

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



Scaled data based on original data using  
LM-79-2024 Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Test Report Prepared for  
Cooper Lighting Solutions

Brand: INVUE

Report Number: P1442081

Luminaire Tested: ABW-C3-827-X-U-A-GM

Issue Date: 4/23/2026

**Test Information**

Test Method: LM-79-2024  
Report Number: P1442081  
TEST IS SCALED FROM IESNA LM-79-24 TEST DATA (G2-2509-539-32)  
Test Lab: COOPER LIGHTING SOLUTIONS  
Issue Date: 4/24/2026  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: INVUE  
Catalog Number: ABW-C3-827-X-U-A-GM  
Description: ARBOR OUTDOOR ARCHITECTURAL WALL MOUNT LUMINAIRE  
ASYMMETRIC OPTIC, GRAPHITE METALLIC PAINTED FINISH  
Light Source: 2200K CCT, 80 CRI LEDS  
Ballast/Driver: -

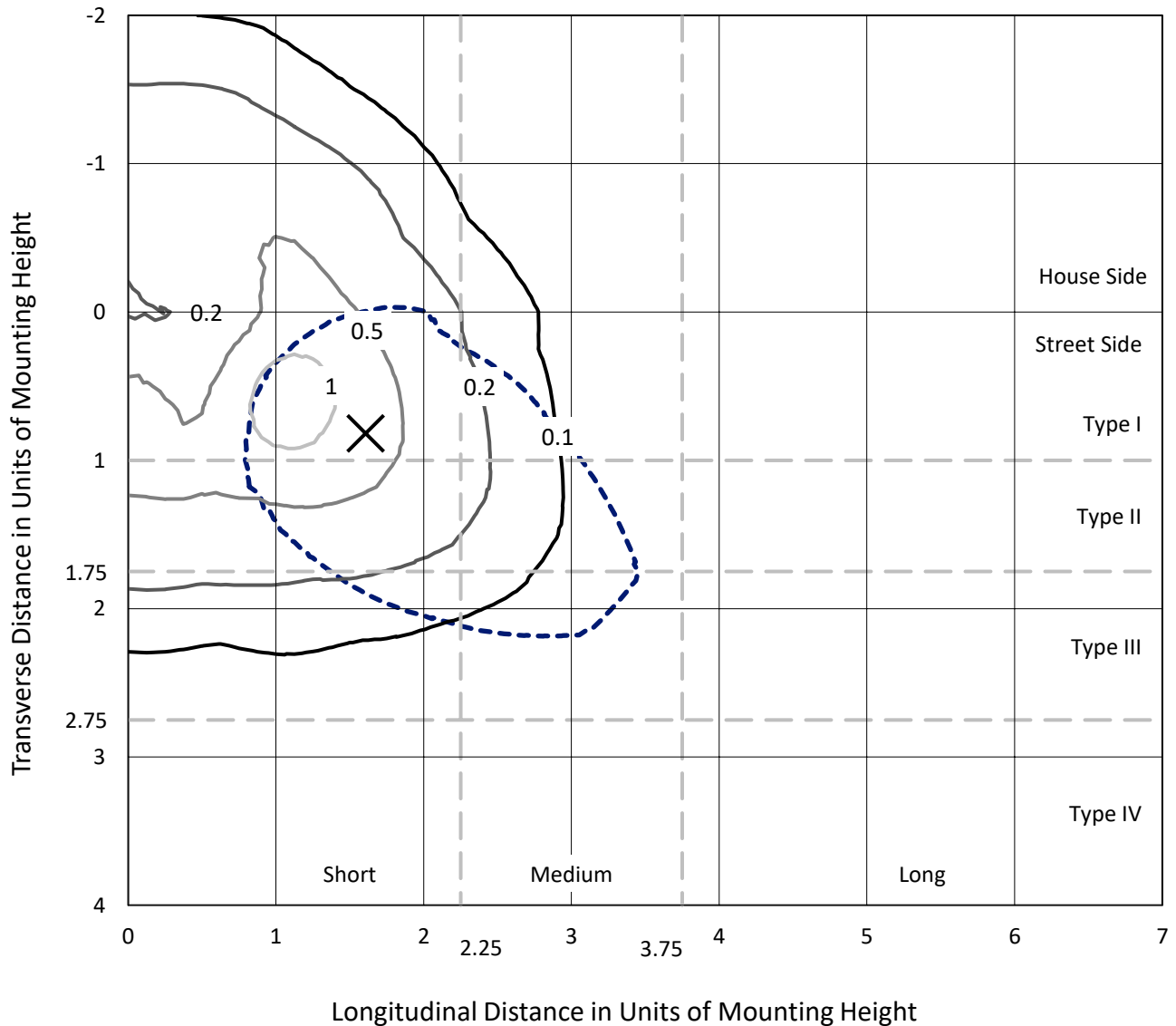
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 871.7 lumens  
Efficiency: N/A  
Efficacy: 36.8 lumens/watt  
Luminous Opening: Circular (Dia: 0.4' x H: 0')  
IES Classification: Type III - Short  
BUG Rating: B1 - U0 - G1  
  
Input Watts (W): 23.7  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9878  
Total Harmonic Distortion (THDi): 0.130909  
Frequency (hertz): 60  
Stabilization Time: 0.5 HR  
Operation Time: 3 HR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT

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 CATALOG NUMBER: ABW-C3-827-X-U-A-GM

### Iso-Footcandle Lines of Horizontal Illumination

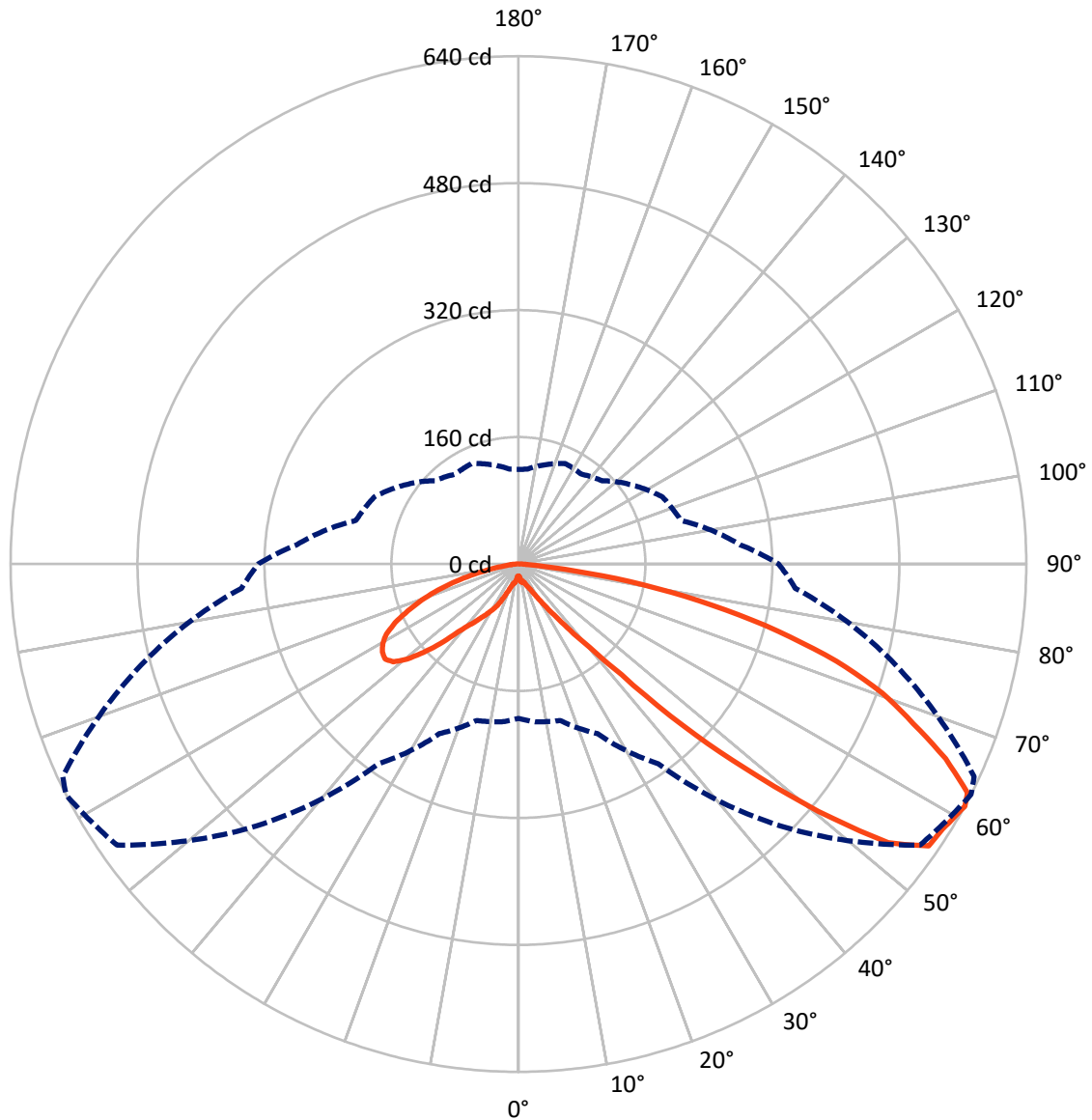
× Max cd  
 - - - 1/2 Max cd



Based on 10 foot mounting height. Maximum calculated value = 1.3 fc  
 Type III - Short - N/A

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### Luminous Intensity Polar Plot



