

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: P1461434

Luminaire Tested: USSL-70-722-U-T2U

Issue Date: 06/10/2026

**Test Information**

Test Method: LM-79-2024  
Report Number: P1461434  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 6/11/2026  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: STREETWORKS  
Catalog Number: USSL-70-722-U-T2U  
Description: USSL DISCRETE LED 1 SQUARE 70W 70CRI 2200K FIXTURE w/ TYPE II URBAN DISTRIBUTION OPTIC  
Light Source: (40) 2200K CCT, 70 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 9869.3 lumens  
Efficiency: N/A  
Efficacy: 135.2 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

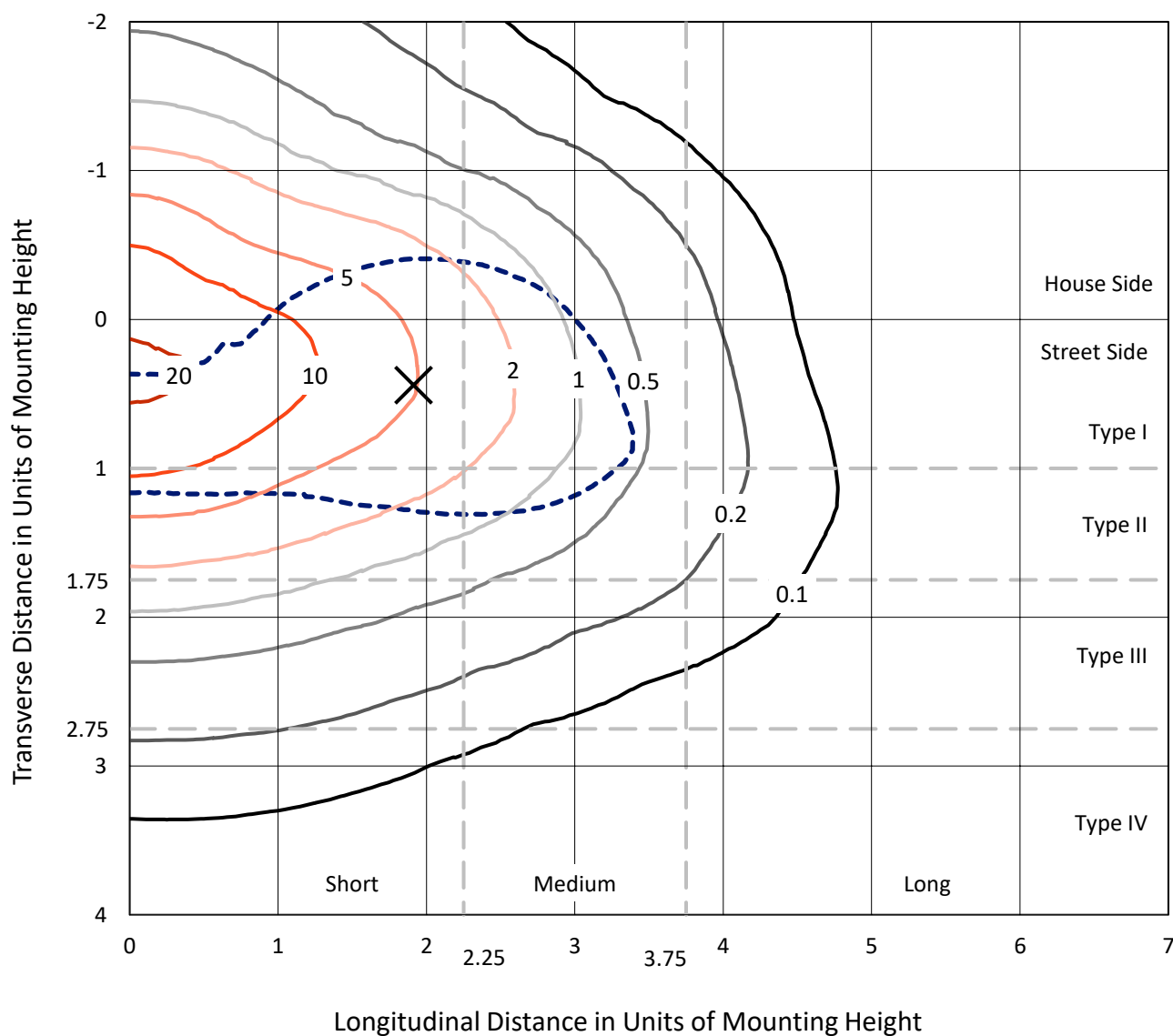
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## Iso-Footcandle Lines of Horizontal Illumination

× Max cd

--- 1/2 Max cd



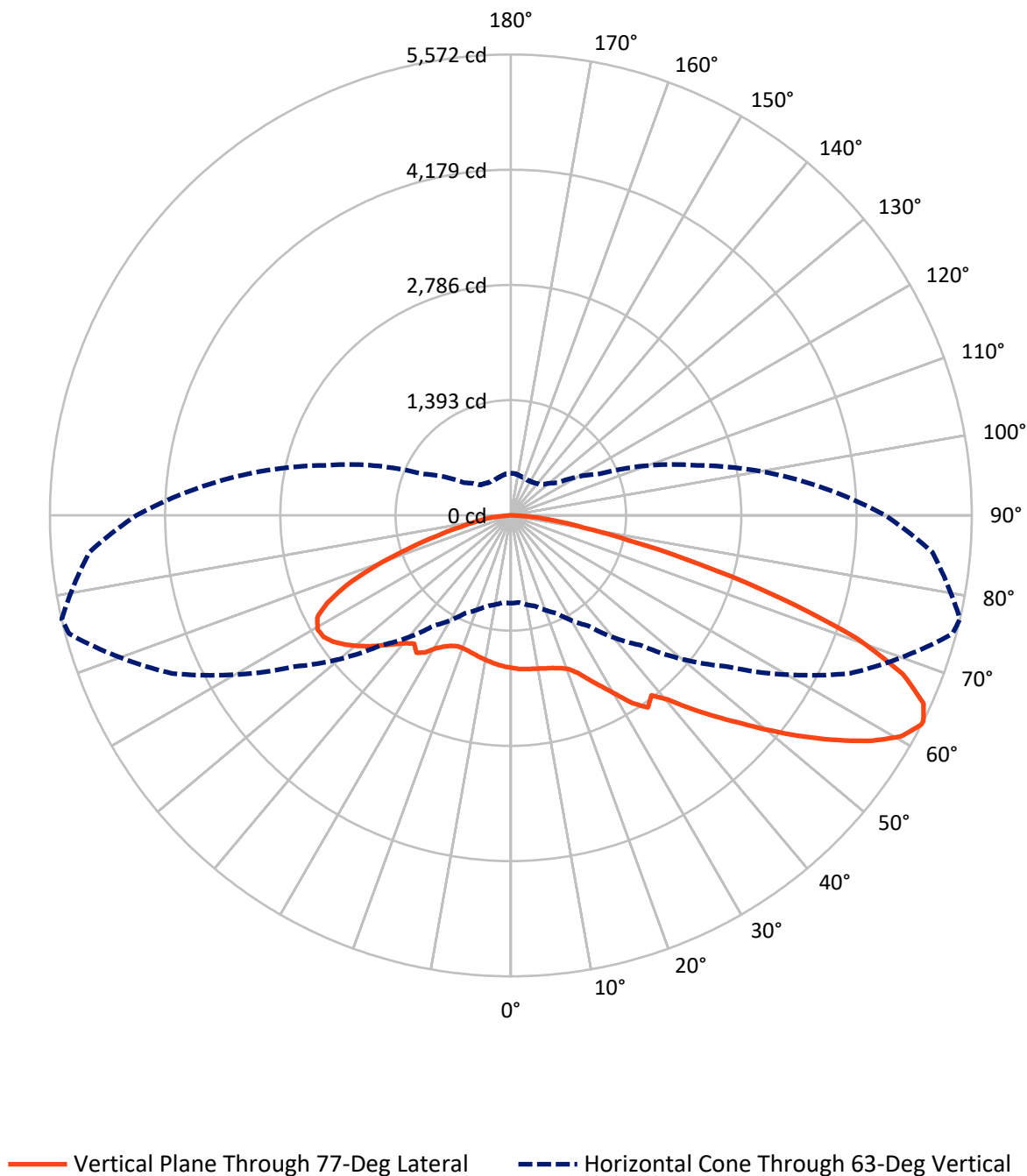
Based on 10 foot mounting height. Maximum calculated value = 22.9 fc

Type II - Short - N/A

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CATALOG NUMBER: USSL-70-722-U-T2U

