

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: P912250

Luminaire Tested: DFN2DIP-SQ4F0-090D110US850-RLLFLL

Issue Date: 11/21/2024

Test Information

Test Method: LM-79-2019
Report Number: P912250
REPORT IS A COMBINATION OF REPORTS P900156 AND P896915
Test Lab: INNOVATION CENTER
Issue Date: 11/21/2024
Manufacturer: COOPER LIGHTING SOLUTIONS
Product Line: NEO-RAY
Catalog Number: DFN2DIP-SQ4F0-090D110US850-RLLFLL
Description: 4 foot, Square Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens
Light Source: -
Ballast/Driver: -

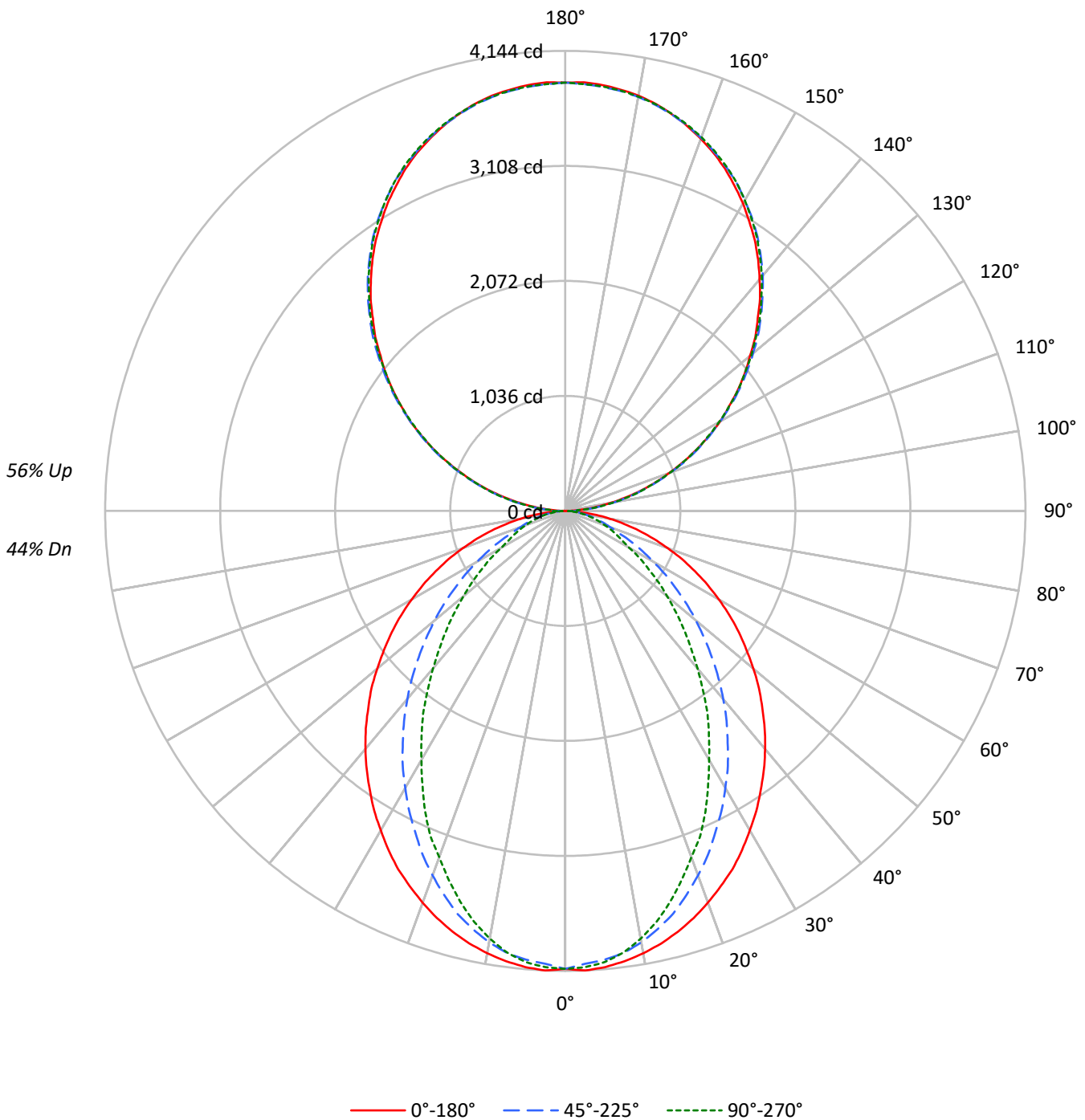
Summary

Lumens per Lamp: N/A
Luminaire Lumens: 19280.0 lumens
Efficiency: N/A
Efficacy: 116.5 lumens/watt
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 3.92' x H: 0.1')
CIE Type: General Diffuse

Input Watts (W): 165.5
Input Voltage (V):
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: 0.983
Total Harmonic Distortion (THDi): 0.073
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 24 FT

TEST NUMBER: P912250
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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 | 0 |
| RCR | | | | | | | | | | | | | | | | | | | | | |
