

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: P1048747

Luminaire Tested: **GALN-SA2C-935-U-T4BC**

Issue Date: 07/10/2025

**Test Information**

Test Method: LM-79-08  
Report Number: P1048747  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 07/10/2025  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: MCGRAW-EDISON  
Catalog Number: GALN-SA2C-935-U-T4BC  
Description: GALLEON II AREA AND ROADWAY LUMINAIRE 1050mA 2xLight Square PACKAGE  
90CRI 3500K FIXTURE w/ TYPE IV ANGLED BACKLIGHT CONTROL  
Light Source: (28) 3500K CCT, 90 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 8419.1 lumens  
Efficiency: N/A  
Efficacy: 87.5 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 1' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B0 - U0 - G3

Input Watts (W): 96.2  
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

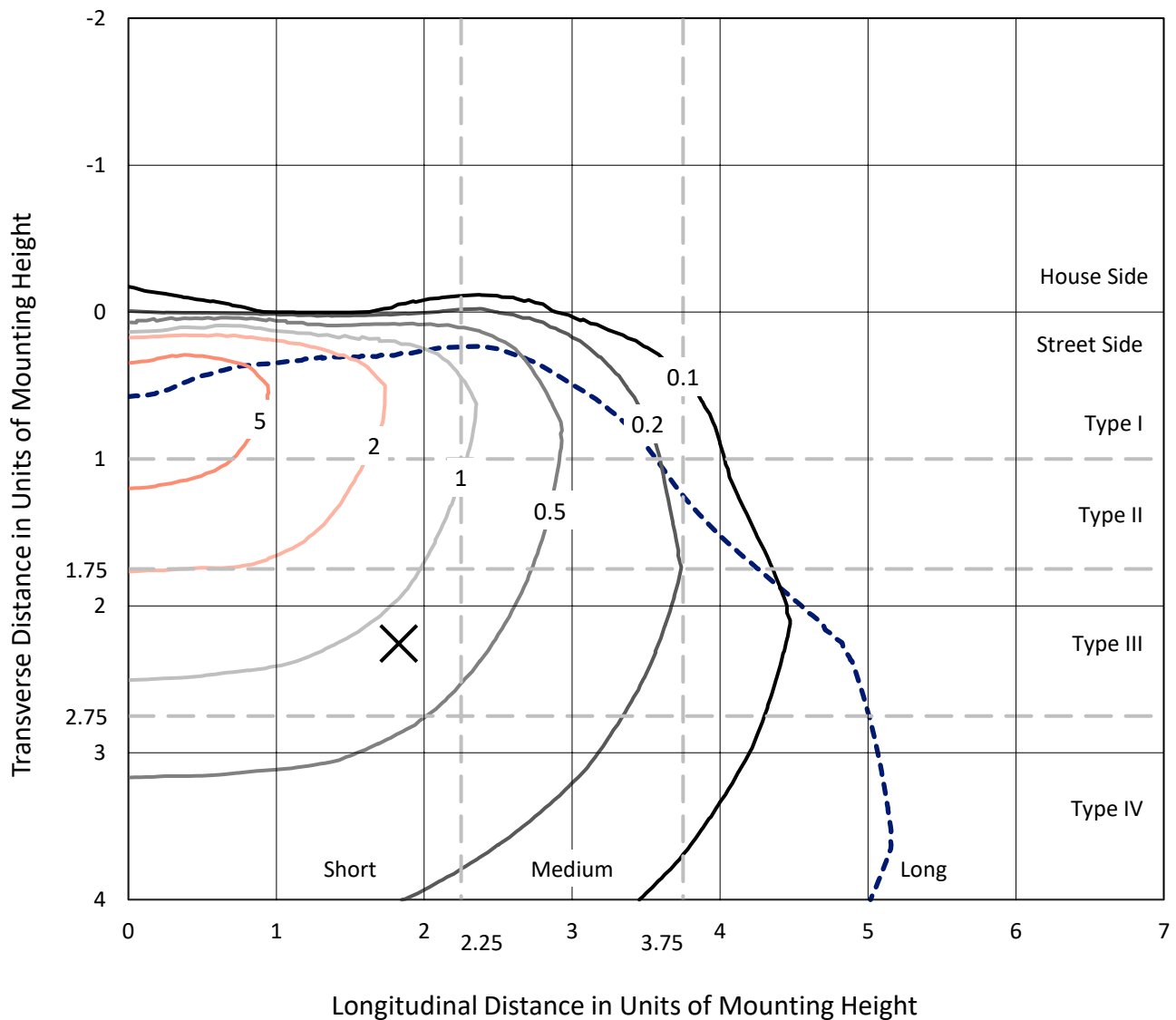


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CATALOG NUMBER: GALN-SA2C-935-U-T4BC

## Iso-Footcandle Lines of Horizontal Illumination

× Max cd  
 --- 1/2 Max cd

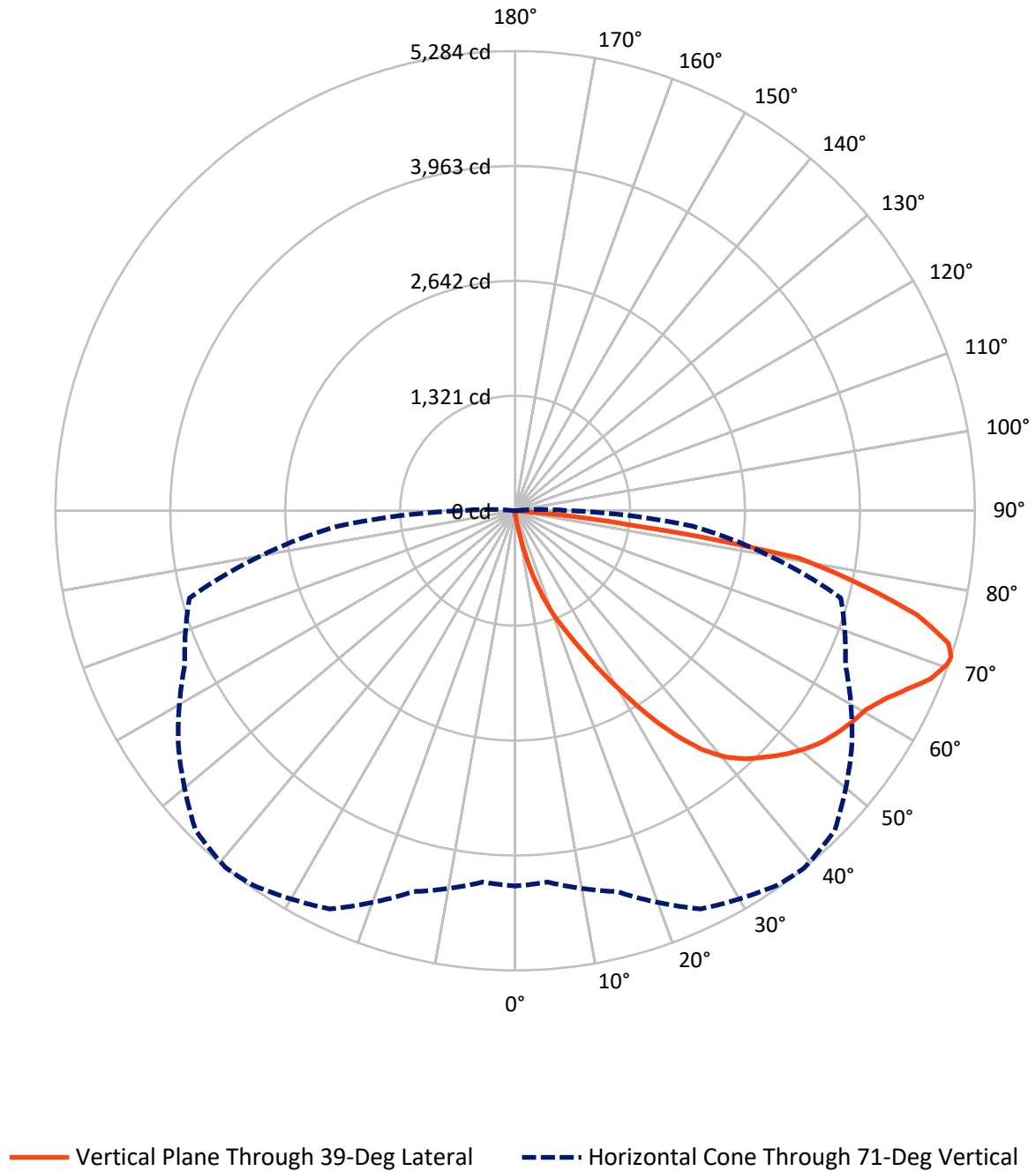


Based on 15 foot mounting height. Maximum calculated value = 8.7 fc  
 Type IV - Short - N/A

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CATALOG NUMBER: GALN-SA2C-935-U-T4BC

