

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: McGRAW-EDISON

Report Number: P385772

Luminaire Tested: **GWC-SA1B-760-U-SL4-HSS**

Issue Date: 3/3/2020

### Test Information

Test Method: LM-79-08  
Report Number: P385772  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1903-205-25)  
Test Lab: INNOVATION CENTER  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: McGRAW-EDISON  
Catalog Number: GWC-SA1B-760-U-SL4-HSS  
Description: GALLEON WALL LUMINAIRE  
(1) 70 CRI, 5700K, 800mA LIGHTSQUARE WITH 16 LEDS AND TYPE IV SPILL LIGHT  
ELIMINATOR OPTICS WITH HOUSE SIDE SHIELD  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

### Summary

Lumens per Lamp: N/A  
Luminaire Lumens: 4954 lumens  
Efficiency: N/A  
Efficacy: 112.6 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 0.5' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B1 - U0 - G2

Input Watts (W): 44  
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: 28.75 FT



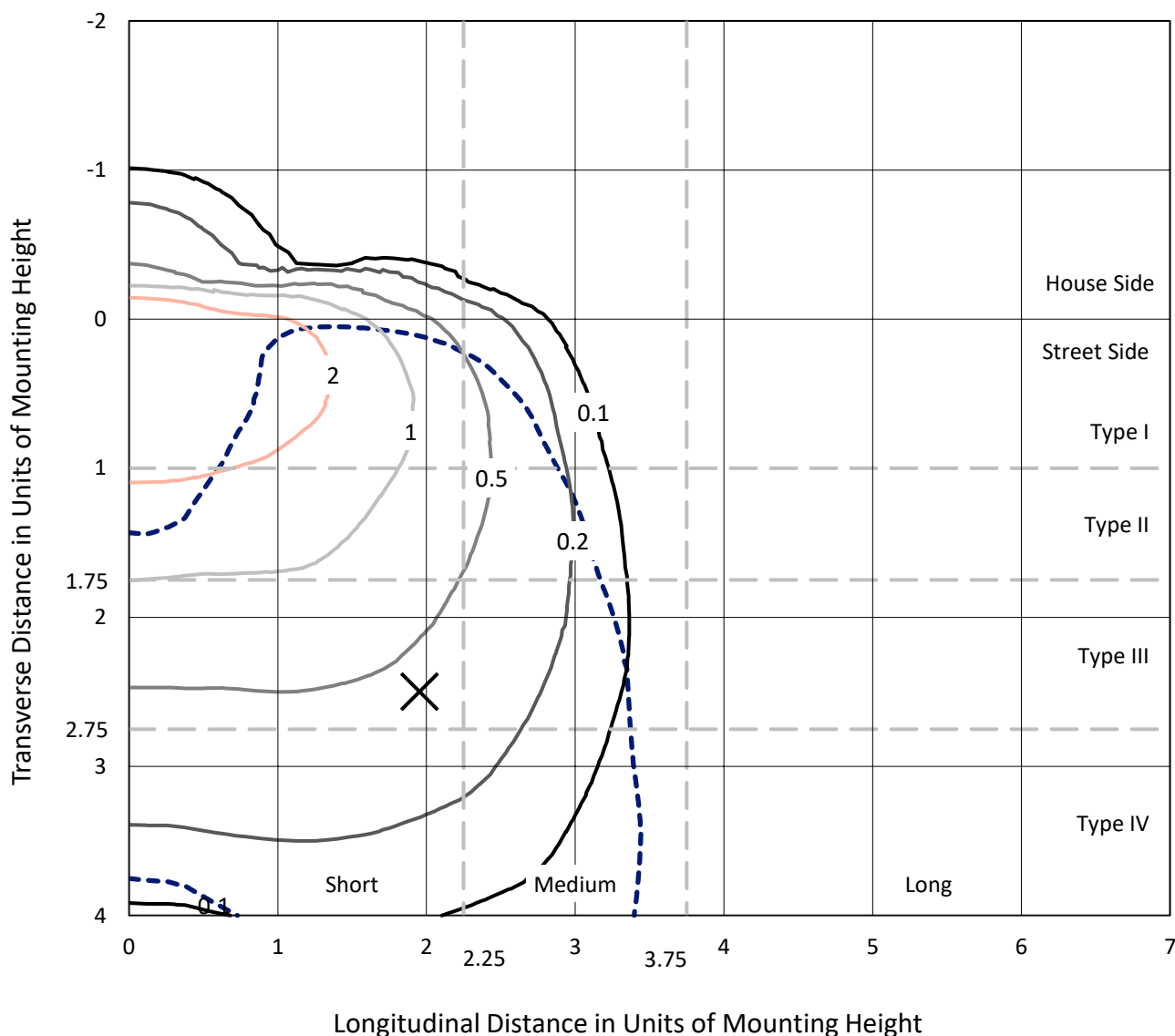
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CATALOG NUMBER: GWC-SA1B-760-U-SL4-HSS

## Iso-Footcandle Lines of Horizontal Illumination

× Max cd

--- 1/2 Max cd

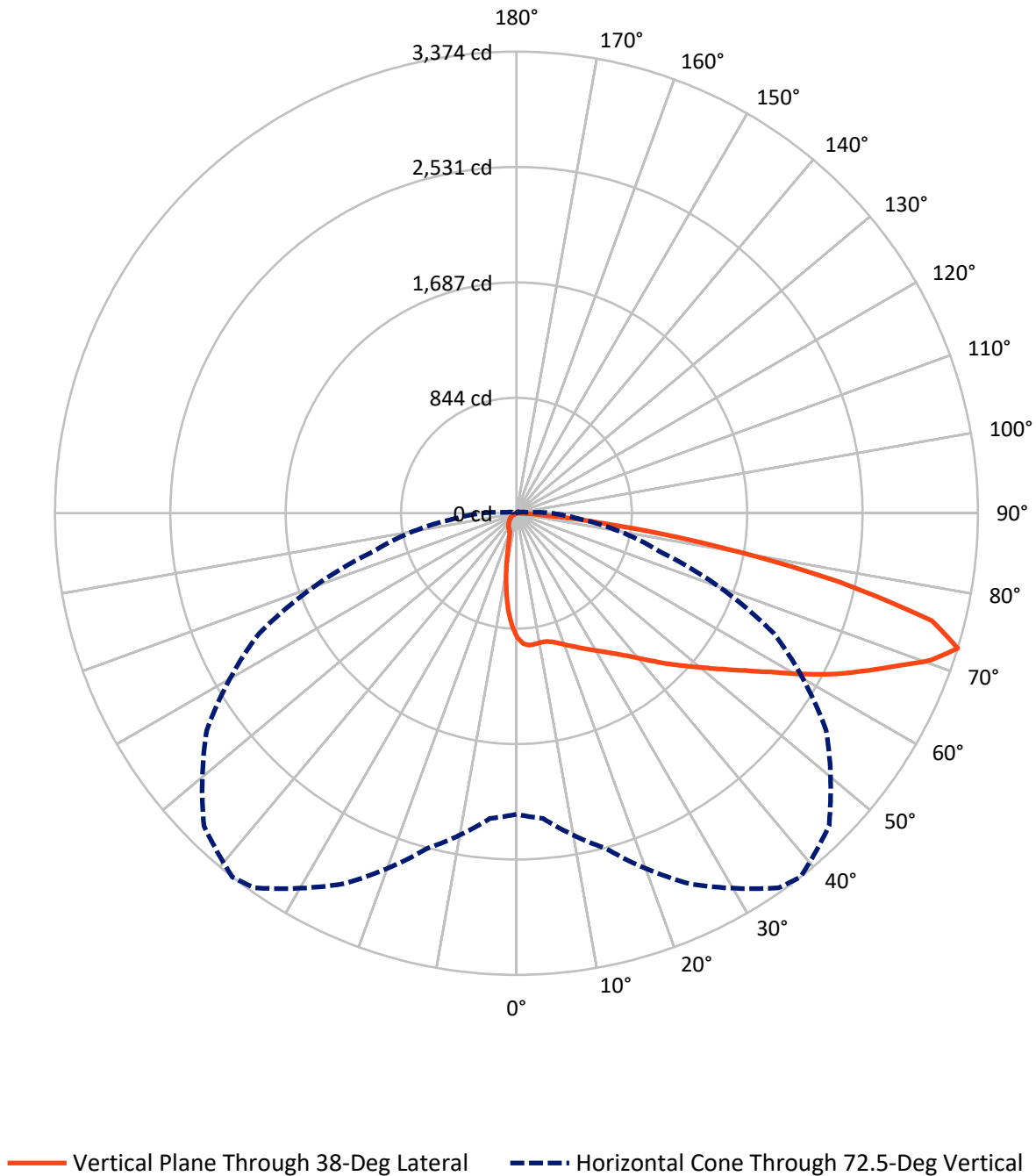


Based on 15 foot mounting height. Maximum calculated value = 4.3 fc  
 Type IV - Short - N/A

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CATALOG NUMBER: GWC-SA1B-760-U-SL4-HSS

