

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: STREETWORKS

Report Number: P348869

Luminaire Tested: **ARCH-N-PA1-10-730-24VDC-T4W-HSS**

Issue Date: 3/3/2020



**Test Information**

Test Method: LM-79-08  
Report Number: P348869  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-19)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: STREETWORKS  
Catalog Number: ARCH-N-PA1-10-730-24VDC-T4W-HSS  
Description: ARCHEON ROADWAY AND AREA LUMINAIRE  
(1) 70 CRI, 3000K, 270mA LIGHT ENGINE WITH 16 LEDS AND  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 1450 lumens  
Efficiency: N/A  
Efficacy: 103.6 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 0.75' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B0 - U0 - G1

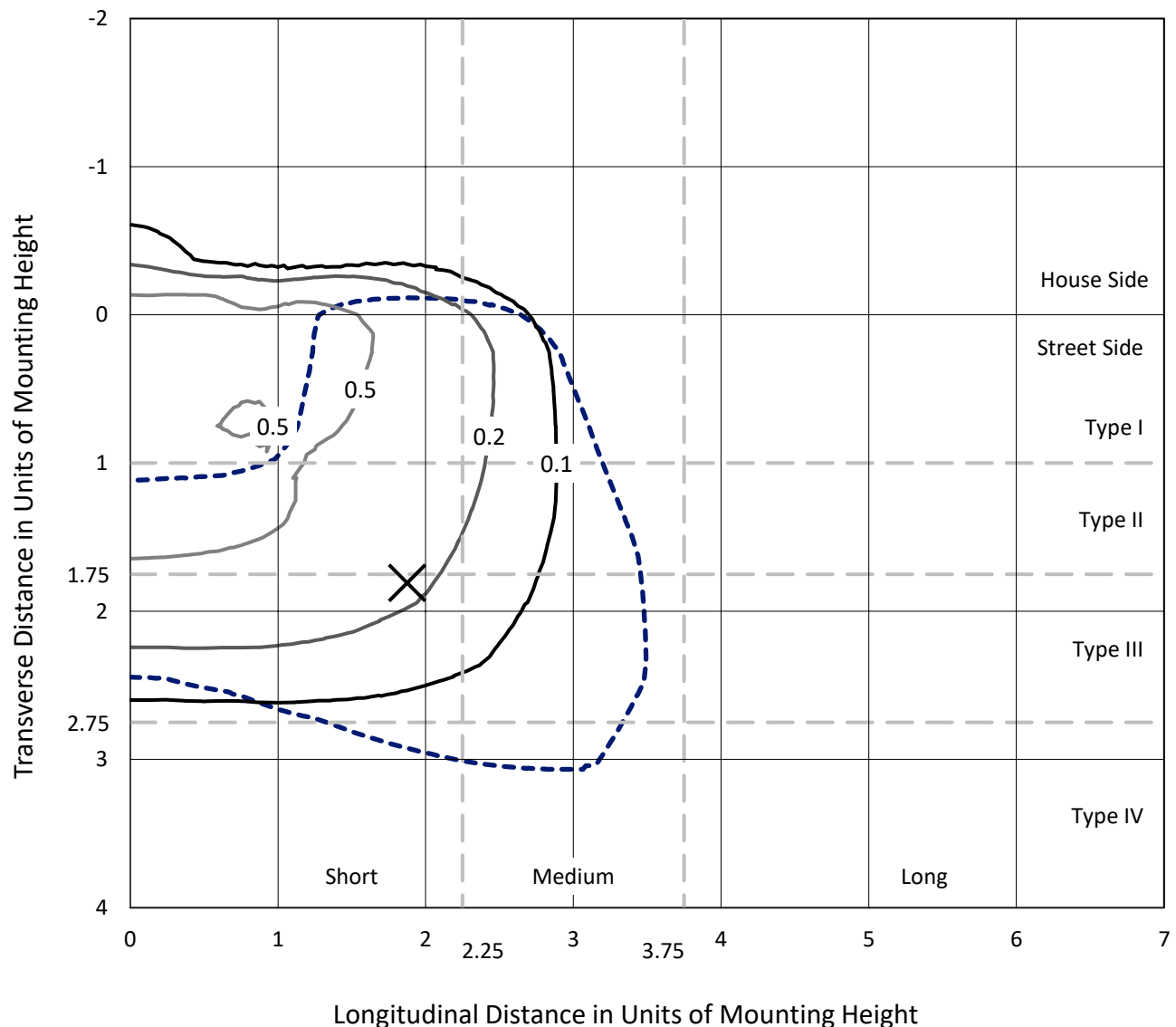
Input Watts (W): 14  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 25 FT

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## Iso-Footcandle Lines of Horizontal Illumination

✕ Max cd  
 - - - 1/2 Max cd

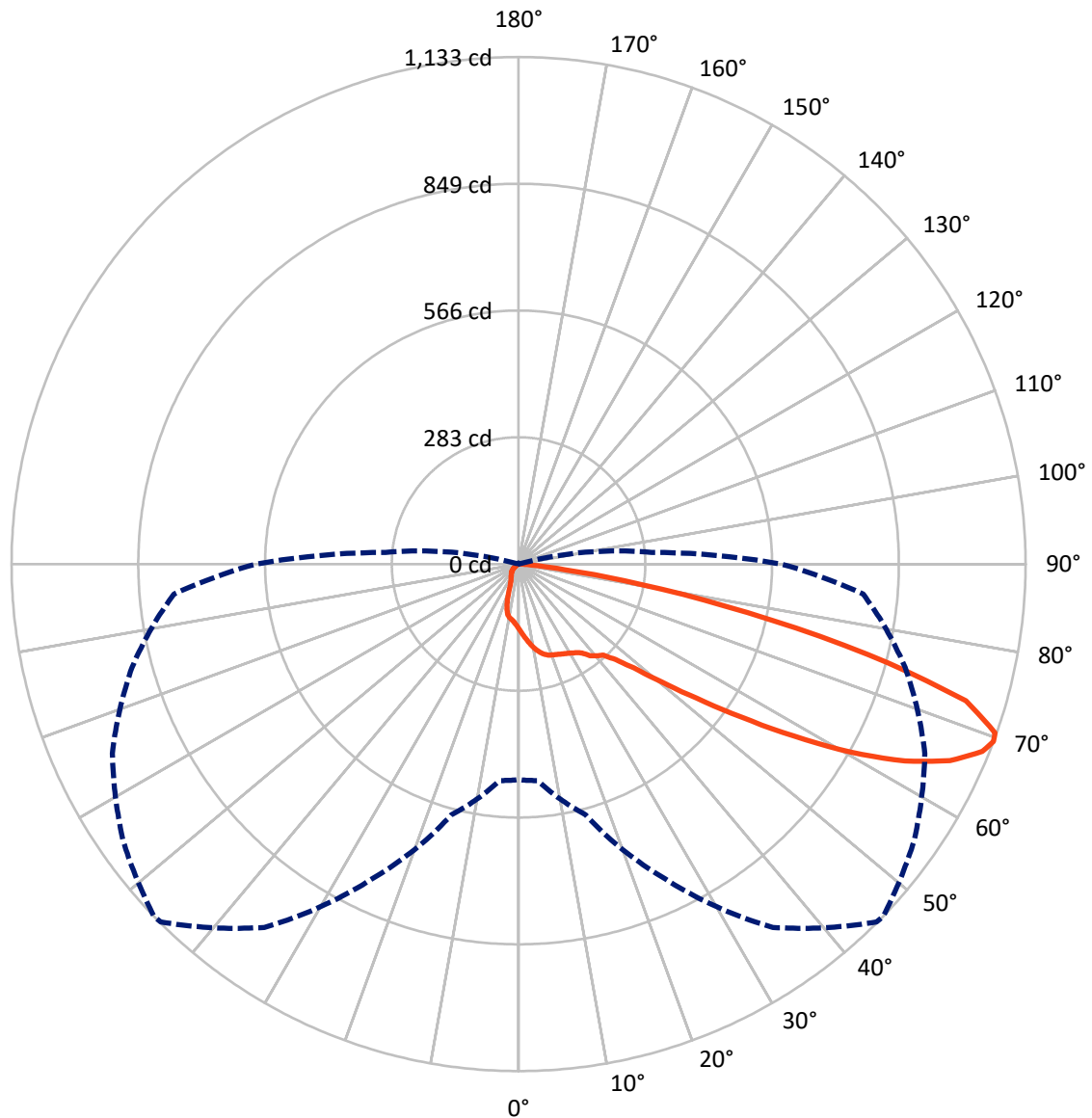


Based on 15 foot mounting height. Maximum calculated value = 0.9 fc  
 Type IV - Short - N/A

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## Luminous Intensity Polar Plot



— Vertical Plane Through 46-Deg Lateral      - - - Horizontal Cone Through 69-Deg Vertical

