

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: P910444

Luminaire Tested: DFN2DIP-4P3F0-060D030US850-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P910444  
REPORT IS A COMBINATION OF REPORTS P899048 AND P895917  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-4P3F0-060D030US850-RLLFLL  
Description: 3 foot, 90deg - 4way Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

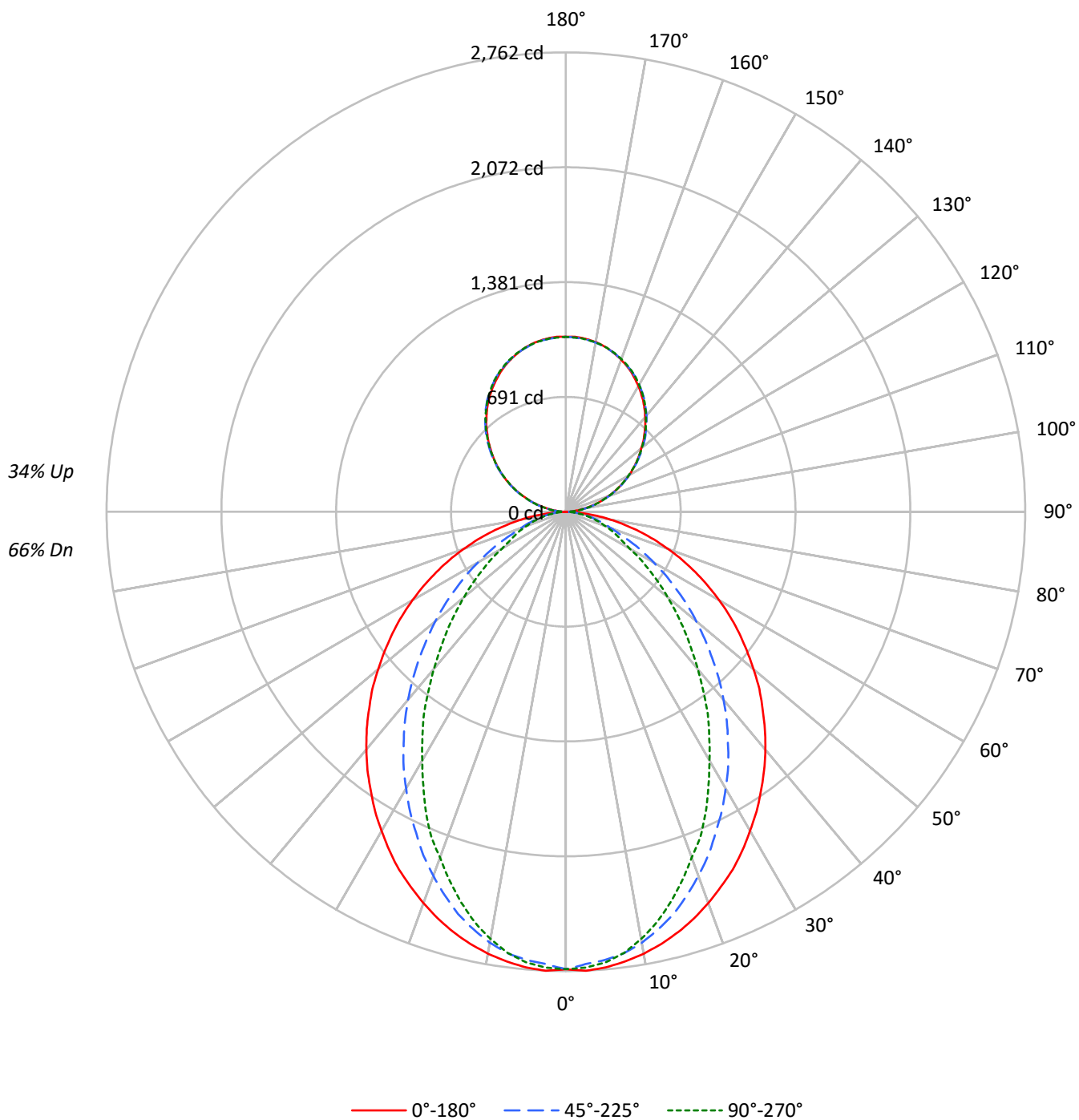
Lumens per Lamp: N/A  
Luminaire Lumens: 8600.3 lumens  
Efficiency: N/A  
Efficacy: 102.0 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.07' x L: 3.07' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 84.3  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9963  
Total Harmonic Distortion (THDi): 0.065  
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   | 111 | 111 | 111 | 111 | 104 | 104 | 104 | 104 | 92 | 92 | 92 | 81 | 81 | 81 | 71 | 71 | 71 |
| 1   | 102 | 98  | 94  | 91  | 96  | 92  | 89  | 86  | 82 | 79 | 77 | 72 | 70 | 69 | 63 | 62 | 61 |
| 2   | 93  | 86  | 80  | 75  | 88  | 81  | 76  | 72  | 72 | 68 | 65 | 64 | 61 | 58 | 57 | 54 | 52 |
| 3   | 86  | 76  | 69  | 63  | 80  | 72  | 66  | 61  | 65 | 59 | 55 | 57 | 53 | 50 | 51 | 48 | 45 |
| 4   | 79  | 68  | 60  | 54  | 74  | 65  | 58  | 52  | 58 | 52 | 48 | 52 | 47 | 44 | 46 | 42 | 40 |
| 5   | 73  | 61  | 53  | 47  | 68  | 58  | 51  | 45  | 52 | 46 | 42 | 47 | 42 | 38 | 42 | 38 | 35 |
| 6   | 67  | 55  | 47  | 41  | 63  | 52  | 45  | 40  | 47 | 41 | 37 | 42 | 38 | 34 | 38 | 34 | 31 |
| 7   | 62  | 50  | 42  | 37  | 59  | 48  | 40  | 35  | 43 | 37 | 33 | 39 | 34 | 30 | 35 | 31 | 28 |
| 8   | 58  | 46  | 38  | 33  | 55  | 44  | 37  | 32  | 40 | 34 | 29 | 36 | 31 | 27 | 32 | 28 | 25 |
| 9   | 54  | 42  | 35  | 29  | 51  | 40  | 33  | 29  | 36 | 31 | 27 | 33 | 28 | 25 | 30 | 26 | 23 |
| 10  | 51  | 39  | 31  | 27  | 48  | 37  | 30  | 26  | 34 | 28 | 24 | 31 | 26 | 23 | 28 | 24 | 21 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3134 | 3134 | 3134 |
| 5°  | 3137 | 3082 | 3103 |
| 10° | 3104 | 3020 | 3001 |
| 15° | 3059 | 2918 | 2844 |
| 20° | 3001 | 2779 | 2652 |
| 25° | 2941 | 2623 | 2466 |
| 30° | 2861 | 2463 | 2231 |
| 35° | 2783 | 2291 | 2024 |
| 40° | 2703 | 2114 | 1788 |
| 45° | 2611 | 1917 | 1573 |
| 50° | 2515 | 1719 | 1364 |
| 55° | 2414 | 1508 | 1163 |
| 60° | 2298 | 1287 | 956  |
| 65° | 2164 | 1063 | 859  |
| 70° | 2002 | 854  | 776  |
| 75° | 1798 | 748  | 704  |
| 80° | 1503 | 621  | 607  |
| 85° | 1019 | 404  | 450  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2611 cd/sqm

