

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: P1048206

Luminaire Tested: **GALN-SA2B-950-U-T2BC**

Issue Date: 07/10/2025

**Test Information**

Test Method: LM-79-08  
Report Number: P1048206  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 07/10/2025  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: MCGRAW-EDISON  
Catalog Number: GALN-SA2B-950-U-T2BC  
Description: GALLEON II AREA AND ROADWAY LUMINAIRE 800mA 2xLight Square PACKAGE  
90CRI 5000K FIXTURE w/ TYPE II ANGLED BACKLIGHT CONTROL  
Light Source: (28) 5000K CCT, 90 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 7224.5 lumens  
Efficiency: N/A  
Efficacy: 99.2 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 1' x H: 0')  
IES Classification: Type II - Short  
BUG Rating: B0 - U0 - G2

Input Watts (W): 72.8  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.97  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT

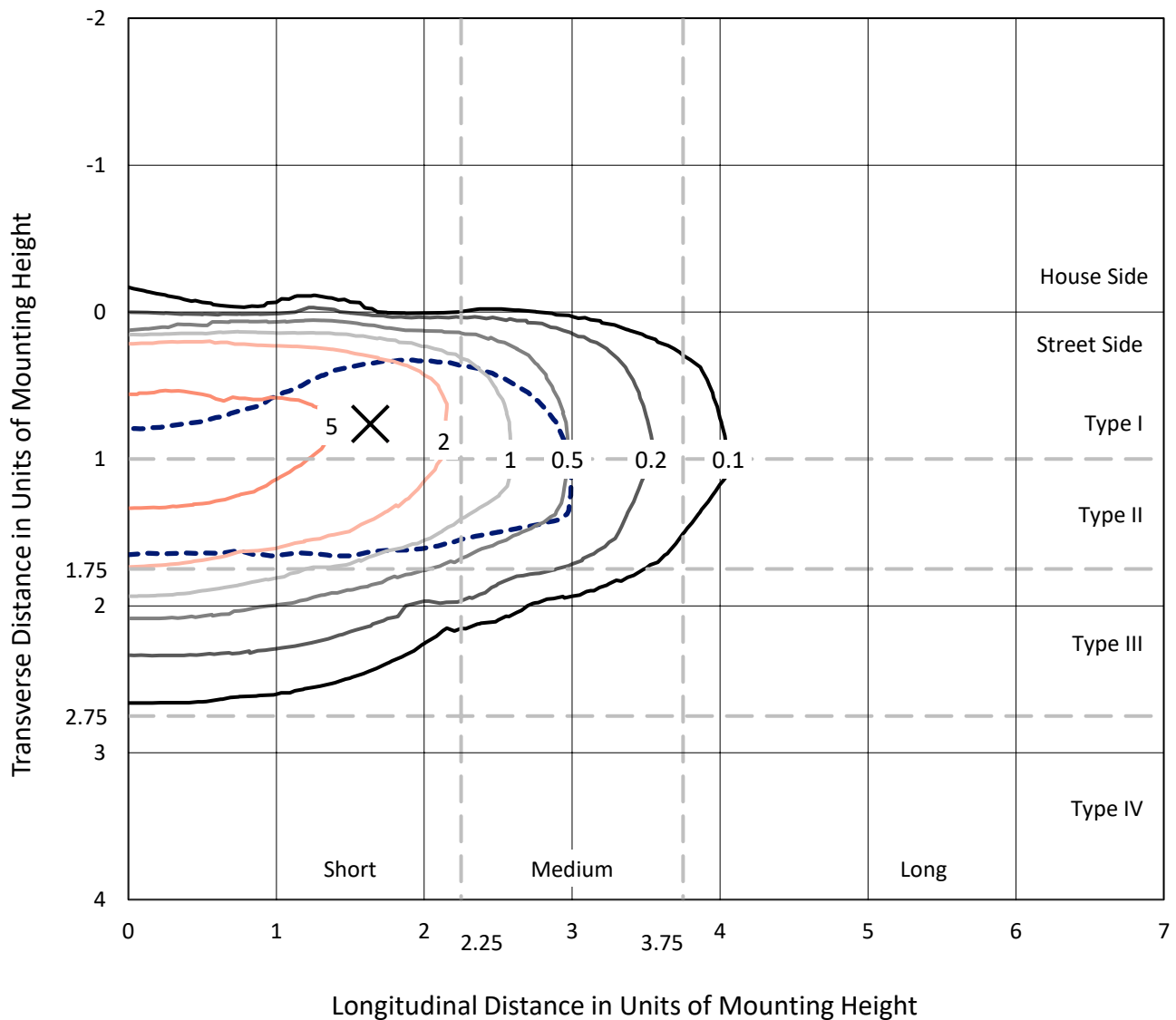


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CATALOG NUMBER: GALN-SA2B-950-U-T2BC

## Iso-Footcandle Lines of Horizontal Illumination

× Max cd  
 - - - 1/2 Max cd

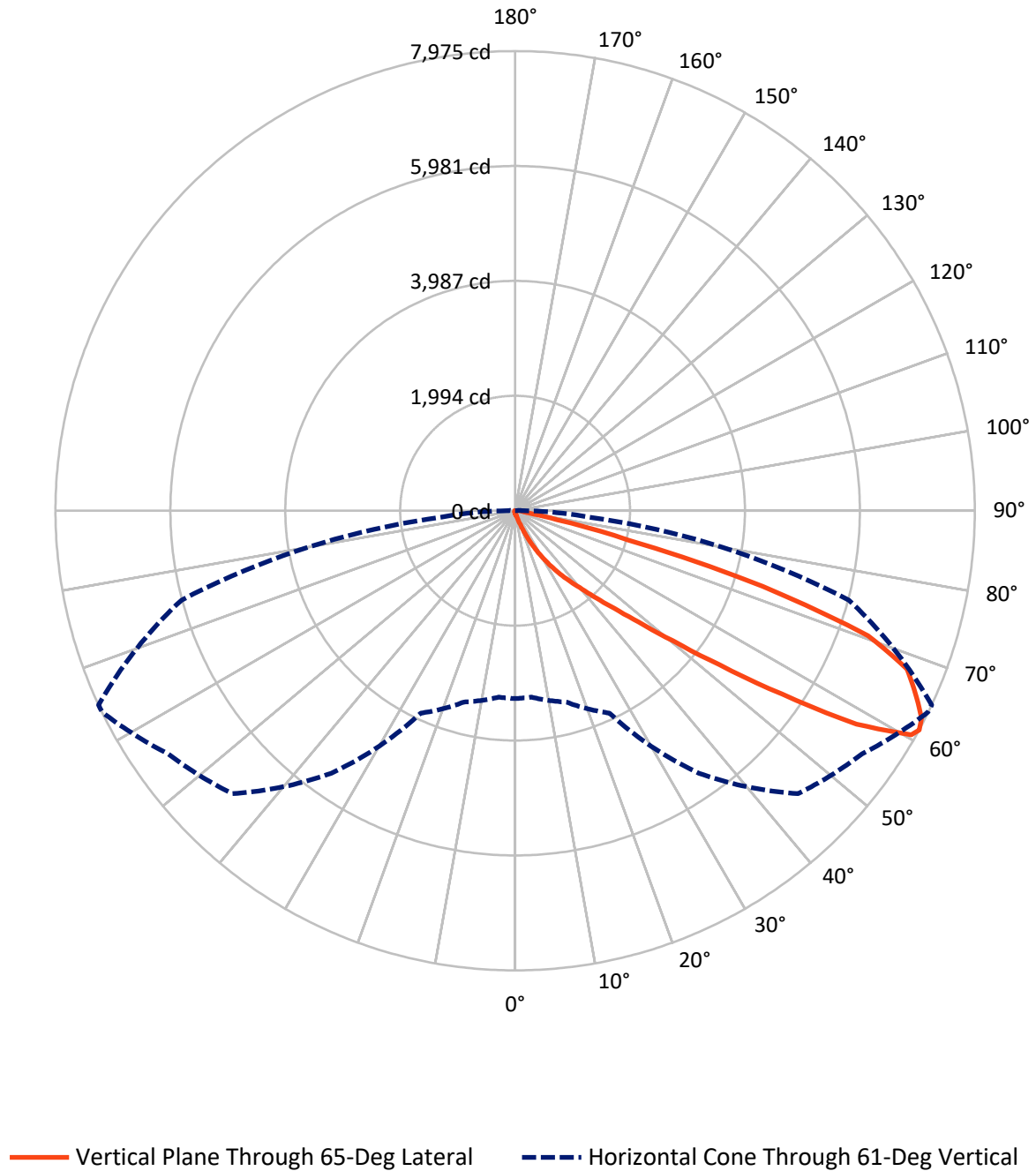


Based on 15 foot mounting height. Maximum calculated value = 9.6 fc  
 Type II - Short - N/A

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CATALOG NUMBER: GALN-SA2B-950-U-T2BC

