

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: P903849

Luminaire Tested: DFN2DIP-SQ3F0-100D090US830-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P903849  
REPORT IS A COMBINATION OF REPORTS P901483 AND P898289  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ3F0-100D090US830-FLLONL  
Description: 3 foot, Square Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

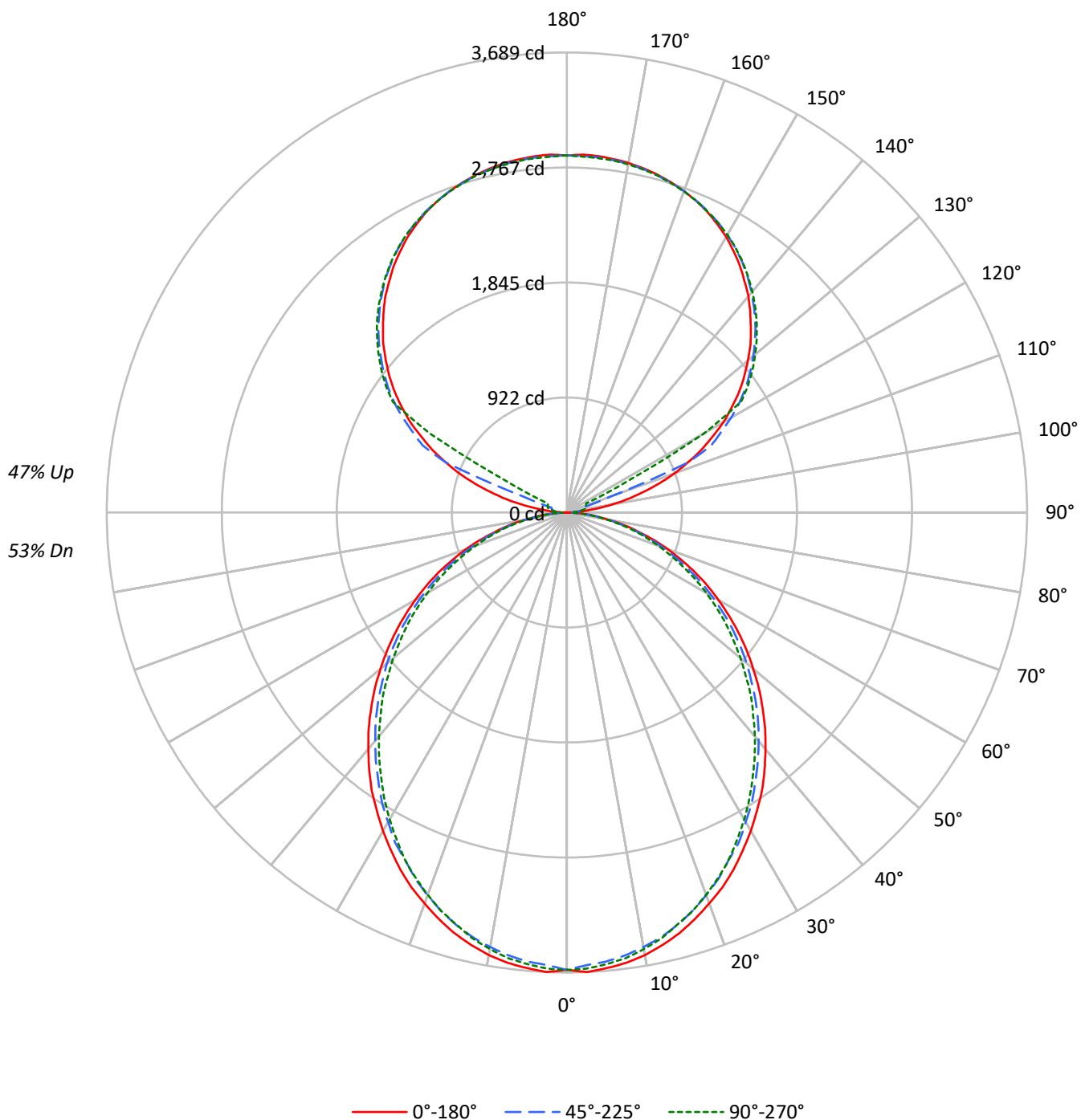
Lumens per Lamp: N/A  
Luminaire Lumens: 17729.2 lumens  
Efficiency: N/A  
Efficacy: 106.2 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.06' x L: 3.06' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 167  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9781  
Total Harmonic Distortion (THDi): 0.075  
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  | 74 | 72 | 70 | 63 | 61 | 59 | 52 | 51 | 49 |
| 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 | 40 | 38 | 35 |
| 4   | 75  | 64  | 56  | 50  | 69  | 59  | 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 | 35 | 31 | 35 | 31 | 27 | 30 | 26 | 23 |
| 7   | 59  | 46  | 38  | 33  | 54  | 43  | 36  | 31  | 37 | 32 | 27 | 32 | 28 | 24 | 27 | 24 | 21 |
| 8   | 54  | 42  | 34  | 29  | 50  | 39  | 32  | 27  | 34 | 28 | 24 | 29 | 25 | 22 | 25 | 21 | 19 |
| 9   | 51  | 38  | 31  | 26  | 47  | 36  | 29  | 24  | 31 | 26 | 22 | 27 | 23 | 19 | 23 | 19 | 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°  | 4202 | 4202 | 4202 |
| 5°  | 4206 | 4141 | 4170 |
| 10° | 4170 | 4082 | 4112 |
| 15° | 4106 | 4012 | 4023 |
| 20° | 4020 | 3916 | 3931 |
| 25° | 3935 | 3802 | 3825 |
| 30° | 3829 | 3695 | 3691 |
| 35° | 3728 | 3570 | 3549 |
| 40° | 3604 | 3443 | 3414 |
| 45° | 3481 | 3316 | 3276 |
| 50° | 3346 | 3182 | 3116 |
| 55° | 3205 | 3027 | 2969 |
| 60° | 3044 | 2844 | 2800 |
| 65° | 2869 | 2654 | 2601 |
| 70° | 2646 | 2422 | 2386 |
| 75° | 2338 | 2144 | 2185 |
| 80° | 1964 | 1789 | 1806 |
| 85° | 1383 | 1185 | 1183 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 3481 cd/sqm