## Luminous Intensity Polar Plot



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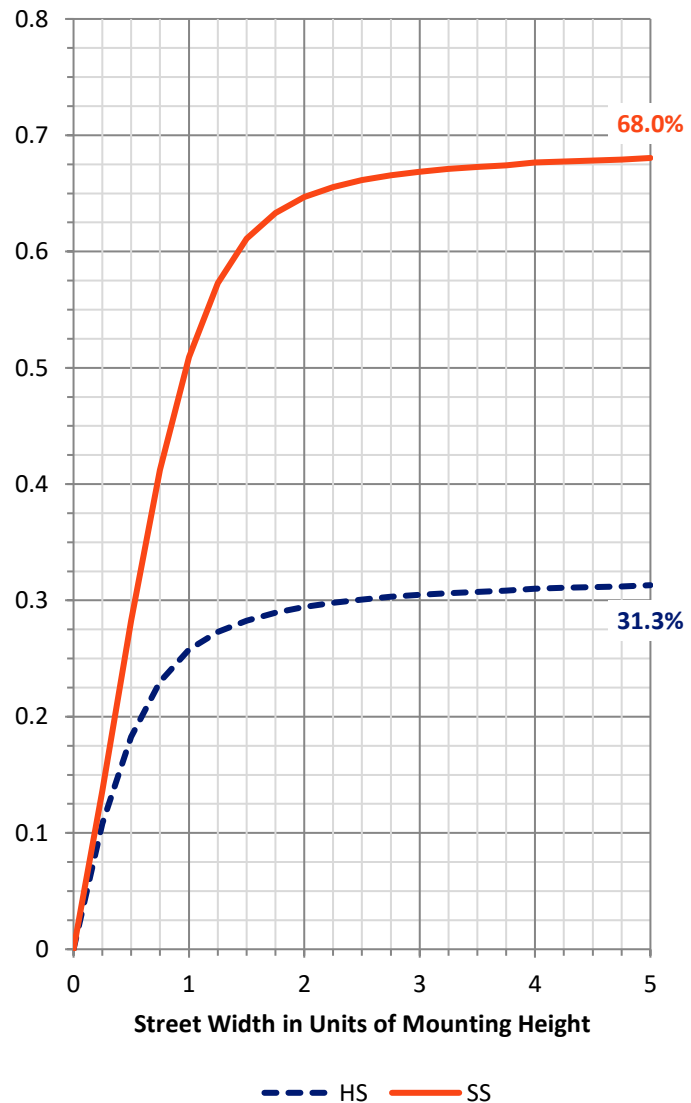
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 3130.2   | 0.0    | 3130.2 |
|                    | % Fixture | 31.7     | 0.0    | 31.7   |
| <b>Street Side</b> | Lumens    | 6739.1   | 0.0    | 6739.1 |
|                    | % Fixture | 68.3     | 0.0    | 68.3   |
| <b>Total</b>       | Lumens    | 9869.3   | 0.0    | 9869.3 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 176.1  | 1.8       |
| 10°-20°   | 540.4  | 5.5       |
| 20°-30°   | 959.5  | 9.7       |
| 30°-40°   | 1429.5 | 14.5      |
| 40°-50°   | 1832.5 | 18.6      |
| 50°-60°   | 2058.5 | 20.9      |
| 60°-70°   | 1817.7 | 18.4      |
| 70°-80°   | 869.1  | 8.8       |
| 80°-90°   | 185.9  | 1.9       |
| 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°    | 9869.3 | 100.0     |
| 0°-180°   | 9869.3 | 100.0     |

**Coefficient of Utilization**



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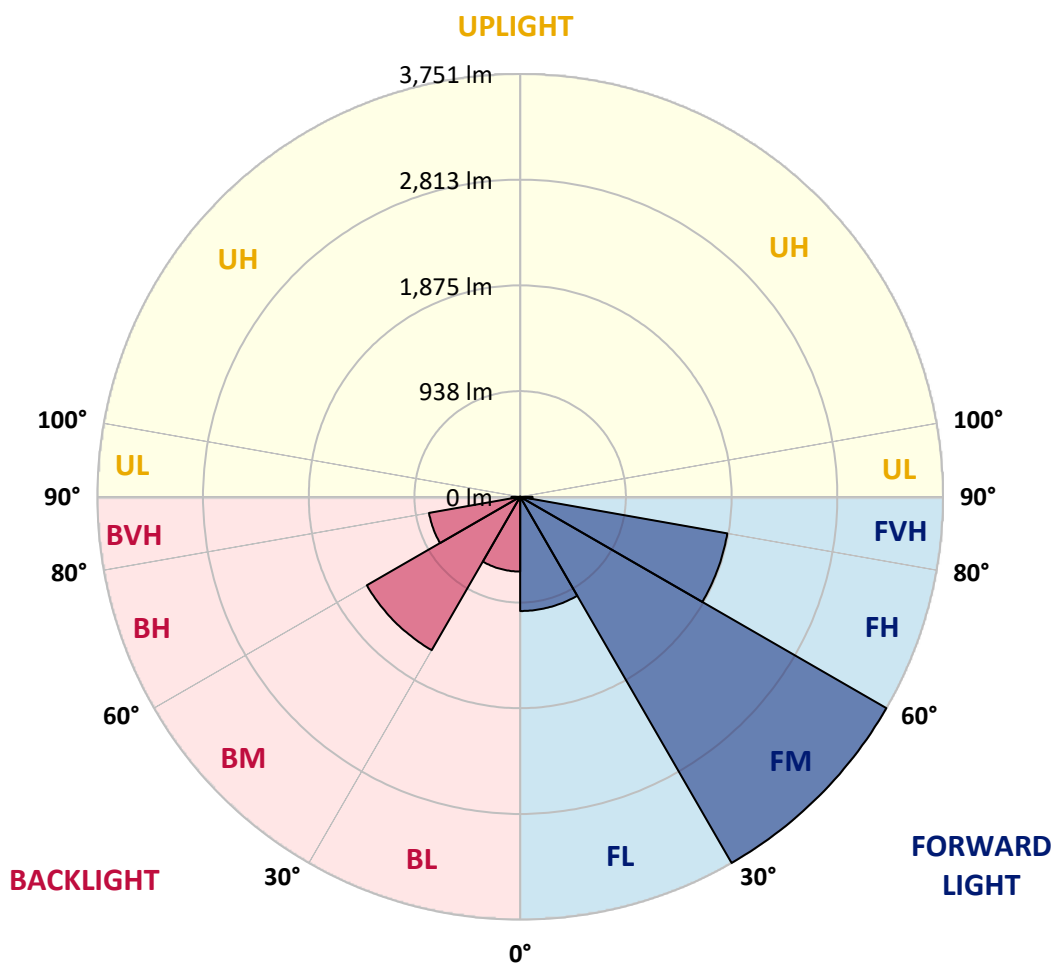
CATALOG NUMBER: USSL-70-722-U-T2U

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 1013.0 | 10.3      |                         |      |         |
| FM   | (30°-60°)   | 3750.7 | 38.0      |                         |      |         |
| FH   | (60°-80°)   | 1866.1 | 18.9      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 109.3  | 1.1       |                         |      | G2/225  |
| BL   | (0°-30°)    | 663.1  | 6.7       | B2/1000                 |      |         |
| BM   | (30°-60°)   | 1569.8 | 15.9      | B2/2500                 |      |         |
| BH   | (60°-80°)   | 820.7  | 8.3       | B2/1000                 |      | G2/1000 |
| BVH  | (80°-90°)   | 76.6   | 0.8       |                         |      | 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



