

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: P912025

Luminaire Tested: DFN2DIP-SQ3F0-100D070US850-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P912025  
REPORT IS A COMBINATION OF REPORTS P901447 AND P898289  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ3F0-100D070US850-FLLONL  
Description: 3 foot, Square Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

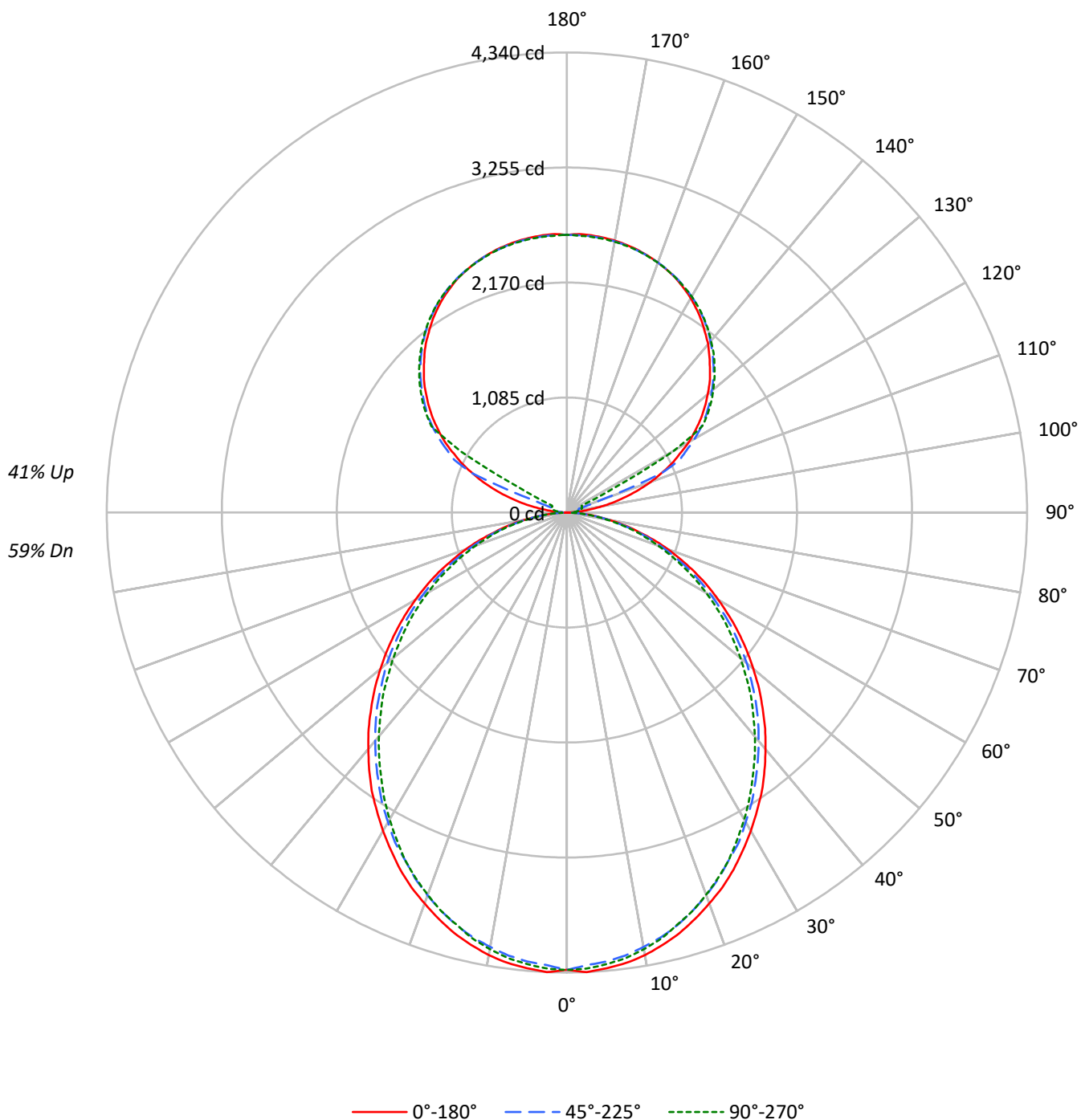
Lumens per Lamp: N/A  
Luminaire Lumens: 18664.5 lumens  
Efficiency: N/A  
Efficacy: 123.6 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.06' x L: 3.06' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 151  
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

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### Luminous Intensity Polar Plot



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**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 | 102 | 102 | 102 | 102 | 88 | 88 | 88 | 76 | 76 | 76 | 64 | 64 | 64 |
| 1   | 100 | 95  | 91  | 88  | 93  | 89  | 86  | 83  | 77 | 75 | 73 | 67 | 65 | 63 | 57 | 56 | 54 |
| 2   | 91  | 83  | 77  | 72  | 85  | 78  | 72  | 68  | 68 | 64 | 60 | 59 | 55 | 53 | 50 | 48 | 46 |
| 3   | 83  | 73  | 66  | 60  | 77  | 69  | 62  | 57  | 60 | 55 | 51 | 52 | 48 | 45 | 44 | 41 | 39 |
| 4   | 76  | 65  | 57  | 51  | 71  | 61  | 54  | 48  | 53 | 48 | 43 | 46 | 42 | 38 | 40 | 36 | 34 |
| 5   | 70  | 58  | 50  | 44  | 65  | 54  | 47  | 41  | 48 | 42 | 37 | 42 | 37 | 33 | 36 | 32 | 29 |
| 6   | 64  | 52  | 44  | 38  | 60  | 49  | 41  | 36  | 43 | 37 | 33 | 38 | 33 | 29 | 32 | 29 | 26 |
| 7   | 59  | 47  | 39  | 33  | 55  | 44  | 37  | 32  | 39 | 33 | 29 | 34 | 29 | 26 | 30 | 26 | 23 |
| 8   | 55  | 43  | 35  | 29  | 51  | 40  | 33  | 28  | 36 | 30 | 26 | 31 | 27 | 23 | 27 | 23 | 21 |
| 9   | 51  | 39  | 31  | 26  | 48  | 37  | 30  | 25  | 33 | 27 | 23 | 29 | 24 | 21 | 25 | 21 | 19 |
| 10  | 48  | 36  | 29  | 24  | 45  | 34  | 27  | 23  | 30 | 25 | 21 | 27 | 22 | 19 | 23 | 20 | 17 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 4944 | 4944 | 4944 |
| 5°  | 4949 | 4872 | 4907 |
| 10° | 4906 | 4803 | 4839 |
| 15° | 4831 | 4721 | 4733 |
| 20° | 4730 | 4608 | 4625 |
| 25° | 4630 | 4473 | 4501 |
| 30° | 4505 | 4348 | 4343 |
| 35° | 4386 | 4200 | 4176 |
| 40° | 4241 | 4051 | 4017 |
