

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: P913690

Luminaire Tested: DFN2DIP-HX4F0-090D050US927-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P913690  
REPORT IS A COMBINATION OF REPORTS P899327 AND P896188  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX4F0-090D050US927-FLLFLL  
Description: 4 foot, Hexagon Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

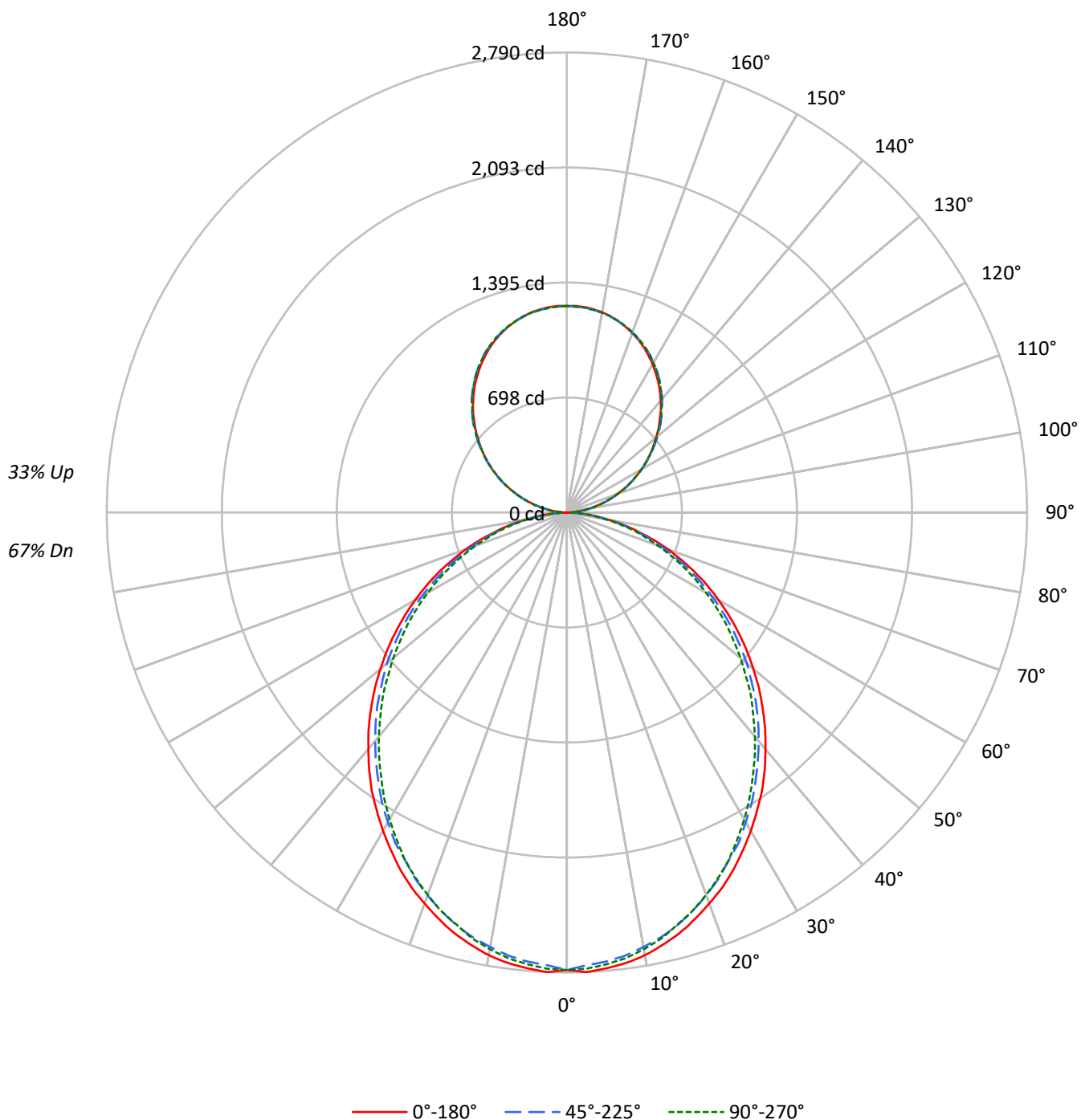
Lumens per Lamp: N/A  
Luminaire Lumens: 10563.8 lumens  
Efficiency: N/A  
Efficacy: 90.1 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.54' x L: 4.09' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 117.3  
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



TEST NUMBER: P913690

CATALOG NUMBER: DFN2DIP-HX4F0-090D050US927-FLLFL

**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 |
| RCR |     |     |     |     |     |     |     |     |    |    |    |  |    |    |    |  |    |
| 0   | 111 | 111 | 111 | 111 | 105 | 105 | 105 | 105 | 93 | 93 | 93 |  | 82 | 82 | 82 |  | 72 |
| 1   | 102 | 97  | 93  | 90  | 96  | 92  | 88  | 85  | 81 | 79 | 76 |  | 72 | 70 | 68 |  | 63 |
| 2   | 93  | 85  | 79  | 73  | 87  | 80  | 75  | 70  | 71 | 67 | 63 |  | 63 | 60 | 57 |  | 56 |
| 3   | 84  | 75  | 67  | 61  | 79  | 71  | 64  | 58  | 63 | 58 | 53 |  | 56 | 52 | 48 |  | 49 |
| 4   | 77  | 66  | 58  | 52  | 73  | 63  | 55  | 50  | 56 | 50 | 45 |  | 50 | 45 | 41 |  | 44 |
| 5   | 71  | 59  | 51  | 45  | 67  | 56  | 48  | 43  | 50 | 44 | 39 |  | 45 | 40 | 36 |  | 40 |
| 6   | 66  | 53  | 45  | 39  | 62  | 50  | 43  | 37  | 45 | 39 | 34 |  | 41 | 35 | 32 |  | 36 |
| 7   | 61  | 48  | 40  | 34  | 57  | 46  | 38  | 33  | 41 | 35 | 30 |  | 37 | 32 | 28 |  | 33 |
| 8   | 56  | 44  | 36  | 30  | 53  | 42  | 34  | 29  | 38 | 32 | 27 |  | 34 | 29 | 25 |  | 30 |
| 9   | 53  | 40  | 32  | 27  | 50  | 38  | 31  | 26  | 35 | 29 | 24 |  | 31 | 26 | 23 |  | 28 |
| 10  | 49  | 37  | 29  | 24  | 46  | 35  | 28  | 24  | 32 | 26 | 22 |  | 29 | 24 | 20 |  | 26 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2063 | 2063 | 2063 |
| 5°  | 2066 | 2034 | 2048 |
| 10° | 2050 | 2007 | 2020 |
| 15° | 2020 | 1974 | 1977 |
| 20° | 1979 | 1928 | 1933 |
| 25° | 1939 | 1874 | 1882 |
| 30° | 1888 | 1823 | 1816 |
| 35° | 1840 | 1763 | 1748 |
