

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: P920251

Luminaire Tested: DFN2DIP-SQ3F0-110D080US935-RLONL

Issue Date: 11/21/2024

Test Information

Test Method: LM-79-2019
Report Number: P920251
REPORT IS A COMBINATION OF REPORTS P901468 AND P898289
Test Lab: INNOVATION CENTER
Issue Date: 11/21/2024
Manufacturer: COOPER LIGHTING SOLUTIONS
Product Line: NEO-RAY
Catalog Number: DFN2DIP-SQ3F0-110D080US935-RLLONL
Description: 3 foot, Square Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens
Light Source: -
Ballast/Driver: -

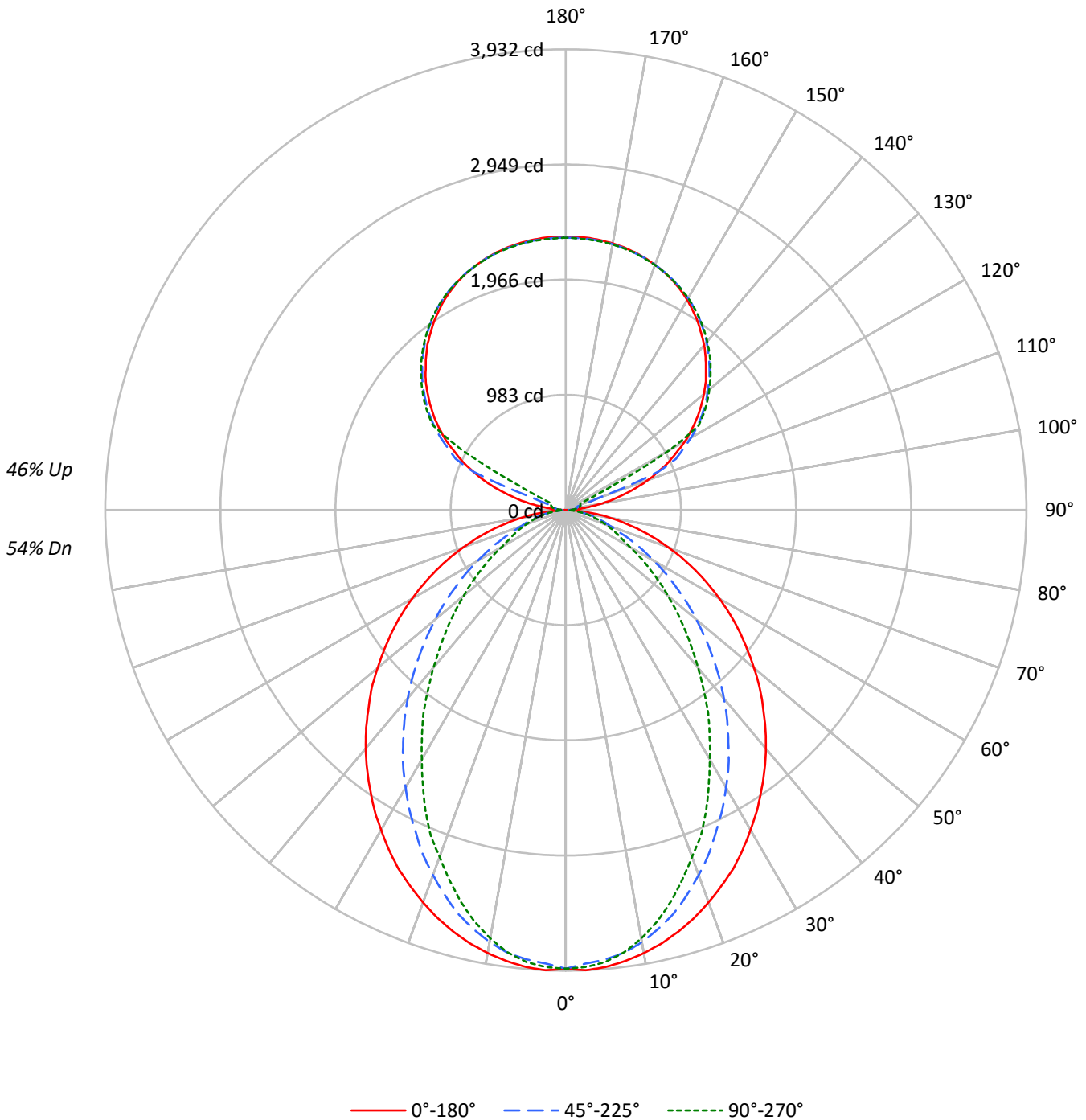
Summary

Lumens per Lamp: N/A
Luminaire Lumens: 14869.4 lumens
Efficiency: N/A
Efficacy: 86.3 lumens/watt
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16
Luminous Opening: Rectangular w/ Sides (W: 3.06' x L: 3.06' x H: 0.1')
CIE Type: General Diffuse

