

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: P1047569

Luminaire Tested: **GALN-SA5A-940-U-T3BC**

Issue Date: 07/10/2025

**Test Information**

Test Method: LM-79-08  
Report Number: P1047569  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 07/10/2025  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: MCGRAW-EDISON  
Catalog Number: GALN-SA5A-940-U-T3BC  
Description: GALLEON II AREA AND ROADWAY LUMINAIRE 615mA 5xLight Square PACKAGE  
90CRI 4000K FIXTURE w/ TYPE III ANGLED BACKLIGHT CONTROL  
Light Source: (70) 4000K CCT, 90 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 13638.8 lumens  
Efficiency: N/A  
Efficacy: 99.8 lumens/watt  
Luminous Opening: Rectangular (W 1.5' x L: 1' x H: 0')  
IES Classification: Type III - Short  
BUG Rating: B0 - U0 - G3

Input Watts (W): 136.6  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.97  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT

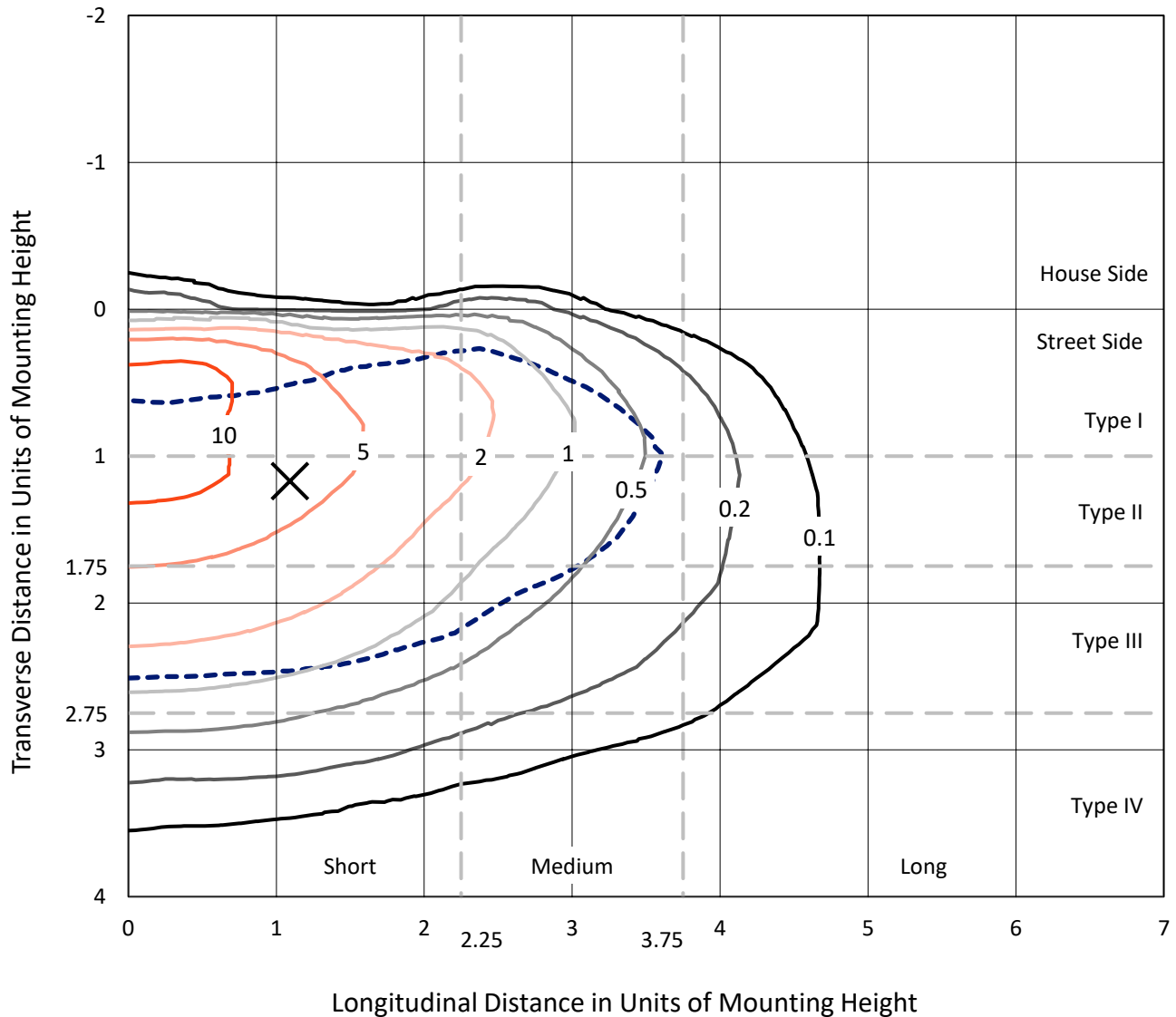


REPORT NUMBER: P1047569

CATALOG NUMBER: GALN-SA5A-940-U-T3BC

## Iso-Footcandle Lines of Horizontal Illumination

× Max cd  
 - - - 1/2 Max cd

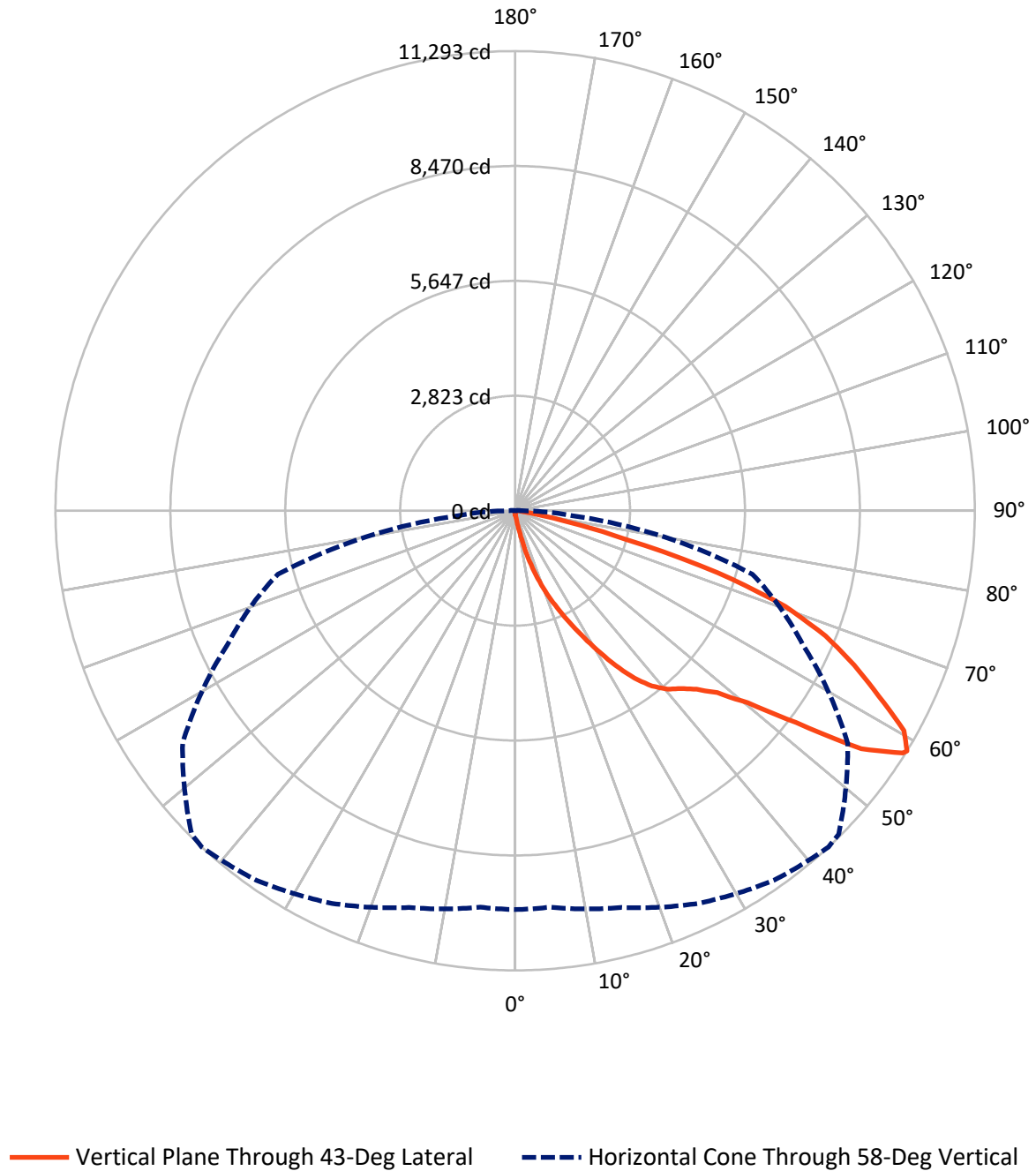


Based on 15 foot mounting height. Maximum calculated value = 15.3 fc  
 Type III - Short - N/A

