

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: P929999

Luminaire Tested: DFN2DS-4P4F0-060DS940-FLL

Issue Date: 11/20/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P929999  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (P333812)  
Test Lab: INNOVATION CENTER  
Issue Date: 11/20/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DS-4P4F0-060DS940-FLL  
Description: 4 foot, 90deg - 4way Define Geo, with Direct Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

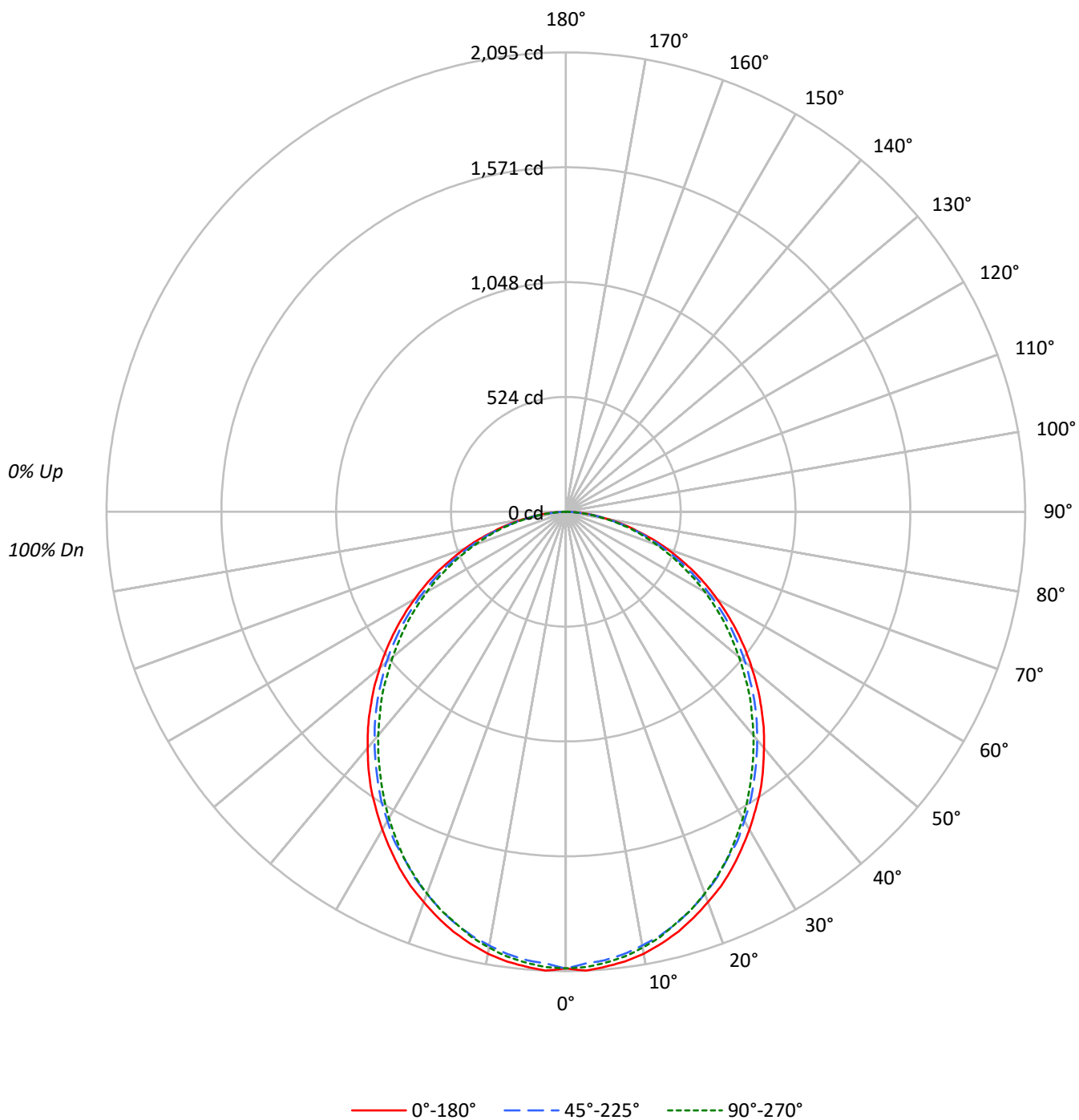
Lumens per Lamp: N/A  
Luminaire Lumens: 5298.4 lumens  
Efficiency: N/A  
Efficacy: 85.5 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular (W 4.07' x L: 4.07' x H: 0')  
CIE Type: Direct

