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: P1433330

Luminaire Tested: EHBR1-54-UNV-N-L930

Issue Date: 3/13/2026

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: | P1433330 |
| | TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2601-654-3) |
| Test Lab: | INNOVATION CENTER |
| Issue Date: | 3/13/2026 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS |
| Product Line: | METALUX |
| Catalog Number: | EHBR1-54-UNV-N-L930 |
| Description: | Elevate Round Highbay at, 53000 lumens, 3000K 90CRI LEDs with N lens |
| Light Source: | - |
| Ballast/Driver: | - |

**Summary**

| | |
|---|---|
| Lumens per Lamp: | N/A |
| Luminaire Lumens: | 48536.8 lumens |
| Efficiency: | N/A |
| Efficacy: | 164.0 lumens/watt |
| Spacing Criteria (0/90/45): | 0.82 / 0.82 / 0.8 |
| Luminous Opening: | Circular (Dia: 1.71' x H: 0') |
| CIE Type: | Direct |

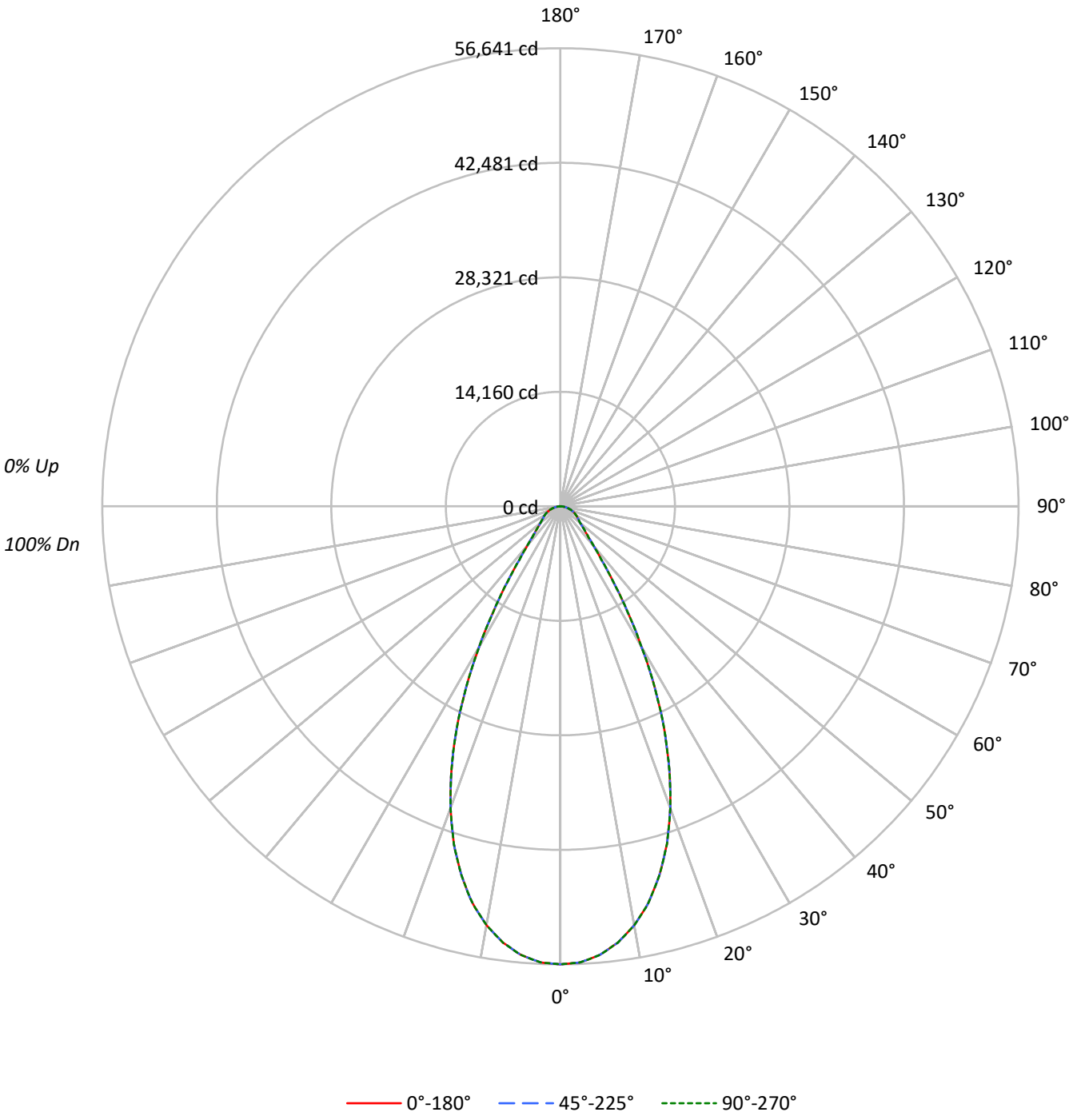
| | |
|---|---|
| Input Watts (W): | 296 |
| Input Voltage (V): | NR |
| Input Current (Ain): | NR |
| Voltage Rise (V): | NR |
| Power Factor: | NR |
| Total Harmonic Distortion (THDi): | NR |
| Frequency (hertz): | 60 |
| Stabilization Time: | NR |
| Operation Time: | NR |
| Ambient Temperature (°C): | NR |
| Test Distance: | 24 FT |

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

Scaled Data Report

TEST NUMBER: P1433330
CATALOG NUMBER: EHBR1-54-UNV-N-L930

## Luminous Intensity Polar Plot



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

Scaled Data Report

TEST NUMBER: P1433330
CATALOG NUMBER: EHBR1-54-UNV-N-L930

## 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 | 112 | 109 | 106 | 104 | 110 | 107 | 104 | 102 | 103 | 101 | 99 | 99 | 97 | 96 | 96 | 94 | 93 | 91 |
| 2 | 106 | 100 | 96 | 92 | 104 | 98 | 94 | 91 | 95 | 92 | 89 | 92 | 89 | 87 | 89 | 87 | 85 | 83 |
| 3 | 100 | 92 | 87 | 82 | 98 | 91 | 86 | 82 | 88 | 84 | 80 | 86 | 82 | 79 | 84 | 80 | 78 | 76 |
| 4 | 94 | 86 | 80 | 75 | 92 | 85 | 79 | 74 | 82 | 77 | 74 | 80 | 76 | 73 | 78 | 75 | 72 | 70 |
| 5 | 89 | 80 | 74 | 69 | 87 | 79 | 73 | 68 | 77 | 72 | 68 | 75 | 71 | 67 | 74 | 70 | 67 | 65 |
| 6 | 85 | 75 | 68 | 64 | 83 | 74 | 68 | 63 | 72 | 67 | 63 | 71 | 66 | 63 | 70 | 65 | 62 | 61 |
| 7 | 80 | 70 | 64 | 59 | 79 | 70 | 63 | 59 | 68 | 63 | 59 | 67 | 62 | 58 | 66 | 61 | 58 | 57 |
| 8 | 76 | 66 | 60 | 55 | 75 | 66 | 59 | 55 | 64 | 59 | 55 | 63 | 58 | 55 | 62 | 58 | 55 | 53 |
| 9 | 73 | 62 | 56 | 52 | 72 | 62 | 56 | 52 | 61 | 56 | 52 | 60 | 55 | 52 | 59 | 55 | 51 | 50 |
| 10 | 69 | 59 | 53 | 49 | 68 | 59 | 53 | 49 | 58 | 52 | 49 | 57 | 52 | 49 | 56 | 52 | 48 | 47 |

