

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: P919824

Luminaire Tested: DFN2DIP-PN4F0-120D100US935-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P919824  
REPORT IS A COMBINATION OF REPORTS P899733 AND P896497  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-120D100US935-FLLFLL  
Description: 4 foot, Pentagon Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

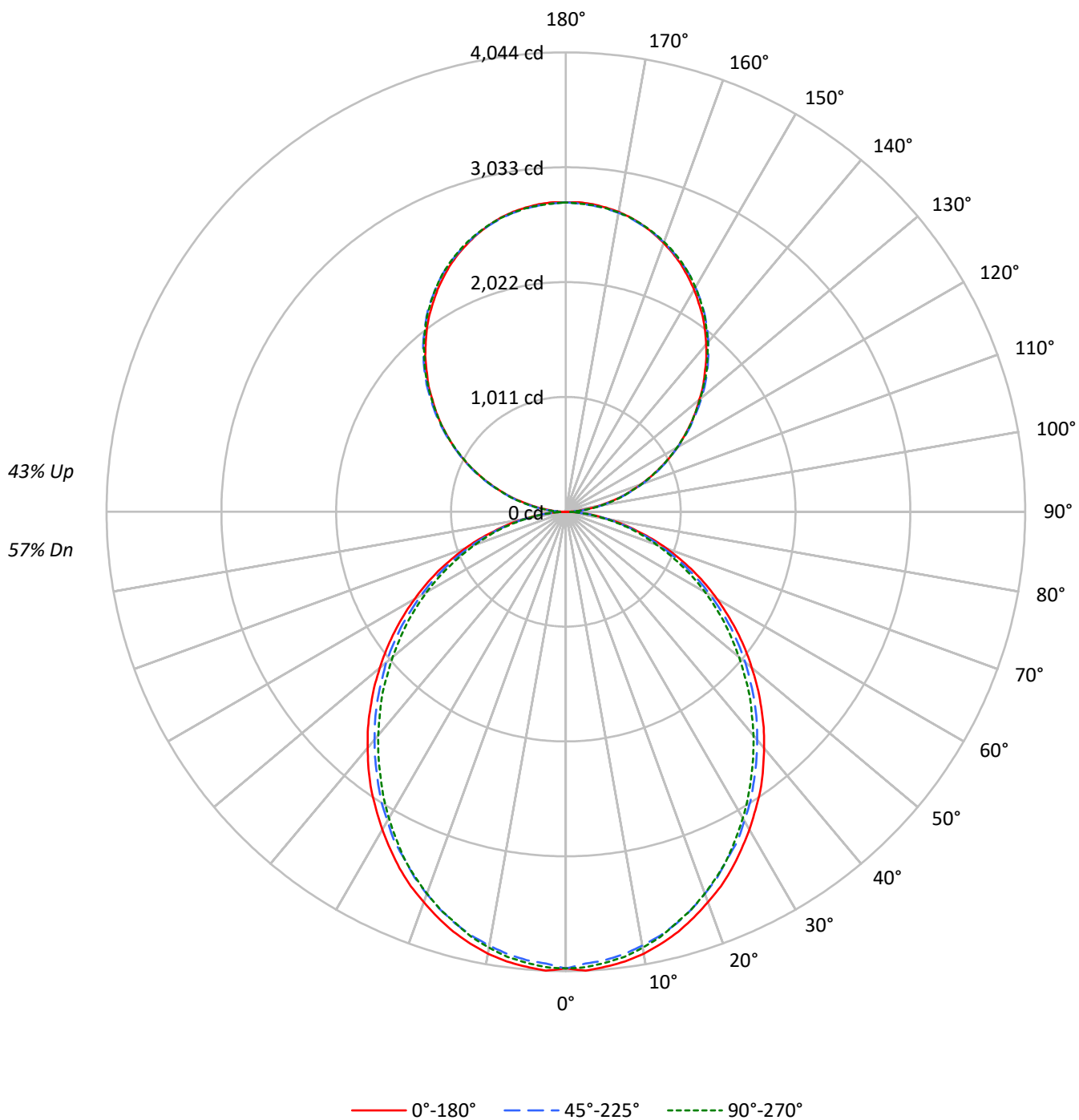
Lumens per Lamp: N/A  
Luminaire Lumens: 17848.5 lumens  
Efficiency: N/A  
Efficacy: 88.7 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.74' x L: 3.94' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 201.2  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9781  
Total Harmonic Distortion (THDi): 0.075  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P919824

