

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: P1047387

Luminaire Tested: **GALN-SA4C-840-U-T3BC**

Issue Date: 07/10/2025

**Test Information**

Test Method: LM-79-08  
Report Number: P1047387  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 07/10/2025  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: MCGRAW-EDISON  
Catalog Number: GALN-SA4C-840-U-T3BC  
Description: GALLEON II AREA AND ROADWAY LUMINAIRE 1050mA 4xLight Square PACKAGE  
80CRI 4000K FIXTURE w/ TYPE III ANGLED BACKLIGHT CONTROL  
Light Source: (56) 4000K CCT, 80 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 21479.8 lumens  
Efficiency: N/A  
Efficacy: 112.8 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 1' x H: 0')  
IES Classification: Type III - Short  
BUG Rating: B0 - U0 - G4

Input Watts (W): 190.4  
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

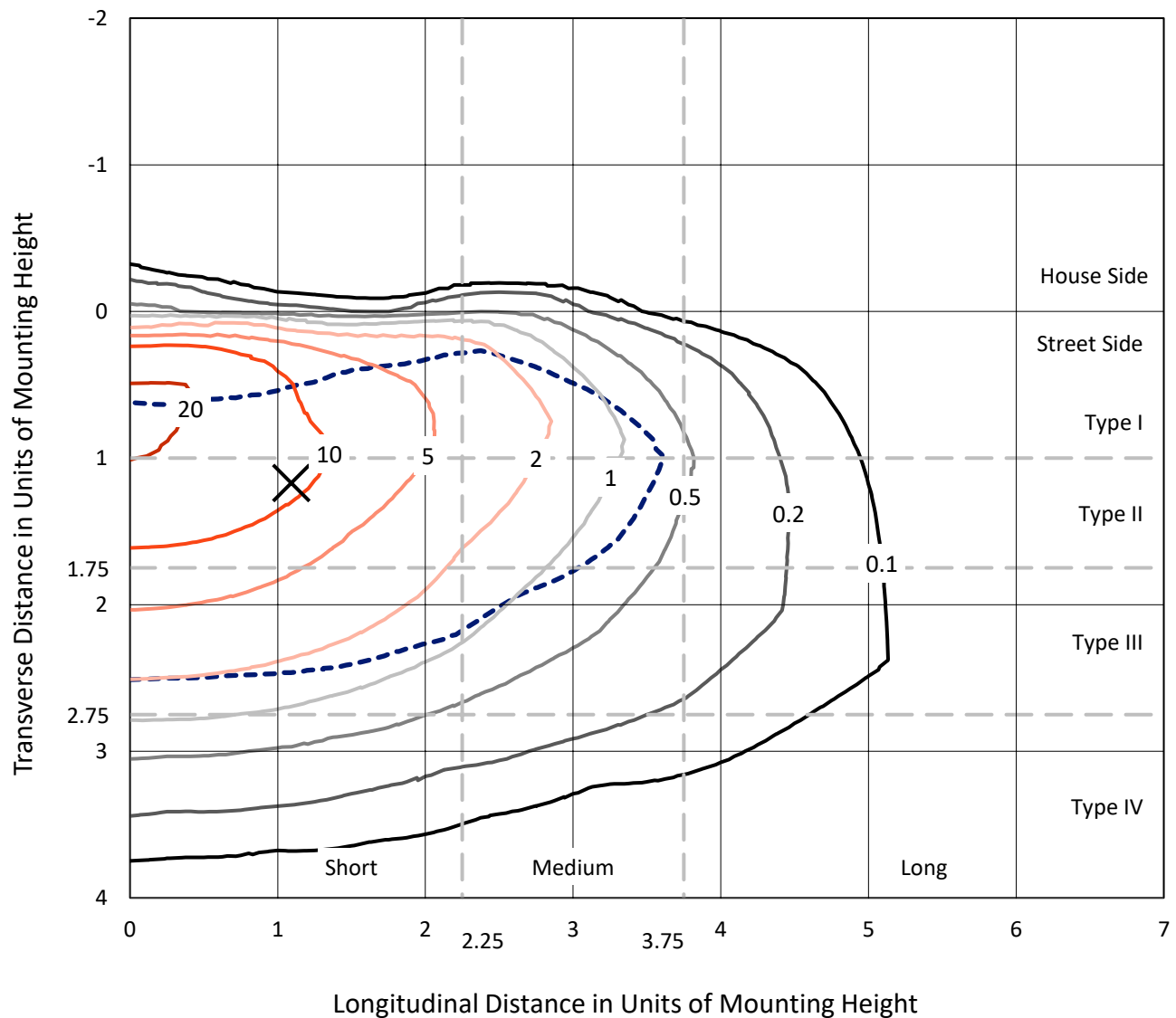


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## Iso-Footcandle Lines of Horizontal Illumination

