

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: P77487

Luminaire Tested: **DFN2DS-RG2F0-020DS927-FLL-1DUDD-W**

Issue Date: 02/20/2024



**Test Information**

Test Method: LM-79-08  
Report Number: P77487  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2401-290-9)  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 02/20/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: NEO-RAY  
Catalog Number: DFN2DS-RG2F0-020DS927-FLL-1DUDD-W  
Description: Define Geo Ring 2ft Diameter Direct Light Only Fixture with Frosted Lens  
Light Source: 2700K CCT, 90 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

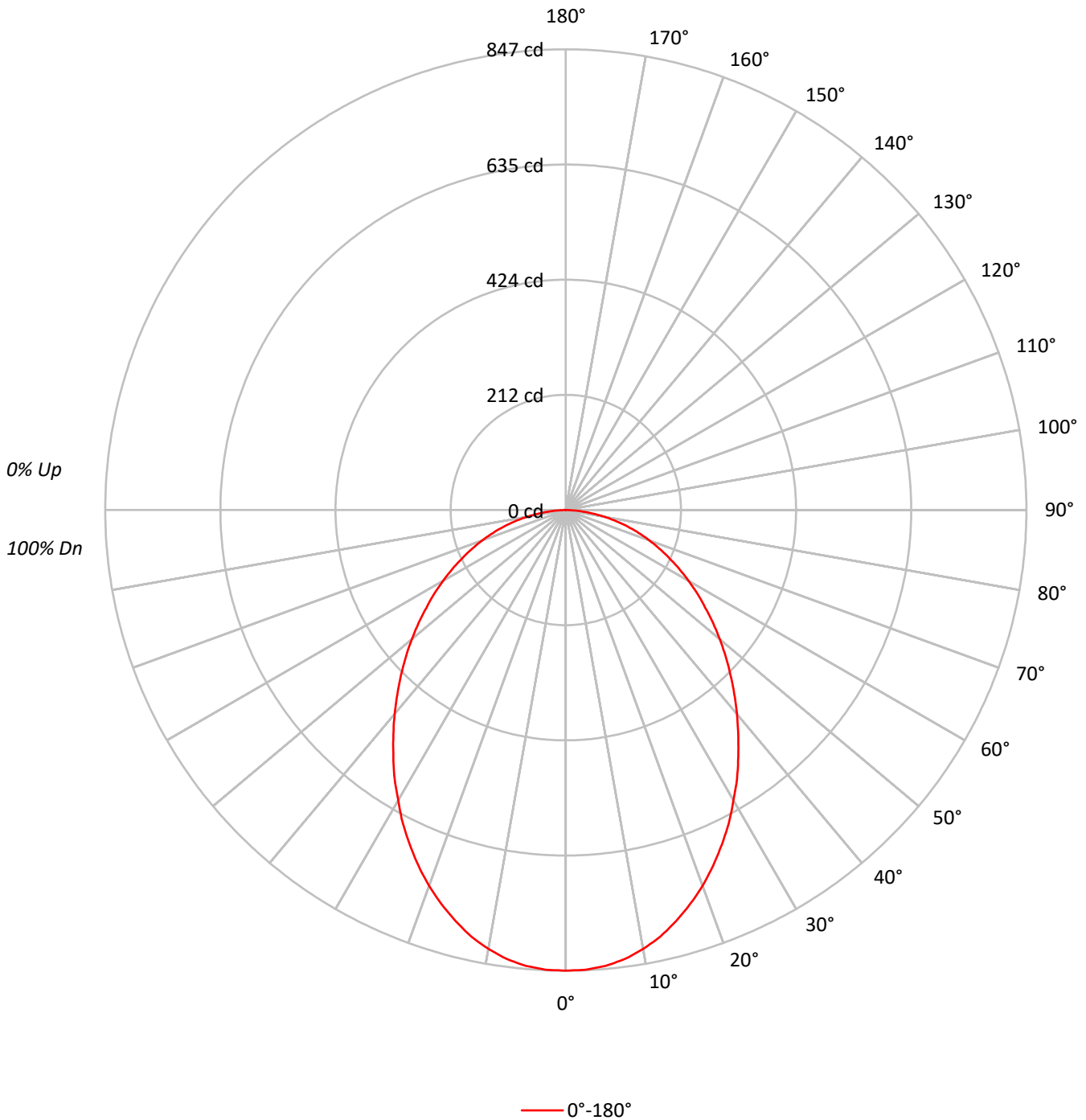
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 1937.5 lumens  
Efficiency: N/A  
Efficacy: 77.2 lumens/watt  
Spacing Criteria (0/90/45): 1.1 / 1.1 / 1.21  
Luminous Opening: Circular (Dia: 2' x H: 0')  
CIE Type: Direct