## Luminous Intensity Polar Plot



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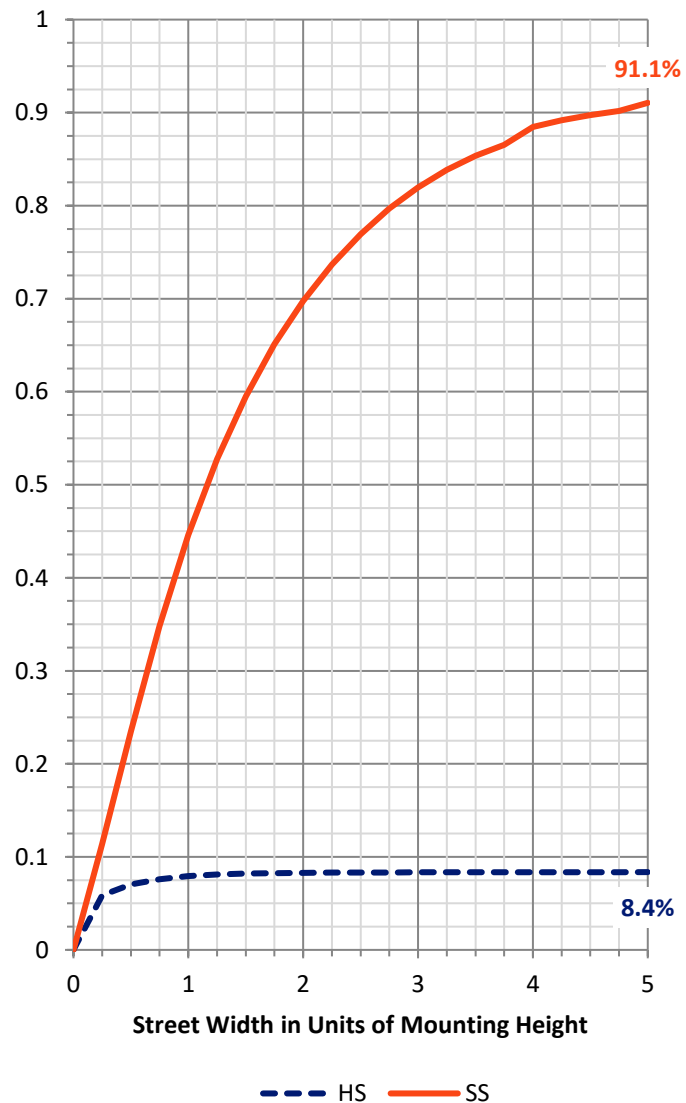
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 416.9    | 0.0    | 416.9  |
|                    | % Fixture | 8.4      | 0.0    | 8.4    |
| <b>Street Side</b> | Lumens    | 4537.1   | 0.0    | 4537.1 |
|                    | % Fixture | 91.6     | 0.0    | 91.6   |
| <b>Total</b>       | Lumens    | 4954.0   | 0.0    | 4954.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 77.6   | 1.6       |
| 10°-20°   | 189.8  | 3.8       |
| 20°-30°   | 301.9  | 6.1       |
| 30°-40°   | 453.9  | 9.2       |
| 40°-50°   | 692.5  | 14.0      |
| 50°-60°   | 978.7  | 19.8      |
| 60°-70°   | 1227.7 | 24.8      |
| 70°-80°   | 917.9  | 18.5      |
| 80°-90°   | 113.8  | 2.3       |
| 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°    | 4954.0 | 100.0     |
| 0°-180°   | 4954.0 | 100.0     |

**Coefficient of Utilization**



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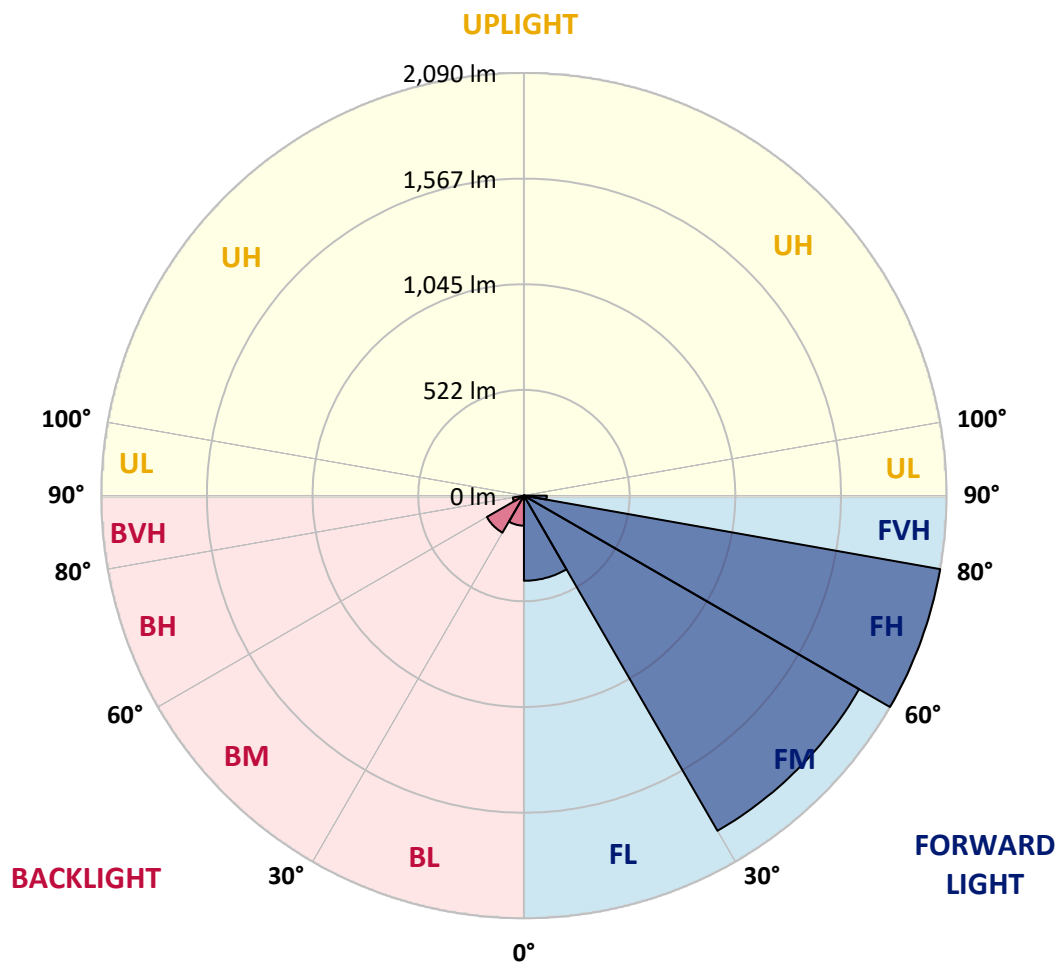
CATALOG NUMBER: GWC-SA1B-760-U-SL4-HSS

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 421.0  | 8.5       |                         |      |         |
| FM   | (30°-60°)   | 1913.5 | 38.6      |                         |      |         |
| FH   | (60°-80°)   | 2089.9 | 42.2      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 112.8  | 2.3       |                         |      | G2/225  |
| BL   | (0°-30°)    | 148.4  | 3.0       | B1/500                  |      |         |
| BM   | (30°-60°)   | 211.7  | 4.3       | B0/220                  |      |         |
| BH   | (60°-80°)   | 55.7   | 1.1       | B0/110                  |      | G0/110  |
| BVH  | (80°-90°)   | 1.1    | 0.0       |                         |      | G0/10   |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B1-U0-G2**

