

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: P800879

Luminaire Tested: **ARCH-M-PA2-40-750-24VDC-T2R**

Issue Date: 5/19/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P800879  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1910-568-9)  
Test Lab: INNOVATION CENTER  
Issue Date: 5/19/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: STREETWORKS  
Catalog Number: ARCH-M-PA2-40-750-24VDC-T2R  
Description: ARCHEON-M ROADWAY AND AREA LUMINAIRE  
(2) 70 CRI, 5000K, 240mA LIGHT ENGINES WITH 16 LEDS AND TYPE II ROADWAY OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 6489 lumens  
Efficiency: N/A  
Efficacy: 180.2 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): 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

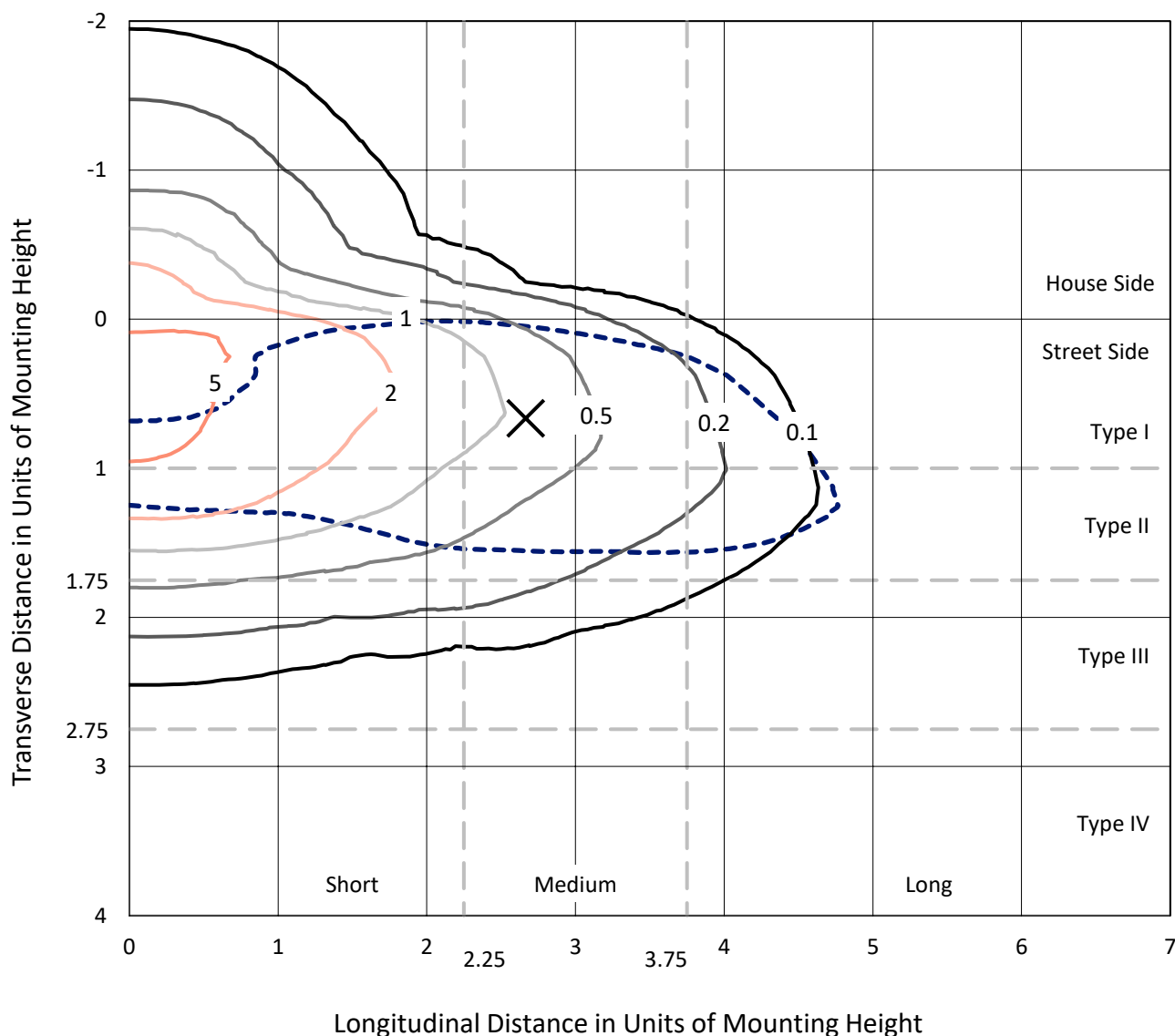
REPORT NUMBER: P800879

CATALOG NUMBER: ARCH-M-PA2-40-750-24VDC-T2R

## Iso-Footcandle Lines of Horizontal Illumination

× Max cd

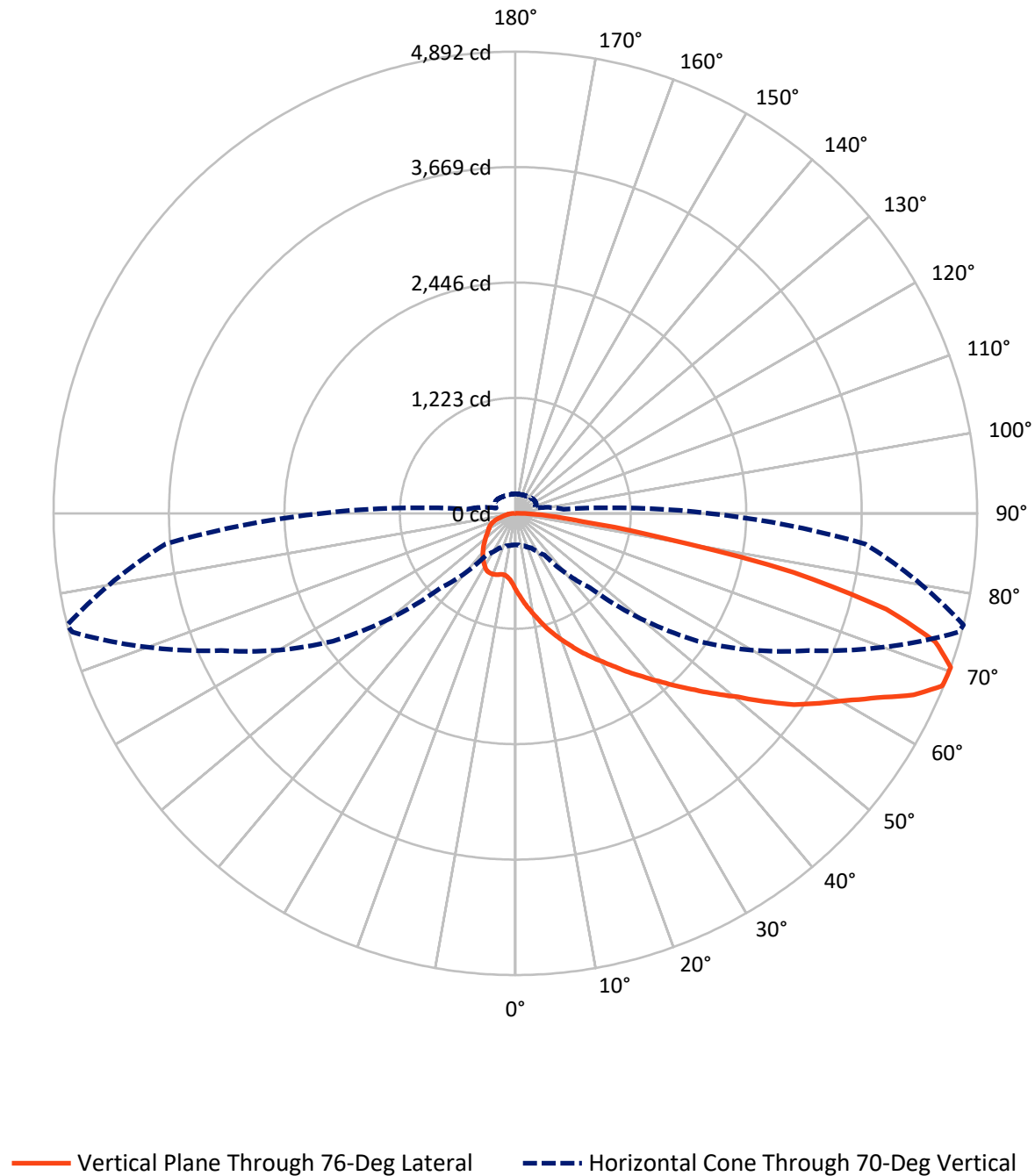
--- 1/2 Max cd



Based on 15 foot mounting height. Maximum calculated value = 6.1 fc  
 Type II - Medium - N/A

