

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: P916732

Luminaire Tested: DFN2DIP-PN3F0-080D040US930-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P916732  
REPORT IS A COMBINATION OF REPORTS P899535 AND P896399  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN3F0-080D040US930-FLLFLL  
Description: 3 foot, Pentagon Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

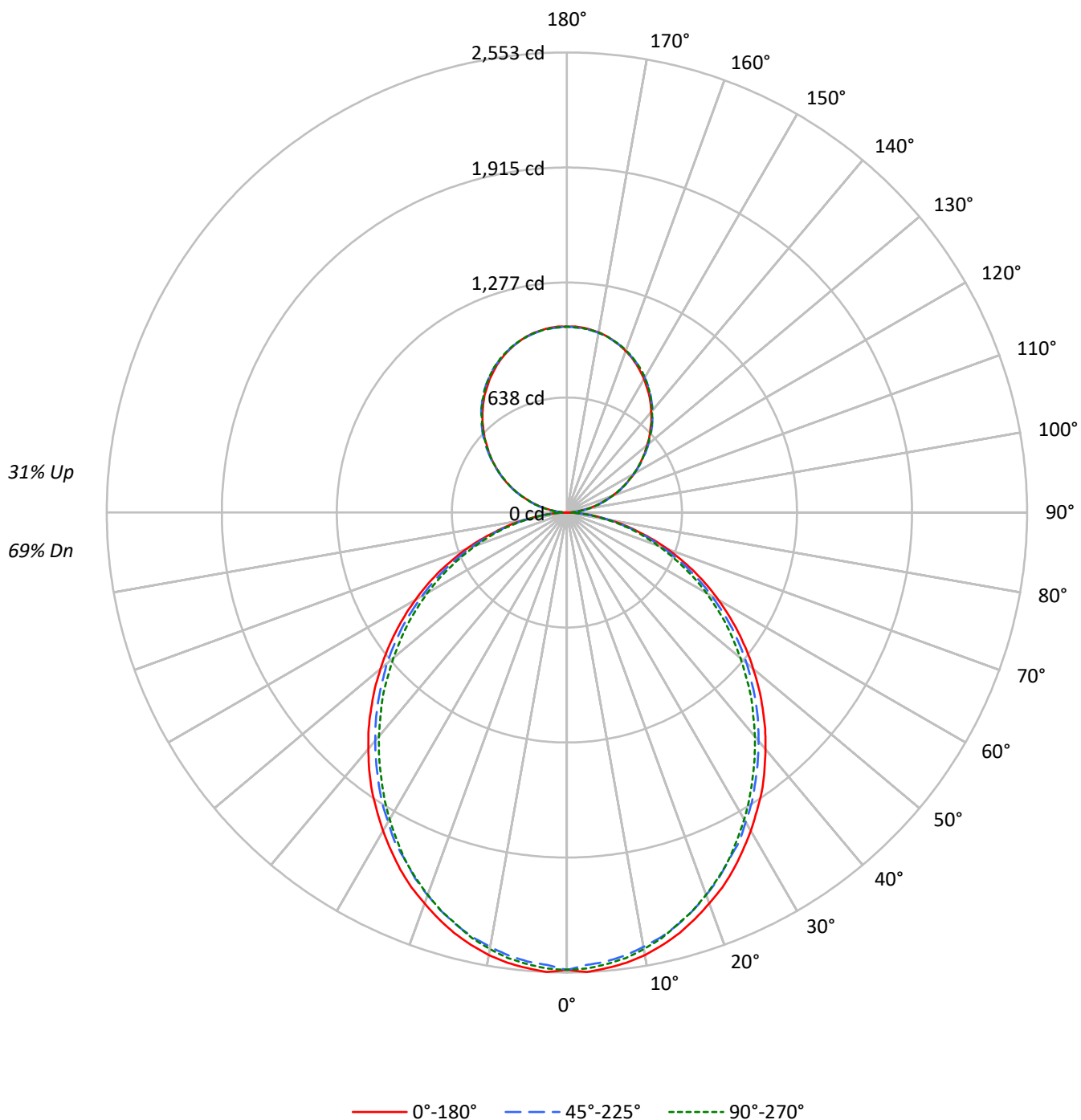
Lumens per Lamp: N/A  
Luminaire Lumens: 9343.3 lumens  
Efficiency: N/A  
Efficacy: 85.0 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 2.96' x L: 3.11' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 109.9  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9967  
Total Harmonic Distortion (THDi): 0.063  
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   | 112 | 112 | 112 | 112 | 106 | 106 | 106 | 106 | 94 | 94 | 94 | 83 | 83 | 83 | 74 | 74 | 74 |
| 1   | 102 | 98  | 94  | 90  | 96  | 92  | 89  | 86  | 83 | 80 | 77 | 74 | 71 | 70 | 65 | 64 | 62 |
| 2   | 93  | 85  | 79  | 74  | 88  | 81  | 75  | 70  | 72 | 68 | 64 | 65 | 61 | 58 | 57 | 55 | 52 |
| 3   | 85  | 75  | 67  | 61  | 80  | 71  | 64  | 59  | 64 | 58 | 54 | 57 | 53 | 49 | 51 | 48 | 45 |
| 4   | 78  | 67  | 58  | 52  | 73  | 63  | 56  | 50  | 57 | 51 | 46 | 51 | 46 | 42 | 46 | 42 | 39 |
| 5   | 71  | 59  | 51  | 45  | 67  | 56  | 49  | 43  | 51 | 45 | 40 | 46 | 41 | 37 | 41 | 37 | 34 |
| 6   | 66  | 53  | 45  | 39  | 62  | 51  | 43  | 38  | 46 | 40 | 35 | 41 | 36 | 32 | 37 | 33 | 30 |
| 7   | 61  | 48  | 40  | 34  | 58  | 46  | 39  | 33  | 42 | 35 | 31 | 38 | 33 | 29 | 34 | 30 | 26 |
| 8   | 57  | 44  | 36  | 31  | 54  | 42  | 35  | 30  | 38 | 32 | 28 | 35 | 29 | 26 | 31 | 27 | 24 |
| 9   | 53  | 40  | 33  | 27  | 50  | 39  | 31  | 26  | 35 | 29 | 25 | 32 | 27 | 23 | 29 | 25 | 21 |
| 10  | 50  | 37  | 30  | 25  | 47  | 36  | 29  | 24  | 32 | 27 | 22 | 30 | 25 | 21 | 27 | 23 | 20 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2967 | 2967 | 2967 |
| 5°  | 2970 | 2923 | 2944 |
| 10° | 2944 | 2882 | 2903 |
| 15° | 2899 | 2832 | 2839 |
| 20° | 2839 | 2764 | 2774 |
| 25° | 2779 | 2683 | 2699 |
| 30° | 2704 | 2608 | 2604 |
| 35° | 2633 | 2519 | 2504 |
| 40° | 2546 | 2430 | 2408 |
| 45° | 2459 | 2340 | 2310 |