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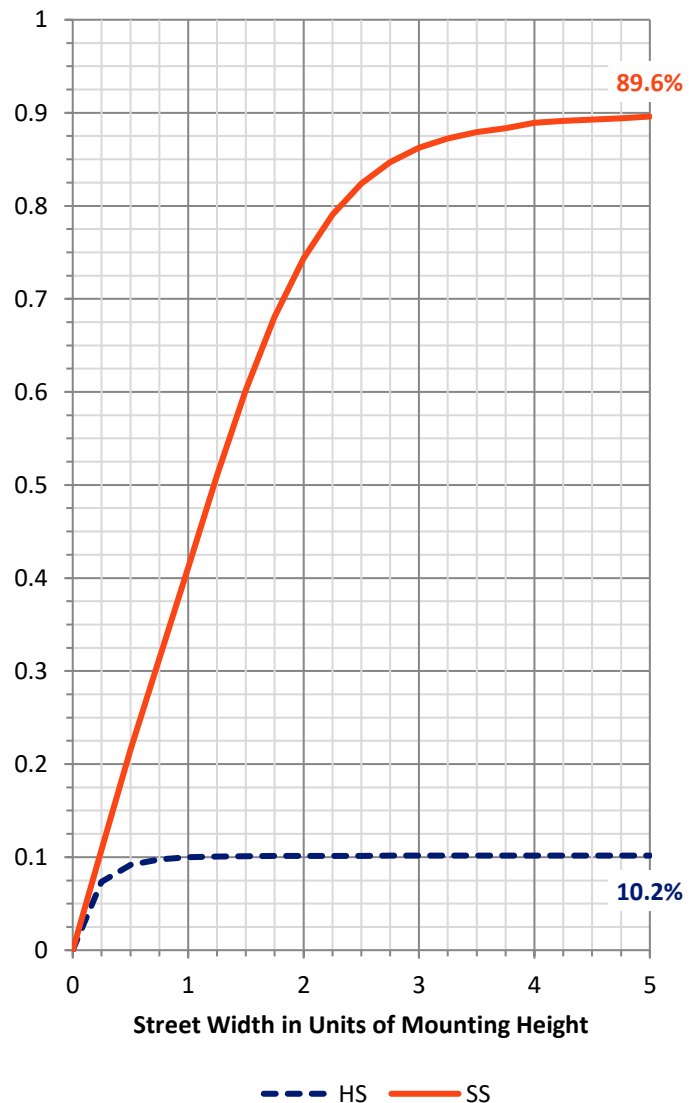
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 148.8    | 0.0    | 148.8  |
|                    | % Fixture | 10.3     | 0.0    | 10.3   |
| <b>Street Side</b> | Lumens    | 1301.2   | 0.0    | 1301.2 |
|                    | % Fixture | 89.7     | 0.0    | 89.7   |
| <b>Total</b>       | Lumens    | 1450.0   | 0.0    | 1450.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 14.5   | 1.0       |
| 10°-20°   | 43.9   | 3.0       |
| 20°-30°   | 69.0   | 4.8       |
| 30°-40°   | 98.9   | 6.8       |
| 40°-50°   | 171.0  | 11.8      |
| 50°-60°   | 337.8  | 23.3      |
| 60°-70°   | 472.1  | 32.6      |
| 70°-80°   | 228.1  | 15.7      |
| 80°-90°   | 14.7   | 1.0       |
| 90°-100°  | 0.0    | 0.0       |
| 100°-110° | 0.0    | 0.0       |
| 110°-120° | 0.0    | 0.0       |
| 120°-130° | 0.0    | 0.0       |
| 130°-140° | 0.0    | 0.0       |
| 140°-150° | 0.0    | 0.0       |
| 150°-160° | 0.0    | 0.0       |
| 160°-170° | 0.0    | 0.0       |
| 170°-180° | 0.0    | 0.0       |
| 0°-90°    | 1450.0 | 100.0     |
| 0°-180°   | 1450.0 | 100.0     |



REPORT NUMBER: P348869

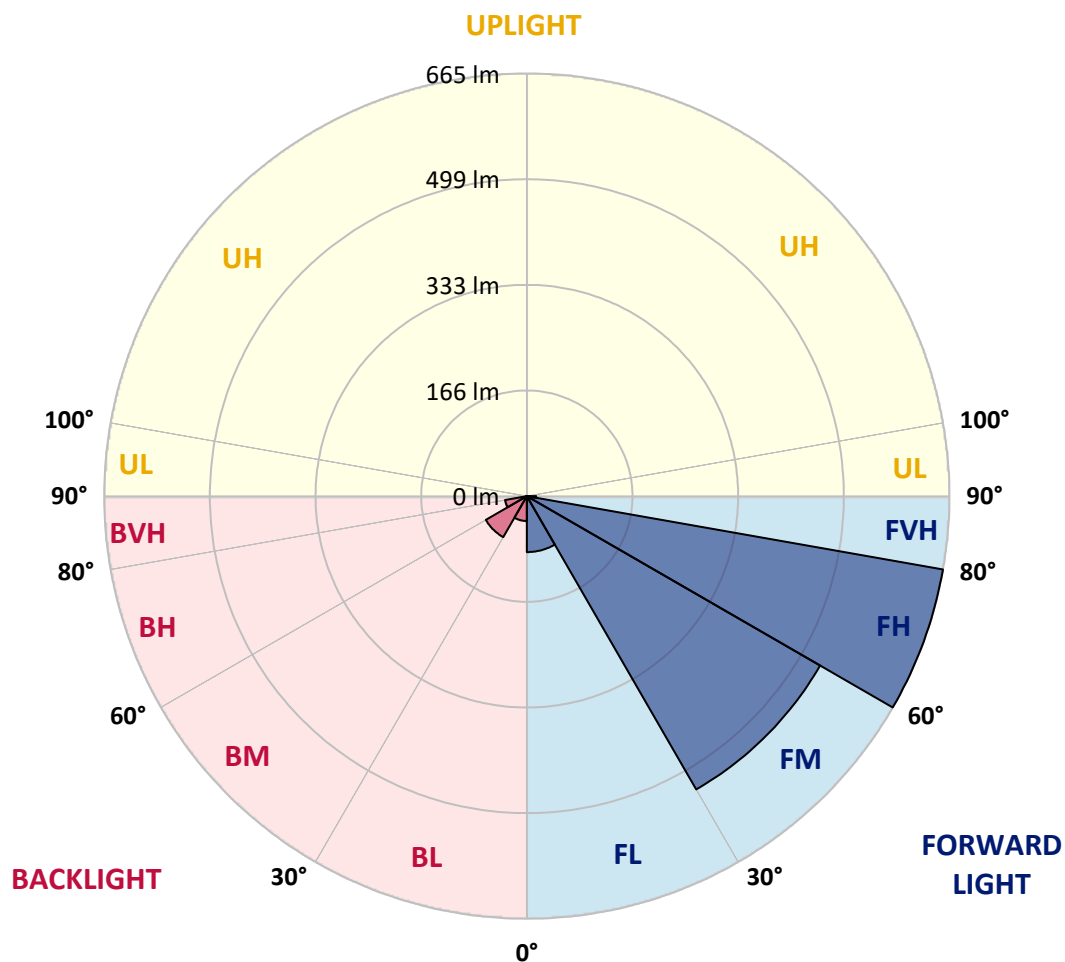
CATALOG NUMBER: ARCH-N-PA1-10-730-24VDC-T4W-HSS

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 88.1   | 6.1       |                         |      |         |
| FM   | (30°-60°)   | 533.2  | 36.8      |                         |      |         |
| FH   | (60°-80°)   | 665.3  | 45.9      |                         |      | G1/1800 |
| FVH  | (80°-90°)   | 14.5   | 1.0       |                         |      | G1/100  |
| BL   | (0°-30°)    | 39.2   | 2.7       | B0/110                  |      |         |
| BM   | (30°-60°)   | 74.6   | 5.1       | B0/220                  |      |         |
| BH   | (60°-80°)   | 34.9   | 2.4       | B0/110                  |      | G0/110  |
| BVH  | (80°-90°)   | 0.1    | 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-G1**

Type IV Short





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CATALOG NUMBER: ARCH-N-PA1-10-730-24VDC-T4W-HSS

