

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: P923613

Luminaire Tested: DFN2DIP-TR3F0-090D030US940-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P923613  
REPORT IS A COMBINATION OF REPORTS P901803 AND P898751  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR3F0-090D030US940-FLLONL  
Description: 3 foot, Triangle Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

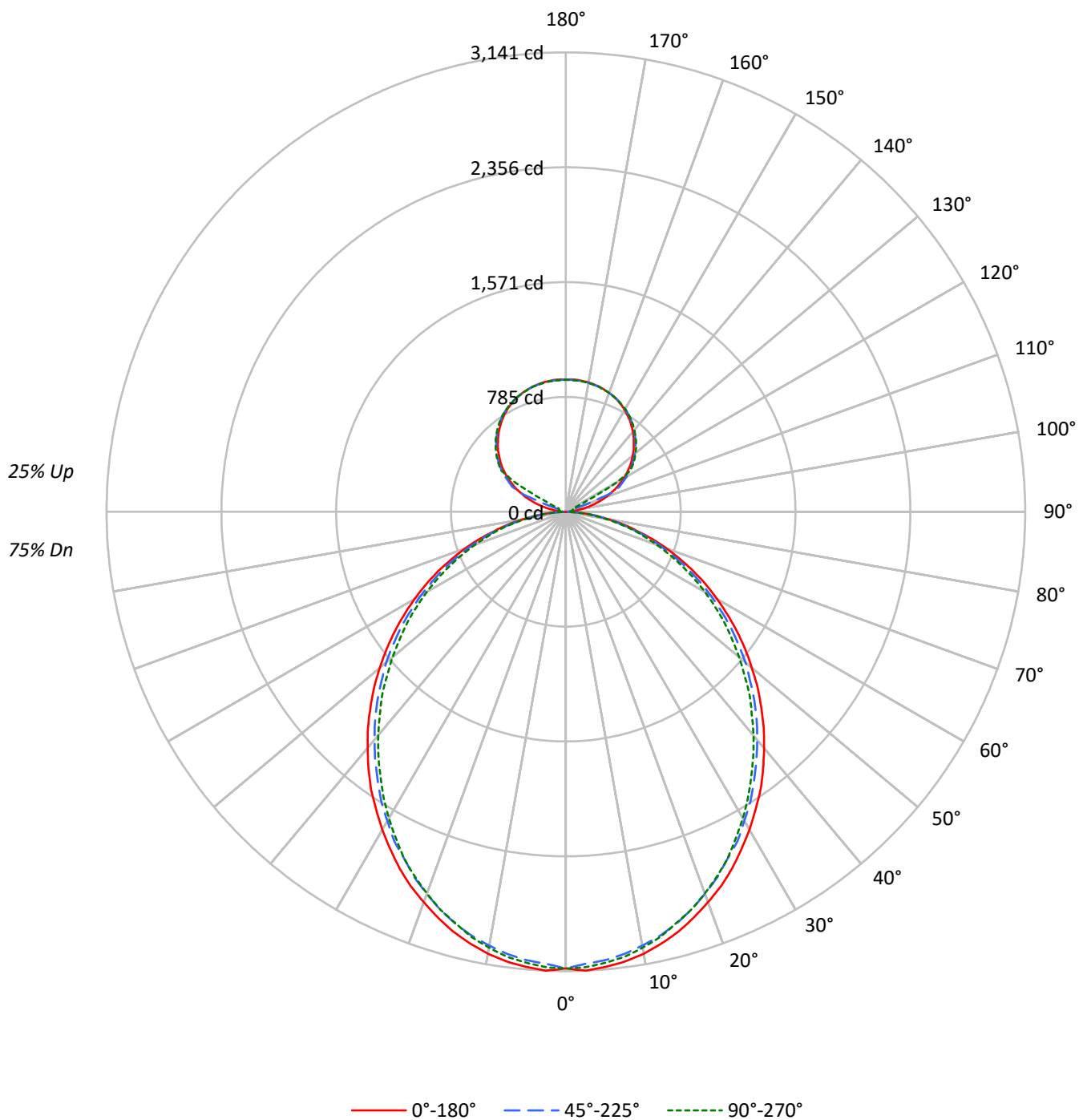
Lumens per Lamp: N/A  
Luminaire Lumens: 10593.6 lumens  
Efficiency: N/A  
Efficacy: 90.1 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 2.74' x L: 3.16' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 117.6  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9951  
Total Harmonic Distortion (THDi): 0.07  
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: P923613

