

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: P911463

Luminaire Tested: DFN2DIP-PN4F0-070D100US850-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P911463  
REPORT IS A COMBINATION OF REPORTS P901244 AND P898053  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-070D100US850-RLLONL  
Description: 4 foot, Pentagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

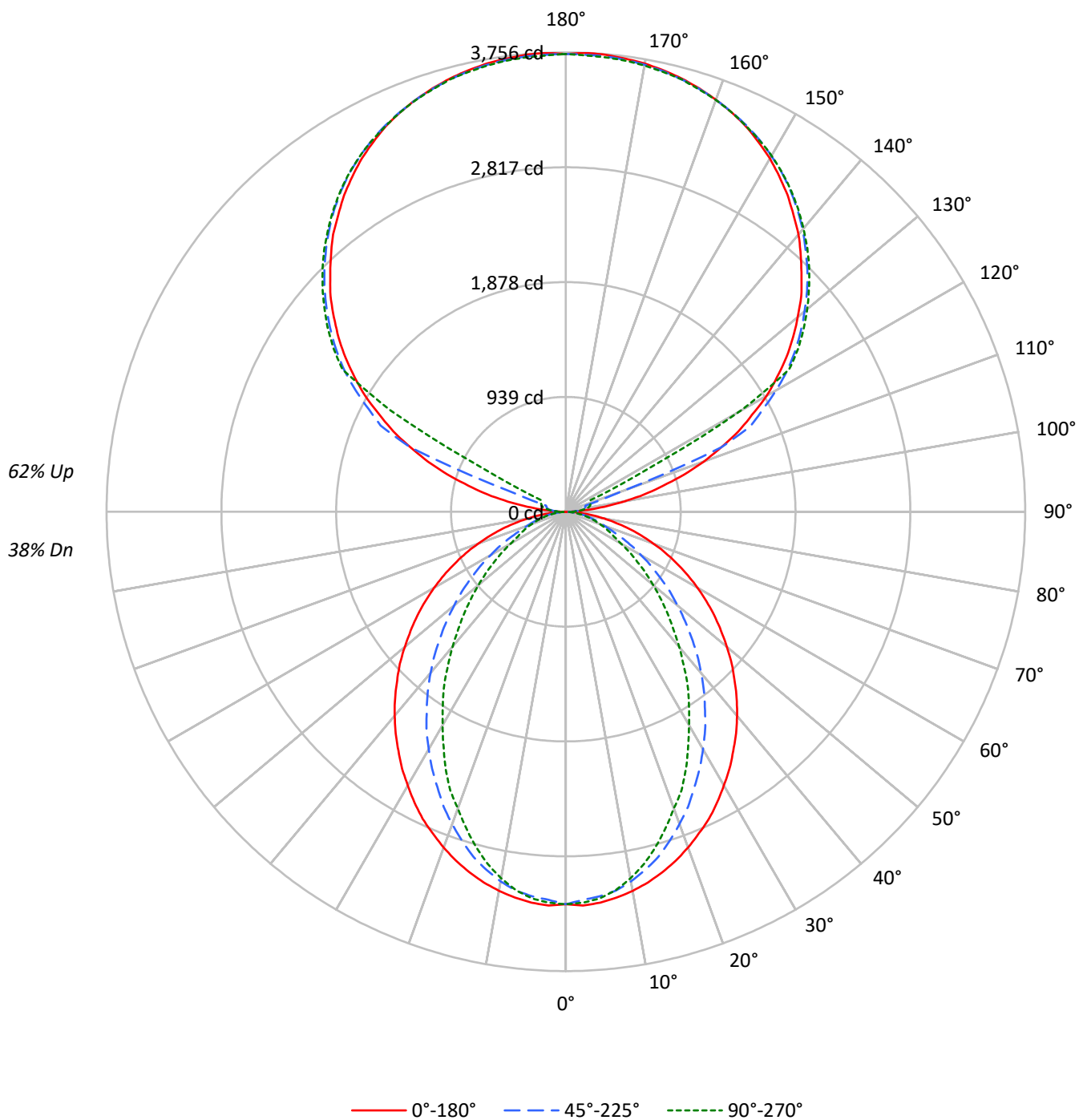
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 17577.6 lumens  
Efficiency: N/A  
Efficacy: 124.1 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.74' x L: 3.94' x H: 0.1')  
CIE Type: Semi-Indirect  
  
Input Watts (W): 141.6  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9789  
Total Harmonic Distortion (THDi): 0.074  
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   | 104 | 104 | 104 | 104 | 95 | 95 | 95 | 95 | 76 | 76 | 76 | 60 | 60 | 60 | 45 | 45 | 45 |
| 1   | 95  | 91  | 88  | 84  | 86 | 83 | 80 | 77 | 67 | 65 | 63 | 53 | 52 | 51 | 40 | 39 | 38 |
| 2   | 87  | 80  | 74  | 69  | 79 | 73 | 68 | 64 | 60 | 56 | 53 | 47 | 45 | 43 | 36 | 34 | 33 |
| 3   | 80  | 71  | 64  | 58  | 72 | 64 | 58 | 54 | 53 | 48 | 45 | 42 | 39 | 37 | 32 | 30 | 28 |
| 4   | 73  | 63  | 55  | 49  | 66 | 57 | 51 | 46 | 47 | 42 | 39 | 38 | 34 | 32 | 29 | 27 | 25 |
| 5   | 67  | 56  | 48  | 42  | 61 | 51 | 44 | 39 | 42 | 37 | 33 | 34 | 30 | 28 | 26 | 24 | 22 |
| 6   | 62  | 50  | 43  | 37  | 56 | 46 | 39 | 34 | 38 | 33 | 29 | 31 | 27 | 24 | 24 | 21 | 19 |
| 7   | 57  | 45  | 38  | 32  | 52 | 42 | 35 | 30 | 35 | 30 | 26 | 28 | 24 | 22 | 22 | 19 | 17 |
| 8   | 53  | 41  | 34  | 29  | 48 | 38 | 31 | 27 | 32 | 27 | 23 | 26 | 22 | 19 | 20 | 18 | 16 |
| 9   | 49  | 38  | 30  | 26  | 45 | 35 | 28 | 24 | 29 | 24 | 21 | 24 | 20 | 17 | 19 | 16 | 14 |
| 10  | 46  | 35  | 28  | 23  | 42 | 32 | 26 | 21 | 27 | 22 | 19 | 22 | 18 | 16 | 17 | 15 | 13 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2342 | 2342 | 2342 |
| 5°  | 2346 | 2305 | 2320 |
| 10° | 2323 | 2260 | 2245 |
| 15° | 2291 | 2186 | 2129 |
| 20° | 2248 | 2083 | 1986 |
| 25° | 2205 | 1968 | 1848 |
| 30° | 2147 | 1850 | 1673 |
| 35° | 2090 | 1723 | 1519 |
| 40° | 2032 | 1591 | 1342 |
| 45° | 1964 | 1446 | 1182 |
| 50° | 1895 | 1298 | 1026 |
