

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: P931511

Luminaire Tested: DFN2DS-TR4F0-070DS940-FLL

Issue Date: 11/20/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P931511  
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-TR4F0-070DS940-FLL  
Description: 4 foot, Triangle Define Geo, with Direct Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

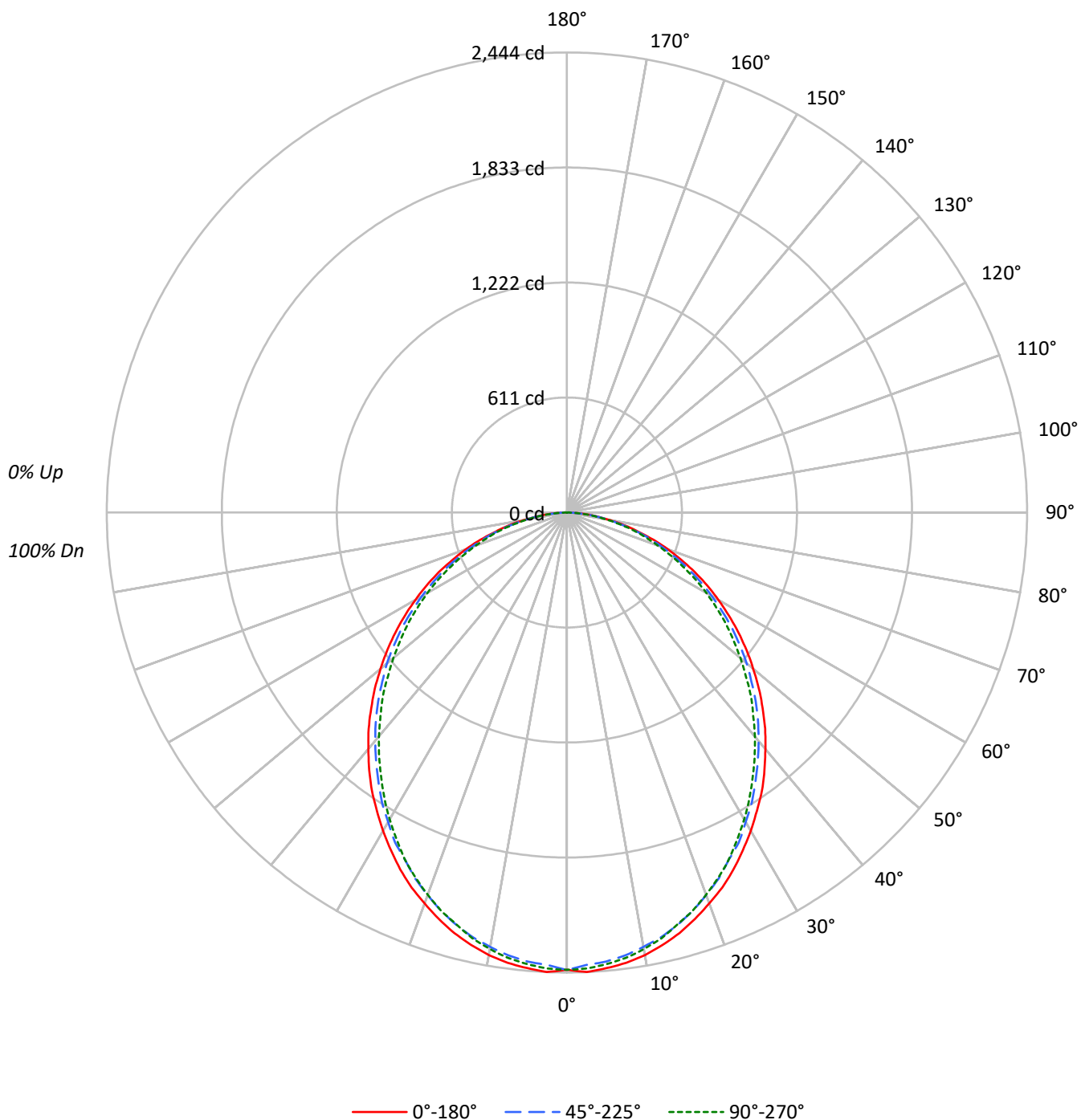
Lumens per Lamp: N/A  
Luminaire Lumens: 6181.6 lumens  
Efficiency: N/A  
Efficacy: 86.1 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular (W 3.96' x L: 3.43' x H: 0')  
CIE Type: Direct

