

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: P922528

Luminaire Tested: DFN2DIP-PN4F0-120D040US940-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P922528  
REPORT IS A COMBINATION OF REPORTS P899625 AND P896497  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-120D040US940-FLLFLL  
Description: 4 foot, Pentagon Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

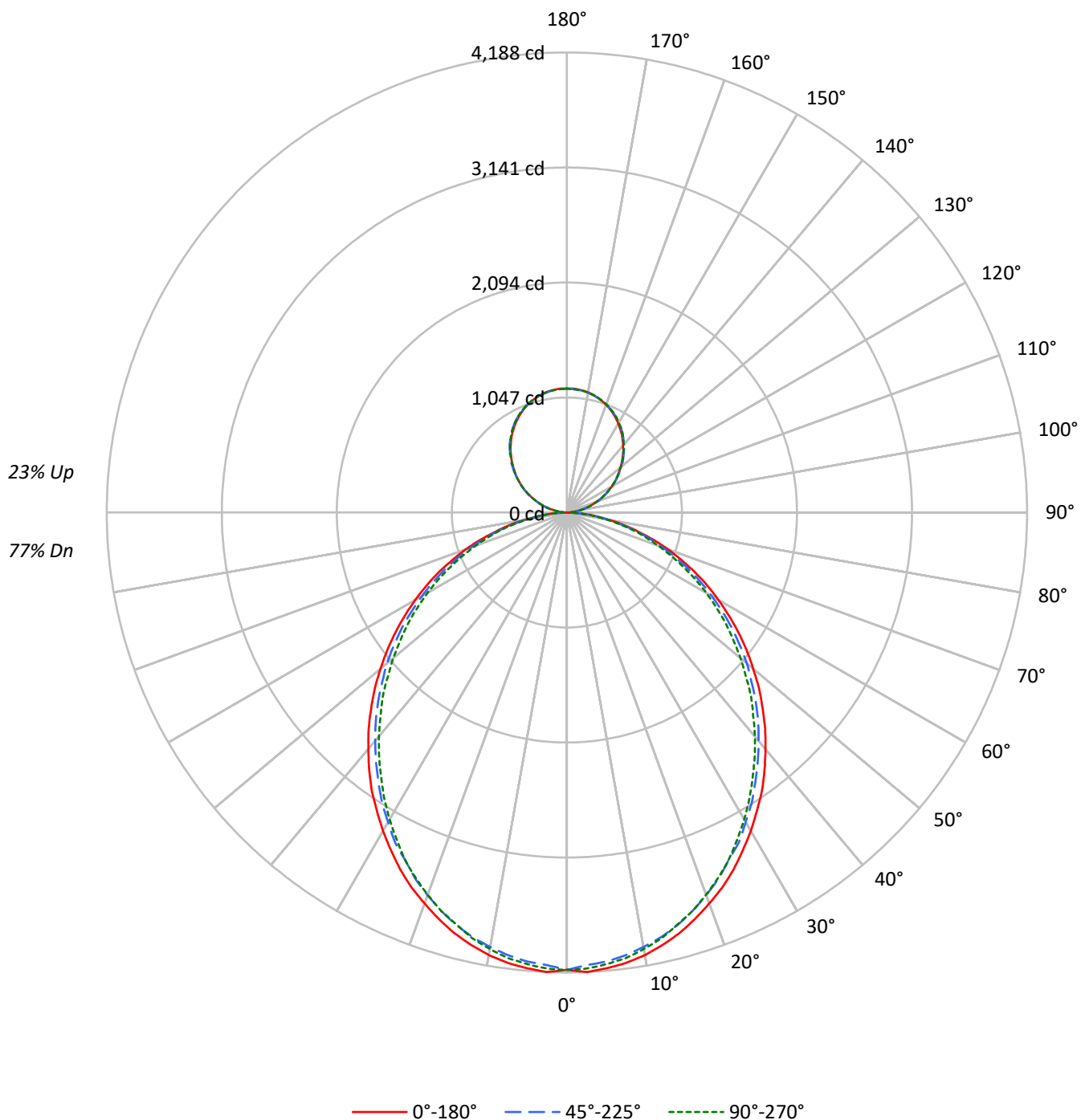
Lumens per Lamp: N/A  
Luminaire Lumens: 13750.2 lumens  
Efficiency: N/A  
Efficacy: 87.8 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.74' x L: 3.94' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 156.6  
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: P922528

