

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: P931224

Luminaire Tested: DFN2DS-SQ4F0-160DS940-RLL

Issue Date: 11/20/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P931224  
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-SQ4F0-160DS940-RLL  
Description: 4 foot, Square Define Geo, with Direct 1in Regressed Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

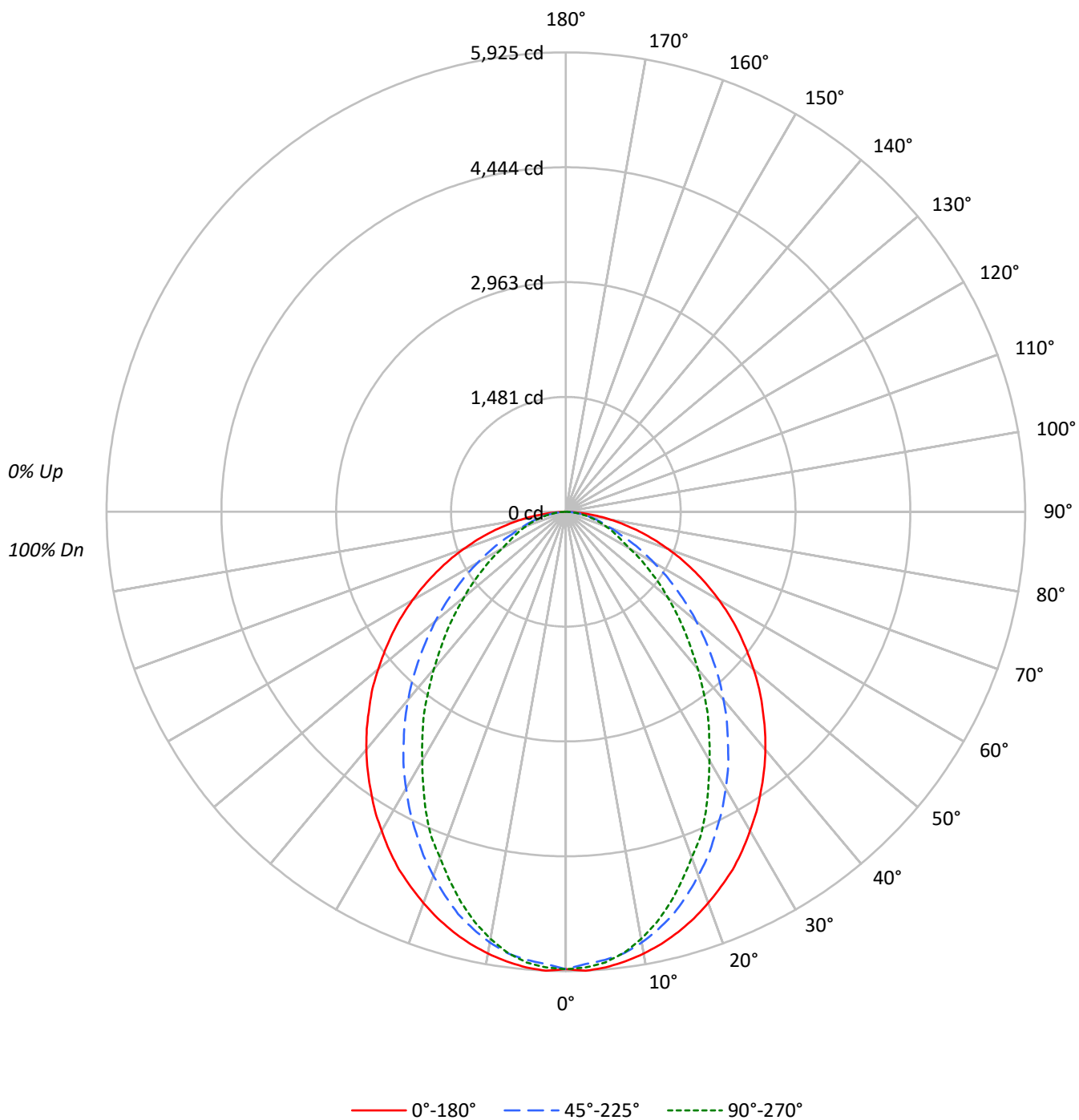
Lumens per Lamp: N/A  
Luminaire Lumens: 12131.2 lumens  
Efficiency: N/A  
Efficacy: 69.5 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular (W 3.92' x L: 3.92' x H: 0')  
CIE Type: Direct

