

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: P913322

Luminaire Tested: DFN2DIP-4P4F0-080D070US927-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P913322  
REPORT IS A COMBINATION OF REPORTS P899137 AND P895967  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-4P4F0-080D070US927-FLLFLL  
Description: 4 foot, 90deg - 4way Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

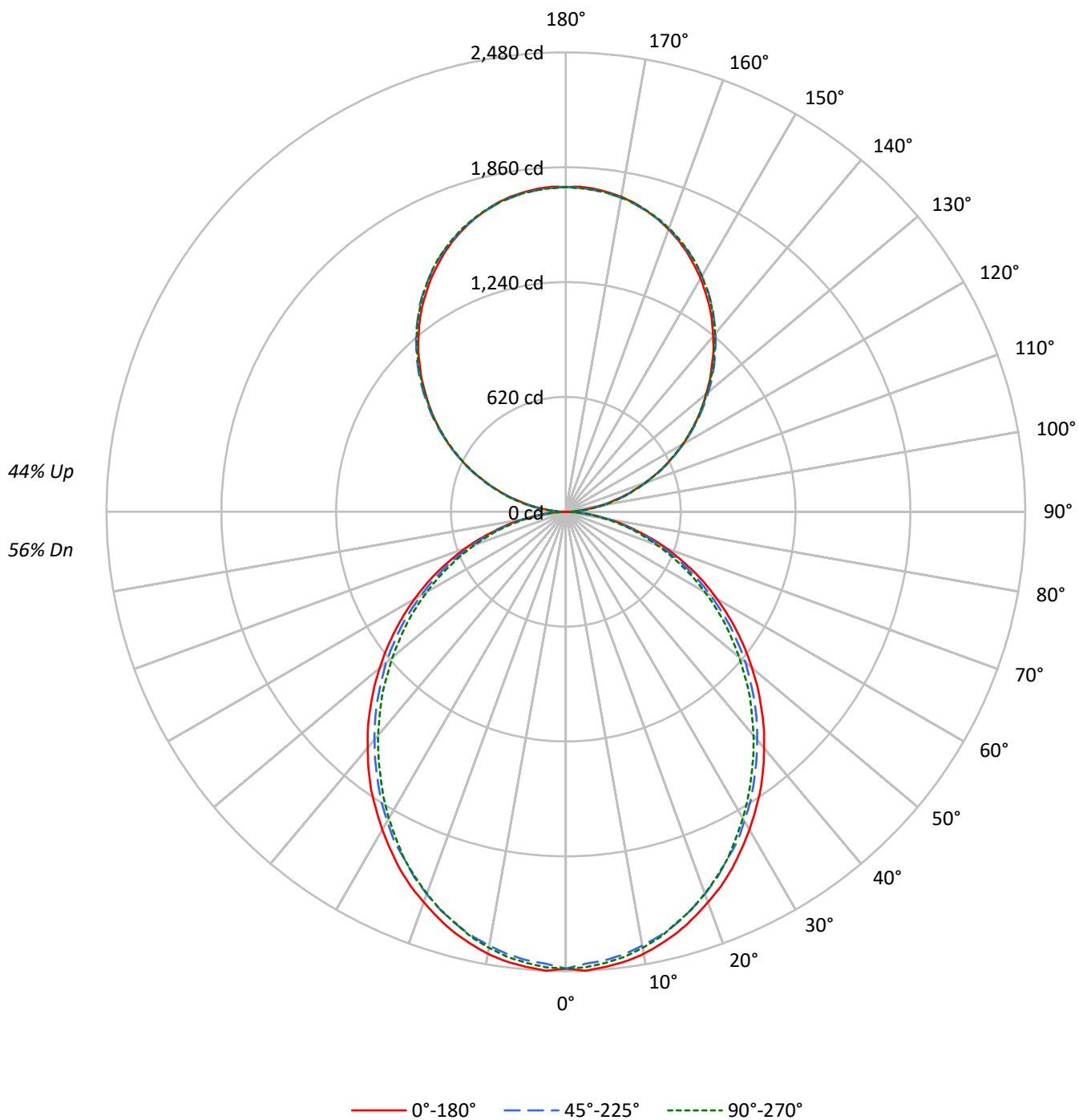
Lumens per Lamp: N/A  
Luminaire Lumens: 11181.7 lumens  
Efficiency: N/A  
Efficacy: 76.1 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 4.07' x L: 4.07' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 146.9  
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   | 109 | 109 | 109 | 109 | 101 | 101 | 101 | 101 | 87 | 87 | 87 |  | 74 | 74 | 74 |  | 62 |
| 1   | 99  | 95  | 91  | 87  | 92  | 88  | 85  | 82  | 76 | 74 | 71 |  | 65 | 63 | 61 |  | 55 |
| 2   | 90  | 83  | 77  | 71  | 84  | 77  | 72  | 67  | 67 | 63 | 59 |  | 57 | 54 | 51 |  | 48 |
| 3   | 82  | 73  | 65  | 59  | 76  | 68  | 61  | 56  | 59 | 54 | 50 |  | 50 | 47 | 43 |  | 43 |
| 4   | 75  | 64  | 56  | 50  | 70  | 60  | 53  | 48  | 52 | 47 | 42 |  | 45 | 41 | 37 |  | 38 |
| 5   | 69  | 57  | 49  | 43  | 64  | 54  | 46  | 41  | 47 | 41 | 37 |  | 40 | 36 | 32 |  | 34 |
| 6   | 64  | 52  | 43  | 38  | 59  | 48  | 41  | 36  | 42 | 36 | 32 |  | 37 | 32 | 28 |  | 31 |
| 7   | 59  | 47  | 39  | 33  | 55  | 44  | 37  | 31  | 38 | 32 | 28 |  | 33 | 29 | 25 |  | 28 |
| 8   | 55  | 42  | 35  | 29  | 51  | 40  | 33  | 28  | 35 | 29 | 25 |  | 30 | 26 | 22 |  | 26 |
| 9   | 51  | 39  | 31  | 26  | 47  | 36  | 30  | 25  | 32 | 26 | 23 |  | 28 | 23 | 20 |  | 24 |
| 10  | 48  | 36  | 28  | 23  | 44  | 34  | 27  | 22  | 30 | 24 | 20 |  | 26 | 21 | 18 |  | 22 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1600 | 1600 | 1600 |
| 5°  | 1602 | 1578 | 1589 |
| 10° | 1590 | 1557 | 1568 |
| 15° | 1566 | 1532 | 1535 |
| 20° | 1535 | 1497 | 1501 |
| 25° | 1504 | 1455 | 1462 |
| 30° | 1464 | 1416 | 1412 |
| 35° | 1427 | 1370 | 1359 |
| 40° | 1381 | 1323 | 1308 |
| 45° | 1336 | 1276 | 1257 |
| 50° | 1286 | 1227 | 1197 |
| 55° | 1233 | 1170 | 1143 |
| 60° | 1174 | 1103 | 1080 |
| 65° | 1110 | 1033 | 1006 |
