

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: P906924

Luminaire Tested: DFN2DIP-SQ4F0-140D080US835-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P906924  
REPORT IS A COMBINATION OF REPORTS P900109 AND P896915  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ4F0-140D080US835-FLLFLL  
Description: 4 foot, Square Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

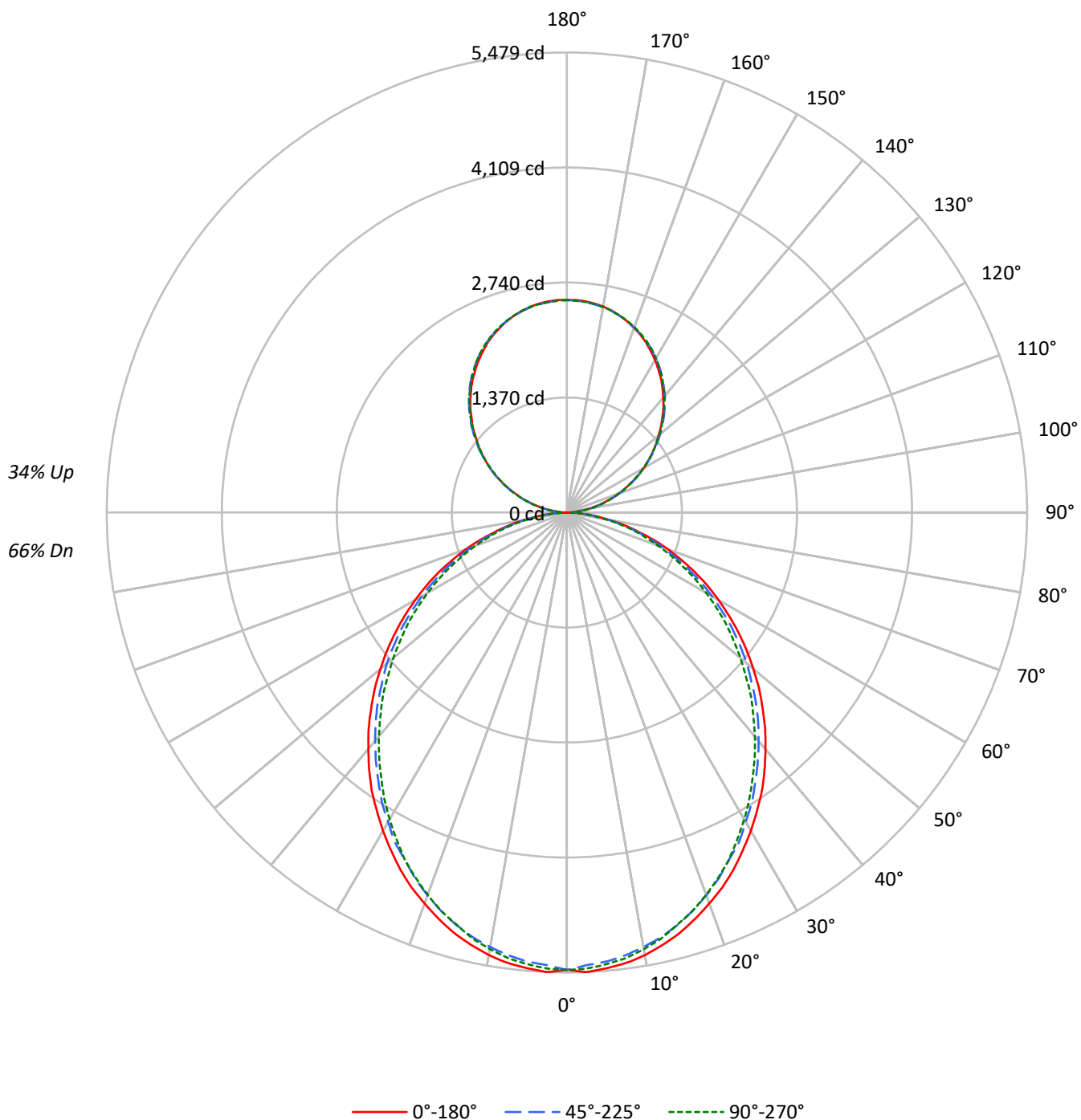
Lumens per Lamp: N/A  
Luminaire Lumens: 20940.0 lumens  
Efficiency: N/A  
Efficacy: 103.0 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 3.92' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 203.3  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9789  
Total Harmonic Distortion (THDi): 0.074  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

