

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: P924694

Luminaire Tested: DFN2DIP-PN2F0-030D020US950-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P924694  
REPORT IS A COMBINATION OF REPORTS P899464 AND P896349  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN2F0-030D020US950-RLLFLL  
Description: 2 foot, Pentagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

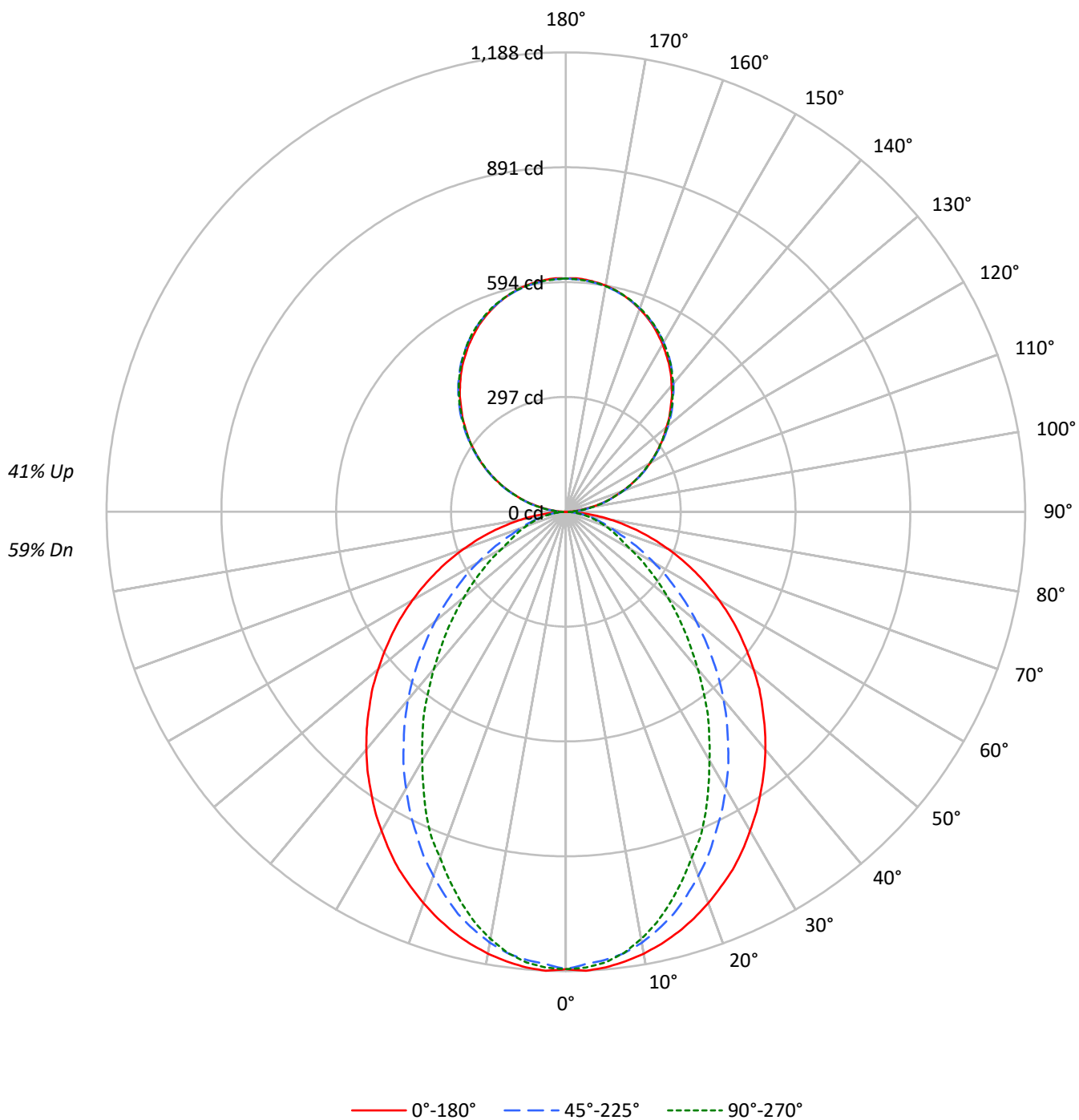
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 4121.3 lumens  
Efficiency: N/A  
Efficacy: 94.1 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 2.17' x L: 2.29' x H: 0.1')  
CIE Type: General Diffuse  
  
Input Watts (W): 43.8  
Input Voltage (V):  
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 | 30 | 10 |
| RCR |     |     |     |     |     |     |     |     |    |    |    |    |    |    |    |    |    |
| 0   | 109 | 109 | 109 | 109 | 102 | 102 | 102 | 102 | 88 | 88 | 88 | 76 | 76 | 76 | 64 | 64 | 64 |
| 1   | 100 | 96  | 92  | 89  | 94  | 90  | 87  | 84  | 78 | 76 | 74 | 68 | 66 | 64 | 58 | 57 | 56 |
| 2   | 92  | 85  | 79  | 74  | 86  | 79  | 74  | 70  | 69 | 65 | 62 | 60 | 57 | 55 | 52 | 50 | 48 |
| 3   | 84  | 75  | 68  | 62  | 78  | 70  | 64  | 59  | 62 | 57 | 53 | 54 | 50 | 47 | 46 | 44 | 41 |
| 4   | 77  | 67  | 59  | 53  | 72  | 63  | 56  | 51  | 55 | 50 | 46 | 48 | 44 | 41 | 42 | 39 | 36 |
| 5   | 71  | 60  | 52  | 46  | 66  | 56  | 49  | 44  | 50 | 44 | 40 | 44 | 39 | 36 | 38 | 34 | 32 |
| 6   | 66  | 54  | 46  | 40  | 61  | 51  | 44  | 39  | 45 | 39 | 35 | 40 | 35 | 32 | 35 | 31 | 28 |
| 7   | 61  | 49  | 41  | 36  | 57  | 46  | 39  | 34  | 41 | 35 | 31 | 36 | 32 | 28 | 32 | 28 | 25 |
| 8   | 57  | 45  | 37  | 32  | 53  | 42  | 35  | 30  | 38 | 32 | 28 | 33 | 29 | 25 | 29 | 26 | 23 |
| 9   | 53  | 41  | 34  | 29  | 50  | 39  | 32  | 27  | 35 | 29 | 25 | 31 | 26 | 23 | 27 | 24 | 21 |
| 10  | 50  | 38  | 31  | 26  | 47  | 36  | 29  | 25  | 32 | 27 | 23 | 29 | 24 | 21 | 25 | 22 | 19 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2562 | 2562 | 2562 |
| 5°  | 2562 | 2516 | 2534 |
| 10° | 2533 | 2461 | 2448 |
| 15° | 2494 | 2374 | 2317 |
| 20° | 2443 | 2257 | 2157 |
| 25° | 2392 | 2127 | 2003 |
| 30° | 2324 | 1994 | 1810 |
| 35° | 2258 | 1851 | 1640 |
