

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: P1047593

Luminaire Tested: **GALN-SA2A-950-U-T3BC**

Issue Date: 07/10/2025

**Test Information**

Test Method: LM-79-08  
Report Number: P1047593  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 07/10/2025  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: MCGRAW-EDISON  
Catalog Number: GALN-SA2A-950-U-T3BC  
Description: GALLEON II AREA AND ROADWAY LUMINAIRE 615mA 2xLight Square PACKAGE  
90CRI 5000K FIXTURE w/ TYPE III ANGLED BACKLIGHT CONTROL  
Light Source: (28) 5000K CCT, 90 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 6066.2 lumens  
Efficiency: N/A  
Efficacy: 108.7 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 1' x H: 0')  
IES Classification: Type III - Short  
BUG Rating: B0 - U0 - G2

Input Watts (W): 55.8  
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

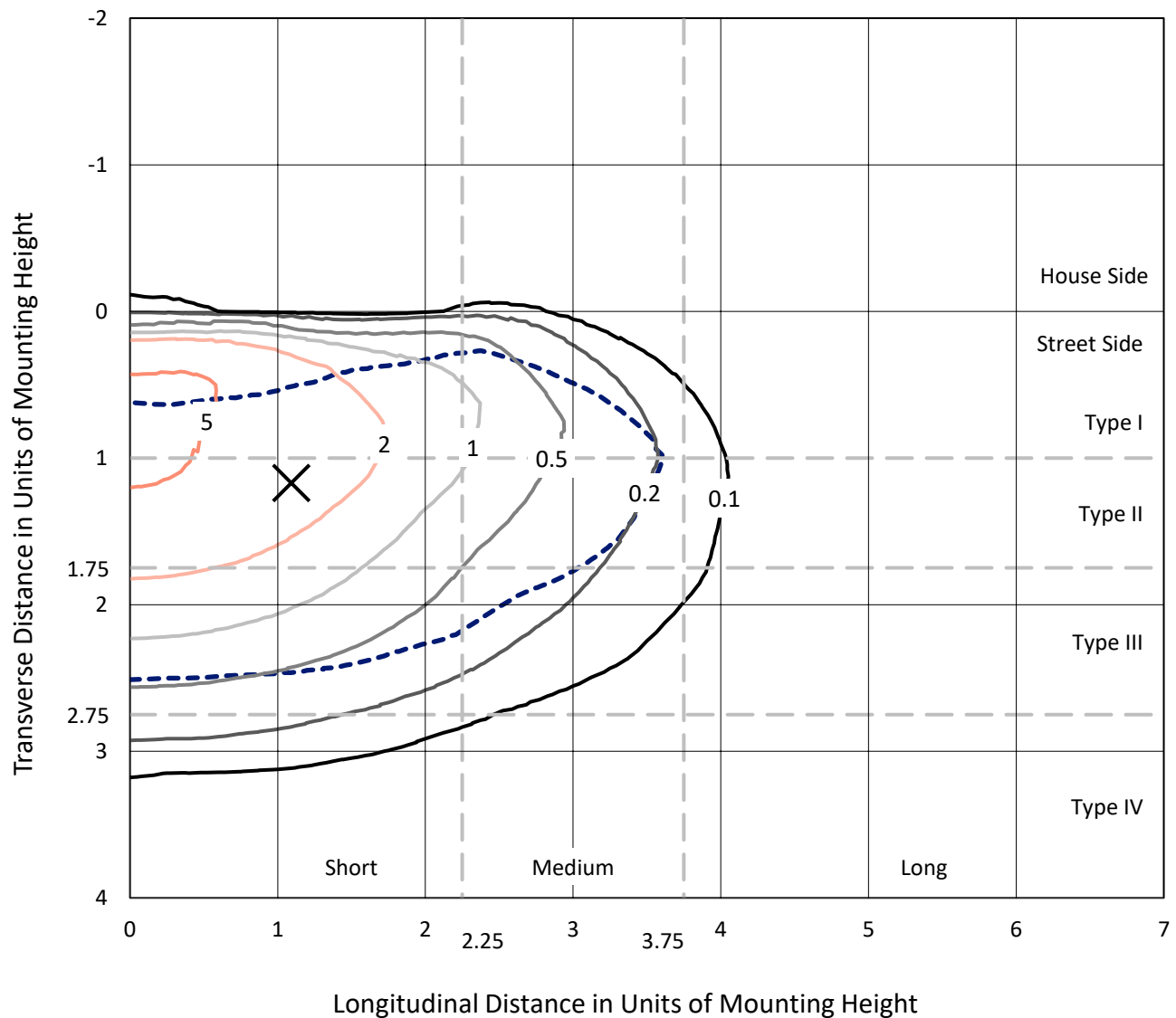


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## Iso-Footcandle Lines of Horizontal Illumination

