

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: P1255090

Luminaire Tested: P3A17R359035DE010 E3PHLD1MW

Issue Date: 1/29/2026

**Test Information**

Test Method: LM-79-2019  
Report Number: P1255090  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G1-2510-583-20)  
Test Lab: INNOVATION CENTER  
Issue Date: 1/29/2026  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: IRiS  
Catalog Number: P3A17R359035DE010 E3PHLD1MW  
Description: 3in Adjustable LED luminaire with, R35 optic, 3500K CCT AND, 90CRI , E3PHLD1MW TRIM  
Light Source: -  
Ballast/Driver: -

**Summary**

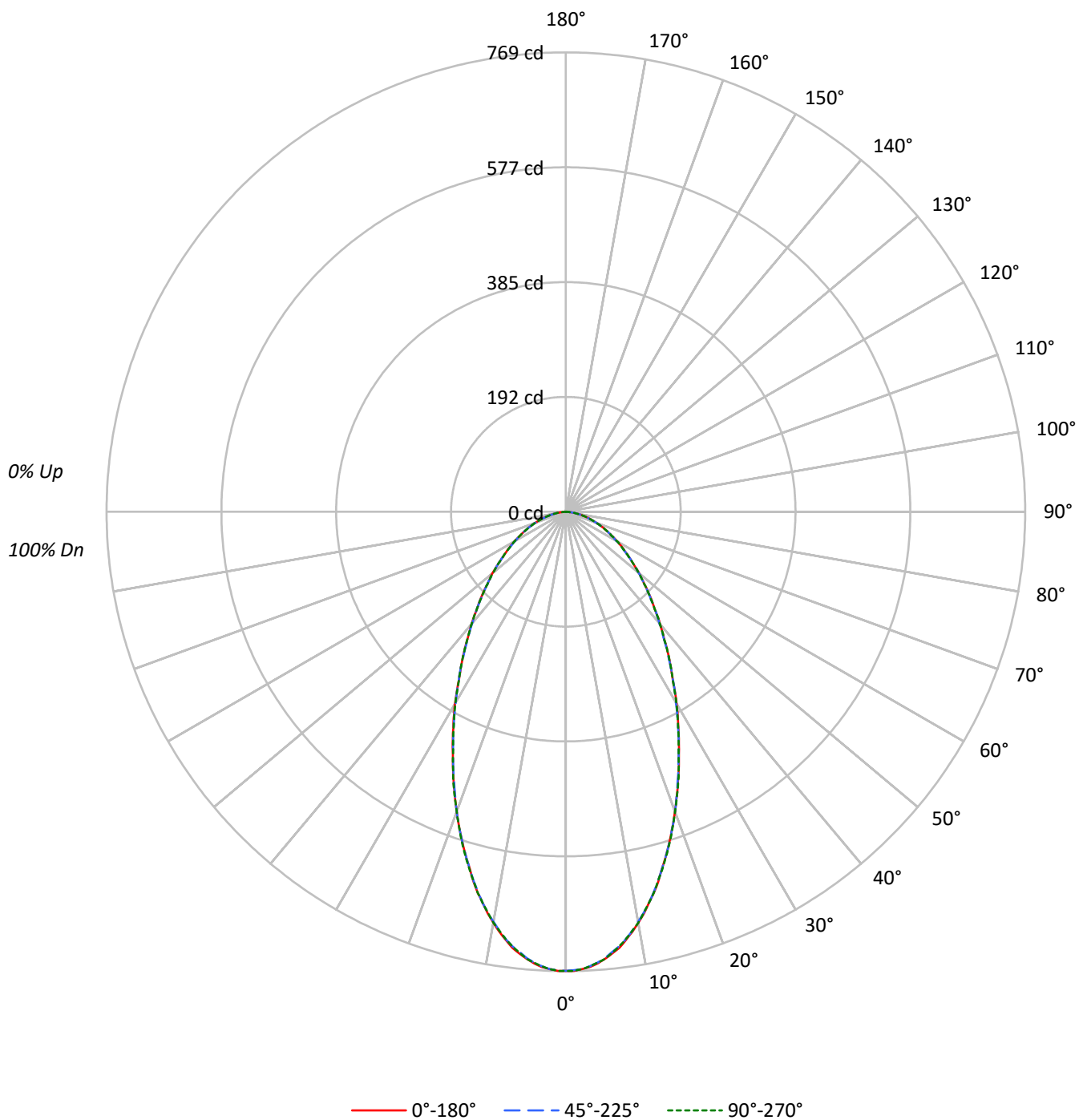
Lumens per Lamp: N/A  
Luminaire Lumens: 1027.0 lumens  
Efficiency: N/A  
Efficacy: 48.4 lumens/watt  
Spacing Criteria (0/90/45): 0.83 / 0.83 / 0.92  
Luminous Opening: Circular (Dia: 0.25' x H: 0')  
CIE Type: Direct