REPORT NUMBER: P1047569

CATALOG NUMBER: GALN-SA5A-940-U-T3BC

## Luminous Intensity Polar Plot



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**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 49.8     | 0.0    | 49.8    |
|                    | % Fixture | 0.4      | 0.0    | 0.4     |
| <b>Street Side</b> | Lumens    | 13589.0  | 0.0    | 13589.0 |
|                    | % Fixture | 99.6     | 0.0    | 99.6    |
| <b>Total</b>       | Lumens    | 13638.8  | 0.0    | 13638.8 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 13.1    | 0.1       |
| 10°-20°   | 156.8   | 1.1       |
| 20°-30°   | 565.1   | 4.1       |
| 30°-40°   | 1292.9  | 9.5       |
| 40°-50°   | 2180.6  | 16.0      |
| 50°-60°   | 3598.5  | 26.4      |
| 60°-70°   | 4021.8  | 29.5      |
| 70°-80°   | 1660.5  | 12.2      |
| 80°-90°   | 149.7   | 1.1       |
| 90°-100°  | 0.0     | 0.0       |
| 100°-110° | 0.0     | 0.0       |
| 110°-120° | 0.0     | 0.0       |
| 120°-130° | 0.0     | 0.0       |
| 130°-140° | 0.0     | 0.0       |
| 140°-150° | 0.0     | 0.0       |
| 150°-160° | 0.0     | 0.0       |
| 160°-170° | 0.0     | 0.0       |
| 170°-180° | 0.0     | 0.0       |
| 0°-90°    | 13638.8 | 100.0     |
| 0°-180°   | 13638.8 | 100.0     |



REPORT NUMBER: P1047569

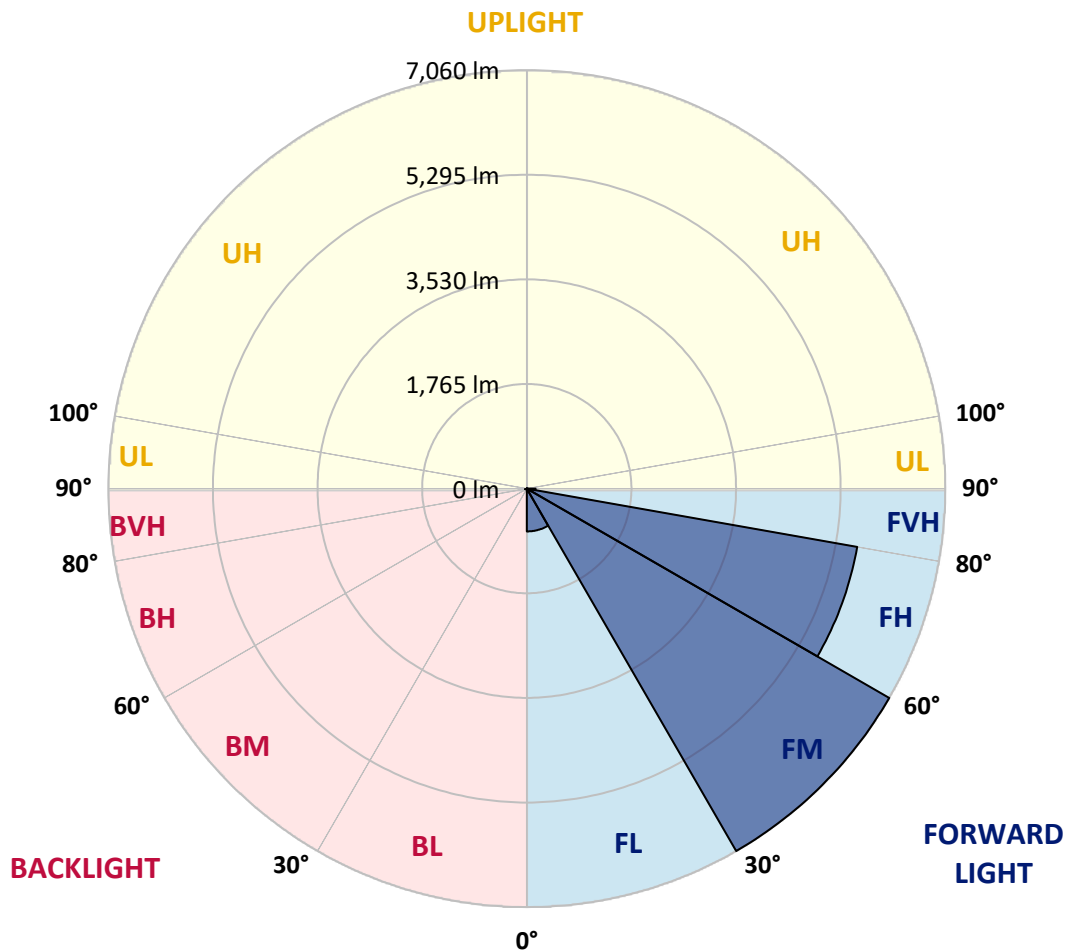
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**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 721.9  | 5.3       |                         |      |         |
| FM   | (30°-60°)   | 7060.0 | 51.8      |                         |      |         |
| FH   | (60°-80°)   | 5659.5 | 41.5      |                         |      | G3/7500 |
| FVH  | (80°-90°)   | 147.6  | 1.1       |                         |      | G2/225  |
| BL   | (0°-30°)    | 13.0   | 0.1       | B0/110                  |      |         |
| BM   | (30°-60°)   | 11.9   | 0.1       | B0/220                  |      |         |
| BH   | (60°-80°)   | 22.8   | 0.2       | B0/110                  |      | G0/110  |
| BVH  | (80°-90°)   | 2.1    | 0.0       |                         |      | G0/10   |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