| 70° | 1028 | 948  | 927  |
| 75° | 914  | 847  | 855  |
| 80° | 778  | 718  | 715  |
| 85° | 564  | 493  | 482  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 1336 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 232.1   | 2.1       |
| 10°-20°   | 653.0   | 5.8       |
| 20°-30°   | 959.7   | 8.6       |
| 30°-40°   | 1114.6  | 10.0      |
| 40°-50°   | 1113.2  | 10.0      |
| 50°-60°   | 970.7   | 8.7       |
| 60°-70°   | 717.6   | 6.4       |
| 70°-80°   | 406.0   | 3.6       |
| 80°-90°   | 112.1   | 1.0       |
| 90°-100°  | 108.5   | 1.0       |
| 100°-110° | 344.8   | 3.1       |
| 110°-120° | 590.1   | 5.3       |
| 120°-130° | 776.1   | 6.9       |
| 130°-140° | 871.1   | 7.8       |
| 140°-150° | 854.2   | 7.6       |
| 150°-160° | 716.6   | 6.4       |
| 160°-170° | 475.2   | 4.2       |
| 170°-180° | 166.1   | 1.5       |
| 0°-30°    | 1844.8  | 16.5      |
| 0°-40°    | 2959.4  | 26.5      |
| 0°-60°    | 5043.4  | 45.1      |
| 0°-90°    | 6279.0  | 56.2      |
| 90°-120°  | 1043.4  | 9.3       |
| 90°-150°  | 3544.8  | 31.7      |
| 90°-180°  | 4903.0  | 43.8      |
| 0°-180°   | 11181.7 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2466 | 2466  | 2466 | 2466  | 2466 |      |
| 5°   | 2466 | 2457  | 2430 | 2449  | 2445 | 234  |
| 15°  | 2348 | 2333  | 2302 | 2312  | 2300 | 661  |
| 25°  | 2125 | 2106  | 2066 | 2070  | 2066 | 978  |
| 35°  | 1833 | 1809  | 1771 | 1757  | 1745 | 1145 |
| 45°  | 1492 | 1475  | 1439 | 1413  | 1404 | 1151 |
| 55°  | 1129 | 1114  | 1086 | 1058  | 1046 | 1009 |
| 65°  | 761  | 747   | 723  | 702   | 690  | 753  |
| 75°  | 398  | 394   | 382  | 368   | 372  | 425  |
| 85°  | 97   | 95    | 93   | 85    | 83   | 108  |
| 90°  | 2    | 19    | 52   | 49    | 50   | 11   |
| 95°  | 77   | 92    | 95   | 95    | 92   | 86   |
| 105° | 318  | 322   | 326  | 328   | 328  | 336  |
| 115° | 592  | 601   | 598  | 596   | 592  | 586  |
| 125° | 861  | 874   | 870  | 866   | 864  | 770  |
| 135° | 1114 | 1130  | 1134 | 1132  | 1128 | 861  |
| 145° | 1352 | 1363  | 1372 | 1373  | 1367 | 845  |
| 155° | 1546 | 1551  | 1556 | 1563  | 1558 | 712  |
| 165° | 1682 | 1681  | 1681 | 1691  | 1684 | 475  |
| 175° | 1751 | 1746  | 1743 | 1754  | 1745 | 166  |