## Luminous Intensity Polar Plot



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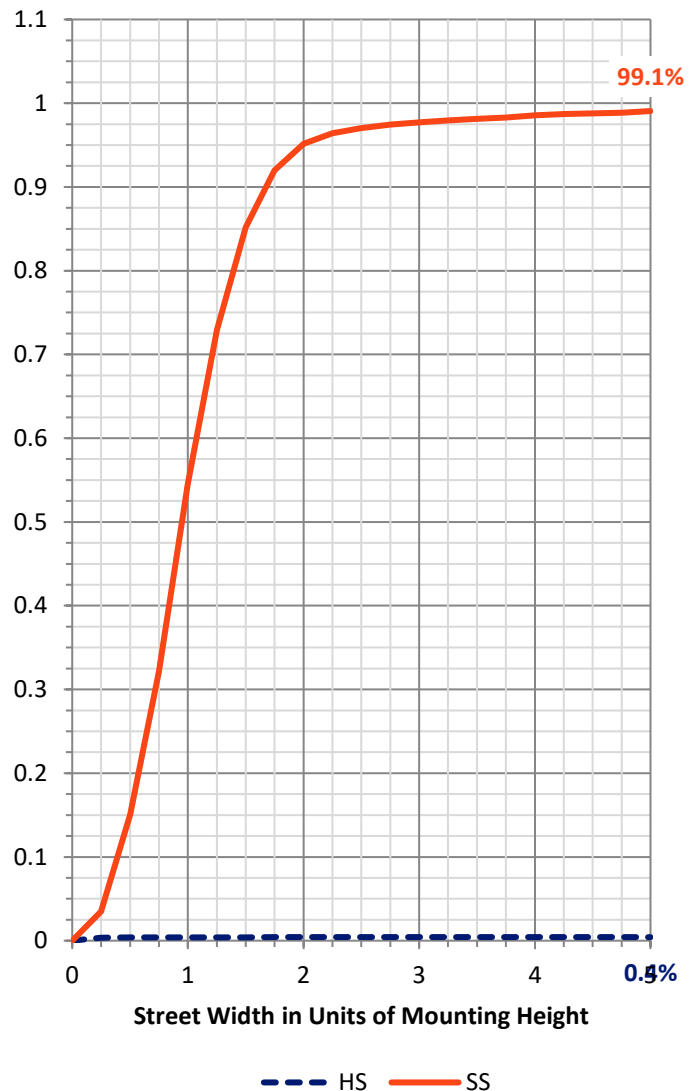
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 30.9     | 0.0    | 30.9   |
|                    | % Fixture | 0.4      | 0.0    | 0.4    |
| <b>Street Side</b> | Lumens    | 7193.6   | 0.0    | 7193.6 |
|                    | % Fixture | 99.6     | 0.0    | 99.6   |
| <b>Total</b>       | Lumens    | 7224.5   | 0.0    | 7224.5 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 5.6    | 0.1       |
| 10°-20°   | 59.4   | 0.8       |
| 20°-30°   | 213.2  | 3.0       |
| 30°-40°   | 567.6  | 7.9       |
| 40°-50°   | 1491.2 | 20.6      |
| 50°-60°   | 2310.1 | 32.0      |
| 60°-70°   | 1937.0 | 26.8      |
| 70°-80°   | 570.0  | 7.9       |
| 80°-90°   | 70.3   | 1.0       |
| 90°-100°  | 0.0    | 0.0       |
| 100°-110° | 0.0    | 0.0       |
| 110°-120° | 0.0    | 0.0       |
| 120°-130° | 0.0    | 0.0       |
| 130°-140° | 0.0    | 0.0       |
| 140°-150° | 0.0    | 0.0       |
| 150°-160° | 0.0    | 0.0       |
| 160°-170° | 0.0    | 0.0       |
| 170°-180° | 0.0    | 0.0       |
| 0°-90°    | 7224.5 | 100.0     |
| 0°-180°   | 7224.5 | 100.0     |



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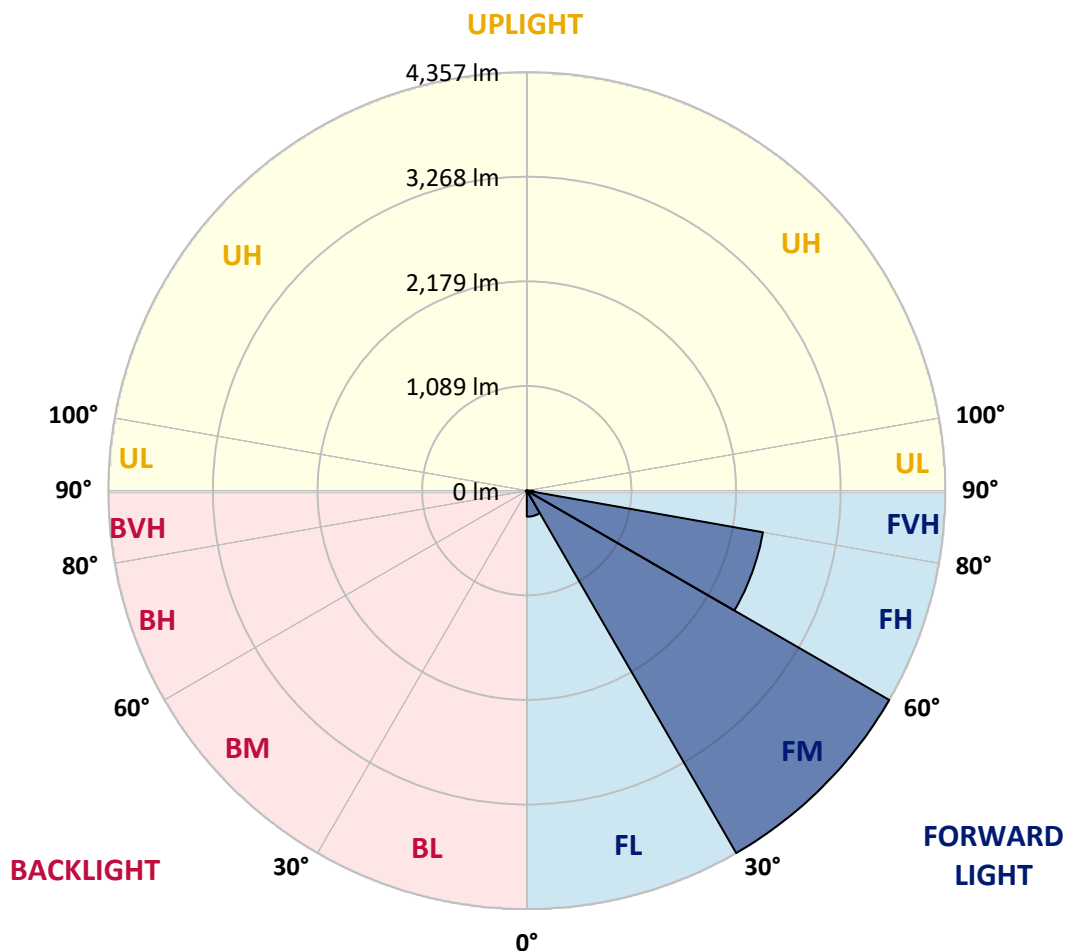
CATALOG NUMBER: GALN-SA2B-950-U-T2BC

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 271.3  | 3.8       |                         |      |         |
| FM   | (30°-60°)   | 4357.2 | 60.3      |                         |      |         |
| FH   | (60°-80°)   | 2496.1 | 34.6      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 69.0   | 1.0       |                         |      | G1/100  |
| BL   | (0°-30°)    | 6.9    | 0.1       | B0/110                  |      |         |
| BM   | (30°-60°)   | 11.7   | 0.2       | B0/220                  |      |         |
| BH   | (60°-80°)   | 10.9   | 0.2       | B0/110                  |      | G0/110  |
| BVH  | (80°-90°)   | 1.3    | 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-G2**