## Luminous Intensity Polar Plot



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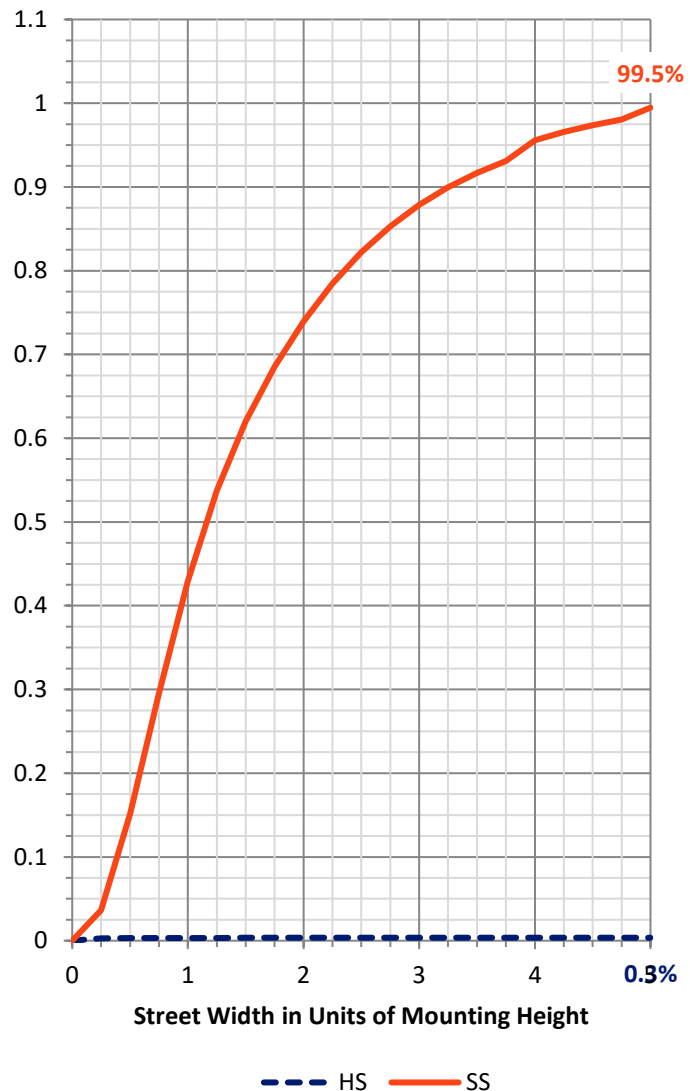
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 29.9     | 0.0    | 29.9   |
|                    | % Fixture | 0.4      | 0.0    | 0.4    |
| <b>Street Side</b> | Lumens    | 8389.2   | 0.0    | 8389.2 |
|                    | % Fixture | 99.6     | 0.0    | 99.6   |
| <b>Total</b>       | Lumens    | 8419.1   | 0.0    | 8419.1 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 7.0    | 0.1       |
| 10°-20°   | 90.0   | 1.1       |
| 20°-30°   | 320.5  | 3.8       |
| 30°-40°   | 772.3  | 9.2       |
| 40°-50°   | 1292.5 | 15.4      |
| 50°-60°   | 1660.1 | 19.7      |
| 60°-70°   | 2100.9 | 25.0      |
| 70°-80°   | 1873.0 | 22.2      |
| 80°-90°   | 302.8  | 3.6       |
| 90°-100°  | 0.0    | 0.0       |
| 100°-110° | 0.0    | 0.0       |
| 110°-120° | 0.0    | 0.0       |
| 120°-130° | 0.0    | 0.0       |
| 130°-140° | 0.0    | 0.0       |
| 140°-150° | 0.0    | 0.0       |
| 150°-160° | 0.0    | 0.0       |
| 160°-170° | 0.0    | 0.0       |
| 170°-180° | 0.0    | 0.0       |
| 0°-90°    | 8419.1 | 100.0     |
| 0°-180°   | 8419.1 | 100.0     |



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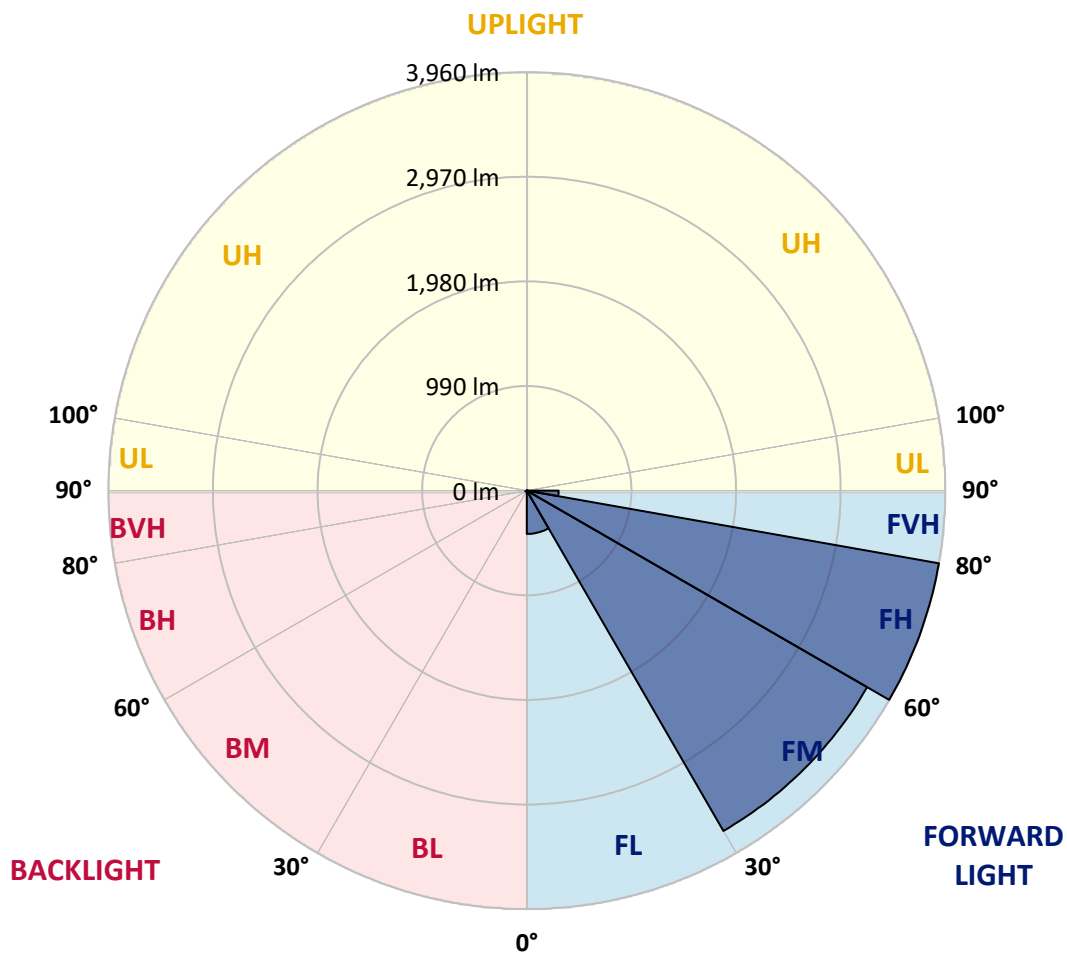
CATALOG NUMBER: GALN-SA2C-935-U-T4BC

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 410.2  | 4.9       |                         |      |         |
| FM   | (30°-60°)   | 3718.1 | 44.2      |                         |      |         |
| FH   | (60°-80°)   | 3959.5 | 47.0      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 301.4  | 3.6       |                         |      | G3/500  |
| BL   | (0°-30°)    | 7.2    | 0.1       | B0/110                  |      |         |
| BM   | (30°-60°)   | 6.9    | 0.1       | B0/220                  |      |         |
| BH   | (60°-80°)   | 14.4   | 0.2       | B0/110                  |      | G0/110  |
| BVH  | (80°-90°)   | 1.4    | 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 IV Short