| 180° | 1754 | 1754  | 1754 | 1754  | 1754 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2465.9 | 2465.9 | 2465.9 | 2465.9 | 2465.9 |
| 2.5°   | 2480.2 | 2468.4 | 2442.3 | 2465.9 | 2461.4 |
| 5°     | 2465.9 | 2456.6 | 2430.5 | 2449.3 | 2444.8 |
| 7.5°   | 2449.3 | 2435.2 | 2409.1 | 2428.2 | 2423.4 |
| 10°    | 2423.4 | 2406.8 | 2378.4 | 2397.2 | 2390.2 |
| 12.5°  | 2387.7 | 2373.6 | 2345.2 | 2357.0 | 2352.2 |
| 15°    | 2347.5 | 2333.4 | 2302.4 | 2312.0 | 2300.2 |
| 17.5°  | 2297.6 | 2283.5 | 2252.6 | 2264.4 | 2252.6 |
| 20°    | 2243.1 | 2229.0 | 2195.8 | 2202.8 | 2193.5 |
| 22.5°  | 2188.7 | 2167.3 | 2136.4 | 2136.4 | 2131.6 |
| 25°    | 2124.6 | 2105.7 | 2065.5 | 2070.0 | 2065.5 |
| 27.5°  | 2053.3 | 2036.8 | 2006.0 | 1999.0 | 1987.2 |
| 30°    | 1982.4 | 1963.3 | 1927.9 | 1920.8 | 1911.2 |
| 32.5°  | 1906.5 | 1892.4 | 1854.3 | 1840.0 | 1830.5 |
| 35°    | 1832.9 | 1809.3 | 1771.3 | 1757.0 | 1745.2 |
| 37.5°  | 1749.9 | 1728.5 | 1690.6 | 1674.0 | 1662.2 |
| 40°    | 1664.7 | 1645.5 | 1607.6 | 1586.4 | 1576.8 |
| 42.5°  | 1581.7 | 1562.5 | 1524.8 | 1500.9 | 1486.8 |
| 45°    | 1491.6 | 1475.0 | 1439.2 | 1413.3 | 1403.8 |
| 47.5°  | 1403.8 | 1387.2 | 1349.2 | 1323.0 | 1308.9 |
| 50°    | 1311.2 | 1299.4 | 1266.1 | 1233.0 | 1221.1 |
| 52.5°  | 1221.1 | 1204.5 | 1173.9 | 1147.7 | 1131.1 |
| 55°    | 1128.8 | 1114.4 | 1086.1 | 1057.6 | 1045.8 |
| 57.5°  | 1036.3 | 1024.4 | 993.5  | 965.0  | 955.4  |
| 60°    | 943.6  | 934.4  | 901.1  | 875.0  | 867.9  |
| 62.5°  | 853.6  | 837.0  | 813.3  | 789.7  | 780.1  |
| 65°    | 761.3  | 746.9  | 723.3  | 701.9  | 690.1  |
| 67.5°  | 666.4  | 654.3  | 633.2  | 616.6  | 607.0  |
| 70°    | 578.6  | 569.0  | 547.7  | 531.1  | 521.7  |
| 72.5°  | 488.5  | 479.0  | 467.1  | 450.6  | 443.5  |
| 75°    | 398.2  | 393.7  | 381.7  | 367.6  | 372.3  |
| 77.5°  | 317.7  | 308.2  | 303.4  | 296.4  | 289.3  |
| 80°    | 237.3  | 234.7  | 230.0  | 222.9  | 218.1  |
| 82.5°  | 161.3  | 161.3  | 159.0  | 149.4  | 149.4  |
| 85°    | 97.1   | 94.8   | 92.6   | 85.3   | 83.0   |
| 87.5°  | 42.8   | 38.0   | 33.2   | 26.1   | 23.7   |
| 90°    | 1.6    | 19.0   | 51.8   | 48.6   | 50.2   |
| 92.5°  | 32.8   | 44.4   | 46.0   | 47.6   | 47.6   |