| 45° | 4096 | 3901 | 3855 |
| 50° | 3937 | 3744 | 3667 |
| 55° | 3770 | 3562 | 3493 |
| 60° | 3582 | 3346 | 3294 |
| 65° | 3375 | 3123 | 3060 |
| 70° | 3113 | 2850 | 2807 |
| 75° | 2750 | 2522 | 2571 |
| 80° | 2311 | 2104 | 2125 |
| 85° | 1627 | 1394 | 1391 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
Vertical Angle: 45°  
Luminance: 4096 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 406.1   | 2.2       |
| 10°-20°   | 1142.7  | 6.1       |
| 20°-30°   | 1679.4  | 9.0       |
| 30°-40°   | 1950.5  | 10.5      |
| 40°-50°   | 1948.1  | 10.4      |
| 50°-60°   | 1698.7  | 9.1       |
| 60°-70°   | 1255.7  | 6.7       |
| 70°-80°   | 710.4   | 3.8       |
| 80°-90°   | 192.1   | 1.0       |
| 90°-100°  | 86.4    | 0.5       |
| 100°-110° | 322.1   | 1.7       |
| 110°-120° | 854.1   | 4.6       |
| 120°-130° | 1416.6  | 7.6       |
| 130°-140° | 1504.8  | 8.1       |
| 140°-150° | 1398.5  | 7.5       |
| 150°-160° | 1124.4  | 6.0       |
| 160°-170° | 724.5   | 3.9       |
| 170°-180° | 249.4   | 1.3       |
| 0°-30°    | 3228.3  | 17.3      |
| 0°-40°    | 5178.7  | 27.7      |
| 0°-60°    | 8825.5  | 47.3      |
| 0°-90°    | 10983.7 | 58.8      |
| 90°-120°  | 1262.6  | 6.8       |
| 90°-150°  | 5582.5  | 29.9      |
| 90°-180°  | 7681.0  | 41.2      |
| 0°-180°   | 18664.5 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 4315 | 4315  | 4315 | 4315  | 4315 |      |
| 5°   | 4315 | 4299  | 4253 | 4286  | 4278 | 410  |
| 15°  | 4108 | 4083  | 4029 | 4046  | 4025 | 1157 |
| 25°  | 3718 | 3685  | 3614 | 3622  | 3614 | 1711 |
| 35°  | 3208 | 3166  | 3100 | 3075  | 3054 | 2003 |
| 45°  | 2610 | 2581  | 2518 | 2473  | 2456 | 2014 |
| 55°  | 1975 | 1950  | 1900 | 1851  | 1830 | 1766 |
| 65°  | 1332 | 1307  | 1266 | 1228  | 1208 | 1317 |
| 75°  | 697  | 689   | 668  | 643   | 652  | 744  |
| 85°  | 170  | 166   | 162  | 149   | 145  | 190  |
| 90°  | 2    | 23    | 38   | 48    | 51   | 17   |
| 95°  | 123  | 61    | 74   | 84    | 82   | 146  |
| 105° | 576  | 633   | 116  | 136   | 144  | 616  |
| 115° | 1090 | 1122  | 1170 | 292   | 156  | 1073 |
| 125° | 1541 | 1566  | 1602 | 1615  | 1621 | 1375 |
| 135° | 1907 | 1938  | 1954 | 1974  | 1970 | 1473 |
| 145° | 2212 | 2210  | 2243 | 2256  | 2246 | 1384 |