| 40° | 2190 | 1704 | 1446 |
| 45° | 2111 | 1542 | 1269 |
| 50° | 2029 | 1378 | 1098 |
| 55° | 1944 | 1204 | 933  |
| 60° | 1845 | 1024 | 765  |
| 65° | 1730 | 840  | 684  |
| 70° | 1591 | 669  | 613  |
| 75° | 1416 | 580  | 551  |
| 80° | 1166 | 471  | 466  |
| 85° | 762  | 292  | 331  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2111 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 110.9  | 2.7       |
| 10°-20°   | 304.3  | 7.4       |
| 20°-30°   | 427.3  | 10.4      |
| 30°-40°   | 465.7  | 11.3      |
| 40°-50°   | 428.1  | 10.4      |
| 50°-60°   | 336.2  | 8.2       |
| 60°-70°   | 218.8  | 5.3       |
| 70°-80°   | 112.6  | 2.7       |
| 80°-90°   | 30.5   | 0.7       |
| 90°-100°  | 37.3   | 0.9       |
| 100°-110° | 118.7  | 2.9       |
| 110°-120° | 203.0  | 4.9       |
| 120°-130° | 267.0  | 6.5       |
| 130°-140° | 299.7  | 7.3       |
| 140°-150° | 293.9  | 7.1       |
| 150°-160° | 246.5  | 6.0       |
| 160°-170° | 163.5  | 4.0       |
| 170°-180° | 57.1   | 1.4       |
| 0°-30°    | 842.5  | 20.4      |
| 0°-40°    | 1308.2 | 31.7      |
| 0°-60°    | 2072.5 | 50.3      |
| 0°-90°    | 2434.4 | 59.1      |
| 90°-120°  | 359.0  | 8.7       |
| 90°-150°  | 1219.7 | 29.6      |
| 90°-180°  | 1687.0 | 40.9      |
| 0°-180°   | 4121.3 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1183 | 1183  | 1183 | 1183  | 1183 |      |
| 5°   | 1183 | 1178  | 1164 | 1173  | 1170 | 112  |
| 15°  | 1125 | 1113  | 1077 | 1057  | 1046 | 317  |
| 25°  | 1021 | 987   | 916  | 872   | 856  | 470  |
| 35°  | 880  | 825   | 731  | 664   | 640  | 551  |
| 45°  | 719  | 648   | 535  | 459   | 434  | 556  |
| 55°  | 547  | 464   | 348  | 284   | 263  | 489  |
| 65°  | 369  | 283   | 186  | 150   | 147  | 366  |
| 75°  | 197  | 122   | 86   | 78    | 77   | 208  |
| 85°  | 46   | 24    | 20   | 20    | 20   | 53   |
| 90°  | 1    | 7     | 18   | 17    | 17   | 4    |
| 95°  | 26   | 32    | 32   | 32    | 32   | 30   |
| 105° | 110  | 111   | 112  | 113   | 113  | 116  |
| 115° | 204  | 207   | 206  | 205   | 204  | 202  |
| 125° | 296  | 301   | 300  | 298   | 297  | 265  |
| 135° | 383  | 389   | 390  | 390   | 388  | 296  |
| 145° | 465  | 469   | 472  | 472   | 470  | 291  |
| 155° | 532  | 534   | 535  | 538   | 536  | 245  |
