

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: P905871

Luminaire Tested: DFN2DIP-PN3F0-090D090US835-RLLONL

Issue Date: 11/21/2024

Test Information

Test Method: LM-79-2019
Report Number: P905871
REPORT IS A COMBINATION OF REPORTS P901128 AND P897955
Test Lab: INNOVATION CENTER
Issue Date: 11/21/2024
Manufacturer: COOPER LIGHTING SOLUTIONS
Product Line: NEO-RAY
Catalog Number: DFN2DIP-PN3F0-090D090US835-RLONL
Description: 3 foot, Pentagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens
Light Source: -
Ballast/Driver: -

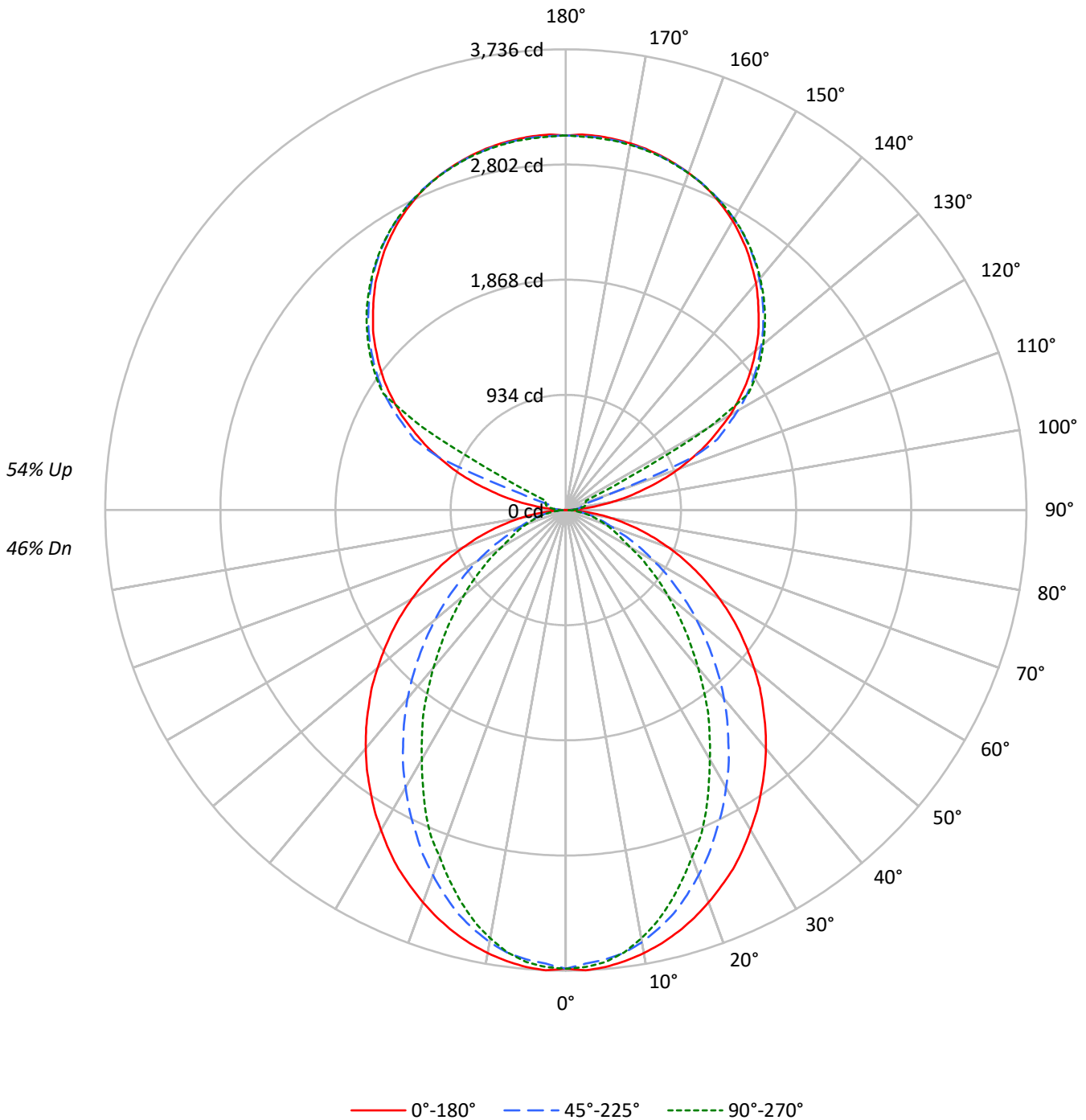
Summary

Lumens per Lamp: N/A
Luminaire Lumens: 16560.0 lumens
Efficiency: N/A
Efficacy: 100.9 lumens/watt
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16
Luminous Opening: Rectangular w/ Sides (W: 2.96' x L: 3.11' x H: 0.1')
CIE Type: General Diffuse