Input Watts (W): 71.8  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9977  
Total Harmonic Distortion (THDi): 0.049  
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°  | 1930 | 1930 | 1930 |
| 5°  | 1937 | 1910 | 1921 |
| 10° | 1926 | 1890 | 1900 |
| 15° | 1902 | 1866 | 1864 |
| 20° | 1868 | 1829 | 1827 |
| 25° | 1835 | 1784 | 1784 |
| 30° | 1792 | 1742 | 1727 |
| 35° | 1751 | 1693 | 1668 |
| 40° | 1701 | 1642 | 1611 |
| 45° | 1651 | 1593 | 1554 |
| 50° | 1597 | 1542 | 1487 |
| 55° | 1540 | 1482 | 1427 |
| 60° | 1477 | 1411 | 1359 |
| 65° | 1410 | 1340 | 1278 |
| 70° | 1324 | 1253 | 1194 |
| 75° | 1204 | 1154 | 1126 |
| 80° | 1069 | 1037 | 983  |
| 85° | 872  | 832  | 746  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 1651 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 228.7  | 3.7       |
| 10°-20°   | 643.4  | 10.4      |
| 20°-30°   | 945.5  | 15.3      |
| 30°-40°   | 1098.2 | 17.8      |
| 40°-50°   | 1096.8 | 17.7      |
| 50°-60°   | 956.4  | 15.5      |
| 60°-70°   | 707.0  | 11.4      |
| 70°-80°   | 400.0  | 6.5       |
| 80°-90°   | 105.6  | 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°    | 1817.6 | 29.4      |
| 0°-40°    | 2915.8 | 47.2      |
| 0°-60°    | 4969.0 | 80.4      |
| 0°-90°    | 6181.6 | 100.0     |
| 90°-120°  | 0.0    | 0.0       |
| 90°-150°  | 0.0    | 0.0       |
| 90°-180°  | 0.0    | 0.0       |
| 0°-180°   | 6181.6 | 100.0     |

**CANDELA DISTRIBUTION:**

|     | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|-----|------|-------|------|-------|------|------|
| 0°  | 2430 | 2430  | 2430 | 2430  | 2430 |      |
| 5°  | 2430 | 2420  | 2395 | 2413  | 2409 | 231  |
| 15° | 2313 | 2299  | 2268 | 2278  | 2266 | 651  |
| 25° | 2093 | 2075  | 2035 | 2040  | 2035 | 963  |
| 35° | 1806 | 1783  | 1745 | 1731  | 1719 | 1128 |
| 45° | 1470 | 1453  | 1418 | 1392  | 1383 | 1134 |
| 55° | 1112 | 1098  | 1070 | 1042  | 1030 | 994  |
| 65° | 750  | 736   | 713  | 692   | 680  | 742  |
| 75° | 392  | 388   | 376  | 362   | 367  | 419  |
| 85° | 96   | 94    | 91   | 84    | 82   | 112  |
| 90° | 0    | 0     | 0    | 0     | 0    |      |