Type II Short



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 64°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 44.2   | 44.2   | 44.2   | 44.2   | 44.2   | 44.2   | 44.2   | 44.2   | 44.2   | 44.2   | 44.2   |
| 2.5°  | 53.7   | 54.2   | 53.2   | 51.2   | 49.7   | 49.7   | 49.2   | 47.7   | 47.7   | 46.2   | 45.2   |
| 5°    | 75.0   | 74.0   | 72.1   | 68.1   | 64.6   | 61.1   | 57.6   | 54.2   | 53.7   | 49.2   | 46.2   |
| 7.5°  | 122.8  | 123.7  | 117.3  | 104.9  | 94.4   | 81.0   | 68.6   | 61.1   | 60.1   | 52.7   | 46.7   |
| 10°   | 269.4  | 261.9  | 247.0  | 198.8  | 163.5  | 123.2  | 91.4   | 71.1   | 70.1   | 56.7   | 47.7   |
| 12.5° | 491.0  | 485.0  | 457.7  | 408.0  | 317.1  | 220.7  | 133.7  | 88.0   | 85.0   | 60.1   | 48.2   |
| 15°   | 707.7  | 698.2  | 683.3  | 633.1  | 526.8  | 395.6  | 218.7  | 120.3  | 112.3  | 65.1   | 47.7   |
| 17.5° | 845.8  | 847.3  | 833.9  | 812.5  | 744.0  | 585.4  | 377.7  | 179.4  | 164.0  | 74.0   | 46.7   |
| 20°   | 966.6  | 963.1  | 970.6  | 959.1  | 910.9  | 795.6  | 549.6  | 284.3  | 257.9  | 88.5   | 47.2   |
| 22.5° | 1105.8 | 1114.2 | 1119.7 | 1117.2 | 1064.0 | 965.6  | 745.0  | 425.4  | 392.1  | 114.8  | 48.7   |
| 25°   | 1292.1 | 1291.1 | 1291.6 | 1285.2 | 1233.5 | 1124.1 | 940.8  | 600.8  | 567.0  | 157.5  | 52.2   |
| 27.5° | 1487.4 | 1493.4 | 1495.9 | 1472.5 | 1404.9 | 1297.6 | 1122.2 | 792.7  | 752.9  | 226.1  | 56.7   |
| 30°   | 1754.3 | 1749.3 | 1737.9 | 1690.2 | 1608.2 | 1475.0 | 1301.1 | 993.9  | 952.2  | 322.0  | 63.6   |
| 32.5° | 2114.1 | 2108.6 | 2051.0 | 1945.6 | 1822.9 | 1659.9 | 1481.0 | 1195.7 | 1145.0 | 441.8  | 73.1   |
| 35°   | 2707.0 | 2715.4 | 2573.8 | 2301.0 | 2080.8 | 1882.0 | 1680.2 | 1396.5 | 1351.7 | 589.4  | 86.0   |
| 37.5° | 3614.9 | 3568.7 | 3376.4 | 2894.3 | 2420.2 | 2159.3 | 1870.6 | 1599.2 | 1560.5 | 771.3  | 102.9  |
| 40°   | 4497.1 | 4451.3 | 4395.7 | 3939.0 | 3010.1 | 2465.0 | 2137.0 | 1837.3 | 1787.1 | 976.5  | 127.7  |
| 42.5° | 5424.4 | 5399.0 | 5396.6 | 5052.2 | 4086.6 | 2945.5 | 2457.5 | 2116.1 | 2073.3 | 1201.7 | 168.5  |
| 45°   | 6081.4 | 6056.0 | 6109.2 | 6169.3 | 5552.6 | 3975.2 | 3015.6 | 2478.4 | 2416.3 | 1475.0 | 233.6  |
| 47.5° | 6169.8 | 6170.8 | 6313.0 | 6501.3 | 6642.0 | 5568.0 | 3759.1 | 2958.4 | 2882.9 | 1866.1 | 342.9  |
| 50°   | 5875.6 | 5887.1 | 6113.2 | 6450.1 | 6828.8 | 6904.4 | 5070.1 | 3655.2 | 3543.4 | 2329.8 | 498.0  |
| 52.5° | 5315.6 | 5328.5 | 5643.6 | 6197.7 | 6656.9 | 7225.4 | 6613.6 | 4566.6 | 4437.9 | 2908.2 | 716.6  |
| 55°   | 4811.1 | 4819.1 | 5180.4 | 5880.6 | 6449.6 | 7051.0 | 7530.0 | 5783.7 | 5614.7 | 3619.9 | 932.3  |
| 57.5° | 4311.7 | 4293.3 | 4528.4 | 5330.0 | 6414.3 | 6836.8 | 7665.2 | 7170.7 | 6984.4 | 4397.7 | 1100.3 |
| 60°   | 3643.8 | 3612.9 | 3801.8 | 4311.7 | 5950.2 | 6977.4 | 7412.3 | 7938.0 | 7895.8 | 5480.5 | 1230.0 |
| 61°   | 3259.6 | 3246.7 | 3436.5 | 3873.9 | 5559.6 | 6941.6 | 7351.6 | 7970.4 | 7974.8 | 5992.9 | 1288.1 |
| 62.5° | 2327.8 | 2364.6 | 2654.8 | 3223.3 | 4656.6 | 6709.5 | 7359.6 | 7870.5 | 7914.7 | 6673.8 | 1438.7 |
| 65°   | 1034.7 | 1093.8 | 1319.4 | 1782.1 | 2708.0 | 5581.4 | 7289.0 | 7651.3 | 7629.4 | 6860.6 | 1957.6 |
| 67.5° | 613.8  | 622.7  | 735.0  | 1009.8 | 1434.2 | 3002.2 | 6432.2 | 7361.6 | 7332.2 | 5972.5 | 2435.6 |
| 70°   | 483.5  | 488.0  | 523.8  | 633.6  | 832.4  | 1150.0 | 3671.1 | 6369.1 | 6496.8 | 4842.9 | 2384.4 |
| 72.5° | 458.7  | 457.7  | 462.7  | 482.1  | 524.3  | 570.5  | 1421.3 | 4233.7 | 4493.6 | 3487.7 | 1999.3 |
| 75°   | 452.7  | 450.7  | 445.8  | 438.3  | 379.7  | 335.9  | 440.3  | 1872.6 | 2023.2 | 2383.0 | 1505.3 |
| 77.5° | 439.3  | 439.8  | 440.8  | 420.4  | 325.5  | 237.6  | 213.2  | 600.8  | 739.0  | 1512.3 | 1070.0 |
| 80°   | 297.2  | 301.7  | 309.1  | 301.2  | 292.7  | 172.0  | 150.6  | 213.7  | 216.7  | 848.8  | 706.7  |
| 82.5° | 150.6  | 150.6  | 147.1  | 131.2  | 113.3  | 111.8  | 119.8  | 155.1  | 157.0  | 429.4  | 332.5  |
| 85°   | 90.9   | 95.9   | 97.9   | 89.0   | 81.5   | 75.0   | 91.4   | 123.2  | 127.7  | 166.5  | 77.5   |
| 87.5° | 20.4   | 20.9   | 22.9   | 30.3   | 44.2   | 60.1   | 85.0   | 112.8  | 114.8  | 106.8  | 9.4    |
| 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-SA2B-950-U-T2BC

**CANDELA DISTRIBUTION (continued):**

|       | 90°   | 95°  | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|-------|-------|------|------|------|------|------|------|------|------|------|------|
| 0°    | 44.2  | 44.2 | 44.2 | 44.2 | 44.2 | 44.2 | 44.2 | 44.2 | 44.2 | 44.2 | 44.2 |
| 2.5°  | 44.7  | 43.7 | 43.2 | 41.7 | 40.3 | 38.8 | 37.8 | 37.3 | 37.8 | 38.3 | 38.3 |
| 5°    | 44.2  | 42.7 | 40.3 | 37.8 | 35.8 | 33.8 | 31.8 | 31.3 | 31.3 | 31.8 | 31.8 |
| 7.5°  | 44.2  | 41.7 | 38.3 | 35.3 | 32.3 | 29.3 | 27.8 | 26.8 | 27.3 | 27.3 | 27.3 |
| 10°   | 44.2  | 41.2 | 36.8 | 32.3 | 28.8 | 25.3 | 22.9 | 21.9 | 21.9 | 21.9 | 21.9 |
| 12.5° | 43.7  | 40.8 | 35.3 | 29.8 | 24.8 | 20.9 | 17.9 | 16.4 | 16.9 | 16.9 | 16.9 |
| 15°   | 42.7  | 39.3 | 33.3 | 25.3 | 19.9 | 15.9 | 12.9 | 11.4 | 11.9 | 12.9 | 13.4 |
| 17.5° | 41.2  | 37.8 | 29.8 | 21.4 | 15.9 | 11.9 | 8.9  | 8.0  | 8.4  | 9.9  | 9.9  |
| 20°   | 40.8  | 36.3 | 26.3 | 17.4 | 11.9 | 8.4  | 6.0  | 5.0  | 5.5  | 7.5  | 8.0  |
| 22.5° | 40.8  | 35.3 | 23.9 | 14.4 | 8.9  | 5.5  | 3.5  | 2.0  | 2.0  | 3.5  | 3.5  |
| 25°   | 41.2  | 34.8 | 21.9 | 11.9 | 6.5  | 4.0  | 2.0  | 1.0  | 2.0  | 5.5  | 6.5  |
| 27.5° | 42.2  | 34.3 | 20.9 | 9.9  | 5.0  | 3.5  | 1.5  | 3.5  | 6.0  | 6.0  | 6.0  |
| 30°   | 43.2  | 33.3 | 19.4 | 8.4  | 4.5  | 2.5  | 2.5  | 5.0  | 5.0  | 6.0  | 6.5  |
| 32.5° | 44.7  | 32.8 | 18.4 | 7.5  | 3.5  | 2.0  | 3.5  | 3.0  | 3.0  | 3.5  | 4.0  |
| 35°   | 47.7  | 33.3 | 17.4 | 7.5  | 3.5  | 2.5  | 3.0  | 1.5  | 1.0  | 1.0  | 1.0  |
| 37.5° | 51.7  | 33.8 | 15.9 | 6.5  | 3.0  | 3.0  | 1.5  | 0.0  | 0.0  | 0.0  | 0.0  |
| 40°   | 58.1  | 35.3 | 14.9 | 6.0  | 2.5  | 2.5  | 0.5  | 0.0  | 0.0  | 0.0  | 0.0  |
| 42.5° | 69.1  | 38.3 | 14.4 | 5.5  | 2.5  | 2.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 45°   | 90.9  | 45.2 | 13.4 | 5.0  | 2.5  | 1.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 47.5° | 130.7 | 61.6 | 12.9 | 4.0  | 1.5  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 50°   | 190.8 | 83.5 | 12.4 | 3.5  | 0.5  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 52.5° | 243.5 | 88.0 | 8.4  | 3.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 55°   | 249.5 | 60.6 | 6.5  | 2.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 57.5° | 198.8 | 39.3 | 5.5  | 1.5  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 60°   | 150.6 | 29.8 | 5.0  | 0.5  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 61°   | 144.6 | 26.8 | 5.0  | 0.5  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 62.5° | 159.5 | 23.4 | 4.5  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 65°   | 259.4 | 19.4 | 4.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 67.5° | 450.7 | 16.9 | 3.5  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 70°   | 569.5 | 15.9 | 3.0  | 0.5  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 72.5° | 496.5 | 14.4 | 3.0  | 1.0  | 0.5  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 75°   | 298.7 | 12.4 | 3.0  | 2.0  | 1.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 77.5° | 156.5 | 9.4  | 3.0  | 2.5  | 1.5  | 0.5  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 80°   | 76.0  | 8.4  | 3.5  | 2.5  | 2.0  | 1.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 82.5° | 29.8  | 7.0  | 4.0  | 3.5  | 2.5  | 1.5  | 0.5  | 0.0  | 0.0  | 0.0  | 0.0  |
| 85°   | 13.4  | 6.0  | 4.5  | 4.0  | 3.5  | 2.0  | 0.5  | 0.0  | 0.0  | 0.0  | 0.0  |
| 87.5° | 7.0   | 5.5  | 5.0  | 4.5  | 3.5  | 2.5  | 1.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 90°   | 0.0   | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |

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

Report Prepared for

Cooper Lighting Solutions

McGraw-Edison

Report Number: SP1-2407-184-17

Test Date: 10/11/2024

Luminaire Tested: GSS-SB1A-950-U-5WQ

Data in this report applies to families of products including GSS-SB1A-950-U-5WQ

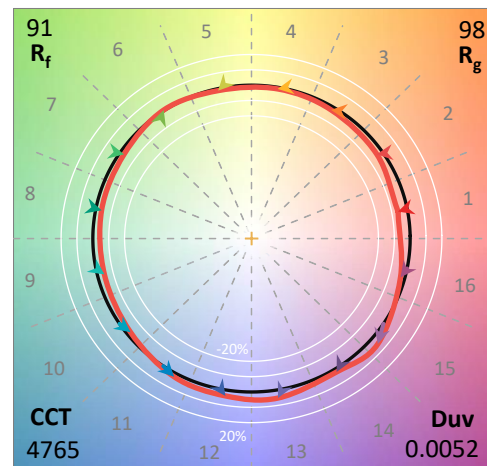
### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2407-184-17  
 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-950-U-5WQ**  
 Description: GALLEON II SITE SLIM 1SQ 350MA 5WQ HIGH DENSITY LIGHTSQUARE WITH 90 CRI  
 5000K CCT 26 LEDS

### Spectral Parameters

CCT (K): 4765  
 CIE  $u'$ : 0.2105  
 CIE  $v'$ : 0.4941  
 Duv: 0.0052  
 CIE x: 0.3536  
 CIE y: 0.3689  
 CIE z: 0.2775  
 Peak Wavelength (nm): 449  
 Dominant Wavelength (nm): 571  
 Purity: 16.80041  
 Rf: 90.7  
 Rg: 98

CRI (Ra): 90.8  
 R1: 89.8  
 R2: 93.1  
 R3: 95.3  
 R4: 90.3  
 R5: 89.0  
 R6: 89.7  
 R7: 94.9  
 R8: 84.0  
 R9: 54.9  
 R10: 83.0  
 R11: 89.6  
 R12: 68.0  
 R13: 90.6  
 R14: 97.3  
 R15: 86.2



### Test Conditions

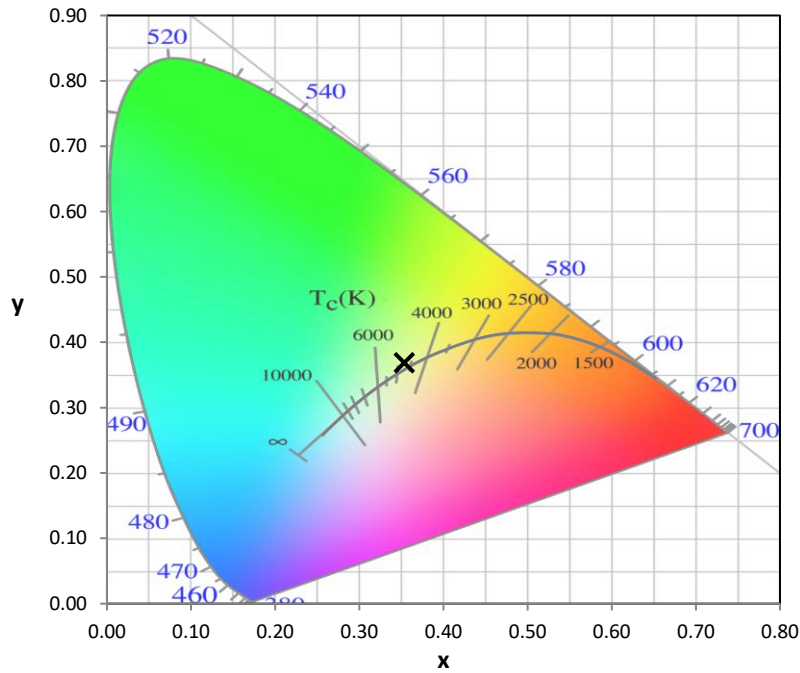
Stabilization Time: 20M  
 Operation Time: 1H 20M  
 Sphere Temperature (°C): 25.2

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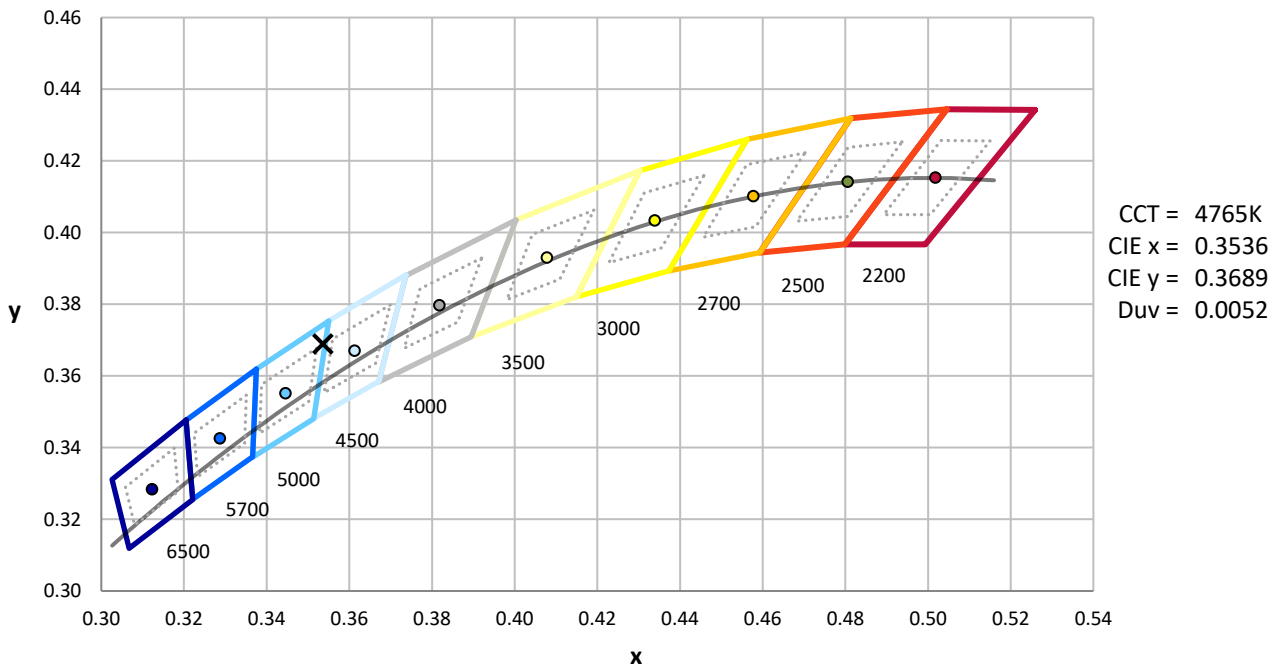
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date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



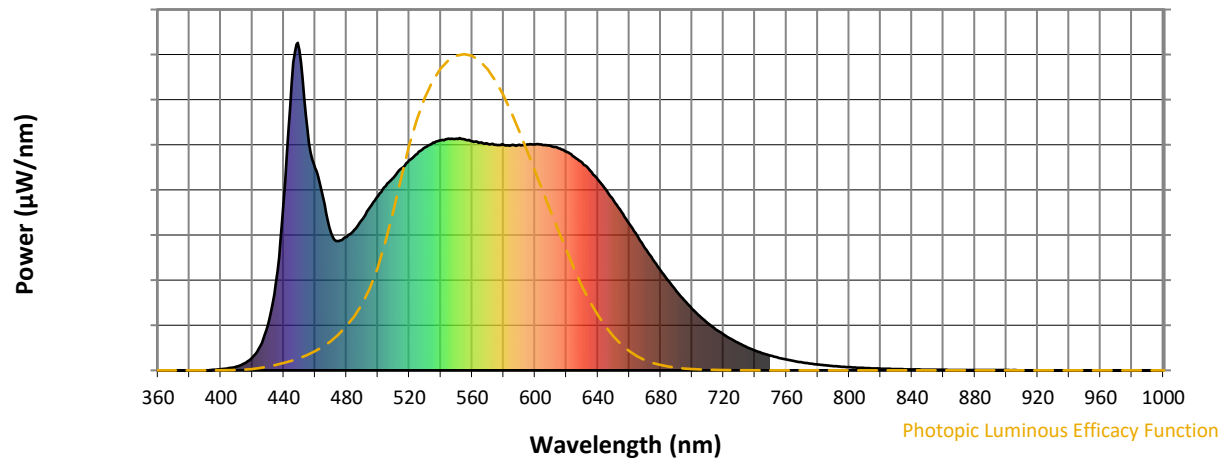
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 5000K 7-step quadrangle

