

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: P918706

Luminaire Tested: DFN2DIP-4P4F0-050D070US935-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P918706  
REPORT IS A COMBINATION OF REPORTS P899131 AND P895967  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-4P4F0-050D070US935-FLLFLL  
Description: 4 foot, 90deg - 4way Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

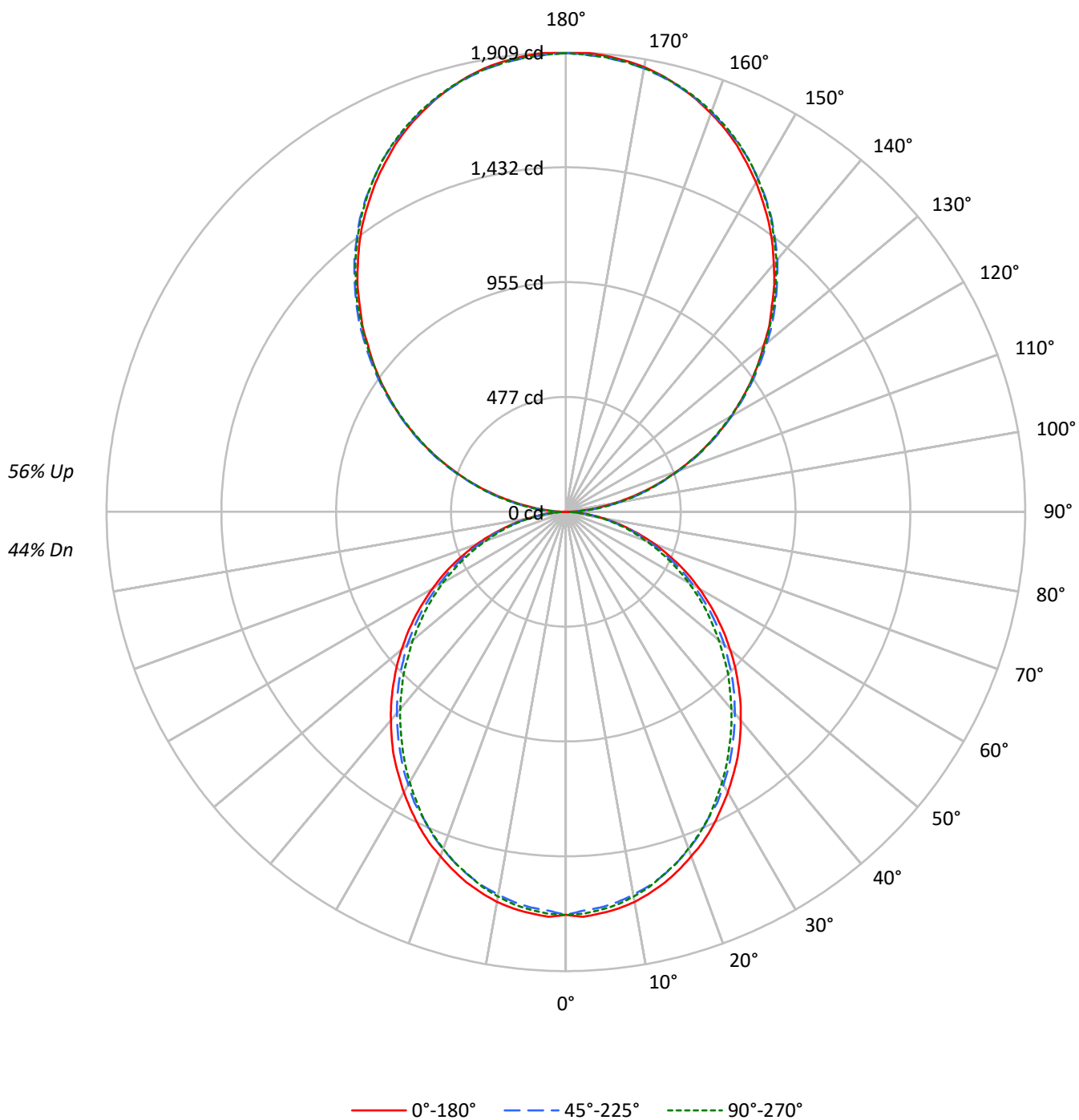
Lumens per Lamp: N/A  
Luminaire Lumens: 9595.9 lumens  
Efficiency: N/A  
Efficacy: 86.3 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 4.07' x L: 4.07' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 111.2  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9951  
Total Harmonic Distortion (THDi): 0.07  
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  | 92  | 88  | 85  | 88 | 85 | 81 | 78 | 70 | 68 | 66 | 57 | 56 | 54 | 45 | 44 | 43 |
| 2   | 88  | 81  | 74  | 69  | 80 | 74 | 69 | 64 | 62 | 58 | 55 | 50 | 48 | 45 | 40 | 38 | 36 |
| 3   | 80  | 71  | 64  | 58  | 73 | 65 | 59 | 54 | 54 | 50 | 46 | 44 | 41 | 38 | 35 | 33 | 31 |
| 4   | 73  | 63  | 55  | 49  | 67 | 58 | 51 | 45 | 48 | 43 | 39 | 40 | 36 | 33 | 31 | 29 | 27 |
| 5   | 67  | 56  | 48  | 42  | 61 | 51 | 44 | 39 | 43 | 38 | 34 | 35 | 31 | 28 | 28 | 25 | 23 |
| 6   | 62  | 50  | 42  | 36  | 57 | 46 | 39 | 34 | 39 | 33 | 29 | 32 | 28 | 25 | 26 | 23 | 20 |
| 7   | 57  | 45  | 37  | 32  | 52 | 42 | 35 | 30 | 35 | 30 | 26 | 29 | 25 | 22 | 23 | 20 | 18 |
| 8   | 53  | 41  | 33  | 28  | 49 | 38 | 31 | 26 | 32 | 27 | 23 | 27 | 23 | 20 | 22 | 19 | 16 |
| 9   | 49  | 37  | 30  | 25  | 45 | 35 | 28 | 23 | 29 | 24 | 20 | 24 | 20 | 18 | 20 | 17 | 15 |
| 10  | 46  | 34  | 27  | 22  | 42 | 32 | 25 | 21 | 27 | 22 | 18 | 23 | 19 | 16 | 18 | 15 | 13 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1087 | 1087 | 1087 |
| 5°  | 1089 | 1072 | 1079 |
| 10° | 1080 | 1058 | 1065 |
| 15° | 1064 | 1041 | 1043 |
| 20° | 1043 | 1017 | 1020 |
| 25° | 1021 | 988  | 993  |
| 30° | 995  | 962  | 959  |
| 35° | 969  | 930  | 923  |
| 40° | 938  | 899  | 889  |
| 45° | 907  | 867  | 854  |
| 50° | 873  | 834  | 813  |
| 55° | 838  | 795  | 776  |
| 60° | 798  | 749  | 734  |
| 65° | 754  | 702  | 683  |
