

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: P800716

Luminaire Tested: **ARCH-M-PA2-70-727-24VDC-T2R-HSS**

Issue Date: 5/19/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P800716  
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-PA2-70-727-24VDC-T2R-HSS  
Description: ARCHEON-M ROADWAY AND AREA LUMINAIRE  
(2) 70 CRI, 2700K, 470mA 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: 8058 lumens  
Efficiency: N/A  
Efficacy: 113.5 lumens/watt  
Luminous Opening: Rectangular (W 0.75' x L: 1' x H: 0')  
IES Classification: Type II - Medium  
BUG Rating: B1 - U0 - G2

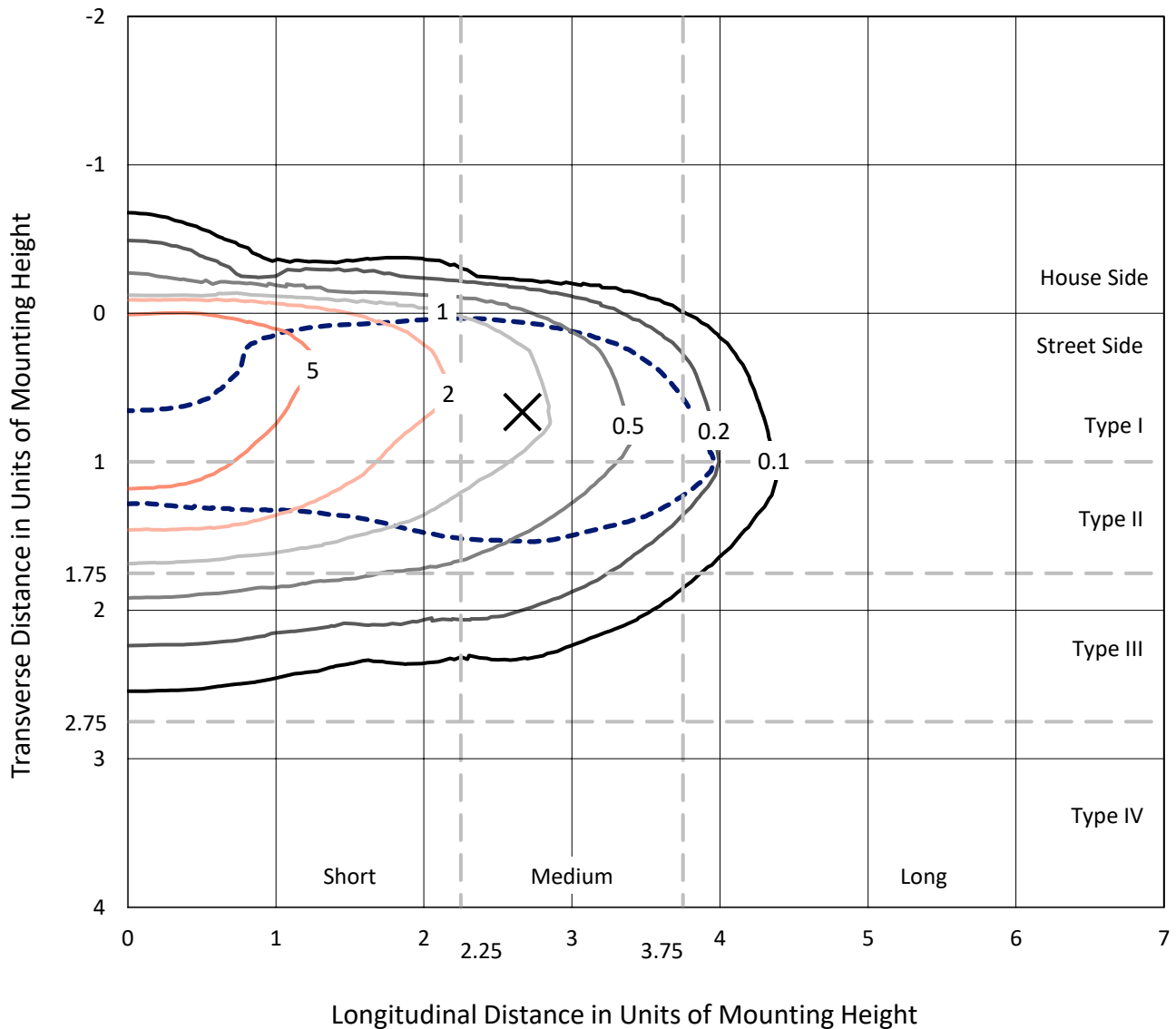
Input Watts (W): 71  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 25 FT

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CATALOG NUMBER: ARCH-M-PA2-70-727-24VDC-T2R-HSS

## Iso-Footcandle Lines of Horizontal Illumination

✕ Max cd  
 - - - 1/2 Max cd

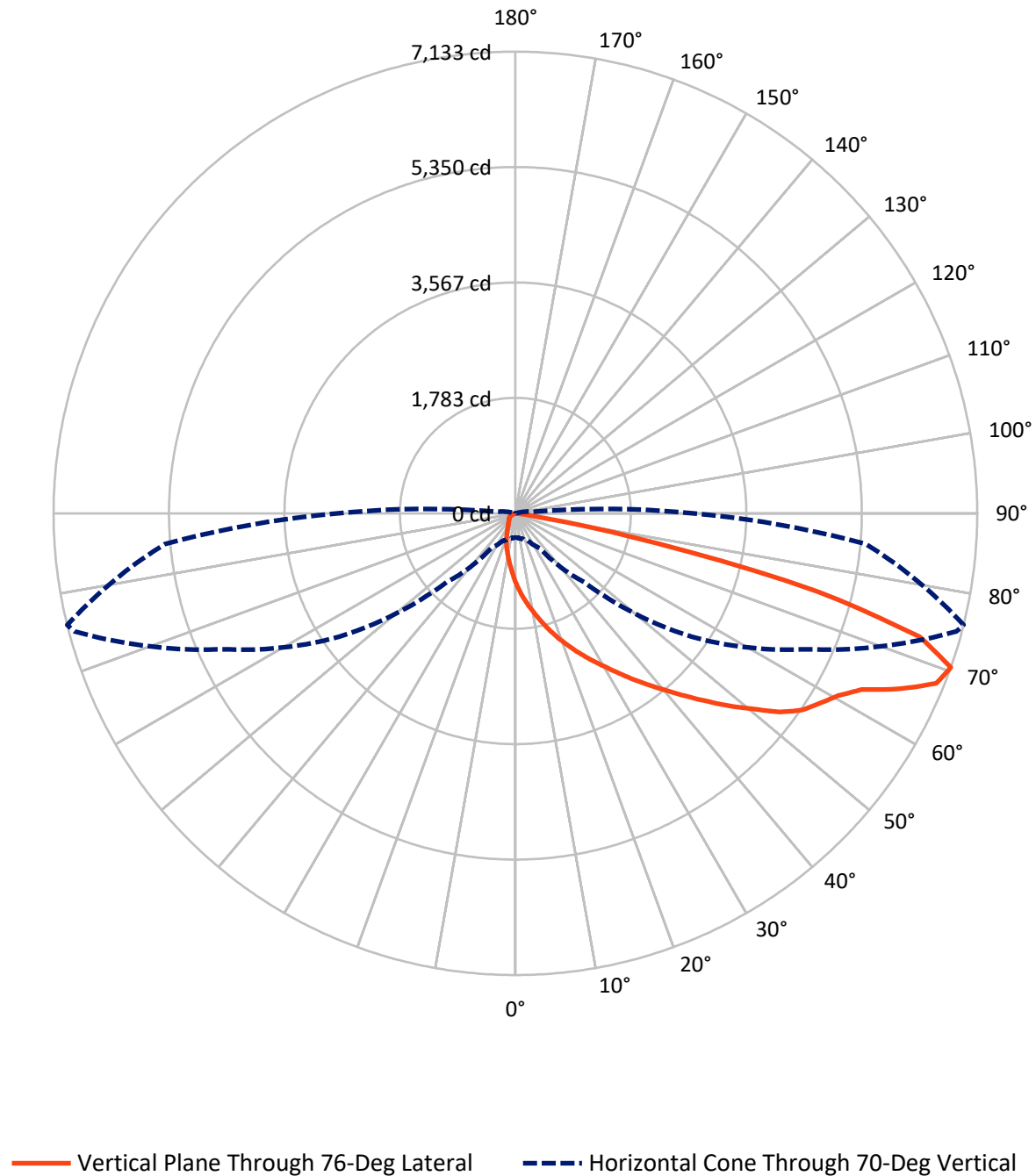


Based on 15 foot mounting height. Maximum calculated value = 9.2 fc  
 Type II - Medium - N/A

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CATALOG NUMBER: ARCH-M-PA2-70-727-24VDC-T2R-HSS

