

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: P1047507

Luminaire Tested: **GALN-SA7C-930-U-T3BC**

Issue Date: 07/10/2025

**Test Information**

Test Method: LM-79-08  
Report Number: P1047507  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 07/10/2025  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: MCGRAW-EDISON  
Catalog Number: GALN-SA7C-930-U-T3BC  
Description: GALLEON II AREA AND ROADWAY LUMINAIRE 1050mA 7xLight Square PACKAGE  
90CRI 3000K FIXTURE w/ TYPE III ANGLED BACKLIGHT CONTROL  
Light Source: (98) 3000K CCT, 90 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 28006 lumens  
Efficiency: N/A  
Efficacy: 84.9 lumens/watt  
Luminous Opening: Rectangular (W 1.5' x L: 1.5' x H: 0')  
IES Classification: Type III - Short  
BUG Rating: B0 - U0 - G4

Input Watts (W): 330  
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



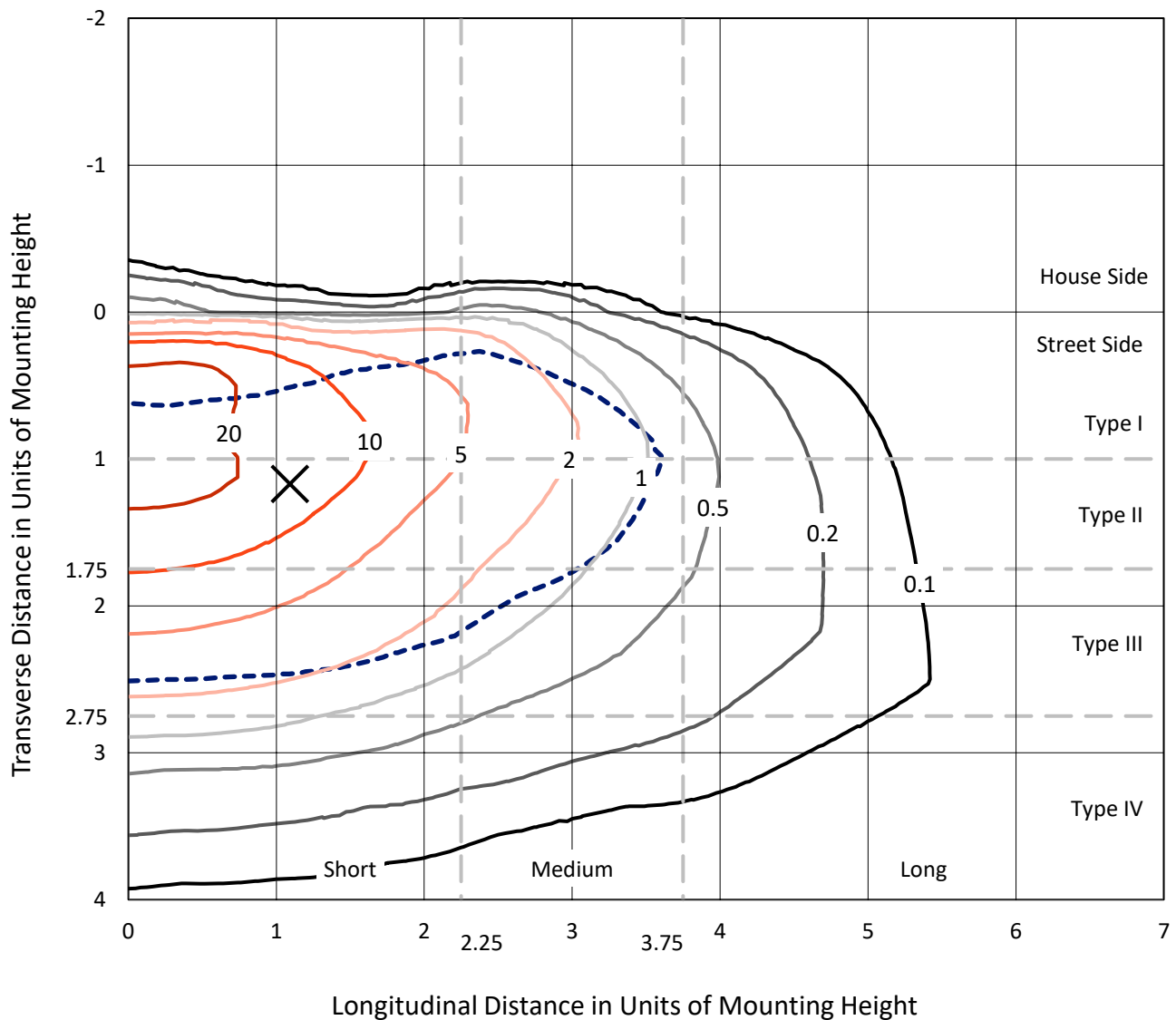
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## Iso-Footcandle Lines of Horizontal Illumination

× Max cd

--- 1/2 Max cd

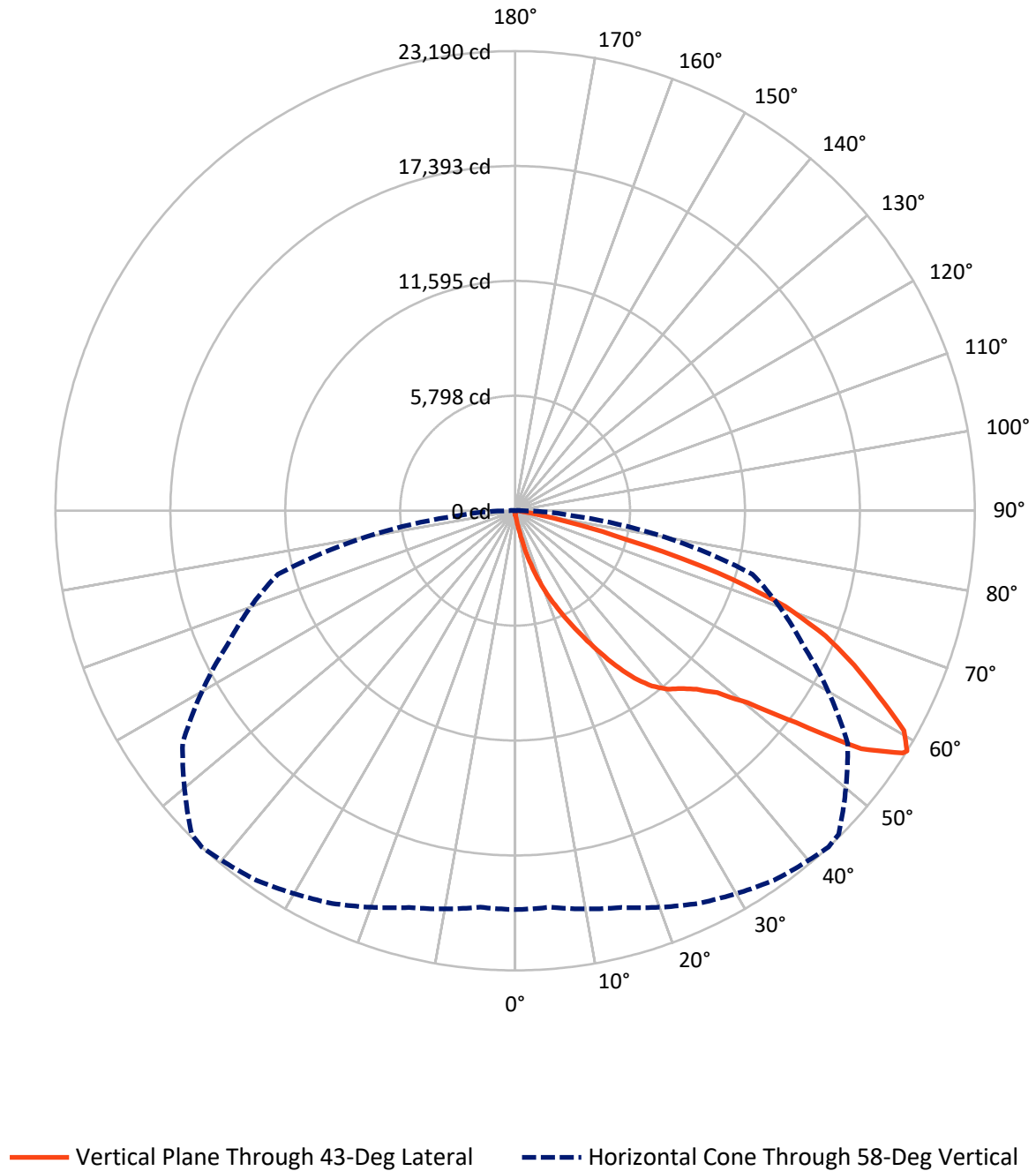


Based on 15 foot mounting height. Maximum calculated value = 31.4 fc  
 Type III - Short - N/A