| 165° | 579  | 578   | 578  | 582   | 580  | 163  |
| 175° | 602  | 601   | 600  | 603   | 600  | 57   |
| 180° | 603  | 603   | 603  | 603   | 603  |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1182.9 | 1182.9 | 1182.9 | 1182.9 | 1182.9 |
| 2.5°   | 1188.2 | 1182.9 | 1171.0 | 1181.8 | 1179.7 |
| 5°     | 1182.9 | 1177.5 | 1163.6 | 1173.2 | 1170.0 |
| 7.5°   | 1173.2 | 1166.8 | 1151.9 | 1156.1 | 1150.7 |
| 10°    | 1160.4 | 1152.9 | 1131.5 | 1128.2 | 1121.9 |
| 12.5°  | 1144.3 | 1134.7 | 1105.8 | 1099.4 | 1087.6 |
| 15°    | 1125.1 | 1113.2 | 1076.9 | 1056.6 | 1045.9 |
| 17.5°  | 1102.5 | 1085.5 | 1040.4 | 1017.0 | 999.8  |
| 20°    | 1076.9 | 1055.4 | 1001.9 | 975.3  | 951.6  |
| 22.5°  | 1049.1 | 1024.4 | 962.3  | 926.0  | 909.9  |
| 25°    | 1021.3 | 986.9  | 916.3  | 872.4  | 856.3  |
| 27.5°  | 988.1  | 951.6  | 873.5  | 823.2  | 798.5  |
| 30°    | 952.8  | 912.0  | 826.4  | 771.9  | 742.9  |
| 32.5°  | 918.4  | 869.2  | 781.5  | 717.2  | 690.4  |
| 35°    | 880.0  | 825.3  | 731.1  | 663.7  | 640.1  |
| 37.5°  | 842.5  | 783.5  | 684.0  | 610.1  | 583.5  |
| 40°    | 802.9  | 738.7  | 634.8  | 558.8  | 531.0  |
| 42.5°  | 762.2  | 693.7  | 585.6  | 506.3  | 479.6  |
| 45°    | 719.4  | 647.6  | 535.3  | 459.2  | 433.5  |
| 47.5°  | 678.7  | 602.7  | 487.1  | 411.0  | 387.5  |
| 50°    | 633.7  | 557.7  | 440.0  | 366.0  | 343.6  |
| 52.5°  | 589.8  | 509.5  | 395.1  | 324.4  | 304.0  |
| 55°    | 546.9  | 463.5  | 347.8  | 283.7  | 263.4  |
| 57.5°  | 503.1  | 417.5  | 306.2  | 246.2  | 229.1  |
| 60°    | 458.1  | 372.5  | 262.3  | 207.7  | 190.6  |
| 62.5°  | 414.3  | 328.7  | 224.8  | 173.4  | 164.9  |
| 65°    | 369.3  | 282.6  | 186.2  | 149.9  | 146.6  |
| 67.5°  | 326.6  | 239.7  | 149.9  | 131.7  | 128.4  |
| 70°    | 281.5  | 198.1  | 124.1  | 113.4  | 109.1  |
| 72.5°  | 238.7  | 159.4  | 103.8  | 95.3   | 93.1   |
| 75°    | 196.9  | 122.0  | 85.7   | 78.1   | 77.1   |
| 77.5°  | 155.2  | 86.6   | 67.4   | 63.2   | 61.0   |
| 80°    | 116.7  | 62.1   | 51.3   | 47.1   | 47.1   |
| 82.5°  | 81.3   | 41.8   | 35.3   | 33.2   | 33.2   |
| 85°    | 46.0   | 23.5   | 20.3   | 20.3   | 20.3   |
| 87.5°  | 17.2   | 8.5    | 8.5    | 7.5    | 7.5    |
| 90°    | 0.6    | 6.6    | 17.8   | 16.7   | 17.3   |
