

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: P1257616

Luminaire Tested: P3A13R709040DE010 E3LDWW1H

Issue Date: 1/29/2026

**Test Information**

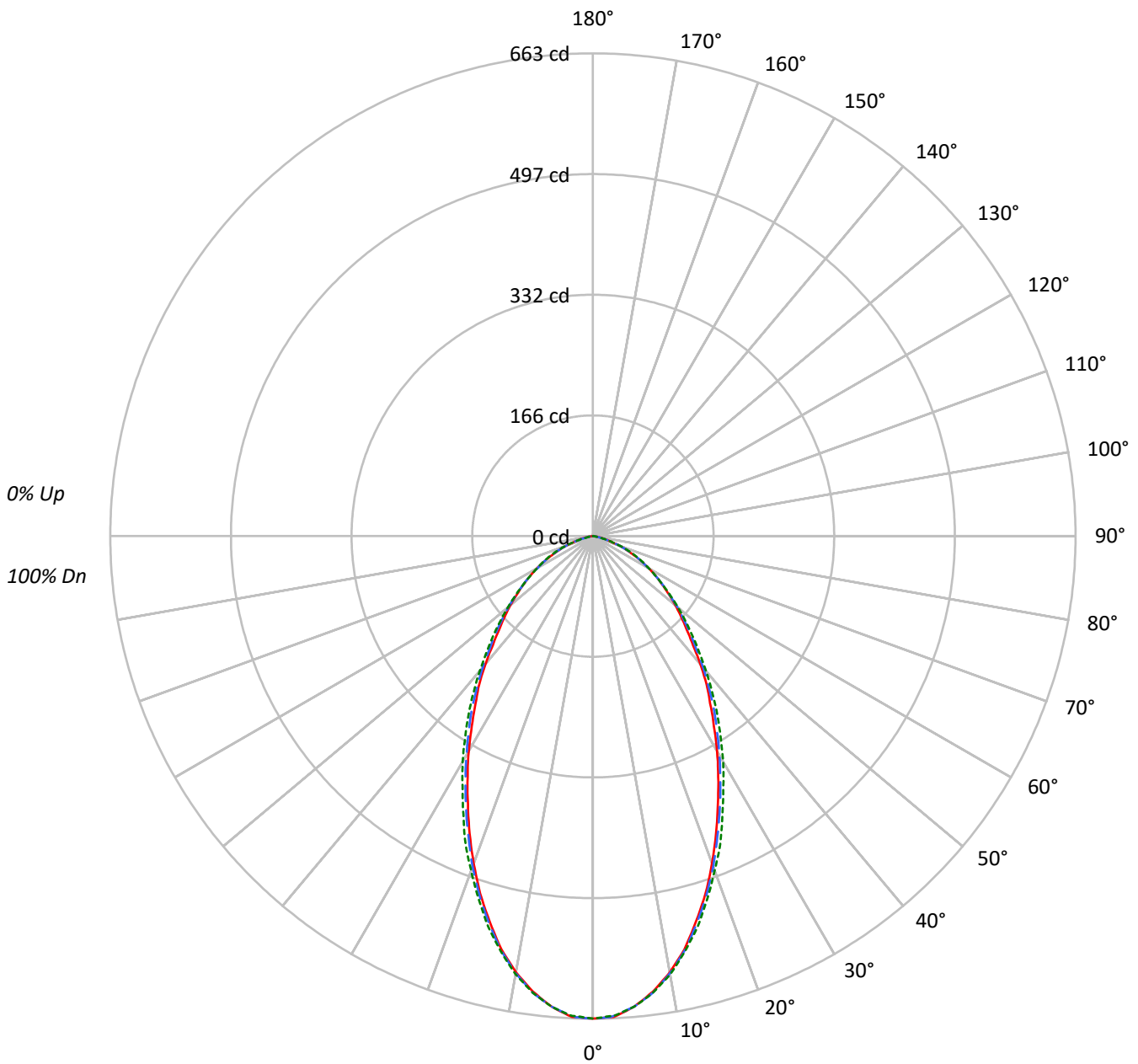
Test Method: LM-79-2019  
Report Number: P1257616  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G1-2509-551-13)  
Test Lab: INNOVATION CENTER  
Issue Date: 1/29/2026  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: IRiS  
Catalog Number: P3A13R709040DE010 E3LDWW1H  
Description: 3in Adjustable LED luminaire with, R70 optic, 4000K CCT AND, 90CRI , E3LDWW1H TRIM  
Light Source: -  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 923.0 lumens  
Efficiency: N/A  
Efficacy: 63.2 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): 14.6  
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: P1257616  
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### Luminous Intensity Polar Plot



— 0°-180°    - - 45°-225°    - - - 90°-270°



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

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

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

|     | 0°     | 45°    | 90°    |
|-----|--------|--------|--------|
| 0°  | 145317 | 145317 | 145317 |
| 5°  | 142879 | 142879 | 142879 |
| 10° | 135446 | 135780 | 136114 |
| 15° | 124382 | 125086 | 126107 |
| 20° | 111660 | 112710 | 114133 |
| 25° | 98256  | 99707  | 101909 |
| 30° | 86368  | 87912  | 90596  |
| 35° | 75168  | 77577  | 79612  |
| 40° | 65666  | 67412  | 69130  |
| 45° | 56626  | 58518  | 59913  |
| 50° | 50455  | 51512  | 52024  |
| 55° | 44424  | 44997  | 44997  |
| 60° | 39076  | 38418  | 39076  |
| 65° | 32118  | 32896  | 33674  |
| 70° | 25132  | 25132  | 26158  |
| 75° | 16606  | 15335  | 15335  |
| 80° | 9471   | 7577   | 5683   |
| 85° | 3774   | 0      | 0      |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 75°  
 Vertical Angle: 45°  
 Luminance: 59913 cd/sqm



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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 60.7   | 6.6       |
| 10°-20°   | 153.9  | 16.7      |
| 20°-30°   | 189.8  | 20.6      |
| 30°-40°   | 180.9  | 19.6      |
| 40°-50°   | 146.3  | 15.9      |
| 50°-60°   | 105.4  | 11.4      |
| 60°-70°   | 63.1   | 6.8       |
| 70°-80°   | 21.1   | 2.3       |
| 80°-90°   | 1.8    | 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°    | 404.4  | 43.8      |
| 0°-40°    | 585.3  | 63.4      |
| 0°-60°    | 836.9  | 90.7      |
| 0°-90°    | 923.0  | 100.0     |
| 90°-120°  | 0.0    | 0.0       |
| 90°-150°  | 0.0    | 0.0       |
| 90°-180°  | 0.0    | 0.0       |
| 0°-180°   | 923.0  | 100.0     |

