

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: P906781

Luminaire Tested: DFN2DIP-SQ4F0-090D080US835-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P906781  
REPORT IS A COMBINATION OF REPORTS P901621 AND P898471  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ4F0-090D080US835-FLLONL  
Description: 4 foot, Square Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

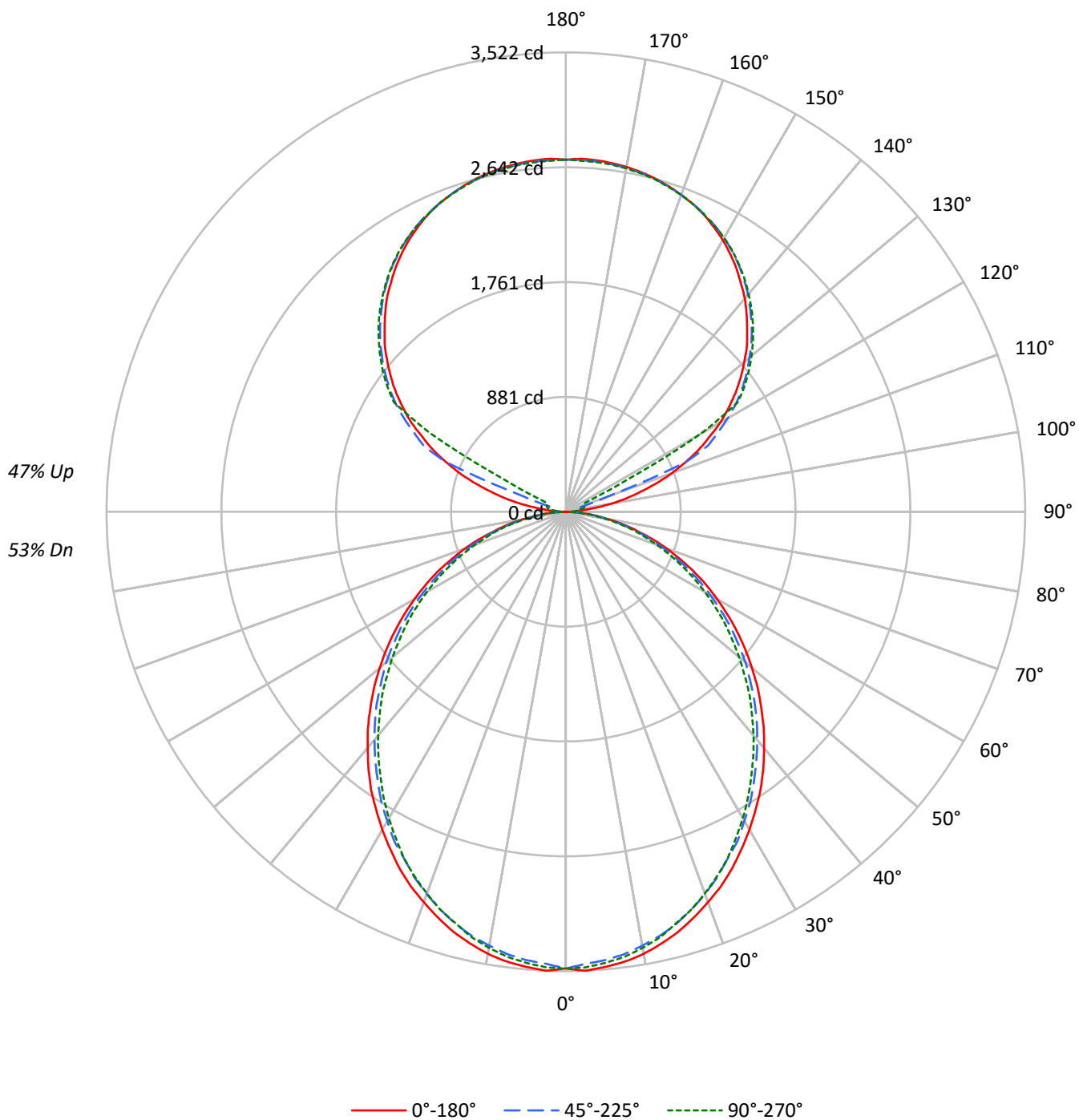
Lumens per Lamp: N/A  
Luminaire Lumens: 16830.0 lumens  
Efficiency: N/A  
Efficacy: 118.4 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 3.92' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 142.2  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.983  
Total Harmonic Distortion (THDi): 0.073  
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 | 71 | 71 | 71 | 59 | 59 | 59 |
| 1   | 98  | 94  | 90  | 87  | 91  | 87  | 84  | 81  | 75 | 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  | 53  | 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 | 24 | 20 | 25 | 21 | 18 | 21 | 18 | 15 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2457 | 2457 | 2457 |
| 5°  | 2461 | 2424 | 2440 |
| 10° | 2441 | 2391 | 2408 |
| 15° | 2405 | 2352 | 2357 |
| 20° | 2357 | 2298 | 2305 |
| 25° | 2308 | 2233 | 2244 |
| 30° | 2248 | 2173 | 2167 |
| 35° | 2191 | 2102 | 2086 |
| 40° | 2120 | 2030 | 2008 |
| 45° | 2050 | 1958 | 1929 |
| 50° | 1973 | 1882 | 1837 |
| 55° | 1892 | 1794 | 1753 |
| 60° | 1801 | 1690 | 1657 |
| 65° | 1702 | 1583 | 1543 |
| 70° | 1575 | 1452 | 1421 |
| 75° | 1400 | 1295 | 1309 |
| 80° | 1189 | 1095 | 1094 |
| 85° | 859  | 749  | 735  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2050 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 329.6   | 2.0       |
| 10°-20°   | 927.4   | 5.5       |
| 20°-30°   | 1362.9  | 8.1       |
| 30°-40°   | 1582.9  | 9.4       |
| 40°-50°   | 1580.9  | 9.4       |
| 50°-60°   | 1378.5  | 8.2       |
| 60°-70°   | 1019.0  | 6.1       |
| 70°-80°   | 576.6   | 3.4       |
| 80°-90°   | 156.9   | 0.9       |
| 90°-100°  | 89.0    | 0.5       |
