

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: P927992

Luminaire Tested: DFN2DIP-HX4F0-080D050US850-FLLONL

Issue Date: 12/12/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P927992  
REPORT IS A COMBINATION OF REPORTS P900845 AND P896187  
Test Lab: INNOVATION CENTER  
Issue Date: 12/12/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX4F0-080D050US850-FLLONL  
Description: 4 foot, Hexagon Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

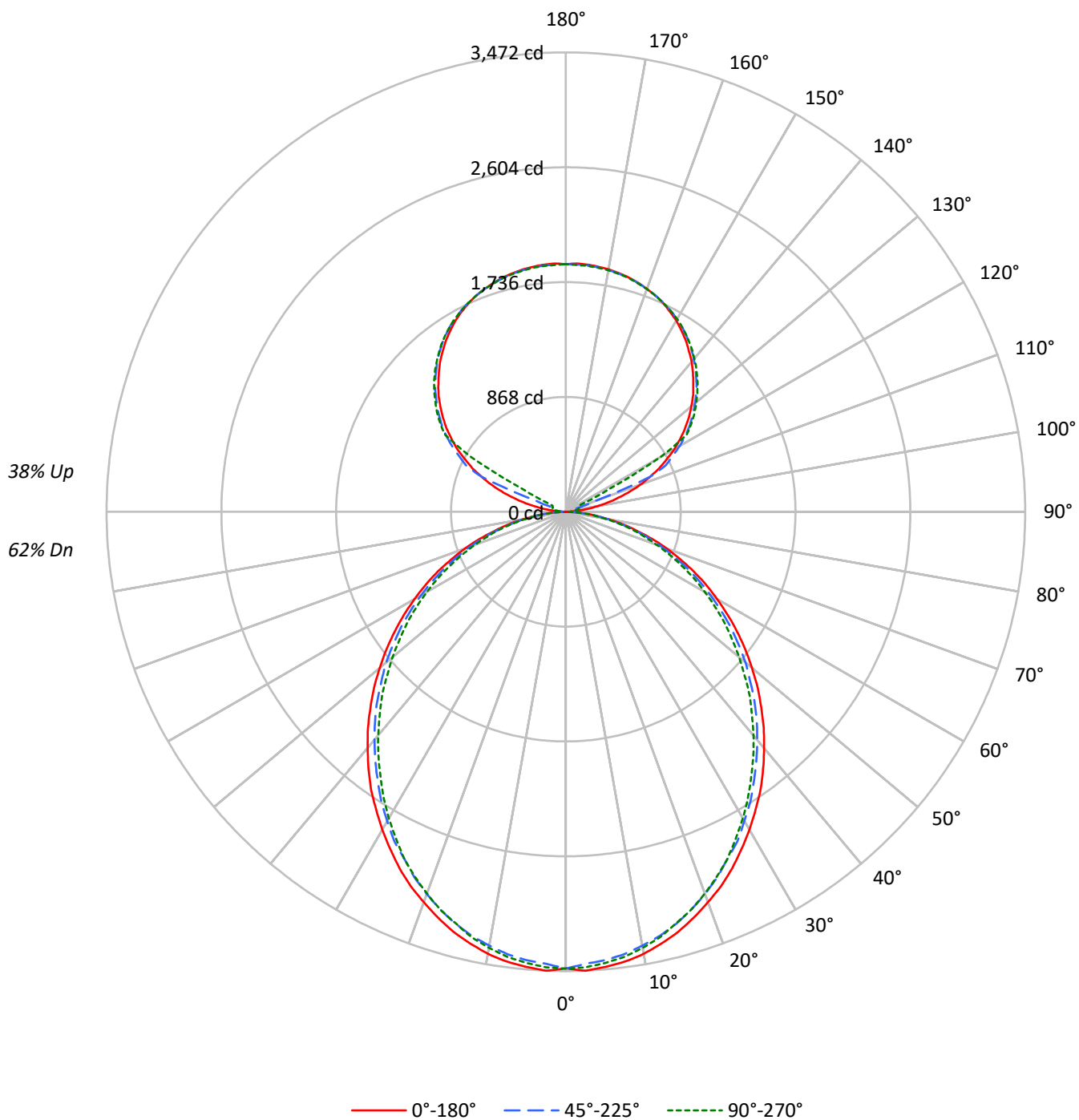
Lumens per Lamp: N/A  
Luminaire Lumens: 14272.9 lumens  
Efficiency: N/A  
Efficacy: 124.9 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.54' x L: 4.09' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 114.3  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9613  
Total Harmonic Distortion (THDi): 0.083  
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 | 30 | 10 |
| RCR |     |     |     |     |     |     |     |     |    |    |    |    |    |    |    |    |    |
| 0   | 110 | 110 | 110 | 110 | 103 | 103 | 103 | 103 | 90 | 90 | 90 | 78 | 78 | 78 | 67 | 67 | 67 |
| 1   | 100 | 96  | 92  | 88  | 94  | 90  | 87  | 83  | 79 | 76 | 74 | 69 | 67 | 65 | 59 | 58 | 56 |
| 2   | 91  | 84  | 78  | 72  | 85  | 79  | 73  | 69  | 69 | 65 | 61 | 60 | 57 | 54 | 52 | 50 | 48 |
| 3   | 83  | 74  | 66  | 60  | 78  | 69  | 63  | 57  | 61 | 56 | 51 | 53 | 49 | 46 | 46 | 43 | 40 |
| 4   | 76  | 65  | 57  | 51  | 71  | 61  | 54  | 49  | 54 | 48 | 44 | 47 | 43 | 39 | 41 | 38 | 35 |
| 5   | 70  | 58  | 50  | 44  | 65  | 55  | 47  | 42  | 49 | 43 | 38 | 43 | 38 | 34 | 37 | 33 | 30 |
| 6   | 65  | 52  | 44  | 38  | 60  | 49  | 42  | 36  | 44 | 38 | 33 | 39 | 34 | 30 | 34 | 30 | 27 |
| 7   | 60  | 47  | 39  | 34  | 56  | 45  | 37  | 32  | 40 | 34 | 29 | 35 | 30 | 27 | 31 | 27 | 24 |
| 8   | 56  | 43  | 35  | 30  | 52  | 41  | 34  | 29  | 36 | 30 | 26 | 32 | 27 | 24 | 28 | 24 | 21 |
| 9   | 52  | 39  | 32  | 27  | 49  | 37  | 30  | 26  | 33 | 28 | 23 | 30 | 25 | 21 | 26 | 22 | 19 |
| 10  | 49  | 36  | 29  | 24  | 45  | 34  | 28  | 23  | 31 | 25 | 21 | 27 | 23 | 19 | 24 | 20 | 18 |

**AVERAGE LUMINANCE (cd/sqm):**

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2567 | 2567 | 2567 |
| 5°  | 2571 | 2531 | 2548 |
| 10° | 2551 | 2498 | 2514 |
| 15° | 2513 | 2457 | 2460 |
