

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: P1048025

Luminaire Tested: **GALN-SA2A-850-U-T2BC**

Issue Date: 07/10/2025

**Test Information**

Test Method: LM-79-08  
Report Number: P1048025  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 07/10/2025  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: MCGRAW-EDISON  
Catalog Number: GALN-SA2A-850-U-T2BC  
Description: GALLEON II AREA AND ROADWAY LUMINAIRE 615mA 2xLight Square PACKAGE  
80CRI 5000K FIXTURE w/ TYPE II ANGLED BACKLIGHT CONTROL  
Light Source: (28) 5000K CCT, 80 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 6652.2 lumens  
Efficiency: N/A  
Efficacy: 119.2 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 1' x H: 0')  
IES Classification: Type II - Short  
BUG Rating: B0 - U0 - G2

Input Watts (W): 55.8  
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

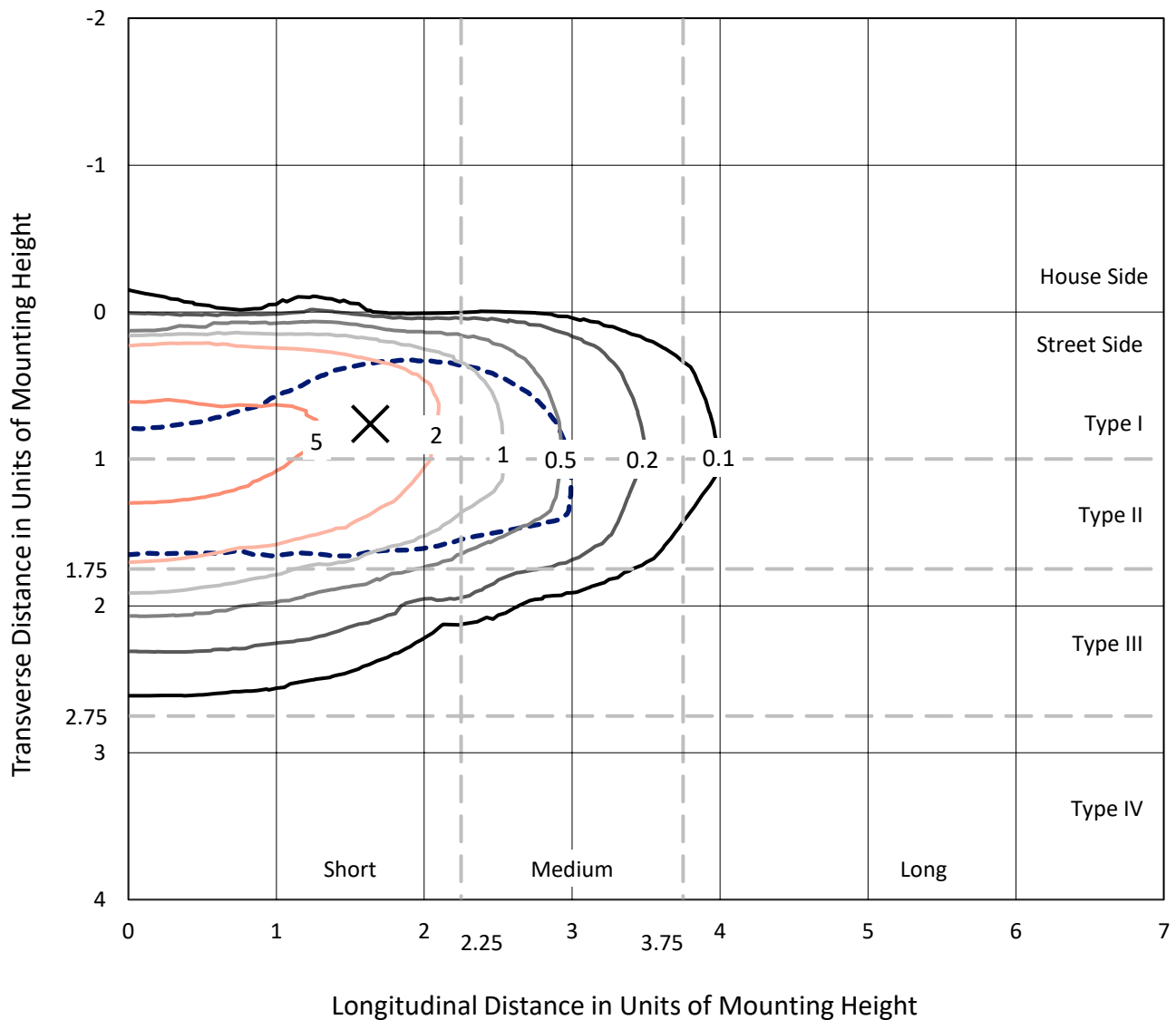


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## Iso-Footcandle Lines of Horizontal Illumination

