

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: P975145

Luminaire Tested: 12EN-LD2-08-UNV-L850-CD1

Issue Date: 03/13/2025

**Test Information**

Test Method: LM-79-2019  
Report Number: P975145  
Test Lab: INNOVATION CENTER(P3)  
Issue Date: 03/13/2025  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: METALUX  
Catalog Number: 12EN-LD2-08-UNV-L850-CD1  
Description: METALUX ENCOUNTER 1x2 800LM PACKAGE 80CRI 5000K TROFFER  
Light Source: 5000K CCT, 80+ CRI LEDS  
Ballast/Driver: -

**Summary**

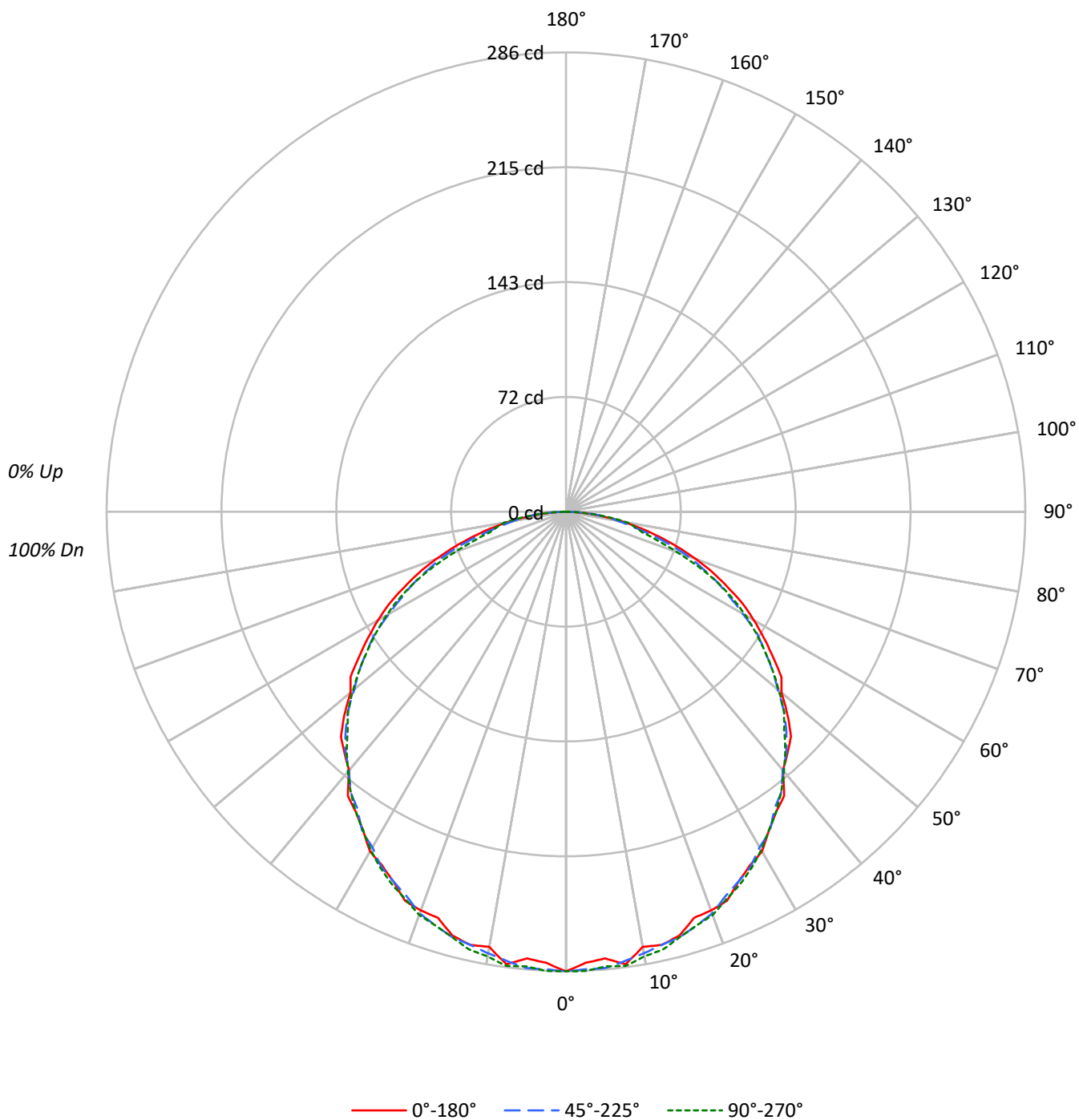
Lumens per Lamp: N/A  
Luminaire Lumens: 831.9 lumens  
Efficiency: N/A  
Efficacy: 84.0 lumens/watt  
Spacing Criteria (0/90/45): 1.26 / 1.26 / 1.38  
Luminous Opening: Rectangular (W 1' x L: 2' x H: 0')  
CIE Type: Direct

