

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: P922984

Luminaire Tested: DFN2DIP-SQ3F0-110D100US940-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P922984  
REPORT IS A COMBINATION OF REPORTS P899983 AND P896733  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ3F0-110D100US940-FLLFLL  
Description: 3 foot, Square Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

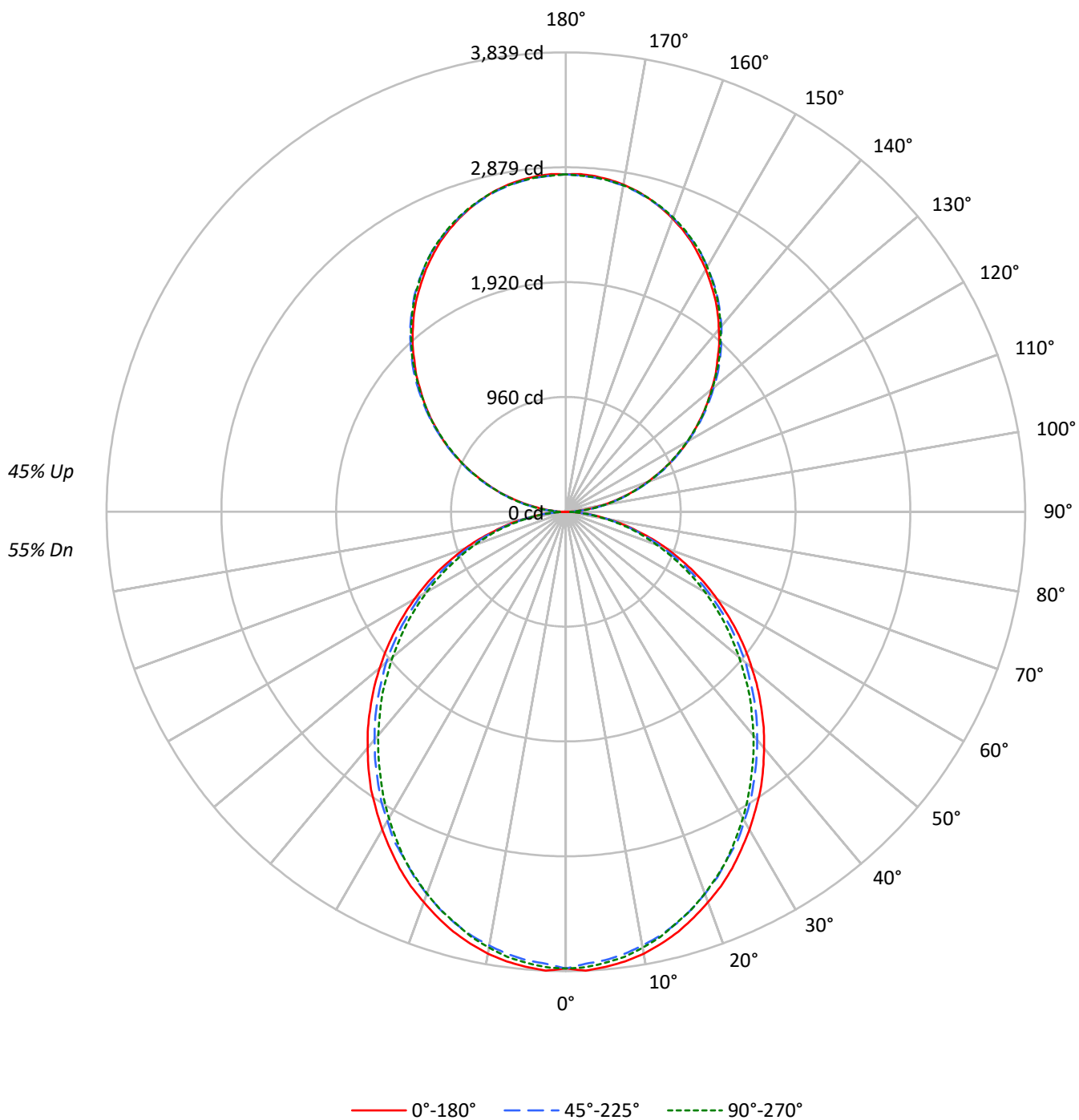
Lumens per Lamp: N/A  
Luminaire Lumens: 17602.4 lumens  
Efficiency: N/A  
Efficacy: 92.9 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.06' x L: 3.06' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 189.4  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9977  
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-SQ3F0-110D100US940-FLLFLL

### Luminous Intensity Polar Plot



TEST NUMBER: P922984

CATALOG NUMBER: DFN2DIP-SQ3F0-110D100US940-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   | 108 | 108 | 108 | 108 | 101 | 101 | 101 | 101 | 86 | 86 | 86 | 73 | 73 | 73 | 61 | 61 | 61 |
| 1   | 99  | 95  | 91  | 87  | 92  | 88  | 85  | 82  | 76 | 73 | 71 | 64 | 63 | 61 | 54 | 53 | 51 |
| 2   | 90  | 83  | 76  | 71  | 83  | 77  | 72  | 67  | 66 | 62 | 59 | 56 | 53 | 51 | 47 | 45 | 43 |
| 3   | 82  | 73  | 65  | 59  | 76  | 68  | 61  | 56  | 58 | 53 | 49 | 50 | 46 | 43 | 42 | 39 | 37 |
| 4   | 75  | 64  | 56  | 50  | 70  | 60  | 53  | 47  | 52 | 46 | 42 | 45 | 40 | 37 | 38 | 34 | 32 |
| 5   | 69  | 57  | 49  | 43  | 64  | 54  | 46  | 41  | 47 | 41 | 36 | 40 | 36 | 32 | 34 | 30 | 28 |
| 6   | 64  | 51  | 43  | 37  | 59  | 48  | 41  | 36  | 42 | 36 | 32 | 36 | 32 | 28 | 31 | 27 | 24 |
| 7   | 59  | 47  | 38  | 33  | 55  | 44  | 36  | 31  | 38 | 32 | 28 | 33 | 28 | 25 | 28 | 24 | 22 |
| 8   | 55  | 42  | 34  | 29  | 51  | 40  | 33  | 28  | 35 | 29 | 25 | 30 | 26 | 22 | 26 | 22 | 19 |
| 9   | 51  | 39  | 31  | 26  | 47  | 36  | 29  | 25  | 32 | 26 | 22 | 28 | 23 | 20 | 24 | 20 | 18 |
| 10  | 48  | 35  | 28  | 23  | 44  | 33  | 27  | 22  | 29 | 24 | 20 | 26 | 21 | 18 | 22 | 19 | 16 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 4373 | 4373 | 4373 |
| 5°  | 4377 | 4309 | 4340 |
| 10° | 4339 | 4248 | 4280 |
| 15° | 4273 | 4175 | 4186 |
| 20° | 4183 | 4075 | 4091 |
| 25° | 4095 | 3956 | 3981 |
| 30° | 3984 | 3845 | 3841 |
