

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: P919237

Luminaire Tested: DFN2DIP-PN2F0-030D020US935-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P919237  
REPORT IS A COMBINATION OF REPORTS P900983 AND P897905  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN2F0-030D020US935-FLLONL  
Description: 2 foot, Pentagon Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

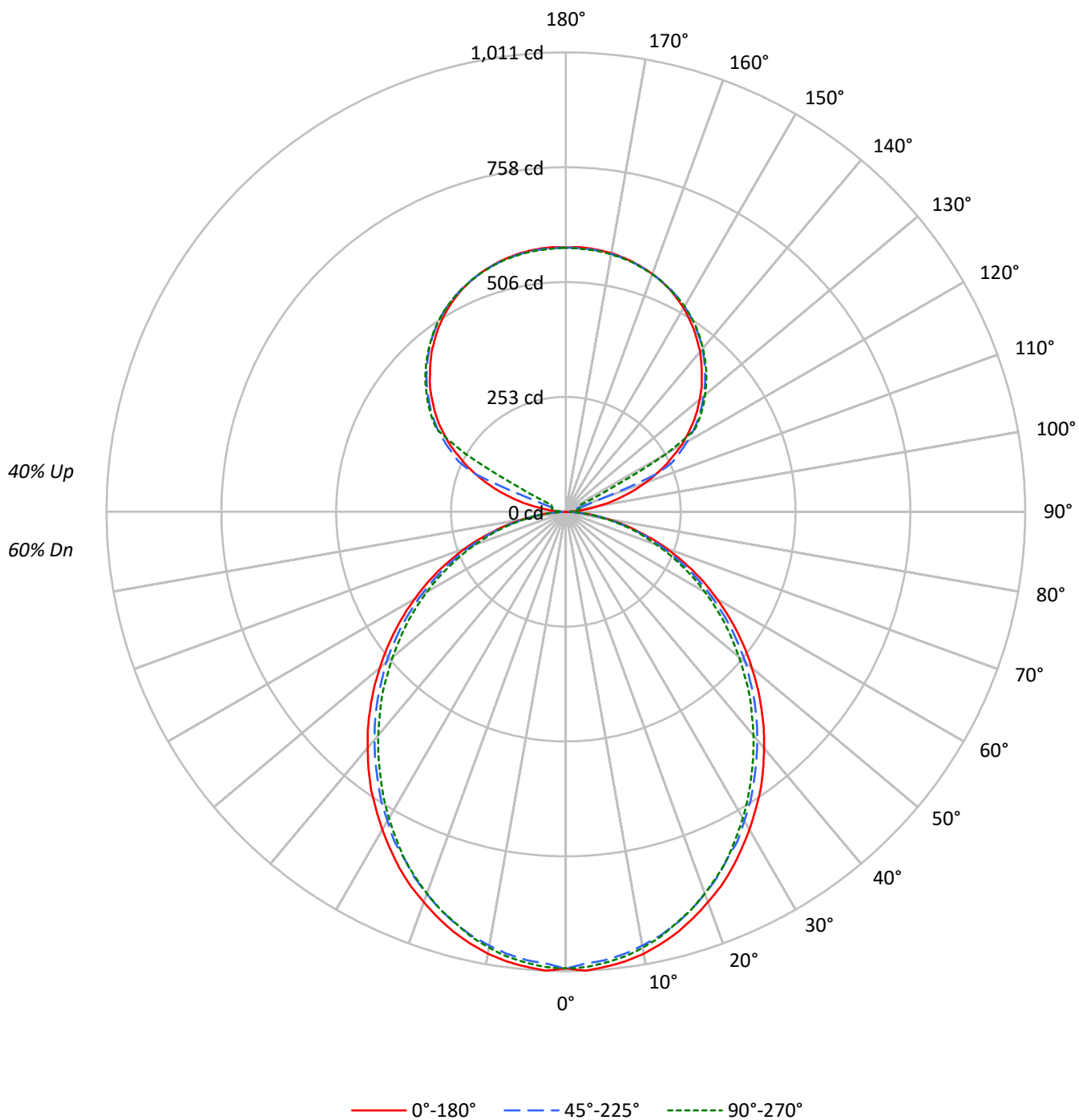
Lumens per Lamp: N/A  
Luminaire Lumens: 4261.9 lumens  
Efficiency: N/A  
Efficacy: 97.3 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 2.17' x L: 2.29' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 43.8  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9972  
Total Harmonic Distortion (THDi): 0.128  
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 |
| RCR |     |     |     |     |     |     |     |     |    |    |    |  |    |    |    |  |    |
| 0   | 110 | 110 | 110 | 110 | 102 | 102 | 102 | 102 | 89 | 89 | 89 |  | 77 | 77 | 77 |  | 65 |
| 1   | 100 | 96  | 92  | 88  | 93  | 90  | 86  | 83  | 78 | 75 | 73 |  | 67 | 66 | 64 |  | 58 |
| 2   | 91  | 84  | 77  | 72  | 85  | 78  | 73  | 68  | 68 | 64 | 61 |  | 59 | 56 | 53 |  | 51 |
| 3   | 83  | 73  | 66  | 60  | 77  | 69  | 62  | 57  | 60 | 55 | 51 |  | 52 | 48 | 45 |  | 45 |
| 4   | 76  | 65  | 57  | 51  | 71  | 61  | 54  | 48  | 54 | 48 | 44 |  | 47 | 42 | 39 |  | 40 |
| 5   | 70  | 58  | 50  | 44  | 65  | 55  | 47  | 42  | 48 | 42 | 38 |  | 42 | 37 | 34 |  | 36 |
| 6   | 64  | 52  | 44  | 38  | 60  | 49  | 42  | 36  | 43 | 37 | 33 |  | 38 | 33 | 30 |  | 33 |
| 7   | 60  | 47  | 39  | 33  | 56  | 44  | 37  | 32  | 39 | 33 | 29 |  | 35 | 30 | 26 |  | 30 |
| 8   | 55  | 43  | 35  | 30  | 52  | 40  | 33  | 28  | 36 | 30 | 26 |  | 32 | 27 | 23 |  | 28 |
| 9   | 52  | 39  | 32  | 26  | 48  | 37  | 30  | 25  | 33 | 27 | 23 |  | 29 | 24 | 21 |  | 26 |
| 10  | 48  | 36  | 29  | 24  | 45  | 34  | 27  | 23  | 30 | 25 | 21 |  | 27 | 22 | 19 |  | 24 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2177 | 2177 | 2177 |
| 5°  | 2177 | 2142 | 2158 |
| 10° | 2156 | 2108 | 2125 |
| 15° | 2120 | 2069 | 2077 |
| 20° | 2074 | 2016 | 2027 |
| 25° | 2028 | 1954 | 1969 |
| 30° | 1971 | 1896 | 1898 |
| 35° | 1917 | 1828 | 1822 |