## Luminous Intensity Polar Plot



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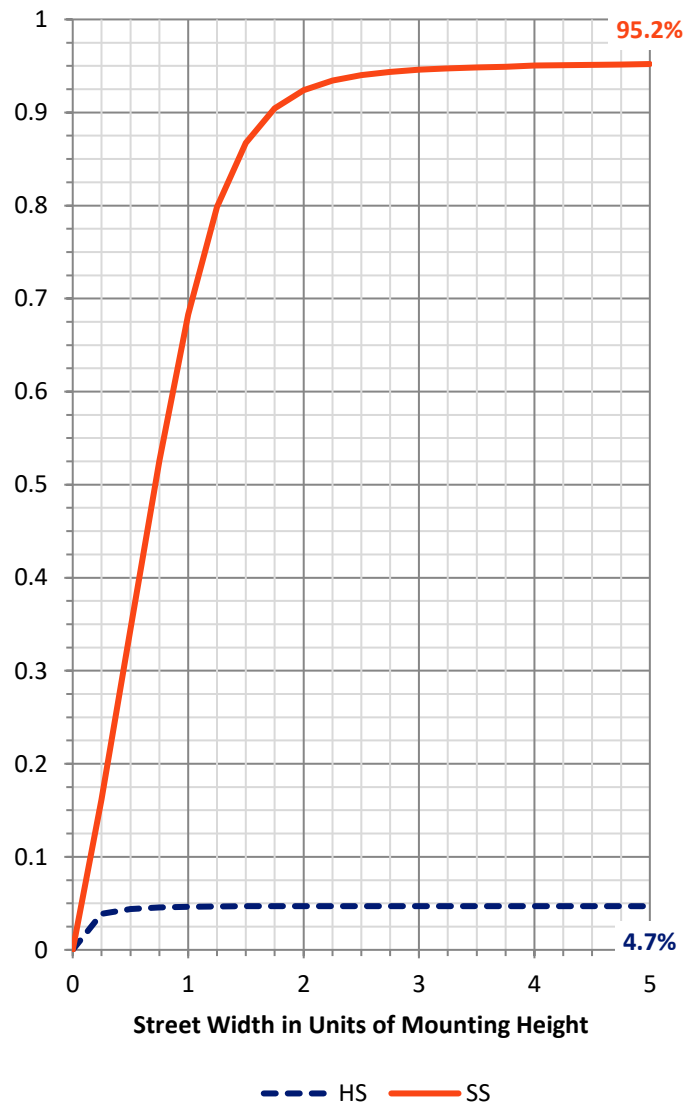
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 380.0    | 0.0    | 380.0  |
|                    | % Fixture | 4.7      | 0.0    | 4.7    |
| <b>Street Side</b> | Lumens    | 7678.0   | 0.0    | 7678.0 |
|                    | % Fixture | 95.3     | 0.0    | 95.3   |
| <b>Total</b>       | Lumens    | 8058.0   | 0.0    | 8058.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 101.6  | 1.3       |
| 10°-20°   | 328.0  | 4.1       |
| 20°-30°   | 610.8  | 7.6       |
| 30°-40°   | 1080.3 | 13.4      |
| 40°-50°   | 1652.1 | 20.5      |
| 50°-60°   | 1873.1 | 23.2      |
| 60°-70°   | 1605.7 | 19.9      |
| 70°-80°   | 777.7  | 9.7       |
| 80°-90°   | 28.8   | 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°    | 8058.0 | 100.0     |
| 0°-180°   | 8058.0 | 100.0     |

**Coefficient of Utilization**



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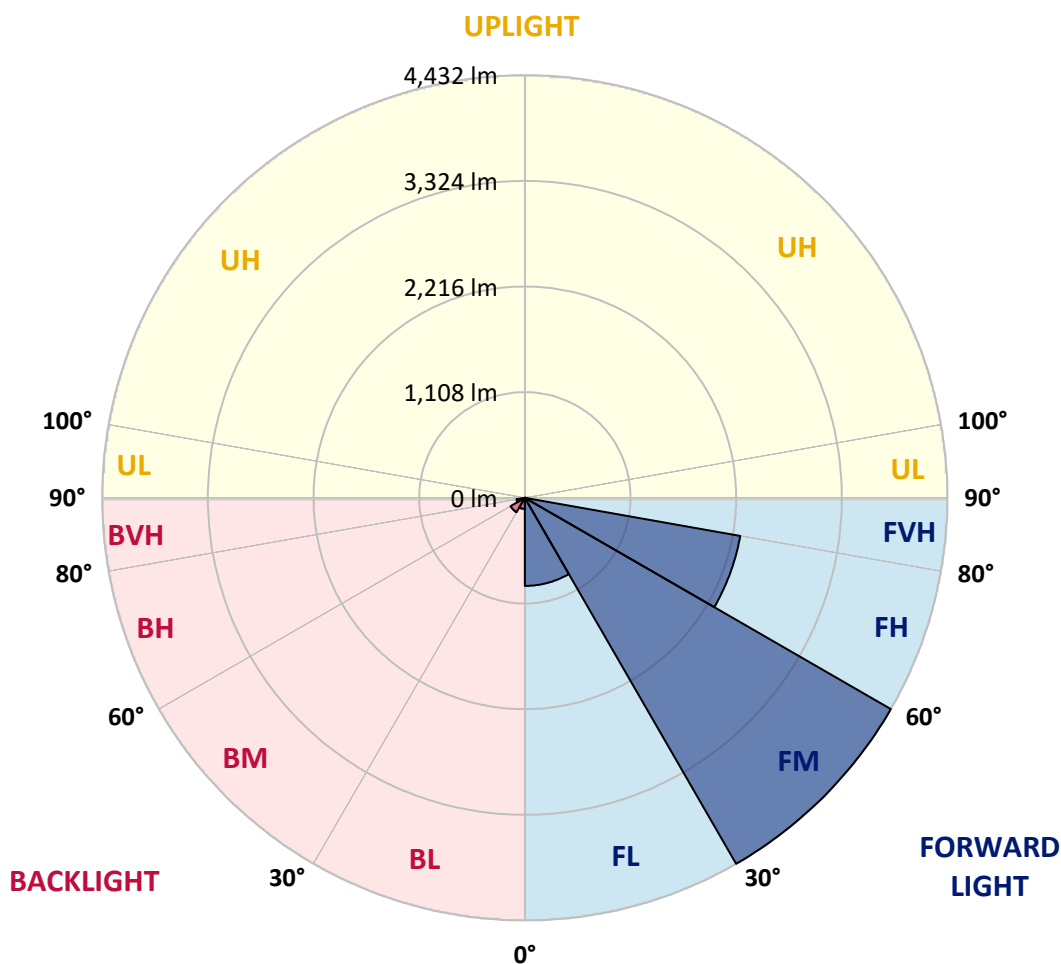
CATALOG NUMBER: ARCH-M-PA2-70-727-24VDC-T2R-HSS

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 923.8  | 11.5      |                         |      |         |
| FM   | (30°-60°)   | 4432.0 | 55.0      |                         |      |         |
| FH   | (60°-80°)   | 2293.9 | 28.5      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 28.4   | 0.4       |                         |      | G1/100  |
| BL   | (0°-30°)    | 116.6  | 1.4       | B1/500                  |      |         |
| BM   | (30°-60°)   | 173.5  | 2.2       | B0/220                  |      |         |
| BH   | (60°-80°)   | 89.5   | 1.1       | B0/110                  |      | G0/110  |
| BVH  | (80°-90°)   | 0.5    | 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 II Medium



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CATALOG NUMBER: ARCH-M-PA2-70-727-24VDC-T2R-HSS