| 35° | 3880 | 3715 | 3694 |
| 40° | 3751 | 3583 | 3553 |
| 45° | 3623 | 3450 | 3409 |
| 50° | 3482 | 3311 | 3243 |
| 55° | 3335 | 3150 | 3089 |
| 60° | 3168 | 2960 | 2914 |
| 65° | 2985 | 2762 | 2706 |
| 70° | 2753 | 2520 | 2483 |
| 75° | 2433 | 2231 | 2274 |
| 80° | 2045 | 1861 | 1880 |
| 85° | 1439 | 1233 | 1230 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 3623 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 359.2   | 2.0       |
| 10°-20°   | 1010.7  | 5.7       |
| 20°-30°   | 1485.4  | 8.4       |
| 30°-40°   | 1725.2  | 9.8       |
| 40°-50°   | 1723.0  | 9.8       |
| 50°-60°   | 1502.4  | 8.5       |
| 60°-70°   | 1110.6  | 6.3       |
| 70°-80°   | 628.4   | 3.6       |
| 80°-90°   | 173.9   | 1.0       |
| 90°-100°  | 174.5   | 1.0       |
| 100°-110° | 554.5   | 3.2       |
| 110°-120° | 948.9   | 5.4       |
| 120°-130° | 1247.9  | 7.1       |
| 130°-140° | 1400.8  | 8.0       |
| 140°-150° | 1373.6  | 7.8       |
| 150°-160° | 1152.3  | 6.5       |
| 160°-170° | 764.1   | 4.3       |
| 170°-180° | 267.1   | 1.5       |
| 0°-30°    | 2855.3  | 16.2      |
| 0°-40°    | 4580.5  | 26.0      |
| 0°-60°    | 7805.9  | 44.3      |
| 0°-90°    | 9718.8  | 55.2      |
| 90°-120°  | 1677.9  | 9.5       |
| 90°-150°  | 5700.1  | 32.4      |
| 90°-180°  | 7884.0  | 44.8      |
| 0°-180°   | 17602.4 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3817 | 3817  | 3817 | 3817  | 3817 |      |
| 5°   | 3817 | 3802  | 3762 | 3791  | 3784 | 362  |
| 15°  | 3633 | 3611  | 3564 | 3578  | 3560 | 1023 |
| 25°  | 3288 | 3259  | 3197 | 3204  | 3197 | 1513 |
| 35°  | 2837 | 2800  | 2742 | 2719  | 2701 | 1772 |
| 45°  | 2309 | 2283  | 2228 | 2188  | 2173 | 1782 |
| 55°  | 1747 | 1725  | 1681 | 1637  | 1619 | 1562 |
| 65°  | 1178 | 1156  | 1120 | 1086  | 1068 | 1165 |
| 75°  | 616  | 609   | 591  | 569   | 576  | 658  |
| 85°  | 150  | 147   | 143  | 132   | 128  | 168  |
| 90°  | 3    | 31    | 83   | 78    | 81   | 17   |
| 95°  | 124  | 148   | 152  | 152   | 148  | 138  |
| 105° | 512  | 519   | 524  | 528   | 528  | 540  |
| 115° | 952  | 966   | 962  | 959   | 952  | 942  |
| 125° | 1385 | 1406  | 1400 | 1392  | 1389 | 1238 |
| 135° | 1791 | 1818  | 1823 | 1820  | 1814 | 1385 |
| 145° | 2175 | 2192  | 2206 | 2208  | 2199 | 1359 |