| 40° | 1781 | 1702 | 1682 |
| 45° | 1722 | 1641 | 1615 |
| 50° | 1658 | 1578 | 1537 |
| 55° | 1591 | 1504 | 1466 |
| 60° | 1515 | 1416 | 1384 |
| 65° | 1432 | 1326 | 1288 |
| 70° | 1326 | 1215 | 1184 |
| 75° | 1180 | 1083 | 1089 |
| 80° | 1004 | 914  | 906  |
| 85° | 728  | 623  | 602  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
Vertical Angle: 45°  
Luminance: 1722 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 261.1   | 2.5       |
| 10°-20°   | 734.7   | 7.0       |
| 20°-30°   | 1079.6  | 10.2      |
| 30°-40°   | 1253.9  | 11.9      |
| 40°-50°   | 1252.4  | 11.9      |
| 50°-60°   | 1092.1  | 10.3      |
| 60°-70°   | 807.3   | 7.6       |
| 70°-80°   | 456.7   | 4.3       |
| 80°-90°   | 124.1   | 1.2       |
| 90°-100°  | 77.5    | 0.7       |
| 100°-110° | 246.3   | 2.3       |
| 110°-120° | 421.5   | 4.0       |
| 120°-130° | 554.3   | 5.2       |
| 130°-140° | 622.2   | 5.9       |
| 140°-150° | 610.1   | 5.8       |
| 150°-160° | 511.8   | 4.8       |
| 160°-170° | 339.4   | 3.2       |
| 170°-180° | 118.6   | 1.1       |
| 0°-30°    | 2075.4  | 19.6      |
| 0°-40°    | 3329.4  | 31.5      |
| 0°-60°    | 5673.8  | 53.7      |
| 0°-90°    | 7061.9  | 66.9      |
| 90°-120°  | 745.3   | 7.1       |
| 90°-150°  | 2532.0  | 24.0      |
| 90°-180°  | 3502.0  | 33.2      |
| 0°-180°   | 10563.8 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2774 | 2774  | 2774 | 2774  | 2774 |      |
| 5°   | 2774 | 2764  | 2734 | 2756  | 2750 | 263  |
| 15°  | 2641 | 2625  | 2590 | 2601  | 2588 | 744  |
| 25°  | 2390 | 2369  | 2324 | 2329  | 2324 | 1100 |
| 35°  | 2062 | 2036  | 1993 | 1977  | 1963 | 1288 |
| 45°  | 1678 | 1659  | 1619 | 1590  | 1579 | 1295 |
| 55°  | 1270 | 1254  | 1222 | 1190  | 1176 | 1135 |
| 65°  | 856  | 840   | 814  | 790   | 776  | 847  |
| 75°  | 448  | 443   | 429  | 414   | 419  | 478  |
| 85°  | 109  | 107   | 104  | 96    | 93   | 122  |
| 90°  | 1    | 14    | 37   | 35    | 36   | 10   |
| 95°  | 55   | 66    | 68   | 68    | 66   | 61   |
| 105° | 227  | 230   | 233  | 234   | 234  | 240  |
| 115° | 423  | 429   | 427  | 426   | 423  | 418  |
| 125° | 615  | 625   | 622  | 618   | 617  | 550  |
| 135° | 796  | 807   | 810  | 809   | 806  | 615  |
| 145° | 966  | 974   | 980  | 981   | 977  | 604  |
