

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: P911526

Luminaire Tested: DFN2DIP-PN4F0-090D080US850-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P911526  
REPORT IS A COMBINATION OF REPORTS P899692 AND P896497  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-090D080US850-RLLFLL  
Description: 4 foot, Pentagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

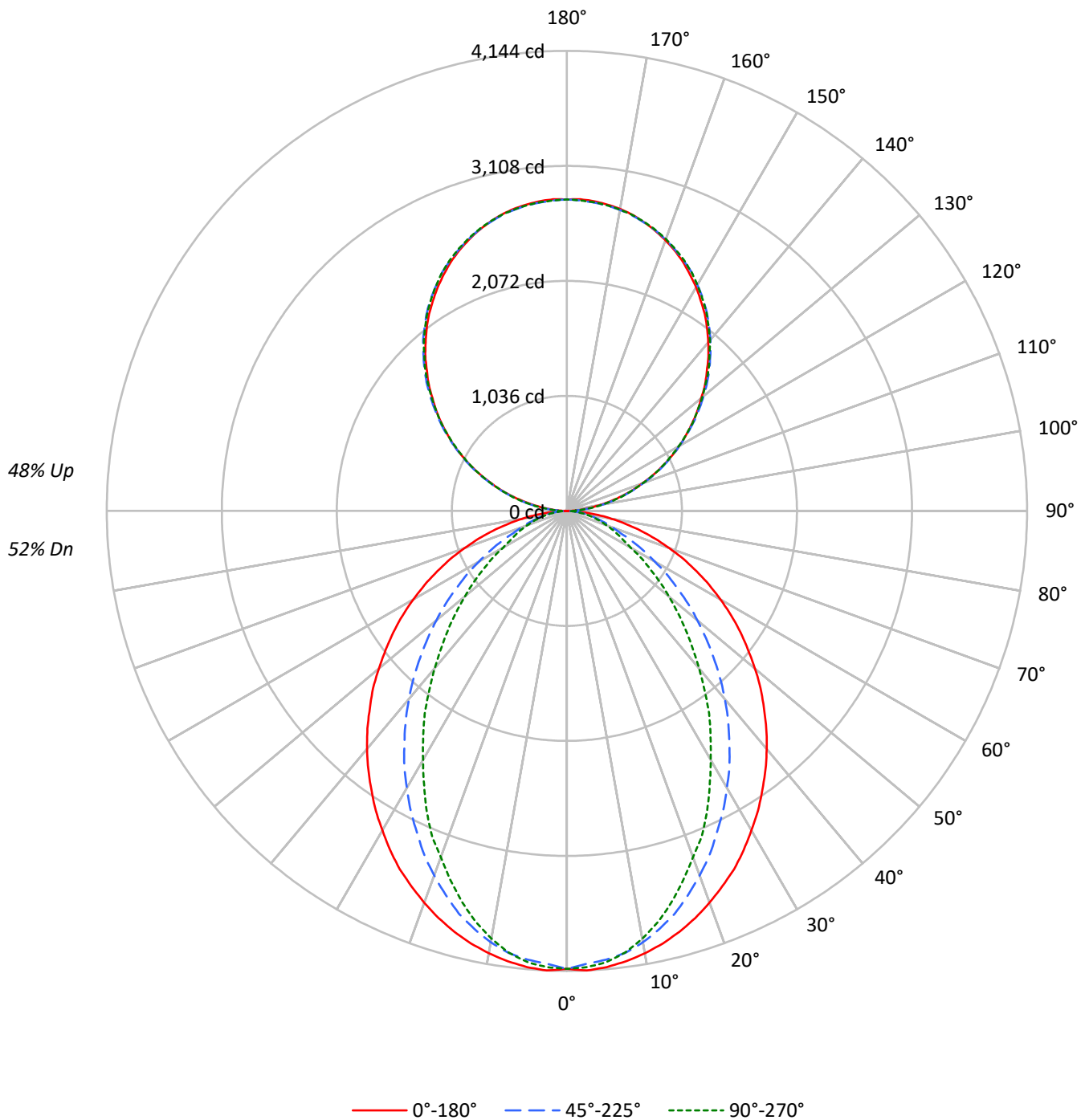
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 16335.6 lumens  
Efficiency: N/A  
Efficacy: 111.7 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): 146.3  
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