× Max cd  
 - - - 1/2 Max cd

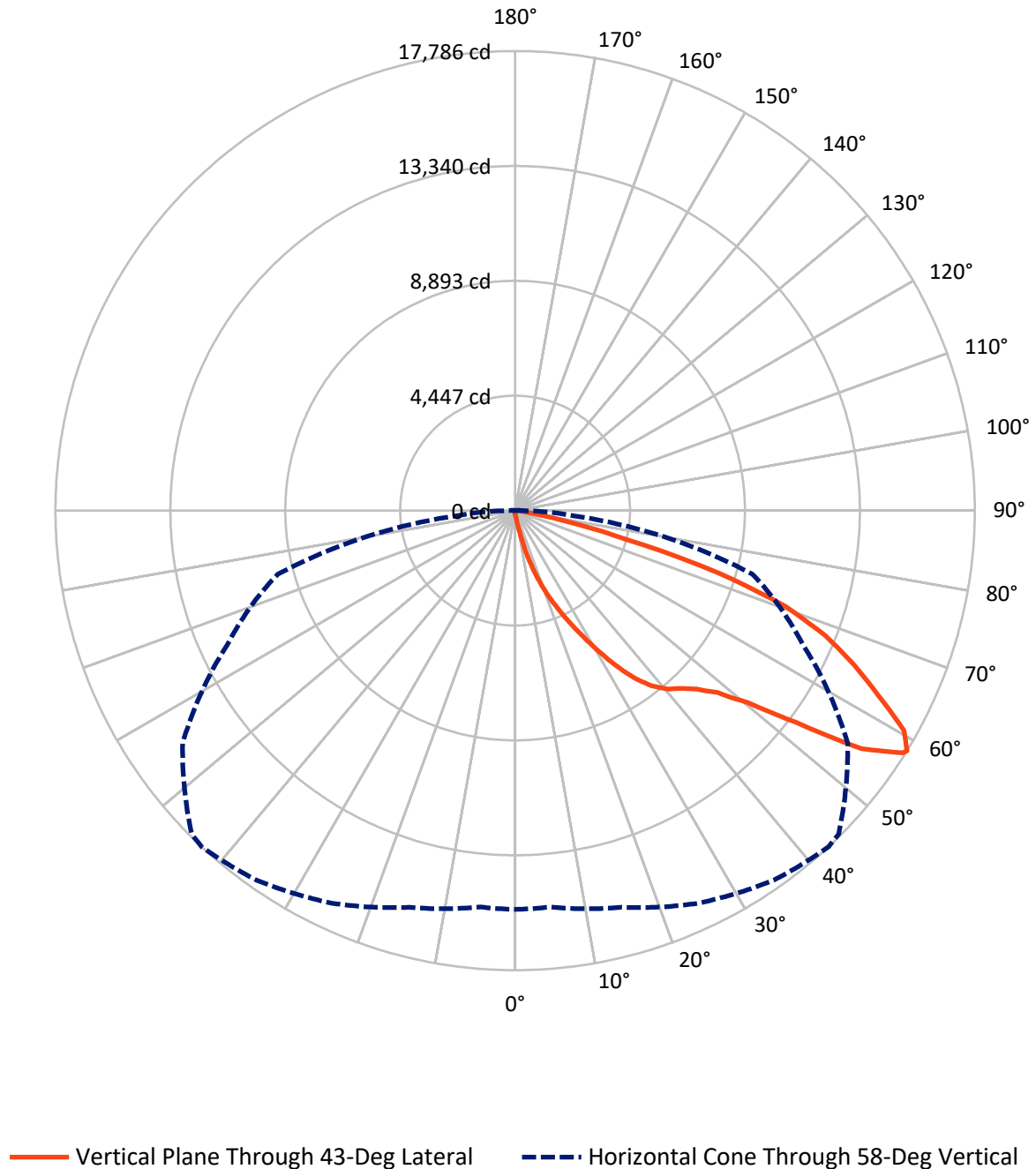


Based on 15 foot mounting height. Maximum calculated value = 24.1 fc  
 Type III - Short - N/A

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## Luminous Intensity Polar Plot



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CATALOG NUMBER: GALN-SA4C-840-U-T3BC

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 78.4     | 0.0    | 78.4    |
|                    | % Fixture | 0.4      | 0.0    | 0.4     |
| <b>Street Side</b> | Lumens    | 21401.4  | 0.0    | 21401.4 |
|                    | % Fixture | 99.6     | 0.0    | 99.6    |
| <b>Total</b>       | Lumens    | 21479.8  | 0.0    | 21479.8 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 20.6    | 0.1       |
| 10°-20°   | 246.9   | 1.1       |
| 20°-30°   | 889.9   | 4.1       |
| 30°-40°   | 2036.1  | 9.5       |
| 40°-50°   | 3434.2  | 16.0      |
| 50°-60°   | 5667.2  | 26.4      |
| 60°-70°   | 6333.9  | 29.5      |
| 70°-80°   | 2615.2  | 12.2      |
| 80°-90°   | 235.7   | 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°    | 21479.8 | 100.0     |
| 0°-180°   | 21479.8 | 100.0     |



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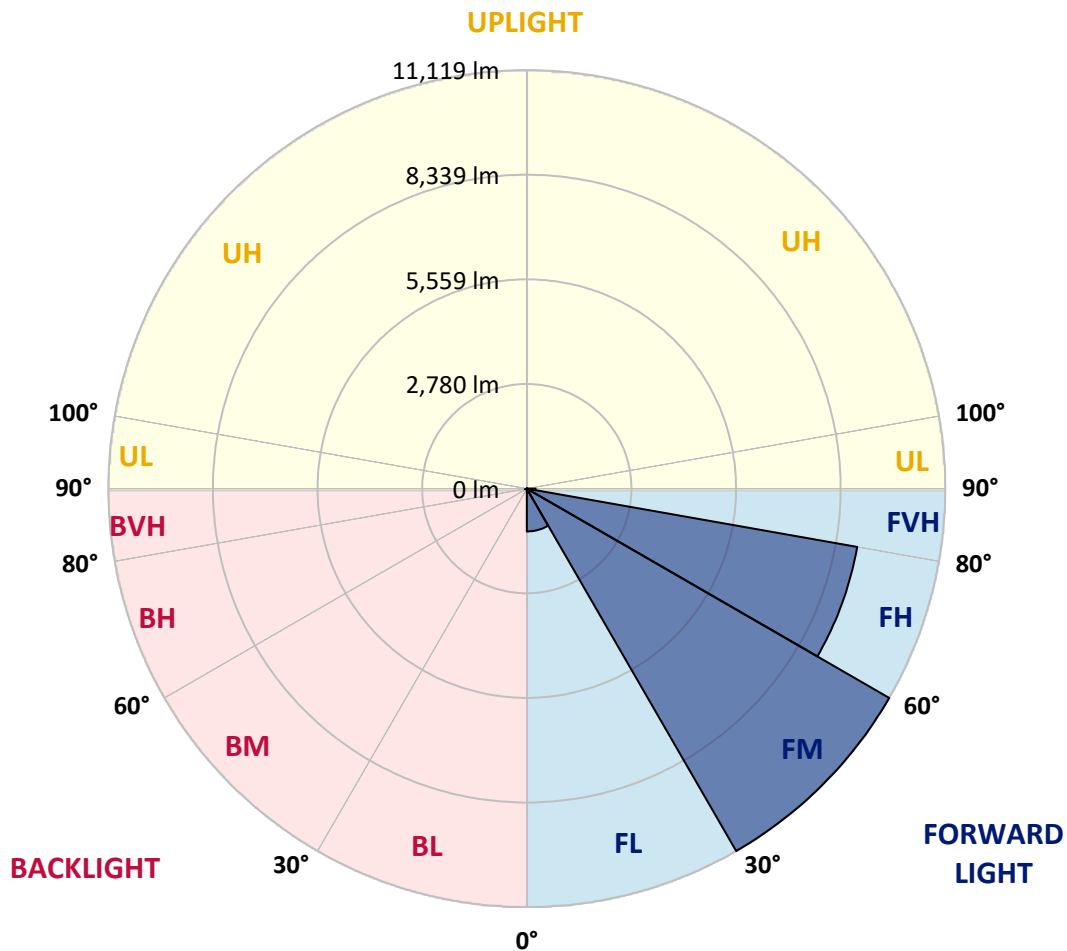
CATALOG NUMBER: GALN-SA4C-840-U-T3BC

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |          |
|------|-------------|---------|-----------|-------------------------|------|----------|
|      |             |         |           | B                       | U    | G        |
| FL   | (0°-30°)    | 1137.0  | 5.3       |                         |      |          |
| FM   | (30°-60°)   | 11118.8 | 51.8      |                         |      |          |
| FH   | (60°-80°)   | 8913.1  | 41.5      |                         |      | G4/12000 |
| FVH  | (80°-90°)   | 232.5   | 1.1       |                         |      | G3/500   |
| BL   | (0°-30°)    | 20.4    | 0.1       | B0/110                  |      |          |
| BM   | (30°-60°)   | 18.8    | 0.1       | B0/220                  |      |          |
| BH   | (60°-80°)   | 35.9    | 0.2       | B0/110                  |      | G0/110   |
| BVH  | (80°-90°)   | 3.2     | 0.0       |                         |      | G0/10    |
| UL   | (90°-100°)  | 0.0     | 0.0       |                         | U0/0 |          |
| UH   | (100°-180°) | 0.0     | 0.0       |                         | U0/0 |          |

