

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: P915820

Luminaire Tested: DFN2DIP-4P3F0-020D030US930-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P915820  
REPORT IS A COMBINATION OF REPORTS P899040 AND P895917  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-4P3F0-020D030US930-RLLFLL  
Description: 3 foot, 90deg - 4way Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

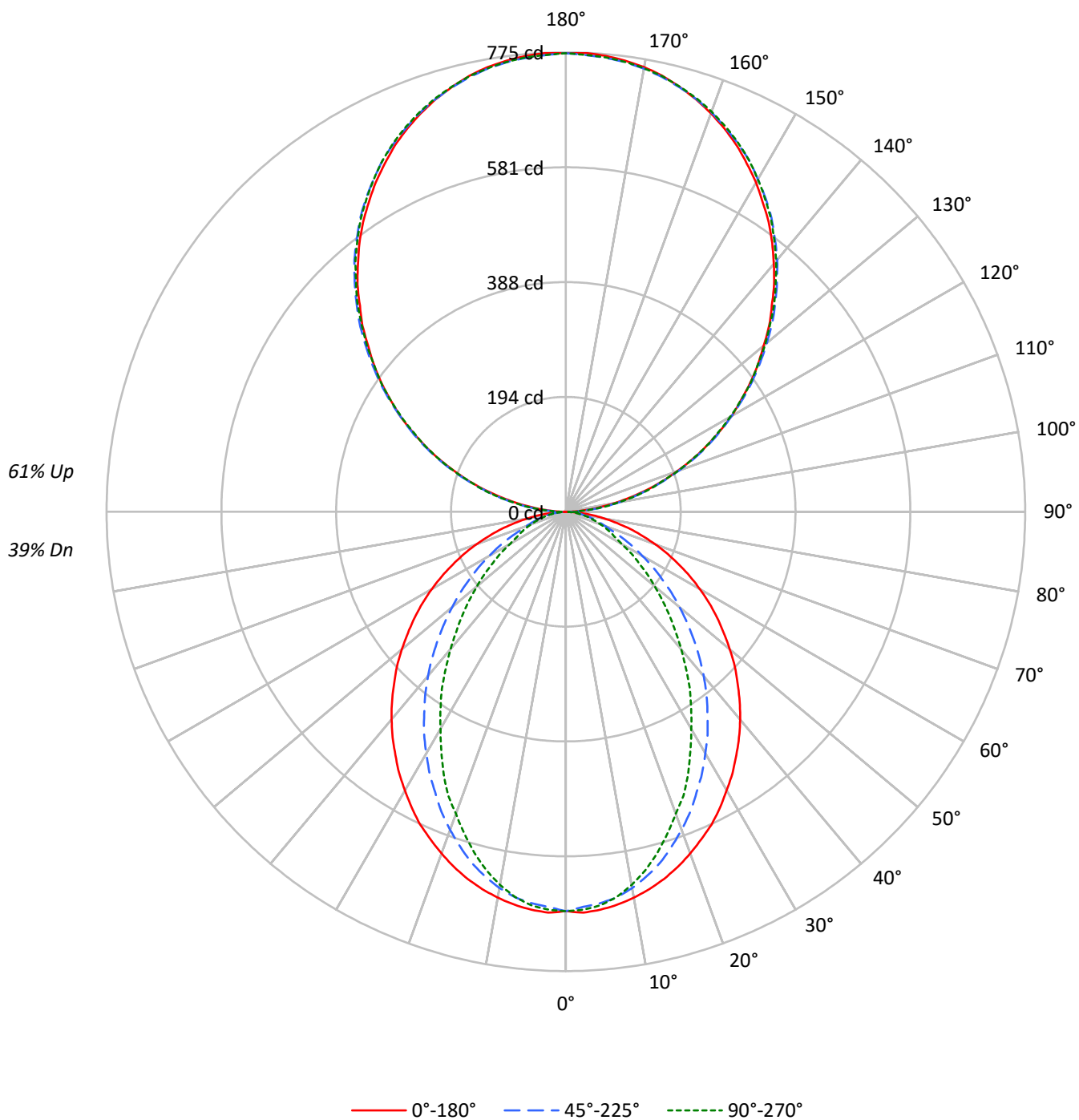
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 3550.6 lumens  
Efficiency: N/A  
Efficacy: 93.7 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.07' x L: 3.07' x H: 0.1')  
CIE Type: Semi-Indirect  
  
