

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: P923943

Luminaire Tested: DFN2DIP-TR4F0-120D080US940-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P923943  
REPORT IS A COMBINATION OF REPORTS P901977 AND P898849  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR4F0-120D080US940-FLLONL  
Description: 4 foot, Triangle Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

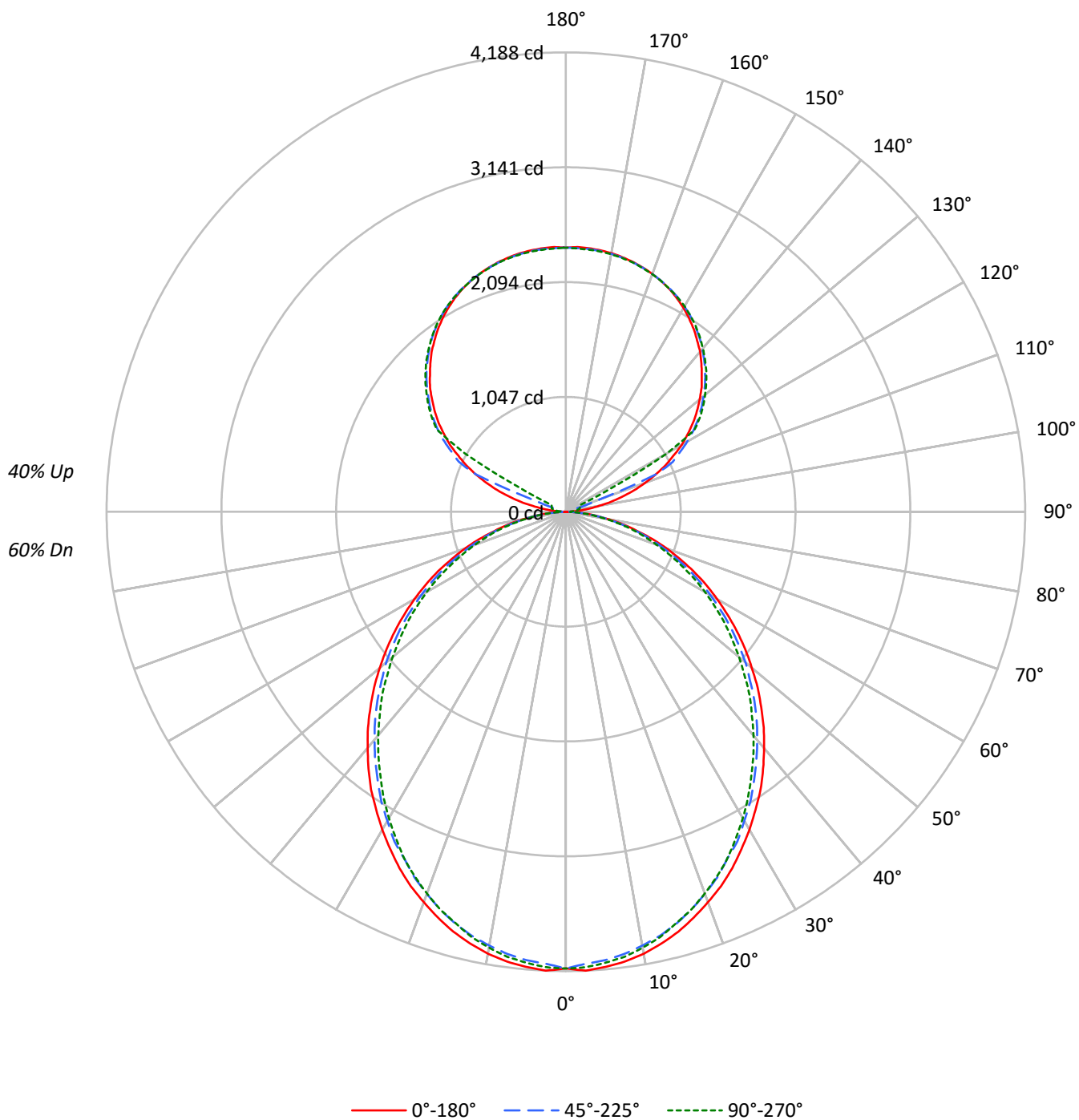
Lumens per Lamp: N/A  
Luminaire Lumens: 17655.9 lumens  
Efficiency: N/A  
Efficacy: 95.5 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.43' x L: 3.96' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 184.8  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9821  
Total Harmonic Distortion (THDi): 0.08  
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: P923943

CATALOG NUMBER: DFN2DIP-TR4F0-120D080US940-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 | 102 | 102 | 102 | 102 | 89 | 89 | 89 |  | 77 | 77 | 77 |  | 65 |
| 1   | 100 | 96  | 92  | 88  | 93  | 90  | 86  | 83  | 78 | 75 | 73 |  | 67 | 66 | 64 |  | 58 |
| 2   | 91  | 84  | 77  | 72  | 85  | 78  | 73  | 68  | 68 | 64 | 61 |  | 59 | 56 | 53 |  | 51 |
| 3   | 83  | 73  | 66  | 60  | 77  | 69  | 62  | 57  | 60 | 55 | 51 |  | 52 | 48 | 45 |  | 45 |
| 4   | 76  | 65  | 57  | 51  | 71  | 61  | 54  | 48  | 54 | 48 | 44 |  | 47 | 42 | 39 |  | 40 |
| 5   | 70  | 58  | 50  | 44  | 65  | 55  | 47  | 42  | 48 | 42 | 38 |  | 42 | 37 | 34 |  | 36 |
| 6   | 64  | 52  | 44  | 38  | 60  | 49  | 42  | 36  | 43 | 37 | 33 |  | 38 | 33 | 30 |  | 33 |
| 7   | 60  | 47  | 39  | 33  | 56  | 44  | 37  | 32  | 39 | 33 | 29 |  | 35 | 30 | 26 |  | 30 |
| 8   | 55  | 43  | 35  | 30  | 52  | 40  | 33  | 28  | 36 | 30 | 26 |  | 32 | 27 | 23 |  | 28 |
| 9   | 52  | 39  | 32  | 26  | 48  | 37  | 30  | 25  | 33 | 27 | 23 |  | 29 | 24 | 21 |  | 26 |
| 10  | 48  | 36  | 29  | 24  | 45  | 34  | 27  | 23  | 30 | 25 | 21 |  | 27 | 22 | 19 |  | 24 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3308 | 3308 | 3308 |
| 5°  | 3313 | 3262 | 3283 |
| 10° | 3286 | 3218 | 3239 |
| 15° | 3238 | 3165 | 3169 |
| 20° | 3173 | 3091 | 3098 |
| 25° | 3108 | 3003 | 3016 |
| 30° | 3026 | 2921 | 2911 |
| 35° | 2949 | 2824 | 2801 |
| 40° | 2854 | 2727 | 2695 |