| 100°-110° | 331.9   | 2.0       |
| 110°-120° | 880.2   | 5.2       |
| 120°-130° | 1459.9  | 8.7       |
| 130°-140° | 1550.7  | 9.2       |
| 140°-150° | 1441.2  | 8.6       |
| 150°-160° | 1158.7  | 6.9       |
| 160°-170° | 746.6   | 4.4       |
| 170°-180° | 257.0   | 1.5       |
| 0°-30°    | 2619.9  | 15.6      |
| 0°-40°    | 4202.8  | 25.0      |
| 0°-60°    | 7162.3  | 42.6      |
| 0°-90°    | 8914.8  | 53.0      |
| 90°-120°  | 1301.1  | 7.7       |
| 90°-150°  | 5752.9  | 34.2      |
| 90°-180°  | 7915.0  | 47.0      |
| 0°-180°   | 16830.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3502 | 3502  | 3502 | 3502  | 3502 |      |
| 5°   | 3502 | 3489  | 3452 | 3478  | 3472 | 332  |
| 15°  | 3334 | 3314  | 3270 | 3283  | 3266 | 939  |
| 25°  | 3017 | 2990  | 2933 | 2940  | 2933 | 1388 |
| 35°  | 2603 | 2570  | 2516 | 2495  | 2478 | 1626 |
| 45°  | 2118 | 2095  | 2044 | 2007  | 1994 | 1635 |
| 55°  | 1603 | 1583  | 1542 | 1502  | 1485 | 1433 |
| 65°  | 1081 | 1061  | 1027 | 997   | 980  | 1069 |
| 75°  | 566  | 559   | 542  | 522   | 529  | 604  |
| 85°  | 138  | 135   | 132  | 121   | 118  | 154  |
| 90°  | 2    | 23    | 39   | 49    | 53   | 16   |
| 95°  | 127  | 62    | 76   | 86    | 84   | 150  |
| 105° | 594  | 653   | 119  | 141   | 148  | 635  |
| 115° | 1123 | 1156  | 1205 | 301   | 160  | 1106 |
| 125° | 1588 | 1614  | 1651 | 1664  | 1670 | 1416 |
| 135° | 1965 | 1997  | 2014 | 2034  | 2030 | 1518 |
| 145° | 2280 | 2278  | 2311 | 2325  | 2315 | 1426 |
| 155° | 2510 | 2493  | 2516 | 2528  | 2512 | 1157 |
| 165° | 2645 | 2634  | 2639 | 2653  | 2639 | 747  |
| 175° | 2706 | 2692  | 2696 | 2710  | 2690 | 258  |
| 180° | 2700 | 2700  | 2700 | 2700  | 2700 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3501.9 | 3501.9 | 3501.9 | 3501.9 | 3501.9 |
| 2.5°   | 3522.3 | 3505.5 | 3468.4 | 3501.9 | 3495.5 |
| 5°     | 3501.9 | 3488.7 | 3451.6 | 3478.4 | 3471.9 |
| 7.5°   | 3478.4 | 3458.4 | 3421.2 | 3448.4 | 3441.6 |
| 10°    | 3441.6 | 3418.0 | 3377.6 | 3404.4 | 3394.4 |
| 12.5°  | 3390.8 | 3370.8 | 3330.5 | 3347.2 | 3340.5 |