— Vertical Plane Through 63-Deg Lateral      - - - Horizontal Cone Through 61-Deg Vertical

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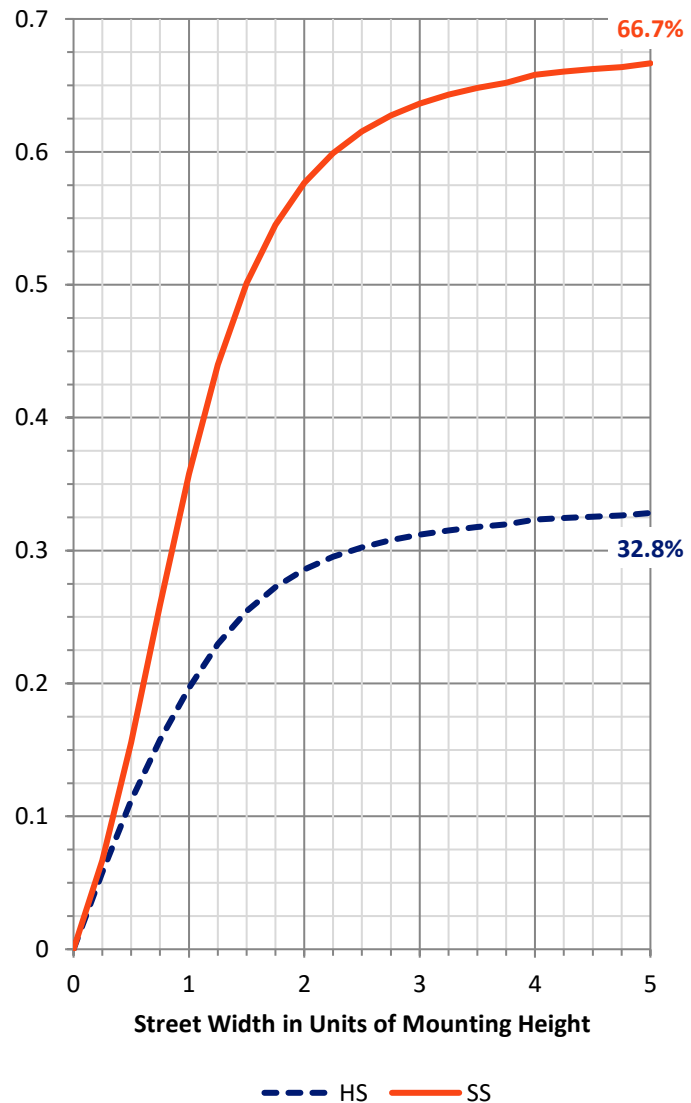
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total |
|--------------------|-----------|----------|--------|-------|
| <b>House Side</b>  | Lumens    | 288.2    | 0.0    | 288.2 |
|                    | % Fixture | 33.1     | 0.0    | 33.1  |
| <b>Street Side</b> | Lumens    | 583.5    | 0.0    | 583.5 |
|                    | % Fixture | 66.9     | 0.0    | 66.9  |
| <b>Total</b>       | Lumens    | 871.7    | 0.0    | 871.7 |
|                    | % Fixture | 100.0    | 0.0    | 100.0 |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 2.1    | 0.2       |
| 10°-20°   | 8.6    | 1.0       |
| 20°-30°   | 21.7   | 2.5       |
| 30°-40°   | 49.6   | 5.7       |
| 40°-50°   | 129.0  | 14.8      |
| 50°-60°   | 247.1  | 28.3      |
| 60°-70°   | 249.5  | 28.6      |
| 70°-80°   | 144.2  | 16.5      |
| 80°-90°   | 20.0   | 2.3       |
| 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°    | 871.7  | 100.0     |
| 0°-180°   | 871.7  | 100.0     |



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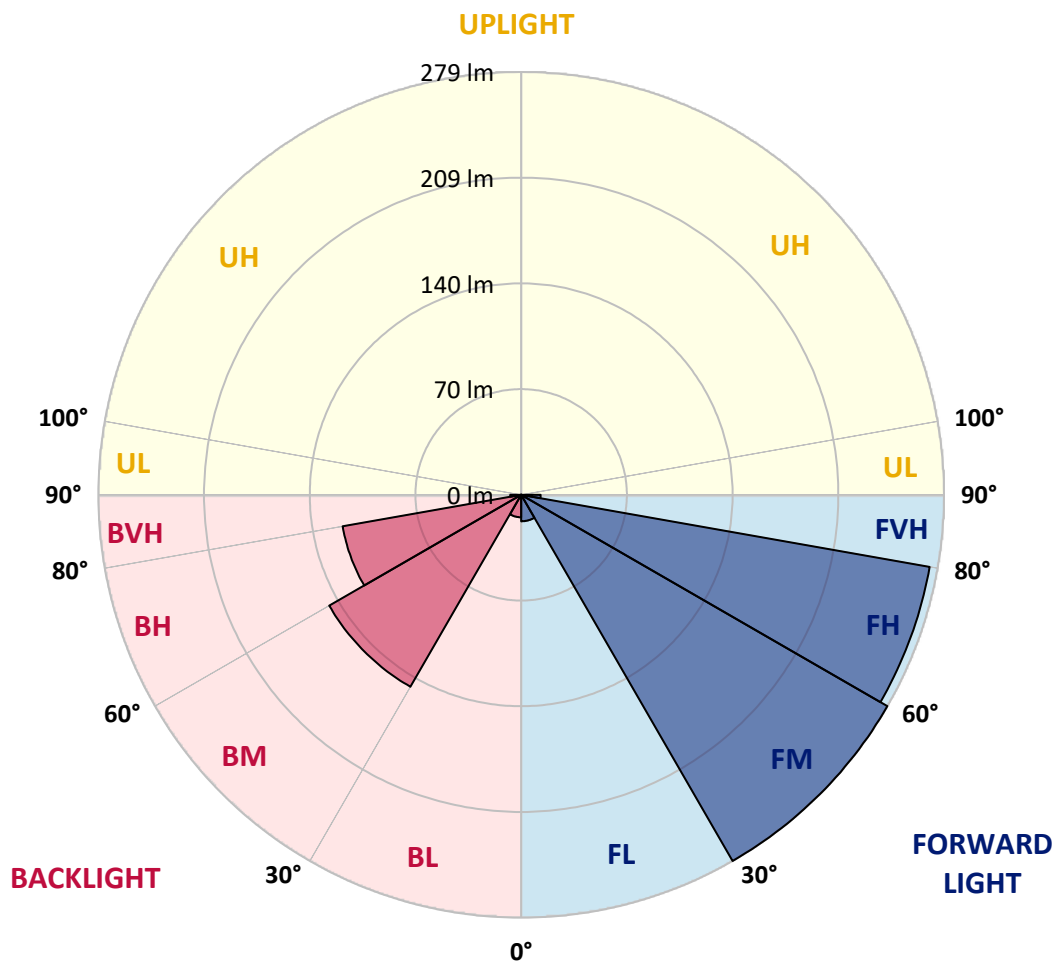
CATALOG NUMBER: ABW-C3-827-X-U-A-GM

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |        |
|------|-------------|--------|-----------|-------------------------|------|--------|
|      |             |        |           | B                       | U    | G      |
| FL   | (0°-30°)    | 17.5   | 2.0       |                         |      |        |
| FM   | (30°-60°)   | 279.3  | 32.0      |                         |      |        |
| FH   | (60°-80°)   | 273.9  | 31.4      |                         |      | G0/660 |
| FVH  | (80°-90°)   | 12.9   | 1.5       |                         |      | G1/100 |
| BL   | (0°-30°)    | 14.9   | 1.7       | B0/110                  |      |        |
| BM   | (30°-60°)   | 146.4  | 16.8      | B0/220                  |      |        |
| BH   | (60°-80°)   | 119.7  | 13.7      | B1/500                  |      | G1/500 |
| BVH  | (80°-90°)   | 7.2    | 0.8       |                         |      | G0/10  |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |        |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |        |

