

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: P800884

Luminaire Tested: **ARCH-M-PA2-40-750-24VDC-T4W-HSS**

Issue Date: 5/19/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P800884  
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-PA2-40-750-24VDC-T4W-HSS  
Description: ARCHEON-M ROADWAY AND AREA LUMINAIRE  
(2) 70 CRI, 5000K, 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: 4789 lumens  
Efficiency: N/A  
Efficacy: 133.0 lumens/watt  
Luminous Opening: Rectangular (W 0.75' x L: 1' x H: 0')  
IES Classification: Type IV - Medium  
BUG Rating: B1 - U0 - G2

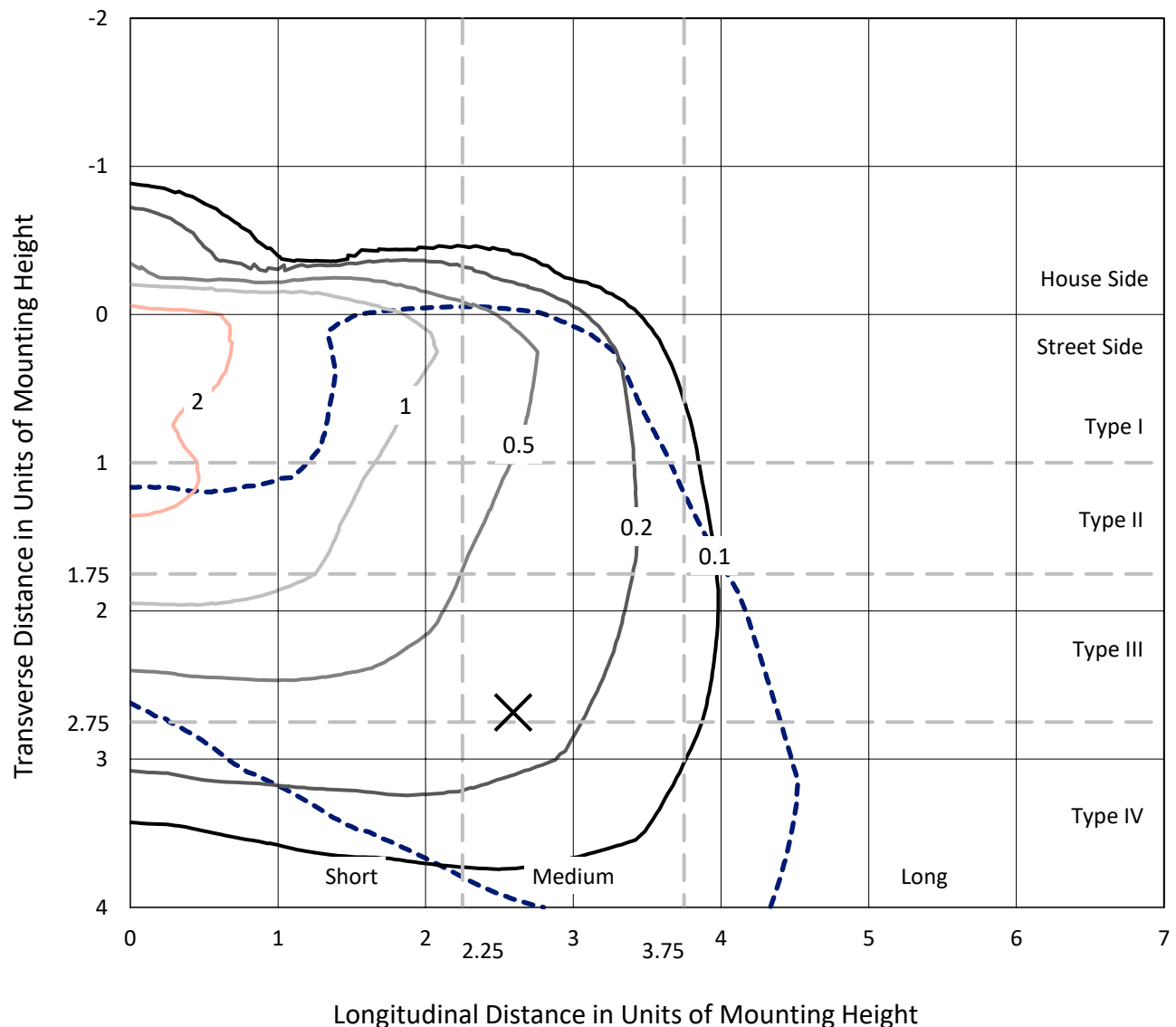
Input Watts (W): 36  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 25 FT

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## Iso-Footcandle Lines of Horizontal Illumination

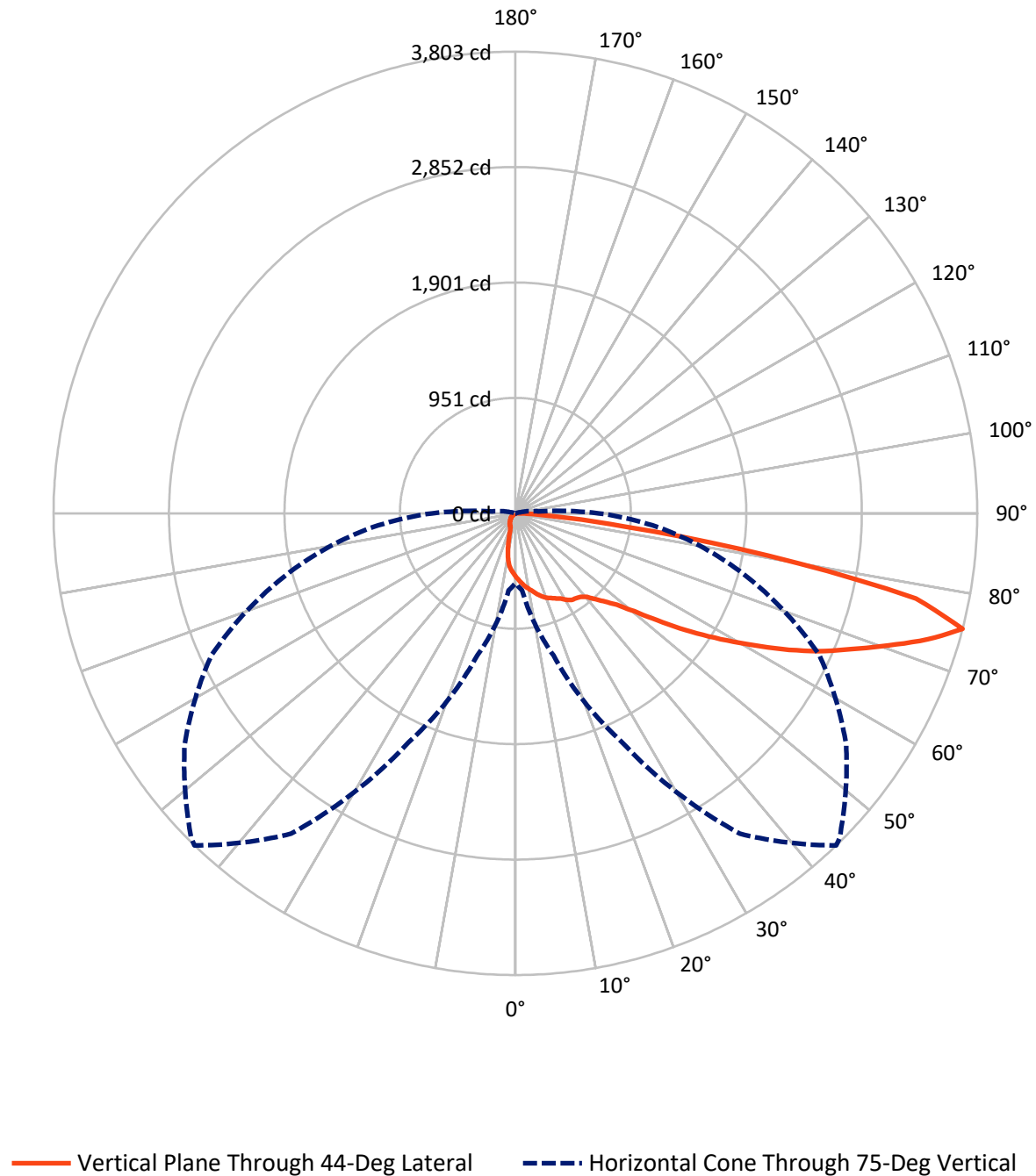
× Max cd  
 --- 1/2 Max cd



Based on 15 foot mounting height. Maximum calculated value = 3.1 fc  
 Type IV - Medium - N/A

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## Luminous Intensity Polar Plot