| 15°    | 3333.7 | 3313.7 | 3269.7 | 3283.3 | 3266.5 |
| 17.5°  | 3262.9 | 3242.9 | 3199.0 | 3215.8 | 3199.0 |
| 20°    | 3185.4 | 3165.4 | 3118.2 | 3128.2 | 3115.0 |
| 22.5°  | 3108.2 | 3077.9 | 3033.9 | 3033.9 | 3027.1 |
| 25°    | 3017.1 | 2990.3 | 2933.2 | 2939.6 | 2933.2 |
| 27.5°  | 2916.0 | 2892.4 | 2848.9 | 2838.9 | 2822.1 |
| 30°    | 2815.3 | 2788.1 | 2737.7 | 2727.7 | 2714.2 |
| 32.5°  | 2707.4 | 2687.4 | 2633.4 | 2613.1 | 2599.5 |
| 35°    | 2603.1 | 2569.5 | 2515.5 | 2495.2 | 2478.4 |
| 37.5°  | 2485.2 | 2454.8 | 2400.8 | 2377.3 | 2360.5 |
| 40°    | 2364.0 | 2336.9 | 2282.9 | 2252.9 | 2239.4 |
| 42.5°  | 2246.1 | 2219.0 | 2165.4 | 2131.5 | 2111.5 |
| 45°    | 2118.2 | 2094.7 | 2043.9 | 2007.1 | 1993.6 |
| 47.5°  | 1993.6 | 1970.0 | 1916.0 | 1878.9 | 1858.9 |
| 50°    | 1862.1 | 1845.3 | 1798.1 | 1751.0 | 1734.2 |
| 52.5°  | 1734.2 | 1710.6 | 1667.0 | 1629.9 | 1606.3 |
| 55°    | 1603.1 | 1582.7 | 1542.3 | 1502.0 | 1485.2 |
| 57.5°  | 1471.6 | 1454.8 | 1410.9 | 1370.5 | 1356.9 |
| 60°    | 1340.1 | 1326.9 | 1279.7 | 1242.6 | 1232.6 |
| 62.5°  | 1212.2 | 1188.6 | 1155.0 | 1121.5 | 1107.9 |
| 65°    | 1081.1 | 1060.7 | 1027.1 | 996.8  | 980.0  |
| 67.5°  | 946.4  | 929.3  | 899.2  | 875.7  | 862.1  |
| 70°    | 821.7  | 808.1  | 777.8  | 754.2  | 741.0  |
| 72.5°  | 693.8  | 680.2  | 663.4  | 639.9  | 629.9  |
| 75°    | 565.6  | 559.1  | 542.0  | 522.0  | 528.8  |
| 77.5°  | 451.2  | 437.7  | 430.9  | 420.9  | 410.9  |
| 80°    | 336.9  | 333.3  | 326.5  | 316.5  | 309.8  |
| 82.5°  | 229.0  | 229.0  | 225.8  | 212.2  | 212.2  |
| 85°    | 137.9  | 134.7  | 131.5  | 121.1  | 117.9  |
| 87.5°  | 60.7   | 53.9   | 47.2   | 37.2   | 33.6   |
| 90°    | 1.9    | 23.4   | 39.0   | 48.9   | 52.7   |
| 92.5°  | 48.9   | 41.1   | 46.9   | 50.8   | 52.7   |
| 95°    | 126.9  | 62.4   | 76.1   | 86.1   | 84.0   |
| 97.5°  | 228.5  | 68.4   | 99.5   | 105.6  | 107.4  |
| 100°   | 345.9  | 78.2   | 111.4  | 126.9  | 130.8  |
| 102.5° | 474.7  | 470.9  | 115.3  | 136.6  | 142.7  |
| 105°   | 593.9  | 652.6  | 119.2  | 140.6  | 148.5  |
| 107.5° | 732.6  | 781.3  | 123.2  | 144.5  | 152.4  |