| 70° | 698  | 644  | 630  |
| 75° | 621  | 575  | 581  |
| 80° | 529  | 488  | 486  |
| 85° | 384  | 335  | 328  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1443 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 157.7  | 1.6       |
| 10°-20°   | 443.6  | 4.6       |
| 20°-30°   | 651.9  | 6.8       |
| 30°-40°   | 757.2  | 7.9       |
| 40°-50°   | 756.2  | 7.9       |
| 50°-60°   | 659.4  | 6.9       |
| 60°-70°   | 487.4  | 5.1       |
| 70°-80°   | 275.8  | 2.9       |
| 80°-90°   | 78.2   | 0.8       |
| 90°-100°  | 117.9  | 1.2       |
| 100°-110° | 374.8  | 3.9       |
| 110°-120° | 641.3  | 6.7       |
| 120°-130° | 843.5  | 8.8       |
| 130°-140° | 946.7  | 9.9       |
| 140°-150° | 928.4  | 9.7       |
| 150°-160° | 778.8  | 8.1       |
| 160°-170° | 516.5  | 5.4       |
| 170°-180° | 180.5  | 1.9       |
| 0°-30°    | 1253.2 | 13.1      |
| 0°-40°    | 2010.3 | 20.9      |
| 0°-60°    | 3425.9 | 35.7      |
| 0°-90°    | 4267.4 | 44.5      |
| 90°-120°  | 1134.1 | 11.8      |
| 90°-150°  | 3852.7 | 40.1      |
| 90°-180°  | 5328.0 | 55.5      |
| 0°-180°   | 9595.9 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1675 | 1675  | 1675 | 1675  | 1675 |      |
| 5°   | 1675 | 1669  | 1651 | 1664  | 1661 | 159  |
| 15°  | 1595 | 1585  | 1564 | 1570  | 1562 | 449  |
| 25°  | 1443 | 1430  | 1403 | 1406  | 1403 | 664  |
| 35°  | 1245 | 1229  | 1203 | 1194  | 1186 | 778  |
| 45°  | 1013 | 1002  | 978  | 960   | 954  | 782  |
| 55°  | 767  | 757   | 738  | 718   | 710  | 686  |
| 65°  | 517  | 507   | 491  | 477   | 469  | 511  |
| 75°  | 270  | 267   | 259  | 250   | 253  | 289  |
| 85°  | 66   | 64    | 63   | 58    | 56   | 74   |
| 90°  | 2    | 21    | 56   | 53    | 55   | 9    |
| 95°  | 84   | 100   | 103  | 103   | 100  | 93   |
| 105° | 346  | 350   | 354  | 357   | 357  | 365  |
| 115° | 644  | 653   | 650  | 648   | 644  | 637  |
| 125° | 936  | 950   | 946  | 941   | 939  | 837  |
| 135° | 1211 | 1229  | 1232 | 1230  | 1226 | 936  |
| 145° | 1470 | 1481  | 1491 | 1492  | 1486 | 918  |
| 155° | 1681 | 1685  | 1691 | 1699  | 1694 | 774  |
| 165° | 1828 | 1827  | 1827 | 1838  | 1830 | 516  |
| 175° | 1903 | 1898  | 1895 | 1906  | 1896 | 181  |