**BUG Rating: B1-U0-G1**

Type III Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°    | 5°    | 15°   | 25°   | 35°   | 45°   | 55°   | 63°   | 65°   | 75°   | 85°   |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 15.1  | 15.1  | 15.1  | 15.1  | 15.1  | 15.1  | 15.1  | 15.1  | 15.1  | 15.1  | 15.1  |
| 2.5°  | 27.8  | 26.2  | 24.6  | 23.8  | 21.4  | 20.6  | 19.8  | 18.3  | 18.3  | 16.7  | 15.9  |
| 5°    | 34.1  | 32.6  | 28.6  | 24.6  | 23.0  | 19.8  | 16.7  | 15.9  | 15.9  | 15.9  | 14.3  |
| 7.5°  | 37.3  | 34.1  | 33.3  | 27.8  | 27.0  | 27.0  | 26.2  | 22.2  | 21.4  | 19.8  | 19.8  |
| 10°   | 36.5  | 36.5  | 36.5  | 31.8  | 31.0  | 29.4  | 26.2  | 23.8  | 23.8  | 21.4  | 22.2  |
| 12.5° | 33.3  | 33.3  | 37.3  | 35.7  | 30.2  | 29.4  | 26.2  | 21.4  | 21.4  | 20.6  | 19.8  |
| 15°   | 34.1  | 35.7  | 41.3  | 40.5  | 37.3  | 31.8  | 27.0  | 24.6  | 23.8  | 22.2  | 21.4  |
| 17.5° | 42.9  | 42.1  | 42.1  | 42.9  | 42.1  | 34.9  | 28.6  | 24.6  | 25.4  | 23.8  | 23.8  |
| 20°   | 48.4  | 48.4  | 48.4  | 47.6  | 46.1  | 37.3  | 31.0  | 28.6  | 27.8  | 27.0  | 26.2  |
| 22.5° | 58.0  | 57.2  | 59.6  | 55.6  | 50.8  | 40.5  | 34.9  | 31.8  | 32.6  | 31.0  | 28.6  |
| 25°   | 72.3  | 74.6  | 65.9  | 58.0  | 53.2  | 43.7  | 38.1  | 35.7  | 36.5  | 37.3  | 33.3  |
| 27.5° | 87.3  | 86.5  | 73.0  | 65.1  | 58.8  | 49.2  | 45.3  | 42.9  | 44.5  | 44.5  | 41.3  |
| 30°   | 95.3  | 98.5  | 85.0  | 73.8  | 65.1  | 58.0  | 53.2  | 52.4  | 54.8  | 54.8  | 49.2  |
| 32.5° | 105.6 | 107.2 | 93.7  | 81.0  | 73.0  | 68.3  | 67.5  | 65.1  | 67.5  | 64.3  | 58.8  |
| 35°   | 116.7 | 117.5 | 106.4 | 88.9  | 83.4  | 82.6  | 85.0  | 81.8  | 85.0  | 77.0  | 69.9  |
| 37.5° | 124.7 | 126.2 | 116.7 | 99.2  | 94.5  | 96.9  | 106.4 | 105.6 | 109.6 | 97.7  | 83.4  |
| 40°   | 131.8 | 135.8 | 127.0 | 111.2 | 108.8 | 116.7 | 136.6 | 138.2 | 144.5 | 126.2 | 100.0 |
| 42.5° | 142.1 | 146.1 | 140.5 | 125.5 | 128.6 | 146.1 | 186.6 | 190.6 | 204.9 | 170.7 | 130.2 |
| 45°   | 164.4 | 167.5 | 167.5 | 154.8 | 165.2 | 204.9 | 284.3 | 290.6 | 307.3 | 239.8 | 177.1 |
| 47.5° | 179.4 | 179.4 | 185.0 | 177.1 | 199.3 | 268.4 | 376.4 | 385.1 | 399.4 | 311.2 | 226.3 |
| 50°   | 199.3 | 199.3 | 211.2 | 210.4 | 246.9 | 354.1 | 471.6 | 489.9 | 501.0 | 391.4 | 281.9 |
| 52.5° | 205.6 | 209.6 | 223.9 | 231.1 | 284.3 | 412.1 | 561.4 | 583.6 | 589.9 | 451.8 | 321.6 |
| 55°   | 209.6 | 214.4 | 226.3 | 237.4 | 304.9 | 455.0 | 613.8 | 627.3 | 621.7 | 490.7 | 340.6 |
| 57.5° | 209.6 | 212.8 | 222.3 | 236.6 | 307.3 | 470.8 | 615.4 | 630.4 | 624.1 | 503.4 | 349.4 |
| 60°   | 201.7 | 204.1 | 209.6 | 235.8 | 308.1 | 469.3 | 614.6 | 636.8 | 631.2 | 499.4 | 352.5 |
| 61°   | 194.5 | 199.3 | 204.1 | 235.8 | 307.3 | 466.9 | 617.7 | 640.0 | 633.6 | 492.3 | 350.2 |
| 62.5° | 185.8 | 191.4 | 194.5 | 235.0 | 300.9 | 457.3 | 614.6 | 635.2 | 623.3 | 479.6 | 340.6 |
| 65°   | 169.1 | 172.3 | 173.1 | 227.1 | 281.9 | 424.8 | 578.8 | 591.5 | 574.1 | 445.4 | 315.2 |
| 67.5° | 145.3 | 148.5 | 150.9 | 212.8 | 260.4 | 385.1 | 527.2 | 536.7 | 522.5 | 401.0 | 289.8 |
| 70°   | 119.9 | 123.9 | 129.4 | 194.5 | 235.0 | 339.0 | 472.4 | 486.7 | 471.6 | 350.2 | 262.0 |
| 72.5° | 92.1  | 97.7  | 107.2 | 166.7 | 202.5 | 287.4 | 404.1 | 419.2 | 401.8 | 291.4 | 223.1 |
| 75°   | 66.7  | 72.3  | 85.0  | 135.0 | 164.4 | 228.7 | 324.0 | 338.2 | 318.4 | 228.7 | 180.2 |
| 77.5° | 43.7  | 47.6  | 60.3  | 96.9  | 119.9 | 166.7 | 243.8 | 250.1 | 230.3 | 157.2 | 130.2 |
| 80°   | 26.2  | 29.4  | 38.1  | 58.0  | 70.7  | 105.6 | 156.4 | 160.4 | 140.5 | 88.9  | 77.8  |
| 82.5° | 16.7  | 17.5  | 19.8  | 23.8  | 23.8  | 49.2  | 69.1  | 69.9  | 52.4  | 27.0  | 31.0  |
| 85°   | 10.3  | 11.1  | 9.5   | 7.9   | 8.7   | 10.3  | 10.3  | 11.1  | 9.5   | 7.9   | 7.9   |
| 87.5° | 7.9   | 7.9   | 7.1   | 6.4   | 6.4   | 6.4   | 7.9   | 7.9   | 7.9   | 6.4   | 6.4   |
| 90°   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |



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CATALOG NUMBER: ABW-C3-827-X-U-A-GM

**CANDELA DISTRIBUTION (continued):**

|       | 90°   | 95°   | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 15.1  | 15.1  | 15.1  | 15.1  | 15.1  | 15.1  | 15.1  | 15.1  | 15.1  | 15.1  | 15.1  |
| 2.5°  | 15.1  | 15.1  | 15.1  | 15.1  | 15.1  | 15.1  | 15.1  | 15.9  | 15.9  | 16.7  | 16.7  |
| 5°    | 13.5  | 14.3  | 15.9  | 15.9  | 16.7  | 16.7  | 17.5  | 17.5  | 15.9  | 15.1  | 15.1  |
| 7.5°  | 19.8  | 20.6  | 19.8  | 20.6  | 20.6  | 19.1  | 19.1  | 19.8  | 20.6  | 19.1  | 18.3  |
| 10°   | 21.4  | 20.6  | 20.6  | 22.2  | 26.2  | 23.0  | 24.6  | 24.6  | 23.8  | 21.4  | 20.6  |
| 12.5° | 20.6  | 21.4  | 22.2  | 23.8  | 25.4  | 30.2  | 27.8  | 27.8  | 26.2  | 23.8  | 23.0  |
| 15°   | 21.4  | 23.0  | 23.8  | 24.6  | 28.6  | 33.3  | 31.8  | 30.2  | 28.6  | 23.8  | 23.8  |
| 17.5° | 24.6  | 25.4  | 27.0  | 27.8  | 32.6  | 36.5  | 36.5  | 31.8  | 29.4  | 25.4  | 24.6  |
| 20°   | 26.2  | 27.0  | 31.0  | 32.6  | 37.3  | 38.9  | 42.1  | 36.5  | 32.6  | 28.6  | 27.8  |
| 22.5° | 28.6  | 29.4  | 34.1  | 39.7  | 42.9  | 43.7  | 45.3  | 38.9  | 33.3  | 31.0  | 29.4  |
| 25°   | 34.1  | 34.1  | 38.9  | 48.4  | 50.8  | 46.8  | 47.6  | 42.1  | 34.9  | 31.0  | 30.2  |
| 27.5° | 41.3  | 42.9  | 47.6  | 59.6  | 55.6  | 51.6  | 51.6  | 45.3  | 36.5  | 32.6  | 31.8  |
| 30°   | 51.6  | 50.0  | 56.4  | 66.7  | 62.7  | 58.0  | 56.4  | 48.4  | 38.9  | 34.1  | 33.3  |
| 32.5° | 61.9  | 61.1  | 65.9  | 73.8  | 71.5  | 63.5  | 60.3  | 52.4  | 41.3  | 35.7  | 34.1  |
| 35°   | 72.3  | 73.0  | 76.2  | 82.6  | 78.6  | 68.3  | 65.9  | 56.4  | 44.5  | 38.1  | 37.3  |
| 37.5° | 85.8  | 86.5  | 85.8  | 92.9  | 86.5  | 75.4  | 72.3  | 61.1  | 49.2  | 44.5  | 42.1  |
| 40°   | 100.8 | 102.4 | 100.0 | 103.2 | 95.3  | 84.2  | 80.2  | 68.3  | 58.0  | 52.4  | 51.6  |
| 42.5° | 127.0 | 127.8 | 120.7 | 119.1 | 108.8 | 96.9  | 94.5  | 81.0  | 71.5  | 65.9  | 63.5  |
| 45°   | 165.2 | 161.2 | 149.3 | 143.7 | 129.4 | 112.7 | 110.4 | 97.7  | 86.5  | 81.8  | 80.2  |
| 47.5° | 205.6 | 200.1 | 178.6 | 166.7 | 147.7 | 131.0 | 126.2 | 116.7 | 104.0 | 97.7  | 96.1  |
| 50°   | 254.9 | 234.2 | 207.2 | 189.0 | 165.9 | 149.3 | 140.5 | 132.6 | 118.3 | 111.2 | 108.8 |
| 52.5° | 292.2 | 258.0 | 223.1 | 205.6 | 178.6 | 157.2 | 147.7 | 142.9 | 128.6 | 119.9 | 117.5 |
| 55°   | 308.1 | 271.5 | 229.5 | 212.0 | 183.4 | 159.6 | 148.5 | 146.1 | 132.6 | 123.1 | 121.5 |
| 57.5° | 316.0 | 277.1 | 225.5 | 210.4 | 180.2 | 156.4 | 144.5 | 143.7 | 132.6 | 123.1 | 123.1 |
| 60°   | 327.1 | 281.1 | 216.8 | 204.1 | 176.3 | 151.7 | 140.5 | 141.3 | 130.2 | 121.5 | 120.7 |
| 61°   | 327.9 | 280.3 | 212.0 | 200.1 | 173.9 | 148.5 | 138.2 | 139.7 | 129.4 | 119.9 | 119.1 |
| 62.5° | 325.5 | 276.3 | 204.9 | 193.7 | 167.5 | 142.9 | 134.2 | 136.6 | 125.5 | 116.7 | 115.9 |
| 65°   | 308.9 | 262.8 | 189.0 | 177.1 | 151.7 | 131.0 | 123.9 | 127.8 | 118.3 | 108.8 | 108.8 |
| 67.5° | 289.0 | 245.3 | 170.7 | 155.6 | 135.0 | 117.5 | 112.7 | 115.1 | 108.0 | 99.2  | 99.2  |
| 70°   | 259.6 | 220.7 | 150.9 | 133.4 | 116.7 | 102.4 | 99.2  | 103.2 | 96.9  | 88.1  | 88.1  |
| 72.5° | 220.7 | 188.2 | 129.4 | 109.6 | 95.3  | 86.5  | 85.0  | 88.9  | 82.6  | 75.4  | 76.2  |
| 75°   | 175.5 | 149.3 | 102.4 | 83.4  | 73.0  | 69.9  | 69.1  | 71.5  | 67.5  | 61.9  | 61.9  |
| 77.5° | 125.5 | 105.6 | 72.3  | 58.0  | 52.4  | 53.2  | 50.8  | 52.4  | 50.8  | 46.1  | 46.8  |
| 80°   | 73.0  | 58.8  | 41.3  | 34.9  | 33.3  | 34.9  | 33.3  | 34.1  | 34.1  | 31.0  | 31.8  |
| 82.5° | 27.8  | 20.6  | 18.3  | 19.1  | 18.3  | 19.1  | 15.9  | 16.7  | 17.5  | 18.3  | 18.3  |
| 85°   | 7.9   | 7.9   | 8.7   | 9.5   | 9.5   | 8.7   | 7.9   | 7.9   | 8.7   | 10.3  | 10.3  |
| 87.5° | 6.4   | 5.6   | 6.4   | 7.1   | 7.1   | 7.1   | 6.4   | 6.4   | 7.1   | 7.9   | 8.7   |
| 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

