

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: P928712

Luminaire Tested: DFN2DIP-HX4F0-100D050US930-FLLONL

Issue Date: 12/12/2024

Test Information

Test Method: LM-79-2019
Report Number: P928712
REPORT IS A COMBINATION OF REPORTS P900849 AND P896187
Test Lab: INNOVATION CENTER
Issue Date: 12/12/2024
Manufacturer: COOPER LIGHTING SOLUTIONS
Product Line: NEO-RAY
Catalog Number: DFN2DIP-HX4F0-100D050US930-FLONL
Description: 4 foot, Hexagon Define Geo, with Direct Frosted Lens, Indirect Open No Lens
Light Source: -
Ballast/Driver: -

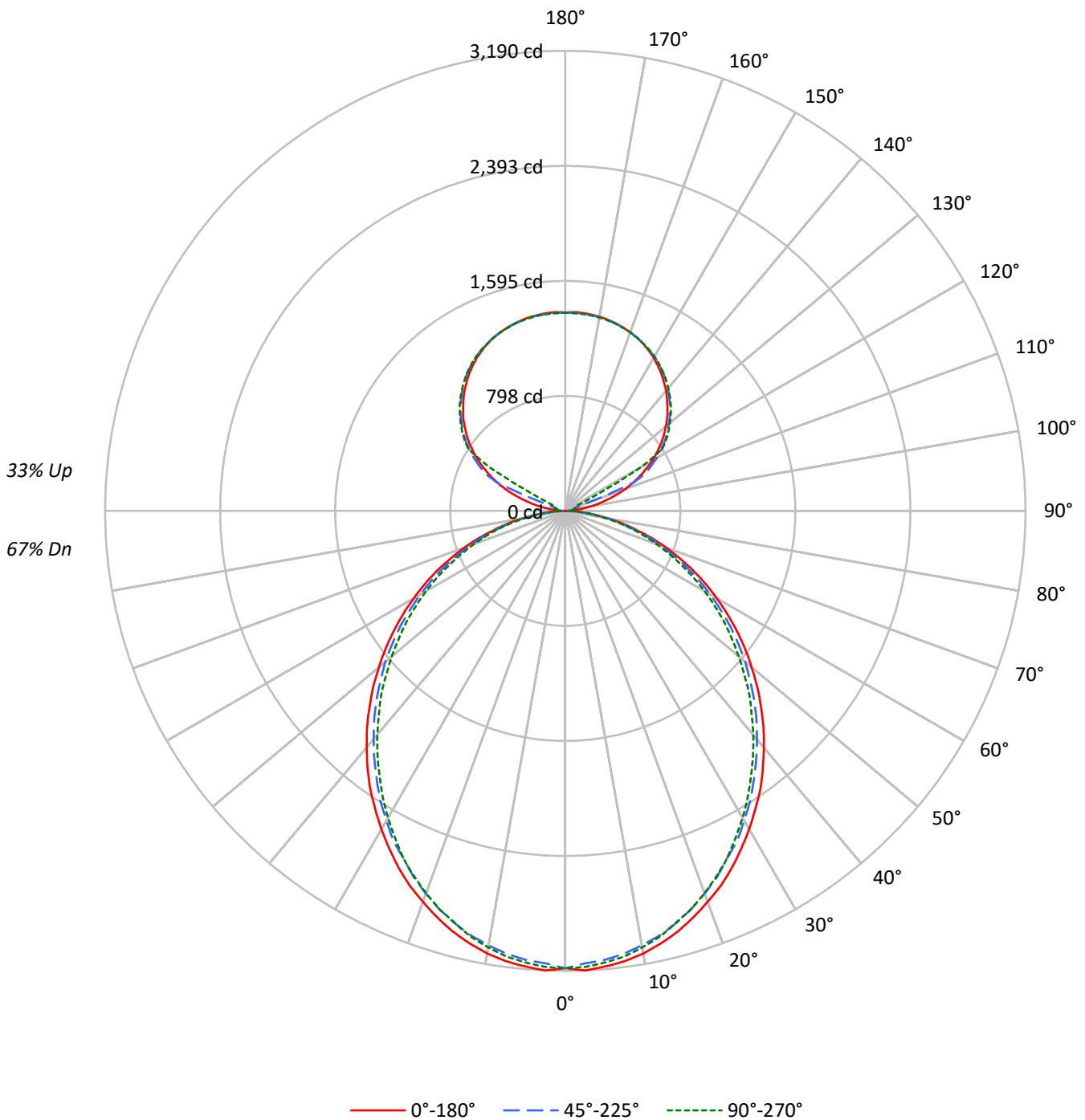
Summary

Lumens per Lamp: N/A
Luminaire Lumens: 12102.8 lumens
Efficiency: N/A
Efficacy: 88.3 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): 137
Input Voltage (V):
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: 0.946
Total Harmonic Distortion (THDi): 0.132
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 | 111 | 111 | 111 | 111 | 105 | 105 | 105 | 105 | 93 | 93 | 93 | 82 | 82 | 82 | 71 | 71 | 71 | 67 | 67 | 67 | 67 |
| 1 | 102 | 97 | 93 | 90 | 95 | 92 | 88 | 85 | 81 | 79 | 76 | 72 | 70 | 68 | 63 | 62 | 60 | 56 | 56 | 56 | 56 |
| 2 | 92 | 85 | 79 | 73 | 87 | 80 | 75 | 70 | 71 | 67 | 63 | 63 | 60 | 57 | 56 | 53 | 51 | 47 | 47 | 47 | 47 |
| 3 | 84 | 75 | 67 | 61 | 79 | 71 | 64 | 58 | 63 | 58 | 53 | 56 | 52 | 48 | 49 | 46 | 43 | 40 | 40 | 40 | 40 |
