

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: P919876

Luminaire Tested: DFN2DIP-SQ2F0-040D070US935-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P919876  
REPORT IS A COMBINATION OF REPORTS P899821 AND P896659  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ2F0-040D070US935-FLLFLL  
Description: 2 foot, Square Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

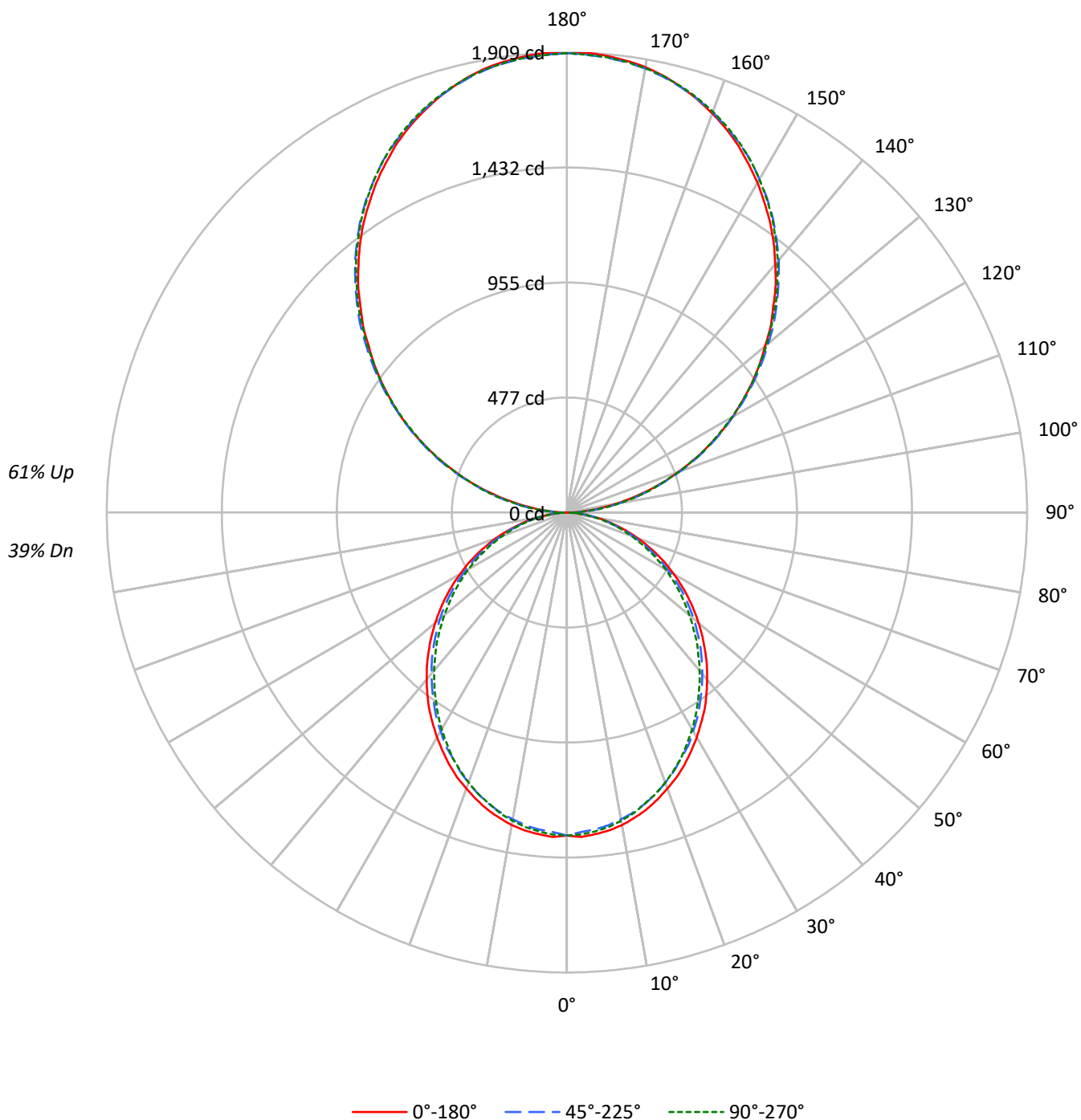
Lumens per Lamp: N/A  
Luminaire Lumens: 8743.4 lumens  
Efficiency: N/A  
Efficacy: 99.1 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 2.21' x L: 2.21' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 88.2  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9952  
Total Harmonic Distortion (THDi): 0.069  
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   | 105 | 105 | 105 | 105 | 95 | 95 | 95 | 95 | 77 | 77 | 77 | 61 | 61 | 61 | 46 | 46 | 46 |
| 1   | 95  | 91  | 87  | 84  | 86 | 83 | 80 | 77 | 68 | 65 | 63 | 54 | 52 | 51 | 41 | 40 | 39 |
| 2   | 87  | 79  | 73  | 68  | 79 | 72 | 67 | 63 | 59 | 56 | 52 | 47 | 45 | 42 | 36 | 34 | 33 |
| 3   | 79  | 70  | 63  | 57  | 72 | 64 | 58 | 53 | 52 | 48 | 44 | 42 | 38 | 36 | 32 | 30 | 28 |
| 4   | 72  | 62  | 54  | 48  | 65 | 56 | 50 | 44 | 46 | 41 | 37 | 37 | 33 | 31 | 28 | 26 | 24 |
| 5   | 66  | 55  | 47  | 41  | 60 | 50 | 43 | 38 | 41 | 36 | 32 | 33 | 29 | 27 | 26 | 23 | 21 |
| 6   | 61  | 49  | 41  | 36  | 55 | 45 | 38 | 33 | 37 | 32 | 28 | 30 | 26 | 23 | 23 | 20 | 18 |
| 7   | 56  | 44  | 37  | 31  | 51 | 41 | 34 | 29 | 34 | 28 | 25 | 27 | 23 | 20 | 21 | 18 | 16 |
| 8   | 52  | 40  | 33  | 27  | 47 | 37 | 30 | 26 | 31 | 26 | 22 | 25 | 21 | 18 | 19 | 17 | 15 |
| 9   | 49  | 37  | 29  | 24  | 44 | 34 | 27 | 23 | 28 | 23 | 19 | 23 | 19 | 16 | 18 | 15 | 13 |
| 10  | 45  | 34  | 26  | 22  | 41 | 31 | 25 | 20 | 26 | 21 | 18 | 21 | 17 | 15 | 17 | 14 | 12 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2947 | 2947 | 2947 |
| 5°  | 2946 | 2899 | 2921 |
| 10° | 2917 | 2854 | 2877 |
| 15° | 2869 | 2800 | 2812 |
| 20° | 2806 | 2729 | 2744 |
| 25° | 2743 | 2644 | 2667 |
| 30° | 2666 | 2565 | 2570 |
