

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: P1048102

Luminaire Tested: **GALN-SA3B-930-U-T2BC**

Issue Date: 07/10/2025

**Test Information**

Test Method: LM-79-08  
Report Number: P1048102  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 07/10/2025  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: MCGRAW-EDISON  
Catalog Number: GALN-SA3B-930-U-T2BC  
Description: GALLEON II AREA AND ROADWAY LUMINAIRE 800mA 3xLight Square PACKAGE  
90CRI 3000K FIXTURE w/ TYPE II ANGLED BACKLIGHT CONTROL  
Light Source: (42) 3000K CCT, 90 CRI LEDs  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 9693.2 lumens  
Efficiency: N/A  
Efficacy: 91.3 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): 106.2  
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

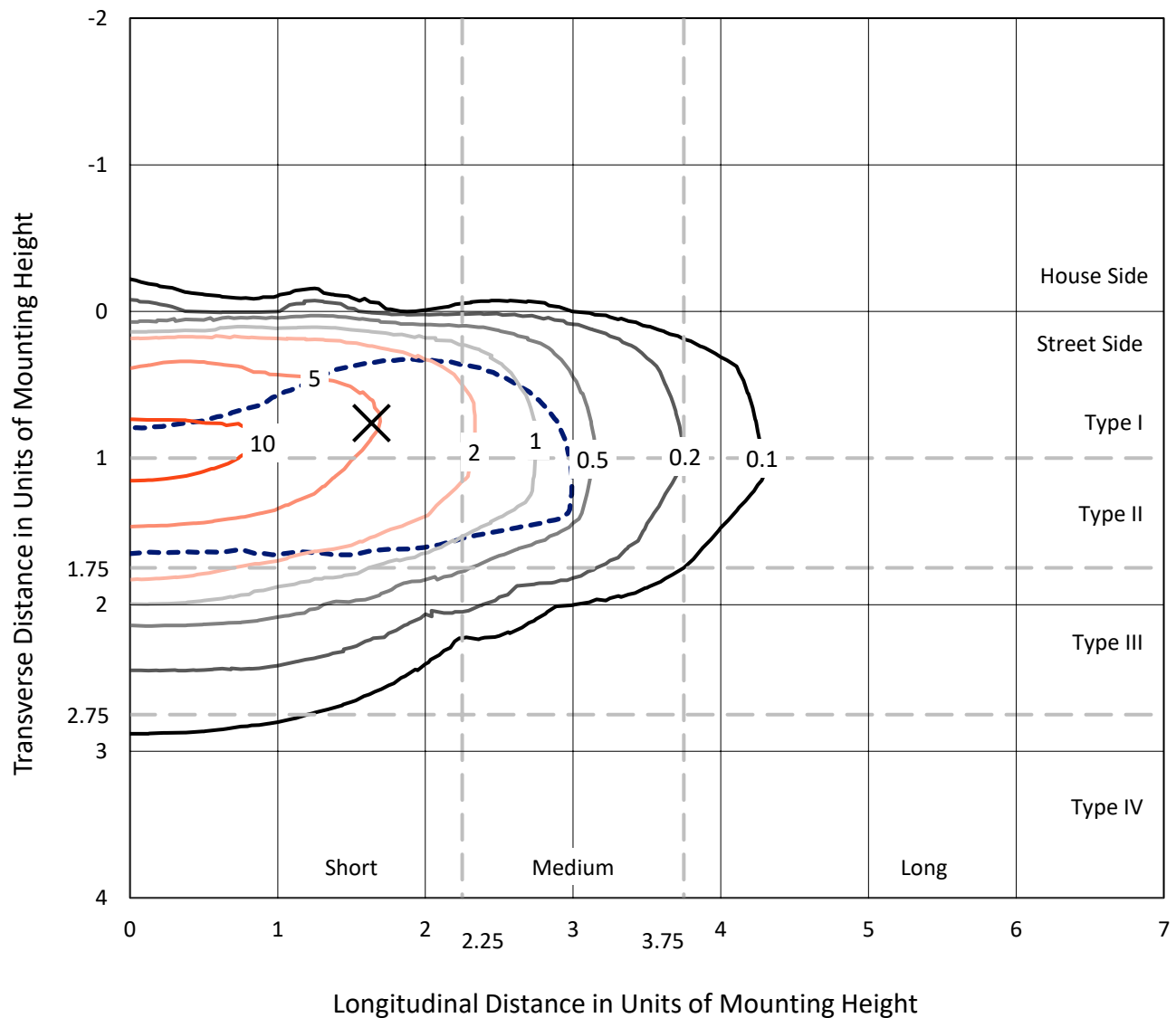


REPORT NUMBER: P1048102

CATALOG NUMBER: GALN-SA3B-930-U-T2BC

## Iso-Footcandle Lines of Horizontal Illumination

✕ Max cd  
 - - - 1/2 Max cd

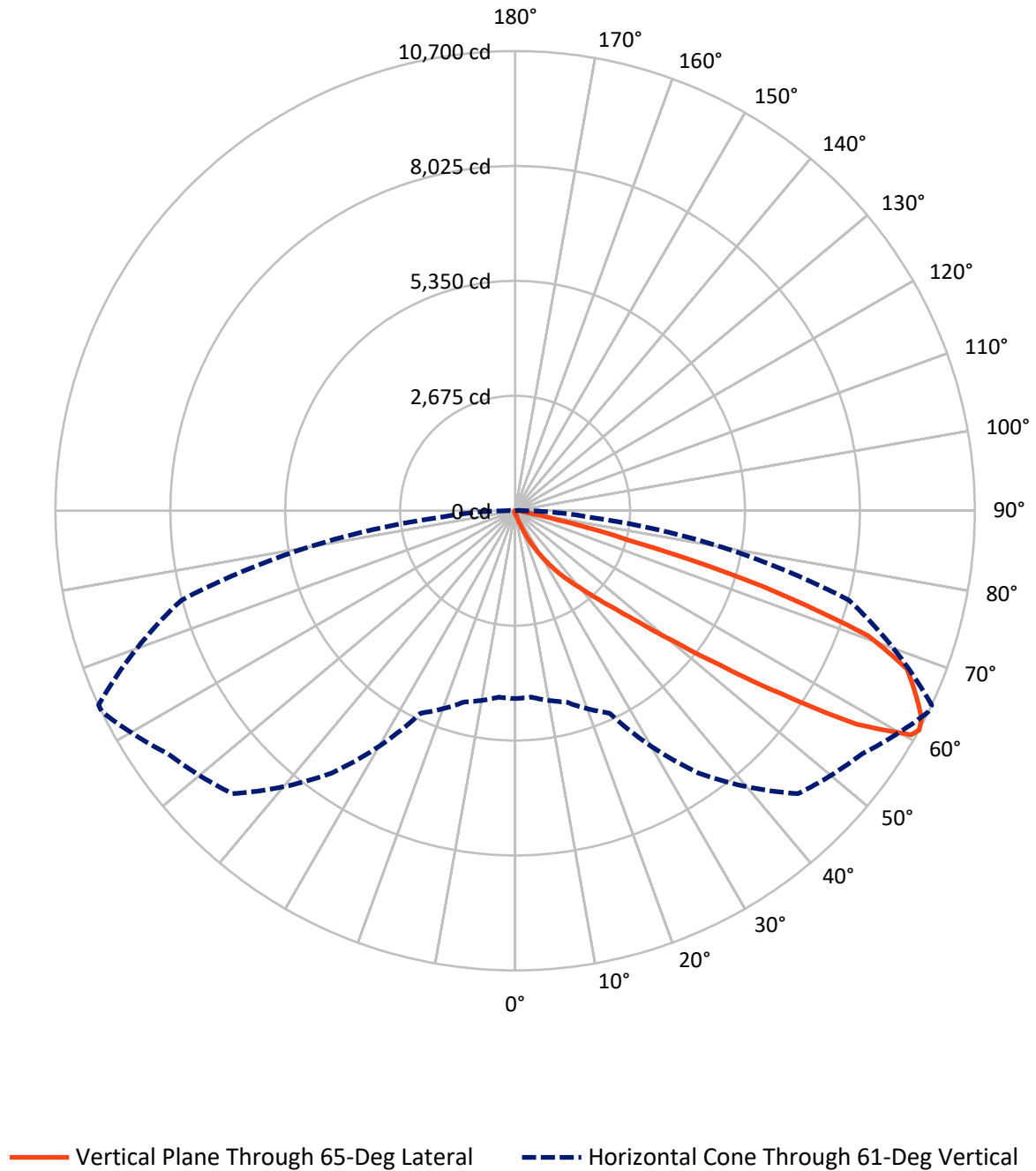


Based on 15 foot mounting height. Maximum calculated value = 12.8 fc  
 Type II - Short - N/A

REPORT NUMBER: P1048102

CATALOG NUMBER: GALN-SA3B-930-U-T2BC

## Luminous Intensity Polar Plot



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CATALOG NUMBER: GALN-SA3B-930-U-T2BC

