

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: P904907

Luminaire Tested: DFN2DIP-4P3F0-020D030US835-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P904907  
REPORT IS A COMBINATION OF REPORTS P900559 AND P897473  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-4P3F0-020D030US835-FLLONL  
Description: 3 foot, 90deg - 4way Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

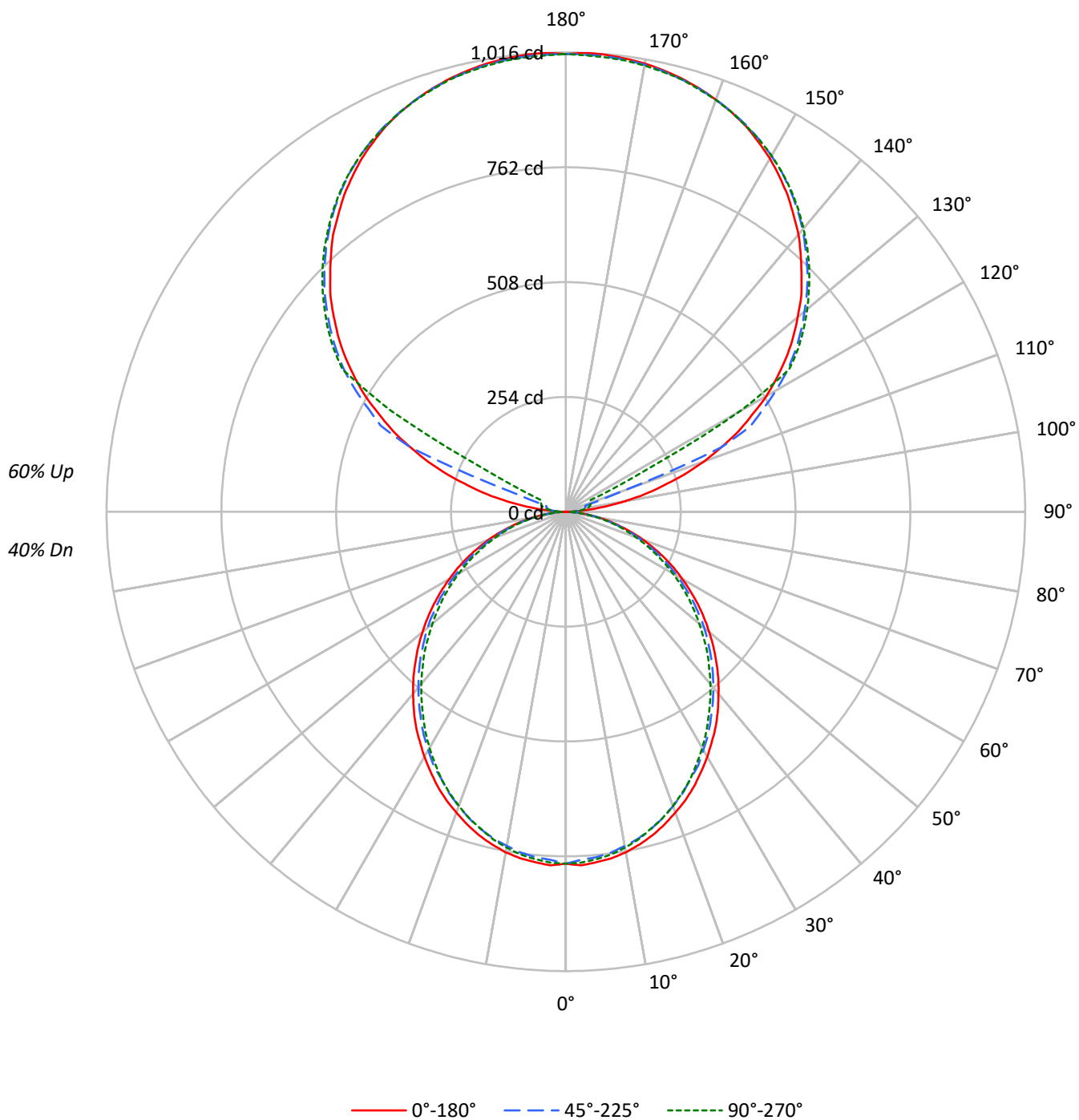
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 4950.0 lumens  
Efficiency: N/A  
Efficacy: 130.6 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.07' x L: 3.07' x H: 0.1')  
CIE Type: General Diffuse  
  
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 | 50 | 30 | 10 |
| RCR |     |     |     |     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 0   | 105 | 105 | 105 | 105 | 95 | 95 | 95 | 95 | 78 | 78 | 78 | 62 | 62 | 62 | 47 | 47 | 47 |    |    | 40 |
| 1   | 96  | 91  | 87  | 84  | 87 | 83 | 80 | 77 | 68 | 66 | 64 | 54 | 53 | 51 | 41 | 41 | 40 |    |    | 34 |
| 2   | 87  | 80  | 74  | 69  | 79 | 73 | 68 | 63 | 60 | 56 | 53 | 48 | 45 | 43 | 37 | 35 | 33 |    |    | 28 |
| 3   | 79  | 70  | 63  | 57  | 72 | 64 | 58 | 53 | 53 | 48 | 44 | 42 | 39 | 36 | 32 | 30 | 28 |    |    | 24 |
| 4   | 73  | 62  | 54  | 48  | 66 | 57 | 50 | 45 | 47 | 42 | 38 | 37 | 34 | 31 | 29 | 26 | 24 |    |    | 21 |
| 5   | 67  | 55  | 47  | 41  | 60 | 50 | 44 | 38 | 42 | 37 | 33 | 34 | 30 | 27 | 26 | 23 | 21 |    |    | 18 |
| 6   | 61  | 49  | 41  | 36  | 56 | 45 | 38 | 33 | 38 | 32 | 28 | 30 | 26 | 23 | 24 | 21 | 19 |    |    | 16 |
| 7   | 57  | 45  | 37  | 31  | 51 | 41 | 34 | 29 | 34 | 29 | 25 | 28 | 24 | 21 | 22 | 19 | 17 |    |    | 14 |
| 8   | 52  | 40  | 33  | 27  | 48 | 37 | 30 | 26 | 31 | 26 | 22 | 25 | 21 | 18 | 20 | 17 | 15 |    |    | 12 |
| 9   | 49  | 37  | 29  | 24  | 44 | 34 | 27 | 23 | 28 | 23 | 20 | 23 | 19 | 17 | 18 | 15 | 13 |    |    | 11 |
| 10  | 46  | 34  | 27  | 22  | 41 | 31 | 25 | 20 | 26 | 21 | 18 | 21 | 18 | 15 | 17 | 14 | 12 |    |    | 10 |

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

|     | 0°  | 45° | 90° |
|-----|-----|-----|-----|
| 0°  | 887 | 887 | 887 |
| 5°  | 888 | 874 | 880 |
| 10° | 880 | 862 | 868 |
| 15° | 866 | 847 | 849 |
