

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: P930619

Luminaire Tested: DFN2DS-PN3F0-090DS840-FLL

Issue Date: 11/20/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P930619  
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-PN3F0-090DS840-FLL  
Description: 3 foot, Pentagon Define Geo, with Direct Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

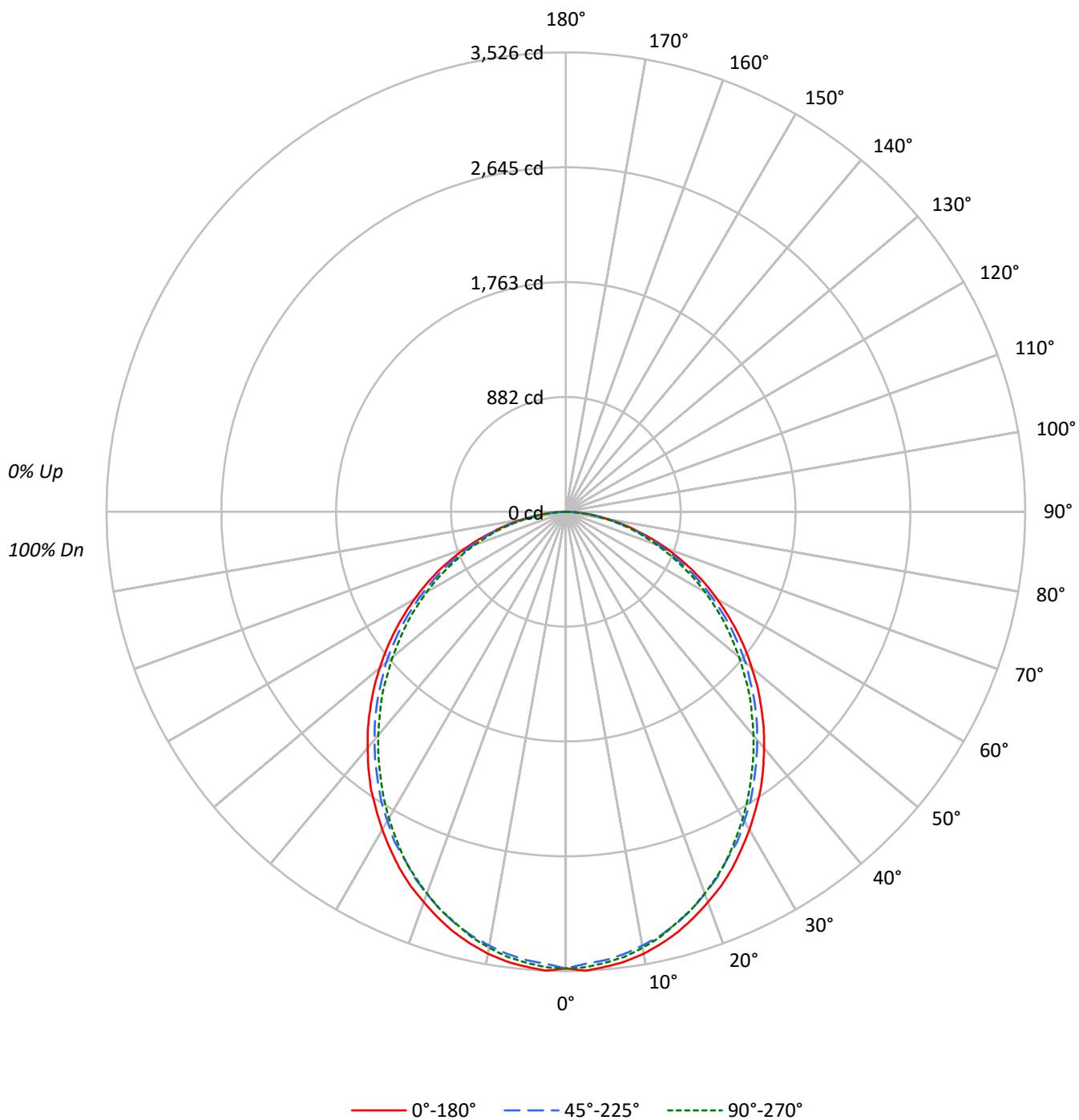
Lumens per Lamp: N/A  
Luminaire Lumens: 8918.9 lumens  
Efficiency: N/A  
Efficacy: 91.8 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular (W 3.11' x L: 2.96' x H: 0')  
CIE Type: Direct

