

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: P1461493

Luminaire Tested: USSL-50-730-U-T2R-HSS

Issue Date: 06/10/2026

**Test Information**

Test Method: LM-79-2024  
Report Number: P1461493  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 6/11/2026  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: STREETWORKS  
Catalog Number: USSL-50-730-U-T2R-HSS  
Description: USSL DISCRETE LED 1 SQUARE 50W 70CRI 3000K FIXTURE w/ TYPE II ROADWAY  
DISTRIBUTION OPTIC AND HOUSE SIDE SHIELD  
Light Source: (40) 3000K CCT, 70 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 5652 lumens  
Efficiency: N/A  
Efficacy: 108.7 lumens/watt  
Luminous Opening: Rectangular (W 0.67' x L: 0.67' x H: 0')  
IES Classification: Type II - Short  
BUG Rating: B1 - U0 - G1

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

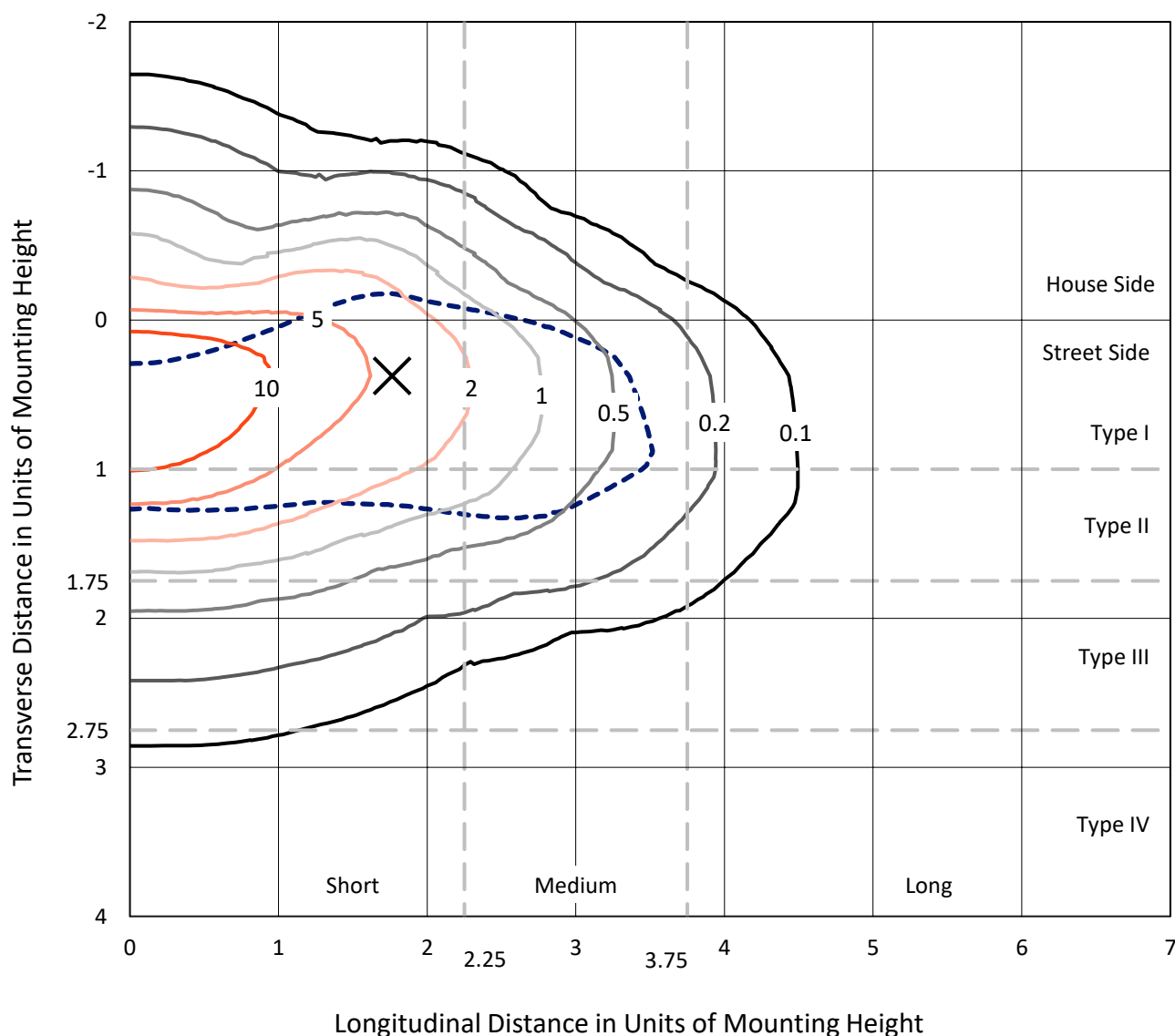
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## Iso-Footcandle Lines of Horizontal Illumination

× Max cd

--- 1/2 Max cd

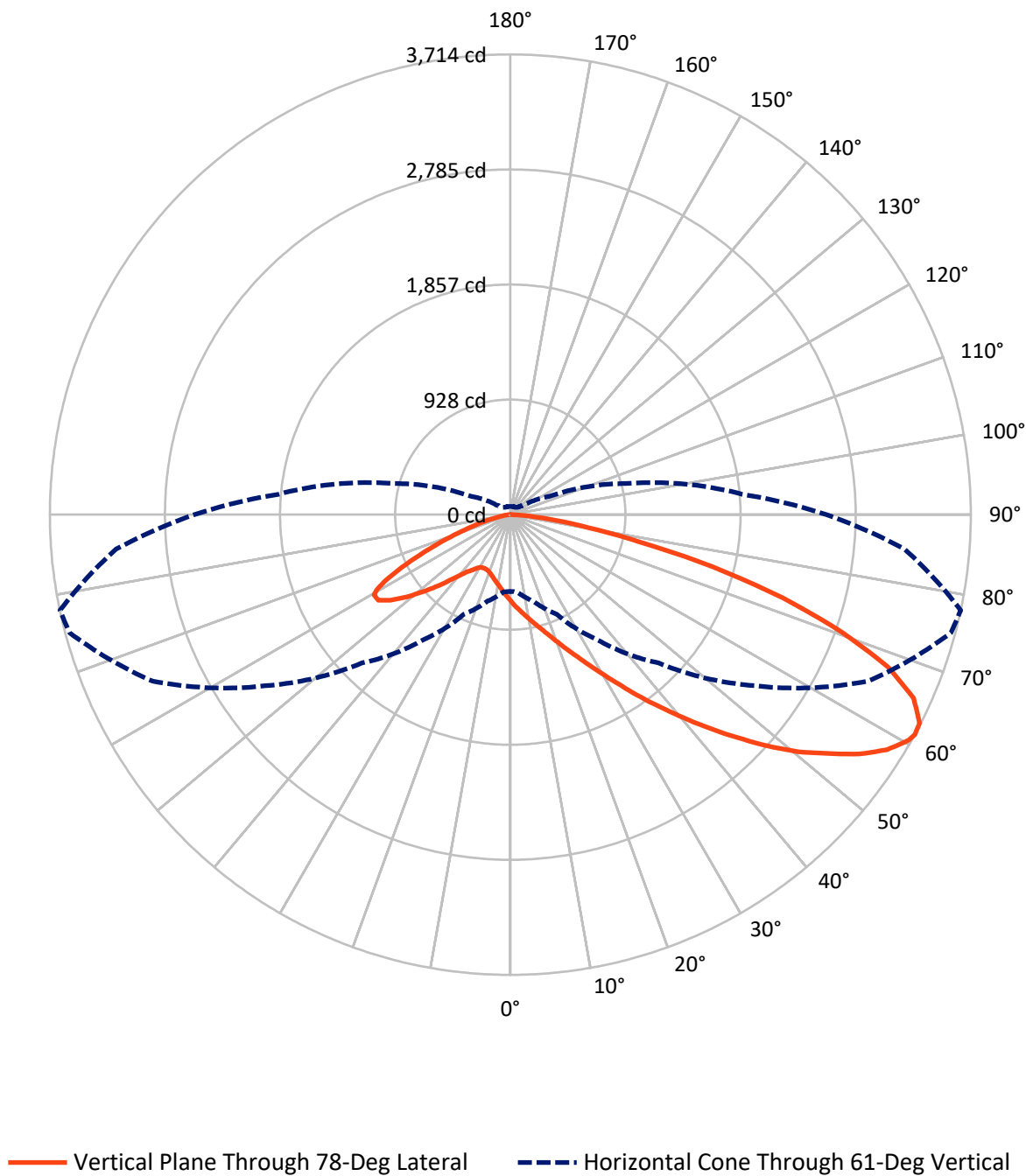


Based on 10 foot mounting height. Maximum calculated value = 19 fc  
 Type II - Short - N/A

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## Luminous Intensity Polar Plot



