

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: P919595

Luminaire Tested: DFN2DIP-PN4F0-060D060US935-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P919595  
REPORT IS A COMBINATION OF REPORTS P901170 AND P898053  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-060D060US935-RLLONL  
Description: 4 foot, Pentagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

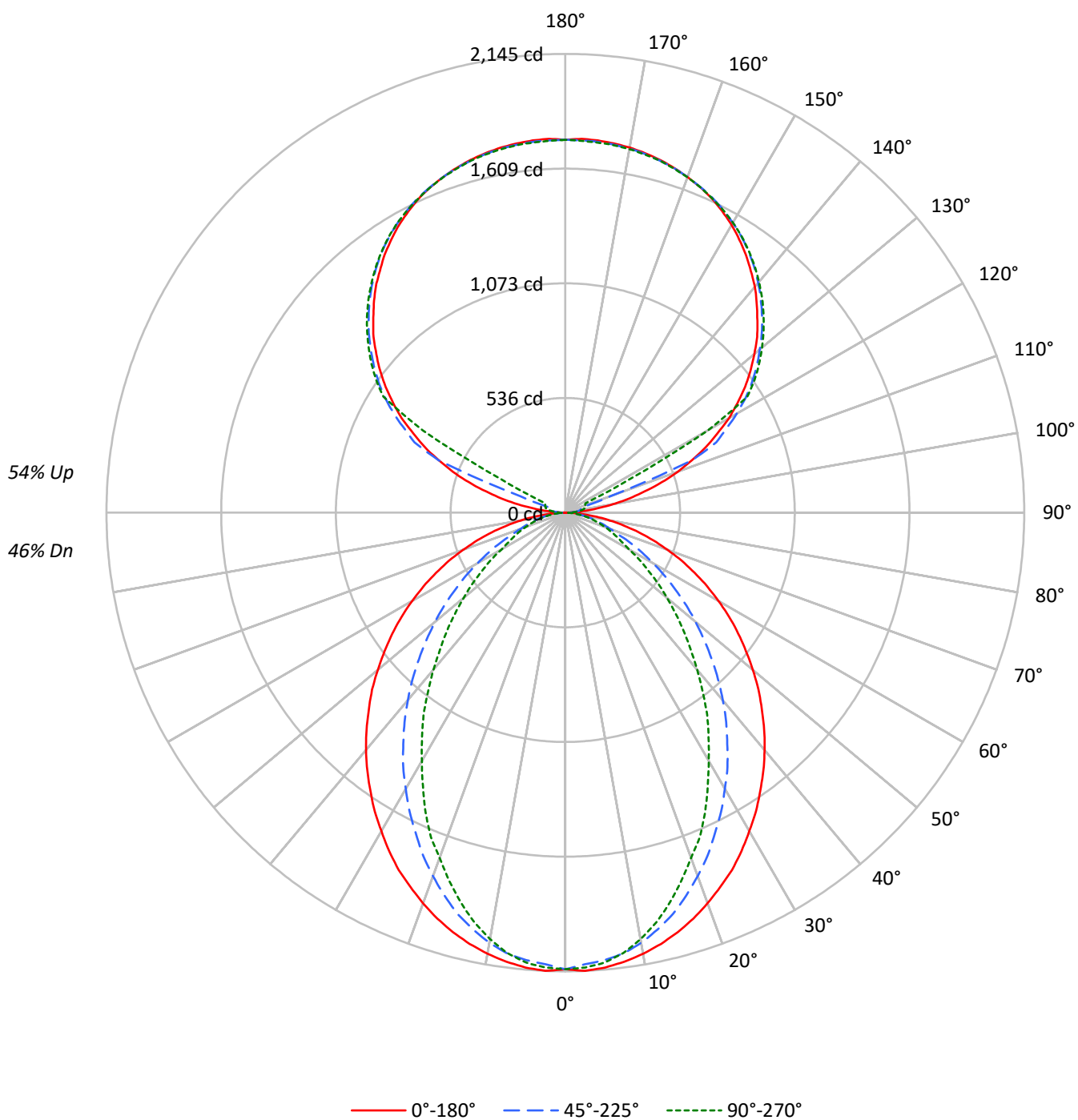
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 9505.4 lumens  
Efficiency: N/A  
Efficacy: 95.3 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.74' x L: 3.94' x H: 0.1')  
CIE Type: General Diffuse  
  
Input Watts (W): 99.7  
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   | 106 | 106 | 106 | 106 | 98 | 98 | 98 | 98 | 81 | 81 | 81 | 66 | 66 | 66 | 53 | 53 | 53 |
| 1   | 97  | 93  | 90  | 86  | 89 | 86 | 83 | 80 | 72 | 70 | 68 | 59 | 58 | 56 | 47 | 46 | 45 |
| 2   | 89  | 82  | 76  | 71  | 82 | 76 | 70 | 66 | 63 | 60 | 57 | 52 | 50 | 48 | 42 | 40 | 39 |
| 3   | 81  | 72  | 65  | 60  | 75 | 67 | 61 | 56 | 56 | 52 | 48 | 47 | 43 | 41 | 38 | 35 | 34 |
| 4   | 75  | 64  | 57  | 51  | 68 | 60 | 53 | 48 | 50 | 45 | 41 | 42 | 38 | 35 | 34 | 31 | 29 |
| 5   | 69  | 58  | 50  | 44  | 63 | 53 | 46 | 41 | 45 | 40 | 36 | 38 | 34 | 31 | 31 | 28 | 26 |
| 6   | 63  | 52  | 44  | 38  | 58 | 48 | 41 | 36 | 41 | 36 | 32 | 34 | 30 | 27 | 28 | 25 | 23 |
| 7   | 59  | 47  | 39  | 34  | 54 | 44 | 37 | 32 | 37 | 32 | 28 | 31 | 27 | 24 | 26 | 23 | 21 |
| 8   | 55  | 43  | 35  | 30  | 50 | 40 | 33 | 28 | 34 | 29 | 25 | 29 | 25 | 22 | 24 | 21 | 19 |
| 9   | 51  | 39  | 32  | 27  | 47 | 36 | 30 | 25 | 31 | 26 | 22 | 27 | 23 | 20 | 22 | 19 | 17 |
| 10  | 48  | 36  | 29  | 24  | 44 | 33 | 27 | 23 | 29 | 24 | 20 | 25 | 21 | 18 | 20 | 18 | 15 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1559 | 1559 | 1559 |
| 5°  | 1561 | 1534 | 1544 |
| 10° | 1546 | 1504 | 1494 |
| 15° | 1524 | 1455 | 1416 |
| 20° | 1496 | 1386 | 1321 |
| 25° | 1467 | 1310 | 1230 |
| 30° | 1429 | 1231 | 1113 |
| 35° | 1391 | 1147 | 1011 |
| 40° | 1352 | 1059 | 893  |
| 45° | 1307 | 962  | 787  |
| 50° | 1261 | 864  | 683  |
| 55° | 1213 | 759  | 583  |
| 60° | 1156 | 650  | 480  |
| 65° | 1092 | 538  | 432  |