| 20° | 848 | 826 | 830 |
| 25° | 830 | 802 | 807 |
| 30° | 808 | 780 | 779 |
| 35° | 787 | 753 | 749 |
| 40° | 761 | 727 | 721 |
| 45° | 735 | 700 | 691 |
| 50° | 706 | 672 | 658 |
| 55° | 676 | 639 | 627 |
| 60° | 643 | 600 | 591 |
| 65° | 605 | 560 | 549 |
| 70° | 558 | 511 | 504 |
| 75° | 494 | 452 | 461 |
| 80° | 415 | 378 | 381 |
| 85° | 292 | 250 | 250 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 735 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 73.2   | 1.5       |
| 10°-20°   | 206.1  | 4.2       |
| 20°-30°   | 302.9  | 6.1       |
| 30°-40°   | 351.8  | 7.1       |
| 40°-50°   | 351.3  | 7.1       |
| 50°-60°   | 306.3  | 6.2       |
| 60°-70°   | 226.5  | 4.6       |
| 70°-80°   | 128.1  | 2.6       |
| 80°-90°   | 35.6   | 0.7       |
| 90°-100°  | 33.4   | 0.7       |
| 100°-110° | 124.4  | 2.5       |
| 110°-120° | 330.1  | 6.7       |
| 120°-130° | 547.5  | 11.1      |
| 130°-140° | 581.5  | 11.7      |
| 140°-150° | 540.5  | 10.9      |
| 150°-160° | 434.5  | 8.8       |
| 160°-170° | 280.0  | 5.7       |
| 170°-180° | 96.4   | 1.9       |
| 0°-30°    | 582.2  | 11.8      |
| 0°-40°    | 934.0  | 18.9      |
| 0°-60°    | 1591.6 | 32.2      |
| 0°-90°    | 1981.8 | 40.0      |
| 90°-120°  | 487.9  | 9.9       |
| 90°-150°  | 2157.3 | 43.6      |
| 90°-180°  | 2968.0 | 60.0      |
| 0°-180°   | 4950.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 778  | 778   | 778  | 778   | 778  |      |
| 5°   | 778  | 775   | 767  | 773   | 772  | 74   |
| 15°  | 741  | 736   | 727  | 730   | 726  | 209  |
| 25°  | 670  | 664   | 652  | 653   | 652  | 309  |
| 35°  | 578  | 571   | 559  | 554   | 551  | 361  |
| 45°  | 471  | 466   | 454  | 446   | 443  | 363  |
| 55°  | 356  | 352   | 343  | 334   | 330  | 318  |
| 65°  | 240  | 236   | 228  | 222   | 218  | 238  |
| 75°  | 126  | 124   | 120  | 116   | 118  | 134  |
| 85°  | 31   | 30    | 29   | 27    | 26   | 34   |
| 90°  | 1    | 9     | 15   | 18    | 20   | 5    |
| 95°  | 48   | 23    | 28   | 32    | 32   | 56   |
| 105° | 223  | 245   | 45   | 53    | 56   | 238  |
| 115° | 421  | 434   | 452  | 113   | 60   | 415  |
| 125° | 596  | 605   | 619  | 624   | 626  | 531  |
| 135° | 737  | 749   | 755  | 763   | 761  | 569  |
