

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



Scaled data based on original data using  
LM-79-08 Approved Method: Electrical and Photometric Measurements of Solid-State  
Lighting Products

Test Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

Brand: NEO-RAY

Report Number: P79182

Luminaire Tested: **DFN2DIP-RG4F0-100D090US935-FLL-FLL-1DUDD-W**

Issue Date: 02/20/2024



**Test Information**

Test Method: LM-79-08  
Report Number: P79182  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 02/20/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-RG4F0-100D090US935-FLL-FLL-1DUDD-W  
Description: Define Geo Ring 4ft Diameter Direct/Indirect Fixture w/ Frosted Lens  
Light Source: 3500K CCT, 90 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

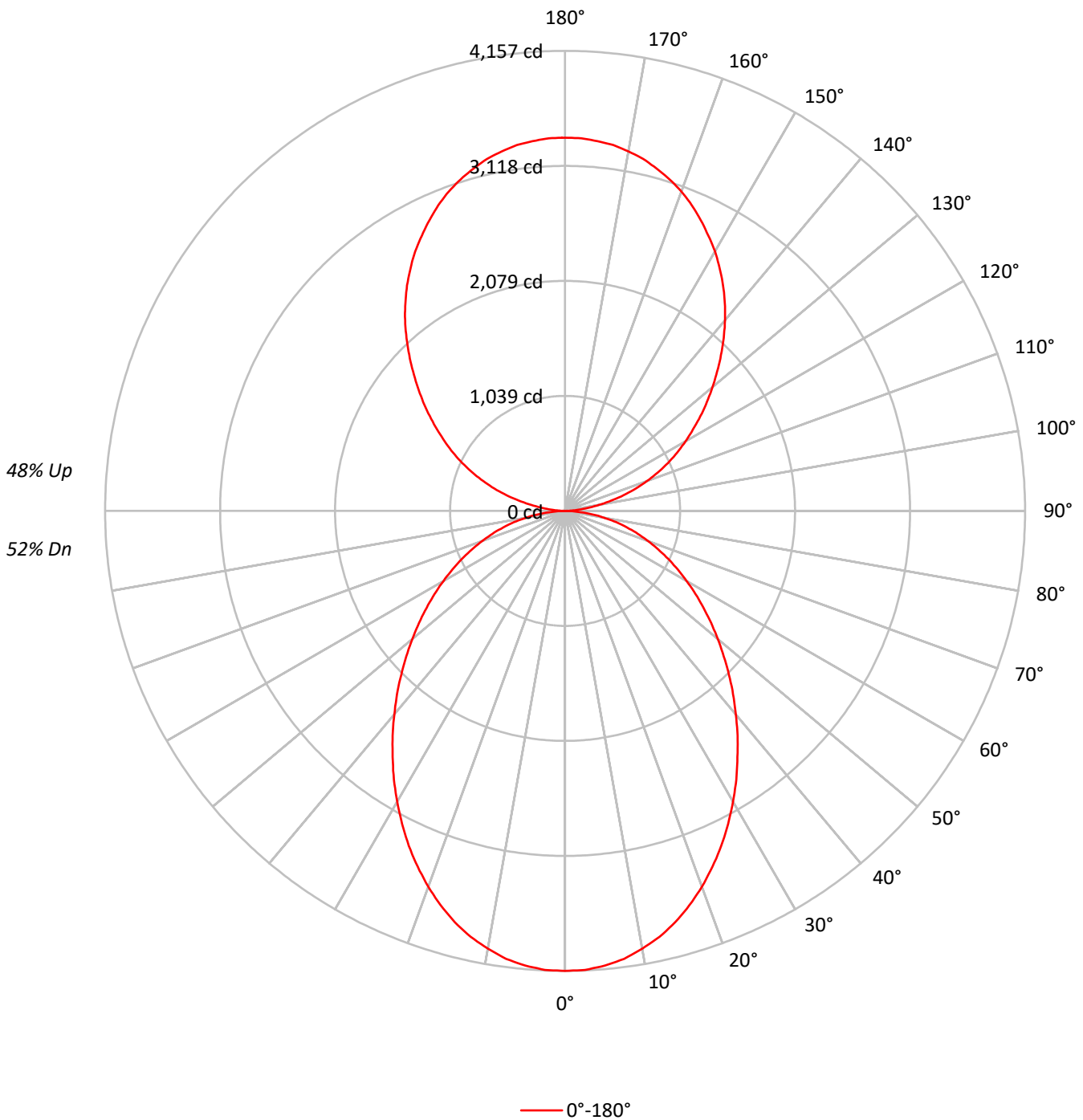
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 18224.5 lumens  
Efficiency: N/A  
Efficacy: 71.3 lumens/watt  
Spacing Criteria (0/90/45): 1.11 / 1.11 / 1.21  
Luminous Opening: Circular (Dia: 4' x H: 0')  
CIE Type: General Diffuse