| 4 | 77 | 66 | 58 | 52 | 72 | 63 | 55 | 50 | 56 | 50 | 45 | 50 | 45 | 41 | 44 | 40 | 37 | 34 | 34 | 34 | 34 |
| 5 | 71 | 59 | 51 | 44 | 67 | 56 | 48 | 43 | 50 | 44 | 39 | 45 | 40 | 36 | 40 | 36 | 33 | 30 | 30 | 30 | 30 |
| 6 | 66 | 53 | 45 | 39 | 62 | 50 | 43 | 37 | 45 | 39 | 34 | 41 | 35 | 32 | 36 | 32 | 29 | 26 | 26 | 26 | 26 |
| 7 | 61 | 48 | 40 | 34 | 57 | 46 | 38 | 33 | 41 | 35 | 30 | 37 | 32 | 28 | 33 | 29 | 26 | 23 | 23 | 23 | 23 |
| 8 | 56 | 44 | 36 | 30 | 53 | 42 | 34 | 29 | 38 | 31 | 27 | 34 | 29 | 25 | 30 | 26 | 23 | 21 | 21 | 21 | 21 |
| 9 | 53 | 40 | 32 | 27 | 50 | 38 | 31 | 26 | 35 | 29 | 24 | 31 | 26 | 23 | 28 | 24 | 21 | 19 | 19 | 19 | 19 |
| 10 | 49 | 37 | 29 | 24 | 46 | 35 | 28 | 24 | 32 | 26 | 22 | 29 | 24 | 20 | 26 | 22 | 19 | 17 | 17 | 17 | 17 |

AVERAGE LUMINANCE (cd/sqm):

| | 0° | 45° | 90° |
|-----|------|------|------|
| 0° | 2358 | 2358 | 2358 |
| 5° | 2362 | 2325 | 2341 |
| 10° | 2343 | 2294 | 2309 |
| 15° | 2309 | 2257 | 2260 |
| 20° | 2262 | 2204 | 2209 |
| 25° | 2216 | 2142 | 2151 |
| 30° | 2158 | 2084 | 2076 |
| 35° | 2104 | 2015 | 1998 |
| 40° | 2036 | 1946 | 1923 |
| 45° | 1969 | 1876 | 1846 |
| 50° | 1895 | 1803 | 1757 |
| 55° | 1818 | 1719 | 1676 |
| 60° | 1731 | 1619 | 1582 |
| 65° | 1637 | 1516 | 1472 |
| 70° | 1516 | 1389 | 1354 |
| 75° | 1348 | 1238 | 1244 |
| 80° | 1147 | 1045 | 1035 |
| 85° | 833 | 713 | 689 |