CATALOG NUMBER: DFN2DIP-PN4F0-120D040US940-FLLFLL

### Luminous Intensity Polar Plot



TEST NUMBER: P922528

CATALOG NUMBER: DFN2DIP-PN4F0-120D040US940-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   | 114 | 114 | 114 | 114 | 108 | 108 | 108 | 108 | 98 | 98 | 98 | 89 | 89 | 89 | 81 | 81 | 81 |
| 1   | 104 | 99  | 95  | 92  | 99  | 95  | 91  | 88  | 86 | 84 | 81 | 79 | 77 | 75 | 72 | 70 | 68 |
| 2   | 95  | 87  | 80  | 75  | 90  | 83  | 77  | 72  | 76 | 71 | 67 | 69 | 66 | 62 | 63 | 60 | 58 |
| 3   | 86  | 76  | 69  | 63  | 82  | 73  | 66  | 61  | 67 | 61 | 57 | 61 | 57 | 53 | 56 | 52 | 49 |
| 4   | 79  | 68  | 59  | 53  | 75  | 65  | 57  | 52  | 60 | 53 | 48 | 55 | 50 | 45 | 50 | 46 | 42 |
| 5   | 73  | 61  | 52  | 46  | 69  | 58  | 50  | 44  | 53 | 47 | 42 | 49 | 44 | 39 | 45 | 41 | 37 |
| 6   | 67  | 55  | 46  | 40  | 64  | 52  | 45  | 39  | 48 | 42 | 37 | 45 | 39 | 35 | 41 | 36 | 33 |
| 7   | 62  | 49  | 41  | 35  | 59  | 48  | 40  | 34  | 44 | 37 | 33 | 41 | 35 | 31 | 37 | 33 | 29 |
| 8   | 58  | 45  | 37  | 31  | 55  | 43  | 36  | 31  | 40 | 34 | 29 | 37 | 32 | 28 | 34 | 30 | 26 |
| 9   | 54  | 41  | 33  | 28  | 52  | 40  | 32  | 27  | 37 | 31 | 26 | 34 | 29 | 25 | 32 | 27 | 24 |
| 10  | 51  | 38  | 30  | 25  | 48  | 37  | 30  | 25  | 34 | 28 | 24 | 32 | 26 | 23 | 30 | 25 | 22 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3039 | 3039 | 3039 |
| 5°  | 3044 | 2997 | 3018 |
| 10° | 3019 | 2957 | 2977 |
| 15° | 2975 | 2909 | 2914 |
| 20° | 2915 | 2842 | 2849 |
| 25° | 2855 | 2761 | 2774 |
| 30° | 2781 | 2686 | 2679 |
| 35° | 2710 | 2598 | 2578 |
| 40° | 2623 | 2509 | 2481 |
| 45° | 2535 | 2419 | 2383 |
| 50° | 2440 | 2326 | 2269 |
| 55° | 2341 | 2217 | 2165 |
| 60° | 2228 | 2088 | 2045 |
| 65° | 2106 | 1955 | 1904 |
| 70° | 1949 | 1792 | 1752 |
| 75° | 1732 | 1598 | 1612 |
| 80° | 1472 | 1350 | 1345 |
| 85° | 1065 | 921  | 900  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2535 cd/sqm

