

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: P921175

Luminaire Tested: DFN2DIP-TR4F0-110D070US935-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P921175  
REPORT IS A COMBINATION OF REPORTS P901957 AND P898849  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR4F0-110D070US935-FLLONL  
Description: 4 foot, Triangle Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

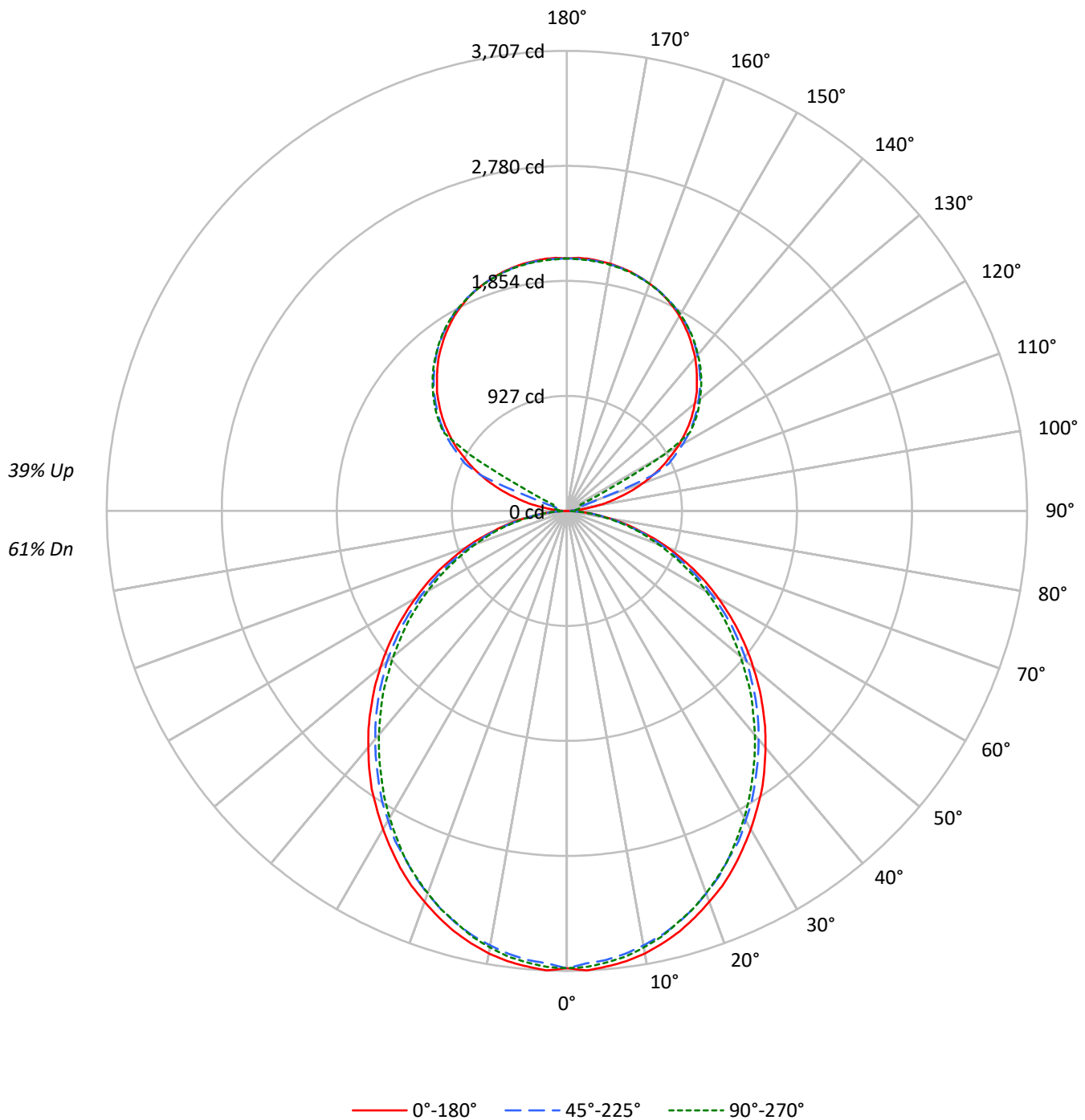
Lumens per Lamp: N/A  
Luminaire Lumens: 15343.0 lumens  
Efficiency: N/A  
Efficacy: 93.1 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.43' x L: 3.96' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 164.8  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9613  
Total Harmonic Distortion (THDi): 0.083  
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: P921175

CATALOG NUMBER: DFN2DIP-TR4F0-110D070US935-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 |
| RCR |     |     |     |     |     |     |     |     |    |    |    |  |    |    |    |  |    |
| 0   | 110 | 110 | 110 | 110 | 103 | 103 | 103 | 103 | 90 | 90 | 90 |  | 77 | 77 | 77 |  | 66 |
| 1   | 100 | 96  | 92  | 88  | 94  | 90  | 86  | 83  | 79 | 76 | 74 |  | 68 | 66 | 65 |  | 59 |
| 2   | 91  | 84  | 77  | 72  | 85  | 79  | 73  | 68  | 69 | 65 | 61 |  | 60 | 57 | 54 |  | 52 |
| 3   | 83  | 74  | 66  | 60  | 78  | 69  | 63  | 57  | 61 | 56 | 51 |  | 53 | 49 | 46 |  | 46 |
| 4   | 76  | 65  | 57  | 51  | 71  | 61  | 54  | 49  | 54 | 48 | 44 |  | 47 | 43 | 39 |  | 41 |
| 5   | 70  | 58  | 50  | 44  | 65  | 55  | 47  | 42  | 48 | 42 | 38 |  | 42 | 38 | 34 |  | 37 |
| 6   | 65  | 52  | 44  | 38  | 60  | 49  | 42  | 36  | 44 | 38 | 33 |  | 38 | 34 | 30 |  | 34 |
| 7   | 60  | 47  | 39  | 33  | 56  | 45  | 37  | 32  | 40 | 34 | 29 |  | 35 | 30 | 26 |  | 31 |
| 8   | 56  | 43  | 35  | 30  | 52  | 41  | 33  | 28  | 36 | 30 | 26 |  | 32 | 27 | 24 |  | 28 |
| 9   | 52  | 39  | 32  | 27  | 48  | 37  | 30  | 25  | 33 | 27 | 23 |  | 30 | 25 | 21 |  | 26 |
| 10  | 48  | 36  | 29  | 24  | 45  | 34  | 28  | 23  | 31 | 25 | 21 |  | 27 | 23 | 19 |  | 24 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2928 | 2928 | 2928 |
| 5°  | 2932 | 2887 | 2906 |
| 10° | 2909 | 2848 | 2867 |
| 15° | 2866 | 2801 | 2805 |
| 20° | 2808 | 2736 | 2742 |
| 25° | 2751 | 2658 | 2669 |
