

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: P909666

Luminaire Tested: DFN2DIP-SQ4F0-140D110US840-RLLFLL

Issue Date: 11/21/2024

Test Information

Test Method: LM-79-2019
Report Number: P909666
REPORT IS A COMBINATION OF REPORTS P900164 AND P896915
Test Lab: INNOVATION CENTER
Issue Date: 11/21/2024
Manufacturer: COOPER LIGHTING SOLUTIONS
Product Line: NEO-RAY
Catalog Number: DFN2DIP-SQ4F0-140D110US840-RLLFLL
Description: 4 foot, Square Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens
Light Source: -
Ballast/Driver: -

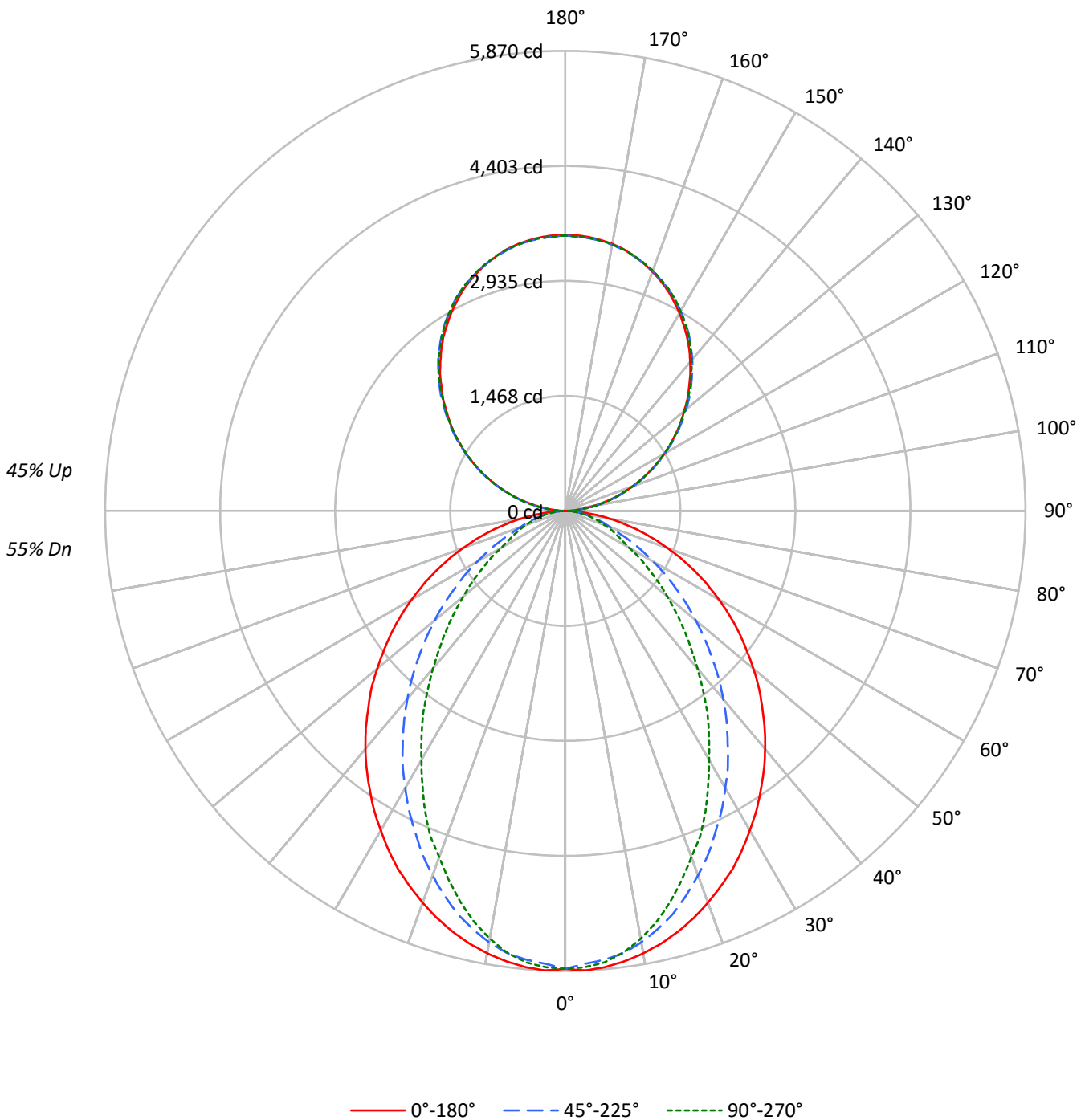
Summary

Lumens per Lamp: N/A
Luminaire Lumens: 21848.4 lumens
Efficiency: N/A
Efficacy: 96.4 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): 226.6
Input Voltage (V):
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: 0.9789
Total Harmonic Distortion (THDi): 0.074
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: P909666