CATALOG NUMBER: DFN2DIP-TR3F0-090D030US940-FLONL

**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   | 113 | 113 | 113 | 113 | 108 | 108 | 108 | 108 | 97 | 97 | 97 | 88 | 88 | 88 | 79 | 79 | 79 |
| 1   | 103 | 99  | 95  | 91  | 98  | 94  | 91  | 87  | 85 | 83 | 80 | 77 | 75 | 73 | 70 | 68 | 67 |
| 2   | 94  | 86  | 80  | 75  | 89  | 82  | 77  | 72  | 75 | 70 | 66 | 68 | 64 | 61 | 62 | 59 | 56 |
| 3   | 86  | 76  | 68  | 62  | 81  | 73  | 66  | 60  | 66 | 61 | 56 | 60 | 56 | 52 | 55 | 51 | 48 |
| 4   | 79  | 67  | 59  | 53  | 75  | 64  | 57  | 51  | 59 | 53 | 48 | 54 | 49 | 45 | 49 | 45 | 41 |
| 5   | 72  | 60  | 52  | 46  | 69  | 58  | 50  | 44  | 53 | 46 | 41 | 48 | 43 | 39 | 44 | 40 | 36 |
| 6   | 67  | 54  | 46  | 40  | 63  | 52  | 44  | 39  | 48 | 41 | 36 | 44 | 38 | 34 | 40 | 35 | 32 |
| 7   | 62  | 49  | 41  | 35  | 59  | 47  | 39  | 34  | 43 | 37 | 32 | 40 | 34 | 30 | 37 | 32 | 28 |
| 8   | 58  | 45  | 37  | 31  | 55  | 43  | 36  | 30  | 40 | 33 | 29 | 37 | 31 | 27 | 34 | 29 | 25 |
| 9   | 54  | 41  | 33  | 28  | 51  | 39  | 32  | 27  | 37 | 30 | 26 | 34 | 28 | 24 | 31 | 26 | 23 |
| 10  | 50  | 38  | 30  | 25  | 48  | 36  | 29  | 25  | 34 | 28 | 23 | 31 | 26 | 22 | 29 | 24 | 21 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3891 | 3891 | 3891 |
| 5°  | 3895 | 3834 | 3860 |
| 10° | 3862 | 3779 | 3805 |
| 15° | 3803 | 3713 | 3721 |
| 20° | 3724 | 3624 | 3635 |
| 25° | 3645 | 3517 | 3536 |
| 30° | 3547 | 3417 | 3411 |
| 35° | 3454 | 3301 | 3278 |
| 40° | 3340 | 3183 | 3152 |
| 45° | 3226 | 3064 | 3022 |
| 50° | 3102 | 2939 | 2873 |
| 55° | 2971 | 2795 | 2734 |
| 60° | 2823 | 2625 | 2576 |
| 65° | 2662 | 2447 | 2389 |
| 70° | 2456 | 2231 | 2188 |
| 75° | 2172 | 1972 | 1998 |
| 80° | 1828 | 1640 | 1642 |
| 85° | 1291 | 1081 | 1060 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 3226 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 293.9   | 2.8       |
| 10°-20°   | 827.0   | 7.8       |
| 20°-30°   | 1215.3  | 11.5      |
| 30°-40°   | 1411.5  | 13.3      |
| 40°-50°   | 1409.7  | 13.3      |
| 50°-60°   | 1229.3  | 11.6      |
| 60°-70°   | 908.7   | 8.6       |
| 70°-80°   | 514.1   | 4.9       |
| 80°-90°   | 137.3   | 1.3       |
| 90°-100°  | 29.8    | 0.3       |
| 100°-110° | 111.0   | 1.0       |
| 110°-120° | 294.3   | 2.8       |
| 120°-130° | 488.2   | 4.6       |
| 130°-140° | 518.5   | 4.9       |
| 140°-150° | 481.9   | 4.5       |
| 150°-160° | 387.5   | 3.7       |
| 160°-170° | 249.7   | 2.4       |
| 170°-180° | 85.9    | 0.8       |
| 0°-30°    | 2336.2  | 22.1      |
| 0°-40°    | 3747.7  | 35.4      |
| 0°-60°    | 6386.7  | 60.3      |
| 0°-90°    | 7946.7  | 75.0      |
| 90°-120°  | 435.1   | 4.1       |
| 90°-150°  | 1923.7  | 18.2      |
| 90°-180°  | 2647.0  | 25.0      |
| 0°-180°   | 10593.6 | 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°  | 1    | 8     | 13   | 16    | 18   | 10   |
| 95°  | 42   | 21    | 25   | 29    | 28   | 50   |
| 105° | 199  | 218   | 40   | 47    | 50   | 212  |
| 115° | 376  | 387   | 403  | 101   | 54   | 370  |
| 125° | 531  | 540   | 552  | 557   | 559  | 474  |
| 135° | 657  | 668   | 674  | 680   | 679  | 508  |
| 145° | 762  | 762   | 773  | 777   | 774  | 477  |
| 155° | 840  | 834   | 841  | 845   | 840  | 387  |
| 165° | 884  | 881   | 883  | 887   | 883  | 250  |
| 175° | 905  | 900   | 902  | 906   | 900  | 86   |
| 180° | 903  | 903   | 903  | 903   | 903  |      |