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CATALOG NUMBER: DFN2DIP-SQ3F0-100D090US830-FLONL

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 345.2   | 1.9       |
| 10°-20°   | 971.2   | 5.5       |
| 20°-30°   | 1427.3  | 8.1       |
| 30°-40°   | 1657.7  | 9.4       |
| 40°-50°   | 1655.7  | 9.3       |
| 50°-60°   | 1443.7  | 8.1       |
| 60°-70°   | 1067.2  | 6.0       |
| 70°-80°   | 603.8   | 3.4       |
| 80°-90°   | 164.4   | 0.9       |
| 90°-100°  | 94.4    | 0.5       |
| 100°-110° | 351.9   | 2.0       |
| 110°-120° | 933.3   | 5.3       |
| 120°-130° | 1548.0  | 8.7       |
| 130°-140° | 1644.3  | 9.3       |
| 140°-150° | 1528.2  | 8.6       |
| 150°-160° | 1228.6  | 6.9       |
| 160°-170° | 791.7   | 4.5       |
| 170°-180° | 272.5   | 1.5       |
| 0°-30°    | 2743.7  | 15.5      |
| 0°-40°    | 4401.4  | 24.8      |
| 0°-60°    | 7500.8  | 42.3      |
| 0°-90°    | 9336.2  | 52.7      |
| 90°-120°  | 1379.6  | 7.8       |
| 90°-150°  | 6100.2  | 34.4      |
| 90°-180°  | 8393.0  | 47.3      |
| 0°-180°   | 17729.2 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3668 | 3668  | 3668 | 3668  | 3668 |      |
| 5°   | 3668 | 3654  | 3615 | 3643  | 3636 | 348  |
| 15°  | 3491 | 3470  | 3424 | 3438  | 3421 | 983  |
| 25°  | 3160 | 3132  | 3072 | 3078  | 3072 | 1454 |
| 35°  | 2726 | 2691  | 2634 | 2613  | 2596 | 1702 |
| 45°  | 2218 | 2194  | 2140 | 2102  | 2088 | 1712 |
| 55°  | 1679 | 1658  | 1615 | 1573  | 1555 | 1501 |
| 65°  | 1132 | 1111  | 1076 | 1044  | 1026 | 1119 |
| 75°  | 592  | 586   | 568  | 547   | 554  | 632  |
| 85°  | 144  | 141   | 138  | 127   | 124  | 161  |
| 90°  | 2    | 25    | 41   | 52    | 56   | 16   |
| 95°  | 135  | 66    | 81   | 91    | 89   | 159  |
| 105° | 630  | 692   | 126  | 149   | 157  | 673  |
| 115° | 1191 | 1226  | 1278 | 319   | 170  | 1173 |
| 125° | 1684 | 1711  | 1750 | 1765  | 1771 | 1502 |
| 135° | 2084 | 2117  | 2136 | 2157  | 2152 | 1610 |
| 145° | 2418 | 2415  | 2451 | 2465  | 2455 | 1512 |
| 155° | 2662 | 2644  | 2668 | 2681  | 2664 | 1227 |
| 165° | 2805 | 2792  | 2799 | 2813  | 2799 | 792  |
| 175° | 2869 | 2854  | 2859 | 2873  | 2852 | 273  |
| 180° | 2863 | 2863  | 2863 | 2863  | 2863 |      |