| 92.5°  | 11.3   | 15.3   | 15.8   | 16.4   | 16.4   |
| 95°    | 26.5   | 31.7   | 32.5   | 32.5   | 31.7   |
| 97.5°  | 44.2   | 48.9   | 50.9   | 50.9   | 50.9   |
| 100°   | 64.6   | 68.8   | 70.2   | 70.2   | 69.6   |
| 102.5° | 86.1   | 89.1   | 91.1   | 91.7   | 91.1   |
| 105°   | 109.5  | 111.0  | 112.1  | 113.0  | 113.0  |
| 107.5° | 132.8  | 135.0  | 135.0  | 135.4  | 132.8  |
| 110°   | 155.4  | 158.3  | 158.3  | 158.3  | 156.8  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|--------|-------|-------|-------|-------|-------|
| 112.5° | 179.7 | 182.8 | 182.3 | 180.8 | 179.7 |
| 115°   | 203.8 | 206.6 | 205.8 | 205.2 | 203.8 |
| 117.5° | 227.6 | 231.6 | 229.1 | 227.6 | 226.1 |
| 120°   | 251.6 | 255.6 | 251.6 | 251.6 | 249.9 |
| 122.5° | 273.4 | 278.5 | 276.0 | 274.6 | 273.4 |
| 125°   | 296.3 | 300.9 | 299.5 | 297.8 | 297.3 |
| 127.5° | 318.7 | 324.4 | 322.4 | 320.2 | 318.7 |
| 130°   | 339.6 | 346.2 | 345.3 | 344.2 | 342.2 |
| 132.5° | 363.1 | 368.2 | 368.5 | 366.0 | 364.5 |
| 135°   | 383.3 | 388.9 | 390.0 | 389.5 | 388.0 |
| 137.5° | 405.8 | 410.4 | 411.4 | 411.0 | 408.8 |
| 140°   | 425.7 | 430.3 | 432.8 | 432.8 | 430.8 |
| 142.5° | 446.1 | 450.6 | 452.1 | 452.6 | 450.6 |
| 145°   | 465.4 | 469.0 | 471.9 | 472.4 | 470.4 |
| 147.5° | 482.6 | 487.2 | 489.4 | 490.3 | 488.3 |
| 150°   | 500.5 | 503.5 | 505.5 | 507.1 | 505.5 |
| 152.5° | 516.3 | 519.4 | 521.9 | 523.9 | 521.9 |
| 155°   | 532.1 | 533.6 | 535.2 | 537.8 | 536.1 |
| 157.5° | 545.8 | 546.8 | 547.8 | 551.4 | 548.8 |
| 160°   | 558.0 | 559.0 | 559.6 | 562.7 | 560.5 |
| 162.5° | 569.3 | 569.3 | 569.7 | 573.3 | 570.7 |
| 165°   | 578.9 | 578.3 | 578.3 | 581.9 | 579.5 |
| 167.5° | 587.6 | 585.9 | 585.9 | 589.6 | 587.1 |
| 170°   | 594.2 | 592.7 | 592.1 | 595.8 | 592.7 |
| 172.5° | 598.7 | 597.2 | 596.7 | 600.4 | 597.2 |
| 175°   | 602.4 | 600.9 | 599.8 | 603.4 | 600.4 |
| 177.5° | 604.4 | 602.9 | 601.8 | 604.8 | 601.8 |
| 180°   | 603.4 | 603.4 | 603.4 | 603.4 | 603.4 |

TEST NUMBER: P924694

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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 | 11.10            | 12.02 | 11.99 | 12.91 | 14.05 | 7.07           | 7.98  | 7.95  | 8.88  | 10.02 |
