

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: P917797

Luminaire Tested: DFN2DIP-SQ4F0-120D070US930-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P917797  
REPORT IS A COMBINATION OF REPORTS P901609 AND P898471  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ4F0-120D070US930-FLLONL  
Description: 4 foot, Square Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

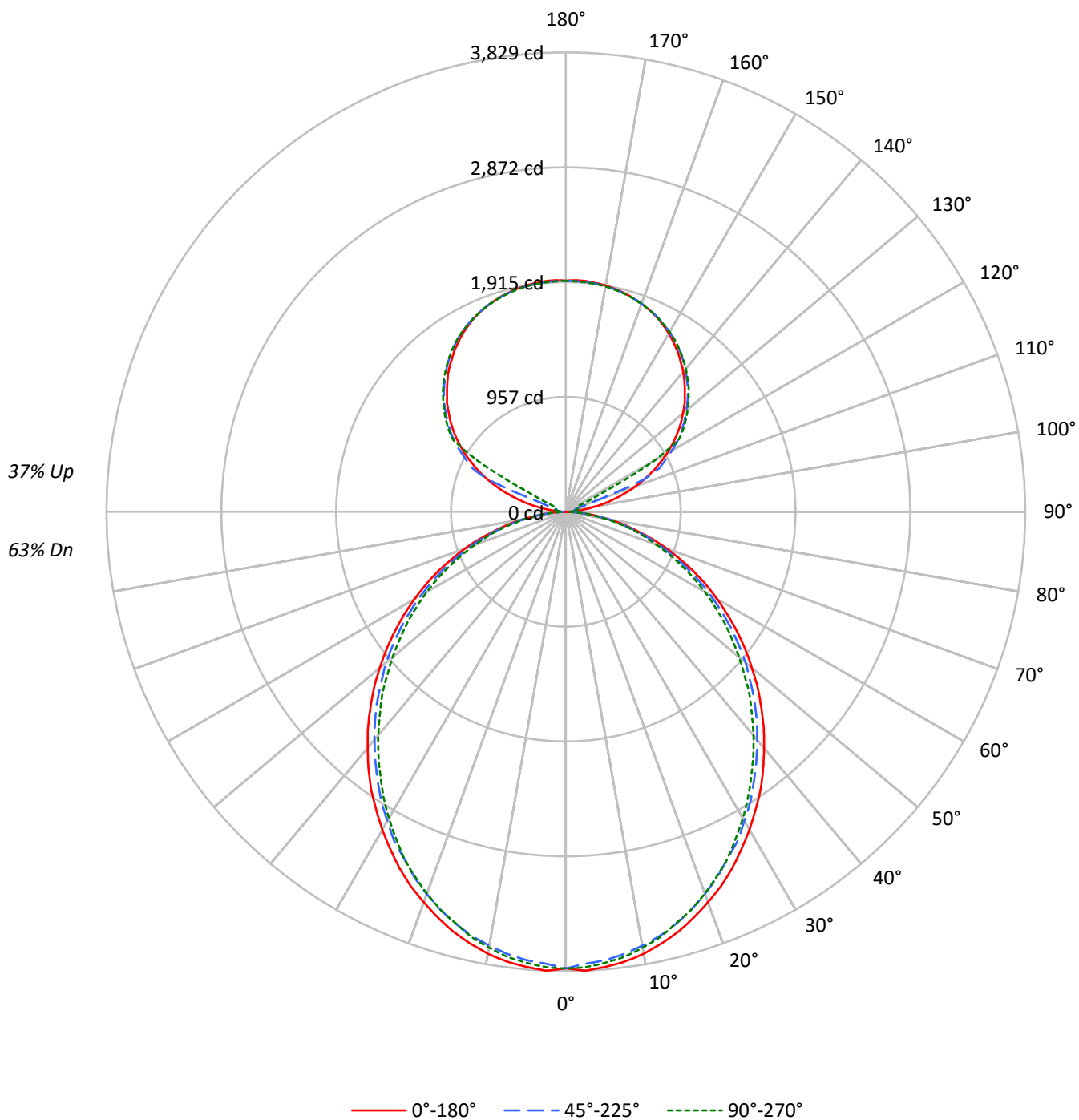
Lumens per Lamp: N/A  
Luminaire Lumens: 15335.7 lumens  
Efficiency: N/A  
Efficacy: 90.3 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 3.92' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 169.8  
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



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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   | 110 | 110 | 110 | 110 | 103 | 103 | 103 | 103 | 91 | 91 | 91 | 79 | 79 | 79 | 68 | 68 | 68 |
| 1   | 101 | 96  | 92  | 89  | 94  | 91  | 87  | 84  | 80 | 77 | 75 | 70 | 68 | 66 | 60 | 59 | 58 |
| 2   | 92  | 84  | 78  | 73  | 86  | 79  | 74  | 69  | 70 | 66 | 62 | 61 | 58 | 55 | 53 | 51 | 49 |
| 3   | 84  | 74  | 67  | 61  | 78  | 70  | 63  | 58  | 62 | 56 | 52 | 54 | 50 | 47 | 47 | 44 | 41 |
| 4   | 77  | 66  | 57  | 51  | 72  | 62  | 55  | 49  | 55 | 49 | 44 | 48 | 44 | 40 | 42 | 39 | 36 |
| 5   | 70  | 59  | 50  | 44  | 66  | 55  | 48  | 42  | 49 | 43 | 38 | 43 | 39 | 35 | 38 | 34 | 31 |
| 6   | 65  | 53  | 44  | 38  | 61  | 50  | 42  | 37  | 44 | 38 | 34 | 39 | 34 | 30 | 34 | 31 | 27 |
| 7   | 60  | 48  | 39  | 34  | 56  | 45  | 38  | 32  | 40 | 34 | 30 | 36 | 31 | 27 | 31 | 27 | 24 |
| 8   | 56  | 43  | 35  | 30  | 52  | 41  | 34  | 29  | 37 | 31 | 26 | 33 | 28 | 24 | 29 | 25 | 22 |
| 9   | 52  | 40  | 32  | 27  | 49  | 38  | 31  | 26  | 34 | 28 | 24 | 30 | 25 | 22 | 27 | 23 | 20 |
| 10  | 49  | 36  | 29  | 24  | 46  | 35  | 28  | 23  | 31 | 25 | 21 | 28 | 23 | 20 | 25 | 21 | 18 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2671 | 2671 | 2671 |
| 5°  | 2675 | 2634 | 2652 |
| 10° | 2654 | 2600 | 2617 |
| 15° | 2615 | 2557 | 2562 |
| 20° | 2562 | 2498 | 2505 |
| 25° | 2509 | 2428 | 2440 |
| 30° | 2444 | 2362 | 2356 |
| 35° | 2381 | 2285 | 2267 |
| 40° | 2305 | 2206 | 2183 |
| 45° | 2228 | 2128 | 2097 |