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

Type III Short



REPORT NUMBER: P1047569

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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 43°     | 45°     | 55°     | 65°     | 75°    | 85°    |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--------|--------|
| 0°    | 89.2    | 89.2    | 89.2    | 89.2    | 89.2    | 89.2    | 89.2    | 89.2    | 89.2    | 89.2   | 89.2   |
| 2.5°  | 107.0   | 110.6   | 107.0   | 107.0   | 107.0   | 103.4   | 103.4   | 99.9    | 99.9    | 96.3   | 92.7   |
| 5°    | 157.0   | 157.0   | 146.3   | 139.1   | 132.0   | 128.4   | 124.8   | 117.7   | 110.6   | 103.4  | 96.3   |
| 7.5°  | 349.6   | 349.6   | 317.5   | 274.7   | 217.6   | 185.5   | 178.4   | 146.3   | 124.8   | 110.6  | 96.3   |
| 10°   | 834.7   | 834.7   | 763.4   | 645.6   | 499.4   | 371.0   | 331.7   | 210.5   | 149.8   | 117.7  | 99.9   |
| 12.5° | 1387.6  | 1405.4  | 1316.3  | 1166.4  | 948.8   | 724.1   | 645.6   | 385.2   | 199.8   | 128.4  | 99.9   |
| 15°   | 1883.4  | 1840.6  | 1815.7  | 1673.0  | 1466.1  | 1198.5  | 1098.7  | 649.2   | 288.9   | 146.3  | 99.9   |
| 17.5° | 2218.7  | 2218.7  | 2183.1  | 2086.8  | 1897.7  | 1662.3  | 1580.2  | 1048.7  | 467.3   | 167.7  | 103.4  |
| 20°   | 2611.1  | 2611.1  | 2546.9  | 2479.1  | 2311.5  | 2111.7  | 2033.2  | 1491.0  | 724.1   | 214.0  | 103.4  |
| 22.5° | 3085.5  | 3092.7  | 3021.3  | 2900.1  | 2739.5  | 2518.4  | 2450.6  | 1901.3  | 1048.7  | 285.4  | 107.0  |
| 25°   | 3663.4  | 3670.5  | 3567.1  | 3453.0  | 3206.8  | 2967.8  | 2864.4  | 2372.1  | 1444.7  | 399.5  | 107.0  |
| 27.5° | 4301.9  | 4351.9  | 4198.5  | 4002.3  | 3741.9  | 3442.3  | 3363.8  | 2796.6  | 1837.1  | 563.6  | 114.1  |
| 30°   | 5097.4  | 5097.4  | 4894.1  | 4619.4  | 4337.6  | 3966.6  | 3866.7  | 3242.5  | 2254.4  | 781.2  | 121.3  |
| 32.5° | 5782.3  | 5728.8  | 5468.4  | 5179.4  | 4879.8  | 4533.8  | 4426.8  | 3709.8  | 2682.5  | 1052.3 | 135.5  |
| 35°   | 6306.6  | 6260.3  | 5939.2  | 5628.9  | 5368.5  | 5051.0  | 4922.6  | 4216.3  | 3135.5  | 1359.1 | 157.0  |
| 37.5° | 6756.1  | 6738.3  | 6303.1  | 5914.3  | 5743.0  | 5464.8  | 5350.7  | 4694.3  | 3581.4  | 1690.8 | 181.9  |
| 40°   | 7248.4  | 7191.3  | 6727.6  | 6246.0  | 5989.2  | 5764.4  | 5661.0  | 5079.6  | 4009.4  | 2079.6 | 217.6  |
| 42.5° | 7669.3  | 7601.5  | 7184.1  | 6713.3  | 6274.5  | 5971.3  | 5871.5  | 5404.2  | 4426.8  | 2468.4 | 264.0  |
| 45°   | 8136.6  | 8100.9  | 7680.0  | 7323.3  | 6738.3  | 6253.1  | 6121.1  | 5664.6  | 4808.5  | 2932.2 | 324.6  |
| 47.5° | 8839.3  | 8775.1  | 8382.7  | 8090.2  | 7412.4  | 6681.2  | 6492.1  | 5932.1  | 5175.9  | 3388.7 | 417.4  |
| 50°   | 9656.1  | 9613.3  | 9381.5  | 9149.6  | 8475.4  | 7412.4  | 7187.7  | 6317.3  | 5586.1  | 3930.9 | 538.6  |
| 52.5° | 10323.2 | 10316.1 | 10344.6 | 10348.2 | 9838.1  | 8643.1  | 8307.8  | 6938.0  | 6056.9  | 4466.0 | 709.9  |
| 55°   | 10308.9 | 10341.0 | 10654.9 | 11015.2 | 11054.5 | 10323.2 | 9998.6  | 7983.2  | 6670.5  | 5125.9 | 948.8  |
| 57.5° | 9923.7  | 9898.7  | 10230.5 | 10772.7 | 11154.3 | 11232.8 | 11179.3 | 9606.2  | 7594.4  | 5921.4 | 1316.3 |
| 58°   | 9798.8  | 9777.4  | 10091.3 | 10644.2 | 11083.0 | 11293.4 | 11239.9 | 9973.6  | 7801.3  | 6035.5 | 1416.1 |
| 60°   | 9345.8  | 9349.4  | 9534.9  | 10037.8 | 10476.6 | 10976.0 | 11025.9 | 11022.3 | 8832.1  | 6798.9 | 1919.1 |
| 62.5° | 8746.5  | 8718.0  | 8889.2  | 9299.4  | 9684.7  | 10020.0 | 10105.6 | 11093.7 | 10341.0 | 7769.1 | 2878.7 |
| 65°   | 7919.0  | 7876.2  | 8058.1  | 8521.8  | 8935.6  | 9153.2  | 9156.8  | 10137.7 | 11050.9 | 8810.7 | 4248.4 |
| 67.5° | 6381.5  | 6345.9  | 6709.7  | 7305.4  | 7943.9  | 8229.3  | 8357.7  | 8796.5  | 10451.6 | 9517.0 | 5033.2 |
| 70°   | 3909.5  | 3984.5  | 4491.0  | 5425.6  | 6517.1  | 7041.5  | 7234.1  | 7369.6  | 8899.9  | 9410.0 | 4209.2 |
| 72.5° | 1805.0  | 1715.8  | 2147.4  | 2800.2  | 4045.1  | 5211.5  | 5411.3  | 5942.8  | 7055.7  | 8168.7 | 3139.1 |
| 75°   | 841.8   | 809.7   | 909.6   | 1223.5  | 1833.5  | 2814.4  | 3178.3  | 4744.2  | 5411.3  | 5682.4 | 2265.1 |
| 77.5° | 431.6   | 435.2   | 517.2   | 556.5   | 756.2   | 1302.0  | 1494.6  | 3121.2  | 3966.6  | 3171.2 | 1519.6 |
| 80°   | 189.1   | 196.2   | 199.8   | 217.6   | 306.8   | 503.0   | 567.2   | 1448.2  | 2711.0  | 1615.9 | 831.1  |
| 82.5° | 121.3   | 124.8   | 124.8   | 124.8   | 146.3   | 199.8   | 228.3   | 581.4   | 1351.9  | 802.6  | 256.8  |
| 85°   | 64.2    | 64.2    | 71.3    | 89.2    | 103.4   | 121.3   | 128.4   | 185.5   | 445.9   | 239.0  | 60.6   |
| 87.5° | 35.7    | 39.2    | 42.8    | 53.5    | 67.8    | 82.0    | 89.2    | 128.4   | 171.2   | 164.1  | 14.3   |
| 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: P1047569

CATALOG NUMBER: GALN-SA5A-940-U-T3BC

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°  | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|-------|--------|------|------|------|------|------|------|------|------|------|------|
| 0°    | 89.2   | 89.2 | 89.2 | 89.2 | 89.2 | 89.2 | 89.2 | 89.2 | 89.2 | 89.2 | 89.2 |
| 2.5°  | 92.7   | 89.2 | 85.6 | 82.0 | 78.5 | 74.9 | 74.9 | 74.9 | 74.9 | 74.9 | 74.9 |
| 5°    | 89.2   | 85.6 | 82.0 | 74.9 | 67.8 | 64.2 | 60.6 | 57.1 | 57.1 | 57.1 | 57.1 |
| 7.5°  | 89.2   | 85.6 | 74.9 | 67.8 | 60.6 | 53.5 | 46.4 | 46.4 | 46.4 | 46.4 | 46.4 |
| 10°   | 89.2   | 82.0 | 71.3 | 60.6 | 49.9 | 42.8 | 39.2 | 35.7 | 35.7 | 35.7 | 35.7 |
| 12.5° | 89.2   | 78.5 | 67.8 | 53.5 | 42.8 | 35.7 | 32.1 | 28.5 | 28.5 | 28.5 | 28.5 |
| 15°   | 89.2   | 78.5 | 64.2 | 49.9 | 39.2 | 28.5 | 25.0 | 21.4 | 21.4 | 21.4 | 21.4 |
| 17.5° | 85.6   | 74.9 | 60.6 | 42.8 | 32.1 | 21.4 | 17.8 | 14.3 | 14.3 | 17.8 | 17.8 |
| 20°   | 82.0   | 71.3 | 53.5 | 35.7 | 25.0 | 17.8 | 10.7 | 10.7 | 10.7 | 10.7 | 10.7 |
| 22.5° | 82.0   | 71.3 | 49.9 | 32.1 | 21.4 | 10.7 | 7.1  | 7.1  | 7.1  | 7.1  | 10.7 |
| 25°   | 82.0   | 67.8 | 42.8 | 25.0 | 14.3 | 7.1  | 3.6  | 3.6  | 3.6  | 3.6  | 3.6  |
| 27.5° | 82.0   | 67.8 | 39.2 | 21.4 | 10.7 | 7.1  | 3.6  | 0.0  | 0.0  | 0.0  | 0.0  |
| 30°   | 78.5   | 64.2 | 35.7 | 17.8 | 7.1  | 3.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 32.5° | 78.5   | 60.6 | 28.5 | 14.3 | 7.1  | 3.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 35°   | 82.0   | 57.1 | 25.0 | 10.7 | 3.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 3.6  |
| 37.5° | 85.6   | 53.5 | 21.4 | 7.1  | 3.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 40°   | 89.2   | 49.9 | 21.4 | 7.1  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 42.5° | 96.3   | 49.9 | 17.8 | 7.1  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 45°   | 103.4  | 49.9 | 14.3 | 3.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 47.5° | 117.7  | 53.5 | 14.3 | 3.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 50°   | 128.4  | 57.1 | 10.7 | 3.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 52.5° | 142.7  | 53.5 | 10.7 | 3.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 55°   | 160.5  | 53.5 | 10.7 | 3.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 57.5° | 174.8  | 49.9 | 10.7 | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 58°   | 181.9  | 46.4 | 7.1  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 60°   | 217.6  | 42.8 | 7.1  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 62.5° | 338.9  | 35.7 | 7.1  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 65°   | 688.5  | 32.1 | 7.1  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 67.5° | 1284.2 | 28.5 | 7.1  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 70°   | 1437.5 | 32.1 | 3.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 72.5° | 906.0  | 25.0 | 3.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 75°   | 478.0  | 25.0 | 3.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 77.5° | 239.0  | 25.0 | 3.6  | 3.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 80°   | 110.6  | 17.8 | 3.6  | 3.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 82.5° | 46.4   | 10.7 | 7.1  | 3.6  | 3.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 85°   | 21.4   | 10.7 | 7.1  | 7.1  | 3.6  | 3.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 87.5° | 10.7   | 10.7 | 10.7 | 7.1  | 7.1  | 3.6  | 3.6  | 0.0  | 0.0  | 0.0  | 0.0  |
| 90°   | 0.0    | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |

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

Report Prepared for

Cooper Lighting Solutions

McGraw-Edison

Report Number: SP1-2407-184-16

Test Date: 10/11/2024

Luminaire Tested: GSS-SB1A-940-U-5WQ

Data in this report applies to families of products including GSS-SB1A-940-U-5WQ

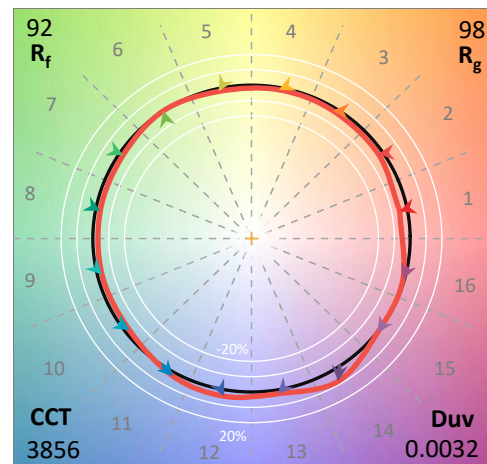
### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2407-184-16  
 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-940-U-5WQ**  
 Description: GALLEON II SITE SLIM 1SQ 350MA 5WQ HIGH DENSITY LIGHTSQUARE WITH 90 CRI 4000K CCT 26 LEDS

### Spectral Parameters

CCT (K): 3856  
 CIE  $u'$ : 0.2261  
 CIE  $v'$ : 0.5084  
 Duv: 0.0032  
 CIE x: 0.3896  
 CIE y: 0.3894  
 CIE z: 0.2211  
 Peak Wavelength (nm): 614  
 Dominant Wavelength (nm): 578  
 Purity: 33.77304  
 R<sub>f</sub>: 91.8  
 R<sub>g</sub>: 98.4

CRI (Ra): 92.1  
 R1: 91.8  
 R2: 94.1  
 R3: 95.3  
 R4: 92.8  
 R5: 91.0  
 R6: 91.6  
 R7: 95.0  
 R8: 85.2  
 R9: 60.7  
 R10: 85.2  
 R11: 92.4  
 R12: 74.5  
 R13: 92.3  
 R14: 97.0  
 R15: 88.5



### Test Conditions

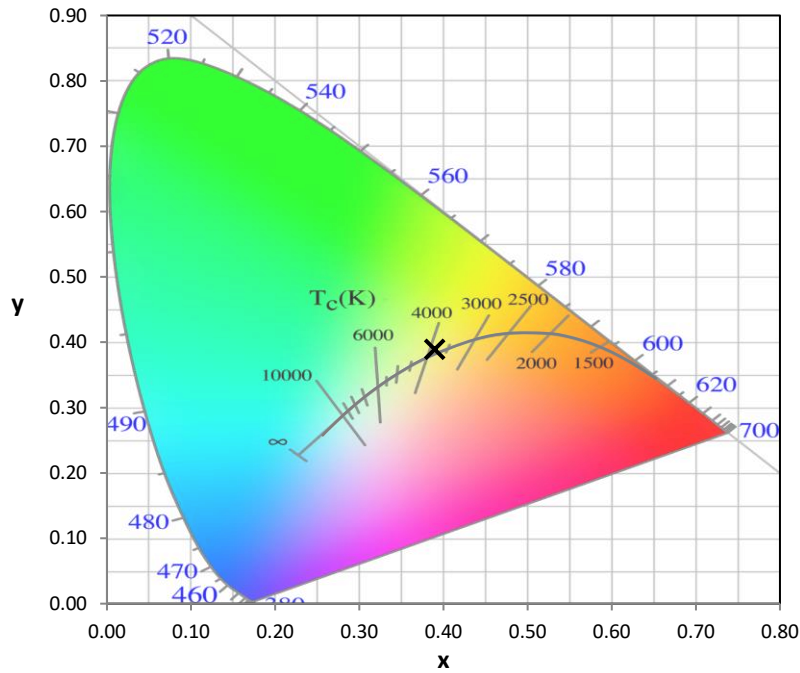
Stabilization Time: 23M  
 Operation Time: 1H 23M  
 Sphere Temperature (°C): 25.2

REPORT NUMBER: SP1-2407-184-16

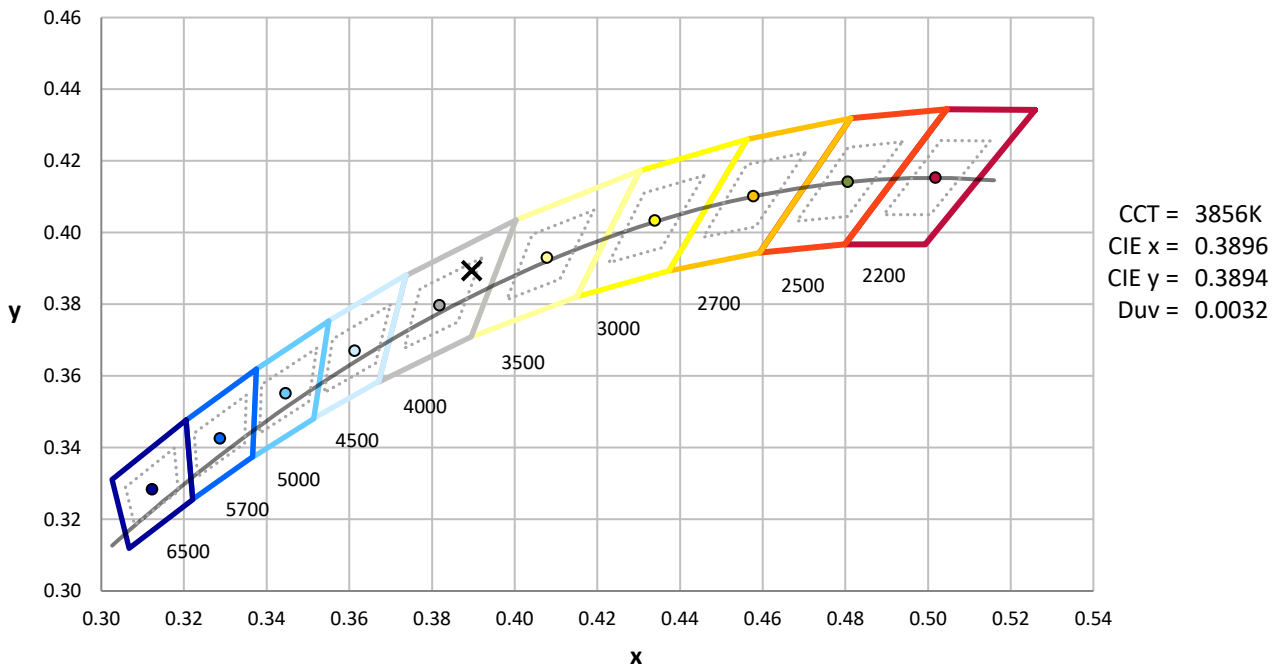
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| 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: SP1-2407-184-16

**CIE 1931 Chromaticity Diagram**



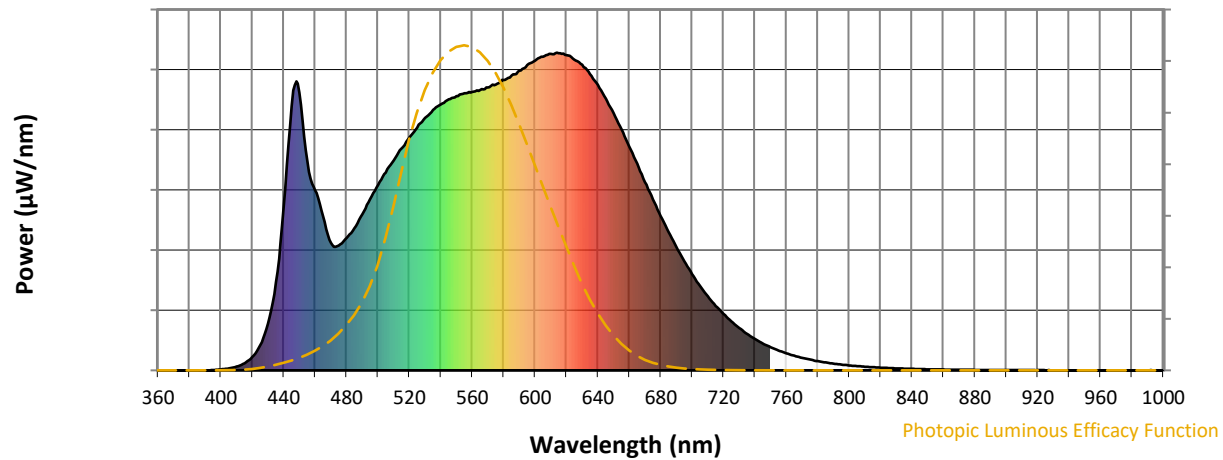
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 4000K 4-step quadrangle