| 35° | 2592 | 2473 | 2468 |
| 40° | 2502 | 2380 | 2370 |
| 45° | 2411 | 2286 | 2270 |
| 50° | 2313 | 2187 | 2154 |
| 55° | 2209 | 2073 | 2047 |
| 60° | 2091 | 1939 | 1924 |
| 65° | 1962 | 1798 | 1779 |
| 70° | 1798 | 1627 | 1621 |
| 75° | 1574 | 1423 | 1471 |
| 80° | 1299 | 1161 | 1195 |
| 85° | 878  | 733  | 750  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 2656 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 126.1  | 1.4       |
| 10°-20°   | 354.9  | 4.1       |
| 20°-30°   | 521.5  | 6.0       |
| 30°-40°   | 605.7  | 6.9       |
| 40°-50°   | 605.0  | 6.9       |
| 50°-60°   | 527.5  | 6.0       |
| 60°-70°   | 389.9  | 4.5       |
| 70°-80°   | 220.6  | 2.5       |
| 80°-90°   | 63.6   | 0.7       |
| 90°-100°  | 117.9  | 1.3       |
| 100°-110° | 374.8  | 4.3       |
| 110°-120° | 641.3  | 7.3       |
| 120°-130° | 843.5  | 9.6       |
| 130°-140° | 946.7  | 10.8      |
| 140°-150° | 928.4  | 10.6      |
| 150°-160° | 778.8  | 8.9       |
| 160°-170° | 516.5  | 5.9       |
| 170°-180° | 180.5  | 2.1       |
| 0°-30°    | 1002.5 | 11.5      |
| 0°-40°    | 1608.3 | 18.4      |
| 0°-60°    | 2740.7 | 31.3      |
| 0°-90°    | 3414.9 | 39.1      |
| 90°-120°  | 1134.1 | 13.0      |
| 90°-150°  | 3852.7 | 44.1      |
| 90°-180°  | 5328.0 | 60.9      |
| 0°-180°   | 8743.4 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1340 | 1340  | 1340 | 1340  | 1340 |      |
| 5°   | 1340 | 1335  | 1321 | 1331  | 1329 | 127  |
| 15°  | 1276 | 1268  | 1251 | 1256  | 1250 | 359  |
| 25°  | 1154 | 1144  | 1122 | 1125  | 1122 | 531  |
| 35°  | 996  | 983   | 963  | 955   | 948  | 622  |
| 45°  | 810  | 802   | 782  | 768   | 763  | 626  |
| 55°  | 614  | 606   | 590  | 575   | 568  | 548  |
| 65°  | 414  | 406   | 393  | 381   | 375  | 409  |
| 75°  | 216  | 214   | 207  | 200   | 202  | 231  |
| 85°  | 53   | 52    | 50   | 46    | 45   | 59   |
| 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°     | 1340.1 | 1340.1 | 1340.1 | 1340.1 | 1340.1 |
| 2.5°   | 1347.9 | 1341.4 | 1327.2 | 1340.1 | 1337.6 |
| 5°     | 1340.1 | 1335.0 | 1320.8 | 1331.0 | 1328.6 |
| 7.5°   | 1331.0 | 1323.4 | 1309.1 | 1319.6 | 1317.0 |