**CANDELA DISTRIBUTION:**

|     | 0°  | 22.5° | 45° | 67.5° | 90° | Flux |
|-----|-----|-------|-----|-------|-----|------|
| 0°  | 663 | 663   | 663 | 663   | 663 |      |
| 5°  | 649 | 649   | 649 | 649   | 649 | 61   |
| 15° | 548 | 549   | 551 | 553   | 556 | 153  |
| 25° | 406 | 409   | 412 | 418   | 421 | 187  |
| 35° | 281 | 283   | 290 | 295   | 297 | 176  |
| 45° | 183 | 185   | 189 | 192   | 193 | 142  |
| 55° | 116 | 116   | 118 | 118   | 118 | 105  |
| 65° | 62  | 63    | 63  | 65    | 65  | 62   |
| 75° | 20  | 20    | 18  | 18    | 18  | 22   |
| 85° | 2   | 2     | 0   | 0     | 0   | 3    |
| 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°    | 662.7 | 662.7 | 662.7 | 662.7 | 662.7 | 662.7 | 662.7 | 662.7 | 662.7 | 662.7 | 662.7 |
| 2°    | 661.2 | 661.2 | 661.2 | 661.2 | 661.2 | 661.2 | 661.2 | 661.2 | 661.2 | 661.2 | 659.7 |
| 2.5°  | 661.2 | 659.7 | 659.7 | 659.7 | 659.7 | 659.7 | 659.7 | 659.7 | 659.7 | 661.2 | 659.7 |
| 5°    | 649.1 | 649.1 | 649.1 | 649.1 | 649.1 | 649.1 | 649.1 | 649.1 | 650.6 | 649.1 | 649.1 |
| 7.5°  | 631.0 | 631.0 | 631.0 | 631.0 | 632.5 | 632.5 | 632.5 | 632.5 | 634.0 | 634.0 | 632.5 |
| 10°   | 608.3 | 608.3 | 608.3 | 608.3 | 609.8 | 609.8 | 611.3 | 609.8 | 609.8 | 611.3 | 611.3 |
| 12.5° | 581.2 | 579.6 | 579.6 | 579.6 | 581.2 | 582.7 | 582.7 | 582.7 | 584.2 | 584.2 | 584.2 |
| 15°   | 547.9 | 547.9 | 547.9 | 549.5 | 549.5 | 551.0 | 552.5 | 552.5 | 554.0 | 554.0 | 555.5 |
| 17.5° | 514.7 | 514.7 | 513.2 | 514.7 | 516.2 | 517.8 | 519.3 | 520.8 | 522.3 | 522.3 | 522.3 |
| 20°   | 478.5 | 477.0 | 478.5 | 480.0 | 481.5 | 483.0 | 484.5 | 487.6 | 489.1 | 489.1 | 489.1 |
| 22.5° | 442.3 | 440.8 | 442.3 | 443.8 | 445.3 | 446.8 | 451.3 | 452.9 | 454.4 | 454.4 | 457.4 |
| 25°   | 406.1 | 406.1 | 407.6 | 409.1 | 410.6 | 412.1 | 415.1 | 418.1 | 419.6 | 421.2 | 421.2 |
| 27.5° | 372.8 | 372.8 | 372.8 | 372.8 | 375.9 | 378.9 | 381.9 | 384.9 | 386.4 | 387.9 | 387.9 |
| 30°   | 341.1 | 339.6 | 339.6 | 341.1 | 344.2 | 347.2 | 350.2 | 353.2 | 354.7 | 356.2 | 357.8 |
| 32.5° | 309.4 | 309.4 | 309.4 | 311.0 | 312.5 | 317.0 | 320.0 | 321.5 | 324.5 | 326.1 | 326.1 |
| 35°   | 280.8 | 280.8 | 280.8 | 283.8 | 286.8 | 289.8 | 291.3 | 294.4 | 297.4 | 297.4 | 297.4 |
| 37.5° | 256.6 | 258.1 | 261.1 | 259.6 | 259.6 | 261.1 | 262.7 | 265.7 | 268.7 | 268.7 | 268.7 |
| 40°   | 229.4 | 231.0 | 232.5 | 231.0 | 232.5 | 235.5 | 237.0 | 238.5 | 240.0 | 241.5 | 241.5 |
| 42.5° | 203.8 | 203.8 | 203.8 | 205.3 | 208.3 | 209.8 | 212.8 | 214.3 | 215.9 | 215.9 | 215.9 |
| 45°   | 182.6 | 182.6 | 184.2 | 185.7 | 187.2 | 188.7 | 190.2 | 191.7 | 193.2 | 193.2 | 193.2 |
| 47.5° | 164.5 | 164.5 | 166.0 | 166.0 | 167.6 | 169.1 | 170.6 | 170.6 | 172.1 | 173.6 | 172.1 |
| 50°   | 147.9 | 147.9 | 147.9 | 149.4 | 149.4 | 151.0 | 151.0 | 152.5 | 152.5 | 152.5 | 152.5 |
| 52.5° | 131.3 | 131.3 | 131.3 | 131.3 | 132.8 | 132.8 | 132.8 | 134.3 | 134.3 | 134.3 | 134.3 |
| 55°   | 116.2 | 116.2 | 116.2 | 116.2 | 116.2 | 117.7 | 117.7 | 117.7 | 117.7 | 117.7 | 117.7 |
| 57.5° | 102.6 | 102.6 | 102.6 | 102.6 | 102.6 | 102.6 | 102.6 | 102.6 | 102.6 | 102.6 | 102.6 |
| 60°   | 89.1  | 89.1  | 89.1  | 89.1  | 89.1  | 87.6  | 89.1  | 89.1  | 89.1  | 89.1  | 89.1  |
| 62.5° | 75.5  | 75.5  | 75.5  | 75.5  | 75.5  | 75.5  | 75.5  | 77.0  | 77.0  | 77.0  | 77.0  |
| 65°   | 61.9  | 63.4  | 63.4  | 63.4  | 63.4  | 63.4  | 63.4  | 64.9  | 64.9  | 64.9  | 64.9  |
| 67.5° | 49.8  | 51.3  | 51.3  | 51.3  | 51.3  | 51.3  | 51.3  | 51.3  | 52.8  | 52.8  | 52.8  |
| 70°   | 39.2  | 39.2  | 39.2  | 39.2  | 39.2  | 39.2  | 39.2  | 39.2  | 39.2  | 39.2  | 40.8  |
| 72.5° | 27.2  | 27.2  | 27.2  | 27.2  | 27.2  | 27.2  | 27.2  | 27.2  | 28.7  | 28.7  | 28.7  |
| 75°   | 19.6  | 19.6  | 19.6  | 19.6  | 18.1  | 18.1  | 18.1  | 18.1  | 18.1  | 18.1  | 18.1  |
| 77.5° | 13.6  | 13.6  | 13.6  | 12.1  | 12.1  | 10.6  | 10.6  | 10.6  | 10.6  | 10.6  | 9.1   |
| 80°   | 7.5   | 7.5   | 7.5   | 7.5   | 7.5   | 6.0   | 6.0   | 4.5   | 4.5   | 4.5   | 4.5   |
| 82.5° | 4.5   | 4.5   | 4.5   | 3.0   | 3.0   | 3.0   | 3.0   | 1.5   | 1.5   | 1.5   | 1.5   |
| 85°   | 1.5   | 1.5   | 1.5   | 1.5   | 1.5   | 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: SP1-2504-409-14

Test Date: 05/14/2025

Luminaire Tested: LD3A05R129040D010 E3D1H

Data in this report applies to families of products including LD3A

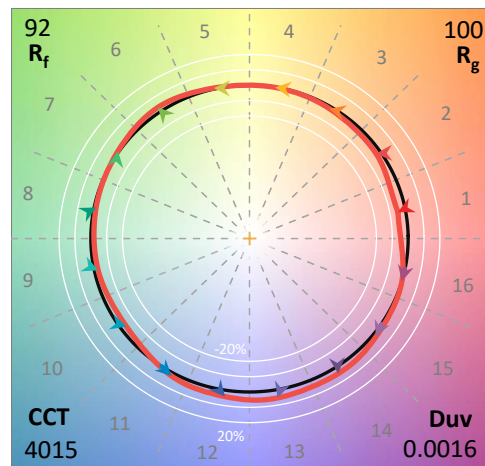
**Test Information**

Test Method: LM-79-2019  
 Report Number: SP1-2504-409-14  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry: 4π  
 Issue Date: 05/18/2025  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: IRiS  
 Catalog Number: **LD3A05R129040D010 E3D1H**  
 Description: 3in Adjustable LED luminaire with, R12 optic, 4000K CCT AND, 90CRI LEDS, E3D1H TRIM