CATALOG NUMBER: DFN2DIP-SQ4F0-140D110US840-RLFL

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 | 108 | 108 | 108 | 108 | 101 | 101 | 101 | 101 | 86 | 86 | 86 | 73 | 73 | 73 | 61 | 61 | 61 | 55 |
| 1 | 99 | 95 | 92 | 88 | 92 | 89 | 85 | 83 | 76 | 74 | 72 | 65 | 63 | 62 | 55 | 53 | 52 | 47 |
| 2 | 91 | 84 | 78 | 73 | 84 | 78 | 73 | 69 | 68 | 64 | 60 | 58 | 55 | 52 | 49 | 47 | 45 | 41 |
| 3 | 83 | 74 | 67 | 61 | 77 | 69 | 63 | 58 | 60 | 55 | 51 | 51 | 48 | 45 | 44 | 41 | 39 | 35 |
| 4 | 77 | 66 | 58 | 52 | 71 | 62 | 55 | 50 | 54 | 48 | 44 | 46 | 42 | 39 | 39 | 36 | 34 | 30 |
| 5 | 70 | 59 | 51 | 45 | 65 | 55 | 48 | 43 | 48 | 43 | 39 | 42 | 38 | 34 | 36 | 32 | 30 | 27 |
| 6 | 65 | 53 | 45 | 40 | 60 | 50 | 43 | 38 | 44 | 38 | 34 | 38 | 34 | 30 | 33 | 29 | 27 | 24 |
| 7 | 60 | 48 | 40 | 35 | 56 | 45 | 38 | 33 | 40 | 34 | 30 | 35 | 30 | 27 | 30 | 26 | 24 | 21 |
| 8 | 56 | 44 | 36 | 31 | 52 | 41 | 35 | 30 | 37 | 31 | 27 | 32 | 27 | 24 | 28 | 24 | 22 | 19 |
| 9 | 52 | 40 | 33 | 28 | 49 | 38 | 31 | 27 | 34 | 28 | 24 | 29 | 25 | 22 | 26 | 22 | 20 | 18 |
| 10 | 49 | 37 | 30 | 25 | 46 | 35 | 29 | 24 | 31 | 26 | 22 | 27 | 23 | 20 | 24 | 20 | 18 | 16 |

AVERAGE LUMINANCE (cd/sqm):

| | 0° | 45° | 90° |
|-----|------|------|------|
| 0° | 4100 | 4100 | 4100 |
| 5° | 4107 | 4036 | 4062 |
| 10° | 4066 | 3957 | 3931 |
| 15° | 4010 | 3827 | 3728 |
| 20° | 3936 | 3648 | 3478 |
| 25° | 3860 | 3446 | 3237 |
| 30° | 3758 | 3240 | 2930 |
| 35° | 3658 | 3018 | 2661 |
| 40° | 3557 | 2788 | 2352 |
| 45° | 3439 | 2532 | 2072 |
| 50° | 3316 | 2275 | 1799 |
| 55° | 3189 | 1999 | 1536 |
| 60° | 3042 | 1711 | 1265 |
| 65° | 2872 | 1418 | 1140 |
| 70° | 2666 | 1144 | 1034 |
| 75° | 2408 | 1011 | 943 |
| 80° | 2034 | 851 | 822 |
| 85° | 1416 | 572 | 626 |

MAXIMUM LUMINANCE 45°-90°:

Horizontal Angle: 0°
 Vertical Angle: 45°
 Luminance: 3439 cd/sqm



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ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|---------|-----------|
| 0°-10° | 547.6 | 2.5 |
| 10°-20° | 1503.4 | 6.9 |
| 20°-30° | 2110.7 | 9.7 |
| 30°-40° | 2300.8 | 10.5 |
| 40°-50° | 2114.7 | 9.7 |
| 50°-60° | 1660.7 | 7.6 |
| 60°-70° | 1081.0 | 4.9 |
| 70°-80° | 556.5 | 2.5 |
| 80°-90° | 152.0 | 0.7 |
| 90°-100° | 217.4 | 1.0 |
| 100°-110° | 690.8 | 3.2 |
| 110°-120° | 1182.1 | 5.4 |
| 120°-130° | 1554.6 | 7.1 |
| 130°-140° | 1745.0 | 8.0 |
| 140°-150° | 1711.2 | 7.8 |
| 150°-160° | 1435.4 | 6.6 |
| 160°-170° | 951.9 | 4.4 |
| 170°-180° | 332.7 | 1.5 |
| 0°-30° | 4161.7 | 19.0 |
| 0°-40° | 6462.5 | 29.6 |
| 0°-60° | 10237.9 | 46.9 |
| 0°-90° | 12027.4 | 55.0 |
| 90°-120° | 2090.2 | 9.6 |
| 90°-150° | 7101.0 | 32.5 |
| 90°-180° | 9821.0 | 45.0 |
| 0°-180° | 21848.4 | 100.0 |

