

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: P906920

Luminaire Tested: DFN2DIP-SQ4F0-140D070US835-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P906920  
REPORT IS A COMBINATION OF REPORTS P900091 AND P896915  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ4F0-140D070US835-FLLFLL  
Description: 4 foot, Square Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

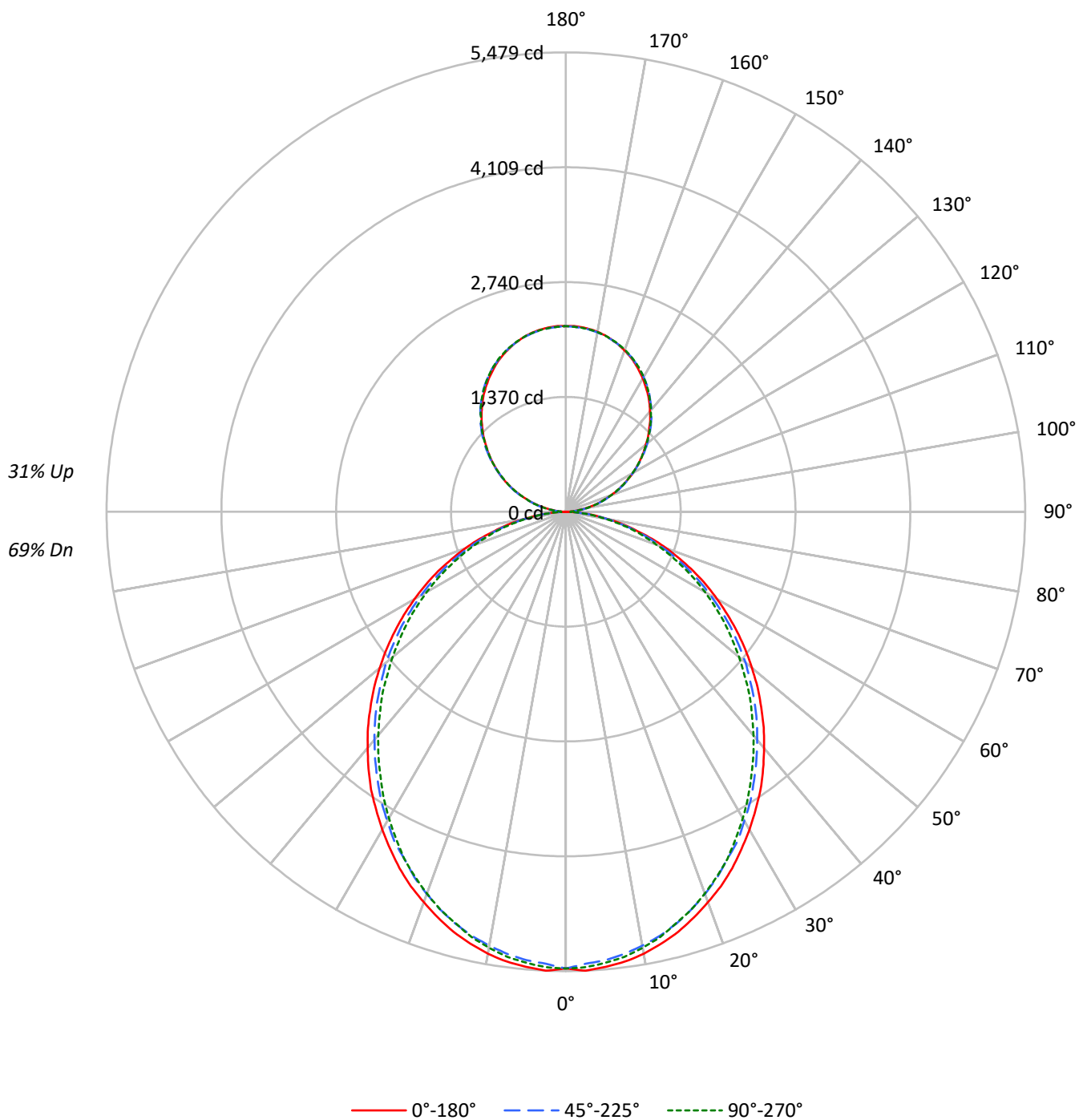
Lumens per Lamp: N/A  
Luminaire Lumens: 20055.0 lumens  
Efficiency: N/A  
Efficacy: 102.3 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 3.92' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 196  
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