Input Watts (W): 21.2  
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: P1255090

CATALOG NUMBER: P3A17R359035DE010 E3PHLD1MW

### Luminous Intensity Polar Plot



TEST NUMBER: P1255090

CATALOG NUMBER: P3A17R359035DE010 E3PHLD1MW

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

|     |     |     |     |     |     |     |     |     |     |     |     |  |     |     |     |  |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|-----|-----|-----|--|-----|
| RF  | 20  |     |     |     | 20  |     |     |     | 20  |     |     |  | 20  |     |     |  | 20  |
| RC  | 80  |     |     |     | 70  |     |     |     | 50  |     |     |  | 30  |     |     |  | 0   |
| RW  | 70  | 50  | 30  | 10  | 70  | 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 |  | 100 |
| 1   | 111 | 107 | 103 | 100 | 108 | 105 | 101 | 99  | 100 | 98  | 95  |  | 97  | 95  | 93  |  | 88  |
| 2   | 103 | 96  | 90  | 85  | 100 | 94  | 89  | 84  | 90  | 86  | 82  |  | 87  | 84  | 81  |  | 77  |
| 3   | 95  | 86  | 79  | 74  | 93  | 85  | 78  | 73  | 82  | 76  | 72  |  | 79  | 75  | 71  |  | 68  |
| 4   | 88  | 78  | 71  | 65  | 86  | 77  | 70  | 65  | 75  | 68  | 64  |  | 72  | 67  | 63  |  | 60  |
| 5   | 82  | 71  | 64  | 58  | 80  | 70  | 63  | 58  | 68  | 62  | 57  |  | 66  | 61  | 56  |  | 54  |
| 6   | 77  | 65  | 58  | 52  | 75  | 65  | 57  | 52  | 63  | 56  | 51  |  | 61  | 55  | 51  |  | 49  |
| 7   | 72  | 60  | 53  | 47  | 71  | 60  | 52  | 47  | 58  | 52  | 47  |  | 57  | 51  | 46  |  | 44  |
| 8   | 68  | 56  | 48  | 43  | 66  | 55  | 48  | 43  | 54  | 47  | 43  |  | 53  | 47  | 43  |  | 41  |
| 9   | 64  | 52  | 45  | 40  | 63  | 51  | 44  | 40  | 50  | 44  | 39  |  | 49  | 44  | 39  |  | 38  |
| 10  | 60  | 49  | 42  | 37  | 59  | 48  | 41  | 37  | 47  | 41  | 37  |  | 46  | 41  | 36  |  | 35  |

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

|     | 0°     | 45°    | 90°    |
|-----|--------|--------|--------|
| 0°  | 168561 | 168561 | 168561 |
| 5°  | 165419 | 165133 | 165419 |
| 10° | 155530 | 155241 | 155530 |
| 15° | 140818 | 140818 | 141113 |
| 20° | 124634 | 124634 | 124634 |
| 25° | 108393 | 108079 | 108079 |
| 30° | 93964  | 93305  | 93635  |
| 35° | 80897  | 80549  | 80897  |
| 40° | 70189  | 69817  | 70189  |
| 45° | 61650  | 61247  | 61247  |
| 50° | 54719  | 54275  | 54275  |
| 55° | 48132  | 48132  | 48132  |
| 60° | 43593  | 43023  | 43593  |
| 65° | 39174  | 39174  | 39174  |
| 70° | 34814  | 34814  | 34814  |
| 75° | 31432  | 30331  | 31432  |
| 80° | 26771  | 26771  | 26771  |
| 85° | 16605  | 16605  | 16605  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 61650 cd/sqm

