

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: P924957

Luminaire Tested: DFN2DIP-PN3F0-090D070US950-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P924957  
REPORT IS A COMBINATION OF REPORTS P901099 AND P897955  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN3F0-090D070US950-FLLONL  
Description: 3 foot, Pentagon Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

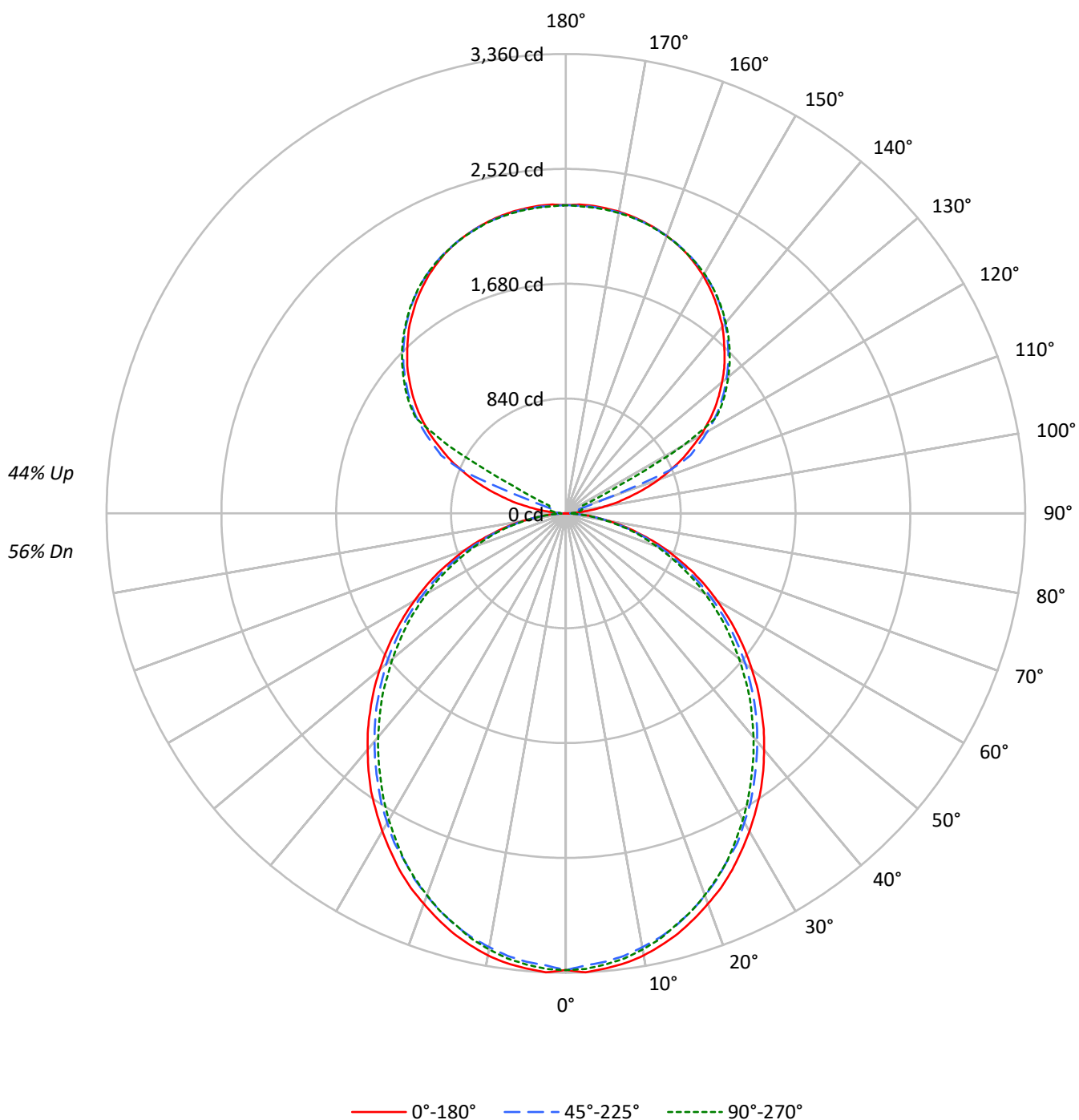
Lumens per Lamp: N/A  
Luminaire Lumens: 15111.4 lumens  
Efficiency: N/A  
Efficacy: 102.6 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 2.96' x L: 3.11' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 147.3  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9954  
Total Harmonic Distortion (THDi): 0.076  
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   | 109 | 109 | 109 | 109 | 101 | 101 | 101 | 101 | 87 | 87 | 87 | 74 | 74 | 74 | 62 | 62 | 62 |
| 1   | 99  | 95  | 91  | 87  | 92  | 88  | 85  | 82  | 76 | 74 | 71 | 65 | 63 | 62 | 55 | 53 | 52 |
| 2   | 90  | 83  | 77  | 71  | 84  | 77  | 72  | 67  | 67 | 63 | 59 | 57 | 54 | 51 | 48 | 46 | 44 |
| 3   | 82  | 73  | 65  | 59  | 76  | 68  | 61  | 56  | 59 | 54 | 50 | 51 | 47 | 44 | 43 | 40 | 38 |
| 4   | 75  | 64  | 56  | 50  | 70  | 60  | 53  | 48  | 52 | 47 | 42 | 45 | 41 | 37 | 38 | 35 | 32 |
| 5   | 69  | 58  | 49  | 43  | 64  | 54  | 46  | 41  | 47 | 41 | 37 | 40 | 36 | 32 | 34 | 31 | 28 |
| 6   | 64  | 52  | 43  | 38  | 59  | 48  | 41  | 36  | 42 | 36 | 32 | 37 | 32 | 28 | 31 | 28 | 25 |
| 7   | 59  | 47  | 39  | 33  | 55  | 44  | 37  | 31  | 38 | 33 | 28 | 33 | 29 | 25 | 29 | 25 | 22 |
| 8   | 55  | 42  | 35  | 29  | 51  | 40  | 33  | 28  | 35 | 29 | 25 | 30 | 26 | 22 | 26 | 23 | 20 |
| 9   | 51  | 39  | 31  | 26  | 48  | 36  | 30  | 25  | 32 | 26 | 23 | 28 | 23 | 20 | 24 | 21 | 18 |
| 10  | 48  | 36  | 28  | 23  | 44  | 34  | 27  | 22  | 30 | 24 | 20 | 26 | 21 | 18 | 22 | 19 | 16 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3905 | 3905 | 3905 |
| 5°  | 3909 | 3848 | 3875 |
| 10° | 3875 | 3794 | 3821 |
| 15° | 3816 | 3728 | 3737 |
| 20° | 3737 | 3639 | 3652 |
| 25° | 3658 | 3533 | 3553 |
| 30° | 3559 | 3433 | 3428 |
| 35° | 3466 | 3316 | 3296 |
| 40° | 3351 | 3198 | 3170 |
| 45° | 3237 | 3080 | 3041 |
| 50° | 3111 | 2955 | 2892 |
