

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: P914480

Luminaire Tested: DFN2DIP-SQ2F0-070D040US927-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P914480  
REPORT IS A COMBINATION OF REPORTS P899791 AND P896659  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ2F0-070D040US927-FLLFLL  
Description: 2 foot, Square Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

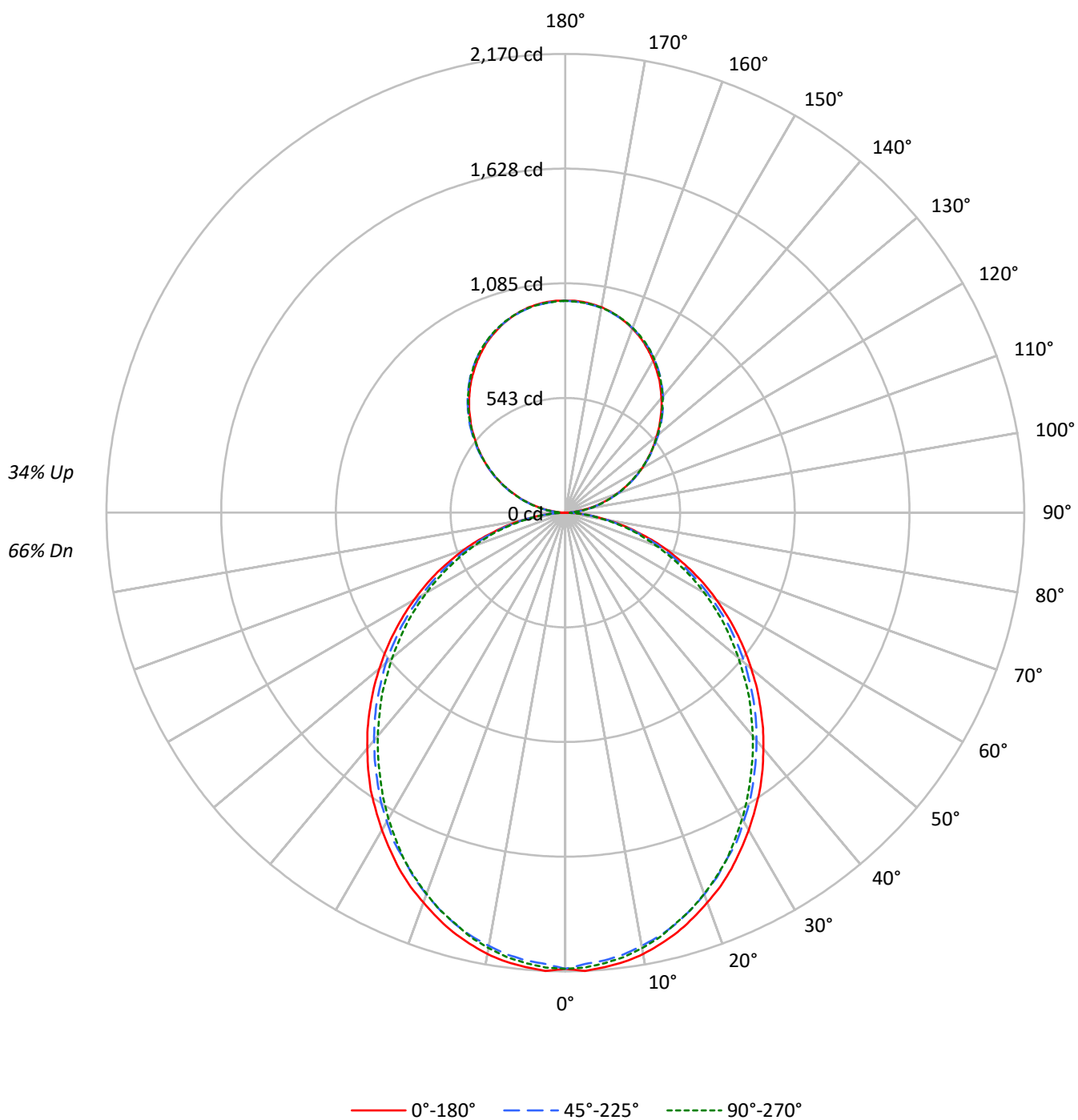
Lumens per Lamp: N/A  
Luminaire Lumens: 8294.2 lumens  
Efficiency: N/A  
Efficacy: 85.3 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 2.21' x L: 2.21' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 97.2  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9977  
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



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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 | 104 | 104 | 104 | 104 | 92 | 92 | 92 | 81 | 81 | 81 | 71 | 71 | 71 |
| 1   | 101 | 97  | 93  | 89  | 95  | 91  | 88  | 85  | 81 | 78 | 76 | 72 | 70 | 68 | 63 | 61 | 60 |
| 2   | 92  | 85  | 78  | 73  | 87  | 80  | 74  | 70  | 71 | 67 | 63 | 63 | 60 | 57 | 55 | 53 | 51 |
| 3   | 84  | 75  | 67  | 61  | 79  | 70  | 64  | 58  | 63 | 57 | 53 | 56 | 51 | 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 | 32 |
| 6   | 65  | 53  | 45  | 39  | 61  | 50  | 43  | 37  | 45 | 39 | 34 | 40 | 35 | 31 | 36 | 32 | 29 |
| 7   | 61  | 48  | 40  | 34  | 57  | 46  | 38  | 33  | 41 | 35 | 30 | 37 | 32 | 28 | 33 | 29 | 25 |
| 8   | 56  | 44  | 36  | 30  | 53  | 42  | 34  | 29  | 38 | 31 | 27 | 34 | 29 | 25 | 30 | 26 | 23 |
| 9   | 53  | 40  | 32  | 27  | 49  | 38  | 31  | 26  | 34 | 28 | 24 | 31 | 26 | 22 | 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°  | 4745 | 4745 | 4745 |
| 5°  | 4744 | 4668 | 4703 |
| 10° | 4697 | 4595 | 4633 |
| 15° | 4620 | 4509 | 4527 |
| 20° | 4518 | 4394 | 4418 |
| 25° | 4417 | 4258 | 4294 |
| 30° | 4292 | 4131 | 4138 |
| 35° | 4173 | 3982 | 3973 |
| 40° | 4028 | 3832 | 3816 |
| 45° | 3883 | 3681 | 3654 |
| 50° | 3724 | 3522 | 3468 |
| 55° | 3557 | 3338 | 3295 |
| 60° | 3368 | 3122 | 3098 |
| 65° | 3159 | 2896 | 2864 |
| 70° | 2896 | 2621 | 2611 |
| 75° | 2533 | 2290 | 2368 |
| 80° | 2092 | 1870 | 1923 |
