

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: P909723

Luminaire Tested: DFN2DIP-TR2F0-020D030US840-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P909723  
REPORT IS A COMBINATION OF REPORTS P901752 AND P897145  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR2F0-020D030US840-RLLONL  
Description: 2 foot, Triangle Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

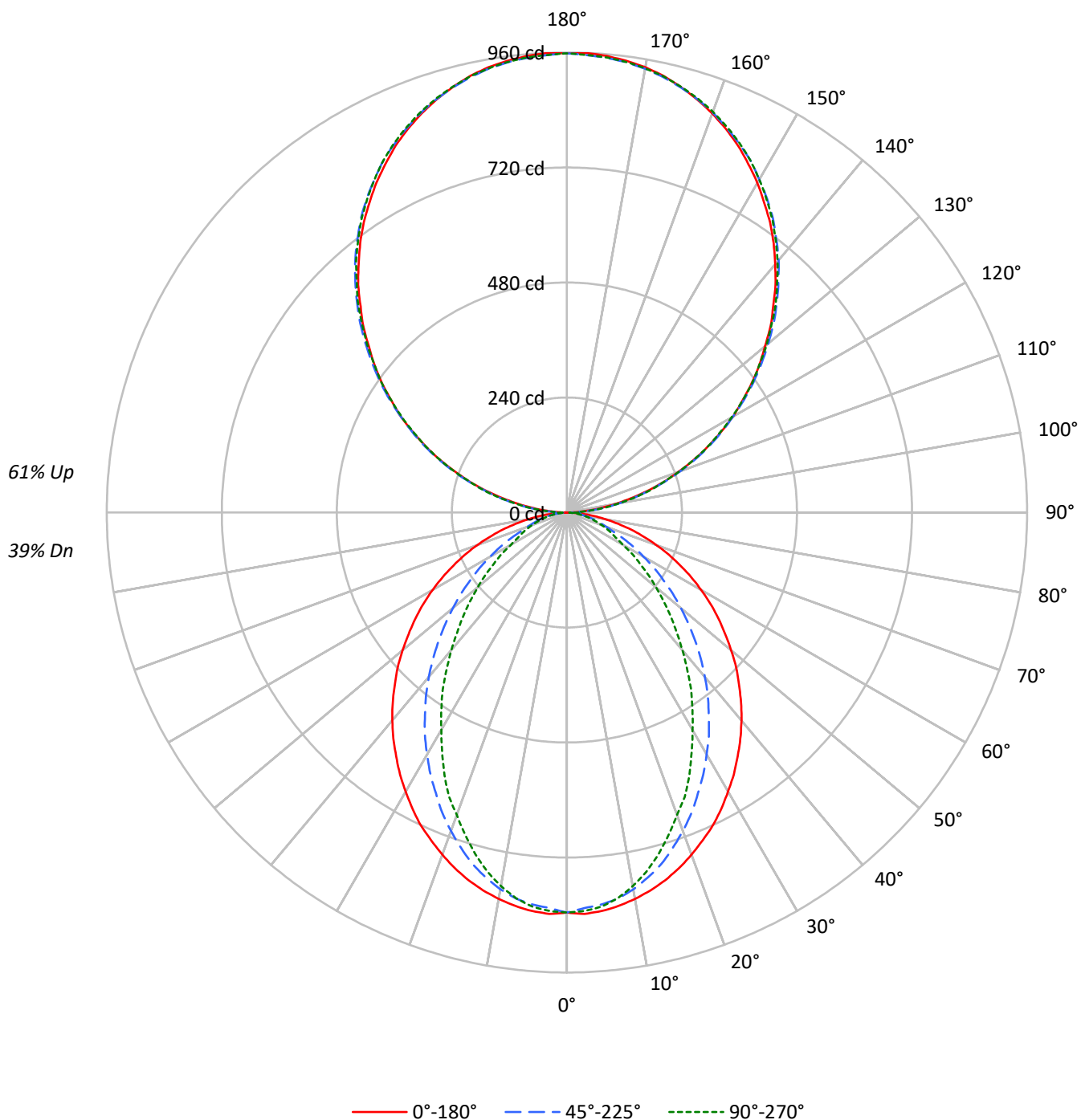
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 4398.0 lumens  
Efficiency: N/A  
Efficacy: 118.9 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 2.04' x L: 2.36' x H: 0.1')  
CIE Type: Semi-Indirect  
  
Input Watts (W): 37  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9968  
Total Harmonic Distortion (THDi): 0.064  
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°  | 1862 | 1862 | 1862 |
| 5°  | 1862 | 1828 | 1841 |
| 10° | 1841 | 1788 | 1778 |
| 15° | 1813 | 1725 | 1682 |
| 20° | 1776 | 1640 | 1566 |
| 25° | 1739 | 1545 | 1454 |
| 30° | 1690 | 1448 | 1313 |
| 35° | 1642 | 1344 | 1189 |
| 40° | 1593 | 1237 | 1048 |
| 45° | 1536 | 1119 | 920  |
| 50° | 1478 | 1000 | 795  |
| 55° | 1415 | 874  | 675  |
| 60° | 1344 | 743  | 553  |
| 65° | 1261 | 610  | 494  |
| 70° | 1160 | 485  | 443  |
| 75° | 1034 | 419  | 396  |
| 80° | 852  | 341  | 334  |
| 85° | 559  | 211  | 235  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
Vertical Angle: 45°  
Luminance: 1536 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 78.2   | 1.8       |
| 10°-20°   | 214.8  | 4.9       |
| 20°-30°   | 301.5  | 6.9       |
| 30°-40°   | 328.7  | 7.5       |
| 40°-50°   | 302.1  | 6.9       |
| 50°-60°   | 237.3  | 5.4       |
| 60°-70°   | 154.4  | 3.5       |
| 70°-80°   | 79.5   | 1.8       |
| 80°-90°   | 23.0   | 0.5       |
| 90°-100°  | 59.3   | 1.3       |
| 100°-110° | 188.4  | 4.3       |
| 110°-120° | 322.4  | 7.3       |
| 120°-130° | 424.0  | 9.6       |
| 130°-140° | 475.9  | 10.8      |
| 140°-150° | 466.7  | 10.6      |
| 150°-160° | 391.5  | 8.9       |
| 160°-170° | 259.6  | 5.9       |
| 170°-180° | 90.7   | 2.1       |
| 0°-30°    | 594.5  | 13.5      |
| 0°-40°    | 923.2  | 21.0      |
| 0°-60°    | 1462.6 | 33.3      |
| 0°-90°    | 1719.5 | 39.1      |
| 90°-120°  | 570.1  | 13.0      |
| 90°-150°  | 1936.6 | 44.0      |
| 90°-180°  | 2678.0 | 60.9      |
| 0°-180°   | 4398.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°  | 22.5° | 45° | 67.5° | 90° | Flux |