× Max cd  
 - - - 1/2 Max cd

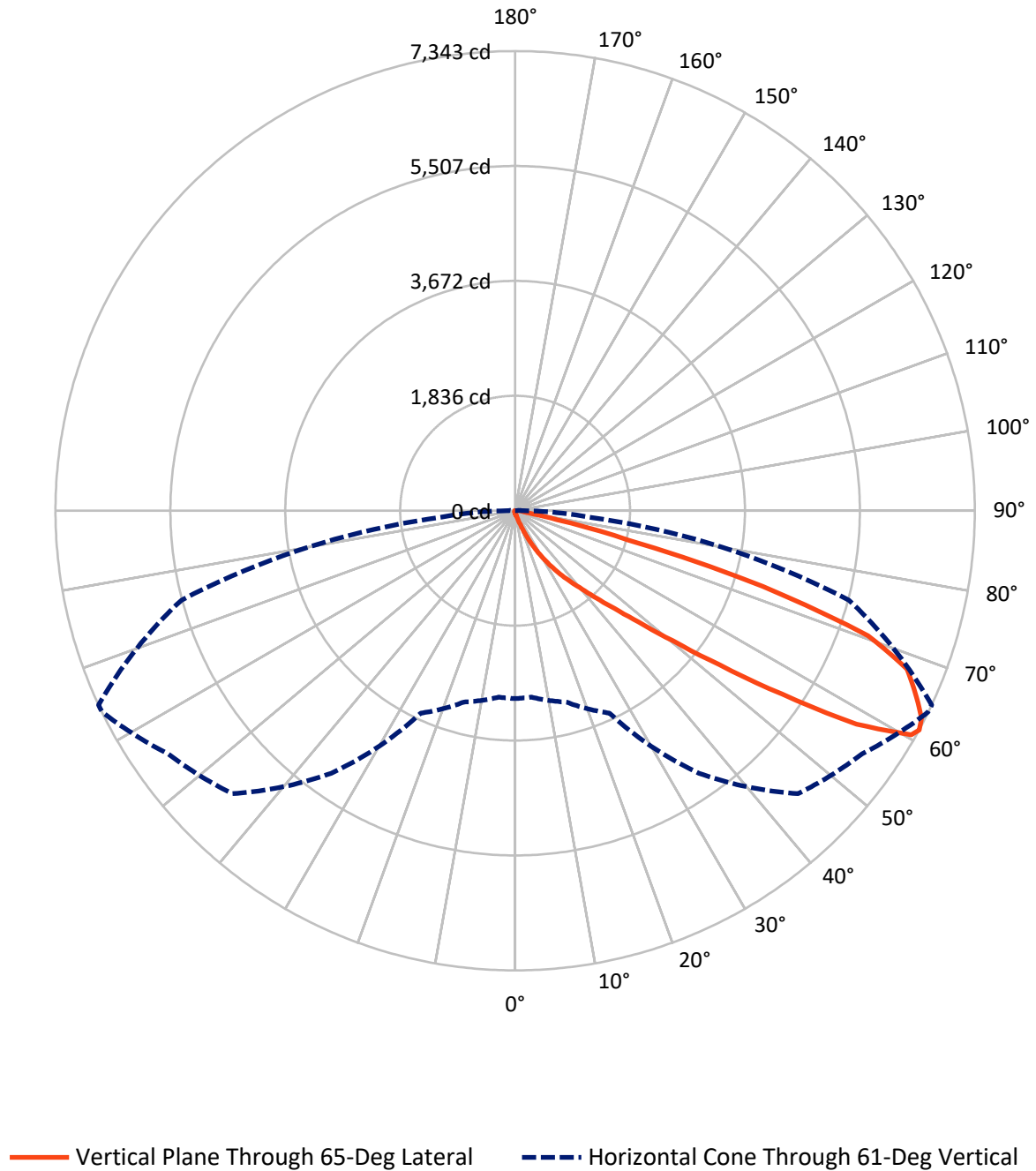


Based on 15 foot mounting height. Maximum calculated value = 8.8 fc  
 Type II - Short - N/A

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CATALOG NUMBER: GALN-SA2A-850-U-T2BC

## Luminous Intensity Polar Plot



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CATALOG NUMBER: GALN-SA2A-850-U-T2BC

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 28.4     | 0.0    | 28.4   |
|                    | % Fixture | 0.4      | 0.0    | 0.4    |
| <b>Street Side</b> | Lumens    | 6623.8   | 0.0    | 6623.8 |
|                    | % Fixture | 99.6     | 0.0    | 99.6   |
| <b>Total</b>       | Lumens    | 6652.2   | 0.0    | 6652.2 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 5.2    | 0.1       |
| 10°-20°   | 54.7   | 0.8       |
| 20°-30°   | 196.3  | 3.0       |
| 30°-40°   | 522.7  | 7.9       |
| 40°-50°   | 1373.0 | 20.6      |
| 50°-60°   | 2127.1 | 32.0      |
| 60°-70°   | 1783.5 | 26.8      |
| 70°-80°   | 524.9  | 7.9       |
| 80°-90°   | 64.7   | 1.0       |
| 90°-100°  | 0.0    | 0.0       |
| 100°-110° | 0.0    | 0.0       |
| 110°-120° | 0.0    | 0.0       |
| 120°-130° | 0.0    | 0.0       |
| 130°-140° | 0.0    | 0.0       |
| 140°-150° | 0.0    | 0.0       |
| 150°-160° | 0.0    | 0.0       |
| 160°-170° | 0.0    | 0.0       |
| 170°-180° | 0.0    | 0.0       |
| 0°-90°    | 6652.2 | 100.0     |
| 0°-180°   | 6652.2 | 100.0     |



