

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: P911522

Luminaire Tested: DFN2DIP-PN4F0-090D070US850-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P911522  
REPORT IS A COMBINATION OF REPORTS P899674 AND P896497  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-090D070US850-RLLFLL  
Description: 4 foot, Pentagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

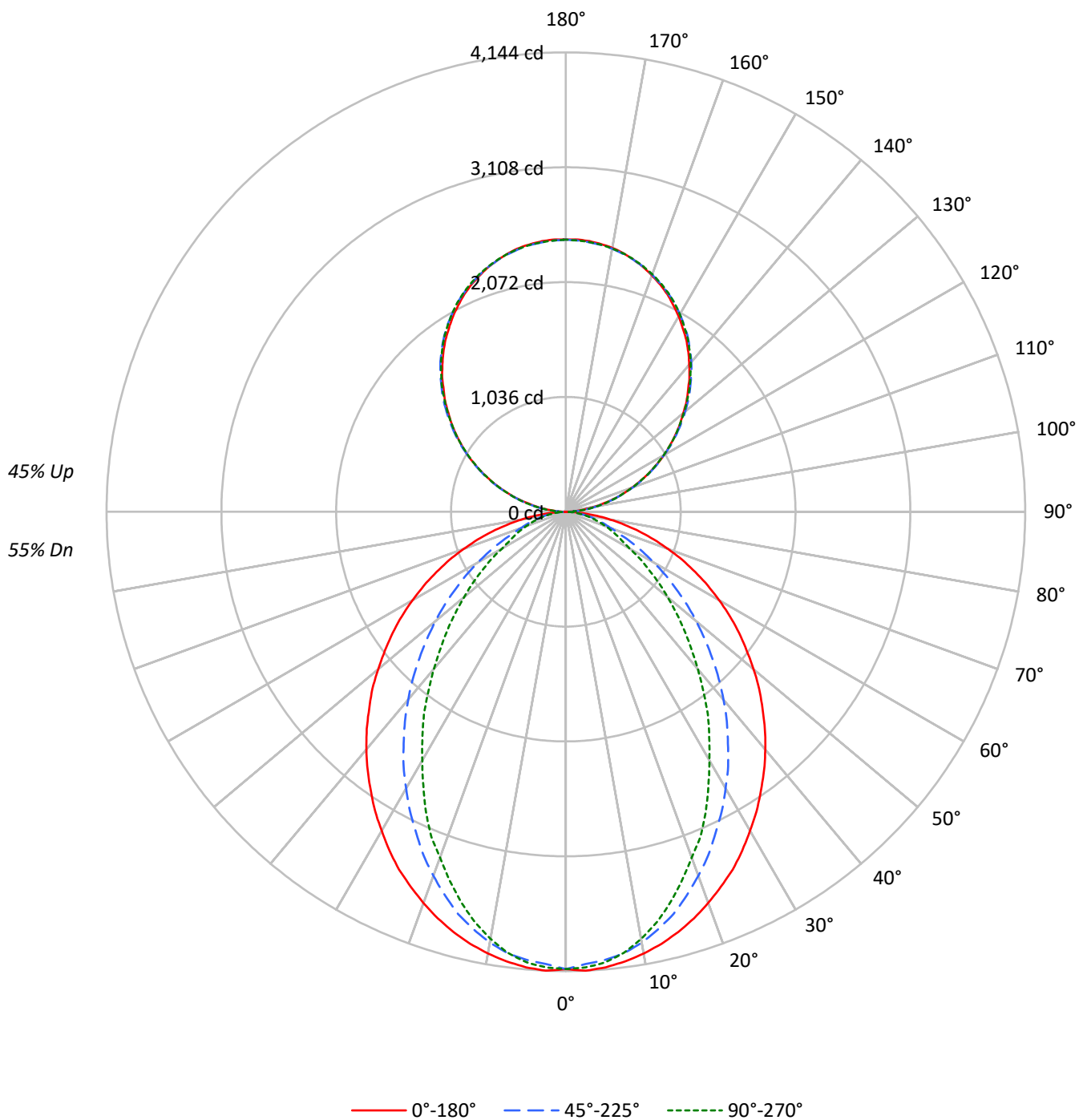
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 15354.2 lumens  
Efficiency: N/A  
Efficacy: 109.0 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: General Diffuse  
  
Input Watts (W): 140.9  
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   | 108 | 108 | 108 | 108 | 101 | 101 | 101 | 101 | 86 | 86 | 86 | 73 | 73 | 73 | 61 | 61 | 61 |
| 1   | 99  | 95  | 92  | 88  | 92  | 89  | 86  | 83  | 76 | 74 | 72 | 65 | 63 | 62 | 55 | 54 | 53 |
| 2   | 91  | 84  | 78  | 73  | 84  | 78  | 73  | 69  | 68 | 64 | 60 | 58 | 55 | 53 | 49 | 47 | 45 |
| 3   | 83  | 74  | 67  | 61  | 77  | 69  | 63  | 58  | 60 | 55 | 51 | 52 | 48 | 45 | 44 | 41 | 39 |
| 4   | 77  | 66  | 58  | 52  | 71  | 62  | 55  | 50  | 54 | 49 | 44 | 46 | 42 | 39 | 39 | 36 | 34 |
| 5   | 71  | 59  | 51  | 45  | 65  | 55  | 48  | 43  | 48 | 43 | 39 | 42 | 38 | 34 | 36 | 33 | 30 |
| 6   | 65  | 53  | 45  | 40  | 60  | 50  | 43  | 38  | 44 | 38 | 34 | 38 | 34 | 30 | 33 | 29 | 27 |
| 7   | 60  | 48  | 41  | 35  | 56  | 45  | 38  | 33  | 40 | 34 | 30 | 35 | 30 | 27 | 30 | 27 | 24 |
| 8   | 56  | 44  | 36  | 31  | 52  | 41  | 35  | 30  | 37 | 31 | 27 | 32 | 28 | 24 | 28 | 24 | 22 |
| 9   | 52  | 40  | 33  | 28  | 49  | 38  | 31  | 27  | 34 | 28 | 24 | 30 | 25 | 22 | 26 | 22 | 20 |
| 10  | 49  | 37  | 30  | 25  | 46  | 35  | 29  | 24  | 31 | 26 | 22 | 27 | 23 | 20 | 24 | 20 | 18 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3011 | 3011 | 3011 |
| 5°  | 3016 | 2964 | 2983 |
| 10° | 2986 | 2906 | 2886 |
| 15° | 2945 | 2810 | 2737 |
| 20° | 2891 | 2678 | 2553 |
| 25° | 2835 | 2530 | 2376 |
| 30° | 2760 | 2378 | 2151 |
| 35° | 2687 | 2215 | 1953 |
| 40° | 2612 | 2046 | 1726 |
| 45° | 2526 | 1859 | 1520 |
| 50° | 2436 | 1669 | 1319 |
| 55° | 2343 | 1467 | 1126 |
| 60° | 2234 | 1255 | 927  |
| 65° | 2110 | 1040 | 835  |