**Spectral Parameters**

CCT (K): 4015  
 CIE u': 0.2239  
 CIE v': 0.5033  
 Duv: 0.0016  
 CIE x: 0.3809  
 CIE y: 0.3805  
 CIE z: 0.2386  
 Peak Wavelength (nm): 450  
 Dominant Wavelength (nm): 578  
 Purity: 28.51686  
 Rf: 91.5  
 Rg: 100.3

|           |      |      |      |
|-----------|------|------|------|
| CRI (Ra): | 92.3 |      |      |
| R1:       | 93.1 | R9:  | 58.4 |
| R2:       | 93.8 | R10: | 85.3 |
| R3:       | 94.2 | R11: | 94.4 |
| R4:       | 94.2 | R12: | 74.9 |
| R5:       | 92.7 | R13: | 93.3 |
| R6:       | 91.9 | R14: | 96.5 |
| R7:       | 94.0 | R15: | 89.0 |
| R8:       | 84.8 |      |      |



**Test Conditions**

Stabilization Time: 26M  
 Operation Time: 1H 26M  
 Sphere Temperature (°C): 24.9

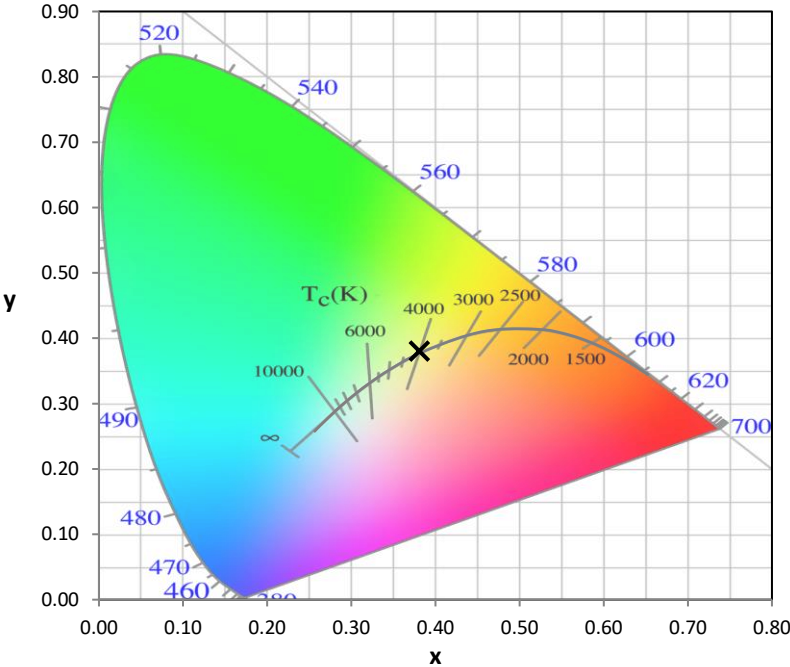


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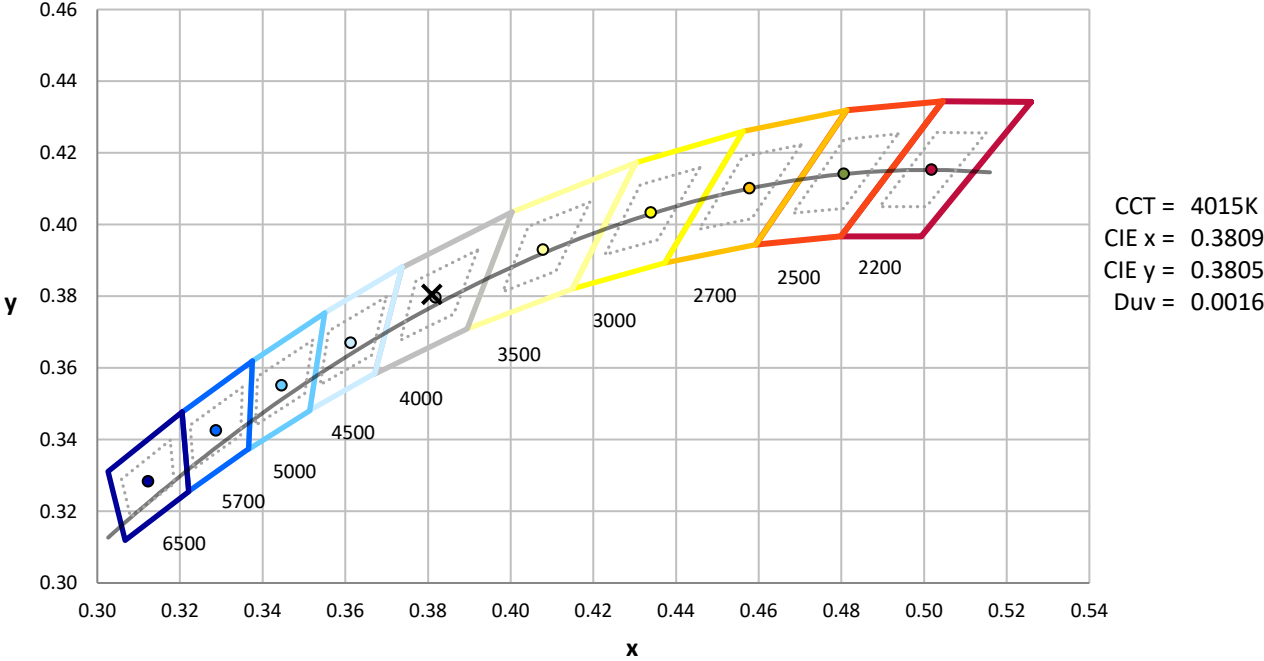
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date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

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CIE 1931 Chromaticity Diagram



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

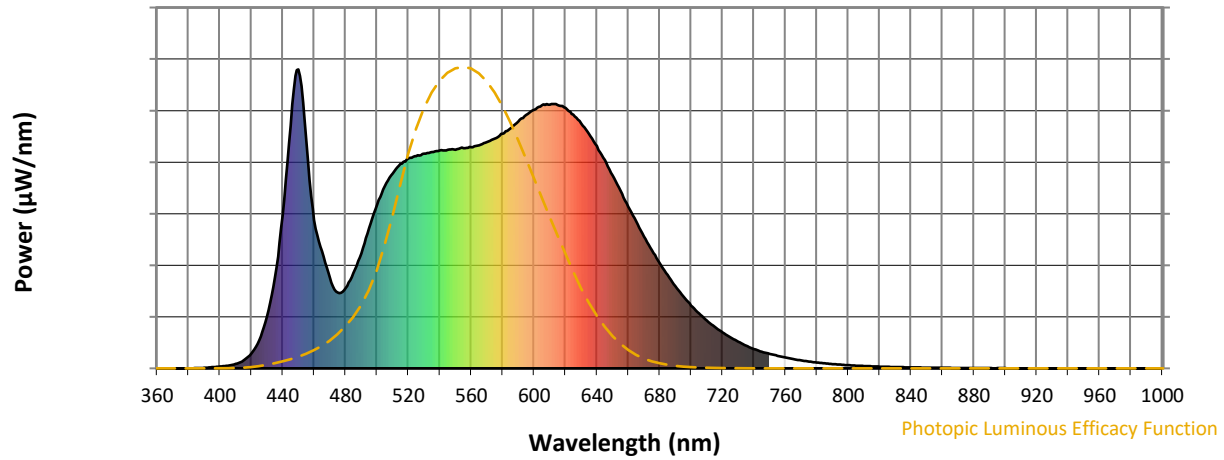


CCT = 4015K  
 CIE x = 0.3809  
 CIE y = 0.3805  
 Duv = 0.0016

Point lies inside the ANSI 4000K 4-step quadrangle

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**Photopic Flux vs. Wavelength**