Input Watts (W): 174.6  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9971  
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   | 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°  | 4139 | 4139 | 4139 |
| 5°  | 4155 | 4087 | 4110 |
| 10° | 4123 | 4020 | 3986 |
| 15° | 4075 | 3901 | 3789 |
| 20° | 4010 | 3731 | 3544 |
| 25° | 3943 | 3538 | 3306 |
| 30° | 3849 | 3339 | 3002 |
| 35° | 3759 | 3123 | 2734 |
| 40° | 3667 | 2899 | 2425 |
| 45° | 3560 | 2649 | 2145 |
| 50° | 3450 | 2395 | 1871 |
| 55° | 3337 | 2122 | 1607 |
| 60° | 3206 | 1835 | 1334 |
| 65° | 3058 | 1542 | 1214 |
| 70° | 2880 | 1270 | 1117 |
| 75° | 2663 | 1158 | 1042 |
| 80° | 2351 | 1034 | 950  |
| 85° | 1846 | 816  | 816  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 3560 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 552.8   | 4.6       |
| 10°-20°   | 1517.6  | 12.5      |
| 20°-30°   | 2130.7  | 17.6      |
| 30°-40°   | 2322.6  | 19.1      |
| 40°-50°   | 2134.7  | 17.6      |
| 50°-60°   | 1676.5  | 13.8      |
| 60°-70°   | 1091.2  | 9.0       |
| 70°-80°   | 561.7   | 4.6       |
| 80°-90°   | 143.4   | 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°    | 4201.1  | 34.6      |
| 0°-40°    | 6523.7  | 53.8      |
| 0°-60°    | 10334.9 | 85.2      |
| 0°-90°    | 12131.2 | 100.0     |
| 90°-120°  | 0.0     | 0.0       |
| 90°-150°  | 0.0     | 0.0       |
| 90°-180°  | 0.0     | 0.0       |
| 0°-180°   | 12131.2 | 100.0     |

**CANDELA DISTRIBUTION:**

|     | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|-----|------|-------|------|-------|------|------|
| 0°  | 5899 | 5899  | 5899 | 5899  | 5899 |      |
| 5°  | 5899 | 5872  | 5802 | 5850  | 5835 | 559  |
| 15° | 5610 | 5552  | 5370 | 5269  | 5216 | 1581 |
| 25° | 5093 | 4922  | 4569 | 4351  | 4270 | 2342 |
| 35° | 4388 | 4116  | 3646 | 3310  | 3192 | 2747 |
| 45° | 3587 | 3229  | 2669 | 2290  | 2162 | 2770 |
| 55° | 2728 | 2311  | 1735 | 1415  | 1313 | 2437 |
| 65° | 1842 | 1409  | 929  | 748   | 731  | 1826 |
| 75° | 982  | 608   | 427  | 390   | 384  | 1039 |
| 85° | 229  | 117   | 101  | 101   | 101  | 275  |
| 90° | 0    | 0     | 0    | 0     | 0    |      |