TEST NUMBER: P911526

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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 | 100 | 100 | 100 | 100 | 84 | 84 | 84 | 71 | 71 | 71 | 58 | 58 | 58 |
| 1   | 99  | 95  | 91  | 88  | 91  | 88  | 84  | 82  | 75 | 72 | 70 | 63 | 61 | 60 | 52 | 51 | 50 |
| 2   | 90  | 83  | 77  | 72  | 83  | 77  | 72  | 68  | 66 | 62 | 59 | 56 | 53 | 51 | 46 | 44 | 43 |
| 3   | 83  | 74  | 66  | 61  | 76  | 68  | 62  | 57  | 59 | 54 | 50 | 50 | 46 | 44 | 42 | 39 | 37 |
| 4   | 76  | 65  | 58  | 52  | 70  | 61  | 54  | 49  | 53 | 47 | 43 | 45 | 41 | 38 | 37 | 35 | 32 |
| 5   | 70  | 59  | 51  | 45  | 65  | 55  | 48  | 42  | 47 | 42 | 38 | 40 | 36 | 33 | 34 | 31 | 28 |
| 6   | 65  | 53  | 45  | 39  | 60  | 49  | 42  | 37  | 43 | 37 | 33 | 37 | 32 | 29 | 31 | 28 | 25 |
| 7   | 60  | 48  | 40  | 35  | 55  | 45  | 38  | 33  | 39 | 33 | 29 | 34 | 29 | 26 | 28 | 25 | 23 |
| 8   | 56  | 44  | 36  | 31  | 51  | 41  | 34  | 29  | 36 | 30 | 26 | 31 | 27 | 23 | 26 | 23 | 21 |
| 9   | 52  | 40  | 33  | 28  | 48  | 37  | 31  | 26  | 33 | 27 | 24 | 28 | 24 | 21 | 24 | 21 | 19 |
| 10  | 49  | 37  | 30  | 25  | 45  | 34  | 28  | 24  | 30 | 25 | 21 | 26 | 22 | 19 | 23 | 19 | 17 |

**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   | 2.4       |
| 10°-20°   | 1061.3  | 6.5       |
| 20°-30°   | 1490.1  | 9.1       |
| 30°-40°   | 1624.3  | 9.9       |
| 40°-50°   | 1492.9  | 9.1       |
| 50°-60°   | 1172.4  | 7.2       |
| 60°-70°   | 763.1   | 4.7       |
| 70°-80°   | 392.8   | 2.4       |
| 80°-90°   | 108.3   | 0.7       |
| 90°-100°  | 173.6   | 1.1       |
| 100°-110° | 551.7   | 3.4       |
| 110°-120° | 944.1   | 5.8       |
| 120°-130° | 1241.6  | 7.6       |
| 130°-140° | 1393.7  | 8.5       |
| 140°-150° | 1366.6  | 8.4       |
| 150°-160° | 1146.4  | 7.0       |
| 160°-170° | 760.3   | 4.7       |
| 170°-180° | 265.7   | 1.6       |
| 0°-30°    | 2938.0  | 18.0      |
| 0°-40°    | 4562.3  | 27.9      |
| 0°-60°    | 7227.6  | 44.2      |
| 0°-90°    | 8491.9  | 52.0      |
| 90°-120°  | 1669.4  | 10.2      |
| 90°-150°  | 5671.3  | 34.7      |
| 90°-180°  | 7844.0  | 48.0      |
| 0°-180°   | 16335.6 | 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°  | 3    | 30    | 83   | 78    | 80   | 16   |
| 95°  | 124  | 147   | 151  | 151   | 147  | 137  |
| 105° | 509  | 516   | 521  | 525   | 525  | 537  |
| 115° | 947  | 961   | 957  | 954   | 947  | 937  |
| 125° | 1378 | 1399  | 1392 | 1385  | 1382 | 1231 |
| 135° | 1782 | 1809  | 1814 | 1811  | 1804 | 1378 |
| 145° | 2164 | 2181  | 2194 | 2197  | 2188 | 1352 |
| 155° | 2474 | 2481  | 2489 | 2500  | 2493 | 1139 |
| 165° | 2692 | 2689  | 2689 | 2706  | 2694 | 759  |
| 175° | 2801 | 2794  | 2789 | 2806  | 2792 | 266  |
| 180° | 2806 | 2806  | 2806 | 2806  | 2806 |      |

