

Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269

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Peachtree City, GA 30269

Scaled data based on original data using  
LM-79-2024 Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Test Report Prepared for  
Cooper Lighting Solutions

Brand: STREETWORKS

Report Number: P1461593

Luminaire Tested: USSL-50-727-U-T3R-HSS

Issue Date: 06/10/2026

**Test Information**

Test Method: LM-79-2024  
Report Number: P1461593  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 6/11/2026  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: STREETWORKS  
Catalog Number: USSL-50-727-U-T3R-HSS  
Description: USSL DISCRETE LED 1 SQUARE 50W 70CRI 2700K FIXTURE w/ TYPE III DISTRIBUTION  
OPTIC AND HOUSE SIDE SHIELD  
Light Source: (40) 2700K CCT, 70 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 5337.9 lumens  
Efficiency: N/A  
Efficacy: 102.7 lumens/watt  
Luminous Opening: Rectangular (W 0.67' x L: 0.67' x H: 0')  
IES Classification: Type II - Short  
BUG Rating: B1 - U0 - G1

Input Watts (W): 52  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.98  
Total Harmonic Distortion (THDi): 3.35%  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT

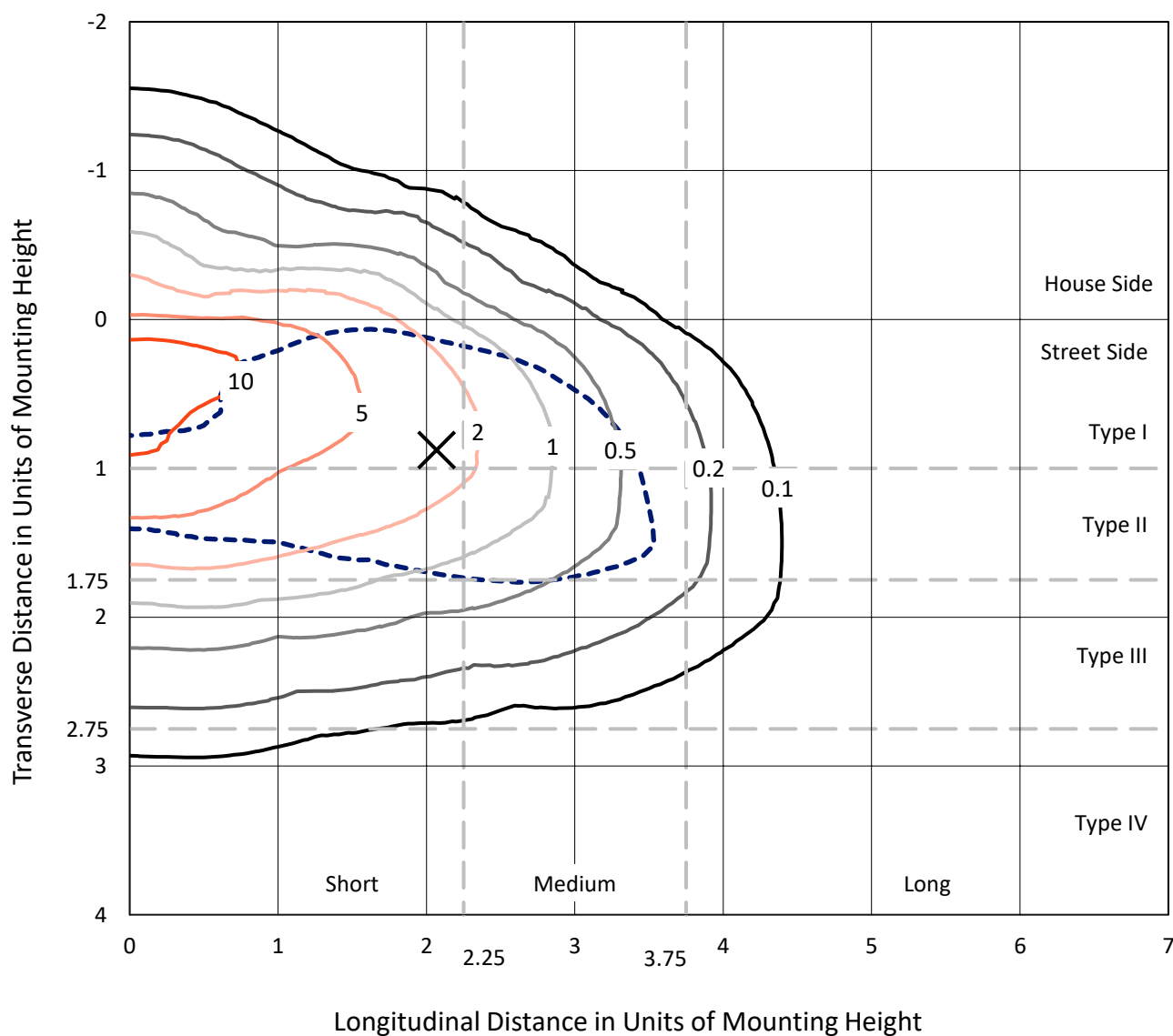
REPORT NUMBER: P1461593

CATALOG NUMBER: USSL-50-727-U-T3R-HSS

## Iso-Footcandle Lines of Horizontal Illumination

× Max cd

--- 1/2 Max cd



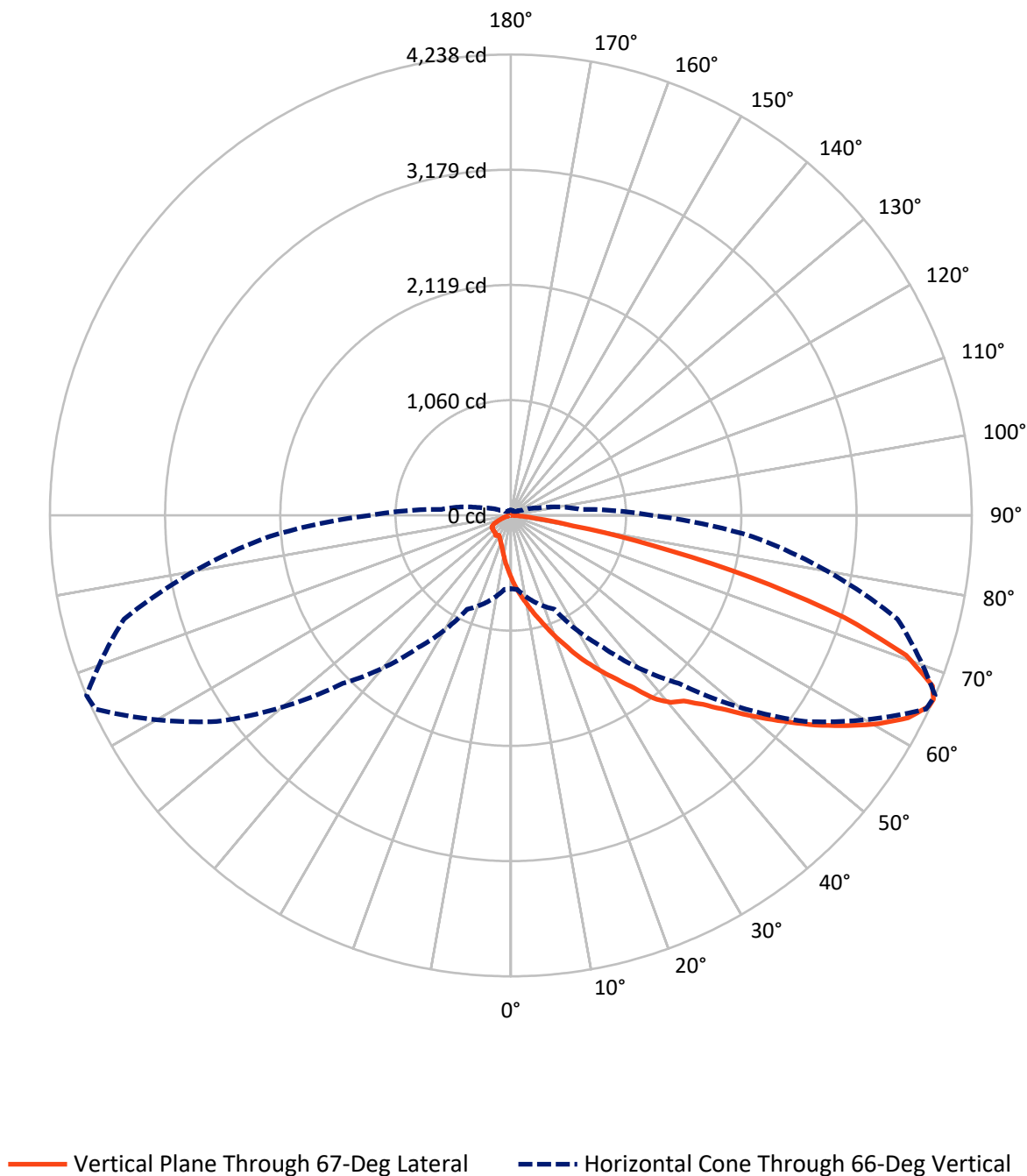
Based on 10 foot mounting height. Maximum calculated value = 12.5 fc

