

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: P910180

Luminaire Tested: DFN2DIP-TR4F0-090D040US840-RLLFLL

Issue Date: 11/21/2024

Test Information

Test Method: LM-79-2019
Report Number: P910180
REPORT IS A COMBINATION OF REPORTS P900380 AND P897293
Test Lab: INNOVATION CENTER
Issue Date: 11/21/2024
Manufacturer: COOPER LIGHTING SOLUTIONS
Product Line: NEO-RAY
Catalog Number: DFN2DIP-TR4F0-090D040US840-RLLFLL
Description: 4 foot, Triangle Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens
Light Source: -
Ballast/Driver: -

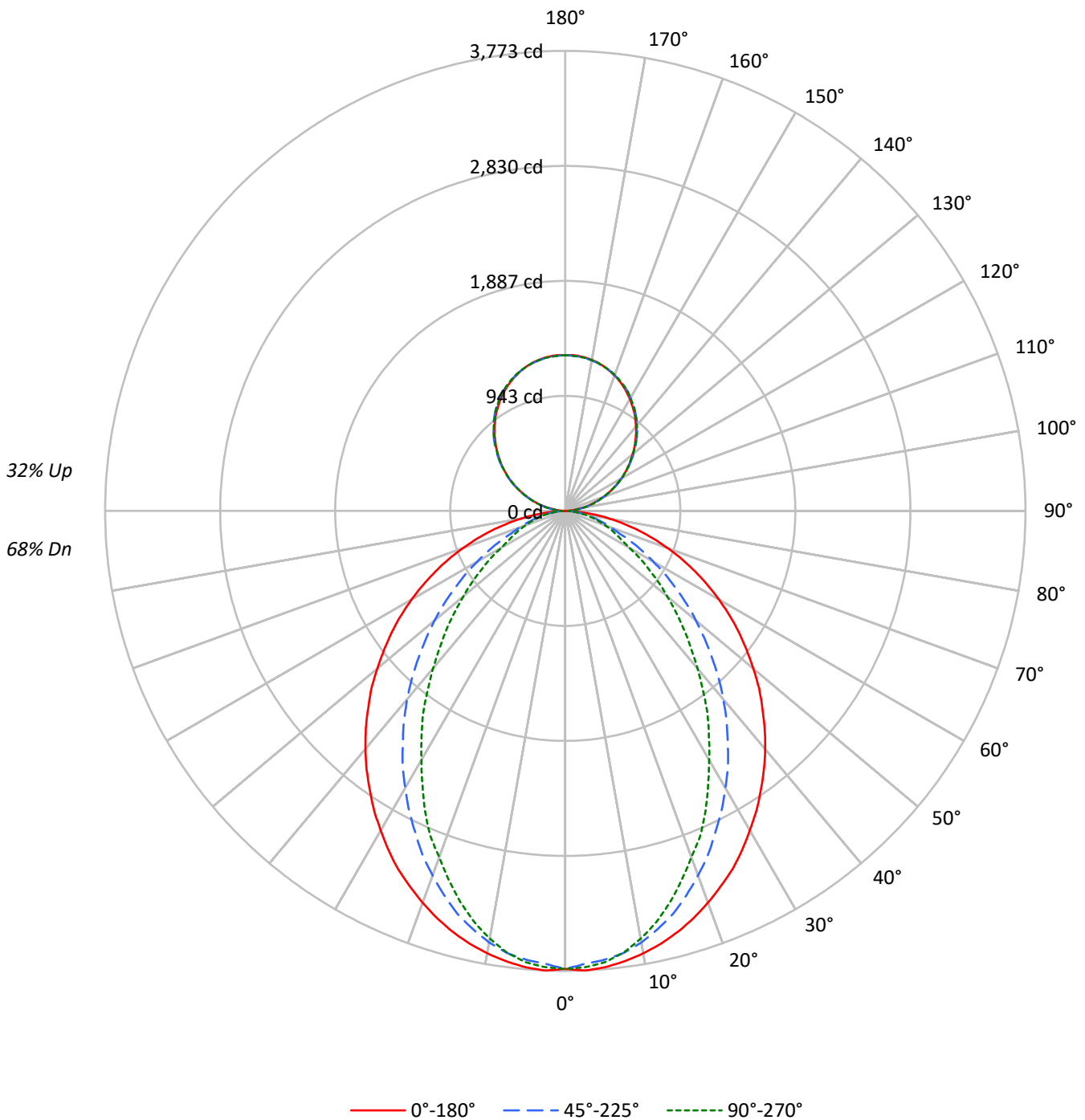
Summary

Lumens per Lamp: N/A
Luminaire Lumens: 11300.4 lumens
Efficiency: N/A
Efficacy: 95.9 lumens/watt
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16
Luminous Opening: Rectangular w/ Sides (W: 3.43' x L: 3.96' x H: 0.1')
CIE Type: Semi-Direct