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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°    | 2.6    | 30.5   | 83.0   | 77.9   | 80.4   |
| 92.5°  | 52.5   | 71.1   | 73.6   | 76.1   | 76.1   |
| 95°    | 123.5  | 147.2  | 151.4  | 151.4  | 147.2  |
| 97.5°  | 205.6  | 227.6  | 236.9  | 236.9  | 236.9  |
| 100°   | 300.3  | 319.7  | 326.5  | 326.5  | 323.9  |
| 102.5° | 400.1  | 414.5  | 423.7  | 426.3  | 423.7  |
| 105°   | 509.3  | 516.0  | 521.1  | 525.3  | 525.3  |
| 107.5° | 617.5  | 627.7  | 627.7  | 629.4  | 617.5  |
| 110°   | 722.4  | 735.9  | 735.9  | 735.9  | 729.2  |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 835.7  | 850.2  | 847.6  | 840.8  | 835.7  |
| 115°   | 947.4  | 960.9  | 956.7  | 954.2  | 947.4  |
| 117.5° | 1058.2 | 1076.8 | 1065.0 | 1058.2 | 1051.4 |
| 120°   | 1169.9 | 1188.5 | 1169.9 | 1169.9 | 1162.2 |
| 122.5° | 1271.4 | 1295.1 | 1283.2 | 1276.5 | 1271.4 |
| 125°   | 1377.9 | 1399.1 | 1392.3 | 1384.7 | 1382.3 |
| 127.5° | 1482.1 | 1508.2 | 1498.9 | 1488.8 | 1482.1 |
| 130°   | 1579.3 | 1609.7 | 1605.5 | 1600.5 | 1591.2 |
| 132.5° | 1688.5 | 1712.1 | 1713.8 | 1702.0 | 1695.2 |
| 135°   | 1782.3 | 1808.6 | 1813.7 | 1811.1 | 1804.3 |
| 137.5° | 1887.2 | 1908.4 | 1912.6 | 1910.9 | 1900.7 |
| 140°   | 1979.5 | 2000.5 | 2012.4 | 2012.4 | 2003.1 |
| 142.5° | 2074.2 | 2095.3 | 2102.1 | 2104.7 | 2095.3 |
| 145°   | 2163.9 | 2180.7 | 2194.3 | 2196.8 | 2187.5 |
| 147.5° | 2244.2 | 2265.4 | 2275.4 | 2279.8 | 2270.5 |
| 150°   | 2327.1 | 2341.4 | 2350.7 | 2358.4 | 2350.7 |
| 152.5° | 2400.7 | 2415.1 | 2426.9 | 2436.3 | 2426.9 |
| 155°   | 2474.3 | 2481.1 | 2488.7 | 2500.5 | 2492.9 |
| 157.5° | 2537.7 | 2542.8 | 2547.0 | 2563.9 | 2552.1 |
| 160°   | 2594.4 | 2599.5 | 2602.0 | 2616.4 | 2606.3 |
| 162.5° | 2646.9 | 2646.9 | 2649.4 | 2665.5 | 2653.6 |
| 165°   | 2691.7 | 2689.1 | 2689.1 | 2706.1 | 2694.2 |
| 167.5° | 2732.2 | 2724.7 | 2724.7 | 2741.6 | 2729.7 |
| 170°   | 2762.7 | 2756.0 | 2753.4 | 2770.4 | 2756.0 |
| 172.5° | 2783.9 | 2777.2 | 2774.6 | 2791.5 | 2777.2 |
| 175°   | 2800.8 | 2794.0 | 2788.9 | 2805.9 | 2791.5 |
| 177.5° | 2810.1 | 2803.3 | 2798.2 | 2812.6 | 2798.2 |
| 180°   | 2805.9 | 2805.9 | 2805.9 | 2805.9 | 2805.9 |

