

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: P909800

Luminaire Tested: DFN2DIP-TR2F0-060D030US840-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P909800  
REPORT IS A COMBINATION OF REPORTS P900239 AND P897145  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR2F0-060D030US840-FLLFLL  
Description: 2 foot, Triangle Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

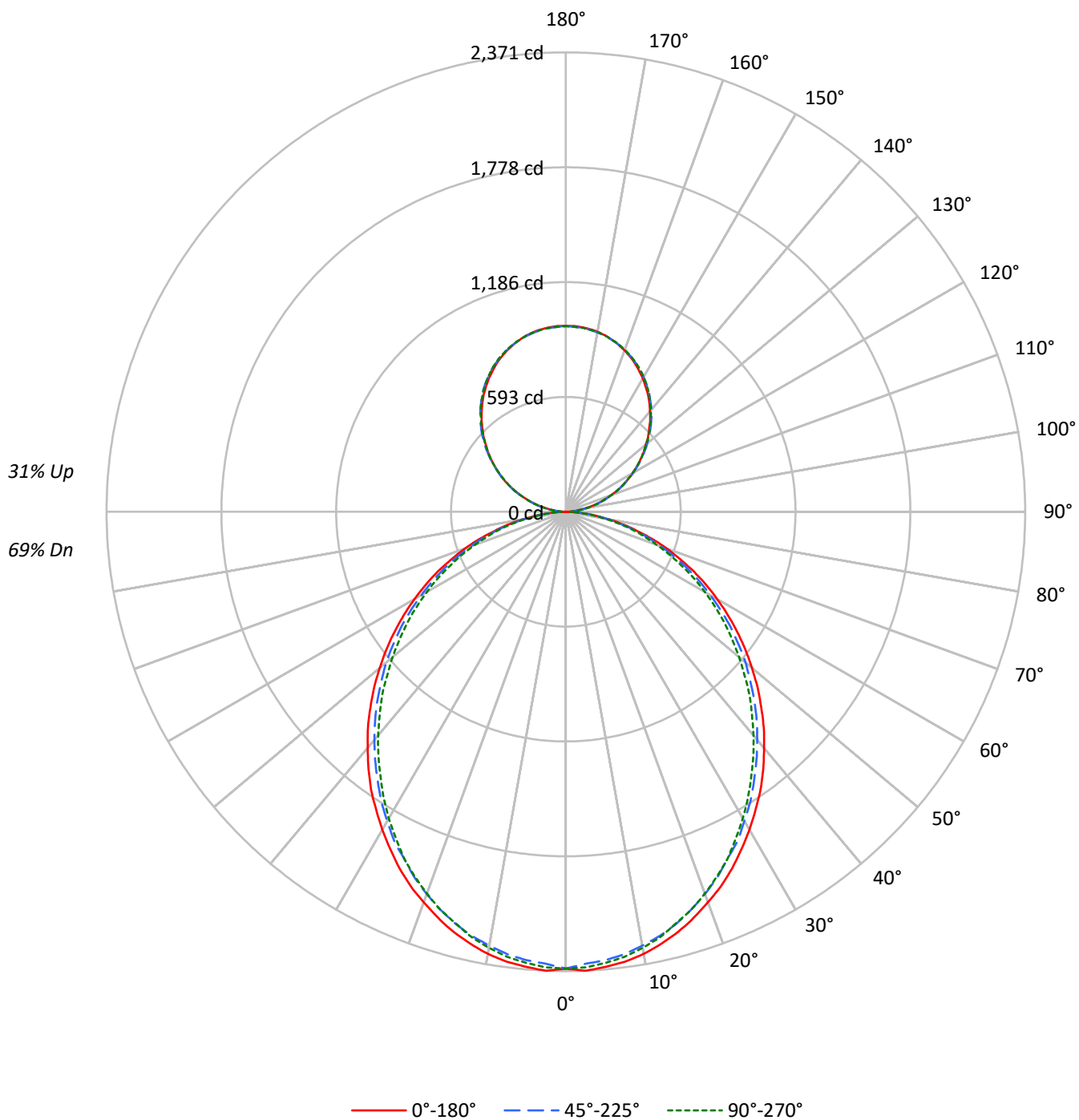
Lumens per Lamp: N/A  
Luminaire Lumens: 8679.8 lumens  
Efficiency: N/A  
Efficacy: 106.9 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 2.04' x L: 2.36' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 81.2  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9971  
Total Harmonic Distortion (THDi): 0.049  
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: P909800

