

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: P929098

Luminaire Tested: DFN2DIP-HX4F0-110D110US935-RLLONL

Issue Date: 12/12/2024

Test Information

Test Method: LM-79-2019
Report Number: P929098
REPORT IS A COMBINATION OF REPORTS P900960 AND P896187
Test Lab: INNOVATION CENTER
Issue Date: 12/12/2024
Manufacturer: COOPER LIGHTING SOLUTIONS
Product Line: NEO-RAY
Catalog Number: DFN2DIP-HX4F0-110D110US935-RLONL
Description: 4 foot, Hexagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens
Light Source: -
Ballast/Driver: -

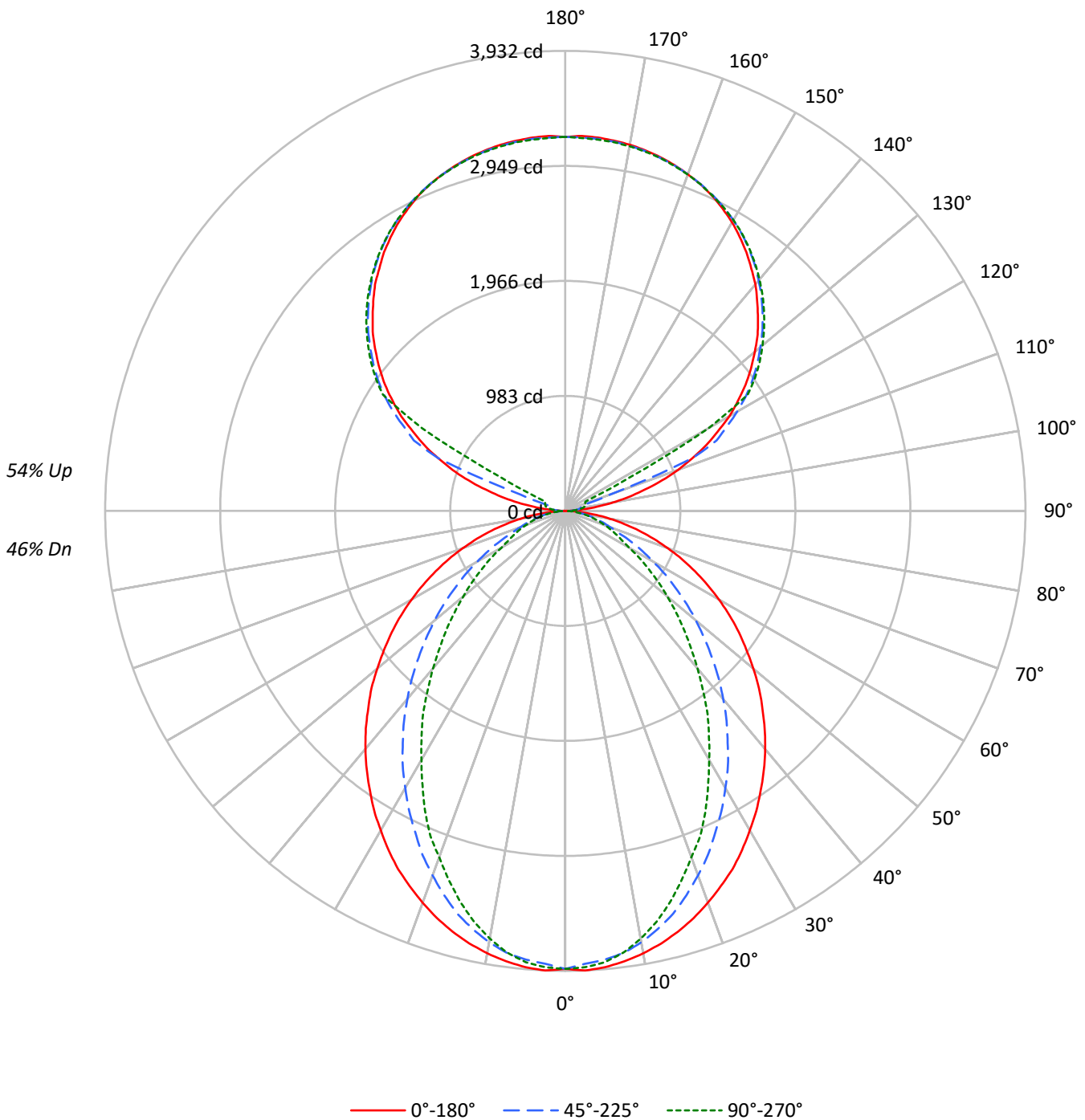
Summary

Lumens per Lamp: N/A
Luminaire Lumens: 17426.6 lumens
Efficiency: N/A
Efficacy: 87.4 lumens/watt
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16
Luminous Opening: Rectangular w/ Sides (W: 3.54' x L: 4.09' x H: 0.1')
CIE Type: General Diffuse