**CANDELA DISTRIBUTION (FULL):**

|       | 0°    | 5°    | 15°   | 25°   | 35°    | 45°    | 46°    | 55°    | 65°    | 75°   | 85°   |
|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|-------|-------|
| 0°    | 145.3 | 145.3 | 145.3 | 145.3 | 145.3  | 145.3  | 145.3  | 145.3  | 145.3  | 145.3 | 145.3 |
| 2.5°  | 161.4 | 161.2 | 160.2 | 159.8 | 157.5  | 156.2  | 155.6  | 153.9  | 151.5  | 149.0 | 146.3 |
| 5°    | 179.8 | 179.7 | 177.9 | 176.2 | 171.9  | 167.8  | 167.0  | 163.1  | 157.6  | 152.4 | 147.3 |
| 7.5°  | 198.5 | 197.6 | 195.9 | 192.6 | 186.3  | 179.8  | 179.1  | 173.6  | 165.7  | 158.3 | 150.9 |
| 10°   | 214.4 | 213.9 | 211.6 | 206.6 | 199.2  | 191.8  | 191.0  | 184.2  | 175.3  | 166.2 | 156.7 |
| 12.5° | 226.8 | 226.4 | 223.3 | 217.1 | 209.3  | 201.6  | 200.6  | 194.4  | 185.0  | 174.7 | 163.6 |
| 15°   | 234.3 | 234.1 | 230.4 | 223.8 | 216.1  | 209.4  | 208.5  | 203.1  | 194.4  | 183.6 | 171.1 |
| 17.5° | 236.1 | 236.2 | 232.3 | 225.6 | 219.3  | 214.5  | 213.8  | 209.7  | 202.4  | 191.7 | 178.5 |
| 20°   | 232.2 | 233.0 | 229.5 | 223.7 | 219.8  | 217.3  | 216.7  | 214.3  | 208.1  | 198.0 | 184.5 |
| 22.5° | 226.6 | 227.0 | 224.6 | 220.7 | 219.1  | 219.6  | 219.3  | 218.0  | 212.7  | 203.5 | 190.4 |
| 25°   | 223.2 | 223.2 | 221.8 | 218.5 | 219.6  | 222.5  | 222.6  | 222.3  | 218.2  | 210.1 | 197.6 |
| 27.5° | 223.1 | 222.7 | 221.0 | 218.6 | 221.6  | 226.1  | 226.3  | 228.2  | 225.6  | 218.2 | 206.6 |
| 30°   | 228.5 | 228.0 | 224.6 | 221.4 | 225.2  | 230.0  | 230.7  | 234.7  | 233.4  | 227.0 | 216.6 |
| 32.5° | 241.2 | 239.5 | 231.8 | 226.6 | 229.5  | 235.2  | 236.1  | 242.5  | 244.5  | 237.8 | 226.3 |
| 35°   | 258.6 | 253.2 | 242.2 | 236.5 | 236.8  | 242.8  | 243.7  | 253.0  | 259.1  | 247.7 | 233.7 |
| 37.5° | 282.6 | 280.0 | 261.9 | 246.9 | 248.1  | 257.3  | 259.6  | 269.8  | 268.1  | 253.2 | 242.2 |
| 40°   | 335.2 | 331.1 | 311.9 | 275.8 | 258.9  | 268.9  | 269.7  | 275.1  | 275.3  | 265.5 | 259.9 |
| 42.5° | 406.9 | 405.2 | 385.0 | 328.4 | 280.2  | 276.8  | 278.1  | 287.3  | 297.6  | 291.5 | 291.2 |
| 45°   | 486.2 | 485.3 | 463.9 | 398.1 | 323.2  | 302.4  | 304.1  | 316.4  | 336.1  | 337.4 | 346.0 |
| 47.5° | 550.1 | 549.7 | 537.4 | 476.0 | 389.1  | 345.8  | 346.4  | 359.4  | 394.0  | 411.0 | 424.8 |
| 50°   | 608.3 | 610.2 | 600.5 | 560.2 | 478.8  | 413.9  | 412.6  | 421.3  | 476.8  | 504.7 | 521.9 |
| 52.5° | 689.2 | 692.0 | 664.7 | 638.8 | 573.0  | 498.3  | 497.3  | 506.4  | 576.3  | 597.3 | 600.3 |
| 55°   | 760.6 | 755.9 | 734.3 | 726.8 | 687.8  | 602.6  | 602.3  | 610.4  | 672.6  | 681.5 | 687.1 |
| 57.5° | 792.2 | 790.3 | 800.7 | 817.9 | 808.1  | 725.9  | 725.3  | 719.1  | 758.7  | 759.7 | 777.0 |
| 60°   | 812.1 | 814.3 | 846.2 | 899.0 | 923.4  | 858.5  | 854.6  | 817.3  | 841.0  | 838.9 | 857.4 |
| 62.5° | 797.1 | 801.5 | 858.9 | 947.0 | 1009.8 | 974.3  | 968.7  | 907.1  | 911.3  | 904.0 | 921.3 |
| 65°   | 717.7 | 724.6 | 818.6 | 937.9 | 1052.6 | 1064.8 | 1059.1 | 986.5  | 967.1  | 955.1 | 945.5 |
| 67.5° | 582.8 | 586.8 | 685.0 | 859.3 | 1033.3 | 1118.8 | 1117.6 | 1056.0 | 1009.2 | 946.5 | 872.1 |
| 69°   | 481.6 | 485.6 | 580.1 | 776.5 | 990.8  | 1130.3 | 1132.6 | 1078.3 | 1001.2 | 894.0 | 772.7 |
| 70°   | 407.9 | 412.2 | 500.2 | 705.5 | 941.5  | 1125.0 | 1129.0 | 1076.2 | 978.2  | 833.2 | 685.5 |
| 72.5° | 213.9 | 217.6 | 308.0 | 486.0 | 767.6  | 1033.0 | 1045.1 | 985.2  | 829.2  | 605.1 | 405.3 |
| 75°   | 67.2  | 69.3  | 120.3 | 254.1 | 525.5  | 803.2  | 806.0  | 772.9  | 588.8  | 332.9 | 168.8 |
| 77.5° | 25.6  | 25.0  | 40.0  | 93.6  | 265.7  | 505.7  | 522.8  | 483.0  | 309.0  | 117.7 | 39.0  |
| 80°   | 13.8  | 13.9  | 20.8  | 38.8  | 113.7  | 259.9  | 274.3  | 234.1  | 109.8  | 36.7  | 9.0   |
| 82.5° | 6.0   | 6.3   | 11.7  | 20.5  | 52.2   | 95.9   | 103.1  | 85.8   | 41.9   | 24.7  | 3.3   |
| 85°   | 1.3   | 1.4   | 5.6   | 11.1  | 21.3   | 26.9   | 28.2   | 27.8   | 26.7   | 19.2  | 1.3   |
| 87.5° | 0.0   | 0.0   | 2.5   | 4.0   | 5.4    | 6.1    | 5.4    | 7.0    | 14.8   | 12.9  | 0.7   |
| 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: ARCH-N-PA1-10-730-24VDC-T4W-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°   | 95°   | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 145.3 | 145.3 | 145.3 | 145.3 | 145.3 | 145.3 | 145.3 | 145.3 | 145.3 | 145.3 | 145.3 |
| 2.5°  | 145.4 | 144.2 | 142.1 | 139.8 | 138.1 | 136.4 | 135.1 | 134.5 | 133.8 | 133.3 | 133.9 |
| 5°    | 145.1 | 142.8 | 138.7 | 134.7 | 131.9 | 129.6 | 127.7 | 126.9 | 126.2 | 125.6 | 125.6 |
| 7.5°  | 147.5 | 144.2 | 137.9 | 132.2 | 127.7 | 124.6 | 122.0 | 120.9 | 120.1 | 119.7 | 119.3 |
| 10°   | 152.1 | 147.8 | 139.4 | 131.9 | 126.2 | 120.9 | 115.3 | 111.0 | 108.2 | 106.9 | 106.5 |
| 12.5° | 158.0 | 152.6 | 142.3 | 133.3 | 125.0 | 114.8 | 103.0 | 92.8  | 86.2  | 84.0  | 82.7  |
| 15°   | 164.9 | 158.3 | 146.0 | 135.2 | 120.8 | 102.2 | 82.1  | 68.8  | 62.7  | 61.5  | 60.1  |
| 17.5° | 171.6 | 164.3 | 150.5 | 135.5 | 111.6 | 81.7  | 60.2  | 51.1  | 48.7  | 49.6  | 49.8  |
| 20°   | 177.4 | 170.2 | 154.9 | 132.5 | 94.8  | 61.3  | 46.6  | 44.3  | 45.2  | 46.8  | 47.0  |
| 22.5° | 183.4 | 175.9 | 159.0 | 124.6 | 73.3  | 46.5  | 41.9  | 42.5  | 43.4  | 44.9  | 45.2  |
| 25°   | 190.6 | 182.8 | 162.8 | 110.1 | 55.0  | 39.6  | 39.8  | 40.7  | 41.5  | 43.0  | 43.1  |
| 27.5° | 198.9 | 191.6 | 165.3 | 91.3  | 40.8  | 36.4  | 37.3  | 38.5  | 39.4  | 40.7  | 41.0  |
| 30°   | 209.9 | 203.1 | 166.2 | 71.8  | 34.2  | 33.5  | 33.9  | 35.4  | 36.7  | 37.9  | 38.1  |
| 32.5° | 220.2 | 214.6 | 163.4 | 54.2  | 31.7  | 30.9  | 30.9  | 31.7  | 33.2  | 34.4  | 34.7  |
| 35°   | 229.7 | 226.1 | 154.7 | 39.6  | 29.8  | 28.4  | 27.7  | 27.7  | 28.7  | 29.6  | 29.9  |
| 37.5° | 242.3 | 242.2 | 140.7 | 31.6  | 27.9  | 26.4  | 25.0  | 23.9  | 23.5  | 23.7  | 23.9  |
| 40°   | 263.9 | 264.1 | 122.3 | 28.3  | 26.4  | 24.3  | 22.1  | 20.1  | 18.3  | 17.7  | 17.6  |
| 42.5° | 297.5 | 294.4 | 103.1 | 26.8  | 25.0  | 22.1  | 18.8  | 16.2  | 13.3  | 12.4  | 12.4  |
| 45°   | 350.9 | 332.8 | 82.7  | 25.4  | 23.6  | 19.6  | 15.6  | 12.0  | 9.7   | 9.0   | 9.0   |
| 47.5° | 428.8 | 383.2 | 64.0  | 23.8  | 21.7  | 16.9  | 11.8  | 8.6   | 7.1   | 6.7   | 6.8   |
| 50°   | 509.3 | 432.5 | 49.1  | 21.8  | 19.4  | 13.9  | 8.7   | 6.3   | 5.4   | 5.4   | 5.4   |
| 52.5° | 580.7 | 468.7 | 38.3  | 19.7  | 16.5  | 10.9  | 6.6   | 4.9   | 4.5   | 4.4   | 4.5   |
| 55°   | 647.5 | 492.0 | 29.3  | 17.3  | 13.1  | 8.2   | 5.0   | 4.0   | 3.7   | 3.6   | 3.5   |
| 57.5° | 711.9 | 503.6 | 22.0  | 13.9  | 9.5   | 5.9   | 4.0   | 3.4   | 3.1   | 2.9   | 2.9   |
| 60°   | 754.8 | 494.2 | 15.1  | 10.3  | 6.6   | 4.3   | 3.3   | 2.9   | 2.6   | 2.4   | 2.3   |
| 62.5° | 779.0 | 468.6 | 9.7   | 7.4   | 4.7   | 3.2   | 2.7   | 2.4   | 2.0   | 1.8   | 1.8   |
| 65°   | 769.3 | 426.3 | 6.8   | 5.3   | 3.4   | 2.4   | 2.0   | 2.0   | 1.4   | 1.2   | 1.1   |
| 67.5° | 681.7 | 360.1 | 5.2   | 3.9   | 2.4   | 1.8   | 1.5   | 1.7   | 0.9   | 0.5   | 0.5   |
| 69°   | 586.5 | 298.5 | 4.4   | 3.3   | 2.0   | 1.4   | 1.3   | 1.6   | 0.6   | 0.4   | 0.3   |
| 70°   | 509.8 | 257.5 | 4.0   | 2.9   | 1.7   | 1.2   | 1.2   | 1.5   | 0.6   | 0.3   | 0.3   |
| 72.5° | 305.0 | 143.6 | 3.1   | 2.0   | 1.1   | 1.0   | 1.0   | 1.7   | 0.6   | 0.3   | 0.3   |
| 75°   | 123.3 | 50.6  | 2.2   | 1.4   | 0.8   | 0.8   | 1.2   | 2.2   | 0.5   | 0.3   | 0.2   |
| 77.5° | 27.9  | 11.1  | 1.3   | 0.9   | 0.5   | 0.8   | 1.4   | 1.7   | 0.3   | 0.1   | 0.0   |
| 80°   | 6.8   | 2.7   | 0.8   | 0.5   | 0.3   | 0.6   | 1.0   | 1.0   | 0.1   | 0.0   | 0.0   |
| 82.5° | 2.2   | 1.0   | 0.3   | 0.3   | 0.1   | 0.2   | 0.5   | 0.3   | 0.0   | 0.0   | 0.0   |
| 85°   | 1.0   | 0.5   | 0.1   | 0.1   | 0.0   | 0.0   | 0.1   | 0.0   | 0.0   | 0.0   | 0.0   |
| 87.5° | 0.6   | 0.2   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 90°   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |



Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

STREETWORKS

Report Number: SP1-2101-121-6

Luminaire Tested: IFLD-S-SA2E-730-U-T2

Test Date: 03/04/2021

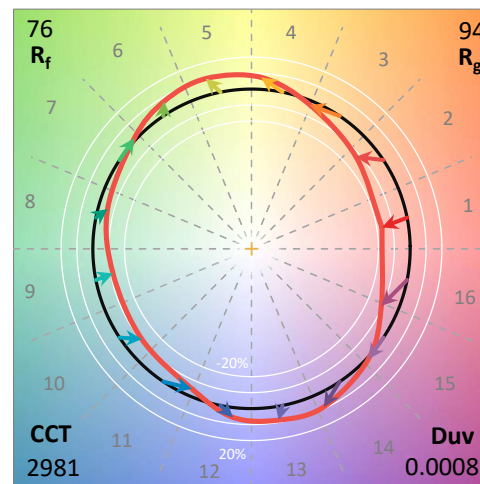
### Test Information

Test Method: LM-79-08  
 Report Number: SP1-2101-121-6  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1  
 Measurement Geometry:  $4\pi$   
 Issue Date: 03/04/2021  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: STREETWORKS  
 Catalog Number: **IFLD-S-SA2E-730-U-T2**  
 Description: STREETWORKS INF FLOOD

PROGRAMMED @ 615mA.

### Spectral Parameters

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 2981   | CRI (Ra): | 72.3 |      |       |
| CIE u':                   | 0.2509 | R1:       | 68.0 | R9:  | -36.9 |
| CIE v':                   | 0.5228 | R2:       | 82.9 | R10: | 62.7  |
| Duv:                      | 0.0008 | R3:       | 95.0 | R11: | 65.3  |
| CIE x:                    | 0.4393 | R4:       | 68.7 | R12: | 58.3  |
| CIE y:                    | 0.4068 | R5:       | 68.4 | R13: | 70.8  |
| CIE z:                    | 0.1540 | R6:       | 77.8 | R14: | 97.4  |
| Peak Wavelength (nm):     | 598    | R7:       | 76.5 |      |       |
| Dominant Wavelength (nm): | 582    | R8:       | 41.3 |      |       |
| Purity:                   | 54.3   |           |      |      |       |
| Rf:                       | 76.2   |           |      |      |       |
| Rg:                       | 94.1   |           |      |      |       |



### Test Conditions

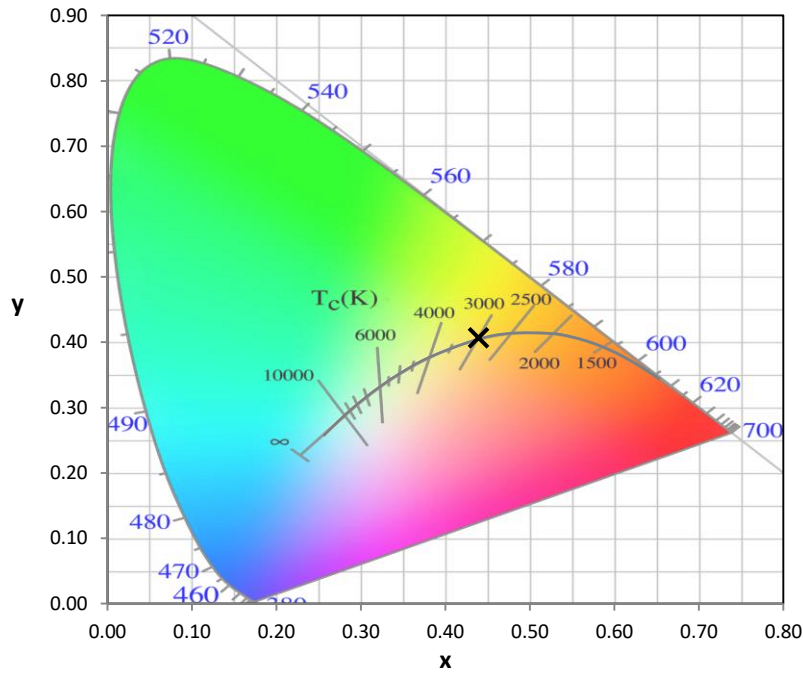
Stabilization Time: 64M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.0/30%  
 Sphere Temperature (°C): 24.1

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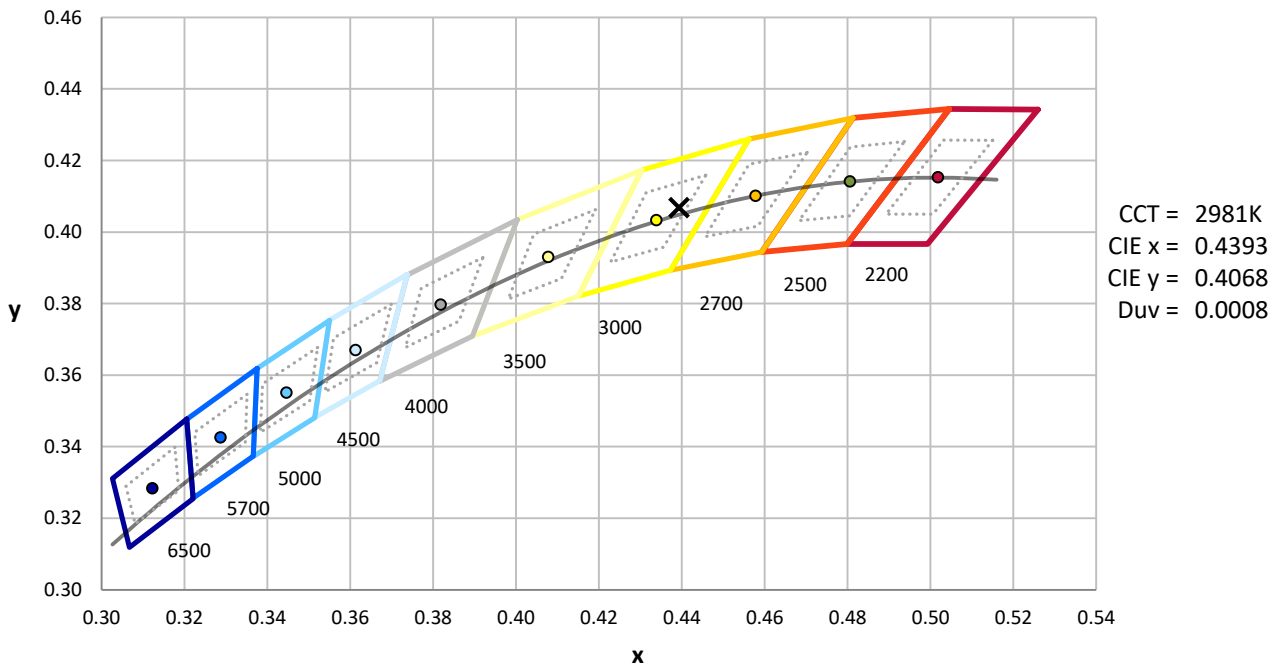
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 1/31/2021        | 7/31/2021            |
| Power Meter                    | IN0071                | 12/1/2020        | 12/1/2021            |
| AC Power Source                | IN0063                | 12/1/2020        | 12/1/2021            |
| DC Power Source                | IN0208                | 12/1/2020        | 12/1/2021            |
| Sphere Thermometer             | IN0085                | 12/1/2020        | 12/1/2021            |
| Room Thermometer               | IN0046                | 12/1/2020        | 12/1/2021            |