× Max cd  
 - - - 1/2 Max cd

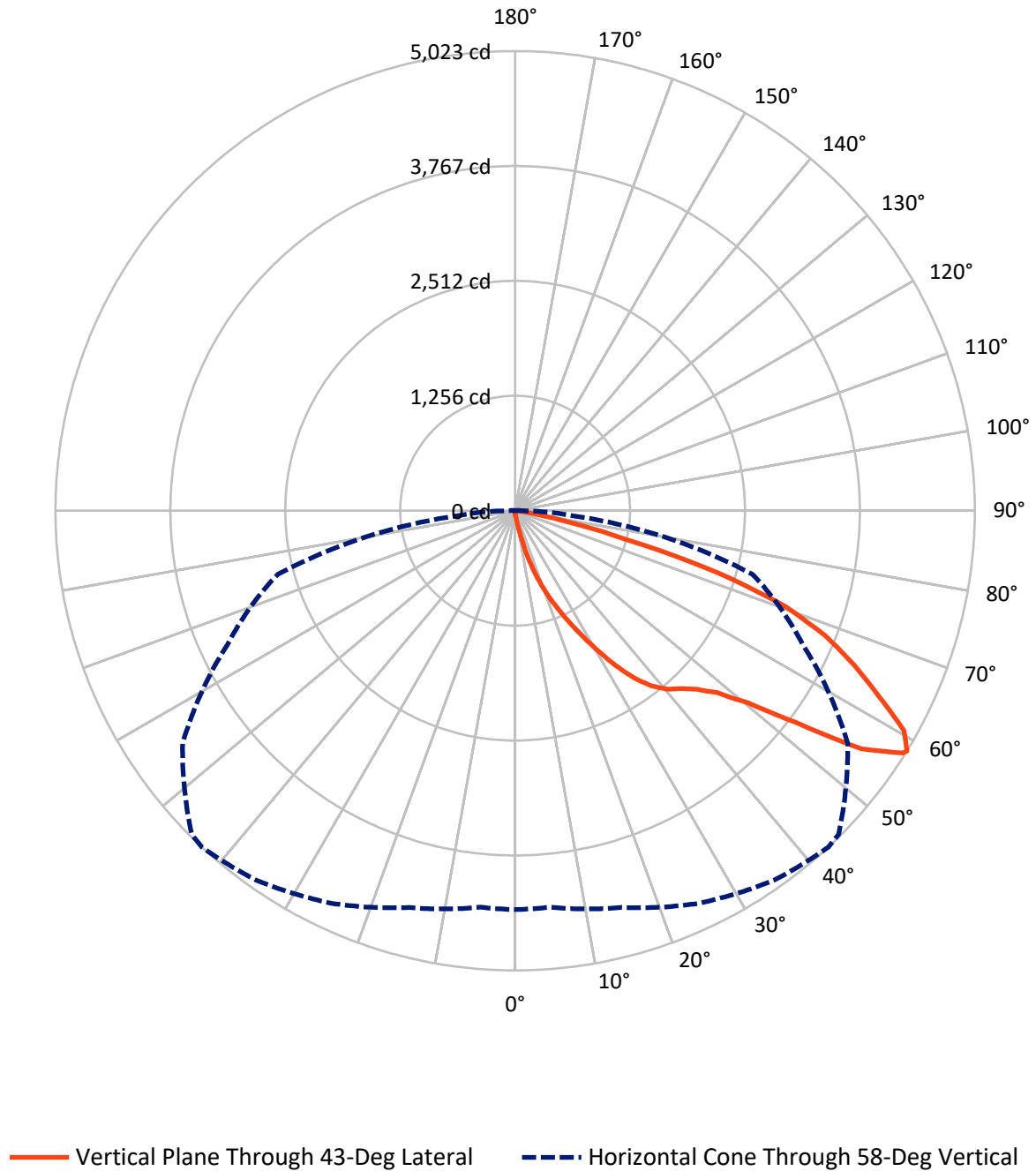


Based on 15 foot mounting height. Maximum calculated value = 6.8 fc  
 Type III - Short - N/A

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CATALOG NUMBER: GALN-SA2A-950-U-T3BC

## Luminous Intensity Polar Plot



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CATALOG NUMBER: GALN-SA2A-950-U-T3BC

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 22.2     | 0.0    | 22.2   |
|                    | % Fixture | 0.4      | 0.0    | 0.4    |
| <b>Street Side</b> | Lumens    | 6044.0   | 0.0    | 6044.0 |
|                    | % Fixture | 99.6     | 0.0    | 99.6   |
| <b>Total</b>       | Lumens    | 6066.2   | 0.0    | 6066.2 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 5.8    | 0.1       |
| 10°-20°   | 69.7   | 1.1       |
| 20°-30°   | 251.3  | 4.1       |
| 30°-40°   | 575.0  | 9.5       |
| 40°-50°   | 969.9  | 16.0      |
| 50°-60°   | 1600.5 | 26.4      |
| 60°-70°   | 1788.8 | 29.5      |
| 70°-80°   | 738.6  | 12.2      |
| 80°-90°   | 66.6   | 1.1       |
| 90°-100°  | 0.0    | 0.0       |
| 100°-110° | 0.0    | 0.0       |
| 110°-120° | 0.0    | 0.0       |
| 120°-130° | 0.0    | 0.0       |
| 130°-140° | 0.0    | 0.0       |
| 140°-150° | 0.0    | 0.0       |
| 150°-160° | 0.0    | 0.0       |
| 160°-170° | 0.0    | 0.0       |
| 170°-180° | 0.0    | 0.0       |
| 0°-90°    | 6066.2 | 100.0     |
| 0°-180°   | 6066.2 | 100.0     |



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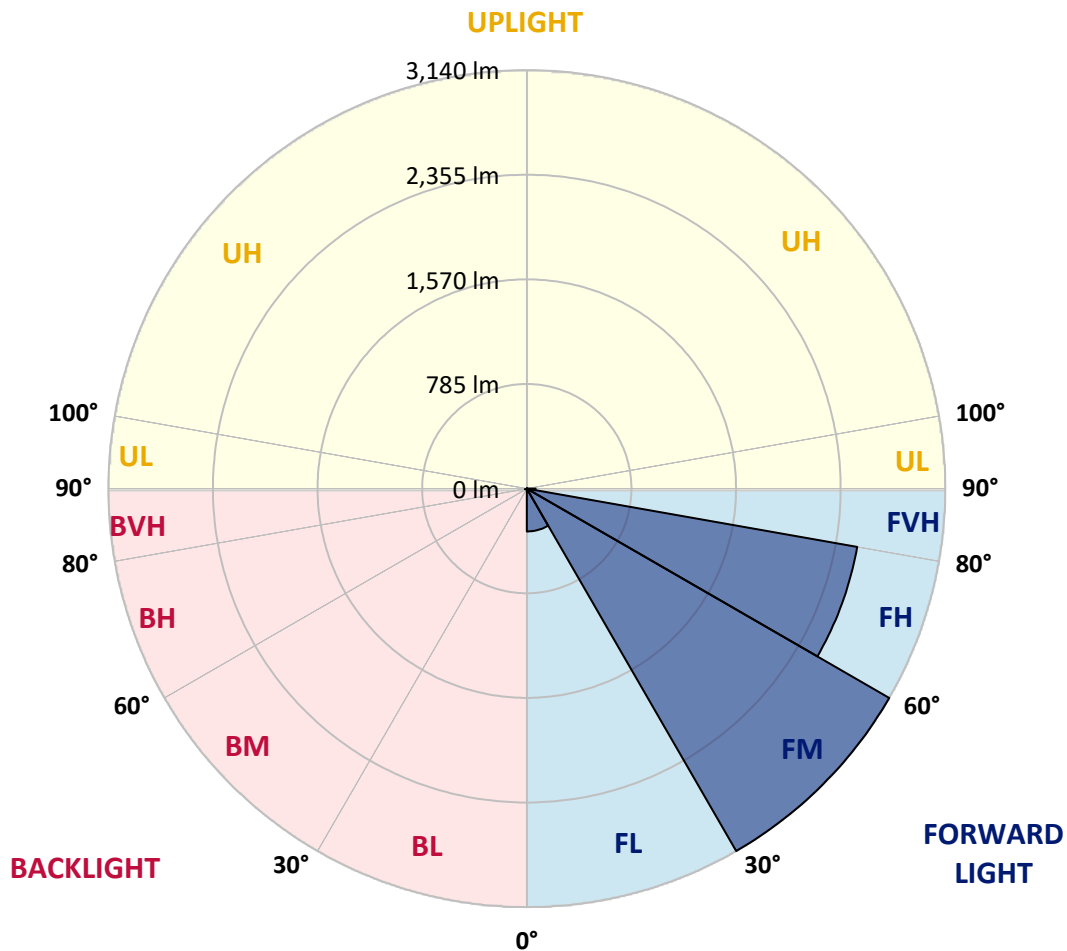
CATALOG NUMBER: GALN-SA2A-950-U-T3BC