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 75°    | 77°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1842.6 | 1842.6 | 1842.6 | 1842.6 | 1842.6 | 1842.6 | 1842.6 | 1842.6 | 1842.6 | 1842.6 | 1842.6 |
| 2.5°  | 1887.1 | 1895.3 | 1887.5 | 1886.6 | 1883.4 | 1874.2 | 1874.7 | 1862.8 | 1854.1 | 1858.2 | 1846.7 |
| 5°    | 1958.2 | 1959.1 | 1955.0 | 1948.1 | 1936.2 | 1917.8 | 1901.3 | 1883.9 | 1863.2 | 1865.1 | 1847.2 |
| 7.5°  | 2052.7 | 2055.0 | 2039.4 | 2025.6 | 2001.8 | 1968.3 | 1939.8 | 1903.1 | 1872.0 | 1872.9 | 1843.5 |
| 10°   | 2157.7 | 2160.0 | 2146.7 | 2122.9 | 2084.3 | 2035.3 | 1982.5 | 1933.0 | 1885.3 | 1883.0 | 1840.3 |
| 12.5° | 2276.5 | 2279.3 | 2269.2 | 2227.9 | 2177.4 | 2110.0 | 2039.8 | 1966.4 | 1903.6 | 1897.2 | 1845.3 |
| 15°   | 2409.5 | 2414.6 | 2390.3 | 2349.5 | 2283.9 | 2194.0 | 2104.1 | 2008.6 | 1924.7 | 1914.6 | 1850.4 |
| 17.5° | 2601.7 | 2585.2 | 2567.8 | 2511.8 | 2413.2 | 2302.2 | 2175.6 | 2059.6 | 1952.2 | 1941.2 | 1859.1 |
| 20°   | 2796.7 | 2798.1 | 2780.2 | 2745.3 | 2625.1 | 2482.0 | 2288.5 | 2133.4 | 1995.8 | 1980.7 | 1886.6 |
| 22.5° | 2782.0 | 2782.5 | 2790.7 | 2806.8 | 2793.5 | 2718.3 | 2540.7 | 2299.0 | 2094.9 | 2065.5 | 1939.8 |
| 25°   | 2830.6 | 2838.9 | 2833.4 | 2821.5 | 2763.2 | 2724.2 | 2685.7 | 2506.3 | 2240.7 | 2200.8 | 2039.8 |
| 27.5° | 2946.2 | 2960.0 | 2951.3 | 2940.7 | 2874.2 | 2799.9 | 2687.1 | 2598.5 | 2389.8 | 2341.7 | 2152.2 |
| 30°   | 3070.5 | 3075.6 | 3063.2 | 3046.7 | 2998.5 | 2933.8 | 2826.5 | 2671.5 | 2542.1 | 2508.6 | 2311.8 |
| 32.5° | 3163.7 | 3165.0 | 3159.1 | 3162.7 | 3113.7 | 3070.1 | 2994.9 | 2839.4 | 2718.3 | 2706.8 | 2574.2 |
| 35°   | 3232.5 | 3247.6 | 3243.0 | 3259.1 | 3229.7 | 3207.7 | 3167.3 | 3090.7 | 2898.1 | 2852.7 | 2650.8 |
| 37.5° | 3299.9 | 3316.9 | 3330.6 | 3338.9 | 3311.4 | 3309.1 | 3301.7 | 3177.9 | 2822.8 | 2761.4 | 2531.1 |
| 40°   | 3321.0 | 3330.6 | 3388.0 | 3421.0 | 3378.8 | 3376.5 | 3361.4 | 3204.5 | 2969.6 | 2927.4 | 2692.6 |
| 42.5° | 3299.0 | 3297.1 | 3365.5 | 3390.7 | 3413.6 | 3437.0 | 3466.4 | 3406.8 | 3217.3 | 3192.1 | 2935.7 |
| 45°   | 3159.5 | 3138.4 | 3175.1 | 3305.8 | 3385.2 | 3475.6 | 3599.9 | 3626.9 | 3503.1 | 3466.4 | 3203.1 |
| 47.5° | 2981.1 | 2967.3 | 3013.2 | 3167.8 | 3308.6 | 3488.4 | 3706.8 | 3865.9 | 3790.7 | 3756.3 | 3511.8 |
| 50°   | 2700.4 | 2716.4 | 2811.8 | 2981.5 | 3183.8 | 3468.2 | 3793.0 | 4096.6 | 4118.2 | 4093.0 | 3822.8 |
| 52.5° | 2333.4 | 2344.9 | 2548.5 | 2766.0 | 3011.8 | 3339.3 | 3830.6 | 4334.7 | 4459.0 | 4444.8 | 4140.7 |
| 55°   | 1940.3 | 1974.7 | 2121.0 | 2456.8 | 2752.2 | 3178.3 | 3804.5 | 4526.9 | 4819.1 | 4794.8 | 4474.6 |
| 57.5° | 1605.9 | 1641.7 | 1742.6 | 2046.7 | 2445.3 | 2934.8 | 3707.2 | 4663.1 | 5140.6 | 5142.9 | 4786.5 |
| 60°   | 1305.0 | 1336.7 | 1411.0 | 1656.4 | 2085.2 | 2644.4 | 3512.7 | 4690.7 | 5400.3 | 5421.8 | 5012.7 |
| 62.5° | 1093.1 | 1105.9 | 1176.1 | 1351.3 | 1723.3 | 2297.2 | 3240.3 | 4566.4 | 5528.2 | 5570.4 | 5116.3 |
| 63°   | 1061.9 | 1055.9 | 1134.8 | 1302.7 | 1627.5 | 2220.1 | 3183.8 | 4518.7 | 5528.7 | 5572.3 | 5115.9 |
| 65°   | 901.3  | 910.1  | 961.0  | 1103.2 | 1370.1 | 1898.6 | 2860.0 | 4267.7 | 5420.0 | 5482.8 | 5000.7 |
| 67.5° | 706.9  | 715.1  | 784.8  | 900.4  | 1090.3 | 1539.4 | 2432.9 | 3824.6 | 5051.7 | 5108.1 | 4609.5 |
| 70°   | 560.5  | 564.2  | 608.7  | 713.7  | 885.7  | 1199.5 | 1911.9 | 3205.4 | 4377.8 | 4421.9 | 3904.9 |
| 72.5° | 454.6  | 466.5  | 495.9  | 559.6  | 671.1  | 911.4  | 1442.6 | 2527.9 | 3456.8 | 3390.7 | 2871.0 |
| 75°   | 381.2  | 384.8  | 414.2  | 445.9  | 503.7  | 656.4  | 1040.8 | 1863.7 | 2356.8 | 2351.8 | 1871.0 |
| 77.5° | 322.0  | 329.3  | 336.2  | 351.4  | 384.4  | 467.0  | 731.2  | 1294.5 | 1500.9 | 1475.2 | 1078.9 |
| 80°   | 271.6  | 274.3  | 271.6  | 274.3  | 286.7  | 316.0  | 474.8  | 847.7  | 956.8  | 889.9  | 656.4  |
| 82.5° | 189.4  | 203.2  | 205.0  | 214.2  | 218.8  | 231.2  | 317.4  | 552.3  | 609.2  | 547.7  | 386.7  |
| 85°   | 112.4  | 111.0  | 116.5  | 132.1  | 147.2  | 145.9  | 201.4  | 276.1  | 328.4  | 305.5  | 185.8  |
| 87.5° | 39.9   | 37.6   | 37.6   | 46.3   | 50.0   | 54.1   | 66.1   | 86.2   | 81.6   | 82.1   | 46.3   |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

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CATALOG NUMBER: USSL-70-722-U-T2U

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1842.6 | 1842.6 | 1842.6 | 1842.6 | 1842.6 | 1842.6 | 1842.6 | 1842.6 | 1842.6 | 1842.6 | 1842.6 |
| 2.5°  | 1840.8 | 1833.0 | 1829.3 | 1822.9 | 1812.8 | 1807.3 | 1802.2 | 1795.4 | 1793.1 | 1787.1 | 1786.2 |
| 5°    | 1834.3 | 1826.5 | 1811.4 | 1794.9 | 1781.1 | 1770.6 | 1751.3 | 1739.8 | 1729.3 | 1727.5 | 1730.2 |
| 7.5°  | 1824.2 | 1814.6 | 1790.8 | 1766.9 | 1739.8 | 1722.0 | 1697.2 | 1681.1 | 1672.0 | 1670.1 | 1673.8 |
| 10°   | 1820.1 | 1802.7 | 1767.8 | 1733.9 | 1699.9 | 1672.0 | 1644.9 | 1624.7 | 1611.4 | 1609.6 | 1605.4 |
| 12.5° | 1816.0 | 1794.0 | 1746.3 | 1703.6 | 1655.0 | 1622.4 | 1593.1 | 1576.6 | 1562.8 | 1561.0 | 1560.0 |
| 15°   | 1814.2 | 1786.2 | 1724.3 | 1666.9 | 1613.2 | 1574.3 | 1544.9 | 1531.6 | 1527.5 | 1524.7 | 1526.1 |
| 17.5° | 1816.9 | 1780.7 | 1705.0 | 1629.8 | 1568.3 | 1528.8 | 1505.9 | 1497.2 | 1495.8 | 1496.7 | 1499.9 |
| 20°   | 1831.6 | 1784.8 | 1688.9 | 1598.6 | 1528.8 | 1488.5 | 1471.5 | 1466.9 | 1466.9 | 1472.0 | 1475.2 |
| 22.5° | 1864.6 | 1806.8 | 1680.7 | 1573.3 | 1495.8 | 1458.2 | 1438.5 | 1433.0 | 1438.9 | 1448.1 | 1450.4 |
| 25°   | 1951.8 | 1870.6 | 1697.2 | 1559.1 | 1470.1 | 1425.2 | 1404.1 | 1403.2 | 1409.6 | 1417.8 | 1418.8 |
| 27.5° | 2051.3 | 1950.4 | 1735.7 | 1556.8 | 1446.3 | 1391.2 | 1368.8 | 1366.0 | 1369.2 | 1377.5 | 1377.5 |
| 30°   | 2188.0 | 2056.8 | 1794.0 | 1573.3 | 1429.8 | 1354.1 | 1327.5 | 1318.8 | 1322.4 | 1333.0 | 1329.8 |
| 32.5° | 2404.5 | 2226.5 | 1884.3 | 1602.2 | 1414.6 | 1316.9 | 1281.6 | 1274.3 | 1274.3 | 1282.5 | 1286.2 |
| 35°   | 2509.1 | 2352.2 | 1929.7 | 1591.2 | 1380.7 | 1273.8 | 1231.6 | 1221.1 | 1234.8 | 1250.4 | 1252.7 |
| 37.5° | 2402.7 | 2242.6 | 1866.0 | 1543.1 | 1332.5 | 1222.9 | 1182.5 | 1173.8 | 1185.7 | 1200.9 | 1202.7 |
| 40°   | 2530.2 | 2344.4 | 1915.1 | 1544.4 | 1302.2 | 1175.2 | 1127.9 | 1100.0 | 1101.8 | 1113.7 | 1111.0 |
| 42.5° | 2744.4 | 2518.7 | 1987.5 | 1550.9 | 1265.6 | 1123.4 | 1053.2 | 1004.6 | 997.7  | 999.5  | 1002.3 |
| 45°   | 2989.8 | 2715.0 | 2073.3 | 1552.2 | 1218.8 | 1059.6 | 961.4  | 901.3  | 884.4  | 874.3  | 871.5  |
| 47.5° | 3252.2 | 2925.1 | 2166.9 | 1549.0 | 1158.7 | 977.5  | 868.3  | 808.2  | 775.7  | 760.5  | 761.9  |
| 50°   | 3536.6 | 3142.6 | 2250.4 | 1533.9 | 1094.5 | 890.3  | 780.2  | 721.5  | 684.8  | 676.1  | 672.0  |
| 52.5° | 3805.8 | 3355.8 | 2330.7 | 1511.9 | 1022.4 | 801.3  | 697.2  | 646.8  | 616.0  | 607.8  | 605.9  |
| 55°   | 4090.7 | 3567.8 | 2398.1 | 1473.8 | 941.3  | 717.4  | 624.3  | 590.3  | 568.8  | 563.3  | 564.2  |
| 57.5° | 4334.7 | 3754.5 | 2434.3 | 1418.3 | 863.3  | 643.1  | 571.1  | 548.6  | 535.3  | 538.1  | 539.9  |
| 60°   | 4516.4 | 3848.5 | 2427.0 | 1338.5 | 783.9  | 582.5  | 527.5  | 515.6  | 515.6  | 538.1  | 544.9  |
| 62.5° | 4544.3 | 3829.7 | 2353.1 | 1223.8 | 697.7  | 531.6  | 489.9  | 478.4  | 489.9  | 517.4  | 522.9  |
| 63°   | 4527.8 | 3798.5 | 2333.9 | 1186.7 | 684.4  | 520.6  | 481.6  | 470.6  | 486.2  | 508.2  | 508.2  |
| 65°   | 4365.0 | 3632.4 | 2162.8 | 1062.8 | 614.2  | 484.4  | 452.7  | 447.2  | 468.8  | 483.5  | 485.8  |
| 67.5° | 3966.4 | 3292.5 | 1870.1 | 879.8  | 540.8  | 443.1  | 414.7  | 424.3  | 440.4  | 451.8  | 455.5  |
| 70°   | 3333.8 | 2727.4 | 1496.3 | 707.8  | 471.5  | 400.0  | 383.9  | 389.9  | 404.6  | 414.7  | 418.3  |
| 72.5° | 2426.1 | 2055.4 | 1122.4 | 565.1  | 410.5  | 358.2  | 349.5  | 349.1  | 358.7  | 362.4  | 367.9  |
| 75°   | 1572.9 | 1375.6 | 819.7  | 455.9  | 350.4  | 315.6  | 306.0  | 303.2  | 321.5  | 328.9  | 336.2  |
| 77.5° | 937.6  | 852.3  | 585.3  | 374.8  | 298.6  | 259.2  | 264.7  | 264.7  | 283.5  | 306.4  | 317.0  |
| 80°   | 567.0  | 521.1  | 433.9  | 311.0  | 234.9  | 211.9  | 217.4  | 220.6  | 266.5  | 310.5  | 314.7  |
| 82.5° | 341.7  | 335.8  | 322.0  | 240.8  | 182.1  | 161.9  | 172.9  | 194.0  | 250.9  | 192.2  | 221.6  |
| 85°   | 168.3  | 181.2  | 206.9  | 134.4  | 113.3  | 110.5  | 116.1  | 171.6  | 166.0  | 76.6   | 72.0   |
| 87.5° | 43.1   | 51.4   | 48.6   | 35.8   | 30.7   | 28.4   | 38.5   | 64.2   | 52.8   | 18.3   | 11.0   |
| 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: SP2-2501-321-2

