

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: P922912

Luminaire Tested: DFN2DIP-SQ3F0-090D100US940-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P922912  
REPORT IS A COMBINATION OF REPORTS P899979 AND P896733  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ3F0-090D100US940-FLLFLL  
Description: 3 foot, Square Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

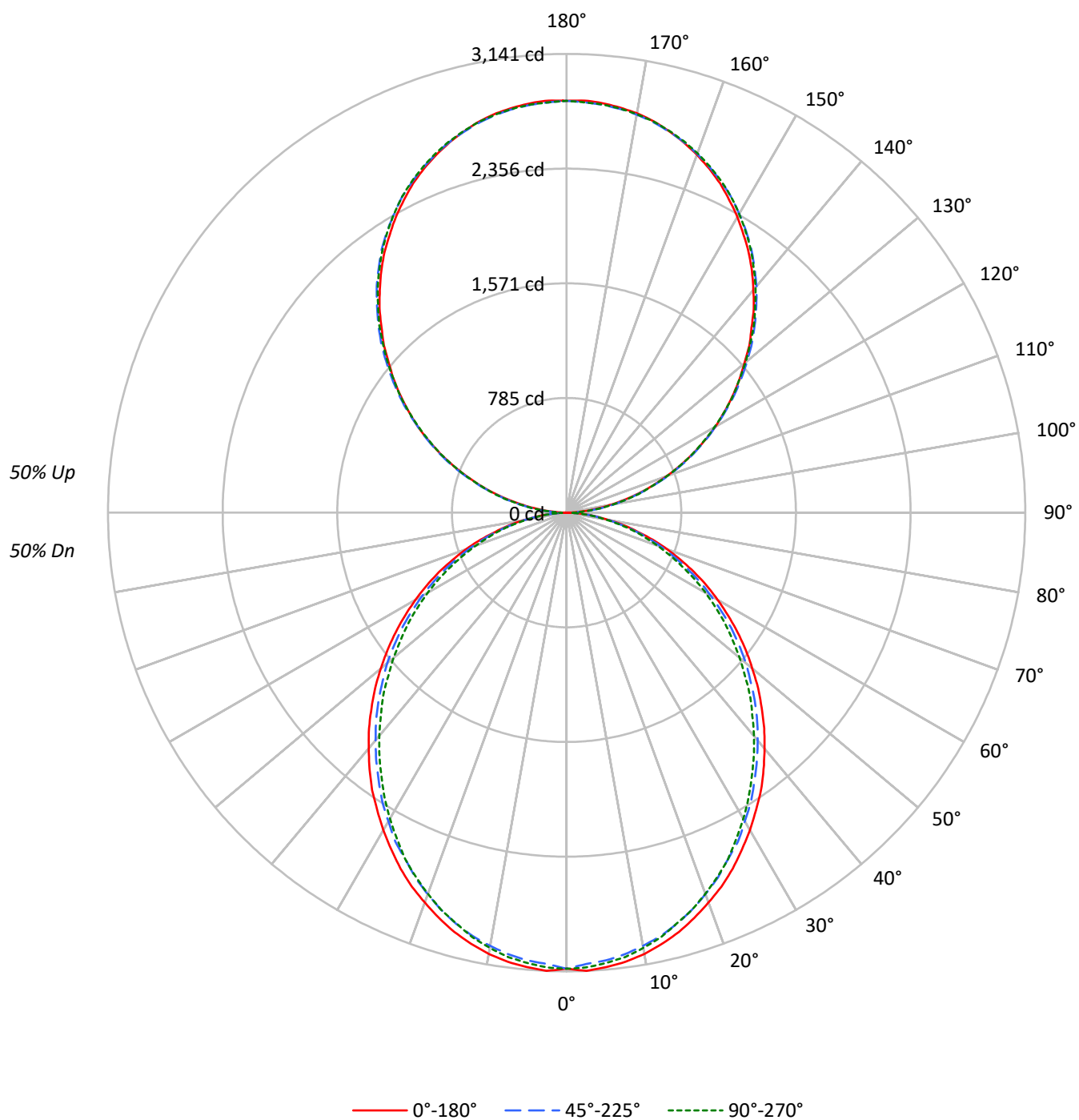
Lumens per Lamp: N/A  
Luminaire Lumens: 15836.8 lumens  
Efficiency: N/A  
Efficacy: 95.8 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.06' x L: 3.06' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 165.3  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.996  
Total Harmonic Distortion (THDi): 0.064  
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: P922912

CATALOG NUMBER: DFN2DIP-SQ3F0-090D100US940-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   | 107 | 107 | 107 | 107 | 99 | 99 | 99 | 99 | 83 | 83 | 83 | 69 | 69 | 69 | 56 | 56 | 56 |
| 1   | 98  | 93  | 90  | 86  | 90 | 86 | 83 | 80 | 73 | 71 | 69 | 61 | 59 | 58 | 50 | 49 | 48 |
| 2   | 89  | 82  | 76  | 70  | 82 | 76 | 70 | 66 | 64 | 60 | 57 | 54 | 51 | 48 | 44 | 42 | 40 |
| 3   | 81  | 72  | 64  | 59  | 75 | 67 | 60 | 55 | 57 | 52 | 48 | 47 | 44 | 41 | 39 | 36 | 34 |
| 4   | 74  | 64  | 56  | 50  | 68 | 59 | 52 | 47 | 50 | 45 | 41 | 42 | 38 | 35 | 35 | 32 | 29 |
| 5   | 68  | 57  | 48  | 42  | 63 | 53 | 45 | 40 | 45 | 39 | 35 | 38 | 34 | 30 | 31 | 28 | 26 |
| 6   | 63  | 51  | 43  | 37  | 58 | 47 | 40 | 35 | 41 | 35 | 31 | 34 | 30 | 27 | 28 | 25 | 23 |
| 7   | 58  | 46  | 38  | 32  | 54 | 43 | 36 | 31 | 37 | 31 | 27 | 31 | 27 | 23 | 26 | 23 | 20 |
| 8   | 54  | 42  | 34  | 29  | 50 | 39 | 32 | 27 | 34 | 28 | 24 | 29 | 24 | 21 | 24 | 20 | 18 |
| 9   | 50  | 38  | 31  | 25  | 46 | 36 | 29 | 24 | 31 | 25 | 21 | 26 | 22 | 19 | 22 | 19 | 16 |
| 10  | 47  | 35  | 28  | 23  | 43 | 33 | 26 | 22 | 28 | 23 | 19 | 24 | 20 | 17 | 20 | 17 | 15 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3578 | 3578 | 3578 |
| 5°  | 3581 | 3526 | 3551 |
| 10° | 3550 | 3476 | 3501 |
| 15° | 3496 | 3416 | 3425 |
| 20° | 3423 | 3334 | 3347 |
| 25° | 3350 | 3237 | 3257 |
| 30° | 3260 | 3146 | 3143 |
| 35° | 3174 | 3039 | 3022 |
| 40° | 3069 | 2931 | 2907 |