TEST NUMBER: P910444

CATALOG NUMBER: DFN2DIP-4P3F0-060D030US850-RLLFLL

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 257.7  | 3.0       |
| 10°-20°   | 707.6  | 8.2       |
| 20°-30°   | 993.4  | 11.6      |
| 30°-40°   | 1082.8 | 12.6      |
| 40°-50°   | 995.2  | 11.6      |
| 50°-60°   | 781.6  | 9.1       |
| 60°-70°   | 508.8  | 5.9       |
| 70°-80°   | 261.9  | 3.0       |
| 80°-90°   | 69.8   | 0.8       |
| 90°-100°  | 65.1   | 0.8       |
| 100°-110° | 206.9  | 2.4       |
| 110°-120° | 354.0  | 4.1       |
| 120°-130° | 465.6  | 5.4       |
| 130°-140° | 522.6  | 6.1       |
| 140°-150° | 512.5  | 6.0       |
| 150°-160° | 429.9  | 5.0       |
| 160°-170° | 285.1  | 3.3       |
| 170°-180° | 99.7   | 1.2       |
| 0°-30°    | 1958.7 | 22.8      |
| 0°-40°    | 3041.5 | 35.4      |
| 0°-60°    | 4818.4 | 56.0      |
| 0°-90°    | 5658.9 | 65.8      |
| 90°-120°  | 626.0  | 7.3       |
| 90°-150°  | 2126.7 | 24.7      |
| 90°-180°  | 2941.0 | 34.2      |
| 0°-180°   | 8600.3 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2750 | 2750  | 2750 | 2750  | 2750 |      |
| 5°   | 2750 | 2738  | 2705 | 2728  | 2720 | 261  |
| 15°  | 2616 | 2588  | 2504 | 2456  | 2432 | 737  |
| 25°  | 2374 | 2295  | 2130 | 2028  | 1991 | 1092 |
| 35°  | 2046 | 1919  | 1700 | 1543  | 1488 | 1281 |
| 45°  | 1672 | 1506  | 1244 | 1068  | 1008 | 1292 |
| 55°  | 1272 | 1078  | 809  | 660   | 612  | 1136 |
| 65°  | 859  | 657   | 433  | 349   | 341  | 851  |
| 75°  | 458  | 284   | 199  | 182   | 179  | 484  |
| 85°  | 107  | 55    | 47   | 47    | 47   | 123  |
| 90°  | 1    | 11    | 31   | 29    | 30   | 8    |
| 95°  | 46   | 55    | 57   | 57    | 55   | 52   |
| 105° | 191  | 194   | 195  | 197   | 197  | 202  |
| 115° | 355  | 360   | 359  | 358   | 355  | 351  |
| 125° | 517  | 525   | 522  | 519   | 518  | 462  |
| 135° | 668  | 678   | 680  | 679   | 677  | 517  |
| 145° | 812  | 818   | 823  | 824   | 820  | 507  |
| 155° | 928  | 930   | 933  | 938   | 935  | 427  |
| 165° | 1009 | 1008  | 1008 | 1015  | 1010 | 285  |
| 175° | 1050 | 1048  | 1046 | 1052  | 1047 | 100  |
| 180° | 1052 | 1052  | 1052 | 1052  | 1052 |      |

