

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

Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
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: P1461958

Luminaire Tested: USSL-70-727-U-T2RE

Issue Date: 06/10/2026

**Test Information**

Test Method: LM-79-2024  
Report Number: P1461958  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 6/11/2026  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: STREETWORKS  
Catalog Number: USSL-70-727-U-T2RE  
Description: USSL DISCRETE LED 1 SQUARE 70W 70CRI 2700K FIXTURE w/ TYPE II ROADWAY  
ILLUMINANCE DISTRIBUTION OPTIC  
Light Source: (40) 2700K CCT, 70 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 10910 lumens  
Efficiency: N/A  
Efficacy: 149.5 lumens/watt  
Luminous Opening: Rectangular (W 0.67' x L: 0.67' x H: 0')  
IES Classification: Type II - Short  
BUG Rating: B2 - U0 - G2

Input Watts (W): 73  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.98  
Total Harmonic Distortion (THDi): 2.73%  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT

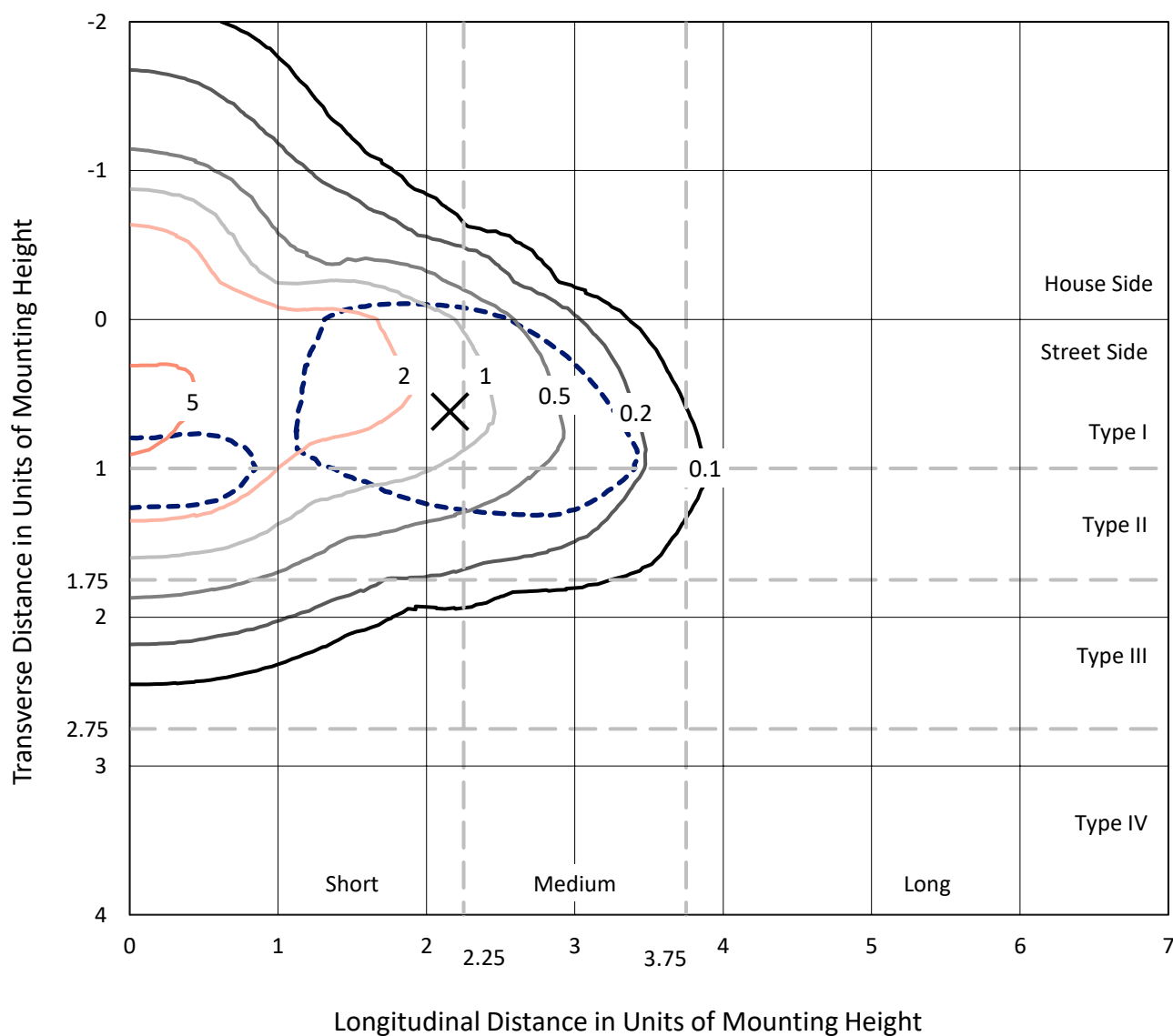
REPORT NUMBER: P1461958

CATALOG NUMBER: USSL-70-727-U-T2RE

## Iso-Footcandle Lines of Horizontal Illumination

× Max cd

--- 1/2 Max cd



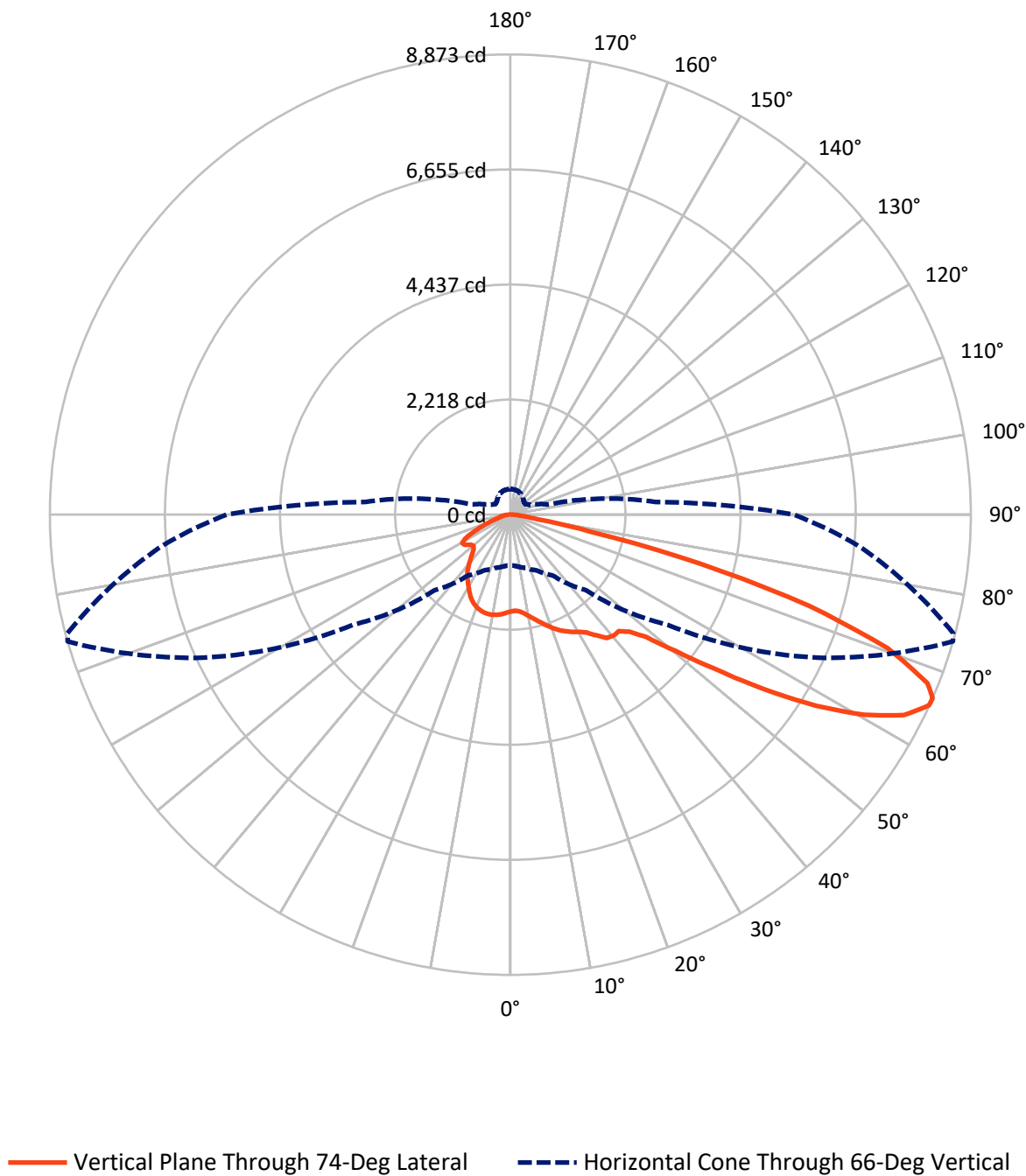
Based on 20 foot mounting height. Maximum calculated value = 5.5 fc