| 70° | 1959 | 839  | 757  |
| 75° | 1769 | 741  | 690  |
| 80° | 1495 | 622  | 600  |
| 85° | 1041 | 418  | 455  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2526 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 386.6   | 2.5       |
| 10°-20°   | 1061.3  | 6.9       |
| 20°-30°   | 1490.1  | 9.7       |
| 30°-40°   | 1624.3  | 10.6      |
| 40°-50°   | 1492.9  | 9.7       |
| 50°-60°   | 1172.4  | 7.6       |
| 60°-70°   | 763.1   | 5.0       |
| 70°-80°   | 392.8   | 2.6       |
| 80°-90°   | 107.3   | 0.7       |
| 90°-100°  | 151.9   | 1.0       |
| 100°-110° | 482.7   | 3.1       |
| 110°-120° | 826.1   | 5.4       |
| 120°-130° | 1086.4  | 7.1       |
| 130°-140° | 1219.5  | 7.9       |
| 140°-150° | 1195.8  | 7.8       |
| 150°-160° | 1003.1  | 6.5       |
| 160°-170° | 665.3   | 4.3       |
| 170°-180° | 232.5   | 1.5       |
| 0°-30°    | 2938.0  | 19.1      |
| 0°-40°    | 4562.3  | 29.7      |
| 0°-60°    | 7227.6  | 47.1      |
| 0°-90°    | 8490.9  | 55.3      |
| 90°-120°  | 1460.7  | 9.5       |
| 90°-150°  | 4962.4  | 32.3      |
| 90°-180°  | 6863.0  | 44.7      |
| 0°-180°   | 15354.2 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 4125 | 4125  | 4125 | 4125  | 4125 |      |
| 5°   | 4125 | 4106  | 4058 | 4091  | 4080 | 391  |
| 15°  | 3924 | 3882  | 3756 | 3685  | 3648 | 1106 |
| 25°  | 3562 | 3442  | 3196 | 3043  | 2986 | 1638 |
| 35°  | 3069 | 2878  | 2550 | 2315  | 2232 | 1921 |
| 45°  | 2509 | 2258  | 1867 | 1601  | 1512 | 1937 |
| 55°  | 1908 | 1616  | 1213 | 989   | 918  | 1705 |
| 65°  | 1288 | 986   | 650  | 523   | 511  | 1277 |
| 75°  | 687  | 425   | 299  | 272   | 269  | 726  |
| 85°  | 160  | 82    | 71   | 71    | 71   | 184  |
| 90°  | 2    | 27    | 72   | 68    | 70   | 15   |
| 95°  | 108  | 129   | 132  | 132   | 129  | 120  |
| 105° | 446  | 452   | 456  | 460   | 460  | 470  |
| 115° | 829  | 841   | 837  | 835   | 829  | 820  |
| 125° | 1206 | 1224  | 1218 | 1212  | 1210 | 1077 |
| 135° | 1560 | 1582  | 1587 | 1585  | 1579 | 1205 |
| 145° | 1893 | 1908  | 1920 | 1922  | 1914 | 1183 |
| 155° | 2165 | 2171  | 2178 | 2188  | 2181 | 997  |
| 165° | 2355 | 2353  | 2353 | 2368  | 2357 | 664  |
| 175° | 2451 | 2445  | 2440 | 2455  | 2443 | 233  |
