

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



Scaled data based on original data using  
LM-79-2019 Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Test Report Prepared for  
Cooper Lighting Solutions

Brand: METALUX

Report Number: P975320

Luminaire Tested: 22EN-LD2-25-UNV-L935-CD1

Issue Date: 03/13/2025

**Test Information**

Test Method: LM-79-2019  
Report Number: P975320  
Test Lab: INNOVATION CENTER(P3)  
Issue Date: 03/13/2025  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: METALUX  
Catalog Number: 22EN-LD2-25-UNV-L935-CD1  
Description: METALUX ENCOUNTER 2x2 2500LM PACKAGE 90CRI 3500K STANDARD TROFFER  
Light Source: 3500K CCT, 90 CRI LEDS  
Ballast/Driver: -

**Summary**

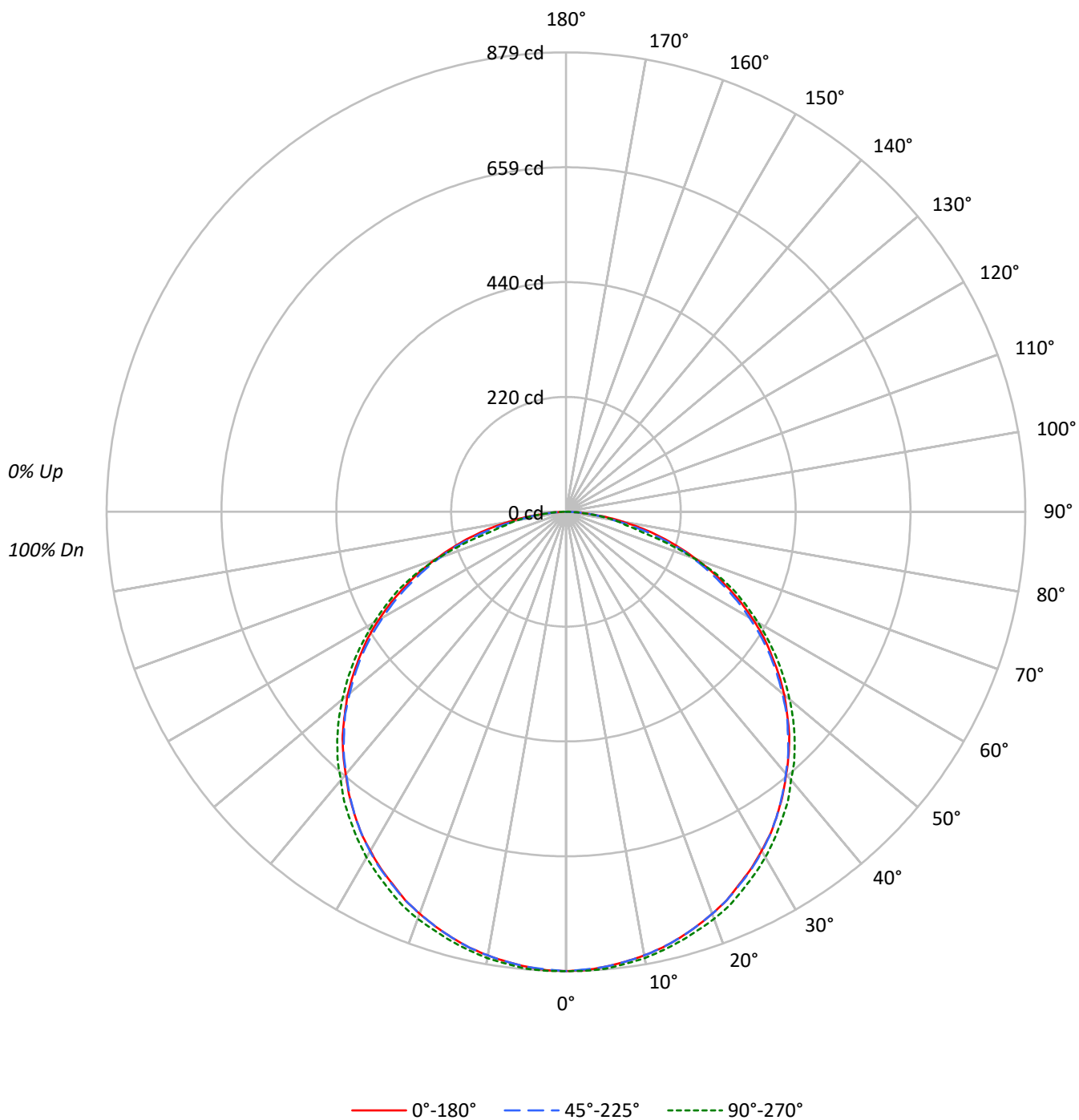
Lumens per Lamp: N/A  
Luminaire Lumens: 2594.9 lumens  
Efficiency: N/A  
Efficacy: 129.7 lumens/watt  
Spacing Criteria (0/90/45): 1.27 / 1.29 / 1.39  
Luminous Opening: Rectangular (W 1.67' x L: 1.83' x H: 0')  
CIE Type: Direct

