

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: P918620

Luminaire Tested: DFN2DIP-4P3F0-050D060US935-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P918620  
REPORT IS A COMBINATION OF REPORTS P899076 AND P895917  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-4P3F0-050D060US935-RLLFLL  
Description: 3 foot, 90deg - 4way Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

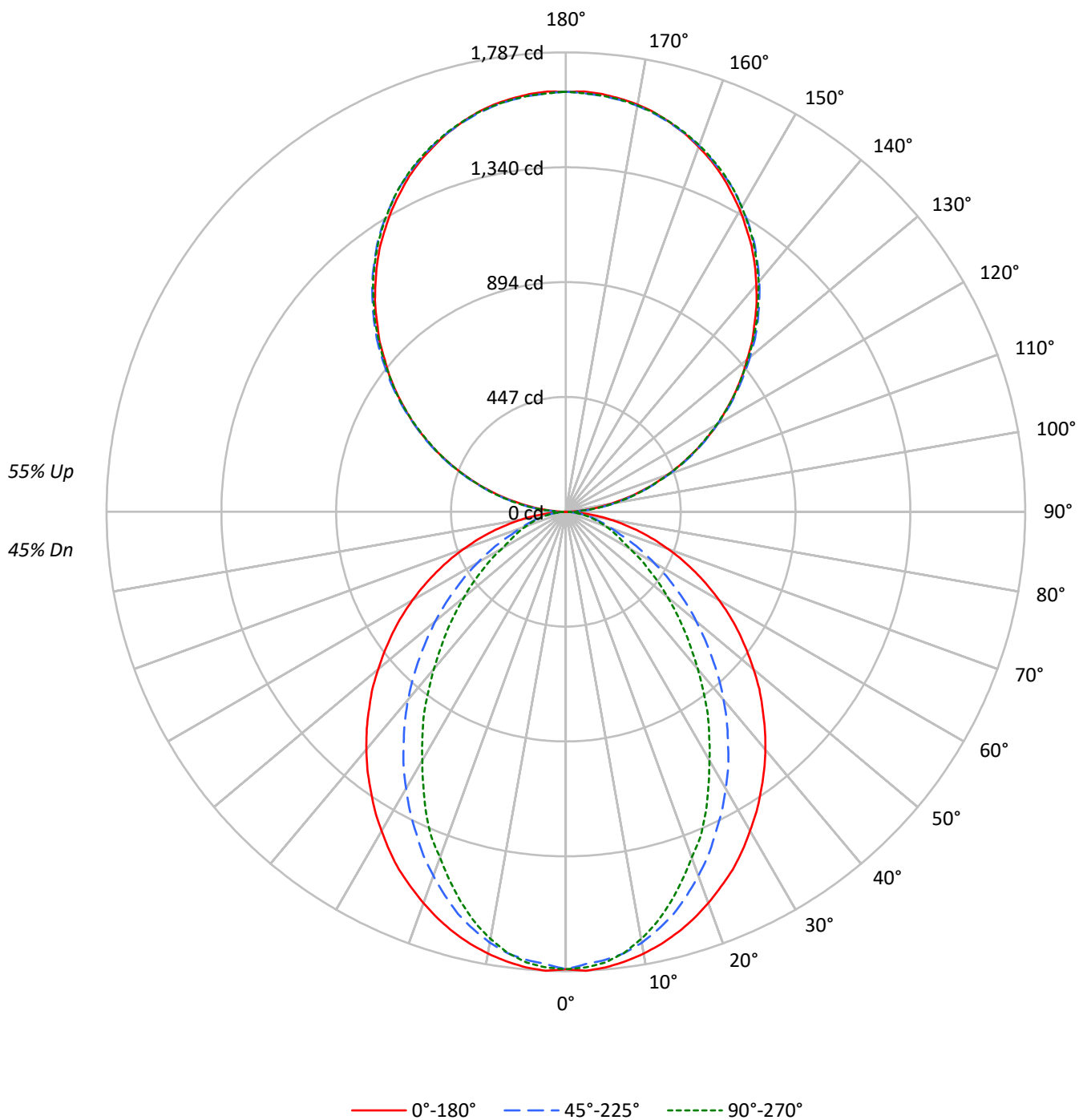
Lumens per Lamp: N/A  
Luminaire Lumens: 8231.2 lumens  
Efficiency: N/A  
Efficacy: 85.7 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.07' x L: 3.07' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 96  
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 | 30 | 10 |
| RCR |     |     |     |     |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 0   | 106 | 106 | 106 | 106 | 97 | 97 | 97 | 97 | 80 | 80 | 80 | 65 | 65 | 65 | 51 | 51 | 51 |
| 1   | 97  | 93  | 89  | 86  | 89 | 85 | 82 | 79 | 71 | 69 | 67 | 58 | 56 | 55 | 46 | 45 | 44 |
| 2   | 89  | 82  | 76  | 71  | 81 | 75 | 70 | 66 | 63 | 59 | 56 | 51 | 49 | 47 | 41 | 39 | 38 |
| 3   | 81  | 72  | 65  | 59  | 74 | 66 | 60 | 55 | 56 | 51 | 47 | 46 | 43 | 40 | 37 | 34 | 33 |
| 4   | 74  | 64  | 56  | 51  | 68 | 59 | 52 | 47 | 50 | 45 | 41 | 41 | 37 | 35 | 33 | 30 | 28 |
| 5   | 68  | 57  | 49  | 44  | 63 | 53 | 46 | 41 | 45 | 39 | 35 | 37 | 33 | 30 | 30 | 27 | 25 |
| 6   | 63  | 51  | 44  | 38  | 58 | 48 | 41 | 36 | 40 | 35 | 31 | 34 | 30 | 27 | 27 | 24 | 22 |
| 7   | 58  | 47  | 39  | 33  | 54 | 43 | 36 | 31 | 37 | 31 | 28 | 31 | 27 | 24 | 25 | 22 | 20 |
| 8   | 54  | 42  | 35  | 30  | 50 | 39 | 33 | 28 | 34 | 28 | 25 | 28 | 24 | 21 | 23 | 20 | 18 |
| 9   | 51  | 39  | 31  | 27  | 46 | 36 | 29 | 25 | 31 | 26 | 22 | 26 | 22 | 19 | 21 | 18 | 16 |
| 10  | 47  | 36  | 29  | 24  | 43 | 33 | 27 | 23 | 28 | 23 | 20 | 24 | 20 | 17 | 20 | 17 | 15 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2028 | 2028 | 2028 |
| 5°  | 2030 | 1994 | 2008 |
| 10° | 2008 | 1954 | 1942 |
| 15° | 1979 | 1888 | 1840 |
| 20° | 1942 | 1798 | 1716 |
| 25° | 1903 | 1697 | 1595 |
| 30° | 1851 | 1593 | 1443 |
| 35° | 1800 | 1482 | 1310 |
| 40° | 1749 | 1368 | 1157 |
| 45° | 1689 | 1240 | 1018 |
| 50° | 1627 | 1112 | 882  |
| 55° | 1562 | 975  | 752  |
| 60° | 1487 | 833  | 618  |
