

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: INVUE

Report Number: P674484

Luminaire Tested: **CCP-SA-1E-840-U-AFL-HSS**

Issue Date: 04/16/2023

**Test Information**

Test Method: LM-79-08  
Report Number: P674484  
Test Lab: INNOVATION CENTER(G2)  
Issue Date: 04/16/2023  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: INVUE  
Catalog Number: CCP-SA-1E-840-U-AFL-HSS  
Description: INVUE CLEAR CURVE POLE MOUNT Light Square Luminaire @1050mA w/ AFL  
distribution lens and House Side Shield  
Light Source: (16) 4000K CCT, 80 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 4833.9 lumens  
Efficiency: N/A  
Efficacy: 86.2 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 0.5' x H: 0')  
IES Classification: Type II - Short  
BUG Rating: B1 - U0 - G1

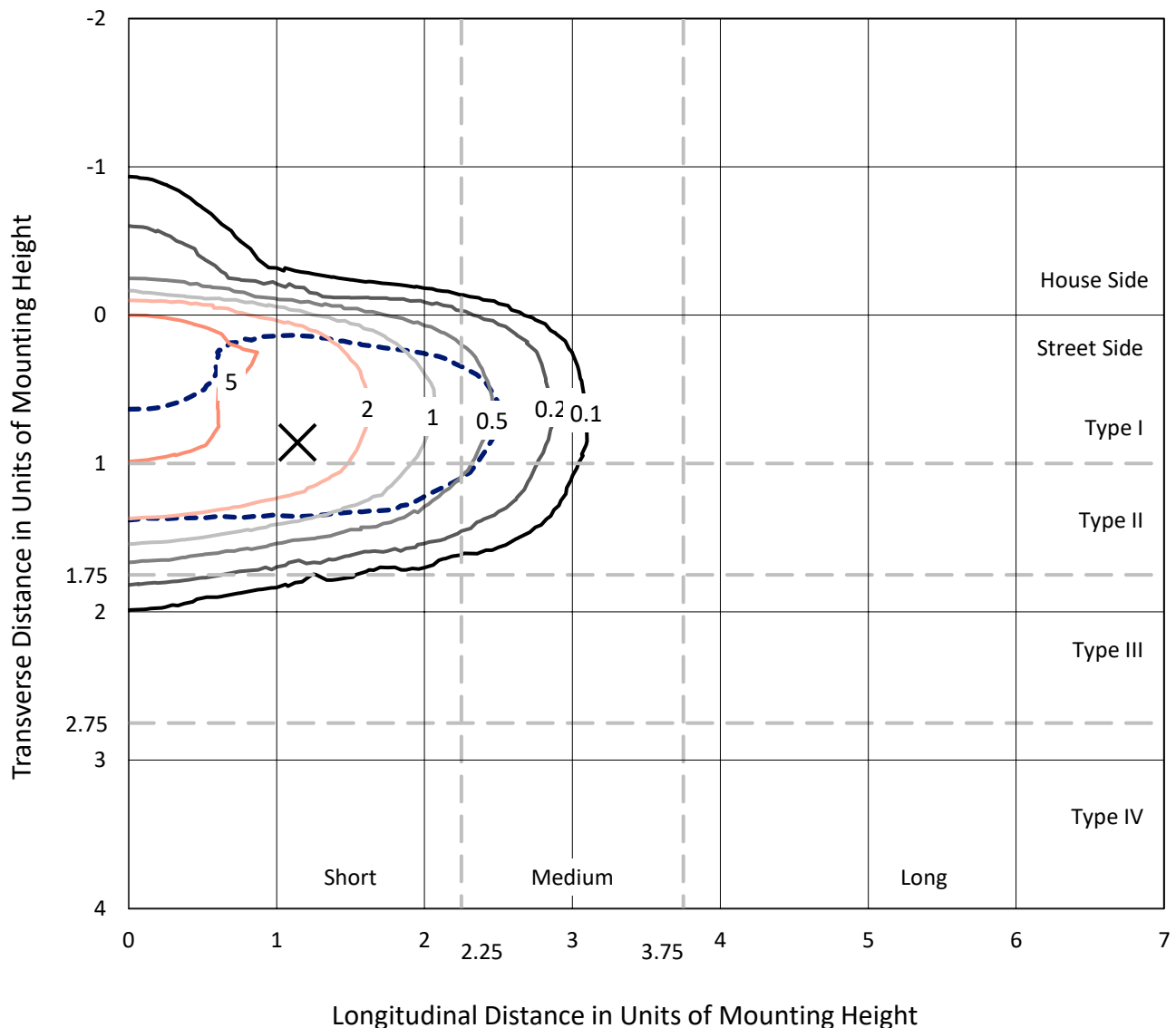
Input Watts (W): 56.1  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 25 FT

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## Iso-Footcandle Lines of Horizontal Illumination

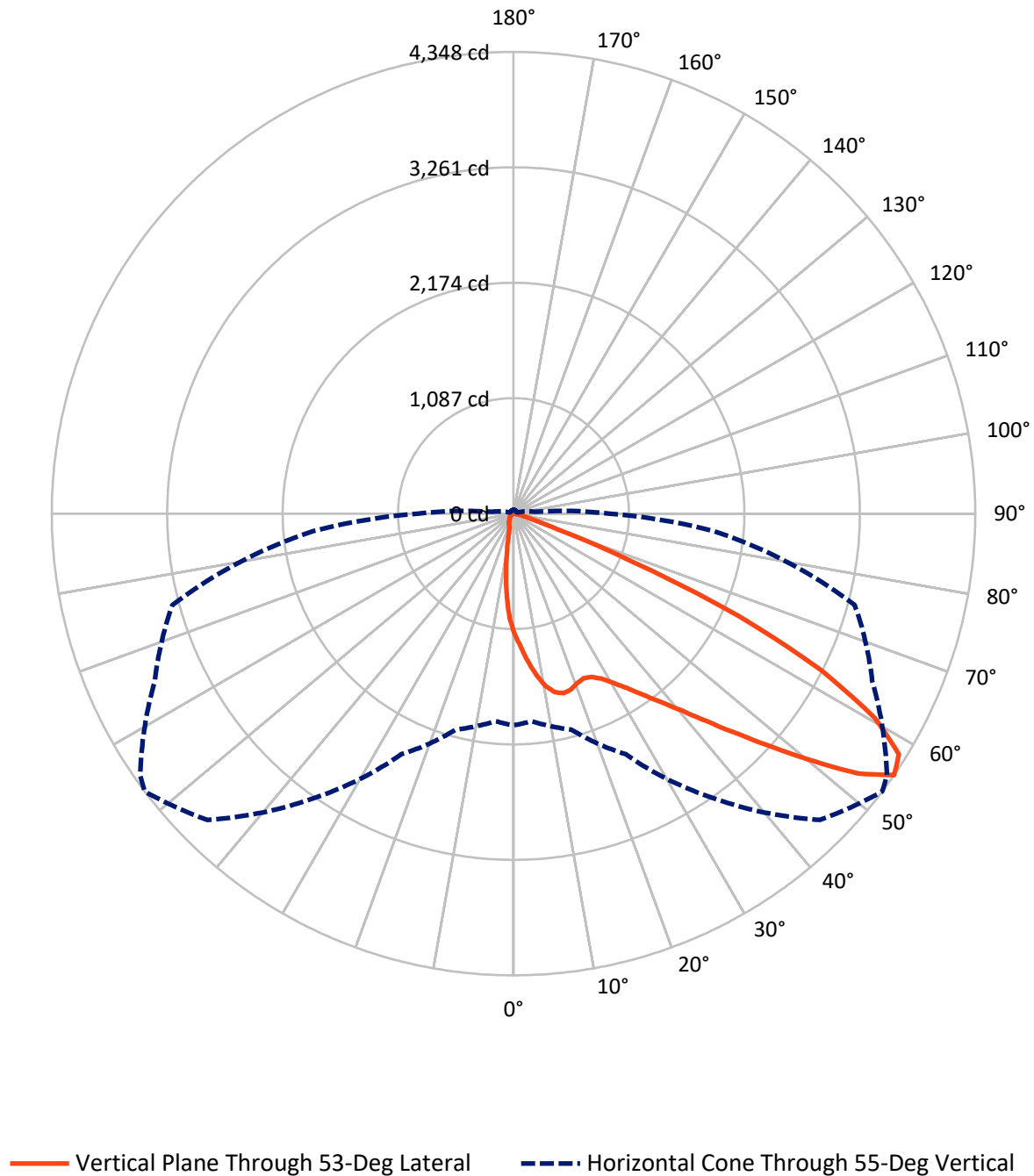
× Max cd  
 - - - 1/2 Max cd



Based on 15 foot mounting height. Maximum calculated value = 7.3 fc  
 Type II - Short - N/A

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## Luminous Intensity Polar Plot



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CATALOG NUMBER: CCP-SA-1E-840-U-AFL-HSS