Type IV Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 38°    | 45°    | 55°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 911.0  | 911.0  | 911.0  | 911.0  | 911.0  | 911.0  | 911.0  | 911.0  | 911.0  | 911.0  | 911.0  |
| 2.5°  | 967.0  | 967.2  | 964.9  | 961.2  | 956.5  | 954.0  | 949.9  | 943.3  | 936.3  | 923.8  | 910.2  |
| 5°    | 986.7  | 986.7  | 983.9  | 978.9  | 971.3  | 969.0  | 961.2  | 950.7  | 936.3  | 916.0  | 893.1  |
| 7.5°  | 984.7  | 985.1  | 981.2  | 976.0  | 968.4  | 966.4  | 956.9  | 945.2  | 927.3  | 902.6  | 873.4  |
| 10°   | 974.0  | 975.0  | 971.9  | 969.5  | 962.5  | 960.2  | 951.3  | 939.6  | 921.7  | 895.4  | 861.9  |
| 12.5° | 963.1  | 964.1  | 965.1  | 967.4  | 963.1  | 962.3  | 955.3  | 945.4  | 928.3  | 900.9  | 863.1  |
| 15°   | 956.1  | 958.1  | 965.5  | 974.4  | 975.4  | 974.6  | 970.1  | 960.8  | 943.5  | 915.1  | 871.9  |
| 17.5° | 956.1  | 959.4  | 974.8  | 991.7  | 997.6  | 998.3  | 994.3  | 981.4  | 960.8  | 930.4  | 880.2  |
| 20°   | 964.1  | 968.6  | 992.7  | 1016.6 | 1026.4 | 1026.4 | 1018.8 | 1000.7 | 976.7  | 944.1  | 885.7  |
| 22.5° | 984.7  | 990.6  | 1020.9 | 1048.5 | 1059.0 | 1056.7 | 1046.4 | 1020.1 | 993.1  | 959.8  | 892.7  |
| 25°   | 1025.2 | 1029.7 | 1061.2 | 1089.0 | 1095.4 | 1090.2 | 1077.3 | 1043.5 | 1014.1 | 981.0  | 905.5  |
| 27.5° | 1077.5 | 1078.1 | 1110.6 | 1134.0 | 1130.1 | 1126.6 | 1110.4 | 1072.9 | 1044.3 | 1011.2 | 927.5  |
| 30°   | 1134.9 | 1134.9 | 1163.5 | 1181.4 | 1169.4 | 1166.6 | 1150.3 | 1108.5 | 1083.0 | 1052.4 | 958.8  |
| 32.5° | 1190.4 | 1192.9 | 1216.1 | 1227.5 | 1214.1 | 1211.2 | 1195.4 | 1153.6 | 1134.5 | 1115.1 | 1007.5 |
| 35°   | 1244.1 | 1246.0 | 1268.0 | 1274.2 | 1261.4 | 1262.2 | 1250.9 | 1215.5 | 1208.3 | 1205.9 | 1081.0 |
| 37.5° | 1296.2 | 1296.6 | 1319.0 | 1322.9 | 1316.5 | 1323.5 | 1324.6 | 1293.3 | 1306.7 | 1326.6 | 1184.5 |
| 40°   | 1343.7 | 1344.1 | 1366.3 | 1376.4 | 1387.3 | 1396.4 | 1404.4 | 1387.7 | 1432.0 | 1478.3 | 1307.7 |
| 42.5° | 1381.8 | 1386.1 | 1414.3 | 1433.4 | 1462.2 | 1479.5 | 1501.3 | 1500.5 | 1581.1 | 1650.7 | 1456.7 |
| 45°   | 1415.3 | 1422.7 | 1462.0 | 1495.5 | 1544.9 | 1572.5 | 1606.6 | 1633.4 | 1749.0 | 1842.6 | 1607.5 |
| 47.5° | 1459.5 | 1466.5 | 1511.4 | 1566.3 | 1632.1 | 1668.4 | 1724.9 | 1782.8 | 1933.6 | 2031.1 | 1754.8 |
| 50°   | 1521.9 | 1518.8 | 1563.0 | 1641.8 | 1726.4 | 1773.9 | 1854.6 | 1941.2 | 2116.7 | 2195.3 | 1841.4 |
| 52.5° | 1588.3 | 1587.1 | 1619.8 | 1723.9 | 1837.5 | 1893.0 | 1999.6 | 2104.9 | 2291.8 | 2308.4 | 1881.1 |
| 55°   | 1670.6 | 1661.8 | 1689.3 | 1817.5 | 1969.4 | 2029.0 | 2154.5 | 2267.1 | 2431.2 | 2372.2 | 1901.1 |
| 57.5° | 1756.8 | 1742.2 | 1768.6 | 1921.8 | 2118.1 | 2188.7 | 2326.1 | 2425.1 | 2524.0 | 2415.8 | 1900.8 |
| 60°   | 1845.9 | 1828.6 | 1859.9 | 2052.3 | 2302.9 | 2384.5 | 2512.1 | 2531.9 | 2610.7 | 2437.8 | 1886.9 |
| 62.5° | 1920.4 | 1910.1 | 1956.6 | 2191.8 | 2509.2 | 2589.5 | 2652.6 | 2629.0 | 2683.7 | 2454.9 | 1854.1 |
| 65°   | 1999.2 | 1999.8 | 2074.9 | 2354.5 | 2728.5 | 2782.7 | 2788.0 | 2754.9 | 2744.8 | 2451.4 | 1743.5 |
| 67.5° | 2105.8 | 2115.6 | 2240.9 | 2575.5 | 2941.9 | 2983.7 | 2983.3 | 2891.3 | 2789.4 | 2312.3 | 1498.0 |
| 70°   | 2218.5 | 2241.8 | 2432.3 | 2828.3 | 3174.8 | 3217.2 | 3195.4 | 2978.1 | 2626.5 | 1869.8 | 1060.2 |
| 72.5° | 2199.6 | 2239.9 | 2538.6 | 2987.8 | 3342.1 | 3374.4 | 3232.6 | 2764.8 | 2075.9 | 1086.7 | 451.4  |
| 75°   | 1697.0 | 1743.7 | 2327.8 | 2829.8 | 3166.6 | 3137.6 | 2777.5 | 2151.4 | 1134.5 | 303.3  | 101.6  |
| 77.5° | 896.4  | 921.3  | 1537.7 | 2155.8 | 2469.1 | 2408.4 | 1956.6 | 1193.5 | 345.9  | 75.1   | 45.7   |
| 80°   | 469.5  | 475.3  | 670.1  | 1223.1 | 1523.9 | 1524.3 | 1159.6 | 524.2  | 142.6  | 38.5   | 30.7   |
| 82.5° | 251.4  | 256.4  | 354.1  | 565.2  | 798.5  | 723.8  | 444.0  | 288.4  | 82.9   | 21.8   | 29.4   |
| 85°   | 60.5   | 61.5   | 200.8  | 258.2  | 314.0  | 224.3  | 131.9  | 242.2  | 22.4   | 12.8   | 23.9   |
| 87.5° | 23.2   | 23.7   | 74.5   | 111.7  | 80.0   | 51.8   | 61.7   | 90.3   | 2.9    | 4.9    | 3.7    |
| 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: GWC-SA1B-760-U-SL4-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 911.0  | 911.0  | 911.0 | 911.0 | 911.0 | 911.0 | 911.0 | 911.0 | 911.0 | 911.0 | 911.0 |
| 2.5°  | 902.0  | 896.6  | 883.5 | 866.8 | 852.0 | 841.3 | 825.2 | 814.7 | 807.7 | 807.5 | 804.9 |
| 5°    | 879.1  | 868.2  | 839.8 | 806.1 | 775.4 | 747.9 | 715.4 | 689.6 | 670.5 | 667.4 | 660.8 |
| 7.5°  | 854.7  | 836.8  | 793.1 | 740.5 | 689.0 | 636.8 | 576.1 | 538.4 | 506.1 | 490.7 | 489.0 |
| 10°   | 839.6  | 814.5  | 752.6 | 676.5 | 595.8 | 510.9 | 431.4 | 376.5 | 336.8 | 325.5 | 317.0 |
| 12.5° | 836.5  | 803.4  | 721.3 | 616.4 | 501.2 | 388.9 | 301.0 | 242.6 | 210.9 | 200.8 | 198.1 |
| 15°   | 839.6  | 798.3  | 695.0 | 556.9 | 405.3 | 275.9 | 202.0 | 168.1 | 156.2 | 153.3 | 153.1 |
| 17.5° | 841.5  | 792.1  | 665.2 | 490.9 | 312.3 | 197.1 | 154.7 | 144.8 | 143.0 | 142.8 | 143.2 |
| 20°   | 841.3  | 782.6  | 629.6 | 417.2 | 232.3 | 154.9 | 139.9 | 137.8 | 137.4 | 137.6 | 137.4 |
| 22.5° | 839.8  | 771.5  | 590.5 | 341.3 | 175.5 | 138.5 | 133.5 | 132.3 | 132.1 | 132.1 | 132.1 |
| 25°   | 842.5  | 762.7  | 547.5 | 268.7 | 144.6 | 130.9 | 127.8 | 126.7 | 126.5 | 126.5 | 126.1 |
| 27.5° | 852.2  | 757.7  | 500.4 | 206.8 | 130.6 | 124.1 | 121.6 | 121.4 | 120.8 | 120.6 | 121.0 |
| 30°   | 867.8  | 757.7  | 448.7 | 160.9 | 122.2 | 117.1 | 115.2 | 114.8 | 114.6 | 114.4 | 114.6 |
| 32.5° | 895.4  | 763.5  | 392.3 | 133.7 | 114.2 | 109.2 | 108.0 | 108.6 | 108.0 | 108.0 | 108.0 |
| 35°   | 945.2  | 780.8  | 333.3 | 116.7 | 105.8 | 101.6 | 100.4 | 101.2 | 100.8 | 100.8 | 100.6 |
| 37.5° | 1017.8 | 812.9  | 273.8 | 106.4 | 98.3  | 94.0  | 92.4  | 93.6  | 93.2  | 93.2  | 93.0  |
| 40°   | 1106.3 | 859.6  | 217.3 | 98.6  | 91.1  | 86.6  | 85.2  | 85.8  | 84.8  | 84.8  | 85.2  |
| 42.5° | 1215.5 | 918.8  | 167.9 | 90.9  | 83.9  | 79.6  | 78.8  | 78.2  | 76.3  | 75.3  | 75.5  |
| 45°   | 1336.9 | 980.6  | 130.9 | 83.5  | 77.2  | 73.7  | 72.4  | 70.8  | 67.7  | 65.6  | 65.8  |
| 47.5° | 1445.3 | 1028.1 | 106.4 | 76.3  | 71.0  | 68.3  | 66.5  | 63.4  | 58.8  | 56.4  | 56.6  |
| 50°   | 1502.3 | 1035.3 | 90.5  | 69.1  | 65.2  | 62.5  | 59.9  | 55.1  | 49.8  | 47.1  | 46.9  |
| 52.5° | 1516.9 | 1001.6 | 78.8  | 62.5  | 59.5  | 56.4  | 52.9  | 46.5  | 40.5  | 37.7  | 37.2  |
| 55°   | 1522.3 | 950.1  | 68.3  | 56.4  | 53.3  | 49.8  | 45.3  | 38.1  | 32.5  | 29.6  | 29.4  |
| 57.5° | 1504.6 | 873.4  | 60.1  | 50.8  | 47.1  | 42.8  | 37.2  | 30.4  | 25.1  | 22.8  | 22.8  |
| 60°   | 1465.3 | 769.5  | 53.7  | 44.9  | 40.7  | 35.8  | 30.0  | 23.7  | 18.7  | 16.9  | 16.9  |
| 62.5° | 1386.9 | 634.9  | 47.7  | 38.7  | 34.8  | 29.6  | 24.3  | 17.9  | 13.2  | 12.1  | 12.3  |
| 65°   | 1239.0 | 481.6  | 41.8  | 33.1  | 29.6  | 24.5  | 18.9  | 12.8  | 8.8   | 8.8   | 9.3   |
| 67.5° | 1010.4 | 334.5  | 35.6  | 28.2  | 25.5  | 20.0  | 14.4  | 8.8   | 6.2   | 7.0   | 7.8   |
| 70°   | 668.9  | 187.6  | 30.4  | 23.2  | 21.8  | 15.8  | 10.7  | 6.0   | 4.9   | 6.6   | 8.0   |
| 72.5° | 252.4  | 73.0   | 25.5  | 18.7  | 18.9  | 12.1  | 7.6   | 4.5   | 4.5   | 7.2   | 9.5   |
| 75°   | 70.4   | 35.8   | 18.3  | 13.8  | 14.8  | 8.8   | 5.6   | 3.9   | 4.3   | 8.2   | 11.1  |
| 77.5° | 41.4   | 26.3   | 11.9  | 8.0   | 10.1  | 6.2   | 3.7   | 3.1   | 3.7   | 7.0   | 10.7  |
| 80°   | 33.3   | 14.0   | 7.0   | 4.1   | 5.6   | 3.5   | 2.5   | 1.9   | 1.0   | 2.7   | 5.6   |
| 82.5° | 33.3   | 8.4    | 3.3   | 2.9   | 2.9   | 1.9   | 1.2   | 0.8   | 0.2   | 0.0   | 1.4   |
| 85°   | 22.4   | 3.5    | 2.1   | 1.9   | 1.4   | 0.6   | 0.4   | 0.2   | 0.0   | 0.0   | 0.0   |
| 87.5° | 3.7    | 1.4    | 0.8   | 0.4   | 0.2   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 90°   | 0.0    | 0.0    | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |



Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

INVUE

Report Number: SP1-2012-088-5-R3

Luminaire Tested: CCW-SA1A-760-U-SL2-HSS

Test Date: 01/19/2021

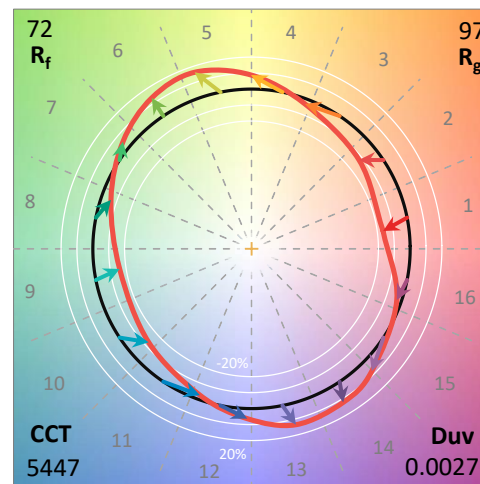
### Test Information

Test Method: LM-79-08  
 Report Number: SP1-2012-088-5-R3  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1  
 Measurement Geometry:  $4\pi$   
 Issue Date: 01/19/2021  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: INVUE  
 Catalog Number: **CCW-SA1A-760-U-SL2-HSS**  
 Description: INVUE WALL PACK

\*\*\*THIS IS A REVISION OF SP1-2012-088-5-R2. TO UPDATE THE CATALOG  
 INFORMATION.\*\*\*TESTED IN SITU. INVUE WALL PACK LIGHT SQUARE T2 OPTICS 1-SQUARE WITH  
 HOUSE SIDE SHIELD

### Spectral Parameters

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 5447   | CRI (Ra): | 71.9 |      |       |
| CIE u':                   | 0.2053 | R1:       | 70.7 | R9:  | -27.5 |
| CIE v':                   | 0.4809 | R2:       | 74.8 | R10: | 41.5  |
| Duv:                      | 0.0027 | R3:       | 78.7 | R11: | 74.9  |
| CIE x:                    | 0.3337 | R4:       | 74.0 | R12: | 49.9  |
| CIE y:                    | 0.3473 | R5:       | 72.5 | R13: | 70.2  |
| CIE z:                    | 0.3190 | R6:       | 67.7 | R14: | 88.1  |
| Peak Wavelength (nm):     | 443    | R7:       | 77.7 |      |       |
| Dominant Wavelength (nm): | 556    | R8:       | 58.8 |      |       |
| Purity:                   | 4.5    |           |      |      |       |
| Rf:                       | 72.3   |           |      |      |       |
| Rg:                       | 97.2   |           |      |      |       |



### Test Conditions

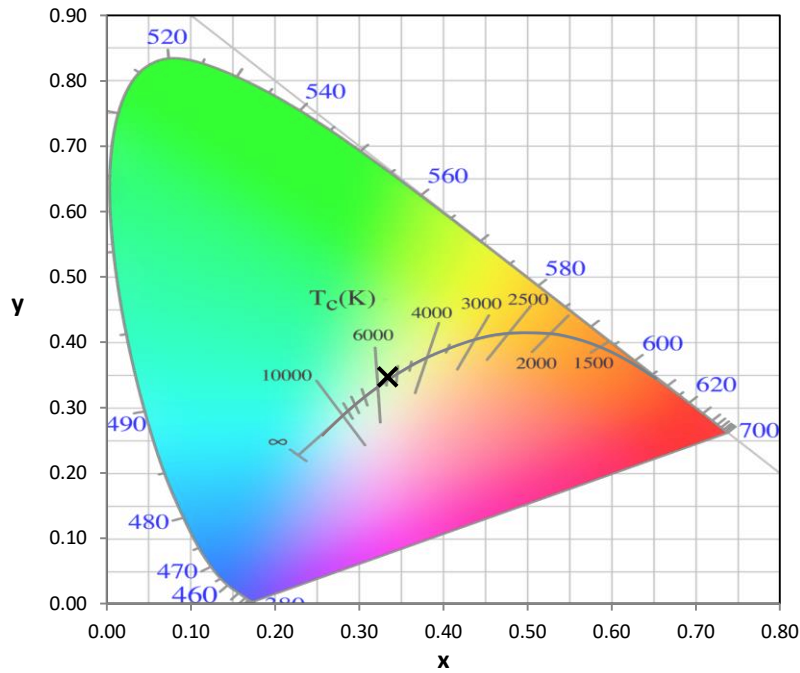
Stabilization Time: 75M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.4/18%  
 Sphere Temperature (°C): 25.3

REPORT NUMBER: SP1-2012-088-5-R3

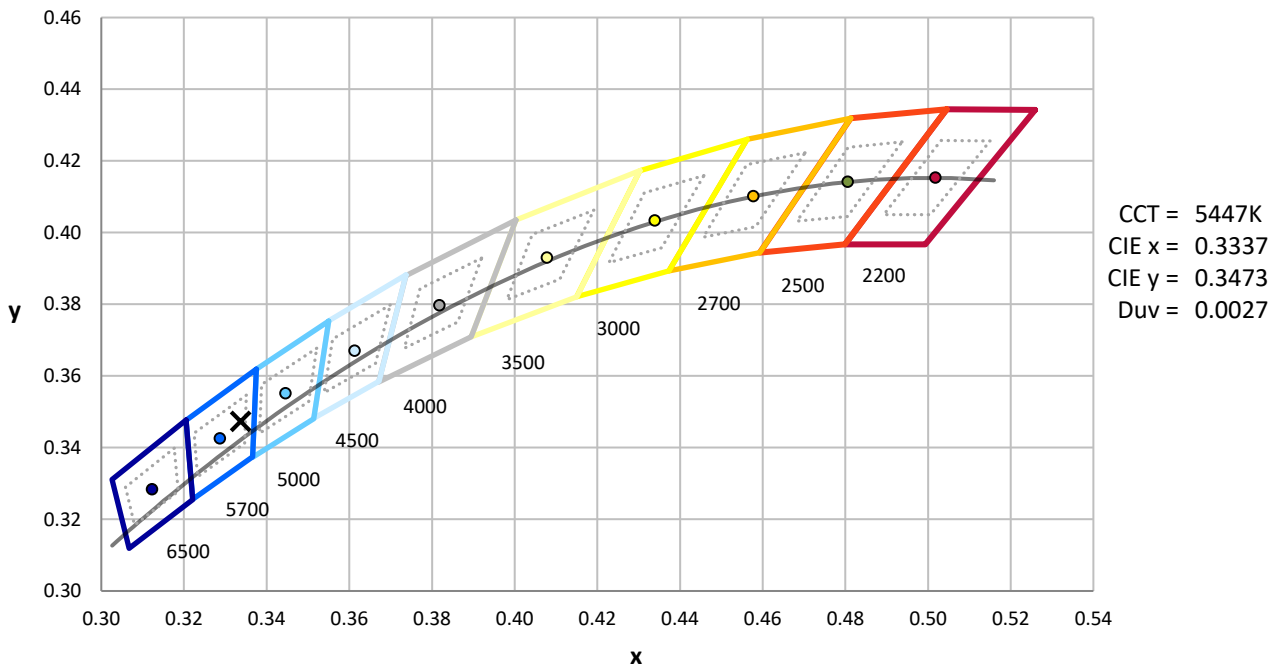
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 7/29/2020        | 1/29/2021            |
| 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: SP1-2012-088-5-R3

