

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: P919174

Luminaire Tested: DFN2DIP-HX4F0-100D100US935-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P919174  
REPORT IS A COMBINATION OF REPORTS P899419 AND P896188  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX4F0-100D100US935-FLLFLL  
Description: 4 foot, Hexagon Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

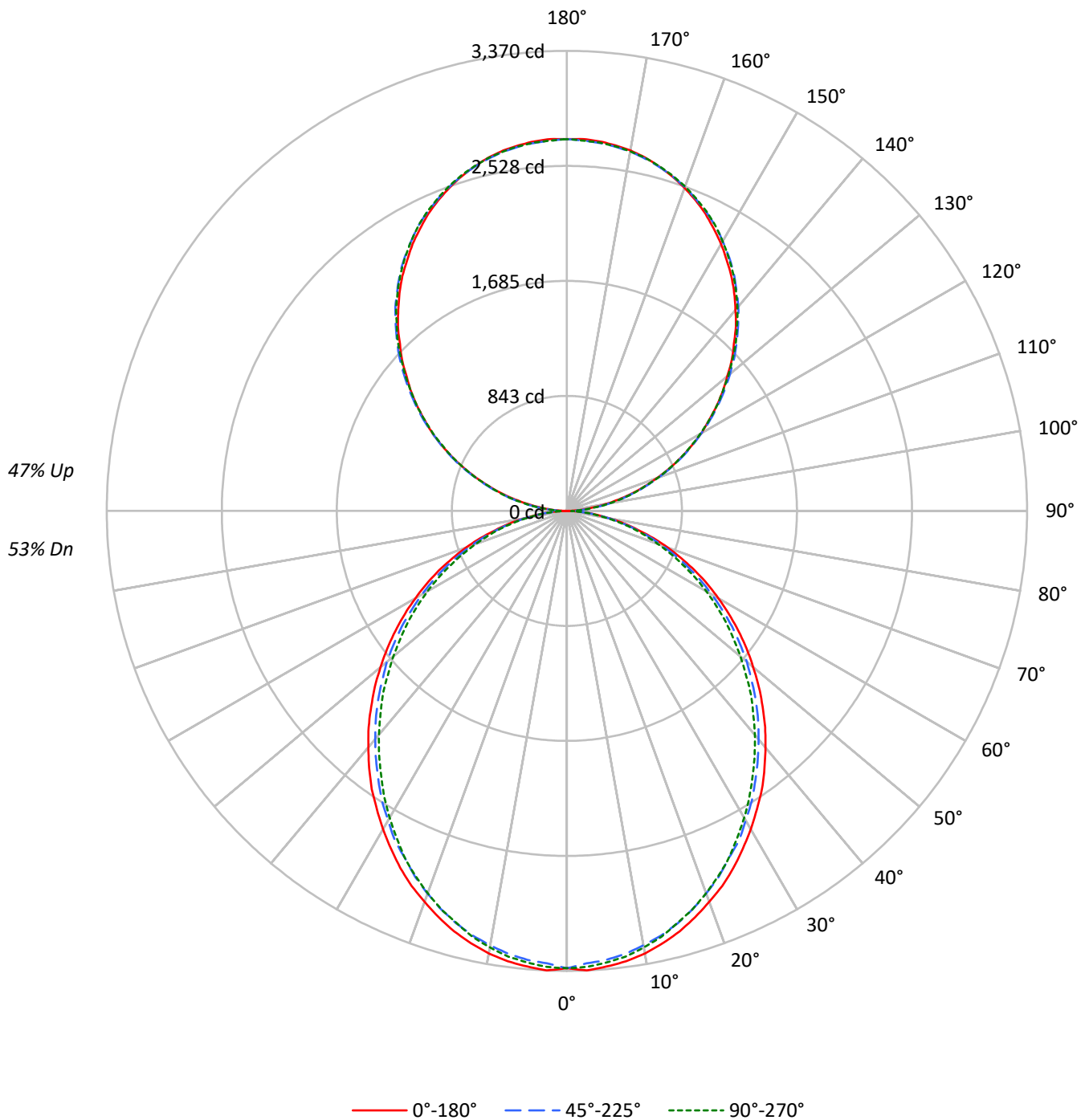
Lumens per Lamp: N/A  
Luminaire Lumens: 16143.7 lumens  
Efficiency: N/A  
Efficacy: 102.8 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.54' x L: 4.09' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 157.1  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.946  
Total Harmonic Distortion (THDi): 0.132  
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



TEST NUMBER: P919174

CATALOG NUMBER: DFN2DIP-HX4F0-100D100US935-FLLFL

**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 | 71 | 71 | 71 | 59 | 59 | 59 |
| 1   | 98  | 94  | 90  | 87  | 91  | 87  | 84  | 81  | 74 | 72 | 70 | 63 | 61 | 59 | 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  | 75  | 67  | 61  | 55  | 58 | 53 | 49 | 49 | 45 | 42 | 41 | 38 | 36 |
| 4   | 75  | 64  | 56  | 50  | 69  | 60  | 52  | 47  | 51 | 46 | 41 | 43 | 39 | 36 | 36 | 33 | 31 |
| 5   | 69  | 57  | 49  | 43  | 63  | 53  | 46  | 40  | 46 | 40 | 36 | 39 | 35 | 31 | 33 | 29 | 27 |
| 6   | 63  | 51  | 43  | 37  | 58  | 48  | 40  | 35  | 41 | 36 | 31 | 35 | 31 | 27 | 30 | 26 | 24 |
| 7   | 59  | 46  | 38  | 33  | 54  | 43  | 36  | 31  | 37 | 32 | 28 | 32 | 28 | 24 | 27 | 24 | 21 |
| 8   | 54  | 42  | 34  | 29  | 50  | 39  | 32  | 27  | 34 | 29 | 24 | 29 | 25 | 22 | 25 | 21 | 19 |
| 9   | 51  | 38  | 31  | 26  | 47  | 36  | 29  | 24  | 31 | 26 | 22 | 27 | 23 | 19 | 23 | 20 | 17 |
| 10  | 47  | 35  | 28  | 23  | 44  | 33  | 26  | 22  | 29 | 23 | 20 | 25 | 21 | 18 | 21 | 18 | 15 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2491 | 2491 | 2491 |
| 5°  | 2495 | 2457 | 2473 |
| 10° | 2475 | 2424 | 2440 |
| 15° | 2439 | 2384 | 2388 |
| 20° | 2390 | 2329 | 2334 |
| 25° | 2341 | 2263 | 2272 |
| 30° | 2280 | 2201 | 2194 |
| 35° | 2222 | 2129 | 2110 |
| 40° | 2151 | 2056 | 2031 |
| 45° | 2080 | 1982 | 1950 |
| 50° | 2002 | 1905 | 1857 |