## AVERAGE LUMINANCE (cd/sqm):

| | 0° | 45° | 90° |
|---|---|---|---|
| 0° | 265990 | 265990 | 265990 |
| 5° | 262527 | 262527 | 262527 |
| 10° | 250808 | 250808 | 250808 |
| 15° | 229741 | 229741 | 229741 |
| 20° | 198449 | 198449 | 198449 |
| 25° | 157271 | 157271 | 157271 |
| 30° | 108792 | 108792 | 108792 |
| 35° | 65193 | 65193 | 65193 |
| 40° | 38953 | 38953 | 38953 |
| 45° | 28278 | 28278 | 28278 |
| 50° | 23553 | 23553 | 23553 |
| 55° | 21752 | 21752 | 21752 |
| 60° | 21249 | 21249 | 21249 |
| 65° | 20819 | 20819 | 20819 |
| 70° | 20112 | 20112 | 20112 |
| 75° | 19287 | 19287 | 19287 |
| 80° | 17822 | 17822 | 17822 |
| 85° | 14688 | 14688 | 14688 |

## MAXIMUM LUMINANCE 45°-90°:

Horizontal Angle: 0°
Vertical Angle: 45°
Luminance: 28278 cd/sqm

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

Scaled Data Report

TEST NUMBER: P1433330
CATALOG NUMBER: EHBR1-54-UNV-N-L930

**ZONAL LUMENS:**

| Zone | Lumens | % Fixture |
|---|---|---|
| 0°-10° | 5217.5 | 10.7 |
| 10°-20° | 13096.8 | 27.0 |
| 20°-30° | 13694.1 | 28.2 |
| 30°-40° | 7419.8 | 15.3 |
| 40°-50° | 3413.5 | 7.0 |
| 50°-60° | 2405.5 | 5.0 |
| 60°-70° | 1851.3 | 3.8 |
| 70°-80° | 1122.3 | 2.3 |
| 80°-90° | 316.0 | 0.7 |
| 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° | 32008.4 | 65.9 |
| 0°-40° | 39428.2 | 81.2 |
| 0°-60° | 45247.3 | 93.2 |
| 0°-90° | 48536.8 | 100.0 |
| 90°-120° | 0.0 | 0.0 |
| 90°-150° | 0.0 | 0.0 |
| 90°-180° | 0.0 | 0.0 |
| 0°-180° | 48536.8 | 100.0 |

**CANDELA DISTRIBUTION:**

| | 0° | 22.5° | 45° | 67.5° | 90° | Flux |
|---|---|---|---|---|---|---|
| 0° | 56641 | 56641 | 56641 | 56641 | 56641 | |
| 5° | 55690 | 55690 | 55690 | 55690 | 55690 | 5218 |
| 15° | 47255 | 47255 | 47255 | 47255 | 47255 | 13097 |
| 25° | 30352 | 30352 | 30352 | 30352 | 30352 | 13694 |
| 35° | 11372 | 11372 | 11372 | 11372 | 11372 | 7420 |
| 45° | 4258 | 4258 | 4258 | 4258 | 4258 | 3414 |
| 55° | 2657 | 2657 | 2657 | 2657 | 2657 | 2406 |
| 65° | 1874 | 1874 | 1874 | 1874 | 1874 | 1851 |
| 75° | 1063 | 1063 | 1063 | 1063 | 1063 | 1122 |
| 85° | 273 | 273 | 273 | 273 | 273 | 316 |
| 90° | 2 | 2 | 2 | 2 | 2 | |

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

Scaled Data Report

TEST NUMBER: P1433330
CATALOG NUMBER: EHBR1-54-UNV-N-L930

**CANDELA DISTRIBUTION (FULL):**

| | 0° | 22.5° | 45° | 67.5° | 90° |
|---|---|---|---|---|---|
| 0° | 56640.7 | 56640.7 | 56640.7 | 56640.7 | 56640.7 |
| 2.5° | 56439.9 | 56439.9 | 56439.9 | 56439.9 | 56439.9 |
| 5° | 55690.5 | 55690.5 | 55690.5 | 55690.5 | 55690.5 |
| 7.5° | 54411.3 | 54411.3 | 54411.3 | 54411.3 | 54411.3 |
| 10° | 52596.5 | 52596.5 | 52596.5 | 52596.5 | 52596.5 |
| 12.5° | 50251.0 | 50251.0 | 50251.0 | 50251.0 | 50251.0 |
| 15° | 47254.7 | 47254.7 | 47254.7 | 47254.7 | 47254.7 |
| 17.5° | 43778.3 | 43778.3 | 43778.3 | 43778.3 | 43778.3 |
| 20° | 39709.9 | 39709.9 | 39709.9 | 39709.9 | 39709.9 |
| 22.5° | 35180.2 | 35180.2 | 35180.2 | 35180.2 | 35180.2 |
| 25° | 30352.1 | 30352.1 | 30352.1 | 30352.1 | 30352.1 |
| 27.5° | 25233.6 | 25233.6 | 25233.6 | 25233.6 | 25233.6 |
| 30° | 20062.7 | 20062.7 | 20062.7 | 20062.7 | 20062.7 |
| 32.5° | 15397.5 | 15397.5 | 15397.5 | 15397.5 | 15397.5 |
| 35° | 11371.8 | 11371.8 | 11371.8 | 11371.8 | 11371.8 |
| 37.5° | 8349.6 | 8349.6 | 8349.6 | 8349.6 | 8349.6 |
| 40° | 6354.2 | 6354.2 | 6354.2 | 6354.2 | 6354.2 |
| 42.5° | 5095.1 | 5095.1 | 5095.1 | 5095.1 | 5095.1 |
| 45° | 4257.9 | 4257.9 | 4257.9 | 4257.9 | 4257.9 |
| 47.5° | 3654.6 | 3654.6 | 3654.6 | 3654.6 | 3654.6 |
| 50° | 3223.9 | 3223.9 | 3223.9 | 3223.9 | 3223.9 |
| 52.5° | 2909.3 | 2909.3 | 2909.3 | 2909.3 | 2909.3 |
| 55° | 2656.8 | 2656.8 | 2656.8 | 2656.8 | 2656.8 |
| 57.5° | 2452.0 | 2452.0 | 2452.0 | 2452.0 | 2452.0 |
| 60° | 2262.4 | 2262.4 | 2262.4 | 2262.4 | 2262.4 |
| 62.5° | 2072.9 | 2072.9 | 2072.9 | 2072.9 | 2072.9 |
| 65° | 1873.6 | 1873.6 | 1873.6 | 1873.6 | 1873.6 |
| 67.5° | 1670.4 | 1670.4 | 1670.4 | 1670.4 | 1670.4 |
| 70° | 1464.8 | 1464.8 | 1464.8 | 1464.8 | 1464.8 |
| 72.5° | 1264.7 | 1264.7 | 1264.7 | 1264.7 | 1264.7 |
| 75° | 1063.0 | 1063.0 | 1063.0 | 1063.0 | 1063.0 |
| 77.5° | 865.5 | 865.5 | 865.5 | 865.5 | 865.5 |
| 80° | 659.0 | 659.0 | 659.0 | 659.0 | 659.0 |
| 82.5° | 461.3 | 461.3 | 461.3 | 461.3 | 461.3 |
| 85° | 272.6 | 272.6 | 272.6 | 272.6 | 272.6 |
| 87.5° | 97.6 | 97.6 | 97.6 | 97.6 | 97.6 |
| 90° | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 |

