

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: P922385

Luminaire Tested: DFN2DIP-PN4F0-080D040US940-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P922385  
REPORT IS A COMBINATION OF REPORTS P901137 AND P898053  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-080D040US940-FLONL  
Description: 4 foot, Pentagon Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

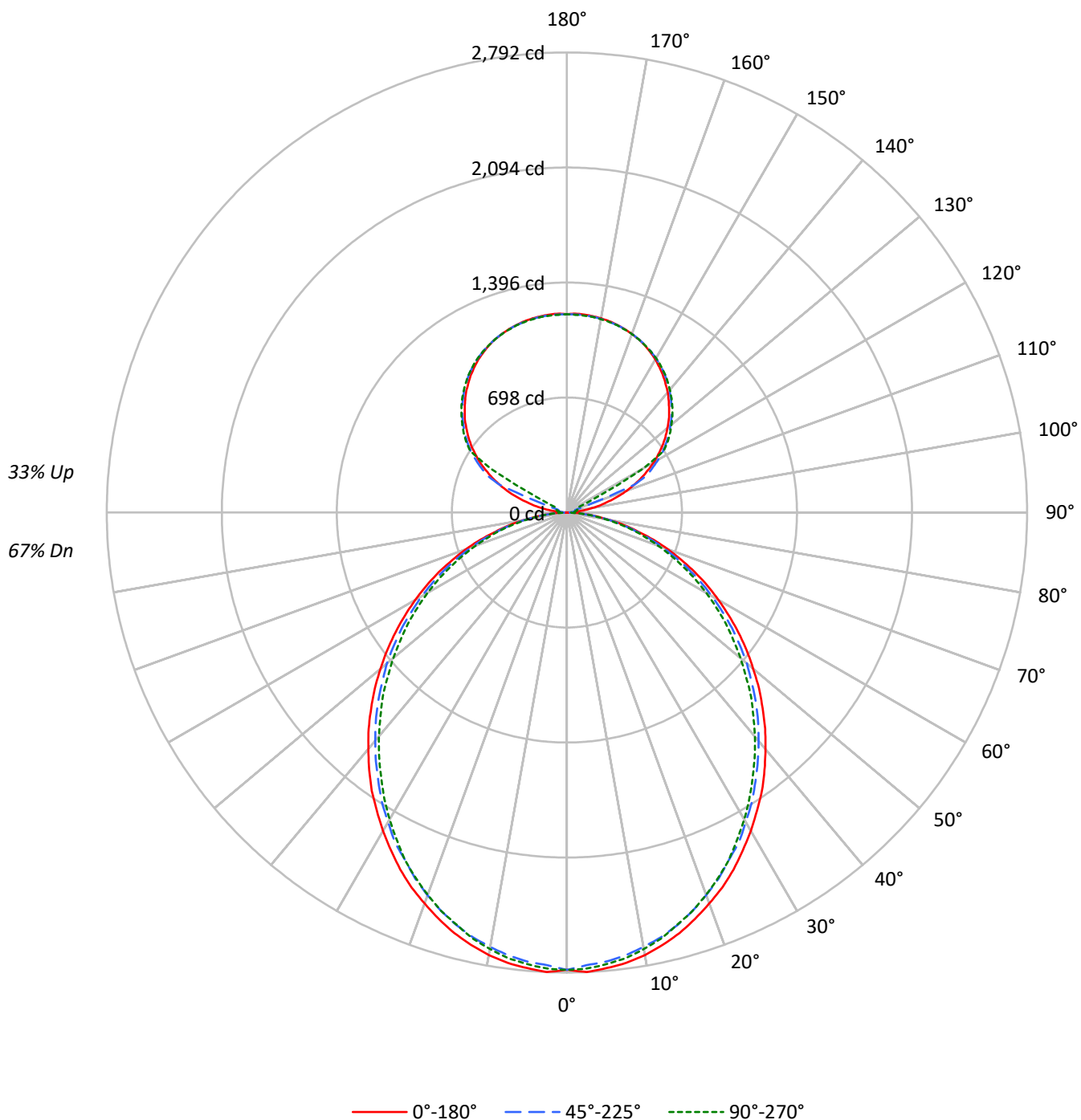
Lumens per Lamp: N/A  
Luminaire Lumens: 10593.5 lumens  
Efficiency: N/A  
Efficacy: 98.5 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.74' x L: 3.94' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 107.5  
Input Voltage (V):  
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



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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 |
| RCR |     |     |     |     |     |     |     |     |    |    |    |  |    |    |    |  |    |
| 0   | 111 | 111 | 111 | 111 | 105 | 105 | 105 | 105 | 93 | 93 | 93 |  | 82 | 82 | 82 |  | 71 |
| 1   | 102 | 97  | 93  | 90  | 95  | 92  | 88  | 85  | 81 | 79 | 76 |  | 72 | 70 | 68 |  | 63 |
| 2   | 92  | 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  | 72  | 63  | 55  | 50  | 56 | 50 | 45 |  | 50 | 45 | 41 |  | 44 |
| 5   | 71  | 59  | 51  | 44  | 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 | 31 | 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°  | 2026 | 2026 | 2026 |
| 5°  | 2029 | 1998 | 2012 |
| 10° | 2013 | 1972 | 1985 |
| 15° | 1983 | 1939 | 1943 |
| 20° | 1943 | 1895 | 1900 |
| 25° | 1904 | 1841 | 1850 |
| 30° | 1854 | 1791 | 1786 |
| 35° | 1806 | 1732 | 1718 |
| 40° | 1748 | 1673 | 1654 |
| 45° | 1690 | 1613 | 1589 |
| 50° | 1627 | 1550 | 1513 |
| 55° | 1560 | 1478 | 1443 |
| 60° | 1485 | 1392 | 1363 |
| 65° | 1404 | 1303 | 1269 |
| 70° | 1299 | 1195 | 1168 |
| 75° | 1155 | 1065 | 1075 |
| 80° | 981  | 900  | 896  |
| 85° | 709  | 614  | 600  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
Vertical Angle: 45°  
Luminance: 1690 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 261.3   | 2.5       |
| 10°-20°   | 735.1   | 6.9       |
| 20°-30°   | 1080.3  | 10.2      |
