

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: P911217

Luminaire Tested: DFN2DIP-PN3F0-060D030US850-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P911217  
REPORT IS A COMBINATION OF REPORTS P901037 AND P897955  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN3F0-060D030US850-FLLONL  
Description: 3 foot, Pentagon Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

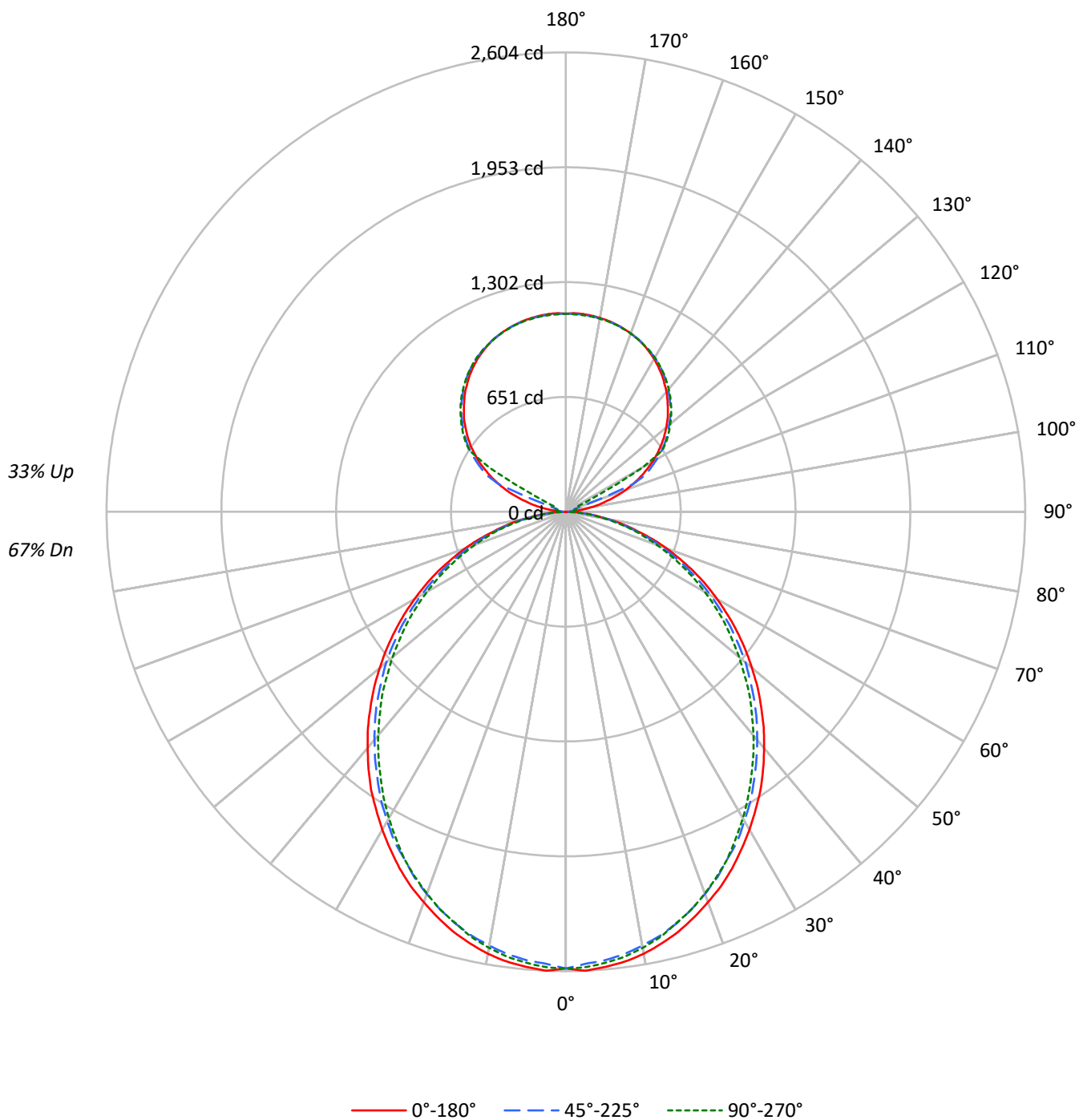
Lumens per Lamp: N/A  
Luminaire Lumens: 9881.1 lumens  
Efficiency: N/A  
Efficacy: 123.1 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 2.96' x L: 3.11' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 80.3  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9821  
Total Harmonic Distortion (THDi): 0.08  
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   | 111 | 111 | 111 | 111 | 105 | 105 | 105 | 105 | 93 | 93 | 93 | 82 | 82 | 82 | 71 | 71 | 71 |
| 1   | 102 | 97  | 93  | 90  | 95  | 92  | 88  | 85  | 81 | 79 | 76 | 72 | 70 | 68 | 63 | 62 | 60 |
| 2   | 92  | 85  | 79  | 73  | 87  | 80  | 75  | 70  | 71 | 67 | 63 | 63 | 60 | 57 | 56 | 53 | 51 |
| 3   | 84  | 75  | 67  | 61  | 79  | 71  | 64  | 58  | 63 | 58 | 53 | 56 | 52 | 48 | 49 | 46 | 43 |
| 4   | 77  | 66  | 58  | 52  | 72  | 63  | 55  | 50  | 56 | 50 | 45 | 50 | 45 | 41 | 44 | 40 | 37 |
| 5   | 71  | 59  | 51  | 44  | 67  | 56  | 48  | 43  | 50 | 44 | 39 | 45 | 40 | 36 | 40 | 36 | 33 |
| 6   | 66  | 53  | 45  | 39  | 62  | 50  | 43  | 37  | 45 | 39 | 34 | 41 | 35 | 32 | 36 | 32 | 29 |
| 7   | 61  | 48  | 40  | 34  | 57  | 46  | 38  | 33  | 41 | 35 | 30 | 37 | 32 | 28 | 33 | 29 | 26 |
| 8   | 56  | 44  | 36  | 30  | 53  | 42  | 34  | 29  | 38 | 31 | 27 | 34 | 29 | 25 | 30 | 26 | 23 |
| 9   | 53  | 40  | 32  | 27  | 50  | 38  | 31  | 26  | 35 | 29 | 24 | 31 | 26 | 23 | 28 | 24 | 21 |
| 10  | 49  | 37  | 29  | 24  | 46  | 35  | 28  | 24  | 32 | 26 | 22 | 29 | 24 | 20 | 26 | 22 | 19 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3027 | 3027 | 3027 |
| 5°  | 3030 | 2982 | 3003 |
| 10° | 3003 | 2940 | 2961 |
| 15° | 2957 | 2889 | 2897 |
| 20° | 2896 | 2820 | 2830 |
| 25° | 2835 | 2737 | 2754 |
| 30° | 2758 | 2661 | 2657 |
| 35° | 2686 | 2570 | 2554 |
| 40° | 2597 | 2479 | 2457 |
| 45° | 2508 | 2387 | 2357 |