Invue

Report Number: SP1-2509-539-6

Test Date: 04/15/2026

Luminaire Tested: Luxscape Bollard

Data in this report applies to families of products including ;Luxscape

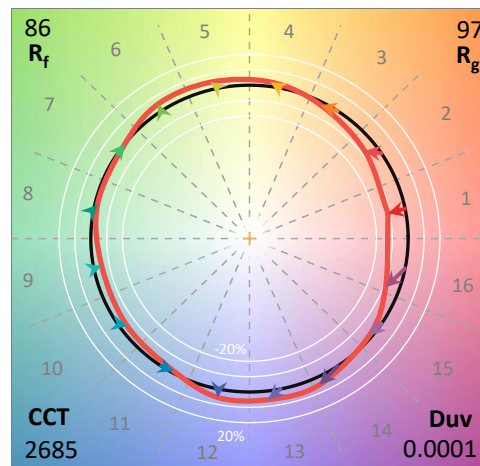
**Test Information**

Test Method: LM-79-2019  
 Report Number: SP1-2509-539-6  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry: 4π  
 Issue Date: 04/15/2026  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: Invue  
 Catalog Number: **Luxscape Bollard**  
 Description: ARB-C1-827-LED-XX-Dx-S-GM-SPECULAR REFLECTOR

**Spectral Parameters**

CCT (K): 2685  
 CIE u': 0.2631  
 CIE v': 0.5278  
 Duv: 0.0001  
 CIE x: 0.4613  
 CIE y: 0.4112  
 CIE z: 0.1276  
 Peak Wavelength (nm): 607  
 Dominant Wavelength (nm): 584  
 Purity: 61.87869  
 Rf: 85.8  
 Rg: 97.1

|           |      |      |      |
|-----------|------|------|------|
| CRI (Ra): | 83.3 |      |      |
| R1:       | 82.0 | R9:  | 7.2  |
| R2:       | 92.1 | R10: | 83.2 |
| R3:       | 95.4 | R11: | 84.1 |
| R4:       | 82.6 | R12: | 80.9 |
| R5:       | 82.9 | R13: | 84.4 |
| R6:       | 92.4 | R14: | 98.1 |
| R7:       | 81.6 | R15: | 73.2 |
| R8:       | 57.2 |      |      |



**Test Conditions**

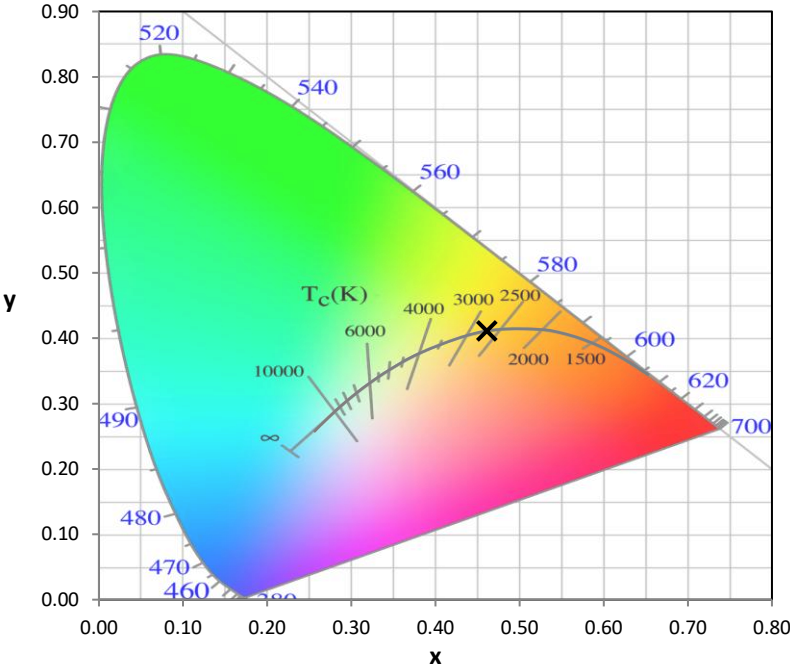
Stabilization Time: 29M  
 Operation Time: 1H 29M  
 Sphere Temperature (°C): 25.1

REPORT NUMBER: SP1-2509-539-6

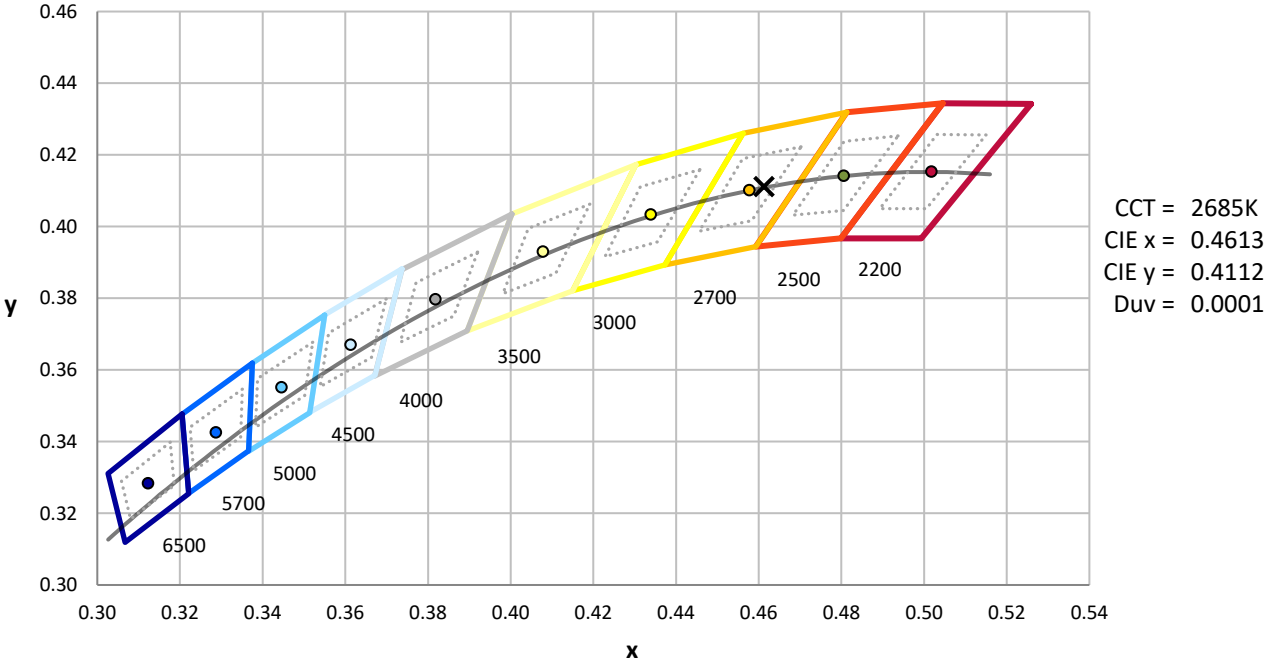
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | 76INCH SPHERE IN0058  | 12/16/2025       | 6/16/2026            |
| Power Meter                    | XITRON INXT2011004    | 10/21/2025       | 10/21/2026           |
| AC Power Source                | CHROMA 61603 IN0063   | 10/21/2025       | 10/21/2026           |
| DC Power Source                | AGILENT E3634A IN0208 | 10/21/2025       | 10/21/2026           |
| Sphere Thermometer             | ONSET IN0085          | 10/21/2025       | 10/21/2026           |
| Room Thermometer               | ONSET IN0046          | 10/21/2025       | 10/21/2026           |