| 55° | 1921 | 1816 | 1770 |
| 60° | 1829 | 1710 | 1672 |
| 65° | 1729 | 1601 | 1555 |
| 70° | 1601 | 1467 | 1430 |
| 75° | 1424 | 1308 | 1315 |
| 80° | 1212 | 1104 | 1094 |
| 85° | 879  | 753  | 728  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
Vertical Angle: 45°  
Luminance: 2080 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 315.3   | 2.0       |
| 10°-20°   | 887.2   | 5.5       |
| 20°-30°   | 1303.8  | 8.1       |
| 30°-40°   | 1514.3  | 9.4       |
| 40°-50°   | 1512.4  | 9.4       |
| 50°-60°   | 1318.8  | 8.2       |
| 60°-70°   | 974.9   | 6.0       |
| 70°-80°   | 551.6   | 3.4       |
| 80°-90°   | 153.3   | 0.9       |
| 90°-100°  | 168.5   | 1.0       |
| 100°-110° | 535.4   | 3.3       |
| 110°-120° | 916.2   | 5.7       |
| 120°-130° | 1204.9  | 7.5       |
| 130°-140° | 1352.5  | 8.4       |
| 140°-150° | 1326.3  | 8.2       |
| 150°-160° | 1112.6  | 6.9       |
| 160°-170° | 737.8   | 4.6       |
| 170°-180° | 257.9   | 1.6       |
| 0°-30°    | 2506.3  | 15.5      |
| 0°-40°    | 4020.6  | 24.9      |
| 0°-60°    | 6851.8  | 42.4      |
| 0°-90°    | 8531.6  | 52.8      |
| 90°-120°  | 1620.1  | 10.0      |
| 90°-150°  | 5503.8  | 34.1      |
| 90°-180°  | 7612.0  | 47.2      |
| 0°-180°   | 16143.7 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3350 | 3350  | 3350 | 3350  | 3350 |      |
| 5°   | 3350 | 3338  | 3302 | 3328  | 3322 | 318  |
| 15°  | 3189 | 3170  | 3128 | 3141  | 3125 | 898  |
| 25°  | 2886 | 2861  | 2806 | 2812  | 2806 | 1328 |
| 35°  | 2490 | 2458  | 2406 | 2387  | 2371 | 1555 |
| 45°  | 2026 | 2004  | 1955 | 1920  | 1907 | 1564 |
| 55°  | 1534 | 1514  | 1476 | 1437  | 1421 | 1371 |
| 65°  | 1034 | 1015  | 983  | 954   | 938  | 1023 |
| 75°  | 541  | 535   | 518  | 499   | 506  | 578  |
| 85°  | 132  | 129   | 126  | 116   | 113  | 147  |
| 90°  | 2    | 30    | 80   | 76    | 78   | 16   |
| 95°  | 120  | 143   | 147  | 147   | 143  | 133  |
| 105° | 494  | 501   | 506  | 510   | 510  | 522  |
| 115° | 920  | 932   | 928  | 926   | 920  | 909  |
| 125° | 1337 | 1358  | 1351 | 1344  | 1341 | 1195 |
| 135° | 1730 | 1755  | 1760 | 1758  | 1751 | 1337 |
| 145° | 2100 | 2116  | 2130 | 2132  | 2123 | 1312 |
| 155° | 2401 | 2408  | 2415 | 2427  | 2419 | 1105 |
