

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: NEO-RAY

Report Number: P931580

Luminaire Tested: DFN2DS-TR4F0-110DS930-RLL

Issue Date: 11/20/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P931580  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (P333882)  
Test Lab: INNOVATION CENTER  
Issue Date: 11/20/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DS-TR4F0-110DS930-RLL  
Description: 4 foot, Triangle Define Geo, with Direct 1in Regressed Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

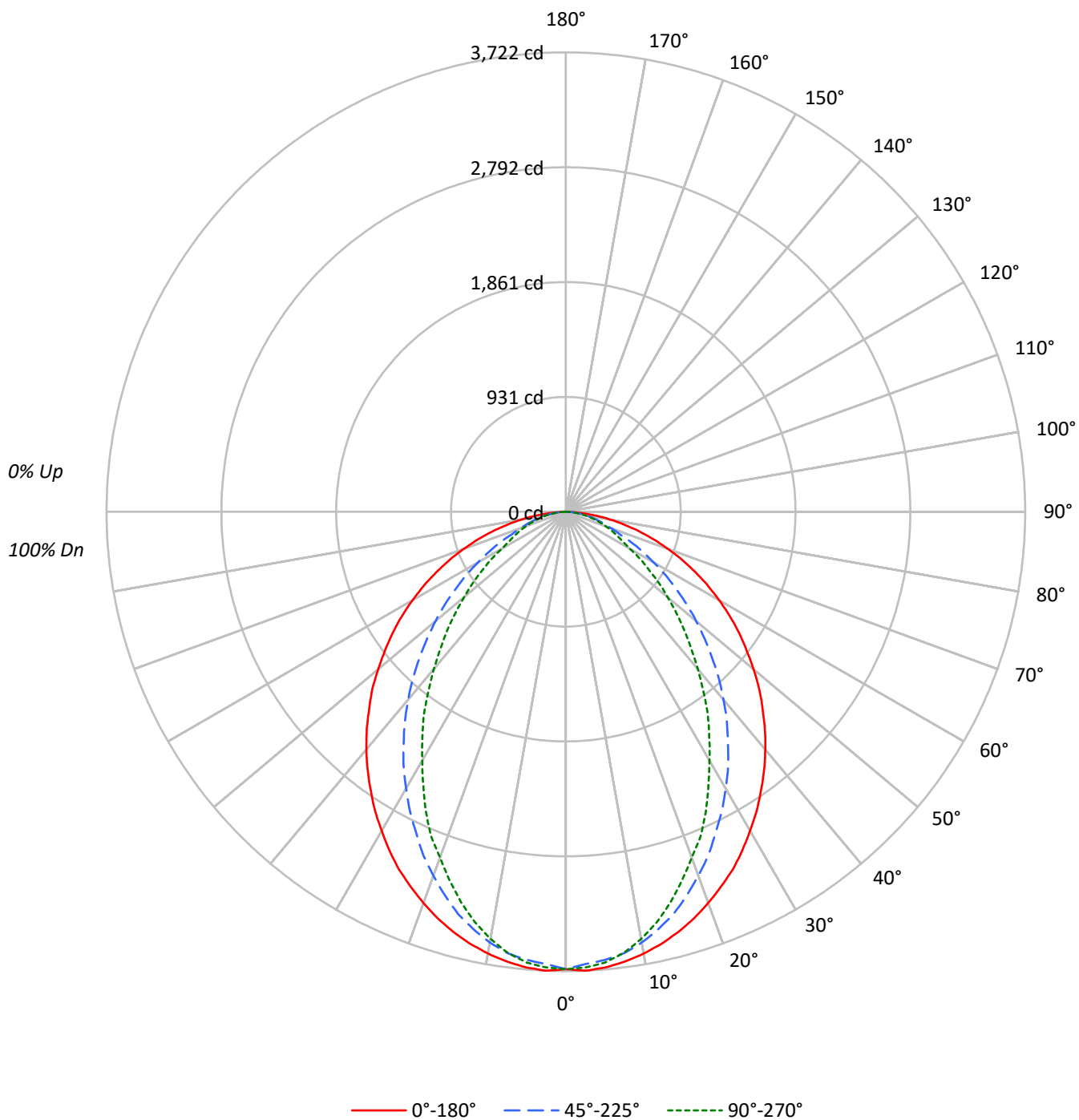
Lumens per Lamp: N/A  
Luminaire Lumens: 7620.3 lumens  
Efficiency: N/A  
Efficacy: 64.1 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular (W 3.96' x L: 3.43' x H: 0')  
CIE Type: Direct

