

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: P929990

Luminaire Tested: DFN2DS-4P4F0-060DS840-RLL

Issue Date: 11/20/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P929990  
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-4P4F0-060DS840-RLL  
Description: 4 foot, 90deg - 4way Define Geo, with Direct 1in Regressed Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

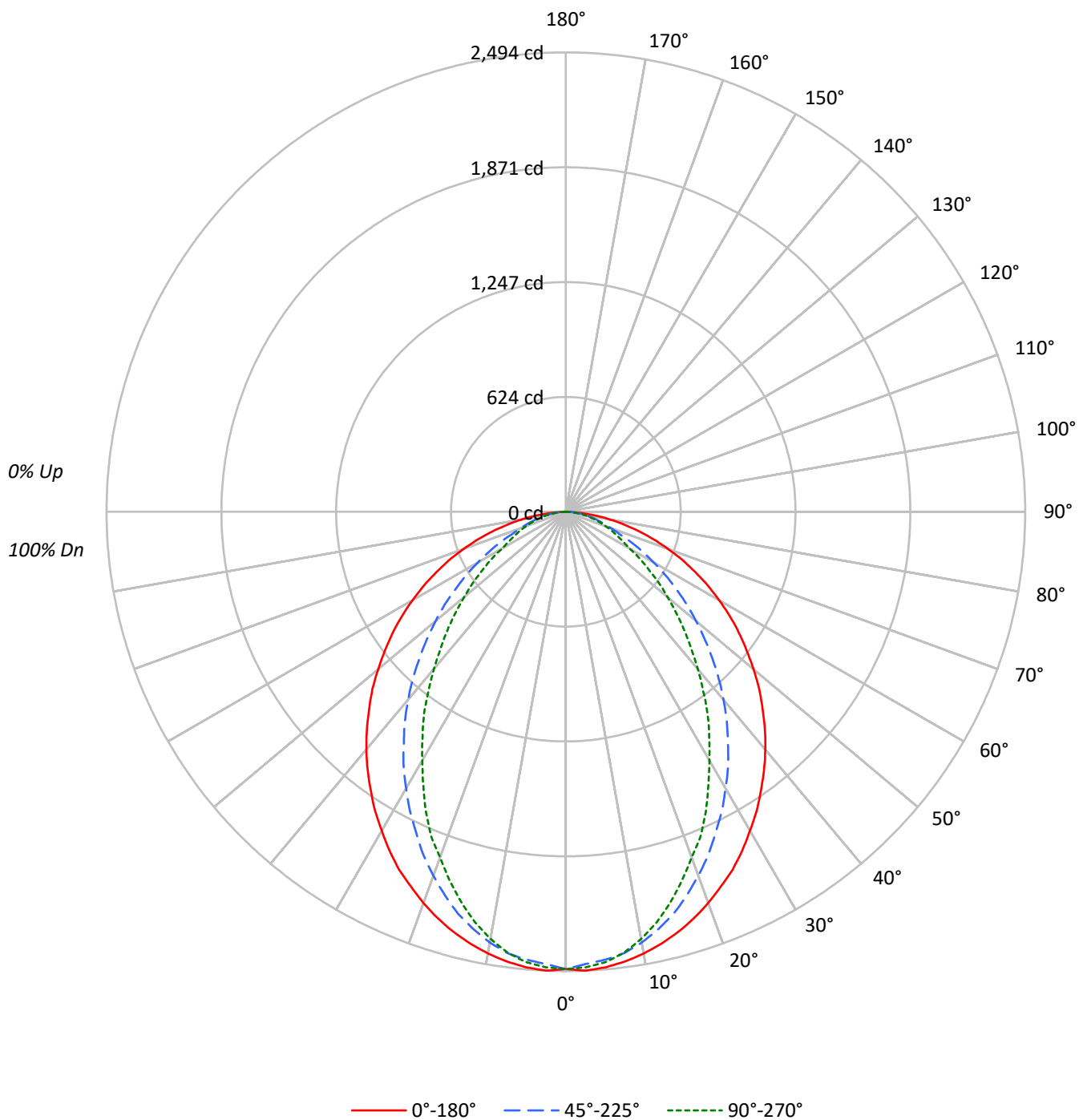
Lumens per Lamp: N/A  
Luminaire Lumens: 5105.1 lumens  
Efficiency: N/A  
Efficacy: 82.3 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular (W 4.07' x L: 4.07' x H: 0')  
CIE Type: Direct