| 45° | 2964 | 2823 | 2790 |
| 50° | 2849 | 2709 | 2653 |
| 55° | 2728 | 2578 | 2528 |
| 60° | 2592 | 2421 | 2384 |
| 65° | 2443 | 2260 | 2214 |
| 70° | 2253 | 2062 | 2032 |
| 75° | 1991 | 1825 | 1861 |
| 80° | 1673 | 1522 | 1538 |
| 85° | 1178 | 1010 | 1006 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2964 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 293.9   | 1.9       |
| 10°-20°   | 827.0   | 5.2       |
| 20°-30°   | 1215.3  | 7.7       |
| 30°-40°   | 1411.5  | 8.9       |
| 40°-50°   | 1409.7  | 8.9       |
| 50°-60°   | 1229.3  | 7.8       |
| 60°-70°   | 908.7   | 5.7       |
| 70°-80°   | 514.1   | 3.2       |
| 80°-90°   | 143.7   | 0.9       |
| 90°-100°  | 174.5   | 1.1       |
| 100°-110° | 554.5   | 3.5       |
| 110°-120° | 948.9   | 6.0       |
| 120°-130° | 1247.9  | 7.9       |
| 130°-140° | 1400.8  | 8.8       |
| 140°-150° | 1373.6  | 8.7       |
| 150°-160° | 1152.3  | 7.3       |
| 160°-170° | 764.1   | 4.8       |
| 170°-180° | 267.1   | 1.7       |
| 0°-30°    | 2336.2  | 14.8      |
| 0°-40°    | 3747.7  | 23.7      |
| 0°-60°    | 6386.7  | 40.3      |
| 0°-90°    | 7953.2  | 50.2      |
| 90°-120°  | 1677.9  | 10.6      |
| 90°-150°  | 5700.1  | 36.0      |
| 90°-180°  | 7884.0  | 49.8      |
| 0°-180°   | 15836.8 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3123 | 3123  | 3123 | 3123  | 3123 |      |
| 5°   | 3123 | 3111  | 3078 | 3102  | 3096 | 296  |
| 15°  | 2973 | 2955  | 2916 | 2928  | 2913 | 837  |
| 25°  | 2690 | 2666  | 2616 | 2621  | 2616 | 1238 |
| 35°  | 2321 | 2291  | 2243 | 2225  | 2210 | 1449 |
| 45°  | 1889 | 1868  | 1823 | 1790  | 1778 | 1458 |
| 55°  | 1430 | 1411  | 1375 | 1339  | 1324 | 1278 |
| 65°  | 964  | 946   | 916  | 889   | 874  | 953  |
| 75°  | 504  | 499   | 483  | 466   | 472  | 538  |
| 85°  | 123  | 120   | 117  | 108   | 105  | 137  |
| 90°  | 3    | 31    | 83   | 78    | 81   | 15   |
| 95°  | 124  | 148   | 152  | 152   | 148  | 138  |
| 105° | 512  | 519   | 524  | 528   | 528  | 540  |
| 115° | 952  | 966   | 962  | 959   | 952  | 942  |
| 125° | 1385 | 1406  | 1400 | 1392  | 1389 | 1238 |
| 135° | 1791 | 1818  | 1823 | 1820  | 1814 | 1385 |
| 145° | 2175 | 2192  | 2206 | 2208  | 2199 | 1359 |
| 155° | 2487 | 2494  | 2501 | 2513  | 2506 | 1145 |
