

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: P800366

Luminaire Tested: **ARCH-S-PA2-30-722-24VDC-T2R**

Issue Date: 10/13/2021



**Test Information**

Test Method: LM-79-08  
Report Number: P800366  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2108-332-13)  
Test Lab: INNOVATION CENTER  
Issue Date: 10/13/2021  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: STREETWORKS  
Catalog Number: ARCH-S-PA2-30-722-24VDC-T2R  
Description: ARCHEON ROADWAY AND AREA LUMINAIRE  
(2) 70 CRI, 2200K, 320mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE II  
ROADWAY OPTICS  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 3871 lumens  
Efficiency: N/A  
Efficacy: 129.0 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 1' x H: 0')  
IES Classification: Type II - Short  
BUG Rating: B1 - U0 - G1

Input Watts (W): 30  
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

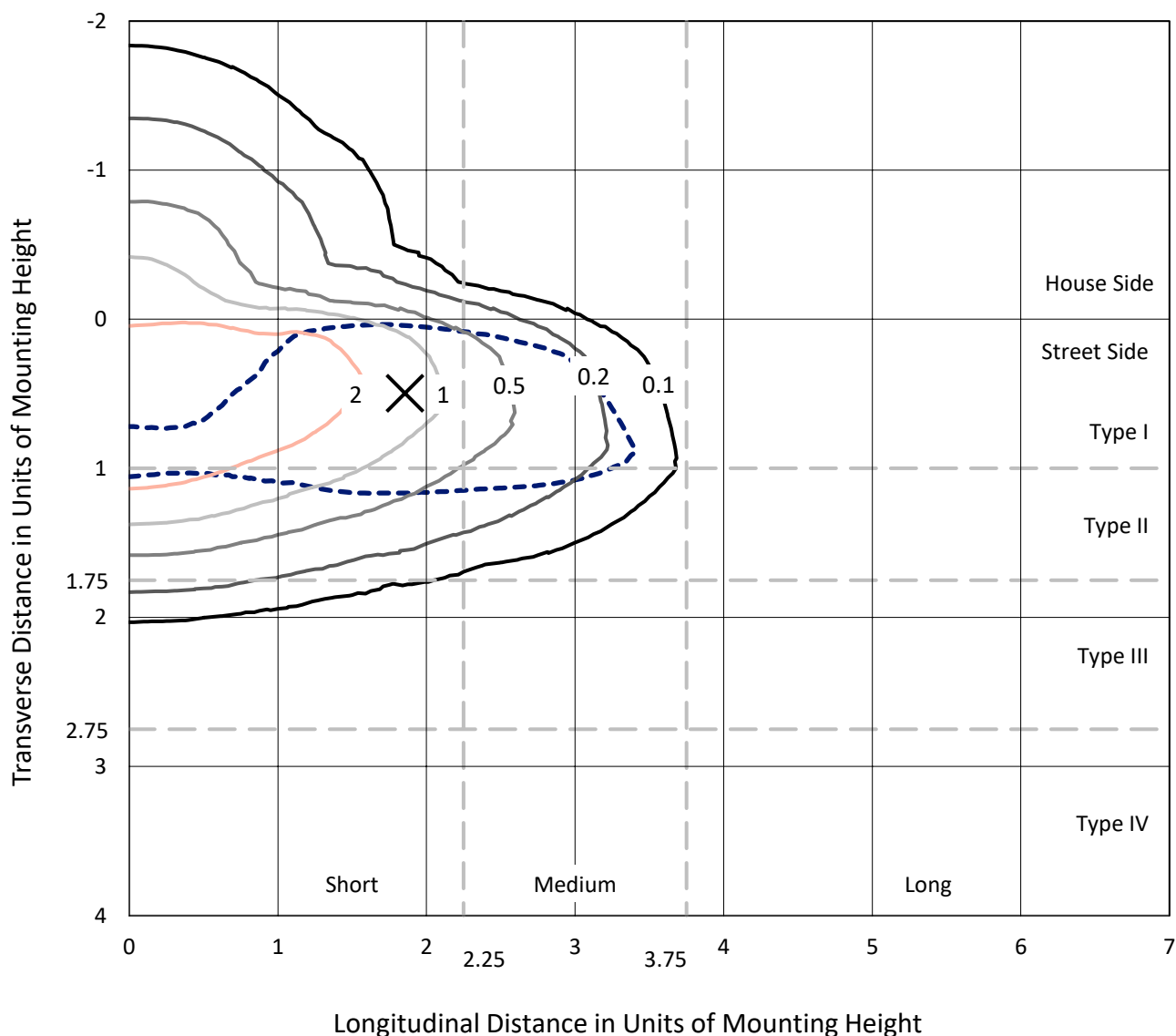
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## Iso-Footcandle Lines of Horizontal Illumination

