

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: P930291

Luminaire Tested: DFN2DS-HX4F0-060DS830-FLL

Issue Date: 11/20/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P930291  
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-HX4F0-060DS830-FLL  
Description: 4 foot, Hexagon Define Geo, with Direct Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

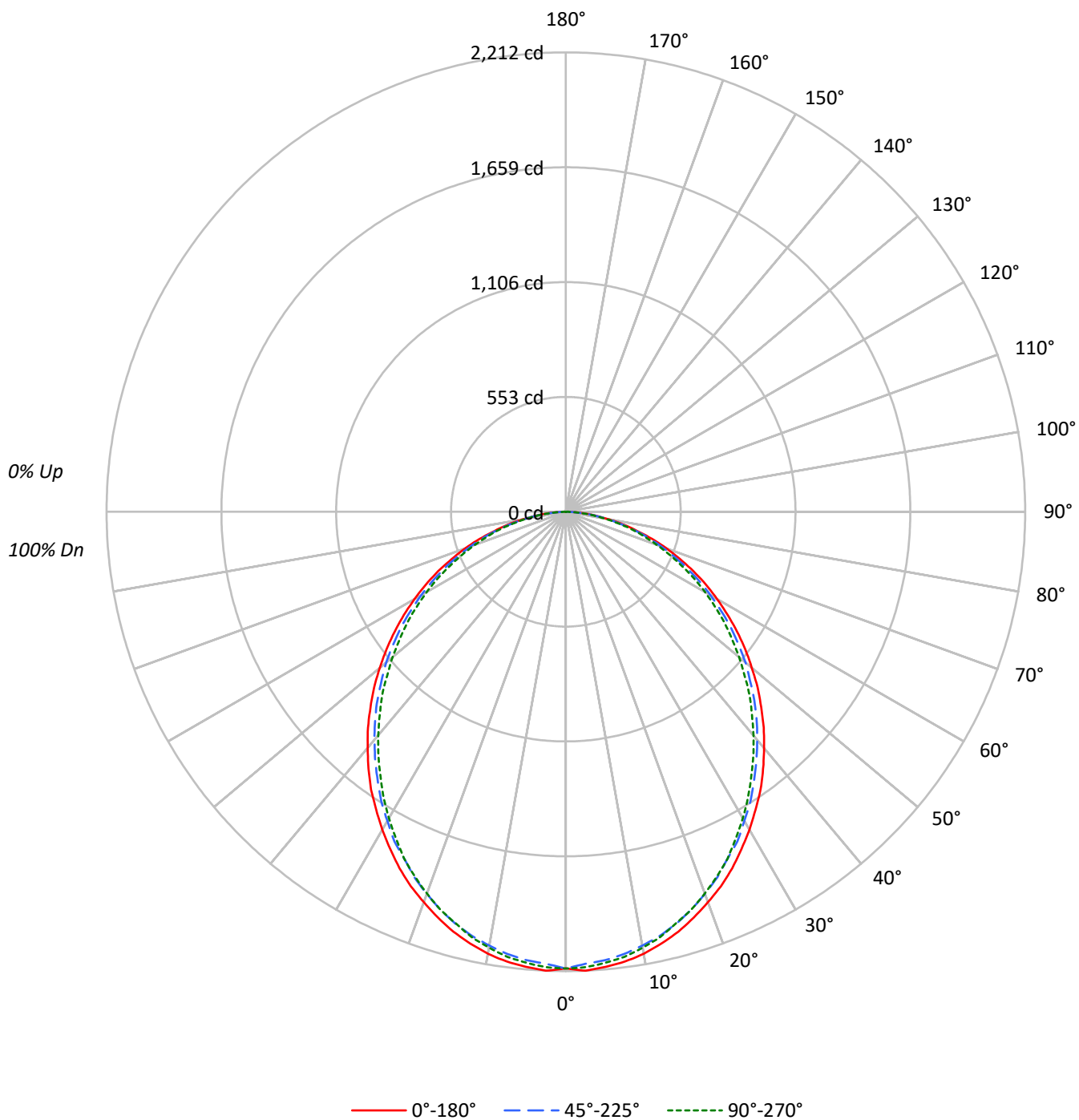
Lumens per Lamp: N/A  
Luminaire Lumens: 5595.4 lumens  
Efficiency: N/A  
Efficacy: 94.8 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular (W 4.09' x L: 3.54' x H: 0')  
CIE Type: Direct