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CATALOG NUMBER: P3A17R359035DE010 E3PHLD1MW

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 69.9   | 6.8       |
| 10°-20°   | 173.0  | 16.8      |
| 20°-30°   | 205.6  | 20.0      |
| 30°-40°   | 188.9  | 18.4      |
| 40°-50°   | 153.4  | 14.9      |
| 50°-60°   | 113.5  | 11.1      |
| 60°-70°   | 75.0   | 7.3       |
| 70°-80°   | 38.9   | 3.8       |
| 80°-90°   | 8.7    | 0.9       |
| 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°    | 448.5  | 43.7      |
| 0°-40°    | 637.5  | 62.1      |
| 0°-60°    | 904.4  | 88.1      |
| 0°-90°    | 1027.0 | 100.0     |
| 90°-120°  | 0.0    | 0.0       |
| 90°-150°  | 0.0    | 0.0       |
| 90°-180°  | 0.0    | 0.0       |
| 0°-180°   | 1027.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|     | 0°  | 22.5° | 45° | 67.5° | 90° | Flux |
|-----|-----|-------|-----|-------|-----|------|
| 0°  | 769 | 769   | 769 | 769   | 769 |      |
| 5°  | 752 | 750   | 750 | 750   | 752 | 70   |
| 15° | 620 | 620   | 620 | 620   | 622 | 173  |
| 25° | 448 | 447   | 447 | 448   | 447 | 206  |
| 35° | 302 | 301   | 301 | 302   | 302 | 189  |
| 45° | 199 | 198   | 198 | 198   | 198 | 154  |
| 55° | 126 | 126   | 126 | 126   | 126 | 114  |
| 65° | 76  | 76    | 76  | 76    | 76  | 75   |
| 75° | 37  | 37    | 36  | 37    | 37  | 39   |
| 85° | 7   | 7     | 7   | 7     | 7   | 9    |
| 90° | 0   | 0     | 0   | 0     | 0   |      |

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**CANDELA DISTRIBUTION (FULL):**