Input Watts (W): 25.1  
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: P77487  
CATALOG NUMBER: DFN2DS-RG2F0-020DS927-FLL-1DUDD-W

### Luminous Intensity Polar Plot





TEST NUMBER: P77487

CATALOG NUMBER: DFN2DS-RG2F0-020DS927-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  | 0   |
| RCR |     |     |     |     |     |     |     |     |     |     |     |  |     |     |     |  |     |     |     |     |
| 0   | 119 | 119 | 119 | 119 | 116 | 116 | 116 | 116 | 111 | 111 | 111 |  | 106 | 106 | 106 |  | 102 | 102 | 102 | 100 |
| 1   | 109 | 105 | 100 | 97  | 106 | 102 | 99  | 95  | 98  | 95  | 92  |  | 94  | 92  | 89  |  | 91  | 89  | 87  | 85  |
| 2   | 100 | 92  | 85  | 80  | 97  | 90  | 84  | 79  | 86  | 81  | 77  |  | 83  | 79  | 75  |  | 80  | 77  | 73  | 71  |
| 3   | 91  | 81  | 73  | 67  | 89  | 79  | 72  | 66  | 77  | 70  | 65  |  | 74  | 68  | 64  |  | 71  | 67  | 63  | 61  |
| 4   | 84  | 72  | 64  | 57  | 82  | 71  | 63  | 57  | 68  | 62  | 56  |  | 66  | 60  | 55  |  | 64  | 59  | 55  | 52  |
| 5   | 77  | 65  | 56  | 50  | 75  | 64  | 56  | 50  | 62  | 55  | 49  |  | 60  | 53  | 48  |  | 58  | 52  | 48  | 46  |
| 6   | 72  | 59  | 50  | 44  | 70  | 58  | 50  | 44  | 56  | 49  | 43  |  | 54  | 48  | 43  |  | 53  | 47  | 43  | 41  |
| 7   | 67  | 54  | 45  | 39  | 65  | 53  | 45  | 39  | 51  | 44  | 39  |  | 50  | 43  | 38  |  | 48  | 43  | 38  | 36  |
| 8   | 62  | 49  | 41  | 35  | 61  | 48  | 40  | 35  | 47  | 40  | 35  |  | 46  | 39  | 35  |  | 45  | 39  | 34  | 32  |
| 9   | 58  | 45  | 37  | 32  | 57  | 45  | 37  | 32  | 43  | 36  | 32  |  | 42  | 36  | 31  |  | 41  | 36  | 31  | 29  |
| 10  | 55  | 42  | 34  | 29  | 54  | 41  | 34  | 29  | 40  | 34  | 29  |  | 39  | 33  | 29  |  | 39  | 33  | 29  | 27  |

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

|     |      |
|-----|------|
|     | 0°   |
| 0°  | 2902 |
| 5°  | 2893 |
| 10° | 2851 |
| 15° | 2776 |
| 20° | 2681 |
| 25° | 2566 |
| 30° | 2438 |
| 35° | 2313 |
| 40° | 2190 |
| 45° | 2075 |
| 50° | 1970 |
| 55° | 1869 |
| 60° | 1788 |
| 65° | 1709 |
| 70° | 1638 |
| 75° | 1565 |
| 80° | 1436 |
| 85° | 1116 |



