

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: P1048505

Luminaire Tested: **GALN-SA5A-827-U-T4BC**

Issue Date: 07/10/2025

**Test Information**

Test Method: LM-79-08  
Report Number: P1048505  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 07/10/2025  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: MCGRAW-EDISON  
Catalog Number: GALN-SA5A-827-U-T4BC  
Description: GALLEON II AREA AND ROADWAY LUMINAIRE 615mA 5xLight Square PACKAGE  
80CRI 2700K FIXTURE w/ TYPE IV ANGLED BACKLIGHT CONTROL  
Light Source: (70) 2700K CCT, 80 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 15509.3 lumens  
Efficiency: N/A  
Efficacy: 113.5 lumens/watt  
Luminous Opening: Rectangular (W 1.5' x L: 1' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B0 - U0 - G4

Input Watts (W): 136.6  
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

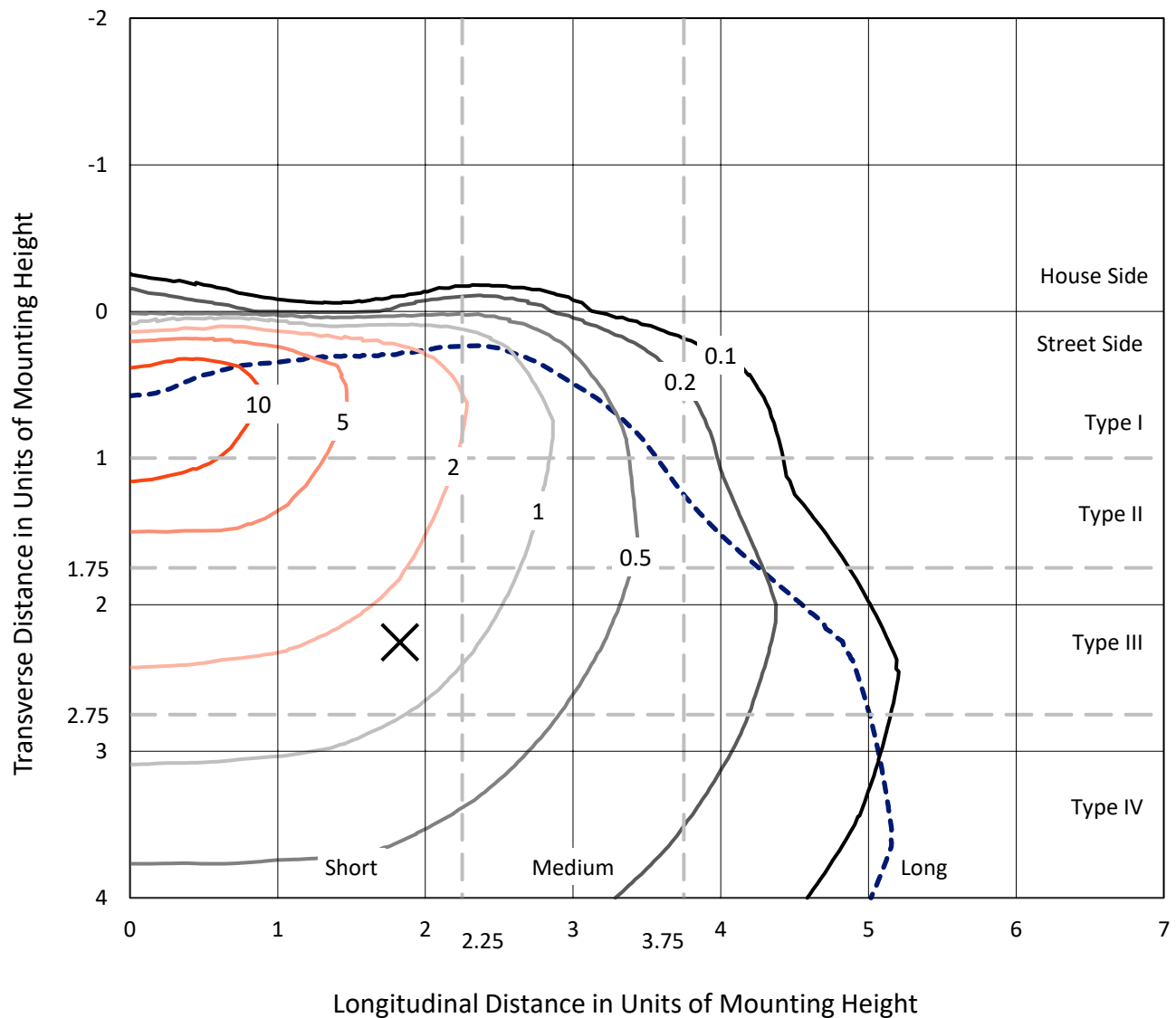


REPORT NUMBER: P1048505

CATALOG NUMBER: GALN-SA5A-827-U-T4BC

## Iso-Footcandle Lines of Horizontal Illumination

× Max cd  
 - - - 1/2 Max cd

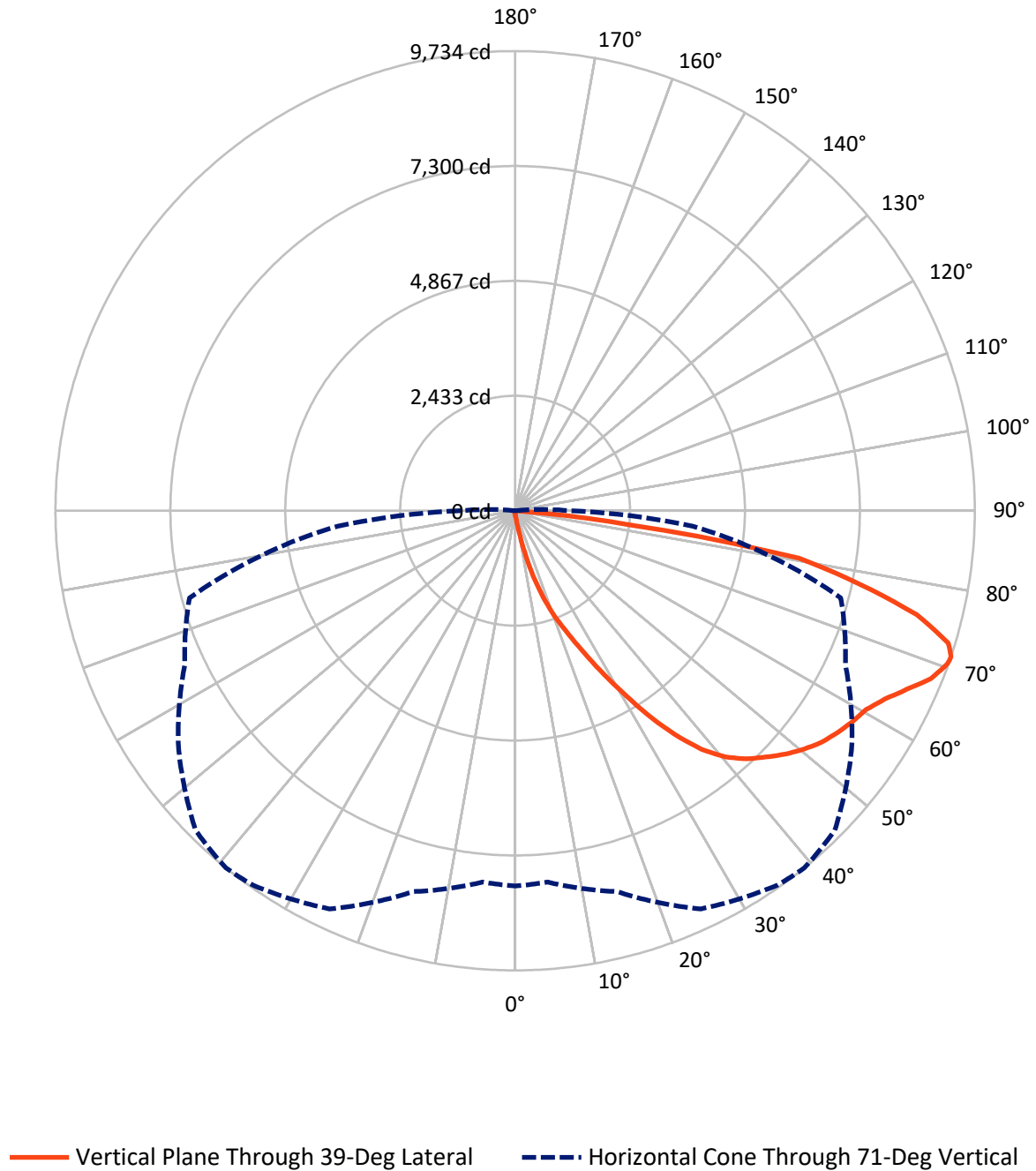


Based on 15 foot mounting height. Maximum calculated value = 15.9 fc  
 Type IV - Short - N/A

REPORT NUMBER: P1048505

CATALOG NUMBER: GALN-SA5A-827-U-T4BC

## Luminous Intensity Polar Plot



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CATALOG NUMBER: GALN-SA5A-827-U-T4BC

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 55.1     | 0.0    | 55.1    |
|                    | % Fixture | 0.4      | 0.0    | 0.4     |
| <b>Street Side</b> | Lumens    | 15454.3  | 0.0    | 15454.3 |
|                    | % Fixture | 99.6     | 0.0    | 99.6    |
