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

Scaled data based on original data using

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

Test Report Prepared for

Cooper Lighting Solutions

Brand: METALUX

Report Number: P1590964

Luminaire Tested: 24CGTX-65-L93050-W2A2-4500K

Issue Date: 9/7/2026

Report Generated By 670265710 / DESKTOP-98SHLC4

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

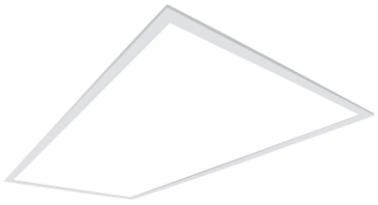
Scaled Data Report

**Test Information**

| | |
|---|---|
| Test Method: | LM-79-2019 |
| Report Number: | P1590964 |
| | TEST IS SCALED FROM IESNA LM-79-24 TEST DATA (G3-2512-631-20) |
| Test Lab: | COOPER LIGHTING SOLUTIONS |
| Issue Date: | 9/7/2026 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS |
| Product Line: | METALUX |
| | |
| Catalog Number: | 24CGTX-65-L93050-W2A2-4500K |
| Description: | 2X4 6500 LUMEN CGTX TROFFER WITH VividTune LEDS AT 4500K CCT |
| Light Source: | 4500K CCT, 90 CRI LEDS |
| Ballast/Driver: | - |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 7318.9 lumens |
| Efficiency: | N/A |
| Efficacy: | 114.0 lumens/watt |
| Spacing Criteria (0/90/45): | 1.28 / 1.27 / 1.39 |
| Luminous Opening: | Rectangular (W 2' x L: 4' x H: 0') |
| CIE Type: | Direct |
| | |
| Input Watts (W): | 64.2 |
| Input Voltage (V): | 120 |
| Input Current (Ain): | NR |
| Voltage Rise (V): | NR |
| Power Factor: | NR |
| Total Harmonic Distortion (THDi): | NR |
| Frequency (hertz): | 60 |
| Stabilization Time: | NR |
| Operation Time: | NR |
| Ambient Temperature (°C): | NR |
| Test Distance: | 24 FT |

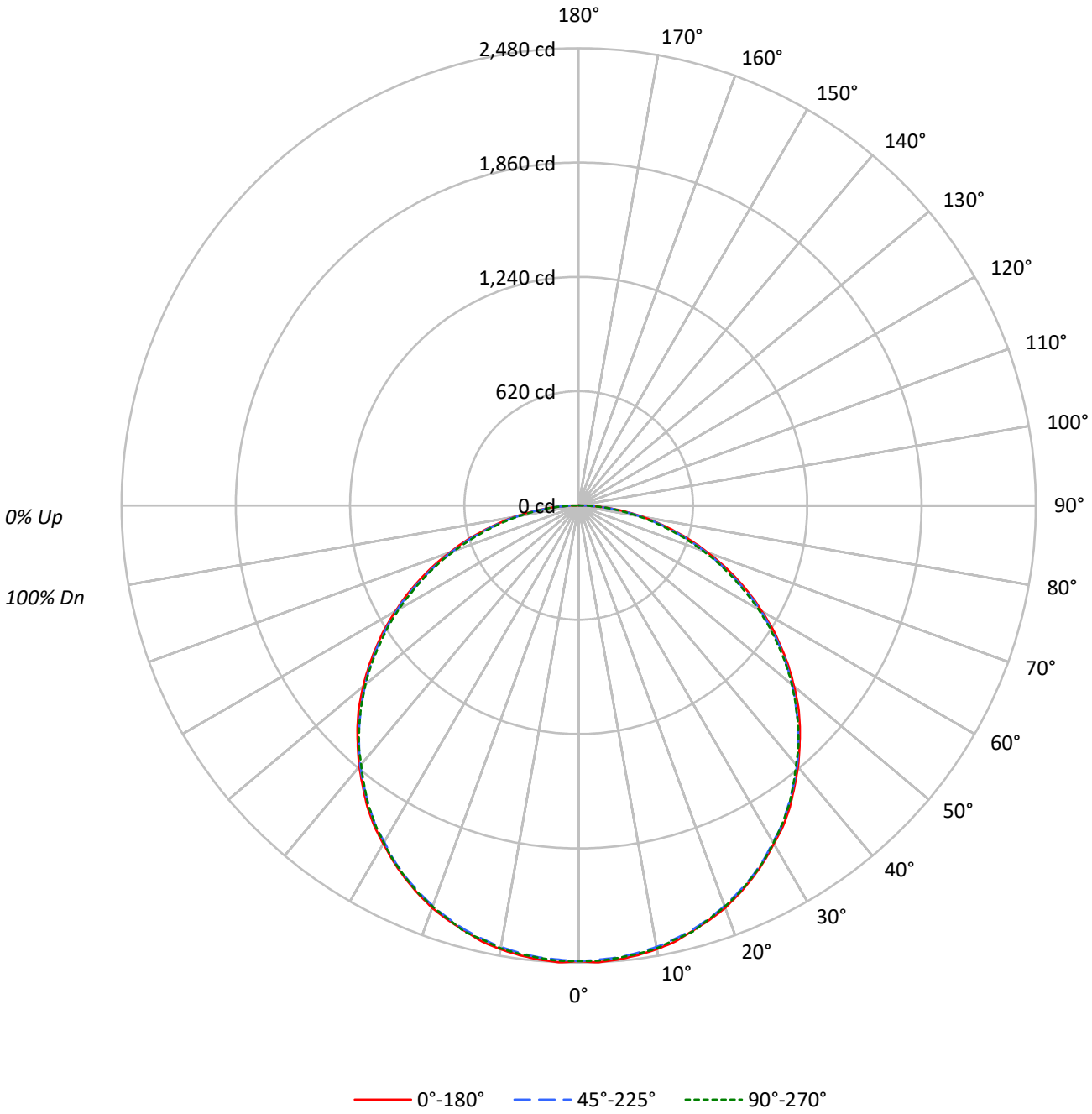


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Peachtree City, GA 30269

Scaled Data Report

TEST NUMBER: P1590964
CATALOG NUMBER: 24CGTX-65-L93050-W2A2-4500K

## Luminous Intensity Polar Plot



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## COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:

| RF | 20 | | | | 20 | | | | 20 | | | 20 | | | 20 | | | 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RC | 80 | | | | 70 | | | | 50 | | | 30 | | | 10 | | | 0 |
| RW | 70 | 50 | 30 | 10 | 70 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 0 |
| RCR | | | | | | | | | | | | | | | | | | |
| 0 | 119 | 119 | 119 | 119 | 116 | 116 | 116 | 116 | 111 | 111 | 111 | 106 | 106 | 106 | 102 | 102 | 102 | 100 |
| 1 | 108 | 103 | 99 | 95 | 106 | 101 | 97 | 93 | 97 | 93 | 90 | 93 | 90 | 88 | 89 | 87 | 85 | 83 |
| 2 | 98 | 90 | 83 | 77 | 96 | 88 | 81 | 76 | 84 | 79 | 74 | 81 | 76 | 72 | 78 | 74 | 71 | 69 |
| 3 | 89 | 79 | 70 | 64 | 87 | 77 | 69 | 63 | 74 | 67 | 62 | 71 | 66 | 61 | 69 | 64 | 60 | 57 |
| 4 | 82 | 70 | 61 | 54 | 79 | 68 | 60 | 53 | 66 | 58 | 53 | 63 | 57 | 52 | 61 | 56 | 51 | 49 |
| 5 | 75 | 62 | 53 | 46 | 73 | 61 | 52 | 46 | 59 | 51 | 45 | 57 | 50 | 45 | 55 | 49 | 44 | 42 |
| 6 | 69 | 56 | 47 | 40 | 67 | 55 | 46 | 40 | 53 | 45 | 40 | 51 | 44 | 39 | 50 | 44 | 39 | 37 |
| 7 | 64 | 51 | 42 | 35 | 62 | 50 | 41 | 35 | 48 | 41 | 35 | 47 | 40 | 35 | 45 | 39 | 34 | 32 |
| 8 | 60 | 46 | 37 | 32 | 58 | 45 | 37 | 31 | 44 | 37 | 31 | 43 | 36 | 31 | 42 | 35 | 31 | 29 |
| 9 | 56 | 42 | 34 | 28 | 54 | 42 | 34 | 28 | 40 | 33 | 28 | 39 | 33 | 28 | 38 | 32 | 28 | 26 |
| 10 | 52 | 39 | 31 | 26 | 51 | 38 | 31 | 26 | 37 | 30 | 25 | 36 | 30 | 25 | 36 | 30 | 25 | 23 |

