

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: P917985

Luminaire Tested: DFN2DIP-TR2F0-060D030US930-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P917985  
REPORT IS A COMBINATION OF REPORTS P901759 AND P897145  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR2F0-060D030US930-FLLONL  
Description: 2 foot, Triangle Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

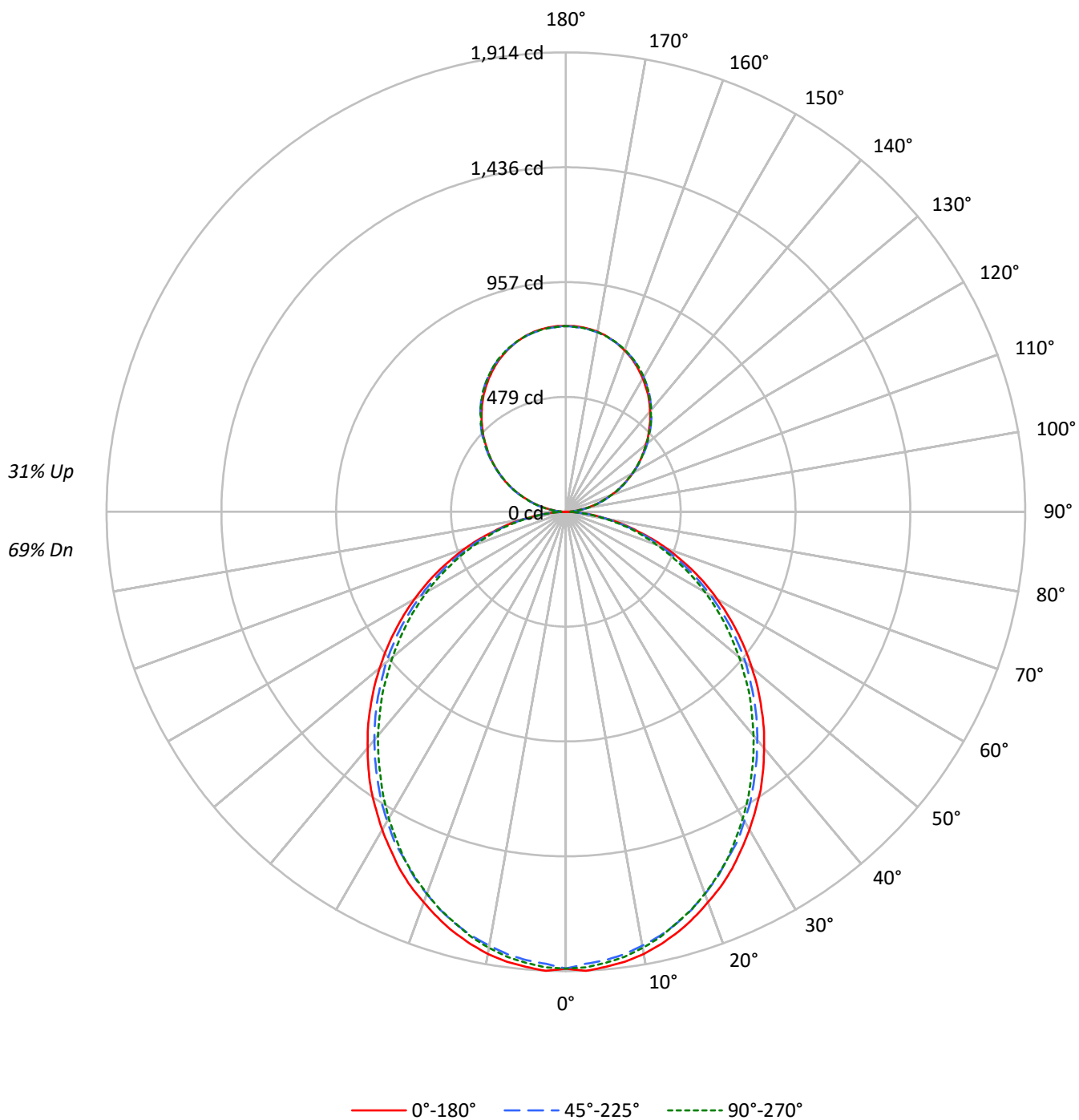
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 7007.5 lumens  
Efficiency: N/A  
Efficacy: 86.3 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 2.04' x L: 2.36' x H: 0.1')  
CIE Type: Semi-Direct  
  