|       | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|-------|-------|-------|-------|-------|-------|
| 0°    | 768.7 | 768.7 | 768.7 | 768.7 | 768.7 |
| 1°    | 768.7 | 767.4 | 767.4 | 767.4 | 768.7 |
| 2°    | 766.1 | 766.1 | 766.1 | 766.1 | 766.1 |
| 3°    | 763.4 | 762.1 | 762.1 | 762.1 | 762.1 |
| 4°    | 758.1 | 756.8 | 756.8 | 756.8 | 756.8 |
| 5°    | 751.5 | 750.2 | 750.2 | 750.2 | 751.5 |
| 6°    | 743.6 | 742.2 | 740.9 | 740.9 | 742.2 |
| 7°    | 735.6 | 733.0 | 733.0 | 733.0 | 733.0 |
| 8°    | 723.7 | 722.4 | 722.4 | 722.4 | 722.4 |
| 9°    | 711.8 | 709.1 | 710.4 | 710.4 | 710.4 |
| 10°   | 698.5 | 697.2 | 697.2 | 697.2 | 698.5 |
| 11°   | 685.2 | 683.9 | 683.9 | 682.6 | 683.9 |
| 12°   | 669.3 | 669.3 | 669.3 | 669.3 | 669.3 |
| 13°   | 654.8 | 653.4 | 653.4 | 653.4 | 654.8 |
| 14°   | 638.9 | 637.5 | 637.5 | 637.5 | 637.5 |
| 15°   | 620.3 | 620.3 | 620.3 | 620.3 | 621.6 |
| 17.5° | 577.9 | 576.6 | 577.9 | 577.9 | 579.2 |
| 20°   | 534.1 | 532.8 | 534.1 | 534.1 | 534.1 |
| 22.5° | 490.4 | 490.4 | 489.1 | 490.4 | 491.7 |
| 25°   | 448.0 | 446.7 | 446.7 | 448.0 | 446.7 |
| 27.5° | 408.2 | 406.9 | 406.9 | 406.9 | 406.9 |
| 30°   | 371.1 | 368.5 | 368.5 | 369.8 | 369.8 |
| 32.5° | 332.7 | 332.7 | 334.0 | 332.7 | 332.7 |
| 35°   | 302.2 | 300.9 | 300.9 | 302.2 | 302.2 |
| 37.5° | 271.7 | 270.4 | 270.4 | 271.7 | 271.7 |
| 40°   | 245.2 | 245.2 | 243.9 | 245.2 | 245.2 |
| 42.5° | 220.0 | 220.0 | 220.0 | 220.0 | 220.0 |
| 45°   | 198.8 | 197.5 | 197.5 | 197.5 | 197.5 |
| 47.5° | 177.6 | 177.6 | 177.6 | 176.3 | 177.6 |
| 50°   | 160.4 | 159.1 | 159.1 | 159.1 | 159.1 |
| 52.5° | 141.8 | 141.8 | 141.8 | 141.8 | 141.8 |
| 55°   | 125.9 | 125.9 | 125.9 | 125.9 | 125.9 |
| 57.5° | 112.7 | 111.3 | 111.3 | 111.3 | 111.3 |
| 60°   | 99.4  | 99.4  | 98.1  | 99.4  | 99.4  |
| 62.5° | 86.2  | 86.2  | 86.2  | 86.2  | 86.2  |
| 65°   | 75.5  | 75.5  | 75.5  | 75.5  | 75.5  |
| 67.5° | 64.9  | 64.9  | 64.9  | 64.9  | 64.9  |
| 70°   | 54.3  | 54.3  | 54.3  | 54.3  | 54.3  |
| 72.5° | 46.4  | 45.1  | 45.1  | 45.1  | 45.1  |
| 75°   | 37.1  | 37.1  | 35.8  | 37.1  | 37.1  |
| 77.5° | 27.8  | 27.8  | 27.8  | 27.8  | 27.8  |
| 80°   | 21.2  | 21.2  | 21.2  | 19.9  | 21.2  |
| 82.5° | 13.3  | 13.3  | 13.3  | 13.3  | 13.3  |
| 85°   | 6.6   | 6.6   | 6.6   | 6.6   | 6.6   |
| 87.5° | 1.3   | 1.3   | 1.3   | 2.7   | 2.7   |



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**CANDELA DISTRIBUTION (continued):**

|     | 0°  | 22.5° | 45° | 67.5° | 90° |
|-----|-----|-------|-----|-------|-----|
| 90° | 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: SP1-2504-409-24

Test Date: 05/15/2025

Luminaire Tested: LD3A17R159035D010 E3D1WH

Data in this report applies to families of products including LD3A

### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2504-409-24  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry:  $4\pi$   
 Issue Date: 09/15/2025  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: IRiS  
 Catalog Number: **LD3A17R159035D010 E3D1WH**  
 Description: 3in Adjustable LED luminaire with, R15 optic, 3500K CCT AND, 90CRI LEDS, E3D1WH TRIM

### Spectral Parameters

CCT (K): 3464  
 CIE  $u'$ : 0.2361  
 CIE  $v'$ : 0.5136  
 Duv: 0.0012  
 CIE x: 0.4086  
 CIE y: 0.3951  
 CIE z: 0.1963  
 Peak Wavelength (nm): 614  
 Dominant Wavelength (nm): 580  
 Purity: 41.2143  
 R<sub>f</sub>: 91.8  
 R<sub>g</sub>: 98.4

CRI (Ra): 92.8  
 R1: 93.1  
 R2: 95.9  
 R3: 98.0  
 R4: 94.1  
 R5: 92.9  
 R6: 95.0  
 R7: 92.5  
 R8: 81.1  
 R9: 53.9  
 R10: 89.9  
 R11: 95.7  
 R12: 78.6  
 R13: 94.0  
 R14: 98.5  
 R15: 88.0



REPORT NUMBER: SP1-2504-409-24

| 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           |

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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 3500K 4-step quadrangle