## AVERAGE LUMINANCE (cd/sqm):

| | 0° | 45° | 90° |
|---|---|---|---|
| 0° | 3326 | 3326 | 3326 |
| 5° | 3339 | 3325 | 3328 |
| 10° | 3339 | 3323 | 3333 |
| 15° | 3327 | 3320 | 3333 |
| 20° | 3326 | 3311 | 3316 |
| 25° | 3311 | 3300 | 3303 |
| 30° | 3291 | 3277 | 3283 |
| 35° | 3281 | 3259 | 3266 |
| 40° | 3252 | 3237 | 3224 |
| 45° | 3229 | 3201 | 3201 |
| 50° | 3192 | 3164 | 3159 |
| 55° | 3144 | 3122 | 3095 |
| 60° | 3088 | 3068 | 3031 |
| 65° | 3022 | 2966 | 2929 |
| 70° | 2917 | 2864 | 2815 |
| 75° | 2815 | 2744 | 2657 |
| 80° | 2707 | 2586 | 2481 |
| 85° | 2464 | 2351 | 2286 |

## MAXIMUM LUMINANCE 45°-90°:

Horizontal Angle: 0°
Vertical Angle: 45°
Luminance: 3229 cd/sqm

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TEST NUMBER: P1590964
CATALOG NUMBER: 24CGTX-65-L93050-W2A2-4500K

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 234.2 | 3.2 |
| 10°-20° | 673.3 | 9.2 |
| 20°-30° | 1024.7 | 14.0 |
| 30°-40° | 1242.8 | 17.0 |
| 40°-50° | 1299.5 | 17.8 |
| 50°-60° | 1189.1 | 16.2 |
| 60°-70° | 924.0 | 12.6 |
| 70°-80° | 558.1 | 7.6 |
| 80°-90° | 173.2 | 2.4 |
| 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°-30° | 1932.2 | 26.4 |
| 0°-40° | 3175.0 | 43.4 |
| 0°-60° | 5663.6 | 77.4 |
| 0°-90° | 7318.9 | 100.0 |
| 90°-120° | 0.0 | 0.0 |
| 90°-150° | 0.0 | 0.0 |
| 90°-180° | 0.0 | 0.0 |
| 0°-180° | 7318.9 | 100.0 |

**CANDELA DISTRIBUTION:**

| | 0° | 22.5° | 45° | 67.5° | 90° | Flux |
|---|---|---|---|---|---|---|
| 0° | 2472 | 2472 | 2472 | 2472 | 2472 | |
| 5° | 2472 | 2465 | 2462 | 2462 | 2464 | 235 |
| 15° | 2389 | 2389 | 2383 | 2383 | 2393 | 675 |
| 25° | 2230 | 2224 | 2223 | 2218 | 2225 | 1028 |
| 35° | 1998 | 1988 | 1984 | 1984 | 1988 | 1248 |
| 45° | 1697 | 1687 | 1682 | 1678 | 1682 | 1308 |
| 55° | 1340 | 1339 | 1331 | 1323 | 1320 | 1199 |
| 65° | 949 | 942 | 932 | 922 | 920 | 939 |
| 75° | 541 | 538 | 528 | 517 | 511 | 573 |
| 85° | 160 | 161 | 152 | 149 | 148 | 181 |
| 90° | 0 | 0 | 0 | 0 | 0 | |

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Scaled Data Report

TEST NUMBER: P1590964
CATALOG NUMBER: 24CGTX-65-L93050-W2A2-4500K

**CANDELA DISTRIBUTION (FULL):**

| | 0° | 22.5° | 45° | 67.5° | 90° |
|---|---|---|---|---|---|
| 0° | *2472.1* | 2472.1 | 2472.1 | 2472.1 | 2472.1 |
| 2.5° | *2480.4* | *2472.1* | *2465.8* | *2463.7* | *2472.1* |
| 5° | *2472.1* | 2464.8 | 2461.6 | 2461.6 | 2463.7 |
| 7.5° | *2460.6* | 2454.3 | 2448.1 | 2447.0 | 2453.3 |
| 10° | *2443.9* | 2432.4 | 2432.4 | 2430.3 | 2439.7 |
| 12.5° | *2423.0* | 2413.7 | 2408.4 | 2410.5 | 2411.6 |
| 15° | *2388.6* | 2388.6 | 2383.4 | 2383.4 | 2392.8 |
| 17.5° | *2358.4* | 2352.1 | 2349.0 | 2352.1 | 2352.1 |
| 20° | *2322.9* | 2313.5 | 2312.5 | 2308.3 | 2315.6 |
| 22.5° | *2278.1* | 2272.8 | 2268.7 | 2269.7 | 2274.9 |
| 25° | *2230.1* | 2223.8 | 2222.8 | 2217.6 | 2224.9 |
| 27.5° | *2176.9* | 2171.7 | 2169.6 | 2168.5 | 2173.8 |
| 30° | *2118.5* | 2113.3 | 2109.1 | 2111.2 | 2113.3 |
| 32.5° | *2063.2* | 2053.8 | 2053.8 | 2049.6 | 2052.8 |
| 35° | *1997.5* | 1988.1 | 1983.9 | 1983.9 | 1988.1 |
| 37.5° | *1922.4* | 1919.2 | 1915.1 | 1911.9 | 1911.9 |
| 40° | *1851.4* | 1845.2 | 1843.1 | 1840.0 | 1835.8 |
| 42.5° | *1773.2* | 1769.0 | 1763.8 | 1762.8 | 1764.9 |
| 45° | *1697.1* | 1686.6 | 1682.5 | 1678.3 | 1682.5 |
| 47.5° | *1615.7* | 1605.3 | 1596.9 | 1594.9 | 1596.9 |
| 50° | *1525.0* | 1518.7 | 1511.4 | 1508.3 | 1509.3 |
| 52.5° | *1435.3* | 1425.9 | 1422.7 | 1419.6 | 1417.5 |
| 55° | *1340.3* | 1339.3 | 1331.0 | 1322.6 | 1319.5 |
| 57.5° | *1248.6* | 1243.3 | 1233.9 | 1227.7 | 1225.6 |
| 60° | *1147.4* | 1145.3 | 1140.1 | 1130.7 | 1126.5 |
| 62.5° | *1051.4* | 1044.1 | 1038.9 | 1025.3 | 1023.2 |
| 65° | *949.2* | 941.9 | 931.5 | 922.1 | 920.0 |
| 67.5° | *848.0* | 839.7 | 831.3 | 820.9 | 820.9 |
| 70° | *741.6* | 739.5 | 728.1 | 718.7 | 715.5 |
| 72.5° | *645.7* | 638.4 | 627.9 | 615.4 | 612.3 |
| 75° | *541.4* | 538.2 | 527.8 | 517.4 | 511.1 |
| 77.5° | *441.2* | 440.2 | 431.8 | 418.3 | 415.1 |
| 80° | *349.4* | 343.2 | 333.8 | 324.4 | 320.2 |
| 82.5° | *253.5* | 250.3 | 242.0 | 234.7 | 234.7 |
| 85° | *159.6* | 160.6 | 152.3 | 149.2 | 148.1 |
| 87.5° | *76.1* | 74.1 | 72.0 | 70.9 | 72.0 |
| 90° | *0.0* | 0.0 | 0.0 | 0.0 | 0.0 |