Input Watts (W): 255.6  
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: P79182  
CATALOG NUMBER: DFN2DIP-RG4F0-100D090US935-FLL-FLL-1DUDD-W

### Luminous Intensity Polar Plot





TEST NUMBER: P79182

CATALOG NUMBER: DFN2DIP-RG4F0-100D090US935-FLL-FLL-1DUDD-W

**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 | 50 | 30 | 10 | 0  |
| RCR |     |     |     |     |     |     |     |     |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 0   | 108 | 108 | 108 | 108 | 100 | 100 | 100 | 100 | 85 | 85 | 85 | 71 | 71 | 71 | 58 | 58 | 58 | 52 |    |    | 52 |
| 1   | 98  | 94  | 90  | 87  | 91  | 87  | 84  | 81  | 74 | 72 | 70 | 62 | 61 | 59 | 51 | 50 | 49 | 44 |    |    | 44 |
| 2   | 90  | 82  | 76  | 71  | 83  | 76  | 71  | 67  | 65 | 61 | 58 | 55 | 52 | 50 | 45 | 43 | 42 | 37 |    |    | 37 |
| 3   | 82  | 72  | 65  | 59  | 75  | 67  | 61  | 56  | 58 | 53 | 49 | 49 | 45 | 42 | 40 | 38 | 36 | 32 |    |    | 32 |
| 4   | 75  | 64  | 56  | 50  | 69  | 60  | 53  | 48  | 51 | 46 | 42 | 44 | 40 | 36 | 36 | 33 | 31 | 27 |    |    | 27 |
| 5   | 69  | 57  | 49  | 43  | 64  | 54  | 46  | 41  | 46 | 41 | 36 | 39 | 35 | 32 | 33 | 30 | 27 | 24 |    |    | 24 |
| 6   | 64  | 52  | 44  | 38  | 59  | 48  | 41  | 36  | 42 | 36 | 32 | 36 | 31 | 28 | 30 | 27 | 24 | 21 |    |    | 21 |
| 7   | 59  | 47  | 39  | 33  | 54  | 44  | 37  | 31  | 38 | 32 | 28 | 32 | 28 | 25 | 27 | 24 | 21 | 19 |    |    | 19 |
| 8   | 55  | 42  | 35  | 29  | 51  | 40  | 33  | 28  | 35 | 29 | 25 | 30 | 25 | 22 | 25 | 22 | 19 | 17 |    |    | 17 |
| 9   | 51  | 39  | 31  | 26  | 47  | 36  | 30  | 25  | 32 | 26 | 23 | 27 | 23 | 20 | 23 | 20 | 17 | 15 |    |    | 15 |
| 10  | 48  | 36  | 29  | 24  | 44  | 34  | 27  | 23  | 29 | 24 | 20 | 25 | 21 | 18 | 22 | 18 | 16 | 14 |    |    | 14 |

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

|     |      |
|-----|------|
|     | 0°   |
| 0°  | 3560 |
| 5°  | 3546 |
| 10° | 3493 |
| 15° | 3413 |
| 20° | 3294 |
| 25° | 3157 |
| 30° | 3001 |
| 35° | 2840 |
| 40° | 2684 |
| 45° | 2537 |
| 50° | 2400 |
| 55° | 2280 |
| 60° | 2176 |
| 65° | 2085 |
| 70° | 2002 |
| 75° | 1919 |
| 80° | 1801 |
| 85° | 1479 |