| 30° | 2679 | 2585 | 2577 |
| 35° | 2610 | 2500 | 2479 |
| 40° | 2526 | 2413 | 2386 |
| 45° | 2443 | 2327 | 2290 |
| 50° | 2351 | 2236 | 2180 |
| 55° | 2255 | 2131 | 2078 |
| 60° | 2147 | 2006 | 1962 |
| 65° | 2028 | 1877 | 1824 |
| 70° | 1878 | 1719 | 1677 |
| 75° | 1669 | 1530 | 1540 |
| 80° | 1419 | 1290 | 1280 |
| 85° | 1027 | 876  | 848  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
Vertical Angle: 45°  
Luminance: 2443 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 346.9   | 2.3       |
| 10°-20°   | 975.9   | 6.4       |
| 20°-30°   | 1434.2  | 9.3       |
| 30°-40°   | 1665.7  | 10.9      |
| 40°-50°   | 1663.7  | 10.8      |
| 50°-60°   | 1450.7  | 9.5       |
| 60°-70°   | 1072.4  | 7.0       |
| 70°-80°   | 606.7   | 4.0       |
| 80°-90°   | 163.7   | 1.1       |
| 90°-100°  | 67.1    | 0.4       |
| 100°-110° | 250.0   | 1.6       |
| 110°-120° | 663.1   | 4.3       |
| 120°-130° | 1099.8  | 7.2       |
| 130°-140° | 1168.3  | 7.6       |
| 140°-150° | 1085.8  | 7.1       |
| 150°-160° | 872.9   | 5.7       |
| 160°-170° | 562.5   | 3.7       |
| 170°-180° | 193.6   | 1.3       |
| 0°-30°    | 2757.0  | 18.0      |
| 0°-40°    | 4422.7  | 28.8      |
| 0°-60°    | 7537.0  | 49.1      |
| 0°-90°    | 9379.8  | 61.1      |
| 90°-120°  | 980.2   | 6.4       |
| 90°-150°  | 4334.1  | 28.2      |
| 90°-180°  | 5963.0  | 38.9      |
| 0°-180°   | 15343.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3685 | 3685  | 3685 | 3685  | 3685 |      |
| 5°   | 3685 | 3671  | 3632 | 3660  | 3654 | 350  |
| 15°  | 3508 | 3487  | 3441 | 3455  | 3437 | 988  |
| 25°  | 3175 | 3147  | 3087 | 3094  | 3087 | 1461 |
| 35°  | 2739 | 2704  | 2647 | 2626  | 2608 | 1711 |
| 45°  | 2229 | 2204  | 2151 | 2112  | 2098 | 1720 |
| 55°  | 1687 | 1666  | 1623 | 1580  | 1563 | 1508 |
| 65°  | 1138 | 1116  | 1081 | 1049  | 1031 | 1125 |
| 75°  | 595  | 588   | 570  | 549   | 556  | 635  |
| 85°  | 145  | 142   | 138  | 127   | 124  | 162  |
| 90°  | 1    | 18    | 29   | 37    | 40   | 14   |
| 95°  | 96   | 47    | 57   | 65    | 63   | 113  |
| 105° | 448  | 492   | 90   | 106   | 112  | 478  |
| 115° | 846  | 871   | 908  | 227   | 121  | 833  |
| 125° | 1196 | 1216  | 1244 | 1254  | 1258 | 1067 |
| 135° | 1481 | 1504  | 1517 | 1532  | 1529 | 1144 |