TEST NUMBER: P910444

CATALOG NUMBER: DFN2DIP-4P3F0-060D030US850-RLLFLL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2750.1 | 2750.1 | 2750.1 | 2750.1 | 2750.1 |
| 2.5°   | 2762.5 | 2750.1 | 2722.6 | 2747.7 | 2742.7 |
| 5°     | 2750.1 | 2737.7 | 2705.2 | 2727.7 | 2720.3 |
| 7.5°   | 2727.7 | 2712.8 | 2678.0 | 2687.8 | 2675.4 |
| 10°    | 2697.8 | 2680.3 | 2630.8 | 2623.1 | 2608.3 |
| 12.5°  | 2660.6 | 2638.1 | 2570.8 | 2556.0 | 2528.5 |
| 15°    | 2615.7 | 2588.2 | 2503.7 | 2456.4 | 2431.6 |
| 17.5°  | 2563.5 | 2523.5 | 2419.0 | 2364.3 | 2324.5 |
| 20°    | 2503.7 | 2453.8 | 2329.5 | 2267.4 | 2212.5 |
| 22.5°  | 2439.0 | 2381.7 | 2237.3 | 2152.8 | 2115.5 |
| 25°    | 2374.4 | 2294.6 | 2130.4 | 2028.5 | 1991.0 |
| 27.5°  | 2297.3 | 2212.5 | 2030.8 | 1913.8 | 1856.6 |
| 30°    | 2215.1 | 2120.3 | 1921.2 | 1794.5 | 1727.2 |
| 32.5°  | 2135.4 | 2020.8 | 1817.0 | 1667.5 | 1605.2 |
| 35°    | 2045.9 | 1918.9 | 1700.0 | 1543.1 | 1488.2 |
| 37.5°  | 1958.7 | 1821.6 | 1590.4 | 1418.5 | 1356.4 |
| 40°    | 1866.6 | 1717.4 | 1475.7 | 1299.1 | 1234.4 |
| 42.5°  | 1772.1 | 1612.8 | 1361.4 | 1177.1 | 1115.1 |
| 45°    | 1672.5 | 1505.6 | 1244.5 | 1067.5 | 1007.9 |
| 47.5°  | 1578.0 | 1401.3 | 1132.5 | 955.6  | 901.0  |
| 50°    | 1473.4 | 1296.8 | 1022.9 | 851.0  | 799.0  |
| 52.5°  | 1371.2 | 1184.5 | 918.4  | 754.1  | 706.9  |
| 55°    | 1271.7 | 1077.6 | 808.8  | 659.6  | 612.3  |
| 57.5°  | 1169.8 | 970.6  | 711.9  | 572.5  | 532.5  |
| 60°    | 1065.2 | 866.1  | 609.7  | 483.0  | 443.0  |
| 62.5°  | 963.3  | 764.2  | 522.6  | 403.2  | 383.4  |
| 65°    | 858.7  | 657.0  | 433.1  | 348.6  | 340.9  |
| 67.5°  | 759.1  | 557.4  | 348.6  | 306.1  | 298.7  |
| 70°    | 654.5  | 460.5  | 288.6  | 263.8  | 253.7  |
| 72.5°  | 555.1  | 370.7  | 241.3  | 221.6  | 216.5  |
| 75°    | 457.9  | 283.6  | 199.1  | 181.7  | 179.3  |
| 77.5°  | 361.0  | 201.5  | 156.8  | 146.8  | 141.8  |
| 80°    | 271.2  | 144.4  | 119.3  | 109.6  | 109.6  |
| 82.5°  | 189.1  | 97.1   | 82.1   | 77.1   | 77.1   |
| 85°    | 106.9  | 54.7   | 47.2   | 47.2   | 47.2   |
| 87.5°  | 39.9   | 19.9   | 19.9   | 17.4   | 17.4   |
| 90°    | 1.0    | 11.4   | 31.1   | 29.2   | 30.2   |
