

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: P921455

Luminaire Tested: DFN2DIP-4P4F0-060D060US940-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P921455  
REPORT IS A COMBINATION OF REPORTS P900641 AND P897523  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-4P4F0-060D060US940-FLLONL  
Description: 4 foot, 90deg - 4way Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

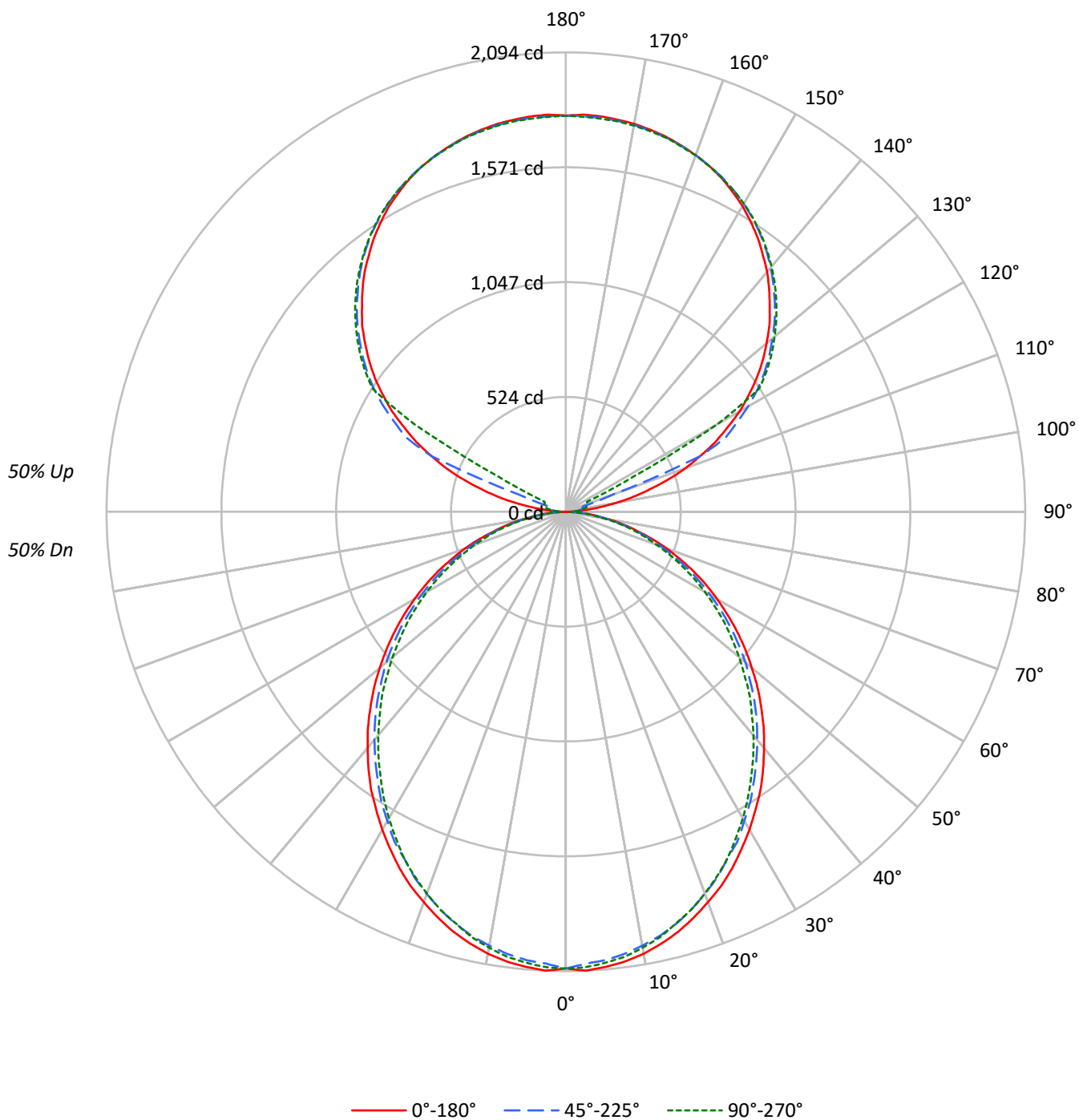
Lumens per Lamp: N/A  
Luminaire Lumens: 10593.5 lumens  
Efficiency: N/A  
Efficacy: 94.8 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 4.07' x L: 4.07' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 111.8  
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



TEST NUMBER: P921455

CATALOG NUMBER: DFN2DIP-4P4F0-060D060US940-FLONL

**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   | 107 | 107 | 107 | 107 | 99 | 99 | 99 | 99 | 83 | 83 | 83 | 69 | 69 | 69 | 56 | 56 | 56 |
| 1   | 98  | 93  | 90  | 86  | 90 | 86 | 83 | 80 | 73 | 71 | 68 | 61 | 59 | 58 | 50 | 48 | 47 |
| 2   | 89  | 82  | 75  | 70  | 82 | 76 | 70 | 66 | 64 | 60 | 57 | 53 | 51 | 48 | 44 | 42 | 40 |
| 3   | 81  | 72  | 64  | 59  | 75 | 66 | 60 | 55 | 56 | 52 | 48 | 47 | 44 | 41 | 39 | 36 | 34 |
| 4   | 74  | 64  | 56  | 50  | 68 | 59 | 52 | 47 | 50 | 45 | 41 | 42 | 38 | 35 | 35 | 32 | 29 |
| 5   | 68  | 57  | 48  | 42  | 63 | 53 | 45 | 40 | 45 | 39 | 35 | 38 | 34 | 30 | 31 | 28 | 26 |
| 6   | 63  | 51  | 43  | 37  | 58 | 47 | 40 | 35 | 40 | 35 | 31 | 34 | 30 | 27 | 28 | 25 | 23 |
| 7   | 58  | 46  | 38  | 32  | 53 | 43 | 36 | 30 | 37 | 31 | 27 | 31 | 27 | 23 | 26 | 23 | 20 |
| 8   | 54  | 42  | 34  | 29  | 50 | 39 | 32 | 27 | 33 | 28 | 24 | 28 | 24 | 21 | 24 | 20 | 18 |
| 9   | 50  | 38  | 30  | 25  | 46 | 35 | 29 | 24 | 31 | 25 | 21 | 26 | 22 | 19 | 22 | 19 | 16 |
| 10  | 47  | 35  | 28  | 23  | 43 | 33 | 26 | 22 | 28 | 23 | 19 | 24 | 20 | 17 | 20 | 17 | 15 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1351 | 1351 | 1351 |
| 5°  | 1353 | 1332 | 1341 |
| 10° | 1342 | 1315 | 1324 |
| 15° | 1322 | 1293 | 1296 |
| 20° | 1296 | 1264 | 1267 |
| 25° | 1269 | 1228 | 1234 |
| 30° | 1236 | 1195 | 1192 |
| 35° | 1205 | 1156 | 1147 |
| 40° | 1166 | 1117 | 1105 |
| 45° | 1128 | 1077 | 1061 |
| 50° | 1085 | 1036 | 1011 |