| 155° | 1105 | 1108  | 1111 | 1116  | 1113 | 508  |
| 165° | 1202 | 1201  | 1201 | 1208  | 1203 | 339  |
| 175° | 1250 | 1247  | 1245 | 1253  | 1246 | 119  |
| 180° | 1253 | 1253  | 1253 | 1253  | 1253 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2774.1 | 2774.1 | 2774.1 | 2774.1 | 2774.1 |
| 2.5°   | 2790.3 | 2777.0 | 2747.6 | 2774.1 | 2769.1 |
| 5°     | 2774.1 | 2763.7 | 2734.3 | 2755.5 | 2750.4 |
| 7.5°   | 2755.5 | 2739.7 | 2710.2 | 2731.8 | 2726.4 |
| 10°    | 2726.4 | 2707.7 | 2675.7 | 2696.9 | 2689.0 |
| 12.5°  | 2686.1 | 2670.3 | 2638.4 | 2651.6 | 2646.3 |
| 15°    | 2640.9 | 2625.1 | 2590.2 | 2601.0 | 2587.7 |
| 17.5°  | 2584.8 | 2569.0 | 2534.2 | 2547.5 | 2534.2 |
| 20°    | 2523.4 | 2507.6 | 2470.2 | 2478.1 | 2467.6 |
| 22.5°  | 2462.3 | 2438.3 | 2403.4 | 2403.4 | 2398.0 |
| 25°    | 2390.1 | 2368.9 | 2323.6 | 2328.7 | 2323.6 |
| 27.5°  | 2310.0 | 2291.3 | 2256.8 | 2248.9 | 2235.6 |
| 30°    | 2230.2 | 2208.7 | 2168.8 | 2160.8 | 2150.1 |
| 32.5°  | 2144.8 | 2128.9 | 2086.1 | 2070.0 | 2059.3 |
| 35°    | 2062.1 | 2035.5 | 1992.7 | 1976.7 | 1963.3 |
| 37.5°  | 1968.7 | 1944.6 | 1901.9 | 1883.3 | 1869.9 |
| 40°    | 1872.7 | 1851.2 | 1808.5 | 1784.7 | 1774.0 |
| 42.5°  | 1779.3 | 1757.8 | 1715.4 | 1688.5 | 1672.7 |
| 45°    | 1678.0 | 1659.4 | 1619.1 | 1590.0 | 1579.3 |
| 47.5°  | 1579.3 | 1560.6 | 1517.8 | 1488.4 | 1472.6 |
| 50°    | 1475.1 | 1461.8 | 1424.4 | 1387.1 | 1373.8 |
| 52.5°  | 1373.8 | 1355.1 | 1320.6 | 1291.2 | 1272.5 |
| 55°    | 1269.9 | 1253.8 | 1221.8 | 1189.9 | 1176.5 |
| 57.5°  | 1165.8 | 1152.5 | 1117.7 | 1085.7 | 1074.9 |
| 60°    | 1061.6 | 1051.1 | 1013.8 | 984.4  | 976.4  |
| 62.5°  | 960.3  | 941.6  | 915.0  | 888.4  | 877.7  |
| 65°    | 856.4  | 840.3  | 813.6  | 789.6  | 776.3  |
| 67.5°  | 749.7  | 736.2  | 712.3  | 693.7  | 682.9  |
| 70°    | 650.9  | 640.2  | 616.2  | 597.5  | 587.0  |
| 72.5°  | 549.6  | 538.8  | 525.5  | 506.9  | 499.0  |
| 75°    | 448.1  | 442.9  | 429.4  | 413.5  | 418.9  |
| 77.5°  | 357.4  | 346.7  | 341.4  | 333.4  | 325.5  |
| 80°    | 266.9  | 264.0  | 258.6  | 250.7  | 245.4  |
| 82.5°  | 181.4  | 181.4  | 178.9  | 168.1  | 168.1  |
| 85°    | 109.2  | 106.7  | 104.2  | 95.9   | 93.4   |
| 87.5°  | 48.1   | 42.7   | 37.4   | 29.5   | 26.6   |
| 90°    | 1.1    | 13.6   | 37.0   | 34.8   | 35.9   |