| 165° | 2612 | 2610  | 2610 | 2626  | 2615 | 737  |
| 175° | 2718 | 2712  | 2707 | 2723  | 2709 | 258  |
| 180° | 2723 | 2723  | 2723 | 2723  | 2723 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3350.2 | 3350.2 | 3350.2 | 3350.2 | 3350.2 |
| 2.5°   | 3369.7 | 3353.6 | 3318.0 | 3350.2 | 3344.0 |
| 5°     | 3350.2 | 3337.6 | 3302.0 | 3327.7 | 3321.5 |
| 7.5°   | 3327.7 | 3308.5 | 3272.9 | 3298.9 | 3292.5 |
| 10°    | 3292.5 | 3269.9 | 3231.2 | 3256.9 | 3247.3 |
| 12.5°  | 3243.9 | 3224.8 | 3186.1 | 3202.2 | 3195.7 |
| 15°    | 3189.2 | 3170.1 | 3128.0 | 3141.0 | 3125.0 |
| 17.5°  | 3121.5 | 3102.4 | 3060.3 | 3076.4 | 3060.3 |
| 20°    | 3047.3 | 3028.2 | 2983.1 | 2992.7 | 2980.0 |
| 22.5°  | 2973.5 | 2944.5 | 2902.4 | 2902.4 | 2896.0 |
| 25°    | 2886.4 | 2860.8 | 2806.1 | 2812.2 | 2806.1 |
| 27.5°  | 2789.6 | 2767.1 | 2725.4 | 2715.8 | 2699.7 |
| 30°    | 2693.3 | 2667.3 | 2619.1 | 2609.5 | 2596.5 |
| 32.5°  | 2590.1 | 2570.9 | 2519.3 | 2499.8 | 2486.8 |
| 35°    | 2490.3 | 2458.1 | 2406.5 | 2387.0 | 2370.9 |
| 37.5°  | 2377.5 | 2348.4 | 2296.8 | 2274.2 | 2258.1 |
| 40°    | 2261.6 | 2235.6 | 2184.0 | 2155.3 | 2142.3 |
| 42.5°  | 2148.8 | 2122.8 | 2071.6 | 2039.1 | 2020.0 |
| 45°    | 2026.4 | 2003.9 | 1955.3 | 1920.1 | 1907.2 |
| 47.5°  | 1907.2 | 1884.6 | 1833.0 | 1797.4 | 1778.3 |
| 50°    | 1781.4 | 1765.3 | 1720.2 | 1675.1 | 1659.1 |
| 52.5°  | 1659.1 | 1636.5 | 1594.7 | 1559.3 | 1536.7 |
| 55°    | 1533.6 | 1514.2 | 1475.5 | 1436.8 | 1420.8 |
| 57.5°  | 1407.8 | 1391.7 | 1349.7 | 1311.1 | 1298.1 |
| 60°    | 1282.0 | 1269.4 | 1224.3 | 1188.7 | 1179.1 |
| 62.5°  | 1159.7 | 1137.1 | 1105.0 | 1072.9 | 1059.9 |
| 65°    | 1034.2 | 1014.8 | 982.7  | 953.6  | 937.5  |
| 67.5°  | 905.4  | 889.0  | 860.3  | 837.8  | 824.7  |
| 70°    | 786.1  | 773.1  | 744.1  | 721.5  | 708.9  |
| 72.5°  | 663.7  | 650.7  | 634.7  | 612.2  | 602.5  |
| 75°    | 541.1  | 534.9  | 518.5  | 499.4  | 505.8  |
| 77.5°  | 431.7  | 418.7  | 412.2  | 402.6  | 393.0  |
| 80°    | 322.3  | 318.9  | 312.4  | 302.8  | 296.4  |
| 82.5°  | 219.1  | 219.1  | 216.0  | 203.0  | 203.0  |
| 85°    | 131.9  | 128.9  | 125.8  | 115.9  | 112.8  |
| 87.5°  | 58.1   | 51.6   | 45.1   | 35.6   | 32.1   |
| 90°    | 2.5    | 29.5   | 80.4   | 75.5   | 78.0   |
