

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: IRiS

Report Number: P1251795

Luminaire Tested: P3A09R709030DE010 E3LDWW1H

Issue Date: 1/29/2026

**Test Information**

Test Method: LM-79-2019  
Report Number: P1251795  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G1-2509-551-13)  
Test Lab: INNOVATION CENTER  
Issue Date: 1/29/2026  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: IRiS  
Catalog Number: P3A09R709030DE010 E3LDWW1H  
Description: 3in Adjustable LED luminaire with, R70 optic, 3000K CCT AND, 90CRI , E3LDWW1H TRIM  
Light Source: -  
Ballast/Driver: -

**Summary**

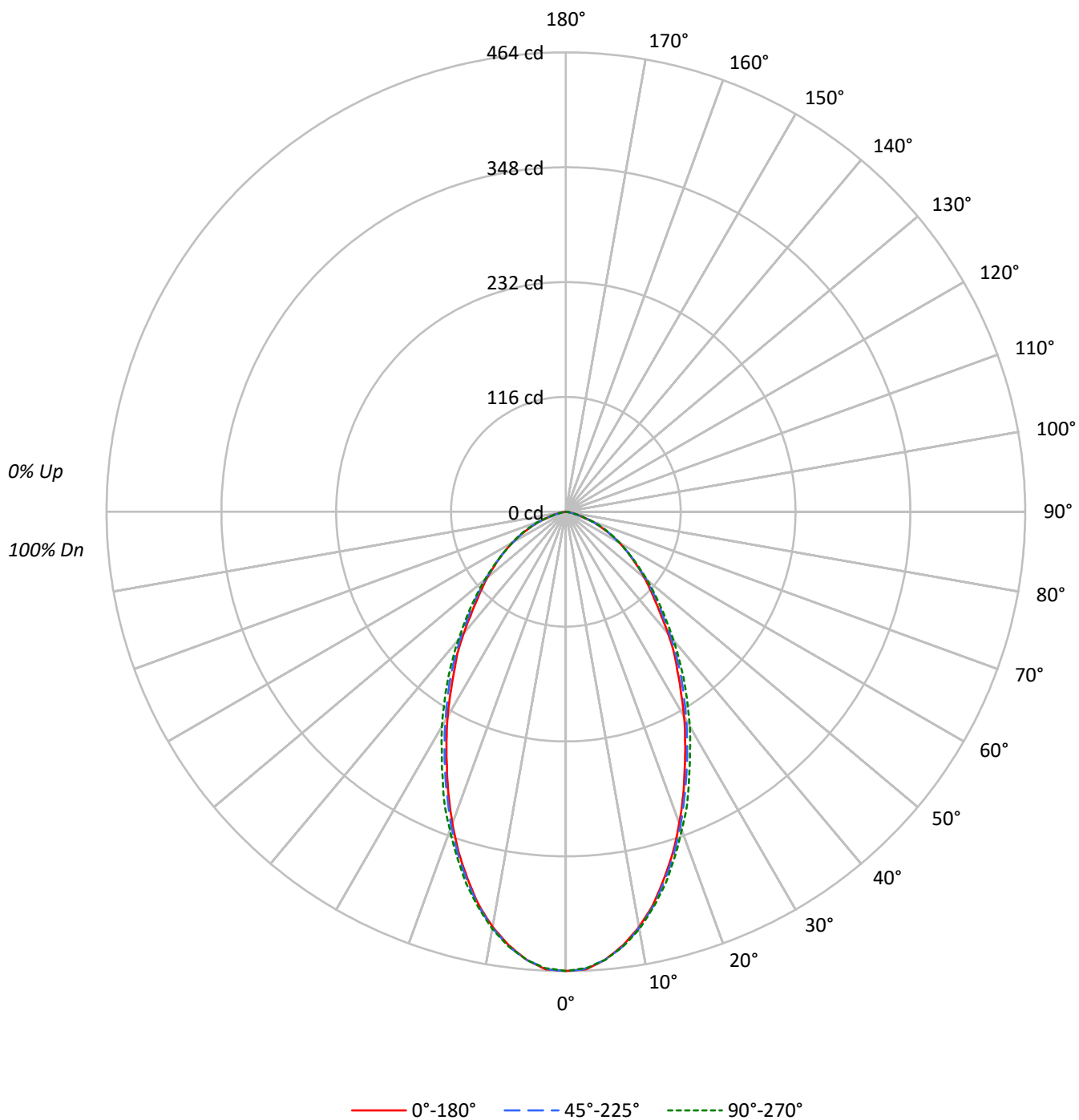
Lumens per Lamp: N/A  
Luminaire Lumens: 646.0 lumens  
Efficiency: N/A  
Efficacy: 58.2 lumens/watt  
Spacing Criteria (0/90/45): 0.87 / 0.89 / 0.97  
Luminous Opening: Circular (Dia: 0.25' x H: 0')  
CIE Type: Direct