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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°    | 0.6    | 7.8    | 13.0   | 16.4   | 17.6   |
| 92.5°  | 16.4   | 13.7   | 15.7   | 17.0   | 17.6   |
| 95°    | 42.4   | 20.9   | 25.4   | 28.8   | 28.1   |
| 97.5°  | 76.4   | 22.9   | 33.3   | 35.3   | 35.9   |
| 100°   | 115.7  | 26.1   | 37.3   | 42.4   | 43.8   |
| 102.5° | 158.7  | 157.5  | 38.5   | 45.7   | 47.7   |
| 105°   | 198.6  | 218.2  | 39.9   | 47.0   | 49.7   |
| 107.5° | 245.0  | 261.3  | 41.2   | 48.3   | 51.0   |
| 110°   | 289.4  | 303.1  | 114.3  | 49.0   | 51.6   |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|--------|-------|-------|-------|-------|-------|
| 112.5° | 331.3 | 343.0 | 331.9 | 50.3  | 52.3  |
| 115°   | 375.6 | 386.7 | 403.1 | 100.6 | 53.6  |
| 117.5° | 414.2 | 427.2 | 438.4 | 344.9 | 173.8 |
| 120°   | 457.3 | 467.1 | 478.8 | 486.7 | 398.5 |
| 122.5° | 493.8 | 504.4 | 517.5 | 521.3 | 522.0 |
| 125°   | 531.1 | 539.6 | 552.1 | 556.6 | 558.6 |
| 127.5° | 565.1 | 574.2 | 584.1 | 590.6 | 591.2 |
| 130°   | 597.1 | 607.6 | 614.7 | 621.9 | 621.3 |
| 132.5° | 629.7 | 638.3 | 645.4 | 651.3 | 650.7 |
| 135°   | 657.2 | 667.7 | 673.5 | 680.1 | 678.8 |
| 137.5° | 685.9 | 693.8 | 700.3 | 706.9 | 704.9 |
| 140°   | 714.0 | 719.3 | 726.4 | 732.3 | 729.1 |
| 142.5° | 737.6 | 742.2 | 750.6 | 755.8 | 752.6 |
| 145°   | 762.4 | 761.7 | 772.8 | 777.4 | 774.1 |
| 147.5° | 783.9 | 781.9 | 793.1 | 796.3 | 793.7 |
| 150°   | 804.9 | 800.3 | 810.7 | 814.6 | 811.4 |
| 152.5° | 822.4 | 817.3 | 827.1 | 831.0 | 826.4 |
| 155°   | 839.5 | 833.7 | 841.4 | 845.3 | 840.2 |
| 157.5° | 853.2 | 848.0 | 853.9 | 858.4 | 853.2 |
| 160°   | 865.0 | 861.0 | 865.0 | 868.9 | 864.2 |
| 162.5° | 875.4 | 871.5 | 874.8 | 879.3 | 873.4 |
| 165°   | 884.5 | 880.7 | 882.6 | 887.2 | 882.6 |
| 167.5° | 891.7 | 887.8 | 889.7 | 894.4 | 888.5 |
| 170°   | 897.6 | 893.7 | 895.0 | 899.6 | 893.7 |
| 172.5° | 901.5 | 897.6 | 898.9 | 903.5 | 897.6 |
| 175°   | 904.7 | 900.2 | 901.5 | 906.1 | 899.6 |
| 177.5° | 906.1 | 901.5 | 902.2 | 906.8 | 900.9 |
| 180°   | 902.9 | 902.9 | 902.9 | 902.9 | 902.9 |