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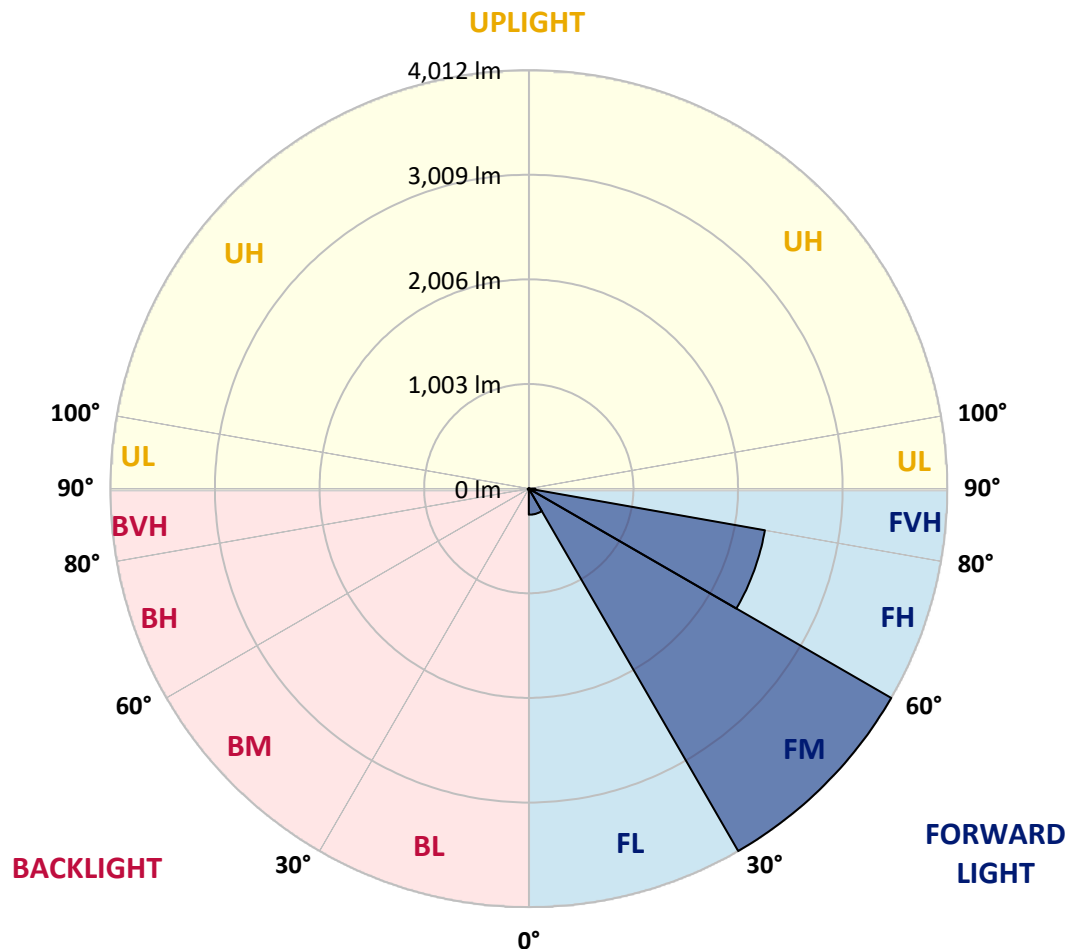
CATALOG NUMBER: GALN-SA2A-850-U-T2BC

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 249.8  | 3.8       |                         |      |         |
| FM   | (30°-60°)   | 4012.0 | 60.3      |                         |      |         |
| FH   | (60°-80°)   | 2298.4 | 34.6      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 63.5   | 1.0       |                         |      | G1/100  |
| BL   | (0°-30°)    | 6.4    | 0.1       | B0/110                  |      |         |
| BM   | (30°-60°)   | 10.8   | 0.2       | B0/220                  |      |         |
| BH   | (60°-80°)   | 10.0   | 0.2       | B0/110                  |      | G0/110  |
| BVH  | (80°-90°)   | 1.2    | 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-G2**

