

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: P923012

Luminaire Tested: DFN2DIP-SQ3F0-120D080US940-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P923012  
REPORT IS A COMBINATION OF REPORTS P899949 AND P896733  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ3F0-120D080US940-FLLFLL  
Description: 3 foot, Square Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

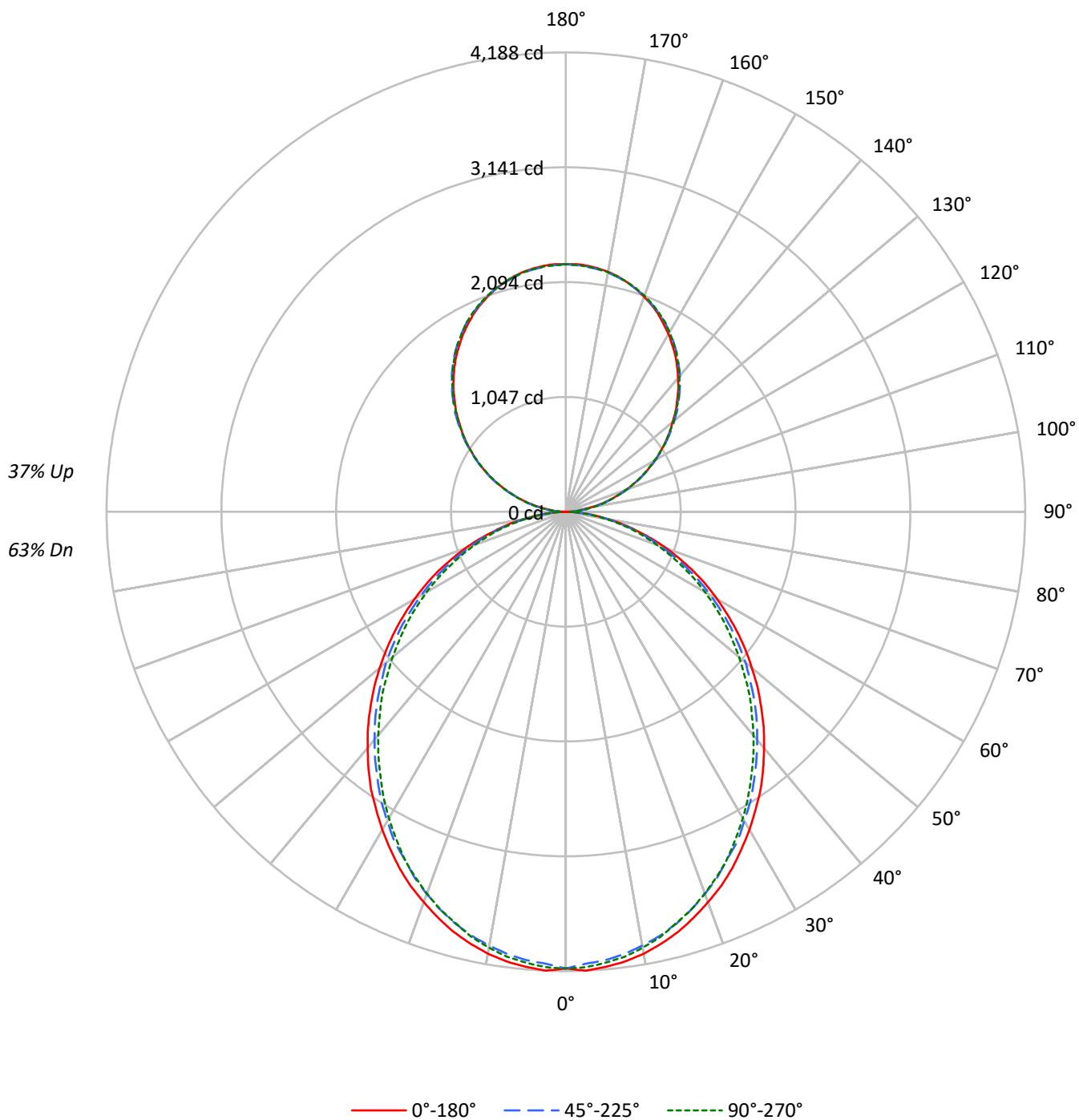
Lumens per Lamp: N/A  
Luminaire Lumens: 16906.8 lumens  
Efficiency: N/A  
Efficacy: 90.8 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.06' x L: 3.06' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 186.2  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9957  
Total Harmonic Distortion (THDi): 0.049  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