| 20° | 2463 | 2400 | 2405 |
| 25° | 2413 | 2332 | 2341 |
| 30° | 2350 | 2268 | 2260 |
| 35° | 2290 | 2194 | 2175 |
| 40° | 2217 | 2118 | 2093 |
| 45° | 2143 | 2043 | 2010 |
| 50° | 2063 | 1963 | 1913 |
| 55° | 1979 | 1871 | 1824 |
| 60° | 1885 | 1762 | 1723 |
| 65° | 1782 | 1650 | 1603 |
| 70° | 1650 | 1512 | 1474 |
| 75° | 1468 | 1348 | 1355 |
| 80° | 1249 | 1138 | 1127 |
| 85° | 907  | 775  | 749  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2143 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 324.9   | 2.3       |
| 10°-20°   | 914.2   | 6.4       |
| 20°-30°   | 1343.5  | 9.4       |
| 30°-40°   | 1560.4  | 10.9      |
| 40°-50°   | 1558.4  | 10.9      |
| 50°-60°   | 1358.9  | 9.5       |
| 60°-70°   | 1004.5  | 7.0       |
| 70°-80°   | 568.4   | 4.0       |
| 80°-90°   | 153.3   | 1.1       |
| 90°-100°  | 61.7    | 0.4       |
| 100°-110° | 230.0   | 1.6       |
| 110°-120° | 610.1   | 4.3       |
| 120°-130° | 1011.9  | 7.1       |
| 130°-140° | 1074.8  | 7.5       |
| 140°-150° | 999.0   | 7.0       |
| 150°-160° | 803.1   | 5.6       |
| 160°-170° | 517.5   | 3.6       |
| 170°-180° | 178.1   | 1.2       |
| 0°-30°    | 2582.6  | 18.1      |
| 0°-40°    | 4143.0  | 29.0      |
| 0°-60°    | 7060.4  | 49.5      |
| 0°-90°    | 8786.6  | 61.6      |
| 90°-120°  | 901.9   | 6.3       |
| 90°-150°  | 3987.5  | 27.9      |
| 90°-180°  | 5486.0  | 38.4      |
| 0°-180°   | 14272.9 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3452 | 3452  | 3452 | 3452  | 3452 |      |
| 5°   | 3452 | 3439  | 3402 | 3429  | 3423 | 328  |
| 15°  | 3286 | 3267  | 3223 | 3237  | 3220 | 926  |
| 25°  | 2974 | 2948  | 2892 | 2898  | 2892 | 1369 |
| 35°  | 2566 | 2533  | 2480 | 2460  | 2443 | 1602 |
| 45°  | 2088 | 2065  | 2015 | 1979  | 1965 | 1612 |
| 55°  | 1580 | 1560  | 1520 | 1481  | 1464 | 1413 |
| 65°  | 1066 | 1046  | 1012 | 983   | 966  | 1054 |
| 75°  | 558  | 551   | 534  | 515   | 521  | 595  |
| 85°  | 136  | 133   | 130  | 119   | 116  | 152  |
| 90°  | 1    | 16    | 27   | 34    | 36   | 13   |
| 95°  | 88   | 43    | 53   | 60    | 58   | 104  |
| 105° | 412  | 452   | 83   | 98    | 103  | 440  |
| 115° | 779  | 802   | 836  | 209   | 111  | 767  |
| 125° | 1101 | 1118  | 1144 | 1154  | 1158 | 982  |
| 135° | 1362 | 1384  | 1396 | 1410  | 1407 | 1052 |