| 55° | 1041 | 988  | 965  |
| 60° | 992  | 931  | 912  |
| 65° | 937  | 872  | 850  |
| 70° | 868  | 801  | 783  |
| 75° | 772  | 715  | 722  |
| 80° | 657  | 606  | 604  |
| 85° | 476  | 416  | 407  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 1128 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 195.9   | 1.8       |
| 10°-20°   | 551.3   | 5.2       |
| 20°-30°   | 810.2   | 7.6       |
| 30°-40°   | 941.0   | 8.9       |
| 40°-50°   | 939.8   | 8.9       |
| 50°-60°   | 819.5   | 7.7       |
| 60°-70°   | 605.8   | 5.7       |
| 70°-80°   | 342.7   | 3.2       |
| 80°-90°   | 93.6    | 0.9       |
| 90°-100°  | 59.5    | 0.6       |
| 100°-110° | 222.0   | 2.1       |
| 110°-120° | 588.7   | 5.6       |
| 120°-130° | 976.3   | 9.2       |
| 130°-140° | 1037.1  | 9.8       |
| 140°-150° | 963.9   | 9.1       |
| 150°-160° | 774.9   | 7.3       |
| 160°-170° | 499.3   | 4.7       |
| 170°-180° | 171.9   | 1.6       |
| 0°-30°    | 1557.4  | 14.7      |
| 0°-40°    | 2498.4  | 23.6      |
| 0°-60°    | 4257.8  | 40.2      |
| 0°-90°    | 5300.0  | 50.0      |
| 90°-120°  | 870.2   | 8.2       |
| 90°-150°  | 3847.4  | 36.3      |
| 90°-180°  | 5294.0  | 50.0      |
| 0°-180°   | 10593.5 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2082 | 2082  | 2082 | 2082  | 2082 |      |
| 5°   | 2082 | 2074  | 2052 | 2068  | 2064 | 198  |
| 15°  | 1982 | 1970  | 1944 | 1952  | 1942 | 558  |
| 25°  | 1794 | 1778  | 1744 | 1748  | 1744 | 825  |
| 35°  | 1548 | 1528  | 1495 | 1483  | 1473 | 966  |
| 45°  | 1259 | 1245  | 1215 | 1193  | 1185 | 972  |
| 55°  | 953  | 941   | 917  | 893   | 883  | 852  |
| 65°  | 643  | 631   | 611  | 592   | 583  | 635  |
| 75°  | 336  | 332   | 322  | 310   | 314  | 359  |
| 85°  | 82   | 80    | 78   | 72    | 70   | 91   |
| 90°  | 1    | 16    | 26   | 33    | 35   | 10   |
| 95°  | 85   | 42    | 51   | 58    | 56   | 101  |
| 105° | 397  | 436   | 80   | 94    | 99   | 424  |
| 115° | 751  | 774   | 806  | 201   | 107  | 740  |
| 125° | 1062 | 1079  | 1104 | 1113  | 1117 | 947  |
| 135° | 1314 | 1335  | 1347 | 1360  | 1358 | 1015 |
| 145° | 1525 | 1523  | 1546 | 1555  | 1548 | 954  |
| 155° | 1679 | 1667  | 1683 | 1691  | 1680 | 774  |
| 165° | 1769 | 1761  | 1765 | 1774  | 1765 | 500  |