**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 261.3    | 0.0    | 261.3  |
|                    | % Fixture | 5.4      | 0.0    | 5.4    |
| <b>Street Side</b> | Lumens    | 4572.7   | 0.0    | 4572.7 |
|                    | % Fixture | 94.6     | 0.0    | 94.6   |
| <b>Total</b>       | Lumens    | 4833.9   | 0.0    | 4833.9 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 101.1  | 2.1       |
| 10°-20°   | 264.3  | 5.5       |
| 20°-30°   | 442.3  | 9.2       |
| 30°-40°   | 723.7  | 15.0      |
| 40°-50°   | 1163.2 | 24.1      |
| 50°-60°   | 1313.3 | 27.2      |
| 60°-70°   | 700.5  | 14.5      |
| 70°-80°   | 115.1  | 2.4       |
| 80°-90°   | 10.3   | 0.2       |
| 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°    | 4833.9 | 100.0     |
| 0°-180°   | 4833.9 | 100.0     |

**Coefficient of Utilization**



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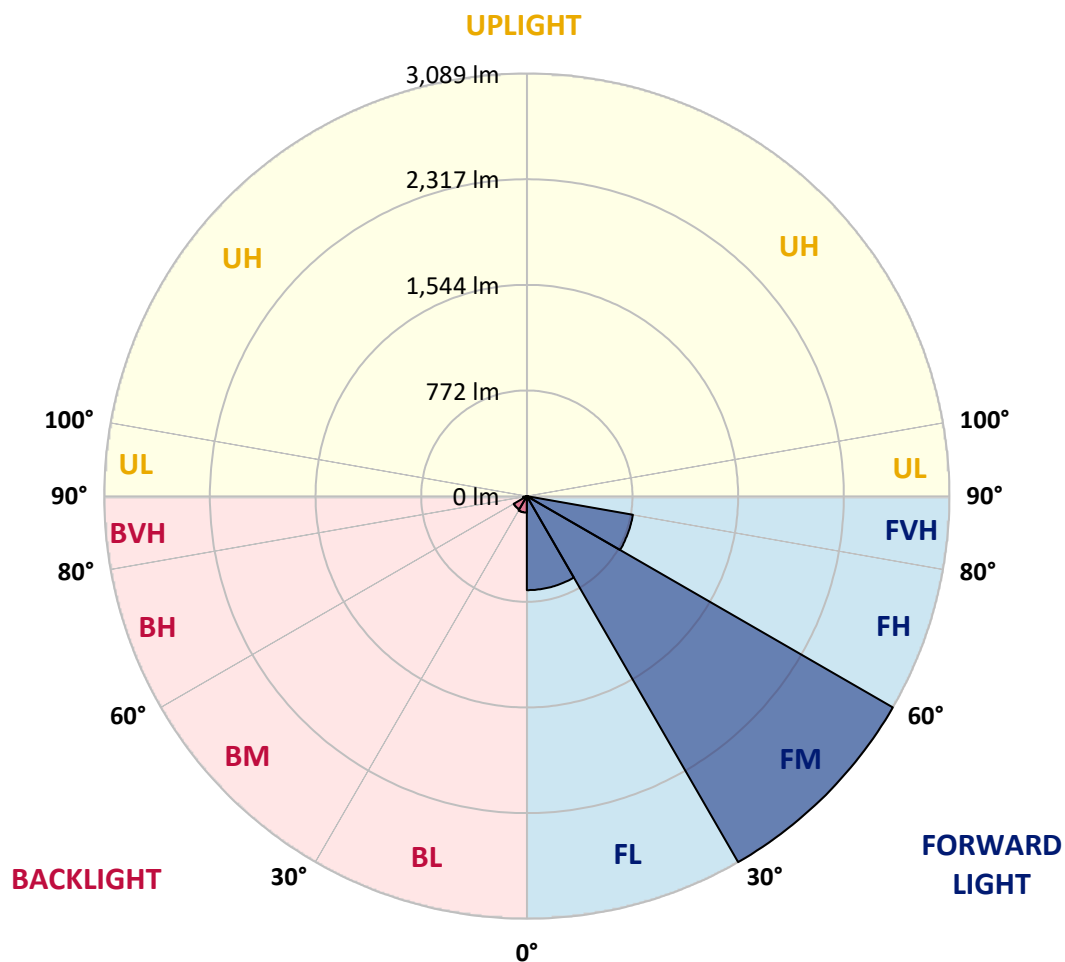
CATALOG NUMBER: CCP-SA-1E-840-U-AFL-HSS

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 687.2  | 14.2      |                         |      |         |
| FM   | (30°-60°)   | 3088.9 | 63.9      |                         |      |         |
| FH   | (60°-80°)   | 787.1  | 16.3      |                         |      | G1/1800 |
| FVH  | (80°-90°)   | 9.5    | 0.2       |                         |      | G0/10   |
| BL   | (0°-30°)    | 120.6  | 2.5       | B1/500                  |      |         |
| BM   | (30°-60°)   | 111.3  | 2.3       | B0/220                  |      |         |
| BH   | (60°-80°)   | 28.6   | 0.6       | B0/110                  |      | G0/110  |
| BVH  | (80°-90°)   | 0.8    | 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-G1**

Type II Short





REPORT NUMBER: P674484

CATALOG NUMBER: CCP-SA-1E-840-U-AFL-HSS

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 53°    | 55°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1131.3 | 1131.3 | 1131.3 | 1131.3 | 1131.3 | 1131.3 | 1131.3 | 1131.3 | 1131.3 | 1131.3 | 1131.3 |
| 2.5°  | 1356.6 | 1348.5 | 1353.2 | 1340.9 | 1318.5 | 1290.5 | 1248.6 | 1250.7 | 1217.7 | 1188.9 | 1149.0 |
| 5°    | 1580.6 | 1572.2 | 1569.6 | 1538.3 | 1506.9 | 1456.5 | 1394.3 | 1384.1 | 1323.5 | 1250.3 | 1166.8 |
| 7.5°  | 1698.8 | 1691.6 | 1697.1 | 1685.7 | 1654.7 | 1609.0 | 1530.2 | 1522.6 | 1429.0 | 1318.0 | 1195.2 |
| 10°   | 1644.6 | 1642.0 | 1665.3 | 1692.4 | 1717.4 | 1711.9 | 1648.8 | 1637.0 | 1531.9 | 1392.6 | 1224.4 |
| 12.5° | 1498.9 | 1506.9 | 1536.6 | 1586.6 | 1663.6 | 1736.1 | 1725.9 | 1728.0 | 1637.0 | 1473.5 | 1256.6 |
| 15°   | 1413.3 | 1423.1 | 1440.0 | 1465.8 | 1560.7 | 1689.5 | 1755.1 | 1776.3 | 1737.8 | 1563.7 | 1294.7 |
| 17.5° | 1406.1 | 1414.2 | 1416.7 | 1426.5 | 1481.9 | 1614.5 | 1743.3 | 1783.5 | 1827.5 | 1648.8 | 1337.5 |
| 20°   | 1461.6 | 1465.0 | 1462.9 | 1455.7 | 1475.6 | 1573.9 | 1706.0 | 1763.6 | 1901.7 | 1739.5 | 1375.2 |
| 22.5° | 1566.2 | 1561.1 | 1554.8 | 1528.1 | 1526.8 | 1585.3 | 1685.7 | 1745.8 | 1945.7 | 1814.4 | 1400.2 |
| 25°   | 1695.8 | 1685.2 | 1676.3 | 1638.7 | 1620.9 | 1645.0 | 1703.9 | 1752.2 | 1985.5 | 1887.3 | 1418.0 |
| 27.5° | 1837.3 | 1840.7 | 1818.7 | 1767.8 | 1739.9 | 1734.8 | 1760.2 | 1796.2 | 2024.1 | 1952.5 | 1427.7 |
| 30°   | 1988.5 | 1990.2 | 1961.4 | 1908.9 | 1883.5 | 1850.8 | 1849.1 | 1870.7 | 2065.6 | 2027.5 | 1437.0 |
| 32.5° | 2160.9 | 2165.5 | 2118.5 | 2063.9 | 2019.4 | 1977.1 | 1956.3 | 1974.5 | 2140.1 | 2125.3 | 1456.1 |
| 35°   | 2409.9 | 2389.6 | 2326.0 | 2243.5 | 2180.3 | 2124.9 | 2093.1 | 2105.0 | 2239.2 | 2242.6 | 1494.2 |
| 37.5° | 2666.6 | 2664.4 | 2594.1 | 2475.1 | 2371.8 | 2302.8 | 2248.5 | 2268.0 | 2378.6 | 2399.7 | 1555.2 |
| 40°   | 2905.9 | 2911.4 | 2850.4 | 2746.6 | 2613.6 | 2495.0 | 2437.0 | 2450.1 | 2563.6 | 2590.3 | 1629.3 |
| 42.5° | 3062.1 | 3059.2 | 3063.8 | 3034.2 | 2900.8 | 2761.0 | 2673.8 | 2681.0 | 2778.8 | 2792.8 | 1722.1 |
| 45°   | 3134.1 | 3122.7 | 3162.5 | 3256.5 | 3203.6 | 3056.6 | 2957.1 | 2948.2 | 3002.0 | 2998.2 | 1806.4 |
| 47.5° | 3071.9 | 3050.7 | 3142.2 | 3368.8 | 3471.3 | 3426.8 | 3284.5 | 3268.4 | 3222.7 | 3192.2 | 1894.0 |
| 50°   | 2762.3 | 2753.0 | 2948.6 | 3315.4 | 3639.4 | 3769.0 | 3664.4 | 3604.7 | 3419.6 | 3335.3 | 1940.2 |
| 52.5° | 2467.9 | 2442.1 | 2574.2 | 3043.1 | 3564.5 | 4044.3 | 4065.9 | 3959.6 | 3583.1 | 3376.4 | 1924.5 |
| 55°   | 1993.6 | 1961.8 | 2105.8 | 2500.1 | 3267.6 | 4079.5 | 4348.0 | 4292.5 | 3726.2 | 3325.6 | 1892.8 |
| 57.5° | 1210.9 | 1179.5 | 1391.3 | 1790.7 | 2613.2 | 3787.2 | 4278.5 | 4334.9 | 3836.4 | 3269.7 | 1872.0 |
| 60°   | 509.1  | 489.2  | 572.2  | 854.7  | 1668.7 | 3112.5 | 3910.1 | 4050.7 | 3857.1 | 3193.0 | 1880.5 |
| 62.5° | 264.7  | 255.8  | 260.5  | 342.2  | 674.7  | 2049.5 | 3254.4 | 3499.2 | 3647.9 | 3159.1 | 1889.0 |
| 65°   | 198.6  | 191.9  | 177.0  | 188.0  | 262.2  | 886.0  | 2338.8 | 2666.6 | 3194.3 | 3073.2 | 1831.8 |
| 67.5° | 163.1  | 156.7  | 146.1  | 142.7  | 154.6  | 307.5  | 1193.9 | 1620.0 | 2503.1 | 2706.8 | 1626.8 |
| 70°   | 130.0  | 127.9  | 124.5  | 118.2  | 116.0  | 149.1  | 428.2  | 660.3  | 1655.2 | 1908.9 | 1179.1 |
| 72.5° | 108.4  | 108.8  | 105.0  | 99.5   | 91.9   | 96.1   | 170.7  | 225.7  | 800.9  | 915.3  | 493.8  |
| 75°   | 90.6   | 90.6   | 91.9   | 84.3   | 76.7   | 66.1   | 94.9   | 110.1  | 257.1  | 211.3  | 105.5  |
| 77.5° | 71.2   | 72.0   | 77.5   | 71.2   | 61.4   | 41.5   | 51.7   | 58.9   | 76.2   | 61.0   | 38.5   |
| 80°   | 56.8   | 55.9   | 53.8   | 64.0   | 55.1   | 29.2   | 24.6   | 27.1   | 35.6   | 29.2   | 19.1   |
| 82.5° | 39.8   | 39.4   | 37.7   | 43.2   | 42.8   | 21.6   | 16.1   | 16.5   | 21.6   | 18.6   | 11.9   |
| 85°   | 9.7    | 11.4   | 24.1   | 20.3   | 17.8   | 12.7   | 9.7    | 10.6   | 14.0   | 12.3   | 6.4    |
| 87.5° | 4.2    | 4.2    | 11.0   | 13.1   | 8.5    | 5.5    | 4.2    | 4.7    | 7.2    | 7.2    | 3.8    |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |



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CATALOG NUMBER: CCP-SA-1E-840-U-AFL-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1131.3 | 1131.3 | 1131.3 | 1131.3 | 1131.3 | 1131.3 | 1131.3 | 1131.3 | 1131.3 | 1131.3 | 1131.3 |
| 2.5°  | 1135.1 | 1107.5 | 1072.8 | 1036.0 | 998.3  | 953.0  | 924.1  | 900.4  | 881.8  | 867.4  | 862.3  |
| 5°    | 1139.3 | 1086.4 | 1007.6 | 909.7  | 810.2  | 717.0  | 645.0  | 591.7  | 547.6  | 523.5  | 512.9  |
| 7.5°  | 1138.9 | 1068.6 | 926.3  | 762.4  | 600.6  | 466.3  | 371.0  | 312.1  | 272.8  | 256.7  | 246.9  |
| 10°   | 1138.5 | 1045.3 | 833.5  | 598.9  | 401.5  | 270.2  | 199.1  | 166.0  | 151.6  | 146.1  | 145.3  |
| 12.5° | 1150.7 | 1018.6 | 729.7  | 440.9  | 252.0  | 168.1  | 138.5  | 130.9  | 127.5  | 125.8  | 125.4  |
| 15°   | 1157.5 | 994.0  | 620.5  | 311.3  | 169.8  | 133.0  | 123.7  | 120.3  | 119.0  | 118.2  | 117.7  |
| 17.5° | 1164.7 | 955.9  | 516.7  | 225.3  | 136.0  | 120.7  | 115.2  | 113.1  | 112.2  | 112.2  | 112.2  |
| 20°   | 1166.0 | 914.8  | 413.8  | 166.0  | 120.7  | 112.7  | 107.2  | 105.0  | 103.8  | 102.9  | 102.9  |
| 22.5° | 1156.7 | 866.1  | 325.3  | 134.7  | 111.8  | 105.0  | 99.1   | 95.7   | 93.6   | 93.2   | 93.2   |
| 25°   | 1133.4 | 797.1  | 249.5  | 118.2  | 104.6  | 97.4   | 90.2   | 86.4   | 84.7   | 84.7   | 84.7   |
| 27.5° | 1099.9 | 715.8  | 192.7  | 105.0  | 95.3   | 88.1   | 81.7   | 78.4   | 77.9   | 77.5   | 77.9   |
| 30°   | 1061.8 | 637.4  | 147.4  | 93.2   | 84.3   | 78.4   | 73.3   | 71.6   | 72.4   | 72.4   | 72.8   |
| 32.5° | 1023.7 | 559.1  | 115.2  | 83.9   | 74.5   | 69.5   | 66.9   | 66.9   | 68.2   | 68.2   | 68.2   |
| 35°   | 991.1  | 482.4  | 96.6   | 76.2   | 67.8   | 63.5   | 62.3   | 63.5   | 64.4   | 64.8   | 64.8   |
| 37.5° | 972.9  | 416.3  | 85.1   | 69.5   | 62.3   | 58.9   | 58.4   | 59.7   | 61.4   | 62.7   | 63.1   |
| 40°   | 966.1  | 365.5  | 78.4   | 64.4   | 57.2   | 55.1   | 54.6   | 56.3   | 59.3   | 61.4   | 61.8   |
| 42.5° | 966.5  | 320.6  | 72.4   | 59.3   | 53.8   | 50.8   | 50.8   | 53.4   | 56.3   | 58.4   | 58.4   |
| 45°   | 969.5  | 282.1  | 66.5   | 54.2   | 50.8   | 45.7   | 46.2   | 49.6   | 51.7   | 53.8   | 53.8   |
| 47.5° | 972.0  | 251.2  | 60.1   | 48.7   | 44.0   | 41.5   | 42.4   | 44.9   | 47.9   | 51.2   | 51.2   |
| 50°   | 957.2  | 229.1  | 53.8   | 42.8   | 38.5   | 37.7   | 39.4   | 41.5   | 45.7   | 49.1   | 49.6   |
| 52.5° | 921.6  | 209.2  | 48.3   | 38.1   | 34.7   | 35.2   | 37.3   | 38.5   | 41.9   | 42.4   | 42.8   |
| 55°   | 905.9  | 199.1  | 44.0   | 34.7   | 31.8   | 33.0   | 34.3   | 34.7   | 33.9   | 31.8   | 31.8   |
| 57.5° | 902.5  | 192.3  | 39.8   | 31.3   | 29.2   | 30.9   | 30.5   | 28.0   | 25.4   | 22.9   | 22.4   |
| 60°   | 905.9  | 183.0  | 36.4   | 27.1   | 26.7   | 27.1   | 25.8   | 21.2   | 17.8   | 16.1   | 15.2   |
| 62.5° | 886.5  | 169.4  | 33.5   | 23.3   | 23.3   | 22.9   | 19.5   | 14.4   | 11.4   | 10.2   | 9.7    |
| 65°   | 822.1  | 142.7  | 30.5   | 19.5   | 19.1   | 18.2   | 13.1   | 9.7    | 7.6    | 6.4    | 5.9    |
| 67.5° | 695.4  | 110.5  | 27.5   | 16.1   | 15.2   | 12.7   | 8.5    | 6.4    | 4.2    | 3.8    | 3.4    |
| 70°   | 474.4  | 68.6   | 23.3   | 12.7   | 11.4   | 8.0    | 5.1    | 3.8    | 2.5    | 2.1    | 1.7    |
| 72.5° | 172.0  | 39.8   | 19.5   | 9.7    | 7.6    | 5.1    | 3.0    | 1.7    | 1.3    | 1.3    | 0.8    |
| 75°   | 40.7   | 28.0   | 14.8   | 7.2    | 5.1    | 3.0    | 1.7    | 1.3    | 0.8    | 0.8    | 0.4    |
| 77.5° | 18.6   | 21.6   | 9.7    | 4.2    | 3.4    | 2.1    | 1.3    | 0.8    | 0.4    | 0.4    | 0.0    |
| 80°   | 10.6   | 15.2   | 4.7    | 3.0    | 2.5    | 1.7    | 0.8    | 0.4    | 0.4    | 0.0    | 0.0    |
| 82.5° | 5.5    | 8.5    | 3.4    | 2.5    | 2.1    | 1.3    | 0.8    | 0.0    | 0.0    | 0.0    | 0.0    |
| 85°   | 3.8    | 4.2    | 2.5    | 2.1    | 1.7    | 1.3    | 0.8    | 0.0    | 0.0    | 0.0    | 0.0    |
| 87.5° | 3.0    | 3.0    | 2.5    | 2.1    | 1.7    | 1.3    | 0.4    | 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)