REPORT NUMBER: SP1-2509-539-6

CIE 1931 Chromaticity Diagram



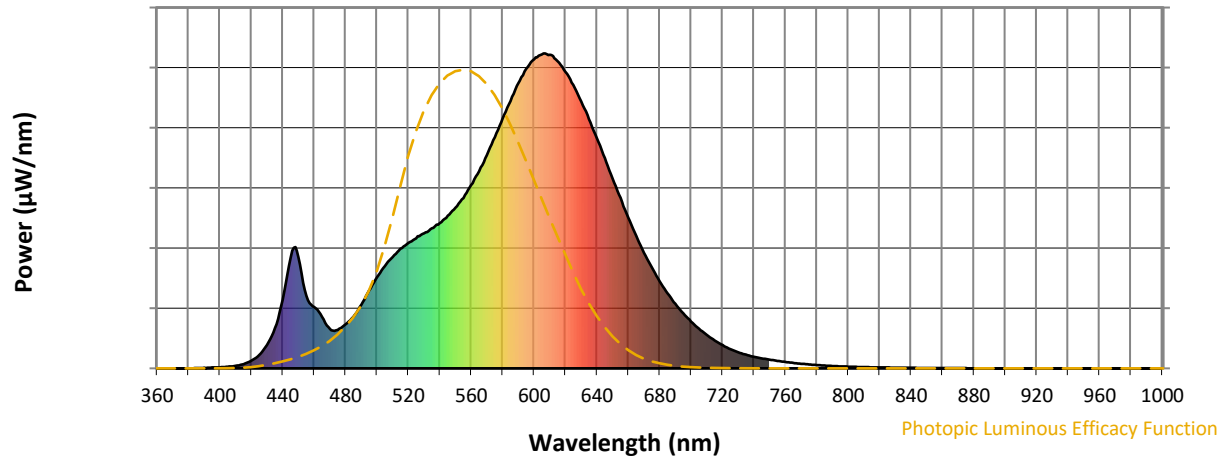
CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 2700K 4-step quadrangle

REPORT NUMBER: SP1-2509-539-6

**Photopic Flux vs. Wavelength**

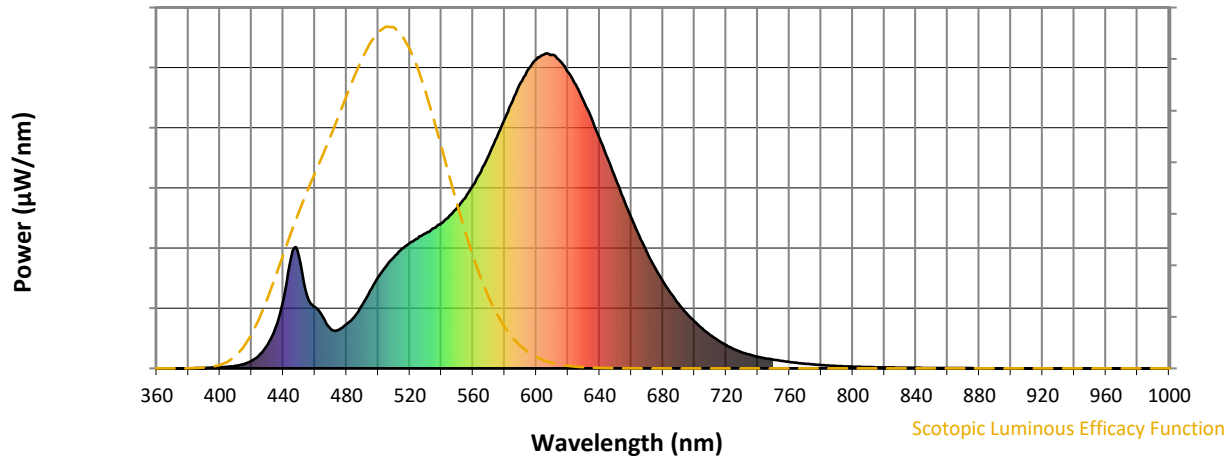


**Photopic Lumens: NR**

| 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    | 202                      | NR            | 620    | 941                      | NR            | 750    | 28                       | NR            | 880    | 0                        | NR            |
| 365    | 0                        | NR            | 495    | 247                      | NR            | 625    | 900                      | NR            | 755    | 24                       | NR            | 885    | 0                        | NR            |
| 370    | 0                        | NR            | 500    | 290                      | NR            | 630    | 847                      | NR            | 760    | 20                       | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 324                      | NR            | 635    | 791                      | NR            | 765    | 17                       | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 354                      | NR            | 640    | 730                      | NR            | 770    | 15                       | NR            | 900    | 0                        | NR            |
| 385    | 1                        | NR            | 515    | 380                      | NR            | 645    | 668                      | NR            | 775    | 13                       | NR            | 905    | 0                        | NR            |
| 390    | 2                        | NR            | 520    | 398                      | NR            | 650    | 602                      | NR            | 780    | 11                       | NR            | 910    | 0                        | NR            |
| 395    | 3                        | NR            | 525    | 413                      | NR            | 655    | 541                      | NR            | 785    | 9                        | NR            | 915    | 0                        | NR            |
| 400    | 3                        | NR            | 530    | 428                      | NR            | 660    | 478                      | NR            | 790    | 8                        | NR            | 920    | 0                        | NR            |
| 405    | 5                        | NR            | 535    | 445                      | NR            | 665    | 421                      | NR            | 795    | 6                        | NR            | 925    | 0                        | NR            |
| 410    | 8                        | NR            | 540    | 461                      | NR            | 670    | 367                      | NR            | 800    | 5                        | NR            | 930    | 0                        | NR            |
| 415    | 14                       | NR            | 545    | 485                      | NR            | 675    | 320                      | NR            | 805    | 5                        | NR            | 935    | 0                        | NR            |
| 420    | 24                       | NR            | 550    | 510                      | NR            | 680    | 277                      | NR            | 810    | 4                        | NR            | 940    | 0                        | NR            |
| 425    | 43                       | NR            | 555    | 541                      | NR            | 685    | 238                      | NR            | 815    | 3                        | NR            | 945    | 0                        | NR            |
| 430    | 74                       | NR            | 560    | 582                      | NR            | 690    | 205                      | NR            | 820    | 3                        | NR            | 950    | 0                        | NR            |
| 435    | 128                      | NR            | 565    | 626                      | NR            | 695    | 175                      | NR            | 825    | 3                        | NR            | 955    | 0                        | NR            |
| 440    | 218                      | NR            | 570    | 677                      | NR            | 700    | 148                      | NR            | 830    | 2                        | NR            | 960    | 0                        | NR            |
| 445    | 352                      | NR            | 575    | 734                      | NR            | 705    | 126                      | NR            | 835    | 2                        | NR            | 965    | 0                        | NR            |
| 450    | 354                      | NR            | 580    | 793                      | NR            | 710    | 106                      | NR            | 840    | 2                        | NR            | 970    | 0                        | NR            |
| 455    | 230                      | NR            | 585    | 849                      | NR            | 715    | 89                       | NR            | 845    | 1                        | NR            | 975    | 0                        | NR            |
| 460    | 195                      | NR            | 590    | 907                      | NR            | 720    | 74                       | NR            | 850    | 1                        | NR            | 980    | 0                        | NR            |
| 465    | 164                      | NR            | 595    | 951                      | NR            | 725    | 61                       | NR            | 855    | 1                        | NR            | 985    | 0                        | NR            |
| 470    | 125                      | NR            | 600    | 981                      | NR            | 730    | 51                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 122                      | NR            | 605    | 997                      | NR            | 735    | 43                       | NR            | 865    | 1                        | NR            | 995    | 0                        | NR            |
| 480    | 140                      | NR            | 610    | 996                      | NR            | 740    | 37                       | NR            | 870    | 1                        | NR            | 1000   | 0                        | NR            |
| 485    | 164                      | NR            | 615    | 976                      | NR            | 745    | 32                       | NR            | 875    | 1                        | NR            |        |                          |               |