| 40° | 1850 | 1759 | 1750 |
| 45° | 1784 | 1690 | 1675 |
| 50° | 1711 | 1617 | 1590 |
| 55° | 1635 | 1532 | 1511 |
| 60° | 1549 | 1433 | 1419 |
| 65° | 1454 | 1330 | 1312 |
| 70° | 1333 | 1204 | 1196 |
| 75° | 1168 | 1053 | 1084 |
| 80° | 966  | 859  | 879  |
| 85° | 656  | 543  | 551  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
Vertical Angle: 45°  
Luminance: 1784 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 94.6   | 2.2       |
| 10°-20°   | 266.2  | 6.2       |
| 20°-30°   | 391.1  | 9.2       |
| 30°-40°   | 454.3  | 10.7      |
| 40°-50°   | 453.7  | 10.6      |
| 50°-60°   | 395.6  | 9.3       |
| 60°-70°   | 292.5  | 6.9       |
| 70°-80°   | 165.5  | 3.9       |
| 80°-90°   | 44.7   | 1.0       |
| 90°-100°  | 19.2   | 0.4       |
| 100°-110° | 71.4   | 1.7       |
| 110°-120° | 189.5  | 4.4       |
| 120°-130° | 314.2  | 7.4       |
| 130°-140° | 333.8  | 7.8       |
| 140°-150° | 310.2  | 7.3       |
| 150°-160° | 249.4  | 5.9       |
| 160°-170° | 160.7  | 3.8       |
| 170°-180° | 55.3   | 1.3       |
| 0°-30°    | 751.9  | 17.6      |
| 0°-40°    | 1206.2 | 28.3      |
| 0°-60°    | 2055.6 | 48.2      |
| 0°-90°    | 2558.2 | 60.0      |
| 90°-120°  | 280.0  | 6.6       |
| 90°-150°  | 1238.3 | 29.1      |
| 90°-180°  | 1704.0 | 40.0      |
| 0°-180°   | 4261.9 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1005 | 1005  | 1005 | 1005  | 1005 |      |
| 5°   | 1005 | 1001  | 991  | 998   | 996  | 95   |
| 15°  | 957  | 951   | 938  | 942   | 938  | 269  |
| 25°  | 866  | 858   | 842  | 844   | 842  | 398  |
| 35°  | 747  | 737   | 722  | 716   | 711  | 467  |
| 45°  | 608  | 601   | 587  | 576   | 572  | 469  |
| 55°  | 460  | 454   | 443  | 431   | 426  | 411  |
| 65°  | 310  | 304   | 295  | 286   | 281  | 307  |
| 75°  | 162  | 160   | 156  | 150   | 152  | 173  |
| 85°  | 40   | 39    | 38   | 35    | 34   | 44   |
| 90°  | 0    | 5     | 8    | 10    | 11   | 4    |
| 95°  | 27   | 13    | 16   | 18    | 18   | 32   |
| 105° | 128  | 140   | 26   | 30    | 32   | 137  |
| 115° | 242  | 249   | 260  | 65    | 34   | 238  |
| 125° | 342  | 347   | 355  | 358   | 360  | 305  |
| 135° | 423  | 430   | 434  | 438   | 437  | 327  |
| 145° | 491  | 490   | 498  | 500   | 498  | 307  |
