

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: P904968

Luminaire Tested: DFN2DIP-4P3F0-050D030US835-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P904968  
REPORT IS A COMBINATION OF REPORTS P899046 AND P895917  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-4P3F0-050D030US835-RLLFLL  
Description: 3 foot, 90deg - 4way Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

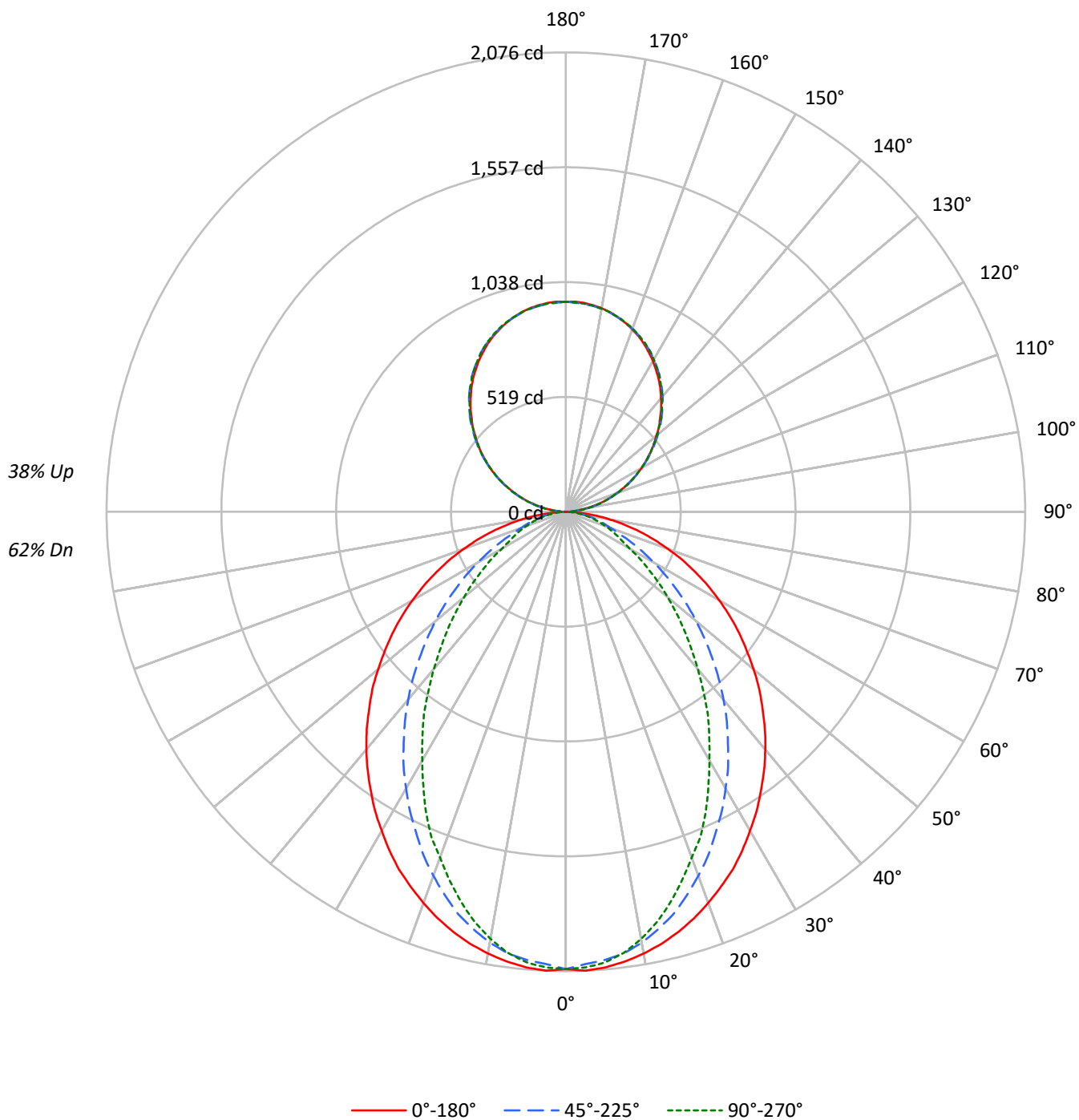
Lumens per Lamp: N/A  
Luminaire Lumens: 6905.0 lumens  
Efficiency: N/A  
Efficacy: 97.1 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.07' x L: 3.07' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 71.1  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9971  
Total Harmonic Distortion (THDi): 0.049  
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   | 110 | 110 | 110 | 110 | 103 | 103 | 103 | 103 | 90 | 90 | 90 | 78 | 78 | 78 | 67 | 67 | 67 |
| 1   | 101 | 97  | 93  | 90  | 94  | 91  | 88  | 85  | 80 | 77 | 75 | 69 | 68 | 66 | 60 | 59 | 58 |
| 2   | 92  | 85  | 79  | 74  | 86  | 80  | 75  | 70  | 71 | 67 | 63 | 62 | 59 | 56 | 53 | 51 | 49 |
| 3   | 85  | 75  | 68  | 63  | 79  | 71  | 65  | 60  | 63 | 58 | 54 | 55 | 51 | 48 | 48 | 45 | 43 |
| 4   | 78  | 67  | 60  | 54  | 73  | 63  | 57  | 51  | 56 | 51 | 46 | 49 | 45 | 42 | 43 | 40 | 37 |
| 5   | 72  | 60  | 52  | 46  | 67  | 57  | 50  | 44  | 51 | 45 | 41 | 45 | 40 | 37 | 39 | 36 | 33 |
| 6   | 66  | 54  | 46  | 41  | 62  | 51  | 44  | 39  | 46 | 40 | 36 | 41 | 36 | 32 | 36 | 32 | 29 |
| 7   | 62  | 49  | 42  | 36  | 58  | 47  | 40  | 35  | 42 | 36 | 32 | 37 | 33 | 29 | 33 | 29 | 26 |
| 8   | 57  | 45  | 37  | 32  | 54  | 43  | 36  | 31  | 38 | 33 | 28 | 34 | 30 | 26 | 30 | 27 | 24 |
| 9   | 53  | 41  | 34  | 29  | 50  | 39  | 32  | 28  | 35 | 30 | 26 | 32 | 27 | 24 | 28 | 24 | 22 |
| 10  | 50  | 38  | 31  | 26  | 47  | 36  | 30  | 25  | 33 | 27 | 23 | 29 | 25 | 22 | 26 | 22 | 20 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2355 | 2355 | 2355 |
| 5°  | 2357 | 2316 | 2332 |
| 10° | 2332 | 2269 | 2255 |
| 15° | 2299 | 2193 | 2137 |
| 20° | 2255 | 2088 | 1993 |
| 25° | 2210 | 1971 | 1853 |
| 30° | 2150 | 1851 | 1676 |
| 35° | 2091 | 1722 | 1521 |
| 40° | 2031 | 1588 | 1343 |
| 45° | 1962 | 1441 | 1182 |