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 75°    | 76°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1078.6 | 1078.6 | 1078.6 | 1078.6 | 1078.6 | 1078.6 | 1078.6 | 1078.6 | 1078.6 | 1078.6 | 1078.6 |
| 2.5°  | 1474.4 | 1466.3 | 1458.3 | 1427.4 | 1399.2 | 1373.8 | 1325.5 | 1262.4 | 1206.1 | 1194.0 | 1128.3 |
| 5°    | 1732.0 | 1722.6 | 1710.5 | 1679.6 | 1643.4 | 1600.5 | 1529.4 | 1432.8 | 1333.5 | 1312.0 | 1190.0 |
| 7.5°  | 1906.4 | 1898.3 | 1880.9 | 1866.1 | 1829.9 | 1788.3 | 1709.1 | 1596.5 | 1459.6 | 1432.8 | 1261.1 |
| 10°   | 2025.8 | 2020.4 | 2017.7 | 2005.6 | 1978.8 | 1945.3 | 1866.1 | 1748.1 | 1587.1 | 1556.2 | 1336.2 |
| 12.5° | 2068.7 | 2068.7 | 2082.1 | 2102.2 | 2106.3 | 2095.5 | 2023.1 | 1905.0 | 1721.2 | 1689.0 | 1424.7 |
| 15°   | 2011.0 | 2017.7 | 2047.2 | 2111.6 | 2178.7 | 2223.0 | 2177.4 | 2067.3 | 1868.8 | 1833.9 | 1529.4 |
| 17.5° | 1994.9 | 2001.6 | 2021.7 | 2078.1 | 2168.0 | 2286.0 | 2308.8 | 2224.3 | 2008.3 | 1978.8 | 1636.7 |
| 20°   | 2040.5 | 2047.2 | 2064.7 | 2113.0 | 2181.4 | 2300.8 | 2396.0 | 2375.9 | 2155.9 | 2125.0 | 1745.4 |
| 22.5° | 2149.2 | 2153.2 | 2153.2 | 2190.8 | 2251.1 | 2339.7 | 2451.0 | 2519.5 | 2307.5 | 2273.9 | 1852.7 |
| 25°   | 2382.6 | 2374.6 | 2342.4 | 2323.6 | 2362.5 | 2434.9 | 2520.8 | 2645.6 | 2476.5 | 2430.9 | 1968.1 |
| 27.5° | 2688.5 | 2715.3 | 2637.5 | 2547.6 | 2518.1 | 2559.7 | 2618.7 | 2756.9 | 2640.2 | 2591.9 | 2072.7 |
| 30°   | 3103.0 | 3092.3 | 2990.3 | 2861.5 | 2734.1 | 2719.3 | 2739.5 | 2852.2 | 2803.9 | 2758.2 | 2189.4 |
| 32.5° | 3443.8 | 3463.9 | 3356.6 | 3199.6 | 3009.1 | 2919.2 | 2897.8 | 2966.2 | 2978.3 | 2948.8 | 2327.6 |
| 35°   | 3793.9 | 3815.4 | 3710.8 | 3536.4 | 3309.6 | 3159.4 | 3097.7 | 3107.1 | 3194.3 | 3156.7 | 2472.5 |
| 37.5° | 4107.9 | 4126.6 | 4023.3 | 3844.9 | 3618.2 | 3434.4 | 3345.9 | 3273.4 | 3403.5 | 3370.0 | 2625.4 |
| 40°   | 4346.7 | 4349.3 | 4279.6 | 4119.9 | 3905.3 | 3714.8 | 3614.2 | 3472.0 | 3624.9 | 3602.1 | 2785.1 |
| 42.5° | 4515.7 | 4521.1 | 4470.1 | 4333.2 | 4134.7 | 3957.6 | 3875.8 | 3706.7 | 3879.8 | 3859.7 | 2970.2 |
| 45°   | 4594.8 | 4604.2 | 4598.9 | 4472.8 | 4307.8 | 4154.8 | 4128.0 | 3956.3 | 4158.8 | 4140.1 | 3183.5 |
| 47.5° | 4519.7 | 4519.7 | 4588.1 | 4570.7 | 4419.1 | 4317.1 | 4348.0 | 4216.5 | 4462.0 | 4444.6 | 3400.9 |
| 50°   | 4207.1 | 4211.2 | 4350.7 | 4550.6 | 4462.0 | 4439.2 | 4535.8 | 4471.4 | 4737.1 | 4747.8 | 3661.1 |
| 52.5° | 3386.1 | 3379.4 | 3850.3 | 4234.0 | 4432.5 | 4494.2 | 4708.9 | 4731.7 | 5067.1 | 5099.3 | 3920.0 |
| 55°   | 2530.2 | 2526.2 | 2976.9 | 3673.2 | 4225.9 | 4466.1 | 4805.5 | 4963.8 | 5348.8 | 5368.9 | 4113.2 |
| 57.5° | 2003.0 | 1992.2 | 2240.4 | 2960.8 | 3759.1 | 4339.9 | 4809.5 | 5008.0 | 5505.8 | 5540.6 | 4301.0 |
| 60°   | 1540.1 | 1530.7 | 1715.9 | 2202.8 | 3097.7 | 4004.6 | 4694.1 | 5010.7 | 5657.4 | 5719.1 | 4553.3 |
| 62.5° | 1101.4 | 1112.2 | 1254.4 | 1580.4 | 2382.6 | 3531.0 | 4543.9 | 5048.3 | 5927.0 | 5996.8 | 4911.5 |
| 65°   | 743.2  | 737.9  | 855.9  | 1075.9 | 1694.4 | 2893.7 | 4313.1 | 5127.4 | 6412.7 | 6534.7 | 5340.8 |
| 67.5° | 516.5  | 520.5  | 574.2  | 700.3  | 1075.9 | 2221.6 | 3929.4 | 5171.7 | 6914.4 | 7009.7 | 5641.3 |
| 70°   | 373.0  | 378.3  | 407.8  | 470.9  | 657.4  | 1506.6 | 3321.7 | 4969.1 | 7049.9 | 7133.1 | 5432.0 |
| 72.5° | 245.5  | 256.2  | 300.5  | 334.0  | 419.9  | 943.1  | 2447.0 | 4280.9 | 6466.3 | 6528.0 | 4557.3 |
| 75°   | 132.8  | 135.5  | 193.2  | 249.5  | 299.2  | 587.6  | 1459.6 | 2887.0 | 4837.7 | 4817.5 | 3005.1 |
| 77.5° | 103.3  | 107.3  | 119.4  | 178.4  | 201.2  | 323.3  | 576.9  | 1304.0 | 2291.4 | 2229.7 | 1025.0 |
| 80°   | 63.1   | 65.7   | 83.2   | 106.0  | 140.9  | 187.8  | 169.0  | 354.2  | 465.5  | 436.0  | 150.3  |
| 82.5° | 37.6   | 40.2   | 49.6   | 88.5   | 111.3  | 88.5   | 59.0   | 85.9   | 87.2   | 85.9   | 37.6   |
| 85°   | 6.7    | 6.7    | 34.9   | 61.7   | 59.0   | 25.5   | 34.9   | 28.2   | 25.5   | 26.8   | 8.0    |
| 87.5° | 0.0    | 0.0    | 13.4   | 18.8   | 26.8   | 9.4    | 13.4   | 6.7    | 6.7    | 6.7    | 4.0    |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

REPORT NUMBER: P800716

CATALOG NUMBER: ARCH-M-PA2-70-727-24VDC-T2R-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1078.6 | 1078.6 | 1078.6 | 1078.6 | 1078.6 | 1078.6 | 1078.6 | 1078.6 | 1078.6 | 1078.6 | 1078.6 |
| 2.5°  | 1088.0 | 1042.4 | 948.5  | 866.6  | 784.8  | 724.4  | 678.8  | 631.9  | 615.8  | 595.7  | 584.9  |
| 5°    | 1106.8 | 1016.9 | 830.4  | 681.5  | 555.4  | 458.8  | 397.1  | 359.5  | 335.4  | 317.9  | 313.9  |
| 7.5°  | 1135.0 | 996.8  | 735.2  | 533.9  | 395.8  | 299.2  | 248.2  | 222.7  | 209.3  | 201.2  | 198.6  |
| 10°   | 1168.5 | 979.3  | 641.3  | 415.9  | 279.0  | 210.6  | 182.5  | 171.7  | 166.4  | 163.7  | 162.3  |
| 12.5° | 1215.5 | 972.6  | 562.1  | 320.6  | 210.6  | 173.1  | 158.3  | 151.6  | 147.6  | 143.5  | 142.2  |
| 15°   | 1277.2 | 975.3  | 489.7  | 248.2  | 174.4  | 154.3  | 142.2  | 135.5  | 130.1  | 126.1  | 126.1  |
| 17.5° | 1341.6 | 979.3  | 418.6  | 201.2  | 158.3  | 140.9  | 127.4  | 118.1  | 114.0  | 110.0  | 108.7  |
| 20°   | 1401.9 | 978.0  | 350.1  | 171.7  | 143.5  | 126.1  | 112.7  | 103.3  | 96.6   | 92.6   | 92.6   |
| 22.5° | 1459.6 | 969.9  | 285.8  | 154.3  | 131.5  | 111.3  | 96.6   | 87.2   | 81.8   | 77.8   | 77.8   |
| 25°   | 1521.3 | 953.8  | 233.4  | 140.9  | 116.7  | 97.9   | 83.2   | 73.8   | 69.8   | 65.7   | 65.7   |
| 27.5° | 1569.6 | 927.0  | 190.5  | 128.8  | 103.3  | 84.5   | 71.1   | 63.1   | 59.0   | 56.3   | 56.3   |
| 30°   | 1621.9 | 888.1  | 158.3  | 115.4  | 89.9   | 72.4   | 60.4   | 53.7   | 49.6   | 48.3   | 48.3   |
| 32.5° | 1679.6 | 845.2  | 135.5  | 102.0  | 76.5   | 61.7   | 51.0   | 47.0   | 42.9   | 41.6   | 41.6   |
| 35°   | 1746.7 | 807.6  | 122.1  | 88.5   | 67.1   | 52.3   | 44.3   | 40.2   | 37.6   | 37.6   | 37.6   |
| 37.5° | 1823.2 | 768.7  | 110.0  | 77.8   | 57.7   | 44.3   | 37.6   | 36.2   | 34.9   | 33.5   | 33.5   |
| 40°   | 1906.4 | 727.1  | 99.3   | 68.4   | 49.6   | 37.6   | 32.2   | 32.2   | 30.9   | 30.9   | 30.9   |
| 42.5° | 2000.3 | 690.9  | 89.9   | 60.4   | 42.9   | 32.2   | 28.2   | 28.2   | 26.8   | 26.8   | 26.8   |
| 45°   | 2102.2 | 657.4  | 81.8   | 53.7   | 37.6   | 28.2   | 25.5   | 24.1   | 22.8   | 22.8   | 22.8   |
| 47.5° | 2223.0 | 638.6  | 75.1   | 47.0   | 32.2   | 24.1   | 21.5   | 20.1   | 18.8   | 17.4   | 17.4   |
| 50°   | 2377.2 | 646.6  | 68.4   | 38.9   | 28.2   | 20.1   | 17.4   | 16.1   | 14.8   | 13.4   | 13.4   |
| 52.5° | 2499.3 | 642.6  | 59.0   | 33.5   | 22.8   | 16.1   | 13.4   | 12.1   | 10.7   | 9.4    | 9.4    |
| 55°   | 2587.9 | 626.5  | 51.0   | 28.2   | 17.4   | 13.4   | 10.7   | 8.0    | 6.7    | 6.7    | 6.7    |
| 57.5° | 2675.1 | 610.4  | 42.9   | 22.8   | 13.4   | 9.4    | 6.7    | 5.4    | 5.4    | 5.4    | 5.4    |
| 60°   | 2810.6 | 587.6  | 37.6   | 18.8   | 10.7   | 6.7    | 4.0    | 4.0    | 2.7    | 2.7    | 2.7    |
| 62.5° | 2975.6 | 559.4  | 30.9   | 16.1   | 8.0    | 5.4    | 2.7    | 2.7    | 0.0    | 0.0    | 0.0    |
| 65°   | 3156.7 | 509.8  | 25.5   | 12.1   | 6.7    | 4.0    | 2.7    | 0.0    | 0.0    | 0.0    | 0.0    |
| 67.5° | 3115.1 | 409.2  | 21.5   | 8.0    | 5.4    | 2.7    | 1.3    | 0.0    | 0.0    | 0.0    | 0.0    |
| 70°   | 2755.6 | 276.4  | 17.4   | 6.7    | 4.0    | 2.7    | 1.3    | 0.0    | 0.0    | 0.0    | 0.0    |
| 72.5° | 2158.6 | 163.7  | 12.1   | 5.4    | 2.7    | 1.3    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 75°   | 1381.8 | 81.8   | 8.0    | 4.0    | 2.7    | 1.3    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 77.5° | 462.8  | 40.2   | 5.4    | 2.7    | 1.3    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 80°   | 65.7   | 13.4   | 2.7    | 1.3    | 1.3    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 82.5° | 14.8   | 5.4    | 1.3    | 1.3    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 85°   | 5.4    | 2.7    | 1.3    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |
| 87.5° | 2.7    | 1.3    | 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: SP1-2101-121-5