TEST NUMBER: P906920

CATALOG NUMBER: DFN2DIP-SQ4F0-140D070US835-FLLFLL

### Luminous Intensity Polar Plot



TEST NUMBER: P906920

CATALOG NUMBER: DFN2DIP-SQ4F0-140D070US835-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   | 112 | 112 | 112 | 112 | 106 | 106 | 106 | 106 | 94 | 94 | 94 | 83 | 83 | 83 | 74 | 74 | 74 |
| 1   | 102 | 98  | 94  | 90  | 96  | 92  | 89  | 86  | 83 | 80 | 77 | 74 | 71 | 70 | 65 | 64 | 62 |
| 2   | 93  | 85  | 79  | 74  | 88  | 81  | 75  | 70  | 72 | 68 | 64 | 65 | 61 | 58 | 57 | 55 | 52 |
| 3   | 85  | 75  | 67  | 61  | 80  | 71  | 64  | 59  | 64 | 58 | 54 | 57 | 53 | 49 | 51 | 48 | 45 |
| 4   | 78  | 67  | 58  | 52  | 73  | 63  | 56  | 50  | 57 | 51 | 46 | 51 | 46 | 42 | 46 | 42 | 39 |
| 5   | 71  | 59  | 51  | 45  | 67  | 56  | 49  | 43  | 51 | 45 | 40 | 46 | 41 | 37 | 41 | 37 | 34 |
| 6   | 66  | 53  | 45  | 39  | 62  | 51  | 43  | 38  | 46 | 40 | 35 | 41 | 36 | 32 | 37 | 33 | 30 |
| 7   | 61  | 48  | 40  | 34  | 58  | 46  | 39  | 33  | 42 | 36 | 31 | 38 | 33 | 29 | 34 | 30 | 26 |
| 8   | 57  | 44  | 36  | 31  | 54  | 42  | 35  | 30  | 38 | 32 | 28 | 35 | 29 | 26 | 31 | 27 | 24 |
| 9   | 53  | 40  | 33  | 27  | 50  | 39  | 31  | 26  | 35 | 29 | 25 | 32 | 27 | 23 | 29 | 25 | 21 |
| 10  | 50  | 37  | 30  | 25  | 47  | 36  | 29  | 24  | 32 | 27 | 22 | 30 | 25 | 21 | 27 | 23 | 20 |

**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: P906920

CATALOG NUMBER: DFN2DIP-SQ4F0-140D070US835-FLLFLL

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 512.7   | 2.6       |
| 10°-20°   | 1442.6  | 7.2       |
| 20°-30°   | 2120.0  | 10.6      |
| 30°-40°   | 2462.3  | 12.3      |
| 40°-50°   | 2459.3  | 12.3      |
| 50°-60°   | 2144.4  | 10.7      |
| 60°-70°   | 1585.2  | 7.9       |
| 70°-80°   | 896.9   | 4.5       |
| 80°-90°   | 243.0   | 1.2       |
| 90°-100°  | 137.0   | 0.7       |
| 100°-110° | 435.3   | 2.2       |
| 110°-120° | 744.9   | 3.7       |
| 120°-130° | 979.6   | 4.9       |
| 130°-140° | 1099.6  | 5.5       |
| 140°-150° | 1078.3  | 5.4       |
| 150°-160° | 904.5   | 4.5       |
| 160°-170° | 599.9   | 3.0       |
| 170°-180° | 209.7   | 1.0       |
| 0°-30°    | 4075.3  | 20.3      |
| 0°-40°    | 6537.6  | 32.6      |
| 0°-60°    | 11141.3 | 55.6      |
| 0°-90°    | 13866.3 | 69.1      |
| 90°-120°  | 1317.2  | 6.6       |
| 90°-150°  | 4474.7  | 22.3      |
| 90°-180°  | 6189.0  | 30.9      |
| 0°-180°   | 20055.0 | 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    | 24    | 65   | 61    | 63   | 19   |
| 95°  | 97   | 116   | 120  | 120   | 116  | 108  |
| 105° | 402  | 407   | 411  | 414   | 414  | 424  |
| 115° | 748  | 758   | 755  | 753   | 748  | 739  |
| 125° | 1087 | 1104  | 1099 | 1093  | 1091 | 972  |
| 135° | 1406 | 1427  | 1431 | 1429  | 1424 | 1087 |
| 145° | 1707 | 1721  | 1731 | 1733  | 1726 | 1067 |
| 155° | 1952 | 1958  | 1964 | 1973  | 1967 | 899  |
| 165° | 2124 | 2122  | 2122 | 2135  | 2126 | 599  |
| 175° | 2210 | 2204  | 2200 | 2214  | 2202 | 210  |
| 180° | 2214 | 2214  | 2214 | 2214  | 2214 |      |