| 155° | 2436 | 2419  | 2442 | 2453  | 2438 | 1123 |
| 165° | 2567 | 2556  | 2561 | 2574  | 2561 | 725  |
| 175° | 2626 | 2612  | 2616 | 2629  | 2610 | 250  |
| 180° | 2620 | 2620  | 2620 | 2620  | 2620 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 4315.2 | 4315.2 | 4315.2 | 4315.2 | 4315.2 |
| 2.5°   | 4340.3 | 4319.6 | 4273.8 | 4315.2 | 4307.2 |
| 5°     | 4315.2 | 4298.9 | 4253.1 | 4286.2 | 4278.2 |
| 7.5°   | 4286.2 | 4261.4 | 4215.6 | 4249.1 | 4240.8 |
| 10°    | 4240.8 | 4211.8 | 4162.0 | 4195.0 | 4182.7 |
| 12.5°  | 4178.3 | 4153.6 | 4103.9 | 4124.6 | 4116.2 |
| 15°    | 4107.8 | 4083.2 | 4029.0 | 4045.7 | 4025.1 |
| 17.5°  | 4020.7 | 3996.1 | 3941.8 | 3962.6 | 3941.8 |
| 20°    | 3925.1 | 3900.5 | 3842.4 | 3854.7 | 3838.4 |
| 22.5°  | 3830.0 | 3792.7 | 3738.4 | 3738.4 | 3730.1 |
| 25°    | 3717.8 | 3684.8 | 3614.3 | 3622.2 | 3614.3 |
| 27.5°  | 3593.2 | 3564.1 | 3510.4 | 3498.1 | 3477.4 |
| 30°    | 3469.1 | 3435.6 | 3373.5 | 3361.2 | 3344.4 |
| 32.5°  | 3336.1 | 3311.5 | 3244.9 | 3219.9 | 3203.1 |
| 35°    | 3207.6 | 3166.2 | 3099.7 | 3074.6 | 3053.9 |
| 37.5°  | 3062.3 | 3024.8 | 2958.4 | 2929.3 | 2908.6 |
| 40°    | 2913.0 | 2879.5 | 2813.1 | 2776.2 | 2759.4 |
| 42.5°  | 2767.7 | 2734.2 | 2668.3 | 2626.4 | 2601.8 |
| 45°    | 2610.1 | 2581.1 | 2518.5 | 2473.2 | 2456.5 |
| 47.5°  | 2456.5 | 2427.5 | 2361.0 | 2315.1 | 2290.5 |
| 50°    | 2294.5 | 2273.8 | 2215.7 | 2157.6 | 2136.9 |
| 52.5°  | 2136.9 | 2107.9 | 2054.1 | 2008.4 | 1979.3 |
| 55°    | 1975.4 | 1950.3 | 1900.5 | 1850.7 | 1830.1 |
| 57.5°  | 1813.3 | 1792.6 | 1738.5 | 1688.8 | 1672.0 |
| 60°    | 1651.3 | 1635.0 | 1576.9 | 1531.1 | 1518.8 |
| 62.5°  | 1493.7 | 1464.7 | 1423.3 | 1381.9 | 1365.2 |
| 65°    | 1332.1 | 1307.1 | 1265.7 | 1228.2 | 1207.6 |
| 67.5°  | 1166.2 | 1145.0 | 1108.1 | 1079.1 | 1062.3 |
| 70°    | 1012.5 | 995.8  | 958.4  | 929.3  | 913.0  |
| 72.5°  | 854.9  | 838.2  | 817.6  | 788.5  | 776.1  |
| 75°    | 696.9  | 689.0  | 667.8  | 643.2  | 651.5  |
| 77.5°  | 556.1  | 539.3  | 530.9  | 518.6  | 506.3  |
| 80°    | 415.1  | 410.8  | 402.3  | 390.0  | 381.7  |
| 82.5°  | 282.2  | 282.2  | 278.2  | 261.5  | 261.5  |
| 85°    | 169.9  | 166.0  | 162.0  | 149.3  | 145.3  |
| 87.5°  | 74.9   | 66.4   | 58.1   | 45.8   | 41.4   |
| 90°    | 1.8    | 22.7   | 37.8   | 47.5   | 51.1   |