Input Watts (W): 9.9  
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: 25 FT

TEST NUMBER: P975145

CATALOG NUMBER: 12EN-LD2-08-UNV-L850-CD1

### Luminous Intensity Polar Plot



TEST NUMBER: P975145

CATALOG NUMBER: 12EN-LD2-08-UNV-L850-CD1

**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   | 109 | 104 | 99  | 95  | 106 | 101 | 97  | 94  | 97  | 94  | 91  |  | 93  | 90  | 88  |  | 90  | 87  | 85  | 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  | 69  | 60  | 54  | 66  | 59  | 53  |  | 64  | 57  | 52  |  | 61  | 56  | 52  | 49  |
| 5   | 75  | 62  | 53  | 46  | 73  | 61  | 53  | 46  | 59  | 52  | 46  |  | 57  | 50  | 45  |  | 55  | 49  | 45  | 43  |
| 6   | 70  | 56  | 47  | 40  | 68  | 55  | 47  | 40  | 53  | 46  | 40  |  | 52  | 45  | 40  |  | 50  | 44  | 39  | 37  |
| 7   | 64  | 51  | 42  | 36  | 63  | 50  | 42  | 36  | 48  | 41  | 35  |  | 47  | 40  | 35  |  | 46  | 39  | 35  | 33  |
| 8   | 60  | 46  | 38  | 32  | 58  | 46  | 37  | 32  | 44  | 37  | 31  |  | 43  | 36  | 31  |  | 42  | 36  | 31  | 29  |
| 9   | 56  | 42  | 34  | 29  | 55  | 42  | 34  | 28  | 41  | 33  | 28  |  | 40  | 33  | 28  |  | 39  | 32  | 28  | 26  |
| 10  | 53  | 39  | 31  | 26  | 51  | 39  | 31  | 26  | 38  | 31  | 26  |  | 37  | 30  | 26  |  | 36  | 30  | 25  | 24  |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1540 | 1540 | 1540 |
| 5°  | 1508 | 1540 | 1535 |
| 10° | 1503 | 1525 | 1536 |
| 15° | 1522 | 1527 | 1527 |
| 20° | 1513 | 1524 | 1530 |
| 25° | 1509 | 1509 | 1521 |
| 30° | 1517 | 1498 | 1511 |
| 35° | 1499 | 1486 | 1499 |
| 40° | 1476 | 1476 | 1483 |
| 45° | 1508 | 1477 | 1462 |
| 50° | 1466 | 1441 | 1449 |
| 55° | 1474 | 1418 | 1418 |
| 60° | 1454 | 1368 | 1390 |
| 65° | 1415 | 1326 | 1326 |
| 70° | 1353 | 1275 | 1164 |
| 75° | 1248 | 1123 | 1019 |
| 80° | 1116 | 1023 | 1209 |
| 85° | 926  | 1050 | 988  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 1508 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 27.0   | 3.3       |
| 10°-20°   | 77.2   | 9.3       |
| 20°-30°   | 117.6  | 14.1      |
| 30°-40°   | 142.5  | 17.1      |
| 40°-50°   | 149.4  | 18.0      |
| 50°-60°   | 136.7  | 16.4      |
| 60°-70°   | 104.5  | 12.6      |
| 70°-80°   | 58.7   | 7.1       |
| 80°-90°   | 18.3   | 2.2       |
| 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°    | 221.9  | 26.7      |
| 0°-40°    | 364.3  | 43.8      |
| 0°-60°    | 650.5  | 78.2      |
| 0°-90°    | 831.9  | 100.0     |
| 90°-120°  | 0.0    | 0.0       |
| 90°-150°  | 0.0    | 0.0       |
| 90°-180°  | 0.0    | 0.0       |
| 0°-180°   | 831.9  | 100.0     |