Input Watts (W): 20  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT

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### Luminous Intensity Polar Plot



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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 | 100 |    |    |
| 1   | 109 | 104 | 99  | 95  | 106 | 101 | 98  | 94  | 97  | 94  | 91  | 93  | 91  | 88  | 90  | 88  | 86  | 83  |    |    |
| 2   | 99  | 90  | 83  | 77  | 96  | 88  | 82  | 76  | 85  | 79  | 75  | 81  | 77  | 73  | 78  | 75  | 71  | 69  |    |    |
| 3   | 90  | 79  | 71  | 64  | 87  | 77  | 70  | 63  | 74  | 68  | 62  | 72  | 66  | 61  | 69  | 64  | 60  | 58  |    |    |
| 4   | 82  | 70  | 61  | 54  | 80  | 68  | 60  | 54  | 66  | 59  | 53  | 64  | 57  | 52  | 61  | 56  | 51  | 49  |    |    |
| 5   | 75  | 62  | 53  | 46  | 73  | 61  | 53  | 46  | 59  | 51  | 46  | 57  | 50  | 45  | 55  | 49  | 45  | 42  |    |    |
| 6   | 69  | 56  | 47  | 40  | 68  | 55  | 46  | 40  | 53  | 46  | 40  | 51  | 45  | 39  | 50  | 44  | 39  | 37  |    |    |
| 7   | 64  | 51  | 42  | 36  | 63  | 50  | 41  | 35  | 48  | 41  | 35  | 47  | 40  | 35  | 45  | 39  | 35  | 33  |    |    |
| 8   | 60  | 46  | 38  | 32  | 58  | 45  | 37  | 32  | 44  | 37  | 31  | 43  | 36  | 31  | 42  | 36  | 31  | 29  |    |    |
| 9   | 56  | 42  | 34  | 28  | 54  | 42  | 34  | 28  | 41  | 33  | 28  | 39  | 33  | 28  | 38  | 32  | 28  | 26  |    |    |
| 10  | 52  | 39  | 31  | 26  | 51  | 39  | 31  | 26  | 38  | 30  | 26  | 37  | 30  | 25  | 36  | 30  | 25  | 24  |    |    |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3096 | 3096 | 3096 |
| 5°  | 3090 | 3090 | 3104 |
| 10° | 3083 | 3083 | 3102 |
| 15° | 3076 | 3076 | 3100 |
| 20° | 3069 | 3069 | 3108 |
| 25° | 3054 | 3059 | 3105 |
| 30° | 3047 | 3052 | 3105 |
| 35° | 3035 | 3035 | 3096 |
| 40° | 3015 | 3009 | 3082 |
| 45° | 3011 | 2992 | 3083 |
| 50° | 2988 | 2960 | 3061 |
| 55° | 2954 | 2922 | 3035 |
| 60° | 2916 | 2851 | 2990 |
| 65° | 2837 | 2760 | 2946 |
| 70° | 2735 | 2652 | 2693 |
| 75° | 2577 | 2413 | 2058 |
| 80° | 2266 | 1893 | 1972 |
| 85° | 1645 | 1597 | 1540 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 45°