**BUG Rating: B0-U0-G4**

Type III Short



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 43°     | 45°     | 55°     | 65°     | 75°     | 85°    |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--------|
| 0°    | 140.4   | 140.4   | 140.4   | 140.4   | 140.4   | 140.4   | 140.4   | 140.4   | 140.4   | 140.4   | 140.4  |
| 2.5°  | 168.5   | 174.2   | 168.5   | 168.5   | 168.5   | 162.9   | 162.9   | 157.3   | 157.3   | 151.7   | 146.1  |
| 5°    | 247.2   | 247.2   | 230.3   | 219.1   | 207.9   | 202.2   | 196.6   | 185.4   | 174.2   | 162.9   | 151.7  |
| 7.5°  | 550.5   | 550.5   | 500.0   | 432.6   | 342.7   | 292.1   | 280.9   | 230.3   | 196.6   | 174.2   | 151.7  |
| 10°   | 1314.6  | 1314.6  | 1202.2  | 1016.8  | 786.5   | 584.3   | 522.5   | 331.5   | 235.9   | 185.4   | 157.3  |
| 12.5° | 2185.3  | 2213.4  | 2073.0  | 1837.0  | 1494.3  | 1140.4  | 1016.8  | 606.7   | 314.6   | 202.2   | 157.3  |
| 15°   | 2966.2  | 2898.8  | 2859.5  | 2634.8  | 2308.9  | 1887.6  | 1730.3  | 1022.4  | 455.0   | 230.3   | 157.3  |
| 17.5° | 3494.3  | 3494.3  | 3438.1  | 3286.4  | 2988.7  | 2617.9  | 2488.7  | 1651.6  | 735.9   | 264.0   | 162.9  |
| 20°   | 4112.3  | 4112.3  | 4011.1  | 3904.4  | 3640.4  | 3325.8  | 3202.2  | 2348.3  | 1140.4  | 337.1   | 162.9  |
| 22.5° | 4859.4  | 4870.7  | 4758.3  | 4567.3  | 4314.5  | 3966.2  | 3859.5  | 2994.3  | 1651.6  | 449.4   | 168.5  |
| 25°   | 5769.5  | 5780.8  | 5617.9  | 5438.1  | 5050.5  | 4674.1  | 4511.1  | 3735.9  | 2275.2  | 629.2   | 168.5  |
| 27.5° | 6775.1  | 6853.8  | 6612.2  | 6303.2  | 5893.1  | 5421.2  | 5297.6  | 4404.4  | 2893.2  | 887.6   | 179.8  |
| 30°   | 8027.9  | 8027.9  | 7707.7  | 7275.1  | 6831.3  | 6247.1  | 6089.8  | 5106.6  | 3550.5  | 1230.3  | 191.0  |
| 32.5° | 9106.5  | 9022.3  | 8612.2  | 8157.1  | 7685.2  | 7140.3  | 6971.8  | 5842.6  | 4224.6  | 1657.3  | 213.5  |
| 35°   | 9932.4  | 9859.3  | 9353.7  | 8865.0  | 8454.9  | 7954.9  | 7752.6  | 6640.3  | 4938.1  | 2140.4  | 247.2  |
| 37.5° | 10640.2 | 10612.1 | 9926.8  | 9314.4  | 9044.7  | 8606.6  | 8426.8  | 7393.1  | 5640.3  | 2662.9  | 286.5  |
| 40°   | 11415.5 | 11325.6 | 10595.3 | 9836.9  | 9432.4  | 9078.5  | 8915.5  | 7999.8  | 6314.5  | 3275.2  | 342.7  |
| 42.5° | 12078.4 | 11971.7 | 11314.4 | 10572.8 | 9881.8  | 9404.3  | 9247.0  | 8511.1  | 6971.8  | 3887.6  | 415.7  |
| 45°   | 12814.3 | 12758.2 | 12095.2 | 11533.5 | 10612.1 | 9848.1  | 9640.2  | 8921.2  | 7572.9  | 4617.9  | 511.2  |
| 47.5° | 13921.0 | 13819.9 | 13202.0 | 12741.3 | 11673.9 | 10522.2 | 10224.5 | 9342.5  | 8151.5  | 5337.0  | 657.3  |
| 50°   | 15207.5 | 15140.1 | 14775.0 | 14409.8 | 13348.0 | 11673.9 | 11320.0 | 9949.2  | 8797.6  | 6190.9  | 848.3  |
| 52.5° | 16258.1 | 16246.8 | 16291.8 | 16297.4 | 15494.0 | 13612.1 | 13084.0 | 10926.7 | 9539.1  | 7033.6  | 1118.0 |
| 55°   | 16235.6 | 16286.2 | 16780.5 | 17347.9 | 17409.7 | 16258.1 | 15746.9 | 12572.8 | 10505.4 | 8072.9  | 1494.3 |
| 57.5° | 15628.9 | 15589.6 | 16112.0 | 16965.9 | 17567.0 | 17690.6 | 17606.4 | 15128.9 | 11960.4 | 9325.6  | 2073.0 |
| 58°   | 15432.3 | 15398.5 | 15892.9 | 16763.7 | 17454.7 | 17786.1 | 17701.9 | 15707.5 | 12286.3 | 9505.4  | 2230.3 |
| 60°   | 14718.8 | 14724.4 | 15016.5 | 15808.6 | 16499.6 | 17286.1 | 17364.8 | 17359.2 | 13909.8 | 10707.6 | 3022.4 |
| 62.5° | 13775.0 | 13730.0 | 13999.7 | 14645.8 | 15252.5 | 15780.6 | 15915.4 | 17471.5 | 16286.2 | 12235.7 | 4533.6 |
| 65°   | 12471.6 | 12404.2 | 12690.7 | 13421.1 | 14072.7 | 14415.4 | 14421.0 | 15965.9 | 17404.1 | 13876.1 | 6690.9 |
| 67.5° | 10050.3 | 9994.2  | 10567.2 | 11505.4 | 12511.0 | 12960.4 | 13162.6 | 13853.6 | 16460.3 | 14988.4 | 7926.8 |
| 70°   | 6157.2  | 6275.1  | 7072.9  | 8544.8  | 10263.8 | 11089.6 | 11393.0 | 11606.5 | 14016.6 | 14819.9 | 6629.1 |
| 72.5° | 2842.6  | 2702.2  | 3381.9  | 4410.0  | 6370.6  | 8207.7  | 8522.3  | 9359.3  | 11112.1 | 12864.9 | 4943.7 |
| 75°   | 1325.8  | 1275.3  | 1432.6  | 1926.9  | 2887.6  | 4432.5  | 5005.5  | 7471.7  | 8522.3  | 8949.2  | 3567.3 |
| 77.5° | 679.8   | 685.4   | 814.6   | 876.4   | 1191.0  | 2050.5  | 2353.9  | 4915.6  | 6247.1  | 4994.3  | 2393.2 |
| 80°   | 297.7   | 309.0   | 314.6   | 342.7   | 483.1   | 792.1   | 893.2   | 2280.8  | 4269.6  | 2544.9  | 1309.0 |
| 82.5° | 191.0   | 196.6   | 196.6   | 196.6   | 230.3   | 314.6   | 359.5   | 915.7   | 2129.2  | 1264.0  | 404.5  |
| 85°   | 101.1   | 101.1   | 112.4   | 140.4   | 162.9   | 191.0   | 202.2   | 292.1   | 702.2   | 376.4   | 95.5   |
| 87.5° | 56.2    | 61.8    | 67.4    | 84.3    | 106.7   | 129.2   | 140.4   | 202.2   | 269.7   | 258.4   | 22.5   |
| 90°   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0    |

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CATALOG NUMBER: GALN-SA4C-840-U-T3BC