Luminaire Tested: IFLD-S-SA2E-727-U-T2

Test Date: 03/04/2021

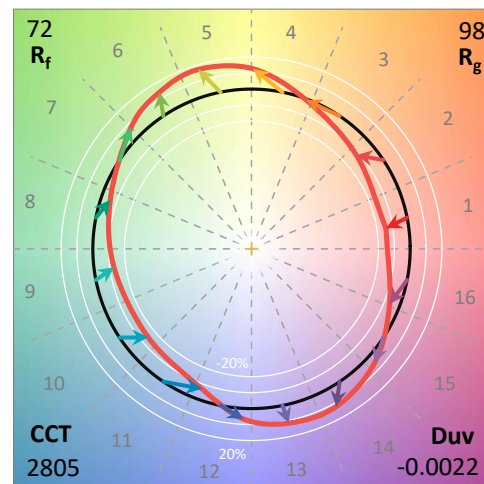
### Test Information

Test Method: LM-79-08  
 Report Number: SP1-2101-121-5  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1  
 Measurement Geometry:  $4\pi$   
 Issue Date: 03/04/2021  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: STREETWORKS  
 Catalog Number: **IFLD-S-SA2E-727-U-T2**  
 Description: STREETWORKS INF FLOOD

PROGRAMMED @ 1500mA.

### Spectral Parameters

|                           |         |           |      |      |       |
|---------------------------|---------|-----------|------|------|-------|
| CCT (K):                  | 2805    | CRI (Ra): | 72.4 |      |       |
| CIE u':                   | 0.2586  | R1:       | 69.8 | R9:  | -15.0 |
| CIE v':                   | 0.5221  | R2:       | 81.3 | R10: | 55.6  |
| Duv:                      | -0.0022 | R3:       | 90.2 | R11: | 61.7  |
| CIE x:                    | 0.4477  | R4:       | 68.5 | R12: | 47.2  |
| CIE y:                    | 0.4017  | R5:       | 67.5 | R13: | 71.4  |
| CIE z:                    | 0.1506  | R6:       | 72.4 | R14: | 93.9  |
| Peak Wavelength (nm):     | 599     | R7:       | 79.4 |      |       |
| Dominant Wavelength (nm): | 584     | R8:       | 49.9 |      |       |
| Purity:                   | 55.3    |           |      |      |       |
| Rf:                       | 71.9    |           |      |      |       |
| Rg:                       | 97.9    |           |      |      |       |



### Test Conditions

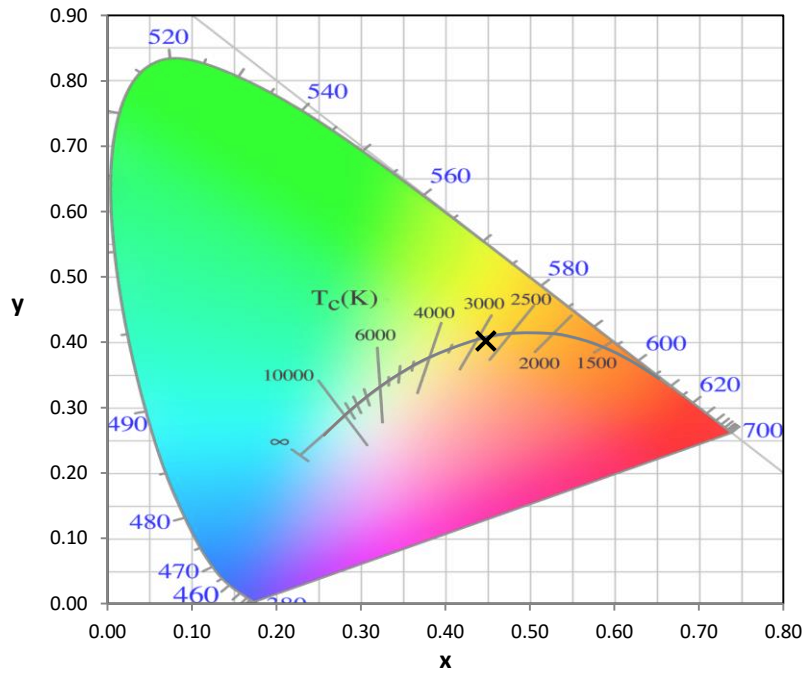
Stabilization Time: 60M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.3/31%  
 Sphere Temperature (°C): 24.8

REPORT NUMBER: SP1-2101-121-5

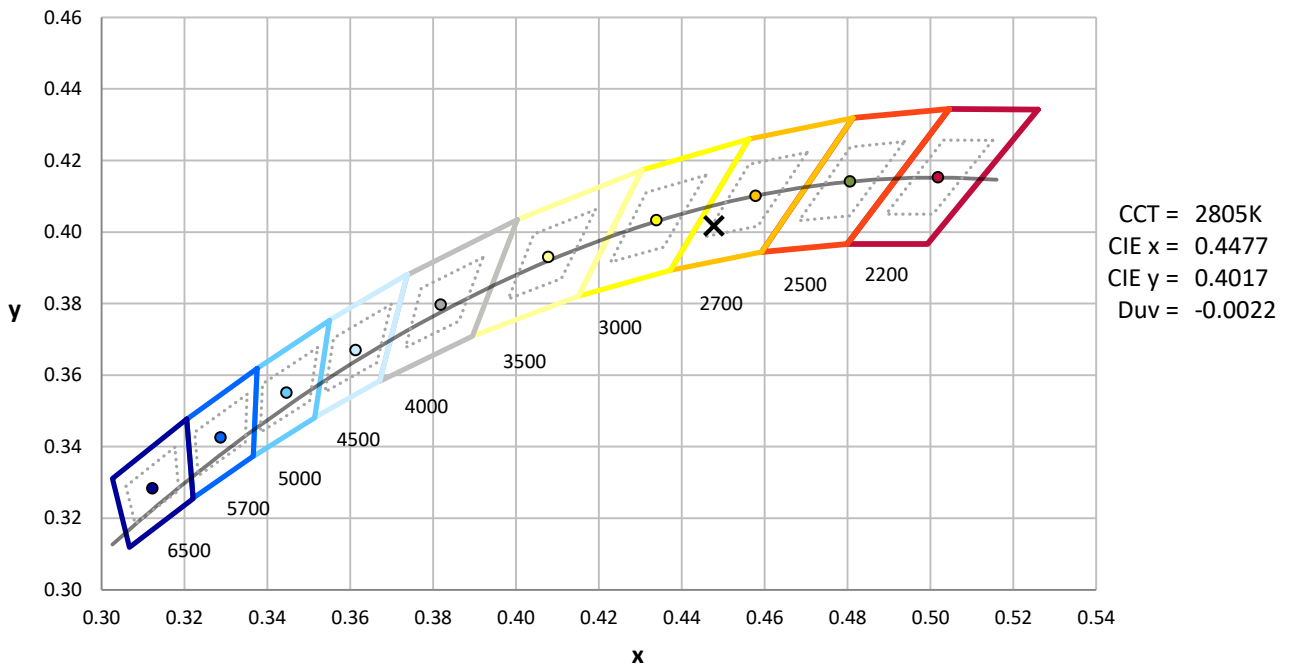
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date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

