

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: P1048795

Luminaire Tested: **GALN-SA5C-940-U-T4BC**

Issue Date: 07/10/2025

**Test Information**

Test Method: LM-79-08  
Report Number: P1048795  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 07/10/2025  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: MCGRAW-EDISON  
Catalog Number: GALN-SA5C-940-U-T4BC  
Description: GALLEON II AREA AND ROADWAY LUMINAIRE 1050mA 5xLight Square PACKAGE  
90CRI 4000K FIXTURE w/ TYPE IV ANGLED BACKLIGHT CONTROL  
Light Source: (70) 4000K CCT, 90 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 20527.9 lumens  
Efficiency: N/A  
Efficacy: 87.0 lumens/watt  
Luminous Opening: Rectangular (W 1.5' x L: 1' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B0 - U0 - G4

Input Watts (W): 236  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.97  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT

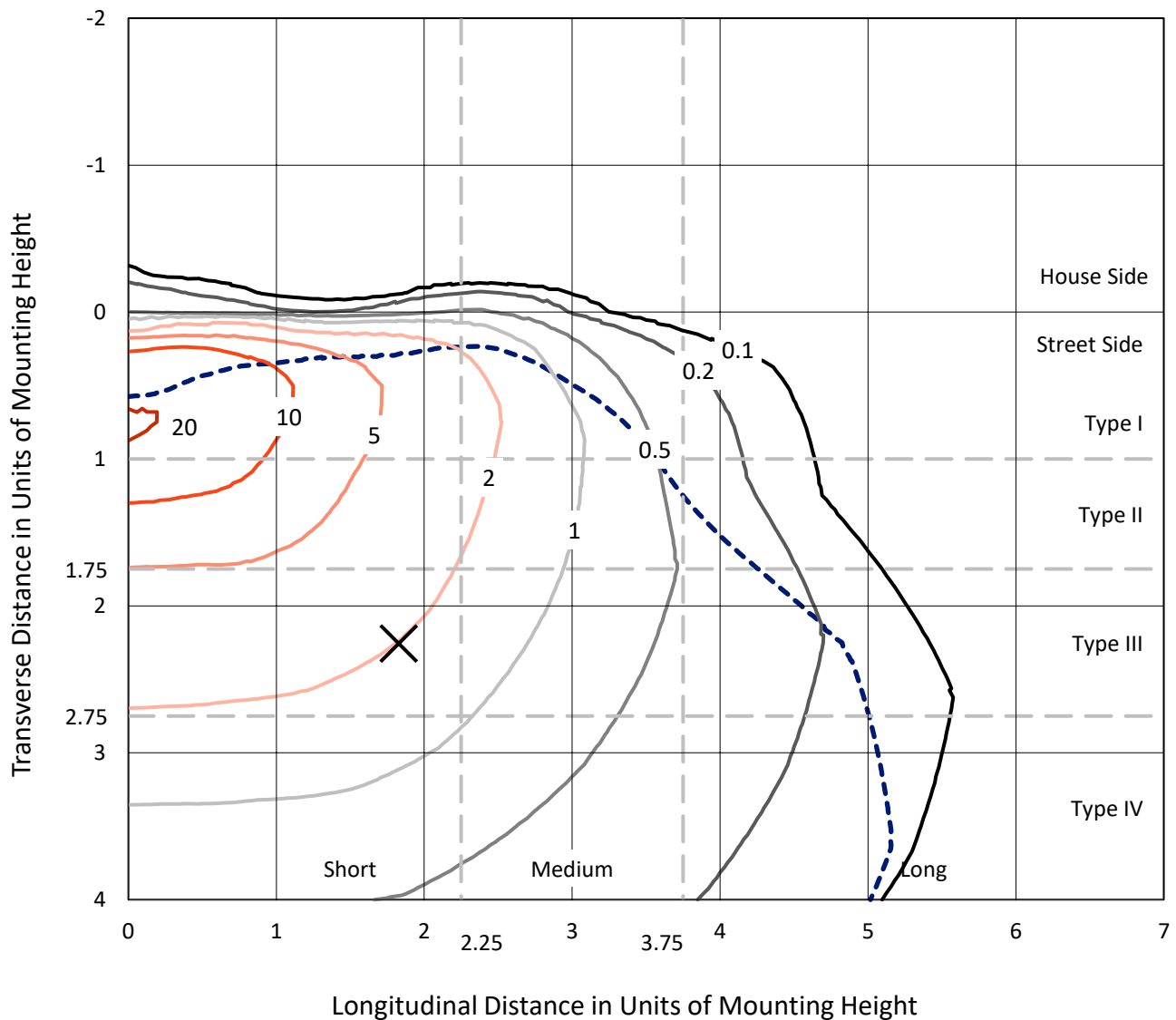


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## Iso-Footcandle Lines of Horizontal Illumination