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

Scaled Data Report

TEST NUMBER: P1433330
CATALOG NUMBER: EHBR1-54-UNV-N-L930

**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 | 19.31 | 20.47 | 19.68 | 20.79 | 21.10 | 19.31 | 20.47 | 19.68 | 20.79 | 21.10 |
| | 3H | 21.19 | 22.22 | 21.57 | 22.55 | 22.92 | 21.19 | 22.22 | 21.57 | 22.55 | 22.92 |
| | 4H | 21.92 | 22.88 | 22.32 | 23.23 | 23.62 | 21.92 | 22.88 | 22.32 | 23.23 | 23.62 |
| | 6H | 22.46 | 23.34 | 22.88 | 23.72 | 24.11 | 22.46 | 23.34 | 22.88 | 23.72 | 24.11 |
| | 8H | 22.63 | 23.46 | 23.06 | 23.86 | 24.26 | 22.63 | 23.46 | 23.06 | 23.86 | 24.26 |
| | 12H | 22.73 | 23.52 | 23.16 | 23.91 | 24.34 | 22.73 | 23.52 | 23.16 | 23.91 | 24.34 |
| 4H | 2H | 19.91 | 20.87 | 20.31 | 21.22 | 21.61 | 19.91 | 20.87 | 20.31 | 21.22 | 21.61 |
| | 3H | 21.99 | 22.78 | 22.40 | 23.19 | 23.59 | 21.99 | 22.78 | 22.40 | 23.19 | 23.59 |
| | 4H | 22.84 | 23.55 | 23.28 | 23.97 | 24.42 | 22.84 | 23.55 | 23.28 | 23.97 | 24.42 |
| | 6H | 23.51 | 24.13 | 23.98 | 24.58 | 25.04 | 23.51 | 24.13 | 23.98 | 24.58 | 25.04 |
| | 8H | 23.73 | 24.30 | 24.20 | 24.75 | 25.22 | 23.73 | 24.30 | 24.20 | 24.75 | 25.22 |
| | 12H | 23.86 | 24.36 | 24.35 | 24.85 | 25.32 | 23.86 | 24.36 | 24.35 | 24.85 | 25.32 |
| 8H | 4H | 23.13 | 23.70 | 23.60 | 24.15 | 24.62 | 23.13 | 23.70 | 23.60 | 24.15 | 24.62 |
| | 6H | 23.93 | 24.39 | 24.44 | 24.89 | 25.38 | 23.93 | 24.39 | 24.44 | 24.89 | 25.38 |
| | 8H | 24.23 | 24.64 | 24.75 | 25.15 | 25.65 | 24.23 | 24.64 | 24.75 | 25.15 | 25.65 |
| | 12H | 24.44 | 24.80 | 24.96 | 25.29 | 25.87 | 24.44 | 24.80 | 24.96 | 25.29 | 25.87 |
| 12H | 4H | 23.14 | 23.64 | 23.63 | 24.13 | 24.60 | 23.14 | 23.64 | 23.63 | 24.13 | 24.60 |
| | 6H | 23.98 | 24.39 | 24.51 | 24.91 | 25.40 | 23.98 | 24.39 | 24.51 | 24.91 | 25.40 |
| | 8H | 24.33 | 24.69 | 24.85 | 25.18 | 25.76 | 24.33 | 24.69 | 24.85 | 25.18 | 25.76 |

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

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

Report Prepared for

Cooper Lighting Solutions

Metalux

Report Number: SP1-2506-472-5

Test Date: 08/01/2025

Luminaire Tested: EHBR-60-L930-N

Data in this report applies to families of products including EHBR-60-L930-N

Report Generated By FNC07603 / LDUCLS01DT446
Version: v7.04

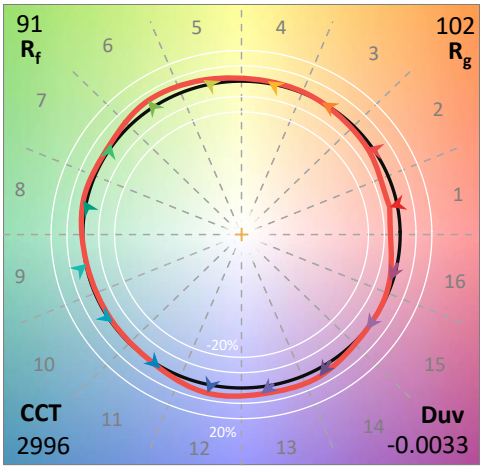
## Test Information

| | |
|---|---|
| Test Method: | LM-79-2019 |
| Report Number: | SP1-2506-472-5 |
| Test Lab: | COOPER LIGHTING SOLUTIONS |
| Photometer: | SP1 - 76IN SPHERE |
| Measurement Geometry: | 4π |
| Issue Date: | 08/05/2025 |
| Manufacturer: | COOPER LIGHTING SOLUTIONS |
| Product Line: | Metalux |
| Catalog Number: | **EHBR-60-L930-N** |
| Description: | Elevate Round Highbay at, 60000 lumens, 3000K 90CRI LEDs with N lens |

## Spectral Parameters

| | |
|---|---|
| CCT (K): | 2996 |
| CIE u': | 0.2519 |
| CIE v': | 0.5169 |
| Duv: | -0.0033 |
| CIE x: | 0.4325 |
| CIE y: | 0.3945 |
| CIE z: | 0.1730 |
| Peak Wavelength (nm): | 630 |
| Dominant Wavelength (nm): | 584 |
| Purity: | 48.21818 |
| Rf: | 91.3 |
| Rg: | 102 |

| | |
|---|---|
| CRI (Ra): | 94.4 |
| R1: | 96.8 |
| R2: | 98.1 |
| R3: | 97.8 |
| R4: | 95.6 |
| R5: | 96.9 |
| R6: | 95.7 |
| R7: | 90.9 |
| R8: | 83.0 |
| R9: | 61.4 |
| R10: | 94.4 |
| R11: | 95.7 |
| R12: | 88.5 |
| R13: | 97.3 |
| R14: | 97.8 |
| R15: | 92.3 |




## Test Conditions

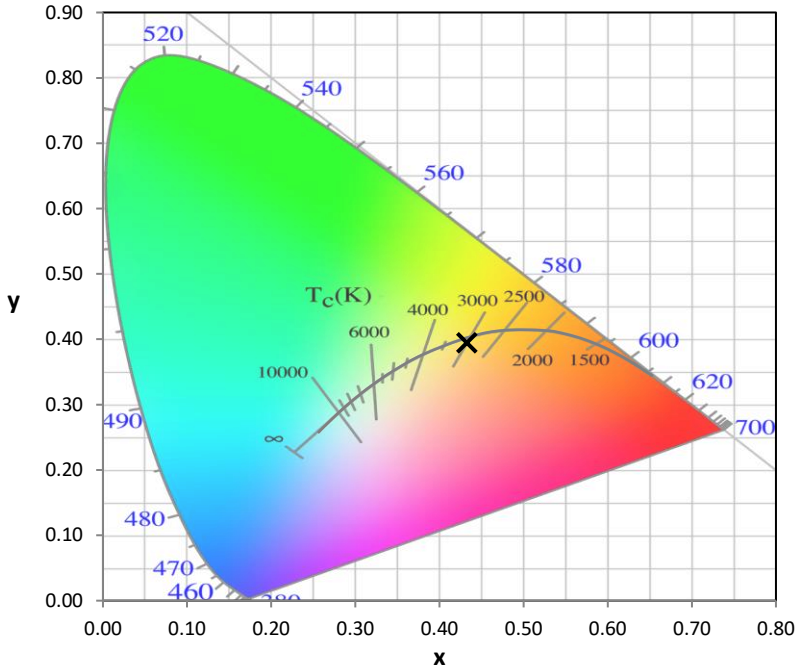
| | |
|---|---|
| Stabilization Time: | 40M |
| Operation Time: | 1H 40M |
| Sphere Temperature (°C): | 25.0 |