REPORT NUMBER: P800879  
CATALOG NUMBER: ARCH-M-PA2-40-750-24VDC-T2R

## Luminous Intensity Polar Plot



REPORT NUMBER: P800879

CATALOG NUMBER: ARCH-M-PA2-40-750-24VDC-T2R

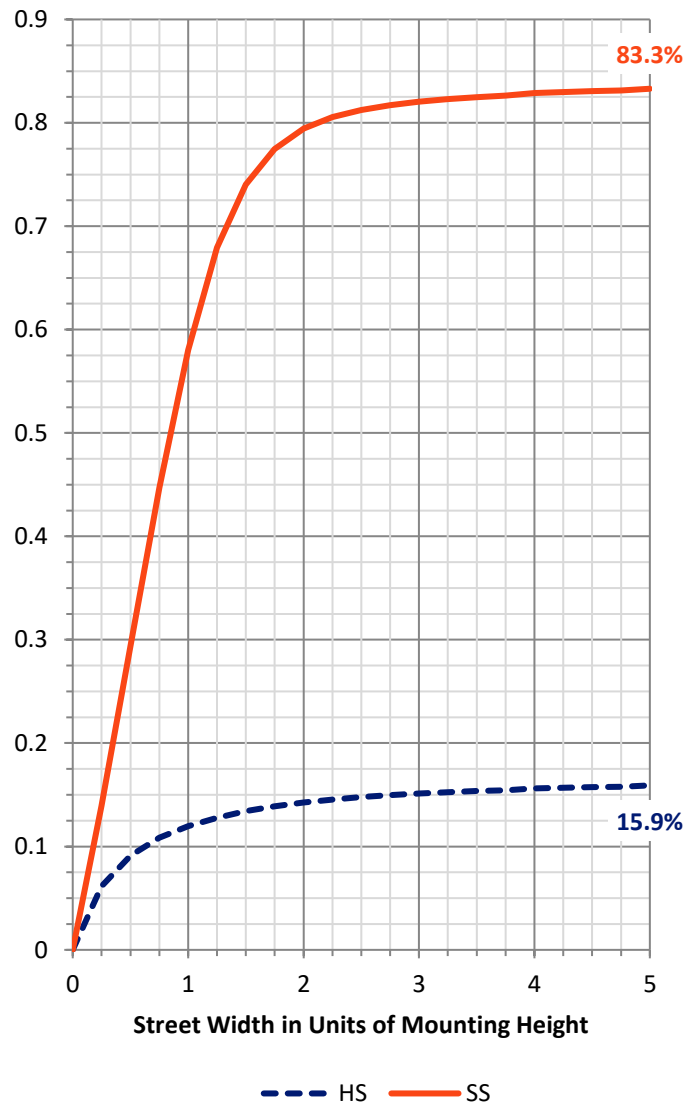
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 1059.4   | 0.0    | 1059.4 |
|                    | % Fixture | 16.3     | 0.0    | 16.3   |
| <b>Street Side</b> | Lumens    | 5429.6   | 0.0    | 5429.6 |
|                    | % Fixture | 83.7     | 0.0    | 83.7   |
| <b>Total</b>       | Lumens    | 6489.0   | 0.0    | 6489.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 84.3   | 1.3       |
| 10°-20°   | 286.6  | 4.4       |
| 20°-30°   | 512.7  | 7.9       |
| 30°-40°   | 829.4  | 12.8      |
| 40°-50°   | 1199.8 | 18.5      |
| 50°-60°   | 1373.2 | 21.2      |
| 60°-70°   | 1263.2 | 19.5      |
| 70°-80°   | 781.2  | 12.0      |
| 80°-90°   | 158.6  | 2.4       |
| 90°-100°  | 0.0    | 0.0       |
| 100°-110° | 0.0    | 0.0       |
| 110°-120° | 0.0    | 0.0       |
| 120°-130° | 0.0    | 0.0       |
| 130°-140° | 0.0    | 0.0       |
| 140°-150° | 0.0    | 0.0       |
| 150°-160° | 0.0    | 0.0       |
| 160°-170° | 0.0    | 0.0       |
| 170°-180° | 0.0    | 0.0       |
| 0°-90°    | 6489.0 | 100.0     |
| 0°-180°   | 6489.0 | 100.0     |

**Coefficient of Utilization**



REPORT NUMBER: P800879

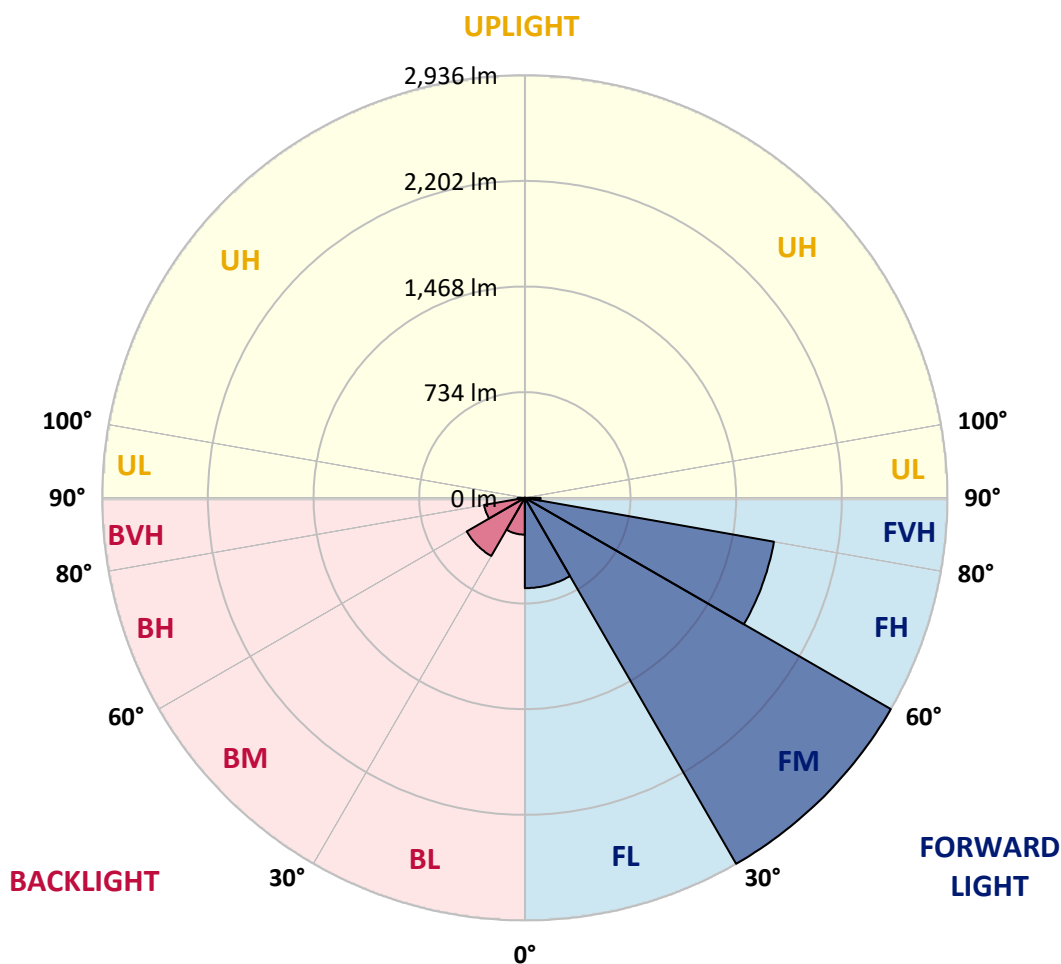
CATALOG NUMBER: ARCH-M-PA2-40-750-24VDC-T2R

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 627.7  | 9.7       |                         |      |         |
| FM   | (30°-60°)   | 2936.0 | 45.2      |                         |      |         |
| FH   | (60°-80°)   | 1757.0 | 27.1      |                         |      | G1/1800 |
| FVH  | (80°-90°)   | 108.9  | 1.7       |                         |      | G2/225  |
| BL   | (0°-30°)    | 255.9  | 3.9       | B1/500                  |      |         |
| BM   | (30°-60°)   | 466.4  | 7.2       | B1/1000                 |      |         |
| BH   | (60°-80°)   | 287.3  | 4.4       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 49.7   | 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 II Medium