| 180° | 2455 | 2455  | 2455 | 2455  | 2455 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 4125.1 | 4125.1 | 4125.1 | 4125.1 | 4125.1 |
| 2.5°   | 4143.8 | 4125.1 | 4083.9 | 4121.6 | 4114.1 |
| 5°     | 4125.1 | 4106.5 | 4057.8 | 4091.4 | 4080.3 |
| 7.5°   | 4091.4 | 4069.3 | 4017.0 | 4031.7 | 4013.0 |
| 10°    | 4046.7 | 4020.6 | 3946.2 | 3934.6 | 3912.4 |
| 12.5°  | 3990.8 | 3957.2 | 3856.2 | 3834.0 | 3792.8 |
| 15°    | 3923.5 | 3882.4 | 3755.6 | 3684.7 | 3647.5 |
| 17.5°  | 3845.1 | 3785.3 | 3628.4 | 3546.5 | 3486.7 |
| 20°    | 3755.6 | 3680.8 | 3494.1 | 3401.1 | 3318.7 |
| 22.5°  | 3658.6 | 3572.6 | 3355.9 | 3229.2 | 3173.4 |
| 25°    | 3561.6 | 3441.9 | 3195.6 | 3042.7 | 2986.4 |
| 27.5°  | 3445.9 | 3318.7 | 3046.2 | 2870.8 | 2784.8 |
| 30°    | 3322.7 | 3180.5 | 2881.8 | 2691.8 | 2590.7 |
| 32.5°  | 3203.0 | 3031.1 | 2725.4 | 2501.2 | 2407.7 |
| 35°    | 3068.8 | 2878.3 | 2549.9 | 2314.7 | 2232.3 |
| 37.5°  | 2938.1 | 2732.6 | 2385.6 | 2127.7 | 2034.7 |
| 40°    | 2799.9 | 2576.1 | 2213.7 | 1948.7 | 1851.7 |
| 42.5°  | 2658.1 | 2419.3 | 2042.1 | 1765.7 | 1672.6 |
| 45°    | 2508.8 | 2258.5 | 1866.7 | 1601.3 | 1511.8 |
| 47.5°  | 2366.9 | 2102.0 | 1698.8 | 1433.4 | 1351.4 |
| 50°    | 2210.1 | 1945.1 | 1534.4 | 1276.6 | 1198.5 |
| 52.5°  | 2056.9 | 1776.8 | 1377.6 | 1131.2 | 1060.3 |
| 55°    | 1907.5 | 1616.4 | 1213.1 | 989.4  | 918.5  |
| 57.5°  | 1754.7 | 1456.0 | 1067.9 | 858.7  | 798.9  |
| 60°    | 1597.7 | 1299.1 | 914.6  | 724.4  | 664.6  |
| 62.5°  | 1444.9 | 1146.3 | 783.8  | 604.8  | 575.1  |
| 65°    | 1288.0 | 985.5  | 649.5  | 522.8  | 511.4  |
| 67.5°  | 1138.7 | 836.1  | 522.8  | 459.0  | 447.9  |
| 70°    | 981.9  | 690.8  | 433.0  | 395.7  | 380.6  |
| 72.5°  | 832.5  | 556.1  | 362.0  | 332.3  | 324.8  |
| 75°    | 686.8  | 425.4  | 298.7  | 272.5  | 268.9  |
| 77.5°  | 541.4  | 302.2  | 235.2  | 220.2  | 212.7  |
| 80°    | 406.8  | 216.7  | 179.0  | 164.4  | 164.4  |
| 82.5°  | 283.6  | 145.7  | 123.2  | 115.7  | 115.7  |
| 85°    | 160.4  | 82.0   | 70.9   | 70.9   | 70.9   |
| 87.5°  | 59.8   | 29.7   | 29.7   | 26.2   | 26.2   |
| 90°    | 2.2    | 26.6   | 72.5   | 68.1   | 70.3   |
| 92.5°  | 45.9   | 62.2   | 64.4   | 66.7   | 66.7   |