| 55° | 1822 | 1141 | 876  |
| 60° | 1738 | 976  | 721  |
| 65° | 1641 | 809  | 650  |
| 70° | 1524 | 653  | 589  |
| 75° | 1376 | 576  | 537  |
| 80° | 1163 | 484  | 467  |
| 85° | 810  | 325  | 354  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1996 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 300.7   | 1.7       |
| 10°-20°   | 825.5   | 4.7       |
| 20°-30°   | 1158.9  | 6.6       |
| 30°-40°   | 1263.3  | 7.2       |
| 40°-50°   | 1161.1  | 6.6       |
| 50°-60°   | 911.9   | 5.2       |
| 60°-70°   | 593.5   | 3.4       |
| 70°-80°   | 305.5   | 1.7       |
| 80°-90°   | 84.6    | 0.5       |
| 90°-100°  | 123.4   | 0.7       |
| 100°-110° | 460.1   | 2.6       |
| 110°-120° | 1220.2  | 6.9       |
| 120°-130° | 2023.8  | 11.5      |
| 130°-140° | 2149.7  | 12.2      |
| 140°-150° | 1997.9  | 11.4      |
| 150°-160° | 1606.3  | 9.1       |
| 160°-170° | 1035.0  | 5.9       |
| 170°-180° | 356.2   | 2.0       |
| 0°-30°    | 2285.1  | 13.0      |
| 0°-40°    | 3548.4  | 20.2      |
| 0°-60°    | 5621.4  | 32.0      |
| 0°-90°    | 6605.1  | 37.6      |
| 90°-120°  | 1803.7  | 10.3      |
| 90°-150°  | 7975.0  | 45.4      |
| 90°-180°  | 10973.0 | 62.4      |
| 0°-180°   | 17577.6 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3208 | 3208  | 3208 | 3208  | 3208 |      |
| 5°   | 3208 | 3194  | 3156 | 3182  | 3174 | 304  |
| 15°  | 3052 | 3020  | 2921 | 2866  | 2837 | 860  |
| 25°  | 2770 | 2677  | 2485 | 2366  | 2323 | 1274 |
| 35°  | 2387 | 2239  | 1983 | 1800  | 1736 | 1494 |
| 45°  | 1951 | 1756  | 1452 | 1246  | 1176 | 1507 |
| 55°  | 1484 | 1257  | 944  | 770   | 714  | 1326 |
| 65°  | 1002 | 766   | 505  | 407   | 398  | 993  |
| 75°  | 534  | 331   | 232  | 212   | 209  | 565  |
| 85°  | 125  | 64    | 55   | 55    | 55   | 143  |
| 90°  | 3    | 32    | 54   | 68    | 73   | 16   |
| 95°  | 176  | 86    | 106  | 119   | 116  | 208  |
| 105° | 823  | 905   | 165  | 195   | 206  | 880  |
| 115° | 1557 | 1603  | 1671 | 417   | 222  | 1533 |
| 125° | 2202 | 2237  | 2288 | 2308  | 2316 | 1964 |
| 135° | 2725 | 2768  | 2792 | 2819  | 2814 | 2105 |
| 145° | 3161 | 3158  | 3204 | 3223  | 3209 | 1977 |
| 155° | 3480 | 3456  | 3488 | 3504  | 3483 | 1604 |
