

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: P919023

Luminaire Tested: DFN2DIP-HX3F0-080D070US935-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P919023  
REPORT IS A COMBINATION OF REPORTS P900787 AND P897645  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX3F0-080D070US935-FLLONL  
Description: 3 foot, Hexagon Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

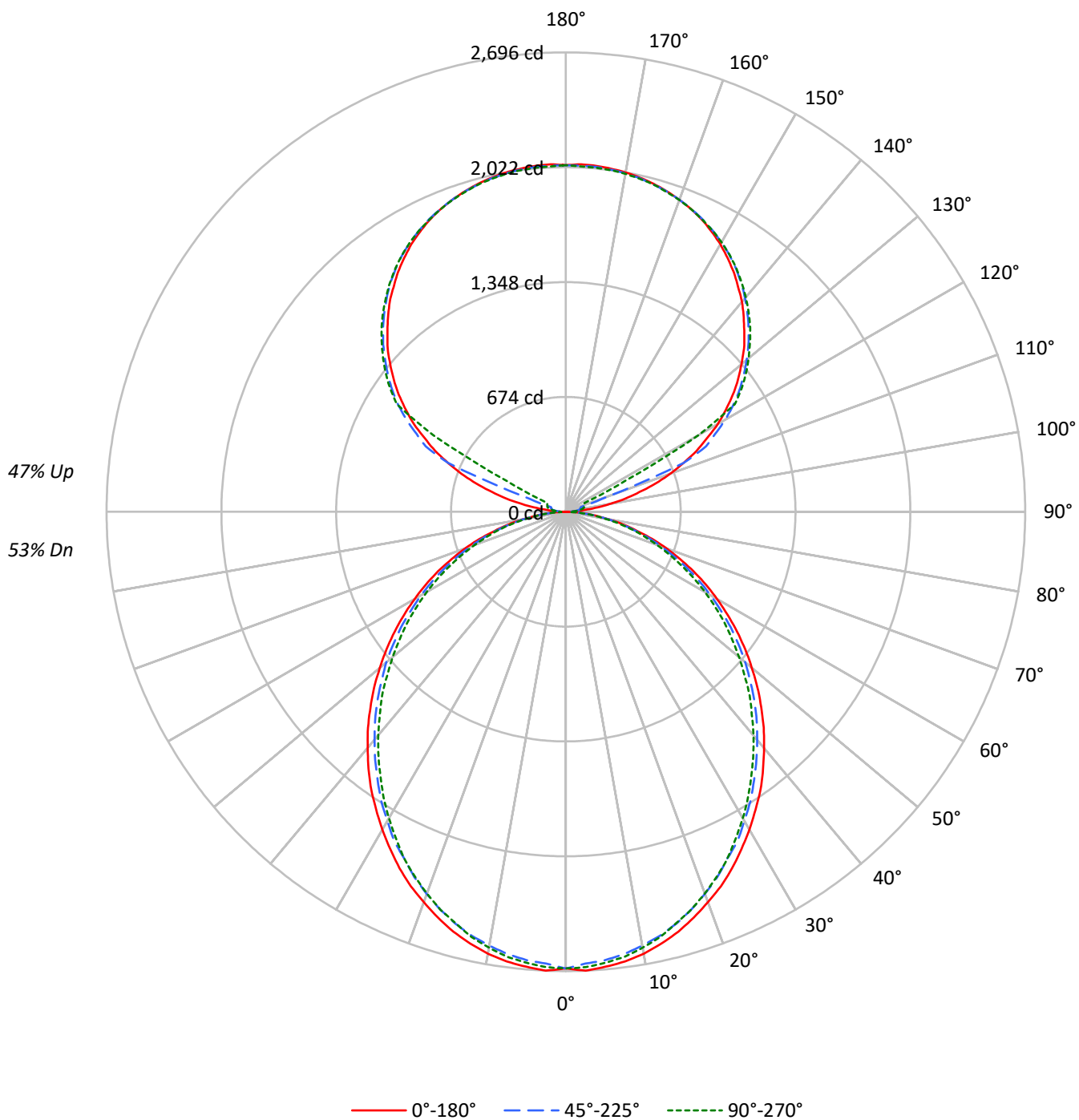
Lumens per Lamp: N/A  
Luminaire Lumens: 12785.8 lumens  
Efficiency: N/A  
Efficacy: 95.8 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 2.84' x L: 3.28' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 133.4  
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 | 30 | 10 |
| RCR |     |     |     |     |     |     |     |     |    |    |    |    |    |    |    |    |    |
| 0   | 108 | 108 | 108 | 108 | 100 | 100 | 100 | 100 | 85 | 85 | 85 | 72 | 72 | 72 | 59 | 59 | 59 |
| 1   | 99  | 94  | 90  | 87  | 91  | 87  | 84  | 81  | 75 | 72 | 70 | 63 | 61 | 60 | 52 | 51 | 50 |
| 2   | 90  | 82  | 76  | 71  | 83  | 76  | 71  | 66  | 65 | 61 | 58 | 55 | 52 | 50 | 46 | 44 | 42 |
| 3   | 82  | 72  | 65  | 59  | 76  | 67  | 61  | 56  | 58 | 53 | 49 | 49 | 45 | 42 | 41 | 38 | 36 |
| 4   | 75  | 64  | 56  | 50  | 69  | 60  | 53  | 47  | 51 | 46 | 42 | 44 | 40 | 36 | 37 | 33 | 31 |
| 5   | 69  | 57  | 49  | 43  | 63  | 53  | 46  | 41  | 46 | 40 | 36 | 39 | 35 | 31 | 33 | 30 | 27 |
| 6   | 63  | 51  | 43  | 37  | 59  | 48  | 41  | 35  | 41 | 36 | 31 | 35 | 31 | 28 | 30 | 26 | 24 |
| 7   | 59  | 46  | 38  | 33  | 54  | 43  | 36  | 31  | 38 | 32 | 28 | 32 | 28 | 24 | 27 | 24 | 21 |
| 8   | 54  | 42  | 34  | 29  | 50  | 39  | 32  | 27  | 34 | 29 | 25 | 30 | 25 | 22 | 25 | 22 | 19 |
| 9   | 51  | 38  | 31  | 26  | 47  | 36  | 29  | 25  | 31 | 26 | 22 | 27 | 23 | 20 | 23 | 20 | 17 |
| 10  | 47  | 35  | 28  | 23  | 44  | 33  | 26  | 22  | 29 | 24 | 20 | 25 | 21 | 18 | 21 | 18 | 16 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3104 | 3104 | 3104 |
| 5°  | 3108 | 3059 | 3080 |
| 10° | 3082 | 3016 | 3037 |
| 15° | 3035 | 2964 | 2970 |
| 20° | 2972 | 2893 | 2902 |
| 25° | 2910 | 2808 | 2823 |
| 30° | 2832 | 2729 | 2723 |
| 35° | 2758 | 2637 | 2618 |
| 40° | 2668 | 2543 | 2517 |
| 45° | 2577 | 2449 | 2414 |