Input Watts (W): 59  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.099  
Total Harmonic Distortion (THDi): 0.979  
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°  | 1635 | 1635 | 1635 |
| 5°  | 1641 | 1618 | 1627 |
| 10° | 1632 | 1602 | 1610 |
| 15° | 1612 | 1581 | 1579 |
| 20° | 1583 | 1549 | 1548 |
| 25° | 1554 | 1511 | 1511 |
| 30° | 1518 | 1476 | 1463 |
| 35° | 1484 | 1434 | 1413 |
| 40° | 1441 | 1392 | 1365 |
| 45° | 1399 | 1350 | 1316 |
| 50° | 1353 | 1306 | 1260 |
| 55° | 1305 | 1256 | 1209 |
| 60° | 1252 | 1195 | 1151 |
| 65° | 1194 | 1135 | 1083 |
| 70° | 1122 | 1062 | 1012 |
| 75° | 1020 | 978  | 954  |
| 80° | 906  | 878  | 833  |
| 85° | 739  | 704  | 631  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
Vertical Angle: 45°  
Luminance: 1399 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 207.0  | 3.7       |
| 10°-20°   | 582.4  | 10.4      |
| 20°-30°   | 855.9  | 15.3      |
| 30°-40°   | 994.1  | 17.8      |
| 40°-50°   | 992.8  | 17.7      |
| 50°-60°   | 865.7  | 15.5      |
| 60°-70°   | 639.9  | 11.4      |
| 70°-80°   | 362.1  | 6.5       |
| 80°-90°   | 95.6   | 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°    | 1645.3 | 29.4      |
| 0°-40°    | 2639.3 | 47.2      |
| 0°-60°    | 4497.9 | 80.4      |
| 0°-90°    | 5595.4 | 100.0     |
| 90°-120°  | 0.0    | 0.0       |
| 90°-150°  | 0.0    | 0.0       |
| 90°-180°  | 0.0    | 0.0       |
| 0°-180°   | 5595.4 | 100.0     |

**CANDELA DISTRIBUTION:**

|     | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|-----|------|-------|------|-------|------|------|
| 0°  | 2199 | 2199  | 2199 | 2199  | 2199 |      |
| 5°  | 2199 | 2191  | 2168 | 2184  | 2180 | 209  |
| 15° | 2094 | 2081  | 2053 | 2062  | 2051 | 590  |
| 25° | 1895 | 1878  | 1842 | 1846  | 1842 | 872  |
| 35° | 1635 | 1614  | 1580 | 1567  | 1556 | 1021 |
| 45° | 1330 | 1315  | 1284 | 1260  | 1252 | 1027 |
| 55° | 1007 | 994   | 969  | 943   | 933  | 900  |
| 65° | 679  | 666   | 645  | 626   | 615  | 671  |
| 75° | 355  | 351   | 340  | 328   | 332  | 379  |
| 85° | 87   | 85    | 82   | 76    | 74   | 102  |
| 90° | 0    | 0     | 0    | 0     | 0    |      |