**CANDELA DISTRIBUTION:**

|     | 0°  | 22.5° | 45° | 67.5° | 90° | Flux |
|-----|-----|-------|-----|-------|-----|------|
| 0°  | 286 | 286   | 286 | 286   | 286 |      |
| 5°  | 279 | 284   | 285 | 287   | 284 | 27   |
| 15° | 273 | 273   | 274 | 274   | 274 | 77   |
| 25° | 254 | 255   | 254 | 256   | 256 | 118  |
| 35° | 228 | 227   | 226 | 228   | 228 | 143  |
| 45° | 198 | 195   | 194 | 192   | 192 | 151  |
| 55° | 157 | 155   | 151 | 151   | 151 | 140  |
| 65° | 111 | 108   | 104 | 103   | 104 | 110  |
| 75° | 60  | 58    | 54  | 50    | 49  | 64   |
| 85° | 15  | 15    | 17  | 16    | 16  | 17   |
| 90° | 0   | 0     | 0   | 0     | 0   |      |

TEST NUMBER: P975145

CATALOG NUMBER: 12EN-LD2-08-UNV-L850-CD1

**CANDELA DISTRIBUTION (FULL):**

|       | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|-------|-------|-------|-------|-------|-------|
| 0°    | 286.1 | 286.1 | 286.1 | 286.1 | 286.1 |
| 2.5°  | 281.1 | 285.1 | 285.1 | 287.2 | 286.1 |
| 5°    | 279.1 | 284.1 | 285.1 | 287.2 | 284.1 |
| 7.5°  | 284.1 | 283.1 | 282.1 | 284.1 | 285.1 |
| 10°   | 275.1 | 279.1 | 279.1 | 284.1 | 281.1 |
| 12.5° | 276.1 | 277.1 | 276.1 | 276.1 | 279.1 |
| 15°   | 273.1 | 273.1 | 274.1 | 274.1 | 274.1 |
| 17.5° | 265.1 | 269.1 | 270.1 | 271.1 | 270.1 |
| 20°   | 264.1 | 265.1 | 266.1 | 267.1 | 267.1 |
| 22.5° | 262.1 | 260.1 | 259.1 | 263.1 | 261.1 |
| 25°   | 254.1 | 255.1 | 254.1 | 256.1 | 256.1 |
| 27.5° | 248.1 | 248.1 | 249.1 | 248.1 | 250.1 |
| 30°   | 244.1 | 243.1 | 241.1 | 243.1 | 243.1 |
| 32.5° | 235.1 | 236.1 | 236.1 | 235.1 | 235.1 |
| 35°   | 228.1 | 227.1 | 226.1 | 228.1 | 228.1 |
| 37.5° | 223.1 | 218.1 | 220.1 | 219.1 | 220.1 |
| 40°   | 210.1 | 213.1 | 210.1 | 210.1 | 211.1 |
| 42.5° | 204.1 | 203.1 | 203.1 | 202.1 | 202.1 |
| 45°   | 198.1 | 195.1 | 194.1 | 192.1 | 192.1 |
| 47.5° | 187.1 | 187.1 | 184.1 | 182.1 | 184.1 |
| 50°   | 175.1 | 176.1 | 172.1 | 171.1 | 173.1 |
| 52.5° | 169.1 | 166.1 | 162.1 | 163.1 | 162.1 |
| 55°   | 157.1 | 155.1 | 151.1 | 151.1 | 151.1 |
| 57.5° | 146.1 | 145.1 | 141.1 | 140.1 | 140.1 |
| 60°   | 135.1 | 133.1 | 127.1 | 128.1 | 129.1 |
| 62.5° | 124.1 | 121.1 | 115.1 | 117.1 | 117.1 |
| 65°   | 111.1 | 108.1 | 104.1 | 103.1 | 104.1 |
| 67.5° | 99.1  | 95.0  | 92.0  | 91.0  | 89.0  |
| 70°   | 86.0  | 84.0  | 81.0  | 75.0  | 74.0  |
| 72.5° | 73.0  | 70.0  | 68.0  | 61.0  | 60.0  |
| 75°   | 60.0  | 58.0  | 54.0  | 50.0  | 49.0  |
| 77.5° | 48.0  | 47.0  | 42.0  | 42.0  | 44.0  |
| 80°   | 36.0  | 35.0  | 33.0  | 37.0  | 39.0  |
| 82.5° | 25.0  | 24.0  | 27.0  | 28.0  | 28.0  |
| 85°   | 15.0  | 15.0  | 17.0  | 16.0  | 16.0  |
| 87.5° | 6.0   | 7.0   | 7.0   | 8.0   | 8.0   |
| 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: SP1-2506-457-4

Test Date: 07/15/2025

Luminaire Tested: 14EN-LD2-51-UNV-L950-CD1-U

Data in this report applies to families of products including 14EN-LD2-51-UNV-L950-CD1-U

### Test Information

Test Method: LM-79-2019  
 Report Number: SP1-2506-457-4  
 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-L950-CD1-U**  
 Description: 1x4 ENCOUNTER 5100LM WITH LIGHTNING BOARDS