REPORT NUMBER: SP1-2509-539-6

**Scotopic Flux vs. Wavelength**



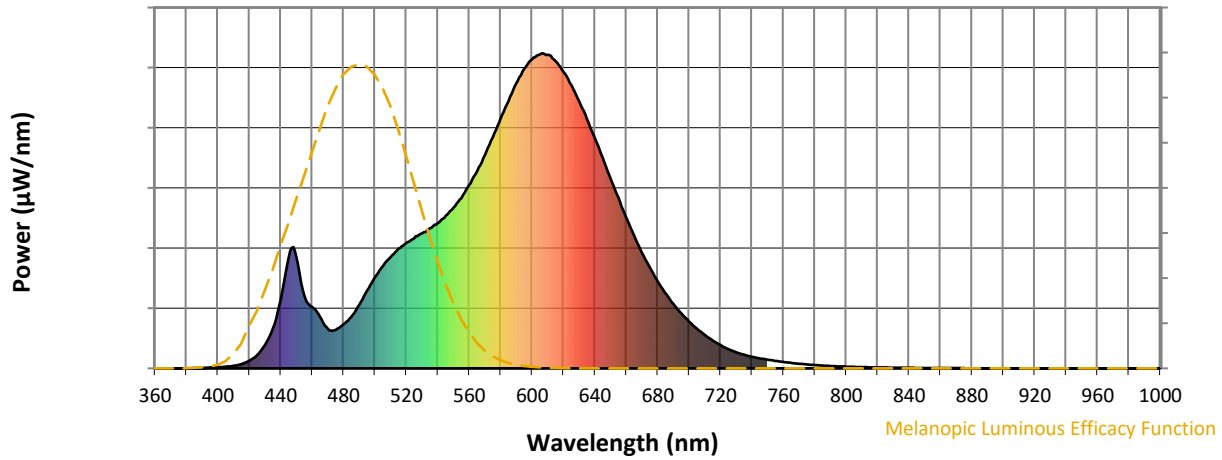
**Scotopic Lumens: NR**

**S/P: 1.22**

| 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    | 202                      | NR            | 620    | 941                      | NR            | 750    | 28                       | NR            | 880    | 0                        | NR            |
| 365    | 0                        | NR            | 495    | 247                      | NR            | 625    | 900                      | NR            | 755    | 24                       | NR            | 885    | 0                        | NR            |
| 370    | 0                        | NR            | 500    | 290                      | NR            | 630    | 847                      | NR            | 760    | 20                       | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 324                      | NR            | 635    | 791                      | NR            | 765    | 17                       | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 354                      | NR            | 640    | 730                      | NR            | 770    | 15                       | NR            | 900    | 0                        | NR            |
| 385    | 1                        | NR            | 515    | 380                      | NR            | 645    | 668                      | NR            | 775    | 13                       | NR            | 905    | 0                        | NR            |
| 390    | 2                        | NR            | 520    | 398                      | NR            | 650    | 602                      | NR            | 780    | 11                       | NR            | 910    | 0                        | NR            |
| 395    | 3                        | NR            | 525    | 413                      | NR            | 655    | 541                      | NR            | 785    | 9                        | NR            | 915    | 0                        | NR            |
| 400    | 3                        | NR            | 530    | 428                      | NR            | 660    | 478                      | NR            | 790    | 8                        | NR            | 920    | 0                        | NR            |
| 405    | 5                        | NR            | 535    | 445                      | NR            | 665    | 421                      | NR            | 795    | 6                        | NR            | 925    | 0                        | NR            |
| 410    | 8                        | NR            | 540    | 461                      | NR            | 670    | 367                      | NR            | 800    | 5                        | NR            | 930    | 0                        | NR            |
| 415    | 14                       | NR            | 545    | 485                      | NR            | 675    | 320                      | NR            | 805    | 5                        | NR            | 935    | 0                        | NR            |
| 420    | 24                       | NR            | 550    | 510                      | NR            | 680    | 277                      | NR            | 810    | 4                        | NR            | 940    | 0                        | NR            |
| 425    | 43                       | NR            | 555    | 541                      | NR            | 685    | 238                      | NR            | 815    | 3                        | NR            | 945    | 0                        | NR            |
| 430    | 74                       | NR            | 560    | 582                      | NR            | 690    | 205                      | NR            | 820    | 3                        | NR            | 950    | 0                        | NR            |
| 435    | 128                      | NR            | 565    | 626                      | NR            | 695    | 175                      | NR            | 825    | 3                        | NR            | 955    | 0                        | NR            |
| 440    | 218                      | NR            | 570    | 677                      | NR            | 700    | 148                      | NR            | 830    | 2                        | NR            | 960    | 0                        | NR            |
| 445    | 352                      | NR            | 575    | 734                      | NR            | 705    | 126                      | NR            | 835    | 2                        | NR            | 965    | 0                        | NR            |
| 450    | 354                      | NR            | 580    | 793                      | NR            | 710    | 106                      | NR            | 840    | 2                        | NR            | 970    | 0                        | NR            |
| 455    | 230                      | NR            | 585    | 849                      | NR            | 715    | 89                       | NR            | 845    | 1                        | NR            | 975    | 0                        | NR            |
| 460    | 195                      | NR            | 590    | 907                      | NR            | 720    | 74                       | NR            | 850    | 1                        | NR            | 980    | 0                        | NR            |
| 465    | 164                      | NR            | 595    | 951                      | NR            | 725    | 61                       | NR            | 855    | 1                        | NR            | 985    | 0                        | NR            |
| 470    | 125                      | NR            | 600    | 981                      | NR            | 730    | 51                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 122                      | NR            | 605    | 997                      | NR            | 735    | 43                       | NR            | 865    | 1                        | NR            | 995    | 0                        | NR            |
| 480    | 140                      | NR            | 610    | 996                      | NR            | 740    | 37                       | NR            | 870    | 1                        | NR            | 1000   | 0                        | NR            |
| 485    | 164                      | NR            | 615    | 976                      | NR            | 745    | 32                       | NR            | 875    | 1                        | NR            |        |                          |               |

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**Melanopic Flux vs. Wavelength**