| 70° | 1014 | 434  | 392  |
| 75° | 916  | 383  | 357  |
| 80° | 773  | 322  | 311  |
| 85° | 539  | 216  | 235  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
Vertical Angle: 45°  
Luminance: 1307 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 200.1  | 2.1       |
| 10°-20°   | 549.3  | 5.8       |
| 20°-30°   | 771.2  | 8.1       |
| 30°-40°   | 840.7  | 8.8       |
| 40°-50°   | 772.7  | 8.1       |
| 50°-60°   | 606.8  | 6.4       |
| 60°-70°   | 395.0  | 4.2       |
| 70°-80°   | 203.3  | 2.1       |
| 80°-90°   | 55.0   | 0.6       |
| 90°-100°  | 57.5   | 0.6       |
| 100°-110° | 214.3  | 2.3       |
| 110°-120° | 568.4  | 6.0       |
| 120°-130° | 942.7  | 9.9       |
| 130°-140° | 1001.4 | 10.5      |
| 140°-150° | 930.7  | 9.8       |
| 150°-160° | 748.2  | 7.9       |
| 160°-170° | 482.1  | 5.1       |
| 170°-180° | 165.9  | 1.7       |
| 0°-30°    | 1520.7 | 16.0      |
| 0°-40°    | 2361.4 | 24.8      |
| 0°-60°    | 3740.9 | 39.4      |
| 0°-90°    | 4394.1 | 46.2      |
| 90°-120°  | 840.2  | 8.8       |
| 90°-150°  | 3714.9 | 39.1      |
| 90°-180°  | 5111.0 | 53.8      |
| 0°-180°   | 9505.4 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2135 | 2135  | 2135 | 2135  | 2135 |      |
| 5°   | 2135 | 2126  | 2100 | 2118  | 2112 | 202  |
| 15°  | 2031 | 2009  | 1944 | 1907  | 1888 | 572  |
| 25°  | 1843 | 1782  | 1654 | 1575  | 1546 | 848  |
| 35°  | 1588 | 1490  | 1320 | 1198  | 1155 | 994  |
| 45°  | 1298 | 1169  | 966  | 829   | 782  | 1003 |
| 55°  | 987  | 837   | 628  | 512   | 475  | 882  |
| 65°  | 667  | 510   | 336  | 271   | 265  | 661  |
| 75°  | 356  | 220   | 154  | 141   | 139  | 376  |
| 85°  | 83   | 42    | 37   | 37    | 37   | 95   |
| 90°  | 1    | 15    | 25   | 32    | 34   | 9    |
| 95°  | 82   | 40    | 49   | 56    | 54   | 97   |
| 105° | 384  | 421   | 77   | 91    | 96   | 410  |
| 115° | 725  | 747   | 778  | 194   | 104  | 714  |
| 125° | 1026 | 1042  | 1066 | 1075  | 1079 | 915  |
| 135° | 1269 | 1289  | 1301 | 1313  | 1311 | 980  |
| 145° | 1472 | 1471  | 1492 | 1501  | 1495 | 921  |
| 155° | 1621 | 1610  | 1625 | 1632  | 1622 | 747  |
| 165° | 1708 | 1701  | 1704 | 1713  | 1704 | 483  |