**CIE 1931 Chromaticity Diagram**



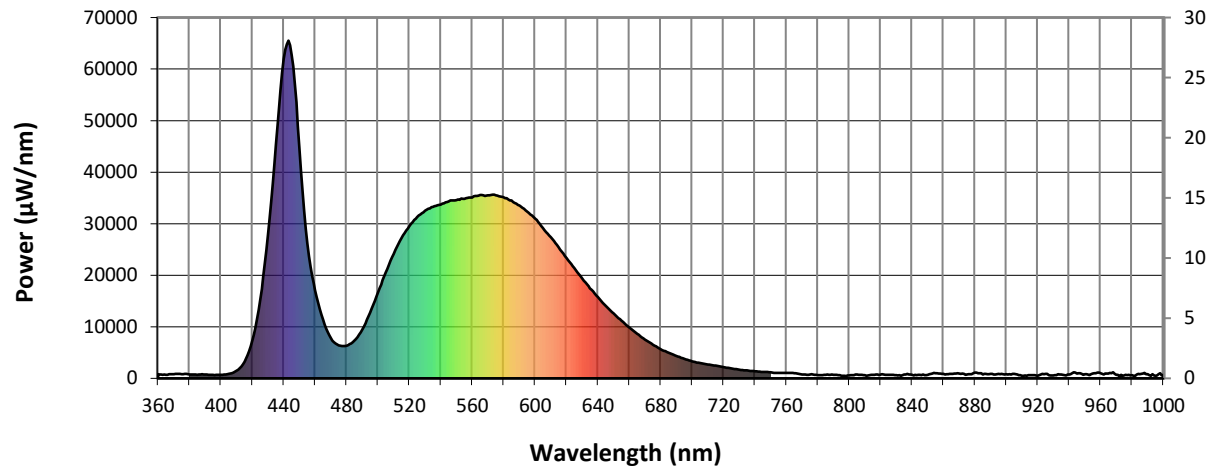
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 5700K 4-step quadrangle

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### Photopic Flux vs. Wavelength

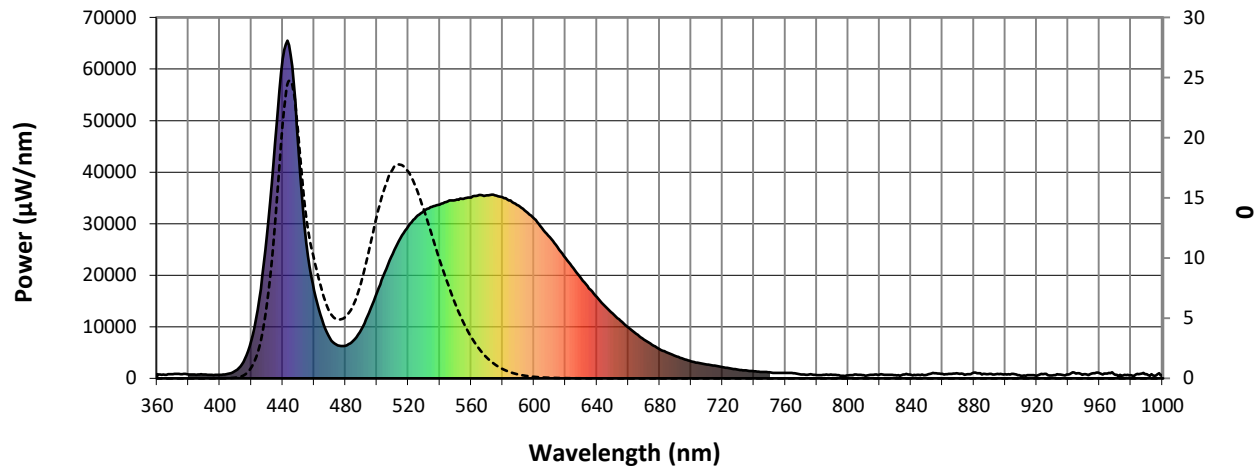


#####

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 828              | 0.0              | 490       | 9471             | 1.3              | 620       | 23317            | 6.1              | 750       | 1157             | 0.0              | 880       | 1136             | 0.0              |
| 365       | 696              | 0.0              | 495       | 12752            | 2.3              | 625       | 21413            | 4.7              | 755       | 1067             | 0.0              | 885       | 773              | 0.0              |
| 370       | 807              | 0.0              | 500       | 16685            | 3.7              | 630       | 19344            | 3.5              | 760       | 1059             | 0.0              | 890       | 872              | 0.0              |
| 375       | 837              | 0.0              | 505       | 20565            | 5.8              | 635       | 17464            | 2.6              | 765       | 1009             | 0.0              | 895       | 891              | 0.0              |
| 380       | 757              | 0.0              | 510       | 24119            | 8.3              | 640       | 15745            | 1.9              | 770       | 774              | 0.0              | 900       | 807              | 0.0              |
| 385       | 706              | 0.0              | 515       | 27181            | 11.3             | 645       | 14060            | 1.4              | 775       | 761              | 0.0              | 905       | 899              | 0.0              |
| 390       | 746              | 0.0              | 520       | 29555            | 14.3             | 650       | 12579            | 0.9              | 780       | 653              | 0.0              | 910       | 506              | 0.0              |
| 395       | 660              | 0.0              | 525       | 31307            | 16.8             | 655       | 11181            | 0.6              | 785       | 704              | 0.0              | 915       | 598              | 0.0              |
| 400       | 671              | 0.0              | 530       | 32558            | 19.2             | 660       | 9847             | 0.4              | 790       | 663              | 0.0              | 920       | 510              | 0.0              |
| 405       | 848              | 0.0              | 535       | 33301            | 20.7             | 665       | 8641             | 0.3              | 795       | 493              | 0.0              | 925       | 874              | 0.0              |
| 410       | 1490             | 0.0              | 540       | 33727            | 22.0             | 670       | 7535             | 0.2              | 800       | 584              | 0.0              | 930       | 549              | 0.0              |
| 415       | 3203             | 0.0              | 545       | 34356            | 22.9             | 675       | 6542             | 0.1              | 805       | 739              | 0.0              | 935       | 720              | 0.0              |
| 420       | 7298             | 0.0              | 550       | 34589            | 23.5             | 680       | 5664             | 0.1              | 810       | 601              | 0.0              | 940       | 754              | 0.0              |
| 425       | 15315            | 0.1              | 555       | 34855            | 23.8             | 685       | 4962             | 0.0              | 815       | 677              | 0.0              | 945       | 931              | 0.0              |
| 430       | 27886            | 0.2              | 560       | 35083            | 23.8             | 690       | 4369             | 0.0              | 820       | 726              | 0.0              | 950       | 811              | 0.0              |
| 435       | 45485            | 0.5              | 565       | 35553            | 23.6             | 695       | 3785             | 0.0              | 825       | 693              | 0.0              | 955       | 955              | 0.0              |
| 440       | 61965            | 1.0              | 570       | 35511            | 23.1             | 700       | 3318             | 0.0              | 830       | 619              | 0.0              | 960       | 1025             | 0.0              |
| 445       | 62721            | 1.3              | 575       | 35515            | 22.1             | 705       | 2962             | 0.0              | 835       | 738              | 0.0              | 965       | 916              | 0.0              |
| 450       | 44754            | 1.2              | 580       | 35114            | 20.9             | 710       | 2689             | 0.0              | 840       | 681              | 0.0              | 970       | 695              | 0.0              |
| 455       | 26152            | 0.9              | 585       | 34546            | 19.2             | 715       | 2476             | 0.0              | 845       | 691              | 0.0              | 975       | 568              | 0.0              |
| 460       | 17101            | 0.7              | 590       | 33522            | 17.3             | 720       | 2192             | 0.0              | 850       | 710              | 0.0              | 980       | 643              | 0.0              |
| 465       | 11400            | 0.6              | 595       | 32326            | 15.3             | 725       | 1939             | 0.0              | 855       | 1025             | 0.0              | 985       | 804              | 0.0              |
| 470       | 7763             | 0.5              | 600       | 30973            | 13.3             | 730       | 1698             | 0.0              | 860       | 889              | 0.0              | 990       | 812              | 0.0              |
| 475       | 6419             | 0.5              | 605       | 29160            | 11.3             | 735       | 1533             | 0.0              | 865       | 885              | 0.0              | 995       | 496              | 0.0              |
| 480       | 6330             | 0.6              | 610       | 27373            | 9.4              | 740       | 1375             | 0.0              | 870       | 905              | 0.0              | 1000      | 659              | 0.0              |
| 485       | 7299             | 0.9              | 615       | 25423            | 7.7              | 745       | 1254             | 0.0              | 875       | 739              | 0.0              |           |                  |                  |

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### Scotopic Flux vs. Wavelength