× Max cd  
 - - - 1/2 Max cd

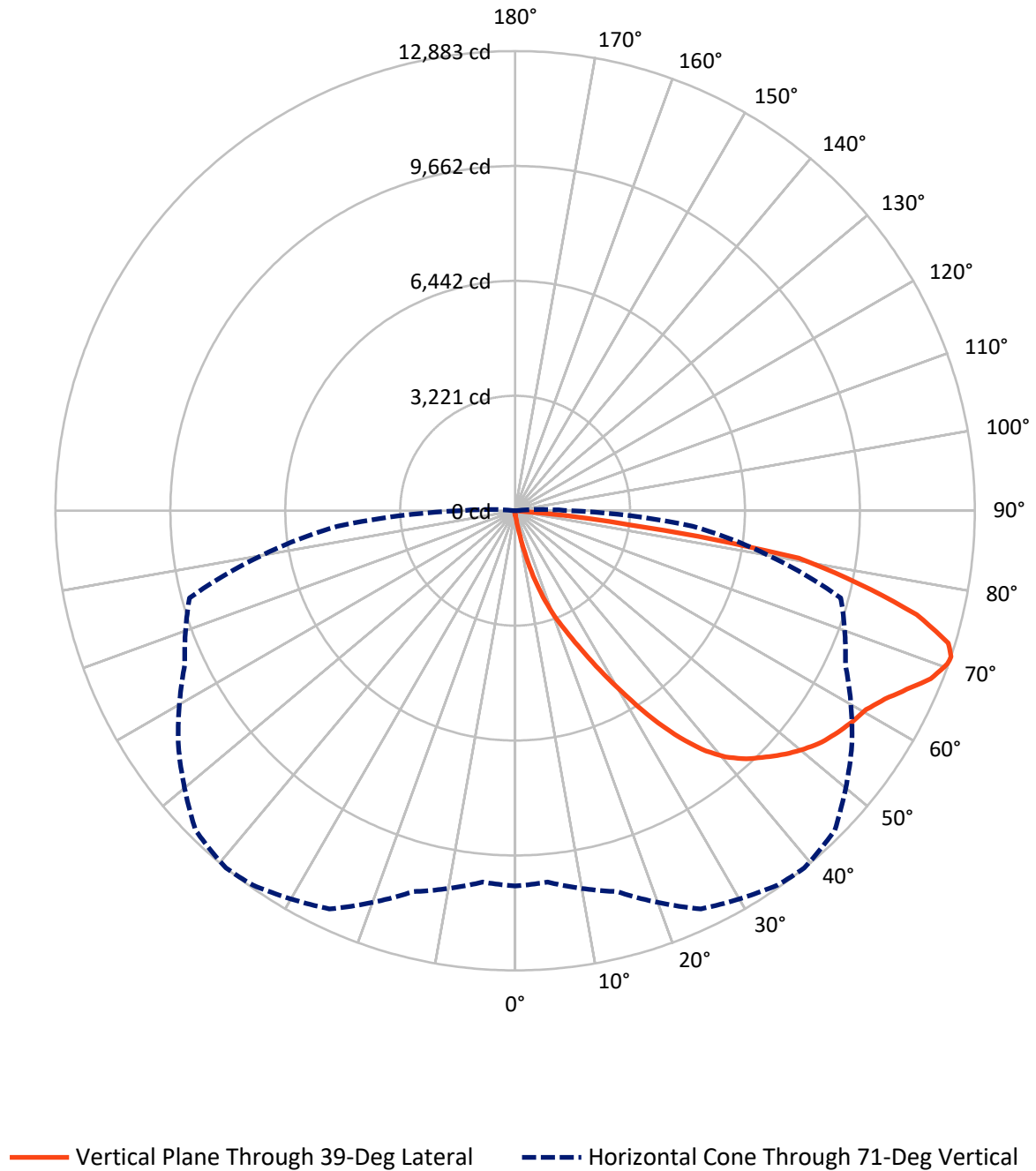


Based on 15 foot mounting height. Maximum calculated value = 21.1 fc  
 Type IV - Short - N/A

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## Luminous Intensity Polar Plot



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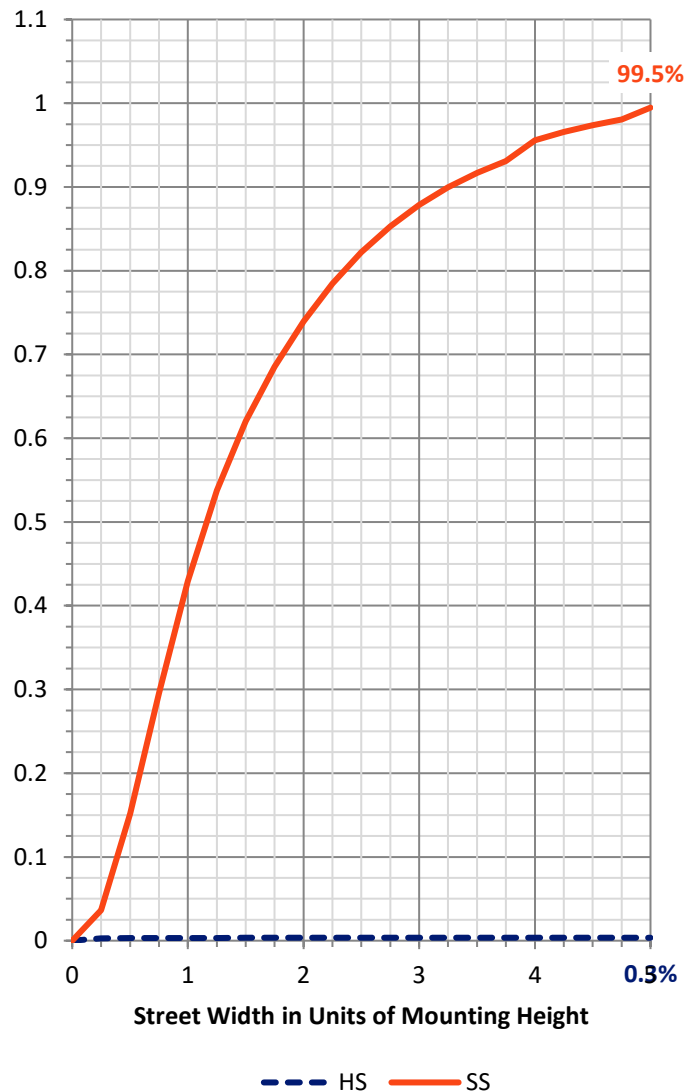
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 72.9     | 0.0    | 72.9    |
|                    | % Fixture | 0.4      | 0.0    | 0.4     |
| <b>Street Side</b> | Lumens    | 20455.0  | 0.0    | 20455.0 |
|                    | % Fixture | 99.6     | 0.0    | 99.6    |
| <b>Total</b>       | Lumens    | 20527.9  | 0.0    | 20527.9 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 17.2    | 0.1       |
| 10°-20°   | 219.4   | 1.1       |
| 20°-30°   | 781.3   | 3.8       |
| 30°-40°   | 1883.1  | 9.2       |
| 40°-50°   | 3151.5  | 15.4      |
| 50°-60°   | 4047.8  | 19.7      |
| 60°-70°   | 5122.5  | 25.0      |
| 70°-80°   | 4566.9  | 22.2      |
| 80°-90°   | 738.2   | 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°    | 20527.9 | 100.0     |
| 0°-180°   | 20527.9 | 100.0     |



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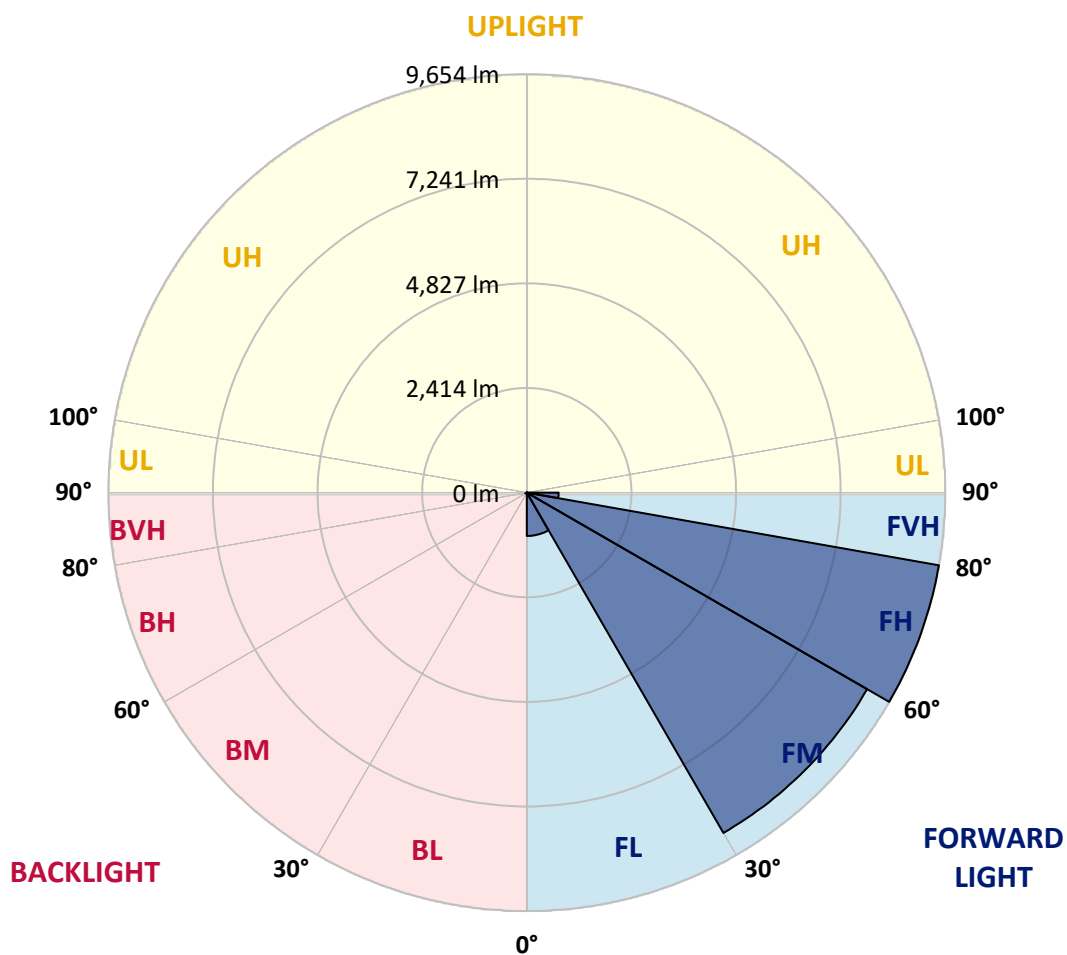
CATALOG NUMBER: GALN-SA5C-940-U-T4BC