| 50° | 1890 | 1292 | 1025 |
| 55° | 1814 | 1133 | 874  |
| 60° | 1727 | 967  | 718  |
| 65° | 1626 | 799  | 646  |
| 70° | 1504 | 642  | 583  |
| 75° | 1351 | 562  | 529  |
| 80° | 1129 | 467  | 456  |
| 85° | 766  | 304  | 338  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 1962 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 193.7  | 2.8       |
| 10°-20°   | 531.7  | 7.7       |
| 20°-30°   | 746.5  | 10.8      |
| 30°-40°   | 813.7  | 11.8      |
| 40°-50°   | 747.9  | 10.8      |
| 50°-60°   | 587.3  | 8.5       |
| 60°-70°   | 382.3  | 5.5       |
| 70°-80°   | 196.8  | 2.9       |
| 80°-90°   | 52.9   | 0.8       |
| 90°-100°  | 58.7   | 0.9       |
| 100°-110° | 186.5  | 2.7       |
| 110°-120° | 319.2  | 4.6       |
| 120°-130° | 419.8  | 6.1       |
| 130°-140° | 471.2  | 6.8       |
| 140°-150° | 462.1  | 6.7       |
| 150°-160° | 387.7  | 5.6       |
| 160°-170° | 257.1  | 3.7       |
| 170°-180° | 89.9   | 1.3       |
| 0°-30°    | 1471.8 | 21.3      |
| 0°-40°    | 2285.5 | 33.1      |
| 0°-60°    | 3620.7 | 52.4      |
| 0°-90°    | 4252.7 | 61.6      |
| 90°-120°  | 564.5  | 8.2       |
| 90°-150°  | 1917.7 | 27.8      |
| 90°-180°  | 2652.0 | 38.4      |
| 0°-180°   | 6905.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2066 | 2066  | 2066 | 2066  | 2066 |      |
| 5°   | 2066 | 2057  | 2033 | 2050  | 2044 | 196  |
| 15°  | 1966 | 1945  | 1881 | 1846  | 1827 | 554  |
| 25°  | 1784 | 1724  | 1601 | 1524  | 1496 | 821  |
| 35°  | 1537 | 1442  | 1277 | 1160  | 1118 | 962  |
| 45°  | 1257 | 1131  | 935  | 802   | 757  | 971  |
| 55°  | 956  | 810   | 608  | 496   | 460  | 854  |
| 65°  | 645  | 494   | 325  | 262   | 256  | 640  |
| 75°  | 344  | 213   | 150  | 136   | 135  | 364  |
| 85°  | 80   | 41    | 36   | 36    | 36   | 92   |
| 90°  | 1    | 10    | 28   | 26    | 27   | 7    |
| 95°  | 42   | 50    | 51   | 51    | 50   | 46   |
| 105° | 172  | 174   | 176  | 178   | 178  | 182  |
| 115° | 320  | 325   | 324  | 323   | 320  | 317  |
| 125° | 466  | 473   | 471  | 468   | 467  | 416  |
| 135° | 603  | 612   | 613  | 612   | 610  | 466  |
| 145° | 732  | 737   | 742  | 743   | 740  | 457  |
| 155° | 837  | 839   | 842  | 846   | 843  | 385  |