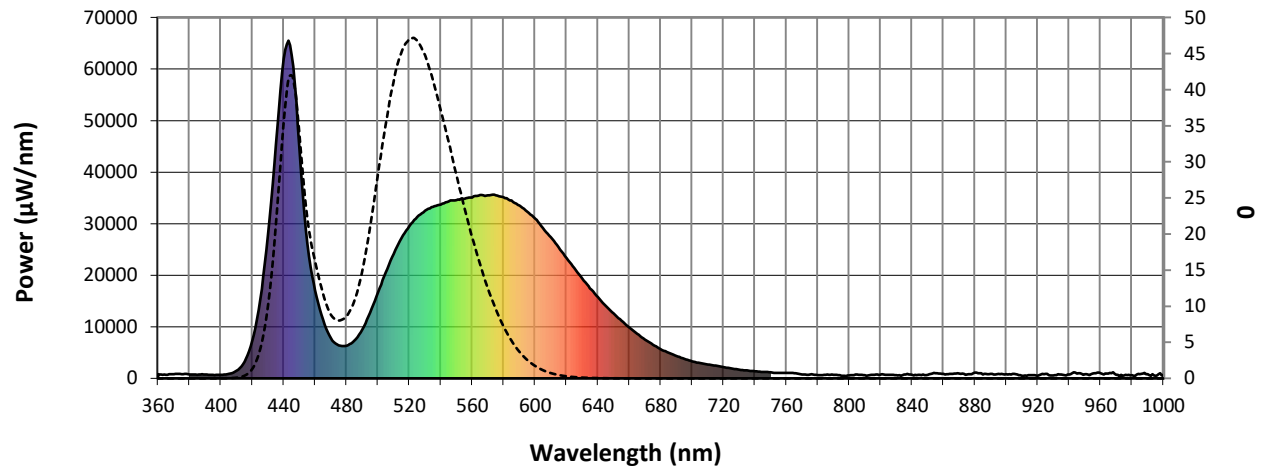
Scotopic Lumens: 1610.2

S/P: 0.74

| 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       | 828              | 0.0              | 490       | 9471             | 14.6             | 620       | 23317            | 0.3              | 750       | 1157             | 0.0              | 880       | 1136             | 0.0              |
| 365       | 696              | 0.0              | 495       | 12752            | 20.6             | 625       | 21413            | 0.2              | 755       | 1067             | 0.0              | 885       | 773              | 0.0              |
| 370       | 807              | 0.0              | 500       | 16685            | 27.9             | 630       | 19344            | 0.1              | 760       | 1059             | 0.0              | 890       | 872              | 0.0              |
| 375       | 837              | 0.0              | 505       | 20565            | 35.0             | 635       | 17464            | 0.1              | 765       | 1009             | 0.0              | 895       | 891              | 0.0              |
| 380       | 757              | 0.0              | 510       | 24119            | 40.9             | 640       | 15745            | 0.0              | 770       | 774              | 0.0              | 900       | 807              | 0.0              |
| 385       | 706              | 0.0              | 515       | 27181            | 45.1             | 645       | 14060            | 0.0              | 775       | 761              | 0.0              | 905       | 899              | 0.0              |
| 390       | 746              | 0.0              | 520       | 29555            | 47.0             | 650       | 12579            | 0.0              | 780       | 653              | 0.0              | 910       | 506              | 0.0              |
| 395       | 660              | 0.0              | 525       | 31307            | 46.8             | 655       | 11181            | 0.0              | 785       | 704              | 0.0              | 915       | 598              | 0.0              |
| 400       | 671              | 0.0              | 530       | 32558            | 44.9             | 660       | 9847             | 0.0              | 790       | 663              | 0.0              | 920       | 510              | 0.0              |
| 405       | 848              | 0.0              | 535       | 33301            | 41.5             | 665       | 8641             | 0.0              | 795       | 493              | 0.0              | 925       | 874              | 0.0              |
| 410       | 1490             | 0.1              | 540       | 33727            | 37.3             | 670       | 7535             | 0.0              | 800       | 584              | 0.0              | 930       | 549              | 0.0              |
| 415       | 3203             | 0.3              | 545       | 34356            | 32.9             | 675       | 6542             | 0.0              | 805       | 739              | 0.0              | 935       | 720              | 0.0              |
| 420       | 7298             | 1.2              | 550       | 34589            | 28.3             | 680       | 5664             | 0.0              | 810       | 601              | 0.0              | 940       | 754              | 0.0              |
| 425       | 15315            | 3.7              | 555       | 34855            | 23.8             | 685       | 4962             | 0.0              | 815       | 677              | 0.0              | 945       | 931              | 0.0              |
| 430       | 27886            | 9.5              | 560       | 35083            | 19.6             | 690       | 4369             | 0.0              | 820       | 726              | 0.0              | 950       | 811              | 0.0              |
| 435       | 45485            | 20.3             | 565       | 35553            | 16.0             | 695       | 3785             | 0.0              | 825       | 693              | 0.0              | 955       | 955              | 0.0              |
| 440       | 61965            | 34.6             | 570       | 35511            | 12.5             | 700       | 3318             | 0.0              | 830       | 619              | 0.0              | 960       | 1025             | 0.0              |
| 445       | 62721            | 42.0             | 575       | 35515            | 9.7              | 705       | 2962             | 0.0              | 835       | 738              | 0.0              | 965       | 916              | 0.0              |
| 450       | 44754            | 34.7             | 580       | 35114            | 7.2              | 710       | 2689             | 0.0              | 840       | 681              | 0.0              | 970       | 695              | 0.0              |
| 455       | 26152            | 22.9             | 585       | 34546            | 5.3              | 715       | 2476             | 0.0              | 845       | 691              | 0.0              | 975       | 568              | 0.0              |
| 460       | 17101            | 16.5             | 590       | 33522            | 3.7              | 720       | 2192             | 0.0              | 850       | 710              | 0.0              | 980       | 643              | 0.0              |
| 465       | 11400            | 12.0             | 595       | 32326            | 2.6              | 725       | 1939             | 0.0              | 855       | 1025             | 0.0              | 985       | 804              | 0.0              |
| 470       | 7763             | 8.9              | 600       | 30973            | 1.7              | 730       | 1698             | 0.0              | 860       | 889              | 0.0              | 990       | 812              | 0.0              |
| 475       | 6419             | 8.0              | 605       | 29160            | 1.1              | 735       | 1533             | 0.0              | 865       | 885              | 0.0              | 995       | 496              | 0.0              |
| 480       | 6330             | 8.5              | 610       | 27373            | 0.7              | 740       | 1375             | 0.0              | 870       | 905              | 0.0              | 1000      | 659              | 0.0              |
| 485       | 7299             | 10.6             | 615       | 25423            | 0.5              | 745       | 1254             | 0.0              | 875       | 739              | 0.0              |           |                  |                  |

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### Melanopic Flux vs. Wavelength

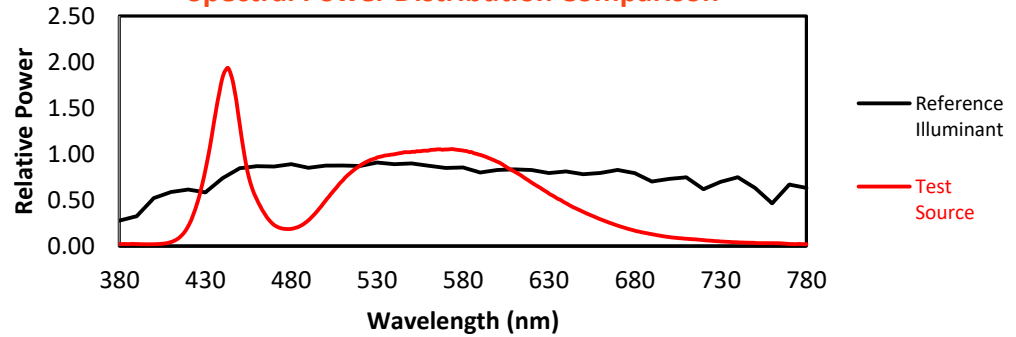

**Melanopic Lumens: 4010.3**
**S/P: 1.85**

| 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       | 828              | 0.0              | 490       | 9471             | 7.9              | 620       | 23317            | 0.0              | 750       | 1157             | 0.0              | 880       | 1136             | 0.0              |
| 365       | 696              | 0.0              | 495       | 12752            | 10.5             | 625       | 21413            | 0.0              | 755       | 1067             | 0.0              | 885       | 773              | 0.0              |
| 370       | 807              | 0.0              | 500       | 16685            | 13.4             | 630       | 19344            | 0.0              | 760       | 1059             | 0.0              | 890       | 872              | 0.0              |
| 375       | 837              | 0.0              | 505       | 20565            | 15.8             | 635       | 17464            | 0.0              | 765       | 1009             | 0.0              | 895       | 891              | 0.0              |
| 380       | 757              | 0.0              | 510       | 24119            | 17.3             | 640       | 15745            | 0.0              | 770       | 774              | 0.0              | 900       | 807              | 0.0              |
| 385       | 706              | 0.0              | 515       | 27181            | 17.8             | 645       | 14060            | 0.0              | 775       | 761              | 0.0              | 905       | 899              | 0.0              |
| 390       | 746              | 0.0              | 520       | 29555            | 17.2             | 650       | 12579            | 0.0              | 780       | 653              | 0.0              | 910       | 506              | 0.0              |
| 395       | 660              | 0.0              | 525       | 31307            | 15.9             | 655       | 11181            | 0.0              | 785       | 704              | 0.0              | 915       | 598              | 0.0              |
| 400       | 671              | 0.0              | 530       | 32558            | 14.1             | 660       | 9847             | 0.0              | 790       | 663              | 0.0              | 920       | 510              | 0.0              |
| 405       | 848              | 0.0              | 535       | 33301            | 12.0             | 665       | 8641             | 0.0              | 795       | 493              | 0.0              | 925       | 874              | 0.0              |
| 410       | 1490             | 0.1              | 540       | 33727            | 9.9              | 670       | 7535             | 0.0              | 800       | 584              | 0.0              | 930       | 549              | 0.0              |
| 415       | 3203             | 0.2              | 545       | 34356            | 8.0              | 675       | 6542             | 0.0              | 805       | 739              | 0.0              | 935       | 720              | 0.0              |
| 420       | 7298             | 0.8              | 550       | 34589            | 6.2              | 680       | 5664             | 0.0              | 810       | 601              | 0.0              | 940       | 754              | 0.0              |
| 425       | 15315            | 2.4              | 555       | 34855            | 4.7              | 685       | 4962             | 0.0              | 815       | 677              | 0.0              | 945       | 931              | 0.0              |
| 430       | 27886            | 5.9              | 560       | 35083            | 3.5              | 690       | 4369             | 0.0              | 820       | 726              | 0.0              | 950       | 811              | 0.0              |
| 435       | 45485            | 12.1             | 565       | 35553            | 2.5              | 695       | 3785             | 0.0              | 825       | 693              | 0.0              | 955       | 955              | 0.0              |
| 440       | 61965            | 20.7             | 570       | 35511            | 1.7              | 700       | 3318             | 0.0              | 830       | 619              | 0.0              | 960       | 1025             | 0.0              |
| 445       | 62721            | 24.7             | 575       | 35515            | 1.2              | 705       | 2962             | 0.0              | 835       | 738              | 0.0              | 965       | 916              | 0.0              |
| 450       | 44754            | 20.6             | 580       | 35114            | 0.8              | 710       | 2689             | 0.0              | 840       | 681              | 0.0              | 970       | 695              | 0.0              |
| 455       | 26152            | 13.7             | 585       | 34546            | 0.5              | 715       | 2476             | 0.0              | 845       | 691              | 0.0              | 975       | 568              | 0.0              |
| 460       | 17101            | 10.1             | 590       | 33522            | 0.3              | 720       | 2192             | 0.0              | 850       | 710              | 0.0              | 980       | 643              | 0.0              |
| 465       | 11400            | 7.4              | 595       | 32326            | 0.2              | 725       | 1939             | 0.0              | 855       | 1025             | 0.0              | 985       | 804              | 0.0              |
| 470       | 7763             | 5.6              | 600       | 30973            | 0.1              | 730       | 1698             | 0.0              | 860       | 889              | 0.0              | 990       | 812              | 0.0              |
| 475       | 6419             | 4.9              | 605       | 29160            | 0.1              | 735       | 1533             | 0.0              | 865       | 885              | 0.0              | 995       | 496              | 0.0              |
| 480       | 6330             | 5.1              | 610       | 27373            | 0.0              | 740       | 1375             | 0.0              | 870       | 905              | 0.0              | 1000      | 659              | 0.0              |
| 485       | 7299             | 6.0              | 615       | 25423            | 0.0              | 745       | 1254             | 0.0              | 875       | 739              | 0.0              |           |                  |                  |