Test Date: 04/09/2025

Luminaire Tested: GKO-PB1E-722-U-T4W

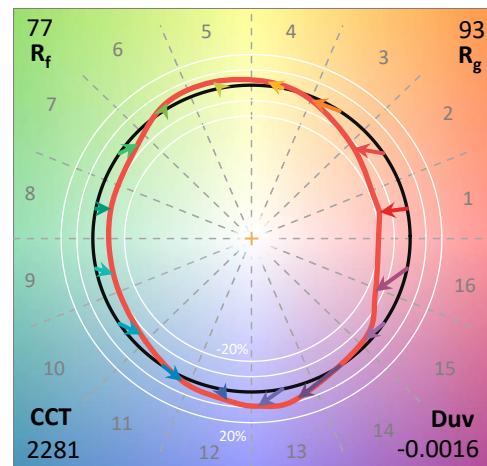
Data in this report applies to families of products including GKO-PB1E-722-U-T4W

### Test Information

Test Method: LM-79-2019  
 Report Number: SP2-2501-321-2  
 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-722-U-T4W**  
 Description: Gekko Wedge Wall Pack Fixture 1 SQ w/ T4W distribution

### Spectral Parameters

|                           |          |           |      |      |       |
|---------------------------|----------|-----------|------|------|-------|
| CCT (K):                  | 2281     | CRI (Ra): | 70.6 |      |       |
| CIE u':                   | 0.2851   | R1:       | 68.4 | R9:  | -35.1 |
| CIE v':                   | 0.5324   | R2:       | 88.7 | R10: | 78.0  |
| Duv:                      | -0.0016  | R3:       | 85.7 | R11: | 60.2  |
| CIE x:                    | 0.4942   | R4:       | 63.2 | R12: | 73.8  |
| CIE y:                    | 0.4102   | R5:       | 69.0 | R13: | 72.8  |
| CIE z:                    | 0.0956   | R6:       | 88.6 | R14: | 92.4  |
| Peak Wavelength (nm):     | 602      | R7:       | 68.8 | R15: | 58.4  |
| Dominant Wavelength (nm): | 587      | R8:       | 32.6 |      |       |
| Purity:                   | 71.48321 |           |      |      |       |
| Rf:                       | 76.9     |           |      |      |       |
| Rg:                       | 92.6     |           |      |      |       |



### Test Conditions

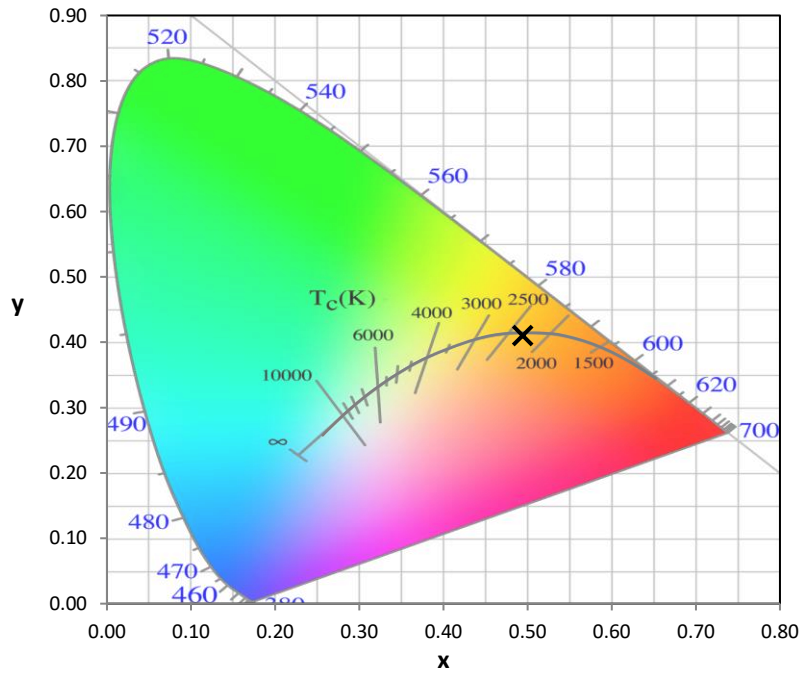
Stabilization Time: 40M  
 Operation Time: 1H 40M  
 Sphere Temperature (°C): 25.0

REPORT NUMBER: SP2-2501-321-2

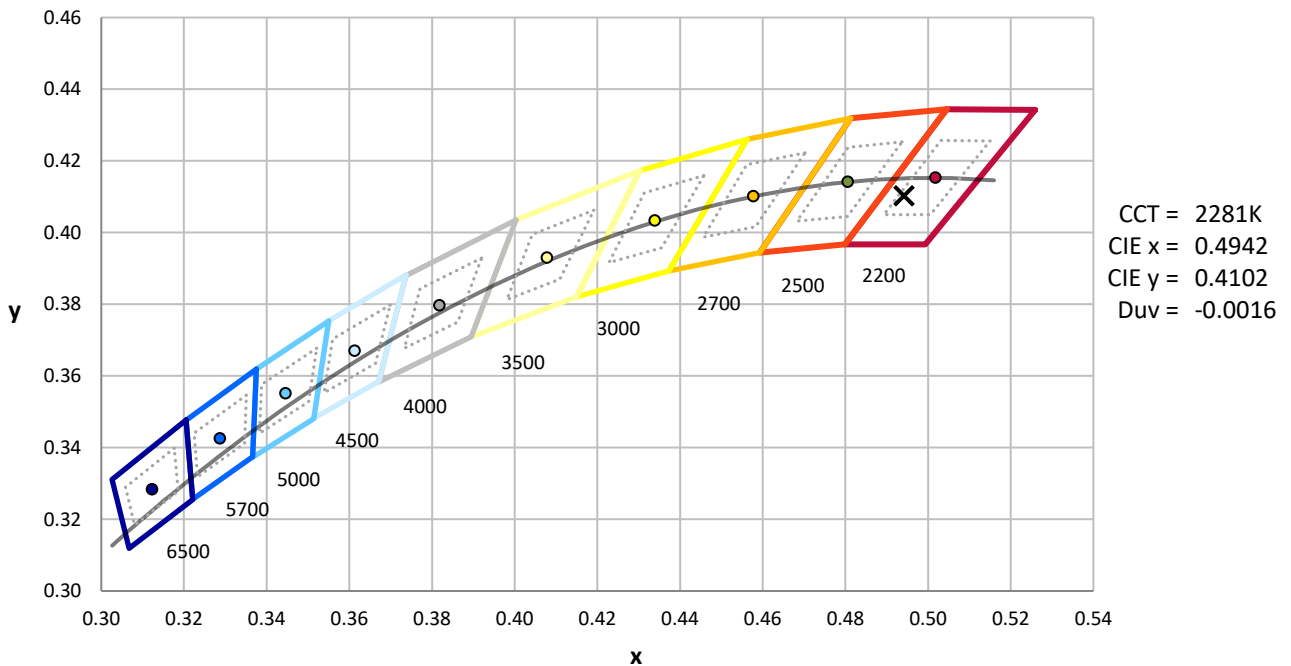
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| 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           |