### Spectral Parameters

CCT (K): 4838  
 CIE  $u'$ : 0.2122  
 CIE  $v'$ : 0.4888  
 Duv: 0.0015  
 CIE x: 0.3502  
 CIE y: 0.3586  
 CIE z: 0.2912  
 Peak Wavelength (nm): 630  
 Dominant Wavelength (nm): 573  
 Purity: 12.68613  
 R<sub>f</sub>: 91.2  
 R<sub>g</sub>: 100.8

CRI (Ra): 93.6  
 R1: 94.4  
 R2: 94.8  
 R3: 93.6  
 R4: 94.8  
 R5: 93.3  
 R6: 91.9  
 R7: 95.9  
 R8: 89.8  
 R9: 69.6  
 R10: 86.3  
 R11: 94.3  
 R12: 70.2  
 R13: 94.4  
 R14: 96.0  
 R15: 92.2



### Test Conditions

Stabilization Time: M  
 Operation Time: 1H 0M  
 Sphere Temperature (°C): 25.0

REPORT NUMBER: SP1-2506-457-4

| 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 5000K 4-step quadrangle

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### Photopic Flux vs. Wavelength

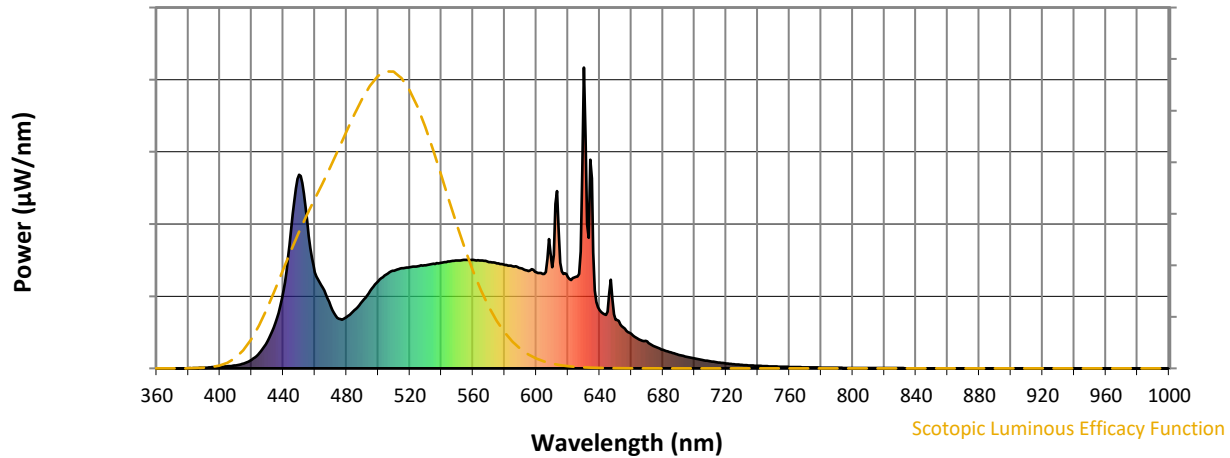


### Photopic Lumens: NR

| 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       | 223                         | NR               | 620       | 303                         | NR               | 750       | 6                           | NR               | 880       | 0                           | NR               |
| 365       | 0                           | NR               | 495       | 258                         | NR               | 625       | 305                         | NR               | 755       | 5                           | NR               | 885       | 0                           | NR               |
| 370       | 0                           | NR               | 500       | 290                         | NR               | 630       | 1000                        | NR               | 760       | 5                           | NR               | 890       | 0                           | NR               |
| 375       | 0                           | NR               | 505       | 311                         | NR               | 635       | 631                         | NR               | 765       | 4                           | NR               | 895       | 0                           | NR               |
| 380       | 0                           | NR               | 510       | 325                         | NR               | 640       | 194                         | NR               | 770       | 4                           | NR               | 900       | 0                           | NR               |
| 385       | 1                           | NR               | 515       | 333                         | NR               | 645       | 188                         | NR               | 775       | 3                           | NR               | 905       | 0                           | NR               |
| 390       | 2                           | NR               | 520       | 336                         | NR               | 650       | 162                         | NR               | 780       | 3                           | NR               | 910       | 0                           | NR               |
| 395       | 4                           | NR               | 525       | 340                         | NR               | 655       | 136                         | NR               | 785       | 2                           | NR               | 915       | 0                           | NR               |
| 400       | 5                           | NR               | 530       | 343                         | NR               | 660       | 115                         | NR               | 790       | 2                           | NR               | 920       | 0                           | NR               |
| 405       | 7                           | NR               | 535       | 348                         | NR               | 665       | 96                          | NR               | 795       | 2                           | NR               | 925       | 0                           | NR               |
| 410       | 10                          | NR               | 540       | 352                         | NR               | 670       | 89                          | NR               | 800       | 1                           | NR               | 930       | 0                           | NR               |
| 415       | 16                          | NR               | 545       | 356                         | NR               | 675       | 72                          | NR               | 805       | 1                           | NR               | 935       | 0                           | NR               |