Type II - Short - N/A

REPORT NUMBER: P1461593

CATALOG NUMBER: USSL-50-727-U-T3R-HSS

## Luminous Intensity Polar Plot



REPORT NUMBER: P1461593

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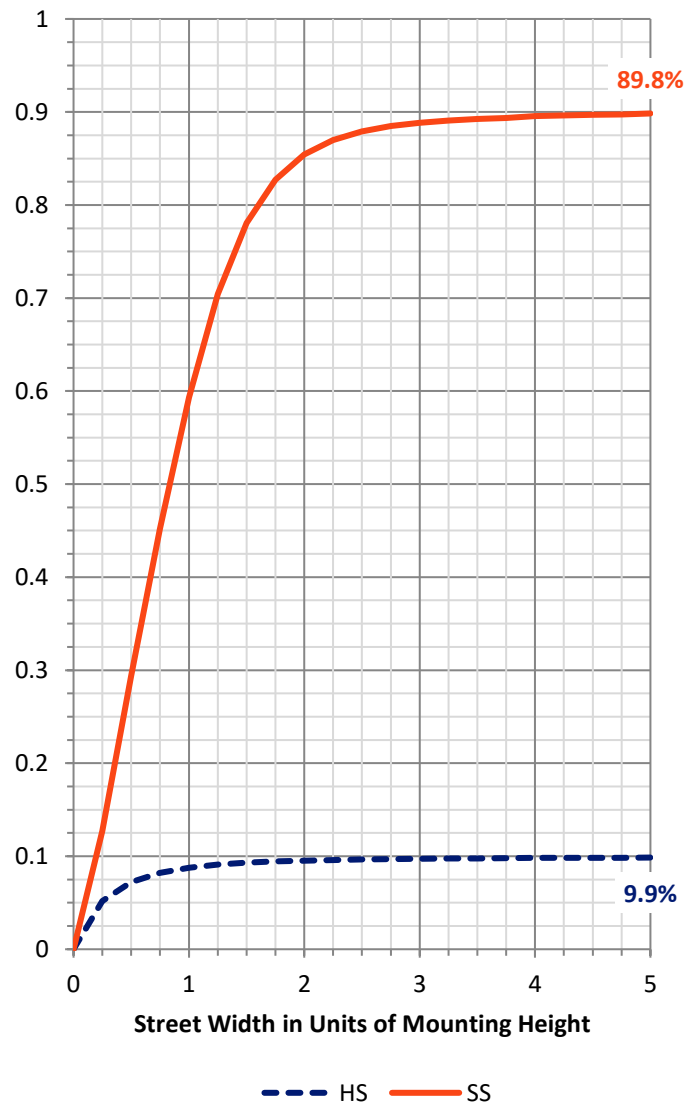
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 530.9    | 0.0    | 530.9  |
|                    | % Fixture | 9.9      | 0.0    | 9.9    |
| <b>Street Side</b> | Lumens    | 4806.9   | 0.0    | 4806.9 |
|                    | % Fixture | 90.1     | 0.0    | 90.1   |
| <b>Total</b>       | Lumens    | 5337.9   | 0.0    | 5337.9 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 58.6   | 1.1       |
| 10°-20°   | 209.5  | 3.9       |
| 20°-30°   | 400.4  | 7.5       |
| 30°-40°   | 653.2  | 12.2      |
| 40°-50°   | 1002.4 | 18.8      |
| 50°-60°   | 1287.9 | 24.1      |
| 60°-70°   | 1174.1 | 22.0      |
| 70°-80°   | 498.6  | 9.3       |
| 80°-90°   | 53.1   | 1.0       |
| 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°    | 5337.9 | 100.0     |
| 0°-180°   | 5337.9 | 100.0     |

**Coefficient of Utilization**



REPORT NUMBER: P1461593

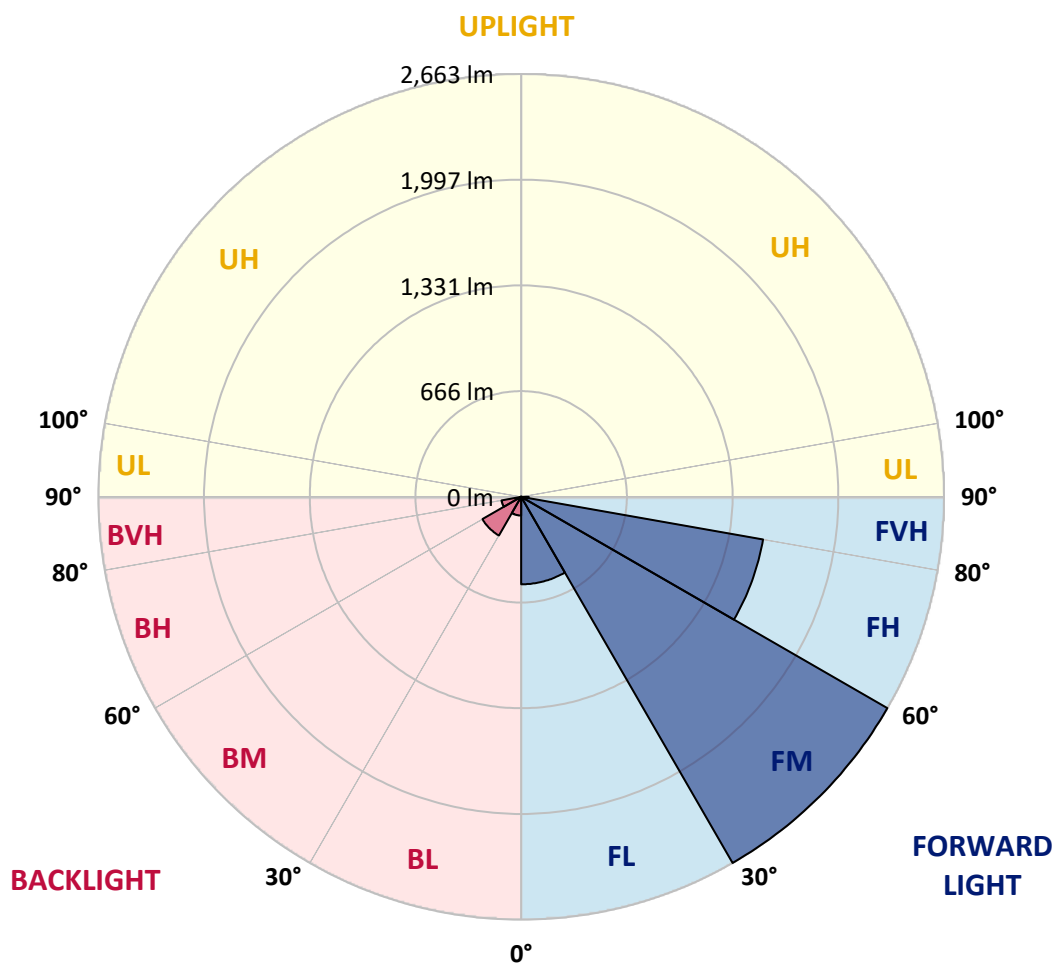
CATALOG NUMBER: USSL-50-727-U-T3R-HSS

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 550.8  | 10.3      |                         |      |         |
| FM   | (30°-60°)   | 2662.6 | 49.9      |                         |      |         |
| FH   | (60°-80°)   | 1546.8 | 29.0      |                         |      | G1/1800 |
| FVH  | (80°-90°)   | 46.8   | 0.9       |                         |      | G1/100  |
| BL   | (0°-30°)    | 117.8  | 2.2       | B1/500                  |      |         |
| BM   | (30°-60°)   | 280.9  | 5.3       | B1/1000                 |      |         |
| BH   | (60°-80°)   | 125.9  | 2.4       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 6.3    | 0.1       |                         |      | 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: P1461593