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### Photopic Flux vs. Wavelength

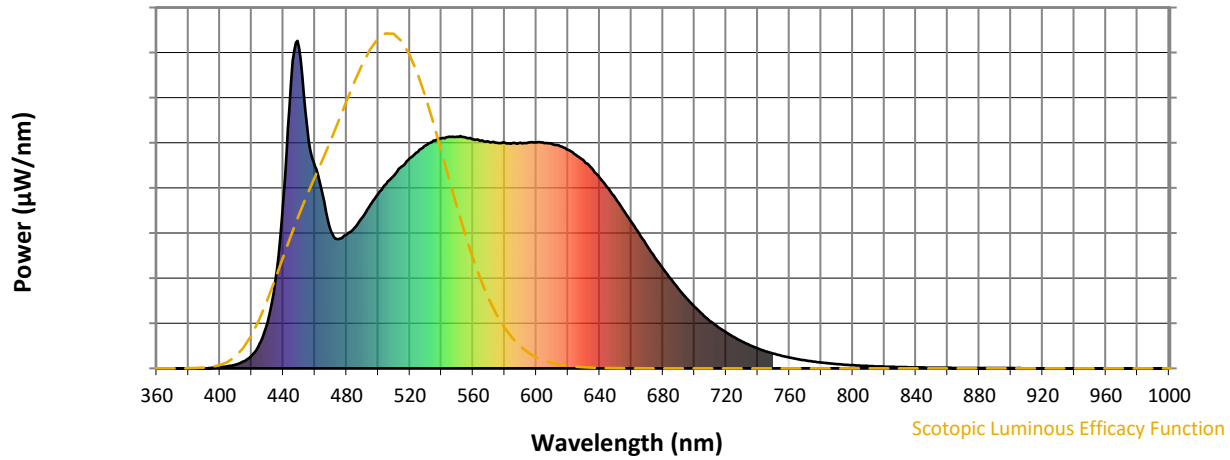


### Photopic Lumens: NR

| 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       | 462                         | NR               | 620       | 668                         | NR               | 750       | 45                          | NR               | 880       | 1                           | NR               |
| 365       | 0                           | NR               | 495       | 498                         | NR               | 625       | 652                         | NR               | 755       | 39                          | NR               | 885       | 1                           | NR               |
| 370       | 0                           | NR               | 500       | 533                         | NR               | 630       | 634                         | NR               | 760       | 33                          | NR               | 890       | 1                           | NR               |
| 375       | 0                           | NR               | 505       | 562                         | NR               | 635       | 610                         | NR               | 765       | 28                          | NR               | 895       | 1                           | NR               |
| 380       | 0                           | NR               | 510       | 590                         | NR               | 640       | 583                         | NR               | 770       | 24                          | NR               | 900       | 1                           | NR               |
| 385       | 0                           | NR               | 515       | 617                         | NR               | 645       | 552                         | NR               | 775       | 21                          | NR               | 905       | 1                           | NR               |
| 390       | 0                           | NR               | 520       | 642                         | NR               | 650       | 519                         | NR               | 780       | 18                          | NR               | 910       | 0                           | NR               |
| 395       | 2                           | NR               | 525       | 661                         | NR               | 655       | 484                         | NR               | 785       | 15                          | NR               | 915       | 0                           | NR               |
| 400       | 4                           | NR               | 530       | 681                         | NR               | 660       | 448                         | NR               | 790       | 13                          | NR               | 920       | 0                           | NR               |
| 405       | 7                           | NR               | 535       | 695                         | NR               | 665       | 411                         | NR               | 795       | 11                          | NR               | 925       | 0                           | NR               |
| 410       | 12                          | NR               | 540       | 702                         | NR               | 670       | 373                         | NR               | 800       | 10                          | NR               | 930       | 0                           | NR               |
| 415       | 21                          | NR               | 545       | 708                         | NR               | 675       | 338                         | NR               | 805       | 8                           | NR               | 935       | 0                           | NR               |
| 420       | 39                          | NR               | 550       | 707                         | NR               | 680       | 305                         | NR               | 810       | 7                           | NR               | 940       | 0                           | NR               |
| 425       | 74                          | NR               | 555       | 706                         | NR               | 685       | 272                         | NR               | 815       | 6                           | NR               | 945       | 0                           | NR               |
| 430       | 139                         | NR               | 560       | 700                         | NR               | 690       | 243                         | NR               | 820       | 5                           | NR               | 950       | 0                           | NR               |
| 435       | 270                         | NR               | 565       | 696                         | NR               | 695       | 214                         | NR               | 825       | 5                           | NR               | 955       | 0                           | NR               |
| 440       | 517                         | NR               | 570       | 692                         | NR               | 700       | 188                         | NR               | 830       | 4                           | NR               | 960       | 0                           | NR               |
| 445       | 877                         | NR               | 575       | 689                         | NR               | 705       | 165                         | NR               | 835       | 3                           | NR               | 965       | 0                           | NR               |
| 450       | 978                         | NR               | 580       | 688                         | NR               | 710       | 144                         | NR               | 840       | 3                           | NR               | 970       | 0                           | NR               |
| 455       | 738                         | NR               | 585       | 688                         | NR               | 715       | 125                         | NR               | 845       | 3                           | NR               | 975       | 0                           | NR               |
| 460       | 618                         | NR               | 590       | 689                         | NR               | 720       | 110                         | NR               | 850       | 2                           | NR               | 980       | 0                           | NR               |
| 465       | 529                         | NR               | 595       | 690                         | NR               | 725       | 95                          | NR               | 855       | 2                           | NR               | 985       | 0                           | NR               |
| 470       | 420                         | NR               | 600       | 690                         | NR               | 730       | 82                          | NR               | 860       | 2                           | NR               | 990       | 0                           | NR               |
| 475       | 395                         | NR               | 605       | 688                         | NR               | 735       | 71                          | NR               | 865       | 1                           | NR               | 995       | 0                           | NR               |
| 480       | 408                         | NR               | 610       | 685                         | NR               | 740       | 61                          | NR               | 870       | 1                           | NR               | 1000      | 0                           | NR               |
| 485       | 429                         | NR               | 615       | 678                         | NR               | 745       | 52                          | NR               | 875       | 1                           | NR               |           |                             |                  |

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### Scotopic Flux vs. Wavelength