REPORT NUMBER: P1047507

CATALOG NUMBER: GALN-SA7C-930-U-T3BC

## Luminous Intensity Polar Plot



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**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 102.2    | 0.0    | 102.2   |
|                    | % Fixture | 0.4      | 0.0    | 0.4     |
| <b>Street Side</b> | Lumens    | 27903.8  | 0.0    | 27903.8 |
|                    | % Fixture | 99.6     | 0.0    | 99.6    |
| <b>Total</b>       | Lumens    | 28006.0  | 0.0    | 28006.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 26.8    | 0.1       |
| 10°-20°   | 321.9   | 1.1       |
| 20°-30°   | 1160.3  | 4.1       |
| 30°-40°   | 2654.8  | 9.5       |
| 40°-50°   | 4477.6  | 16.0      |
| 50°-60°   | 7389.1  | 26.4      |
| 60°-70°   | 8258.3  | 29.5      |
| 70°-80°   | 3409.7  | 12.2      |
| 80°-90°   | 307.4   | 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°    | 28006.0 | 100.0     |
| 0°-180°   | 28006.0 | 100.0     |



REPORT NUMBER: P1047507

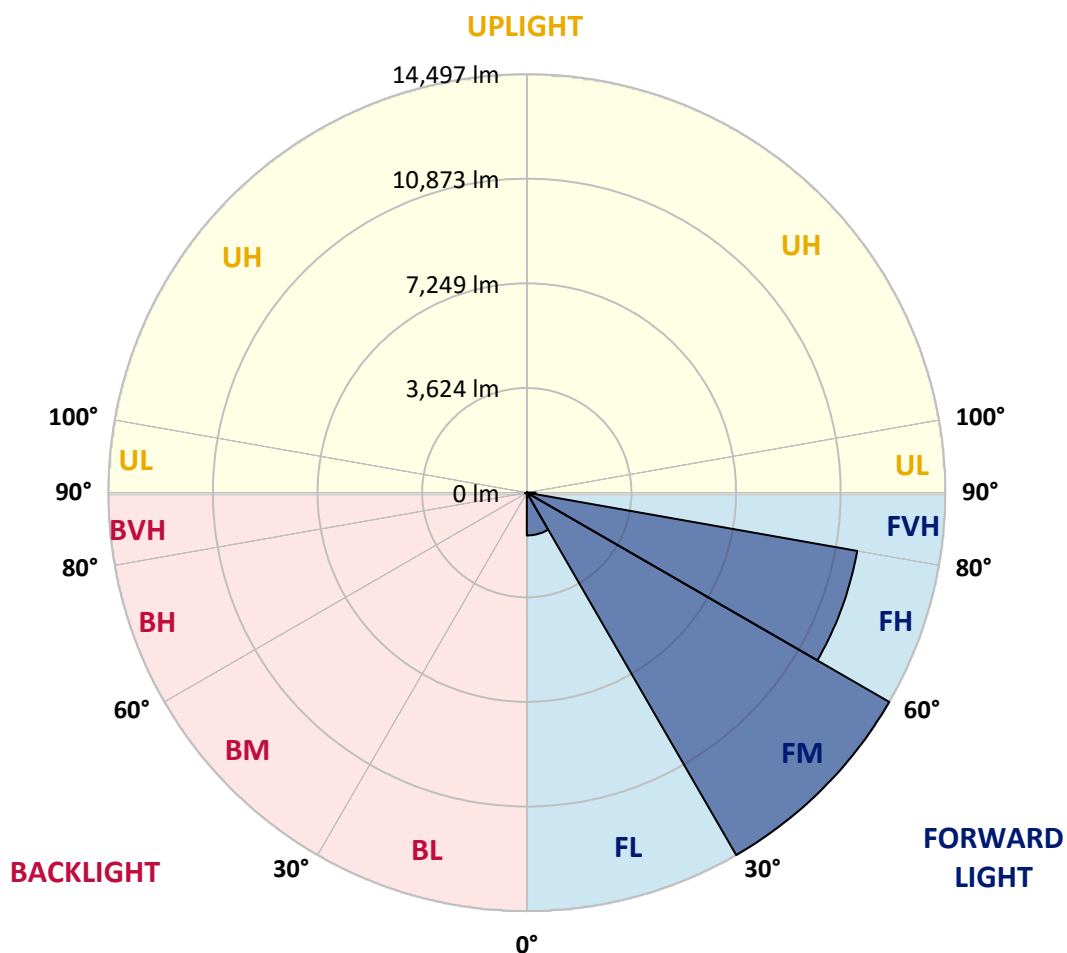
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**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone |             | Lumens  | % Fixture | Zone Rating/Lumen Limit |      |          |
|------|-------------|---------|-----------|-------------------------|------|----------|
|      |             |         |           | B                       | U    | G        |
| FL   | (0°-30°)    | 1482.4  | 5.3       |                         |      |          |
| FM   | (30°-60°)   | 14497.0 | 51.8      |                         |      |          |
| FH   | (60°-80°)   | 11621.2 | 41.5      |                         |      | G4/12000 |
| FVH  | (80°-90°)   | 303.2   | 1.1       |                         |      | G3/500   |
| BL   | (0°-30°)    | 26.7    | 0.1       | B0/110                  |      |          |
| BM   | (30°-60°)   | 24.5    | 0.1       | B0/220                  |      |          |
| BH   | (60°-80°)   | 46.9    | 0.2       | B0/110                  |      | G0/110   |
| BVH  | (80°-90°)   | 4.2     | 0.0       |                         |      | G0/10    |
| UL   | (90°-100°)  | 0.0     | 0.0       |                         | U0/0 |          |
| UH   | (100°-180°) | 0.0     | 0.0       |                         | U0/0 |          |