Type II - Short - N/A

REPORT NUMBER: P1461958

CATALOG NUMBER: USSL-70-727-U-T2RE

## Luminous Intensity Polar Plot



REPORT NUMBER: P1461958

CATALOG NUMBER: USSL-70-727-U-T2RE

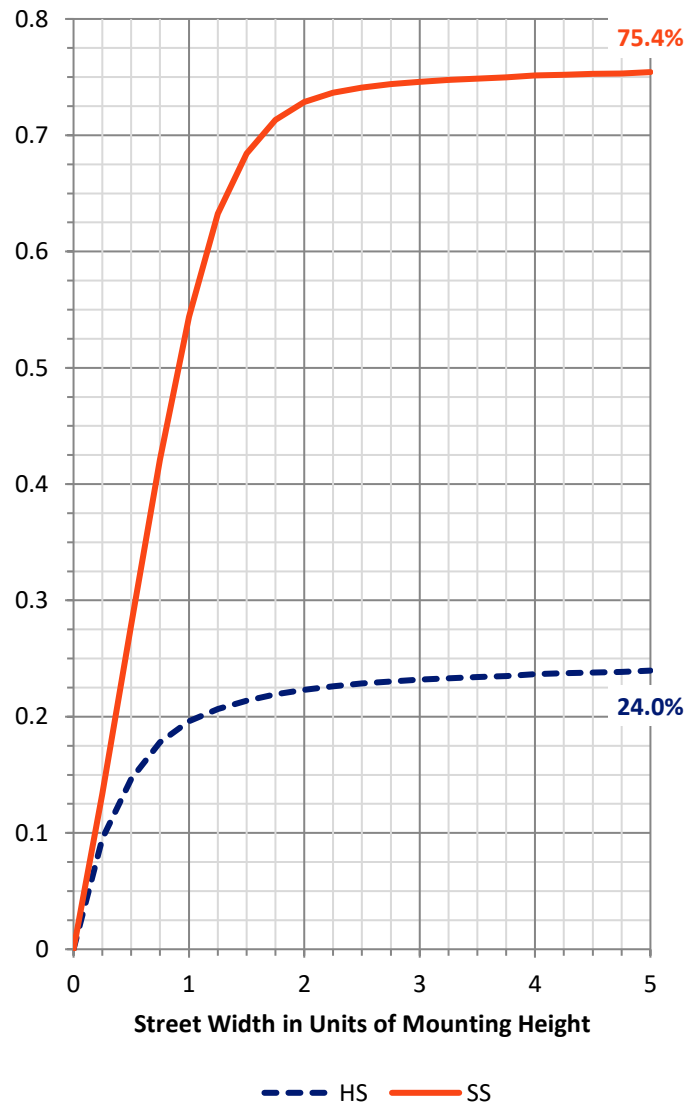
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 2655.5   | 0.0    | 2655.5  |
|                    | % Fixture | 24.3     | 0.0    | 24.3    |
| <b>Street Side</b> | Lumens    | 8254.5   | 0.0    | 8254.5  |
|                    | % Fixture | 75.7     | 0.0    | 75.7    |
| <b>Total</b>       | Lumens    | 10910.0  | 0.0    | 10910.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 175.6   | 1.6       |
| 10°-20°   | 542.4   | 5.0       |
| 20°-30°   | 1010.6  | 9.3       |
| 30°-40°   | 1516.2  | 13.9      |
| 40°-50°   | 1998.1  | 18.3      |
| 50°-60°   | 2435.5  | 22.3      |
| 60°-70°   | 2226.0  | 20.4      |
| 70°-80°   | 870.1   | 8.0       |
| 80°-90°   | 135.5   | 1.2       |
| 90°-100°  | 0.0     | 0.0       |
| 100°-110° | 0.0     | 0.0       |
| 110°-120° | 0.0     | 0.0       |
| 120°-130° | 0.0     | 0.0       |
| 130°-140° | 0.0     | 0.0       |
| 140°-150° | 0.0     | 0.0       |
| 150°-160° | 0.0     | 0.0       |
| 160°-170° | 0.0     | 0.0       |
| 170°-180° | 0.0     | 0.0       |
| 0°-90°    | 10910.0 | 100.0     |
| 0°-180°   | 10910.0 | 100.0     |