Input Watts (W): 97.2  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9954  
Total Harmonic Distortion (THDi): 0.076  
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°  | 4098 | 4098 | 4098 |
| 5°  | 4113 | 4054 | 4078 |
| 10° | 4089 | 4013 | 4033 |
| 15° | 4039 | 3961 | 3957 |
| 20° | 3967 | 3883 | 3879 |
| 25° | 3895 | 3787 | 3787 |
| 30° | 3804 | 3699 | 3667 |
| 35° | 3718 | 3593 | 3540 |
| 40° | 3611 | 3487 | 3421 |
| 45° | 3505 | 3382 | 3299 |
| 50° | 3390 | 3273 | 3157 |
| 55° | 3270 | 3146 | 3030 |
| 60° | 3136 | 2995 | 2885 |
| 65° | 2993 | 2844 | 2713 |
| 70° | 2811 | 2661 | 2535 |
| 75° | 2557 | 2450 | 2391 |
| 80° | 2270 | 2200 | 2088 |
| 85° | 1851 | 1765 | 1583 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 3505 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 329.9  | 3.7       |
| 10°-20°   | 928.3  | 10.4      |
| 20°-30°   | 1364.2 | 15.3      |
| 30°-40°   | 1584.5 | 17.8      |
| 40°-50°   | 1582.5 | 17.7      |
| 50°-60°   | 1379.9 | 15.5      |
| 60°-70°   | 1020.1 | 11.4      |
| 70°-80°   | 577.1  | 6.5       |
| 80°-90°   | 152.3  | 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       |
| <hr/>     |        |           |
| 0°-30°    | 2622.5 | 29.4      |
| 0°-40°    | 4207.0 | 47.2      |
| 0°-60°    | 7169.4 | 80.4      |
| 0°-90°    | 8918.9 | 100.0     |
| 90°-120°  | 0.0    | 0.0       |
| 90°-150°  | 0.0    | 0.0       |
| 90°-180°  | 0.0    | 0.0       |
| 0°-180°   | 8918.9 | 100.0     |

**CANDELA DISTRIBUTION:**

|     | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|-----|------|-------|------|-------|------|------|
| 0°  | 3505 | 3505  | 3505 | 3505  | 3505 |      |
| 5°  | 3505 | 3492  | 3455 | 3482  | 3475 | 333  |
| 15° | 3337 | 3317  | 3273 | 3287  | 3270 | 940  |
| 25° | 3020 | 2993  | 2936 | 2942  | 2936 | 1390 |
| 35° | 2606 | 2572  | 2518 | 2498  | 2481 | 1627 |
| 45° | 2120 | 2097  | 2046 | 2009  | 1996 | 1636 |
| 55° | 1605 | 1584  | 1544 | 1504  | 1487 | 1435 |
| 65° | 1082 | 1062  | 1028 | 998   | 981  | 1070 |
| 75° | 566  | 560   | 542  | 522   | 529  | 604  |
| 85° | 138  | 135   | 132  | 121   | 118  | 162  |
| 90° | 0    | 0     | 0    | 0     | 0    |      |