CATALOG NUMBER: DFN2DIP-PN4F0-120D100US935-FLLFLL

### Luminous Intensity Polar Plot



TEST NUMBER: P919824

CATALOG NUMBER: DFN2DIP-PN4F0-120D100US935-FLLFL

**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 | 75 | 75 | 75 | 63 | 63 | 63 |
| 1   | 99  | 95  | 91  | 88  | 92  | 89  | 85  | 82  | 77 | 74 | 72 | 66 | 64 | 62 | 56 | 54 | 53 |
| 2   | 91  | 83  | 77  | 72  | 84  | 78  | 72  | 67  | 67 | 63 | 60 | 58 | 55 | 52 | 49 | 47 | 45 |
| 3   | 83  | 73  | 66  | 60  | 77  | 68  | 62  | 56  | 59 | 54 | 50 | 51 | 47 | 44 | 43 | 41 | 38 |
| 4   | 76  | 65  | 57  | 51  | 70  | 61  | 53  | 48  | 53 | 47 | 43 | 46 | 41 | 38 | 39 | 36 | 33 |
| 5   | 69  | 58  | 49  | 43  | 64  | 54  | 47  | 41  | 47 | 41 | 37 | 41 | 36 | 33 | 35 | 31 | 29 |
| 6   | 64  | 52  | 44  | 38  | 59  | 49  | 41  | 36  | 43 | 37 | 32 | 37 | 32 | 29 | 32 | 28 | 25 |
| 7   | 59  | 47  | 39  | 33  | 55  | 44  | 37  | 32  | 39 | 33 | 28 | 34 | 29 | 25 | 29 | 25 | 22 |
| 8   | 55  | 43  | 35  | 29  | 51  | 40  | 33  | 28  | 35 | 29 | 25 | 31 | 26 | 23 | 27 | 23 | 20 |
| 9   | 51  | 39  | 31  | 26  | 48  | 37  | 30  | 25  | 32 | 27 | 23 | 28 | 24 | 20 | 25 | 21 | 18 |
| 10  | 48  | 36  | 28  | 24  | 45  | 34  | 27  | 23  | 30 | 24 | 21 | 26 | 22 | 19 | 23 | 19 | 17 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2935 | 2935 | 2935 |
| 5°  | 2939 | 2894 | 2914 |
| 10° | 2915 | 2856 | 2875 |
| 15° | 2873 | 2809 | 2814 |
| 20° | 2815 | 2744 | 2751 |
| 25° | 2757 | 2666 | 2679 |
| 30° | 2685 | 2594 | 2586 |
| 35° | 2616 | 2509 | 2489 |
| 40° | 2532 | 2422 | 2396 |
| 45° | 2448 | 2336 | 2301 |
| 50° | 2356 | 2246 | 2191 |
| 55° | 2260 | 2141 | 2090 |
| 60° | 2151 | 2016 | 1974 |
| 65° | 2033 | 1887 | 1838 |
| 70° | 1882 | 1731 | 1692 |
| 75° | 1673 | 1543 | 1557 |
| 80° | 1421 | 1304 | 1298 |
| 85° | 1028 | 889  | 868  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2448 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 378.4   | 2.1       |
| 10°-20°   | 1064.6  | 6.0       |
| 20°-30°   | 1564.6  | 8.8       |
| 30°-40°   | 1817.2  | 10.2      |
| 40°-50°   | 1814.9  | 10.2      |
| 50°-60°   | 1582.5  | 8.9       |
| 60°-70°   | 1169.9  | 6.6       |
| 70°-80°   | 661.9   | 3.7       |
| 80°-90°   | 182.4   | 1.0       |
| 90°-100°  | 168.5   | 0.9       |
| 100°-110° | 535.4   | 3.0       |
| 110°-120° | 916.2   | 5.1       |
| 120°-130° | 1204.9  | 6.8       |
| 130°-140° | 1352.5  | 7.6       |
| 140°-150° | 1326.3  | 7.4       |
| 150°-160° | 1112.6  | 6.2       |
| 160°-170° | 737.8   | 4.1       |
| 170°-180° | 257.9   | 1.4       |
| 0°-30°    | 3007.6  | 16.9      |
| 0°-40°    | 4824.8  | 27.0      |
| 0°-60°    | 8222.2  | 46.1      |
| 0°-90°    | 10236.4 | 57.4      |