| 0 | 106 | 106 | 106 | 106 | 97 | 97 | 97 | 97 | 80 | 80 | 80 | 65 | 65 | 65 | 51 | 51 | 51 | 44 | | | 44 |
| 1 | 97 | 93 | 89 | 86 | 89 | 85 | 82 | 79 | 71 | 69 | 67 | 58 | 56 | 55 | 45 | 44 | 44 | 38 | | | 38 |
| 2 | 89 | 81 | 76 | 71 | 81 | 75 | 70 | 66 | 62 | 59 | 56 | 51 | 49 | 46 | 40 | 39 | 37 | 32 | | | 32 |
| 3 | 81 | 72 | 65 | 59 | 74 | 66 | 60 | 55 | 55 | 51 | 47 | 45 | 42 | 40 | 36 | 34 | 32 | 28 | | | 28 |
| 4 | 74 | 64 | 56 | 51 | 68 | 59 | 52 | 47 | 50 | 45 | 41 | 41 | 37 | 34 | 33 | 30 | 28 | 24 | | | 24 |
| 5 | 68 | 57 | 49 | 44 | 62 | 53 | 46 | 41 | 45 | 39 | 35 | 37 | 33 | 30 | 30 | 27 | 25 | 21 | | | 21 |
| 6 | 63 | 51 | 44 | 38 | 58 | 48 | 41 | 36 | 40 | 35 | 31 | 33 | 29 | 26 | 27 | 24 | 22 | 19 | | | 19 |
| 7 | 58 | 46 | 39 | 33 | 53 | 43 | 36 | 31 | 37 | 31 | 27 | 30 | 27 | 24 | 25 | 22 | 20 | 17 | | | 17 |
| 8 | 54 | 42 | 35 | 30 | 50 | 39 | 33 | 28 | 33 | 28 | 24 | 28 | 24 | 21 | 23 | 20 | 18 | 15 | | | 15 |
| 9 | 51 | 39 | 31 | 26 | 46 | 36 | 29 | 25 | 31 | 26 | 22 | 26 | 22 | 19 | 21 | 18 | 16 | 14 | | | 14 |
| 10 | 47 | 35 | 28 | 24 | 43 | 33 | 27 | 22 | 28 | 23 | 20 | 24 | 20 | 17 | 20 | 17 | 15 | 13 | | | 13 |