TEST NUMBER: P922528

CATALOG NUMBER: DFN2DIP-PN4F0-120D040US940-FLLFLL

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 391.9   | 2.9       |
| 10°-20°   | 1102.6  | 8.0       |
| 20°-30°   | 1620.4  | 11.8      |
| 30°-40°   | 1882.0  | 13.7      |
| 40°-50°   | 1879.7  | 13.7      |
| 50°-60°   | 1639.0  | 11.9      |
| 60°-70°   | 1211.6  | 8.8       |
| 70°-80°   | 685.5   | 5.0       |
| 80°-90°   | 184.1   | 1.3       |
| 90°-100°  | 69.8    | 0.5       |
| 100°-110° | 221.8   | 1.6       |
| 110°-120° | 379.5   | 2.8       |
| 120°-130° | 499.2   | 3.6       |
| 130°-140° | 560.3   | 4.1       |
| 140°-150° | 549.4   | 4.0       |
| 150°-160° | 460.9   | 3.4       |
| 160°-170° | 305.7   | 2.2       |
| 170°-180° | 106.8   | 0.8       |
| 0°-30°    | 3114.9  | 22.7      |
| 0°-40°    | 4996.9  | 36.3      |
| 0°-60°    | 8515.5  | 61.9      |
| 0°-90°    | 10596.7 | 77.1      |
| 90°-120°  | 671.2   | 4.9       |
| 90°-150°  | 2280.1  | 16.6      |
| 90°-180°  | 3153.0  | 22.9      |
| 0°-180°   | 13750.2 | 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°  | 1    | 12    | 33   | 31    | 32   | 13   |
| 95°  | 50   | 59    | 61   | 61    | 59   | 55   |
| 105° | 205  | 207   | 210  | 211   | 211  | 216  |
| 115° | 381  | 386   | 385  | 384   | 381  | 377  |
| 125° | 554  | 562   | 560  | 557   | 556  | 495  |
| 135° | 717  | 727   | 729  | 728   | 725  | 554  |
| 145° | 870  | 877   | 882  | 883   | 880  | 544  |
| 155° | 995  | 998   | 1000 | 1005  | 1002 | 458  |
| 165° | 1082 | 1081  | 1081 | 1088  | 1083 | 305  |
| 175° | 1126 | 1123  | 1121 | 1128  | 1122 | 107  |
| 180° | 1128 | 1128  | 1128 | 1128  | 1128 |      |

TEST NUMBER: P922528

CATALOG NUMBER: DFN2DIP-PN4F0-120D040US940-FLLFLL

**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°    | 1.0    | 12.2   | 33.3   | 31.3   | 32.3   |
| 92.5°  | 21.0   | 28.5   | 29.6   | 30.6   | 30.6   |
| 95°    | 49.7   | 59.2   | 60.9   | 60.9   | 59.2   |
| 97.5°  | 82.7   | 91.5   | 95.2   | 95.2   | 95.2   |
| 100°   | 120.7  | 128.6  | 131.3  | 131.3  | 130.3  |
| 102.5° | 160.9  | 166.7  | 170.4  | 171.4  | 170.4  |
| 105°   | 204.7  | 207.4  | 209.5  | 211.2  | 211.2  |
| 107.5° | 248.3  | 252.4  | 252.4  | 253.0  | 248.3  |
| 110°   | 290.4  | 295.9  | 295.9  | 295.9  | 293.2  |

TEST NUMBER: P922528

CATALOG NUMBER: DFN2DIP-PN4F0-120D040US940-FLLFL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 336.0  | 341.8  | 340.7  | 338.0  | 336.0  |
| 115°   | 380.8  | 386.4  | 384.6  | 383.6  | 380.8  |
| 117.5° | 425.4  | 432.9  | 428.2  | 425.4  | 422.8  |
| 120°   | 470.4  | 477.8  | 470.4  | 470.4  | 467.3  |
| 122.5° | 511.1  | 520.7  | 515.9  | 513.2  | 511.1  |
| 125°   | 554.0  | 562.5  | 559.8  | 556.7  | 555.7  |
| 127.5° | 595.8  | 606.4  | 602.6  | 598.5  | 595.8  |
| 130°   | 634.9  | 647.2  | 645.5  | 643.5  | 639.7  |
| 132.5° | 678.8  | 688.3  | 689.0  | 684.2  | 681.5  |
| 135°   | 716.6  | 727.1  | 729.2  | 728.1  | 725.4  |
| 137.5° | 758.8  | 767.2  | 768.9  | 768.2  | 764.2  |
| 140°   | 795.8  | 804.3  | 809.0  | 809.0  | 805.3  |
| 142.5° | 833.9  | 842.4  | 845.1  | 846.1  | 842.4  |
| 145°   | 870.0  | 876.7  | 882.2  | 883.2  | 879.5  |
| 147.5° | 902.2  | 910.7  | 914.8  | 916.5  | 912.8  |
| 150°   | 935.6  | 941.4  | 945.1  | 948.2  | 945.1  |
| 152.5° | 965.2  | 970.9  | 975.7  | 979.5  | 975.7  |
| 155°   | 994.7  | 997.5  | 1000.5 | 1005.3 | 1002.2 |
| 157.5° | 1020.3 | 1022.3 | 1024.0 | 1030.8 | 1026.0 |
| 160°   | 1043.0 | 1045.1 | 1046.1 | 1051.9 | 1047.8 |
| 162.5° | 1064.1 | 1064.1 | 1065.1 | 1071.6 | 1066.8 |
| 165°   | 1082.2 | 1081.1 | 1081.1 | 1087.9 | 1083.2 |
| 167.5° | 1098.5 | 1095.4 | 1095.4 | 1102.2 | 1097.4 |
| 170°   | 1110.7 | 1108.0 | 1107.0 | 1113.7 | 1108.0 |
| 172.5° | 1119.2 | 1116.5 | 1115.4 | 1122.3 | 1116.5 |
| 175°   | 1126.1 | 1123.3 | 1121.2 | 1128.0 | 1122.3 |
| 177.5° | 1129.8 | 1127.0 | 1125.0 | 1130.8 | 1125.0 |
| 180°   | 1128.0 | 1128.0 | 1128.0 | 1128.0 | 1128.0 |