CATALOG NUMBER: USSL-50-727-U-T3R-HSS

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 67°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 572.8  | 572.8  | 572.8  | 572.8  | 572.8  | 572.8  | 572.8  | 572.8  | 572.8  | 572.8  | 572.8  |
| 2.5°  | 720.0  | 729.9  | 722.9  | 713.4  | 698.7  | 680.0  | 666.0  | 640.7  | 637.8  | 617.2  | 587.5  |
| 5°    | 874.8  | 875.2  | 863.1  | 849.5  | 821.2  | 787.1  | 747.9  | 706.0  | 699.8  | 657.6  | 605.8  |
| 7.5°  | 1021.6 | 1035.2 | 1019.4 | 997.0  | 953.7  | 904.5  | 843.3  | 776.1  | 764.0  | 699.4  | 624.9  |
| 10°   | 1182.7 | 1191.1 | 1172.8 | 1140.1 | 1095.0 | 1030.0 | 949.3  | 854.3  | 833.7  | 751.2  | 646.2  |
| 12.5° | 1315.5 | 1311.5 | 1302.7 | 1271.9 | 1222.7 | 1155.5 | 1056.1 | 932.1  | 913.7  | 805.8  | 670.4  |
| 15°   | 1400.7 | 1407.6 | 1399.9 | 1382.3 | 1343.4 | 1278.5 | 1178.3 | 1030.8 | 997.8  | 866.0  | 696.8  |
| 17.5° | 1453.9 | 1459.7 | 1462.7 | 1461.6 | 1444.3 | 1394.1 | 1290.6 | 1130.6 | 1092.8 | 931.3  | 729.1  |
| 20°   | 1490.2 | 1497.2 | 1501.2 | 1516.3 | 1516.6 | 1497.2 | 1410.9 | 1233.0 | 1198.8 | 1004.7 | 771.7  |
| 22.5° | 1532.4 | 1538.6 | 1545.6 | 1563.2 | 1583.0 | 1580.5 | 1519.2 | 1352.2 | 1305.3 | 1091.0 | 816.1  |
| 25°   | 1593.0 | 1599.9 | 1602.1 | 1616.1 | 1637.4 | 1652.8 | 1624.9 | 1475.5 | 1431.5 | 1188.2 | 871.5  |
| 27.5° | 1671.1 | 1678.1 | 1684.7 | 1687.3 | 1696.4 | 1714.4 | 1716.2 | 1592.6 | 1550.8 | 1283.2 | 930.6  |
| 30°   | 1795.9 | 1799.2 | 1794.8 | 1781.2 | 1768.0 | 1776.1 | 1801.7 | 1704.5 | 1672.9 | 1393.0 | 999.2  |
| 32.5° | 1885.0 | 1891.7 | 1897.9 | 1886.9 | 1852.8 | 1858.3 | 1893.1 | 1828.9 | 1798.8 | 1521.8 | 1088.0 |
| 35°   | 1911.8 | 1926.9 | 1929.8 | 1915.1 | 1906.0 | 1949.6 | 2004.7 | 1970.5 | 1947.1 | 1674.4 | 1202.9 |
| 37.5° | 2057.5 | 2065.2 | 2059.7 | 1983.8 | 1939.4 | 2007.6 | 2124.7 | 2147.4 | 2133.5 | 1877.7 | 1357.7 |
| 40°   | 2311.4 | 2298.6 | 2304.1 | 2136.8 | 2031.1 | 2074.4 | 2226.3 | 2282.1 | 2260.4 | 1994.0 | 1443.2 |
| 42.5° | 2521.0 | 2508.9 | 2466.3 | 2272.6 | 2176.8 | 2161.4 | 2305.6 | 2348.5 | 2331.6 | 2086.1 | 1537.5 |
| 45°   | 2645.7 | 2641.0 | 2552.9 | 2434.7 | 2435.1 | 2270.7 | 2413.5 | 2492.4 | 2478.4 | 2245.0 | 1689.1 |
| 47.5° | 2669.2 | 2659.0 | 2628.5 | 2566.5 | 2609.1 | 2456.4 | 2554.4 | 2693.1 | 2672.9 | 2445.0 | 1859.0 |
| 50°   | 2596.9 | 2579.7 | 2623.0 | 2633.6 | 2651.3 | 2562.1 | 2712.9 | 2912.2 | 2904.4 | 2651.6 | 2028.2 |
| 52.5° | 2383.4 | 2390.7 | 2516.2 | 2594.4 | 2614.2 | 2617.9 | 2873.6 | 3151.4 | 3145.5 | 2864.5 | 2181.9 |
| 55°   | 2079.9 | 2104.9 | 2295.3 | 2449.8 | 2542.3 | 2682.1 | 3035.8 | 3377.1 | 3401.7 | 3082.4 | 2323.6 |
| 57.5° | 1603.6 | 1631.5 | 1997.3 | 2250.5 | 2441.4 | 2729.4 | 3217.1 | 3638.4 | 3647.2 | 3286.1 | 2431.4 |
| 60°   | 1219.8 | 1256.5 | 1568.7 | 1933.5 | 2257.9 | 2725.4 | 3367.9 | 3879.1 | 3887.5 | 3493.8 | 2475.1 |
| 62.5° | 962.9  | 986.4  | 1221.2 | 1539.7 | 1995.9 | 2620.4 | 3463.0 | 4082.7 | 4099.6 | 3634.3 | 2414.9 |
| 65°   | 764.0  | 760.0  | 921.1  | 1106.4 | 1661.2 | 2362.1 | 3396.9 | 4206.8 | 4225.9 | 3694.1 | 2286.9 |
| 66°   | 672.6  | 683.6  | 821.2  | 953.7  | 1482.9 | 2184.1 | 3303.3 | 4212.6 | 4238.0 | 3681.3 | 2230.7 |
| 67.5° | 549.0  | 557.8  | 667.1  | 757.8  | 1238.1 | 1887.2 | 3108.5 | 4145.1 | 4181.1 | 3609.4 | 2129.1 |
| 70°   | 354.8  | 368.8  | 433.7  | 496.9  | 812.8  | 1348.9 | 2575.7 | 3789.9 | 3855.2 | 3304.4 | 1896.4 |
| 72.5° | 226.4  | 233.0  | 262.7  | 293.2  | 461.6  | 880.3  | 1974.6 | 3160.2 | 3204.6 | 2722.4 | 1471.5 |
| 75°   | 158.9  | 158.9  | 169.2  | 173.9  | 256.1  | 507.9  | 1268.9 | 2198.1 | 2277.7 | 1812.8 | 951.5  |
| 77.5° | 130.6  | 129.2  | 129.2  | 121.8  | 147.5  | 274.5  | 732.1  | 1295.0 | 1326.9 | 1008.8 | 528.8  |
| 80°   | 106.4  | 107.5  | 107.2  | 95.0   | 100.9  | 149.4  | 367.7  | 596.3  | 582.4  | 445.5  | 242.9  |
| 82.5° | 77.4   | 80.4   | 83.3   | 72.3   | 74.1   | 99.1   | 176.5  | 262.4  | 248.4  | 195.6  | 121.1  |
| 85°   | 53.9   | 56.9   | 58.3   | 49.9   | 47.0   | 59.8   | 90.3   | 108.3  | 104.9  | 85.5   | 56.5   |
| 87.5° | 31.9   | 31.2   | 31.2   | 27.5   | 24.2   | 29.7   | 34.9   | 33.0   | 27.2   | 21.7   | 13.2   |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

REPORT NUMBER: P1461593

CATALOG NUMBER: USSL-50-727-U-T3R-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 572.8  | 572.8  | 572.8 | 572.8 | 572.8 | 572.8 | 572.8 | 572.8 | 572.8 | 572.8 | 572.8 |
| 2.5°  | 576.5  | 563.3  | 536.9 | 514.5 | 491.4 | 471.2 | 456.9 | 441.1 | 431.5 | 429.7 | 425.3 |
| 5°    | 581.6  | 554.8  | 507.1 | 459.1 | 418.7 | 389.3 | 365.1 | 350.8 | 339.8 | 335.4 | 335.8 |
| 7.5°  | 587.5  | 547.1  | 473.4 | 411.4 | 360.7 | 329.2 | 307.5 | 295.4 | 287.7 | 286.6 | 288.1 |
| 10°   | 593.0  | 541.6  | 442.2 | 364.4 | 315.9 | 287.3 | 274.1 | 267.5 | 263.5 | 262.7 | 262.4 |
| 12.5° | 602.2  | 535.0  | 414.7 | 327.0 | 282.6 | 261.3 | 253.2 | 248.8 | 247.3 | 247.7 | 247.0 |
| 15°   | 614.3  | 530.3  | 385.3 | 296.1 | 258.3 | 243.7 | 236.7 | 234.5 | 234.9 | 234.9 | 234.5 |
| 17.5° | 628.6  | 526.9  | 359.2 | 270.8 | 239.6 | 227.5 | 223.5 | 222.0 | 222.7 | 223.8 | 223.5 |
| 20°   | 651.0  | 527.7  | 336.1 | 253.2 | 225.3 | 213.9 | 209.5 | 209.5 | 211.4 | 212.5 | 213.2 |
| 22.5° | 675.2  | 530.6  | 317.4 | 237.8 | 212.1 | 200.7 | 196.0 | 197.8 | 198.9 | 201.5 | 201.5 |
| 25°   | 707.1  | 538.3  | 300.9 | 223.8 | 197.4 | 185.7 | 181.6 | 182.7 | 185.3 | 188.6 | 189.0 |
| 27.5° | 741.2  | 549.3  | 287.0 | 210.6 | 183.1 | 170.3 | 166.6 | 167.0 | 170.6 | 173.2 | 174.7 |
| 30°   | 787.1  | 567.7  | 280.4 | 200.7 | 169.2 | 155.2 | 150.1 | 150.1 | 154.9 | 158.9 | 158.9 |
| 32.5° | 857.2  | 605.8  | 287.7 | 197.4 | 157.4 | 141.3 | 136.5 | 136.1 | 139.4 | 143.8 | 143.8 |
| 35°   | 937.9  | 666.0  | 310.4 | 202.2 | 151.2 | 131.4 | 124.8 | 125.1 | 127.3 | 130.3 | 131.0 |
| 37.5° | 1062.7 | 746.0  | 334.3 | 206.2 | 143.8 | 121.1 | 115.6 | 116.7 | 118.2 | 120.4 | 120.4 |
| 40°   | 1117.7 | 767.3  | 320.7 | 196.0 | 137.6 | 113.8 | 107.2 | 109.0 | 110.8 | 112.7 | 112.7 |
| 42.5° | 1188.9 | 809.9  | 324.8 | 187.1 | 135.4 | 107.9 | 100.9 | 102.7 | 104.2 | 106.4 | 106.4 |
| 45°   | 1309.3 | 898.7  | 344.9 | 179.8 | 134.3 | 103.8 | 96.1  | 96.9  | 97.6  | 99.8  | 100.2 |
| 47.5° | 1442.9 | 983.8  | 365.5 | 173.2 | 128.8 | 99.8  | 91.0  | 91.0  | 91.7  | 93.2  | 93.2  |
| 50°   | 1568.4 | 1059.0 | 383.5 | 167.0 | 119.6 | 95.4  | 85.9  | 85.1  | 84.4  | 84.8  | 84.8  |
| 52.5° | 1683.2 | 1132.8 | 397.4 | 161.8 | 110.8 | 90.6  | 80.4  | 78.5  | 77.1  | 76.3  | 76.7  |
| 55°   | 1771.7 | 1185.3 | 411.4 | 157.4 | 102.0 | 84.4  | 73.8  | 70.5  | 69.4  | 68.3  | 68.6  |
| 57.5° | 1826.3 | 1194.8 | 422.7 | 151.9 | 93.9  | 77.1  | 67.2  | 63.5  | 62.7  | 61.6  | 61.6  |
| 60°   | 1798.4 | 1130.6 | 411.4 | 144.6 | 85.9  | 69.0  | 59.4  | 58.0  | 56.5  | 55.8  | 55.8  |
| 62.5° | 1630.0 | 956.3  | 373.2 | 134.7 | 77.1  | 60.2  | 53.9  | 52.8  | 51.4  | 51.0  | 50.6  |
| 65°   | 1377.9 | 720.0  | 295.4 | 119.3 | 67.2  | 52.8  | 48.8  | 47.7  | 47.3  | 48.8  | 49.5  |
| 66°   | 1295.0 | 640.0  | 258.7 | 113.0 | 63.1  | 50.3  | 47.0  | 45.5  | 46.6  | 48.4  | 48.8  |
| 67.5° | 1164.7 | 553.4  | 212.1 | 103.1 | 59.4  | 46.6  | 43.7  | 43.3  | 45.5  | 46.2  | 46.6  |
| 70°   | 980.5  | 439.2  | 154.9 | 84.8  | 49.9  | 40.7  | 38.9  | 41.1  | 40.7  | 40.7  | 40.7  |
| 72.5° | 727.3  | 332.5  | 114.9 | 66.4  | 40.4  | 35.6  | 36.0  | 35.6  | 34.5  | 34.1  | 33.8  |
| 75°   | 451.7  | 214.7  | 79.6  | 48.4  | 33.0  | 33.8  | 31.2  | 29.4  | 27.9  | 27.2  | 26.8  |
| 77.5° | 255.4  | 120.0  | 51.4  | 34.9  | 27.9  | 31.2  | 26.4  | 24.2  | 23.1  | 22.4  | 22.0  |
| 80°   | 128.4  | 68.6   | 31.9  | 23.9  | 23.9  | 26.4  | 22.4  | 20.5  | 18.7  | 15.4  | 13.6  |
| 82.5° | 71.9   | 38.5   | 19.8  | 16.9  | 18.7  | 21.3  | 18.7  | 16.1  | 13.6  | 4.8   | 4.8   |
| 85°   | 38.5   | 19.4   | 9.2   | 8.8   | 9.9   | 11.4  | 9.9   | 8.4   | 4.8   | 1.1   | 1.8   |
| 87.5° | 8.1    | 3.7    | 2.9   | 2.9   | 2.6   | 2.2   | 1.5   | 1.1   | 0.7   | 0.4   | 0.4   |
| 90°   | 0.0    | 0.0    | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |

LM-79-2019: Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Report Prepared for

Cooper Lighting Solutions

McGraw-Edison

Report Number: SP2-2501-321-3

Test Date: 04/09/2025

Luminaire Tested: GKO-PB1E-727-U-T4W

Data in this report applies to families of products including GKO-PB1E-727-U-T4W

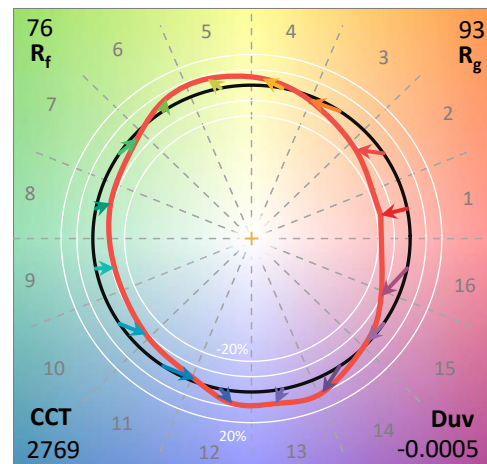
### Test Information

Test Method: LM-79-2019  
 Report Number: SP2-2501-321-3  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP2 - 165CM SPHERE  
 Measurement Geometry:  $4\pi$   
 Issue Date: 04/10/2025  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: McGraw-Edison  
 Catalog Number: **GKO-PB1E-727-U-T4W**  
 Description: Gekko Wedge Wall Pack Fixture 1 SQ w/ T4W distribution

### Spectral Parameters

CCT (K): 2769  
 CIE  $u'$ : 0.2596  
 CIE  $v'$ : 0.5253  
 Duv: -0.0005  
 CIE x: 0.4535  
 CIE y: 0.4078  
 CIE z: 0.1387  
 Peak Wavelength (nm): 597  
 Dominant Wavelength (nm): 584  
 Purity: 58.54014  
 R<sub>f</sub>: 75.7  
 R<sub>g</sub>: 93.2

CRI (Ra): 71.7  
 R1: 68.0  
 R2: 84.0  
 R3: 94.6  
 R4: 65.9  
 R5: 67.3  
 R6: 78.7  
 R7: 75.2  
 R8: 39.8  
 R9: -34.5  
 R10: 64.3  
 R11: 60.9  
 R12: 54.4  
 R13: 71.2  
 R14: 97.6  
 R15: 59.5



### Test Conditions

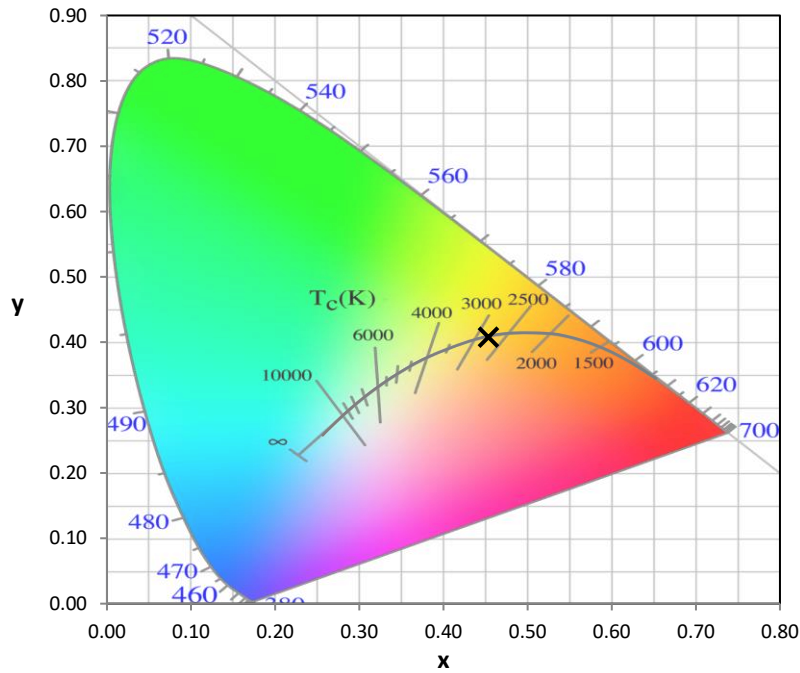
Stabilization Time: 36M  
 Operation Time: 1H 36M  
 Sphere Temperature (°C): 25.0

REPORT NUMBER: SP2-2501-321-3

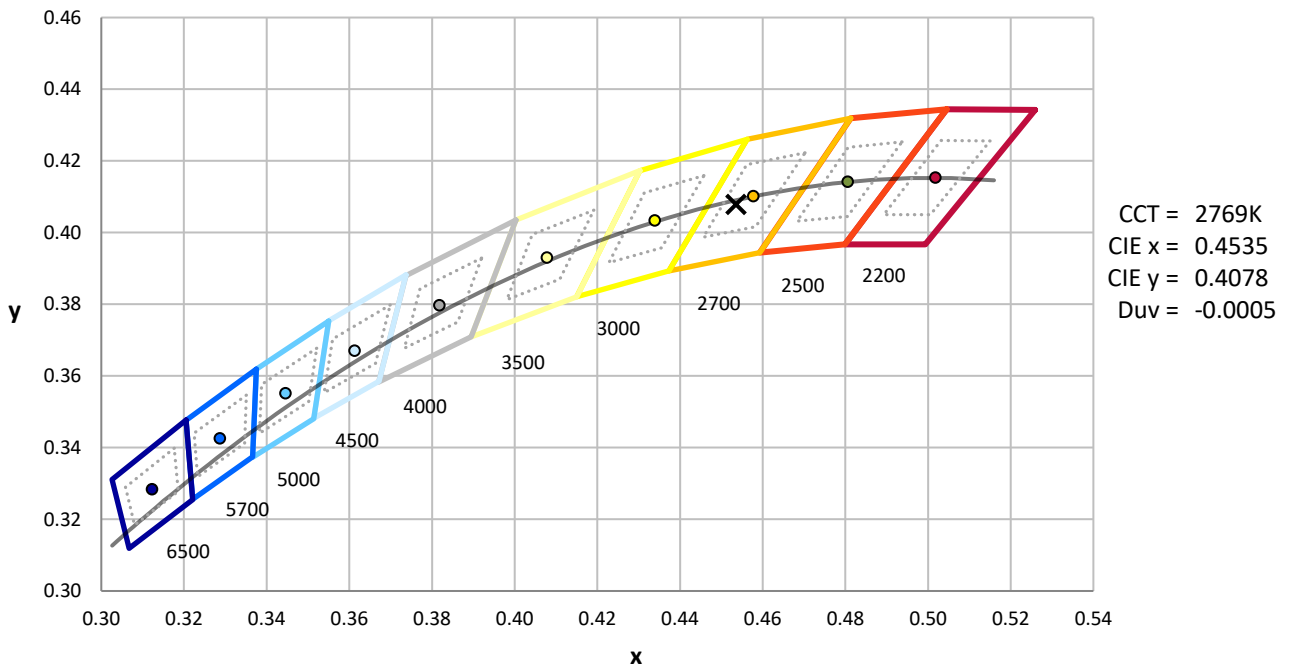
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN2187                | 1/6/2025         | 7/6/2025             |
| Power Meter                    | INXT2011002           | 1/21/2025        | 1/21/2026            |
| AC Power Source                | IN0458                | 10/22/2024       | 10/22/2025           |
| DC Power Source                | IN0212                | 10/22/2024       | 10/22/2025           |
| Sphere Thermometer             | IN4036B               | 10/22/2024       | 10/22/2025           |
| Room Thermometer               | IN0046                | 10/22/2024       | 10/22/2025           |