| 110°   | 865.6  | 906.4  | 342.0  | 146.6  | 154.3  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 990.6  | 1025.6 | 992.5  | 150.3  | 156.4  |
| 115°   | 1123.3 | 1156.5 | 1205.4 | 300.9  | 160.3  |
| 117.5° | 1238.6 | 1277.6 | 1311.0 | 1031.4 | 519.7  |
| 120°   | 1367.6 | 1396.8 | 1432.1 | 1455.5 | 1191.7 |
| 122.5° | 1476.8 | 1508.2 | 1547.4 | 1559.0 | 1561.1 |
| 125°   | 1588.2 | 1613.7 | 1650.8 | 1664.5 | 1670.3 |
| 127.5° | 1689.8 | 1717.2 | 1746.7 | 1766.1 | 1768.0 |
| 130°   | 1785.6 | 1816.9 | 1838.3 | 1859.9 | 1858.0 |
| 132.5° | 1883.3 | 1908.8 | 1930.2 | 1947.8 | 1945.9 |
| 135°   | 1965.4 | 1996.7 | 2014.1 | 2033.9 | 2029.9 |
| 137.5° | 2051.3 | 2074.7 | 2094.4 | 2113.9 | 2108.1 |
| 140°   | 2135.2 | 2151.0 | 2172.4 | 2190.0 | 2180.2 |
| 142.5° | 2205.8 | 2219.4 | 2244.7 | 2260.3 | 2250.5 |
| 145°   | 2280.0 | 2277.9 | 2311.1 | 2324.8 | 2315.0 |
| 147.5° | 2344.3 | 2338.5 | 2371.6 | 2381.4 | 2373.7 |
| 150°   | 2406.9 | 2393.2 | 2424.5 | 2436.1 | 2426.4 |
| 152.5° | 2459.6 | 2444.0 | 2473.2 | 2485.1 | 2471.4 |
| 155°   | 2510.4 | 2493.0 | 2516.4 | 2528.0 | 2512.5 |
| 157.5° | 2551.4 | 2535.9 | 2553.5 | 2567.2 | 2551.4 |
| 160°   | 2586.7 | 2574.9 | 2586.7 | 2598.3 | 2584.6 |
| 162.5° | 2617.8 | 2606.2 | 2615.9 | 2629.6 | 2612.0 |
| 165°   | 2645.2 | 2633.6 | 2639.4 | 2653.0 | 2639.4 |
| 167.5° | 2666.7 | 2654.9 | 2660.9 | 2674.6 | 2657.0 |
| 170°   | 2684.4 | 2672.5 | 2676.5 | 2690.2 | 2672.5 |
| 172.5° | 2696.0 | 2684.4 | 2688.3 | 2702.0 | 2684.4 |
| 175°   | 2705.7 | 2692.0 | 2696.0 | 2709.6 | 2690.2 |
| 177.5° | 2709.6 | 2696.0 | 2698.0 | 2711.7 | 2694.1 |
| 180°   | 2699.9 | 2699.9 | 2699.9 | 2699.9 | 2699.9 |

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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 | 10.68            | 11.57 | 11.61 | 12.52 | 13.74 | 10.23          | 11.12 | 11.17 | 12.07 | 13.30 |
|                 | 3H   | 12.35            | 13.14 | 13.29 | 14.10 | 15.35 | 11.86          | 12.65 | 12.80 | 13.61 | 14.86 |
|                 | 4H   | 12.94            | 13.69 | 13.89 | 14.65 | 15.91 | 12.44          | 13.20 | 13.40 | 14.16 | 15.42 |