TEST NUMBER: P906920

CATALOG NUMBER: DFN2DIP-SQ4F0-140D070US835-FLLFL

**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°    | 2.0    | 24.0   | 65.4   | 61.4   | 63.4   |
| 92.5°  | 41.4   | 56.1   | 58.1   | 60.1   | 60.1   |
| 95°    | 97.4   | 116.1  | 119.5  | 119.5  | 116.1  |
| 97.5°  | 162.2  | 179.5  | 186.9  | 186.9  | 186.9  |
| 100°   | 236.9  | 252.3  | 257.6  | 257.6  | 255.6  |
| 102.5° | 315.7  | 327.0  | 334.4  | 336.4  | 334.4  |
| 105°   | 401.8  | 407.1  | 411.1  | 414.5  | 414.5  |
| 107.5° | 487.2  | 495.2  | 495.2  | 496.6  | 487.2  |
| 110°   | 570.0  | 580.7  | 580.7  | 580.7  | 575.3  |

TEST NUMBER: P906920

CATALOG NUMBER: DFN2DIP-SQ4F0-140D070US835-FLLFLL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 659.4  | 670.8  | 668.8  | 663.4  | 659.4  |
| 115°   | 747.5  | 758.2  | 754.9  | 752.9  | 747.5  |
| 117.5° | 834.9  | 849.6  | 840.3  | 834.9  | 829.6  |
| 120°   | 923.0  | 937.7  | 923.0  | 923.0  | 917.0  |
| 122.5° | 1003.1 | 1021.8 | 1012.5 | 1007.1 | 1003.1 |
| 125°   | 1087.2 | 1103.9 | 1098.6 | 1092.6 | 1090.6 |
| 127.5° | 1169.3 | 1190.0 | 1182.7 | 1174.7 | 1169.3 |
| 130°   | 1246.1 | 1270.1 | 1266.8 | 1262.8 | 1255.4 |
| 132.5° | 1332.2 | 1350.9 | 1352.2 | 1342.9 | 1337.5 |
| 135°   | 1406.3 | 1426.9 | 1431.0 | 1428.9 | 1423.6 |
| 137.5° | 1489.0 | 1505.7 | 1509.0 | 1507.7 | 1499.7 |
| 140°   | 1561.8 | 1578.5 | 1587.8 | 1587.8 | 1580.5 |
| 142.5° | 1636.5 | 1653.2 | 1658.5 | 1660.5 | 1653.2 |
| 145°   | 1707.3 | 1720.6 | 1731.3 | 1733.3 | 1726.0 |
| 147.5° | 1770.7 | 1787.4 | 1795.4 | 1798.7 | 1791.4 |
| 150°   | 1836.1 | 1847.4 | 1854.8 | 1860.8 | 1854.8 |
| 152.5° | 1894.1 | 1905.5 | 1914.8 | 1922.2 | 1914.8 |
| 155°   | 1952.2 | 1957.5 | 1963.6 | 1972.9 | 1966.9 |
| 157.5° | 2002.3 | 2006.3 | 2009.6 | 2023.0 | 2013.6 |
| 160°   | 2047.0 | 2051.0 | 2053.0 | 2064.3 | 2056.3 |
| 162.5° | 2088.4 | 2088.4 | 2090.4 | 2103.0 | 2093.7 |
| 165°   | 2123.7 | 2121.7 | 2121.7 | 2135.1 | 2125.7 |
| 167.5° | 2155.8 | 2149.8 | 2149.8 | 2163.1 | 2153.8 |
| 170°   | 2179.8 | 2174.5 | 2172.5 | 2185.8 | 2174.5 |
| 172.5° | 2196.5 | 2191.1 | 2189.1 | 2202.5 | 2191.1 |
| 175°   | 2209.8 | 2204.5 | 2200.5 | 2213.8 | 2202.5 |
| 177.5° | 2217.2 | 2211.8 | 2207.8 | 2219.2 | 2207.8 |
| 180°   | 2213.8 | 2213.8 | 2213.8 | 2213.8 | 2213.8 |