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°   | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 140.4  | 140.4 | 140.4 | 140.4 | 140.4 | 140.4 | 140.4 | 140.4 | 140.4 | 140.4 | 140.4 |
| 2.5°  | 146.1  | 140.4 | 134.8 | 129.2 | 123.6 | 118.0 | 118.0 | 118.0 | 118.0 | 118.0 | 118.0 |
| 5°    | 140.4  | 134.8 | 129.2 | 118.0 | 106.7 | 101.1 | 95.5  | 89.9  | 89.9  | 89.9  | 89.9  |
| 7.5°  | 140.4  | 134.8 | 118.0 | 106.7 | 95.5  | 84.3  | 73.0  | 73.0  | 73.0  | 73.0  | 73.0  |
| 10°   | 140.4  | 129.2 | 112.4 | 95.5  | 78.6  | 67.4  | 61.8  | 56.2  | 56.2  | 56.2  | 56.2  |
| 12.5° | 140.4  | 123.6 | 106.7 | 84.3  | 67.4  | 56.2  | 50.6  | 44.9  | 44.9  | 44.9  | 44.9  |
| 15°   | 140.4  | 123.6 | 101.1 | 78.6  | 61.8  | 44.9  | 39.3  | 33.7  | 33.7  | 33.7  | 33.7  |
| 17.5° | 134.8  | 118.0 | 95.5  | 67.4  | 50.6  | 33.7  | 28.1  | 22.5  | 22.5  | 28.1  | 28.1  |
| 20°   | 129.2  | 112.4 | 84.3  | 56.2  | 39.3  | 28.1  | 16.9  | 16.9  | 16.9  | 16.9  | 16.9  |
| 22.5° | 129.2  | 112.4 | 78.6  | 50.6  | 33.7  | 16.9  | 11.2  | 11.2  | 11.2  | 11.2  | 16.9  |
| 25°   | 129.2  | 106.7 | 67.4  | 39.3  | 22.5  | 11.2  | 5.6   | 5.6   | 5.6   | 5.6   | 5.6   |
| 27.5° | 129.2  | 106.7 | 61.8  | 33.7  | 16.9  | 11.2  | 5.6   | 0.0   | 0.0   | 0.0   | 0.0   |
| 30°   | 123.6  | 101.1 | 56.2  | 28.1  | 11.2  | 5.6   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 32.5° | 123.6  | 95.5  | 44.9  | 22.5  | 11.2  | 5.6   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 35°   | 129.2  | 89.9  | 39.3  | 16.9  | 5.6   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 5.6   |
| 37.5° | 134.8  | 84.3  | 33.7  | 11.2  | 5.6   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 40°   | 140.4  | 78.6  | 33.7  | 11.2  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 42.5° | 151.7  | 78.6  | 28.1  | 11.2  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 45°   | 162.9  | 78.6  | 22.5  | 5.6   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 47.5° | 185.4  | 84.3  | 22.5  | 5.6   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 50°   | 202.2  | 89.9  | 16.9  | 5.6   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 52.5° | 224.7  | 84.3  | 16.9  | 5.6   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 55°   | 252.8  | 84.3  | 16.9  | 5.6   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 57.5° | 275.3  | 78.6  | 16.9  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 58°   | 286.5  | 73.0  | 11.2  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 60°   | 342.7  | 67.4  | 11.2  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 62.5° | 533.7  | 56.2  | 11.2  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 65°   | 1084.2 | 50.6  | 11.2  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 67.5° | 2022.4 | 44.9  | 11.2  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 70°   | 2264.0 | 50.6  | 5.6   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 72.5° | 1426.9 | 39.3  | 5.6   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 75°   | 752.8  | 39.3  | 5.6   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 77.5° | 376.4  | 39.3  | 5.6   | 5.6   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 80°   | 174.2  | 28.1  | 5.6   | 5.6   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 82.5° | 73.0   | 16.9  | 11.2  | 5.6   | 5.6   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 85°   | 33.7   | 16.9  | 11.2  | 11.2  | 5.6   | 5.6   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 87.5° | 16.9   | 16.9  | 16.9  | 11.2  | 11.2  | 5.6   | 5.6   | 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: SP1-2407-184-11

Test Date: 10/11/2024

Luminaire Tested: GSS-SB1A-840-U-5WQ

Data in this report applies to families of products including GSS-SB1A-840-U-5WQ

### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2407-184-11  
 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-840-U-5WQ**  
 Description: GALLEON II SITE SLIM 1SQ 350MA 5WQ HIGH DENSITY LIGHTSQUARE WITH 80 CRI  
 4000K CCT 26 LEDS

### Spectral Parameters

CCT (K): 3897  
 CIE  $u'$ : 0.2249  
 CIE  $v'$ : 0.5084  
 Duv: 0.0039  
 CIE x: 0.3882  
 CIE y: 0.3900  
 CIE z: 0.2218  
 Peak Wavelength (nm): 445  
 Dominant Wavelength (nm): 577  
 Purity: 33.54925  
 R<sub>f</sub>: 81.8  
 R<sub>g</sub>: 98.6

CRI (Ra): 80.2  
 R1: 78.9  
 R2: 83.5  
 R3: 88.3  
 R4: 82.1  
 R5: 78.8  
 R6: 78.4  
 R7: 85.8  
 R8: 65.8  
 R9: 6.7  
 R10: 61.9  
 R11: 81.9  
 R12: 58.9  
 R13: 79.2  
 R14: 93.2  
 R15: 71.9



### Test Conditions

Stabilization Time: 24M  
 Operation Time: 1H 24M  
 Sphere Temperature (°C): 25.2