INVUE

Report Number: SP1-2104-224-8

Luminaire Tested: CCW-SA-2A-840-U-SL4

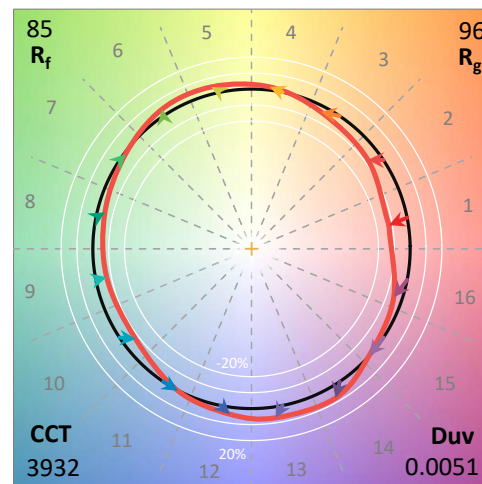
Test Date: 04/27/2021

### Test Information

Test Method: LM-79-08  
 Report Number: SP1-2104-224-8  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1  
 Measurement Geometry:  $4\pi$   
 Issue Date: 04/27/2021  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: INVUE  
 Catalog Number: **CCW-SA-2A-840-U-SL4**  
 Description: INVUE WALL PACK ClearCurve Light Square

### Spectral Parameters

|                           |        |           |      |      |      |
|---------------------------|--------|-----------|------|------|------|
| CCT (K):                  | 3932   | CRI (Ra): | 81.8 |      |      |
| CIE u':                   | 0.2235 | R1:       | 78.9 | R9:  | 0.1  |
| CIE v':                   | 0.5092 | R2:       | 86.4 | R10: | 69.8 |
| Duv:                      | 0.0051 | R3:       | 94.7 | R11: | 82.4 |
| CIE x:                    | 0.3873 | R4:       | 82.5 | R12: | 67.7 |
| CIE y:                    | 0.3923 | R5:       | 79.9 | R13: | 80.2 |
| CIE z:                    | 0.2205 | R6:       | 83.2 | R14: | 97.1 |
| Peak Wavelength (nm):     | 590    | R7:       | 86.3 |      |      |
| Dominant Wavelength (nm): | 576    | R8:       | 62.5 |      |      |
| Purity:                   | 34     |           |      |      |      |
|                           |        |           |      |      |      |
| Rf:                       | 85.2   |           |      |      |      |
| Rg:                       | 96.1   |           |      |      |      |



### Test Conditions

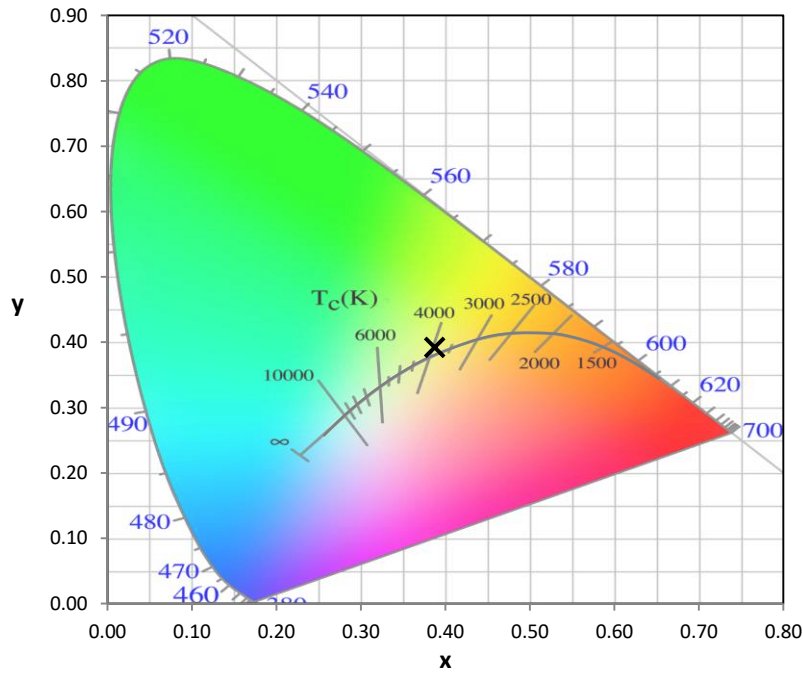
Stabilization Time: 123M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.9/41%  
 Sphere Temperature (°C): 24.2

REPORT NUMBER: SP1-2104-224-8

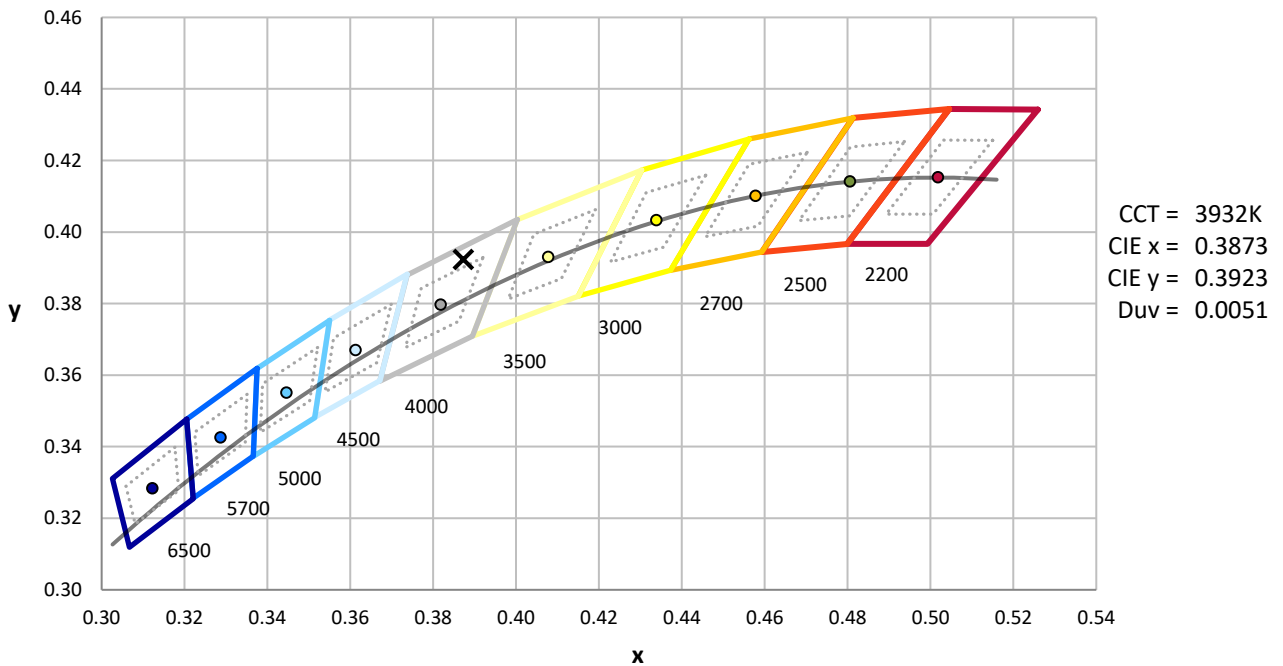
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| 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: SP1-2104-224-8

**CIE 1931 Chromaticity Diagram**



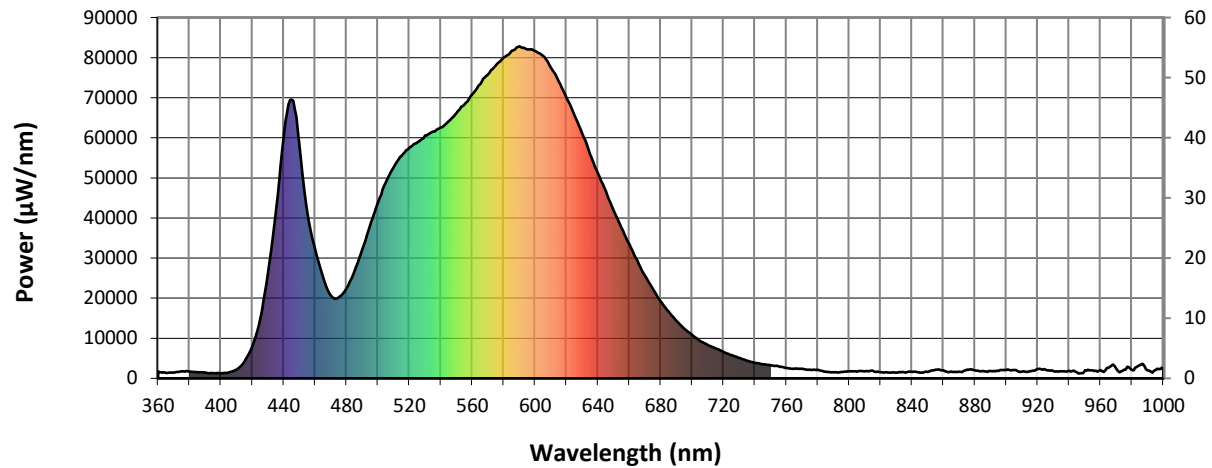
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 4000K 7-step quadrangle

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### Photopic Flux vs. Wavelength