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**CIE 1931 Chromaticity Diagram**



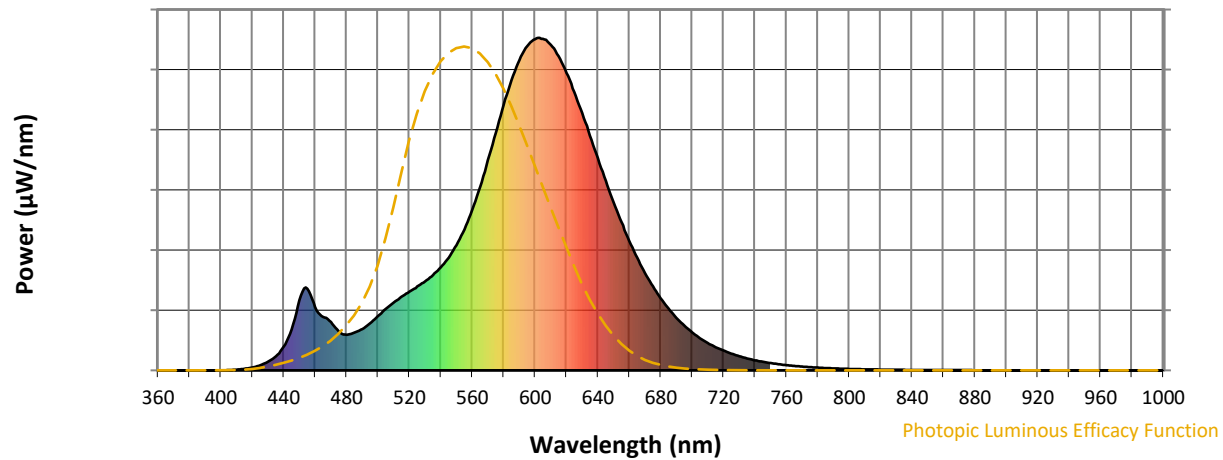
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 2200K 4-step quadrangle

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### Photopic Flux vs. Wavelength

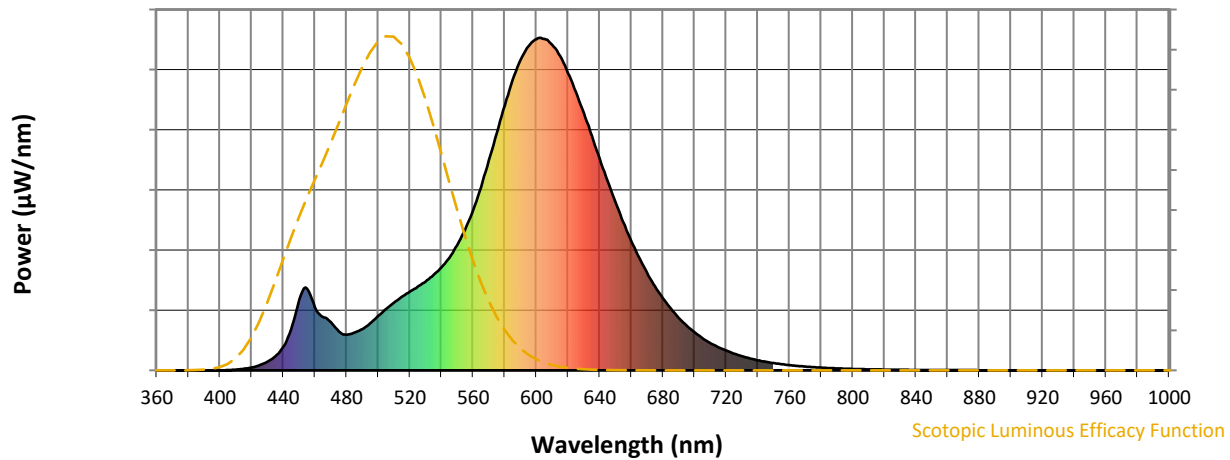


### Photopic Lumens: NR

| λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>λ</sup> /nm | Lumens<br>(φ/nm) |
|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|
| 360       | 0                           | NR               | 490       | 124                         | NR               | 620       | 894                         | NR               | 750       | 22                          | NR               | 880       | 0                           | NR               |
| 365       | 0                           | NR               | 495       | 141                         | NR               | 625       | 837                         | NR               | 755       | 19                          | NR               | 885       | 0                           | NR               |
| 370       | 0                           | NR               | 500       | 163                         | NR               | 630       | 774                         | NR               | 760       | 16                          | NR               | 890       | 0                           | NR               |
| 375       | 0                           | NR               | 505       | 184                         | NR               | 635       | 706                         | NR               | 765       | 13                          | NR               | 895       | 0                           | NR               |
| 380       | 0                           | NR               | 510       | 204                         | NR               | 640       | 638                         | NR               | 770       | 11                          | NR               | 900       | 0                           | NR               |
| 385       | 0                           | NR               | 515       | 221                         | NR               | 645       | 570                         | NR               | 775       | 10                          | NR               | 905       | 0                           | NR               |
| 390       | 0                           | NR               | 520       | 237                         | NR               | 650       | 505                         | NR               | 780       | 8                           | NR               | 910       | 0                           | NR               |
| 395       | 0                           | NR               | 525       | 252                         | NR               | 655       | 446                         | NR               | 785       | 7                           | NR               | 915       | 0                           | NR               |
| 400       | 0                           | NR               | 530       | 268                         | NR               | 660       | 389                         | NR               | 790       | 6                           | NR               | 920       | 0                           | NR               |
| 405       | 1                           | NR               | 535       | 287                         | NR               | 665       | 339                         | NR               | 795       | 5                           | NR               | 925       | 0                           | NR               |
| 410       | 2                           | NR               | 540       | 310                         | NR               | 670       | 292                         | NR               | 800       | 4                           | NR               | 930       | 0                           | NR               |
| 415       | 5                           | NR               | 545       | 339                         | NR               | 675       | 253                         | NR               | 805       | 4                           | NR               | 935       | 0                           | NR               |
| 420       | 9                           | NR               | 550       | 377                         | NR               | 680       | 217                         | NR               | 810       | 3                           | NR               | 940       | 0                           | NR               |
| 425       | 15                          | NR               | 555       | 424                         | NR               | 685       | 186                         | NR               | 815       | 3                           | NR               | 945       | 0                           | NR               |
| 430       | 26                          | NR               | 560       | 482                         | NR               | 690       | 158                         | NR               | 820       | 2                           | NR               | 950       | 0                           | NR               |
| 435       | 43                          | NR               | 565       | 551                         | NR               | 695       | 135                         | NR               | 825       | 2                           | NR               | 955       | 0                           | NR               |
| 440       | 71                          | NR               | 570       | 632                         | NR               | 700       | 114                         | NR               | 830       | 2                           | NR               | 960       | 0                           | NR               |
| 445       | 123                         | NR               | 575       | 714                         | NR               | 705       | 97                          | NR               | 835       | 2                           | NR               | 965       | 0                           | NR               |
| 450       | 210                         | NR               | 580       | 797                         | NR               | 710       | 82                          | NR               | 840       | 1                           | NR               | 970       | 0                           | NR               |
| 455       | 245                         | NR               | 585       | 873                         | NR               | 715       | 70                          | NR               | 845       | 1                           | NR               | 975       | 0                           | NR               |
| 460       | 190                         | NR               | 590       | 934                         | NR               | 720       | 59                          | NR               | 850       | 1                           | NR               | 980       | 0                           | NR               |
| 465       | 161                         | NR               | 595       | 975                         | NR               | 725       | 50                          | NR               | 855       | 1                           | NR               | 985       | 0                           | NR               |
| 470       | 145                         | NR               | 600       | 996                         | NR               | 730       | 43                          | NR               | 860       | 1                           | NR               | 990       | 0                           | NR               |
| 475       | 117                         | NR               | 605       | 997                         | NR               | 735       | 36                          | NR               | 865       | 1                           | NR               | 995       | 0                           | NR               |
| 480       | 107                         | NR               | 610       | 978                         | NR               | 740       | 30                          | NR               | 870       | 1                           | NR               | 1000      | 0                           | NR               |
| 485       | 113                         | NR               | 615       | 945                         | NR               | 745       | 26                          | NR               | 875       | 1                           | NR               |           |                             |                  |

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### Scotopic Flux vs. Wavelength



