

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: P800644

Luminaire Tested: **ARCH-M-PA2-60-722-24VDC-T2R-HSS**

Issue Date: 5/19/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P800644  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1910-568-13)  
Test Lab: INNOVATION CENTER  
Issue Date: 5/19/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: STREETWORKS  
Catalog Number: ARCH-M-PA2-60-722-24VDC-T2R-HSS  
Description: ARCHEON-M ROADWAY AND AREA LUMINAIRE  
(2) 70 CRI, 2200K, 405mA LIGHT ENGINES WITH 16 LEDS AND TYPE II ROADWAY  
OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 6214 lumens  
Efficiency: N/A  
Efficacy: 101.9 lumens/watt  
Luminous Opening: Rectangular (W 0.75' x L: 1' x H: 0')  
IES Classification: Type II - Medium  
BUG Rating: B0 - U0 - G1

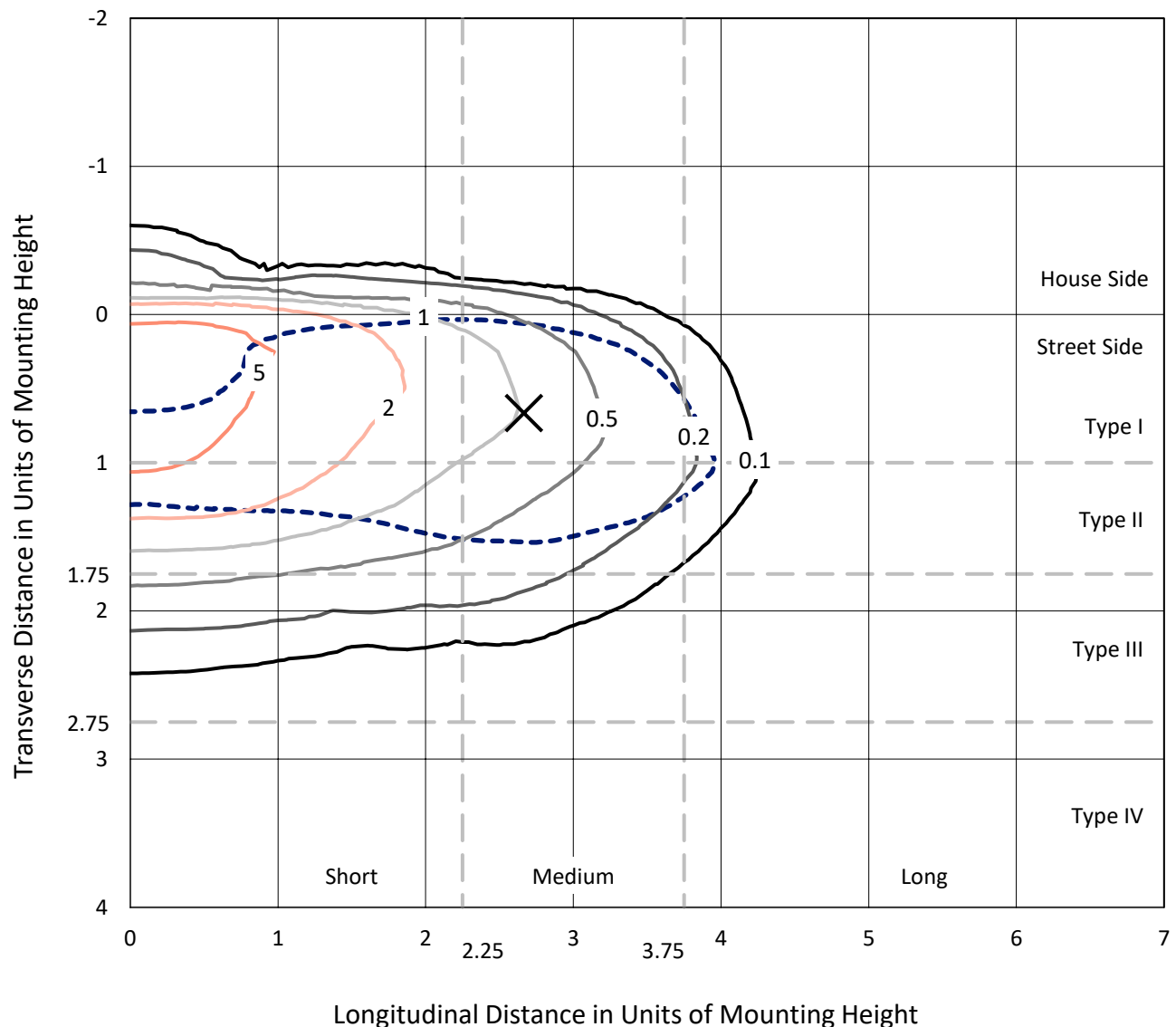
Input Watts (W): 61  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 25 FT

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## Iso-Footcandle Lines of Horizontal Illumination

