



(END OF REPORT)