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 41.4     | 0.0    | 41.4   |
|                    | % Fixture | 0.4      | 0.0    | 0.4    |
| <b>Street Side</b> | Lumens    | 9651.8   | 0.0    | 9651.8 |
|                    | % Fixture | 99.6     | 0.0    | 99.6   |
| <b>Total</b>       | Lumens    | 9693.2   | 0.0    | 9693.2 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 7.5    | 0.1       |
| 10°-20°   | 79.7   | 0.8       |
| 20°-30°   | 286.1  | 3.0       |
| 30°-40°   | 761.6  | 7.9       |
| 40°-50°   | 2000.7 | 20.6      |
| 50°-60°   | 3099.5 | 32.0      |
| 60°-70°   | 2598.9 | 26.8      |
| 70°-80°   | 764.8  | 7.9       |
| 80°-90°   | 94.3   | 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°    | 9693.2 | 100.0     |
| 0°-180°   | 9693.2 | 100.0     |



REPORT NUMBER: P1048102

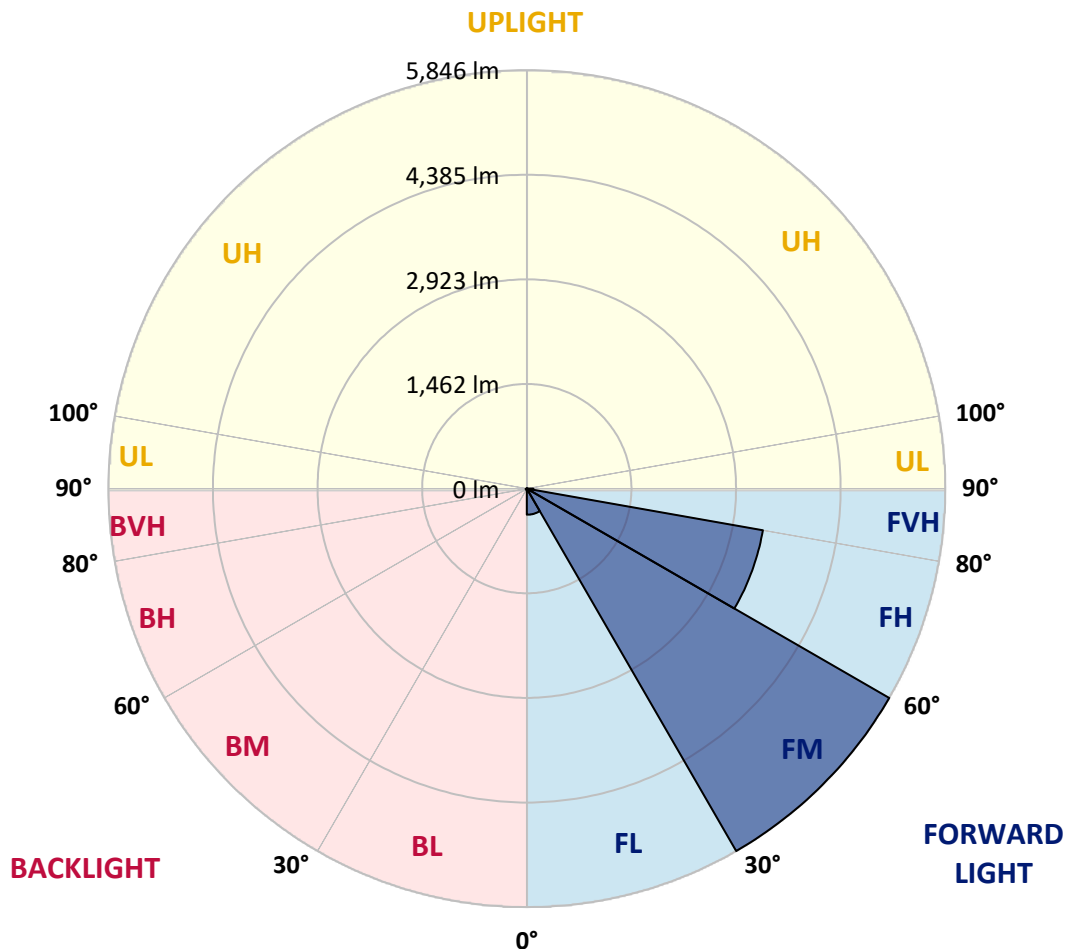
CATALOG NUMBER: GALN-SA3B-930-U-T2BC

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 364.0  | 3.8       |                         |      |         |
| FM   | (30°-60°)   | 5846.1 | 60.3      |                         |      |         |
| FH   | (60°-80°)   | 3349.1 | 34.6      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 92.6   | 1.0       |                         |      | G1/100  |
| BL   | (0°-30°)    | 9.3    | 0.1       | B0/110                  |      |         |
| BM   | (30°-60°)   | 15.7   | 0.2       | B0/220                  |      |         |
| BH   | (60°-80°)   | 14.6   | 0.2       | B0/110                  |      | G0/110  |
| BVH  | (80°-90°)   | 1.8    | 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



REPORT NUMBER: P1048102

CATALOG NUMBER: GALN-SA3B-930-U-T2BC

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°     | 64°     | 65°     | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|---------|---------|---------|--------|--------|
| 0°    | 59.3   | 59.3   | 59.3   | 59.3   | 59.3   | 59.3   | 59.3    | 59.3    | 59.3    | 59.3   | 59.3   |
| 2.5°  | 72.0   | 72.7   | 71.3   | 68.7   | 66.7   | 66.7   | 66.0    | 64.0    | 64.0    | 62.0   | 60.7   |
| 5°    | 100.7  | 99.4   | 96.7   | 91.4   | 86.7   | 82.0   | 77.3    | 72.7    | 72.0    | 66.0   | 62.0   |
| 7.5°  | 164.7  | 166.0  | 157.4  | 140.7  | 126.7  | 108.7  | 92.0    | 82.0    | 80.7    | 70.7   | 62.7   |
| 10°   | 361.4  | 351.4  | 331.4  | 266.7  | 219.4  | 165.4  | 122.7   | 95.4    | 94.0    | 76.0   | 64.0   |
| 12.5° | 658.8  | 650.8  | 614.1  | 547.4  | 425.4  | 296.1  | 179.4   | 118.0   | 114.0   | 80.7   | 64.7   |
| 15°   | 949.5  | 936.8  | 916.8  | 849.5  | 706.8  | 530.8  | 293.4   | 161.4   | 150.7   | 87.3   | 64.0   |
| 17.5° | 1134.9 | 1136.9 | 1118.9 | 1090.2 | 998.2  | 785.5  | 506.8   | 240.7   | 220.0   | 99.4   | 62.7   |
| 20°   | 1296.9 | 1292.2 | 1302.2 | 1286.9 | 1222.2 | 1067.5 | 737.5   | 381.4   | 346.1   | 118.7  | 63.3   |
| 22.5° | 1483.6 | 1494.9 | 1502.3 | 1498.9 | 1427.6 | 1295.6 | 999.5   | 570.8   | 526.1   | 154.0  | 65.3   |
| 25°   | 1733.7 | 1732.3 | 1733.0 | 1724.3 | 1655.0 | 1508.3 | 1262.2  | 806.1   | 760.8   | 211.4  | 70.0   |
| 27.5° | 1995.7 | 2003.7 | 2007.0 | 1975.7 | 1885.0 | 1741.0 | 1505.6  | 1063.5  | 1010.2  | 303.4  | 76.0   |
| 30°   | 2353.8 | 2347.1 | 2331.8 | 2267.8 | 2157.7 | 1979.0 | 1745.7  | 1333.6  | 1277.6  | 432.1  | 85.3   |
| 32.5° | 2836.5 | 2829.2 | 2751.8 | 2610.5 | 2445.8 | 2227.1 | 1987.0  | 1604.3  | 1536.3  | 592.8  | 98.0   |
| 35°   | 3632.0 | 3643.3 | 3453.3 | 3087.2 | 2791.8 | 2525.1 | 2254.4  | 1873.7  | 1813.7  | 790.8  | 115.4  |
| 37.5° | 4850.2 | 4788.2 | 4530.2 | 3883.4 | 3247.3 | 2897.2 | 2509.8  | 2145.7  | 2093.7  | 1034.9 | 138.0  |
| 40°   | 6033.8 | 5972.4 | 5897.8 | 5285.0 | 4038.7 | 3307.3 | 2867.2  | 2465.1  | 2397.8  | 1310.2 | 171.4  |
| 42.5° | 7278.0 | 7244.0 | 7240.7 | 6778.6 | 5483.0 | 3952.1 | 3297.3  | 2839.2  | 2781.8  | 1612.3 | 226.0  |
| 45°   | 8159.5 | 8125.5 | 8196.8 | 8277.5 | 7450.0 | 5333.6 | 4046.1  | 3325.3  | 3241.9  | 1979.0 | 313.4  |
| 47.5° | 8278.2 | 8279.5 | 8470.2 | 8722.9 | 8911.6 | 7470.7 | 5043.6  | 3969.4  | 3868.0  | 2503.8 | 460.1  |
| 50°   | 7883.4 | 7898.8 | 8202.2 | 8654.3 | 9162.4 | 9263.7 | 6802.6  | 4904.2  | 4754.2  | 3125.9 | 668.1  |
| 52.5° | 7132.0 | 7149.3 | 7572.1 | 8315.5 | 8931.6 | 9694.4 | 8873.6  | 6127.1  | 5954.4  | 3902.1 | 961.5  |
| 55°   | 6455.2 | 6465.9 | 6950.6 | 7890.1 | 8653.6 | 9460.4 | 10103.2 | 7760.1  | 7533.4  | 4856.9 | 1250.9 |
| 57.5° | 5785.1 | 5760.4 | 6075.8 | 7151.3 | 8606.2 | 9173.0 | 10284.6 | 9621.1  | 9371.1  | 5900.4 | 1476.3 |
| 60°   | 4888.9 | 4847.6 | 5100.9 | 5785.1 | 7983.5 | 9361.7 | 9945.2  | 10650.6 | 10593.9 | 7353.4 | 1650.3 |
| 61°   | 4373.5 | 4356.1 | 4610.8 | 5197.6 | 7459.4 | 9313.7 | 9863.8  | 10694.0 | 10700.0 | 8040.8 | 1728.3 |
| 62.5° | 3123.2 | 3172.6 | 3562.0 | 4324.8 | 6247.8 | 9002.3 | 9874.5  | 10559.9 | 10619.3 | 8954.3 | 1930.4 |
| 65°   | 1388.3 | 1467.6 | 1770.3 | 2391.1 | 3633.3 | 7488.7 | 9779.8  | 10265.9 | 10236.5 | 9205.0 | 2626.5 |
| 67.5° | 823.5  | 835.5  | 986.2  | 1354.9 | 1924.4 | 4028.1 | 8630.3  | 9877.1  | 9837.8  | 8013.5 | 3267.9 |
| 70°   | 648.8  | 654.8  | 702.8  | 850.2  | 1116.9 | 1543.0 | 4925.6  | 8545.6  | 8716.9  | 6497.9 | 3199.3 |
| 72.5° | 615.4  | 614.1  | 620.8  | 646.8  | 703.5  | 765.5  | 1907.0  | 5680.4  | 6029.1  | 4679.5 | 2682.5 |
| 75°   | 607.4  | 604.8  | 598.1  | 588.1  | 509.4  | 450.7  | 590.8   | 2512.5  | 2714.5  | 3197.3 | 2019.7 |
| 77.5° | 589.4  | 590.1  | 591.4  | 564.1  | 436.7  | 318.7  | 286.1   | 806.1   | 991.5   | 2029.0 | 1435.6 |
| 80°   | 398.7  | 404.7  | 414.7  | 404.1  | 392.7  | 230.7  | 202.0   | 286.7   | 290.7   | 1138.9 | 948.2  |
| 82.5° | 202.0  | 202.0  | 197.4  | 176.0  | 152.0  | 150.0  | 160.7   | 208.0   | 210.7   | 576.1  | 446.1  |
| 85°   | 122.0  | 128.7  | 131.4  | 119.4  | 109.4  | 100.7  | 122.7   | 165.4   | 171.4   | 223.4  | 104.0  |
| 87.5° | 27.3   | 28.0   | 30.7   | 40.7   | 59.3   | 80.7   | 114.0   | 151.4   | 154.0   | 143.4  | 12.7   |
| 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: P1048102