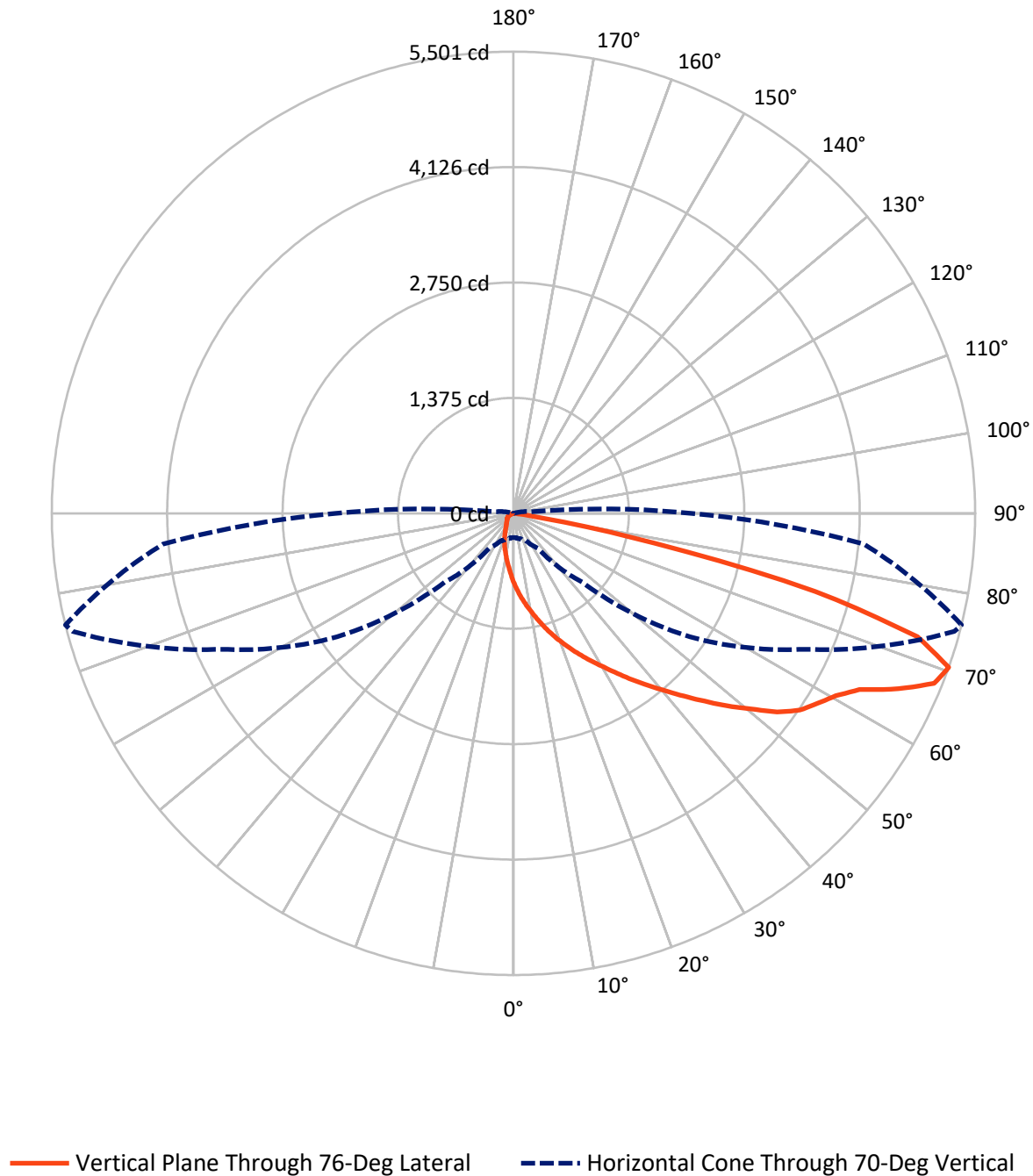
✕ Max cd  
 - - - 1/2 Max cd



Based on 15 foot mounting height. Maximum calculated value = 7.1 fc  
 Type II - Medium - N/A

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## Luminous Intensity Polar Plot



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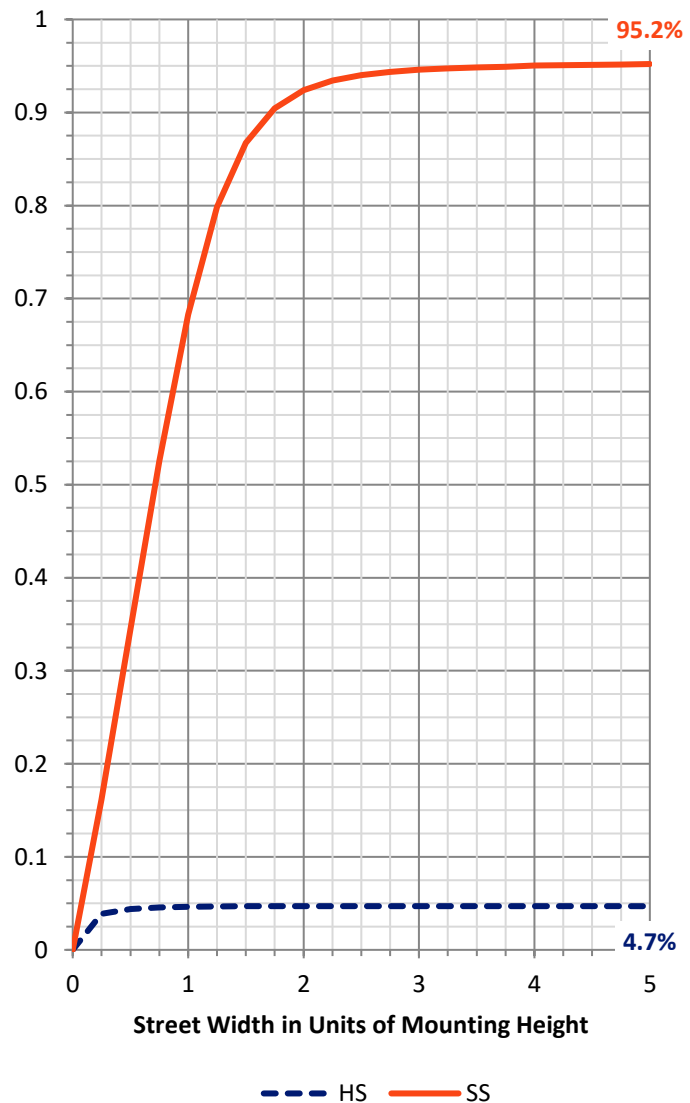
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 293.1    | 0.0    | 293.1  |
|                    | % Fixture | 4.7      | 0.0    | 4.7    |
| <b>Street Side</b> | Lumens    | 5920.9   | 0.0    | 5920.9 |
|                    | % Fixture | 95.3     | 0.0    | 95.3   |
| <b>Total</b>       | Lumens    | 6214.0   | 0.0    | 6214.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 78.4   | 1.3       |
| 10°-20°   | 252.9  | 4.1       |
| 20°-30°   | 471.0  | 7.6       |
| 30°-40°   | 833.1  | 13.4      |
| 40°-50°   | 1274.0 | 20.5      |
| 50°-60°   | 1444.4 | 23.2      |
| 60°-70°   | 1238.2 | 19.9      |
| 70°-80°   | 599.7  | 9.7       |
| 80°-90°   | 22.2   | 0.4       |
| 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°    | 6214.0 | 100.0     |
| 0°-180°   | 6214.0 | 100.0     |

**Coefficient of Utilization**



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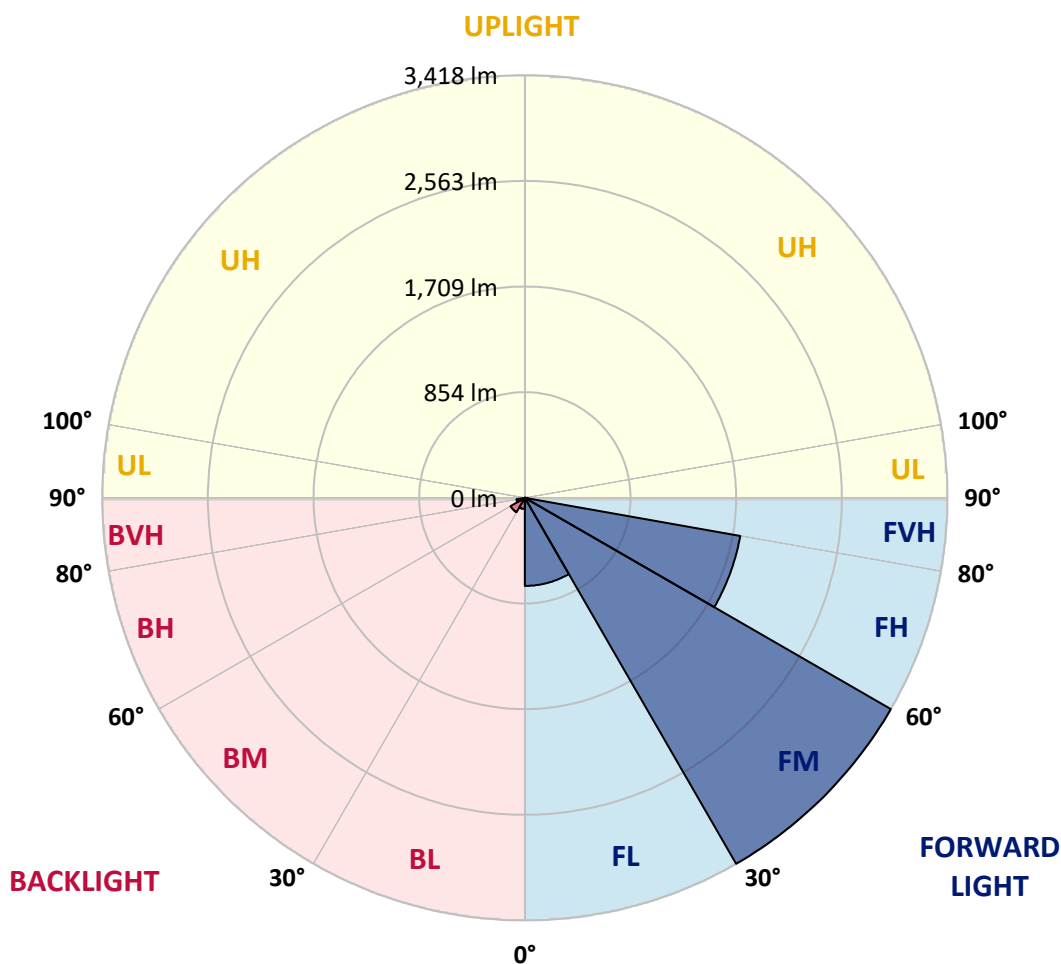
CATALOG NUMBER: ARCH-M-PA2-60-722-24VDC-T2R-HSS