✕ Max cd

--- 1/2 Max cd

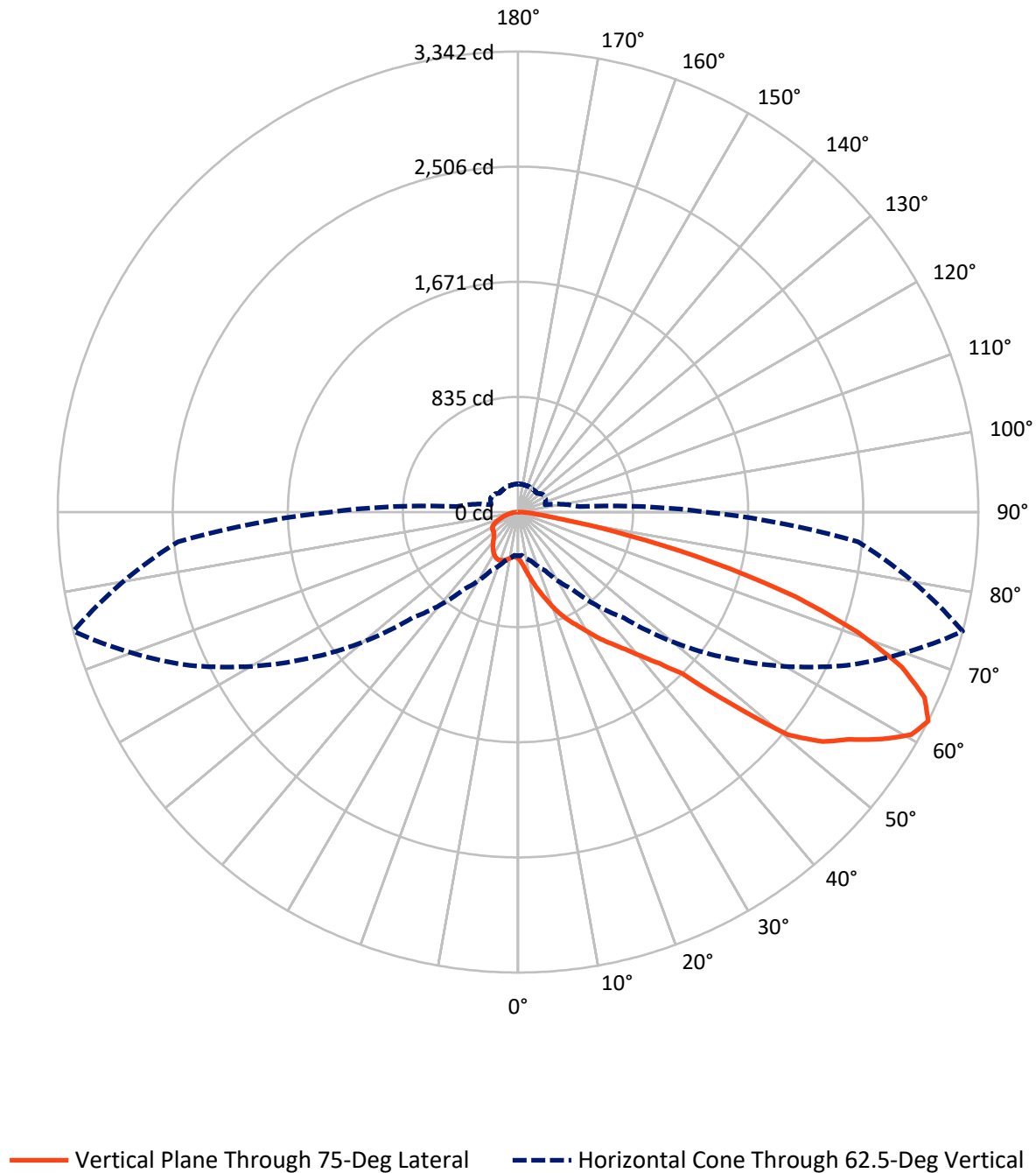


Based on 15 foot mounting height. Maximum calculated value = 4.1 fc

Type II - Short - N/A

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## Luminous Intensity Polar Plot



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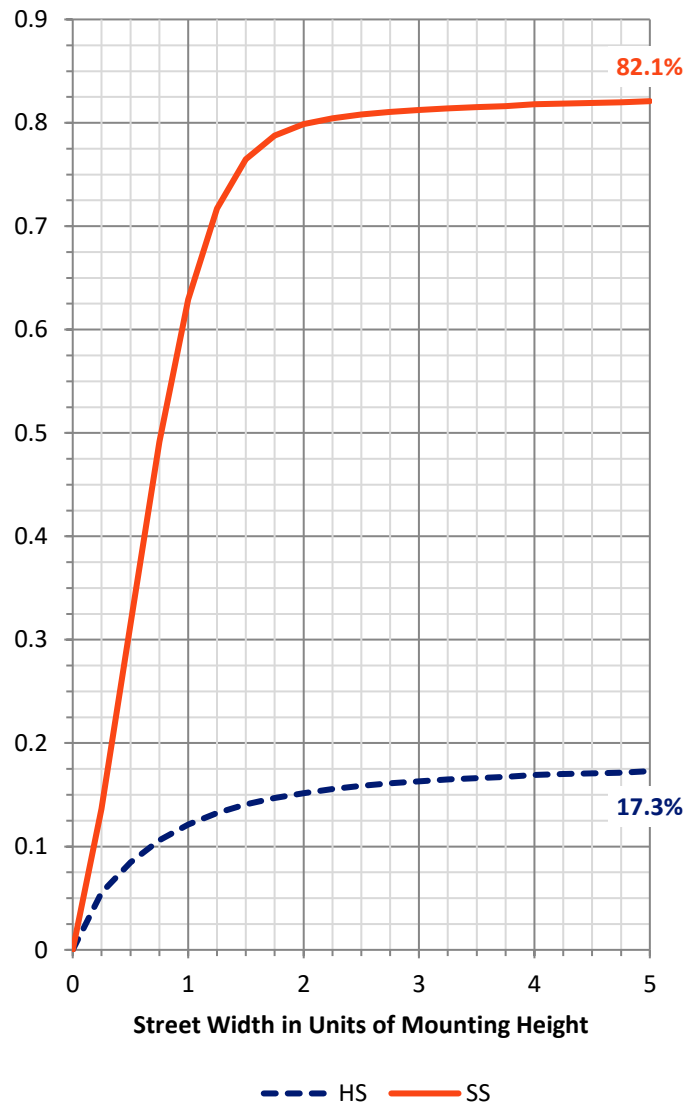
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 682.7    | 0.0    | 682.7  |
|                    | % Fixture | 17.6     | 0.0    | 17.6   |
| <b>Street Side</b> | Lumens    | 3188.3   | 0.0    | 3188.3 |
|                    | % Fixture | 82.4     | 0.0    | 82.4   |
| <b>Total</b>       | Lumens    | 3871.0   | 0.0    | 3871.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**Coefficient of Utilization**

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 40.5   | 1.0       |
| 10°-20°   | 160.2  | 4.1       |
| 20°-30°   | 316.9  | 8.2       |
| 30°-40°   | 528.2  | 13.6      |
| 40°-50°   | 779.5  | 20.1      |
| 50°-60°   | 937.0  | 24.2      |
| 60°-70°   | 728.2  | 18.8      |
| 70°-80°   | 322.2  | 8.3       |
| 80°-90°   | 58.3   | 1.5       |
| 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°    | 3871.0 | 100.0     |
| 0°-180°   | 3871.0 | 100.0     |



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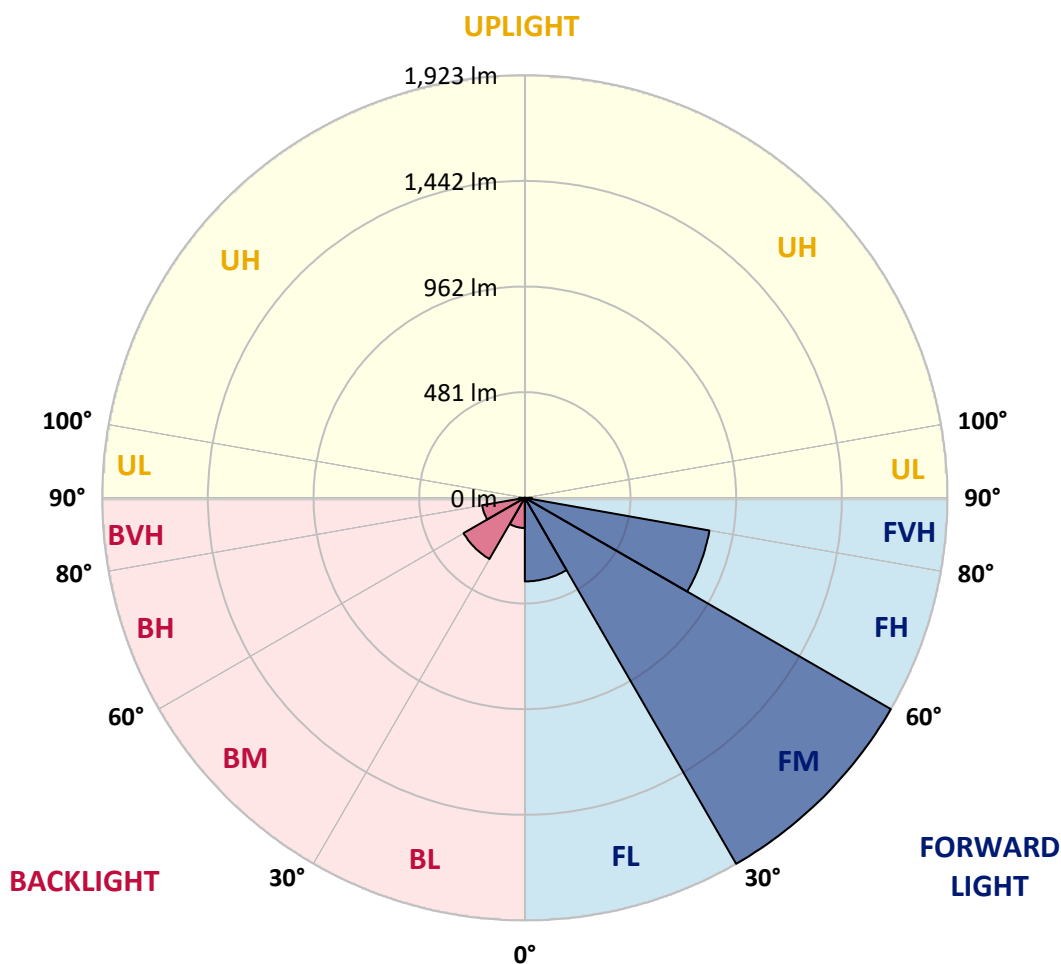
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**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 380.2  | 9.8       |                         |      |         |
| FM   | (30°-60°)   | 1923.1 | 49.7      |                         |      |         |
| FH   | (60°-80°)   | 852.9  | 22.0      |                         |      | G1/1800 |
| FVH  | (80°-90°)   | 32.1   | 0.8       |                         |      | G1/100  |
| BL   | (0°-30°)    | 137.4  | 3.5       | B1/500                  |      |         |
| BM   | (30°-60°)   | 321.6  | 8.3       | B1/1000                 |      |         |
| BH   | (60°-80°)   | 197.5  | 5.1       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 26.3   | 0.7       |                         |      | G1/100  |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B1-U0-G1**