| 180° | 1906 | 1906  | 1906 | 1906  | 1906 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1675.1 | 1675.1 | 1675.1 | 1675.1 | 1675.1 |
| 2.5°   | 1684.8 | 1676.8 | 1659.1 | 1675.1 | 1672.1 |
| 5°     | 1675.1 | 1668.8 | 1651.0 | 1663.8 | 1660.8 |
| 7.5°   | 1663.8 | 1654.2 | 1636.5 | 1649.5 | 1646.2 |
| 10°    | 1646.2 | 1634.9 | 1615.7 | 1628.4 | 1623.7 |
| 12.5°  | 1621.9 | 1612.4 | 1593.1 | 1601.1 | 1597.8 |
| 15°    | 1594.6 | 1585.0 | 1564.0 | 1570.5 | 1562.5 |
| 17.5°  | 1560.7 | 1551.2 | 1530.2 | 1538.2 | 1530.2 |
| 20°    | 1523.7 | 1514.2 | 1491.6 | 1496.3 | 1490.0 |
| 22.5°  | 1486.8 | 1472.2 | 1451.2 | 1451.2 | 1447.9 |
| 25°    | 1443.2 | 1430.4 | 1403.0 | 1406.1 | 1403.0 |
| 27.5°  | 1394.8 | 1383.5 | 1362.7 | 1357.9 | 1349.9 |
| 30°    | 1346.6 | 1333.7 | 1309.6 | 1304.8 | 1298.3 |
| 32.5°  | 1295.0 | 1285.5 | 1259.6 | 1249.9 | 1243.5 |
| 35°    | 1245.1 | 1229.1 | 1203.2 | 1193.5 | 1185.5 |
| 37.5°  | 1188.7 | 1174.2 | 1148.4 | 1137.1 | 1129.1 |
| 40°    | 1130.8 | 1117.8 | 1092.0 | 1077.6 | 1071.2 |
| 42.5°  | 1074.4 | 1061.4 | 1035.8 | 1019.5 | 1010.0 |
| 45°    | 1013.2 | 1001.9 | 977.7  | 960.1  | 953.6  |
| 47.5°  | 953.6  | 942.3  | 916.5  | 898.7  | 889.2  |
| 50°    | 890.7  | 882.7  | 860.1  | 837.6  | 829.5  |
| 52.5°  | 829.5  | 818.2  | 797.4  | 779.6  | 768.4  |
| 55°    | 766.8  | 757.1  | 737.7  | 718.4  | 710.4  |
| 57.5°  | 703.9  | 695.9  | 674.9  | 655.6  | 649.0  |
| 60°    | 641.0  | 634.7  | 612.2  | 594.3  | 589.6  |
| 62.5°  | 579.9  | 568.6  | 552.5  | 536.4  | 529.9  |
| 65°    | 517.1  | 507.4  | 491.3  | 476.8  | 468.7  |
| 67.5°  | 452.7  | 444.5  | 430.2  | 418.9  | 412.3  |
| 70°    | 393.0  | 386.6  | 372.0  | 360.8  | 354.5  |
| 72.5°  | 331.9  | 325.4  | 317.4  | 306.1  | 301.3  |
| 75°    | 270.5  | 267.4  | 259.2  | 249.7  | 253.0  |
| 77.5°  | 215.9  | 209.3  | 206.1  | 201.3  | 196.6  |
| 80°    | 161.2  | 159.5  | 156.2  | 151.4  | 148.2  |
| 82.5°  | 109.5  | 109.5  | 108.0  | 101.5  | 101.5  |
| 85°    | 66.0   | 64.4   | 62.9   | 57.9   | 56.4   |
| 87.5°  | 29.0   | 25.8   | 22.6   | 17.7   | 16.1   |
| 90°    | 1.7    | 20.7   | 56.3   | 52.9   | 54.6   |
| 92.5°  | 35.6   | 48.3   | 50.0   | 51.7   | 51.7   |
| 95°    | 83.9   | 100.0  | 102.9  | 102.9  | 100.0  |