| 50° | 2364 | 2245 | 2197 |
| 55° | 2264 | 2136 | 2093 |
| 60° | 2151 | 2006 | 1973 |
| 65° | 2027 | 1872 | 1832 |
| 70° | 1870 | 1708 | 1679 |
| 75° | 1653 | 1511 | 1537 |
| 80° | 1390 | 1260 | 1268 |
| 85° | 981  | 834  | 826  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2459 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 238.9  | 2.6       |
| 10°-20°   | 672.1  | 7.2       |
| 20°-30°   | 987.7  | 10.6      |
| 30°-40°   | 1147.1 | 12.3      |
| 40°-50°   | 1145.7 | 12.3      |
| 50°-60°   | 999.0  | 10.7      |
| 60°-70°   | 738.5  | 7.9       |
| 70°-80°   | 417.8  | 4.5       |
| 80°-90°   | 113.2  | 1.2       |
| 90°-100°  | 63.8   | 0.7       |
| 100°-110° | 202.8  | 2.2       |
| 110°-120° | 347.0  | 3.7       |
| 120°-130° | 456.4  | 4.9       |
| 130°-140° | 512.3  | 5.5       |
| 140°-150° | 502.4  | 5.4       |
| 150°-160° | 421.4  | 4.5       |
| 160°-170° | 279.5  | 3.0       |
| 170°-180° | 97.7   | 1.0       |
| 0°-30°    | 1898.6 | 20.3      |
| 0°-40°    | 3045.8 | 32.6      |
| 0°-60°    | 5190.5 | 55.6      |
| 0°-90°    | 6460.1 | 69.1      |
| 90°-120°  | 613.6  | 6.6       |
| 90°-150°  | 2084.7 | 22.3      |
| 90°-180°  | 2883.0 | 30.9      |
| 0°-180°   | 9343.3 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2538 | 2538  | 2538 | 2538  | 2538 |      |
| 5°   | 2538 | 2528  | 2501 | 2521  | 2516 | 241  |
| 15°  | 2416 | 2402  | 2370 | 2379  | 2367 | 680  |
| 25°  | 2186 | 2167  | 2126 | 2130  | 2126 | 1006 |
| 35°  | 1886 | 1862  | 1823 | 1808  | 1796 | 1178 |
| 45°  | 1535 | 1518  | 1481 | 1455  | 1445 | 1185 |
| 55°  | 1162 | 1147  | 1118 | 1088  | 1076 | 1039 |
| 65°  | 784  | 769   | 744  | 722   | 710  | 775  |
| 75°  | 410  | 405   | 393  | 378   | 383  | 438  |
| 85°  | 100  | 98    | 95   | 88    | 85   | 112  |
| 90°  | 1    | 11    | 30   | 29    | 30   | 9    |
| 95°  | 45   | 54    | 56   | 56    | 54   | 51   |
| 105° | 187  | 190   | 192  | 193   | 193  | 198  |
| 115° | 348  | 353   | 352  | 351   | 348  | 344  |
| 125° | 506  | 514   | 512  | 509   | 508  | 453  |
| 135° | 655  | 665   | 667  | 666   | 663  | 506  |
| 145° | 795  | 802   | 807  | 808   | 804  | 497  |
| 155° | 910  | 912   | 915  | 919   | 916  | 419  |
| 165° | 989  | 988   | 988  | 995   | 990  | 279  |
