

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: P1048631

Luminaire Tested: **GALN-SA9C-840-U-T4BC**

Issue Date: 07/10/2025

**Test Information**

Test Method: LM-79-08  
Report Number: P1048631  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 07/10/2025  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: MCGRAW-EDISON  
Catalog Number: GALN-SA9C-840-U-T4BC  
Description: GALLEON II AREA AND ROADWAY LUMINAIRE 1050mA 9xLight Square PACKAGE  
80CRI 4000K FIXTURE w/ TYPE IV ANGLED BACKLIGHT CONTROL  
Light Source: (126) 4000K CCT, 80 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 45562.5 lumens  
Efficiency: N/A  
Efficacy: 109.2 lumens/watt  
Luminous Opening: Rectangular (W 1.5' x L: 1.5' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B0 - U0 - G5

Input Watts (W): 417.1  
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

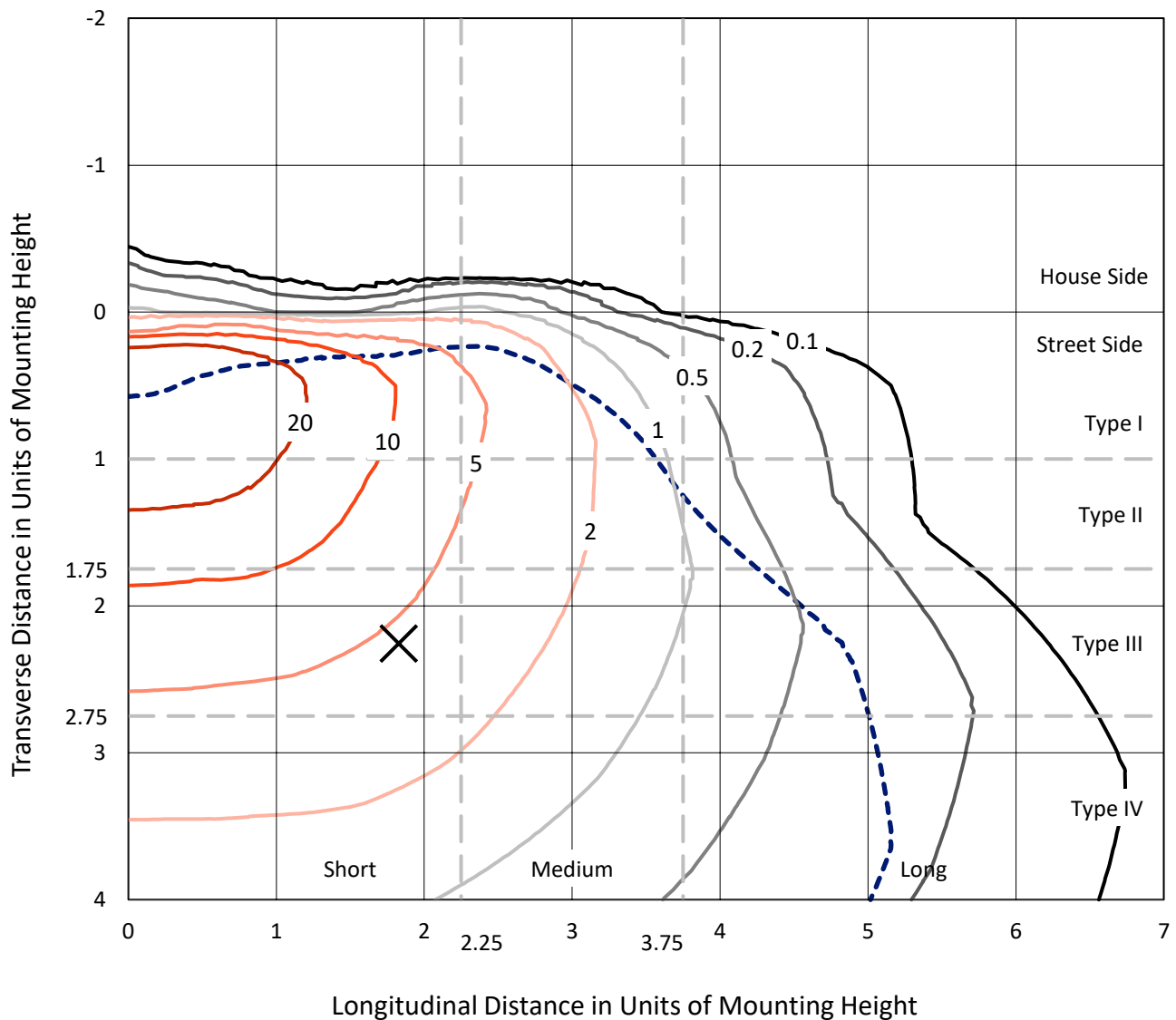


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## Iso-Footcandle Lines of Horizontal Illumination

× Max cd  
- - - 1/2 Max cd

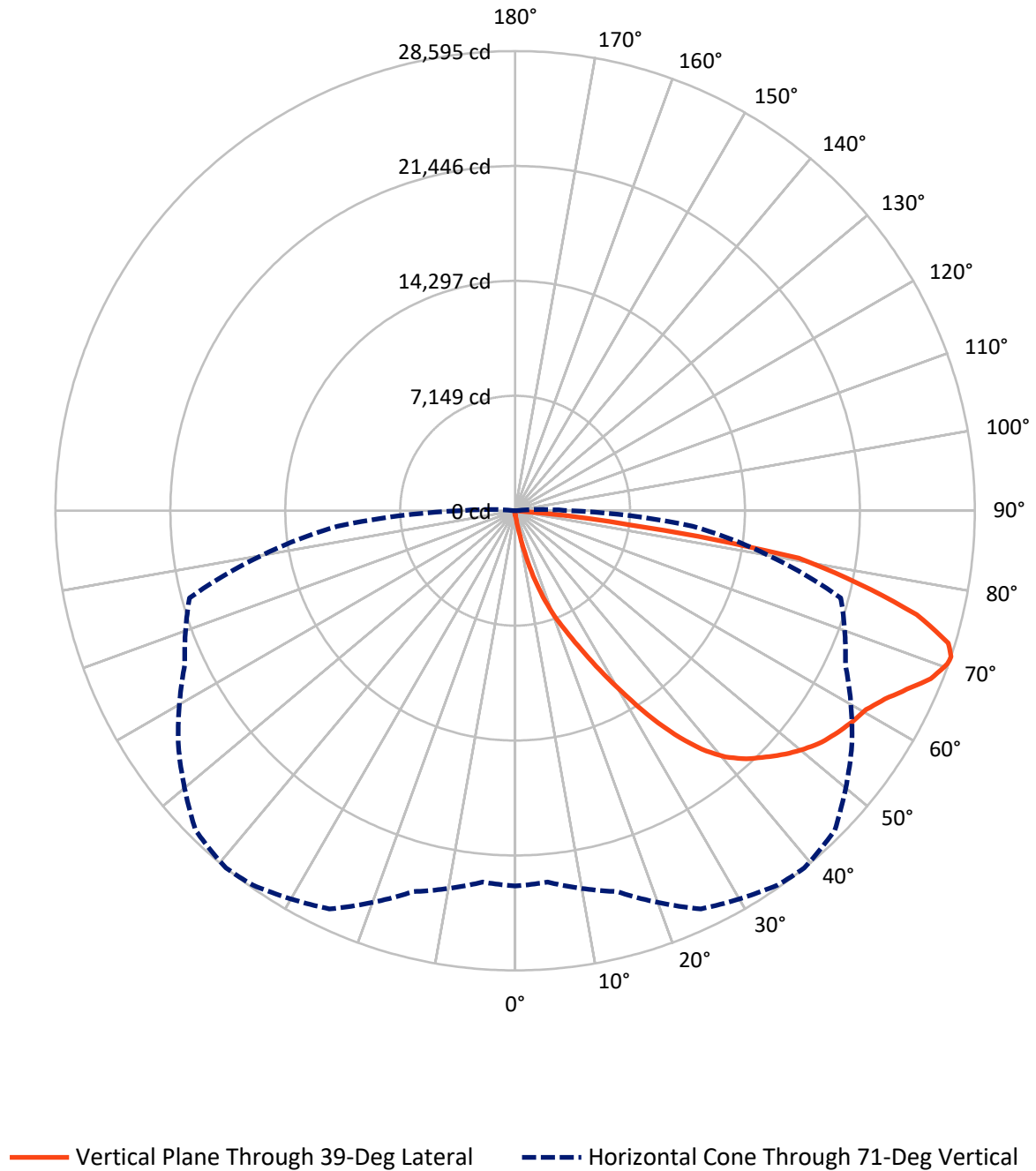


Based on 15 foot mounting height. Maximum calculated value = 46.9 fc  
Type IV - Short - N/A

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CATALOG NUMBER: GALN-SA9C-840-U-T4BC

