

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: P801019

Luminaire Tested: **ARCH-M-PA2-40-730-12VDC-T4W-HSS**

Issue Date: 5/19/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P801019  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1910-568-15)  
Test Lab: INNOVATION CENTER  
Issue Date: 5/19/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: STREETWORKS  
Catalog Number: ARCH-M-PA2-40-730-12VDC-T4W-HSS  
Description: ARCHEON-M ROADWAY AND AREA LUMINAIRE  
(2) 70 CRI, 3000K, 240mA LIGHT ENGINES WITH 16 LEDS AND TYPE IV WIDE  
OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 4361 lumens  
Efficiency: N/A  
Efficacy: 121.1 lumens/watt  
Luminous Opening: Rectangular (W 0.75' x L: 1' x H: 0')  
IES Classification: Type IV - Medium  
BUG Rating: B0 - U0 - G2

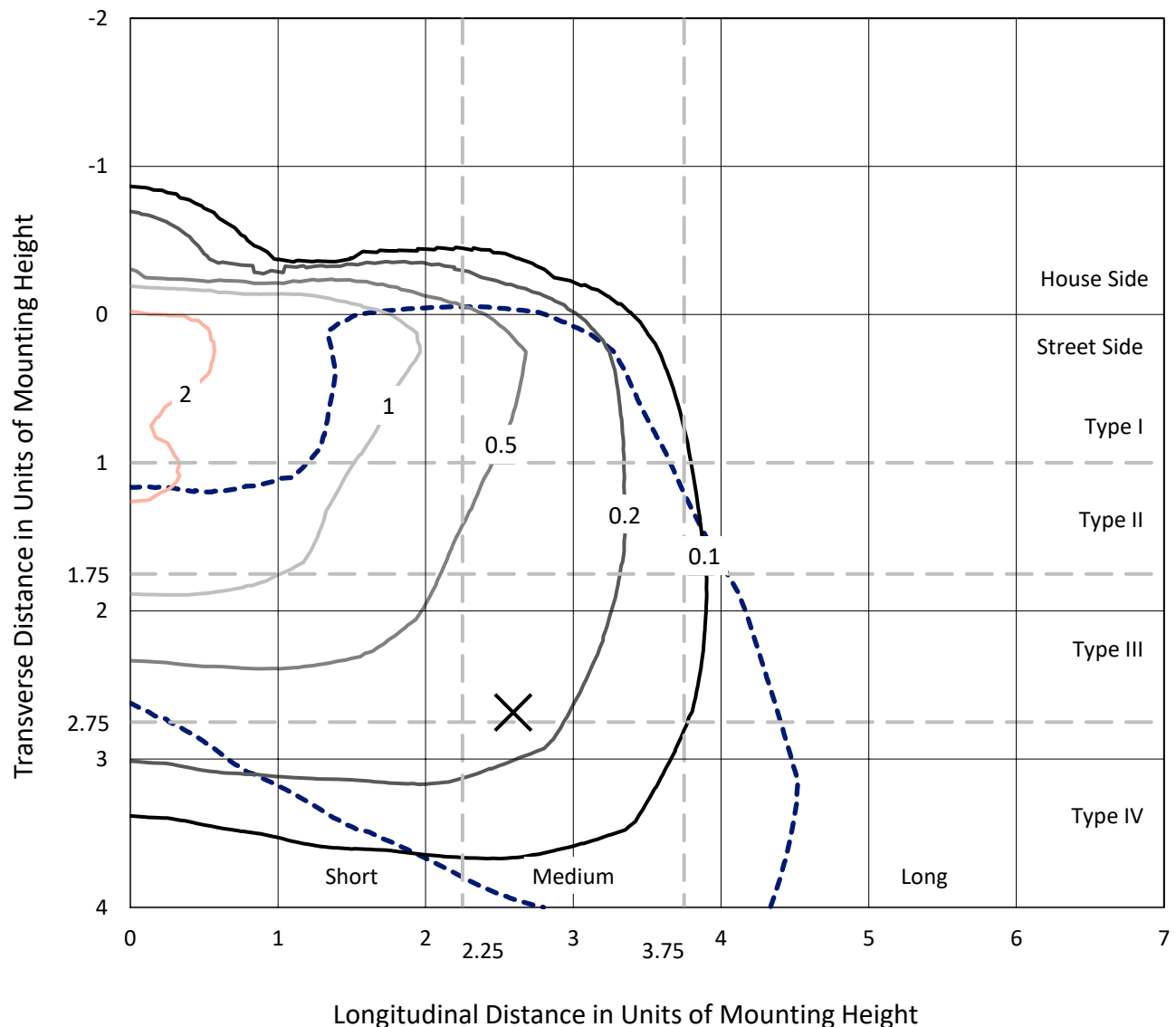
Input Watts (W): 36  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 25 FT

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## Iso-Footcandle Lines of Horizontal Illumination