| 30°-40°   | 1254.7  | 11.8      |
| 40°-50°   | 1253.1  | 11.8      |
| 50°-60°   | 1092.7  | 10.3      |
| 60°-70°   | 807.7   | 7.6       |
| 70°-80°   | 457.0   | 4.3       |
| 80°-90°   | 122.7   | 1.2       |
| 90°-100°  | 39.7    | 0.4       |
| 100°-110° | 148.0   | 1.4       |
| 110°-120° | 392.4   | 3.7       |
| 120°-130° | 650.9   | 6.1       |
| 130°-140° | 691.4   | 6.5       |
| 140°-150° | 642.6   | 6.1       |
| 150°-160° | 516.6   | 4.9       |
| 160°-170° | 332.9   | 3.1       |
| 170°-180° | 114.6   | 1.1       |
| 0°-30°    | 2076.6  | 19.6      |
| 0°-40°    | 3331.3  | 31.4      |
| 0°-60°    | 5677.0  | 53.6      |
| 0°-90°    | 7064.5  | 66.7      |
| 90°-120°  | 580.1   | 5.5       |
| 90°-150°  | 2565.0  | 24.2      |
| 90°-180°  | 3529.0  | 33.3      |
| 0°-180°   | 10593.5 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2776 | 2776  | 2776 | 2776  | 2776 |      |
| 5°   | 2776 | 2765  | 2736 | 2757  | 2752 | 263  |
| 15°  | 2642 | 2626  | 2592 | 2602  | 2589 | 744  |
| 25°  | 2392 | 2370  | 2325 | 2330  | 2325 | 1100 |
| 35°  | 2063 | 2037  | 1994 | 1978  | 1964 | 1288 |
| 45°  | 1679 | 1660  | 1620 | 1591  | 1580 | 1296 |
| 55°  | 1271 | 1254  | 1222 | 1190  | 1177 | 1136 |
| 65°  | 857  | 841   | 814  | 790   | 777  | 847  |
| 75°  | 448  | 443   | 430  | 414   | 419  | 479  |
| 85°  | 109  | 107   | 104  | 96    | 94   | 122  |
| 90°  | 1    | 10    | 17   | 22    | 24   | 10   |
| 95°  | 56   | 28    | 34   | 38    | 38   | 67   |
| 105° | 265  | 291   | 53   | 63    | 66   | 283  |
| 115° | 501  | 516   | 537  | 134   | 72   | 493  |
| 125° | 708  | 720   | 736  | 742   | 745  | 632  |
| 135° | 876  | 890   | 898  | 907   | 905  | 677  |
| 145° | 1016 | 1016  | 1030 | 1036  | 1032 | 636  |
| 155° | 1119 | 1112  | 1122 | 1127  | 1120 | 516  |
| 165° | 1179 | 1174  | 1177 | 1183  | 1177 | 333  |
| 175° | 1206 | 1200  | 1202 | 1208  | 1199 | 115  |
| 180° | 1204 | 1204  | 1204 | 1204  | 1204 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2775.7 | 2775.7 | 2775.7 | 2775.7 | 2775.7 |
| 2.5°   | 2791.9 | 2778.6 | 2749.1 | 2775.7 | 2770.6 |
| 5°     | 2775.7 | 2765.3 | 2735.9 | 2757.1 | 2752.0 |