TEST NUMBER: P77487  
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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 79.6   | 4.1       |
| 10°-20°   | 220.1  | 11.4      |
| 20°-30°   | 312.2  | 16.1      |
| 30°-40°   | 345.9  | 17.9      |
| 40°-50°   | 330.8  | 17.1      |
| 50°-60°   | 280.9  | 14.5      |
| 60°-70°   | 209.2  | 10.8      |
| 70°-80°   | 124.7  | 6.4       |
| 80°-90°   | 34.1   | 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°    | 611.9  | 31.6      |
| 0°-40°    | 957.9  | 49.4      |
| 0°-60°    | 1569.6 | 81.0      |
| 0°-90°    | 1937.5 | 100.0     |
| 90°-120°  | 0.0    | 0.0       |
| 90°-150°  | 0.0    | 0.0       |
| 90°-180°  | 0.0    | 0.0       |
| 0°-180°   | 1937.5 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°  | Flux |
|------|-----|------|
| 0°   | 847 |      |
| 5°   | 841 | 80   |
| 15°  | 783 | 220  |
| 25°  | 679 | 312  |
| 35°  | 553 | 346  |
| 45°  | 428 | 331  |
| 55°  | 313 | 281  |
| 65°  | 211 | 209  |
| 75°  | 118 | 125  |
| 85°  | 28  | 33   |
| 90°  | 0   | 1    |
| 95°  | 0   | 0    |
| 105° | 0   | 0    |
| 115° | 0   | 0    |
| 125° | 0   | 0    |
| 135° | 0   | 0    |
| 145° | 0   | 0    |
| 155° | 0   | 0    |
| 165° | 0   | 0    |
| 175° | 0   | 0    |
| 180° | 0   | 0    |



TEST NUMBER: P77487

CATALOG NUMBER: DFN2DS-RG2F0-020DS927-FLL-1DUDD-W

**CANDELA DISTRIBUTION (FULL):**

|        | 0°    |
|--------|-------|
| 0°     | 846.9 |
| 2.5°   | 846.0 |
| 5°     | 841.2 |
| 7.5°   | 832.7 |
| 10°    | 819.5 |
| 12.5°  | 803.4 |
| 15°    | 782.6 |
| 17.5°  | 759.9 |
| 20°    | 735.4 |
| 22.5°  | 708.0 |
| 25°    | 678.7 |
| 27.5°  | 649.4 |
| 30°    | 616.3 |
| 32.5°  | 586.0 |
| 35°    | 552.9 |
| 37.5°  | 520.8 |
| 40°    | 489.6 |
| 42.5°  | 458.4 |
| 45°    | 428.2 |
| 47.5°  | 398.9 |
| 50°    | 369.6 |
| 52.5°  | 341.2 |
| 55°    | 312.9 |
| 57.5°  | 287.3 |
| 60°    | 260.9 |
| 62.5°  | 235.4 |
| 65°    | 210.8 |
| 67.5°  | 187.1 |
| 70°    | 163.5 |
| 72.5°  | 140.8 |
| 75°    | 118.2 |
| 77.5°  | 95.5  |
| 80°    | 72.8  |
| 82.5°  | 50.1  |
| 85°    | 28.4  |
| 87.5°  | 10.4  |
| 90°    | 0.0   |
| 92.5°  | 0.0   |
| 95°    | 0.0   |
| 97.5°  | 0.0   |
| 100°   | 0.0   |
| 102.5° | 0.0   |
| 105°   | 0.0   |
| 107.5° | 0.0   |
| 110°   | 0.0   |



TEST NUMBER: P77487  
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**CANDELA DISTRIBUTION (continued):**

|        | 0°  |
|--------|-----|
| 112.5° | 0.0 |
| 115°   | 0.0 |
| 117.5° | 0.0 |
| 120°   | 0.0 |
| 122.5° | 0.0 |
| 125°   | 0.0 |
| 127.5° | 0.0 |
| 130°   | 0.0 |
| 132.5° | 0.0 |
| 135°   | 0.0 |
| 137.5° | 0.0 |
| 140°   | 0.0 |
| 142.5° | 0.0 |
| 145°   | 0.0 |
| 147.5° | 0.0 |
| 150°   | 0.0 |
| 152.5° | 0.0 |
| 155°   | 0.0 |
| 157.5° | 0.0 |
| 160°   | 0.0 |
| 162.5° | 0.0 |
| 165°   | 0.0 |
| 167.5° | 0.0 |
| 170°   | 0.0 |
| 172.5° | 0.0 |
| 175°   | 0.0 |
| 177.5° | 0.0 |
| 180°   | 0.0 |

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: SP1-2401-290-1

Test Date: 01/18/2024

Luminaire Tested: RNG2DIP-RG2F0-020D020US927-FLL-FLL-1-D-UDD-W

Data in this report applies to families of products including RNG2DIP-RG2F0-020D020US927-FLL-FLL-1-D-UDD-W.