CANDELA DISTRIBUTION:

| | 0° | 22.5° | 45° | 67.5° | 90° | Flux |
|------|------|-------|------|-------|------|------|
| 0° | 5843 | 5843 | 5843 | 5843 | 5843 | |
| 5° | 5843 | 5817 | 5748 | 5796 | 5780 | 554 |
| 15° | 5558 | 5499 | 5320 | 5219 | 5167 | 1566 |
| 25° | 5045 | 4875 | 4526 | 4310 | 4230 | 2320 |
| 35° | 4347 | 4077 | 3612 | 3279 | 3162 | 2721 |
| 45° | 3554 | 3199 | 2644 | 2268 | 2142 | 2744 |
| 55° | 2702 | 2290 | 1718 | 1402 | 1301 | 2414 |
| 65° | 1824 | 1396 | 920 | 740 | 724 | 1809 |
| 75° | 973 | 603 | 423 | 386 | 381 | 1029 |
| 85° | 227 | 116 | 100 | 100 | 100 | 261 |
| 90° | 3 | 38 | 104 | 98 | 101 | 21 |
| 95° | 155 | 184 | 190 | 190 | 184 | 172 |
| 105° | 638 | 646 | 652 | 658 | 658 | 673 |
| 115° | 1186 | 1203 | 1198 | 1195 | 1186 | 1173 |
| 125° | 1725 | 1752 | 1743 | 1734 | 1731 | 1542 |
| 135° | 2232 | 2264 | 2271 | 2268 | 2259 | 1725 |
| 145° | 2709 | 2730 | 2747 | 2751 | 2739 | 1693 |
| 155° | 3098 | 3106 | 3116 | 3131 | 3121 | 1426 |
| 165° | 3370 | 3367 | 3367 | 3388 | 3373 | 951 |
| 175° | 3507 | 3498 | 3492 | 3513 | 3495 | 333 |
| 180° | 3513 | 3513 | 3513 | 3513 | 3513 | |



TEST NUMBER: P909666

CATALOG NUMBER: DFN2DIP-SQ4F0-140D110US840-RLFL

CANDELA DISTRIBUTION (FULL):