Type II Short



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 75°    | 85°    | 90°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 337.4  | 337.4  | 337.4  | 337.4  | 337.4  | 337.4  | 337.4  | 337.4  | 337.4  | 337.4  | 337.4  |
| 2.5°  | 431.4  | 418.9  | 418.9  | 405.3  | 406.4  | 394.9  | 382.3  | 369.8  | 356.2  | 345.8  | 340.6  |
| 5°    | 564.1  | 554.7  | 551.6  | 535.9  | 510.8  | 482.6  | 452.3  | 421.0  | 388.6  | 363.5  | 351.0  |
| 7.5°  | 688.4  | 681.1  | 676.9  | 659.2  | 624.7  | 594.4  | 546.4  | 488.9  | 433.5  | 386.5  | 367.7  |
| 10°   | 780.4  | 775.1  | 766.8  | 758.4  | 733.3  | 707.2  | 647.7  | 566.2  | 484.7  | 414.7  | 386.5  |
| 12.5° | 847.2  | 839.9  | 839.9  | 838.9  | 822.1  | 798.1  | 742.7  | 655.0  | 544.3  | 446.1  | 407.4  |
| 15°   | 892.1  | 891.1  | 894.2  | 900.5  | 896.3  | 880.6  | 825.3  | 736.5  | 604.9  | 481.6  | 431.4  |
| 17.5° | 925.6  | 921.4  | 927.7  | 944.4  | 956.9  | 950.6  | 904.7  | 814.8  | 671.7  | 520.2  | 457.6  |
| 20°   | 962.1  | 953.8  | 962.1  | 983.0  | 998.7  | 1008.1 | 986.2  | 890.0  | 743.8  | 562.0  | 482.6  |
| 22.5° | 1032.1 | 1031.1 | 1026.9 | 1033.2 | 1043.6 | 1060.3 | 1047.8 | 966.3  | 813.8  | 603.8  | 511.9  |
| 25°   | 1157.5 | 1146.0 | 1134.5 | 1120.9 | 1109.4 | 1114.6 | 1104.2 | 1037.3 | 877.5  | 649.8  | 537.0  |
| 27.5° | 1297.5 | 1284.9 | 1264.0 | 1230.6 | 1199.3 | 1180.5 | 1158.5 | 1099.0 | 939.1  | 691.6  | 561.0  |
| 30°   | 1425.9 | 1421.8 | 1390.4 | 1353.9 | 1299.5 | 1265.1 | 1223.3 | 1170.0 | 1013.3 | 737.5  | 586.0  |
| 32.5° | 1546.1 | 1537.7 | 1506.4 | 1467.7 | 1404.0 | 1365.4 | 1307.9 | 1247.3 | 1097.9 | 793.9  | 612.2  |
| 35°   | 1649.5 | 1641.1 | 1604.6 | 1555.5 | 1500.1 | 1466.7 | 1400.9 | 1316.3 | 1175.2 | 843.0  | 634.1  |
| 37.5° | 1727.9 | 1718.5 | 1684.0 | 1635.9 | 1586.8 | 1571.2 | 1514.7 | 1404.0 | 1263.0 | 904.7  | 661.3  |
| 40°   | 1771.7 | 1760.2 | 1737.3 | 1703.8 | 1663.1 | 1655.8 | 1631.7 | 1512.7 | 1373.7 | 979.9  | 701.0  |
| 42.5° | 1777.0 | 1766.5 | 1754.0 | 1750.8 | 1747.7 | 1754.0 | 1765.5 | 1635.9 | 1500.1 | 1080.2 | 759.5  |
| 45°   | 1731.0 | 1724.7 | 1725.8 | 1761.3 | 1810.4 | 1867.8 | 1936.8 | 1817.7 | 1670.4 | 1271.3 | 891.1  |
| 47.5° | 1632.8 | 1629.7 | 1652.6 | 1712.2 | 1821.9 | 1952.5 | 2147.8 | 2129.0 | 2073.6 | 1579.5 | 1060.3 |
| 50°   | 1474.0 | 1468.8 | 1517.9 | 1611.9 | 1768.6 | 1980.7 | 2289.9 | 2495.7 | 2541.6 | 1818.7 | 1171.1 |
| 52.5° | 1246.3 | 1252.5 | 1328.8 | 1457.3 | 1646.4 | 1950.4 | 2348.4 | 2646.1 | 2767.3 | 1995.3 | 1255.7 |
| 55°   | 1013.3 | 1003.9 | 1072.9 | 1231.6 | 1465.6 | 1839.6 | 2359.9 | 2732.8 | 2913.5 | 2158.3 | 1338.2 |
| 57.5° | 738.6  | 761.6  | 834.7  | 978.8  | 1232.7 | 1639.1 | 2293.0 | 2792.4 | 3109.9 | 2321.2 | 1414.5 |
| 60°   | 500.4  | 500.4  | 565.2  | 709.3  | 952.7  | 1395.7 | 2114.4 | 2770.4 | 3281.3 | 2448.7 | 1431.2 |
| 62.5° | 318.6  | 315.5  | 367.7  | 470.1  | 682.2  | 1084.3 | 1846.9 | 2632.5 | 3341.8 | 2479.0 | 1361.2 |
| 65°   | 201.6  | 205.8  | 224.6  | 287.3  | 436.7  | 769.9  | 1482.4 | 2357.8 | 3242.6 | 2409.0 | 1239.0 |
| 67.5° | 161.9  | 163.0  | 172.4  | 198.5  | 268.5  | 494.1  | 1099.0 | 1978.6 | 3005.5 | 2232.4 | 1095.8 |
| 70°   | 143.1  | 145.2  | 147.3  | 156.7  | 183.9  | 312.4  | 721.9  | 1593.1 | 2616.9 | 1925.3 | 942.3  |
| 72.5° | 130.6  | 132.7  | 134.8  | 136.8  | 151.5  | 203.7  | 426.2  | 1207.6 | 2111.2 | 1479.2 | 718.7  |
| 75°   | 120.1  | 122.2  | 122.2  | 123.3  | 131.6  | 151.5  | 234.0  | 832.6  | 1469.8 | 920.3  | 448.2  |
| 77.5° | 107.6  | 108.6  | 108.6  | 110.7  | 119.1  | 119.1  | 145.2  | 515.0  | 815.9  | 416.8  | 226.7  |
| 80°   | 90.9   | 93.0   | 93.0   | 96.1   | 104.5  | 91.9   | 97.2   | 263.3  | 338.5  | 171.3  | 101.3  |
| 82.5° | 66.9   | 71.0   | 73.1   | 78.3   | 83.6   | 70.0   | 70.0   | 132.7  | 143.1  | 76.3   | 54.3   |
| 85°   | 36.6   | 37.6   | 54.3   | 58.5   | 61.6   | 41.8   | 47.0   | 65.8   | 71.0   | 33.4   | 27.2   |
| 87.5° | 10.4   | 11.5   | 26.1   | 32.4   | 29.3   | 17.8   | 19.8   | 25.1   | 25.1   | 9.4    | 7.3    |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