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CATALOG NUMBER: DFN2DIP-SQ3F0-120D080US940-FLLFLL

### Luminous Intensity Polar Plot



TEST NUMBER: P923012

CATALOG NUMBER: DFN2DIP-SQ3F0-120D080US940-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   | 110 | 110 | 110 | 110 | 103 | 103 | 103 | 103 | 90 | 90 | 90 | 79 | 79 | 79 | 68 | 68 | 68 |
| 1   | 101 | 96  | 92  | 89  | 94  | 90  | 87  | 84  | 79 | 77 | 74 | 69 | 67 | 66 | 60 | 59 | 57 |
| 2   | 92  | 84  | 78  | 72  | 86  | 79  | 73  | 69  | 70 | 65 | 62 | 61 | 58 | 55 | 53 | 50 | 48 |
| 3   | 84  | 74  | 66  | 60  | 78  | 70  | 63  | 58  | 61 | 56 | 52 | 54 | 50 | 46 | 47 | 44 | 41 |
| 4   | 77  | 66  | 57  | 51  | 71  | 62  | 54  | 49  | 55 | 49 | 44 | 48 | 43 | 40 | 42 | 38 | 35 |
| 5   | 70  | 58  | 50  | 44  | 66  | 55  | 48  | 42  | 49 | 43 | 38 | 43 | 38 | 35 | 38 | 34 | 31 |
| 6   | 65  | 53  | 44  | 38  | 61  | 50  | 42  | 37  | 44 | 38 | 33 | 39 | 34 | 30 | 34 | 30 | 27 |
| 7   | 60  | 48  | 39  | 34  | 56  | 45  | 38  | 32  | 40 | 34 | 30 | 36 | 31 | 27 | 31 | 27 | 24 |
| 8   | 56  | 43  | 35  | 30  | 52  | 41  | 34  | 29  | 37 | 31 | 26 | 33 | 28 | 24 | 29 | 25 | 22 |
| 9   | 52  | 40  | 32  | 27  | 49  | 38  | 30  | 26  | 34 | 28 | 24 | 30 | 25 | 22 | 27 | 23 | 20 |
| 10  | 49  | 36  | 29  | 24  | 46  | 35  | 28  | 23  | 31 | 25 | 21 | 28 | 23 | 20 | 25 | 21 | 18 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 4771 | 4771 | 4771 |
| 5°  | 4775 | 4701 | 4734 |
| 10° | 4734 | 4635 | 4669 |
| 15° | 4661 | 4555 | 4567 |
| 20° | 4564 | 4446 | 4463 |
| 25° | 4467 | 4316 | 4343 |
| 30° | 4347 | 4195 | 4191 |
| 35° | 4232 | 4052 | 4030 |
| 40° | 4092 | 3909 | 3876 |
| 45° | 3952 | 3764 | 3719 |
| 50° | 3799 | 3612 | 3538 |
| 55° | 3638 | 3437 | 3370 |
| 60° | 3456 | 3229 | 3178 |
| 65° | 3257 | 3013 | 2953 |
| 70° | 3004 | 2749 | 2709 |
| 75° | 2654 | 2433 | 2481 |
| 80° | 2231 | 2031 | 2051 |
| 85° | 1570 | 1345 | 1343 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 3952 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 391.9   | 2.3       |
| 10°-20°   | 1102.6  | 6.5       |
| 20°-30°   | 1620.4  | 9.6       |
| 30°-40°   | 1882.0  | 11.1      |
| 40°-50°   | 1879.7  | 11.1      |
| 50°-60°   | 1639.0  | 9.7       |
| 60°-70°   | 1211.6  | 7.2       |
| 70°-80°   | 685.5   | 4.1       |
| 80°-90°   | 187.3   | 1.1       |
| 90°-100°  | 139.6   | 0.8       |
| 100°-110° | 443.6   | 2.6       |
| 110°-120° | 759.1   | 4.5       |
| 120°-130° | 998.3   | 5.9       |
| 130°-140° | 1120.6  | 6.6       |
| 140°-150° | 1098.9  | 6.5       |
| 150°-160° | 921.8   | 5.5       |
| 160°-170° | 611.3   | 3.6       |
| 170°-180° | 213.7   | 1.3       |
| 0°-30°    | 3114.9  | 18.4      |
| 0°-40°    | 4996.9  | 29.6      |
| 0°-60°    | 8515.5  | 50.4      |
| 0°-90°    | 10599.9 | 62.7      |
| 90°-120°  | 1342.3  | 7.9       |
| 90°-150°  | 4560.1  | 27.0      |
| 90°-180°  | 6307.0  | 37.3      |
| 0°-180°   | 16906.8 | 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    | 24    | 67   | 63    | 65   | 16   |
| 95°  | 99   | 118   | 122  | 122   | 118  | 111  |
| 105° | 410  | 415   | 419  | 422   | 422  | 432  |
| 115° | 762  | 773   | 769  | 767   | 762  | 753  |
| 125° | 1108 | 1125  | 1120 | 1113  | 1111 | 990  |
| 135° | 1433 | 1454  | 1458 | 1456  | 1451 | 1108 |
| 145° | 1740 | 1754  | 1764 | 1766  | 1759 | 1087 |
| 155° | 1990 | 1995  | 2001 | 2010  | 2004 | 916  |
| 165° | 2164 | 2162  | 2162 | 2176  | 2166 | 611  |
| 175° | 2252 | 2247  | 2242 | 2256  | 2244 | 214  |
| 180° | 2256 | 2256  | 2256 | 2256  | 2256 |      |