| 50° | 2411 | 2291 | 2241 |
| 55° | 2310 | 2179 | 2135 |
| 60° | 2194 | 2047 | 2013 |
| 65° | 2068 | 1910 | 1869 |
| 70° | 1908 | 1742 | 1713 |
| 75° | 1686 | 1542 | 1568 |
| 80° | 1418 | 1285 | 1294 |
| 85° | 1000 | 850  | 844  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2508 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 243.7  | 2.5       |
| 10°-20°   | 685.6  | 6.9       |
| 20°-30°   | 1007.6 | 10.2      |
| 30°-40°   | 1170.3 | 11.8      |
| 40°-50°   | 1168.8 | 11.8      |
| 50°-60°   | 1019.2 | 10.3      |
| 60°-70°   | 753.4  | 7.6       |
| 70°-80°   | 426.3  | 4.3       |
| 80°-90°   | 114.5  | 1.2       |
| 90°-100°  | 37.0   | 0.4       |
| 100°-110° | 138.0  | 1.4       |
| 110°-120° | 366.1  | 3.7       |
| 120°-130° | 607.1  | 6.1       |
| 130°-140° | 644.9  | 6.5       |
| 140°-150° | 599.4  | 6.1       |
| 150°-160° | 481.9  | 4.9       |
| 160°-170° | 310.5  | 3.1       |
| 170°-180° | 106.9  | 1.1       |
| 0°-30°    | 1937.0 | 19.6      |
| 0°-40°    | 3107.2 | 31.4      |
| 0°-60°    | 5295.3 | 53.6      |
| 0°-90°    | 6589.4 | 66.7      |
| 90°-120°  | 541.1  | 5.5       |
| 90°-150°  | 2392.5 | 24.2      |
| 90°-180°  | 3292.0 | 33.3      |
| 0°-180°   | 9881.1 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2589 | 2589  | 2589 | 2589  | 2589 |      |
| 5°   | 2589 | 2579  | 2552 | 2572  | 2567 | 246  |
| 15°  | 2465 | 2450  | 2417 | 2428  | 2415 | 694  |
| 25°  | 2231 | 2211  | 2168 | 2173  | 2168 | 1026 |
| 35°  | 1925 | 1900  | 1860 | 1845  | 1832 | 1202 |
| 45°  | 1566 | 1549  | 1511 | 1484  | 1474 | 1209 |
| 55°  | 1185 | 1170  | 1140 | 1110  | 1098 | 1060 |
| 65°  | 799  | 784   | 759  | 737   | 724  | 790  |
| 75°  | 418  | 413   | 401  | 386   | 391  | 446  |
| 85°  | 102  | 100   | 97   | 90    | 87   | 114  |
| 90°  | 1    | 10    | 16   | 20    | 22   | 9    |
| 95°  | 53   | 26    | 32   | 36    | 35   | 63   |
| 105° | 247  | 271   | 50   | 58    | 62   | 264  |
| 115° | 467  | 481   | 501  | 125   | 67   | 460  |
| 125° | 660  | 671   | 687  | 692   | 695  | 589  |
| 135° | 817  | 830   | 838  | 846   | 844  | 631  |
| 145° | 948  | 947   | 961  | 967   | 963  | 593  |
| 155° | 1044 | 1037  | 1046 | 1051  | 1045 | 481  |
| 165° | 1100 | 1095  | 1098 | 1103  | 1098 | 311  |