Input Watts (W): 37.9  
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



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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 | 30 | 10 |
| RCR |     |     |     |     |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 0   | 105 | 105 | 105 | 105 | 95 | 95 | 95 | 95 | 77 | 77 | 77 | 61 | 61 | 61 | 46 | 46 | 46 |
| 1   | 96  | 92  | 88  | 85  | 87 | 83 | 80 | 78 | 68 | 66 | 64 | 54 | 53 | 51 | 41 | 40 | 40 |
| 2   | 87  | 80  | 75  | 70  | 79 | 73 | 68 | 64 | 60 | 57 | 54 | 48 | 46 | 44 | 37 | 35 | 34 |
| 3   | 80  | 71  | 64  | 58  | 73 | 65 | 59 | 54 | 53 | 49 | 46 | 43 | 40 | 37 | 33 | 31 | 29 |
| 4   | 73  | 63  | 55  | 50  | 66 | 58 | 51 | 46 | 48 | 43 | 39 | 38 | 35 | 32 | 30 | 27 | 26 |
| 5   | 67  | 56  | 48  | 43  | 61 | 52 | 45 | 40 | 43 | 38 | 34 | 35 | 31 | 28 | 27 | 24 | 22 |
| 6   | 62  | 51  | 43  | 37  | 56 | 46 | 40 | 35 | 39 | 33 | 30 | 31 | 28 | 25 | 25 | 22 | 20 |
| 7   | 57  | 46  | 38  | 33  | 52 | 42 | 35 | 30 | 35 | 30 | 26 | 29 | 25 | 22 | 22 | 20 | 18 |
| 8   | 53  | 41  | 34  | 29  | 49 | 38 | 32 | 27 | 32 | 27 | 23 | 26 | 22 | 20 | 21 | 18 | 16 |
| 9   | 50  | 38  | 31  | 26  | 45 | 35 | 29 | 24 | 29 | 24 | 21 | 24 | 20 | 18 | 19 | 17 | 15 |
| 10  | 46  | 35  | 28  | 23  | 42 | 32 | 26 | 22 | 27 | 22 | 19 | 22 | 19 | 16 | 18 | 15 | 13 |