| 92.5°  | 47.5   | 39.8   | 45.5   | 49.4   | 51.1   |
| 95°    | 123.1  | 60.6   | 73.9   | 83.5   | 81.5   |
| 97.5°  | 221.7  | 66.4   | 96.6   | 102.5  | 104.2  |
| 100°   | 335.7  | 75.9   | 108.0  | 123.1  | 127.0  |
| 102.5° | 460.6  | 457.0  | 111.9  | 132.6  | 138.4  |
| 105°   | 576.3  | 633.2  | 115.7  | 136.4  | 144.1  |
| 107.5° | 710.9  | 758.2  | 119.6  | 140.3  | 147.9  |
| 110°   | 840.0  | 879.5  | 331.8  | 142.3  | 149.7  |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 961.3  | 995.2  | 963.1  | 145.8  | 151.7  |
| 115°   | 1090.0 | 1122.2 | 1169.7 | 292.0  | 155.6  |
| 117.5° | 1201.9 | 1239.8 | 1272.1 | 1000.9 | 504.3  |
| 120°   | 1327.0 | 1355.4 | 1389.7 | 1412.4 | 1156.5 |
| 122.5° | 1433.0 | 1463.4 | 1501.6 | 1512.8 | 1514.8 |
| 125°   | 1541.2 | 1565.9 | 1602.0 | 1615.3 | 1620.8 |
| 127.5° | 1639.8 | 1666.3 | 1694.9 | 1713.8 | 1715.6 |
| 130°   | 1732.7 | 1763.1 | 1783.8 | 1804.8 | 1803.0 |
| 132.5° | 1827.5 | 1852.3 | 1873.0 | 1890.1 | 1888.3 |
| 135°   | 1907.1 | 1937.5 | 1954.5 | 1973.6 | 1969.8 |
| 137.5° | 1990.4 | 2013.3 | 2032.4 | 2051.3 | 2045.7 |
| 140°   | 2071.9 | 2087.2 | 2108.0 | 2125.1 | 2115.6 |
| 142.5° | 2140.4 | 2153.7 | 2178.2 | 2193.3 | 2183.8 |
| 145°   | 2212.5 | 2210.5 | 2242.6 | 2255.9 | 2246.5 |
| 147.5° | 2274.8 | 2269.2 | 2301.4 | 2310.8 | 2303.4 |
| 150°   | 2335.6 | 2322.4 | 2352.7 | 2363.9 | 2354.5 |
| 152.5° | 2386.7 | 2371.6 | 2400.0 | 2411.4 | 2398.2 |
| 155°   | 2436.0 | 2419.1 | 2441.8 | 2453.1 | 2438.0 |
| 157.5° | 2475.8 | 2460.8 | 2477.8 | 2491.1 | 2475.8 |
| 160°   | 2510.1 | 2498.6 | 2510.1 | 2521.3 | 2508.0 |
| 162.5° | 2540.3 | 2529.0 | 2538.4 | 2551.7 | 2534.6 |
| 165°   | 2566.8 | 2555.6 | 2561.1 | 2574.4 | 2561.1 |
| 167.5° | 2587.7 | 2576.2 | 2582.1 | 2595.4 | 2578.3 |
| 170°   | 2604.8 | 2593.4 | 2597.2 | 2610.5 | 2593.4 |
| 172.5° | 2616.1 | 2604.8 | 2608.7 | 2621.9 | 2604.8 |
| 175°   | 2625.6 | 2612.2 | 2616.1 | 2629.3 | 2610.5 |
| 177.5° | 2629.3 | 2616.1 | 2618.1 | 2631.4 | 2614.2 |
| 180°   | 2619.9 | 2619.9 | 2619.9 | 2619.9 | 2619.9 |

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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 | 13.57            | 14.52 | 14.45 | 15.41 | 16.55 | 13.13          | 14.07 | 14.00 | 14.97 | 16.11 |