TEST NUMBER: P922528

CATALOG NUMBER: DFN2DIP-PN4F0-120D040US940-FLLFLL

**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 | 13.34            | 14.51 | 14.02 | 15.21 | 16.04 | 12.90          | 14.07 | 13.58 | 14.77 | 15.60 |
|                 | 3H   | 15.02            | 16.08 | 15.72 | 16.79 | 17.65 | 14.54          | 15.59 | 15.24 | 16.31 | 17.16 |
|                 | 4H   | 15.63            | 16.62 | 16.34 | 17.34 | 18.21 | 15.14          | 16.14 | 15.86 | 16.86 | 17.73 |
|                 | 6H   | 16.05            | 16.96 | 16.78 | 17.70 | 18.58 | 15.55          | 16.47 | 16.28 | 17.20 | 18.09 |
|                 | 8H   | 16.16            | 17.04 | 16.90 | 17.79 | 18.67 | 15.67          | 16.54 | 16.41 | 17.30 | 18.18 |
|                 | 12H  | 16.22            | 17.06 | 16.97 | 17.80 | 18.72 | 15.72          | 16.56 | 16.47 | 17.30 | 18.22 |
| 4H              | 2H   | 13.84            | 14.83 | 14.56 | 15.55 | 16.42 | 13.49          | 14.48 | 14.21 | 15.20 | 16.07 |
|                 | 3H   | 15.73            | 16.56 | 16.47 | 17.32 | 18.21 | 15.33          | 16.16 | 16.06 | 16.92 | 17.81 |
|                 | 4H   | 16.46            | 17.22 | 17.21 | 17.98 | 18.89 | 16.04          | 16.80 | 16.79 | 17.56 | 18.48 |
|                 | 6H   | 17.00            | 17.65 | 17.76 | 18.44 | 19.36 | 16.57          | 17.23 | 17.34 | 18.01 | 18.94 |
|                 | 8H   | 17.16            | 17.77 | 17.93 | 18.55 | 19.49 | 16.73          | 17.34 | 17.50 | 18.12 | 19.06 |
|                 | 12H  | 17.25            | 17.80 | 18.04 | 18.60 | 19.54 | 16.81          | 17.36 | 17.60 | 18.16 | 19.10 |
| 8H              | 4H   | 16.68            | 17.30 | 17.46 | 18.08 | 19.01 | 16.31          | 16.92 | 17.08 | 17.71 | 18.64 |
|                 | 6H   | 17.33            | 17.84 | 18.13 | 18.66 | 19.60 | 16.96          | 17.46 | 17.76 | 18.29 | 19.23 |
|                 | 8H   | 17.56            | 18.01 | 18.37 | 18.83 | 19.79 | 17.17          | 17.62 | 17.99 | 18.45 | 19.40 |
|                 | 12H  | 17.71            | 18.10 | 18.52 | 18.92 | 19.93 | 17.30          | 17.70 | 18.12 | 18.52 | 19.53 |
| 12H             | 4H   | 16.68            | 17.24 | 17.48 | 18.04 | 18.98 | 16.32          | 16.87 | 17.11 | 17.68 | 18.62 |
|                 | 6H   | 17.36            | 17.82 | 18.18 | 18.64 | 19.59 | 17.00          | 17.45 | 17.81 | 18.28 | 19.23 |
|                 | 8H   | 17.62            | 18.02 | 18.44 | 18.83 | 19.85 | 17.25          | 17.65 | 18.07 | 18.46 | 19.48 |