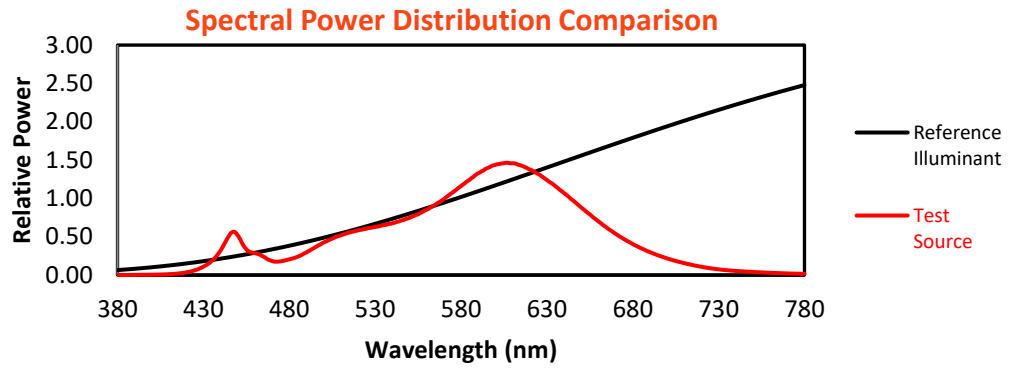
**Melanopic Lumens: NR**

**M/P: 2.26**

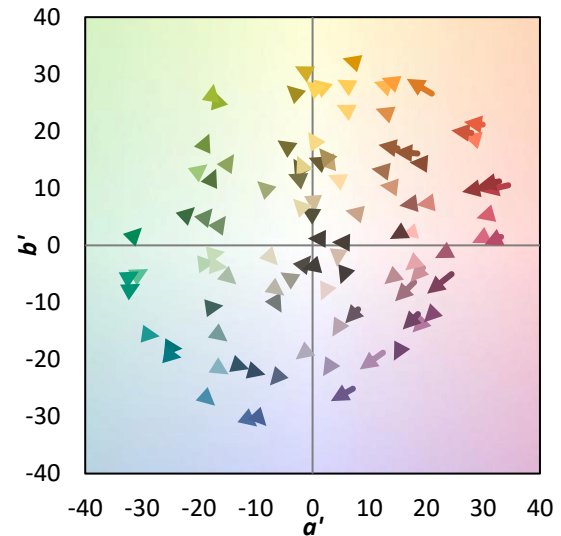
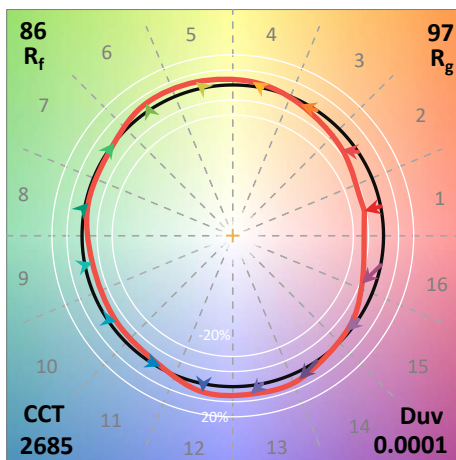
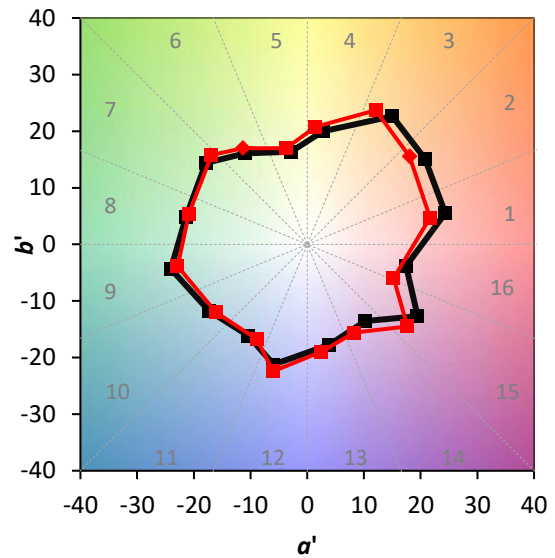
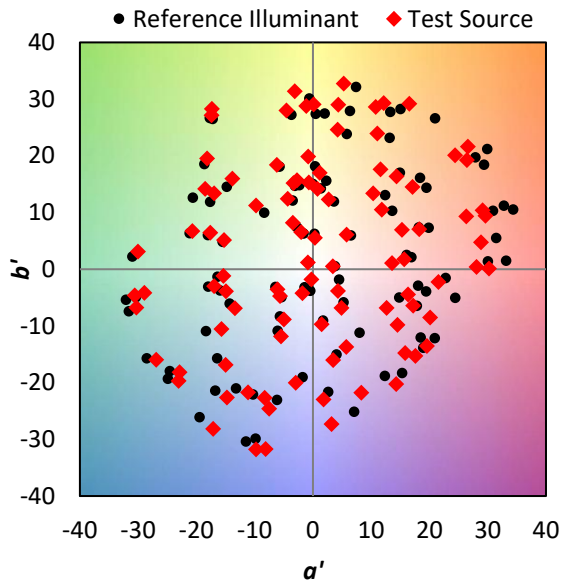
| λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 360    | 0                        | NR            | 490    | 202                      | NR            | 620    | 941                      | NR            | 750    | 28                       | NR            | 880    | 0                        | NR            |
| 365    | 0                        | NR            | 495    | 247                      | NR            | 625    | 900                      | NR            | 755    | 24                       | NR            | 885    | 0                        | NR            |
| 370    | 0                        | NR            | 500    | 290                      | NR            | 630    | 847                      | NR            | 760    | 20                       | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 324                      | NR            | 635    | 791                      | NR            | 765    | 17                       | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 354                      | NR            | 640    | 730                      | NR            | 770    | 15                       | NR            | 900    | 0                        | NR            |
| 385    | 1                        | NR            | 515    | 380                      | NR            | 645    | 668                      | NR            | 775    | 13                       | NR            | 905    | 0                        | NR            |
| 390    | 2                        | NR            | 520    | 398                      | NR            | 650    | 602                      | NR            | 780    | 11                       | NR            | 910    | 0                        | NR            |
| 395    | 3                        | NR            | 525    | 413                      | NR            | 655    | 541                      | NR            | 785    | 9                        | NR            | 915    | 0                        | NR            |
| 400    | 3                        | NR            | 530    | 428                      | NR            | 660    | 478                      | NR            | 790    | 8                        | NR            | 920    | 0                        | NR            |
| 405    | 5                        | NR            | 535    | 445                      | NR            | 665    | 421                      | NR            | 795    | 6                        | NR            | 925    | 0                        | NR            |
| 410    | 8                        | NR            | 540    | 461                      | NR            | 670    | 367                      | NR            | 800    | 5                        | NR            | 930    | 0                        | NR            |
| 415    | 14                       | NR            | 545    | 485                      | NR            | 675    | 320                      | NR            | 805    | 5                        | NR            | 935    | 0                        | NR            |
| 420    | 24                       | NR            | 550    | 510                      | NR            | 680    | 277                      | NR            | 810    | 4                        | NR            | 940    | 0                        | NR            |
| 425    | 43                       | NR            | 555    | 541                      | NR            | 685    | 238                      | NR            | 815    | 3                        | NR            | 945    | 0                        | NR            |
| 430    | 74                       | NR            | 560    | 582                      | NR            | 690    | 205                      | NR            | 820    | 3                        | NR            | 950    | 0                        | NR            |
| 435    | 128                      | NR            | 565    | 626                      | NR            | 695    | 175                      | NR            | 825    | 3                        | NR            | 955    | 0                        | NR            |
| 440    | 218                      | NR            | 570    | 677                      | NR            | 700    | 148                      | NR            | 830    | 2                        | NR            | 960    | 0                        | NR            |
| 445    | 352                      | NR            | 575    | 734                      | NR            | 705    | 126                      | NR            | 835    | 2                        | NR            | 965    | 0                        | NR            |
| 450    | 354                      | NR            | 580    | 793                      | NR            | 710    | 106                      | NR            | 840    | 2                        | NR            | 970    | 0                        | NR            |
| 455    | 230                      | NR            | 585    | 849                      | NR            | 715    | 89                       | NR            | 845    | 1                        | NR            | 975    | 0                        | NR            |
| 460    | 195                      | NR            | 590    | 907                      | NR            | 720    | 74                       | NR            | 850    | 1                        | NR            | 980    | 0                        | NR            |
| 465    | 164                      | NR            | 595    | 951                      | NR            | 725    | 61                       | NR            | 855    | 1                        | NR            | 985    | 0                        | NR            |
| 470    | 125                      | NR            | 600    | 981                      | NR            | 730    | 51                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 122                      | NR            | 605    | 997                      | NR            | 735    | 43                       | NR            | 865    | 1                        | NR            | 995    | 0                        | NR            |
| 480    | 140                      | NR            | 610    | 996                      | NR            | 740    | 37                       | NR            | 870    | 1                        | NR            | 1000   | 0                        | NR            |
| 485    | 164                      | NR            | 615    | 976                      | NR            | 745    | 32                       | NR            | 875    | 1                        | NR            |        |                          |               |