Luminance: 3083 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 83.1   | 3.2       |
| 10°-20°   | 238.6  | 9.2       |
| 20°-30°   | 364.3  | 14.0      |
| 30°-40°   | 443.7  | 17.1      |
| 40°-50°   | 467.0  | 18.0      |
| 50°-60°   | 430.0  | 16.6      |
| 60°-70°   | 334.7  | 12.9      |
| 70°-80°   | 185.8  | 7.2       |
| 80°-90°   | 47.7   | 1.8       |
| 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°    | 686.0  | 26.4      |
| 0°-40°    | 1129.7 | 43.5      |
| 0°-60°    | 2026.7 | 78.1      |
| 0°-90°    | 2594.9 | 100.0     |
| 90°-120°  | 0.0    | 0.0       |
| 90°-150°  | 0.0    | 0.0       |
| 90°-180°  | 0.0    | 0.0       |
| 0°-180°   | 2594.9 | 100.0     |

**CANDELA DISTRIBUTION:**

|     | 0°  | 22.5° | 45° | 67.5° | 90° | Flux |
|-----|-----|-------|-----|-------|-----|------|
| 0°  | 879 | 879   | 879 | 879   | 879 |      |
| 5°  | 874 | 874   | 874 | 876   | 878 | 83   |
| 15° | 844 | 844   | 844 | 848   | 850 | 238  |
| 25° | 786 | 787   | 787 | 794   | 799 | 363  |
| 35° | 706 | 706   | 706 | 714   | 720 | 442  |
| 45° | 604 | 600   | 600 | 610   | 619 | 465  |
| 55° | 481 | 480   | 476 | 484   | 494 | 430  |
| 65° | 340 | 336   | 331 | 342   | 353 | 337  |
| 75° | 189 | 185   | 177 | 158   | 151 | 199  |
| 85° | 41  | 38    | 40  | 38    | 38  | 51   |
| 90° | 0   | 0     | 0   | 0     | 0   |      |