| 95°    | 77.2   | 92.0   | 94.7   | 94.7   | 92.0   |
| 97.5°  | 128.5  | 142.2  | 148.1  | 148.1  | 148.1  |
| 100°   | 187.7  | 199.9  | 204.1  | 204.1  | 202.5  |
| 102.5° | 250.1  | 259.0  | 264.9  | 266.5  | 264.9  |
| 105°   | 318.3  | 322.5  | 325.7  | 328.4  | 328.4  |
| 107.5° | 386.0  | 392.3  | 392.3  | 393.4  | 386.0  |
| 110°   | 451.5  | 460.0  | 460.0  | 460.0  | 455.7  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 522.4  | 531.4  | 529.8  | 525.5  | 522.4  |
| 115°   | 592.2  | 600.6  | 598.0  | 596.4  | 592.2  |
| 117.5° | 661.4  | 673.0  | 665.7  | 661.4  | 657.2  |
| 120°   | 731.2  | 742.8  | 731.2  | 731.2  | 726.4  |
| 122.5° | 794.6  | 809.5  | 802.1  | 797.8  | 794.6  |
| 125°   | 861.3  | 874.5  | 870.3  | 865.5  | 864.0  |
| 127.5° | 926.3  | 942.7  | 936.9  | 930.6  | 926.3  |
| 130°   | 987.1  | 1006.1 | 1003.5 | 1000.4 | 994.5  |
| 132.5° | 1055.3 | 1070.2 | 1071.2 | 1063.8 | 1059.5 |
| 135°   | 1114.0 | 1130.4 | 1133.6 | 1131.9 | 1127.7 |
| 137.5° | 1179.6 | 1192.8 | 1195.4 | 1194.4 | 1188.0 |
| 140°   | 1237.2 | 1250.5 | 1257.8 | 1257.8 | 1252.0 |
| 142.5° | 1296.4 | 1309.6 | 1313.8 | 1315.4 | 1309.6 |
| 145°   | 1352.5 | 1363.0 | 1371.5 | 1373.1 | 1367.3 |
| 147.5° | 1402.7 | 1415.9 | 1422.3 | 1424.9 | 1419.1 |
| 150°   | 1454.5 | 1463.5 | 1469.3 | 1474.1 | 1469.3 |
| 152.5° | 1500.5 | 1509.5 | 1516.9 | 1522.7 | 1516.9 |
| 155°   | 1546.5 | 1550.7 | 1555.5 | 1562.9 | 1558.1 |
| 157.5° | 1586.2 | 1589.4 | 1592.0 | 1602.6 | 1595.1 |
| 160°   | 1621.6 | 1624.8 | 1626.3 | 1635.3 | 1629.0 |
| 162.5° | 1654.4 | 1654.4 | 1656.0 | 1666.0 | 1658.6 |
| 165°   | 1682.4 | 1680.8 | 1680.8 | 1691.4 | 1683.9 |
| 167.5° | 1707.8 | 1703.0 | 1703.0 | 1713.6 | 1706.2 |
| 170°   | 1726.8 | 1722.6 | 1721.0 | 1731.5 | 1722.6 |
| 172.5° | 1740.0 | 1735.7 | 1734.2 | 1744.8 | 1735.7 |
| 175°   | 1750.6 | 1746.4 | 1743.2 | 1753.7 | 1744.8 |
| 177.5° | 1756.4 | 1752.1 | 1749.0 | 1758.0 | 1749.0 |
| 180°   | 1753.7 | 1753.7 | 1753.7 | 1753.7 | 1753.7 |

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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 | 9.47             | 10.39 | 10.37 | 11.31 | 12.49 | 9.03           | 9.95  | 9.93  | 10.87 | 12.05 |