| 92.5°  | 23.4   | 31.7   | 32.9   | 34.0   | 34.0   |
| 95°    | 55.1   | 65.8   | 67.6   | 67.6   | 65.8   |
| 97.5°  | 91.7   | 101.6  | 105.8  | 105.8  | 105.8  |
| 100°   | 134.0  | 142.8  | 145.8  | 145.8  | 144.7  |
| 102.5° | 178.6  | 185.1  | 189.2  | 190.4  | 189.2  |
| 105°   | 227.4  | 230.4  | 232.7  | 234.5  | 234.5  |
| 107.5° | 275.7  | 280.2  | 280.2  | 281.0  | 275.7  |
| 110°   | 322.5  | 328.6  | 328.6  | 328.6  | 325.5  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 373.1  | 379.5  | 378.4  | 375.4  | 373.1  |
| 115°   | 422.9  | 429.0  | 427.1  | 426.0  | 422.9  |
| 117.5° | 472.5  | 480.8  | 475.5  | 472.5  | 469.4  |
| 120°   | 522.3  | 530.6  | 522.3  | 522.3  | 518.9  |
| 122.5° | 567.6  | 578.2  | 572.9  | 569.9  | 567.6  |
| 125°   | 615.2  | 624.6  | 621.6  | 618.2  | 617.1  |
| 127.5° | 661.6  | 673.4  | 669.2  | 664.6  | 661.6  |
| 130°   | 705.1  | 718.7  | 716.8  | 714.5  | 710.3  |
| 132.5° | 753.8  | 764.4  | 765.2  | 759.9  | 756.8  |
| 135°   | 795.7  | 807.4  | 809.7  | 808.6  | 805.6  |
| 137.5° | 842.6  | 852.0  | 853.9  | 853.1  | 848.6  |
| 140°   | 883.7  | 893.2  | 898.4  | 898.4  | 894.3  |
| 142.5° | 926.0  | 935.5  | 938.5  | 939.6  | 935.5  |
| 145°   | 966.1  | 973.6  | 979.6  | 980.8  | 976.6  |
| 147.5° | 1002.0 | 1011.4 | 1015.9 | 1017.8 | 1013.6 |
| 150°   | 1038.9 | 1045.4 | 1049.5 | 1052.9 | 1049.5 |
| 152.5° | 1071.8 | 1078.2 | 1083.5 | 1087.7 | 1083.5 |
| 155°   | 1104.6 | 1107.6 | 1111.0 | 1116.3 | 1112.9 |
| 157.5° | 1133.0 | 1135.2 | 1137.1 | 1144.7 | 1139.4 |
| 160°   | 1158.2 | 1160.5 | 1161.7 | 1168.1 | 1163.6 |
| 162.5° | 1181.7 | 1181.7 | 1182.8 | 1190.0 | 1184.7 |
| 165°   | 1201.7 | 1200.6 | 1200.6 | 1208.2 | 1202.8 |
| 167.5° | 1219.8 | 1216.4 | 1216.4 | 1224.0 | 1218.7 |
| 170°   | 1233.4 | 1230.4 | 1229.3 | 1236.8 | 1230.4 |
| 172.5° | 1242.9 | 1239.8 | 1238.7 | 1246.3 | 1239.8 |
| 175°   | 1250.5 | 1247.4 | 1245.2 | 1252.7 | 1246.3 |
| 177.5° | 1254.6 | 1251.6 | 1249.3 | 1255.7 | 1249.3 |
| 180°   | 1252.7 | 1252.7 | 1252.7 | 1252.7 | 1252.7 |

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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 | 11.21            | 12.25 | 12.01 | 13.07 | 14.08 | 10.78          | 11.82 | 11.58 | 12.64 | 13.65 |