TEST NUMBER: P903849

CATALOG NUMBER: DFN2DIP-SQ3F0-100D090US830-FLLONL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3667.5 | 3667.5 | 3667.5 | 3667.5 | 3667.5 |
| 2.5°   | 3688.8 | 3671.2 | 3632.3 | 3667.5 | 3660.7 |
| 5°     | 3667.5 | 3653.7 | 3614.7 | 3642.8 | 3636.0 |
| 7.5°   | 3642.8 | 3621.8 | 3582.9 | 3611.4 | 3604.3 |
| 10°    | 3604.3 | 3579.6 | 3537.3 | 3565.4 | 3554.9 |
| 12.5°  | 3551.1 | 3530.2 | 3487.9 | 3505.5 | 3498.3 |
| 15°    | 3491.3 | 3470.3 | 3424.3 | 3438.5 | 3421.0 |
| 17.5°  | 3417.2 | 3396.3 | 3350.2 | 3367.8 | 3350.2 |
| 20°    | 3335.9 | 3315.0 | 3265.6 | 3276.1 | 3262.2 |
| 22.5°  | 3255.2 | 3223.4 | 3177.3 | 3177.3 | 3170.2 |
| 25°    | 3159.8 | 3131.7 | 3071.8 | 3078.5 | 3071.8 |
| 27.5°  | 3053.8 | 3029.1 | 2983.5 | 2973.1 | 2955.4 |
| 30°    | 2948.4 | 2919.9 | 2867.1 | 2856.7 | 2842.4 |
| 32.5°  | 2835.4 | 2814.4 | 2757.9 | 2736.6 | 2722.3 |
| 35°    | 2726.1 | 2691.0 | 2634.4 | 2613.1 | 2595.5 |
| 37.5°  | 2602.6 | 2570.8 | 2514.3 | 2489.6 | 2472.0 |
| 40°    | 2475.8 | 2447.3 | 2390.9 | 2359.5 | 2345.2 |
| 42.5°  | 2352.3 | 2323.8 | 2267.8 | 2232.2 | 2211.3 |
| 45°    | 2218.4 | 2193.7 | 2140.5 | 2102.0 | 2087.8 |
| 47.5°  | 2087.8 | 2063.1 | 2006.6 | 1967.7 | 1946.7 |
| 50°    | 1950.1 | 1932.5 | 1883.1 | 1833.7 | 1816.2 |
| 52.5°  | 1816.2 | 1791.5 | 1745.8 | 1706.9 | 1682.2 |
| 55°    | 1678.9 | 1657.6 | 1615.2 | 1572.9 | 1555.4 |
| 57.5°  | 1541.2 | 1523.5 | 1477.5 | 1435.3 | 1421.1 |
| 60°    | 1403.4 | 1389.6 | 1340.2 | 1301.3 | 1290.8 |
| 62.5°  | 1269.5 | 1244.8 | 1209.7 | 1174.5 | 1160.3 |
| 65°    | 1132.2 | 1110.9 | 1075.7 | 1043.9 | 1026.3 |
| 67.5°  | 991.2  | 973.2  | 941.8  | 917.1  | 902.9  |
| 70°    | 860.5  | 846.3  | 814.5  | 789.9  | 776.0  |
| 72.5°  | 726.6  | 712.4  | 694.8  | 670.1  | 659.6  |
| 75°    | 592.3  | 585.6  | 567.6  | 546.7  | 553.7  |
| 77.5°  | 472.6  | 458.4  | 451.2  | 440.7  | 430.3  |
| 80°    | 352.8  | 349.1  | 342.0  | 331.5  | 324.4  |
| 82.5°  | 239.9  | 239.9  | 236.5  | 222.3  | 222.3  |
| 85°    | 144.4  | 141.1  | 137.7  | 126.9  | 123.5  |
| 87.5°  | 63.6   | 56.5   | 49.4   | 38.9   | 35.2   |
| 90°    | 2.0    | 24.9   | 41.3   | 51.9   | 55.8   |
| 92.5°  | 51.9   | 43.5   | 49.7   | 53.9   | 55.8   |
| 95°    | 134.6  | 66.2   | 80.7   | 91.2   | 89.1   |
| 97.5°  | 242.3  | 72.6   | 105.6  | 111.9  | 113.9  |
| 100°   | 366.7  | 82.9   | 118.1  | 134.6  | 138.7  |
| 102.5° | 503.3  | 499.4  | 122.2  | 144.9  | 151.3  |
| 105°   | 629.7  | 692.0  | 126.4  | 149.1  | 157.4  |
| 107.5° | 776.8  | 828.5  | 130.6  | 153.3  | 161.6  |
| 110°   | 917.8  | 961.1  | 362.6  | 155.4  | 163.6  |