TEST NUMBER: P975320

CATALOG NUMBER: 22EN-LD2-25-UNV-L935-CD1

**CANDELA DISTRIBUTION (FULL):**

|       | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|-------|-------|-------|-------|-------|-------|
| 0°    | 879.0 | 879.0 | 879.0 | 879.0 | 879.0 |
| 2.5°  | 877.8 | 876.4 | 876.4 | 879.0 | 879.0 |
| 5°    | 873.8 | 873.8 | 873.8 | 876.4 | 877.8 |
| 7.5°  | 868.5 | 868.5 | 868.5 | 872.4 | 872.4 |
| 10°   | 862.0 | 860.7 | 862.0 | 864.6 | 867.2 |
| 12.5° | 854.1 | 852.7 | 854.1 | 856.7 | 859.3 |
| 15°   | 843.5 | 843.5 | 843.5 | 847.5 | 850.1 |
| 17.5° | 831.7 | 830.4 | 831.7 | 835.7 | 839.7 |
| 20°   | 818.6 | 818.6 | 818.6 | 823.8 | 829.1 |
| 22.5° | 804.2 | 802.8 | 804.2 | 810.8 | 816.0 |
| 25°   | 785.7 | 787.1 | 787.1 | 793.6 | 798.9 |
| 27.5° | 768.7 | 767.3 | 769.9 | 775.3 | 781.9 |
| 30°   | 749.0 | 749.0 | 750.3 | 756.9 | 763.4 |
| 32.5° | 729.2 | 728.0 | 729.2 | 735.8 | 742.4 |
| 35°   | 705.7 | 705.7 | 705.7 | 713.5 | 720.0 |
| 37.5° | 681.9 | 680.6 | 680.6 | 688.5 | 697.7 |
| 40°   | 655.6 | 654.4 | 654.4 | 663.6 | 670.2 |
| 42.5° | 630.7 | 629.5 | 629.5 | 637.3 | 646.5 |
| 45°   | 604.4 | 600.5 | 600.5 | 609.7 | 618.9 |
| 47.5° | 574.2 | 571.6 | 572.9 | 580.8 | 590.0 |
| 50°   | 545.3 | 541.3 | 540.1 | 549.3 | 558.5 |
| 52.5° | 513.8 | 512.4 | 508.5 | 516.4 | 526.9 |
| 55°   | 480.9 | 479.7 | 475.7 | 483.5 | 494.1 |
| 57.5° | 449.4 | 445.4 | 441.4 | 448.0 | 459.9 |
| 60°   | 413.9 | 409.9 | 404.7 | 413.9 | 424.4 |
| 62.5° | 378.4 | 373.2 | 369.2 | 377.1 | 388.9 |
| 65°   | 340.3 | 336.3 | 331.1 | 341.7 | 353.4 |
| 67.5° | 304.8 | 301.0 | 294.4 | 303.6 | 311.4 |
| 70°   | 265.5 | 260.1 | 257.5 | 258.9 | 261.5 |
| 72.5° | 227.4 | 224.6 | 220.8 | 210.2 | 207.6 |
| 75°   | 189.3 | 185.3 | 177.3 | 157.7 | 151.2 |
| 77.5° | 151.2 | 148.4 | 134.0 | 116.9 | 116.9 |
| 80°   | 111.7 | 110.3 | 93.3  | 95.9  | 97.2  |
| 82.5° | 76.2  | 73.6  | 68.4  | 67.0  | 67.0  |
| 85°   | 40.7  | 38.1  | 39.5  | 38.1  | 38.1  |
| 87.5° | 15.8  | 15.8  | 17.1  | 15.8  | 15.8  |
| 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

Metalux

Report Number: SP1-2506-457-2

Test Date: 07/10/2025

Luminaire Tested: 14EN-LD2-51-UNV-L935-CD1-U

Data in this report applies to families of products including 14EN-LD2-51-UNV-L935-CD1-U

### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2506-457-2  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry:  $4\pi$   
 Issue Date: 07/15/2025  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: Metalux  
 Catalog Number: **14EN-LD2-51-UNV-L935-CD1-U**  
 Description: 1x4 ENCOUNTER 5100LM WITH LIGHTNING BOARDS

### Spectral Parameters

CCT (K): 3351  
 CIE  $u'$ : 0.2401  
 CIE  $v'$ : 0.5129  
 Duv: -0.0010  
 CIE x: 0.4127  
 CIE y: 0.3919  
 CIE z: 0.1954  
 Peak Wavelength (nm): 630  
 Dominant Wavelength (nm): 581  
 Purity: 41.49069  
 R<sub>f</sub>: 91.3  
 R<sub>g</sub>: 99.9

CRI (Ra): 93.4  
 R1: 94.4  
 R2: 96.7  
 R3: 97.5  
 R4: 94.5  
 R5: 94.2  
 R6: 95.5  
 R7: 91.8  
 R8: 82.4  
 R9: 57.9  
 R10: 91.0  
 R11: 95.6  
 R12: 80.9  
 R13: 95.0  
 R14: 97.9  
 R15: 90.2



### Test Conditions

Stabilization Time: 28M  
 Operation Time: 1H 28M  
 Sphere Temperature (°C): 24.0