REPORT NUMBER: P800879

CATALOG NUMBER: ARCH-M-PA2-40-750-24VDC-T2R

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 75°    | 76°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 811.5  | 811.5  | 811.5  | 811.5  | 811.5  | 811.5  | 811.5  | 811.5  | 811.5  | 811.5  | 811.5  |
| 2.5°  | 1034.2 | 1026.5 | 1025.7 | 1013.7 | 1002.6 | 972.7  | 951.4  | 913.9  | 876.3  | 875.5  | 837.9  |
| 5°    | 1195.5 | 1187.8 | 1183.5 | 1169.0 | 1150.2 | 1111.0 | 1072.6 | 1014.6 | 950.6  | 946.3  | 875.5  |
| 7.5°  | 1304.7 | 1297.9 | 1289.3 | 1283.3 | 1265.4 | 1230.4 | 1183.5 | 1114.4 | 1026.5 | 1018.0 | 919.0  |
| 10°   | 1378.1 | 1373.8 | 1372.1 | 1367.8 | 1356.7 | 1328.6 | 1283.3 | 1210.0 | 1102.4 | 1093.1 | 965.1  |
| 12.5° | 1409.6 | 1407.9 | 1415.6 | 1427.6 | 1431.8 | 1420.7 | 1377.2 | 1308.1 | 1186.1 | 1175.8 | 1020.5 |
| 15°   | 1372.9 | 1374.6 | 1394.3 | 1435.2 | 1478.7 | 1502.6 | 1477.0 | 1409.6 | 1280.8 | 1266.3 | 1085.4 |
| 17.5° | 1355.9 | 1358.4 | 1372.1 | 1411.3 | 1472.8 | 1547.0 | 1559.0 | 1506.1 | 1372.1 | 1351.6 | 1153.6 |
| 20°   | 1385.7 | 1389.2 | 1399.4 | 1430.1 | 1472.8 | 1552.1 | 1614.4 | 1598.2 | 1461.7 | 1440.4 | 1219.3 |
| 22.5° | 1461.7 | 1465.9 | 1465.1 | 1484.7 | 1513.7 | 1568.3 | 1645.1 | 1685.2 | 1555.5 | 1531.7 | 1287.6 |
| 25°   | 1623.8 | 1620.4 | 1591.4 | 1582.0 | 1589.7 | 1624.7 | 1686.1 | 1768.9 | 1653.7 | 1629.8 | 1359.3 |
| 27.5° | 1844.0 | 1839.7 | 1786.8 | 1739.0 | 1696.3 | 1711.7 | 1744.1 | 1836.3 | 1753.5 | 1726.2 | 1427.6 |
| 30°   | 2079.5 | 2074.3 | 2012.9 | 1935.3 | 1840.5 | 1818.4 | 1814.1 | 1895.2 | 1854.2 | 1825.2 | 1500.1 |
| 32.5° | 2309.0 | 2304.7 | 2239.0 | 2148.6 | 2018.0 | 1951.5 | 1910.5 | 1960.9 | 1968.5 | 1940.4 | 1579.4 |
| 35°   | 2518.1 | 2518.1 | 2461.7 | 2354.2 | 2206.6 | 2105.9 | 2038.5 | 2041.9 | 2099.9 | 2067.5 | 1669.9 |
| 37.5° | 2704.1 | 2703.2 | 2641.8 | 2536.0 | 2394.3 | 2279.1 | 2195.5 | 2140.0 | 2225.4 | 2197.2 | 1764.6 |
| 40°   | 2851.7 | 2845.7 | 2800.5 | 2708.3 | 2565.8 | 2451.5 | 2367.0 | 2255.2 | 2365.3 | 2339.7 | 1865.3 |
| 42.5° | 2959.2 | 2955.8 | 2925.1 | 2844.9 | 2709.2 | 2601.7 | 2543.7 | 2400.3 | 2524.0 | 2498.4 | 1983.0 |
| 45°   | 3001.0 | 3007.8 | 3007.8 | 2931.9 | 2824.4 | 2726.3 | 2700.7 | 2559.9 | 2695.5 | 2669.9 | 2109.3 |
| 47.5° | 2933.6 | 2951.5 | 2988.2 | 2993.3 | 2898.6 | 2832.1 | 2840.6 | 2720.3 | 2872.2 | 2858.5 | 2247.6 |
| 50°   | 2722.8 | 2756.1 | 2836.3 | 2981.4 | 2928.5 | 2913.1 | 2960.1 | 2884.1 | 3061.6 | 3057.3 | 2415.7 |
| 52.5° | 2179.3 | 2260.4 | 2510.4 | 2770.6 | 2908.0 | 2950.7 | 3078.7 | 3068.4 | 3305.6 | 3312.5 | 2635.0 |
| 55°   | 1671.6 | 1702.3 | 1991.6 | 2434.4 | 2782.6 | 2938.7 | 3158.0 | 3248.5 | 3570.2 | 3578.7 | 2836.3 |
| 57.5° | 1351.6 | 1372.1 | 1529.9 | 1991.6 | 2496.7 | 2873.9 | 3220.3 | 3353.4 | 3773.2 | 3795.4 | 3015.5 |
| 60°   | 1070.9 | 1100.7 | 1206.5 | 1524.0 | 2096.5 | 2717.7 | 3263.8 | 3470.3 | 3991.7 | 4025.0 | 3229.7 |
| 62.5° | 796.1  | 810.6  | 910.5  | 1128.9 | 1659.6 | 2437.0 | 3240.8 | 3597.5 | 4259.6 | 4299.7 | 3487.4 |
| 65°   | 566.6  | 579.4  | 650.2  | 802.9  | 1227.0 | 2057.3 | 3106.8 | 3692.2 | 4595.8 | 4636.8 | 3746.8 |
| 67.5° | 424.1  | 429.2  | 469.3  | 561.5  | 826.8  | 1598.2 | 2835.5 | 3676.0 | 4841.6 | 4878.2 | 3850.9 |
| 70°   | 335.3  | 337.0  | 356.7  | 406.2  | 537.6  | 1112.7 | 2360.2 | 3437.9 | 4859.5 | 4891.9 | 3719.5 |
| 72.5° | 278.2  | 277.3  | 288.4  | 312.3  | 374.6  | 704.0  | 1748.4 | 2995.9 | 4629.1 | 4651.3 | 3352.6 |
| 75°   | 229.5  | 231.2  | 238.9  | 252.6  | 285.9  | 464.2  | 1133.2 | 2390.1 | 4083.8 | 4059.9 | 2813.3 |
| 77.5° | 192.8  | 192.0  | 195.4  | 207.3  | 231.2  | 333.6  | 663.9  | 1727.1 | 3026.6 | 3014.7 | 1846.5 |
| 80°   | 155.3  | 157.0  | 162.1  | 172.4  | 194.5  | 254.3  | 392.5  | 1077.7 | 1623.8 | 1580.3 | 882.3  |
| 82.5° | 104.1  | 120.3  | 130.6  | 142.5  | 168.1  | 187.7  | 249.2  | 547.8  | 726.1  | 715.1  | 400.2  |
| 85°   | 49.5   | 65.7   | 97.3   | 110.9  | 136.5  | 117.8  | 169.0  | 261.1  | 363.5  | 359.2  | 144.2  |
| 87.5° | 10.2   | 10.2   | 52.1   | 62.3   | 84.5   | 50.3   | 93.9   | 113.5  | 175.8  | 164.7  | 58.9   |
| 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: P800879