**Test Information**

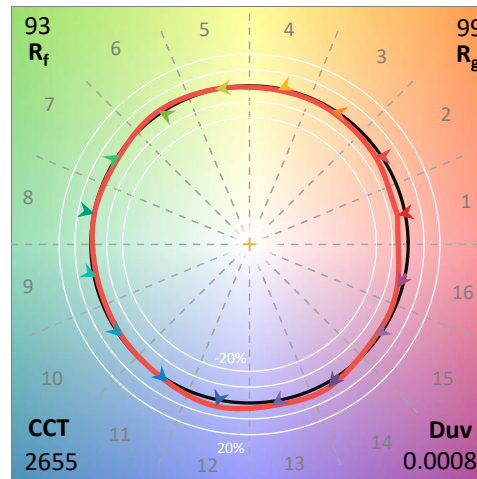
Test Method: LM-79-2019  
 Report Number: SP1-2401-290-1  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry: 4π  
 Issue Date: 01/19/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: NEO-RAY  
 Catalog Number: **RNG2DIP-RG2F0-020D020US927-FLL-FLL-1-D-UDD-W**  
 Description: 2' RING DIRECT/INDIRECT FIXTURE WITH FROSTED LIGHT LEVEL 1

**Spectral Parameters**

CCT (K): 2655  
 CIE u': 0.2643  
 CIE v': 0.5293  
 Duv: 0.0008  
 CIE x: 0.4648  
 CIE y: 0.4137  
 CIE z: 0.1215  
 Peak Wavelength (nm): 625  
 Dominant Wavelength (nm): 584  
 Purity: 63.9

|           |      |      |      |
|-----------|------|------|------|
| CRI (Ra): | 93.4 |      |      |
| R1:       | 93.4 | R9:  | 59.7 |
| R2:       | 96.8 | R10: | 92.1 |
| R3:       | 99.2 | R11: | 95.8 |
| R4:       | 94.0 | R12: | 87.6 |
| R5:       | 93.5 | R13: | 94.3 |
| R6:       | 97.2 | R14: | 98.8 |
| R7:       | 91.9 |      |      |
| R8:       | 81.5 |      |      |

Rf: 93.2  
 Rg: 98.9



**Test Conditions**

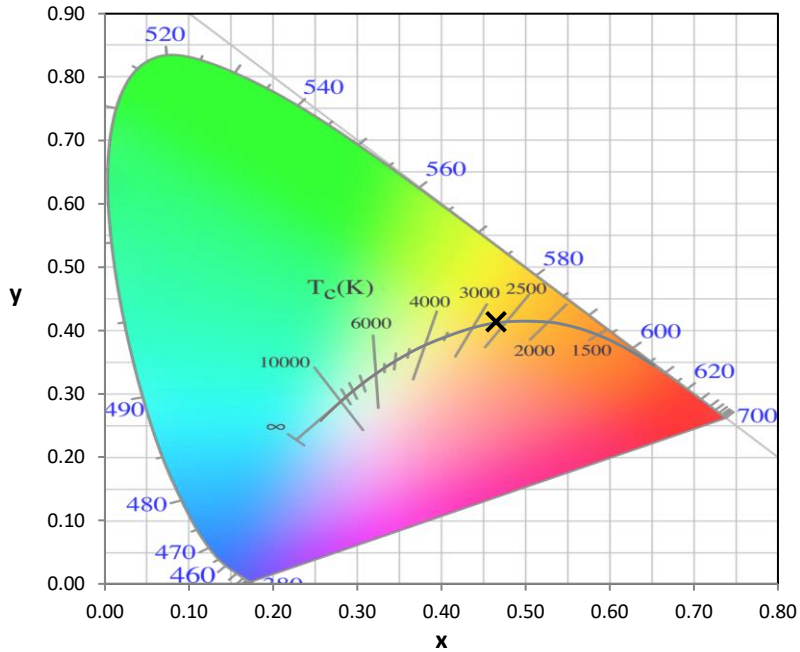
Stabilization Time: 23M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.6/15%  
 Sphere Temperature (°C): 25.0

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| 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 2700K 4-step quadrangle

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**Photopic Flux vs. Wavelength**