| <b>Total</b>       | Lumens    | 15509.3  | 0.0    | 15509.3 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 13.0    | 0.1       |
| 10°-20°   | 165.8   | 1.1       |
| 20°-30°   | 590.3   | 3.8       |
| 30°-40°   | 1422.7  | 9.2       |
| 40°-50°   | 2381.1  | 15.4      |
| 50°-60°   | 3058.2  | 19.7      |
| 60°-70°   | 3870.2  | 25.0      |
| 70°-80°   | 3450.4  | 22.2      |
| 80°-90°   | 557.7   | 3.6       |
| 90°-100°  | 0.0     | 0.0       |
| 100°-110° | 0.0     | 0.0       |
| 110°-120° | 0.0     | 0.0       |
| 120°-130° | 0.0     | 0.0       |
| 130°-140° | 0.0     | 0.0       |
| 140°-150° | 0.0     | 0.0       |
| 150°-160° | 0.0     | 0.0       |
| 160°-170° | 0.0     | 0.0       |
| 170°-180° | 0.0     | 0.0       |
| 0°-90°    | 15509.3 | 100.0     |
| 0°-180°   | 15509.3 | 100.0     |



REPORT NUMBER: P1048505

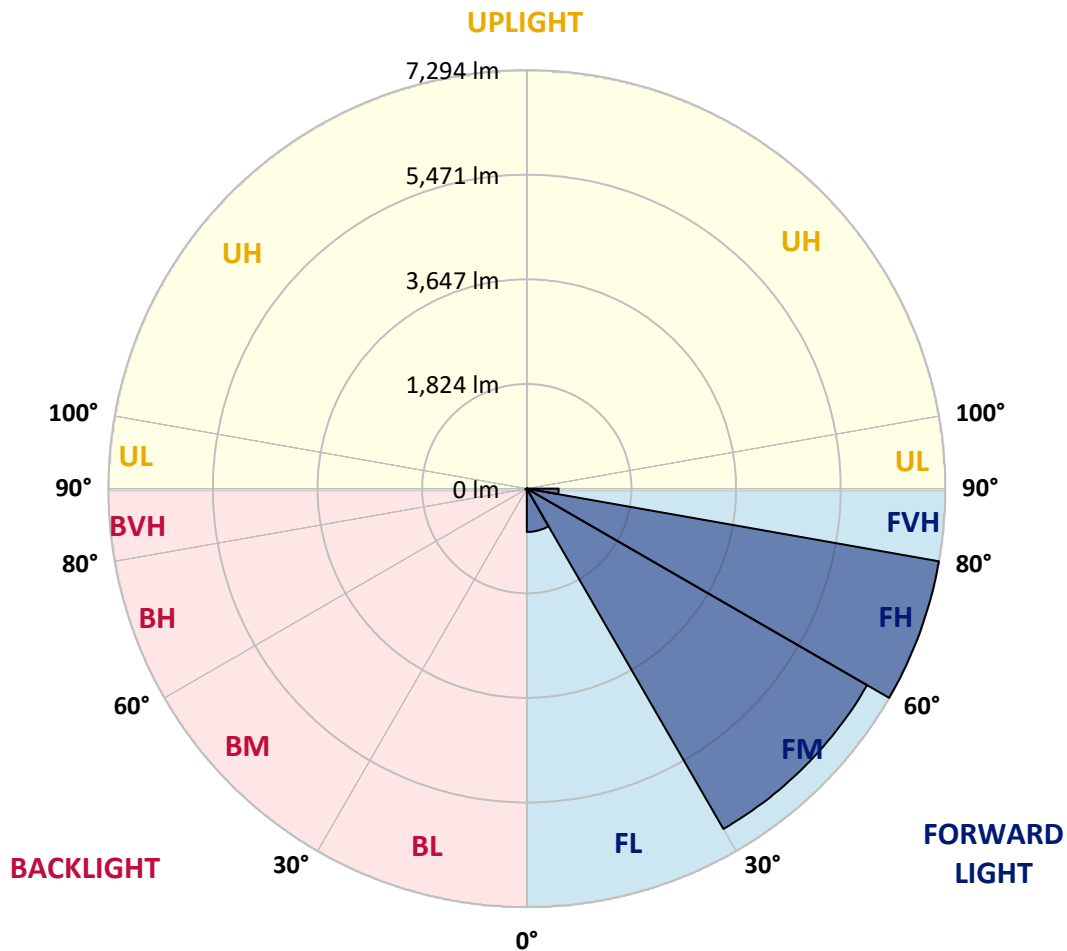
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**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 755.7  | 4.9       |                         |      |         |
| FM   | (30°-60°)   | 6849.3 | 44.2      |                         |      |         |
| FH   | (60°-80°)   | 7294.1 | 47.0      |                         |      | G3/7500 |
| FVH  | (80°-90°)   | 555.2  | 3.6       |                         |      | G4/750  |
| BL   | (0°-30°)    | 13.3   | 0.1       | B0/110                  |      |         |
| BM   | (30°-60°)   | 12.7   | 0.1       | B0/220                  |      |         |
| BH   | (60°-80°)   | 26.5   | 0.2       | B0/110                  |      | G0/110  |
| BVH  | (80°-90°)   | 2.5    | 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 IV Short