CATALOG NUMBER: GALN-SA3B-930-U-T2BC

**CANDELA DISTRIBUTION (continued):**

|       | 90°   | 95°   | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|-------|-------|-------|------|------|------|------|------|------|------|------|------|
| 0°    | 59.3  | 59.3  | 59.3 | 59.3 | 59.3 | 59.3 | 59.3 | 59.3 | 59.3 | 59.3 | 59.3 |
| 2.5°  | 60.0  | 58.7  | 58.0 | 56.0 | 54.0 | 52.0 | 50.7 | 50.0 | 50.7 | 51.3 | 51.3 |
| 5°    | 59.3  | 57.3  | 54.0 | 50.7 | 48.0 | 45.3 | 42.7 | 42.0 | 42.0 | 42.7 | 42.7 |
| 7.5°  | 59.3  | 56.0  | 51.3 | 47.3 | 43.3 | 39.3 | 37.3 | 36.0 | 36.7 | 36.7 | 36.7 |
| 10°   | 59.3  | 55.3  | 49.3 | 43.3 | 38.7 | 34.0 | 30.7 | 29.3 | 29.3 | 29.3 | 29.3 |
| 12.5° | 58.7  | 54.7  | 47.3 | 40.0 | 33.3 | 28.0 | 24.0 | 22.0 | 22.7 | 22.7 | 22.7 |
| 15°   | 57.3  | 52.7  | 44.7 | 34.0 | 26.7 | 21.3 | 17.3 | 15.3 | 16.0 | 17.3 | 18.0 |
| 17.5° | 55.3  | 50.7  | 40.0 | 28.7 | 21.3 | 16.0 | 12.0 | 10.7 | 11.3 | 13.3 | 13.3 |
| 20°   | 54.7  | 48.7  | 35.3 | 23.3 | 16.0 | 11.3 | 8.0  | 6.7  | 7.3  | 10.0 | 10.7 |
| 22.5° | 54.7  | 47.3  | 32.0 | 19.3 | 12.0 | 7.3  | 4.7  | 2.7  | 2.7  | 4.7  | 4.7  |
| 25°   | 55.3  | 46.7  | 29.3 | 16.0 | 8.7  | 5.3  | 2.7  | 1.3  | 2.7  | 7.3  | 8.7  |
| 27.5° | 56.7  | 46.0  | 28.0 | 13.3 | 6.7  | 4.7  | 2.0  | 4.7  | 8.0  | 8.0  | 8.0  |
| 30°   | 58.0  | 44.7  | 26.0 | 11.3 | 6.0  | 3.3  | 3.3  | 6.7  | 6.7  | 8.0  | 8.7  |
| 32.5° | 60.0  | 44.0  | 24.7 | 10.0 | 4.7  | 2.7  | 4.7  | 4.0  | 4.0  | 4.7  | 5.3  |
| 35°   | 64.0  | 44.7  | 23.3 | 10.0 | 4.7  | 3.3  | 4.0  | 2.0  | 1.3  | 1.3  | 1.3  |
| 37.5° | 69.3  | 45.3  | 21.3 | 8.7  | 4.0  | 4.0  | 2.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 40°   | 78.0  | 47.3  | 20.0 | 8.0  | 3.3  | 3.3  | 0.7  | 0.0  | 0.0  | 0.0  | 0.0  |
| 42.5° | 92.7  | 51.3  | 19.3 | 7.3  | 3.3  | 2.7  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 45°   | 122.0 | 60.7  | 18.0 | 6.7  | 3.3  | 1.3  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 47.5° | 175.4 | 82.7  | 17.3 | 5.3  | 2.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 50°   | 256.0 | 112.0 | 16.7 | 4.7  | 0.7  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 52.5° | 326.7 | 118.0 | 11.3 | 4.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 55°   | 334.7 | 81.3  | 8.7  | 2.7  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 57.5° | 266.7 | 52.7  | 7.3  | 2.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 60°   | 202.0 | 40.0  | 6.7  | 0.7  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 61°   | 194.0 | 36.0  | 6.7  | 0.7  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 62.5° | 214.0 | 31.3  | 6.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 65°   | 348.1 | 26.0  | 5.3  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 67.5° | 604.8 | 22.7  | 4.7  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 70°   | 764.1 | 21.3  | 4.0  | 0.7  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 72.5° | 666.1 | 19.3  | 4.0  | 1.3  | 0.7  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 75°   | 400.7 | 16.7  | 4.0  | 2.7  | 1.3  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 77.5° | 210.0 | 12.7  | 4.0  | 3.3  | 2.0  | 0.7  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 80°   | 102.0 | 11.3  | 4.7  | 3.3  | 2.7  | 1.3  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 82.5° | 40.0  | 9.3   | 5.3  | 4.7  | 3.3  | 2.0  | 0.7  | 0.0  | 0.0  | 0.0  | 0.0  |
| 85°   | 18.0  | 8.0   | 6.0  | 5.3  | 4.7  | 2.7  | 0.7  | 0.0  | 0.0  | 0.0  | 0.0  |
| 87.5° | 9.3   | 7.3   | 6.7  | 6.0  | 4.7  | 3.3  | 1.3  | 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: SP1-2407-184-14