| 420       | 28                          | NR               | 550       | 358                         | NR               | 680       | 62                          | NR               | 810       | 1                           | NR               | 940       | 0                           | NR               |
| 425       | 52                          | NR               | 555       | 361                         | NR               | 685       | 53                          | NR               | 815       | 1                           | NR               | 945       | 0                           | NR               |
| 430       | 89                          | NR               | 560       | 361                         | NR               | 690       | 45                          | NR               | 820       | 1                           | NR               | 950       | 0                           | NR               |
| 435       | 151                         | NR               | 565       | 359                         | NR               | 695       | 39                          | NR               | 825       | 1                           | NR               | 955       | 0                           | NR               |
| 440       | 256                         | NR               | 570       | 354                         | NR               | 700       | 33                          | NR               | 830       | 1                           | NR               | 960       | 0                           | NR               |
| 445       | 462                         | NR               | 575       | 349                         | NR               | 705       | 28                          | NR               | 835       | 1                           | NR               | 965       | 0                           | NR               |
| 450       | 643                         | NR               | 580       | 344                         | NR               | 710       | 23                          | NR               | 840       | 0                           | NR               | 970       | 0                           | NR               |
| 455       | 492                         | NR               | 585       | 339                         | NR               | 715       | 20                          | NR               | 845       | 0                           | NR               | 975       | 0                           | NR               |
| 460       | 319                         | NR               | 590       | 333                         | NR               | 720       | 16                          | NR               | 850       | 0                           | NR               | 980       | 0                           | NR               |
| 465       | 269                         | NR               | 595       | 324                         | NR               | 725       | 14                          | NR               | 855       | 0                           | NR               | 985       | 0                           | NR               |
| 470       | 207                         | NR               | 600       | 319                         | NR               | 730       | 11                          | NR               | 860       | 0                           | NR               | 990       | 0                           | NR               |
| 475       | 165                         | NR               | 605       | 314                         | NR               | 735       | 10                          | NR               | 865       | 0                           | NR               | 995       | 0                           | NR               |
| 480       | 171                         | NR               | 610       | 336                         | NR               | 740       | 8                           | NR               | 870       | 0                           | NR               | 1000      | 0                           | NR               |
| 485       | 194                         | NR               | 615       | 351                         | NR               | 745       | 7                           | NR               | 875       | 0                           | NR               |           |                             |                  |