Input Watts (W): 172.3
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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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 | 108 | 108 | 108 | 108 | 100 | 100 | 100 | 100 | 86 | 86 | 86 | 72 | 72 | 72 | 60 | 60 | 60 | 54 | 54 | 54 |
| 1 | 99 | 95 | 91 | 88 | 92 | 88 | 85 | 82 | 76 | 74 | 71 | 64 | 63 | 61 | 54 | 53 | 52 | 47 | 47 | 47 |
| 2 | 91 | 84 | 78 | 73 | 84 | 78 | 73 | 68 | 67 | 63 | 60 | 57 | 54 | 52 | 48 | 46 | 44 | 40 | 40 | 40 |
| 3 | 83 | 74 | 67 | 61 | 77 | 69 | 63 | 58 | 60 | 55 | 51 | 51 | 48 | 45 | 43 | 40 | 38 | 34 | 34 | 34 |
| 4 | 76 | 66 | 58 | 52 | 71 | 62 | 55 | 49 | 53 | 48 | 44 | 46 | 42 | 39 | 39 | 36 | 33 | 30 | 30 | 30 |
| 5 | 70 | 59 | 51 | 45 | 65 | 55 | 48 | 43 | 48 | 43 | 38 | 41 | 37 | 34 | 35 | 32 | 30 | 26 | 26 | 26 |
| 6 | 65 | 53 | 45 | 40 | 60 | 50 | 43 | 38 | 44 | 38 | 34 | 38 | 33 | 30 | 32 | 29 | 26 | 23 | 23 | 23 |
| 7 | 60 | 48 | 40 | 35 | 56 | 45 | 38 | 33 | 40 | 34 | 30 | 34 | 30 | 27 | 29 | 26 | 24 | 21 | 21 | 21 |
| 8 | 56 | 44 | 36 | 31 | 52 | 41 | 34 | 30 | 36 | 31 | 27 | 32 | 27 | 24 | 27 | 24 | 21 | 19 | 19 | 19 |
| 9 | 52 | 40 | 33 | 28 | 49 | 38 | 31 | 27 | 33 | 28 | 24 | 29 | 25 | 22 | 25 | 22 | 19 | 17 | 17 | 17 |
| 10 | 49 | 37 | 30 | 25 | 45 | 35 | 28 | 24 | 31 | 26 | 22 | 27 | 23 | 20 | 23 | 20 | 18 | 16 | 16 | 16 |

AVERAGE LUMINANCE (cd/sqm):

| | 0° | 45° | 90° |
|-----|------|------|------|
| 0° | 4485 | 4485 | 4485 |
| 5° | 4489 | 4411 | 4441 |
| 10° | 4442 | 4321 | 4295 |
| 15° | 4378 | 4176 | 4070 |
| 20° | 4294 | 3976 | 3795 |
| 25° | 4209 | 3753 | 3529 |
| 30° | 4094 | 3524 | 3192 |
| 35° | 3982 | 3279 | 2897 |
| 40° | 3868 | 3025 | 2558 |
| 45° | 3736 | 2744 | 2251 |
| 50° | 3598 | 2460 | 1951 |
| 55° | 3455 | 2158 | 1664 |
| 60° | 3288 | 1841 | 1368 |
| 65° | 3097 | 1521 | 1229 |
| 70° | 2865 | 1221 | 1111 |
| 75° | 2572 | 1070 | 1007 |
| 80° | 2149 | 889 | 869 |
| 85° | 1457 | 578 | 643 |

MAXIMUM LUMINANCE 45°-90°:

Horizontal Angle: 0°
 Vertical Angle: 45°
 Luminance: 3736 cd/sqm



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ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|---------|-----------|
| 0°-10° | 366.9 | 2.5 |
| 10°-20° | 1007.1 | 6.8 |
| 20°-30° | 1413.9 | 9.5 |
| 30°-40° | 1541.3 | 10.4 |
| 40°-50° | 1416.6 | 9.5 |
| 50°-60° | 1112.5 | 7.5 |
| 60°-70° | 724.2 | 4.9 |
| 70°-80° | 372.8 | 2.5 |
| 80°-90° | 99.2 | 0.7 |
| 90°-100° | 76.7 | 0.5 |
| 100°-110° | 285.7 | 1.9 |
| 110°-120° | 757.9 | 5.1 |
| 120°-130° | 1256.9 | 8.5 |
| 130°-140° | 1335.2 | 9.0 |
| 140°-150° | 1240.9 | 8.3 |
| 150°-160° | 997.6 | 6.7 |
| 160°-170° | 642.8 | 4.3 |
| 170°-180° | 221.3 | 1.5 |
| 0°-30° | 2787.9 | 18.7 |
| 0°-40° | 4329.1 | 29.1 |
| 0°-60° | 6858.3 | 46.1 |
| 0°-90° | 8054.4 | 54.2 |
| 90°-120° | 1120.2 | 7.5 |
| 90°-150° | 4953.3 | 33.3 |
| 90°-180° | 6815.0 | 45.8 |
| 0°-180° | 14869.4 | 100.0 |

CANDELA DISTRIBUTION:

| | 0° | 22.5° | 45° | 67.5° | 90° | Flux |
|------|------|-------|------|-------|------|------|
| 0° | 3914 | 3914 | 3914 | 3914 | 3914 | |
| 5° | 3914 | 3897 | 3850 | 3882 | 3872 | 371 |
| 15° | 3723 | 3684 | 3564 | 3496 | 3461 | 1049 |
| 25° | 3380 | 3266 | 3032 | 2887 | 2834 | 1554 |
| 35° | 2912 | 2731 | 2420 | 2196 | 2118 | 1823 |
| 45° | 2381 | 2143 | 1771 | 1520 | 1435 | 1838 |
| 55° | 1810 | 1534 | 1151 | 939 | 872 | 1617 |
| 65° | 1222 | 935 | 616 | 496 | 485 | 1212 |
| 75° | 652 | 404 | 283 | 259 | 255 | 689 |
| 85° | 152 | 78 | 67 | 67 | 67 | 175 |
| 90° | 2 | 20 | 34 | 42 | 45 | 14 |
| 95° | 109 | 54 | 66 | 74 | 72 | 129 |
| 105° | 511 | 562 | 103 | 121 | 128 | 546 |
| 115° | 967 | 996 | 1038 | 259 | 138 | 952 |
| 125° | 1367 | 1389 | 1421 | 1433 | 1438 | 1220 |
| 135° | 1692 | 1719 | 1734 | 1751 | 1748 | 1307 |
| 145° | 1963 | 1961 | 1990 | 2002 | 1993 | 1228 |
| 155° | 2161 | 2146 | 2167 | 2177 | 2163 | 996 |
| 165° | 2278 | 2268 | 2272 | 2284 | 2272 | 643 |
| 175° | 2330 | 2318 | 2321 | 2333 | 2316 | 222 |
| 180° | 2325 | 2325 | 2325 | 2325 | 2325 | |



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CANDELA DISTRIBUTION (FULL):