Test Date: 10/11/2024

Luminaire Tested: GSS-SB1A-930-U-5WQ

Data in this report applies to families of products including GSS-SB1A-930-U-5WQ

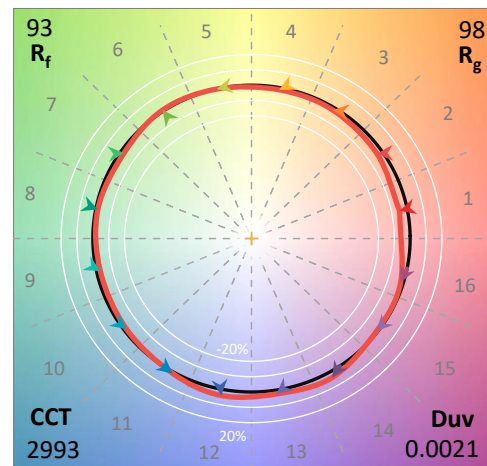
### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2407-184-14  
 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-930-U-5WQ**  
 Description: GALLEON II SITE SLIM 1SQ 350MA 5WQ HIGH DENSITY LIGHTSQUARE WITH 90 CRI  
 3000K CCT 26 LEDS

### Spectral Parameters

CCT (K): 2993  
 CIE  $u'$ : 0.2501  
 CIE  $v'$ : 0.5245  
 Duv: 0.0021  
 CIE x: 0.4406  
 CIE y: 0.4107  
 CIE z: 0.1487  
 Peak Wavelength (nm): 621  
 Dominant Wavelength (nm): 582  
 Purity: 55.53327  
 R<sub>f</sub>: 92.6  
 R<sub>g</sub>: 98.5

CRI (Ra): 92.4  
 R1: 92.2  
 R2: 95.2  
 R3: 97.0  
 R4: 93.1  
 R5: 91.7  
 R6: 94.2  
 R7: 93.3  
 R8: 82.3  
 R9: 58.2  
 R10: 87.7  
 R11: 93.5  
 R12: 81.7  
 R13: 92.9  
 R14: 97.6  
 R15: 88.1



### Test Conditions

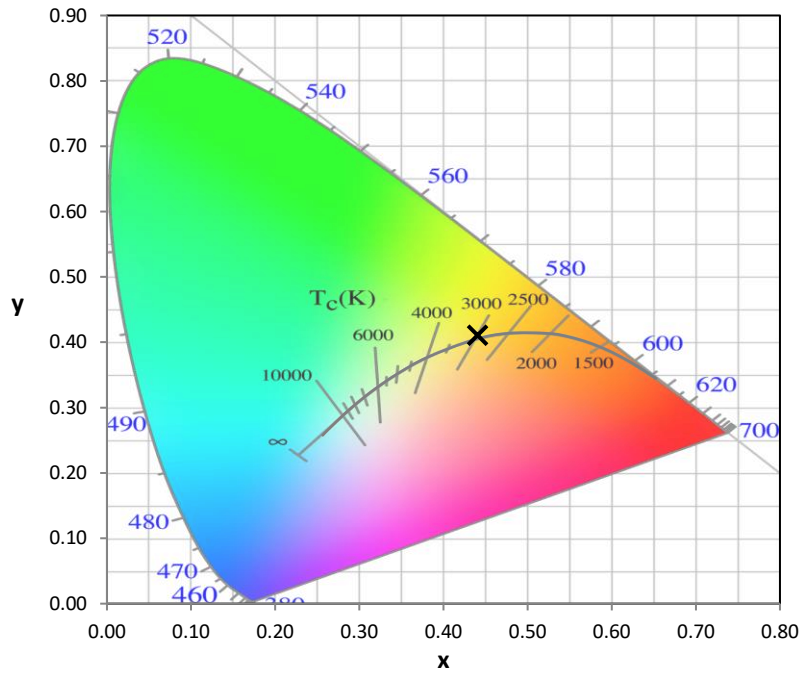
Stabilization Time: 20M  
 Operation Time: 1H 20M  
 Sphere Temperature (°C): 25.2

REPORT NUMBER: SP1-2407-184-14

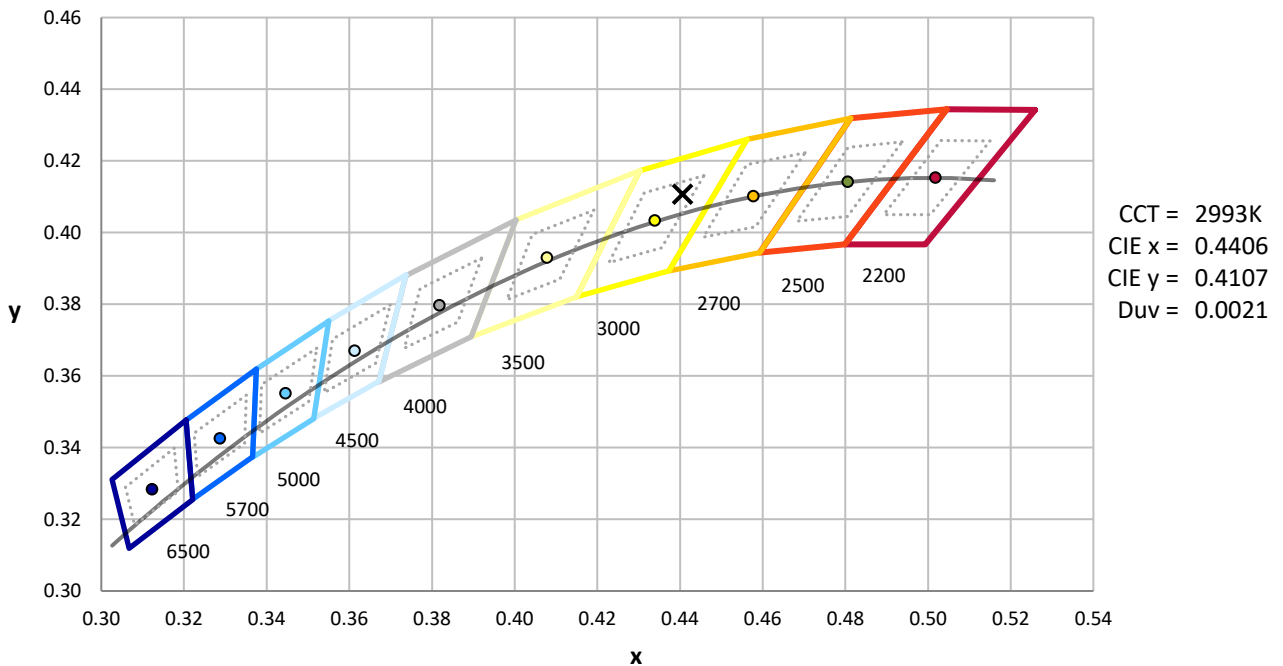
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| 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: SP1-2407-184-14

**CIE 1931 Chromaticity Diagram**



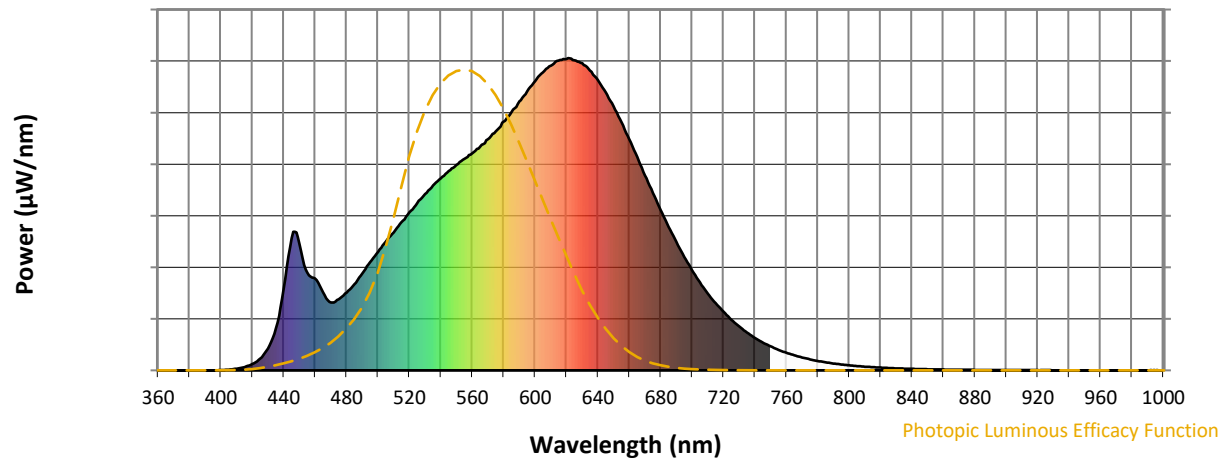
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 3000K 4-step quadrangle

