

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: P906853

Luminaire Tested: DFN2DIP-SQ4F0-110D080US835-FLLONL

Issue Date: 11/21/2024

Test Information

Test Method: LM-79-2019
Report Number: P906853
REPORT IS A COMBINATION OF REPORTS P901625 AND P898471
Test Lab: INNOVATION CENTER
Issue Date: 11/21/2024
Manufacturer: COOPER LIGHTING SOLUTIONS
Product Line: NEO-RAY
Catalog Number: DFN2DIP-SQ4F0-110D080US835-FLLONL
Description: 4 foot, Square Define Geo, with Direct Frosted Lens, Indirect Open No Lens
Light Source: -
Ballast/Driver: -

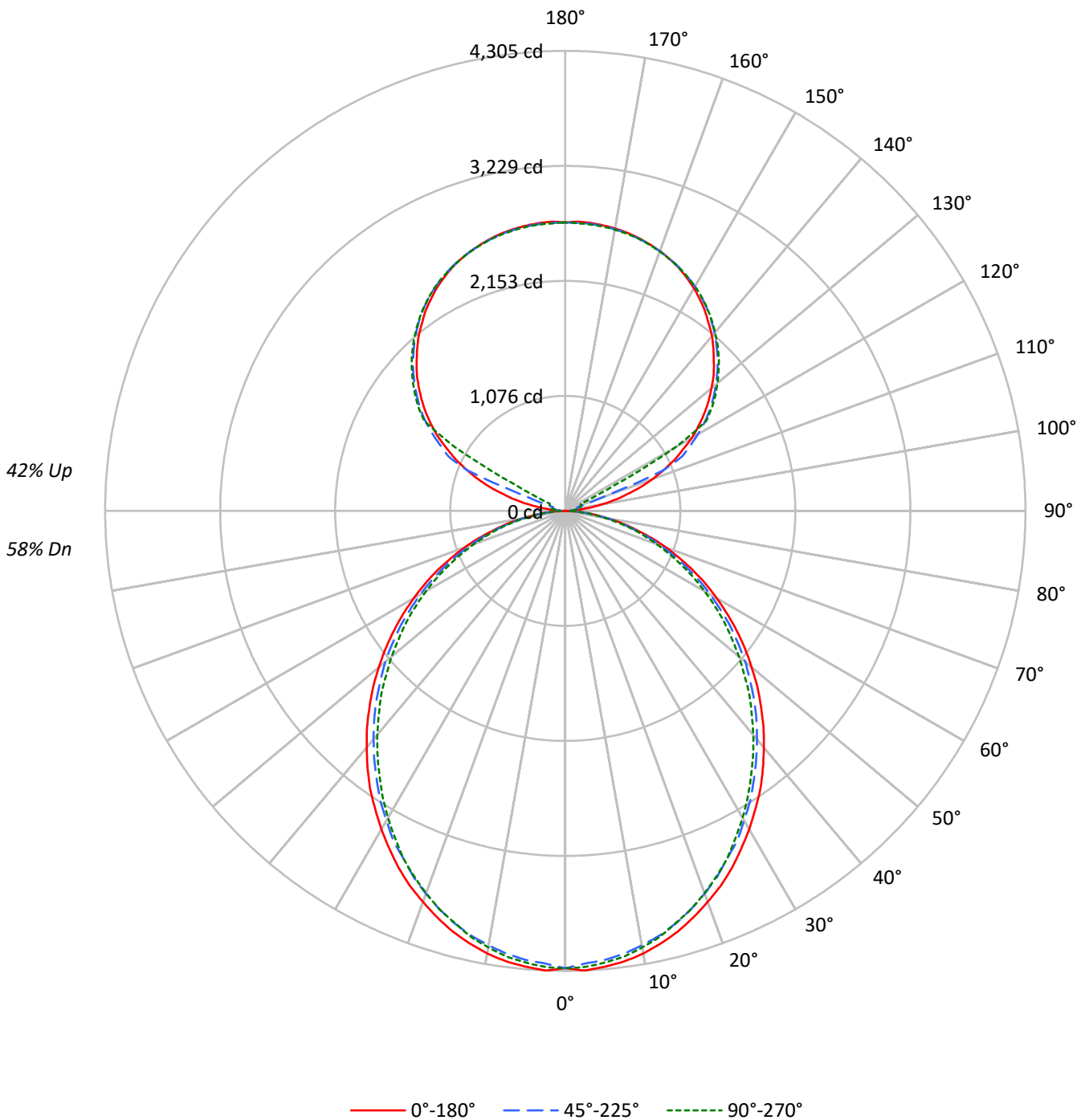
Summary

Lumens per Lamp: N/A
Luminaire Lumens: 18810.0 lumens
Efficiency: N/A
Efficacy: 114.3 lumens/watt
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 3.92' x H: 0.1')
CIE Type: General Diffuse