| 175° | 1125 | 1120  | 1121 | 1127  | 1119 | 107  |
| 180° | 1123 | 1123  | 1123 | 1123  | 1123 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2589.1 | 2589.1 | 2589.1 | 2589.1 | 2589.1 |
| 2.5°   | 2604.2 | 2591.7 | 2564.2 | 2589.1 | 2584.3 |
| 5°     | 2589.1 | 2579.3 | 2551.8 | 2571.7 | 2566.9 |
| 7.5°   | 2571.7 | 2556.9 | 2529.4 | 2549.5 | 2544.5 |
| 10°    | 2544.5 | 2527.1 | 2497.1 | 2517.0 | 2509.6 |
| 12.5°  | 2507.0 | 2492.1 | 2462.3 | 2474.7 | 2469.7 |
| 15°    | 2464.6 | 2449.9 | 2417.4 | 2427.5 | 2415.1 |
| 17.5°  | 2412.4 | 2397.7 | 2365.2 | 2377.5 | 2365.2 |
| 20°    | 2355.1 | 2340.3 | 2305.4 | 2312.8 | 2303.1 |
| 22.5°  | 2298.1 | 2275.6 | 2243.1 | 2243.1 | 2238.1 |
| 25°    | 2230.6 | 2210.9 | 2168.5 | 2173.3 | 2168.5 |
| 27.5°  | 2155.9 | 2138.5 | 2106.2 | 2098.9 | 2086.5 |
| 30°    | 2081.5 | 2061.3 | 2024.1 | 2016.7 | 2006.6 |
| 32.5°  | 2001.6 | 1986.9 | 1947.0 | 1931.9 | 1921.9 |
| 35°    | 1924.6 | 1899.7 | 1859.8 | 1844.7 | 1832.3 |
| 37.5°  | 1837.4 | 1814.9 | 1775.1 | 1757.5 | 1745.1 |
| 40°    | 1747.8 | 1727.7 | 1687.9 | 1665.7 | 1655.6 |
| 42.5°  | 1660.6 | 1640.5 | 1601.0 | 1575.9 | 1561.0 |
| 45°    | 1566.1 | 1548.6 | 1511.1 | 1484.0 | 1473.9 |
| 47.5°  | 1473.9 | 1456.4 | 1416.6 | 1389.1 | 1374.3 |
| 50°    | 1376.7 | 1364.3 | 1329.5 | 1294.5 | 1282.1 |
| 52.5°  | 1282.1 | 1264.7 | 1232.4 | 1205.0 | 1187.6 |
| 55°    | 1185.2 | 1170.1 | 1140.3 | 1110.4 | 1098.0 |
| 57.5°  | 1088.0 | 1075.6 | 1043.1 | 1013.3 | 1003.2 |
| 60°    | 990.8  | 981.0  | 946.2  | 918.7  | 911.3  |
| 62.5°  | 896.2  | 878.8  | 853.9  | 829.1  | 819.1  |
| 65°    | 799.3  | 784.3  | 759.4  | 736.9  | 724.5  |
| 67.5°  | 699.7  | 687.0  | 664.8  | 647.4  | 637.3  |
| 70°    | 607.5  | 597.5  | 575.0  | 557.6  | 547.8  |
| 72.5°  | 512.9  | 502.9  | 490.5  | 473.1  | 465.7  |
| 75°    | 418.1  | 413.4  | 400.7  | 385.9  | 390.9  |
| 77.5°  | 333.6  | 323.6  | 318.5  | 311.2  | 303.8  |
| 80°    | 249.1  | 246.4  | 241.4  | 234.0  | 229.0  |
| 82.5°  | 169.3  | 169.3  | 166.9  | 156.9  | 156.9  |
| 85°    | 101.9  | 99.6   | 97.1   | 89.5   | 87.2   |
| 87.5°  | 44.9   | 39.9   | 34.8   | 27.5   | 24.8   |
| 90°    | 0.8    | 9.8    | 16.2   | 20.4   | 21.8   |
| 92.5°  | 20.4   | 17.1   | 19.5   | 21.2   | 21.8   |