REPORT NUMBER: SP1-2407-184-14

### Photopic Flux vs. Wavelength

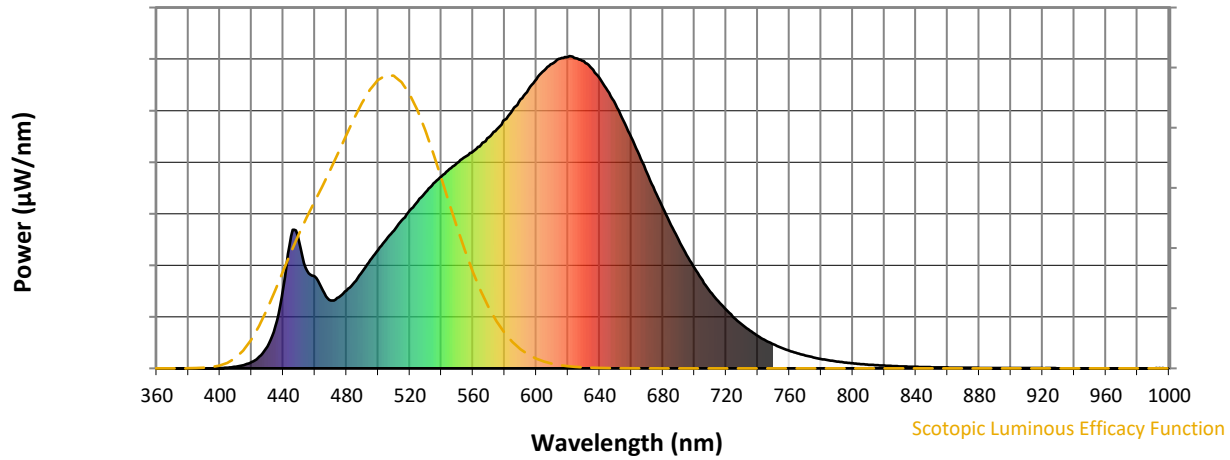


### Photopic Lumens: NR

| $\lambda$<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               | 310                                    | NR                             | 620               | 998                                    | NR                             | 750               | 77                                     | NR                             | 880               | 2                                      | NR                             |
| 365               | 0                                      | NR                             | 495               | 347                                    | NR                             | 625               | 993                                    | NR                             | 755               | 66                                     | NR                             | 885               | 1                                      | NR                             |
| 370               | 0                                      | NR                             | 500               | 379                                    | NR                             | 630               | 983                                    | NR                             | 760               | 56                                     | NR                             | 890               | 1                                      | NR                             |
| 375               | 0                                      | NR                             | 505               | 412                                    | NR                             | 635               | 960                                    | NR                             | 765               | 48                                     | NR                             | 895               | 1                                      | NR                             |
| 380               | 0                                      | NR                             | 510               | 442                                    | NR                             | 640               | 930                                    | NR                             | 770               | 41                                     | NR                             | 900               | 1                                      | NR                             |
| 385               | 0                                      | NR                             | 515               | 475                                    | NR                             | 645               | 889                                    | NR                             | 775               | 35                                     | NR                             | 905               | 1                                      | NR                             |
| 390               | 0                                      | NR                             | 520               | 506                                    | NR                             | 650               | 846                                    | NR                             | 780               | 30                                     | NR                             | 910               | 1                                      | NR                             |
| 395               | 0                                      | NR                             | 525               | 535                                    | NR                             | 655               | 794                                    | NR                             | 785               | 26                                     | NR                             | 915               | 1                                      | NR                             |
| 400               | 1                                      | NR                             | 530               | 565                                    | NR                             | 660               | 740                                    | NR                             | 790               | 22                                     | NR                             | 920               | 1                                      | NR                             |
| 405               | 2                                      | NR                             | 535               | 592                                    | NR                             | 665               | 684                                    | NR                             | 795               | 19                                     | NR                             | 925               | 1                                      | NR                             |
| 410               | 6                                      | NR                             | 540               | 615                                    | NR                             | 670               | 624                                    | NR                             | 800               | 16                                     | NR                             | 930               | 0                                      | NR                             |
| 415               | 10                                     | NR                             | 545               | 638                                    | NR                             | 675               | 567                                    | NR                             | 805               | 14                                     | NR                             | 935               | 0                                      | NR                             |
| 420               | 20                                     | NR                             | 550               | 658                                    | NR                             | 680               | 513                                    | NR                             | 810               | 12                                     | NR                             | 940               | 0                                      | NR                             |
| 425               | 38                                     | NR                             | 555               | 678                                    | NR                             | 685               | 459                                    | NR                             | 815               | 10                                     | NR                             | 945               | 0                                      | NR                             |
| 430               | 70                                     | NR                             | 560               | 695                                    | NR                             | 690               | 412                                    | NR                             | 820               | 9                                      | NR                             | 950               | 0                                      | NR                             |
| 435               | 136                                    | NR                             | 565               | 716                                    | NR                             | 695               | 363                                    | NR                             | 825               | 8                                      | NR                             | 955               | 0                                      | NR                             |
| 440               | 262                                    | NR                             | 570               | 740                                    | NR                             | 700               | 320                                    | NR                             | 830               | 7                                      | NR                             | 960               | 0                                      | NR                             |
| 445               | 424                                    | NR                             | 575               | 765                                    | NR                             | 705               | 281                                    | NR                             | 835               | 6                                      | NR                             | 965               | 0                                      | NR                             |
| 450               | 406                                    | NR                             | 580               | 796                                    | NR                             | 710               | 245                                    | NR                             | 840               | 5                                      | NR                             | 970               | 0                                      | NR                             |
| 455               | 313                                    | NR                             | 585               | 827                                    | NR                             | 715               | 215                                    | NR                             | 845               | 4                                      | NR                             | 975               | 0                                      | NR                             |
| 460               | 294                                    | NR                             | 590               | 861                                    | NR                             | 720               | 188                                    | NR                             | 850               | 4                                      | NR                             | 980               | 0                                      | NR                             |
| 465               | 250                                    | NR                             | 595               | 894                                    | NR                             | 725               | 162                                    | NR                             | 855               | 3                                      | NR                             | 985               | 0                                      | NR                             |
| 470               | 217                                    | NR                             | 600               | 927                                    | NR                             | 730               | 140                                    | NR                             | 860               | 3                                      | NR                             | 990               | 0                                      | NR                             |
| 475               | 228                                    | NR                             | 605               | 954                                    | NR                             | 735               | 121                                    | NR                             | 865               | 2                                      | NR                             | 995               | 0                                      | NR                             |
| 480               | 249                                    | NR                             | 610               | 976                                    | NR                             | 740               | 104                                    | NR                             | 870               | 2                                      | NR                             | 1000              | 0                                      | NR                             |
| 485               | 276                                    | NR                             | 615               | 992                                    | NR                             | 745               | 89                                     | NR                             | 875               | 2                                      | NR                             |                   |                                        |                                |