Input Watts (W): 164.6
Input Voltage (V):
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: 0.9951
Total Harmonic Distortion (THDi): 0.07
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 | | 0 | |
| RW | 70 | 50 | 30 | 10 | 70 | 50 | 30 | 10 | 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 | 75 | 75 | 75 | 63 | 63 | 63 | 58 | | |
| 1 | 100 | 95 | 91 | 88 | 93 | 89 | 85 | 82 | 77 | 74 | 72 | 66 | 64 | 63 | 56 | 55 | 54 | 49 | | |
| 2 | 91 | 83 | 77 | 72 | 84 | 78 | 72 | 68 | 67 | 63 | 60 | 58 | 55 | 52 | 49 | 47 | 45 | 41 | | |
| 3 | 83 | 73 | 66 | 60 | 77 | 68 | 62 | 57 | 60 | 54 | 50 | 51 | 47 | 44 | 44 | 41 | 38 | 35 | | |
| 4 | 76 | 65 | 57 | 51 | 70 | 61 | 54 | 48 | 53 | 47 | 43 | 46 | 41 | 38 | 39 | 36 | 33 | 30 | | |
| 5 | 70 | 58 | 50 | 43 | 65 | 54 | 47 | 41 | 47 | 42 | 37 | 41 | 37 | 33 | 35 | 32 | 29 | 26 | | |
| 6 | 64 | 52 | 44 | 38 | 60 | 49 | 41 | 36 | 43 | 37 | 32 | 37 | 32 | 29 | 32 | 28 | 25 | 23 | | |
| 7 | 59 | 47 | 39 | 33 | 55 | 44 | 37 | 32 | 39 | 33 | 29 | 34 | 29 | 26 | 29 | 26 | 23 | 20 | | |
| 8 | 55 | 43 | 35 | 29 | 51 | 40 | 33 | 28 | 35 | 30 | 25 | 31 | 26 | 23 | 27 | 23 | 20 | 18 | | |
| 9 | 51 | 39 | 31 | 26 | 48 | 37 | 30 | 25 | 33 | 27 | 23 | 29 | 24 | 21 | 25 | 21 | 18 | 16 | | |
| 10 | 48 | 36 | 28 | 24 | 45 | 34 | 27 | 23 | 30 | 24 | 21 | 26 | 22 | 19 | 23 | 19 | 17 | 15 | | |

AVERAGE LUMINANCE (cd/sqm):

| | 0° | 45° | 90° |
|-----|------|------|------|
| 0° | 3003 | 3003 | 3003 |
| 5° | 3008 | 2962 | 2982 |
| 10° | 2984 | 2923 | 2943 |
| 15° | 2940 | 2875 | 2880 |
| 20° | 2880 | 2809 | 2817 |
| 25° | 2821 | 2730 | 2743 |
| 30° | 2747 | 2656 | 2649 |
| 35° | 2677 | 2569 | 2549 |
| 40° | 2591 | 2481 | 2454 |
| 45° | 2505 | 2393 | 2358 |
| 50° | 2411 | 2300 | 2245 |
| 55° | 2313 | 2193 | 2142 |
| 60° | 2201 | 2066 | 2025 |
| 65° | 2080 | 1935 | 1885 |
| 70° | 1925 | 1774 | 1736 |
| 75° | 1711 | 1583 | 1600 |
| 80° | 1454 | 1339 | 1336 |
| 85° | 1051 | 916 | 898 |

MAXIMUM LUMINANCE 45°-90°:

Horizontal Angle: 0°
 Vertical Angle: 45°
 Luminance: 2505 cd/sqm



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ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|---------|-----------|
| 0°-10° | 402.8 | 2.1 |
| 10°-20° | 1133.5 | 6.0 |
| 20°-30° | 1665.7 | 8.9 |
| 30°-40° | 1934.7 | 10.3 |
| 40°-50° | 1932.3 | 10.3 |
| 50°-60° | 1684.9 | 9.0 |
| 60°-70° | 1245.5 | 6.6 |
| 70°-80° | 704.7 | 3.7 |
| 80°-90° | 190.7 | 1.0 |
| 90°-100° | 89.0 | 0.5 |
| 100°-110° | 331.9 | 1.8 |
| 110°-120° | 880.2 | 4.7 |
| 120°-130° | 1459.9 | 7.8 |
| 130°-140° | 1550.7 | 8.2 |
| 140°-150° | 1441.2 | 7.7 |
| 150°-160° | 1158.7 | 6.2 |
| 160°-170° | 746.6 | 4.0 |
| 170°-180° | 257.0 | 1.4 |
| 0°-30° | 3202.1 | 17.0 |
| 0°-40° | 5136.7 | 27.3 |
| 0°-60° | 8753.8 | 46.5 |
| 0°-90° | 10894.7 | 57.9 |
| 90°-120° | 1301.1 | 6.9 |
| 90°-150° | 5752.9 | 30.6 |
| 90°-180° | 7915.0 | 42.1 |
| 0°-180° | 18810.0 | 100.0 |

