

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: P919679

Luminaire Tested: DFN2DIP-PN4F0-080D090US935-RLLONL

Issue Date: 11/21/2024

Test Information

Test Method: LM-79-2019
Report Number: P919679
REPORT IS A COMBINATION OF REPORTS P901228 AND P898053
Test Lab: INNOVATION CENTER
Issue Date: 11/21/2024
Manufacturer: COOPER LIGHTING SOLUTIONS
Product Line: NEO-RAY
Catalog Number: DFN2DIP-PN4F0-080D090US935-RLONL
Description: 4 foot, Pentagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens
Light Source: -
Ballast/Driver: -

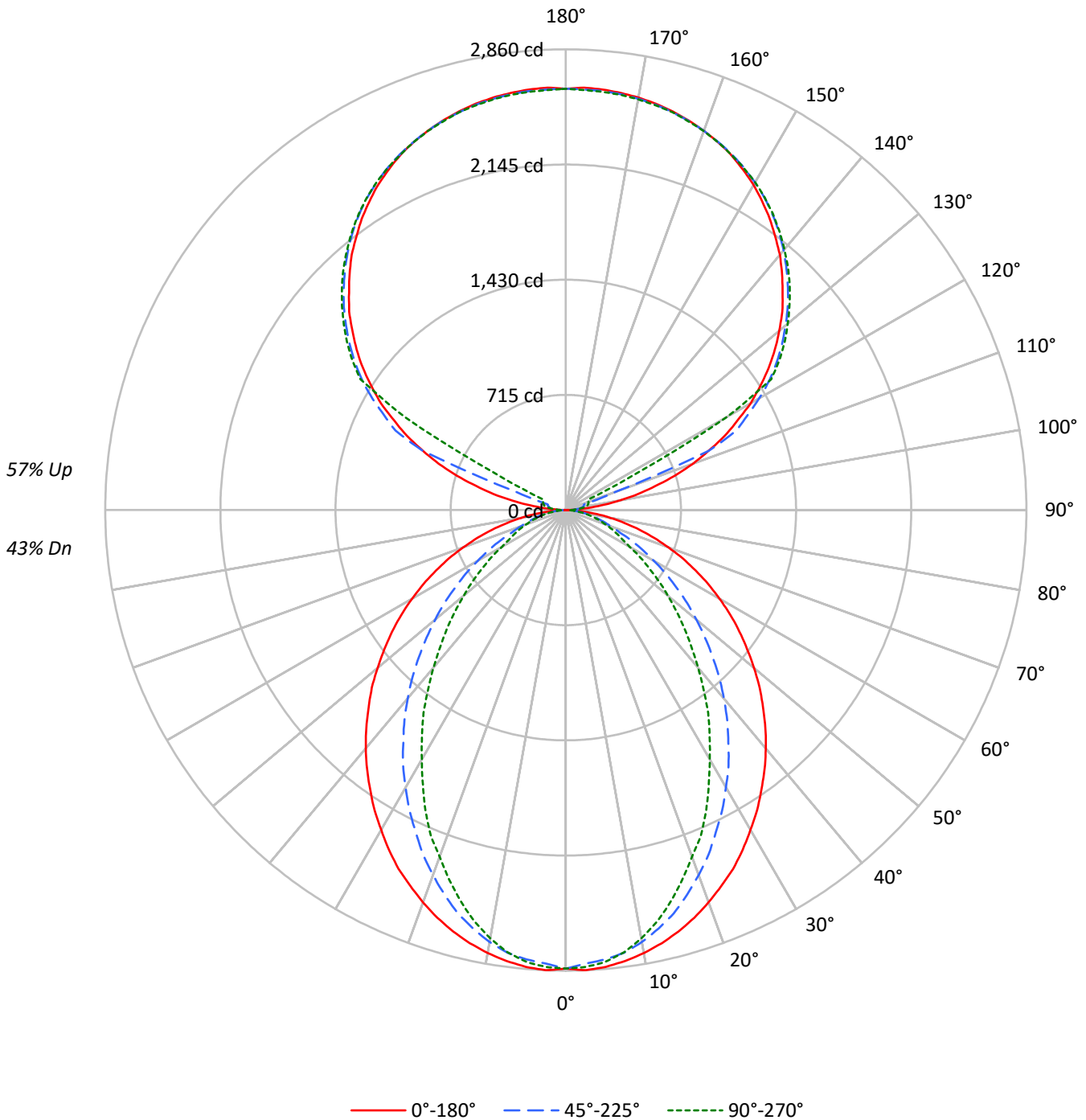
Summary

Lumens per Lamp: N/A
Luminaire Lumens: 13526.3 lumens
Efficiency: N/A
Efficacy: 94.1 lumens/watt
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16
Luminous Opening: Rectangular w/ Sides (W: 3.74' x L: 3.94' x H: 0.1')
CIE Type: General Diffuse