TEST NUMBER: P79182  
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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 390.4   | 2.1       |
| 10°-20°   | 1081.4  | 5.9       |
| 20°-30°   | 1535.2  | 8.4       |
| 30°-40°   | 1699.8  | 9.3       |
| 40°-50°   | 1617.8  | 8.9       |
| 50°-60°   | 1369.0  | 7.5       |
| 60°-70°   | 1020.3  | 5.6       |
| 70°-80°   | 613.5   | 3.4       |
| 80°-90°   | 177.7   | 1.0       |
| 90°-100°  | 141.2   | 0.8       |
| 100°-110° | 578.8   | 3.2       |
| 110°-120° | 1013.1  | 5.6       |
| 120°-130° | 1336.1  | 7.3       |
| 130°-140° | 1537.7  | 8.4       |
| 140°-150° | 1555.5  | 8.5       |
| 150°-160° | 1335.6  | 7.3       |
| 160°-170° | 902.9   | 5.0       |
| 170°-180° | 318.6   | 1.7       |
| 0°-30°    | 3007.0  | 16.5      |
| 0°-40°    | 4706.8  | 25.8      |
| 0°-60°    | 7693.6  | 42.2      |
| 0°-90°    | 9505.2  | 52.2      |
| 90°-120°  | 1733.0  | 9.5       |
| 90°-150°  | 6162.3  | 33.8      |
| 90°-180°  | 8719.0  | 47.8      |
| 0°-180°   | 18224.5 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | Flux |
|------|------|------|
| 0°   | 4157 |      |
| 5°   | 4125 | 390  |
| 15°  | 3848 | 1081 |
| 25°  | 3340 | 1535 |
| 35°  | 2716 | 1700 |
| 45°  | 2094 | 1618 |
| 55°  | 1527 | 1369 |
| 65°  | 1029 | 1020 |
| 75°  | 580  | 614  |
| 85°  | 150  | 169  |
| 90°  | 4    | 16   |
| 95°  | 113  | 134  |
| 105° | 548  | 579  |
| 115° | 1025 | 1013 |
| 125° | 1493 | 1336 |
| 135° | 1992 | 1538 |
| 145° | 2489 | 1555 |
| 155° | 2900 | 1336 |
| 165° | 3201 | 903  |
| 175° | 3354 | 319  |
| 180° | 3372 |      |



TEST NUMBER: P79182

CATALOG NUMBER: DFN2DIP-RG4F0-100D090US935-FLL-FLL-1DUDD-W

**CANDELA DISTRIBUTION (FULL):**

| 0°     |        |
|--------|--------|
| 0°     | 4156.7 |
| 2.5°   | 4151.8 |
| 5°     | 4124.6 |
| 7.5°   | 4082.7 |
| 10°    | 4016.1 |
| 12.5°  | 3942.1 |
| 15°    | 3848.3 |
| 17.5°  | 3737.3 |
| 20°    | 3614.0 |
| 22.5°  | 3480.8 |
| 25°    | 3340.2 |
| 27.5°  | 3189.7 |
| 30°    | 3034.3 |
| 32.5°  | 2878.9 |
| 35°    | 2716.0 |
| 37.5°  | 2560.6 |
| 40°    | 2400.3 |
| 42.5°  | 2247.3 |
| 45°    | 2094.4 |
| 47.5°  | 1946.4 |
| 50°    | 1800.8 |
| 52.5°  | 1662.7 |
| 55°    | 1527.0 |
| 57.5°  | 1398.7 |
| 60°    | 1270.4 |
| 62.5°  | 1147.1 |
| 65°    | 1028.7 |
| 67.5°  | 912.7  |
| 70°    | 799.3  |
| 72.5°  | 690.7  |
| 75°    | 579.7  |
| 77.5°  | 473.6  |
| 80°    | 365.1  |
| 82.5°  | 259.0  |
| 85°    | 150.5  |
| 87.5°  | 59.2   |
| 90°    | 4.4    |
| 92.5°  | 46.6   |
| 95°    | 113.1  |
| 97.5°  | 201.9  |
| 100°   | 310.6  |
| 102.5° | 428.2  |
| 105°   | 548.0  |
| 107.5° | 670.0  |
| 110°   | 787.6  |