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 321.1  | 5.3       |                         |      |         |
| FM   | (30°-60°)   | 3140.1 | 51.8      |                         |      |         |
| FH   | (60°-80°)   | 2517.2 | 41.5      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 65.7   | 1.1       |                         |      | G1/100  |
| BL   | (0°-30°)    | 5.8    | 0.1       | B0/110                  |      |         |
| BM   | (30°-60°)   | 5.3    | 0.1       | B0/220                  |      |         |
| BH   | (60°-80°)   | 10.2   | 0.2       | B0/110                  |      | G0/110  |
| BVH  | (80°-90°)   | 0.9    | 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 III Short



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 43°    | 45°    | 55°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 39.7   | 39.7   | 39.7   | 39.7   | 39.7   | 39.7   | 39.7   | 39.7   | 39.7   | 39.7   | 39.7   |
| 2.5°  | 47.6   | 49.2   | 47.6   | 47.6   | 47.6   | 46.0   | 46.0   | 44.4   | 44.4   | 42.8   | 41.3   |
| 5°    | 69.8   | 69.8   | 65.0   | 61.9   | 58.7   | 57.1   | 55.5   | 52.4   | 49.2   | 46.0   | 42.8   |
| 7.5°  | 155.5  | 155.5  | 141.2  | 122.2  | 96.8   | 82.5   | 79.3   | 65.0   | 55.5   | 49.2   | 42.8   |
| 10°   | 371.3  | 371.3  | 339.5  | 287.2  | 222.1  | 165.0  | 147.5  | 93.6   | 66.6   | 52.4   | 44.4   |
| 12.5° | 617.2  | 625.1  | 585.4  | 518.8  | 422.0  | 322.1  | 287.2  | 171.3  | 88.8   | 57.1   | 44.4   |
| 15°   | 837.7  | 818.7  | 807.6  | 744.1  | 652.1  | 533.1  | 488.7  | 288.8  | 128.5  | 65.0   | 44.4   |
| 17.5° | 986.8  | 986.8  | 971.0  | 928.1  | 844.0  | 739.3  | 702.8  | 466.4  | 207.8  | 74.6   | 46.0   |
| 20°   | 1161.4 | 1161.4 | 1132.8 | 1102.7 | 1028.1 | 939.2  | 904.3  | 663.2  | 322.1  | 95.2   | 46.0   |
| 22.5° | 1372.4 | 1375.5 | 1343.8 | 1289.9 | 1218.5 | 1120.1 | 1090.0 | 845.6  | 466.4  | 126.9  | 47.6   |
| 25°   | 1629.4 | 1632.6 | 1586.6 | 1535.8 | 1426.3 | 1320.0 | 1274.0 | 1055.1 | 642.6  | 177.7  | 47.6   |
| 27.5° | 1913.4 | 1935.6 | 1867.4 | 1780.1 | 1664.3 | 1531.0 | 1496.1 | 1243.9 | 817.1  | 250.7  | 50.8   |
| 30°   | 2267.2 | 2267.2 | 2176.8 | 2054.6 | 1929.3 | 1764.3 | 1719.8 | 1442.2 | 1002.7 | 347.5  | 53.9   |
| 32.5° | 2571.8 | 2548.0 | 2432.2 | 2303.7 | 2170.4 | 2016.5 | 1968.9 | 1650.0 | 1193.1 | 468.0  | 60.3   |
| 35°   | 2805.0 | 2784.4 | 2641.6 | 2503.6 | 2387.8 | 2246.6 | 2189.4 | 1875.3 | 1394.6 | 604.5  | 69.8   |
| 37.5° | 3004.9 | 2997.0 | 2803.4 | 2630.5 | 2554.4 | 2430.6 | 2379.8 | 2087.9 | 1592.9 | 752.0  | 80.9   |
| 40°   | 3223.9 | 3198.5 | 2992.2 | 2778.1 | 2663.8 | 2563.9 | 2517.9 | 2259.3 | 1783.3 | 925.0  | 96.8   |
| 42.5° | 3411.1 | 3381.0 | 3195.3 | 2985.9 | 2790.8 | 2655.9 | 2611.5 | 2403.6 | 1968.9 | 1097.9 | 117.4  |
| 45°   | 3618.9 | 3603.1 | 3415.9 | 3257.2 | 2997.0 | 2781.2 | 2722.5 | 2519.5 | 2138.7 | 1304.2 | 144.4  |
| 47.5° | 3931.5 | 3902.9 | 3728.4 | 3598.3 | 3296.9 | 2971.6 | 2887.5 | 2638.4 | 2302.1 | 1507.2 | 185.6  |
| 50°   | 4294.8 | 4275.8 | 4172.6 | 4069.5 | 3769.7 | 3296.9 | 3196.9 | 2809.8 | 2484.5 | 1748.4 | 239.6  |
| 52.5° | 4591.5 | 4588.3 | 4601.0 | 4602.6 | 4375.7 | 3844.2 | 3695.1 | 3085.9 | 2694.0 | 1986.4 | 315.7  |
| 55°   | 4585.2 | 4599.4 | 4739.0 | 4899.3 | 4916.7 | 4591.5 | 4447.1 | 3550.7 | 2966.9 | 2279.9 | 422.0  |
| 57.5° | 4413.8 | 4402.7 | 4550.2 | 4791.4 | 4961.2 | 4996.1 | 4972.3 | 4272.6 | 3377.8 | 2633.7 | 585.4  |
| 58°   | 4358.3 | 4348.8 | 4488.4 | 4734.3 | 4929.4 | 5023.0 | 4999.2 | 4436.0 | 3469.8 | 2684.5 | 629.9  |
| 60°   | 4156.8 | 4158.4 | 4240.9 | 4464.6 | 4659.7 | 4881.8 | 4904.0 | 4902.5 | 3928.3 | 3024.0 | 853.6  |
| 62.5° | 3890.2 | 3877.5 | 3953.7 | 4136.2 | 4307.5 | 4456.6 | 4494.7 | 4934.2 | 4599.4 | 3455.5 | 1280.4 |
| 65°   | 3522.2 | 3503.1 | 3584.0 | 3790.3 | 3974.3 | 4071.1 | 4072.7 | 4509.0 | 4915.2 | 3918.8 | 1889.6 |
| 67.5° | 2838.4 | 2822.5 | 2984.3 | 3249.3 | 3533.3 | 3660.2 | 3717.3 | 3912.5 | 4648.6 | 4232.9 | 2238.6 |
| 70°   | 1738.9 | 1772.2 | 1997.5 | 2413.2 | 2898.6 | 3131.9 | 3217.5 | 3277.8 | 3958.5 | 4185.3 | 1872.1 |
| 72.5° | 802.8  | 763.1  | 955.1  | 1245.4 | 1799.2 | 2318.0 | 2406.8 | 2643.2 | 3138.2 | 3633.2 | 1396.2 |
| 75°   | 374.4  | 360.1  | 404.6  | 544.2  | 815.5  | 1251.8 | 1413.6 | 2110.1 | 2406.8 | 2527.4 | 1007.5 |
| 77.5° | 192.0  | 193.6  | 230.1  | 247.5  | 336.4  | 579.1  | 664.8  | 1388.2 | 1764.3 | 1410.4 | 675.9  |
| 80°   | 84.1   | 87.3   | 88.8   | 96.8   | 136.4  | 223.7  | 252.3  | 644.1  | 1205.8 | 718.7  | 369.7  |
| 82.5° | 53.9   | 55.5   | 55.5   | 55.5   | 65.0   | 88.8   | 101.5  | 258.6  | 601.3  | 357.0  | 114.2  |
| 85°   | 28.6   | 28.6   | 31.7   | 39.7   | 46.0   | 53.9   | 57.1   | 82.5   | 198.3  | 106.3  | 27.0   |
| 87.5° | 15.9   | 17.5   | 19.0   | 23.8   | 30.1   | 36.5   | 39.7   | 57.1   | 76.2   | 73.0   | 6.3    |
| 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-SA2A-950-U-T3BC