| 45° | 2760 | 2629 | 2587 |
| 50° | 2656 | 2526 | 2463 |
| 55° | 2548 | 2407 | 2348 |
| 60° | 2425 | 2266 | 2216 |
| 65° | 2292 | 2120 | 2061 |
| 70° | 2122 | 1942 | 1894 |
| 75° | 1886 | 1729 | 1740 |
| 80° | 1603 | 1458 | 1446 |
| 85° | 1160 | 989  | 958  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2760 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 391.9   | 2.2       |
| 10°-20°   | 1102.6  | 6.2       |
| 20°-30°   | 1620.4  | 9.2       |
| 30°-40°   | 1882.0  | 10.7      |
| 40°-50°   | 1879.7  | 10.6      |
| 50°-60°   | 1639.0  | 9.3       |
| 60°-70°   | 1211.6  | 6.9       |
| 70°-80°   | 685.5   | 3.9       |
| 80°-90°   | 185.2   | 1.0       |
| 90°-100°  | 79.4    | 0.4       |
| 100°-110° | 295.9   | 1.7       |
| 110°-120° | 784.9   | 4.4       |
| 120°-130° | 1301.8  | 7.4       |
| 130°-140° | 1382.8  | 7.8       |
| 140°-150° | 1285.1  | 7.3       |
| 150°-160° | 1033.2  | 5.9       |
| 160°-170° | 665.8   | 3.8       |
| 170°-180° | 229.2   | 1.3       |
| 0°-30°    | 3114.9  | 17.6      |
| 0°-40°    | 4996.9  | 28.3      |
| 0°-60°    | 8515.5  | 48.2      |
| 0°-90°    | 10597.8 | 60.0      |
| 90°-120°  | 1160.2  | 6.6       |
| 90°-150°  | 5129.9  | 29.1      |
| 90°-180°  | 7058.0  | 40.0      |
| 0°-180°   | 17655.9 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 4164 | 4164  | 4164 | 4164  | 4164 |      |
| 5°   | 4164 | 4148  | 4104 | 4136  | 4128 | 395  |
| 15°  | 3964 | 3940  | 3888 | 3904  | 3884 | 1116 |
| 25°  | 3587 | 3555  | 3487 | 3495  | 3487 | 1651 |
| 35°  | 3095 | 3055  | 2991 | 2967  | 2947 | 1933 |
| 45°  | 2518 | 2490  | 2430 | 2386  | 2370 | 1944 |
| 55°  | 1906 | 1882  | 1834 | 1786  | 1766 | 1704 |
| 65°  | 1285 | 1261  | 1221 | 1185  | 1165 | 1271 |
| 75°  | 672  | 665   | 644  | 621   | 629  | 718  |
| 85°  | 164  | 160   | 156  | 144   | 140  | 183  |
| 90°  | 2    | 21    | 35   | 44    | 47   | 16   |
| 95°  | 113  | 56    | 68   | 77    | 75   | 134  |
| 105° | 530  | 582   | 106  | 125   | 132  | 566  |
| 115° | 1002 | 1031  | 1075 | 268   | 143  | 986  |
| 125° | 1416 | 1439  | 1472 | 1484  | 1489 | 1263 |
| 135° | 1753 | 1780  | 1796 | 1814  | 1810 | 1354 |
| 145° | 2033 | 2031  | 2061 | 2073  | 2064 | 1272 |
| 155° | 2238 | 2223  | 2244 | 2254  | 2240 | 1032 |