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CATALOG NUMBER: DFN2DIP-RG4F0-100D090US935-FLL-FLL-1DUDD-W

**CANDELA DISTRIBUTION (continued):**

|        | 0°     |
|--------|--------|
| 112.5° | 905.2  |
| 115°   | 1025.0 |
| 117.5° | 1142.5 |
| 120°   | 1255.7 |
| 122.5° | 1371.0 |
| 125°   | 1493.1 |
| 127.5° | 1615.1 |
| 130°   | 1737.1 |
| 132.5° | 1863.6 |
| 135°   | 1992.2 |
| 137.5° | 2120.9 |
| 140°   | 2249.6 |
| 142.5° | 2371.6 |
| 145°   | 2489.2 |
| 147.5° | 2600.1 |
| 150°   | 2708.8 |
| 152.5° | 2804.2 |
| 155°   | 2899.6 |
| 157.5° | 2990.6 |
| 160°   | 3072.6 |
| 162.5° | 3141.4 |
| 165°   | 3201.3 |
| 167.5° | 3259.0 |
| 170°   | 3298.9 |
| 172.5° | 3334.4 |
| 175°   | 3354.4 |
| 177.5° | 3369.9 |
| 180°   | 3372.1 |

Signify Classified - Internal  
Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269



LM-79-2019: Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Report Prepared for

Cooper Lighting Solutions

NEO-RAY

Report Number: SP1-2401-290-3

Test Date: 01/18/2024

Luminaire Tested: RNG2DIP-RG2F0-020D020US935-FLL-FLL-1-D-UDD-W

Data in this report applies to families of products including RNG2DIP-RG2F0-020D020US935-FLL-FLL-1-D-UDD-W.



**Test Information**

Test Method: LM-79-2019  
 Report Number: SP1-2401-290-3  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry: 4π  
 Issue Date: 01/19/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: NEO-RAY  
 Catalog Number: **RNG2DIP-RG2F0-020D020US935-FLL-FLL-1-D-UDD-W**  
 Description: 2' RING DIRECT/INDIRECT FIXTURE WITH FROSTED LIGHT LEVEL 1

**Spectral Parameters**

CCT (K): 3266  
 CIE u': 0.2418  
 CIE v': 0.5165  
 Duv: 0.0004  
 CIE x: 0.4195  
 CIE y: 0.3983  
 CIE z: 0.1822  
 Peak Wavelength (nm): 622  
 Dominant Wavelength (nm): 581  
 Purity: 45.7

|           |      |      |      |
|-----------|------|------|------|
| CRI (Ra): | 94.3 |      |      |
| R1:       | 95.8 | R9:  | 70.9 |
| R2:       | 99.6 | R10: | 97.8 |
| R3:       | 97.8 | R11: | 93.7 |
| R4:       | 92.3 | R12: | 78.5 |
| R5:       | 94.5 | R13: | 97.3 |
| R6:       | 96.9 | R14: | 99.5 |
| R7:       | 91.7 |      |      |
| R8:       | 85.8 |      |      |

Rf: 89.7  
 Rg: 96

**Test Conditions**

Stabilization Time: 23M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.6/15%  
 Sphere Temperature (°C): 25.0



REPORT NUMBER: SP1-2401-290-3

| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | 76INCH SPHERE IN0058  | 8/9/2023         | 2/9/2024             |
| Power Meter                    | XITRON 2801 IN0071    | 10/23/2023       | 10/23/2024           |
| AC Power Source                | CHROMA 61603 IN0063   | 10/24/2023       | 10/24/2024           |
| DC Power Source                | AGILENT E3634A IN0208 | 10/24/2023       | 10/24/2024           |
| Sphere Thermometer             | ONSET IN0085          | 10/24/2023       | 10/24/2024           |
| Room Thermometer               | ONSET IN0046          | 10/24/2023       | 10/24/2024           |

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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 7-step quadrangle

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**Photopic Flux vs. Wavelength**