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### Photopic Flux vs. Wavelength



### Photopic Lumens: NR

| 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    | 358                      | NR            | 620    | 985                      | NR            | 750    | 62                       | NR            | 880    | 1                        | NR            |
| 365    | 0                        | NR            | 495    | 424                      | NR            | 625    | 960                      | NR            | 755    | 53                       | NR            | 885    | 1                        | NR            |
| 370    | 0                        | NR            | 500    | 486                      | NR            | 630    | 930                      | NR            | 760    | 46                       | NR            | 890    | 1                        | NR            |
| 375    | 0                        | NR            | 505    | 547                      | NR            | 635    | 889                      | NR            | 765    | 40                       | NR            | 895    | 1                        | NR            |
| 380    | 0                        | NR            | 510    | 590                      | NR            | 640    | 844                      | NR            | 770    | 34                       | NR            | 900    | 1                        | NR            |
| 385    | 0                        | NR            | 515    | 623                      | NR            | 645    | 792                      | NR            | 775    | 30                       | NR            | 905    | 1                        | NR            |
| 390    | 1                        | NR            | 520    | 645                      | NR            | 650    | 738                      | NR            | 780    | 25                       | NR            | 910    | 1                        | NR            |
| 395    | 2                        | NR            | 525    | 662                      | NR            | 655    | 681                      | NR            | 785    | 22                       | NR            | 915    | 1                        | NR            |
| 400    | 4                        | NR            | 530    | 671                      | NR            | 660    | 623                      | NR            | 790    | 19                       | NR            | 920    | 1                        | NR            |
| 405    | 7                        | NR            | 535    | 685                      | NR            | 665    | 568                      | NR            | 795    | 16                       | NR            | 925    | 1                        | NR            |
| 410    | 12                       | NR            | 540    | 693                      | NR            | 670    | 513                      | NR            | 800    | 14                       | NR            | 930    | 0                        | NR            |
| 415    | 22                       | NR            | 545    | 704                      | NR            | 675    | 461                      | NR            | 805    | 12                       | NR            | 935    | 0                        | NR            |
| 420    | 39                       | NR            | 550    | 712                      | NR            | 680    | 414                      | NR            | 810    | 10                       | NR            | 940    | 0                        | NR            |
| 425    | 70                       | NR            | 555    | 726                      | NR            | 685    | 368                      | NR            | 815    | 9                        | NR            | 945    | 0                        | NR            |
| 430    | 120                      | NR            | 560    | 740                      | NR            | 690    | 326                      | NR            | 820    | 8                        | NR            | 950    | 0                        | NR            |
| 435    | 200                      | NR            | 565    | 757                      | NR            | 695    | 288                      | NR            | 825    | 7                        | NR            | 955    | 0                        | NR            |
| 440    | 315                      | NR            | 570    | 782                      | NR            | 700    | 253                      | NR            | 830    | 6                        | NR            | 960    | 0                        | NR            |
| 445    | 475                      | NR            | 575    | 809                      | NR            | 705    | 222                      | NR            | 835    | 5                        | NR            | 965    | 0                        | NR            |
| 450    | 656                      | NR            | 580    | 844                      | NR            | 710    | 194                      | NR            | 840    | 4                        | NR            | 970    | 0                        | NR            |
| 455    | 697                      | NR            | 585    | 874                      | NR            | 715    | 169                      | NR            | 845    | 4                        | NR            | 975    | 0                        | NR            |
| 460    | 539                      | NR            | 590    | 911                      | NR            | 720    | 148                      | NR            | 850    | 3                        | NR            | 980    | 0                        | NR            |
| 465    | 408                      | NR            | 595    | 943                      | NR            | 725    | 128                      | NR            | 855    | 3                        | NR            | 985    | 0                        | NR            |
| 470    | 341                      | NR            | 600    | 968                      | NR            | 730    | 111                      | NR            | 860    | 2                        | NR            | 990    | 0                        | NR            |
| 475    | 291                      | NR            | 605    | 988                      | NR            | 735    | 95                       | NR            | 865    | 2                        | NR            | 995    | 0                        | NR            |
| 480    | 278                      | NR            | 610    | 996                      | NR            | 740    | 81                       | NR            | 870    | 2                        | NR            | 1000   | 0                        | NR            |
| 485    | 308                      | NR            | 615    | 998                      | NR            | 745    | 70                       | NR            | 875    | 2                        | NR            |        |                          |               |