| 55° | 2980 | 2812 | 2755 |
| 60° | 2831 | 2641 | 2597 |
| 65° | 2669 | 2464 | 2411 |
| 70° | 2462 | 2248 | 2211 |
| 75° | 2176 | 1989 | 2023 |
| 80° | 1830 | 1658 | 1669 |
| 85° | 1291 | 1098 | 1088 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 3237 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 314.4   | 2.1       |
| 10°-20°   | 884.7   | 5.9       |
| 20°-30°   | 1300.2  | 8.6       |
| 30°-40°   | 1510.1  | 10.0      |
| 40°-50°   | 1508.2  | 10.0      |
| 50°-60°   | 1315.1  | 8.7       |
| 60°-70°   | 972.2   | 6.4       |
| 70°-80°   | 550.0   | 3.6       |
| 80°-90°   | 149.1   | 1.0       |
| 90°-100°  | 74.3    | 0.5       |
| 100°-110° | 277.0   | 1.8       |
| 110°-120° | 734.8   | 4.9       |
| 120°-130° | 1218.6  | 8.1       |
| 130°-140° | 1294.5  | 8.6       |
| 140°-150° | 1203.1  | 8.0       |
| 150°-160° | 967.2   | 6.4       |
| 160°-170° | 623.3   | 4.1       |
| 170°-180° | 214.5   | 1.4       |
| 0°-30°    | 2499.3  | 16.5      |
| 0°-40°    | 4009.4  | 26.5      |
| 0°-60°    | 6832.8  | 45.2      |
| 0°-90°    | 8504.1  | 56.3      |
| 90°-120°  | 1086.1  | 7.2       |
| 90°-150°  | 4802.2  | 31.8      |
| 90°-180°  | 6607.0  | 43.7      |
| 0°-180°   | 15111.4 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3341 | 3341  | 3341 | 3341  | 3341 |      |
| 5°   | 3341 | 3328  | 3293 | 3318  | 3312 | 317  |
| 15°  | 3180 | 3161  | 3119 | 3132  | 3116 | 896  |
| 25°  | 2878 | 2853  | 2798 | 2804  | 2798 | 1324 |
| 35°  | 2483 | 2451  | 2400 | 2380  | 2364 | 1551 |
| 45°  | 2021 | 1998  | 1950 | 1915  | 1902 | 1560 |
| 55°  | 1529 | 1510  | 1471 | 1433  | 1417 | 1367 |
| 65°  | 1031 | 1012  | 980  | 951   | 935  | 1020 |
| 75°  | 540  | 533   | 517  | 498   | 504  | 576  |
| 85°  | 132  | 128   | 126  | 116   | 112  | 147  |
| 90°  | 2    | 20    | 32   | 41    | 44   | 14   |
| 95°  | 106  | 52    | 64   | 72    | 70   | 125  |
| 105° | 496  | 545   | 100  | 117   | 124  | 530  |
| 115° | 938  | 965   | 1006 | 251   | 134  | 923  |
| 125° | 1326 | 1347  | 1378 | 1390  | 1394 | 1182 |
| 135° | 1641 | 1667  | 1681 | 1698  | 1694 | 1267 |
| 145° | 1903 | 1902  | 1929 | 1941  | 1932 | 1190 |
| 155° | 2096 | 2081  | 2100 | 2110  | 2097 | 966  |
| 165° | 2208 | 2198  | 2203 | 2215  | 2203 | 624  |