#####

| λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) |
|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|
| 360    | 1629          | NR            | 490    | 29053         | NR            | 620    | 74209         | NR            | 750    | 6888          | NR            | 880    | 1748          | NR            |
| 365    | 1454          | NR            | 495    | 31666         | NR            | 625    | 74272         | NR            | 755    | 6228          | NR            | 885    | 2090          | NR            |
| 370    | 1629          | NR            | 500    | 34017         | NR            | 630    | 73480         | NR            | 760    | 5422          | NR            | 890    | 1758          | NR            |
| 375    | 1858          | NR            | 505    | 36249         | NR            | 635    | 71830         | NR            | 765    | 4797          | NR            | 895    | 1314          | NR            |
| 380    | 1749          | NR            | 510    | 38217         | NR            | 640    | 69587         | NR            | 770    | 4188          | NR            | 900    | 1396          | NR            |
| 385    | 1536          | NR            | 515    | 39860         | NR            | 645    | 66732         | NR            | 775    | 3908          | NR            | 905    | 1719          | NR            |
| 390    | 1529          | NR            | 520    | 41609         | NR            | 650    | 63415         | NR            | 780    | 3310          | NR            | 910    | 1294          | NR            |
| 395    | 1463          | NR            | 525    | 42891         | NR            | 655    | 59840         | NR            | 785    | 2985          | NR            | 915    | 1111          | NR            |
| 400    | 1224          | NR            | 530    | 44613         | NR            | 660    | 56027         | NR            | 790    | 2855          | NR            | 920    | 1575          | NR            |
| 405    | 1043          | NR            | 535    | 46325         | NR            | 665    | 51741         | NR            | 795    | 2630          | NR            | 925    | 1667          | NR            |
| 410    | 987           | NR            | 540    | 47843         | NR            | 670    | 47426         | NR            | 800    | 2493          | NR            | 930    | 1367          | NR            |
| 415    | 1121          | NR            | 545    | 49858         | NR            | 675    | 42932         | NR            | 805    | 2287          | NR            | 935    | 1770          | NR            |
| 420    | 1486          | NR            | 550    | 51603         | NR            | 680    | 38693         | NR            | 810    | 2365          | NR            | 940    | 1320          | NR            |
| 425    | 2215          | NR            | 555    | 53318         | NR            | 685    | 34666         | NR            | 815    | 2293          | NR            | 945    | 1116          | NR            |
| 430    | 3506          | NR            | 560    | 54494         | NR            | 690    | 30616         | NR            | 820    | 2133          | NR            | 950    | 1061          | NR            |
| 435    | 5766          | NR            | 565    | 56036         | NR            | 695    | 26969         | NR            | 825    | 2062          | NR            | 955    | 1031          | NR            |
| 440    | 9588          | NR            | 570    | 57542         | NR            | 700    | 24034         | NR            | 830    | 1984          | NR            | 960    | 1226          | NR            |
| 445    | 16724         | NR            | 575    | 59048         | NR            | 705    | 21175         | NR            | 835    | 1661          | NR            | 965    | 1706          | NR            |
| 450    | 30943         | NR            | 580    | 60878         | NR            | 710    | 18518         | NR            | 840    | 1876          | NR            | 970    | 2450          | NR            |
| 455    | 47636         | NR            | 585    | 62497         | NR            | 715    | 16588         | NR            | 845    | 1600          | NR            | 975    | 1734          | NR            |
| 460    | 49838         | NR            | 590    | 64427         | NR            | 720    | 14496         | NR            | 850    | 1696          | NR            | 980    | 2566          | NR            |
| 465    | 39446         | NR            | 595    | 66624         | NR            | 725    | 12823         | NR            | 855    | 1520          | NR            | 985    | 1729          | NR            |
| 470    | 34419         | NR            | 600    | 68452         | NR            | 730    | 11311         | NR            | 860    | 1911          | NR            | 990    | 1841          | NR            |
| 475    | 31320         | NR            | 605    | 70794         | NR            | 735    | 9697          | NR            | 865    | 1622          | NR            | 995    | 1376          | NR            |
| 480    | 27788         | NR            | 610    | 72666         | NR            | 740    | 8643          | NR            | 870    | 1892          | NR            | 1000   | 1354          | NR            |
| 485    | 27149         | NR            | 615    | 73950         | NR            | 745    | 7625          | NR            | 875    | 1742          | NR            |        |               |               |