REPORT NUMBER: SP1-2407-184-16

### Photopic Flux vs. Wavelength

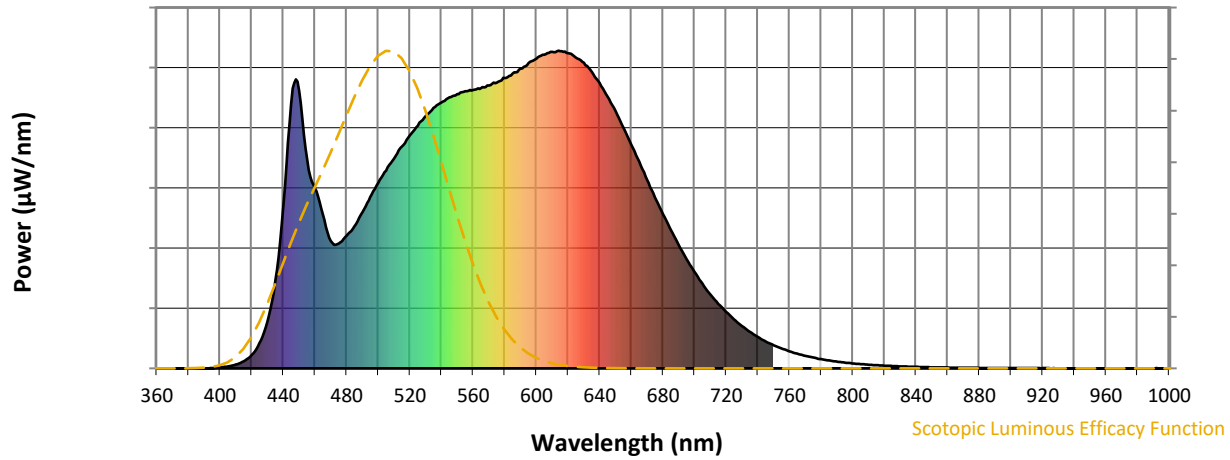


### Photopic Lumens: NR

| 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       | 492                         | NR               | 620       | 993                         | NR               | 750       | 73                          | NR               | 880       | 1                           | NR               |
| 365       | 0                           | NR               | 495       | 539                         | NR               | 625       | 978                         | NR               | 755       | 62                          | NR               | 885       | 1                           | NR               |
| 370       | 0                           | NR               | 500       | 583                         | NR               | 630       | 962                         | NR               | 760       | 54                          | NR               | 890       | 1                           | NR               |
| 375       | 0                           | NR               | 505       | 623                         | NR               | 635       | 933                         | NR               | 765       | 46                          | NR               | 895       | 1                           | NR               |
| 380       | 0                           | NR               | 510       | 661                         | NR               | 640       | 898                         | NR               | 770       | 39                          | NR               | 900       | 1                           | NR               |
| 385       | 0                           | NR               | 515       | 698                         | NR               | 645       | 855                         | NR               | 775       | 34                          | NR               | 905       | 1                           | NR               |
| 390       | 0                           | NR               | 520       | 733                         | NR               | 650       | 810                         | NR               | 780       | 29                          | NR               | 910       | 1                           | NR               |
| 395       | 1                           | NR               | 525       | 764                         | NR               | 655       | 759                         | NR               | 785       | 25                          | NR               | 915       | 1                           | NR               |
| 400       | 3                           | NR               | 530       | 794                         | NR               | 660       | 704                         | NR               | 790       | 21                          | NR               | 920       | 1                           | NR               |
| 405       | 6                           | NR               | 535       | 820                         | NR               | 665       | 651                         | NR               | 795       | 18                          | NR               | 925       | 1                           | NR               |
| 410       | 12                          | NR               | 540       | 837                         | NR               | 670       | 592                         | NR               | 800       | 16                          | NR               | 930       | 1                           | NR               |
| 415       | 22                          | NR               | 545       | 853                         | NR               | 675       | 538                         | NR               | 805       | 13                          | NR               | 935       | 0                           | NR               |
| 420       | 42                          | NR               | 550       | 864                         | NR               | 680       | 486                         | NR               | 810       | 12                          | NR               | 940       | 0                           | NR               |
| 425       | 79                          | NR               | 555       | 872                         | NR               | 685       | 435                         | NR               | 815       | 10                          | NR               | 945       | 0                           | NR               |
| 430       | 147                         | NR               | 560       | 876                         | NR               | 690       | 389                         | NR               | 820       | 9                           | NR               | 950       | 0                           | NR               |
| 435       | 278                         | NR               | 565       | 883                         | NR               | 695       | 344                         | NR               | 825       | 7                           | NR               | 955       | 0                           | NR               |
| 440       | 515                         | NR               | 570       | 891                         | NR               | 700       | 303                         | NR               | 830       | 6                           | NR               | 960       | 0                           | NR               |
| 445       | 832                         | NR               | 575       | 900                         | NR               | 705       | 266                         | NR               | 835       | 5                           | NR               | 965       | 0                           | NR               |
| 450       | 874                         | NR               | 580       | 914                         | NR               | 710       | 233                         | NR               | 840       | 5                           | NR               | 970       | 0                           | NR               |
| 455       | 659                         | NR               | 585       | 927                         | NR               | 715       | 203                         | NR               | 845       | 4                           | NR               | 975       | 0                           | NR               |
| 460       | 567                         | NR               | 590       | 944                         | NR               | 720       | 178                         | NR               | 850       | 4                           | NR               | 980       | 0                           | NR               |
| 465       | 485                         | NR               | 595       | 961                         | NR               | 725       | 154                         | NR               | 855       | 3                           | NR               | 985       | 0                           | NR               |
| 470       | 401                         | NR               | 600       | 975                         | NR               | 730       | 133                         | NR               | 860       | 3                           | NR               | 990       | 0                           | NR               |
| 475       | 393                         | NR               | 605       | 988                         | NR               | 735       | 115                         | NR               | 865       | 2                           | NR               | 995       | 1                           | NR               |
| 480       | 417                         | NR               | 610       | 996                         | NR               | 740       | 98                          | NR               | 870       | 2                           | NR               | 1000      | 0                           | NR               |
| 485       | 448                         | NR               | 615       | 998                         | NR               | 745       | 85                          | NR               | 875       | 2                           | NR               |           |                             |                  |