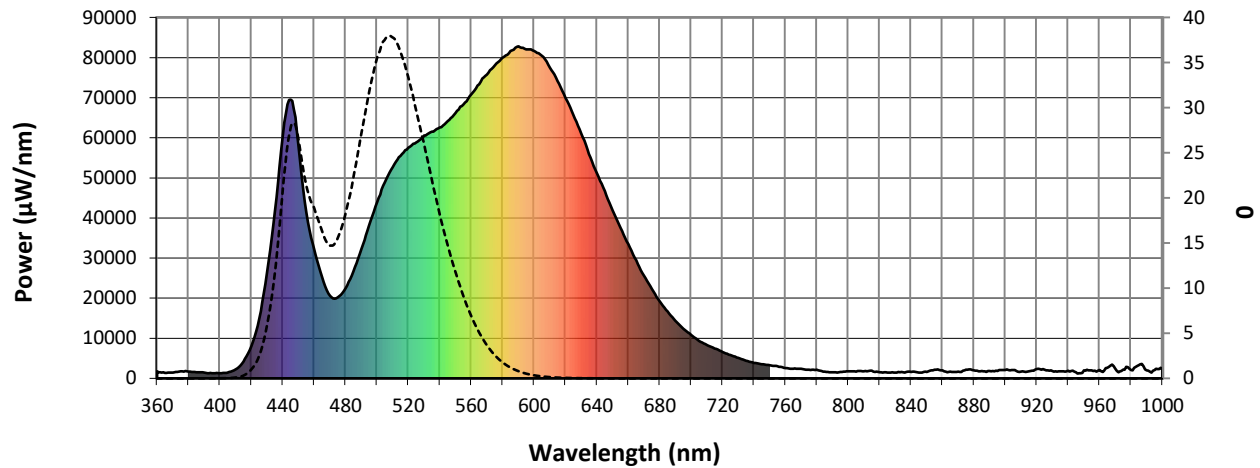


#####

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 1725             | 0.0              | 490       | 32247            | 4.6              | 620       | 69956            | 18.2             | 750       | 3261             | 0.0              | 880       | 1960             | 0.0              |
| 365       | 1400             | 0.0              | 495       | 38143            | 6.9              | 625       | 65781            | 14.5             | 755       | 3018             | 0.0              | 885       | 1828             | 0.0              |
| 370       | 1447             | 0.0              | 500       | 43918            | 9.7              | 630       | 61092            | 11.1             | 760       | 2521             | 0.0              | 890       | 1806             | 0.0              |
| 375       | 1728             | 0.0              | 505       | 48833            | 13.7             | 635       | 55954            | 8.4              | 765       | 2437             | 0.0              | 895       | 1814             | 0.0              |
| 380       | 1669             | 0.0              | 510       | 52659            | 18.1             | 640       | 51151            | 6.1              | 770       | 2407             | 0.0              | 900       | 2078             | 0.0              |
| 385       | 1495             | 0.0              | 515       | 55510            | 23.0             | 645       | 46656            | 4.5              | 775       | 2143             | 0.0              | 905       | 2072             | 0.0              |
| 390       | 1437             | 0.0              | 520       | 57534            | 27.9             | 650       | 41933            | 3.1              | 780       | 2156             | 0.0              | 910       | 1650             | 0.0              |
| 395       | 1307             | 0.0              | 525       | 58806            | 31.6             | 655       | 37478            | 2.2              | 785       | 1708             | 0.0              | 915       | 1725             | 0.0              |
| 400       | 1277             | 0.0              | 530       | 60565            | 35.7             | 660       | 33501            | 1.4              | 790       | 1555             | 0.0              | 920       | 2324             | 0.0              |
| 405       | 1471             | 0.0              | 535       | 61554            | 38.2             | 665       | 29439            | 0.9              | 795       | 1560             | 0.0              | 925       | 2173             | 0.0              |
| 410       | 2252             | 0.0              | 540       | 62542            | 40.8             | 670       | 25594            | 0.6              | 800       | 1752             | 0.0              | 930       | 1833             | 0.0              |
| 415       | 4196             | 0.0              | 545       | 64150            | 42.7             | 675       | 22306            | 0.4              | 805       | 1696             | 0.0              | 935       | 1740             | 0.0              |
| 420       | 7969             | 0.0              | 550       | 66171            | 45.0             | 680       | 19204            | 0.2              | 810       | 1762             | 0.0              | 940       | 1956             | 0.0              |
| 425       | 14965            | 0.1              | 555       | 68352            | 46.7             | 685       | 16645            | 0.1              | 815       | 1884             | 0.0              | 945       | 1549             | 0.0              |
| 430       | 26348            | 0.2              | 560       | 70775            | 48.1             | 690       | 14365            | 0.1              | 820       | 1502             | 0.0              | 950       | 2026             | 0.0              |
| 435       | 41840            | 0.5              | 565       | 73374            | 48.8             | 695       | 12367            | 0.1              | 825       | 1454             | 0.0              | 955       | 1971             | 0.0              |
| 440       | 60229            | 0.9              | 570       | 75776            | 49.3             | 700       | 10847            | 0.0              | 830       | 1466             | 0.0              | 960       | 2048             | 0.0              |
| 445       | 69537            | 1.4              | 575       | 78035            | 48.6             | 705       | 9369             | 0.0              | 835       | 1541             | 0.0              | 965       | 2608             | 0.0              |
| 450       | 58253            | 1.5              | 580       | 79996            | 47.5             | 710       | 8303             | 0.0              | 840       | 1616             | 0.0              | 970       | 2403             | 0.0              |
| 455       | 41363            | 1.4              | 585       | 81672            | 45.4             | 715       | 7458             | 0.0              | 845       | 1445             | 0.0              | 975       | 2154             | 0.0              |
| 460       | 32336            | 1.3              | 590       | 82819            | 42.8             | 720       | 6565             | 0.0              | 850       | 1636             | 0.0              | 980       | 2109             | 0.0              |
| 465       | 25279            | 1.3              | 595       | 82030            | 38.9             | 725       | 5799             | 0.0              | 855       | 2149             | 0.0              | 985       | 3271             | 0.0              |
| 470       | 20560            | 1.3              | 600       | 81639            | 35.2             | 730       | 5071             | 0.0              | 860       | 2002             | 0.0              | 990       | 1987             | 0.0              |
| 475       | 20192            | 1.6              | 605       | 80430            | 31.1             | 735       | 4394             | 0.0              | 865       | 1653             | 0.0              | 995       | 2115             | 0.0              |
| 480       | 22473            | 2.1              | 610       | 77509            | 26.6             | 740       | 3856             | 0.0              | 870       | 1669             | 0.0              | 1000      | 2424             | 0.0              |
| 485       | 26686            | 3.2              | 615       | 74116            | 22.4             | 745       | 3544             | 0.0              | 875       | 2164             | 0.0              |           |                  |                  |

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### Scotopic Flux vs. Wavelength