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### Scotopic Flux vs. Wavelength



Scotopic Lumens: NR

S/P: 1.6

| 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       | 358                         | NR               | 620       | 985                         | NR               | 750       | 62                          | NR               | 880       | 1                           | NR               |
| 365       | 0                           | NR               | 495       | 424                         | NR               | 625       | 960                         | NR               | 755       | 53                          | NR               | 885       | 1                           | NR               |
| 370       | 0                           | NR               | 500       | 486                         | NR               | 630       | 930                         | NR               | 760       | 46                          | NR               | 890       | 1                           | NR               |
| 375       | 0                           | NR               | 505       | 547                         | NR               | 635       | 889                         | NR               | 765       | 40                          | NR               | 895       | 1                           | NR               |
| 380       | 0                           | NR               | 510       | 590                         | NR               | 640       | 844                         | NR               | 770       | 34                          | NR               | 900       | 1                           | NR               |
| 385       | 0                           | NR               | 515       | 623                         | NR               | 645       | 792                         | NR               | 775       | 30                          | NR               | 905       | 1                           | NR               |
| 390       | 1                           | NR               | 520       | 645                         | NR               | 650       | 738                         | NR               | 780       | 25                          | NR               | 910       | 1                           | NR               |
| 395       | 2                           | NR               | 525       | 662                         | NR               | 655       | 681                         | NR               | 785       | 22                          | NR               | 915       | 1                           | NR               |
| 400       | 4                           | NR               | 530       | 671                         | NR               | 660       | 623                         | NR               | 790       | 19                          | NR               | 920       | 1                           | NR               |
| 405       | 7                           | NR               | 535       | 685                         | NR               | 665       | 568                         | NR               | 795       | 16                          | NR               | 925       | 1                           | NR               |
| 410       | 12                          | NR               | 540       | 693                         | NR               | 670       | 513                         | NR               | 800       | 14                          | NR               | 930       | 0                           | NR               |
| 415       | 22                          | NR               | 545       | 704                         | NR               | 675       | 461                         | NR               | 805       | 12                          | NR               | 935       | 0                           | NR               |
| 420       | 39                          | NR               | 550       | 712                         | NR               | 680       | 414                         | NR               | 810       | 10                          | NR               | 940       | 0                           | NR               |
| 425       | 70                          | NR               | 555       | 726                         | NR               | 685       | 368                         | NR               | 815       | 9                           | NR               | 945       | 0                           | NR               |
| 430       | 120                         | NR               | 560       | 740                         | NR               | 690       | 326                         | NR               | 820       | 8                           | NR               | 950       | 0                           | NR               |
| 435       | 200                         | NR               | 565       | 757                         | NR               | 695       | 288                         | NR               | 825       | 7                           | NR               | 955       | 0                           | NR               |
| 440       | 315                         | NR               | 570       | 782                         | NR               | 700       | 253                         | NR               | 830       | 6                           | NR               | 960       | 0                           | NR               |
| 445       | 475                         | NR               | 575       | 809                         | NR               | 705       | 222                         | NR               | 835       | 5                           | NR               | 965       | 0                           | NR               |
| 450       | 656                         | NR               | 580       | 844                         | NR               | 710       | 194                         | NR               | 840       | 4                           | NR               | 970       | 0                           | NR               |
| 455       | 697                         | NR               | 585       | 874                         | NR               | 715       | 169                         | NR               | 845       | 4                           | NR               | 975       | 0                           | NR               |
| 460       | 539                         | NR               | 590       | 911                         | NR               | 720       | 148                         | NR               | 850       | 3                           | NR               | 980       | 0                           | NR               |
| 465       | 408                         | NR               | 595       | 943                         | NR               | 725       | 128                         | NR               | 855       | 3                           | NR               | 985       | 0                           | NR               |
| 470       | 341                         | NR               | 600       | 968                         | NR               | 730       | 111                         | NR               | 860       | 2                           | NR               | 990       | 0                           | NR               |
| 475       | 291                         | NR               | 605       | 988                         | NR               | 735       | 95                          | NR               | 865       | 2                           | NR               | 995       | 0                           | NR               |
| 480       | 278                         | NR               | 610       | 996                         | NR               | 740       | 81                          | NR               | 870       | 2                           | NR               | 1000      | 0                           | NR               |
| 485       | 308                         | NR               | 615       | 998                         | NR               | 745       | 70                          | NR               | 875       | 2                           | NR               |           |                             |                  |