| 145° | 1718 | 1716  | 1741 | 1751  | 1744 | 1074 |
| 155° | 1891 | 1878  | 1896 | 1904  | 1893 | 872  |
| 165° | 1993 | 1984  | 1988 | 1999  | 1988 | 563  |
| 175° | 2038 | 2028  | 2031 | 2041  | 2027 | 194  |
| 180° | 2034 | 2034  | 2034 | 2034  | 2034 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3685.2 | 3685.2 | 3685.2 | 3685.2 | 3685.2 |
| 2.5°   | 3706.6 | 3688.9 | 3649.9 | 3685.2 | 3678.4 |
| 5°     | 3685.2 | 3671.3 | 3632.2 | 3660.4 | 3653.6 |
| 7.5°   | 3660.4 | 3639.4 | 3600.3 | 3628.8 | 3621.7 |
| 10°    | 3621.7 | 3596.8 | 3554.4 | 3582.5 | 3572.0 |
| 12.5°  | 3568.3 | 3547.2 | 3504.8 | 3522.4 | 3515.3 |
| 15°    | 3508.1 | 3487.0 | 3440.8 | 3455.1 | 3437.4 |
| 17.5°  | 3433.7 | 3412.7 | 3366.4 | 3384.1 | 3366.4 |
| 20°    | 3352.1 | 3331.0 | 3281.4 | 3291.9 | 3278.1 |
| 22.5°  | 3270.9 | 3238.9 | 3192.7 | 3192.7 | 3185.5 |
| 25°    | 3175.0 | 3146.9 | 3086.7 | 3093.5 | 3086.7 |
| 27.5°  | 3068.6 | 3043.8 | 2997.9 | 2987.4 | 2969.8 |
| 30°    | 2962.6 | 2934.0 | 2881.0 | 2870.5 | 2856.2 |
| 32.5°  | 2849.0 | 2828.0 | 2771.2 | 2749.8 | 2735.5 |
| 35°    | 2739.3 | 2704.0 | 2647.1 | 2625.7 | 2608.0 |
| 37.5°  | 2615.2 | 2583.3 | 2526.5 | 2501.6 | 2484.0 |
| 40°    | 2487.8 | 2459.2 | 2402.4 | 2370.8 | 2356.6 |
| 42.5°  | 2363.7 | 2335.1 | 2278.7 | 2243.0 | 2222.0 |
| 45°    | 2229.1 | 2204.2 | 2150.9 | 2112.2 | 2097.9 |
| 47.5°  | 2097.9 | 2073.1 | 2016.3 | 1977.2 | 1956.1 |
| 50°    | 1959.5 | 1941.9 | 1892.2 | 1842.6 | 1825.0 |
| 52.5°  | 1825.0 | 1800.1 | 1754.3 | 1715.1 | 1690.3 |
| 55°    | 1687.0 | 1665.5 | 1623.1 | 1580.5 | 1562.9 |
| 57.5°  | 1548.6 | 1530.9 | 1484.7 | 1442.2 | 1427.9 |
| 60°    | 1410.2 | 1396.4 | 1346.7 | 1307.6 | 1297.1 |
| 62.5°  | 1275.7 | 1250.9 | 1215.5 | 1180.2 | 1165.9 |
| 65°    | 1137.6 | 1116.2 | 1080.9 | 1049.0 | 1031.3 |
| 67.5°  | 995.9  | 977.9  | 946.3  | 921.5  | 907.2  |
| 70°    | 864.7  | 850.4  | 818.5  | 793.7  | 779.7  |
| 72.5°  | 730.1  | 715.8  | 698.2  | 673.4  | 662.8  |
| 75°    | 595.1  | 588.4  | 570.3  | 549.3  | 556.5  |
| 77.5°  | 474.8  | 460.5  | 453.4  | 442.9  | 432.4  |
| 80°    | 354.6  | 350.8  | 343.6  | 333.1  | 326.0  |
| 82.5°  | 241.0  | 241.0  | 237.6  | 223.3  | 223.3  |
| 85°    | 145.2  | 141.7  | 138.4  | 127.4  | 124.1  |
| 87.5°  | 63.9   | 56.7   | 49.6   | 39.1   | 35.3   |