Input Watts (W): 11.1  
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

TEST NUMBER: P1251795

CATALOG NUMBER: P3A09R709030DE010 E3LDWW1H

### Luminous Intensity Polar Plot



TEST NUMBER: P1251795

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**COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:**

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| RF  | 20  |     |     |     | 20  |     |     |     |     | 20  |     |     |     |     | 20  |     |     |     |     | 20  |
| RC  | 80  |     |     |     | 70  |     |     |     |     | 50  |     |     |     |     | 30  |     |     |     |     | 10  |
| RW  | 70  | 50  | 30  | 10  | 70  | 50  | 30  | 10  | 50  | 30  | 10  | 50  | 30  | 10  | 50  | 30  | 10  | 50  | 30  | 10  |
| RCR |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 0   | 119 | 119 | 119 | 119 | 116 | 116 | 116 | 116 | 111 | 111 | 111 | 106 | 106 | 106 | 102 | 102 | 102 | 102 | 102 | 100 |
| 1   | 111 | 108 | 104 | 101 | 109 | 105 | 102 | 100 | 101 | 99  | 97  | 97  | 95  | 94  | 94  | 92  | 91  | 91  | 91  | 89  |
| 2   | 103 | 97  | 91  | 87  | 101 | 95  | 90  | 86  | 92  | 87  | 84  | 88  | 85  | 82  | 85  | 83  | 80  | 80  | 80  | 78  |
| 3   | 96  | 87  | 81  | 75  | 94  | 86  | 80  | 75  | 83  | 78  | 73  | 80  | 76  | 72  | 78  | 74  | 71  | 71  | 71  | 69  |
| 4   | 89  | 79  | 72  | 66  | 87  | 78  | 71  | 66  | 76  | 70  | 65  | 73  | 68  | 64  | 71  | 67  | 63  | 63  | 63  | 61  |
| 5   | 83  | 72  | 64  | 59  | 81  | 71  | 64  | 59  | 69  | 63  | 58  | 67  | 62  | 57  | 66  | 61  | 57  | 57  | 57  | 55  |
| 6   | 78  | 66  | 58  | 53  | 76  | 65  | 58  | 53  | 64  | 57  | 52  | 62  | 56  | 52  | 61  | 55  | 51  | 51  | 51  | 50  |
| 7   | 73  | 61  | 53  | 48  | 71  | 60  | 53  | 48  | 59  | 52  | 47  | 57  | 52  | 47  | 56  | 51  | 47  | 47  | 47  | 45  |
| 8   | 68  | 56  | 49  | 44  | 67  | 56  | 49  | 44  | 54  | 48  | 43  | 53  | 47  | 43  | 52  | 47  | 43  | 43  | 43  | 41  |
| 9   | 64  | 52  | 45  | 40  | 63  | 52  | 45  | 40  | 51  | 44  | 40  | 50  | 44  | 40  | 49  | 43  | 40  | 40  | 40  | 38  |
| 10  | 61  | 49  | 42  | 37  | 60  | 48  | 42  | 37  | 47  | 41  | 37  | 47  | 41  | 37  | 46  | 40  | 37  | 37  | 37  | 35  |

**AVERAGE LUMINANCE (cd/sqm):**

|     | 0°     | 45°    | 90°    |
|-----|--------|--------|--------|
| 0°  | 101702 | 101702 | 101702 |
| 5°  | 100000 | 100000 | 100000 |
| 10° | 94810  | 95033  | 95278  |
| 15° | 87061  | 87537  | 88264  |
| 20° | 78150  | 78897  | 79877  |
| 25° | 68762  | 69778  | 71327  |
| 30° | 60465  | 61528  | 63402  |
| 35° | 52602  | 54288  | 55707  |
| 40° | 45972  | 47174  | 48376  |
| 45° | 39632  | 40965  | 41927  |
| 50° | 35308  | 36024  | 36400  |
| 55° | 31081  | 31502  | 31502  |
| 60° | 27322  | 26884  | 27322  |
| 65° | 22467  | 23037  | 23556  |
| 70° | 17631  | 17631  | 18272  |
| 75° | 11607  | 10760  | 10760  |
| 80° | 6693   | 5304   | 4041   |
| 85° | 2768   | 0      | 0      |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 75°