REPORT NUMBER: SP1-2401-290-3

Scotopic Flux vs. Wavelength



Scotopic Lumens: 6226

S/P: 1.58

| λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) |
|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|
| 360    | 1629          | NR            | 490    | 29053         | NR            | 620    | 74209         | NR            | 750    | 6888          | NR            | 880    | 1748          | NR            |
| 365    | 1454          | NR            | 495    | 31666         | NR            | 625    | 74272         | NR            | 755    | 6228          | NR            | 885    | 2090          | NR            |
| 370    | 1629          | NR            | 500    | 34017         | NR            | 630    | 73480         | NR            | 760    | 5422          | NR            | 890    | 1758          | NR            |
| 375    | 1858          | NR            | 505    | 36249         | NR            | 635    | 71830         | NR            | 765    | 4797          | NR            | 895    | 1314          | NR            |
| 380    | 1749          | NR            | 510    | 38217         | NR            | 640    | 69587         | NR            | 770    | 4188          | NR            | 900    | 1396          | NR            |
| 385    | 1536          | NR            | 515    | 39860         | NR            | 645    | 66732         | NR            | 775    | 3908          | NR            | 905    | 1719          | NR            |
| 390    | 1529          | NR            | 520    | 41609         | NR            | 650    | 63415         | NR            | 780    | 3310          | NR            | 910    | 1294          | NR            |
| 395    | 1463          | NR            | 525    | 42891         | NR            | 655    | 59840         | NR            | 785    | 2985          | NR            | 915    | 1111          | NR            |
| 400    | 1224          | NR            | 530    | 44613         | NR            | 660    | 56027         | NR            | 790    | 2855          | NR            | 920    | 1575          | NR            |
| 405    | 1043          | NR            | 535    | 46325         | NR            | 665    | 51741         | NR            | 795    | 2630          | NR            | 925    | 1667          | NR            |
| 410    | 987           | NR            | 540    | 47843         | NR            | 670    | 47426         | NR            | 800    | 2493          | NR            | 930    | 1367          | NR            |
| 415    | 1121          | NR            | 545    | 49858         | NR            | 675    | 42932         | NR            | 805    | 2287          | NR            | 935    | 1770          | NR            |
| 420    | 1486          | NR            | 550    | 51603         | NR            | 680    | 38693         | NR            | 810    | 2365          | NR            | 940    | 1320          | NR            |
| 425    | 2215          | NR            | 555    | 53318         | NR            | 685    | 34666         | NR            | 815    | 2293          | NR            | 945    | 1116          | NR            |
| 430    | 3506          | NR            | 560    | 54494         | NR            | 690    | 30616         | NR            | 820    | 2133          | NR            | 950    | 1061          | NR            |
| 435    | 5766          | NR            | 565    | 56036         | NR            | 695    | 26969         | NR            | 825    | 2062          | NR            | 955    | 1031          | NR            |
| 440    | 9588          | NR            | 570    | 57542         | NR            | 700    | 24034         | NR            | 830    | 1984          | NR            | 960    | 1226          | NR            |
| 445    | 16724         | NR            | 575    | 59048         | NR            | 705    | 21175         | NR            | 835    | 1661          | NR            | 965    | 1706          | NR            |
| 450    | 30943         | NR            | 580    | 60878         | NR            | 710    | 18518         | NR            | 840    | 1876          | NR            | 970    | 2450          | NR            |
| 455    | 47636         | NR            | 585    | 62497         | NR            | 715    | 16588         | NR            | 845    | 1600          | NR            | 975    | 1734          | NR            |
| 460    | 49838         | NR            | 590    | 64427         | NR            | 720    | 14496         | NR            | 850    | 1696          | NR            | 980    | 2566          | NR            |
| 465    | 39446         | NR            | 595    | 66624         | NR            | 725    | 12823         | NR            | 855    | 1520          | NR            | 985    | 1729          | NR            |
| 470    | 34419         | NR            | 600    | 68452         | NR            | 730    | 11311         | NR            | 860    | 1911          | NR            | 990    | 1841          | NR            |
| 475    | 31320         | NR            | 605    | 70794         | NR            | 735    | 9697          | NR            | 865    | 1622          | NR            | 995    | 1376          | NR            |
| 480    | 27788         | NR            | 610    | 72666         | NR            | 740    | 8643          | NR            | 870    | 1892          | NR            | 1000   | 1354          | NR            |
| 485    | 27149         | NR            | 615    | 73950         | NR            | 745    | 7625          | NR            | 875    | 1742          | NR            |        |               |               |

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Melanopic Flux vs. Wavelength