| 175° | 2259 | 2247  | 2250 | 2262  | 2246 | 215  |
| 180° | 2254 | 2254  | 2254 | 2254  | 2254 |      |



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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3340.8 | 3340.8 | 3340.8 | 3340.8 | 3340.8 |
| 2.5°   | 3360.3 | 3344.2 | 3308.9 | 3340.8 | 3334.7 |
| 5°     | 3340.8 | 3328.2 | 3292.8 | 3318.4 | 3312.2 |
| 7.5°   | 3318.4 | 3299.3 | 3263.8 | 3289.8 | 3283.3 |
| 10°    | 3283.3 | 3260.8 | 3222.2 | 3247.8 | 3238.3 |
| 12.5°  | 3234.8 | 3215.7 | 3177.3 | 3193.2 | 3186.8 |
| 15°    | 3180.3 | 3161.3 | 3119.3 | 3132.3 | 3116.2 |
| 17.5°  | 3112.8 | 3093.7 | 3051.8 | 3067.9 | 3051.8 |
| 20°    | 3038.9 | 3019.8 | 2974.8 | 2984.3 | 2971.7 |
| 22.5°  | 2965.2 | 2936.3 | 2894.3 | 2894.3 | 2887.9 |
| 25°    | 2878.3 | 2852.7 | 2798.3 | 2804.4 | 2798.3 |
| 27.5°  | 2781.9 | 2759.3 | 2717.9 | 2708.3 | 2692.3 |
| 30°    | 2685.8 | 2659.8 | 2611.8 | 2602.2 | 2589.3 |
| 32.5°  | 2582.9 | 2563.8 | 2512.3 | 2492.9 | 2479.9 |
| 35°    | 2483.4 | 2451.3 | 2399.8 | 2380.4 | 2364.4 |
| 37.5°  | 2370.9 | 2341.9 | 2290.4 | 2267.9 | 2251.9 |
| 40°    | 2255.3 | 2229.4 | 2177.9 | 2149.3 | 2136.4 |
| 42.5°  | 2142.8 | 2116.9 | 2065.8 | 2033.5 | 2014.4 |
| 45°    | 2020.8 | 1998.3 | 1949.9 | 1914.8 | 1901.9 |
| 47.5°  | 1901.9 | 1879.4 | 1827.9 | 1792.5 | 1773.4 |
| 50°    | 1776.4 | 1760.4 | 1715.4 | 1670.5 | 1654.4 |
| 52.5°  | 1654.4 | 1631.9 | 1590.3 | 1554.9 | 1532.4 |
| 55°    | 1529.4 | 1509.9 | 1471.4 | 1432.9 | 1416.9 |
| 57.5°  | 1403.9 | 1387.9 | 1346.0 | 1307.5 | 1294.5 |
| 60°    | 1278.5 | 1265.9 | 1220.8 | 1185.4 | 1175.9 |
| 62.5°  | 1156.4 | 1133.9 | 1101.9 | 1069.9 | 1056.9 |
| 65°    | 1031.4 | 1011.9 | 979.9  | 950.9  | 934.9  |
| 67.5°  | 902.9  | 886.6  | 857.8  | 835.4  | 822.4  |
| 70°    | 783.9  | 770.9  | 742.0  | 719.5  | 706.9  |
| 72.5°  | 661.9  | 648.9  | 632.9  | 610.5  | 600.9  |
| 75°    | 539.6  | 533.4  | 517.1  | 498.0  | 504.5  |
| 77.5°  | 430.4  | 417.6  | 411.1  | 401.5  | 392.0  |
| 80°    | 321.4  | 318.0  | 311.5  | 301.9  | 295.5  |
| 82.5°  | 218.5  | 218.5  | 215.4  | 202.4  | 202.4  |
| 85°    | 131.6  | 128.5  | 125.5  | 115.5  | 112.5  |
| 87.5°  | 57.9   | 51.4   | 45.0   | 35.5   | 32.1   |
| 90°    | 1.5    | 19.6   | 32.5   | 40.8   | 44.0   |