| 165° | 910  | 909   | 909  | 915   | 911  | 257  |
| 175° | 947  | 945   | 943  | 949   | 944  | 90   |
| 180° | 949  | 949   | 949  | 949   | 949  |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2066.5 | 2066.5 | 2066.5 | 2066.5 | 2066.5 |
| 2.5°   | 2075.8 | 2066.5 | 2045.9 | 2064.7 | 2060.9 |
| 5°     | 2066.5 | 2057.2 | 2032.8 | 2049.6 | 2044.1 |
| 7.5°   | 2049.6 | 2038.5 | 2012.3 | 2019.7 | 2010.3 |
| 10°    | 2027.2 | 2014.1 | 1976.8 | 1971.1 | 1959.9 |
| 12.5°  | 1999.2 | 1982.4 | 1931.8 | 1920.7 | 1900.0 |
| 15°    | 1965.5 | 1944.9 | 1881.4 | 1845.9 | 1827.2 |
| 17.5°  | 1926.2 | 1896.3 | 1817.7 | 1776.6 | 1746.6 |
| 20°    | 1881.4 | 1843.9 | 1750.4 | 1703.8 | 1662.5 |
| 22.5°  | 1832.8 | 1789.7 | 1681.2 | 1617.7 | 1589.7 |
| 25°    | 1784.1 | 1724.2 | 1600.8 | 1524.2 | 1496.0 |
| 27.5°  | 1726.2 | 1662.5 | 1526.0 | 1438.1 | 1395.1 |
| 30°    | 1664.5 | 1593.3 | 1443.7 | 1348.4 | 1297.8 |
| 32.5°  | 1604.6 | 1518.5 | 1365.3 | 1253.0 | 1206.2 |
| 35°    | 1537.3 | 1441.9 | 1277.4 | 1159.5 | 1118.3 |
| 37.5°  | 1471.8 | 1368.9 | 1195.1 | 1065.9 | 1019.3 |
| 40°    | 1402.6 | 1290.5 | 1108.9 | 976.2  | 927.6  |
| 42.5°  | 1331.6 | 1211.9 | 1023.0 | 884.5  | 837.9  |
| 45°    | 1256.8 | 1131.4 | 935.1  | 802.2  | 757.3  |
| 47.5°  | 1185.7 | 1053.0 | 851.0  | 718.1  | 677.0  |
| 50°    | 1107.2 | 974.4  | 768.7  | 639.5  | 600.4  |
| 52.5°  | 1030.4 | 890.1  | 690.1  | 566.7  | 531.2  |
| 55°    | 955.6  | 809.7  | 607.7  | 495.6  | 460.1  |
| 57.5°  | 879.0  | 729.4  | 534.9  | 430.2  | 400.2  |
| 60°    | 800.4  | 650.8  | 458.1  | 362.9  | 332.9  |
| 62.5°  | 723.8  | 574.2  | 392.7  | 303.0  | 288.1  |
| 65°    | 645.2  | 493.7  | 325.4  | 261.9  | 256.2  |
| 67.5°  | 570.4  | 418.9  | 261.9  | 230.0  | 224.4  |
| 70°    | 491.9  | 346.0  | 216.9  | 198.2  | 190.7  |
| 72.5°  | 417.1  | 278.6  | 181.4  | 166.5  | 162.7  |
| 75°    | 344.1  | 213.1  | 149.6  | 136.5  | 134.7  |
| 77.5°  | 271.2  | 151.4  | 117.9  | 110.3  | 106.5  |
| 80°    | 203.8  | 108.5  | 89.7   | 82.3   | 82.3   |
| 82.5°  | 142.1  | 73.0   | 61.7   | 57.9   | 57.9   |
| 85°    | 80.4   | 41.1   | 35.5   | 35.5   | 35.5   |
| 87.5°  | 30.0   | 14.9   | 14.9   | 13.1   | 13.1   |
| 90°    | 0.9    | 10.3   | 28.0   | 26.3   | 27.2   |