## Luminous Intensity Polar Plot



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CATALOG NUMBER: GALN-SA9C-840-U-T4BC

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 161.9    | 0.0    | 161.9   |
|                    | % Fixture | 0.4      | 0.0    | 0.4     |
| <b>Street Side</b> | Lumens    | 45400.5  | 0.0    | 45400.5 |
|                    | % Fixture | 99.6     | 0.0    | 99.6    |
| <b>Total</b>       | Lumens    | 45562.5  | 0.0    | 45562.5 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 38.1    | 0.1       |
| 10°-20°   | 487.0   | 1.1       |
| 20°-30°   | 1734.2  | 3.8       |
| 30°-40°   | 4179.6  | 9.2       |
| 40°-50°   | 6994.9  | 15.4      |
| 50°-60°   | 8984.2  | 19.7      |
| 60°-70°   | 11369.5 | 25.0      |
| 70°-80°   | 10136.4 | 22.2      |
| 80°-90°   | 1638.5  | 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°    | 45562.5 | 100.0     |
| 0°-180°   | 45562.5 | 100.0     |



REPORT NUMBER: P1048631

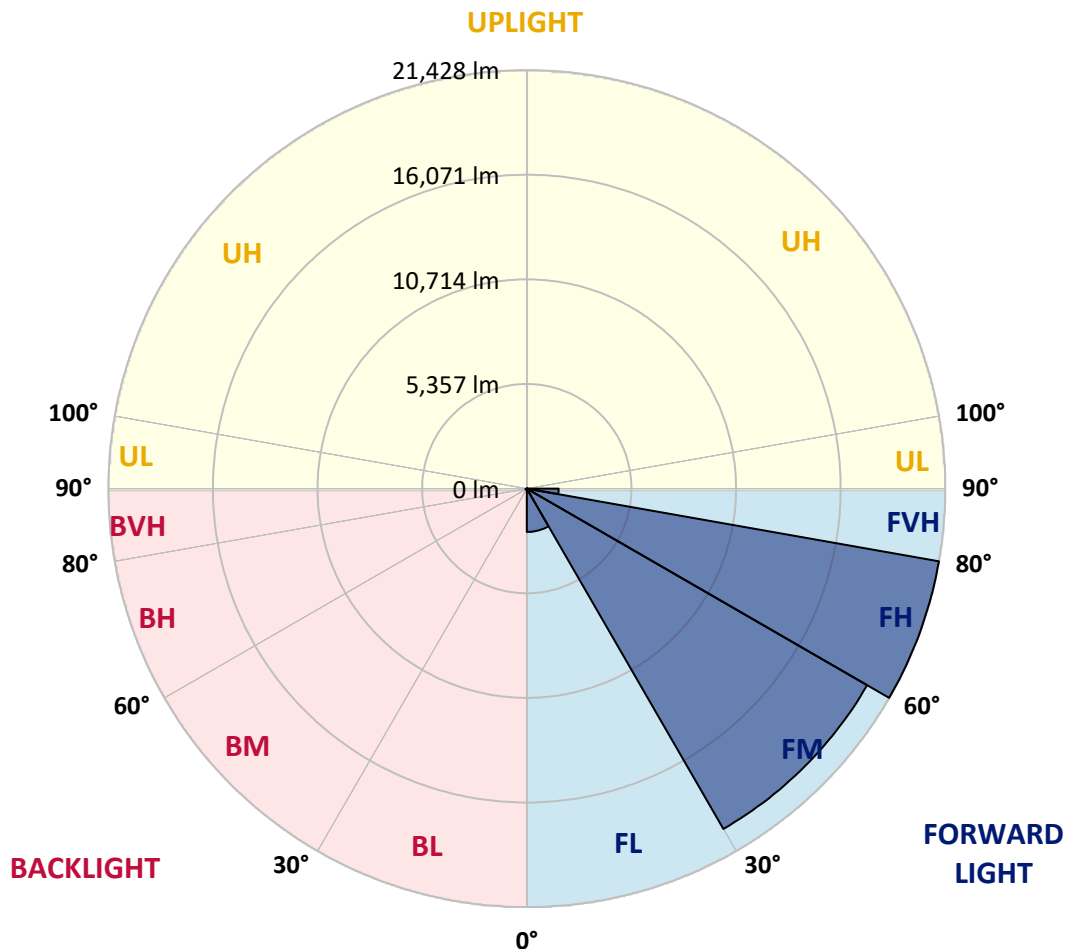
CATALOG NUMBER: GALN-SA9C-840-U-T4BC

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

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |        |
|------|-------------|---------|-----------|-------------------------|------|--------|
|      |             |         |           | B                       | U    | G      |
| FL   | (0°-30°)    | 2220.1  | 4.9       |                         |      |        |
| FM   | (30°-60°)   | 20121.3 | 44.2      |                         |      |        |
| FH   | (60°-80°)   | 21428.1 | 47.0      |                         |      | G5     |
| FVH  | (80°-90°)   | 1631.1  | 3.6       |                         |      | G5     |
| BL   | (0°-30°)    | 39.2    | 0.1       | B0/110                  |      |        |
| BM   | (30°-60°)   | 37.5    | 0.1       | B0/220                  |      |        |
| BH   | (60°-80°)   | 77.9    | 0.2       | B0/110                  |      | G0/110 |
| BVH  | (80°-90°)   | 7.4     | 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-G5**