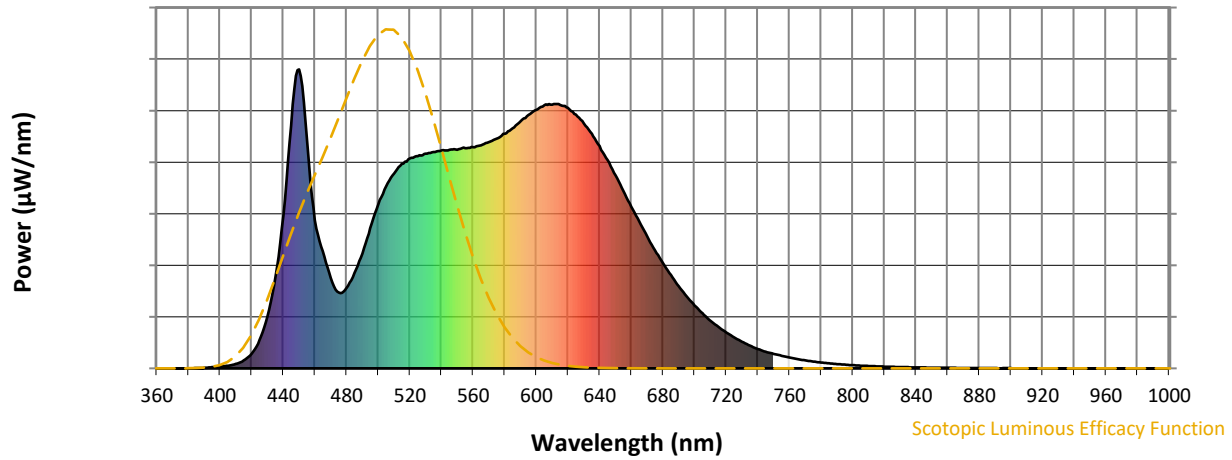


**Photopic Lumens: NR**

| $\lambda$ (nm) | Power W <sup>^</sup> /nm | Lumens ( $\phi$ /nm) | $\lambda$ (nm) | Power W <sup>^</sup> /nm | Lumens ( $\phi$ /nm) | $\lambda$ (nm) | Power W <sup>^</sup> /nm | Lumens ( $\phi$ /nm) | $\lambda$ (nm) | Power W <sup>^</sup> /nm | Lumens ( $\phi$ /nm) | $\lambda$ (nm) | Power W <sup>^</sup> /nm | Lumens ( $\phi$ /nm) |
|----------------|--------------------------|----------------------|----------------|--------------------------|----------------------|----------------|--------------------------|----------------------|----------------|--------------------------|----------------------|----------------|--------------------------|----------------------|
| 360            | 0                        | NR                   | 490            | 385                      | NR                   | 620            | 871                      | NR                   | 750            | 49                       | NR                   | 880            | 1                        | NR                   |
| 365            | 0                        | NR                   | 495            | 468                      | NR                   | 625            | 849                      | NR                   | 755            | 42                       | NR                   | 885            | 1                        | NR                   |
| 370            | 0                        | NR                   | 500            | 547                      | NR                   | 630            | 819                      | NR                   | 760            | 36                       | NR                   | 890            | 1                        | NR                   |
| 375            | 0                        | NR                   | 505            | 609                      | NR                   | 635            | 784                      | NR                   | 765            | 31                       | NR                   | 895            | 1                        | NR                   |
| 380            | 0                        | NR                   | 510            | 652                      | NR                   | 640            | 744                      | NR                   | 770            | 27                       | NR                   | 900            | 1                        | NR                   |
| 385            | 1                        | NR                   | 515            | 684                      | NR                   | 645            | 697                      | NR                   | 775            | 23                       | NR                   | 905            | 0                        | NR                   |
| 390            | 2                        | NR                   | 520            | 702                      | NR                   | 650            | 645                      | NR                   | 780            | 20                       | NR                   | 910            | 0                        | NR                   |
| 395            | 4                        | NR                   | 525            | 710                      | NR                   | 655            | 594                      | NR                   | 785            | 17                       | NR                   | 915            | 0                        | NR                   |
| 400            | 6                        | NR                   | 530            | 718                      | NR                   | 660            | 541                      | NR                   | 790            | 14                       | NR                   | 920            | 0                        | NR                   |
| 405            | 9                        | NR                   | 535            | 723                      | NR                   | 665            | 491                      | NR                   | 795            | 12                       | NR                   | 925            | 0                        | NR                   |
| 410            | 15                       | NR                   | 540            | 729                      | NR                   | 670            | 441                      | NR                   | 800            | 11                       | NR                   | 930            | 0                        | NR                   |
| 415            | 26                       | NR                   | 545            | 731                      | NR                   | 675            | 395                      | NR                   | 805            | 9                        | NR                   | 935            | 0                        | NR                   |
| 420            | 49                       | NR                   | 550            | 731                      | NR                   | 680            | 352                      | NR                   | 810            | 8                        | NR                   | 940            | 0                        | NR                   |
| 425            | 95                       | NR                   | 555            | 736                      | NR                   | 685            | 312                      | NR                   | 815            | 7                        | NR                   | 945            | 0                        | NR                   |
| 430            | 173                      | NR                   | 560            | 740                      | NR                   | 690            | 275                      | NR                   | 820            | 6                        | NR                   | 950            | 0                        | NR                   |
| 435            | 305                      | NR                   | 565            | 746                      | NR                   | 695            | 241                      | NR                   | 825            | 5                        | NR                   | 955            | 0                        | NR                   |
| 440            | 511                      | NR                   | 570            | 757                      | NR                   | 700            | 210                      | NR                   | 830            | 4                        | NR                   | 960            | 0                        | NR                   |
| 445            | 811                      | NR                   | 575            | 768                      | NR                   | 705            | 184                      | NR                   | 835            | 4                        | NR                   | 965            | 0                        | NR                   |
| 450            | 1000                     | NR                   | 580            | 785                      | NR                   | 710            | 159                      | NR                   | 840            | 3                        | NR                   | 970            | 0                        | NR                   |
| 455            | 760                      | NR                   | 585            | 803                      | NR                   | 715            | 139                      | NR                   | 845            | 3                        | NR                   | 975            | 0                        | NR                   |
| 460            | 496                      | NR                   | 590            | 826                      | NR                   | 720            | 120                      | NR                   | 850            | 3                        | NR                   | 980            | 0                        | NR                   |
| 465            | 392                      | NR                   | 595            | 848                      | NR                   | 725            | 104                      | NR                   | 855            | 2                        | NR                   | 985            | 0                        | NR                   |
| 470            | 302                      | NR                   | 600            | 865                      | NR                   | 730            | 89                       | NR                   | 860            | 2                        | NR                   | 990            | 0                        | NR                   |
| 475            | 253                      | NR                   | 605            | 879                      | NR                   | 735            | 76                       | NR                   | 865            | 2                        | NR                   | 995            | 0                        | NR                   |
| 480            | 269                      | NR                   | 610            | 882                      | NR                   | 740            | 65                       | NR                   | 870            | 1                        | NR                   | 1000           | 0                        | NR                   |
| 485            | 319                      | NR                   | 615            | 881                      | NR                   | 745            | 55                       | NR                   | 875            | 1                        | NR                   |                |                          |                      |