Input Watts (W): 143.8
Input Voltage (V):
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: 0.9971
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 | | | | 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 | 0 | |
| RCR | | | | | | | | | | | | | | | | | | | | | | |
| 0 | 106 | 106 | 106 | 106 | 97 | 97 | 97 | 97 | 80 | 80 | 80 | 64 | 64 | 64 | 50 | 50 | 50 | 43 | | | | 43 |
| 1 | 97 | 93 | 89 | 86 | 88 | 85 | 82 | 79 | 70 | 68 | 66 | 57 | 56 | 54 | 45 | 44 | 43 | 37 | | | | 37 |
| 2 | 88 | 81 | 75 | 71 | 81 | 75 | 70 | 65 | 62 | 59 | 55 | 51 | 48 | 46 | 40 | 38 | 37 | 32 | | | | 32 |
| 3 | 81 | 72 | 65 | 59 | 74 | 66 | 60 | 55 | 55 | 51 | 47 | 45 | 42 | 39 | 36 | 34 | 32 | 28 | | | | 28 |
| 4 | 74 | 64 | 56 | 50 | 68 | 59 | 52 | 47 | 49 | 44 | 40 | 40 | 37 | 34 | 32 | 30 | 28 | 24 | | | | 24 |
| 5 | 68 | 57 | 49 | 43 | 62 | 53 | 46 | 41 | 44 | 39 | 35 | 36 | 33 | 30 | 29 | 27 | 24 | 21 | | | | 21 |
| 6 | 63 | 51 | 43 | 38 | 57 | 47 | 40 | 35 | 40 | 35 | 31 | 33 | 29 | 26 | 27 | 24 | 22 | 19 | | | | 19 |
| 7 | 58 | 46 | 39 | 33 | 53 | 43 | 36 | 31 | 36 | 31 | 27 | 30 | 26 | 23 | 24 | 22 | 19 | 17 | | | | 17 |
| 8 | 54 | 42 | 35 | 30 | 49 | 39 | 32 | 28 | 33 | 28 | 24 | 28 | 24 | 21 | 23 | 20 | 18 | 15 | | | | 15 |
| 9 | 50 | 39 | 31 | 26 | 46 | 36 | 29 | 25 | 31 | 25 | 22 | 26 | 22 | 19 | 21 | 18 | 16 | 14 | | | | 14 |
| 10 | 47 | 35 | 28 | 24 | 43 | 33 | 27 | 22 | 28 | 23 | 20 | 24 | 20 | 17 | 19 | 17 | 15 | 13 | | | | 13 |

AVERAGE LUMINANCE (cd/sqm):

| | 0° | 45° | 90° |
|-----|------|------|------|
| 0° | 2078 | 2078 | 2078 |
| 5° | 2081 | 2045 | 2059 |
| 10° | 2061 | 2006 | 1992 |
| 15° | 2032 | 1939 | 1889 |
| 20° | 1995 | 1848 | 1762 |
| 25° | 1956 | 1746 | 1640 |
| 30° | 1905 | 1641 | 1484 |
| 35° | 1854 | 1529 | 1348 |
| 40° | 1803 | 1412 | 1191 |
| 45° | 1743 | 1283 | 1049 |
| 50° | 1681 | 1152 | 910 |
| 55° | 1617 | 1012 | 777 |
| 60° | 1542 | 866 | 640 |
| 65° | 1456 | 717 | 576 |
| 70° | 1352 | 579 | 522 |
| 75° | 1221 | 511 | 476 |
| 80° | 1031 | 430 | 414 |
| 85° | 719 | 288 | 314 |

MAXIMUM LUMINANCE 45°-90°:

Horizontal Angle: 0°
 Vertical Angle: 45°
 Luminance: 1743 cd/sqm



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ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|---------|-----------|
| 0°-10° | 266.8 | 2.0 |
| 10°-20° | 732.4 | 5.4 |
| 20°-30° | 1028.3 | 7.6 |
| 30°-40° | 1120.9 | 8.3 |
| 40°-50° | 1030.3 | 7.6 |
| 50°-60° | 809.1 | 6.0 |
| 60°-70° | 526.6 | 3.9 |
| 70°-80° | 271.1 | 2.0 |
| 80°-90° | 73.8 | 0.5 |
| 90°-100° | 86.2 | 0.6 |
| 100°-110° | 321.5 | 2.4 |
| 110°-120° | 852.6 | 6.3 |
| 120°-130° | 1414.1 | 10.5 |
| 130°-140° | 1502.1 | 11.1 |
| 140°-150° | 1396.0 | 10.3 |
| 150°-160° | 1122.4 | 8.3 |
| 160°-170° | 723.2 | 5.3 |
| 170°-180° | 248.9 | 1.8 |
| 0°-30° | 2027.6 | 15.0 |
| 0°-40° | 3148.5 | 23.3 |
| 0°-60° | 4987.8 | 36.9 |
| 0°-90° | 5859.4 | 43.3 |
| 90°-120° | 1260.3 | 9.3 |
| 90°-150° | 5572.4 | 41.2 |
| 90°-180° | 7667.0 | 56.7 |
| 0°-180° | 13526.3 | 100.0 |

CANDELA DISTRIBUTION:

| | 0° | 22.5° | 45° | 67.5° | 90° | Flux |
|------|------|-------|------|-------|------|------|
| 0° | 2847 | 2847 | 2847 | 2847 | 2847 | |
| 5° | 2847 | 2834 | 2800 | 2824 | 2816 | 270 |
| 15° | 2708 | 2679 | 2592 | 2543 | 2517 | 763 |
| 25° | 2458 | 2375 | 2205 | 2100 | 2061 | 1130 |
| 35° | 2118 | 1986 | 1760 | 1597 | 1540 | 1326 |
| 45° | 1731 | 1559 | 1288 | 1105 | 1043 | 1337 |
| 55° | 1316 | 1116 | 837 | 683 | 634 | 1176 |
| 65° | 889 | 680 | 448 | 361 | 353 | 881 |
| 75° | 474 | 294 | 206 | 188 | 186 | 501 |
| 85° | 111 | 57 | 49 | 49 | 49 | 127 |
| 90° | 2 | 23 | 38 | 47 | 51 | 13 |
| 95° | 123 | 60 | 74 | 83 | 81 | 146 |
| 105° | 575 | 632 | 116 | 136 | 144 | 615 |
| 115° | 1088 | 1120 | 1168 | 291 | 155 | 1071 |
| 125° | 1538 | 1563 | 1599 | 1612 | 1618 | 1372 |
| 135° | 1904 | 1934 | 1951 | 1970 | 1966 | 1471 |
| 145° | 2208 | 2206 | 2239 | 2252 | 2242 | 1381 |
| 155° | 2432 | 2415 | 2437 | 2449 | 2434 | 1121 |
| 165° | 2562 | 2551 | 2557 | 2570 | 2557 | 724 |
| 175° | 2621 | 2608 | 2611 | 2625 | 2606 | 249 |
| 180° | 2615 | 2615 | 2615 | 2615 | 2615 | |



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CANDELA DISTRIBUTION (FULL):