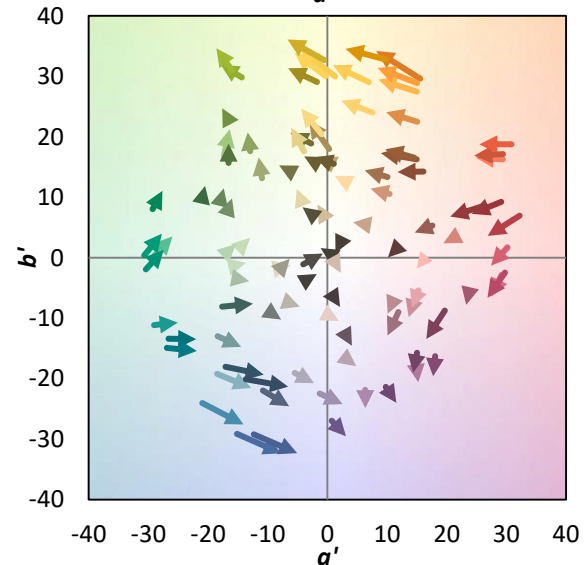
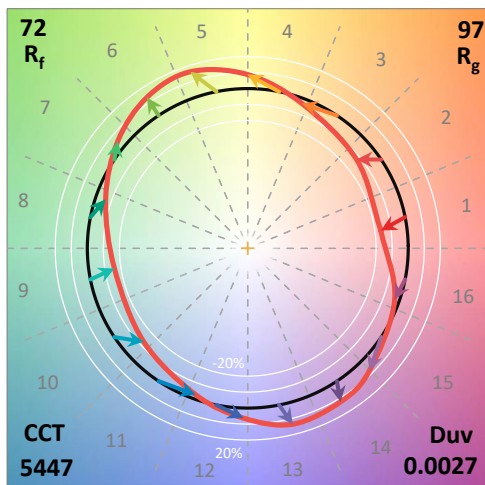
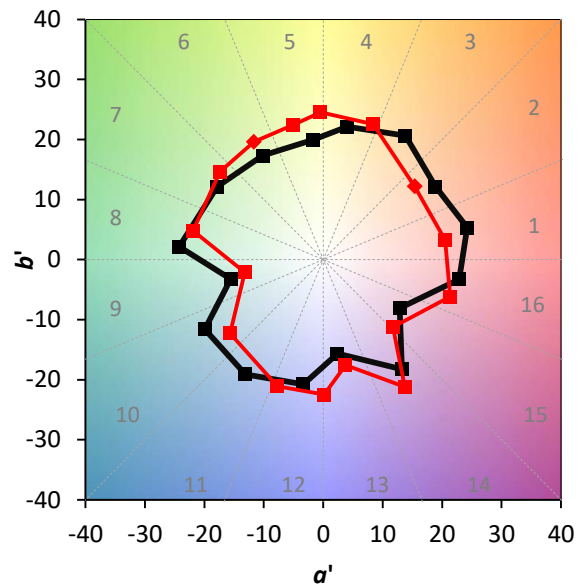
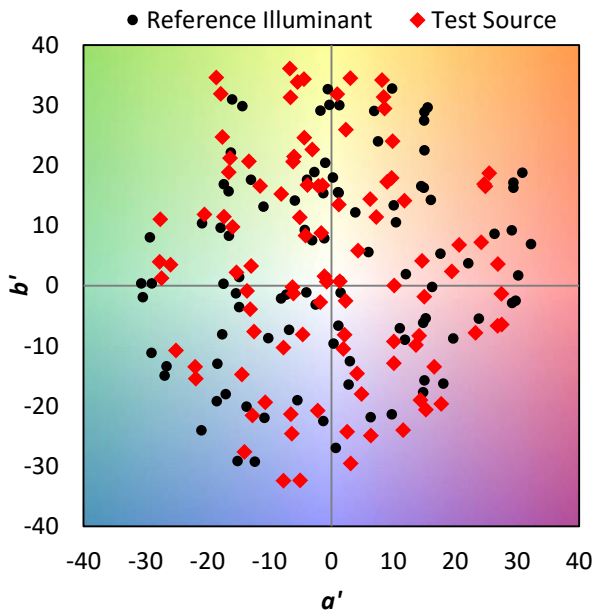
### Summary