Type II Short



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 64°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 40.7   | 40.7   | 40.7   | 40.7   | 40.7   | 40.7   | 40.7   | 40.7   | 40.7   | 40.7   | 40.7   |
| 2.5°  | 49.4   | 49.9   | 49.0   | 47.1   | 45.8   | 45.8   | 45.3   | 43.9   | 43.9   | 42.6   | 41.6   |
| 5°    | 69.1   | 68.2   | 66.4   | 62.7   | 59.5   | 56.3   | 53.1   | 49.9   | 49.4   | 45.3   | 42.6   |
| 7.5°  | 113.0  | 113.9  | 108.0  | 96.6   | 86.9   | 74.6   | 63.1   | 56.3   | 55.4   | 48.5   | 43.0   |
| 10°   | 248.0  | 241.2  | 227.4  | 183.0  | 150.5  | 113.5  | 84.2   | 65.4   | 64.5   | 52.2   | 43.9   |
| 12.5° | 452.1  | 446.6  | 421.4  | 375.7  | 291.9  | 203.2  | 123.1  | 81.0   | 78.2   | 55.4   | 44.4   |
| 15°   | 651.6  | 642.9  | 629.2  | 583.0  | 485.1  | 364.2  | 201.3  | 110.7  | 103.4  | 59.9   | 43.9   |
| 17.5° | 778.8  | 780.2  | 767.8  | 748.2  | 685.0  | 539.1  | 347.8  | 165.2  | 151.0  | 68.2   | 43.0   |
| 20°   | 890.0  | 886.8  | 893.7  | 883.2  | 838.8  | 732.6  | 506.1  | 261.7  | 237.5  | 81.5   | 43.5   |
| 22.5° | 1018.2 | 1025.9 | 1031.0 | 1028.7 | 979.7  | 889.1  | 685.9  | 391.7  | 361.0  | 105.7  | 44.8   |
| 25°   | 1189.8 | 1188.8 | 1189.3 | 1183.3 | 1135.8 | 1035.1 | 866.2  | 553.2  | 522.1  | 145.1  | 48.0   |
| 27.5° | 1369.6 | 1375.1 | 1377.4 | 1355.9 | 1293.6 | 1194.8 | 1033.3 | 729.9  | 693.3  | 208.2  | 52.2   |
| 30°   | 1615.3 | 1610.7 | 1600.2 | 1556.3 | 1480.8 | 1358.2 | 1198.0 | 915.2  | 876.8  | 296.5  | 58.6   |
| 32.5° | 1946.6 | 1941.6 | 1888.5 | 1791.5 | 1678.5 | 1528.4 | 1363.6 | 1101.0 | 1054.3 | 406.8  | 67.3   |
| 35°   | 2492.5 | 2500.3 | 2369.9 | 2118.7 | 1916.0 | 1732.9 | 1547.1 | 1285.9 | 1244.7 | 542.7  | 79.2   |
| 37.5° | 3328.6 | 3286.0 | 3108.9 | 2665.1 | 2228.5 | 1988.3 | 1722.4 | 1472.6 | 1436.9 | 710.2  | 94.7   |
| 40°   | 4140.8 | 4098.7 | 4047.5 | 3626.9 | 2771.7 | 2269.7 | 1967.7 | 1691.7 | 1645.5 | 899.2  | 117.6  |
| 42.5° | 4994.7 | 4971.3 | 4969.1 | 4651.9 | 3762.8 | 2712.2 | 2262.8 | 1948.5 | 1909.1 | 1106.5 | 155.1  |
| 45°   | 5599.6 | 5576.3 | 5625.3 | 5680.6 | 5112.7 | 3660.3 | 2776.7 | 2282.0 | 2224.8 | 1358.2 | 215.1  |
| 47.5° | 5681.1 | 5682.0 | 5812.9 | 5986.3 | 6115.8 | 5126.9 | 3461.3 | 2724.1 | 2654.5 | 1718.3 | 315.7  |
| 50°   | 5410.2 | 5420.7 | 5628.9 | 5939.2 | 6287.9 | 6357.4 | 4668.4 | 3365.6 | 3262.7 | 2145.2 | 458.5  |
| 52.5° | 4894.5 | 4906.4 | 5196.5 | 5706.7 | 6129.5 | 6653.0 | 6089.7 | 4204.9 | 4086.3 | 2677.9 | 659.9  |
| 55°   | 4430.0 | 4437.3 | 4770.0 | 5414.8 | 5938.7 | 6492.4 | 6933.5 | 5325.5 | 5169.9 | 3333.1 | 858.5  |
| 57.5° | 3970.1 | 3953.2 | 4169.6 | 4907.7 | 5906.2 | 6295.2 | 7058.0 | 6602.7 | 6431.1 | 4049.3 | 1013.1 |
| 60°   | 3355.1 | 3326.7 | 3500.6 | 3970.1 | 5478.8 | 6424.7 | 6825.1 | 7309.2 | 7270.3 | 5046.4 | 1132.6 |
| 61°   | 3001.4 | 2989.5 | 3164.3 | 3567.0 | 5119.1 | 6391.7 | 6769.2 | 7339.0 | 7343.1 | 5518.2 | 1186.1 |
| 62.5° | 2143.4 | 2177.3 | 2444.5 | 2968.0 | 4287.7 | 6178.0 | 6776.6 | 7247.0 | 7287.7 | 6145.1 | 1324.7 |
| 65°   | 952.7  | 1007.2 | 1214.9 | 1640.9 | 2493.5 | 5139.3 | 6711.6 | 7045.2 | 7025.0 | 6317.1 | 1802.5 |
| 67.5° | 565.1  | 573.4  | 676.8  | 929.8  | 1320.6 | 2764.3 | 5922.7 | 6778.4 | 6751.4 | 5499.4 | 2242.7 |
| 70°   | 445.2  | 449.4  | 482.3  | 583.4  | 766.5  | 1058.9 | 3380.3 | 5864.6 | 5982.2 | 4459.3 | 2195.6 |
| 72.5° | 422.4  | 421.4  | 426.0  | 443.9  | 482.8  | 525.3  | 1308.7 | 3898.3 | 4137.6 | 3211.4 | 1840.9 |
| 75°   | 416.9  | 415.0  | 410.5  | 403.6  | 349.6  | 309.3  | 405.4  | 1724.2 | 1862.9 | 2194.2 | 1386.1 |
| 77.5° | 404.5  | 405.0  | 405.9  | 387.1  | 299.7  | 218.7  | 196.3  | 553.2  | 680.4  | 1392.5 | 985.2  |
| 80°   | 273.6  | 277.8  | 284.6  | 277.3  | 269.5  | 158.3  | 138.7  | 196.8  | 199.5  | 781.6  | 650.7  |
| 82.5° | 138.7  | 138.7  | 135.4  | 120.8  | 104.3  | 103.0  | 110.3  | 142.8  | 144.6  | 395.4  | 306.1  |
| 85°   | 83.7   | 88.3   | 90.1   | 81.9   | 75.0   | 69.1   | 84.2   | 113.5  | 117.6  | 153.3  | 71.4   |
| 87.5° | 18.8   | 19.2   | 21.0   | 27.9   | 40.7   | 55.4   | 78.2   | 103.9  | 105.7  | 98.4   | 8.7    |
| 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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**CANDELA DISTRIBUTION (continued):**