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**CANDELA DISTRIBUTION (continued):**

|       | 95°   | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 337.4 | 337.4 | 337.4 | 337.4 | 337.4 | 337.4 | 337.4 | 337.4 | 337.4 | 337.4 |
| 2.5°  | 336.4 | 328.0 | 320.7 | 315.5 | 310.3 | 307.1 | 306.1 | 304.0 | 304.0 | 305.0 |
| 5°    | 340.6 | 325.9 | 314.4 | 308.2 | 304.0 | 301.9 | 300.9 | 300.9 | 301.9 | 301.9 |
| 7.5°  | 351.0 | 329.1 | 318.6 | 313.4 | 309.2 | 307.1 | 307.1 | 306.1 | 307.1 | 307.1 |
| 10°   | 365.6 | 338.5 | 327.0 | 320.7 | 317.6 | 314.4 | 313.4 | 312.4 | 312.4 | 312.4 |
| 12.5° | 381.3 | 348.9 | 336.4 | 329.1 | 323.8 | 319.7 | 317.6 | 315.5 | 314.4 | 314.4 |
| 15°   | 395.9 | 359.4 | 342.6 | 334.3 | 327.0 | 320.7 | 316.5 | 313.4 | 312.4 | 312.4 |
| 17.5° | 411.6 | 366.7 | 346.8 | 335.3 | 325.9 | 317.6 | 312.4 | 308.2 | 306.1 | 306.1 |
| 20°   | 428.3 | 371.9 | 346.8 | 332.2 | 319.7 | 311.3 | 305.0 | 300.9 | 296.7 | 296.7 |
| 22.5° | 441.9 | 374.0 | 342.6 | 324.9 | 312.4 | 301.9 | 295.6 | 290.4 | 287.3 | 287.3 |
| 25°   | 453.4 | 371.9 | 333.2 | 313.4 | 298.8 | 289.4 | 283.1 | 278.9 | 275.8 | 275.8 |
| 27.5° | 460.7 | 363.5 | 321.8 | 300.9 | 287.3 | 277.9 | 273.7 | 269.5 | 267.4 | 267.4 |
| 30°   | 464.9 | 353.1 | 307.1 | 287.3 | 273.7 | 268.5 | 266.4 | 262.2 | 259.1 | 258.0 |
| 32.5° | 467.0 | 337.4 | 292.5 | 273.7 | 264.3 | 262.2 | 262.2 | 257.0 | 252.8 | 251.8 |
| 35°   | 464.9 | 320.7 | 277.9 | 262.2 | 259.1 | 260.1 | 258.0 | 251.8 | 246.5 | 244.4 |
| 37.5° | 461.7 | 300.9 | 262.2 | 253.9 | 257.0 | 259.1 | 252.8 | 244.4 | 236.1 | 234.0 |
| 40°   | 459.6 | 283.1 | 249.7 | 245.5 | 254.9 | 255.9 | 244.4 | 228.8 | 222.5 | 220.4 |
| 42.5° | 470.1 | 265.3 | 238.2 | 239.2 | 249.7 | 250.7 | 229.8 | 222.5 | 218.3 | 217.3 |
| 45°   | 505.6 | 249.7 | 228.8 | 235.0 | 243.4 | 239.2 | 222.5 | 221.5 | 218.3 | 217.3 |
| 47.5° | 532.8 | 238.2 | 224.6 | 231.9 | 238.2 | 223.6 | 221.5 | 220.4 | 217.3 | 216.2 |
| 50°   | 542.2 | 230.9 | 223.6 | 229.8 | 230.9 | 216.2 | 219.4 | 219.4 | 216.2 | 215.2 |
| 52.5° | 543.2 | 226.7 | 225.6 | 228.8 | 219.4 | 213.1 | 217.3 | 217.3 | 214.2 | 213.1 |
| 55°   | 547.4 | 224.6 | 226.7 | 228.8 | 206.8 | 208.9 | 213.1 | 214.2 | 211.0 | 210.0 |
| 57.5° | 539.0 | 221.5 | 228.8 | 229.8 | 201.6 | 204.8 | 208.9 | 208.9 | 208.9 | 208.9 |
| 60°   | 506.7 | 215.2 | 227.7 | 227.7 | 197.4 | 199.5 | 203.7 | 205.8 | 206.8 | 206.8 |
| 62.5° | 447.1 | 202.7 | 221.5 | 221.5 | 193.3 | 195.3 | 200.6 | 200.6 | 203.7 | 203.7 |
| 65°   | 371.9 | 184.9 | 208.9 | 207.9 | 189.1 | 191.2 | 197.4 | 195.3 | 200.6 | 201.6 |
| 67.5° | 310.3 | 163.0 | 190.1 | 192.2 | 184.9 | 190.1 | 194.3 | 187.0 | 197.4 | 197.4 |
| 70°   | 247.6 | 136.8 | 165.1 | 174.5 | 177.6 | 191.2 | 188.0 | 176.5 | 190.1 | 187.0 |
| 72.5° | 192.2 | 116.0 | 135.8 | 152.5 | 169.2 | 190.1 | 174.5 | 161.9 | 170.3 | 165.1 |
| 75°   | 140.0 | 96.1  | 111.8 | 126.4 | 157.7 | 187.0 | 160.9 | 142.1 | 142.1 | 140.0 |
| 77.5° | 98.2  | 78.3  | 89.8  | 100.3 | 146.3 | 178.6 | 144.2 | 122.2 | 117.0 | 116.0 |
| 80°   | 66.9  | 61.6  | 71.0  | 77.3  | 129.5 | 161.9 | 124.3 | 101.3 | 91.9  | 89.8  |
| 82.5° | 43.9  | 43.9  | 48.1  | 52.2  | 100.3 | 134.8 | 97.2  | 75.2  | 97.2  | 93.0  |
| 85°   | 25.1  | 26.1  | 26.1  | 30.3  | 55.4  | 95.1  | 68.9  | 75.2  | 44.9  | 41.8  |
| 87.5° | 8.4   | 8.4   | 8.4   | 8.4   | 11.5  | 38.7  | 29.3  | 27.2  | 10.4  | 9.4   |
| 90°   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |



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

Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

STREETWORKS

Report Number: SP1-2101-121-4

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

Test Date: 03/03/2021

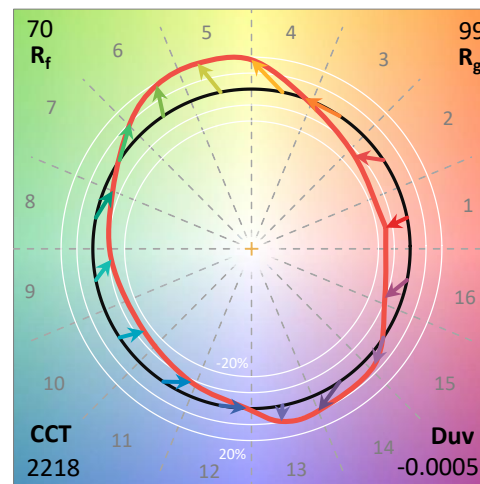
### Test Information

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

PROGRAMMED @ 800mA.

### Spectral Parameters

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



### Test Conditions

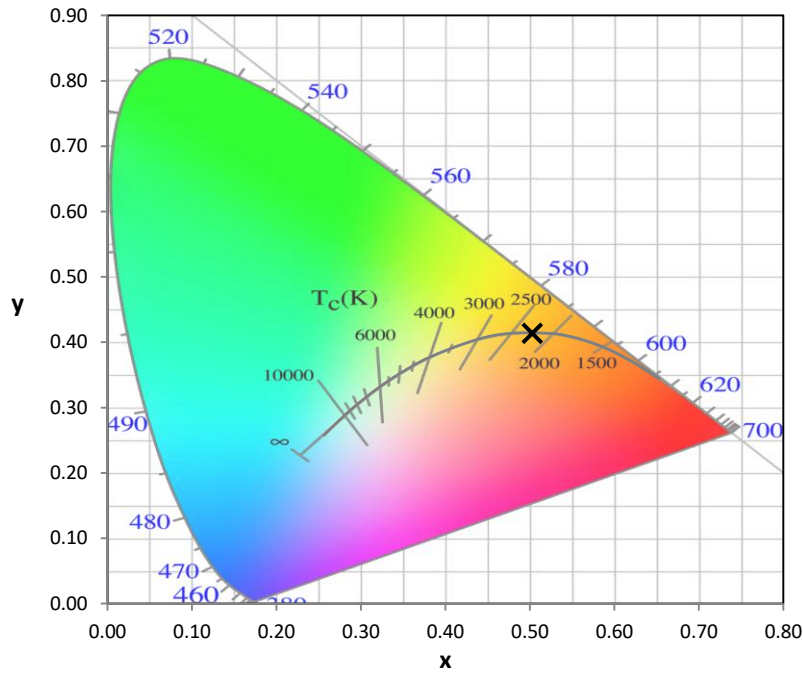
Stabilization Time: 95M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.3/31%  
 Sphere Temperature (°C): 24.8

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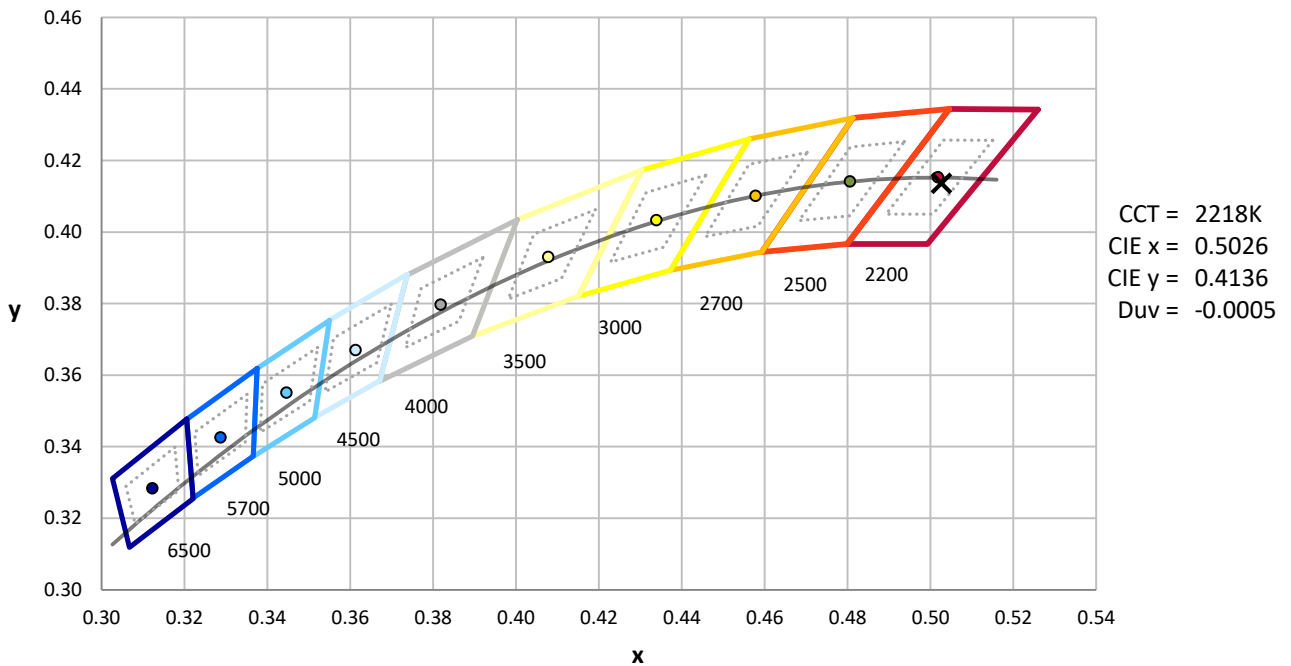
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date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

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**CIE 1931 Chromaticity Diagram**



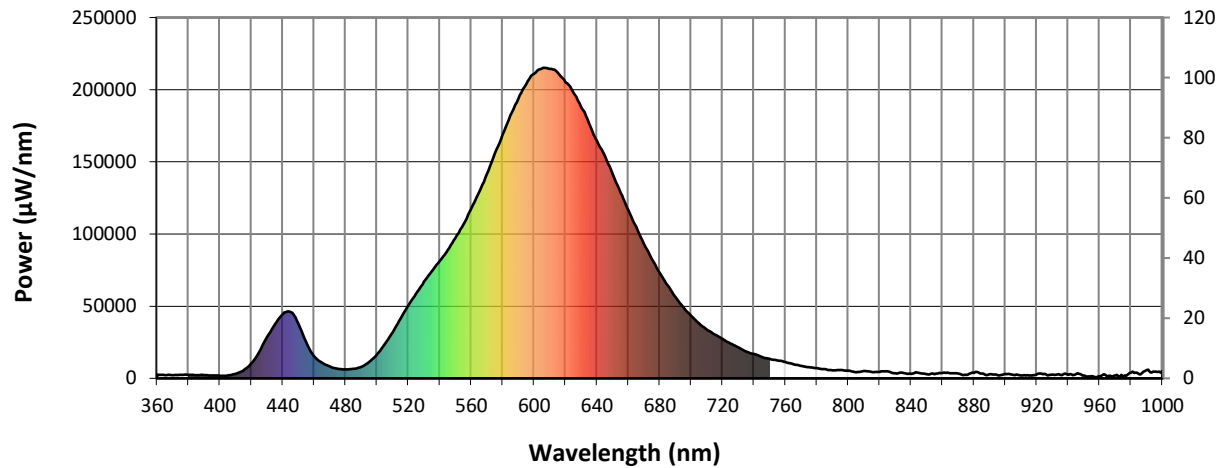
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 2200K 4-step quadrangle