Input Watts (W): 118.9  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9613  
Total Harmonic Distortion (THDi): 0.083  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

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### Luminous Intensity Polar Plot



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

|     |     |     |     |     |     |     |     |     |     |     |     |  |     |     |     |  |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|-----|-----|-----|--|-----|
| RF  | 20  |     |     |     | 20  |     |     |     | 20  |     |     |  | 20  |     |     |  | 20  |
| RC  | 80  |     |     |     | 70  |     |     |     | 50  |     |     |  | 30  |     |     |  | 10  |
| RW  | 70  | 50  | 30  | 10  | 70  | 50  | 30  | 10  | 50  | 30  | 10  |  | 50  | 30  | 10  |  | 50  |
| RCR |     |     |     |     |     |     |     |     |     |     |     |  |     |     |     |  |     |
| 0   | 119 | 119 | 119 | 119 | 116 | 116 | 116 | 116 | 111 | 111 | 111 |  | 106 | 106 | 106 |  | 102 |
| 1   | 110 | 106 | 102 | 98  | 107 | 103 | 100 | 97  | 99  | 96  | 94  |  | 95  | 93  | 91  |  | 92  |
| 2   | 101 | 94  | 87  | 82  | 98  | 92  | 86  | 81  | 88  | 83  | 79  |  | 85  | 81  | 78  |  | 82  |
| 3   | 93  | 83  | 76  | 70  | 90  | 82  | 75  | 69  | 79  | 73  | 68  |  | 76  | 71  | 67  |  | 74  |
| 4   | 86  | 75  | 66  | 60  | 83  | 73  | 66  | 60  | 71  | 64  | 59  |  | 69  | 63  | 58  |  | 66  |
| 5   | 79  | 67  | 59  | 53  | 77  | 66  | 58  | 52  | 64  | 57  | 52  |  | 62  | 56  | 51  |  | 60  |
| 6   | 74  | 61  | 53  | 47  | 72  | 60  | 52  | 46  | 58  | 51  | 46  |  | 57  | 50  | 46  |  | 55  |
| 7   | 68  | 56  | 47  | 42  | 67  | 55  | 47  | 42  | 53  | 46  | 41  |  | 52  | 46  | 41  |  | 51  |
| 8   | 64  | 51  | 43  | 38  | 62  | 51  | 43  | 37  | 49  | 42  | 37  |  | 48  | 42  | 37  |  | 47  |
| 9   | 60  | 47  | 39  | 34  | 59  | 47  | 39  | 34  | 46  | 39  | 34  |  | 44  | 38  | 34  |  | 44  |
| 10  | 56  | 44  | 36  | 31  | 55  | 43  | 36  | 31  | 42  | 36  | 31  |  | 41  | 35  | 31  |  | 41  |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2944 | 2944 | 2944 |
| 5°  | 2955 | 2907 | 2923 |
| 10° | 2932 | 2859 | 2835 |
| 15° | 2898 | 2774 | 2694 |
| 20° | 2852 | 2653 | 2520 |
| 25° | 2804 | 2516 | 2351 |
| 30° | 2738 | 2375 | 2135 |
| 35° | 2673 | 2221 | 1945 |
| 40° | 2608 | 2062 | 1725 |
| 45° | 2532 | 1884 | 1526 |
| 50° | 2453 | 1703 | 1330 |
| 55° | 2373 | 1509 | 1143 |
| 60° | 2280 | 1305 | 949  |
| 65° | 2175 | 1097 | 863  |
| 70° | 2048 | 903  | 794  |
| 75° | 1894 | 823  | 742  |
| 80° | 1672 | 736  | 676  |
| 85° | 1313 | 581  | 581  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2532 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 347.3  | 4.6       |
| 10°-20°   | 953.3  | 12.5      |
| 20°-30°   | 1338.4 | 17.6      |
| 30°-40°   | 1458.9 | 19.1      |
| 40°-50°   | 1340.9 | 17.6      |
| 50°-60°   | 1053.1 | 13.8      |
| 60°-70°   | 685.5  | 9.0       |
| 70°-80°   | 352.9  | 4.6       |
| 80°-90°   | 90.1   | 1.2       |
| 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°    | 2638.9 | 34.6      |
| 0°-40°    | 4097.9 | 53.8      |
| 0°-60°    | 6491.9 | 85.2      |
| 0°-90°    | 7620.3 | 100.0     |
| 90°-120°  | 0.0    | 0.0       |
| 90°-150°  | 0.0    | 0.0       |
| 90°-180°  | 0.0    | 0.0       |
| 0°-180°   | 7620.3 | 100.0     |