| 92.5°  | 17.7   | 24.0   | 24.9   | 25.7   | 25.7   |
| 95°    | 41.8   | 49.8   | 51.2   | 51.2   | 49.8   |
| 97.5°  | 69.5   | 76.9   | 80.1   | 80.1   | 80.1   |
| 100°   | 101.5  | 108.1  | 110.4  | 110.4  | 109.6  |
| 102.5° | 135.3  | 140.2  | 143.3  | 144.2  | 143.3  |
| 105°   | 172.2  | 174.5  | 176.2  | 177.6  | 177.6  |
| 107.5° | 208.8  | 212.2  | 212.2  | 212.8  | 208.8  |
| 110°   | 244.3  | 248.9  | 248.9  | 248.9  | 246.6  |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|--------|-------|-------|-------|-------|-------|
| 112.5° | 282.6 | 287.5 | 286.6 | 284.3 | 282.6 |
| 115°   | 320.4 | 324.9 | 323.5 | 322.7 | 320.4 |
| 117.5° | 357.8 | 364.1 | 360.1 | 357.8 | 355.5 |
| 120°   | 395.6 | 401.9 | 395.6 | 395.6 | 393.0 |
| 122.5° | 429.9 | 437.9 | 433.9 | 431.6 | 429.9 |
| 125°   | 466.0 | 473.1 | 470.8 | 468.2 | 467.4 |
| 127.5° | 501.1 | 510.0 | 506.9 | 503.4 | 501.1 |
| 130°   | 534.0 | 544.3 | 542.9 | 541.2 | 538.0 |
| 132.5° | 570.9 | 578.9 | 579.5 | 575.5 | 573.2 |
| 135°   | 602.7 | 611.5 | 613.3 | 612.4 | 610.1 |
| 137.5° | 638.1 | 645.3 | 646.7 | 646.2 | 642.7 |
| 140°   | 669.3 | 676.5 | 680.5 | 680.5 | 677.3 |
| 142.5° | 701.4 | 708.5 | 710.8 | 711.7 | 708.5 |
| 145°   | 731.7 | 737.4 | 742.0 | 742.8 | 739.7 |
| 147.5° | 758.9 | 766.0 | 769.4 | 770.9 | 767.7 |
| 150°   | 786.9 | 791.8 | 794.9 | 797.5 | 794.9 |
| 152.5° | 811.8 | 816.6 | 820.6 | 823.8 | 820.6 |
| 155°   | 836.7 | 838.9 | 841.5 | 845.5 | 843.0 |
| 157.5° | 858.1 | 859.8 | 861.3 | 867.0 | 863.0 |
| 160°   | 877.3 | 879.0 | 879.9 | 884.7 | 881.3 |
| 162.5° | 895.0 | 895.0 | 895.9 | 901.3 | 897.3 |
| 165°   | 910.2 | 909.3 | 909.3 | 915.0 | 911.0 |
| 167.5° | 923.9 | 921.3 | 921.3 | 927.0 | 923.0 |
| 170°   | 934.2 | 931.9 | 931.1 | 936.8 | 931.9 |
| 172.5° | 941.3 | 939.1 | 938.2 | 943.9 | 939.1 |
| 175°   | 947.1 | 944.8 | 943.1 | 948.8 | 943.9 |
| 177.5° | 950.2 | 947.9 | 946.2 | 951.1 | 946.2 |
| 180°   | 948.8 | 948.8 | 948.8 | 948.8 | 948.8 |

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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 | 11.11            | 12.04 | 11.97 | 12.92 | 14.01 | 7.07           | 8.00  | 7.93  | 8.88  | 9.98  |