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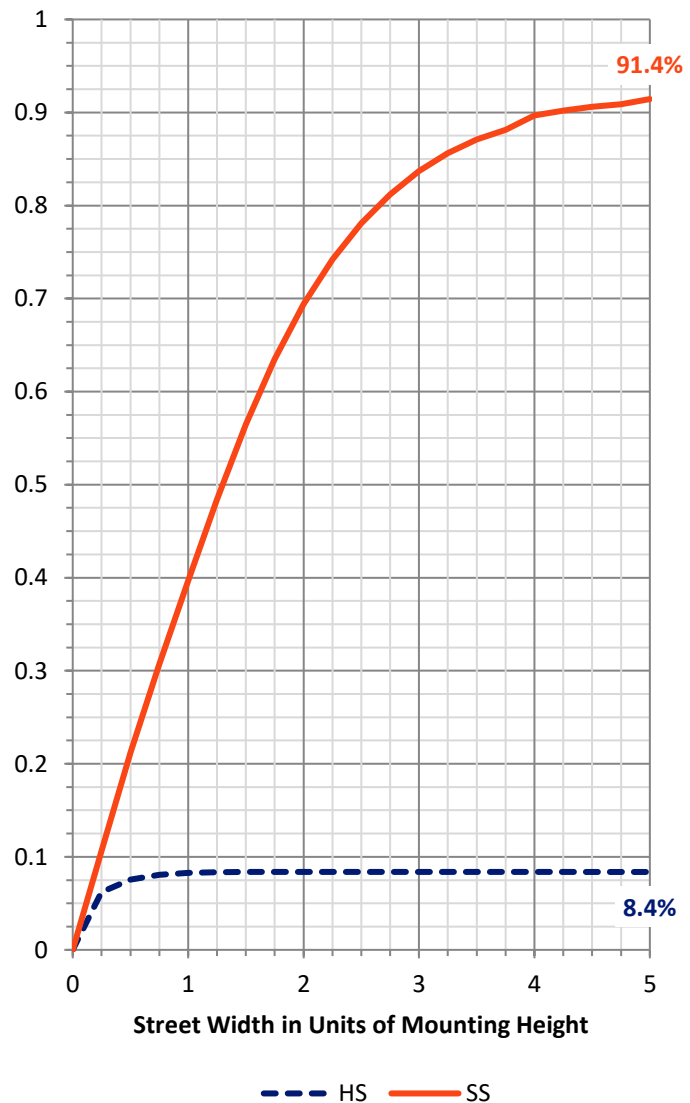
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 403.9    | 0.0    | 403.9  |
|                    | % Fixture | 8.4      | 0.0    | 8.4    |
| <b>Street Side</b> | Lumens    | 4385.1   | 0.0    | 4385.1 |
|                    | % Fixture | 91.6     | 0.0    | 91.6   |
| <b>Total</b>       | Lumens    | 4789.0   | 0.0    | 4789.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 49.2   | 1.0       |
| 10°-20°   | 137.8  | 2.9       |
| 20°-30°   | 227.3  | 4.7       |
| 30°-40°   | 329.9  | 6.9       |
| 40°-50°   | 536.3  | 11.2      |
| 50°-60°   | 945.5  | 19.7      |
| 60°-70°   | 1358.9 | 28.4      |
| 70°-80°   | 1088.2 | 22.7      |
| 80°-90°   | 115.9  | 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°    | 4789.0 | 100.0     |
| 0°-180°   | 4789.0 | 100.0     |

**Coefficient of Utilization**



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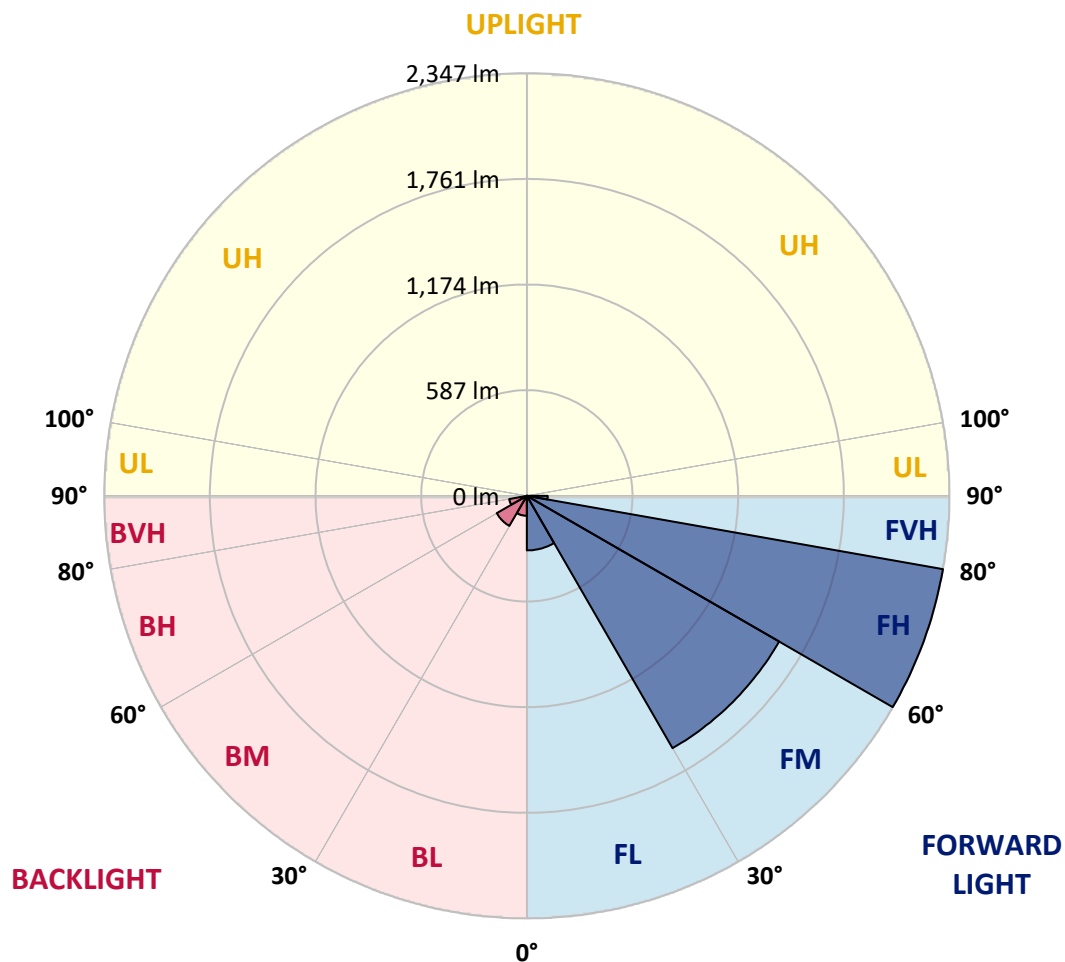
CATALOG NUMBER: ARCH-M-PA2-40-750-24VDC-T4W-HSS

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 303.3  | 6.3       |                         |      |         |
| FM   | (30°-60°)   | 1618.7 | 33.8      |                         |      |         |
| FH   | (60°-80°)   | 2347.5 | 49.0      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 115.6  | 2.4       |                         |      | G2/225  |
| BL   | (0°-30°)    | 111.0  | 2.3       | B1/500                  |      |         |
| BM   | (30°-60°)   | 193.1  | 4.0       | B0/220                  |      |         |
| BH   | (60°-80°)   | 99.6   | 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: B1-U0-G2**