| 97.5°  | 139.7  | 154.5  | 160.9  | 160.9  | 160.9  |
| 100°   | 204.0  | 217.2  | 221.8  | 221.8  | 220.1  |
| 102.5° | 271.8  | 281.5  | 287.9  | 289.6  | 287.9  |
| 105°   | 345.9  | 350.5  | 354.0  | 356.9  | 356.9  |
| 107.5° | 419.5  | 426.4  | 426.4  | 427.6  | 419.5  |
| 110°   | 490.8  | 500.0  | 500.0  | 500.0  | 495.3  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 567.7  | 577.6  | 575.8  | 571.2  | 567.7  |
| 115°   | 643.6  | 652.8  | 650.0  | 648.2  | 643.6  |
| 117.5° | 718.8  | 731.5  | 723.5  | 718.8  | 714.3  |
| 120°   | 794.7  | 807.4  | 794.7  | 794.7  | 789.5  |
| 122.5° | 863.7  | 879.8  | 871.8  | 867.1  | 863.7  |
| 125°   | 936.1  | 950.5  | 945.9  | 940.7  | 939.0  |
| 127.5° | 1006.8 | 1024.6 | 1018.3 | 1011.4 | 1006.8 |
| 130°   | 1072.9 | 1093.6 | 1090.7 | 1087.3 | 1080.9 |
| 132.5° | 1147.0 | 1163.1 | 1164.2 | 1156.2 | 1151.6 |
| 135°   | 1210.8 | 1228.6 | 1232.1 | 1230.3 | 1225.7 |
| 137.5° | 1282.0 | 1296.4 | 1299.2 | 1298.1 | 1291.2 |
| 140°   | 1344.7 | 1359.1 | 1367.1 | 1367.1 | 1360.8 |
| 142.5° | 1409.0 | 1423.4 | 1428.0 | 1429.7 | 1423.4 |
| 145°   | 1470.0 | 1481.4 | 1490.6 | 1492.4 | 1486.1 |
| 147.5° | 1524.6 | 1538.9 | 1545.8 | 1548.7 | 1542.4 |
| 150°   | 1580.9 | 1590.6 | 1597.0 | 1602.1 | 1597.0 |
| 152.5° | 1630.8 | 1640.6 | 1648.6 | 1655.0 | 1648.6 |
| 155°   | 1680.8 | 1685.4 | 1690.7 | 1698.7 | 1693.5 |
| 157.5° | 1724.0 | 1727.4 | 1730.3 | 1741.8 | 1733.7 |
| 160°   | 1762.5 | 1765.9 | 1767.6 | 1777.4 | 1770.5 |
| 162.5° | 1798.1 | 1798.1 | 1799.8 | 1810.7 | 1802.7 |
| 165°   | 1828.5 | 1826.8 | 1826.8 | 1838.3 | 1830.2 |
| 167.5° | 1856.1 | 1851.0 | 1851.0 | 1862.4 | 1854.4 |
| 170°   | 1876.8 | 1872.2 | 1870.5 | 1882.0 | 1872.2 |
| 172.5° | 1891.2 | 1886.5 | 1884.8 | 1896.3 | 1886.5 |
| 175°   | 1902.6 | 1898.1 | 1894.6 | 1906.1 | 1896.3 |
| 177.5° | 1909.0 | 1904.4 | 1900.9 | 1910.7 | 1900.9 |
| 180°   | 1906.1 | 1906.1 | 1906.1 | 1906.1 | 1906.1 |

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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 | 7.04             | 7.86  | 8.05  | 8.87  | 10.22 | 6.60           | 7.41  | 7.60  | 8.43  | 9.78  |