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TEST NUMBER: P1590964
CATALOG NUMBER: 24CGTX-65-L93050-W2A2-4500K

**CIE UGR TABLE:**

| Reflectances: | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ceiling | 0.7 | 0.7 | 0.5 | 0.5 | 0.3 | 0.7 | 0.7 | 0.5 | 0.5 | 0.3 |
| | Wall | 0.5 | 0.3 | 0.5 | 0.3 | 0.3 | 0.5 | 0.3 | 0.5 | 0.3 | 0.3 |
| | Reference plane | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| Room dimensions | | Viewed crosswise | | | | | Viewed endwise | | | | |
| X=2H | Y=2H | 16.19 | 17.85 | 16.55 | 18.17 | 18.48 | 16.09 | 17.76 | 16.46 | 18.07 | 18.38 |
| | 3H | 18.11 | 19.62 | 18.49 | 19.94 | 20.30 | 17.97 | 19.47 | 18.34 | 19.80 | 20.16 |
| | 4H | 18.87 | 20.29 | 19.27 | 20.64 | 21.01 | 18.69 | 20.11 | 19.08 | 20.45 | 20.83 |
| | 6H | 19.47 | 20.79 | 19.88 | 21.15 | 21.55 | 19.24 | 20.56 | 19.65 | 20.92 | 21.31 |
| | 8H | 19.69 | 20.95 | 20.11 | 21.34 | 21.74 | 19.44 | 20.70 | 19.86 | 21.09 | 21.48 |
| | 12H | 19.84 | 21.05 | 20.27 | 21.43 | 21.86 | 19.58 | 20.79 | 20.01 | 21.17 | 21.60 |
| 4H | 2H | 16.84 | 18.26 | 17.23 | 18.61 | 18.98 | 16.76 | 18.18 | 17.16 | 18.53 | 18.91 |
| | 3H | 18.99 | 20.18 | 19.40 | 20.58 | 20.98 | 18.86 | 20.06 | 19.27 | 20.45 | 20.85 |
| | 4H | 19.89 | 20.97 | 20.32 | 21.38 | 21.82 | 19.72 | 20.80 | 20.15 | 21.21 | 21.65 |
| | 6H | 20.63 | 21.58 | 21.09 | 22.02 | 22.48 | 20.41 | 21.36 | 20.86 | 21.80 | 22.25 |
| | 8H | 20.91 | 21.80 | 21.37 | 22.24 | 22.70 | 20.66 | 21.55 | 21.12 | 21.99 | 22.45 |
| | 12H | 21.12 | 21.92 | 21.60 | 22.39 | 22.86 | 20.85 | 21.65 | 21.33 | 22.13 | 22.60 |
| 8H | 4H | 20.23 | 21.12 | 20.69 | 21.56 | 22.03 | 20.08 | 20.97 | 20.54 | 21.41 | 21.88 |
| | 6H | 21.12 | 21.86 | 21.61 | 22.34 | 22.82 | 20.91 | 21.65 | 21.40 | 22.14 | 22.61 |
| | 8H | 21.48 | 22.14 | 21.98 | 22.65 | 23.13 | 21.24 | 21.91 | 21.75 | 22.41 | 22.90 |
| | 12H | 21.78 | 22.37 | 22.28 | 22.86 | 23.42 | 21.52 | 22.11 | 22.03 | 22.60 | 23.16 |
| 12H | 4H | 20.27 | 21.08 | 20.75 | 21.55 | 22.02 | 20.13 | 20.93 | 20.61 | 21.41 | 21.87 |
| | 6H | 21.19 | 21.85 | 21.69 | 22.36 | 22.84 | 20.99 | 21.66 | 21.50 | 22.16 | 22.65 |
| | 8H | 21.61 | 22.20 | 22.12 | 22.69 | 23.25 | 21.39 | 21.98 | 21.89 | 22.47 | 23.03 |

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

Report Prepared for

Cooper Lighting Solutions

Metalux

Report Number: SP1-2512-631-28-R2

Test Date: 02/05/2026

Luminaire Tested: 22CGTX-50-L93050-W2A-4500K

Data in this report applies to families of products including 22CGTX

Report Generated By FNC07603 / LDUCLS01DT446
Version: v7.05

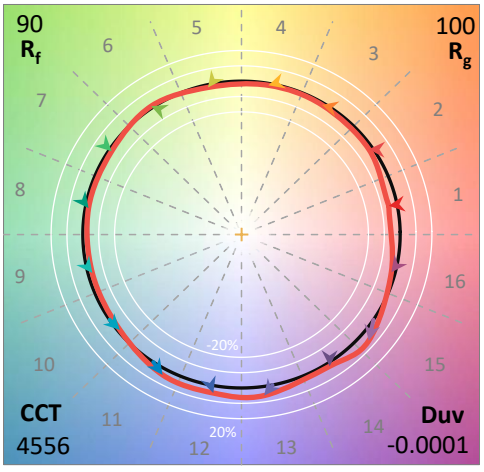
## Test Information

| | |
|---|---|
| Test Method: | LM-79-2019 |
| Report Number: | SP1-2512-631-28-R2 |
| Test Lab: | COOPER LIGHTING SOLUTIONS |
| Photometer: | SP1 - 76IN SPHERE |
| Measurement Geometry: | 4π |
| Issue Date: | 07/28/2026 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS |
| Product Line: | Metalux |
| Catalog Number: | **22CGTX-50-L93050-W2A-4500K** |
| Description: | *THIS IS A REVISION OF REPORT SP1-2512-631-28-R2 TO UPDATE THE CATALOG INFORMATION* 2X2 5000 LUMEN HE CGTX TUNABLE WHITE FROM 3000K TO 5000K - 3 Volt |

## Spectral Parameters

| | |
|---|---|
| CCT (K): | 4556 |
| CIE u': | 0.2166 |
| CIE v': | 0.4916 |
| Duv: | -0.0001 |
| CIE x: | 0.3588 |
| CIE y: | 0.3619 |
| CIE z: | 0.2793 |
| Peak Wavelength (nm): | 630 |
| Dominant Wavelength (nm): | 576 |
| Purity: | 16.26758 |
| Rf: | 90.4 |
| Rg: | 99.5 |

| | | | |
|---|---|---|---|
| CRI (Ra): | 93.8 | | |
| R1: | 95.1 | R9: | 68.4 |
| R2: | 96.4 | R10: | 89.0 |
| R3: | 95.1 | R11: | 94.6 |
| R4: | 94.5 | R12: | 68.9 |
| R5: | 93.5 | R13: | 95.8 |
| R6: | 93.0 | R14: | 96.7 |
| R7: | 94.8 | R15: | 92.7 |
| R8: | 88.3 | | |