| 145° | 855  | 854   | 867  | 872   | 868  | 535  |
| 155° | 941  | 935   | 944  | 948   | 942  | 434  |
| 165° | 992  | 988   | 990  | 995   | 990  | 280  |
| 175° | 1015 | 1010  | 1011 | 1016  | 1009 | 97   |
| 180° | 1012 | 1012  | 1012 | 1012  | 1012 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|--------|-------|-------|-------|-------|-------|
| 0°     | 778.2 | 778.2 | 778.2 | 778.2 | 778.2 |
| 2.5°   | 782.7 | 779.0 | 770.7 | 778.2 | 776.8 |
| 5°     | 778.2 | 775.3 | 767.0 | 773.0 | 771.5 |
| 7.5°   | 773.0 | 768.5 | 760.3 | 766.3 | 764.8 |
| 10°    | 764.8 | 759.6 | 750.6 | 756.5 | 754.3 |
| 12.5°  | 753.5 | 749.1 | 740.1 | 743.8 | 742.3 |
| 15°    | 740.8 | 736.4 | 726.6 | 729.6 | 725.9 |
| 17.5°  | 725.1 | 720.7 | 710.9 | 714.6 | 710.9 |
| 20°    | 707.9 | 703.4 | 692.9 | 695.2 | 692.2 |
| 22.5°  | 690.7 | 684.0 | 674.2 | 674.2 | 672.7 |
| 25°    | 670.5 | 664.5 | 651.8 | 653.2 | 651.8 |
| 27.5°  | 648.0 | 642.8 | 633.1 | 630.9 | 627.1 |
| 30°    | 625.6 | 619.6 | 608.4 | 606.2 | 603.1 |
| 32.5°  | 601.6 | 597.2 | 585.2 | 580.7 | 577.7 |
| 35°    | 578.5 | 571.0 | 559.0 | 554.5 | 550.7 |
| 37.5°  | 552.3 | 545.5 | 533.5 | 528.3 | 524.5 |
| 40°    | 525.3 | 519.3 | 507.3 | 500.7 | 497.6 |
| 42.5°  | 499.1 | 493.1 | 481.2 | 473.7 | 469.2 |
| 45°    | 470.7 | 465.5 | 454.2 | 446.0 | 443.0 |
| 47.5°  | 443.0 | 437.8 | 425.8 | 417.5 | 413.1 |
| 50°    | 413.8 | 410.1 | 399.6 | 389.1 | 385.4 |
| 52.5°  | 385.4 | 380.1 | 370.4 | 362.2 | 357.0 |
| 55°    | 356.2 | 351.7 | 342.7 | 333.8 | 330.0 |
| 57.5°  | 327.0 | 323.3 | 313.5 | 304.6 | 301.5 |
| 60°    | 297.8 | 294.9 | 284.4 | 276.1 | 273.9 |
| 62.5°  | 269.4 | 264.1 | 256.7 | 249.2 | 246.2 |
| 65°    | 240.2 | 235.7 | 228.3 | 221.5 | 217.8 |
| 67.5°  | 210.3 | 206.5 | 199.8 | 194.6 | 191.6 |
| 70°    | 182.6 | 179.6 | 172.8 | 167.6 | 164.7 |
| 72.5°  | 154.2 | 151.2 | 147.4 | 142.2 | 140.0 |
| 75°    | 125.7 | 124.3 | 120.4 | 116.0 | 117.5 |
| 77.5°  | 100.3 | 97.3  | 95.7  | 93.5  | 91.3  |
| 80°    | 74.9  | 74.1  | 72.6  | 70.3  | 68.8  |
| 82.5°  | 50.9  | 50.9  | 50.2  | 47.2  | 47.2  |
| 85°    | 30.6  | 29.9  | 29.2  | 26.9  | 26.2  |
| 87.5°  | 13.5  | 12.0  | 10.5  | 8.3   | 7.5   |
| 90°    | 0.7   | 8.8   | 14.6  | 18.4  | 19.7  |