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

Type III Short



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 5°      | 15°     | 25°     | 35°     | 43°     | 45°     | 55°     | 65°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 183.1   | 183.1   | 183.1   | 183.1   | 183.1   | 183.1   | 183.1   | 183.1   | 183.1   | 183.1   | 183.1   |
| 2.5°  | 219.7   | 227.1   | 219.7   | 219.7   | 219.7   | 212.4   | 212.4   | 205.1   | 205.1   | 197.8   | 190.4   |
| 5°    | 322.3   | 322.3   | 300.3   | 285.7   | 271.0   | 263.7   | 256.4   | 241.7   | 227.1   | 212.4   | 197.8   |
| 7.5°  | 717.8   | 717.8   | 651.9   | 564.0   | 446.8   | 380.9   | 366.2   | 300.3   | 256.4   | 227.1   | 197.8   |
| 10°   | 1714.0  | 1714.0  | 1567.5  | 1325.8  | 1025.5  | 761.8   | 681.2   | 432.2   | 307.6   | 241.7   | 205.1   |
| 12.5° | 2849.3  | 2885.9  | 2702.8  | 2395.2  | 1948.4  | 1486.9  | 1325.8  | 791.1   | 410.2   | 263.7   | 205.1   |
| 15°   | 3867.5  | 3779.6  | 3728.3  | 3435.3  | 3010.5  | 2461.1  | 2256.0  | 1333.1  | 593.3   | 300.3   | 205.1   |
| 17.5° | 4556.0  | 4556.0  | 4482.7  | 4285.0  | 3896.8  | 3413.3  | 3244.9  | 2153.5  | 959.5   | 344.3   | 212.4   |
| 20°   | 5361.7  | 5361.7  | 5229.9  | 5090.7  | 4746.4  | 4336.2  | 4175.1  | 3061.7  | 1486.9  | 439.5   | 212.4   |
| 22.5° | 6335.9  | 6350.5  | 6204.1  | 5955.0  | 5625.4  | 5171.3  | 5032.1  | 3904.1  | 2153.5  | 586.0   | 219.7   |
| 25°   | 7522.5  | 7537.2  | 7324.7  | 7090.3  | 6584.9  | 6094.2  | 5881.8  | 4871.0  | 2966.5  | 820.4   | 219.7   |
| 27.5° | 8833.6  | 8936.2  | 8621.2  | 8218.4  | 7683.7  | 7068.4  | 6907.2  | 5742.6  | 3772.2  | 1157.3  | 234.4   |
| 30°   | 10467.1 | 10467.1 | 10049.5 | 9485.5  | 8906.9  | 8145.1  | 7940.0  | 6658.2  | 4629.2  | 1604.1  | 249.0   |
| 32.5° | 11873.4 | 11763.5 | 11228.8 | 10635.5 | 10020.2 | 9309.7  | 9090.0  | 7617.7  | 5508.2  | 2160.8  | 278.3   |
| 35°   | 12950.1 | 12854.9 | 12195.7 | 11558.4 | 11023.7 | 10371.8 | 10108.1 | 8657.8  | 6438.4  | 2790.7  | 322.3   |
| 37.5° | 13873.1 | 13836.4 | 12942.8 | 12144.4 | 11792.8 | 11221.5 | 10987.1 | 9639.4  | 7354.0  | 3471.9  | 373.6   |
| 40°   | 14883.9 | 14766.7 | 13814.5 | 12825.6 | 12298.2 | 11836.8 | 11624.4 | 10430.4 | 8233.0  | 4270.3  | 446.8   |
| 42.5° | 15748.2 | 15609.0 | 14752.0 | 13785.2 | 12884.2 | 12261.6 | 12056.5 | 11097.0 | 9090.0  | 5068.7  | 542.0   |
| 45°   | 16707.7 | 16634.5 | 15770.2 | 15037.7 | 13836.4 | 12840.3 | 12569.3 | 11631.7 | 9873.7  | 6020.9  | 666.6   |
| 47.5° | 18150.7 | 18018.9 | 17213.1 | 16612.5 | 15220.8 | 13719.2 | 13331.0 | 12181.0 | 10628.2 | 6958.5  | 857.0   |
| 50°   | 19828.1 | 19740.2 | 19264.1 | 18788.0 | 17403.6 | 15220.8 | 14759.3 | 12972.1 | 11470.5 | 8071.9  | 1106.0  |
| 52.5° | 21197.8 | 21183.1 | 21241.7 | 21249.1 | 20201.6 | 17747.8 | 17059.3 | 14246.6 | 12437.4 | 9170.6  | 1457.6  |
| 55°   | 21168.5 | 21234.4 | 21879.0 | 22618.8 | 22699.4 | 21197.8 | 20531.2 | 16392.8 | 13697.3 | 10525.6 | 1948.4  |
| 57.5° | 20377.4 | 20326.1 | 21007.3 | 22120.7 | 22904.5 | 23065.6 | 22955.7 | 19725.5 | 15594.4 | 12159.1 | 2702.8  |
| 58°   | 20121.1 | 20077.1 | 20721.7 | 21857.0 | 22758.0 | 23190.1 | 23080.2 | 20480.0 | 16019.2 | 12393.5 | 2907.9  |
| 60°   | 19190.8 | 19198.1 | 19579.0 | 20611.8 | 21512.8 | 22538.2 | 22640.8 | 22633.4 | 18136.1 | 13961.0 | 3940.7  |
| 62.5° | 17960.3 | 17901.7 | 18253.2 | 19095.6 | 19886.7 | 20575.2 | 20751.0 | 22779.9 | 21234.4 | 15953.3 | 5911.1  |
| 65°   | 16260.9 | 16173.0 | 16546.6 | 17498.8 | 18348.5 | 18795.3 | 18802.6 | 20816.9 | 22692.0 | 18092.1 | 8723.8  |
| 67.5° | 13104.0 | 13030.7 | 13777.8 | 15001.1 | 16312.2 | 16898.2 | 17161.9 | 18062.8 | 21461.5 | 19542.4 | 10335.2 |
| 70°   | 8027.9  | 8181.7  | 9221.8  | 11140.9 | 13382.3 | 14459.0 | 14854.6 | 15132.9 | 18275.2 | 19322.7 | 8643.2  |
| 72.5° | 3706.3  | 3523.2  | 4409.5  | 5749.9  | 8306.3  | 10701.4 | 11111.6 | 12203.0 | 14488.3 | 16773.7 | 6445.8  |
| 75°   | 1728.6  | 1662.7  | 1867.8  | 2512.4  | 3764.9  | 5779.2  | 6526.3  | 9741.9  | 11111.6 | 11668.3 | 4651.2  |
| 77.5° | 886.3   | 893.6   | 1062.1  | 1142.7  | 1552.8  | 2673.5  | 3069.1  | 6409.1  | 8145.1  | 6511.7  | 3120.3  |
| 80°   | 388.2   | 402.9   | 410.2   | 446.8   | 629.9   | 1032.8  | 1164.6  | 2973.8  | 5566.8  | 3318.1  | 1706.7  |
| 82.5° | 249.0   | 256.4   | 256.4   | 256.4   | 300.3   | 410.2   | 468.8   | 1193.9  | 2776.1  | 1648.1  | 527.4   |
| 85°   | 131.8   | 131.8   | 146.5   | 183.1   | 212.4   | 249.0   | 263.7   | 380.9   | 915.6   | 490.8   | 124.5   |
| 87.5° | 73.2    | 80.6    | 87.9    | 109.9   | 139.2   | 168.5   | 183.1   | 263.7   | 351.6   | 336.9   | 29.3    |
| 90°   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |



REPORT NUMBER: P1047507

CATALOG NUMBER: GALN-SA7C-930-U-T3BC

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°   | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 183.1  | 183.1 | 183.1 | 183.1 | 183.1 | 183.1 | 183.1 | 183.1 | 183.1 | 183.1 | 183.1 |
| 2.5°  | 190.4  | 183.1 | 175.8 | 168.5 | 161.1 | 153.8 | 153.8 | 153.8 | 153.8 | 153.8 | 153.8 |
| 5°    | 183.1  | 175.8 | 168.5 | 153.8 | 139.2 | 131.8 | 124.5 | 117.2 | 117.2 | 117.2 | 117.2 |
| 7.5°  | 183.1  | 175.8 | 153.8 | 139.2 | 124.5 | 109.9 | 95.2  | 95.2  | 95.2  | 95.2  | 95.2  |
| 10°   | 183.1  | 168.5 | 146.5 | 124.5 | 102.5 | 87.9  | 80.6  | 73.2  | 73.2  | 73.2  | 73.2  |
| 12.5° | 183.1  | 161.1 | 139.2 | 109.9 | 87.9  | 73.2  | 65.9  | 58.6  | 58.6  | 58.6  | 58.6  |
| 15°   | 183.1  | 161.1 | 131.8 | 102.5 | 80.6  | 58.6  | 51.3  | 43.9  | 43.9  | 43.9  | 43.9  |
| 17.5° | 175.8  | 153.8 | 124.5 | 87.9  | 65.9  | 43.9  | 36.6  | 29.3  | 29.3  | 36.6  | 36.6  |
| 20°   | 168.5  | 146.5 | 109.9 | 73.2  | 51.3  | 36.6  | 22.0  | 22.0  | 22.0  | 22.0  | 22.0  |
| 22.5° | 168.5  | 146.5 | 102.5 | 65.9  | 43.9  | 22.0  | 14.6  | 14.6  | 14.6  | 14.6  | 22.0  |
| 25°   | 168.5  | 139.2 | 87.9  | 51.3  | 29.3  | 14.6  | 7.3   | 7.3   | 7.3   | 7.3   | 7.3   |
| 27.5° | 168.5  | 139.2 | 80.6  | 43.9  | 22.0  | 14.6  | 7.3   | 0.0   | 0.0   | 0.0   | 0.0   |
| 30°   | 161.1  | 131.8 | 73.2  | 36.6  | 14.6  | 7.3   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 32.5° | 161.1  | 124.5 | 58.6  | 29.3  | 14.6  | 7.3   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 35°   | 168.5  | 117.2 | 51.3  | 22.0  | 7.3   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 7.3   |
| 37.5° | 175.8  | 109.9 | 43.9  | 14.6  | 7.3   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 40°   | 183.1  | 102.5 | 43.9  | 14.6  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 42.5° | 197.8  | 102.5 | 36.6  | 14.6  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 45°   | 212.4  | 102.5 | 29.3  | 7.3   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 47.5° | 241.7  | 109.9 | 29.3  | 7.3   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 50°   | 263.7  | 117.2 | 22.0  | 7.3   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 52.5° | 293.0  | 109.9 | 22.0  | 7.3   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 55°   | 329.6  | 109.9 | 22.0  | 7.3   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 57.5° | 358.9  | 102.5 | 22.0  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 58°   | 373.6  | 95.2  | 14.6  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 60°   | 446.8  | 87.9  | 14.6  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 62.5° | 695.9  | 73.2  | 14.6  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 65°   | 1413.7 | 65.9  | 14.6  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 67.5° | 2636.9 | 58.6  | 14.6  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 70°   | 2951.9 | 65.9  | 7.3   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 72.5° | 1860.5 | 51.3  | 7.3   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 75°   | 981.5  | 51.3  | 7.3   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 77.5° | 490.8  | 51.3  | 7.3   | 7.3   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 80°   | 227.1  | 36.6  | 7.3   | 7.3   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 82.5° | 95.2   | 22.0  | 14.6  | 7.3   | 7.3   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 85°   | 43.9   | 22.0  | 14.6  | 14.6  | 7.3   | 7.3   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 87.5° | 22.0   | 22.0  | 22.0  | 14.6  | 14.6  | 7.3   | 7.3   | 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: SP1-2407-184-14