Input Watts (W): 81.2  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9971  
Total Harmonic Distortion (THDi): 0.049  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P917985

CATALOG NUMBER: DFN2DIP-TR2F0-060D030US930-FLLONL

### Luminous Intensity Polar Plot



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CATALOG NUMBER: DFN2DIP-TR2F0-060D030US930-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   | 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°  | 4245 | 4245 | 4245 |
| 5°  | 4246 | 4177 | 4207 |
| 10° | 4205 | 4111 | 4143 |
| 15° | 4137 | 4034 | 4047 |
| 20° | 4047 | 3930 | 3948 |
| 25° | 3958 | 3809 | 3836 |
| 30° | 3847 | 3695 | 3695 |
| 35° | 3742 | 3562 | 3546 |
| 40° | 3613 | 3427 | 3404 |
| 45° | 3484 | 3292 | 3258 |
| 50° | 3343 | 3149 | 3091 |
| 55° | 3195 | 2985 | 2934 |
| 60° | 3027 | 2791 | 2755 |
| 65° | 2843 | 2588 | 2544 |
| 70° | 2609 | 2341 | 2316 |
| 75° | 2287 | 2046 | 2094 |
| 80° | 1896 | 1669 | 1693 |
| 85° | 1292 | 1051 | 1052 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
Vertical Angle: 45°  
Luminance: 3484 cd/sqm

TEST NUMBER: P917985

CATALOG NUMBER: DFN2DIP-TR2F0-060D030US930-FLLONL

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 179.1  | 2.6       |
| 10°-20°   | 504.1  | 7.2       |
| 20°-30°   | 740.8  | 10.6      |
| 30°-40°   | 860.4  | 12.3      |
| 40°-50°   | 859.3  | 12.3      |
| 50°-60°   | 749.3  | 10.7      |
| 60°-70°   | 553.9  | 7.9       |
| 70°-80°   | 313.4  | 4.5       |
| 80°-90°   | 84.9   | 1.2       |
| 90°-100°  | 47.9   | 0.7       |
| 100°-110° | 152.1  | 2.2       |
| 110°-120° | 260.3  | 3.7       |
| 120°-130° | 342.3  | 4.9       |
| 130°-140° | 384.2  | 5.5       |
| 140°-150° | 376.8  | 5.4       |
| 150°-160° | 316.1  | 4.5       |
| 160°-170° | 209.6  | 3.0       |
| 170°-180° | 73.3   | 1.0       |
| 0°-30°    | 1424.0 | 20.3      |
| 0°-40°    | 2284.3 | 32.6      |
| 0°-60°    | 3892.9 | 55.6      |
| 0°-90°    | 4845.1 | 69.1      |
| 90°-120°  | 460.2  | 6.6       |
| 90°-150°  | 1563.5 | 22.3      |
| 90°-180°  | 2162.0 | 30.9      |
| 0°-180°   | 7007.5 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1903 | 1903  | 1903 | 1903  | 1903 |      |
| 5°   | 1903 | 1896  | 1876 | 1891  | 1887 | 181  |
| 15°  | 1812 | 1801  | 1777 | 1785  | 1776 | 510  |
| 25°  | 1640 | 1625  | 1594 | 1598  | 1594 | 755  |
| 35°  | 1415 | 1397  | 1367 | 1356  | 1347 | 884  |
| 45°  | 1151 | 1138  | 1111 | 1091  | 1084 | 889  |
| 55°  | 871  | 860   | 838  | 816   | 807  | 779  |
| 65°  | 588  | 577   | 558  | 542   | 533  | 581  |
| 75°  | 307  | 304   | 295  | 284   | 287  | 328  |
| 85°  | 75   | 73    | 71   | 66    | 64   | 84   |
| 90°  | 1    | 8     | 23   | 21    | 22   | 7    |
| 95°  | 34   | 41    | 42   | 42    | 41   | 38   |
| 105° | 140  | 142   | 144  | 145   | 145  | 148  |
| 115° | 261  | 265   | 264  | 263   | 261  | 258  |
| 125° | 380  | 386   | 384  | 382   | 381  | 339  |
| 135° | 491  | 499   | 500  | 499   | 497  | 380  |
| 145° | 597  | 601   | 605  | 606   | 603  | 373  |
| 155° | 682  | 684   | 686  | 689   | 687  | 314  |
| 165° | 742  | 741   | 741  | 746   | 743  | 209  |
| 175° | 772  | 770   | 769  | 774   | 770  | 73   |
| 180° | 774  | 774   | 774  | 774   | 774  |      |

