

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: P931491

Luminaire Tested: DFN2DS-TR4F0-060DS935-FLL

Issue Date: 11/20/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P931491  
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-TR4F0-060DS935-FLL  
Description: 4 foot, Triangle Define Geo, with Direct Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

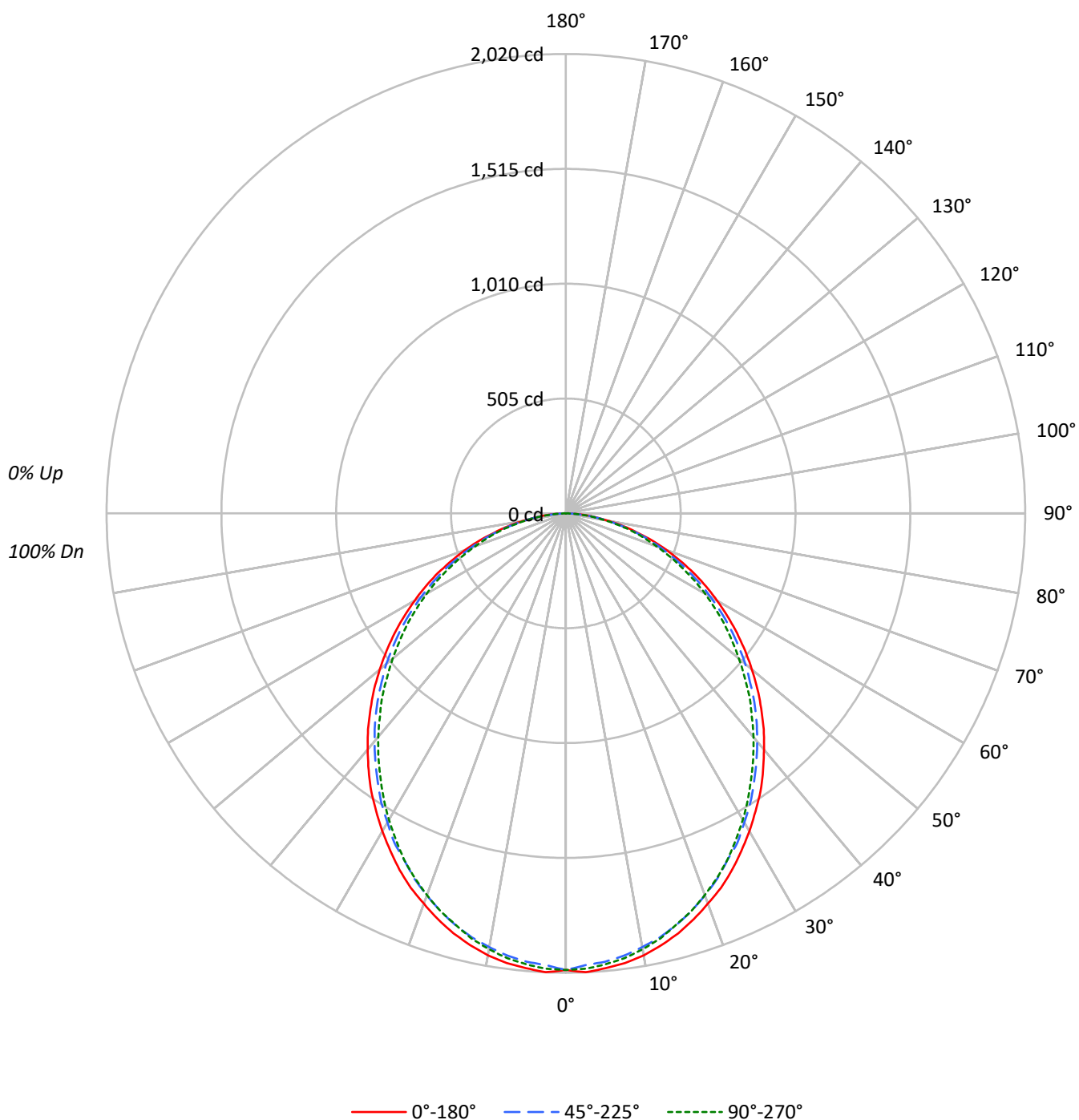
Lumens per Lamp: N/A  
Luminaire Lumens: 5108.4 lumens  
Efficiency: N/A  
Efficacy: 85.7 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular (W 3.96' x L: 3.43' x H: 0')  
CIE Type: Direct

Input Watts (W): 59.6  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9781  
Total Harmonic Distortion (THDi): 0.075  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P931491