**Summary**

$R_f = 85.8$   
 $R_g = 97.1$   
 $CIE R_a = 83.3$   
 $R_9 = 7.2$

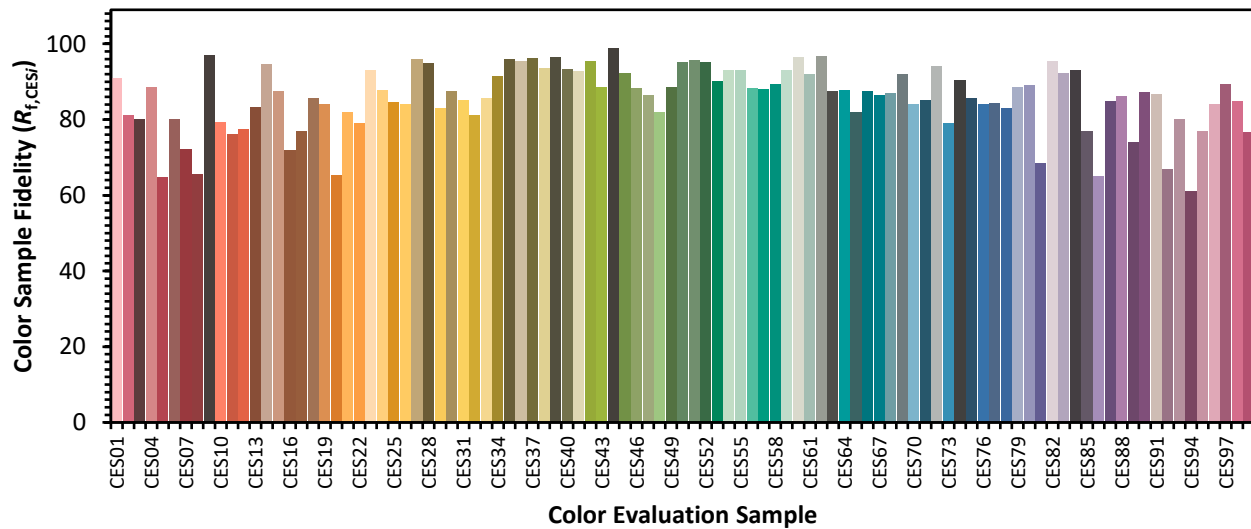


**Color Vector Graphics**

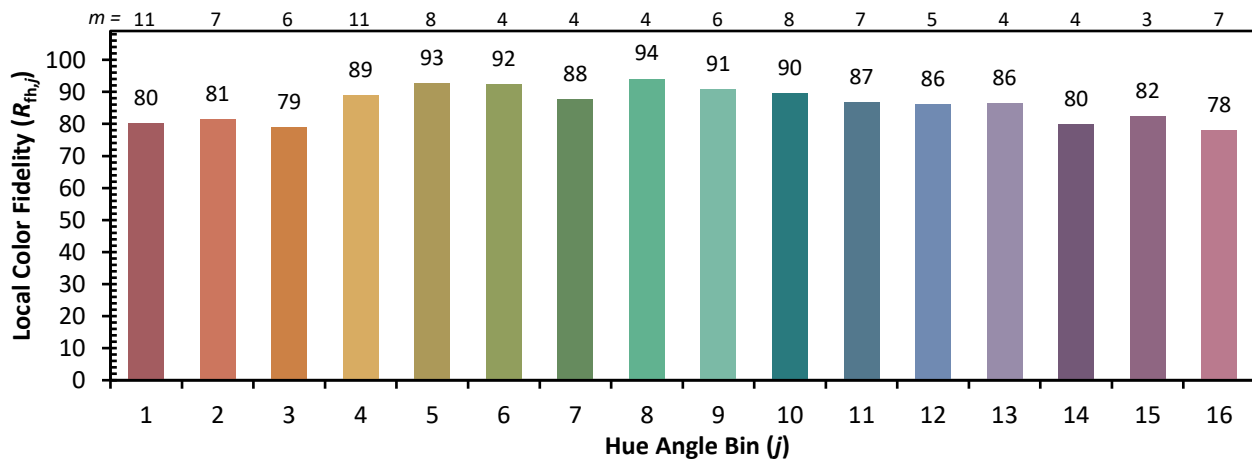
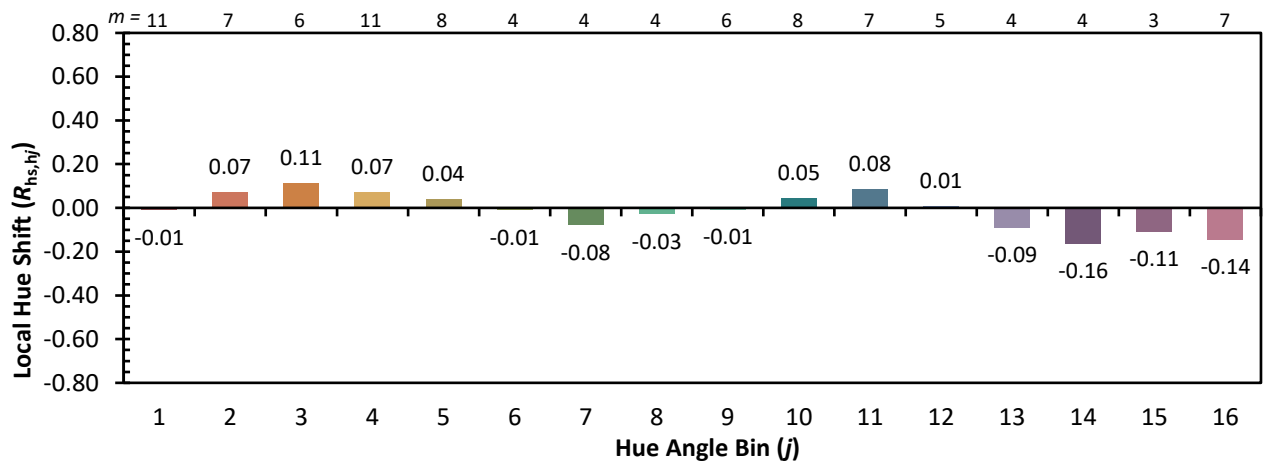
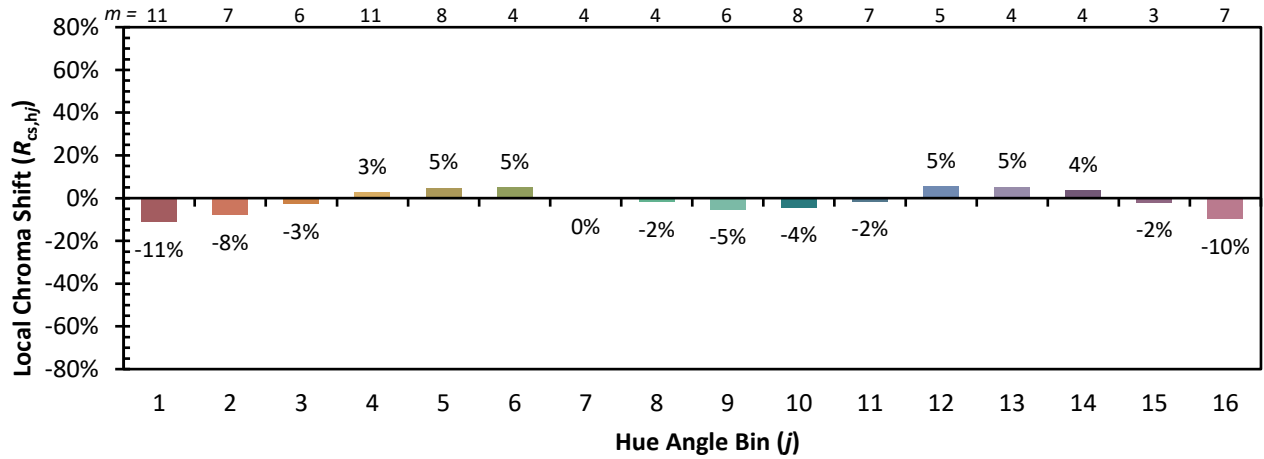


Individual Sample Fidelity Index ( $R_{f,i}$ )

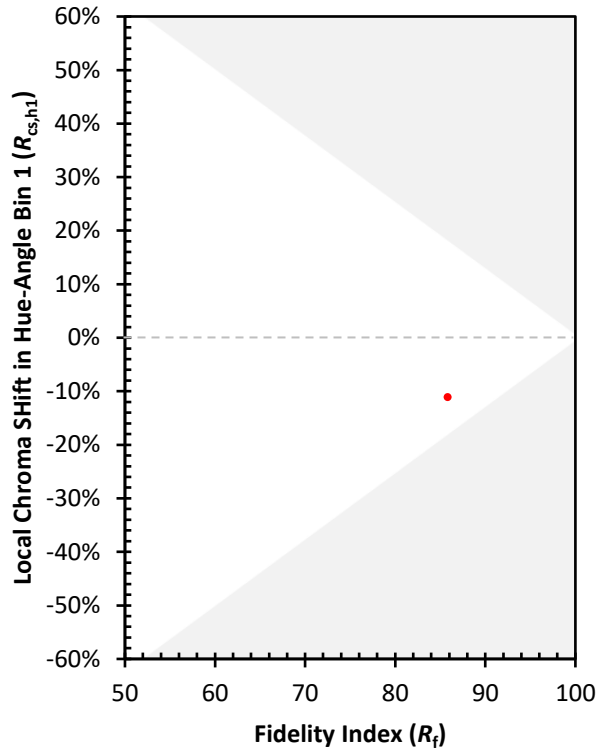
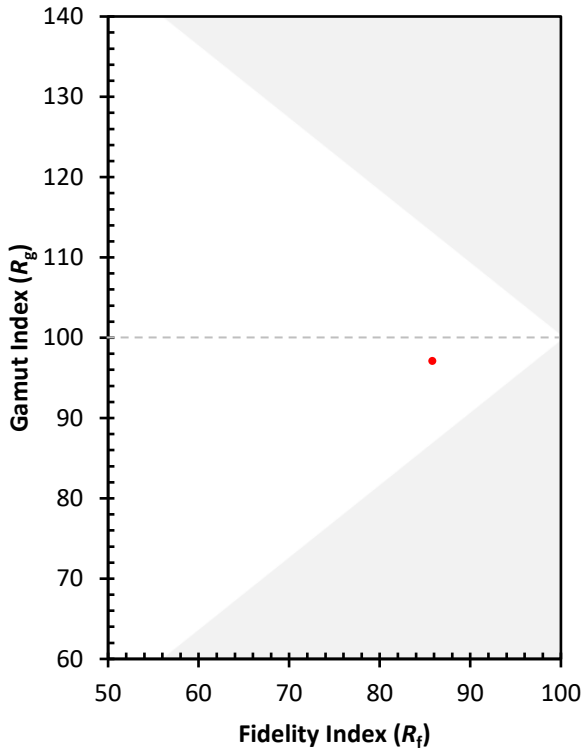
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 84 | CES51 = 96 | CES76 = 84 |
| CES02 = 64 | CES27 = 96 | CES52 = 95 | CES77 = 84 |
| CES03 = 32 | CES28 = 95 | CES53 = 90 | CES78 = 83 |
| CES04 = 71 | CES29 = 83 | CES54 = 93 | CES79 = 89 |
| CES05 = 51 | CES30 = 87 | CES55 = 93 | CES80 = 89 |
| CES06 = 52 | CES31 = 85 | CES56 = 88 | CES81 = 69 |
| CES07 = 43 | CES32 = 81 | CES57 = 88 | CES82 = 95 |
| CES08 = 42 | CES33 = 86 | CES58 = 89 | CES83 = 92 |
| CES09 = 29 | CES34 = 91 | CES59 = 93 | CES84 = 93 |
| CES10 = 77 | CES35 = 96 | CES60 = 97 | CES85 = 77 |
| CES11 = 60 | CES36 = 95 | CES61 = 92 | CES86 = 65 |
| CES12 = 66 | CES37 = 96 | CES62 = 97 | CES87 = 85 |
| CES13 = 44 | CES38 = 94 | CES63 = 87 | CES88 = 86 |
| CES14 = 74 | CES39 = 96 | CES64 = 88 | CES89 = 74 |
| CES15 = 72 | CES40 = 93 | CES65 = 82 | CES90 = 87 |
| CES16 = 48 | CES41 = 93 | CES66 = 87 | CES91 = 87 |
| CES17 = 50 | CES42 = 95 | CES67 = 86 | CES92 = 67 |
| CES18 = 57 | CES43 = 89 | CES68 = 87 | CES93 = 80 |
| CES19 = 73 | CES44 = 99 | CES69 = 92 | CES94 = 61 |
| CES20 = 67 | CES45 = 92 | CES70 = 84 | CES95 = 77 |
| CES21 = 87 | CES46 = 88 | CES71 = 85 | CES96 = 84 |
| CES22 = 79 | CES47 = 86 | CES72 = 94 | CES97 = 89 |
| CES23 = 92 | CES48 = 82 | CES73 = 79 | CES98 = 85 |
| CES24 = 91 | CES49 = 89 | CES74 = 90 | CES99 = 77 |
| CES25 = 72 | CES50 = 95 | CES75 = 86 |            |



Color Rendition by Hue-Angle Bin



Measure Comparisons



(END OF REPORT)