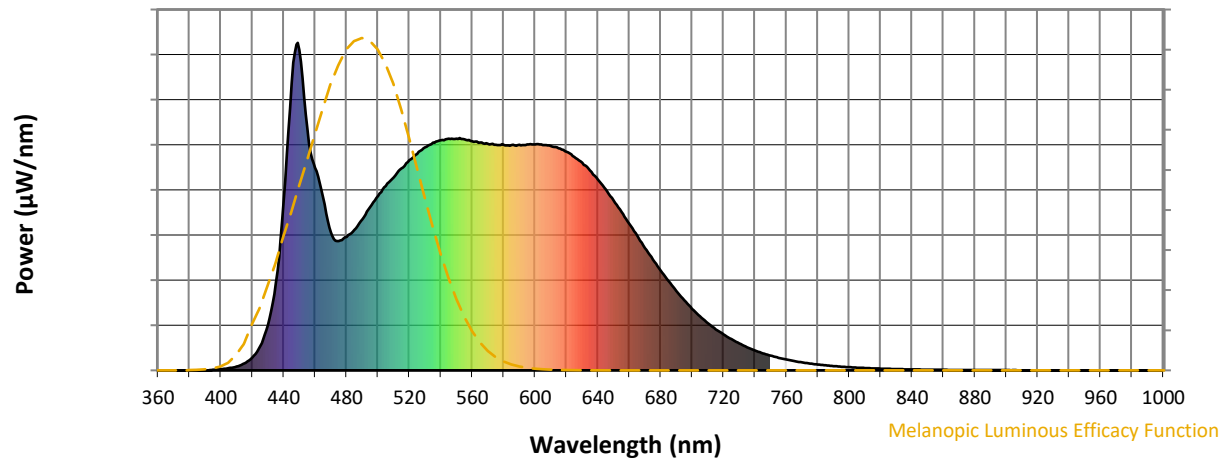
Scotopic Lumens: NR

S/P: 1.99

| $\lambda$<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               | 462                                  | NR                             | 620               | 668                                  | NR                             | 750               | 45                                   | NR                             | 880               | 1                                    | NR                             |
| 365               | 0                                    | NR                             | 495               | 498                                  | NR                             | 625               | 652                                  | NR                             | 755               | 39                                   | NR                             | 885               | 1                                    | NR                             |
| 370               | 0                                    | NR                             | 500               | 533                                  | NR                             | 630               | 634                                  | NR                             | 760               | 33                                   | NR                             | 890               | 1                                    | NR                             |
| 375               | 0                                    | NR                             | 505               | 562                                  | NR                             | 635               | 610                                  | NR                             | 765               | 28                                   | NR                             | 895               | 1                                    | NR                             |
| 380               | 0                                    | NR                             | 510               | 590                                  | NR                             | 640               | 583                                  | NR                             | 770               | 24                                   | NR                             | 900               | 1                                    | NR                             |
| 385               | 0                                    | NR                             | 515               | 617                                  | NR                             | 645               | 552                                  | NR                             | 775               | 21                                   | NR                             | 905               | 1                                    | NR                             |
| 390               | 0                                    | NR                             | 520               | 642                                  | NR                             | 650               | 519                                  | NR                             | 780               | 18                                   | NR                             | 910               | 0                                    | NR                             |
| 395               | 2                                    | NR                             | 525               | 661                                  | NR                             | 655               | 484                                  | NR                             | 785               | 15                                   | NR                             | 915               | 0                                    | NR                             |
| 400               | 4                                    | NR                             | 530               | 681                                  | NR                             | 660               | 448                                  | NR                             | 790               | 13                                   | NR                             | 920               | 0                                    | NR                             |
| 405               | 7                                    | NR                             | 535               | 695                                  | NR                             | 665               | 411                                  | NR                             | 795               | 11                                   | NR                             | 925               | 0                                    | NR                             |
| 410               | 12                                   | NR                             | 540               | 702                                  | NR                             | 670               | 373                                  | NR                             | 800               | 10                                   | NR                             | 930               | 0                                    | NR                             |
| 415               | 21                                   | NR                             | 545               | 708                                  | NR                             | 675               | 338                                  | NR                             | 805               | 8                                    | NR                             | 935               | 0                                    | NR                             |
| 420               | 39                                   | NR                             | 550               | 707                                  | NR                             | 680               | 305                                  | NR                             | 810               | 7                                    | NR                             | 940               | 0                                    | NR                             |
| 425               | 74                                   | NR                             | 555               | 706                                  | NR                             | 685               | 272                                  | NR                             | 815               | 6                                    | NR                             | 945               | 0                                    | NR                             |
| 430               | 139                                  | NR                             | 560               | 700                                  | NR                             | 690               | 243                                  | NR                             | 820               | 5                                    | NR                             | 950               | 0                                    | NR                             |
| 435               | 270                                  | NR                             | 565               | 696                                  | NR                             | 695               | 214                                  | NR                             | 825               | 5                                    | NR                             | 955               | 0                                    | NR                             |
| 440               | 517                                  | NR                             | 570               | 692                                  | NR                             | 700               | 188                                  | NR                             | 830               | 4                                    | NR                             | 960               | 0                                    | NR                             |
| 445               | 877                                  | NR                             | 575               | 689                                  | NR                             | 705               | 165                                  | NR                             | 835               | 3                                    | NR                             | 965               | 0                                    | NR                             |
| 450               | 978                                  | NR                             | 580               | 688                                  | NR                             | 710               | 144                                  | NR                             | 840               | 3                                    | NR                             | 970               | 0                                    | NR                             |
| 455               | 738                                  | NR                             | 585               | 688                                  | NR                             | 715               | 125                                  | NR                             | 845               | 3                                    | NR                             | 975               | 0                                    | NR                             |
| 460               | 618                                  | NR                             | 590               | 689                                  | NR                             | 720               | 110                                  | NR                             | 850               | 2                                    | NR                             | 980               | 0                                    | NR                             |
| 465               | 529                                  | NR                             | 595               | 690                                  | NR                             | 725               | 95                                   | NR                             | 855               | 2                                    | NR                             | 985               | 0                                    | NR                             |
| 470               | 420                                  | NR                             | 600               | 690                                  | NR                             | 730               | 82                                   | NR                             | 860               | 2                                    | NR                             | 990               | 0                                    | NR                             |
| 475               | 395                                  | NR                             | 605               | 688                                  | NR                             | 735               | 71                                   | NR                             | 865               | 1                                    | NR                             | 995               | 0                                    | NR                             |
| 480               | 408                                  | NR                             | 610               | 685                                  | NR                             | 740               | 61                                   | NR                             | 870               | 1                                    | NR                             | 1000              | 0                                    | NR                             |
| 485               | 429                                  | NR                             | 615               | 678                                  | NR                             | 745               | 52                                   | NR                             | 875               | 1                                    | NR                             |                   |                                      |                                |

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### Melanopic Flux vs. Wavelength


**Melanopic Lumens: NR**
**M/P: 4.22**

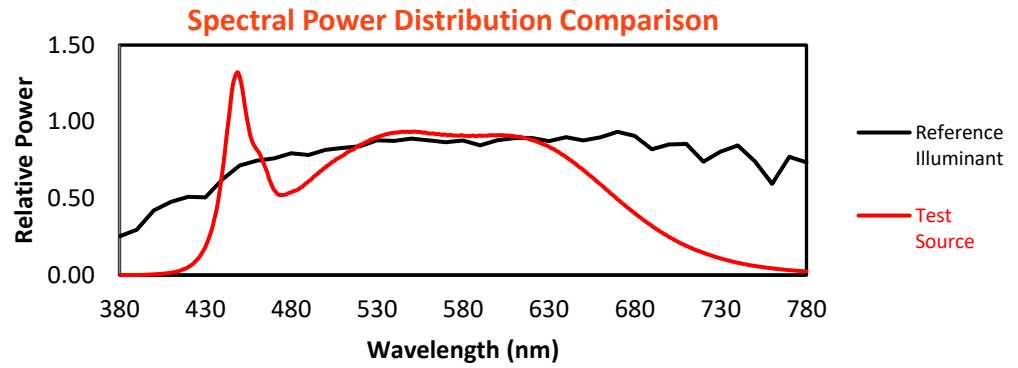
| $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<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               | 462                                  | NR                             | 620               | 668                                  | NR                             | 750               | 45                                   | NR                             | 880               | 1                                    | NR                             |
| 365               | 0                                    | NR                             | 495               | 498                                  | NR                             | 625               | 652                                  | NR                             | 755               | 39                                   | NR                             | 885               | 1                                    | NR                             |
| 370               | 0                                    | NR                             | 500               | 533                                  | NR                             | 630               | 634                                  | NR                             | 760               | 33                                   | NR                             | 890               | 1                                    | NR                             |
| 375               | 0                                    | NR                             | 505               | 562                                  | NR                             | 635               | 610                                  | NR                             | 765               | 28                                   | NR                             | 895               | 1                                    | NR                             |
| 380               | 0                                    | NR                             | 510               | 590                                  | NR                             | 640               | 583                                  | NR                             | 770               | 24                                   | NR                             | 900               | 1                                    | NR                             |
| 385               | 0                                    | NR                             | 515               | 617                                  | NR                             | 645               | 552                                  | NR                             | 775               | 21                                   | NR                             | 905               | 1                                    | NR                             |
| 390               | 0                                    | NR                             | 520               | 642                                  | NR                             | 650               | 519                                  | NR                             | 780               | 18                                   | NR                             | 910               | 0                                    | NR                             |
| 395               | 2                                    | NR                             | 525               | 661                                  | NR                             | 655               | 484                                  | NR                             | 785               | 15                                   | NR                             | 915               | 0                                    | NR                             |
| 400               | 4                                    | NR                             | 530               | 681                                  | NR                             | 660               | 448                                  | NR                             | 790               | 13                                   | NR                             | 920               | 0                                    | NR                             |
| 405               | 7                                    | NR                             | 535               | 695                                  | NR                             | 665               | 411                                  | NR                             | 795               | 11                                   | NR                             | 925               | 0                                    | NR                             |
| 410               | 12                                   | NR                             | 540               | 702                                  | NR                             | 670               | 373                                  | NR                             | 800               | 10                                   | NR                             | 930               | 0                                    | NR                             |
| 415               | 21                                   | NR                             | 545               | 708                                  | NR                             | 675               | 338                                  | NR                             | 805               | 8                                    | NR                             | 935               | 0                                    | NR                             |
| 420               | 39                                   | NR                             | 550               | 707                                  | NR                             | 680               | 305                                  | NR                             | 810               | 7                                    | NR                             | 940               | 0                                    | NR                             |
| 425               | 74                                   | NR                             | 555               | 706                                  | NR                             | 685               | 272                                  | NR                             | 815               | 6                                    | NR                             | 945               | 0                                    | NR                             |
| 430               | 139                                  | NR                             | 560               | 700                                  | NR                             | 690               | 243                                  | NR                             | 820               | 5                                    | NR                             | 950               | 0                                    | NR                             |
| 435               | 270                                  | NR                             | 565               | 696                                  | NR                             | 695               | 214                                  | NR                             | 825               | 5                                    | NR                             | 955               | 0                                    | NR                             |
| 440               | 517                                  | NR                             | 570               | 692                                  | NR                             | 700               | 188                                  | NR                             | 830               | 4                                    | NR                             | 960               | 0                                    | NR                             |
| 445               | 877                                  | NR                             | 575               | 689                                  | NR                             | 705               | 165                                  | NR                             | 835               | 3                                    | NR                             | 965               | 0                                    | NR                             |
| 450               | 978                                  | NR                             | 580               | 688                                  | NR                             | 710               | 144                                  | NR                             | 840               | 3                                    | NR                             | 970               | 0                                    | NR                             |
| 455               | 738                                  | NR                             | 585               | 688                                  | NR                             | 715               | 125                                  | NR                             | 845               | 3                                    | NR                             | 975               | 0                                    | NR                             |
| 460               | 618                                  | NR                             | 590               | 689                                  | NR                             | 720               | 110                                  | NR                             | 850               | 2                                    | NR                             | 980               | 0                                    | NR                             |
| 465               | 529                                  | NR                             | 595               | 690                                  | NR                             | 725               | 95                                   | NR                             | 855               | 2                                    | NR                             | 985               | 0                                    | NR                             |
| 470               | 420                                  | NR                             | 600               | 690                                  | NR                             | 730               | 82                                   | NR                             | 860               | 2                                    | NR                             | 990               | 0                                    | NR                             |
| 475               | 395                                  | NR                             | 605               | 688                                  | NR                             | 735               | 71                                   | NR                             | 865               | 1                                    | NR                             | 995               | 0                                    | NR                             |
| 480               | 408                                  | NR                             | 610               | 685                                  | NR                             | 740               | 61                                   | NR                             | 870               | 1                                    | NR                             | 1000              | 0                                    | NR                             |
| 485               | 429                                  | NR                             | 615               | 678                                  | NR                             | 745               | 52                                   | NR                             | 875               | 1                                    | NR                             |                   |                                      |                                |