Input Watts (W): 62  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9933  
Total Harmonic Distortion (THDi): 0.066  
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°  | 1610 | 1610 | 1610 |
| 5°  | 1617 | 1590 | 1599 |
| 10° | 1604 | 1564 | 1551 |
| 15° | 1586 | 1518 | 1474 |
| 20° | 1560 | 1452 | 1379 |
| 25° | 1534 | 1376 | 1286 |
| 30° | 1498 | 1299 | 1168 |
| 35° | 1462 | 1215 | 1064 |
| 40° | 1427 | 1128 | 944  |
| 45° | 1385 | 1031 | 835  |
| 50° | 1342 | 932  | 728  |
| 55° | 1298 | 826  | 625  |
| 60° | 1248 | 714  | 519  |
| 65° | 1190 | 600  | 472  |
| 70° | 1121 | 494  | 434  |
| 75° | 1036 | 450  | 406  |
| 80° | 914  | 402  | 369  |
| 85° | 718  | 317  | 317  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 1385 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 232.6  | 4.6       |
| 10°-20°   | 638.6  | 12.5      |
| 20°-30°   | 896.6  | 17.6      |
| 30°-40°   | 977.4  | 19.1      |
| 40°-50°   | 898.3  | 17.6      |
| 50°-60°   | 705.5  | 13.8      |
| 60°-70°   | 459.2  | 9.0       |
| 70°-80°   | 236.4  | 4.6       |
| 80°-90°   | 60.3   | 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°    | 1767.9 | 34.6      |
| 0°-40°    | 2745.3 | 53.8      |
| 0°-60°    | 4349.1 | 85.2      |
| 0°-90°    | 5105.1 | 100.0     |
| 90°-120°  | 0.0    | 0.0       |
| 90°-150°  | 0.0    | 0.0       |
| 90°-180°  | 0.0    | 0.0       |
| 0°-180°   | 5105.1 | 100.0     |

**CANDELA DISTRIBUTION:**

|     | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|-----|------|-------|------|-------|------|------|
| 0°  | 2482 | 2482  | 2482 | 2482  | 2482 |      |
| 5°  | 2482 | 2471  | 2442 | 2462  | 2455 | 235  |
| 15° | 2361 | 2336  | 2260 | 2217  | 2195 | 665  |
| 25° | 2143 | 2071  | 1923 | 1831  | 1797 | 986  |
| 35° | 1847 | 1732  | 1534 | 1393  | 1343 | 1156 |
| 45° | 1510 | 1359  | 1123 | 964   | 910  | 1166 |
| 55° | 1148 | 973   | 730  | 595   | 553  | 1026 |
| 65° | 775  | 593   | 391  | 315   | 308  | 768  |
| 75° | 413  | 256   | 180  | 164   | 162  | 437  |
| 85° | 96   | 49    | 43   | 43    | 43   | 116  |
| 90° | 0    | 0     | 0    | 0     | 0    |      |

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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|-------|--------|--------|--------|--------|--------|
| 0°    | 2482.3 | 2482.3 | 2482.3 | 2482.3 | 2482.3 |
| 2.5°  | 2493.5 | 2482.3 | 2457.5 | 2480.1 | 2475.6 |
| 5°    | 2482.3 | 2471.1 | 2441.7 | 2462.1 | 2455.4 |
| 7.5°  | 2462.1 | 2448.6 | 2417.2 | 2426.0 | 2414.8 |
| 10°   | 2435.0 | 2419.3 | 2374.6 | 2367.7 | 2354.3 |
| 12.5° | 2401.5 | 2381.2 | 2320.4 | 2307.1 | 2282.3 |
| 15°   | 2361.0 | 2336.1 | 2259.9 | 2217.2 | 2194.8 |
| 17.5° | 2313.8 | 2277.8 | 2183.4 | 2134.0 | 2098.1 |
| 20°   | 2259.9 | 2214.8 | 2102.6 | 2046.5 | 1997.0 |
| 22.5° | 2201.5 | 2149.7 | 2019.4 | 1943.1 | 1909.5 |
| 25°   | 2143.1 | 2071.2 | 1922.9 | 1830.9 | 1797.1 |
| 27.5° | 2073.6 | 1997.0 | 1833.0 | 1727.4 | 1675.8 |
| 30°   | 1999.4 | 1913.8 | 1734.1 | 1619.7 | 1559.0 |
| 32.5° | 1927.4 | 1824.0 | 1640.0 | 1505.1 | 1448.8 |
| 35°   | 1846.6 | 1732.0 | 1534.4 | 1392.8 | 1343.2 |
| 37.5° | 1768.0 | 1644.2 | 1435.5 | 1280.4 | 1224.3 |
| 40°   | 1684.8 | 1550.1 | 1332.0 | 1172.6 | 1114.2 |
| 42.5° | 1599.5 | 1455.8 | 1228.8 | 1062.5 | 1006.5 |
| 45°   | 1509.6 | 1359.0 | 1123.3 | 963.6  | 909.7  |
| 47.5° | 1424.3 | 1264.9 | 1022.2 | 862.6  | 813.2  |
| 50°   | 1329.9 | 1170.5 | 923.3  | 768.2  | 721.2  |
| 52.5° | 1237.6 | 1069.2 | 828.9  | 680.7  | 638.0  |
| 55°   | 1147.8 | 972.7  | 730.0  | 595.4  | 552.7  |
| 57.5° | 1055.9 | 876.1  | 642.5  | 516.7  | 480.7  |
| 60°   | 961.5  | 781.8  | 550.3  | 435.9  | 399.9  |
| 62.5° | 869.5  | 689.8  | 471.7  | 364.0  | 346.0  |
| 65°   | 775.1  | 593.0  | 390.9  | 314.6  | 307.7  |
| 67.5° | 685.2  | 503.1  | 314.6  | 276.3  | 269.6  |
| 70°   | 590.8  | 415.6  | 260.5  | 238.1  | 229.0  |
| 72.5° | 501.0  | 334.6  | 217.8  | 200.0  | 195.4  |
| 75°   | 413.3  | 256.0  | 179.7  | 164.0  | 161.9  |
| 77.5° | 325.8  | 181.9  | 141.5  | 132.5  | 128.0  |
| 80°   | 244.7  | 130.3  | 107.7  | 98.9   | 98.9   |
| 82.5° | 170.7  | 87.7   | 74.1   | 69.6   | 69.6   |
| 85°   | 96.5   | 49.3   | 42.6   | 42.6   | 42.6   |
| 87.5° | 36.0   | 17.9   | 17.9   | 15.7   | 15.7   |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