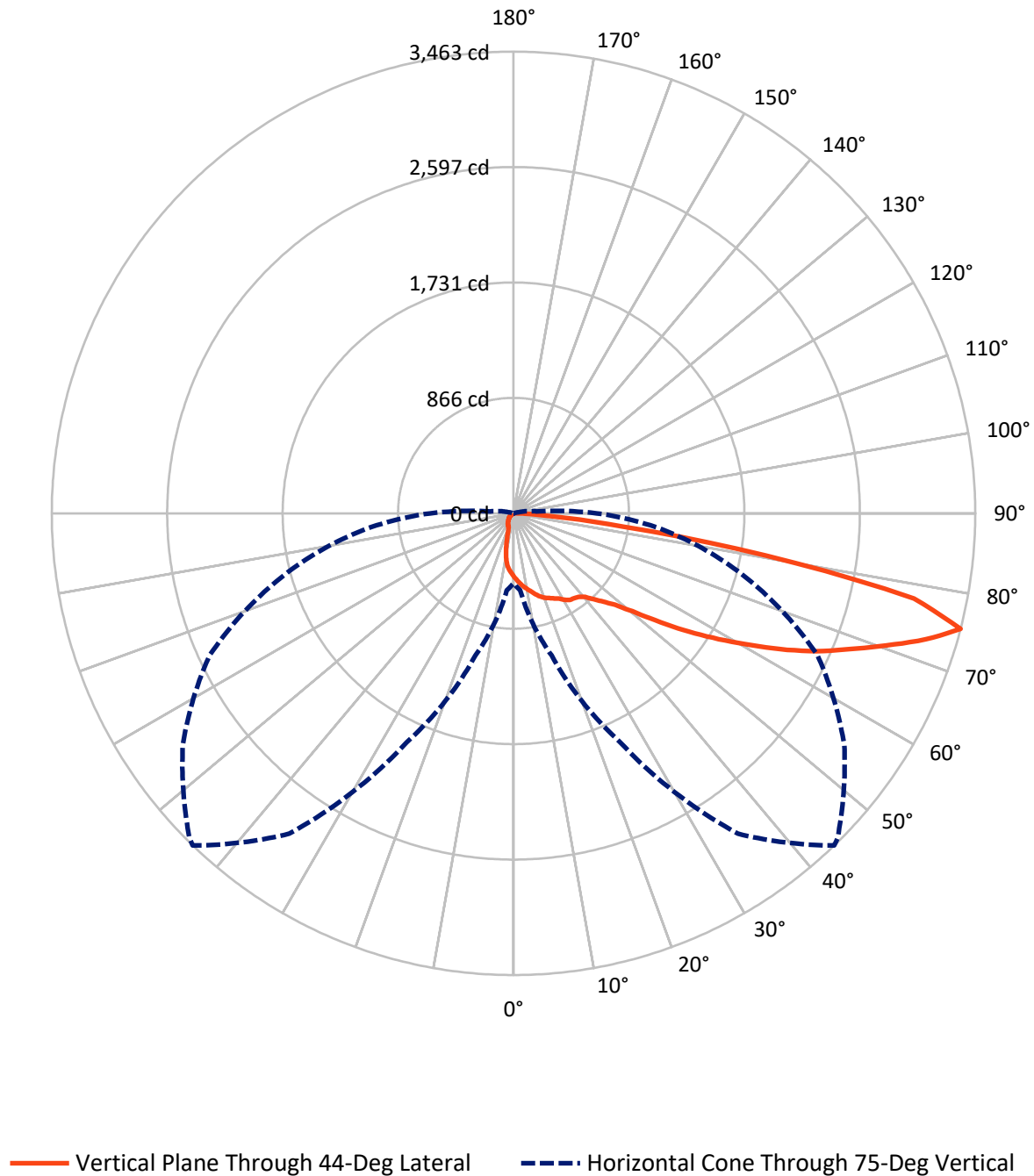
× Max cd  
 - - - 1/2 Max cd



Based on 15 foot mounting height. Maximum calculated value = 2.9 fc  
 Type IV - Medium - N/A

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## Luminous Intensity Polar Plot



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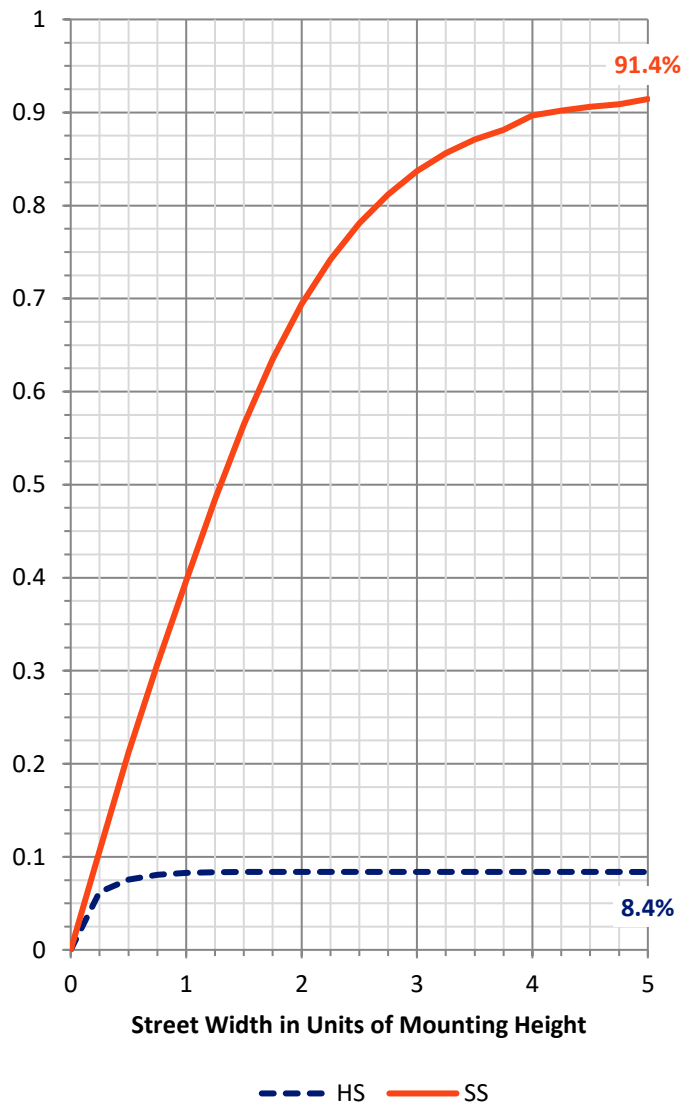
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 367.8    | 0.0    | 367.8  |
|                    | % Fixture | 8.4      | 0.0    | 8.4    |
| <b>Street Side</b> | Lumens    | 3993.2   | 0.0    | 3993.2 |
|                    | % Fixture | 91.6     | 0.0    | 91.6   |
| <b>Total</b>       | Lumens    | 4361.0   | 0.0    | 4361.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 44.8   | 1.0       |
| 10°-20°   | 125.4  | 2.9       |
| 20°-30°   | 207.0  | 4.7       |
| 30°-40°   | 300.5  | 6.9       |
| 40°-50°   | 488.4  | 11.2      |
| 50°-60°   | 861.0  | 19.7      |
| 60°-70°   | 1237.4 | 28.4      |
| 70°-80°   | 990.9  | 22.7      |
| 80°-90°   | 105.6  | 2.4       |
| 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°    | 4361.0 | 100.0     |
| 0°-180°   | 4361.0 | 100.0     |

**Coefficient of Utilization**



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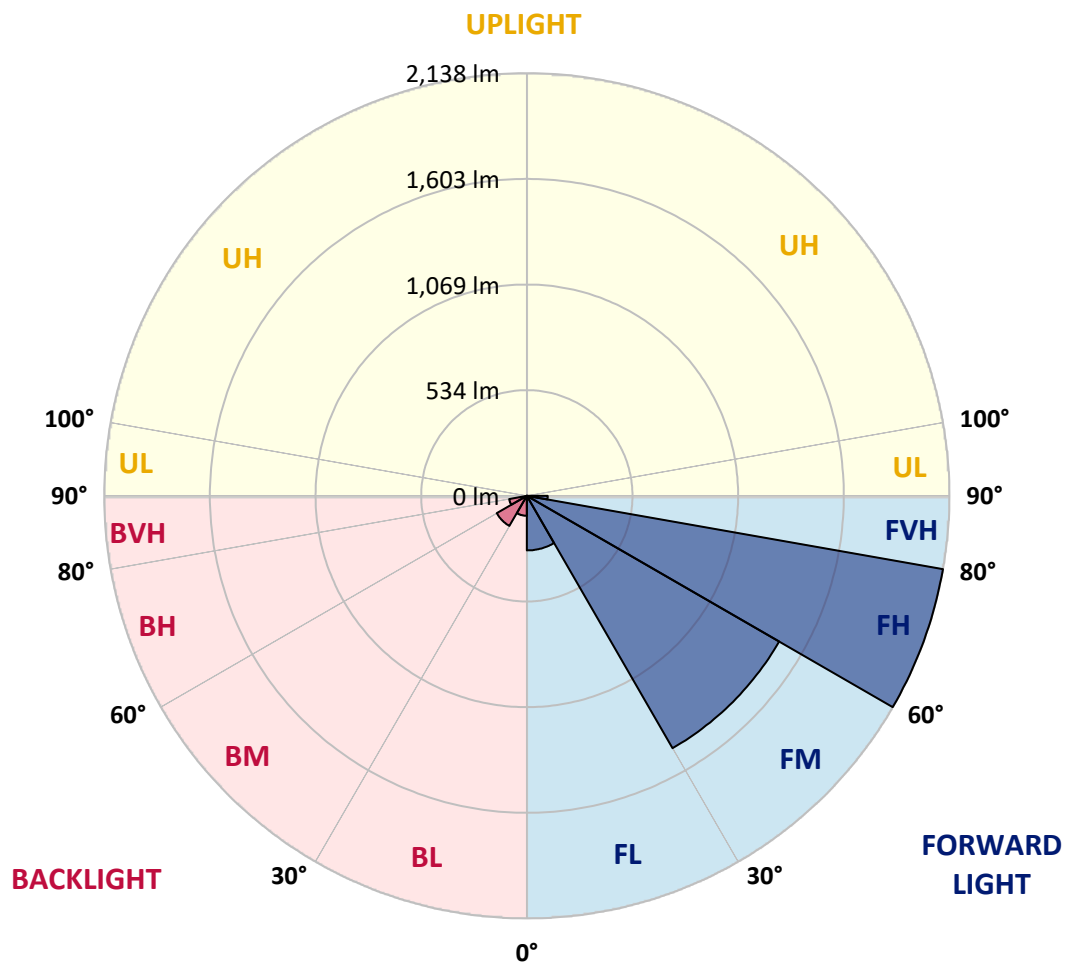
CATALOG NUMBER: ARCH-M-PA2-40-730-12VDC-T4W-HSS