REPORT NUMBER: SP1-2101-121-5

**CIE 1931 Chromaticity Diagram**

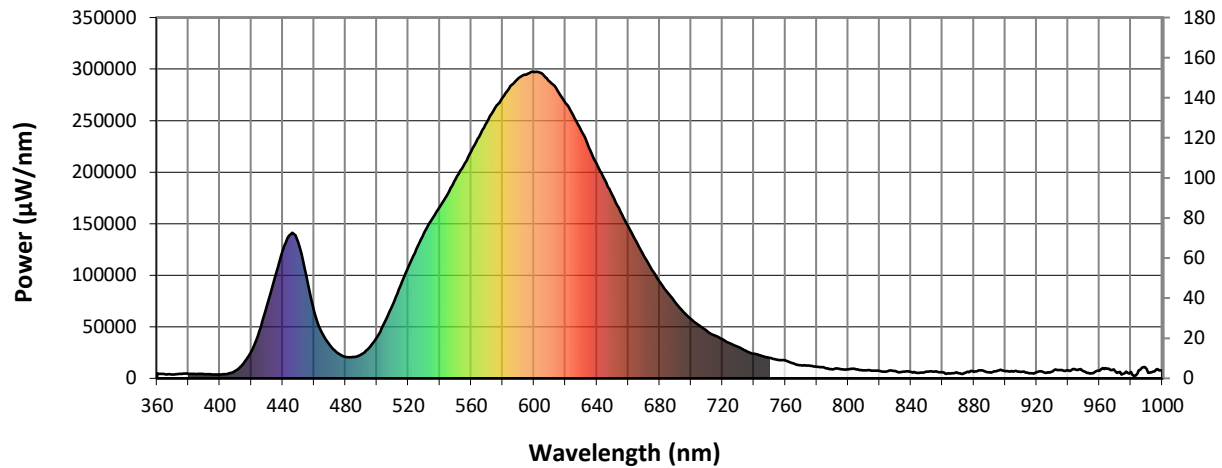


**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



REPORT NUMBER: SP1-2101-121-5

### Photopic Flux vs. Wavelength

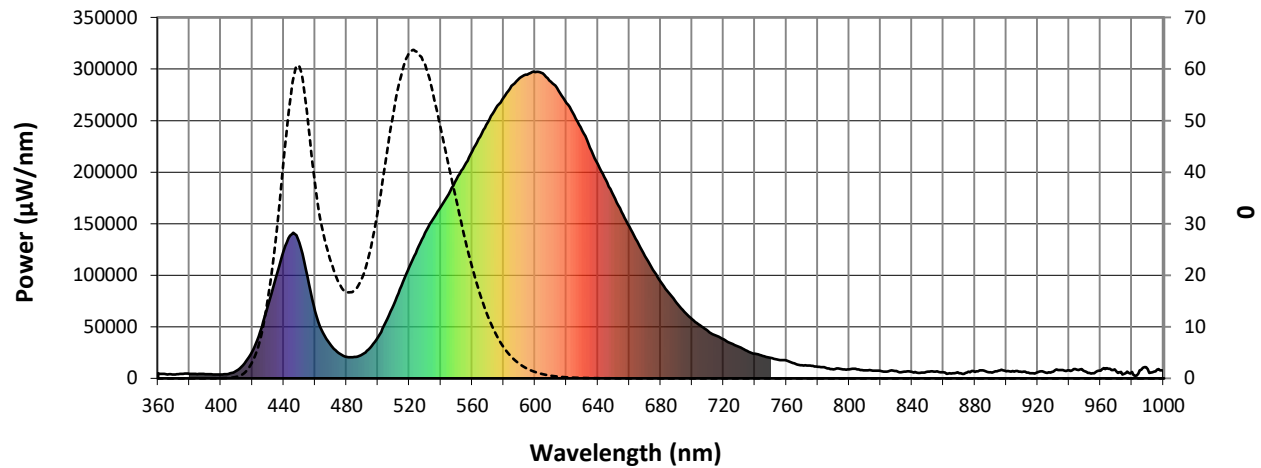


#####

| 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       | 4854             | 0.0              | 490       | 23280            | 3.3              | 620       | 266893           | 69.5             | 750       | 19996            | 0.0              | 880       | 6314             | 0.0              |
| 365       | 4049             | 0.0              | 495       | 29582            | 5.4              | 625       | 255096           | 56.3             | 755       | 17900            | 0.0              | 885       | 7853             | 0.0              |
| 370       | 3795             | 0.0              | 500       | 39981            | 8.8              | 630       | 240244           | 43.5             | 760       | 17272            | 0.0              | 890       | 5823             | 0.0              |
| 375       | 4296             | 0.0              | 505       | 54556            | 15.3             | 635       | 223787           | 33.6             | 765       | 14514            | 0.0              | 895       | 7346             | 0.0              |
| 380       | 4496             | 0.0              | 510       | 71364            | 24.5             | 640       | 207566           | 24.8             | 770       | 12643            | 0.0              | 900       | 6920             | 0.0              |
| 385       | 4186             | 0.0              | 515       | 89828            | 37.2             | 645       | 192517           | 18.5             | 775       | 12475            | 0.0              | 905       | 6608             | 0.0              |
| 390       | 3945             | 0.0              | 520       | 108414           | 52.6             | 650       | 177187           | 12.9             | 780       | 11188            | 0.0              | 910       | 6279             | 0.0              |
| 395       | 3780             | 0.0              | 525       | 124929           | 67.1             | 655       | 161553           | 9.3              | 785       | 10229            | 0.0              | 915       | 5131             | 0.0              |
| 400       | 3679             | 0.0              | 530       | 141352           | 83.2             | 660       | 147361           | 6.1              | 790       | 8578             | 0.0              | 920       | 5855             | 0.0              |
| 405       | 4475             | 0.0              | 535       | 154552           | 95.8             | 665       | 132756           | 4.2              | 795       | 9114             | 0.0              | 925       | 5678             | 0.0              |
| 410       | 7499             | 0.0              | 540       | 166297           | 108.4            | 670       | 118534           | 2.6              | 800       | 8597             | 0.0              | 930       | 6661             | 0.0              |
| 415       | 14449            | 0.0              | 545       | 178874           | 119.1            | 675       | 105260           | 1.8              | 805       | 8790             | 0.0              | 935       | 8074             | 0.0              |
| 420       | 26000            | 0.1              | 550       | 193176           | 131.3            | 680       | 93637            | 1.1              | 810       | 7814             | 0.0              | 940       | 7823             | 0.0              |
| 425       | 45491            | 0.2              | 555       | 206008           | 140.7            | 685       | 83217            | 0.7              | 815       | 7533             | 0.0              | 945       | 8364             | 0.0              |
| 430       | 70707            | 0.6              | 560       | 220126           | 149.6            | 690       | 73671            | 0.4              | 820       | 7303             | 0.0              | 950       | 6763             | 0.0              |
| 435       | 98169            | 1.2              | 565       | 234383           | 155.8            | 695       | 64520            | 0.3              | 825       | 6745             | 0.0              | 955       | 4883             | 0.0              |
| 440       | 123846           | 1.9              | 570       | 248161           | 161.4            | 700       | 57442            | 0.2              | 830       | 7209             | 0.0              | 960       | 7488             | 0.0              |
| 445       | 139822           | 2.9              | 575       | 261970           | 163.0            | 705       | 51479            | 0.1              | 835       | 6674             | 0.0              | 965       | 9316             | 0.0              |
| 450       | 131679           | 3.4              | 580       | 272271           | 161.8            | 710       | 45940            | 0.1              | 840       | 6151             | 0.0              | 970       | 6857             | 0.0              |
| 455       | 99242            | 3.3              | 585       | 283822           | 157.7            | 715       | 41575            | 0.0              | 845       | 5371             | 0.0              | 975       | 4388             | 0.0              |
| 460       | 65216            | 2.7              | 590       | 291192           | 150.6            | 720       | 37753            | 0.0              | 850       | 6484             | 0.0              | 980       | 6095             | 0.0              |
| 465       | 44137            | 2.3              | 595       | 294651           | 139.7            | 725       | 33818            | 0.0              | 855       | 6614             | 0.0              | 985       | 7701             | 0.0              |
| 470       | 32002            | 2.0              | 600       | 297168           | 128.1            | 730       | 30414            | 0.0              | 860       | 5959             | 0.0              | 990       | 9045             | 0.0              |
| 475       | 24549            | 1.9              | 605       | 295658           | 114.5            | 735       | 26662            | 0.0              | 865       | 4768             | 0.0              | 995       | 6989             | 0.0              |
| 480       | 20801            | 2.0              | 610       | 287633           | 98.8             | 740       | 23848            | 0.0              | 870       | 5098             | 0.0              | 1000      | 7341             | 0.0              |
| 485       | 20656            | 2.4              | 615       | 279152           | 84.3             | 745       | 21851            | 0.0              | 875       | 5516             | 0.0              |           |                  |                  |

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### Scotopic Flux vs. Wavelength



