

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: P801000

Luminaire Tested: **ARCH-M-PA2-40-722-12VDC-T3**

Issue Date: 5/19/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P801000  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1910-568-10)  
Test Lab: INNOVATION CENTER  
Issue Date: 5/19/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: STREETWORKS  
Catalog Number: ARCH-M-PA2-40-722-12VDC-T3  
Description: ARCHEON-M ROADWAY AND AREA LUMINAIRE  
(2) 70 CRI, 2200K, 240mA LIGHT ENGINES WITH 16 LEDS AND TYPE III OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

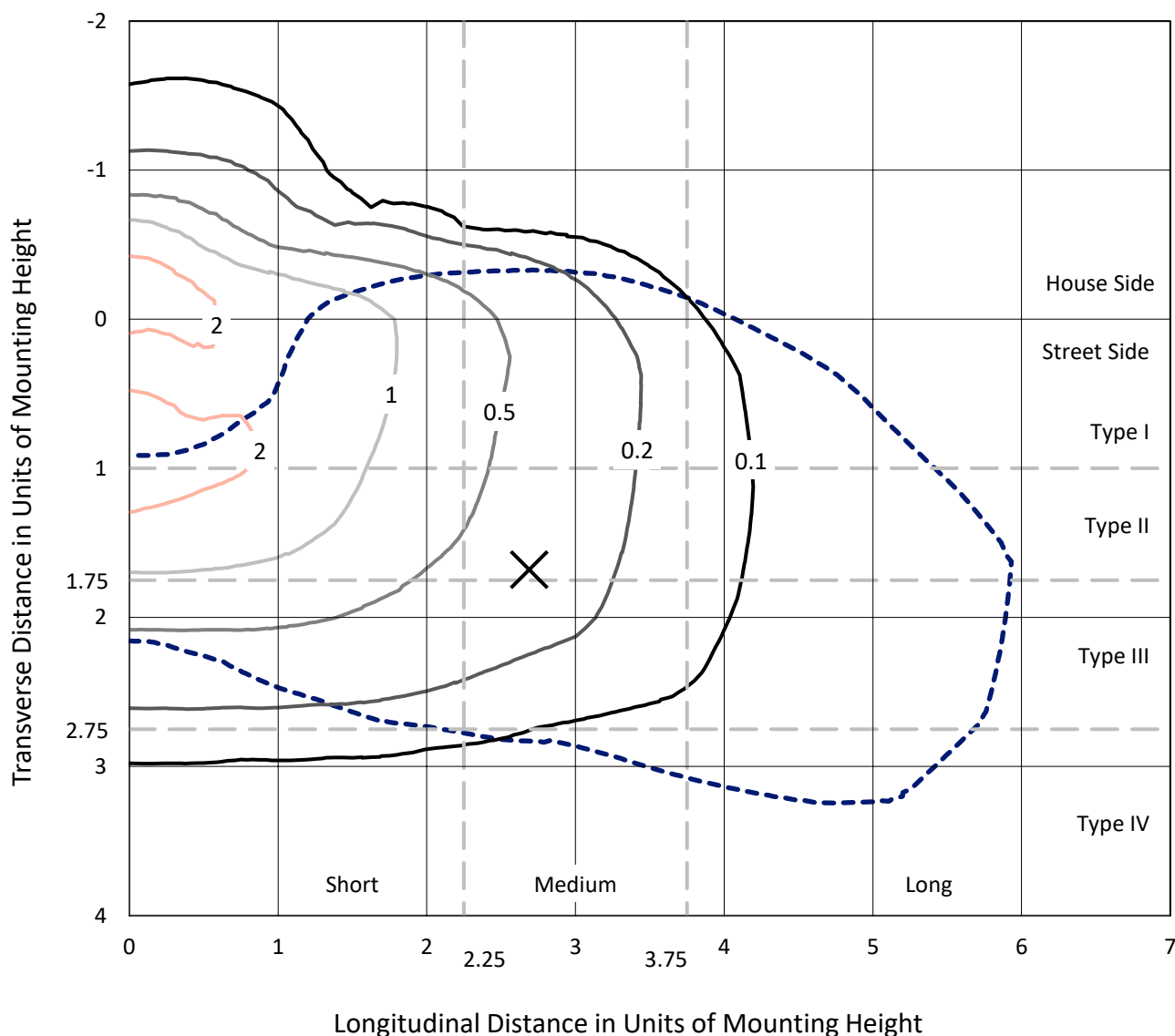
Lumens per Lamp: N/A  
Luminaire Lumens: 4741 lumens  
Efficiency: N/A  
Efficacy: 131.7 lumens/watt  
Luminous Opening: Rectangular (W 0.75' x L: 1' x H: 0')  
IES Classification: Type IV - Medium  
BUG Rating: B1 - U0 - G2

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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 CATALOG NUMBER: ARCH-M-PA2-40-722-12VDC-T3

## Iso-Footcandle Lines of Horizontal Illumination

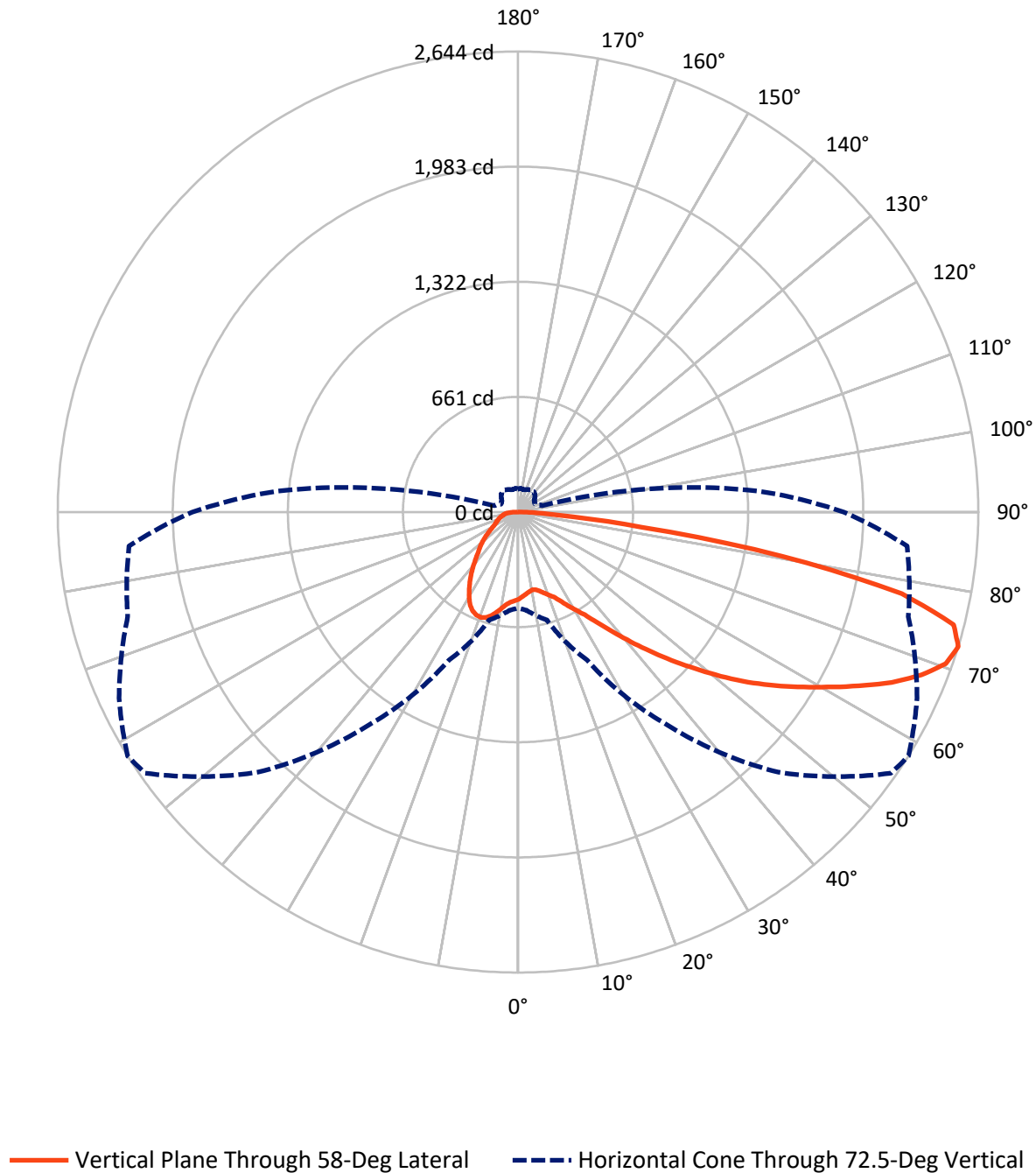
× Max cd  
 - - - 1/2 Max cd



Based on 15 foot mounting height. Maximum calculated value = 2.6 fc  
 Type IV - Medium - N/A

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## Luminous Intensity Polar Plot