|------|-----|-------|-----|-------|-----|------|
| 0°   | 835 | 835   | 835 | 835   | 835 |      |
| 5°   | 835 | 831   | 821 | 828   | 826 | 79   |
| 15°  | 794 | 786   | 760 | 746   | 738 | 224  |
| 25°  | 721 | 696   | 647 | 616   | 604 | 331  |
| 35°  | 621 | 582   | 516 | 468   | 452 | 389  |
| 45°  | 508 | 457   | 378 | 324   | 306 | 392  |
| 55°  | 386 | 327   | 246 | 200   | 186 | 345  |
| 65°  | 261 | 199   | 132 | 106   | 104 | 258  |
| 75°  | 139 | 86    | 60  | 55    | 54  | 147  |
| 85°  | 32  | 17    | 14  | 14    | 14  | 37   |
| 90°  | 1   | 10    | 28  | 27    | 28  | 4    |
| 95°  | 42  | 50    | 52  | 52    | 50  | 47   |
| 105° | 174 | 176   | 178 | 179   | 179 | 184  |
| 115° | 324 | 328   | 327 | 326   | 324 | 320  |
| 125° | 471 | 478   | 475 | 473   | 472 | 420  |
| 135° | 609 | 618   | 619 | 618   | 616 | 470  |
| 145° | 739 | 745   | 749 | 750   | 747 | 462  |
| 155° | 845 | 847   | 850 | 854   | 851 | 389  |
| 165° | 919 | 918   | 918 | 924   | 920 | 259  |
| 175° | 956 | 954   | 952 | 958   | 953 | 91   |
| 180° | 958 | 958   | 958 | 958   | 958 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|--------|-------|-------|-------|-------|-------|
| 0°     | 834.8 | 834.8 | 834.8 | 834.8 | 834.8 |
| 2.5°   | 838.5 | 834.8 | 826.4 | 834.0 | 832.5 |
| 5°     | 834.8 | 831.0 | 821.1 | 828.0 | 825.7 |
| 7.5°   | 828.0 | 823.4 | 812.8 | 815.9 | 812.0 |
| 10°    | 818.9 | 813.5 | 798.5 | 796.2 | 791.7 |
| 12.5°  | 807.6 | 800.7 | 780.3 | 775.9 | 767.5 |
| 15°    | 794.0 | 785.6 | 759.9 | 745.6 | 738.1 |
| 17.5°  | 778.1 | 766.0 | 734.3 | 717.6 | 705.6 |
| 20°    | 759.9 | 744.8 | 707.1 | 688.2 | 671.6 |
| 22.5°  | 740.3 | 723.0 | 679.1 | 653.5 | 642.2 |
| 25°    | 720.7 | 696.5 | 646.6 | 615.7 | 604.3 |
| 27.5°  | 697.3 | 671.6 | 616.4 | 580.9 | 563.5 |
| 30°    | 672.4 | 643.6 | 583.2 | 544.7 | 524.2 |
| 32.5°  | 648.1 | 613.4 | 551.5 | 506.1 | 487.3 |
| 35°    | 621.0 | 582.5 | 516.0 | 468.4 | 451.7 |
| 37.5°  | 594.5 | 552.9 | 482.7 | 430.6 | 411.7 |
| 40°    | 566.5 | 521.3 | 448.0 | 394.4 | 374.7 |
| 42.5°  | 537.9 | 489.6 | 413.2 | 357.3 | 338.5 |
| 45°    | 507.7 | 457.0 | 377.8 | 324.1 | 305.9 |
| 47.5°  | 479.0 | 425.4 | 343.8 | 290.0 | 273.5 |
| 50°    | 447.3 | 393.6 | 310.5 | 258.3 | 242.6 |
| 52.5°  | 416.2 | 359.5 | 278.7 | 228.9 | 214.6 |
| 55°    | 386.0 | 327.1 | 245.5 | 200.3 | 185.8 |
| 57.5°  | 355.1 | 294.6 | 216.1 | 173.8 | 161.7 |
| 60°    | 323.4 | 262.9 | 185.1 | 146.6 | 134.5 |
| 62.5°  | 292.4 | 232.0 | 158.6 | 122.4 | 116.3 |