| 85° | 1414 | 1181 | 1208 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 3883 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 203.1  | 2.4       |
| 10°-20°   | 571.4  | 6.9       |
| 20°-30°   | 839.7  | 10.1      |
| 30°-40°   | 975.3  | 11.8      |
| 40°-50°   | 974.1  | 11.7      |
| 50°-60°   | 849.4  | 10.2      |
| 60°-70°   | 627.9  | 7.6       |
| 70°-80°   | 355.2  | 4.3       |
| 80°-90°   | 96.6   | 1.2       |
| 90°-100°  | 62.0   | 0.7       |
| 100°-110° | 197.0  | 2.4       |
| 110°-120° | 337.2  | 4.1       |
| 120°-130° | 443.5  | 5.3       |
| 130°-140° | 497.8  | 6.0       |
| 140°-150° | 488.1  | 5.9       |
| 150°-160° | 409.5  | 4.9       |
| 160°-170° | 271.5  | 3.3       |
| 170°-180° | 94.9   | 1.1       |
| 0°-30°    | 1614.2 | 19.5      |
| 0°-40°    | 2589.5 | 31.2      |
| 0°-60°    | 4412.9 | 53.2      |
| 0°-90°    | 5492.7 | 66.2      |
| 90°-120°  | 596.2  | 7.2       |
| 90°-150°  | 2025.6 | 24.4      |
| 90°-180°  | 2801.0 | 33.8      |
| 0°-180°   | 8294.2 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2158 | 2158  | 2158 | 2158  | 2158 |      |
| 5°   | 2158 | 2150  | 2127 | 2143  | 2139 | 205  |
| 15°  | 2054 | 2042  | 2015 | 2023  | 2013 | 578  |
| 25°  | 1859 | 1842  | 1807 | 1811  | 1807 | 855  |
| 35°  | 1604 | 1583  | 1550 | 1537  | 1527 | 1002 |
| 45°  | 1305 | 1291  | 1259 | 1237  | 1228 | 1007 |
| 55°  | 988  | 975   | 950  | 925   | 915  | 883  |
| 65°  | 666  | 654   | 633  | 614   | 604  | 659  |
| 75°  | 348  | 344   | 334  | 322   | 326  | 372  |
| 85°  | 85   | 83    | 81   | 75    | 73   | 95   |
| 90°  | 1    | 11    | 30   | 28    | 29   | 8    |
| 95°  | 44   | 53    | 54   | 54    | 53   | 49   |
| 105° | 182  | 184   | 186  | 188   | 188  | 192  |
| 115° | 338  | 343   | 342  | 341   | 338  | 335  |
| 125° | 492  | 500   | 497  | 495   | 494  | 440  |
| 135° | 637  | 646   | 648  | 647   | 644  | 492  |
| 145° | 773  | 779   | 784  | 785   | 781  | 483  |
| 155° | 884  | 886   | 889  | 893   | 890  | 407  |
| 165° | 961  | 960   | 960  | 966   | 962  | 271  |
| 175° | 1000 | 998   | 996  | 1002  | 997  | 95   |
| 180° | 1002 | 1002  | 1002 | 1002  | 1002 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2157.7 | 2157.7 | 2157.7 | 2157.7 | 2157.7 |