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**Scotopic Flux vs. Wavelength**



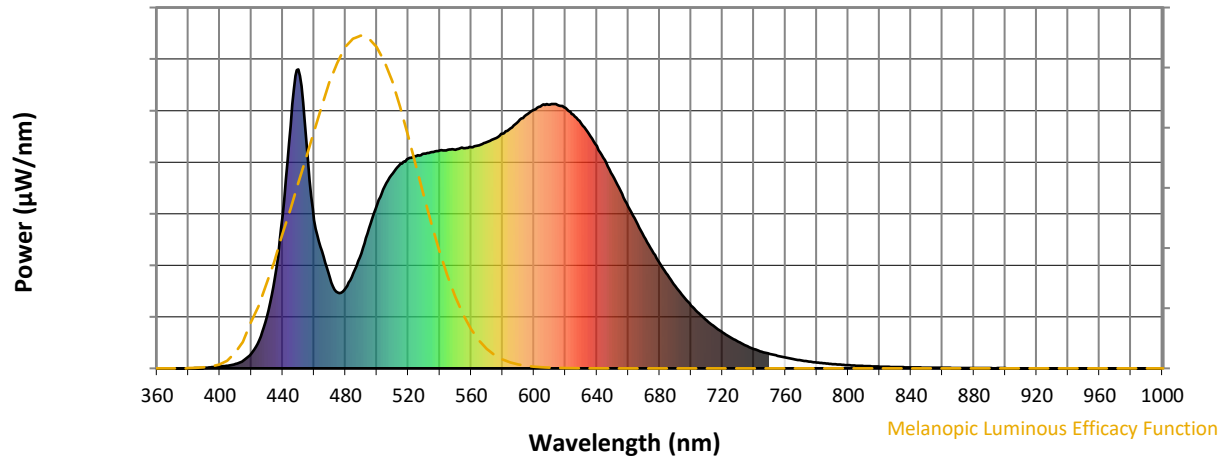
**Scotopic Lumens: NR**

**S/P: 1.77**

| $\lambda$ (nm) | Power W <sup>^</sup> /nm | Lumens ( $\phi$ /nm) | $\lambda$ (nm) | Power W <sup>^</sup> /nm | Lumens ( $\phi$ /nm) | $\lambda$ (nm) | Power W <sup>^</sup> /nm | Lumens ( $\phi$ /nm) | $\lambda$ (nm) | Power W <sup>^</sup> /nm | Lumens ( $\phi$ /nm) | $\lambda$ (nm) | Power W <sup>^</sup> /nm | Lumens ( $\phi$ /nm) |
|----------------|--------------------------|----------------------|----------------|--------------------------|----------------------|----------------|--------------------------|----------------------|----------------|--------------------------|----------------------|----------------|--------------------------|----------------------|
| 360            | 0                        | NR                   | 490            | 385                      | NR                   | 620            | 871                      | NR                   | 750            | 49                       | NR                   | 880            | 1                        | NR                   |
| 365            | 0                        | NR                   | 495            | 468                      | NR                   | 625            | 849                      | NR                   | 755            | 42                       | NR                   | 885            | 1                        | NR                   |
| 370            | 0                        | NR                   | 500            | 547                      | NR                   | 630            | 819                      | NR                   | 760            | 36                       | NR                   | 890            | 1                        | NR                   |
| 375            | 0                        | NR                   | 505            | 609                      | NR                   | 635            | 784                      | NR                   | 765            | 31                       | NR                   | 895            | 1                        | NR                   |
| 380            | 0                        | NR                   | 510            | 652                      | NR                   | 640            | 744                      | NR                   | 770            | 27                       | NR                   | 900            | 1                        | NR                   |
| 385            | 1                        | NR                   | 515            | 684                      | NR                   | 645            | 697                      | NR                   | 775            | 23                       | NR                   | 905            | 0                        | NR                   |
| 390            | 2                        | NR                   | 520            | 702                      | NR                   | 650            | 645                      | NR                   | 780            | 20                       | NR                   | 910            | 0                        | NR                   |
| 395            | 4                        | NR                   | 525            | 710                      | NR                   | 655            | 594                      | NR                   | 785            | 17                       | NR                   | 915            | 0                        | NR                   |
| 400            | 6                        | NR                   | 530            | 718                      | NR                   | 660            | 541                      | NR                   | 790            | 14                       | NR                   | 920            | 0                        | NR                   |
| 405            | 9                        | NR                   | 535            | 723                      | NR                   | 665            | 491                      | NR                   | 795            | 12                       | NR                   | 925            | 0                        | NR                   |
| 410            | 15                       | NR                   | 540            | 729                      | NR                   | 670            | 441                      | NR                   | 800            | 11                       | NR                   | 930            | 0                        | NR                   |
| 415            | 26                       | NR                   | 545            | 731                      | NR                   | 675            | 395                      | NR                   | 805            | 9                        | NR                   | 935            | 0                        | NR                   |
| 420            | 49                       | NR                   | 550            | 731                      | NR                   | 680            | 352                      | NR                   | 810            | 8                        | NR                   | 940            | 0                        | NR                   |
| 425            | 95                       | NR                   | 555            | 736                      | NR                   | 685            | 312                      | NR                   | 815            | 7                        | NR                   | 945            | 0                        | NR                   |
| 430            | 173                      | NR                   | 560            | 740                      | NR                   | 690            | 275                      | NR                   | 820            | 6                        | NR                   | 950            | 0                        | NR                   |
| 435            | 305                      | NR                   | 565            | 746                      | NR                   | 695            | 241                      | NR                   | 825            | 5                        | NR                   | 955            | 0                        | NR                   |
| 440            | 511                      | NR                   | 570            | 757                      | NR                   | 700            | 210                      | NR                   | 830            | 4                        | NR                   | 960            | 0                        | NR                   |
| 445            | 811                      | NR                   | 575            | 768                      | NR                   | 705            | 184                      | NR                   | 835            | 4                        | NR                   | 965            | 0                        | NR                   |
| 450            | 1000                     | NR                   | 580            | 785                      | NR                   | 710            | 159                      | NR                   | 840            | 3                        | NR                   | 970            | 0                        | NR                   |
| 455            | 760                      | NR                   | 585            | 803                      | NR                   | 715            | 139                      | NR                   | 845            | 3                        | NR                   | 975            | 0                        | NR                   |
| 460            | 496                      | NR                   | 590            | 826                      | NR                   | 720            | 120                      | NR                   | 850            | 3                        | NR                   | 980            | 0                        | NR                   |
| 465            | 392                      | NR                   | 595            | 848                      | NR                   | 725            | 104                      | NR                   | 855            | 2                        | NR                   | 985            | 0                        | NR                   |
| 470            | 302                      | NR                   | 600            | 865                      | NR                   | 730            | 89                       | NR                   | 860            | 2                        | NR                   | 990            | 0                        | NR                   |
| 475            | 253                      | NR                   | 605            | 879                      | NR                   | 735            | 76                       | NR                   | 865            | 2                        | NR                   | 995            | 0                        | NR                   |
| 480            | 269                      | NR                   | 610            | 882                      | NR                   | 740            | 65                       | NR                   | 870            | 1                        | NR                   | 1000           | 0                        | NR                   |
| 485            | 319                      | NR                   | 615            | 881                      | NR                   | 745            | 55                       | NR                   | 875            | 1                        | NR                   |                |                          |                      |

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**Melanopic Flux vs. Wavelength**