| 175° | 1747 | 1738  | 1741 | 1750  | 1737 | 166  |
| 180° | 1743 | 1743  | 1743 | 1743  | 1743 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2135.1 | 2135.1 | 2135.1 | 2135.1 | 2135.1 |
| 2.5°   | 2144.7 | 2135.1 | 2113.7 | 2133.2 | 2129.3 |
| 5°     | 2135.1 | 2125.5 | 2100.2 | 2117.7 | 2111.9 |
| 7.5°   | 2117.7 | 2106.2 | 2079.1 | 2086.7 | 2077.1 |
| 10°    | 2094.5 | 2080.9 | 2042.5 | 2036.5 | 2025.0 |
| 12.5°  | 2065.6 | 2048.1 | 1995.9 | 1984.4 | 1963.1 |
| 15°    | 2030.7 | 2009.4 | 1943.8 | 1907.1 | 1887.8 |
| 17.5°  | 1990.2 | 1959.2 | 1878.0 | 1835.6 | 1804.7 |
| 20°    | 1943.8 | 1905.0 | 1808.5 | 1760.3 | 1717.7 |
| 22.5°  | 1893.6 | 1849.1 | 1737.0 | 1671.4 | 1642.4 |
| 25°    | 1843.4 | 1781.5 | 1654.0 | 1574.9 | 1545.7 |
| 27.5°  | 1783.6 | 1717.7 | 1576.7 | 1485.8 | 1441.4 |
| 30°    | 1719.8 | 1646.1 | 1491.6 | 1393.2 | 1340.9 |
| 32.5°  | 1657.9 | 1568.9 | 1410.7 | 1294.6 | 1246.2 |
| 35°    | 1588.4 | 1489.8 | 1319.8 | 1198.0 | 1155.4 |
| 37.5°  | 1520.7 | 1414.3 | 1234.8 | 1101.3 | 1053.1 |
| 40°    | 1449.1 | 1333.3 | 1145.7 | 1008.6 | 958.4  |
| 42.5°  | 1375.8 | 1252.1 | 1057.0 | 913.9  | 865.7  |
| 45°    | 1298.5 | 1168.9 | 966.2  | 828.8  | 782.5  |
| 47.5°  | 1225.1 | 1088.0 | 879.3  | 741.9  | 699.5  |
| 50°    | 1143.9 | 1006.8 | 794.2  | 660.7  | 620.3  |
| 52.5°  | 1064.5 | 919.6  | 713.0  | 585.5  | 548.8  |
| 55°    | 987.3  | 836.6  | 627.9  | 512.1  | 475.4  |
| 57.5°  | 908.2  | 753.5  | 552.7  | 444.4  | 413.5  |
| 60°    | 827.0  | 672.4  | 473.4  | 375.0  | 344.0  |
| 62.5°  | 747.9  | 593.3  | 405.7  | 313.1  | 297.6  |
| 65°    | 666.7  | 510.1  | 336.2  | 270.6  | 264.7  |
| 67.5°  | 589.4  | 432.7  | 270.6  | 237.6  | 231.9  |
| 70°    | 508.2  | 357.5  | 224.0  | 204.8  | 197.0  |
| 72.5°  | 430.9  | 287.8  | 187.4  | 172.0  | 168.1  |
| 75°    | 355.5  | 220.2  | 154.5  | 141.0  | 139.2  |
| 77.5°  | 280.3  | 156.4  | 121.7  | 114.0  | 110.1  |
| 80°    | 210.5  | 112.1  | 92.6   | 85.1   | 85.1   |
| 82.5°  | 146.8  | 75.4   | 63.7   | 59.8   | 59.8   |
| 85°    | 83.0   | 42.4   | 36.7   | 36.7   | 36.7   |
| 87.5°  | 31.0   | 15.4   | 15.4   | 13.5   | 13.5   |
| 90°    | 1.2    | 15.2   | 25.1   | 31.6   | 34.0   |
| 92.5°  | 31.6   | 26.5   | 30.2   | 32.8   | 34.0   |