Test Date: 10/11/2024

Luminaire Tested: GSS-SB1A-930-U-5WQ

Data in this report applies to families of products including GSS-SB1A-930-U-5WQ

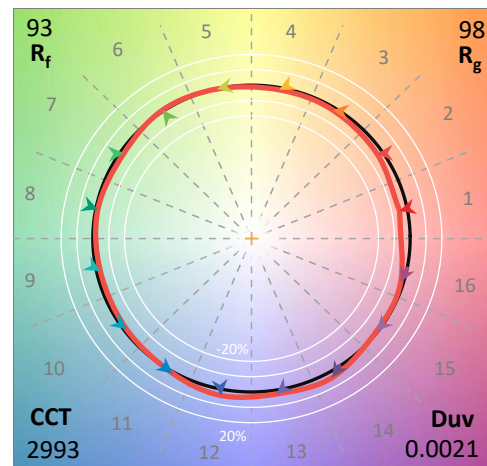
### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2407-184-14  
 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-930-U-5WQ**  
 Description: GALLEON II SITE SLIM 1SQ 350MA 5WQ HIGH DENSITY LIGHTSQUARE WITH 90 CRI  
 3000K CCT 26 LEDS

### Spectral Parameters

CCT (K): 2993  
 CIE  $u'$ : 0.2501  
 CIE  $v'$ : 0.5245  
 Duv: 0.0021  
 CIE x: 0.4406  
 CIE y: 0.4107  
 CIE z: 0.1487  
 Peak Wavelength (nm): 621  
 Dominant Wavelength (nm): 582  
 Purity: 55.53327  
 R<sub>f</sub>: 92.6  
 R<sub>g</sub>: 98.5

CRI (Ra): 92.4  
 R1: 92.2  
 R2: 95.2  
 R3: 97.0  
 R4: 93.1  
 R5: 91.7  
 R6: 94.2  
 R7: 93.3  
 R8: 82.3  
 R9: 58.2  
 R10: 87.7  
 R11: 93.5  
 R12: 81.7  
 R13: 92.9  
 R14: 97.6  
 R15: 88.1



### Test Conditions

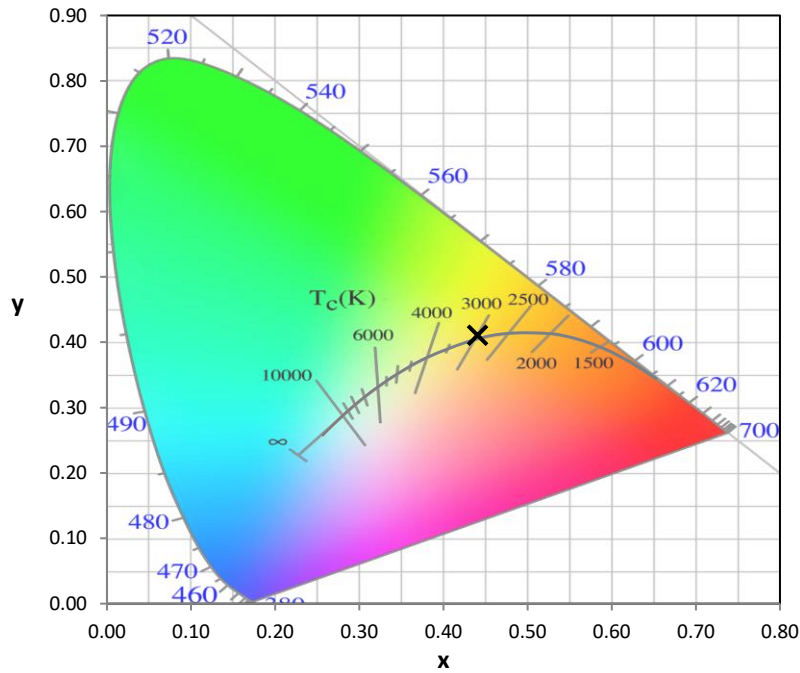
Stabilization Time: 20M  
 Operation Time: 1H 20M  
 Sphere Temperature (°C): 25.2

REPORT NUMBER: SP1-2407-184-14

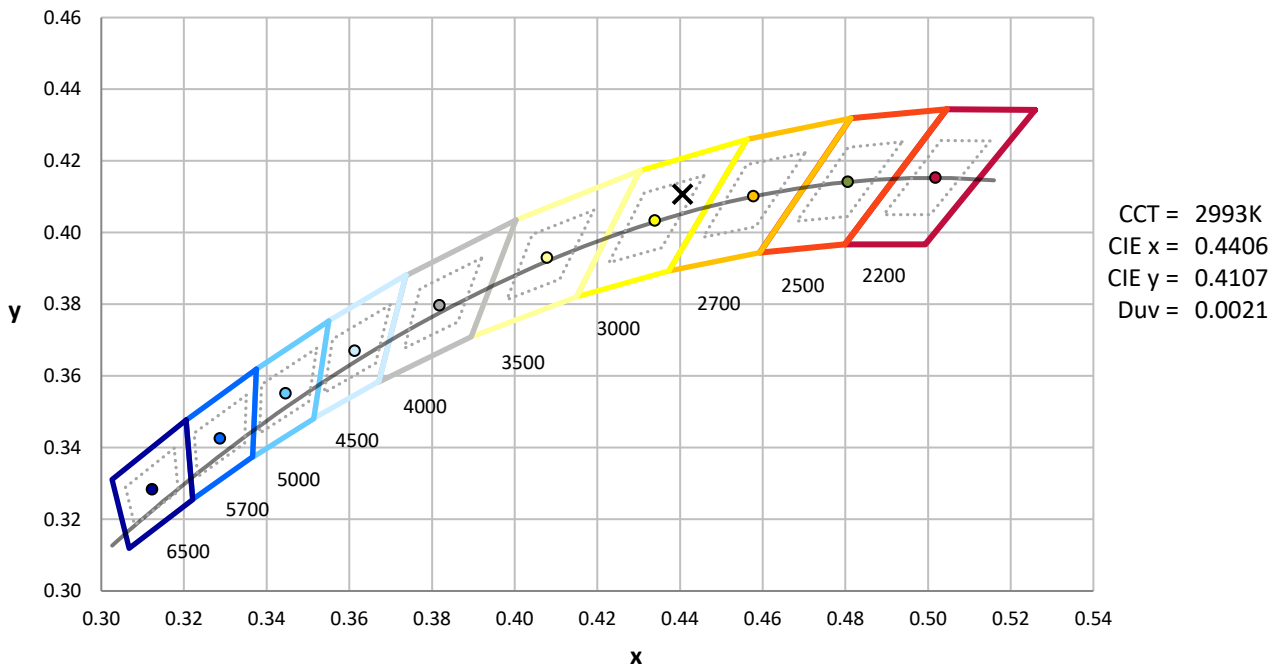
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date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



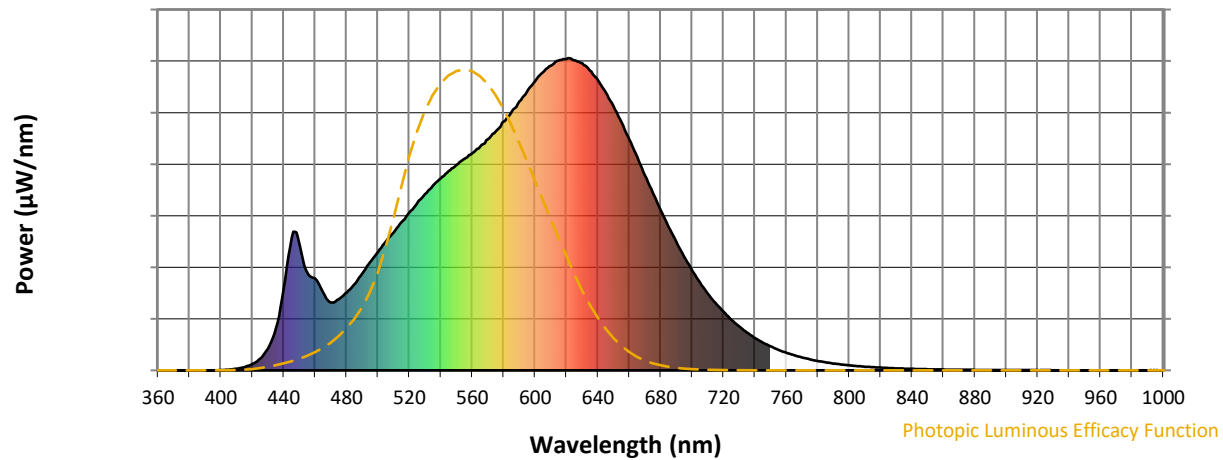
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 3000K 4-step quadrangle

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### Photopic Flux vs. Wavelength