| 2.5°   | 2170.3 | 2159.9 | 2137.0 | 2157.7 | 2153.7 |
| 5°     | 2157.7 | 2149.6 | 2126.7 | 2143.2 | 2139.2 |
| 7.5°   | 2143.2 | 2130.8 | 2107.9 | 2124.7 | 2120.5 |
| 10°    | 2120.5 | 2105.9 | 2081.1 | 2097.6 | 2091.4 |
| 12.5°  | 2089.2 | 2076.9 | 2052.1 | 2062.4 | 2058.2 |
| 15°    | 2054.0 | 2041.7 | 2014.6 | 2023.0 | 2012.6 |
| 17.5°  | 2010.4 | 1998.1 | 1971.0 | 1981.4 | 1971.0 |
| 20°    | 1962.6 | 1950.4 | 1921.3 | 1927.5 | 1919.3 |
| 22.5°  | 1915.1 | 1896.4 | 1869.3 | 1869.3 | 1865.1 |
| 25°    | 1859.0 | 1842.5 | 1807.3 | 1811.2 | 1807.3 |
| 27.5°  | 1796.7 | 1782.2 | 1755.3 | 1749.1 | 1738.8 |
| 30°    | 1734.6 | 1717.8 | 1686.9 | 1680.7 | 1672.3 |
| 32.5°  | 1668.1 | 1655.8 | 1622.5 | 1610.0 | 1601.6 |
| 35°    | 1603.8 | 1583.2 | 1549.9 | 1537.4 | 1527.0 |
| 37.5°  | 1531.2 | 1512.5 | 1479.2 | 1464.7 | 1454.4 |
| 40°    | 1456.6 | 1439.9 | 1406.6 | 1388.1 | 1379.7 |
| 42.5°  | 1383.9 | 1367.2 | 1334.2 | 1313.3 | 1300.9 |
| 45°    | 1305.1 | 1290.6 | 1259.3 | 1236.7 | 1228.3 |
| 47.5°  | 1228.3 | 1213.8 | 1180.5 | 1157.6 | 1145.3 |
| 50°    | 1147.3 | 1136.9 | 1107.9 | 1078.9 | 1068.5 |
| 52.5°  | 1068.5 | 1054.0 | 1027.1 | 1004.2 | 989.7  |
| 55°    | 987.7  | 975.2  | 950.3  | 925.4  | 915.0  |
| 57.5°  | 906.7  | 896.4  | 869.3  | 844.4  | 836.1  |
| 60°    | 825.7  | 817.5  | 788.5  | 765.6  | 759.5  |
| 62.5°  | 746.9  | 732.4  | 711.7  | 691.0  | 682.6  |
| 65°    | 666.1  | 653.5  | 632.9  | 614.2  | 603.8  |
| 67.5°  | 583.1  | 572.6  | 554.1  | 539.6  | 531.2  |
| 70°    | 506.3  | 498.0  | 479.2  | 464.7  | 456.5  |
| 72.5°  | 427.5  | 419.1  | 408.8  | 394.3  | 388.1  |
| 75°    | 348.5  | 344.5  | 333.9  | 321.6  | 325.8  |
| 77.5°  | 278.1  | 269.7  | 265.5  | 259.3  | 253.2  |
| 80°    | 207.6  | 205.4  | 201.2  | 195.0  | 190.8  |
| 82.5°  | 141.1  | 141.1  | 139.1  | 130.8  | 130.8  |
| 85°    | 85.0   | 83.0   | 81.0   | 74.6   | 72.6   |
| 87.5°  | 37.4   | 33.3   | 29.1   | 22.9   | 20.7   |
| 90°    | 0.9    | 10.9   | 29.6   | 27.8   | 28.7   |
| 92.5°  | 18.7   | 25.3   | 26.3   | 27.2   | 27.2   |
| 95°    | 44.1   | 52.6   | 54.1   | 54.1   | 52.6   |