REPORT NUMBER: P1048505

CATALOG NUMBER: GALN-SA5A-827-U-T4BC

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 39°    | 45°    | 55°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 85.0   | 85.0   | 85.0   | 85.0   | 85.0   | 85.0   | 85.0   | 85.0   | 85.0   | 85.0   | 85.0   |
| 2.5°  | 97.6   | 97.6   | 97.6   | 94.5   | 94.5   | 93.4   | 92.4   | 92.4   | 90.3   | 89.2   | 87.1   |
| 5°    | 148.0  | 144.9  | 137.5  | 133.3  | 124.9  | 119.7  | 114.4  | 107.1  | 99.7   | 94.5   | 88.2   |
| 7.5°  | 334.9  | 342.3  | 318.1  | 273.0  | 226.8  | 206.8  | 173.2  | 139.6  | 115.5  | 99.7   | 89.2   |
| 10°   | 853.6  | 849.4  | 767.5  | 677.2  | 522.9  | 460.9  | 361.2  | 227.8  | 149.1  | 109.2  | 90.3   |
| 12.5° | 1452.0 | 1447.8 | 1351.2 | 1228.4 | 1024.7 | 895.6  | 706.6  | 425.2  | 214.2  | 123.9  | 90.3   |
| 15°   | 1954.9 | 1938.1 | 1907.7 | 1785.9 | 1547.6 | 1439.4 | 1189.5 | 751.7  | 346.5  | 149.1  | 92.4   |
| 17.5° | 2287.7 | 2273.0 | 2244.7 | 2200.6 | 2049.4 | 1921.3 | 1720.8 | 1181.1 | 560.6  | 193.2  | 96.6   |
| 20°   | 2593.3 | 2582.8 | 2559.7 | 2551.3 | 2453.6 | 2385.4 | 2219.5 | 1674.6 | 873.5  | 262.5  | 102.9  |
| 22.5° | 3013.2 | 2991.2 | 3000.6 | 2950.2 | 2854.7 | 2772.8 | 2671.0 | 2191.1 | 1255.7 | 378.0  | 114.4  |
| 25°   | 3527.7 | 3517.2 | 3490.9 | 3455.2 | 3322.9 | 3251.5 | 3095.1 | 2678.3 | 1683.0 | 529.2  | 127.0  |
| 27.5° | 4149.2 | 4137.7 | 4131.4 | 4049.5 | 3897.2 | 3819.5 | 3601.2 | 3138.2 | 2163.8 | 741.2  | 143.8  |
| 30°   | 4865.2 | 4870.5 | 4829.6 | 4724.6 | 4547.1 | 4437.9 | 4213.3 | 3620.1 | 2656.3 | 990.1  | 161.7  |
| 32.5° | 5606.5 | 5596.0 | 5533.0 | 5409.1 | 5250.6 | 5148.7 | 4863.1 | 4148.2 | 3172.8 | 1318.7 | 182.7  |
| 35°   | 6405.5 | 6385.5 | 6219.6 | 6077.9 | 5942.4 | 5814.4 | 5554.0 | 4761.3 | 3689.4 | 1687.2 | 211.0  |
| 37.5° | 7211.8 | 7118.3 | 6785.5 | 6606.0 | 6512.5 | 6407.6 | 6165.0 | 5415.4 | 4202.8 | 2098.8 | 245.7  |
| 40°   | 7820.7 | 7748.3 | 7353.5 | 7022.8 | 6948.3 | 6859.0 | 6678.4 | 5980.2 | 4748.7 | 2540.8 | 287.7  |
| 42.5° | 8157.7 | 8117.8 | 7763.0 | 7436.5 | 7261.1 | 7182.4 | 7028.0 | 6473.7 | 5288.4 | 3029.0 | 348.6  |
| 45°   | 8301.6 | 8239.6 | 8002.4 | 7850.1 | 7570.8 | 7440.7 | 7256.9 | 6846.4 | 5852.2 | 3583.3 | 433.6  |
| 47.5° | 8257.5 | 8221.8 | 8051.7 | 8107.3 | 7904.7 | 7702.1 | 7432.3 | 7132.0 | 6334.1 | 4219.6 | 550.1  |
| 50°   | 7980.3 | 7949.9 | 7897.4 | 8198.7 | 8173.5 | 7934.1 | 7659.0 | 7357.7 | 6727.8 | 4875.7 | 730.7  |
| 52.5° | 7453.3 | 7440.7 | 7575.0 | 8127.3 | 8325.7 | 8138.8 | 7877.4 | 7557.2 | 7095.2 | 5561.3 | 989.0  |
| 55°   | 6774.0 | 6825.4 | 7209.7 | 8016.0 | 8403.4 | 8290.0 | 8070.6 | 7744.1 | 7390.3 | 6174.5 | 1370.1 |
| 57.5° | 6494.7 | 6508.3 | 6988.2 | 7937.3 | 8438.1 | 8423.4 | 8258.5 | 7922.6 | 7661.1 | 6664.8 | 1951.8 |
| 60°   | 6821.2 | 6800.2 | 7053.2 | 7997.1 | 8507.4 | 8543.1 | 8425.5 | 8088.4 | 7896.3 | 7085.8 | 2726.6 |
| 62.5° | 7411.3 | 7399.7 | 7480.6 | 8252.2 | 8710.0 | 8782.4 | 8657.5 | 8208.1 | 8104.2 | 7363.0 | 3610.6 |
| 65°   | 7938.3 | 7914.2 | 8064.3 | 8704.7 | 9065.9 | 9117.4 | 9008.2 | 8412.9 | 8195.5 | 7564.5 | 4441.1 |
| 67.5° | 8166.1 | 8160.9 | 8402.4 | 9135.2 | 9439.7 | 9495.3 | 9399.8 | 8695.3 | 8174.5 | 7628.6 | 4807.5 |
| 70°   | 8062.2 | 8042.3 | 8428.6 | 9317.9 | 9650.7 | 9713.7 | 9621.3 | 8800.3 | 7946.7 | 7426.0 | 4264.7 |
| 71°   | 7947.8 | 7894.2 | 8349.9 | 9305.3 | 9680.1 | 9733.6 | 9572.0 | 8704.7 | 7717.8 | 7138.3 | 3772.3 |
| 72.5° | 7592.9 | 7602.3 | 8133.6 | 9174.0 | 9609.8 | 9594.0 | 9292.7 | 8362.5 | 7441.7 | 6485.2 | 3030.0 |
| 75°   | 6719.4 | 6775.0 | 7433.3 | 8622.8 | 8981.9 | 8781.4 | 8320.5 | 7708.4 | 6887.4 | 4650.0 | 2104.0 |
| 77.5° | 5491.0 | 5573.9 | 6297.3 | 7562.4 | 7460.6 | 7440.7 | 7421.8 | 6791.8 | 5881.6 | 2497.7 | 1463.6 |
| 80°   | 2621.6 | 2801.1 | 3798.5 | 5398.6 | 5864.8 | 6090.5 | 5948.7 | 5473.1 | 4548.2 | 1189.5 | 874.6  |
| 82.5° | 171.1  | 169.0  | 239.4  | 453.6  | 1911.9 | 2471.5 | 3926.6 | 3911.9 | 3170.7 | 579.5  | 357.0  |
| 85°   | 80.8   | 82.9   | 91.3   | 103.9  | 120.7  | 132.3  | 182.7  | 1070.9 | 1517.1 | 276.1  | 77.7   |
| 87.5° | 47.2   | 48.3   | 56.7   | 72.4   | 94.5   | 105.0  | 124.9  | 160.6  | 197.4  | 152.2  | 16.8   |
| 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: P1048505