| 165° | 2359 | 2348  | 2354 | 2366  | 2354 | 666  |
| 175° | 2413 | 2400  | 2404 | 2416  | 2399 | 230  |
| 180° | 2408 | 2408  | 2408 | 2408  | 2408 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 4163.7 | 4163.7 | 4163.7 | 4163.7 | 4163.7 |
| 2.5°   | 4187.8 | 4167.9 | 4123.7 | 4163.7 | 4156.0 |
| 5°     | 4163.7 | 4147.9 | 4103.7 | 4135.6 | 4127.9 |
| 7.5°   | 4135.6 | 4111.8 | 4067.6 | 4099.9 | 4091.9 |
| 10°    | 4091.9 | 4063.8 | 4015.8 | 4047.7 | 4035.8 |
| 12.5°  | 4031.5 | 4007.7 | 3959.7 | 3979.7 | 3971.6 |
| 15°    | 3963.6 | 3939.8 | 3887.5 | 3903.6 | 3883.7 |
| 17.5°  | 3879.5 | 3855.7 | 3803.4 | 3823.4 | 3803.4 |
| 20°    | 3787.3 | 3763.5 | 3707.5 | 3719.3 | 3703.6 |
| 22.5°  | 3695.5 | 3659.4 | 3607.1 | 3607.1 | 3599.1 |
| 25°    | 3587.2 | 3555.3 | 3487.4 | 3495.1 | 3487.4 |
| 27.5°  | 3467.0 | 3439.0 | 3387.2 | 3375.2 | 3355.3 |
| 30°    | 3347.2 | 3314.9 | 3255.0 | 3243.2 | 3227.0 |
| 32.5°  | 3218.9 | 3195.2 | 3131.0 | 3106.8 | 3090.7 |
| 35°    | 3094.9 | 3055.0 | 2990.8 | 2966.6 | 2946.7 |
| 37.5°  | 2954.7 | 2918.7 | 2854.5 | 2826.5 | 2806.5 |
| 40°    | 2810.8 | 2778.5 | 2714.3 | 2678.6 | 2662.5 |
| 42.5°  | 2670.6 | 2638.3 | 2574.5 | 2534.2 | 2510.4 |
| 45°    | 2518.5 | 2490.5 | 2430.1 | 2386.4 | 2370.3 |
| 47.5°  | 2370.3 | 2342.2 | 2278.1 | 2233.9 | 2210.1 |
| 50°    | 2213.9 | 2194.0 | 2137.9 | 2081.8 | 2061.8 |
| 52.5°  | 2061.8 | 2033.8 | 1982.0 | 1937.8 | 1909.8 |
| 55°    | 1905.9 | 1881.8 | 1833.7 | 1785.7 | 1765.8 |
| 57.5°  | 1749.6 | 1729.7 | 1677.4 | 1629.4 | 1613.3 |
| 60°    | 1593.3 | 1577.6 | 1521.5 | 1477.4 | 1465.4 |
| 62.5°  | 1441.3 | 1413.2 | 1373.3 | 1333.4 | 1317.2 |
| 65°    | 1285.4 | 1261.1 | 1221.2 | 1185.1 | 1165.2 |
| 67.5°  | 1125.2 | 1104.8 | 1069.2 | 1041.2 | 1025.0 |
| 70°    | 977.0  | 960.8  | 924.7  | 896.7  | 881.0  |
| 72.5°  | 824.9  | 808.8  | 788.8  | 760.8  | 748.9  |
| 75°    | 672.4  | 664.8  | 644.3  | 620.6  | 628.7  |
| 77.5°  | 536.5  | 520.3  | 512.3  | 500.3  | 488.5  |
| 80°    | 400.6  | 396.3  | 388.3  | 376.4  | 368.3  |
| 82.5°  | 272.2  | 272.2  | 268.5  | 252.4  | 252.4  |
| 85°    | 164.0  | 160.2  | 156.3  | 144.0  | 140.2  |
| 87.5°  | 72.2   | 64.1   | 56.1   | 44.1   | 39.9   |
| 90°    | 1.7    | 20.9   | 34.8   | 43.6   | 47.0   |