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 39°    | 45°    | 55°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 46.2   | 46.2   | 46.2   | 46.2   | 46.2   | 46.2   | 46.2   | 46.2   | 46.2   | 46.2   | 46.2   |
| 2.5°  | 53.0   | 53.0   | 53.0   | 51.3   | 51.3   | 50.7   | 50.2   | 50.2   | 49.0   | 48.4   | 47.3   |
| 5°    | 80.4   | 78.7   | 74.7   | 72.4   | 67.8   | 65.0   | 62.1   | 58.1   | 54.1   | 51.3   | 47.9   |
| 7.5°  | 181.8  | 185.8  | 172.7  | 148.2  | 123.1  | 112.3  | 94.0   | 75.8   | 62.7   | 54.1   | 48.4   |
| 10°   | 463.4  | 461.1  | 416.6  | 367.6  | 283.8  | 250.2  | 196.1  | 123.7  | 80.9   | 59.3   | 49.0   |
| 12.5° | 788.2  | 785.9  | 733.5  | 666.8  | 556.3  | 486.2  | 383.6  | 230.8  | 116.3  | 67.3   | 49.0   |
| 15°   | 1061.2 | 1052.1 | 1035.6 | 969.5  | 840.1  | 781.4  | 645.7  | 408.1  | 188.1  | 80.9   | 50.2   |
| 17.5° | 1241.9 | 1233.9 | 1218.5 | 1194.6 | 1112.5 | 1043.0 | 934.1  | 641.2  | 304.3  | 104.9  | 52.4   |
| 20°   | 1407.7 | 1402.0 | 1389.5 | 1384.9 | 1331.9 | 1294.9 | 1204.8 | 909.0  | 474.2  | 142.5  | 55.9   |
| 22.5° | 1635.7 | 1623.7 | 1628.9 | 1601.5 | 1549.6 | 1505.2 | 1449.9 | 1189.4 | 681.6  | 205.2  | 62.1   |
| 25°   | 1915.0 | 1909.3 | 1895.0 | 1875.6 | 1803.8 | 1765.1 | 1680.2 | 1453.9 | 913.6  | 287.2  | 69.0   |
| 27.5° | 2252.4 | 2246.1 | 2242.7 | 2198.2 | 2115.6 | 2073.4 | 1954.9 | 1703.5 | 1174.6 | 402.4  | 78.1   |
| 30°   | 2641.1 | 2643.9 | 2621.7 | 2564.7 | 2468.4 | 2409.1 | 2287.1 | 1965.1 | 1441.9 | 537.4  | 87.8   |
| 32.5° | 3043.4 | 3037.7 | 3003.5 | 2936.3 | 2850.2 | 2794.9 | 2639.9 | 2251.8 | 1722.3 | 715.8  | 99.2   |
| 35°   | 3477.1 | 3466.3 | 3376.3 | 3299.3 | 3225.8 | 3156.3 | 3014.9 | 2584.6 | 2002.7 | 915.9  | 114.6  |
| 37.5° | 3914.8 | 3864.1 | 3683.5 | 3586.0 | 3535.3 | 3478.3 | 3346.6 | 2939.7 | 2281.4 | 1139.3 | 133.4  |
| 40°   | 4245.4 | 4206.1 | 3991.8 | 3812.3 | 3771.8 | 3723.4 | 3625.3 | 3246.3 | 2577.8 | 1379.2 | 156.2  |
| 42.5° | 4428.4 | 4406.7 | 4214.1 | 4036.8 | 3941.6 | 3898.9 | 3815.1 | 3514.2 | 2870.7 | 1644.2 | 189.2  |
| 45°   | 4506.4 | 4472.8 | 4344.0 | 4261.4 | 4109.8 | 4039.1 | 3939.4 | 3716.5 | 3176.8 | 1945.2 | 235.4  |
| 47.5° | 4482.5 | 4463.1 | 4370.8 | 4401.0 | 4291.0 | 4181.0 | 4034.5 | 3871.5 | 3438.4 | 2290.5 | 298.6  |
| 50°   | 4332.0 | 4315.5 | 4287.0 | 4450.6 | 4436.9 | 4307.0 | 4157.6 | 3994.1 | 3652.1 | 2646.8 | 396.7  |
| 52.5° | 4045.9 | 4039.1 | 4112.0 | 4411.8 | 4519.5 | 4418.1 | 4276.2 | 4102.4 | 3851.6 | 3018.9 | 536.9  |
| 55°   | 3677.2 | 3705.1 | 3913.7 | 4351.4 | 4561.7 | 4500.2 | 4381.1 | 4203.8 | 4011.7 | 3351.8 | 743.8  |
| 57.5° | 3525.6 | 3533.0 | 3793.5 | 4308.7 | 4580.5 | 4572.5 | 4483.1 | 4300.7 | 4158.8 | 3617.9 | 1059.5 |
| 60°   | 3702.8 | 3691.4 | 3828.8 | 4341.2 | 4618.1 | 4637.5 | 4573.7 | 4390.7 | 4286.4 | 3846.5 | 1480.1 |
| 62.5° | 4023.1 | 4016.9 | 4060.8 | 4479.6 | 4728.1 | 4767.5 | 4699.6 | 4455.7 | 4399.3 | 3996.9 | 1960.0 |
| 65°   | 4309.2 | 4296.1 | 4377.6 | 4725.3 | 4921.3 | 4949.3 | 4890.0 | 4566.8 | 4448.9 | 4106.3 | 2410.8 |
| 67.5° | 4432.9 | 4430.1 | 4561.1 | 4959.0 | 5124.2 | 5154.4 | 5102.6 | 4720.2 | 4437.5 | 4141.1 | 2609.7 |
| 70°   | 4376.5 | 4365.7 | 4575.4 | 5058.1 | 5238.8 | 5273.0 | 5222.8 | 4777.2 | 4313.8 | 4031.1 | 2315.1 |
| 71°   | 4314.4 | 4285.3 | 4532.7 | 5051.3 | 5254.8 | 5283.8 | 5196.1 | 4725.3 | 4189.6 | 3875.0 | 2047.8 |
| 72.5° | 4121.7 | 4126.9 | 4415.2 | 4980.0 | 5216.6 | 5208.0 | 5044.4 | 4539.5 | 4039.7 | 3520.5 | 1644.8 |
| 75°   | 3647.6 | 3677.8 | 4035.1 | 4680.8 | 4875.8 | 4766.9 | 4516.7 | 4184.4 | 3738.7 | 2524.2 | 1142.1 |
| 77.5° | 2980.7 | 3025.8 | 3418.4 | 4105.2 | 4049.9 | 4039.1 | 4028.8 | 3686.9 | 3192.7 | 1355.9 | 794.5  |
| 80°   | 1423.1 | 1520.6 | 2062.0 | 2930.6 | 3183.6 | 3306.2 | 3229.2 | 2971.0 | 2468.9 | 645.7  | 474.8  |
| 82.5° | 92.9   | 91.8   | 129.9  | 246.2  | 1037.8 | 1341.6 | 2131.5 | 2123.6 | 1721.2 | 314.6  | 193.8  |
| 85°   | 43.9   | 45.0   | 49.6   | 56.4   | 65.5   | 71.8   | 99.2   | 581.3  | 823.5  | 149.9  | 42.2   |
| 87.5° | 25.6   | 26.2   | 30.8   | 39.3   | 51.3   | 57.0   | 67.8   | 87.2   | 107.1  | 82.6   | 9.1    |
| 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: P1048747

CATALOG NUMBER: GALN-SA2C-935-U-T4BC

**CANDELA DISTRIBUTION (continued):**

|       | 90°   | 95°  | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|-------|-------|------|------|------|------|------|------|------|------|------|------|
| 0°    | 46.2  | 46.2 | 46.2 | 46.2 | 46.2 | 46.2 | 46.2 | 46.2 | 46.2 | 46.2 | 46.2 |
| 2.5°  | 46.7  | 46.2 | 44.5 | 42.7 | 41.0 | 39.9 | 39.3 | 39.9 | 39.9 | 40.5 | 40.5 |
| 5°    | 46.7  | 45.0 | 42.2 | 38.8 | 36.5 | 34.2 | 33.1 | 32.5 | 33.1 | 33.1 | 33.1 |
| 7.5°  | 46.2  | 43.3 | 39.3 | 35.3 | 32.5 | 29.6 | 28.5 | 27.9 | 27.9 | 28.5 | 28.5 |
| 10°   | 45.0  | 42.2 | 37.0 | 32.5 | 29.1 | 25.6 | 23.9 | 22.2 | 22.2 | 22.2 | 22.8 |
| 12.5° | 44.5  | 40.5 | 34.2 | 29.6 | 25.1 | 21.1 | 17.7 | 16.0 | 16.5 | 16.5 | 16.5 |
| 15°   | 43.3  | 38.8 | 32.5 | 26.8 | 21.1 | 16.0 | 13.1 | 11.4 | 12.0 | 12.5 | 12.0 |
| 17.5° | 43.3  | 38.2 | 30.2 | 23.4 | 16.5 | 12.0 | 9.7  | 8.5  | 8.5  | 9.1  | 9.1  |
| 20°   | 43.3  | 37.0 | 28.5 | 19.9 | 12.5 | 9.1  | 6.8  | 6.3  | 6.3  | 7.4  | 8.0  |
| 22.5° | 44.5  | 37.0 | 26.2 | 16.5 | 10.3 | 6.8  | 5.1  | 4.6  | 5.1  | 6.3  | 6.8  |
| 25°   | 46.2  | 36.5 | 23.9 | 14.8 | 8.5  | 5.1  | 4.0  | 2.8  | 3.4  | 4.6  | 5.1  |
| 27.5° | 47.9  | 35.9 | 21.7 | 13.1 | 6.8  | 4.0  | 2.8  | 2.3  | 1.7  | 2.3  | 2.3  |
| 30°   | 49.6  | 35.9 | 19.4 | 10.8 | 5.7  | 2.8  | 1.7  | 1.1  | 0.6  | 0.0  | 0.0  |
| 32.5° | 50.7  | 34.8 | 17.7 | 8.5  | 4.6  | 2.3  | 1.1  | 0.6  | 0.0  | 0.0  | 0.0  |
| 35°   | 51.9  | 33.6 | 15.4 | 6.8  | 3.4  | 1.7  | 0.6  | 0.0  | 0.0  | 0.0  | 0.0  |
| 37.5° | 53.0  | 31.9 | 13.1 | 5.7  | 2.8  | 1.1  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 40°   | 54.1  | 29.6 | 10.8 | 5.1  | 1.7  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 42.5° | 55.3  | 27.9 | 9.1  | 4.0  | 1.1  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 45°   | 58.1  | 26.8 | 7.4  | 3.4  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 47.5° | 63.3  | 25.6 | 6.8  | 2.3  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 50°   | 70.7  | 24.5 | 6.3  | 1.7  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 52.5° | 80.9  | 23.9 | 5.7  | 1.1  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 55°   | 99.2  | 23.4 | 5.1  | 1.1  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 57.5° | 130.5 | 22.8 | 5.1  | 1.1  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 60°   | 200.0 | 21.7 | 5.1  | 1.1  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 62.5° | 357.3 | 21.1 | 4.6  | 1.1  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 65°   | 622.9 | 21.7 | 4.6  | 1.1  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 67.5° | 893.1 | 22.8 | 4.0  | 1.7  | 0.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 70°   | 764.3 | 19.9 | 4.0  | 2.3  | 1.1  | 0.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 71°   | 622.9 | 17.7 | 4.0  | 2.3  | 1.1  | 0.6  | 0.6  | 0.0  | 0.0  | 0.0  | 0.0  |
| 72.5° | 400.7 | 13.7 | 3.4  | 2.3  | 1.1  | 1.1  | 0.6  | 0.0  | 0.0  | 0.0  | 0.0  |
| 75°   | 169.3 | 11.4 | 3.4  | 2.3  | 1.7  | 1.1  | 1.1  | 0.6  | 0.0  | 0.0  | 0.0  |
| 77.5° | 72.4  | 8.5  | 3.4  | 2.8  | 2.3  | 1.7  | 1.7  | 1.1  | 0.6  | 0.0  | 0.0  |
| 80°   | 27.4  | 6.8  | 4.0  | 3.4  | 2.8  | 2.8  | 2.3  | 1.1  | 0.6  | 0.0  | 0.0  |
| 82.5° | 12.5  | 5.7  | 4.0  | 3.4  | 3.4  | 2.8  | 2.3  | 1.7  | 1.1  | 0.0  | 0.0  |
| 85°   | 8.0   | 5.1  | 4.0  | 3.4  | 3.4  | 2.8  | 2.8  | 1.7  | 1.1  | 0.0  | 0.0  |
| 87.5° | 6.3   | 5.1  | 4.0  | 4.0  | 3.4  | 3.4  | 2.3  | 1.7  | 0.6  | 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: SP1-2407-184-15