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   | 109 | 104 | 100 | 96  | 106 | 102 | 98  | 95  | 98  | 95  | 92  |  | 94  | 91  | 89  |  | 90  |
| 2   | 99  | 91  | 85  | 79  | 97  | 89  | 83  | 78  | 86  | 81  | 76  |  | 83  | 78  | 74  |  | 80  |
| 3   | 91  | 80  | 72  | 66  | 88  | 79  | 71  | 65  | 76  | 69  | 64  |  | 73  | 68  | 63  |  | 71  |
| 4   | 83  | 71  | 63  | 56  | 81  | 70  | 62  | 56  | 68  | 61  | 55  |  | 65  | 59  | 54  |  | 63  |
| 5   | 77  | 64  | 55  | 49  | 75  | 63  | 55  | 48  | 61  | 53  | 48  |  | 59  | 52  | 47  |  | 57  |
| 6   | 71  | 58  | 49  | 43  | 69  | 57  | 48  | 42  | 55  | 48  | 42  |  | 53  | 47  | 42  |  | 52  |
| 7   | 66  | 52  | 44  | 38  | 64  | 52  | 43  | 38  | 50  | 43  | 37  |  | 49  | 42  | 37  |  | 47  |
| 8   | 61  | 48  | 40  | 34  | 60  | 47  | 39  | 34  | 46  | 39  | 33  |  | 45  | 38  | 33  |  | 44  |
| 9   | 57  | 44  | 36  | 30  | 56  | 43  | 36  | 30  | 42  | 35  | 30  |  | 41  | 35  | 30  |  | 40  |
| 10  | 54  | 41  | 33  | 28  | 53  | 40  | 33  | 28  | 39  | 32  | 27  |  | 38  | 32  | 27  |  | 37  |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1351 | 1351 | 1351 |
| 5°  | 1356 | 1337 | 1345 |
| 10° | 1348 | 1323 | 1330 |
| 15° | 1331 | 1306 | 1305 |
| 20° | 1308 | 1280 | 1279 |
| 25° | 1284 | 1249 | 1249 |
| 30° | 1254 | 1220 | 1209 |
| 35° | 1226 | 1185 | 1167 |
| 40° | 1191 | 1150 | 1128 |
| 45° | 1156 | 1115 | 1088 |
| 50° | 1118 | 1079 | 1041 |
| 55° | 1078 | 1037 | 999  |
| 60° | 1034 | 988  | 951  |
| 65° | 987  | 938  | 894  |
| 70° | 927  | 877  | 836  |
| 75° | 843  | 808  | 788  |
| 80° | 748  | 726  | 688  |
| 85° | 610  | 581  | 522  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 1156 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 196.0  | 3.7       |
| 10°-20°   | 551.5  | 10.4      |
| 20°-30°   | 810.5  | 15.3      |
| 30°-40°   | 941.3  | 17.8      |
| 40°-50°   | 940.1  | 17.7      |
| 50°-60°   | 819.8  | 15.5      |
| 60°-70°   | 606.0  | 11.4      |
| 70°-80°   | 342.9  | 6.5       |
| 80°-90°   | 90.5   | 1.7       |
| 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°    | 1558.0 | 29.4      |
| 0°-40°    | 2499.3 | 47.2      |
| 0°-60°    | 4259.1 | 80.4      |
| 0°-90°    | 5298.4 | 100.0     |
| 90°-120°  | 0.0    | 0.0       |
| 90°-150°  | 0.0    | 0.0       |
| 90°-180°  | 0.0    | 0.0       |
| 0°-180°   | 5298.4 | 100.0     |