Type IV Medium



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 44°    | 45°    | 55°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 521.3  | 521.3  | 521.3  | 521.3  | 521.3  | 521.3  | 521.3  | 521.3  | 521.3  | 521.3  | 521.3  |
| 2.5°  | 568.1  | 567.2  | 564.6  | 560.1  | 555.7  | 551.3  | 550.4  | 543.4  | 535.4  | 529.2  | 523.9  |
| 5°    | 618.4  | 617.6  | 613.1  | 603.4  | 593.7  | 582.2  | 581.3  | 564.6  | 549.5  | 532.7  | 518.6  |
| 7.5°  | 670.6  | 668.8  | 660.9  | 645.8  | 629.1  | 611.4  | 609.6  | 584.9  | 562.8  | 540.7  | 520.4  |
| 10°   | 711.2  | 709.4  | 698.0  | 680.3  | 657.3  | 635.2  | 632.6  | 607.0  | 584.9  | 556.6  | 529.2  |
| 12.5° | 751.0  | 747.4  | 732.4  | 713.0  | 684.7  | 663.5  | 660.9  | 634.4  | 607.8  | 578.7  | 545.1  |
| 15°   | 788.1  | 783.7  | 769.5  | 744.8  | 714.8  | 694.4  | 692.7  | 664.4  | 637.0  | 603.4  | 566.3  |
| 17.5° | 813.7  | 811.9  | 795.1  | 767.8  | 738.6  | 721.8  | 720.1  | 690.9  | 663.5  | 628.2  | 588.4  |
| 20°   | 827.0  | 827.0  | 811.1  | 781.0  | 754.5  | 743.0  | 740.4  | 713.0  | 686.5  | 652.9  | 611.4  |
| 22.5° | 829.6  | 832.3  | 819.9  | 787.2  | 767.8  | 758.0  | 756.3  | 732.4  | 706.8  | 675.9  | 637.0  |
| 25°   | 834.9  | 834.9  | 828.7  | 793.4  | 779.2  | 776.6  | 775.7  | 754.5  | 731.5  | 700.6  | 662.6  |
| 27.5° | 841.1  | 841.1  | 836.7  | 802.2  | 796.9  | 796.0  | 795.1  | 785.4  | 766.9  | 730.7  | 692.7  |
| 30°   | 857.0  | 857.9  | 854.3  | 819.9  | 816.4  | 826.1  | 827.8  | 822.5  | 799.6  | 754.5  | 723.6  |
| 32.5° | 896.8  | 888.8  | 879.1  | 832.3  | 838.4  | 850.8  | 851.7  | 841.1  | 816.4  | 780.1  | 760.7  |
| 35°   | 996.6  | 949.8  | 905.6  | 842.9  | 845.5  | 857.9  | 859.6  | 858.8  | 843.7  | 812.8  | 803.1  |
| 37.5° | 1089.4 | 1023.1 | 960.4  | 867.6  | 858.8  | 872.0  | 875.5  | 890.6  | 879.1  | 857.9  | 860.5  |
| 40°   | 1143.2 | 1117.6 | 1073.5 | 935.6  | 885.3  | 905.6  | 909.1  | 932.1  | 927.7  | 918.8  | 935.6  |
| 42.5° | 1309.3 | 1311.1 | 1263.4 | 1037.2 | 933.9  | 966.5  | 971.0  | 989.5  | 995.7  | 1000.1 | 1040.8 |
| 45°   | 1501.9 | 1508.1 | 1496.6 | 1220.1 | 1025.7 | 1036.3 | 1042.5 | 1067.3 | 1090.2 | 1118.5 | 1192.7 |
| 47.5° | 1733.4 | 1728.1 | 1685.7 | 1443.6 | 1185.7 | 1126.5 | 1130.9 | 1178.6 | 1218.3 | 1280.2 | 1386.2 |
| 50°   | 1938.4 | 1951.6 | 1871.3 | 1652.1 | 1410.9 | 1268.7 | 1264.3 | 1311.1 | 1382.7 | 1469.3 | 1602.7 |
| 52.5° | 2145.1 | 2125.7 | 2017.0 | 1858.9 | 1677.8 | 1462.2 | 1448.9 | 1474.6 | 1575.3 | 1677.8 | 1814.7 |
| 55°   | 2199.9 | 2201.7 | 2164.6 | 2085.1 | 1900.4 | 1697.2 | 1675.1 | 1673.3 | 1798.8 | 1868.6 | 2037.3 |
| 57.5° | 2307.7 | 2312.1 | 2321.0 | 2336.9 | 2249.4 | 1932.2 | 1909.2 | 1884.5 | 2006.4 | 2047.1 | 2260.9 |
| 60°   | 2417.3 | 2422.6 | 2476.4 | 2562.1 | 2503.8 | 2185.8 | 2161.0 | 2102.7 | 2170.8 | 2225.5 | 2495.9 |
| 62.5° | 2403.1 | 2440.2 | 2596.6 | 2767.1 | 2760.1 | 2464.1 | 2433.2 | 2292.7 | 2336.0 | 2383.7 | 2711.5 |
| 65°   | 2169.9 | 2209.6 | 2561.3 | 2823.7 | 3017.1 | 2738.8 | 2688.5 | 2488.8 | 2491.5 | 2548.9 | 2919.1 |
| 67.5° | 1961.4 | 2004.7 | 2340.4 | 2799.8 | 3186.8 | 2985.3 | 2933.2 | 2685.8 | 2644.3 | 2739.7 | 3030.4 |
| 70°   | 1841.2 | 1884.5 | 2164.6 | 2725.6 | 3234.5 | 3258.3 | 3213.3 | 2911.1 | 2826.3 | 2913.8 | 2905.8 |
| 72.5° | 1441.0 | 1509.0 | 1940.2 | 2584.2 | 3285.7 | 3550.8 | 3515.4 | 3196.5 | 2980.9 | 2731.8 | 2212.3 |
| 75°   | 574.3  | 637.0  | 1211.3 | 2079.8 | 3221.2 | 3802.6 | 3775.2 | 3324.6 | 2759.2 | 1950.8 | 1132.6 |
| 77.5° | 173.2  | 185.5  | 336.6  | 1028.4 | 2361.6 | 3371.4 | 3362.6 | 2795.4 | 1952.5 | 905.6  | 309.2  |
| 80°   | 57.4   | 63.6   | 103.4  | 283.6  | 1077.9 | 2106.3 | 2146.0 | 1781.1 | 887.0  | 207.6  | 62.7   |
| 82.5° | 23.9   | 26.5   | 52.1   | 114.0  | 381.7  | 907.4  | 894.1  | 797.8  | 309.2  | 129.0  | 23.0   |
| 85°   | 6.2    | 8.0    | 23.9   | 65.4   | 139.6  | 312.8  | 328.7  | 267.7  | 174.9  | 106.9  | 7.1    |
| 87.5° | 0.0    | 0.0    | 11.5   | 26.5   | 62.7   | 94.5   | 99.0   | 81.3   | 99.0   | 80.4   | 3.5    |
| 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-M-PA2-40-750-24VDC-T4W-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 521.3  | 521.3  | 521.3 | 521.3 | 521.3 | 521.3 | 521.3 | 521.3 | 521.3 | 521.3 | 521.3 |
| 2.5°  | 519.5  | 515.1  | 507.1 | 501.8 | 494.8 | 493.0 | 489.5 | 485.0 | 484.2 | 479.7 | 480.6 |
| 5°    | 510.7  | 503.6  | 489.5 | 479.7 | 468.3 | 464.7 | 458.5 | 454.1 | 450.6 | 444.4 | 445.3 |
| 7.5°  | 508.9  | 498.3  | 478.9 | 460.3 | 441.7 | 428.5 | 409.9 | 394.9 | 382.6 | 369.3 | 372.0 |
| 10°   | 515.1  | 501.8  | 474.4 | 448.8 | 415.2 | 372.8 | 324.2 | 292.4 | 276.5 | 260.6 | 262.4 |
| 12.5° | 527.4  | 511.5  | 476.2 | 437.3 | 369.3 | 296.9 | 229.7 | 186.4 | 174.9 | 167.9 | 168.7 |
| 15°   | 546.0  | 526.6  | 481.5 | 415.2 | 307.5 | 214.7 | 152.8 | 134.3 | 138.7 | 141.4 | 141.4 |
| 17.5° | 565.4  | 543.4  | 485.9 | 375.5 | 237.7 | 150.2 | 124.6 | 122.8 | 129.0 | 135.2 | 135.2 |
| 20°   | 589.3  | 561.0  | 486.8 | 325.1 | 171.4 | 121.9 | 117.5 | 117.5 | 121.9 | 129.0 | 129.0 |
| 22.5° | 612.3  | 580.5  | 478.9 | 267.7 | 130.8 | 113.1 | 113.1 | 113.1 | 115.7 | 122.8 | 123.7 |
| 25°   | 639.7  | 604.3  | 462.1 | 206.7 | 112.2 | 107.8 | 107.8 | 108.7 | 110.4 | 116.6 | 117.5 |
| 27.5° | 668.8  | 629.1  | 433.8 | 151.1 | 102.5 | 101.6 | 102.5 | 103.4 | 104.3 | 110.4 | 112.2 |
| 30°   | 702.4  | 656.4  | 397.6 | 113.1 | 93.7  | 93.7  | 96.3  | 98.1  | 98.1  | 103.4 | 105.1 |
| 32.5° | 741.3  | 692.7  | 354.3 | 93.7  | 84.8  | 83.9  | 88.3  | 91.0  | 91.0  | 95.4  | 97.2  |
| 35°   | 789.8  | 729.8  | 302.2 | 83.0  | 77.7  | 76.0  | 77.7  | 82.2  | 83.9  | 87.5  | 88.3  |
| 37.5° | 854.3  | 773.9  | 246.5 | 76.9  | 72.4  | 68.9  | 68.9  | 69.8  | 73.3  | 76.9  | 77.7  |
| 40°   | 936.5  | 822.5  | 191.7 | 72.4  | 67.1  | 63.6  | 61.0  | 60.1  | 59.2  | 61.8  | 63.6  |
| 42.5° | 1039.9 | 877.3  | 143.1 | 68.0  | 62.7  | 57.4  | 53.9  | 50.4  | 45.9  | 45.1  | 45.9  |
| 45°   | 1172.4 | 944.5  | 106.0 | 64.5  | 60.1  | 52.1  | 45.9  | 39.8  | 31.8  | 29.2  | 30.0  |
| 47.5° | 1328.8 | 1014.3 | 83.0  | 61.0  | 58.3  | 45.9  | 38.0  | 27.4  | 19.4  | 17.7  | 18.6  |
| 50°   | 1494.9 | 1081.4 | 70.7  | 56.5  | 54.8  | 39.8  | 27.4  | 16.8  | 11.5  | 11.5  | 12.4  |
| 52.5° | 1636.2 | 1119.4 | 64.5  | 53.0  | 49.5  | 32.7  | 17.7  | 9.7   | 7.1   | 7.1   | 8.0   |
| 55°   | 1773.2 | 1139.7 | 60.1  | 49.5  | 42.4  | 23.0  | 9.7   | 6.2   | 4.4   | 4.4   | 4.4   |
| 57.5° | 1914.5 | 1148.5 | 54.8  | 45.1  | 33.6  | 14.1  | 5.3   | 3.5   | 2.7   | 2.7   | 2.7   |
| 60°   | 2040.0 | 1131.8 | 46.8  | 37.1  | 22.1  | 7.1   | 2.7   | 2.7   | 1.8   | 0.9   | 0.9   |
| 62.5° | 2145.1 | 1100.0 | 32.7  | 26.5  | 13.3  | 3.5   | 1.8   | 0.9   | 0.0   | 0.0   | 0.0   |
| 65°   | 2209.6 | 1048.7 | 21.2  | 17.7  | 8.0   | 2.7   | 0.9   | 0.0   | 0.0   | 0.0   | 0.0   |
| 67.5° | 2191.1 | 952.4  | 13.3  | 11.5  | 3.5   | 1.8   | 0.9   | 0.0   | 0.0   | 0.0   | 0.0   |
| 70°   | 1977.3 | 781.0  | 9.7   | 7.1   | 2.7   | 0.9   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 72.5° | 1425.1 | 528.3  | 7.1   | 4.4   | 1.8   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 75°   | 685.6  | 188.2  | 4.4   | 3.5   | 0.9   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 77.5° | 167.9  | 41.5   | 2.7   | 1.8   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 80°   | 37.1   | 8.0    | 1.8   | 0.9   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 82.5° | 12.4   | 3.5    | 0.9   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 85°   | 4.4    | 1.8    | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 87.5° | 2.7    | 0.9    | 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: SP1-2101-121-8