| 145° | 1580 | 1579  | 1602 | 1611  | 1605 | 988  |
| 155° | 1740 | 1728  | 1744 | 1752  | 1742 | 802  |
| 165° | 1833 | 1825  | 1829 | 1839  | 1829 | 518  |
| 175° | 1875 | 1866  | 1869 | 1878  | 1865 | 178  |
| 180° | 1871 | 1871  | 1871 | 1871  | 1871 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3452.1 | 3452.1 | 3452.1 | 3452.1 | 3452.1 |
| 2.5°   | 3472.2 | 3455.6 | 3419.0 | 3452.1 | 3445.8 |
| 5°     | 3452.1 | 3439.1 | 3402.5 | 3428.9 | 3422.6 |
| 7.5°   | 3428.9 | 3409.2 | 3372.6 | 3399.3 | 3392.7 |
| 10°    | 3392.7 | 3369.4 | 3329.6 | 3355.9 | 3346.2 |
| 12.5°  | 3342.6 | 3322.9 | 3283.1 | 3299.6 | 3293.0 |
| 15°    | 3286.3 | 3266.6 | 3223.2 | 3236.6 | 3220.1 |
| 17.5°  | 3216.5 | 3196.8 | 3153.4 | 3170.1 | 3153.4 |
| 20°    | 3140.1 | 3120.4 | 3073.9 | 3083.8 | 3070.7 |
| 22.5°  | 3064.1 | 3034.1 | 2990.8 | 2990.8 | 2984.1 |
| 25°    | 2974.2 | 2947.8 | 2891.5 | 2897.8 | 2891.5 |
| 27.5°  | 2874.5 | 2851.3 | 2808.3 | 2798.5 | 2781.9 |
| 30°    | 2775.3 | 2748.4 | 2698.9 | 2689.0 | 2675.6 |
| 32.5°  | 2668.9 | 2649.2 | 2595.9 | 2575.9 | 2562.6 |
| 35°    | 2566.0 | 2533.0 | 2479.7 | 2459.7 | 2443.1 |
| 37.5°  | 2449.8 | 2419.8 | 2366.7 | 2343.4 | 2326.9 |
| 40°    | 2330.5 | 2303.6 | 2250.5 | 2220.9 | 2207.5 |
| 42.5°  | 2214.2 | 2187.4 | 2134.6 | 2101.1 | 2081.5 |
| 45°    | 2088.1 | 2064.8 | 2014.8 | 1978.6 | 1965.3 |
| 47.5°  | 1965.3 | 1942.0 | 1888.7 | 1852.1 | 1832.4 |
| 50°    | 1835.6 | 1819.1 | 1772.5 | 1726.0 | 1709.5 |
| 52.5°  | 1709.5 | 1686.2 | 1643.3 | 1606.7 | 1583.4 |
| 55°    | 1580.2 | 1560.1 | 1520.4 | 1480.6 | 1464.0 |
| 57.5°  | 1450.7 | 1434.2 | 1390.8 | 1351.0 | 1337.6 |
| 60°    | 1321.0 | 1308.1 | 1261.5 | 1224.9 | 1215.0 |
| 62.5°  | 1194.9 | 1171.8 | 1138.6 | 1105.6 | 1092.1 |
| 65°    | 1065.7 | 1045.7 | 1012.5 | 982.6  | 966.0  |
| 67.5°  | 932.9  | 916.0  | 886.4  | 863.2  | 849.8  |
| 70°    | 810.0  | 796.6  | 766.8  | 743.5  | 730.4  |
| 72.5°  | 683.9  | 670.6  | 654.0  | 630.8  | 620.9  |
| 75°    | 557.5  | 551.2  | 534.3  | 514.6  | 521.2  |
| 77.5°  | 444.8  | 431.4  | 424.7  | 414.9  | 405.0  |
| 80°    | 332.1  | 328.6  | 321.9  | 312.1  | 305.3  |
| 82.5°  | 225.8  | 225.8  | 222.6  | 209.2  | 209.2  |
| 85°    | 136.0  | 132.7  | 129.6  | 119.4  | 116.2  |
| 87.5°  | 59.9   | 53.2   | 46.5   | 36.6   | 33.2   |