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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|-------|--------|--------|--------|--------|--------|
| 0°    | 2429.5 | 2429.5 | 2429.5 | 2429.5 | 2429.5 |
| 2.5°  | 2443.7 | 2432.0 | 2406.3 | 2429.5 | 2425.1 |
| 5°    | 2429.5 | 2420.4 | 2394.7 | 2413.2 | 2408.8 |
| 7.5°  | 2413.2 | 2399.3 | 2373.5 | 2392.4 | 2387.7 |
| 10°   | 2387.7 | 2371.3 | 2343.3 | 2361.9 | 2355.0 |
| 12.5° | 2352.5 | 2338.6 | 2310.6 | 2322.2 | 2317.5 |
| 15°   | 2312.9 | 2299.0 | 2268.4 | 2277.9 | 2266.2 |
| 17.5° | 2263.7 | 2249.9 | 2219.4 | 2231.1 | 2219.4 |
| 20°   | 2209.9 | 2196.1 | 2163.4 | 2170.3 | 2161.1 |
| 22.5° | 2156.4 | 2135.4 | 2104.9 | 2104.9 | 2100.1 |
| 25°   | 2093.3 | 2074.6 | 2035.0 | 2039.5 | 2035.0 |
| 27.5° | 2023.1 | 2006.7 | 1976.5 | 1969.5 | 1957.9 |
| 30°   | 1953.2 | 1934.3 | 1899.4 | 1892.5 | 1883.0 |
| 32.5° | 1878.3 | 1864.5 | 1827.0 | 1812.9 | 1803.4 |
| 35°   | 1805.9 | 1782.7 | 1745.2 | 1731.1 | 1719.4 |
| 37.5° | 1724.1 | 1703.1 | 1665.6 | 1649.3 | 1637.6 |
| 40°   | 1640.1 | 1621.3 | 1583.8 | 1563.1 | 1553.6 |
| 42.5° | 1558.3 | 1539.5 | 1502.3 | 1478.8 | 1464.8 |
| 45°   | 1469.6 | 1453.2 | 1418.0 | 1392.5 | 1383.0 |
| 47.5° | 1383.0 | 1366.7 | 1329.3 | 1303.5 | 1289.7 |
| 50°   | 1291.9 | 1280.2 | 1247.5 | 1214.8 | 1203.1 |
| 52.5° | 1203.1 | 1186.8 | 1156.6 | 1130.8 | 1114.4 |
| 55°   | 1112.1 | 1098.1 | 1070.0 | 1042.0 | 1030.3 |
| 57.5° | 1021.0 | 1009.3 | 978.8  | 950.8  | 941.4  |
| 60°   | 929.7  | 920.5  | 887.9  | 862.1  | 855.2  |
| 62.5° | 841.0  | 824.7  | 801.4  | 778.1  | 768.6  |
| 65°   | 750.1  | 735.9  | 712.6  | 691.6  | 679.9  |
| 67.5° | 656.6  | 644.7  | 623.9  | 607.5  | 598.1  |
| 70°   | 570.1  | 560.7  | 539.6  | 523.2  | 514.1  |
| 72.5° | 481.3  | 472.0  | 460.3  | 443.9  | 437.0  |
| 75°   | 392.4  | 387.9  | 376.0  | 362.2  | 366.9  |
| 77.5° | 313.1  | 303.6  | 298.9  | 292.0  | 285.1  |
| 80°   | 233.7  | 231.3  | 226.6  | 219.6  | 214.9  |
| 82.5° | 158.9  | 158.9  | 156.6  | 147.3  | 147.3  |
| 85°   | 95.7   | 93.5   | 91.3   | 84.0   | 81.8   |
| 87.5° | 42.1   | 37.5   | 32.7   | 25.8   | 23.3   |
| 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 | 13.57            | 15.18 | 13.93 | 15.49 | 15.81 | 13.12          | 14.73 | 13.49 | 15.05 | 15.36 |
|                 | 3H   | 15.32            | 16.77 | 15.69 | 17.10 | 17.46 | 14.83          | 16.28 | 15.20 | 16.61 | 16.97 |
|                 | 4H   | 15.96            | 17.33 | 16.36 | 17.68 | 18.06 | 15.47          | 16.84 | 15.87 | 17.19 | 17.56 |
|                 | 6H   | 16.43            | 17.70 | 16.84 | 18.07 | 18.46 | 15.93          | 17.20 | 16.34 | 17.56 | 17.96 |
|                 | 8H   | 16.58            | 17.79 | 17.00 | 18.18 | 18.57 | 16.07          | 17.28 | 16.50 | 17.67 | 18.07 |
|                 | 12H  | 16.67            | 17.83 | 17.10 | 18.21 | 18.64 | 16.15          | 17.31 | 16.58 | 17.70 | 18.12 |
| 4H              | 2H   | 14.13            | 15.50 | 14.53 | 15.84 | 16.22 | 13.77          | 15.14 | 14.17 | 15.49 | 15.87 |
|                 | 3H   | 16.10            | 17.25 | 16.51 | 17.65 | 18.05 | 15.70          | 16.84 | 16.11 | 17.24 | 17.64 |
|                 | 4H   | 16.88            | 17.92 | 17.31 | 18.33 | 18.77 | 16.46          | 17.49 | 16.89 | 17.91 | 18.34 |
|                 | 6H   | 17.48            | 18.38 | 17.93 | 18.82 | 19.28 | 17.04          | 17.95 | 17.50 | 18.39 | 18.85 |
|                 | 8H   | 17.67            | 18.51 | 18.13 | 18.95 | 19.42 | 17.23          | 18.07 | 17.69 | 18.52 | 18.98 |
|                 | 12H  | 17.80            | 18.56 | 18.28 | 19.03 | 19.50 | 17.35          | 18.11 | 17.83 | 18.58 | 19.05 |
| 8H              | 4H   | 17.15            | 18.00 | 17.61 | 18.44 | 18.91 | 16.78          | 17.63 | 17.24 | 18.07 | 18.53 |
|                 | 6H   | 17.87            | 18.57 | 18.36 | 19.06 | 19.53 | 17.49          | 18.19 | 17.98 | 18.68 | 19.15 |
|                 | 8H   | 18.13            | 18.76 | 18.64 | 19.26 | 19.75 | 17.73          | 18.37 | 18.24 | 18.87 | 19.36 |
|                 | 12H  | 18.33            | 18.88 | 18.83 | 19.37 | 19.94 | 17.91          | 18.47 | 18.42 | 18.96 | 19.52 |
| 12H             | 4H   | 17.18            | 17.94 | 17.66 | 18.41 | 18.88 | 16.81          | 17.57 | 17.29 | 18.05 | 18.52 |
|                 | 6H   | 17.91            | 18.54 | 18.42 | 19.05 | 19.54 | 17.54          | 18.18 | 18.05 | 18.68 | 19.17 |
|                 | 8H   | 18.23            | 18.78 | 18.73 | 19.27 | 19.84 | 17.85          | 18.41 | 18.36 | 18.90 | 19.46 |