| 65° | 1400 | 688  | 556  |
| 70° | 1295 | 553  | 502  |
| 75° | 1163 | 484  | 455  |
| 80° | 972  | 402  | 393  |
| 85° | 660  | 262  | 292  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 1689 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 166.8  | 2.0       |
| 10°-20°   | 457.8  | 5.6       |
| 20°-30°   | 642.7  | 7.8       |
| 30°-40°   | 700.6  | 8.5       |
| 40°-50°   | 643.9  | 7.8       |
| 50°-60°   | 505.7  | 6.1       |
| 60°-70°   | 329.2  | 4.0       |
| 70°-80°   | 169.5  | 2.1       |
| 80°-90°   | 47.9   | 0.6       |
| 90°-100°  | 101.1  | 1.2       |
| 100°-110° | 321.2  | 3.9       |
| 110°-120° | 549.7  | 6.7       |
| 120°-130° | 723.0  | 8.8       |
| 130°-140° | 811.5  | 9.9       |
| 140°-150° | 795.8  | 9.7       |
| 150°-160° | 667.5  | 8.1       |
| 160°-170° | 442.7  | 5.4       |
| 170°-180° | 154.7  | 1.9       |
| 0°-30°    | 1267.2 | 15.4      |
| 0°-40°    | 1967.8 | 23.9      |
| 0°-60°    | 3117.4 | 37.9      |
| 0°-90°    | 3663.9 | 44.5      |
| 90°-120°  | 972.0  | 11.8      |
| 90°-150°  | 3302.3 | 40.1      |
| 90°-180°  | 4567.0 | 55.5      |
| 0°-180°   | 8231.2 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1779 | 1779  | 1779 | 1779  | 1779 |      |
| 5°   | 1779 | 1771  | 1750 | 1765  | 1760 | 169  |
| 15°  | 1692 | 1675  | 1620 | 1589  | 1573 | 477  |
| 25°  | 1536 | 1484  | 1378 | 1312  | 1288 | 706  |
| 35°  | 1324 | 1242  | 1100 | 998   | 963  | 828  |
| 45°  | 1082 | 974   | 805  | 691   | 652  | 836  |
| 55°  | 823  | 697   | 523  | 427   | 396  | 735  |
| 65°  | 556  | 425   | 280  | 226   | 221  | 551  |
| 75°  | 296  | 184   | 129  | 118   | 116  | 313  |
| 85°  | 69   | 35    | 31   | 31    | 31   | 79   |
| 90°  | 2    | 18    | 48   | 45    | 47   | 8    |
| 95°  | 72   | 86    | 88   | 88    | 86   | 80   |
| 105° | 296  | 300   | 303  | 306   | 306  | 313  |
| 115° | 552  | 560   | 557  | 556   | 552  | 546  |
| 125° | 802  | 815   | 811  | 806   | 805  | 717  |
| 135° | 1038 | 1053  | 1056 | 1055  | 1051 | 802  |
| 145° | 1260 | 1270  | 1278 | 1279  | 1274 | 787  |
| 155° | 1441 | 1445  | 1449 | 1456  | 1452 | 663  |
| 165° | 1567 | 1566  | 1566 | 1576  | 1569 | 442  |
| 175° | 1631 | 1627  | 1624 | 1634  | 1625 | 155  |
| 180° | 1634 | 1634  | 1634 | 1634  | 1634 |      |