| 92.5°  | 43.6   | 36.6   | 41.8   | 45.3   | 47.0   |
| 95°    | 113.2  | 55.6   | 67.9   | 76.8   | 74.9   |
| 97.5°  | 203.8  | 61.0   | 88.7   | 94.2   | 95.8   |
| 100°   | 308.4  | 69.7   | 99.3   | 113.2  | 116.6  |
| 102.5° | 423.3  | 419.9  | 102.8  | 121.8  | 127.2  |
| 105°   | 529.6  | 581.9  | 106.3  | 125.4  | 132.4  |
| 107.5° | 653.3  | 696.7  | 109.9  | 128.9  | 135.9  |
| 110°   | 771.9  | 808.2  | 305.0  | 130.7  | 137.6  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 883.3  | 914.5  | 885.0  | 134.0  | 139.5  |
| 115°   | 1001.7 | 1031.3 | 1074.9 | 268.3  | 142.9  |
| 117.5° | 1104.5 | 1139.2 | 1169.0 | 919.7  | 463.4  |
| 120°   | 1219.5 | 1245.5 | 1277.0 | 1297.9 | 1062.7 |
| 122.5° | 1316.9 | 1344.9 | 1379.8 | 1390.2 | 1392.0 |
| 125°   | 1416.2 | 1439.0 | 1472.0 | 1484.3 | 1489.4 |
| 127.5° | 1506.8 | 1531.2 | 1557.6 | 1574.8 | 1576.5 |
| 130°   | 1592.2 | 1620.1 | 1639.2 | 1658.5 | 1656.8 |
| 132.5° | 1679.4 | 1702.1 | 1721.2 | 1736.9 | 1735.2 |
| 135°   | 1752.6 | 1780.5 | 1796.0 | 1813.6 | 1810.1 |
| 137.5° | 1829.2 | 1850.0 | 1867.6 | 1885.0 | 1879.8 |
| 140°   | 1904.0 | 1918.1 | 1937.2 | 1952.8 | 1944.1 |
| 142.5° | 1966.9 | 1979.1 | 2001.6 | 2015.5 | 2006.8 |
| 145°   | 2033.1 | 2031.2 | 2060.8 | 2073.0 | 2064.3 |
| 147.5° | 2090.4 | 2085.3 | 2114.8 | 2123.5 | 2116.7 |
| 150°   | 2146.3 | 2134.0 | 2162.0 | 2172.3 | 2163.6 |
| 152.5° | 2193.3 | 2179.3 | 2205.4 | 2216.0 | 2203.8 |
| 155°   | 2238.5 | 2223.0 | 2243.9 | 2254.2 | 2240.4 |
| 157.5° | 2275.1 | 2261.3 | 2277.0 | 2289.2 | 2275.1 |
| 160°   | 2306.6 | 2296.1 | 2306.6 | 2316.9 | 2304.7 |
| 162.5° | 2334.3 | 2324.0 | 2332.6 | 2344.8 | 2329.1 |
| 165°   | 2358.8 | 2348.4 | 2353.6 | 2365.7 | 2353.6 |
| 167.5° | 2377.9 | 2367.4 | 2372.8 | 2385.0 | 2369.3 |
| 170°   | 2393.7 | 2383.1 | 2386.7 | 2398.9 | 2383.1 |
| 172.5° | 2404.1 | 2393.7 | 2397.2 | 2409.4 | 2393.7 |
| 175°   | 2412.7 | 2400.5 | 2404.1 | 2416.2 | 2398.9 |
| 177.5° | 2416.2 | 2404.1 | 2405.8 | 2418.1 | 2402.4 |
| 180°   | 2407.5 | 2407.5 | 2407.5 | 2407.5 | 2407.5 |

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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 | 12.30            | 13.26 | 13.17 | 14.15 | 15.27 | 11.87          | 12.83 | 12.73 | 13.71 | 14.84 |