Input Watts (W): 117.8
Input Voltage (V):
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: 0.099
Total Harmonic Distortion (THDi): 0.979
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 24 FT

TEST NUMBER: P910180
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Luminous Intensity Polar Plot





TEST NUMBER: P910180

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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 | 112 | 112 | 112 | 112 | 105 | 105 | 105 | 105 | 94 | 94 | 94 | 83 | 83 | 83 | 73 | 73 | 73 | 68 | | | | 68 |
| 1 | 103 | 98 | 95 | 91 | 97 | 93 | 90 | 87 | 83 | 81 | 78 | 74 | 72 | 70 | 66 | 64 | 63 | 59 | | | | 59 |
| 2 | 94 | 87 | 81 | 76 | 89 | 82 | 77 | 72 | 74 | 70 | 66 | 66 | 63 | 60 | 59 | 56 | 54 | 50 | | | | 50 |
| 3 | 86 | 77 | 70 | 64 | 81 | 73 | 67 | 61 | 66 | 61 | 56 | 59 | 55 | 51 | 52 | 49 | 47 | 44 | | | | 44 |
| 4 | 79 | 69 | 61 | 55 | 75 | 65 | 58 | 53 | 59 | 53 | 49 | 53 | 48 | 45 | 47 | 44 | 41 | 38 | | | | 38 |
| 5 | 73 | 62 | 53 | 48 | 69 | 59 | 51 | 46 | 53 | 47 | 43 | 48 | 43 | 39 | 43 | 39 | 36 | 33 | | | | 33 |
| 6 | 68 | 56 | 48 | 42 | 64 | 53 | 46 | 40 | 48 | 42 | 38 | 44 | 39 | 35 | 39 | 35 | 32 | 30 | | | | 30 |
| 7 | 63 | 51 | 43 | 37 | 59 | 48 | 41 | 36 | 44 | 38 | 33 | 40 | 35 | 31 | 36 | 32 | 29 | 27 | | | | 27 |
| 8 | 58 | 46 | 38 | 33 | 55 | 44 | 37 | 32 | 40 | 34 | 30 | 37 | 32 | 28 | 33 | 29 | 26 | 24 | | | | 24 |
| 9 | 55 | 42 | 35 | 30 | 52 | 41 | 34 | 29 | 37 | 31 | 27 | 34 | 29 | 25 | 31 | 27 | 24 | 22 | | | | 22 |
| 10 | 51 | 39 | 32 | 27 | 48 | 37 | 31 | 26 | 34 | 29 | 25 | 32 | 27 | 23 | 29 | 25 | 22 | 20 | | | | 20 |

AVERAGE LUMINANCE (cd/sqm):

| | 0° | 45° | 90° |
|-----|------|------|------|
| 0° | 2984 | 2984 | 2984 |
| 5° | 2989 | 2937 | 2956 |
| 10° | 2959 | 2879 | 2859 |
| 15° | 2919 | 2784 | 2711 |
| 20° | 2865 | 2653 | 2528 |
| 25° | 2810 | 2506 | 2352 |
| 30° | 2736 | 2355 | 2128 |
| 35° | 2663 | 2193 | 1932 |
| 40° | 2589 | 2025 | 1707 |
| 45° | 2503 | 1839 | 1503 |
| 50° | 2415 | 1651 | 1304 |
| 55° | 2322 | 1450 | 1112 |
| 60° | 2215 | 1240 | 915 |
| 65° | 2091 | 1027 | 824 |
| 70° | 1942 | 828 | 745 |
| 75° | 1754 | 730 | 678 |
| 80° | 1482 | 612 | 588 |
| 85° | 1032 | 408 | 441 |

MAXIMUM LUMINANCE 45°-90°:

Horizontal Angle: 0°
 Vertical Angle: 45°
 Luminance: 2503 cd/sqm



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ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------------|----------------|--------------|
| 0°-10° | 352.1 | 3.1 |
| 10°-20° | 966.5 | 8.6 |
| 20°-30° | 1356.9 | 12.0 |
| 30°-40° | 1479.1 | 13.1 |
| 40°-50° | 1359.4 | 12.0 |
| 50°-60° | 1067.6 | 9.4 |
| 60°-70° | 694.9 | 6.1 |
| 70°-80° | 357.7 | 3.2 |
| 80°-90° | 94.9 | 0.8 |
| 90°-100° | 79.1 | 0.7 |
| 100°-110° | 251.2 | 2.2 |
| 110°-120° | 429.8 | 3.8 |
| 120°-130° | 565.3 | 5.0 |
| 130°-140° | 634.5 | 5.6 |
| 140°-150° | 622.2 | 5.5 |
| 150°-160° | 522.0 | 4.6 |
| 160°-170° | 346.2 | 3.1 |
| 170°-180° | 121.0 | 1.1 |
| 0°-30° | 2675.4 | 23.7 |
| 0°-40° | 4154.5 | 36.8 |
| 0°-60° | 6581.5 | 58.2 |
| 0°-90° | 7729.1 | 68.4 |
| 90°-120° | 760.1 | 6.7 |
| 90°-150° | 2582.2 | 22.9 |
| 90°-180° | 3571.0 | 31.6 |
| 0°-180° | 11300.4 | 100.0 |

CANDELA DISTRIBUTION:

| | 0° | 22.5° | 45° | 67.5° | 90° | Flux |
|------|------|-------|------|-------|------|------|
| 0° | 3756 | 3756 | 3756 | 3756 | 3756 | |
| 5° | 3756 | 3739 | 3695 | 3726 | 3716 | 356 |
| 15° | 3573 | 3535 | 3420 | 3355 | 3321 | 1007 |
| 25° | 3243 | 3134 | 2910 | 2771 | 2720 | 1492 |
| 35° | 2794 | 2621 | 2322 | 2108 | 2033 | 1749 |
| 45° | 2284 | 2057 | 1700 | 1458 | 1377 | 1764 |
| 55° | 1737 | 1472 | 1105 | 901 | 836 | 1552 |
| 65° | 1173 | 897 | 592 | 476 | 466 | 1163 |
| 75° | 625 | 387 | 272 | 248 | 245 | 661 |
| 85° | 146 | 75 | 64 | 64 | 64 | 168 |
| 90° | 1 | 14 | 38 | 35 | 37 | 11 |
| 95° | 56 | 67 | 69 | 69 | 67 | 63 |
| 105° | 232 | 235 | 237 | 239 | 239 | 245 |
| 115° | 431 | 438 | 436 | 434 | 431 | 427 |
| 125° | 627 | 637 | 634 | 630 | 629 | 561 |
| 135° | 812 | 823 | 826 | 825 | 822 | 627 |
| 145° | 985 | 993 | 999 | 1000 | 996 | 616 |
| 155° | 1126 | 1130 | 1133 | 1138 | 1135 | 519 |
| 165° | 1226 | 1224 | 1224 | 1232 | 1227 | 346 |
| 175° | 1275 | 1272 | 1270 | 1278 | 1271 | 121 |
| 180° | 1278 | 1278 | 1278 | 1278 | 1278 | |



TEST NUMBER: P910180

CATALOG NUMBER: DFN2DIP-TR4F0-090D040US840-RLLFLL

CANDELA DISTRIBUTION (FULL):