| 50° | 2144 | 2046 | 1997 |
| 55° | 2057 | 1950 | 1906 |
| 60° | 1958 | 1837 | 1801 |
| 65° | 1850 | 1721 | 1677 |
| 70° | 1712 | 1578 | 1544 |
| 75° | 1522 | 1407 | 1423 |
| 80° | 1293 | 1191 | 1188 |
| 85° | 934  | 814  | 799  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2228 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 358.3   | 2.3       |
| 10°-20°   | 1008.1  | 6.6       |
| 20°-30°   | 1481.5  | 9.7       |
| 30°-40°   | 1720.7  | 11.2      |
| 40°-50°   | 1718.6  | 11.2      |
| 50°-60°   | 1498.5  | 9.8       |
| 60°-70°   | 1107.8  | 7.2       |
| 70°-80°   | 626.7   | 4.1       |
| 80°-90°   | 168.8   | 1.1       |
| 90°-100°  | 63.5    | 0.4       |
| 100°-110° | 236.8   | 1.5       |
| 110°-120° | 627.9   | 4.1       |
| 120°-130° | 1041.5  | 6.8       |
| 130°-140° | 1106.3  | 7.2       |
| 140°-150° | 1028.1  | 6.7       |
| 150°-160° | 826.6   | 5.4       |
| 160°-170° | 532.6   | 3.5       |
| 170°-180° | 183.3   | 1.2       |
| 0°-30°    | 2848.0  | 18.6      |
| 0°-40°    | 4568.7  | 29.8      |
| 0°-60°    | 7785.8  | 50.8      |
| 0°-90°    | 9689.1  | 63.2      |
| 90°-120°  | 928.2   | 6.1       |
| 90°-150°  | 4104.1  | 26.8      |
| 90°-180°  | 5647.0  | 36.8      |
| 0°-180°   | 15335.7 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3807 | 3807  | 3807 | 3807  | 3807 |      |
| 5°   | 3807 | 3792  | 3752 | 3781  | 3774 | 361  |
| 15°  | 3624 | 3602  | 3554 | 3569  | 3551 | 1021 |
| 25°  | 3280 | 3251  | 3188 | 3196  | 3188 | 1509 |
| 35°  | 2830 | 2793  | 2734 | 2712  | 2694 | 1767 |
| 45°  | 2303 | 2277  | 2222 | 2182  | 2167 | 1777 |
| 55°  | 1743 | 1720  | 1677 | 1633  | 1614 | 1558 |
| 65°  | 1175 | 1153  | 1117 | 1084  | 1065 | 1162 |
| 75°  | 615  | 608   | 589  | 567   | 575  | 656  |
| 85°  | 150  | 146   | 143  | 132   | 128  | 167  |
| 90°  | 1    | 17    | 28   | 35    | 38   | 14   |
| 95°  | 90   | 44    | 54   | 61    | 60   | 107  |
| 105° | 424  | 466   | 85   | 100   | 106  | 453  |
| 115° | 801  | 825   | 860  | 215   | 114  | 789  |
| 125° | 1133 | 1151  | 1178 | 1188  | 1192 | 1010 |
| 135° | 1402 | 1424  | 1437 | 1451  | 1448 | 1083 |
| 145° | 1626 | 1625  | 1649 | 1658  | 1652 | 1017 |
| 155° | 1791 | 1778  | 1795 | 1803  | 1792 | 825  |
| 165° | 1887 | 1879  | 1883 | 1893  | 1883 | 533  |