REPORT NUMBER: SP1-2506-457-2

| 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<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       | 140                         | NR               | 620       | 345                         | NR               | 750       | 8                           | NR               | 880       | 0                           | NR               |
| 365       | 0                           | NR               | 495       | 166                         | NR               | 625       | 344                         | NR               | 755       | 7                           | NR               | 885       | 0                           | NR               |
| 370       | 0                           | NR               | 500       | 190                         | NR               | 630       | 1000                        | NR               | 760       | 6                           | NR               | 890       | 0                           | NR               |
| 375       | 0                           | NR               | 505       | 208                         | NR               | 635       | 658                         | NR               | 765       | 5                           | NR               | 895       | 0                           | NR               |
| 380       | 0                           | NR               | 510       | 221                         | NR               | 640       | 232                         | NR               | 770       | 4                           | NR               | 900       | 0                           | NR               |
| 385       | 0                           | NR               | 515       | 230                         | NR               | 645       | 222                         | NR               | 775       | 4                           | NR               | 905       | 0                           | NR               |
| 390       | 1                           | NR               | 520       | 235                         | NR               | 650       | 194                         | NR               | 780       | 3                           | NR               | 910       | 0                           | NR               |
| 395       | 1                           | NR               | 525       | 241                         | NR               | 655       | 165                         | NR               | 785       | 3                           | NR               | 915       | 0                           | NR               |
| 400       | 2                           | NR               | 530       | 246                         | NR               | 660       | 141                         | NR               | 790       | 2                           | NR               | 920       | 0                           | NR               |
| 405       | 3                           | NR               | 535       | 254                         | NR               | 665       | 120                         | NR               | 795       | 2                           | NR               | 925       | 0                           | NR               |
| 410       | 5                           | NR               | 540       | 262                         | NR               | 670       | 109                         | NR               | 800       | 2                           | NR               | 930       | 0                           | NR               |
| 415       | 8                           | NR               | 545       | 269                         | NR               | 675       | 90                          | NR               | 805       | 1                           | NR               | 935       | 0                           | NR               |
| 420       | 14                          | NR               | 550       | 279                         | NR               | 680       | 77                          | NR               | 810       | 1                           | NR               | 940       | 0                           | NR               |
| 425       | 25                          | NR               | 555       | 288                         | NR               | 685       | 66                          | NR               | 815       | 1                           | NR               | 945       | 0                           | NR               |
| 430       | 42                          | NR               | 560       | 297                         | NR               | 690       | 57                          | NR               | 820       | 1                           | NR               | 950       | 0                           | NR               |
| 435       | 71                          | NR               | 565       | 305                         | NR               | 695       | 49                          | NR               | 825       | 1                           | NR               | 955       | 0                           | NR               |
| 440       | 117                         | NR               | 570       | 313                         | NR               | 700       | 42                          | NR               | 830       | 1                           | NR               | 960       | 0                           | NR               |
| 445       | 211                         | NR               | 575       | 320                         | NR               | 705       | 35                          | NR               | 835       | 1                           | NR               | 965       | 0                           | NR               |
| 450       | 316                         | NR               | 580       | 327                         | NR               | 710       | 30                          | NR               | 840       | 1                           | NR               | 970       | 0                           | NR               |
| 455       | 265                         | NR               | 585       | 334                         | NR               | 715       | 25                          | NR               | 845       | 1                           | NR               | 975       | 0                           | NR               |
| 460       | 175                         | NR               | 590       | 340                         | NR               | 720       | 21                          | NR               | 850       | 0                           | NR               | 980       | 0                           | NR               |
| 465       | 149                         | NR               | 595       | 342                         | NR               | 725       | 17                          | NR               | 855       | 0                           | NR               | 985       | 0                           | NR               |
| 470       | 122                         | NR               | 600       | 345                         | NR               | 730       | 14                          | NR               | 860       | 0                           | NR               | 990       | 0                           | NR               |
| 475       | 99                          | NR               | 605       | 346                         | NR               | 735       | 12                          | NR               | 865       | 0                           | NR               | 995       | 0                           | NR               |
| 480       | 103                         | NR               | 610       | 371                         | NR               | 740       | 11                          | NR               | 870       | 0                           | NR               | 1000      | 0                           | NR               |
| 485       | 120                         | NR               | 615       | 390                         | NR               | 745       | 9                           | NR               | 875       | 0                           | NR               |           |                             |                  |