CATALOG NUMBER: GALN-SA5A-827-U-T4BC

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°  | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|-------|--------|------|------|------|------|------|------|------|------|------|------|
| 0°    | 85.0   | 85.0 | 85.0 | 85.0 | 85.0 | 85.0 | 85.0 | 85.0 | 85.0 | 85.0 | 85.0 |
| 2.5°  | 86.1   | 85.0 | 81.9 | 78.7 | 75.6 | 73.5 | 72.4 | 73.5 | 73.5 | 74.5 | 74.5 |
| 5°    | 86.1   | 82.9 | 77.7 | 71.4 | 67.2 | 63.0 | 60.9 | 59.8 | 60.9 | 60.9 | 60.9 |
| 7.5°  | 85.0   | 79.8 | 72.4 | 65.1 | 59.8 | 54.6 | 52.5 | 51.4 | 51.4 | 52.5 | 52.5 |
| 10°   | 82.9   | 77.7 | 68.2 | 59.8 | 53.5 | 47.2 | 44.1 | 40.9 | 40.9 | 40.9 | 42.0 |
| 12.5° | 81.9   | 74.5 | 63.0 | 54.6 | 46.2 | 38.8 | 32.5 | 29.4 | 30.4 | 30.4 | 30.4 |
| 15°   | 79.8   | 71.4 | 59.8 | 49.3 | 38.8 | 29.4 | 24.1 | 21.0 | 22.0 | 23.1 | 22.0 |
| 17.5° | 79.8   | 70.3 | 55.6 | 43.0 | 30.4 | 22.0 | 17.8 | 15.7 | 15.7 | 16.8 | 16.8 |
| 20°   | 79.8   | 68.2 | 52.5 | 36.7 | 23.1 | 16.8 | 12.6 | 11.5 | 11.5 | 13.6 | 14.7 |
| 22.5° | 81.9   | 68.2 | 48.3 | 30.4 | 18.9 | 12.6 | 9.4  | 8.4  | 9.4  | 11.5 | 12.6 |
| 25°   | 85.0   | 67.2 | 44.1 | 27.3 | 15.7 | 9.4  | 7.3  | 5.2  | 6.3  | 8.4  | 9.4  |
| 27.5° | 88.2   | 66.1 | 39.9 | 24.1 | 12.6 | 7.3  | 5.2  | 4.2  | 3.1  | 4.2  | 4.2  |
| 30°   | 91.3   | 66.1 | 35.7 | 19.9 | 10.5 | 5.2  | 3.1  | 2.1  | 1.0  | 0.0  | 0.0  |
| 32.5° | 93.4   | 64.0 | 32.5 | 15.7 | 8.4  | 4.2  | 2.1  | 1.0  | 0.0  | 0.0  | 0.0  |
| 35°   | 95.5   | 61.9 | 28.3 | 12.6 | 6.3  | 3.1  | 1.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 37.5° | 97.6   | 58.8 | 24.1 | 10.5 | 5.2  | 2.1  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 40°   | 99.7   | 54.6 | 19.9 | 9.4  | 3.1  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 42.5° | 101.8  | 51.4 | 16.8 | 7.3  | 2.1  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 45°   | 107.1  | 49.3 | 13.6 | 6.3  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 47.5° | 116.5  | 47.2 | 12.6 | 4.2  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 50°   | 130.2  | 45.1 | 11.5 | 3.1  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 52.5° | 149.1  | 44.1 | 10.5 | 2.1  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 55°   | 182.7  | 43.0 | 9.4  | 2.1  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 57.5° | 240.4  | 42.0 | 9.4  | 2.1  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 60°   | 368.5  | 39.9 | 9.4  | 2.1  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 62.5° | 658.3  | 38.8 | 8.4  | 2.1  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 65°   | 1147.5 | 39.9 | 8.4  | 2.1  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 67.5° | 1645.2 | 42.0 | 7.3  | 3.1  | 1.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 70°   | 1407.9 | 36.7 | 7.3  | 4.2  | 2.1  | 1.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 71°   | 1147.5 | 32.5 | 7.3  | 4.2  | 2.1  | 1.0  | 1.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 72.5° | 738.1  | 25.2 | 6.3  | 4.2  | 2.1  | 2.1  | 1.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 75°   | 311.8  | 21.0 | 6.3  | 4.2  | 3.1  | 2.1  | 2.1  | 1.0  | 0.0  | 0.0  | 0.0  |
| 77.5° | 133.3  | 15.7 | 6.3  | 5.2  | 4.2  | 3.1  | 3.1  | 2.1  | 1.0  | 0.0  | 0.0  |
| 80°   | 50.4   | 12.6 | 7.3  | 6.3  | 5.2  | 5.2  | 4.2  | 2.1  | 1.0  | 0.0  | 0.0  |
| 82.5° | 23.1   | 10.5 | 7.3  | 6.3  | 6.3  | 5.2  | 4.2  | 3.1  | 2.1  | 0.0  | 0.0  |
| 85°   | 14.7   | 9.4  | 7.3  | 6.3  | 6.3  | 5.2  | 4.2  | 3.1  | 2.1  | 0.0  | 0.0  |
| 87.5° | 11.5   | 9.4  | 7.3  | 7.3  | 6.3  | 6.3  | 4.2  | 3.1  | 1.0  | 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  |

Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269



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

Report Prepared for

Cooper Lighting Solutions

McGraw-Edison

Report Number: SP1-2407-184-8

Test Date: 10/10/2024

Luminaire Tested: GSS-SB1A-827-U-5WQ

Data in this report applies to families of products including GSS-SB1A-827-U-5WQ

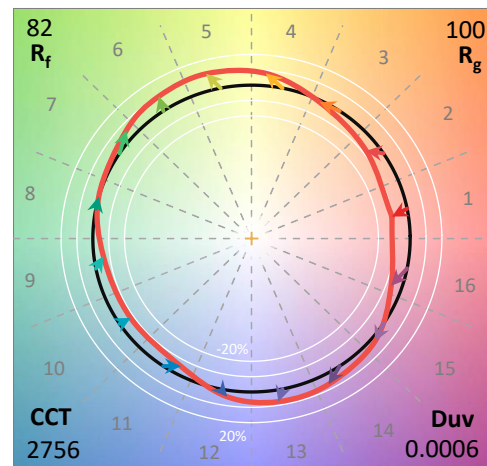
### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2407-184-8  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry:  $4\pi$   
 Issue Date: 10/15/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: McGraw-Edison  
 Catalog Number: **GSS-SB1A-827-U-5WQ**  
 Description: GALLEON II SITE SLIM 1SQ 350MA 5WQ HIGH DENSITY LIGHTSQUARE WITH 80 CRI  
 2700K CCT 26 LEDS

### Spectral Parameters

CCT (K): 2756  
 CIE  $u'$ : 0.2599  
 CIE  $v'$ : 0.5271  
 Duv: 0.0006  
 CIE x: 0.4563  
 CIE y: 0.4112  
 CIE z: 0.1325  
 Peak Wavelength (nm): 609  
 Dominant Wavelength (nm): 583  
 Purity: 60.41121  
 R<sub>f</sub>: 82.2  
 R<sub>g</sub>: 99.9

CRI (Ra): 82.9  
 R1: 81.6  
 R2: 88.8  
 R3: 96.0  
 R4: 83.4  
 R5: 81.4  
 R6: 87.0  
 R7: 84.0  
 R8: 60.8  
 R9: 10.8  
 R10: 74.8  
 R11: 84.3  
 R12: 72.1  
 R13: 82.9  
 R14: 97.3  
 R15: 73.7