Type IV Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 39°     | 45°     | 55°     | 65°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 249.8   | 249.8   | 249.8   | 249.8   | 249.8   | 249.8   | 249.8   | 249.8   | 249.8   | 249.8   | 249.8   |
| 2.5°  | 286.8   | 286.8   | 286.8   | 277.6   | 277.6   | 274.5   | 271.4   | 271.4   | 265.3   | 262.2   | 256.0   |
| 5°    | 434.9   | 425.6   | 404.0   | 391.7   | 367.0   | 351.6   | 336.2   | 314.6   | 293.0   | 277.6   | 259.1   |
| 7.5°  | 983.9   | 1005.5  | 934.6   | 801.9   | 666.2   | 607.6   | 508.9   | 410.2   | 339.3   | 293.0   | 262.2   |
| 10°   | 2507.6  | 2495.2  | 2254.6  | 1989.4  | 1536.0  | 1354.0  | 1061.0  | 669.3   | 438.0   | 320.8   | 265.3   |
| 12.5° | 4265.6  | 4253.3  | 3969.5  | 3608.7  | 3010.3  | 2630.9  | 2075.8  | 1249.2  | 629.2   | 364.0   | 265.3   |
| 15°   | 5743.0  | 5693.7  | 5604.2  | 5246.5  | 4546.3  | 4228.6  | 3494.6  | 2208.4  | 1017.8  | 438.0   | 271.4   |
| 17.5° | 6720.8  | 6677.6  | 6594.3  | 6464.8  | 6020.6  | 5644.3  | 5055.2  | 3469.9  | 1647.0  | 567.5   | 283.8   |
| 20°   | 7618.3  | 7587.5  | 7519.6  | 7494.9  | 7208.1  | 7007.6  | 6520.3  | 4919.5  | 2566.2  | 771.1   | 302.3   |
| 22.5° | 8852.0  | 8787.3  | 8815.0  | 8667.0  | 8386.3  | 8145.7  | 7846.5  | 6437.0  | 3688.9  | 1110.4  | 336.2   |
| 25°   | 10363.4 | 10332.5 | 10255.4 | 10150.5 | 9761.9  | 9552.2  | 9092.6  | 7868.1  | 4944.2  | 1554.5  | 373.2   |
| 27.5° | 12189.3 | 12155.4 | 12136.9 | 11896.3 | 11449.1 | 11220.8 | 10579.3 | 9219.1  | 6356.8  | 2177.5  | 422.6   |
| 30°   | 14292.8 | 14308.2 | 14187.9 | 13879.5 | 13358.3 | 13037.5 | 12377.4 | 10634.8 | 7803.4  | 2908.5  | 475.0   |
| 32.5° | 16470.3 | 16439.5 | 16254.4 | 15890.5 | 15424.8 | 15125.6 | 14286.6 | 12186.2 | 9320.9  | 3873.9  | 536.7   |
| 35°   | 18817.5 | 18758.9 | 18271.6 | 17855.2 | 17457.3 | 17081.0 | 16316.1 | 13987.5 | 10838.4 | 4956.5  | 620.0   |
| 37.5° | 21186.3 | 20911.8 | 19934.1 | 19406.6 | 19132.1 | 18823.7 | 18111.2 | 15909.0 | 12346.6 | 6165.6  | 721.7   |
| 40°   | 22975.2 | 22762.4 | 21602.7 | 20631.1 | 20412.1 | 20150.0 | 19619.5 | 17568.4 | 13950.4 | 7464.1  | 845.1   |
| 42.5° | 23965.3 | 23848.1 | 22805.6 | 21846.3 | 21331.3 | 21099.9 | 20646.5 | 19018.0 | 15535.8 | 8898.3  | 1024.0  |
| 45°   | 24387.8 | 24205.9 | 23508.8 | 23061.6 | 22241.1 | 21858.7 | 21318.9 | 20112.9 | 17192.1 | 10526.8 | 1273.8  |
| 47.5° | 24258.3 | 24153.4 | 23653.8 | 23817.2 | 23222.0 | 22626.7 | 21834.0 | 20951.9 | 18607.8 | 12395.9 | 1616.2  |
| 50°   | 23444.0 | 23354.6 | 23200.4 | 24085.6 | 24011.5 | 23308.3 | 22500.2 | 21615.0 | 19764.4 | 14323.7 | 2146.7  |
| 52.5° | 21895.7 | 21858.7 | 22253.5 | 23875.8 | 24458.8 | 23909.8 | 23141.8 | 22201.0 | 20843.9 | 16337.7 | 2905.4  |
| 55°   | 19900.1 | 20051.3 | 21180.1 | 23548.9 | 24687.0 | 24353.9 | 23709.3 | 22750.1 | 21710.6 | 18139.0 | 4025.1  |
| 57.5° | 19079.7 | 19119.8 | 20529.3 | 23317.6 | 24788.8 | 24745.6 | 24261.4 | 23274.4 | 22506.4 | 19579.4 | 5733.8  |
| 60°   | 20038.9 | 19977.2 | 20720.6 | 23493.4 | 24992.4 | 25097.2 | 24751.8 | 23761.7 | 23197.3 | 20816.2 | 8010.0  |
| 62.5° | 21772.3 | 21738.4 | 21975.9 | 24242.9 | 25587.6 | 25800.5 | 25433.4 | 24113.3 | 23808.0 | 21630.4 | 10607.0 |
| 65°   | 23320.7 | 23249.7 | 23690.8 | 25572.2 | 26633.2 | 26784.4 | 26463.6 | 24714.8 | 24076.3 | 22222.6 | 13046.7 |
| 67.5° | 23990.0 | 23974.5 | 24683.9 | 26836.8 | 27731.3 | 27894.7 | 27614.1 | 25544.5 | 24014.6 | 22410.8 | 14123.2 |
| 70°   | 23684.6 | 23626.0 | 24761.0 | 27373.5 | 28351.2 | 28536.3 | 28264.8 | 25852.9 | 23345.3 | 21815.5 | 12528.6 |
| 71°   | 23348.4 | 23191.1 | 24529.7 | 27336.5 | 28437.6 | 28594.9 | 28119.9 | 25572.2 | 22672.9 | 20970.4 | 11082.0 |
| 72.5° | 22305.9 | 22333.7 | 23894.3 | 26950.9 | 28230.9 | 28184.7 | 27299.4 | 24566.7 | 21861.8 | 19051.9 | 8901.4  |
| 75°   | 19739.7 | 19903.2 | 21837.1 | 25331.6 | 26386.5 | 25797.4 | 24443.4 | 22645.2 | 20233.2 | 13660.5 | 6181.0  |
| 77.5° | 16131.1 | 16374.7 | 18499.8 | 22216.5 | 21917.3 | 21858.7 | 21803.2 | 19952.6 | 17278.4 | 7337.6  | 4299.6  |
| 80°   | 7701.6  | 8229.0  | 11159.1 | 15859.7 | 17229.1 | 17892.2 | 17475.8 | 16078.6 | 13361.3 | 3494.6  | 2569.3  |
| 82.5° | 502.7   | 496.6   | 703.2   | 1332.4  | 5616.6  | 7260.5  | 11535.4 | 11492.2 | 9314.7  | 1702.6  | 1048.7  |
| 85°   | 237.5   | 243.7   | 268.3   | 305.3   | 354.7   | 388.6   | 536.7   | 3146.0  | 4456.9  | 811.2   | 228.2   |
| 87.5° | 138.8   | 141.9   | 166.6   | 212.8   | 277.6   | 308.4   | 367.0   | 471.9   | 579.9   | 447.2   | 49.3    |
| 90°   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |

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CATALOG NUMBER: GALN-SA9C-840-U-T4BC

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°   | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 249.8  | 249.8 | 249.8 | 249.8 | 249.8 | 249.8 | 249.8 | 249.8 | 249.8 | 249.8 | 249.8 |
| 2.5°  | 252.9  | 249.8 | 240.6 | 231.3 | 222.1 | 215.9 | 212.8 | 215.9 | 215.9 | 219.0 | 219.0 |
| 5°    | 252.9  | 243.7 | 228.2 | 209.7 | 197.4 | 185.1 | 178.9 | 175.8 | 178.9 | 178.9 | 178.9 |
| 7.5°  | 249.8  | 234.4 | 212.8 | 191.2 | 175.8 | 160.4 | 154.2 | 151.1 | 151.1 | 154.2 | 154.2 |
| 10°   | 243.7  | 228.2 | 200.5 | 175.8 | 157.3 | 138.8 | 129.5 | 120.3 | 120.3 | 120.3 | 123.4 |
| 12.5° | 240.6  | 219.0 | 185.1 | 160.4 | 135.7 | 114.1 | 95.6  | 86.4  | 89.4  | 89.4  | 89.4  |
| 15°   | 234.4  | 209.7 | 175.8 | 145.0 | 114.1 | 86.4  | 70.9  | 61.7  | 64.8  | 67.9  | 64.8  |
| 17.5° | 234.4  | 206.7 | 163.5 | 126.5 | 89.4  | 64.8  | 52.4  | 46.3  | 46.3  | 49.3  | 49.3  |
| 20°   | 234.4  | 200.5 | 154.2 | 108.0 | 67.9  | 49.3  | 37.0  | 33.9  | 33.9  | 40.1  | 43.2  |
| 22.5° | 240.6  | 200.5 | 141.9 | 89.4  | 55.5  | 37.0  | 27.8  | 24.7  | 27.8  | 33.9  | 37.0  |
| 25°   | 249.8  | 197.4 | 129.5 | 80.2  | 46.3  | 27.8  | 21.6  | 15.4  | 18.5  | 24.7  | 27.8  |
| 27.5° | 259.1  | 194.3 | 117.2 | 70.9  | 37.0  | 21.6  | 15.4  | 12.3  | 9.3   | 12.3  | 12.3  |
| 30°   | 268.3  | 194.3 | 104.9 | 58.6  | 30.8  | 15.4  | 9.3   | 6.2   | 3.1   | 0.0   | 0.0   |
| 32.5° | 274.5  | 188.1 | 95.6  | 46.3  | 24.7  | 12.3  | 6.2   | 3.1   | 0.0   | 0.0   | 0.0   |
| 35°   | 280.7  | 182.0 | 83.3  | 37.0  | 18.5  | 9.3   | 3.1   | 0.0   | 0.0   | 0.0   | 0.0   |
| 37.5° | 286.8  | 172.7 | 70.9  | 30.8  | 15.4  | 6.2   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 40°   | 293.0  | 160.4 | 58.6  | 27.8  | 9.3   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 42.5° | 299.2  | 151.1 | 49.3  | 21.6  | 6.2   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 45°   | 314.6  | 145.0 | 40.1  | 18.5  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 47.5° | 342.4  | 138.8 | 37.0  | 12.3  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 50°   | 382.5  | 132.6 | 33.9  | 9.3   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 52.5° | 438.0  | 129.5 | 30.8  | 6.2   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 55°   | 536.7  | 126.5 | 27.8  | 6.2   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 57.5° | 706.3  | 123.4 | 27.8  | 6.2   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 60°   | 1082.6 | 117.2 | 27.8  | 6.2   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 62.5° | 1933.9 | 114.1 | 24.7  | 6.2   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 65°   | 3371.2 | 117.2 | 24.7  | 6.2   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 67.5° | 4833.2 | 123.4 | 21.6  | 9.3   | 3.1   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 70°   | 4136.1 | 108.0 | 21.6  | 12.3  | 6.2   | 3.1   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 71°   | 3371.2 | 95.6  | 21.6  | 12.3  | 6.2   | 3.1   | 3.1   | 0.0   | 0.0   | 0.0   | 0.0   |
| 72.5° | 2168.3 | 74.0  | 18.5  | 12.3  | 6.2   | 6.2   | 3.1   | 0.0   | 0.0   | 0.0   | 0.0   |
| 75°   | 916.0  | 61.7  | 18.5  | 12.3  | 9.3   | 6.2   | 6.2   | 3.1   | 0.0   | 0.0   | 0.0   |
| 77.5° | 391.7  | 46.3  | 18.5  | 15.4  | 12.3  | 9.3   | 9.3   | 6.2   | 3.1   | 0.0   | 0.0   |
| 80°   | 148.0  | 37.0  | 21.6  | 18.5  | 15.4  | 15.4  | 12.3  | 6.2   | 3.1   | 0.0   | 0.0   |
| 82.5° | 67.9   | 30.8  | 21.6  | 18.5  | 18.5  | 15.4  | 12.3  | 9.3   | 6.2   | 0.0   | 0.0   |
| 85°   | 43.2   | 27.8  | 21.6  | 18.5  | 18.5  | 15.4  | 15.4  | 9.3   | 6.2   | 0.0   | 0.0   |
| 87.5° | 33.9   | 27.8  | 21.6  | 21.6  | 18.5  | 18.5  | 12.3  | 9.3   | 3.1   | 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: SP1-2407-184-11