| 175° | 1030 | 1027  | 1025 | 1031  | 1026 | 98   |
| 180° | 1031 | 1031  | 1031 | 1031  | 1031 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2537.9 | 2537.9 | 2537.9 | 2537.9 | 2537.9 |
| 2.5°   | 2552.6 | 2540.5 | 2513.6 | 2537.9 | 2533.2 |
| 5°     | 2537.9 | 2528.3 | 2501.4 | 2520.8 | 2516.2 |
| 7.5°   | 2520.8 | 2506.3 | 2479.4 | 2499.1 | 2494.2 |
| 10°    | 2494.2 | 2477.0 | 2447.8 | 2467.2 | 2460.0 |
| 12.5°  | 2457.4 | 2442.9 | 2413.6 | 2425.8 | 2420.9 |
| 15°    | 2416.0 | 2401.5 | 2369.6 | 2379.4 | 2367.3 |
| 17.5°  | 2364.7 | 2350.2 | 2318.3 | 2330.5 | 2318.3 |
| 20°    | 2308.5 | 2294.0 | 2259.8 | 2267.1 | 2257.5 |
| 22.5°  | 2252.6 | 2230.6 | 2198.7 | 2198.7 | 2193.8 |
| 25°    | 2186.5 | 2167.1 | 2125.7 | 2130.4 | 2125.7 |
| 27.5°  | 2113.3 | 2096.2 | 2064.6 | 2057.3 | 2045.2 |
| 30°    | 2040.3 | 2020.6 | 1984.1 | 1976.9 | 1967.0 |
| 32.5°  | 1962.1 | 1947.6 | 1908.5 | 1893.7 | 1883.9 |
| 35°    | 1886.4 | 1862.1 | 1823.0 | 1808.2 | 1796.1 |
| 37.5°  | 1801.0 | 1779.0 | 1739.9 | 1722.8 | 1710.7 |
| 40°    | 1713.3 | 1693.5 | 1654.5 | 1632.7 | 1622.9 |
| 42.5°  | 1627.8 | 1608.1 | 1569.3 | 1544.7 | 1530.2 |
| 45°    | 1535.1 | 1518.0 | 1481.2 | 1454.6 | 1444.8 |
| 47.5°  | 1444.8 | 1427.7 | 1388.5 | 1361.6 | 1347.1 |
| 50°    | 1349.5 | 1337.3 | 1303.1 | 1268.9 | 1256.8 |
| 52.5°  | 1256.8 | 1239.7 | 1208.1 | 1181.2 | 1164.1 |
| 55°    | 1161.7 | 1147.0 | 1117.8 | 1088.5 | 1076.3 |
| 57.5°  | 1066.5 | 1054.3 | 1022.5 | 993.2  | 983.3  |
| 60°    | 971.2  | 961.6  | 927.4  | 900.5  | 893.2  |
| 62.5°  | 878.5  | 861.4  | 837.1  | 812.8  | 802.9  |
| 65°    | 783.5  | 768.7  | 744.4  | 722.4  | 710.2  |
| 67.5°  | 685.8  | 673.4  | 651.7  | 634.6  | 624.8  |
| 70°    | 595.5  | 585.6  | 563.7  | 546.6  | 537.0  |
| 72.5°  | 502.8  | 493.0  | 480.8  | 463.7  | 456.5  |
| 75°    | 409.9  | 405.2  | 392.8  | 378.3  | 383.2  |
| 77.5°  | 327.0  | 317.2  | 312.3  | 305.0  | 297.7  |
| 80°    | 244.2  | 241.6  | 236.7  | 229.4  | 224.5  |
| 82.5°  | 166.0  | 166.0  | 163.6  | 153.8  | 153.8  |
| 85°    | 100.0  | 97.6   | 95.3   | 87.8   | 85.4   |
| 87.5°  | 44.0   | 39.1   | 34.2   | 26.9   | 24.4   |
| 90°    | 0.9    | 11.2   | 30.5   | 28.6   | 29.5   |
| 92.5°  | 19.2   | 26.1   | 27.1   | 28.0   | 28.0   |