TEST NUMBER: P906920

CATALOG NUMBER: DFN2DIP-SQ4F0-140D070US835-FLLFLL

**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 | 13.55            | 14.61 | 14.32 | 15.41 | 16.37 | 13.10          | 14.17 | 13.87 | 14.96 | 15.93 |
|                 | 3H   | 15.23            | 16.18 | 16.01 | 16.99 | 17.99 | 14.73          | 15.69 | 15.52 | 16.50 | 17.50 |
|                 | 4H   | 15.82            | 16.73 | 16.63 | 17.54 | 18.55 | 15.33          | 16.23 | 16.13 | 17.05 | 18.06 |
|                 | 6H   | 16.24            | 17.07 | 17.06 | 17.89 | 18.92 | 15.74          | 16.57 | 16.56 | 17.39 | 18.42 |
|                 | 8H   | 16.35            | 17.15 | 17.18 | 17.99 | 19.01 | 15.85          | 16.64 | 16.68 | 17.48 | 18.51 |
|                 | 12H  | 16.41            | 17.17 | 17.24 | 18.00 | 19.05 | 15.90          | 16.66 | 16.73 | 17.49 | 18.54 |
| 4H              | 2H   | 14.03            | 14.93 | 14.84 | 15.75 | 16.76 | 13.68          | 14.58 | 14.48 | 15.39 | 16.40 |
|                 | 3H   | 15.92            | 16.67 | 16.74 | 17.52 | 18.55 | 15.51          | 16.27 | 16.33 | 17.11 | 18.14 |
|                 | 4H   | 16.65            | 17.33 | 17.48 | 18.18 | 19.23 | 16.22          | 16.91 | 17.06 | 17.75 | 18.81 |
|                 | 6H   | 17.18            | 17.77 | 18.03 | 18.64 | 19.70 | 16.74          | 17.34 | 17.59 | 18.21 | 19.27 |
|                 | 8H   | 17.33            | 17.89 | 18.19 | 18.75 | 19.83 | 16.90          | 17.45 | 17.75 | 18.32 | 19.39 |
|                 | 12H  | 17.42            | 17.92 | 18.29 | 18.80 | 19.88 | 16.97          | 17.47 | 17.84 | 18.36 | 19.43 |
| 8H              | 4H   | 16.86            | 17.41 | 17.71 | 18.28 | 19.35 | 16.48          | 17.04 | 17.34 | 17.90 | 18.97 |
|                 | 6H   | 17.50            | 17.96 | 18.39 | 18.87 | 19.94 | 17.12          | 17.58 | 18.00 | 18.49 | 19.56 |
|                 | 8H   | 17.73            | 18.14 | 18.62 | 19.04 | 20.13 | 17.34          | 17.75 | 18.23 | 18.65 | 19.73 |
|                 | 12H  | 17.87            | 18.23 | 18.77 | 19.13 | 20.27 | 17.46          | 17.82 | 18.36 | 18.72 | 19.86 |
| 12H             | 4H   | 16.85            | 17.35 | 17.73 | 18.24 | 19.32 | 16.49          | 16.99 | 17.36 | 17.87 | 18.95 |
|                 | 6H   | 17.54            | 17.94 | 18.43 | 18.85 | 19.93 | 17.16          | 17.57 | 18.06 | 18.47 | 19.56 |
|                 | 8H   | 17.79            | 18.15 | 18.69 | 19.04 | 20.19 | 17.41          | 17.77 | 18.31 | 18.66 | 19.81 |