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |          |
|------|-------------|--------|-----------|-------------------------|------|----------|
|      |             |        |           | B                       | U    | G        |
| FL   | (0°-30°)    | 1000.3 | 4.9       |                         |      |          |
| FM   | (30°-60°)   | 9065.5 | 44.2      |                         |      |          |
| FH   | (60°-80°)   | 9654.3 | 47.0      |                         |      | G4/12000 |
| FVH  | (80°-90°)   | 734.9  | 3.6       |                         |      | G4/750   |
| BL   | (0°-30°)    | 17.6   | 0.1       | B0/110                  |      |          |
| BM   | (30°-60°)   | 16.9   | 0.1       | B0/220                  |      |          |
| BH   | (60°-80°)   | 35.1   | 0.2       | B0/110                  |      | G0/110   |
| BVH  | (80°-90°)   | 3.3    | 0.0       |                         |      | G0/10    |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |          |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |          |

**BUG Rating: B0-U0-G4**

Type IV Short



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 39°     | 45°     | 55°     | 65°     | 75°     | 85°    |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--------|
| 0°    | 112.6   | 112.6   | 112.6   | 112.6   | 112.6   | 112.6   | 112.6   | 112.6   | 112.6   | 112.6   | 112.6  |
| 2.5°  | 129.2   | 129.2   | 129.2   | 125.1   | 125.1   | 123.7   | 122.3   | 122.3   | 119.5   | 118.1   | 115.3  |
| 5°    | 195.9   | 191.8   | 182.0   | 176.5   | 165.4   | 158.4   | 151.5   | 141.7   | 132.0   | 125.1   | 116.7  |
| 7.5°  | 443.3   | 453.0   | 421.1   | 361.3   | 300.2   | 273.8   | 229.3   | 184.8   | 152.9   | 132.0   | 118.1  |
| 10°   | 1129.8  | 1124.2  | 1015.8  | 896.3   | 692.0   | 610.0   | 478.0   | 301.5   | 197.3   | 144.5   | 119.5  |
| 12.5° | 1921.9  | 1916.3  | 1788.5  | 1625.9  | 1356.3  | 1185.4  | 935.2   | 562.8   | 283.5   | 164.0   | 119.5  |
| 15°   | 2587.5  | 2565.3  | 2525.0  | 2363.8  | 2048.3  | 1905.2  | 1574.4  | 995.0   | 458.6   | 197.3   | 122.3  |
| 17.5° | 3028.0  | 3008.5  | 2971.0  | 2912.7  | 2712.6  | 2543.0  | 2277.6  | 1563.3  | 742.1   | 255.7   | 127.8  |
| 20°   | 3432.4  | 3418.5  | 3387.9  | 3376.8  | 3247.6  | 3157.2  | 2937.7  | 2216.5  | 1156.2  | 347.4   | 136.2  |
| 22.5° | 3988.2  | 3959.1  | 3971.6  | 3904.9  | 3778.4  | 3670.0  | 3535.2  | 2900.2  | 1662.0  | 500.3   | 151.5  |
| 25°   | 4669.2  | 4655.3  | 4620.5  | 4573.3  | 4398.2  | 4303.7  | 4096.6  | 3544.9  | 2227.6  | 700.4   | 168.1  |
| 27.5° | 5491.8  | 5476.5  | 5468.2  | 5359.8  | 5158.3  | 5055.5  | 4766.4  | 4153.6  | 2864.0  | 981.1   | 190.4  |
| 30°   | 6439.5  | 6446.5  | 6392.3  | 6253.3  | 6018.5  | 5874.0  | 5576.6  | 4791.4  | 3515.8  | 1310.4  | 214.0  |
| 32.5° | 7420.6  | 7406.7  | 7323.3  | 7159.4  | 6949.5  | 6814.7  | 6436.8  | 5490.4  | 4199.5  | 1745.4  | 241.8  |
| 35°   | 8478.1  | 8451.7  | 8232.2  | 8044.6  | 7865.3  | 7695.8  | 7351.1  | 6302.0  | 4883.2  | 2233.1  | 279.3  |
| 37.5° | 9545.4  | 9421.7  | 8981.2  | 8743.5  | 8619.9  | 8480.9  | 8159.9  | 7167.7  | 5562.7  | 2777.9  | 325.2  |
| 40°   | 10351.3 | 10255.5 | 9733.0  | 9295.2  | 9196.6  | 9078.4  | 8839.4  | 7915.3  | 6285.3  | 3362.9  | 380.8  |
| 42.5° | 10797.4 | 10744.6 | 10274.9 | 9842.7  | 9610.7  | 9506.5  | 9302.2  | 8568.5  | 6999.6  | 4009.1  | 461.4  |
| 45°   | 10987.8 | 10905.8 | 10591.8 | 10390.3 | 10020.6 | 9848.3  | 9605.1  | 9061.8  | 7745.8  | 4742.8  | 573.9  |
| 47.5° | 10929.4 | 10882.2 | 10657.1 | 10730.7 | 10462.5 | 10194.3 | 9837.2  | 9439.8  | 8383.6  | 5584.9  | 728.2  |
| 50°   | 10562.6 | 10522.3 | 10452.8 | 10851.6 | 10818.3 | 10501.4 | 10137.3 | 9738.5  | 8904.7  | 6453.4  | 967.2  |
| 52.5° | 9865.0  | 9848.3  | 10026.2 | 10757.1 | 11019.8 | 10772.4 | 10426.4 | 10002.6 | 9391.1  | 7360.9  | 1309.0 |
| 55°   | 8965.9  | 9034.0  | 9542.6  | 10609.8 | 11122.6 | 10972.5 | 10682.1 | 10249.9 | 9781.6  | 8172.4  | 1813.5 |
| 57.5° | 8596.2  | 8614.3  | 9249.4  | 10505.6 | 11168.4 | 11149.0 | 10930.8 | 10486.1 | 10140.1 | 8821.4  | 2583.3 |
| 60°   | 9028.4  | 9000.6  | 9335.5  | 10584.8 | 11260.2 | 11307.4 | 11151.8 | 10705.7 | 10451.4 | 9378.6  | 3608.9 |
| 62.5° | 9809.4  | 9794.1  | 9901.1  | 10922.5 | 11528.4 | 11624.2 | 11458.9 | 10864.1 | 10726.5 | 9745.5  | 4778.9 |
| 65°   | 10507.0 | 10475.0 | 10673.7 | 11521.4 | 11999.4 | 12067.5 | 11923.0 | 11135.1 | 10847.4 | 10012.3 | 5878.1 |
| 67.5° | 10808.5 | 10801.6 | 11121.2 | 12091.2 | 12494.2 | 12567.8 | 12441.3 | 11508.9 | 10819.7 | 10097.0 | 6363.1 |
| 70°   | 10671.0 | 10644.6 | 11155.9 | 12333.0 | 12773.5 | 12856.8 | 12734.6 | 11647.9 | 10518.1 | 9828.8  | 5644.7 |
| 71°   | 10519.5 | 10448.6 | 11051.7 | 12316.3 | 12812.4 | 12883.3 | 12669.2 | 11521.4 | 10215.2 | 9448.1  | 4992.9 |
| 72.5° | 10049.8 | 10062.3 | 10765.5 | 12142.6 | 12719.3 | 12698.4 | 12299.6 | 11068.4 | 9849.7  | 8583.7  | 4010.5 |
| 75°   | 8893.6  | 8967.3  | 9838.6  | 11413.0 | 11888.3 | 11622.9 | 11012.8 | 10202.7 | 9116.0  | 6154.7  | 2784.8 |
| 77.5° | 7267.8  | 7377.5  | 8335.0  | 10009.5 | 9874.7  | 9848.3  | 9823.3  | 8989.5  | 7784.7  | 3305.9  | 1937.1 |
| 80°   | 3469.9  | 3707.5  | 5027.7  | 7145.5  | 7762.5  | 8061.2  | 7873.6  | 7244.1  | 6019.9  | 1574.4  | 1157.6 |
| 82.5° | 226.5   | 223.7   | 316.8   | 600.3   | 2530.5  | 3271.2  | 5197.2  | 5177.8  | 4196.7  | 767.1   | 472.5  |
| 85°   | 107.0   | 109.8   | 120.9   | 137.6   | 159.8   | 175.1   | 241.8   | 1417.4  | 2008.0  | 365.5   | 102.8  |
| 87.5° | 62.5    | 63.9    | 75.0    | 95.9    | 125.1   | 139.0   | 165.4   | 212.6   | 261.3   | 201.5   | 22.2   |
| 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: P1048795