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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 | 11.17            | 12.01 | 12.11 | 12.97 | 14.22 | 7.13           | 7.98  | 8.08  | 8.94  | 10.18 |
|                 | 3H   | 12.85            | 13.61 | 13.81 | 14.57 | 15.84 | 8.32           | 9.08  | 9.28  | 10.05 | 11.31 |
|                 | 4H   | 13.46            | 14.17 | 14.43 | 15.15 | 16.42 | 8.77           | 9.49  | 9.75  | 10.46 | 11.74 |
|                 | 6H   | 13.88            | 14.54 | 14.87 | 15.52 | 16.81 | 9.10           | 9.75  | 10.08 | 10.73 | 12.02 |
|                 | 8H   | 14.01            | 14.64 | 15.00 | 15.63 | 16.92 | 9.19           | 9.81  | 10.18 | 10.81 | 12.09 |
|                 | 12H  | 14.08            | 14.67 | 15.07 | 15.66 | 16.97 | 9.23           | 9.83  | 10.23 | 10.82 | 12.13 |
| 4H              | 2H   | 11.19            | 11.90 | 12.16 | 12.87 | 14.15 | 7.73           | 8.45  | 8.71  | 9.42  | 10.69 |
|                 | 3H   | 13.02            | 13.62 | 14.01 | 14.62 | 15.91 | 9.08           | 9.68  | 10.07 | 10.68 | 11.97 |
|                 | 4H   | 13.72            | 14.26 | 14.71 | 15.25 | 16.57 | 9.63           | 10.18 | 10.63 | 11.17 | 12.48 |
|                 | 6H   | 14.23            | 14.70 | 15.24 | 15.72 | 17.03 | 10.05          | 10.52 | 11.06 | 11.54 | 12.85 |
|                 | 8H   | 14.41            | 14.85 | 15.42 | 15.86 | 17.19 | 10.18          | 10.62 | 11.19 | 11.63 | 12.96 |
|                 | 12H  | 14.51            | 14.90 | 15.54 | 15.93 | 17.26 | 10.25          | 10.64 | 11.28 | 11.67 | 13.00 |
| 8H              | 4H   | 13.68            | 14.12 | 14.69 | 15.13 | 16.46 | 9.92           | 10.35 | 10.92 | 11.36 | 12.69 |
|                 | 6H   | 14.25            | 14.61 | 15.29 | 15.67 | 16.99 | 10.44          | 10.80 | 11.47 | 11.85 | 13.17 |
|                 | 8H   | 14.47            | 14.79 | 15.51 | 15.83 | 17.17 | 10.63          | 10.94 | 11.67 | 11.98 | 13.33 |
|                 | 12H  | 14.61            | 14.89 | 15.66 | 15.93 | 17.31 | 10.75          | 11.03 | 11.79 | 12.06 | 13.45 |
| 12H             | 4H   | 13.64            | 14.03 | 14.66 | 15.06 | 16.39 | 9.92           | 10.31 | 10.95 | 11.34 | 12.67 |
|                 | 6H   | 14.23            | 14.55 | 15.27 | 15.59 | 16.93 | 10.49          | 10.80 | 11.53 | 11.84 | 13.19 |
|                 | 8H   | 14.45            | 14.73 | 15.50 | 15.77 | 17.15 | 10.70          | 10.98 | 11.74 | 12.01 | 13.40 |