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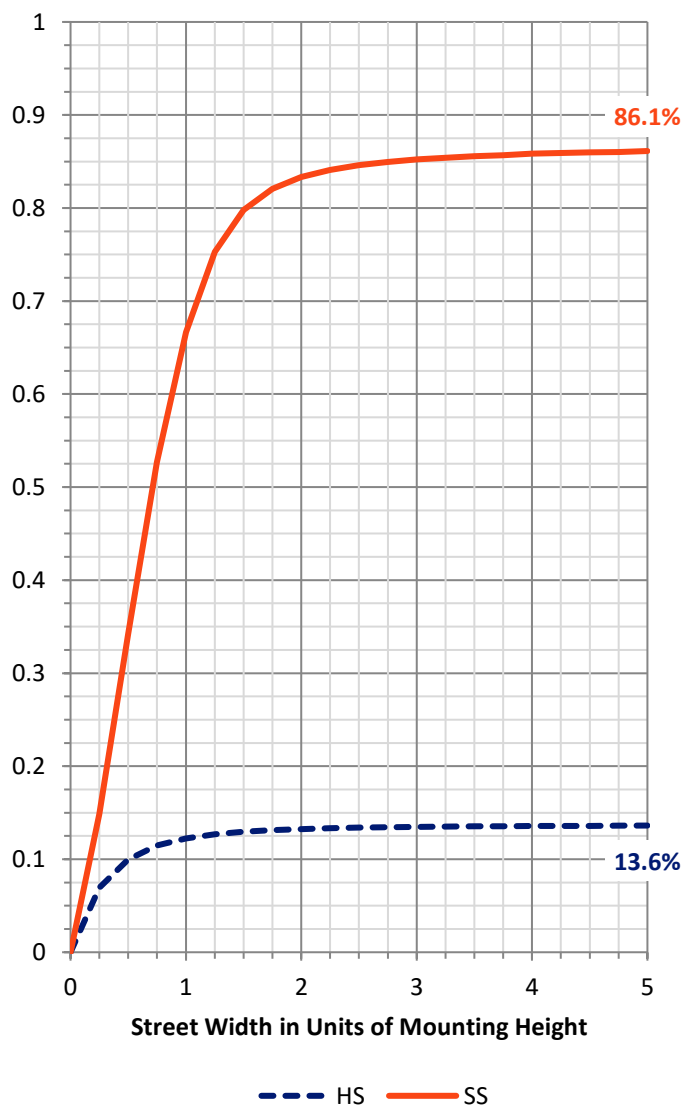
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 775.7    | 0.0    | 775.7  |
|                    | % Fixture | 13.7     | 0.0    | 13.7   |
| <b>Street Side</b> | Lumens    | 4876.3   | 0.0    | 4876.3 |
|                    | % Fixture | 86.3     | 0.0    | 86.3   |
| <b>Total</b>       | Lumens    | 5652.0   | 0.0    | 5652.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 70.6   | 1.2       |
| 10°-20°   | 251.7  | 4.5       |
| 20°-30°   | 520.7  | 9.2       |
| 30°-40°   | 895.8  | 15.8      |
| 40°-50°   | 1207.0 | 21.4      |
| 50°-60°   | 1249.7 | 22.1      |
| 60°-70°   | 971.2  | 17.2      |
| 70°-80°   | 425.8  | 7.5       |
| 80°-90°   | 59.4   | 1.1       |
| 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°    | 5652.0 | 100.0     |
| 0°-180°   | 5652.0 | 100.0     |

**Coefficient of Utilization**



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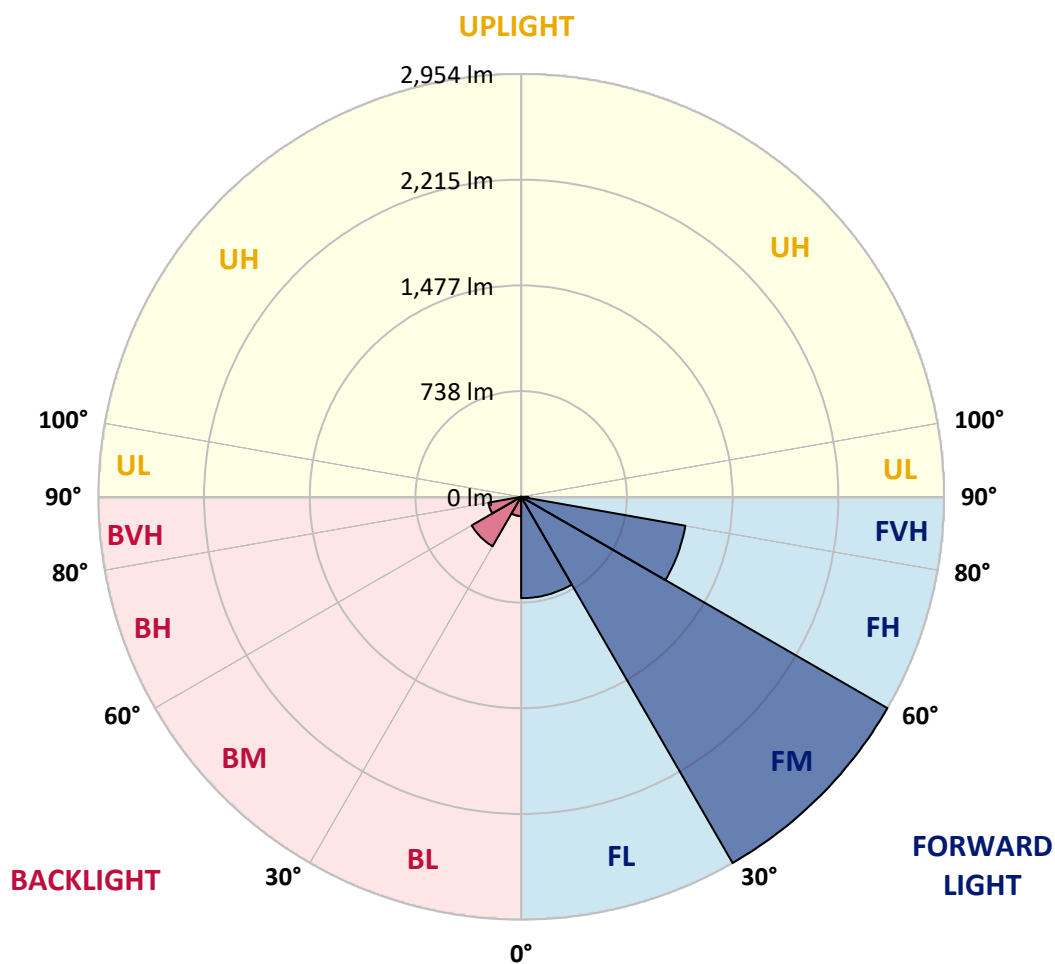
CATALOG NUMBER: USSL-50-730-U-T2R-HSS

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 708.1  | 12.5      |                         |      |         |
| FM   | (30°-60°)   | 2953.7 | 52.3      |                         |      |         |
| FH   | (60°-80°)   | 1164.3 | 20.6      |                         |      | G1/1800 |
| FVH  | (80°-90°)   | 50.1   | 0.9       |                         |      | G1/100  |
| BL   | (0°-30°)    | 134.9  | 2.4       | B1/500                  |      |         |
| BM   | (30°-60°)   | 398.8  | 7.1       | B1/1000                 |      |         |
| BH   | (60°-80°)   | 232.8  | 4.1       | B1/500                  |      | G1/500  |
| BVH  | (80°-90°)   | 9.2    | 0.2       |                         |      | G0/10   |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B1-U0-G1**