#####

| $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) |
|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|
| 360               | 1543                                 | NR                             | 490               | 19797                                | NR                             | 620               | 85353                                | NR                             | 750               | 8090                                 | NR                             | 880               | 1792                                 | NR                             |
| 365               | 1414                                 | NR                             | 495               | 23402                                | NR                             | 625               | 85989                                | NR                             | 755               | 7198                                 | NR                             | 885               | 2020                                 | NR                             |
| 370               | 1551                                 | NR                             | 500               | 26949                                | NR                             | 630               | 85515                                | NR                             | 760               | 6225                                 | NR                             | 890               | 1828                                 | NR                             |
| 375               | 1796                                 | NR                             | 505               | 29825                                | NR                             | 635               | 83747                                | NR                             | 765               | 5688                                 | NR                             | 895               | 1860                                 | NR                             |
| 380               | 1726                                 | NR                             | 510               | 32000                                | NR                             | 640               | 81402                                | NR                             | 770               | 5021                                 | NR                             | 900               | 1911                                 | NR                             |
| 385               | 1466                                 | NR                             | 515               | 33805                                | NR                             | 645               | 78259                                | NR                             | 775               | 4504                                 | NR                             | 905               | 1780                                 | NR                             |
| 390               | 1558                                 | NR                             | 520               | 35652                                | NR                             | 650               | 74273                                | NR                             | 780               | 3834                                 | NR                             | 910               | 1898                                 | NR                             |
| 395               | 1442                                 | NR                             | 525               | 37021                                | NR                             | 655               | 70182                                | NR                             | 785               | 3465                                 | NR                             | 915               | 1803                                 | NR                             |
| 400               | 1203                                 | NR                             | 530               | 38939                                | NR                             | 660               | 65368                                | NR                             | 790               | 3329                                 | NR                             | 920               | 1835                                 | NR                             |
| 405               | 1067                                 | NR                             | 535               | 40941                                | NR                             | 665               | 60328                                | NR                             | 795               | 2970                                 | NR                             | 925               | 1737                                 | NR                             |
| 410               | 1017                                 | NR                             | 540               | 42696                                | NR                             | 670               | 55011                                | NR                             | 800               | 2874                                 | NR                             | 930               | 1738                                 | NR                             |
| 415               | 1324                                 | NR                             | 545               | 44809                                | NR                             | 675               | 49838                                | NR                             | 805               | 2736                                 | NR                             | 935               | 2125                                 | NR                             |
| 420               | 1972                                 | NR                             | 550               | 46959                                | NR                             | 680               | 44927                                | NR                             | 810               | 2648                                 | NR                             | 940               | 1637                                 | NR                             |
| 425               | 3033                                 | NR                             | 555               | 49260                                | NR                             | 685               | 40277                                | NR                             | 815               | 2400                                 | NR                             | 945               | 1569                                 | NR                             |
| 430               | 4609                                 | NR                             | 560               | 51165                                | NR                             | 690               | 35795                                | NR                             | 820               | 2470                                 | NR                             | 950               | 1938                                 | NR                             |
| 435               | 7105                                 | NR                             | 565               | 53562                                | NR                             | 695               | 31683                                | NR                             | 825               | 2425                                 | NR                             | 955               | 1864                                 | NR                             |
| 440               | 11197                                | NR                             | 570               | 56177                                | NR                             | 700               | 27880                                | NR                             | 830               | 2392                                 | NR                             | 960               | 2093                                 | NR                             |
| 445               | 18973                                | NR                             | 575               | 58898                                | NR                             | 705               | 24664                                | NR                             | 835               | 1867                                 | NR                             | 965               | 2277                                 | NR                             |
| 450               | 27311                                | NR                             | 580               | 62115                                | NR                             | 710               | 21670                                | NR                             | 840               | 1912                                 | NR                             | 970               | 2629                                 | NR                             |
| 455               | 25348                                | NR                             | 585               | 65028                                | NR                             | 715               | 19241                                | NR                             | 845               | 1927                                 | NR                             | 975               | 2541                                 | NR                             |
| 460               | 18677                                | NR                             | 590               | 68395                                | NR                             | 720               | 16927                                | NR                             | 850               | 2066                                 | NR                             | 980               | 2508                                 | NR                             |
| 465               | 16400                                | NR                             | 595               | 72374                                | NR                             | 725               | 14936                                | NR                             | 855               | 1671                                 | NR                             | 985               | 2238                                 | NR                             |
| 470               | 15032                                | NR                             | 600               | 75401                                | NR                             | 730               | 13104                                | NR                             | 860               | 1946                                 | NR                             | 990               | 2619                                 | NR                             |
| 475               | 13281                                | NR                             | 605               | 78653                                | NR                             | 735               | 11394                                | NR                             | 865               | 2045                                 | NR                             | 995               | 1965                                 | NR                             |
| 480               | 14079                                | NR                             | 610               | 81994                                | NR                             | 740               | 10108                                | NR                             | 870               | 2206                                 | NR                             | 1000              | 3108                                 | NR                             |
| 485               | 16672                                | NR                             | 615               | 84326                                | NR                             | 745               | 9008                                 | NR                             | 875               | 1893                                 | NR                             |                   |                                      |                                |

