

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: P930764

Luminaire Tested: DFN2DS-PN4F0-110DS840-RLL

Issue Date: 11/20/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P930764  
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-PN4F0-110DS840-RLL  
Description: 4 foot, Pentagon Define Geo, with Direct 1in Regressed Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

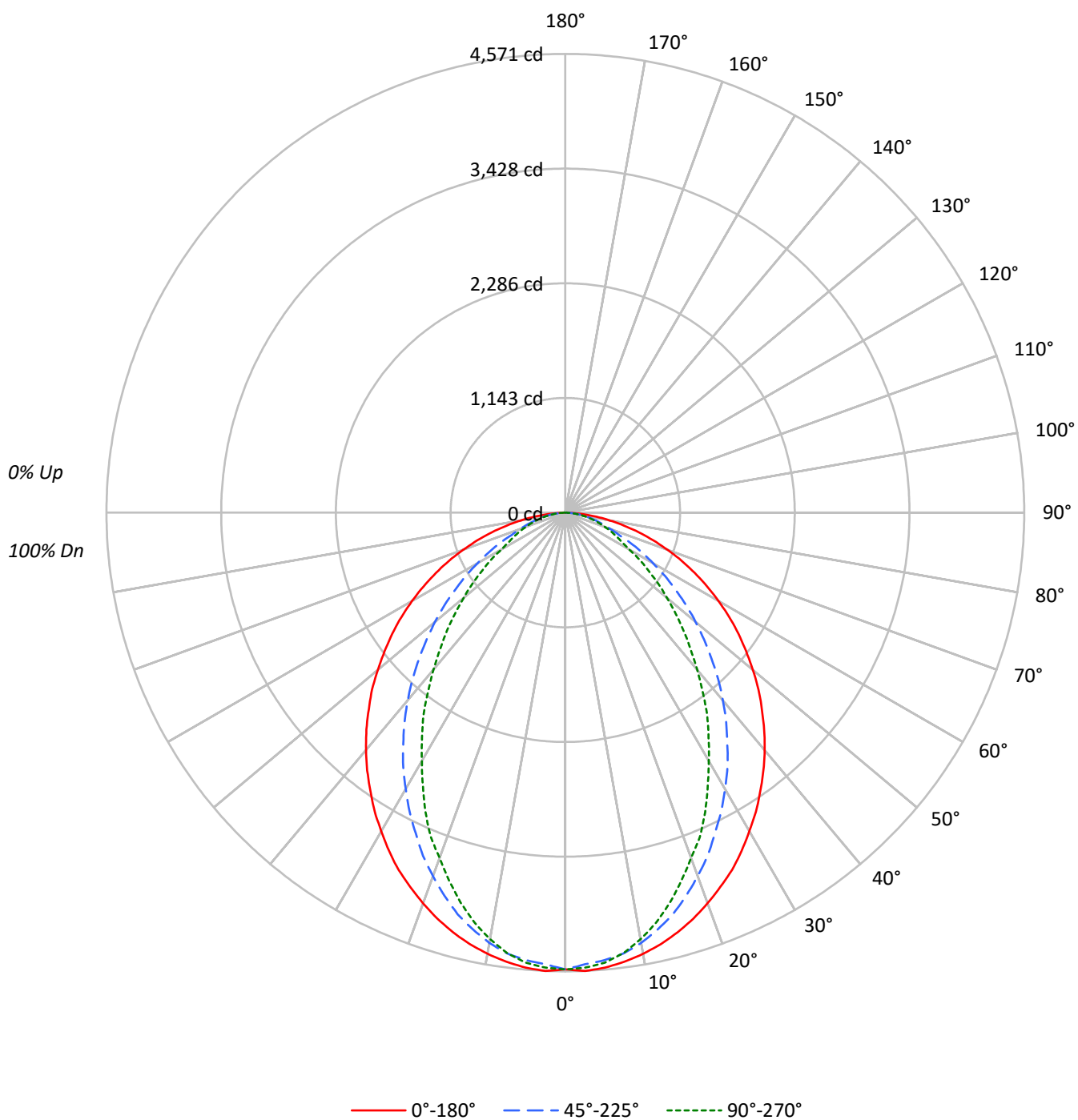
Lumens per Lamp: N/A  
Luminaire Lumens: 9359.4 lumens  
Efficiency: N/A  
Efficacy: 78.7 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular (W 3.94' x L: 3.74' x H: 0')  
CIE Type: Direct