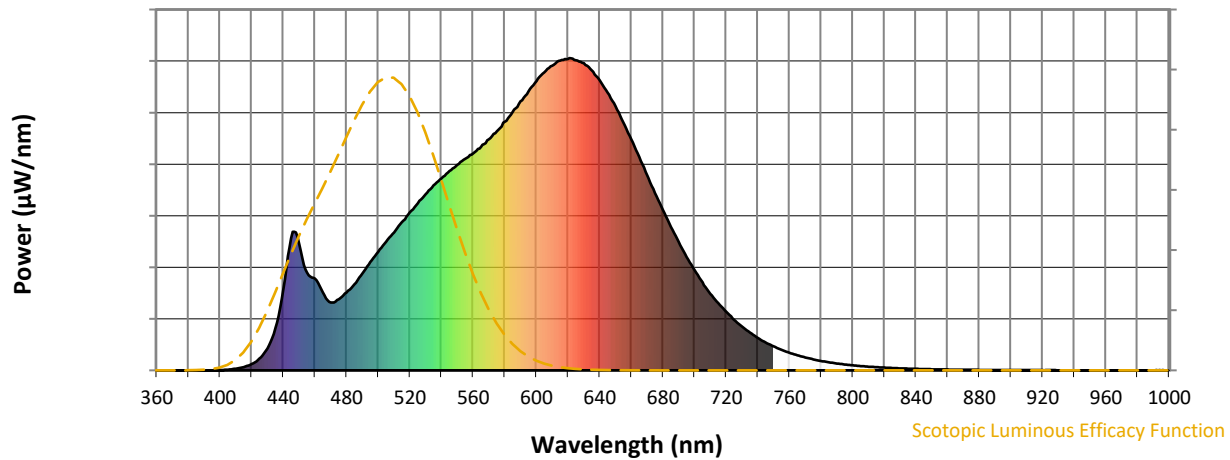


### Photopic Lumens: NR

| $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) |
|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|
| 360               | 0                                    | NR                             | 490               | 310                                  | NR                             | 620               | 998                                  | NR                             | 750               | 77                                   | NR                             | 880               | 2                                    | NR                             |
| 365               | 0                                    | NR                             | 495               | 347                                  | NR                             | 625               | 993                                  | NR                             | 755               | 66                                   | NR                             | 885               | 1                                    | NR                             |
| 370               | 0                                    | NR                             | 500               | 379                                  | NR                             | 630               | 983                                  | NR                             | 760               | 56                                   | NR                             | 890               | 1                                    | NR                             |
| 375               | 0                                    | NR                             | 505               | 412                                  | NR                             | 635               | 960                                  | NR                             | 765               | 48                                   | NR                             | 895               | 1                                    | NR                             |
| 380               | 0                                    | NR                             | 510               | 442                                  | NR                             | 640               | 930                                  | NR                             | 770               | 41                                   | NR                             | 900               | 1                                    | NR                             |
| 385               | 0                                    | NR                             | 515               | 475                                  | NR                             | 645               | 889                                  | NR                             | 775               | 35                                   | NR                             | 905               | 1                                    | NR                             |
| 390               | 0                                    | NR                             | 520               | 506                                  | NR                             | 650               | 846                                  | NR                             | 780               | 30                                   | NR                             | 910               | 1                                    | NR                             |
| 395               | 0                                    | NR                             | 525               | 535                                  | NR                             | 655               | 794                                  | NR                             | 785               | 26                                   | NR                             | 915               | 1                                    | NR                             |
| 400               | 1                                    | NR                             | 530               | 565                                  | NR                             | 660               | 740                                  | NR                             | 790               | 22                                   | NR                             | 920               | 1                                    | NR                             |
| 405               | 2                                    | NR                             | 535               | 592                                  | NR                             | 665               | 684                                  | NR                             | 795               | 19                                   | NR                             | 925               | 1                                    | NR                             |
| 410               | 6                                    | NR                             | 540               | 615                                  | NR                             | 670               | 624                                  | NR                             | 800               | 16                                   | NR                             | 930               | 0                                    | NR                             |
| 415               | 10                                   | NR                             | 545               | 638                                  | NR                             | 675               | 567                                  | NR                             | 805               | 14                                   | NR                             | 935               | 0                                    | NR                             |
| 420               | 20                                   | NR                             | 550               | 658                                  | NR                             | 680               | 513                                  | NR                             | 810               | 12                                   | NR                             | 940               | 0                                    | NR                             |
| 425               | 38                                   | NR                             | 555               | 678                                  | NR                             | 685               | 459                                  | NR                             | 815               | 10                                   | NR                             | 945               | 0                                    | NR                             |
| 430               | 70                                   | NR                             | 560               | 695                                  | NR                             | 690               | 412                                  | NR                             | 820               | 9                                    | NR                             | 950               | 0                                    | NR                             |
| 435               | 136                                  | NR                             | 565               | 716                                  | NR                             | 695               | 363                                  | NR                             | 825               | 8                                    | NR                             | 955               | 0                                    | NR                             |
| 440               | 262                                  | NR                             | 570               | 740                                  | NR                             | 700               | 320                                  | NR                             | 830               | 7                                    | NR                             | 960               | 0                                    | NR                             |
| 445               | 424                                  | NR                             | 575               | 765                                  | NR                             | 705               | 281                                  | NR                             | 835               | 6                                    | NR                             | 965               | 0                                    | NR                             |
| 450               | 406                                  | NR                             | 580               | 796                                  | NR                             | 710               | 245                                  | NR                             | 840               | 5                                    | NR                             | 970               | 0                                    | NR                             |
| 455               | 313                                  | NR                             | 585               | 827                                  | NR                             | 715               | 215                                  | NR                             | 845               | 4                                    | NR                             | 975               | 0                                    | NR                             |
| 460               | 294                                  | NR                             | 590               | 861                                  | NR                             | 720               | 188                                  | NR                             | 850               | 4                                    | NR                             | 980               | 0                                    | NR                             |
| 465               | 250                                  | NR                             | 595               | 894                                  | NR                             | 725               | 162                                  | NR                             | 855               | 3                                    | NR                             | 985               | 0                                    | NR                             |
| 470               | 217                                  | NR                             | 600               | 927                                  | NR                             | 730               | 140                                  | NR                             | 860               | 3                                    | NR                             | 990               | 0                                    | NR                             |
| 475               | 228                                  | NR                             | 605               | 954                                  | NR                             | 735               | 121                                  | NR                             | 865               | 2                                    | NR                             | 995               | 0                                    | NR                             |
| 480               | 249                                  | NR                             | 610               | 976                                  | NR                             | 740               | 104                                  | NR                             | 870               | 2                                    | NR                             | 1000              | 0                                    | NR                             |
| 485               | 276                                  | NR                             | 615               | 992                                  | NR                             | 745               | 89                                   | NR                             | 875               | 2                                    | NR                             |                   |                                      |                                |

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### Scotopic Flux vs. Wavelength