**CANDELA DISTRIBUTION:**

|     | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|-----|------|-------|------|-------|------|------|
| 0°  | 2082 | 2082  | 2082 | 2082  | 2082 |      |
| 5°  | 2082 | 2075  | 2052 | 2068  | 2065 | 198  |
| 15° | 1982 | 1970  | 1944 | 1952  | 1942 | 558  |
| 25° | 1794 | 1778  | 1744 | 1748  | 1744 | 826  |
| 35° | 1548 | 1528  | 1496 | 1484  | 1474 | 967  |
| 45° | 1260 | 1246  | 1215 | 1194  | 1186 | 972  |
| 55° | 953  | 941   | 917  | 893   | 883  | 852  |
| 65° | 643  | 631   | 611  | 593   | 583  | 636  |
| 75° | 336  | 332   | 322  | 310   | 314  | 359  |
| 85° | 82   | 80    | 78   | 72    | 70   | 96   |
| 90° | 0    | 0     | 0    | 0     | 0    |      |



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|-------|--------|--------|--------|--------|--------|
| 0°    | 2082.5 | 2082.5 | 2082.5 | 2082.5 | 2082.5 |
| 2.5°  | 2094.6 | 2084.6 | 2062.5 | 2082.5 | 2078.6 |
| 5°    | 2082.5 | 2074.6 | 2052.5 | 2068.5 | 2064.6 |
| 7.5°  | 2068.5 | 2056.6 | 2034.5 | 2050.6 | 2046.6 |
| 10°   | 2046.6 | 2032.6 | 2008.5 | 2024.5 | 2018.5 |
| 12.5° | 2016.5 | 2004.5 | 1980.5 | 1990.5 | 1986.5 |
| 15°   | 1982.4 | 1970.5 | 1944.4 | 1952.5 | 1942.5 |
| 17.5° | 1940.4 | 1928.5 | 1902.4 | 1912.3 | 1902.4 |
| 20°   | 1894.3 | 1882.4 | 1854.3 | 1860.3 | 1852.4 |
| 22.5° | 1848.4 | 1830.3 | 1804.2 | 1804.2 | 1800.1 |
| 25°   | 1794.2 | 1778.3 | 1744.2 | 1748.1 | 1744.2 |
| 27.5° | 1734.0 | 1720.0 | 1694.1 | 1688.2 | 1678.2 |
| 30°   | 1674.2 | 1658.0 | 1628.1 | 1622.1 | 1614.0 |
| 32.5° | 1610.0 | 1598.1 | 1566.0 | 1553.9 | 1545.8 |
| 35°   | 1548.0 | 1528.0 | 1495.9 | 1483.8 | 1473.8 |
| 37.5° | 1477.9 | 1459.8 | 1427.7 | 1413.6 | 1403.7 |
| 40°   | 1405.8 | 1389.6 | 1357.6 | 1339.8 | 1331.7 |
| 42.5° | 1335.7 | 1319.5 | 1287.7 | 1267.5 | 1255.6 |
| 45°   | 1259.7 | 1245.6 | 1215.4 | 1193.6 | 1185.5 |
| 47.5° | 1185.5 | 1171.5 | 1139.4 | 1117.3 | 1105.4 |
| 50°   | 1107.3 | 1097.3 | 1069.3 | 1041.2 | 1031.2 |
| 52.5° | 1031.2 | 1017.2 | 991.3  | 969.2  | 955.2  |
| 55°   | 953.3  | 941.1  | 917.2  | 893.2  | 883.2  |
| 57.5° | 875.1  | 865.2  | 839.0  | 815.0  | 806.9  |
| 60°   | 796.9  | 789.1  | 761.1  | 738.9  | 733.0  |
| 62.5° | 720.8  | 706.8  | 686.8  | 666.9  | 658.8  |
| 65°   | 642.9  | 630.8  | 610.8  | 592.7  | 582.7  |
| 67.5° | 562.8  | 552.6  | 534.8  | 520.7  | 512.6  |
| 70°   | 488.6  | 480.6  | 462.5  | 448.5  | 440.6  |
| 72.5° | 412.6  | 404.5  | 394.5  | 380.5  | 374.6  |
| 75°   | 336.3  | 332.5  | 322.3  | 310.4  | 314.4  |
| 77.5° | 268.3  | 260.3  | 256.2  | 250.3  | 244.3  |
| 80°   | 200.3  | 198.2  | 194.2  | 188.2  | 184.2  |