Input Watts (W): 119  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.996  
Total Harmonic Distortion (THDi): 0.064  
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°  | 3322 | 3322 | 3322 |
| 5°  | 3335 | 3280 | 3298 |
| 10° | 3309 | 3227 | 3199 |
| 15° | 3271 | 3131 | 3041 |
| 20° | 3218 | 2994 | 2844 |
| 25° | 3164 | 2839 | 2654 |
| 30° | 3090 | 2680 | 2409 |
| 35° | 3017 | 2507 | 2195 |
| 40° | 2943 | 2327 | 1946 |
| 45° | 2857 | 2126 | 1722 |
| 50° | 2769 | 1922 | 1502 |
| 55° | 2678 | 1703 | 1290 |
| 60° | 2573 | 1473 | 1070 |
| 65° | 2454 | 1238 | 974  |
| 70° | 2312 | 1019 | 896  |
| 75° | 2137 | 929  | 837  |
| 80° | 1886 | 830  | 763  |
| 85° | 1482 | 655  | 655  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2857 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 426.5  | 4.6       |
| 10°-20°   | 1170.9 | 12.5      |
| 20°-30°   | 1643.8 | 17.6      |
| 30°-40°   | 1791.9 | 19.1      |
| 40°-50°   | 1646.9 | 17.6      |
| 50°-60°   | 1293.4 | 13.8      |
| 60°-70°   | 841.9  | 9.0       |
| 70°-80°   | 433.4  | 4.6       |
| 80°-90°   | 110.6  | 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°    | 3241.2 | 34.6      |
| 0°-40°    | 5033.1 | 53.8      |
| 0°-60°    | 7973.4 | 85.2      |
| 0°-90°    | 9359.4 | 100.0     |
| 90°-120°  | 0.0    | 0.0       |
| 90°-150°  | 0.0    | 0.0       |
| 90°-180°  | 0.0    | 0.0       |
| 0°-180°   | 9359.4 | 100.0     |

**CANDELA DISTRIBUTION:**

|     | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|-----|------|-------|------|-------|------|------|
| 0°  | 4551 | 4551  | 4551 | 4551  | 4551 |      |
| 5°  | 4551 | 4530  | 4477 | 4514  | 4502 | 432  |
| 15° | 4328 | 4283  | 4143 | 4065  | 4024 | 1220 |
| 25° | 3929 | 3797  | 3525 | 3357  | 3295 | 1807 |
| 35° | 3386 | 3175  | 2813 | 2554  | 2463 | 2119 |
| 45° | 2768 | 2492  | 2059 | 1767  | 1668 | 2137 |
| 55° | 2104 | 1783  | 1338 | 1092  | 1013 | 1880 |
| 65° | 1421 | 1087  | 717  | 577   | 564  | 1409 |
| 75° | 758  | 469   | 329  | 301   | 297  | 801  |
| 85° | 177  | 90    | 78   | 78    | 78   | 212  |
| 90° | 0    | 0     | 0    | 0     | 0    |      |