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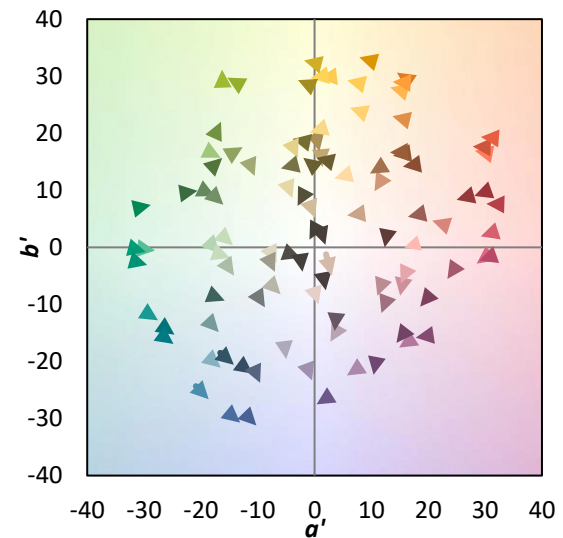
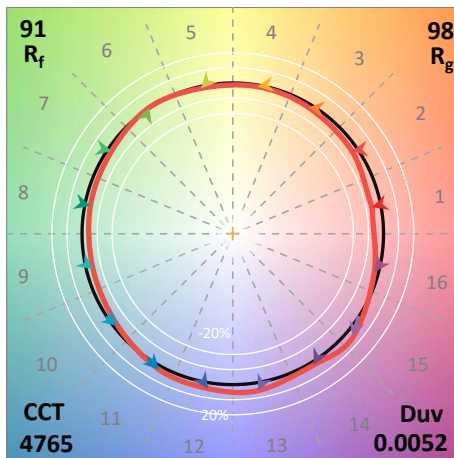
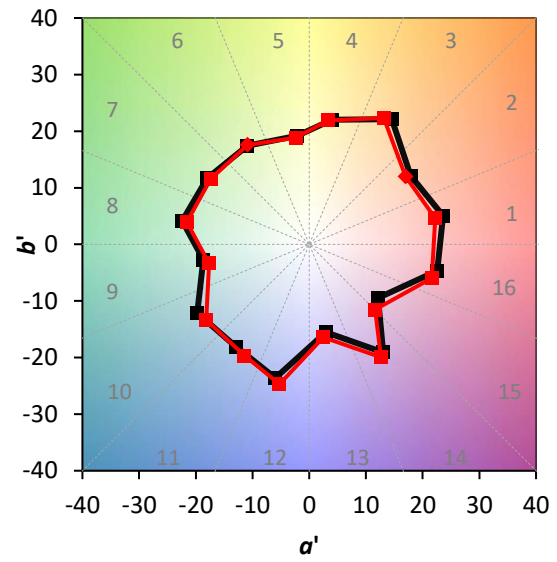
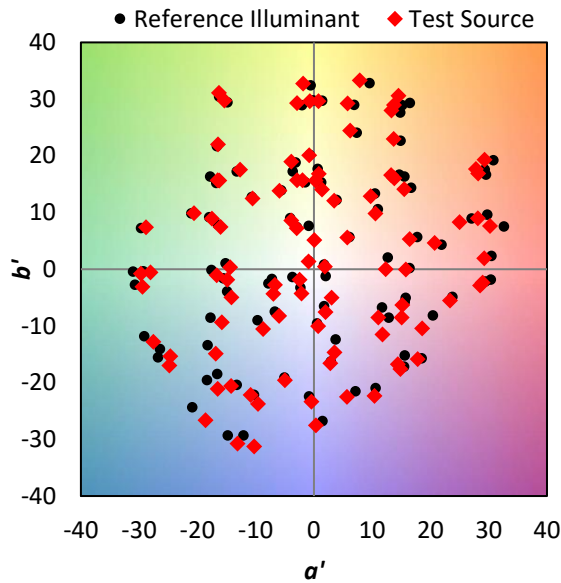
TM-30-18