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 276.2  | 6.3       |                         |      |         |
| FM   | (30°-60°)   | 1474.1 | 33.8      |                         |      |         |
| FH   | (60°-80°)   | 2137.7 | 49.0      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 105.3  | 2.4       |                         |      | G2/225  |
| BL   | (0°-30°)    | 101.0  | 2.3       | B0/110                  |      |         |
| BM   | (30°-60°)   | 175.8  | 4.0       | B0/220                  |      |         |
| BH   | (60°-80°)   | 90.7   | 2.1       | B0/110                  |      | G0/110  |
| BVH  | (80°-90°)   | 0.3    | 0.0       |                         |      | G0/10   |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B0-U0-G2**

Type IV Medium





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 44°    | 45°    | 55°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 474.7  | 474.7  | 474.7  | 474.7  | 474.7  | 474.7  | 474.7  | 474.7  | 474.7  | 474.7  | 474.7  |
| 2.5°  | 517.3  | 516.5  | 514.1  | 510.1  | 506.1  | 502.0  | 501.2  | 494.8  | 487.6  | 481.9  | 477.1  |
| 5°    | 563.2  | 562.4  | 558.4  | 549.5  | 540.7  | 530.2  | 529.4  | 514.1  | 500.4  | 485.1  | 472.3  |
| 7.5°  | 610.6  | 609.0  | 601.8  | 588.1  | 572.8  | 556.7  | 555.1  | 532.6  | 512.5  | 492.4  | 473.9  |
| 10°   | 647.7  | 646.0  | 635.6  | 619.5  | 598.6  | 578.5  | 576.1  | 552.7  | 532.6  | 506.9  | 481.9  |
| 12.5° | 683.9  | 680.6  | 667.0  | 649.3  | 623.5  | 604.2  | 601.8  | 577.7  | 553.5  | 527.0  | 496.4  |
| 15°   | 717.6  | 713.6  | 700.8  | 678.2  | 650.9  | 632.4  | 630.8  | 605.0  | 580.1  | 549.5  | 515.7  |
| 17.5° | 741.0  | 739.4  | 724.1  | 699.1  | 672.6  | 657.3  | 655.7  | 629.1  | 604.2  | 572.0  | 535.8  |
| 20°   | 753.0  | 753.0  | 738.6  | 711.2  | 687.1  | 676.6  | 674.2  | 649.3  | 625.1  | 594.6  | 556.7  |
| 22.5° | 755.5  | 757.9  | 746.6  | 716.8  | 699.1  | 690.3  | 688.7  | 667.0  | 643.6  | 615.5  | 580.1  |
| 25°   | 760.3  | 760.3  | 754.7  | 722.5  | 709.6  | 707.2  | 706.4  | 687.1  | 666.2  | 638.0  | 603.4  |
| 27.5° | 765.9  | 765.9  | 761.9  | 730.5  | 725.7  | 724.9  | 724.1  | 715.2  | 698.3  | 665.4  | 630.8  |
| 30°   | 780.4  | 781.2  | 778.0  | 746.6  | 743.4  | 752.2  | 753.9  | 749.0  | 728.1  | 687.1  | 658.9  |
| 32.5° | 816.6  | 809.4  | 800.5  | 757.9  | 763.5  | 774.8  | 775.6  | 765.9  | 743.4  | 710.4  | 692.7  |
| 35°   | 907.5  | 864.9  | 824.7  | 767.5  | 769.9  | 781.2  | 782.8  | 782.0  | 768.3  | 740.2  | 731.3  |
| 37.5° | 992.0  | 931.7  | 874.5  | 790.1  | 782.0  | 794.1  | 797.3  | 811.0  | 800.5  | 781.2  | 783.6  |
| 40°   | 1041.1 | 1017.7 | 977.5  | 852.0  | 806.1  | 824.7  | 827.9  | 848.8  | 844.8  | 836.7  | 852.0  |
| 42.5° | 1192.3 | 1193.9 | 1150.5 | 944.5  | 850.4  | 880.2  | 884.2  | 901.1  | 906.7  | 910.7  | 947.7  |
| 45°   | 1367.7 | 1373.3 | 1362.9 | 1111.1 | 934.1  | 943.7  | 949.4  | 971.9  | 992.8  | 1018.5 | 1086.1 |
| 47.5° | 1578.5 | 1573.7 | 1535.1 | 1314.6 | 1079.7 | 1025.8 | 1029.8 | 1073.3 | 1109.5 | 1165.8 | 1262.3 |
| 50°   | 1765.2 | 1777.2 | 1704.0 | 1504.5 | 1284.8 | 1155.3 | 1151.3 | 1193.9 | 1259.1 | 1337.9 | 1459.4 |
| 52.5° | 1953.4 | 1935.7 | 1836.8 | 1692.8 | 1527.8 | 1331.5 | 1319.4 | 1342.8 | 1434.5 | 1527.8 | 1652.5 |
| 55°   | 2003.3 | 2004.9 | 1971.1 | 1898.7 | 1730.6 | 1545.5 | 1525.4 | 1523.8 | 1638.0 | 1701.6 | 1855.3 |
| 57.5° | 2101.5 | 2105.5 | 2113.5 | 2128.0 | 2048.4 | 1759.5 | 1738.6 | 1716.1 | 1827.1 | 1864.1 | 2058.8 |
| 60°   | 2201.2 | 2206.0 | 2255.1 | 2333.2 | 2280.1 | 1990.4 | 1967.9 | 1914.8 | 1976.8 | 2026.6 | 2272.8 |
| 62.5° | 2188.3 | 2222.1 | 2364.5 | 2519.8 | 2513.4 | 2243.9 | 2215.7 | 2087.8 | 2127.2 | 2170.6 | 2469.1 |
| 65°   | 1975.9 | 2012.2 | 2332.4 | 2571.3 | 2747.5 | 2494.1 | 2448.2 | 2266.4 | 2268.8 | 2321.1 | 2658.2 |
| 67.5° | 1786.1 | 1825.5 | 2131.2 | 2549.6 | 2902.0 | 2718.5 | 2671.1 | 2445.8 | 2408.0 | 2494.9 | 2759.6 |
| 70°   | 1676.7 | 1716.1 | 1971.1 | 2482.0 | 2945.4 | 2967.1 | 2926.1 | 2651.0 | 2573.7 | 2653.4 | 2646.1 |
| 72.5° | 1312.2 | 1374.2 | 1766.8 | 2353.3 | 2992.1 | 3233.4 | 3201.3 | 2910.8 | 2714.5 | 2487.6 | 2014.6 |
| 75°   | 523.0  | 580.1  | 1103.0 | 1893.9 | 2933.4 | 3462.7 | 3437.8 | 3027.5 | 2512.6 | 1776.4 | 1031.4 |