Luminaire Tested: IFLD-S-SA2E-750-U-T2

Test Date: 03/05/2021

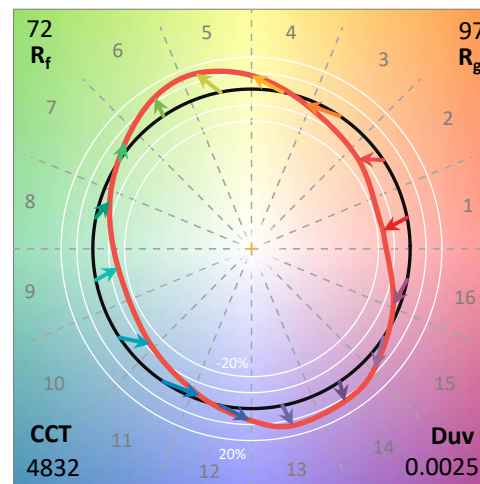
### Test Information

Test Method: LM-79-08  
 Report Number: SP1-2101-121-8  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1  
 Measurement Geometry:  $4\pi$   
 Issue Date: 03/05/2021  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: STREETWORKS  
 Catalog Number: **IFLD-S-SA2E-750-U-T2**  
 Description: STREETWORKS INF FLOOD

PROGRAMMED @ 615mA.

### Spectral Parameters

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 4832   | CRI (Ra): | 71.7 |      |       |
| CIE u':                   | 0.2115 | R1:       | 69.5 | R9:  | -27.7 |
| CIE v':                   | 0.4900 | R2:       | 75.7 | R10: | 42.9  |
| Duv:                      | 0.0025 | R3:       | 80.8 | R11: | 71.2  |
| CIE x:                    | 0.3506 | R4:       | 73.2 | R12: | 44.6  |
| CIE y:                    | 0.3611 | R5:       | 70.3 | R13: | 69.8  |
| CIE z:                    | 0.2884 | R6:       | 67.3 | R14: | 89.2  |
| Peak Wavelength (nm):     | 444    | R7:       | 79.9 |      |       |
| Dominant Wavelength (nm): | 572    | R8:       | 57.2 |      |       |
| Purity:                   | 13.7   |           |      |      |       |
| Rf:                       | 72.3   |           |      |      |       |
| Rg:                       | 96.7   |           |      |      |       |



### Test Conditions

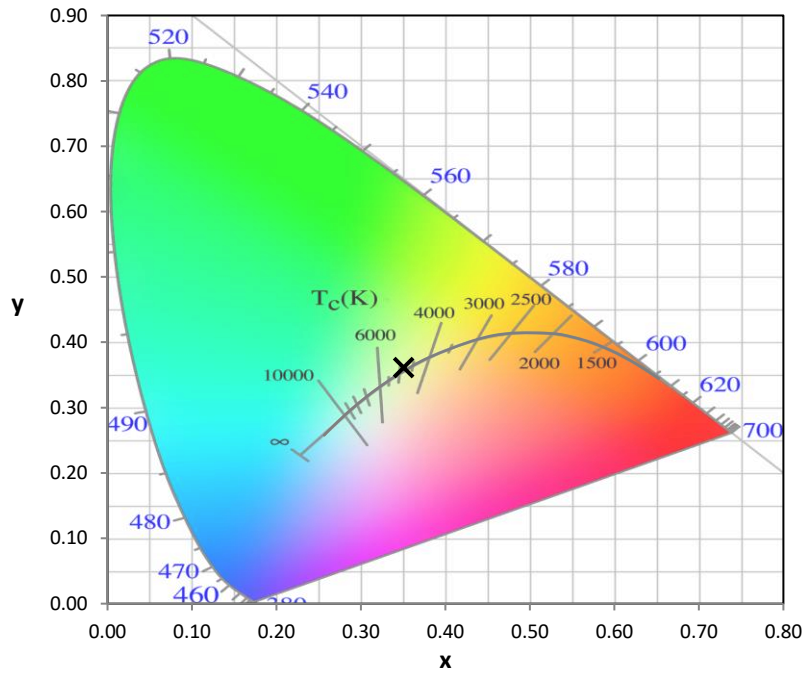
Stabilization Time: 47M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.9/31%  
 Sphere Temperature (°C): 24.4

REPORT NUMBER: SP1-2101-121-8

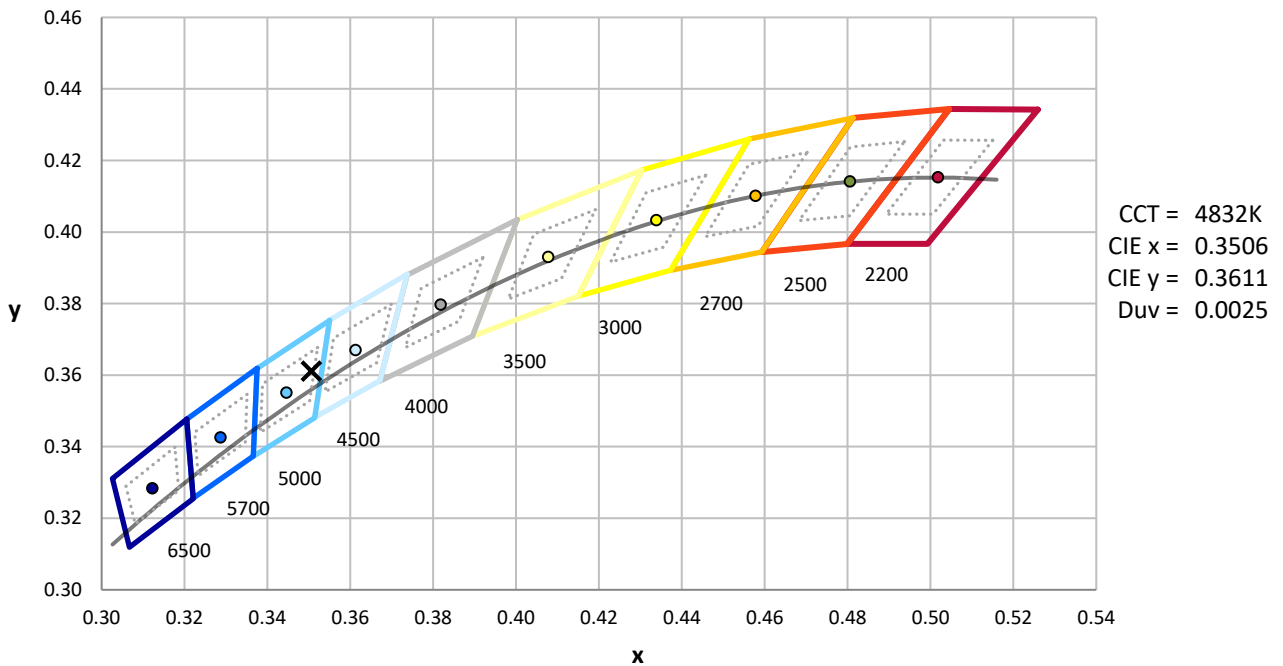
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date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



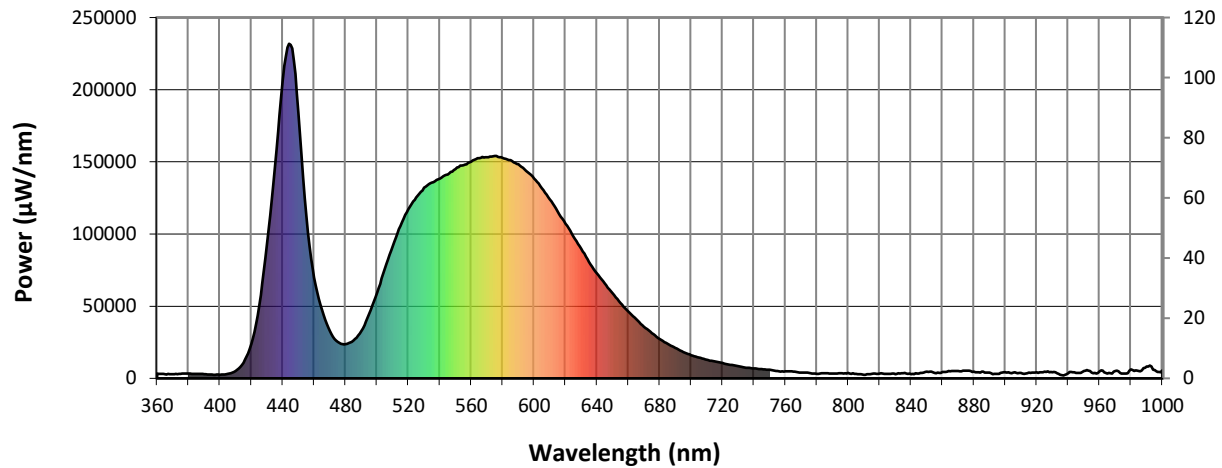
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 5000K 4-step quadrangle