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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°  | 5258 | 5258 | 5258 |
| 5°  | 5259 | 5173 | 5211 |
| 10° | 5209 | 5092 | 5131 |
| 15° | 5124 | 4997 | 5012 |
| 20° | 5013 | 4868 | 4891 |
| 25° | 4902 | 4718 | 4751 |
| 30° | 4765 | 4577 | 4577 |
| 35° | 4634 | 4412 | 4393 |
| 40° | 4475 | 4245 | 4216 |
| 45° | 4316 | 4077 | 4036 |
| 50° | 4141 | 3901 | 3828 |
| 55° | 3957 | 3697 | 3634 |
| 60° | 3750 | 3457 | 3412 |
| 65° | 3521 | 3206 | 3151 |
| 70° | 3232 | 2900 | 2868 |
| 75° | 2833 | 2534 | 2594 |
| 80° | 2349 | 2067 | 2096 |
| 85° | 1600 | 1303 | 1303 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 4316 cd/sqm

TEST NUMBER: P909800

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 221.9  | 2.6       |
| 10°-20°   | 624.4  | 7.2       |
| 20°-30°   | 917.5  | 10.6      |
| 30°-40°   | 1065.7 | 12.3      |
| 40°-50°   | 1064.4 | 12.3      |
| 50°-60°   | 928.1  | 10.7      |
| 60°-70°   | 686.1  | 7.9       |
| 70°-80°   | 388.2  | 4.5       |
| 80°-90°   | 105.2  | 1.2       |
| 90°-100°  | 59.3   | 0.7       |
| 100°-110° | 188.4  | 2.2       |
| 110°-120° | 322.4  | 3.7       |
| 120°-130° | 424.0  | 4.9       |
| 130°-140° | 475.9  | 5.5       |
| 140°-150° | 466.7  | 5.4       |
| 150°-160° | 391.5  | 4.5       |
| 160°-170° | 259.6  | 3.0       |
| 170°-180° | 90.7   | 1.0       |
| 0°-30°    | 1763.8 | 20.3      |
| 0°-40°    | 2829.5 | 32.6      |
| 0°-60°    | 4821.9 | 55.6      |
| 0°-90°    | 6001.3 | 69.1      |
| 90°-120°  | 570.1  | 6.6       |
| 90°-150°  | 1936.6 | 22.3      |
| 90°-180°  | 2678.0 | 30.9      |
| 0°-180°   | 8679.8 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2358 | 2358  | 2358 | 2358  | 2358 |      |
| 5°   | 2358 | 2349  | 2324 | 2342  | 2337 | 224  |
| 15°  | 2244 | 2231  | 2201 | 2210  | 2199 | 632  |
| 25°  | 2031 | 2013  | 1975 | 1979  | 1975 | 935  |
| 35°  | 1752 | 1730  | 1694 | 1680  | 1668 | 1094 |
| 45°  | 1426 | 1410  | 1376 | 1351  | 1342 | 1101 |
| 55°  | 1079 | 1066  | 1038 | 1011  | 1000 | 965  |
| 65°  | 728  | 714   | 692  | 671   | 660  | 720  |
| 75°  | 381  | 376   | 365  | 351   | 356  | 406  |
| 85°  | 93   | 91    | 88   | 82    | 79   | 104  |
| 90°  | 1    | 10    | 28   | 27    | 28   | 8    |
| 95°  | 42   | 50    | 52   | 52    | 50   | 47   |
| 105° | 174  | 176   | 178  | 179   | 179  | 184  |
| 115° | 324  | 328   | 327  | 326   | 324  | 320  |
| 125° | 471  | 478   | 475  | 473   | 472  | 420  |
| 135° | 609  | 618   | 619  | 618   | 616  | 470  |
| 145° | 739  | 745   | 749  | 750   | 747  | 462  |
| 155° | 845  | 847   | 850  | 854   | 851  | 389  |
| 165° | 919  | 918   | 918  | 924   | 920  | 259  |
| 175° | 956  | 954   | 952  | 958   | 953  | 91   |
| 180° | 958  | 958   | 958  | 958   | 958  |      |