Test Date: 10/11/2024

Luminaire Tested: GSS-SB1A-840-U-5WQ

Data in this report applies to families of products including GSS-SB1A-840-U-5WQ

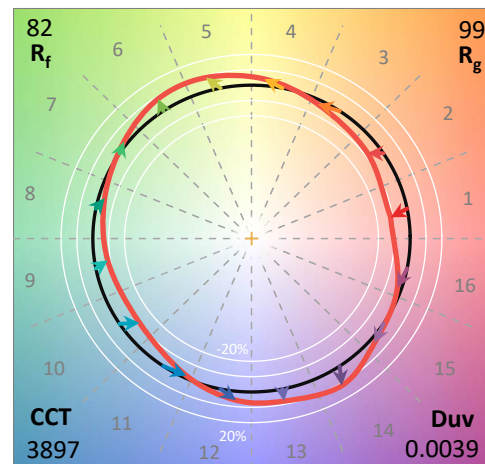
### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2407-184-11  
 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-840-U-5WQ**  
 Description: GALLEON II SITE SLIM 1SQ 350MA 5WQ HIGH DENSITY LIGHTSQUARE WITH 80 CRI  
 4000K CCT 26 LEDS

### Spectral Parameters

CCT (K): 3897  
 CIE  $u'$ : 0.2249  
 CIE  $v'$ : 0.5084  
 Duv: 0.0039  
 CIE x: 0.3882  
 CIE y: 0.3900  
 CIE z: 0.2218  
 Peak Wavelength (nm): 445  
 Dominant Wavelength (nm): 577  
 Purity: 33.54925  
 R<sub>f</sub>: 81.8  
 R<sub>g</sub>: 98.6

CRI (Ra): 80.2  
 R1: 78.9  
 R2: 83.5  
 R3: 88.3  
 R4: 82.1  
 R5: 78.8  
 R6: 78.4  
 R7: 85.8  
 R8: 65.8  
 R9: 6.7  
 R10: 61.9  
 R11: 81.9  
 R12: 58.9  
 R13: 79.2  
 R14: 93.2  
 R15: 71.9



### Test Conditions

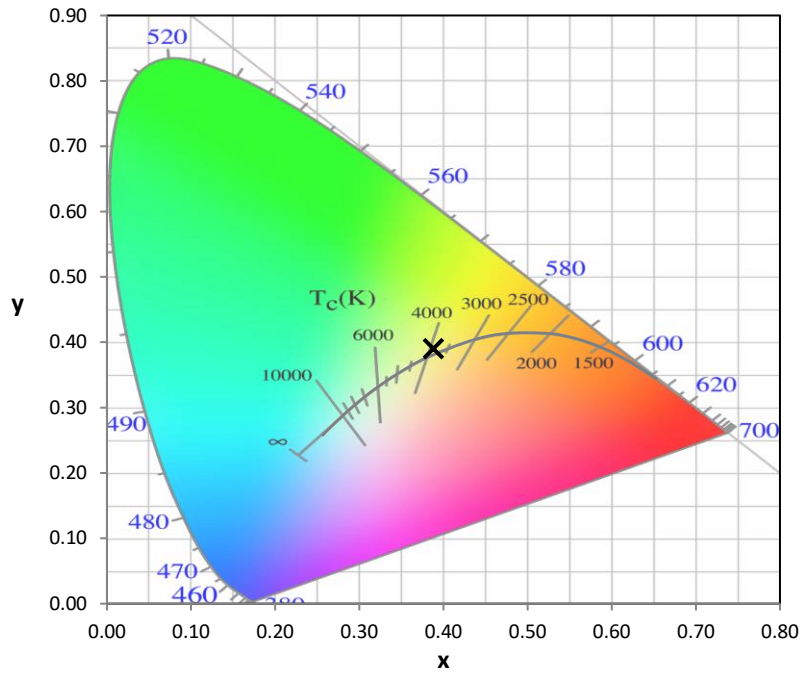
Stabilization Time: 24M  
 Operation Time: 1H 24M  
 Sphere Temperature (°C): 25.2

REPORT NUMBER: SP1-2407-184-11

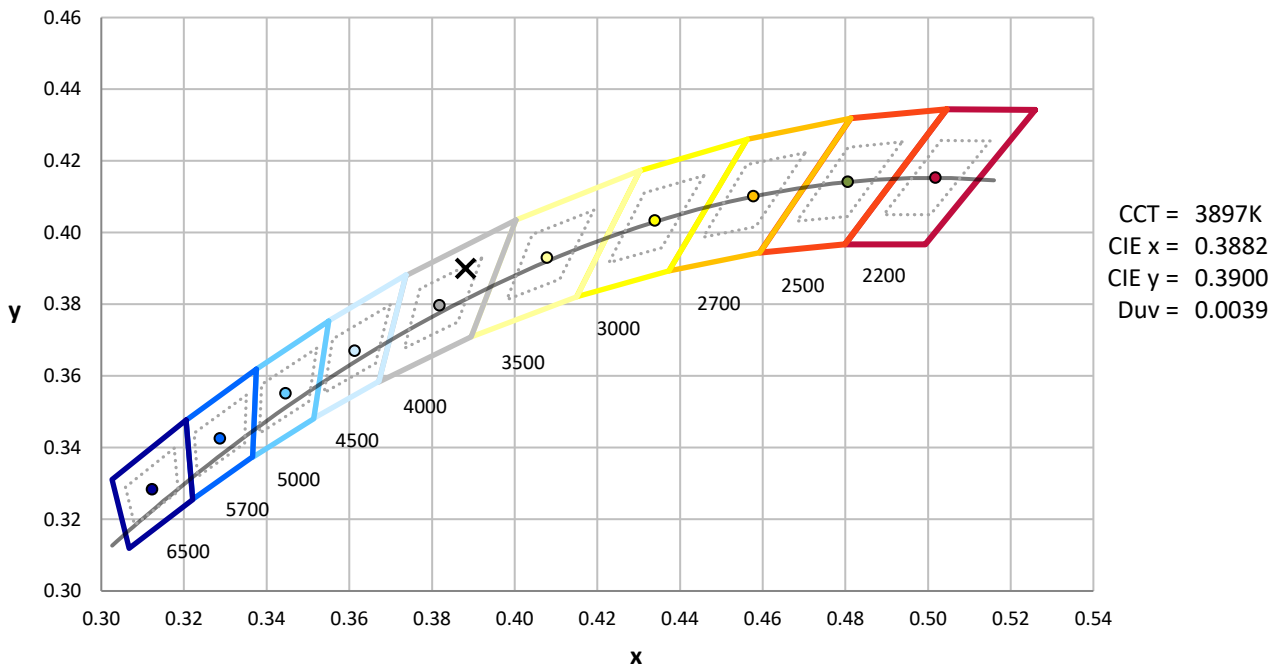
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| 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**



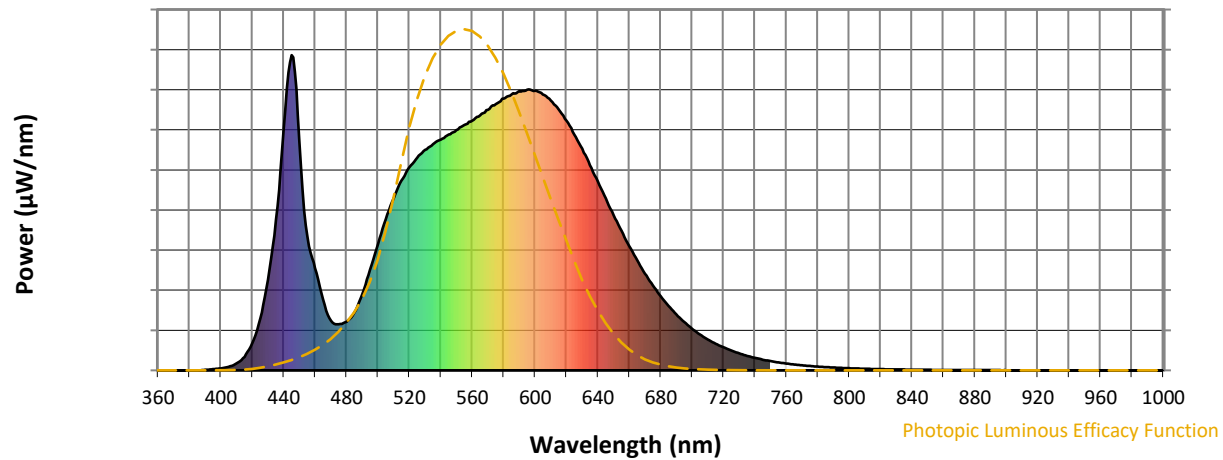
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 4000K 4-step quadrangle