TEST NUMBER: P917985

CATALOG NUMBER: DFN2DIP-TR2F0-060D030US930-FLLONL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1903.4 | 1903.4 | 1903.4 | 1903.4 | 1903.4 |
| 2.5°   | 1914.5 | 1905.4 | 1885.1 | 1903.4 | 1899.9 |
| 5°     | 1903.4 | 1896.2 | 1876.0 | 1890.6 | 1887.1 |
| 7.5°   | 1890.6 | 1879.8 | 1859.5 | 1874.3 | 1870.6 |
| 10°    | 1870.6 | 1857.8 | 1835.8 | 1850.4 | 1844.9 |
| 12.5°  | 1843.1 | 1832.1 | 1810.2 | 1819.3 | 1815.7 |
| 15°    | 1811.9 | 1801.1 | 1777.2 | 1784.6 | 1775.5 |
| 17.5°  | 1773.5 | 1762.7 | 1738.8 | 1747.8 | 1738.8 |
| 20°    | 1731.4 | 1720.5 | 1694.8 | 1700.3 | 1693.1 |
| 22.5°  | 1689.5 | 1672.9 | 1649.0 | 1649.0 | 1645.4 |
| 25°    | 1639.9 | 1625.4 | 1594.2 | 1597.7 | 1594.2 |
| 27.5°  | 1584.9 | 1572.1 | 1548.4 | 1543.0 | 1533.9 |
| 30°    | 1530.2 | 1515.4 | 1488.1 | 1482.6 | 1475.2 |
| 32.5°  | 1471.5 | 1460.7 | 1431.3 | 1420.2 | 1412.9 |
| 35°    | 1414.9 | 1396.6 | 1367.3 | 1356.2 | 1347.0 |
| 37.5°  | 1350.8 | 1334.2 | 1305.0 | 1292.1 | 1283.0 |
| 40°    | 1284.9 | 1270.2 | 1240.9 | 1224.6 | 1217.2 |
| 42.5°  | 1220.8 | 1206.1 | 1177.0 | 1158.5 | 1147.6 |
| 45°    | 1151.4 | 1138.5 | 1110.9 | 1091.0 | 1083.5 |
| 47.5°  | 1083.5 | 1070.7 | 1041.5 | 1021.2 | 1010.3 |
| 50°    | 1012.1 | 1003.0 | 977.4  | 951.7  | 942.6  |
| 52.5°  | 942.6  | 929.8  | 906.0  | 885.9  | 873.1  |
| 55°    | 871.3  | 860.2  | 838.3  | 816.4  | 807.2  |
| 57.5°  | 799.9  | 790.8  | 766.9  | 744.9  | 737.5  |
| 60°    | 728.4  | 721.2  | 695.6  | 675.4  | 669.9  |
| 62.5°  | 658.8  | 646.0  | 627.8  | 609.5  | 602.2  |
| 65°    | 587.6  | 576.6  | 558.3  | 541.8  | 532.6  |
| 67.5°  | 514.4  | 505.1  | 488.8  | 476.0  | 468.6  |
| 70°    | 446.6  | 439.3  | 422.7  | 409.9  | 402.8  |
| 72.5°  | 377.1  | 369.7  | 360.6  | 347.8  | 342.3  |
| 75°    | 307.4  | 303.9  | 294.6  | 283.7  | 287.4  |
| 77.5°  | 245.2  | 237.9  | 234.2  | 228.8  | 223.3  |
| 80°    | 183.1  | 181.2  | 177.5  | 172.0  | 168.4  |
| 82.5°  | 124.5  | 124.5  | 122.7  | 115.4  | 115.4  |
| 85°    | 74.9   | 73.2   | 71.4   | 65.8   | 64.1   |
| 87.5°  | 33.0   | 29.4   | 25.6   | 20.2   | 18.3   |
| 90°    | 0.7    | 8.4    | 22.8   | 21.4   | 22.2   |
| 92.5°  | 14.4   | 19.6   | 20.3   | 21.0   | 21.0   |
| 95°    | 34.1   | 40.6   | 41.7   | 41.7   | 40.6   |
| 97.5°  | 56.7   | 62.7   | 65.3   | 65.3   | 65.3   |
| 100°   | 82.8   | 88.1   | 90.0   | 90.0   | 89.4   |
| 102.5° | 110.3  | 114.3  | 116.8  | 117.6  | 116.8  |
| 105°   | 140.4  | 142.3  | 143.7  | 144.8  | 144.8  |
| 107.5° | 170.2  | 173.0  | 173.0  | 173.5  | 170.2  |
| 110°   | 199.2  | 202.9  | 202.9  | 202.9  | 201.1  |