MAXIMUM LUMINANCE 45°-90°:

Horizontal Angle: 0°
 Vertical Angle: 45°
 Luminance: 1969 cd/sqm



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ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|---------|-----------|
| 0°-10° | 298.5 | 2.5 |
| 10°-20° | 839.8 | 6.9 |
| 20°-30° | 1234.2 | 10.2 |
| 30°-40° | 1433.4 | 11.8 |
| 40°-50° | 1431.6 | 11.8 |
| 50°-60° | 1248.3 | 10.3 |
| 60°-70° | 922.8 | 7.6 |
| 70°-80° | 522.1 | 4.3 |
| 80°-90° | 140.2 | 1.2 |
| 90°-100° | 45.4 | 0.4 |
| 100°-110° | 169.1 | 1.4 |
| 110°-120° | 448.4 | 3.7 |
| 120°-130° | 743.6 | 6.1 |
| 130°-140° | 789.9 | 6.5 |
| 140°-150° | 734.1 | 6.1 |
| 150°-160° | 590.2 | 4.9 |
| 160°-170° | 380.3 | 3.1 |
| 170°-180° | 130.9 | 1.1 |
| 0°-30° | 2372.4 | 19.6 |
| 0°-40° | 3805.8 | 31.4 |
| 0°-60° | 6485.8 | 53.6 |
| 0°-90° | 8071.0 | 66.7 |
| 90°-120° | 662.8 | 5.5 |
| 90°-150° | 2930.4 | 24.2 |
| 90°-180° | 4032.0 | 33.3 |
| 0°-180° | 12102.8 | 100.0 |

CANDELA DISTRIBUTION:

| | 0° | 22.5° | 45° | 67.5° | 90° | Flux |
|------|------|-------|------|-------|------|------|
| 0° | 3171 | 3171 | 3171 | 3171 | 3171 | |
| 5° | 3171 | 3159 | 3126 | 3150 | 3144 | 301 |
| 15° | 3019 | 3001 | 2961 | 2973 | 2958 | 850 |
| 25° | 2732 | 2708 | 2656 | 2662 | 2656 | 1257 |
| 35° | 2357 | 2327 | 2278 | 2260 | 2244 | 1472 |
| 45° | 1918 | 1897 | 1851 | 1818 | 1805 | 1480 |
| 55° | 1452 | 1433 | 1397 | 1360 | 1345 | 1298 |
| 65° | 979 | 961 | 930 | 903 | 888 | 968 |
| 75° | 512 | 506 | 491 | 473 | 479 | 547 |
| 85° | 125 | 122 | 119 | 110 | 107 | 139 |
| 90° | 1 | 12 | 20 | 25 | 27 | 11 |
| 95° | 65 | 32 | 39 | 44 | 43 | 77 |
| 105° | 302 | 332 | 61 | 72 | 76 | 323 |
| 115° | 572 | 589 | 614 | 153 | 82 | 563 |
| 125° | 809 | 822 | 841 | 848 | 851 | 721 |
| 135° | 1001 | 1017 | 1026 | 1036 | 1034 | 773 |
| 145° | 1161 | 1160 | 1177 | 1184 | 1179 | 726 |
| 155° | 1279 | 1270 | 1282 | 1288 | 1280 | 589 |
| 165° | 1347 | 1342 | 1344 | 1351 | 1344 | 381 |
| 175° | 1378 | 1371 | 1373 | 1380 | 1370 | 131 |
| 180° | 1375 | 1375 | 1375 | 1375 | 1375 | |