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### Photopic Flux vs. Wavelength

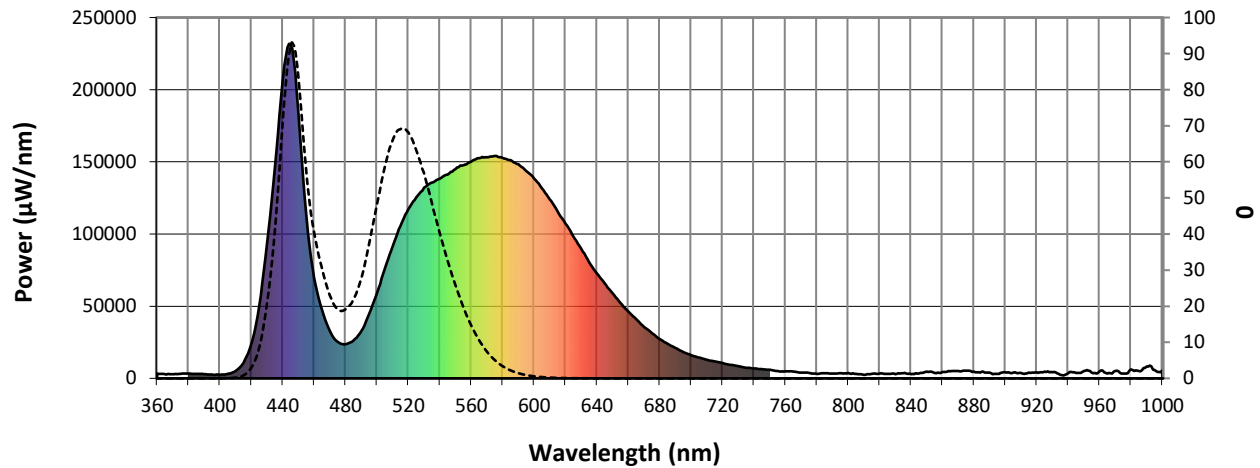


#####

| 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       | 3353             | 0.0              | 490       | 32805            | 4.7              | 620       | 107081           | 27.9             | 750       | 5910             | 0.0              | 880       | 4619             | 0.0              |
| 365       | 2862             | 0.0              | 495       | 44523            | 8.1              | 625       | 98536            | 21.7             | 755       | 5030             | 0.0              | 885       | 4614             | 0.0              |
| 370       | 2810             | 0.0              | 500       | 59272            | 13.1             | 630       | 89745            | 16.2             | 760       | 4853             | 0.0              | 890       | 3959             | 0.0              |
| 375       | 3214             | 0.0              | 505       | 75789            | 21.2             | 635       | 80639            | 12.1             | 765       | 4704             | 0.0              | 895       | 3106             | 0.0              |
| 380       | 3349             | 0.0              | 510       | 91523            | 31.4             | 640       | 72702            | 8.7              | 770       | 3920             | 0.0              | 900       | 4270             | 0.0              |
| 385       | 3025             | 0.0              | 515       | 105611           | 43.7             | 645       | 65679            | 6.3              | 775       | 3859             | 0.0              | 905       | 3918             | 0.0              |
| 390       | 2882             | 0.0              | 520       | 117273           | 56.9             | 650       | 59001            | 4.3              | 780       | 3115             | 0.0              | 910       | 3872             | 0.0              |
| 395       | 2575             | 0.0              | 525       | 125211           | 67.2             | 655       | 52143            | 3.0              | 785       | 3474             | 0.0              | 915       | 3970             | 0.0              |
| 400       | 2553             | 0.0              | 530       | 132145           | 77.8             | 660       | 46377            | 1.9              | 790       | 3401             | 0.0              | 920       | 4123             | 0.0              |
| 405       | 3040             | 0.0              | 535       | 135784           | 84.2             | 665       | 41029            | 1.3              | 795       | 3536             | 0.0              | 925       | 4692             | 0.0              |
| 410       | 5218             | 0.0              | 540       | 138313           | 90.1             | 670       | 35613            | 0.8              | 800       | 3687             | 0.0              | 930       | 4313             | 0.0              |
| 415       | 10898            | 0.0              | 545       | 141311           | 94.1             | 675       | 31345            | 0.5              | 805       | 3213             | 0.0              | 935       | 2374             | 0.0              |
| 420       | 23692            | 0.1              | 550       | 144916           | 98.5             | 680       | 27204            | 0.3              | 810       | 2541             | 0.0              | 940       | 3564             | 0.0              |
| 425       | 50574            | 0.3              | 555       | 147753           | 100.9            | 685       | 23938            | 0.2              | 815       | 3033             | 0.0              | 945       | 3888             | 0.0              |
| 430       | 93101            | 0.7              | 560       | 150201           | 102.1            | 690       | 21157            | 0.1              | 820       | 3270             | 0.0              | 950       | 5143             | 0.0              |
| 435       | 146856           | 1.7              | 565       | 152596           | 101.5            | 695       | 18244            | 0.1              | 825       | 3208             | 0.0              | 955       | 3966             | 0.0              |
| 440       | 206284           | 3.2              | 570       | 153241           | 99.6             | 700       | 16063            | 0.0              | 830       | 2991             | 0.0              | 960       | 4927             | 0.0              |
| 445       | 230963           | 4.8              | 575       | 154079           | 95.9             | 705       | 14433            | 0.0              | 835       | 3477             | 0.0              | 965       | 3279             | 0.0              |
| 450       | 184279           | 4.8              | 580       | 152658           | 90.7             | 710       | 12921            | 0.0              | 840       | 2982             | 0.0              | 970       | 5201             | 0.0              |
| 455       | 112612           | 3.8              | 585       | 151127           | 84.0             | 715       | 11715            | 0.0              | 845       | 3443             | 0.0              | 975       | 3421             | 0.0              |
| 460       | 69904            | 2.9              | 590       | 148249           | 76.6             | 720       | 10565            | 0.0              | 850       | 4753             | 0.0              | 980       | 6148             | 0.0              |
| 465       | 47480            | 2.4              | 595       | 143567           | 68.1             | 725       | 9312             | 0.0              | 855       | 3744             | 0.0              | 985       | 5069             | 0.0              |
| 470       | 32573            | 2.0              | 600       | 138422           | 59.7             | 730       | 8354             | 0.0              | 860       | 4355             | 0.0              | 990       | 8231             | 0.0              |
| 475       | 25178            | 2.0              | 605       | 131783           | 51.0             | 735       | 7425             | 0.0              | 865       | 4984             | 0.0              | 995       | 5852             | 0.0              |
| 480       | 23726            | 2.3              | 610       | 124021           | 42.6             | 740       | 6965             | 0.0              | 870       | 5065             | 0.0              | 1000      | 5471             | 0.0              |
| 485       | 26206            | 3.1              | 615       | 115646           | 34.9             | 745       | 6343             | 0.0              | 875       | 5430             | 0.0              |           |                  |                  |

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### Scotopic Flux vs. Wavelength