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CATALOG NUMBER: DFN2DIP-TR2F0-060D030US930-FLLONL

**CANDELA DISTRIBUTION (continued):**

|        | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|--------|-------|-------|-------|-------|-------|
| 112.5° | 230.4 | 234.4 | 233.7 | 231.8 | 230.4 |
| 115°   | 261.2 | 264.9 | 263.7 | 263.1 | 261.2 |
| 117.5° | 291.7 | 296.9 | 293.6 | 291.7 | 289.8 |
| 120°   | 322.5 | 327.7 | 322.5 | 322.5 | 320.4 |
| 122.5° | 350.5 | 357.0 | 353.8 | 351.9 | 350.5 |
| 125°   | 379.9 | 385.7 | 383.8 | 381.7 | 381.1 |
| 127.5° | 408.5 | 415.8 | 413.3 | 410.4 | 408.5 |
| 130°   | 435.4 | 443.8 | 442.6 | 441.2 | 438.6 |
| 132.5° | 465.5 | 472.0 | 472.5 | 469.2 | 467.3 |
| 135°   | 491.4 | 498.6 | 500.0 | 499.3 | 497.4 |
| 137.5° | 520.2 | 526.1 | 527.3 | 526.8 | 524.0 |
| 140°   | 545.7 | 551.5 | 554.8 | 554.8 | 552.2 |
| 142.5° | 571.9 | 577.6 | 579.5 | 580.2 | 577.6 |
| 145°   | 596.6 | 601.2 | 605.0 | 605.6 | 603.1 |
| 147.5° | 618.7 | 624.5 | 627.3 | 628.5 | 625.9 |
| 150°   | 641.6 | 645.6 | 648.1 | 650.2 | 648.1 |
| 152.5° | 661.9 | 665.8 | 669.0 | 671.6 | 669.0 |
| 155°   | 682.2 | 684.0 | 686.1 | 689.3 | 687.3 |
| 157.5° | 699.6 | 701.0 | 702.2 | 706.9 | 703.6 |
| 160°   | 715.3 | 716.6 | 717.4 | 721.3 | 718.5 |
| 162.5° | 729.7 | 729.7 | 730.4 | 734.8 | 731.6 |
| 165°   | 742.1 | 741.4 | 741.4 | 746.0 | 742.7 |
| 167.5° | 753.3 | 751.1 | 751.1 | 755.8 | 752.5 |
| 170°   | 761.7 | 759.8 | 759.1 | 763.8 | 759.8 |
| 172.5° | 767.4 | 765.6 | 764.9 | 769.6 | 765.6 |
| 175°   | 772.2 | 770.3 | 768.9 | 773.6 | 769.6 |
| 177.5° | 774.7 | 772.8 | 771.4 | 775.4 | 771.4 |
| 180°   | 773.6 | 773.6 | 773.6 | 773.6 | 773.6 |