| 50° | 2478 | 2350 | 2295 |
| 55° | 2374 | 2235 | 2185 |
| 60° | 2257 | 2100 | 2060 |
| 65° | 2128 | 1959 | 1911 |
| 70° | 1965 | 1788 | 1751 |
| 75° | 1739 | 1582 | 1601 |
| 80° | 1466 | 1319 | 1318 |
| 85° | 1040 | 874  | 854  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2577 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 252.3   | 2.0       |
| 10°-20°   | 709.8   | 5.6       |
| 20°-30°   | 1043.1  | 8.2       |
| 30°-40°   | 1211.4  | 9.5       |
| 40°-50°   | 1209.9  | 9.5       |
| 50°-60°   | 1055.0  | 8.3       |
| 60°-70°   | 779.9   | 6.1       |
| 70°-80°   | 441.2   | 3.5       |
| 80°-90°   | 120.1   | 0.9       |
| 90°-100°  | 67.1    | 0.5       |
| 100°-110° | 250.0   | 2.0       |
| 110°-120° | 663.1   | 5.2       |
| 120°-130° | 1099.8  | 8.6       |
| 130°-140° | 1168.3  | 9.1       |
| 140°-150° | 1085.8  | 8.5       |
| 150°-160° | 872.9   | 6.8       |
| 160°-170° | 562.5   | 4.4       |
| 170°-180° | 193.6   | 1.5       |
| 0°-30°    | 2005.1  | 15.7      |
| 0°-40°    | 3216.5  | 25.2      |
| 0°-60°    | 5481.5  | 42.9      |
| 0°-90°    | 6822.7  | 53.4      |
| 90°-120°  | 980.2   | 7.7       |
| 90°-150°  | 4334.1  | 33.9      |
| 90°-180°  | 5963.0  | 46.6      |
| 0°-180°   | 12785.8 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2680 | 2680  | 2680 | 2680  | 2680 |      |
| 5°   | 2680 | 2670  | 2642 | 2662  | 2657 | 254  |
| 15°  | 2551 | 2536  | 2502 | 2513  | 2500 | 719  |
| 25°  | 2309 | 2289  | 2245 | 2250  | 2245 | 1063 |
| 35°  | 1992 | 1966  | 1925 | 1910  | 1897 | 1244 |
| 45°  | 1621 | 1603  | 1564 | 1536  | 1526 | 1251 |
| 55°  | 1227 | 1211  | 1180 | 1150  | 1137 | 1097 |
| 65°  | 827  | 812   | 786  | 763   | 750  | 818  |
| 75°  | 433  | 428   | 415  | 400   | 405  | 462  |
| 85°  | 106  | 103   | 101  | 93    | 90   | 118  |
| 90°  | 1    | 18    | 29   | 37    | 40   | 12   |
| 95°  | 96   | 47    | 57   | 65    | 63   | 113  |
| 105° | 448  | 492   | 90   | 106   | 112  | 478  |
| 115° | 846  | 871   | 908  | 227   | 121  | 833  |
| 125° | 1196 | 1216  | 1244 | 1254  | 1258 | 1067 |
| 135° | 1481 | 1504  | 1517 | 1532  | 1529 | 1144 |
| 145° | 1718 | 1716  | 1741 | 1751  | 1744 | 1074 |
| 155° | 1891 | 1878  | 1896 | 1904  | 1893 | 872  |