Test Date: 10/11/2024

Luminaire Tested: GSS-SB1A-935-U-5WQ

Data in this report applies to families of products including GSS-SB1A-935-U-5WQ

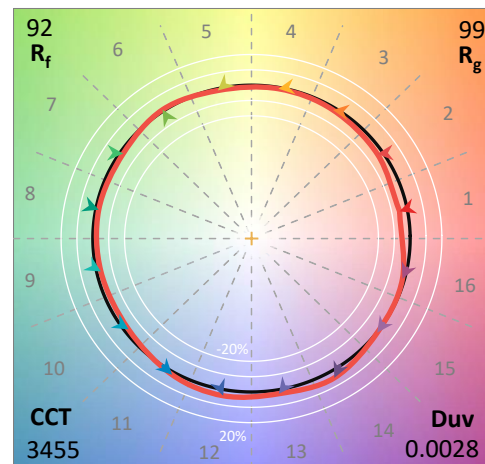
### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2407-184-15  
 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-935-U-5WQ**  
 Description: GALLEON II SITE SLIM 1SQ 350MA 5WQ HIGH DENSITY LIGHTSQUARE WITH 90 CRI  
 3500K CCT 26 LEDS

### Spectral Parameters

CCT (K): 3455  
 CIE  $u'$ : 0.2356  
 CIE  $v'$ : 0.5159  
 Duv: 0.0028  
 CIE x: 0.4109  
 CIE y: 0.3999  
 CIE z: 0.1892  
 Peak Wavelength (nm): 616  
 Dominant Wavelength (nm): 579  
 Purity: 43.35383  
 R<sub>f</sub>: 92.3  
 R<sub>g</sub>: 98.5

CRI (Ra): 92.2  
 R1: 92.0  
 R2: 94.4  
 R3: 95.6  
 R4: 93.2  
 R5: 91.4  
 R6: 92.5  
 R7: 94.5  
 R8: 84.2  
 R9: 59.8  
 R10: 85.8  
 R11: 93.2  
 R12: 78.0  
 R13: 92.5  
 R14: 97.0  
 R15: 88.4



### Test Conditions

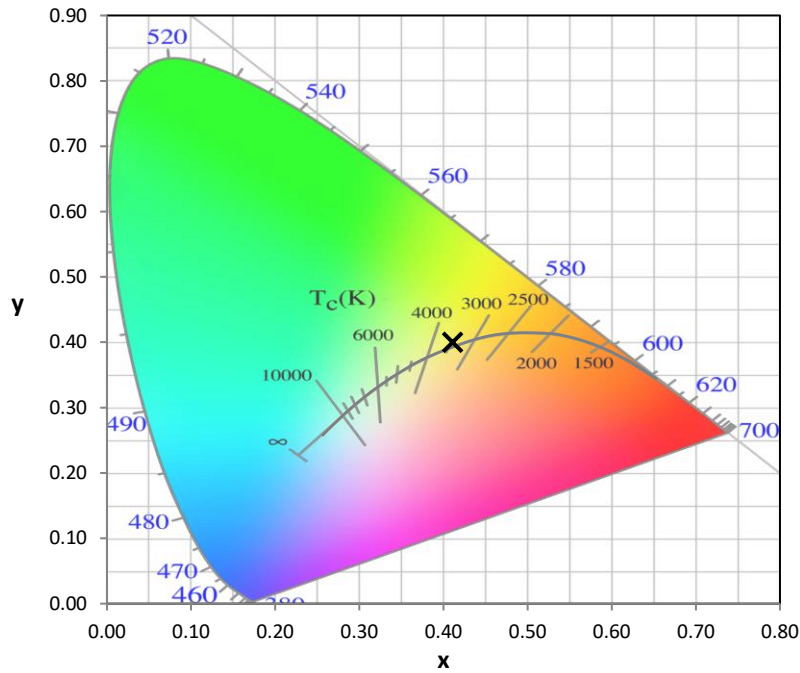
Stabilization Time: 20M  
 Operation Time: 1H 20M  
 Sphere Temperature (°C): 25.2

REPORT NUMBER: SP1-2407-184-15

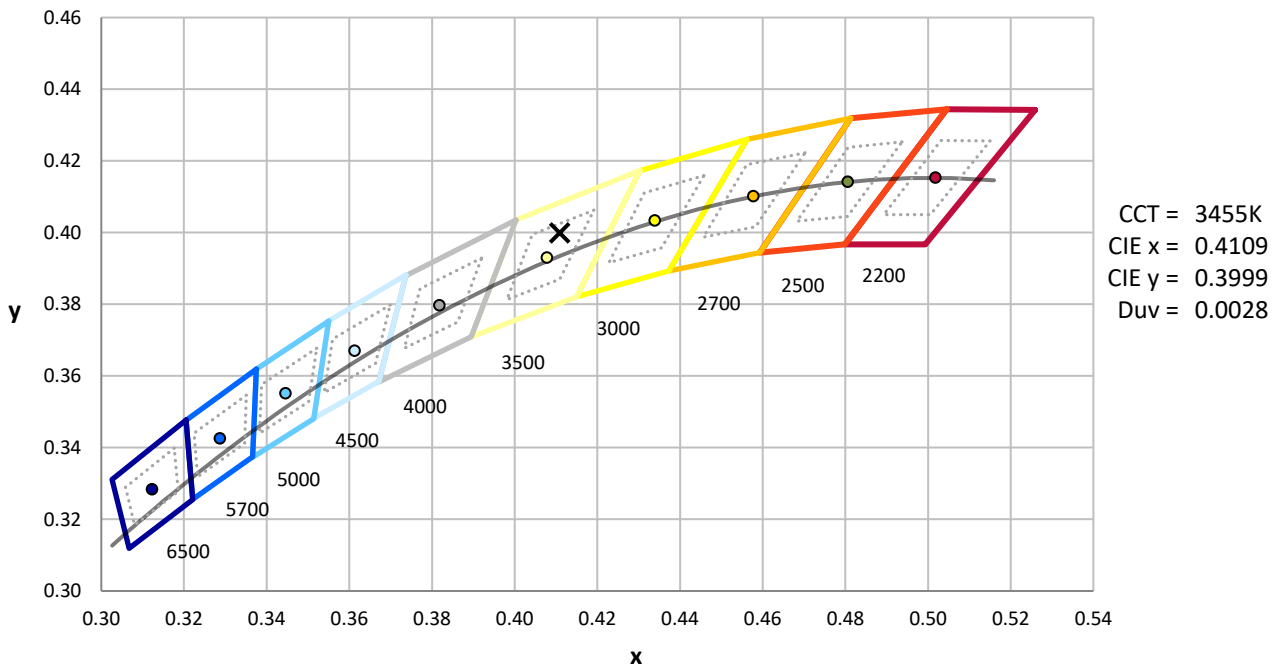
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date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

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**CIE 1931 Chromaticity Diagram**



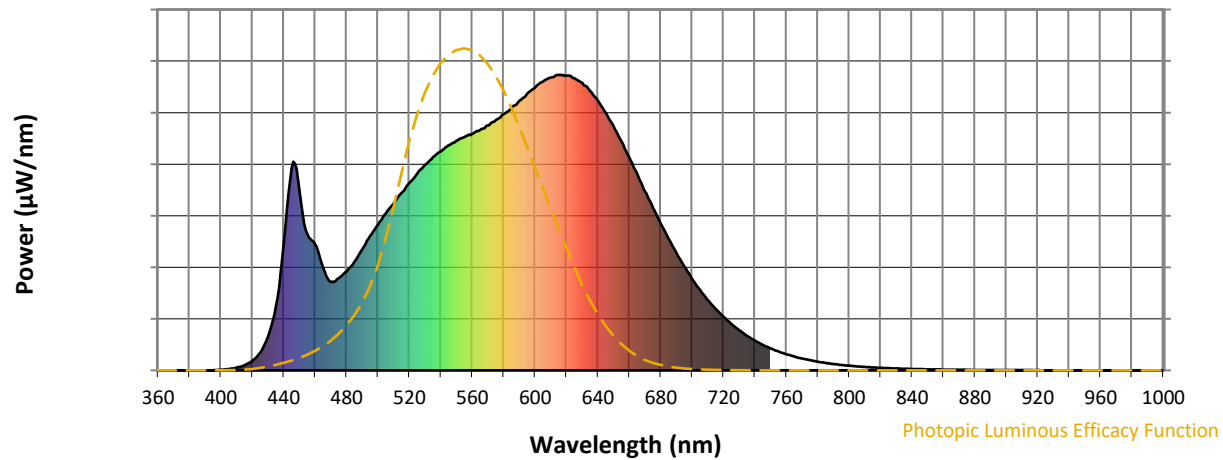
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 3500K 4-step quadrangle