### Summary

$R_f = 90.7$   
 $R_g = 98$   
 CIE  $R_a = 90.8$   
 $R_9 = 54.9$

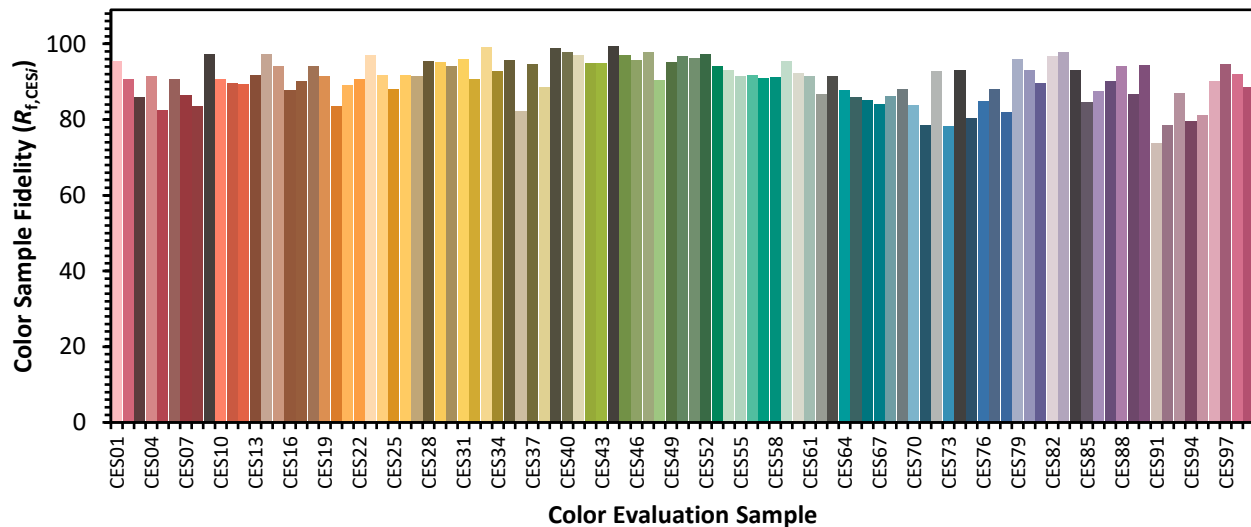


### Color Vector Graphics

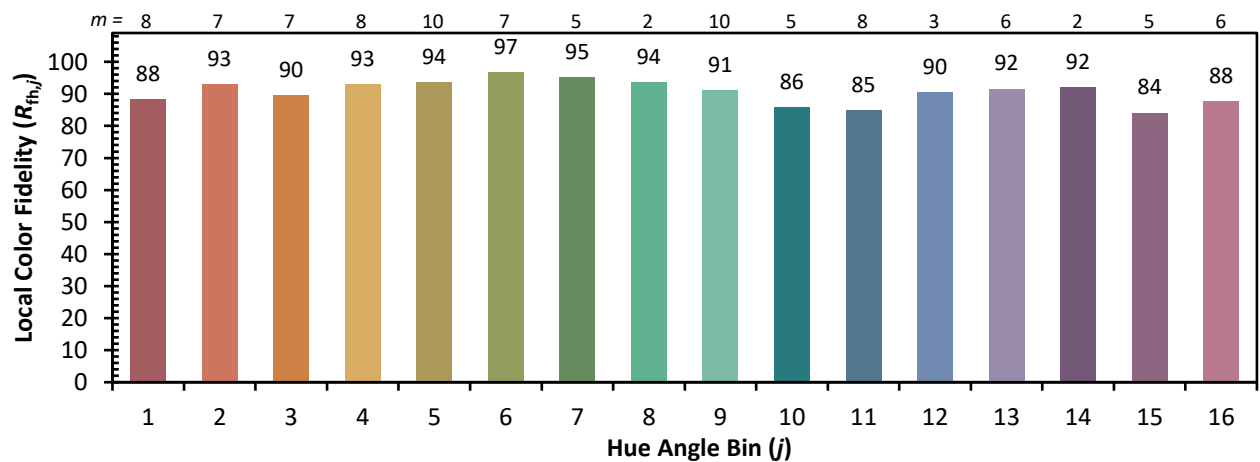
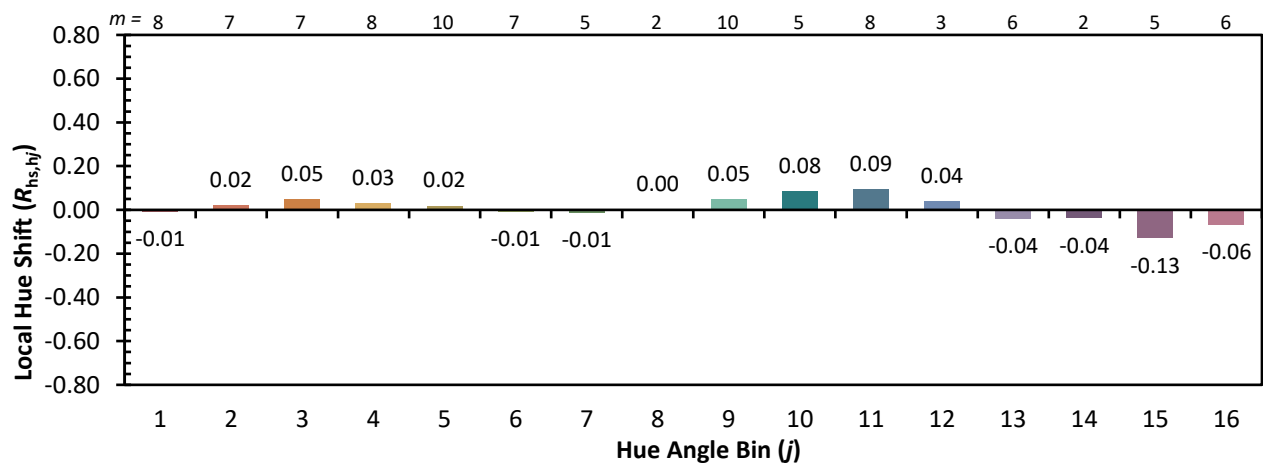
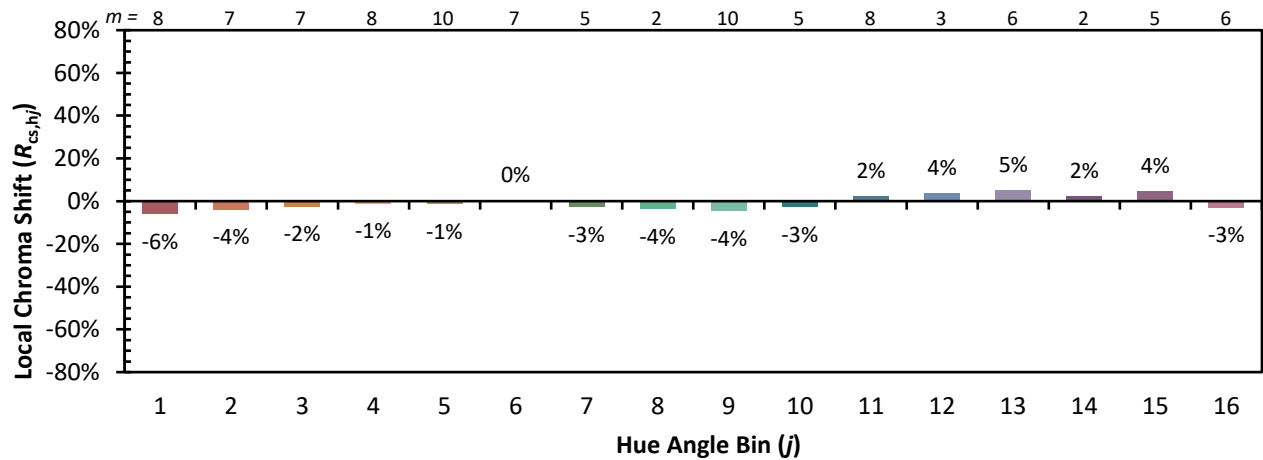


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

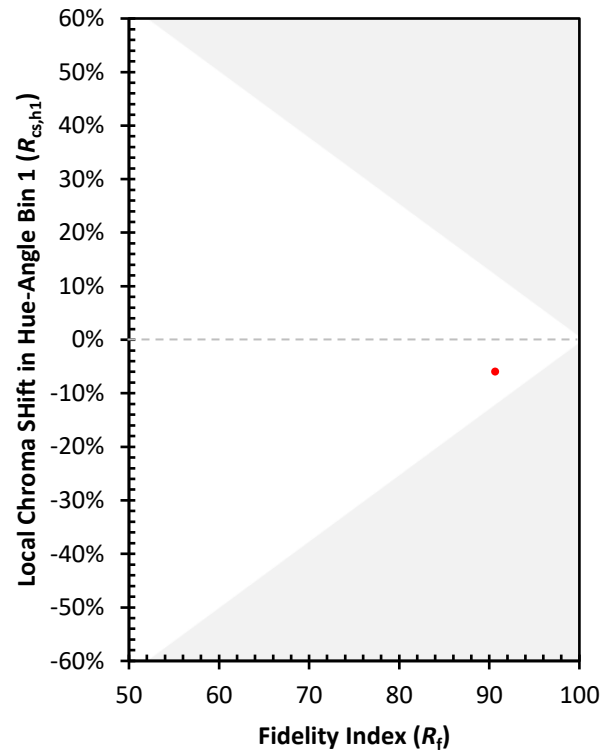
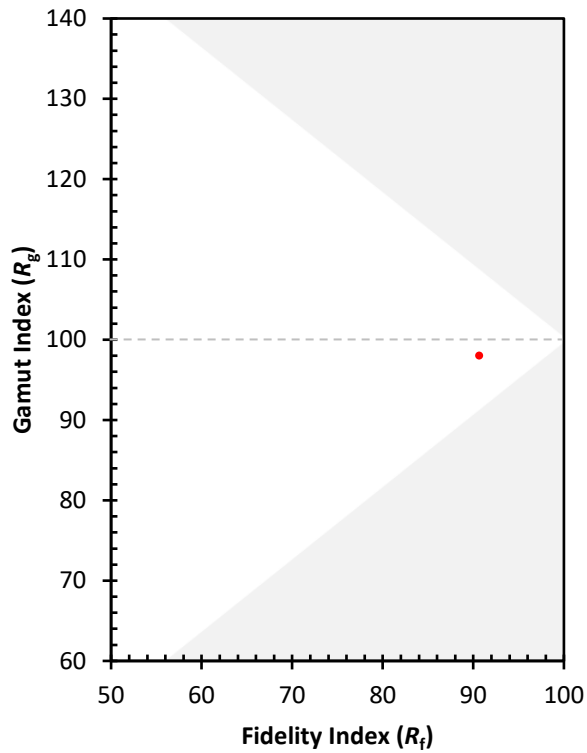
|            |             |            |            |
|------------|-------------|------------|------------|
| CES01 = 85 | CES26 = 92  | CES51 = 96 | CES76 = 85 |
| CES02 = 60 | CES27 = 92  | CES52 = 97 | CES77 = 88 |
| CES03 = 31 | CES28 = 95  | CES53 = 94 | CES78 = 82 |
| CES04 = 69 | CES29 = 95  | CES54 = 93 | CES79 = 96 |
| CES05 = 48 | CES30 = 94  | CES55 = 92 | CES80 = 93 |
| CES06 = 50 | CES31 = 96  | CES56 = 92 | CES81 = 89 |
| CES07 = 41 | CES32 = 91  | CES57 = 91 | CES82 = 97 |
| CES08 = 40 | CES33 = 99  | CES58 = 91 | CES83 = 98 |
| CES09 = 29 | CES34 = 93  | CES59 = 95 | CES84 = 93 |
| CES10 = 73 | CES35 = 96  | CES60 = 92 | CES85 = 85 |
| CES11 = 56 | CES36 = 82  | CES61 = 92 | CES86 = 88 |
| CES12 = 62 | CES37 = 95  | CES62 = 87 | CES87 = 90 |
| CES13 = 42 | CES38 = 89  | CES63 = 91 | CES88 = 94 |
| CES14 = 74 | CES39 = 99  | CES64 = 88 | CES89 = 87 |
| CES15 = 71 | CES40 = 98  | CES65 = 86 | CES90 = 94 |
| CES16 = 46 | CES41 = 97  | CES66 = 85 | CES91 = 74 |
| CES17 = 48 | CES42 = 95  | CES67 = 84 | CES92 = 78 |
| CES18 = 56 | CES43 = 95  | CES68 = 86 | CES93 = 87 |
| CES19 = 70 | CES44 = 100 | CES69 = 88 | CES94 = 80 |
| CES20 = 65 | CES45 = 97  | CES70 = 84 | CES95 = 81 |
| CES21 = 85 | CES46 = 96  | CES71 = 79 | CES96 = 90 |
| CES22 = 77 | CES47 = 98  | CES72 = 93 | CES97 = 95 |
| CES23 = 91 | CES48 = 90  | CES73 = 78 | CES98 = 92 |
| CES24 = 90 | CES49 = 95  | CES74 = 93 | CES99 = 88 |
| CES25 = 70 | CES50 = 97  | CES75 = 80 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)