|                 | 3H   | 8.71             | 9.44  | 9.72  | 10.46 | 11.83 | 8.22           | 8.95  | 9.23  | 9.97  | 11.34 |
|                 | 4H   | 9.30             | 9.99  | 10.32 | 11.01 | 12.39 | 8.80           | 9.49  | 9.83  | 10.52 | 11.89 |
|                 | 6H   | 9.70             | 10.33 | 10.73 | 11.36 | 12.75 | 9.20           | 9.83  | 10.23 | 10.86 | 12.25 |
|                 | 8H   | 9.80             | 10.41 | 10.85 | 11.46 | 12.84 | 9.30           | 9.91  | 10.34 | 10.95 | 12.34 |
|                 | 12H  | 9.85             | 10.43 | 10.90 | 11.47 | 12.88 | 9.34           | 9.92  | 10.39 | 10.96 | 12.37 |
| 4H              | 2H   | 7.50             | 8.19  | 8.53  | 9.22  | 10.59 | 7.15           | 7.84  | 8.18  | 8.86  | 10.24 |
|                 | 3H   | 9.37             | 9.95  | 10.41 | 11.00 | 12.39 | 8.96           | 9.54  | 10.00 | 10.59 | 11.98 |
|                 | 4H   | 10.09            | 10.61 | 11.13 | 11.66 | 13.07 | 9.66           | 10.19 | 10.71 | 11.24 | 12.65 |
|                 | 6H   | 10.60            | 11.06 | 11.66 | 12.13 | 13.53 | 10.17          | 10.63 | 11.23 | 11.69 | 13.10 |
|                 | 8H   | 10.75            | 11.18 | 11.81 | 12.24 | 13.66 | 10.32          | 10.74 | 11.38 | 11.80 | 13.23 |
|                 | 12H  | 10.83            | 11.21 | 11.90 | 12.29 | 13.72 | 10.38          | 10.76 | 11.46 | 11.84 | 13.27 |
| 8H              | 4H   | 10.28            | 10.70 | 11.34 | 11.76 | 13.19 | 9.90           | 10.33 | 10.96 | 11.39 | 12.81 |
|                 | 6H   | 10.91            | 11.27 | 12.00 | 12.37 | 13.79 | 10.53          | 10.88 | 11.61 | 11.99 | 13.41 |
|                 | 8H   | 11.14            | 11.45 | 12.23 | 12.53 | 13.97 | 10.75          | 11.05 | 11.84 | 12.14 | 13.58 |
|                 | 12H  | 11.27            | 11.54 | 12.36 | 12.63 | 14.10 | 10.86          | 11.13 | 11.95 | 12.21 | 13.69 |
| 12H             | 4H   | 10.26            | 10.65 | 11.34 | 11.72 | 13.15 | 9.89           | 10.28 | 10.97 | 11.35 | 12.78 |
|                 | 6H   | 10.94            | 11.25 | 12.03 | 12.34 | 13.78 | 10.57          | 10.88 | 11.66 | 11.97 | 13.41 |
|                 | 8H   | 11.19            | 11.46 | 12.28 | 12.54 | 14.02 | 10.81          | 11.08 | 11.90 | 12.16 | 13.64 |