AVERAGE LUMINANCE (cd/sqm):

| | 0° | 45° | 90° |
|-----|------|------|------|
| 0° | 2894 | 2894 | 2894 |
| 5° | 2899 | 2849 | 2868 |
| 10° | 2870 | 2794 | 2775 |
| 15° | 2831 | 2702 | 2632 |
| 20° | 2779 | 2575 | 2455 |
| 25° | 2725 | 2433 | 2285 |
| 30° | 2653 | 2287 | 2069 |
| 35° | 2583 | 2130 | 1879 |
| 40° | 2511 | 1968 | 1661 |
| 45° | 2428 | 1788 | 1463 |
| 50° | 2341 | 1606 | 1270 |
| 55° | 2251 | 1411 | 1084 |
| 60° | 2147 | 1208 | 893 |
| 65° | 2027 | 1001 | 805 |
| 70° | 1882 | 808 | 730 |
| 75° | 1700 | 714 | 666 |
| 80° | 1436 | 600 | 580 |
| 85° | 1000 | 404 | 442 |

MAXIMUM LUMINANCE 45°-90°:

Horizontal Angle: 90°
 Vertical Angle: 90°
 Luminance: 3037 cd/sqm



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ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|---------|-----------|
| 0°-10° | 386.6 | 2.0 |
| 10°-20° | 1061.3 | 5.5 |
| 20°-30° | 1490.1 | 7.7 |
| 30°-40° | 1624.3 | 8.4 |
| 40°-50° | 1492.9 | 7.7 |
| 50°-60° | 1172.4 | 6.1 |
| 60°-70° | 763.1 | 4.0 |
| 70°-80° | 392.8 | 2.0 |
| 80°-90° | 111.3 | 0.6 |
| 90°-100° | 238.7 | 1.2 |
| 100°-110° | 758.6 | 3.9 |
| 110°-120° | 1298.1 | 6.7 |
| 120°-130° | 1707.2 | 8.9 |
| 130°-140° | 1916.3 | 9.9 |
| 140°-150° | 1879.1 | 9.7 |
| 150°-160° | 1576.3 | 8.2 |
| 160°-170° | 1045.4 | 5.4 |
| 170°-180° | 365.4 | 1.9 |
| 0°-30° | 2938.0 | 15.2 |
| 0°-40° | 4562.3 | 23.7 |
| 0°-60° | 7227.6 | 37.5 |
| 0°-90° | 8494.8 | 44.1 |
| 90°-120° | 2295.4 | 11.9 |
| 90°-150° | 7798.0 | 40.4 |
| 90°-180° | 10785.0 | 55.9 |
| 0°-180° | 19280.0 | 100.0 |

CANDELA DISTRIBUTION:

| | 0° | 22.5° | 45° | 67.5° | 90° | Flux |
|------|------|-------|------|-------|------|------|
| 0° | 4125 | 4125 | 4125 | 4125 | 4125 | |
| 5° | 4125 | 4106 | 4058 | 4091 | 4080 | 391 |
| 15° | 3924 | 3882 | 3756 | 3685 | 3648 | 1106 |
| 25° | 3562 | 3442 | 3196 | 3043 | 2986 | 1638 |
| 35° | 3069 | 2878 | 2550 | 2315 | 2232 | 1921 |
| 45° | 2509 | 2258 | 1867 | 1601 | 1512 | 1937 |
| 55° | 1908 | 1616 | 1213 | 989 | 918 | 1705 |
| 65° | 1288 | 986 | 650 | 523 | 511 | 1277 |
| 75° | 687 | 425 | 299 | 272 | 269 | 726 |
| 85° | 160 | 82 | 71 | 71 | 71 | 184 |
| 90° | 3 | 42 | 114 | 107 | 110 | 19 |
| 95° | 170 | 202 | 208 | 208 | 202 | 189 |
| 105° | 700 | 710 | 716 | 722 | 722 | 739 |
| 115° | 1303 | 1321 | 1316 | 1312 | 1303 | 1288 |
| 125° | 1895 | 1924 | 1914 | 1904 | 1900 | 1693 |
| 135° | 2451 | 2487 | 2494 | 2490 | 2481 | 1894 |
| 145° | 2975 | 2998 | 3017 | 3021 | 3008 | 1859 |
| 155° | 3402 | 3411 | 3422 | 3438 | 3428 | 1566 |
| 165° | 3701 | 3698 | 3698 | 3721 | 3704 | 1044 |
| 175° | 3851 | 3842 | 3835 | 3858 | 3838 | 366 |
| 180° | 3858 | 3858 | 3858 | 3858 | 3858 | |