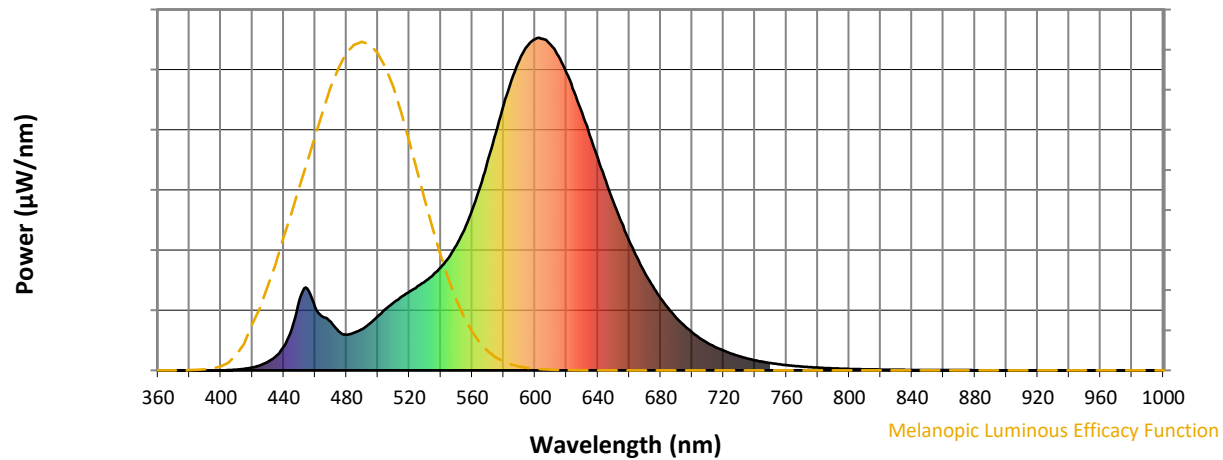
Scotopic Lumens: NR

S/P: 0.98

| λ (nm) | Power W <sup>^</sup> /nm | Lumens (Φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (Φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (Φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (Φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (Φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 360    | 0                        | NR            | 490    | 124                      | NR            | 620    | 894                      | NR            | 750    | 22                       | NR            | 880    | 0                        | NR            |
| 365    | 0                        | NR            | 495    | 141                      | NR            | 625    | 837                      | NR            | 755    | 19                       | NR            | 885    | 0                        | NR            |
| 370    | 0                        | NR            | 500    | 163                      | NR            | 630    | 774                      | NR            | 760    | 16                       | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 184                      | NR            | 635    | 706                      | NR            | 765    | 13                       | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 204                      | NR            | 640    | 638                      | NR            | 770    | 11                       | NR            | 900    | 0                        | NR            |
| 385    | 0                        | NR            | 515    | 221                      | NR            | 645    | 570                      | NR            | 775    | 10                       | NR            | 905    | 0                        | NR            |
| 390    | 0                        | NR            | 520    | 237                      | NR            | 650    | 505                      | NR            | 780    | 8                        | NR            | 910    | 0                        | NR            |
| 395    | 0                        | NR            | 525    | 252                      | NR            | 655    | 446                      | NR            | 785    | 7                        | NR            | 915    | 0                        | NR            |
| 400    | 0                        | NR            | 530    | 268                      | NR            | 660    | 389                      | NR            | 790    | 6                        | NR            | 920    | 0                        | NR            |
| 405    | 1                        | NR            | 535    | 287                      | NR            | 665    | 339                      | NR            | 795    | 5                        | NR            | 925    | 0                        | NR            |
| 410    | 2                        | NR            | 540    | 310                      | NR            | 670    | 292                      | NR            | 800    | 4                        | NR            | 930    | 0                        | NR            |
| 415    | 5                        | NR            | 545    | 339                      | NR            | 675    | 253                      | NR            | 805    | 4                        | NR            | 935    | 0                        | NR            |
| 420    | 9                        | NR            | 550    | 377                      | NR            | 680    | 217                      | NR            | 810    | 3                        | NR            | 940    | 0                        | NR            |
| 425    | 15                       | NR            | 555    | 424                      | NR            | 685    | 186                      | NR            | 815    | 3                        | NR            | 945    | 0                        | NR            |
| 430    | 26                       | NR            | 560    | 482                      | NR            | 690    | 158                      | NR            | 820    | 2                        | NR            | 950    | 0                        | NR            |
| 435    | 43                       | NR            | 565    | 551                      | NR            | 695    | 135                      | NR            | 825    | 2                        | NR            | 955    | 0                        | NR            |
| 440    | 71                       | NR            | 570    | 632                      | NR            | 700    | 114                      | NR            | 830    | 2                        | NR            | 960    | 0                        | NR            |
| 445    | 123                      | NR            | 575    | 714                      | NR            | 705    | 97                       | NR            | 835    | 2                        | NR            | 965    | 0                        | NR            |
| 450    | 210                      | NR            | 580    | 797                      | NR            | 710    | 82                       | NR            | 840    | 1                        | NR            | 970    | 0                        | NR            |
| 455    | 245                      | NR            | 585    | 873                      | NR            | 715    | 70                       | NR            | 845    | 1                        | NR            | 975    | 0                        | NR            |
| 460    | 190                      | NR            | 590    | 934                      | NR            | 720    | 59                       | NR            | 850    | 1                        | NR            | 980    | 0                        | NR            |
| 465    | 161                      | NR            | 595    | 975                      | NR            | 725    | 50                       | NR            | 855    | 1                        | NR            | 985    | 0                        | NR            |
| 470    | 145                      | NR            | 600    | 996                      | NR            | 730    | 43                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 117                      | NR            | 605    | 997                      | NR            | 735    | 36                       | NR            | 865    | 1                        | NR            | 995    | 0                        | NR            |
| 480    | 107                      | NR            | 610    | 978                      | NR            | 740    | 30                       | NR            | 870    | 1                        | NR            | 1000   | 0                        | NR            |
| 485    | 113                      | NR            | 615    | 945                      | NR            | 745    | 26                       | NR            | 875    | 1                        | NR            |        |                          |               |

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### Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 1.75

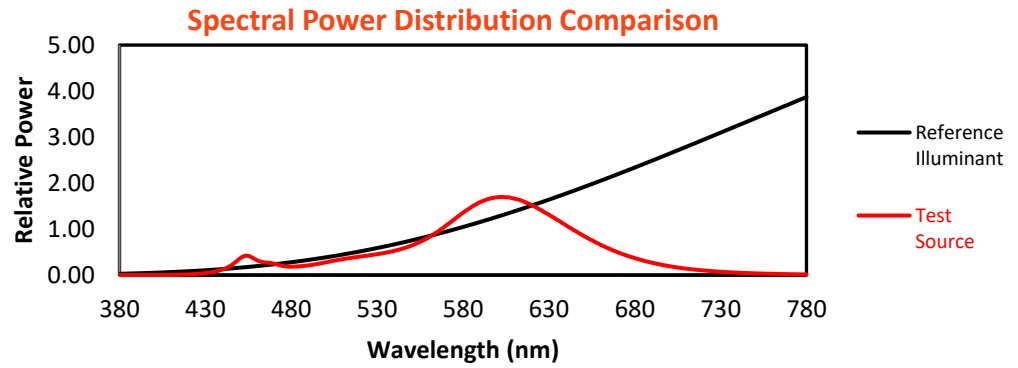
| $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<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               | 124                                  | NR                             | 620               | 894                                  | NR                             | 750               | 22                                   | NR                             | 880               | 0                                    | NR                             |
| 365               | 0                                    | NR                             | 495               | 141                                  | NR                             | 625               | 837                                  | NR                             | 755               | 19                                   | NR                             | 885               | 0                                    | NR                             |
| 370               | 0                                    | NR                             | 500               | 163                                  | NR                             | 630               | 774                                  | NR                             | 760               | 16                                   | NR                             | 890               | 0                                    | NR                             |
| 375               | 0                                    | NR                             | 505               | 184                                  | NR                             | 635               | 706                                  | NR                             | 765               | 13                                   | NR                             | 895               | 0                                    | NR                             |
| 380               | 0                                    | NR                             | 510               | 204                                  | NR                             | 640               | 638                                  | NR                             | 770               | 11                                   | NR                             | 900               | 0                                    | NR                             |
| 385               | 0                                    | NR                             | 515               | 221                                  | NR                             | 645               | 570                                  | NR                             | 775               | 10                                   | NR                             | 905               | 0                                    | NR                             |
| 390               | 0                                    | NR                             | 520               | 237                                  | NR                             | 650               | 505                                  | NR                             | 780               | 8                                    | NR                             | 910               | 0                                    | NR                             |
| 395               | 0                                    | NR                             | 525               | 252                                  | NR                             | 655               | 446                                  | NR                             | 785               | 7                                    | NR                             | 915               | 0                                    | NR                             |
| 400               | 0                                    | NR                             | 530               | 268                                  | NR                             | 660               | 389                                  | NR                             | 790               | 6                                    | NR                             | 920               | 0                                    | NR                             |
| 405               | 1                                    | NR                             | 535               | 287                                  | NR                             | 665               | 339                                  | NR                             | 795               | 5                                    | NR                             | 925               | 0                                    | NR                             |
| 410               | 2                                    | NR                             | 540               | 310                                  | NR                             | 670               | 292                                  | NR                             | 800               | 4                                    | NR                             | 930               | 0                                    | NR                             |
| 415               | 5                                    | NR                             | 545               | 339                                  | NR                             | 675               | 253                                  | NR                             | 805               | 4                                    | NR                             | 935               | 0                                    | NR                             |
| 420               | 9                                    | NR                             | 550               | 377                                  | NR                             | 680               | 217                                  | NR                             | 810               | 3                                    | NR                             | 940               | 0                                    | NR                             |
| 425               | 15                                   | NR                             | 555               | 424                                  | NR                             | 685               | 186                                  | NR                             | 815               | 3                                    | NR                             | 945               | 0                                    | NR                             |
| 430               | 26                                   | NR                             | 560               | 482                                  | NR                             | 690               | 158                                  | NR                             | 820               | 2                                    | NR                             | 950               | 0                                    | NR                             |
| 435               | 43                                   | NR                             | 565               | 551                                  | NR                             | 695               | 135                                  | NR                             | 825               | 2                                    | NR                             | 955               | 0                                    | NR                             |
| 440               | 71                                   | NR                             | 570               | 632                                  | NR                             | 700               | 114                                  | NR                             | 830               | 2                                    | NR                             | 960               | 0                                    | NR                             |
| 445               | 123                                  | NR                             | 575               | 714                                  | NR                             | 705               | 97                                   | NR                             | 835               | 2                                    | NR                             | 965               | 0                                    | NR                             |
| 450               | 210                                  | NR                             | 580               | 797                                  | NR                             | 710               | 82                                   | NR                             | 840               | 1                                    | NR                             | 970               | 0                                    | NR                             |
| 455               | 245                                  | NR                             | 585               | 873                                  | NR                             | 715               | 70                                   | NR                             | 845               | 1                                    | NR                             | 975               | 0                                    | NR                             |
| 460               | 190                                  | NR                             | 590               | 934                                  | NR                             | 720               | 59                                   | NR                             | 850               | 1                                    | NR                             | 980               | 0                                    | NR                             |
| 465               | 161                                  | NR                             | 595               | 975                                  | NR                             | 725               | 50                                   | NR                             | 855               | 1                                    | NR                             | 985               | 0                                    | NR                             |
| 470               | 145                                  | NR                             | 600               | 996                                  | NR                             | 730               | 43                                   | NR                             | 860               | 1                                    | NR                             | 990               | 0                                    | NR                             |
| 475               | 117                                  | NR                             | 605               | 997                                  | NR                             | 735               | 36                                   | NR                             | 865               | 1                                    | NR                             | 995               | 0                                    | NR                             |
| 480               | 107                                  | NR                             | 610               | 978                                  | NR                             | 740               | 30                                   | NR                             | 870               | 1                                    | NR                             | 1000              | 0                                    | NR                             |
| 485               | 113                                  | NR                             | 615               | 945                                  | NR                             | 745               | 26                                   | NR                             | 875               | 1                                    | NR                             |                   |                                      |                                |