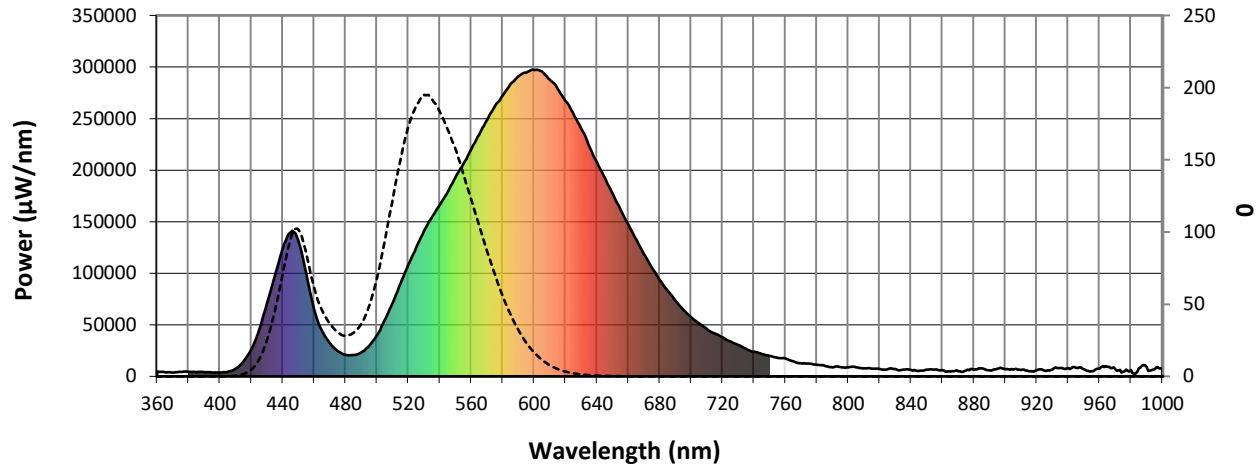
Scotopic Lumens: 15895.6

S/P: 1.11

| 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       | 4854             | 0.0              | 490       | 23280            | 35.8             | 620       | 266893           | 3.3              | 750       | 19996            | 0.0              | 880       | 6314             | 0.0              |
| 365       | 4049             | 0.0              | 495       | 29582            | 47.8             | 625       | 255096           | 2.2              | 755       | 17900            | 0.0              | 885       | 7853             | 0.0              |
| 370       | 3795             | 0.0              | 500       | 39981            | 66.9             | 630       | 240244           | 1.4              | 760       | 17272            | 0.0              | 890       | 5823             | 0.0              |
| 375       | 4296             | 0.0              | 505       | 54556            | 92.7             | 635       | 223787           | 0.9              | 765       | 14514            | 0.0              | 895       | 7346             | 0.0              |
| 380       | 4496             | 0.0              | 510       | 71364            | 121.0            | 640       | 207566           | 0.5              | 770       | 12643            | 0.0              | 900       | 6920             | 0.0              |
| 385       | 4186             | 0.0              | 515       | 89828            | 148.9            | 645       | 192517           | 0.3              | 775       | 12475            | 0.0              | 905       | 6608             | 0.0              |
| 390       | 3945             | 0.0              | 520       | 108414           | 172.3            | 650       | 177187           | 0.2              | 780       | 11188            | 0.0              | 910       | 6279             | 0.0              |
| 395       | 3780             | 0.0              | 525       | 124929           | 186.9            | 655       | 161553           | 0.1              | 785       | 10229            | 0.0              | 915       | 5131             | 0.0              |
| 400       | 3679             | 0.1              | 530       | 141352           | 194.9            | 660       | 147361           | 0.1              | 790       | 8578             | 0.0              | 920       | 5855             | 0.0              |
| 405       | 4475             | 0.1              | 535       | 154552           | 192.6            | 665       | 132756           | 0.0              | 795       | 9114             | 0.0              | 925       | 5678             | 0.0              |
| 410       | 7499             | 0.4              | 540       | 166297           | 183.8            | 670       | 118534           | 0.0              | 800       | 8597             | 0.0              | 930       | 6661             | 0.0              |
| 415       | 14449            | 1.5              | 545       | 178874           | 171.5            | 675       | 105260           | 0.0              | 805       | 8790             | 0.0              | 935       | 8074             | 0.0              |
| 420       | 26000            | 4.3              | 550       | 193176           | 158.0            | 680       | 93637            | 0.0              | 810       | 7814             | 0.0              | 940       | 7823             | 0.0              |
| 425       | 45491            | 11.1             | 555       | 206008           | 140.8            | 685       | 83217            | 0.0              | 815       | 7533             | 0.0              | 945       | 8364             | 0.0              |
| 430       | 70707            | 24.1             | 560       | 220126           | 123.0            | 690       | 73671            | 0.0              | 820       | 7303             | 0.0              | 950       | 6763             | 0.0              |
| 435       | 98169            | 43.9             | 565       | 234383           | 105.2            | 695       | 64520            | 0.0              | 825       | 6745             | 0.0              | 955       | 4883             | 0.0              |
| 440       | 123846           | 69.2             | 570       | 248161           | 87.6             | 700       | 57442            | 0.0              | 830       | 7209             | 0.0              | 960       | 7488             | 0.0              |
| 445       | 139822           | 93.6             | 575       | 261970           | 71.3             | 705       | 51479            | 0.0              | 835       | 6674             | 0.0              | 965       | 9316             | 0.0              |
| 450       | 131679           | 102.1            | 580       | 272271           | 56.1             | 710       | 45940            | 0.0              | 840       | 6151             | 0.0              | 970       | 6857             | 0.0              |
| 455       | 99242            | 86.7             | 585       | 283822           | 43.4             | 715       | 41575            | 0.0              | 845       | 5371             | 0.0              | 975       | 4388             | 0.0              |
| 460       | 65216            | 63.0             | 590       | 291192           | 32.4             | 720       | 37753            | 0.0              | 850       | 6484             | 0.0              | 980       | 6095             | 0.0              |
| 465       | 44137            | 46.6             | 595       | 294651           | 23.5             | 725       | 33818            | 0.0              | 855       | 6614             | 0.0              | 985       | 7701             | 0.0              |
| 470       | 32002            | 36.9             | 600       | 297168           | 16.7             | 730       | 30414            | 0.0              | 860       | 5959             | 0.0              | 990       | 9045             | 0.0              |
| 475       | 24549            | 30.7             | 605       | 295658           | 11.6             | 735       | 26662            | 0.0              | 865       | 4768             | 0.0              | 995       | 6989             | 0.0              |
| 480       | 20801            | 28.1             | 610       | 287633           | 7.8              | 740       | 23848            | 0.0              | 870       | 5098             | 0.0              | 1000      | 7341             | 0.0              |
| 485       | 20656            | 29.9             | 615       | 279152           | 5.2              | 745       | 21851            | 0.0              | 875       | 5516             | 0.0              |           |                  |                  |

REPORT NUMBER: SP1-2101-121-5

### Melanopic Flux vs. Wavelength



**Melanopic Lumens: 5527.7**

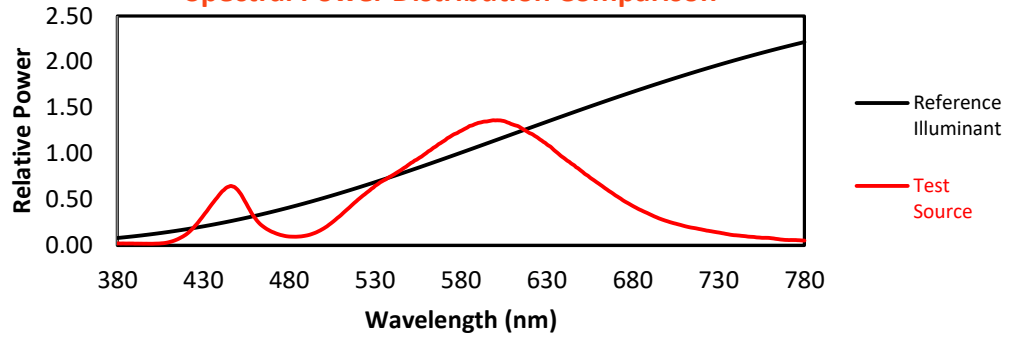
**M/P: 0.39**

| 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       | 4854             | 0.0              | 490       | 23280            | 19.4             | 620       | 266893           | 0.2              | 750       | 19996            | 0.0              | 880       | 6314             | 0.0              |
| 365       | 4049             | 0.0              | 495       | 29582            | 24.4             | 625       | 255096           | 0.1              | 755       | 17900            | 0.0              | 885       | 7853             | 0.0              |
| 370       | 3795             | 0.0              | 500       | 39981            | 32.1             | 630       | 240244           | 0.1              | 760       | 17272            | 0.0              | 890       | 5823             | 0.0              |
| 375       | 4296             | 0.0              | 505       | 54556            | 41.9             | 635       | 223787           | 0.1              | 765       | 14514            | 0.0              | 895       | 7346             | 0.0              |
| 380       | 4496             | 0.0              | 510       | 71364            | 51.2             | 640       | 207566           | 0.0              | 770       | 12643            | 0.0              | 900       | 6920             | 0.0              |
| 385       | 4186             | 0.0              | 515       | 89828            | 58.7             | 645       | 192517           | 0.0              | 775       | 12475            | 0.0              | 905       | 6608             | 0.0              |
| 390       | 3945             | 0.0              | 520       | 108414           | 63.1             | 650       | 177187           | 0.0              | 780       | 11188            | 0.0              | 910       | 6279             | 0.0              |
| 395       | 3780             | 0.0              | 525       | 124929           | 63.4             | 655       | 161553           | 0.0              | 785       | 10229            | 0.0              | 915       | 5131             | 0.0              |
| 400       | 3679             | 0.0              | 530       | 141352           | 61.1             | 660       | 147361           | 0.0              | 790       | 8578             | 0.0              | 920       | 5855             | 0.0              |
| 405       | 4475             | 0.1              | 535       | 154552           | 55.6             | 665       | 132756           | 0.0              | 795       | 9114             | 0.0              | 925       | 5678             | 0.0              |
| 410       | 7499             | 0.3              | 540       | 166297           | 48.7             | 670       | 118534           | 0.0              | 800       | 8597             | 0.0              | 930       | 6661             | 0.0              |
| 415       | 14449            | 1.0              | 545       | 178874           | 41.5             | 675       | 105260           | 0.0              | 805       | 8790             | 0.0              | 935       | 8074             | 0.0              |
| 420       | 26000            | 3.0              | 550       | 193176           | 34.7             | 680       | 93637            | 0.0              | 810       | 7814             | 0.0              | 940       | 7823             | 0.0              |
| 425       | 45491            | 7.1              | 555       | 206008           | 27.8             | 685       | 83217            | 0.0              | 815       | 7533             | 0.0              | 945       | 8364             | 0.0              |
| 430       | 70707            | 14.9             | 560       | 220126           | 21.7             | 690       | 73671            | 0.0              | 820       | 7303             | 0.0              | 950       | 6763             | 0.0              |
| 435       | 98169            | 26.2             | 565       | 234383           | 16.5             | 695       | 64520            | 0.0              | 825       | 6745             | 0.0              | 955       | 4883             | 0.0              |
| 440       | 123846           | 41.4             | 570       | 248161           | 12.1             | 700       | 57442            | 0.0              | 830       | 7209             | 0.0              | 960       | 7488             | 0.0              |
| 445       | 139822           | 55.1             | 575       | 261970           | 8.7              | 705       | 51479            | 0.0              | 835       | 6674             | 0.0              | 965       | 9316             | 0.0              |
| 450       | 131679           | 60.7             | 580       | 272271           | 6.1              | 710       | 45940            | 0.0              | 840       | 6151             | 0.0              | 970       | 6857             | 0.0              |
| 455       | 99242            | 52.0             | 585       | 283822           | 4.2              | 715       | 41575            | 0.0              | 845       | 5371             | 0.0              | 975       | 4388             | 0.0              |
| 460       | 65216            | 38.4             | 590       | 291192           | 2.9              | 720       | 37753            | 0.0              | 850       | 6484             | 0.0              | 980       | 6095             | 0.0              |
| 465       | 44137            | 28.8             | 595       | 294651           | 1.9              | 725       | 33818            | 0.0              | 855       | 6614             | 0.0              | 985       | 7701             | 0.0              |
| 470       | 32002            | 22.9             | 600       | 297168           | 1.3              | 730       | 30414            | 0.0              | 860       | 5959             | 0.0              | 990       | 9045             | 0.0              |
| 475       | 24549            | 18.7             | 605       | 295658           | 0.8              | 735       | 26662            | 0.0              | 865       | 4768             | 0.0              | 995       | 6989             | 0.0              |
| 480       | 20801            | 16.7             | 610       | 287633           | 0.5              | 740       | 23848            | 0.0              | 870       | 5098             | 0.0              | 1000      | 7341             | 0.0              |
| 485       | 20656            | 17.0             | 615       | 279152           | 0.3              | 745       | 21851            | 0.0              | 875       | 5516             | 0.0              |           |                  |                  |