**CANDELA DISTRIBUTION (continued):**

|       | 90°   | 95°  | 105° | 115° | 125° | 135° | 145° | 155° | 165° | 175° | 180° |
|-------|-------|------|------|------|------|------|------|------|------|------|------|
| 0°    | 39.7  | 39.7 | 39.7 | 39.7 | 39.7 | 39.7 | 39.7 | 39.7 | 39.7 | 39.7 | 39.7 |
| 2.5°  | 41.3  | 39.7 | 38.1 | 36.5 | 34.9 | 33.3 | 33.3 | 33.3 | 33.3 | 33.3 | 33.3 |
| 5°    | 39.7  | 38.1 | 36.5 | 33.3 | 30.1 | 28.6 | 27.0 | 25.4 | 25.4 | 25.4 | 25.4 |
| 7.5°  | 39.7  | 38.1 | 33.3 | 30.1 | 27.0 | 23.8 | 20.6 | 20.6 | 20.6 | 20.6 | 20.6 |
| 10°   | 39.7  | 36.5 | 31.7 | 27.0 | 22.2 | 19.0 | 17.5 | 15.9 | 15.9 | 15.9 | 15.9 |
| 12.5° | 39.7  | 34.9 | 30.1 | 23.8 | 19.0 | 15.9 | 14.3 | 12.7 | 12.7 | 12.7 | 12.7 |
| 15°   | 39.7  | 34.9 | 28.6 | 22.2 | 17.5 | 12.7 | 11.1 | 9.5  | 9.5  | 9.5  | 9.5  |
| 17.5° | 38.1  | 33.3 | 27.0 | 19.0 | 14.3 | 9.5  | 7.9  | 6.3  | 6.3  | 7.9  | 7.9  |
| 20°   | 36.5  | 31.7 | 23.8 | 15.9 | 11.1 | 7.9  | 4.8  | 4.8  | 4.8  | 4.8  | 4.8  |
| 22.5° | 36.5  | 31.7 | 22.2 | 14.3 | 9.5  | 4.8  | 3.2  | 3.2  | 3.2  | 3.2  | 4.8  |
| 25°   | 36.5  | 30.1 | 19.0 | 11.1 | 6.3  | 3.2  | 1.6  | 1.6  | 1.6  | 1.6  | 1.6  |
| 27.5° | 36.5  | 30.1 | 17.5 | 9.5  | 4.8  | 3.2  | 1.6  | 0.0  | 0.0  | 0.0  | 0.0  |
| 30°   | 34.9  | 28.6 | 15.9 | 7.9  | 3.2  | 1.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 32.5° | 34.9  | 27.0 | 12.7 | 6.3  | 3.2  | 1.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 35°   | 36.5  | 25.4 | 11.1 | 4.8  | 1.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 1.6  |
| 37.5° | 38.1  | 23.8 | 9.5  | 3.2  | 1.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 40°   | 39.7  | 22.2 | 9.5  | 3.2  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 42.5° | 42.8  | 22.2 | 7.9  | 3.2  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 45°   | 46.0  | 22.2 | 6.3  | 1.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 47.5° | 52.4  | 23.8 | 6.3  | 1.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 50°   | 57.1  | 25.4 | 4.8  | 1.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 52.5° | 63.5  | 23.8 | 4.8  | 1.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 55°   | 71.4  | 23.8 | 4.8  | 1.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 57.5° | 77.7  | 22.2 | 4.8  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 58°   | 80.9  | 20.6 | 3.2  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 60°   | 96.8  | 19.0 | 3.2  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 62.5° | 150.7 | 15.9 | 3.2  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 65°   | 306.2 | 14.3 | 3.2  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 67.5° | 571.2 | 12.7 | 3.2  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 70°   | 639.4 | 14.3 | 1.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 72.5° | 403.0 | 11.1 | 1.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 75°   | 212.6 | 11.1 | 1.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 77.5° | 106.3 | 11.1 | 1.6  | 1.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 80°   | 49.2  | 7.9  | 1.6  | 1.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 82.5° | 20.6  | 4.8  | 3.2  | 1.6  | 1.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 85°   | 9.5   | 4.8  | 3.2  | 3.2  | 1.6  | 1.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 87.5° | 4.8   | 4.8  | 4.8  | 3.2  | 3.2  | 1.6  | 1.6  | 0.0  | 0.0  | 0.0  | 0.0  |
| 90°   | 0.0   | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |



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

Report Prepared for

Cooper Lighting Solutions

McGraw-Edison

Report Number: SP1-2407-184-17

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

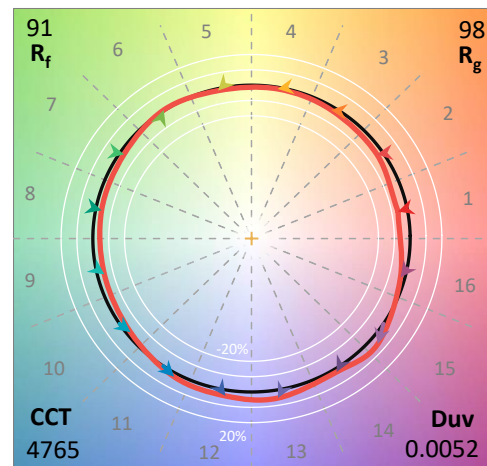
### Test Information

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  
 R<sub>f</sub>: 90.7  
 R<sub>g</sub>: 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