REPORT NUMBER: SP2-2501-321-3

**CIE 1931 Chromaticity Diagram**



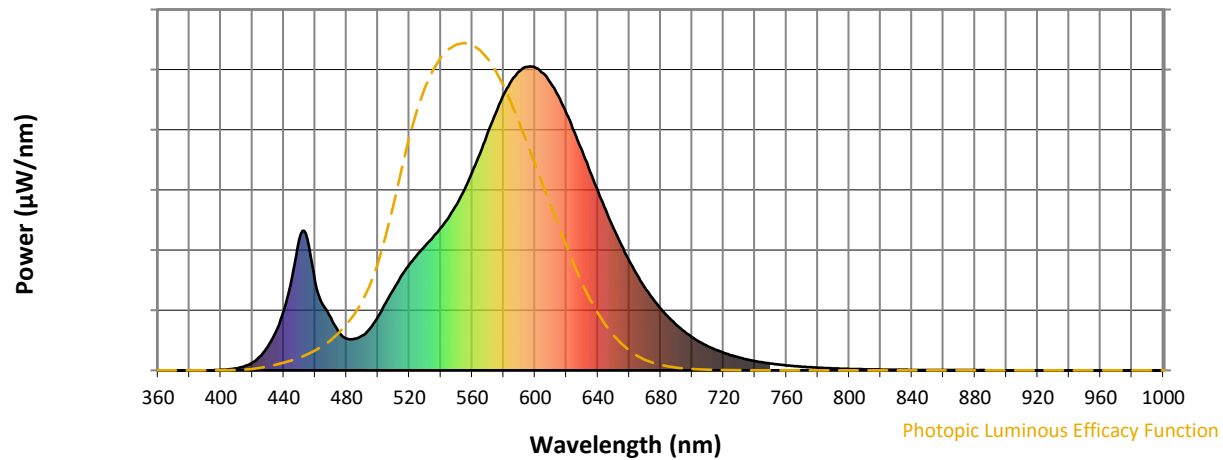
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 2700K 4-step quadrangle

REPORT NUMBER: SP2-2501-321-3

### Photopic Flux vs. Wavelength

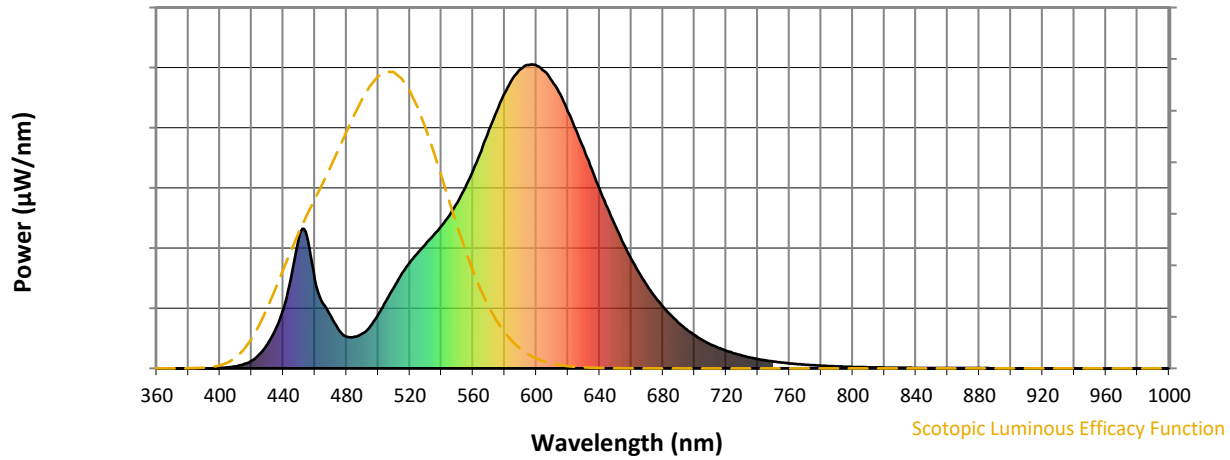


### Photopic Lumens: NR

| $\lambda$<br>(nm) | Power<br>$\text{W}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) |
|-------------------|-------------------------------|--------------------------------|-------------------|-------------------------------|--------------------------------|-------------------|-------------------------------|--------------------------------|-------------------|-------------------------------|--------------------------------|-------------------|-------------------------------|--------------------------------|
| 360               | 0                             | NR                             | 490               | 114                           | NR                             | 620               | 844                           | NR                             | 750               | 22                            | NR                             | 880               | 1                             | NR                             |
| 365               | 0                             | NR                             | 495               | 138                           | NR                             | 625               | 785                           | NR                             | 755               | 19                            | NR                             | 885               | 1                             | NR                             |
| 370               | 0                             | NR                             | 500               | 176                           | NR                             | 630               | 722                           | NR                             | 760               | 16                            | NR                             | 890               | 1                             | NR                             |
| 375               | 0                             | NR                             | 505               | 222                           | NR                             | 635               | 655                           | NR                             | 765               | 14                            | NR                             | 895               | 0                             | NR                             |
| 380               | 0                             | NR                             | 510               | 268                           | NR                             | 640               | 591                           | NR                             | 770               | 12                            | NR                             | 900               | 0                             | NR                             |
| 385               | 0                             | NR                             | 515               | 311                           | NR                             | 645               | 527                           | NR                             | 775               | 10                            | NR                             | 905               | 0                             | NR                             |
| 390               | 0                             | NR                             | 520               | 348                           | NR                             | 650               | 467                           | NR                             | 780               | 9                             | NR                             | 910               | 0                             | NR                             |
| 395               | 0                             | NR                             | 525               | 381                           | NR                             | 655               | 412                           | NR                             | 785               | 8                             | NR                             | 915               | 0                             | NR                             |
| 400               | 2                             | NR                             | 530               | 410                           | NR                             | 660               | 360                           | NR                             | 790               | 7                             | NR                             | 920               | 0                             | NR                             |
| 405               | 4                             | NR                             | 535               | 438                           | NR                             | 665               | 314                           | NR                             | 795               | 6                             | NR                             | 925               | 0                             | NR                             |
| 410               | 7                             | NR                             | 540               | 469                           | NR                             | 670               | 272                           | NR                             | 800               | 5                             | NR                             | 930               | 0                             | NR                             |
| 415               | 13                            | NR                             | 545               | 503                           | NR                             | 675               | 236                           | NR                             | 805               | 4                             | NR                             | 935               | 0                             | NR                             |
| 420               | 25                            | NR                             | 550               | 544                           | NR                             | 680               | 203                           | NR                             | 810               | 4                             | NR                             | 940               | 0                             | NR                             |
| 425               | 46                            | NR                             | 555               | 594                           | NR                             | 685               | 175                           | NR                             | 815               | 3                             | NR                             | 945               | 0                             | NR                             |
| 430               | 79                            | NR                             | 560               | 652                           | NR                             | 690               | 149                           | NR                             | 820               | 3                             | NR                             | 950               | 0                             | NR                             |
| 435               | 128                           | NR                             | 565               | 714                           | NR                             | 695               | 128                           | NR                             | 825               | 2                             | NR                             | 955               | 0                             | NR                             |
| 440               | 196                           | NR                             | 570               | 783                           | NR                             | 700               | 109                           | NR                             | 830               | 2                             | NR                             | 960               | 0                             | NR                             |
| 445               | 299                           | NR                             | 575               | 847                           | NR                             | 705               | 93                            | NR                             | 835               | 2                             | NR                             | 965               | 0                             | NR                             |
| 450               | 433                           | NR                             | 580               | 906                           | NR                             | 710               | 80                            | NR                             | 840               | 2                             | NR                             | 970               | 0                             | NR                             |
| 455               | 433                           | NR                             | 585               | 953                           | NR                             | 715               | 68                            | NR                             | 845               | 1                             | NR                             | 975               | 0                             | NR                             |
| 460               | 293                           | NR                             | 590               | 985                           | NR                             | 720               | 58                            | NR                             | 850               | 1                             | NR                             | 980               | 0                             | NR                             |
| 465               | 215                           | NR                             | 595               | 998                           | NR                             | 725               | 50                            | NR                             | 855               | 1                             | NR                             | 985               | 0                             | NR                             |
| 470               | 173                           | NR                             | 600               | 997                           | NR                             | 730               | 42                            | NR                             | 860               | 1                             | NR                             | 990               | 0                             | NR                             |
| 475               | 127                           | NR                             | 605               | 978                           | NR                             | 735               | 36                            | NR                             | 865               | 1                             | NR                             | 995               | 0                             | NR                             |
| 480               | 104                           | NR                             | 610               | 945                           | NR                             | 740               | 30                            | NR                             | 870               | 1                             | NR                             | 1000              | 0                             | NR                             |
| 485               | 104                           | NR                             | 615               | 902                           | NR                             | 745               | 26                            | NR                             | 875               | 1                             | NR                             |                   |                               |                                |