REPORT NUMBER: SP1-2506-472-5

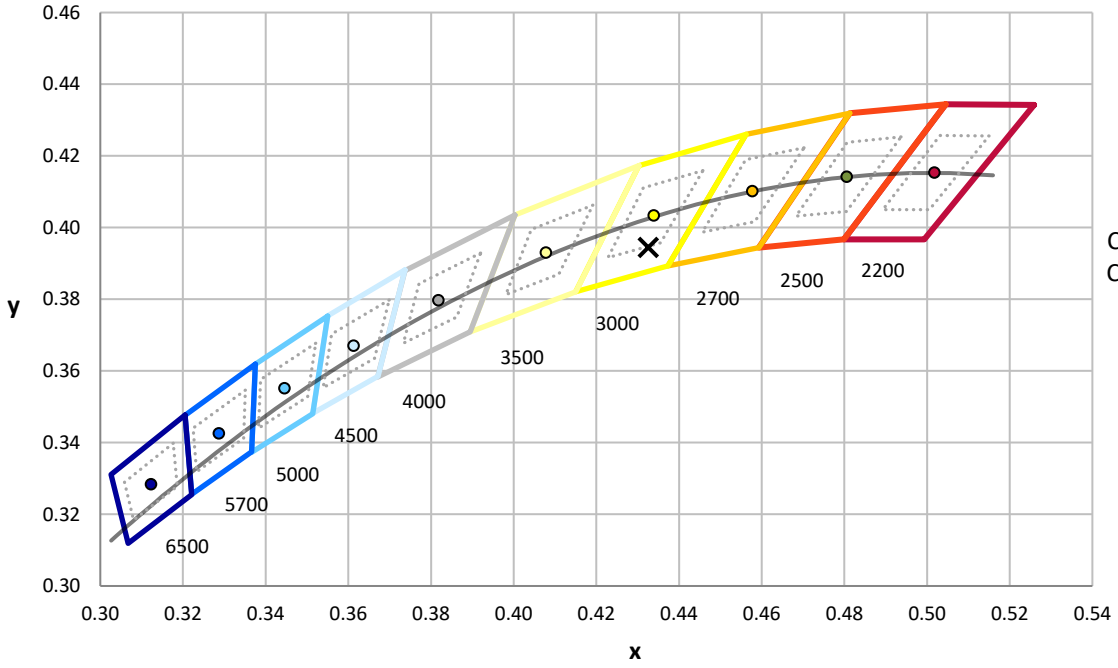
| Measurement and Test Equipment | | | |
|---|---|---|---|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | 76INCH SPHERE IN0058 | 6/16/2025 | 12/16/2025 |
| Power Meter | XITRON INXT2011004 | 1/21/2025 | 1/21/2026 |
| AC Power Source | CHROMA 61603 IN0063 | 10/22/2024 | 10/22/2025 |
| DC Power Source | AGILENT E3634A IN0208 | 10/22/2024 | 10/22/2025 |
| Sphere Thermometer | ONSET IN0085 | 10/22/2024 | 10/22/2025 |
| Room Thermometer | ONSET IN0046 | 10/22/2024 | 10/22/2025 |