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### Photopic Flux vs. Wavelength

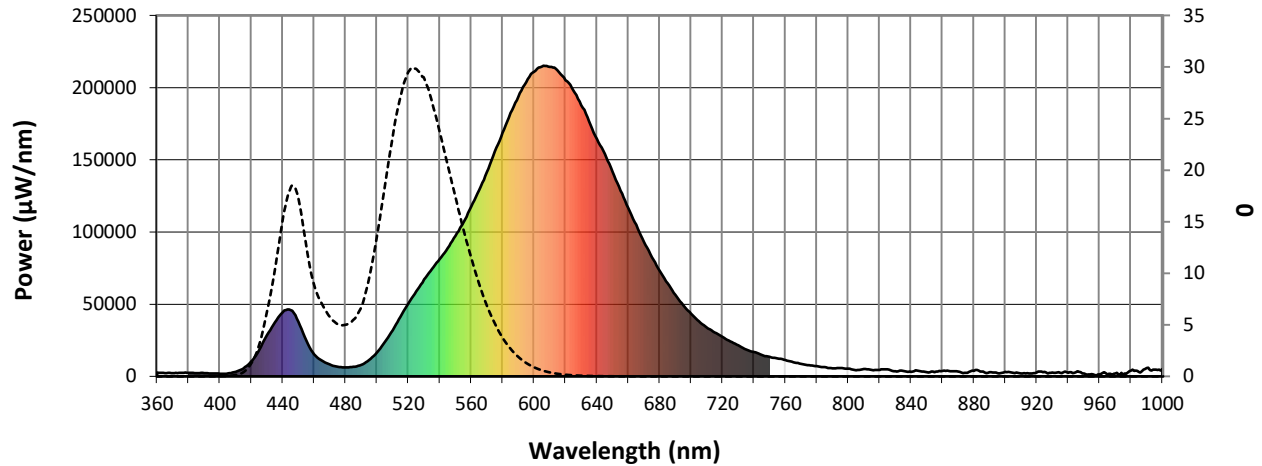


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| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm)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



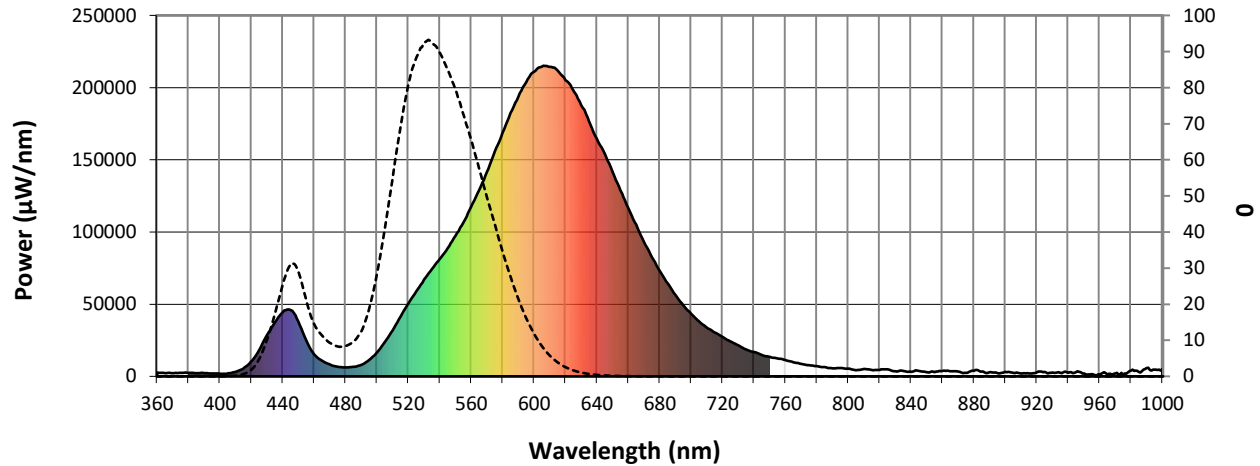
Scotopic Lumens: 7290.1

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              |           |                  |                  |