## Test Conditions

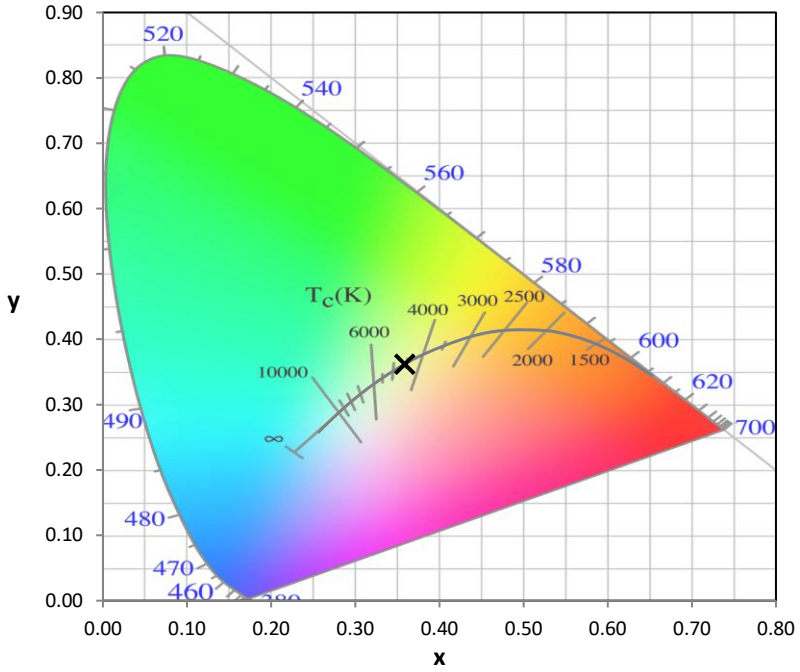
| | |
|---|---|
| Stabilization Time: | 41M |
| Operation Time: | 1H 41M |
| Sphere Temperature (°C): | 25.1 |

REPORT NUMBER: SP1-2512-631-28-R2

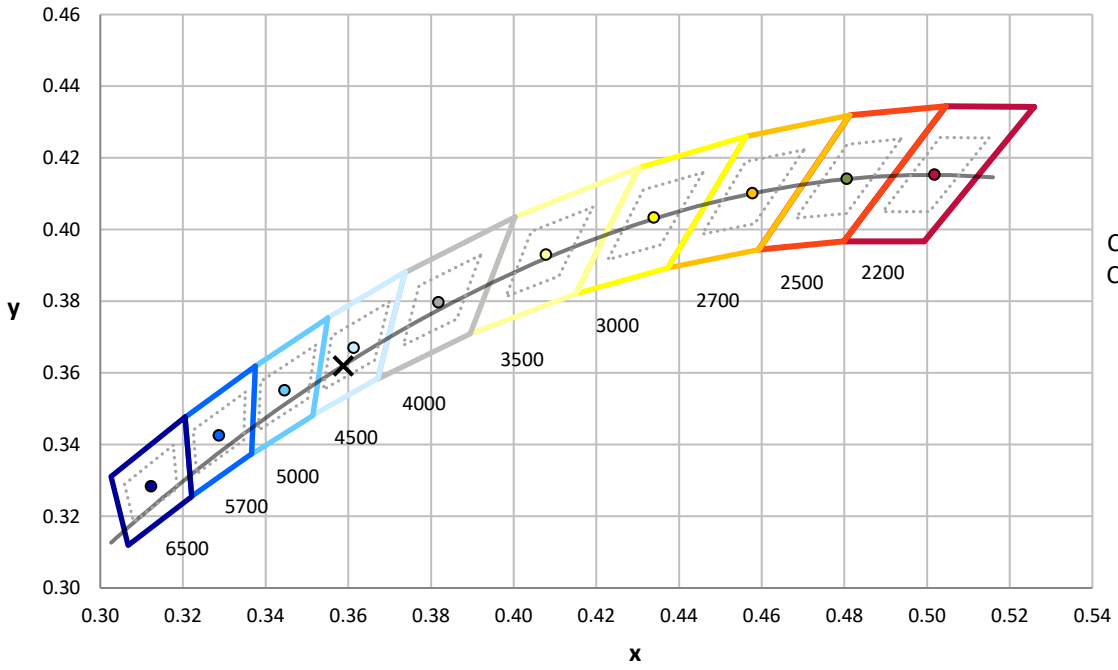
| Measurement and Test Equipment | | | |
|---|---|---|---|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | 76INCH SPHERE IN0058 | 12/16/2025 | 6/16/2026 |
| Power Meter | XITRON INXT2011004 | 10/21/2025 | 10/21/2026 |
| AC Power Source | CHROMA 61603 IN0063 | 10/21/2025 | 10/21/2026 |
| DC Power Source | AGILENT E3634A IN0208 | 10/21/2025 | 10/21/2026 |
| Sphere Thermometer | ONSET IN0085 | 10/21/2025 | 10/21/2026 |
| Room Thermometer | ONSET IN0046 | 10/21/2025 | 10/21/2026 |