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CATALOG NUMBER: DFN2DIP-SQ4F0-140D080US835-FLLFLL

### Luminous Intensity Polar Plot



TEST NUMBER: P906924

CATALOG NUMBER: DFN2DIP-SQ4F0-140D080US835-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   | 111 | 111 | 111 | 111 | 104 | 104 | 104 | 104 | 92 | 92 | 92 | 81 | 81 | 81 | 71 | 71 | 71 |
| 1   | 101 | 97  | 93  | 89  | 95  | 91  | 88  | 85  | 81 | 78 | 76 | 72 | 70 | 68 | 63 | 61 | 60 |
| 2   | 92  | 85  | 78  | 73  | 87  | 80  | 74  | 70  | 71 | 67 | 63 | 63 | 60 | 57 | 55 | 53 | 51 |
| 3   | 84  | 75  | 67  | 61  | 79  | 70  | 64  | 58  | 63 | 57 | 53 | 56 | 51 | 48 | 49 | 46 | 43 |
| 4   | 77  | 66  | 58  | 52  | 72  | 63  | 55  | 50  | 56 | 50 | 45 | 50 | 45 | 41 | 44 | 40 | 37 |
| 5   | 71  | 59  | 51  | 44  | 67  | 56  | 48  | 43  | 50 | 44 | 39 | 45 | 40 | 36 | 40 | 36 | 32 |
| 6   | 65  | 53  | 45  | 39  | 61  | 50  | 43  | 37  | 45 | 39 | 34 | 40 | 35 | 31 | 36 | 32 | 29 |
| 7   | 61  | 48  | 40  | 34  | 57  | 46  | 38  | 33  | 41 | 35 | 30 | 37 | 32 | 28 | 33 | 29 | 25 |
| 8   | 56  | 44  | 36  | 30  | 53  | 42  | 34  | 29  | 38 | 31 | 27 | 34 | 29 | 25 | 30 | 26 | 23 |
| 9   | 53  | 40  | 32  | 27  | 49  | 38  | 31  | 26  | 34 | 28 | 24 | 31 | 26 | 22 | 28 | 24 | 21 |
| 10  | 49  | 37  | 29  | 24  | 46  | 35  | 28  | 24  | 32 | 26 | 22 | 29 | 24 | 20 | 26 | 22 | 19 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3822 | 3822 | 3822 |
| 5°  | 3828 | 3770 | 3796 |
| 10° | 3797 | 3720 | 3745 |
| 15° | 3741 | 3659 | 3666 |
| 20° | 3666 | 3575 | 3585 |
| 25° | 3591 | 3474 | 3491 |
| 30° | 3497 | 3380 | 3371 |
| 35° | 3408 | 3269 | 3244 |
| 40° | 3298 | 3157 | 3124 |
| 45° | 3188 | 3045 | 3001 |
| 50° | 3069 | 2927 | 2858 |
| 55° | 2943 | 2791 | 2727 |
| 60° | 2802 | 2629 | 2577 |
| 65° | 2647 | 2462 | 2400 |
| 70° | 2450 | 2258 | 2210 |
| 75° | 2178 | 2014 | 2036 |
| 80° | 1850 | 1704 | 1701 |
| 85° | 1337 | 1165 | 1143 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 3188 cd/sqm