TEST NUMBER: P928712

CATALOG NUMBER: DFN2DIP-HX4F0-100D050US930-FLLONL

CANDELA DISTRIBUTION (FULL):

| | 0° | 22.5° | 45° | 67.5° | 90° |
|--------|--------|--------|--------|--------|--------|
| 0° | 3171.2 | 3171.2 | 3171.2 | 3171.2 | 3171.2 |
| 2.5° | 3189.7 | 3174.4 | 3140.8 | 3171.2 | 3165.4 |
| 5° | 3171.2 | 3159.3 | 3125.6 | 3149.9 | 3144.0 |
| 7.5° | 3149.9 | 3131.7 | 3098.1 | 3122.7 | 3116.6 |
| 10° | 3116.6 | 3095.2 | 3058.6 | 3082.9 | 3073.9 |
| 12.5° | 3070.6 | 3052.5 | 3015.9 | 3031.1 | 3025.0 |
| 15° | 3018.8 | 3000.7 | 2960.9 | 2973.2 | 2958.0 |
| 17.5° | 2954.8 | 2936.7 | 2896.8 | 2912.1 | 2896.8 |
| 20° | 2884.5 | 2866.4 | 2823.7 | 2832.8 | 2820.8 |
| 22.5° | 2814.7 | 2787.2 | 2747.4 | 2747.4 | 2741.3 |
| 25° | 2732.2 | 2707.9 | 2656.2 | 2662.0 | 2656.2 |
| 27.5° | 2640.6 | 2619.2 | 2579.8 | 2570.8 | 2555.5 |
| 30° | 2549.4 | 2524.8 | 2479.1 | 2470.1 | 2457.8 |
| 32.5° | 2451.7 | 2433.6 | 2384.7 | 2366.3 | 2354.0 |
| 35° | 2357.2 | 2326.8 | 2277.9 | 2259.5 | 2244.3 |
| 37.5° | 2250.5 | 2222.9 | 2174.1 | 2152.7 | 2137.5 |
| 40° | 2140.8 | 2116.1 | 2067.3 | 2040.2 | 2027.9 |
| 42.5° | 2034.0 | 2009.4 | 1960.9 | 1930.2 | 1912.1 |
| 45° | 1918.2 | 1896.8 | 1850.9 | 1817.5 | 1805.3 |
| 47.5° | 1805.3 | 1784.0 | 1735.1 | 1701.4 | 1683.3 |
| 50° | 1686.2 | 1671.0 | 1628.3 | 1585.6 | 1570.4 |
| 52.5° | 1570.4 | 1549.1 | 1509.5 | 1476.0 | 1454.6 |
| 55° | 1451.7 | 1433.3 | 1396.7 | 1360.1 | 1344.9 |
| 57.5° | 1332.6 | 1317.4 | 1277.6 | 1241.1 | 1228.8 |
| 60° | 1213.5 | 1201.6 | 1158.8 | 1125.2 | 1116.1 |
| 62.5° | 1097.7 | 1076.4 | 1046.0 | 1015.6 | 1003.3 |
| 65° | 979.0 | 960.6 | 930.2 | 902.6 | 887.5 |
| 67.5° | 857.1 | 841.5 | 814.3 | 793.0 | 780.7 |
| 70° | 744.1 | 731.8 | 704.3 | 683.0 | 671.0 |
| 72.5° | 628.3 | 616.0 | 600.8 | 579.5 | 570.3 |
| 75° | 512.1 | 506.4 | 490.8 | 472.7 | 478.8 |
| 77.5° | 408.6 | 396.3 | 390.1 | 381.1 | 372.0 |
| 80° | 305.1 | 301.9 | 295.7 | 286.6 | 280.5 |
| 82.5° | 207.4 | 207.4 | 204.5 | 192.2 | 192.2 |
| 85° | 124.9 | 122.0 | 119.1 | 109.7 | 106.8 |
| 87.5° | 55.0 | 48.8 | 42.7 | 33.7 | 30.4 |
| 90° | 1.0 | 11.9 | 19.9 | 24.9 | 26.8 |
| 92.5° | 24.9 | 20.9 | 23.9 | 25.9 | 26.8 |
| 95° | 64.6 | 31.8 | 38.8 | 43.8 | 42.8 |
| 97.5° | 116.4 | 34.9 | 50.7 | 53.8 | 54.7 |
| 100° | 176.2 | 39.9 | 56.7 | 64.6 | 66.7 |
| 102.5° | 241.8 | 239.9 | 58.8 | 69.6 | 72.7 |
| 105° | 302.5 | 332.4 | 60.7 | 71.6 | 75.6 |
| 107.5° | 373.2 | 398.0 | 62.8 | 73.6 | 77.7 |
| 110° | 440.9 | 461.7 | 174.2 | 74.7 | 78.6 |