Type II Short



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 55°    | 65°    | 75°    | 78°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 697.9  | 697.9  | 697.9  | 697.9  | 697.9  | 697.9  | 697.9  | 697.9  | 697.9  | 697.9  | 697.9  |
| 2.5°  | 883.3  | 872.2  | 880.6  | 863.5  | 847.5  | 828.2  | 806.1  | 777.3  | 747.3  | 737.0  | 715.7  |
| 5°    | 1049.3 | 1055.7 | 1050.0 | 1028.4 | 996.8  | 945.2  | 906.1  | 850.6  | 795.5  | 773.8  | 732.8  |
| 7.5°  | 1244.9 | 1240.0 | 1227.8 | 1196.7 | 1146.5 | 1087.6 | 1014.7 | 935.3  | 844.1  | 814.9  | 751.8  |
| 10°   | 1415.1 | 1403.3 | 1391.6 | 1353.2 | 1293.2 | 1225.9 | 1127.9 | 1016.2 | 900.4  | 860.5  | 772.7  |
| 12.5° | 1581.1 | 1585.7 | 1560.2 | 1519.2 | 1445.5 | 1359.3 | 1242.6 | 1110.1 | 958.5  | 908.3  | 797.4  |
| 15°   | 1777.9 | 1765.8 | 1741.4 | 1680.7 | 1598.6 | 1498.3 | 1365.3 | 1208.4 | 1024.2 | 963.4  | 826.7  |
| 17.5° | 1950.4 | 1941.3 | 1920.4 | 1856.2 | 1763.9 | 1641.5 | 1486.5 | 1310.6 | 1095.6 | 1025.7 | 861.6  |
| 20°   | 2114.5 | 2109.2 | 2081.5 | 2021.0 | 1936.3 | 1796.5 | 1627.9 | 1431.1 | 1178.4 | 1100.2 | 902.6  |
| 22.5° | 2285.8 | 2279.4 | 2245.9 | 2180.6 | 2089.8 | 1962.2 | 1774.1 | 1554.2 | 1282.1 | 1184.9 | 950.9  |
| 25°   | 2439.3 | 2449.2 | 2401.7 | 2339.8 | 2242.1 | 2110.3 | 1930.6 | 1688.3 | 1382.8 | 1276.5 | 1014.3 |
| 27.5° | 2681.3 | 2652.8 | 2593.9 | 2502.0 | 2394.1 | 2267.2 | 2083.0 | 1826.9 | 1502.1 | 1382.4 | 1078.5 |
| 30°   | 2938.1 | 2921.0 | 2847.7 | 2703.3 | 2535.0 | 2394.1 | 2226.2 | 1989.9 | 1631.3 | 1507.0 | 1167.8 |
| 32.5° | 3153.5 | 3144.8 | 3072.6 | 2934.3 | 2726.9 | 2519.5 | 2369.4 | 2149.8 | 1778.3 | 1645.7 | 1277.6 |
| 35°   | 3291.8 | 3278.1 | 3226.8 | 3121.6 | 2924.1 | 2680.9 | 2516.4 | 2327.6 | 1943.5 | 1807.2 | 1404.5 |
| 37.5° | 3353.0 | 3335.9 | 3282.7 | 3202.9 | 3064.2 | 2837.1 | 2647.1 | 2494.8 | 2118.7 | 1971.7 | 1524.9 |
| 40°   | 3300.2 | 3294.1 | 3255.7 | 3180.5 | 3118.2 | 2959.8 | 2769.4 | 2652.4 | 2306.7 | 2156.3 | 1695.9 |
| 42.5° | 3134.9 | 3123.9 | 3120.8 | 3087.0 | 3080.6 | 3011.1 | 2877.7 | 2799.8 | 2511.9 | 2357.6 | 1877.1 |
| 45°   | 2909.2 | 2902.8 | 2930.9 | 2946.1 | 2985.6 | 3002.3 | 2954.1 | 2941.2 | 2718.9 | 2563.9 | 2086.4 |
| 47.5° | 2641.4 | 2637.2 | 2693.8 | 2757.3 | 2860.2 | 2942.3 | 2978.0 | 3050.6 | 2920.6 | 2788.8 | 2294.2 |
| 50°   | 2198.8 | 2177.9 | 2353.8 | 2513.8 | 2683.2 | 2856.4 | 2955.2 | 3137.9 | 3130.0 | 3006.5 | 2504.7 |
| 52.5° | 1699.3 | 1691.3 | 1908.6 | 2179.8 | 2477.3 | 2712.5 | 2899.4 | 3186.6 | 3299.4 | 3201.0 | 2725.0 |
| 55°   | 1247.2 | 1253.3 | 1445.5 | 1782.5 | 2144.1 | 2500.5 | 2816.2 | 3198.7 | 3468.8 | 3410.3 | 2932.0 |
| 57.5° | 910.6  | 932.3  | 1076.6 | 1363.1 | 1763.1 | 2205.3 | 2696.9 | 3195.7 | 3598.0 | 3579.4 | 3099.6 |
| 60°   | 682.7  | 682.3  | 817.2  | 1009.0 | 1353.9 | 1859.2 | 2503.9 | 3186.9 | 3672.8 | 3693.7 | 3182.4 |
| 61°   | 619.2  | 625.7  | 724.1  | 885.9  | 1237.3 | 1692.8 | 2407.4 | 3180.1 | 3679.3 | 3713.5 | 3190.4 |
| 62.5° | 536.0  | 534.1  | 611.3  | 740.4  | 1024.6 | 1446.3 | 2234.9 | 3159.6 | 3671.7 | 3704.0 | 3176.7 |
| 65°   | 431.6  | 433.5  | 485.5  | 560.0  | 767.8  | 1077.0 | 1874.8 | 3034.6 | 3550.1 | 3573.7 | 3086.3 |
| 67.5° | 356.3  | 360.9  | 395.5  | 444.5  | 569.5  | 764.7  | 1434.9 | 2781.2 | 3313.5 | 3287.6 | 2887.2 |
| 70°   | 291.8  | 296.7  | 323.3  | 356.0  | 434.6  | 559.6  | 1053.8 | 2332.2 | 2903.9 | 2832.9 | 2526.3 |
| 72.5° | 236.3  | 236.3  | 258.7  | 288.3  | 333.2  | 402.3  | 728.6  | 1789.7 | 2378.5 | 2295.0 | 2043.8 |
| 75°   | 187.7  | 186.9  | 202.9  | 217.7  | 246.9  | 294.0  | 498.4  | 1230.9 | 1783.6 | 1689.0 | 1456.1 |
| 77.5° | 129.5  | 131.4  | 145.5  | 160.3  | 174.8  | 204.4  | 330.9  | 757.1  | 1151.8 | 1073.6 | 917.1  |
| 80°   | 95.7   | 96.5   | 104.5  | 112.4  | 110.9  | 129.5  | 208.6  | 385.6  | 640.9  | 639.4  | 520.5  |
| 82.5° | 69.5   | 71.4   | 74.5   | 79.0   | 76.7   | 84.7   | 125.4  | 193.4  | 339.2  | 337.3  | 279.6  |
| 85°   | 44.4   | 44.1   | 44.1   | 46.7   | 46.3   | 50.9   | 68.0   | 103.7  | 145.1  | 150.8  | 136.0  |
| 87.5° | 16.0   | 16.7   | 19.4   | 23.6   | 22.0   | 20.9   | 20.5   | 27.4   | 24.7   | 23.2   | 22.0   |
| 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-50-730-U-T2R-HSS

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 697.9  | 697.9  | 697.9 | 697.9 | 697.9 | 697.9 | 697.9 | 697.9 | 697.9 | 697.9 | 697.9 |
| 2.5°  | 700.9  | 686.1  | 655.3 | 624.9 | 601.8 | 575.2 | 558.1 | 544.4 | 528.4 | 523.5 | 533.4 |
| 5°    | 703.6  | 672.8  | 616.2 | 561.1 | 516.3 | 481.3 | 447.9 | 434.6 | 412.9 | 406.9 | 406.5 |
| 7.5°  | 707.7  | 662.2  | 578.2 | 504.5 | 446.8 | 400.0 | 368.9 | 349.9 | 337.0 | 332.4 | 336.2 |
| 10°   | 712.7  | 652.3  | 542.1 | 451.3 | 386.0 | 345.7 | 315.7 | 298.6 | 290.6 | 286.8 | 285.7 |
| 12.5° | 722.6  | 645.8  | 514.4 | 409.1 | 341.5 | 303.2 | 279.2 | 265.2 | 256.4 | 254.5 | 252.6 |
| 15°   | 733.6  | 641.3  | 485.1 | 371.5 | 306.2 | 270.5 | 249.2 | 239.0 | 231.7 | 228.3 | 228.3 |
| 17.5° | 748.4  | 640.9  | 456.6 | 336.6 | 277.3 | 244.7 | 226.0 | 217.7 | 212.7 | 210.8 | 210.5 |
| 20°   | 768.5  | 643.2  | 433.5 | 311.9 | 253.0 | 223.0 | 208.9 | 201.7 | 198.7 | 196.8 | 196.8 |
| 22.5° | 797.0  | 650.8  | 413.7 | 288.3 | 232.5 | 205.9 | 193.4 | 189.2 | 186.5 | 184.6 | 184.6 |
| 25°   | 836.5  | 667.9  | 399.3 | 269.0 | 215.4 | 191.8 | 181.6 | 177.0 | 175.1 | 174.4 | 174.0 |
| 27.5° | 879.5  | 688.8  | 393.2 | 255.3 | 200.2 | 179.7 | 171.0 | 166.4 | 164.9 | 164.1 | 164.1 |
| 30°   | 936.1  | 718.8  | 389.0 | 245.4 | 188.4 | 168.7 | 160.7 | 155.8 | 153.9 | 153.9 | 153.5 |
| 32.5° | 1010.5 | 768.1  | 397.0 | 237.8 | 180.5 | 159.6 | 150.8 | 146.6 | 144.7 | 144.4 | 144.0 |
| 35°   | 1109.7 | 838.1  | 416.0 | 235.2 | 172.5 | 150.8 | 142.1 | 138.3 | 136.4 | 136.0 | 135.2 |
| 37.5° | 1198.2 | 895.0  | 440.7 | 234.0 | 165.3 | 143.2 | 134.9 | 130.7 | 128.4 | 127.6 | 128.0 |
| 40°   | 1327.4 | 985.8  | 473.7 | 236.3 | 158.8 | 135.6 | 128.0 | 123.8 | 121.6 | 120.8 | 120.4 |
| 42.5° | 1471.7 | 1100.6 | 524.3 | 245.4 | 154.6 | 128.8 | 121.9 | 117.4 | 115.5 | 114.7 | 114.3 |
| 45°   | 1642.7 | 1235.4 | 591.9 | 258.3 | 151.6 | 123.5 | 115.5 | 111.7 | 109.8 | 108.7 | 108.7 |
| 47.5° | 1821.6 | 1377.5 | 661.8 | 274.7 | 149.3 | 119.3 | 109.8 | 106.0 | 103.7 | 102.6 | 101.8 |
| 50°   | 2019.5 | 1522.6 | 743.5 | 292.5 | 147.4 | 115.1 | 104.1 | 99.2  | 96.9  | 94.6  | 94.6  |
| 52.5° | 2211.0 | 1688.6 | 828.2 | 313.0 | 145.9 | 108.3 | 97.6  | 92.3  | 88.5  | 86.2  | 85.9  |
| 55°   | 2394.1 | 1839.8 | 908.7 | 332.0 | 144.4 | 102.6 | 90.4  | 84.0  | 80.5  | 79.0  | 79.4  |
| 57.5° | 2537.7 | 1947.3 | 979.0 | 348.0 | 140.9 | 96.1  | 82.4  | 76.7  | 74.1  | 75.2  | 74.1  |
| 60°   | 2575.3 | 1933.3 | 993.8 | 351.0 | 134.5 | 88.1  | 74.5  | 71.0  | 70.3  | 68.4  | 68.4  |
| 61°   | 2547.6 | 1880.1 | 968.0 | 346.5 | 131.4 | 84.3  | 72.2  | 69.5  | 68.4  | 66.5  | 66.5  |
| 62.5° | 2474.3 | 1743.7 | 895.8 | 331.3 | 125.4 | 79.0  | 68.8  | 66.9  | 65.3  | 63.4  | 63.8  |
| 65°   | 2306.0 | 1464.5 | 702.8 | 286.4 | 112.4 | 71.4  | 63.1  | 61.9  | 60.0  | 58.5  | 57.4  |
| 67.5° | 2056.4 | 1184.1 | 504.9 | 229.5 | 98.8  | 64.6  | 56.6  | 55.1  | 53.2  | 51.3  | 50.5  |
| 70°   | 1773.0 | 916.7  | 342.3 | 177.0 | 84.7  | 57.0  | 49.8  | 47.1  | 45.6  | 44.1  | 43.3  |
| 72.5° | 1419.3 | 689.5  | 216.2 | 130.7 | 70.3  | 47.9  | 40.6  | 39.1  | 37.6  | 36.5  | 36.1  |
| 75°   | 1040.5 | 481.7  | 144.4 | 97.6  | 56.6  | 38.7  | 32.7  | 29.6  | 28.9  | 28.1  | 27.0  |
| 77.5° | 620.8  | 270.5  | 93.5  | 71.0  | 44.8  | 30.4  | 25.1  | 22.8  | 22.4  | 21.3  | 21.3  |
| 80°   | 326.7  | 143.6  | 61.5  | 49.0  | 31.9  | 23.2  | 19.8  | 18.2  | 16.7  | 13.3  | 11.0  |
| 82.5° | 185.0  | 77.9   | 40.3  | 30.8  | 21.3  | 17.1  | 14.8  | 13.7  | 11.4  | 3.4   | 1.9   |
| 85°   | 92.3   | 39.5   | 19.4  | 15.6  | 10.3  | 6.8   | 7.2   | 5.7   | 2.7   | 0.4   | 0.0   |
| 87.5° | 16.7   | 5.7    | 3.4   | 3.4   | 2.7   | 1.9   | 1.5   | 0.8   | 0.4   | 0.0   | 0.0   |
| 90°   | 0.0    | 0.0    | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |

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

Report Prepared for

Cooper Lighting Solutions

McGraw-Edison

Report Number: SP2-2501-321-4

Test Date: 04/10/2025

Luminaire Tested: GKO-PB1E-730-U-T4W

Data in this report applies to families of products including GKO-PB1E-730-U-T4W

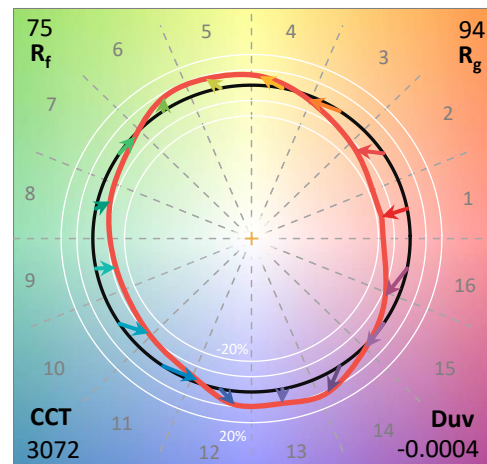
### Test Information

Test Method: LM-79-2019  
 Report Number: SP2-2501-321-4  
 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-730-U-T4W**  
 Description: Gekko Wedge Wall Pack Fixture 1 SQ w/ T4W distribution

### Spectral Parameters

CCT (K): 3072  
 CIE  $u'$ : 0.2482  
 CIE  $v'$ : 0.5193  
 Duv: -0.0004  
 CIE x: 0.4313  
 CIE y: 0.4010  
 CIE z: 0.1677  
 Peak Wavelength (nm): 593  
 Dominant Wavelength (nm): 582  
 Purity: 49.8225  
 R<sub>f</sub>: 74.7  
 R<sub>g</sub>: 94.2

CRI (Ra): 71.7  
 R1: 68.1  
 R2: 82.1  
 R3: 93.4  
 R4: 67.3  
 R5: 67.2  
 R6: 74.9  
 R7: 77.5  
 R8: 43.4  
 R9: -33.9  
 R10: 58.6  
 R11: 62.0  
 R12: 48.5  
 R13: 70.7  
 R14: 96.4  
 R15: 60.2



### Test Conditions

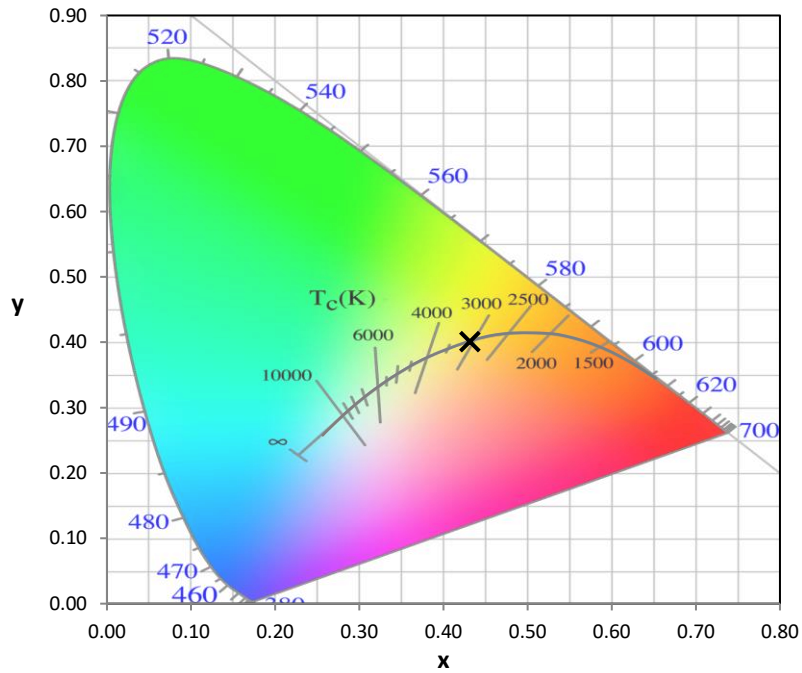
Stabilization Time: 30M  
 Operation Time: 1H 30M  
 Sphere Temperature (°C): 25.7

REPORT NUMBER: SP2-2501-321-4

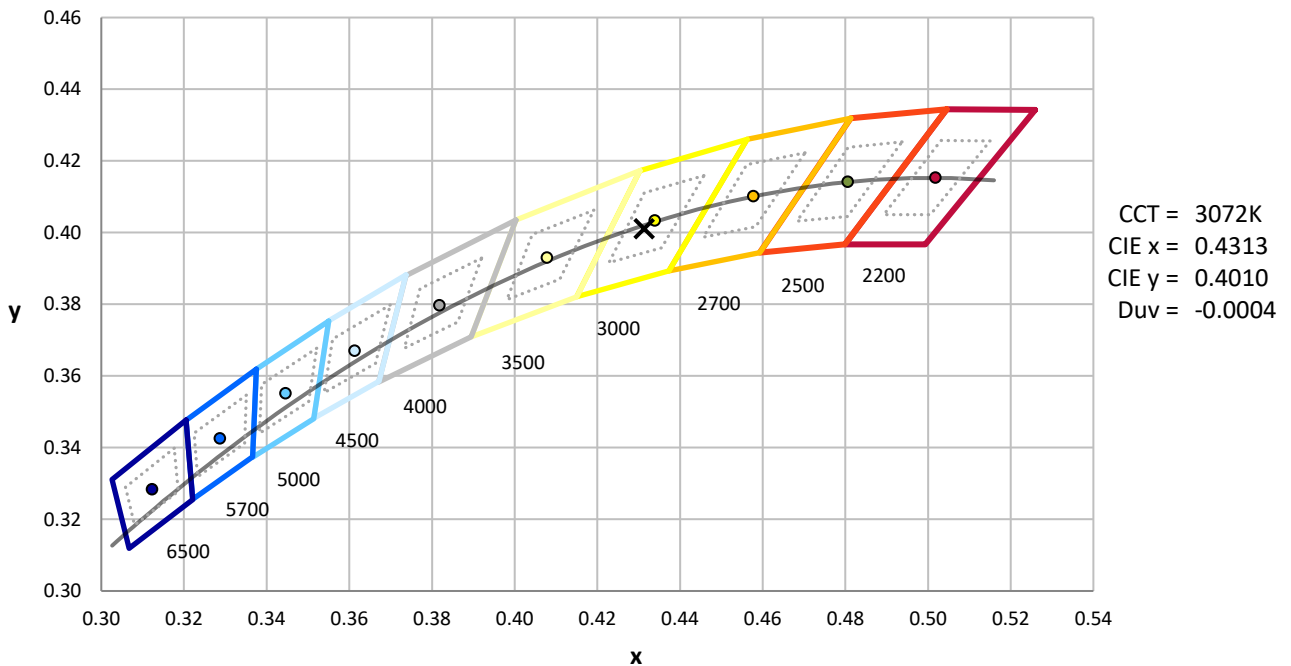
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| 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: SP2-2501-321-4