REPORT NUMBER: SP1-2512-631-28-R2

**CIE 1931 Chromaticity Diagram**




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

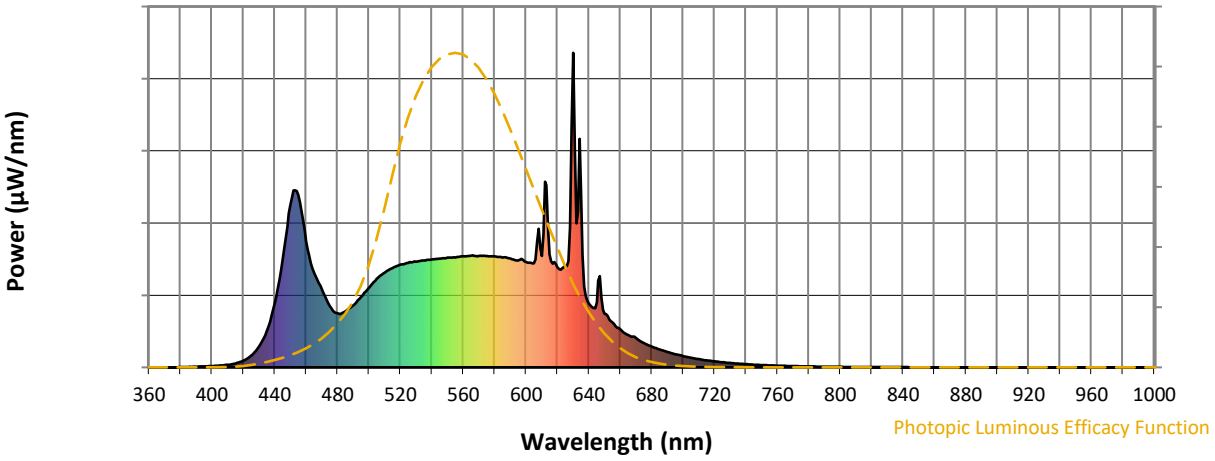



CCT = 4556K
CIE x = 0.3588
CIE y = 0.3619
Duv = -0.0001

Point lies inside the ANSI 4500K 4-step quadrangle

REPORT NUMBER: SP1-2512-631-28-R2

## Photopic Flux vs. Wavelength

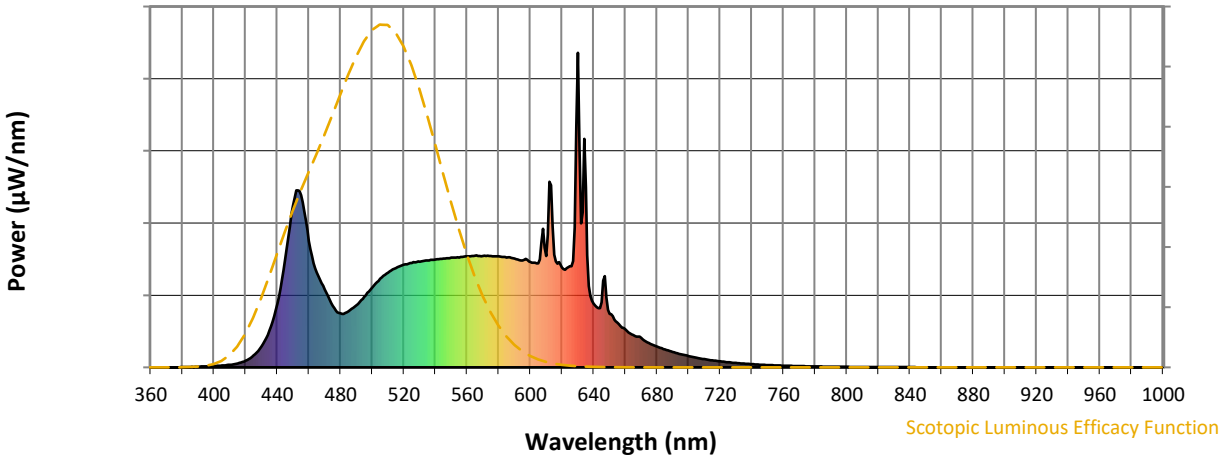



## Photopic Lumens: NR

| λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 360 | 0 | NR | 490 | 198 | NR | 620 | 318 | NR | 750 | 7 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 223 | NR | 625 | 321 | NR | 755 | 6 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 254 | NR | 630 | 1000 | NR | 760 | 5 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 282 | NR | 635 | 572 | NR | 765 | 5 | NR | 895 | 0 | NR |
| 380 | 1 | NR | 510 | 301 | NR | 640 | 202 | NR | 770 | 4 | NR | 900 | 0 | NR |
| 385 | 1 | NR | 515 | 316 | NR | 645 | 207 | NR | 775 | 3 | NR | 905 | 0 | NR |
| 390 | 2 | NR | 520 | 327 | NR | 650 | 170 | NR | 780 | 3 | NR | 910 | 0 | NR |
| 395 | 3 | NR | 525 | 332 | NR | 655 | 143 | NR | 785 | 2 | NR | 915 | 0 | NR |
| 400 | 4 | NR | 530 | 336 | NR | 660 | 121 | NR | 790 | 2 | NR | 920 | 0 | NR |
| 405 | 6 | NR | 535 | 340 | NR | 665 | 102 | NR | 795 | 2 | NR | 925 | 0 | NR |
| 410 | 8 | NR | 540 | 343 | NR | 670 | 94 | NR | 800 | 2 | NR | 930 | 0 | NR |
| 415 | 12 | NR | 545 | 346 | NR | 675 | 77 | NR | 805 | 1 | NR | 935 | 0 | NR |
| 420 | 21 | NR | 550 | 349 | NR | 680 | 66 | NR | 810 | 1 | NR | 940 | 0 | NR |
| 425 | 37 | NR | 555 | 349 | NR | 685 | 57 | NR | 815 | 1 | NR | 945 | 0 | NR |
| 430 | 66 | NR | 560 | 353 | NR | 690 | 49 | NR | 820 | 1 | NR | 950 | 0 | NR |
| 435 | 117 | NR | 565 | 355 | NR | 695 | 42 | NR | 825 | 1 | NR | 955 | 0 | NR |
| 440 | 203 | NR | 570 | 354 | NR | 700 | 36 | NR | 830 | 1 | NR | 960 | 0 | NR |
| 445 | 343 | NR | 575 | 354 | NR | 705 | 31 | NR | 835 | 1 | NR | 965 | 0 | NR |
| 450 | 516 | NR | 580 | 353 | NR | 710 | 26 | NR | 840 | 1 | NR | 970 | 0 | NR |
| 455 | 547 | NR | 585 | 349 | NR | 715 | 22 | NR | 845 | 0 | NR | 975 | 0 | NR |
| 460 | 402 | NR | 590 | 346 | NR | 720 | 19 | NR | 850 | 0 | NR | 980 | 0 | NR |
| 465 | 301 | NR | 595 | 340 | NR | 725 | 16 | NR | 855 | 0 | NR | 985 | 0 | NR |
| 470 | 248 | NR | 600 | 335 | NR | 730 | 14 | NR | 860 | 0 | NR | 990 | 0 | NR |
| 475 | 195 | NR | 605 | 330 | NR | 735 | 12 | NR | 865 | 0 | NR | 995 | 0 | NR |
| 480 | 172 | NR | 610 | 354 | NR | 740 | 10 | NR | 870 | 0 | NR | 1000 | 0 | NR |
| 485 | 178 | NR | 615 | 358 | NR | 745 | 9 | NR | 875 | 0 | NR | | | |

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## Scotopic Flux vs. Wavelength

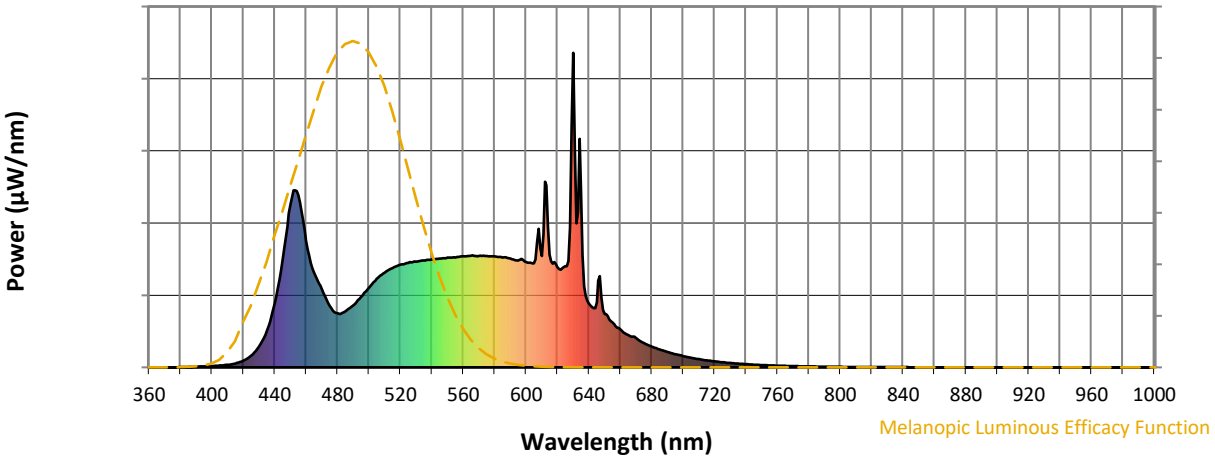



**Scotopic Lumens: NR** **S/P: 1.95**

| λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 360 | 0 | NR | 490 | 198 | NR | 620 | 318 | NR | 750 | 7 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 223 | NR | 625 | 321 | NR | 755 | 6 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 254 | NR | 630 | 1000 | NR | 760 | 5 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 282 | NR | 635 | 572 | NR | 765 | 5 | NR | 895 | 0 | NR |
| 380 | 1 | NR | 510 | 301 | NR | 640 | 202 | NR | 770 | 4 | NR | 900 | 0 | NR |
| 385 | 1 | NR | 515 | 316 | NR | 645 | 207 | NR | 775 | 3 | NR | 905 | 0 | NR |
| 390 | 2 | NR | 520 | 327 | NR | 650 | 170 | NR | 780 | 3 | NR | 910 | 0 | NR |
| 395 | 3 | NR | 525 | 332 | NR | 655 | 143 | NR | 785 | 2 | NR | 915 | 0 | NR |
| 400 | 4 | NR | 530 | 336 | NR | 660 | 121 | NR | 790 | 2 | NR | 920 | 0 | NR |
| 405 | 6 | NR | 535 | 340 | NR | 665 | 102 | NR | 795 | 2 | NR | 925 | 0 | NR |
| 410 | 8 | NR | 540 | 343 | NR | 670 | 94 | NR | 800 | 2 | NR | 930 | 0 | NR |
| 415 | 12 | NR | 545 | 346 | NR | 675 | 77 | NR | 805 | 1 | NR | 935 | 0 | NR |
| 420 | 21 | NR | 550 | 349 | NR | 680 | 66 | NR | 810 | 1 | NR | 940 | 0 | NR |
| 425 | 37 | NR | 555 | 349 | NR | 685 | 57 | NR | 815 | 1 | NR | 945 | 0 | NR |
| 430 | 66 | NR | 560 | 353 | NR | 690 | 49 | NR | 820 | 1 | NR | 950 | 0 | NR |
| 435 | 117 | NR | 565 | 355 | NR | 695 | 42 | NR | 825 | 1 | NR | 955 | 0 | NR |
| 440 | 203 | NR | 570 | 354 | NR | 700 | 36 | NR | 830 | 1 | NR | 960 | 0 | NR |
| 445 | 343 | NR | 575 | 354 | NR | 705 | 31 | NR | 835 | 1 | NR | 965 | 0 | NR |
| 450 | 516 | NR | 580 | 353 | NR | 710 | 26 | NR | 840 | 1 | NR | 970 | 0 | NR |
| 455 | 547 | NR | 585 | 349 | NR | 715 | 22 | NR | 845 | 0 | NR | 975 | 0 | NR |
| 460 | 402 | NR | 590 | 346 | NR | 720 | 19 | NR | 850 | 0 | NR | 980 | 0 | NR |
| 465 | 301 | NR | 595 | 340 | NR | 725 | 16 | NR | 855 | 0 | NR | 985 | 0 | NR |
| 470 | 248 | NR | 600 | 335 | NR | 730 | 14 | NR | 860 | 0 | NR | 990 | 0 | NR |
| 475 | 195 | NR | 605 | 330 | NR | 735 | 12 | NR | 865 | 0 | NR | 995 | 0 | NR |
| 480 | 172 | NR | 610 | 354 | NR | 740 | 10 | NR | 870 | 0 | NR | 1000 | 0 | NR |
| 485 | 178 | NR | 615 | 358 | NR | 745 | 9 | NR | 875 | 0 | NR | | | |