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### Melanopic Flux vs. Wavelength


**Melanopic Lumens: NR**
**M/P: 3.22**

| $\lambda$<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               | 358                                    | NR                             | 620               | 985                                    | NR                             | 750               | 62                                     | NR                             | 880               | 1                                      | NR                             |
| 365               | 0                                      | NR                             | 495               | 424                                    | NR                             | 625               | 960                                    | NR                             | 755               | 53                                     | NR                             | 885               | 1                                      | NR                             |
| 370               | 0                                      | NR                             | 500               | 486                                    | NR                             | 630               | 930                                    | NR                             | 760               | 46                                     | NR                             | 890               | 1                                      | NR                             |
| 375               | 0                                      | NR                             | 505               | 547                                    | NR                             | 635               | 889                                    | NR                             | 765               | 40                                     | NR                             | 895               | 1                                      | NR                             |
| 380               | 0                                      | NR                             | 510               | 590                                    | NR                             | 640               | 844                                    | NR                             | 770               | 34                                     | NR                             | 900               | 1                                      | NR                             |
| 385               | 0                                      | NR                             | 515               | 623                                    | NR                             | 645               | 792                                    | NR                             | 775               | 30                                     | NR                             | 905               | 1                                      | NR                             |
| 390               | 1                                      | NR                             | 520               | 645                                    | NR                             | 650               | 738                                    | NR                             | 780               | 25                                     | NR                             | 910               | 1                                      | NR                             |
| 395               | 2                                      | NR                             | 525               | 662                                    | NR                             | 655               | 681                                    | NR                             | 785               | 22                                     | NR                             | 915               | 1                                      | NR                             |
| 400               | 4                                      | NR                             | 530               | 671                                    | NR                             | 660               | 623                                    | NR                             | 790               | 19                                     | NR                             | 920               | 1                                      | NR                             |
| 405               | 7                                      | NR                             | 535               | 685                                    | NR                             | 665               | 568                                    | NR                             | 795               | 16                                     | NR                             | 925               | 1                                      | NR                             |
| 410               | 12                                     | NR                             | 540               | 693                                    | NR                             | 670               | 513                                    | NR                             | 800               | 14                                     | NR                             | 930               | 0                                      | NR                             |
| 415               | 22                                     | NR                             | 545               | 704                                    | NR                             | 675               | 461                                    | NR                             | 805               | 12                                     | NR                             | 935               | 0                                      | NR                             |
| 420               | 39                                     | NR                             | 550               | 712                                    | NR                             | 680               | 414                                    | NR                             | 810               | 10                                     | NR                             | 940               | 0                                      | NR                             |
| 425               | 70                                     | NR                             | 555               | 726                                    | NR                             | 685               | 368                                    | NR                             | 815               | 9                                      | NR                             | 945               | 0                                      | NR                             |
| 430               | 120                                    | NR                             | 560               | 740                                    | NR                             | 690               | 326                                    | NR                             | 820               | 8                                      | NR                             | 950               | 0                                      | NR                             |
| 435               | 200                                    | NR                             | 565               | 757                                    | NR                             | 695               | 288                                    | NR                             | 825               | 7                                      | NR                             | 955               | 0                                      | NR                             |
| 440               | 315                                    | NR                             | 570               | 782                                    | NR                             | 700               | 253                                    | NR                             | 830               | 6                                      | NR                             | 960               | 0                                      | NR                             |
| 445               | 475                                    | NR                             | 575               | 809                                    | NR                             | 705               | 222                                    | NR                             | 835               | 5                                      | NR                             | 965               | 0                                      | NR                             |
| 450               | 656                                    | NR                             | 580               | 844                                    | NR                             | 710               | 194                                    | NR                             | 840               | 4                                      | NR                             | 970               | 0                                      | NR                             |
| 455               | 697                                    | NR                             | 585               | 874                                    | NR                             | 715               | 169                                    | NR                             | 845               | 4                                      | NR                             | 975               | 0                                      | NR                             |
| 460               | 539                                    | NR                             | 590               | 911                                    | NR                             | 720               | 148                                    | NR                             | 850               | 3                                      | NR                             | 980               | 0                                      | NR                             |
| 465               | 408                                    | NR                             | 595               | 943                                    | NR                             | 725               | 128                                    | NR                             | 855               | 3                                      | NR                             | 985               | 0                                      | NR                             |
| 470               | 341                                    | NR                             | 600               | 968                                    | NR                             | 730               | 111                                    | NR                             | 860               | 2                                      | NR                             | 990               | 0                                      | NR                             |
| 475               | 291                                    | NR                             | 605               | 988                                    | NR                             | 735               | 95                                     | NR                             | 865               | 2                                      | NR                             | 995               | 0                                      | NR                             |
| 480               | 278                                    | NR                             | 610               | 996                                    | NR                             | 740               | 81                                     | NR                             | 870               | 2                                      | NR                             | 1000              | 0                                      | NR                             |
| 485               | 308                                    | NR                             | 615               | 998                                    | NR                             | 745               | 70                                     | NR                             | 875               | 2                                      | NR                             |                   |                                        |                                |

