

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: P905318

Luminaire Tested: DFN2DIP-HX3F0-060D030US835-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P905318  
REPORT IS A COMBINATION OF REPORTS P899207 AND P896089  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX3F0-060D030US835-FLLFL  
Description: 3 foot, Hexagon Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

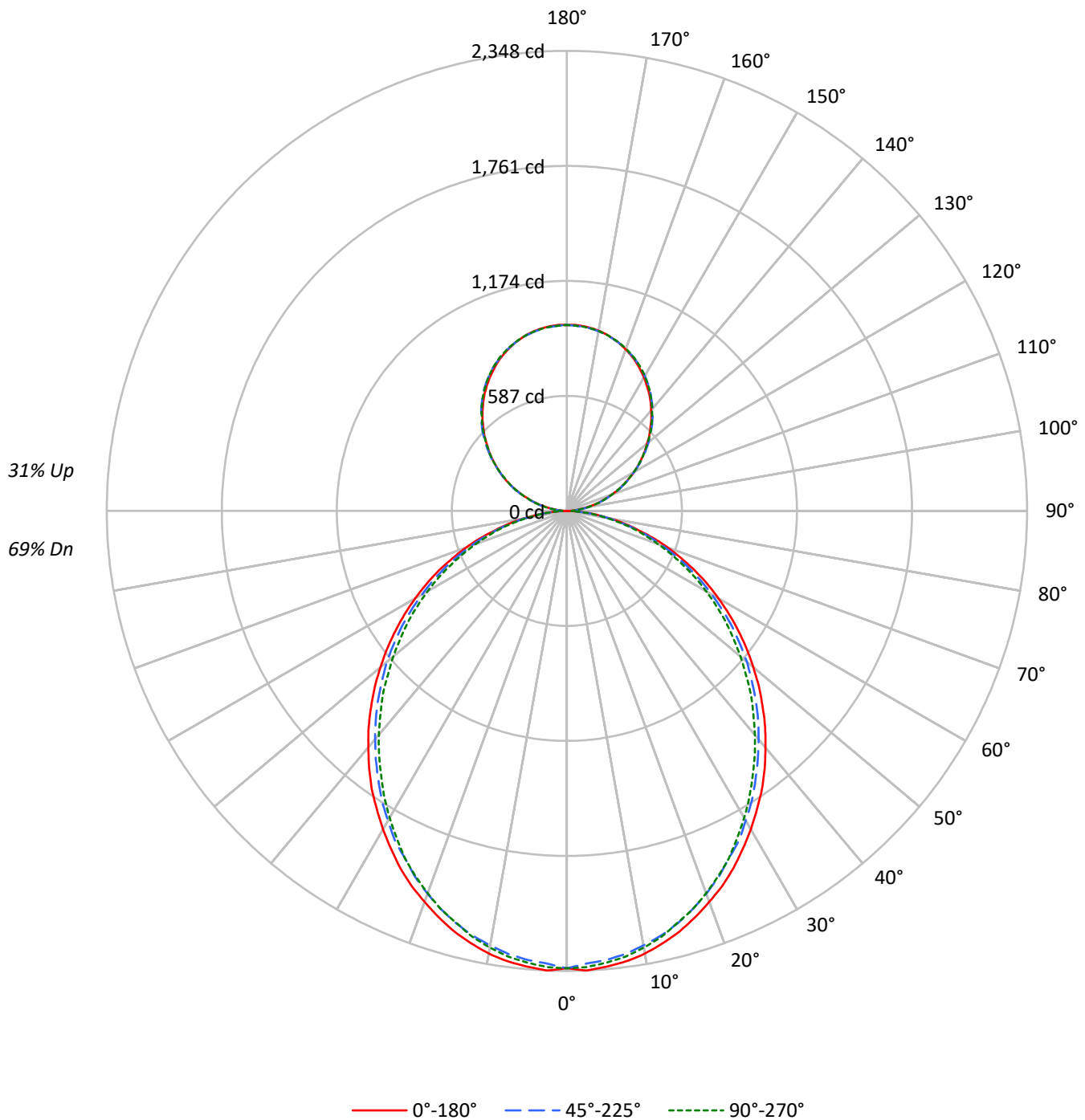
Lumens per Lamp: N/A  
Luminaire Lumens: 8595.0 lumens  
Efficiency: N/A  
Efficacy: 108.0 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 2.84' x L: 3.28' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 79.6  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9933  
Total Harmonic Distortion (THDi): 0.066  
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 | 36 | 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°  | 2704 | 2704 | 2704 |
| 5°  | 2707 | 2665 | 2683 |
| 10° | 2684 | 2627 | 2645 |
| 15° | 2644 | 2582 | 2587 |
| 20° | 2589 | 2520 | 2527 |
| 25° | 2535 | 2446 | 2459 |
| 30° | 2467 | 2377 | 2372 |
| 35° | 2403 | 2297 | 2280 |
| 40° | 2324 | 2215 | 2193 |
| 45° | 2245 | 2133 | 2103 |
| 50° | 2159 | 2047 | 1999 |
| 55° | 2068 | 1947 | 1904 |
| 60° | 1966 | 1829 | 1794 |
| 65° | 1854 | 1707 | 1665 |
| 70° | 1712 | 1557 | 1525 |
| 75° | 1515 | 1378 | 1394 |
| 80° | 1277 | 1149 | 1148 |
| 85° | 905  | 760  | 745  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2245 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 219.7  | 2.6       |
| 10°-20°   | 618.3  | 7.2       |
| 20°-30°   | 908.6  | 10.6      |
| 30°-40°   | 1055.3 | 12.3      |
| 40°-50°   | 1054.0 | 12.3      |
| 50°-60°   | 919.0  | 10.7      |
| 60°-70°   | 679.4  | 7.9       |
| 70°-80°   | 384.4  | 4.5       |
| 80°-90°   | 104.1  | 1.2       |
| 90°-100°  | 58.7   | 0.7       |
| 100°-110° | 186.5  | 2.2       |
| 110°-120° | 319.2  | 3.7       |
| 120°-130° | 419.8  | 4.9       |
| 130°-140° | 471.2  | 5.5       |
| 140°-150° | 462.1  | 5.4       |
| 150°-160° | 387.7  | 4.5       |
| 160°-170° | 257.1  | 3.0       |
| 170°-180° | 89.9   | 1.0       |
| 0°-30°    | 1746.6 | 20.3      |
| 0°-40°    | 2801.8 | 32.6      |
| 0°-60°    | 4774.8 | 55.6      |
| 0°-90°    | 5942.7 | 69.1      |
| 90°-120°  | 564.5  | 6.6       |
| 90°-150°  | 1917.7 | 22.3      |
| 90°-180°  | 2652.0 | 30.9      |
| 0°-180°   | 8595.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2335 | 2335  | 2335 | 2335  | 2335 |      |
| 5°   | 2335 | 2326  | 2301 | 2319  | 2315 | 222  |