| 92.5°  | 18.4  | 15.4  | 17.6  | 19.1  | 19.7  |
| 95°    | 47.6  | 23.4  | 28.5  | 32.3  | 31.5  |
| 97.5°  | 85.7  | 25.7  | 37.3  | 39.6  | 40.3  |
| 100°   | 129.7 | 29.3  | 41.8  | 47.6  | 49.1  |
| 102.5° | 178.0 | 176.6 | 43.2  | 51.2  | 53.5  |
| 105°   | 222.7 | 244.7 | 44.7  | 52.7  | 55.7  |
| 107.5° | 274.7 | 293.0 | 46.2  | 54.2  | 57.2  |
| 110°   | 324.6 | 339.9 | 128.2 | 55.0  | 57.9  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 371.5  | 384.6  | 372.2  | 56.4   | 58.6   |
| 115°   | 421.2  | 433.7  | 452.0  | 112.8  | 60.1   |
| 117.5° | 464.5  | 479.1  | 491.6  | 386.8  | 194.9  |
| 120°   | 512.8  | 523.8  | 537.0  | 545.8  | 446.9  |
| 122.5° | 553.8  | 565.6  | 580.3  | 584.6  | 585.4  |
| 125°   | 595.6  | 605.1  | 619.1  | 624.2  | 626.4  |
| 127.5° | 633.7  | 643.9  | 655.0  | 662.3  | 663.0  |
| 130°   | 669.6  | 681.4  | 689.4  | 697.4  | 696.8  |
| 132.5° | 706.2  | 715.8  | 723.8  | 730.4  | 729.7  |
| 135°   | 737.0  | 748.8  | 755.3  | 762.7  | 761.2  |
| 137.5° | 769.2  | 778.0  | 785.4  | 792.7  | 790.5  |
| 140°   | 800.7  | 806.6  | 814.6  | 821.2  | 817.6  |
| 142.5° | 827.2  | 832.3  | 841.8  | 847.6  | 844.0  |
| 145°   | 855.0  | 854.2  | 866.7  | 871.8  | 868.1  |
| 147.5° | 879.1  | 876.9  | 889.4  | 893.0  | 890.1  |
| 150°   | 902.6  | 897.5  | 909.2  | 913.5  | 909.9  |
| 152.5° | 922.3  | 916.5  | 927.5  | 931.9  | 926.8  |
| 155°   | 941.4  | 934.9  | 943.6  | 948.0  | 942.2  |
| 157.5° | 956.8  | 951.0  | 957.6  | 962.7  | 956.8  |
| 160°   | 970.0  | 965.6  | 970.0  | 974.4  | 969.2  |
| 162.5° | 981.7  | 977.3  | 981.0  | 986.1  | 979.5  |
| 165°   | 991.9  | 987.6  | 989.8  | 994.9  | 989.8  |
| 167.5° | 1000.0 | 995.6  | 997.8  | 1003.0 | 996.4  |
| 170°   | 1006.6 | 1002.2 | 1003.7 | 1008.8 | 1002.2 |
| 172.5° | 1011.0 | 1006.6 | 1008.1 | 1013.2 | 1006.6 |
| 175°   | 1014.6 | 1009.5 | 1011.0 | 1016.1 | 1008.8 |
| 177.5° | 1016.1 | 1011.0 | 1011.8 | 1016.9 | 1010.3 |
| 180°   | 1012.5 | 1012.5 | 1012.5 | 1012.5 | 1012.5 |

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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 | 5.82             | 6.60  | 6.86  | 7.65  | 9.05  | 5.38           | 6.16 | 6.42  | 7.20  | 8.61  |