|                 | 3H   | 12.79            | 13.62 | 13.66 | 14.51 | 15.63 | 8.26           | 9.09  | 9.13  | 9.98  | 11.10 |
|                 | 4H   | 13.40            | 14.19 | 14.29 | 15.08 | 16.21 | 8.71           | 9.50  | 9.60  | 10.39 | 11.52 |
|                 | 6H   | 13.82            | 14.55 | 14.72 | 15.45 | 16.59 | 9.03           | 9.76  | 9.93  | 10.65 | 11.80 |
|                 | 8H   | 13.95            | 14.64 | 14.86 | 15.55 | 16.70 | 9.12           | 9.81  | 10.03 | 10.72 | 11.87 |
|                 | 12H  | 14.01            | 14.67 | 14.92 | 15.58 | 16.75 | 9.16           | 9.82  | 10.07 | 10.73 | 11.90 |
| 4H              | 2H   | 11.14            | 11.92 | 12.03 | 12.82 | 13.95 | 7.67           | 8.46  | 8.57  | 9.35  | 10.49 |
|                 | 3H   | 12.97            | 13.62 | 13.87 | 14.55 | 15.70 | 9.03           | 9.68  | 9.93  | 10.60 | 11.75 |
|                 | 4H   | 13.66            | 14.26 | 14.58 | 15.18 | 16.35 | 9.57           | 10.17 | 10.49 | 11.09 | 12.26 |
|                 | 6H   | 14.18            | 14.69 | 15.11 | 15.63 | 16.81 | 9.99           | 10.50 | 10.92 | 11.45 | 12.62 |
|                 | 8H   | 14.35            | 14.83 | 15.28 | 15.77 | 16.96 | 10.12          | 10.60 | 11.05 | 11.53 | 12.72 |
|                 | 12H  | 14.45            | 14.88 | 15.40 | 15.84 | 17.03 | 10.18          | 10.61 | 11.13 | 11.57 | 12.76 |
| 8H              | 4H   | 13.64            | 14.12 | 14.57 | 15.05 | 16.24 | 9.86           | 10.34 | 10.79 | 11.27 | 12.46 |
|                 | 6H   | 14.20            | 14.60 | 15.16 | 15.57 | 16.76 | 10.37          | 10.77 | 11.33 | 11.74 | 12.93 |
|                 | 8H   | 14.41            | 14.76 | 15.38 | 15.73 | 16.94 | 10.56          | 10.91 | 11.52 | 11.88 | 13.08 |
|                 | 12H  | 14.55            | 14.86 | 15.52 | 15.82 | 17.08 | 10.68          | 10.98 | 11.64 | 11.94 | 13.20 |
| 12H             | 4H   | 13.59            | 14.02 | 14.54 | 14.98 | 16.17 | 9.87           | 10.30 | 10.82 | 11.25 | 12.45 |
|                 | 6H   | 14.18            | 14.53 | 15.14 | 15.49 | 16.70 | 10.42          | 10.77 | 11.38 | 11.74 | 12.95 |
|                 | 8H   | 14.40            | 14.71 | 15.37 | 15.67 | 16.92 | 10.63          | 10.94 | 11.60 | 11.90 | 13.15 |