| | 0° | 22.5° | 45° | 67.5° | 90° |
|--------|--------|--------|--------|--------|--------|
| 0° | 5843.3 | 5843.3 | 5843.3 | 5843.3 | 5843.3 |
| 2.5° | 5869.6 | 5843.3 | 5784.9 | 5838.2 | 5827.5 |
| 5° | 5843.3 | 5816.9 | 5747.9 | 5795.6 | 5779.9 |
| 7.5° | 5795.6 | 5764.1 | 5690.1 | 5710.9 | 5684.5 |
| 10° | 5732.2 | 5695.1 | 5589.7 | 5573.3 | 5541.9 |
| 12.5° | 5653.0 | 5605.4 | 5462.3 | 5430.9 | 5372.6 |
| 15° | 5557.7 | 5499.3 | 5319.8 | 5219.4 | 5166.7 |
| 17.5° | 5446.6 | 5361.9 | 5139.7 | 5023.6 | 4938.8 |
| 20° | 5319.8 | 5213.7 | 4949.6 | 4817.7 | 4701.0 |
| 22.5° | 5182.3 | 5060.6 | 4753.7 | 4574.2 | 4495.1 |
| 25° | 5044.9 | 4875.4 | 4526.5 | 4309.9 | 4230.2 |
| 27.5° | 4881.1 | 4701.0 | 4315.0 | 4066.4 | 3944.7 |
| 30° | 4706.6 | 4505.2 | 4082.2 | 3812.8 | 3669.8 |
| 32.5° | 4537.1 | 4293.6 | 3860.5 | 3543.0 | 3410.6 |
| 35° | 4347.0 | 4077.1 | 3612.0 | 3278.7 | 3162.0 |
| 37.5° | 4161.9 | 3870.6 | 3379.1 | 3013.9 | 2882.1 |
| 40° | 3966.0 | 3649.0 | 3135.6 | 2760.4 | 2622.9 |
| 42.5° | 3765.2 | 3426.9 | 2892.8 | 2501.1 | 2369.2 |
| 45° | 3553.6 | 3199.1 | 2644.2 | 2268.3 | 2141.5 |
| 47.5° | 3352.8 | 2977.5 | 2406.3 | 2030.4 | 1914.3 |
| 50° | 3130.6 | 2755.3 | 2173.4 | 1808.3 | 1697.7 |
| 52.5° | 2913.5 | 2516.8 | 1951.3 | 1602.4 | 1501.9 |
| 55° | 2702.0 | 2289.6 | 1718.5 | 1401.5 | 1301.0 |
| 57.5° | 2485.4 | 2062.3 | 1512.6 | 1216.4 | 1131.7 |
| 60° | 2263.2 | 1840.2 | 1295.5 | 1026.1 | 941.4 |
| 62.5° | 2046.7 | 1623.7 | 1110.3 | 856.7 | 814.7 |
| 65° | 1824.5 | 1395.8 | 920.1 | 740.5 | 724.3 |
| 67.5° | 1613.0 | 1184.4 | 740.5 | 650.3 | 634.5 |
| 70° | 1390.8 | 978.5 | 613.2 | 560.5 | 539.2 |
| 72.5° | 1179.3 | 787.7 | 512.8 | 470.7 | 460.1 |
| 75° | 972.8 | 602.6 | 423.0 | 386.0 | 380.9 |
| 77.5° | 767.0 | 428.1 | 333.3 | 311.9 | 301.2 |
| 80° | 576.2 | 306.9 | 253.6 | 232.9 | 232.9 |
| 82.5° | 401.7 | 206.4 | 174.5 | 163.8 | 163.8 |
| 85° | 227.2 | 116.1 | 100.4 | 100.4 | 100.4 |
| 87.5° | 84.7 | 42.1 | 42.1 | 37.1 | 37.1 |
| 90° | 3.1 | 38.2 | 103.8 | 97.5 | 100.6 |
| 92.5° | 65.6 | 89.0 | 92.1 | 95.3 | 95.3 |
| 95° | 154.6 | 184.3 | 189.6 | 189.6 | 184.3 |
| 97.5° | 257.4 | 284.9 | 296.6 | 296.6 | 296.6 |
| 100° | 376.0 | 400.3 | 408.8 | 408.8 | 405.7 |
| 102.5° | 501.0 | 519.0 | 530.7 | 533.8 | 530.7 |
| 105° | 637.6 | 646.1 | 652.5 | 657.7 | 657.7 |
| 107.5° | 773.2 | 785.9 | 785.9 | 788.0 | 773.2 |
| 110° | 904.5 | 921.5 | 921.5 | 921.5 | 913.0 |



TEST NUMBER: P909666

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CANDELA DISTRIBUTION (continued):

| | 0° | 22.5° | 45° | 67.5° | 90° |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1046.4 | 1064.4 | 1061.3 | 1052.8 | 1046.4 |
| 115° | 1186.3 | 1203.2 | 1197.9 | 1194.8 | 1186.3 |
| 117.5° | 1325.0 | 1348.3 | 1333.4 | 1325.0 | 1316.6 |
| 120° | 1464.8 | 1488.1 | 1464.8 | 1464.8 | 1455.3 |
| 122.5° | 1592.0 | 1621.5 | 1606.7 | 1598.2 | 1592.0 |
| 125° | 1725.4 | 1751.8 | 1743.3 | 1733.8 | 1730.6 |
| 127.5° | 1855.6 | 1888.4 | 1876.8 | 1864.1 | 1855.6 |
| 130° | 1977.4 | 2015.6 | 2010.2 | 2003.9 | 1992.3 |
| 132.5° | 2114.1 | 2143.7 | 2145.9 | 2131.0 | 2122.5 |
| 135° | 2231.6 | 2264.4 | 2270.8 | 2267.7 | 2259.2 |
| 137.5° | 2363.0 | 2389.4 | 2394.7 | 2392.6 | 2380.0 |
| 140° | 2478.4 | 2504.9 | 2519.7 | 2519.7 | 2508.1 |
| 142.5° | 2597.1 | 2623.5 | 2632.0 | 2635.1 | 2623.5 |
| 145° | 2709.3 | 2730.5 | 2747.4 | 2750.6 | 2739.0 |
| 147.5° | 2810.0 | 2836.4 | 2849.1 | 2854.4 | 2842.8 |
| 150° | 2913.8 | 2931.7 | 2943.4 | 2952.9 | 2943.4 |
| 152.5° | 3005.9 | 3023.8 | 3038.7 | 3050.4 | 3038.7 |
| 155° | 3098.1 | 3106.4 | 3116.0 | 3130.9 | 3121.3 |
| 157.5° | 3177.4 | 3183.8 | 3189.1 | 3210.3 | 3195.4 |
| 160° | 3248.4 | 3254.8 | 3257.9 | 3276.0 | 3263.3 |
| 162.5° | 3314.1 | 3314.1 | 3317.3 | 3337.4 | 3322.6 |
| 165° | 3370.2 | 3367.0 | 3367.0 | 3388.2 | 3373.4 |
| 167.5° | 3421.0 | 3411.5 | 3411.5 | 3432.7 | 3417.9 |
| 170° | 3459.2 | 3450.7 | 3447.6 | 3468.7 | 3450.7 |
| 172.5° | 3485.7 | 3477.2 | 3474.0 | 3495.2 | 3477.2 |
| 175° | 3506.9 | 3498.4 | 3492.0 | 3513.2 | 3495.2 |
| 177.5° | 3518.5 | 3510.0 | 3503.6 | 3521.7 | 3503.6 |
| 180° | 3513.2 | 3513.2 | 3513.2 | 3513.2 | 3513.2 |