| 155° | 2487 | 2494  | 2501 | 2513  | 2506 | 1145 |
| 165° | 2705 | 2703  | 2703 | 2720  | 2708 | 763  |
| 175° | 2815 | 2808  | 2803 | 2820  | 2806 | 267  |
| 180° | 2820 | 2820  | 2820 | 2820  | 2820 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3816.7 | 3816.7 | 3816.7 | 3816.7 | 3816.7 |
| 2.5°   | 3838.8 | 3820.5 | 3780.0 | 3816.7 | 3809.7 |
| 5°     | 3816.7 | 3802.3 | 3761.8 | 3790.9 | 3784.0 |
| 7.5°   | 3790.9 | 3769.2 | 3728.7 | 3758.3 | 3750.9 |
| 10°    | 3750.9 | 3725.1 | 3681.2 | 3710.3 | 3699.4 |
| 12.5°  | 3695.6 | 3673.8 | 3629.8 | 3648.1 | 3640.7 |
| 15°    | 3633.3 | 3611.4 | 3563.5 | 3578.3 | 3560.1 |
| 17.5°  | 3556.1 | 3534.4 | 3486.5 | 3504.8 | 3486.5 |
| 20°    | 3471.7 | 3449.8 | 3398.5 | 3409.4 | 3395.0 |
| 22.5°  | 3387.6 | 3354.4 | 3306.6 | 3306.6 | 3299.1 |
| 25°    | 3288.3 | 3259.1 | 3196.8 | 3203.8 | 3196.8 |
| 27.5°  | 3178.1 | 3152.4 | 3104.8 | 3094.0 | 3075.7 |
| 30°    | 3068.3 | 3038.7 | 2983.8 | 2972.9 | 2958.1 |
| 32.5°  | 2950.7 | 2928.9 | 2870.1 | 2847.9 | 2833.1 |
| 35°    | 2837.0 | 2800.4 | 2741.6 | 2719.4 | 2701.1 |
| 37.5°  | 2708.5 | 2675.4 | 2616.6 | 2590.9 | 2572.6 |
| 40°    | 2576.5 | 2546.9 | 2488.1 | 2455.4 | 2440.6 |
| 42.5°  | 2448.0 | 2418.4 | 2360.0 | 2323.0 | 2301.2 |
| 45°    | 2308.6 | 2282.9 | 2227.6 | 2187.5 | 2172.7 |
| 47.5°  | 2172.7 | 2147.1 | 2088.2 | 2047.7 | 2025.9 |
| 50°    | 2029.4 | 2011.2 | 1959.7 | 1908.3 | 1890.1 |
| 52.5°  | 1890.1 | 1864.3 | 1816.9 | 1776.3 | 1750.6 |
| 55°    | 1747.1 | 1724.9 | 1681.0 | 1636.9 | 1618.6 |
| 57.5°  | 1603.8 | 1585.6 | 1537.7 | 1493.6 | 1478.8 |
| 60°    | 1460.5 | 1446.2 | 1394.7 | 1354.2 | 1343.4 |
| 62.5°  | 1321.2 | 1295.5 | 1258.8 | 1222.3 | 1207.5 |
| 65°    | 1178.2 | 1156.0 | 1119.5 | 1086.4 | 1068.1 |
| 67.5°  | 1031.4 | 1012.8 | 980.1  | 954.4  | 939.6  |
| 70°    | 895.5  | 880.7  | 847.7  | 822.0  | 807.5  |
| 72.5°  | 756.2  | 741.4  | 723.1  | 697.4  | 686.4  |
| 75°    | 616.4  | 609.4  | 590.7  | 568.9  | 576.3  |
| 77.5°  | 491.8  | 477.0  | 469.6  | 458.7  | 447.8  |
| 80°    | 367.2  | 363.3  | 355.9  | 345.0  | 337.6  |
| 82.5°  | 249.6  | 249.6  | 246.1  | 231.3  | 231.3  |
| 85°    | 150.3  | 146.8  | 143.3  | 132.0  | 128.5  |
| 87.5°  | 66.2   | 58.8   | 51.4   | 40.5   | 36.6   |