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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|-------|--------|--------|--------|--------|--------|
| 0°    | 3505.4 | 3505.4 | 3505.4 | 3505.4 | 3505.4 |
| 2.5°  | 3525.8 | 3509.0 | 3471.9 | 3505.4 | 3499.0 |
| 5°    | 3505.4 | 3492.2 | 3455.1 | 3481.9 | 3475.4 |
| 7.5°  | 3481.9 | 3461.9 | 3424.6 | 3451.8 | 3445.0 |
| 10°   | 3445.0 | 3421.4 | 3381.0 | 3407.8 | 3397.8 |
| 12.5° | 3394.2 | 3374.2 | 3333.8 | 3350.5 | 3343.8 |
| 15°   | 3337.0 | 3317.0 | 3273.0 | 3286.6 | 3269.8 |
| 17.5° | 3266.2 | 3246.1 | 3202.2 | 3219.0 | 3202.2 |
| 20°   | 3188.6 | 3168.6 | 3121.3 | 3131.3 | 3118.1 |
| 22.5° | 3111.3 | 3081.0 | 3036.9 | 3036.9 | 3030.1 |
| 25°   | 3020.1 | 2993.3 | 2936.1 | 2942.5 | 2936.1 |
| 27.5° | 2918.9 | 2895.3 | 2851.7 | 2841.7 | 2824.9 |
| 30°   | 2818.1 | 2790.9 | 2740.4 | 2730.4 | 2716.9 |
| 32.5° | 2710.1 | 2690.1 | 2636.0 | 2615.7 | 2602.1 |
| 35°   | 2605.7 | 2572.1 | 2518.0 | 2497.7 | 2480.9 |
| 37.5° | 2487.7 | 2457.3 | 2403.2 | 2379.7 | 2362.9 |
| 40°   | 2366.4 | 2339.2 | 2285.2 | 2255.2 | 2241.6 |
| 42.5° | 2248.3 | 2221.2 | 2167.6 | 2133.6 | 2113.6 |
| 45°   | 2120.3 | 2096.8 | 2045.9 | 2009.1 | 1995.6 |
| 47.5° | 1995.6 | 1972.0 | 1917.9 | 1880.8 | 1860.8 |
| 50°   | 1864.0 | 1847.1 | 1799.9 | 1752.8 | 1735.9 |
| 52.5° | 1735.9 | 1712.3 | 1668.7 | 1631.5 | 1607.9 |
| 55°   | 1604.7 | 1584.3 | 1543.8 | 1503.5 | 1486.7 |
| 57.5° | 1473.1 | 1456.3 | 1412.3 | 1371.9 | 1358.3 |
| 60°   | 1341.4 | 1328.2 | 1281.0 | 1243.8 | 1233.8 |
| 62.5° | 1213.4 | 1189.8 | 1156.2 | 1122.6 | 1109.0 |
| 65°   | 1082.2 | 1061.8 | 1028.1 | 997.8  | 981.0  |
| 67.5° | 947.3  | 930.2  | 900.1  | 876.6  | 863.0  |
| 70°   | 822.5  | 808.9  | 778.6  | 755.0  | 741.7  |
| 72.5° | 694.5  | 680.9  | 664.1  | 640.5  | 630.5  |
| 75°   | 566.2  | 559.7  | 542.5  | 522.5  | 529.3  |
| 77.5° | 451.7  | 438.1  | 431.3  | 421.3  | 411.3  |
| 80°   | 337.2  | 333.6  | 326.8  | 316.8  | 310.1  |
| 82.5° | 229.2  | 229.2  | 226.0  | 212.4  | 212.4  |
| 85°   | 138.0  | 134.8  | 131.6  | 121.2  | 118.0  |
| 87.5° | 60.8   | 54.0   | 47.2   | 37.2   | 33.6   |
| 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 | 16.18            | 17.79 | 16.55 | 18.11 | 18.42 | 15.74          | 17.35 | 16.10 | 17.66 | 17.98 |
|                 | 3H   | 17.93            | 19.39 | 18.31 | 19.71 | 20.07 | 17.44          | 18.90 | 17.82 | 19.22 | 19.58 |
|                 | 4H   | 18.58            | 19.95 | 18.98 | 20.30 | 20.67 | 18.08          | 19.45 | 18.48 | 19.80 | 20.18 |
|                 | 6H   | 19.05            | 20.32 | 19.46 | 20.68 | 21.07 | 18.55          | 19.82 | 18.96 | 20.18 | 20.57 |
|                 | 8H   | 19.19            | 20.40 | 19.62 | 20.79 | 21.19 | 18.69          | 19.90 | 19.11 | 20.29 | 20.69 |
|                 | 12H  | 19.28            | 20.44 | 19.71 | 20.82 | 21.25 | 18.77          | 19.93 | 19.20 | 20.31 | 20.74 |
| 4H              | 2H   | 16.74            | 18.11 | 17.14 | 18.46 | 18.84 | 16.39          | 17.76 | 16.79 | 18.11 | 18.48 |
|                 | 3H   | 18.72            | 19.86 | 19.13 | 20.26 | 20.66 | 18.31          | 19.46 | 18.72 | 19.86 | 20.26 |
|                 | 4H   | 19.50            | 20.53 | 19.93 | 20.94 | 21.38 | 19.07          | 20.11 | 19.50 | 20.52 | 20.96 |
|                 | 6H   | 20.09            | 21.00 | 20.55 | 21.44 | 21.89 | 19.66          | 20.56 | 20.11 | 21.00 | 21.46 |
|                 | 8H   | 20.28            | 21.13 | 20.74 | 21.57 | 22.04 | 19.84          | 20.69 | 20.30 | 21.13 | 21.60 |
|                 | 12H  | 20.41            | 21.17 | 20.89 | 21.65 | 22.12 | 19.96          | 20.72 | 20.44 | 21.20 | 21.67 |
| 8H              | 4H   | 19.77            | 20.61 | 20.23 | 21.06 | 21.52 | 19.39          | 20.24 | 19.85 | 20.68 | 21.15 |
|                 | 6H   | 20.48            | 21.19 | 20.98 | 21.67 | 22.15 | 20.10          | 20.80 | 20.59 | 21.29 | 21.77 |
|                 | 8H   | 20.74            | 21.37 | 21.25 | 21.88 | 22.37 | 20.35          | 20.98 | 20.86 | 21.49 | 21.97 |
|                 | 12H  | 20.94            | 21.50 | 21.45 | 21.99 | 22.55 | 20.53          | 21.09 | 21.04 | 21.58 | 22.14 |
| 12H             | 4H   | 19.79            | 20.55 | 20.27 | 21.03 | 21.50 | 19.43          | 20.19 | 19.91 | 20.67 | 21.14 |
|                 | 6H   | 20.53            | 21.16 | 21.04 | 21.67 | 22.15 | 20.16          | 20.79 | 20.67 | 21.30 | 21.78 |
|                 | 8H   | 20.84            | 21.40 | 21.35 | 21.89 | 22.45 | 20.46          | 21.02 | 20.97 | 21.51 | 22.07 |