**CIE 1931 Chromaticity Diagram**



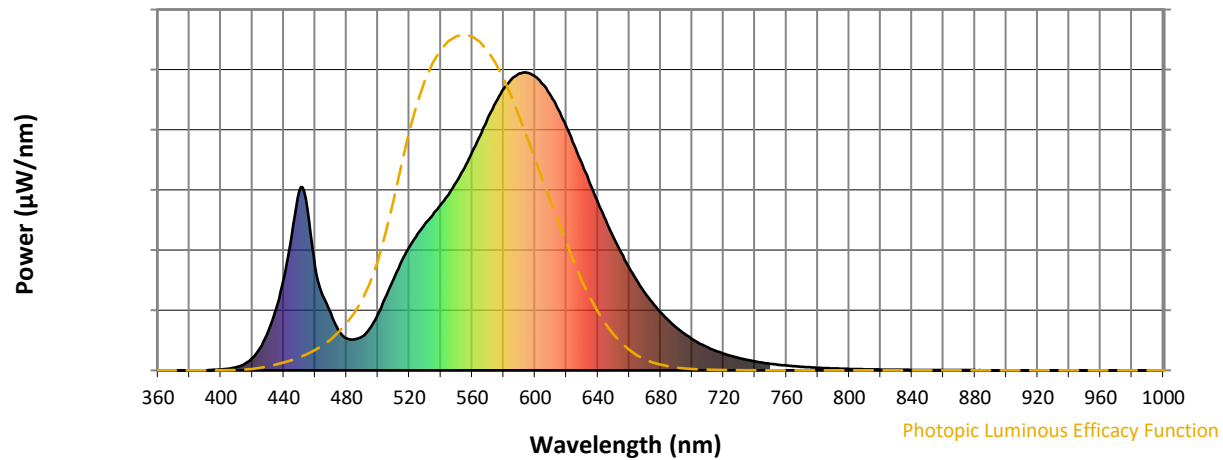
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 3000K 4-step quadrangle

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### Photopic Flux vs. Wavelength

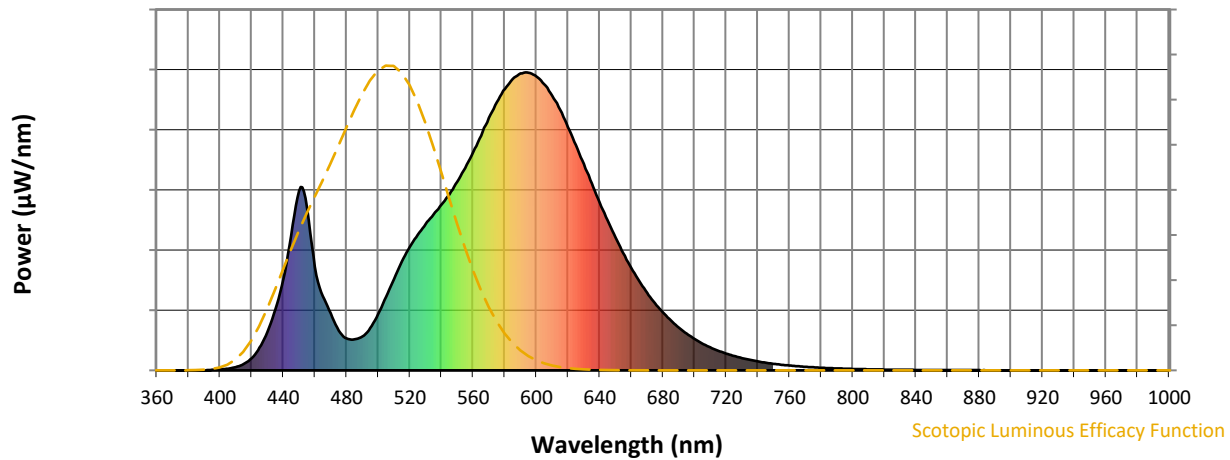


### Photopic Lumens: NR

| $\lambda$<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               | 817                                  | NR                             | 750               | 22                                   | NR                             | 880               | 1                                    | NR                             |
| 365               | 0                                    | NR                             | 495               | 141                                  | NR                             | 625               | 756                                  | NR                             | 755               | 19                                   | NR                             | 885               | 1                                    | NR                             |
| 370               | 0                                    | NR                             | 500               | 189                                  | NR                             | 630               | 693                                  | NR                             | 760               | 16                                   | NR                             | 890               | 0                                    | NR                             |
| 375               | 0                                    | NR                             | 505               | 247                                  | NR                             | 635               | 628                                  | NR                             | 765               | 14                                   | NR                             | 895               | 0                                    | NR                             |
| 380               | 0                                    | NR                             | 510               | 307                                  | NR                             | 640               | 564                                  | NR                             | 770               | 12                                   | NR                             | 900               | 0                                    | NR                             |
| 385               | 0                                    | NR                             | 515               | 366                                  | NR                             | 645               | 504                                  | NR                             | 775               | 10                                   | NR                             | 905               | 0                                    | NR                             |
| 390               | 0                                    | NR                             | 520               | 415                                  | NR                             | 650               | 446                                  | NR                             | 780               | 9                                    | NR                             | 910               | 0                                    | NR                             |
| 395               | 2                                    | NR                             | 525               | 455                                  | NR                             | 655               | 393                                  | NR                             | 785               | 8                                    | NR                             | 915               | 0                                    | NR                             |
| 400               | 3                                    | NR                             | 530               | 491                                  | NR                             | 660               | 344                                  | NR                             | 790               | 7                                    | NR                             | 920               | 0                                    | NR                             |
| 405               | 6                                    | NR                             | 535               | 523                                  | NR                             | 665               | 300                                  | NR                             | 795               | 6                                    | NR                             | 925               | 0                                    | NR                             |
| 410               | 11                                   | NR                             | 540               | 556                                  | NR                             | 670               | 260                                  | NR                             | 800               | 5                                    | NR                             | 930               | 0                                    | NR                             |
| 415               | 21                                   | NR                             | 545               | 591                                  | NR                             | 675               | 226                                  | NR                             | 805               | 4                                    | NR                             | 935               | 0                                    | NR                             |
| 420               | 41                                   | NR                             | 550               | 632                                  | NR                             | 680               | 195                                  | NR                             | 810               | 4                                    | NR                             | 940               | 0                                    | NR                             |
| 425               | 76                                   | NR                             | 555               | 679                                  | NR                             | 685               | 167                                  | NR                             | 815               | 3                                    | NR                             | 945               | 0                                    | NR                             |
| 430               | 129                                  | NR                             | 560               | 732                                  | NR                             | 690               | 144                                  | NR                             | 820               | 3                                    | NR                             | 950               | 0                                    | NR                             |
| 435               | 205                                  | NR                             | 565               | 787                                  | NR                             | 695               | 123                                  | NR                             | 825               | 2                                    | NR                             | 955               | 0                                    | NR                             |
| 440               | 307                                  | NR                             | 570               | 847                                  | NR                             | 700               | 105                                  | NR                             | 830               | 2                                    | NR                             | 960               | 0                                    | NR                             |
| 445               | 451                                  | NR                             | 575               | 900                                  | NR                             | 705               | 90                                   | NR                             | 835               | 2                                    | NR                             | 965               | 0                                    | NR                             |
| 450               | 603                                  | NR                             | 580               | 944                                  | NR                             | 710               | 77                                   | NR                             | 840               | 2                                    | NR                             | 970               | 0                                    | NR                             |
| 455               | 544                                  | NR                             | 585               | 977                                  | NR                             | 715               | 66                                   | NR                             | 845               | 1                                    | NR                             | 975               | 0                                    | NR                             |
| 460               | 348                                  | NR                             | 590               | 997                                  | NR                             | 720               | 56                                   | NR                             | 850               | 1                                    | NR                             | 980               | 0                                    | NR                             |
| 465               | 249                                  | NR                             | 595               | 998                                  | NR                             | 725               | 48                                   | NR                             | 855               | 1                                    | NR                             | 985               | 0                                    | NR                             |
| 470               | 191                                  | NR                             | 600               | 986                                  | NR                             | 730               | 41                                   | NR                             | 860               | 1                                    | NR                             | 990               | 0                                    | NR                             |
| 475               | 133                                  | NR                             | 605               | 960                                  | NR                             | 735               | 35                                   | NR                             | 865               | 1                                    | NR                             | 995               | 0                                    | NR                             |
| 480               | 107                                  | NR                             | 610               | 921                                  | NR                             | 740               | 30                                   | NR                             | 870               | 1                                    | NR                             | 1000              | 0                                    | NR                             |
| 485               | 104                                  | NR                             | 615               | 874                                  | NR                             | 745               | 26                                   | NR                             | 875               | 1                                    | NR                             |                   |                                      |                                |

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### Scotopic Flux vs. Wavelength