| | 0° | 22.5° | 45° | 67.5° | 90° |
|--------|--------|--------|--------|--------|--------|
| 0° | 3914.4 | 3914.4 | 3914.4 | 3914.4 | 3914.4 |
| 2.5° | 3932.0 | 3914.4 | 3875.3 | 3911.0 | 3903.9 |
| 5° | 3914.4 | 3896.7 | 3850.5 | 3882.4 | 3871.9 |
| 7.5° | 3882.4 | 3861.3 | 3811.7 | 3825.7 | 3807.9 |
| 10° | 3840.0 | 3815.1 | 3744.5 | 3733.5 | 3712.5 |
| 12.5° | 3786.9 | 3755.0 | 3659.2 | 3638.1 | 3599.0 |
| 15° | 3723.0 | 3684.0 | 3563.7 | 3496.4 | 3461.0 |
| 17.5° | 3648.7 | 3591.9 | 3443.0 | 3365.2 | 3308.5 |
| 20° | 3563.7 | 3492.6 | 3315.6 | 3227.3 | 3149.1 |
| 22.5° | 3471.6 | 3390.0 | 3184.5 | 3064.2 | 3011.2 |
| 25° | 3379.5 | 3266.0 | 3032.3 | 2887.2 | 2833.8 |
| 27.5° | 3269.8 | 3149.1 | 2890.5 | 2724.0 | 2642.5 |
| 30° | 3152.9 | 3018.0 | 2734.6 | 2554.2 | 2458.3 |
| 32.5° | 3039.4 | 2876.2 | 2586.1 | 2373.4 | 2284.7 |
| 35° | 2912.0 | 2731.2 | 2419.7 | 2196.4 | 2118.2 |
| 37.5° | 2788.0 | 2592.9 | 2263.6 | 2019.0 | 1930.7 |
| 40° | 2656.8 | 2444.5 | 2100.6 | 1849.1 | 1757.0 |
| 42.5° | 2522.2 | 2295.6 | 1937.8 | 1675.5 | 1587.2 |
| 45° | 2380.6 | 2143.0 | 1771.3 | 1519.5 | 1434.6 |
| 47.5° | 2246.0 | 1994.6 | 1612.0 | 1360.1 | 1282.4 |
| 50° | 2097.1 | 1845.7 | 1456.0 | 1211.3 | 1137.3 |
| 52.5° | 1951.7 | 1686.0 | 1307.2 | 1073.4 | 1006.1 |
| 55° | 1810.0 | 1533.8 | 1151.2 | 938.8 | 871.6 |
| 57.5° | 1665.0 | 1381.6 | 1013.2 | 814.8 | 758.0 |
| 60° | 1516.1 | 1232.8 | 867.8 | 687.4 | 630.7 |
| 62.5° | 1371.1 | 1087.7 | 743.8 | 573.9 | 545.7 |
| 65° | 1222.2 | 935.0 | 616.4 | 496.1 | 485.2 |
| 67.5° | 1080.6 | 793.4 | 496.1 | 435.6 | 425.1 |
| 70° | 931.7 | 655.5 | 410.8 | 375.5 | 361.2 |
| 72.5° | 790.0 | 527.7 | 343.5 | 315.3 | 308.2 |
| 75° | 651.7 | 403.6 | 283.4 | 258.6 | 255.2 |
| 77.5° | 513.8 | 286.8 | 223.3 | 209.0 | 201.8 |
| 80° | 386.0 | 205.6 | 169.9 | 156.0 | 156.0 |
| 82.5° | 269.1 | 138.3 | 116.9 | 109.8 | 109.8 |
| 85° | 152.2 | 77.8 | 67.2 | 67.2 | 67.2 |
| 87.5° | 56.7 | 28.2 | 28.2 | 24.8 | 24.8 |
| 90° | 1.6 | 20.1 | 33.6 | 42.1 | 45.4 |
| 92.5° | 42.1 | 35.4 | 40.4 | 43.7 | 45.4 |
| 95° | 109.3 | 53.7 | 65.5 | 74.1 | 72.3 |
| 97.5° | 196.7 | 58.9 | 85.7 | 90.9 | 92.5 |
| 100° | 297.8 | 67.3 | 95.9 | 109.3 | 112.6 |
| 102.5° | 408.7 | 405.4 | 99.3 | 117.6 | 122.9 |
| 105° | 511.3 | 561.9 | 102.6 | 121.1 | 127.9 |
| 107.5° | 630.8 | 672.7 | 106.1 | 124.4 | 131.2 |
| 110° | 745.3 | 780.4 | 294.5 | 126.2 | 132.9 |



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CANDELA DISTRIBUTION (continued):

| | 0° | 22.5° | 45° | 67.5° | 90° |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 852.9 | 883.0 | 854.5 | 129.4 | 134.7 |
| 115° | 967.2 | 995.7 | 1037.8 | 259.1 | 138.0 |
| 117.5° | 1066.4 | 1100.0 | 1128.8 | 888.0 | 447.5 |
| 120° | 1177.5 | 1202.6 | 1233.0 | 1253.2 | 1026.1 |
| 122.5° | 1271.5 | 1298.6 | 1332.3 | 1342.3 | 1344.1 |
| 125° | 1367.4 | 1389.4 | 1421.3 | 1433.1 | 1438.1 |
| 127.5° | 1454.9 | 1478.5 | 1503.9 | 1520.6 | 1522.2 |
| 130° | 1537.4 | 1564.3 | 1582.8 | 1601.4 | 1599.7 |
| 132.5° | 1621.5 | 1643.5 | 1661.9 | 1677.1 | 1675.4 |
| 135° | 1692.2 | 1719.2 | 1734.1 | 1751.2 | 1747.7 |
| 137.5° | 1766.2 | 1786.3 | 1803.3 | 1820.1 | 1815.1 |
| 140° | 1838.4 | 1852.0 | 1870.4 | 1885.6 | 1877.1 |
| 142.5° | 1899.2 | 1910.9 | 1932.7 | 1946.1 | 1937.7 |
| 145° | 1963.1 | 1961.3 | 1989.9 | 2001.6 | 1993.2 |
| 147.5° | 2018.4 | 2013.4 | 2041.9 | 2050.4 | 2043.8 |
| 150° | 2072.3 | 2060.5 | 2087.5 | 2097.5 | 2089.1 |
| 152.5° | 2117.7 | 2104.3 | 2129.4 | 2139.7 | 2127.9 |
| 155° | 2161.4 | 2146.5 | 2166.6 | 2176.6 | 2163.3 |
| 157.5° | 2196.7 | 2183.4 | 2198.6 | 2210.4 | 2196.7 |
| 160° | 2227.1 | 2217.0 | 2227.1 | 2237.1 | 2225.3 |
| 162.5° | 2253.9 | 2243.9 | 2252.3 | 2264.1 | 2248.9 |
| 165° | 2277.5 | 2267.5 | 2272.5 | 2284.2 | 2272.5 |
| 167.5° | 2296.0 | 2285.9 | 2291.0 | 2302.8 | 2287.7 |
| 170° | 2311.3 | 2301.0 | 2304.5 | 2316.3 | 2301.0 |
| 172.5° | 2321.3 | 2311.3 | 2314.6 | 2326.4 | 2311.3 |
| 175° | 2329.6 | 2317.8 | 2321.3 | 2333.0 | 2316.3 |
| 177.5° | 2333.0 | 2321.3 | 2323.0 | 2334.8 | 2319.6 |
| 180° | 2324.6 | 2324.6 | 2324.6 | 2324.6 | 2324.6 |