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### Photopic Flux vs. Wavelength

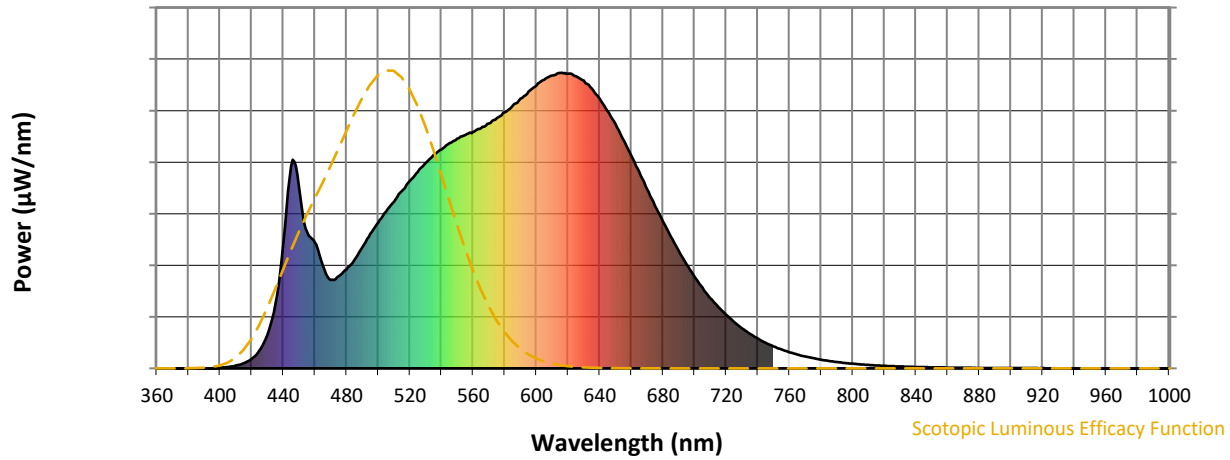


### Photopic Lumens: NR

| $\lambda$<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               | 410                                    | NR                             | 620               | 997                                    | NR                             | 750               | 74                                     | NR                             | 880               | 1                                      | NR                             |
| 365               | 0                                      | NR                             | 495               | 454                                    | NR                             | 625               | 988                                    | NR                             | 755               | 64                                     | NR                             | 885               | 1                                      | NR                             |
| 370               | 0                                      | NR                             | 500               | 493                                    | NR                             | 630               | 973                                    | NR                             | 760               | 54                                     | NR                             | 890               | 1                                      | NR                             |
| 375               | 0                                      | NR                             | 505               | 530                                    | NR                             | 635               | 946                                    | NR                             | 765               | 47                                     | NR                             | 895               | 1                                      | NR                             |
| 380               | 0                                      | NR                             | 510               | 564                                    | NR                             | 640               | 913                                    | NR                             | 770               | 40                                     | NR                             | 900               | 1                                      | NR                             |
| 385               | 0                                      | NR                             | 515               | 599                                    | NR                             | 645               | 870                                    | NR                             | 775               | 34                                     | NR                             | 905               | 1                                      | NR                             |
| 390               | 0                                      | NR                             | 520               | 634                                    | NR                             | 650               | 826                                    | NR                             | 780               | 29                                     | NR                             | 910               | 1                                      | NR                             |
| 395               | 0                                      | NR                             | 525               | 664                                    | NR                             | 655               | 774                                    | NR                             | 785               | 25                                     | NR                             | 915               | 1                                      | NR                             |
| 400               | 2                                      | NR                             | 530               | 695                                    | NR                             | 660               | 720                                    | NR                             | 790               | 21                                     | NR                             | 920               | 1                                      | NR                             |
| 405               | 4                                      | NR                             | 535               | 722                                    | NR                             | 665               | 664                                    | NR                             | 795               | 18                                     | NR                             | 925               | 1                                      | NR                             |
| 410               | 9                                      | NR                             | 540               | 741                                    | NR                             | 670               | 605                                    | NR                             | 800               | 16                                     | NR                             | 930               | 0                                      | NR                             |
| 415               | 17                                     | NR                             | 545               | 762                                    | NR                             | 675               | 550                                    | NR                             | 805               | 13                                     | NR                             | 935               | 0                                      | NR                             |
| 420               | 32                                     | NR                             | 550               | 777                                    | NR                             | 680               | 497                                    | NR                             | 810               | 12                                     | NR                             | 940               | 0                                      | NR                             |
| 425               | 61                                     | NR                             | 555               | 789                                    | NR                             | 685               | 445                                    | NR                             | 815               | 10                                     | NR                             | 945               | 0                                      | NR                             |
| 430               | 114                                    | NR                             | 560               | 800                                    | NR                             | 690               | 398                                    | NR                             | 820               | 9                                      | NR                             | 950               | 0                                      | NR                             |
| 435               | 218                                    | NR                             | 565               | 813                                    | NR                             | 695               | 352                                    | NR                             | 825               | 7                                      | NR                             | 955               | 0                                      | NR                             |
| 440               | 427                                    | NR                             | 570               | 828                                    | NR                             | 700               | 309                                    | NR                             | 830               | 6                                      | NR                             | 960               | 0                                      | NR                             |
| 445               | 684                                    | NR                             | 575               | 846                                    | NR                             | 705               | 273                                    | NR                             | 835               | 5                                      | NR                             | 965               | 0                                      | NR                             |
| 450               | 611                                    | NR                             | 580               | 866                                    | NR                             | 710               | 237                                    | NR                             | 840               | 5                                      | NR                             | 970               | 0                                      | NR                             |
| 455               | 461                                    | NR                             | 585               | 888                                    | NR                             | 715               | 208                                    | NR                             | 845               | 4                                      | NR                             | 975               | 0                                      | NR                             |
| 460               | 427                                    | NR                             | 590               | 913                                    | NR                             | 720               | 181                                    | NR                             | 850               | 4                                      | NR                             | 980               | 0                                      | NR                             |
| 465               | 349                                    | NR                             | 595               | 936                                    | NR                             | 725               | 157                                    | NR                             | 855               | 3                                      | NR                             | 985               | 0                                      | NR                             |
| 470               | 298                                    | NR                             | 600               | 957                                    | NR                             | 730               | 136                                    | NR                             | 860               | 3                                      | NR                             | 990               | 1                                      | NR                             |
| 475               | 312                                    | NR                             | 605               | 976                                    | NR                             | 735               | 117                                    | NR                             | 865               | 2                                      | NR                             | 995               | 0                                      | NR                             |
| 480               | 335                                    | NR                             | 610               | 990                                    | NR                             | 740               | 100                                    | NR                             | 870               | 2                                      | NR                             | 1000              | 0                                      | NR                             |
| 485               | 367                                    | NR                             | 615               | 999                                    | NR                             | 745               | 86                                     | NR                             | 875               | 2                                      | NR                             |                   |                                        |                                |

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### Scotopic Flux vs. Wavelength