| 155° | 540  | 537   | 542  | 544   | 541  | 249  |
| 165° | 569  | 567   | 568  | 571   | 568  | 161  |
| 175° | 582  | 580   | 580  | 583   | 579  | 55   |
| 180° | 581  | 581   | 581  | 581   | 581  |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1005.0 | 1005.0 | 1005.0 | 1005.0 | 1005.0 |
| 2.5°   | 1010.9 | 1006.1 | 995.4  | 1005.0 | 1003.2 |
| 5°     | 1005.0 | 1001.3 | 990.6  | 998.3  | 996.4  |
| 7.5°   | 998.3  | 992.6  | 981.9  | 989.7  | 987.7  |
| 10°    | 987.7  | 980.9  | 969.4  | 977.1  | 974.2  |
| 12.5°  | 973.2  | 967.4  | 955.9  | 960.6  | 958.7  |
| 15°    | 956.7  | 951.1  | 938.4  | 942.3  | 937.5  |
| 17.5°  | 936.4  | 930.7  | 918.1  | 922.9  | 918.1  |
| 20°    | 914.2  | 908.4  | 894.9  | 897.8  | 894.0  |
| 22.5°  | 892.1  | 883.4  | 870.7  | 870.7  | 868.7  |
| 25°    | 865.9  | 858.2  | 841.8  | 843.7  | 841.8  |
| 27.5°  | 836.9  | 830.1  | 817.6  | 814.8  | 809.9  |
| 30°    | 808.0  | 800.2  | 785.7  | 782.8  | 778.9  |
| 32.5°  | 777.1  | 771.3  | 755.8  | 749.9  | 746.1  |
| 35°    | 747.1  | 737.4  | 721.9  | 716.1  | 711.3  |
| 37.5°  | 713.3  | 704.6  | 689.1  | 682.3  | 677.4  |
| 40°    | 678.5  | 670.7  | 655.2  | 646.6  | 642.7  |
| 42.5°  | 644.6  | 636.9  | 621.5  | 611.7  | 606.0  |
| 45°    | 608.0  | 601.1  | 586.6  | 576.0  | 572.1  |
| 47.5°  | 572.1  | 565.4  | 549.9  | 539.2  | 533.5  |
| 50°    | 534.4  | 529.6  | 516.1  | 502.6  | 497.7  |
| 52.5°  | 497.7  | 490.9  | 478.5  | 467.8  | 461.0  |
| 55°    | 460.1  | 454.3  | 442.6  | 431.1  | 426.3  |
| 57.5°  | 422.3  | 417.5  | 404.9  | 393.3  | 389.4  |
| 60°    | 384.6  | 380.8  | 367.3  | 356.6  | 353.8  |
| 62.5°  | 347.9  | 341.1  | 331.5  | 321.8  | 318.0  |
| 65°    | 310.3  | 304.4  | 294.8  | 286.1  | 281.3  |
| 67.5°  | 271.6  | 266.7  | 258.0  | 251.3  | 247.5  |
| 70°    | 235.8  | 232.0  | 223.3  | 216.5  | 212.7  |
| 72.5°  | 199.1  | 195.2  | 190.4  | 183.7  | 180.8  |
| 75°    | 162.3  | 160.5  | 155.6  | 149.8  | 151.8  |
| 77.5°  | 129.5  | 125.6  | 123.6  | 120.8  | 118.0  |
| 80°    | 96.7   | 95.7   | 93.7   | 90.8   | 88.9   |
| 82.5°  | 65.7   | 65.7   | 64.8   | 60.9   | 60.9   |
| 85°    | 39.6   | 38.7   | 37.7   | 34.8   | 33.8   |
| 87.5°  | 17.4   | 15.5   | 13.5   | 10.7   | 9.6    |