| 77.5° | 157.7  | 169.0  | 306.5  | 936.5  | 2150.5 | 3070.1 | 3062.1 | 2545.6 | 1778.0 | 824.7  | 281.6  |
| 80°   | 52.3   | 57.9   | 94.1   | 258.3  | 981.5  | 1918.0 | 1954.2 | 1622.0 | 807.8  | 189.1  | 57.1   |
| 82.5° | 21.7   | 24.1   | 47.5   | 103.8  | 347.6  | 826.3  | 814.2  | 726.5  | 281.6  | 117.5  | 20.9   |
| 85°   | 5.6    | 7.2    | 21.7   | 59.5   | 127.1  | 284.8  | 299.3  | 243.8  | 159.3  | 97.3   | 6.4    |
| 87.5° | 0.0    | 0.0    | 10.5   | 24.1   | 57.1   | 86.1   | 90.1   | 74.0   | 90.1   | 73.2   | 3.2    |
| 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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**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 474.7  | 474.7  | 474.7 | 474.7 | 474.7 | 474.7 | 474.7 | 474.7 | 474.7 | 474.7 | 474.7 |
| 2.5°  | 473.1  | 469.0  | 461.8 | 457.0 | 450.5 | 448.9 | 445.7 | 441.7 | 440.9 | 436.9 | 437.7 |
| 5°    | 465.0  | 458.6  | 445.7 | 436.9 | 426.4 | 423.2 | 417.6 | 413.5 | 410.3 | 404.7 | 405.5 |
| 7.5°  | 463.4  | 453.8  | 436.1 | 419.2 | 402.3 | 390.2 | 373.3 | 359.6 | 348.4 | 336.3 | 338.7 |
| 10°   | 469.0  | 457.0  | 432.0 | 408.7 | 378.1 | 339.5 | 295.3 | 266.3 | 251.8 | 237.3 | 238.9 |
| 12.5° | 480.3  | 465.8  | 433.6 | 398.2 | 336.3 | 270.3 | 209.2 | 169.8 | 159.3 | 152.9 | 153.7 |
| 15°   | 497.2  | 479.5  | 438.5 | 378.1 | 280.0 | 195.5 | 139.2 | 122.3 | 126.3 | 128.7 | 128.7 |
| 17.5° | 514.9  | 494.8  | 442.5 | 341.9 | 216.4 | 136.8 | 113.4 | 111.8 | 117.5 | 123.1 | 123.1 |
| 20°   | 536.6  | 510.9  | 443.3 | 296.1 | 156.1 | 111.0 | 107.0 | 107.0 | 111.0 | 117.5 | 117.5 |
| 22.5° | 557.5  | 528.6  | 436.1 | 243.8 | 119.1 | 103.0 | 103.0 | 103.0 | 105.4 | 111.8 | 112.6 |
| 25°   | 582.5  | 550.3  | 420.8 | 188.3 | 102.2 | 98.2  | 98.2  | 99.0  | 100.6 | 106.2 | 107.0 |
| 27.5° | 609.0  | 572.8  | 395.0 | 137.6 | 93.3  | 92.5  | 93.3  | 94.1  | 94.9  | 100.6 | 102.2 |
| 30°   | 639.6  | 597.8  | 362.0 | 103.0 | 85.3  | 85.3  | 87.7  | 89.3  | 89.3  | 94.1  | 95.7  |
| 32.5° | 675.0  | 630.8  | 322.6 | 85.3  | 77.2  | 76.4  | 80.5  | 82.9  | 82.9  | 86.9  | 88.5  |
| 35°   | 719.3  | 664.5  | 275.2 | 75.6  | 70.8  | 69.2  | 70.8  | 74.8  | 76.4  | 79.6  | 80.5  |
| 37.5° | 778.0  | 704.8  | 224.5 | 70.0  | 66.0  | 62.8  | 62.8  | 63.6  | 66.8  | 70.0  | 70.8  |
| 40°   | 852.8  | 749.0  | 174.6 | 66.0  | 61.1  | 57.9  | 55.5  | 54.7  | 53.9  | 56.3  | 57.9  |
| 42.5° | 946.9  | 798.9  | 130.3 | 61.9  | 57.1  | 52.3  | 49.1  | 45.9  | 41.8  | 41.0  | 41.8  |
| 45°   | 1067.6 | 860.1  | 96.5  | 58.7  | 54.7  | 47.5  | 41.8  | 36.2  | 29.0  | 26.5  | 27.4  |
| 47.5° | 1210.0 | 923.6  | 75.6  | 55.5  | 53.1  | 41.8  | 34.6  | 24.9  | 17.7  | 16.1  | 16.9  |
| 50°   | 1361.3 | 984.8  | 64.4  | 51.5  | 49.9  | 36.2  | 24.9  | 15.3  | 10.5  | 10.5  | 11.3  |
| 52.5° | 1490.0 | 1019.4 | 58.7  | 48.3  | 45.1  | 29.8  | 16.1  | 8.8   | 6.4   | 6.4   | 7.2   |
| 55°   | 1614.7 | 1037.9 | 54.7  | 45.1  | 38.6  | 20.9  | 8.8   | 5.6   | 4.0   | 4.0   | 4.0   |
| 57.5° | 1743.4 | 1045.9 | 49.9  | 41.0  | 30.6  | 12.9  | 4.8   | 3.2   | 2.4   | 2.4   | 2.4   |
| 60°   | 1857.7 | 1030.6 | 42.6  | 33.8  | 20.1  | 6.4   | 2.4   | 2.4   | 1.6   | 0.8   | 0.8   |
| 62.5° | 1953.4 | 1001.7 | 29.8  | 24.1  | 12.1  | 3.2   | 1.6   | 0.8   | 0.0   | 0.0   | 0.0   |
| 65°   | 2012.2 | 955.0  | 19.3  | 16.1  | 7.2   | 2.4   | 0.8   | 0.0   | 0.0   | 0.0   | 0.0   |
| 67.5° | 1995.3 | 867.3  | 12.1  | 10.5  | 3.2   | 1.6   | 0.8   | 0.0   | 0.0   | 0.0   | 0.0   |
| 70°   | 1800.6 | 711.2  | 8.8   | 6.4   | 2.4   | 0.8   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 72.5° | 1297.7 | 481.1  | 6.4   | 4.0   | 1.6   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 75°   | 624.3  | 171.4  | 4.0   | 3.2   | 0.8   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 77.5° | 152.9  | 37.8   | 2.4   | 1.6   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 80°   | 33.8   | 7.2    | 1.6   | 0.8   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 82.5° | 11.3   | 3.2    | 0.8   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 85°   | 4.0    | 1.6    | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 87.5° | 2.4    | 0.8    | 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