| | 0° | 22.5° | 45° | 67.5° | 90° |
|--------|--------|--------|--------|--------|--------|
| 0° | 2846.8 | 2846.8 | 2846.8 | 2846.8 | 2846.8 |
| 2.5° | 2859.6 | 2846.8 | 2818.4 | 2844.3 | 2839.1 |
| 5° | 2846.8 | 2834.0 | 2800.3 | 2823.6 | 2815.9 |
| 7.5° | 2823.6 | 2808.2 | 2772.2 | 2782.3 | 2769.4 |
| 10° | 2792.6 | 2774.7 | 2723.3 | 2715.3 | 2700.0 |
| 12.5° | 2754.2 | 2730.9 | 2661.2 | 2645.8 | 2617.4 |
| 15° | 2707.7 | 2679.3 | 2591.8 | 2542.9 | 2517.1 |
| 17.5° | 2653.5 | 2612.3 | 2504.0 | 2447.5 | 2406.1 |
| 20° | 2591.8 | 2540.1 | 2411.4 | 2347.2 | 2290.3 |
| 22.5° | 2524.8 | 2465.5 | 2316.0 | 2228.5 | 2189.9 |
| 25° | 2457.8 | 2375.3 | 2205.3 | 2099.8 | 2061.0 |
| 27.5° | 2378.0 | 2290.3 | 2102.2 | 1981.2 | 1921.8 |
| 30° | 2293.0 | 2194.9 | 1988.8 | 1857.6 | 1787.9 |
| 32.5° | 2210.4 | 2091.9 | 1880.8 | 1726.1 | 1661.6 |
| 35° | 2117.8 | 1986.3 | 1759.7 | 1597.4 | 1540.5 |
| 37.5° | 2027.6 | 1885.8 | 1646.3 | 1468.3 | 1404.1 |
| 40° | 1932.3 | 1777.8 | 1527.7 | 1344.8 | 1277.8 |
| 42.5° | 1834.4 | 1669.6 | 1409.3 | 1218.6 | 1154.3 |
| 45° | 1731.3 | 1558.6 | 1288.2 | 1105.1 | 1043.4 |
| 47.5° | 1633.5 | 1450.6 | 1172.3 | 989.2 | 932.6 |
| 50° | 1525.2 | 1342.4 | 1058.9 | 881.0 | 827.1 |
| 52.5° | 1419.4 | 1226.1 | 950.6 | 780.7 | 731.8 |
| 55° | 1316.4 | 1115.5 | 837.2 | 682.8 | 633.9 |
| 57.5° | 1210.9 | 1004.8 | 736.9 | 592.6 | 551.3 |
| 60° | 1102.6 | 896.6 | 631.1 | 499.9 | 458.7 |
| 62.5° | 997.1 | 791.0 | 541.0 | 417.4 | 396.9 |
| 65° | 888.9 | 680.0 | 448.2 | 360.8 | 352.8 |
| 67.5° | 785.8 | 577.0 | 360.8 | 316.8 | 309.2 |
| 70° | 677.6 | 476.7 | 298.8 | 273.0 | 262.7 |
| 72.5° | 574.5 | 383.7 | 249.9 | 229.4 | 224.1 |
| 75° | 474.0 | 293.6 | 206.1 | 188.0 | 185.6 |
| 77.5° | 373.7 | 208.5 | 162.4 | 152.0 | 146.8 |
| 80° | 280.7 | 149.6 | 123.6 | 113.4 | 113.4 |
| 82.5° | 195.7 | 100.6 | 85.0 | 79.8 | 79.8 |
| 85° | 110.7 | 56.6 | 48.9 | 48.9 | 48.9 |
| 87.5° | 41.2 | 20.5 | 20.5 | 18.1 | 18.1 |
| 90° | 1.8 | 22.7 | 37.7 | 47.4 | 51.0 |
| 92.5° | 47.4 | 39.8 | 45.4 | 49.2 | 51.0 |
| 95° | 123.0 | 60.4 | 73.7 | 83.3 | 81.4 |
| 97.5° | 221.4 | 66.3 | 96.4 | 102.2 | 104.0 |
| 100° | 335.0 | 75.8 | 107.9 | 123.0 | 126.7 |
| 102.5° | 459.8 | 456.2 | 111.7 | 132.3 | 138.2 |
| 105° | 575.2 | 632.1 | 115.5 | 136.2 | 143.8 |
| 107.5° | 709.6 | 756.8 | 119.3 | 140.0 | 147.7 |
| 110° | 838.4 | 878.0 | 331.2 | 142.0 | 149.5 |



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CANDELA DISTRIBUTION (continued):

| | 0° | 22.5° | 45° | 67.5° | 90° |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 959.5 | 993.4 | 961.3 | 145.6 | 151.4 |
| 115° | 1088.0 | 1120.2 | 1167.6 | 291.4 | 155.2 |
| 117.5° | 1199.7 | 1237.5 | 1269.8 | 999.1 | 503.3 |
| 120° | 1324.6 | 1353.0 | 1387.2 | 1409.8 | 1154.3 |
| 122.5° | 1430.5 | 1460.9 | 1498.8 | 1510.0 | 1512.1 |
| 125° | 1538.3 | 1563.1 | 1599.0 | 1612.3 | 1617.9 |
| 127.5° | 1636.8 | 1663.3 | 1691.9 | 1710.7 | 1712.5 |
| 130° | 1729.6 | 1760.0 | 1780.6 | 1801.5 | 1799.7 |
| 132.5° | 1824.2 | 1848.9 | 1869.6 | 1886.7 | 1884.9 |
| 135° | 1903.8 | 1934.1 | 1950.9 | 1970.0 | 1966.3 |
| 137.5° | 1986.9 | 2009.6 | 2028.7 | 2047.5 | 2041.9 |
| 140° | 2068.2 | 2083.5 | 2104.2 | 2121.2 | 2111.9 |
| 142.5° | 2136.6 | 2149.8 | 2174.3 | 2189.3 | 2180.0 |
| 145° | 2208.5 | 2206.4 | 2238.6 | 2251.9 | 2242.4 |
| 147.5° | 2270.7 | 2265.1 | 2297.2 | 2306.7 | 2299.2 |
| 150° | 2331.4 | 2318.2 | 2348.5 | 2359.7 | 2350.3 |
| 152.5° | 2382.4 | 2367.3 | 2395.6 | 2407.1 | 2393.8 |
| 155° | 2431.6 | 2414.8 | 2437.4 | 2448.7 | 2433.6 |
| 157.5° | 2471.4 | 2456.3 | 2473.4 | 2486.6 | 2471.4 |
| 160° | 2505.5 | 2494.1 | 2505.5 | 2516.8 | 2503.5 |
| 162.5° | 2535.6 | 2524.4 | 2533.8 | 2547.1 | 2530.0 |
| 165° | 2562.2 | 2550.9 | 2556.6 | 2569.8 | 2556.6 |
| 167.5° | 2583.1 | 2571.6 | 2577.4 | 2590.7 | 2573.6 |
| 170° | 2600.1 | 2588.7 | 2592.5 | 2605.7 | 2588.7 |
| 172.5° | 2611.4 | 2600.1 | 2603.9 | 2617.2 | 2600.1 |
| 175° | 2620.8 | 2607.5 | 2611.4 | 2624.6 | 2605.7 |
| 177.5° | 2624.6 | 2611.4 | 2613.4 | 2626.6 | 2609.6 |
| 180° | 2615.2 | 2615.2 | 2615.2 | 2615.2 | 2615.2 |