Input Watts (W): 199.5
Input Voltage (V):
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: 0.9967
Total Harmonic Distortion (THDi): 0.063
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





TEST NUMBER: P929098
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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 | | 0 |
| RCR | | | | | | | | | | | | | | | | | | | |
| 0 | 106 | 106 | 106 | 106 | 98 | 98 | 98 | 98 | 81 | 81 | 81 | 66 | 66 | 66 | 53 | 53 | 53 | | 46 |
| 1 | 97 | 93 | 90 | 86 | 89 | 86 | 83 | 80 | 72 | 70 | 68 | 59 | 58 | 56 | 47 | 46 | 45 | | 40 |
| 2 | 89 | 82 | 76 | 71 | 82 | 76 | 70 | 66 | 63 | 60 | 57 | 52 | 50 | 48 | 42 | 40 | 39 | | 34 |
| 3 | 81 | 72 | 65 | 60 | 75 | 67 | 61 | 56 | 56 | 52 | 48 | 47 | 43 | 41 | 38 | 35 | 34 | | 29 |
| 4 | 75 | 64 | 57 | 51 | 68 | 60 | 53 | 48 | 50 | 45 | 41 | 42 | 38 | 35 | 34 | 31 | 29 | | 26 |
| 5 | 69 | 58 | 50 | 44 | 63 | 53 | 46 | 41 | 45 | 40 | 36 | 38 | 34 | 31 | 31 | 28 | 26 | | 23 |
| 6 | 63 | 52 | 44 | 38 | 58 | 48 | 41 | 36 | 41 | 36 | 32 | 34 | 30 | 27 | 28 | 25 | 23 | | 20 |
| 7 | 59 | 47 | 39 | 34 | 54 | 44 | 37 | 32 | 37 | 32 | 28 | 31 | 27 | 24 | 26 | 23 | 21 | | 18 |
| 8 | 55 | 43 | 35 | 30 | 50 | 40 | 33 | 28 | 34 | 29 | 25 | 29 | 25 | 22 | 24 | 21 | 19 | | 16 |
| 9 | 51 | 39 | 32 | 27 | 47 | 36 | 30 | 25 | 31 | 26 | 22 | 27 | 23 | 20 | 22 | 19 | 17 | | 15 |
| 10 | 48 | 36 | 29 | 24 | 44 | 33 | 27 | 23 | 29 | 24 | 20 | 25 | 21 | 18 | 20 | 18 | 15 | | 13 |

AVERAGE LUMINANCE (cd/sqm):

| | 0° | 45° | 90° |
|-----|------|------|------|
| 0° | 2911 | 2911 | 2911 |
| 5° | 2915 | 2865 | 2883 |
| 10° | 2887 | 2809 | 2789 |
| 15° | 2847 | 2716 | 2644 |
| 20° | 2795 | 2588 | 2466 |
| 25° | 2741 | 2445 | 2295 |
| 30° | 2669 | 2298 | 2077 |
| 35° | 2599 | 2141 | 1885 |
| 40° | 2527 | 1977 | 1666 |
| 45° | 2444 | 1796 | 1467 |
| 50° | 2357 | 1613 | 1273 |
| 55° | 2267 | 1417 | 1086 |
| 60° | 2163 | 1212 | 894 |
| 65° | 2043 | 1004 | 805 |
| 70° | 1898 | 810 | 729 |
| 75° | 1716 | 715 | 663 |
| 80° | 1452 | 601 | 576 |
| 85° | 1015 | 402 | 433 |

MAXIMUM LUMINANCE 45°-90°:

Horizontal Angle: 0°
 Vertical Angle: 45°
 Luminance: 2444 cd/sqm



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ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|---------|-----------|
| 0°-10° | 366.9 | 2.1 |
| 10°-20° | 1007.1 | 5.8 |
| 20°-30° | 1413.9 | 8.1 |
| 30°-40° | 1541.3 | 8.8 |
| 40°-50° | 1416.6 | 8.1 |
| 50°-60° | 1112.5 | 6.4 |
| 60°-70° | 724.2 | 4.2 |
| 70°-80° | 372.8 | 2.1 |
| 80°-90° | 100.8 | 0.6 |
| 90°-100° | 105.4 | 0.6 |
| 100°-110° | 392.9 | 2.3 |
| 110°-120° | 1042.0 | 6.0 |
| 120°-130° | 1728.3 | 9.9 |
| 130°-140° | 1835.9 | 10.5 |
| 140°-150° | 1706.2 | 9.8 |
| 150°-160° | 1371.8 | 7.9 |
| 160°-170° | 883.9 | 5.1 |
| 170°-180° | 304.2 | 1.7 |
| 0°-30° | 2787.9 | 16.0 |
| 0°-40° | 4329.2 | 24.8 |
| 0°-60° | 6858.3 | 39.4 |
| 0°-90° | 8056.0 | 46.2 |
| 90°-120° | 1540.3 | 8.8 |
| 90°-150° | 6810.7 | 39.1 |
| 90°-180° | 9371.0 | 53.8 |
| 0°-180° | 17426.6 | 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 | 28 | 46 | 58 | 62 | 16 |
| 95° | 150 | 74 | 90 | 102 | 99 | 178 |
| 105° | 703 | 773 | 141 | 166 | 176 | 751 |
| 115° | 1330 | 1369 | 1427 | 356 | 190 | 1309 |
| 125° | 1880 | 1910 | 1954 | 1971 | 1978 | 1677 |
| 135° | 2327 | 2364 | 2384 | 2408 | 2403 | 1797 |
| 145° | 2699 | 2697 | 2736 | 2752 | 2741 | 1688 |
| 155° | 2972 | 2951 | 2979 | 2993 | 2974 | 1370 |
| 165° | 3132 | 3118 | 3125 | 3141 | 3125 | 885 |
| 175° | 3203 | 3187 | 3192 | 3208 | 3185 | 305 |
| 180° | 3196 | 3196 | 3196 | 3196 | 3196 | |



TEST NUMBER: P929098

CATALOG NUMBER: DFN2DIP-HX4F0-110D110US935-RLONL

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 | 3733.6 | 3712.5 |
| 12.5° | 3786.9 | 3755.0 | 3659.2 | 3638.1 | 3599.0 |
| 15° | 3723.1 | 3684.0 | 3563.7 | 3496.4 | 3461.0 |
| 17.5° | 3648.7 | 3591.9 | 3443.1 | 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 | 2876.3 | 2586.1 | 2373.4 | 2284.7 |
| 35° | 2912.0 | 2731.2 | 2419.7 | 2196.4 | 2118.2 |
| 37.5° | 2788.0 | 2592.9 | 2263.7 | 2019.0 | 1930.7 |
| 40° | 2656.8 | 2444.5 | 2100.6 | 1849.1 | 1757.0 |
| 42.5° | 2522.2 | 2295.6 | 1937.9 | 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 | 814.9 | 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° | 2.2 | 27.7 | 46.1 | 57.9 | 62.3 |
| 92.5° | 57.9 | 48.6 | 55.4 | 60.2 | 62.3 |
| 95° | 150.2 | 73.9 | 90.1 | 101.9 | 99.4 |
| 97.5° | 270.5 | 81.0 | 117.8 | 124.9 | 127.2 |
| 100° | 409.5 | 92.6 | 131.8 | 150.2 | 154.9 |
| 102.5° | 561.9 | 557.5 | 136.5 | 161.8 | 168.9 |
| 105° | 703.1 | 772.6 | 141.2 | 166.4 | 175.8 |
| 107.5° | 867.4 | 925.0 | 145.9 | 171.1 | 180.5 |
| 110° | 1024.7 | 1073.1 | 404.8 | 173.6 | 182.6 |



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CANDELA DISTRIBUTION (continued):

