

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: P908288

Luminaire Tested: DFN2DIP-HX4F0-120D050US840-FLLFLL

Issue Date: 11/21/2024

Test Information

Test Method: LM-79-2019
Report Number: P908288
REPORT IS A COMBINATION OF REPORTS P899333 AND P896188
Test Lab: INNOVATION CENTER
Issue Date: 11/21/2024
Manufacturer: COOPER LIGHTING SOLUTIONS
Product Line: NEO-RAY
Catalog Number: DFN2DIP-HX4F0-120D050US840-FLLFLL
Description: 4 foot, Hexagon Define Geo, with Direct Frosted Lens, Indirect Frosted Lens
Light Source: -
Ballast/Driver: -

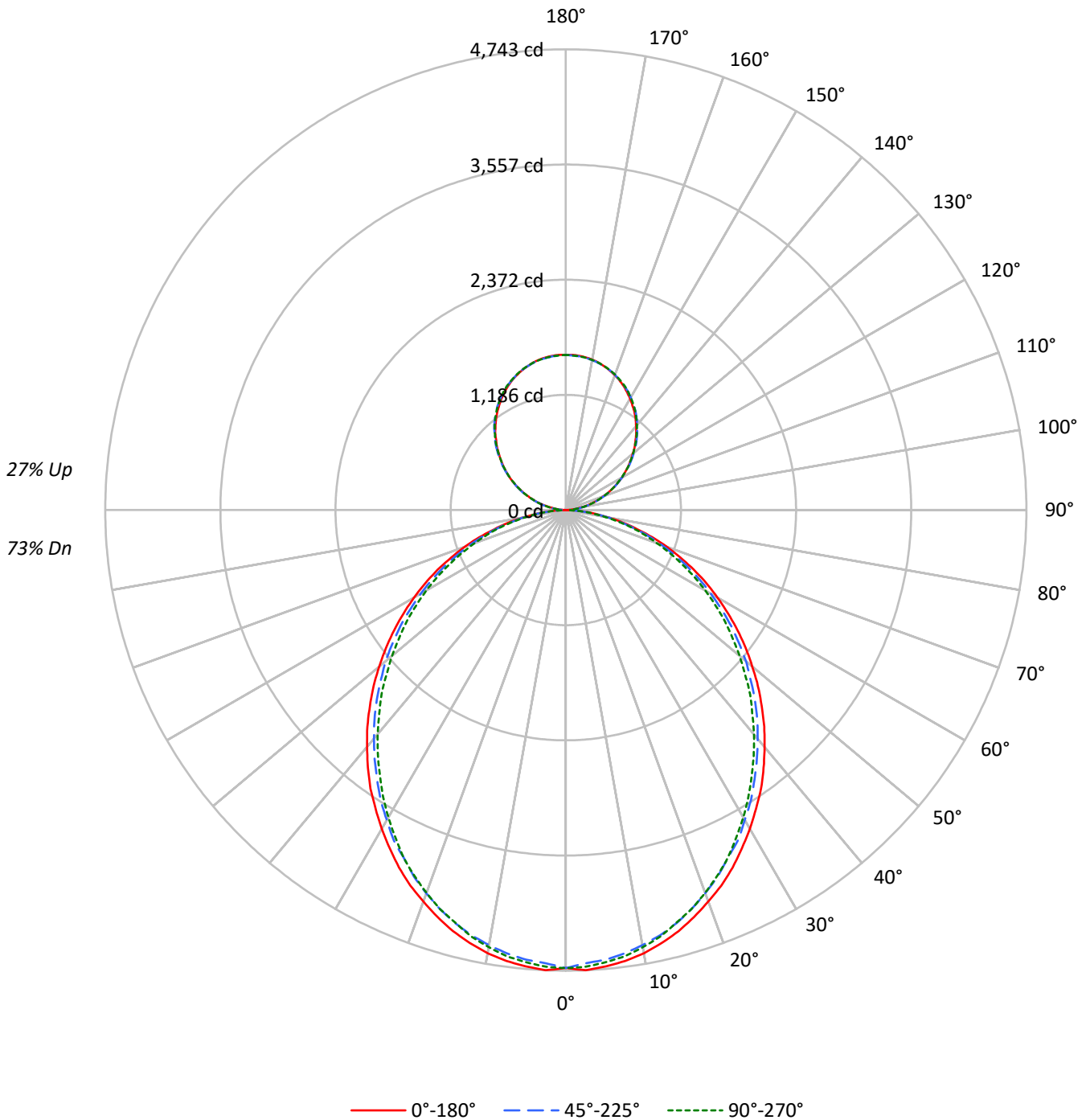
Summary

Lumens per Lamp: N/A
Luminaire Lumens: 16465.8 lumens
Efficiency: N/A
Efficacy: 106.4 lumens/watt
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29
Luminous Opening: Rectangular w/ Sides (W: 3.54' x L: 4.09' x H: 0.1')
CIE Type: Semi-Direct