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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°    | 2.1    | 24.5   | 66.7   | 62.6   | 64.6   |
| 92.5°  | 42.2   | 57.2   | 59.2   | 61.2   | 61.2   |
| 95°    | 99.3   | 118.3  | 121.7  | 121.7  | 118.3  |
| 97.5°  | 165.3  | 183.0  | 190.5  | 190.5  | 190.5  |
| 100°   | 241.5  | 257.1  | 262.5  | 262.5  | 260.5  |
| 102.5° | 321.7  | 333.3  | 340.7  | 342.8  | 340.7  |
| 105°   | 409.5  | 414.9  | 419.0  | 422.4  | 422.4  |
| 107.5° | 496.5  | 504.7  | 504.7  | 506.0  | 496.5  |
| 110°   | 580.9  | 591.7  | 591.7  | 591.7  | 586.3  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 672.0  | 683.6  | 681.5  | 676.1  | 672.0  |
| 115°   | 761.8  | 772.7  | 769.3  | 767.2  | 761.8  |
| 117.5° | 850.9  | 865.9  | 856.3  | 850.9  | 845.4  |
| 120°   | 940.7  | 955.6  | 940.7  | 940.7  | 934.5  |
| 122.5° | 1022.3 | 1041.3 | 1031.8 | 1026.4 | 1022.3 |
| 125°   | 1108.0 | 1125.0 | 1119.5 | 1113.4 | 1111.4 |
| 127.5° | 1191.7 | 1212.7 | 1205.2 | 1197.1 | 1191.7 |
| 130°   | 1269.9 | 1294.3 | 1290.9 | 1286.9 | 1279.4 |
| 132.5° | 1357.6 | 1376.6 | 1378.0 | 1368.5 | 1363.1 |
| 135°   | 1433.1 | 1454.2 | 1458.3 | 1456.3 | 1450.8 |
| 137.5° | 1517.4 | 1534.5 | 1537.8 | 1536.5 | 1528.3 |
| 140°   | 1591.6 | 1608.6 | 1618.1 | 1618.1 | 1610.6 |
| 142.5° | 1667.8 | 1684.8 | 1690.2 | 1692.3 | 1684.8 |
| 145°   | 1739.9 | 1753.5 | 1764.3 | 1766.4 | 1758.9 |
| 147.5° | 1804.5 | 1821.5 | 1829.6 | 1833.1 | 1825.6 |
| 150°   | 1871.2 | 1882.7 | 1890.2 | 1896.3 | 1890.2 |
| 152.5° | 1930.3 | 1941.9 | 1951.4 | 1958.9 | 1951.4 |
| 155°   | 1989.5 | 1994.9 | 2001.1 | 2010.5 | 2004.5 |
| 157.5° | 2040.5 | 2044.6 | 2048.0 | 2061.5 | 2052.1 |
| 160°   | 2086.1 | 2090.2 | 2092.2 | 2103.7 | 2095.6 |
| 162.5° | 2128.2 | 2128.2 | 2130.3 | 2143.2 | 2133.7 |
| 165°   | 2164.3 | 2162.2 | 2162.2 | 2175.9 | 2166.3 |
| 167.5° | 2196.9 | 2190.8 | 2190.8 | 2204.4 | 2194.9 |
| 170°   | 2221.4 | 2216.0 | 2213.9 | 2227.6 | 2216.0 |
| 172.5° | 2238.5 | 2233.0 | 2231.0 | 2244.5 | 2233.0 |
| 175°   | 2252.0 | 2246.6 | 2242.5 | 2256.1 | 2244.5 |
| 177.5° | 2259.5 | 2254.1 | 2250.0 | 2261.6 | 2250.0 |
| 180°   | 2256.1 | 2256.1 | 2256.1 | 2256.1 | 2256.1 |