|                 | 3H   | 12.89            | 13.82 | 13.70 | 14.65 | 15.69 | 12.41          | 13.35 | 13.23 | 14.18 | 15.21 |
|                 | 4H   | 13.48            | 14.36 | 14.31 | 15.20 | 16.25 | 13.01          | 13.89 | 13.84 | 14.73 | 15.77 |
|                 | 6H   | 13.89            | 14.70 | 14.73 | 15.55 | 16.61 | 13.42          | 14.23 | 14.26 | 15.07 | 16.14 |
|                 | 8H   | 14.00            | 14.78 | 14.85 | 15.64 | 16.70 | 13.53          | 14.30 | 14.38 | 15.16 | 16.23 |
|                 | 12H  | 14.06            | 14.79 | 14.91 | 15.65 | 16.74 | 13.58          | 14.31 | 14.43 | 15.17 | 16.26 |
| 4H              | 2H   | 11.70            | 12.58 | 12.53 | 13.41 | 14.46 | 11.35          | 12.23 | 12.18 | 13.07 | 14.12 |
|                 | 3H   | 13.58            | 14.31 | 14.42 | 15.18 | 16.25 | 13.19          | 13.92 | 14.03 | 14.79 | 15.86 |
|                 | 4H   | 14.30            | 14.97 | 15.16 | 15.84 | 16.93 | 13.90          | 14.56 | 14.75 | 15.43 | 16.52 |
|                 | 6H   | 14.83            | 15.41 | 15.70 | 16.30 | 17.39 | 14.42          | 15.00 | 15.29 | 15.89 | 16.98 |
|                 | 8H   | 14.98            | 15.52 | 15.86 | 16.41 | 17.52 | 14.57          | 15.11 | 15.44 | 16.00 | 17.10 |
|                 | 12H  | 15.06            | 15.55 | 15.96 | 16.46 | 17.57 | 14.64          | 15.13 | 15.54 | 16.04 | 17.15 |
| 8H              | 4H   | 14.51            | 15.05 | 15.39 | 15.94 | 17.05 | 14.15          | 14.69 | 15.03 | 15.58 | 16.69 |
|                 | 6H   | 15.15            | 15.60 | 16.06 | 16.53 | 17.64 | 14.79          | 15.24 | 15.69 | 16.17 | 17.27 |
|                 | 8H   | 15.38            | 15.77 | 16.29 | 16.70 | 17.82 | 15.01          | 15.40 | 15.92 | 16.33 | 17.45 |
|                 | 12H  | 15.52            | 15.87 | 16.43 | 16.78 | 17.96 | 15.13          | 15.48 | 16.05 | 16.40 | 17.57 |
| 12H             | 4H   | 14.51            | 14.99 | 15.40 | 15.90 | 17.01 | 14.15          | 14.64 | 15.05 | 15.55 | 16.66 |
|                 | 6H   | 15.18            | 15.58 | 16.10 | 16.50 | 17.63 | 14.83          | 15.23 | 15.75 | 16.15 | 17.28 |
|                 | 8H   | 15.44            | 15.79 | 16.35 | 16.70 | 17.88 | 15.08          | 15.43 | 15.99 | 16.34 | 17.52 |