| 82.5° | 136.2  | 136.2  | 134.2  | 126.2  | 126.2  |
| 85°   | 82.0   | 80.1   | 78.1   | 72.0   | 70.1   |
| 87.5° | 36.1   | 32.1   | 28.0   | 22.1   | 20.0   |
| 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 | 12.33            | 13.94 | 12.69 | 14.25 | 14.57 | 11.88          | 13.49 | 12.25 | 13.81 | 14.12 |
|                 | 3H   | 14.08            | 15.53 | 14.46 | 15.86 | 16.22 | 13.59          | 15.04 | 13.96 | 15.37 | 15.73 |
|                 | 4H   | 14.72            | 16.09 | 15.12 | 16.44 | 16.82 | 14.23          | 15.60 | 14.63 | 15.95 | 16.32 |
|                 | 6H   | 15.19            | 16.46 | 15.60 | 16.83 | 17.22 | 14.69          | 15.96 | 15.10 | 16.32 | 16.72 |
|                 | 8H   | 15.34            | 16.55 | 15.76 | 16.94 | 17.34 | 14.83          | 16.04 | 15.26 | 16.43 | 16.83 |
|                 | 12H  | 15.43            | 16.59 | 15.86 | 16.97 | 17.40 | 14.91          | 16.07 | 15.34 | 16.46 | 16.88 |
| 4H              | 2H   | 12.89            | 14.26 | 13.29 | 14.61 | 14.98 | 12.54          | 13.90 | 12.93 | 14.25 | 14.63 |
|                 | 3H   | 14.86            | 16.01 | 15.27 | 16.41 | 16.81 | 14.46          | 15.60 | 14.87 | 16.00 | 16.40 |
|                 | 4H   | 15.64            | 16.68 | 16.07 | 17.09 | 17.53 | 15.22          | 16.25 | 15.65 | 16.67 | 17.10 |
|                 | 6H   | 16.24            | 17.14 | 16.69 | 17.58 | 18.04 | 15.80          | 16.71 | 16.26 | 17.15 | 17.61 |
|                 | 8H   | 16.43            | 17.27 | 16.89 | 17.71 | 18.18 | 15.99          | 16.83 | 16.45 | 17.28 | 17.74 |
|                 | 12H  | 16.56            | 17.32 | 17.04 | 17.79 | 18.26 | 16.11          | 16.87 | 16.59 | 17.34 | 17.81 |
| 8H              | 4H   | 15.91            | 16.76 | 16.37 | 17.20 | 17.67 | 15.54          | 16.39 | 16.00 | 16.83 | 17.29 |
|                 | 6H   | 16.63            | 17.33 | 17.12 | 17.82 | 18.29 | 16.25          | 16.95 | 16.74 | 17.44 | 17.91 |
|                 | 8H   | 16.89            | 17.52 | 17.40 | 18.02 | 18.51 | 16.49          | 17.13 | 17.00 | 17.63 | 18.12 |
|                 | 12H  | 17.09            | 17.64 | 17.59 | 18.14 | 18.70 | 16.67          | 17.23 | 17.18 | 17.72 | 18.28 |
| 12H             | 4H   | 15.94            | 16.70 | 16.42 | 17.18 | 17.64 | 15.57          | 16.33 | 16.05 | 16.81 | 17.28 |
|                 | 6H   | 16.67            | 17.30 | 17.18 | 17.81 | 18.30 | 16.30          | 16.94 | 16.81 | 17.44 | 17.93 |
|                 | 8H   | 16.99            | 17.54 | 17.49 | 18.04 | 18.60 | 16.61          | 17.17 | 17.12 | 17.66 | 18.22 |