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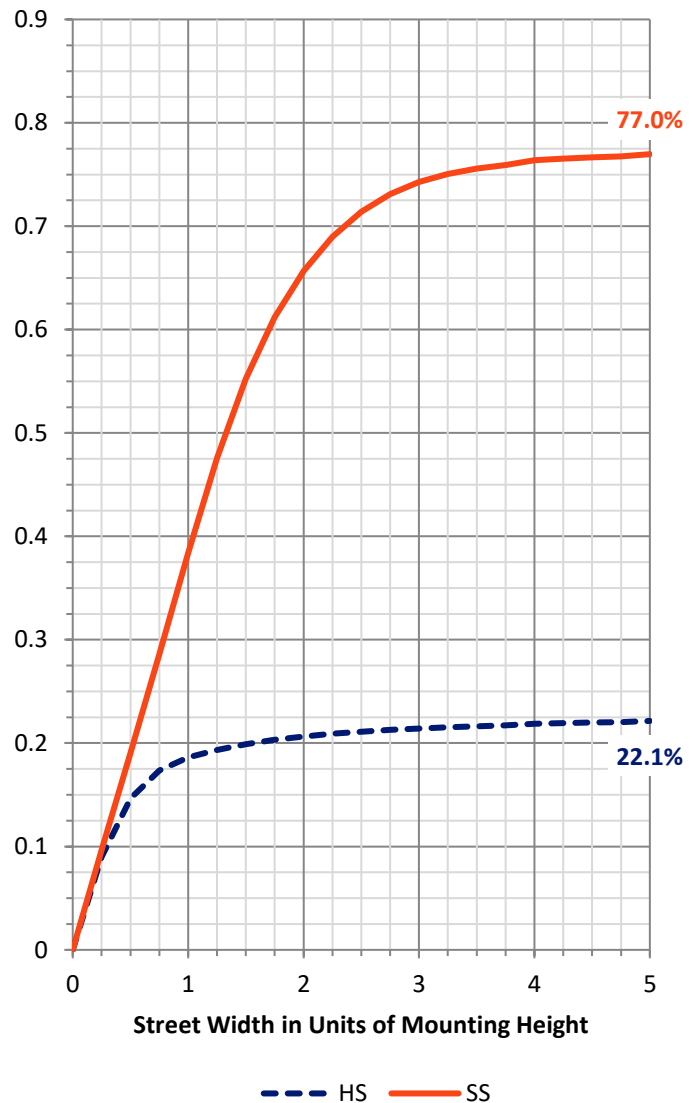
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 1075.2   | 0.0    | 1075.2 |
|                    | % Fixture | 22.7     | 0.0    | 22.7   |
| <b>Street Side</b> | Lumens    | 3665.8   | 0.0    | 3665.8 |
|                    | % Fixture | 77.3     | 0.0    | 77.3   |
| <b>Total</b>       | Lumens    | 4741.0   | 0.0    | 4741.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 48.2   | 1.0       |
| 10°-20°   | 153.0  | 3.2       |
| 20°-30°   | 274.0  | 5.8       |
| 30°-40°   | 412.2  | 8.7       |
| 40°-50°   | 667.6  | 14.1      |
| 50°-60°   | 1004.9 | 21.2      |
| 60°-70°   | 1182.7 | 24.9      |
| 70°-80°   | 838.6  | 17.7      |
| 80°-90°   | 159.8  | 3.4       |
| 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°    | 4741.0 | 100.0     |
| 0°-180°   | 4741.0 | 100.0     |



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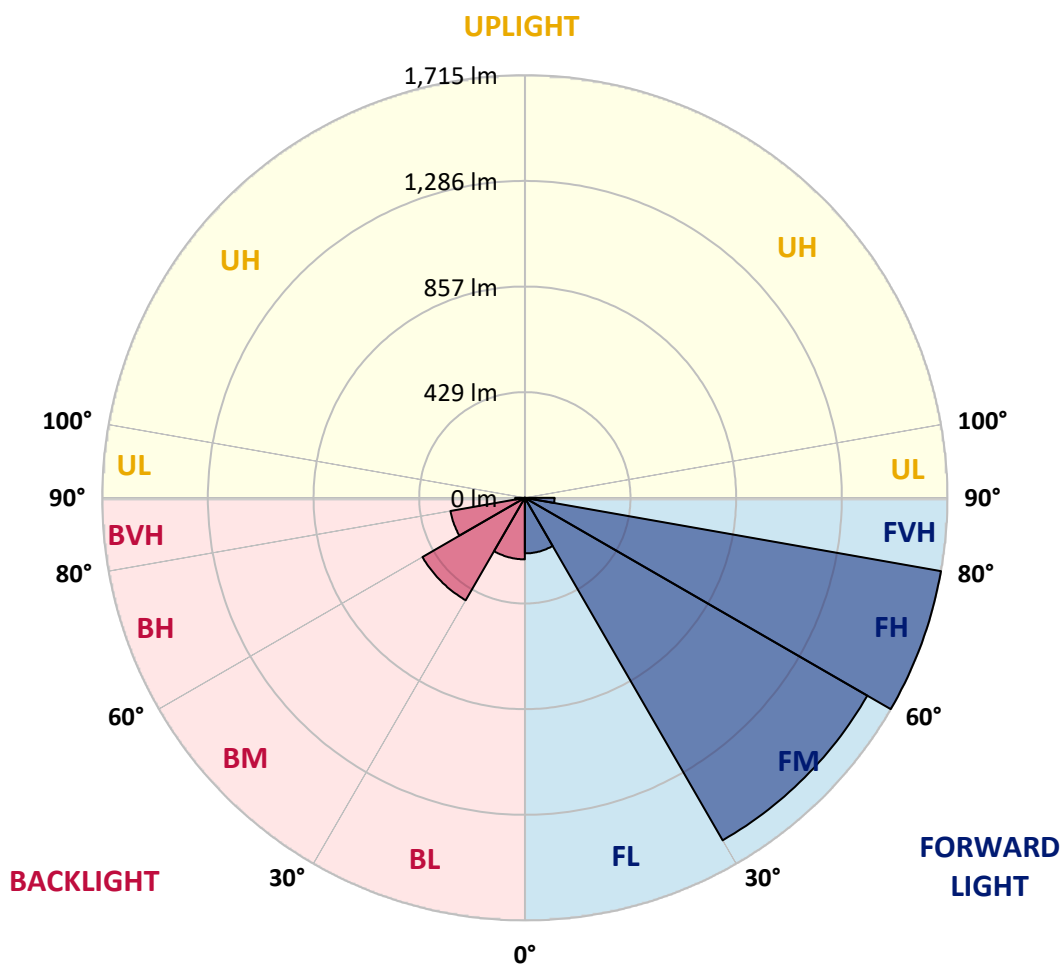
CATALOG NUMBER: ARCH-M-PA2-40-722-12VDC-T3