CANDELA DISTRIBUTION:

| | 0° | 22.5° | 45° | 67.5° | 90° | Flux |
|------|------|-------|------|-------|------|------|
| 0° | 4280 | 4280 | 4280 | 4280 | 4280 | |
| 5° | 4280 | 4264 | 4219 | 4251 | 4244 | 406 |
| 15° | 4074 | 4050 | 3996 | 4013 | 3992 | 1148 |
| 25° | 3688 | 3655 | 3585 | 3593 | 3585 | 1697 |
| 35° | 3182 | 3140 | 3074 | 3050 | 3029 | 1987 |
| 45° | 2589 | 2560 | 2498 | 2453 | 2437 | 1998 |
| 55° | 1959 | 1934 | 1885 | 1836 | 1815 | 1752 |
| 65° | 1321 | 1296 | 1255 | 1218 | 1198 | 1306 |
| 75° | 691 | 683 | 662 | 638 | 646 | 738 |
| 85° | 169 | 165 | 161 | 148 | 144 | 188 |
| 90° | 2 | 23 | 39 | 49 | 53 | 17 |
| 95° | 127 | 62 | 76 | 86 | 84 | 150 |
| 105° | 594 | 653 | 119 | 141 | 148 | 635 |
| 115° | 1123 | 1156 | 1205 | 301 | 160 | 1106 |
| 125° | 1588 | 1614 | 1651 | 1664 | 1670 | 1416 |
| 135° | 1965 | 1997 | 2014 | 2034 | 2030 | 1518 |
| 145° | 2280 | 2278 | 2311 | 2325 | 2315 | 1426 |
| 155° | 2510 | 2493 | 2516 | 2528 | 2512 | 1157 |
| 165° | 2645 | 2634 | 2639 | 2653 | 2639 | 747 |
| 175° | 2706 | 2692 | 2696 | 2710 | 2690 | 258 |
| 180° | 2700 | 2700 | 2700 | 2700 | 2700 | |



TEST NUMBER: P906853

CATALOG NUMBER: DFN2DIP-SQ4F0-110D080US835-FLLONL

CANDELA DISTRIBUTION (FULL):