REPORT NUMBER: SP1-2506-472-5

## CIE 1931 Chromaticity Diagram




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

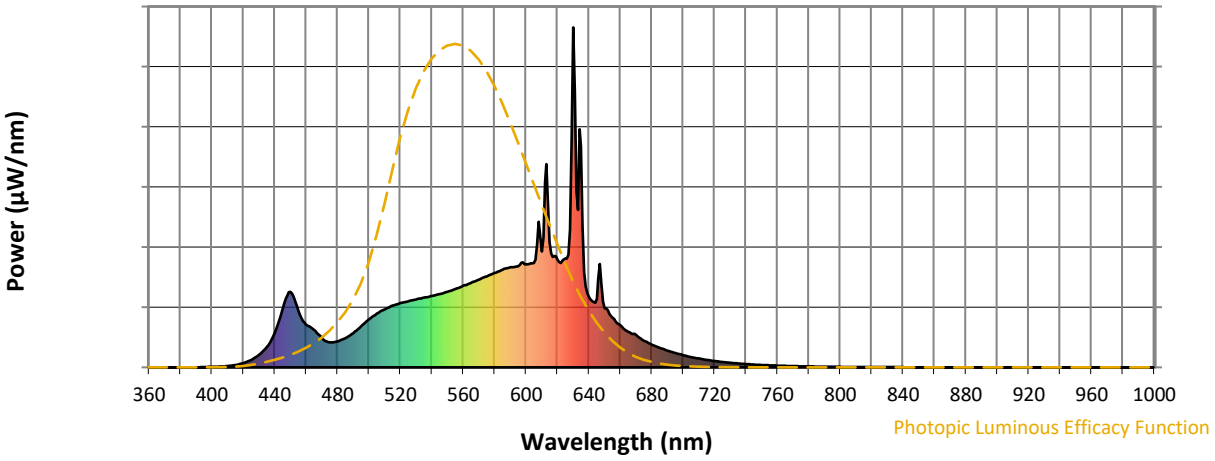



CCT = 2996K
CIE x = 0.4325
CIE y = 0.3945
Duv = -0.0033

Point lies inside the ANSI 3000K 7-step quadrangle

REPORT NUMBER: SP1-2506-472-5

## Photopic Flux vs. Wavelength

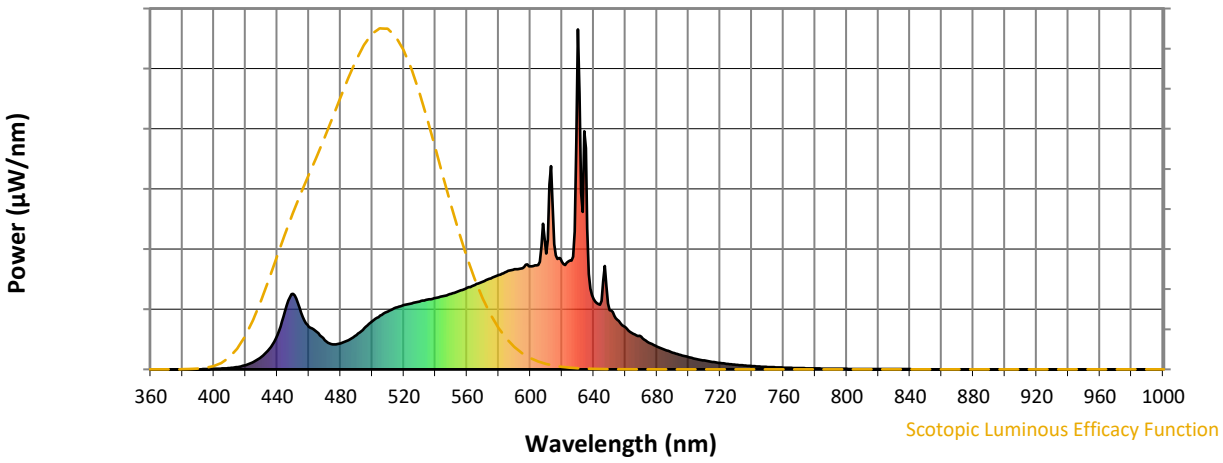



## Photopic Lumens: NR

| 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 | 101 | NR | 620 | 317 | NR | 750 | 7 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 121 | NR | 625 | 320 | NR | 755 | 6 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 141 | NR | 630 | 1000 | NR | 760 | 5 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 158 | NR | 635 | 651 | NR | 765 | 4 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 171 | NR | 640 | 207 | NR | 770 | 4 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 182 | NR | 645 | 201 | NR | 775 | 3 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 189 | NR | 650 | 174 | NR | 780 | 3 | NR | 910 | 0 | NR |
| 395 | 1 | NR | 525 | 194 | NR | 655 | 146 | NR | 785 | 2 | NR | 915 | 0 | NR |
| 400 | 1 | NR | 530 | 199 | NR | 660 | 124 | NR | 790 | 2 | NR | 920 | 0 | NR |
| 405 | 3 | NR | 535 | 205 | NR | 665 | 105 | NR | 795 | 2 | NR | 925 | 0 | NR |
| 410 | 4 | NR | 540 | 210 | NR | 670 | 96 | NR | 800 | 1 | NR | 930 | 0 | NR |
| 415 | 7 | NR | 545 | 216 | NR | 675 | 79 | NR | 805 | 1 | NR | 935 | 0 | NR |
| 420 | 13 | NR | 550 | 222 | NR | 680 | 67 | NR | 810 | 1 | NR | 940 | 0 | NR |
| 425 | 22 | NR | 555 | 230 | NR | 685 | 58 | NR | 815 | 1 | NR | 945 | 0 | NR |
| 430 | 37 | NR | 560 | 240 | NR | 690 | 49 | NR | 820 | 1 | NR | 950 | 0 | NR |
| 435 | 60 | NR | 565 | 248 | NR | 695 | 42 | NR | 825 | 1 | NR | 955 | 0 | NR |
| 440 | 101 | NR | 570 | 258 | NR | 700 | 36 | NR | 830 | 1 | NR | 960 | 0 | NR |
| 445 | 172 | NR | 575 | 268 | NR | 705 | 30 | NR | 835 | 1 | NR | 965 | 0 | NR |
| 450 | 223 | NR | 580 | 278 | NR | 710 | 26 | NR | 840 | 1 | NR | 970 | 0 | NR |
| 455 | 167 | NR | 585 | 287 | NR | 715 | 22 | NR | 845 | 0 | NR | 975 | 0 | NR |
| 460 | 126 | NR | 590 | 295 | NR | 720 | 19 | NR | 850 | 0 | NR | 980 | 0 | NR |
| 465 | 111 | NR | 595 | 298 | NR | 725 | 16 | NR | 855 | 0 | NR | 985 | 0 | NR |
| 470 | 86 | NR | 600 | 303 | NR | 730 | 14 | NR | 860 | 0 | NR | 990 | 0 | NR |
| 475 | 74 | NR | 605 | 307 | NR | 735 | 12 | NR | 865 | 0 | NR | 995 | 0 | NR |
| 480 | 77 | NR | 610 | 341 | NR | 740 | 10 | NR | 870 | 0 | NR | 1000 | 0 | NR |
| 485 | 86 | NR | 615 | 368 | NR | 745 | 8 | NR | 875 | 0 | NR | | | |

REPORT NUMBER: SP1-2506-472-5

## Scotopic Flux vs. Wavelength

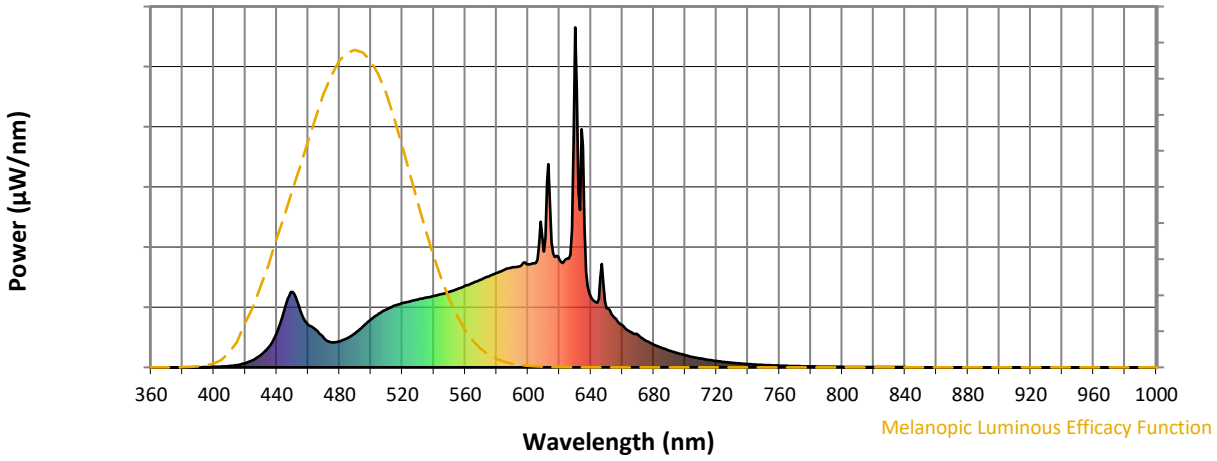



**Scotopic Lumens: NR** **S/P: 1.44**

| 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 | 101 | NR | 620 | 317 | NR | 750 | 7 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 121 | NR | 625 | 320 | NR | 755 | 6 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 141 | NR | 630 | 1000 | NR | 760 | 5 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 158 | NR | 635 | 651 | NR | 765 | 4 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 171 | NR | 640 | 207 | NR | 770 | 4 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 182 | NR | 645 | 201 | NR | 775 | 3 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 189 | NR | 650 | 174 | NR | 780 | 3 | NR | 910 | 0 | NR |
| 395 | 1 | NR | 525 | 194 | NR | 655 | 146 | NR | 785 | 2 | NR | 915 | 0 | NR |
| 400 | 1 | NR | 530 | 199 | NR | 660 | 124 | NR | 790 | 2 | NR | 920 | 0 | NR |
| 405 | 3 | NR | 535 | 205 | NR | 665 | 105 | NR | 795 | 2 | NR | 925 | 0 | NR |
| 410 | 4 | NR | 540 | 210 | NR | 670 | 96 | NR | 800 | 1 | NR | 930 | 0 | NR |
| 415 | 7 | NR | 545 | 216 | NR | 675 | 79 | NR | 805 | 1 | NR | 935 | 0 | NR |
| 420 | 13 | NR | 550 | 222 | NR | 680 | 67 | NR | 810 | 1 | NR | 940 | 0 | NR |
| 425 | 22 | NR | 555 | 230 | NR | 685 | 58 | NR | 815 | 1 | NR | 945 | 0 | NR |
| 430 | 37 | NR | 560 | 240 | NR | 690 | 49 | NR | 820 | 1 | NR | 950 | 0 | NR |
| 435 | 60 | NR | 565 | 248 | NR | 695 | 42 | NR | 825 | 1 | NR | 955 | 0 | NR |
| 440 | 101 | NR | 570 | 258 | NR | 700 | 36 | NR | 830 | 1 | NR | 960 | 0 | NR |
| 445 | 172 | NR | 575 | 268 | NR | 705 | 30 | NR | 835 | 1 | NR | 965 | 0 | NR |
| 450 | 223 | NR | 580 | 278 | NR | 710 | 26 | NR | 840 | 1 | NR | 970 | 0 | NR |
| 455 | 167 | NR | 585 | 287 | NR | 715 | 22 | NR | 845 | 0 | NR | 975 | 0 | NR |
| 460 | 126 | NR | 590 | 295 | NR | 720 | 19 | NR | 850 | 0 | NR | 980 | 0 | NR |
| 465 | 111 | NR | 595 | 298 | NR | 725 | 16 | NR | 855 | 0 | NR | 985 | 0 | NR |
| 470 | 86 | NR | 600 | 303 | NR | 730 | 14 | NR | 860 | 0 | NR | 990 | 0 | NR |
| 475 | 74 | NR | 605 | 307 | NR | 735 | 12 | NR | 865 | 0 | NR | 995 | 0 | NR |
| 480 | 77 | NR | 610 | 341 | NR | 740 | 10 | NR | 870 | 0 | NR | 1000 | 0 | NR |
| 485 | 86 | NR | 615 | 368 | NR | 745 | 8 | NR | 875 | 0 | NR | | | |