| 95°    | 108.0  | 128.8  | 132.5  | 132.5  | 128.8  |
| 97.5°  | 179.9  | 199.1  | 207.3  | 207.3  | 207.3  |
| 100°   | 262.7  | 279.8  | 285.7  | 285.7  | 283.5  |
| 102.5° | 350.1  | 362.6  | 370.8  | 373.1  | 370.8  |
| 105°   | 445.6  | 451.5  | 455.9  | 459.7  | 459.7  |
| 107.5° | 540.3  | 549.2  | 549.2  | 550.7  | 540.3  |
| 110°   | 632.1  | 644.0  | 644.0  | 644.0  | 638.0  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 731.3  | 743.9  | 741.7  | 735.7  | 731.3  |
| 115°   | 829.0  | 840.8  | 837.2  | 835.0  | 829.0  |
| 117.5° | 925.9  | 942.2  | 931.9  | 925.9  | 920.0  |
| 120°   | 1023.6 | 1039.9 | 1023.6 | 1023.6 | 1017.0 |
| 122.5° | 1112.4 | 1133.2 | 1122.9 | 1116.9 | 1112.4 |
| 125°   | 1205.7 | 1224.2 | 1218.3 | 1211.7 | 1209.5 |
| 127.5° | 1296.8 | 1319.7 | 1311.6 | 1302.7 | 1296.8 |
| 130°   | 1381.9 | 1408.5 | 1404.9 | 1400.4 | 1392.2 |
| 132.5° | 1477.4 | 1498.1 | 1499.6 | 1489.3 | 1483.3 |
| 135°   | 1559.6 | 1582.4 | 1587.0 | 1584.7 | 1578.8 |
| 137.5° | 1651.3 | 1669.8 | 1673.5 | 1672.0 | 1663.2 |
| 140°   | 1732.0 | 1750.6 | 1760.9 | 1760.9 | 1752.8 |
| 142.5° | 1814.9 | 1833.4 | 1839.3 | 1841.5 | 1833.4 |
| 145°   | 1893.4 | 1908.1 | 1920.0 | 1922.2 | 1914.1 |
| 147.5° | 1963.7 | 1982.2 | 1991.1 | 1994.8 | 1986.7 |
| 150°   | 2036.2 | 2048.8 | 2057.0 | 2063.6 | 2057.0 |
| 152.5° | 2100.6 | 2113.2 | 2123.5 | 2131.7 | 2123.5 |
| 155°   | 2165.0 | 2170.9 | 2177.6 | 2187.9 | 2181.3 |
| 157.5° | 2220.6 | 2225.0 | 2228.6 | 2243.5 | 2233.1 |
| 160°   | 2270.1 | 2274.6 | 2276.8 | 2289.3 | 2280.4 |
| 162.5° | 2316.0 | 2316.0 | 2318.3 | 2332.2 | 2321.9 |
| 165°   | 2355.2 | 2353.0 | 2353.0 | 2367.8 | 2357.4 |
| 167.5° | 2390.8 | 2384.1 | 2384.1 | 2398.9 | 2388.6 |
| 170°   | 2417.4 | 2411.5 | 2409.3 | 2424.1 | 2411.5 |
| 172.5° | 2435.9 | 2429.9 | 2427.7 | 2442.6 | 2429.9 |
| 175°   | 2450.7 | 2444.8 | 2440.4 | 2455.1 | 2442.6 |
| 177.5° | 2458.9 | 2452.9 | 2448.5 | 2461.1 | 2448.5 |
| 180°   | 2455.1 | 2455.1 | 2455.1 | 2455.1 | 2455.1 |

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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 | 11.46            | 12.34 | 12.38 | 13.27 | 14.47 | 7.43           | 8.30  | 8.35  | 9.24  | 10.43 |