| 175° | 1810 | 1800  | 1803 | 1812  | 1799 | 172  |
| 180° | 1806 | 1806  | 1806 | 1806  | 1806 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2081.8 | 2081.8 | 2081.8 | 2081.8 | 2081.8 |
| 2.5°   | 2093.9 | 2083.9 | 2061.8 | 2081.8 | 2078.0 |
| 5°     | 2081.8 | 2073.9 | 2051.8 | 2067.8 | 2064.0 |
| 7.5°   | 2067.8 | 2055.9 | 2033.8 | 2050.0 | 2045.9 |
| 10°    | 2045.9 | 2031.9 | 2007.9 | 2023.8 | 2017.9 |
| 12.5°  | 2015.8 | 2003.9 | 1979.9 | 1989.9 | 1985.8 |
| 15°    | 1981.7 | 1969.9 | 1943.8 | 1951.9 | 1941.9 |
| 17.5°  | 1939.7 | 1927.9 | 1901.8 | 1911.6 | 1901.8 |
| 20°    | 1893.6 | 1881.8 | 1853.7 | 1859.7 | 1851.8 |
| 22.5°  | 1847.8 | 1829.7 | 1803.6 | 1803.6 | 1799.6 |
| 25°    | 1793.6 | 1777.7 | 1743.7 | 1747.5 | 1743.7 |
| 27.5°  | 1733.5 | 1719.5 | 1693.5 | 1687.7 | 1677.7 |
| 30°    | 1673.7 | 1657.4 | 1627.5 | 1621.6 | 1613.5 |
| 32.5°  | 1609.4 | 1597.6 | 1565.5 | 1553.4 | 1545.3 |
| 35°    | 1547.5 | 1527.5 | 1495.4 | 1483.3 | 1473.3 |
| 37.5°  | 1477.4 | 1459.3 | 1427.3 | 1413.2 | 1403.2 |
| 40°    | 1405.3 | 1389.2 | 1357.2 | 1339.3 | 1331.2 |
| 42.5°  | 1335.2 | 1319.1 | 1287.3 | 1267.1 | 1255.2 |
| 45°    | 1259.3 | 1245.2 | 1215.0 | 1193.2 | 1185.1 |
| 47.5°  | 1185.1 | 1171.1 | 1139.1 | 1117.0 | 1105.0 |
| 50°    | 1107.0 | 1097.0 | 1069.0 | 1040.9 | 1030.9 |
| 52.5°  | 1030.9 | 1016.9 | 991.0  | 968.9  | 954.9  |
| 55°    | 953.0  | 940.8  | 916.9  | 892.9  | 882.9  |
| 57.5°  | 874.9  | 864.9  | 838.7  | 814.8  | 806.6  |
| 60°    | 796.7  | 788.8  | 760.8  | 738.7  | 732.7  |
| 62.5°  | 720.6  | 706.6  | 686.6  | 666.6  | 658.6  |
| 65°    | 642.7  | 630.6  | 610.6  | 592.5  | 582.6  |
| 67.5°  | 562.6  | 552.4  | 534.6  | 520.6  | 512.5  |
| 70°    | 488.5  | 480.5  | 462.4  | 448.4  | 440.5  |
| 72.5°  | 412.4  | 404.4  | 394.4  | 380.4  | 374.4  |
| 75°    | 336.2  | 332.4  | 322.2  | 310.3  | 314.3  |
| 77.5°  | 268.2  | 260.2  | 256.1  | 250.2  | 244.2  |
| 80°    | 200.3  | 198.1  | 194.1  | 188.2  | 184.1  |
| 82.5°  | 136.2  | 136.2  | 134.2  | 126.2  | 126.2  |
| 85°    | 81.9   | 80.1   | 78.1   | 72.0   | 70.1   |
| 87.5°  | 36.1   | 32.1   | 28.0   | 22.1   | 20.0   |
| 90°    | 1.2    | 15.7   | 26.0   | 32.7   | 35.2   |
| 92.5°  | 32.7   | 27.5   | 31.3   | 34.0   | 35.2   |