### Test Conditions

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

REPORT NUMBER: SP1-2407-184-8

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



REPORT NUMBER: SP1-2407-184-8

### Photopic Flux vs. Wavelength

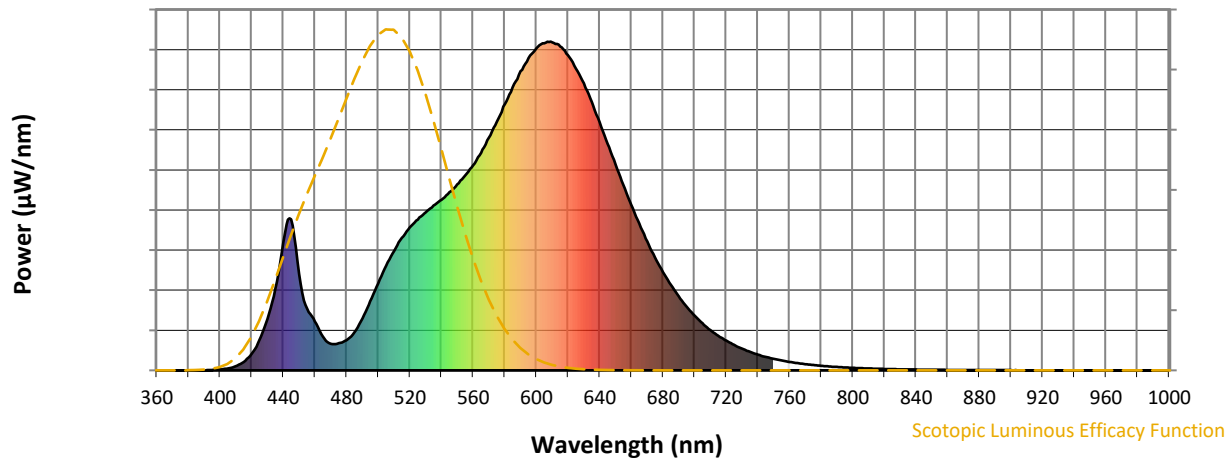


### Photopic Lumens: NR

| λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) |
|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|
| 360       | 0                           | NR               | 490       | 158                         | NR               | 620       | 959                         | NR               | 750       | 35                          | NR               | 880       | 1                           | NR               |
| 365       | 0                           | NR               | 495       | 211                         | NR               | 625       | 918                         | NR               | 755       | 30                          | NR               | 885       | 1                           | NR               |
| 370       | 0                           | NR               | 500       | 264                         | NR               | 630       | 873                         | NR               | 760       | 26                          | NR               | 890       | 1                           | NR               |
| 375       | 0                           | NR               | 505       | 318                         | NR               | 635       | 816                         | NR               | 765       | 22                          | NR               | 895       | 1                           | NR               |
| 380       | 0                           | NR               | 510       | 363                         | NR               | 640       | 755                         | NR               | 770       | 19                          | NR               | 900       | 1                           | NR               |
| 385       | 0                           | NR               | 515       | 403                         | NR               | 645       | 689                         | NR               | 775       | 16                          | NR               | 905       | 1                           | NR               |
| 390       | 0                           | NR               | 520       | 435                         | NR               | 650       | 626                         | NR               | 780       | 14                          | NR               | 910       | 0                           | NR               |
| 395       | 1                           | NR               | 525       | 459                         | NR               | 655       | 564                         | NR               | 785       | 12                          | NR               | 915       | 0                           | NR               |
| 400       | 3                           | NR               | 530       | 481                         | NR               | 660       | 503                         | NR               | 790       | 10                          | NR               | 920       | 0                           | NR               |
| 405       | 6                           | NR               | 535       | 501                         | NR               | 665       | 447                         | NR               | 795       | 9                           | NR               | 925       | 0                           | NR               |
| 410       | 13                          | NR               | 540       | 519                         | NR               | 670       | 392                         | NR               | 800       | 8                           | NR               | 930       | 0                           | NR               |
| 415       | 26                          | NR               | 545       | 542                         | NR               | 675       | 343                         | NR               | 805       | 7                           | NR               | 935       | 0                           | NR               |
| 420       | 51                          | NR               | 550       | 565                         | NR               | 680       | 299                         | NR               | 810       | 6                           | NR               | 940       | 0                           | NR               |
| 425       | 93                          | NR               | 555       | 593                         | NR               | 685       | 260                         | NR               | 815       | 5                           | NR               | 945       | 0                           | NR               |
| 430       | 156                         | NR               | 560       | 624                         | NR               | 690       | 225                         | NR               | 820       | 4                           | NR               | 950       | 0                           | NR               |
| 435       | 250                         | NR               | 565       | 662                         | NR               | 695       | 194                         | NR               | 825       | 4                           | NR               | 955       | 0                           | NR               |
| 440       | 391                         | NR               | 570       | 707                         | NR               | 700       | 166                         | NR               | 830       | 3                           | NR               | 960       | 0                           | NR               |
| 445       | 460                         | NR               | 575       | 756                         | NR               | 705       | 143                         | NR               | 835       | 3                           | NR               | 965       | 0                           | NR               |
| 450       | 293                         | NR               | 580       | 810                         | NR               | 710       | 122                         | NR               | 840       | 2                           | NR               | 970       | 0                           | NR               |
| 455       | 188                         | NR               | 585       | 860                         | NR               | 715       | 105                         | NR               | 845       | 2                           | NR               | 975       | 0                           | NR               |
| 460       | 149                         | NR               | 590       | 910                         | NR               | 720       | 90                          | NR               | 850       | 2                           | NR               | 980       | 0                           | NR               |
| 465       | 103                         | NR               | 595       | 950                         | NR               | 725       | 77                          | NR               | 855       | 2                           | NR               | 985       | 0                           | NR               |
| 470       | 80                          | NR               | 600       | 980                         | NR               | 730       | 66                          | NR               | 860       | 1                           | NR               | 990       | 0                           | NR               |
| 475       | 82                          | NR               | 605       | 995                         | NR               | 735       | 56                          | NR               | 865       | 1                           | NR               | 995       | 0                           | NR               |
| 480       | 92                          | NR               | 610       | 998                         | NR               | 740       | 48                          | NR               | 870       | 1                           | NR               | 1000      | 0                           | NR               |
| 485       | 116                         | NR               | 615       | 985                         | NR               | 745       | 41                          | NR               | 875       | 1                           | NR               |           |                             |                  |

REPORT NUMBER: SP1-2407-184-8

### Scotopic Flux vs. Wavelength



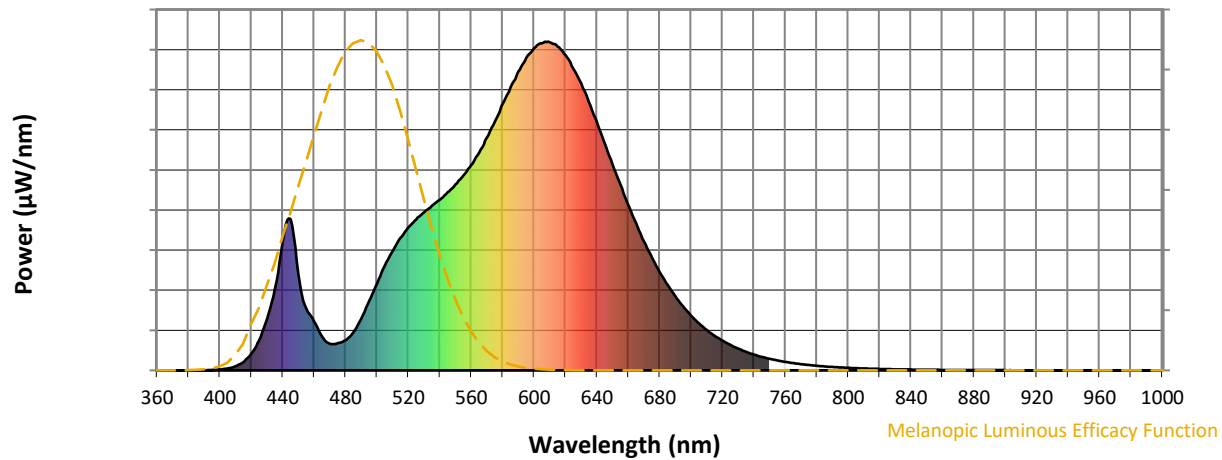
Scotopic Lumens: NR

S/P: 1.2

| λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) |
|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|
| 360       | 0                           | NR               | 490       | 158                         | NR               | 620       | 959                         | NR               | 750       | 35                          | NR               | 880       | 1                           | NR               |
| 365       | 0                           | NR               | 495       | 211                         | NR               | 625       | 918                         | NR               | 755       | 30                          | NR               | 885       | 1                           | NR               |
| 370       | 0                           | NR               | 500       | 264                         | NR               | 630       | 873                         | NR               | 760       | 26                          | NR               | 890       | 1                           | NR               |
| 375       | 0                           | NR               | 505       | 318                         | NR               | 635       | 816                         | NR               | 765       | 22                          | NR               | 895       | 1                           | NR               |
| 380       | 0                           | NR               | 510       | 363                         | NR               | 640       | 755                         | NR               | 770       | 19                          | NR               | 900       | 1                           | NR               |
| 385       | 0                           | NR               | 515       | 403                         | NR               | 645       | 689                         | NR               | 775       | 16                          | NR               | 905       | 1                           | NR               |
| 390       | 0                           | NR               | 520       | 435                         | NR               | 650       | 626                         | NR               | 780       | 14                          | NR               | 910       | 0                           | NR               |
| 395       | 1                           | NR               | 525       | 459                         | NR               | 655       | 564                         | NR               | 785       | 12                          | NR               | 915       | 0                           | NR               |
| 400       | 3                           | NR               | 530       | 481                         | NR               | 660       | 503                         | NR               | 790       | 10                          | NR               | 920       | 0                           | NR               |
| 405       | 6                           | NR               | 535       | 501                         | NR               | 665       | 447                         | NR               | 795       | 9                           | NR               | 925       | 0                           | NR               |
| 410       | 13                          | NR               | 540       | 519                         | NR               | 670       | 392                         | NR               | 800       | 8                           | NR               | 930       | 0                           | NR               |
| 415       | 26                          | NR               | 545       | 542                         | NR               | 675       | 343                         | NR               | 805       | 7                           | NR               | 935       | 0                           | NR               |
| 420       | 51                          | NR               | 550       | 565                         | NR               | 680       | 299                         | NR               | 810       | 6                           | NR               | 940       | 0                           | NR               |
| 425       | 93                          | NR               | 555       | 593                         | NR               | 685       | 260                         | NR               | 815       | 5                           | NR               | 945       | 0                           | NR               |
| 430       | 156                         | NR               | 560       | 624                         | NR               | 690       | 225                         | NR               | 820       | 4                           | NR               | 950       | 0                           | NR               |
| 435       | 250                         | NR               | 565       | 662                         | NR               | 695       | 194                         | NR               | 825       | 4                           | NR               | 955       | 0                           | NR               |
| 440       | 391                         | NR               | 570       | 707                         | NR               | 700       | 166                         | NR               | 830       | 3                           | NR               | 960       | 0                           | NR               |
| 445       | 460                         | NR               | 575       | 756                         | NR               | 705       | 143                         | NR               | 835       | 3                           | NR               | 965       | 0                           | NR               |
| 450       | 293                         | NR               | 580       | 810                         | NR               | 710       | 122                         | NR               | 840       | 2                           | NR               | 970       | 0                           | NR               |
| 455       | 188                         | NR               | 585       | 860                         | NR               | 715       | 105                         | NR               | 845       | 2                           | NR               | 975       | 0                           | NR               |
| 460       | 149                         | NR               | 590       | 910                         | NR               | 720       | 90                          | NR               | 850       | 2                           | NR               | 980       | 0                           | NR               |
| 465       | 103                         | NR               | 595       | 950                         | NR               | 725       | 77                          | NR               | 855       | 2                           | NR               | 985       | 0                           | NR               |
| 470       | 80                          | NR               | 600       | 980                         | NR               | 730       | 66                          | NR               | 860       | 1                           | NR               | 990       | 0                           | NR               |
| 475       | 82                          | NR               | 605       | 995                         | NR               | 735       | 56                          | NR               | 865       | 1                           | NR               | 995       | 0                           | NR               |
| 480       | 92                          | NR               | 610       | 998                         | NR               | 740       | 48                          | NR               | 870       | 1                           | NR               | 1000      | 0                           | NR               |
| 485       | 116                         | NR               | 615       | 985                         | NR               | 745       | 41                          | NR               | 875       | 1                           | NR               |           |                             |                  |