| 165° | 3667 | 3651  | 3659 | 3678  | 3659 | 1036 |
| 175° | 3751 | 3732  | 3737 | 3756  | 3729 | 357  |
| 180° | 3743 | 3743  | 3743 | 3743  | 3743 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3208.4 | 3208.4 | 3208.4 | 3208.4 | 3208.4 |
| 2.5°   | 3222.9 | 3208.4 | 3176.4 | 3205.7 | 3199.8 |
| 5°     | 3208.4 | 3193.9 | 3156.1 | 3182.3 | 3173.6 |
| 7.5°   | 3182.3 | 3165.0 | 3124.4 | 3135.7 | 3121.3 |
| 10°    | 3147.5 | 3127.2 | 3069.2 | 3060.3 | 3043.0 |
| 12.5°  | 3104.0 | 3077.8 | 2999.3 | 2982.0 | 2949.9 |
| 15°    | 3051.6 | 3019.6 | 2921.0 | 2865.9 | 2836.9 |
| 17.5°  | 2990.6 | 2944.2 | 2822.2 | 2758.3 | 2711.8 |
| 20°    | 2921.0 | 2862.8 | 2717.7 | 2645.3 | 2581.2 |
| 22.5°  | 2845.6 | 2778.7 | 2610.1 | 2511.6 | 2468.2 |
| 25°    | 2770.1 | 2677.0 | 2485.4 | 2366.5 | 2322.8 |
| 27.5°  | 2680.1 | 2581.2 | 2369.3 | 2232.9 | 2166.0 |
| 30°    | 2584.3 | 2473.7 | 2241.4 | 2093.6 | 2015.1 |
| 32.5°  | 2491.3 | 2357.6 | 2119.7 | 1945.4 | 1872.7 |
| 35°    | 2386.8 | 2238.6 | 1983.3 | 1800.4 | 1736.3 |
| 37.5°  | 2285.2 | 2125.3 | 1855.5 | 1654.8 | 1582.5 |
| 40°    | 2177.6 | 2003.6 | 1721.7 | 1515.7 | 1440.1 |
| 42.5°  | 2067.4 | 1881.6 | 1588.3 | 1373.3 | 1301.0 |
| 45°    | 1951.3 | 1756.5 | 1451.9 | 1245.5 | 1175.9 |
| 47.5°  | 1840.9 | 1634.9 | 1321.3 | 1114.9 | 1051.1 |
| 50°    | 1719.0 | 1512.9 | 1193.4 | 992.9  | 932.2  |
| 52.5°  | 1599.7 | 1381.9 | 1071.4 | 879.8  | 824.7  |
| 55°    | 1483.6 | 1257.2 | 943.5  | 769.5  | 714.4  |
| 57.5°  | 1364.7 | 1132.4 | 830.5  | 667.8  | 621.4  |
| 60°    | 1242.7 | 1010.4 | 711.3  | 563.5  | 516.9  |
| 62.5°  | 1123.7 | 891.5  | 609.6  | 470.4  | 447.3  |
| 65°    | 1001.8 | 766.4  | 505.3  | 406.7  | 397.7  |
| 67.5°  | 885.6  | 650.3  | 406.7  | 357.0  | 348.4  |
| 70°    | 763.7  | 537.2  | 336.7  | 307.7  | 296.0  |
| 72.5°  | 647.5  | 432.5  | 281.6  | 258.5  | 252.6  |
| 75°    | 534.2  | 330.8  | 232.2  | 211.9  | 209.2  |
| 77.5°  | 421.1  | 235.0  | 183.0  | 171.2  | 165.5  |
| 80°    | 316.4  | 168.5  | 139.3  | 127.9  | 127.9  |
| 82.5°  | 220.6  | 113.3  | 95.8   | 89.9   | 89.9   |
| 85°    | 124.8  | 63.8   | 55.1   | 55.1   | 55.1   |
| 87.5°  | 46.5   | 23.1   | 23.1   | 20.3   | 20.3   |
| 90°    | 2.6    | 32.5   | 54.0   | 67.9   | 73.0   |