|                 | 3H   | 11.14            | 11.97 | 12.06 | 12.90 | 14.10 | 10.65          | 11.48 | 11.57 | 12.41 | 13.61 |
|                 | 4H   | 11.74            | 12.52 | 12.67 | 13.45 | 14.67 | 11.24          | 12.02 | 12.17 | 12.96 | 14.17 |
|                 | 6H   | 12.14            | 12.86 | 13.08 | 13.81 | 15.03 | 11.64          | 12.36 | 12.58 | 13.31 | 14.53 |
|                 | 8H   | 12.25            | 12.94 | 13.20 | 13.90 | 15.12 | 11.75          | 12.44 | 12.70 | 13.40 | 14.62 |
|                 | 12H  | 12.31            | 12.96 | 13.26 | 13.91 | 15.16 | 11.80          | 12.45 | 12.75 | 13.40 | 14.65 |
| 4H              | 2H   | 9.94             | 10.72 | 10.88 | 11.66 | 12.87 | 9.59           | 10.37 | 10.52 | 11.30 | 12.52 |
|                 | 3H   | 11.82            | 12.47 | 12.76 | 13.44 | 14.67 | 11.41          | 12.06 | 12.36 | 13.03 | 14.26 |
|                 | 4H   | 12.54            | 13.13 | 13.49 | 14.10 | 15.35 | 12.12          | 12.71 | 13.07 | 13.67 | 14.93 |
|                 | 6H   | 13.06            | 13.58 | 14.03 | 14.56 | 15.81 | 12.63          | 13.14 | 13.60 | 14.13 | 15.38 |
|                 | 8H   | 13.22            | 13.70 | 14.19 | 14.68 | 15.94 | 12.78          | 13.26 | 13.75 | 14.24 | 15.51 |
|                 | 12H  | 13.30            | 13.73 | 14.29 | 14.72 | 16.00 | 12.85          | 13.28 | 13.84 | 14.27 | 15.55 |
| 8H              | 4H   | 12.74            | 13.22 | 13.71 | 14.20 | 15.47 | 12.37          | 12.84 | 13.34 | 13.82 | 15.09 |
|                 | 6H   | 13.38            | 13.78 | 14.38 | 14.80 | 16.06 | 13.00          | 13.40 | 13.99 | 14.42 | 15.68 |
|                 | 8H   | 13.61            | 13.96 | 14.61 | 14.97 | 16.25 | 13.21          | 13.57 | 14.22 | 14.57 | 15.86 |
|                 | 12H  | 13.75            | 14.05 | 14.75 | 15.06 | 16.39 | 13.33          | 13.64 | 14.34 | 14.64 | 15.97 |
| 12H             | 4H   | 12.73            | 13.16 | 13.72 | 14.16 | 15.43 | 12.36          | 12.80 | 13.35 | 13.79 | 15.06 |
|                 | 6H   | 13.41            | 13.76 | 14.42 | 14.77 | 16.06 | 13.04          | 13.39 | 14.05 | 14.40 | 15.68 |
|                 | 8H   | 13.66            | 13.97 | 14.67 | 14.97 | 16.30 | 13.28          | 13.59 | 14.29 | 14.59 | 15.92 |