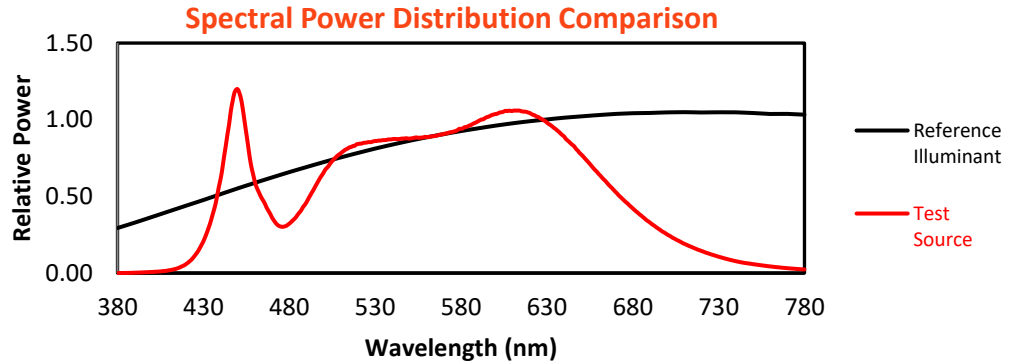
**Melanopic Lumens: NR**

**M/P: 3.62**

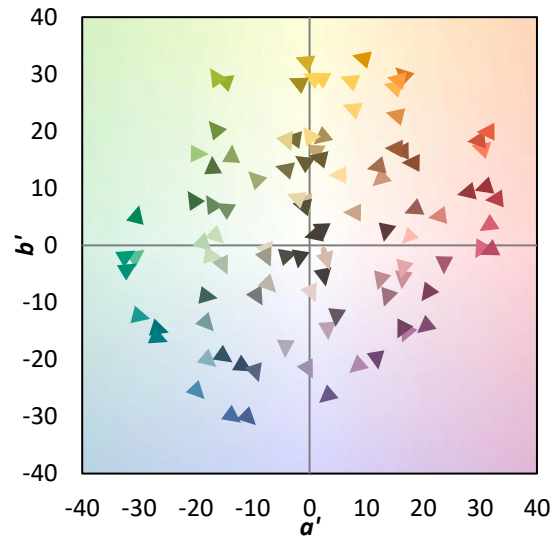
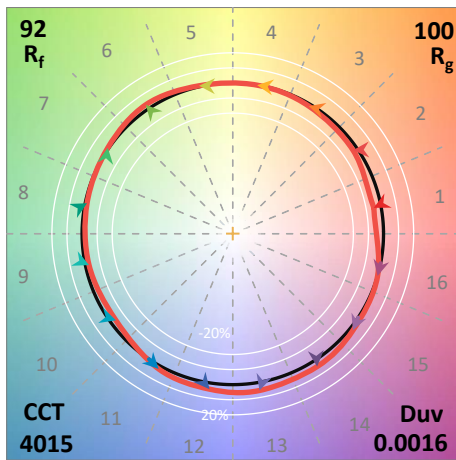
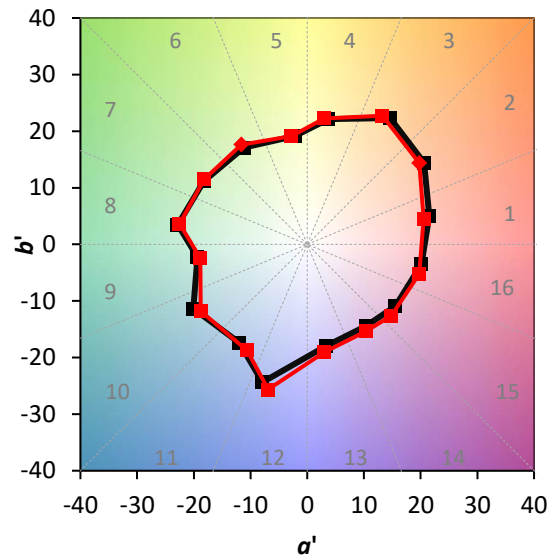
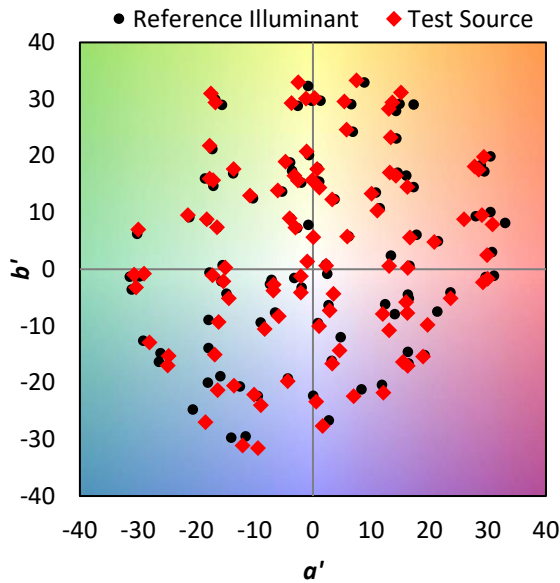
| λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) | λ (nm) | Power W <sup>^</sup> /nm | Lumens (φ/nm) |
|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|--------|--------------------------|---------------|
| 360    | 0                        | NR            | 490    | 385                      | NR            | 620    | 871                      | NR            | 750    | 49                       | NR            | 880    | 1                        | NR            |
| 365    | 0                        | NR            | 495    | 468                      | NR            | 625    | 849                      | NR            | 755    | 42                       | NR            | 885    | 1                        | NR            |
| 370    | 0                        | NR            | 500    | 547                      | NR            | 630    | 819                      | NR            | 760    | 36                       | NR            | 890    | 1                        | NR            |
| 375    | 0                        | NR            | 505    | 609                      | NR            | 635    | 784                      | NR            | 765    | 31                       | NR            | 895    | 1                        | NR            |
| 380    | 0                        | NR            | 510    | 652                      | NR            | 640    | 744                      | NR            | 770    | 27                       | NR            | 900    | 1                        | NR            |
| 385    | 1                        | NR            | 515    | 684                      | NR            | 645    | 697                      | NR            | 775    | 23                       | NR            | 905    | 0                        | NR            |
| 390    | 2                        | NR            | 520    | 702                      | NR            | 650    | 645                      | NR            | 780    | 20                       | NR            | 910    | 0                        | NR            |
| 395    | 4                        | NR            | 525    | 710                      | NR            | 655    | 594                      | NR            | 785    | 17                       | NR            | 915    | 0                        | NR            |
| 400    | 6                        | NR            | 530    | 718                      | NR            | 660    | 541                      | NR            | 790    | 14                       | NR            | 920    | 0                        | NR            |
| 405    | 9                        | NR            | 535    | 723                      | NR            | 665    | 491                      | NR            | 795    | 12                       | NR            | 925    | 0                        | NR            |
| 410    | 15                       | NR            | 540    | 729                      | NR            | 670    | 441                      | NR            | 800    | 11                       | NR            | 930    | 0                        | NR            |
| 415    | 26                       | NR            | 545    | 731                      | NR            | 675    | 395                      | NR            | 805    | 9                        | NR            | 935    | 0                        | NR            |
| 420    | 49                       | NR            | 550    | 731                      | NR            | 680    | 352                      | NR            | 810    | 8                        | NR            | 940    | 0                        | NR            |
| 425    | 95                       | NR            | 555    | 736                      | NR            | 685    | 312                      | NR            | 815    | 7                        | NR            | 945    | 0                        | NR            |
| 430    | 173                      | NR            | 560    | 740                      | NR            | 690    | 275                      | NR            | 820    | 6                        | NR            | 950    | 0                        | NR            |
| 435    | 305                      | NR            | 565    | 746                      | NR            | 695    | 241                      | NR            | 825    | 5                        | NR            | 955    | 0                        | NR            |
| 440    | 511                      | NR            | 570    | 757                      | NR            | 700    | 210                      | NR            | 830    | 4                        | NR            | 960    | 0                        | NR            |
| 445    | 811                      | NR            | 575    | 768                      | NR            | 705    | 184                      | NR            | 835    | 4                        | NR            | 965    | 0                        | NR            |
| 450    | 1000                     | NR            | 580    | 785                      | NR            | 710    | 159                      | NR            | 840    | 3                        | NR            | 970    | 0                        | NR            |
| 455    | 760                      | NR            | 585    | 803                      | NR            | 715    | 139                      | NR            | 845    | 3                        | NR            | 975    | 0                        | NR            |
| 460    | 496                      | NR            | 590    | 826                      | NR            | 720    | 120                      | NR            | 850    | 3                        | NR            | 980    | 0                        | NR            |
| 465    | 392                      | NR            | 595    | 848                      | NR            | 725    | 104                      | NR            | 855    | 2                        | NR            | 985    | 0                        | NR            |
| 470    | 302                      | NR            | 600    | 865                      | NR            | 730    | 89                       | NR            | 860    | 2                        | NR            | 990    | 0                        | NR            |
| 475    | 253                      | NR            | 605    | 879                      | NR            | 735    | 76                       | NR            | 865    | 2                        | NR            | 995    | 0                        | NR            |
| 480    | 269                      | NR            | 610    | 882                      | NR            | 740    | 65                       | NR            | 870    | 1                        | NR            | 1000   | 0                        | NR            |
| 485    | 319                      | NR            | 615    | 881                      | NR            | 745    | 55                       | NR            | 875    | 1                        | NR            |        |                          |               |