| 15°  | 2222 | 2209  | 2180 | 2189  | 2178 | 626  |
| 25°  | 2011 | 1994  | 1955 | 1960  | 1955 | 926  |
| 35°  | 1735 | 1713  | 1677 | 1663  | 1652 | 1084 |
| 45°  | 1412 | 1396  | 1363 | 1338  | 1329 | 1090 |
| 55°  | 1069 | 1055  | 1028 | 1001  | 990  | 955  |
| 65°  | 721  | 707   | 685  | 664   | 653  | 713  |
| 75°  | 377  | 373   | 361  | 348   | 352  | 402  |
| 85°  | 92   | 90    | 88   | 81    | 79   | 103  |
| 90°  | 1    | 10    | 28   | 26    | 27   | 8    |
| 95°  | 42   | 50    | 51   | 51    | 50   | 46   |
| 105° | 172  | 174   | 176  | 178   | 178  | 182  |
| 115° | 320  | 325   | 324  | 323   | 320  | 317  |
| 125° | 466  | 473   | 471  | 468   | 467  | 416  |
| 135° | 603  | 612   | 613  | 612   | 610  | 466  |
| 145° | 732  | 737   | 742  | 743   | 740  | 457  |
| 155° | 837  | 839   | 842  | 846   | 843  | 385  |
| 165° | 910  | 909   | 909  | 915   | 911  | 257  |
| 175° | 947  | 945   | 943  | 949   | 944  | 90   |
| 180° | 949  | 949   | 949  | 949   | 949  |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2334.6 | 2334.6 | 2334.6 | 2334.6 | 2334.6 |
| 2.5°   | 2348.2 | 2337.0 | 2312.2 | 2334.6 | 2330.3 |
| 5°     | 2334.6 | 2325.8 | 2301.0 | 2318.9 | 2314.6 |
| 7.5°   | 2318.9 | 2305.6 | 2280.8 | 2298.9 | 2294.4 |
| 10°    | 2294.4 | 2278.7 | 2251.7 | 2269.6 | 2262.9 |
| 12.5°  | 2260.6 | 2247.2 | 2220.3 | 2231.5 | 2227.0 |
| 15°    | 2222.4 | 2209.1 | 2179.8 | 2188.9 | 2177.7 |
| 17.5°  | 2175.3 | 2162.0 | 2132.7 | 2143.8 | 2132.7 |
| 20°    | 2123.6 | 2110.3 | 2078.8 | 2085.5 | 2076.7 |
| 22.5°  | 2072.2 | 2051.9 | 2022.6 | 2022.6 | 2018.1 |
| 25°    | 2011.4 | 1993.6 | 1955.4 | 1959.7 | 1955.4 |
| 27.5°  | 1944.0 | 1928.3 | 1899.2 | 1892.6 | 1881.4 |
| 30°    | 1876.9 | 1858.7 | 1825.2 | 1818.5 | 1809.4 |
| 32.5°  | 1804.9 | 1791.6 | 1755.6 | 1742.0 | 1733.0 |
| 35°    | 1735.4 | 1713.0 | 1677.0 | 1663.4 | 1652.2 |
| 37.5°  | 1656.8 | 1636.5 | 1600.6 | 1584.8 | 1573.6 |
| 40°    | 1576.0 | 1557.9 | 1522.0 | 1502.0 | 1492.9 |
| 42.5°  | 1497.4 | 1479.3 | 1443.6 | 1421.0 | 1407.6 |
| 45°    | 1412.2 | 1396.4 | 1362.6 | 1338.1 | 1329.0 |
| 47.5°  | 1329.0 | 1313.3 | 1277.4 | 1252.6 | 1239.2 |
| 50°    | 1241.4 | 1230.2 | 1198.8 | 1167.3 | 1156.1 |
| 52.5°  | 1156.1 | 1140.4 | 1111.3 | 1086.6 | 1070.9 |
| 55°    | 1068.7 | 1055.1 | 1028.2 | 1001.3 | 990.1  |
| 57.5°  | 981.1  | 969.9  | 940.6  | 913.7  | 904.6  |
| 60°    | 893.4  | 884.6  | 853.2  | 828.4  | 821.7  |
| 62.5°  | 808.1  | 792.4  | 770.0  | 747.6  | 738.6  |
| 65°    | 720.7  | 707.2  | 684.8  | 664.5  | 653.3  |