|                 | 3H   | 15.23            | 16.08 | 16.12 | 16.99 | 18.15 | 14.74          | 15.59 | 15.63 | 16.50 | 17.66 |
|                 | 4H   | 15.82            | 16.62 | 16.73 | 17.54 | 18.71 | 15.33          | 16.13 | 16.23 | 17.04 | 18.22 |
|                 | 6H   | 16.22            | 16.96 | 17.14 | 17.88 | 19.07 | 15.72          | 16.46 | 16.64 | 17.38 | 18.57 |
|                 | 8H   | 16.33            | 17.03 | 17.25 | 17.97 | 19.16 | 15.82          | 16.53 | 16.75 | 17.47 | 18.65 |
|                 | 12H  | 16.38            | 17.05 | 17.31 | 17.98 | 19.19 | 15.87          | 16.54 | 16.80 | 17.47 | 18.68 |
| 4H              | 2H   | 14.04            | 14.84 | 14.95 | 15.75 | 16.93 | 13.68          | 14.49 | 14.59 | 15.40 | 16.57 |
|                 | 3H   | 15.91            | 16.58 | 16.83 | 17.52 | 18.71 | 15.50          | 16.17 | 16.42 | 17.11 | 18.30 |
|                 | 4H   | 16.62            | 17.23 | 17.55 | 18.17 | 19.39 | 16.20          | 16.81 | 17.13 | 17.75 | 18.96 |
|                 | 6H   | 17.13            | 17.66 | 18.08 | 18.63 | 19.84 | 16.70          | 17.23 | 17.65 | 18.19 | 19.41 |
|                 | 8H   | 17.28            | 17.78 | 18.23 | 18.74 | 19.96 | 16.85          | 17.34 | 17.79 | 18.30 | 19.53 |
|                 | 12H  | 17.36            | 17.80 | 18.33 | 18.78 | 20.01 | 16.91          | 17.36 | 17.88 | 18.33 | 19.56 |
| 8H              | 4H   | 16.82            | 17.31 | 17.77 | 18.27 | 19.50 | 16.44          | 16.94 | 17.39 | 17.89 | 19.12 |
|                 | 6H   | 17.45            | 17.86 | 18.42 | 18.85 | 20.08 | 17.06          | 17.47 | 18.04 | 18.47 | 19.70 |
|                 | 8H   | 17.67            | 18.03 | 18.65 | 19.01 | 20.26 | 17.27          | 17.63 | 18.26 | 18.62 | 19.87 |
|                 | 12H  | 17.80            | 18.12 | 18.78 | 19.10 | 20.39 | 17.39          | 17.71 | 18.37 | 18.69 | 19.98 |
| 12H             | 4H   | 16.81            | 17.25 | 17.77 | 18.23 | 19.46 | 16.44          | 16.88 | 17.41 | 17.86 | 19.09 |
|                 | 6H   | 17.48            | 17.84 | 18.46 | 18.83 | 20.07 | 17.10          | 17.47 | 18.09 | 18.45 | 19.70 |
|                 | 8H   | 17.72            | 18.04 | 18.70 | 19.02 | 20.31 | 17.34          | 17.66 | 18.32 | 18.64 | 19.93 |