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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°  | 1595 | 1595 | 1595 |
| 5°  | 1601 | 1578 | 1587 |
| 10° | 1592 | 1562 | 1570 |
| 15° | 1572 | 1542 | 1540 |
| 20° | 1544 | 1511 | 1510 |
| 25° | 1516 | 1474 | 1474 |
| 30° | 1481 | 1440 | 1427 |
| 35° | 1447 | 1399 | 1378 |
| 40° | 1406 | 1357 | 1331 |
| 45° | 1364 | 1317 | 1284 |
| 50° | 1319 | 1274 | 1229 |
| 55° | 1273 | 1225 | 1179 |
| 60° | 1221 | 1166 | 1123 |
| 65° | 1165 | 1107 | 1056 |
| 70° | 1094 | 1036 | 987  |
| 75° | 995  | 954  | 931  |
| 80° | 884  | 856  | 813  |
| 85° | 720  | 686  | 616  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
Vertical Angle: 45°  
Luminance: 1364 cd/sqm

TEST NUMBER: P931491

CATALOG NUMBER: DFN2DS-TR4F0-060DS935-FLL

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 189.0  | 3.7       |
| 10°-20°   | 531.7  | 10.4      |
| 20°-30°   | 781.4  | 15.3      |
| 30°-40°   | 907.5  | 17.8      |
| 40°-50°   | 906.4  | 17.7      |
| 50°-60°   | 790.4  | 15.5      |
| 60°-70°   | 584.3  | 11.4      |
| 70°-80°   | 330.6  | 6.5       |
| 80°-90°   | 87.2   | 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°    | 1502.1 | 29.4      |
| 0°-40°    | 2409.6 | 47.2      |
| 0°-60°    | 4106.3 | 80.4      |
| 0°-90°    | 5108.4 | 100.0     |
| 90°-120°  | 0.0    | 0.0       |
| 90°-150°  | 0.0    | 0.0       |
| 90°-180°  | 0.0    | 0.0       |
| 0°-180°   | 5108.4 | 100.0     |

**CANDELA DISTRIBUTION:**

|     | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|-----|------|-------|------|-------|------|------|
| 0°  | 2008 | 2008  | 2008 | 2008  | 2008 |      |
| 5°  | 2008 | 2000  | 1979 | 1994  | 1991 | 191  |
| 15° | 1911 | 1900  | 1875 | 1882  | 1873 | 538  |
| 25° | 1730 | 1714  | 1682 | 1685  | 1682 | 796  |
| 35° | 1492 | 1473  | 1442 | 1430  | 1421 | 932  |
| 45° | 1214 | 1201  | 1172 | 1151  | 1143 | 937  |
| 55° | 919  | 907   | 884  | 861   | 852  | 822  |
| 65° | 620  | 608   | 589  | 572   | 562  | 613  |
| 75° | 324  | 321   | 311  | 299   | 303  | 346  |
| 85° | 79   | 77    | 75   | 69    | 68   | 93   |
| 90° | 0    | 0     | 0    | 0     | 0    |      |