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TM-30-18

### Summary

$R_f = 91.8$   
 $R_g = 98.4$   
 $CIE R_a = 92.8$   
 $R_9 = 53.9$



### Color Vector Graphics



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 95 | CES51 = 98 | CES76 = 89 |
| CES02 = 62 | CES27 = 92 | CES52 = 99 | CES77 = 90 |
| CES03 = 31 | CES28 = 97 | CES53 = 98 | CES78 = 86 |
| CES04 = 70 | CES29 = 97 | CES54 = 93 | CES79 = 94 |
| CES05 = 49 | CES30 = 93 | CES55 = 92 | CES80 = 93 |
| CES06 = 51 | CES31 = 97 | CES56 = 95 | CES81 = 84 |
| CES07 = 42 | CES32 = 92 | CES57 = 94 | CES82 = 97 |
| CES08 = 41 | CES33 = 99 | CES58 = 94 | CES83 = 97 |
| CES09 = 29 | CES34 = 96 | CES59 = 97 | CES84 = 95 |
| CES10 = 75 | CES35 = 97 | CES60 = 93 | CES85 = 83 |
| CES11 = 58 | CES36 = 83 | CES61 = 93 | CES86 = 83 |
| CES12 = 64 | CES37 = 97 | CES62 = 88 | CES87 = 92 |
| CES13 = 43 | CES38 = 88 | CES63 = 93 | CES88 = 96 |
| CES14 = 74 | CES39 = 98 | CES64 = 91 | CES89 = 86 |
| CES15 = 71 | CES40 = 96 | CES65 = 88 | CES90 = 96 |
| CES16 = 47 | CES41 = 97 | CES66 = 89 | CES91 = 76 |
| CES17 = 49 | CES42 = 96 | CES67 = 88 | CES92 = 78 |
| CES18 = 56 | CES43 = 96 | CES68 = 90 | CES93 = 87 |
| CES19 = 71 | CES44 = 99 | CES69 = 91 | CES94 = 78 |
| CES20 = 66 | CES45 = 98 | CES70 = 88 | CES95 = 83 |
| CES21 = 86 | CES46 = 97 | CES71 = 83 | CES96 = 91 |
| CES22 = 78 | CES47 = 95 | CES72 = 95 | CES97 = 96 |
| CES23 = 91 | CES48 = 91 | CES73 = 83 | CES98 = 94 |
| CES24 = 90 | CES49 = 96 | CES74 = 92 | CES99 = 90 |
| CES25 = 71 | CES50 = 98 | CES75 = 84 |            |



### Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)