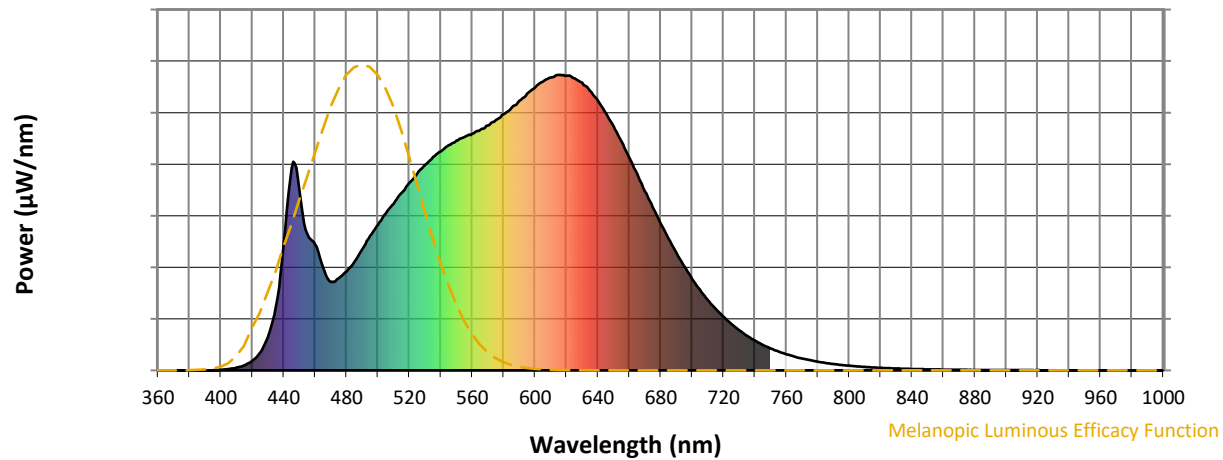
Scotopic Lumens: NR

S/P: 1.58

| 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       | 410                         | NR               | 620       | 997                         | NR               | 750       | 74                          | NR               | 880       | 1                           | NR               |
| 365       | 0                           | NR               | 495       | 454                         | NR               | 625       | 988                         | NR               | 755       | 64                          | NR               | 885       | 1                           | NR               |
| 370       | 0                           | NR               | 500       | 493                         | NR               | 630       | 973                         | NR               | 760       | 54                          | NR               | 890       | 1                           | NR               |
| 375       | 0                           | NR               | 505       | 530                         | NR               | 635       | 946                         | NR               | 765       | 47                          | NR               | 895       | 1                           | NR               |
| 380       | 0                           | NR               | 510       | 564                         | NR               | 640       | 913                         | NR               | 770       | 40                          | NR               | 900       | 1                           | NR               |
| 385       | 0                           | NR               | 515       | 599                         | NR               | 645       | 870                         | NR               | 775       | 34                          | NR               | 905       | 1                           | NR               |
| 390       | 0                           | NR               | 520       | 634                         | NR               | 650       | 826                         | NR               | 780       | 29                          | NR               | 910       | 1                           | NR               |
| 395       | 0                           | NR               | 525       | 664                         | NR               | 655       | 774                         | NR               | 785       | 25                          | NR               | 915       | 1                           | NR               |
| 400       | 2                           | NR               | 530       | 695                         | NR               | 660       | 720                         | NR               | 790       | 21                          | NR               | 920       | 1                           | NR               |
| 405       | 4                           | NR               | 535       | 722                         | NR               | 665       | 664                         | NR               | 795       | 18                          | NR               | 925       | 1                           | NR               |
| 410       | 9                           | NR               | 540       | 741                         | NR               | 670       | 605                         | NR               | 800       | 16                          | NR               | 930       | 0                           | NR               |
| 415       | 17                          | NR               | 545       | 762                         | NR               | 675       | 550                         | NR               | 805       | 13                          | NR               | 935       | 0                           | NR               |
| 420       | 32                          | NR               | 550       | 777                         | NR               | 680       | 497                         | NR               | 810       | 12                          | NR               | 940       | 0                           | NR               |
| 425       | 61                          | NR               | 555       | 789                         | NR               | 685       | 445                         | NR               | 815       | 10                          | NR               | 945       | 0                           | NR               |
| 430       | 114                         | NR               | 560       | 800                         | NR               | 690       | 398                         | NR               | 820       | 9                           | NR               | 950       | 0                           | NR               |
| 435       | 218                         | NR               | 565       | 813                         | NR               | 695       | 352                         | NR               | 825       | 7                           | NR               | 955       | 0                           | NR               |
| 440       | 427                         | NR               | 570       | 828                         | NR               | 700       | 309                         | NR               | 830       | 6                           | NR               | 960       | 0                           | NR               |
| 445       | 684                         | NR               | 575       | 846                         | NR               | 705       | 273                         | NR               | 835       | 5                           | NR               | 965       | 0                           | NR               |
| 450       | 611                         | NR               | 580       | 866                         | NR               | 710       | 237                         | NR               | 840       | 5                           | NR               | 970       | 0                           | NR               |
| 455       | 461                         | NR               | 585       | 888                         | NR               | 715       | 208                         | NR               | 845       | 4                           | NR               | 975       | 0                           | NR               |
| 460       | 427                         | NR               | 590       | 913                         | NR               | 720       | 181                         | NR               | 850       | 4                           | NR               | 980       | 0                           | NR               |
| 465       | 349                         | NR               | 595       | 936                         | NR               | 725       | 157                         | NR               | 855       | 3                           | NR               | 985       | 0                           | NR               |
| 470       | 298                         | NR               | 600       | 957                         | NR               | 730       | 136                         | NR               | 860       | 3                           | NR               | 990       | 1                           | NR               |
| 475       | 312                         | NR               | 605       | 976                         | NR               | 735       | 117                         | NR               | 865       | 2                           | NR               | 995       | 0                           | NR               |
| 480       | 335                         | NR               | 610       | 990                         | NR               | 740       | 100                         | NR               | 870       | 2                           | NR               | 1000      | 0                           | NR               |
| 485       | 367                         | NR               | 615       | 999                         | NR               | 745       | 86                          | NR               | 875       | 2                           | NR               |           |                             |                  |

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### Melanopic Flux vs. Wavelength


**Melanopic Lumens: NR**
**M/P: 3.14**

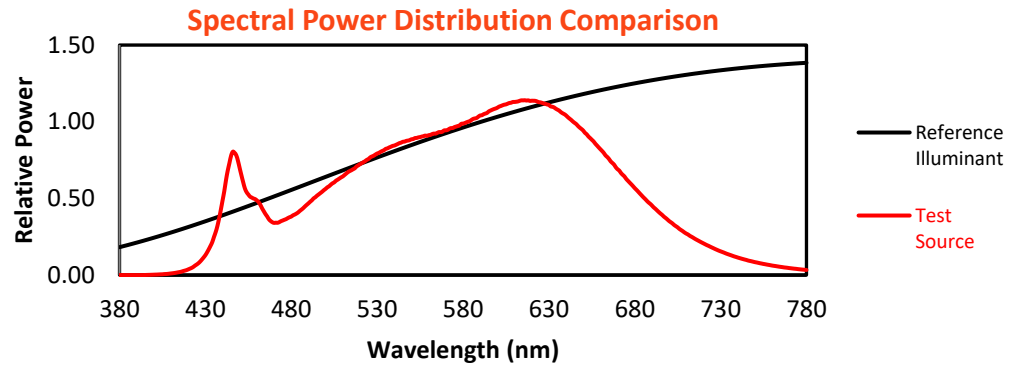
| $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | 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               | 410                                    | NR                             | 620               | 997                                    | NR                             | 750               | 74                                     | NR                             | 880               | 1                                      | NR                             |
| 365               | 0                                      | NR                             | 495               | 454                                    | NR                             | 625               | 988                                    | NR                             | 755               | 64                                     | NR                             | 885               | 1                                      | NR                             |
| 370               | 0                                      | NR                             | 500               | 493                                    | NR                             | 630               | 973                                    | NR                             | 760               | 54                                     | NR                             | 890               | 1                                      | NR                             |
| 375               | 0                                      | NR                             | 505               | 530                                    | NR                             | 635               | 946                                    | NR                             | 765               | 47                                     | NR                             | 895               | 1                                      | NR                             |
| 380               | 0                                      | NR                             | 510               | 564                                    | NR                             | 640               | 913                                    | NR                             | 770               | 40                                     | NR                             | 900               | 1                                      | NR                             |
| 385               | 0                                      | NR                             | 515               | 599                                    | NR                             | 645               | 870                                    | NR                             | 775               | 34                                     | NR                             | 905               | 1                                      | NR                             |
| 390               | 0                                      | NR                             | 520               | 634                                    | NR                             | 650               | 826                                    | NR                             | 780               | 29                                     | NR                             | 910               | 1                                      | NR                             |
| 395               | 0                                      | NR                             | 525               | 664                                    | NR                             | 655               | 774                                    | NR                             | 785               | 25                                     | NR                             | 915               | 1                                      | NR                             |
| 400               | 2                                      | NR                             | 530               | 695                                    | NR                             | 660               | 720                                    | NR                             | 790               | 21                                     | NR                             | 920               | 1                                      | NR                             |
| 405               | 4                                      | NR                             | 535               | 722                                    | NR                             | 665               | 664                                    | NR                             | 795               | 18                                     | NR                             | 925               | 1                                      | NR                             |
| 410               | 9                                      | NR                             | 540               | 741                                    | NR                             | 670               | 605                                    | NR                             | 800               | 16                                     | NR                             | 930               | 0                                      | NR                             |
| 415               | 17                                     | NR                             | 545               | 762                                    | NR                             | 675               | 550                                    | NR                             | 805               | 13                                     | NR                             | 935               | 0                                      | NR                             |
| 420               | 32                                     | NR                             | 550               | 777                                    | NR                             | 680               | 497                                    | NR                             | 810               | 12                                     | NR                             | 940               | 0                                      | NR                             |
| 425               | 61                                     | NR                             | 555               | 789                                    | NR                             | 685               | 445                                    | NR                             | 815               | 10                                     | NR                             | 945               | 0                                      | NR                             |
| 430               | 114                                    | NR                             | 560               | 800                                    | NR                             | 690               | 398                                    | NR                             | 820               | 9                                      | NR                             | 950               | 0                                      | NR                             |
| 435               | 218                                    | NR                             | 565               | 813                                    | NR                             | 695               | 352                                    | NR                             | 825               | 7                                      | NR                             | 955               | 0                                      | NR                             |
| 440               | 427                                    | NR                             | 570               | 828                                    | NR                             | 700               | 309                                    | NR                             | 830               | 6                                      | NR                             | 960               | 0                                      | NR                             |
| 445               | 684                                    | NR                             | 575               | 846                                    | NR                             | 705               | 273                                    | NR                             | 835               | 5                                      | NR                             | 965               | 0                                      | NR                             |
| 450               | 611                                    | NR                             | 580               | 866                                    | NR                             | 710               | 237                                    | NR                             | 840               | 5                                      | NR                             | 970               | 0                                      | NR                             |
| 455               | 461                                    | NR                             | 585               | 888                                    | NR                             | 715               | 208                                    | NR                             | 845               | 4                                      | NR                             | 975               | 0                                      | NR                             |
| 460               | 427                                    | NR                             | 590               | 913                                    | NR                             | 720               | 181                                    | NR                             | 850               | 4                                      | NR                             | 980               | 0                                      | NR                             |
| 465               | 349                                    | NR                             | 595               | 936                                    | NR                             | 725               | 157                                    | NR                             | 855               | 3                                      | NR                             | 985               | 0                                      | NR                             |
| 470               | 298                                    | NR                             | 600               | 957                                    | NR                             | 730               | 136                                    | NR                             | 860               | 3                                      | NR                             | 990               | 1                                      | NR                             |
| 475               | 312                                    | NR                             | 605               | 976                                    | NR                             | 735               | 117                                    | NR                             | 865               | 2                                      | NR                             | 995               | 0                                      | NR                             |
| 480               | 335                                    | NR                             | 610               | 990                                    | NR                             | 740               | 100                                    | NR                             | 870               | 2                                      | NR                             | 1000              | 0                                      | NR                             |
| 485               | 367                                    | NR                             | 615               | 999                                    | NR                             | 745               | 86                                     | NR                             | 875               | 2                                      | NR                             |                   |                                        |                                |