TEST NUMBER: P903849

CATALOG NUMBER: DFN2DIP-SQ3F0-100D090US830-FLLONL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1050.4 | 1087.5 | 1052.3 | 159.4  | 165.8  |
| 115°   | 1191.1 | 1226.2 | 1278.2 | 319.1  | 169.9  |
| 117.5° | 1313.3 | 1354.7 | 1390.1 | 1093.7 | 551.0  |
| 120°   | 1450.1 | 1481.1 | 1518.5 | 1543.3 | 1263.7 |
| 122.5° | 1566.0 | 1599.2 | 1640.8 | 1653.0 | 1655.3 |
| 125°   | 1684.0 | 1711.1 | 1750.5 | 1765.0 | 1771.1 |
| 127.5° | 1791.8 | 1820.8 | 1852.1 | 1872.7 | 1874.7 |
| 130°   | 1893.4 | 1926.7 | 1949.3 | 1972.1 | 1970.2 |
| 132.5° | 1997.0 | 2024.0 | 2046.6 | 2065.4 | 2063.4 |
| 135°   | 2084.1 | 2117.2 | 2135.7 | 2156.6 | 2152.5 |
| 137.5° | 2175.1 | 2199.9 | 2220.8 | 2241.5 | 2235.3 |
| 140°   | 2264.1 | 2280.9 | 2303.5 | 2322.1 | 2311.9 |
| 142.5° | 2338.9 | 2353.4 | 2380.2 | 2396.7 | 2386.4 |
| 145°   | 2417.6 | 2415.4 | 2450.6 | 2465.1 | 2454.8 |
| 147.5° | 2485.8 | 2479.6 | 2514.8 | 2525.2 | 2517.0 |
| 150°   | 2552.2 | 2537.7 | 2570.9 | 2583.1 | 2572.9 |
| 152.5° | 2608.0 | 2591.5 | 2622.5 | 2635.1 | 2620.6 |
| 155°   | 2661.9 | 2643.5 | 2668.2 | 2680.6 | 2664.1 |
| 157.5° | 2705.5 | 2689.0 | 2707.6 | 2722.2 | 2705.5 |
| 160°   | 2742.8 | 2730.3 | 2742.8 | 2755.1 | 2740.6 |
| 162.5° | 2775.8 | 2763.4 | 2773.8 | 2788.3 | 2769.7 |
| 165°   | 2804.8 | 2792.5 | 2798.7 | 2813.2 | 2798.7 |
| 167.5° | 2827.7 | 2815.2 | 2821.5 | 2836.0 | 2817.4 |
| 170°   | 2846.4 | 2833.8 | 2838.0 | 2852.5 | 2833.8 |
| 172.5° | 2858.7 | 2846.4 | 2850.5 | 2865.0 | 2846.4 |
| 175°   | 2869.0 | 2854.5 | 2858.7 | 2873.2 | 2852.5 |
| 177.5° | 2873.2 | 2858.7 | 2860.9 | 2875.4 | 2856.8 |
| 180°   | 2862.9 | 2862.9 | 2862.9 | 2862.9 | 2862.9 |