REPORT NUMBER: SP1-2506-457-4

### Scotopic Flux vs. Wavelength



Scotopic Lumens: NR

S/P: 2.02

| 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    | 223                      | NR            | 620    | 303                      | NR            | 750    | 6                        | NR            | 880    | 0                        | NR            |
| 365    | 0                        | NR            | 495    | 258                      | NR            | 625    | 305                      | NR            | 755    | 5                        | NR            | 885    | 0                        | NR            |
| 370    | 0                        | NR            | 500    | 290                      | NR            | 630    | 1000                     | NR            | 760    | 5                        | NR            | 890    | 0                        | NR            |
| 375    | 0                        | NR            | 505    | 311                      | NR            | 635    | 631                      | NR            | 765    | 4                        | NR            | 895    | 0                        | NR            |
| 380    | 0                        | NR            | 510    | 325                      | NR            | 640    | 194                      | NR            | 770    | 4                        | NR            | 900    | 0                        | NR            |
| 385    | 1                        | NR            | 515    | 333                      | NR            | 645    | 188                      | NR            | 775    | 3                        | NR            | 905    | 0                        | NR            |
| 390    | 2                        | NR            | 520    | 336                      | NR            | 650    | 162                      | NR            | 780    | 3                        | NR            | 910    | 0                        | NR            |
| 395    | 4                        | NR            | 525    | 340                      | NR            | 655    | 136                      | NR            | 785    | 2                        | NR            | 915    | 0                        | NR            |
| 400    | 5                        | NR            | 530    | 343                      | NR            | 660    | 115                      | NR            | 790    | 2                        | NR            | 920    | 0                        | NR            |
| 405    | 7                        | NR            | 535    | 348                      | NR            | 665    | 96                       | NR            | 795    | 2                        | NR            | 925    | 0                        | NR            |
| 410    | 10                       | NR            | 540    | 352                      | NR            | 670    | 89                       | NR            | 800    | 1                        | NR            | 930    | 0                        | NR            |
| 415    | 16                       | NR            | 545    | 356                      | NR            | 675    | 72                       | NR            | 805    | 1                        | NR            | 935    | 0                        | NR            |
| 420    | 28                       | NR            | 550    | 358                      | NR            | 680    | 62                       | NR            | 810    | 1                        | NR            | 940    | 0                        | NR            |
| 425    | 52                       | NR            | 555    | 361                      | NR            | 685    | 53                       | NR            | 815    | 1                        | NR            | 945    | 0                        | NR            |
| 430    | 89                       | NR            | 560    | 361                      | NR            | 690    | 45                       | NR            | 820    | 1                        | NR            | 950    | 0                        | NR            |
| 435    | 151                      | NR            | 565    | 359                      | NR            | 695    | 39                       | NR            | 825    | 1                        | NR            | 955    | 0                        | NR            |
| 440    | 256                      | NR            | 570    | 354                      | NR            | 700    | 33                       | NR            | 830    | 1                        | NR            | 960    | 0                        | NR            |
| 445    | 462                      | NR            | 575    | 349                      | NR            | 705    | 28                       | NR            | 835    | 1                        | NR            | 965    | 0                        | NR            |
| 450    | 643                      | NR            | 580    | 344                      | NR            | 710    | 23                       | NR            | 840    | 0                        | NR            | 970    | 0                        | NR            |
| 455    | 492                      | NR            | 585    | 339                      | NR            | 715    | 20                       | NR            | 845    | 0                        | NR            | 975    | 0                        | NR            |
| 460    | 319                      | NR            | 590    | 333                      | NR            | 720    | 16                       | NR            | 850    | 0                        | NR            | 980    | 0                        | NR            |
| 465    | 269                      | NR            | 595    | 324                      | NR            | 725    | 14                       | NR            | 855    | 0                        | NR            | 985    | 0                        | NR            |
| 470    | 207                      | NR            | 600    | 319                      | NR            | 730    | 11                       | NR            | 860    | 0                        | NR            | 990    | 0                        | NR            |
| 475    | 165                      | NR            | 605    | 314                      | NR            | 735    | 10                       | NR            | 865    | 0                        | NR            | 995    | 0                        | NR            |
| 480    | 171                      | NR            | 610    | 336                      | NR            | 740    | 8                        | NR            | 870    | 0                        | NR            | 1000   | 0                        | NR            |
| 485    | 194                      | NR            | 615    | 351                      | NR            | 745    | 7                        | NR            | 875    | 0                        | NR            |        |                          |               |

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### Melanopic Flux vs. Wavelength