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### Photopic Flux vs. Wavelength

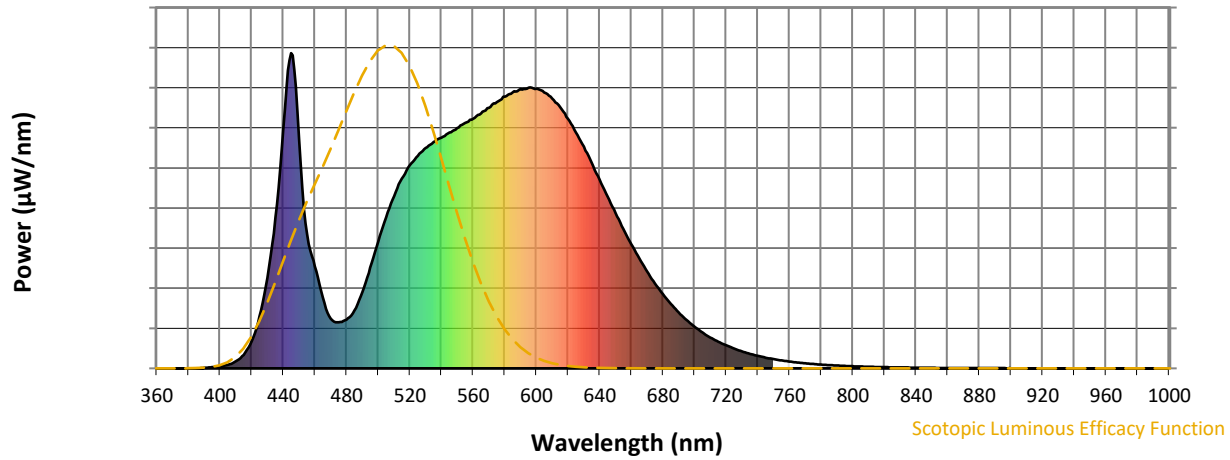


### Photopic Lumens: NR

| 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    | 242                      | NR            | 620    | 792                      | NR            | 750    | 29                       | NR            | 880    | 1                        | NR            |
| 365    | 0                        | NR            | 495    | 320                      | NR            | 625    | 748                      | NR            | 755    | 25                       | NR            | 885    | 1                        | NR            |
| 370    | 0                        | NR            | 500    | 401                      | NR            | 630    | 703                      | NR            | 760    | 22                       | NR            | 890    | 1                        | NR            |
| 375    | 0                        | NR            | 505    | 479                      | NR            | 635    | 651                      | NR            | 765    | 19                       | NR            | 895    | 1                        | NR            |
| 380    | 0                        | NR            | 510    | 546                      | NR            | 640    | 599                      | NR            | 770    | 16                       | NR            | 900    | 1                        | NR            |
| 385    | 0                        | NR            | 515    | 602                      | NR            | 645    | 545                      | NR            | 775    | 14                       | NR            | 905    | 0                        | NR            |
| 390    | 2                        | NR            | 520    | 645                      | NR            | 650    | 493                      | NR            | 780    | 12                       | NR            | 910    | 0                        | NR            |
| 395    | 4                        | NR            | 525    | 674                      | NR            | 655    | 443                      | NR            | 785    | 10                       | NR            | 915    | 0                        | NR            |
| 400    | 6                        | NR            | 530    | 699                      | NR            | 660    | 394                      | NR            | 790    | 9                        | NR            | 920    | 0                        | NR            |
| 405    | 11                       | NR            | 535    | 718                      | NR            | 665    | 349                      | NR            | 795    | 8                        | NR            | 925    | 0                        | NR            |
| 410    | 22                       | NR            | 540    | 732                      | NR            | 670    | 307                      | NR            | 800    | 7                        | NR            | 930    | 0                        | NR            |
| 415    | 43                       | NR            | 545    | 749                      | NR            | 675    | 269                      | NR            | 805    | 6                        | NR            | 935    | 0                        | NR            |
| 420    | 86                       | NR            | 550    | 762                      | NR            | 680    | 235                      | NR            | 810    | 5                        | NR            | 940    | 0                        | NR            |
| 425    | 164                      | NR            | 555    | 778                      | NR            | 685    | 204                      | NR            | 815    | 5                        | NR            | 945    | 0                        | NR            |
| 430    | 288                      | NR            | 560    | 792                      | NR            | 690    | 178                      | NR            | 820    | 4                        | NR            | 950    | 0                        | NR            |
| 435    | 478                      | NR            | 565    | 809                      | NR            | 695    | 153                      | NR            | 825    | 3                        | NR            | 955    | 0                        | NR            |
| 440    | 766                      | NR            | 570    | 827                      | NR            | 700    | 132                      | NR            | 830    | 3                        | NR            | 960    | 0                        | NR            |
| 445    | 1000                     | NR            | 575    | 845                      | NR            | 705    | 114                      | NR            | 835    | 3                        | NR            | 965    | 0                        | NR            |
| 450    | 726                      | NR            | 580    | 862                      | NR            | 710    | 98                       | NR            | 840    | 2                        | NR            | 970    | 0                        | NR            |
| 455    | 425                      | NR            | 585    | 875                      | NR            | 715    | 84                       | NR            | 845    | 2                        | NR            | 975    | 0                        | NR            |
| 460    | 324                      | NR            | 590    | 887                      | NR            | 720    | 73                       | NR            | 850    | 2                        | NR            | 980    | 0                        | NR            |
| 465    | 225                      | NR            | 595    | 890                      | NR            | 725    | 63                       | NR            | 855    | 1                        | NR            | 985    | 0                        | NR            |
| 470    | 157                      | NR            | 600    | 887                      | NR            | 730    | 54                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 147                      | NR            | 605    | 875                      | NR            | 735    | 46                       | NR            | 865    | 1                        | NR            | 995    | 0                        | NR            |
| 480    | 154                      | NR            | 610    | 856                      | NR            | 740    | 40                       | NR            | 870    | 1                        | NR            | 1000   | 0                        | NR            |
| 485    | 184                      | NR            | 615    | 828                      | NR            | 745    | 34                       | NR            | 875    | 1                        | NR            |        |                          |               |

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### Scotopic Flux vs. Wavelength