| 95°    | 52.8   | 26.0   | 31.6   | 35.8   | 34.9   |
| 97.5°  | 95.0   | 28.5   | 41.4   | 43.9   | 44.7   |
| 100°   | 143.8  | 32.5   | 46.4   | 52.8   | 54.5   |
| 102.5° | 197.4  | 195.8  | 47.9   | 56.8   | 59.3   |
| 105°   | 247.0  | 271.4  | 49.6   | 58.4   | 61.8   |
| 107.5° | 304.6  | 324.9  | 51.2   | 60.1   | 63.4   |
| 110°   | 360.0  | 376.9  | 142.2  | 61.0   | 64.2   |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 412.0  | 426.5  | 412.8  | 62.5   | 65.0   |
| 115°   | 467.1  | 481.0  | 501.3  | 125.1  | 66.7   |
| 117.5° | 515.1  | 531.3  | 545.2  | 429.0  | 216.1  |
| 120°   | 568.7  | 580.9  | 595.5  | 605.3  | 495.6  |
| 122.5° | 614.2  | 627.3  | 643.6  | 648.3  | 649.2  |
| 125°   | 660.5  | 671.1  | 686.6  | 692.2  | 694.7  |
| 127.5° | 702.8  | 714.1  | 726.4  | 734.5  | 735.3  |
| 130°   | 742.6  | 755.7  | 764.5  | 773.4  | 772.8  |
| 132.5° | 783.2  | 793.8  | 802.7  | 810.0  | 809.2  |
| 135°   | 817.3  | 830.4  | 837.6  | 845.8  | 844.2  |
| 137.5° | 853.0  | 862.8  | 871.0  | 879.1  | 876.7  |
| 140°   | 888.0  | 894.5  | 903.4  | 910.7  | 906.7  |
| 142.5° | 917.4  | 923.0  | 933.6  | 940.0  | 936.0  |
| 145°   | 948.2  | 947.3  | 961.2  | 966.8  | 962.7  |
| 147.5° | 974.9  | 972.5  | 986.3  | 990.3  | 987.1  |
| 150°   | 1001.0 | 995.3  | 1008.3 | 1013.1 | 1009.1 |
| 152.5° | 1022.8 | 1016.4 | 1028.6 | 1033.5 | 1027.8 |
| 155°   | 1044.0 | 1036.8 | 1046.5 | 1051.3 | 1044.9 |
| 157.5° | 1061.1 | 1054.7 | 1062.0 | 1067.6 | 1061.1 |
| 160°   | 1075.7 | 1070.9 | 1075.7 | 1080.6 | 1074.8 |
| 162.5° | 1088.7 | 1083.8 | 1087.9 | 1093.6 | 1086.3 |
| 165°   | 1100.0 | 1095.2 | 1097.7 | 1103.3 | 1097.7 |
| 167.5° | 1109.0 | 1104.1 | 1106.6 | 1112.3 | 1105.0 |
| 170°   | 1116.3 | 1111.4 | 1113.1 | 1118.8 | 1111.4 |
| 172.5° | 1121.2 | 1116.3 | 1118.0 | 1123.6 | 1116.3 |
| 175°   | 1125.2 | 1119.5 | 1121.2 | 1126.9 | 1118.8 |
| 177.5° | 1126.9 | 1121.2 | 1122.1 | 1127.7 | 1120.4 |
| 180°   | 1122.9 | 1122.9 | 1122.9 | 1122.9 | 1122.9 |

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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 | 12.49            | 13.53 | 13.29 | 14.35 | 15.36 | 12.05          | 13.09 | 12.85 | 13.91 | 14.92 |