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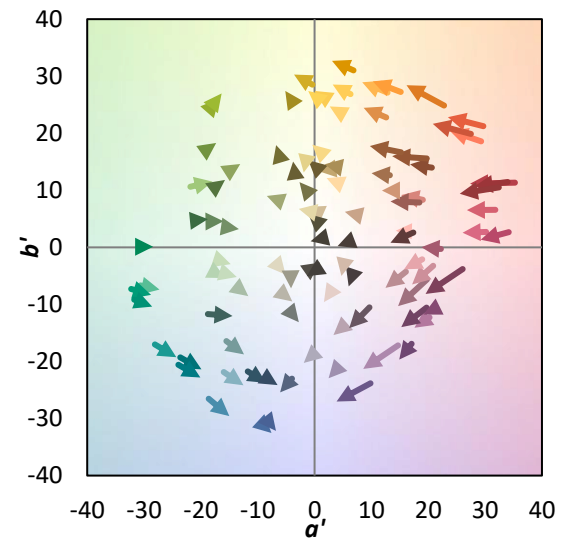
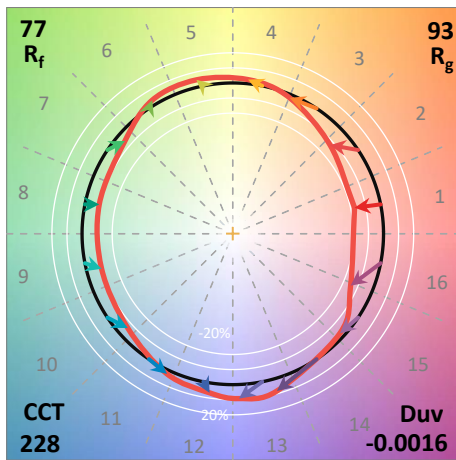
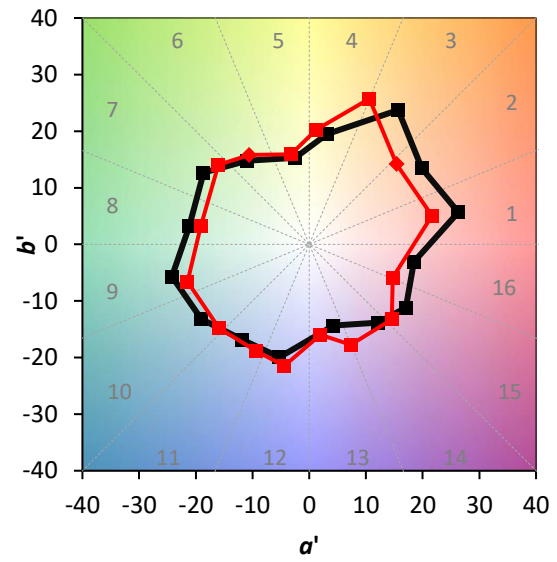
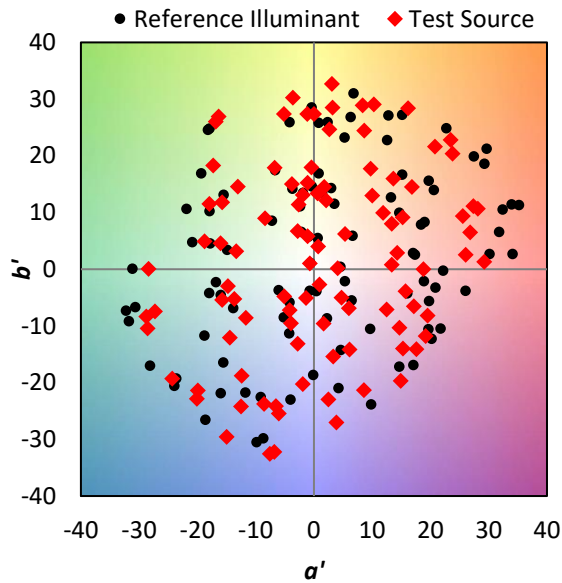
TM-30-18