| 90°    | 1.3    | 16.2   | 27.1   | 33.9   | 36.5   |
| 92.5°  | 33.9   | 28.5   | 32.5   | 35.3   | 36.5   |
| 95°    | 87.9   | 43.3   | 52.8   | 59.7   | 58.2   |
| 97.5°  | 158.4  | 47.5   | 69.0   | 73.2   | 74.4   |
| 100°   | 239.8  | 54.2   | 77.2   | 87.9   | 90.7   |
| 102.5° | 329.0  | 326.4  | 80.0   | 94.7   | 98.9   |
| 105°   | 411.7  | 452.4  | 82.6   | 97.5   | 102.9  |
| 107.5° | 507.8  | 541.5  | 85.4   | 100.1  | 105.7  |
| 110°   | 600.0  | 628.2  | 237.0  | 101.6  | 106.9  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 686.6  | 710.9  | 687.9  | 104.2  | 108.3  |
| 115°   | 778.6  | 801.6  | 835.5  | 208.6  | 111.1  |
| 117.5° | 858.5  | 885.5  | 908.7  | 714.9  | 360.2  |
| 120°   | 947.9  | 968.2  | 992.6  | 1008.9 | 826.0  |
| 122.5° | 1023.6 | 1045.3 | 1072.5 | 1080.6 | 1082.1 |
| 125°   | 1100.8 | 1118.5 | 1144.3 | 1153.7 | 1157.8 |
| 127.5° | 1171.2 | 1190.2 | 1210.7 | 1224.1 | 1225.4 |
| 130°   | 1237.6 | 1259.4 | 1274.1 | 1289.1 | 1287.9 |
| 132.5° | 1305.4 | 1323.0 | 1337.8 | 1350.1 | 1348.8 |
| 135°   | 1362.3 | 1384.0 | 1396.0 | 1409.8 | 1407.0 |
| 137.5° | 1421.7 | 1438.0 | 1451.7 | 1465.2 | 1461.2 |
| 140°   | 1480.0 | 1490.9 | 1505.7 | 1517.9 | 1511.2 |
| 142.5° | 1528.9 | 1538.4 | 1555.9 | 1566.7 | 1559.9 |
| 145°   | 1580.3 | 1578.9 | 1601.8 | 1611.4 | 1604.6 |
| 147.5° | 1624.9 | 1620.8 | 1643.9 | 1650.6 | 1645.3 |
| 150°   | 1668.3 | 1658.8 | 1680.5 | 1688.6 | 1681.8 |
| 152.5° | 1704.8 | 1694.0 | 1714.3 | 1722.5 | 1713.0 |
| 155°   | 1740.0 | 1727.9 | 1744.1 | 1752.2 | 1741.5 |
| 157.5° | 1768.4 | 1757.7 | 1769.9 | 1779.4 | 1768.4 |
| 160°   | 1792.9 | 1784.7 | 1792.9 | 1800.9 | 1791.5 |
| 162.5° | 1814.4 | 1806.5 | 1813.1 | 1822.6 | 1810.4 |
| 165°   | 1833.4 | 1825.4 | 1829.4 | 1838.8 | 1829.4 |
| 167.5° | 1848.4 | 1840.2 | 1844.4 | 1853.8 | 1841.6 |
| 170°   | 1860.6 | 1852.4 | 1855.1 | 1864.6 | 1852.4 |
| 172.5° | 1868.7 | 1860.6 | 1863.3 | 1872.8 | 1860.6 |
| 175°   | 1875.4 | 1865.9 | 1868.7 | 1878.1 | 1864.6 |
| 177.5° | 1878.1 | 1868.7 | 1870.1 | 1879.5 | 1867.3 |
| 180°   | 1871.3 | 1871.3 | 1871.3 | 1871.3 | 1871.3 |

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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 | 11.55            | 12.53 | 12.40 | 13.40 | 14.50 | 11.12          | 12.09 | 11.97 | 12.97 | 14.06 |