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 712.4  | 11.5      |                         |      |         |
| FM   | (30°-60°)   | 3417.8 | 55.0      |                         |      |         |
| FH   | (60°-80°)   | 1768.9 | 28.5      |                         |      | G1/1800 |
| FVH  | (80°-90°)   | 21.9   | 0.4       |                         |      | G1/100  |
| BL   | (0°-30°)    | 89.9   | 1.4       | B0/110                  |      |         |
| BM   | (30°-60°)   | 133.8  | 2.2       | B0/220                  |      |         |
| BH   | (60°-80°)   | 69.0   | 1.1       | B0/110                  |      | G0/110  |
| BVH  | (80°-90°)   | 0.4    | 0.0       |                         |      | G0/10   |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B0-U0-G1**

Type II Medium



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 75°    | 76°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 831.8  | 831.8  | 831.8  | 831.8  | 831.8  | 831.8  | 831.8  | 831.8  | 831.8  | 831.8  | 831.8  |
| 2.5°  | 1137.0 | 1130.8 | 1124.6 | 1100.8 | 1079.0 | 1059.4 | 1022.1 | 973.5  | 930.1  | 920.8  | 870.1  |
| 5°    | 1335.6 | 1328.4 | 1319.1 | 1295.3 | 1267.3 | 1234.2 | 1179.4 | 1104.9 | 1028.3 | 1011.8 | 917.7  |
| 7.5°  | 1470.1 | 1463.9 | 1450.4 | 1439.1 | 1411.1 | 1379.1 | 1318.0 | 1231.1 | 1125.6 | 1104.9 | 972.5  |
| 10°   | 1562.2 | 1558.0 | 1556.0 | 1546.7 | 1526.0 | 1500.1 | 1439.1 | 1348.0 | 1223.9 | 1200.1 | 1030.4 |
| 12.5° | 1595.3 | 1595.3 | 1605.6 | 1621.2 | 1624.3 | 1616.0 | 1560.1 | 1469.1 | 1327.3 | 1302.5 | 1098.7 |
| 15°   | 1550.8 | 1556.0 | 1578.7 | 1628.4 | 1680.1 | 1714.3 | 1679.1 | 1594.3 | 1441.1 | 1414.2 | 1179.4 |
| 17.5° | 1538.4 | 1543.6 | 1559.1 | 1602.5 | 1671.8 | 1762.9 | 1780.5 | 1715.3 | 1548.7 | 1526.0 | 1262.2 |
| 20°   | 1573.6 | 1578.7 | 1592.2 | 1629.4 | 1682.2 | 1774.3 | 1847.7 | 1832.2 | 1662.5 | 1638.7 | 1346.0 |
| 22.5° | 1657.4 | 1660.5 | 1660.5 | 1689.4 | 1736.0 | 1804.3 | 1890.1 | 1942.9 | 1779.4 | 1753.6 | 1428.7 |
| 25°   | 1837.4 | 1831.2 | 1806.3 | 1791.9 | 1821.9 | 1877.7 | 1943.9 | 2040.1 | 1909.8 | 1874.6 | 1517.7 |
| 27.5° | 2073.3 | 2093.9 | 2033.9 | 1964.6 | 1941.9 | 1973.9 | 2019.5 | 2126.0 | 2036.0 | 1998.8 | 1598.4 |
| 30°   | 2392.9 | 2384.7 | 2306.0 | 2206.7 | 2108.4 | 2097.0 | 2112.6 | 2199.5 | 2162.2 | 2127.0 | 1688.4 |
| 32.5° | 2655.7 | 2671.2 | 2588.5 | 2467.4 | 2320.5 | 2251.2 | 2234.6 | 2287.4 | 2296.7 | 2274.0 | 1795.0 |
| 35°   | 2925.7 | 2942.3 | 2861.6 | 2727.1 | 2552.3 | 2436.4 | 2388.8 | 2396.0 | 2463.3 | 2434.3 | 1906.7 |
| 37.5° | 3167.8 | 3182.3 | 3102.6 | 2965.0 | 2790.2 | 2648.5 | 2580.2 | 2524.3 | 2624.7 | 2598.8 | 2024.6 |
| 40°   | 3352.0 | 3354.0 | 3300.2 | 3177.1 | 3011.6 | 2864.7 | 2787.1 | 2677.4 | 2795.4 | 2777.8 | 2147.7 |
| 42.5° | 3482.3 | 3486.5 | 3447.1 | 3341.6 | 3188.5 | 3051.9 | 2988.8 | 2858.5 | 2991.9 | 2976.4 | 2290.5 |
| 45°   | 3543.4 | 3550.6 | 3546.5 | 3449.2 | 3322.0 | 3204.0 | 3183.3 | 3050.9 | 3207.1 | 3192.6 | 2455.0 |
| 47.5° | 3485.4 | 3485.4 | 3538.2 | 3524.7 | 3407.8 | 3329.2 | 3353.0 | 3251.6 | 3440.9 | 3427.5 | 2622.6 |
| 50°   | 3244.4 | 3247.5 | 3355.1 | 3509.2 | 3440.9 | 3423.3 | 3497.8 | 3448.2 | 3653.0 | 3661.3 | 2823.3 |
| 52.5° | 2611.2 | 2606.0 | 2969.2 | 3265.1 | 3418.2 | 3465.8 | 3631.3 | 3648.9 | 3907.5 | 3932.4 | 3023.0 |
| 55°   | 1951.2 | 1948.1 | 2295.7 | 2832.6 | 3258.9 | 3444.0 | 3705.8 | 3827.9 | 4124.8 | 4140.3 | 3172.0 |
| 57.5° | 1544.6 | 1536.3 | 1727.7 | 2283.3 | 2898.8 | 3346.8 | 3708.9 | 3862.0 | 4245.8 | 4272.7 | 3316.8 |
| 60°   | 1187.7 | 1180.4 | 1323.2 | 1698.7 | 2388.8 | 3088.2 | 3619.9 | 3864.1 | 4362.7 | 4410.3 | 3511.3 |
| 62.5° | 849.4  | 857.6  | 967.3  | 1218.7 | 1837.4 | 2723.0 | 3504.0 | 3893.0 | 4570.7 | 4624.5 | 3787.5 |
| 65°   | 573.1  | 569.0  | 660.0  | 829.7  | 1306.6 | 2231.5 | 3326.1 | 3954.1 | 4945.2 | 5039.3 | 4118.6 |
| 67.5° | 398.3  | 401.4  | 442.8  | 540.0  | 829.7  | 1713.2 | 3030.2 | 3988.2 | 5332.1 | 5405.6 | 4350.3 |
| 70°   | 287.6  | 291.7  | 314.5  | 363.1  | 506.9  | 1161.8 | 2561.6 | 3832.0 | 5436.6 | 5500.7 | 4188.9 |
| 72.5° | 189.3  | 197.6  | 231.7  | 257.6  | 323.8  | 727.3  | 1887.0 | 3301.3 | 4986.6 | 5034.2 | 3514.4 |
| 75°   | 102.4  | 104.5  | 149.0  | 192.4  | 230.7  | 453.1  | 1125.6 | 2226.4 | 3730.6 | 3715.1 | 2317.4 |
| 77.5° | 79.7   | 82.8   | 92.1   | 137.6  | 155.2  | 249.3  | 444.9  | 1005.6 | 1767.0 | 1719.4 | 790.4  |
| 80°   | 48.6   | 50.7   | 64.1   | 81.7   | 108.6  | 144.8  | 130.4  | 273.1  | 359.0  | 336.2  | 115.9  |
| 82.5° | 29.0   | 31.0   | 38.3   | 68.3   | 85.9   | 68.3   | 45.5   | 66.2   | 67.2   | 66.2   | 29.0   |
| 85°   | 5.2    | 5.2    | 26.9   | 47.6   | 45.5   | 19.7   | 26.9   | 21.7   | 19.7   | 20.7   | 6.2    |
| 87.5° | 0.0    | 0.0    | 10.3   | 14.5   | 20.7   | 7.2    | 10.3   | 5.2    | 5.2    | 5.2    | 3.1    |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |



REPORT NUMBER: P800644

CATALOG NUMBER: ARCH-M-PA2-60-722-24VDC-T2R-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°   | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 831.8  | 831.8 | 831.8 | 831.8 | 831.8 | 831.8 | 831.8 | 831.8 | 831.8 | 831.8 | 831.8 |
| 2.5°  | 839.0  | 803.9 | 731.4 | 668.3 | 605.2 | 558.7 | 523.5 | 487.3 | 474.9 | 459.3 | 451.1 |
| 5°    | 853.5  | 784.2 | 640.4 | 525.6 | 428.3 | 353.8 | 306.2 | 277.3 | 258.6 | 245.2 | 242.1 |
| 7.5°  | 875.2  | 768.7 | 566.9 | 411.8 | 305.2 | 230.7 | 191.4 | 171.7 | 161.4 | 155.2 | 153.1 |
| 10°   | 901.1  | 755.2 | 494.5 | 320.7 | 215.2 | 162.4 | 140.7 | 132.4 | 128.3 | 126.2 | 125.2 |
| 12.5° | 937.3  | 750.1 | 433.5 | 247.3 | 162.4 | 133.5 | 122.1 | 116.9 | 113.8 | 110.7 | 109.7 |
| 15°   | 984.9  | 752.1 | 377.6 | 191.4 | 134.5 | 119.0 | 109.7 | 104.5 | 100.4 | 97.2  | 97.2  |
| 17.5° | 1034.6 | 755.2 | 322.8 | 155.2 | 122.1 | 108.6 | 98.3  | 91.0  | 87.9  | 84.8  | 83.8  |
| 20°   | 1081.1 | 754.2 | 270.0 | 132.4 | 110.7 | 97.2  | 86.9  | 79.7  | 74.5  | 71.4  | 71.4  |
| 22.5° | 1125.6 | 748.0 | 220.4 | 119.0 | 101.4 | 85.9  | 74.5  | 67.2  | 63.1  | 60.0  | 60.0  |
| 25°   | 1173.2 | 735.6 | 180.0 | 108.6 | 90.0  | 75.5  | 64.1  | 56.9  | 53.8  | 50.7  | 50.7  |
| 27.5° | 1210.4 | 714.9 | 146.9 | 99.3  | 79.7  | 65.2  | 54.8  | 48.6  | 45.5  | 43.5  | 43.5  |
| 30°   | 1250.8 | 684.9 | 122.1 | 89.0  | 69.3  | 55.9  | 46.6  | 41.4  | 38.3  | 37.2  | 37.2  |
| 32.5° | 1295.3 | 651.8 | 104.5 | 78.6  | 59.0  | 47.6  | 39.3  | 36.2  | 33.1  | 32.1  | 32.1  |
| 35°   | 1347.0 | 622.8 | 94.1  | 68.3  | 51.7  | 40.3  | 34.1  | 31.0  | 29.0  | 29.0  | 29.0  |
| 37.5° | 1406.0 | 592.8 | 84.8  | 60.0  | 44.5  | 34.1  | 29.0  | 27.9  | 26.9  | 25.9  | 25.9  |
| 40°   | 1470.1 | 560.7 | 76.6  | 52.8  | 38.3  | 29.0  | 24.8  | 24.8  | 23.8  | 23.8  | 23.8  |
| 42.5° | 1542.5 | 532.8 | 69.3  | 46.6  | 33.1  | 24.8  | 21.7  | 21.7  | 20.7  | 20.7  | 20.7  |
| 45°   | 1621.2 | 506.9 | 63.1  | 41.4  | 29.0  | 21.7  | 19.7  | 18.6  | 17.6  | 17.6  | 17.6  |
| 47.5° | 1714.3 | 492.4 | 57.9  | 36.2  | 24.8  | 18.6  | 16.6  | 15.5  | 14.5  | 13.4  | 13.4  |
| 50°   | 1833.2 | 498.7 | 52.8  | 30.0  | 21.7  | 15.5  | 13.4  | 12.4  | 11.4  | 10.3  | 10.3  |
| 52.5° | 1927.4 | 495.6 | 45.5  | 25.9  | 17.6  | 12.4  | 10.3  | 9.3   | 8.3   | 7.2   | 7.2   |
| 55°   | 1995.7 | 483.1 | 39.3  | 21.7  | 13.4  | 10.3  | 8.3   | 6.2   | 5.2   | 5.2   | 5.2   |
| 57.5° | 2062.9 | 470.7 | 33.1  | 17.6  | 10.3  | 7.2   | 5.2   | 4.1   | 4.1   | 4.1   | 4.1   |
| 60°   | 2167.4 | 453.1 | 29.0  | 14.5  | 8.3   | 5.2   | 3.1   | 3.1   | 2.1   | 2.1   | 2.1   |
| 62.5° | 2294.6 | 431.4 | 23.8  | 12.4  | 6.2   | 4.1   | 2.1   | 2.1   | 0.0   | 0.0   | 0.0   |
| 65°   | 2434.3 | 393.1 | 19.7  | 9.3   | 5.2   | 3.1   | 2.1   | 0.0   | 0.0   | 0.0   | 0.0   |
| 67.5° | 2402.2 | 315.5 | 16.6  | 6.2   | 4.1   | 2.1   | 1.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 70°   | 2125.0 | 213.1 | 13.4  | 5.2   | 3.1   | 2.1   | 1.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 72.5° | 1664.6 | 126.2 | 9.3   | 4.1   | 2.1   | 1.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 75°   | 1065.6 | 63.1  | 6.2   | 3.1   | 2.1   | 1.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 77.5° | 356.9  | 31.0  | 4.1   | 2.1   | 1.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 80°   | 50.7   | 10.3  | 2.1   | 1.0   | 1.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 82.5° | 11.4   | 4.1   | 1.0   | 1.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 85°   | 4.1    | 2.1   | 1.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 87.5° | 2.1    | 1.0   | 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   |