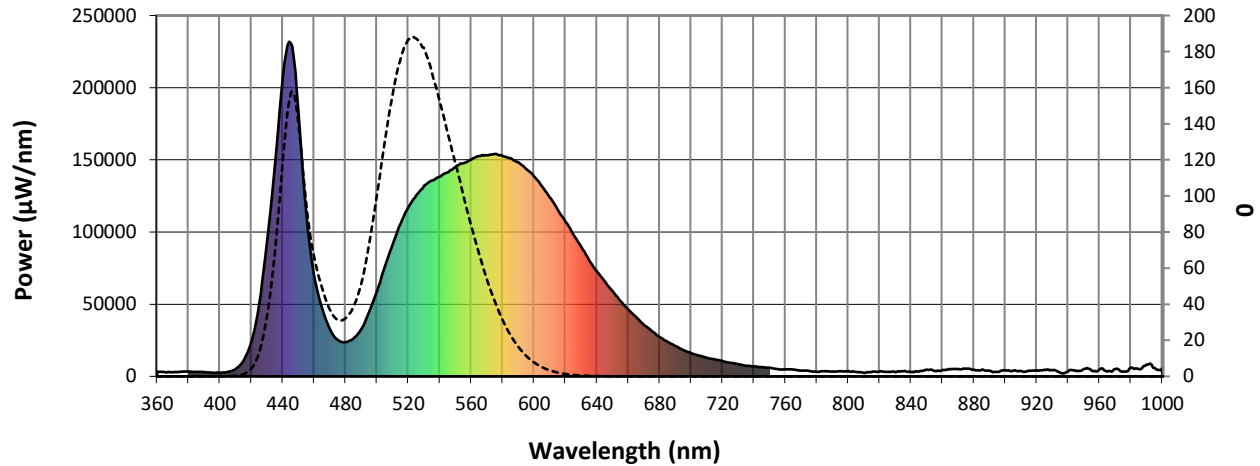
Scotopic Lumens: 15745.7

S/P: 1.71

| 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       | 3353             | 0.0              | 490       | 32805            | 50.5             | 620       | 107081           | 1.3              | 750       | 5910             | 0.0              | 880       | 4619             | 0.0              |
| 365       | 2862             | 0.0              | 495       | 44523            | 72.0             | 625       | 98536            | 0.8              | 755       | 5030             | 0.0              | 885       | 4614             | 0.0              |
| 370       | 2810             | 0.0              | 500       | 59272            | 99.1             | 630       | 89745            | 0.5              | 760       | 4853             | 0.0              | 890       | 3959             | 0.0              |
| 375       | 3214             | 0.0              | 505       | 75789            | 128.8            | 635       | 80639            | 0.3              | 765       | 4704             | 0.0              | 895       | 3106             | 0.0              |
| 380       | 3349             | 0.0              | 510       | 91523            | 155.1            | 640       | 72702            | 0.2              | 770       | 3920             | 0.0              | 900       | 4270             | 0.0              |
| 385       | 3025             | 0.0              | 515       | 105611           | 175.1            | 645       | 65679            | 0.1              | 775       | 3859             | 0.0              | 905       | 3918             | 0.0              |
| 390       | 2882             | 0.0              | 520       | 117273           | 186.4            | 650       | 59001            | 0.1              | 780       | 3115             | 0.0              | 910       | 3872             | 0.0              |
| 395       | 2575             | 0.0              | 525       | 125211           | 187.3            | 655       | 52143            | 0.0              | 785       | 3474             | 0.0              | 915       | 3970             | 0.0              |
| 400       | 2553             | 0.0              | 530       | 132145           | 182.2            | 660       | 46377            | 0.0              | 790       | 3401             | 0.0              | 920       | 4123             | 0.0              |
| 405       | 3040             | 0.1              | 535       | 135784           | 169.2            | 665       | 41029            | 0.0              | 795       | 3536             | 0.0              | 925       | 4692             | 0.0              |
| 410       | 5218             | 0.3              | 540       | 138313           | 152.8            | 670       | 35613            | 0.0              | 800       | 3687             | 0.0              | 930       | 4313             | 0.0              |
| 415       | 10898            | 1.1              | 545       | 141311           | 135.5            | 675       | 31345            | 0.0              | 805       | 3213             | 0.0              | 935       | 2374             | 0.0              |
| 420       | 23692            | 3.9              | 550       | 144916           | 118.5            | 680       | 27204            | 0.0              | 810       | 2541             | 0.0              | 940       | 3564             | 0.0              |
| 425       | 50574            | 12.4             | 555       | 147753           | 101.0            | 685       | 23938            | 0.0              | 815       | 3033             | 0.0              | 945       | 3888             | 0.0              |
| 430       | 93101            | 31.7             | 560       | 150201           | 84.0             | 690       | 21157            | 0.0              | 820       | 3270             | 0.0              | 950       | 5143             | 0.0              |
| 435       | 146856           | 65.7             | 565       | 152596           | 68.5             | 695       | 18244            | 0.0              | 825       | 3208             | 0.0              | 955       | 3966             | 0.0              |
| 440       | 206284           | 115.3            | 570       | 153241           | 54.1             | 700       | 16063            | 0.0              | 830       | 2991             | 0.0              | 960       | 4927             | 0.0              |
| 445       | 230963           | 154.7            | 575       | 154079           | 42.0             | 705       | 14433            | 0.0              | 835       | 3477             | 0.0              | 965       | 3279             | 0.0              |
| 450       | 184279           | 142.8            | 580       | 152658           | 31.5             | 710       | 12921            | 0.0              | 840       | 2982             | 0.0              | 970       | 5201             | 0.0              |
| 455       | 112612           | 98.4             | 585       | 151127           | 23.1             | 715       | 11715            | 0.0              | 845       | 3443             | 0.0              | 975       | 3421             | 0.0              |
| 460       | 69904            | 67.5             | 590       | 148249           | 16.5             | 720       | 10565            | 0.0              | 850       | 4753             | 0.0              | 980       | 6148             | 0.0              |
| 465       | 47480            | 50.1             | 595       | 143567           | 11.4             | 725       | 9312             | 0.0              | 855       | 3744             | 0.0              | 985       | 5069             | 0.0              |
| 470       | 32573            | 37.5             | 600       | 138422           | 7.8              | 730       | 8354             | 0.0              | 860       | 4355             | 0.0              | 990       | 8231             | 0.0              |
| 475       | 25178            | 31.5             | 605       | 131783           | 5.2              | 735       | 7425             | 0.0              | 865       | 4984             | 0.0              | 995       | 5852             | 0.0              |
| 480       | 23726            | 32.0             | 610       | 124021           | 3.4              | 740       | 6965             | 0.0              | 870       | 5065             | 0.0              | 1000      | 5471             | 0.0              |
| 485       | 26206            | 38.0             | 615       | 115646           | 2.1              | 745       | 6343             | 0.0              | 875       | 5430             | 0.0              |           |                  |                  |

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### Melanopic Flux vs. Wavelength



**Melanopic Lumens: 6193.8**

**M/P: 0.67**

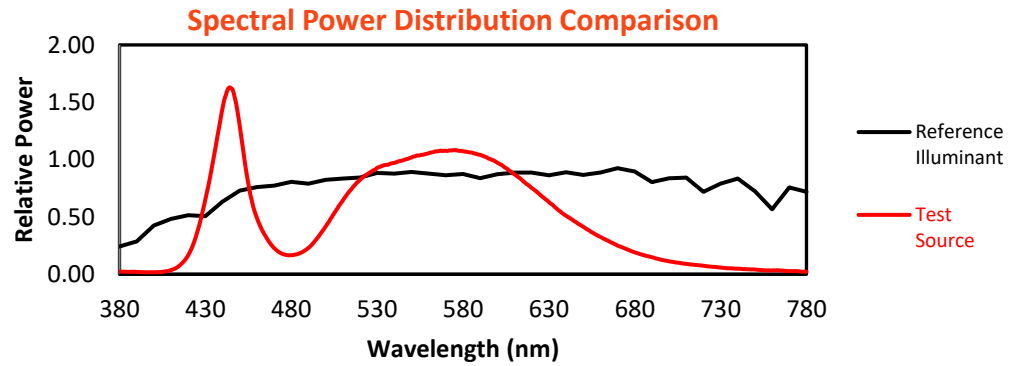
| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 3353             | 0.0              | 490       | 32805            | 27.3             | 620       | 107081           | 0.1              | 750       | 5910             | 0.0              | 880       | 4619             | 0.0              |
| 365       | 2862             | 0.0              | 495       | 44523            | 36.8             | 625       | 98536            | 0.1              | 755       | 5030             | 0.0              | 885       | 4614             | 0.0              |
| 370       | 2810             | 0.0              | 500       | 59272            | 47.6             | 630       | 89745            | 0.0              | 760       | 4853             | 0.0              | 890       | 3959             | 0.0              |
| 375       | 3214             | 0.0              | 505       | 75789            | 58.2             | 635       | 80639            | 0.0              | 765       | 4704             | 0.0              | 895       | 3106             | 0.0              |
| 380       | 3349             | 0.0              | 510       | 91523            | 65.7             | 640       | 72702            | 0.0              | 770       | 3920             | 0.0              | 900       | 4270             | 0.0              |
| 385       | 3025             | 0.0              | 515       | 105611           | 69.0             | 645       | 65679            | 0.0              | 775       | 3859             | 0.0              | 905       | 3918             | 0.0              |
| 390       | 2882             | 0.0              | 520       | 117273           | 68.3             | 650       | 59001            | 0.0              | 780       | 3115             | 0.0              | 910       | 3872             | 0.0              |
| 395       | 2575             | 0.0              | 525       | 125211           | 63.5             | 655       | 52143            | 0.0              | 785       | 3474             | 0.0              | 915       | 3970             | 0.0              |
| 400       | 2553             | 0.0              | 530       | 132145           | 57.1             | 660       | 46377            | 0.0              | 790       | 3401             | 0.0              | 920       | 4123             | 0.0              |
| 405       | 3040             | 0.1              | 535       | 135784           | 48.9             | 665       | 41029            | 0.0              | 795       | 3536             | 0.0              | 925       | 4692             | 0.0              |
| 410       | 5218             | 0.2              | 540       | 138313           | 40.5             | 670       | 35613            | 0.0              | 800       | 3687             | 0.0              | 930       | 4313             | 0.0              |
| 415       | 10898            | 0.7              | 545       | 141311           | 32.8             | 675       | 31345            | 0.0              | 805       | 3213             | 0.0              | 935       | 2374             | 0.0              |
| 420       | 23692            | 2.7              | 550       | 144916           | 26.0             | 680       | 27204            | 0.0              | 810       | 2541             | 0.0              | 940       | 3564             | 0.0              |
| 425       | 50574            | 7.9              | 555       | 147753           | 19.9             | 685       | 23938            | 0.0              | 815       | 3033             | 0.0              | 945       | 3888             | 0.0              |
| 430       | 93101            | 19.7             | 560       | 150201           | 14.8             | 690       | 21157            | 0.0              | 820       | 3270             | 0.0              | 950       | 5143             | 0.0              |
| 435       | 146856           | 39.2             | 565       | 152596           | 10.7             | 695       | 18244            | 0.0              | 825       | 3208             | 0.0              | 955       | 3966             | 0.0              |
| 440       | 206284           | 68.9             | 570       | 153241           | 7.5              | 700       | 16063            | 0.0              | 830       | 2991             | 0.0              | 960       | 4927             | 0.0              |
| 445       | 230963           | 91.1             | 575       | 154079           | 5.1              | 705       | 14433            | 0.0              | 835       | 3477             | 0.0              | 965       | 3279             | 0.0              |
| 450       | 184279           | 84.9             | 580       | 152658           | 3.4              | 710       | 12921            | 0.0              | 840       | 2982             | 0.0              | 970       | 5201             | 0.0              |
| 455       | 112612           | 59.0             | 585       | 151127           | 2.2              | 715       | 11715            | 0.0              | 845       | 3443             | 0.0              | 975       | 3421             | 0.0              |
| 460       | 69904            | 41.2             | 590       | 148249           | 1.5              | 720       | 10565            | 0.0              | 850       | 4753             | 0.0              | 980       | 6148             | 0.0              |
| 465       | 47480            | 31.0             | 595       | 143567           | 0.9              | 725       | 9312             | 0.0              | 855       | 3744             | 0.0              | 985       | 5069             | 0.0              |
| 470       | 32573            | 23.3             | 600       | 138422           | 0.6              | 730       | 8354             | 0.0              | 860       | 4355             | 0.0              | 990       | 8231             | 0.0              |
| 475       | 25178            | 19.2             | 605       | 131783           | 0.4              | 735       | 7425             | 0.0              | 865       | 4984             | 0.0              | 995       | 5852             | 0.0              |
| 480       | 23726            | 19.1             | 610       | 124021           | 0.2              | 740       | 6965             | 0.0              | 870       | 5065             | 0.0              | 1000      | 5471             | 0.0              |
| 485       | 26206            | 21.6             | 615       | 115646           | 0.1              | 745       | 6343             | 0.0              | 875       | 5430             | 0.0              |           |                  |                  |