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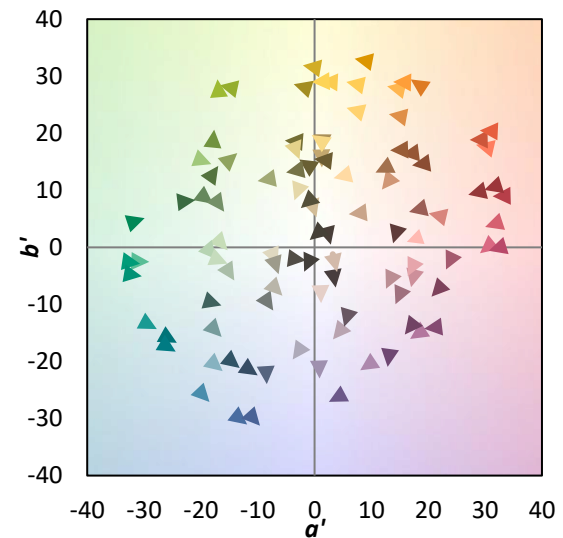
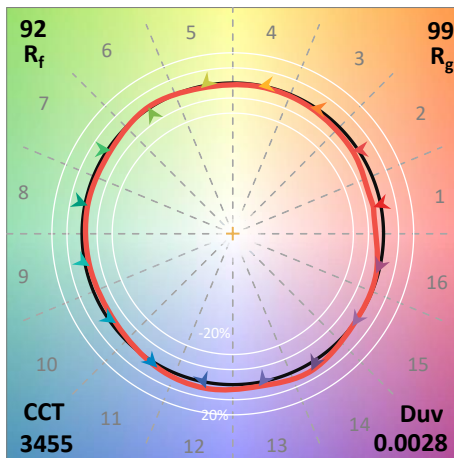
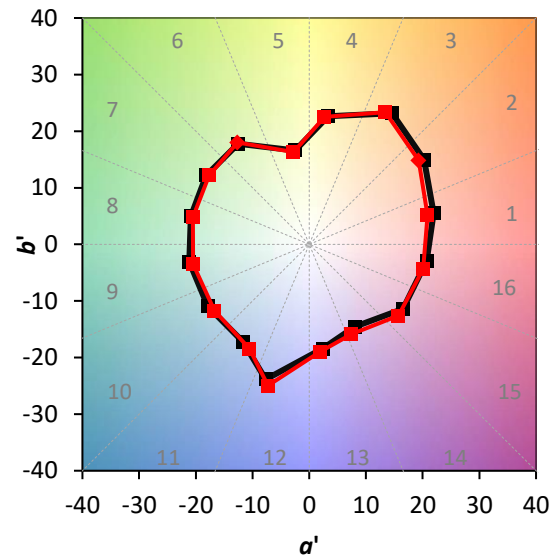
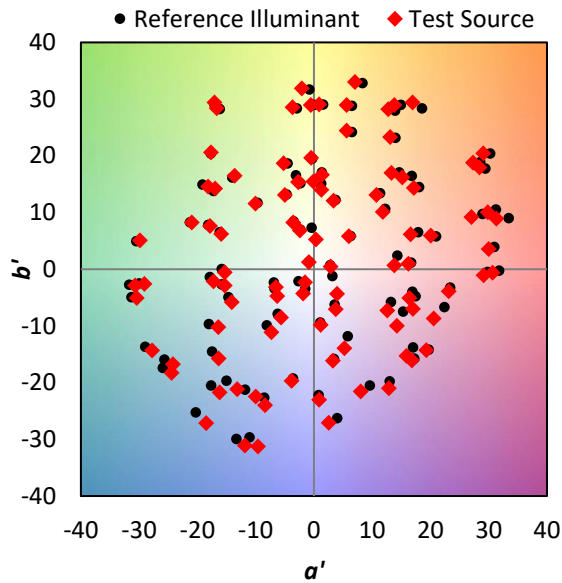
TM-30-18