Melanopic Lumens: NR

M/P: 4.31

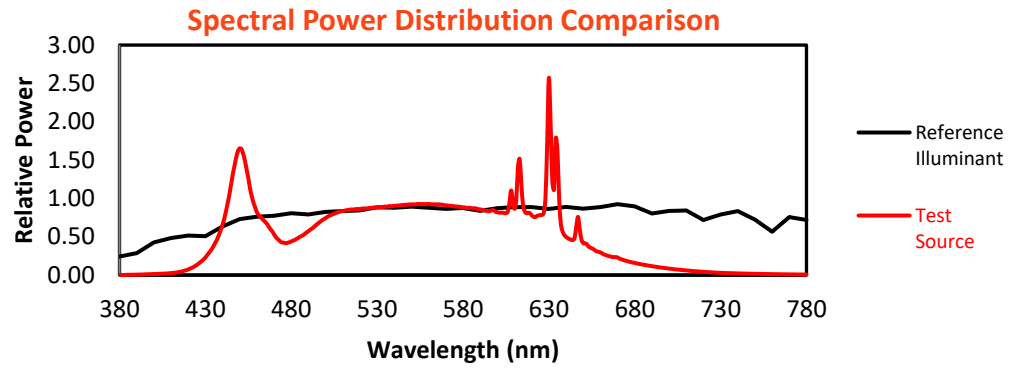
| λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) | λ<br>(nm) | Power<br>W <sup>^</sup> /nm | Lumens<br>(φ/nm) |
|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|-----------|-----------------------------|------------------|
| 360       | 0                           | NR               | 490       | 223                         | NR               | 620       | 303                         | NR               | 750       | 6                           | NR               | 880       | 0                           | NR               |
| 365       | 0                           | NR               | 495       | 258                         | NR               | 625       | 305                         | NR               | 755       | 5                           | NR               | 885       | 0                           | NR               |
| 370       | 0                           | NR               | 500       | 290                         | NR               | 630       | 1000                        | NR               | 760       | 5                           | NR               | 890       | 0                           | NR               |
| 375       | 0                           | NR               | 505       | 311                         | NR               | 635       | 631                         | NR               | 765       | 4                           | NR               | 895       | 0                           | NR               |
| 380       | 0                           | NR               | 510       | 325                         | NR               | 640       | 194                         | NR               | 770       | 4                           | NR               | 900       | 0                           | NR               |
| 385       | 1                           | NR               | 515       | 333                         | NR               | 645       | 188                         | NR               | 775       | 3                           | NR               | 905       | 0                           | NR               |
| 390       | 2                           | NR               | 520       | 336                         | NR               | 650       | 162                         | NR               | 780       | 3                           | NR               | 910       | 0                           | NR               |
| 395       | 4                           | NR               | 525       | 340                         | NR               | 655       | 136                         | NR               | 785       | 2                           | NR               | 915       | 0                           | NR               |
| 400       | 5                           | NR               | 530       | 343                         | NR               | 660       | 115                         | NR               | 790       | 2                           | NR               | 920       | 0                           | NR               |
| 405       | 7                           | NR               | 535       | 348                         | NR               | 665       | 96                          | NR               | 795       | 2                           | NR               | 925       | 0                           | NR               |
| 410       | 10                          | NR               | 540       | 352                         | NR               | 670       | 89                          | NR               | 800       | 1                           | NR               | 930       | 0                           | NR               |
| 415       | 16                          | NR               | 545       | 356                         | NR               | 675       | 72                          | NR               | 805       | 1                           | NR               | 935       | 0                           | NR               |
| 420       | 28                          | NR               | 550       | 358                         | NR               | 680       | 62                          | NR               | 810       | 1                           | NR               | 940       | 0                           | NR               |
| 425       | 52                          | NR               | 555       | 361                         | NR               | 685       | 53                          | NR               | 815       | 1                           | NR               | 945       | 0                           | NR               |
| 430       | 89                          | NR               | 560       | 361                         | NR               | 690       | 45                          | NR               | 820       | 1                           | NR               | 950       | 0                           | NR               |
| 435       | 151                         | NR               | 565       | 359                         | NR               | 695       | 39                          | NR               | 825       | 1                           | NR               | 955       | 0                           | NR               |
| 440       | 256                         | NR               | 570       | 354                         | NR               | 700       | 33                          | NR               | 830       | 1                           | NR               | 960       | 0                           | NR               |
| 445       | 462                         | NR               | 575       | 349                         | NR               | 705       | 28                          | NR               | 835       | 1                           | NR               | 965       | 0                           | NR               |
| 450       | 643                         | NR               | 580       | 344                         | NR               | 710       | 23                          | NR               | 840       | 0                           | NR               | 970       | 0                           | NR               |
| 455       | 492                         | NR               | 585       | 339                         | NR               | 715       | 20                          | NR               | 845       | 0                           | NR               | 975       | 0                           | NR               |
| 460       | 319                         | NR               | 590       | 333                         | NR               | 720       | 16                          | NR               | 850       | 0                           | NR               | 980       | 0                           | NR               |
| 465       | 269                         | NR               | 595       | 324                         | NR               | 725       | 14                          | NR               | 855       | 0                           | NR               | 985       | 0                           | NR               |
| 470       | 207                         | NR               | 600       | 319                         | NR               | 730       | 11                          | NR               | 860       | 0                           | NR               | 990       | 0                           | NR               |
| 475       | 165                         | NR               | 605       | 314                         | NR               | 735       | 10                          | NR               | 865       | 0                           | NR               | 995       | 0                           | NR               |
| 480       | 171                         | NR               | 610       | 336                         | NR               | 740       | 8                           | NR               | 870       | 0                           | NR               | 1000      | 0                           | NR               |
| 485       | 194                         | NR               | 615       | 351                         | NR               | 745       | 7                           | NR               | 875       | 0                           | NR               |           |                             |                  |