| 165° | 2705 | 2703  | 2703 | 2720  | 2708 | 763  |
| 175° | 2815 | 2808  | 2803 | 2820  | 2806 | 267  |
| 180° | 2820 | 2820  | 2820 | 2820  | 2820 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3122.7 | 3122.7 | 3122.7 | 3122.7 | 3122.7 |
| 2.5°   | 3140.9 | 3125.9 | 3092.8 | 3122.7 | 3117.0 |
| 5°     | 3122.7 | 3110.9 | 3077.8 | 3101.7 | 3095.9 |
| 7.5°   | 3101.7 | 3083.9 | 3050.7 | 3075.0 | 3068.9 |
| 10°    | 3068.9 | 3047.9 | 3011.8 | 3035.7 | 3026.8 |
| 12.5°  | 3023.6 | 3005.8 | 2969.8 | 2984.7 | 2978.8 |
| 15°    | 2972.7 | 2954.9 | 2915.6 | 2927.8 | 2912.8 |
| 17.5°  | 2909.6 | 2891.7 | 2852.6 | 2867.6 | 2852.6 |
| 20°    | 2840.5 | 2822.6 | 2780.5 | 2789.4 | 2777.7 |
| 22.5°  | 2771.6 | 2744.6 | 2705.4 | 2705.4 | 2699.3 |
| 25°    | 2690.4 | 2666.5 | 2615.6 | 2621.3 | 2615.6 |
| 27.5°  | 2600.2 | 2579.2 | 2540.4 | 2531.5 | 2516.5 |
| 30°    | 2510.4 | 2486.2 | 2441.2 | 2432.3 | 2420.3 |
| 32.5°  | 2414.2 | 2396.4 | 2348.2 | 2330.1 | 2318.0 |
| 35°    | 2321.2 | 2291.2 | 2243.1 | 2225.0 | 2210.0 |
| 37.5°  | 2216.1 | 2189.0 | 2140.8 | 2119.9 | 2104.9 |
| 40°    | 2108.0 | 2083.8 | 2035.7 | 2008.9 | 1996.9 |
| 42.5°  | 2002.9 | 1978.7 | 1930.9 | 1900.7 | 1882.8 |
| 45°    | 1888.8 | 1867.9 | 1822.6 | 1789.8 | 1777.7 |
| 47.5°  | 1777.7 | 1756.7 | 1708.5 | 1675.4 | 1657.6 |
| 50°    | 1660.5 | 1645.5 | 1603.4 | 1561.4 | 1546.4 |
| 52.5°  | 1546.4 | 1525.4 | 1486.5 | 1453.4 | 1432.4 |
| 55°    | 1429.5 | 1411.3 | 1375.3 | 1339.3 | 1324.4 |
| 57.5°  | 1312.2 | 1297.3 | 1258.1 | 1222.1 | 1210.0 |
| 60°    | 1195.0 | 1183.2 | 1141.1 | 1108.0 | 1099.1 |
| 62.5°  | 1080.9 | 1059.9 | 1029.9 | 1000.1 | 987.9  |
| 65°    | 964.0  | 945.8  | 915.9  | 888.9  | 873.9  |
| 67.5°  | 843.9  | 828.7  | 801.8  | 780.9  | 768.7  |
| 70°    | 732.7  | 720.6  | 693.6  | 672.5  | 660.8  |
| 72.5°  | 618.7  | 606.5  | 591.6  | 570.6  | 561.7  |
| 75°    | 504.4  | 498.6  | 483.3  | 465.5  | 471.5  |
| 77.5°  | 402.3  | 390.3  | 384.2  | 375.3  | 366.4  |
| 80°    | 300.4  | 297.2  | 291.1  | 282.2  | 276.3  |
| 82.5°  | 204.2  | 204.2  | 201.3  | 189.2  | 189.2  |
| 85°    | 123.0  | 120.1  | 117.3  | 108.0  | 105.1  |
| 87.5°  | 54.1   | 48.1   | 42.1   | 33.2   | 30.0   |
| 90°    | 2.6    | 30.6   | 83.3   | 78.2   | 80.8   |