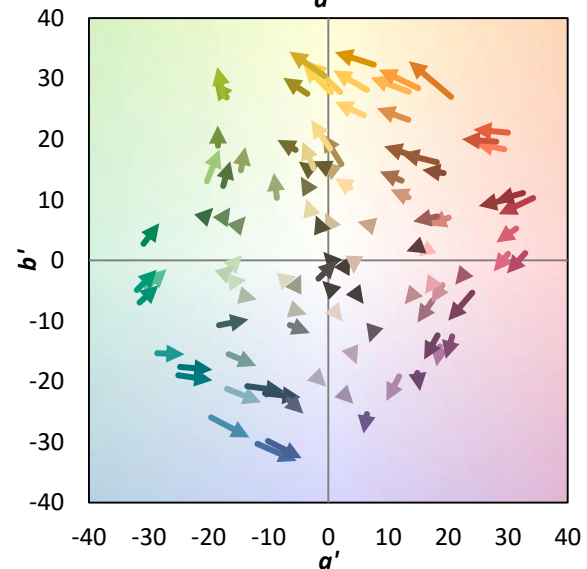
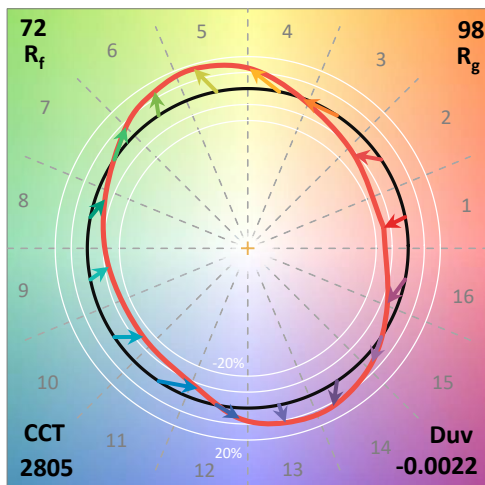
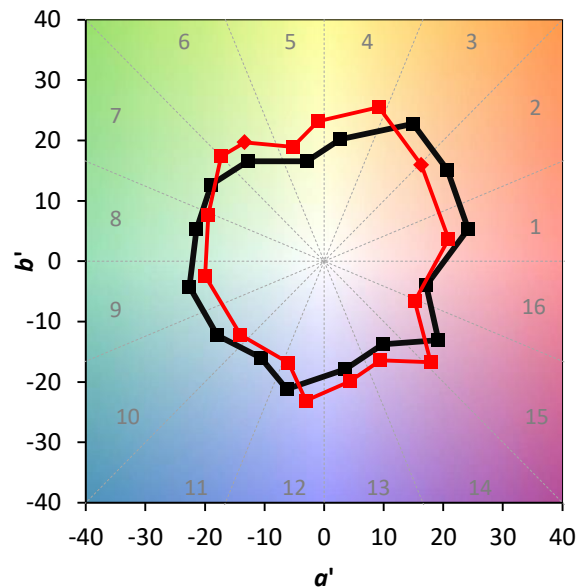
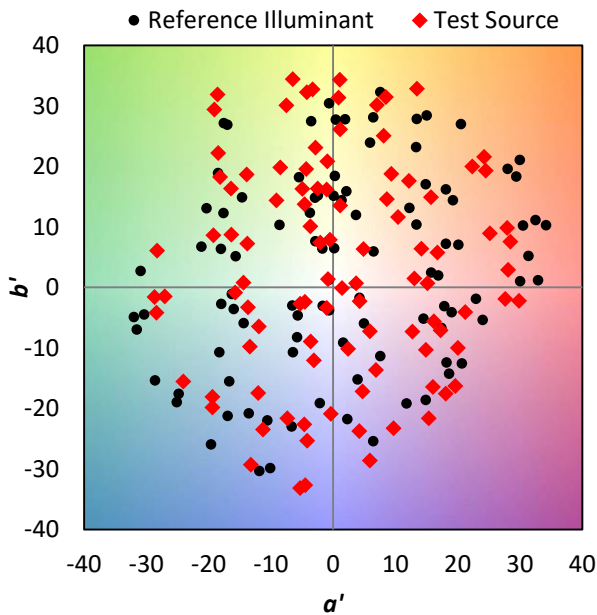
### Summary