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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 | 13.76            | 14.75 | 14.60 | 15.61 | 16.69 | 13.32          | 14.30 | 14.16 | 15.17 | 16.24 |
|                 | 3H   | 15.43            | 16.31 | 16.28 | 17.19 | 18.29 | 14.94          | 15.82 | 15.79 | 16.70 | 17.80 |
|                 | 4H   | 16.02            | 16.86 | 16.89 | 17.73 | 18.85 | 15.52          | 16.36 | 16.39 | 17.24 | 18.35 |
|                 | 6H   | 16.42            | 17.19 | 17.30 | 18.08 | 19.21 | 15.92          | 16.69 | 16.80 | 17.58 | 18.71 |
|                 | 8H   | 16.53            | 17.26 | 17.42 | 18.17 | 19.29 | 16.02          | 16.76 | 16.91 | 17.66 | 18.79 |
|                 | 12H  | 16.58            | 17.28 | 17.47 | 18.18 | 19.33 | 16.07          | 16.77 | 16.96 | 17.67 | 18.82 |
| 4H              | 2H   | 14.23            | 15.07 | 15.11 | 15.95 | 17.07 | 13.88          | 14.72 | 14.75 | 15.60 | 16.71 |
|                 | 3H   | 16.11            | 16.81 | 16.99 | 17.72 | 18.85 | 15.70          | 16.40 | 16.58 | 17.31 | 18.44 |
|                 | 4H   | 16.82            | 17.46 | 17.72 | 18.37 | 19.52 | 16.40          | 17.04 | 17.29 | 17.94 | 19.10 |
|                 | 6H   | 17.34            | 17.89 | 18.25 | 18.82 | 19.98 | 16.91          | 17.46 | 17.82 | 18.39 | 19.55 |
|                 | 8H   | 17.49            | 18.00 | 18.40 | 18.93 | 20.10 | 17.05          | 17.57 | 17.97 | 18.49 | 19.66 |
|                 | 12H  | 17.57            | 18.03 | 18.50 | 18.97 | 20.15 | 17.12          | 17.58 | 18.05 | 18.53 | 19.70 |
| 8H              | 4H   | 17.02            | 17.54 | 17.94 | 18.46 | 19.64 | 16.65          | 17.16 | 17.56 | 18.09 | 19.26 |
|                 | 6H   | 17.65            | 18.08 | 18.59 | 19.05 | 20.22 | 17.27          | 17.70 | 18.21 | 18.66 | 19.83 |
|                 | 8H   | 17.87            | 18.25 | 18.82 | 19.21 | 20.40 | 17.48          | 17.86 | 18.43 | 18.82 | 20.00 |
|                 | 12H  | 18.01            | 18.34 | 18.96 | 19.29 | 20.53 | 17.60          | 17.93 | 18.55 | 18.88 | 20.12 |
| 12H             | 4H   | 17.01            | 17.48 | 17.95 | 18.42 | 19.60 | 16.65          | 17.11 | 17.58 | 18.05 | 19.23 |
|                 | 6H   | 17.68            | 18.06 | 18.63 | 19.02 | 20.21 | 17.31          | 17.69 | 18.26 | 18.65 | 19.84 |
|                 | 8H   | 17.93            | 18.26 | 18.88 | 19.21 | 20.45 | 17.55          | 17.88 | 18.50 | 18.83 | 20.07 |