| 90°    | 1.4    | 17.7   | 29.4   | 36.9   | 39.7   |
| 92.5°  | 36.9   | 30.9   | 35.3   | 38.3   | 39.7   |
| 95°    | 95.6   | 47.0   | 57.3   | 64.8   | 63.3   |
| 97.5°  | 172.1  | 51.6   | 75.0   | 79.6   | 80.9   |
| 100°   | 260.6  | 58.9   | 83.9   | 95.6   | 98.6   |
| 102.5° | 357.6  | 354.8  | 86.9   | 103.0  | 107.5  |
| 105°   | 447.5  | 491.6  | 89.8   | 105.9  | 111.8  |
| 107.5° | 551.9  | 588.7  | 92.8   | 108.9  | 114.9  |
| 110°   | 652.1  | 682.9  | 257.6  | 110.5  | 116.2  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 746.3  | 772.7  | 747.7  | 113.2  | 117.8  |
| 115°   | 846.3  | 871.2  | 908.1  | 226.7  | 120.8  |
| 117.5° | 933.1  | 962.5  | 987.7  | 777.1  | 391.5  |
| 120°   | 1030.3 | 1052.3 | 1078.9 | 1096.6 | 897.8  |
| 122.5° | 1112.6 | 1136.2 | 1165.8 | 1174.5 | 1176.0 |
| 125°   | 1196.5 | 1215.7 | 1243.7 | 1254.0 | 1258.3 |
| 127.5° | 1273.1 | 1293.6 | 1315.9 | 1330.6 | 1332.0 |
| 130°   | 1345.2 | 1368.8 | 1384.9 | 1401.2 | 1399.8 |
| 132.5° | 1418.8 | 1438.0 | 1454.1 | 1467.4 | 1466.0 |
| 135°   | 1480.7 | 1504.2 | 1517.4 | 1532.2 | 1529.3 |
| 137.5° | 1545.3 | 1563.1 | 1577.9 | 1592.6 | 1588.2 |
| 140°   | 1608.6 | 1620.5 | 1636.6 | 1649.8 | 1642.5 |
| 142.5° | 1661.7 | 1672.1 | 1691.1 | 1702.8 | 1695.5 |
| 145°   | 1717.7 | 1716.1 | 1741.1 | 1751.4 | 1744.1 |
| 147.5° | 1766.1 | 1761.8 | 1786.7 | 1794.1 | 1788.3 |
| 150°   | 1813.3 | 1803.0 | 1826.6 | 1835.3 | 1828.0 |
| 152.5° | 1853.0 | 1841.2 | 1863.3 | 1872.2 | 1861.9 |
| 155°   | 1891.3 | 1878.1 | 1895.7 | 1904.5 | 1892.8 |
| 157.5° | 1922.2 | 1910.5 | 1923.7 | 1934.1 | 1922.2 |
| 160°   | 1948.8 | 1939.8 | 1948.8 | 1957.5 | 1947.1 |
| 162.5° | 1972.2 | 1963.4 | 1970.7 | 1981.1 | 1967.8 |
| 165°   | 1992.8 | 1984.1 | 1988.4 | 1998.7 | 1988.4 |
| 167.5° | 2009.1 | 2000.1 | 2004.7 | 2015.0 | 2001.7 |
| 170°   | 2022.3 | 2013.4 | 2016.4 | 2026.7 | 2013.4 |
| 172.5° | 2031.1 | 2022.3 | 2025.3 | 2035.6 | 2022.3 |
| 175°   | 2038.4 | 2028.1 | 2031.1 | 2041.3 | 2026.7 |
| 177.5° | 2041.3 | 2031.1 | 2032.6 | 2043.0 | 2029.6 |
| 180°   | 2034.0 | 2034.0 | 2034.0 | 2034.0 | 2034.0 |

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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 | 11.97            | 12.94 | 12.82 | 13.82 | 14.92 | 11.54          | 12.51 | 12.39 | 13.38 | 14.49 |