TEST NUMBER: P909666
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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 | 12.52 | 13.39 | 13.44 | 14.33 | 15.53 | 8.48 | 9.35 | 9.40 | 10.29 | 11.49 |
| | 3H | 14.21 | 14.99 | 15.14 | 15.93 | 17.15 | 9.67 | 10.45 | 10.60 | 11.40 | 12.62 |
| | 4H | 14.82 | 15.56 | 15.76 | 16.50 | 17.74 | 10.13 | 10.86 | 11.07 | 11.81 | 13.04 |
| | 6H | 15.25 | 15.93 | 16.20 | 16.88 | 18.12 | 10.45 | 11.13 | 11.41 | 12.08 | 13.33 |
| | 8H | 15.38 | 16.02 | 16.34 | 16.99 | 18.24 | 10.54 | 11.19 | 11.51 | 12.16 | 13.40 |
| | 12H | 15.44 | 16.06 | 16.41 | 17.02 | 18.29 | 10.59 | 11.20 | 11.56 | 12.17 | 13.43 |
| 4H | 2H | 12.54 | 13.28 | 13.50 | 14.23 | 15.46 | 9.08 | 9.82 | 10.04 | 10.77 | 12.00 |
| | 3H | 14.38 | 14.99 | 15.34 | 15.97 | 17.22 | 10.44 | 11.05 | 11.40 | 12.03 | 13.28 |
| | 4H | 15.08 | 15.64 | 16.05 | 16.61 | 17.88 | 10.99 | 11.55 | 11.96 | 12.52 | 13.79 |
| | 6H | 15.60 | 16.08 | 16.58 | 17.08 | 18.35 | 11.41 | 11.89 | 12.39 | 12.89 | 14.16 |
| | 8H | 15.78 | 16.23 | 16.76 | 17.22 | 18.50 | 11.54 | 11.99 | 12.53 | 12.98 | 14.26 |
| | 12H | 15.88 | 16.28 | 16.88 | 17.29 | 18.58 | 11.61 | 12.01 | 12.61 | 13.02 | 14.31 |
| 8H | 4H | 15.05 | 15.50 | 16.03 | 16.49 | 17.77 | 11.28 | 11.72 | 12.26 | 12.71 | 14.00 |
| | 6H | 15.62 | 15.99 | 16.63 | 17.02 | 18.31 | 11.80 | 12.17 | 12.81 | 13.20 | 14.48 |
| | 8H | 15.84 | 16.17 | 16.86 | 17.19 | 18.49 | 11.99 | 12.32 | 13.01 | 13.33 | 14.64 |
| | 12H | 15.99 | 16.27 | 17.01 | 17.28 | 18.63 | 12.11 | 12.40 | 13.13 | 13.41 | 14.76 |
| 12H | 4H | 15.00 | 15.41 | 16.01 | 16.41 | 17.70 | 11.28 | 11.69 | 12.29 | 12.69 | 13.98 |
| | 6H | 15.60 | 15.92 | 16.62 | 16.94 | 18.24 | 11.85 | 12.17 | 12.86 | 13.19 | 14.49 |
| | 8H | 15.82 | 16.11 | 16.84 | 17.12 | 18.47 | 12.06 | 12.35 | 13.08 | 13.36 | 14.71 |