$R_f = 72.3$   
 $R_g = 97.2$   
 CIE  $R_a = 71.9$   
 $R_g = -27.5$

### Spectral Power Distribution Comparison



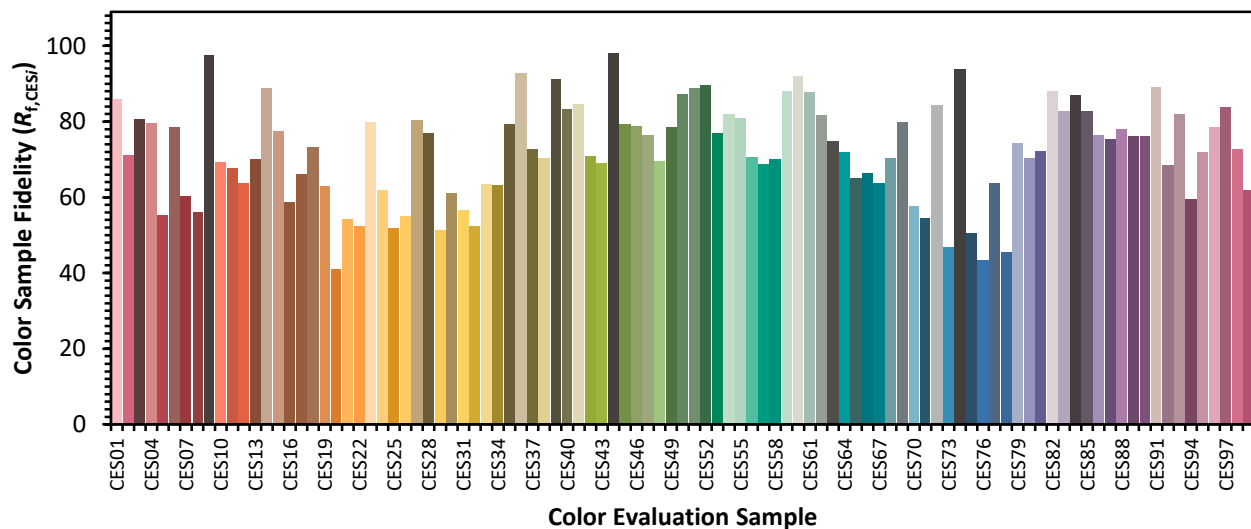
### Color Vector Graphics



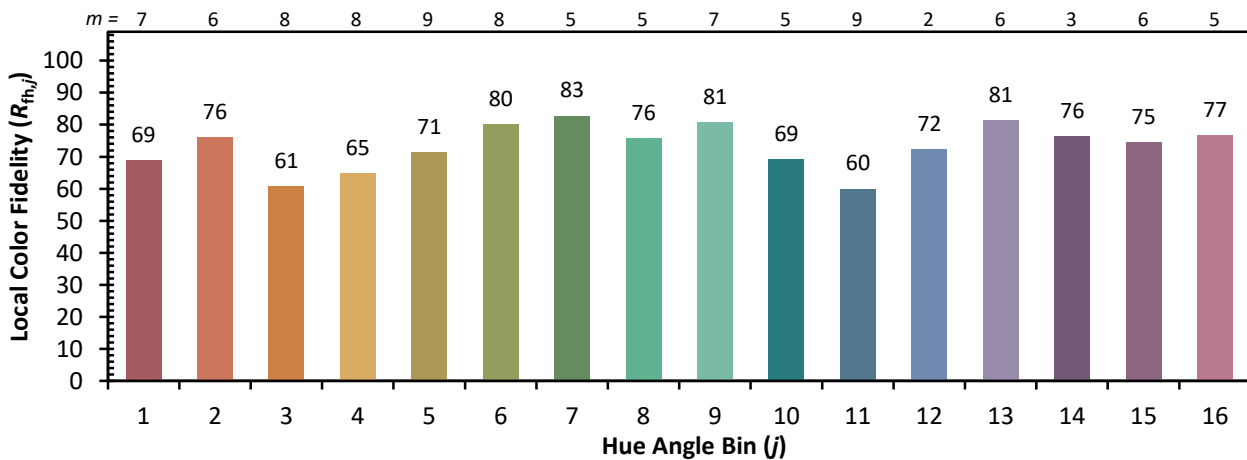
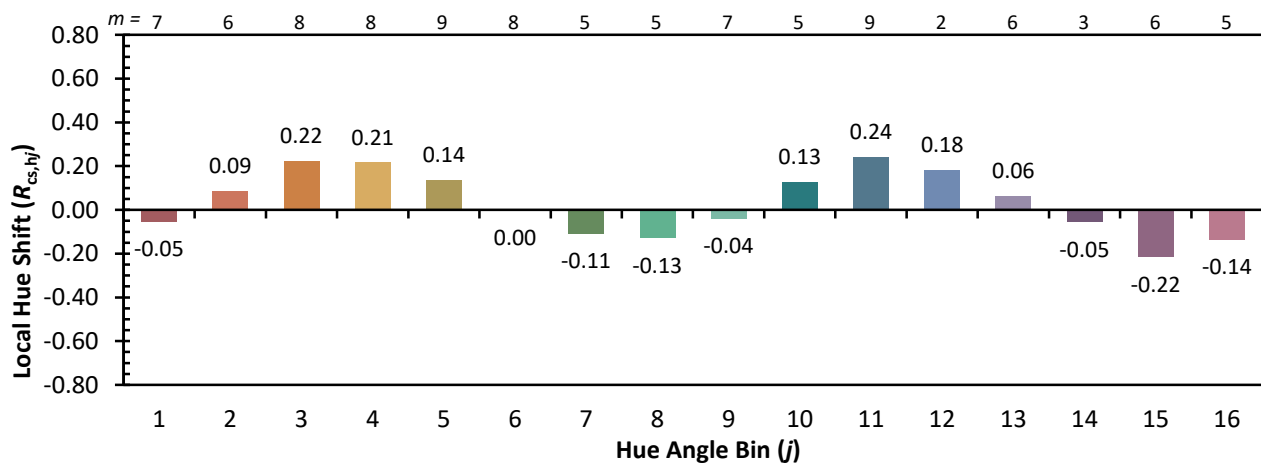
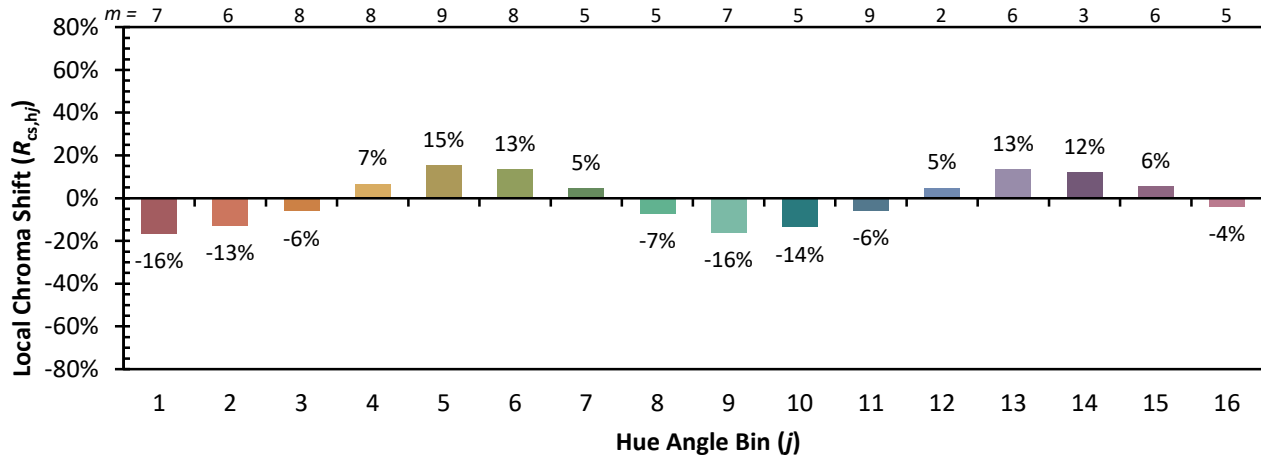


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

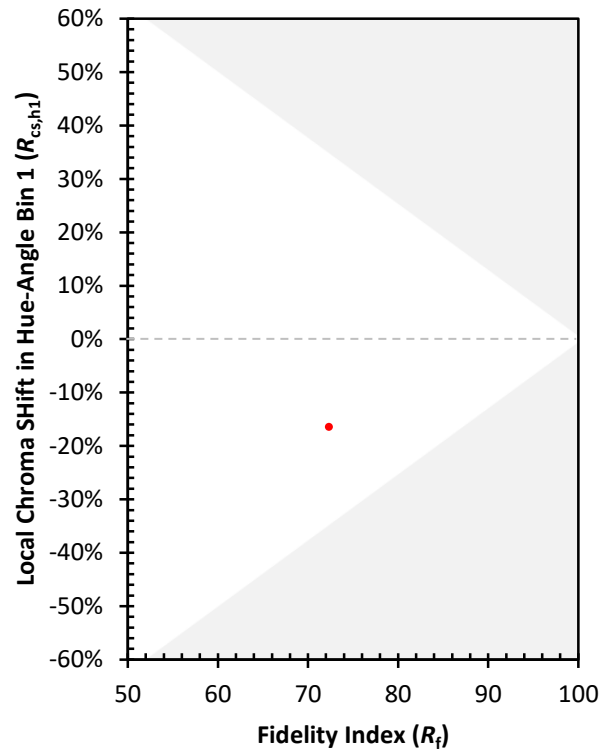
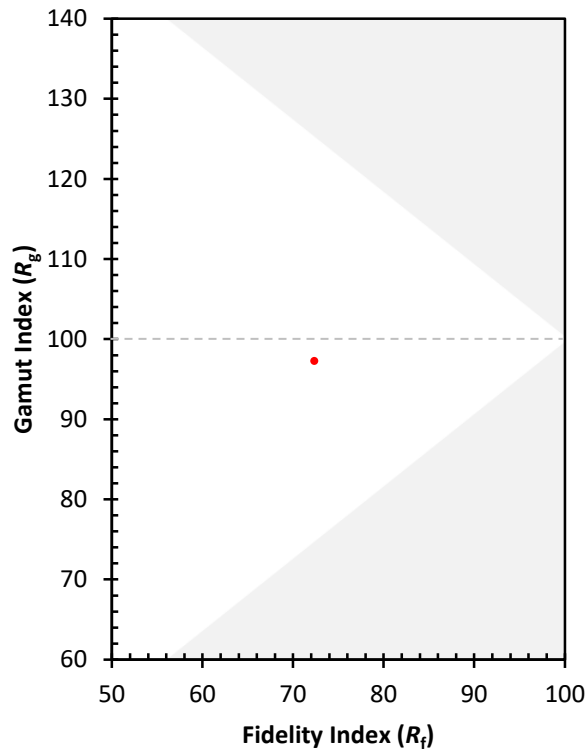
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 55 | CES51 = 89 | CES76 = 43 |
| CES02 = 59 | CES27 = 80 | CES52 = 90 | CES77 = 64 |
| CES03 = 30 | CES28 = 77 | CES53 = 77 | CES78 = 46 |
| CES04 = 69 | CES29 = 51 | CES54 = 82 | CES79 = 74 |
| CES05 = 46 | CES30 = 61 | CES55 = 81 | CES80 = 70 |
| CES06 = 50 | CES31 = 56 | CES56 = 71 | CES81 = 72 |
| CES07 = 38 | CES32 = 52 | CES57 = 69 | CES82 = 88 |
| CES08 = 38 | CES33 = 63 | CES58 = 70 | CES83 = 83 |
| CES09 = 29 | CES34 = 63 | CES59 = 88 | CES84 = 87 |
| CES10 = 72 | CES35 = 79 | CES60 = 92 | CES85 = 83 |
| CES11 = 55 | CES36 = 93 | CES61 = 88 | CES86 = 76 |
| CES12 = 61 | CES37 = 73 | CES62 = 82 | CES87 = 75 |
| CES13 = 41 | CES38 = 70 | CES63 = 75 | CES88 = 78 |
| CES14 = 74 | CES39 = 91 | CES64 = 72 | CES89 = 76 |
| CES15 = 70 | CES40 = 83 | CES65 = 65 | CES90 = 76 |
| CES16 = 46 | CES41 = 85 | CES66 = 66 | CES91 = 89 |
| CES17 = 48 | CES42 = 71 | CES67 = 64 | CES92 = 69 |
| CES18 = 55 | CES43 = 69 | CES68 = 70 | CES93 = 82 |
| CES19 = 71 | CES44 = 98 | CES69 = 80 | CES94 = 60 |
| CES20 = 64 | CES45 = 79 | CES70 = 58 | CES95 = 72 |
| CES21 = 85 | CES46 = 79 | CES71 = 54 | CES96 = 79 |
| CES22 = 77 | CES47 = 76 | CES72 = 84 | CES97 = 84 |
| CES23 = 91 | CES48 = 69 | CES73 = 47 | CES98 = 73 |
| CES24 = 90 | CES49 = 79 | CES74 = 94 | CES99 = 62 |
| CES25 = 71 | CES50 = 87 | CES75 = 50 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)