| 175° | 1930 | 1920  | 1923 | 1933  | 1919 | 184  |
| 180° | 1926 | 1926  | 1926 | 1926  | 1926 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3806.9 | 3806.9 | 3806.9 | 3806.9 | 3806.9 |
| 2.5°   | 3829.0 | 3810.7 | 3770.3 | 3806.9 | 3799.9 |
| 5°     | 3806.9 | 3792.4 | 3752.1 | 3781.2 | 3774.2 |
| 7.5°   | 3781.2 | 3759.4 | 3719.1 | 3748.6 | 3741.2 |
| 10°    | 3741.2 | 3715.6 | 3671.7 | 3700.8 | 3690.0 |
| 12.5°  | 3686.0 | 3664.3 | 3620.4 | 3638.7 | 3631.3 |
| 15°    | 3623.9 | 3602.2 | 3554.4 | 3569.1 | 3550.9 |
| 17.5°  | 3547.0 | 3525.3 | 3477.5 | 3495.8 | 3477.5 |
| 20°    | 3462.7 | 3441.0 | 3389.8 | 3400.6 | 3386.3 |
| 22.5°  | 3378.8 | 3345.8 | 3298.0 | 3298.0 | 3290.7 |
| 25°    | 3279.8 | 3250.7 | 3188.5 | 3195.6 | 3188.5 |
| 27.5°  | 3169.9 | 3144.3 | 3096.9 | 3086.0 | 3067.8 |
| 30°    | 3060.4 | 3030.9 | 2976.1 | 2965.2 | 2950.5 |
| 32.5°  | 2943.1 | 2921.4 | 2862.7 | 2840.6 | 2825.8 |
| 35°    | 2829.7 | 2793.2 | 2734.5 | 2712.4 | 2694.2 |
| 37.5°  | 2701.5 | 2668.6 | 2609.9 | 2584.3 | 2566.0 |
| 40°    | 2569.9 | 2540.4 | 2481.7 | 2449.1 | 2434.3 |
| 42.5°  | 2441.7 | 2412.2 | 2353.9 | 2317.1 | 2295.3 |
| 45°    | 2302.6 | 2277.0 | 2221.9 | 2181.9 | 2167.1 |
| 47.5°  | 2167.1 | 2141.5 | 2082.8 | 2042.5 | 2020.7 |
| 50°    | 2024.2 | 2006.0 | 1954.7 | 1903.4 | 1885.1 |
| 52.5°  | 1885.1 | 1859.5 | 1812.2 | 1771.7 | 1746.1 |
| 55°    | 1742.6 | 1720.5 | 1676.6 | 1632.7 | 1614.5 |
| 57.5°  | 1599.7 | 1581.4 | 1533.7 | 1489.8 | 1475.0 |
| 60°    | 1456.8 | 1442.4 | 1391.1 | 1350.8 | 1339.9 |
| 62.5°  | 1317.8 | 1292.1 | 1255.6 | 1219.1 | 1204.4 |
| 65°    | 1175.3 | 1153.1 | 1116.6 | 1083.5 | 1065.4 |
| 67.5°  | 1028.8 | 1010.2 | 977.5  | 951.9  | 937.2  |
| 70°    | 893.2  | 878.5  | 845.5  | 819.9  | 805.5  |
| 72.5°  | 754.2  | 739.5  | 721.2  | 695.6  | 684.7  |
| 75°    | 614.8  | 607.8  | 589.1  | 567.4  | 574.8  |
| 77.5°  | 490.5  | 475.7  | 468.4  | 457.5  | 446.6  |
| 80°    | 366.2  | 362.3  | 355.0  | 344.1  | 336.7  |
| 82.5°  | 248.9  | 248.9  | 245.5  | 230.7  | 230.7  |
| 85°    | 149.9  | 146.4  | 142.9  | 131.7  | 128.2  |
| 87.5°  | 66.0   | 58.6   | 51.3   | 40.4   | 36.5   |
| 90°    | 1.3    | 16.7   | 27.8   | 34.9   | 37.6   |