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

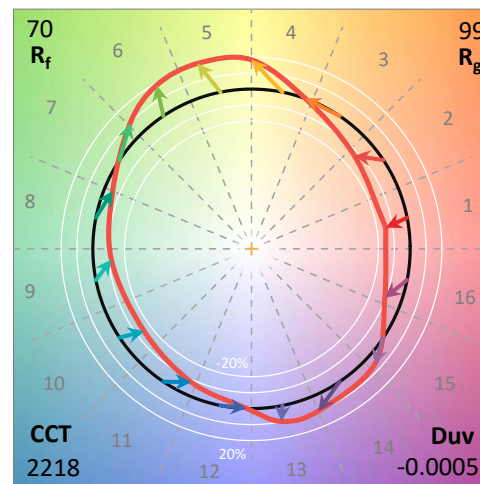
### Test Information

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

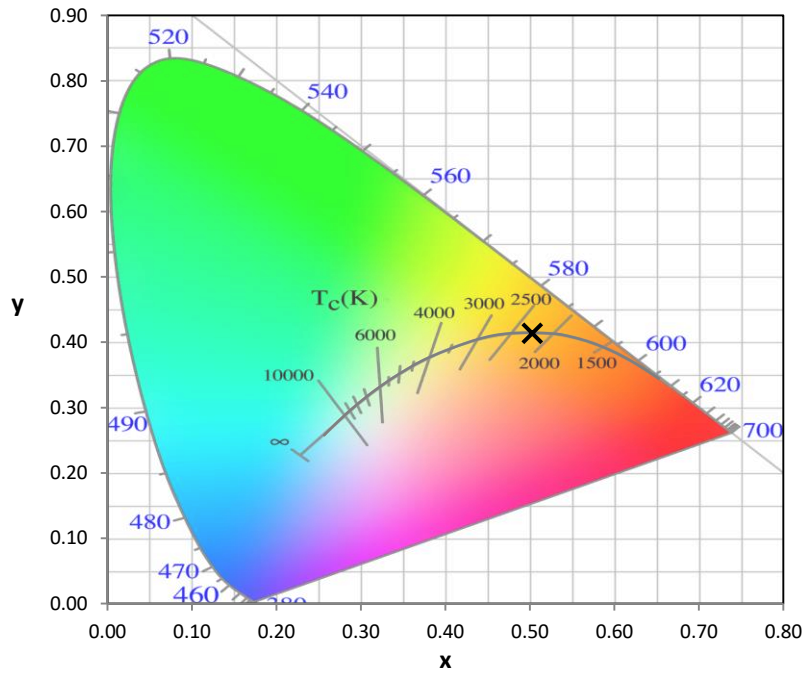
Stabilization Time: 95M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.3/31%  
 Sphere Temperature (°C): 24.8

REPORT NUMBER: SP1-2101-121-4

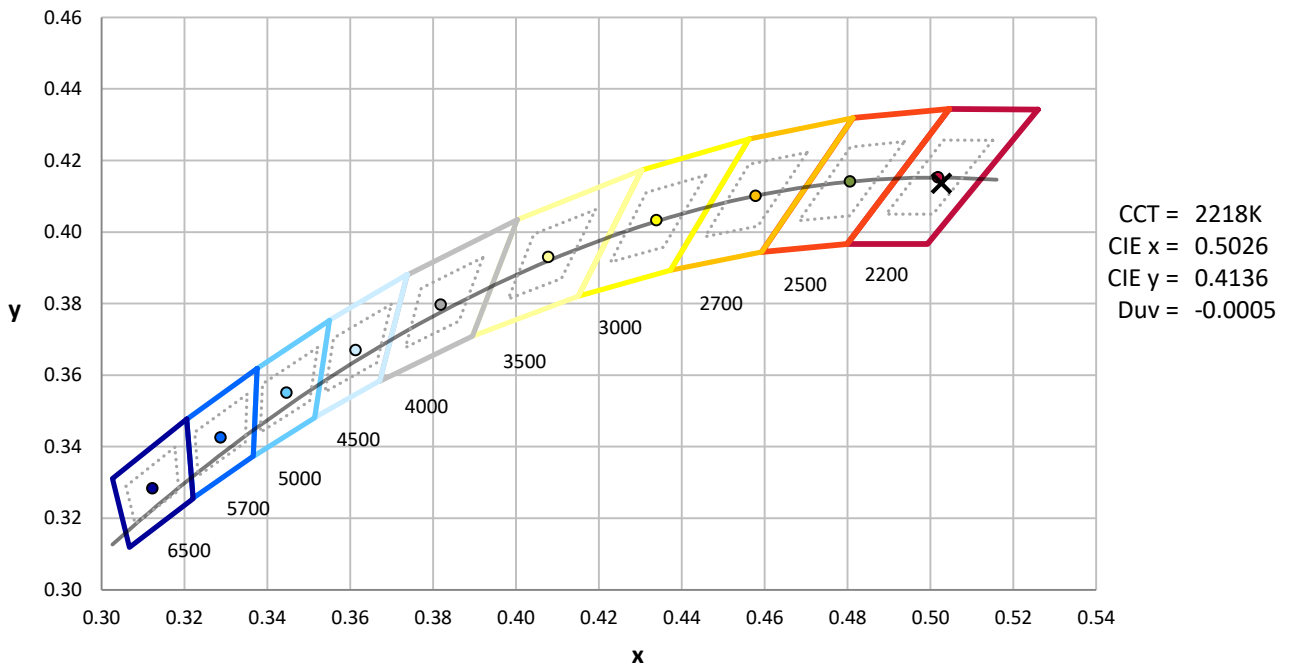
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date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