Vertical Angle: 45°

Luminance: 41927 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 42.5   | 6.6       |
| 10°-20°   | 107.7  | 16.7      |
| 20°-30°   | 132.8  | 20.6      |
| 30°-40°   | 126.6  | 19.6      |
| 40°-50°   | 102.4  | 15.9      |
| 50°-60°   | 73.7   | 11.4      |
| 60°-70°   | 44.2   | 6.8       |
| 70°-80°   | 14.8   | 2.3       |
| 80°-90°   | 1.3    | 0.2       |
| 90°-100°  | 0.0    | 0.0       |
| 100°-110° | 0.0    | 0.0       |
| 110°-120° | 0.0    | 0.0       |
| 120°-130° | 0.0    | 0.0       |
| 130°-140° | 0.0    | 0.0       |
| 140°-150° | 0.0    | 0.0       |
| 150°-160° | 0.0    | 0.0       |
| 160°-170° | 0.0    | 0.0       |
| 170°-180° | 0.0    | 0.0       |
| 0°-30°    | 283.0  | 43.8      |
| 0°-40°    | 409.6  | 63.4      |
| 0°-60°    | 585.8  | 90.7      |
| 0°-90°    | 646.0  | 100.0     |
| 90°-120°  | 0.0    | 0.0       |
| 90°-150°  | 0.0    | 0.0       |
| 90°-180°  | 0.0    | 0.0       |
| 0°-180°   | 646.0  | 100.0     |

**CANDELA DISTRIBUTION:**

|     | 0°  | 22.5° | 45° | 67.5° | 90° | Flux |
|-----|-----|-------|-----|-------|-----|------|
| 0°  | 464 | 464   | 464 | 464   | 464 |      |
| 5°  | 454 | 454   | 454 | 455   | 454 | 42   |
| 15° | 384 | 384   | 386 | 387   | 389 | 107  |
| 25° | 284 | 286   | 288 | 293   | 295 | 131  |
| 35° | 196 | 198   | 203 | 207   | 208 | 124  |
| 45° | 128 | 130   | 132 | 134   | 135 | 100  |
| 55° | 81  | 81    | 82  | 82    | 82  | 73   |
| 65° | 43  | 44    | 44  | 45    | 45  | 43   |
| 75° | 14  | 14    | 13  | 13    | 13  | 15   |
| 85° | 1   | 1     | 0   | 0     | 0   | 2    |
| 90° | 0   | 0     | 0   | 0     | 0   |      |

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**CANDELA DISTRIBUTION (FULL):**