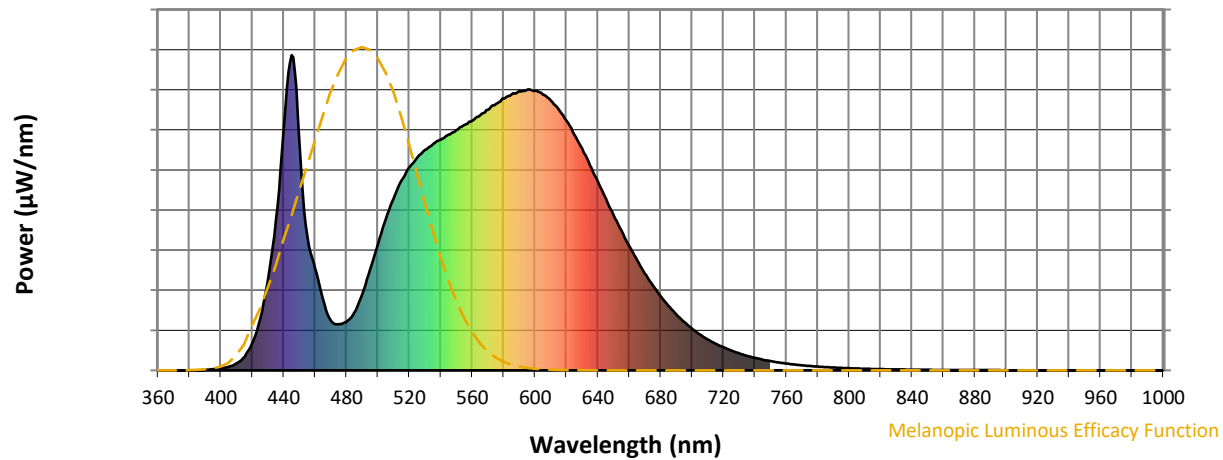
Scotopic Lumens: NR

S/P: 1.57

| 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    | 242                      | NR            | 620    | 792                      | NR            | 750    | 29                       | NR            | 880    | 1                        | NR            |
| 365    | 0                        | NR            | 495    | 320                      | NR            | 625    | 748                      | NR            | 755    | 25                       | NR            | 885    | 1                        | NR            |
| 370    | 0                        | NR            | 500    | 401                      | NR            | 630    | 703                      | NR            | 760    | 22                       | NR            | 890    | 1                        | NR            |
| 375    | 0                        | NR            | 505    | 479                      | NR            | 635    | 651                      | NR            | 765    | 19                       | NR            | 895    | 1                        | NR            |
| 380    | 0                        | NR            | 510    | 546                      | NR            | 640    | 599                      | NR            | 770    | 16                       | NR            | 900    | 1                        | NR            |
| 385    | 0                        | NR            | 515    | 602                      | NR            | 645    | 545                      | NR            | 775    | 14                       | NR            | 905    | 0                        | NR            |
| 390    | 2                        | NR            | 520    | 645                      | NR            | 650    | 493                      | NR            | 780    | 12                       | NR            | 910    | 0                        | NR            |
| 395    | 4                        | NR            | 525    | 674                      | NR            | 655    | 443                      | NR            | 785    | 10                       | NR            | 915    | 0                        | NR            |
| 400    | 6                        | NR            | 530    | 699                      | NR            | 660    | 394                      | NR            | 790    | 9                        | NR            | 920    | 0                        | NR            |
| 405    | 11                       | NR            | 535    | 718                      | NR            | 665    | 349                      | NR            | 795    | 8                        | NR            | 925    | 0                        | NR            |
| 410    | 22                       | NR            | 540    | 732                      | NR            | 670    | 307                      | NR            | 800    | 7                        | NR            | 930    | 0                        | NR            |
| 415    | 43                       | NR            | 545    | 749                      | NR            | 675    | 269                      | NR            | 805    | 6                        | NR            | 935    | 0                        | NR            |
| 420    | 86                       | NR            | 550    | 762                      | NR            | 680    | 235                      | NR            | 810    | 5                        | NR            | 940    | 0                        | NR            |
| 425    | 164                      | NR            | 555    | 778                      | NR            | 685    | 204                      | NR            | 815    | 5                        | NR            | 945    | 0                        | NR            |
| 430    | 288                      | NR            | 560    | 792                      | NR            | 690    | 178                      | NR            | 820    | 4                        | NR            | 950    | 0                        | NR            |
| 435    | 478                      | NR            | 565    | 809                      | NR            | 695    | 153                      | NR            | 825    | 3                        | NR            | 955    | 0                        | NR            |
| 440    | 766                      | NR            | 570    | 827                      | NR            | 700    | 132                      | NR            | 830    | 3                        | NR            | 960    | 0                        | NR            |
| 445    | 1000                     | NR            | 575    | 845                      | NR            | 705    | 114                      | NR            | 835    | 3                        | NR            | 965    | 0                        | NR            |
| 450    | 726                      | NR            | 580    | 862                      | NR            | 710    | 98                       | NR            | 840    | 2                        | NR            | 970    | 0                        | NR            |
| 455    | 425                      | NR            | 585    | 875                      | NR            | 715    | 84                       | NR            | 845    | 2                        | NR            | 975    | 0                        | NR            |
| 460    | 324                      | NR            | 590    | 887                      | NR            | 720    | 73                       | NR            | 850    | 2                        | NR            | 980    | 0                        | NR            |
| 465    | 225                      | NR            | 595    | 890                      | NR            | 725    | 63                       | NR            | 855    | 1                        | NR            | 985    | 0                        | NR            |
| 470    | 157                      | NR            | 600    | 887                      | NR            | 730    | 54                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 147                      | NR            | 605    | 875                      | NR            | 735    | 46                       | NR            | 865    | 1                        | NR            | 995    | 0                        | NR            |
| 480    | 154                      | NR            | 610    | 856                      | NR            | 740    | 40                       | NR            | 870    | 1                        | NR            | 1000   | 0                        | NR            |
| 485    | 184                      | NR            | 615    | 828                      | NR            | 745    | 34                       | NR            | 875    | 1                        | NR            |        |                          |               |

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### Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 3.06

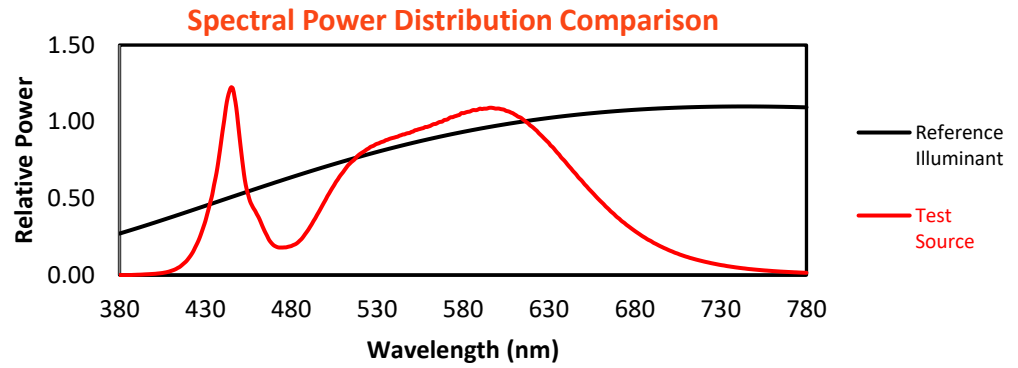
| λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) |
|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|
| 360       | 0                           | NR               | 490       | 242                         | NR               | 620       | 792                         | NR               | 750       | 29                          | NR               | 880       | 1                           | NR               |
| 365       | 0                           | NR               | 495       | 320                         | NR               | 625       | 748                         | NR               | 755       | 25                          | NR               | 885       | 1                           | NR               |
| 370       | 0                           | NR               | 500       | 401                         | NR               | 630       | 703                         | NR               | 760       | 22                          | NR               | 890       | 1                           | NR               |
| 375       | 0                           | NR               | 505       | 479                         | NR               | 635       | 651                         | NR               | 765       | 19                          | NR               | 895       | 1                           | NR               |
| 380       | 0                           | NR               | 510       | 546                         | NR               | 640       | 599                         | NR               | 770       | 16                          | NR               | 900       | 1                           | NR               |
| 385       | 0                           | NR               | 515       | 602                         | NR               | 645       | 545                         | NR               | 775       | 14                          | NR               | 905       | 0                           | NR               |
| 390       | 2                           | NR               | 520       | 645                         | NR               | 650       | 493                         | NR               | 780       | 12                          | NR               | 910       | 0                           | NR               |
| 395       | 4                           | NR               | 525       | 674                         | NR               | 655       | 443                         | NR               | 785       | 10                          | NR               | 915       | 0                           | NR               |
| 400       | 6                           | NR               | 530       | 699                         | NR               | 660       | 394                         | NR               | 790       | 9                           | NR               | 920       | 0                           | NR               |
| 405       | 11                          | NR               | 535       | 718                         | NR               | 665       | 349                         | NR               | 795       | 8                           | NR               | 925       | 0                           | NR               |
| 410       | 22                          | NR               | 540       | 732                         | NR               | 670       | 307                         | NR               | 800       | 7                           | NR               | 930       | 0                           | NR               |
| 415       | 43                          | NR               | 545       | 749                         | NR               | 675       | 269                         | NR               | 805       | 6                           | NR               | 935       | 0                           | NR               |
| 420       | 86                          | NR               | 550       | 762                         | NR               | 680       | 235                         | NR               | 810       | 5                           | NR               | 940       | 0                           | NR               |
| 425       | 164                         | NR               | 555       | 778                         | NR               | 685       | 204                         | NR               | 815       | 5                           | NR               | 945       | 0                           | NR               |
| 430       | 288                         | NR               | 560       | 792                         | NR               | 690       | 178                         | NR               | 820       | 4                           | NR               | 950       | 0                           | NR               |
| 435       | 478                         | NR               | 565       | 809                         | NR               | 695       | 153                         | NR               | 825       | 3                           | NR               | 955       | 0                           | NR               |
| 440       | 766                         | NR               | 570       | 827                         | NR               | 700       | 132                         | NR               | 830       | 3                           | NR               | 960       | 0                           | NR               |
| 445       | 1000                        | NR               | 575       | 845                         | NR               | 705       | 114                         | NR               | 835       | 3                           | NR               | 965       | 0                           | NR               |
| 450       | 726                         | NR               | 580       | 862                         | NR               | 710       | 98                          | NR               | 840       | 2                           | NR               | 970       | 0                           | NR               |
| 455       | 425                         | NR               | 585       | 875                         | NR               | 715       | 84                          | NR               | 845       | 2                           | NR               | 975       | 0                           | NR               |
| 460       | 324                         | NR               | 590       | 887                         | NR               | 720       | 73                          | NR               | 850       | 2                           | NR               | 980       | 0                           | NR               |
| 465       | 225                         | NR               | 595       | 890                         | NR               | 725       | 63                          | NR               | 855       | 1                           | NR               | 985       | 0                           | NR               |
| 470       | 157                         | NR               | 600       | 887                         | NR               | 730       | 54                          | NR               | 860       | 1                           | NR               | 990       | 0                           | NR               |
| 475       | 147                         | NR               | 605       | 875                         | NR               | 735       | 46                          | NR               | 865       | 1                           | NR               | 995       | 0                           | NR               |
| 480       | 154                         | NR               | 610       | 856                         | NR               | 740       | 40                          | NR               | 870       | 1                           | NR               | 1000      | 0                           | NR               |
| 485       | 184                         | NR               | 615       | 828                         | NR               | 745       | 34                          | NR               | 875       | 1                           | NR               |           |                             |                  |