REPORT NUMBER: SP1-2407-184-11

| 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: SP1-2407-184-11

### Photopic Flux vs. Wavelength

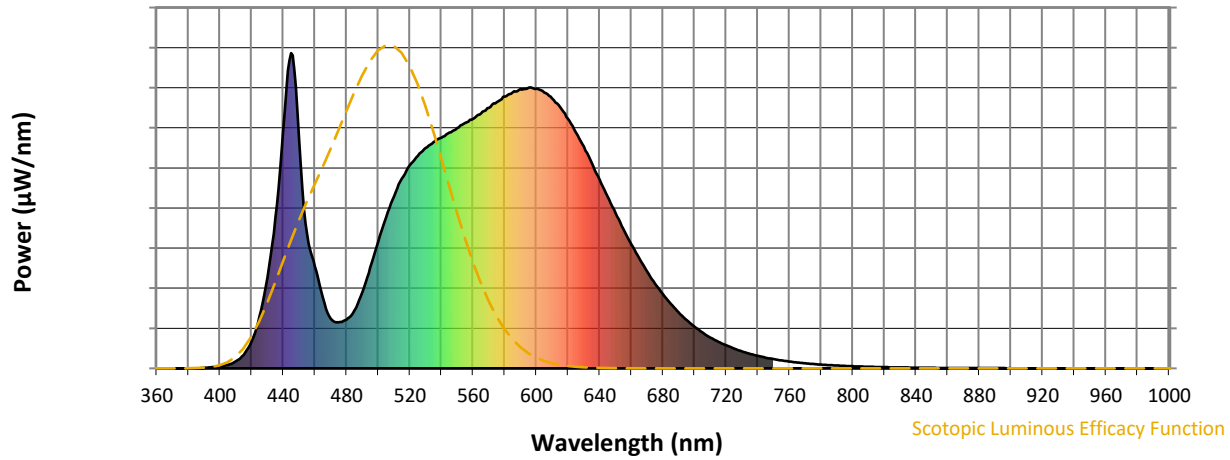


### Photopic Lumens: NR

| 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       | 242                         | NR               | 620       | 792                         | NR               | 750       | 29                          | NR               | 880       | 1                           | NR               |
| 365       | 0                           | NR               | 495       | 320                         | NR               | 625       | 748                         | NR               | 755       | 25                          | NR               | 885       | 1                           | NR               |
| 370       | 0                           | NR               | 500       | 401                         | NR               | 630       | 703                         | NR               | 760       | 22                          | NR               | 890       | 1                           | NR               |
| 375       | 0                           | NR               | 505       | 479                         | NR               | 635       | 651                         | NR               | 765       | 19                          | NR               | 895       | 1                           | NR               |
| 380       | 0                           | NR               | 510       | 546                         | NR               | 640       | 599                         | NR               | 770       | 16                          | NR               | 900       | 1                           | NR               |
| 385       | 0                           | NR               | 515       | 602                         | NR               | 645       | 545                         | NR               | 775       | 14                          | NR               | 905       | 0                           | NR               |
| 390       | 2                           | NR               | 520       | 645                         | NR               | 650       | 493                         | NR               | 780       | 12                          | NR               | 910       | 0                           | NR               |
| 395       | 4                           | NR               | 525       | 674                         | NR               | 655       | 443                         | NR               | 785       | 10                          | NR               | 915       | 0                           | NR               |
| 400       | 6                           | NR               | 530       | 699                         | NR               | 660       | 394                         | NR               | 790       | 9                           | NR               | 920       | 0                           | NR               |
| 405       | 11                          | NR               | 535       | 718                         | NR               | 665       | 349                         | NR               | 795       | 8                           | NR               | 925       | 0                           | NR               |
| 410       | 22                          | NR               | 540       | 732                         | NR               | 670       | 307                         | NR               | 800       | 7                           | NR               | 930       | 0                           | NR               |
| 415       | 43                          | NR               | 545       | 749                         | NR               | 675       | 269                         | NR               | 805       | 6                           | NR               | 935       | 0                           | NR               |
| 420       | 86                          | NR               | 550       | 762                         | NR               | 680       | 235                         | NR               | 810       | 5                           | NR               | 940       | 0                           | NR               |
| 425       | 164                         | NR               | 555       | 778                         | NR               | 685       | 204                         | NR               | 815       | 5                           | NR               | 945       | 0                           | NR               |
| 430       | 288                         | NR               | 560       | 792                         | NR               | 690       | 178                         | NR               | 820       | 4                           | NR               | 950       | 0                           | NR               |
| 435       | 478                         | NR               | 565       | 809                         | NR               | 695       | 153                         | NR               | 825       | 3                           | NR               | 955       | 0                           | NR               |
| 440       | 766                         | NR               | 570       | 827                         | NR               | 700       | 132                         | NR               | 830       | 3                           | NR               | 960       | 0                           | NR               |
| 445       | 1000                        | NR               | 575       | 845                         | NR               | 705       | 114                         | NR               | 835       | 3                           | NR               | 965       | 0                           | NR               |
| 450       | 726                         | NR               | 580       | 862                         | NR               | 710       | 98                          | NR               | 840       | 2                           | NR               | 970       | 0                           | NR               |
| 455       | 425                         | NR               | 585       | 875                         | NR               | 715       | 84                          | NR               | 845       | 2                           | NR               | 975       | 0                           | NR               |
| 460       | 324                         | NR               | 590       | 887                         | NR               | 720       | 73                          | NR               | 850       | 2                           | NR               | 980       | 0                           | NR               |
| 465       | 225                         | NR               | 595       | 890                         | NR               | 725       | 63                          | NR               | 855       | 1                           | NR               | 985       | 0                           | NR               |
| 470       | 157                         | NR               | 600       | 887                         | NR               | 730       | 54                          | NR               | 860       | 1                           | NR               | 990       | 0                           | NR               |
| 475       | 147                         | NR               | 605       | 875                         | NR               | 735       | 46                          | NR               | 865       | 1                           | NR               | 995       | 0                           | NR               |
| 480       | 154                         | NR               | 610       | 856                         | NR               | 740       | 40                          | NR               | 870       | 1                           | NR               | 1000      | 0                           | NR               |
| 485       | 184                         | NR               | 615       | 828                         | NR               | 745       | 34                          | NR               | 875       | 1                           | NR               |           |                             |                  |

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### Scotopic Flux vs. Wavelength



Scotopic Lumens: NR

S/P: 1.57

| 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    | 242                      | NR            | 620    | 792                      | NR            | 750    | 29                       | NR            | 880    | 1                        | NR            |
| 365    | 0                        | NR            | 495    | 320                      | NR            | 625    | 748                      | NR            | 755    | 25                       | NR            | 885    | 1                        | NR            |
| 370    | 0                        | NR            | 500    | 401                      | NR            | 630    | 703                      | NR            | 760    | 22                       | NR            | 890    | 1                        | NR            |
| 375    | 0                        | NR            | 505    | 479                      | NR            | 635    | 651                      | NR            | 765    | 19                       | NR            | 895    | 1                        | NR            |
| 380    | 0                        | NR            | 510    | 546                      | NR            | 640    | 599                      | NR            | 770    | 16                       | NR            | 900    | 1                        | NR            |
| 385    | 0                        | NR            | 515    | 602                      | NR            | 645    | 545                      | NR            | 775    | 14                       | NR            | 905    | 0                        | NR            |
| 390    | 2                        | NR            | 520    | 645                      | NR            | 650    | 493                      | NR            | 780    | 12                       | NR            | 910    | 0                        | NR            |
| 395    | 4                        | NR            | 525    | 674                      | NR            | 655    | 443                      | NR            | 785    | 10                       | NR            | 915    | 0                        | NR            |
| 400    | 6                        | NR            | 530    | 699                      | NR            | 660    | 394                      | NR            | 790    | 9                        | NR            | 920    | 0                        | NR            |
| 405    | 11                       | NR            | 535    | 718                      | NR            | 665    | 349                      | NR            | 795    | 8                        | NR            | 925    | 0                        | NR            |
| 410    | 22                       | NR            | 540    | 732                      | NR            | 670    | 307                      | NR            | 800    | 7                        | NR            | 930    | 0                        | NR            |
| 415    | 43                       | NR            | 545    | 749                      | NR            | 675    | 269                      | NR            | 805    | 6                        | NR            | 935    | 0                        | NR            |
| 420    | 86                       | NR            | 550    | 762                      | NR            | 680    | 235                      | NR            | 810    | 5                        | NR            | 940    | 0                        | NR            |
| 425    | 164                      | NR            | 555    | 778                      | NR            | 685    | 204                      | NR            | 815    | 5                        | NR            | 945    | 0                        | NR            |
| 430    | 288                      | NR            | 560    | 792                      | NR            | 690    | 178                      | NR            | 820    | 4                        | NR            | 950    | 0                        | NR            |
| 435    | 478                      | NR            | 565    | 809                      | NR            | 695    | 153                      | NR            | 825    | 3                        | NR            | 955    | 0                        | NR            |
| 440    | 766                      | NR            | 570    | 827                      | NR            | 700    | 132                      | NR            | 830    | 3                        | NR            | 960    | 0                        | NR            |
| 445    | 1000                     | NR            | 575    | 845                      | NR            | 705    | 114                      | NR            | 835    | 3                        | NR            | 965    | 0                        | NR            |
| 450    | 726                      | NR            | 580    | 862                      | NR            | 710    | 98                       | NR            | 840    | 2                        | NR            | 970    | 0                        | NR            |
| 455    | 425                      | NR            | 585    | 875                      | NR            | 715    | 84                       | NR            | 845    | 2                        | NR            | 975    | 0                        | NR            |
| 460    | 324                      | NR            | 590    | 887                      | NR            | 720    | 73                       | NR            | 850    | 2                        | NR            | 980    | 0                        | NR            |
| 465    | 225                      | NR            | 595    | 890                      | NR            | 725    | 63                       | NR            | 855    | 1                        | NR            | 985    | 0                        | NR            |
| 470    | 157                      | NR            | 600    | 887                      | NR            | 730    | 54                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 147                      | NR            | 605    | 875                      | NR            | 735    | 46                       | NR            | 865    | 1                        | NR            | 995    | 0                        | NR            |
| 480    | 154                      | NR            | 610    | 856                      | NR            | 740    | 40                       | NR            | 870    | 1                        | NR            | 1000   | 0                        | NR            |
| 485    | 184                      | NR            | 615    | 828                      | NR            | 745    | 34                       | NR            | 875    | 1                        | NR            |        |                          |               |