REPORT NUMBER: SP2-2501-321-3

### Scotopic Flux vs. Wavelength



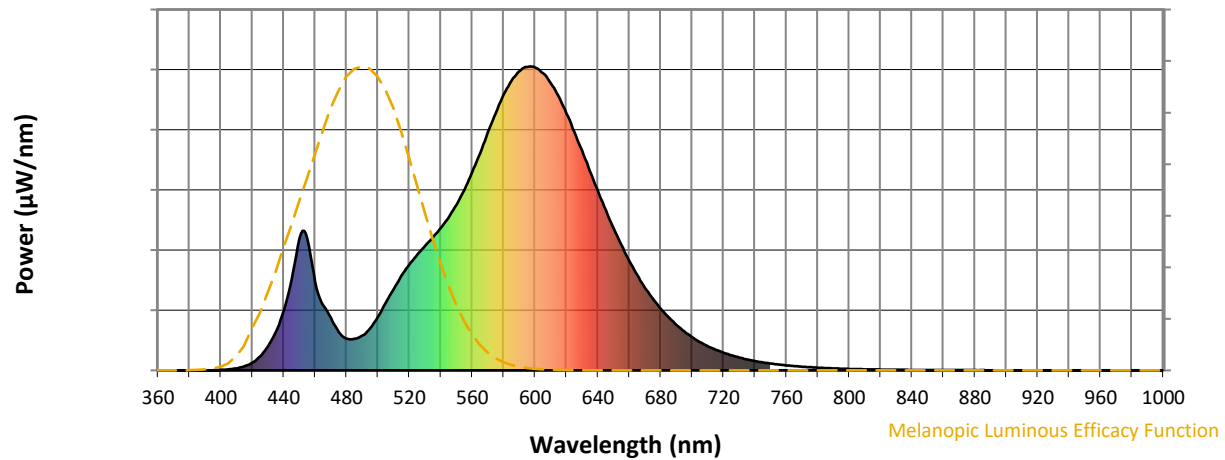
Scotopic Lumens: NR

S/P: 1.14

| $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) |
|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|
| 360               | 0                                    | NR                             | 490               | 114                                  | NR                             | 620               | 844                                  | NR                             | 750               | 22                                   | NR                             | 880               | 1                                    | NR                             |
| 365               | 0                                    | NR                             | 495               | 138                                  | NR                             | 625               | 785                                  | NR                             | 755               | 19                                   | NR                             | 885               | 1                                    | NR                             |
| 370               | 0                                    | NR                             | 500               | 176                                  | NR                             | 630               | 722                                  | NR                             | 760               | 16                                   | NR                             | 890               | 1                                    | NR                             |
| 375               | 0                                    | NR                             | 505               | 222                                  | NR                             | 635               | 655                                  | NR                             | 765               | 14                                   | NR                             | 895               | 0                                    | NR                             |
| 380               | 0                                    | NR                             | 510               | 268                                  | NR                             | 640               | 591                                  | NR                             | 770               | 12                                   | NR                             | 900               | 0                                    | NR                             |
| 385               | 0                                    | NR                             | 515               | 311                                  | NR                             | 645               | 527                                  | NR                             | 775               | 10                                   | NR                             | 905               | 0                                    | NR                             |
| 390               | 0                                    | NR                             | 520               | 348                                  | NR                             | 650               | 467                                  | NR                             | 780               | 9                                    | NR                             | 910               | 0                                    | NR                             |
| 395               | 0                                    | NR                             | 525               | 381                                  | NR                             | 655               | 412                                  | NR                             | 785               | 8                                    | NR                             | 915               | 0                                    | NR                             |
| 400               | 2                                    | NR                             | 530               | 410                                  | NR                             | 660               | 360                                  | NR                             | 790               | 7                                    | NR                             | 920               | 0                                    | NR                             |
| 405               | 4                                    | NR                             | 535               | 438                                  | NR                             | 665               | 314                                  | NR                             | 795               | 6                                    | NR                             | 925               | 0                                    | NR                             |
| 410               | 7                                    | NR                             | 540               | 469                                  | NR                             | 670               | 272                                  | NR                             | 800               | 5                                    | NR                             | 930               | 0                                    | NR                             |
| 415               | 13                                   | NR                             | 545               | 503                                  | NR                             | 675               | 236                                  | NR                             | 805               | 4                                    | NR                             | 935               | 0                                    | NR                             |
| 420               | 25                                   | NR                             | 550               | 544                                  | NR                             | 680               | 203                                  | NR                             | 810               | 4                                    | NR                             | 940               | 0                                    | NR                             |
| 425               | 46                                   | NR                             | 555               | 594                                  | NR                             | 685               | 175                                  | NR                             | 815               | 3                                    | NR                             | 945               | 0                                    | NR                             |
| 430               | 79                                   | NR                             | 560               | 652                                  | NR                             | 690               | 149                                  | NR                             | 820               | 3                                    | NR                             | 950               | 0                                    | NR                             |
| 435               | 128                                  | NR                             | 565               | 714                                  | NR                             | 695               | 128                                  | NR                             | 825               | 2                                    | NR                             | 955               | 0                                    | NR                             |
| 440               | 196                                  | NR                             | 570               | 783                                  | NR                             | 700               | 109                                  | NR                             | 830               | 2                                    | NR                             | 960               | 0                                    | NR                             |
| 445               | 299                                  | NR                             | 575               | 847                                  | NR                             | 705               | 93                                   | NR                             | 835               | 2                                    | NR                             | 965               | 0                                    | NR                             |
| 450               | 433                                  | NR                             | 580               | 906                                  | NR                             | 710               | 80                                   | NR                             | 840               | 2                                    | NR                             | 970               | 0                                    | NR                             |
| 455               | 433                                  | NR                             | 585               | 953                                  | NR                             | 715               | 68                                   | NR                             | 845               | 1                                    | NR                             | 975               | 0                                    | NR                             |
| 460               | 293                                  | NR                             | 590               | 985                                  | NR                             | 720               | 58                                   | NR                             | 850               | 1                                    | NR                             | 980               | 0                                    | NR                             |
| 465               | 215                                  | NR                             | 595               | 998                                  | NR                             | 725               | 50                                   | NR                             | 855               | 1                                    | NR                             | 985               | 0                                    | NR                             |
| 470               | 173                                  | NR                             | 600               | 997                                  | NR                             | 730               | 42                                   | NR                             | 860               | 1                                    | NR                             | 990               | 0                                    | NR                             |
| 475               | 127                                  | NR                             | 605               | 978                                  | NR                             | 735               | 36                                   | NR                             | 865               | 1                                    | NR                             | 995               | 0                                    | NR                             |
| 480               | 104                                  | NR                             | 610               | 945                                  | NR                             | 740               | 30                                   | NR                             | 870               | 1                                    | NR                             | 1000              | 0                                    | NR                             |
| 485               | 104                                  | NR                             | 615               | 902                                  | NR                             | 745               | 26                                   | NR                             | 875               | 1                                    | NR                             |                   |                                      |                                |

REPORT NUMBER: SP2-2501-321-3

### Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 2.08

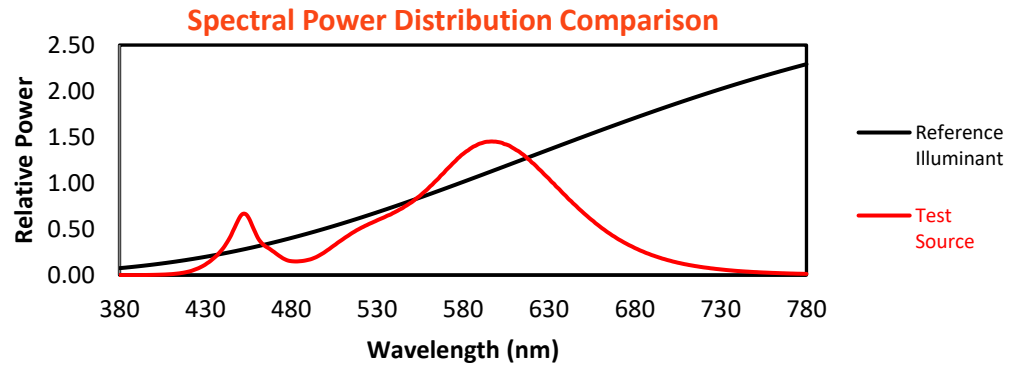
| $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) |
|-------------------|----------------------------------------|--------------------------------|-------------------|----------------------------------------|--------------------------------|-------------------|----------------------------------------|--------------------------------|-------------------|----------------------------------------|--------------------------------|-------------------|----------------------------------------|--------------------------------|
| 360               | 0                                      | NR                             | 490               | 114                                    | NR                             | 620               | 844                                    | NR                             | 750               | 22                                     | NR                             | 880               | 1                                      | NR                             |
| 365               | 0                                      | NR                             | 495               | 138                                    | NR                             | 625               | 785                                    | NR                             | 755               | 19                                     | NR                             | 885               | 1                                      | NR                             |
| 370               | 0                                      | NR                             | 500               | 176                                    | NR                             | 630               | 722                                    | NR                             | 760               | 16                                     | NR                             | 890               | 1                                      | NR                             |
| 375               | 0                                      | NR                             | 505               | 222                                    | NR                             | 635               | 655                                    | NR                             | 765               | 14                                     | NR                             | 895               | 0                                      | NR                             |
| 380               | 0                                      | NR                             | 510               | 268                                    | NR                             | 640               | 591                                    | NR                             | 770               | 12                                     | NR                             | 900               | 0                                      | NR                             |
| 385               | 0                                      | NR                             | 515               | 311                                    | NR                             | 645               | 527                                    | NR                             | 775               | 10                                     | NR                             | 905               | 0                                      | NR                             |
| 390               | 0                                      | NR                             | 520               | 348                                    | NR                             | 650               | 467                                    | NR                             | 780               | 9                                      | NR                             | 910               | 0                                      | NR                             |
| 395               | 0                                      | NR                             | 525               | 381                                    | NR                             | 655               | 412                                    | NR                             | 785               | 8                                      | NR                             | 915               | 0                                      | NR                             |
| 400               | 2                                      | NR                             | 530               | 410                                    | NR                             | 660               | 360                                    | NR                             | 790               | 7                                      | NR                             | 920               | 0                                      | NR                             |
| 405               | 4                                      | NR                             | 535               | 438                                    | NR                             | 665               | 314                                    | NR                             | 795               | 6                                      | NR                             | 925               | 0                                      | NR                             |
| 410               | 7                                      | NR                             | 540               | 469                                    | NR                             | 670               | 272                                    | NR                             | 800               | 5                                      | NR                             | 930               | 0                                      | NR                             |
| 415               | 13                                     | NR                             | 545               | 503                                    | NR                             | 675               | 236                                    | NR                             | 805               | 4                                      | NR                             | 935               | 0                                      | NR                             |
| 420               | 25                                     | NR                             | 550               | 544                                    | NR                             | 680               | 203                                    | NR                             | 810               | 4                                      | NR                             | 940               | 0                                      | NR                             |
| 425               | 46                                     | NR                             | 555               | 594                                    | NR                             | 685               | 175                                    | NR                             | 815               | 3                                      | NR                             | 945               | 0                                      | NR                             |
| 430               | 79                                     | NR                             | 560               | 652                                    | NR                             | 690               | 149                                    | NR                             | 820               | 3                                      | NR                             | 950               | 0                                      | NR                             |
| 435               | 128                                    | NR                             | 565               | 714                                    | NR                             | 695               | 128                                    | NR                             | 825               | 2                                      | NR                             | 955               | 0                                      | NR                             |
| 440               | 196                                    | NR                             | 570               | 783                                    | NR                             | 700               | 109                                    | NR                             | 830               | 2                                      | NR                             | 960               | 0                                      | NR                             |
| 445               | 299                                    | NR                             | 575               | 847                                    | NR                             | 705               | 93                                     | NR                             | 835               | 2                                      | NR                             | 965               | 0                                      | NR                             |
| 450               | 433                                    | NR                             | 580               | 906                                    | NR                             | 710               | 80                                     | NR                             | 840               | 2                                      | NR                             | 970               | 0                                      | NR                             |
| 455               | 433                                    | NR                             | 585               | 953                                    | NR                             | 715               | 68                                     | NR                             | 845               | 1                                      | NR                             | 975               | 0                                      | NR                             |
| 460               | 293                                    | NR                             | 590               | 985                                    | NR                             | 720               | 58                                     | NR                             | 850               | 1                                      | NR                             | 980               | 0                                      | NR                             |
| 465               | 215                                    | NR                             | 595               | 998                                    | NR                             | 725               | 50                                     | NR                             | 855               | 1                                      | NR                             | 985               | 0                                      | NR                             |
| 470               | 173                                    | NR                             | 600               | 997                                    | NR                             | 730               | 42                                     | NR                             | 860               | 1                                      | NR                             | 990               | 0                                      | NR                             |
| 475               | 127                                    | NR                             | 605               | 978                                    | NR                             | 735               | 36                                     | NR                             | 865               | 1                                      | NR                             | 995               | 0                                      | NR                             |
| 480               | 104                                    | NR                             | 610               | 945                                    | NR                             | 740               | 30                                     | NR                             | 870               | 1                                      | NR                             | 1000              | 0                                      | NR                             |
| 485               | 104                                    | NR                             | 615               | 902                                    | NR                             | 745               | 26                                     | NR                             | 875               | 1                                      | NR                             |                   |                                        |                                |