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 225.5  | 4.8       |                         |      |         |
| FM   | (30°-60°)   | 1605.0 | 33.9      |                         |      |         |
| FH   | (60°-80°)   | 1714.8 | 36.2      |                         |      | G1/1800 |
| FVH  | (80°-90°)   | 120.5  | 2.5       |                         |      | G2/225  |
| BL   | (0°-30°)    | 249.8  | 5.3       | B1/500                  |      |         |
| BM   | (30°-60°)   | 479.7  | 10.1      | B1/1000                 |      |         |
| BH   | (60°-80°)   | 306.4  | 6.5       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 39.3   | 0.8       |                         |      | G1/100  |
| 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°    | 45°    | 55°    | 58°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 500.1  | 500.1  | 500.1  | 500.1  | 500.1  | 500.1  | 500.1  | 500.1  | 500.1  | 500.1  | 500.1  |
| 2.5°  | 481.3  | 478.8  | 479.4  | 479.4  | 481.9  | 483.2  | 483.8  | 485.7  | 486.9  | 490.1  | 494.4  |
| 5°    | 458.8  | 456.9  | 457.5  | 458.1  | 462.5  | 466.9  | 470.7  | 473.2  | 476.9  | 481.9  | 488.2  |
| 7.5°  | 442.5  | 441.2  | 441.9  | 443.1  | 446.9  | 451.9  | 458.1  | 461.9  | 467.5  | 476.9  | 487.6  |
| 10°   | 430.6  | 430.6  | 431.2  | 433.7  | 437.5  | 443.7  | 448.8  | 453.1  | 464.4  | 481.3  | 497.6  |
| 12.5° | 421.2  | 421.2  | 423.1  | 428.1  | 434.4  | 440.6  | 452.5  | 457.5  | 472.5  | 495.7  | 515.1  |
| 15°   | 420.6  | 421.2  | 421.8  | 426.2  | 433.1  | 446.9  | 464.4  | 471.9  | 490.1  | 517.6  | 540.1  |
| 17.5° | 430.6  | 431.2  | 428.7  | 430.0  | 438.1  | 457.5  | 480.7  | 489.4  | 512.6  | 542.6  | 565.8  |
| 20°   | 461.3  | 461.3  | 453.8  | 446.9  | 452.5  | 473.8  | 500.1  | 508.8  | 534.5  | 567.7  | 590.8  |
| 22.5° | 523.9  | 527.0  | 509.5  | 494.4  | 485.7  | 497.6  | 521.4  | 530.7  | 559.5  | 595.2  | 618.4  |
| 25°   | 599.6  | 602.7  | 578.9  | 557.7  | 541.4  | 539.5  | 555.2  | 565.2  | 588.9  | 625.9  | 645.3  |
| 27.5° | 672.8  | 667.2  | 645.3  | 625.2  | 604.6  | 587.7  | 599.6  | 608.4  | 635.9  | 664.1  | 675.9  |
| 30°   | 730.4  | 726.0  | 704.7  | 690.3  | 670.9  | 649.0  | 642.1  | 651.5  | 674.1  | 700.4  | 706.6  |
| 32.5° | 794.2  | 791.1  | 769.8  | 751.1  | 734.8  | 714.1  | 699.1  | 703.5  | 716.0  | 734.8  | 738.5  |
| 35°   | 875.6  | 882.5  | 860.0  | 821.8  | 803.6  | 783.6  | 773.0  | 774.2  | 783.6  | 795.5  | 789.2  |
| 37.5° | 961.3  | 969.5  | 970.7  | 910.6  | 886.2  | 868.1  | 856.8  | 861.2  | 872.5  | 880.6  | 861.2  |
| 40°   | 1120.3 | 1112.2 | 1079.6 | 1035.2 | 997.6  | 980.1  | 964.5  | 963.8  | 972.0  | 986.4  | 951.3  |
| 42.5° | 1331.2 | 1323.7 | 1258.0 | 1200.4 | 1141.0 | 1120.9 | 1090.3 | 1077.1 | 1080.9 | 1099.0 | 1050.2 |
| 45°   | 1533.4 | 1530.3 | 1477.7 | 1410.7 | 1339.4 | 1300.6 | 1230.5 | 1198.6 | 1195.4 | 1209.8 | 1151.6 |
| 47.5° | 1713.0 | 1699.3 | 1661.1 | 1609.1 | 1601.6 | 1500.2 | 1371.3 | 1328.1 | 1313.1 | 1321.2 | 1256.1 |
| 50°   | 1905.2 | 1858.2 | 1805.7 | 1773.7 | 1828.2 | 1733.7 | 1513.4 | 1468.3 | 1431.4 | 1437.0 | 1369.4 |
| 52.5° | 2007.2 | 1928.3 | 1893.9 | 1903.3 | 1976.5 | 1940.2 | 1668.0 | 1612.9 | 1553.4 | 1561.6 | 1482.1 |
| 55°   | 1919.6 | 1918.9 | 1934.0 | 1992.2 | 2094.2 | 2052.2 | 1815.0 | 1753.1 | 1688.0 | 1689.9 | 1611.6 |
| 57.5° | 1799.4 | 1823.8 | 1901.4 | 2029.7 | 2240.0 | 2169.9 | 1959.6 | 1893.9 | 1834.4 | 1825.1 | 1758.7 |
| 60°   | 1689.9 | 1716.8 | 1829.4 | 2023.5 | 2290.7 | 2277.6 | 2097.3 | 2039.7 | 1991.5 | 1964.0 | 1913.3 |
| 62.5° | 1523.4 | 1543.4 | 1703.0 | 1983.4 | 2248.1 | 2355.2 | 2236.9 | 2197.4 | 2161.1 | 2104.2 | 2079.8 |
| 65°   | 1327.5 | 1334.4 | 1502.7 | 1851.3 | 2194.9 | 2385.2 | 2375.8 | 2358.3 | 2323.3 | 2239.4 | 2244.4 |
| 67.5° | 1115.3 | 1129.1 | 1276.8 | 1640.4 | 2078.5 | 2371.4 | 2483.5 | 2497.9 | 2456.6 | 2330.8 | 2349.5 |
| 70°   | 889.4  | 906.3  | 1018.3 | 1348.8 | 1880.8 | 2312.0 | 2583.0 | 2606.1 | 2526.7 | 2360.8 | 2368.9 |
| 72.5° | 550.1  | 566.4  | 641.5  | 936.9  | 1490.8 | 2112.3 | 2613.7 | 2643.7 | 2528.5 | 2320.7 | 2242.5 |
| 75°   | 190.3  | 192.1  | 251.0  | 449.4  | 885.0  | 1594.7 | 2513.5 | 2584.2 | 2449.1 | 2174.9 | 1951.5 |
| 77.5° | 87.0   | 90.1   | 111.4  | 185.3  | 392.4  | 860.6  | 2075.4 | 2252.5 | 2207.5 | 1947.1 | 1502.1 |
| 80°   | 60.1   | 61.3   | 77.0   | 110.8  | 226.6  | 302.9  | 1310.0 | 1540.9 | 1619.8 | 1507.7 | 962.6  |
| 82.5° | 45.1   | 46.3   | 59.5   | 75.1   | 163.4  | 147.1  | 498.8  | 716.0  | 890.0  | 873.7  | 402.4  |
| 85°   | 43.2   | 42.6   | 46.3   | 50.1   | 108.9  | 87.6   | 161.5  | 221.6  | 347.4  | 297.3  | 101.4  |
| 87.5° | 18.8   | 20.7   | 47.6   | 28.2   | 57.0   | 40.7   | 70.1   | 82.0   | 105.8  | 92.0   | 36.3   |
| 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-PA2-40-722-12VDC-T3

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 500.1  | 500.1  | 500.1 | 500.1 | 500.1 | 500.1 | 500.1 | 500.1 | 500.1 | 500.1 | 500.1 |
| 2.5°  | 496.3  | 497.6  | 501.3 | 507.0 | 510.1 | 516.3 | 520.7 | 523.2 | 525.1 | 525.7 | 525.7 |
| 5°    | 491.9  | 494.4  | 502.6 | 512.0 | 520.7 | 533.9 | 545.8 | 552.6 | 557.7 | 559.5 | 560.2 |
| 7.5°  | 493.2  | 499.4  | 511.3 | 525.1 | 536.4 | 553.3 | 567.7 | 581.4 | 592.7 | 597.1 | 597.1 |
| 10°   | 505.1  | 513.8  | 530.1 | 548.3 | 562.7 | 580.2 | 595.2 | 607.1 | 620.2 | 627.8 | 629.0 |
| 12.5° | 523.2  | 533.9  | 555.2 | 575.2 | 591.5 | 605.2 | 619.0 | 627.8 | 634.0 | 639.6 | 640.9 |
| 15°   | 548.9  | 562.0  | 583.3 | 604.0 | 618.4 | 627.1 | 630.9 | 630.9 | 630.3 | 630.9 | 632.1 |
| 17.5° | 574.6  | 587.1  | 608.4 | 629.0 | 635.9 | 630.9 | 626.5 | 625.2 | 624.6 | 623.4 | 624.0 |
| 20°   | 599.6  | 611.5  | 629.6 | 645.3 | 639.6 | 622.1 | 616.5 | 615.9 | 614.0 | 612.7 | 611.5 |
| 22.5° | 624.6  | 633.4  | 648.4 | 654.0 | 631.5 | 606.5 | 599.6 | 595.8 | 593.3 | 590.2 | 587.1 |
| 25°   | 653.4  | 655.9  | 667.2 | 658.4 | 611.5 | 577.7 | 567.7 | 562.0 | 559.5 | 556.4 | 553.9 |
| 27.5° | 680.3  | 680.3  | 682.2 | 651.5 | 582.1 | 539.5 | 524.5 | 514.5 | 513.8 | 513.2 | 512.6 |
| 30°   | 704.7  | 701.6  | 695.3 | 630.9 | 543.9 | 492.6 | 470.0 | 460.0 | 463.8 | 466.9 | 467.5 |
| 32.5° | 733.5  | 727.3  | 709.7 | 602.7 | 498.2 | 440.0 | 412.5 | 408.1 | 412.5 | 416.2 | 413.7 |
| 35°   | 778.6  | 767.3  | 724.8 | 570.2 | 454.4 | 391.8 | 365.5 | 359.3 | 358.0 | 357.4 | 352.4 |
| 37.5° | 843.1  | 823.7  | 736.7 | 535.1 | 411.2 | 349.2 | 329.8 | 316.7 | 304.8 | 292.3 | 290.4 |
| 40°   | 921.9  | 888.7  | 744.8 | 495.1 | 365.5 | 313.6 | 292.9 | 276.0 | 256.0 | 234.1 | 231.6 |
| 42.5° | 1008.3 | 958.8  | 748.5 | 450.6 | 325.5 | 284.1 | 258.5 | 237.2 | 214.7 | 197.8 | 194.6 |
| 45°   | 1101.5 | 1034.6 | 745.4 | 408.1 | 292.9 | 259.1 | 230.3 | 207.2 | 189.0 | 177.1 | 174.6 |
| 47.5° | 1192.3 | 1121.6 | 736.7 | 374.3 | 267.9 | 237.8 | 208.4 | 187.1 | 173.4 | 160.2 | 157.1 |
| 50°   | 1308.7 | 1204.8 | 726.0 | 348.0 | 240.3 | 216.6 | 194.6 | 172.1 | 156.5 | 150.2 | 149.0 |
| 52.5° | 1437.6 | 1288.1 | 713.5 | 314.8 | 213.4 | 199.7 | 185.9 | 165.9 | 160.9 | 149.0 | 147.1 |
| 55°   | 1577.2 | 1386.9 | 711.0 | 272.9 | 189.6 | 187.8 | 177.1 | 171.5 | 172.7 | 149.0 | 145.8 |
| 57.5° | 1724.3 | 1492.7 | 716.6 | 230.9 | 170.2 | 177.1 | 180.9 | 176.5 | 174.6 | 152.1 | 145.8 |
| 60°   | 1877.6 | 1594.7 | 699.7 | 192.1 | 155.2 | 168.4 | 185.3 | 174.0 | 160.2 | 150.8 | 146.5 |
| 62.5° | 2026.6 | 1680.5 | 626.5 | 164.6 | 144.0 | 165.9 | 182.8 | 164.6 | 149.0 | 149.0 | 147.1 |
| 65°   | 2134.9 | 1718.7 | 490.1 | 144.6 | 136.4 | 162.7 | 178.4 | 158.3 | 145.8 | 150.2 | 147.7 |
| 67.5° | 2147.4 | 1679.2 | 329.2 | 128.9 | 130.2 | 157.1 | 168.4 | 152.7 | 142.7 | 154.0 | 150.2 |
| 70°   | 2070.4 | 1576.6 | 201.5 | 117.0 | 122.0 | 147.1 | 159.6 | 147.1 | 138.3 | 150.8 | 145.2 |
| 72.5° | 1870.7 | 1385.1 | 142.1 | 107.0 | 113.3 | 137.7 | 151.5 | 142.1 | 132.1 | 136.4 | 130.8 |
| 75°   | 1534.6 | 1073.4 | 112.7 | 97.6  | 104.5 | 128.9 | 144.6 | 134.6 | 124.5 | 122.7 | 118.9 |
| 77.5° | 1087.1 | 687.8  | 90.8  | 90.1  | 95.1  | 118.3 | 135.2 | 125.8 | 115.8 | 112.0 | 109.5 |
| 80°   | 625.2  | 337.3  | 78.2  | 81.4  | 86.4  | 107.7 | 123.9 | 115.8 | 106.4 | 100.8 | 97.0  |
| 82.5° | 239.1  | 117.7  | 68.8  | 70.7  | 76.4  | 96.4  | 112.7 | 105.8 | 96.4  | 101.4 | 85.1  |
| 85°   | 77.6   | 64.5   | 56.3  | 58.2  | 63.8  | 80.1  | 99.5  | 93.9  | 83.2  | 73.9  | 68.2  |
| 87.5° | 34.4   | 35.0   | 30.0  | 33.2  | 40.1  | 53.2  | 72.6  | 68.8  | 60.7  | 50.7  | 48.8  |
| 90°   | 0.0    | 0.0    | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |



LM-79-08: Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

STREETWORKS

Report Number: SP1-2101-121-4

Luminaire Tested: IFLD-S-SA2B-722-U-T3R

Test Date: 03/03/2021

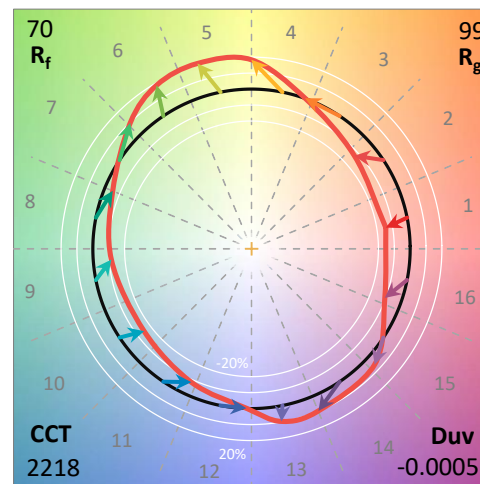
### Test Information

Test Method: LM-79-08  
 Report Number: SP1-2101-121-4  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1  
 Measurement Geometry:  $4\pi$   
 Issue Date: 03/03/2021  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: STREETWORKS  
 Catalog Number: **IFLD-S-SA2B-722-U-T3R**  
 Description: STREETWORKS INF FLOOD

PROGRAMMED @ 800mA.

### Spectral Parameters

|                           |         |           |      |      |       |
|---------------------------|---------|-----------|------|------|-------|
| CCT (K):                  | 2218    | CRI (Ra): | 72.2 |      |       |
| CIE u':                   | 0.2889  | R1:       | 69.1 | R9:  | -16.8 |
| CIE v':                   | 0.5350  | R2:       | 83.2 | R10: | 61.9  |
| Duv:                      | -0.0005 | R3:       | 95.4 | R11: | 60.1  |
| CIE x:                    | 0.5026  | R4:       | 66.4 | R12: | 51.2  |
| CIE y:                    | 0.4136  | R5:       | 66.2 | R13: | 71.3  |
| CIE z:                    | 0.0839  | R6:       | 76.7 | R14: | 97.1  |
| Peak Wavelength (nm):     | 606     | R7:       | 76.7 |      |       |
| Dominant Wavelength (nm): | 587     | R8:       | 43.9 |      |       |
| Purity:                   | 75.3    |           |      |      |       |
| Rf:                       | 70      |           |      |      |       |
| Rg:                       | 99.3    |           |      |      |       |



### Test Conditions

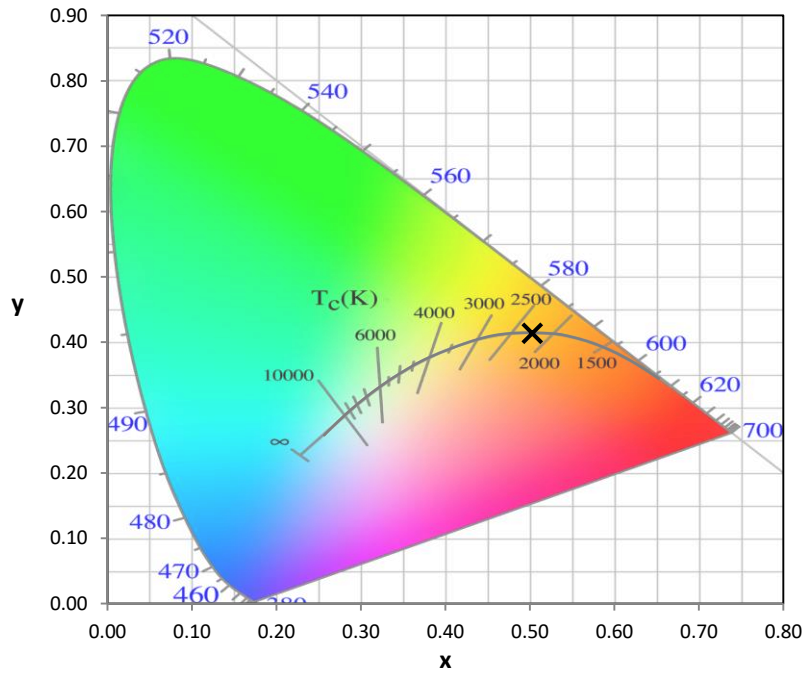
Stabilization Time: 95M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.3/31%  
 Sphere Temperature (°C): 24.8

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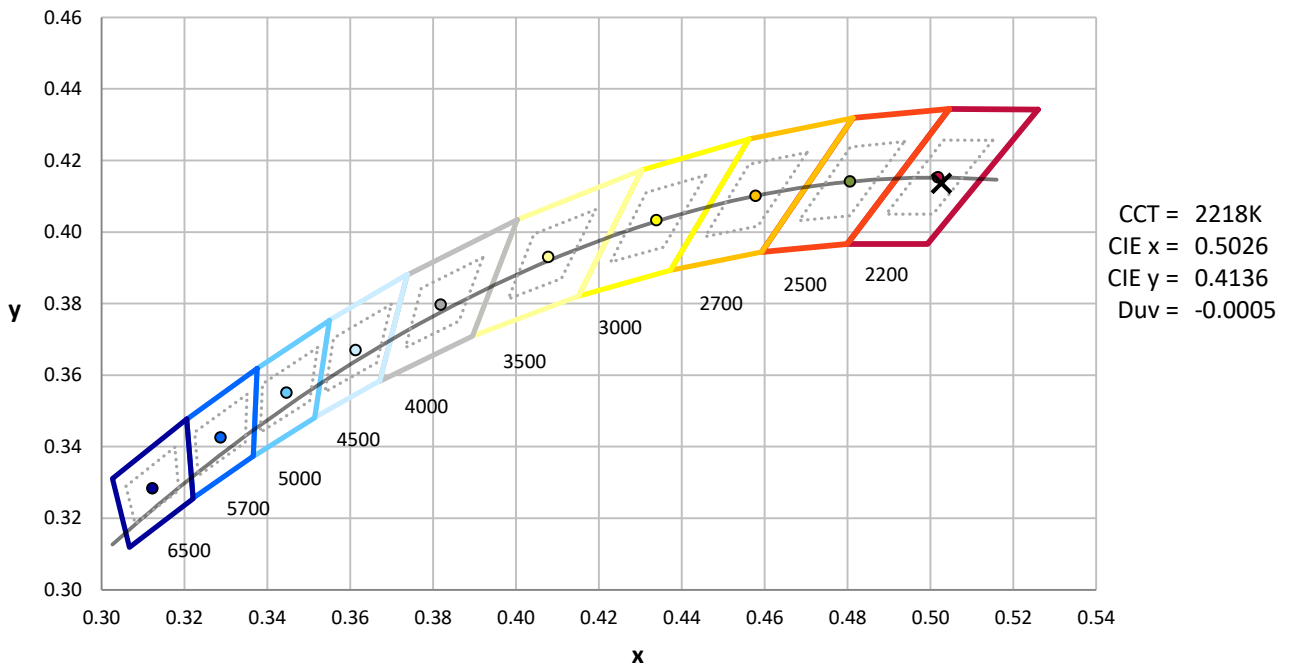
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date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

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**CIE 1931 Chromaticity Diagram**



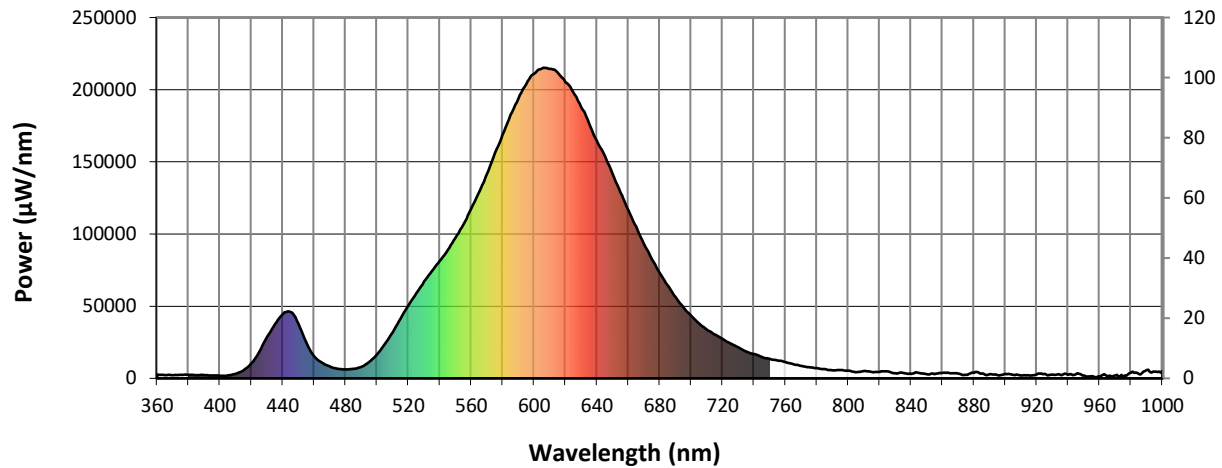
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 2200K 4-step quadrangle