|                 | 3H   | 13.64            | 14.51 | 14.50 | 15.39 | 16.52 | 13.16          | 14.03 | 14.03 | 14.92 | 16.05 |
|                 | 4H   | 14.23            | 15.05 | 15.11 | 15.94 | 17.08 | 13.75          | 14.58 | 14.64 | 15.47 | 16.61 |
|                 | 6H   | 14.63            | 15.39 | 15.53 | 16.29 | 17.45 | 14.16          | 14.92 | 15.05 | 15.82 | 16.97 |
|                 | 8H   | 14.74            | 15.46 | 15.64 | 16.38 | 17.53 | 14.27          | 14.99 | 15.17 | 15.91 | 17.06 |
|                 | 12H  | 14.79            | 15.48 | 15.70 | 16.39 | 17.57 | 14.31          | 15.00 | 15.22 | 15.91 | 17.09 |
| 4H              | 2H   | 12.44            | 13.27 | 13.33 | 14.16 | 15.30 | 12.10          | 12.92 | 12.99 | 13.81 | 14.95 |
|                 | 3H   | 14.32            | 15.01 | 15.22 | 15.93 | 17.08 | 13.93          | 14.61 | 14.82 | 15.54 | 16.69 |
|                 | 4H   | 15.04            | 15.66 | 15.95 | 16.58 | 17.76 | 14.63          | 15.26 | 15.54 | 16.18 | 17.36 |
|                 | 6H   | 15.56            | 16.10 | 16.48 | 17.04 | 18.22 | 15.15          | 15.69 | 16.07 | 16.63 | 17.82 |
|                 | 8H   | 15.71            | 16.22 | 16.64 | 17.15 | 18.35 | 15.30          | 15.80 | 16.23 | 16.74 | 17.94 |
|                 | 12H  | 15.79            | 16.24 | 16.74 | 17.20 | 18.40 | 15.37          | 15.82 | 16.31 | 16.78 | 17.98 |
| 8H              | 4H   | 15.24            | 15.75 | 16.17 | 16.69 | 17.88 | 14.88          | 15.39 | 15.81 | 16.33 | 17.52 |
|                 | 6H   | 15.88            | 16.30 | 16.83 | 17.28 | 18.47 | 15.52          | 15.93 | 16.47 | 16.91 | 18.11 |
|                 | 8H   | 16.10            | 16.47 | 17.06 | 17.44 | 18.65 | 15.73          | 16.10 | 16.69 | 17.07 | 18.28 |
|                 | 12H  | 16.24            | 16.56 | 17.20 | 17.53 | 18.79 | 15.85          | 16.18 | 16.82 | 17.14 | 18.40 |
| 12H             | 4H   | 15.23            | 15.69 | 16.18 | 16.65 | 17.85 | 14.88          | 15.34 | 15.83 | 16.29 | 17.49 |
|                 | 6H   | 15.91            | 16.28 | 16.87 | 17.25 | 18.46 | 15.56          | 15.93 | 16.52 | 16.90 | 18.11 |
|                 | 8H   | 16.16            | 16.48 | 17.12 | 17.45 | 18.71 | 15.80          | 16.13 | 16.77 | 17.09 | 18.35 |