REPORT NUMBER: SP1-2407-184-16

### Scotopic Flux vs. Wavelength



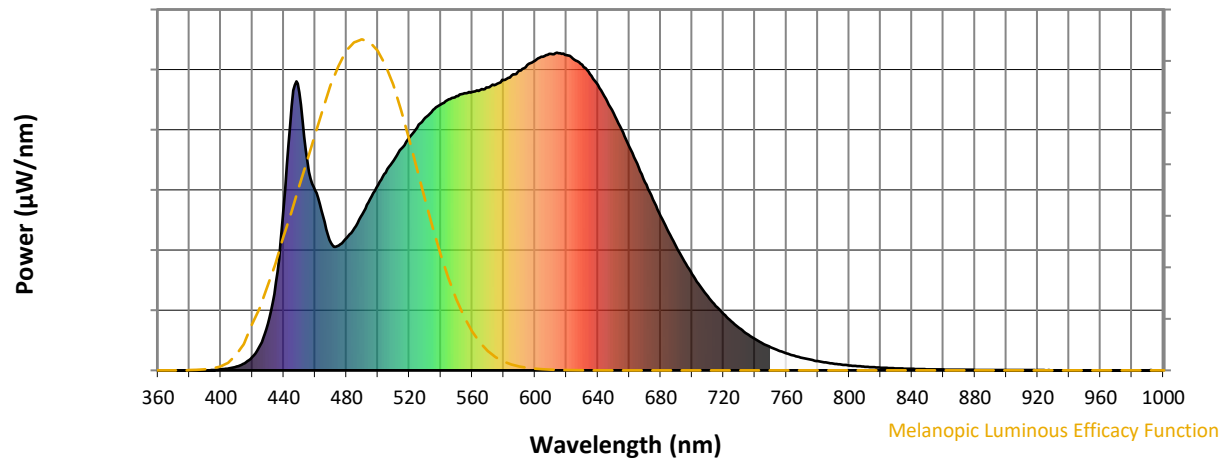
Scotopic Lumens: NR

S/P: 1.72

| λ (nm) | Power W <sup>^</sup> /nm | Lumens (Φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (Φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (Φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (Φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (Φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 360    | 0                        | NR            | 490    | 492                      | NR            | 620    | 993                      | NR            | 750    | 73                       | NR            | 880    | 1                        | NR            |
| 365    | 0                        | NR            | 495    | 539                      | NR            | 625    | 978                      | NR            | 755    | 62                       | NR            | 885    | 1                        | NR            |
| 370    | 0                        | NR            | 500    | 583                      | NR            | 630    | 962                      | NR            | 760    | 54                       | NR            | 890    | 1                        | NR            |
| 375    | 0                        | NR            | 505    | 623                      | NR            | 635    | 933                      | NR            | 765    | 46                       | NR            | 895    | 1                        | NR            |
| 380    | 0                        | NR            | 510    | 661                      | NR            | 640    | 898                      | NR            | 770    | 39                       | NR            | 900    | 1                        | NR            |
| 385    | 0                        | NR            | 515    | 698                      | NR            | 645    | 855                      | NR            | 775    | 34                       | NR            | 905    | 1                        | NR            |
| 390    | 0                        | NR            | 520    | 733                      | NR            | 650    | 810                      | NR            | 780    | 29                       | NR            | 910    | 1                        | NR            |
| 395    | 1                        | NR            | 525    | 764                      | NR            | 655    | 759                      | NR            | 785    | 25                       | NR            | 915    | 1                        | NR            |
| 400    | 3                        | NR            | 530    | 794                      | NR            | 660    | 704                      | NR            | 790    | 21                       | NR            | 920    | 1                        | NR            |
| 405    | 6                        | NR            | 535    | 820                      | NR            | 665    | 651                      | NR            | 795    | 18                       | NR            | 925    | 1                        | NR            |
| 410    | 12                       | NR            | 540    | 837                      | NR            | 670    | 592                      | NR            | 800    | 16                       | NR            | 930    | 1                        | NR            |
| 415    | 22                       | NR            | 545    | 853                      | NR            | 675    | 538                      | NR            | 805    | 13                       | NR            | 935    | 0                        | NR            |
| 420    | 42                       | NR            | 550    | 864                      | NR            | 680    | 486                      | NR            | 810    | 12                       | NR            | 940    | 0                        | NR            |
| 425    | 79                       | NR            | 555    | 872                      | NR            | 685    | 435                      | NR            | 815    | 10                       | NR            | 945    | 0                        | NR            |
| 430    | 147                      | NR            | 560    | 876                      | NR            | 690    | 389                      | NR            | 820    | 9                        | NR            | 950    | 0                        | NR            |
| 435    | 278                      | NR            | 565    | 883                      | NR            | 695    | 344                      | NR            | 825    | 7                        | NR            | 955    | 0                        | NR            |
| 440    | 515                      | NR            | 570    | 891                      | NR            | 700    | 303                      | NR            | 830    | 6                        | NR            | 960    | 0                        | NR            |
| 445    | 832                      | NR            | 575    | 900                      | NR            | 705    | 266                      | NR            | 835    | 5                        | NR            | 965    | 0                        | NR            |
| 450    | 874                      | NR            | 580    | 914                      | NR            | 710    | 233                      | NR            | 840    | 5                        | NR            | 970    | 0                        | NR            |
| 455    | 659                      | NR            | 585    | 927                      | NR            | 715    | 203                      | NR            | 845    | 4                        | NR            | 975    | 0                        | NR            |
| 460    | 567                      | NR            | 590    | 944                      | NR            | 720    | 178                      | NR            | 850    | 4                        | NR            | 980    | 0                        | NR            |
| 465    | 485                      | NR            | 595    | 961                      | NR            | 725    | 154                      | NR            | 855    | 3                        | NR            | 985    | 0                        | NR            |
| 470    | 401                      | NR            | 600    | 975                      | NR            | 730    | 133                      | NR            | 860    | 3                        | NR            | 990    | 0                        | NR            |
| 475    | 393                      | NR            | 605    | 988                      | NR            | 735    | 115                      | NR            | 865    | 2                        | NR            | 995    | 1                        | NR            |
| 480    | 417                      | NR            | 610    | 996                      | NR            | 740    | 98                       | NR            | 870    | 2                        | NR            | 1000   | 0                        | NR            |
| 485    | 448                      | NR            | 615    | 998                      | NR            | 745    | 85                       | NR            | 875    | 2                        | NR            |        |                          |               |

REPORT NUMBER: SP1-2407-184-16

### Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 3.52

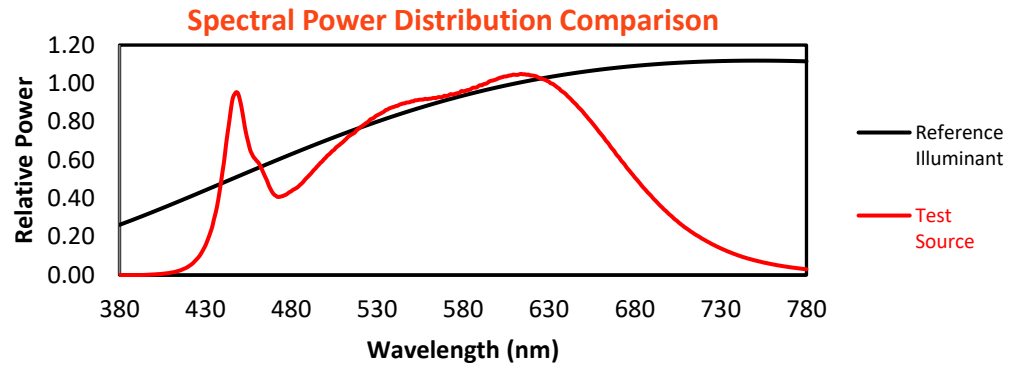
| λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 360    | 0                        | NR            | 490    | 492                      | NR            | 620    | 993                      | NR            | 750    | 73                       | NR            | 880    | 1                        | NR            |
| 365    | 0                        | NR            | 495    | 539                      | NR            | 625    | 978                      | NR            | 755    | 62                       | NR            | 885    | 1                        | NR            |
| 370    | 0                        | NR            | 500    | 583                      | NR            | 630    | 962                      | NR            | 760    | 54                       | NR            | 890    | 1                        | NR            |
| 375    | 0                        | NR            | 505    | 623                      | NR            | 635    | 933                      | NR            | 765    | 46                       | NR            | 895    | 1                        | NR            |
| 380    | 0                        | NR            | 510    | 661                      | NR            | 640    | 898                      | NR            | 770    | 39                       | NR            | 900    | 1                        | NR            |
| 385    | 0                        | NR            | 515    | 698                      | NR            | 645    | 855                      | NR            | 775    | 34                       | NR            | 905    | 1                        | NR            |
| 390    | 0                        | NR            | 520    | 733                      | NR            | 650    | 810                      | NR            | 780    | 29                       | NR            | 910    | 1                        | NR            |
| 395    | 1                        | NR            | 525    | 764                      | NR            | 655    | 759                      | NR            | 785    | 25                       | NR            | 915    | 1                        | NR            |
| 400    | 3                        | NR            | 530    | 794                      | NR            | 660    | 704                      | NR            | 790    | 21                       | NR            | 920    | 1                        | NR            |
| 405    | 6                        | NR            | 535    | 820                      | NR            | 665    | 651                      | NR            | 795    | 18                       | NR            | 925    | 1                        | NR            |
| 410    | 12                       | NR            | 540    | 837                      | NR            | 670    | 592                      | NR            | 800    | 16                       | NR            | 930    | 1                        | NR            |
| 415    | 22                       | NR            | 545    | 853                      | NR            | 675    | 538                      | NR            | 805    | 13                       | NR            | 935    | 0                        | NR            |
| 420    | 42                       | NR            | 550    | 864                      | NR            | 680    | 486                      | NR            | 810    | 12                       | NR            | 940    | 0                        | NR            |
| 425    | 79                       | NR            | 555    | 872                      | NR            | 685    | 435                      | NR            | 815    | 10                       | NR            | 945    | 0                        | NR            |
| 430    | 147                      | NR            | 560    | 876                      | NR            | 690    | 389                      | NR            | 820    | 9                        | NR            | 950    | 0                        | NR            |
| 435    | 278                      | NR            | 565    | 883                      | NR            | 695    | 344                      | NR            | 825    | 7                        | NR            | 955    | 0                        | NR            |
| 440    | 515                      | NR            | 570    | 891                      | NR            | 700    | 303                      | NR            | 830    | 6                        | NR            | 960    | 0                        | NR            |
| 445    | 832                      | NR            | 575    | 900                      | NR            | 705    | 266                      | NR            | 835    | 5                        | NR            | 965    | 0                        | NR            |
| 450    | 874                      | NR            | 580    | 914                      | NR            | 710    | 233                      | NR            | 840    | 5                        | NR            | 970    | 0                        | NR            |
| 455    | 659                      | NR            | 585    | 927                      | NR            | 715    | 203                      | NR            | 845    | 4                        | NR            | 975    | 0                        | NR            |
| 460    | 567                      | NR            | 590    | 944                      | NR            | 720    | 178                      | NR            | 850    | 4                        | NR            | 980    | 0                        | NR            |
| 465    | 485                      | NR            | 595    | 961                      | NR            | 725    | 154                      | NR            | 855    | 3                        | NR            | 985    | 0                        | NR            |
| 470    | 401                      | NR            | 600    | 975                      | NR            | 730    | 133                      | NR            | 860    | 3                        | NR            | 990    | 0                        | NR            |
| 475    | 393                      | NR            | 605    | 988                      | NR            | 735    | 115                      | NR            | 865    | 2                        | NR            | 995    | 1                        | NR            |
| 480    | 417                      | NR            | 610    | 996                      | NR            | 740    | 98                       | NR            | 870    | 2                        | NR            | 1000   | 0                        | NR            |
| 485    | 448                      | NR            | 615    | 998                      | NR            | 745    | 85                       | NR            | 875    | 2                        | NR            |        |                          |               |