REPORT NUMBER: SP1-2101-121-4

### Photopic Flux vs. Wavelength

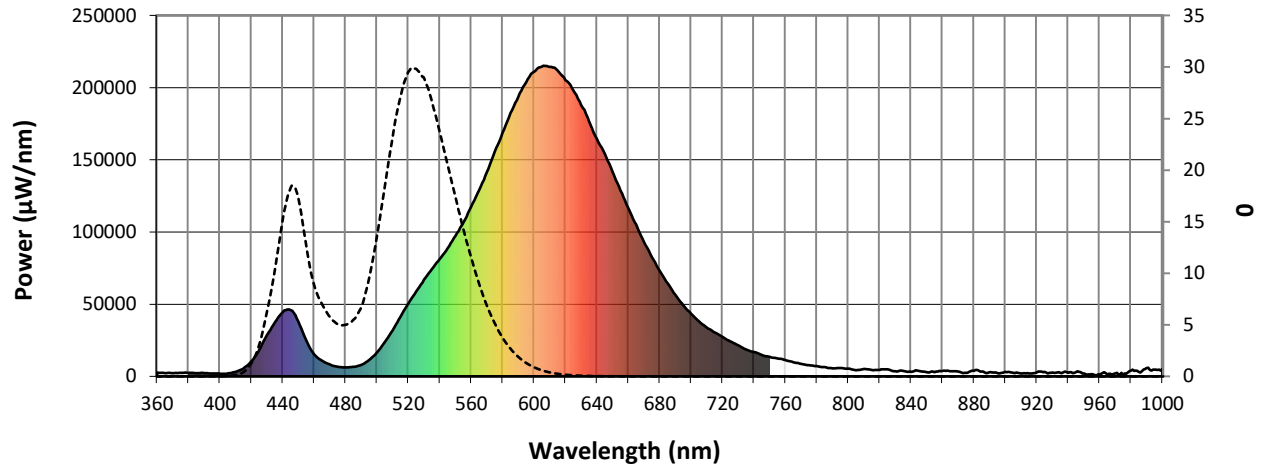


#####

| 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       | 2623             | 0.0              | 490       | 7941             | 1.1              | 620       | 205150           | 53.4             | 750       | 13431            | 0.0              | 880       | 3867             | 0.0              |
| 365       | 2260             | 0.0              | 495       | 11299            | 2.0              | 625       | 198277           | 43.7             | 755       | 12426            | 0.0              | 885       | 3345             | 0.0              |
| 370       | 2306             | 0.0              | 500       | 16633            | 3.7              | 630       | 187878           | 34.0             | 760       | 11385            | 0.0              | 890       | 2956             | 0.0              |
| 375       | 2437             | 0.0              | 505       | 23672            | 6.6              | 635       | 176836           | 26.6             | 765       | 9797             | 0.0              | 895       | 2272             | 0.0              |
| 380       | 2473             | 0.0              | 510       | 32025            | 11.0             | 640       | 164455           | 19.7             | 770       | 8562             | 0.0              | 900       | 3003             | 0.0              |
| 385       | 2203             | 0.0              | 515       | 41295            | 17.1             | 645       | 154086           | 14.8             | 775       | 7810             | 0.0              | 905       | 2480             | 0.0              |
| 390       | 2262             | 0.0              | 520       | 50628            | 24.6             | 650       | 141592           | 10.3             | 780       | 7052             | 0.0              | 910       | 2068             | 0.0              |
| 395       | 2028             | 0.0              | 525       | 58836            | 31.6             | 655       | 128604           | 7.4              | 785       | 6345             | 0.0              | 915       | 2064             | 0.0              |
| 400       | 1806             | 0.0              | 530       | 67109            | 39.5             | 660       | 116713           | 4.9              | 790       | 5524             | 0.0              | 920       | 2581             | 0.0              |
| 405       | 1945             | 0.0              | 535       | 74404            | 46.1             | 665       | 104993           | 3.3              | 795       | 5788             | 0.0              | 925       | 3137             | 0.0              |
| 410       | 3199             | 0.0              | 540       | 81280            | 53.0             | 670       | 93149            | 2.0              | 800       | 5282             | 0.0              | 930       | 2747             | 0.0              |
| 415       | 5572             | 0.0              | 545       | 88806            | 59.1             | 675       | 82543            | 1.4              | 805       | 4258             | 0.0              | 935       | 2471             | 0.0              |
| 420       | 10322            | 0.0              | 550       | 97367            | 66.2             | 680       | 73089            | 0.8              | 810       | 5156             | 0.0              | 940       | 2339             | 0.0              |
| 425       | 18494            | 0.1              | 555       | 106598           | 72.8             | 685       | 64438            | 0.6              | 815       | 4391             | 0.0              | 945       | 2917             | 0.0              |
| 430       | 28541            | 0.2              | 560       | 117615           | 79.9             | 690       | 56546            | 0.3              | 820       | 4383             | 0.0              | 950       | 1966             | 0.0              |
| 435       | 37453            | 0.4              | 565       | 129103           | 85.8             | 695       | 49328            | 0.2              | 825       | 4881             | 0.0              | 955       | 1580             | 0.0              |
| 440       | 44455            | 0.7              | 570       | 141415           | 92.0             | 700       | 43493            | 0.1              | 830       | 3588             | 0.0              | 960       | 1318             | 0.0              |
| 445       | 45934            | 1.0              | 575       | 155854           | 97.0             | 705       | 38035            | 0.1              | 835       | 3835             | 0.0              | 965       | 1419             | 0.0              |
| 450       | 37926            | 1.0              | 580       | 168613           | 100.2            | 710       | 33716            | 0.0              | 840       | 3014             | 0.0              | 970       | 1917             | 0.0              |
| 455       | 24793            | 0.8              | 585       | 182390           | 101.3            | 715       | 30449            | 0.0              | 845       | 3765             | 0.0              | 975       | 1210             | 0.0              |
| 460       | 15340            | 0.6              | 590       | 194054           | 100.3            | 720       | 27240            | 0.0              | 850       | 2906             | 0.0              | 980       | 3915             | 0.0              |
| 465       | 10883            | 0.6              | 595       | 203639           | 96.5             | 725       | 24231            | 0.0              | 855       | 2947             | 0.0              | 985       | 3180             | 0.0              |
| 470       | 8138             | 0.5              | 600       | 211043           | 91.0             | 730       | 21490            | 0.0              | 860       | 3864             | 0.0              | 990       | 5676             | 0.0              |
| 475       | 6653             | 0.5              | 605       | 214591           | 83.1             | 735       | 18548            | 0.0              | 865       | 3546             | 0.0              | 995       | 4736             | 0.0              |
| 480       | 6220             | 0.6              | 610       | 214337           | 73.6             | 740       | 16963            | 0.0              | 870       | 3253             | 0.0              | 1000      | 5113             | 0.0              |
| 485       | 6613             | 0.8              | 615       | 211915           | 64.0             | 745       | 14922            | 0.0              | 875       | 2450             | 0.0              |           |                  |                  |

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### Scotopic Flux vs. Wavelength