**Coefficient of Utilization**



REPORT NUMBER: P1461958

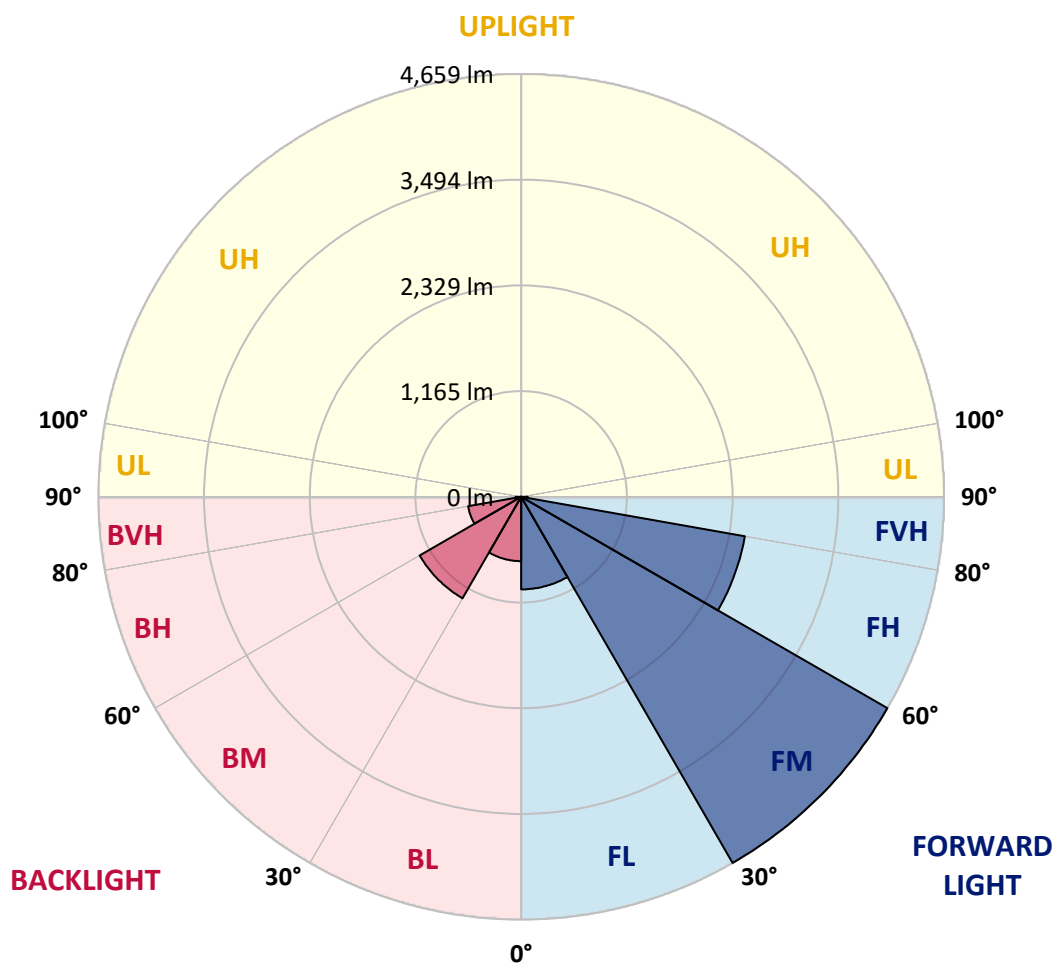
CATALOG NUMBER: USSL-70-727-U-T2RE

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 1019.9 | 9.3       |                         |      |         |
| FM   | (30°-60°)   | 4658.7 | 42.7      |                         |      |         |
| FH   | (60°-80°)   | 2502.6 | 22.9      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 73.3   | 0.7       |                         |      | G1/100  |
| BL   | (0°-30°)    | 708.8  | 6.5       | B2/1000                 |      |         |
| BM   | (30°-60°)   | 1291.0 | 11.8      | B2/2500                 |      |         |
| BH   | (60°-80°)   | 593.5  | 5.4       | B2/1000                 |      | G2/1000 |
| BVH  | (80°-90°)   | 62.2   | 0.6       |                         |      | G1/100  |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B2-U0-G2**