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### Melanopic Flux vs. Wavelength


**Melanopic Lumens: NR**
**M/P: 3.06**

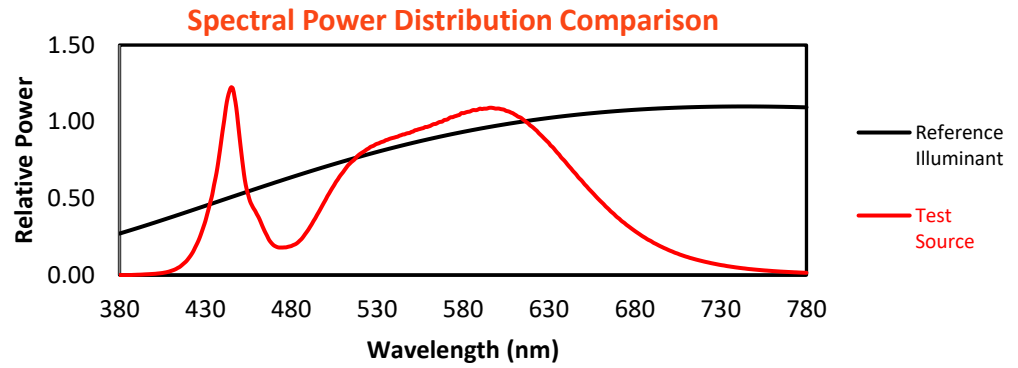
| $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<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               | 242                                  | NR                             | 620               | 792                                  | NR                             | 750               | 29                                   | NR                             | 880               | 1                                    | NR                             |
| 365               | 0                                    | NR                             | 495               | 320                                  | NR                             | 625               | 748                                  | NR                             | 755               | 25                                   | NR                             | 885               | 1                                    | NR                             |
| 370               | 0                                    | NR                             | 500               | 401                                  | NR                             | 630               | 703                                  | NR                             | 760               | 22                                   | NR                             | 890               | 1                                    | NR                             |
| 375               | 0                                    | NR                             | 505               | 479                                  | NR                             | 635               | 651                                  | NR                             | 765               | 19                                   | NR                             | 895               | 1                                    | NR                             |
| 380               | 0                                    | NR                             | 510               | 546                                  | NR                             | 640               | 599                                  | NR                             | 770               | 16                                   | NR                             | 900               | 1                                    | NR                             |
| 385               | 0                                    | NR                             | 515               | 602                                  | NR                             | 645               | 545                                  | NR                             | 775               | 14                                   | NR                             | 905               | 0                                    | NR                             |
| 390               | 2                                    | NR                             | 520               | 645                                  | NR                             | 650               | 493                                  | NR                             | 780               | 12                                   | NR                             | 910               | 0                                    | NR                             |
| 395               | 4                                    | NR                             | 525               | 674                                  | NR                             | 655               | 443                                  | NR                             | 785               | 10                                   | NR                             | 915               | 0                                    | NR                             |
| 400               | 6                                    | NR                             | 530               | 699                                  | NR                             | 660               | 394                                  | NR                             | 790               | 9                                    | NR                             | 920               | 0                                    | NR                             |
| 405               | 11                                   | NR                             | 535               | 718                                  | NR                             | 665               | 349                                  | NR                             | 795               | 8                                    | NR                             | 925               | 0                                    | NR                             |
| 410               | 22                                   | NR                             | 540               | 732                                  | NR                             | 670               | 307                                  | NR                             | 800               | 7                                    | NR                             | 930               | 0                                    | NR                             |
| 415               | 43                                   | NR                             | 545               | 749                                  | NR                             | 675               | 269                                  | NR                             | 805               | 6                                    | NR                             | 935               | 0                                    | NR                             |
| 420               | 86                                   | NR                             | 550               | 762                                  | NR                             | 680               | 235                                  | NR                             | 810               | 5                                    | NR                             | 940               | 0                                    | NR                             |
| 425               | 164                                  | NR                             | 555               | 778                                  | NR                             | 685               | 204                                  | NR                             | 815               | 5                                    | NR                             | 945               | 0                                    | NR                             |
| 430               | 288                                  | NR                             | 560               | 792                                  | NR                             | 690               | 178                                  | NR                             | 820               | 4                                    | NR                             | 950               | 0                                    | NR                             |
| 435               | 478                                  | NR                             | 565               | 809                                  | NR                             | 695               | 153                                  | NR                             | 825               | 3                                    | NR                             | 955               | 0                                    | NR                             |
| 440               | 766                                  | NR                             | 570               | 827                                  | NR                             | 700               | 132                                  | NR                             | 830               | 3                                    | NR                             | 960               | 0                                    | NR                             |
| 445               | 1000                                 | NR                             | 575               | 845                                  | NR                             | 705               | 114                                  | NR                             | 835               | 3                                    | NR                             | 965               | 0                                    | NR                             |
| 450               | 726                                  | NR                             | 580               | 862                                  | NR                             | 710               | 98                                   | NR                             | 840               | 2                                    | NR                             | 970               | 0                                    | NR                             |
| 455               | 425                                  | NR                             | 585               | 875                                  | NR                             | 715               | 84                                   | NR                             | 845               | 2                                    | NR                             | 975               | 0                                    | NR                             |
| 460               | 324                                  | NR                             | 590               | 887                                  | NR                             | 720               | 73                                   | NR                             | 850               | 2                                    | NR                             | 980               | 0                                    | NR                             |
| 465               | 225                                  | NR                             | 595               | 890                                  | NR                             | 725               | 63                                   | NR                             | 855               | 1                                    | NR                             | 985               | 0                                    | NR                             |
| 470               | 157                                  | NR                             | 600               | 887                                  | NR                             | 730               | 54                                   | NR                             | 860               | 1                                    | NR                             | 990               | 0                                    | NR                             |
| 475               | 147                                  | NR                             | 605               | 875                                  | NR                             | 735               | 46                                   | NR                             | 865               | 1                                    | NR                             | 995               | 0                                    | NR                             |
| 480               | 154                                  | NR                             | 610               | 856                                  | NR                             | 740               | 40                                   | NR                             | 870               | 1                                    | NR                             | 1000              | 0                                    | NR                             |
| 485               | 184                                  | NR                             | 615               | 828                                  | NR                             | 745               | 34                                   | NR                             | 875               | 1                                    | NR                             |                   |                                      |                                |