TEST NUMBER: P909800

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2357.6 | 2357.6 | 2357.6 | 2357.6 | 2357.6 |
| 2.5°   | 2371.4 | 2360.1 | 2335.0 | 2357.6 | 2353.3 |
| 5°     | 2357.6 | 2348.7 | 2323.7 | 2341.8 | 2337.4 |
| 7.5°   | 2341.8 | 2328.3 | 2303.3 | 2321.6 | 2317.0 |
| 10°    | 2317.0 | 2301.2 | 2273.9 | 2292.0 | 2285.2 |
| 12.5°  | 2282.9 | 2269.4 | 2242.2 | 2253.5 | 2249.0 |
| 15°    | 2244.3 | 2230.9 | 2201.3 | 2210.5 | 2199.2 |
| 17.5°  | 2196.8 | 2183.3 | 2153.7 | 2164.9 | 2153.7 |
| 20°    | 2144.6 | 2131.1 | 2099.3 | 2106.1 | 2097.2 |
| 22.5°  | 2092.6 | 2072.1 | 2042.6 | 2042.6 | 2038.0 |
| 25°    | 2031.2 | 2013.3 | 1974.7 | 1979.0 | 1974.7 |
| 27.5°  | 1963.2 | 1947.3 | 1917.9 | 1911.3 | 1900.0 |
| 30°    | 1895.4 | 1877.0 | 1843.2 | 1836.4 | 1827.3 |
| 32.5°  | 1822.7 | 1809.3 | 1772.9 | 1759.2 | 1750.1 |
| 35°    | 1752.5 | 1729.9 | 1693.5 | 1679.8 | 1668.5 |
| 37.5°  | 1673.1 | 1652.6 | 1616.4 | 1600.4 | 1589.1 |
| 40°    | 1591.5 | 1573.3 | 1537.0 | 1516.8 | 1507.6 |
| 42.5°  | 1512.2 | 1493.9 | 1457.8 | 1435.0 | 1421.5 |
| 45°    | 1426.1 | 1410.2 | 1376.0 | 1351.3 | 1342.1 |
| 47.5°  | 1342.1 | 1326.3 | 1290.0 | 1265.0 | 1251.4 |
| 50°    | 1253.6 | 1242.3 | 1210.6 | 1178.8 | 1167.5 |
| 52.5°  | 1167.5 | 1151.7 | 1122.3 | 1097.3 | 1081.5 |
| 55°    | 1079.2 | 1065.5 | 1038.3 | 1011.2 | 999.9  |
| 57.5°  | 990.8  | 979.5  | 949.9  | 922.7  | 913.5  |
| 60°    | 902.2  | 893.3  | 861.6  | 836.6  | 829.8  |
| 62.5°  | 816.1  | 800.2  | 777.6  | 755.0  | 745.9  |
| 65°    | 727.8  | 714.2  | 691.6  | 671.1  | 659.7  |
| 67.5°  | 637.1  | 625.6  | 605.4  | 589.6  | 580.4  |
| 70°    | 553.2  | 544.1  | 523.6  | 507.8  | 498.9  |
| 72.5°  | 467.1  | 458.0  | 446.7  | 430.8  | 424.0  |
| 75°    | 380.7  | 376.5  | 364.9  | 351.4  | 356.0  |
| 77.5°  | 303.8  | 294.7  | 290.0  | 283.4  | 276.6  |
| 80°    | 226.8  | 224.4  | 219.8  | 213.1  | 208.5  |
| 82.5°  | 154.2  | 154.2  | 152.0  | 142.9  | 142.9  |
| 85°    | 92.8   | 90.7   | 88.5   | 81.5   | 79.4   |
| 87.5°  | 40.9   | 36.4   | 31.7   | 25.0   | 22.6   |
| 90°    | 0.9    | 10.4   | 28.3   | 26.6   | 27.5   |
| 92.5°  | 17.9   | 24.2   | 25.1   | 26.0   | 26.0   |
| 95°    | 42.2   | 50.3   | 51.7   | 51.7   | 50.3   |
| 97.5°  | 70.2   | 77.7   | 80.9   | 80.9   | 80.9   |
| 100°   | 102.5  | 109.2  | 111.5  | 111.5  | 110.7  |
| 102.5° | 136.6  | 141.6  | 144.7  | 145.6  | 144.7  |
| 105°   | 173.9  | 176.2  | 177.9  | 179.4  | 179.4  |
| 107.5° | 210.9  | 214.3  | 214.3  | 214.9  | 210.9  |
| 110°   | 246.7  | 251.4  | 251.4  | 251.4  | 249.0  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|--------|-------|-------|-------|-------|-------|
| 112.5° | 285.4 | 290.3 | 289.4 | 287.1 | 285.4 |
| 115°   | 323.6 | 328.1 | 326.7 | 325.9 | 323.6 |
| 117.5° | 361.3 | 367.7 | 363.7 | 361.3 | 359.0 |
| 120°   | 399.5 | 405.9 | 399.5 | 399.5 | 396.9 |
| 122.5° | 434.1 | 442.2 | 438.2 | 435.9 | 434.1 |
| 125°   | 470.6 | 477.8 | 475.4 | 472.8 | 472.0 |
| 127.5° | 506.0 | 515.0 | 511.9 | 508.4 | 506.0 |
| 130°   | 539.3 | 549.7 | 548.3 | 546.5 | 543.3 |
| 132.5° | 576.5 | 584.6 | 585.2 | 581.2 | 578.9 |
| 135°   | 608.6 | 617.5 | 619.4 | 618.4 | 616.1 |
| 137.5° | 644.4 | 651.7 | 653.1 | 652.6 | 649.0 |
| 140°   | 675.9 | 683.2 | 687.2 | 687.2 | 684.0 |
| 142.5° | 708.3 | 715.5 | 717.8 | 718.7 | 715.5 |
| 145°   | 738.9 | 744.7 | 749.3 | 750.1 | 747.0 |
| 147.5° | 766.4 | 773.6 | 777.0 | 778.5 | 775.3 |
| 150°   | 794.7 | 799.6 | 802.7 | 805.4 | 802.7 |
| 152.5° | 819.8 | 824.7 | 828.7 | 831.9 | 828.7 |
| 155°   | 845.0 | 847.2 | 849.8 | 853.8 | 851.3 |
| 157.5° | 866.6 | 868.3 | 869.8 | 875.6 | 871.5 |
| 160°   | 886.0 | 887.7 | 888.6 | 893.4 | 890.0 |
| 162.5° | 903.8 | 903.8 | 904.7 | 910.2 | 906.2 |
| 165°   | 919.2 | 918.3 | 918.3 | 924.0 | 920.0 |
| 167.5° | 933.0 | 930.4 | 930.4 | 936.1 | 932.1 |
| 170°   | 943.4 | 941.1 | 940.3 | 946.0 | 941.1 |
| 172.5° | 950.6 | 948.4 | 947.5 | 953.2 | 948.4 |
| 175°   | 956.4 | 954.1 | 952.4 | 958.2 | 953.2 |
| 177.5° | 959.6 | 957.3 | 955.5 | 960.5 | 955.5 |
| 180°   | 958.2 | 958.2 | 958.2 | 958.2 | 958.2 |