TEST NUMBER: P912250

CATALOG NUMBER: DFN2DIP-SQ4F0-090D110US850-RLFL

CANDELA DISTRIBUTION (FULL):

| | 0° | 22.5° | 45° | 67.5° | 90° |
|--------|--------|--------|--------|--------|--------|
| 0° | 4125.1 | 4125.1 | 4125.1 | 4125.1 | 4125.1 |
| 2.5° | 4143.8 | 4125.1 | 4083.9 | 4121.6 | 4114.1 |
| 5° | 4125.1 | 4106.5 | 4057.8 | 4091.4 | 4080.3 |
| 7.5° | 4091.4 | 4069.3 | 4017.0 | 4031.7 | 4013.0 |
| 10° | 4046.7 | 4020.6 | 3946.2 | 3934.6 | 3912.4 |
| 12.5° | 3990.8 | 3957.2 | 3856.2 | 3834.0 | 3792.8 |
| 15° | 3923.5 | 3882.4 | 3755.6 | 3684.7 | 3647.5 |
| 17.5° | 3845.1 | 3785.3 | 3628.4 | 3546.5 | 3486.7 |
| 20° | 3755.6 | 3680.8 | 3494.1 | 3401.1 | 3318.7 |
| 22.5° | 3658.6 | 3572.6 | 3355.9 | 3229.2 | 3173.4 |
| 25° | 3561.6 | 3441.9 | 3195.6 | 3042.7 | 2986.4 |
| 27.5° | 3445.9 | 3318.7 | 3046.2 | 2870.8 | 2784.8 |
| 30° | 3322.7 | 3180.5 | 2881.8 | 2691.8 | 2590.7 |
| 32.5° | 3203.0 | 3031.1 | 2725.4 | 2501.2 | 2407.7 |
| 35° | 3068.8 | 2878.3 | 2549.9 | 2314.7 | 2232.3 |
| 37.5° | 2938.1 | 2732.6 | 2385.6 | 2127.7 | 2034.7 |
| 40° | 2799.9 | 2576.1 | 2213.7 | 1948.7 | 1851.7 |
| 42.5° | 2658.1 | 2419.3 | 2042.1 | 1765.7 | 1672.6 |
| 45° | 2508.8 | 2258.5 | 1866.7 | 1601.3 | 1511.8 |
| 47.5° | 2366.9 | 2102.0 | 1698.8 | 1433.4 | 1351.4 |
| 50° | 2210.1 | 1945.1 | 1534.4 | 1276.6 | 1198.5 |
| 52.5° | 2056.9 | 1776.8 | 1377.6 | 1131.2 | 1060.3 |
| 55° | 1907.5 | 1616.4 | 1213.1 | 989.4 | 918.5 |
| 57.5° | 1754.7 | 1456.0 | 1067.9 | 858.7 | 798.9 |
| 60° | 1597.7 | 1299.1 | 914.6 | 724.4 | 664.6 |
| 62.5° | 1444.9 | 1146.3 | 783.8 | 604.8 | 575.1 |
| 65° | 1288.0 | 985.5 | 649.5 | 522.8 | 511.4 |
| 67.5° | 1138.7 | 836.1 | 522.8 | 459.0 | 447.9 |
| 70° | 981.9 | 690.8 | 433.0 | 395.7 | 380.6 |
| 72.5° | 832.5 | 556.1 | 362.0 | 332.3 | 324.8 |
| 75° | 686.8 | 425.4 | 298.7 | 272.5 | 268.9 |
| 77.5° | 541.4 | 302.2 | 235.2 | 220.2 | 212.7 |
| 80° | 406.8 | 216.7 | 179.0 | 164.4 | 164.4 |
| 82.5° | 283.6 | 145.7 | 123.2 | 115.7 | 115.7 |
| 85° | 160.4 | 82.0 | 70.9 | 70.9 | 70.9 |
| 87.5° | 59.8 | 29.7 | 29.7 | 26.2 | 26.2 |
| 90° | 3.4 | 41.9 | 114.0 | 107.0 | 110.5 |
| 92.5° | 72.1 | 97.7 | 101.1 | 104.7 | 104.7 |
| 95° | 169.8 | 202.4 | 208.2 | 208.2 | 202.4 |
| 97.5° | 282.7 | 312.8 | 325.7 | 325.7 | 325.7 |
| 100° | 412.9 | 439.6 | 448.9 | 448.9 | 445.5 |
| 102.5° | 550.2 | 569.9 | 582.8 | 586.2 | 582.8 |
| 105° | 700.2 | 709.5 | 716.5 | 722.3 | 722.3 |
| 107.5° | 849.1 | 863.0 | 863.0 | 865.4 | 849.1 |
| 110° | 993.3 | 1012.0 | 1012.0 | 1012.0 | 1002.6 |