| 10°    | 1317.0 | 1307.9 | 1292.5 | 1302.8 | 1298.9 |
| 12.5°  | 1297.5 | 1289.9 | 1274.4 | 1280.9 | 1278.2 |
| 15°    | 1275.7 | 1268.0 | 1251.2 | 1256.4 | 1250.0 |
| 17.5°  | 1248.6 | 1241.0 | 1224.2 | 1230.5 | 1224.2 |
| 20°    | 1218.9 | 1211.3 | 1193.3 | 1197.0 | 1192.1 |
| 22.5°  | 1189.4 | 1177.8 | 1161.0 | 1161.0 | 1158.4 |
| 25°    | 1154.5 | 1144.3 | 1122.4 | 1124.9 | 1122.4 |
| 27.5°  | 1115.9 | 1106.8 | 1090.2 | 1086.3 | 1079.9 |
| 30°    | 1077.3 | 1066.9 | 1047.7 | 1043.8 | 1038.6 |
| 32.5°  | 1036.0 | 1028.4 | 1007.7 | 1000.0 | 994.7  |
| 35°    | 996.1  | 983.3  | 962.6  | 954.8  | 948.4  |
| 37.5°  | 951.0  | 939.3  | 918.7  | 909.7  | 903.3  |
| 40°    | 904.7  | 894.2  | 873.6  | 862.1  | 857.0  |
| 42.5°  | 859.5  | 849.1  | 828.6  | 815.6  | 808.0  |
| 45°    | 810.5  | 801.6  | 782.1  | 768.1  | 762.8  |
| 47.5°  | 762.8  | 753.8  | 733.2  | 719.0  | 711.4  |
| 50°    | 712.6  | 706.1  | 688.1  | 670.0  | 663.6  |
| 52.5°  | 663.6  | 654.6  | 637.9  | 623.7  | 614.7  |
| 55°    | 613.5  | 605.6  | 590.2  | 574.7  | 568.3  |
| 57.5°  | 563.1  | 556.7  | 539.8  | 524.4  | 519.3  |
| 60°    | 512.8  | 507.7  | 489.7  | 475.5  | 471.7  |
| 62.5°  | 463.9  | 454.9  | 442.0  | 429.1  | 424.0  |
| 65°    | 413.7  | 405.9  | 393.0  | 381.4  | 375.1  |
| 67.5°  | 362.1  | 355.6  | 344.1  | 335.1  | 329.9  |
| 70°    | 314.4  | 309.3  | 297.6  | 288.6  | 283.5  |
| 72.5°  | 265.5  | 260.3  | 253.9  | 244.9  | 241.0  |
| 75°    | 216.5  | 214.0  | 207.4  | 199.8  | 202.3  |
| 77.5°  | 172.6  | 167.5  | 164.9  | 161.0  | 157.2  |
| 80°    | 128.9  | 127.5  | 124.9  | 121.1  | 118.6  |
| 82.5°  | 87.6   | 87.6   | 86.4   | 81.2   | 81.2   |
| 85°    | 52.8   | 51.6   | 50.3   | 46.3   | 45.1   |
| 87.5°  | 23.2   | 20.7   | 18.1   | 14.2   | 12.8   |
| 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 | 9.80             | 10.58 | 10.85 | 11.63 | 13.05 | 9.36           | 10.13 | 10.41 | 11.18 | 12.60 |
|                 | 3H   | 11.44            | 12.13 | 12.49 | 13.19 | 14.63 | 10.95          | 11.64 | 12.00 | 12.70 | 14.14 |