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## Melanopic Flux vs. Wavelength




**Melanopic Lumens: NR** **M/P: 4.17**

| λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) | λ (nm) | Power W^/nm | Lumens (ϕ/nm) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 360 | 0 | NR | 490 | 198 | NR | 620 | 318 | NR | 750 | 7 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 223 | NR | 625 | 321 | NR | 755 | 6 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 254 | NR | 630 | 1000 | NR | 760 | 5 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 282 | NR | 635 | 572 | NR | 765 | 5 | NR | 895 | 0 | NR |
| 380 | 1 | NR | 510 | 301 | NR | 640 | 202 | NR | 770 | 4 | NR | 900 | 0 | NR |
| 385 | 1 | NR | 515 | 316 | NR | 645 | 207 | NR | 775 | 3 | NR | 905 | 0 | NR |
| 390 | 2 | NR | 520 | 327 | NR | 650 | 170 | NR | 780 | 3 | NR | 910 | 0 | NR |
| 395 | 3 | NR | 525 | 332 | NR | 655 | 143 | NR | 785 | 2 | NR | 915 | 0 | NR |
| 400 | 4 | NR | 530 | 336 | NR | 660 | 121 | NR | 790 | 2 | NR | 920 | 0 | NR |
| 405 | 6 | NR | 535 | 340 | NR | 665 | 102 | NR | 795 | 2 | NR | 925 | 0 | NR |
| 410 | 8 | NR | 540 | 343 | NR | 670 | 94 | NR | 800 | 2 | NR | 930 | 0 | NR |
| 415 | 12 | NR | 545 | 346 | NR | 675 | 77 | NR | 805 | 1 | NR | 935 | 0 | NR |
| 420 | 21 | NR | 550 | 349 | NR | 680 | 66 | NR | 810 | 1 | NR | 940 | 0 | NR |
| 425 | 37 | NR | 555 | 349 | NR | 685 | 57 | NR | 815 | 1 | NR | 945 | 0 | NR |
| 430 | 66 | NR | 560 | 353 | NR | 690 | 49 | NR | 820 | 1 | NR | 950 | 0 | NR |
| 435 | 117 | NR | 565 | 355 | NR | 695 | 42 | NR | 825 | 1 | NR | 955 | 0 | NR |
| 440 | 203 | NR | 570 | 354 | NR | 700 | 36 | NR | 830 | 1 | NR | 960 | 0 | NR |
| 445 | 343 | NR | 575 | 354 | NR | 705 | 31 | NR | 835 | 1 | NR | 965 | 0 | NR |
| 450 | 516 | NR | 580 | 353 | NR | 710 | 26 | NR | 840 | 1 | NR | 970 | 0 | NR |
| 455 | 547 | NR | 585 | 349 | NR | 715 | 22 | NR | 845 | 0 | NR | 975 | 0 | NR |
| 460 | 402 | NR | 590 | 346 | NR | 720 | 19 | NR | 850 | 0 | NR | 980 | 0 | NR |
| 465 | 301 | NR | 595 | 340 | NR | 725 | 16 | NR | 855 | 0 | NR | 985 | 0 | NR |
| 470 | 248 | NR | 600 | 335 | NR | 730 | 14 | NR | 860 | 0 | NR | 990 | 0 | NR |
| 475 | 195 | NR | 605 | 330 | NR | 735 | 12 | NR | 865 | 0 | NR | 995 | 0 | NR |
| 480 | 172 | NR | 610 | 354 | NR | 740 | 10 | NR | 870 | 0 | NR | 1000 | 0 | NR |
| 485 | 178 | NR | 615 | 358 | NR | 745 | 9 | NR | 875 | 0 | NR | | | |

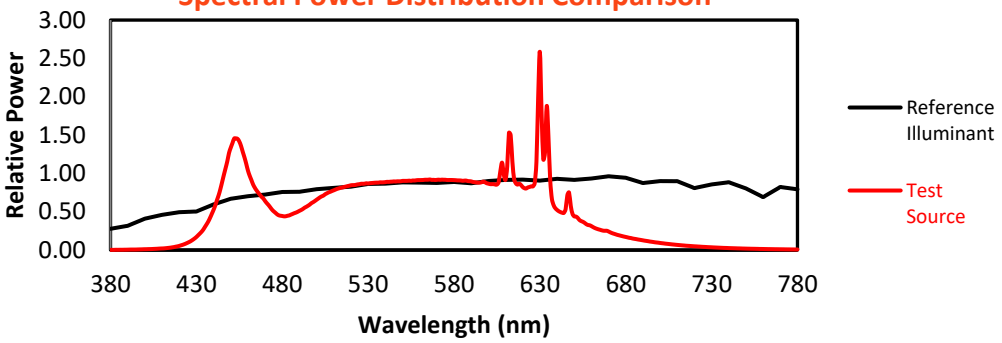
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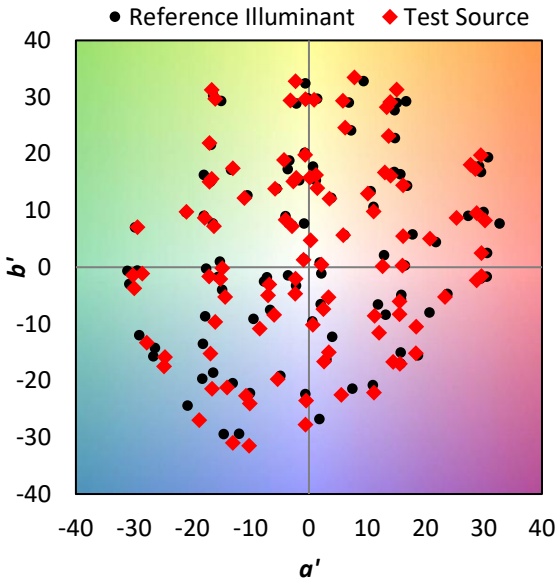
## Summary

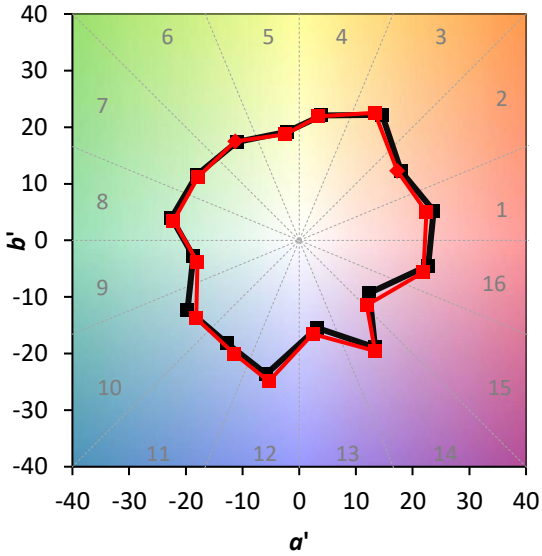
$R_f$ = 90.4
$R_g$ = 99.5
CIE $R_a$ = 93.8
$R_9$ = 68.4