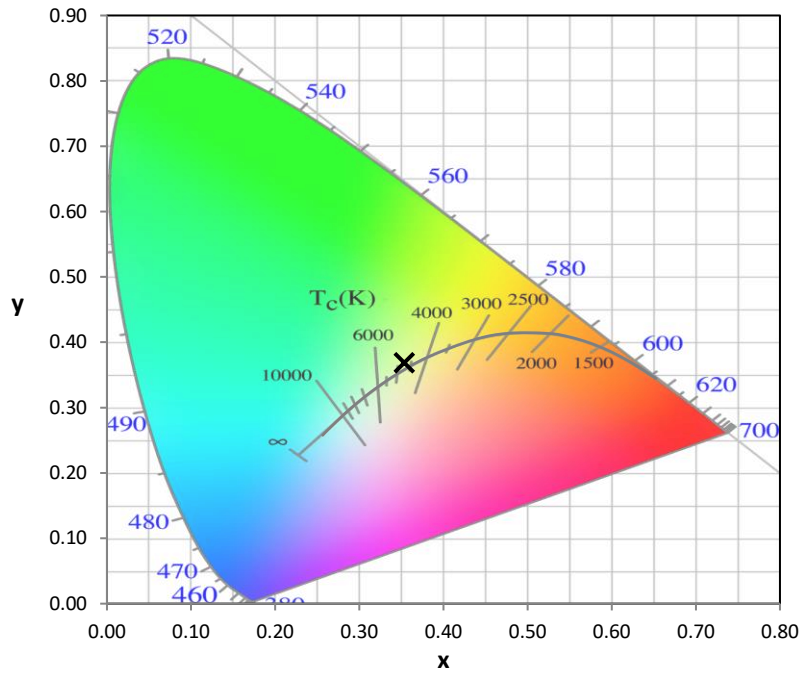
Stabilization Time: 20M  
 Operation Time: 1H 20M  
 Sphere Temperature (°C): 25.2

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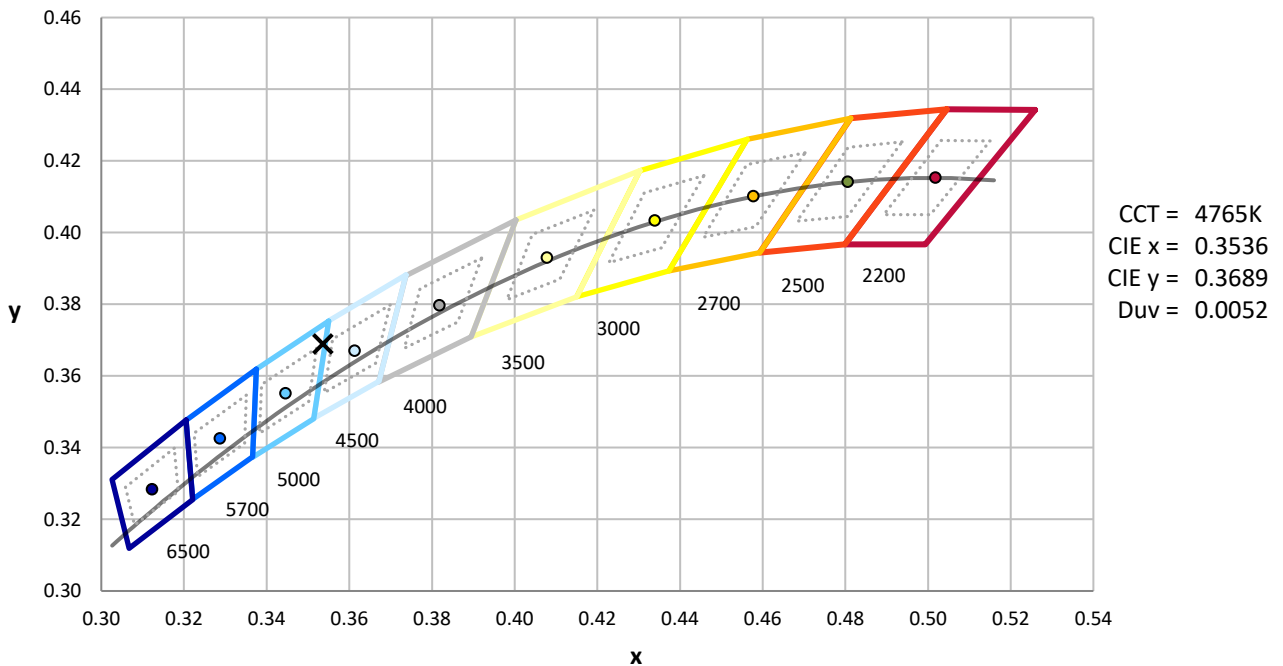
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date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

REPORT NUMBER: SP1-2407-184-17

**CIE 1931 Chromaticity Diagram**



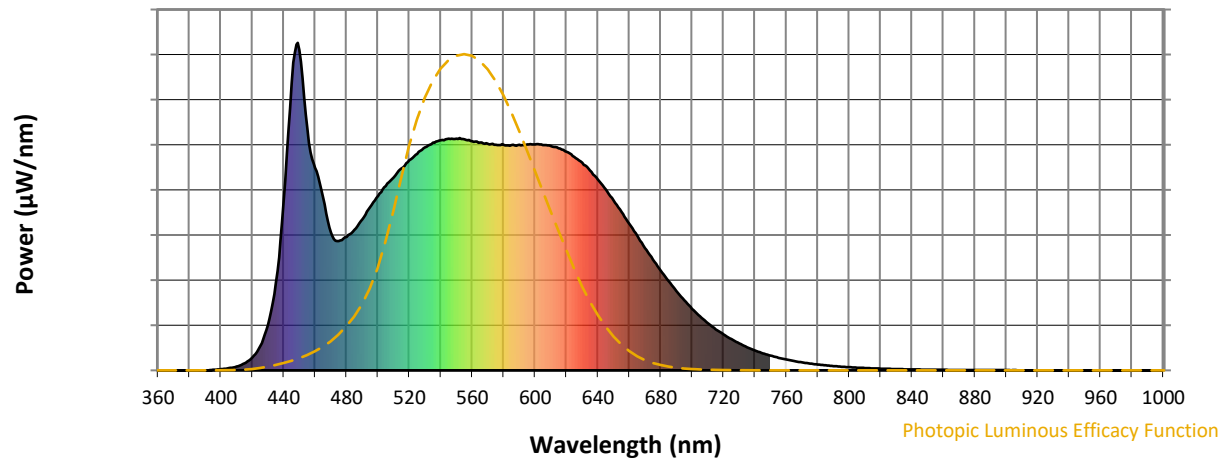
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 5000K 7-step quadrangle

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### Photopic Flux vs. Wavelength