TEST NUMBER: P906924

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 512.7   | 2.4       |
| 10°-20°   | 1442.6  | 6.9       |
| 20°-30°   | 2120.0  | 10.1      |
| 30°-40°   | 2462.3  | 11.8      |
| 40°-50°   | 2459.3  | 11.7      |
| 50°-60°   | 2144.4  | 10.2      |
| 60°-70°   | 1585.2  | 7.6       |
| 70°-80°   | 896.9   | 4.3       |
| 80°-90°   | 243.9   | 1.2       |
| 90°-100°  | 156.6   | 0.7       |
| 100°-110° | 497.5   | 2.4       |
| 110°-120° | 851.3   | 4.1       |
| 120°-130° | 1119.6  | 5.3       |
| 130°-140° | 1256.7  | 6.0       |
| 140°-150° | 1232.3  | 5.9       |
| 150°-160° | 1033.7  | 4.9       |
| 160°-170° | 685.6   | 3.3       |
| 170°-180° | 239.6   | 1.1       |
| <hr/>     |         |           |
| 0°-30°    | 4075.3  | 19.5      |
| 0°-40°    | 6537.6  | 31.2      |
| 0°-60°    | 11141.3 | 53.2      |
| 0°-90°    | 13867.2 | 66.2      |
| 90°-120°  | 1505.3  | 7.2       |
| 90°-150°  | 5113.9  | 24.4      |
| 90°-180°  | 7073.0  | 33.8      |
| 0°-180°   | 20940.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 5448 | 5448  | 5448 | 5448  | 5448 |      |
| 5°   | 5448 | 5427  | 5369 | 5411  | 5401 | 517  |
| 15°  | 5186 | 5155  | 5086 | 5107  | 5081 | 1461 |
| 25°  | 4693 | 4652  | 4563 | 4573  | 4563 | 2160 |
| 35°  | 4049 | 3997  | 3913 | 3881  | 3855 | 2529 |
| 45°  | 3295 | 3258  | 3180 | 3122  | 3101 | 2543 |
| 55°  | 2494 | 2462  | 2399 | 2336  | 2310 | 2229 |
| 65°  | 1682 | 1650  | 1598 | 1550  | 1524 | 1663 |
| 75°  | 880  | 870   | 843  | 812   | 822  | 939  |
| 85°  | 214  | 210   | 204  | 188   | 183  | 239  |
| 90°  | 2    | 28    | 75   | 70    | 72   | 20   |
| 95°  | 111  | 133   | 136  | 136   | 133  | 124  |
| 105° | 459  | 465   | 470  | 474   | 474  | 485  |
| 115° | 854  | 866   | 863  | 860   | 854  | 845  |
| 125° | 1242 | 1262  | 1256 | 1249  | 1246 | 1110 |
| 135° | 1607 | 1631  | 1635 | 1633  | 1627 | 1242 |
| 145° | 1951 | 1966  | 1979 | 1981  | 1972 | 1219 |
| 155° | 2231 | 2237  | 2244 | 2255  | 2248 | 1027 |
| 165° | 2427 | 2425  | 2425 | 2440  | 2429 | 685  |
| 175° | 2526 | 2519  | 2515 | 2530  | 2517 | 240  |
| 180° | 2530 | 2530  | 2530 | 2530  | 2530 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 5447.5 | 5447.5 | 5447.5 | 5447.5 | 5447.5 |
| 2.5°   | 5479.1 | 5453.0 | 5395.2 | 5447.5 | 5437.5 |
| 5°     | 5447.5 | 5426.9 | 5369.1 | 5410.8 | 5400.8 |
| 7.5°   | 5410.8 | 5379.7 | 5321.9 | 5364.1 | 5353.5 |
| 10°    | 5353.5 | 5316.9 | 5254.1 | 5295.8 | 5280.2 |
| 12.5°  | 5274.6 | 5243.5 | 5180.7 | 5206.8 | 5196.3 |
| 15°    | 5185.7 | 5154.6 | 5086.2 | 5107.4 | 5081.2 |
| 17.5°  | 5075.7 | 5044.6 | 4976.2 | 5002.3 | 4976.2 |
| 20°    | 4955.1 | 4924.0 | 4850.6 | 4866.2 | 4845.6 |
| 22.5°  | 4835.0 | 4787.8 | 4719.4 | 4719.4 | 4708.9 |
| 25°    | 4693.3 | 4651.6 | 4562.7 | 4572.7 | 4562.7 |
| 27.5°  | 4536.0 | 4499.4 | 4431.6 | 4416.0 | 4389.9 |
| 30°    | 4379.3 | 4337.1 | 4258.7 | 4243.2 | 4222.0 |
| 32.5°  | 4211.5 | 4180.4 | 4096.4 | 4064.8 | 4043.6 |
| 35°    | 4049.2 | 3997.0 | 3913.0 | 3881.4 | 3855.2 |
| 37.5°  | 3865.8 | 3818.6 | 3734.6 | 3698.0 | 3671.8 |
| 40°    | 3677.4 | 3635.2 | 3551.2 | 3504.6 | 3483.4 |