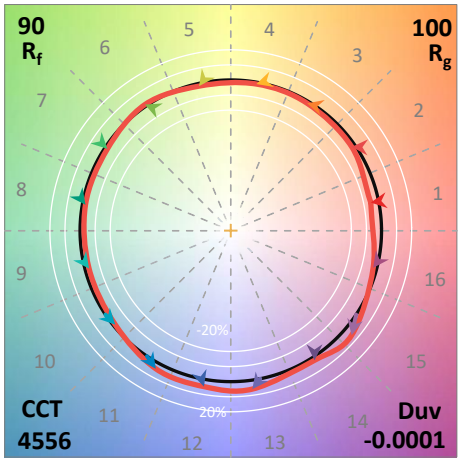
## Spectral Power Distribution Comparison

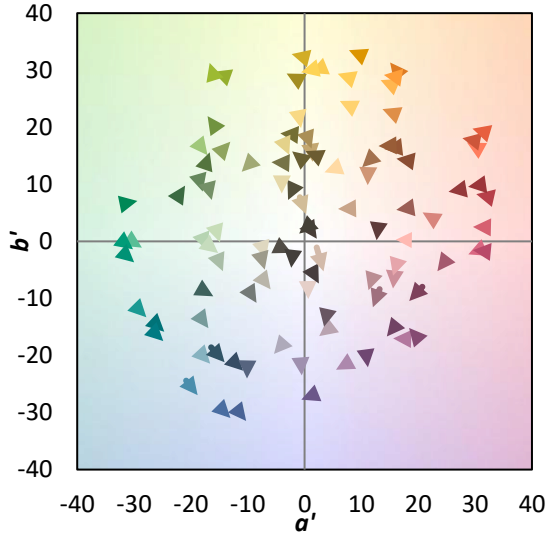



## Color Vector Graphics



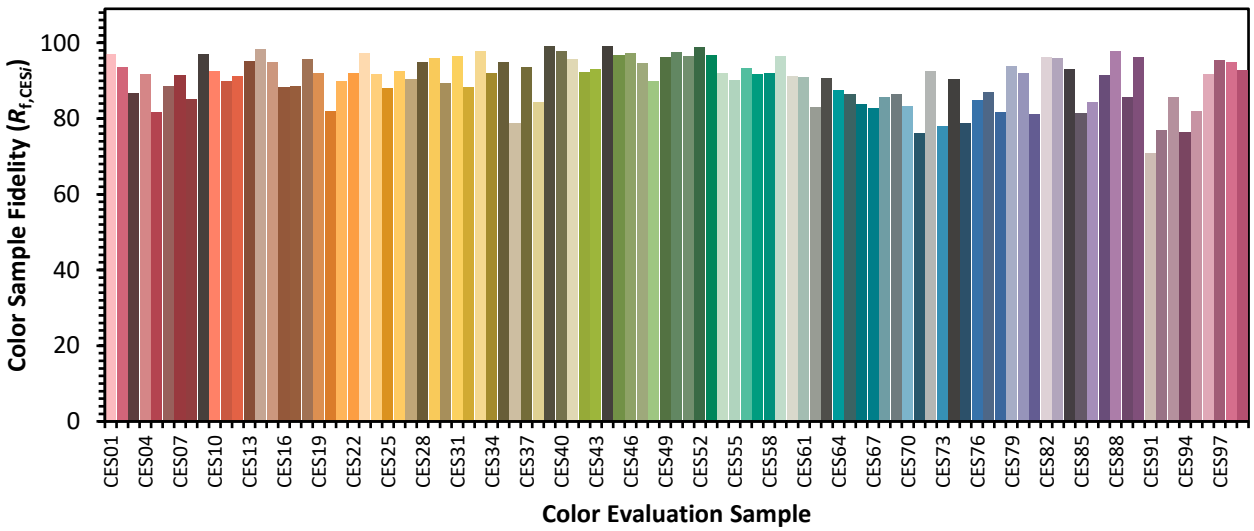



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**Individual Sample Fidelity Index ($R_{f,i}$)**

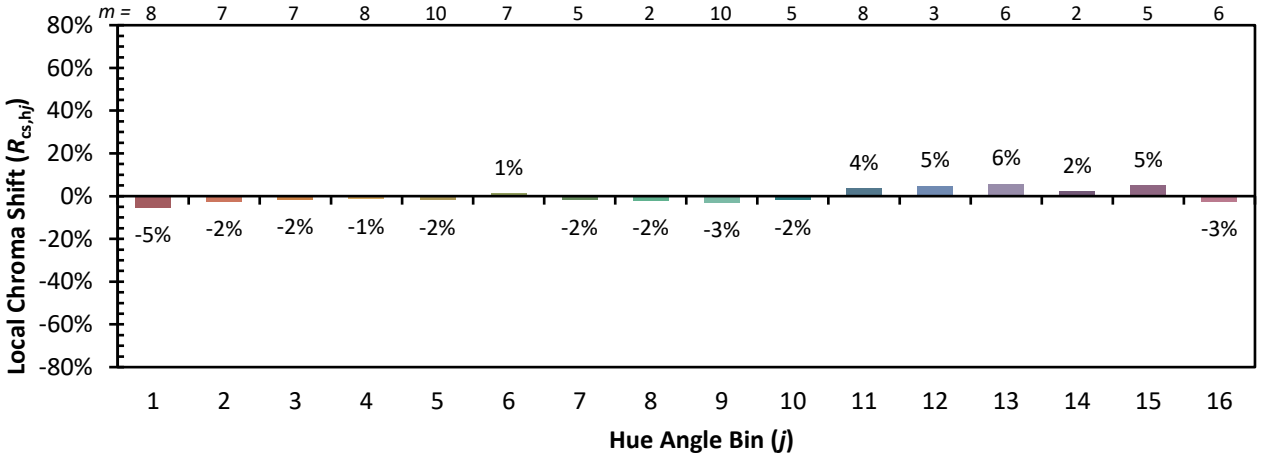
| | | | |
|---|---|---|---|
| CES01 = 85 | CES26 = 92 | CES51 = 96 | CES76 = 85 |
| CES02 = 61 | CES27 = 90 | CES52 = 99 | CES77 = 87 |
| CES03 = 31 | CES28 = 95 | CES53 = 97 | CES78 = 82 |
| CES04 = 69 | CES29 = 96 | CES54 = 92 | CES79 = 94 |
| CES05 = 48 | CES30 = 89 | CES55 = 90 | CES80 = 92 |
| CES06 = 50 | CES31 = 97 | CES56 = 93 | CES81 = 81 |
| CES07 = 41 | CES32 = 88 | CES57 = 92 | CES82 = 96 |
| CES08 = 40 | CES33 = 98 | CES58 = 92 | CES83 = 96 |
| CES09 = 29 | CES34 = 92 | CES59 = 97 | CES84 = 93 |
| CES10 = 74 | CES35 = 95 | CES60 = 91 | CES85 = 82 |
| CES11 = 56 | CES36 = 79 | CES61 = 91 | CES86 = 84 |
| CES12 = 62 | CES37 = 94 | CES62 = 83 | CES87 = 91 |
| CES13 = 43 | CES38 = 84 | CES63 = 91 | CES88 = 98 |
| CES14 = 74 | CES39 = 99 | CES64 = 87 | CES89 = 86 |
| CES15 = 71 | CES40 = 98 | CES65 = 86 | CES90 = 96 |
| CES16 = 47 | CES41 = 96 | CES66 = 84 | CES91 = 71 |
| CES17 = 49 | CES42 = 92 | CES67 = 83 | CES92 = 77 |
| CES18 = 56 | CES43 = 93 | CES68 = 86 | CES93 = 86 |
| CES19 = 70 | CES44 = 99 | CES69 = 87 | CES94 = 76 |
| CES20 = 65 | CES45 = 97 | CES70 = 83 | CES95 = 82 |
| CES21 = 85 | CES46 = 97 | CES71 = 76 | CES96 = 92 |
| CES22 = 77 | CES47 = 95 | CES72 = 92 | CES97 = 95 |
| CES23 = 91 | CES48 = 90 | CES73 = 78 | CES98 = 95 |
| CES24 = 90 | CES49 = 96 | CES74 = 91 | CES99 = 93 |
| CES25 = 70 | CES50 = 98 | CES75 = 79 | |