Type II Short



REPORT NUMBER: P1461958

CATALOG NUMBER: USSL-70-727-U-T2RE

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 74°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1866.2 | 1866.2 | 1866.2 | 1866.2 | 1866.2 | 1866.2 | 1866.2 | 1866.2 | 1866.2 | 1866.2 | 1866.2 |
| 2.5°  | 1848.5 | 1847.4 | 1843.4 | 1844.9 | 1846.9 | 1847.9 | 1852.0 | 1849.5 | 1853.5 | 1859.1 | 1863.1 |
| 5°    | 1794.8 | 1795.8 | 1801.9 | 1815.1 | 1839.3 | 1860.6 | 1876.3 | 1877.8 | 1874.3 | 1880.8 | 1883.9 |
| 7.5°  | 1713.4 | 1709.3 | 1722.5 | 1745.7 | 1777.1 | 1824.7 | 1883.4 | 1917.8 | 1920.3 | 1926.4 | 1928.9 |
| 10°   | 1743.2 | 1744.2 | 1741.7 | 1735.1 | 1751.3 | 1794.8 | 1871.2 | 1949.7 | 1988.6 | 1995.2 | 1996.7 |
| 12.5° | 1916.8 | 1913.7 | 1895.0 | 1868.2 | 1844.9 | 1829.7 | 1881.9 | 1980.5 | 2065.0 | 2070.1 | 2085.8 |
| 15°   | 2135.9 | 2115.1 | 2103.5 | 2068.1 | 2015.4 | 1957.2 | 1940.0 | 2028.6 | 2148.5 | 2163.2 | 2192.5 |
| 17.5° | 2339.3 | 2327.1 | 2315.0 | 2274.0 | 2203.2 | 2129.8 | 2055.9 | 2092.9 | 2241.6 | 2261.9 | 2304.9 |
| 20°   | 2550.8 | 2547.8 | 2531.6 | 2494.6 | 2420.8 | 2319.6 | 2203.2 | 2181.4 | 2331.7 | 2356.5 | 2427.8 |
| 22.5° | 2767.4 | 2768.9 | 2752.7 | 2705.1 | 2644.9 | 2520.4 | 2368.1 | 2274.5 | 2419.2 | 2451.6 | 2542.2 |
| 25°   | 2967.2 | 2963.7 | 2939.9 | 2922.2 | 2867.1 | 2740.6 | 2558.4 | 2382.8 | 2492.1 | 2527.0 | 2647.4 |
| 27.5° | 3120.6 | 3107.4 | 3132.7 | 3125.1 | 3071.5 | 2946.0 | 2738.0 | 2502.2 | 2560.9 | 2601.9 | 2739.0 |
| 30°   | 3293.6 | 3282.0 | 3309.3 | 3332.6 | 3276.9 | 3151.9 | 2913.1 | 2602.9 | 2620.6 | 2667.7 | 2825.6 |
| 32.5° | 3536.0 | 3531.4 | 3528.9 | 3546.1 | 3504.6 | 3351.3 | 3089.7 | 2745.6 | 2710.7 | 2756.7 | 2913.1 |
| 35°   | 3875.5 | 3860.4 | 3810.8 | 3780.9 | 3736.9 | 3545.6 | 3290.6 | 2939.9 | 2858.5 | 2906.0 | 3012.8 |
| 37.5° | 4243.4 | 4236.3 | 4145.2 | 4035.4 | 3918.5 | 3716.6 | 3477.8 | 3131.7 | 3016.8 | 3058.3 | 3091.7 |
| 40°   | 4651.2 | 4597.6 | 4521.2 | 4353.2 | 4117.4 | 3820.4 | 3507.2 | 3112.0 | 3063.9 | 3116.5 | 3106.9 |
| 42.5° | 4992.8 | 4921.5 | 4835.9 | 4669.0 | 4319.8 | 3941.8 | 3548.7 | 3108.4 | 3071.0 | 3131.2 | 3083.1 |
| 45°   | 5258.5 | 5225.1 | 5091.5 | 4920.4 | 4527.3 | 4053.6 | 3661.0 | 3248.1 | 3218.2 | 3282.0 | 3133.2 |
| 47.5° | 5303.0 | 5267.6 | 5222.5 | 5099.1 | 4668.5 | 4180.7 | 3816.8 | 3515.3 | 3522.8 | 3610.9 | 3336.1 |
| 50°   | 4902.2 | 4893.6 | 4968.0 | 5051.0 | 4740.8 | 4261.6 | 4005.6 | 3914.5 | 4131.6 | 4184.7 | 3847.7 |
| 52.5° | 4128.5 | 4118.4 | 4361.8 | 4659.8 | 4563.2 | 4305.1 | 4234.8 | 4502.5 | 4938.2 | 5026.7 | 4515.1 |
| 55°   | 3274.9 | 3338.7 | 3565.9 | 4045.0 | 4085.0 | 4129.0 | 4473.1 | 5182.1 | 5941.1 | 5985.1 | 5239.2 |
| 57.5° | 2762.3 | 2742.6 | 2911.6 | 3354.8 | 3487.4 | 3755.6 | 4571.3 | 5926.4 | 6951.6 | 6914.1 | 5943.6 |
| 60°   | 2326.1 | 2333.7 | 2423.8 | 2754.7 | 2927.3 | 3215.7 | 4504.0 | 6596.9 | 7840.6 | 7795.6 | 6539.7 |
| 62.5° | 1760.9 | 1743.7 | 1833.8 | 2106.0 | 2460.2 | 2745.1 | 4270.7 | 6913.1 | 8509.6 | 8462.0 | 6830.1 |
| 65°   | 1151.7 | 1172.9 | 1245.3 | 1415.3 | 1746.2 | 2292.2 | 3884.6 | 6727.4 | 8867.3 | 8823.3 | 6811.4 |
| 66°   | 979.6  | 988.2  | 1061.6 | 1182.5 | 1432.5 | 2059.5 | 3702.5 | 6527.0 | 8873.4 | 8836.5 | 6709.7 |
| 67.5° | 750.4  | 763.1  | 824.8  | 899.7  | 1051.5 | 1596.0 | 3379.1 | 6116.1 | 8670.5 | 8637.1 | 6421.3 |
| 70°   | 550.5  | 554.6  | 603.7  | 620.9  | 646.2  | 882.5  | 2535.1 | 5275.7 | 7711.6 | 7701.5 | 5307.0 |
| 72.5° | 420.0  | 425.0  | 453.4  | 468.1  | 460.0  | 532.8  | 1434.5 | 4298.1 | 6021.5 | 6011.4 | 3658.5 |
| 75°   | 362.3  | 360.8  | 369.4  | 368.4  | 363.3  | 381.0  | 629.5  | 2896.9 | 3771.3 | 3791.0 | 1788.2 |
| 77.5° | 297.5  | 299.1  | 305.1  | 299.6  | 295.5  | 298.0  | 383.6  | 1502.9 | 1594.4 | 1552.4 | 540.9  |
| 80°   | 238.3  | 240.4  | 246.4  | 242.9  | 237.3  | 242.9  | 279.3  | 544.0  | 534.9  | 475.6  | 218.1  |
| 82.5° | 187.7  | 182.2  | 187.2  | 189.8  | 185.2  | 192.3  | 209.5  | 248.5  | 231.8  | 225.7  | 152.8  |
| 85°   | 121.4  | 122.5  | 113.3  | 126.5  | 122.5  | 124.5  | 143.7  | 169.5  | 162.4  | 160.9  | 105.3  |
| 87.5° | 40.5   | 44.0   | 48.1   | 49.1   | 50.6   | 52.6   | 61.7   | 74.9   | 94.1   | 97.7   | 43.5   |
| 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: P1461958