| 95°    | 84.9   | 41.7   | 50.9   | 57.6   | 56.2   |
| 97.5°  | 152.8  | 45.7   | 66.5   | 70.6   | 71.9   |
| 100°   | 231.3  | 52.3   | 74.5   | 84.9   | 87.5   |
| 102.5° | 317.4  | 315.0  | 77.1   | 91.4   | 95.4   |
| 105°   | 397.2  | 436.4  | 79.7   | 94.0   | 99.3   |
| 107.5° | 490.0  | 522.5  | 82.4   | 96.7   | 101.9  |
| 110°   | 578.9  | 606.2  | 228.7  | 98.1   | 103.2  |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 662.5  | 685.9  | 663.7  | 100.5  | 104.6  |
| 115°   | 751.3  | 773.5  | 806.2  | 201.3  | 107.2  |
| 117.5° | 828.3  | 854.4  | 876.7  | 689.8  | 347.5  |
| 120°   | 914.6  | 934.2  | 957.8  | 973.4  | 797.0  |
| 122.5° | 987.7  | 1008.6 | 1034.8 | 1042.6 | 1044.0 |
| 125°   | 1062.2 | 1079.2 | 1104.0 | 1113.2 | 1117.0 |
| 127.5° | 1130.2 | 1148.4 | 1168.1 | 1181.2 | 1182.4 |
| 130°   | 1194.2 | 1215.1 | 1229.4 | 1243.8 | 1242.6 |
| 132.5° | 1259.5 | 1276.6 | 1290.8 | 1302.6 | 1301.4 |
| 135°   | 1314.5 | 1335.4 | 1347.0 | 1360.2 | 1357.5 |
| 137.5° | 1371.8 | 1387.5 | 1400.7 | 1413.7 | 1409.9 |
| 140°   | 1428.0 | 1438.6 | 1452.9 | 1464.6 | 1458.1 |
| 142.5° | 1475.2 | 1484.3 | 1501.3 | 1511.6 | 1505.1 |
| 145°   | 1524.8 | 1523.4 | 1545.6 | 1554.8 | 1548.3 |
| 147.5° | 1567.8 | 1563.9 | 1586.1 | 1592.6 | 1587.5 |
| 150°   | 1609.7 | 1600.5 | 1621.5 | 1629.2 | 1622.7 |
| 152.5° | 1644.9 | 1634.5 | 1654.0 | 1662.0 | 1652.8 |
| 155°   | 1678.9 | 1667.2 | 1682.9 | 1690.7 | 1680.2 |
| 157.5° | 1706.4 | 1695.9 | 1707.7 | 1716.9 | 1706.4 |
| 160°   | 1729.9 | 1722.0 | 1729.9 | 1737.7 | 1728.6 |
| 162.5° | 1750.7 | 1742.9 | 1749.4 | 1758.6 | 1746.9 |
| 165°   | 1769.1 | 1761.3 | 1765.1 | 1774.3 | 1765.1 |
| 167.5° | 1783.4 | 1775.6 | 1779.6 | 1788.8 | 1776.9 |
| 170°   | 1795.3 | 1787.3 | 1790.0 | 1799.1 | 1787.3 |
| 172.5° | 1803.0 | 1795.3 | 1797.9 | 1807.1 | 1795.3 |
| 175°   | 1809.5 | 1800.4 | 1803.0 | 1812.1 | 1799.1 |
| 177.5° | 1812.1 | 1803.0 | 1804.4 | 1813.6 | 1801.8 |
| 180°   | 1805.6 | 1805.6 | 1805.6 | 1805.6 | 1805.6 |

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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 | 8.34             | 9.20  | 9.30  | 10.17 | 11.44 | 7.89           | 8.76  | 8.85  | 9.73  | 11.00 |