REPORT NUMBER: SP2-2501-321-3

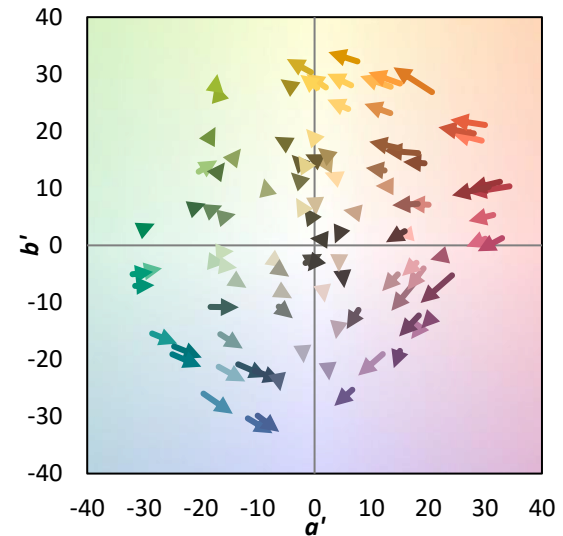
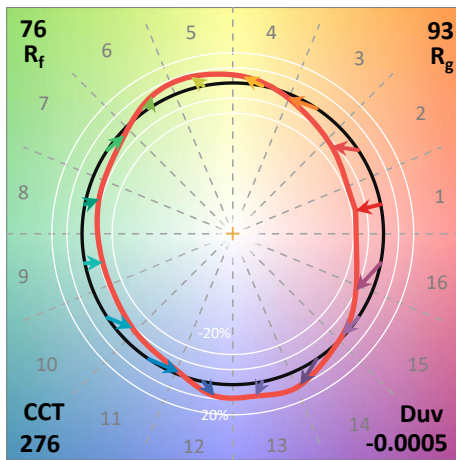
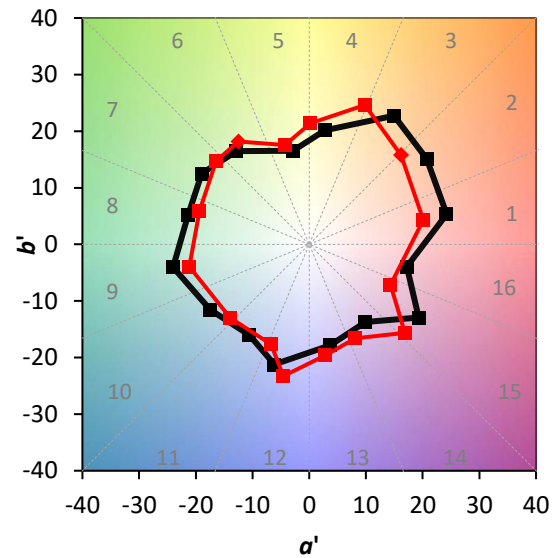
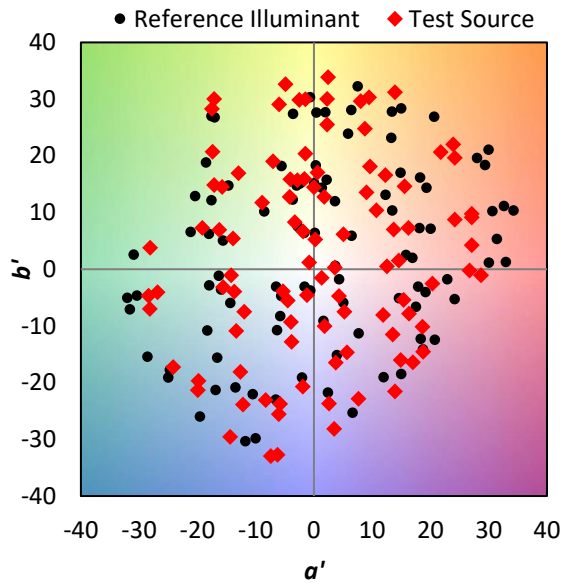
TM-30-18