| | 0° | 22.5° | 45° | 67.5° | 90° |
|--------|--------|--------|--------|--------|--------|
| 0° | 3756.4 | 3756.4 | 3756.4 | 3756.4 | 3756.4 |
| 2.5° | 3773.4 | 3756.4 | 3718.8 | 3753.2 | 3746.3 |
| 5° | 3756.4 | 3739.4 | 3695.1 | 3725.7 | 3715.6 |
| 7.5° | 3725.7 | 3705.5 | 3657.9 | 3671.3 | 3654.3 |
| 10° | 3685.0 | 3661.2 | 3593.4 | 3582.9 | 3562.7 |
| 12.5° | 3634.1 | 3603.5 | 3511.5 | 3491.3 | 3453.7 |
| 15° | 3572.8 | 3535.3 | 3419.9 | 3355.3 | 3321.4 |
| 17.5° | 3501.4 | 3447.0 | 3304.1 | 3229.4 | 3175.0 |
| 20° | 3419.9 | 3351.7 | 3181.8 | 3097.1 | 3022.0 |
| 22.5° | 3331.5 | 3253.3 | 3056.0 | 2940.5 | 2889.7 |
| 25° | 3243.2 | 3134.2 | 2909.9 | 2770.7 | 2719.5 |
| 27.5° | 3137.9 | 3022.0 | 2773.9 | 2614.1 | 2535.9 |
| 30° | 3025.7 | 2896.2 | 2624.2 | 2451.1 | 2359.1 |
| 32.5° | 2916.7 | 2760.2 | 2481.7 | 2277.7 | 2192.5 |
| 35° | 2794.5 | 2621.0 | 2322.0 | 2107.8 | 2032.8 |
| 37.5° | 2675.4 | 2488.3 | 2172.3 | 1937.5 | 1852.8 |
| 40° | 2549.6 | 2345.8 | 2015.8 | 1774.5 | 1686.2 |
| 42.5° | 2420.4 | 2203.0 | 1859.6 | 1607.9 | 1523.1 |
| 45° | 2284.5 | 2056.6 | 1699.8 | 1458.1 | 1376.6 |
| 47.5° | 2155.4 | 1914.1 | 1546.9 | 1305.3 | 1230.6 |
| 50° | 2012.6 | 1771.2 | 1397.2 | 1162.5 | 1091.4 |
| 52.5° | 1873.0 | 1618.0 | 1254.5 | 1030.1 | 965.5 |
| 55° | 1737.0 | 1471.9 | 1104.7 | 901.0 | 836.4 |
| 57.5° | 1597.8 | 1325.9 | 972.4 | 781.9 | 727.5 |
| 60° | 1454.9 | 1183.0 | 832.8 | 659.6 | 605.2 |
| 62.5° | 1315.8 | 1043.8 | 713.8 | 550.8 | 523.7 |
| 65° | 1172.9 | 897.4 | 591.5 | 476.1 | 465.6 |
| 67.5° | 1036.9 | 761.3 | 476.1 | 418.0 | 407.9 |
| 70° | 894.1 | 629.0 | 394.3 | 360.3 | 346.6 |
| 72.5° | 758.1 | 506.3 | 329.6 | 302.6 | 295.8 |
| 75° | 625.4 | 387.4 | 272.0 | 248.1 | 244.9 |
| 77.5° | 493.0 | 275.2 | 214.2 | 200.6 | 193.7 |
| 80° | 370.4 | 197.3 | 163.0 | 149.7 | 149.7 |
| 82.5° | 258.2 | 132.7 | 112.2 | 105.3 | 105.3 |
| 85° | 146.0 | 74.6 | 64.5 | 64.5 | 64.5 |
| 87.5° | 54.4 | 27.1 | 27.1 | 23.8 | 23.8 |
| 90° | 1.1 | 13.8 | 37.8 | 35.4 | 36.6 |
| 92.5° | 23.8 | 32.3 | 33.5 | 34.6 | 34.6 |
| 95° | 56.2 | 67.1 | 69.0 | 69.0 | 67.1 |
| 97.5° | 93.6 | 103.6 | 107.9 | 107.9 | 107.9 |
| 100° | 136.7 | 145.6 | 148.7 | 148.7 | 147.5 |
| 102.5° | 182.2 | 188.7 | 193.0 | 194.1 | 193.0 |
| 105° | 231.9 | 234.9 | 237.2 | 239.1 | 239.1 |
| 107.5° | 281.1 | 285.8 | 285.8 | 286.5 | 281.1 |
| 110° | 328.9 | 335.1 | 335.1 | 335.1 | 332.0 |



TEST NUMBER: P910180

CATALOG NUMBER: DFN2DIP-TR4F0-090D040US840-RLLFLL

CANDELA DISTRIBUTION (continued):

| | 0° | 22.5° | 45° | 67.5° | 90° |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 380.5 | 387.1 | 385.9 | 382.8 | 380.5 |
| 115° | 431.3 | 437.6 | 435.6 | 434.4 | 431.3 |
| 117.5° | 481.8 | 490.3 | 484.9 | 481.8 | 478.8 |
| 120° | 532.7 | 541.1 | 532.7 | 532.7 | 529.2 |
| 122.5° | 578.9 | 589.7 | 584.3 | 581.2 | 578.9 |
| 125° | 627.4 | 637.0 | 634.0 | 630.5 | 629.3 |
| 127.5° | 674.8 | 686.7 | 682.5 | 677.8 | 674.8 |
| 130° | 719.0 | 733.0 | 731.0 | 728.7 | 724.5 |
| 132.5° | 768.7 | 779.5 | 780.3 | 774.9 | 771.8 |
| 135° | 811.5 | 823.4 | 825.8 | 824.6 | 821.5 |
| 137.5° | 859.3 | 868.9 | 870.8 | 870.0 | 865.5 |
| 140° | 901.2 | 910.9 | 916.3 | 916.3 | 912.0 |
| 142.5° | 944.4 | 954.0 | 957.0 | 958.3 | 954.0 |
| 145° | 985.2 | 992.9 | 999.1 | 1000.3 | 996.0 |
| 147.5° | 1021.8 | 1031.4 | 1036.0 | 1037.9 | 1033.7 |
| 150° | 1059.6 | 1066.1 | 1070.4 | 1073.8 | 1070.4 |
| 152.5° | 1093.1 | 1099.5 | 1105.0 | 1109.2 | 1105.0 |
| 155° | 1126.5 | 1129.6 | 1133.1 | 1138.5 | 1135.0 |
| 157.5° | 1155.5 | 1157.7 | 1159.6 | 1167.4 | 1162.0 |
| 160° | 1181.2 | 1183.6 | 1184.7 | 1191.2 | 1186.6 |
| 162.5° | 1205.1 | 1205.1 | 1206.3 | 1213.6 | 1208.2 |
| 165° | 1225.6 | 1224.4 | 1224.4 | 1232.0 | 1226.7 |
| 167.5° | 1244.1 | 1240.5 | 1240.5 | 1248.3 | 1242.8 |
| 170° | 1257.9 | 1254.8 | 1253.6 | 1261.3 | 1254.8 |
| 172.5° | 1267.5 | 1264.5 | 1263.2 | 1271.0 | 1264.5 |
| 175° | 1275.3 | 1272.1 | 1269.8 | 1277.5 | 1271.0 |
| 177.5° | 1279.5 | 1276.4 | 1274.0 | 1280.6 | 1274.0 |
| 180° | 1277.5 | 1277.5 | 1277.5 | 1277.5 | 1277.5 |