Input Watts (W): 154.8
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





TEST NUMBER: P908288

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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 | 113 | 113 | 113 | 113 | 107 | 107 | 107 | 107 | 96 | 96 | 96 | 86 | 86 | 86 | 77 | 77 | 77 | 77 | 77 | 77 | 73 |
| 1 | 103 | 98 | 94 | 91 | 97 | 94 | 90 | 87 | 84 | 82 | 79 | 76 | 74 | 72 | 68 | 67 | 65 | 65 | 65 | 65 | 61 |
| 2 | 94 | 86 | 80 | 74 | 89 | 82 | 76 | 71 | 74 | 69 | 66 | 67 | 63 | 60 | 60 | 57 | 55 | 55 | 55 | 55 | 51 |
| 3 | 86 | 76 | 68 | 62 | 81 | 72 | 65 | 60 | 65 | 60 | 55 | 59 | 55 | 51 | 53 | 50 | 47 | 47 | 47 | 47 | 44 |
| 4 | 78 | 67 | 59 | 53 | 74 | 64 | 57 | 51 | 58 | 52 | 47 | 53 | 48 | 44 | 48 | 44 | 40 | 40 | 40 | 40 | 37 |
| 5 | 72 | 60 | 51 | 45 | 68 | 57 | 50 | 44 | 52 | 46 | 41 | 47 | 42 | 38 | 43 | 39 | 35 | 35 | 35 | 35 | 33 |
| 6 | 67 | 54 | 45 | 39 | 63 | 52 | 44 | 38 | 47 | 41 | 36 | 43 | 38 | 33 | 39 | 35 | 31 | 31 | 31 | 31 | 29 |
| 7 | 62 | 49 | 41 | 35 | 58 | 47 | 39 | 34 | 43 | 36 | 32 | 39 | 34 | 30 | 36 | 31 | 28 | 28 | 28 | 28 | 25 |
| 8 | 57 | 45 | 36 | 31 | 54 | 43 | 35 | 30 | 39 | 33 | 28 | 36 | 30 | 27 | 33 | 28 | 25 | 25 | 25 | 25 | 23 |
| 9 | 53 | 41 | 33 | 28 | 51 | 39 | 32 | 27 | 36 | 30 | 25 | 33 | 28 | 24 | 30 | 26 | 22 | 22 | 22 | 22 | 20 |
| 10 | 50 | 38 | 30 | 25 | 48 | 36 | 29 | 24 | 33 | 27 | 23 | 31 | 25 | 22 | 28 | 24 | 20 | 20 | 20 | 20 | 19 |

AVERAGE LUMINANCE (cd/sqm):

| | 0° | 45° | 90° |
|-----|------|------|------|
| 0° | 3506 | 3506 | 3506 |
| 5° | 3512 | 3458 | 3481 |
| 10° | 3484 | 3411 | 3434 |
| 15° | 3433 | 3356 | 3360 |
| 20° | 3364 | 3278 | 3285 |
| 25° | 3295 | 3185 | 3198 |
| 30° | 3209 | 3098 | 3087 |
| 35° | 3128 | 2996 | 2970 |
| 40° | 3028 | 2893 | 2859 |
| 45° | 2928 | 2790 | 2745 |
| 50° | 2818 | 2682 | 2613 |
| 55° | 2704 | 2556 | 2492 |
| 60° | 2574 | 2407 | 2353 |
| 65° | 2434 | 2253 | 2189 |
| 70° | 2254 | 2065 | 2013 |
| 75° | 2005 | 1840 | 1850 |
| 80° | 1706 | 1554 | 1539 |
| 85° | 1238 | 1059 | 1024 |

MAXIMUM LUMINANCE 45°-90°:

Horizontal Angle: 0°
 Vertical Angle: 45°
 Luminance: 2928 cd/sqm



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ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|---------|-----------|
| 0°-10° | 443.8 | 2.7 |
| 10°-20° | 1248.7 | 7.6 |
| 20°-30° | 1835.1 | 11.1 |
| 30°-40° | 2131.4 | 12.9 |
| 40°-50° | 2128.7 | 12.9 |
| 50°-60° | 1856.2 | 11.3 |
| 60°-70° | 1372.1 | 8.3 |
| 70°-80° | 776.3 | 4.7 |
| 80°-90° | 209.4 | 1.3 |
| 90°-100° | 98.8 | 0.6 |
| 100°-110° | 314.0 | 1.9 |
| 110°-120° | 537.3 | 3.3 |
| 120°-130° | 706.6 | 4.3 |
| 130°-140° | 793.2 | 4.8 |
| 140°-150° | 777.8 | 4.7 |
| 150°-160° | 652.5 | 4.0 |
| 160°-170° | 432.7 | 2.6 |
| 170°-180° | 151.2 | 0.9 |
| 0°-30° | 3527.6 | 21.4 |
| 0°-40° | 5659.0 | 34.4 |
| 0°-60° | 9643.8 | 58.6 |
| 0°-90° | 12001.7 | 72.9 |
| 90°-120° | 950.1 | 5.8 |
| 90°-150° | 3227.7 | 19.6 |
| 90°-180° | 4464.0 | 27.1 |
| 0°-180° | 16465.8 | 100.0 |

CANDELA DISTRIBUTION:

| | 0° | 22.5° | 45° | 67.5° | 90° | Flux |
|------|------|-------|------|-------|------|------|
| 0° | 4715 | 4715 | 4715 | 4715 | 4715 | |
| 5° | 4715 | 4698 | 4648 | 4684 | 4675 | 448 |
| 15° | 4489 | 4462 | 4403 | 4421 | 4398 | 1264 |
| 25° | 4062 | 4026 | 3950 | 3958 | 3950 | 1869 |
| 35° | 3505 | 3460 | 3387 | 3360 | 3337 | 2189 |
| 45° | 2852 | 2820 | 2752 | 2703 | 2684 | 2201 |
| 55° | 2158 | 2131 | 2077 | 2022 | 2000 | 1930 |
| 65° | 1456 | 1428 | 1383 | 1342 | 1320 | 1439 |
| 75° | 762 | 753 | 730 | 703 | 712 | 813 |
| 85° | 186 | 181 | 177 | 163 | 159 | 207 |
| 90° | 1 | 17 | 47 | 44 | 46 | 16 |
| 95° | 70 | 84 | 86 | 86 | 84 | 78 |
| 105° | 290 | 294 | 297 | 299 | 299 | 306 |
| 115° | 539 | 547 | 544 | 543 | 539 | 533 |
| 125° | 784 | 796 | 792 | 788 | 787 | 701 |
| 135° | 1014 | 1029 | 1032 | 1031 | 1027 | 784 |
| 145° | 1232 | 1241 | 1249 | 1250 | 1245 | 769 |
| 155° | 1408 | 1412 | 1416 | 1423 | 1419 | 648 |
| 165° | 1532 | 1530 | 1530 | 1540 | 1533 | 432 |
| 175° | 1594 | 1590 | 1587 | 1597 | 1589 | 151 |
| 180° | 1597 | 1597 | 1597 | 1597 | 1597 | |



TEST NUMBER: P908288

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CANDELA DISTRIBUTION (FULL):