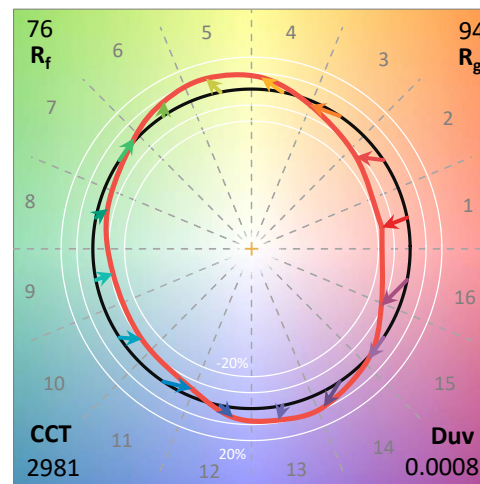
### Test Information

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

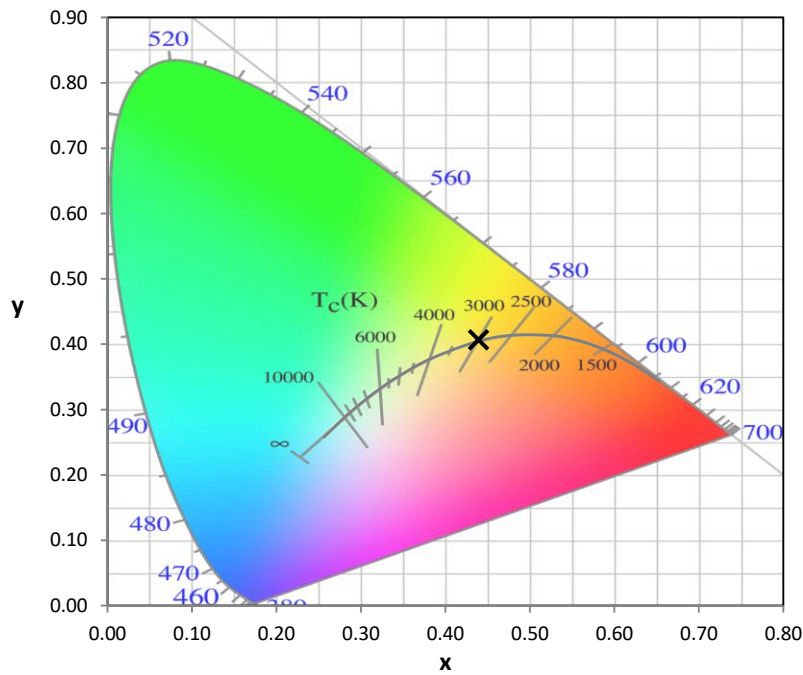
Stabilization Time: 64M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.0/30%  
 Sphere Temperature (°C): 24.1

REPORT NUMBER: SP1-2101-121-6

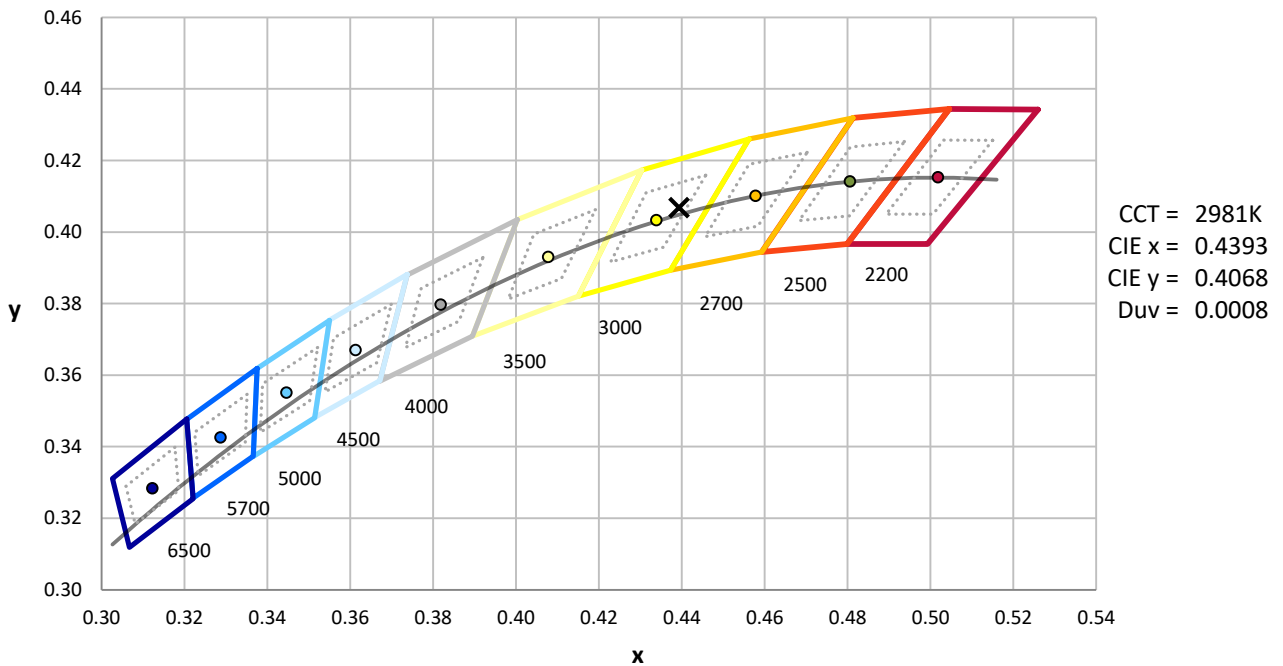
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date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

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**CIE 1931 Chromaticity Diagram**



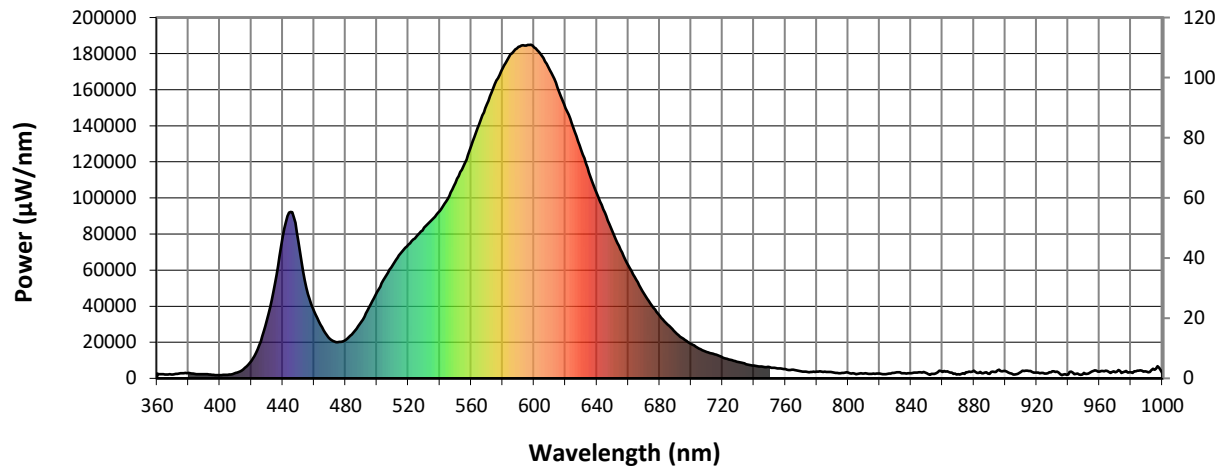
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 3000K 4-step quadrangle