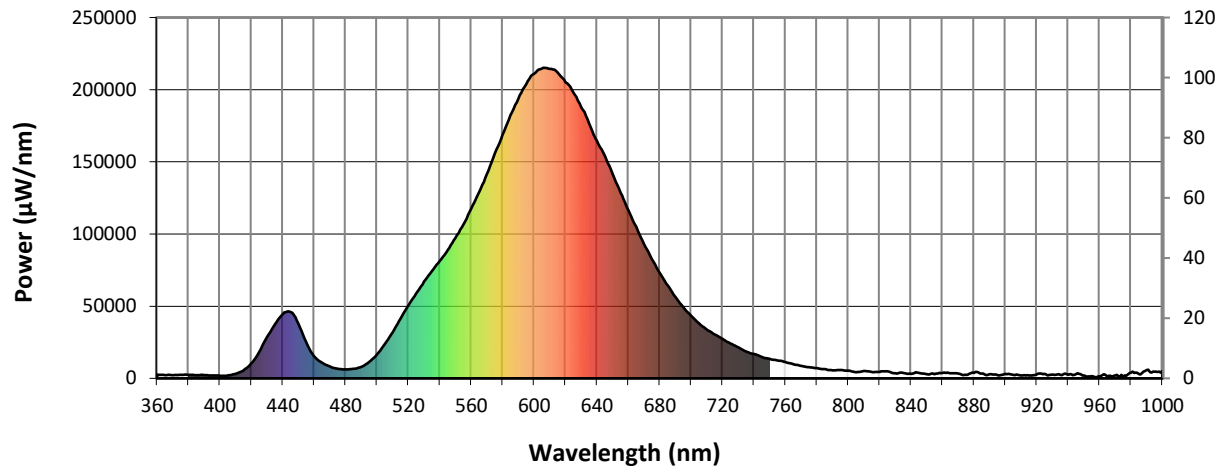
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 2200K 4-step quadrangle

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### Photopic Flux vs. Wavelength

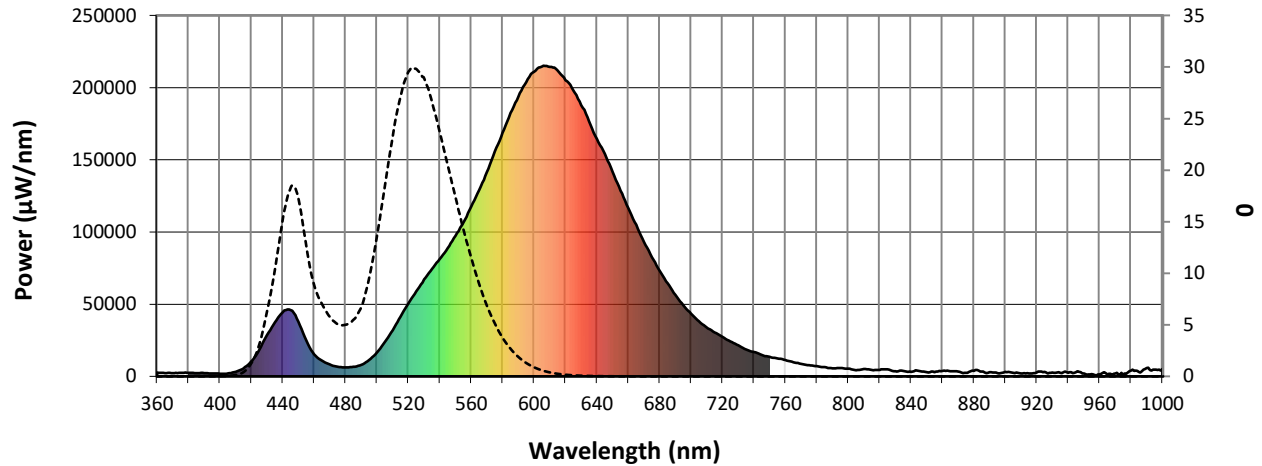


#####

| 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       | 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