CATALOG NUMBER: USSL-70-727-U-T2RE

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1866.2 | 1866.2 | 1866.2 | 1866.2 | 1866.2 | 1866.2 | 1866.2 | 1866.2 | 1866.2 | 1866.2 | 1866.2 |
| 2.5°  | 1870.7 | 1878.3 | 1888.4 | 1900.6 | 1909.2 | 1915.2 | 1911.7 | 1912.2 | 1910.7 | 1905.6 | 1904.6 |
| 5°    | 1892.5 | 1904.1 | 1920.8 | 1924.4 | 1914.7 | 1895.5 | 1872.2 | 1849.0 | 1836.3 | 1822.6 | 1822.1 |
| 7.5°  | 1939.0 | 1944.6 | 1948.6 | 1920.3 | 1867.7 | 1819.1 | 1768.0 | 1733.1 | 1717.4 | 1707.8 | 1716.4 |
| 10°   | 2000.8 | 2001.3 | 1966.9 | 1883.9 | 1794.8 | 1728.5 | 1686.5 | 1659.7 | 1644.5 | 1639.0 | 1641.5 |
| 12.5° | 2080.7 | 2069.1 | 1978.5 | 1839.9 | 1724.5 | 1660.2 | 1625.3 | 1608.6 | 1597.0 | 1592.9 | 1594.9 |
| 15°   | 2177.4 | 2139.4 | 1976.0 | 1786.2 | 1658.7 | 1608.1 | 1583.8 | 1571.2 | 1563.1 | 1560.0 | 1563.6 |
| 17.5° | 2273.0 | 2199.6 | 1959.8 | 1727.0 | 1609.1 | 1573.7 | 1557.5 | 1543.3 | 1539.8 | 1537.8 | 1540.8 |
| 20°   | 2367.1 | 2252.3 | 1931.9 | 1663.3 | 1572.7 | 1555.0 | 1537.3 | 1528.7 | 1532.7 | 1534.7 | 1540.3 |
| 22.5° | 2453.1 | 2284.1 | 1887.4 | 1597.5 | 1543.3 | 1533.2 | 1527.1 | 1525.1 | 1532.2 | 1536.2 | 1541.3 |
| 25°   | 2516.4 | 2293.2 | 1827.7 | 1540.3 | 1508.4 | 1512.5 | 1519.0 | 1516.0 | 1518.0 | 1518.5 | 1522.1 |
| 27.5° | 2566.0 | 2290.2 | 1742.2 | 1485.1 | 1465.9 | 1484.1 | 1499.3 | 1486.7 | 1481.1 | 1476.0 | 1479.1 |
| 30°   | 2609.5 | 2283.1 | 1649.1 | 1419.9 | 1406.2 | 1437.1 | 1454.3 | 1430.5 | 1415.3 | 1405.7 | 1414.8 |
| 32.5° | 2646.4 | 2282.1 | 1562.6 | 1335.4 | 1336.9 | 1369.8 | 1387.5 | 1360.2 | 1337.4 | 1328.3 | 1326.8 |
| 35°   | 2684.9 | 2285.1 | 1482.1 | 1249.3 | 1240.2 | 1284.3 | 1293.4 | 1268.1 | 1239.2 | 1229.1 | 1230.1 |
| 37.5° | 2708.7 | 2287.7 | 1398.6 | 1140.0 | 1135.0 | 1177.0 | 1185.6 | 1166.9 | 1146.1 | 1134.5 | 1130.9 |
| 40°   | 2688.9 | 2257.3 | 1283.7 | 1028.7 | 1011.5 | 1047.4 | 1070.2 | 1066.7 | 1036.3 | 1001.4 | 999.9  |
| 42.5° | 2677.3 | 2228.0 | 1162.3 | 920.9  | 905.3  | 924.5  | 965.0  | 943.7  | 886.5  | 880.0  | 875.4  |
| 45°   | 2769.9 | 2245.7 | 1061.1 | 830.9  | 796.0  | 826.8  | 864.8  | 814.2  | 789.9  | 781.3  | 788.4  |