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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 | 13.99            | 15.13 | 14.70 | 15.86 | 16.72 | 13.56          | 14.70 | 14.27 | 15.43 | 16.29 |
|                 | 3H   | 15.66            | 16.69 | 16.38 | 17.42 | 18.32 | 15.19          | 16.22 | 15.91 | 16.96 | 17.85 |
|                 | 4H   | 16.25            | 17.22 | 16.99 | 17.97 | 18.88 | 15.79          | 16.75 | 16.53 | 17.50 | 18.41 |
|                 | 6H   | 16.66            | 17.55 | 17.41 | 18.31 | 19.23 | 16.19          | 17.09 | 16.94 | 17.84 | 18.76 |
|                 | 8H   | 16.77            | 17.62 | 17.53 | 18.40 | 19.32 | 16.30          | 17.15 | 17.06 | 17.93 | 18.85 |
|                 | 12H  | 16.82            | 17.64 | 17.59 | 18.41 | 19.36 | 16.35          | 17.16 | 17.12 | 17.93 | 18.88 |
| 4H              | 2H   | 14.48            | 15.45 | 15.22 | 16.20 | 17.10 | 14.14          | 15.11 | 14.88 | 15.85 | 16.76 |
|                 | 3H   | 16.36            | 17.17 | 17.12 | 17.95 | 18.88 | 15.97          | 16.78 | 16.73 | 17.56 | 18.49 |
|                 | 4H   | 17.08            | 17.81 | 17.85 | 18.60 | 19.55 | 16.68          | 17.41 | 17.45 | 18.20 | 19.15 |
|                 | 6H   | 17.60            | 18.24 | 18.39 | 19.05 | 20.01 | 17.20          | 17.83 | 17.99 | 18.64 | 19.60 |
|                 | 8H   | 17.75            | 18.35 | 18.54 | 19.15 | 20.12 | 17.35          | 17.94 | 18.14 | 18.75 | 19.72 |
|                 | 12H  | 17.83            | 18.37 | 18.65 | 19.20 | 20.17 | 17.42          | 17.95 | 18.23 | 18.78 | 19.76 |
| 8H              | 4H   | 17.29            | 17.89 | 18.09 | 18.69 | 19.67 | 16.94          | 17.53 | 17.73 | 18.34 | 19.31 |
|                 | 6H   | 17.92            | 18.42 | 18.75 | 19.27 | 20.24 | 17.57          | 18.06 | 18.39 | 18.91 | 19.88 |
|                 | 8H   | 18.14            | 18.58 | 18.98 | 19.43 | 20.42 | 17.78          | 18.22 | 18.61 | 19.06 | 20.05 |
|                 | 12H  | 18.28            | 18.67 | 19.12 | 19.50 | 20.55 | 17.90          | 18.29 | 18.74 | 19.12 | 20.17 |
| 12H             | 4H   | 17.29            | 17.83 | 18.10 | 18.65 | 19.63 | 16.94          | 17.48 | 17.76 | 18.31 | 19.28 |
|                 | 6H   | 17.95            | 18.40 | 18.79 | 19.24 | 20.23 | 17.61          | 18.05 | 18.44 | 18.89 | 19.88 |
|                 | 8H   | 18.20            | 18.59 | 19.04 | 19.43 | 20.47 | 17.85          | 18.24 | 18.69 | 19.07 | 20.12 |