CATALOG NUMBER: ARCH-M-PA2-40-750-24VDC-T2R

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°   | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 811.5  | 811.5 | 811.5 | 811.5 | 811.5 | 811.5 | 811.5 | 811.5 | 811.5 | 811.5 | 811.5 |
| 2.5°  | 815.7  | 792.7 | 746.6 | 709.9 | 672.4 | 651.1 | 624.6 | 611.8 | 609.2 | 602.4 | 607.5 |
| 5°    | 830.2  | 785.0 | 698.0 | 640.8 | 602.4 | 583.6 | 574.3 | 570.8 | 570.0 | 568.3 | 568.3 |
| 7.5°  | 849.9  | 780.8 | 667.3 | 609.2 | 584.5 | 578.5 | 581.1 | 586.2 | 587.1 | 588.8 | 587.9 |
| 10°   | 873.8  | 781.6 | 650.2 | 601.6 | 589.6 | 590.5 | 599.0 | 605.8 | 609.2 | 611.8 | 611.0 |
| 12.5° | 907.0  | 791.9 | 647.6 | 606.7 | 601.6 | 605.0 | 613.5 | 620.3 | 623.8 | 624.6 | 624.6 |
| 15°   | 950.6  | 813.2 | 653.6 | 617.8 | 613.5 | 616.1 | 621.2 | 623.8 | 624.6 | 623.8 | 623.8 |
| 17.5° | 998.3  | 838.8 | 662.2 | 624.6 | 617.8 | 615.2 | 613.5 | 611.0 | 605.8 | 602.4 | 602.4 |
| 20°   | 1044.4 | 861.8 | 666.4 | 623.8 | 611.8 | 601.6 | 591.3 | 578.5 | 570.0 | 563.2 | 563.2 |
| 22.5° | 1090.5 | 883.2 | 666.4 | 614.4 | 595.6 | 576.0 | 554.6 | 534.2 | 521.4 | 512.8 | 512.8 |
| 25°   | 1139.1 | 903.6 | 661.3 | 598.2 | 570.0 | 541.8 | 512.8 | 487.2 | 474.4 | 465.9 | 464.2 |
| 27.5° | 1180.1 | 915.6 | 647.6 | 575.1 | 538.4 | 502.6 | 469.3 | 442.9 | 433.5 | 425.8 | 425.8 |
| 30°   | 1223.6 | 923.3 | 622.0 | 545.3 | 502.6 | 461.6 | 427.5 | 406.2 | 395.9 | 384.8 | 384.0 |
| 32.5° | 1272.3 | 928.4 | 593.0 | 513.7 | 465.9 | 422.4 | 393.4 | 376.3 | 354.1 | 342.2 | 340.5 |
| 35°   | 1328.6 | 935.2 | 562.3 | 477.8 | 429.2 | 390.0 | 372.9 | 344.7 | 323.4 | 313.2 | 312.3 |
| 37.5° | 1388.3 | 940.3 | 529.0 | 446.3 | 395.9 | 368.6 | 351.6 | 318.3 | 299.5 | 284.1 | 282.4 |
| 40°   | 1451.4 | 940.3 | 494.9 | 415.6 | 369.5 | 359.2 | 326.8 | 296.9 | 265.4 | 257.7 | 256.0 |
| 42.5° | 1521.4 | 938.6 | 460.8 | 385.7 | 344.7 | 337.9 | 312.3 | 280.7 | 264.5 | 257.7 | 256.0 |
| 45°   | 1595.6 | 932.6 | 428.4 | 351.6 | 319.1 | 305.5 | 285.9 | 277.3 | 270.5 | 270.5 | 270.5 |
| 47.5° | 1680.1 | 927.5 | 391.7 | 320.8 | 300.4 | 285.0 | 270.5 | 265.4 | 264.5 | 267.1 | 269.6 |
| 50°   | 1788.5 | 925.8 | 360.9 | 298.7 | 285.9 | 267.9 | 266.2 | 262.0 | 262.8 | 262.8 | 262.8 |
| 52.5° | 1919.9 | 910.5 | 331.9 | 282.4 | 271.3 | 250.0 | 255.1 | 259.4 | 261.1 | 260.3 | 259.4 |
| 55°   | 2016.3 | 883.2 | 307.2 | 271.3 | 261.1 | 243.2 | 250.0 | 256.8 | 258.5 | 256.0 | 256.0 |
| 57.5° | 2103.4 | 844.8 | 287.6 | 262.8 | 254.3 | 238.9 | 246.6 | 253.4 | 251.7 | 250.9 | 250.0 |
| 60°   | 2203.2 | 808.1 | 272.2 | 258.5 | 247.5 | 237.2 | 244.0 | 248.3 | 245.7 | 244.0 | 243.2 |
| 62.5° | 2311.6 | 772.2 | 261.1 | 258.5 | 242.3 | 236.4 | 241.5 | 243.2 | 238.1 | 236.4 | 236.4 |
| 65°   | 2361.9 | 715.9 | 249.2 | 258.5 | 239.8 | 234.7 | 236.4 | 234.7 | 229.5 | 229.5 | 228.7 |
| 67.5° | 2279.1 | 622.9 | 233.8 | 255.1 | 243.2 | 232.1 | 228.7 | 226.1 | 220.1 | 220.1 | 218.4 |
| 70°   | 2050.5 | 512.0 | 211.6 | 244.0 | 244.0 | 231.2 | 218.4 | 212.5 | 205.6 | 208.2 | 204.8 |
| 72.5° | 1751.8 | 406.2 | 184.3 | 225.3 | 238.9 | 230.4 | 207.3 | 198.0 | 192.0 | 194.5 | 189.4 |
| 75°   | 1419.0 | 314.9 | 151.9 | 195.4 | 226.1 | 226.1 | 196.3 | 183.5 | 176.6 | 176.6 | 170.7 |
| 77.5° | 904.5  | 232.9 | 123.7 | 162.1 | 203.1 | 220.1 | 186.9 | 167.2 | 157.0 | 154.4 | 150.2 |
| 80°   | 448.0  | 163.8 | 101.5 | 128.8 | 173.2 | 206.5 | 180.0 | 148.5 | 134.0 | 128.8 | 121.2 |
| 82.5° | 238.1  | 113.5 | 81.1  | 100.7 | 138.2 | 186.0 | 171.5 | 128.0 | 110.1 | 102.4 | 93.9  |
| 85°   | 106.7  | 70.0  | 64.8  | 76.8  | 105.0 | 152.7 | 154.4 | 105.0 | 84.5  | 100.7 | 74.2  |
| 87.5° | 39.3   | 31.6  | 31.6  | 39.3  | 60.6  | 64.0  | 109.2 | 67.4  | 53.8  | 36.7  | 29.0  |
| 90°   | 0.0    | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |



Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

STREETWORKS

Report Number: SP1-2101-121-8

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

Test Date: 03/05/2021

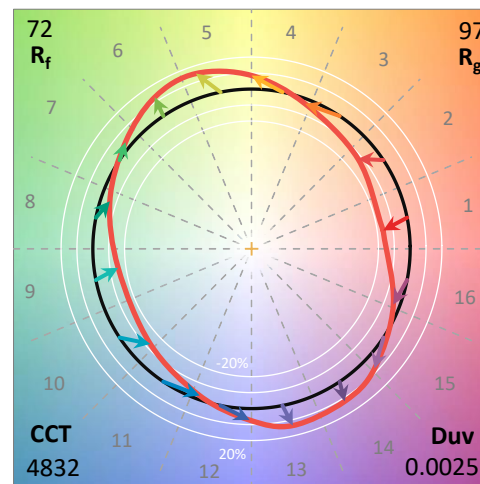
### Test Information

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

PROGRAMMED @ 615mA.

### Spectral Parameters

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



### Test Conditions

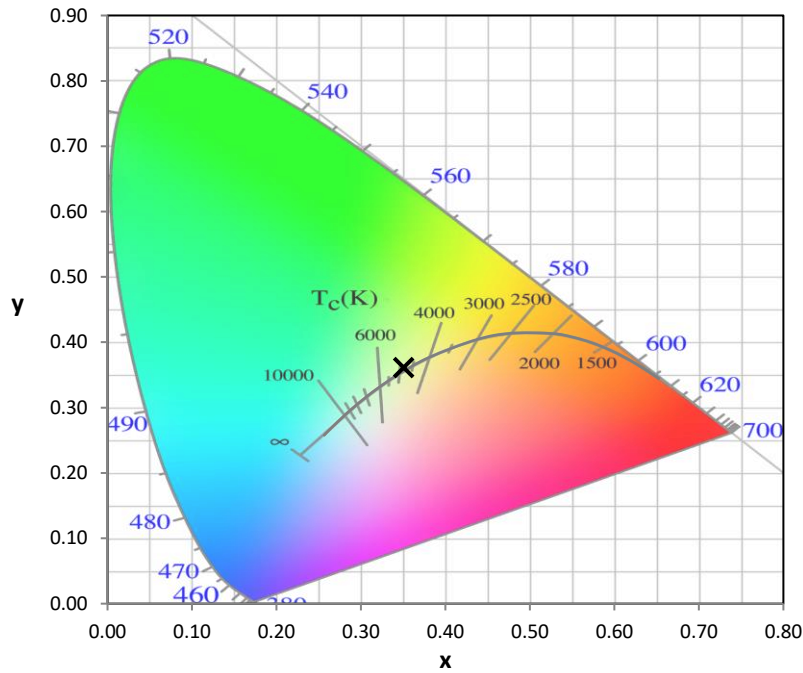
Stabilization Time: 47M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.9/31%  
 Sphere Temperature (°C): 24.4