| 47.5° | 3031.0 | 2345.9 | 986.7  | 766.6  | 719.0  | 747.9  | 762.1  | 744.3  | 723.6  | 720.6  | 723.6  |
| 50°   | 3601.3 | 2609.5 | 953.3  | 731.2  | 666.4  | 683.6  | 678.1  | 686.7  | 671.0  | 674.0  | 677.0  |
| 52.5° | 4324.9 | 3082.6 | 970.5  | 726.6  | 630.0  | 616.3  | 612.3  | 631.0  | 634.0  | 648.2  | 653.3  |
| 55°   | 5080.3 | 3499.6 | 1030.2 | 742.8  | 589.5  | 541.4  | 548.0  | 580.9  | 610.8  | 630.0  | 634.5  |
| 57.5° | 5720.4 | 3702.5 | 1096.5 | 742.8  | 535.4  | 482.2  | 497.4  | 545.5  | 593.0  | 609.2  | 611.3  |
| 60°   | 5988.1 | 3670.6 | 1117.3 | 692.7  | 479.2  | 434.2  | 460.0  | 524.2  | 568.8  | 577.9  | 582.9  |
| 62.5° | 5951.7 | 3485.4 | 1030.2 | 591.0  | 420.5  | 398.2  | 438.7  | 501.5  | 532.8  | 543.5  | 546.0  |
| 65°   | 5676.4 | 3067.4 | 845.5  | 472.1  | 370.9  | 372.4  | 421.0  | 472.6  | 497.9  | 510.6  | 515.6  |
| 66°   | 5463.9 | 2801.3 | 754.5  | 436.7  | 353.2  | 364.3  | 413.9  | 457.9  | 482.2  | 491.8  | 496.4  |
| 67.5° | 5009.0 | 2326.6 | 644.2  | 380.0  | 333.5  | 353.2  | 398.7  | 435.7  | 454.9  | 466.0  | 469.6  |
| 70°   | 3651.9 | 1418.3 | 463.0  | 303.6  | 304.6  | 331.4  | 360.8  | 386.6  | 423.0  | 438.7  | 443.8  |
| 72.5° | 2161.2 | 708.9  | 337.0  | 257.1  | 281.3  | 308.7  | 322.8  | 352.2  | 399.2  | 426.6  | 433.7  |
| 75°   | 987.2  | 347.6  | 245.9  | 227.7  | 252.0  | 268.2  | 284.4  | 324.9  | 382.5  | 424.0  | 431.1  |
| 77.5° | 335.0  | 224.2  | 199.9  | 204.4  | 210.5  | 221.6  | 245.9  | 297.5  | 363.8  | 409.9  | 421.5  |
| 80°   | 181.2  | 177.6  | 165.5  | 173.1  | 174.6  | 184.7  | 211.0  | 263.1  | 330.4  | 370.4  | 372.9  |
| 82.5° | 145.2  | 137.6  | 131.6  | 134.6  | 137.6  | 150.8  | 169.5  | 217.6  | 280.3  | 228.7  | 231.2  |
| 85°   | 93.6   | 82.5   | 85.5   | 90.1   | 93.1   | 104.7  | 116.9  | 161.4  | 201.9  | 106.8  | 101.7  |
| 87.5° | 27.8   | 25.3   | 30.4   | 33.9   | 33.4   | 33.9   | 45.0   | 84.5   | 118.9  | 50.1   | 34.4   |
| 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



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**



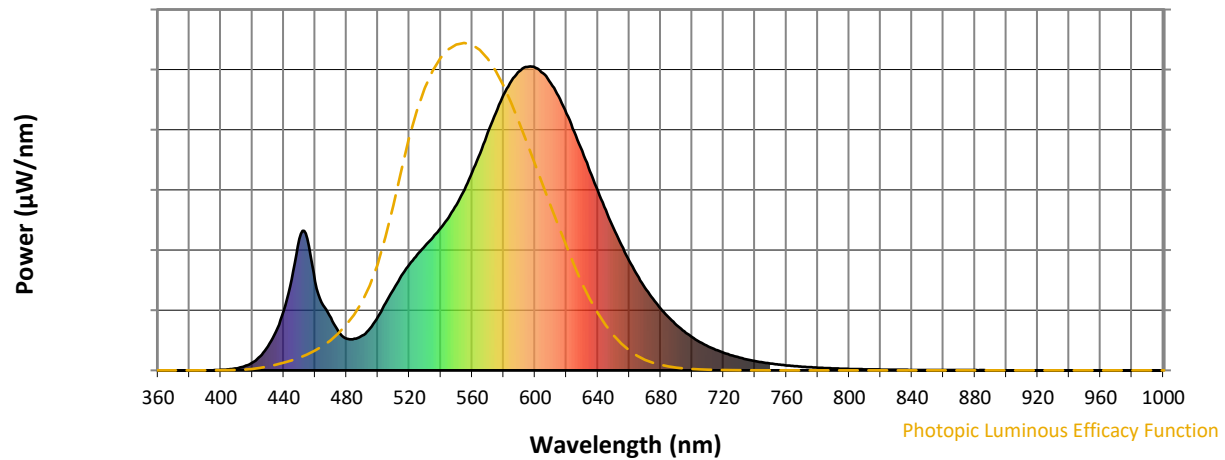
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