| 165° | 1993 | 1984  | 1988 | 1999  | 1988 | 563  |
| 175° | 2038 | 2028  | 2031 | 2041  | 2027 | 194  |
| 180° | 2034 | 2034  | 2034 | 2034  | 2034 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2680.1 | 2680.1 | 2680.1 | 2680.1 | 2680.1 |
| 2.5°   | 2695.7 | 2682.9 | 2654.5 | 2680.1 | 2675.2 |
| 5°     | 2680.1 | 2670.0 | 2641.6 | 2662.1 | 2657.2 |
| 7.5°   | 2662.1 | 2646.8 | 2618.4 | 2639.1 | 2634.0 |
| 10°    | 2634.0 | 2615.9 | 2585.0 | 2605.5 | 2597.9 |
| 12.5°  | 2595.1 | 2579.8 | 2548.9 | 2561.7 | 2556.6 |
| 15°    | 2551.4 | 2536.1 | 2502.4 | 2512.8 | 2500.0 |
| 17.5°  | 2497.2 | 2481.9 | 2448.2 | 2461.2 | 2448.2 |
| 20°    | 2437.9 | 2422.6 | 2386.5 | 2394.2 | 2384.0 |
| 22.5°  | 2378.9 | 2355.6 | 2321.9 | 2321.9 | 2316.8 |
| 25°    | 2309.1 | 2288.6 | 2244.9 | 2249.8 | 2244.9 |
| 27.5°  | 2231.7 | 2213.7 | 2180.3 | 2172.6 | 2159.8 |
| 30°    | 2154.6 | 2133.8 | 2095.3 | 2087.7 | 2077.2 |
| 32.5°  | 2072.1 | 2056.8 | 2015.4 | 1999.8 | 1989.5 |
| 35°    | 1992.2 | 1966.5 | 1925.2 | 1909.6 | 1896.8 |
| 37.5°  | 1901.9 | 1878.7 | 1837.5 | 1819.4 | 1806.5 |
| 40°    | 1809.3 | 1788.5 | 1747.2 | 1724.2 | 1713.8 |
| 42.5°  | 1719.1 | 1698.2 | 1657.2 | 1631.2 | 1616.0 |
| 45°    | 1621.2 | 1603.1 | 1564.3 | 1536.1 | 1525.8 |
| 47.5°  | 1525.8 | 1507.7 | 1466.4 | 1438.0 | 1422.6 |
| 50°    | 1425.1 | 1412.3 | 1376.1 | 1340.1 | 1327.2 |
| 52.5°  | 1327.2 | 1309.1 | 1275.8 | 1247.4 | 1229.3 |
| 55°    | 1226.8 | 1211.3 | 1180.4 | 1149.5 | 1136.6 |
| 57.5°  | 1126.3 | 1113.4 | 1079.8 | 1048.9 | 1038.4 |
| 60°    | 1025.6 | 1015.5 | 979.4  | 951.0  | 943.3  |
| 62.5°  | 927.7  | 909.7  | 884.0  | 858.3  | 847.9  |
| 65°    | 827.4  | 811.8  | 786.1  | 762.8  | 750.0  |
| 67.5°  | 724.3  | 711.2  | 688.2  | 670.2  | 659.8  |
| 70°    | 628.9  | 618.5  | 595.3  | 577.2  | 567.1  |
| 72.5°  | 531.0  | 520.6  | 507.7  | 489.7  | 482.1  |
| 75°    | 432.8  | 427.9  | 414.8  | 399.5  | 404.7  |
| 77.5°  | 345.3  | 334.9  | 329.8  | 322.1  | 314.4  |
| 80°    | 257.9  | 255.1  | 249.9  | 242.3  | 237.0  |
| 82.5°  | 175.3  | 175.3  | 172.8  | 162.4  | 162.4  |
| 85°    | 105.6  | 103.1  | 100.7  | 92.7   | 90.2   |
| 87.5°  | 46.5   | 41.3   | 36.1   | 28.4   | 25.7   |
| 90°    | 1.4    | 17.7   | 29.4   | 36.9   | 39.7   |