REPORT NUMBER: SP1-2407-184-14

### Scotopic Flux vs. Wavelength



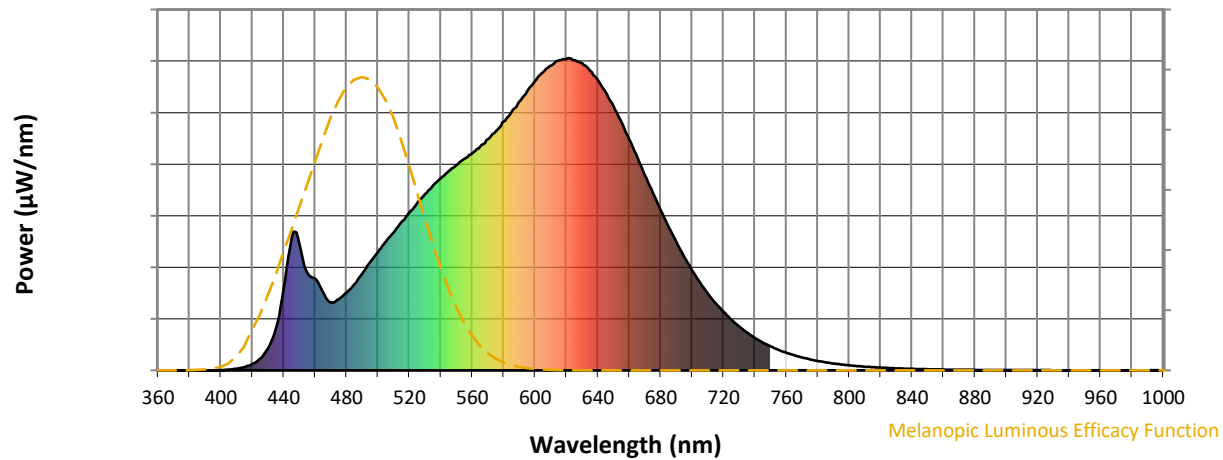
Scotopic Lumens: NR

S/P: 1.39

| 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       | 310                         | NR               | 620       | 998                         | NR               | 750       | 77                          | NR               | 880       | 2                           | NR               |
| 365       | 0                           | NR               | 495       | 347                         | NR               | 625       | 993                         | NR               | 755       | 66                          | NR               | 885       | 1                           | NR               |
| 370       | 0                           | NR               | 500       | 379                         | NR               | 630       | 983                         | NR               | 760       | 56                          | NR               | 890       | 1                           | NR               |
| 375       | 0                           | NR               | 505       | 412                         | NR               | 635       | 960                         | NR               | 765       | 48                          | NR               | 895       | 1                           | NR               |
| 380       | 0                           | NR               | 510       | 442                         | NR               | 640       | 930                         | NR               | 770       | 41                          | NR               | 900       | 1                           | NR               |
| 385       | 0                           | NR               | 515       | 475                         | NR               | 645       | 889                         | NR               | 775       | 35                          | NR               | 905       | 1                           | NR               |
| 390       | 0                           | NR               | 520       | 506                         | NR               | 650       | 846                         | NR               | 780       | 30                          | NR               | 910       | 1                           | NR               |
| 395       | 0                           | NR               | 525       | 535                         | NR               | 655       | 794                         | NR               | 785       | 26                          | NR               | 915       | 1                           | NR               |
| 400       | 1                           | NR               | 530       | 565                         | NR               | 660       | 740                         | NR               | 790       | 22                          | NR               | 920       | 1                           | NR               |
| 405       | 2                           | NR               | 535       | 592                         | NR               | 665       | 684                         | NR               | 795       | 19                          | NR               | 925       | 1                           | NR               |
| 410       | 6                           | NR               | 540       | 615                         | NR               | 670       | 624                         | NR               | 800       | 16                          | NR               | 930       | 0                           | NR               |
| 415       | 10                          | NR               | 545       | 638                         | NR               | 675       | 567                         | NR               | 805       | 14                          | NR               | 935       | 0                           | NR               |
| 420       | 20                          | NR               | 550       | 658                         | NR               | 680       | 513                         | NR               | 810       | 12                          | NR               | 940       | 0                           | NR               |
| 425       | 38                          | NR               | 555       | 678                         | NR               | 685       | 459                         | NR               | 815       | 10                          | NR               | 945       | 0                           | NR               |
| 430       | 70                          | NR               | 560       | 695                         | NR               | 690       | 412                         | NR               | 820       | 9                           | NR               | 950       | 0                           | NR               |
| 435       | 136                         | NR               | 565       | 716                         | NR               | 695       | 363                         | NR               | 825       | 8                           | NR               | 955       | 0                           | NR               |
| 440       | 262                         | NR               | 570       | 740                         | NR               | 700       | 320                         | NR               | 830       | 7                           | NR               | 960       | 0                           | NR               |
| 445       | 424                         | NR               | 575       | 765                         | NR               | 705       | 281                         | NR               | 835       | 6                           | NR               | 965       | 0                           | NR               |
| 450       | 406                         | NR               | 580       | 796                         | NR               | 710       | 245                         | NR               | 840       | 5                           | NR               | 970       | 0                           | NR               |
| 455       | 313                         | NR               | 585       | 827                         | NR               | 715       | 215                         | NR               | 845       | 4                           | NR               | 975       | 0                           | NR               |
| 460       | 294                         | NR               | 590       | 861                         | NR               | 720       | 188                         | NR               | 850       | 4                           | NR               | 980       | 0                           | NR               |
| 465       | 250                         | NR               | 595       | 894                         | NR               | 725       | 162                         | NR               | 855       | 3                           | NR               | 985       | 0                           | NR               |
| 470       | 217                         | NR               | 600       | 927                         | NR               | 730       | 140                         | NR               | 860       | 3                           | NR               | 990       | 0                           | NR               |
| 475       | 228                         | NR               | 605       | 954                         | NR               | 735       | 121                         | NR               | 865       | 2                           | NR               | 995       | 0                           | NR               |
| 480       | 249                         | NR               | 610       | 976                         | NR               | 740       | 104                         | NR               | 870       | 2                           | NR               | 1000      | 0                           | NR               |
| 485       | 276                         | NR               | 615       | 992                         | NR               | 745       | 89                          | NR               | 875       | 2                           | NR               |           |                             |                  |

REPORT NUMBER: SP1-2407-184-14

### Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 2.69

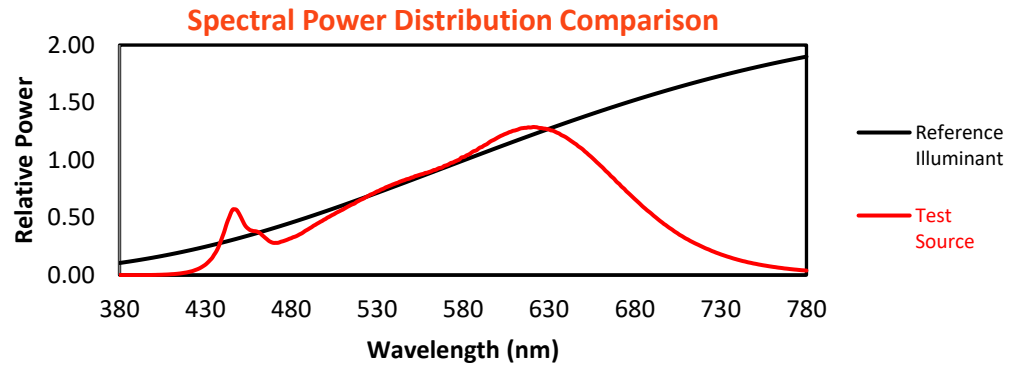
| $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | 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               | 310                                    | NR                             | 620               | 998                                    | NR                             | 750               | 77                                     | NR                             | 880               | 2                                      | NR                             |
| 365               | 0                                      | NR                             | 495               | 347                                    | NR                             | 625               | 993                                    | NR                             | 755               | 66                                     | NR                             | 885               | 1                                      | NR                             |
| 370               | 0                                      | NR                             | 500               | 379                                    | NR                             | 630               | 983                                    | NR                             | 760               | 56                                     | NR                             | 890               | 1                                      | NR                             |
| 375               | 0                                      | NR                             | 505               | 412                                    | NR                             | 635               | 960                                    | NR                             | 765               | 48                                     | NR                             | 895               | 1                                      | NR                             |
| 380               | 0                                      | NR                             | 510               | 442                                    | NR                             | 640               | 930                                    | NR                             | 770               | 41                                     | NR                             | 900               | 1                                      | NR                             |
| 385               | 0                                      | NR                             | 515               | 475                                    | NR                             | 645               | 889                                    | NR                             | 775               | 35                                     | NR                             | 905               | 1                                      | NR                             |
| 390               | 0                                      | NR                             | 520               | 506                                    | NR                             | 650               | 846                                    | NR                             | 780               | 30                                     | NR                             | 910               | 1                                      | NR                             |
| 395               | 0                                      | NR                             | 525               | 535                                    | NR                             | 655               | 794                                    | NR                             | 785               | 26                                     | NR                             | 915               | 1                                      | NR                             |
| 400               | 1                                      | NR                             | 530               | 565                                    | NR                             | 660               | 740                                    | NR                             | 790               | 22                                     | NR                             | 920               | 1                                      | NR                             |
| 405               | 2                                      | NR                             | 535               | 592                                    | NR                             | 665               | 684                                    | NR                             | 795               | 19                                     | NR                             | 925               | 1                                      | NR                             |
| 410               | 6                                      | NR                             | 540               | 615                                    | NR                             | 670               | 624                                    | NR                             | 800               | 16                                     | NR                             | 930               | 0                                      | NR                             |
| 415               | 10                                     | NR                             | 545               | 638                                    | NR                             | 675               | 567                                    | NR                             | 805               | 14                                     | NR                             | 935               | 0                                      | NR                             |
| 420               | 20                                     | NR                             | 550               | 658                                    | NR                             | 680               | 513                                    | NR                             | 810               | 12                                     | NR                             | 940               | 0                                      | NR                             |
| 425               | 38                                     | NR                             | 555               | 678                                    | NR                             | 685               | 459                                    | NR                             | 815               | 10                                     | NR                             | 945               | 0                                      | NR                             |
| 430               | 70                                     | NR                             | 560               | 695                                    | NR                             | 690               | 412                                    | NR                             | 820               | 9                                      | NR                             | 950               | 0                                      | NR                             |
| 435               | 136                                    | NR                             | 565               | 716                                    | NR                             | 695               | 363                                    | NR                             | 825               | 8                                      | NR                             | 955               | 0                                      | NR                             |
| 440               | 262                                    | NR                             | 570               | 740                                    | NR                             | 700               | 320                                    | NR                             | 830               | 7                                      | NR                             | 960               | 0                                      | NR                             |
| 445               | 424                                    | NR                             | 575               | 765                                    | NR                             | 705               | 281                                    | NR                             | 835               | 6                                      | NR                             | 965               | 0                                      | NR                             |
| 450               | 406                                    | NR                             | 580               | 796                                    | NR                             | 710               | 245                                    | NR                             | 840               | 5                                      | NR                             | 970               | 0                                      | NR                             |
| 455               | 313                                    | NR                             | 585               | 827                                    | NR                             | 715               | 215                                    | NR                             | 845               | 4                                      | NR                             | 975               | 0                                      | NR                             |
| 460               | 294                                    | NR                             | 590               | 861                                    | NR                             | 720               | 188                                    | NR                             | 850               | 4                                      | NR                             | 980               | 0                                      | NR                             |
| 465               | 250                                    | NR                             | 595               | 894                                    | NR                             | 725               | 162                                    | NR                             | 855               | 3                                      | NR                             | 985               | 0                                      | NR                             |
| 470               | 217                                    | NR                             | 600               | 927                                    | NR                             | 730               | 140                                    | NR                             | 860               | 3                                      | NR                             | 990               | 0                                      | NR                             |
| 475               | 228                                    | NR                             | 605               | 954                                    | NR                             | 735               | 121                                    | NR                             | 865               | 2                                      | NR                             | 995               | 0                                      | NR                             |
| 480               | 249                                    | NR                             | 610               | 976                                    | NR                             | 740               | 104                                    | NR                             | 870               | 2                                      | NR                             | 1000              | 0                                      | NR                             |
| 485               | 276                                    | NR                             | 615               | 992                                    | NR                             | 745               | 89                                     | NR                             | 875               | 2                                      | NR                             |                   |                                        |                                |