| 97.5°  | 73.4   | 81.3   | 84.6   | 84.6   | 84.6   |
| 100°   | 107.3  | 114.2  | 116.6  | 116.6  | 115.7  |
| 102.5° | 142.9  | 148.1  | 151.4  | 152.3  | 151.4  |
| 105°   | 181.9  | 184.3  | 186.1  | 187.6  | 187.6  |
| 107.5° | 220.5  | 224.2  | 224.2  | 224.7  | 220.5  |
| 110°   | 258.0  | 262.8  | 262.8  | 262.8  | 260.5  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 298.5  | 303.6  | 302.7  | 300.3  | 298.5  |
| 115°   | 338.3  | 343.3  | 341.7  | 340.8  | 338.3  |
| 117.5° | 377.9  | 384.6  | 380.4  | 377.9  | 375.6  |
| 120°   | 417.9  | 424.5  | 417.9  | 417.9  | 415.1  |
| 122.5° | 454.1  | 462.6  | 458.4  | 455.9  | 454.1  |
| 125°   | 492.2  | 499.7  | 497.3  | 494.6  | 493.7  |
| 127.5° | 529.3  | 538.7  | 535.4  | 531.7  | 529.3  |
| 130°   | 564.0  | 575.0  | 573.5  | 571.6  | 568.3  |
| 132.5° | 603.0  | 611.5  | 612.1  | 607.8  | 605.5  |
| 135°   | 636.6  | 645.9  | 647.8  | 646.8  | 644.4  |
| 137.5° | 674.1  | 681.6  | 683.1  | 682.5  | 678.9  |
| 140°   | 706.9  | 714.5  | 718.7  | 718.7  | 715.4  |
| 142.5° | 740.8  | 748.4  | 750.8  | 751.7  | 748.4  |
| 145°   | 772.9  | 778.9  | 783.7  | 784.7  | 781.3  |
| 147.5° | 801.5  | 809.1  | 812.7  | 814.2  | 810.9  |
| 150°   | 831.2  | 836.3  | 839.6  | 842.3  | 839.6  |
| 152.5° | 857.5  | 862.5  | 866.8  | 870.1  | 866.8  |
| 155°   | 883.7  | 886.1  | 888.8  | 893.1  | 890.3  |
| 157.5° | 906.4  | 908.2  | 909.7  | 915.8  | 911.5  |
| 160°   | 926.6  | 928.4  | 929.3  | 934.5  | 930.8  |
| 162.5° | 945.3  | 945.3  | 946.3  | 952.0  | 947.8  |
| 165°   | 961.4  | 960.4  | 960.4  | 966.5  | 962.3  |
| 167.5° | 975.9  | 973.1  | 973.1  | 979.2  | 974.9  |
| 170°   | 986.7  | 984.3  | 983.4  | 989.4  | 984.3  |
| 172.5° | 994.3  | 991.9  | 990.9  | 997.0  | 991.9  |
| 175°   | 1000.4 | 997.9  | 996.1  | 1002.1 | 997.0  |
| 177.5° | 1003.7 | 1001.2 | 999.4  | 1004.6 | 999.4  |
| 180°   | 1002.1 | 1002.1 | 1002.1 | 1002.1 | 1002.1 |

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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 | 13.94            | 14.97 | 14.75 | 15.80 | 16.82 | 13.50          | 14.53 | 14.30 | 15.35 | 16.37 |
|                 | 3H   | 15.60            | 16.52 | 16.41 | 17.36 | 18.40 | 15.11          | 16.03 | 15.92 | 16.87 | 17.91 |