| 92.5°  | 36.9   | 30.9   | 35.3   | 38.3   | 39.7   |
| 95°    | 95.6   | 47.0   | 57.3   | 64.8   | 63.3   |
| 97.5°  | 172.1  | 51.6   | 75.0   | 79.6   | 80.9   |
| 100°   | 260.6  | 58.9   | 83.9   | 95.6   | 98.6   |
| 102.5° | 357.6  | 354.8  | 86.9   | 103.0  | 107.5  |
| 105°   | 447.5  | 491.6  | 89.8   | 105.9  | 111.8  |
| 107.5° | 551.9  | 588.7  | 92.8   | 108.9  | 114.9  |
| 110°   | 652.1  | 682.9  | 257.6  | 110.5  | 116.2  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 746.3  | 772.7  | 747.7  | 113.2  | 117.8  |
| 115°   | 846.3  | 871.2  | 908.1  | 226.7  | 120.8  |
| 117.5° | 933.1  | 962.5  | 987.7  | 777.1  | 391.5  |
| 120°   | 1030.3 | 1052.3 | 1078.9 | 1096.6 | 897.8  |
| 122.5° | 1112.6 | 1136.2 | 1165.8 | 1174.5 | 1176.0 |
| 125°   | 1196.5 | 1215.7 | 1243.7 | 1254.0 | 1258.3 |
| 127.5° | 1273.1 | 1293.6 | 1315.9 | 1330.6 | 1332.0 |
| 130°   | 1345.2 | 1368.8 | 1384.9 | 1401.2 | 1399.8 |
| 132.5° | 1418.8 | 1438.0 | 1454.1 | 1467.4 | 1466.0 |
| 135°   | 1480.7 | 1504.2 | 1517.4 | 1532.2 | 1529.3 |
| 137.5° | 1545.3 | 1563.1 | 1577.9 | 1592.6 | 1588.2 |
| 140°   | 1608.6 | 1620.5 | 1636.6 | 1649.8 | 1642.5 |
| 142.5° | 1661.7 | 1672.1 | 1691.1 | 1702.8 | 1695.5 |
| 145°   | 1717.7 | 1716.1 | 1741.1 | 1751.4 | 1744.1 |
| 147.5° | 1766.1 | 1761.8 | 1786.7 | 1794.1 | 1788.3 |
| 150°   | 1813.3 | 1803.0 | 1826.6 | 1835.3 | 1828.0 |
| 152.5° | 1853.0 | 1841.2 | 1863.3 | 1872.2 | 1861.9 |
| 155°   | 1891.3 | 1878.1 | 1895.7 | 1904.5 | 1892.8 |
| 157.5° | 1922.2 | 1910.5 | 1923.7 | 1934.1 | 1922.2 |
| 160°   | 1948.8 | 1939.8 | 1948.8 | 1957.5 | 1947.1 |
| 162.5° | 1972.2 | 1963.4 | 1970.7 | 1981.1 | 1967.8 |
| 165°   | 1992.8 | 1984.1 | 1988.4 | 1998.7 | 1988.4 |
| 167.5° | 2009.1 | 2000.1 | 2004.7 | 2015.0 | 2001.7 |
| 170°   | 2022.3 | 2013.4 | 2016.4 | 2026.7 | 2013.4 |
| 172.5° | 2031.1 | 2022.3 | 2025.3 | 2035.6 | 2022.3 |
| 175°   | 2038.4 | 2028.1 | 2031.1 | 2041.3 | 2026.7 |
| 177.5° | 2041.3 | 2031.1 | 2032.6 | 2043.0 | 2029.6 |
| 180°   | 2034.0 | 2034.0 | 2034.0 | 2034.0 | 2034.0 |

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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 | 11.47            | 12.36 | 12.40 | 13.31 | 14.53 | 11.04          | 11.93 | 11.97 | 12.88 | 14.10 |