REPORT NUMBER: SP1-2101-121-6

**CIE 1931 Chromaticity Diagram**



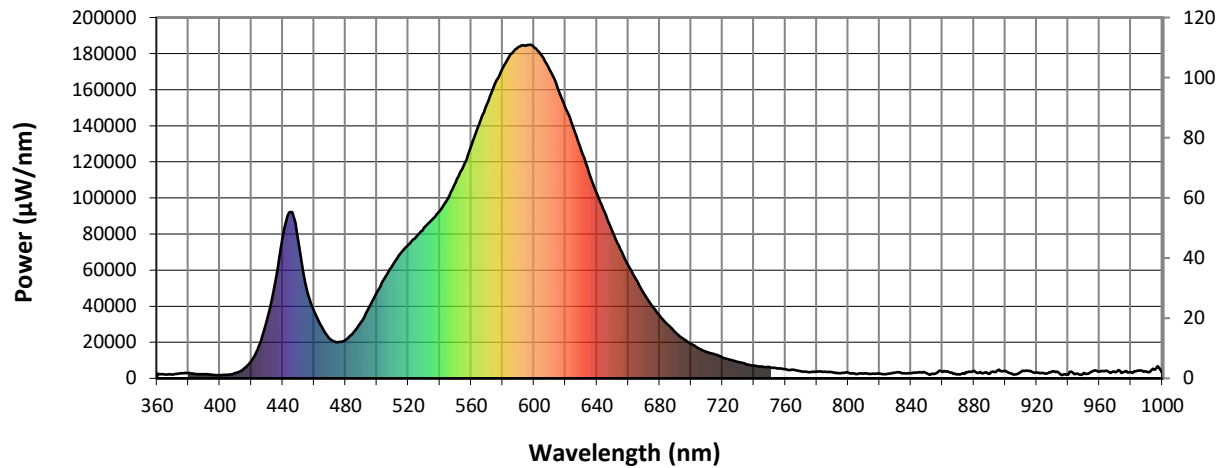
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 3000K 4-step quadrangle

REPORT NUMBER: SP1-2101-121-6

### Photopic Flux vs. Wavelength

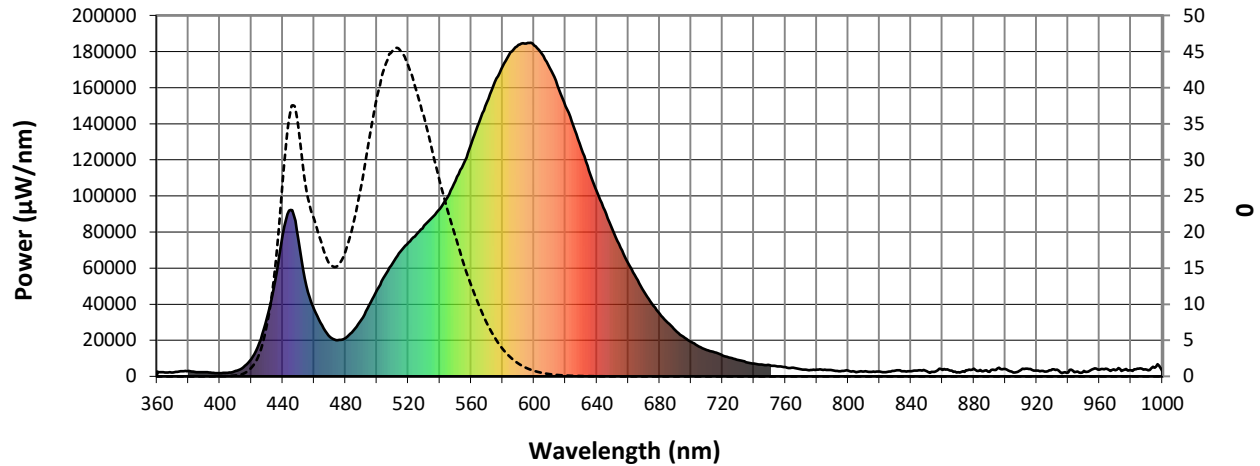


#####

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 2718             | 0.0              | 490       | 31388            | 4.5              | 620       | 149681           | 39.0             | 750       | 6127             | 0.0              | 880       | 4244             | 0.0              |
| 365       | 2104             | 0.0              | 495       | 39325            | 7.1              | 625       | 139059           | 30.7             | 755       | 5537             | 0.0              | 885       | 2890             | 0.0              |
| 370       | 2172             | 0.0              | 500       | 47816            | 10.5             | 630       | 126485           | 22.9             | 760       | 5066             | 0.0              | 890       | 2506             | 0.0              |
| 375       | 2770             | 0.0              | 505       | 55667            | 15.6             | 635       | 114115           | 17.1             | 765       | 4739             | 0.0              | 895       | 4522             | 0.0              |
| 380       | 2942             | 0.0              | 510       | 62766            | 21.6             | 640       | 102385           | 12.2             | 770       | 3828             | 0.0              | 900       | 4104             | 0.0              |
| 385       | 2372             | 0.0              | 515       | 69117            | 28.6             | 645       | 91895            | 8.8              | 775       | 3411             | 0.0              | 905       | 2090             | 0.0              |
| 390       | 2265             | 0.0              | 520       | 74088            | 35.9             | 650       | 81196            | 5.9              | 780       | 3776             | 0.0              | 910       | 3618             | 0.0              |
| 395       | 2023             | 0.0              | 525       | 78477            | 42.1             | 655       | 71232            | 4.1              | 785       | 3744             | 0.0              | 915       | 4126             | 0.0              |
| 400       | 1804             | 0.0              | 530       | 83585            | 49.2             | 660       | 62529            | 2.6              | 790       | 3446             | 0.0              | 920       | 3214             | 0.0              |
| 405       | 2029             | 0.0              | 535       | 87899            | 54.5             | 665       | 54721            | 1.7              | 795       | 2834             | 0.0              | 925       | 2696             | 0.0              |
| 410       | 2968             | 0.0              | 540       | 92850            | 60.5             | 670       | 47069            | 1.0              | 800       | 3213             | 0.0              | 930       | 3892             | 0.0              |
| 415       | 5120             | 0.0              | 545       | 99487            | 66.2             | 675       | 40348            | 0.7              | 805       | 2357             | 0.0              | 935       | 2376             | 0.0              |
| 420       | 9660             | 0.0              | 550       | 108411           | 73.7             | 680       | 34816            | 0.4              | 810       | 2616             | 0.0              | 940       | 2172             | 0.0              |
| 425       | 18379            | 0.1              | 555       | 117570           | 80.3             | 685       | 29890            | 0.3              | 815       | 2510             | 0.0              | 945       | 2531             | 0.0              |
| 430       | 32455            | 0.3              | 560       | 128783           | 87.5             | 690       | 25584            | 0.1              | 820       | 2684             | 0.0              | 950       | 3041             | 0.0              |
| 435       | 52561            | 0.6              | 565       | 140888           | 93.7             | 695       | 21945            | 0.1              | 825       | 2434             | 0.0              | 955       | 3777             | 0.0              |
| 440       | 78320            | 1.2              | 570       | 151789           | 98.7             | 700       | 19163            | 0.1              | 830       | 3163             | 0.0              | 960       | 3733             | 0.0              |
| 445       | 92278            | 1.9              | 575       | 163210           | 101.6            | 705       | 16563            | 0.0              | 835       | 2905             | 0.0              | 965       | 4082             | 0.0              |
| 450       | 75996            | 2.0              | 580       | 171760           | 102.1            | 710       | 14632            | 0.0              | 840       | 2917             | 0.0              | 970       | 3333             | 0.0              |
| 455       | 50251            | 1.7              | 585       | 179606           | 99.8             | 715       | 13282            | 0.0              | 845       | 3384             | 0.0              | 975       | 3396             | 0.0              |
| 460       | 37320            | 1.5              | 590       | 183682           | 95.0             | 720       | 11587            | 0.0              | 850       | 2926             | 0.0              | 980       | 3415             | 0.0              |
| 465       | 28321            | 1.5              | 595       | 184440           | 87.4             | 725       | 10271            | 0.0              | 855       | 2420             | 0.0              | 985       | 4316             | 0.0              |
| 470       | 21814            | 1.4              | 600       | 183413           | 79.0             | 730       | 9052             | 0.0              | 860       | 3637             | 0.0              | 990       | 3771             | 0.0              |
| 475       | 19996            | 1.6              | 605       | 178745           | 69.2             | 735       | 7872             | 0.0              | 865       | 3162             | 0.0              | 995       | 4745             | 0.0              |
| 480       | 21364            | 2.0              | 610       | 170867           | 58.7             | 740       | 7066             | 0.0              | 870       | 2292             | 0.0              | 1000      | 2768             | 0.0              |
| 485       | 25425            | 3.0              | 615       | 161088           | 48.6             | 745       | 6501             | 0.0              | 875       | 3357             | 0.0              |           |                  |                  |

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### Scotopic Flux vs. Wavelength