CATALOG NUMBER: GALN-SA5C-940-U-T4BC

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°   | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 112.6  | 112.6 | 112.6 | 112.6 | 112.6 | 112.6 | 112.6 | 112.6 | 112.6 | 112.6 | 112.6 |
| 2.5°  | 113.9  | 112.6 | 108.4 | 104.2 | 100.1 | 97.3  | 95.9  | 97.3  | 97.3  | 98.7  | 98.7  |
| 5°    | 113.9  | 109.8 | 102.8 | 94.5  | 88.9  | 83.4  | 80.6  | 79.2  | 80.6  | 80.6  | 80.6  |
| 7.5°  | 112.6  | 105.6 | 95.9  | 86.2  | 79.2  | 72.3  | 69.5  | 68.1  | 68.1  | 69.5  | 69.5  |
| 10°   | 109.8  | 102.8 | 90.3  | 79.2  | 70.9  | 62.5  | 58.4  | 54.2  | 54.2  | 54.2  | 55.6  |
| 12.5° | 108.4  | 98.7  | 83.4  | 72.3  | 61.1  | 51.4  | 43.1  | 38.9  | 40.3  | 40.3  | 40.3  |
| 15°   | 105.6  | 94.5  | 79.2  | 65.3  | 51.4  | 38.9  | 32.0  | 27.8  | 29.2  | 30.6  | 29.2  |
| 17.5° | 105.6  | 93.1  | 73.7  | 57.0  | 40.3  | 29.2  | 23.6  | 20.8  | 20.8  | 22.2  | 22.2  |
| 20°   | 105.6  | 90.3  | 69.5  | 48.6  | 30.6  | 22.2  | 16.7  | 15.3  | 15.3  | 18.1  | 19.5  |
| 22.5° | 108.4  | 90.3  | 63.9  | 40.3  | 25.0  | 16.7  | 12.5  | 11.1  | 12.5  | 15.3  | 16.7  |
| 25°   | 112.6  | 88.9  | 58.4  | 36.1  | 20.8  | 12.5  | 9.7   | 6.9   | 8.3   | 11.1  | 12.5  |
| 27.5° | 116.7  | 87.5  | 52.8  | 32.0  | 16.7  | 9.7   | 6.9   | 5.6   | 4.2   | 5.6   | 5.6   |
| 30°   | 120.9  | 87.5  | 47.2  | 26.4  | 13.9  | 6.9   | 4.2   | 2.8   | 1.4   | 0.0   | 0.0   |
| 32.5° | 123.7  | 84.8  | 43.1  | 20.8  | 11.1  | 5.6   | 2.8   | 1.4   | 0.0   | 0.0   | 0.0   |
| 35°   | 126.5  | 82.0  | 37.5  | 16.7  | 8.3   | 4.2   | 1.4   | 0.0   | 0.0   | 0.0   | 0.0   |
| 37.5° | 129.2  | 77.8  | 32.0  | 13.9  | 6.9   | 2.8   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 40°   | 132.0  | 72.3  | 26.4  | 12.5  | 4.2   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 42.5° | 134.8  | 68.1  | 22.2  | 9.7   | 2.8   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 45°   | 141.7  | 65.3  | 18.1  | 8.3   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 47.5° | 154.2  | 62.5  | 16.7  | 5.6   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 50°   | 172.3  | 59.8  | 15.3  | 4.2   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 52.5° | 197.3  | 58.4  | 13.9  | 2.8   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 55°   | 241.8  | 57.0  | 12.5  | 2.8   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 57.5° | 318.2  | 55.6  | 12.5  | 2.8   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 60°   | 487.8  | 52.8  | 12.5  | 2.8   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 62.5° | 871.3  | 51.4  | 11.1  | 2.8   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 65°   | 1518.9 | 52.8  | 11.1  | 2.8   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 67.5° | 2177.5 | 55.6  | 9.7   | 4.2   | 1.4   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 70°   | 1863.5 | 48.6  | 9.7   | 5.6   | 2.8   | 1.4   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 71°   | 1518.9 | 43.1  | 9.7   | 5.6   | 2.8   | 1.4   | 1.4   | 0.0   | 0.0   | 0.0   | 0.0   |
| 72.5° | 976.9  | 33.4  | 8.3   | 5.6   | 2.8   | 2.8   | 1.4   | 0.0   | 0.0   | 0.0   | 0.0   |
| 75°   | 412.7  | 27.8  | 8.3   | 5.6   | 4.2   | 2.8   | 2.8   | 1.4   | 0.0   | 0.0   | 0.0   |
| 77.5° | 176.5  | 20.8  | 8.3   | 6.9   | 5.6   | 4.2   | 4.2   | 2.8   | 1.4   | 0.0   | 0.0   |
| 80°   | 66.7   | 16.7  | 9.7   | 8.3   | 6.9   | 6.9   | 5.6   | 2.8   | 1.4   | 0.0   | 0.0   |
| 82.5° | 30.6   | 13.9  | 9.7   | 8.3   | 8.3   | 6.9   | 5.6   | 4.2   | 2.8   | 0.0   | 0.0   |
| 85°   | 19.5   | 12.5  | 9.7   | 8.3   | 8.3   | 6.9   | 6.9   | 4.2   | 2.8   | 0.0   | 0.0   |
| 87.5° | 15.3   | 12.5  | 9.7   | 9.7   | 8.3   | 8.3   | 5.6   | 4.2   | 1.4   | 0.0   | 0.0   |
| 90°   | 0.0    | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |

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



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

Report Prepared for

Cooper Lighting Solutions

McGraw-Edison

Report Number: SP1-2407-184-16

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

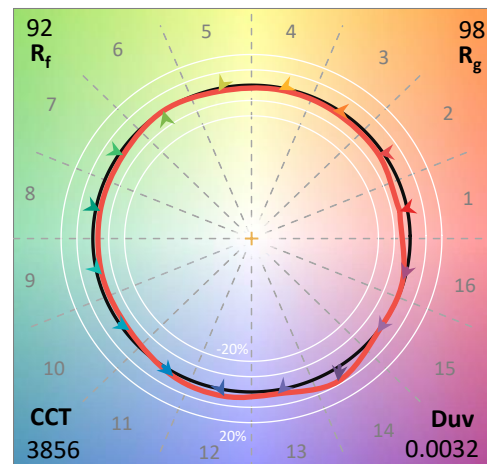
### Test Information

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

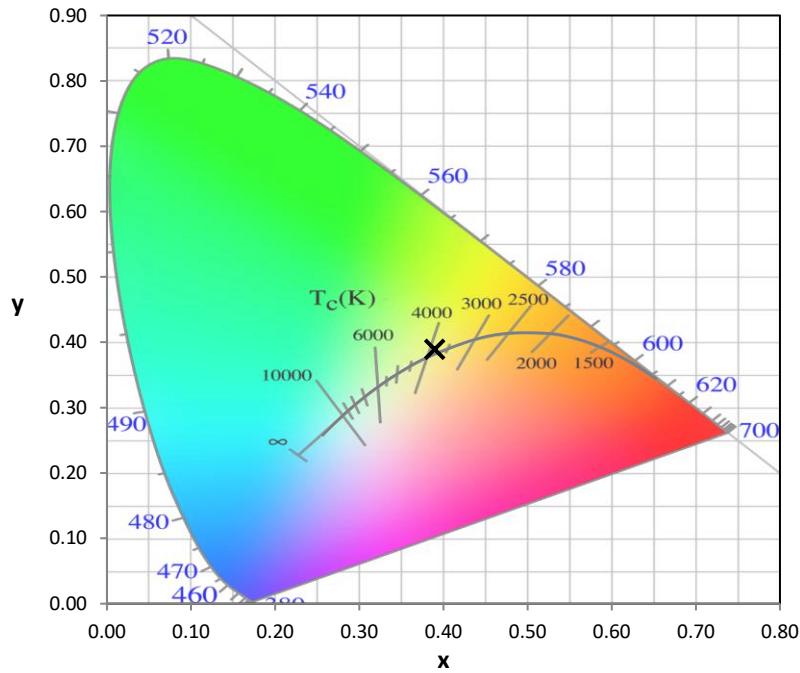
Stabilization Time: 23M  
 Operation Time: 1H 23M  
 Sphere Temperature (°C): 25.2

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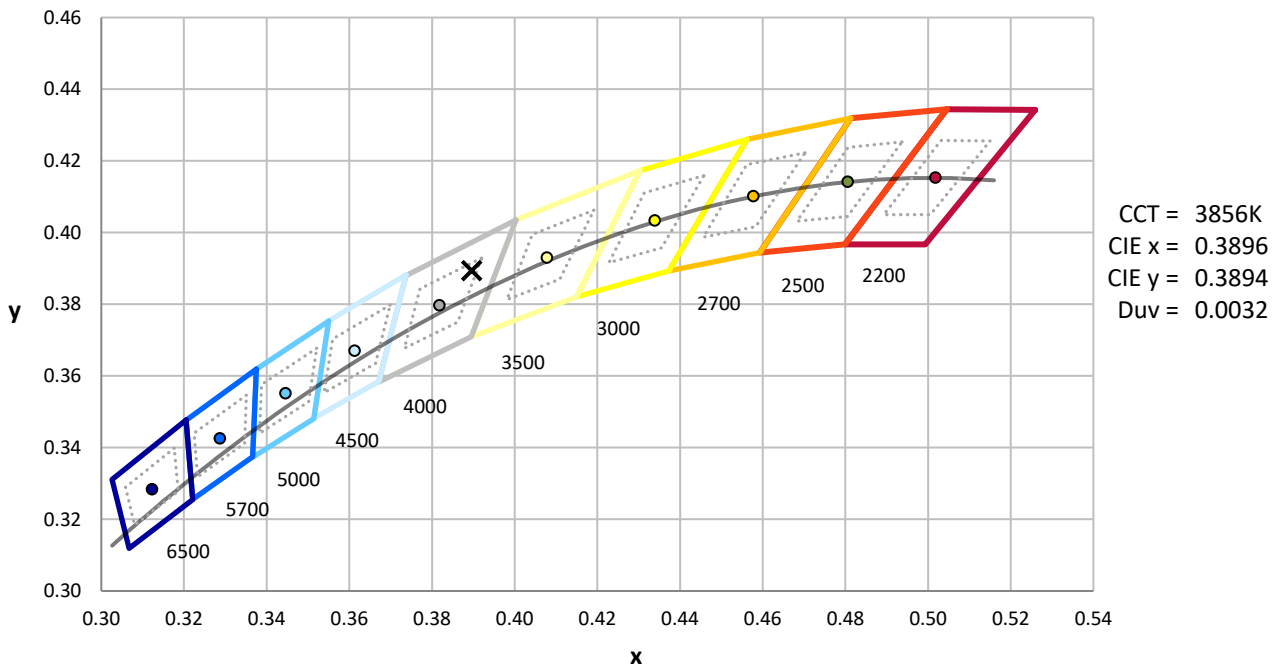
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date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

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**CIE 1931 Chromaticity Diagram**