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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 | 14.51            | 15.58 | 15.29 | 16.37 | 17.34 | 14.09          | 15.15 | 14.86 | 15.95 | 16.92 |
|                 | 3H   | 16.16            | 17.12 | 16.95 | 17.93 | 18.93 | 15.70          | 16.66 | 16.49 | 17.47 | 18.46 |
|                 | 4H   | 16.75            | 17.65 | 17.55 | 18.46 | 19.47 | 16.29          | 17.19 | 17.09 | 18.00 | 19.01 |
|                 | 6H   | 17.14            | 17.97 | 17.95 | 18.79 | 19.82 | 16.68          | 17.51 | 17.49 | 18.33 | 19.36 |
|                 | 8H   | 17.24            | 18.03 | 18.07 | 18.87 | 19.90 | 16.78          | 17.57 | 17.61 | 18.42 | 19.44 |
|                 | 12H  | 17.29            | 18.04 | 18.12 | 18.88 | 19.93 | 16.82          | 17.58 | 17.65 | 18.41 | 19.47 |
| 4H              | 2H   | 14.99            | 15.89 | 15.80 | 16.71 | 17.72 | 14.65          | 15.55 | 15.46 | 16.37 | 17.38 |
|                 | 3H   | 16.85            | 17.60 | 17.67 | 18.45 | 19.47 | 16.46          | 17.22 | 17.28 | 18.06 | 19.09 |
|                 | 4H   | 17.55            | 18.24 | 18.38 | 19.08 | 20.14 | 17.16          | 17.84 | 17.99 | 18.69 | 19.74 |
|                 | 6H   | 18.05            | 18.65 | 18.90 | 19.52 | 20.58 | 17.66          | 18.25 | 18.51 | 19.12 | 20.18 |
|                 | 8H   | 18.20            | 18.75 | 19.05 | 19.62 | 20.69 | 17.80          | 18.36 | 18.65 | 19.22 | 20.29 |
|                 | 12H  | 18.27            | 18.77 | 19.14 | 19.66 | 20.73 | 17.86          | 18.36 | 18.74 | 19.25 | 20.33 |
| 8H              | 4H   | 17.75            | 18.31 | 18.61 | 19.17 | 20.24 | 17.40          | 17.96 | 18.25 | 18.82 | 19.89 |
|                 | 6H   | 18.36            | 18.82 | 19.25 | 19.73 | 20.80 | 18.01          | 18.47 | 18.89 | 19.38 | 20.45 |
|                 | 8H   | 18.57            | 18.98 | 19.46 | 19.88 | 20.97 | 18.22          | 18.62 | 19.11 | 19.53 | 20.61 |
|                 | 12H  | 18.70            | 19.06 | 19.59 | 19.95 | 21.09 | 18.33          | 18.69 | 19.22 | 19.58 | 20.72 |
| 12H             | 4H   | 17.75            | 18.25 | 18.62 | 19.13 | 20.21 | 17.40          | 17.90 | 18.28 | 18.79 | 19.86 |
|                 | 6H   | 18.39            | 18.80 | 19.28 | 19.70 | 20.79 | 18.05          | 18.46 | 18.94 | 19.36 | 20.45 |
|                 | 8H   | 18.63            | 18.99 | 19.52 | 19.88 | 21.02 | 18.28          | 18.64 | 19.18 | 19.53 | 20.67 |