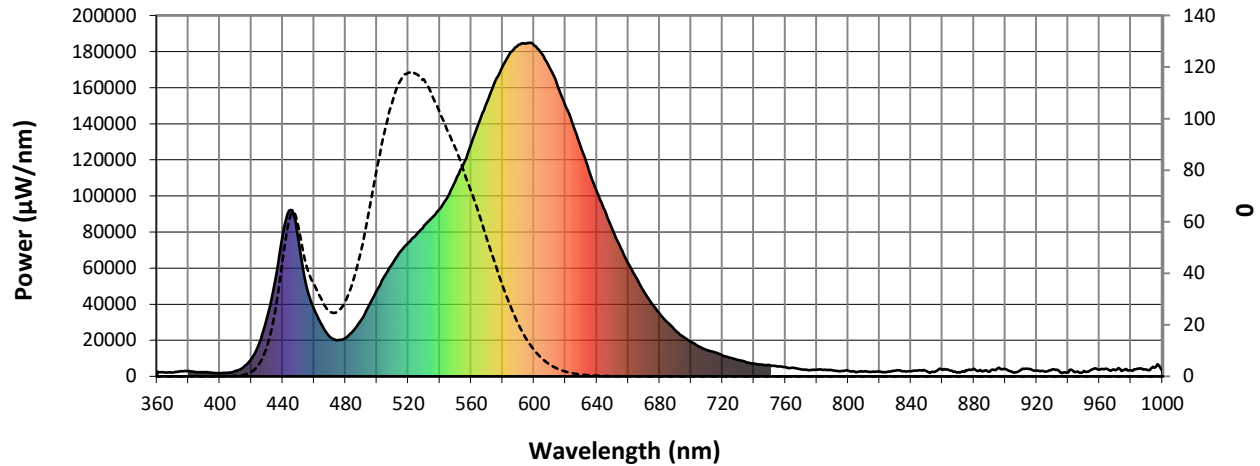
Scotopic Lumens: 10635.1

S/P: 1.22

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 2718             | 0.0              | 490       | 31388            | 48.3             | 620       | 149681           | 1.9              | 750       | 6127             | 0.0              | 880       | 4244             | 0.0              |
| 365       | 2104             | 0.0              | 495       | 39325            | 63.6             | 625       | 139059           | 1.2              | 755       | 5537             | 0.0              | 885       | 2890             | 0.0              |
| 370       | 2172             | 0.0              | 500       | 47816            | 80.0             | 630       | 126485           | 0.7              | 760       | 5066             | 0.0              | 890       | 2506             | 0.0              |
| 375       | 2770             | 0.0              | 505       | 55667            | 94.6             | 635       | 114115           | 0.4              | 765       | 4739             | 0.0              | 895       | 4522             | 0.0              |
| 380       | 2942             | 0.0              | 510       | 62766            | 106.4            | 640       | 102385           | 0.3              | 770       | 3828             | 0.0              | 900       | 4104             | 0.0              |
| 385       | 2372             | 0.0              | 515       | 69117            | 114.6            | 645       | 91895            | 0.2              | 775       | 3411             | 0.0              | 905       | 2090             | 0.0              |
| 390       | 2265             | 0.0              | 520       | 74088            | 117.8            | 650       | 81196            | 0.1              | 780       | 3776             | 0.0              | 910       | 3618             | 0.0              |
| 395       | 2023             | 0.0              | 525       | 78477            | 117.4            | 655       | 71232            | 0.1              | 785       | 3744             | 0.0              | 915       | 4126             | 0.0              |
| 400       | 1804             | 0.0              | 530       | 83585            | 115.2            | 660       | 62529            | 0.0              | 790       | 3446             | 0.0              | 920       | 3214             | 0.0              |
| 405       | 2029             | 0.1              | 535       | 87899            | 109.5            | 665       | 54721            | 0.0              | 795       | 2834             | 0.0              | 925       | 2696             | 0.0              |
| 410       | 2968             | 0.2              | 540       | 92850            | 102.6            | 670       | 47069            | 0.0              | 800       | 3213             | 0.0              | 930       | 3892             | 0.0              |
| 415       | 5120             | 0.5              | 545       | 99487            | 95.4             | 675       | 40348            | 0.0              | 805       | 2357             | 0.0              | 935       | 2376             | 0.0              |
| 420       | 9660             | 1.6              | 550       | 108411           | 88.6             | 680       | 34816            | 0.0              | 810       | 2616             | 0.0              | 940       | 2172             | 0.0              |
| 425       | 18379            | 4.5              | 555       | 117570           | 80.3             | 685       | 29890            | 0.0              | 815       | 2510             | 0.0              | 945       | 2531             | 0.0              |
| 430       | 32455            | 11.0             | 560       | 128783           | 72.0             | 690       | 25584            | 0.0              | 820       | 2684             | 0.0              | 950       | 3041             | 0.0              |
| 435       | 52561            | 23.5             | 565       | 140888           | 63.2             | 695       | 21945            | 0.0              | 825       | 2434             | 0.0              | 955       | 3777             | 0.0              |
| 440       | 78320            | 43.8             | 570       | 151789           | 53.6             | 700       | 19163            | 0.0              | 830       | 3163             | 0.0              | 960       | 3733             | 0.0              |
| 445       | 92278            | 61.8             | 575       | 163210           | 44.4             | 705       | 16563            | 0.0              | 835       | 2905             | 0.0              | 965       | 4082             | 0.0              |
| 450       | 75996            | 58.9             | 580       | 171760           | 35.4             | 710       | 14632            | 0.0              | 840       | 2917             | 0.0              | 970       | 3333             | 0.0              |
| 455       | 50251            | 43.9             | 585       | 179606           | 27.4             | 715       | 13282            | 0.0              | 845       | 3384             | 0.0              | 975       | 3396             | 0.0              |
| 460       | 37320            | 36.0             | 590       | 183682           | 20.5             | 720       | 11587            | 0.0              | 850       | 2926             | 0.0              | 980       | 3415             | 0.0              |
| 465       | 28321            | 29.9             | 595       | 184440           | 14.7             | 725       | 10271            | 0.0              | 855       | 2420             | 0.0              | 985       | 4316             | 0.0              |
| 470       | 21814            | 25.1             | 600       | 183413           | 10.3             | 730       | 9052             | 0.0              | 860       | 3637             | 0.0              | 990       | 3771             | 0.0              |
| 475       | 19996            | 25.0             | 605       | 178745           | 7.0              | 735       | 7872             | 0.0              | 865       | 3162             | 0.0              | 995       | 4745             | 0.0              |
| 480       | 21364            | 28.9             | 610       | 170867           | 4.6              | 740       | 7066             | 0.0              | 870       | 2292             | 0.0              | 1000      | 2768             | 0.0              |
| 485       | 25425            | 36.9             | 615       | 161088           | 3.0              | 745       | 6501             | 0.0              | 875       | 3357             | 0.0              |           |                  |                  |

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### Melanopic Flux vs. Wavelength