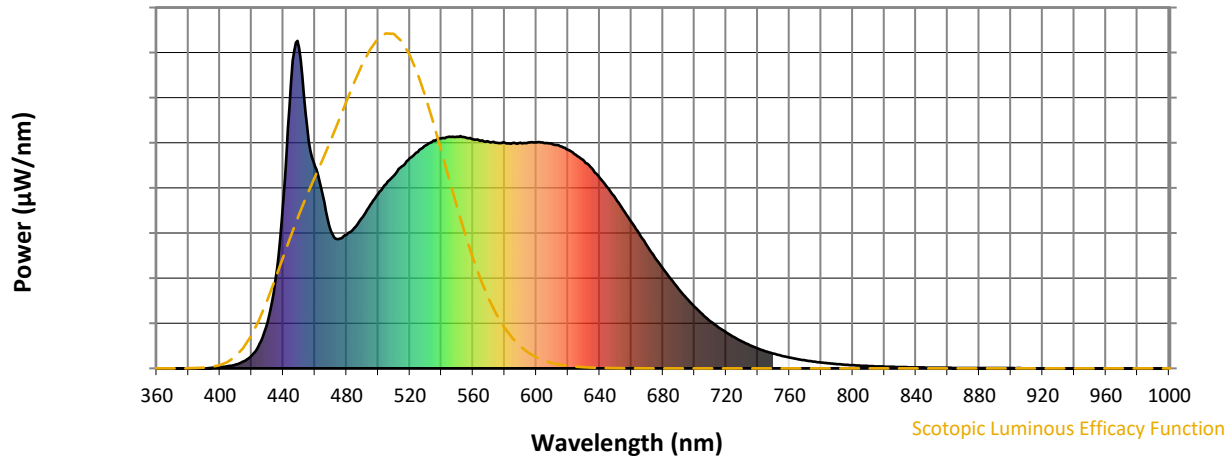


### Photopic Lumens: NR

| λ (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    | 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



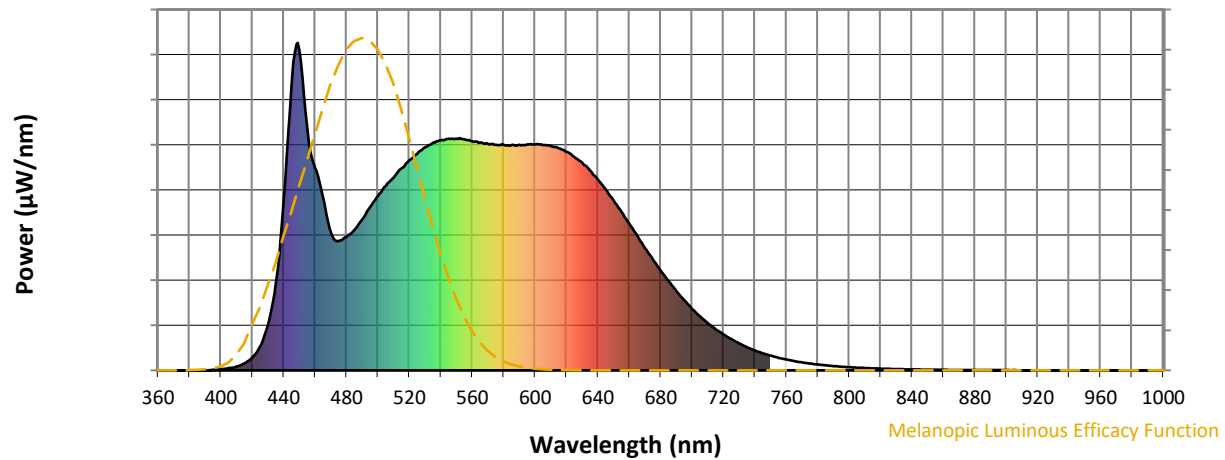
Scotopic Lumens: NR

S/P: 1.99

| 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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### Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 4.22

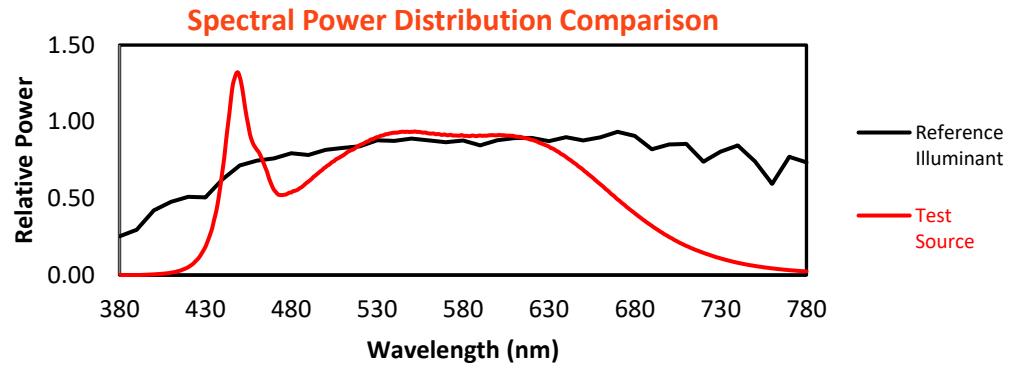
| λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) |
|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|
| 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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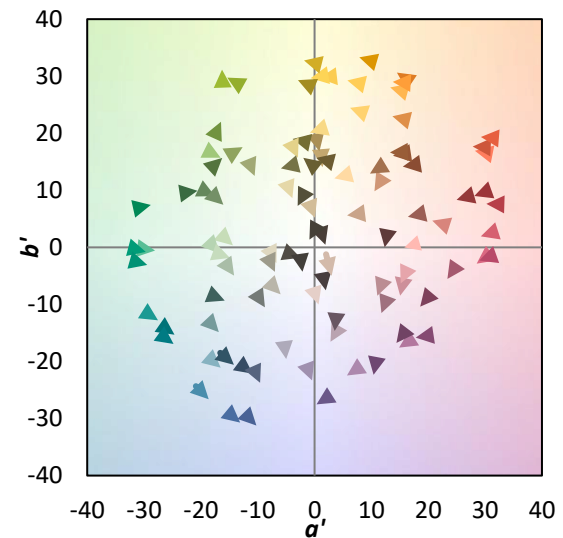
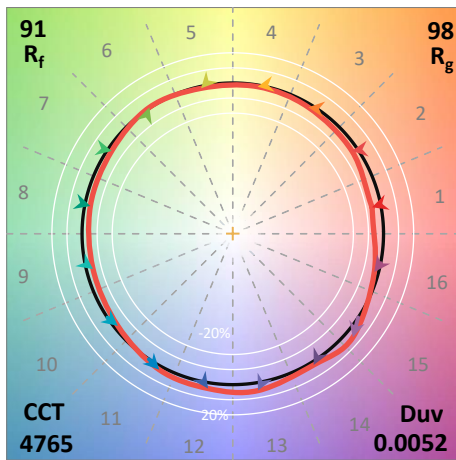
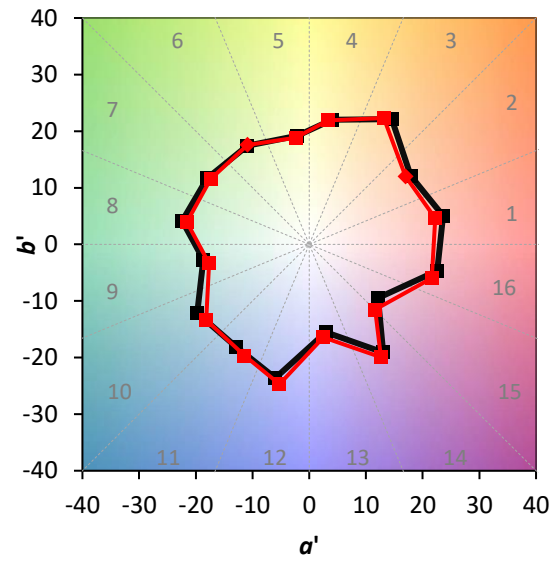
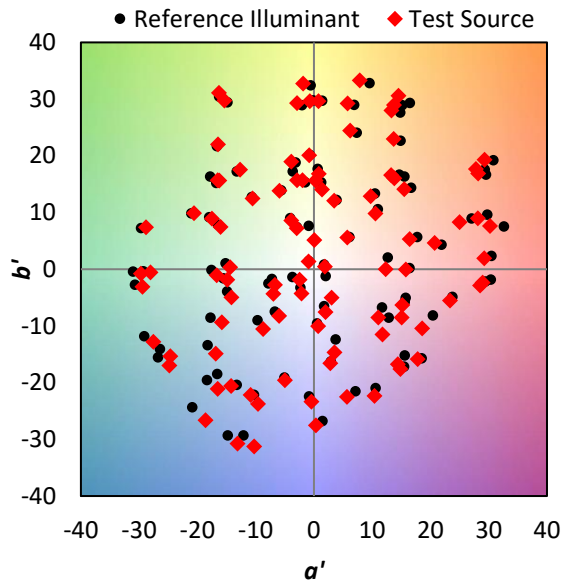
TM-30-18