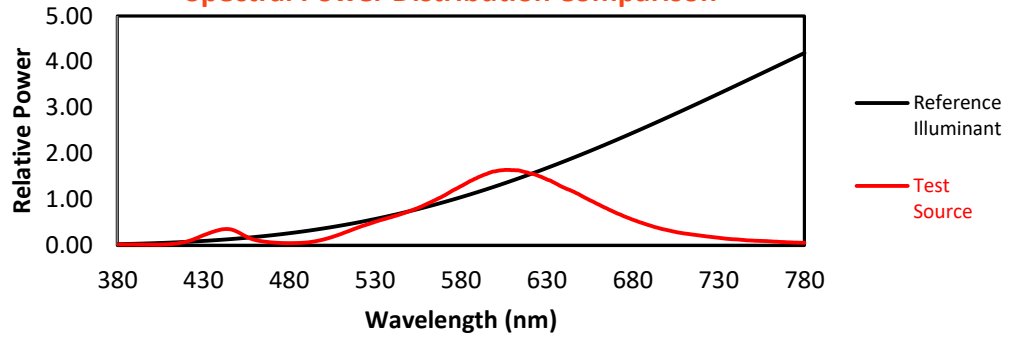
REPORT NUMBER: SP1-2101-121-4

TM-30-18

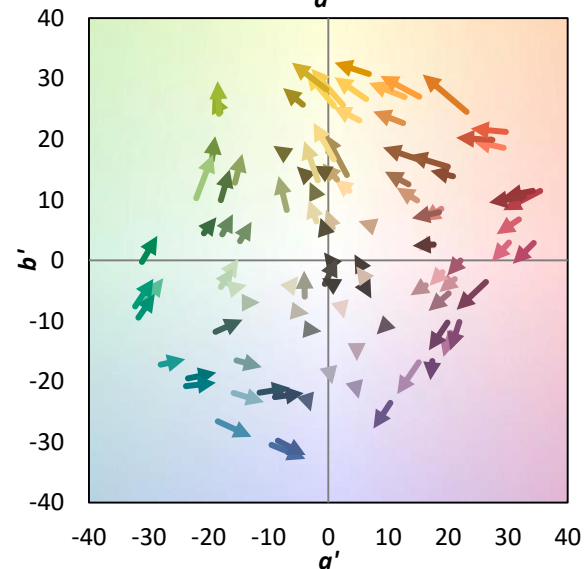
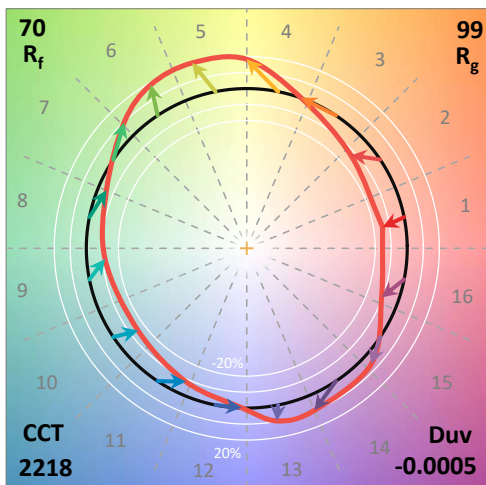
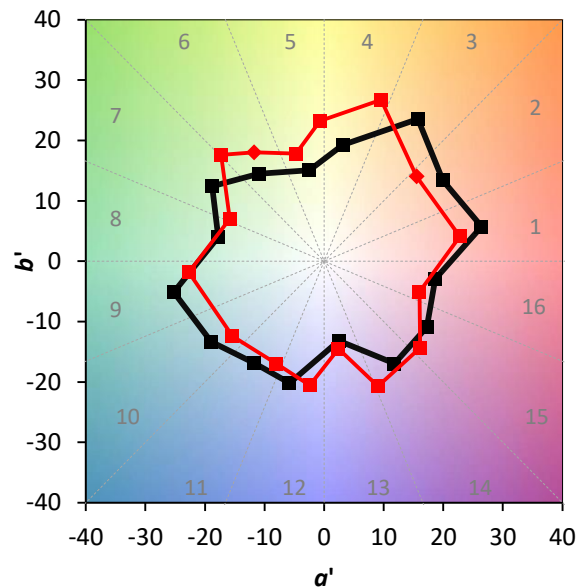
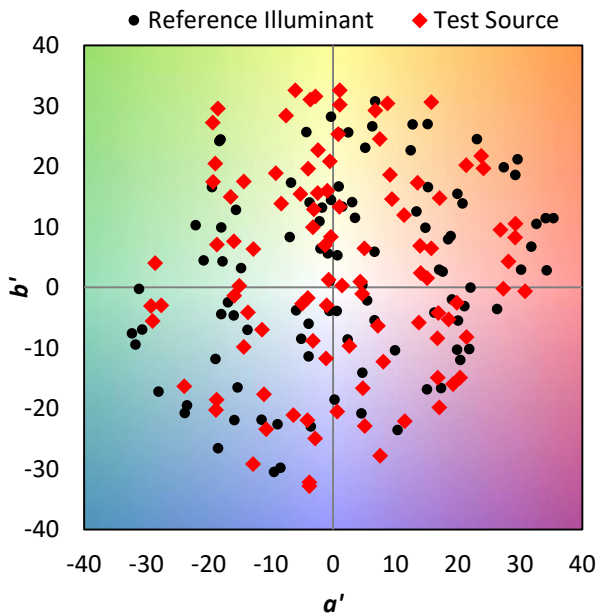
### Summary