| 7.5°   | 2757.1 | 2741.2 | 2711.8 | 2733.3 | 2727.9 |
| 10°    | 2727.9 | 2709.2 | 2677.2 | 2698.4 | 2690.6 |
| 12.5°  | 2687.7 | 2671.8 | 2639.8 | 2653.1 | 2647.8 |
| 15°    | 2642.4 | 2626.5 | 2591.7 | 2602.5 | 2589.2 |
| 17.5°  | 2586.3 | 2570.4 | 2535.6 | 2549.0 | 2535.6 |
| 20°    | 2524.9 | 2509.0 | 2471.6 | 2479.6 | 2469.1 |
| 22.5°  | 2463.7 | 2439.6 | 2404.8 | 2404.8 | 2399.4 |
| 25°    | 2391.5 | 2370.3 | 2325.0 | 2330.0 | 2325.0 |
| 27.5°  | 2311.3 | 2292.7 | 2258.1 | 2250.1 | 2236.9 |
| 30°    | 2231.5 | 2209.9 | 2170.1 | 2162.1 | 2151.3 |
| 32.5°  | 2146.0 | 2130.1 | 2087.3 | 2071.2 | 2060.5 |
| 35°    | 2063.2 | 2036.7 | 1993.9 | 1977.7 | 1964.4 |
| 37.5°  | 1969.8 | 1945.7 | 1903.0 | 1884.3 | 1871.0 |
| 40°    | 1873.8 | 1852.3 | 1809.5 | 1785.7 | 1774.9 |
| 42.5°  | 1780.4 | 1758.8 | 1716.4 | 1689.4 | 1673.7 |
| 45°    | 1679.0 | 1660.3 | 1620.1 | 1590.9 | 1580.2 |
| 47.5°  | 1580.2 | 1561.5 | 1518.7 | 1489.2 | 1473.4 |
| 50°    | 1476.0 | 1462.7 | 1425.2 | 1387.9 | 1374.6 |
| 52.5°  | 1374.6 | 1355.8 | 1321.3 | 1291.9 | 1273.2 |
| 55°    | 1270.6 | 1254.5 | 1222.5 | 1190.5 | 1177.1 |
| 57.5°  | 1166.4 | 1153.2 | 1118.3 | 1086.3 | 1075.5 |
| 60°    | 1062.2 | 1051.8 | 1014.3 | 984.9  | 977.0  |
| 62.5°  | 960.8  | 942.2  | 915.5  | 888.9  | 878.2  |
| 65°    | 856.9  | 840.8  | 814.1  | 790.1  | 776.8  |
| 67.5°  | 750.1  | 736.6  | 712.7  | 694.1  | 683.3  |
| 70°    | 651.3  | 640.5  | 616.5  | 597.8  | 587.3  |
| 72.5°  | 549.9  | 539.2  | 525.8  | 507.2  | 499.3  |
| 75°    | 448.3  | 443.2  | 429.6  | 413.8  | 419.1  |
| 77.5°  | 357.7  | 346.9  | 341.5  | 333.6  | 325.7  |
| 80°    | 267.1  | 264.2  | 258.9  | 250.9  | 245.5  |
| 82.5°  | 181.6  | 181.6  | 179.0  | 168.2  | 168.2  |
| 85°    | 109.3  | 106.7  | 104.2  | 96.0   | 93.5   |
| 87.5°  | 48.2   | 42.8   | 37.4   | 29.4   | 26.7   |
| 90°    | 0.8    | 10.4   | 17.4   | 21.8   | 23.5   |
| 92.5°  | 21.8   | 18.3   | 20.9   | 22.6   | 23.5   |
| 95°    | 56.5   | 27.8   | 33.9   | 38.3   | 37.5   |
| 97.5°  | 101.9  | 30.5   | 44.4   | 47.1   | 47.9   |
| 100°   | 154.2  | 34.9   | 49.7   | 56.5   | 58.3   |