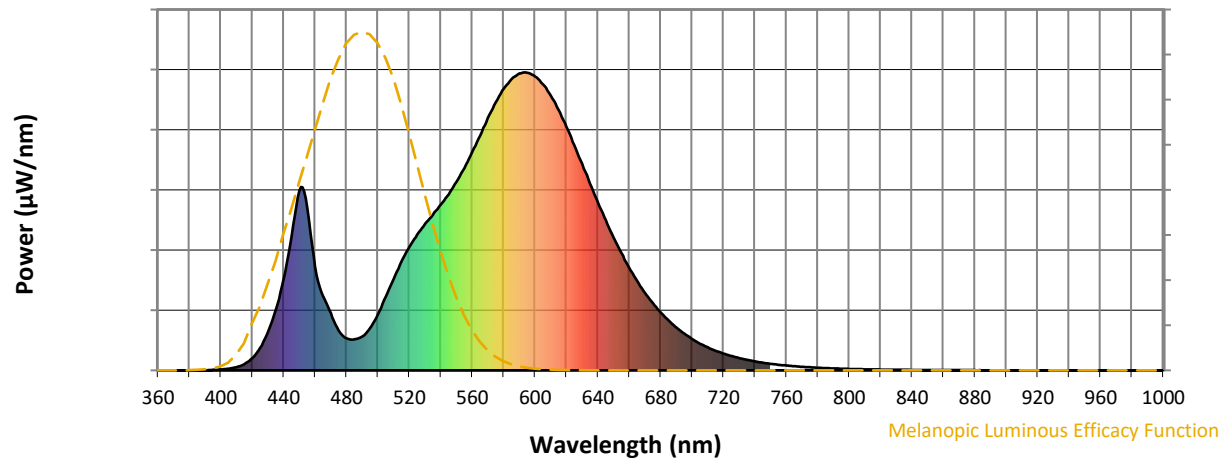
Scotopic Lumens: NR

S/P: 1.24

| 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    | 114                      | NR            | 620    | 817                      | NR            | 750    | 22                       | NR            | 880    | 1                        | NR            |
| 365    | 0                        | NR            | 495    | 141                      | NR            | 625    | 756                      | NR            | 755    | 19                       | NR            | 885    | 1                        | NR            |
| 370    | 0                        | NR            | 500    | 189                      | NR            | 630    | 693                      | NR            | 760    | 16                       | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 247                      | NR            | 635    | 628                      | NR            | 765    | 14                       | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 307                      | NR            | 640    | 564                      | NR            | 770    | 12                       | NR            | 900    | 0                        | NR            |
| 385    | 0                        | NR            | 515    | 366                      | NR            | 645    | 504                      | NR            | 775    | 10                       | NR            | 905    | 0                        | NR            |
| 390    | 0                        | NR            | 520    | 415                      | NR            | 650    | 446                      | NR            | 780    | 9                        | NR            | 910    | 0                        | NR            |
| 395    | 2                        | NR            | 525    | 455                      | NR            | 655    | 393                      | NR            | 785    | 8                        | NR            | 915    | 0                        | NR            |
| 400    | 3                        | NR            | 530    | 491                      | NR            | 660    | 344                      | NR            | 790    | 7                        | NR            | 920    | 0                        | NR            |
| 405    | 6                        | NR            | 535    | 523                      | NR            | 665    | 300                      | NR            | 795    | 6                        | NR            | 925    | 0                        | NR            |
| 410    | 11                       | NR            | 540    | 556                      | NR            | 670    | 260                      | NR            | 800    | 5                        | NR            | 930    | 0                        | NR            |
| 415    | 21                       | NR            | 545    | 591                      | NR            | 675    | 226                      | NR            | 805    | 4                        | NR            | 935    | 0                        | NR            |
| 420    | 41                       | NR            | 550    | 632                      | NR            | 680    | 195                      | NR            | 810    | 4                        | NR            | 940    | 0                        | NR            |
| 425    | 76                       | NR            | 555    | 679                      | NR            | 685    | 167                      | NR            | 815    | 3                        | NR            | 945    | 0                        | NR            |
| 430    | 129                      | NR            | 560    | 732                      | NR            | 690    | 144                      | NR            | 820    | 3                        | NR            | 950    | 0                        | NR            |
| 435    | 205                      | NR            | 565    | 787                      | NR            | 695    | 123                      | NR            | 825    | 2                        | NR            | 955    | 0                        | NR            |
| 440    | 307                      | NR            | 570    | 847                      | NR            | 700    | 105                      | NR            | 830    | 2                        | NR            | 960    | 0                        | NR            |
| 445    | 451                      | NR            | 575    | 900                      | NR            | 705    | 90                       | NR            | 835    | 2                        | NR            | 965    | 0                        | NR            |
| 450    | 603                      | NR            | 580    | 944                      | NR            | 710    | 77                       | NR            | 840    | 2                        | NR            | 970    | 0                        | NR            |
| 455    | 544                      | NR            | 585    | 977                      | NR            | 715    | 66                       | NR            | 845    | 1                        | NR            | 975    | 0                        | NR            |
| 460    | 348                      | NR            | 590    | 997                      | NR            | 720    | 56                       | NR            | 850    | 1                        | NR            | 980    | 0                        | NR            |
| 465    | 249                      | NR            | 595    | 998                      | NR            | 725    | 48                       | NR            | 855    | 1                        | NR            | 985    | 0                        | NR            |
| 470    | 191                      | NR            | 600    | 986                      | NR            | 730    | 41                       | NR            | 860    | 1                        | NR            | 990    | 0                        | NR            |
| 475    | 133                      | NR            | 605    | 960                      | NR            | 735    | 35                       | NR            | 865    | 1                        | NR            | 995    | 0                        | NR            |
| 480    | 107                      | NR            | 610    | 921                      | NR            | 740    | 30                       | NR            | 870    | 1                        | NR            | 1000   | 0                        | NR            |
| 485    | 104                      | NR            | 615    | 874                      | NR            | 745    | 26                       | NR            | 875    | 1                        | NR            |        |                          |               |

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### Melanopic Flux vs. Wavelength


**Melanopic Lumens: NR**
**M/P: 2.3**

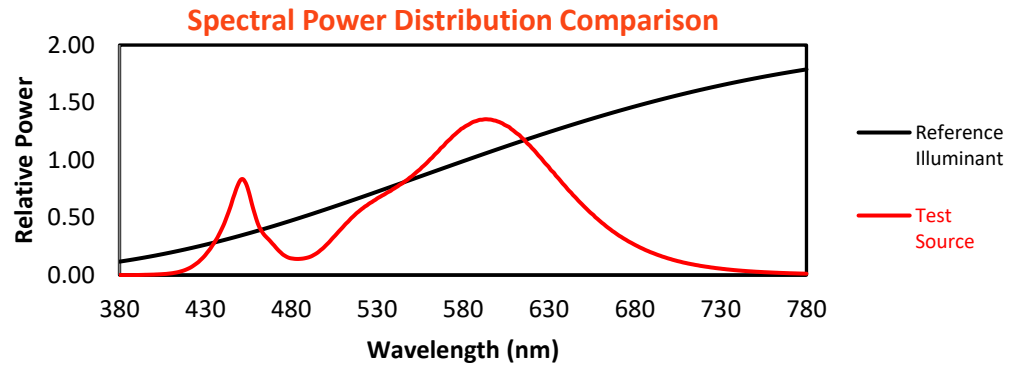
| $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>$\text{W}^\wedge/\text{nm}$ | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<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               | 817                                  | NR                             | 750               | 22                                   | NR                             | 880               | 1                                    | NR                             |
| 365               | 0                                    | NR                             | 495               | 141                                  | NR                             | 625               | 756                                  | NR                             | 755               | 19                                   | NR                             | 885               | 1                                    | NR                             |
| 370               | 0                                    | NR                             | 500               | 189                                  | NR                             | 630               | 693                                  | NR                             | 760               | 16                                   | NR                             | 890               | 0                                    | NR                             |
| 375               | 0                                    | NR                             | 505               | 247                                  | NR                             | 635               | 628                                  | NR                             | 765               | 14                                   | NR                             | 895               | 0                                    | NR                             |
| 380               | 0                                    | NR                             | 510               | 307                                  | NR                             | 640               | 564                                  | NR                             | 770               | 12                                   | NR                             | 900               | 0                                    | NR                             |
| 385               | 0                                    | NR                             | 515               | 366                                  | NR                             | 645               | 504                                  | NR                             | 775               | 10                                   | NR                             | 905               | 0                                    | NR                             |
| 390               | 0                                    | NR                             | 520               | 415                                  | NR                             | 650               | 446                                  | NR                             | 780               | 9                                    | NR                             | 910               | 0                                    | NR                             |
| 395               | 2                                    | NR                             | 525               | 455                                  | NR                             | 655               | 393                                  | NR                             | 785               | 8                                    | NR                             | 915               | 0                                    | NR                             |
| 400               | 3                                    | NR                             | 530               | 491                                  | NR                             | 660               | 344                                  | NR                             | 790               | 7                                    | NR                             | 920               | 0                                    | NR                             |
| 405               | 6                                    | NR                             | 535               | 523                                  | NR                             | 665               | 300                                  | NR                             | 795               | 6                                    | NR                             | 925               | 0                                    | NR                             |
| 410               | 11                                   | NR                             | 540               | 556                                  | NR                             | 670               | 260                                  | NR                             | 800               | 5                                    | NR                             | 930               | 0                                    | NR                             |
| 415               | 21                                   | NR                             | 545               | 591                                  | NR                             | 675               | 226                                  | NR                             | 805               | 4                                    | NR                             | 935               | 0                                    | NR                             |
| 420               | 41                                   | NR                             | 550               | 632                                  | NR                             | 680               | 195                                  | NR                             | 810               | 4                                    | NR                             | 940               | 0                                    | NR                             |
| 425               | 76                                   | NR                             | 555               | 679                                  | NR                             | 685               | 167                                  | NR                             | 815               | 3                                    | NR                             | 945               | 0                                    | NR                             |
| 430               | 129                                  | NR                             | 560               | 732                                  | NR                             | 690               | 144                                  | NR                             | 820               | 3                                    | NR                             | 950               | 0                                    | NR                             |
| 435               | 205                                  | NR                             | 565               | 787                                  | NR                             | 695               | 123                                  | NR                             | 825               | 2                                    | NR                             | 955               | 0                                    | NR                             |
| 440               | 307                                  | NR                             | 570               | 847                                  | NR                             | 700               | 105                                  | NR                             | 830               | 2                                    | NR                             | 960               | 0                                    | NR                             |
| 445               | 451                                  | NR                             | 575               | 900                                  | NR                             | 705               | 90                                   | NR                             | 835               | 2                                    | NR                             | 965               | 0                                    | NR                             |
| 450               | 603                                  | NR                             | 580               | 944                                  | NR                             | 710               | 77                                   | NR                             | 840               | 2                                    | NR                             | 970               | 0                                    | NR                             |
| 455               | 544                                  | NR                             | 585               | 977                                  | NR                             | 715               | 66                                   | NR                             | 845               | 1                                    | NR                             | 975               | 0                                    | NR                             |
| 460               | 348                                  | NR                             | 590               | 997                                  | NR                             | 720               | 56                                   | NR                             | 850               | 1                                    | NR                             | 980               | 0                                    | NR                             |
| 465               | 249                                  | NR                             | 595               | 998                                  | NR                             | 725               | 48                                   | NR                             | 855               | 1                                    | NR                             | 985               | 0                                    | NR                             |
| 470               | 191                                  | NR                             | 600               | 986                                  | NR                             | 730               | 41                                   | NR                             | 860               | 1                                    | NR                             | 990               | 0                                    | NR                             |
| 475               | 133                                  | NR                             | 605               | 960                                  | NR                             | 735               | 35                                   | NR                             | 865               | 1                                    | NR                             | 995               | 0                                    | NR                             |
| 480               | 107                                  | NR                             | 610               | 921                                  | NR                             | 740               | 30                                   | NR                             | 870               | 1                                    | NR                             | 1000              | 0                                    | NR                             |
| 485               | 104                                  | NR                             | 615               | 874                                  | NR                             | 745               | 26                                   | NR                             | 875               | 1                                    | NR                             |                   |                                      |                                |