**Summary**

$R_f = 91.5$   
 $R_g = 100.3$   
 CIE  $R_a = 92.3$   
 $R_9 = 58.4$

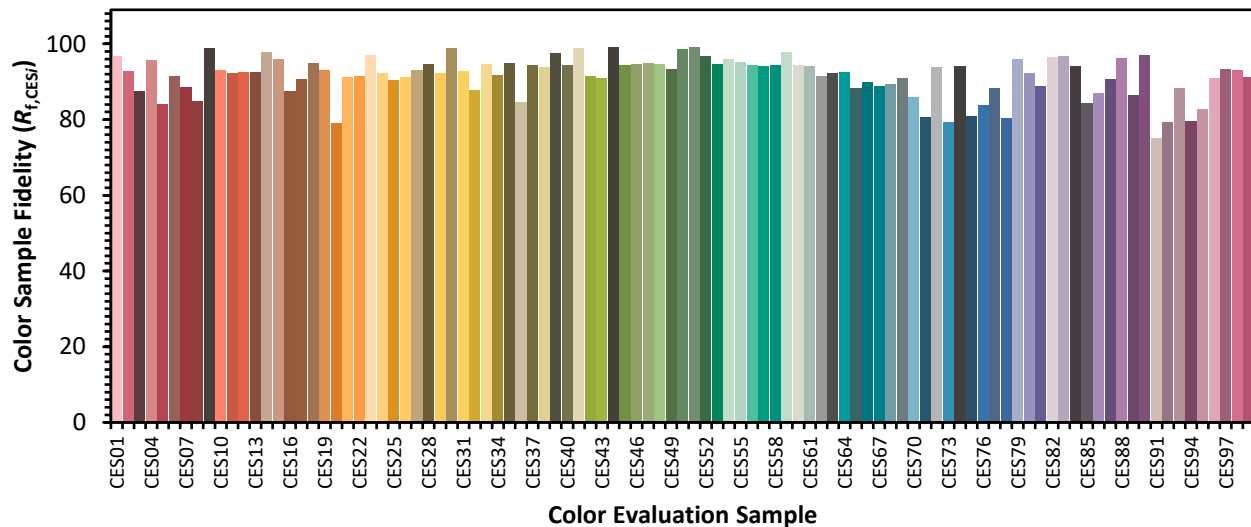


**Color Vector Graphics**

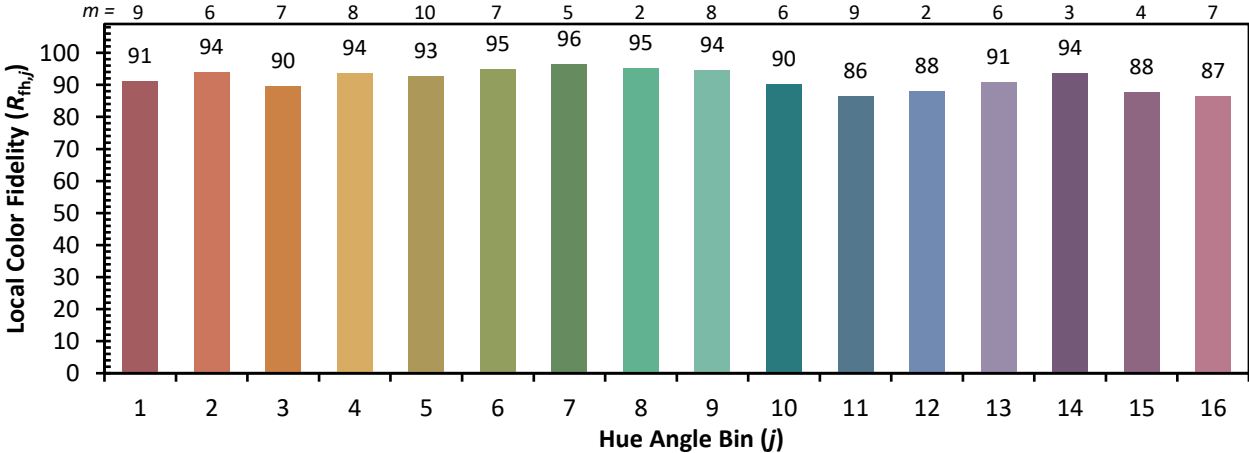
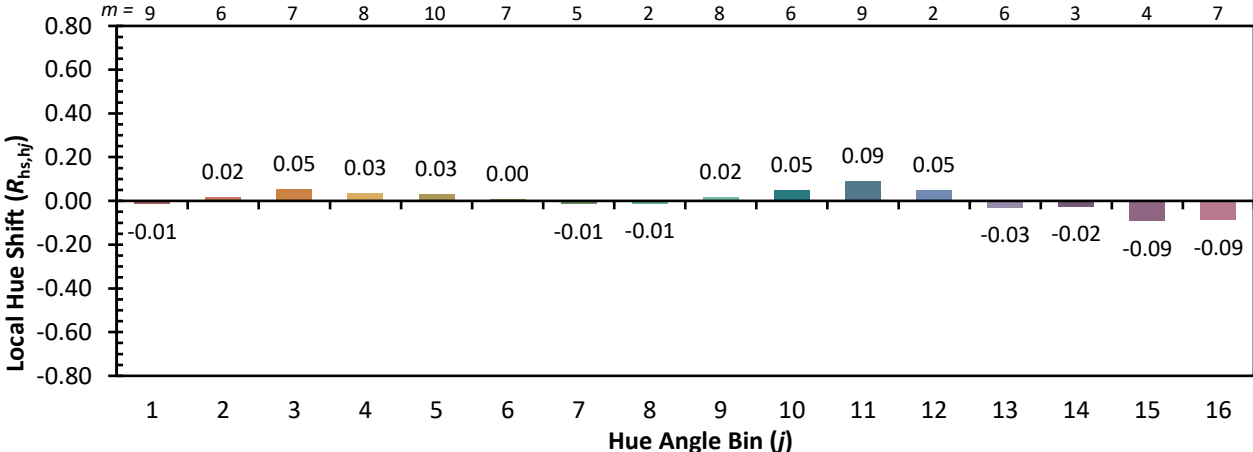
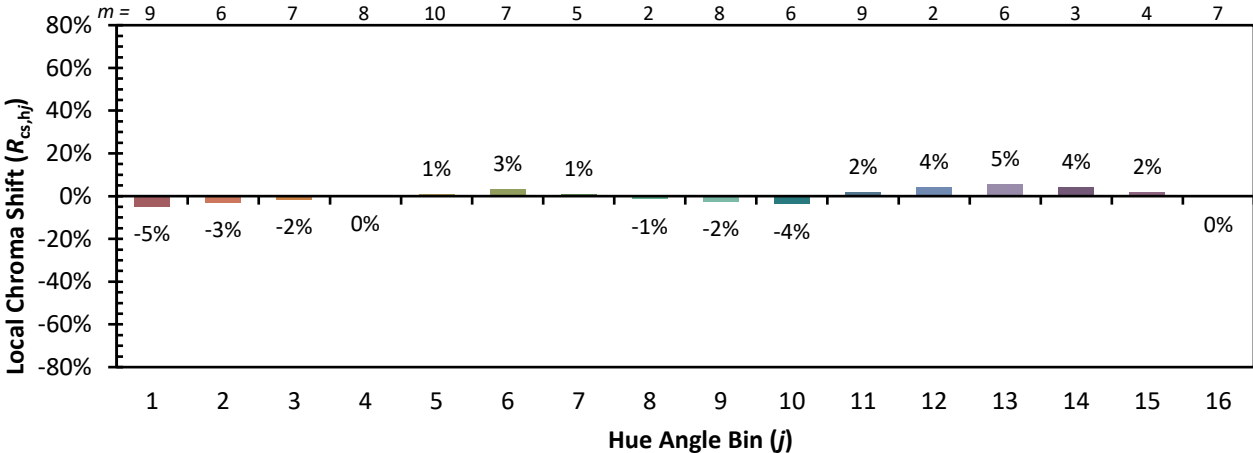