| 92.5°  | 67.9   | 56.9   | 65.0   | 70.4   | 73.0   |
| 95°    | 175.9  | 86.5   | 105.5  | 119.3  | 116.4  |
| 97.5°  | 316.7  | 94.8   | 138.0  | 146.3  | 148.9  |
| 100°   | 479.5  | 108.3  | 154.4  | 175.9  | 181.4  |
| 102.5° | 658.0  | 652.9  | 159.8  | 189.4  | 197.7  |
| 105°   | 823.3  | 904.6  | 165.4  | 194.9  | 205.8  |
| 107.5° | 1015.6 | 1083.2 | 170.8  | 200.4  | 211.3  |
| 110°   | 1199.8 | 1256.5 | 474.0  | 203.3  | 213.8  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1373.2 | 1421.7 | 1375.8 | 208.4  | 216.8  |
| 115°   | 1557.1 | 1603.2 | 1671.0 | 417.1  | 222.2  |
| 117.5° | 1717.0 | 1771.1 | 1817.3 | 1429.8 | 720.4  |
| 120°   | 1895.8 | 1936.3 | 1985.2 | 2017.7 | 1652.1 |
| 122.5° | 2047.3 | 2090.7 | 2145.0 | 2161.1 | 2164.0 |
| 125°   | 2201.7 | 2237.1 | 2288.5 | 2307.5 | 2315.5 |
| 127.5° | 2342.5 | 2380.5 | 2421.3 | 2448.3 | 2450.9 |
| 130°   | 2475.3 | 2518.8 | 2548.4 | 2578.2 | 2575.7 |
| 132.5° | 2610.7 | 2646.1 | 2675.7 | 2700.1 | 2697.5 |
| 135°   | 2724.6 | 2768.0 | 2792.1 | 2819.4 | 2814.0 |
| 137.5° | 2843.6 | 2876.1 | 2903.4 | 2930.4 | 2922.3 |
| 140°   | 2959.9 | 2981.9 | 3011.4 | 3035.9 | 3022.4 |
| 142.5° | 3057.7 | 3076.7 | 3111.7 | 3133.3 | 3119.8 |
| 145°   | 3160.6 | 3157.8 | 3203.8 | 3222.8 | 3209.2 |
| 147.5° | 3249.7 | 3241.7 | 3287.6 | 3301.2 | 3290.6 |
| 150°   | 3336.5 | 3317.6 | 3361.0 | 3377.1 | 3363.6 |
| 152.5° | 3409.5 | 3388.0 | 3428.6 | 3444.9 | 3425.9 |
| 155°   | 3480.0 | 3455.9 | 3488.4 | 3504.4 | 3482.9 |
| 157.5° | 3536.9 | 3515.4 | 3539.8 | 3558.8 | 3536.9 |
| 160°   | 3585.8 | 3569.4 | 3585.8 | 3601.9 | 3583.0 |
| 162.5° | 3628.9 | 3612.8 | 3626.3 | 3645.3 | 3620.9 |
| 165°   | 3666.8 | 3650.7 | 3658.8 | 3677.8 | 3658.8 |
| 167.5° | 3696.7 | 3680.3 | 3688.8 | 3707.7 | 3683.2 |
| 170°   | 3721.1 | 3704.8 | 3710.3 | 3729.2 | 3704.8 |
| 172.5° | 3737.2 | 3721.1 | 3726.7 | 3745.6 | 3721.1 |
| 175°   | 3750.7 | 3731.8 | 3737.2 | 3756.3 | 3729.2 |
| 177.5° | 3756.3 | 3737.2 | 3740.2 | 3759.2 | 3734.7 |
| 180°   | 3742.8 | 3742.8 | 3742.8 | 3742.8 | 3742.8 |

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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 | 8.83             | 9.57  | 9.89  | 10.63 | 12.07 | 4.79           | 5.53 | 5.86 | 6.59 | 8.03  |