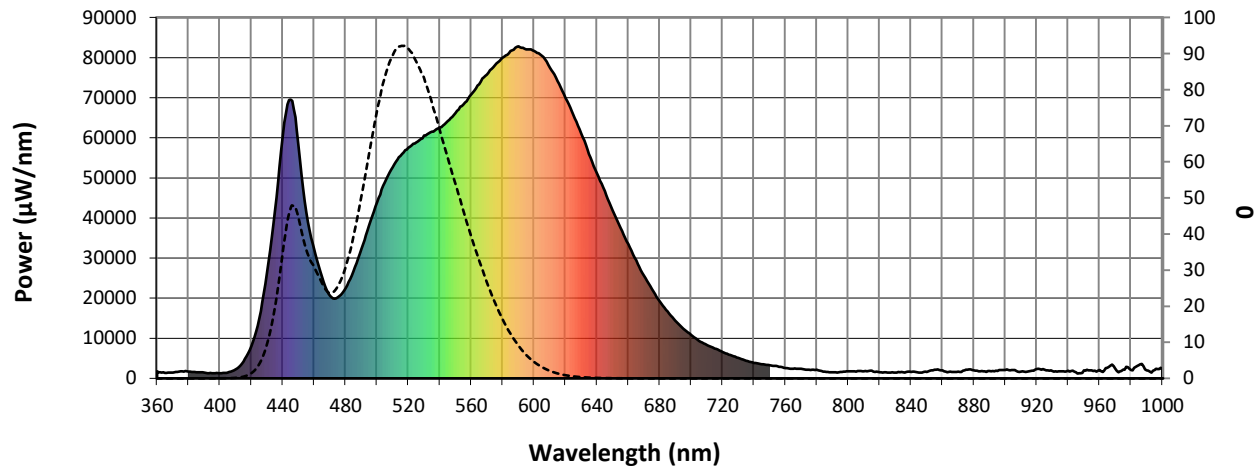
Scotopic Lumens: 7846

S/P: 1.64

| 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       | 1725             | 0.0              | 490       | 32247            | 49.7             | 620       | 69956            | 0.9              | 750       | 3261             | 0.0              | 880       | 1960             | 0.0              |
| 365       | 1400             | 0.0              | 495       | 38143            | 61.7             | 625       | 65781            | 0.6              | 755       | 3018             | 0.0              | 885       | 1828             | 0.0              |
| 370       | 1447             | 0.0              | 500       | 43918            | 73.5             | 630       | 61092            | 0.3              | 760       | 2521             | 0.0              | 890       | 1806             | 0.0              |
| 375       | 1728             | 0.0              | 505       | 48833            | 83.0             | 635       | 55954            | 0.2              | 765       | 2437             | 0.0              | 895       | 1814             | 0.0              |
| 380       | 1669             | 0.0              | 510       | 52659            | 89.3             | 640       | 51151            | 0.1              | 770       | 2407             | 0.0              | 900       | 2078             | 0.0              |
| 385       | 1495             | 0.0              | 515       | 55510            | 92.0             | 645       | 46656            | 0.1              | 775       | 2143             | 0.0              | 905       | 2072             | 0.0              |
| 390       | 1437             | 0.0              | 520       | 57534            | 91.5             | 650       | 41933            | 0.0              | 780       | 2156             | 0.0              | 910       | 1650             | 0.0              |
| 395       | 1307             | 0.0              | 525       | 58806            | 88.0             | 655       | 37478            | 0.0              | 785       | 1708             | 0.0              | 915       | 1725             | 0.0              |
| 400       | 1277             | 0.0              | 530       | 60565            | 83.5             | 660       | 33501            | 0.0              | 790       | 1555             | 0.0              | 920       | 2324             | 0.0              |
| 405       | 1471             | 0.0              | 535       | 61554            | 76.7             | 665       | 29439            | 0.0              | 795       | 1560             | 0.0              | 925       | 2173             | 0.0              |
| 410       | 2252             | 0.1              | 540       | 62542            | 69.1             | 670       | 25594            | 0.0              | 800       | 1752             | 0.0              | 930       | 1833             | 0.0              |
| 415       | 4196             | 0.4              | 545       | 64150            | 61.5             | 675       | 22306            | 0.0              | 805       | 1696             | 0.0              | 935       | 1740             | 0.0              |
| 420       | 7969             | 1.3              | 550       | 66171            | 54.1             | 680       | 19204            | 0.0              | 810       | 1762             | 0.0              | 940       | 1956             | 0.0              |
| 425       | 14965            | 3.7              | 555       | 68352            | 46.7             | 685       | 16645            | 0.0              | 815       | 1884             | 0.0              | 945       | 1549             | 0.0              |
| 430       | 26348            | 9.0              | 560       | 70775            | 39.6             | 690       | 14365            | 0.0              | 820       | 1502             | 0.0              | 950       | 2026             | 0.0              |
| 435       | 41840            | 18.7             | 565       | 73374            | 32.9             | 695       | 12367            | 0.0              | 825       | 1454             | 0.0              | 955       | 1971             | 0.0              |
| 440       | 60229            | 33.7             | 570       | 75776            | 26.7             | 700       | 10847            | 0.0              | 830       | 1466             | 0.0              | 960       | 2048             | 0.0              |
| 445       | 69537            | 46.6             | 575       | 78035            | 21.3             | 705       | 9369             | 0.0              | 835       | 1541             | 0.0              | 965       | 2608             | 0.0              |
| 450       | 58253            | 45.1             | 580       | 79996            | 16.5             | 710       | 8303             | 0.0              | 840       | 1616             | 0.0              | 970       | 2403             | 0.0              |
| 455       | 41363            | 36.1             | 585       | 81672            | 12.5             | 715       | 7458             | 0.0              | 845       | 1445             | 0.0              | 975       | 2154             | 0.0              |
| 460       | 32336            | 31.2             | 590       | 82819            | 9.2              | 720       | 6565             | 0.0              | 850       | 1636             | 0.0              | 980       | 2109             | 0.0              |
| 465       | 25279            | 26.7             | 595       | 82030            | 6.5              | 725       | 5799             | 0.0              | 855       | 2149             | 0.0              | 985       | 3271             | 0.0              |
| 470       | 20560            | 23.7             | 600       | 81639            | 4.6              | 730       | 5071             | 0.0              | 860       | 2002             | 0.0              | 990       | 1987             | 0.0              |
| 475       | 20192            | 25.2             | 605       | 80430            | 3.2              | 735       | 4394             | 0.0              | 865       | 1653             | 0.0              | 995       | 2115             | 0.0              |
| 480       | 22473            | 30.4             | 610       | 77509            | 2.1              | 740       | 3856             | 0.0              | 870       | 1669             | 0.0              | 1000      | 2424             | 0.0              |
| 485       | 26686            | 38.7             | 615       | 74116            | 1.4              | 745       | 3544             | 0.0              | 875       | 2164             | 0.0              |           |                  |                  |

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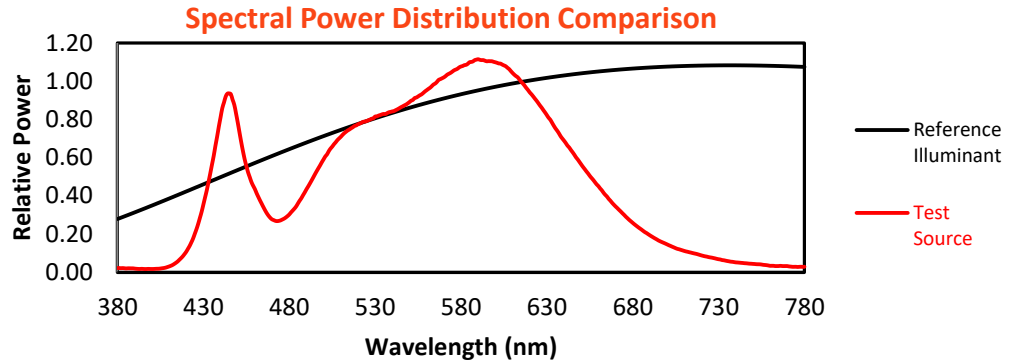
### Melanopic Flux vs. Wavelength