|       | 90°   | 95°  | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|-------|-------|------|------|------|------|------|------|------|------|------|------|
| 0°    | 40.7  | 40.7 | 40.7 | 40.7 | 40.7 | 40.7 | 40.7 | 40.7 | 40.7 | 40.7 | 40.7 |
| 2.5°  | 41.2  | 40.3 | 39.8 | 38.4 | 37.1 | 35.7 | 34.8 | 34.3 | 34.8 | 35.2 | 35.2 |
| 5°    | 40.7  | 39.4 | 37.1 | 34.8 | 32.9 | 31.1 | 29.3 | 28.8 | 28.8 | 29.3 | 29.3 |
| 7.5°  | 40.7  | 38.4 | 35.2 | 32.5 | 29.7 | 27.0 | 25.6 | 24.7 | 25.2 | 25.2 | 25.2 |
| 10°   | 40.7  | 38.0 | 33.9 | 29.7 | 26.5 | 23.3 | 21.0 | 20.1 | 20.1 | 20.1 | 20.1 |
| 12.5° | 40.3  | 37.5 | 32.5 | 27.5 | 22.9 | 19.2 | 16.5 | 15.1 | 15.6 | 15.6 | 15.6 |
| 15°   | 39.4  | 36.2 | 30.7 | 23.3 | 18.3 | 14.6 | 11.9 | 10.5 | 11.0 | 11.9 | 12.4 |
| 17.5° | 38.0  | 34.8 | 27.5 | 19.7 | 14.6 | 11.0 | 8.2  | 7.3  | 7.8  | 9.2  | 9.2  |
| 20°   | 37.5  | 33.4 | 24.3 | 16.0 | 11.0 | 7.8  | 5.5  | 4.6  | 5.0  | 6.9  | 7.3  |
| 22.5° | 37.5  | 32.5 | 22.0 | 13.3 | 8.2  | 5.0  | 3.2  | 1.8  | 1.8  | 3.2  | 3.2  |
| 25°   | 38.0  | 32.0 | 20.1 | 11.0 | 5.9  | 3.7  | 1.8  | 0.9  | 1.8  | 5.0  | 5.9  |
| 27.5° | 38.9  | 31.6 | 19.2 | 9.2  | 4.6  | 3.2  | 1.4  | 3.2  | 5.5  | 5.5  | 5.5  |
| 30°   | 39.8  | 30.7 | 17.8 | 7.8  | 4.1  | 2.3  | 2.3  | 4.6  | 4.6  | 5.5  | 5.9  |
| 32.5° | 41.2  | 30.2 | 16.9 | 6.9  | 3.2  | 1.8  | 3.2  | 2.7  | 2.7  | 3.2  | 3.7  |
| 35°   | 43.9  | 30.7 | 16.0 | 6.9  | 3.2  | 2.3  | 2.7  | 1.4  | 0.9  | 0.9  | 0.9  |
| 37.5° | 47.6  | 31.1 | 14.6 | 5.9  | 2.7  | 2.7  | 1.4  | 0.0  | 0.0  | 0.0  | 0.0  |
| 40°   | 53.5  | 32.5 | 13.7 | 5.5  | 2.3  | 2.3  | 0.5  | 0.0  | 0.0  | 0.0  | 0.0  |
| 42.5° | 63.6  | 35.2 | 13.3 | 5.0  | 2.3  | 1.8  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 45°   | 83.7  | 41.6 | 12.4 | 4.6  | 2.3  | 0.9  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 47.5° | 120.3 | 56.7 | 11.9 | 3.7  | 1.4  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 50°   | 175.7 | 76.9 | 11.4 | 3.2  | 0.5  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 52.5° | 224.2 | 81.0 | 7.8  | 2.7  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 55°   | 229.7 | 55.8 | 5.9  | 1.8  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 57.5° | 183.0 | 36.2 | 5.0  | 1.4  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 60°   | 138.7 | 27.5 | 4.6  | 0.5  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 61°   | 133.2 | 24.7 | 4.6  | 0.5  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 62.5° | 146.9 | 21.5 | 4.1  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 65°   | 238.9 | 17.8 | 3.7  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 67.5° | 415.0 | 15.6 | 3.2  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 70°   | 524.4 | 14.6 | 2.7  | 0.5  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 72.5° | 457.1 | 13.3 | 2.7  | 0.9  | 0.5  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 75°   | 275.0 | 11.4 | 2.7  | 1.8  | 0.9  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 77.5° | 144.1 | 8.7  | 2.7  | 2.3  | 1.4  | 0.5  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 80°   | 70.0  | 7.8  | 3.2  | 2.3  | 1.8  | 0.9  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 82.5° | 27.5  | 6.4  | 3.7  | 3.2  | 2.3  | 1.4  | 0.5  | 0.0  | 0.0  | 0.0  | 0.0  |
| 85°   | 12.4  | 5.5  | 4.1  | 3.7  | 3.2  | 1.8  | 0.5  | 0.0  | 0.0  | 0.0  | 0.0  |
| 87.5° | 6.4   | 5.0  | 4.6  | 4.1  | 3.2  | 2.3  | 0.9  | 0.0  | 0.0  | 0.0  | 0.0  |
| 90°   | 0.0   | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |



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

Report Prepared for

Cooper Lighting Solutions

McGraw-Edison

Report Number: SP1-2407-184-12

Test Date: 10/11/2024

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

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

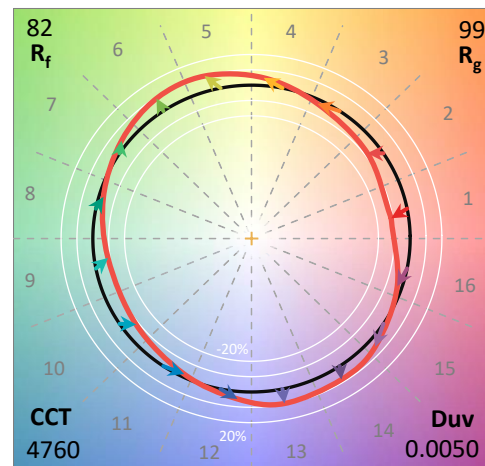
### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2407-184-12  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry:  $4\pi$   
 Issue Date: 10/15/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: McGraw-Edison  
 Catalog Number: **GSS-SB1A-850-U-5WQ**  
 Description: GALLEON II SITE SLIM 1SQ 350MA 5WQ HIGH DENSITY LIGHTSQUARE WITH 80 CRI  
 5000K CCT 26 LEDS