REPORT NUMBER: SP1-2101-121-8

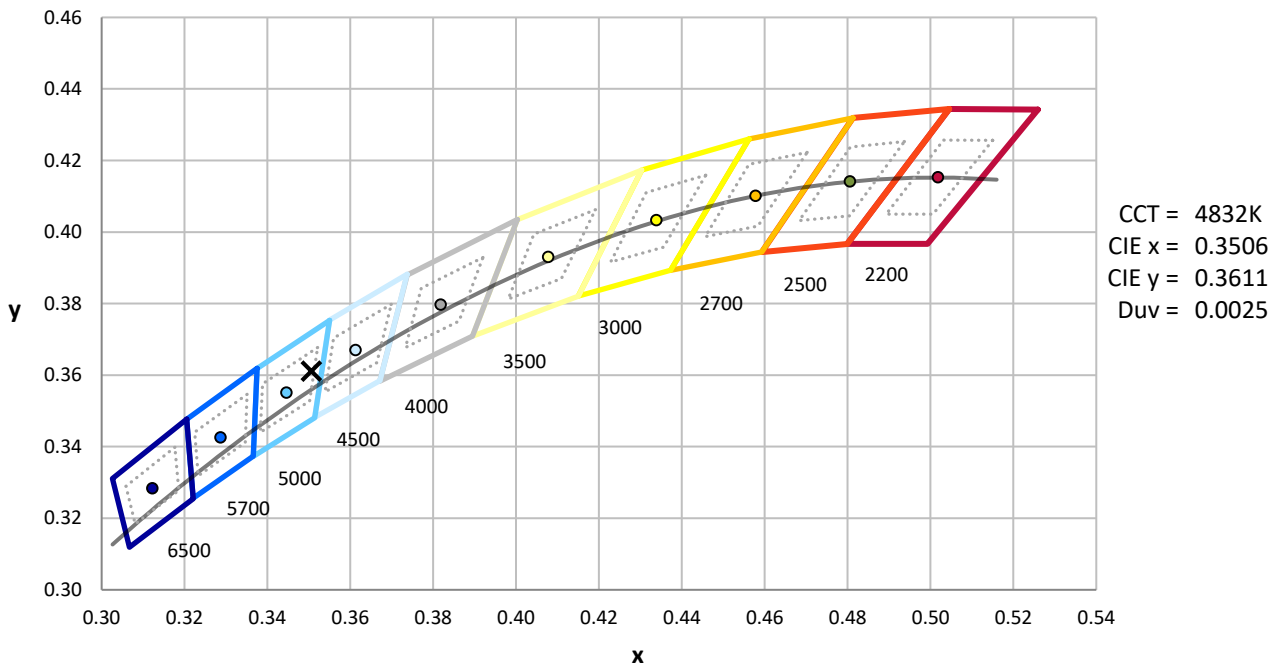
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date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

REPORT NUMBER: SP1-2101-121-8

**CIE 1931 Chromaticity Diagram**



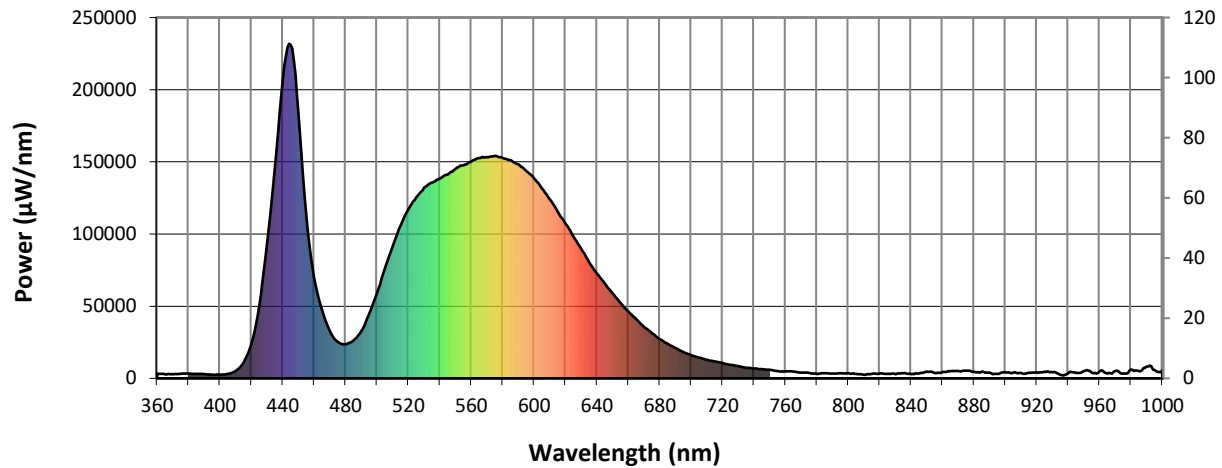
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 5000K 4-step quadrangle

REPORT NUMBER: SP1-2101-121-8

### Photopic Flux vs. Wavelength

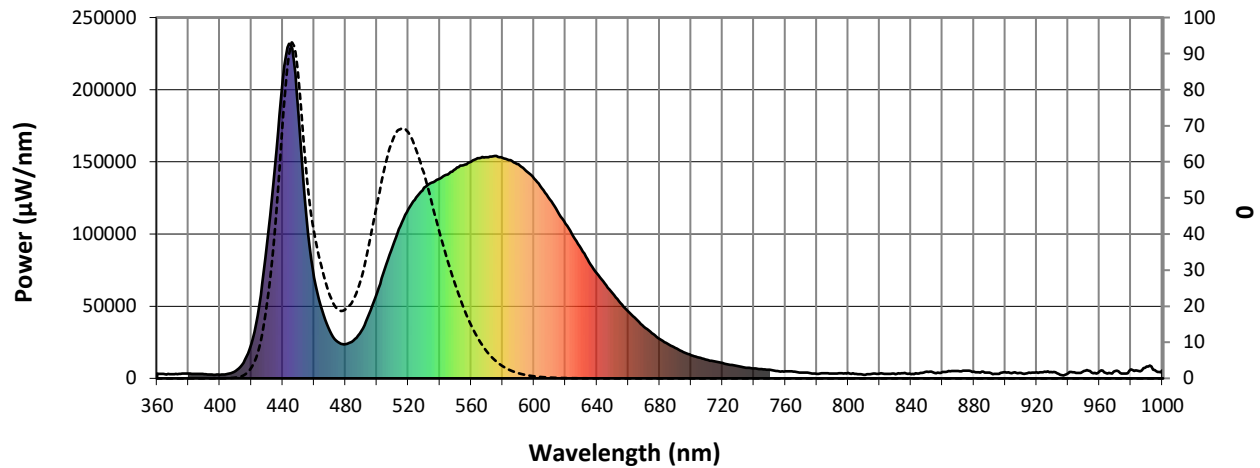


#####

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 3353             | 0.0              | 490       | 32805            | 4.7              | 620       | 107081           | 27.9             | 750       | 5910             | 0.0              | 880       | 4619             | 0.0              |
| 365       | 2862             | 0.0              | 495       | 44523            | 8.1              | 625       | 98536            | 21.7             | 755       | 5030             | 0.0              | 885       | 4614             | 0.0              |
| 370       | 2810             | 0.0              | 500       | 59272            | 13.1             | 630       | 89745            | 16.2             | 760       | 4853             | 0.0              | 890       | 3959             | 0.0              |
| 375       | 3214             | 0.0              | 505       | 75789            | 21.2             | 635       | 80639            | 12.1             | 765       | 4704             | 0.0              | 895       | 3106             | 0.0              |
| 380       | 3349             | 0.0              | 510       | 91523            | 31.4             | 640       | 72702            | 8.7              | 770       | 3920             | 0.0              | 900       | 4270             | 0.0              |
| 385       | 3025             | 0.0              | 515       | 105611           | 43.7             | 645       | 65679            | 6.3              | 775       | 3859             | 0.0              | 905       | 3918             | 0.0              |
| 390       | 2882             | 0.0              | 520       | 117273           | 56.9             | 650       | 59001            | 4.3              | 780       | 3115             | 0.0              | 910       | 3872             | 0.0              |
| 395       | 2575             | 0.0              | 525       | 125211           | 67.2             | 655       | 52143            | 3.0              | 785       | 3474             | 0.0              | 915       | 3970             | 0.0              |
| 400       | 2553             | 0.0              | 530       | 132145           | 77.8             | 660       | 46377            | 1.9              | 790       | 3401             | 0.0              | 920       | 4123             | 0.0              |
| 405       | 3040             | 0.0              | 535       | 135784           | 84.2             | 665       | 41029            | 1.3              | 795       | 3536             | 0.0              | 925       | 4692             | 0.0              |
| 410       | 5218             | 0.0              | 540       | 138313           | 90.1             | 670       | 35613            | 0.8              | 800       | 3687             | 0.0              | 930       | 4313             | 0.0              |
| 415       | 10898            | 0.0              | 545       | 141311           | 94.1             | 675       | 31345            | 0.5              | 805       | 3213             | 0.0              | 935       | 2374             | 0.0              |
| 420       | 23692            | 0.1              | 550       | 144916           | 98.5             | 680       | 27204            | 0.3              | 810       | 2541             | 0.0              | 940       | 3564             | 0.0              |
| 425       | 50574            | 0.3              | 555       | 147753           | 100.9            | 685       | 23938            | 0.2              | 815       | 3033             | 0.0              | 945       | 3888             | 0.0              |
| 430       | 93101            | 0.7              | 560       | 150201           | 102.1            | 690       | 21157            | 0.1              | 820       | 3270             | 0.0              | 950       | 5143             | 0.0              |
| 435       | 146856           | 1.7              | 565       | 152596           | 101.5            | 695       | 18244            | 0.1              | 825       | 3208             | 0.0              | 955       | 3966             | 0.0              |
| 440       | 206284           | 3.2              | 570       | 153241           | 99.6             | 700       | 16063            | 0.0              | 830       | 2991             | 0.0              | 960       | 4927             | 0.0              |
| 445       | 230963           | 4.8              | 575       | 154079           | 95.9             | 705       | 14433            | 0.0              | 835       | 3477             | 0.0              | 965       | 3279             | 0.0              |
| 450       | 184279           | 4.8              | 580       | 152658           | 90.7             | 710       | 12921            | 0.0              | 840       | 2982             | 0.0              | 970       | 5201             | 0.0              |
| 455       | 112612           | 3.8              | 585       | 151127           | 84.0             | 715       | 11715            | 0.0              | 845       | 3443             | 0.0              | 975       | 3421             | 0.0              |
| 460       | 69904            | 2.9              | 590       | 148249           | 76.6             | 720       | 10565            | 0.0              | 850       | 4753             | 0.0              | 980       | 6148             | 0.0              |
| 465       | 47480            | 2.4              | 595       | 143567           | 68.1             | 725       | 9312             | 0.0              | 855       | 3744             | 0.0              | 985       | 5069             | 0.0              |
| 470       | 32573            | 2.0              | 600       | 138422           | 59.7             | 730       | 8354             | 0.0              | 860       | 4355             | 0.0              | 990       | 8231             | 0.0              |
| 475       | 25178            | 2.0              | 605       | 131783           | 51.0             | 735       | 7425             | 0.0              | 865       | 4984             | 0.0              | 995       | 5852             | 0.0              |
| 480       | 23726            | 2.3              | 610       | 124021           | 42.6             | 740       | 6965             | 0.0              | 870       | 5065             | 0.0              | 1000      | 5471             | 0.0              |
| 485       | 26206            | 3.1              | 615       | 115646           | 34.9             | 745       | 6343             | 0.0              | 875       | 5430             | 0.0              |           |                  |                  |