| 92.5°  | 40.8   | 34.2   | 39.1   | 42.5   | 44.0   |
| 95°    | 105.9  | 52.1   | 63.5   | 71.8   | 70.1   |
| 97.5°  | 190.7  | 57.1   | 83.1   | 88.1   | 89.7   |
| 100°   | 288.8  | 65.3   | 92.9   | 105.9  | 109.2  |
| 102.5° | 396.2  | 393.1  | 96.3   | 114.1  | 119.1  |
| 105°   | 495.8  | 544.7  | 99.5   | 117.3  | 123.9  |
| 107.5° | 611.5  | 652.2  | 102.8  | 120.7  | 127.3  |
| 110°   | 722.6  | 756.6  | 285.4  | 122.4  | 128.8  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 826.9  | 856.1  | 828.5  | 125.5  | 130.5  |
| 115°   | 937.7  | 965.4  | 1006.2 | 251.2  | 133.8  |
| 117.5° | 1033.9 | 1066.5 | 1094.3 | 861.0  | 433.8  |
| 120°   | 1141.6 | 1166.0 | 1195.5 | 1215.0 | 994.8  |
| 122.5° | 1232.8 | 1258.9 | 1291.7 | 1301.4 | 1303.1 |
| 125°   | 1325.8 | 1347.0 | 1378.1 | 1389.5 | 1394.3 |
| 127.5° | 1410.6 | 1433.4 | 1458.0 | 1474.3 | 1475.8 |
| 130°   | 1490.5 | 1516.7 | 1534.5 | 1552.5 | 1551.0 |
| 132.5° | 1572.1 | 1593.4 | 1611.2 | 1625.9 | 1624.4 |
| 135°   | 1640.6 | 1666.7 | 1681.3 | 1697.7 | 1694.5 |
| 137.5° | 1712.2 | 1731.9 | 1748.3 | 1764.6 | 1759.7 |
| 140°   | 1782.4 | 1795.5 | 1813.4 | 1828.1 | 1819.9 |
| 142.5° | 1841.2 | 1852.7 | 1873.8 | 1886.7 | 1878.6 |
| 145°   | 1903.2 | 1901.5 | 1929.2 | 1940.6 | 1932.5 |
| 147.5° | 1956.8 | 1952.1 | 1979.7 | 1987.8 | 1981.5 |
| 150°   | 2009.1 | 1997.8 | 2023.9 | 2033.5 | 2025.4 |
| 152.5° | 2053.1 | 2040.1 | 2064.6 | 2074.4 | 2063.0 |
| 155°   | 2095.6 | 2081.0 | 2100.5 | 2110.2 | 2097.3 |
| 157.5° | 2129.8 | 2116.8 | 2131.5 | 2143.0 | 2129.8 |
| 160°   | 2159.3 | 2149.4 | 2159.3 | 2168.9 | 2157.5 |
| 162.5° | 2185.2 | 2175.5 | 2183.6 | 2195.1 | 2180.4 |
| 165°   | 2208.0 | 2198.4 | 2203.2 | 2214.6 | 2203.2 |
| 167.5° | 2226.1 | 2216.1 | 2221.2 | 2232.6 | 2218.0 |
| 170°   | 2240.8 | 2230.9 | 2234.2 | 2245.6 | 2230.9 |
| 172.5° | 2250.5 | 2240.8 | 2244.1 | 2255.4 | 2240.8 |
| 175°   | 2258.6 | 2247.1 | 2250.5 | 2261.8 | 2245.6 |
| 177.5° | 2261.8 | 2250.5 | 2252.2 | 2263.7 | 2248.9 |
| 180°   | 2253.7 | 2253.7 | 2253.7 | 2253.7 | 2253.7 |

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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 | 12.53            | 13.45 | 13.43 | 14.37 | 15.55 | 12.09          | 13.01 | 12.99 | 13.93 | 15.11 |