Melanopic Lumens: 2506.4 M/P: 0.64

| λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) |
|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|
| 360    | 1629          | NR            | 490    | 29053         | NR            | 620    | 74209         | NR            | 750    | 6888          | NR            | 880    | 1748          | NR            |
| 365    | 1454          | NR            | 495    | 31666         | NR            | 625    | 74272         | NR            | 755    | 6228          | NR            | 885    | 2090          | NR            |
| 370    | 1629          | NR            | 500    | 34017         | NR            | 630    | 73480         | NR            | 760    | 5422          | NR            | 890    | 1758          | NR            |
| 375    | 1858          | NR            | 505    | 36249         | NR            | 635    | 71830         | NR            | 765    | 4797          | NR            | 895    | 1314          | NR            |
| 380    | 1749          | NR            | 510    | 38217         | NR            | 640    | 69587         | NR            | 770    | 4188          | NR            | 900    | 1396          | NR            |
| 385    | 1536          | NR            | 515    | 39860         | NR            | 645    | 66732         | NR            | 775    | 3908          | NR            | 905    | 1719          | NR            |
| 390    | 1529          | NR            | 520    | 41609         | NR            | 650    | 63415         | NR            | 780    | 3310          | NR            | 910    | 1294          | NR            |
| 395    | 1463          | NR            | 525    | 42891         | NR            | 655    | 59840         | NR            | 785    | 2985          | NR            | 915    | 1111          | NR            |
| 400    | 1224          | NR            | 530    | 44613         | NR            | 660    | 56027         | NR            | 790    | 2855          | NR            | 920    | 1575          | NR            |
| 405    | 1043          | NR            | 535    | 46325         | NR            | 665    | 51741         | NR            | 795    | 2630          | NR            | 925    | 1667          | NR            |
| 410    | 987           | NR            | 540    | 47843         | NR            | 670    | 47426         | NR            | 800    | 2493          | NR            | 930    | 1367          | NR            |
| 415    | 1121          | NR            | 545    | 49858         | NR            | 675    | 42932         | NR            | 805    | 2287          | NR            | 935    | 1770          | NR            |
| 420    | 1486          | NR            | 550    | 51603         | NR            | 680    | 38693         | NR            | 810    | 2365          | NR            | 940    | 1320          | NR            |
| 425    | 2215          | NR            | 555    | 53318         | NR            | 685    | 34666         | NR            | 815    | 2293          | NR            | 945    | 1116          | NR            |
| 430    | 3506          | NR            | 560    | 54494         | NR            | 690    | 30616         | NR            | 820    | 2133          | NR            | 950    | 1061          | NR            |
| 435    | 5766          | NR            | 565    | 56036         | NR            | 695    | 26969         | NR            | 825    | 2062          | NR            | 955    | 1031          | NR            |
| 440    | 9588          | NR            | 570    | 57542         | NR            | 700    | 24034         | NR            | 830    | 1984          | NR            | 960    | 1226          | NR            |
| 445    | 16724         | NR            | 575    | 59048         | NR            | 705    | 21175         | NR            | 835    | 1661          | NR            | 965    | 1706          | NR            |
| 450    | 30943         | NR            | 580    | 60878         | NR            | 710    | 18518         | NR            | 840    | 1876          | NR            | 970    | 2450          | NR            |
| 455    | 47636         | NR            | 585    | 62497         | NR            | 715    | 16588         | NR            | 845    | 1600          | NR            | 975    | 1734          | NR            |
| 460    | 49838         | NR            | 590    | 64427         | NR            | 720    | 14496         | NR            | 850    | 1696          | NR            | 980    | 2566          | NR            |
| 465    | 39446         | NR            | 595    | 66624         | NR            | 725    | 12823         | NR            | 855    | 1520          | NR            | 985    | 1729          | NR            |
| 470    | 34419         | NR            | 600    | 68452         | NR            | 730    | 11311         | NR            | 860    | 1911          | NR            | 990    | 1841          | NR            |
| 475    | 31320         | NR            | 605    | 70794         | NR            | 735    | 9697          | NR            | 865    | 1622          | NR            | 995    | 1376          | NR            |
| 480    | 27788         | NR            | 610    | 72666         | NR            | 740    | 8643          | NR            | 870    | 1892          | NR            | 1000   | 1354          | NR            |
| 485    | 27149         | NR            | 615    | 73950         | NR            | 745    | 7625          | NR            | 875    | 1742          | NR            |        |               |               |