| | 0° | 22.5° | 45° | 67.5° | 90° |
|--------|--------|--------|--------|--------|--------|
| 0° | 4715.4 | 4715.4 | 4715.4 | 4715.4 | 4715.4 |
| 2.5° | 4742.7 | 4720.1 | 4670.1 | 4715.4 | 4706.7 |
| 5° | 4715.4 | 4697.5 | 4647.5 | 4683.6 | 4674.9 |
| 7.5° | 4683.6 | 4656.6 | 4606.6 | 4643.2 | 4634.1 |
| 10° | 4634.1 | 4602.3 | 4547.9 | 4584.0 | 4570.6 |
| 12.5° | 4565.7 | 4538.7 | 4484.4 | 4507.0 | 4497.8 |
| 15° | 4488.8 | 4461.8 | 4402.6 | 4420.9 | 4398.3 |
| 17.5° | 4393.5 | 4366.6 | 4307.4 | 4330.0 | 4307.4 |
| 20° | 4289.1 | 4262.1 | 4198.7 | 4212.1 | 4194.4 |
| 22.5° | 4185.2 | 4144.3 | 4085.1 | 4085.1 | 4076.0 |
| 25° | 4062.5 | 4026.4 | 3949.5 | 3958.2 | 3949.5 |
| 27.5° | 3926.4 | 3894.6 | 3836.0 | 3822.4 | 3799.9 |
| 30° | 3790.7 | 3754.2 | 3686.3 | 3672.9 | 3654.6 |
| 32.5° | 3645.4 | 3618.6 | 3545.8 | 3518.5 | 3500.2 |
| 35° | 3504.9 | 3459.8 | 3387.1 | 3359.7 | 3337.1 |
| 37.5° | 3346.2 | 3305.4 | 3232.7 | 3201.0 | 3178.3 |
| 40° | 3183.2 | 3146.6 | 3073.9 | 3033.5 | 3015.3 |
| 42.5° | 3024.4 | 2987.9 | 2915.7 | 2870.0 | 2843.1 |
| 45° | 2852.2 | 2820.5 | 2752.1 | 2702.6 | 2684.3 |
| 47.5° | 2684.3 | 2652.5 | 2579.9 | 2529.9 | 2503.0 |
| 50° | 2507.3 | 2484.7 | 2421.2 | 2357.6 | 2335.0 |
| 52.5° | 2335.0 | 2303.3 | 2244.6 | 2194.5 | 2162.8 |
| 55° | 2158.5 | 2131.1 | 2076.7 | 2022.4 | 1999.7 |
| 57.5° | 1981.5 | 1958.8 | 1899.7 | 1845.3 | 1827.0 |
| 60° | 1804.4 | 1786.7 | 1723.1 | 1673.1 | 1659.6 |
| 62.5° | 1632.2 | 1600.4 | 1555.3 | 1510.1 | 1491.8 |
| 65° | 1455.7 | 1428.3 | 1383.0 | 1342.1 | 1319.6 |
| 67.5° | 1274.3 | 1251.2 | 1210.8 | 1179.1 | 1160.8 |
| 70° | 1106.4 | 1088.1 | 1047.2 | 1015.5 | 997.7 |
| 72.5° | 934.2 | 915.9 | 893.3 | 861.6 | 848.1 |
| 75° | 761.5 | 752.9 | 729.7 | 702.9 | 712.0 |
| 77.5° | 607.5 | 589.3 | 580.2 | 566.6 | 553.2 |
| 80° | 453.6 | 448.8 | 439.7 | 426.3 | 417.1 |
| 82.5° | 308.3 | 308.3 | 304.1 | 285.8 | 285.8 |
| 85° | 185.7 | 181.4 | 177.0 | 163.1 | 158.8 |
| 87.5° | 81.8 | 72.6 | 63.5 | 50.0 | 45.2 |
| 90° | 1.4 | 17.4 | 47.2 | 44.3 | 45.7 |
| 92.5° | 29.9 | 40.4 | 41.9 | 43.3 | 43.3 |
| 95° | 70.3 | 83.8 | 86.1 | 86.1 | 83.8 |
| 97.5° | 116.9 | 129.5 | 134.8 | 134.8 | 134.8 |
| 100° | 170.9 | 182.0 | 185.8 | 185.8 | 184.4 |
| 102.5° | 227.7 | 235.9 | 241.2 | 242.7 | 241.2 |
| 105° | 289.8 | 293.7 | 296.6 | 298.9 | 298.9 |
| 107.5° | 351.4 | 357.2 | 357.2 | 358.2 | 351.4 |
| 110° | 411.1 | 418.9 | 418.9 | 418.9 | 415.0 |



TEST NUMBER: P908288

CATALOG NUMBER: DFN2DIP-HX4F0-120D050US840-FLLFLL

CANDELA DISTRIBUTION (continued):

| | 0° | 22.5° | 45° | 67.5° | 90° |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 475.6 | 483.8 | 482.4 | 478.6 | 475.6 |
| 115° | 539.2 | 546.9 | 544.5 | 543.1 | 539.2 |
| 117.5° | 602.3 | 612.9 | 606.1 | 602.3 | 598.4 |
| 120° | 665.8 | 676.4 | 665.8 | 665.8 | 661.5 |
| 122.5° | 723.6 | 737.1 | 730.3 | 726.5 | 723.6 |
| 125° | 784.3 | 796.3 | 792.4 | 788.1 | 786.7 |
| 127.5° | 843.4 | 858.4 | 853.1 | 847.3 | 843.4 |
| 130° | 898.9 | 916.2 | 913.7 | 910.9 | 905.5 |
| 132.5° | 961.0 | 974.4 | 975.4 | 968.7 | 964.8 |
| 135° | 1014.4 | 1029.3 | 1032.2 | 1030.8 | 1026.9 |
| 137.5° | 1074.1 | 1086.1 | 1088.5 | 1087.5 | 1081.8 |
| 140° | 1126.5 | 1138.6 | 1145.3 | 1145.3 | 1140.0 |
| 142.5° | 1180.4 | 1192.6 | 1196.4 | 1197.8 | 1192.6 |
| 145° | 1231.5 | 1241.1 | 1248.8 | 1250.3 | 1245.0 |
| 147.5° | 1277.3 | 1289.3 | 1295.1 | 1297.5 | 1292.1 |
| 150° | 1324.4 | 1332.6 | 1337.9 | 1342.2 | 1337.9 |
| 152.5° | 1366.3 | 1374.5 | 1381.2 | 1386.5 | 1381.2 |
| 155° | 1408.2 | 1412.0 | 1416.3 | 1423.1 | 1418.8 |
| 157.5° | 1444.3 | 1447.1 | 1449.6 | 1459.3 | 1452.5 |
| 160° | 1476.5 | 1479.5 | 1480.9 | 1489.0 | 1483.3 |
| 162.5° | 1506.4 | 1506.4 | 1507.8 | 1517.0 | 1510.3 |
| 165° | 1532.0 | 1530.5 | 1530.5 | 1540.1 | 1533.4 |
| 167.5° | 1555.0 | 1550.6 | 1550.6 | 1560.3 | 1553.6 |
| 170° | 1572.4 | 1568.5 | 1567.1 | 1576.7 | 1568.5 |
| 172.5° | 1584.4 | 1580.5 | 1579.1 | 1588.7 | 1580.5 |
| 175° | 1594.1 | 1590.1 | 1587.3 | 1596.9 | 1588.7 |
| 177.5° | 1599.3 | 1595.5 | 1592.6 | 1600.7 | 1592.6 |
| 180° | 1596.9 | 1596.9 | 1596.9 | 1596.9 | 1596.9 |