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>$\text{W}^\wedge/\text{nm}$ | 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

### Scotopic Flux vs. Wavelength



Scotopic Lumens: NR

S/P: 1.14

| λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/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

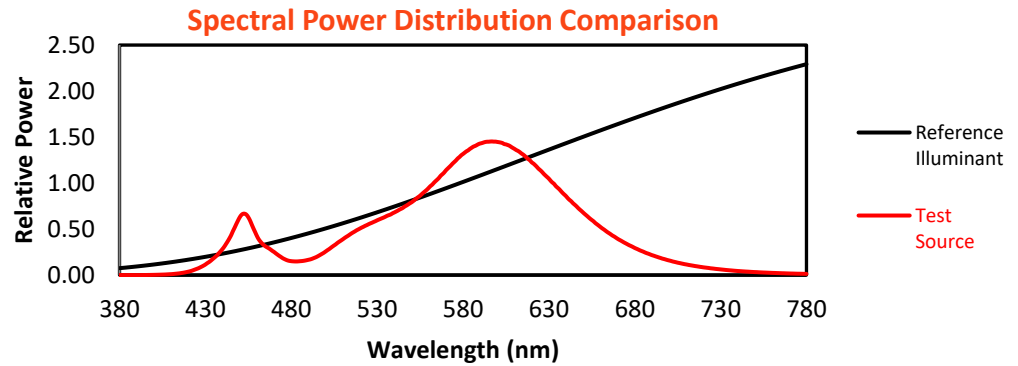
| $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^{\wedge}/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | 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

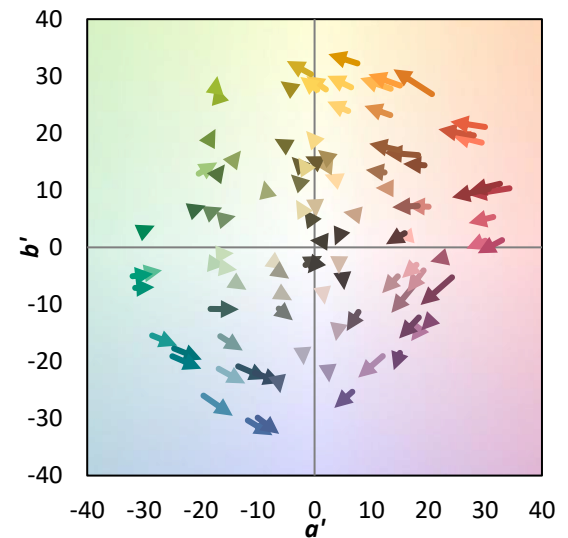
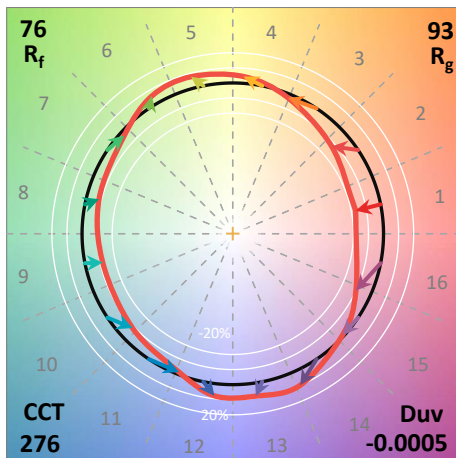
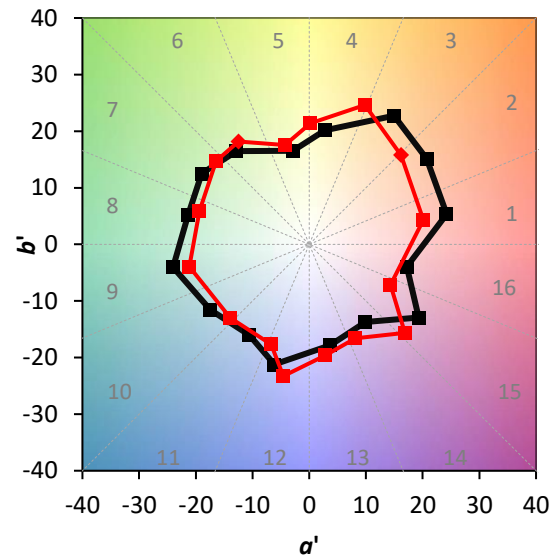
TM-30-18