|                 | 3H   | 13.13            | 13.93 | 14.06 | 14.88 | 16.13 | 12.66          | 13.46 | 13.60 | 14.41 | 15.66 |
|                 | 4H   | 13.71            | 14.47 | 14.66 | 15.43 | 16.68 | 13.24          | 14.00 | 14.19 | 14.96 | 16.21 |
|                 | 6H   | 14.10            | 14.80 | 15.07 | 15.77 | 17.03 | 13.63          | 14.33 | 14.60 | 15.30 | 16.56 |
|                 | 8H   | 14.21            | 14.87 | 15.18 | 15.85 | 17.12 | 13.74          | 14.40 | 14.71 | 15.38 | 16.65 |
|                 | 12H  | 14.25            | 14.89 | 15.23 | 15.86 | 17.15 | 13.78          | 14.41 | 14.76 | 15.39 | 16.68 |
| 4H              | 2H   | 11.93            | 12.69 | 12.89 | 13.65 | 14.90 | 11.59          | 12.35 | 12.55 | 13.31 | 14.56 |
|                 | 3H   | 13.79            | 14.42 | 14.76 | 15.41 | 16.68 | 13.40          | 14.03 | 14.37 | 15.02 | 16.29 |
|                 | 4H   | 14.50            | 15.08 | 15.48 | 16.06 | 17.36 | 14.10          | 14.68 | 15.08 | 15.66 | 16.95 |
|                 | 6H   | 15.01            | 15.51 | 16.00 | 16.52 | 17.81 | 14.61          | 15.10 | 15.60 | 16.11 | 17.40 |
|                 | 8H   | 15.16            | 15.62 | 16.15 | 16.62 | 17.93 | 14.75          | 15.22 | 15.74 | 16.22 | 17.52 |
|                 | 12H  | 15.23            | 15.65 | 16.24 | 16.66 | 17.98 | 14.81          | 15.23 | 15.82 | 16.25 | 17.56 |
| 8H              | 4H   | 14.70            | 15.16 | 15.69 | 16.16 | 17.47 | 14.34          | 14.81 | 15.33 | 15.81 | 17.11 |
|                 | 6H   | 15.32            | 15.71 | 16.34 | 16.75 | 18.05 | 14.96          | 15.35 | 15.98 | 16.39 | 17.69 |
|                 | 8H   | 15.54            | 15.88 | 16.56 | 16.90 | 18.23 | 15.17          | 15.51 | 16.20 | 16.54 | 17.86 |
|                 | 12H  | 15.66            | 15.96 | 16.69 | 16.99 | 18.35 | 15.29          | 15.58 | 16.31 | 16.61 | 17.97 |
| 12H             | 4H   | 14.68            | 15.10 | 15.70 | 16.12 | 17.43 | 14.33          | 14.75 | 15.35 | 15.77 | 17.08 |
|                 | 6H   | 15.35            | 15.69 | 16.38 | 16.72 | 18.04 | 15.00          | 15.34 | 16.03 | 16.37 | 17.69 |
|                 | 8H   | 15.59            | 15.89 | 16.62 | 16.91 | 18.28 | 15.23          | 15.53 | 16.26 | 16.56 | 17.92 |