| 42.5°  | 3494.0 | 3451.8 | 3368.4 | 3315.6 | 3284.5 |
| 45°    | 3295.0 | 3258.4 | 3179.5 | 3122.2 | 3101.1 |
| 47.5°  | 3101.1 | 3064.4 | 2980.5 | 2922.7 | 2891.6 |
| 50°    | 2896.6 | 2870.5 | 2797.1 | 2723.7 | 2697.6 |
| 52.5°  | 2697.6 | 2660.9 | 2593.1 | 2535.3 | 2498.7 |
| 55°    | 2493.7 | 2462.0 | 2399.2 | 2336.4 | 2310.3 |
| 57.5°  | 2289.1 | 2263.0 | 2194.7 | 2131.9 | 2110.7 |
| 60°    | 2084.6 | 2064.1 | 1990.7 | 1932.9 | 1917.3 |
| 62.5°  | 1885.7 | 1849.0 | 1796.7 | 1744.5 | 1723.4 |
| 65°    | 1681.7 | 1650.0 | 1597.8 | 1550.5 | 1524.4 |
| 67.5°  | 1472.2 | 1445.5 | 1398.8 | 1362.1 | 1341.0 |
| 70°    | 1278.2 | 1257.1 | 1209.9 | 1173.2 | 1152.6 |
| 72.5°  | 1079.3 | 1058.1 | 1032.0 | 995.4  | 979.8  |
| 75°    | 879.8  | 869.8  | 843.1  | 812.0  | 822.5  |
| 77.5°  | 701.9  | 680.8  | 670.2  | 654.7  | 639.1  |
| 80°    | 524.1  | 518.5  | 508.0  | 492.4  | 481.8  |
| 82.5°  | 356.2  | 356.2  | 351.2  | 330.1  | 330.1  |
| 85°    | 214.5  | 209.5  | 204.5  | 188.4  | 183.4  |
| 87.5°  | 94.5   | 83.9   | 73.4   | 57.8   | 52.2   |
| 90°    | 2.3    | 27.5   | 74.8   | 70.2   | 72.5   |
| 92.5°  | 47.3   | 64.1   | 66.4   | 68.6   | 68.6   |
| 95°    | 111.4  | 132.7  | 136.5  | 136.5  | 132.7  |
| 97.5°  | 185.4  | 205.2  | 213.6  | 213.6  | 213.6  |
| 100°   | 270.8  | 288.3  | 294.4  | 294.4  | 292.1  |
| 102.5° | 360.8  | 373.8  | 382.1  | 384.4  | 382.1  |
| 105°   | 459.2  | 465.3  | 469.9  | 473.7  | 473.7  |
| 107.5° | 556.8  | 566.0  | 566.0  | 567.5  | 556.8  |
| 110°   | 651.4  | 663.6  | 663.6  | 663.6  | 657.5  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 753.6  | 766.6  | 764.3  | 758.2  | 753.6  |
| 115°   | 854.3  | 866.5  | 862.7  | 860.4  | 854.3  |
| 117.5° | 954.2  | 971.0  | 960.3  | 954.2  | 948.1  |
| 120°   | 1054.9 | 1071.7 | 1054.9 | 1054.9 | 1048.0 |
| 122.5° | 1146.4 | 1167.8 | 1157.1 | 1151.0 | 1146.4 |
| 125°   | 1242.5 | 1261.6 | 1255.5 | 1248.6 | 1246.4 |
| 127.5° | 1336.4 | 1360.0 | 1351.6 | 1342.5 | 1336.4 |
| 130°   | 1424.1 | 1451.5 | 1447.7 | 1443.2 | 1434.8 |
| 132.5° | 1522.5 | 1543.8 | 1545.4 | 1534.7 | 1528.6 |
| 135°   | 1607.1 | 1630.8 | 1635.4 | 1633.1 | 1627.0 |
| 137.5° | 1701.7 | 1720.8 | 1724.6 | 1723.1 | 1713.9 |
| 140°   | 1784.9 | 1803.9 | 1814.6 | 1814.6 | 1806.2 |
| 142.5° | 1870.3 | 1889.4 | 1895.5 | 1897.8 | 1889.4 |
| 145°   | 1951.2 | 1966.4 | 1978.6 | 1980.9 | 1972.5 |
| 147.5° | 2023.6 | 2042.7 | 2051.8 | 2055.7 | 2047.3 |
| 150°   | 2098.4 | 2111.3 | 2119.7 | 2126.6 | 2119.7 |
| 152.5° | 2164.7 | 2177.7 | 2188.4 | 2196.8 | 2188.4 |
| 155°   | 2231.1 | 2237.2 | 2244.1 | 2254.7 | 2247.9 |
| 157.5° | 2288.3 | 2292.9 | 2296.7 | 2311.9 | 2301.3 |
| 160°   | 2339.4 | 2344.0 | 2346.3 | 2359.2 | 2350.1 |
| 162.5° | 2386.7 | 2386.7 | 2389.0 | 2403.5 | 2392.8 |
| 165°   | 2427.1 | 2424.8 | 2424.8 | 2440.1 | 2429.4 |
| 167.5° | 2463.7 | 2456.9 | 2456.9 | 2472.1 | 2461.4 |
| 170°   | 2491.2 | 2485.1 | 2482.8 | 2498.1 | 2485.1 |
| 172.5° | 2510.3 | 2504.2 | 2501.9 | 2517.1 | 2504.2 |
| 175°   | 2525.5 | 2519.4 | 2514.8 | 2530.1 | 2517.1 |
| 177.5° | 2533.9 | 2527.8 | 2523.2 | 2536.2 | 2523.2 |
| 180°   | 2530.1 | 2530.1 | 2530.1 | 2530.1 | 2530.1 |