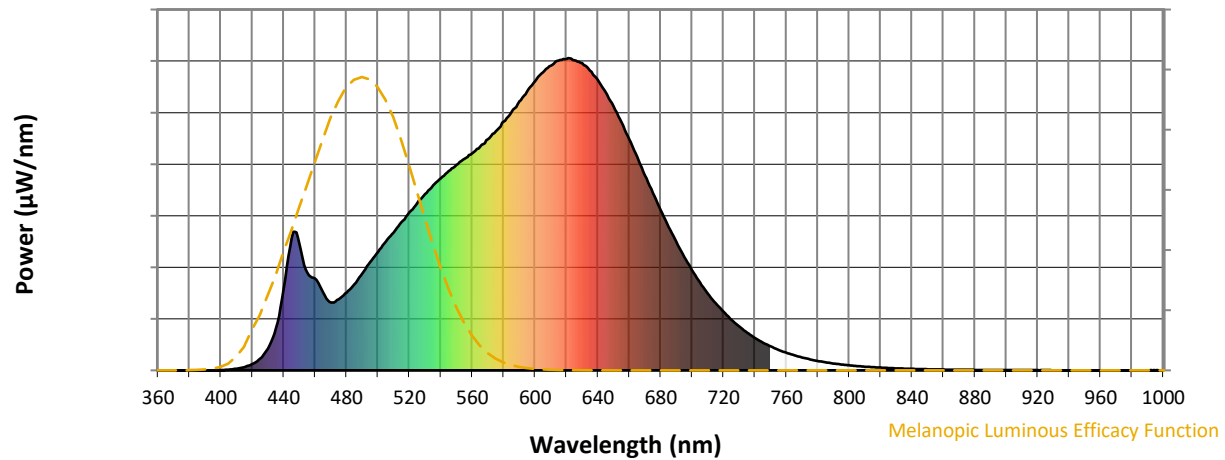
Scotopic Lumens: NR

S/P: 1.39

| 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       | 310                         | NR               | 620       | 998                         | NR               | 750       | 77                          | NR               | 880       | 2                           | NR               |
| 365       | 0                           | NR               | 495       | 347                         | NR               | 625       | 993                         | NR               | 755       | 66                          | NR               | 885       | 1                           | NR               |
| 370       | 0                           | NR               | 500       | 379                         | NR               | 630       | 983                         | NR               | 760       | 56                          | NR               | 890       | 1                           | NR               |
| 375       | 0                           | NR               | 505       | 412                         | NR               | 635       | 960                         | NR               | 765       | 48                          | NR               | 895       | 1                           | NR               |
| 380       | 0                           | NR               | 510       | 442                         | NR               | 640       | 930                         | NR               | 770       | 41                          | NR               | 900       | 1                           | NR               |
| 385       | 0                           | NR               | 515       | 475                         | NR               | 645       | 889                         | NR               | 775       | 35                          | NR               | 905       | 1                           | NR               |
| 390       | 0                           | NR               | 520       | 506                         | NR               | 650       | 846                         | NR               | 780       | 30                          | NR               | 910       | 1                           | NR               |
| 395       | 0                           | NR               | 525       | 535                         | NR               | 655       | 794                         | NR               | 785       | 26                          | NR               | 915       | 1                           | NR               |
| 400       | 1                           | NR               | 530       | 565                         | NR               | 660       | 740                         | NR               | 790       | 22                          | NR               | 920       | 1                           | NR               |
| 405       | 2                           | NR               | 535       | 592                         | NR               | 665       | 684                         | NR               | 795       | 19                          | NR               | 925       | 1                           | NR               |
| 410       | 6                           | NR               | 540       | 615                         | NR               | 670       | 624                         | NR               | 800       | 16                          | NR               | 930       | 0                           | NR               |
| 415       | 10                          | NR               | 545       | 638                         | NR               | 675       | 567                         | NR               | 805       | 14                          | NR               | 935       | 0                           | NR               |
| 420       | 20                          | NR               | 550       | 658                         | NR               | 680       | 513                         | NR               | 810       | 12                          | NR               | 940       | 0                           | NR               |
| 425       | 38                          | NR               | 555       | 678                         | NR               | 685       | 459                         | NR               | 815       | 10                          | NR               | 945       | 0                           | NR               |
| 430       | 70                          | NR               | 560       | 695                         | NR               | 690       | 412                         | NR               | 820       | 9                           | NR               | 950       | 0                           | NR               |
| 435       | 136                         | NR               | 565       | 716                         | NR               | 695       | 363                         | NR               | 825       | 8                           | NR               | 955       | 0                           | NR               |
| 440       | 262                         | NR               | 570       | 740                         | NR               | 700       | 320                         | NR               | 830       | 7                           | NR               | 960       | 0                           | NR               |
| 445       | 424                         | NR               | 575       | 765                         | NR               | 705       | 281                         | NR               | 835       | 6                           | NR               | 965       | 0                           | NR               |
| 450       | 406                         | NR               | 580       | 796                         | NR               | 710       | 245                         | NR               | 840       | 5                           | NR               | 970       | 0                           | NR               |
| 455       | 313                         | NR               | 585       | 827                         | NR               | 715       | 215                         | NR               | 845       | 4                           | NR               | 975       | 0                           | NR               |
| 460       | 294                         | NR               | 590       | 861                         | NR               | 720       | 188                         | NR               | 850       | 4                           | NR               | 980       | 0                           | NR               |
| 465       | 250                         | NR               | 595       | 894                         | NR               | 725       | 162                         | NR               | 855       | 3                           | NR               | 985       | 0                           | NR               |
| 470       | 217                         | NR               | 600       | 927                         | NR               | 730       | 140                         | NR               | 860       | 3                           | NR               | 990       | 0                           | NR               |
| 475       | 228                         | NR               | 605       | 954                         | NR               | 735       | 121                         | NR               | 865       | 2                           | NR               | 995       | 0                           | NR               |
| 480       | 249                         | NR               | 610       | 976                         | NR               | 740       | 104                         | NR               | 870       | 2                           | NR               | 1000      | 0                           | NR               |
| 485       | 276                         | NR               | 615       | 992                         | NR               | 745       | 89                          | NR               | 875       | 2                           | NR               |           |                             |                  |

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### Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 2.69

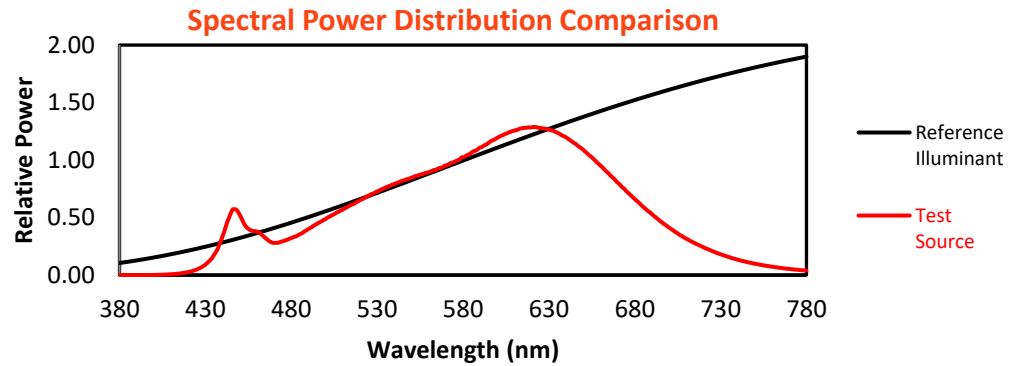
| λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) |
|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|
| 360       | 0                           | NR               | 490       | 310                         | NR               | 620       | 998                         | NR               | 750       | 77                          | NR               | 880       | 2                           | NR               |
| 365       | 0                           | NR               | 495       | 347                         | NR               | 625       | 993                         | NR               | 755       | 66                          | NR               | 885       | 1                           | NR               |
| 370       | 0                           | NR               | 500       | 379                         | NR               | 630       | 983                         | NR               | 760       | 56                          | NR               | 890       | 1                           | NR               |
| 375       | 0                           | NR               | 505       | 412                         | NR               | 635       | 960                         | NR               | 765       | 48                          | NR               | 895       | 1                           | NR               |
| 380       | 0                           | NR               | 510       | 442                         | NR               | 640       | 930                         | NR               | 770       | 41                          | NR               | 900       | 1                           | NR               |
| 385       | 0                           | NR               | 515       | 475                         | NR               | 645       | 889                         | NR               | 775       | 35                          | NR               | 905       | 1                           | NR               |
| 390       | 0                           | NR               | 520       | 506                         | NR               | 650       | 846                         | NR               | 780       | 30                          | NR               | 910       | 1                           | NR               |
| 395       | 0                           | NR               | 525       | 535                         | NR               | 655       | 794                         | NR               | 785       | 26                          | NR               | 915       | 1                           | NR               |
| 400       | 1                           | NR               | 530       | 565                         | NR               | 660       | 740                         | NR               | 790       | 22                          | NR               | 920       | 1                           | NR               |
| 405       | 2                           | NR               | 535       | 592                         | NR               | 665       | 684                         | NR               | 795       | 19                          | NR               | 925       | 1                           | NR               |
| 410       | 6                           | NR               | 540       | 615                         | NR               | 670       | 624                         | NR               | 800       | 16                          | NR               | 930       | 0                           | NR               |
| 415       | 10                          | NR               | 545       | 638                         | NR               | 675       | 567                         | NR               | 805       | 14                          | NR               | 935       | 0                           | NR               |
| 420       | 20                          | NR               | 550       | 658                         | NR               | 680       | 513                         | NR               | 810       | 12                          | NR               | 940       | 0                           | NR               |
| 425       | 38                          | NR               | 555       | 678                         | NR               | 685       | 459                         | NR               | 815       | 10                          | NR               | 945       | 0                           | NR               |
| 430       | 70                          | NR               | 560       | 695                         | NR               | 690       | 412                         | NR               | 820       | 9                           | NR               | 950       | 0                           | NR               |
| 435       | 136                         | NR               | 565       | 716                         | NR               | 695       | 363                         | NR               | 825       | 8                           | NR               | 955       | 0                           | NR               |
| 440       | 262                         | NR               | 570       | 740                         | NR               | 700       | 320                         | NR               | 830       | 7                           | NR               | 960       | 0                           | NR               |
| 445       | 424                         | NR               | 575       | 765                         | NR               | 705       | 281                         | NR               | 835       | 6                           | NR               | 965       | 0                           | NR               |
| 450       | 406                         | NR               | 580       | 796                         | NR               | 710       | 245                         | NR               | 840       | 5                           | NR               | 970       | 0                           | NR               |
| 455       | 313                         | NR               | 585       | 827                         | NR               | 715       | 215                         | NR               | 845       | 4                           | NR               | 975       | 0                           | NR               |
| 460       | 294                         | NR               | 590       | 861                         | NR               | 720       | 188                         | NR               | 850       | 4                           | NR               | 980       | 0                           | NR               |
| 465       | 250                         | NR               | 595       | 894                         | NR               | 725       | 162                         | NR               | 855       | 3                           | NR               | 985       | 0                           | NR               |
| 470       | 217                         | NR               | 600       | 927                         | NR               | 730       | 140                         | NR               | 860       | 3                           | NR               | 990       | 0                           | NR               |
| 475       | 228                         | NR               | 605       | 954                         | NR               | 735       | 121                         | NR               | 865       | 2                           | NR               | 995       | 0                           | NR               |
| 480       | 249                         | NR               | 610       | 976                         | NR               | 740       | 104                         | NR               | 870       | 2                           | NR               | 1000      | 0                           | NR               |
| 485       | 276                         | NR               | 615       | 992                         | NR               | 745       | 89                          | NR               | 875       | 2                           | NR               |           |                             |                  |