### Spectral Parameters

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

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



### Test Conditions

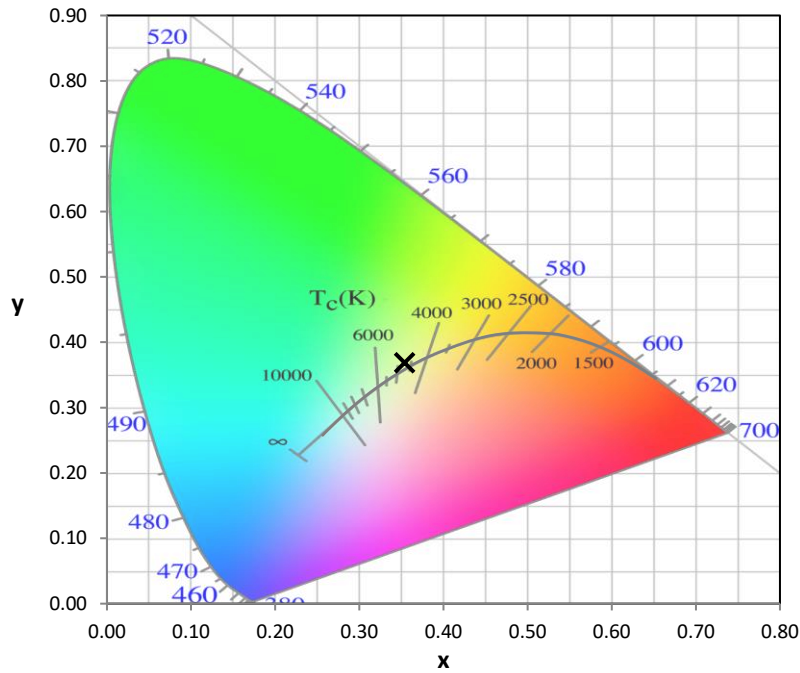
Stabilization Time: 21M  
 Operation Time: 1H 21M  
 Sphere Temperature (°C): 25.2

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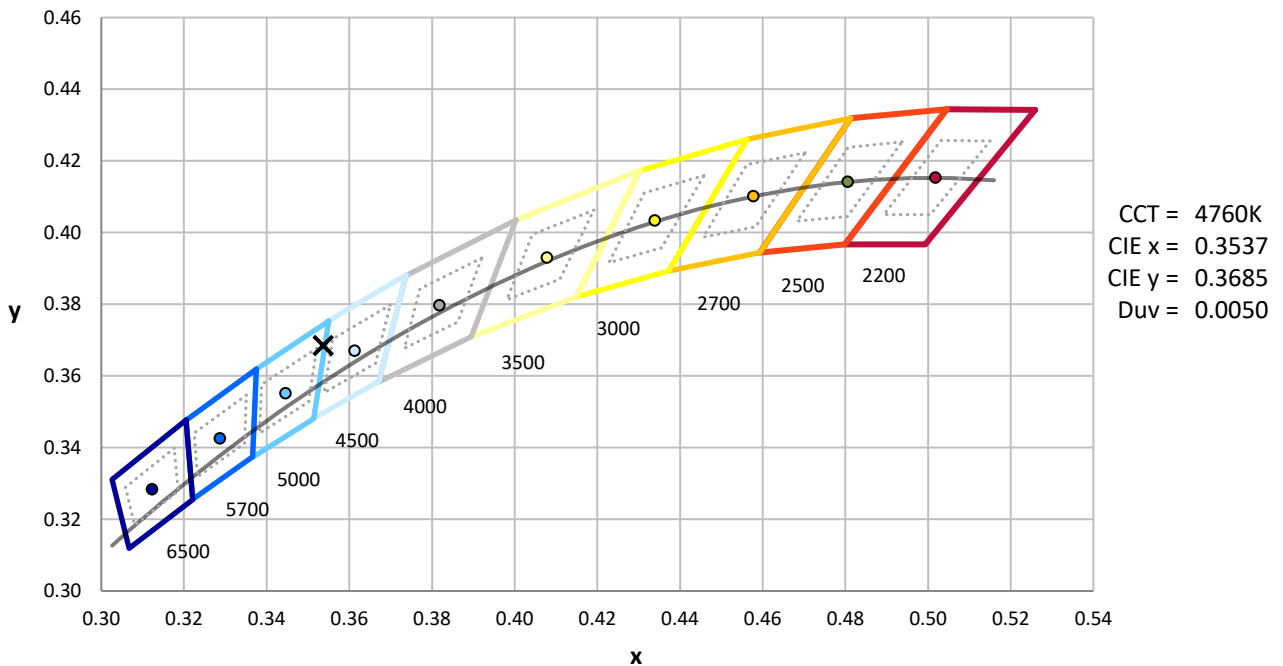
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date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

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**CIE 1931 Chromaticity Diagram**