| | 0° | 22.5° | 45° | 67.5° | 90° |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1172.8 | 1214.2 | 1174.9 | 178.0 | 185.1 |
| 115° | 1329.8 | 1369.1 | 1427.1 | 356.2 | 189.8 |
| 117.5° | 1466.4 | 1512.5 | 1552.0 | 1221.1 | 615.2 |
| 120° | 1619.0 | 1653.6 | 1695.4 | 1723.1 | 1410.8 |
| 122.5° | 1748.4 | 1785.5 | 1831.9 | 1845.6 | 1848.1 |
| 125° | 1880.3 | 1910.5 | 1954.4 | 1970.6 | 1977.5 |
| 127.5° | 2000.5 | 2032.9 | 2067.8 | 2090.9 | 2093.1 |
| 130° | 2113.9 | 2151.0 | 2176.3 | 2201.8 | 2199.7 |
| 132.5° | 2229.6 | 2259.8 | 2285.1 | 2305.9 | 2303.8 |
| 135° | 2326.9 | 2363.9 | 2384.5 | 2407.9 | 2403.1 |
| 137.5° | 2428.5 | 2456.2 | 2479.5 | 2502.6 | 2495.7 |
| 140° | 2527.9 | 2546.5 | 2571.8 | 2592.6 | 2581.1 |
| 142.5° | 2611.3 | 2627.5 | 2657.5 | 2675.9 | 2664.4 |
| 145° | 2699.2 | 2696.7 | 2736.0 | 2752.3 | 2740.7 |
| 147.5° | 2775.3 | 2768.5 | 2807.7 | 2819.3 | 2810.2 |
| 150° | 2849.5 | 2833.3 | 2870.3 | 2884.1 | 2872.6 |
| 152.5° | 2911.8 | 2893.4 | 2928.0 | 2942.0 | 2925.9 |
| 155° | 2972.0 | 2951.3 | 2979.1 | 2992.8 | 2974.4 |
| 157.5° | 3020.6 | 3002.1 | 3023.1 | 3039.2 | 3020.6 |
| 160° | 3062.3 | 3048.3 | 3062.3 | 3076.0 | 3059.8 |
| 162.5° | 3099.1 | 3085.4 | 3096.9 | 3113.1 | 3092.3 |
| 165° | 3131.5 | 3117.8 | 3124.7 | 3140.8 | 3124.7 |
| 167.5° | 3157.0 | 3143.1 | 3150.2 | 3166.4 | 3145.6 |
| 170° | 3178.0 | 3163.9 | 3168.6 | 3184.8 | 3163.9 |
| 172.5° | 3191.6 | 3178.0 | 3182.6 | 3198.8 | 3178.0 |
| 175° | 3203.2 | 3187.0 | 3191.6 | 3207.9 | 3184.8 |
| 177.5° | 3207.9 | 3191.6 | 3194.1 | 3210.3 | 3189.5 |
| 180° | 3196.4 | 3196.4 | 3196.4 | 3196.4 | 3196.4 |



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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 | 10.50 | 11.30 | 11.49 | 12.30 | 13.63 | 6.47 | 7.27 | 7.47 | 8.27 | 9.60 |
| | 3H | 12.17 | 12.89 | 13.18 | 13.90 | 15.25 | 7.66 | 8.37 | 8.66 | 9.39 | 10.73 |
| | 4H | 12.78 | 13.46 | 13.80 | 14.47 | 15.83 | 8.11 | 8.79 | 9.13 | 9.80 | 11.16 |
| | 6H | 13.20 | 13.82 | 14.23 | 14.84 | 16.21 | 8.43 | 9.05 | 9.46 | 10.07 | 11.44 |
| | 8H | 13.33 | 13.92 | 14.36 | 14.96 | 16.32 | 8.52 | 9.11 | 9.55 | 10.15 | 11.51 |
| | 12H | 13.39 | 13.95 | 14.43 | 14.98 | 16.37 | 8.56 | 9.13 | 9.60 | 10.16 | 11.54 |
| 4H | 2H | 10.51 | 11.19 | 11.54 | 12.20 | 13.56 | 7.06 | 7.74 | 8.09 | 8.75 | 10.11 |
| | 3H | 12.34 | 12.90 | 13.37 | 13.95 | 15.31 | 8.41 | 8.97 | 9.45 | 10.02 | 11.39 |
| | 4H | 13.03 | 13.55 | 14.07 | 14.58 | 15.97 | 8.96 | 9.47 | 10.00 | 10.51 | 11.90 |
| | 6H | 13.55 | 13.99 | 14.60 | 15.05 | 16.43 | 9.38 | 9.82 | 10.43 | 10.88 | 12.27 |
| | 8H | 13.72 | 14.13 | 14.77 | 15.18 | 16.59 | 9.51 | 9.92 | 10.56 | 10.97 | 12.37 |
| | 12H | 13.82 | 14.19 | 14.88 | 15.25 | 16.66 | 9.57 | 9.95 | 10.64 | 11.01 | 12.42 |
| 8H | 4H | 13.00 | 13.41 | 14.05 | 14.46 | 15.86 | 9.24 | 9.65 | 10.29 | 10.70 | 12.10 |
| | 6H | 13.56 | 13.90 | 14.64 | 15.00 | 16.40 | 9.76 | 10.10 | 10.83 | 11.19 | 12.59 |
| | 8H | 13.78 | 14.08 | 14.86 | 15.16 | 16.58 | 9.95 | 10.25 | 11.03 | 11.33 | 12.75 |
| | 12H | 13.92 | 14.18 | 15.00 | 15.25 | 16.71 | 10.07 | 10.33 | 11.15 | 11.40 | 12.86 |
| 12H | 4H | 12.95 | 13.32 | 14.02 | 14.39 | 15.79 | 9.24 | 9.61 | 10.31 | 10.68 | 12.09 |
| | 6H | 13.54 | 13.84 | 14.62 | 14.91 | 16.33 | 9.81 | 10.11 | 10.89 | 11.18 | 12.60 |
| | 8H | 13.76 | 14.02 | 14.84 | 15.09 | 16.55 | 10.02 | 10.28 | 11.10 | 11.35 | 12.81 |