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TM-30-18

### Summary

$R_f = 91.2$   
 $R_g = 100.8$   
 $CIE R_a = 93.6$   
 $R_9 = 69.6$

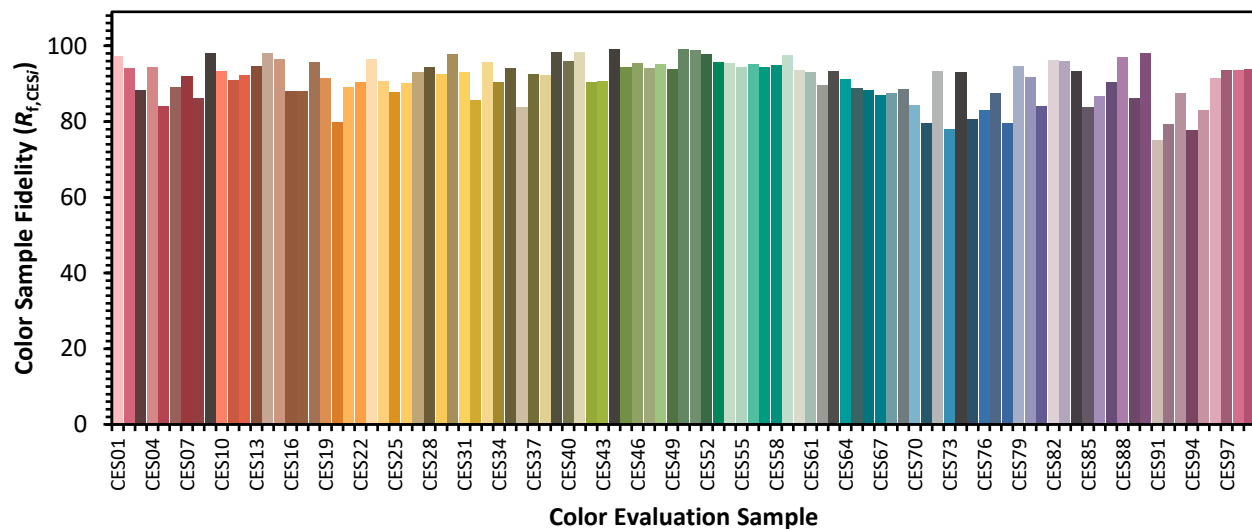


### Color Vector Graphics



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 90 | CES51 = 99 | CES76 = 83 |
| CES02 = 61 | CES27 = 93 | CES52 = 98 | CES77 = 88 |
| CES03 = 31 | CES28 = 94 | CES53 = 96 | CES78 = 80 |
| CES04 = 69 | CES29 = 92 | CES54 = 96 | CES79 = 95 |
| CES05 = 48 | CES30 = 98 | CES55 = 94 | CES80 = 92 |
| CES06 = 50 | CES31 = 93 | CES56 = 95 | CES81 = 84 |
| CES07 = 41 | CES32 = 86 | CES57 = 94 | CES82 = 96 |
| CES08 = 40 | CES33 = 96 | CES58 = 95 | CES83 = 96 |
| CES09 = 29 | CES34 = 90 | CES59 = 98 | CES84 = 93 |
| CES10 = 73 | CES35 = 94 | CES60 = 94 | CES85 = 84 |
| CES11 = 56 | CES36 = 84 | CES61 = 93 | CES86 = 87 |
| CES12 = 62 | CES37 = 93 | CES62 = 90 | CES87 = 90 |
| CES13 = 42 | CES38 = 92 | CES63 = 93 | CES88 = 97 |
| CES14 = 74 | CES39 = 98 | CES64 = 91 | CES89 = 86 |
| CES15 = 71 | CES40 = 96 | CES65 = 89 | CES90 = 98 |
| CES16 = 47 | CES41 = 98 | CES66 = 88 | CES91 = 75 |
| CES17 = 48 | CES42 = 91 | CES67 = 87 | CES92 = 79 |
| CES18 = 56 | CES43 = 91 | CES68 = 88 | CES93 = 88 |
| CES19 = 70 | CES44 = 99 | CES69 = 89 | CES94 = 78 |
| CES20 = 65 | CES45 = 94 | CES70 = 84 | CES95 = 83 |
| CES21 = 85 | CES46 = 95 | CES71 = 80 | CES96 = 92 |
| CES22 = 77 | CES47 = 94 | CES72 = 93 | CES97 = 93 |
| CES23 = 91 | CES48 = 95 | CES73 = 78 | CES98 = 93 |
| CES24 = 90 | CES49 = 94 | CES74 = 93 | CES99 = 94 |
| CES25 = 70 | CES50 = 99 | CES75 = 81 |            |



Color Rendition by Hue-Angle Bin



**Measure Comparisons**



(END OF REPORT)