TEST NUMBER: P931491

CATALOG NUMBER: DFN2DS-TR4F0-060DS935-FLL

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|-------|--------|--------|--------|--------|--------|
| 0°    | 2007.8 | 2007.8 | 2007.8 | 2007.8 | 2007.8 |
| 2.5°  | 2019.5 | 2009.8 | 1988.5 | 2007.8 | 2004.1 |
| 5°    | 2007.8 | 2000.2 | 1978.9 | 1994.3 | 1990.6 |
| 7.5°  | 1994.3 | 1982.8 | 1961.5 | 1977.1 | 1973.2 |
| 10°   | 1973.2 | 1959.7 | 1936.5 | 1951.9 | 1946.1 |
| 12.5° | 1944.1 | 1932.6 | 1909.5 | 1919.1 | 1915.2 |
| 15°   | 1911.3 | 1899.8 | 1874.6 | 1882.5 | 1872.8 |
| 17.5° | 1870.8 | 1859.3 | 1834.1 | 1843.7 | 1834.1 |
| 20°   | 1826.3 | 1814.9 | 1787.8 | 1793.5 | 1786.0 |
| 22.5° | 1782.1 | 1764.6 | 1739.4 | 1739.4 | 1735.6 |
| 25°   | 1729.8 | 1714.5 | 1681.6 | 1685.3 | 1681.6 |
| 27.5° | 1671.8 | 1658.3 | 1633.3 | 1627.6 | 1618.0 |
| 30°   | 1614.1 | 1598.5 | 1569.7 | 1563.9 | 1556.1 |
| 32.5° | 1552.2 | 1540.8 | 1509.8 | 1498.1 | 1490.4 |
| 35°   | 1492.4 | 1473.2 | 1442.2 | 1430.5 | 1420.9 |
| 37.5° | 1424.8 | 1407.4 | 1376.5 | 1362.9 | 1353.3 |
| 40°   | 1355.4 | 1339.8 | 1308.9 | 1291.7 | 1283.9 |
| 42.5° | 1287.8 | 1272.2 | 1241.5 | 1222.1 | 1210.5 |
| 45°   | 1214.5 | 1200.9 | 1171.8 | 1150.8 | 1142.9 |
| 47.5° | 1142.9 | 1129.4 | 1098.6 | 1077.2 | 1065.7 |
| 50°   | 1067.6 | 1058.0 | 1031.0 | 1003.9 | 994.2  |
| 52.5° | 994.2  | 980.7  | 955.7  | 934.5  | 921.0  |
| 55°   | 919.1  | 907.4  | 884.3  | 861.1  | 851.5  |
| 57.5° | 843.7  | 834.1  | 808.9  | 785.8  | 778.0  |
| 60°   | 768.3  | 760.8  | 733.8  | 712.4  | 706.7  |
| 62.5° | 695.0  | 681.5  | 662.2  | 642.9  | 635.2  |
| 65°   | 619.8  | 608.2  | 588.9  | 571.5  | 561.8  |
| 67.5° | 542.6  | 532.8  | 515.6  | 502.1  | 494.2  |
| 70°   | 471.1  | 463.4  | 445.9  | 432.4  | 424.8  |
| 72.5° | 397.8  | 390.0  | 380.4  | 366.9  | 361.1  |
| 75°   | 324.2  | 320.6  | 310.7  | 299.3  | 303.2  |
| 77.5° | 258.7  | 250.9  | 247.0  | 241.3  | 235.6  |
| 80°   | 193.2  | 191.1  | 187.2  | 181.5  | 177.6  |
| 82.5° | 131.3  | 131.3  | 129.4  | 121.7  | 121.7  |
| 85°   | 79.0   | 77.2   | 75.3   | 69.4   | 67.6   |
| 87.5° | 34.8   | 31.0   | 27.0   | 21.3   | 19.3   |
| 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 | 12.90            | 14.52 | 13.27 | 14.83 | 15.14 | 12.46          | 14.07 | 12.83 | 14.39 | 14.70 |
|                 | 3H   | 14.66            | 16.11 | 15.03 | 16.44 | 16.80 | 14.16          | 15.62 | 14.54 | 15.95 | 16.31 |
|                 | 4H   | 15.30            | 16.67 | 15.70 | 17.02 | 17.39 | 14.81          | 16.18 | 15.20 | 16.52 | 16.90 |
|                 | 6H   | 15.77            | 17.04 | 16.18 | 17.40 | 17.79 | 15.27          | 16.54 | 15.68 | 16.90 | 17.29 |
|                 | 8H   | 15.91            | 17.12 | 16.34 | 17.51 | 17.91 | 15.41          | 16.62 | 15.84 | 17.01 | 17.41 |
|                 | 12H  | 16.00            | 17.16 | 16.43 | 17.55 | 17.97 | 15.49          | 16.65 | 15.92 | 17.03 | 17.46 |
| 4H              | 2H   | 13.47            | 14.83 | 13.86 | 15.18 | 15.56 | 13.11          | 14.48 | 13.51 | 14.83 | 15.21 |
|                 | 3H   | 15.44            | 16.59 | 15.85 | 16.98 | 17.38 | 15.03          | 16.18 | 15.44 | 16.58 | 16.98 |
|                 | 4H   | 16.22            | 17.25 | 16.65 | 17.67 | 18.10 | 15.79          | 16.83 | 16.22 | 17.24 | 17.68 |
|                 | 6H   | 16.81            | 17.72 | 17.27 | 18.16 | 18.62 | 16.38          | 17.29 | 16.84 | 17.73 | 18.18 |
|                 | 8H   | 17.00            | 17.85 | 17.46 | 18.29 | 18.76 | 16.57          | 17.41 | 17.03 | 17.85 | 18.32 |
|                 | 12H  | 17.13            | 17.89 | 17.61 | 18.37 | 18.84 | 16.68          | 17.44 | 17.16 | 17.92 | 18.39 |
| 8H              | 4H   | 16.49            | 17.34 | 16.95 | 17.78 | 18.24 | 16.12          | 16.96 | 16.58 | 17.41 | 17.87 |
|                 | 6H   | 17.20            | 17.91 | 17.70 | 18.40 | 18.87 | 16.82          | 17.53 | 17.32 | 18.01 | 18.49 |
|                 | 8H   | 17.46            | 18.09 | 17.97 | 18.60 | 19.09 | 17.07          | 17.70 | 17.58 | 18.21 | 18.70 |
|                 | 12H  | 17.66            | 18.22 | 18.17 | 18.71 | 19.27 | 17.25          | 17.81 | 17.76 | 18.30 | 18.86 |
| 12H             | 4H   | 16.52            | 17.28 | 17.00 | 17.75 | 18.22 | 16.15          | 16.91 | 16.63 | 17.39 | 17.86 |
|                 | 6H   | 17.25            | 17.88 | 17.76 | 18.39 | 18.87 | 16.88          | 17.51 | 17.39 | 18.02 | 18.51 |
|                 | 8H   | 17.56            | 18.12 | 18.07 | 18.61 | 19.17 | 17.19          | 17.74 | 17.69 | 18.23 | 18.80 |

END OF REPORT