| 90°    | 0.4    | 5.1    | 8.4    | 10.5   | 11.4   |
| 92.5°  | 10.5   | 8.9    | 10.1   | 10.9   | 11.4   |
| 95°    | 27.3   | 13.4   | 16.4   | 18.5   | 18.1   |
| 97.5°  | 49.2   | 14.7   | 21.4   | 22.7   | 23.2   |
| 100°   | 74.5   | 16.8   | 23.9   | 27.3   | 28.2   |
| 102.5° | 102.2  | 101.3  | 24.8   | 29.4   | 30.7   |
| 105°   | 127.9  | 140.4  | 25.7   | 30.2   | 31.9   |
| 107.5° | 157.7  | 168.2  | 26.5   | 31.1   | 32.8   |
| 110°   | 186.3  | 195.1  | 73.6   | 31.6   | 33.2   |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|--------|-------|-------|-------|-------|-------|
| 112.5° | 213.2 | 220.8 | 213.6 | 32.4  | 33.7  |
| 115°   | 241.8 | 248.9 | 259.5 | 64.7  | 34.5  |
| 117.5° | 266.6 | 275.0 | 282.1 | 222.1 | 111.8 |
| 120°   | 294.4 | 300.7 | 308.2 | 313.3 | 256.5 |
| 122.5° | 317.9 | 324.6 | 333.0 | 335.5 | 336.0 |
| 125°   | 341.9 | 347.3 | 355.3 | 358.3 | 359.6 |
| 127.5° | 363.8 | 369.6 | 376.0 | 380.1 | 380.6 |
| 130°   | 384.3 | 391.1 | 395.7 | 400.4 | 399.9 |
| 132.5° | 405.4 | 410.9 | 415.4 | 419.2 | 418.9 |
| 135°   | 423.1 | 429.8 | 433.5 | 437.8 | 437.0 |
| 137.5° | 441.5 | 446.6 | 450.8 | 455.0 | 453.7 |
| 140°   | 459.6 | 463.0 | 467.6 | 471.4 | 469.3 |
| 142.5° | 474.8 | 477.8 | 483.2 | 486.5 | 484.4 |
| 145°   | 490.8 | 490.3 | 497.5 | 500.4 | 498.3 |
| 147.5° | 504.6 | 503.3 | 510.5 | 512.6 | 510.9 |
| 150°   | 518.1 | 515.1 | 521.9 | 524.3 | 522.3 |
| 152.5° | 529.4 | 526.1 | 532.4 | 534.9 | 531.9 |
| 155°   | 540.4 | 536.6 | 541.7 | 544.2 | 540.8 |
| 157.5° | 549.2 | 545.9 | 549.7 | 552.6 | 549.2 |
| 160°   | 556.8 | 554.2 | 556.8 | 559.3 | 556.4 |
| 162.5° | 563.4 | 560.9 | 563.1 | 566.0 | 562.2 |
| 165°   | 569.4 | 566.9 | 568.1 | 571.1 | 568.1 |
| 167.5° | 574.0 | 571.4 | 572.7 | 575.7 | 571.9 |
| 170°   | 577.8 | 575.2 | 576.1 | 579.0 | 575.2 |
| 172.5° | 580.3 | 577.8 | 578.7 | 581.6 | 577.8 |
| 175°   | 582.4 | 579.5 | 580.3 | 583.2 | 579.0 |
| 177.5° | 583.2 | 580.3 | 580.7 | 583.7 | 579.9 |
| 180°   | 581.2 | 581.2 | 581.2 | 581.2 | 581.2 |

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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 | 10.73            | 11.69 | 11.60 | 12.58 | 13.70 | 10.30          | 11.26 | 11.16 | 12.14 | 13.26 |