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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 | 13.77            | 14.83 | 14.54 | 15.63 | 16.60 | 13.35          | 14.41 | 14.12 | 15.21 | 16.18 |
|                 | 3H   | 15.42            | 16.38 | 16.21 | 17.18 | 18.18 | 14.96          | 15.92 | 15.75 | 16.72 | 17.72 |
|                 | 4H   | 16.00            | 16.91 | 16.81 | 17.72 | 18.73 | 15.54          | 16.45 | 16.35 | 17.26 | 18.27 |
|                 | 6H   | 16.39            | 17.23 | 17.21 | 18.05 | 19.07 | 15.93          | 16.77 | 16.75 | 17.59 | 18.61 |
|                 | 8H   | 16.50            | 17.29 | 17.32 | 18.13 | 19.15 | 16.04          | 16.83 | 16.86 | 17.67 | 18.70 |
|                 | 12H  | 16.54            | 17.30 | 17.37 | 18.13 | 19.18 | 16.08          | 16.84 | 16.91 | 17.67 | 18.72 |
| 4H              | 2H   | 14.25            | 15.15 | 15.05 | 15.96 | 16.97 | 13.91          | 14.81 | 14.71 | 15.62 | 16.63 |
|                 | 3H   | 16.10            | 16.86 | 16.92 | 17.70 | 18.73 | 15.72          | 16.47 | 16.54 | 17.32 | 18.35 |
|                 | 4H   | 16.81            | 17.49 | 17.64 | 18.34 | 19.39 | 16.41          | 17.10 | 17.25 | 17.94 | 19.00 |
|                 | 6H   | 17.31            | 17.91 | 18.16 | 18.78 | 19.83 | 16.91          | 17.51 | 17.76 | 18.38 | 19.44 |
|                 | 8H   | 17.45            | 18.01 | 18.31 | 18.87 | 19.95 | 17.06          | 17.61 | 17.91 | 18.48 | 19.55 |
|                 | 12H  | 17.53            | 18.03 | 18.40 | 18.91 | 19.99 | 17.12          | 17.62 | 17.99 | 18.51 | 19.58 |
| 8H              | 4H   | 17.01            | 17.56 | 17.86 | 18.43 | 19.50 | 16.66          | 17.21 | 17.51 | 18.08 | 19.15 |
|                 | 6H   | 17.62            | 18.08 | 18.50 | 18.99 | 20.06 | 17.27          | 17.73 | 18.15 | 18.64 | 19.71 |
|                 | 8H   | 17.83            | 18.24 | 18.72 | 19.14 | 20.23 | 17.47          | 17.88 | 18.36 | 18.78 | 19.87 |
|                 | 12H  | 17.95            | 18.31 | 18.85 | 19.21 | 20.35 | 17.58          | 17.94 | 18.48 | 18.84 | 19.98 |
| 12H             | 4H   | 17.00            | 17.50 | 17.88 | 18.39 | 19.46 | 16.66          | 17.16 | 17.53 | 18.04 | 19.12 |
|                 | 6H   | 17.65            | 18.06 | 18.54 | 18.96 | 20.05 | 17.31          | 17.72 | 18.20 | 18.62 | 19.70 |
|                 | 8H   | 17.88            | 18.24 | 18.78 | 19.14 | 20.28 | 17.54          | 17.90 | 18.43 | 18.79 | 19.93 |