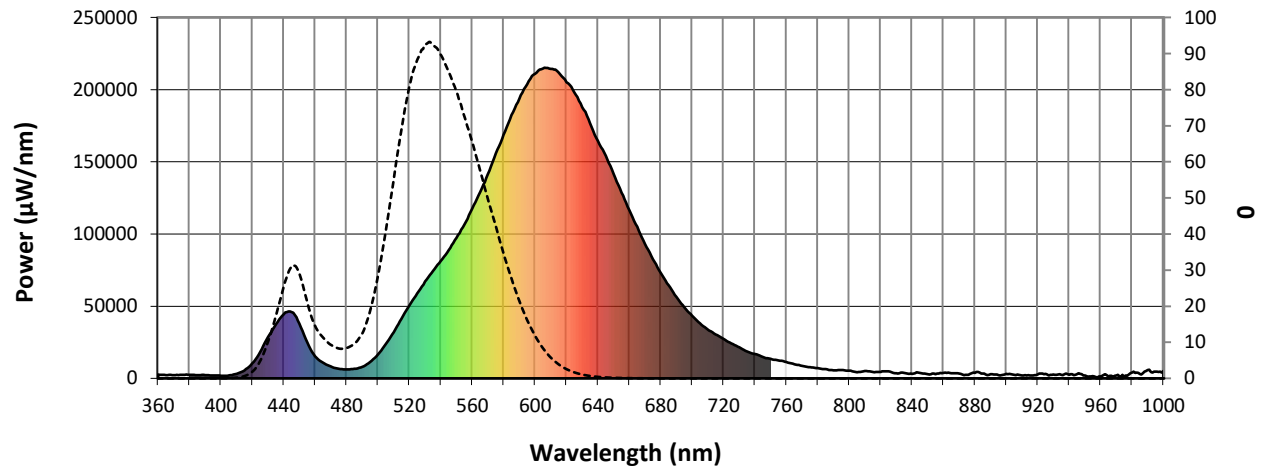
Scotopic Lumens: 7290.1

S/P: 0.84

| 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       | 2623             | 0.0              | 490       | 7941             | 12.2             | 620       | 205150           | 2.6              | 750       | 13431            | 0.0              | 880       | 3867             | 0.0              |
| 365       | 2260             | 0.0              | 495       | 11299            | 18.3             | 625       | 198277           | 1.7              | 755       | 12426            | 0.0              | 885       | 3345             | 0.0              |
| 370       | 2306             | 0.0              | 500       | 16633            | 27.8             | 630       | 187878           | 1.1              | 760       | 11385            | 0.0              | 890       | 2956             | 0.0              |
| 375       | 2437             | 0.0              | 505       | 23672            | 40.2             | 635       | 176836           | 0.7              | 765       | 9797             | 0.0              | 895       | 2272             | 0.0              |
| 380       | 2473             | 0.0              | 510       | 32025            | 54.3             | 640       | 164455           | 0.4              | 770       | 8562             | 0.0              | 900       | 3003             | 0.0              |
| 385       | 2203             | 0.0              | 515       | 41295            | 68.4             | 645       | 154086           | 0.3              | 775       | 7810             | 0.0              | 905       | 2480             | 0.0              |
| 390       | 2262             | 0.0              | 520       | 50628            | 80.5             | 650       | 141592           | 0.2              | 780       | 7052             | 0.0              | 910       | 2068             | 0.0              |
| 395       | 2028             | 0.0              | 525       | 58836            | 88.0             | 655       | 128604           | 0.1              | 785       | 6345             | 0.0              | 915       | 2064             | 0.0              |
| 400       | 1806             | 0.0              | 530       | 67109            | 92.5             | 660       | 116713           | 0.1              | 790       | 5524             | 0.0              | 920       | 2581             | 0.0              |
| 405       | 1945             | 0.1              | 535       | 74404            | 92.7             | 665       | 104993           | 0.0              | 795       | 5788             | 0.0              | 925       | 3137             | 0.0              |
| 410       | 3199             | 0.2              | 540       | 81280            | 89.8             | 670       | 93149            | 0.0              | 800       | 5282             | 0.0              | 930       | 2747             | 0.0              |
| 415       | 5572             | 0.6              | 545       | 88806            | 85.1             | 675       | 82543            | 0.0              | 805       | 4258             | 0.0              | 935       | 2471             | 0.0              |
| 420       | 10322            | 1.7              | 550       | 97367            | 79.6             | 680       | 73089            | 0.0              | 810       | 5156             | 0.0              | 940       | 2339             | 0.0              |
| 425       | 18494            | 4.5              | 555       | 106598           | 72.8             | 685       | 64438            | 0.0              | 815       | 4391             | 0.0              | 945       | 2917             | 0.0              |
| 430       | 28541            | 9.7              | 560       | 117615           | 65.7             | 690       | 56546            | 0.0              | 820       | 4383             | 0.0              | 950       | 1966             | 0.0              |
| 435       | 37453            | 16.7             | 565       | 129103           | 57.9             | 695       | 49328            | 0.0              | 825       | 4881             | 0.0              | 955       | 1580             | 0.0              |
| 440       | 44455            | 24.8             | 570       | 141415           | 49.9             | 700       | 43493            | 0.0              | 830       | 3588             | 0.0              | 960       | 1318             | 0.0              |
| 445       | 45934            | 30.8             | 575       | 155854           | 42.4             | 705       | 38035            | 0.0              | 835       | 3835             | 0.0              | 965       | 1419             | 0.0              |
| 450       | 37926            | 29.4             | 580       | 168613           | 34.7             | 710       | 33716            | 0.0              | 840       | 3014             | 0.0              | 970       | 1917             | 0.0              |
| 455       | 24793            | 21.7             | 585       | 182390           | 27.9             | 715       | 30449            | 0.0              | 845       | 3765             | 0.0              | 975       | 1210             | 0.0              |
| 460       | 15340            | 14.8             | 590       | 194054           | 21.6             | 720       | 27240            | 0.0              | 850       | 2906             | 0.0              | 980       | 3915             | 0.0              |
| 465       | 10883            | 11.5             | 595       | 203639           | 16.2             | 725       | 24231            | 0.0              | 855       | 2947             | 0.0              | 985       | 3180             | 0.0              |
| 470       | 8138             | 9.4              | 600       | 211043           | 11.9             | 730       | 21490            | 0.0              | 860       | 3864             | 0.0              | 990       | 5676             | 0.0              |
| 475       | 6653             | 8.3              | 605       | 214591           | 8.4              | 735       | 18548            | 0.0              | 865       | 3546             | 0.0              | 995       | 4736             | 0.0              |
| 480       | 6220             | 8.4              | 610       | 214337           | 5.8              | 740       | 16963            | 0.0              | 870       | 3253             | 0.0              | 1000      | 5113             | 0.0              |
| 485       | 6613             | 9.6              | 615       | 211915           | 3.9              | 745       | 14922            | 0.0              | 875       | 2450             | 0.0              |           |                  |                  |

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### Melanopic Flux vs. Wavelength


**Melanopic Lumens: 2276.7**
**M/P: 0.26**

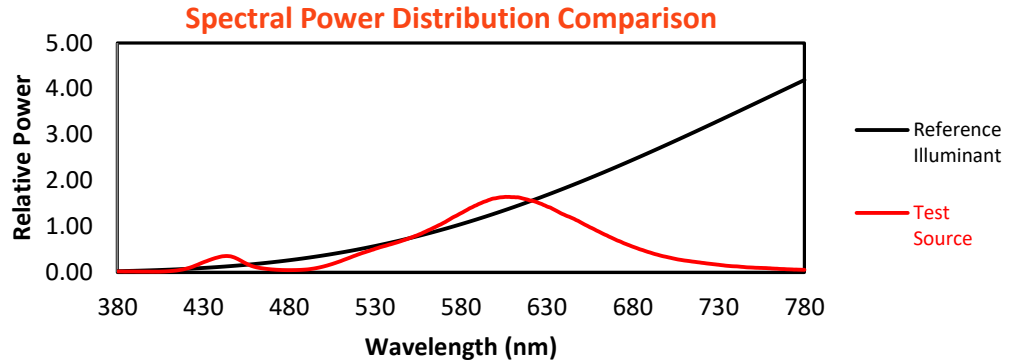
| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 2623             | 0.0              | 490       | 7941             | 6.6              | 620       | 205150           | 0.2              | 750       | 13431            | 0.0              | 880       | 3867             | 0.0              |
| 365       | 2260             | 0.0              | 495       | 11299            | 9.3              | 625       | 198277           | 0.1              | 755       | 12426            | 0.0              | 885       | 3345             | 0.0              |
| 370       | 2306             | 0.0              | 500       | 16633            | 13.4             | 630       | 187878           | 0.1              | 760       | 11385            | 0.0              | 890       | 2956             | 0.0              |
| 375       | 2437             | 0.0              | 505       | 23672            | 18.2             | 635       | 176836           | 0.0              | 765       | 9797             | 0.0              | 895       | 2272             | 0.0              |
| 380       | 2473             | 0.0              | 510       | 32025            | 23.0             | 640       | 164455           | 0.0              | 770       | 8562             | 0.0              | 900       | 3003             | 0.0              |
| 385       | 2203             | 0.0              | 515       | 41295            | 27.0             | 645       | 154086           | 0.0              | 775       | 7810             | 0.0              | 905       | 2480             | 0.0              |
| 390       | 2262             | 0.0              | 520       | 50628            | 29.5             | 650       | 141592           | 0.0              | 780       | 7052             | 0.0              | 910       | 2068             | 0.0              |
| 395       | 2028             | 0.0              | 525       | 58836            | 29.8             | 655       | 128604           | 0.0              | 785       | 6345             | 0.0              | 915       | 2064             | 0.0              |
| 400       | 1806             | 0.0              | 530       | 67109            | 29.0             | 660       | 116713           | 0.0              | 790       | 5524             | 0.0              | 920       | 2581             | 0.0              |
| 405       | 1945             | 0.0              | 535       | 74404            | 26.8             | 665       | 104993           | 0.0              | 795       | 5788             | 0.0              | 925       | 3137             | 0.0              |
| 410       | 3199             | 0.1              | 540       | 81280            | 23.8             | 670       | 93149            | 0.0              | 800       | 5282             | 0.0              | 930       | 2747             | 0.0              |
| 415       | 5572             | 0.4              | 545       | 88806            | 20.6             | 675       | 82543            | 0.0              | 805       | 4258             | 0.0              | 935       | 2471             | 0.0              |
| 420       | 10322            | 1.2              | 550       | 97367            | 17.5             | 680       | 73089            | 0.0              | 810       | 5156             | 0.0              | 940       | 2339             | 0.0              |
| 425       | 18494            | 2.9              | 555       | 106598           | 14.4             | 685       | 64438            | 0.0              | 815       | 4391             | 0.0              | 945       | 2917             | 0.0              |
| 430       | 28541            | 6.0              | 560       | 117615           | 11.6             | 690       | 56546            | 0.0              | 820       | 4383             | 0.0              | 950       | 1966             | 0.0              |
| 435       | 37453            | 10.0             | 565       | 129103           | 9.1              | 695       | 49328            | 0.0              | 825       | 4881             | 0.0              | 955       | 1580             | 0.0              |
| 440       | 44455            | 14.9             | 570       | 141415           | 6.9              | 700       | 43493            | 0.0              | 830       | 3588             | 0.0              | 960       | 1318             | 0.0              |
| 445       | 45934            | 18.1             | 575       | 155854           | 5.2              | 705       | 38035            | 0.0              | 835       | 3835             | 0.0              | 965       | 1419             | 0.0              |
| 450       | 37926            | 17.5             | 580       | 168613           | 3.8              | 710       | 33716            | 0.0              | 840       | 3014             | 0.0              | 970       | 1917             | 0.0              |
| 455       | 24793            | 13.0             | 585       | 182390           | 2.7              | 715       | 30449            | 0.0              | 845       | 3765             | 0.0              | 975       | 1210             | 0.0              |
| 460       | 15340            | 9.0              | 590       | 194054           | 1.9              | 720       | 27240            | 0.0              | 850       | 2906             | 0.0              | 980       | 3915             | 0.0              |
| 465       | 10883            | 7.1              | 595       | 203639           | 1.3              | 725       | 24231            | 0.0              | 855       | 2947             | 0.0              | 985       | 3180             | 0.0              |
| 470       | 8138             | 5.8              | 600       | 211043           | 0.9              | 730       | 21490            | 0.0              | 860       | 3864             | 0.0              | 990       | 5676             | 0.0              |
| 475       | 6653             | 5.1              | 605       | 214591           | 0.6              | 735       | 18548            | 0.0              | 865       | 3546             | 0.0              | 995       | 4736             | 0.0              |
| 480       | 6220             | 5.0              | 610       | 214337           | 0.4              | 740       | 16963            | 0.0              | 870       | 3253             | 0.0              | 1000      | 5113             | 0.0              |
| 485       | 6613             | 5.5              | 615       | 211915           | 0.3              | 745       | 14922            | 0.0              | 875       | 2450             | 0.0              |           |                  |                  |