|       | 0°    | 5°    | 15°   | 25°   | 35°   | 45°   | 55°   | 65°   | 75°   | 85°   | 90°   |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 463.8 | 463.8 | 463.8 | 463.8 | 463.8 | 463.8 | 463.8 | 463.8 | 463.8 | 463.8 | 463.8 |
| 2°    | 462.7 | 462.7 | 462.7 | 462.7 | 462.7 | 462.7 | 462.7 | 462.7 | 462.7 | 462.7 | 461.7 |
| 2.5°  | 462.7 | 461.7 | 461.7 | 461.7 | 461.7 | 461.7 | 461.7 | 461.7 | 461.7 | 462.7 | 461.7 |
| 5°    | 454.3 | 454.3 | 454.3 | 454.3 | 454.3 | 454.3 | 454.3 | 454.3 | 455.3 | 454.3 | 454.3 |
| 7.5°  | 441.6 | 441.6 | 441.6 | 441.6 | 442.7 | 442.7 | 442.7 | 442.7 | 443.7 | 443.7 | 442.7 |
| 10°   | 425.8 | 425.8 | 425.8 | 425.8 | 426.8 | 426.8 | 427.9 | 426.8 | 426.8 | 427.9 | 427.9 |
| 12.5° | 406.7 | 405.7 | 405.7 | 405.7 | 406.7 | 407.8 | 407.8 | 407.8 | 408.9 | 408.9 | 408.9 |
| 15°   | 383.5 | 383.5 | 383.5 | 384.6 | 384.6 | 385.6 | 386.7 | 386.7 | 387.7 | 387.7 | 388.8 |
| 17.5° | 360.3 | 360.3 | 359.2 | 360.3 | 361.3 | 362.4 | 363.4 | 364.5 | 365.5 | 365.5 | 365.5 |
| 20°   | 334.9 | 333.9 | 334.9 | 336.0 | 337.0 | 338.1 | 339.1 | 341.2 | 342.3 | 342.3 | 342.3 |
| 22.5° | 309.6 | 308.5 | 309.6 | 310.6 | 311.7 | 312.7 | 315.9 | 316.9 | 318.0 | 318.0 | 320.1 |
| 25°   | 284.2 | 284.2 | 285.3 | 286.3 | 287.4 | 288.4 | 290.5 | 292.6 | 293.7 | 294.8 | 294.8 |
| 27.5° | 261.0 | 261.0 | 261.0 | 261.0 | 263.1 | 265.2 | 267.3 | 269.4 | 270.5 | 271.5 | 271.5 |
| 30°   | 238.8 | 237.7 | 237.7 | 238.8 | 240.9 | 243.0 | 245.1 | 247.2 | 248.3 | 249.3 | 250.4 |
| 32.5° | 216.6 | 216.6 | 216.6 | 217.6 | 218.7 | 221.9 | 224.0 | 225.0 | 227.1 | 228.2 | 228.2 |
| 35°   | 196.5 | 196.5 | 196.5 | 198.6 | 200.7 | 202.8 | 203.9 | 206.0 | 208.1 | 208.1 | 208.1 |
| 37.5° | 179.6 | 180.7 | 182.8 | 181.7 | 181.7 | 182.8 | 183.8 | 185.9 | 188.1 | 188.1 | 188.1 |
| 40°   | 160.6 | 161.6 | 162.7 | 161.6 | 162.7 | 164.8 | 165.9 | 166.9 | 168.0 | 169.0 | 169.0 |
| 42.5° | 142.6 | 142.6 | 142.6 | 143.7 | 145.8 | 146.9 | 149.0 | 150.0 | 151.1 | 151.1 | 151.1 |
| 45°   | 127.8 | 127.8 | 128.9 | 129.9 | 131.0 | 132.1 | 133.1 | 134.2 | 135.2 | 135.2 | 135.2 |
| 47.5° | 115.2 | 115.2 | 116.2 | 116.2 | 117.3 | 118.3 | 119.4 | 119.4 | 120.4 | 121.5 | 120.4 |
| 50°   | 103.5 | 103.5 | 103.5 | 104.6 | 104.6 | 105.6 | 105.6 | 106.7 | 106.7 | 106.7 | 106.7 |
| 52.5° | 91.9  | 91.9  | 91.9  | 91.9  | 93.0  | 93.0  | 93.0  | 94.0  | 94.0  | 94.0  | 94.0  |
| 55°   | 81.3  | 81.3  | 81.3  | 81.3  | 81.3  | 82.4  | 82.4  | 82.4  | 82.4  | 82.4  | 82.4  |
| 57.5° | 71.8  | 71.8  | 71.8  | 71.8  | 71.8  | 71.8  | 71.8  | 71.8  | 71.8  | 71.8  | 71.8  |
| 60°   | 62.3  | 62.3  | 62.3  | 62.3  | 62.3  | 61.3  | 62.3  | 62.3  | 62.3  | 62.3  | 62.3  |
| 62.5° | 52.8  | 52.8  | 52.8  | 52.8  | 52.8  | 52.8  | 52.8  | 53.9  | 53.9  | 53.9  | 53.9  |
| 65°   | 43.3  | 44.4  | 44.4  | 44.4  | 44.4  | 44.4  | 44.4  | 45.4  | 45.4  | 45.4  | 45.4  |
| 67.5° | 34.9  | 35.9  | 35.9  | 35.9  | 35.9  | 35.9  | 35.9  | 35.9  | 37.0  | 37.0  | 37.0  |
| 70°   | 27.5  | 27.5  | 27.5  | 27.5  | 27.5  | 27.5  | 27.5  | 27.5  | 27.5  | 27.5  | 28.5  |
| 72.5° | 19.0  | 19.0  | 19.0  | 19.0  | 19.0  | 19.0  | 19.0  | 19.0  | 20.1  | 20.1  | 20.1  |
| 75°   | 13.7  | 13.7  | 13.7  | 13.7  | 12.7  | 12.7  | 12.7  | 12.7  | 12.7  | 12.7  | 12.7  |
| 77.5° | 9.5   | 9.5   | 9.5   | 8.5   | 8.5   | 7.4   | 7.4   | 7.4   | 7.4   | 7.4   | 6.3   |
| 80°   | 5.3   | 5.3   | 5.3   | 5.3   | 5.3   | 4.2   | 4.2   | 3.2   | 3.2   | 3.2   | 3.2   |
| 82.5° | 3.2   | 3.2   | 3.2   | 2.1   | 2.1   | 2.1   | 2.1   | 1.1   | 1.1   | 1.1   | 1.1   |
| 85°   | 1.1   | 1.1   | 1.1   | 1.1   | 1.1   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 87.5° | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 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

IRiS

Report Number: SP1-2504-409-28

Test Date: 05/16/2025

Luminaire Tested: LD3A09R159030D010 E3D1H

Data in this report applies to families of products including LD3A

### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2504-409-28  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry:  $4\pi$   
 Issue Date: 01/06/2026  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: IRiS  
 Catalog Number: **LD3A09R159030D010 E3D1H**  
 Description: 3in Adjustable LED luminaire with, R15 optic, 3000K CCT AND, 90CRI LEDS, E3D1H TRIM