TEST NUMBER: P912250

CATALOG NUMBER: DFN2DIP-SQ4F0-090D110US850-RLFL

CANDELA DISTRIBUTION (continued):

| | 0° | 22.5° | 45° | 67.5° | 90° |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1149.1 | 1168.9 | 1165.4 | 1156.1 | 1149.1 |
| 115° | 1302.7 | 1321.3 | 1315.5 | 1312.1 | 1302.7 |
| 117.5° | 1455.1 | 1480.6 | 1464.3 | 1455.1 | 1445.8 |
| 120° | 1608.6 | 1634.2 | 1608.6 | 1608.6 | 1598.2 |
| 122.5° | 1748.2 | 1780.7 | 1764.4 | 1755.1 | 1748.2 |
| 125° | 1894.7 | 1923.8 | 1914.5 | 1904.0 | 1900.5 |
| 127.5° | 2037.8 | 2073.8 | 2061.1 | 2047.1 | 2037.8 |
| 130° | 2171.5 | 2213.5 | 2207.6 | 2200.6 | 2187.8 |
| 132.5° | 2321.6 | 2354.2 | 2356.5 | 2340.2 | 2330.9 |
| 135° | 2450.7 | 2486.7 | 2493.7 | 2490.3 | 2480.9 |
| 137.5° | 2594.9 | 2624.0 | 2629.8 | 2627.4 | 2613.6 |
| 140° | 2721.7 | 2750.8 | 2767.1 | 2767.1 | 2754.3 |
| 142.5° | 2852.0 | 2881.1 | 2890.4 | 2893.8 | 2881.1 |
| 145° | 2975.2 | 2998.5 | 3017.1 | 3020.6 | 3007.8 |
| 147.5° | 3085.8 | 3114.8 | 3128.8 | 3134.6 | 3121.8 |
| 150° | 3199.8 | 3219.5 | 3232.3 | 3242.8 | 3232.3 |
| 152.5° | 3300.9 | 3320.7 | 3337.0 | 3349.8 | 3337.0 |
| 155° | 3402.2 | 3411.4 | 3421.9 | 3438.2 | 3427.7 |
| 157.5° | 3489.4 | 3496.3 | 3502.1 | 3525.4 | 3509.1 |
| 160° | 3567.3 | 3574.3 | 3577.7 | 3597.6 | 3583.6 |
| 162.5° | 3639.4 | 3639.4 | 3643.0 | 3665.0 | 3648.7 |
| 165° | 3701.1 | 3697.5 | 3697.5 | 3720.8 | 3704.5 |
| 167.5° | 3756.8 | 3746.4 | 3746.4 | 3769.7 | 3753.4 |
| 170° | 3798.8 | 3789.5 | 3786.0 | 3809.2 | 3789.5 |
| 172.5° | 3827.8 | 3818.5 | 3815.1 | 3838.4 | 3818.5 |
| 175° | 3851.1 | 3841.8 | 3834.8 | 3858.1 | 3838.4 |
| 177.5° | 3863.9 | 3854.6 | 3847.6 | 3867.4 | 3847.6 |
| 180° | 3858.1 | 3858.1 | 3858.1 | 3858.1 | 3858.1 |