TEST NUMBER: P918620

CATALOG NUMBER: DFN2DIP-4P3F0-050D060US935-RLLFLL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1779.3 | 1779.3 | 1779.3 | 1779.3 | 1779.3 |
| 2.5°   | 1787.3 | 1779.3 | 1761.5 | 1777.7 | 1774.4 |
| 5°     | 1779.3 | 1771.2 | 1750.2 | 1764.7 | 1760.0 |
| 7.5°   | 1764.7 | 1755.1 | 1732.6 | 1739.0 | 1730.9 |
| 10°    | 1745.4 | 1734.1 | 1702.0 | 1697.1 | 1687.5 |
| 12.5°  | 1721.3 | 1706.8 | 1663.3 | 1653.7 | 1635.9 |
| 15°    | 1692.3 | 1674.6 | 1619.9 | 1589.3 | 1573.2 |
| 17.5°  | 1658.5 | 1632.7 | 1565.0 | 1529.6 | 1503.8 |
| 20°    | 1619.9 | 1587.6 | 1507.1 | 1467.0 | 1431.4 |
| 22.5°  | 1578.0 | 1540.9 | 1447.5 | 1392.8 | 1368.7 |
| 25°    | 1536.1 | 1484.5 | 1378.3 | 1312.3 | 1288.1 |
| 27.5°  | 1486.3 | 1431.4 | 1313.9 | 1238.2 | 1201.2 |
| 30°    | 1433.1 | 1371.8 | 1243.0 | 1161.0 | 1117.4 |
| 32.5°  | 1381.6 | 1307.4 | 1175.5 | 1078.8 | 1038.5 |
| 35°    | 1323.6 | 1241.5 | 1099.8 | 998.3  | 962.9  |
| 37.5°  | 1267.2 | 1178.6 | 1029.0 | 917.7  | 877.6  |
| 40°    | 1207.6 | 1111.1 | 954.8  | 840.5  | 798.7  |
| 42.5°  | 1146.5 | 1043.4 | 880.8  | 761.6  | 721.4  |
| 45°    | 1082.1 | 974.1  | 805.1  | 690.7  | 652.0  |
| 47.5°  | 1020.9 | 906.6  | 732.7  | 618.3  | 582.9  |
| 50°    | 953.3  | 839.0  | 661.8  | 550.6  | 516.9  |
| 52.5°  | 887.2  | 766.4  | 594.2  | 487.9  | 457.4  |
| 55°    | 822.8  | 697.1  | 523.2  | 426.7  | 396.1  |
| 57.5°  | 756.8  | 628.0  | 460.5  | 370.4  | 344.6  |
| 60°    | 689.1  | 560.3  | 394.4  | 312.5  | 286.6  |
| 62.5°  | 623.2  | 494.4  | 338.1  | 260.9  | 248.1  |
| 65°    | 555.5  | 425.1  | 280.2  | 225.5  | 220.6  |
| 67.5°  | 491.1  | 360.7  | 225.5  | 198.0  | 193.2  |
| 70°    | 423.5  | 297.9  | 186.8  | 170.6  | 164.2  |
| 72.5°  | 359.1  | 239.9  | 156.2  | 143.4  | 140.1  |
| 75°    | 296.3  | 183.5  | 128.8  | 117.5  | 116.0  |
| 77.5°  | 233.5  | 130.4  | 101.5  | 95.0   | 91.7   |
| 80°    | 175.5  | 93.4   | 77.2   | 70.9   | 70.9   |
| 82.5°  | 122.3  | 62.9   | 53.1   | 49.9   | 49.9   |
| 85°    | 69.2   | 35.4   | 30.6   | 30.6   | 30.6   |
| 87.5°  | 25.8   | 12.8   | 12.8   | 11.3   | 11.3   |
| 90°    | 1.5    | 17.7   | 48.3   | 45.3   | 46.8   |
| 92.5°  | 30.6   | 41.4   | 42.9   | 44.3   | 44.3   |
| 95°    | 71.9   | 85.7   | 88.2   | 88.2   | 85.7   |
| 97.5°  | 119.7  | 132.5  | 137.9  | 137.9  | 137.9  |
| 100°   | 174.9  | 186.1  | 190.1  | 190.1  | 188.6  |
| 102.5° | 233.0  | 241.3  | 246.8  | 248.2  | 246.8  |
| 105°   | 296.5  | 300.5  | 303.4  | 305.9  | 305.9  |
| 107.5° | 359.6  | 365.5  | 365.5  | 366.4  | 359.6  |
| 110°   | 420.7  | 428.5  | 428.5  | 428.5  | 424.6  |