| 90°    | 2.6    | 30.6   | 83.3   | 78.2   | 80.8   |
| 92.5°  | 52.7   | 71.4   | 74.0   | 76.5   | 76.5   |
| 95°    | 124.1  | 147.9  | 152.2  | 152.2  | 147.9  |
| 97.5°  | 206.6  | 228.7  | 238.1  | 238.1  | 238.1  |
| 100°   | 301.8  | 321.4  | 328.1  | 328.1  | 325.7  |
| 102.5° | 402.2  | 416.6  | 426.0  | 428.5  | 426.0  |
| 105°   | 511.8  | 518.6  | 523.7  | 528.0  | 528.0  |
| 107.5° | 620.6  | 630.9  | 630.9  | 632.6  | 620.6  |
| 110°   | 726.1  | 739.7  | 739.7  | 739.7  | 732.9  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 840.0  | 854.4  | 851.9  | 845.1  | 840.0  |
| 115°   | 952.3  | 965.8  | 961.6  | 959.0  | 952.3  |
| 117.5° | 1063.6 | 1082.4 | 1070.4 | 1063.6 | 1056.8 |
| 120°   | 1175.8 | 1194.5 | 1175.8 | 1175.8 | 1168.2 |
| 122.5° | 1277.8 | 1301.6 | 1289.8 | 1283.0 | 1277.8 |
| 125°   | 1385.0 | 1406.2 | 1399.5 | 1391.8 | 1389.3 |
| 127.5° | 1489.6 | 1515.9 | 1506.5 | 1496.4 | 1489.6 |
| 130°   | 1587.3 | 1617.9 | 1613.7 | 1608.6 | 1599.3 |
| 132.5° | 1697.0 | 1720.8 | 1722.5 | 1710.7 | 1703.8 |
| 135°   | 1791.4 | 1817.8 | 1822.8 | 1820.3 | 1813.5 |
| 137.5° | 1896.8 | 1918.1 | 1922.3 | 1920.7 | 1910.4 |
| 140°   | 1989.5 | 2010.7 | 2022.7 | 2022.7 | 2013.3 |
| 142.5° | 2084.7 | 2106.0 | 2112.7 | 2115.3 | 2106.0 |
| 145°   | 2174.8 | 2191.8 | 2205.5 | 2208.0 | 2198.6 |
| 147.5° | 2255.6 | 2276.9 | 2287.1 | 2291.3 | 2282.0 |
| 150°   | 2339.0 | 2353.4 | 2362.8 | 2370.3 | 2362.8 |
| 152.5° | 2412.9 | 2427.3 | 2439.3 | 2448.6 | 2439.3 |
| 155°   | 2486.9 | 2493.7 | 2501.3 | 2513.2 | 2505.5 |
| 157.5° | 2550.6 | 2555.7 | 2560.0 | 2577.0 | 2565.1 |
| 160°   | 2607.6 | 2612.7 | 2615.2 | 2629.7 | 2619.5 |
| 162.5° | 2660.3 | 2660.3 | 2662.8 | 2679.0 | 2667.1 |
| 165°   | 2705.4 | 2702.8 | 2702.8 | 2719.8 | 2707.9 |
| 167.5° | 2746.2 | 2738.5 | 2738.5 | 2755.6 | 2743.6 |
| 170°   | 2776.8 | 2770.0 | 2767.4 | 2784.5 | 2770.0 |
| 172.5° | 2798.0 | 2791.2 | 2788.6 | 2805.7 | 2791.2 |
| 175°   | 2815.0 | 2808.3 | 2803.2 | 2820.1 | 2805.7 |
| 177.5° | 2824.4 | 2817.6 | 2812.5 | 2826.9 | 2812.5 |
| 180°   | 2820.1 | 2820.1 | 2820.1 | 2820.1 | 2820.1 |

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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 | 12.83            | 13.74 | 13.74 | 14.67 | 15.87 | 12.39          | 13.30 | 13.30 | 14.23 | 15.42 |