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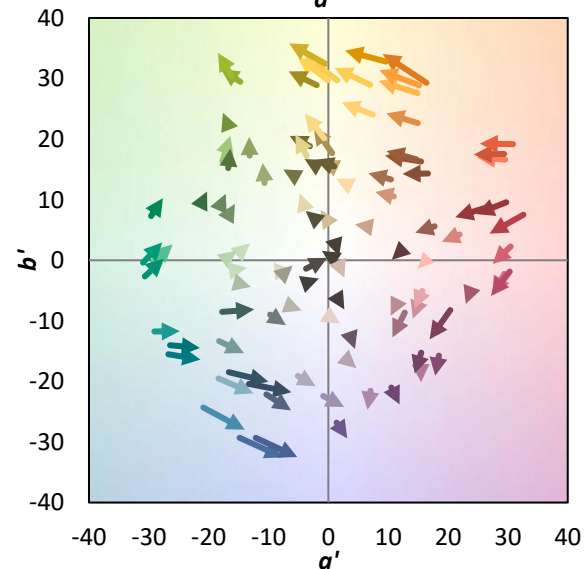
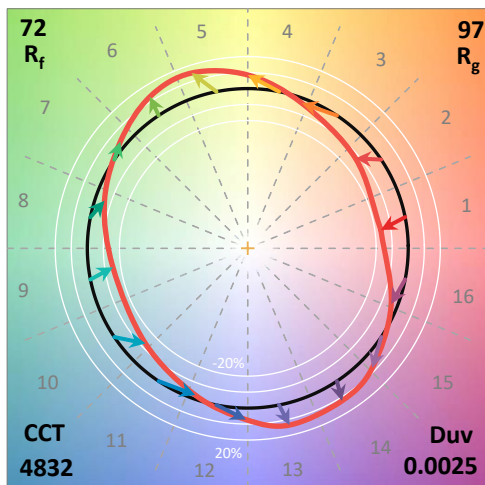
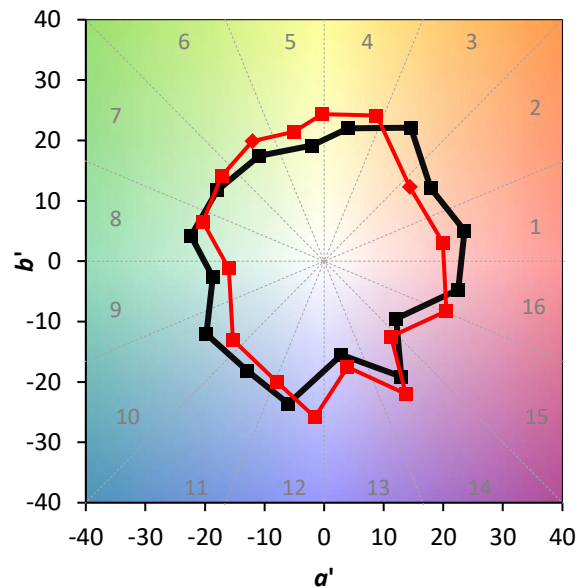
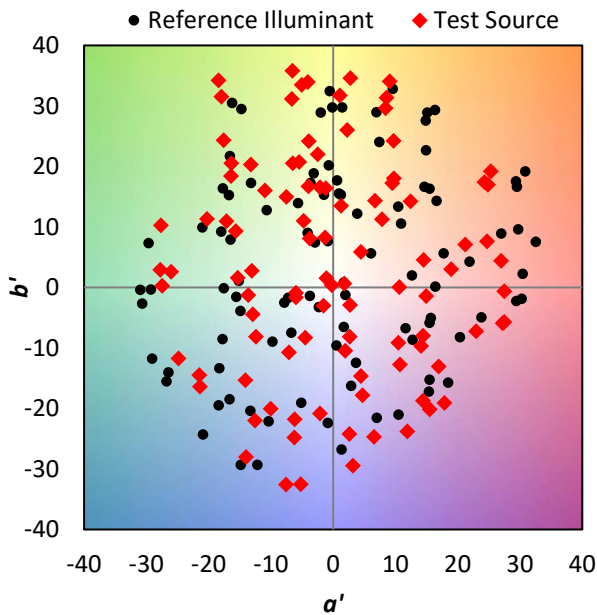
TM-30-18