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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 | 9.04 | 9.82 | 10.06 | 10.84 | 12.21 | 5.00 | 5.78 | 6.02 | 6.80 | 8.17 |
| | 3H | 10.71 | 11.41 | 11.74 | 12.44 | 13.83 | 6.19 | 6.88 | 7.22 | 7.92 | 9.30 |
| | 4H | 11.32 | 11.98 | 12.36 | 13.02 | 14.41 | 6.64 | 7.30 | 7.68 | 8.33 | 9.72 |
| | 6H | 11.74 | 12.35 | 12.79 | 13.39 | 14.79 | 6.96 | 7.56 | 8.01 | 8.60 | 10.01 |
| | 8H | 11.87 | 12.45 | 12.93 | 13.50 | 14.90 | 7.05 | 7.62 | 8.10 | 8.68 | 10.08 |
| | 12H | 11.93 | 12.48 | 12.99 | 13.53 | 14.95 | 7.09 | 7.64 | 8.15 | 8.68 | 10.11 |
| 4H | 2H | 9.05 | 9.71 | 10.10 | 10.74 | 12.14 | 5.59 | 6.25 | 6.64 | 7.29 | 8.68 |
| | 3H | 10.88 | 11.43 | 11.93 | 12.49 | 13.89 | 6.94 | 7.49 | 8.00 | 8.55 | 9.96 |
| | 4H | 11.57 | 12.07 | 12.63 | 13.13 | 14.55 | 7.49 | 7.99 | 8.55 | 9.04 | 10.47 |
| | 6H | 12.09 | 12.52 | 13.16 | 13.59 | 15.02 | 7.90 | 8.33 | 8.97 | 9.41 | 10.84 |
| | 8H | 12.26 | 12.66 | 13.33 | 13.73 | 15.17 | 8.03 | 8.43 | 9.10 | 9.50 | 10.94 |
| | 12H | 12.36 | 12.72 | 13.44 | 13.80 | 15.25 | 8.10 | 8.46 | 9.18 | 9.54 | 10.99 |
| 8H | 4H | 11.53 | 11.94 | 12.61 | 13.01 | 14.44 | 7.76 | 8.17 | 8.84 | 9.24 | 10.67 |
| | 6H | 12.10 | 12.43 | 13.20 | 13.54 | 14.98 | 8.28 | 8.61 | 9.38 | 9.73 | 11.16 |
| | 8H | 12.32 | 12.61 | 13.42 | 13.71 | 15.16 | 8.47 | 8.76 | 9.57 | 9.86 | 11.31 |
| | 12H | 12.46 | 12.71 | 13.56 | 13.80 | 15.30 | 8.59 | 8.85 | 9.70 | 9.94 | 11.43 |
| 12H | 4H | 11.48 | 11.85 | 12.57 | 12.93 | 14.37 | 7.77 | 8.13 | 8.86 | 9.21 | 10.66 |
| | 6H | 12.08 | 12.37 | 13.18 | 13.46 | 14.92 | 8.33 | 8.62 | 9.43 | 9.72 | 11.17 |
| | 8H | 12.30 | 12.55 | 13.40 | 13.64 | 15.14 | 8.54 | 8.80 | 9.65 | 9.89 | 11.38 |