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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 | 13.52 | 14.63 | 14.25 | 15.39 | 16.29 | 13.09 | 14.20 | 13.82 | 14.95 | 15.86 |
| | 3H | 15.20 | 16.20 | 15.94 | 16.96 | 17.90 | 14.73 | 15.73 | 15.47 | 16.49 | 17.42 |
| | 4H | 15.80 | 16.74 | 16.56 | 17.51 | 18.46 | 15.32 | 16.27 | 16.09 | 17.04 | 17.99 |
| | 6H | 16.21 | 17.08 | 16.99 | 17.86 | 18.82 | 15.74 | 16.61 | 16.51 | 17.39 | 18.35 |
| | 8H | 16.32 | 17.15 | 17.11 | 17.96 | 18.92 | 15.85 | 16.68 | 16.64 | 17.48 | 18.44 |
| | 12H | 16.38 | 17.17 | 17.17 | 17.97 | 18.96 | 15.90 | 16.69 | 16.69 | 17.49 | 18.47 |
| 4H | 2H | 14.01 | 14.95 | 14.78 | 15.73 | 16.67 | 13.67 | 14.61 | 14.43 | 15.38 | 16.33 |
| | 3H | 15.90 | 16.69 | 16.68 | 17.50 | 18.46 | 15.51 | 16.30 | 16.29 | 17.10 | 18.07 |
| | 4H | 16.63 | 17.34 | 17.42 | 18.15 | 19.14 | 16.22 | 16.94 | 17.01 | 17.74 | 18.74 |
| | 6H | 17.16 | 17.78 | 17.97 | 18.61 | 19.61 | 16.75 | 17.37 | 17.56 | 18.20 | 19.20 |
| | 8H | 17.31 | 17.89 | 18.13 | 18.72 | 19.73 | 16.90 | 17.48 | 17.72 | 18.31 | 19.32 |
| | 12H | 17.40 | 17.92 | 18.23 | 18.77 | 19.78 | 16.98 | 17.50 | 17.81 | 18.35 | 19.36 |
| 8H | 4H | 16.84 | 17.42 | 17.66 | 18.25 | 19.26 | 16.48 | 17.06 | 17.30 | 17.89 | 18.90 |
| | 6H | 17.49 | 17.97 | 18.33 | 18.84 | 19.85 | 17.12 | 17.60 | 17.97 | 18.47 | 19.48 |
| | 8H | 17.71 | 18.14 | 18.57 | 19.00 | 20.03 | 17.34 | 17.77 | 18.20 | 18.63 | 19.66 |
| | 12H | 17.85 | 18.23 | 18.71 | 19.09 | 20.17 | 17.47 | 17.85 | 18.33 | 18.70 | 19.79 |
| 12H | 4H | 16.84 | 17.36 | 17.68 | 18.21 | 19.23 | 16.49 | 17.01 | 17.32 | 17.86 | 18.88 |
| | 6H | 17.52 | 17.95 | 18.37 | 18.81 | 19.84 | 17.17 | 17.60 | 18.02 | 18.46 | 19.49 |
| | 8H | 17.77 | 18.15 | 18.63 | 19.01 | 20.09 | 17.42 | 17.79 | 18.27 | 18.65 | 19.73 |