|                 | 6H   | 13.34            | 14.04 | 14.31 | 15.01 | 16.28 | 12.84          | 13.54 | 13.81 | 14.50 | 15.78 |
|                 | 8H   | 13.45            | 14.11 | 14.42 | 15.10 | 16.37 | 12.95          | 13.61 | 13.92 | 14.59 | 15.87 |
|                 | 12H  | 13.50            | 14.13 | 14.48 | 15.11 | 16.40 | 12.99          | 13.62 | 13.97 | 14.60 | 15.90 |
| 4H              | 2H   | 11.14            | 11.90 | 12.11 | 12.86 | 14.12 | 10.79          | 11.54 | 11.75 | 12.51 | 13.77 |
|                 | 3H   | 13.02            | 13.65 | 13.99 | 14.64 | 15.91 | 12.61          | 13.24 | 13.58 | 14.23 | 15.51 |
|                 | 4H   | 13.74            | 14.31 | 14.72 | 15.30 | 16.60 | 13.31          | 13.89 | 14.29 | 14.87 | 16.17 |
|                 | 6H   | 14.26            | 14.75 | 15.25 | 15.76 | 17.06 | 13.82          | 14.32 | 14.82 | 15.33 | 16.63 |
|                 | 8H   | 14.41            | 14.87 | 15.40 | 15.87 | 17.19 | 13.97          | 14.43 | 14.97 | 15.44 | 16.75 |
|                 | 12H  | 14.49            | 14.90 | 15.50 | 15.92 | 17.24 | 14.04          | 14.45 | 15.05 | 15.47 | 16.79 |
| 8H              | 4H   | 13.93            | 14.40 | 14.93 | 15.40 | 16.71 | 13.56          | 14.02 | 14.55 | 15.02 | 16.34 |
|                 | 6H   | 14.57            | 14.96 | 15.59 | 16.00 | 17.31 | 14.19          | 14.57 | 15.21 | 15.62 | 16.93 |
|                 | 8H   | 14.80            | 15.13 | 15.82 | 16.16 | 17.49 | 14.40          | 14.74 | 15.43 | 15.77 | 17.10 |
|                 | 12H  | 14.93            | 15.23 | 15.96 | 16.25 | 17.63 | 14.52          | 14.82 | 15.55 | 15.84 | 17.22 |
| 12H             | 4H   | 13.92            | 14.34 | 14.94 | 15.36 | 16.68 | 13.55          | 13.97 | 14.57 | 14.99 | 16.31 |
|                 | 6H   | 14.60            | 14.94 | 15.63 | 15.97 | 17.30 | 14.23          | 14.57 | 15.26 | 15.60 | 16.93 |
|                 | 8H   | 14.85            | 15.15 | 15.88 | 16.17 | 17.54 | 14.47          | 14.77 | 15.50 | 15.79 | 17.16 |