| 92.5°  | 34.9   | 29.3   | 33.4   | 36.3   | 37.6   |
| 95°    | 90.5   | 44.5   | 54.3   | 61.4   | 59.9   |
| 97.5°  | 163.0  | 48.8   | 71.0   | 75.3   | 76.6   |
| 100°   | 246.8  | 55.8   | 79.4   | 90.5   | 93.4   |
| 102.5° | 338.6  | 336.0  | 82.3   | 97.5   | 101.7  |
| 105°   | 423.7  | 465.5  | 85.0   | 100.3  | 105.9  |
| 107.5° | 522.6  | 557.4  | 87.9   | 103.1  | 108.8  |
| 110°   | 617.5  | 646.6  | 243.9  | 104.6  | 110.1  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 706.7  | 731.6  | 708.0  | 107.2  | 111.5  |
| 115°   | 801.4  | 825.0  | 859.9  | 214.7  | 114.4  |
| 117.5° | 883.6  | 911.4  | 935.2  | 735.8  | 370.7  |
| 120°   | 975.6  | 996.5  | 1021.7 | 1038.4 | 850.2  |
| 122.5° | 1053.5 | 1075.9 | 1103.9 | 1112.1 | 1113.6 |
| 125°   | 1133.0 | 1151.2 | 1177.7 | 1187.5 | 1191.6 |
| 127.5° | 1205.5 | 1225.0 | 1246.0 | 1260.0 | 1261.3 |
| 130°   | 1273.8 | 1296.2 | 1311.4 | 1326.8 | 1325.5 |
| 132.5° | 1343.5 | 1361.7 | 1377.0 | 1389.5 | 1388.2 |
| 135°   | 1402.1 | 1424.4 | 1436.9 | 1450.9 | 1448.1 |
| 137.5° | 1463.3 | 1480.1 | 1494.1 | 1508.1 | 1503.9 |
| 140°   | 1523.2 | 1534.5 | 1549.7 | 1562.3 | 1555.3 |
| 142.5° | 1573.5 | 1583.3 | 1601.3 | 1612.4 | 1605.5 |
| 145°   | 1626.5 | 1625.1 | 1648.7 | 1658.5 | 1651.5 |
| 147.5° | 1672.3 | 1668.3 | 1691.9 | 1698.8 | 1693.4 |
| 150°   | 1717.0 | 1707.3 | 1729.7 | 1737.9 | 1731.0 |
| 152.5° | 1754.6 | 1743.5 | 1764.4 | 1772.8 | 1763.1 |
| 155°   | 1790.9 | 1778.4 | 1795.1 | 1803.4 | 1792.4 |
| 157.5° | 1820.2 | 1809.1 | 1821.6 | 1831.4 | 1820.2 |
| 160°   | 1845.3 | 1836.9 | 1845.3 | 1853.6 | 1843.8 |
| 162.5° | 1867.5 | 1859.2 | 1866.1 | 1875.9 | 1863.4 |
| 165°   | 1887.0 | 1878.8 | 1882.8 | 1892.6 | 1882.8 |
| 167.5° | 1902.4 | 1893.9 | 1898.3 | 1908.0 | 1895.5 |
| 170°   | 1915.0 | 1906.6 | 1909.3 | 1919.1 | 1906.6 |
| 172.5° | 1923.3 | 1915.0 | 1917.8 | 1927.5 | 1915.0 |
| 175°   | 1930.2 | 1920.4 | 1923.3 | 1933.0 | 1919.1 |
| 177.5° | 1933.0 | 1923.3 | 1924.8 | 1934.5 | 1921.9 |
| 180°   | 1926.1 | 1926.1 | 1926.1 | 1926.1 | 1926.1 |

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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 | 11.83            | 12.83 | 12.67 | 13.68 | 14.75 | 11.39          | 12.38 | 12.22 | 13.24 | 14.31 |