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CATALOG NUMBER: DFN2DS-4P4F0-060DS840-RLI

**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 | 12.89            | 14.41 | 13.25 | 14.73 | 15.04 | 8.85           | 10.37 | 9.22  | 10.69 | 11.00 |
|                 | 3H   | 14.66            | 16.02 | 15.03 | 16.35 | 16.71 | 10.12          | 11.48 | 10.49 | 11.81 | 12.17 |
|                 | 4H   | 15.32            | 16.60 | 15.72 | 16.95 | 17.33 | 10.62          | 11.90 | 11.02 | 12.25 | 12.63 |
|                 | 6H   | 15.81            | 16.99 | 16.22 | 17.36 | 17.75 | 11.00          | 12.18 | 11.41 | 12.55 | 12.94 |
|                 | 8H   | 15.98            | 17.10 | 16.40 | 17.49 | 17.89 | 11.12          | 12.25 | 11.55 | 12.64 | 13.04 |
|                 | 12H  | 16.08            | 17.16 | 16.51 | 17.54 | 17.97 | 11.20          | 12.28 | 11.63 | 12.66 | 13.09 |
| 4H              | 2H   | 12.99            | 14.27 | 13.39 | 14.62 | 15.00 | 9.55           | 10.83 | 9.95  | 11.18 | 11.55 |
|                 | 3H   | 14.93            | 15.99 | 15.34 | 16.39 | 16.79 | 10.99          | 12.05 | 11.40 | 12.45 | 12.85 |
|                 | 4H   | 15.68            | 16.63 | 16.11 | 17.05 | 17.49 | 11.59          | 12.55 | 12.02 | 12.96 | 13.40 |
|                 | 6H   | 16.27            | 17.10 | 16.73 | 17.54 | 18.00 | 12.08          | 12.91 | 12.53 | 13.35 | 13.81 |
|                 | 8H   | 16.48            | 17.26 | 16.95 | 17.70 | 18.17 | 12.24          | 13.02 | 12.70 | 13.46 | 13.93 |
|                 | 12H  | 16.64            | 17.33 | 17.12 | 17.81 | 18.28 | 12.36          | 13.05 | 12.84 | 13.53 | 14.00 |
| 8H              | 4H   | 15.70            | 16.48 | 16.16 | 16.92 | 17.39 | 11.94          | 12.72 | 12.41 | 13.16 | 13.63 |
|                 | 6H   | 16.34            | 16.98 | 16.83 | 17.47 | 17.95 | 12.53          | 13.17 | 13.03 | 13.66 | 14.14 |
|                 | 8H   | 16.59            | 17.17 | 17.10 | 17.67 | 18.16 | 12.75          | 13.33 | 13.26 | 13.84 | 14.32 |
|                 | 12H  | 16.79            | 17.30 | 17.30 | 17.79 | 18.36 | 12.93          | 13.44 | 13.44 | 13.93 | 14.50 |
| 12H             | 4H   | 15.69            | 16.38 | 16.17 | 16.86 | 17.33 | 11.99          | 12.68 | 12.47 | 13.16 | 13.63 |
|                 | 6H   | 16.32            | 16.90 | 16.83 | 17.41 | 17.89 | 12.59          | 13.17 | 13.11 | 13.68 | 14.17 |
|                 | 8H   | 16.60            | 17.11 | 17.11 | 17.61 | 18.17 | 12.87          | 13.38 | 13.38 | 13.87 | 14.43 |