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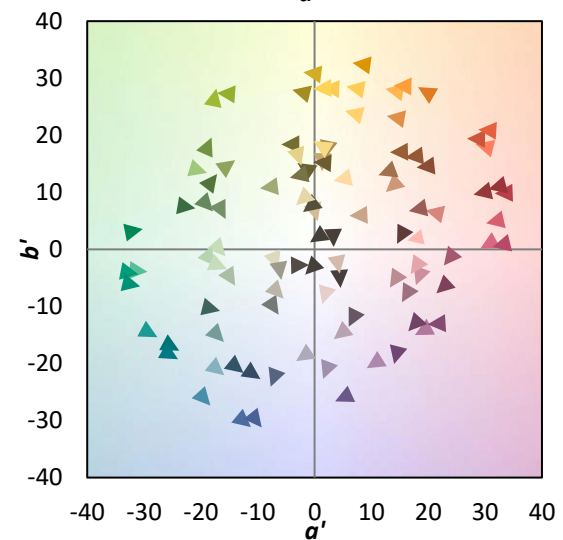
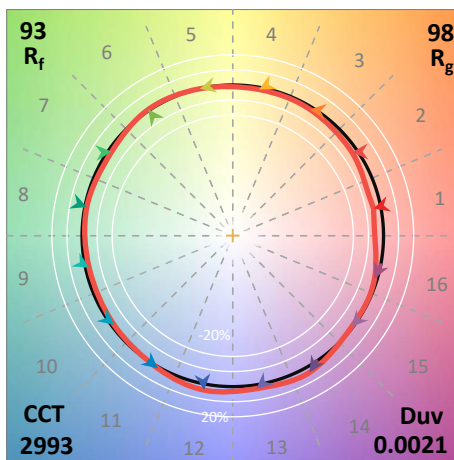
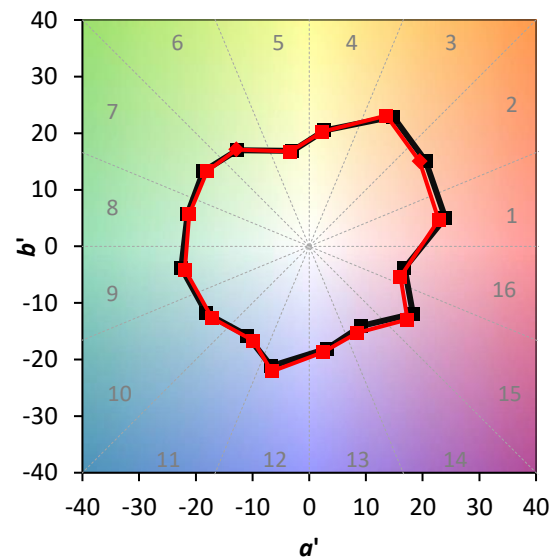
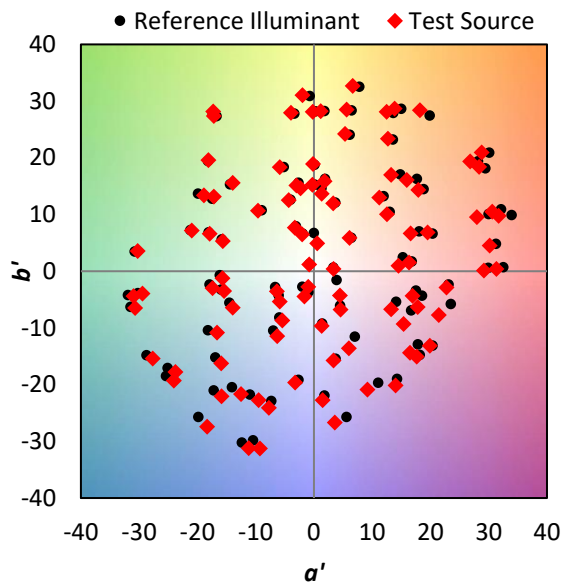
TM-30-18