REPORT NUMBER: SP1-2407-184-16

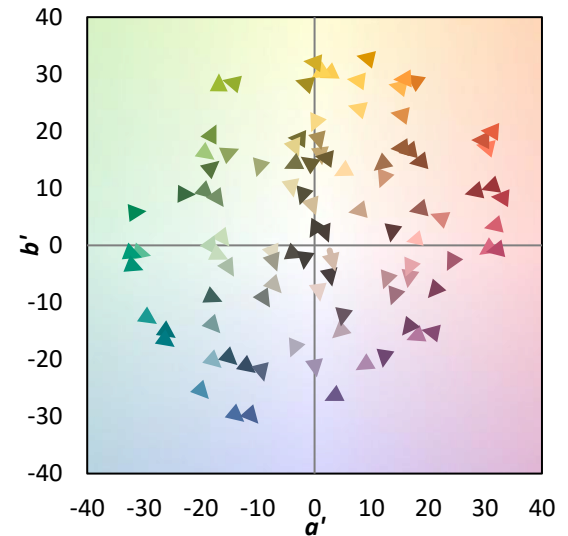
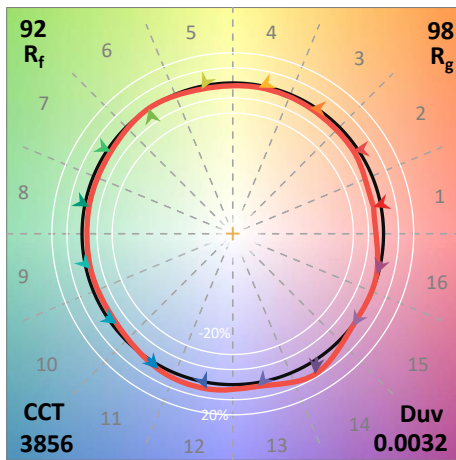
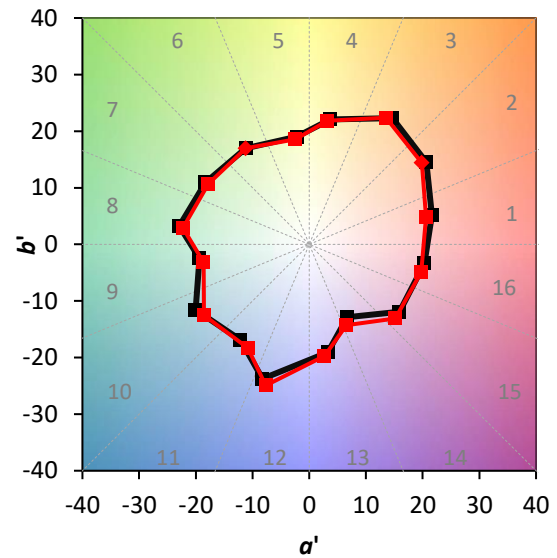
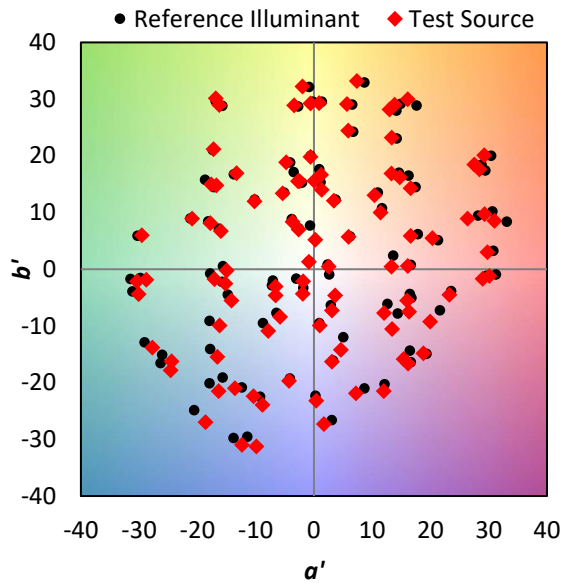
TM-30-18