| 95°    | 82.0   | 40.3   | 49.2   | 55.6   | 54.2   |
| 97.5°  | 147.6  | 44.2   | 64.2   | 68.2   | 69.4   |
| 100°   | 223.3  | 50.5   | 71.9   | 82.0   | 84.5   |
| 102.5° | 306.5  | 304.1  | 74.5   | 88.3   | 92.1   |
| 105°   | 383.5  | 421.4  | 77.0   | 90.7   | 95.9   |
| 107.5° | 473.1  | 504.5  | 79.6   | 93.3   | 98.4   |
| 110°   | 559.0  | 585.3  | 220.8  | 94.7   | 99.6   |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 639.6  | 662.3  | 640.8  | 97.0   | 101.0  |
| 115°   | 725.4  | 746.8  | 778.4  | 194.3  | 103.5  |
| 117.5° | 799.8  | 825.0  | 846.5  | 666.1  | 335.5  |
| 120°   | 883.1  | 902.0  | 924.8  | 939.9  | 769.6  |
| 122.5° | 953.6  | 973.9  | 999.2  | 1006.7 | 1008.1 |
| 125°   | 1025.6 | 1042.1 | 1066.0 | 1074.9 | 1078.6 |
| 127.5° | 1091.2 | 1108.9 | 1127.9 | 1140.5 | 1141.7 |
| 130°   | 1153.0 | 1173.3 | 1187.1 | 1201.0 | 1199.8 |
| 132.5° | 1216.2 | 1232.6 | 1246.4 | 1257.7 | 1256.5 |
| 135°   | 1269.2 | 1289.4 | 1300.6 | 1313.4 | 1310.8 |
| 137.5° | 1324.6 | 1339.7 | 1352.5 | 1365.0 | 1361.3 |
| 140°   | 1378.8 | 1389.0 | 1402.8 | 1414.2 | 1407.9 |
| 142.5° | 1424.3 | 1433.2 | 1449.6 | 1459.6 | 1453.3 |
| 145°   | 1472.3 | 1470.9 | 1492.4 | 1501.2 | 1495.0 |
| 147.5° | 1513.8 | 1510.0 | 1531.5 | 1537.7 | 1532.8 |
| 150°   | 1554.3 | 1545.4 | 1565.6 | 1573.1 | 1566.8 |
| 152.5° | 1588.3 | 1578.2 | 1597.1 | 1604.7 | 1595.9 |
| 155°   | 1621.1 | 1609.8 | 1625.0 | 1632.5 | 1622.4 |
| 157.5° | 1647.6 | 1637.5 | 1648.9 | 1657.8 | 1647.6 |
| 160°   | 1670.3 | 1662.7 | 1670.3 | 1677.8 | 1669.0 |
| 162.5° | 1690.4 | 1682.9 | 1689.2 | 1698.1 | 1686.7 |
| 165°   | 1708.1 | 1700.6 | 1704.3 | 1713.2 | 1704.3 |
| 167.5° | 1722.0 | 1714.4 | 1718.3 | 1727.2 | 1715.7 |
| 170°   | 1733.4 | 1725.8 | 1728.4 | 1737.1 | 1725.8 |
| 172.5° | 1740.9 | 1733.4 | 1735.9 | 1744.8 | 1733.4 |
| 175°   | 1747.2 | 1738.4 | 1740.9 | 1749.7 | 1737.1 |
| 177.5° | 1749.7 | 1740.9 | 1742.2 | 1751.1 | 1739.7 |
| 180°   | 1743.4 | 1743.4 | 1743.4 | 1743.4 | 1743.4 |

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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 | 8.33             | 9.13  | 9.33  | 10.13 | 11.46 | 4.30           | 5.10 | 5.29 | 6.10 | 7.43  |