### Summary

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

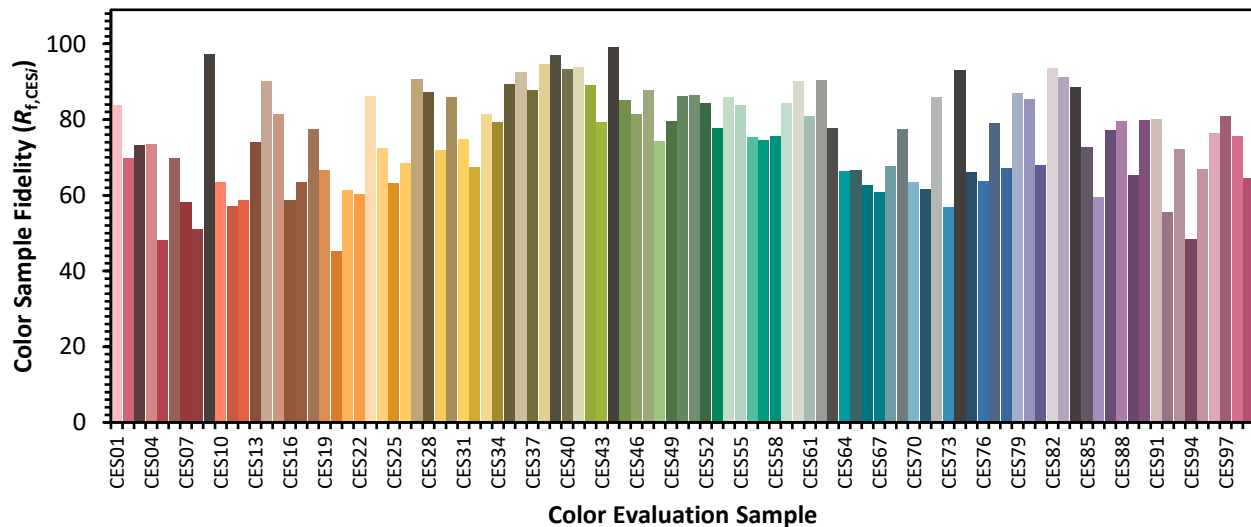


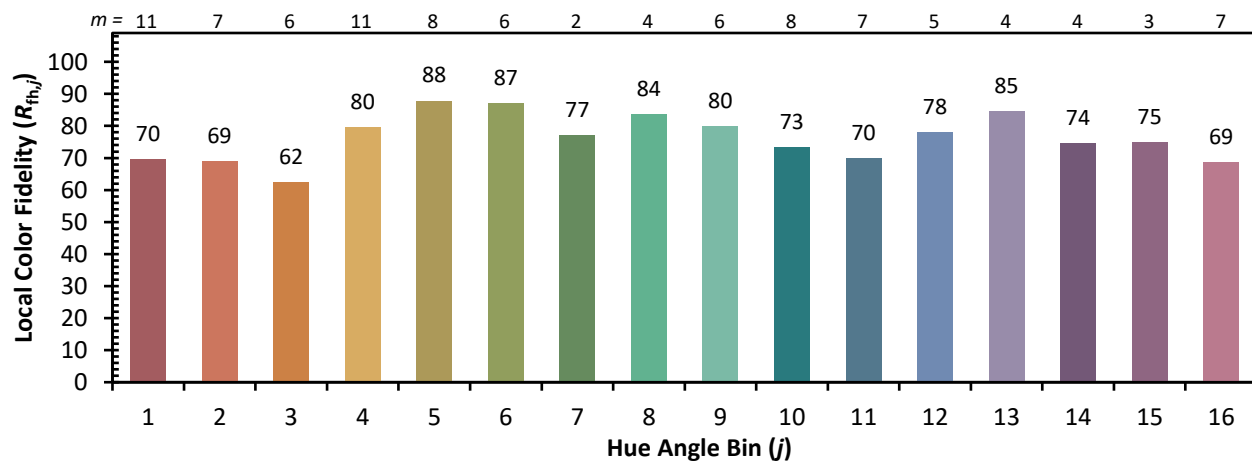
### Color Vector Graphics



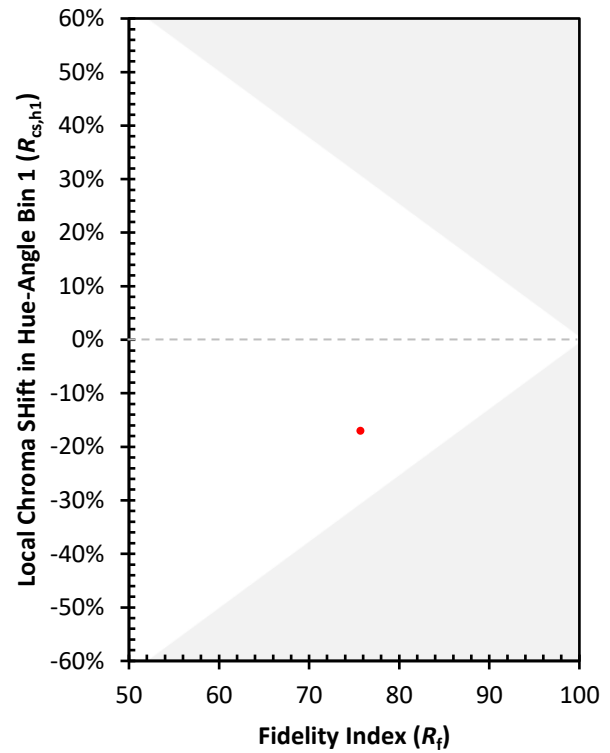
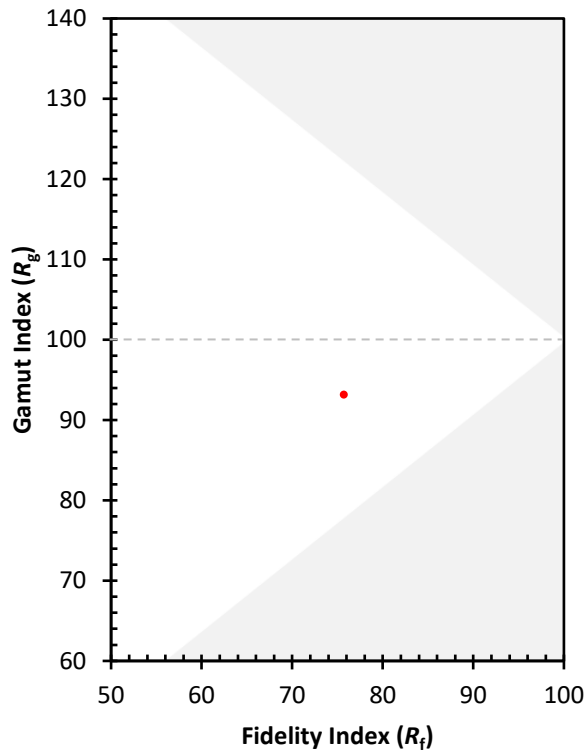
**Individual Sample Fidelity Index ( $R_{f,i}$ )**

|            |            |            |            |
|------------|------------|------------|------------|
| 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)