| 90°-120°  | 1620.1  | 9.1       |
| 90°-150°  | 5503.8  | 30.8      |
| 90°-180°  | 7612.0  | 42.6      |
| 0°-180°   | 17848.5 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 4020 | 4020  | 4020 | 4020  | 4020 |      |
| 5°   | 4020 | 4005  | 3962 | 3993  | 3986 | 382  |
| 15°  | 3827 | 3804  | 3754 | 3769  | 3750 | 1078 |
| 25°  | 3464 | 3433  | 3367 | 3375  | 3367 | 1594 |
| 35°  | 2988 | 2950  | 2888 | 2864  | 2845 | 1866 |
| 45°  | 2432 | 2405  | 2346 | 2304  | 2289 | 1877 |
| 55°  | 1840 | 1817  | 1771 | 1724  | 1705 | 1645 |
| 65°  | 1241 | 1218  | 1179 | 1144  | 1125 | 1227 |
| 75°  | 649  | 642   | 622  | 599   | 607  | 693  |
| 85°  | 158  | 155   | 151  | 139   | 135  | 177  |
| 90°  | 2    | 30    | 80   | 76    | 78   | 17   |
| 95°  | 120  | 143   | 147  | 147   | 143  | 133  |
| 105° | 494  | 501   | 506  | 510   | 510  | 522  |
| 115° | 920  | 932   | 928  | 926   | 920  | 909  |
| 125° | 1337 | 1358  | 1351 | 1344  | 1341 | 1195 |
| 135° | 1730 | 1755  | 1760 | 1758  | 1751 | 1337 |
| 145° | 2100 | 2116  | 2130 | 2132  | 2123 | 1312 |
| 155° | 2401 | 2408  | 2415 | 2427  | 2419 | 1105 |
| 165° | 2612 | 2610  | 2610 | 2626  | 2615 | 737  |
| 175° | 2718 | 2712  | 2707 | 2723  | 2709 | 258  |
| 180° | 2723 | 2723  | 2723 | 2723  | 2723 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 4020.3 | 4020.3 | 4020.3 | 4020.3 | 4020.3 |
| 2.5°   | 4043.6 | 4024.3 | 3981.7 | 4020.3 | 4012.9 |
| 5°     | 4020.3 | 4005.0 | 3962.4 | 3993.1 | 3985.7 |
| 7.5°   | 3993.1 | 3970.1 | 3927.5 | 3958.7 | 3950.9 |
| 10°    | 3950.9 | 3923.8 | 3877.5 | 3908.2 | 3896.8 |
| 12.5°  | 3892.7 | 3869.7 | 3823.3 | 3842.6 | 3834.8 |
| 15°    | 3827.0 | 3804.1 | 3753.6 | 3769.2 | 3749.9 |
| 17.5°  | 3745.9 | 3722.9 | 3672.4 | 3691.7 | 3672.4 |
| 20°    | 3656.8 | 3633.8 | 3579.8 | 3591.2 | 3576.1 |
| 22.5°  | 3568.2 | 3533.4 | 3482.9 | 3482.9 | 3475.2 |
| 25°    | 3463.6 | 3432.9 | 3367.3 | 3374.7 | 3367.3 |
| 27.5°  | 3347.6 | 3320.5 | 3270.5 | 3259.0 | 3239.8 |
| 30°    | 3231.9 | 3200.8 | 3142.9 | 3131.4 | 3115.9 |
| 32.5°  | 3108.0 | 3085.1 | 3023.1 | 2999.8 | 2984.2 |
| 35°    | 2988.3 | 2949.8 | 2887.8 | 2864.5 | 2845.2 |
| 37.5°  | 2852.9 | 2818.1 | 2756.1 | 2729.1 | 2709.8 |
| 40°    | 2714.0 | 2682.8 | 2620.8 | 2586.4 | 2570.8 |
| 42.5°  | 2578.6 | 2547.4 | 2485.9 | 2447.0 | 2424.0 |
| 45°    | 2431.7 | 2404.7 | 2346.4 | 2304.2 | 2288.6 |
| 47.5°  | 2288.6 | 2261.5 | 2199.6 | 2157.0 | 2134.0 |
| 50°    | 2137.7 | 2118.4 | 2064.2 | 2010.1 | 1990.8 |
| 52.5°  | 1990.8 | 1963.8 | 1913.7 | 1871.0 | 1844.0 |
| 55°    | 1840.3 | 1817.0 | 1770.6 | 1724.2 | 1704.9 |
| 57.5°  | 1689.4 | 1670.1 | 1619.6 | 1573.3 | 1557.7 |
| 60°    | 1538.4 | 1523.3 | 1469.1 | 1426.5 | 1415.0 |