|                 | 3H   | 13.51            | 14.40 | 14.35 | 15.27 | 16.36 | 13.02          | 13.91 | 13.86 | 14.78 | 15.87 |
|                 | 4H   | 14.10            | 14.95 | 14.97 | 15.82 | 16.93 | 13.61          | 14.45 | 14.47 | 15.33 | 16.43 |
|                 | 6H   | 14.51            | 15.29 | 15.39 | 16.17 | 17.29 | 14.01          | 14.79 | 14.89 | 15.67 | 16.79 |
|                 | 8H   | 14.62            | 15.36 | 15.51 | 16.26 | 17.38 | 14.12          | 14.86 | 15.01 | 15.76 | 16.88 |
|                 | 12H  | 14.68            | 15.38 | 15.57 | 16.28 | 17.42 | 14.17          | 14.87 | 15.06 | 15.77 | 16.91 |
| 4H              | 2H   | 12.31            | 13.15 | 13.18 | 14.03 | 15.13 | 11.96          | 12.80 | 12.82 | 13.67 | 14.78 |
|                 | 3H   | 14.19            | 14.90 | 15.07 | 15.80 | 16.92 | 13.78          | 14.49 | 14.67 | 15.39 | 16.52 |
|                 | 4H   | 14.92            | 15.56 | 15.81 | 16.46 | 17.61 | 14.49          | 15.13 | 15.38 | 16.04 | 17.18 |
|                 | 6H   | 15.44            | 16.00 | 16.35 | 16.92 | 18.07 | 15.01          | 15.56 | 15.92 | 16.49 | 17.64 |
|                 | 8H   | 15.60            | 16.12 | 16.51 | 17.04 | 18.20 | 15.16          | 15.68 | 16.07 | 16.60 | 17.76 |
|                 | 12H  | 15.68            | 16.15 | 16.61 | 17.09 | 18.26 | 15.23          | 15.70 | 16.16 | 16.64 | 17.81 |
| 8H              | 4H   | 15.12            | 15.64 | 16.03 | 16.56 | 17.73 | 14.75          | 15.26 | 15.66 | 16.19 | 17.35 |
|                 | 6H   | 15.76            | 16.19 | 16.70 | 17.16 | 18.32 | 15.38          | 15.81 | 16.32 | 16.77 | 17.94 |
|                 | 8H   | 15.99            | 16.37 | 16.94 | 17.32 | 18.50 | 15.60          | 15.98 | 16.54 | 16.93 | 18.11 |
|                 | 12H  | 16.13            | 16.46 | 17.08 | 17.41 | 18.64 | 15.72          | 16.05 | 16.67 | 17.00 | 18.23 |
| 12H             | 4H   | 15.12            | 15.58 | 16.04 | 16.52 | 17.69 | 14.75          | 15.21 | 15.68 | 16.15 | 17.32 |
|                 | 6H   | 15.80            | 16.18 | 16.74 | 17.13 | 18.31 | 15.42          | 15.80 | 16.37 | 16.76 | 17.94 |
|                 | 8H   | 16.05            | 16.38 | 17.00 | 17.33 | 18.56 | 15.67          | 16.00 | 16.62 | 16.95 | 18.18 |