**CANDELA DISTRIBUTION:**

|     | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|-----|------|-------|------|-------|------|------|
| 0°  | 3705 | 3705  | 3705 | 3705  | 3705 |      |
| 5°  | 3705 | 3688  | 3645 | 3675  | 3665 | 351  |
| 15° | 3524 | 3487  | 3373 | 3310  | 3276 | 993  |
| 25° | 3199 | 3092  | 2870 | 2733  | 2682 | 1471 |
| 35° | 2756 | 2585  | 2290 | 2079  | 2005 | 1725 |
| 45° | 2253 | 2028  | 1677 | 1438  | 1358 | 1740 |
| 55° | 1713 | 1452  | 1090 | 889   | 825  | 1531 |
| 65° | 1157 | 885   | 584  | 470   | 459  | 1147 |
| 75° | 617  | 382   | 268  | 245   | 242  | 652  |
| 85° | 144  | 74    | 64   | 64    | 64   | 173  |
| 90° | 0    | 0     | 0    | 0     | 0    |      |

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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|-------|--------|--------|--------|--------|--------|
| 0°    | 3705.2 | 3705.2 | 3705.2 | 3705.2 | 3705.2 |
| 2.5°  | 3721.9 | 3705.2 | 3668.2 | 3702.1 | 3695.3 |
| 5°    | 3705.2 | 3688.5 | 3644.8 | 3675.0 | 3665.1 |
| 7.5°  | 3675.0 | 3655.0 | 3608.1 | 3621.3 | 3604.5 |
| 10°   | 3634.8 | 3611.3 | 3544.4 | 3534.1 | 3514.2 |
| 12.5° | 3584.6 | 3554.4 | 3463.7 | 3443.7 | 3406.7 |
| 15°   | 3524.1 | 3487.1 | 3373.3 | 3309.6 | 3276.1 |
| 17.5° | 3453.7 | 3400.0 | 3259.1 | 3185.4 | 3131.7 |
| 20°   | 3373.3 | 3306.0 | 3138.5 | 3054.9 | 2980.9 |
| 22.5° | 3286.2 | 3208.9 | 3014.4 | 2900.5 | 2850.3 |
| 25°   | 3199.0 | 3091.5 | 2870.3 | 2732.9 | 2682.4 |
| 27.5° | 3095.1 | 2980.9 | 2736.1 | 2578.5 | 2501.3 |
| 30°   | 2984.4 | 2856.7 | 2588.5 | 2417.7 | 2327.0 |
| 32.5° | 2877.0 | 2722.6 | 2447.9 | 2246.6 | 2162.7 |
| 35°   | 2756.4 | 2585.3 | 2290.4 | 2079.1 | 2005.1 |
| 37.5° | 2639.1 | 2454.4 | 2142.7 | 1911.1 | 1827.6 |
| 40°   | 2514.8 | 2313.9 | 1988.4 | 1750.3 | 1663.2 |
| 42.5° | 2387.5 | 2173.0 | 1834.3 | 1586.0 | 1502.4 |
| 45°   | 2253.4 | 2028.5 | 1676.7 | 1438.3 | 1358.0 |
| 47.5° | 2126.0 | 1888.0 | 1525.8 | 1287.5 | 1213.9 |
| 50°   | 1985.1 | 1747.1 | 1378.2 | 1146.6 | 1076.5 |
| 52.5° | 1847.4 | 1595.9 | 1237.3 | 1016.1 | 952.3  |
| 55°   | 1713.3 | 1451.8 | 1089.7 | 888.7  | 825.0  |
| 57.5° | 1576.0 | 1307.7 | 959.1  | 771.3  | 717.5  |
| 60°   | 1435.1 | 1166.9 | 821.4  | 650.7  | 597.0  |
| 62.5° | 1297.8 | 1029.6 | 704.1  | 543.3  | 516.5  |
| 65°   | 1156.9 | 885.1  | 583.5  | 469.6  | 459.3  |
| 67.5° | 1022.8 | 751.0  | 469.6  | 412.3  | 402.4  |
| 70°   | 881.9  | 620.5  | 388.8  | 355.4  | 341.9  |
| 72.5° | 747.8  | 499.5  | 325.2  | 298.5  | 291.7  |
| 75°   | 616.9  | 382.1  | 268.2  | 244.7  | 241.6  |
| 77.5° | 486.3  | 271.5  | 211.3  | 197.8  | 191.0  |
| 80°   | 365.4  | 194.6  | 160.8  | 147.7  | 147.7  |
| 82.5° | 254.7  | 130.9  | 110.7  | 103.9  | 103.9  |
| 85°   | 144.1  | 73.7   | 63.7   | 63.7   | 63.7   |
| 87.5° | 53.7   | 26.7   | 26.7   | 23.5   | 23.5   |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