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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|-------|--------|--------|--------|--------|--------|
| 0°    | 4550.8 | 4550.8 | 4550.8 | 4550.8 | 4550.8 |
| 2.5°  | 4571.4 | 4550.8 | 4505.4 | 4546.9 | 4538.6 |
| 5°    | 4550.8 | 4530.3 | 4476.6 | 4513.7 | 4501.5 |
| 7.5°  | 4513.7 | 4489.2 | 4431.5 | 4447.7 | 4427.1 |
| 10°   | 4464.4 | 4435.4 | 4353.3 | 4340.6 | 4316.2 |
| 12.5° | 4402.7 | 4365.6 | 4254.1 | 4229.6 | 4184.2 |
| 15°   | 4328.4 | 4283.0 | 4143.1 | 4065.0 | 4023.8 |
| 17.5° | 4241.9 | 4176.0 | 4002.9 | 3912.4 | 3846.4 |
| 20°   | 4143.1 | 4060.6 | 3854.8 | 3752.0 | 3661.2 |
| 22.5° | 4036.1 | 3941.2 | 3702.3 | 3562.5 | 3500.8 |
| 25°   | 3929.0 | 3797.1 | 3525.3 | 3356.7 | 3294.6 |
| 27.5° | 3801.5 | 3661.2 | 3360.6 | 3167.0 | 3072.2 |
| 30°   | 3665.6 | 3508.7 | 3179.3 | 2969.5 | 2858.1 |
| 32.5° | 3533.6 | 3343.9 | 3006.6 | 2759.4 | 2656.3 |
| 35°   | 3385.5 | 3175.3 | 2813.1 | 2553.6 | 2462.7 |
| 37.5° | 3241.3 | 3014.5 | 2631.7 | 2347.2 | 2244.6 |
| 40°   | 3088.8 | 2841.9 | 2442.1 | 2149.7 | 2042.7 |
| 42.5° | 2932.3 | 2668.9 | 2253.0 | 1947.9 | 1845.2 |
| 45°   | 2767.7 | 2491.5 | 2059.4 | 1766.6 | 1667.9 |
| 47.5° | 2611.2 | 2318.9 | 1874.1 | 1581.3 | 1490.9 |
| 50°   | 2438.1 | 2145.8 | 1692.8 | 1408.3 | 1322.2 |
| 52.5° | 2269.1 | 1960.2 | 1519.7 | 1247.9 | 1169.7 |
| 55°   | 2104.3 | 1783.2 | 1338.3 | 1091.5 | 1013.3 |
| 57.5° | 1935.7 | 1606.2 | 1178.0 | 947.3  | 881.3  |
| 60°   | 1762.7 | 1433.2 | 1008.9 | 799.2  | 733.2  |
| 62.5° | 1594.0 | 1264.6 | 864.8  | 667.3  | 634.4  |
| 65°   | 1420.9 | 1087.1 | 716.6  | 576.8  | 564.1  |
| 67.5° | 1256.3 | 922.4  | 576.8  | 506.4  | 494.2  |
| 70°   | 1083.2 | 762.1  | 477.6  | 436.5  | 419.9  |
| 72.5° | 918.4  | 613.5  | 399.4  | 366.6  | 358.3  |
| 75°   | 757.7  | 469.3  | 329.4  | 300.6  | 296.7  |
| 77.5° | 597.3  | 333.4  | 259.6  | 242.9  | 234.6  |
| 80°   | 448.7  | 239.0  | 197.5  | 181.4  | 181.4  |
| 82.5° | 312.8  | 160.8  | 135.9  | 127.6  | 127.6  |
| 85°   | 177.0  | 90.5   | 78.2   | 78.2   | 78.2   |
| 87.5° | 66.0   | 32.7   | 32.7   | 28.8   | 28.8   |
| 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 | 15.41            | 16.93 | 15.77 | 17.24 | 17.56 | 11.37          | 12.89 | 11.73 | 13.20 | 13.52 |
|                 | 3H   | 17.17            | 18.54 | 17.55 | 18.86 | 19.23 | 12.63          | 14.00 | 13.01 | 14.32 | 14.69 |
|                 | 4H   | 17.84            | 19.12 | 18.24 | 19.47 | 19.85 | 13.13          | 14.41 | 13.53 | 14.76 | 15.14 |
|                 | 6H   | 18.33            | 19.51 | 18.74 | 19.88 | 20.27 | 13.51          | 14.70 | 13.93 | 15.06 | 15.46 |
|                 | 8H   | 18.49            | 19.62 | 18.92 | 20.01 | 20.41 | 13.64          | 14.77 | 14.07 | 15.15 | 15.56 |
|                 | 12H  | 18.59            | 19.67 | 19.03 | 20.06 | 20.48 | 13.72          | 14.80 | 14.15 | 15.18 | 15.61 |
| 4H              | 2H   | 15.51            | 16.79 | 15.91 | 17.14 | 17.52 | 12.06          | 13.34 | 12.46 | 13.69 | 14.07 |
|                 | 3H   | 17.44            | 18.51 | 17.85 | 18.91 | 19.31 | 13.50          | 14.57 | 13.92 | 14.97 | 15.37 |
|                 | 4H   | 18.19            | 19.15 | 18.63 | 19.56 | 20.00 | 14.10          | 15.06 | 14.54 | 15.48 | 15.92 |
|                 | 6H   | 18.78            | 19.62 | 19.24 | 20.06 | 20.52 | 14.59          | 15.42 | 15.05 | 15.87 | 16.33 |
|                 | 8H   | 19.00            | 19.78 | 19.46 | 20.22 | 20.69 | 14.75          | 15.53 | 15.22 | 15.98 | 16.44 |
|                 | 12H  | 19.15            | 19.85 | 19.63 | 20.33 | 20.80 | 14.87          | 15.57 | 15.35 | 16.04 | 16.52 |
| 8H              | 4H   | 18.22            | 18.99 | 18.68 | 19.44 | 19.91 | 14.46          | 15.24 | 14.92 | 15.68 | 16.15 |
|                 | 6H   | 18.85            | 19.50 | 19.35 | 19.99 | 20.47 | 15.04          | 15.69 | 15.54 | 16.18 | 16.66 |
|                 | 8H   | 19.10            | 19.68 | 19.62 | 20.19 | 20.68 | 15.27          | 15.84 | 15.78 | 16.35 | 16.84 |
|                 | 12H  | 19.31            | 19.82 | 19.82 | 20.31 | 20.88 | 15.45          | 15.96 | 15.95 | 16.45 | 17.01 |
| 12H             | 4H   | 18.20            | 18.90 | 18.68 | 19.37 | 19.85 | 14.50          | 15.20 | 14.98 | 15.67 | 16.15 |
|                 | 6H   | 18.84            | 19.41 | 19.35 | 19.92 | 20.41 | 15.11          | 15.69 | 15.62 | 16.20 | 16.68 |
|                 | 8H   | 19.12            | 19.63 | 19.63 | 20.12 | 20.69 | 15.38          | 15.89 | 15.89 | 16.38 | 16.95 |