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### Photopic Flux vs. Wavelength

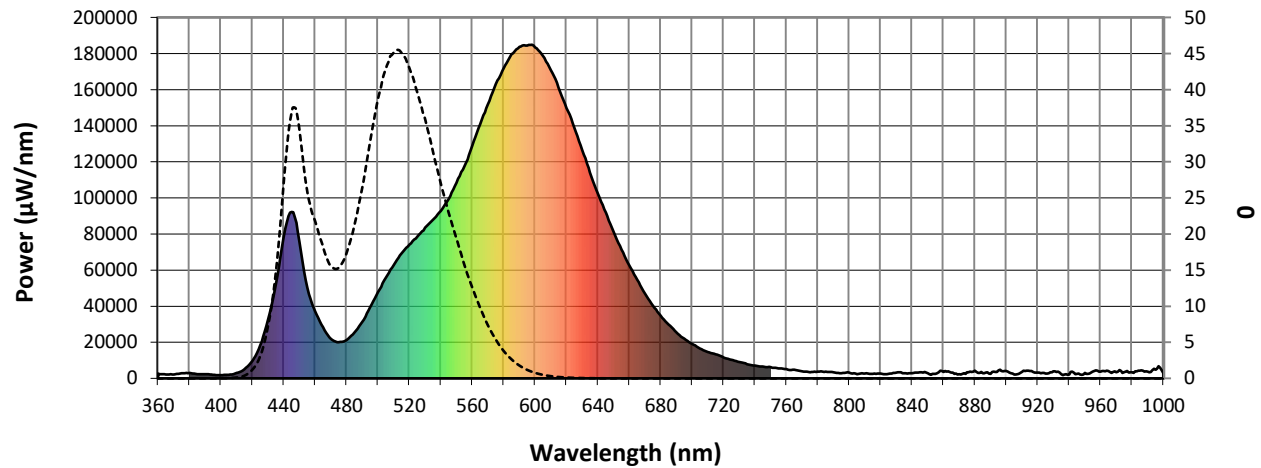


#####

| 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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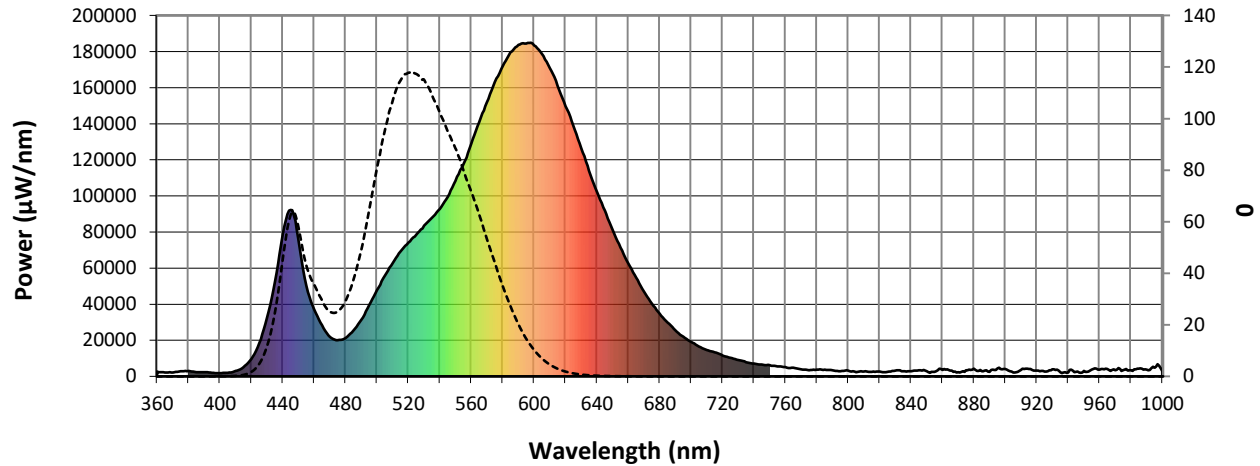
### Scotopic Flux vs. Wavelength