### Spectral Parameters

CCT (K): 3032  
 CIE  $u'$ : 0.2493  
 CIE  $v'$ : 0.5211  
 Duv: 0.0003  
 CIE x: 0.4351  
 CIE y: 0.4042  
 CIE z: 0.1608  
 Peak Wavelength (nm): 615  
 Dominant Wavelength (nm): 582  
 Purity: 51.90029  
 R<sub>f</sub>: 91.6  
 R<sub>g</sub>: 98.2

CRI (Ra): 92.8  
 R1: 93.5  
 R2: 97.3  
 R3: 98.7  
 R4: 93.9  
 R5: 93.6  
 R6: 96.7  
 R7: 90.3  
 R8: 78.4  
 R9: 51.3  
 R10: 93.2  
 R11: 96.4  
 R12: 82.1  
 R13: 94.8  
 R14: 99.6  
 R15: 87.6



### Test Conditions

Stabilization Time: 40M  
 Operation Time: 1H 40M  
 Sphere Temperature (°C): 25.1



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| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | 76INCH SPHERE IN0058  | 12/16/2024       | 6/16/2025            |
| 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           |

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**CIE 1931 Chromaticity Diagram**



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



Point lies inside the ANSI 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               | 285                                    | NR                             | 620               | 993                                    | NR                             | 750               | 55                                     | NR                             | 880               | 1                                      | NR                             |
| 365               | 0                                      | NR                             | 495               | 338                                    | NR                             | 625               | 970                                    | NR                             | 755               | 47                                     | NR                             | 885               | 1                                      | NR                             |
| 370               | 0                                      | NR                             | 500               | 392                                    | NR                             | 630               | 942                                    | NR                             | 760               | 41                                     | NR                             | 890               | 1                                      | NR                             |
| 375               | 0                                      | NR                             | 505               | 440                                    | NR                             | 635               | 902                                    | NR                             | 765               | 35                                     | NR                             | 895               | 1                                      | NR                             |
| 380               | 0                                      | NR                             | 510               | 478                                    | NR                             | 640               | 855                                    | NR                             | 770               | 30                                     | NR                             | 900               | 1                                      | NR                             |
| 385               | 0                                      | NR                             | 515               | 505                                    | NR                             | 645               | 800                                    | NR                             | 775               | 26                                     | NR                             | 905               | 1                                      | NR                             |
| 390               | 0                                      | NR                             | 520               | 524                                    | NR                             | 650               | 743                                    | NR                             | 780               | 22                                     | NR                             | 910               | 0                                      | NR                             |
| 395               | 1                                      | NR                             | 525               | 539                                    | NR                             | 655               | 682                                    | NR                             | 785               | 19                                     | NR                             | 915               | 0                                      | NR                             |
| 400               | 2                                      | NR                             | 530               | 554                                    | NR                             | 660               | 621                                    | NR                             | 790               | 16                                     | NR                             | 920               | 0                                      | NR                             |
| 405               | 3                                      | NR                             | 535               | 565                                    | NR                             | 665               | 563                                    | NR                             | 795               | 14                                     | NR                             | 925               | 1                                      | NR                             |
| 410               | 5                                      | NR                             | 540               | 581                                    | NR                             | 670               | 505                                    | NR                             | 800               | 12                                     | NR                             | 930               | 0                                      | NR                             |
| 415               | 10                                     | NR                             | 545               | 593                                    | NR                             | 675               | 451                                    | NR                             | 805               | 10                                     | NR                             | 935               | 0                                      | NR                             |
| 420               | 17                                     | NR                             | 550               | 606                                    | NR                             | 680               | 401                                    | NR                             | 810               | 9                                      | NR                             | 940               | 0                                      | NR                             |
| 425               | 32                                     | NR                             | 555               | 623                                    | NR                             | 685               | 356                                    | NR                             | 815               | 8                                      | NR                             | 945               | 0                                      | NR                             |
| 430               | 57                                     | NR                             | 560               | 645                                    | NR                             | 690               | 313                                    | NR                             | 820               | 7                                      | NR                             | 950               | 0                                      | NR                             |
| 435               | 103                                    | NR                             | 565               | 667                                    | NR                             | 695               | 274                                    | NR                             | 825               | 6                                      | NR                             | 955               | 0                                      | NR                             |
| 440               | 175                                    | NR                             | 570               | 699                                    | NR                             | 700               | 238                                    | NR                             | 830               | 5                                      | NR                             | 960               | 0                                      | NR                             |
| 445               | 287                                    | NR                             | 575               | 732                                    | NR                             | 705               | 208                                    | NR                             | 835               | 4                                      | NR                             | 965               | 0                                      | NR                             |
| 450               | 460                                    | NR                             | 580               | 774                                    | NR                             | 710               | 180                                    | NR                             | 840               | 4                                      | NR                             | 970               | 0                                      | NR                             |
| 455               | 550                                    | NR                             | 585               | 816                                    | NR                             | 715               | 157                                    | NR                             | 845               | 3                                      | NR                             | 975               | 0                                      | NR                             |
| 460               | 423                                    | NR                             | 590               | 862                                    | NR                             | 720               | 136                                    | NR                             | 850               | 3                                      | NR                             | 980               | 0                                      | NR                             |
| 465               | 309                                    | NR                             | 595               | 907                                    | NR                             | 725               | 117                                    | NR                             | 855               | 2                                      | NR                             | 985               | 0                                      | NR                             |
| 470               | 269                                    | NR                             | 600               | 943                                    | NR                             | 730               | 100                                    | NR                             | 860               | 2                                      | NR                             | 990               | 0                                      | NR                             |
| 475               | 229                                    | NR                             | 605               | 974                                    | NR                             | 735               | 86                                     | NR                             | 865               | 2                                      | NR                             | 995               | 0                                      | NR                             |
| 480               | 214                                    | NR                             | 610               | 991                                    | NR                             | 740               | 72                                     | NR                             | 870               | 2                                      | NR                             | 1000              | 0                                      | NR                             |
| 485               | 241                                    | NR                             | 615               | 1000                                   | NR                             | 745               | 62                                     | NR                             | 875               | 1                                      | NR                             |                   |                                        |                                |