|                 | 3H   | 12.77            | 13.58 | 13.66 | 14.49 | 15.65 | 8.25           | 9.06  | 9.14  | 9.97  | 11.14 |
|                 | 4H   | 13.37            | 14.13 | 14.28 | 15.05 | 16.22 | 8.69           | 9.46  | 9.60  | 10.37 | 11.55 |
|                 | 6H   | 13.78            | 14.48 | 14.70 | 15.40 | 16.59 | 9.00           | 9.71  | 9.92  | 10.63 | 11.82 |
|                 | 8H   | 13.90            | 14.57 | 14.82 | 15.50 | 16.69 | 9.09           | 9.76  | 10.02 | 10.70 | 11.88 |
|                 | 12H  | 13.95            | 14.59 | 14.89 | 15.52 | 16.73 | 9.13           | 9.77  | 10.06 | 10.70 | 11.91 |
| 4H              | 2H   | 11.13            | 11.90 | 12.04 | 12.81 | 13.98 | 7.67           | 8.43  | 8.58  | 9.35  | 10.52 |
|                 | 3H   | 12.94            | 13.58 | 13.87 | 14.52 | 15.71 | 9.00           | 9.64  | 9.93  | 10.59 | 11.77 |
|                 | 4H   | 13.62            | 14.20 | 14.56 | 15.14 | 16.36 | 9.54           | 10.12 | 10.48 | 11.06 | 12.28 |
|                 | 6H   | 14.12            | 14.62 | 15.07 | 15.58 | 16.80 | 9.95           | 10.45 | 10.90 | 11.41 | 12.62 |
|                 | 8H   | 14.29            | 14.75 | 15.24 | 15.71 | 16.94 | 10.07          | 10.53 | 11.02 | 11.49 | 12.72 |
|                 | 12H  | 14.37            | 14.79 | 15.34 | 15.77 | 17.00 | 10.13          | 10.55 | 11.10 | 11.52 | 12.75 |
| 8H              | 4H   | 13.59            | 14.06 | 14.54 | 15.01 | 16.24 | 9.81           | 10.28 | 10.77 | 11.24 | 12.47 |
|                 | 6H   | 14.14            | 14.52 | 15.11 | 15.52 | 16.75 | 10.31          | 10.70 | 11.29 | 11.70 | 12.92 |
|                 | 8H   | 14.34            | 14.68 | 15.33 | 15.67 | 16.91 | 10.49          | 10.83 | 11.48 | 11.82 | 13.06 |
|                 | 12H  | 14.47            | 14.77 | 15.46 | 15.75 | 17.04 | 10.60          | 10.90 | 11.59 | 11.88 | 13.17 |
| 12H             | 4H   | 13.55            | 13.97 | 14.52 | 14.94 | 16.17 | 9.82           | 10.24 | 10.79 | 11.21 | 12.45 |
|                 | 6H   | 14.11            | 14.45 | 15.10 | 15.44 | 16.68 | 10.36          | 10.70 | 11.34 | 11.69 | 12.93 |
|                 | 8H   | 14.32            | 14.62 | 15.31 | 15.60 | 16.89 | 10.56          | 10.86 | 11.54 | 11.84 | 13.13 |