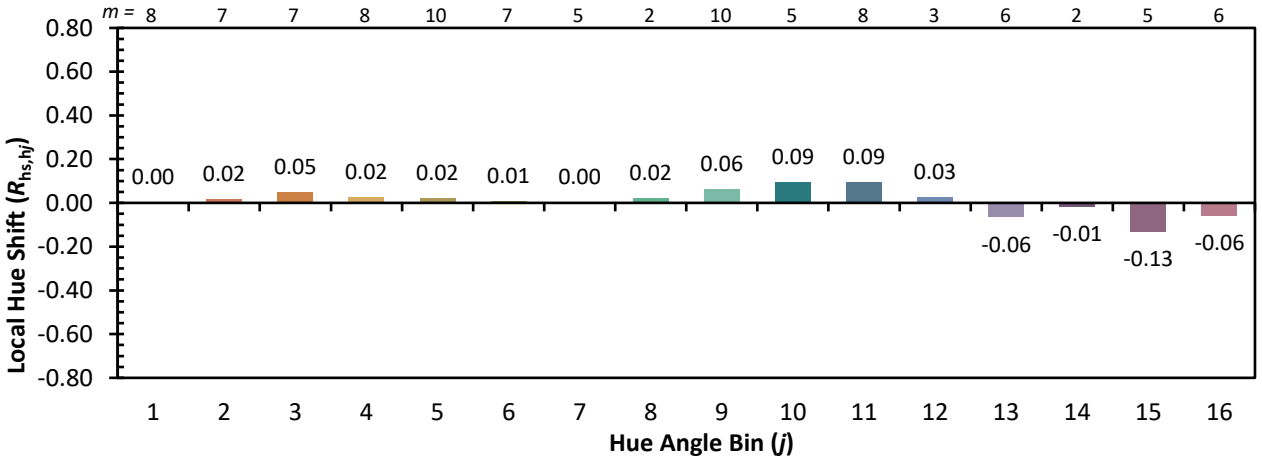


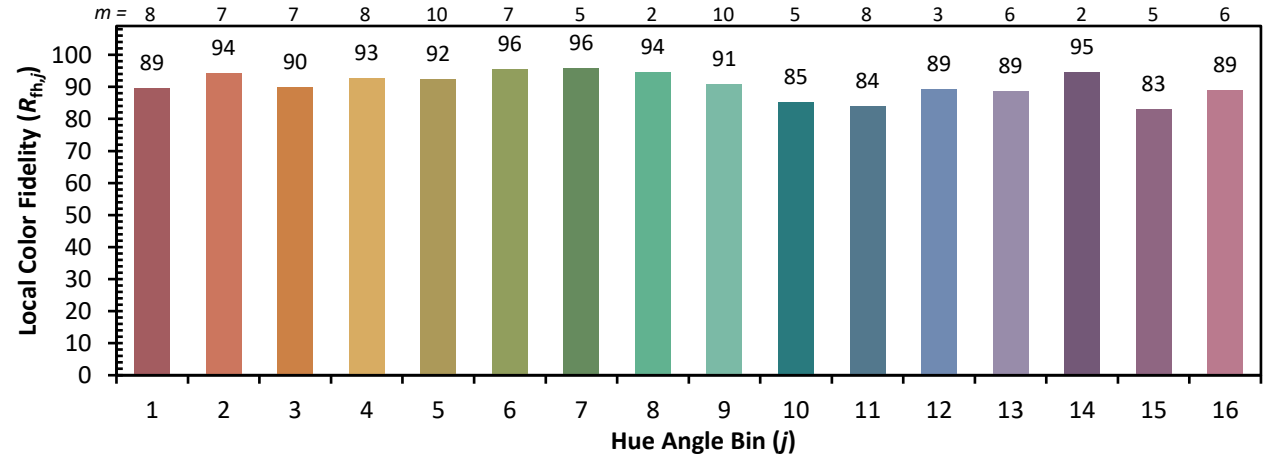
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## Color Rendition by Hue-Angle Bin



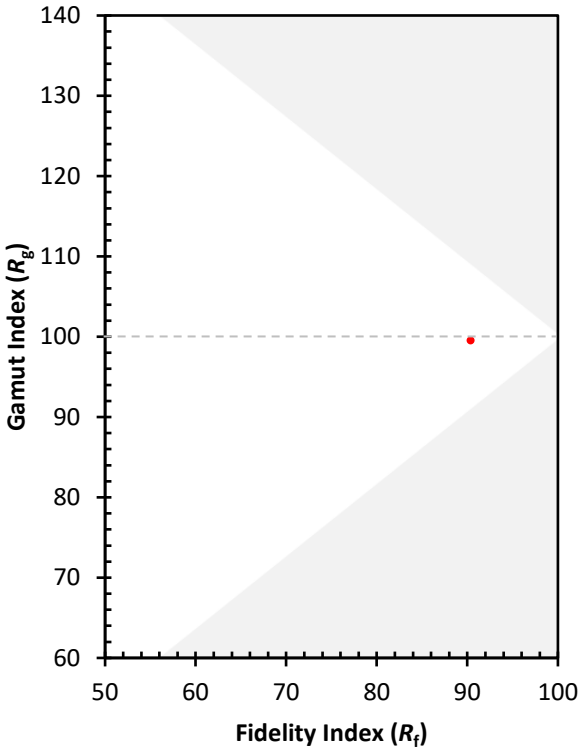



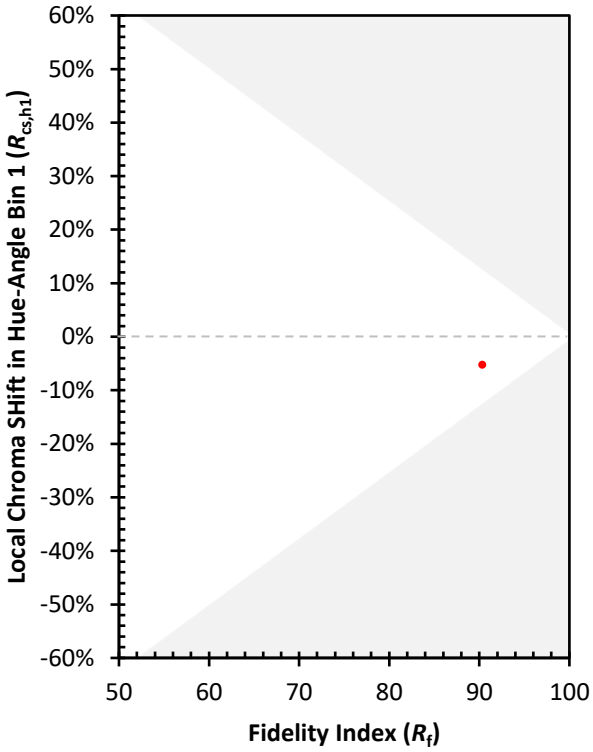



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## Measure Comparisons




(END OF REPORT)