### Summary

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



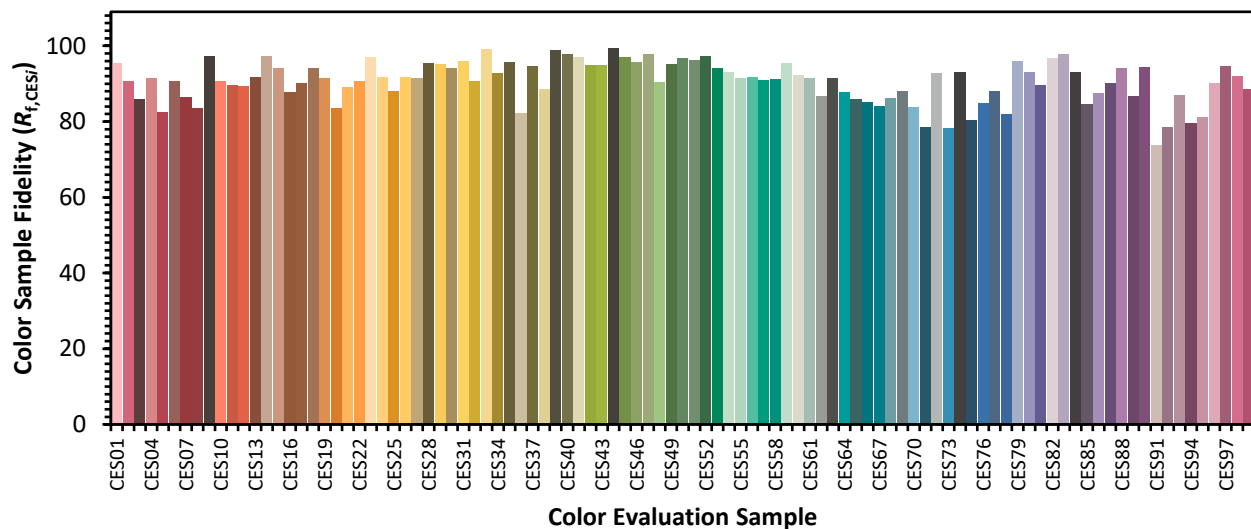
### Color Vector Graphics



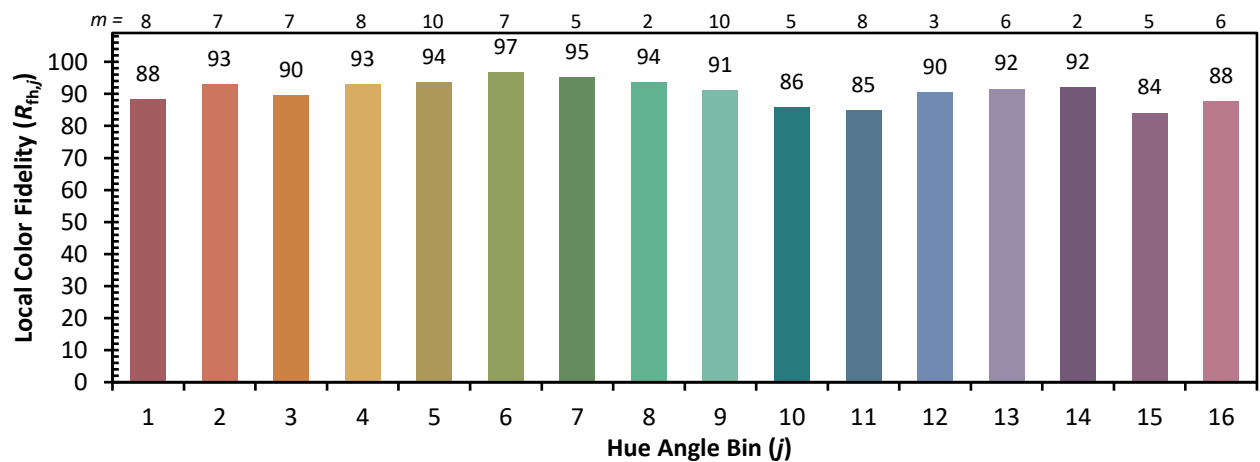
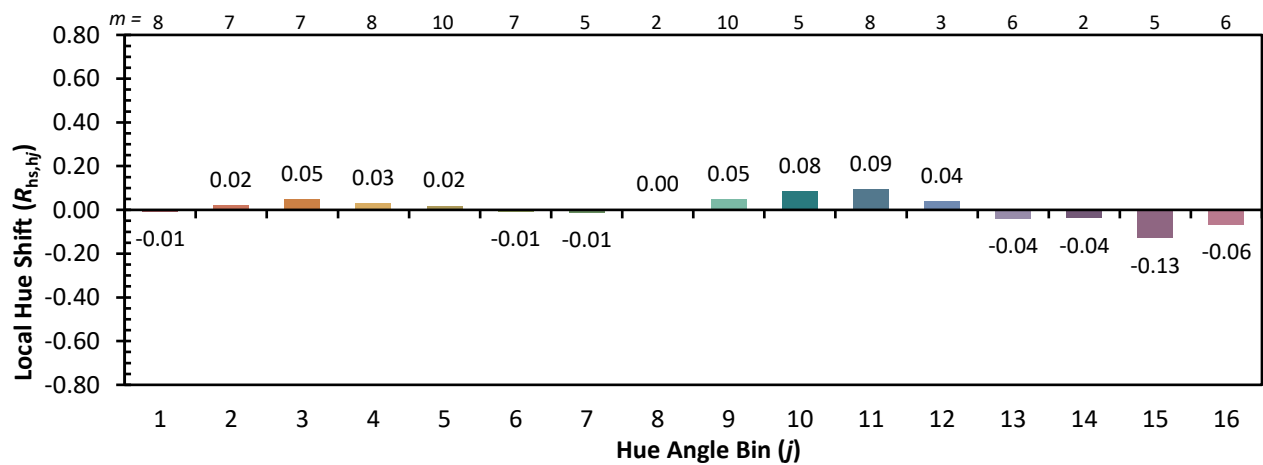
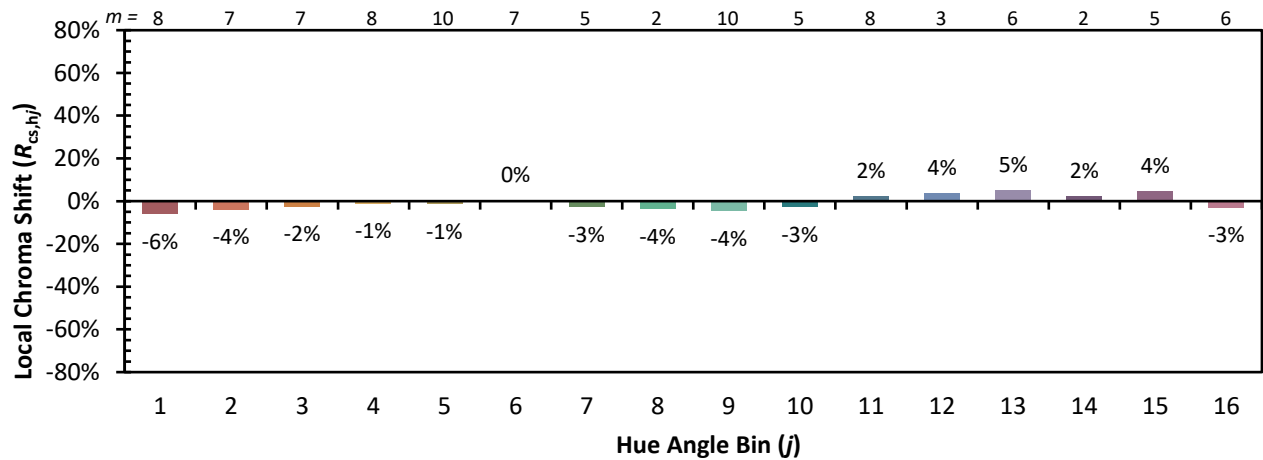


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

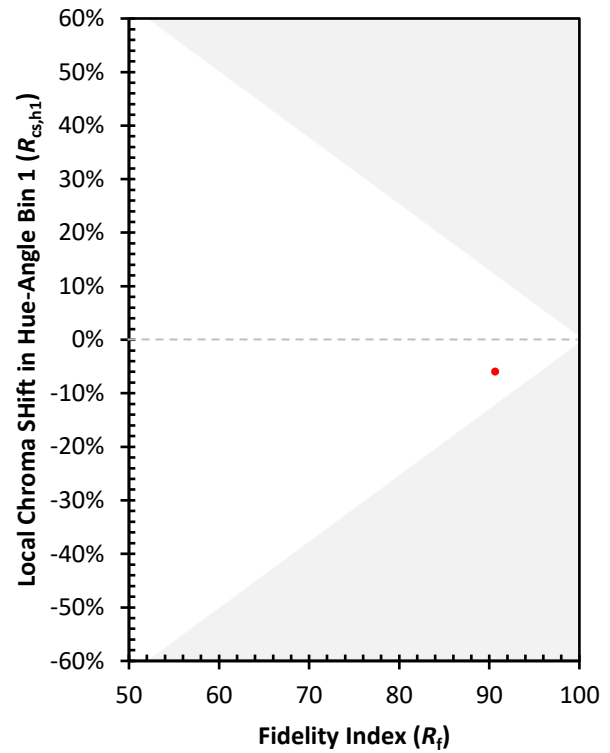