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



Point lies inside the ANSI 5000K 7-step quadrangle

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

REPORT NUMBER: SP1-2407-184-12

### Scotopic Flux vs. Wavelength



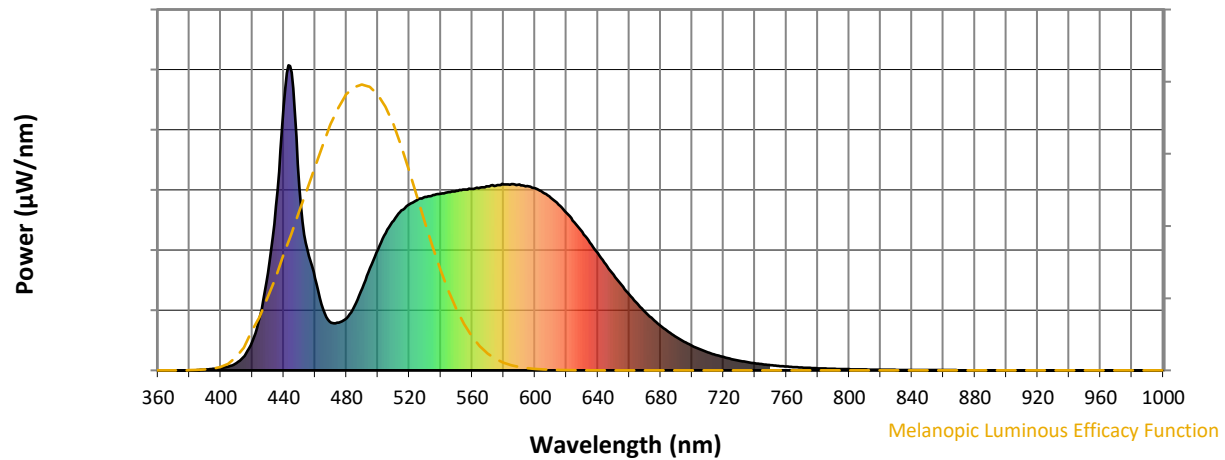
Scotopic Lumens: NR

S/P: 1.83

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

REPORT NUMBER: SP1-2407-184-12

### Melanopic Flux vs. Wavelength


**Melanopic Lumens: NR**
**M/P: 3.74**

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

REPORT NUMBER: SP1-2407-184-12

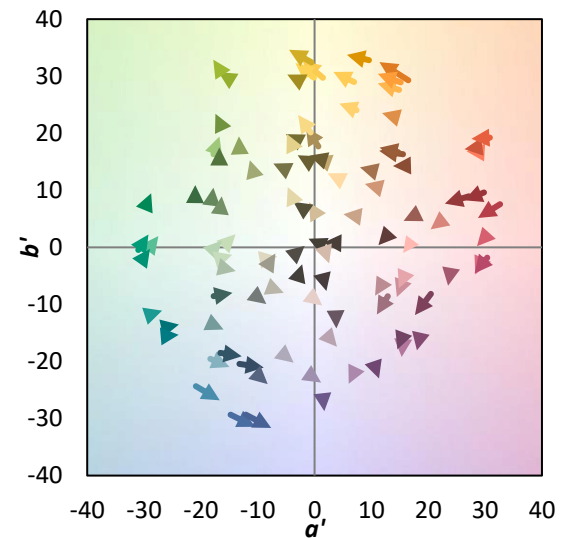
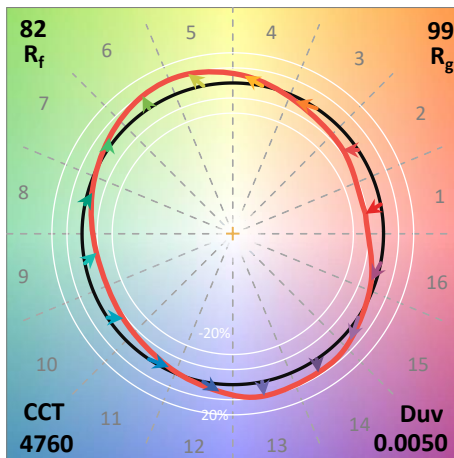
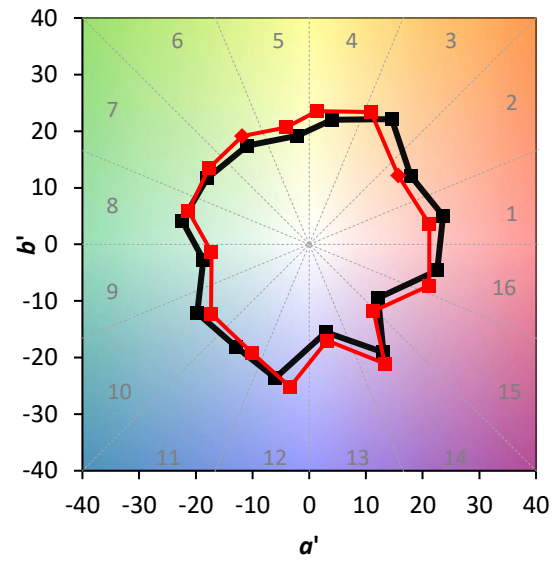
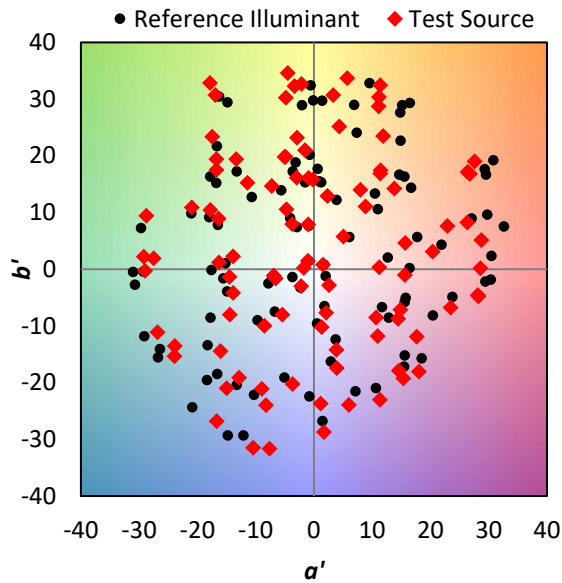
TM-30-18