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Scotopic Flux vs. Wavelength



Scotopic Lumens: 4864.8

S/P: 1.26

| 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    | 1543          | NR            | 490    | 19797         | NR            | 620    | 85353         | NR            | 750    | 8090          | NR            | 880    | 1792          | NR            |
| 365    | 1414          | NR            | 495    | 23402         | NR            | 625    | 85989         | NR            | 755    | 7198          | NR            | 885    | 2020          | NR            |
| 370    | 1551          | NR            | 500    | 26949         | NR            | 630    | 85515         | NR            | 760    | 6225          | NR            | 890    | 1828          | NR            |
| 375    | 1796          | NR            | 505    | 29825         | NR            | 635    | 83747         | NR            | 765    | 5688          | NR            | 895    | 1860          | NR            |
| 380    | 1726          | NR            | 510    | 32000         | NR            | 640    | 81402         | NR            | 770    | 5021          | NR            | 900    | 1911          | NR            |
| 385    | 1466          | NR            | 515    | 33805         | NR            | 645    | 78259         | NR            | 775    | 4504          | NR            | 905    | 1780          | NR            |
| 390    | 1558          | NR            | 520    | 35652         | NR            | 650    | 74273         | NR            | 780    | 3834          | NR            | 910    | 1898          | NR            |
| 395    | 1442          | NR            | 525    | 37021         | NR            | 655    | 70182         | NR            | 785    | 3465          | NR            | 915    | 1803          | NR            |
| 400    | 1203          | NR            | 530    | 38939         | NR            | 660    | 65368         | NR            | 790    | 3329          | NR            | 920    | 1835          | NR            |
| 405    | 1067          | NR            | 535    | 40941         | NR            | 665    | 60328         | NR            | 795    | 2970          | NR            | 925    | 1737          | NR            |
| 410    | 1017          | NR            | 540    | 42696         | NR            | 670    | 55011         | NR            | 800    | 2874          | NR            | 930    | 1738          | NR            |
| 415    | 1324          | NR            | 545    | 44809         | NR            | 675    | 49838         | NR            | 805    | 2736          | NR            | 935    | 2125          | NR            |
| 420    | 1972          | NR            | 550    | 46959         | NR            | 680    | 44927         | NR            | 810    | 2648          | NR            | 940    | 1637          | NR            |
| 425    | 3033          | NR            | 555    | 49260         | NR            | 685    | 40277         | NR            | 815    | 2400          | NR            | 945    | 1569          | NR            |
| 430    | 4609          | NR            | 560    | 51165         | NR            | 690    | 35795         | NR            | 820    | 2470          | NR            | 950    | 1938          | NR            |
| 435    | 7105          | NR            | 565    | 53562         | NR            | 695    | 31683         | NR            | 825    | 2425          | NR            | 955    | 1864          | NR            |
| 440    | 11197         | NR            | 570    | 56177         | NR            | 700    | 27880         | NR            | 830    | 2392          | NR            | 960    | 2093          | NR            |
| 445    | 18973         | NR            | 575    | 58898         | NR            | 705    | 24664         | NR            | 835    | 1867          | NR            | 965    | 2277          | NR            |
| 450    | 27311         | NR            | 580    | 62115         | NR            | 710    | 21670         | NR            | 840    | 1912          | NR            | 970    | 2629          | NR            |
| 455    | 25348         | NR            | 585    | 65028         | NR            | 715    | 19241         | NR            | 845    | 1927          | NR            | 975    | 2541          | NR            |
| 460    | 18677         | NR            | 590    | 68395         | NR            | 720    | 16927         | NR            | 850    | 2066          | NR            | 980    | 2508          | NR            |
| 465    | 16400         | NR            | 595    | 72374         | NR            | 725    | 14936         | NR            | 855    | 1671          | NR            | 985    | 2238          | NR            |
| 470    | 15032         | NR            | 600    | 75401         | NR            | 730    | 13104         | NR            | 860    | 1946          | NR            | 990    | 2619          | NR            |
| 475    | 13281         | NR            | 605    | 78653         | NR            | 735    | 11394         | NR            | 865    | 2045          | NR            | 995    | 1965          | NR            |
| 480    | 14079         | NR            | 610    | 81994         | NR            | 740    | 10108         | NR            | 870    | 2206          | NR            | 1000   | 3108          | NR            |
| 485    | 16672         | NR            | 615    | 84326         | NR            | 745    | 9008          | NR            | 875    | 1893          | NR            |        |               |               |