| 92.5°  | 52.7   | 71.4   | 74.0   | 76.5   | 76.5   |
| 95°    | 124.1  | 147.9  | 152.2  | 152.2  | 147.9  |
| 97.5°  | 206.6  | 228.7  | 238.1  | 238.1  | 238.1  |
| 100°   | 301.8  | 321.4  | 328.1  | 328.1  | 325.7  |
| 102.5° | 402.2  | 416.6  | 426.0  | 428.5  | 426.0  |
| 105°   | 511.8  | 518.6  | 523.7  | 528.0  | 528.0  |
| 107.5° | 620.6  | 630.9  | 630.9  | 632.6  | 620.6  |
| 110°   | 726.1  | 739.7  | 739.7  | 739.7  | 732.9  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 840.0  | 854.4  | 851.9  | 845.1  | 840.0  |
| 115°   | 952.3  | 965.8  | 961.6  | 959.0  | 952.3  |
| 117.5° | 1063.6 | 1082.4 | 1070.4 | 1063.6 | 1056.8 |
| 120°   | 1175.8 | 1194.5 | 1175.8 | 1175.8 | 1168.2 |
| 122.5° | 1277.8 | 1301.6 | 1289.8 | 1283.0 | 1277.8 |
| 125°   | 1385.0 | 1406.2 | 1399.5 | 1391.8 | 1389.3 |
| 127.5° | 1489.6 | 1515.9 | 1506.5 | 1496.4 | 1489.6 |
| 130°   | 1587.3 | 1617.9 | 1613.7 | 1608.6 | 1599.3 |
| 132.5° | 1697.0 | 1720.8 | 1722.5 | 1710.7 | 1703.8 |
| 135°   | 1791.4 | 1817.8 | 1822.8 | 1820.3 | 1813.5 |
| 137.5° | 1896.8 | 1918.1 | 1922.3 | 1920.7 | 1910.4 |
| 140°   | 1989.5 | 2010.7 | 2022.7 | 2022.7 | 2013.3 |
| 142.5° | 2084.7 | 2106.0 | 2112.7 | 2115.3 | 2106.0 |
| 145°   | 2174.8 | 2191.8 | 2205.5 | 2208.0 | 2198.6 |
| 147.5° | 2255.6 | 2276.9 | 2287.1 | 2291.3 | 2282.0 |
| 150°   | 2339.0 | 2353.4 | 2362.8 | 2370.3 | 2362.8 |
| 152.5° | 2412.9 | 2427.3 | 2439.3 | 2448.6 | 2439.3 |
| 155°   | 2486.9 | 2493.7 | 2501.3 | 2513.2 | 2505.5 |
| 157.5° | 2550.6 | 2555.7 | 2560.0 | 2577.0 | 2565.1 |
| 160°   | 2607.6 | 2612.7 | 2615.2 | 2629.7 | 2619.5 |
| 162.5° | 2660.3 | 2660.3 | 2662.8 | 2679.0 | 2667.1 |
| 165°   | 2705.4 | 2702.8 | 2702.8 | 2719.8 | 2707.9 |
| 167.5° | 2746.2 | 2738.5 | 2738.5 | 2755.6 | 2743.6 |
| 170°   | 2776.8 | 2770.0 | 2767.4 | 2784.5 | 2770.0 |
| 172.5° | 2798.0 | 2791.2 | 2788.6 | 2805.7 | 2791.2 |
| 175°   | 2815.0 | 2808.3 | 2803.2 | 2820.1 | 2805.7 |
| 177.5° | 2824.4 | 2817.6 | 2812.5 | 2826.9 | 2812.5 |
| 180°   | 2820.1 | 2820.1 | 2820.1 | 2820.1 | 2820.1 |

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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 | 11.69            | 12.55 | 12.64 | 13.52 | 14.79 | 11.24          | 12.10 | 12.20 | 13.08 | 14.34 |