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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 | 12.51 | 13.51 | 13.30 | 14.32 | 15.30 | 8.48 | 9.49 | 9.27 | 10.29 | 11.28 |
| | 3H | 14.20 | 15.10 | 15.00 | 15.91 | 16.93 | 9.68 | 10.58 | 10.49 | 11.40 | 12.41 |
| | 4H | 14.81 | 15.66 | 15.63 | 16.49 | 17.51 | 10.14 | 10.99 | 10.96 | 11.82 | 12.84 |
| | 6H | 15.24 | 16.03 | 16.08 | 16.86 | 17.90 | 10.47 | 11.26 | 11.30 | 12.09 | 13.13 |
| | 8H | 15.38 | 16.12 | 16.22 | 16.97 | 18.01 | 10.57 | 11.31 | 11.41 | 12.16 | 13.20 |
| | 12H | 15.44 | 16.15 | 16.29 | 16.99 | 18.06 | 10.62 | 11.33 | 11.46 | 12.17 | 13.24 |
| 4H | 2H | 12.55 | 13.40 | 13.37 | 14.22 | 15.25 | 9.10 | 9.95 | 9.92 | 10.77 | 11.80 |
| | 3H | 14.39 | 15.10 | 15.23 | 15.95 | 17.00 | 10.46 | 11.17 | 11.30 | 12.03 | 13.07 |
| | 4H | 15.09 | 15.73 | 15.94 | 16.59 | 17.66 | 11.02 | 11.66 | 11.87 | 12.52 | 13.58 |
| | 6H | 15.62 | 16.17 | 16.48 | 17.05 | 18.12 | 11.45 | 12.00 | 12.31 | 12.88 | 13.96 |
| | 8H | 15.79 | 16.31 | 16.66 | 17.18 | 18.27 | 11.58 | 12.10 | 12.45 | 12.97 | 14.06 |
| | 12H | 15.90 | 16.36 | 16.78 | 17.25 | 18.35 | 11.66 | 12.12 | 12.54 | 13.01 | 14.10 |
| 8H | 4H | 15.07 | 15.59 | 15.94 | 16.46 | 17.55 | 11.31 | 11.83 | 12.18 | 12.70 | 13.79 |
| | 6H | 15.64 | 16.07 | 16.54 | 16.99 | 18.07 | 11.84 | 12.26 | 12.73 | 13.18 | 14.27 |
| | 8H | 15.86 | 16.24 | 16.77 | 17.15 | 18.25 | 12.03 | 12.41 | 12.94 | 13.32 | 14.42 |
| | 12H | 16.01 | 16.34 | 16.91 | 17.24 | 18.40 | 12.16 | 12.49 | 13.07 | 13.39 | 14.55 |
| 12H | 4H | 15.03 | 15.50 | 15.92 | 16.39 | 17.48 | 11.33 | 11.79 | 12.21 | 12.68 | 13.77 |
| | 6H | 15.62 | 16.00 | 16.52 | 16.91 | 18.01 | 11.89 | 12.27 | 12.79 | 13.18 | 14.28 |
| | 8H | 15.85 | 16.18 | 16.76 | 17.08 | 18.24 | 12.11 | 12.44 | 13.01 | 13.34 | 14.50 |