|                 | 3H   | 10.50            | 11.16 | 11.57 | 12.23 | 13.69 | 5.97           | 6.63 | 7.05 | 7.70 | 9.16  |
|                 | 4H   | 11.11            | 11.73 | 12.19 | 12.80 | 14.27 | 6.42           | 7.05 | 7.50 | 8.12 | 9.58  |
|                 | 6H   | 11.53            | 12.10 | 12.62 | 13.18 | 14.65 | 6.74           | 7.31 | 7.83 | 8.39 | 9.87  |
|                 | 8H   | 11.65            | 12.20 | 12.75 | 13.29 | 14.76 | 6.83           | 7.37 | 7.92 | 8.47 | 9.94  |
|                 | 12H  | 11.71            | 12.23 | 12.81 | 13.32 | 14.81 | 6.87           | 7.39 | 7.97 | 8.47 | 9.97  |
| 4H              | 2H   | 8.83             | 9.46  | 9.93  | 10.53 | 12.00 | 5.38           | 6.00 | 6.47 | 7.08 | 8.54  |
|                 | 3H   | 10.66            | 11.18 | 11.76 | 12.28 | 13.76 | 6.72           | 7.24 | 7.82 | 8.34 | 9.82  |
|                 | 4H   | 11.35            | 11.83 | 12.45 | 12.92 | 14.41 | 7.27           | 7.74 | 8.37 | 8.83 | 10.33 |
|                 | 6H   | 11.86            | 12.27 | 12.97 | 13.38 | 14.88 | 7.68           | 8.09 | 8.79 | 9.20 | 10.69 |
|                 | 8H   | 12.04            | 12.42 | 13.15 | 13.52 | 15.03 | 7.81           | 8.19 | 8.92 | 9.29 | 10.80 |
|                 | 12H  | 12.13            | 12.47 | 13.26 | 13.59 | 15.11 | 7.87           | 8.22 | 9.00 | 9.33 | 10.85 |
| 8H              | 4H   | 11.31            | 11.69 | 12.42 | 12.80 | 14.30 | 7.54           | 7.92 | 8.65 | 9.03 | 10.53 |
|                 | 6H   | 11.88            | 12.19 | 13.01 | 13.34 | 14.84 | 8.06           | 8.37 | 9.19 | 9.52 | 11.02 |
|                 | 8H   | 12.09            | 12.37 | 13.23 | 13.50 | 15.02 | 8.25           | 8.52 | 9.39 | 9.65 | 11.18 |
|                 | 12H  | 12.23            | 12.47 | 13.37 | 13.60 | 15.16 | 8.36           | 8.61 | 9.50 | 9.73 | 11.29 |
| 12H             | 4H   | 11.26            | 11.60 | 12.38 | 12.72 | 14.23 | 7.54           | 7.89 | 8.67 | 9.00 | 10.52 |
|                 | 6H   | 11.85            | 12.13 | 12.99 | 13.25 | 14.78 | 8.11           | 8.38 | 9.24 | 9.51 | 11.04 |
|                 | 8H   | 12.07            | 12.31 | 13.21 | 13.44 | 15.00 | 8.31           | 8.56 | 9.45 | 9.68 | 11.24 |