REPORT NUMBER: SP1-2101-121-8

### Scotopic Flux vs. Wavelength



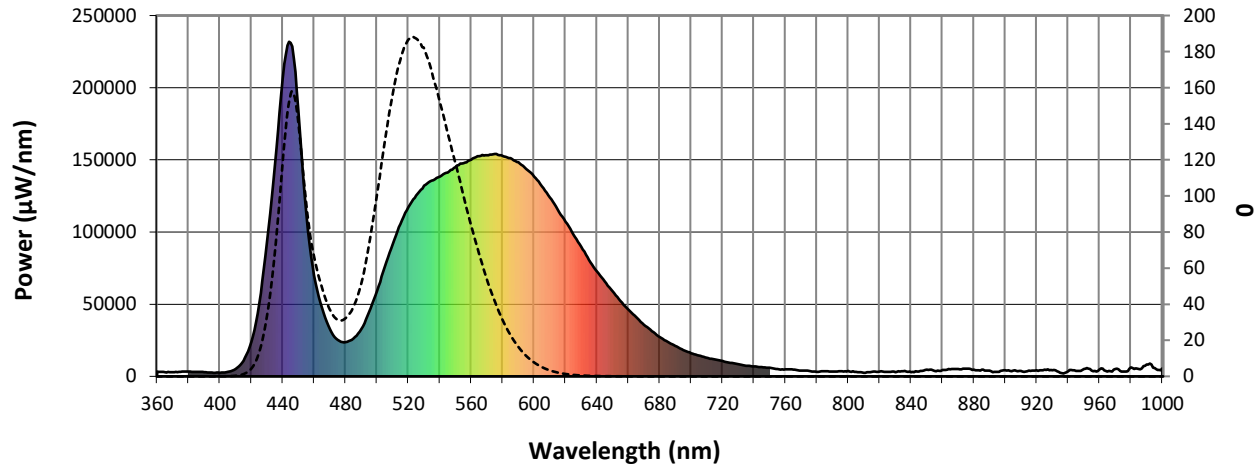
Scotopic Lumens: 15745.7

S/P: 1.71

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 3353             | 0.0              | 490       | 32805            | 50.5             | 620       | 107081           | 1.3              | 750       | 5910             | 0.0              | 880       | 4619             | 0.0              |
| 365       | 2862             | 0.0              | 495       | 44523            | 72.0             | 625       | 98536            | 0.8              | 755       | 5030             | 0.0              | 885       | 4614             | 0.0              |
| 370       | 2810             | 0.0              | 500       | 59272            | 99.1             | 630       | 89745            | 0.5              | 760       | 4853             | 0.0              | 890       | 3959             | 0.0              |
| 375       | 3214             | 0.0              | 505       | 75789            | 128.8            | 635       | 80639            | 0.3              | 765       | 4704             | 0.0              | 895       | 3106             | 0.0              |
| 380       | 3349             | 0.0              | 510       | 91523            | 155.1            | 640       | 72702            | 0.2              | 770       | 3920             | 0.0              | 900       | 4270             | 0.0              |
| 385       | 3025             | 0.0              | 515       | 105611           | 175.1            | 645       | 65679            | 0.1              | 775       | 3859             | 0.0              | 905       | 3918             | 0.0              |
| 390       | 2882             | 0.0              | 520       | 117273           | 186.4            | 650       | 59001            | 0.1              | 780       | 3115             | 0.0              | 910       | 3872             | 0.0              |
| 395       | 2575             | 0.0              | 525       | 125211           | 187.3            | 655       | 52143            | 0.0              | 785       | 3474             | 0.0              | 915       | 3970             | 0.0              |
| 400       | 2553             | 0.0              | 530       | 132145           | 182.2            | 660       | 46377            | 0.0              | 790       | 3401             | 0.0              | 920       | 4123             | 0.0              |
| 405       | 3040             | 0.1              | 535       | 135784           | 169.2            | 665       | 41029            | 0.0              | 795       | 3536             | 0.0              | 925       | 4692             | 0.0              |
| 410       | 5218             | 0.3              | 540       | 138313           | 152.8            | 670       | 35613            | 0.0              | 800       | 3687             | 0.0              | 930       | 4313             | 0.0              |
| 415       | 10898            | 1.1              | 545       | 141311           | 135.5            | 675       | 31345            | 0.0              | 805       | 3213             | 0.0              | 935       | 2374             | 0.0              |
| 420       | 23692            | 3.9              | 550       | 144916           | 118.5            | 680       | 27204            | 0.0              | 810       | 2541             | 0.0              | 940       | 3564             | 0.0              |
| 425       | 50574            | 12.4             | 555       | 147753           | 101.0            | 685       | 23938            | 0.0              | 815       | 3033             | 0.0              | 945       | 3888             | 0.0              |
| 430       | 93101            | 31.7             | 560       | 150201           | 84.0             | 690       | 21157            | 0.0              | 820       | 3270             | 0.0              | 950       | 5143             | 0.0              |
| 435       | 146856           | 65.7             | 565       | 152596           | 68.5             | 695       | 18244            | 0.0              | 825       | 3208             | 0.0              | 955       | 3966             | 0.0              |
| 440       | 206284           | 115.3            | 570       | 153241           | 54.1             | 700       | 16063            | 0.0              | 830       | 2991             | 0.0              | 960       | 4927             | 0.0              |
| 445       | 230963           | 154.7            | 575       | 154079           | 42.0             | 705       | 14433            | 0.0              | 835       | 3477             | 0.0              | 965       | 3279             | 0.0              |
| 450       | 184279           | 142.8            | 580       | 152658           | 31.5             | 710       | 12921            | 0.0              | 840       | 2982             | 0.0              | 970       | 5201             | 0.0              |
| 455       | 112612           | 98.4             | 585       | 151127           | 23.1             | 715       | 11715            | 0.0              | 845       | 3443             | 0.0              | 975       | 3421             | 0.0              |
| 460       | 69904            | 67.5             | 590       | 148249           | 16.5             | 720       | 10565            | 0.0              | 850       | 4753             | 0.0              | 980       | 6148             | 0.0              |
| 465       | 47480            | 50.1             | 595       | 143567           | 11.4             | 725       | 9312             | 0.0              | 855       | 3744             | 0.0              | 985       | 5069             | 0.0              |
| 470       | 32573            | 37.5             | 600       | 138422           | 7.8              | 730       | 8354             | 0.0              | 860       | 4355             | 0.0              | 990       | 8231             | 0.0              |
| 475       | 25178            | 31.5             | 605       | 131783           | 5.2              | 735       | 7425             | 0.0              | 865       | 4984             | 0.0              | 995       | 5852             | 0.0              |
| 480       | 23726            | 32.0             | 610       | 124021           | 3.4              | 740       | 6965             | 0.0              | 870       | 5065             | 0.0              | 1000      | 5471             | 0.0              |
| 485       | 26206            | 38.0             | 615       | 115646           | 2.1              | 745       | 6343             | 0.0              | 875       | 5430             | 0.0              |           |                  |                  |