### Summary

$R_f = 91.8$   
 $R_g = 98.4$   
 $CIE R_a = 92.1$   
 $R_9 = 60.7$

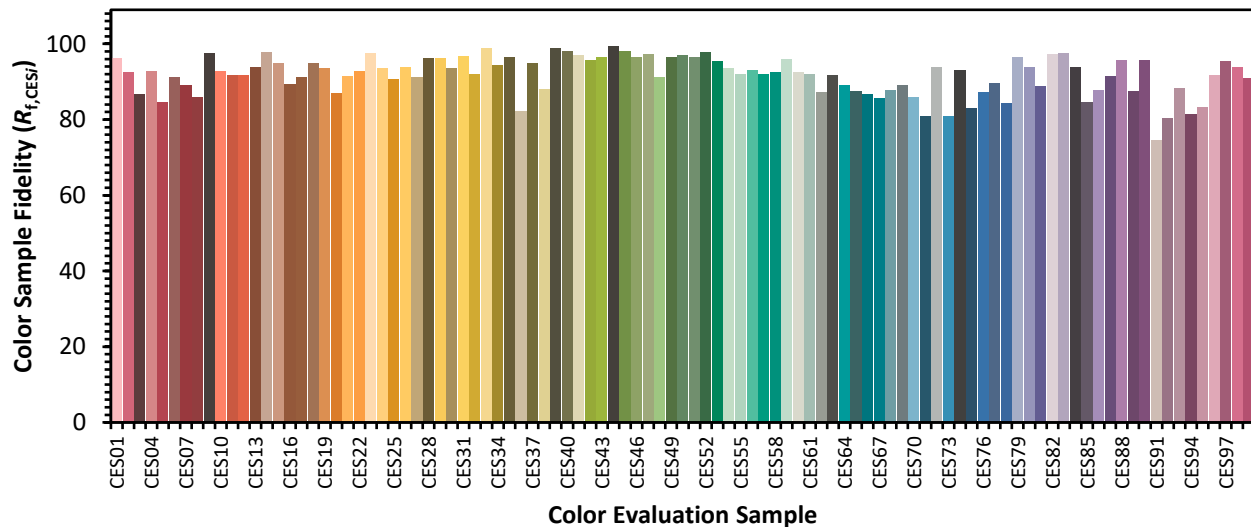


### Color Vector Graphics

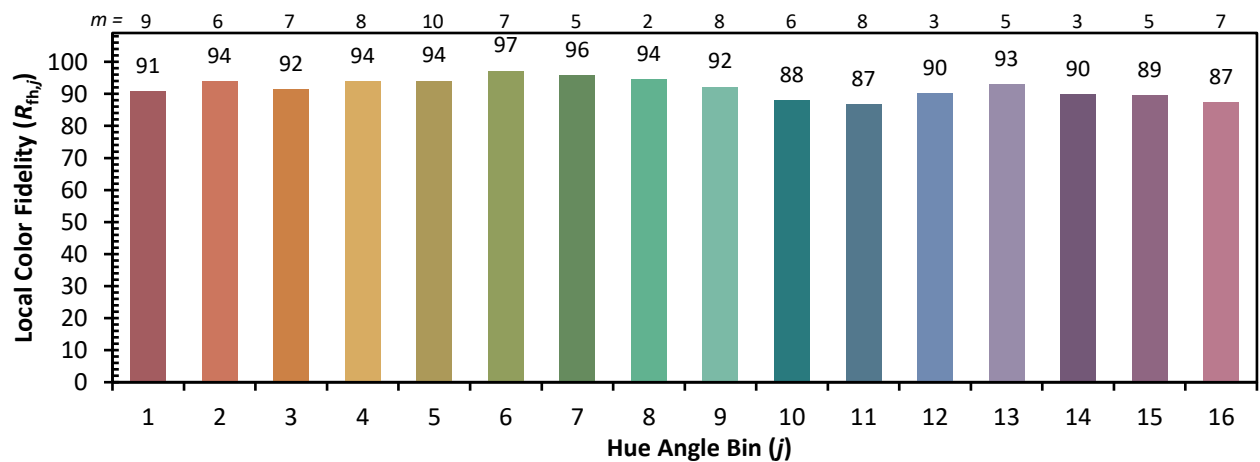
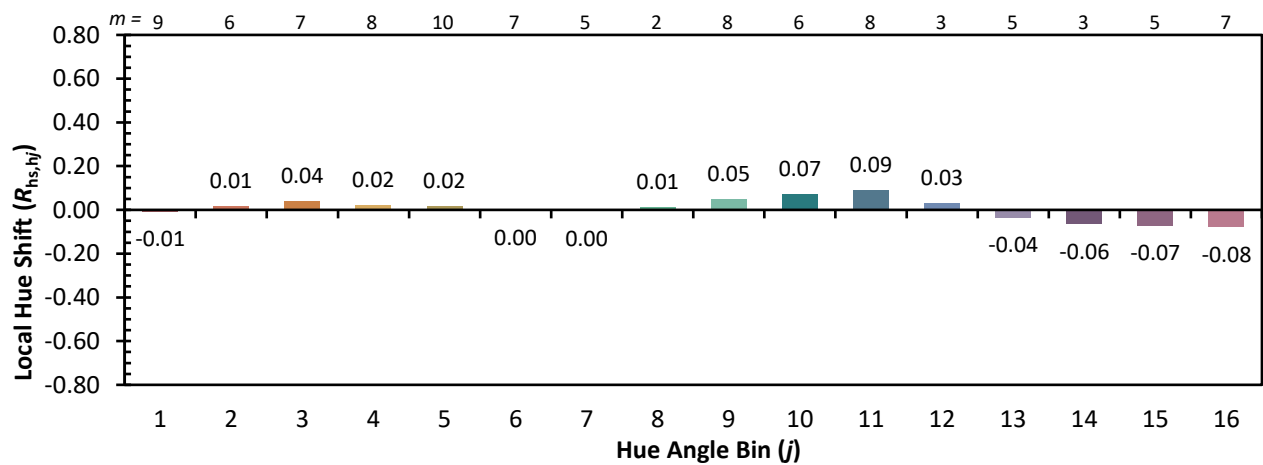
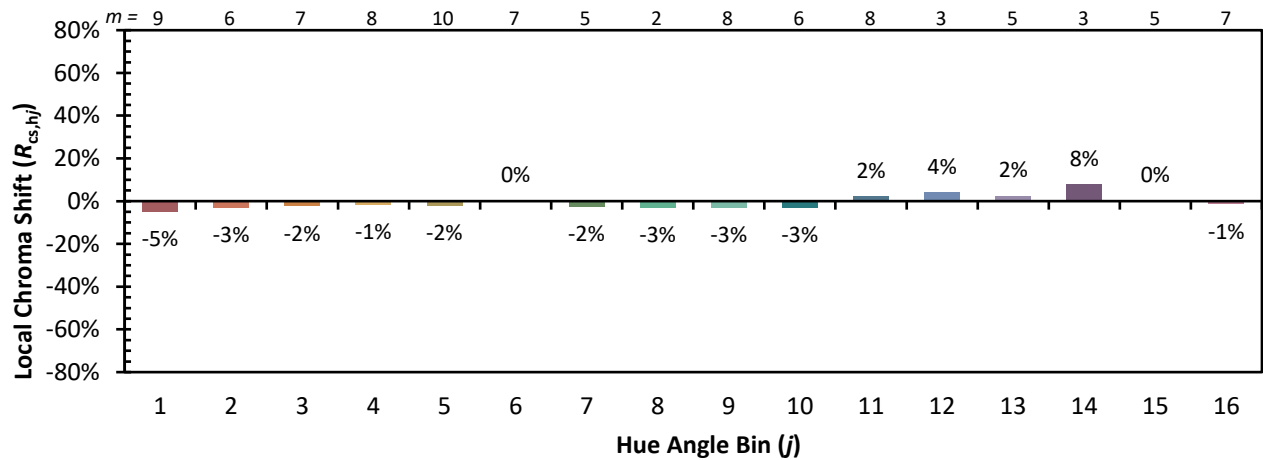


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

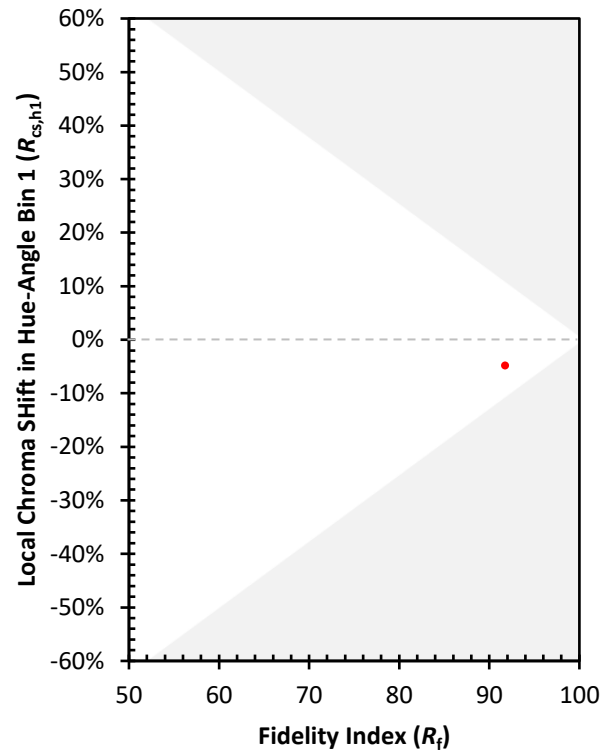
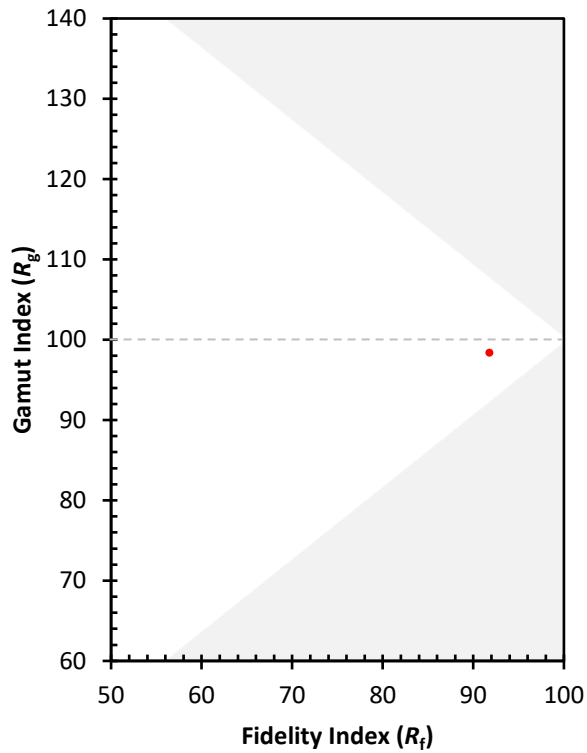
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 94 | CES51 = 96 | CES76 = 87 |
| CES02 = 62 | CES27 = 91 | CES52 = 98 | CES77 = 90 |
| CES03 = 31 | CES28 = 96 | CES53 = 95 | CES78 = 84 |
| CES04 = 69 | CES29 = 96 | CES54 = 94 | CES79 = 96 |
| CES05 = 49 | CES30 = 93 | CES55 = 92 | CES80 = 94 |
| CES06 = 50 | CES31 = 97 | CES56 = 93 | CES81 = 89 |
| CES07 = 42 | CES32 = 92 | CES57 = 92 | CES82 = 97 |
| CES08 = 41 | CES33 = 99 | CES58 = 92 | CES83 = 98 |
| CES09 = 29 | CES34 = 94 | CES59 = 96 | CES84 = 94 |
| CES10 = 74 | CES35 = 96 | CES60 = 93 | CES85 = 85 |
| CES11 = 57 | CES36 = 82 | CES61 = 92 | CES86 = 88 |
| CES12 = 63 | CES37 = 95 | CES62 = 87 | CES87 = 92 |
| CES13 = 43 | CES38 = 88 | CES63 = 92 | CES88 = 96 |
| CES14 = 74 | CES39 = 99 | CES64 = 89 | CES89 = 87 |
| CES15 = 71 | CES40 = 98 | CES65 = 88 | CES90 = 96 |
| CES16 = 47 | CES41 = 97 | CES66 = 87 | CES91 = 74 |
| CES17 = 49 | CES42 = 96 | CES67 = 86 | CES92 = 80 |
| CES18 = 56 | CES43 = 96 | CES68 = 88 | CES93 = 88 |
| CES19 = 71 | CES44 = 99 | CES69 = 89 | CES94 = 82 |
| CES20 = 66 | CES45 = 98 | CES70 = 86 | CES95 = 83 |
| CES21 = 85 | CES46 = 97 | CES71 = 81 | CES96 = 92 |
| CES22 = 78 | CES47 = 97 | CES72 = 94 | CES97 = 95 |
| CES23 = 91 | CES48 = 91 | CES73 = 81 | CES98 = 94 |
| CES24 = 90 | CES49 = 96 | CES74 = 93 | CES99 = 91 |
| CES25 = 71 | CES50 = 97 | CES75 = 83 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)