| | 0° | 22.5° | 45° | 67.5° | 90° |
|--------|--------|--------|--------|--------|--------|
| 0° | 4280.2 | 4280.2 | 4280.2 | 4280.2 | 4280.2 |
| 2.5° | 4305.0 | 4284.5 | 4239.1 | 4280.2 | 4272.3 |
| 5° | 4280.2 | 4264.0 | 4218.6 | 4251.3 | 4243.5 |
| 7.5° | 4251.3 | 4226.9 | 4181.5 | 4214.7 | 4206.4 |
| 10° | 4206.4 | 4177.5 | 4128.2 | 4160.9 | 4148.7 |
| 12.5° | 4144.4 | 4119.9 | 4070.6 | 4091.1 | 4082.8 |
| 15° | 4074.5 | 4050.0 | 3996.3 | 4012.9 | 3992.4 |
| 17.5° | 3988.0 | 3963.6 | 3909.9 | 3930.4 | 3909.9 |
| 20° | 3893.3 | 3868.8 | 3811.2 | 3823.4 | 3807.3 |
| 22.5° | 3799.0 | 3761.8 | 3708.1 | 3708.1 | 3699.8 |
| 25° | 3687.6 | 3654.9 | 3585.0 | 3592.9 | 3585.0 |
| 27.5° | 3564.0 | 3535.2 | 3481.9 | 3469.7 | 3449.2 |
| 30° | 3440.9 | 3407.7 | 3346.1 | 3333.9 | 3317.3 |
| 32.5° | 3309.0 | 3284.6 | 3218.6 | 3193.7 | 3177.1 |
| 35° | 3181.5 | 3140.5 | 3074.5 | 3049.6 | 3029.1 |
| 37.5° | 3037.4 | 3000.3 | 2934.4 | 2905.5 | 2885.0 |
| 40° | 2889.4 | 2856.2 | 2790.3 | 2753.6 | 2737.0 |
| 42.5° | 2745.3 | 2712.1 | 2646.6 | 2605.1 | 2580.7 |
| 45° | 2589.0 | 2560.1 | 2498.1 | 2453.2 | 2436.6 |
| 47.5° | 2436.6 | 2407.8 | 2341.8 | 2296.4 | 2271.9 |
| 50° | 2275.9 | 2255.4 | 2197.7 | 2140.1 | 2119.6 |
| 52.5° | 2119.6 | 2090.7 | 2037.5 | 1992.0 | 1963.2 |
| 55° | 1959.3 | 1934.4 | 1885.1 | 1835.7 | 1815.2 |
| 57.5° | 1798.6 | 1778.1 | 1724.4 | 1675.0 | 1658.4 |
| 60° | 1637.9 | 1621.8 | 1564.1 | 1518.7 | 1506.5 |
| 62.5° | 1481.6 | 1452.8 | 1411.7 | 1370.7 | 1354.1 |
| 65° | 1321.3 | 1296.4 | 1255.4 | 1218.3 | 1197.8 |
| 67.5° | 1156.7 | 1135.8 | 1099.1 | 1070.3 | 1053.7 |
| 70° | 1004.3 | 987.7 | 950.6 | 921.8 | 905.6 |
| 72.5° | 848.0 | 831.4 | 810.9 | 782.1 | 769.8 |
| 75° | 691.2 | 683.4 | 662.4 | 638.0 | 646.3 |
| 77.5° | 551.5 | 534.9 | 526.6 | 514.4 | 502.2 |
| 80° | 411.8 | 407.4 | 399.1 | 386.9 | 378.6 |
| 82.5° | 279.9 | 279.9 | 276.0 | 259.4 | 259.4 |
| 85° | 168.6 | 164.6 | 160.7 | 148.0 | 144.1 |
| 87.5° | 74.2 | 65.9 | 57.6 | 45.4 | 41.0 |
| 90° | 1.9 | 23.4 | 39.0 | 48.9 | 52.7 |
| 92.5° | 48.9 | 41.1 | 46.9 | 50.8 | 52.7 |
| 95° | 126.9 | 62.4 | 76.1 | 86.1 | 84.0 |
| 97.5° | 228.5 | 68.4 | 99.5 | 105.6 | 107.4 |
| 100° | 345.9 | 78.2 | 111.4 | 126.9 | 130.8 |
| 102.5° | 474.7 | 470.9 | 115.3 | 136.6 | 142.7 |
| 105° | 593.9 | 652.6 | 119.2 | 140.6 | 148.5 |
| 107.5° | 732.6 | 781.3 | 123.2 | 144.5 | 152.4 |
| 110° | 865.6 | 906.4 | 342.0 | 146.6 | 154.3 |



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CATALOG NUMBER: DFN2DIP-SQ4F0-110D080US835-FLLONL

CANDELA DISTRIBUTION (continued):

| | 0° | 22.5° | 45° | 67.5° | 90° |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 990.6 | 1025.6 | 992.5 | 150.3 | 156.4 |
| 115° | 1123.3 | 1156.5 | 1205.4 | 300.9 | 160.3 |
| 117.5° | 1238.6 | 1277.6 | 1311.0 | 1031.4 | 519.7 |
| 120° | 1367.6 | 1396.8 | 1432.1 | 1455.5 | 1191.7 |
| 122.5° | 1476.8 | 1508.2 | 1547.4 | 1559.0 | 1561.1 |
| 125° | 1588.2 | 1613.7 | 1650.8 | 1664.5 | 1670.3 |
| 127.5° | 1689.8 | 1717.2 | 1746.7 | 1766.1 | 1768.0 |
| 130° | 1785.6 | 1816.9 | 1838.3 | 1859.9 | 1858.0 |
| 132.5° | 1883.3 | 1908.8 | 1930.2 | 1947.8 | 1945.9 |
| 135° | 1965.4 | 1996.7 | 2014.1 | 2033.9 | 2029.9 |
| 137.5° | 2051.3 | 2074.7 | 2094.4 | 2113.9 | 2108.1 |
| 140° | 2135.2 | 2151.0 | 2172.4 | 2190.0 | 2180.2 |
| 142.5° | 2205.8 | 2219.4 | 2244.7 | 2260.3 | 2250.5 |
| 145° | 2280.0 | 2277.9 | 2311.1 | 2324.8 | 2315.0 |
| 147.5° | 2344.3 | 2338.5 | 2371.6 | 2381.4 | 2373.7 |
| 150° | 2406.9 | 2393.2 | 2424.5 | 2436.1 | 2426.4 |
| 152.5° | 2459.6 | 2444.0 | 2473.2 | 2485.1 | 2471.4 |
| 155° | 2510.4 | 2493.0 | 2516.4 | 2528.0 | 2512.5 |
| 157.5° | 2551.4 | 2535.9 | 2553.5 | 2567.2 | 2551.4 |
| 160° | 2586.7 | 2574.9 | 2586.7 | 2598.3 | 2584.6 |
| 162.5° | 2617.8 | 2606.2 | 2615.9 | 2629.6 | 2612.0 |
| 165° | 2645.2 | 2633.6 | 2639.4 | 2653.0 | 2639.4 |
| 167.5° | 2666.7 | 2654.9 | 2660.9 | 2674.6 | 2657.0 |
| 170° | 2684.4 | 2672.5 | 2676.5 | 2690.2 | 2672.5 |
| 172.5° | 2696.0 | 2684.4 | 2688.3 | 2702.0 | 2684.4 |
| 175° | 2705.7 | 2692.0 | 2696.0 | 2709.6 | 2690.2 |
| 177.5° | 2709.6 | 2696.0 | 2698.0 | 2711.7 | 2694.1 |
| 180° | 2699.9 | 2699.9 | 2699.9 | 2699.9 | 2699.9 |