**Individual Sample Fidelity Index ( $R_{f,i}$ )**

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 91 | CES51 = 99 | CES76 = 84 |
| CES02 = 61 | CES27 = 93 | CES52 = 97 | CES77 = 88 |
| CES03 = 31 | CES28 = 95 | CES53 = 95 | CES78 = 80 |
| CES04 = 69 | CES29 = 92 | CES54 = 96 | CES79 = 96 |
| CES05 = 49 | CES30 = 99 | CES55 = 95 | CES80 = 92 |
| CES06 = 50 | CES31 = 93 | CES56 = 94 | CES81 = 89 |
| CES07 = 42 | CES32 = 88 | CES57 = 94 | CES82 = 96 |
| CES08 = 41 | CES33 = 95 | CES58 = 94 | CES83 = 97 |
| CES09 = 29 | CES34 = 92 | CES59 = 98 | CES84 = 94 |
| CES10 = 74 | CES35 = 95 | CES60 = 94 | CES85 = 84 |
| CES11 = 57 | CES36 = 85 | CES61 = 94 | CES86 = 87 |
| CES12 = 63 | CES37 = 94 | CES62 = 92 | CES87 = 91 |
| CES13 = 43 | CES38 = 94 | CES63 = 92 | CES88 = 96 |
| CES14 = 74 | CES39 = 98 | CES64 = 93 | CES89 = 87 |
| CES15 = 71 | CES40 = 94 | CES65 = 88 | CES90 = 97 |
| CES16 = 47 | CES41 = 99 | CES66 = 90 | CES91 = 75 |
| CES17 = 49 | CES42 = 91 | CES67 = 89 | CES92 = 79 |
| CES18 = 56 | CES43 = 91 | CES68 = 89 | CES93 = 88 |
| CES19 = 71 | CES44 = 99 | CES69 = 91 | CES94 = 80 |
| CES20 = 66 | CES45 = 94 | CES70 = 86 | CES95 = 83 |
| CES21 = 85 | CES46 = 95 | CES71 = 81 | CES96 = 91 |
| CES22 = 78 | CES47 = 95 | CES72 = 94 | CES97 = 93 |
| CES23 = 91 | CES48 = 95 | CES73 = 79 | CES98 = 93 |
| CES24 = 90 | CES49 = 93 | CES74 = 94 | CES99 = 91 |
| CES25 = 71 | CES50 = 99 | CES75 = 81 |            |

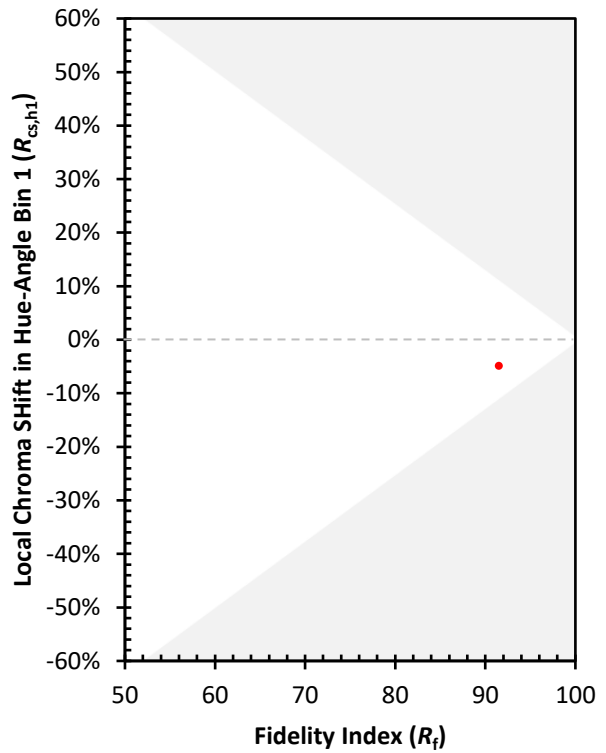
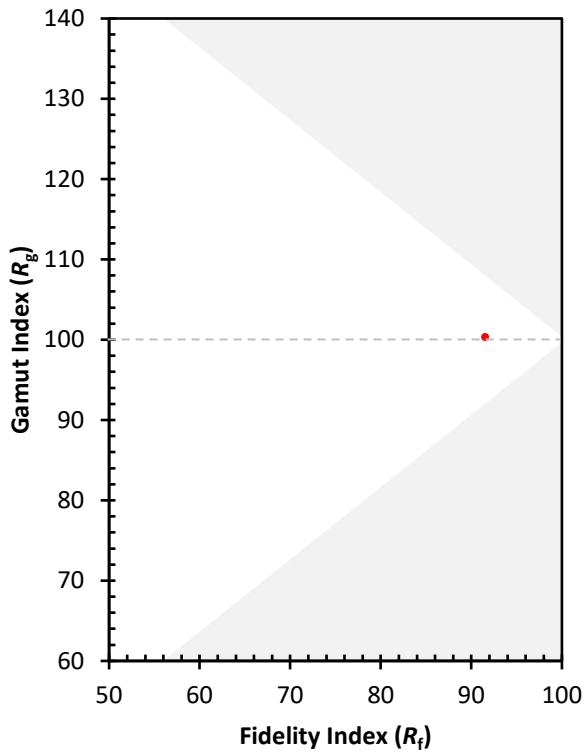


Color Rendition by Hue-Angle Bin





Measure Comparisons



(END OF REPORT)