TEST NUMBER: P918620

CATALOG NUMBER: DFN2DIP-4P3F0-050D060US935-RLLFLL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 486.6  | 495.0  | 493.5  | 489.6  | 486.6  |
| 115°   | 551.6  | 559.6  | 557.1  | 555.6  | 551.6  |
| 117.5° | 616.2  | 627.1  | 620.1  | 616.2  | 612.3  |
| 120°   | 681.2  | 692.1  | 681.2  | 681.2  | 676.7  |
| 122.5° | 740.3  | 754.1  | 747.2  | 743.3  | 740.3  |
| 125°   | 802.4  | 814.7  | 810.7  | 806.3  | 804.9  |
| 127.5° | 863.0  | 878.2  | 872.8  | 866.9  | 863.0  |
| 130°   | 919.6  | 937.4  | 934.9  | 931.9  | 926.5  |
| 132.5° | 983.2  | 996.9  | 997.9  | 991.0  | 987.0  |
| 135°   | 1037.8 | 1053.1 | 1056.0 | 1054.6 | 1050.6 |
| 137.5° | 1098.9 | 1111.2 | 1113.7 | 1112.7 | 1106.8 |
| 140°   | 1152.6 | 1164.9 | 1171.8 | 1171.8 | 1166.4 |
| 142.5° | 1207.7 | 1220.0 | 1224.0 | 1225.5 | 1220.0 |
| 145°   | 1260.0 | 1269.8 | 1277.7 | 1279.2 | 1273.8 |
| 147.5° | 1306.7 | 1319.0 | 1325.0 | 1327.4 | 1322.0 |
| 150°   | 1355.0 | 1363.4 | 1368.8 | 1373.2 | 1368.8 |
| 152.5° | 1397.8 | 1406.3 | 1413.2 | 1418.6 | 1413.2 |
| 155°   | 1440.7 | 1444.7 | 1449.1 | 1456.0 | 1451.6 |
| 157.5° | 1477.6 | 1480.7 | 1483.1 | 1493.0 | 1486.1 |
| 160°   | 1510.7 | 1513.6 | 1515.1 | 1523.4 | 1517.6 |
| 162.5° | 1541.2 | 1541.2 | 1542.6 | 1552.0 | 1545.1 |
| 165°   | 1567.3 | 1565.8 | 1565.8 | 1575.7 | 1568.8 |
| 167.5° | 1591.0 | 1586.6 | 1586.6 | 1596.4 | 1589.5 |
| 170°   | 1608.7 | 1604.7 | 1603.3 | 1613.1 | 1604.7 |
| 172.5° | 1621.0 | 1617.0 | 1615.6 | 1625.4 | 1617.0 |
| 175°   | 1630.8 | 1626.9 | 1623.9 | 1633.8 | 1625.4 |
| 177.5° | 1636.2 | 1632.4 | 1629.4 | 1637.7 | 1629.4 |
| 180°   | 1633.8 | 1633.8 | 1633.8 | 1633.8 | 1633.8 |