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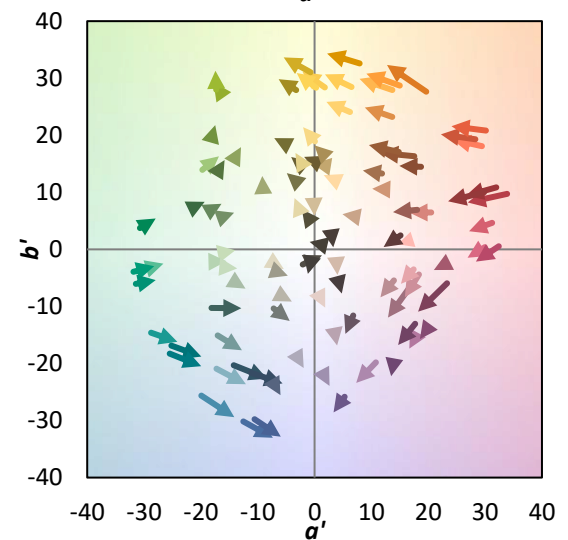
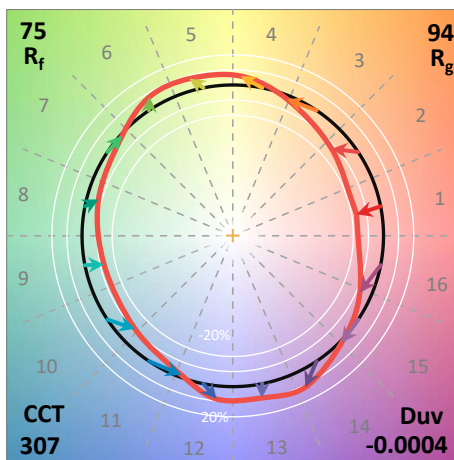
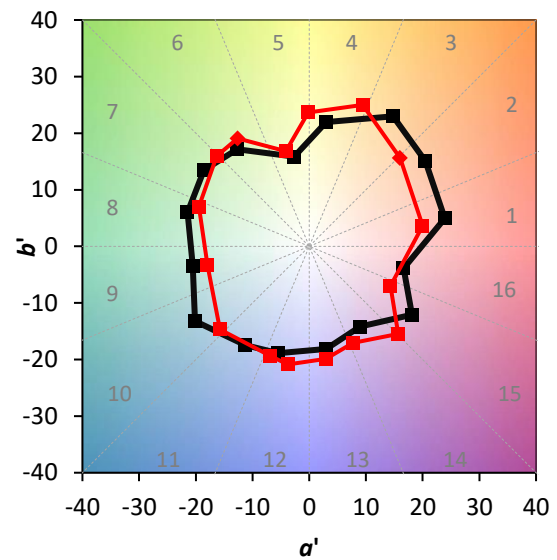
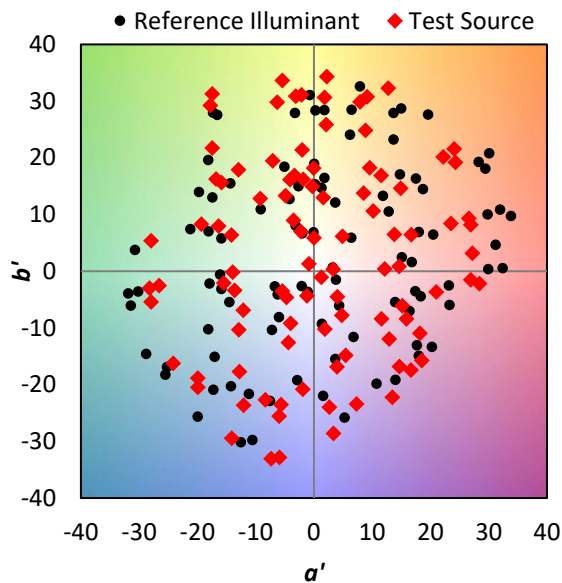
TM-30-18