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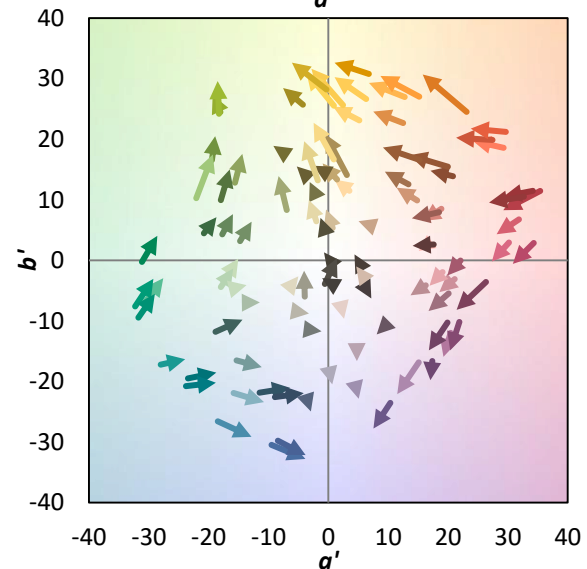
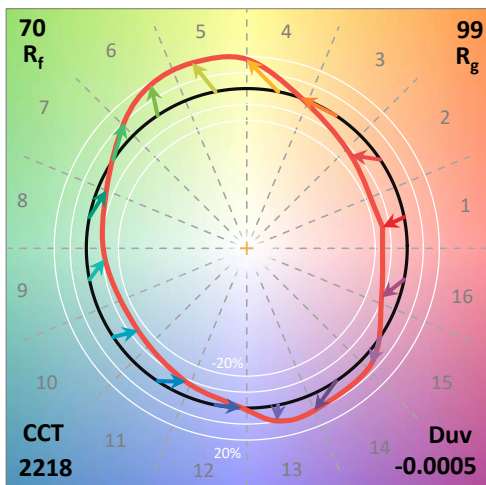
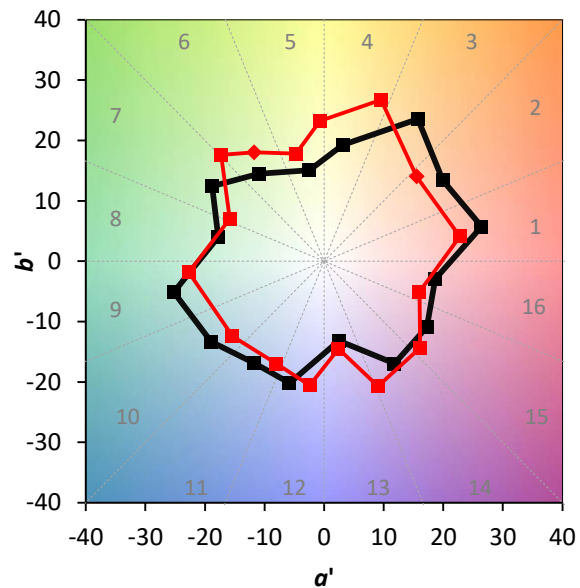
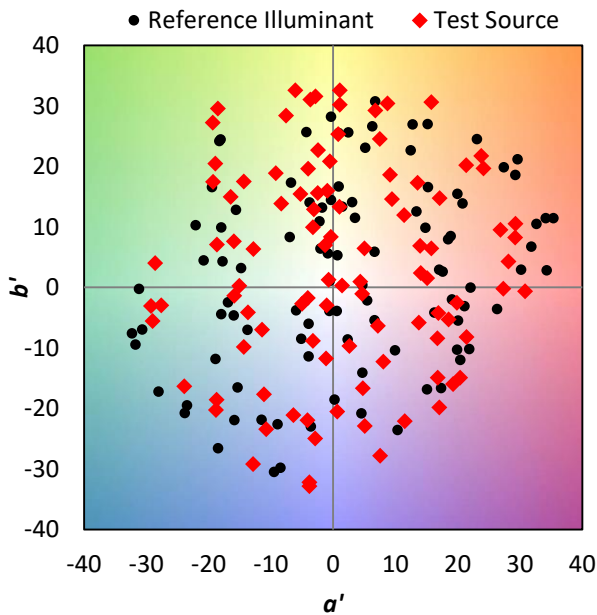
TM-30-18