TEST NUMBER: P918620

CATALOG NUMBER: DFN2DIP-4P3F0-050D060US935-RLLFLL

**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 | 9.03             | 9.82  | 10.04 | 10.83 | 12.18 | 4.99           | 5.78 | 6.00 | 6.80 | 8.15  |
|                 | 3H   | 10.70            | 11.41 | 11.72 | 12.43 | 13.80 | 6.17           | 6.88 | 7.19 | 7.90 | 9.27  |
|                 | 4H   | 11.31            | 11.97 | 12.34 | 13.00 | 14.38 | 6.62           | 7.28 | 7.65 | 8.31 | 9.69  |
|                 | 6H   | 11.72            | 12.34 | 12.76 | 13.37 | 14.76 | 6.93           | 7.54 | 7.97 | 8.57 | 9.96  |
|                 | 8H   | 11.85            | 12.43 | 12.89 | 13.48 | 14.86 | 7.02           | 7.60 | 8.06 | 8.65 | 10.03 |
|                 | 12H  | 11.90            | 12.46 | 12.96 | 13.50 | 14.91 | 7.05           | 7.61 | 8.11 | 8.65 | 10.06 |
| 4H              | 2H   | 9.04             | 9.71  | 10.08 | 10.74 | 12.11 | 5.58           | 6.25 | 6.62 | 7.27 | 8.65  |
|                 | 3H   | 10.86            | 11.42 | 11.91 | 12.47 | 13.86 | 6.92           | 7.47 | 7.97 | 8.53 | 9.92  |
|                 | 4H   | 11.55            | 12.06 | 12.60 | 13.10 | 14.52 | 7.46           | 7.97 | 8.51 | 9.01 | 10.43 |
|                 | 6H   | 12.06            | 12.49 | 13.12 | 13.56 | 14.97 | 7.87           | 8.31 | 8.93 | 9.38 | 10.78 |
|                 | 8H   | 12.23            | 12.64 | 13.29 | 13.70 | 15.12 | 8.00           | 8.40 | 9.06 | 9.46 | 10.89 |
|                 | 12H  | 12.32            | 12.69 | 13.40 | 13.76 | 15.19 | 8.05           | 8.42 | 9.14 | 9.50 | 10.93 |
| 8H              | 4H   | 11.51            | 11.92 | 12.58 | 12.98 | 14.41 | 7.74           | 8.14 | 8.80 | 9.20 | 10.63 |
|                 | 6H   | 12.07            | 12.41 | 13.16 | 13.51 | 14.93 | 8.24           | 8.58 | 9.33 | 9.68 | 11.10 |
|                 | 8H   | 12.29            | 12.58 | 13.38 | 13.67 | 15.11 | 8.43           | 8.72 | 9.52 | 9.81 | 11.25 |
|                 | 12H  | 12.42            | 12.68 | 13.52 | 13.76 | 15.24 | 8.54           | 8.80 | 9.64 | 9.88 | 11.36 |
| 12H             | 4H   | 11.46            | 11.83 | 12.54 | 12.91 | 14.34 | 7.74           | 8.10 | 8.82 | 9.18 | 10.61 |
|                 | 6H   | 12.05            | 12.34 | 13.14 | 13.43 | 14.87 | 8.29           | 8.59 | 9.38 | 9.67 | 11.11 |
|                 | 8H   | 12.26            | 12.52 | 13.36 | 13.60 | 15.09 | 8.49           | 8.75 | 9.59 | 9.84 | 11.32 |