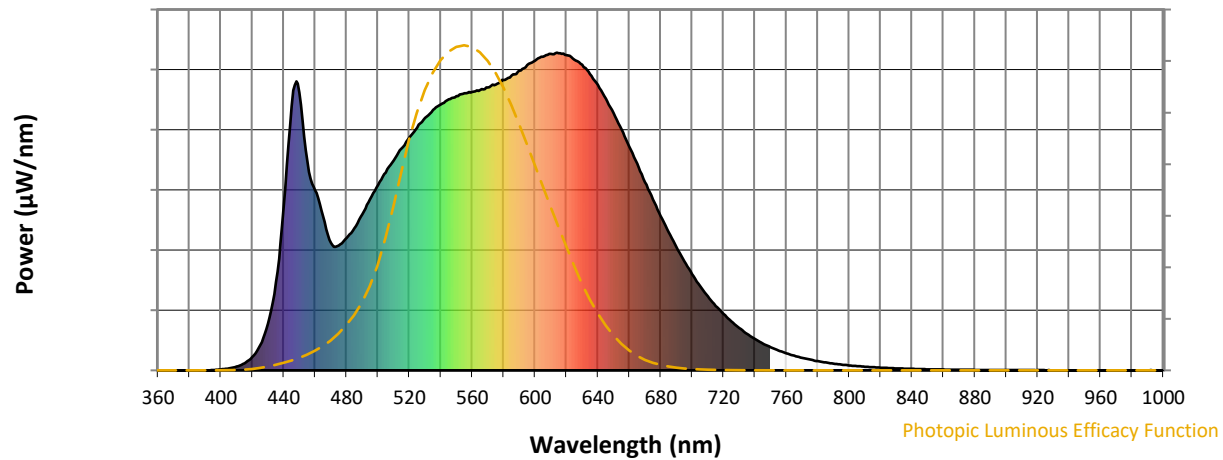
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 4000K 4-step quadrangle

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### Photopic Flux vs. Wavelength

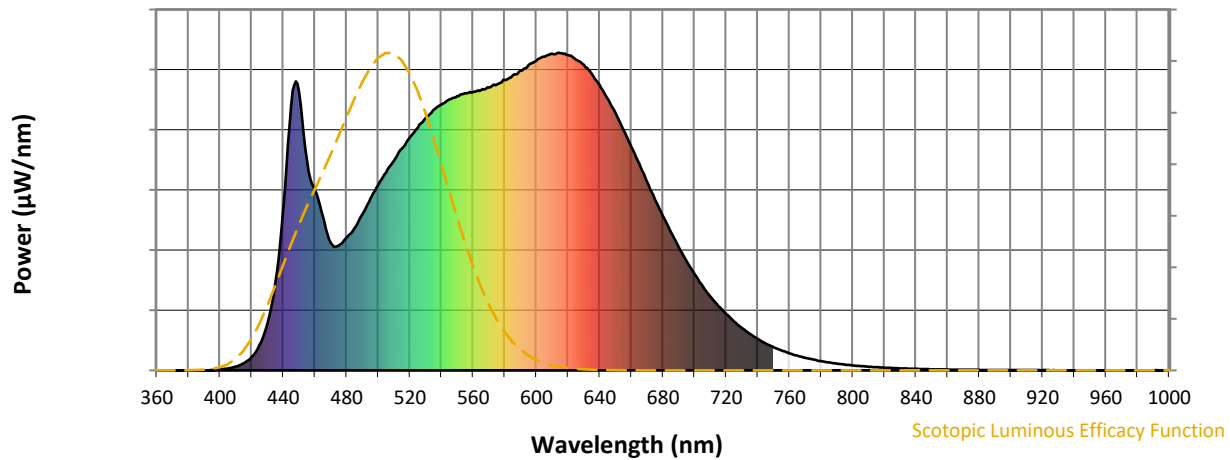


### Photopic Lumens: NR

| $\lambda$<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               | 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                             |                   |                                      |                                |

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### Scotopic Flux vs. Wavelength



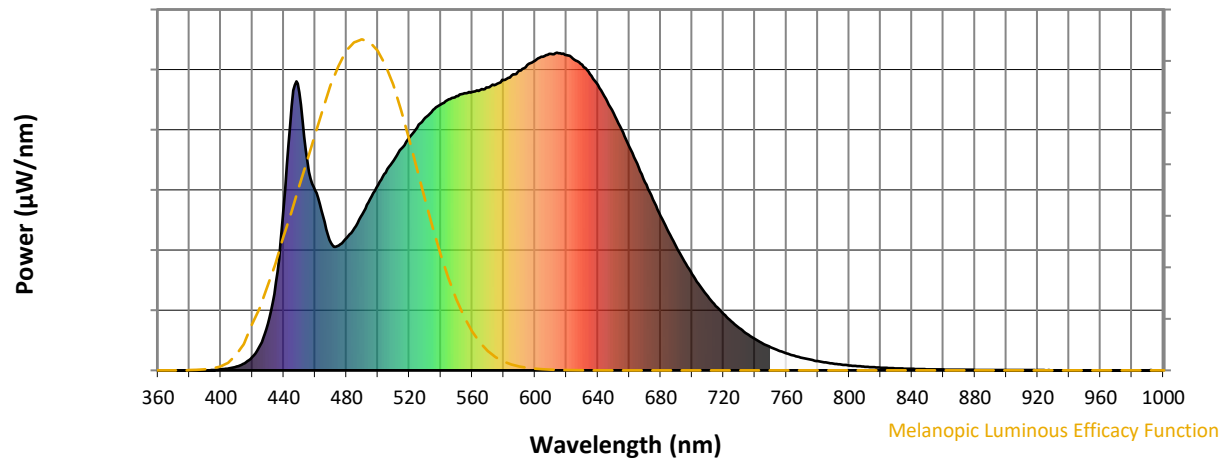
Scotopic Lumens: NR

S/P: 1.72

| 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       | 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               |           |                             |                  |

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### Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 3.52

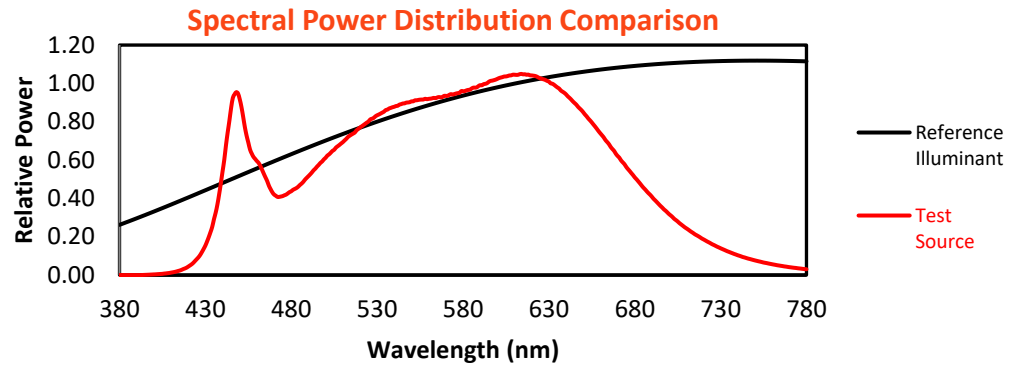
| λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 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            |        |                          |               |