REPORT NUMBER: SP1-2506-457-2

### Scotopic Flux vs. Wavelength



Scotopic Lumens: NR

S/P: 1.57

| 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       | 140                         | NR               | 620       | 345                         | NR               | 750       | 8                           | NR               | 880       | 0                           | NR               |
| 365       | 0                           | NR               | 495       | 166                         | NR               | 625       | 344                         | NR               | 755       | 7                           | NR               | 885       | 0                           | NR               |
| 370       | 0                           | NR               | 500       | 190                         | NR               | 630       | 1000                        | NR               | 760       | 6                           | NR               | 890       | 0                           | NR               |
| 375       | 0                           | NR               | 505       | 208                         | NR               | 635       | 658                         | NR               | 765       | 5                           | NR               | 895       | 0                           | NR               |
| 380       | 0                           | NR               | 510       | 221                         | NR               | 640       | 232                         | NR               | 770       | 4                           | NR               | 900       | 0                           | NR               |
| 385       | 0                           | NR               | 515       | 230                         | NR               | 645       | 222                         | NR               | 775       | 4                           | NR               | 905       | 0                           | NR               |
| 390       | 1                           | NR               | 520       | 235                         | NR               | 650       | 194                         | NR               | 780       | 3                           | NR               | 910       | 0                           | NR               |
| 395       | 1                           | NR               | 525       | 241                         | NR               | 655       | 165                         | NR               | 785       | 3                           | NR               | 915       | 0                           | NR               |
| 400       | 2                           | NR               | 530       | 246                         | NR               | 660       | 141                         | NR               | 790       | 2                           | NR               | 920       | 0                           | NR               |
| 405       | 3                           | NR               | 535       | 254                         | NR               | 665       | 120                         | NR               | 795       | 2                           | NR               | 925       | 0                           | NR               |
| 410       | 5                           | NR               | 540       | 262                         | NR               | 670       | 109                         | NR               | 800       | 2                           | NR               | 930       | 0                           | NR               |
| 415       | 8                           | NR               | 545       | 269                         | NR               | 675       | 90                          | NR               | 805       | 1                           | NR               | 935       | 0                           | NR               |
| 420       | 14                          | NR               | 550       | 279                         | NR               | 680       | 77                          | NR               | 810       | 1                           | NR               | 940       | 0                           | NR               |
| 425       | 25                          | NR               | 555       | 288                         | NR               | 685       | 66                          | NR               | 815       | 1                           | NR               | 945       | 0                           | NR               |
| 430       | 42                          | NR               | 560       | 297                         | NR               | 690       | 57                          | NR               | 820       | 1                           | NR               | 950       | 0                           | NR               |
| 435       | 71                          | NR               | 565       | 305                         | NR               | 695       | 49                          | NR               | 825       | 1                           | NR               | 955       | 0                           | NR               |
| 440       | 117                         | NR               | 570       | 313                         | NR               | 700       | 42                          | NR               | 830       | 1                           | NR               | 960       | 0                           | NR               |
| 445       | 211                         | NR               | 575       | 320                         | NR               | 705       | 35                          | NR               | 835       | 1                           | NR               | 965       | 0                           | NR               |
| 450       | 316                         | NR               | 580       | 327                         | NR               | 710       | 30                          | NR               | 840       | 1                           | NR               | 970       | 0                           | NR               |
| 455       | 265                         | NR               | 585       | 334                         | NR               | 715       | 25                          | NR               | 845       | 1                           | NR               | 975       | 0                           | NR               |
| 460       | 175                         | NR               | 590       | 340                         | NR               | 720       | 21                          | NR               | 850       | 0                           | NR               | 980       | 0                           | NR               |
| 465       | 149                         | NR               | 595       | 342                         | NR               | 725       | 17                          | NR               | 855       | 0                           | NR               | 985       | 0                           | NR               |
| 470       | 122                         | NR               | 600       | 345                         | NR               | 730       | 14                          | NR               | 860       | 0                           | NR               | 990       | 0                           | NR               |
| 475       | 99                          | NR               | 605       | 346                         | NR               | 735       | 12                          | NR               | 865       | 0                           | NR               | 995       | 0                           | NR               |
| 480       | 103                         | NR               | 610       | 371                         | NR               | 740       | 11                          | NR               | 870       | 0                           | NR               | 1000      | 0                           | NR               |
| 485       | 120                         | NR               | 615       | 390                         | NR               | 745       | 9                           | NR               | 875       | 0                           | NR               |           |                             |                  |