| 92.5°  | 19.6   | 26.6   | 27.6   | 28.5   | 28.5   |
| 95°    | 46.4   | 55.2   | 56.8   | 56.8   | 55.2   |
| 97.5°  | 77.1   | 85.3   | 88.8   | 88.8   | 88.8   |
| 100°   | 112.6  | 119.9  | 122.4  | 122.4  | 121.5  |
| 102.5° | 150.0  | 155.5  | 158.9  | 159.9  | 158.9  |
| 105°   | 191.0  | 193.5  | 195.4  | 197.0  | 197.0  |
| 107.5° | 231.6  | 235.3  | 235.3  | 236.0  | 231.6  |
| 110°   | 270.9  | 276.0  | 276.0  | 276.0  | 273.5  |

TEST NUMBER: P910444

CATALOG NUMBER: DFN2DIP-4P3F0-060D030US850-RLLFLL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 313.4  | 318.8  | 317.8  | 315.3  | 313.4  |
| 115°   | 355.3  | 360.3  | 358.8  | 357.9  | 355.3  |
| 117.5° | 396.8  | 403.8  | 399.4  | 396.8  | 394.2  |
| 120°   | 438.7  | 445.7  | 438.7  | 438.7  | 435.8  |
| 122.5° | 476.8  | 485.6  | 481.2  | 478.6  | 476.8  |
| 125°   | 516.8  | 524.7  | 522.1  | 519.2  | 518.3  |
| 127.5° | 555.7  | 565.6  | 562.2  | 558.3  | 555.7  |
| 130°   | 592.2  | 603.6  | 602.1  | 600.2  | 596.6  |
| 132.5° | 633.1  | 642.0  | 642.7  | 638.2  | 635.7  |
| 135°   | 668.4  | 678.2  | 680.1  | 679.2  | 676.6  |
| 137.5° | 707.7  | 715.6  | 717.2  | 716.6  | 712.8  |
| 140°   | 742.3  | 750.2  | 754.7  | 754.7  | 751.1  |
| 142.5° | 777.9  | 785.7  | 788.3  | 789.3  | 785.7  |
| 145°   | 811.5  | 817.8  | 822.9  | 823.8  | 820.3  |
| 147.5° | 841.6  | 849.5  | 853.3  | 854.9  | 851.4  |
| 150°   | 872.7  | 878.1  | 881.5  | 884.4  | 881.5  |
| 152.5° | 900.3  | 905.6  | 910.0  | 913.6  | 910.0  |
| 155°   | 927.9  | 930.3  | 933.2  | 937.7  | 934.9  |
| 157.5° | 951.6  | 953.5  | 955.2  | 961.5  | 957.1  |
| 160°   | 972.9  | 974.8  | 975.8  | 981.1  | 977.4  |
| 162.5° | 992.6  | 992.6  | 993.6  | 999.5  | 995.1  |
| 165°   | 1009.4 | 1008.4 | 1008.4 | 1014.7 | 1010.3 |
| 167.5° | 1024.6 | 1021.7 | 1021.7 | 1028.0 | 1023.6 |
| 170°   | 1036.0 | 1033.5 | 1032.6 | 1038.9 | 1033.5 |
| 172.5° | 1043.9 | 1041.5 | 1040.5 | 1046.8 | 1041.5 |
| 175°   | 1050.3 | 1047.8 | 1045.9 | 1052.2 | 1046.8 |
| 177.5° | 1053.8 | 1051.2 | 1049.3 | 1054.8 | 1049.3 |
| 180°   | 1052.2 | 1052.2 | 1052.2 | 1052.2 | 1052.2 |