### Summary

$R_f = 72.3$   
 $R_g = 96.7$   
 CIE  $R_a = 71.7$   
 $R_g = -27.7$



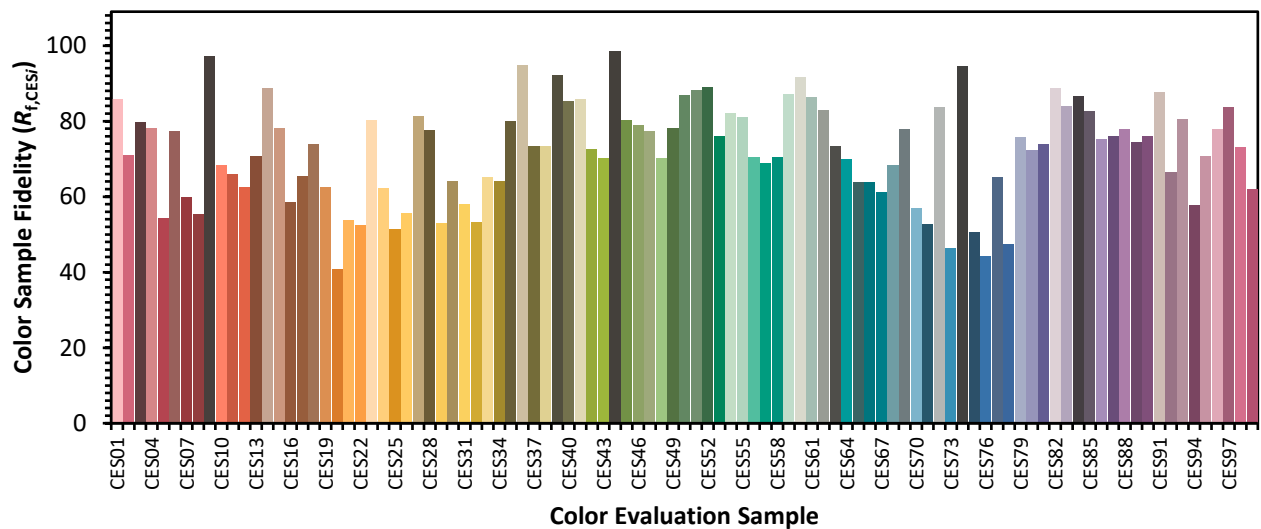
### Color Vector Graphics



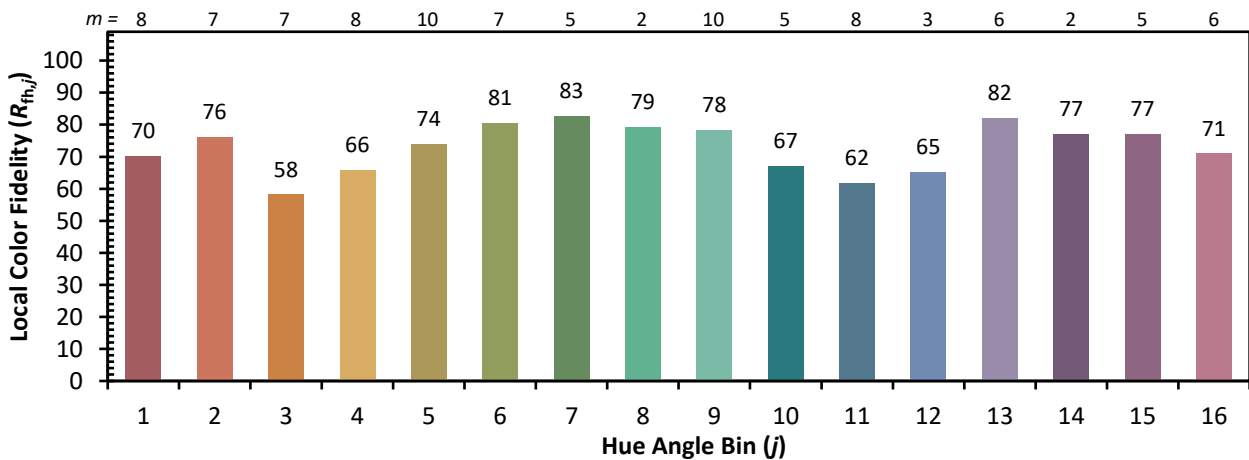
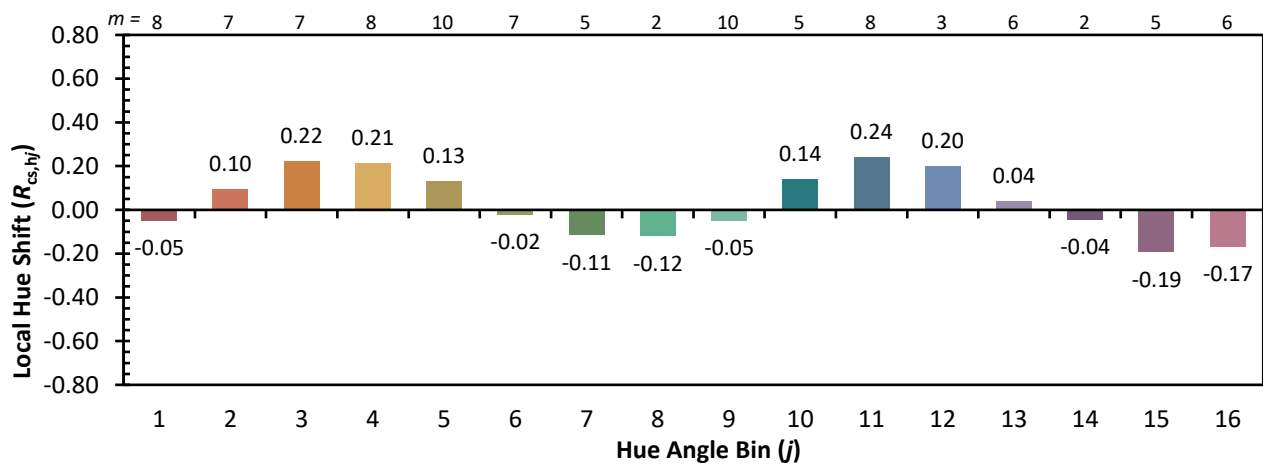
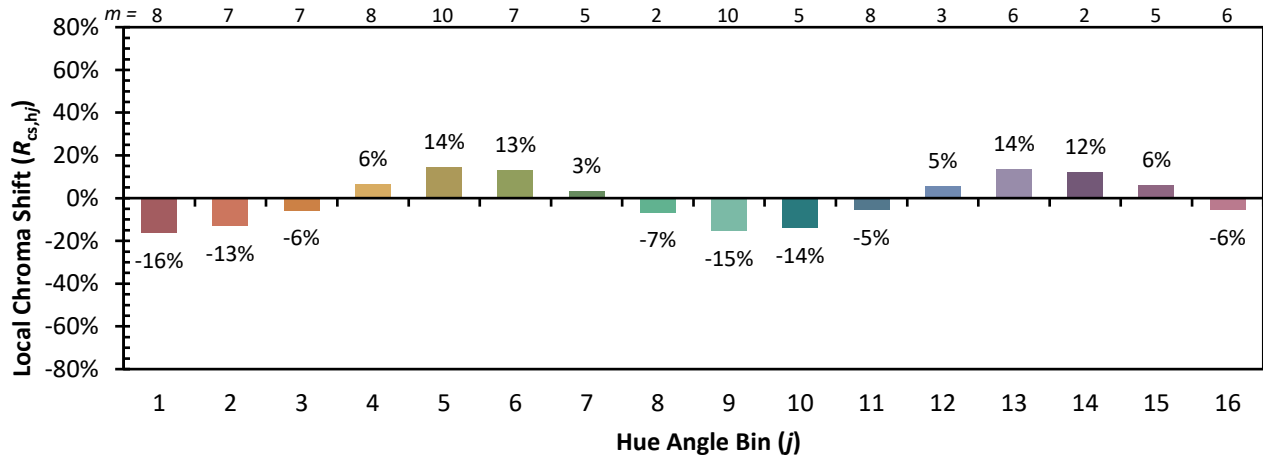


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

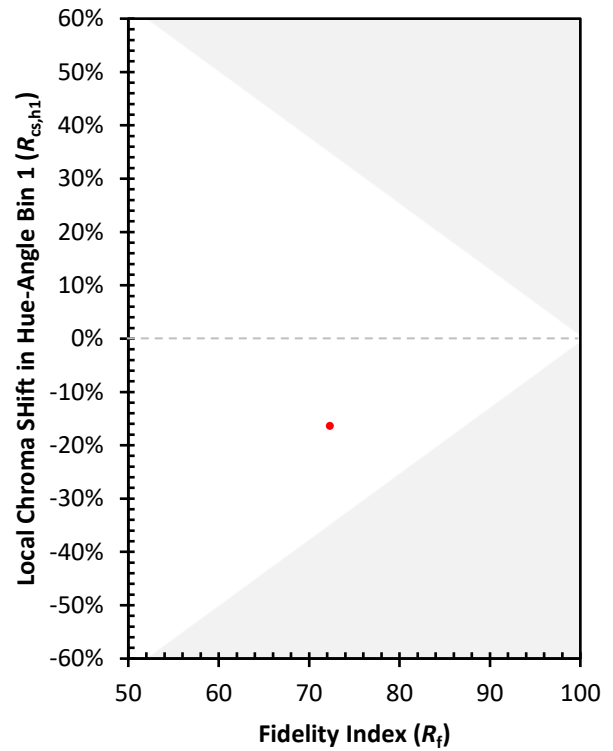
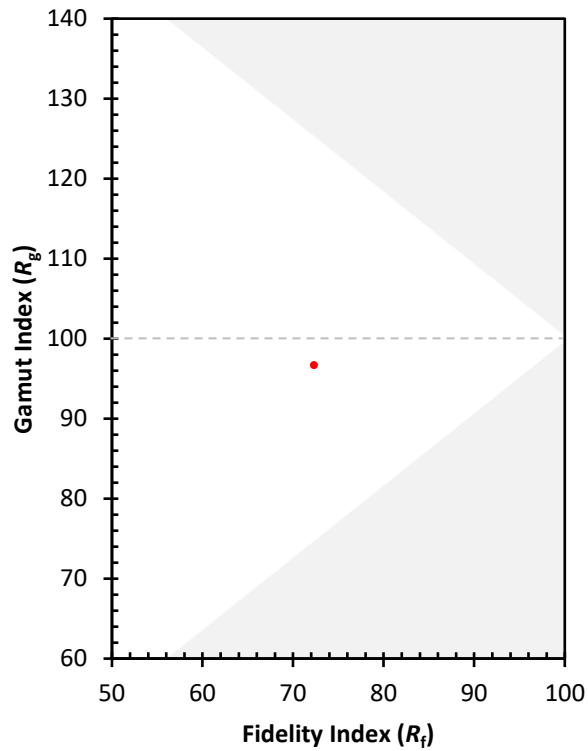
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 56 | CES51 = 88 | CES76 = 44 |
| CES02 = 60 | CES27 = 81 | CES52 = 89 | CES77 = 65 |
| CES03 = 30 | CES28 = 78 | CES53 = 76 | CES78 = 47 |
| CES04 = 69 | CES29 = 53 | CES54 = 82 | CES79 = 76 |
| CES05 = 46 | CES30 = 64 | CES55 = 81 | CES80 = 72 |
| CES06 = 50 | CES31 = 58 | CES56 = 70 | CES81 = 74 |
| CES07 = 39 | CES32 = 53 | CES57 = 69 | CES82 = 89 |
| CES08 = 38 | CES33 = 65 | CES58 = 70 | CES83 = 84 |
| CES09 = 29 | CES34 = 64 | CES59 = 87 | CES84 = 87 |
| CES10 = 73 | CES35 = 80 | CES60 = 92 | CES85 = 83 |
| CES11 = 56 | CES36 = 95 | CES61 = 86 | CES86 = 75 |
| CES12 = 62 | CES37 = 73 | CES62 = 83 | CES87 = 76 |
| CES13 = 42 | CES38 = 73 | CES63 = 73 | CES88 = 78 |
| CES14 = 74 | CES39 = 92 | CES64 = 70 | CES89 = 74 |
| CES15 = 70 | CES40 = 85 | CES65 = 64 | CES90 = 76 |
| CES16 = 46 | CES41 = 86 | CES66 = 64 | CES91 = 88 |
| CES17 = 49 | CES42 = 73 | CES67 = 61 | CES92 = 66 |
| CES18 = 55 | CES43 = 70 | CES68 = 68 | CES93 = 81 |
| CES19 = 71 | CES44 = 98 | CES69 = 78 | CES94 = 58 |
| CES20 = 64 | CES45 = 80 | CES70 = 57 | CES95 = 71 |
| CES21 = 85 | CES46 = 79 | CES71 = 53 | CES96 = 78 |
| CES22 = 77 | CES47 = 77 | CES72 = 84 | CES97 = 84 |
| CES23 = 91 | CES48 = 70 | CES73 = 46 | CES98 = 73 |
| CES24 = 90 | CES49 = 78 | CES74 = 95 | CES99 = 62 |
| CES25 = 71 | CES50 = 87 | CES75 = 50 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)