|                 | 4H   | 12.01            | 12.66 | 13.08 | 13.73 | 15.17 | 11.52          | 12.17 | 12.58 | 13.23 | 14.68 |
|                 | 6H   | 12.39            | 12.99 | 13.47 | 14.06 | 15.51 | 11.89          | 12.49 | 12.97 | 13.56 | 15.02 |
|                 | 8H   | 12.48            | 13.06 | 13.56 | 14.14 | 15.59 | 11.98          | 12.56 | 13.06 | 13.64 | 15.09 |
|                 | 12H  | 12.52            | 13.07 | 13.61 | 14.14 | 15.62 | 12.01          | 12.56 | 13.10 | 13.63 | 15.11 |
| 4H              | 2H   | 10.24            | 10.90 | 11.32 | 11.96 | 13.41 | 9.89           | 10.54 | 10.96 | 11.60 | 13.05 |
|                 | 3H   | 12.08            | 12.63 | 13.16 | 13.71 | 15.17 | 11.67          | 12.22 | 12.75 | 13.31 | 14.76 |
|                 | 4H   | 12.77            | 13.28 | 13.86 | 14.35 | 15.83 | 12.35          | 12.85 | 13.44 | 13.93 | 15.41 |
|                 | 6H   | 13.26            | 13.70 | 14.36 | 14.80 | 16.27 | 12.83          | 13.26 | 13.93 | 14.37 | 15.84 |
|                 | 8H   | 13.40            | 13.80 | 14.50 | 14.90 | 16.39 | 12.97          | 13.37 | 14.06 | 14.46 | 15.95 |
|                 | 12H  | 13.46            | 13.83 | 14.57 | 14.93 | 16.43 | 13.01          | 13.38 | 14.13 | 14.49 | 15.98 |
| 8H              | 4H   | 12.95            | 13.35 | 14.05 | 14.45 | 15.94 | 12.57          | 12.98 | 13.67 | 14.07 | 15.56 |
|                 | 6H   | 13.55            | 13.89 | 14.67 | 15.02 | 16.51 | 13.17          | 13.50 | 14.29 | 14.64 | 16.12 |
|                 | 8H   | 13.76            | 14.05 | 14.88 | 15.17 | 16.68 | 13.37          | 13.66 | 14.49 | 14.78 | 16.28 |
|                 | 12H  | 13.88            | 14.13 | 15.00 | 15.25 | 16.79 | 13.46          | 13.72 | 14.59 | 14.84 | 16.38 |
| 12H             | 4H   | 12.93            | 13.29 | 14.04 | 14.40 | 15.90 | 12.56          | 12.92 | 13.67 | 14.03 | 15.53 |
|                 | 6H   | 13.58            | 13.87 | 14.70 | 14.99 | 16.49 | 13.20          | 13.50 | 14.33 | 14.61 | 16.12 |
|                 | 8H   | 13.80            | 14.06 | 14.93 | 15.17 | 16.71 | 13.42          | 13.68 | 14.55 | 14.79 | 16.33 |