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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 | 12.71 | 13.57 | 13.64 | 14.51 | 15.73 | 8.67 | 9.53 | 9.60 | 10.47 | 11.69 |
| | 3H | 14.38 | 15.16 | 15.32 | 16.11 | 17.35 | 9.85 | 10.63 | 10.79 | 11.58 | 12.81 |
| | 4H | 14.99 | 15.72 | 15.95 | 16.68 | 17.92 | 10.30 | 11.03 | 11.26 | 11.99 | 13.23 |
| | 6H | 15.41 | 16.08 | 16.38 | 17.04 | 18.30 | 10.62 | 11.29 | 11.58 | 12.25 | 13.51 |
| | 8H | 15.54 | 16.18 | 16.51 | 17.15 | 18.41 | 10.71 | 11.35 | 11.68 | 12.32 | 13.58 |
| | 12H | 15.60 | 16.21 | 16.57 | 17.18 | 18.46 | 10.75 | 11.36 | 11.73 | 12.33 | 13.61 |
| 4H | 2H | 12.73 | 13.46 | 13.69 | 14.41 | 15.66 | 9.27 | 10.00 | 10.23 | 10.95 | 12.20 |
| | 3H | 14.56 | 15.16 | 15.53 | 16.15 | 17.41 | 10.61 | 11.22 | 11.58 | 12.20 | 13.46 |
| | 4H | 15.25 | 15.80 | 16.22 | 16.78 | 18.06 | 11.16 | 11.71 | 12.13 | 12.69 | 13.97 |
| | 6H | 15.76 | 16.24 | 16.75 | 17.24 | 18.52 | 11.57 | 12.05 | 12.56 | 13.05 | 14.33 |
| | 8H | 15.93 | 16.38 | 16.92 | 17.37 | 18.67 | 11.70 | 12.14 | 12.69 | 13.14 | 14.43 |
| | 12H | 16.03 | 16.43 | 17.04 | 17.44 | 18.74 | 11.76 | 12.16 | 12.77 | 13.17 | 14.47 |
| 8H | 4H | 15.22 | 15.66 | 16.21 | 16.65 | 17.95 | 11.44 | 11.88 | 12.43 | 12.88 | 14.17 |
| | 6H | 15.78 | 16.14 | 16.79 | 17.18 | 18.48 | 11.95 | 12.31 | 12.96 | 13.35 | 14.65 |
| | 8H | 15.99 | 16.31 | 17.02 | 17.34 | 18.65 | 12.13 | 12.46 | 13.16 | 13.48 | 14.80 |
| | 12H | 16.13 | 16.41 | 17.15 | 17.43 | 18.79 | 12.25 | 12.53 | 13.28 | 13.55 | 14.91 |
| 12H | 4H | 15.17 | 15.57 | 16.18 | 16.58 | 17.88 | 11.44 | 11.84 | 12.45 | 12.85 | 14.16 |
| | 6H | 15.75 | 16.08 | 16.78 | 17.10 | 18.41 | 12.00 | 12.32 | 13.02 | 13.34 | 14.66 |
| | 8H | 15.97 | 16.26 | 17.00 | 17.27 | 18.63 | 12.20 | 12.49 | 13.23 | 13.51 | 14.86 |