|                 | 3H   | 13.22            | 14.10 | 14.08 | 14.98 | 16.10 | 12.75          | 13.62 | 13.61 | 14.51 | 15.63 |
|                 | 4H   | 13.81            | 14.64 | 14.69 | 15.53 | 16.66 | 13.34          | 14.17 | 14.22 | 15.06 | 16.19 |
|                 | 6H   | 14.22            | 14.98 | 15.11 | 15.88 | 17.03 | 13.75          | 14.51 | 14.64 | 15.40 | 16.55 |
|                 | 8H   | 14.33            | 15.06 | 15.23 | 15.97 | 17.12 | 13.85          | 14.58 | 14.75 | 15.50 | 16.64 |
|                 | 12H  | 14.38            | 15.07 | 15.29 | 15.98 | 17.15 | 13.90          | 14.59 | 14.81 | 15.50 | 16.67 |
| 4H              | 2H   | 12.03            | 12.86 | 12.91 | 13.74 | 14.88 | 11.68          | 12.51 | 12.57 | 13.40 | 14.53 |
|                 | 3H   | 13.90            | 14.60 | 14.80 | 15.52 | 16.66 | 13.51          | 14.20 | 14.41 | 15.12 | 16.27 |
|                 | 4H   | 14.62            | 15.25 | 15.53 | 16.17 | 17.35 | 14.22          | 14.85 | 15.13 | 15.77 | 16.94 |
|                 | 6H   | 15.15            | 15.69 | 16.07 | 16.63 | 17.81 | 14.74          | 15.28 | 15.66 | 16.22 | 17.40 |
|                 | 8H   | 15.30            | 15.81 | 16.22 | 16.74 | 17.93 | 14.89          | 15.40 | 15.81 | 16.33 | 17.52 |
|                 | 12H  | 15.38            | 15.84 | 16.32 | 16.79 | 17.99 | 14.96          | 15.42 | 15.90 | 16.37 | 17.56 |
| 8H              | 4H   | 14.83            | 15.34 | 15.76 | 16.27 | 17.46 | 14.47          | 14.98 | 15.39 | 15.91 | 17.10 |
|                 | 6H   | 15.47            | 15.89 | 16.42 | 16.87 | 18.05 | 15.11          | 15.53 | 16.06 | 16.50 | 17.69 |
|                 | 8H   | 15.69            | 16.06 | 16.65 | 17.03 | 18.24 | 15.32          | 15.69 | 16.28 | 16.66 | 17.87 |
|                 | 12H  | 15.83            | 16.16 | 16.79 | 17.12 | 18.37 | 15.44          | 15.77 | 16.41 | 16.73 | 17.99 |
| 12H             | 4H   | 14.82            | 15.28 | 15.77 | 16.23 | 17.43 | 14.47          | 14.93 | 15.41 | 15.88 | 17.08 |
|                 | 6H   | 15.50            | 15.87 | 16.46 | 16.84 | 18.05 | 15.15          | 15.52 | 16.11 | 16.49 | 17.69 |
|                 | 8H   | 15.75            | 16.08 | 16.71 | 17.04 | 18.29 | 15.39          | 15.72 | 16.35 | 16.68 | 17.93 |