| 65°    | 260.6 | 199.4 | 131.5 | 105.8 | 103.5 |
| 67.5°  | 230.5 | 169.2 | 105.8 | 92.9  | 90.7  |
| 70°    | 198.6 | 139.8 | 87.6  | 80.1  | 77.1  |
| 72.5°  | 168.4 | 112.5 | 73.2  | 67.3  | 65.7  |
| 75°    | 139.0 | 86.0  | 60.4  | 55.1  | 54.4  |
| 77.5°  | 109.6 | 61.2  | 47.6  | 44.5  | 43.0  |
| 80°    | 82.3  | 43.8  | 36.3  | 33.2  | 33.2  |
| 82.5°  | 57.4  | 29.5  | 24.9  | 23.4  | 23.4  |
| 85°    | 32.4  | 16.6  | 14.3  | 14.3  | 14.3  |
| 87.5°  | 12.1  | 6.1   | 6.1   | 5.3   | 5.3   |
| 90°    | 0.9   | 10.4  | 28.3  | 26.6  | 27.5  |
| 92.5°  | 17.9  | 24.2  | 25.1  | 26.0  | 26.0  |
| 95°    | 42.2  | 50.3  | 51.7  | 51.7  | 50.3  |
| 97.5°  | 70.2  | 77.7  | 80.9  | 80.9  | 80.9  |
| 100°   | 102.5 | 109.2 | 111.5 | 111.5 | 110.7 |
| 102.5° | 136.6 | 141.6 | 144.7 | 145.6 | 144.7 |
| 105°   | 173.9 | 176.2 | 177.9 | 179.4 | 179.4 |
| 107.5° | 210.9 | 214.3 | 214.3 | 214.9 | 210.9 |
| 110°   | 246.7 | 251.4 | 251.4 | 251.4 | 249.0 |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|--------|-------|-------|-------|-------|-------|
| 112.5° | 285.4 | 290.3 | 289.4 | 287.1 | 285.4 |
| 115°   | 323.6 | 328.1 | 326.7 | 325.9 | 323.6 |
| 117.5° | 361.3 | 367.7 | 363.7 | 361.3 | 359.0 |
| 120°   | 399.5 | 405.9 | 399.5 | 399.5 | 396.9 |
| 122.5° | 434.1 | 442.2 | 438.2 | 435.9 | 434.1 |
| 125°   | 470.6 | 477.8 | 475.4 | 472.8 | 472.0 |
| 127.5° | 506.0 | 515.0 | 511.9 | 508.4 | 506.0 |
| 130°   | 539.3 | 549.7 | 548.3 | 546.5 | 543.3 |
| 132.5° | 576.5 | 584.6 | 585.2 | 581.2 | 578.9 |
| 135°   | 608.6 | 617.5 | 619.4 | 618.4 | 616.1 |
| 137.5° | 644.4 | 651.7 | 653.1 | 652.6 | 649.0 |
| 140°   | 675.9 | 683.2 | 687.2 | 687.2 | 684.0 |
| 142.5° | 708.3 | 715.5 | 717.8 | 718.7 | 715.5 |
| 145°   | 738.9 | 744.7 | 749.3 | 750.1 | 747.0 |
| 147.5° | 766.4 | 773.6 | 777.0 | 778.5 | 775.3 |
| 150°   | 794.7 | 799.6 | 802.7 | 805.4 | 802.7 |
| 152.5° | 819.8 | 824.7 | 828.7 | 831.9 | 828.7 |
| 155°   | 845.0 | 847.2 | 849.8 | 853.8 | 851.3 |
| 157.5° | 866.6 | 868.3 | 869.8 | 875.6 | 871.5 |
| 160°   | 886.0 | 887.7 | 888.6 | 893.4 | 890.0 |
| 162.5° | 903.8 | 903.8 | 904.7 | 910.2 | 906.2 |
| 165°   | 919.2 | 918.3 | 918.3 | 924.0 | 920.0 |
| 167.5° | 933.0 | 930.4 | 930.4 | 936.1 | 932.1 |
| 170°   | 943.4 | 941.1 | 940.3 | 946.0 | 941.1 |
| 172.5° | 950.6 | 948.4 | 947.5 | 953.2 | 948.4 |
| 175°   | 956.4 | 954.1 | 952.4 | 958.2 | 953.2 |
| 177.5° | 959.6 | 957.3 | 955.5 | 960.5 | 955.5 |