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**Summary**

$R_f = 89.7$   
 $R_g = 96$   
 $CIE R_a = 94.3$   
 $R_9 = 70.9$



**Color Vector Graphics**



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

|            |             |            |            |
|------------|-------------|------------|------------|
| CES01 = 86 | CES26 = 96  | CES51 = 90 | CES76 = 95 |
| CES02 = 63 | CES27 = 86  | CES52 = 94 | CES77 = 89 |
| CES03 = 32 | CES28 = 100 | CES53 = 90 | CES78 = 92 |
| CES04 = 70 | CES29 = 86  | CES54 = 86 | CES79 = 92 |
| CES05 = 50 | CES30 = 75  | CES55 = 83 | CES80 = 92 |
| CES06 = 51 | CES31 = 88  | CES56 = 86 | CES81 = 81 |
| CES07 = 43 | CES32 = 94  | CES57 = 83 | CES82 = 97 |
| CES08 = 42 | CES33 = 84  | CES58 = 83 | CES83 = 93 |
| CES09 = 29 | CES34 = 98  | CES59 = 95 | CES84 = 95 |
| CES10 = 75 | CES35 = 99  | CES60 = 89 | CES85 = 81 |
| CES11 = 58 | CES36 = 74  | CES61 = 90 | CES86 = 85 |
| CES12 = 64 | CES37 = 97  | CES62 = 76 | CES87 = 93 |
| CES13 = 44 | CES38 = 71  | CES63 = 88 | CES88 = 92 |
| CES14 = 74 | CES39 = 96  | CES64 = 84 | CES89 = 88 |
| CES15 = 72 | CES40 = 95  | CES65 = 87 | CES90 = 88 |
| CES16 = 48 | CES41 = 88  | CES66 = 83 | CES91 = 71 |
| CES17 = 50 | CES42 = 97  | CES67 = 83 | CES92 = 80 |
| CES18 = 56 | CES43 = 93  | CES68 = 88 | CES93 = 87 |
| CES19 = 71 | CES44 = 99  | CES69 = 89 | CES94 = 83 |
| CES20 = 67 | CES45 = 94  | CES70 = 89 | CES95 = 85 |
| CES21 = 86 | CES46 = 92  | CES71 = 81 | CES96 = 94 |
| CES22 = 78 | CES47 = 85  | CES72 = 94 | CES97 = 94 |
| CES23 = 91 | CES48 = 78  | CES73 = 87 | CES98 = 91 |
| CES24 = 90 | CES49 = 93  | CES74 = 88 | CES99 = 90 |
| CES25 = 71 | CES50 = 91  | CES75 = 85 |            |

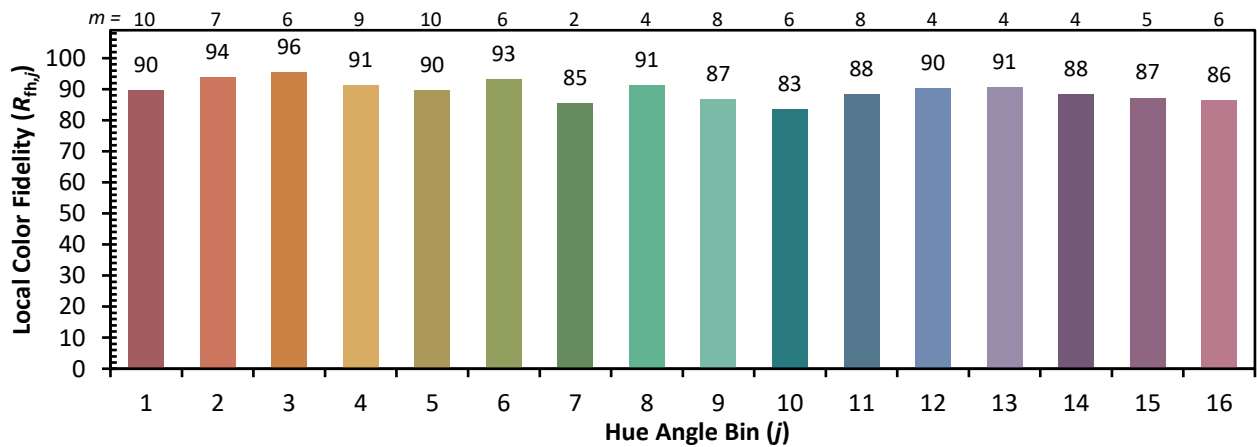




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Color Rendition by Hue-Angle Bin



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Measure Comparisons



(END OF REPORT)