REPORT NUMBER: SP1-2407-184-11

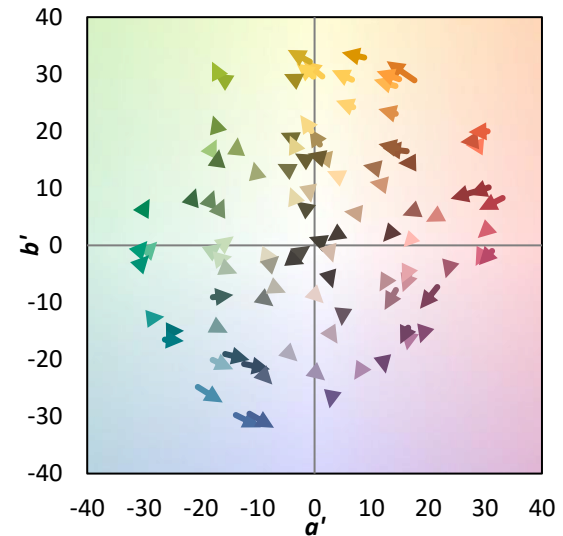
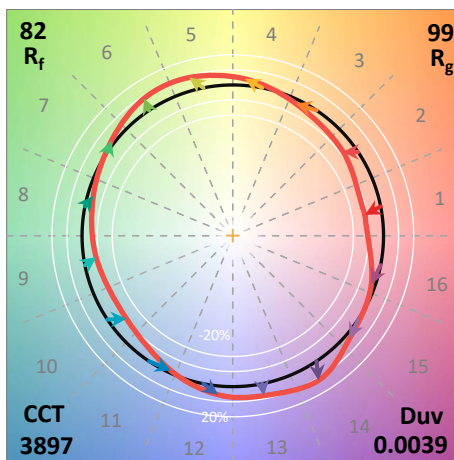
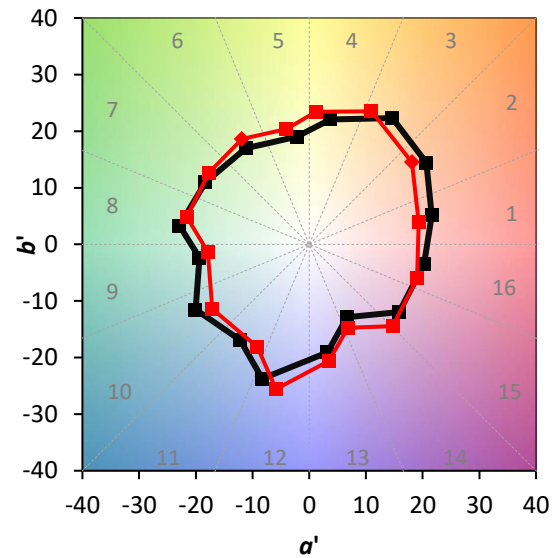
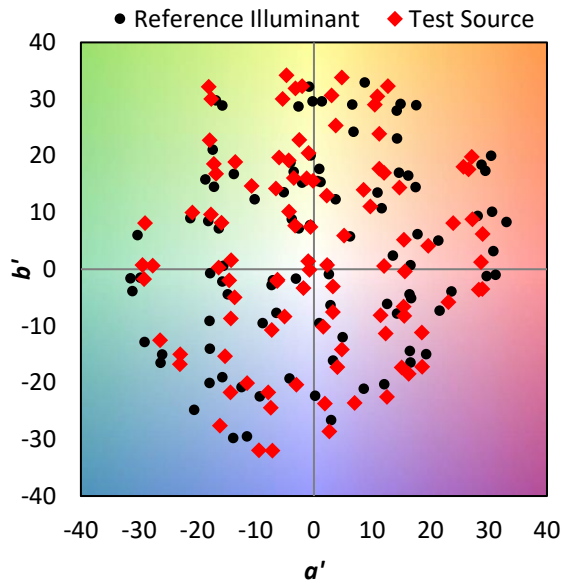
TM-30-18