REPORT NUMBER: SP1-2506-472-5

## Melanopic Flux vs. Wavelength




**Melanopic Lumens: NR** **M/P: 2.85**

| 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 | 101 | NR | 620 | 317 | NR | 750 | 7 | NR | 880 | 0 | NR |
| 365 | 0 | NR | 495 | 121 | NR | 625 | 320 | NR | 755 | 6 | NR | 885 | 0 | NR |
| 370 | 0 | NR | 500 | 141 | NR | 630 | 1000 | NR | 760 | 5 | NR | 890 | 0 | NR |
| 375 | 0 | NR | 505 | 158 | NR | 635 | 651 | NR | 765 | 4 | NR | 895 | 0 | NR |
| 380 | 0 | NR | 510 | 171 | NR | 640 | 207 | NR | 770 | 4 | NR | 900 | 0 | NR |
| 385 | 0 | NR | 515 | 182 | NR | 645 | 201 | NR | 775 | 3 | NR | 905 | 0 | NR |
| 390 | 0 | NR | 520 | 189 | NR | 650 | 174 | NR | 780 | 3 | NR | 910 | 0 | NR |
| 395 | 1 | NR | 525 | 194 | NR | 655 | 146 | NR | 785 | 2 | NR | 915 | 0 | NR |
| 400 | 1 | NR | 530 | 199 | NR | 660 | 124 | NR | 790 | 2 | NR | 920 | 0 | NR |
| 405 | 3 | NR | 535 | 205 | NR | 665 | 105 | NR | 795 | 2 | NR | 925 | 0 | NR |
| 410 | 4 | NR | 540 | 210 | NR | 670 | 96 | NR | 800 | 1 | NR | 930 | 0 | NR |
| 415 | 7 | NR | 545 | 216 | NR | 675 | 79 | NR | 805 | 1 | NR | 935 | 0 | NR |
| 420 | 13 | NR | 550 | 222 | NR | 680 | 67 | NR | 810 | 1 | NR | 940 | 0 | NR |
| 425 | 22 | NR | 555 | 230 | NR | 685 | 58 | NR | 815 | 1 | NR | 945 | 0 | NR |
| 430 | 37 | NR | 560 | 240 | NR | 690 | 49 | NR | 820 | 1 | NR | 950 | 0 | NR |
| 435 | 60 | NR | 565 | 248 | NR | 695 | 42 | NR | 825 | 1 | NR | 955 | 0 | NR |
| 440 | 101 | NR | 570 | 258 | NR | 700 | 36 | NR | 830 | 1 | NR | 960 | 0 | NR |
| 445 | 172 | NR | 575 | 268 | NR | 705 | 30 | NR | 835 | 1 | NR | 965 | 0 | NR |
| 450 | 223 | NR | 580 | 278 | NR | 710 | 26 | NR | 840 | 1 | NR | 970 | 0 | NR |
| 455 | 167 | NR | 585 | 287 | NR | 715 | 22 | NR | 845 | 0 | NR | 975 | 0 | NR |
| 460 | 126 | NR | 590 | 295 | NR | 720 | 19 | NR | 850 | 0 | NR | 980 | 0 | NR |
| 465 | 111 | NR | 595 | 298 | NR | 725 | 16 | NR | 855 | 0 | NR | 985 | 0 | NR |
| 470 | 86 | NR | 600 | 303 | NR | 730 | 14 | NR | 860 | 0 | NR | 990 | 0 | NR |
| 475 | 74 | NR | 605 | 307 | NR | 735 | 12 | NR | 865 | 0 | NR | 995 | 0 | NR |
| 480 | 77 | NR | 610 | 341 | NR | 740 | 10 | NR | 870 | 0 | NR | 1000 | 0 | NR |
| 485 | 86 | NR | 615 | 368 | NR | 745 | 8 | NR | 875 | 0 | NR | | | |

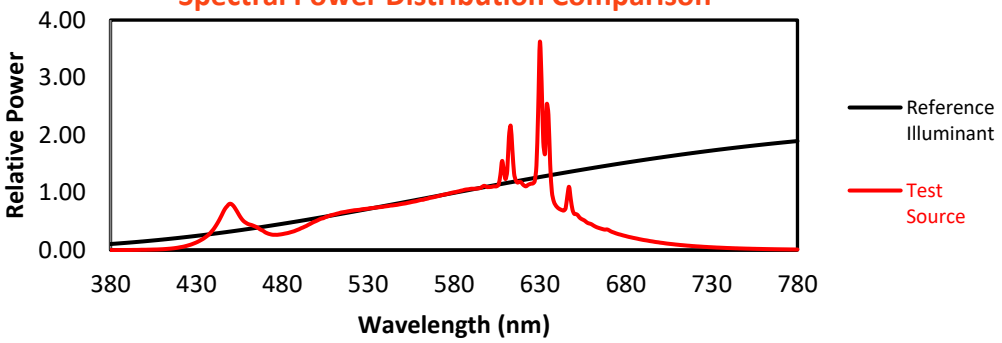
REPORT NUMBER: SP1-2506-472-5

# TM-30-18

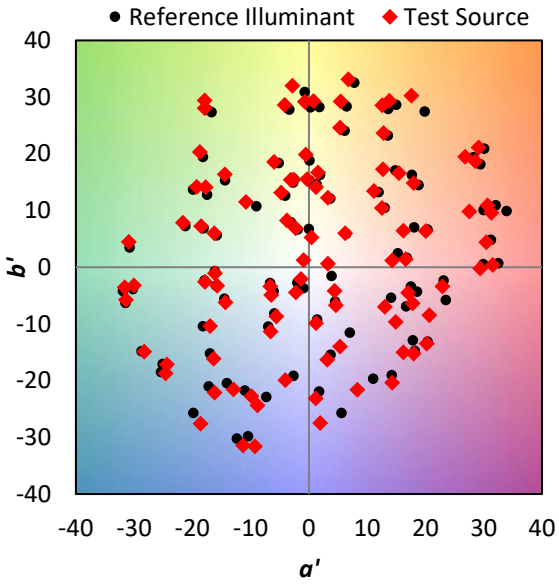
## Summary

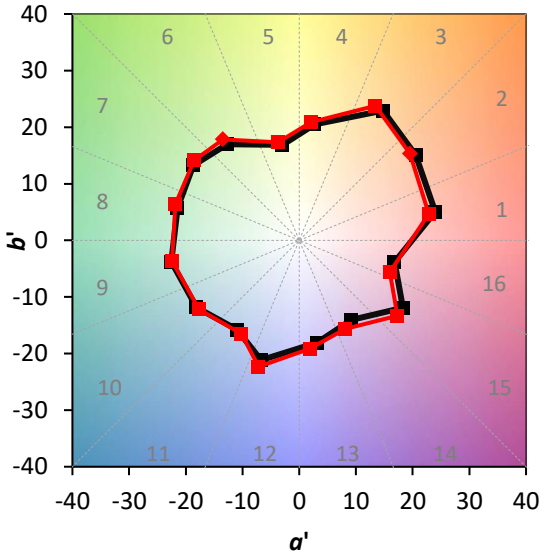
$R_f$ = 91.3
$R_g$ = 102
CIE $R_a$ = 94.4
$R_9$ = 61.4