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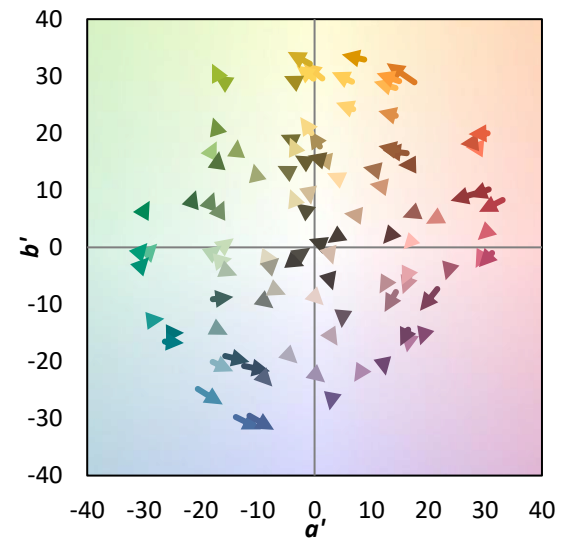
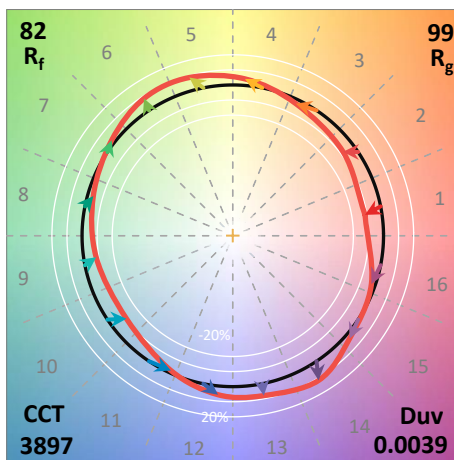
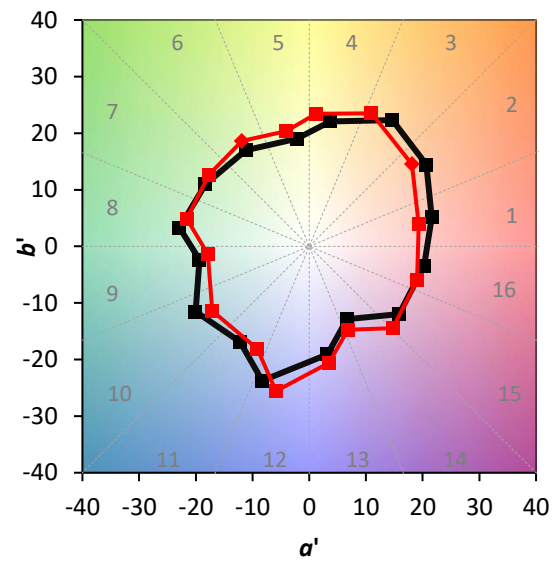
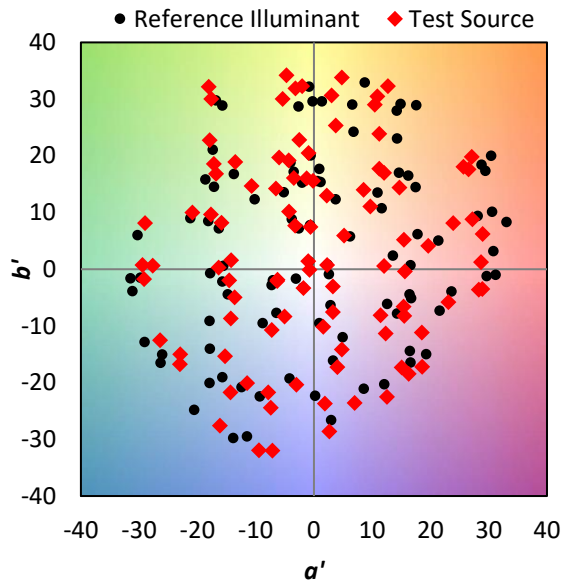
TM-30-18