REPORT NUMBER: SP1-2101-121-8

### Melanopic Flux vs. Wavelength



**Melanopic Lumens: 6193.8**

**M/P: 0.67**

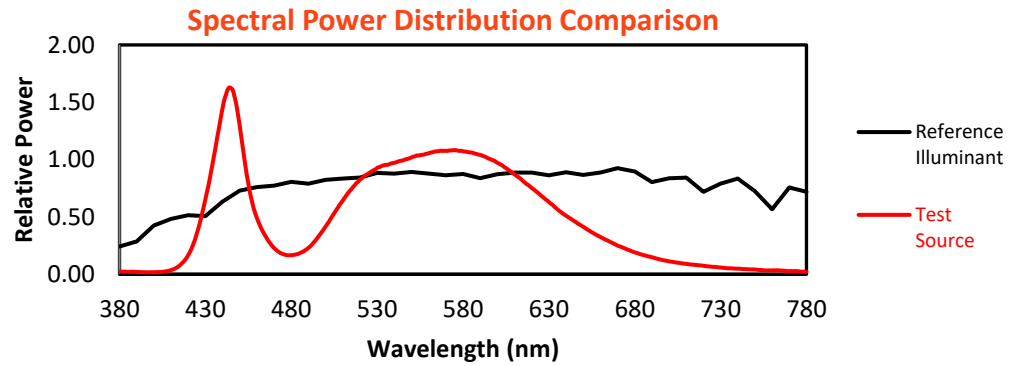
| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------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

REPORT NUMBER: SP1-2101-121-8

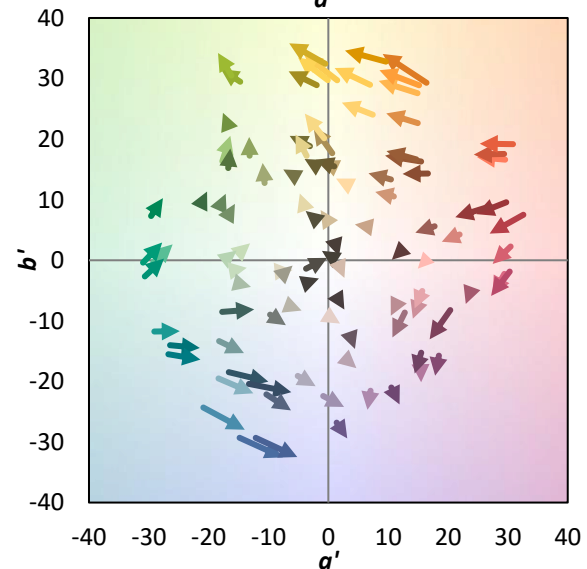
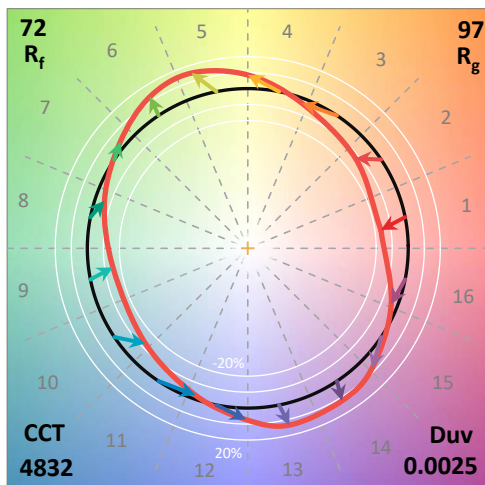
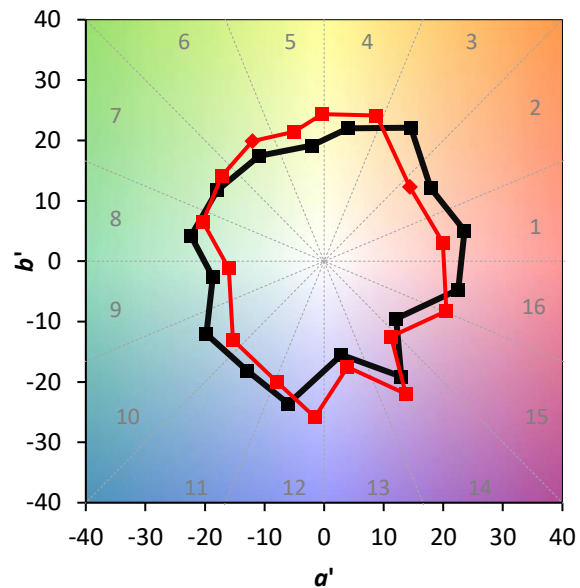
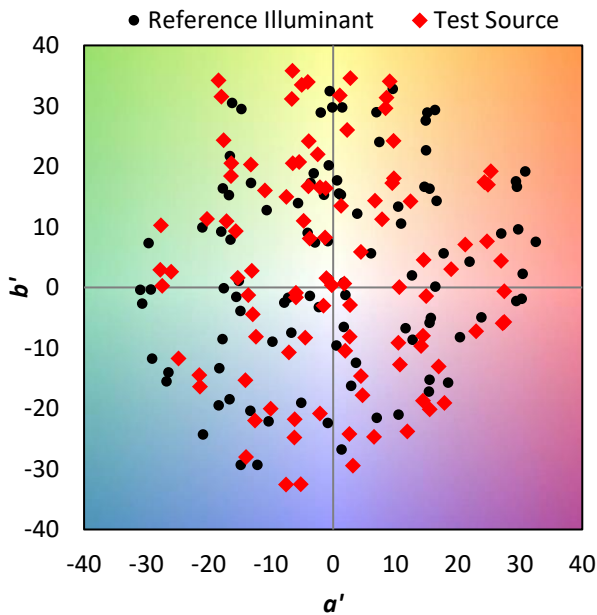
TM-30-18