Input Watts (W): 164.2
Input Voltage (V):
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: 0.9954
Total Harmonic Distortion (THDi): 0.076
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 | 0 |
| RCR | | | | | | | | | | | | | | | | | | | | | |
| 0 | 106 | 106 | 106 | 106 | 98 | 98 | 98 | 98 | 81 | 81 | 81 | 66 | 66 | 66 | 53 | 53 | 53 | 46 | | | 46 |
| 1 | 97 | 93 | 90 | 86 | 89 | 86 | 83 | 80 | 72 | 70 | 68 | 59 | 58 | 56 | 47 | 46 | 45 | 40 | | | 40 |
| 2 | 89 | 82 | 76 | 71 | 82 | 76 | 70 | 66 | 63 | 60 | 57 | 52 | 50 | 48 | 42 | 40 | 39 | 34 | | | 34 |
| 3 | 81 | 72 | 65 | 60 | 75 | 67 | 61 | 56 | 56 | 52 | 48 | 47 | 43 | 41 | 38 | 35 | 34 | 29 | | | 29 |
| 4 | 75 | 64 | 57 | 51 | 68 | 60 | 53 | 48 | 50 | 45 | 41 | 42 | 38 | 35 | 34 | 31 | 29 | 26 | | | 26 |
| 5 | 69 | 58 | 50 | 44 | 63 | 53 | 46 | 41 | 45 | 40 | 36 | 38 | 34 | 31 | 31 | 28 | 26 | 23 | | | 23 |
| 6 | 63 | 52 | 44 | 38 | 58 | 48 | 41 | 36 | 41 | 36 | 32 | 34 | 30 | 27 | 28 | 25 | 23 | 20 | | | 20 |
| 7 | 59 | 47 | 39 | 34 | 54 | 44 | 37 | 32 | 37 | 32 | 28 | 31 | 27 | 24 | 26 | 23 | 21 | 18 | | | 18 |
| 8 | 55 | 43 | 35 | 30 | 50 | 40 | 33 | 28 | 34 | 29 | 25 | 29 | 25 | 22 | 24 | 21 | 19 | 16 | | | 16 |
| 9 | 51 | 39 | 32 | 27 | 47 | 36 | 30 | 25 | 31 | 26 | 22 | 27 | 23 | 20 | 22 | 19 | 17 | 15 | | | 15 |
| 10 | 48 | 36 | 29 | 24 | 44 | 33 | 27 | 23 | 29 | 24 | 20 | 25 | 21 | 18 | 20 | 18 | 15 | 13 | | | 13 |

AVERAGE LUMINANCE (cd/sqm):

| | 0° | 45° | 90° |
|-----|------|------|------|
| 0° | 4348 | 4348 | 4348 |
| 5° | 4353 | 4276 | 4305 |
| 10° | 4307 | 4189 | 4163 |
| 15° | 4245 | 4048 | 3945 |
| 20° | 4164 | 3854 | 3677 |
| 25° | 4081 | 3638 | 3419 |
| 30° | 3971 | 3416 | 3093 |
| 35° | 3862 | 3178 | 2806 |
| 40° | 3752 | 2931 | 2478 |
| 45° | 3623 | 2659 | 2180 |
| 50° | 3491 | 2384 | 1889 |
| 55° | 3352 | 2090 | 1610 |
| 60° | 3191 | 1784 | 1324 |
| 65° | 3005 | 1473 | 1189 |
| 70° | 2781 | 1183 | 1073 |
| 75° | 2498 | 1036 | 973 |
| 80° | 2089 | 859 | 837 |
| 85° | 1418 | 559 | 618 |

MAXIMUM LUMINANCE 45°-90°:

Horizontal Angle: 0°
 Vertical Angle: 45°
 Luminance: 3623 cd/sqm



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ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|---------|-----------|
| 0°-10° | 348.6 | 2.1 |
| 10°-20° | 957.0 | 5.8 |
| 20°-30° | 1343.6 | 8.1 |
| 30°-40° | 1464.6 | 8.8 |
| 40°-50° | 1346.2 | 8.1 |
| 50°-60° | 1057.2 | 6.4 |
| 60°-70° | 688.1 | 4.2 |
| 70°-80° | 354.2 | 2.1 |
| 80°-90° | 95.8 | 0.6 |
| 90°-100° | 100.2 | 0.6 |
| 100°-110° | 373.4 | 2.3 |
| 110°-120° | 990.2 | 6.0 |
| 120°-130° | 1642.4 | 9.9 |
| 130°-140° | 1744.6 | 10.5 |
| 140°-150° | 1621.4 | 9.8 |
| 150°-160° | 1303.5 | 7.9 |
| 160°-170° | 840.0 | 5.1 |
| 170°-180° | 289.1 | 1.7 |
| 0°-30° | 2649.2 | 16.0 |
| 0°-40° | 4113.9 | 24.8 |
| 0°-60° | 6517.2 | 39.4 |
| 0°-90° | 7655.4 | 46.2 |
| 90°-120° | 1463.7 | 8.8 |
| 90°-150° | 6472.0 | 39.1 |
| 90°-180° | 8905.0 | 53.8 |
| 0°-180° | 16560.0 | 100.0 |

CANDELA DISTRIBUTION:

| | 0° | 22.5° | 45° | 67.5° | 90° | Flux |
|------|------|-------|------|-------|------|------|
| 0° | 3720 | 3720 | 3720 | 3720 | 3720 | |
| 5° | 3720 | 3703 | 3659 | 3689 | 3679 | 353 |
| 15° | 3538 | 3501 | 3386 | 3322 | 3289 | 997 |
| 25° | 3212 | 3104 | 2882 | 2744 | 2693 | 1477 |
| 35° | 2767 | 2595 | 2299 | 2087 | 2013 | 1732 |
| 45° | 2262 | 2036 | 1683 | 1444 | 1363 | 1747 |
| 55° | 1720 | 1458 | 1094 | 892 | 828 | 1537 |
| 65° | 1161 | 889 | 586 | 471 | 461 | 1151 |
| 75° | 619 | 384 | 269 | 246 | 242 | 655 |
| 85° | 145 | 74 | 64 | 64 | 64 | 166 |
| 90° | 2 | 26 | 44 | 55 | 59 | 16 |
| 95° | 143 | 70 | 86 | 97 | 94 | 169 |
| 105° | 668 | 734 | 134 | 158 | 167 | 714 |
| 115° | 1264 | 1301 | 1356 | 338 | 180 | 1244 |
| 125° | 1787 | 1815 | 1857 | 1873 | 1879 | 1594 |
| 135° | 2211 | 2246 | 2266 | 2288 | 2284 | 1708 |
| 145° | 2565 | 2563 | 2600 | 2615 | 2604 | 1604 |
| 155° | 2824 | 2805 | 2831 | 2844 | 2826 | 1301 |
| 165° | 2976 | 2963 | 2969 | 2985 | 2969 | 841 |
| 175° | 3044 | 3028 | 3033 | 3048 | 3026 | 290 |
| 180° | 3037 | 3037 | 3037 | 3037 | 3037 | |



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CANDELA DISTRIBUTION (FULL):