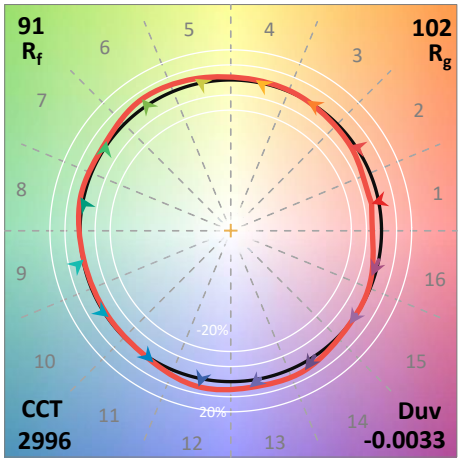
## Spectral Power Distribution Comparison

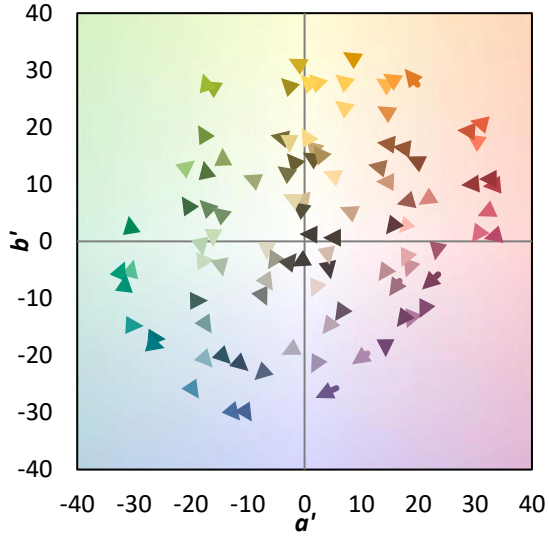



## Color Vector Graphics



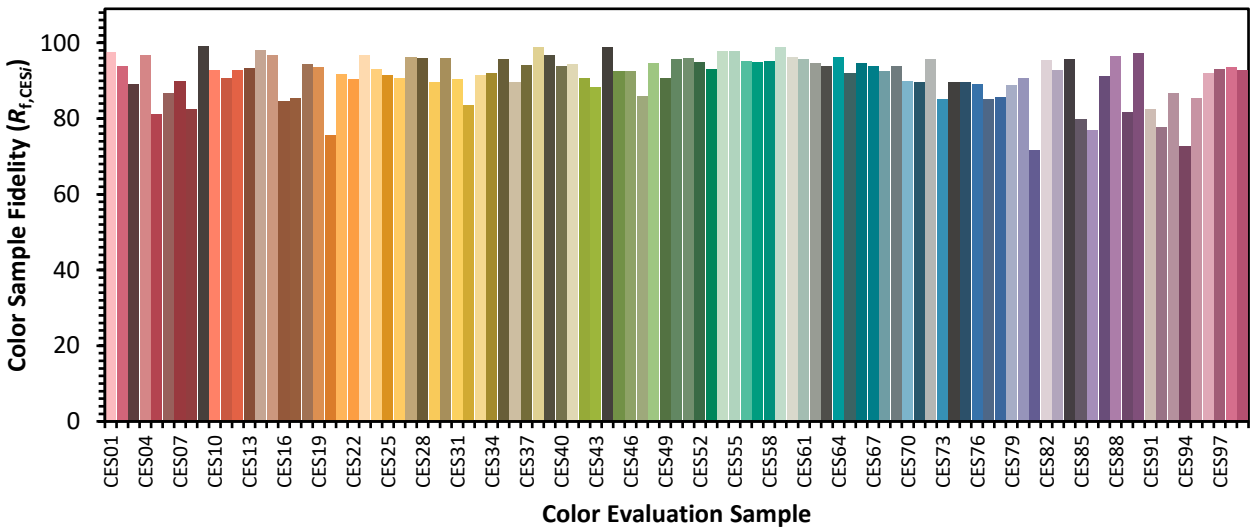



REPORT NUMBER: SP1-2506-472-5

# TM-30-18

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

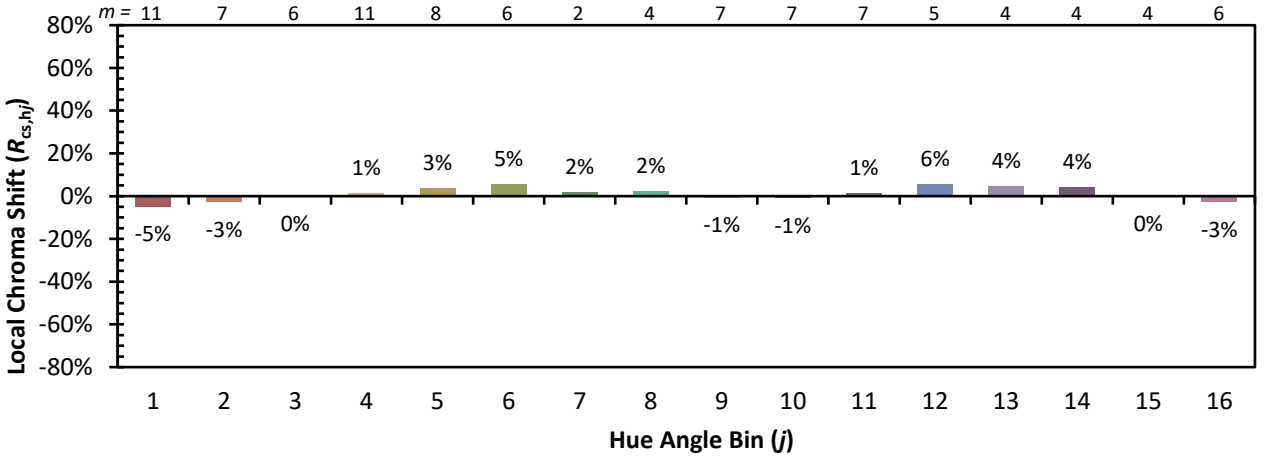
| | | | |
|---|---|---|---|
| CES01 = 86 | CES26 = 91 | CES51 = 96 | CES76 = 89 |
| CES02 = 63 | CES27 = 96 | CES52 = 95 | CES77 = 85 |
| CES03 = 32 | CES28 = 96 | CES53 = 93 | CES78 = 86 |
| CES04 = 70 | CES29 = 90 | CES54 = 98 | CES79 = 89 |
| CES05 = 51 | CES30 = 96 | CES55 = 98 | CES80 = 91 |
| CES06 = 51 | CES31 = 90 | CES56 = 95 | CES81 = 72 |
| CES07 = 44 | CES32 = 84 | CES57 = 95 | CES82 = 95 |
| CES08 = 42 | CES33 = 91 | CES58 = 95 | CES83 = 93 |
| CES09 = 29 | CES34 = 92 | CES59 = 99 | CES84 = 96 |
| CES10 = 76 | CES35 = 96 | CES60 = 96 | CES85 = 80 |
| CES11 = 59 | CES36 = 90 | CES61 = 96 | CES86 = 77 |
| CES12 = 65 | CES37 = 94 | CES62 = 95 | CES87 = 91 |
| CES13 = 44 | CES38 = 99 | CES63 = 94 | CES88 = 96 |
| CES14 = 74 | CES39 = 97 | CES64 = 96 | CES89 = 82 |
| CES15 = 72 | CES40 = 94 | CES65 = 92 | CES90 = 97 |
| CES16 = 48 | CES41 = 94 | CES66 = 95 | CES91 = 82 |
| CES17 = 50 | CES42 = 91 | CES67 = 94 | CES92 = 78 |
| CES18 = 57 | CES43 = 88 | CES68 = 93 | CES93 = 87 |
| CES19 = 72 | CES44 = 99 | CES69 = 94 | CES94 = 73 |
| CES20 = 67 | CES45 = 93 | CES70 = 90 | CES95 = 85 |
| CES21 = 86 | CES46 = 93 | CES71 = 90 | CES96 = 92 |
| CES22 = 79 | CES47 = 86 | CES72 = 96 | CES97 = 93 |
| CES23 = 92 | CES48 = 95 | CES73 = 85 | CES98 = 94 |
| CES24 = 91 | CES49 = 91 | CES74 = 90 | CES99 = 93 |
| CES25 = 72 | CES50 = 96 | CES75 = 90 | |