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

### Spectral Power Distribution Comparison



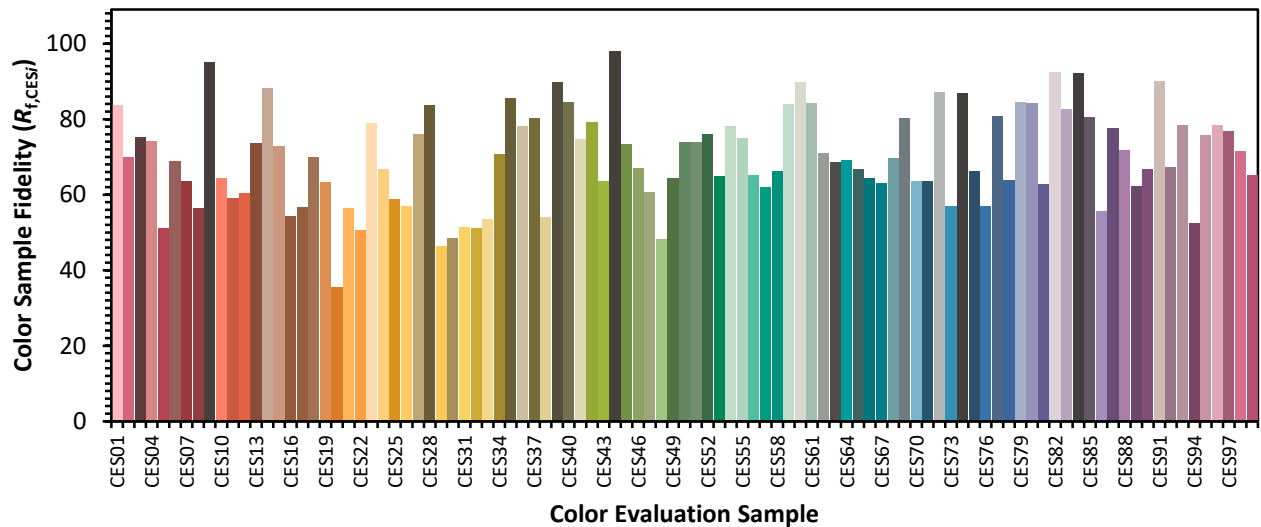
### Color Vector Graphics



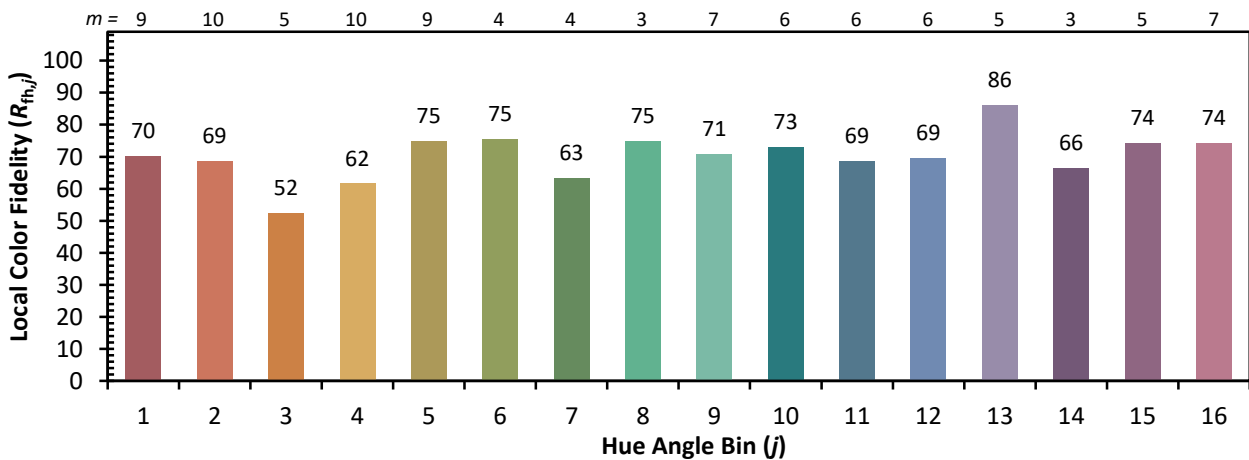
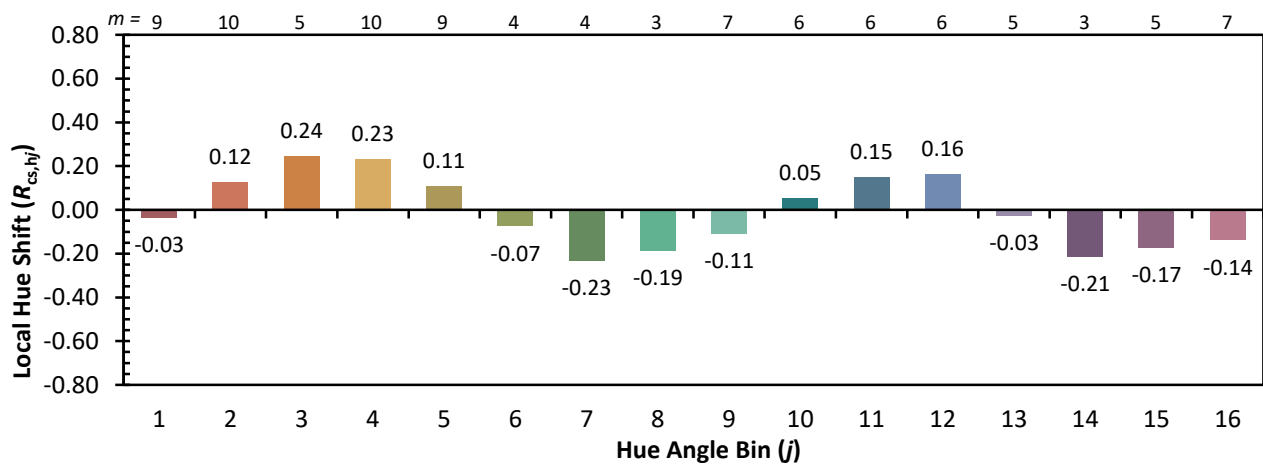
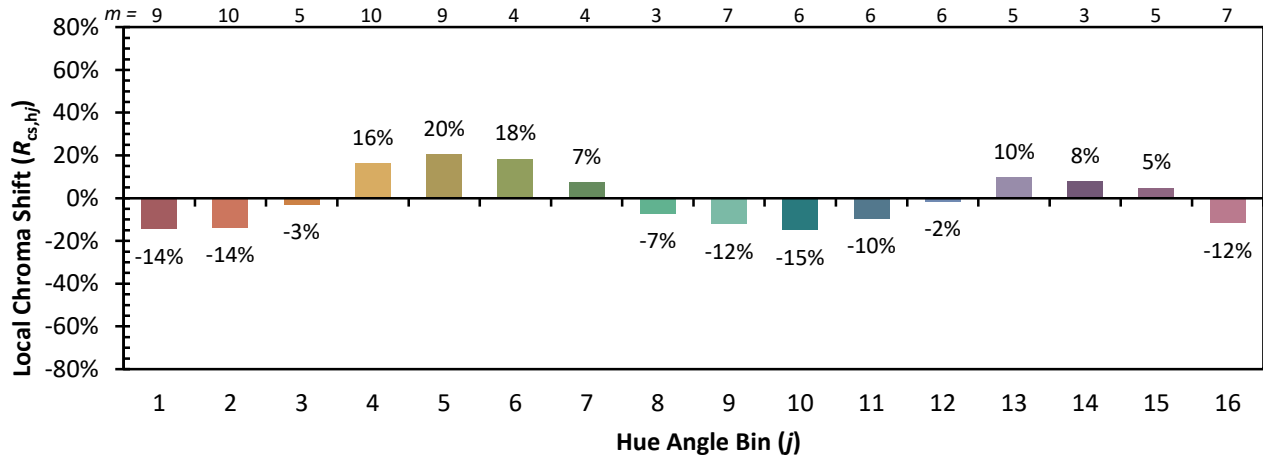


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

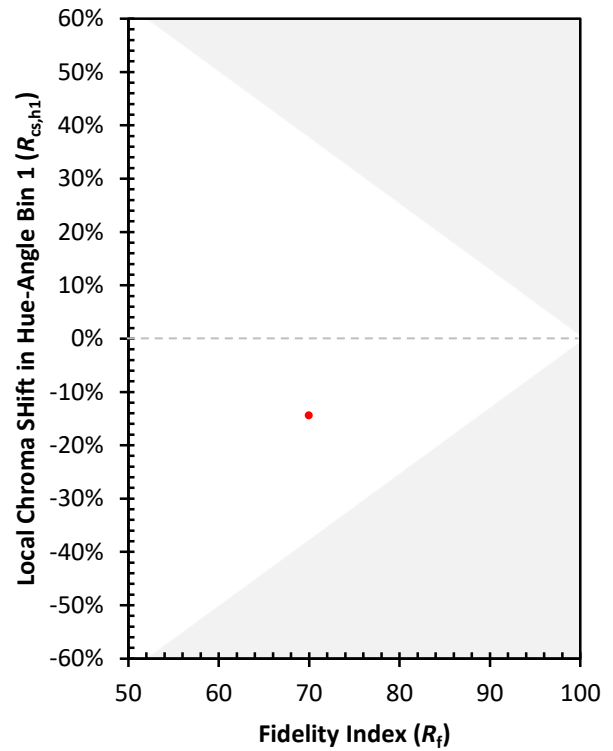
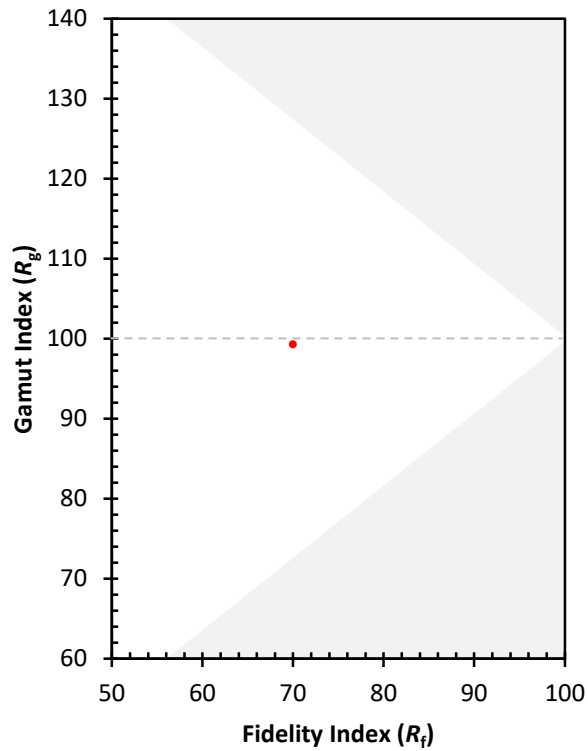
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 87 | CES26 = 57 | CES51 = 74 | CES76 = 57 |
| CES02 = 65 | CES27 = 76 | CES52 = 76 | CES77 = 81 |
| CES03 = 32 | CES28 = 84 | CES53 = 65 | CES78 = 64 |
| CES04 = 72 | CES29 = 46 | CES54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