$R_f = 71.9$   
 $R_g = 97.9$   
 CIE  $R_a = 72.4$   
 $R_g = -15.0$

### Spectral Power Distribution Comparison



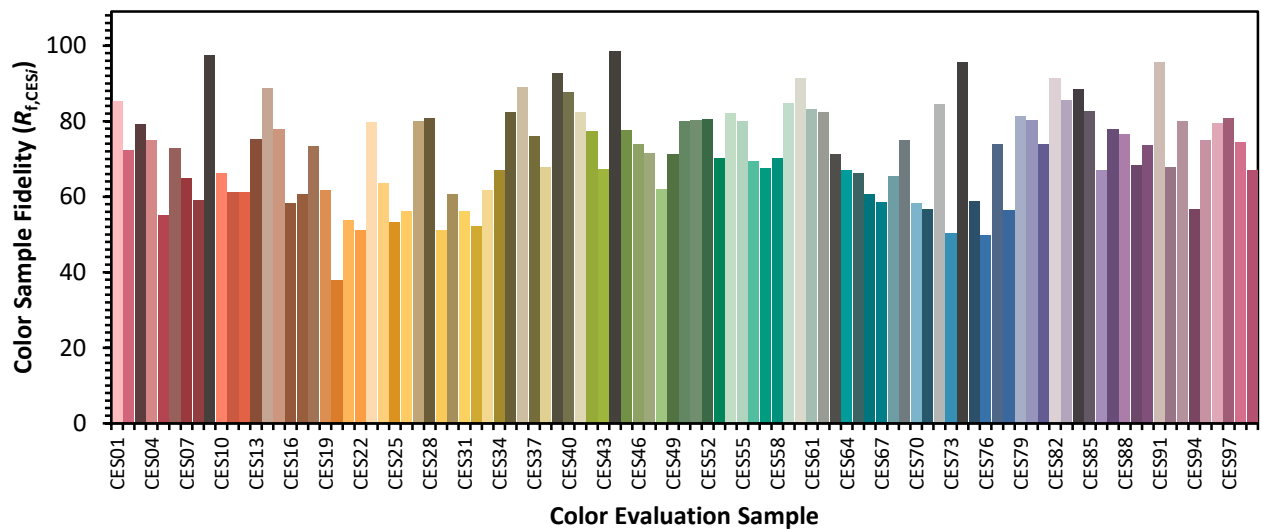
### Color Vector Graphics



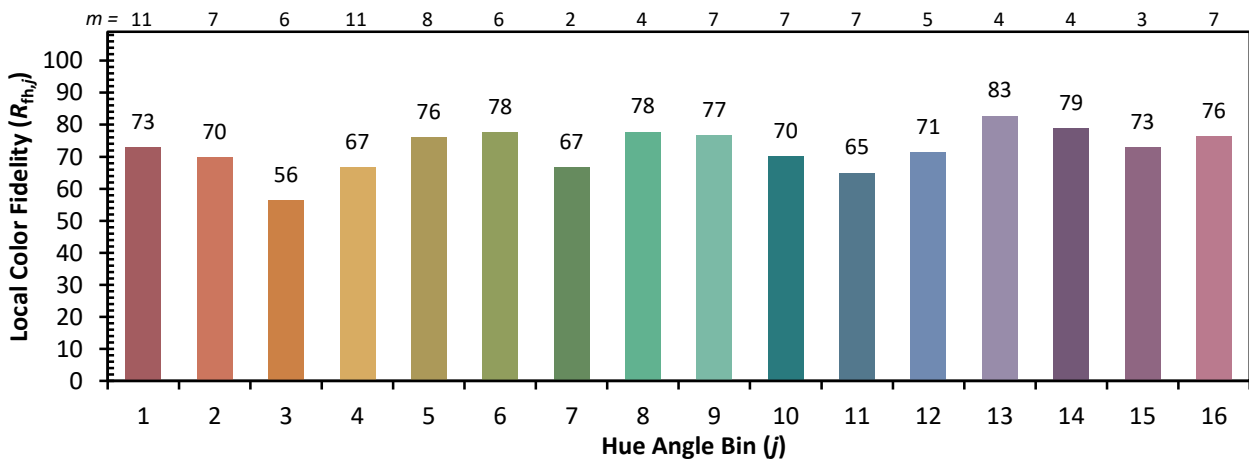
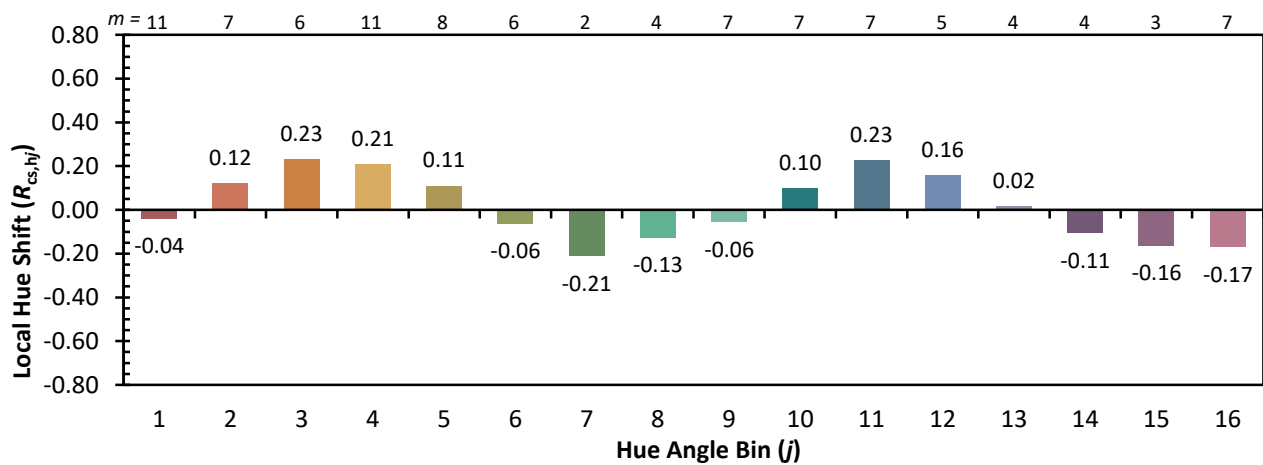
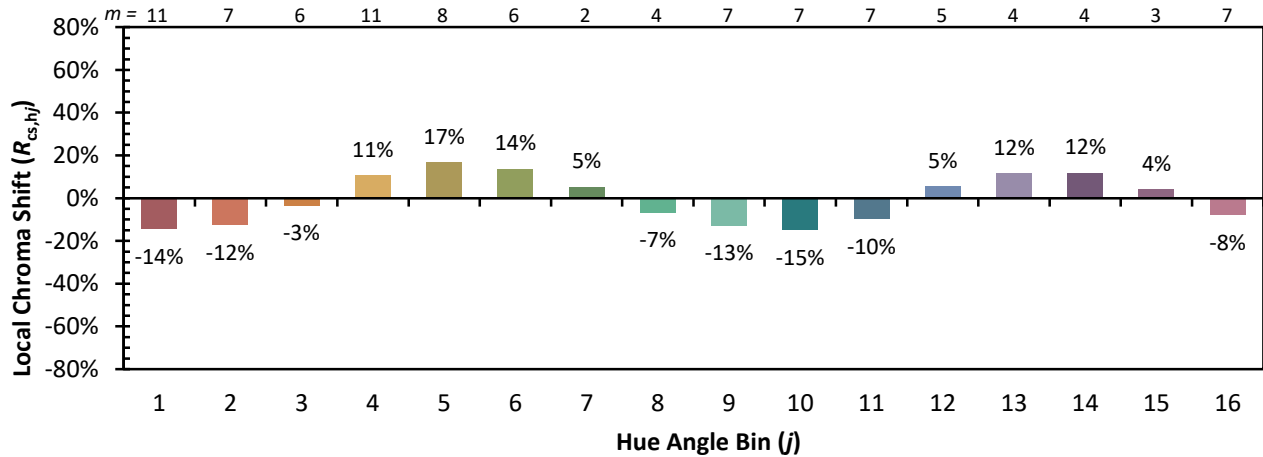


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

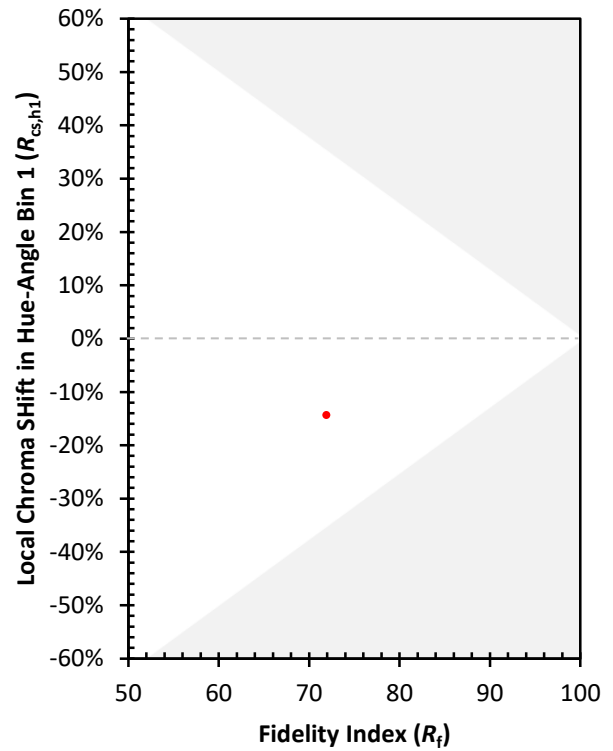
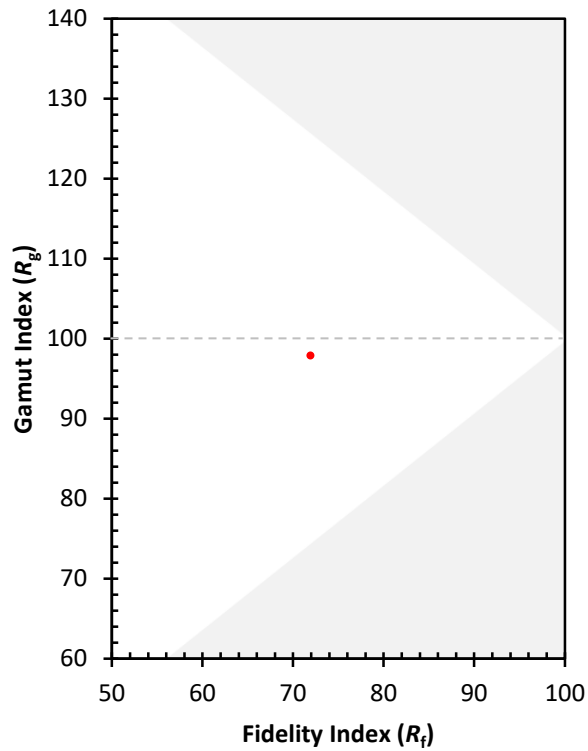
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 56 | CES51 = 80 | CES76 = 50 |
| CES02 = 63 | CES27 = 80 | CES52 = 81 | CES77 = 74 |
| CES03 = 31 | CES28 = 81 | CES53 = 70 | CES78 = 56 |
| CES04 = 71 | CES29 = 51 | CES54 = 82 | CES79 = 81 |
| CES05 = 50 | CES30 = 61 | CES55 = 80 | CES80 = 80 |
| CES06 = 52 | CES31 = 56 | CES56 = 69 | CES81 = 74 |
| CES07 = 42 | CES32 = 52 | CES57 = 67 | CES82 = 91 |
| CES08 = 41 | CES33 = 62 | CES58 = 70 | CES83 = 86 |
| CES09 = 29 | CES34 = 67 | CES59 = 85 | CES84 = 89 |
| CES10 = 76 | CES35 = 83 | CES60 = 91 | CES85 = 83 |
| CES11 = 60 | CES36 = 89 | CES61 = 83 | CES86 = 67 |
| CES12 = 66 | CES37 = 76 | CES62 = 82 | CES87 = 78 |
| CES13 = 43 | CES38 = 68 | CES63 = 71 | CES88 = 76 |
| CES14 = 74 | CES39 = 93 | CES64 = 67 | CES89 = 68 |
| CES15 = 71 | CES40 = 88 | CES65 = 66 | CES90 = 74 |
| CES16 = 48 | CES41 = 82 | CES66 = 61 | CES91 = 96 |
| CES17 = 50 | CES42 = 77 | CES67 = 58 | CES92 = 68 |
| CES18 = 57 | CES43 = 67 | CES68 = 65 | CES93 = 80 |
| CES19 = 73 | CES44 = 99 | CES69 = 75 | CES94 = 57 |
| CES20 = 67 | CES45 = 78 | CES70 = 58 | CES95 = 75 |
| CES21 = 88 | CES46 = 74 | CES71 = 57 | CES96 = 79 |
| CES22 = 80 | CES47 = 71 | CES72 = 85 | CES97 = 81 |
| CES23 = 92 | CES48 = 62 | CES73 = 50 | CES98 = 75 |
| CES24 = 91 | CES49 = 71 | CES74 = 96 | CES99 = 67 |
| CES25 = 73 | CES50 = 80 | CES75 = 59 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)