|                 | 3H   | 12.38            | 13.24 | 13.26 | 14.14 | 15.29 | 11.90          | 12.76 | 12.78 | 13.66 | 14.81 |
|                 | 4H   | 12.96            | 13.77 | 13.85 | 14.68 | 15.83 | 12.48          | 13.29 | 13.37 | 14.20 | 15.35 |
|                 | 6H   | 13.35            | 14.10 | 14.26 | 15.01 | 16.18 | 12.86          | 13.61 | 13.77 | 14.52 | 15.69 |
|                 | 8H   | 13.45            | 14.16 | 14.36 | 15.09 | 16.26 | 12.96          | 13.68 | 13.88 | 14.61 | 15.77 |
|                 | 12H  | 13.49            | 14.17 | 14.41 | 15.10 | 16.29 | 13.00          | 13.68 | 13.92 | 14.60 | 15.80 |
| 4H              | 2H   | 11.20            | 12.01 | 12.10 | 12.91 | 14.07 | 10.85          | 11.66 | 11.75 | 12.56 | 13.72 |
|                 | 3H   | 13.05            | 13.73 | 13.96 | 14.66 | 15.83 | 12.65          | 13.33 | 13.56 | 14.26 | 15.43 |
|                 | 4H   | 13.75            | 14.37 | 14.67 | 15.30 | 16.50 | 13.34          | 13.96 | 14.26 | 14.89 | 16.08 |
|                 | 6H   | 14.25            | 14.79 | 15.19 | 15.74 | 16.94 | 13.83          | 14.37 | 14.77 | 15.32 | 16.52 |
|                 | 8H   | 14.39            | 14.89 | 15.33 | 15.84 | 17.05 | 13.97          | 14.47 | 14.91 | 15.42 | 16.63 |
|                 | 12H  | 14.46            | 14.91 | 15.42 | 15.88 | 17.10 | 14.03          | 14.48 | 14.99 | 15.45 | 16.66 |
| 8H              | 4H   | 13.94            | 14.44 | 14.88 | 15.39 | 16.60 | 13.58          | 14.08 | 14.51 | 15.02 | 16.23 |
|                 | 6H   | 14.56            | 14.97 | 15.52 | 15.96 | 17.17 | 14.18          | 14.60 | 15.15 | 15.59 | 16.80 |
|                 | 8H   | 14.76            | 15.13 | 15.74 | 16.11 | 17.34 | 14.38          | 14.75 | 15.36 | 15.73 | 16.96 |
|                 | 12H  | 14.89            | 15.21 | 15.86 | 16.18 | 17.46 | 14.49          | 14.81 | 15.47 | 15.78 | 17.06 |
| 12H             | 4H   | 13.93            | 14.38 | 14.89 | 15.35 | 16.57 | 13.57          | 14.02 | 14.53 | 14.99 | 16.21 |
|                 | 6H   | 14.58            | 14.95 | 15.55 | 15.93 | 17.15 | 14.22          | 14.59 | 15.19 | 15.56 | 16.79 |
|                 | 8H   | 14.81            | 15.13 | 15.79 | 16.11 | 17.38 | 14.44          | 14.77 | 15.42 | 15.74 | 17.01 |