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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 | 12.47            | 13.35 | 13.40 | 14.31 | 15.54 | 12.02          | 12.91 | 12.96 | 13.86 | 15.09 |
|                 | 3H   | 14.13            | 14.92 | 15.07 | 15.88 | 17.14 | 13.64          | 14.43 | 14.58 | 15.39 | 16.65 |
|                 | 4H   | 14.71            | 15.46 | 15.67 | 16.43 | 17.69 | 14.22          | 14.97 | 15.18 | 15.93 | 17.20 |
|                 | 6H   | 15.11            | 15.80 | 16.08 | 16.77 | 18.05 | 14.61          | 15.30 | 15.58 | 16.27 | 17.55 |
|                 | 8H   | 15.21            | 15.87 | 16.19 | 16.86 | 18.14 | 14.71          | 15.37 | 15.69 | 16.36 | 17.63 |
|                 | 12H  | 15.26            | 15.89 | 16.24 | 16.87 | 18.17 | 14.75          | 15.38 | 15.73 | 16.36 | 17.66 |
| 4H              | 2H   | 12.93            | 13.68 | 13.89 | 14.65 | 15.91 | 12.57          | 13.33 | 13.54 | 14.29 | 15.56 |
|                 | 3H   | 14.79            | 15.42 | 15.77 | 16.41 | 17.69 | 14.38          | 15.01 | 15.36 | 16.01 | 17.28 |
|                 | 4H   | 15.50            | 16.08 | 16.49 | 17.06 | 18.37 | 15.08          | 15.65 | 16.06 | 16.64 | 17.94 |
|                 | 6H   | 16.02            | 16.51 | 17.01 | 17.52 | 18.82 | 15.58          | 16.08 | 16.58 | 17.09 | 18.39 |
|                 | 8H   | 16.16            | 16.62 | 17.16 | 17.63 | 18.95 | 15.73          | 16.19 | 16.72 | 17.19 | 18.51 |
|                 | 12H  | 16.24            | 16.65 | 17.25 | 17.67 | 18.99 | 15.79          | 16.20 | 16.80 | 17.22 | 18.55 |
| 8H              | 4H   | 15.70            | 16.16 | 16.70 | 17.16 | 18.48 | 15.32          | 15.78 | 16.32 | 16.79 | 18.10 |
|                 | 6H   | 16.32            | 16.71 | 17.35 | 17.75 | 19.07 | 15.94          | 16.32 | 16.96 | 17.37 | 18.68 |
|                 | 8H   | 16.54            | 16.88 | 17.57 | 17.91 | 19.24 | 16.15          | 16.49 | 17.18 | 17.52 | 18.85 |
|                 | 12H  | 16.67            | 16.97 | 17.71 | 17.99 | 19.37 | 16.26          | 16.56 | 17.29 | 17.58 | 18.96 |
| 12H             | 4H   | 15.68            | 16.10 | 16.70 | 17.12 | 18.44 | 15.31          | 15.73 | 16.33 | 16.75 | 18.07 |
|                 | 6H   | 16.35            | 16.69 | 17.38 | 17.72 | 19.05 | 15.98          | 16.32 | 17.01 | 17.35 | 18.68 |
|                 | 8H   | 16.59            | 16.89 | 17.63 | 17.92 | 19.29 | 16.21          | 16.51 | 17.25 | 17.53 | 18.91 |