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

|     | 0°  | 45° | 90° |
|-----|-----|-----|-----|
| 0°  | 768 | 768 | 768 |
| 5°  | 769 | 755 | 760 |
| 10° | 761 | 740 | 735 |
| 15° | 750 | 715 | 697 |
| 20° | 735 | 681 | 650 |
| 25° | 721 | 643 | 604 |
| 30° | 701 | 603 | 547 |
| 35° | 682 | 561 | 496 |
| 40° | 662 | 518 | 438 |
| 45° | 640 | 470 | 386 |
| 50° | 616 | 421 | 334 |
| 55° | 592 | 370 | 285 |
| 60° | 563 | 315 | 234 |
| 65° | 530 | 261 | 211 |
| 70° | 491 | 209 | 190 |
| 75° | 441 | 183 | 172 |
| 80° | 368 | 152 | 148 |
| 85° | 250 | 99  | 111 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 778 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 63.2   | 1.8       |
| 10°-20°   | 173.4  | 4.9       |
| 20°-30°   | 243.4  | 6.9       |
| 30°-40°   | 265.4  | 7.5       |
| 40°-50°   | 243.9  | 6.9       |
| 50°-60°   | 191.5  | 5.4       |
| 60°-70°   | 124.7  | 3.5       |
| 70°-80°   | 64.2   | 1.8       |
| 80°-90°   | 18.6   | 0.5       |
| 90°-100°  | 47.9   | 1.3       |
| 100°-110° | 152.1  | 4.3       |
| 110°-120° | 260.3  | 7.3       |
| 120°-130° | 342.3  | 9.6       |
| 130°-140° | 384.2  | 10.8      |
| 140°-150° | 376.8  | 10.6      |
| 150°-160° | 316.1  | 8.9       |
| 160°-170° | 209.6  | 5.9       |
| 170°-180° | 73.3   | 2.1       |
| 0°-30°    | 480.0  | 13.5      |
| 0°-40°    | 745.3  | 21.0      |
| 0°-60°    | 1180.8 | 33.3      |
| 0°-90°    | 1388.2 | 39.1      |
| 90°-120°  | 460.2  | 13.0      |
| 90°-150°  | 1563.5 | 44.0      |
| 90°-180°  | 2162.0 | 60.9      |
| 0°-180°   | 3550.6 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°  | 22.5° | 45° | 67.5° | 90° | Flux |
|------|-----|-------|-----|-------|-----|------|
| 0°   | 674 | 674   | 674 | 674   | 674 |      |
| 5°   | 674 | 671   | 663 | 668   | 667 | 64   |
| 15°  | 641 | 634   | 614 | 602   | 596 | 181  |
| 25°  | 582 | 562   | 522 | 497   | 488 | 268  |
| 35°  | 501 | 470   | 417 | 378   | 365 | 314  |
| 45°  | 410 | 369   | 305 | 262   | 247 | 317  |
| 55°  | 312 | 264   | 198 | 162   | 150 | 278  |
| 65°  | 210 | 161   | 106 | 85    | 84  | 209  |
| 75°  | 112 | 70    | 49  | 44    | 44  | 119  |
| 85°  | 26  | 13    | 12  | 12    | 12  | 30   |
| 90°  | 1   | 8     | 23  | 21    | 22  | 4    |
| 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 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|--------|-------|-------|-------|-------|-------|
| 0°     | 673.9 | 673.9 | 673.9 | 673.9 | 673.9 |
| 2.5°   | 676.9 | 673.9 | 667.2 | 673.4 | 672.1 |
| 5°     | 673.9 | 670.9 | 662.9 | 668.5 | 666.6 |
| 7.5°   | 668.5 | 664.8 | 656.2 | 658.7 | 655.6 |
| 10°    | 661.1 | 656.8 | 644.7 | 642.8 | 639.2 |
| 12.5°  | 652.0 | 646.4 | 630.0 | 626.4 | 619.6 |
| 15°    | 641.0 | 634.2 | 613.5 | 601.9 | 595.9 |
| 17.5°  | 628.2 | 618.4 | 592.8 | 579.4 | 569.6 |
| 20°    | 613.5 | 601.3 | 570.9 | 555.6 | 542.2 |
| 22.5°  | 597.7 | 583.7 | 548.3 | 527.6 | 518.4 |
| 25°    | 581.9 | 562.3 | 522.0 | 497.1 | 487.9 |
| 27.5°  | 563.0 | 542.2 | 497.7 | 469.0 | 454.9 |
| 30°    | 542.8 | 519.6 | 470.8 | 439.8 | 423.2 |
| 32.5°  | 523.3 | 495.2 | 445.2 | 408.6 | 393.4 |
| 35°    | 501.3 | 470.3 | 416.6 | 378.1 | 364.7 |
| 37.5°  | 480.0 | 446.4 | 389.7 | 347.6 | 332.4 |
| 40°    | 457.4 | 420.9 | 361.7 | 318.4 | 302.5 |
| 42.5°  | 434.2 | 395.3 | 333.6 | 288.5 | 273.3 |