| | 0° | 22.5° | 45° | 67.5° | 90° |
|--------|--------|--------|--------|--------|--------|
| 0° | 3719.7 | 3719.7 | 3719.7 | 3719.7 | 3719.7 |
| 2.5° | 3736.5 | 3719.7 | 3682.5 | 3716.5 | 3709.7 |
| 5° | 3719.7 | 3702.9 | 3659.0 | 3689.3 | 3679.3 |
| 7.5° | 3689.3 | 3669.3 | 3622.2 | 3635.4 | 3618.6 |
| 10° | 3649.0 | 3625.4 | 3558.3 | 3547.9 | 3527.9 |
| 12.5° | 3598.6 | 3568.3 | 3477.2 | 3457.2 | 3420.0 |
| 15° | 3537.9 | 3500.8 | 3386.5 | 3322.5 | 3289.0 |
| 17.5° | 3467.2 | 3413.3 | 3271.8 | 3197.9 | 3144.0 |
| 20° | 3386.5 | 3319.0 | 3150.7 | 3066.8 | 2992.5 |
| 22.5° | 3299.0 | 3221.5 | 3026.1 | 2911.8 | 2861.5 |
| 25° | 3211.5 | 3103.6 | 2881.5 | 2743.6 | 2692.9 |
| 27.5° | 3107.2 | 2992.5 | 2746.8 | 2588.6 | 2511.1 |
| 30° | 2996.1 | 2867.9 | 2598.6 | 2427.2 | 2336.1 |
| 32.5° | 2888.2 | 2733.2 | 2457.5 | 2255.4 | 2171.1 |
| 35° | 2767.2 | 2595.4 | 2299.3 | 2087.2 | 2012.9 |
| 37.5° | 2649.3 | 2464.0 | 2151.1 | 1918.6 | 1834.7 |
| 40° | 2524.7 | 2322.9 | 1996.1 | 1757.2 | 1669.7 |
| 42.5° | 2396.8 | 2181.5 | 1841.4 | 1592.2 | 1508.2 |
| 45° | 2262.2 | 2036.5 | 1683.2 | 1443.9 | 1363.2 |
| 47.5° | 2134.3 | 1895.4 | 1531.8 | 1292.5 | 1218.6 |
| 50° | 1992.9 | 1753.9 | 1383.6 | 1151.1 | 1080.7 |
| 52.5° | 1854.7 | 1602.2 | 1242.2 | 1020.0 | 956.1 |
| 55° | 1720.0 | 1457.5 | 1093.9 | 892.2 | 828.2 |
| 57.5° | 1582.2 | 1312.9 | 962.9 | 774.3 | 720.4 |
| 60° | 1440.7 | 1171.4 | 824.7 | 653.2 | 599.3 |
| 62.5° | 1302.9 | 1033.6 | 706.8 | 545.4 | 518.6 |
| 65° | 1161.4 | 888.6 | 585.7 | 471.4 | 461.1 |
| 67.5° | 1026.8 | 753.9 | 471.4 | 413.9 | 403.9 |
| 70° | 885.4 | 622.9 | 390.4 | 356.8 | 343.2 |
| 72.5° | 750.7 | 501.4 | 326.4 | 299.6 | 292.9 |
| 75° | 619.3 | 383.6 | 269.3 | 245.7 | 242.5 |
| 77.5° | 488.2 | 272.5 | 212.1 | 198.6 | 191.8 |
| 80° | 366.8 | 195.4 | 161.4 | 148.2 | 148.2 |
| 82.5° | 255.7 | 131.4 | 111.1 | 104.3 | 104.3 |
| 85° | 144.6 | 73.9 | 63.9 | 63.9 | 63.9 |
| 87.5° | 53.9 | 26.8 | 26.8 | 23.6 | 23.6 |
| 90° | 2.1 | 26.4 | 43.8 | 55.1 | 59.2 |
| 92.5° | 55.1 | 46.2 | 52.7 | 57.2 | 59.2 |
| 95° | 142.8 | 70.2 | 85.6 | 96.8 | 94.5 |
| 97.5° | 257.1 | 77.0 | 112.0 | 118.7 | 120.8 |
| 100° | 389.1 | 88.0 | 125.3 | 142.8 | 147.2 |
| 102.5° | 534.0 | 529.8 | 129.7 | 153.7 | 160.5 |
| 105° | 668.1 | 734.2 | 134.1 | 158.2 | 167.0 |
| 107.5° | 824.2 | 879.0 | 138.6 | 162.6 | 171.5 |
| 110° | 973.7 | 1019.7 | 384.7 | 164.9 | 173.6 |



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CANDELA DISTRIBUTION (continued):

| | 0° | 22.5° | 45° | 67.5° | 90° |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1114.4 | 1153.8 | 1116.5 | 169.1 | 175.9 |
| 115° | 1263.7 | 1301.0 | 1356.1 | 338.5 | 180.3 |
| 117.5° | 1393.4 | 1437.3 | 1474.8 | 1160.4 | 584.6 |
| 120° | 1538.5 | 1571.4 | 1611.1 | 1637.4 | 1340.7 |
| 122.5° | 1661.5 | 1696.7 | 1740.8 | 1753.8 | 1756.2 |
| 125° | 1786.7 | 1815.4 | 1857.2 | 1872.6 | 1879.1 |
| 127.5° | 1901.0 | 1931.8 | 1965.0 | 1986.9 | 1989.0 |
| 130° | 2008.8 | 2044.1 | 2068.1 | 2092.3 | 2090.3 |
| 132.5° | 2118.7 | 2147.4 | 2171.4 | 2191.3 | 2189.2 |
| 135° | 2211.1 | 2246.3 | 2265.9 | 2288.1 | 2283.7 |
| 137.5° | 2307.7 | 2334.0 | 2356.2 | 2378.1 | 2371.6 |
| 140° | 2402.1 | 2419.9 | 2443.9 | 2463.7 | 2452.8 |
| 142.5° | 2481.5 | 2496.9 | 2525.3 | 2542.8 | 2531.9 |
| 145° | 2565.0 | 2562.6 | 2600.0 | 2615.4 | 2604.4 |
| 147.5° | 2637.3 | 2630.8 | 2668.1 | 2679.1 | 2670.4 |
| 150° | 2707.8 | 2692.4 | 2727.6 | 2740.6 | 2729.7 |
| 152.5° | 2767.0 | 2749.5 | 2782.4 | 2795.7 | 2780.3 |
| 155° | 2824.2 | 2804.6 | 2830.9 | 2844.0 | 2826.5 |
| 157.5° | 2870.4 | 2852.9 | 2872.7 | 2888.1 | 2870.4 |
| 160° | 2910.0 | 2896.7 | 2910.0 | 2923.1 | 2907.7 |
| 162.5° | 2945.0 | 2931.9 | 2942.9 | 2958.3 | 2938.5 |
| 165° | 2975.8 | 2962.7 | 2969.3 | 2984.7 | 2969.3 |
| 167.5° | 3000.1 | 2986.8 | 2993.5 | 3008.9 | 2989.1 |
| 170° | 3019.9 | 3006.6 | 3011.0 | 3026.4 | 3006.6 |
| 172.5° | 3033.0 | 3019.9 | 3024.3 | 3039.7 | 3019.9 |
| 175° | 3043.9 | 3028.5 | 3033.0 | 3048.3 | 3026.4 |
| 177.5° | 3048.3 | 3033.0 | 3035.3 | 3050.7 | 3030.9 |
| 180° | 3037.4 | 3037.4 | 3037.4 | 3037.4 | 3037.4 |