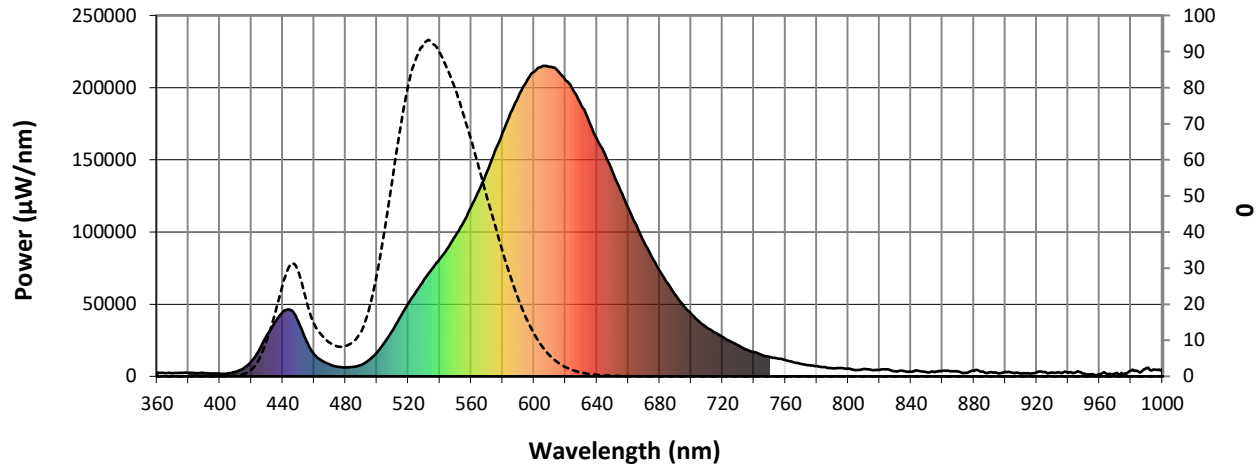
Scotopic Lumens: 7290.1

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**

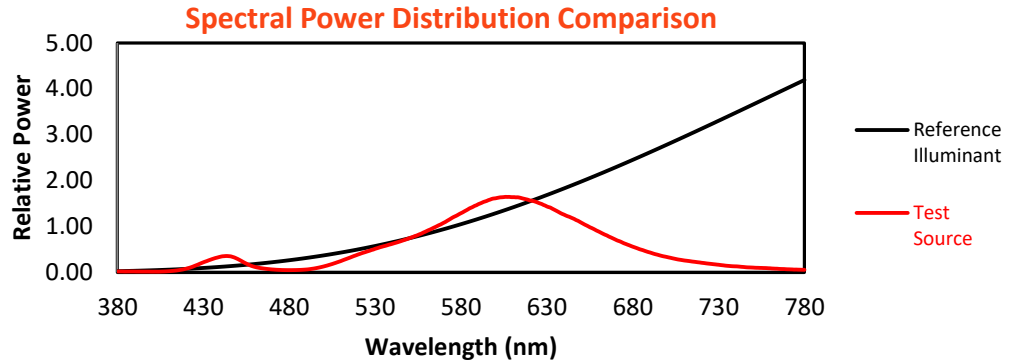
| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 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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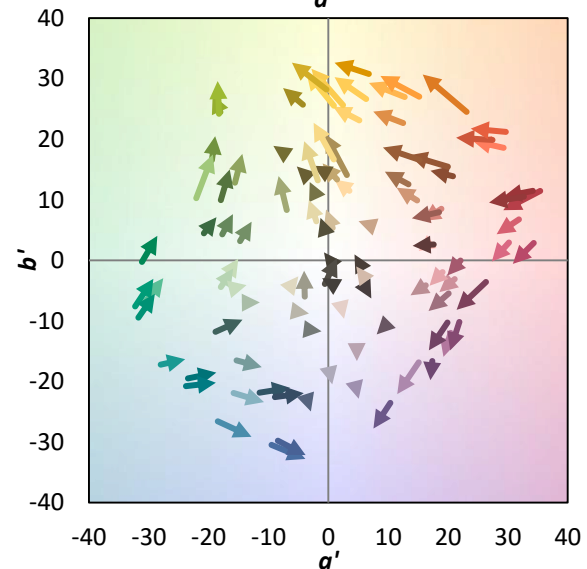
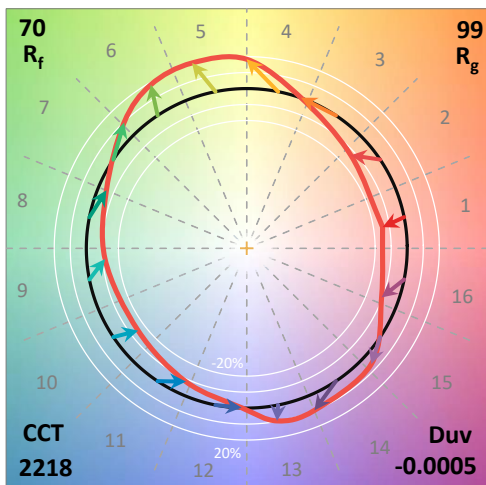
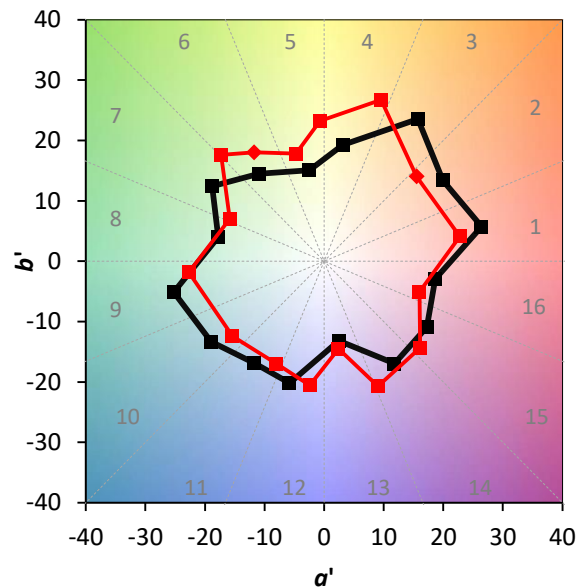
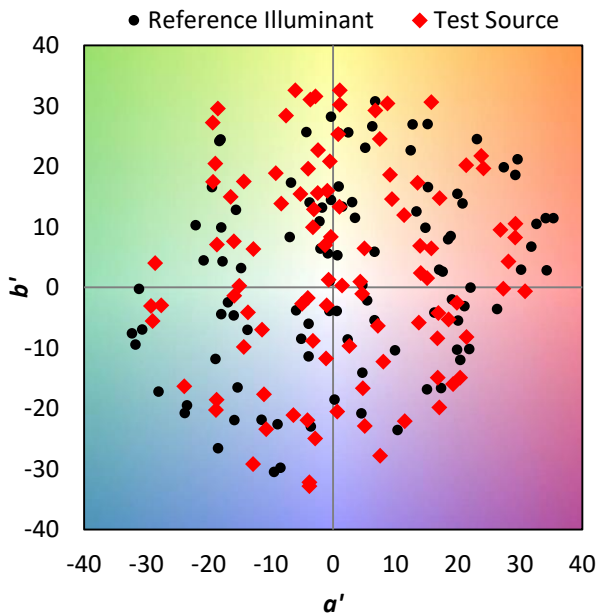
TM-30-18