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**CIE UGR TABLE:**

| Reflectances:   |      |                  |       |       |       |       |                |       |       |       |       |
|-----------------|------|------------------|-------|-------|-------|-------|----------------|-------|-------|-------|-------|
| Ceiling         |      | 0.7              | 0.7   | 0.5   | 0.5   | 0.3   | 0.7            | 0.7   | 0.5   | 0.5   | 0.3   |
| Wall            |      | 0.5              | 0.3   | 0.5   | 0.3   | 0.3   | 0.5            | 0.3   | 0.5   | 0.3   | 0.3   |
| Reference plane |      | 0.2              | 0.2   | 0.2   | 0.2   | 0.2   | 0.2            | 0.2   | 0.2   | 0.2   | 0.2   |
| Room dimensions |      | Viewed crosswise |       |       |       |       | Viewed endwise |       |       |       |       |
| X=2H            | Y=2H | 14.99            | 16.51 | 15.35 | 16.82 | 17.14 | 10.95          | 12.47 | 11.31 | 12.78 | 13.10 |
|                 | 3H   | 16.75            | 18.12 | 17.13 | 18.44 | 18.81 | 12.21          | 13.58 | 12.59 | 13.90 | 14.27 |
|                 | 4H   | 17.42            | 18.70 | 17.82 | 19.05 | 19.42 | 12.71          | 13.99 | 13.11 | 14.34 | 14.72 |
|                 | 6H   | 17.91            | 19.09 | 18.32 | 19.46 | 19.85 | 13.09          | 14.28 | 13.51 | 14.64 | 15.04 |
|                 | 8H   | 18.07            | 19.20 | 18.50 | 19.59 | 19.99 | 13.22          | 14.35 | 13.65 | 14.73 | 15.14 |
|                 | 12H  | 18.17            | 19.25 | 18.61 | 19.63 | 20.06 | 13.30          | 14.38 | 13.73 | 14.76 | 15.19 |
| 4H              | 2H   | 15.09            | 16.37 | 15.49 | 16.72 | 17.10 | 11.64          | 12.92 | 12.04 | 13.27 | 13.65 |
|                 | 3H   | 17.02            | 18.09 | 17.43 | 18.49 | 18.89 | 13.08          | 14.15 | 13.50 | 14.55 | 14.95 |
|                 | 4H   | 17.77            | 18.73 | 18.20 | 19.14 | 19.58 | 13.68          | 14.64 | 14.12 | 15.06 | 15.49 |
|                 | 6H   | 18.36            | 19.20 | 18.82 | 19.64 | 20.10 | 14.17          | 15.00 | 14.63 | 15.45 | 15.91 |
|                 | 8H   | 18.58            | 19.36 | 19.04 | 19.80 | 20.27 | 14.33          | 15.11 | 14.80 | 15.56 | 16.02 |
|                 | 12H  | 18.73            | 19.43 | 19.21 | 19.91 | 20.38 | 14.45          | 15.15 | 14.93 | 15.62 | 16.10 |
| 8H              | 4H   | 17.80            | 18.57 | 18.26 | 19.02 | 19.49 | 14.04          | 14.82 | 14.50 | 15.26 | 15.73 |
|                 | 6H   | 18.43            | 19.08 | 18.93 | 19.57 | 20.05 | 14.62          | 15.27 | 15.12 | 15.76 | 16.24 |
|                 | 8H   | 18.68            | 19.26 | 19.20 | 19.77 | 20.26 | 14.85          | 15.42 | 15.36 | 15.93 | 16.42 |
|                 | 12H  | 18.89            | 19.40 | 19.40 | 19.89 | 20.46 | 15.03          | 15.54 | 15.53 | 16.03 | 16.59 |
| 12H             | 4H   | 17.78            | 18.48 | 18.26 | 18.95 | 19.42 | 14.08          | 14.78 | 14.56 | 15.25 | 15.73 |
|                 | 6H   | 18.41            | 18.99 | 18.93 | 19.50 | 19.99 | 14.69          | 15.27 | 15.20 | 15.78 | 16.26 |
|                 | 8H   | 18.70            | 19.21 | 19.21 | 19.70 | 20.27 | 14.96          | 15.47 | 15.47 | 15.96 | 16.53 |