### Summary

$R_f = 81.8$   
 $R_g = 98.6$   
 $CIE R_a = 80.2$   
 $R_9 = 6.7$

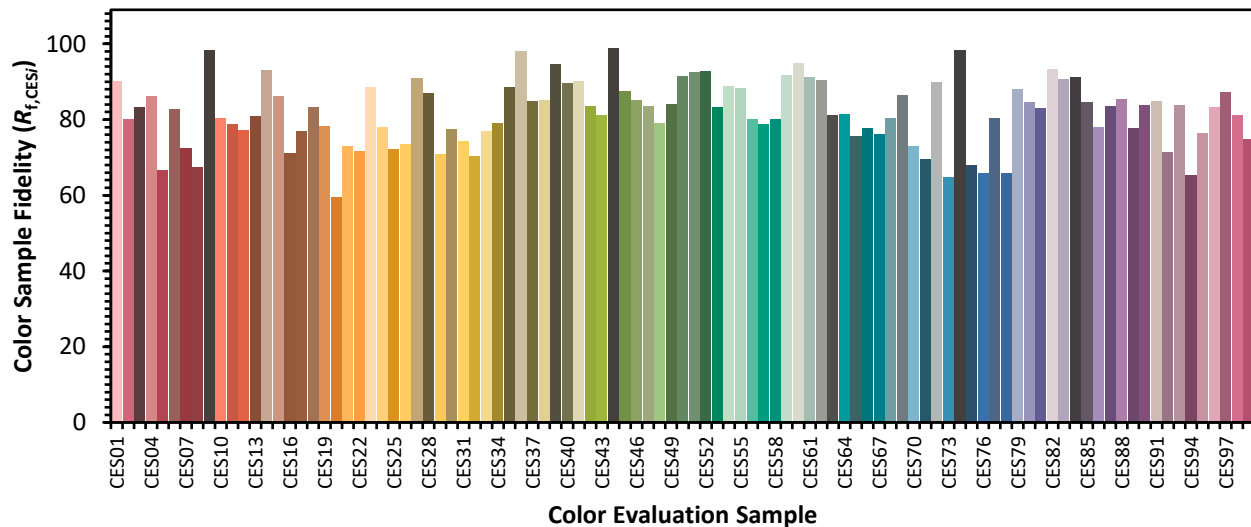


### Color Vector Graphics

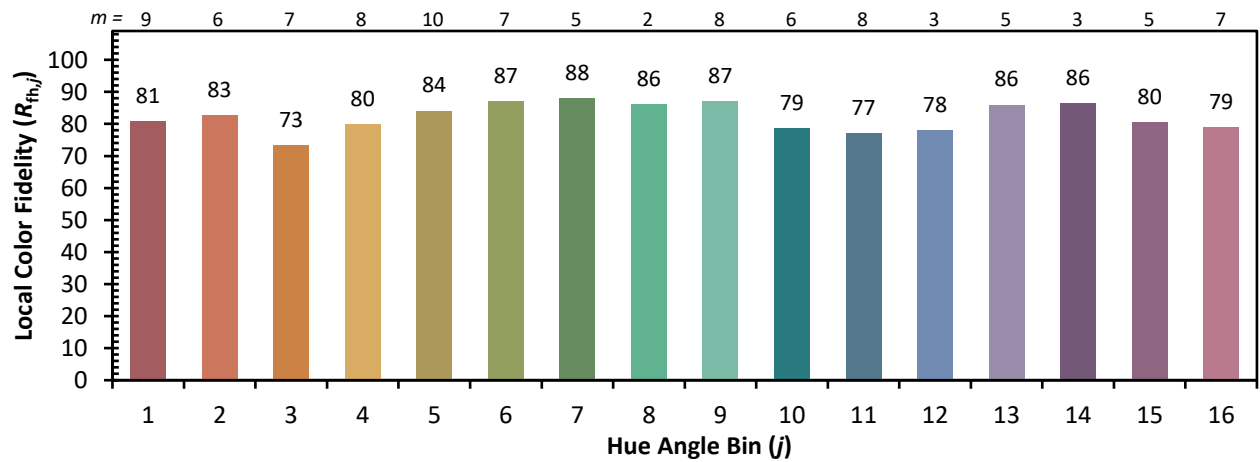
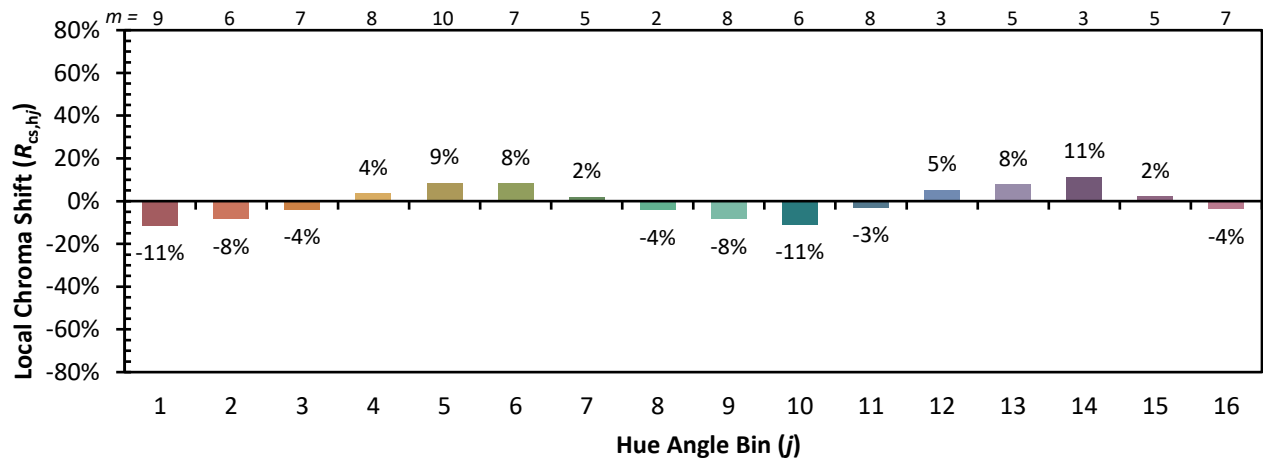


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

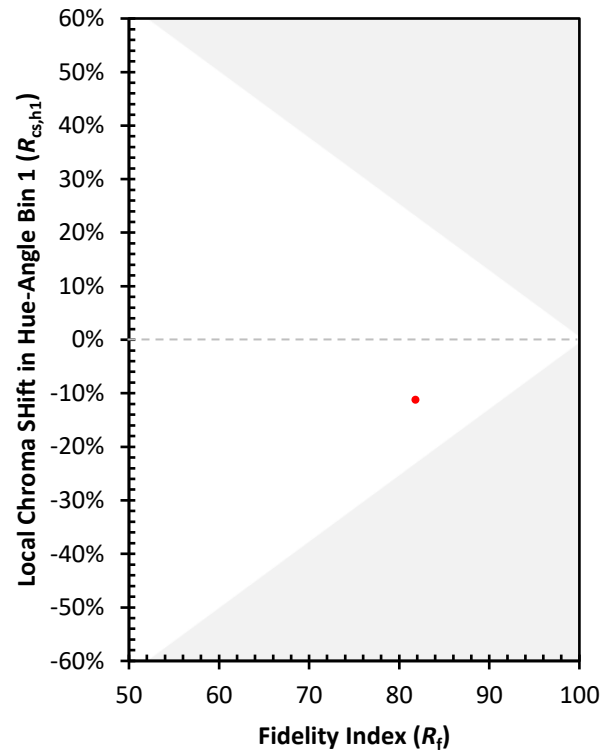
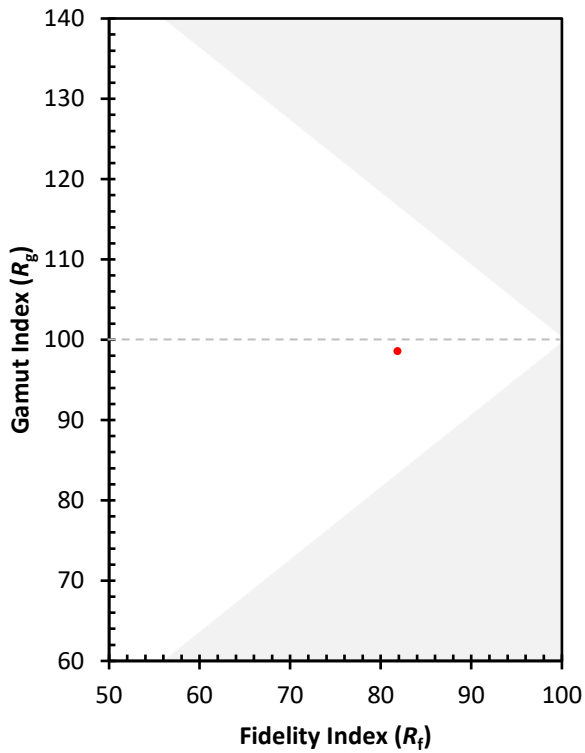
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 73 | CES51 = 93 | CES76 = 66 |
| CES02 = 61 | CES27 = 91 | CES52 = 93 | CES77 = 80 |
| CES03 = 31 | CES28 = 87 | CES53 = 83 | CES78 = 66 |
| CES04 = 69 | CES29 = 71 | CES54 = 89 | CES79 = 88 |
| CES05 = 48 | CES30 = 77 | CES55 = 88 | CES80 = 85 |
| CES06 = 50 | CES31 = 74 | CES56 = 80 | CES81 = 83 |
| CES07 = 41 | CES32 = 70 | CES57 = 79 | CES82 = 93 |
| CES08 = 40 | CES33 = 77 | CES58 = 80 | CES83 = 91 |
| CES09 = 29 | CES34 = 79 | CES59 = 92 | CES84 = 91 |
| CES10 = 74 | CES35 = 88 | CES60 = 95 | CES85 = 84 |
| CES11 = 57 | CES36 = 98 | CES61 = 91 | CES86 = 78 |
| CES12 = 63 | CES37 = 85 | CES62 = 90 | CES87 = 84 |
| CES13 = 42 | CES38 = 85 | CES63 = 81 | CES88 = 85 |
| CES14 = 74 | CES39 = 95 | CES64 = 81 | CES89 = 78 |
| CES15 = 71 | CES40 = 90 | CES65 = 76 | CES90 = 84 |
| CES16 = 47 | CES41 = 90 | CES66 = 78 | CES91 = 85 |
| CES17 = 49 | CES42 = 84 | CES67 = 76 | CES92 = 71 |
| CES18 = 56 | CES43 = 81 | CES68 = 80 | CES93 = 84 |
| CES19 = 71 | CES44 = 99 | CES69 = 86 | CES94 = 65 |
| CES20 = 65 | CES45 = 87 | CES70 = 73 | CES95 = 77 |
| CES21 = 86 | CES46 = 85 | CES71 = 70 | CES96 = 83 |
| CES22 = 78 | CES47 = 84 | CES72 = 90 | CES97 = 87 |
| CES23 = 91 | CES48 = 79 | CES73 = 65 | CES98 = 81 |
| CES24 = 90 | CES49 = 84 | CES74 = 98 | CES99 = 75 |
| CES25 = 71 | CES50 = 91 | CES75 = 68 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)