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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|-------|--------|--------|--------|--------|--------|
| 0°    | 2199.2 | 2199.2 | 2199.2 | 2199.2 | 2199.2 |
| 2.5°  | 2212.0 | 2201.5 | 2178.1 | 2199.2 | 2195.1 |
| 5°    | 2199.2 | 2190.9 | 2167.5 | 2184.4 | 2180.4 |
| 7.5°  | 2184.4 | 2171.9 | 2148.5 | 2165.6 | 2161.3 |
| 10°   | 2161.3 | 2146.5 | 2121.1 | 2138.0 | 2131.7 |
| 12.5° | 2129.5 | 2116.9 | 2091.5 | 2102.1 | 2097.8 |
| 15°   | 2093.5 | 2081.0 | 2053.4 | 2061.9 | 2051.4 |
| 17.5° | 2049.1 | 2036.6 | 2009.0 | 2019.5 | 2009.0 |
| 20°   | 2000.4 | 1987.9 | 1958.2 | 1964.5 | 1956.3 |
| 22.5° | 1952.0 | 1932.9 | 1905.3 | 1905.3 | 1901.1 |
| 25°   | 1894.7 | 1878.0 | 1842.0 | 1846.0 | 1842.0 |
| 27.5° | 1831.2 | 1816.5 | 1789.0 | 1782.8 | 1772.3 |
| 30°   | 1768.0 | 1750.9 | 1719.3 | 1713.0 | 1704.5 |
| 32.5° | 1700.2 | 1687.7 | 1653.8 | 1641.0 | 1632.5 |
| 35°   | 1634.7 | 1613.6 | 1579.7 | 1566.9 | 1556.4 |
| 37.5° | 1560.7 | 1541.6 | 1507.8 | 1492.9 | 1482.3 |
| 40°   | 1484.6 | 1467.5 | 1433.7 | 1414.9 | 1406.3 |
| 42.5° | 1410.6 | 1393.5 | 1359.9 | 1338.6 | 1326.0 |
| 45°   | 1330.3 | 1315.4 | 1283.6 | 1260.5 | 1251.9 |
| 47.5° | 1251.9 | 1237.1 | 1203.3 | 1179.9 | 1167.3 |
| 50°   | 1169.4 | 1158.8 | 1129.3 | 1099.6 | 1089.0 |
| 52.5° | 1089.0 | 1074.3 | 1046.8 | 1023.6 | 1008.8 |
| 55°   | 1006.7 | 993.9  | 968.6  | 943.2  | 932.7  |
| 57.5° | 924.2  | 913.6  | 886.0  | 860.7  | 852.1  |
| 60°   | 841.6  | 833.3  | 803.7  | 780.4  | 774.0  |
| 62.5° | 761.2  | 746.4  | 725.3  | 704.2  | 695.8  |
| 65°   | 678.9  | 666.2  | 645.1  | 626.0  | 615.4  |
| 67.5° | 594.3  | 583.6  | 564.7  | 549.9  | 541.4  |
| 70°   | 516.0  | 507.5  | 488.4  | 473.6  | 465.3  |
| 72.5° | 435.7  | 427.2  | 416.6  | 401.9  | 395.5  |
| 75°   | 355.1  | 351.2  | 340.3  | 327.8  | 332.1  |
| 77.5° | 283.4  | 274.9  | 270.5  | 264.3  | 258.0  |
| 80°   | 211.6  | 209.3  | 205.1  | 198.8  | 194.5  |
| 82.5° | 143.8  | 143.8  | 141.8  | 133.3  | 133.3  |
| 85°   | 86.6   | 84.6   | 82.5   | 76.0   | 74.0   |
| 87.5° | 38.2   | 33.9   | 29.6   | 23.4   | 21.1   |
| 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 | 12.99            | 14.60 | 13.36 | 14.92 | 15.23 | 12.55          | 14.16 | 12.91 | 14.47 | 14.79 |
|                 | 3H   | 14.74            | 16.20 | 15.12 | 16.52 | 16.88 | 14.25          | 15.70 | 14.63 | 16.03 | 16.39 |
|                 | 4H   | 15.39            | 16.76 | 15.79 | 17.10 | 17.48 | 14.89          | 16.26 | 15.29 | 16.61 | 16.99 |
|                 | 6H   | 15.86            | 17.13 | 16.27 | 17.49 | 17.88 | 15.36          | 16.62 | 15.77 | 16.99 | 17.38 |
|                 | 8H   | 16.00            | 17.21 | 16.42 | 17.60 | 18.00 | 15.50          | 16.71 | 15.92 | 17.10 | 17.50 |
|                 | 12H  | 16.09            | 17.25 | 16.52 | 17.63 | 18.06 | 15.58          | 16.74 | 16.01 | 17.12 | 17.55 |
| 4H              | 2H   | 13.55            | 14.92 | 13.95 | 15.27 | 15.64 | 13.20          | 14.57 | 13.60 | 14.92 | 15.29 |
|                 | 3H   | 15.53            | 16.67 | 15.94 | 17.07 | 17.47 | 15.12          | 16.27 | 15.53 | 16.66 | 17.06 |
|                 | 4H   | 16.30            | 17.34 | 16.73 | 17.75 | 18.19 | 15.88          | 16.92 | 16.31 | 17.33 | 17.77 |
|                 | 6H   | 16.90            | 17.80 | 17.35 | 18.25 | 18.70 | 16.47          | 17.37 | 16.92 | 17.81 | 18.27 |
|                 | 8H   | 17.09            | 17.94 | 17.55 | 18.38 | 18.84 | 16.65          | 17.50 | 17.11 | 17.94 | 18.41 |
|                 | 12H  | 17.22            | 17.98 | 17.70 | 18.46 | 18.93 | 16.77          | 17.53 | 17.25 | 18.00 | 18.47 |
| 8H              | 4H   | 16.58            | 17.42 | 17.04 | 17.87 | 18.33 | 16.20          | 17.05 | 16.66 | 17.49 | 17.96 |
|                 | 6H   | 17.29            | 17.99 | 17.78 | 18.48 | 18.96 | 16.91          | 17.61 | 17.40 | 18.10 | 18.58 |
|                 | 8H   | 17.55            | 18.18 | 18.06 | 18.69 | 19.17 | 17.16          | 17.79 | 17.67 | 18.30 | 18.78 |
|                 | 12H  | 17.75            | 18.31 | 18.26 | 18.80 | 19.36 | 17.34          | 17.89 | 17.84 | 18.39 | 18.95 |
| 12H             | 4H   | 16.60            | 17.36 | 17.08 | 17.84 | 18.31 | 16.24          | 17.00 | 16.72 | 17.47 | 17.94 |
|                 | 6H   | 17.34            | 17.97 | 17.85 | 18.48 | 18.96 | 16.97          | 17.60 | 17.48 | 18.11 | 18.59 |
|                 | 8H   | 17.65            | 18.21 | 18.16 | 18.70 | 19.26 | 17.27          | 17.83 | 17.78 | 18.32 | 18.88 |