|                 | 3H   | 14.19            | 15.01 | 15.10 | 15.94 | 17.15 | 13.70          | 14.53 | 14.62 | 15.46 | 16.66 |
|                 | 4H   | 14.77            | 15.55 | 15.70 | 16.49 | 17.70 | 14.29          | 15.07 | 15.22 | 16.00 | 17.22 |
|                 | 6H   | 15.17            | 15.89 | 16.11 | 16.83 | 18.06 | 14.68          | 15.40 | 15.62 | 16.34 | 17.57 |
|                 | 8H   | 15.27            | 15.96 | 16.22 | 16.92 | 18.14 | 14.78          | 15.47 | 15.73 | 16.43 | 17.65 |
|                 | 12H  | 15.32            | 15.98 | 16.28 | 16.93 | 18.18 | 14.83          | 15.48 | 15.78 | 16.43 | 17.68 |
| 4H              | 2H   | 12.99            | 13.77 | 13.93 | 14.71 | 15.92 | 12.64          | 13.42 | 13.57 | 14.36 | 15.57 |
|                 | 3H   | 14.86            | 15.51 | 15.80 | 16.47 | 17.70 | 14.45          | 15.11 | 15.40 | 16.07 | 17.30 |
|                 | 4H   | 15.57            | 16.16 | 16.52 | 17.12 | 18.38 | 15.15          | 15.75 | 16.11 | 16.71 | 17.96 |
|                 | 6H   | 16.08            | 16.59 | 17.05 | 17.58 | 18.83 | 15.66          | 16.17 | 16.62 | 17.16 | 18.41 |
|                 | 8H   | 16.23            | 16.71 | 17.20 | 17.69 | 18.95 | 15.80          | 16.28 | 16.77 | 17.26 | 18.53 |
|                 | 12H  | 16.30            | 16.73 | 17.29 | 17.73 | 19.00 | 15.86          | 16.30 | 16.85 | 17.29 | 18.56 |
| 8H              | 4H   | 15.77            | 16.25 | 16.73 | 17.22 | 18.49 | 15.40          | 15.88 | 16.36 | 16.85 | 18.12 |
|                 | 6H   | 16.39            | 16.79 | 17.39 | 17.81 | 19.07 | 16.02          | 16.41 | 17.01 | 17.43 | 18.70 |
|                 | 8H   | 16.61            | 16.96 | 17.61 | 17.97 | 19.25 | 16.23          | 16.58 | 17.23 | 17.58 | 18.87 |
|                 | 12H  | 16.74            | 17.05 | 17.75 | 18.05 | 19.38 | 16.34          | 16.65 | 17.35 | 17.65 | 18.98 |
| 12H             | 4H   | 15.75            | 16.19 | 16.74 | 17.18 | 18.45 | 15.39          | 15.82 | 16.38 | 16.82 | 18.09 |
|                 | 6H   | 16.42            | 16.77 | 17.42 | 17.78 | 19.06 | 16.06          | 16.41 | 17.06 | 17.41 | 18.70 |
|                 | 8H   | 16.66            | 16.97 | 17.67 | 17.97 | 19.30 | 16.29          | 16.60 | 17.30 | 17.60 | 18.93 |