| 102.5° | 211.6  | 210.0  | 51.4   | 60.9   | 63.6   |
| 105°   | 264.7  | 291.0  | 53.1   | 62.7   | 66.2   |
| 107.5° | 326.6  | 348.4  | 54.9   | 64.5   | 67.9   |
| 110°   | 385.9  | 404.1  | 152.5  | 65.4   | 68.8   |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 441.7  | 457.3  | 442.5  | 67.1   | 69.7   |
| 115°   | 500.8  | 515.6  | 537.4  | 134.1  | 71.5   |
| 117.5° | 552.2  | 569.6  | 584.5  | 459.9  | 231.7  |
| 120°   | 609.8  | 622.8  | 638.5  | 649.0  | 531.4  |
| 122.5° | 658.4  | 672.4  | 689.9  | 695.1  | 696.0  |
| 125°   | 708.1  | 719.5  | 736.0  | 742.2  | 744.8  |
| 127.5° | 753.4  | 765.6  | 778.7  | 787.5  | 788.3  |
| 130°   | 796.1  | 810.1  | 819.6  | 829.2  | 828.4  |
| 132.5° | 839.6  | 851.0  | 860.6  | 868.4  | 867.6  |
| 135°   | 876.3  | 890.3  | 898.0  | 906.8  | 905.1  |
| 137.5° | 914.5  | 925.0  | 933.8  | 942.4  | 939.9  |
| 140°   | 952.0  | 959.0  | 968.6  | 976.4  | 972.1  |
| 142.5° | 983.5  | 989.5  | 1000.9 | 1007.7 | 1003.4 |
| 145°   | 1016.5 | 1015.7 | 1030.4 | 1036.5 | 1032.2 |
| 147.5° | 1045.2 | 1042.6 | 1057.4 | 1061.8 | 1058.4 |
| 150°   | 1073.1 | 1067.0 | 1081.0 | 1086.2 | 1081.8 |
| 152.5° | 1096.6 | 1089.7 | 1102.7 | 1108.0 | 1101.9 |
| 155°   | 1119.3 | 1111.5 | 1121.9 | 1127.1 | 1120.2 |
| 157.5° | 1137.6 | 1130.6 | 1138.5 | 1144.6 | 1137.6 |
| 160°   | 1153.2 | 1148.0 | 1153.2 | 1158.4 | 1152.4 |
| 162.5° | 1167.2 | 1162.0 | 1166.4 | 1172.4 | 1164.6 |
| 165°   | 1179.4 | 1174.2 | 1176.8 | 1182.9 | 1176.8 |
| 167.5° | 1189.0 | 1183.7 | 1186.4 | 1192.5 | 1184.6 |
| 170°   | 1196.9 | 1191.6 | 1193.3 | 1199.4 | 1191.6 |
| 172.5° | 1202.0 | 1196.9 | 1198.6 | 1204.7 | 1196.9 |
| 175°   | 1206.3 | 1200.2 | 1202.0 | 1208.1 | 1199.4 |
| 177.5° | 1208.1 | 1202.0 | 1202.9 | 1209.1 | 1201.2 |
| 180°   | 1203.8 | 1203.8 | 1203.8 | 1203.8 | 1203.8 |

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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 | 11.15            | 12.18 | 11.94 | 13.00 | 14.01 | 10.71          | 11.74 | 11.50 | 12.56 | 13.57 |
|                 | 3H   | 12.82            | 13.75 | 13.63 | 14.58 | 15.62 | 12.34          | 13.27 | 13.15 | 14.10 | 15.14 |