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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|-------|--------|--------|--------|--------|--------|
| 0°    | 5898.6 | 5898.6 | 5898.6 | 5898.6 | 5898.6 |
| 2.5°  | 5925.2 | 5898.6 | 5839.7 | 5893.5 | 5882.7 |
| 5°    | 5898.6 | 5871.9 | 5802.3 | 5850.4 | 5834.6 |
| 7.5°  | 5850.4 | 5818.7 | 5743.9 | 5764.9 | 5738.3 |
| 10°   | 5786.5 | 5749.1 | 5642.6 | 5626.2 | 5594.4 |
| 12.5° | 5706.6 | 5658.5 | 5514.1 | 5482.3 | 5423.4 |
| 15°   | 5610.3 | 5551.5 | 5370.2 | 5268.8 | 5215.5 |
| 17.5° | 5498.2 | 5412.7 | 5188.4 | 5071.1 | 4985.7 |
| 20°   | 5370.2 | 5263.2 | 4996.4 | 4863.3 | 4745.5 |
| 22.5° | 5231.4 | 5108.5 | 4798.7 | 4617.5 | 4537.6 |
| 25°   | 5092.7 | 4921.6 | 4569.4 | 4350.7 | 4270.4 |
| 27.5° | 4927.3 | 4745.5 | 4355.8 | 4105.0 | 3982.1 |
| 30°   | 4751.1 | 4547.9 | 4120.8 | 3849.0 | 3704.6 |
| 32.5° | 4580.2 | 4334.3 | 3897.1 | 3576.6 | 3442.9 |
| 35°   | 4388.1 | 4115.7 | 3646.2 | 3309.8 | 3192.0 |
| 37.5° | 4201.2 | 3907.3 | 3411.2 | 3042.4 | 2909.3 |
| 40°   | 4003.6 | 3683.6 | 3165.4 | 2786.4 | 2647.7 |
| 42.5° | 3800.8 | 3459.3 | 2920.1 | 2524.8 | 2391.7 |
| 45°   | 3587.3 | 3229.4 | 2669.2 | 2289.8 | 2161.8 |
| 47.5° | 3384.5 | 3005.7 | 2429.1 | 2049.6 | 1932.4 |
| 50°   | 3160.3 | 2781.3 | 2194.1 | 1825.4 | 1713.8 |
| 52.5° | 2941.1 | 2540.7 | 1969.8 | 1617.6 | 1516.1 |
| 55°   | 2727.6 | 2311.3 | 1734.8 | 1414.7 | 1313.4 |
| 57.5° | 2508.9 | 2081.9 | 1526.9 | 1227.8 | 1142.3 |
| 60°   | 2284.7 | 1857.7 | 1307.7 | 1035.9 | 950.3  |
| 62.5° | 2066.1 | 1639.0 | 1120.8 | 864.8  | 822.3  |
| 65°   | 1841.8 | 1409.1 | 928.8  | 747.6  | 731.2  |
| 67.5° | 1628.3 | 1195.5 | 747.6  | 656.4  | 640.5  |
| 70°   | 1404.0 | 987.7  | 619.0  | 565.8  | 544.3  |
| 72.5° | 1190.5 | 795.1  | 517.6  | 475.2  | 464.4  |
| 75°   | 982.1  | 608.3  | 427.0  | 389.6  | 384.5  |
| 77.5° | 774.2  | 432.1  | 336.4  | 314.9  | 304.2  |
| 80°   | 581.7  | 309.8  | 256.0  | 235.0  | 235.0  |
| 82.5° | 405.5  | 208.5  | 176.2  | 165.4  | 165.4  |
| 85°   | 229.3  | 117.2  | 101.4  | 101.4  | 101.4  |
| 87.5° | 85.5   | 42.5   | 42.5   | 37.4   | 37.4   |
| 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 | 16.17            | 17.69 | 16.53 | 18.00 | 18.32 | 12.13          | 13.65 | 12.50 | 13.97 | 14.28 |
|                 | 3H   | 17.93            | 19.30 | 18.31 | 19.63 | 19.99 | 13.40          | 14.76 | 13.77 | 15.09 | 15.45 |
|                 | 4H   | 18.60            | 19.88 | 19.00 | 20.23 | 20.61 | 13.90          | 15.18 | 14.30 | 15.53 | 15.90 |
|                 | 6H   | 19.09            | 20.27 | 19.50 | 20.64 | 21.03 | 14.28          | 15.46 | 14.69 | 15.83 | 16.22 |
|                 | 8H   | 19.26            | 20.38 | 19.68 | 20.77 | 21.17 | 14.40          | 15.53 | 14.83 | 15.92 | 16.32 |
|                 | 12H  | 19.36            | 20.44 | 19.79 | 20.82 | 21.25 | 14.48          | 15.56 | 14.91 | 15.94 | 16.37 |
| 4H              | 2H   | 16.27            | 17.55 | 16.67 | 17.90 | 18.28 | 12.83          | 14.11 | 13.23 | 14.46 | 14.83 |
|                 | 3H   | 18.21            | 19.27 | 18.62 | 19.67 | 20.07 | 14.27          | 15.33 | 14.68 | 15.73 | 16.13 |
|                 | 4H   | 18.96            | 19.91 | 19.39 | 20.33 | 20.77 | 14.87          | 15.82 | 15.30 | 16.24 | 16.68 |
|                 | 6H   | 19.55            | 20.38 | 20.01 | 20.82 | 21.28 | 15.36          | 16.19 | 15.81 | 16.63 | 17.09 |
|                 | 8H   | 19.76            | 20.54 | 20.23 | 20.98 | 21.45 | 15.52          | 16.30 | 15.98 | 16.74 | 17.21 |
|                 | 12H  | 19.92            | 20.61 | 20.40 | 21.09 | 21.56 | 15.64          | 16.33 | 16.12 | 16.81 | 17.28 |
| 8H              | 4H   | 18.98            | 19.76 | 19.44 | 20.20 | 20.67 | 15.22          | 16.00 | 15.69 | 16.44 | 16.91 |
|                 | 6H   | 19.62            | 20.26 | 20.11 | 20.75 | 21.23 | 15.81          | 16.45 | 16.31 | 16.94 | 17.42 |
|                 | 8H   | 19.87            | 20.45 | 20.38 | 20.95 | 21.44 | 16.03          | 16.61 | 16.54 | 17.12 | 17.60 |
|                 | 12H  | 20.07            | 20.58 | 20.58 | 21.07 | 21.64 | 16.21          | 16.72 | 16.72 | 17.21 | 17.78 |
| 12H             | 4H   | 18.97            | 19.66 | 19.45 | 20.14 | 20.61 | 15.27          | 15.96 | 15.75 | 16.44 | 16.91 |
|                 | 6H   | 19.60            | 20.18 | 20.11 | 20.69 | 21.17 | 15.87          | 16.45 | 16.39 | 16.96 | 17.45 |
|                 | 8H   | 19.88            | 20.39 | 20.39 | 20.89 | 21.45 | 16.15          | 16.66 | 16.65 | 17.15 | 17.71 |

END OF REPORT