|                 | 3H   | 13.97            | 14.83 | 14.85 | 15.72 | 16.87 | 13.49          | 14.36 | 14.37 | 15.25 | 16.40 |
|                 | 4H   | 14.56            | 15.37 | 15.45 | 16.28 | 17.43 | 14.09          | 14.90 | 14.98 | 15.80 | 16.96 |
|                 | 6H   | 14.96            | 15.71 | 15.87 | 16.62 | 17.79 | 14.49          | 15.24 | 15.39 | 16.15 | 17.32 |
|                 | 8H   | 15.07            | 15.79 | 15.99 | 16.71 | 17.88 | 14.60          | 15.31 | 15.51 | 16.24 | 17.41 |
|                 | 12H  | 15.12            | 15.80 | 16.04 | 16.72 | 17.92 | 14.64          | 15.32 | 15.56 | 16.24 | 17.44 |
| 4H              | 2H   | 12.77            | 13.59 | 13.67 | 14.49 | 15.65 | 12.43          | 13.24 | 13.33 | 14.15 | 15.30 |
|                 | 3H   | 14.65            | 15.33 | 15.56 | 16.26 | 17.43 | 14.26          | 14.93 | 15.17 | 15.87 | 17.04 |
|                 | 4H   | 15.37            | 15.99 | 16.29 | 16.92 | 18.11 | 14.96          | 15.58 | 15.88 | 16.51 | 17.71 |
|                 | 6H   | 15.89            | 16.42 | 16.82 | 17.38 | 18.57 | 15.48          | 16.01 | 16.41 | 16.97 | 18.16 |
|                 | 8H   | 16.04            | 16.54 | 16.98 | 17.49 | 18.70 | 15.63          | 16.13 | 16.56 | 17.07 | 18.29 |
|                 | 12H  | 16.12            | 16.57 | 17.07 | 17.53 | 18.75 | 15.69          | 16.15 | 16.65 | 17.11 | 18.33 |
| 8H              | 4H   | 15.57            | 16.07 | 16.51 | 17.02 | 18.23 | 15.21          | 15.71 | 16.15 | 16.66 | 17.87 |
|                 | 6H   | 16.21            | 16.62 | 17.17 | 17.61 | 18.82 | 15.84          | 16.26 | 16.81 | 17.25 | 18.46 |
|                 | 8H   | 16.43            | 16.79 | 17.40 | 17.77 | 19.00 | 16.06          | 16.43 | 17.03 | 17.40 | 18.63 |
|                 | 12H  | 16.56            | 16.89 | 17.54 | 17.86 | 19.13 | 16.18          | 16.50 | 17.16 | 17.47 | 18.75 |
| 12H             | 4H   | 15.56            | 16.01 | 16.52 | 16.98 | 18.19 | 15.21          | 15.66 | 16.17 | 16.63 | 17.84 |
|                 | 6H   | 16.24            | 16.60 | 17.21 | 17.58 | 18.81 | 15.89          | 16.25 | 16.86 | 17.23 | 18.46 |
|                 | 8H   | 16.48            | 16.81 | 17.46 | 17.78 | 19.05 | 16.13          | 16.45 | 17.10 | 17.42 | 18.70 |