|                 | 3H   | 14.49            | 15.31 | 15.41 | 16.25 | 17.47 | 14.00          | 14.82 | 14.92 | 15.76 | 16.98 |
|                 | 4H   | 15.08            | 15.85 | 16.02 | 16.79 | 18.02 | 14.58          | 15.36 | 15.52 | 16.30 | 17.53 |
|                 | 6H   | 15.48            | 16.19 | 16.43 | 17.14 | 18.38 | 14.98          | 15.69 | 15.93 | 16.64 | 17.88 |
|                 | 8H   | 15.58            | 16.26 | 16.54 | 17.23 | 18.47 | 15.08          | 15.76 | 16.04 | 16.72 | 17.96 |
|                 | 12H  | 15.63            | 16.27 | 16.59 | 17.24 | 18.50 | 15.12          | 15.77 | 16.08 | 16.73 | 17.99 |
| 4H              | 2H   | 13.29            | 14.07 | 14.24 | 15.01 | 16.24 | 12.94          | 13.71 | 13.88 | 14.66 | 15.88 |
|                 | 3H   | 15.16            | 15.80 | 16.11 | 16.78 | 18.02 | 14.75          | 15.40 | 15.70 | 16.37 | 17.61 |
|                 | 4H   | 15.87            | 16.46 | 16.83 | 17.43 | 18.70 | 15.45          | 16.04 | 16.41 | 17.01 | 18.27 |
|                 | 6H   | 16.39            | 16.89 | 17.36 | 17.89 | 19.15 | 15.95          | 16.46 | 16.93 | 17.45 | 18.72 |
|                 | 8H   | 16.53            | 17.01 | 17.51 | 17.99 | 19.27 | 16.10          | 16.57 | 17.07 | 17.56 | 18.84 |
|                 | 12H  | 16.61            | 17.04 | 17.60 | 18.04 | 19.32 | 16.16          | 16.59 | 17.15 | 17.59 | 18.87 |
| 8H              | 4H   | 16.07            | 16.54 | 17.05 | 17.53 | 18.81 | 15.69          | 16.17 | 16.67 | 17.15 | 18.43 |
|                 | 6H   | 16.70            | 17.09 | 17.70 | 18.12 | 19.39 | 16.31          | 16.70 | 17.31 | 17.73 | 19.01 |
|                 | 8H   | 16.91            | 17.26 | 17.92 | 18.28 | 19.57 | 16.52          | 16.87 | 17.53 | 17.88 | 19.18 |
|                 | 12H  | 17.04            | 17.35 | 18.06 | 18.36 | 19.70 | 16.63          | 16.94 | 17.65 | 17.95 | 19.29 |
| 12H             | 4H   | 16.06            | 16.48 | 17.05 | 17.49 | 18.77 | 15.69          | 16.12 | 16.68 | 17.12 | 18.40 |
|                 | 6H   | 16.72            | 17.07 | 17.74 | 18.09 | 19.38 | 16.35          | 16.70 | 17.36 | 17.71 | 19.01 |
|                 | 8H   | 16.96            | 17.27 | 17.98 | 18.28 | 19.62 | 16.58          | 16.89 | 17.60 | 17.90 | 19.24 |