| 92.5°  | 50.9   | 69.0   | 71.5   | 73.9   | 73.9   |
| 95°    | 119.9  | 142.8  | 147.0  | 147.0  | 142.8  |
| 97.5°  | 199.5  | 220.8  | 229.9  | 229.9  | 229.9  |
| 100°   | 291.4  | 310.3  | 316.8  | 316.8  | 314.4  |
| 102.5° | 388.3  | 402.3  | 411.3  | 413.7  | 411.3  |
| 105°   | 494.2  | 500.8  | 505.7  | 509.8  | 509.8  |
| 107.5° | 599.3  | 609.2  | 609.2  | 610.8  | 599.3  |
| 110°   | 701.1  | 714.2  | 714.2  | 714.2  | 707.7  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 811.1  | 825.0  | 822.6  | 816.0  | 811.1  |
| 115°   | 919.5  | 932.5  | 928.5  | 926.0  | 919.5  |
| 117.5° | 1027.0 | 1045.1 | 1033.5 | 1027.0 | 1020.4 |
| 120°   | 1135.3 | 1153.4 | 1135.3 | 1135.3 | 1128.0 |
| 122.5° | 1233.8 | 1256.8 | 1245.3 | 1238.8 | 1233.8 |
| 125°   | 1337.3 | 1357.8 | 1351.3 | 1343.8 | 1341.4 |
| 127.5° | 1438.3 | 1463.7 | 1454.7 | 1444.8 | 1438.3 |
| 130°   | 1532.7 | 1562.2 | 1558.1 | 1553.2 | 1544.2 |
| 132.5° | 1638.6 | 1661.6 | 1663.2 | 1651.7 | 1645.1 |
| 135°   | 1729.7 | 1755.1 | 1760.1 | 1757.6 | 1751.0 |
| 137.5° | 1831.5 | 1852.0 | 1856.1 | 1854.5 | 1844.6 |
| 140°   | 1921.0 | 1941.5 | 1953.0 | 1953.0 | 1944.0 |
| 142.5° | 2012.9 | 2033.4 | 2040.0 | 2042.5 | 2033.4 |
| 145°   | 2099.9 | 2116.3 | 2129.5 | 2131.9 | 2122.9 |
| 147.5° | 2177.9 | 2198.5 | 2208.3 | 2212.4 | 2203.4 |
| 150°   | 2258.4 | 2272.3 | 2281.4 | 2288.7 | 2281.4 |
| 152.5° | 2329.8 | 2343.7 | 2355.3 | 2364.3 | 2355.3 |
| 155°   | 2401.2 | 2407.8 | 2415.2 | 2426.6 | 2419.2 |
| 157.5° | 2462.8 | 2467.7 | 2471.8 | 2488.2 | 2476.7 |
| 160°   | 2517.8 | 2522.7 | 2525.1 | 2539.1 | 2529.3 |
| 162.5° | 2568.7 | 2568.7 | 2571.1 | 2586.7 | 2575.2 |
| 165°   | 2612.2 | 2609.7 | 2609.7 | 2626.1 | 2614.7 |
| 167.5° | 2651.6 | 2644.2 | 2644.2 | 2660.7 | 2649.1 |
| 170°   | 2681.1 | 2674.6 | 2672.1 | 2688.6 | 2674.6 |
| 172.5° | 2701.6 | 2695.1 | 2692.6 | 2709.0 | 2695.1 |
| 175°   | 2718.1 | 2711.5 | 2706.6 | 2723.0 | 2709.0 |
| 177.5° | 2727.1 | 2720.6 | 2715.6 | 2729.5 | 2715.6 |
| 180°   | 2723.0 | 2723.0 | 2723.0 | 2723.0 | 2723.0 |

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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 | 10.70            | 11.59 | 11.63 | 12.54 | 13.77 | 10.27          | 11.16 | 11.20 | 12.11 | 13.34 |