| 180°   | 958.2 | 958.2 | 958.2 | 958.2 | 958.2 |

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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 | 8.06             | 8.81  | 9.12  | 9.87  | 11.29 | 4.05           | 4.80 | 5.10 | 5.85 | 7.27  |
|                 | 3H   | 9.71             | 10.38 | 10.77 | 11.44 | 12.88 | 5.22           | 5.88 | 6.28 | 6.95 | 8.39  |
|                 | 4H   | 10.30            | 10.93 | 11.37 | 12.00 | 13.44 | 5.65           | 6.28 | 6.72 | 7.35 | 8.79  |
|                 | 6H   | 10.70            | 11.28 | 11.78 | 12.35 | 13.81 | 5.95           | 6.54 | 7.03 | 7.60 | 9.06  |
|                 | 8H   | 10.81            | 11.37 | 11.90 | 12.45 | 13.90 | 6.03           | 6.59 | 7.12 | 7.67 | 9.12  |
|                 | 12H  | 10.86            | 11.39 | 11.95 | 12.46 | 13.94 | 6.07           | 6.59 | 7.16 | 7.67 | 9.15  |
| 4H              | 2H   | 8.07             | 8.70  | 9.15  | 9.77  | 11.21 | 4.62           | 5.25 | 5.70 | 6.32 | 7.76  |
|                 | 3H   | 9.86             | 10.39 | 10.95 | 11.48 | 12.94 | 5.95           | 6.47 | 7.03 | 7.56 | 9.02  |
|                 | 4H   | 10.53            | 11.02 | 11.63 | 12.10 | 13.58 | 6.48           | 6.96 | 7.57 | 8.04 | 9.52  |
|                 | 6H   | 11.02            | 11.44 | 12.12 | 12.54 | 14.01 | 6.87           | 7.29 | 7.97 | 8.39 | 9.86  |
|                 | 8H   | 11.18            | 11.57 | 12.28 | 12.67 | 14.16 | 6.99           | 7.38 | 8.09 | 8.47 | 9.96  |
|                 | 12H  | 11.26            | 11.61 | 12.38 | 12.72 | 14.21 | 7.04           | 7.39 | 8.16 | 8.50 | 9.99  |
| 8H              | 4H   | 10.49            | 10.88 | 11.59 | 11.97 | 13.46 | 6.74           | 7.12 | 7.83 | 8.22 | 9.71  |
|                 | 6H   | 11.03            | 11.35 | 12.15 | 12.49 | 13.97 | 7.23           | 7.55 | 8.35 | 8.68 | 10.17 |
|                 | 8H   | 11.23            | 11.51 | 12.36 | 12.63 | 14.14 | 7.41           | 7.68 | 8.53 | 8.80 | 10.31 |
|                 | 12H  | 11.35            | 11.59 | 12.48 | 12.71 | 14.25 | 7.51           | 7.75 | 8.64 | 8.87 | 10.41 |
| 12H             | 4H   | 10.44            | 10.79 | 11.56 | 11.90 | 13.39 | 6.73           | 7.08 | 7.85 | 8.19 | 9.69  |
|                 | 6H   | 11.00            | 11.28 | 12.13 | 12.40 | 13.91 | 7.27           | 7.55 | 8.40 | 8.67 | 10.18 |
|                 | 8H   | 11.20            | 11.45 | 12.33 | 12.56 | 14.11 | 7.46           | 7.71 | 8.59 | 8.82 | 10.37 |