### Summary

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



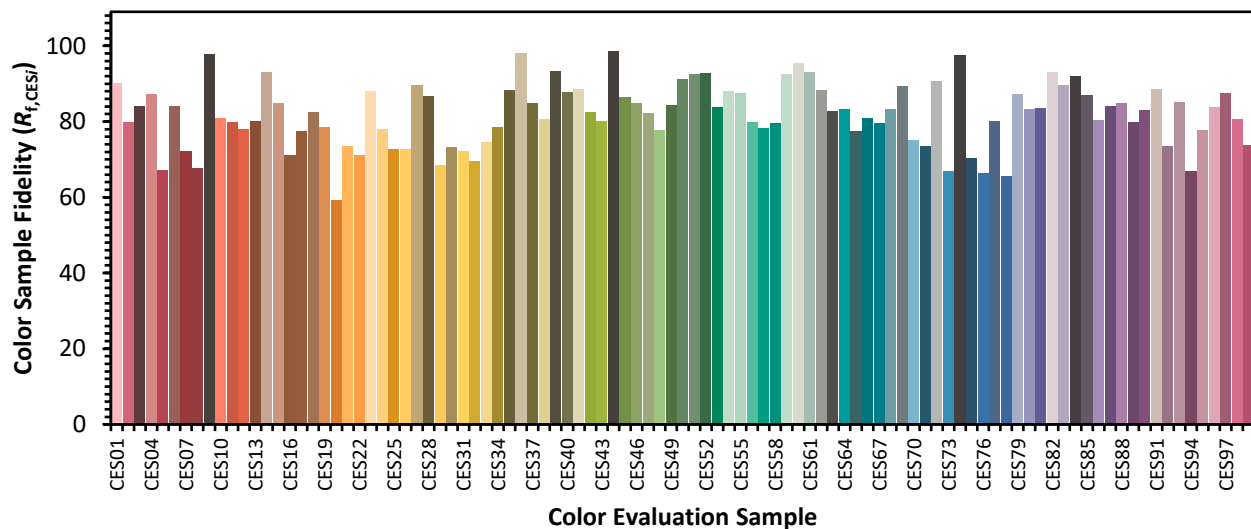
### Color Vector Graphics



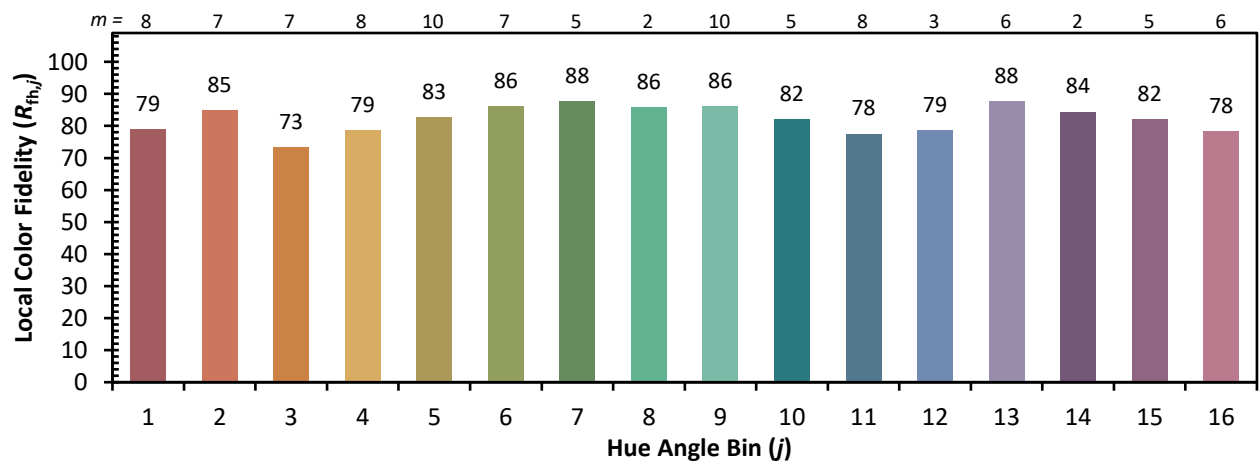


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

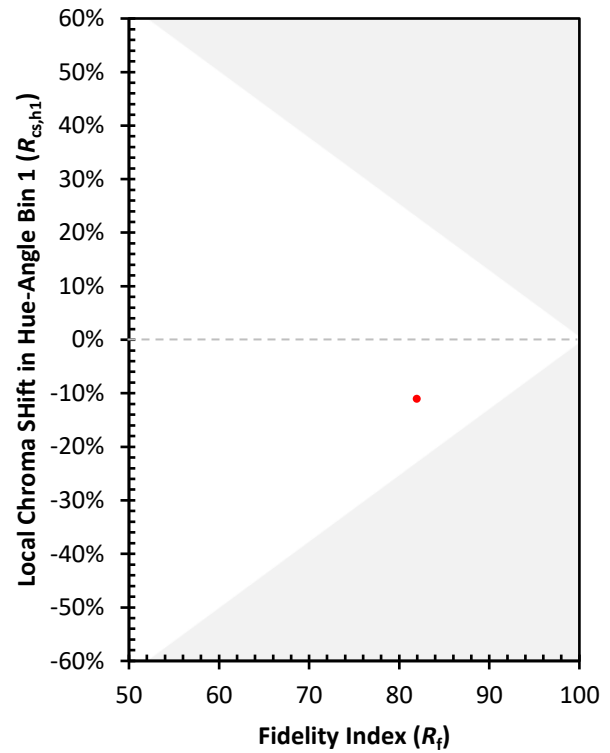
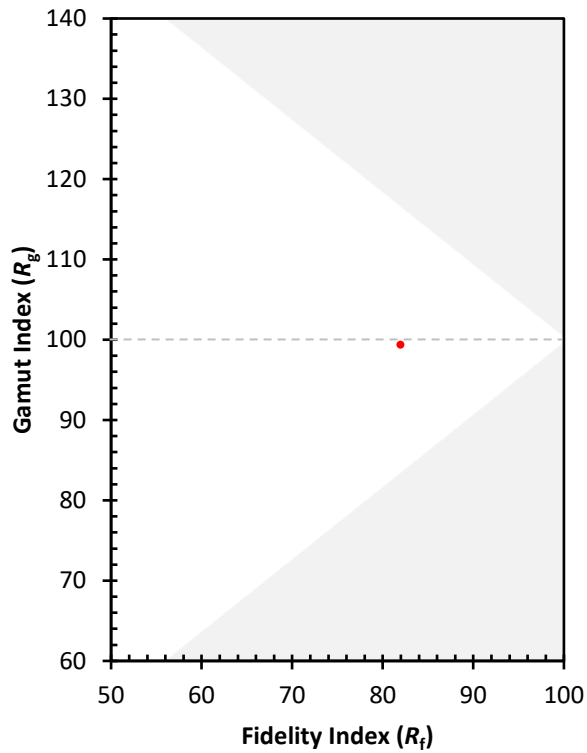
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 73 | CES51 = 92 | CES76 = 66 |
| CES02 = 60 | CES27 = 90 | CES52 = 93 | CES77 = 80 |
| CES03 = 30 | CES28 = 87 | CES53 = 84 | CES78 = 65 |
| CES04 = 69 | CES29 = 69 | CES54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



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)