|                 | 3H   | 10.01            | 10.73 | 11.02 | 11.74 | 13.09 | 5.48           | 6.20 | 6.49 | 7.21 | 8.56  |
|                 | 4H   | 10.62            | 11.30 | 11.64 | 12.31 | 13.67 | 5.93           | 6.61 | 6.95 | 7.63 | 8.98  |
|                 | 6H   | 11.04            | 11.67 | 12.07 | 12.68 | 14.05 | 6.25           | 6.88 | 7.28 | 7.90 | 9.26  |
|                 | 8H   | 11.17            | 11.76 | 12.20 | 12.80 | 14.16 | 6.34           | 6.94 | 7.38 | 7.97 | 9.34  |
|                 | 12H  | 11.23            | 11.79 | 12.27 | 12.82 | 14.21 | 6.39           | 6.95 | 7.43 | 7.98 | 9.37  |
| 4H              | 2H   | 8.35             | 9.02  | 9.37  | 10.04 | 11.39 | 4.89           | 5.57 | 5.92 | 6.58 | 7.94  |
|                 | 3H   | 10.18            | 10.74 | 11.21 | 11.78 | 13.15 | 6.24           | 6.80 | 7.27 | 7.85 | 9.21  |
|                 | 4H   | 10.87            | 11.38 | 11.91 | 12.42 | 13.81 | 6.79           | 7.30 | 7.83 | 8.34 | 9.73  |
|                 | 6H   | 11.39            | 11.83 | 12.44 | 12.89 | 14.27 | 7.21           | 7.65 | 8.26 | 8.71 | 10.09 |
|                 | 8H   | 11.56            | 11.98 | 12.61 | 13.03 | 14.43 | 7.33           | 7.75 | 8.39 | 8.80 | 10.20 |
|                 | 12H  | 11.66            | 12.03 | 12.73 | 13.10 | 14.50 | 7.40           | 7.77 | 8.47 | 8.84 | 10.24 |
| 8H              | 4H   | 10.84            | 11.25 | 11.89 | 12.30 | 13.70 | 7.07           | 7.48 | 8.12 | 8.53 | 9.93  |
|                 | 6H   | 11.40            | 11.74 | 12.48 | 12.84 | 14.24 | 7.59           | 7.93 | 8.66 | 9.02 | 10.42 |
|                 | 8H   | 11.62            | 11.92 | 12.70 | 13.00 | 14.42 | 7.78           | 8.08 | 8.86 | 9.15 | 10.57 |
|                 | 12H  | 11.76            | 12.02 | 12.85 | 13.10 | 14.56 | 7.90           | 8.16 | 8.98 | 9.23 | 10.69 |
| 12H             | 4H   | 10.79            | 11.16 | 11.85 | 12.22 | 13.63 | 7.07           | 7.44 | 8.14 | 8.51 | 9.92  |
|                 | 6H   | 11.38            | 11.68 | 12.46 | 12.76 | 14.17 | 7.63           | 7.93 | 8.72 | 9.01 | 10.43 |
|                 | 8H   | 11.60            | 11.86 | 12.68 | 12.94 | 14.40 | 7.84           | 8.11 | 8.93 | 9.18 | 10.64 |