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### Scotopic Flux vs. Wavelength



Scotopic Lumens: NR

S/P: 1.44

| λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) |
|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|
| 360       | 0                           | NR               | 490       | 285                         | NR               | 620       | 993                         | NR               | 750       | 55                          | NR               | 880       | 1                           | NR               |
| 365       | 0                           | NR               | 495       | 338                         | NR               | 625       | 970                         | NR               | 755       | 47                          | NR               | 885       | 1                           | NR               |
| 370       | 0                           | NR               | 500       | 392                         | NR               | 630       | 942                         | NR               | 760       | 41                          | NR               | 890       | 1                           | NR               |
| 375       | 0                           | NR               | 505       | 440                         | NR               | 635       | 902                         | NR               | 765       | 35                          | NR               | 895       | 1                           | NR               |
| 380       | 0                           | NR               | 510       | 478                         | NR               | 640       | 855                         | NR               | 770       | 30                          | NR               | 900       | 1                           | NR               |
| 385       | 0                           | NR               | 515       | 505                         | NR               | 645       | 800                         | NR               | 775       | 26                          | NR               | 905       | 1                           | NR               |
| 390       | 0                           | NR               | 520       | 524                         | NR               | 650       | 743                         | NR               | 780       | 22                          | NR               | 910       | 0                           | NR               |
| 395       | 1                           | NR               | 525       | 539                         | NR               | 655       | 682                         | NR               | 785       | 19                          | NR               | 915       | 0                           | NR               |
| 400       | 2                           | NR               | 530       | 554                         | NR               | 660       | 621                         | NR               | 790       | 16                          | NR               | 920       | 0                           | NR               |
| 405       | 3                           | NR               | 535       | 565                         | NR               | 665       | 563                         | NR               | 795       | 14                          | NR               | 925       | 1                           | NR               |
| 410       | 5                           | NR               | 540       | 581                         | NR               | 670       | 505                         | NR               | 800       | 12                          | NR               | 930       | 0                           | NR               |
| 415       | 10                          | NR               | 545       | 593                         | NR               | 675       | 451                         | NR               | 805       | 10                          | NR               | 935       | 0                           | NR               |
| 420       | 17                          | NR               | 550       | 606                         | NR               | 680       | 401                         | NR               | 810       | 9                           | NR               | 940       | 0                           | NR               |
| 425       | 32                          | NR               | 555       | 623                         | NR               | 685       | 356                         | NR               | 815       | 8                           | NR               | 945       | 0                           | NR               |
| 430       | 57                          | NR               | 560       | 645                         | NR               | 690       | 313                         | NR               | 820       | 7                           | NR               | 950       | 0                           | NR               |
| 435       | 103                         | NR               | 565       | 667                         | NR               | 695       | 274                         | NR               | 825       | 6                           | NR               | 955       | 0                           | NR               |
| 440       | 175                         | NR               | 570       | 699                         | NR               | 700       | 238                         | NR               | 830       | 5                           | NR               | 960       | 0                           | NR               |
| 445       | 287                         | NR               | 575       | 732                         | NR               | 705       | 208                         | NR               | 835       | 4                           | NR               | 965       | 0                           | NR               |
| 450       | 460                         | NR               | 580       | 774                         | NR               | 710       | 180                         | NR               | 840       | 4                           | NR               | 970       | 0                           | NR               |
| 455       | 550                         | NR               | 585       | 816                         | NR               | 715       | 157                         | NR               | 845       | 3                           | NR               | 975       | 0                           | NR               |
| 460       | 423                         | NR               | 590       | 862                         | NR               | 720       | 136                         | NR               | 850       | 3                           | NR               | 980       | 0                           | NR               |
| 465       | 309                         | NR               | 595       | 907                         | NR               | 725       | 117                         | NR               | 855       | 2                           | NR               | 985       | 0                           | NR               |
| 470       | 269                         | NR               | 600       | 943                         | NR               | 730       | 100                         | NR               | 860       | 2                           | NR               | 990       | 0                           | NR               |
| 475       | 229                         | NR               | 605       | 974                         | NR               | 735       | 86                          | NR               | 865       | 2                           | NR               | 995       | 0                           | NR               |
| 480       | 214                         | NR               | 610       | 991                         | NR               | 740       | 72                          | NR               | 870       | 2                           | NR               | 1000      | 0                           | NR               |
| 485       | 241                         | NR               | 615       | 1000                        | NR               | 745       | 62                          | NR               | 875       | 1                           | NR               |           |                             |                  |