| 67.5°  | 630.9  | 619.5  | 599.5  | 583.8  | 574.7  |
| 70°    | 547.8  | 538.8  | 518.5  | 502.8  | 494.0  |
| 72.5°  | 462.5  | 453.5  | 442.3  | 426.6  | 419.9  |
| 75°    | 377.0  | 372.8  | 361.3  | 348.0  | 352.5  |
| 77.5°  | 300.8  | 291.8  | 287.2  | 280.6  | 273.9  |
| 80°    | 224.6  | 222.2  | 217.7  | 211.0  | 206.5  |
| 82.5°  | 152.7  | 152.7  | 150.5  | 141.5  | 141.5  |
| 85°    | 91.9   | 89.8   | 87.6   | 80.7   | 78.6   |
| 87.5°  | 40.5   | 36.0   | 31.4   | 24.8   | 22.4   |
| 90°    | 0.9    | 10.3   | 28.0   | 26.3   | 27.2   |
| 92.5°  | 17.7   | 24.0   | 24.9   | 25.7   | 25.7   |
| 95°    | 41.8   | 49.8   | 51.2   | 51.2   | 49.8   |
| 97.5°  | 69.5   | 76.9   | 80.1   | 80.1   | 80.1   |
| 100°   | 101.5  | 108.1  | 110.4  | 110.4  | 109.6  |
| 102.5° | 135.3  | 140.2  | 143.3  | 144.2  | 143.3  |
| 105°   | 172.2  | 174.5  | 176.2  | 177.6  | 177.6  |
| 107.5° | 208.8  | 212.2  | 212.2  | 212.8  | 208.8  |
| 110°   | 244.3  | 248.9  | 248.9  | 248.9  | 246.6  |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|--------|-------|-------|-------|-------|-------|
| 112.5° | 282.6 | 287.5 | 286.6 | 284.3 | 282.6 |
| 115°   | 320.4 | 324.9 | 323.5 | 322.7 | 320.4 |
| 117.5° | 357.8 | 364.1 | 360.1 | 357.8 | 355.5 |
| 120°   | 395.6 | 401.9 | 395.6 | 395.6 | 393.0 |
| 122.5° | 429.9 | 437.9 | 433.9 | 431.6 | 429.9 |
| 125°   | 466.0 | 473.1 | 470.8 | 468.2 | 467.4 |
| 127.5° | 501.1 | 510.0 | 506.9 | 503.4 | 501.1 |
| 130°   | 534.0 | 544.3 | 542.9 | 541.2 | 538.0 |
| 132.5° | 570.9 | 578.9 | 579.5 | 575.5 | 573.2 |
| 135°   | 602.7 | 611.5 | 613.3 | 612.4 | 610.1 |
| 137.5° | 638.1 | 645.3 | 646.7 | 646.2 | 642.7 |
| 140°   | 669.3 | 676.5 | 680.5 | 680.5 | 677.3 |
| 142.5° | 701.4 | 708.5 | 710.8 | 711.7 | 708.5 |
| 145°   | 731.7 | 737.4 | 742.0 | 742.8 | 739.7 |
| 147.5° | 758.9 | 766.0 | 769.4 | 770.9 | 767.7 |
| 150°   | 786.9 | 791.8 | 794.9 | 797.5 | 794.9 |
| 152.5° | 811.8 | 816.6 | 820.6 | 823.8 | 820.6 |
| 155°   | 836.7 | 838.9 | 841.5 | 845.5 | 843.0 |
| 157.5° | 858.1 | 859.8 | 861.3 | 867.0 | 863.0 |
| 160°   | 877.3 | 879.0 | 879.9 | 884.7 | 881.3 |
| 162.5° | 895.0 | 895.0 | 895.9 | 901.3 | 897.3 |
| 165°   | 910.2 | 909.3 | 909.3 | 915.0 | 911.0 |
| 167.5° | 923.9 | 921.3 | 921.3 | 927.0 | 923.0 |
| 170°   | 934.2 | 931.9 | 931.1 | 936.8 | 931.9 |
| 172.5° | 941.3 | 939.1 | 938.2 | 943.9 | 939.1 |
| 175°   | 947.1 | 944.8 | 943.1 | 948.8 | 943.9 |
| 177.5° | 950.2 | 947.9 | 946.2 | 951.1 | 946.2 |