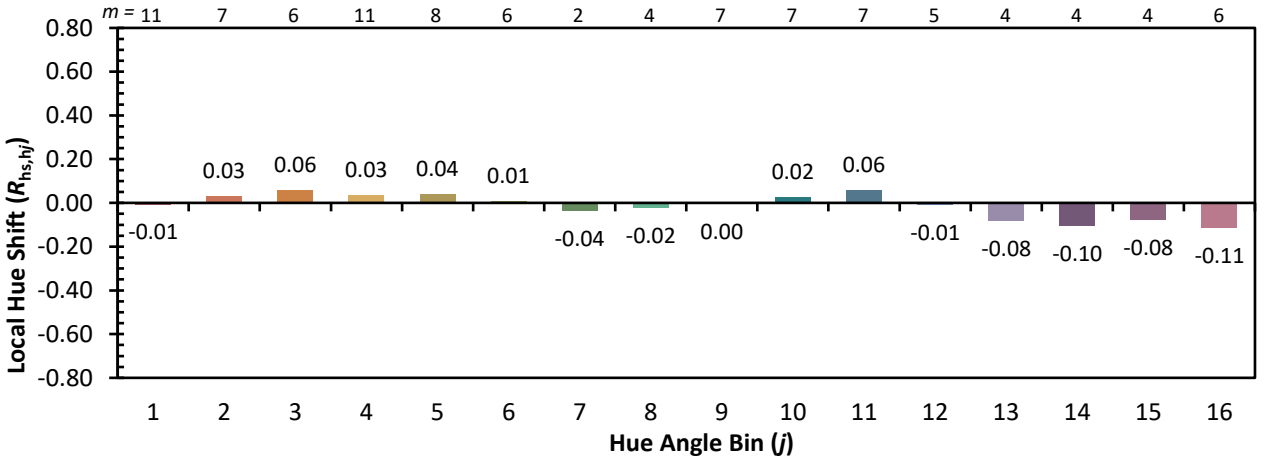


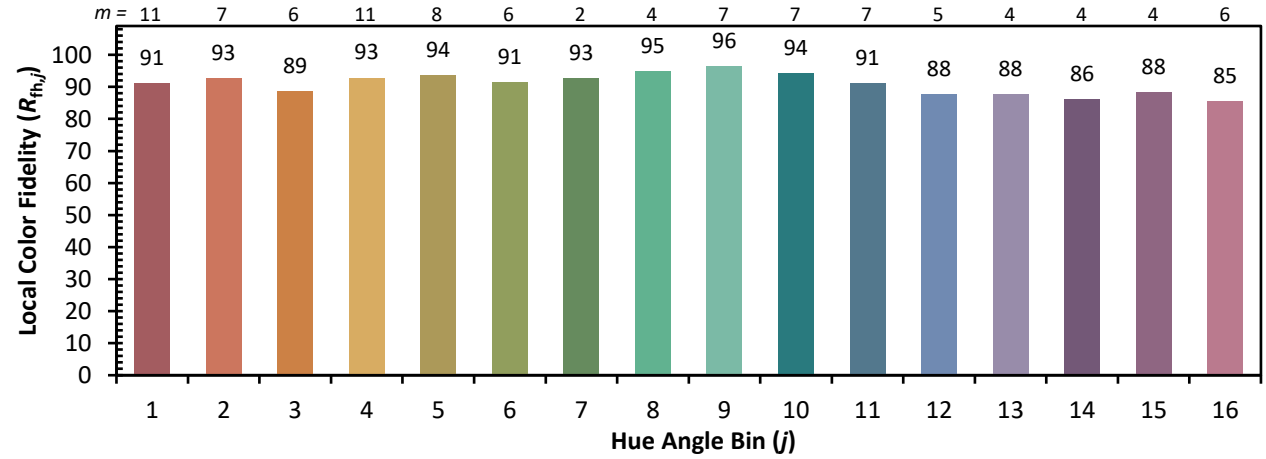
REPORT NUMBER: SP1-2506-472-5

**TM-30-18**

## Color Rendition by Hue-Angle Bin



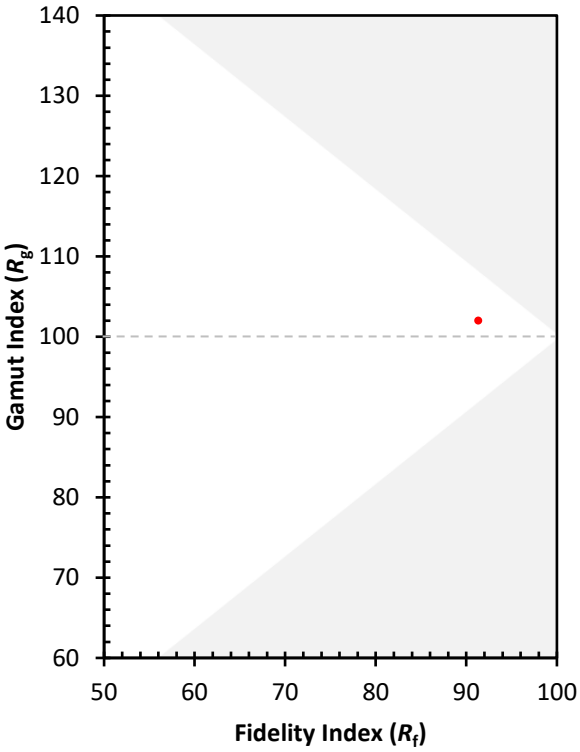



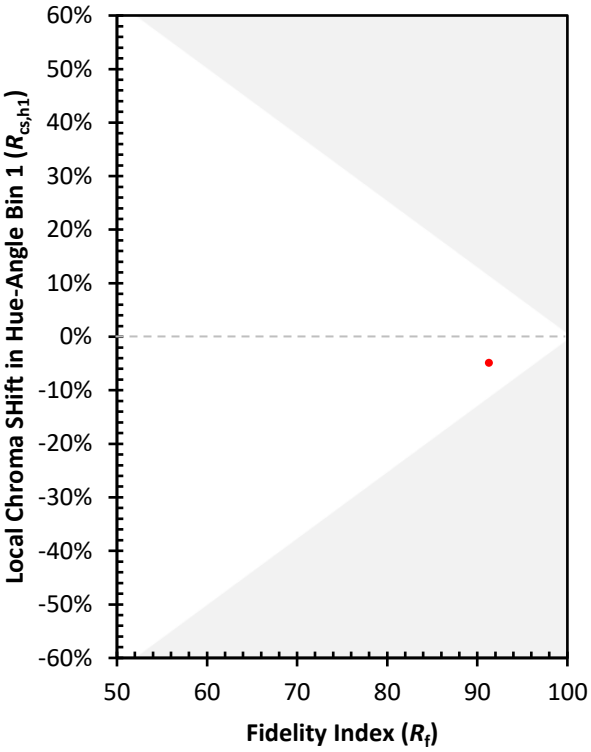



REPORT NUMBER: SP1-2506-472-5

## TM-30-18

### Measure Comparisons




(END OF REPORT)