### Summary

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



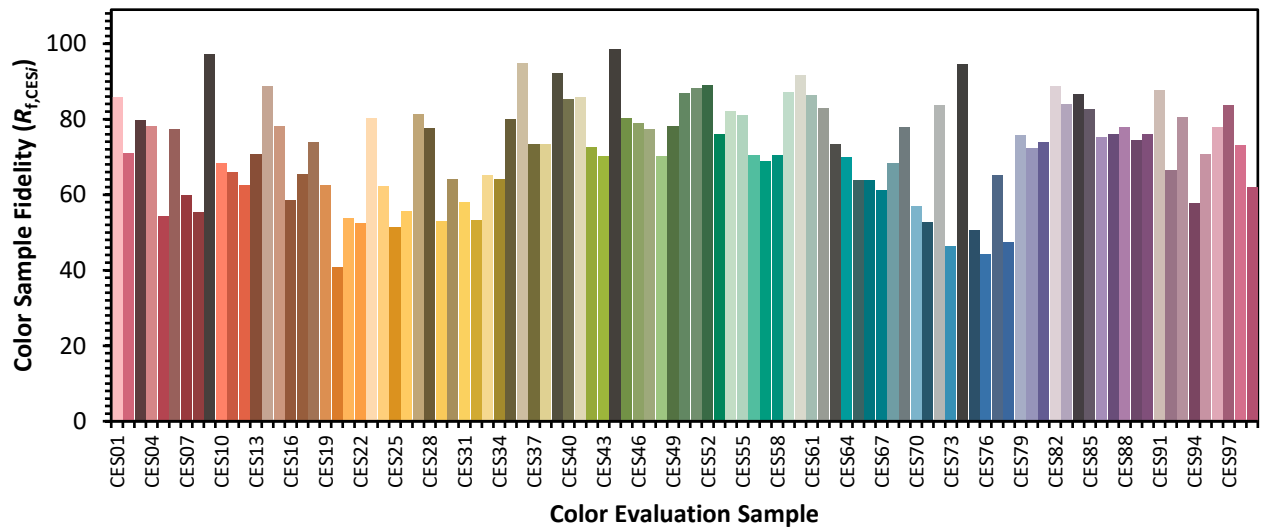
### Color Vector Graphics



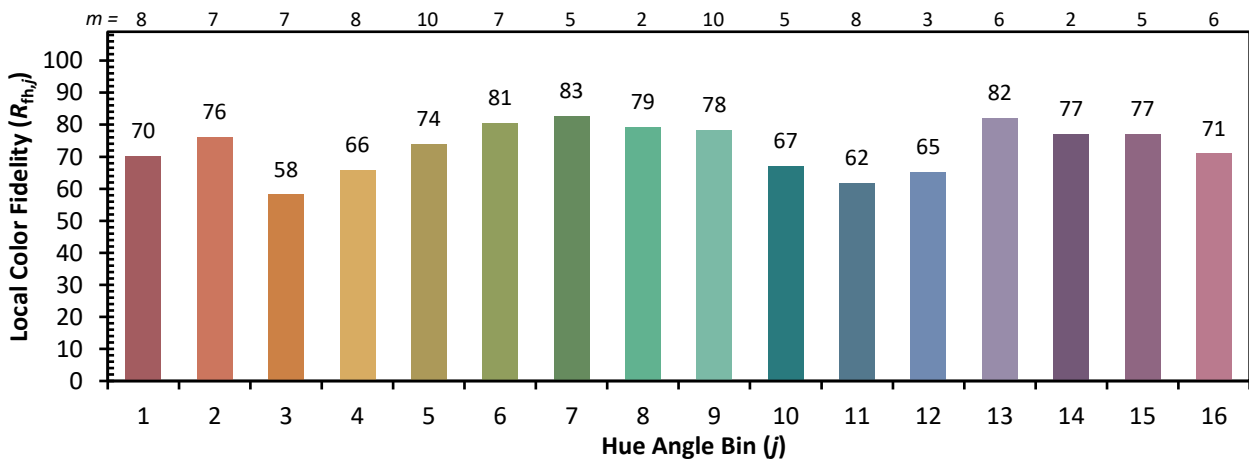
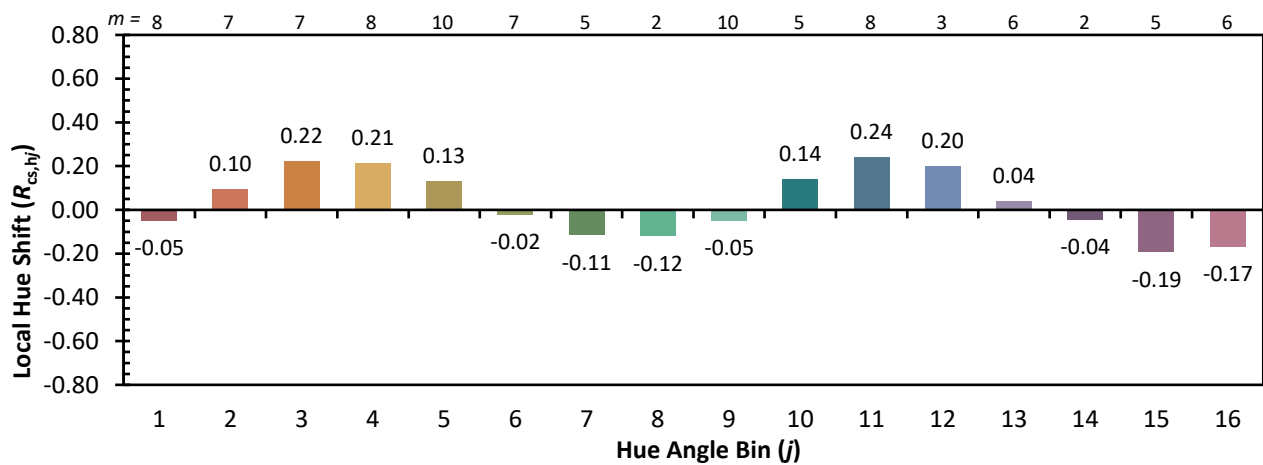
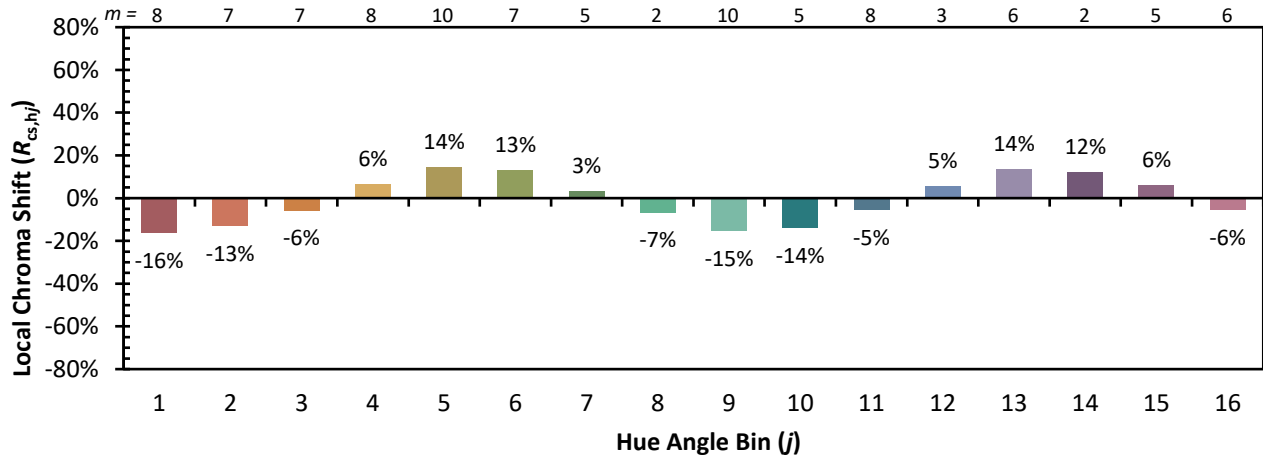


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

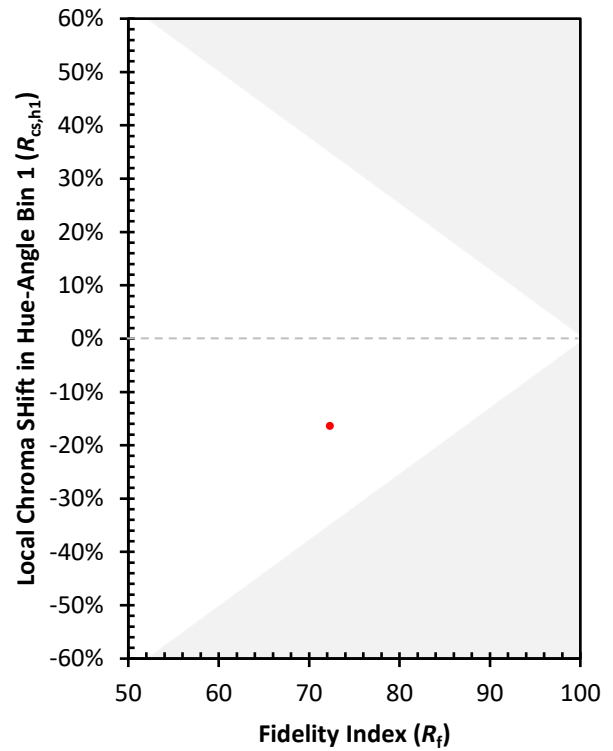
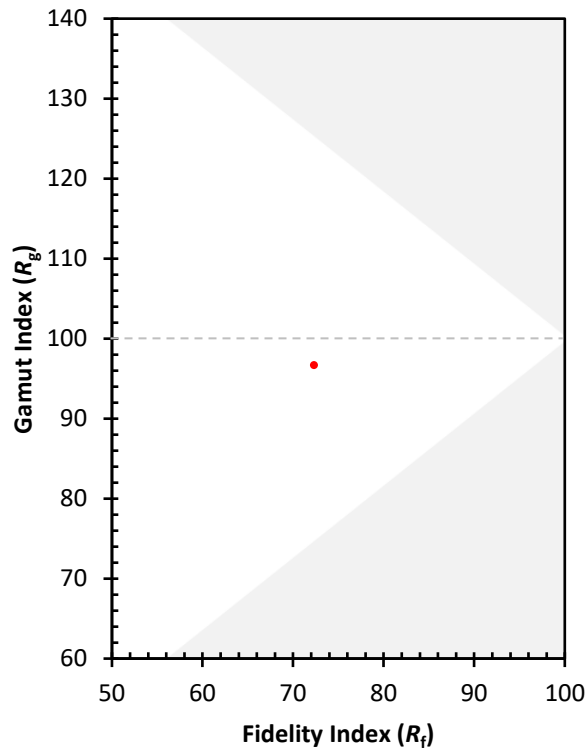
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 56 | CES51 = 88 | CES76 = 44 |
| CES02 = 60 | CES27 = 81 | CES52 = 89 | CES77 = 65 |
| CES03 = 30 | CES28 = 78 | CES53 = 76 | CES78 = 47 |
| CES04 = 69 | CES29 = 53 | CES54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



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)