### Summary

$R_f = 76.9$   
 $R_g = 92.6$   
 $CIE\ R_a = 70.6$   
 $R_g = -35.1$

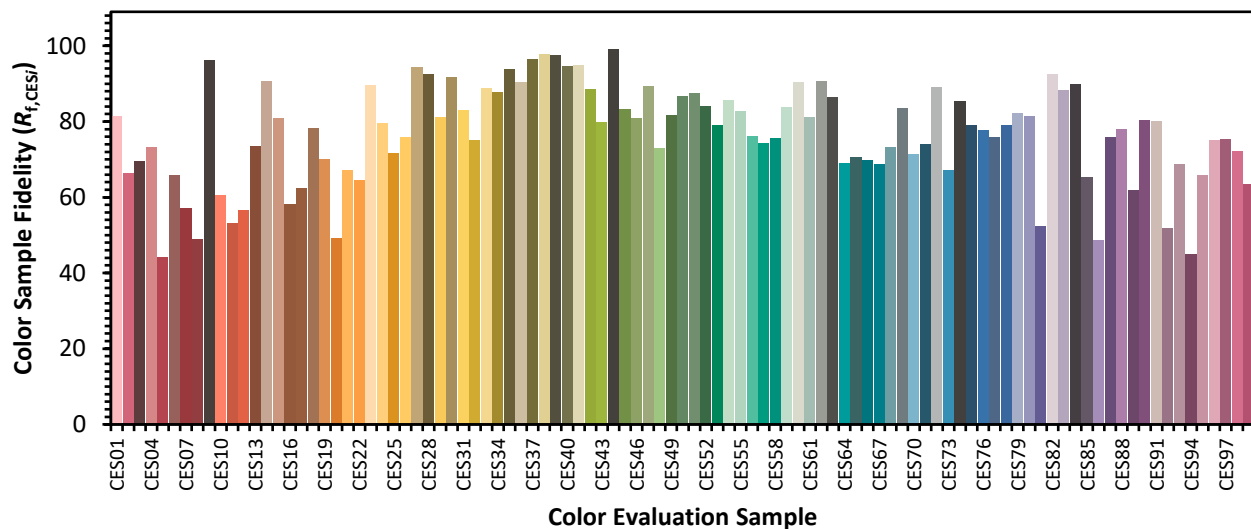


### Color Vector Graphics

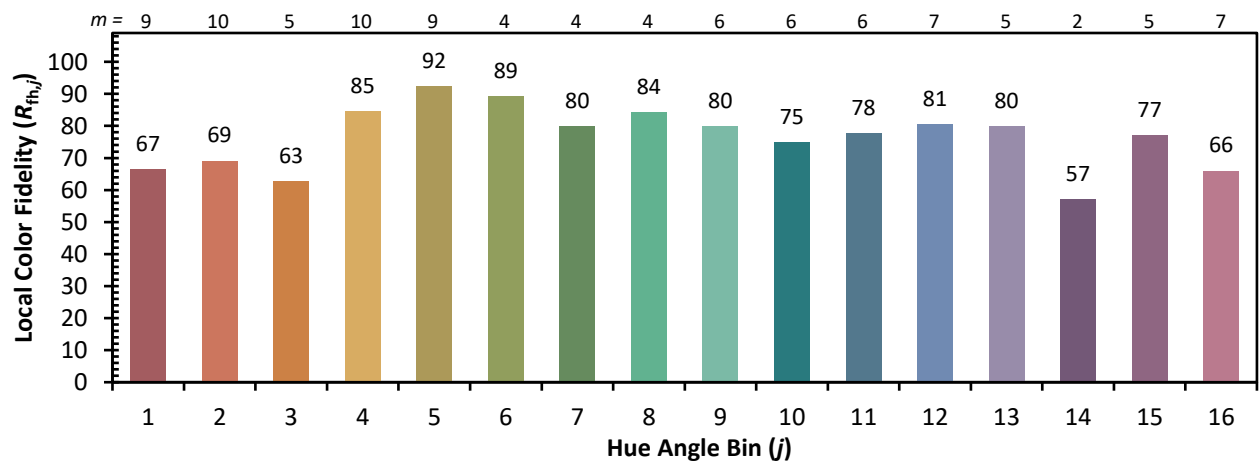
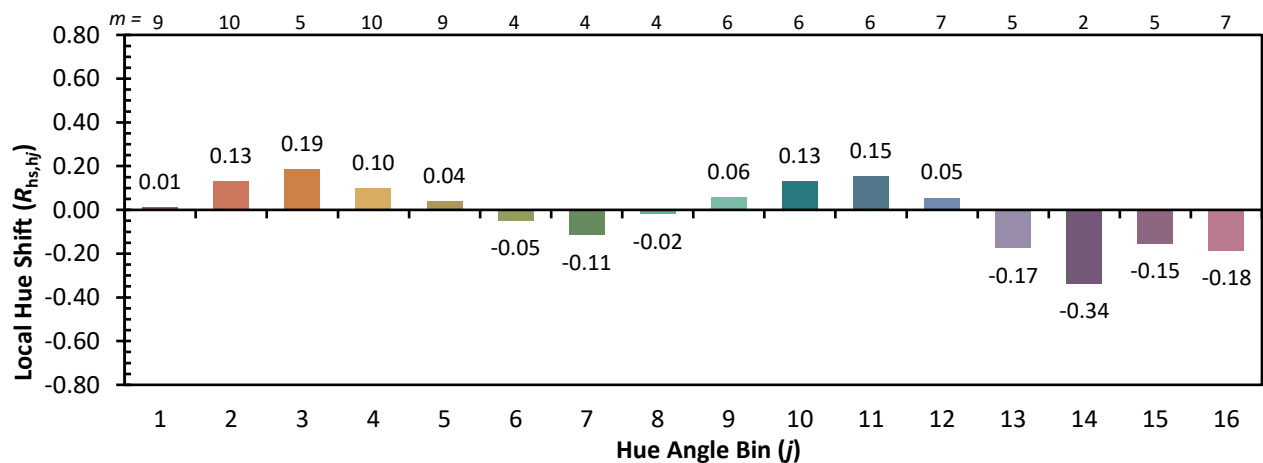
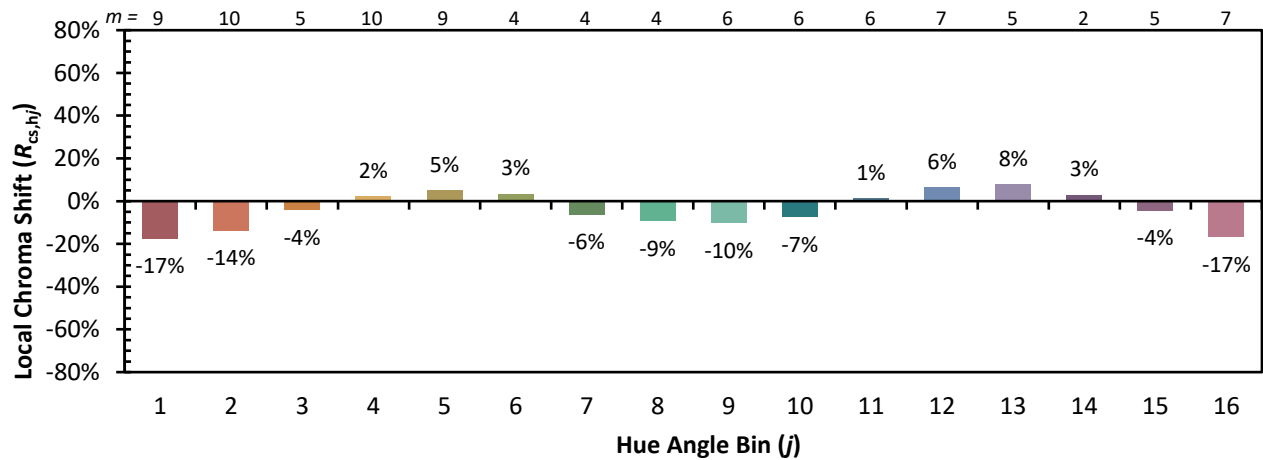


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

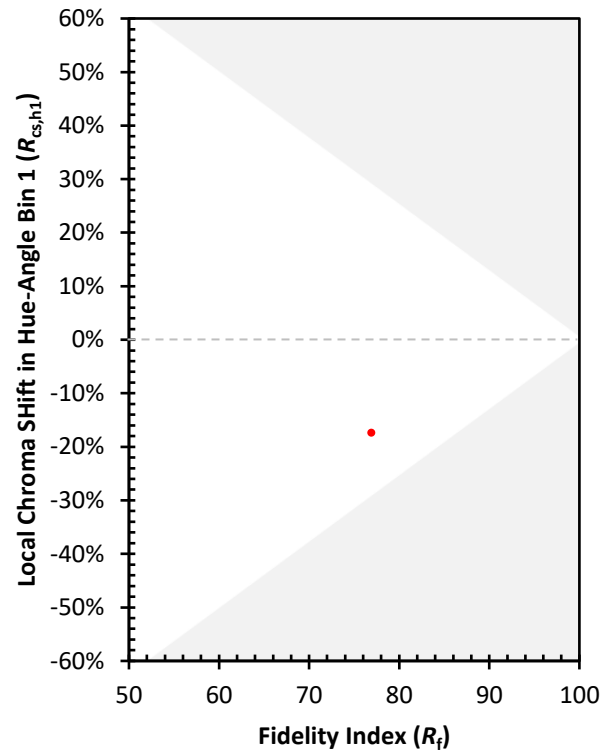
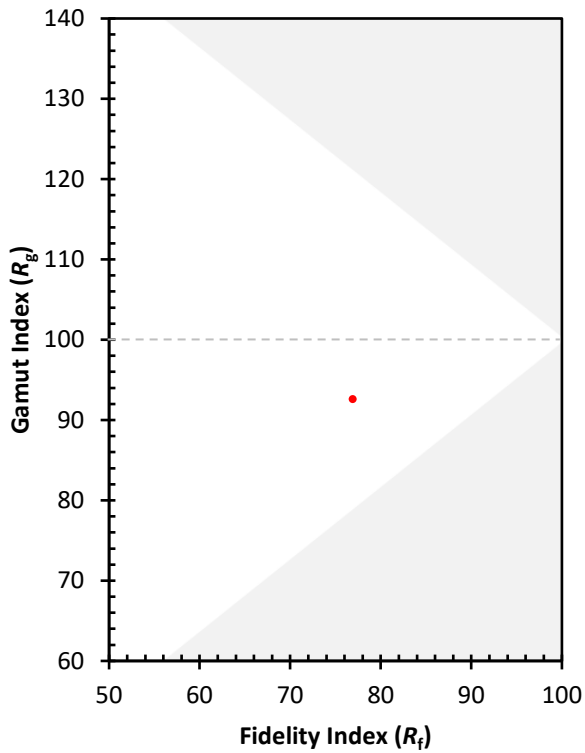
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 87 | CES26 = 76 | CES51 = 88 | CES76 = 78 |
| CES02 = 65 | CES27 = 94 | CES52 = 84 | CES77 = 76 |
| CES03 = 32 | CES28 = 93 | CES53 = 79 | CES78 = 79 |
| CES04 = 72 | CES29 = 81 | CES54 = 86 | CES79 = 82 |
| CES05 = 51 | CES30 = 92 | CES55 = 83 | CES80 = 81 |
| CES06 = 52 | CES31 = 83 | CES56 = 76 | CES81 = 52 |
| CES07 = 44 | CES32 = 75 | CES57 = 74 | CES82 = 92 |
| CES08 = 42 | CES33 = 89 | CES58 = 76 | CES83 = 88 |
| CES09 = 29 | CES34 = 88 | CES59 = 84 | CES84 = 90 |
| CES10 = 79 | CES35 = 94 | CES60 = 91 | CES85 = 65 |
| CES11 = 62 | CES36 = 90 | CES61 = 81 | CES86 = 49 |
| CES12 = 68 | CES37 = 96 | CES62 = 91 | CES87 = 76 |
| CES13 = 44 | CES38 = 98 | CES63 = 86 | CES88 = 78 |
| CES14 = 75 | CES39 = 98 | CES64 = 69 | CES89 = 62 |
| CES15 = 72 | CES40 = 95 | CES65 = 71 | CES90 = 80 |
| CES16 = 48 | CES41 = 95 | CES66 = 70 | CES91 = 80 |
| CES17 = 51 | CES42 = 89 | CES67 = 69 | CES92 = 52 |
| CES18 = 57 | CES43 = 80 | CES68 = 73 | CES93 = 69 |
| CES19 = 74 | CES44 = 99 | CES69 = 84 | CES94 = 45 |
| CES20 = 68 | CES45 = 83 | CES70 = 71 | CES95 = 66 |
| CES21 = 88 | CES46 = 81 | CES71 = 74 | CES96 = 75 |
| CES22 = 81 | CES47 = 89 | CES72 = 89 | CES97 = 75 |
| CES23 = 92 | CES48 = 73 | CES73 = 67 | CES98 = 72 |
| CES24 = 92 | CES49 = 82 | CES74 = 85 | CES99 = 64 |
| CES25 = 73 | CES50 = 87 | CES75 = 79 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)