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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 | 10.27 | 11.05 | 11.28 | 12.07 | 13.43 | 6.23 | 7.01 | 7.24 | 8.03 | 9.39 |
| | 3H | 11.95 | 12.65 | 12.97 | 13.68 | 15.05 | 7.42 | 8.12 | 8.44 | 9.14 | 10.52 |
| | 4H | 12.56 | 13.22 | 13.59 | 14.25 | 15.63 | 7.86 | 8.53 | 8.90 | 9.56 | 10.94 |
| | 6H | 12.98 | 13.59 | 14.03 | 14.62 | 16.02 | 8.18 | 8.79 | 9.23 | 9.83 | 11.22 |
| | 8H | 13.11 | 13.69 | 14.16 | 14.74 | 16.13 | 8.27 | 8.85 | 9.32 | 9.90 | 11.30 |
| | 12H | 13.17 | 13.72 | 14.22 | 14.76 | 16.18 | 8.32 | 8.87 | 9.37 | 9.91 | 11.33 |
| 4H | 2H | 10.28 | 10.95 | 11.32 | 11.97 | 13.36 | 6.82 | 7.49 | 7.86 | 8.51 | 9.90 |
| | 3H | 12.11 | 12.66 | 13.16 | 13.72 | 15.12 | 8.17 | 8.72 | 9.22 | 9.78 | 11.18 |
| | 4H | 12.81 | 13.31 | 13.86 | 14.36 | 15.78 | 8.72 | 9.22 | 9.77 | 10.27 | 11.69 |
| | 6H | 13.32 | 13.76 | 14.39 | 14.83 | 16.24 | 9.13 | 9.57 | 10.20 | 10.64 | 12.05 |
| | 8H | 13.50 | 13.90 | 14.56 | 14.97 | 16.40 | 9.26 | 9.67 | 10.33 | 10.73 | 12.16 |
| | 12H | 13.59 | 13.96 | 14.68 | 15.04 | 16.47 | 9.33 | 9.69 | 10.41 | 10.77 | 12.20 |
| 8H | 4H | 12.77 | 13.17 | 13.84 | 14.24 | 15.67 | 8.99 | 9.40 | 10.06 | 10.46 | 11.89 |
| | 6H | 13.34 | 13.67 | 14.43 | 14.78 | 16.21 | 9.51 | 9.85 | 10.60 | 10.95 | 12.38 |
| | 8H | 13.56 | 13.85 | 14.65 | 14.94 | 16.39 | 9.70 | 10.00 | 10.80 | 11.09 | 12.53 |
| | 12H | 13.70 | 13.96 | 14.80 | 15.04 | 16.53 | 9.82 | 10.08 | 10.92 | 11.17 | 12.65 |
| 12H | 4H | 12.72 | 13.08 | 13.80 | 14.16 | 15.60 | 9.00 | 9.36 | 10.08 | 10.44 | 11.88 |
| | 6H | 13.31 | 13.61 | 14.41 | 14.70 | 16.14 | 9.56 | 9.86 | 10.66 | 10.95 | 12.39 |
| | 8H | 13.54 | 13.79 | 14.63 | 14.88 | 16.37 | 9.77 | 10.03 | 10.87 | 11.12 | 12.60 |