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Melanopic Flux vs. Wavelength



Melanopic Lumens: 1804.6 M/P: 0.47

| 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    | 1543          | NR            | 490    | 19797         | NR            | 620    | 85353         | NR            | 750    | 8090          | NR            | 880    | 1792          | NR            |
| 365    | 1414          | NR            | 495    | 23402         | NR            | 625    | 85989         | NR            | 755    | 7198          | NR            | 885    | 2020          | NR            |
| 370    | 1551          | NR            | 500    | 26949         | NR            | 630    | 85515         | NR            | 760    | 6225          | NR            | 890    | 1828          | NR            |
| 375    | 1796          | NR            | 505    | 29825         | NR            | 635    | 83747         | NR            | 765    | 5688          | NR            | 895    | 1860          | NR            |
| 380    | 1726          | NR            | 510    | 32000         | NR            | 640    | 81402         | NR            | 770    | 5021          | NR            | 900    | 1911          | NR            |
| 385    | 1466          | NR            | 515    | 33805         | NR            | 645    | 78259         | NR            | 775    | 4504          | NR            | 905    | 1780          | NR            |
| 390    | 1558          | NR            | 520    | 35652         | NR            | 650    | 74273         | NR            | 780    | 3834          | NR            | 910    | 1898          | NR            |
| 395    | 1442          | NR            | 525    | 37021         | NR            | 655    | 70182         | NR            | 785    | 3465          | NR            | 915    | 1803          | NR            |
| 400    | 1203          | NR            | 530    | 38939         | NR            | 660    | 65368         | NR            | 790    | 3329          | NR            | 920    | 1835          | NR            |
| 405    | 1067          | NR            | 535    | 40941         | NR            | 665    | 60328         | NR            | 795    | 2970          | NR            | 925    | 1737          | NR            |
| 410    | 1017          | NR            | 540    | 42696         | NR            | 670    | 55011         | NR            | 800    | 2874          | NR            | 930    | 1738          | NR            |
| 415    | 1324          | NR            | 545    | 44809         | NR            | 675    | 49838         | NR            | 805    | 2736          | NR            | 935    | 2125          | NR            |
| 420    | 1972          | NR            | 550    | 46959         | NR            | 680    | 44927         | NR            | 810    | 2648          | NR            | 940    | 1637          | NR            |
| 425    | 3033          | NR            | 555    | 49260         | NR            | 685    | 40277         | NR            | 815    | 2400          | NR            | 945    | 1569          | NR            |
| 430    | 4609          | NR            | 560    | 51165         | NR            | 690    | 35795         | NR            | 820    | 2470          | NR            | 950    | 1938          | NR            |
| 435    | 7105          | NR            | 565    | 53562         | NR            | 695    | 31683         | NR            | 825    | 2425          | NR            | 955    | 1864          | NR            |
| 440    | 11197         | NR            | 570    | 56177         | NR            | 700    | 27880         | NR            | 830    | 2392          | NR            | 960    | 2093          | NR            |
| 445    | 18973         | NR            | 575    | 58898         | NR            | 705    | 24664         | NR            | 835    | 1867          | NR            | 965    | 2277          | NR            |
| 450    | 27311         | NR            | 580    | 62115         | NR            | 710    | 21670         | NR            | 840    | 1912          | NR            | 970    | 2629          | NR            |
| 455    | 25348         | NR            | 585    | 65028         | NR            | 715    | 19241         | NR            | 845    | 1927          | NR            | 975    | 2541          | NR            |
| 460    | 18677         | NR            | 590    | 68395         | NR            | 720    | 16927         | NR            | 850    | 2066          | NR            | 980    | 2508          | NR            |
| 465    | 16400         | NR            | 595    | 72374         | NR            | 725    | 14936         | NR            | 855    | 1671          | NR            | 985    | 2238          | NR            |
| 470    | 15032         | NR            | 600    | 75401         | NR            | 730    | 13104         | NR            | 860    | 1946          | NR            | 990    | 2619          | NR            |
| 475    | 13281         | NR            | 605    | 78653         | NR            | 735    | 11394         | NR            | 865    | 2045          | NR            | 995    | 1965          | NR            |
| 480    | 14079         | NR            | 610    | 81994         | NR            | 740    | 10108         | NR            | 870    | 2206          | NR            | 1000   | 3108          | NR            |
| 485    | 16672         | NR            | 615    | 84326         | NR            | 745    | 9008          | NR            | 875    | 1893          | NR            |        |               |               |