|                 | 3H   | 13.34            | 14.12 | 14.31 | 15.10 | 16.39 | 12.85          | 13.63 | 13.82 | 14.61 | 15.90 |
|                 | 4H   | 13.93            | 14.66 | 14.91 | 15.64 | 16.94 | 13.43          | 14.17 | 14.41 | 15.15 | 16.45 |
|                 | 6H   | 14.32            | 15.00 | 15.31 | 15.99 | 17.30 | 13.82          | 14.50 | 14.81 | 15.49 | 16.80 |
|                 | 8H   | 14.43            | 15.07 | 15.42 | 16.08 | 17.38 | 13.92          | 14.57 | 14.92 | 15.57 | 16.88 |
|                 | 12H  | 14.47            | 15.08 | 15.48 | 16.08 | 17.42 | 13.96          | 14.58 | 14.97 | 15.58 | 16.91 |
| 4H              | 2H   | 12.14            | 12.88 | 13.13 | 13.86 | 15.16 | 11.79          | 12.52 | 12.77 | 13.51 | 14.80 |
|                 | 3H   | 14.00            | 14.62 | 15.00 | 15.63 | 16.94 | 13.60          | 14.21 | 14.59 | 15.22 | 16.53 |
|                 | 4H   | 14.71            | 15.27 | 15.72 | 16.28 | 17.62 | 14.29          | 14.85 | 15.29 | 15.86 | 17.19 |
|                 | 6H   | 15.23            | 15.71 | 16.24 | 16.74 | 18.07 | 14.79          | 15.28 | 15.81 | 16.30 | 17.64 |
|                 | 8H   | 15.37            | 15.82 | 16.39 | 16.85 | 18.19 | 14.94          | 15.39 | 15.95 | 16.41 | 17.76 |
|                 | 12H  | 15.44            | 15.85 | 16.48 | 16.89 | 18.24 | 14.99          | 15.40 | 16.03 | 16.44 | 17.79 |
| 8H              | 4H   | 14.91            | 15.36 | 15.92 | 16.38 | 17.73 | 14.53          | 14.98 | 15.55 | 16.00 | 17.35 |
|                 | 6H   | 15.53            | 15.90 | 16.57 | 16.97 | 18.32 | 15.15          | 15.52 | 16.19 | 16.59 | 17.93 |
|                 | 8H   | 15.75            | 16.08 | 16.80 | 17.13 | 18.49 | 15.36          | 15.68 | 16.41 | 16.73 | 18.10 |
|                 | 12H  | 15.88            | 16.17 | 16.93 | 17.21 | 18.62 | 15.47          | 15.76 | 16.52 | 16.80 | 18.21 |
| 12H             | 4H   | 14.89            | 15.30 | 15.93 | 16.34 | 17.69 | 14.52          | 14.93 | 15.56 | 15.97 | 17.32 |
|                 | 6H   | 15.56            | 15.89 | 16.61 | 16.94 | 18.30 | 15.19          | 15.52 | 16.24 | 16.57 | 17.93 |
|                 | 8H   | 15.80            | 16.09 | 16.85 | 17.13 | 18.54 | 15.42          | 15.71 | 16.47 | 16.75 | 18.16 |