**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



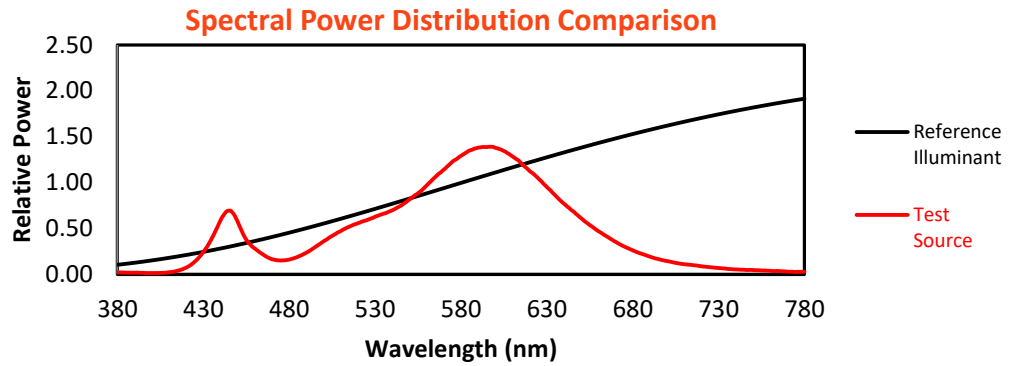
**Melanopic Lumens: 3860**

**M/P: 0.44**

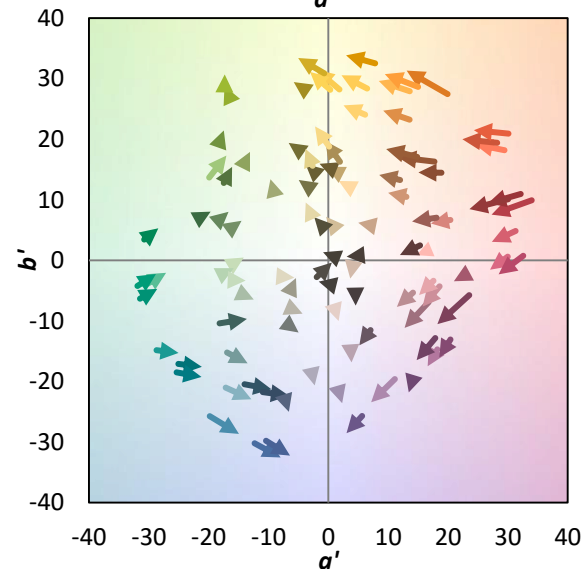
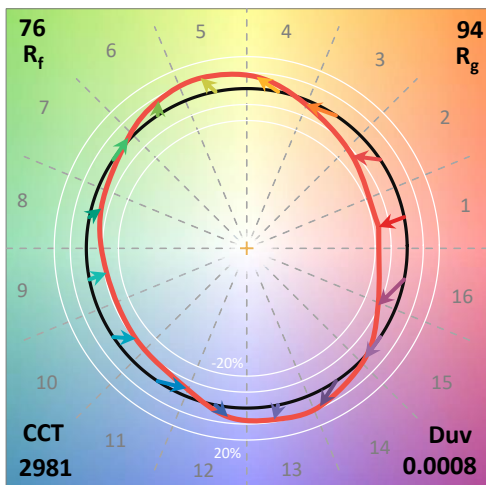
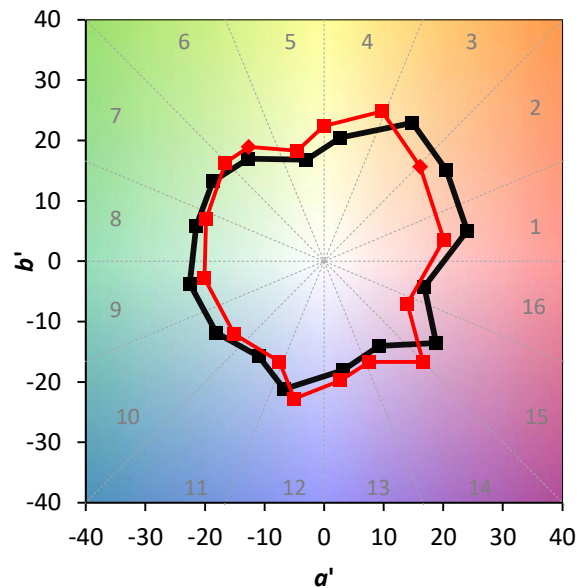
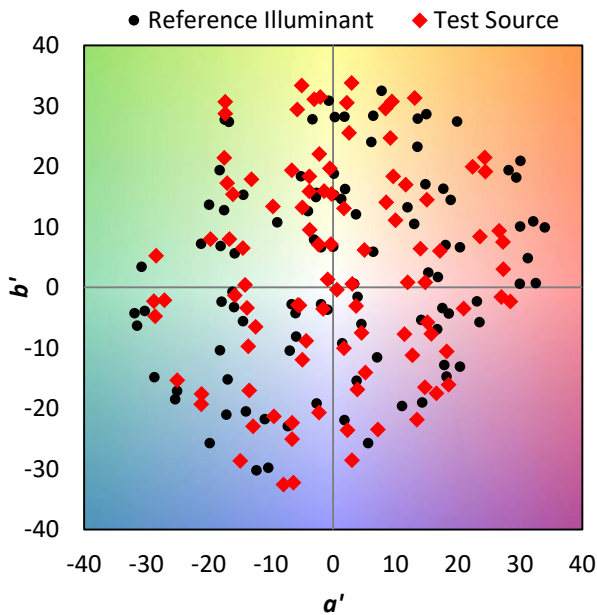
| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 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  $R_a = 72.3$   
 $R_g = -36.9$