### Summary

$R_f = 92.6$   
 $R_g = 98.5$   
 $CIE R_a = 92.4$   
 $R_9 = 58.2$

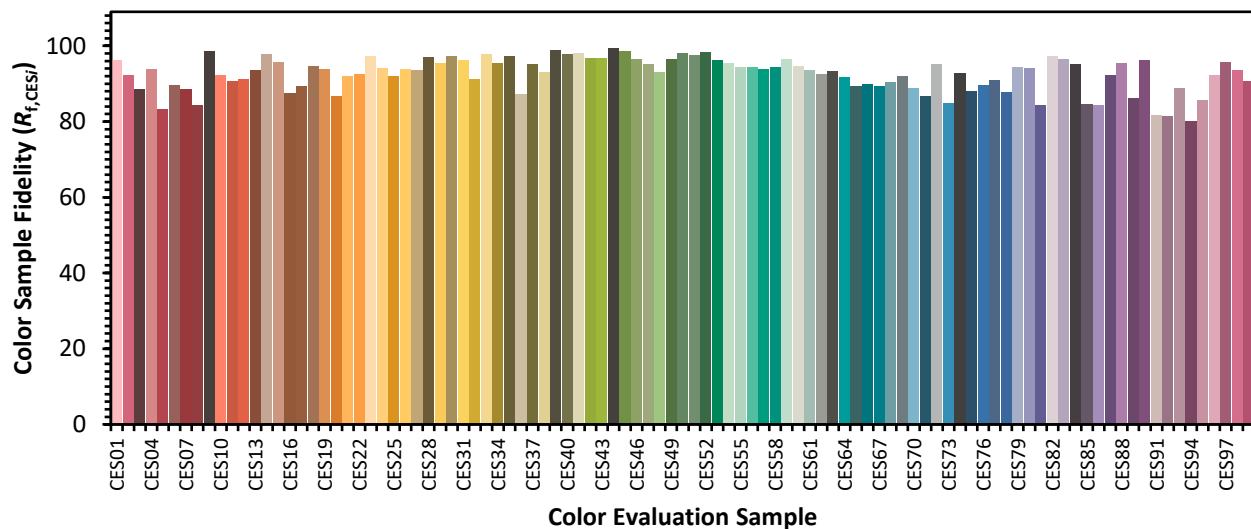


### Color Vector Graphics

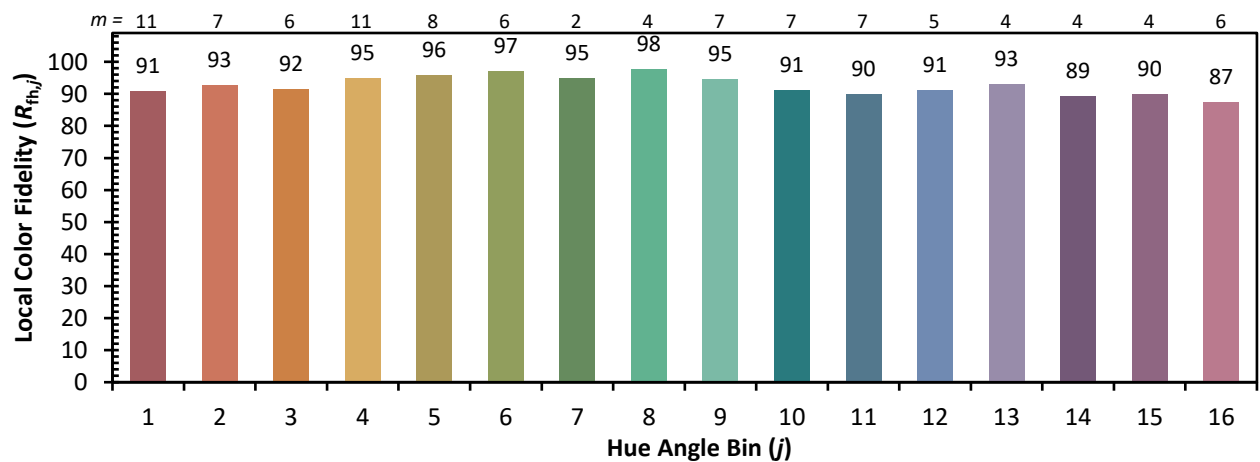
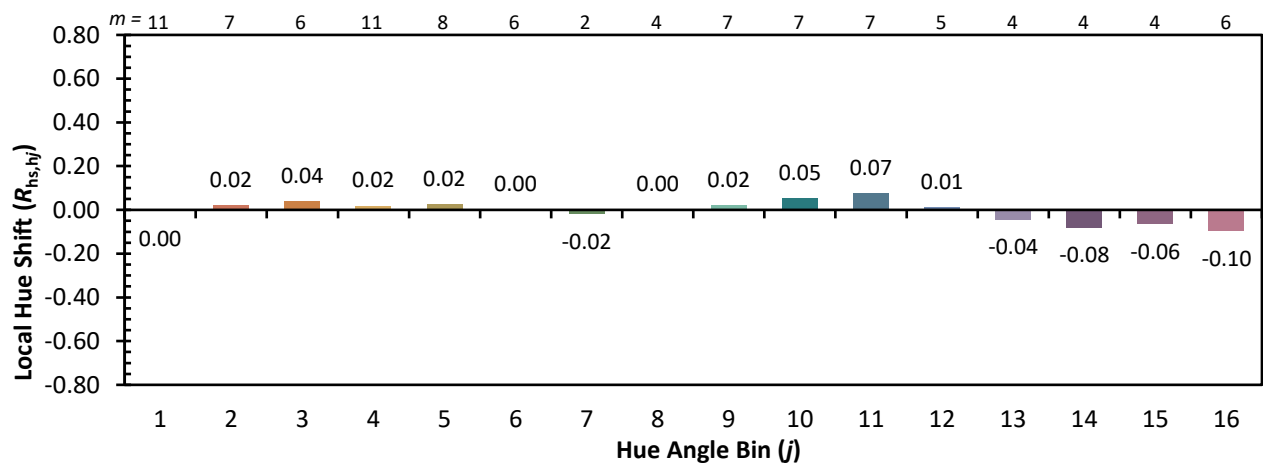
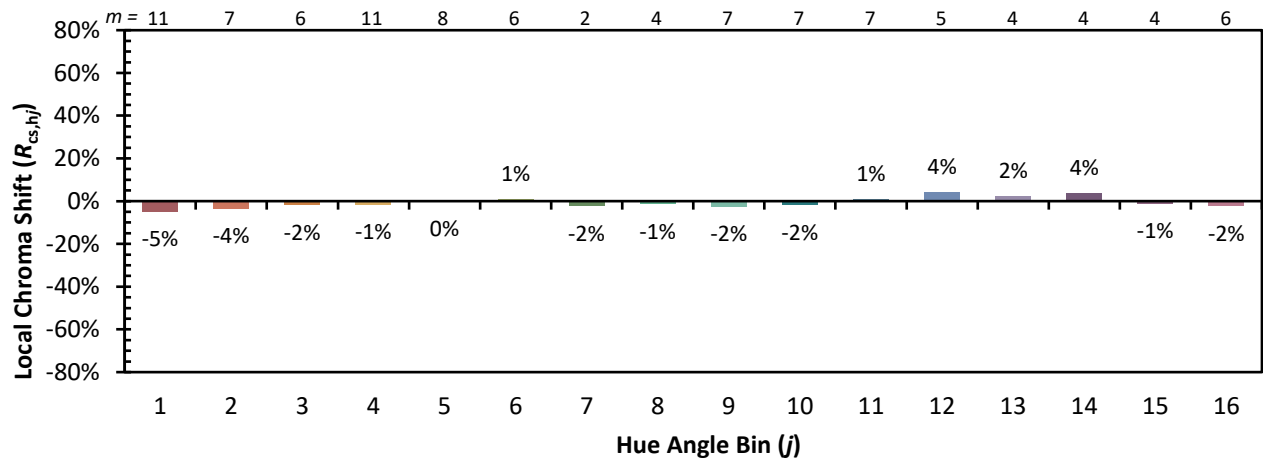


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

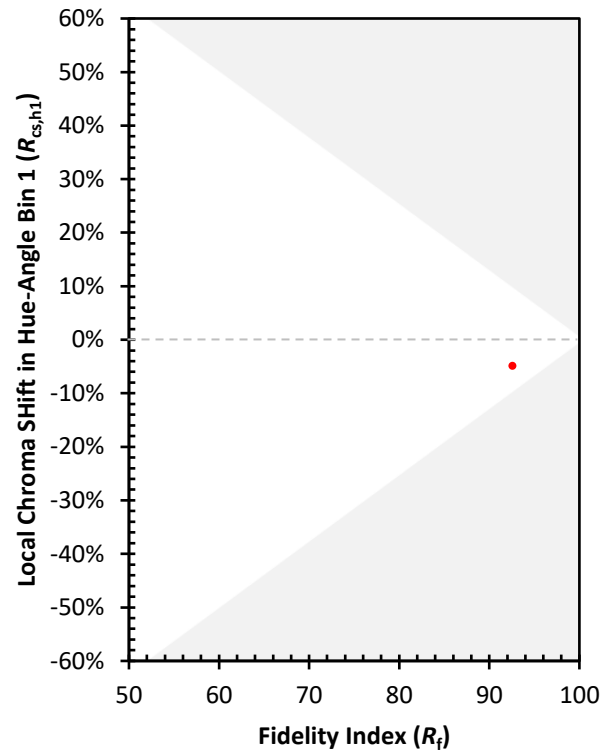
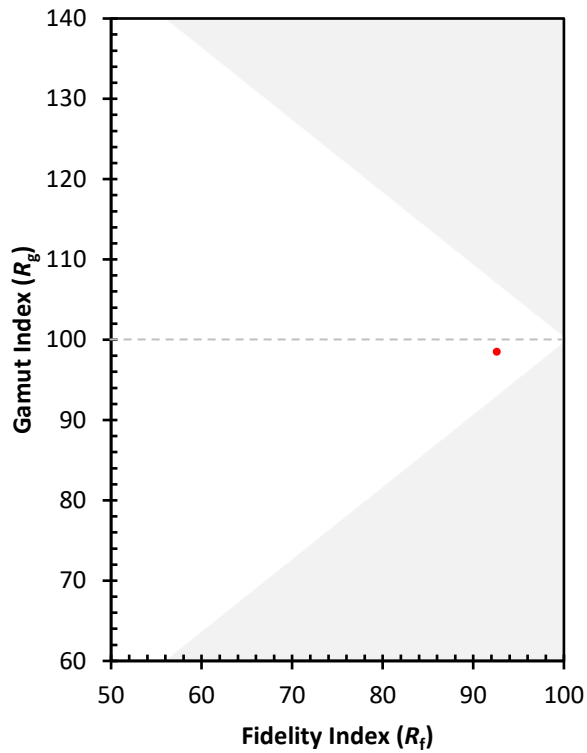
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 94 | CES51 = 98 | CES76 = 90 |
| CES02 = 63 | CES27 = 94 | CES52 = 98 | CES77 = 91 |
| CES03 = 32 | CES28 = 97 | CES53 = 96 | CES78 = 88 |
| CES04 = 70 | CES29 = 95 | CES54 = 95 | CES79 = 94 |
| CES05 = 51 | CES30 = 97 | CES55 = 94 | CES80 = 94 |
| CES06 = 51 | CES31 = 96 | CES56 = 94 | CES81 = 84 |
| CES07 = 43 | CES32 = 91 | CES57 = 94 | CES82 = 97 |
| CES08 = 42 | CES33 = 98 | CES58 = 94 | CES83 = 97 |
| CES09 = 29 | CES34 = 96 | CES59 = 97 | CES84 = 95 |
| CES10 = 76 | CES35 = 97 | CES60 = 95 | CES85 = 85 |
| CES11 = 59 | CES36 = 87 | CES61 = 94 | CES86 = 84 |
| CES12 = 65 | CES37 = 95 | CES62 = 92 | CES87 = 92 |
| CES13 = 44 | CES38 = 93 | CES63 = 93 | CES88 = 95 |
| CES14 = 74 | CES39 = 99 | CES64 = 92 | CES89 = 86 |
| CES15 = 72 | CES40 = 98 | CES65 = 89 | CES90 = 96 |
| CES16 = 48 | CES41 = 98 | CES66 = 90 | CES91 = 82 |
| CES17 = 50 | CES42 = 97 | CES67 = 89 | CES92 = 81 |
| CES18 = 57 | CES43 = 97 | CES68 = 90 | CES93 = 89 |
| CES19 = 72 | CES44 = 99 | CES69 = 92 | CES94 = 80 |
| CES20 = 67 | CES45 = 99 | CES70 = 89 | CES95 = 86 |
| CES21 = 86 | CES46 = 96 | CES71 = 87 | CES96 = 92 |
| CES22 = 79 | CES47 = 95 | CES72 = 95 | CES97 = 96 |
| CES23 = 92 | CES48 = 93 | CES73 = 85 | CES98 = 94 |
| CES24 = 91 | CES49 = 97 | CES74 = 93 | CES99 = 91 |
| CES25 = 72 | CES50 = 98 | CES75 = 88 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)