| 45°    | 409.9 | 368.9 | 305.0 | 261.6 | 247.0 |
| 47.5°  | 386.7 | 343.4 | 277.5 | 234.2 | 220.8 |
| 50°    | 361.1 | 317.8 | 250.7 | 208.6 | 195.8 |
| 52.5°  | 336.0 | 290.2 | 225.0 | 184.8 | 173.3 |
| 55°    | 311.6 | 264.1 | 198.2 | 161.7 | 150.0 |
| 57.5°  | 286.7 | 237.8 | 174.5 | 140.3 | 130.5 |
| 60°    | 261.1 | 212.2 | 149.4 | 118.4 | 108.6 |
| 62.5°  | 236.0 | 187.3 | 128.1 | 98.8  | 93.9  |
| 65°    | 210.4 | 161.0 | 106.2 | 85.4  | 83.6  |
| 67.5°  | 186.1 | 136.6 | 85.4  | 75.0  | 73.2  |
| 70°    | 160.4 | 112.8 | 70.7  | 64.7  | 62.2  |
| 72.5°  | 136.0 | 90.8  | 59.1  | 54.3  | 53.1  |
| 75°    | 112.2 | 69.5  | 48.8  | 44.5  | 43.9  |
| 77.5°  | 88.5  | 49.4  | 38.4  | 36.0  | 34.7  |
| 80°    | 66.4  | 35.4  | 29.3  | 26.8  | 26.8  |
| 82.5°  | 46.3  | 23.8  | 20.1  | 18.9  | 18.9  |
| 85°    | 26.2  | 13.4  | 11.6  | 11.6  | 11.6  |
| 87.5°  | 9.8   | 4.9   | 4.9   | 4.2   | 4.2   |
| 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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**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 | 5.08             | 5.83 | 6.13 | 6.88 | 8.30  | 1.04           | 1.79 | 2.10 | 2.85 | 4.27 |
|                 | 3H   | 6.75             | 7.42 | 7.81 | 8.48 | 9.92  | 2.22           | 2.89 | 3.28 | 3.95 | 5.39 |
|                 | 4H   | 7.35             | 7.99 | 8.42 | 9.05 | 10.49 | 2.66           | 3.30 | 3.74 | 4.36 | 5.81 |
|                 | 6H   | 7.77             | 8.35 | 8.85 | 9.41 | 10.87 | 2.97           | 3.56 | 4.05 | 4.62 | 6.08 |
|                 | 8H   | 7.89             | 8.44 | 8.97 | 9.52 | 10.98 | 3.06           | 3.61 | 4.14 | 4.69 | 6.15 |
|                 | 12H  | 7.94             | 8.47 | 9.03 | 9.55 | 11.02 | 3.10           | 3.62 | 4.19 | 4.70 | 6.17 |
| 4H              | 2H   | 5.09             | 5.72 | 6.17 | 6.79 | 8.23  | 1.63           | 2.26 | 2.71 | 3.33 | 4.77 |
|                 | 3H   | 6.91             | 7.43 | 7.99 | 8.52 | 9.98  | 2.96           | 3.49 | 4.05 | 4.58 | 6.04 |
|                 | 4H   | 7.59             | 8.07 | 8.68 | 9.15 | 10.64 | 3.50           | 3.99 | 4.59 | 5.07 | 6.55 |
|                 | 6H   | 8.10             | 8.51 | 9.20 | 9.62 | 11.09 | 3.91           | 4.32 | 5.01 | 5.43 | 6.90 |
|                 | 8H   | 8.27             | 8.66 | 9.37 | 9.75 | 11.24 | 4.03           | 4.42 | 5.13 | 5.52 | 7.01 |
|                 | 12H  | 8.36             | 8.71 | 9.47 | 9.82 | 11.31 | 4.09           | 4.44 | 5.21 | 5.55 | 7.04 |
| 8H              | 4H   | 7.55             | 7.94 | 8.65 | 9.03 | 10.52 | 3.77           | 4.16 | 4.87 | 5.26 | 6.75 |
|                 | 6H   | 8.11             | 8.43 | 9.23 | 9.57 | 11.05 | 4.28           | 4.60 | 5.40 | 5.74 | 7.22 |
|                 | 8H   | 8.32             | 8.60 | 9.45 | 9.72 | 11.23 | 4.47           | 4.74 | 5.59 | 5.86 | 7.37 |
|                 | 12H  | 8.45             | 8.70 | 9.58 | 9.81 | 11.36 | 4.58           | 4.82 | 5.71 | 5.94 | 7.48 |
| 12H             | 4H   | 7.50             | 7.85 | 8.62 | 8.96 | 10.45 | 3.77           | 4.12 | 4.89 | 5.23 | 6.73 |
|                 | 6H   | 8.08             | 8.36 | 9.21 | 9.48 | 10.99 | 4.33           | 4.61 | 5.45 | 5.73 | 7.23 |
|                 | 8H   | 8.30             | 8.54 | 9.43 | 9.66 | 11.20 | 4.53           | 4.77 | 5.66 | 5.89 | 7.43 |