|                 | 3H   | 7.47             | 8.17  | 8.52  | 9.22  | 10.65 | 6.98           | 7.68 | 8.03  | 8.73  | 10.16 |
|                 | 4H   | 8.05             | 8.72  | 9.11  | 9.77  | 11.20 | 7.56           | 8.22 | 8.62  | 9.28  | 10.71 |
|                 | 6H   | 8.45             | 9.06  | 9.52  | 10.12 | 11.56 | 7.95           | 8.56 | 9.02  | 9.61  | 11.06 |
|                 | 8H   | 8.55             | 9.13  | 9.62  | 10.20 | 11.64 | 8.05           | 8.63 | 9.12  | 9.70  | 11.14 |
|                 | 12H  | 8.59             | 9.14  | 9.67  | 10.21 | 11.68 | 8.08           | 8.63 | 9.16  | 9.70  | 11.17 |
| 4H              | 2H   | 6.27             | 6.93  | 7.34  | 7.99  | 9.42  | 5.92           | 6.58 | 6.98  | 7.63  | 9.07  |
|                 | 3H   | 8.12             | 8.68  | 9.20  | 9.76  | 11.20 | 7.72           | 8.27 | 8.79  | 9.35  | 10.80 |
|                 | 4H   | 8.83             | 9.34  | 9.91  | 10.41 | 11.88 | 8.41           | 8.91 | 9.49  | 9.99  | 11.45 |
|                 | 6H   | 9.34             | 9.77  | 10.43 | 10.87 | 12.33 | 8.91           | 9.34 | 9.99  | 10.44 | 11.90 |
|                 | 8H   | 9.48             | 9.89  | 10.57 | 10.98 | 12.46 | 9.05           | 9.45 | 10.13 | 10.54 | 12.02 |
|                 | 12H  | 9.55             | 9.92  | 10.66 | 11.02 | 12.50 | 9.10           | 9.47 | 10.21 | 10.57 | 12.05 |
| 8H              | 4H   | 9.02             | 9.42  | 10.11 | 10.51 | 11.99 | 8.64           | 9.05 | 9.73  | 10.14 | 11.61 |
|                 | 6H   | 9.64             | 9.98  | 10.75 | 11.11 | 12.58 | 9.25           | 9.59 | 10.37 | 10.72 | 12.20 |
|                 | 8H   | 9.86             | 10.15 | 10.97 | 11.26 | 12.76 | 9.46           | 9.76 | 10.58 | 10.87 | 12.36 |
|                 | 12H  | 9.98             | 10.24 | 11.10 | 11.35 | 12.88 | 9.57           | 9.83 | 10.69 | 10.94 | 12.47 |
| 12H             | 4H   | 9.00             | 9.37  | 10.10 | 10.47 | 11.95 | 8.63           | 9.00 | 9.74  | 10.10 | 11.58 |
|                 | 6H   | 9.67             | 9.96  | 10.78 | 11.07 | 12.57 | 9.29           | 9.59 | 10.41 | 10.70 | 12.19 |
|                 | 8H   | 9.90             | 10.16 | 11.02 | 11.27 | 12.80 | 9.52           | 9.78 | 10.64 | 10.89 | 12.42 |