REPORT NUMBER: SP1-2407-184-14

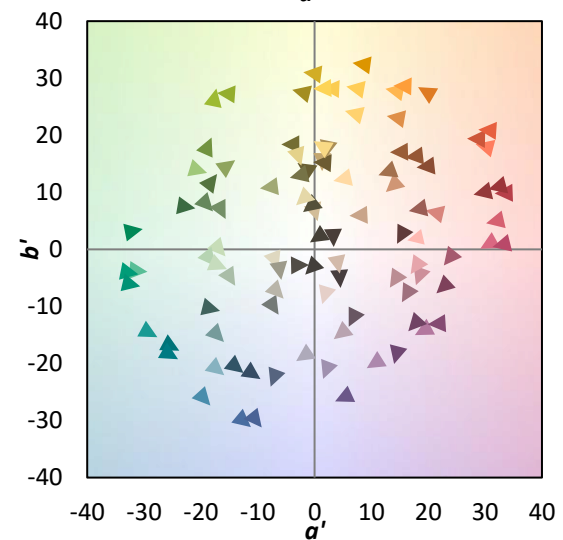
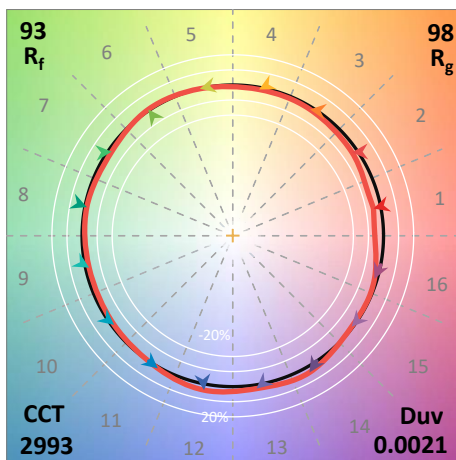
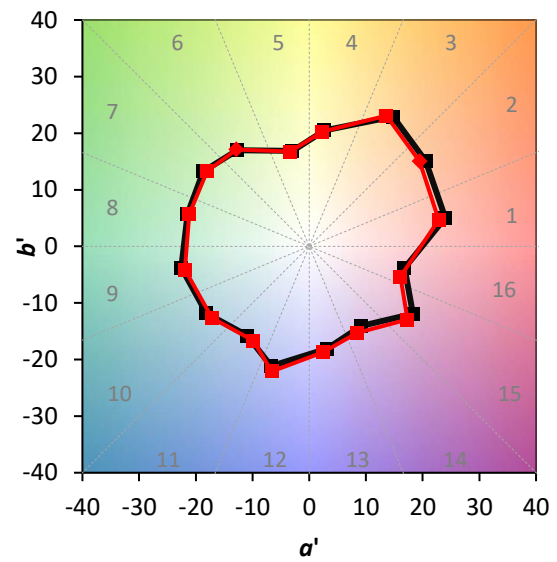
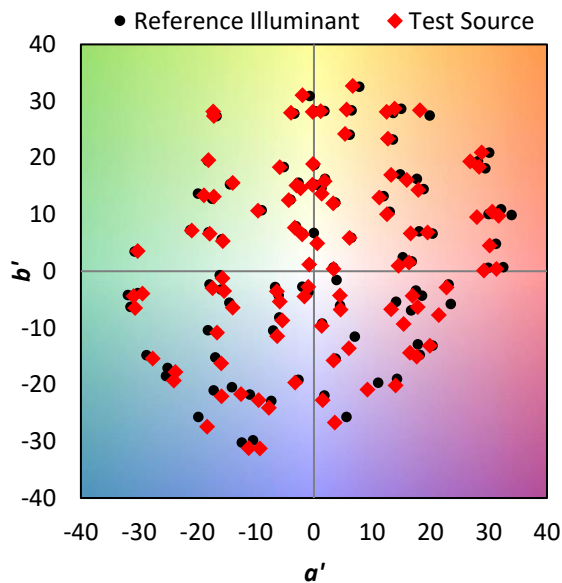
TM-30-18