REPORT NUMBER: SP1-2407-184-8

### Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 2.16

| $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) |
|-------------------|----------------------------------------|--------------------------------|-------------------|----------------------------------------|--------------------------------|-------------------|----------------------------------------|--------------------------------|-------------------|----------------------------------------|--------------------------------|-------------------|----------------------------------------|--------------------------------|
| 360               | 0                                      | NR                             | 490               | 158                                    | NR                             | 620               | 959                                    | NR                             | 750               | 35                                     | NR                             | 880               | 1                                      | NR                             |
| 365               | 0                                      | NR                             | 495               | 211                                    | NR                             | 625               | 918                                    | NR                             | 755               | 30                                     | NR                             | 885               | 1                                      | NR                             |
| 370               | 0                                      | NR                             | 500               | 264                                    | NR                             | 630               | 873                                    | NR                             | 760               | 26                                     | NR                             | 890               | 1                                      | NR                             |
| 375               | 0                                      | NR                             | 505               | 318                                    | NR                             | 635               | 816                                    | NR                             | 765               | 22                                     | NR                             | 895               | 1                                      | NR                             |
| 380               | 0                                      | NR                             | 510               | 363                                    | NR                             | 640               | 755                                    | NR                             | 770               | 19                                     | NR                             | 900               | 1                                      | NR                             |
| 385               | 0                                      | NR                             | 515               | 403                                    | NR                             | 645               | 689                                    | NR                             | 775               | 16                                     | NR                             | 905               | 1                                      | NR                             |
| 390               | 0                                      | NR                             | 520               | 435                                    | NR                             | 650               | 626                                    | NR                             | 780               | 14                                     | NR                             | 910               | 0                                      | NR                             |
| 395               | 1                                      | NR                             | 525               | 459                                    | NR                             | 655               | 564                                    | NR                             | 785               | 12                                     | NR                             | 915               | 0                                      | NR                             |
| 400               | 3                                      | NR                             | 530               | 481                                    | NR                             | 660               | 503                                    | NR                             | 790               | 10                                     | NR                             | 920               | 0                                      | NR                             |
| 405               | 6                                      | NR                             | 535               | 501                                    | NR                             | 665               | 447                                    | NR                             | 795               | 9                                      | NR                             | 925               | 0                                      | NR                             |
| 410               | 13                                     | NR                             | 540               | 519                                    | NR                             | 670               | 392                                    | NR                             | 800               | 8                                      | NR                             | 930               | 0                                      | NR                             |
| 415               | 26                                     | NR                             | 545               | 542                                    | NR                             | 675               | 343                                    | NR                             | 805               | 7                                      | NR                             | 935               | 0                                      | NR                             |
| 420               | 51                                     | NR                             | 550               | 565                                    | NR                             | 680               | 299                                    | NR                             | 810               | 6                                      | NR                             | 940               | 0                                      | NR                             |
| 425               | 93                                     | NR                             | 555               | 593                                    | NR                             | 685               | 260                                    | NR                             | 815               | 5                                      | NR                             | 945               | 0                                      | NR                             |
| 430               | 156                                    | NR                             | 560               | 624                                    | NR                             | 690               | 225                                    | NR                             | 820               | 4                                      | NR                             | 950               | 0                                      | NR                             |
| 435               | 250                                    | NR                             | 565               | 662                                    | NR                             | 695               | 194                                    | NR                             | 825               | 4                                      | NR                             | 955               | 0                                      | NR                             |
| 440               | 391                                    | NR                             | 570               | 707                                    | NR                             | 700               | 166                                    | NR                             | 830               | 3                                      | NR                             | 960               | 0                                      | NR                             |
| 445               | 460                                    | NR                             | 575               | 756                                    | NR                             | 705               | 143                                    | NR                             | 835               | 3                                      | NR                             | 965               | 0                                      | NR                             |
| 450               | 293                                    | NR                             | 580               | 810                                    | NR                             | 710               | 122                                    | NR                             | 840               | 2                                      | NR                             | 970               | 0                                      | NR                             |
| 455               | 188                                    | NR                             | 585               | 860                                    | NR                             | 715               | 105                                    | NR                             | 845               | 2                                      | NR                             | 975               | 0                                      | NR                             |
| 460               | 149                                    | NR                             | 590               | 910                                    | NR                             | 720               | 90                                     | NR                             | 850               | 2                                      | NR                             | 980               | 0                                      | NR                             |
| 465               | 103                                    | NR                             | 595               | 950                                    | NR                             | 725               | 77                                     | NR                             | 855               | 2                                      | NR                             | 985               | 0                                      | NR                             |
| 470               | 80                                     | NR                             | 600               | 980                                    | NR                             | 730               | 66                                     | NR                             | 860               | 1                                      | NR                             | 990               | 0                                      | NR                             |
| 475               | 82                                     | NR                             | 605               | 995                                    | NR                             | 735               | 56                                     | NR                             | 865               | 1                                      | NR                             | 995               | 0                                      | NR                             |
| 480               | 92                                     | NR                             | 610               | 998                                    | NR                             | 740               | 48                                     | NR                             | 870               | 1                                      | NR                             | 1000              | 0                                      | NR                             |
| 485               | 116                                    | NR                             | 615               | 985                                    | NR                             | 745               | 41                                     | NR                             | 875               | 1                                      | NR                             |                   |                                        |                                |