|                 | 3H   | 12.37            | 13.16 | 13.31 | 14.12 | 15.37 | 11.89          | 12.69 | 12.84 | 13.65 | 14.90 |
|                 | 4H   | 12.95            | 13.71 | 13.91 | 14.67 | 15.93 | 12.48          | 13.23 | 13.44 | 14.20 | 15.46 |
|                 | 6H   | 13.36            | 14.05 | 14.33 | 15.02 | 16.30 | 12.88          | 13.58 | 13.85 | 14.54 | 15.82 |
|                 | 8H   | 13.46            | 14.12 | 14.44 | 15.11 | 16.38 | 12.99          | 13.65 | 13.96 | 14.63 | 15.91 |
|                 | 12H  | 13.51            | 14.14 | 14.49 | 15.12 | 16.42 | 13.03          | 13.66 | 14.01 | 14.64 | 15.94 |
| 4H              | 2H   | 11.17            | 11.92 | 12.13 | 12.88 | 14.15 | 10.82          | 11.58 | 11.79 | 12.54 | 13.80 |
|                 | 3H   | 13.04            | 13.67 | 14.01 | 14.66 | 15.94 | 12.64          | 13.27 | 13.62 | 14.27 | 15.54 |
|                 | 4H   | 13.75            | 14.33 | 14.74 | 15.31 | 16.62 | 13.35          | 13.92 | 14.33 | 14.91 | 16.21 |
|                 | 6H   | 14.27            | 14.77 | 15.27 | 15.78 | 17.07 | 13.86          | 14.36 | 14.86 | 15.37 | 16.67 |
|                 | 8H   | 14.42            | 14.88 | 15.42 | 15.89 | 17.20 | 14.01          | 14.47 | 15.01 | 15.48 | 16.79 |
|                 | 12H  | 14.50            | 14.91 | 15.51 | 15.93 | 17.25 | 14.07          | 14.49 | 15.09 | 15.51 | 16.83 |
| 8H              | 4H   | 13.95            | 14.42 | 14.95 | 15.42 | 16.73 | 13.59          | 14.05 | 14.59 | 15.06 | 16.37 |
|                 | 6H   | 14.59            | 14.97 | 15.61 | 16.01 | 17.33 | 14.22          | 14.61 | 15.24 | 15.65 | 16.96 |
|                 | 8H   | 14.81            | 15.15 | 15.84 | 16.18 | 17.51 | 14.44          | 14.78 | 15.47 | 15.81 | 17.14 |
|                 | 12H  | 14.94            | 15.24 | 15.97 | 16.27 | 17.64 | 14.56          | 14.85 | 15.59 | 15.88 | 17.25 |
| 12H             | 4H   | 13.94            | 14.36 | 14.95 | 15.38 | 16.70 | 13.59          | 14.01 | 14.60 | 15.03 | 16.34 |
|                 | 6H   | 14.62            | 14.95 | 15.65 | 15.99 | 17.32 | 14.26          | 14.60 | 15.29 | 15.63 | 16.96 |
|                 | 8H   | 14.86            | 15.16 | 15.89 | 16.18 | 17.56 | 14.50          | 14.80 | 15.54 | 15.83 | 17.20 |