| 95°    | 45.4   | 54.1   | 55.7   | 55.7   | 54.1   |
| 97.5°  | 75.6   | 83.6   | 87.1   | 87.1   | 87.1   |
| 100°   | 110.4  | 117.6  | 120.0  | 120.0  | 119.1  |
| 102.5° | 147.1  | 152.4  | 155.8  | 156.7  | 155.8  |
| 105°   | 187.2  | 189.6  | 191.5  | 193.1  | 193.1  |
| 107.5° | 227.0  | 230.7  | 230.7  | 231.3  | 227.0  |
| 110°   | 265.5  | 270.5  | 270.5  | 270.5  | 268.1  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 307.2  | 312.5  | 311.5  | 309.1  | 307.2  |
| 115°   | 348.2  | 353.3  | 351.6  | 350.7  | 348.2  |
| 117.5° | 389.0  | 395.8  | 391.5  | 389.0  | 386.5  |
| 120°   | 430.1  | 436.8  | 430.1  | 430.1  | 427.2  |
| 122.5° | 467.3  | 476.1  | 471.7  | 469.2  | 467.3  |
| 125°   | 506.5  | 514.3  | 511.8  | 509.0  | 508.1  |
| 127.5° | 544.8  | 554.4  | 551.0  | 547.2  | 544.8  |
| 130°   | 580.5  | 591.7  | 590.2  | 588.3  | 584.9  |
| 132.5° | 620.6  | 629.3  | 630.0  | 625.6  | 623.1  |
| 135°   | 655.2  | 664.8  | 666.7  | 665.7  | 663.2  |
| 137.5° | 693.7  | 701.5  | 703.0  | 702.4  | 698.7  |
| 140°   | 727.6  | 735.4  | 739.7  | 739.7  | 736.3  |
| 142.5° | 762.5  | 770.2  | 772.7  | 773.6  | 770.2  |
| 145°   | 795.4  | 801.6  | 806.6  | 807.6  | 804.1  |
| 147.5° | 824.9  | 832.7  | 836.4  | 838.0  | 834.5  |
| 150°   | 855.4  | 860.7  | 864.1  | 866.9  | 864.1  |
| 152.5° | 882.5  | 887.7  | 892.1  | 895.5  | 892.1  |
| 155°   | 909.5  | 912.0  | 914.8  | 919.2  | 916.3  |
| 157.5° | 932.9  | 934.7  | 936.2  | 942.5  | 938.1  |
| 160°   | 953.7  | 955.5  | 956.4  | 961.7  | 958.0  |
| 162.5° | 972.9  | 972.9  | 973.9  | 979.7  | 975.4  |
| 165°   | 989.4  | 988.5  | 988.5  | 994.7  | 990.3  |
| 167.5° | 1004.4 | 1001.5 | 1001.5 | 1007.8 | 1003.4 |
| 170°   | 1015.5 | 1013.0 | 1012.1 | 1018.3 | 1013.0 |
| 172.5° | 1023.3 | 1020.8 | 1019.9 | 1026.1 | 1020.8 |
| 175°   | 1029.6 | 1027.0 | 1025.2 | 1031.4 | 1026.1 |
| 177.5° | 1033.0 | 1030.5 | 1028.6 | 1033.9 | 1028.6 |
| 180°   | 1031.4 | 1031.4 | 1031.4 | 1031.4 | 1031.4 |

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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 | 12.61            | 13.68 | 13.39 | 14.47 | 15.44 | 12.17          | 13.24 | 12.95 | 14.04 | 15.00 |