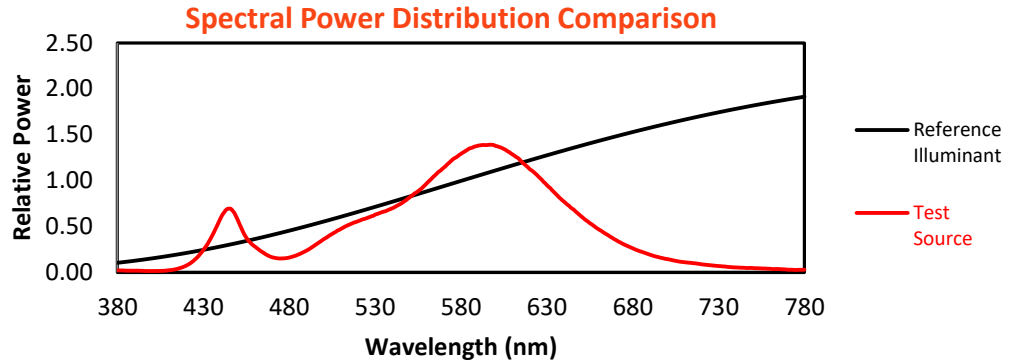
**Melanopic Lumens: 3860**

**M/P: 0.44**

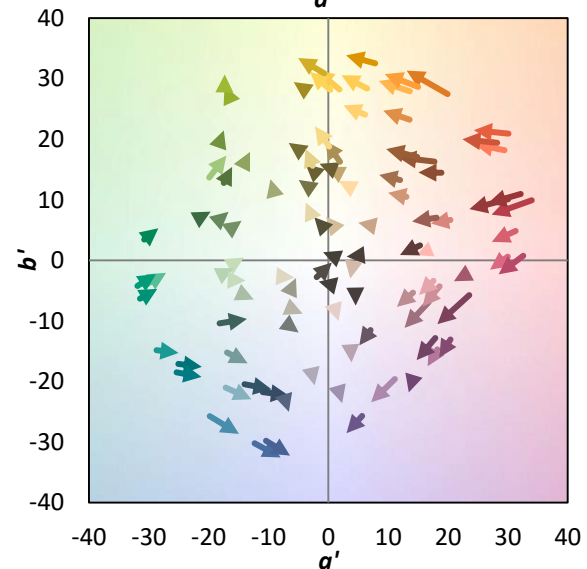
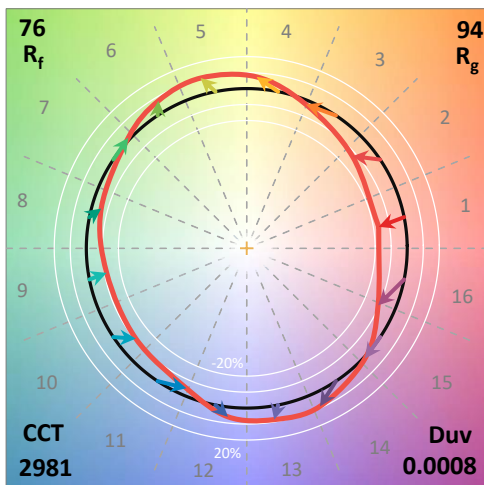
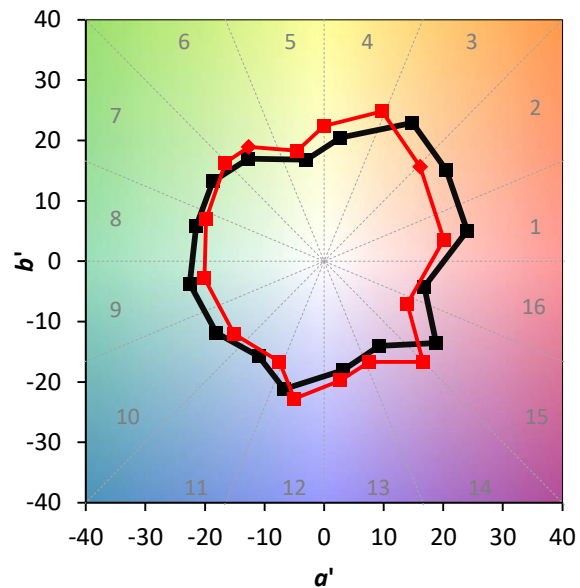
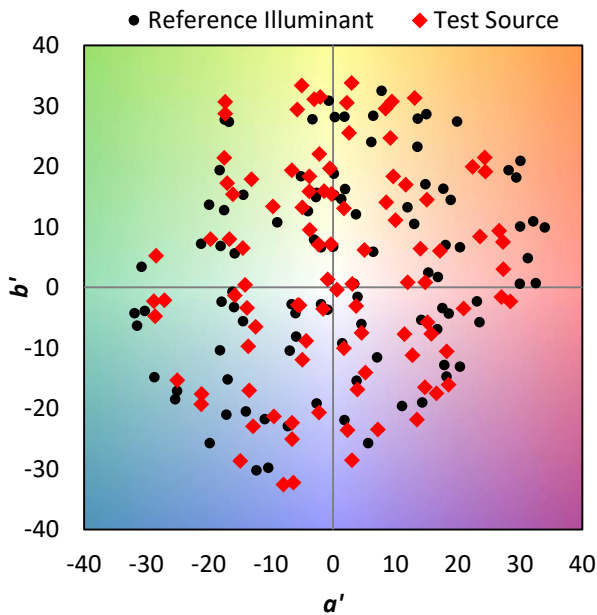
| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 2718             | 0.0              | 490       | 31388            | 26.1             | 620       | 149681           | 0.1              | 750       | 6127             | 0.0              | 880       | 4244             | 0.0              |
| 365       | 2104             | 0.0              | 495       | 39325            | 32.5             | 625       | 139059           | 0.1              | 755       | 5537             | 0.0              | 885       | 2890             | 0.0              |
| 370       | 2172             | 0.0              | 500       | 47816            | 38.4             | 630       | 126485           | 0.0              | 760       | 5066             | 0.0              | 890       | 2506             | 0.0              |
| 375       | 2770             | 0.0              | 505       | 55667            | 42.7             | 635       | 114115           | 0.0              | 765       | 4739             | 0.0              | 895       | 4522             | 0.0              |
| 380       | 2942             | 0.0              | 510       | 62766            | 45.1             | 640       | 102385           | 0.0              | 770       | 3828             | 0.0              | 900       | 4104             | 0.0              |
| 385       | 2372             | 0.0              | 515       | 69117            | 45.2             | 645       | 91895            | 0.0              | 775       | 3411             | 0.0              | 905       | 2090             | 0.0              |
| 390       | 2265             | 0.0              | 520       | 74088            | 43.1             | 650       | 81196            | 0.0              | 780       | 3776             | 0.0              | 910       | 3618             | 0.0              |
| 395       | 2023             | 0.0              | 525       | 78477            | 39.8             | 655       | 71232            | 0.0              | 785       | 3744             | 0.0              | 915       | 4126             | 0.0              |
| 400       | 1804             | 0.0              | 530       | 83585            | 36.1             | 660       | 62529            | 0.0              | 790       | 3446             | 0.0              | 920       | 3214             | 0.0              |
| 405       | 2029             | 0.0              | 535       | 87899            | 31.6             | 665       | 54721            | 0.0              | 795       | 2834             | 0.0              | 925       | 2696             | 0.0              |
| 410       | 2968             | 0.1              | 540       | 92850            | 27.2             | 670       | 47069            | 0.0              | 800       | 3213             | 0.0              | 930       | 3892             | 0.0              |
| 415       | 5120             | 0.3              | 545       | 99487            | 23.1             | 675       | 40348            | 0.0              | 805       | 2357             | 0.0              | 935       | 2376             | 0.0              |
| 420       | 9660             | 1.1              | 550       | 108411           | 19.5             | 680       | 34816            | 0.0              | 810       | 2616             | 0.0              | 940       | 2172             | 0.0              |
| 425       | 18379            | 2.9              | 555       | 117570           | 15.9             | 685       | 29890            | 0.0              | 815       | 2510             | 0.0              | 945       | 2531             | 0.0              |
| 430       | 32455            | 6.9              | 560       | 128783           | 12.7             | 690       | 25584            | 0.0              | 820       | 2684             | 0.0              | 950       | 3041             | 0.0              |
| 435       | 52561            | 14.0             | 565       | 140888           | 9.9              | 695       | 21945            | 0.0              | 825       | 2434             | 0.0              | 955       | 3777             | 0.0              |
| 440       | 78320            | 26.2             | 570       | 151789           | 7.4              | 700       | 19163            | 0.0              | 830       | 3163             | 0.0              | 960       | 3733             | 0.0              |
| 445       | 92278            | 36.4             | 575       | 163210           | 5.4              | 705       | 16563            | 0.0              | 835       | 2905             | 0.0              | 965       | 4082             | 0.0              |
| 450       | 75996            | 35.0             | 580       | 171760           | 3.8              | 710       | 14632            | 0.0              | 840       | 2917             | 0.0              | 970       | 3333             | 0.0              |
| 455       | 50251            | 26.3             | 585       | 179606           | 2.7              | 715       | 13282            | 0.0              | 845       | 3384             | 0.0              | 975       | 3396             | 0.0              |
| 460       | 37320            | 22.0             | 590       | 183682           | 1.8              | 720       | 11587            | 0.0              | 850       | 2926             | 0.0              | 980       | 3415             | 0.0              |
| 465       | 28321            | 18.5             | 595       | 184440           | 1.2              | 725       | 10271            | 0.0              | 855       | 2420             | 0.0              | 985       | 4316             | 0.0              |
| 470       | 21814            | 15.6             | 600       | 183413           | 0.8              | 730       | 9052             | 0.0              | 860       | 3637             | 0.0              | 990       | 3771             | 0.0              |
| 475       | 19996            | 15.3             | 605       | 178745           | 0.5              | 735       | 7872             | 0.0              | 865       | 3162             | 0.0              | 995       | 4745             | 0.0              |
| 480       | 21364            | 17.2             | 610       | 170867           | 0.3              | 740       | 7066             | 0.0              | 870       | 2292             | 0.0              | 1000      | 2768             | 0.0              |
| 485       | 25425            | 21.0             | 615       | 161088           | 0.2              | 745       | 6501             | 0.0              | 875       | 3357             | 0.0              |           |                  |                  |