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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 | 11.81 | 12.74 | 12.69 | 13.65 | 14.80 | 11.36 | 12.30 | 12.25 | 13.21 | 14.36 |
| | 3H | 13.48 | 14.32 | 14.37 | 15.23 | 16.41 | 12.99 | 13.83 | 13.88 | 14.74 | 15.92 |
| | 4H | 14.07 | 14.87 | 14.98 | 15.79 | 16.98 | 13.58 | 14.37 | 14.49 | 15.29 | 16.48 |
| | 6H | 14.48 | 15.21 | 15.40 | 16.14 | 17.34 | 13.98 | 14.71 | 14.90 | 15.64 | 16.84 |
| | 8H | 14.59 | 15.28 | 15.52 | 16.23 | 17.43 | 14.08 | 14.78 | 15.02 | 15.73 | 16.93 |
| | 12H | 14.64 | 15.30 | 15.58 | 16.24 | 17.47 | 14.13 | 14.79 | 15.07 | 15.73 | 16.96 |
| 4H | 2H | 12.28 | 13.07 | 13.20 | 13.99 | 15.18 | 11.92 | 12.72 | 12.84 | 13.64 | 14.83 |
| | 3H | 14.15 | 14.82 | 15.08 | 15.77 | 16.97 | 13.75 | 14.41 | 14.68 | 15.36 | 16.57 |
| | 4H | 14.88 | 15.48 | 15.81 | 16.43 | 17.66 | 14.45 | 15.06 | 15.39 | 16.00 | 17.23 |
| | 6H | 15.40 | 15.92 | 16.35 | 16.89 | 18.12 | 14.97 | 15.49 | 15.92 | 16.46 | 17.69 |
| | 8H | 15.55 | 16.04 | 16.51 | 17.01 | 18.25 | 15.12 | 15.60 | 16.07 | 16.57 | 17.81 |
| | 12H | 15.63 | 16.07 | 16.61 | 17.05 | 18.30 | 15.18 | 15.62 | 16.16 | 16.60 | 17.85 |
| 8H | 4H | 15.08 | 15.57 | 16.03 | 16.53 | 17.77 | 14.70 | 15.19 | 15.66 | 16.15 | 17.40 |
| | 6H | 15.72 | 16.12 | 16.70 | 17.13 | 18.37 | 15.33 | 15.74 | 16.32 | 16.74 | 17.99 |
| | 8H | 15.94 | 16.30 | 16.93 | 17.29 | 18.55 | 15.55 | 15.91 | 16.54 | 16.90 | 18.16 |
| | 12H | 16.08 | 16.39 | 17.07 | 17.38 | 18.69 | 15.67 | 15.98 | 16.66 | 16.97 | 18.28 |
| 12H | 4H | 15.07 | 15.51 | 16.04 | 16.49 | 17.74 | 14.70 | 15.14 | 15.67 | 16.12 | 17.37 |
| | 6H | 15.75 | 16.11 | 16.74 | 17.10 | 18.36 | 15.38 | 15.73 | 16.37 | 16.73 | 17.99 |
| | 8H | 16.00 | 16.31 | 16.99 | 17.30 | 18.61 | 15.62 | 15.93 | 16.61 | 16.92 | 18.23 |