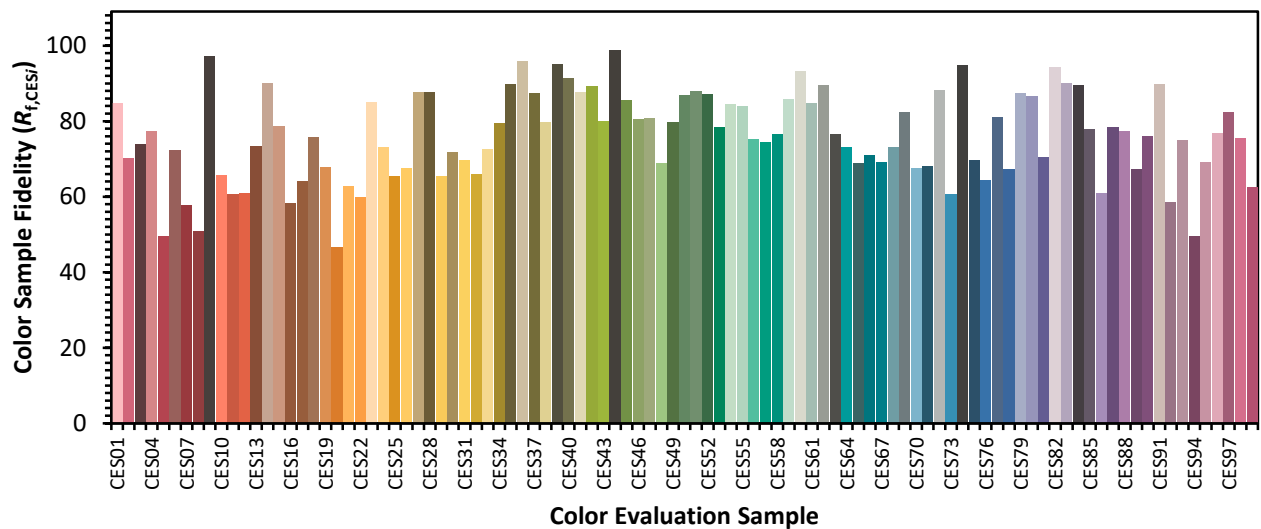
### Color Vector Graphics

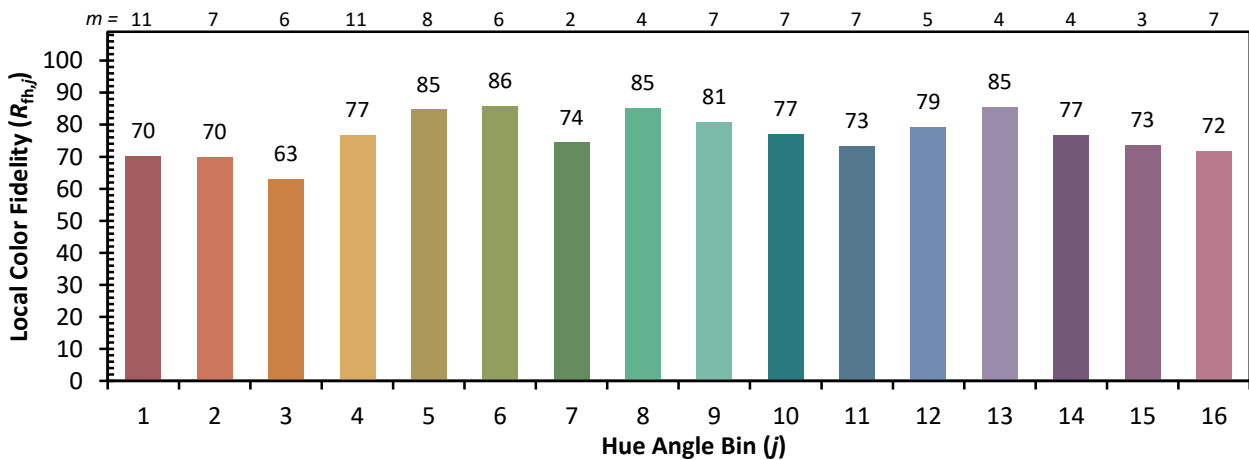
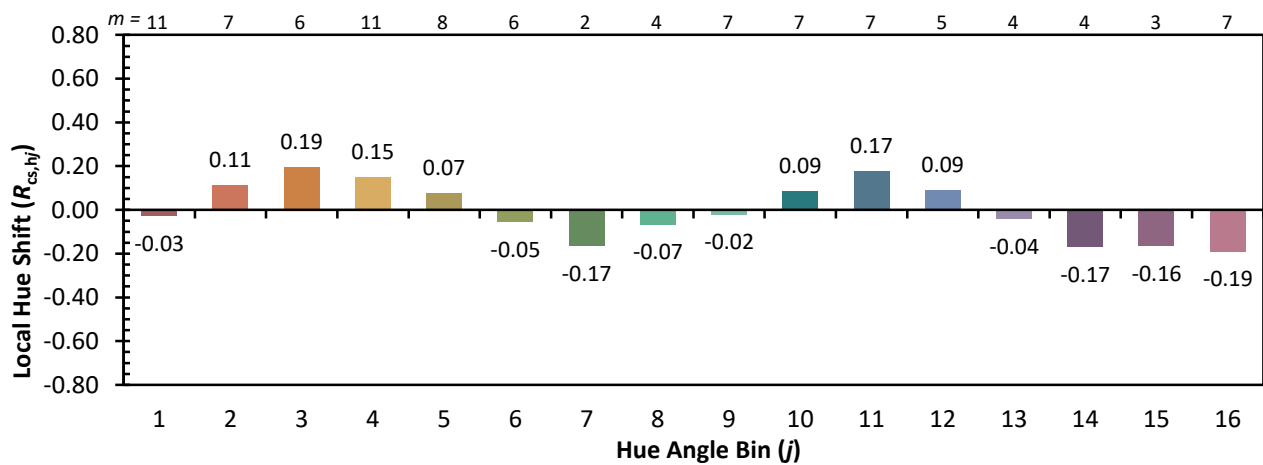
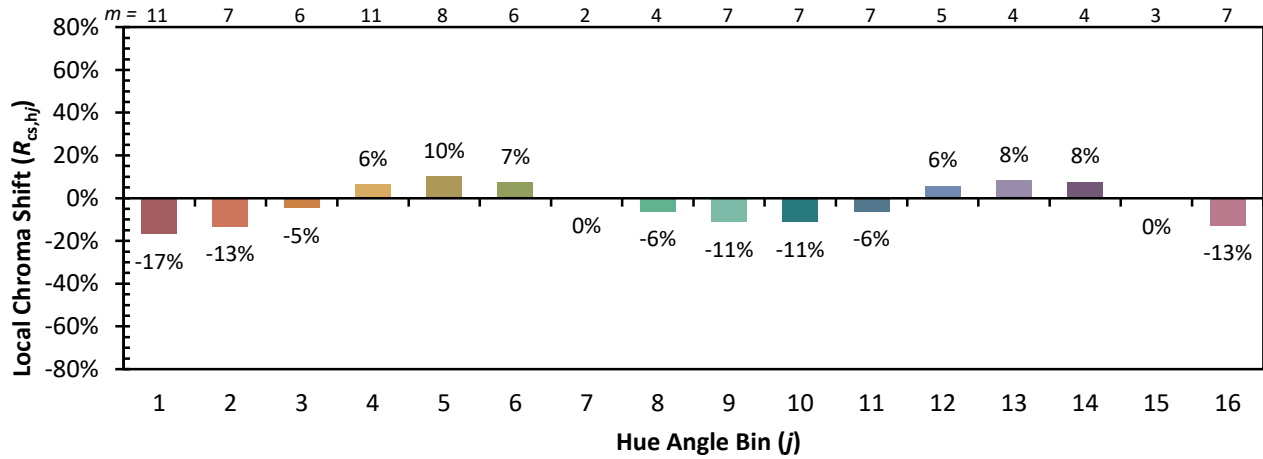




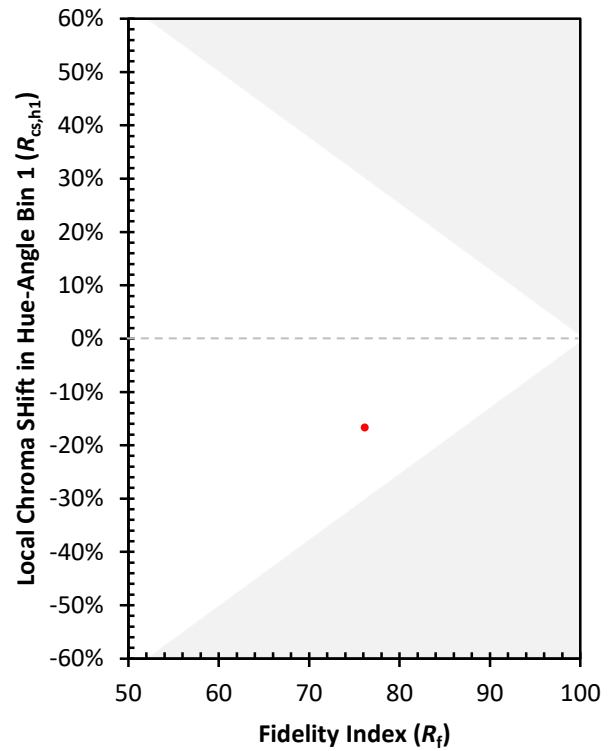
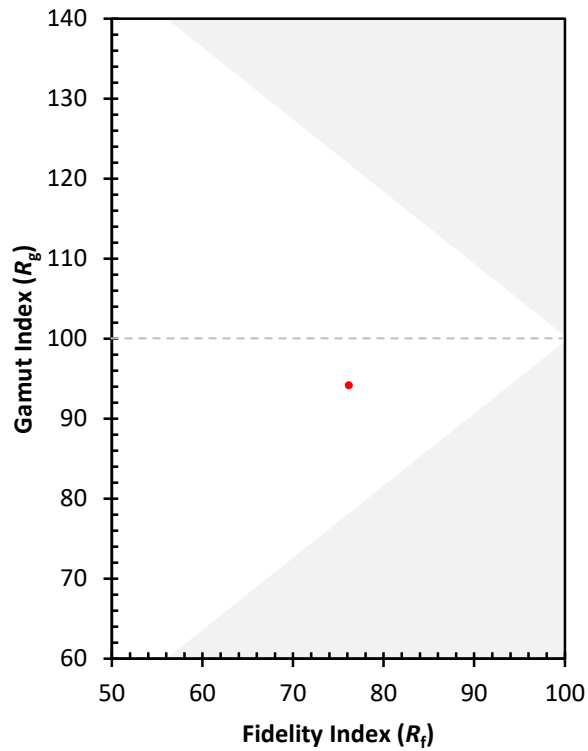
**Individual Sample Fidelity Index ( $R_{f,i}$ )**

|            |            |            |            |
|------------|------------|------------|------------|
| 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)