| 180°   | 948.8 | 948.8 | 948.8 | 948.8 | 948.8 |

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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 | 12.29            | 13.35 | 13.06 | 14.15 | 15.12 | 11.86          | 12.92 | 12.63 | 13.72 | 14.69 |
|                 | 3H   | 13.96            | 14.91 | 14.74 | 15.72 | 16.72 | 13.49          | 14.44 | 14.27 | 15.25 | 16.25 |
|                 | 4H   | 14.55            | 15.45 | 15.35 | 16.26 | 17.27 | 14.08          | 14.98 | 14.88 | 15.79 | 16.80 |
|                 | 6H   | 14.95            | 15.78 | 15.77 | 16.61 | 17.63 | 14.48          | 15.31 | 15.30 | 16.14 | 17.16 |
|                 | 8H   | 15.06            | 15.85 | 15.88 | 16.69 | 17.72 | 14.59          | 15.38 | 15.42 | 16.22 | 17.25 |
|                 | 12H  | 15.11            | 15.87 | 15.94 | 16.70 | 17.75 | 14.64          | 15.39 | 15.47 | 16.23 | 17.28 |
| 4H              | 2H   | 12.77            | 13.67 | 13.58 | 14.49 | 15.50 | 12.43          | 13.33 | 13.24 | 14.14 | 15.15 |
|                 | 3H   | 14.65            | 15.40 | 15.47 | 16.25 | 17.27 | 14.26          | 15.01 | 15.08 | 15.86 | 16.88 |
|                 | 4H   | 15.36            | 16.05 | 16.20 | 16.89 | 17.95 | 14.96          | 15.65 | 15.79 | 16.49 | 17.55 |
|                 | 6H   | 15.88            | 16.48 | 16.73 | 17.35 | 18.40 | 15.48          | 16.07 | 16.33 | 16.94 | 18.00 |
|                 | 8H   | 16.03            | 16.59 | 16.89 | 17.45 | 18.52 | 15.62          | 16.18 | 16.48 | 17.05 | 18.12 |
|                 | 12H  | 16.11            | 16.61 | 16.98 | 17.50 | 18.57 | 15.69          | 16.20 | 16.57 | 17.08 | 18.16 |
| 8H              | 4H   | 15.57            | 16.13 | 16.43 | 16.99 | 18.06 | 15.21          | 15.77 | 16.07 | 16.64 | 17.71 |
|                 | 6H   | 16.20            | 16.66 | 17.08 | 17.57 | 18.64 | 15.84          | 16.30 | 16.72 | 17.21 | 18.28 |
|                 | 8H   | 16.42            | 16.83 | 17.31 | 17.73 | 18.82 | 16.05          | 16.46 | 16.95 | 17.37 | 18.45 |
|                 | 12H  | 16.56            | 16.92 | 17.45 | 17.81 | 18.95 | 16.18          | 16.54 | 17.07 | 17.43 | 18.57 |
| 12H             | 4H   | 15.57            | 16.07 | 16.44 | 16.95 | 18.03 | 15.22          | 15.72 | 16.09 | 16.60 | 17.68 |
|                 | 6H   | 16.23            | 16.64 | 17.12 | 17.54 | 18.63 | 15.88          | 16.29 | 16.78 | 17.19 | 18.28 |
|                 | 8H   | 16.48            | 16.84 | 17.37 | 17.73 | 18.87 | 16.12          | 16.48 | 17.02 | 17.38 | 18.52 |