|                 | 3H   | 13.15            | 13.93 | 14.08 | 14.87 | 16.09 | 8.62           | 9.40  | 9.55  | 10.34 | 11.57 |
|                 | 4H   | 13.76            | 14.50 | 14.70 | 15.45 | 16.68 | 9.07           | 9.81  | 10.02 | 10.76 | 11.99 |
|                 | 6H   | 14.19            | 14.87 | 15.14 | 15.82 | 17.06 | 9.40           | 10.08 | 10.35 | 11.03 | 12.27 |
|                 | 8H   | 14.32            | 14.96 | 15.28 | 15.93 | 17.17 | 9.49           | 10.14 | 10.45 | 11.11 | 12.35 |
|                 | 12H  | 14.38            | 15.00 | 15.35 | 15.96 | 17.22 | 9.54           | 10.15 | 10.50 | 11.11 | 12.38 |
| 4H              | 2H   | 11.49            | 12.23 | 12.44 | 13.17 | 14.40 | 8.03           | 8.77  | 8.98  | 9.72  | 10.95 |
|                 | 3H   | 13.32            | 13.94 | 14.28 | 14.91 | 16.16 | 9.39           | 10.00 | 10.35 | 10.98 | 12.22 |
|                 | 4H   | 14.02            | 14.58 | 14.99 | 15.55 | 16.82 | 9.94           | 10.50 | 10.91 | 11.47 | 12.74 |
|                 | 6H   | 14.54            | 15.02 | 15.52 | 16.02 | 17.28 | 10.36          | 10.84 | 11.34 | 11.84 | 13.10 |
|                 | 8H   | 14.72            | 15.17 | 15.70 | 16.16 | 17.44 | 10.49          | 10.94 | 11.47 | 11.93 | 13.21 |
|                 | 12H  | 14.82            | 15.22 | 15.82 | 16.23 | 17.51 | 10.56          | 10.96 | 11.56 | 11.97 | 13.25 |
| 8H              | 4H   | 13.99            | 14.44 | 14.97 | 15.43 | 16.71 | 10.22          | 10.67 | 11.21 | 11.66 | 12.94 |
|                 | 6H   | 14.56            | 14.93 | 15.57 | 15.96 | 17.24 | 10.74          | 11.12 | 11.75 | 12.14 | 13.42 |
|                 | 8H   | 14.78            | 15.11 | 15.80 | 16.13 | 17.42 | 10.94          | 11.26 | 11.95 | 12.28 | 13.58 |
|                 | 12H  | 14.92            | 15.21 | 15.94 | 16.22 | 17.57 | 11.06          | 11.35 | 12.08 | 12.36 | 13.70 |
| 12H             | 4H   | 13.95            | 14.35 | 14.95 | 15.35 | 16.64 | 10.23          | 10.64 | 11.23 | 11.64 | 12.93 |
|                 | 6H   | 14.54            | 14.87 | 15.55 | 15.88 | 17.18 | 10.79          | 11.12 | 11.81 | 12.14 | 13.44 |
|                 | 8H   | 14.76            | 15.05 | 15.78 | 16.06 | 17.41 | 11.01          | 11.30 | 12.03 | 12.31 | 13.65 |