|                 | 3H   | 14.28            | 15.24 | 15.07 | 16.04 | 17.04 | 13.80          | 14.76 | 14.59 | 15.56 | 16.56 |
|                 | 4H   | 14.88            | 15.78 | 15.68 | 16.59 | 17.60 | 14.39          | 15.29 | 15.19 | 16.11 | 17.12 |
|                 | 6H   | 15.28            | 16.11 | 16.10 | 16.94 | 17.96 | 14.79          | 15.63 | 15.61 | 16.45 | 17.47 |
|                 | 8H   | 15.39            | 16.18 | 16.22 | 17.02 | 18.05 | 14.90          | 15.69 | 15.73 | 16.53 | 17.56 |
|                 | 12H  | 15.44            | 16.20 | 16.27 | 17.03 | 18.09 | 14.95          | 15.70 | 15.78 | 16.54 | 17.59 |
| 4H              | 2H   | 13.10            | 14.00 | 13.90 | 14.81 | 15.82 | 12.74          | 13.65 | 13.55 | 14.46 | 15.47 |
|                 | 3H   | 14.97            | 15.73 | 15.79 | 16.57 | 17.60 | 14.57          | 15.33 | 15.39 | 16.17 | 17.20 |
|                 | 4H   | 15.69            | 16.38 | 16.52 | 17.22 | 18.28 | 15.27          | 15.96 | 16.11 | 16.81 | 17.86 |
|                 | 6H   | 16.21            | 16.81 | 17.06 | 17.68 | 18.73 | 15.79          | 16.38 | 16.64 | 17.25 | 18.31 |
|                 | 8H   | 16.36            | 16.92 | 17.22 | 17.78 | 18.85 | 15.94          | 16.49 | 16.79 | 17.36 | 18.43 |
|                 | 12H  | 16.44            | 16.94 | 17.32 | 17.83 | 18.91 | 16.00          | 16.51 | 16.88 | 17.39 | 18.47 |
| 8H              | 4H   | 15.90            | 16.45 | 16.75 | 17.32 | 18.39 | 15.53          | 16.08 | 16.38 | 16.95 | 18.02 |
|                 | 6H   | 16.53            | 16.99 | 17.41 | 17.90 | 18.97 | 16.16          | 16.62 | 17.04 | 17.52 | 18.59 |
|                 | 8H   | 16.75            | 17.16 | 17.64 | 18.06 | 19.15 | 16.37          | 16.78 | 17.26 | 17.68 | 18.76 |
|                 | 12H  | 16.89            | 17.25 | 17.78 | 18.14 | 19.28 | 16.49          | 16.85 | 17.38 | 17.74 | 18.88 |
| 12H             | 4H   | 15.89            | 16.39 | 16.77 | 17.28 | 18.36 | 15.53          | 16.03 | 16.41 | 16.92 | 17.99 |
|                 | 6H   | 16.56            | 16.97 | 17.45 | 17.87 | 18.96 | 16.20          | 16.61 | 17.09 | 17.51 | 18.60 |
|                 | 8H   | 16.81            | 17.17 | 17.70 | 18.06 | 19.20 | 16.44          | 16.80 | 17.33 | 17.69 | 18.83 |