**Melanopic Lumens: 3084.4**
**M/P: 0.64**

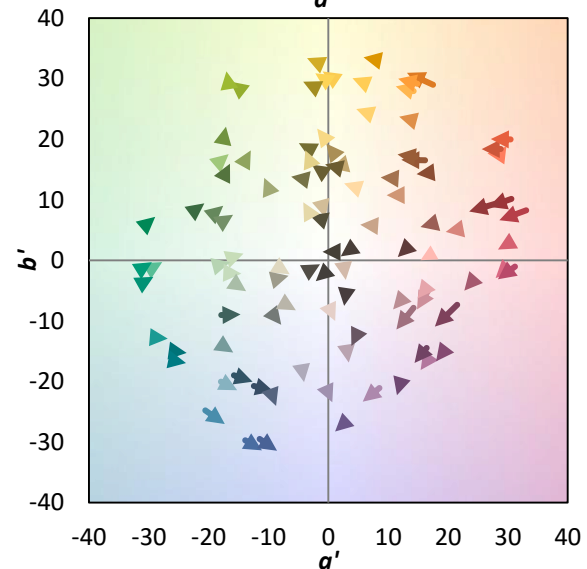
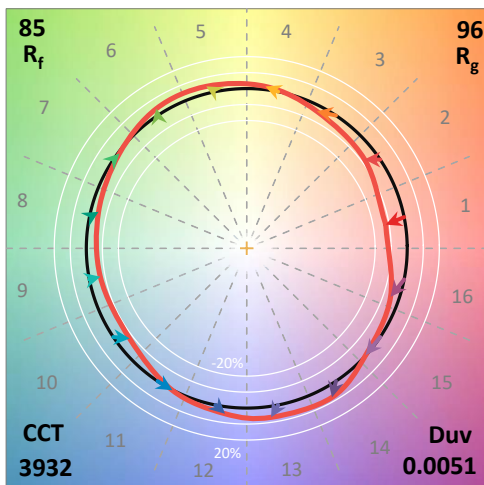
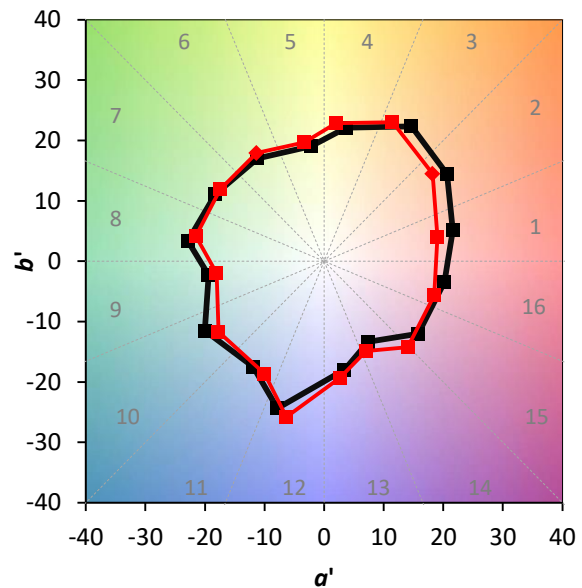
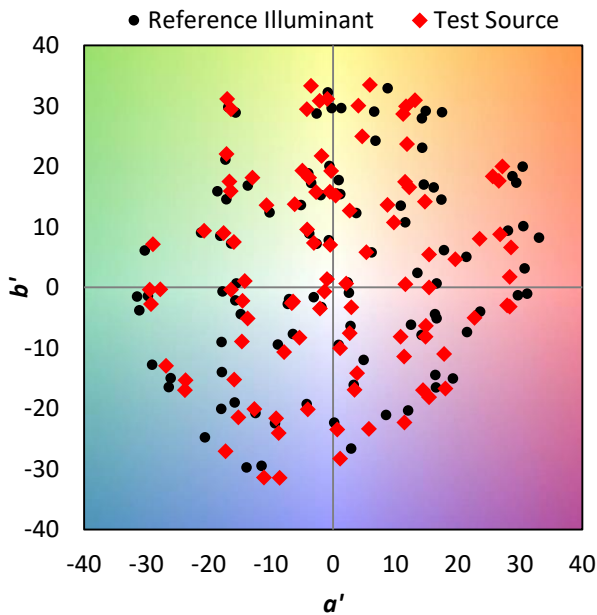
| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 1725             | 0.0              | 490       | 32247            | 26.8             | 620       | 69956            | 0.1              | 750       | 3261             | 0.0              | 880       | 1960             | 0.0              |
| 365       | 1400             | 0.0              | 495       | 38143            | 31.5             | 625       | 65781            | 0.0              | 755       | 3018             | 0.0              | 885       | 1828             | 0.0              |
| 370       | 1447             | 0.0              | 500       | 43918            | 35.3             | 630       | 61092            | 0.0              | 760       | 2521             | 0.0              | 890       | 1806             | 0.0              |
| 375       | 1728             | 0.0              | 505       | 48833            | 37.5             | 635       | 55954            | 0.0              | 765       | 2437             | 0.0              | 895       | 1814             | 0.0              |
| 380       | 1669             | 0.0              | 510       | 52659            | 37.8             | 640       | 51151            | 0.0              | 770       | 2407             | 0.0              | 900       | 2078             | 0.0              |
| 385       | 1495             | 0.0              | 515       | 55510            | 36.3             | 645       | 46656            | 0.0              | 775       | 2143             | 0.0              | 905       | 2072             | 0.0              |
| 390       | 1437             | 0.0              | 520       | 57534            | 33.5             | 650       | 41933            | 0.0              | 780       | 2156             | 0.0              | 910       | 1650             | 0.0              |
| 395       | 1307             | 0.0              | 525       | 58806            | 29.8             | 655       | 37478            | 0.0              | 785       | 1708             | 0.0              | 915       | 1725             | 0.0              |
| 400       | 1277             | 0.0              | 530       | 60565            | 26.2             | 660       | 33501            | 0.0              | 790       | 1555             | 0.0              | 920       | 2324             | 0.0              |
| 405       | 1471             | 0.0              | 535       | 61554            | 22.2             | 665       | 29439            | 0.0              | 795       | 1560             | 0.0              | 925       | 2173             | 0.0              |
| 410       | 2252             | 0.1              | 540       | 62542            | 18.3             | 670       | 25594            | 0.0              | 800       | 1752             | 0.0              | 930       | 1833             | 0.0              |
| 415       | 4196             | 0.3              | 545       | 64150            | 14.9             | 675       | 22306            | 0.0              | 805       | 1696             | 0.0              | 935       | 1740             | 0.0              |
| 420       | 7969             | 0.9              | 550       | 66171            | 11.9             | 680       | 19204            | 0.0              | 810       | 1762             | 0.0              | 940       | 1956             | 0.0              |
| 425       | 14965            | 2.3              | 555       | 68352            | 9.2              | 685       | 16645            | 0.0              | 815       | 1884             | 0.0              | 945       | 1549             | 0.0              |
| 430       | 26348            | 5.6              | 560       | 70775            | 7.0              | 690       | 14365            | 0.0              | 820       | 1502             | 0.0              | 950       | 2026             | 0.0              |
| 435       | 41840            | 11.2             | 565       | 73374            | 5.1              | 695       | 12367            | 0.0              | 825       | 1454             | 0.0              | 955       | 1971             | 0.0              |
| 440       | 60229            | 20.1             | 570       | 75776            | 3.7              | 700       | 10847            | 0.0              | 830       | 1466             | 0.0              | 960       | 2048             | 0.0              |
| 445       | 69537            | 27.4             | 575       | 78035            | 2.6              | 705       | 9369             | 0.0              | 835       | 1541             | 0.0              | 965       | 2608             | 0.0              |
| 450       | 58253            | 26.8             | 580       | 79996            | 1.8              | 710       | 8303             | 0.0              | 840       | 1616             | 0.0              | 970       | 2403             | 0.0              |
| 455       | 41363            | 21.7             | 585       | 81672            | 1.2              | 715       | 7458             | 0.0              | 845       | 1445             | 0.0              | 975       | 2154             | 0.0              |
| 460       | 32336            | 19.1             | 590       | 82819            | 0.8              | 720       | 6565             | 0.0              | 850       | 1636             | 0.0              | 980       | 2109             | 0.0              |
| 465       | 25279            | 16.5             | 595       | 82030            | 0.5              | 725       | 5799             | 0.0              | 855       | 2149             | 0.0              | 985       | 3271             | 0.0              |
| 470       | 20560            | 14.7             | 600       | 81639            | 0.3              | 730       | 5071             | 0.0              | 860       | 2002             | 0.0              | 990       | 1987             | 0.0              |
| 475       | 20192            | 15.4             | 605       | 80430            | 0.2              | 735       | 4394             | 0.0              | 865       | 1653             | 0.0              | 995       | 2115             | 0.0              |
| 480       | 22473            | 18.1             | 610       | 77509            | 0.1              | 740       | 3856             | 0.0              | 870       | 1669             | 0.0              | 1000      | 2424             | 0.0              |
| 485       | 26686            | 22.0             | 615       | 74116            | 0.1              | 745       | 3544             | 0.0              | 875       | 2164             | 0.0              |           |                  |                  |