|                 | 4H   | 13.42            | 14.30 | 14.25 | 15.14 | 16.19 | 12.93          | 13.81 | 13.76 | 14.65 | 15.70 |
|                 | 6H   | 13.83            | 14.64 | 14.67 | 15.49 | 16.55 | 13.34          | 14.15 | 14.18 | 14.99 | 16.06 |
|                 | 8H   | 13.94            | 14.71 | 14.79 | 15.58 | 16.64 | 13.45          | 14.22 | 14.30 | 15.08 | 16.15 |
|                 | 12H  | 14.00            | 14.73 | 14.85 | 15.59 | 16.68 | 13.50          | 14.23 | 14.35 | 15.09 | 16.18 |
| 4H              | 2H   | 11.63            | 12.51 | 12.46 | 13.34 | 14.40 | 11.28          | 12.15 | 12.11 | 12.99 | 14.04 |
|                 | 3H   | 13.51            | 14.24 | 14.36 | 15.12 | 16.18 | 13.11          | 13.84 | 13.95 | 14.71 | 15.78 |
|                 | 4H   | 14.24            | 14.90 | 15.09 | 15.77 | 16.87 | 13.82          | 14.49 | 14.68 | 15.36 | 16.45 |
|                 | 6H   | 14.76            | 15.34 | 15.64 | 16.23 | 17.33 | 14.34          | 14.92 | 15.21 | 15.81 | 16.91 |
|                 | 8H   | 14.92            | 15.46 | 15.80 | 16.35 | 17.46 | 14.49          | 15.03 | 15.37 | 15.92 | 17.03 |
|                 | 12H  | 15.00            | 15.49 | 15.90 | 16.40 | 17.51 | 14.56          | 15.05 | 15.46 | 15.96 | 17.07 |
| 8H              | 4H   | 14.45            | 14.99 | 15.32 | 15.87 | 16.99 | 14.08          | 14.61 | 14.95 | 15.50 | 16.61 |
|                 | 6H   | 15.09            | 15.54 | 15.99 | 16.47 | 17.58 | 14.71          | 15.16 | 15.62 | 16.09 | 17.20 |
|                 | 8H   | 15.31            | 15.71 | 16.23 | 16.63 | 17.76 | 14.93          | 15.32 | 15.84 | 16.25 | 17.38 |
|                 | 12H  | 15.45            | 15.80 | 16.37 | 16.72 | 17.90 | 15.05          | 15.40 | 15.97 | 16.32 | 17.50 |
| 12H             | 4H   | 14.44            | 14.93 | 15.34 | 15.84 | 16.95 | 14.08          | 14.56 | 14.98 | 15.47 | 16.59 |
|                 | 6H   | 15.12            | 15.52 | 16.03 | 16.44 | 17.57 | 14.75          | 15.15 | 15.67 | 16.08 | 17.20 |
|                 | 8H   | 15.37            | 15.72 | 16.29 | 16.64 | 17.82 | 15.00          | 15.35 | 15.92 | 16.26 | 17.44 |