### Summary

$R_f = 92.6$   
 $R_g = 98.5$   
 $\text{CIE } R_a = 92.4$   
 $R_9 = 58.2$

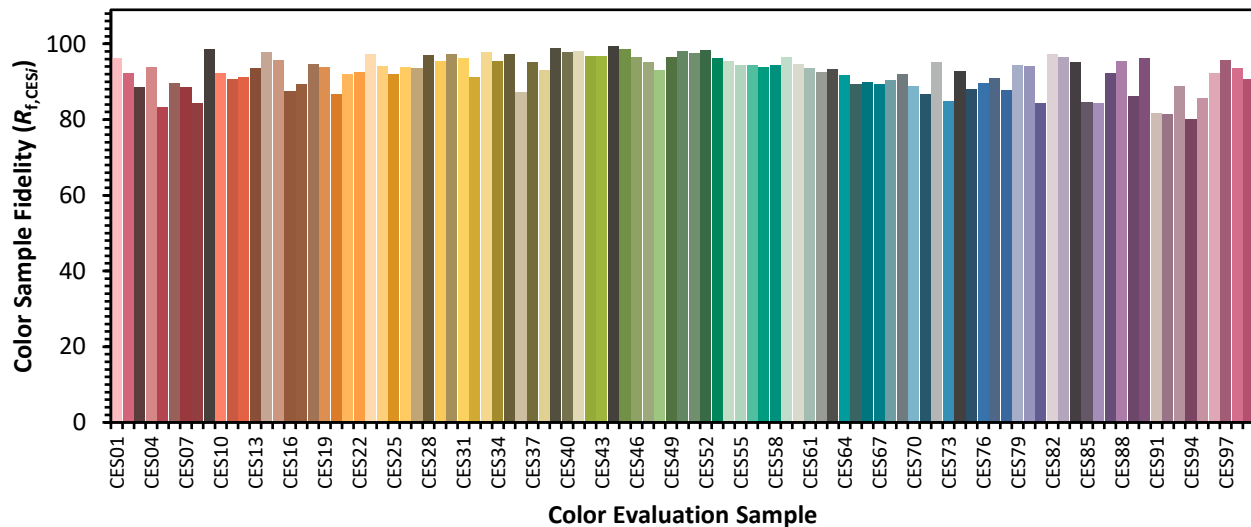


### Color Vector Graphics

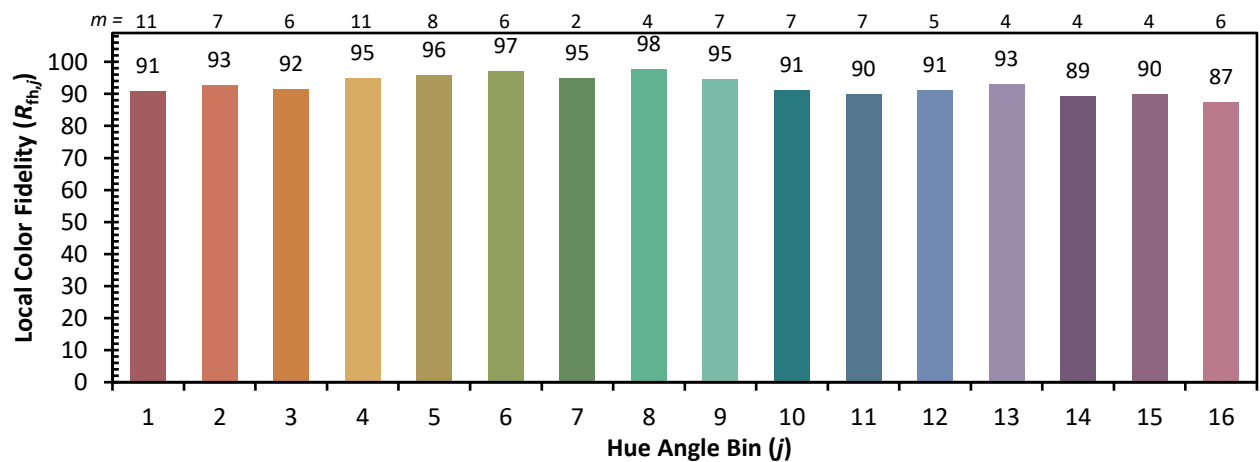
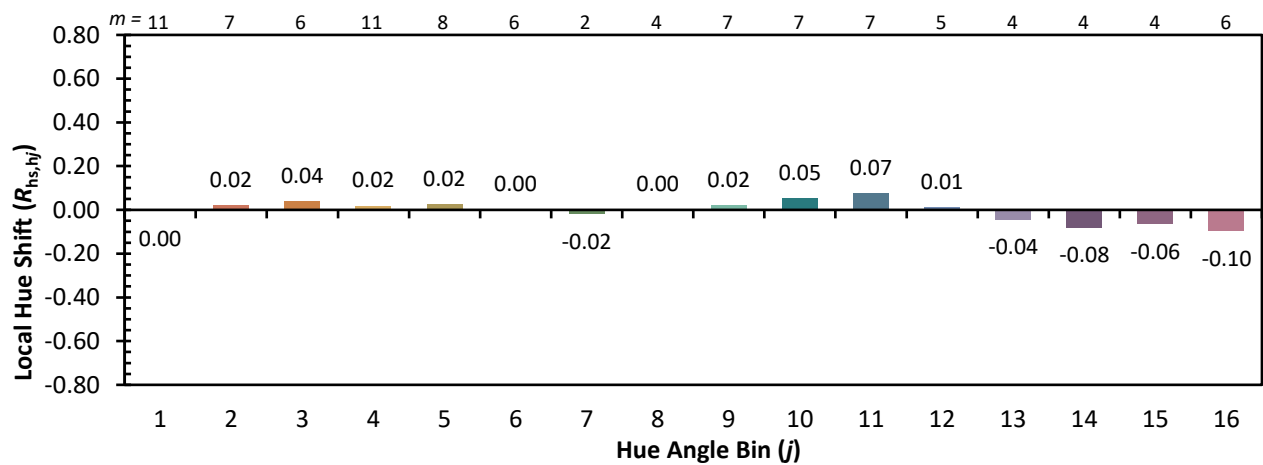
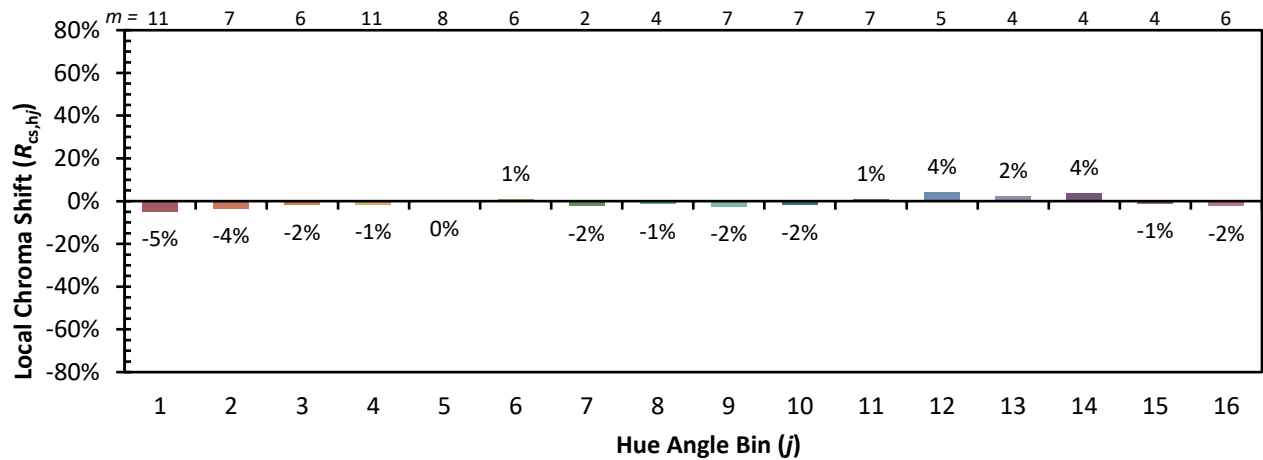


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

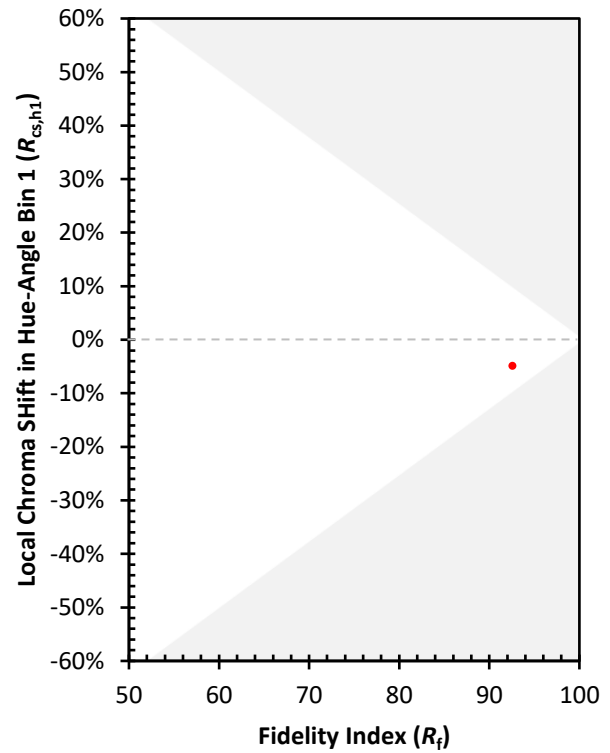
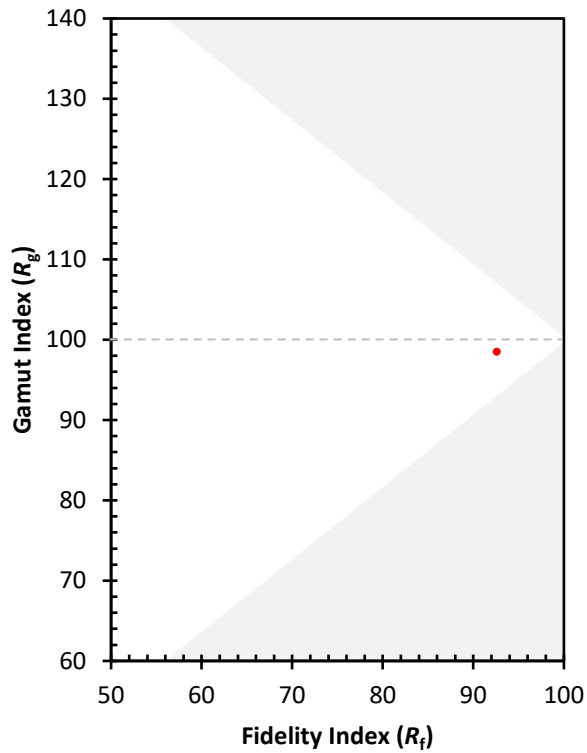
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 94 | CES51 = 98 | CES76 = 90 |
| CES02 = 63 | CES27 = 94 | CES52 = 98 | CES77 = 91 |
| CES03 = 32 | CES28 = 97 | CES53 = 96 | CES78 = 88 |
| CES04 = 70 | CES29 = 95 | CES54 = 95 | CES79 = 94 |
| CES05 = 51 | CES30 = 97 | CES55 = 94 | CES80 = 94 |
| CES06 = 51 | CES31 = 96 | CES56 = 94 | CES81 = 84 |
| CES07 = 43 | CES32 = 91 | CES57 = 94 | CES82 = 97 |
| CES08 = 42 | CES33 = 98 | CES58 = 94 | CES83 = 97 |
| CES09 = 29 | CES34 = 96 | CES59 = 97 | CES84 = 95 |
| CES10 = 76 | CES35 = 97 | CES60 = 95 | CES85 = 85 |
| CES11 = 59 | CES36 = 87 | CES61 = 94 | CES86 = 84 |
| CES12 = 65 | CES37 = 95 | CES62 = 92 | CES87 = 92 |
| CES13 = 44 | CES38 = 93 | CES63 = 93 | CES88 = 95 |
| CES14 = 74 | CES39 = 99 | CES64 = 92 | CES89 = 86 |
| CES15 = 72 | CES40 = 98 | CES65 = 89 | CES90 = 96 |
| CES16 = 48 | CES41 = 98 | CES66 = 90 | CES91 = 82 |
| CES17 = 50 | CES42 = 97 | CES67 = 89 | CES92 = 81 |
| CES18 = 57 | CES43 = 97 | CES68 = 90 | CES93 = 89 |
| CES19 = 72 | CES44 = 99 | CES69 = 92 | CES94 = 80 |
| CES20 = 67 | CES45 = 99 | CES70 = 89 | CES95 = 86 |
| CES21 = 86 | CES46 = 96 | CES71 = 87 | CES96 = 92 |
| CES22 = 79 | CES47 = 95 | CES72 = 95 | CES97 = 96 |
| CES23 = 92 | CES48 = 93 | CES73 = 85 | CES98 = 94 |
| CES24 = 91 | CES49 = 97 | CES74 = 93 | CES99 = 91 |
| CES25 = 72 | CES50 = 98 | CES75 = 88 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)