| 62.5°  | 1391.6 | 1364.5 | 1326.0 | 1287.5 | 1271.9 |
| 65°    | 1241.1 | 1217.7 | 1179.1 | 1144.3 | 1125.1 |
| 67.5°  | 1086.5 | 1066.8 | 1032.3 | 1005.3 | 989.7  |
| 70°    | 943.3  | 927.7  | 892.9  | 865.8  | 850.7  |
| 72.5°  | 796.5  | 780.9  | 761.6  | 734.6  | 723.1  |
| 75°    | 649.3  | 641.9  | 622.2  | 599.3  | 607.0  |
| 77.5°  | 518.0  | 502.4  | 494.6  | 483.1  | 471.7  |
| 80°    | 386.8  | 382.6  | 374.9  | 363.4  | 355.6  |
| 82.5°  | 262.9  | 262.9  | 259.2  | 243.7  | 243.7  |
| 85°    | 158.3  | 154.6  | 150.9  | 139.1  | 135.3  |
| 87.5°  | 69.7   | 61.9   | 54.2   | 42.6   | 38.6   |
| 90°    | 2.5    | 29.5   | 80.4   | 75.5   | 78.0   |
| 92.5°  | 50.9   | 69.0   | 71.5   | 73.9   | 73.9   |
| 95°    | 119.9  | 142.8  | 147.0  | 147.0  | 142.8  |
| 97.5°  | 199.5  | 220.8  | 229.9  | 229.9  | 229.9  |
| 100°   | 291.4  | 310.3  | 316.8  | 316.8  | 314.4  |
| 102.5° | 388.3  | 402.3  | 411.3  | 413.7  | 411.3  |
| 105°   | 494.2  | 500.8  | 505.7  | 509.8  | 509.8  |
| 107.5° | 599.3  | 609.2  | 609.2  | 610.8  | 599.3  |
| 110°   | 701.1  | 714.2  | 714.2  | 714.2  | 707.7  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 811.1  | 825.0  | 822.6  | 816.0  | 811.1  |
| 115°   | 919.5  | 932.5  | 928.5  | 926.0  | 919.5  |
| 117.5° | 1027.0 | 1045.1 | 1033.5 | 1027.0 | 1020.4 |
| 120°   | 1135.3 | 1153.4 | 1135.3 | 1135.3 | 1128.0 |
| 122.5° | 1233.8 | 1256.8 | 1245.3 | 1238.8 | 1233.8 |
| 125°   | 1337.3 | 1357.8 | 1351.3 | 1343.8 | 1341.4 |
| 127.5° | 1438.3 | 1463.7 | 1454.7 | 1444.8 | 1438.3 |
| 130°   | 1532.7 | 1562.2 | 1558.1 | 1553.2 | 1544.2 |
| 132.5° | 1638.6 | 1661.6 | 1663.2 | 1651.7 | 1645.1 |
| 135°   | 1729.7 | 1755.1 | 1760.1 | 1757.6 | 1751.0 |
| 137.5° | 1831.5 | 1852.0 | 1856.1 | 1854.5 | 1844.6 |
| 140°   | 1921.0 | 1941.5 | 1953.0 | 1953.0 | 1944.0 |
| 142.5° | 2012.9 | 2033.4 | 2040.0 | 2042.5 | 2033.4 |
| 145°   | 2099.9 | 2116.3 | 2129.5 | 2131.9 | 2122.9 |
| 147.5° | 2177.9 | 2198.5 | 2208.3 | 2212.4 | 2203.4 |
| 150°   | 2258.4 | 2272.3 | 2281.4 | 2288.7 | 2281.4 |
| 152.5° | 2329.8 | 2343.7 | 2355.3 | 2364.3 | 2355.3 |
| 155°   | 2401.2 | 2407.8 | 2415.2 | 2426.6 | 2419.2 |
| 157.5° | 2462.8 | 2467.7 | 2471.8 | 2488.2 | 2476.7 |
| 160°   | 2517.8 | 2522.7 | 2525.1 | 2539.1 | 2529.3 |
| 162.5° | 2568.7 | 2568.7 | 2571.1 | 2586.7 | 2575.2 |
| 165°   | 2612.2 | 2609.7 | 2609.7 | 2626.1 | 2614.7 |
| 167.5° | 2651.6 | 2644.2 | 2644.2 | 2660.7 | 2649.1 |
| 170°   | 2681.1 | 2674.6 | 2672.1 | 2688.6 | 2674.6 |
| 172.5° | 2701.6 | 2695.1 | 2692.6 | 2709.0 | 2695.1 |
| 175°   | 2718.1 | 2711.5 | 2706.6 | 2723.0 | 2709.0 |
| 177.5° | 2727.1 | 2720.6 | 2715.6 | 2729.5 | 2715.6 |
| 180°   | 2723.0 | 2723.0 | 2723.0 | 2723.0 | 2723.0 |