### Summary

$R_f = 75.7$   
 $R_g = 93.2$   
 $CIE R_a = 71.7$   
 $R_g = -34.5$

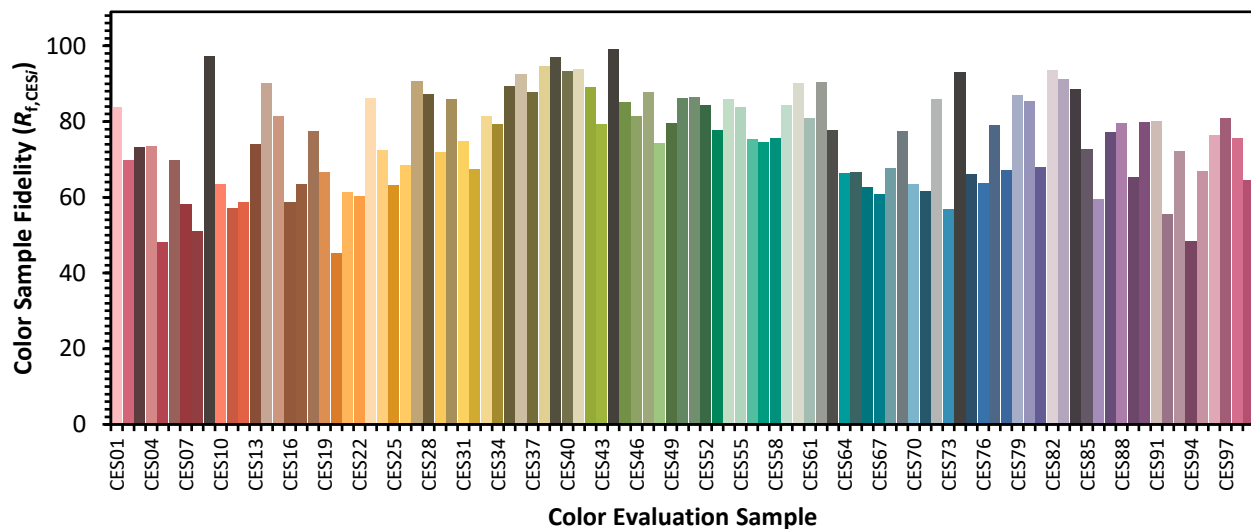


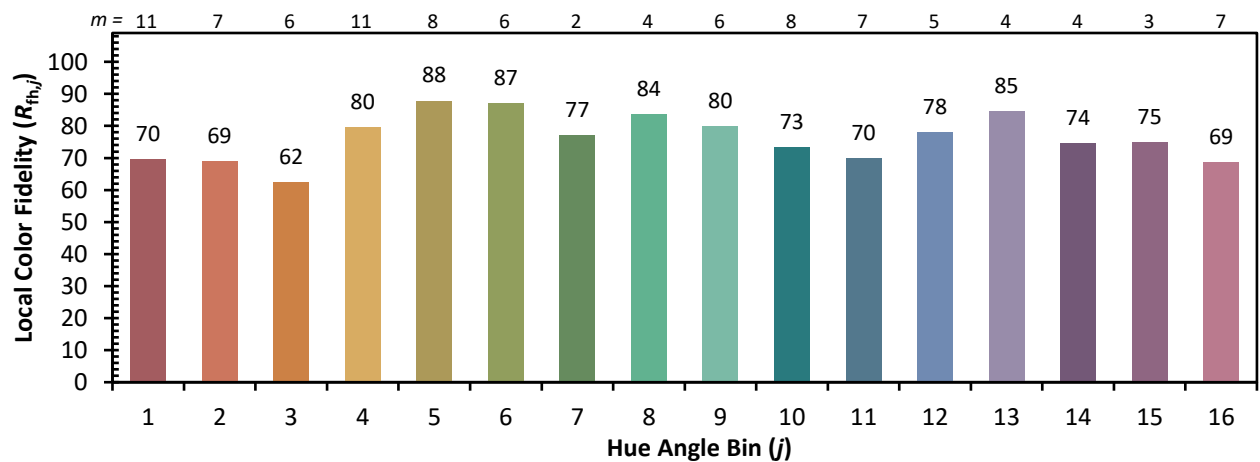
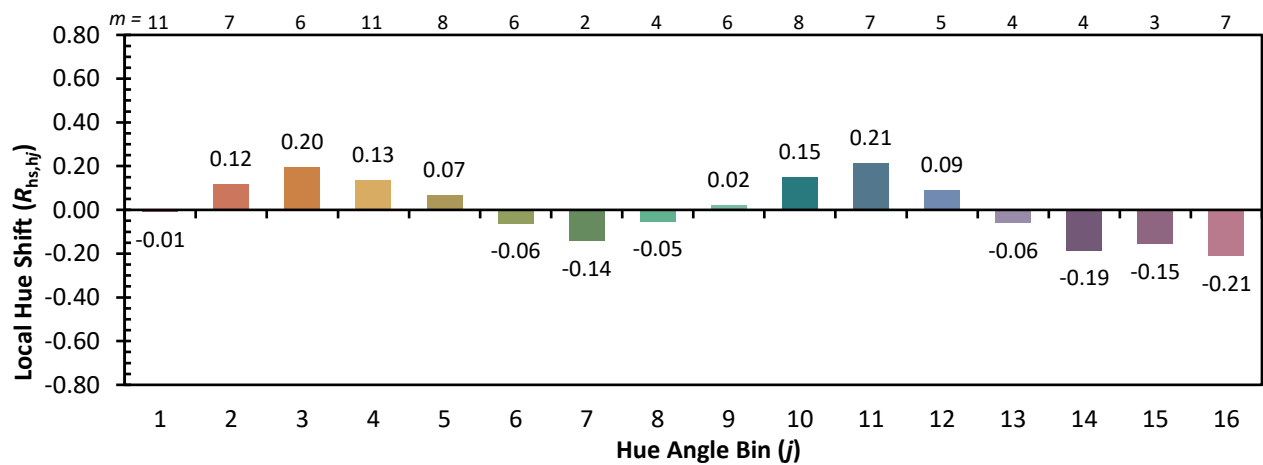
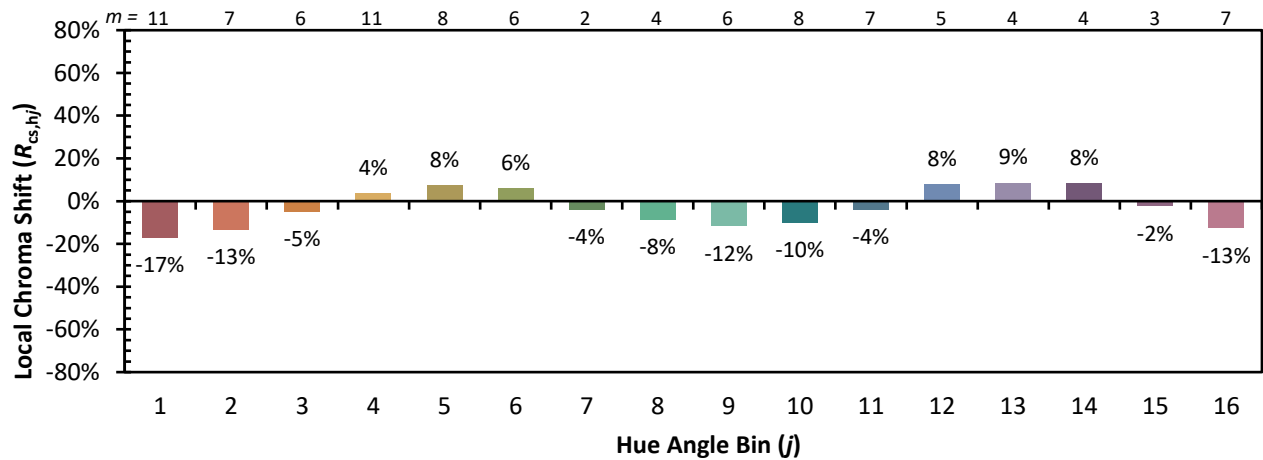
### Color Vector Graphics



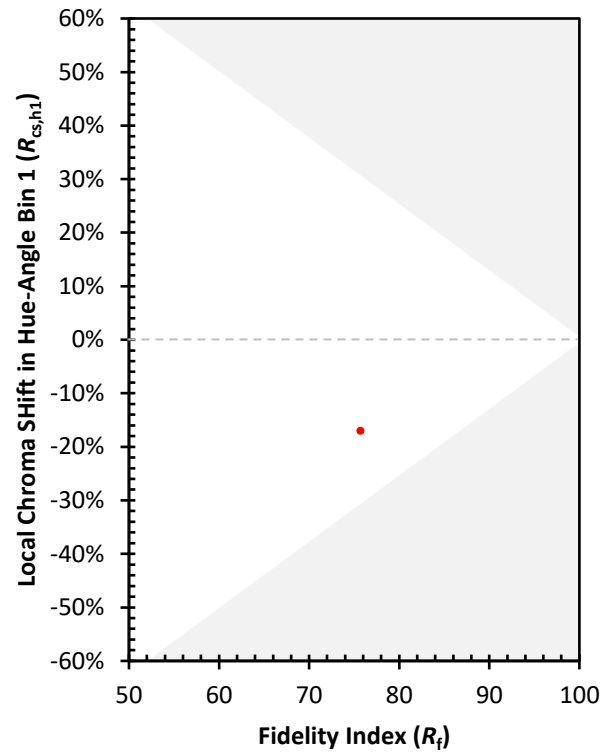
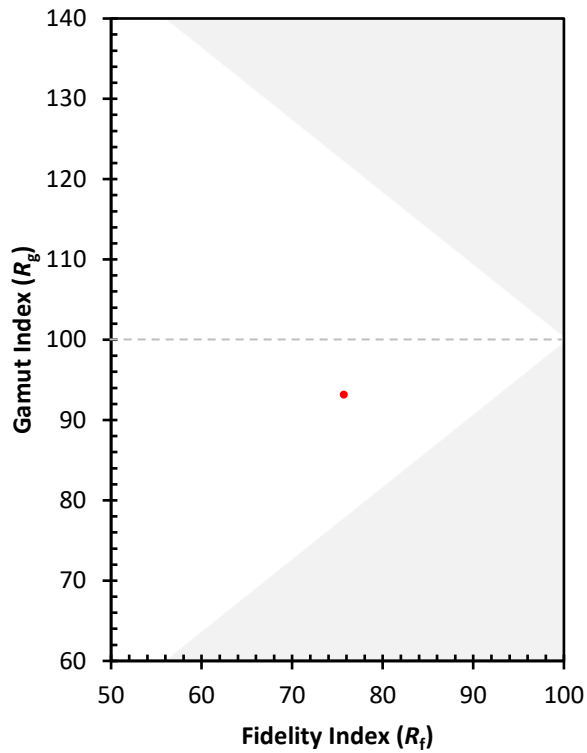
**Individual Sample Fidelity Index ( $R_{f,i}$ )**

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 68 | CES51 = 87 | CES76 = 64 |
| CES02 = 63 | CES27 = 91 | CES52 = 84 | CES77 = 79 |
| CES03 = 31 | CES28 = 87 | CES53 = 78 | CES78 = 67 |
| CES04 = 71 | CES29 = 72 | CES54 = 86 | CES79 = 87 |
| CES05 = 50 | CES30 = 86 | CES55 = 84 | CES80 = 85 |
| CES06 = 52 | CES31 = 75 | CES56 = 75 | CES81 = 68 |
| CES07 = 42 | CES32 = 67 | CES57 = 74 | CES82 = 94 |
| CES08 = 41 | CES33 = 81 | CES58 = 76 | CES83 = 91 |
| CES09 = 29 | CES34 = 79 | CES59 = 84 | CES84 = 89 |
| CES10 = 77 | CES35 = 89 | CES60 = 90 | CES85 = 73 |
| CES11 = 60 | CES36 = 92 | CES61 = 81 | CES86 = 59 |
| CES12 = 66 | CES37 = 88 | CES62 = 90 | CES87 = 77 |
| CES13 = 43 | CES38 = 95 | CES63 = 78 | CES88 = 79 |
| CES14 = 74 | CES39 = 97 | CES64 = 66 | CES89 = 65 |
| CES15 = 72 | CES40 = 93 | CES65 = 67 | CES90 = 80 |
| CES16 = 48 | CES41 = 94 | CES66 = 63 | CES91 = 80 |
| CES17 = 50 | CES42 = 89 | CES67 = 61 | CES92 = 55 |
| CES18 = 57 | CES43 = 79 | CES68 = 68 | CES93 = 72 |
| CES19 = 73 | CES44 = 99 | CES69 = 77 | CES94 = 48 |
| CES20 = 67 | CES45 = 85 | CES70 = 63 | CES95 = 67 |
| CES21 = 87 | CES46 = 81 | CES71 = 62 | CES96 = 76 |
| CES22 = 80 | CES47 = 88 | CES72 = 86 | CES97 = 81 |
| CES23 = 92 | CES48 = 74 | CES73 = 57 | CES98 = 76 |
| CES24 = 91 | CES49 = 80 | CES74 = 93 | CES99 = 64 |
| CES25 = 73 | CES50 = 86 | CES75 = 66 |            |



**Color Rendition by Hue-Angle Bin**


**Measure Comparisons**



(END OF REPORT)