### Summary

$R_f = 85.2$   
 $R_g = 96.1$   
 CIE  $R_a = 81.8$   
 $R_9 = 0.1$

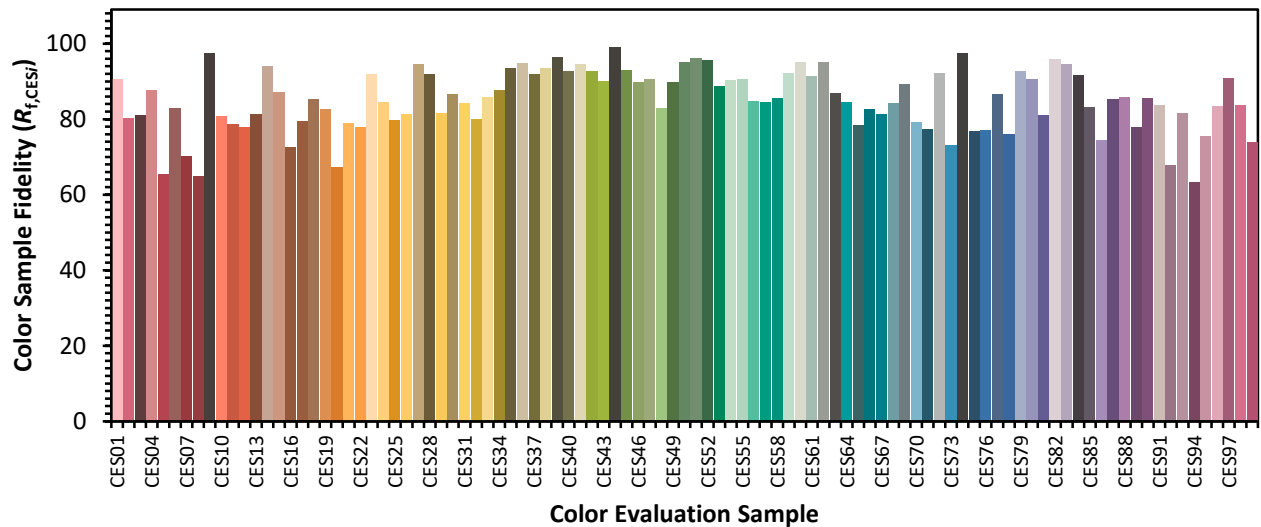


### Color Vector Graphics

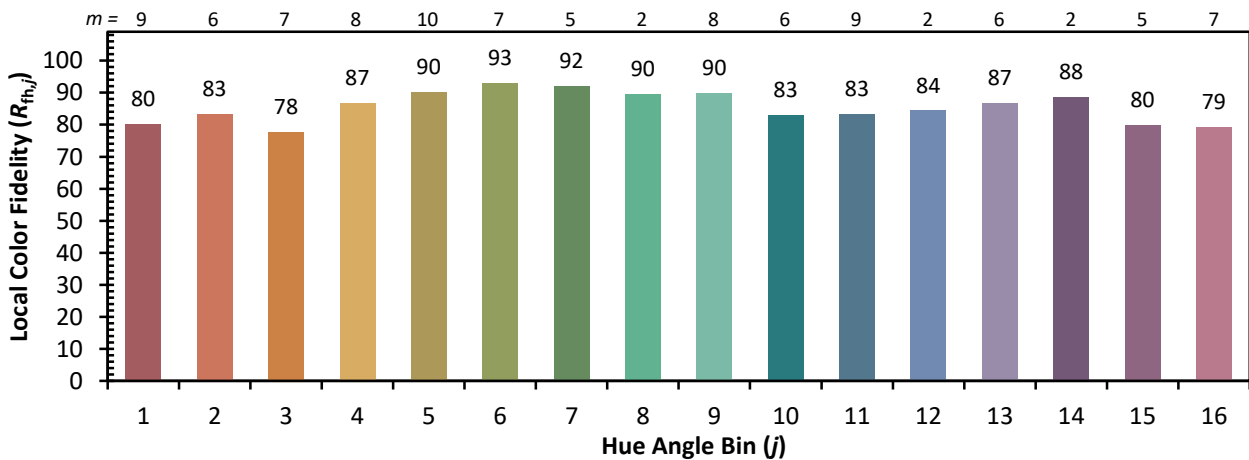
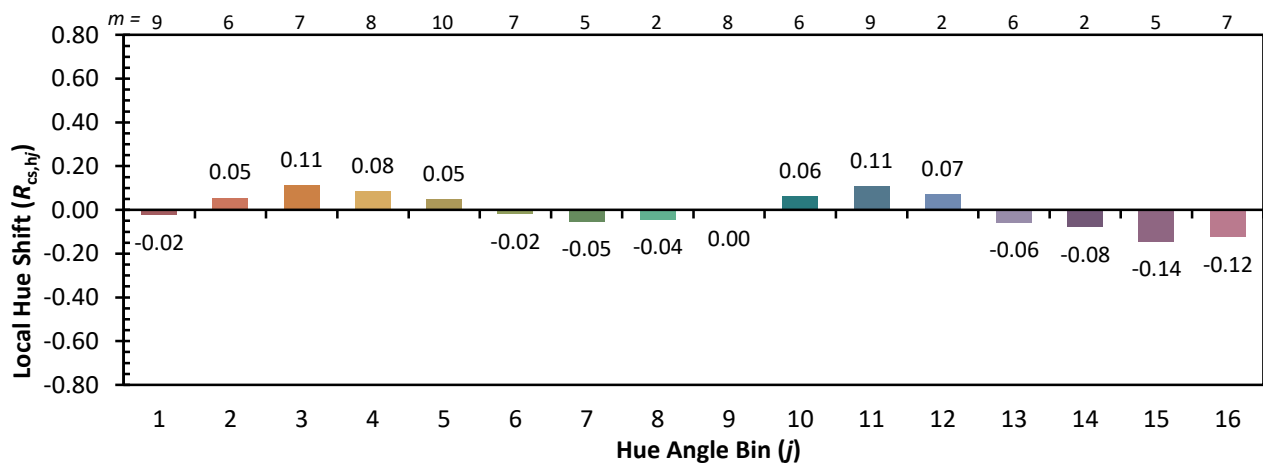
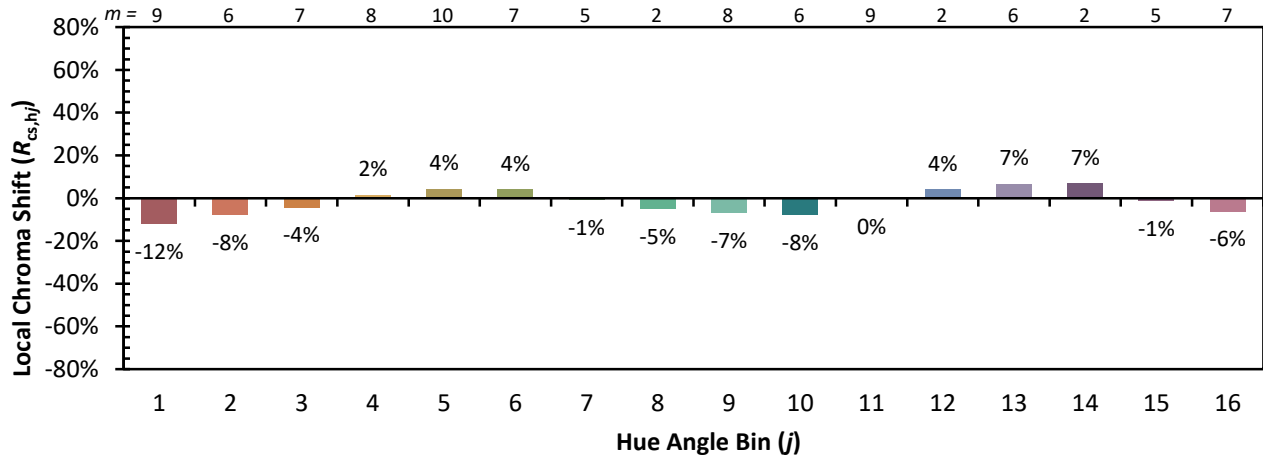


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

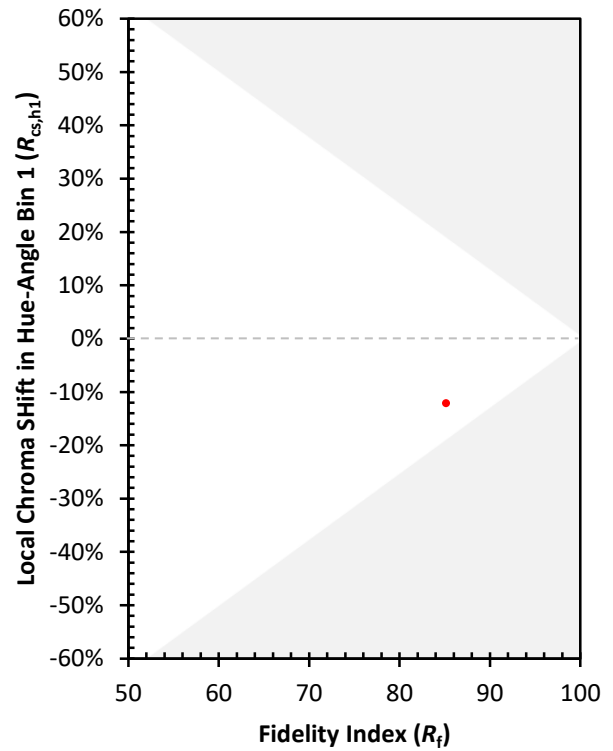
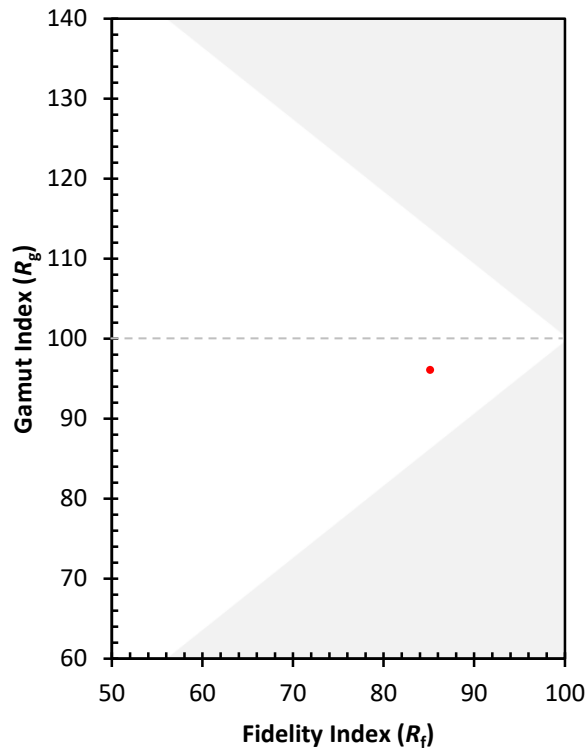
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 81 | CES51 = 96 | CES76 = 77 |
| CES02 = 61 | CES27 = 95 | CES52 = 96 | CES77 = 87 |
| CES03 = 31 | CES28 = 92 | CES53 = 89 | CES78 = 76 |
| CES04 = 69 | CES29 = 82 | CES54 = 90 | CES79 = 93 |
| CES05 = 48 | CES30 = 87 | CES55 = 91 | CES80 = 91 |
| CES06 = 50 | CES31 = 84 | CES56 = 85 | CES81 = 81 |
| CES07 = 40 | CES32 = 80 | CES57 = 84 | CES82 = 96 |
| CES08 = 39 | CES33 = 86 | CES58 = 85 | CES83 = 95 |
| CES09 = 29 | CES34 = 88 | CES59 = 92 | CES84 = 92 |
| CES10 = 74 | CES35 = 93 | CES60 = 95 | CES85 = 83 |
| CES11 = 57 | CES36 = 95 | CES61 = 91 | CES86 = 74 |
| CES12 = 63 | CES37 = 92 | CES62 = 95 | CES87 = 85 |
| CES13 = 42 | CES38 = 93 | CES63 = 87 | CES88 = 86 |
| CES14 = 74 | CES39 = 96 | CES64 = 84 | CES89 = 78 |
| CES15 = 71 | CES40 = 93 | CES65 = 78 | CES90 = 85 |
| CES16 = 47 | CES41 = 95 | CES66 = 83 | CES91 = 84 |
| CES17 = 49 | CES42 = 93 | CES67 = 81 | CES92 = 68 |
| CES18 = 56 | CES43 = 90 | CES68 = 84 | CES93 = 82 |
| CES19 = 71 | CES44 = 99 | CES69 = 89 | CES94 = 63 |
| CES20 = 65 | CES45 = 93 | CES70 = 79 | CES95 = 75 |
| CES21 = 86 | CES46 = 90 | CES71 = 77 | CES96 = 83 |
| CES22 = 78 | CES47 = 91 | CES72 = 92 | CES97 = 91 |
| CES23 = 91 | CES48 = 83 | CES73 = 73 | CES98 = 84 |
| CES24 = 90 | CES49 = 90 | CES74 = 98 | CES99 = 74 |
| CES25 = 71 | CES50 = 95 | CES75 = 77 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)