### Summary

$R_f = 70$   
 $R_g = 99.3$   
 CIE  $R_a = 72.2$   
 $R_g = -16.8$



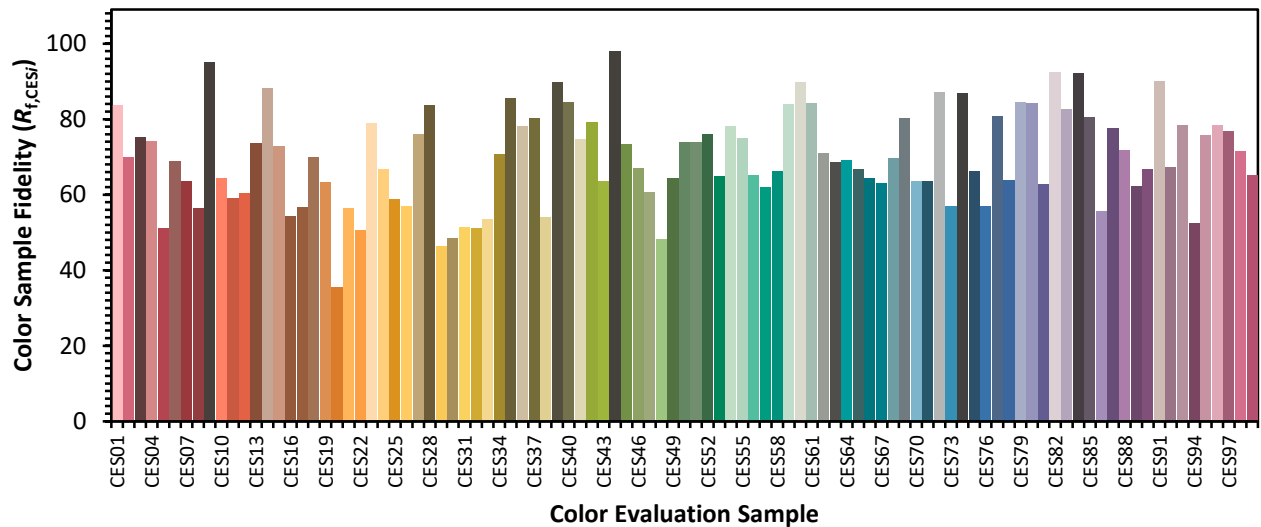
### Color Vector Graphics



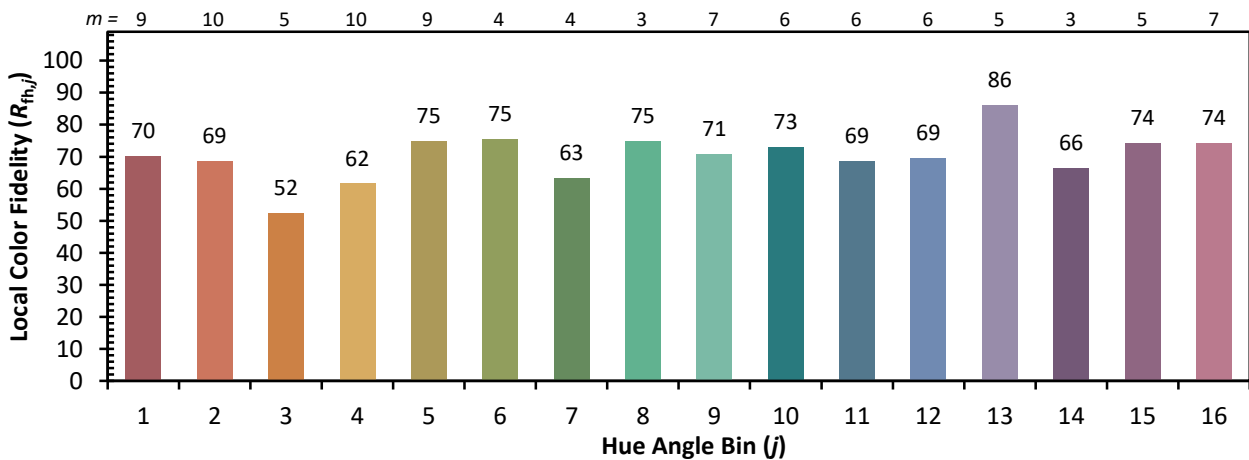
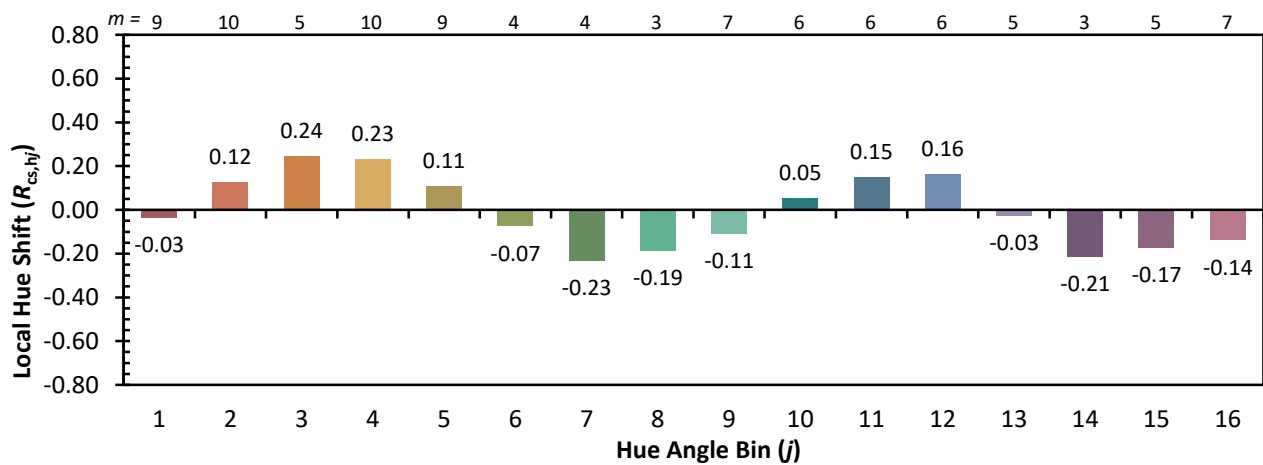
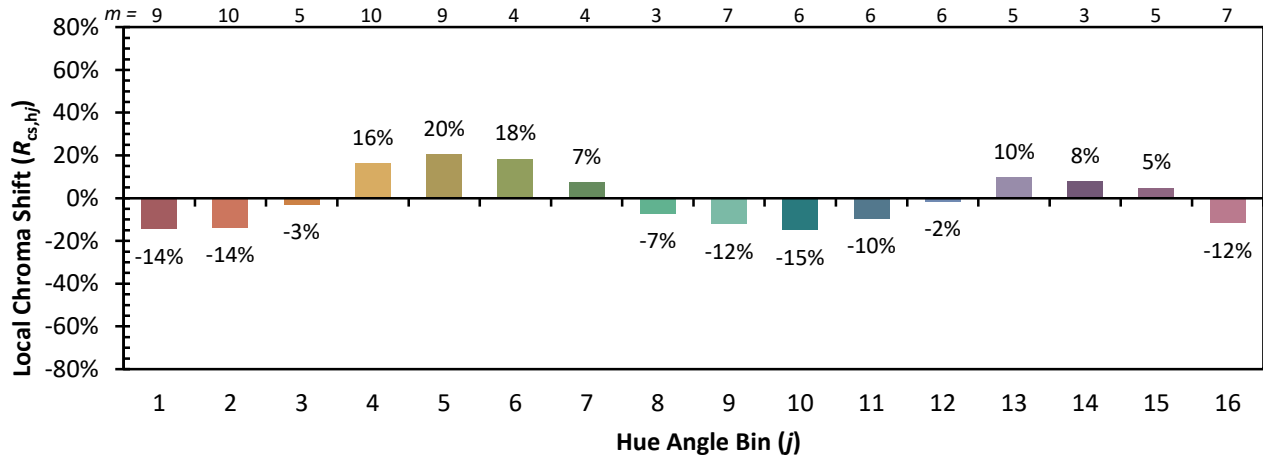


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

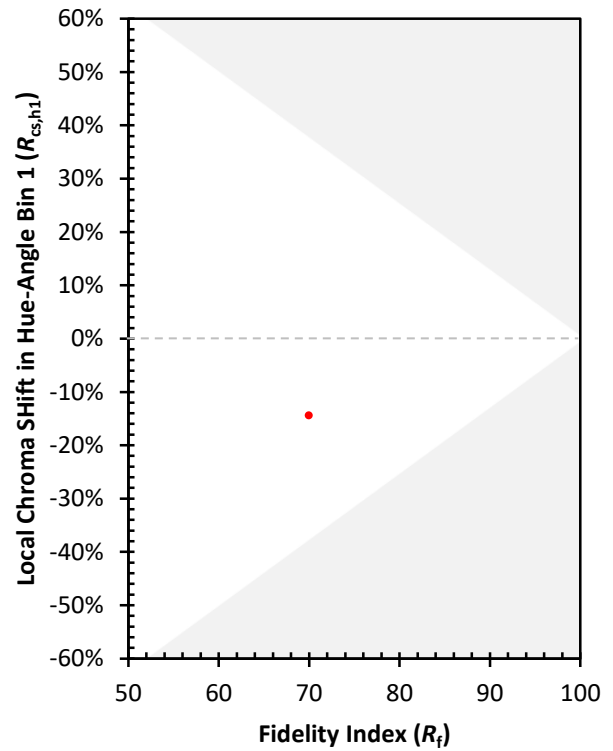
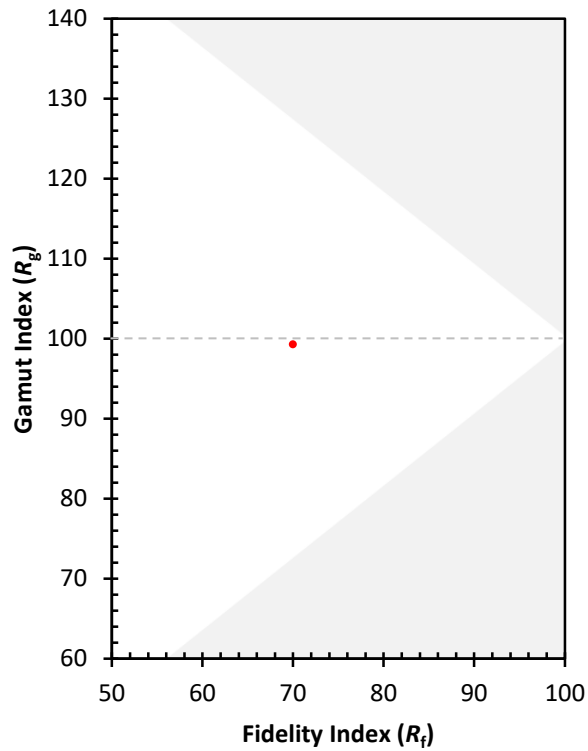
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 87 | CES26 = 57 | CES51 = 74 | CES76 = 57 |
| CES02 = 65 | CES27 = 76 | CES52 = 76 | CES77 = 81 |
| CES03 = 32 | CES28 = 84 | CES53 = 65 | CES78 = 64 |
| CES04 = 72 | CES29 = 46 | CES54 = 78 | CES79 = 85 |
| CES05 = 52 | CES30 = 48 | CES55 = 75 | CES80 = 84 |
| CES06 = 52 | CES31 = 52 | CES56 = 65 | CES81 = 63 |
| CES07 = 44 | CES32 = 51 | CES57 = 62 | CES82 = 92 |
| CES08 = 43 | CES33 = 54 | CES58 = 66 | CES83 = 83 |
| CES09 = 29 | CES34 = 71 | CES59 = 84 | CES84 = 92 |
| CES10 = 79 | CES35 = 86 | CES60 = 90 | CES85 = 81 |
| CES11 = 62 | CES36 = 78 | CES61 = 84 | CES86 = 56 |
| CES12 = 68 | CES37 = 80 | CES62 = 71 | CES87 = 78 |
| CES13 = 45 | CES38 = 54 | CES63 = 68 | CES88 = 72 |
| CES14 = 75 | CES39 = 90 | CES64 = 69 | CES89 = 62 |
| CES15 = 72 | CES40 = 85 | CES65 = 67 | CES90 = 67 |
| CES16 = 49 | CES41 = 75 | CES66 = 64 | CES91 = 90 |
| CES17 = 51 | CES42 = 79 | CES67 = 63 | CES92 = 67 |
| CES18 = 57 | CES43 = 64 | CES68 = 70 | CES93 = 78 |
| CES19 = 74 | CES44 = 98 | CES69 = 80 | CES94 = 52 |
| CES20 = 68 | CES45 = 73 | CES70 = 64 | CES95 = 76 |
| CES21 = 89 | CES46 = 67 | CES71 = 64 | CES96 = 78 |
| CES22 = 81 | CES47 = 61 | CES72 = 87 | CES97 = 77 |
| CES23 = 92 | CES48 = 48 | CES73 = 57 | CES98 = 72 |
| CES24 = 92 | CES49 = 64 | CES74 = 87 | CES99 = 65 |
| CES25 = 74 | CES50 = 74 | CES75 = 66 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)