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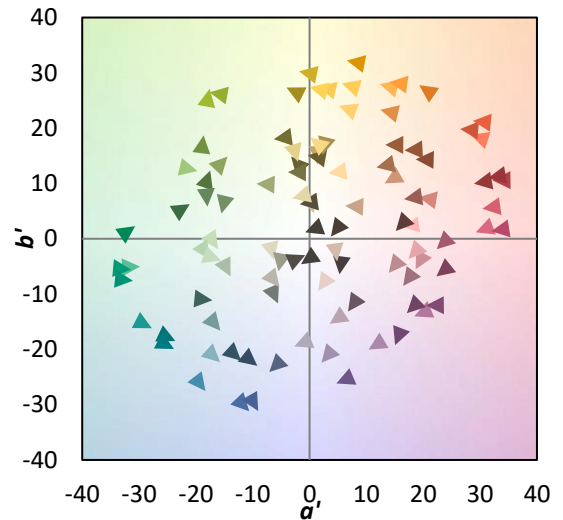
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**Summary**

$R_f = 93.2$   
 $R_g = 98.9$   
 CIE  $R_a = 93.4$   
 $R_9 = 59.7$



**Color Vector Graphics**



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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 95 | CES51 = 98 | CES76 = 92 |
| CES02 = 64 | CES27 = 95 | CES52 = 99 | CES77 = 89 |
| CES03 = 32 | CES28 = 98 | CES53 = 97 | CES78 = 90 |
| CES04 = 71 | CES29 = 96 | CES54 = 96 | CES79 = 92 |
| CES05 = 52 | CES30 = 97 | CES55 = 95 | CES80 = 93 |
| CES06 = 52 | CES31 = 96 | CES56 = 96 | CES81 = 81 |
| CES07 = 44 | CES32 = 91 | CES57 = 95 | CES82 = 97 |
| CES08 = 43 | CES33 = 98 | CES58 = 96 | CES83 = 95 |
| CES09 = 29 | CES34 = 97 | CES59 = 97 | CES84 = 96 |
| CES10 = 77 | CES35 = 98 | CES60 = 96 | CES85 = 84 |
| CES11 = 60 | CES36 = 89 | CES61 = 95 | CES86 = 83 |
| CES12 = 66 | CES37 = 96 | CES62 = 94 | CES87 = 93 |
| CES13 = 44 | CES38 = 94 | CES63 = 95 | CES88 = 95 |
| CES14 = 74 | CES39 = 99 | CES64 = 94 | CES89 = 85 |
| CES15 = 72 | CES40 = 97 | CES65 = 91 | CES90 = 96 |
| CES16 = 49 | CES41 = 97 | CES66 = 93 | CES91 = 85 |
| CES17 = 50 | CES42 = 97 | CES67 = 92 | CES92 = 82 |
| CES18 = 57 | CES43 = 96 | CES68 = 93 | CES93 = 89 |
| CES19 = 72 | CES44 = 99 | CES69 = 94 | CES94 = 80 |
| CES20 = 68 | CES45 = 98 | CES70 = 91 | CES95 = 87 |
| CES21 = 87 | CES46 = 96 | CES71 = 90 | CES96 = 93 |
| CES22 = 79 | CES47 = 93 | CES72 = 96 | CES97 = 96 |
| CES23 = 92 | CES48 = 94 | CES73 = 88 | CES98 = 94 |
| CES24 = 91 | CES49 = 96 | CES74 = 91 | CES99 = 91 |
| CES25 = 72 | CES50 = 99 | CES75 = 91 |            |





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Color Rendition by Hue-Angle Bin



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Measure Comparisons



(END OF REPORT)