REPORT NUMBER: SP1-2504-409-28

### Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 2.84

| λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) |
|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|
| 360       | 0                           | NR               | 490       | 285                         | NR               | 620       | 993                         | NR               | 750       | 55                          | NR               | 880       | 1                           | NR               |
| 365       | 0                           | NR               | 495       | 338                         | NR               | 625       | 970                         | NR               | 755       | 47                          | NR               | 885       | 1                           | NR               |
| 370       | 0                           | NR               | 500       | 392                         | NR               | 630       | 942                         | NR               | 760       | 41                          | NR               | 890       | 1                           | NR               |
| 375       | 0                           | NR               | 505       | 440                         | NR               | 635       | 902                         | NR               | 765       | 35                          | NR               | 895       | 1                           | NR               |
| 380       | 0                           | NR               | 510       | 478                         | NR               | 640       | 855                         | NR               | 770       | 30                          | NR               | 900       | 1                           | NR               |
| 385       | 0                           | NR               | 515       | 505                         | NR               | 645       | 800                         | NR               | 775       | 26                          | NR               | 905       | 1                           | NR               |
| 390       | 0                           | NR               | 520       | 524                         | NR               | 650       | 743                         | NR               | 780       | 22                          | NR               | 910       | 0                           | NR               |
| 395       | 1                           | NR               | 525       | 539                         | NR               | 655       | 682                         | NR               | 785       | 19                          | NR               | 915       | 0                           | NR               |
| 400       | 2                           | NR               | 530       | 554                         | NR               | 660       | 621                         | NR               | 790       | 16                          | NR               | 920       | 0                           | NR               |
| 405       | 3                           | NR               | 535       | 565                         | NR               | 665       | 563                         | NR               | 795       | 14                          | NR               | 925       | 1                           | NR               |
| 410       | 5                           | NR               | 540       | 581                         | NR               | 670       | 505                         | NR               | 800       | 12                          | NR               | 930       | 0                           | NR               |
| 415       | 10                          | NR               | 545       | 593                         | NR               | 675       | 451                         | NR               | 805       | 10                          | NR               | 935       | 0                           | NR               |
| 420       | 17                          | NR               | 550       | 606                         | NR               | 680       | 401                         | NR               | 810       | 9                           | NR               | 940       | 0                           | NR               |
| 425       | 32                          | NR               | 555       | 623                         | NR               | 685       | 356                         | NR               | 815       | 8                           | NR               | 945       | 0                           | NR               |
| 430       | 57                          | NR               | 560       | 645                         | NR               | 690       | 313                         | NR               | 820       | 7                           | NR               | 950       | 0                           | NR               |
| 435       | 103                         | NR               | 565       | 667                         | NR               | 695       | 274                         | NR               | 825       | 6                           | NR               | 955       | 0                           | NR               |
| 440       | 175                         | NR               | 570       | 699                         | NR               | 700       | 238                         | NR               | 830       | 5                           | NR               | 960       | 0                           | NR               |
| 445       | 287                         | NR               | 575       | 732                         | NR               | 705       | 208                         | NR               | 835       | 4                           | NR               | 965       | 0                           | NR               |
| 450       | 460                         | NR               | 580       | 774                         | NR               | 710       | 180                         | NR               | 840       | 4                           | NR               | 970       | 0                           | NR               |
| 455       | 550                         | NR               | 585       | 816                         | NR               | 715       | 157                         | NR               | 845       | 3                           | NR               | 975       | 0                           | NR               |
| 460       | 423                         | NR               | 590       | 862                         | NR               | 720       | 136                         | NR               | 850       | 3                           | NR               | 980       | 0                           | NR               |
| 465       | 309                         | NR               | 595       | 907                         | NR               | 725       | 117                         | NR               | 855       | 2                           | NR               | 985       | 0                           | NR               |
| 470       | 269                         | NR               | 600       | 943                         | NR               | 730       | 100                         | NR               | 860       | 2                           | NR               | 990       | 0                           | NR               |
| 475       | 229                         | NR               | 605       | 974                         | NR               | 735       | 86                          | NR               | 865       | 2                           | NR               | 995       | 0                           | NR               |
| 480       | 214                         | NR               | 610       | 991                         | NR               | 740       | 72                          | NR               | 870       | 2                           | NR               | 1000      | 0                           | NR               |
| 485       | 241                         | NR               | 615       | 1000                        | NR               | 745       | 62                          | NR               | 875       | 1                           | NR               |           |                             |                  |