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### Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 3.16

| 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       | 140                         | NR               | 620       | 345                         | NR               | 750       | 8                           | NR               | 880       | 0                           | NR               |
| 365       | 0                           | NR               | 495       | 166                         | NR               | 625       | 344                         | NR               | 755       | 7                           | NR               | 885       | 0                           | NR               |
| 370       | 0                           | NR               | 500       | 190                         | NR               | 630       | 1000                        | NR               | 760       | 6                           | NR               | 890       | 0                           | NR               |
| 375       | 0                           | NR               | 505       | 208                         | NR               | 635       | 658                         | NR               | 765       | 5                           | NR               | 895       | 0                           | NR               |
| 380       | 0                           | NR               | 510       | 221                         | NR               | 640       | 232                         | NR               | 770       | 4                           | NR               | 900       | 0                           | NR               |
| 385       | 0                           | NR               | 515       | 230                         | NR               | 645       | 222                         | NR               | 775       | 4                           | NR               | 905       | 0                           | NR               |
| 390       | 1                           | NR               | 520       | 235                         | NR               | 650       | 194                         | NR               | 780       | 3                           | NR               | 910       | 0                           | NR               |
| 395       | 1                           | NR               | 525       | 241                         | NR               | 655       | 165                         | NR               | 785       | 3                           | NR               | 915       | 0                           | NR               |
| 400       | 2                           | NR               | 530       | 246                         | NR               | 660       | 141                         | NR               | 790       | 2                           | NR               | 920       | 0                           | NR               |
| 405       | 3                           | NR               | 535       | 254                         | NR               | 665       | 120                         | NR               | 795       | 2                           | NR               | 925       | 0                           | NR               |
| 410       | 5                           | NR               | 540       | 262                         | NR               | 670       | 109                         | NR               | 800       | 2                           | NR               | 930       | 0                           | NR               |
| 415       | 8                           | NR               | 545       | 269                         | NR               | 675       | 90                          | NR               | 805       | 1                           | NR               | 935       | 0                           | NR               |
| 420       | 14                          | NR               | 550       | 279                         | NR               | 680       | 77                          | NR               | 810       | 1                           | NR               | 940       | 0                           | NR               |
| 425       | 25                          | NR               | 555       | 288                         | NR               | 685       | 66                          | NR               | 815       | 1                           | NR               | 945       | 0                           | NR               |
| 430       | 42                          | NR               | 560       | 297                         | NR               | 690       | 57                          | NR               | 820       | 1                           | NR               | 950       | 0                           | NR               |
| 435       | 71                          | NR               | 565       | 305                         | NR               | 695       | 49                          | NR               | 825       | 1                           | NR               | 955       | 0                           | NR               |
| 440       | 117                         | NR               | 570       | 313                         | NR               | 700       | 42                          | NR               | 830       | 1                           | NR               | 960       | 0                           | NR               |
| 445       | 211                         | NR               | 575       | 320                         | NR               | 705       | 35                          | NR               | 835       | 1                           | NR               | 965       | 0                           | NR               |
| 450       | 316                         | NR               | 580       | 327                         | NR               | 710       | 30                          | NR               | 840       | 1                           | NR               | 970       | 0                           | NR               |
| 455       | 265                         | NR               | 585       | 334                         | NR               | 715       | 25                          | NR               | 845       | 1                           | NR               | 975       | 0                           | NR               |
| 460       | 175                         | NR               | 590       | 340                         | NR               | 720       | 21                          | NR               | 850       | 0                           | NR               | 980       | 0                           | NR               |
| 465       | 149                         | NR               | 595       | 342                         | NR               | 725       | 17                          | NR               | 855       | 0                           | NR               | 985       | 0                           | NR               |
| 470       | 122                         | NR               | 600       | 345                         | NR               | 730       | 14                          | NR               | 860       | 0                           | NR               | 990       | 0                           | NR               |
| 475       | 99                          | NR               | 605       | 346                         | NR               | 735       | 12                          | NR               | 865       | 0                           | NR               | 995       | 0                           | NR               |
| 480       | 103                         | NR               | 610       | 371                         | NR               | 740       | 11                          | NR               | 870       | 0                           | NR               | 1000      | 0                           | NR               |
| 485       | 120                         | NR               | 615       | 390                         | NR               | 745       | 9                           | NR               | 875       | 0                           | NR               |           |                             |                  |