|                 | 3H   | 14.16            | 15.09 | 14.97 | 15.92 | 16.96 | 13.68          | 14.61 | 14.49 | 15.44 | 16.48 |
|                 | 4H   | 14.75            | 15.63 | 15.58 | 16.47 | 17.52 | 14.27          | 15.14 | 15.10 | 15.98 | 17.03 |
|                 | 6H   | 15.16            | 15.97 | 16.00 | 16.81 | 17.88 | 14.67          | 15.48 | 15.51 | 16.32 | 17.39 |
|                 | 8H   | 15.26            | 16.03 | 16.11 | 16.90 | 17.97 | 14.77          | 15.54 | 15.62 | 16.41 | 17.47 |
|                 | 12H  | 15.32            | 16.05 | 16.17 | 16.91 | 18.00 | 14.82          | 15.55 | 15.68 | 16.41 | 17.50 |
| 4H              | 2H   | 12.97            | 13.85 | 13.81 | 14.69 | 15.74 | 12.62          | 13.50 | 13.45 | 14.34 | 15.39 |
|                 | 3H   | 14.85            | 15.58 | 15.69 | 16.45 | 17.52 | 14.44          | 15.18 | 15.29 | 16.05 | 17.12 |
|                 | 4H   | 15.56            | 16.23 | 16.42 | 17.10 | 18.19 | 15.15          | 15.81 | 16.00 | 16.68 | 17.78 |
|                 | 6H   | 16.08            | 16.66 | 16.96 | 17.55 | 18.65 | 15.66          | 16.24 | 16.53 | 17.13 | 18.23 |
|                 | 8H   | 16.23            | 16.77 | 17.11 | 17.66 | 18.77 | 15.81          | 16.35 | 16.68 | 17.23 | 18.34 |
|                 | 12H  | 16.31            | 16.80 | 17.21 | 17.71 | 18.82 | 15.87          | 16.36 | 16.77 | 17.27 | 18.38 |
| 8H              | 4H   | 15.77            | 16.31 | 16.65 | 17.20 | 18.31 | 15.40          | 15.94 | 16.28 | 16.83 | 17.94 |
|                 | 6H   | 16.40            | 16.85 | 17.30 | 17.78 | 18.89 | 16.02          | 16.47 | 16.93 | 17.40 | 18.51 |
|                 | 8H   | 16.62            | 17.01 | 17.53 | 17.94 | 19.07 | 16.24          | 16.63 | 17.15 | 17.56 | 18.68 |
|                 | 12H  | 16.75            | 17.10 | 17.67 | 18.02 | 19.20 | 16.35          | 16.70 | 17.27 | 17.62 | 18.80 |
| 12H             | 4H   | 15.76            | 16.25 | 16.66 | 17.16 | 18.27 | 15.40          | 15.89 | 16.30 | 16.79 | 17.91 |
|                 | 6H   | 16.43            | 16.83 | 17.34 | 17.75 | 18.88 | 16.07          | 16.46 | 16.98 | 17.39 | 18.51 |
|                 | 8H   | 16.67            | 17.02 | 17.59 | 17.94 | 19.12 | 16.30          | 16.65 | 17.22 | 17.57 | 18.75 |