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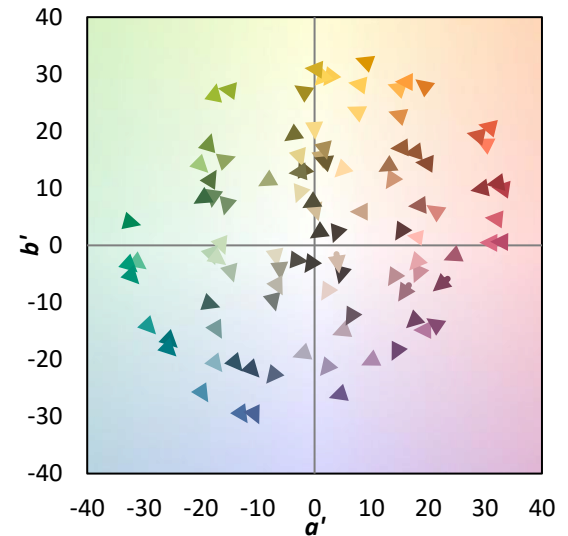
TM-30-18

### Summary

$R_f = 91.6$   
 $R_g = 98.2$   
 $\text{CIE } R_a = 92.8$   
 $R_9 = 51.3$



### Color Vector Graphics



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 96 | CES51 = 97 | CES76 = 92 |
| CES02 = 63 | CES27 = 91 | CES52 = 99 | CES77 = 88 |
| CES03 = 32 | CES28 = 98 | CES53 = 98 | CES78 = 88 |
| CES04 = 70 | CES29 = 97 | CES54 = 93 | CES79 = 91 |
| CES05 = 50 | CES30 = 90 | CES55 = 91 | CES80 = 92 |
| CES06 = 51 | CES31 = 97 | CES56 = 94 | CES81 = 78 |
| CES07 = 43 | CES32 = 93 | CES57 = 93 | CES82 = 96 |
| CES08 = 42 | CES33 = 97 | CES58 = 94 | CES83 = 95 |
| CES09 = 29 | CES34 = 97 | CES59 = 97 | CES84 = 95 |
| CES10 = 76 | CES35 = 98 | CES60 = 93 | CES85 = 80 |
| CES11 = 59 | CES36 = 82 | CES61 = 93 | CES86 = 79 |
| CES12 = 65 | CES37 = 98 | CES62 = 87 | CES87 = 91 |
| CES13 = 44 | CES38 = 86 | CES63 = 94 | CES88 = 95 |
| CES14 = 74 | CES39 = 98 | CES64 = 92 | CES89 = 84 |
| CES15 = 72 | CES40 = 97 | CES65 = 89 | CES90 = 94 |
| CES16 = 48 | CES41 = 96 | CES66 = 90 | CES91 = 77 |
| CES17 = 50 | CES42 = 97 | CES67 = 89 | CES92 = 76 |
| CES18 = 57 | CES43 = 96 | CES68 = 91 | CES93 = 86 |
| CES19 = 72 | CES44 = 99 | CES69 = 92 | CES94 = 76 |
| CES20 = 67 | CES45 = 99 | CES70 = 89 | CES95 = 83 |
| CES21 = 86 | CES46 = 96 | CES71 = 85 | CES96 = 91 |
| CES22 = 79 | CES47 = 93 | CES72 = 95 | CES97 = 96 |
| CES23 = 92 | CES48 = 89 | CES73 = 85 | CES98 = 93 |
| CES24 = 90 | CES49 = 97 | CES74 = 90 | CES99 = 89 |
| CES25 = 72 | CES50 = 97 | CES75 = 86 |            |



Color Rendition by Hue-Angle Bin





**Measure Comparisons**



(END OF REPORT)