### Summary

$R_f = 76.2$   
 $R_g = 94.1$   
 CIE  $R_a = 72.3$   
 $R_g = -36.9$



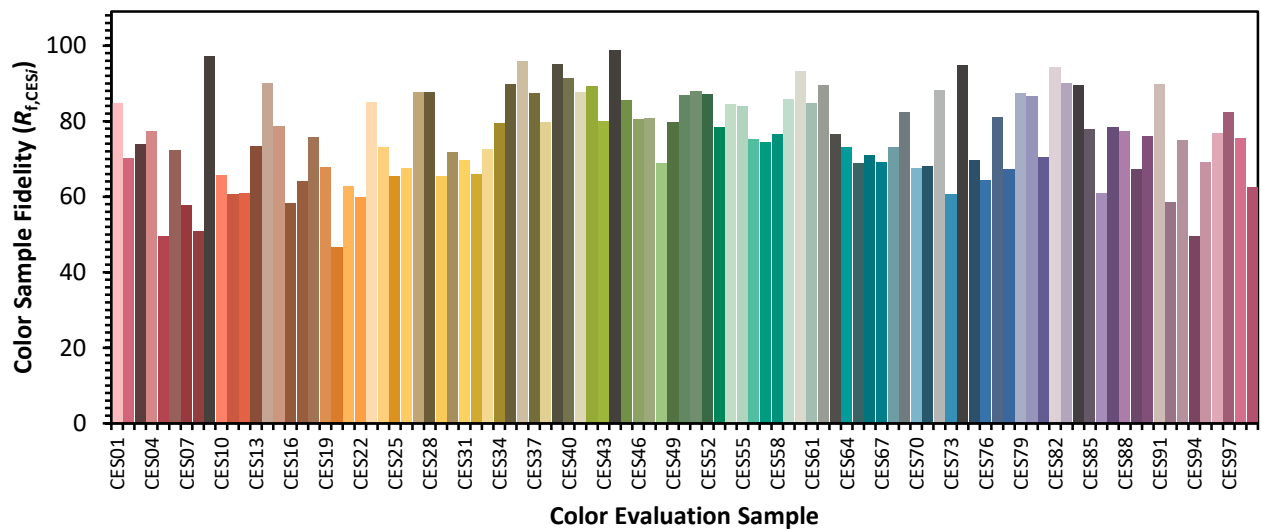
### Color Vector Graphics



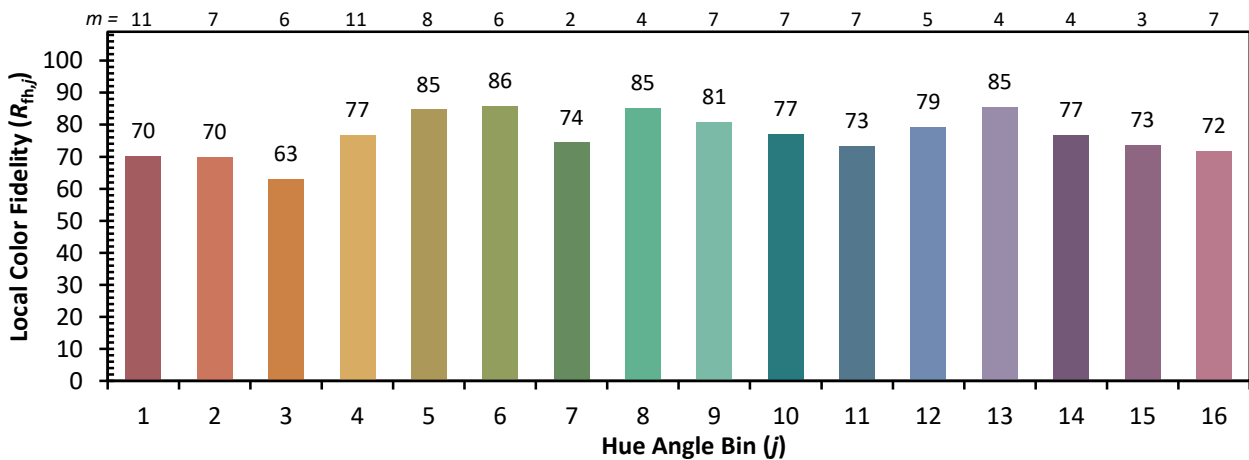
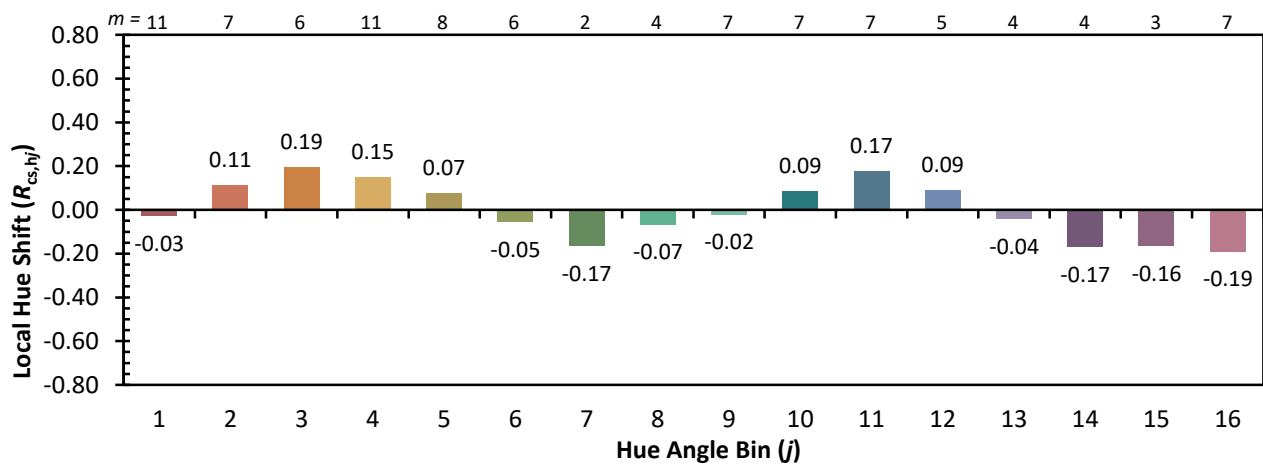
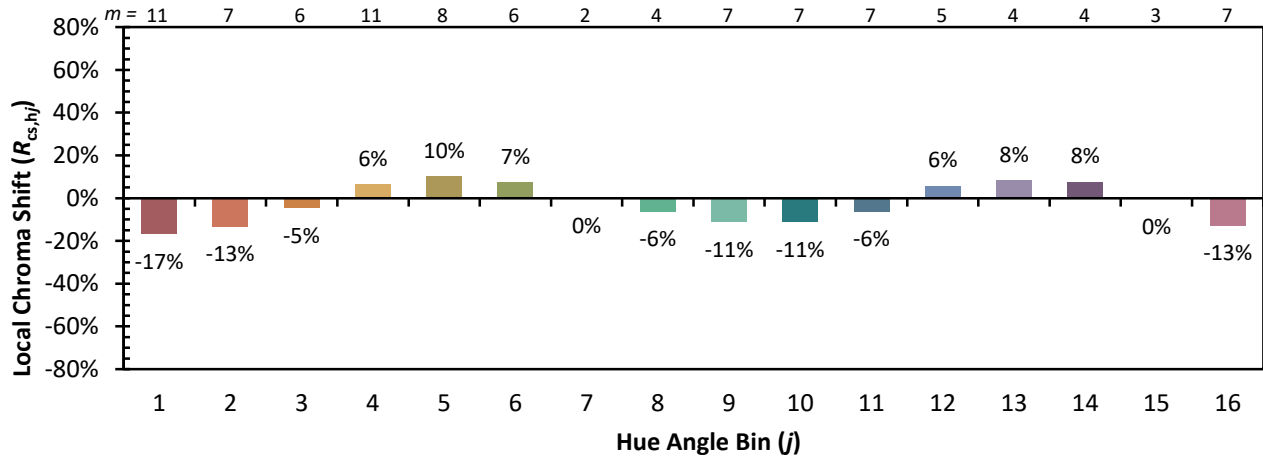


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

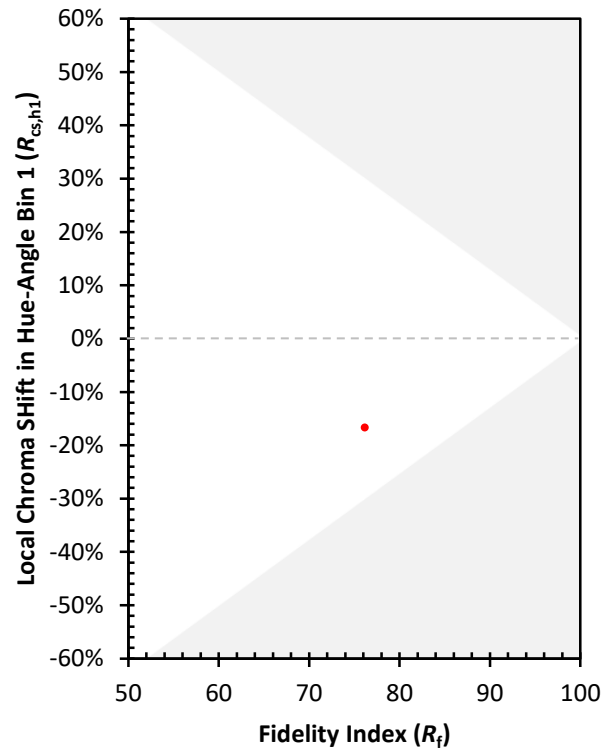
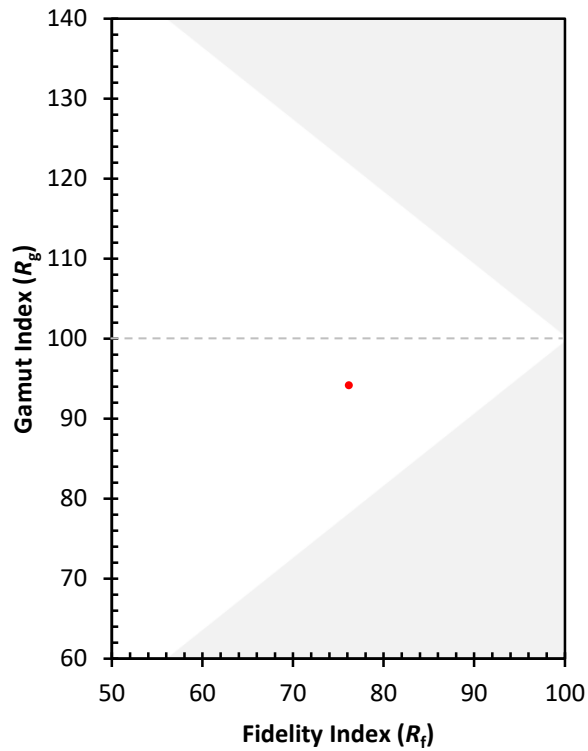
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 67 | CES51 = 88 | CES76 = 64 |
| CES02 = 63 | CES27 = 88 | CES52 = 87 | CES77 = 81 |
| CES03 = 31 | CES28 = 88 | CES53 = 79 | CES78 = 67 |
| CES04 = 71 | CES29 = 66 | CES54 = 84 | CES79 = 87 |
| CES05 = 49 | CES30 = 72 | CES55 = 84 | CES80 = 87 |
| CES06 = 51 | CES31 = 70 | CES56 = 75 | CES81 = 71 |
| CES07 = 41 | CES32 = 66 | CES57 = 74 | CES82 = 94 |
| CES08 = 40 | CES33 = 73 | CES58 = 77 | CES83 = 90 |
| CES09 = 29 | CES34 = 80 | CES59 = 86 | CES84 = 90 |
| CES10 = 76 | CES35 = 90 | CES60 = 93 | CES85 = 78 |
| CES11 = 59 | CES36 = 96 | CES61 = 85 | CES86 = 61 |
| CES12 = 65 | CES37 = 88 | CES62 = 90 | CES87 = 79 |
| CES13 = 43 | CES38 = 80 | CES63 = 77 | CES88 = 77 |
| CES14 = 74 | CES39 = 95 | CES64 = 73 | CES89 = 67 |
| CES15 = 71 | CES40 = 91 | CES65 = 69 | CES90 = 76 |
| CES16 = 47 | CES41 = 88 | CES66 = 71 | CES91 = 90 |
| CES17 = 50 | CES42 = 89 | CES67 = 69 | CES92 = 59 |
| CES18 = 56 | CES43 = 80 | CES68 = 73 | CES93 = 75 |
| CES19 = 73 | CES44 = 99 | CES69 = 82 | CES94 = 50 |
| CES20 = 66 | CES45 = 85 | CES70 = 68 | CES95 = 69 |
| CES21 = 87 | CES46 = 80 | CES71 = 68 | CES96 = 77 |
| CES22 = 79 | CES47 = 81 | CES72 = 88 | CES97 = 83 |
| CES23 = 92 | CES48 = 69 | CES73 = 61 | CES98 = 75 |
| CES24 = 91 | CES49 = 80 | CES74 = 95 | CES99 = 63 |
| CES25 = 73 | CES50 = 87 | CES75 = 70 |            |



### Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)