### Summary

$R_f = 81.8$   
 $R_g = 98.6$   
 $CIE R_a = 80.2$   
 $R_9 = 6.7$

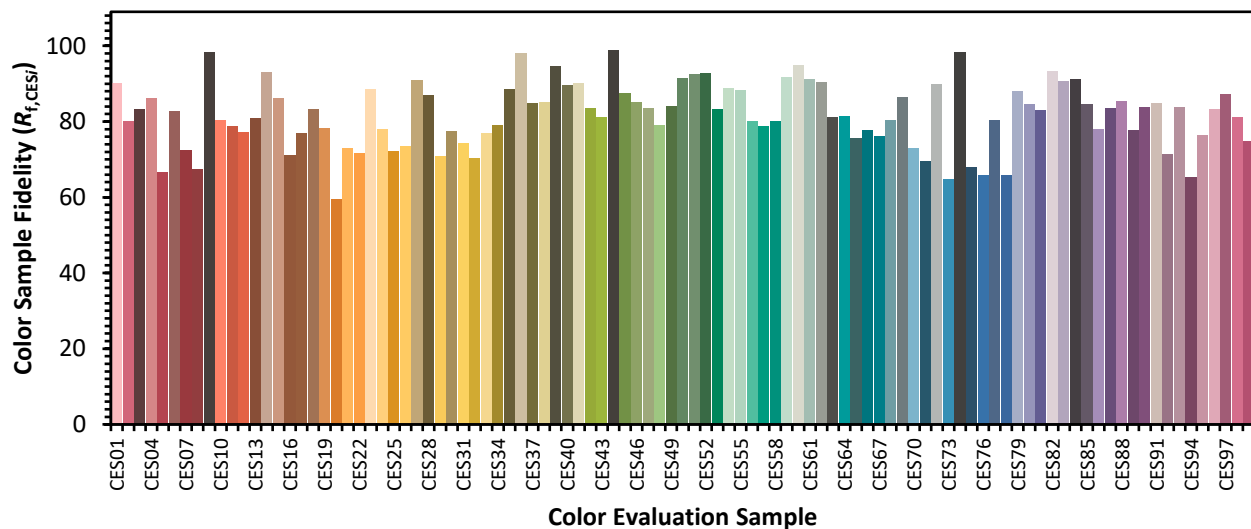


### Color Vector Graphics

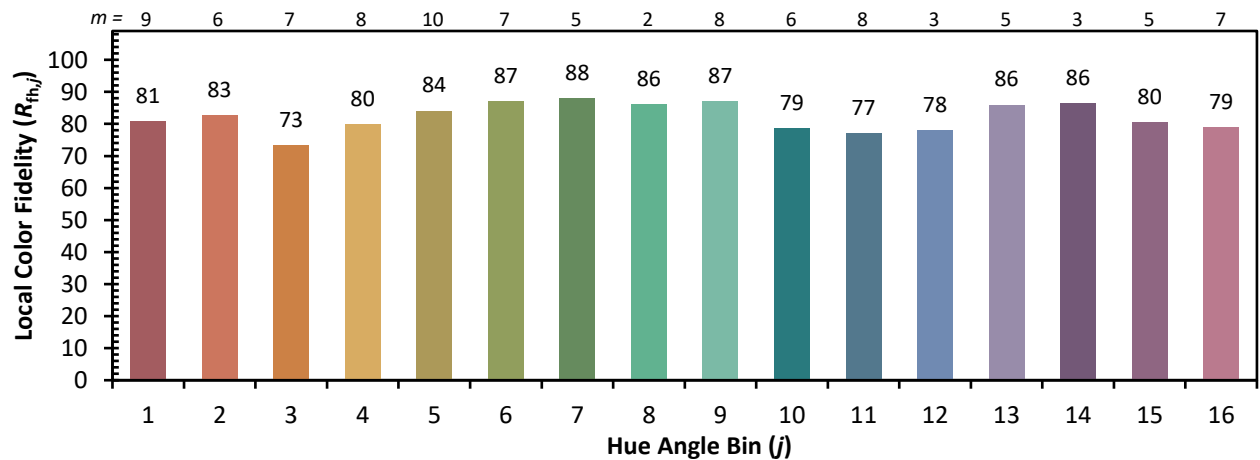
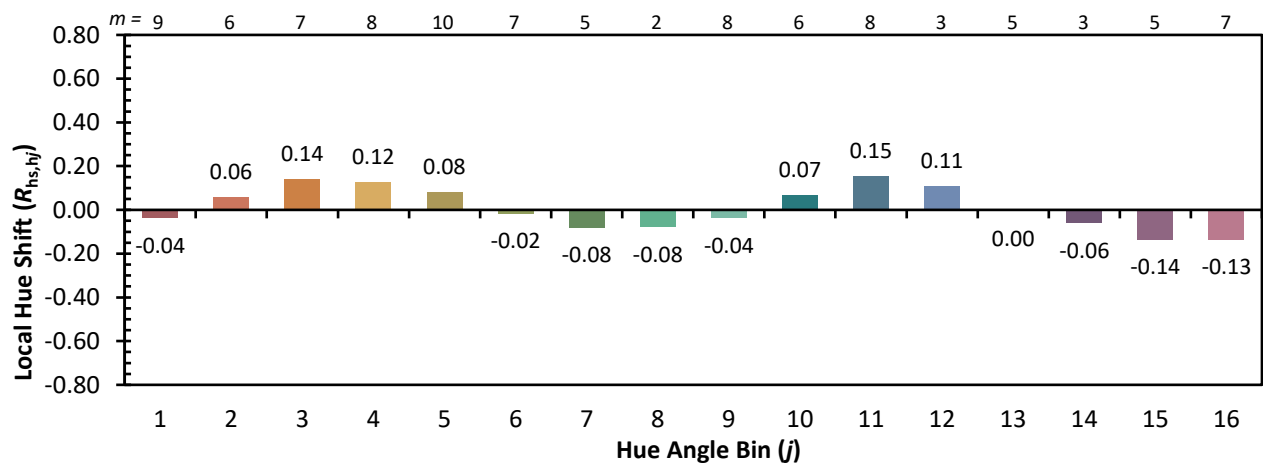
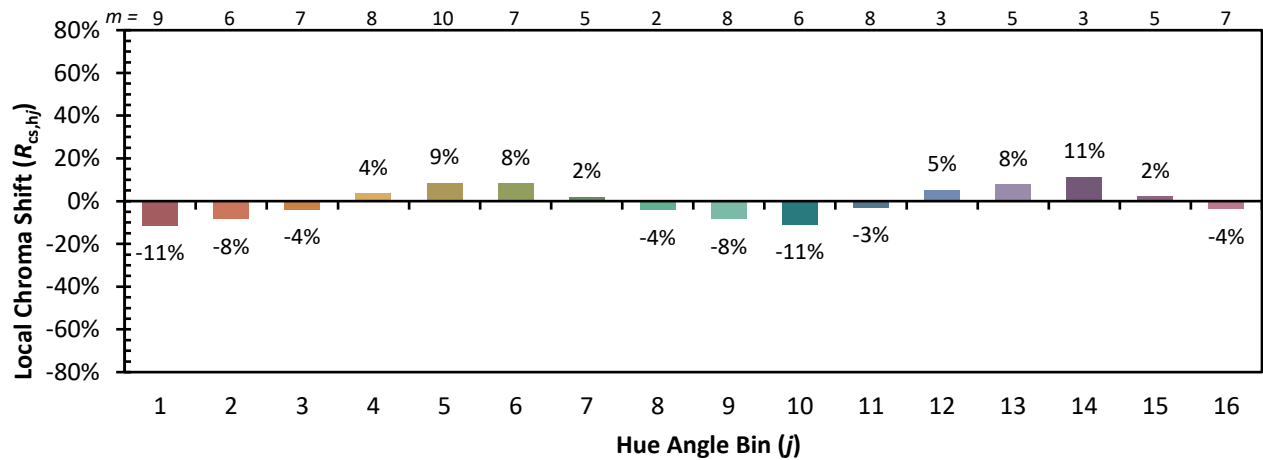


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

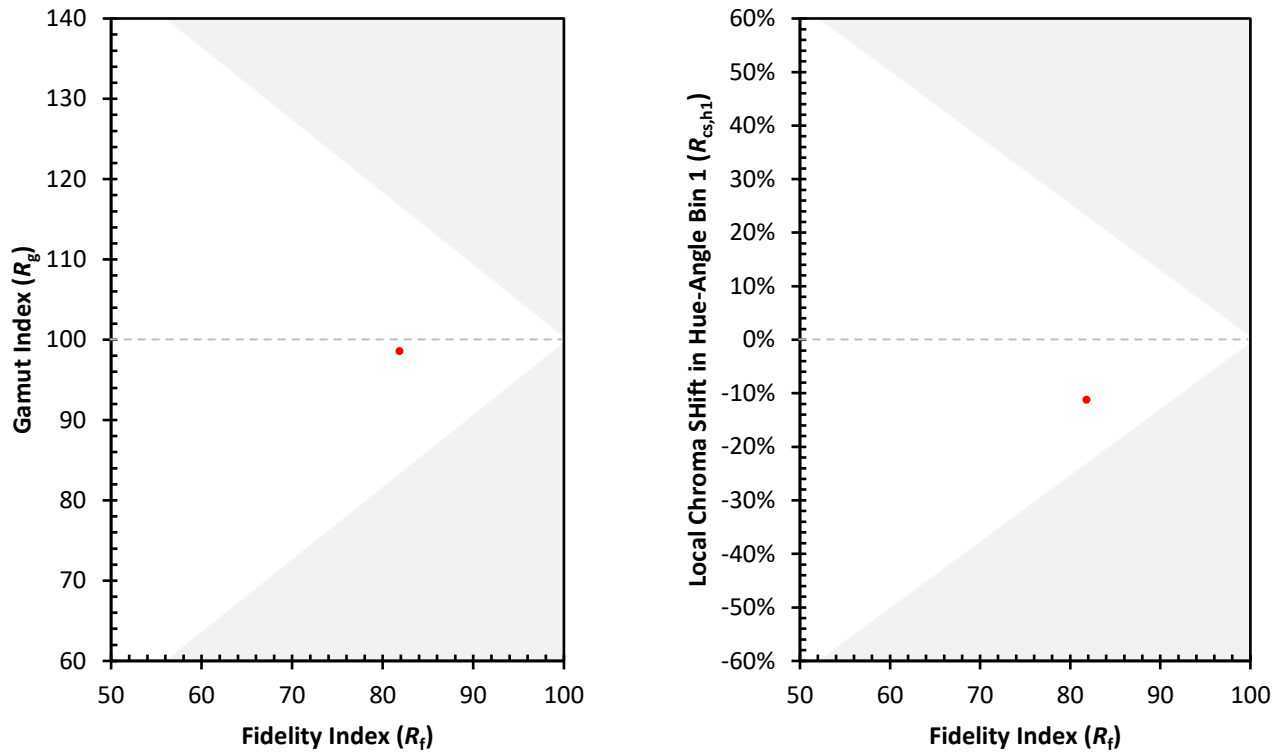
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 73 | CES51 = 93 | CES76 = 66 |
| CES02 = 61 | CES27 = 91 | CES52 = 93 | CES77 = 80 |
| CES03 = 31 | CES28 = 87 | CES53 = 83 | CES78 = 66 |
| CES04 = 69 | CES29 = 71 | CES54 = 89 | CES79 = 88 |
| CES05 = 48 | CES30 = 77 | CES55 = 88 | CES80 = 85 |
| CES06 = 50 | CES31 = 74 | CES56 = 80 | CES81 = 83 |
| CES07 = 41 | CES32 = 70 | CES57 = 79 | CES82 = 93 |
| CES08 = 40 | CES33 = 77 | CES58 = 80 | CES83 = 91 |
| CES09 = 29 | CES34 = 79 | CES59 = 92 | CES84 = 91 |
| CES10 = 74 | CES35 = 88 | CES60 = 95 | CES85 = 84 |
| CES11 = 57 | CES36 = 98 | CES61 = 91 | CES86 = 78 |
| CES12 = 63 | CES37 = 85 | CES62 = 90 | CES87 = 84 |
| CES13 = 42 | CES38 = 85 | CES63 = 81 | CES88 = 85 |
| CES14 = 74 | CES39 = 95 | CES64 = 81 | CES89 = 78 |
| CES15 = 71 | CES40 = 90 | CES65 = 76 | CES90 = 84 |
| CES16 = 47 | CES41 = 90 | CES66 = 78 | CES91 = 85 |
| CES17 = 49 | CES42 = 84 | CES67 = 76 | CES92 = 71 |
| CES18 = 56 | CES43 = 81 | CES68 = 80 | CES93 = 84 |
| CES19 = 71 | CES44 = 99 | CES69 = 86 | CES94 = 65 |
| CES20 = 65 | CES45 = 87 | CES70 = 73 | CES95 = 77 |
| CES21 = 86 | CES46 = 85 | CES71 = 70 | CES96 = 83 |
| CES22 = 78 | CES47 = 84 | CES72 = 90 | CES97 = 87 |
| CES23 = 91 | CES48 = 79 | CES73 = 65 | CES98 = 81 |
| CES24 = 90 | CES49 = 84 | CES74 = 98 | CES99 = 75 |
| CES25 = 71 | CES50 = 91 | CES75 = 68 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)