### Summary

$R_f = 92.3$   
 $R_g = 98.5$   
 $\text{CIE } R_a = 92.2$   
 $R_9 = 59.8$



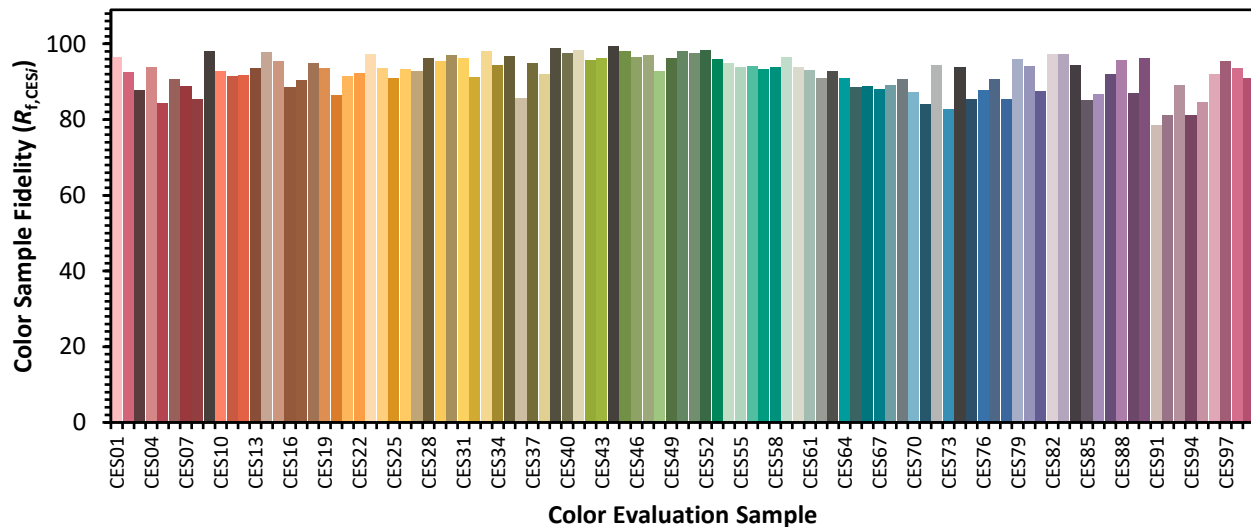
### Color Vector Graphics

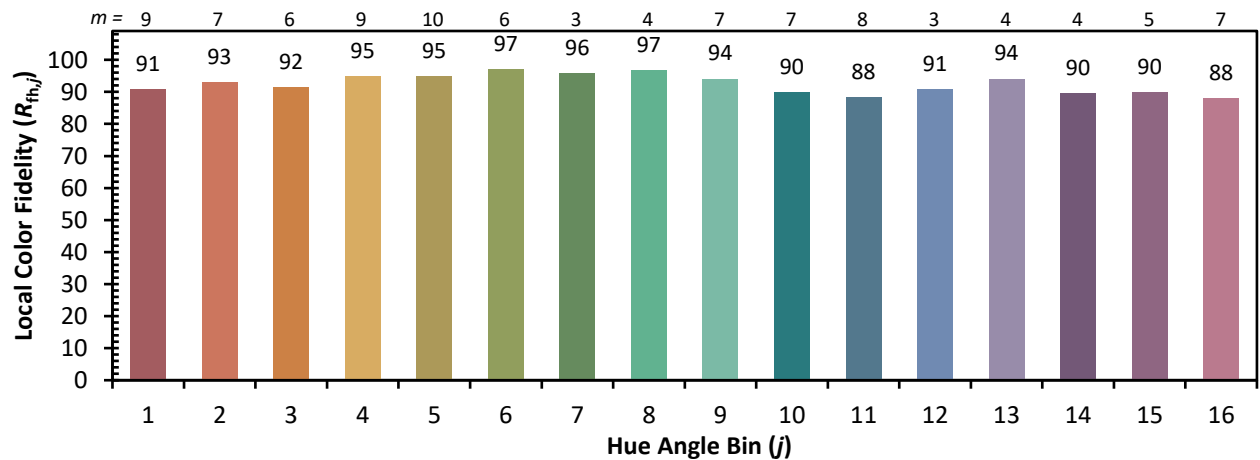
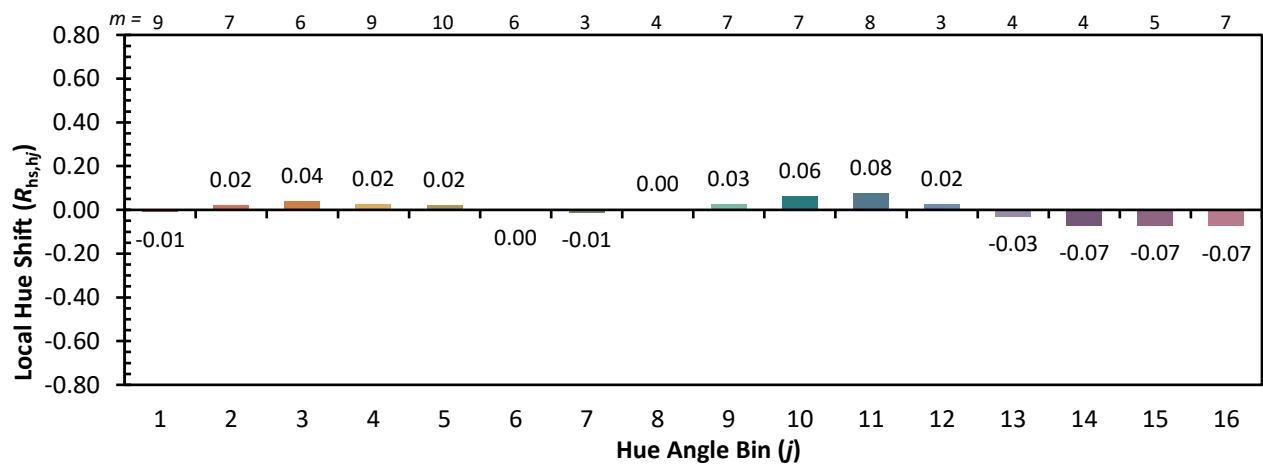
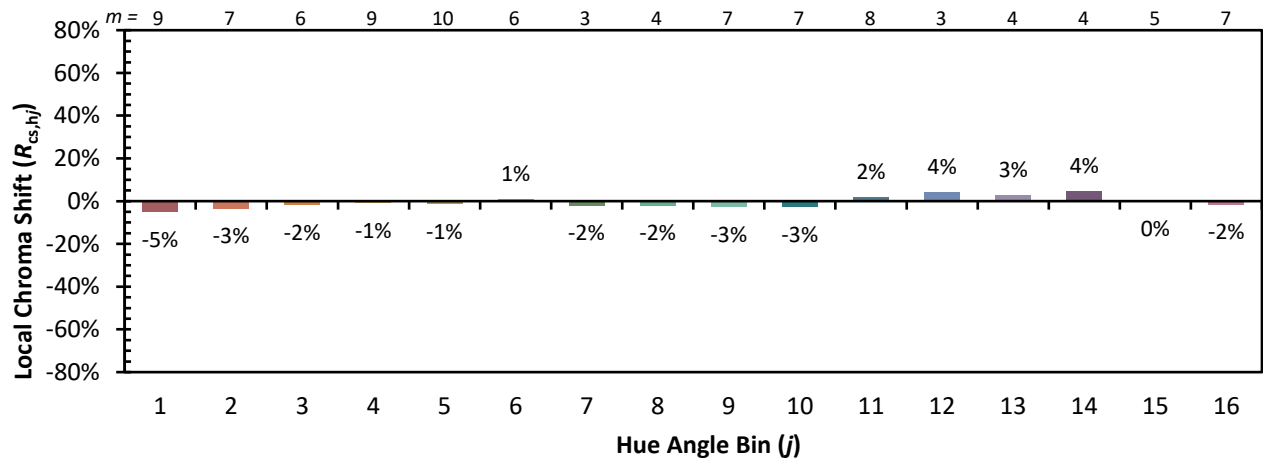


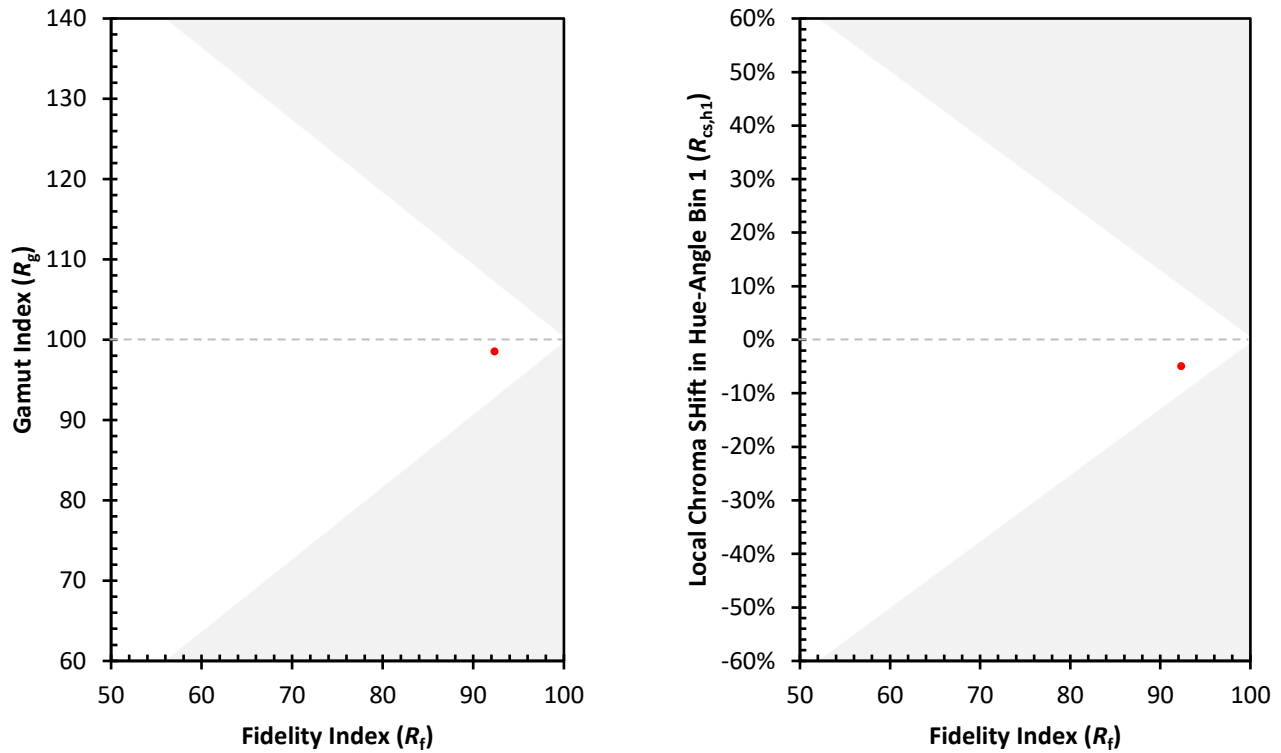


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 93 | CES51 = 97 | CES76 = 88 |
| CES02 = 62 | CES27 = 93 | CES52 = 98 | CES77 = 91 |
| CES03 = 31 | CES28 = 96 | CES53 = 96 | CES78 = 85 |
| CES04 = 70 | CES29 = 95 | CES54 = 95 | CES79 = 96 |
| CES05 = 50 | CES30 = 97 | CES55 = 94 | CES80 = 94 |
| CES06 = 51 | CES31 = 96 | CES56 = 94 | CES81 = 87 |
| CES07 = 42 | CES32 = 91 | CES57 = 93 | CES82 = 97 |
| CES08 = 41 | CES33 = 98 | CES58 = 94 | CES83 = 97 |
| CES09 = 29 | CES34 = 94 | CES59 = 96 | CES84 = 94 |
| CES10 = 75 | CES35 = 97 | CES60 = 94 | CES85 = 85 |
| CES11 = 58 | CES36 = 86 | CES61 = 93 | CES86 = 87 |
| CES12 = 64 | CES37 = 95 | CES62 = 91 | CES87 = 92 |
| CES13 = 43 | CES38 = 92 | CES63 = 93 | CES88 = 96 |
| CES14 = 74 | CES39 = 99 | CES64 = 91 | CES89 = 87 |
| CES15 = 71 | CES40 = 98 | CES65 = 89 | CES90 = 96 |
| CES16 = 47 | CES41 = 98 | CES66 = 89 | CES91 = 78 |
| CES17 = 49 | CES42 = 96 | CES67 = 88 | CES92 = 81 |
| CES18 = 56 | CES43 = 96 | CES68 = 89 | CES93 = 89 |
| CES19 = 71 | CES44 = 99 | CES69 = 91 | CES94 = 81 |
| CES20 = 66 | CES45 = 98 | CES70 = 87 | CES95 = 85 |
| CES21 = 86 | CES46 = 97 | CES71 = 84 | CES96 = 92 |
| CES22 = 78 | CES47 = 97 | CES72 = 95 | CES97 = 95 |
| CES23 = 91 | CES48 = 93 | CES73 = 83 | CES98 = 94 |
| CES24 = 90 | CES49 = 96 | CES74 = 94 | CES99 = 91 |
| CES25 = 71 | CES50 = 98 | CES75 = 85 |            |



**Color Rendition by Hue-Angle Bin**


**Measure Comparisons**


(END OF REPORT)