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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 | 11.85 | 12.65 | 12.85 | 13.65 | 14.98 | 7.82 | 8.62 | 8.81 | 9.62 | 10.95 |
| | 3H | 13.52 | 14.24 | 14.53 | 15.25 | 16.60 | 9.00 | 9.71 | 10.00 | 10.72 | 12.07 |
| | 4H | 14.12 | 14.80 | 15.14 | 15.82 | 17.17 | 9.44 | 10.12 | 10.46 | 11.13 | 12.49 |
| | 6H | 14.54 | 15.16 | 15.57 | 16.18 | 17.55 | 9.76 | 10.38 | 10.79 | 11.40 | 12.77 |
| | 8H | 14.66 | 15.25 | 15.70 | 16.29 | 17.65 | 9.84 | 10.44 | 10.88 | 11.47 | 12.84 |
| | 12H | 14.72 | 15.28 | 15.76 | 16.31 | 17.70 | 9.88 | 10.45 | 10.92 | 11.48 | 12.86 |
| 4H | 2H | 11.86 | 12.54 | 12.89 | 13.56 | 14.91 | 8.41 | 9.08 | 9.43 | 10.10 | 11.45 |
| | 3H | 13.68 | 14.25 | 14.72 | 15.29 | 16.66 | 9.75 | 10.31 | 10.78 | 11.35 | 12.72 |
| | 4H | 14.37 | 14.89 | 15.41 | 15.92 | 17.31 | 10.29 | 10.80 | 11.33 | 11.84 | 13.23 |
| | 6H | 14.88 | 15.32 | 15.93 | 16.38 | 17.77 | 10.70 | 11.14 | 11.75 | 12.20 | 13.59 |
| | 8H | 15.05 | 15.46 | 16.10 | 16.51 | 17.91 | 10.82 | 11.24 | 11.88 | 12.29 | 13.69 |
| | 12H | 15.14 | 15.51 | 16.21 | 16.58 | 17.98 | 10.88 | 11.26 | 11.95 | 12.32 | 13.73 |
| 8H | 4H | 14.33 | 14.75 | 15.39 | 15.80 | 17.20 | 10.56 | 10.98 | 11.61 | 12.03 | 13.43 |
| | 6H | 14.89 | 15.23 | 15.97 | 16.33 | 17.73 | 11.07 | 11.41 | 12.15 | 12.51 | 13.90 |
| | 8H | 15.11 | 15.40 | 16.19 | 16.48 | 17.90 | 11.26 | 11.56 | 12.34 | 12.63 | 14.05 |
| | 12H | 15.24 | 15.50 | 16.32 | 16.57 | 18.03 | 11.37 | 11.63 | 12.46 | 12.71 | 14.17 |
| 12H | 4H | 14.28 | 14.66 | 15.35 | 15.72 | 17.13 | 10.57 | 10.94 | 11.63 | 12.00 | 13.41 |
| | 6H | 14.87 | 15.17 | 15.95 | 16.24 | 17.66 | 11.12 | 11.42 | 12.20 | 12.50 | 13.91 |
| | 8H | 15.08 | 15.35 | 16.17 | 16.42 | 17.88 | 11.32 | 11.59 | 12.41 | 12.66 | 14.12 |