TEST NUMBER: P910444

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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 | 12.44            | 13.42 | 13.26 | 14.25 | 15.28 | 8.40           | 9.38  | 9.22  | 10.21 | 11.24 |
|                 | 3H   | 14.13            | 15.00 | 14.96 | 15.84 | 16.90 | 9.60           | 10.47 | 10.43 | 11.32 | 12.37 |
|                 | 4H   | 14.74            | 15.56 | 15.59 | 16.41 | 17.48 | 10.05          | 10.88 | 10.90 | 11.73 | 12.79 |
|                 | 6H   | 15.16            | 15.92 | 16.02 | 16.78 | 17.86 | 10.37          | 11.13 | 11.23 | 11.99 | 13.07 |
|                 | 8H   | 15.29            | 16.02 | 16.16 | 16.89 | 17.97 | 10.46          | 11.19 | 11.33 | 12.06 | 13.14 |
|                 | 12H  | 15.36            | 16.05 | 16.23 | 16.92 | 18.02 | 10.51          | 11.20 | 11.38 | 12.07 | 13.17 |
| 4H              | 2H   | 12.48            | 13.30 | 13.33 | 14.15 | 15.22 | 9.01           | 9.84  | 9.87  | 10.69 | 11.76 |
|                 | 3H   | 14.31            | 15.00 | 15.18 | 15.88 | 16.97 | 10.37          | 11.06 | 11.23 | 11.94 | 13.02 |
|                 | 4H   | 15.01            | 15.63 | 15.88 | 16.51 | 17.62 | 10.92          | 11.54 | 11.79 | 12.42 | 13.53 |
|                 | 6H   | 15.53            | 16.06 | 16.42 | 16.97 | 18.08 | 11.34          | 11.88 | 12.23 | 12.78 | 13.90 |
|                 | 8H   | 15.70            | 16.20 | 16.59 | 17.10 | 18.23 | 11.47          | 11.97 | 12.36 | 12.87 | 13.99 |
|                 | 12H  | 15.80            | 16.25 | 16.71 | 17.17 | 18.30 | 11.54          | 11.99 | 12.45 | 12.90 | 14.04 |
| 8H              | 4H   | 14.99            | 15.49 | 15.88 | 16.39 | 17.51 | 11.21          | 11.71 | 12.10 | 12.61 | 13.73 |
|                 | 6H   | 15.55            | 15.97 | 16.47 | 16.91 | 18.03 | 11.72          | 12.14 | 12.64 | 13.08 | 14.20 |
|                 | 8H   | 15.77            | 16.13 | 16.69 | 17.07 | 18.21 | 11.91          | 12.28 | 12.84 | 13.21 | 14.35 |
|                 | 12H  | 15.91            | 16.23 | 16.84 | 17.16 | 18.35 | 12.03          | 12.35 | 12.96 | 13.28 | 14.47 |
| 12H             | 4H   | 14.94            | 15.39 | 15.85 | 16.31 | 17.44 | 11.22          | 11.67 | 12.13 | 12.59 | 13.72 |
|                 | 6H   | 15.53            | 15.89 | 16.46 | 16.83 | 17.97 | 11.77          | 12.14 | 12.70 | 13.07 | 14.22 |
|                 | 8H   | 15.75            | 16.07 | 16.68 | 17.00 | 18.19 | 11.98          | 12.31 | 12.91 | 13.23 | 14.43 |