|                 | 3H   | 10.00            | 10.78 | 10.97 | 11.76 | 13.05 | 9.51           | 10.29 | 10.48 | 11.27 | 12.56 |
|                 | 4H   | 10.60            | 11.33 | 11.58 | 12.31 | 13.61 | 10.10          | 10.83 | 11.08 | 11.82 | 13.12 |
|                 | 6H   | 11.00            | 11.67 | 11.99 | 12.66 | 13.98 | 10.50          | 11.17 | 11.49 | 12.16 | 13.48 |
|                 | 8H   | 11.11            | 11.75 | 12.11 | 12.76 | 14.07 | 10.61          | 11.25 | 11.60 | 12.25 | 13.57 |
|                 | 12H  | 11.16            | 11.77 | 12.16 | 12.77 | 14.11 | 10.65          | 11.26 | 11.65 | 12.26 | 13.60 |
| 4H              | 2H   | 8.80             | 9.53  | 9.79  | 10.52 | 11.82 | 8.45           | 9.18  | 9.43  | 10.16 | 11.46 |
|                 | 3H   | 10.67            | 11.28 | 11.67 | 12.30 | 13.61 | 10.27          | 10.88 | 11.26 | 11.89 | 13.21 |
|                 | 4H   | 11.39            | 11.95 | 12.40 | 12.96 | 14.30 | 10.97          | 11.53 | 11.97 | 12.53 | 13.87 |
|                 | 6H   | 11.91            | 12.39 | 12.93 | 13.42 | 14.76 | 11.48          | 11.96 | 12.50 | 12.99 | 14.33 |
|                 | 8H   | 12.06            | 12.51 | 13.08 | 13.54 | 14.89 | 11.63          | 12.08 | 12.65 | 13.10 | 14.45 |
|                 | 12H  | 12.14            | 12.55 | 13.18 | 13.59 | 14.94 | 11.69          | 12.10 | 12.73 | 13.14 | 14.49 |
| 8H              | 4H   | 11.59            | 12.04 | 12.61 | 13.06 | 14.41 | 11.21          | 11.66 | 12.23 | 12.69 | 14.04 |
|                 | 6H   | 12.23            | 12.60 | 13.27 | 13.66 | 15.01 | 11.84          | 12.21 | 12.89 | 13.28 | 14.63 |
|                 | 8H   | 12.45            | 12.78 | 13.50 | 13.83 | 15.20 | 12.06          | 12.39 | 13.11 | 13.44 | 14.80 |
|                 | 12H  | 12.59            | 12.87 | 13.64 | 13.92 | 15.33 | 12.18          | 12.46 | 13.23 | 13.51 | 14.92 |
| 12H             | 4H   | 11.57            | 11.98 | 12.61 | 13.02 | 14.38 | 11.21          | 11.61 | 12.24 | 12.65 | 14.01 |
|                 | 6H   | 12.26            | 12.58 | 13.31 | 13.64 | 15.00 | 11.89          | 12.21 | 12.94 | 13.26 | 14.63 |
|                 | 8H   | 12.50            | 12.79 | 13.56 | 13.84 | 15.25 | 12.12          | 12.41 | 13.18 | 13.46 | 14.87 |