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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 | 13.32            | 14.35 | 14.12 | 15.17 | 16.19 | 12.87          | 13.90 | 13.68 | 14.73 | 15.75 |
|                 | 3H   | 15.00            | 15.92 | 15.81 | 16.76 | 17.80 | 14.51          | 15.43 | 15.32 | 16.27 | 17.31 |
|                 | 4H   | 15.59            | 16.47 | 16.43 | 17.31 | 18.37 | 15.10          | 15.97 | 15.93 | 16.82 | 17.87 |
|                 | 6H   | 16.01            | 16.81 | 16.85 | 17.66 | 18.73 | 15.51          | 16.31 | 16.35 | 17.16 | 18.23 |
|                 | 8H   | 16.12            | 16.88 | 16.97 | 17.75 | 18.83 | 15.62          | 16.38 | 16.47 | 17.25 | 18.32 |
|                 | 12H  | 16.17            | 16.90 | 17.03 | 17.77 | 18.87 | 15.66          | 16.39 | 16.52 | 17.26 | 18.36 |
| 4H              | 2H   | 13.80            | 14.67 | 14.64 | 15.52 | 16.58 | 13.45          | 14.32 | 14.28 | 15.16 | 16.22 |
|                 | 3H   | 15.69            | 16.41 | 16.54 | 17.29 | 18.37 | 15.28          | 16.01 | 16.13 | 16.88 | 17.96 |
|                 | 4H   | 16.41            | 17.07 | 17.27 | 17.95 | 19.05 | 15.99          | 16.65 | 16.85 | 17.53 | 18.63 |
|                 | 6H   | 16.94            | 17.51 | 17.82 | 18.41 | 19.52 | 16.51          | 17.08 | 17.39 | 17.98 | 19.08 |
|                 | 8H   | 17.10            | 17.63 | 17.98 | 18.53 | 19.64 | 16.66          | 17.19 | 17.54 | 18.09 | 19.21 |
|                 | 12H  | 17.18            | 17.66 | 18.08 | 18.57 | 19.70 | 16.73          | 17.21 | 17.63 | 18.13 | 19.25 |
| 8H              | 4H   | 16.62            | 17.16 | 17.50 | 18.05 | 19.17 | 16.24          | 16.78 | 17.13 | 17.67 | 18.79 |
|                 | 6H   | 17.26            | 17.71 | 18.17 | 18.64 | 19.76 | 16.88          | 17.33 | 17.79 | 18.26 | 19.38 |
|                 | 8H   | 17.49            | 17.88 | 18.41 | 18.81 | 19.95 | 17.10          | 17.49 | 18.02 | 18.42 | 19.55 |
|                 | 12H  | 17.63            | 17.98 | 18.55 | 18.90 | 20.08 | 17.22          | 17.57 | 18.14 | 18.49 | 19.67 |
| 12H             | 4H   | 16.61            | 17.10 | 17.52 | 18.01 | 19.13 | 16.25          | 16.73 | 17.15 | 17.64 | 18.77 |
|                 | 6H   | 17.30            | 17.69 | 18.21 | 18.62 | 19.75 | 16.92          | 17.32 | 17.84 | 18.25 | 19.38 |
|                 | 8H   | 17.55            | 17.90 | 18.47 | 18.82 | 20.00 | 17.17          | 17.52 | 18.09 | 18.44 | 19.62 |