### Summary

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



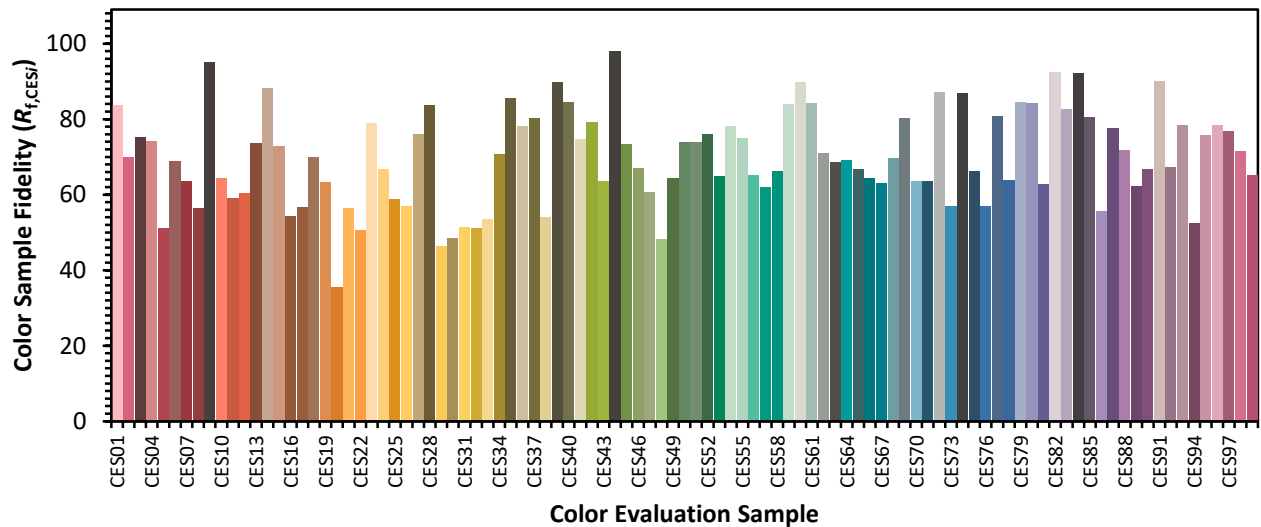
### Color Vector Graphics



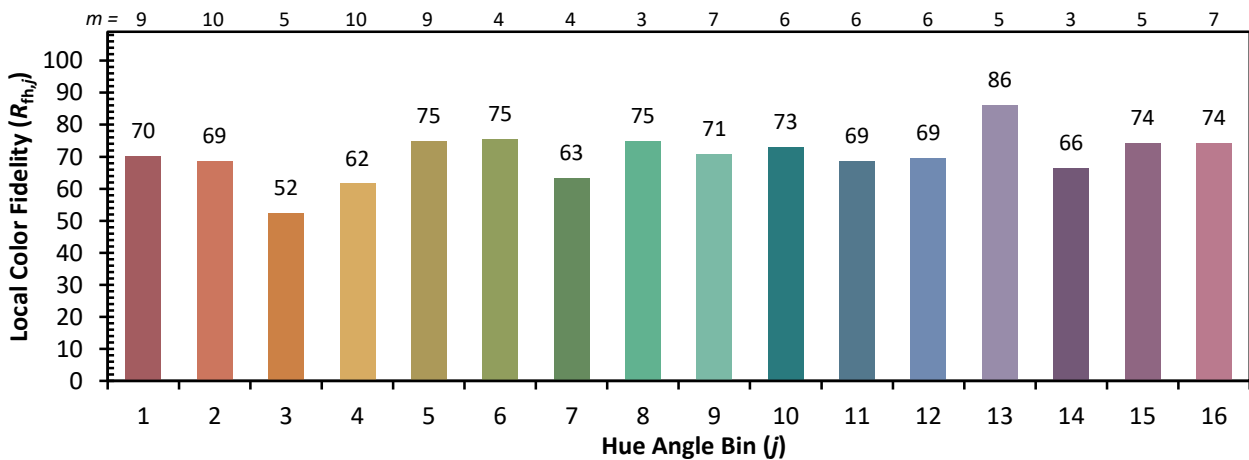
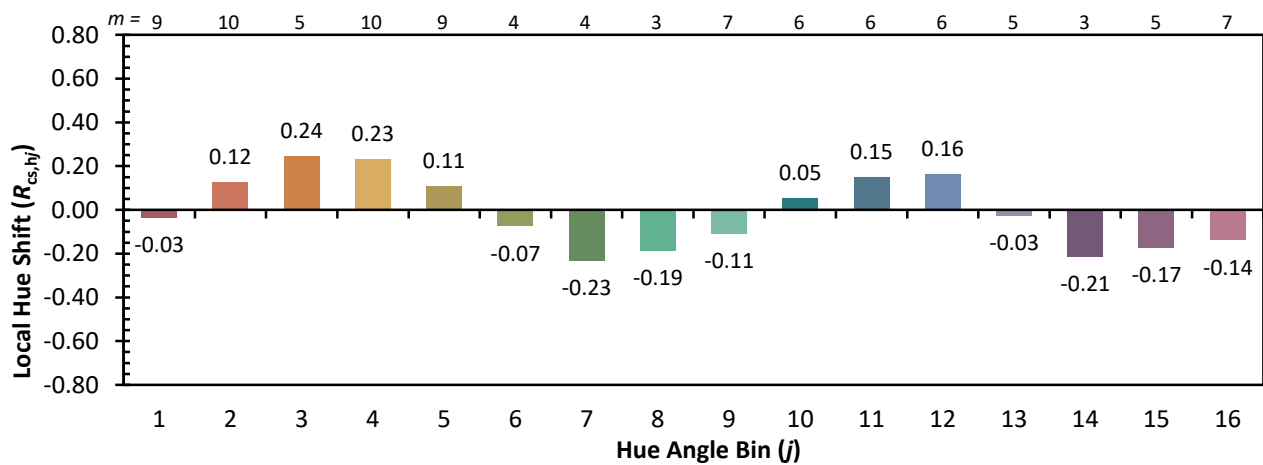
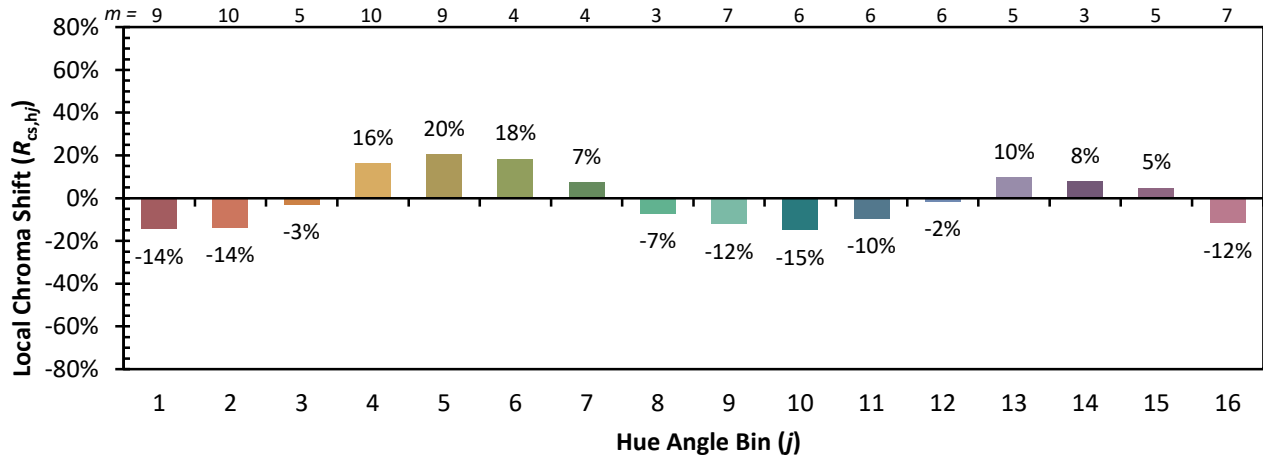


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

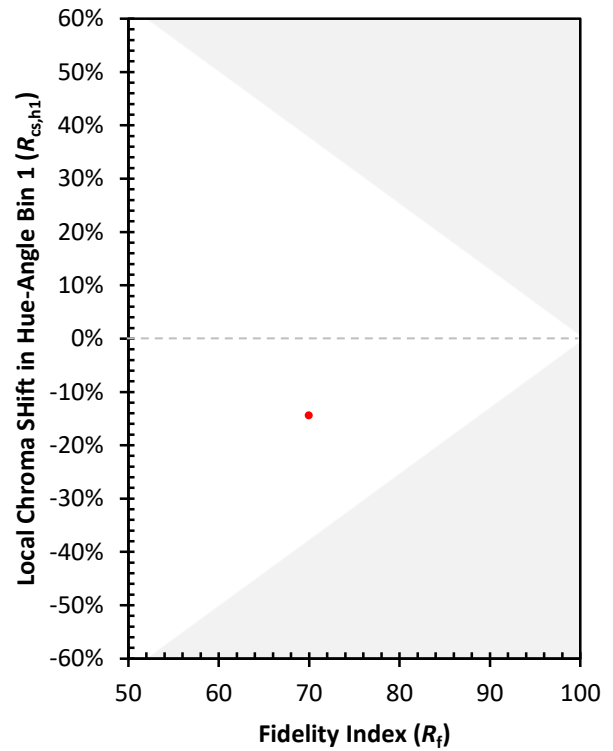
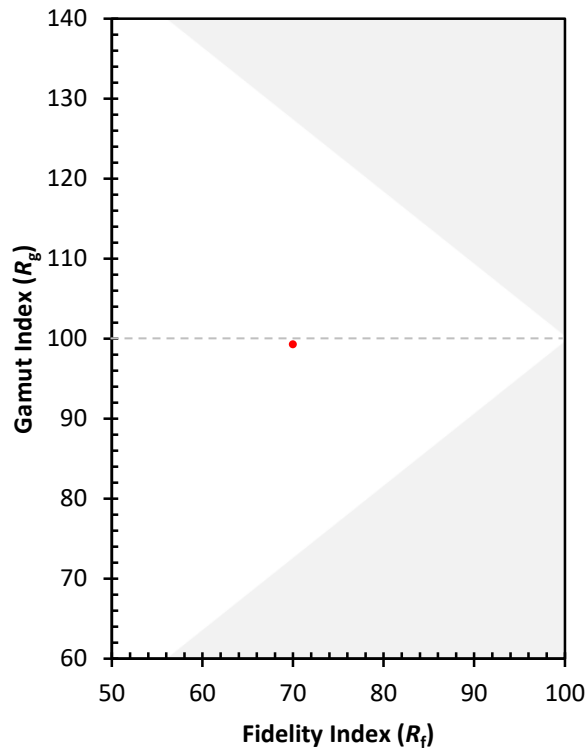
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 87 | CES26 = 57 | CES51 = 74 | CES76 = 57 |
| CES02 = 65 | CES27 = 76 | CES52 = 76 | CES77 = 81 |
| CES03 = 32 | CES28 = 84 | CES53 = 65 | CES78 = 64 |
| CES04 = 72 | CES29 = 46 | CES54 = 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)