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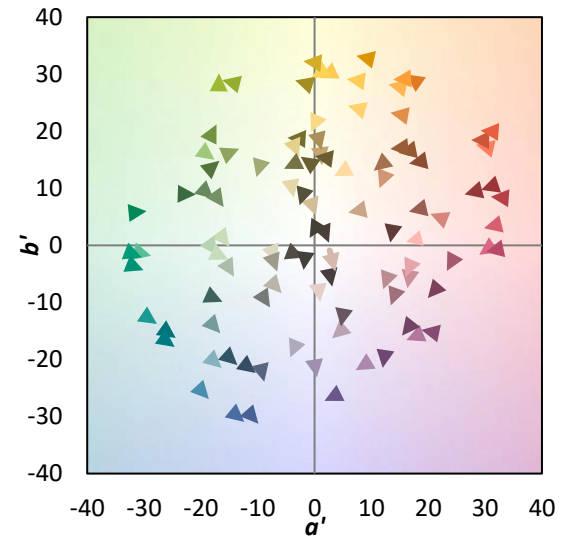
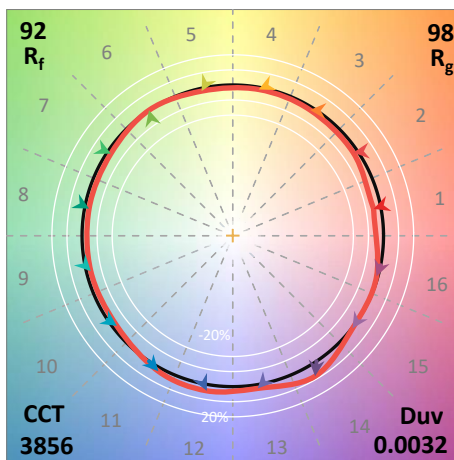
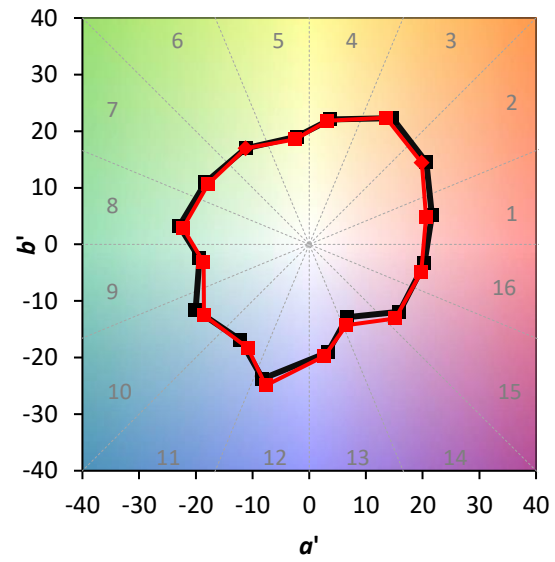
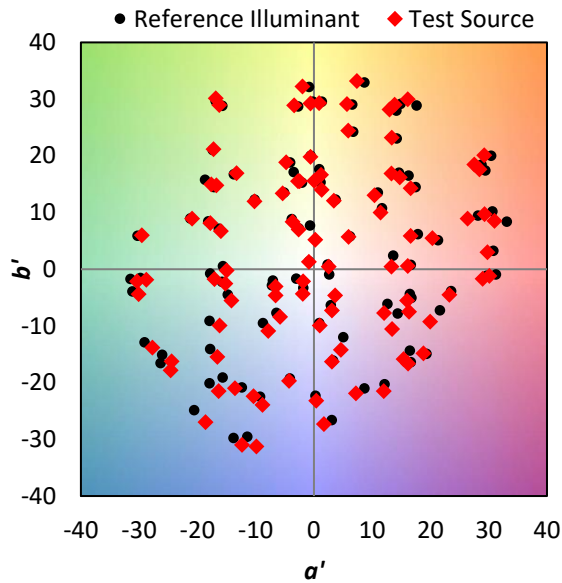
TM-30-18