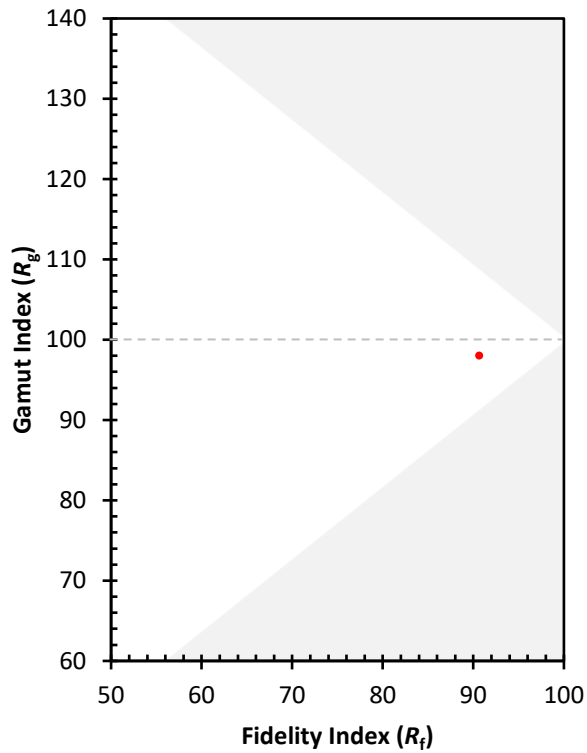
|            |             |            |            |
|------------|-------------|------------|------------|
| CES01 = 85 | CES26 = 92  | CES51 = 96 | CES76 = 85 |
| CES02 = 60 | CES27 = 92  | CES52 = 97 | CES77 = 88 |
| CES03 = 31 | CES28 = 95  | CES53 = 94 | CES78 = 82 |
| CES04 = 69 | CES29 = 95  | 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)