REPORT NUMBER: SP1-2407-184-8

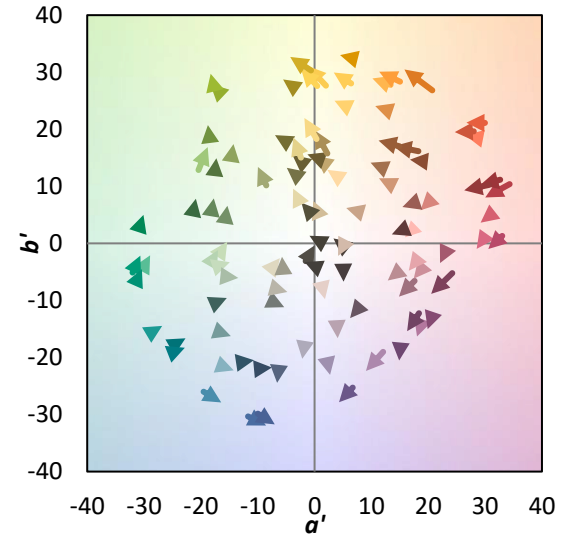
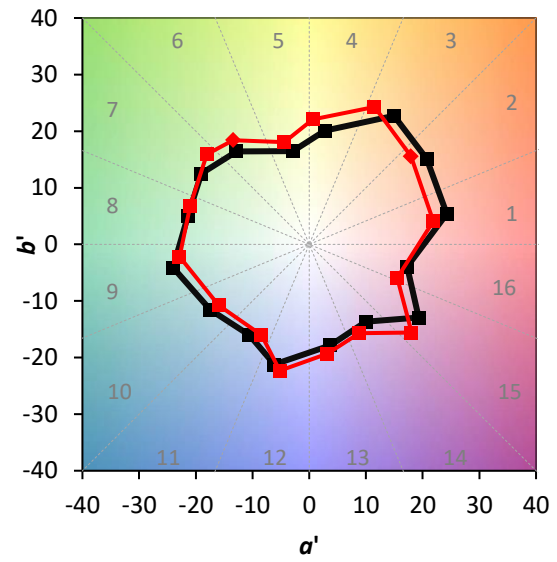
TM-30-18

### Summary

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



### Color Vector Graphics

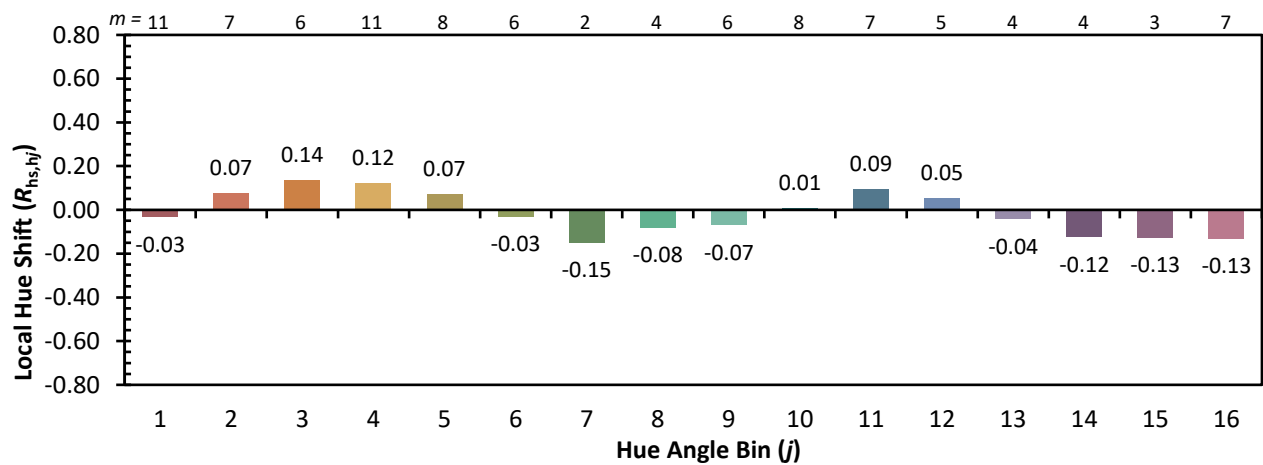


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 76 | CES51 = 89 | CES76 = 75 |
| CES02 = 63 | CES27 = 89 | CES52 = 91 | CES77 = 87 |
| CES03 = 31 | CES28 = 90 | CES53 = 82 | CES78 = 76 |
| CES04 = 71 | CES29 = 68 | CES54 = 88 | CES79 = 91 |
| CES05 = 50 | CES30 = 69 | CES55 = 87 | CES80 = 90 |
| CES06 = 52 | CES31 = 72 | CES56 = 80 | CES81 = 74 |
| CES07 = 43 | CES32 = 71 | CES57 = 78 | CES82 = 95 |
| CES08 = 42 | CES33 = 71 | CES58 = 80 | CES83 = 90 |
| CES09 = 29 | CES34 = 84 | CES59 = 93 | CES84 = 94 |
| CES10 = 77 | CES35 = 92 | CES60 = 96 | CES85 = 83 |
| CES11 = 59 | CES36 = 92 | CES61 = 94 | CES86 = 69 |
| CES12 = 66 | CES37 = 89 | CES62 = 84 | CES87 = 85 |
| CES13 = 44 | CES38 = 75 | CES63 = 79 | CES88 = 84 |
| CES14 = 74 | CES39 = 93 | CES64 = 85 | CES89 = 74 |
| CES15 = 72 | CES40 = 89 | CES65 = 79 | CES90 = 81 |
| CES16 = 48 | CES41 = 85 | CES66 = 83 | CES91 = 96 |
| CES17 = 50 | CES42 = 88 | CES67 = 82 | CES92 = 72 |
| CES18 = 57 | CES43 = 81 | CES68 = 86 | CES93 = 84 |
| CES19 = 73 | CES44 = 98 | CES69 = 92 | CES94 = 63 |
| CES20 = 67 | CES45 = 87 | CES70 = 81 | CES95 = 80 |
| CES21 = 87 | CES46 = 82 | CES71 = 81 | CES96 = 85 |
| CES22 = 79 | CES47 = 76 | CES72 = 93 | CES97 = 87 |
| CES23 = 92 | CES48 = 71 | CES73 = 75 | CES98 = 82 |
| CES24 = 91 | CES49 = 81 | CES74 = 91 | CES99 = 76 |
| CES25 = 72 | CES50 = 88 | CES75 = 79 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)