### Summary

$R_f = 74.7$   
 $R_g = 94.2$   
 $CIE R_a = 71.7$   
 $R_g = -33.9$

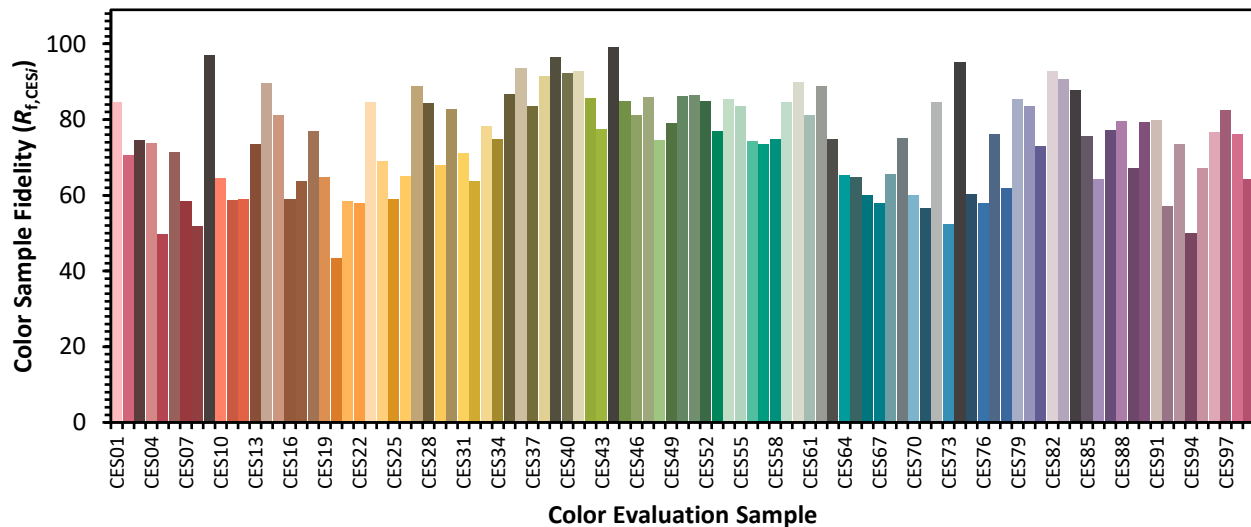


### Color Vector Graphics

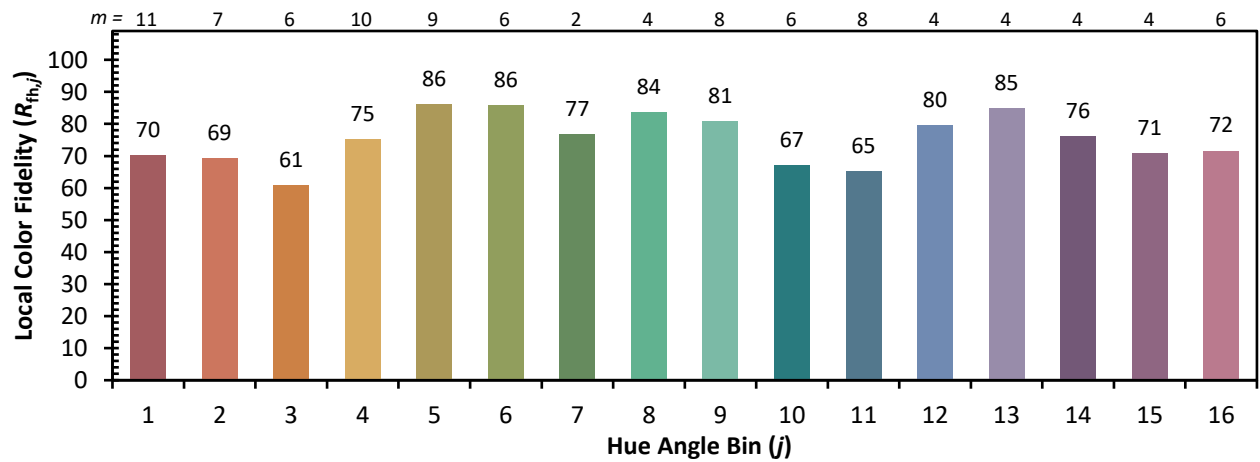
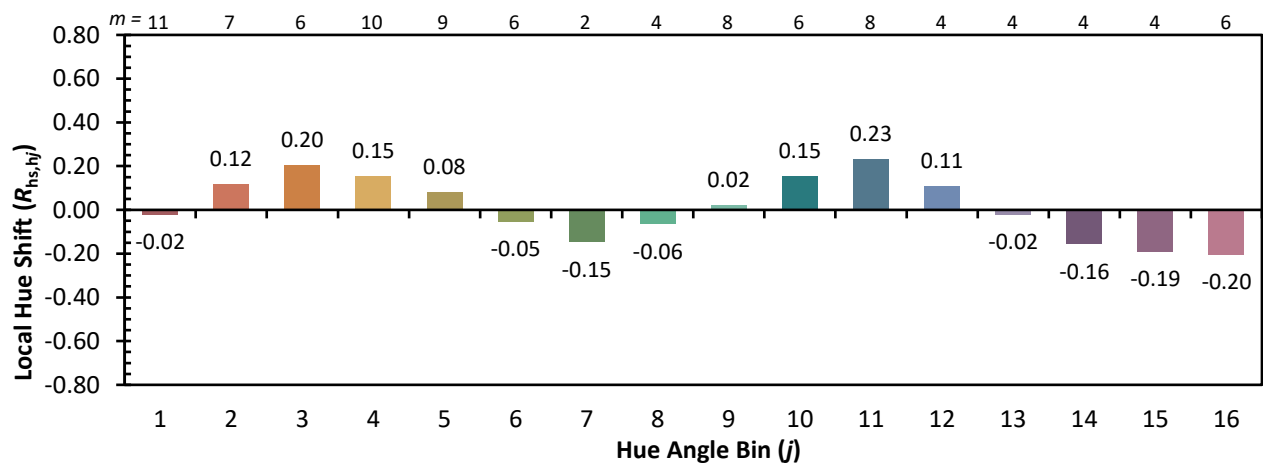
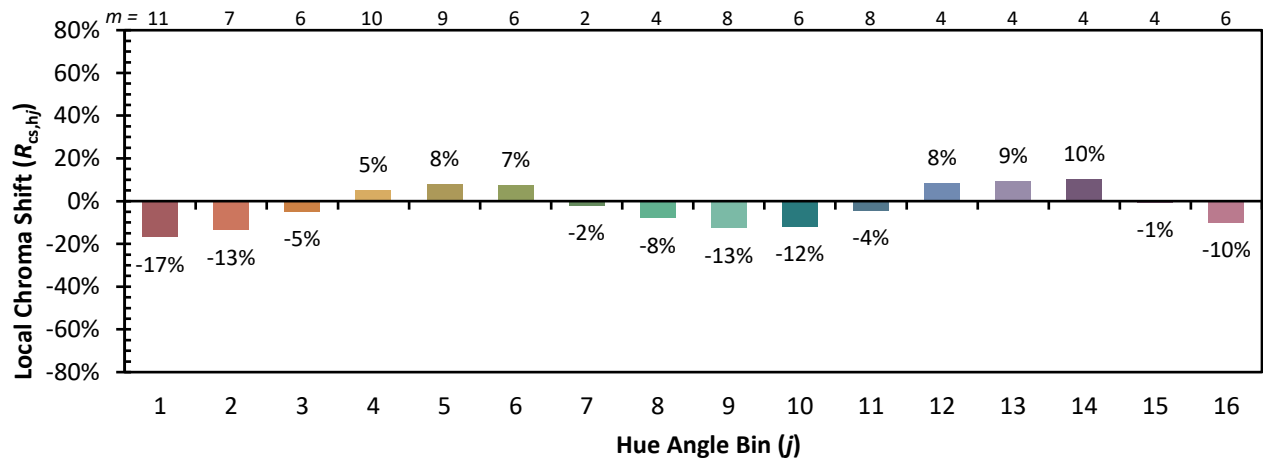


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

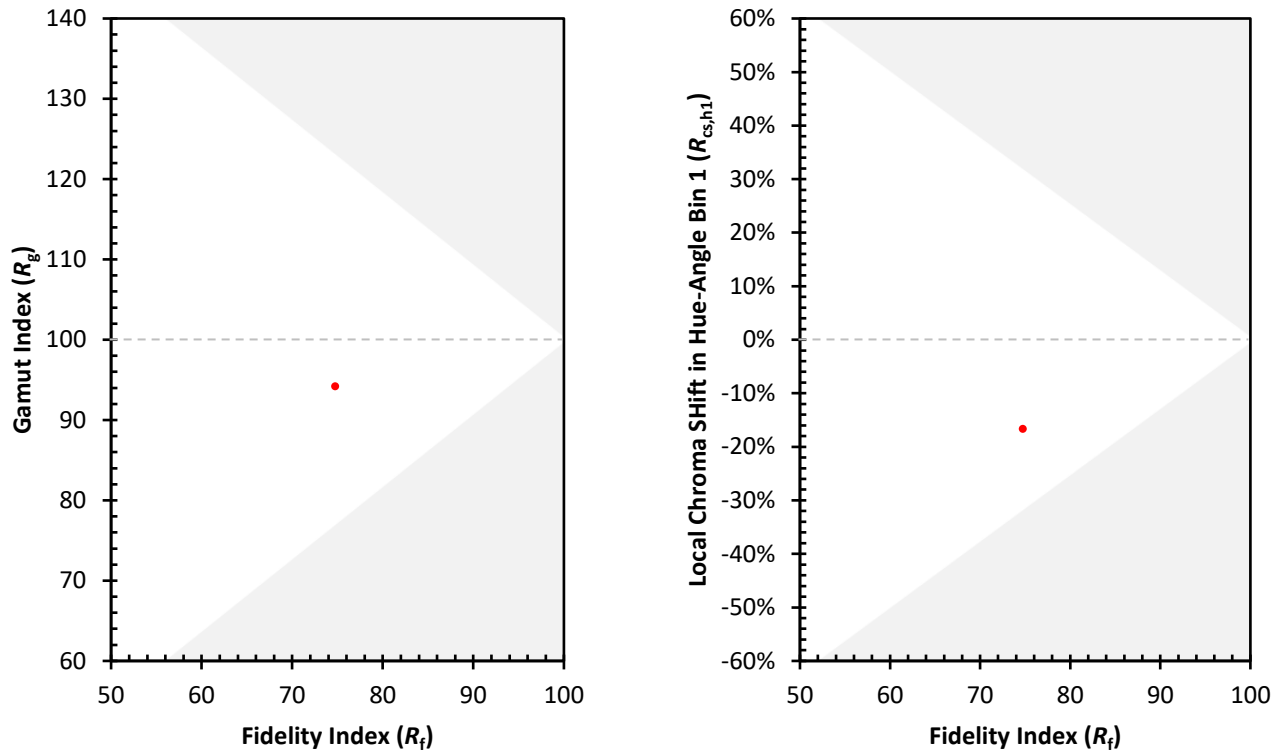
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 65 | CES51 = 86 | CES76 = 58 |
| CES02 = 62 | CES27 = 89 | CES52 = 85 | CES77 = 76 |
| CES03 = 31 | CES28 = 84 | CES53 = 77 | CES78 = 62 |
| CES04 = 71 | CES29 = 68 | CES54 = 85 | CES79 = 85 |
| CES05 = 49 | CES30 = 83 | CES55 = 84 | CES80 = 84 |
| CES06 = 51 | CES31 = 71 | CES56 = 74 | CES81 = 73 |
| CES07 = 41 | CES32 = 64 | CES57 = 74 | CES82 = 93 |
| CES08 = 40 | CES33 = 78 | CES58 = 75 | CES83 = 91 |
| CES09 = 29 | CES34 = 75 | CES59 = 85 | CES84 = 88 |
| CES10 = 76 | CES35 = 87 | CES60 = 90 | CES85 = 76 |
| CES11 = 59 | CES36 = 94 | CES61 = 81 | CES86 = 64 |
| CES12 = 65 | CES37 = 84 | CES62 = 89 | CES87 = 77 |
| CES13 = 43 | CES38 = 92 | CES63 = 75 | CES88 = 80 |
| CES14 = 74 | CES39 = 96 | CES64 = 65 | CES89 = 67 |
| CES15 = 71 | CES40 = 92 | CES65 = 65 | CES90 = 79 |
| CES16 = 47 | CES41 = 93 | CES66 = 60 | CES91 = 80 |
| CES17 = 50 | CES42 = 86 | CES67 = 58 | CES92 = 57 |
| CES18 = 56 | CES43 = 78 | CES68 = 66 | CES93 = 74 |
| CES19 = 73 | CES44 = 99 | CES69 = 75 | CES94 = 50 |
| CES20 = 66 | CES45 = 85 | CES70 = 60 | CES95 = 67 |
| CES21 = 87 | CES46 = 81 | CES71 = 57 | CES96 = 77 |
| CES22 = 79 | CES47 = 86 | CES72 = 85 | CES97 = 83 |
| CES23 = 92 | CES48 = 75 | CES73 = 52 | CES98 = 76 |
| CES24 = 91 | CES49 = 79 | CES74 = 95 | CES99 = 64 |
| CES25 = 73 | CES50 = 86 | CES75 = 60 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)