### Summary

$R_f = 91.8$   
 $R_g = 98.4$   
 $\text{CIE } R_a = 92.1$   
 $R_9 = 60.7$

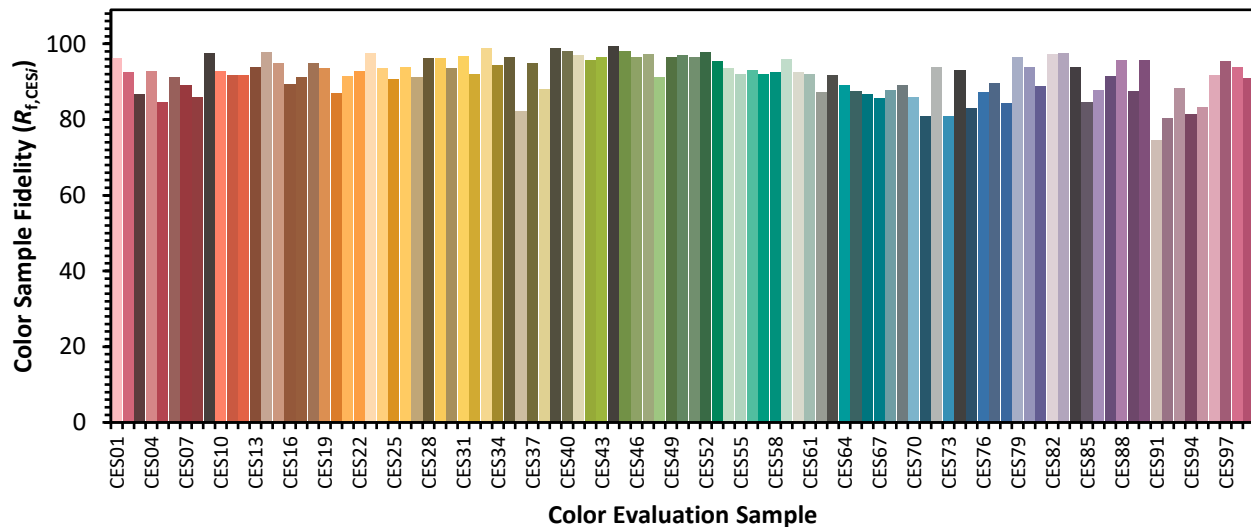


### Color Vector Graphics

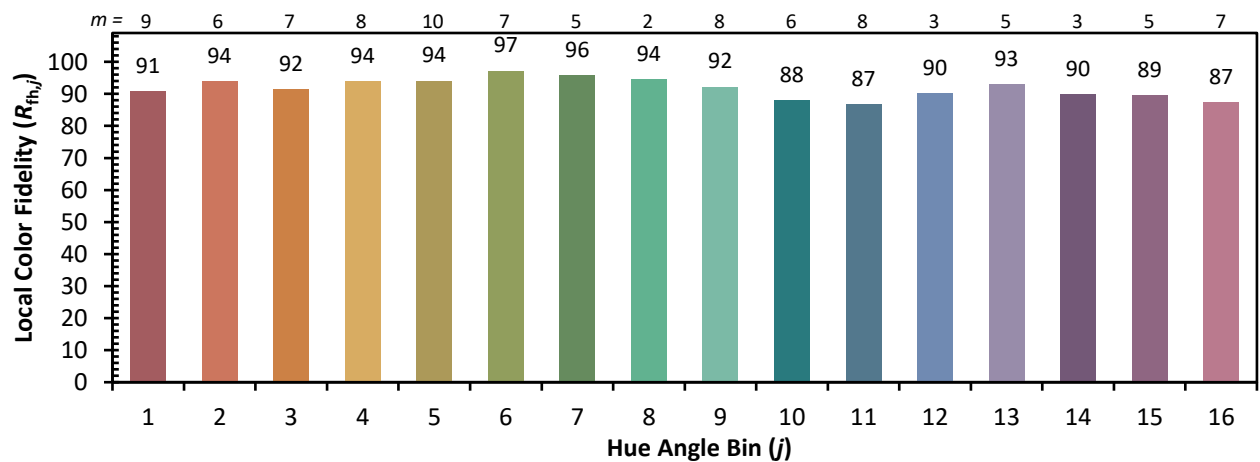
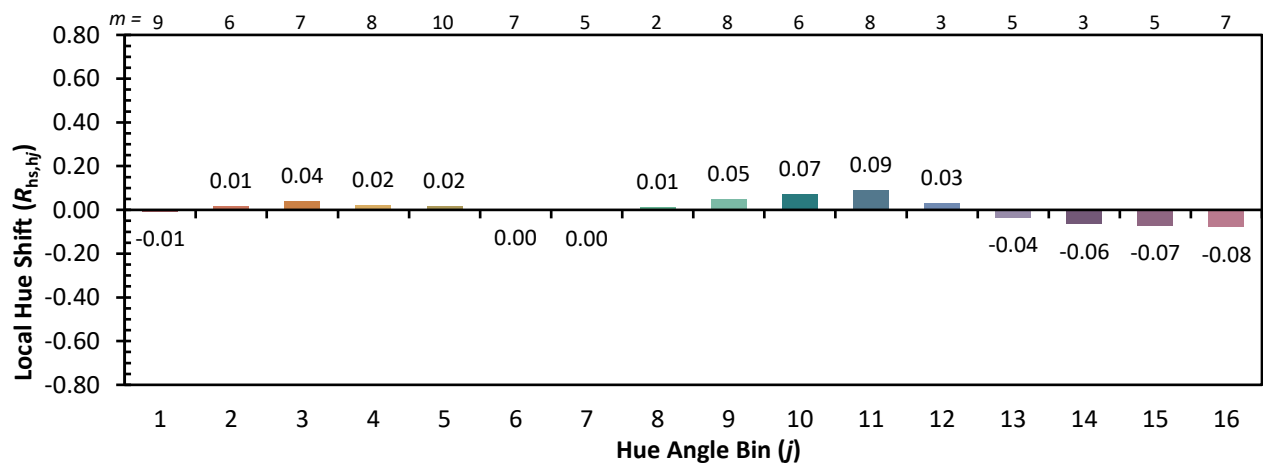
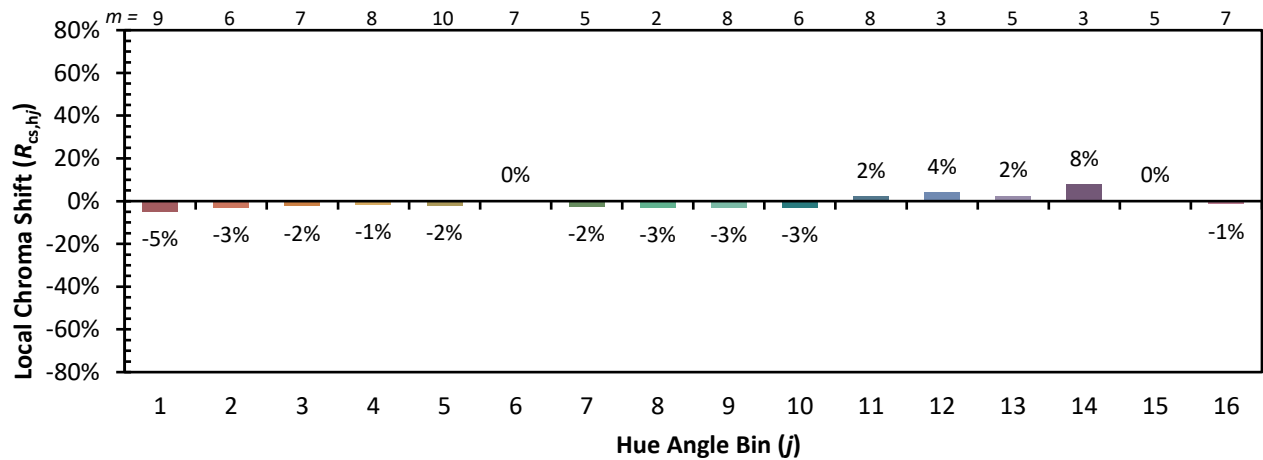


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

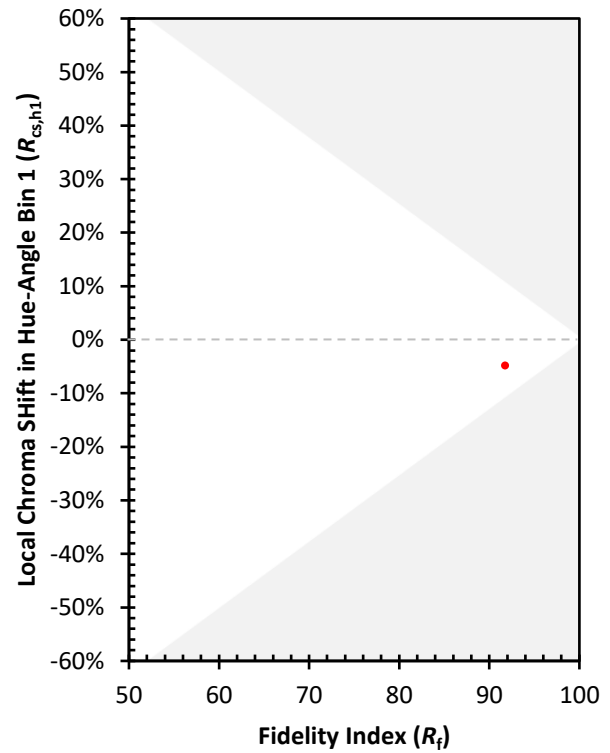
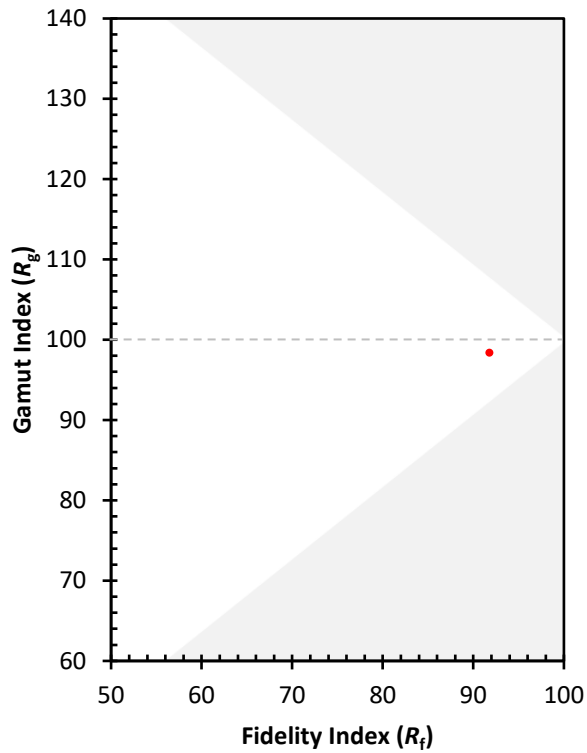
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 94 | CES51 = 96 | CES76 = 87 |
| CES02 = 62 | CES27 = 91 | CES52 = 98 | CES77 = 90 |
| CES03 = 31 | CES28 = 96 | CES53 = 95 | CES78 = 84 |
| CES04 = 69 | CES29 = 96 | CES54 = 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)