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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 | 11.67            | 12.60 | 12.56 | 13.51 | 14.68 | 11.23          | 12.16 | 12.12 | 13.07 | 14.24 |
|                 | 3H   | 13.34            | 14.18 | 14.24 | 15.10 | 16.28 | 12.85          | 13.69 | 13.76 | 14.61 | 15.80 |
|                 | 4H   | 13.93            | 14.72 | 14.85 | 15.65 | 16.85 | 13.44          | 14.24 | 14.36 | 15.16 | 16.36 |
|                 | 6H   | 14.34            | 15.07 | 15.27 | 16.00 | 17.21 | 13.85          | 14.57 | 14.78 | 15.51 | 16.72 |
|                 | 8H   | 14.45            | 15.14 | 15.38 | 16.09 | 17.30 | 13.95          | 14.65 | 14.89 | 15.60 | 16.81 |
|                 | 12H  | 14.50            | 15.16 | 15.44 | 16.10 | 17.34 | 14.00          | 14.66 | 14.94 | 15.60 | 16.84 |
| 4H              | 2H   | 12.14            | 12.93 | 13.06 | 13.86 | 15.05 | 11.79          | 12.58 | 12.71 | 13.51 | 14.70 |
|                 | 3H   | 14.02            | 14.68 | 14.95 | 15.63 | 16.84 | 13.61          | 14.27 | 14.55 | 15.23 | 16.44 |
|                 | 4H   | 14.74            | 15.34 | 15.68 | 16.29 | 17.53 | 14.32          | 14.92 | 15.26 | 15.87 | 17.11 |
|                 | 6H   | 15.26            | 15.78 | 16.22 | 16.75 | 17.99 | 14.83          | 15.35 | 15.79 | 16.33 | 17.56 |
|                 | 8H   | 15.41            | 15.90 | 16.37 | 16.87 | 18.12 | 14.98          | 15.47 | 15.94 | 16.44 | 17.69 |
|                 | 12H  | 15.49            | 15.93 | 16.47 | 16.91 | 18.17 | 15.05          | 15.49 | 16.03 | 16.47 | 17.73 |
| 8H              | 4H   | 14.94            | 15.42 | 15.90 | 16.39 | 17.64 | 14.57          | 15.05 | 15.53 | 16.02 | 17.27 |
|                 | 6H   | 15.58            | 15.98 | 16.56 | 16.99 | 18.24 | 15.20          | 15.60 | 16.18 | 16.61 | 17.86 |
|                 | 8H   | 15.80            | 16.15 | 16.79 | 17.15 | 18.42 | 15.41          | 15.77 | 16.41 | 16.77 | 18.04 |
|                 | 12H  | 15.94            | 16.25 | 16.93 | 17.24 | 18.55 | 15.53          | 15.85 | 16.53 | 16.84 | 18.15 |
| 12H             | 4H   | 14.93            | 15.37 | 15.91 | 16.35 | 17.61 | 14.56          | 15.00 | 15.54 | 15.99 | 17.24 |
|                 | 6H   | 15.61            | 15.96 | 16.60 | 16.96 | 18.23 | 15.24          | 15.60 | 16.24 | 16.60 | 17.86 |
|                 | 8H   | 15.85            | 16.17 | 16.85 | 17.16 | 18.47 | 15.48          | 15.79 | 16.48 | 16.79 | 18.10 |