|                 | 4H   | 16.18            | 17.05 | 17.01 | 17.89 | 18.95 | 15.68          | 16.56 | 16.52 | 17.40 | 18.46 |
|                 | 6H   | 16.57            | 17.38 | 17.42 | 18.23 | 19.30 | 16.07          | 16.88 | 16.92 | 17.73 | 18.80 |
|                 | 8H   | 16.67            | 17.44 | 17.53 | 18.31 | 19.38 | 16.17          | 16.94 | 17.03 | 17.81 | 18.88 |
|                 | 12H  | 16.72            | 17.45 | 17.58 | 18.32 | 19.41 | 16.21          | 16.94 | 17.07 | 17.81 | 18.91 |
| 4H              | 2H   | 14.41            | 15.29 | 15.25 | 16.13 | 17.19 | 14.06          | 14.93 | 14.90 | 15.77 | 16.83 |
|                 | 3H   | 16.27            | 17.00 | 17.12 | 17.88 | 18.95 | 15.86          | 16.59 | 16.71 | 17.47 | 18.54 |
|                 | 4H   | 16.98            | 17.64 | 17.84 | 18.51 | 19.62 | 16.55          | 17.22 | 17.41 | 18.09 | 19.19 |
|                 | 6H   | 17.48            | 18.06 | 18.36 | 18.96 | 20.06 | 17.05          | 17.62 | 17.93 | 18.52 | 19.63 |
|                 | 8H   | 17.63            | 18.16 | 18.51 | 19.06 | 20.17 | 17.19          | 17.73 | 18.07 | 18.62 | 19.74 |
|                 | 12H  | 17.70            | 18.18 | 18.60 | 19.09 | 20.22 | 17.25          | 17.73 | 18.15 | 18.65 | 19.77 |
| 8H              | 4H   | 17.17            | 17.71 | 18.06 | 18.60 | 19.72 | 16.80          | 17.33 | 17.68 | 18.23 | 19.34 |
|                 | 6H   | 17.79            | 18.23 | 18.70 | 19.17 | 20.29 | 17.40          | 17.85 | 18.31 | 18.78 | 19.90 |
|                 | 8H   | 18.00            | 18.39 | 18.92 | 19.32 | 20.45 | 17.60          | 18.00 | 18.52 | 18.93 | 20.06 |
|                 | 12H  | 18.12            | 18.47 | 19.05 | 19.39 | 20.58 | 17.71          | 18.06 | 18.64 | 18.98 | 20.17 |
| 12H             | 4H   | 17.17            | 17.65 | 18.07 | 18.56 | 19.68 | 16.80          | 17.28 | 17.70 | 18.19 | 19.31 |
|                 | 6H   | 17.82            | 18.21 | 18.73 | 19.14 | 20.27 | 17.44          | 17.84 | 18.36 | 18.76 | 19.90 |
|                 | 8H   | 18.05            | 18.40 | 18.97 | 19.32 | 20.50 | 17.67          | 18.02 | 18.59 | 18.94 | 20.12 |