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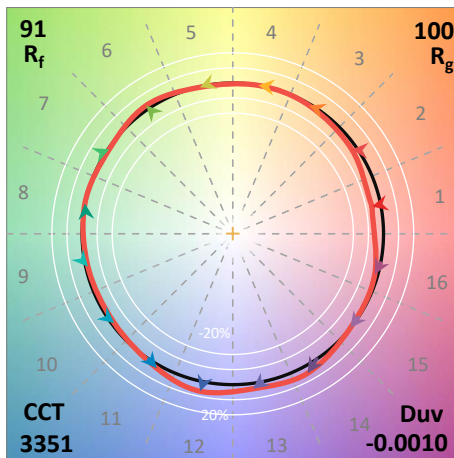
TM-30-18

### Summary

$R_f = 91.3$   
 $R_g = 99.9$   
 $CIE R_a = 93.4$   
 $R_9 = 57.9$



### Color Vector Graphics



**Individual Sample Fidelity Index ( $R_{fi}$ )**

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 93 | CES51 = 98 | CES76 = 88 |
| CES02 = 63 | CES27 = 93 | CES52 = 98 | CES77 = 87 |
| CES03 = 31 | CES28 = 96 | CES53 = 97 | CES78 = 85 |
| CES04 = 70 | CES29 = 95 | CES54 = 95 | CES79 = 91 |
| CES05 = 50 | CES30 = 96 | CES55 = 94 | CES80 = 92 |
| CES06 = 51 | CES31 = 95 | CES56 = 96 | CES81 = 75 |
| CES07 = 43 | CES32 = 87 | CES57 = 95 | CES82 = 96 |
| CES08 = 41 | CES33 = 97 | CES58 = 96 | CES83 = 94 |
| CES09 = 29 | CES34 = 94 | CES59 = 97 | CES84 = 95 |
| CES10 = 75 | CES35 = 96 | CES60 = 94 | CES85 = 80 |
| CES11 = 58 | CES36 = 84 | CES61 = 93 | CES86 = 79 |
| CES12 = 64 | CES37 = 95 | CES62 = 90 | CES87 = 91 |
| CES13 = 44 | CES38 = 91 | CES63 = 94 | CES88 = 97 |
| CES14 = 74 | CES39 = 98 | CES64 = 92 | CES89 = 83 |
| CES15 = 72 | CES40 = 96 | CES65 = 90 | CES90 = 97 |
| CES16 = 48 | CES41 = 97 | CES66 = 91 | CES91 = 77 |
| CES17 = 49 | CES42 = 94 | CES67 = 90 | CES92 = 76 |
| CES18 = 56 | CES43 = 93 | CES68 = 89 | CES93 = 86 |
| CES19 = 71 | CES44 = 99 | CES69 = 91 | CES94 = 73 |
| CES20 = 67 | CES45 = 96 | CES70 = 87 | CES95 = 83 |
| CES21 = 86 | CES46 = 96 | CES71 = 84 | CES96 = 91 |
| CES22 = 78 | CES47 = 91 | CES72 = 94 | CES97 = 95 |
| CES23 = 91 | CES48 = 93 | CES73 = 82 | CES98 = 94 |
| CES24 = 90 | CES49 = 95 | CES74 = 91 | CES99 = 91 |
| CES25 = 71 | CES50 = 99 | CES75 = 86 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)