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CATALOG NUMBER: DFN2DIP-HX4F0-100D050US930-FLLONL

CANDELA DISTRIBUTION (continued):

| | 0° | 22.5° | 45° | 67.5° | 90° |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 504.6 | 522.4 | 505.5 | 76.6 | 79.6 |
| 115° | 572.2 | 589.1 | 614.0 | 153.3 | 81.7 |
| 117.5° | 630.9 | 650.8 | 667.8 | 525.3 | 264.7 |
| 120° | 696.6 | 711.5 | 729.4 | 741.4 | 607.0 |
| 122.5° | 752.2 | 768.2 | 788.2 | 794.1 | 795.2 |
| 125° | 809.0 | 822.0 | 840.9 | 847.8 | 850.9 |
| 127.5° | 860.7 | 874.7 | 889.7 | 899.6 | 900.6 |
| 130° | 909.5 | 925.5 | 936.4 | 947.4 | 946.5 |
| 132.5° | 959.3 | 972.3 | 983.1 | 992.2 | 991.2 |
| 135° | 1001.1 | 1017.1 | 1025.9 | 1036.0 | 1034.0 |
| 137.5° | 1044.8 | 1056.8 | 1066.8 | 1076.8 | 1073.8 |
| 140° | 1087.6 | 1095.7 | 1106.5 | 1115.5 | 1110.6 |
| 142.5° | 1123.6 | 1130.6 | 1143.4 | 1151.4 | 1146.4 |
| 145° | 1161.4 | 1160.3 | 1177.2 | 1184.2 | 1179.2 |
| 147.5° | 1194.1 | 1191.1 | 1208.1 | 1213.0 | 1209.1 |
| 150° | 1226.0 | 1219.1 | 1235.0 | 1240.9 | 1235.9 |
| 152.5° | 1252.8 | 1244.9 | 1259.8 | 1265.9 | 1258.8 |
| 155° | 1278.7 | 1269.9 | 1281.8 | 1287.7 | 1279.8 |
| 157.5° | 1299.6 | 1291.7 | 1300.7 | 1307.7 | 1299.6 |
| 160° | 1317.6 | 1311.6 | 1317.6 | 1323.5 | 1316.6 |
| 162.5° | 1333.4 | 1327.6 | 1332.4 | 1339.5 | 1330.5 |
| 165° | 1347.4 | 1341.5 | 1344.4 | 1351.4 | 1344.4 |
| 167.5° | 1358.4 | 1352.3 | 1355.4 | 1362.4 | 1353.4 |
| 170° | 1367.3 | 1361.3 | 1363.3 | 1370.3 | 1361.3 |
| 172.5° | 1373.3 | 1367.3 | 1369.4 | 1376.3 | 1367.3 |
| 175° | 1378.2 | 1371.2 | 1373.3 | 1380.2 | 1370.3 |
| 177.5° | 1380.2 | 1373.3 | 1374.3 | 1381.3 | 1372.3 |
| 180° | 1375.2 | 1375.2 | 1375.2 | 1375.2 | 1375.2 |



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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 | 11.67 | 12.70 | 12.47 | 13.52 | 14.53 | 11.23 | 12.27 | 12.03 | 13.09 | 14.10 |
| | 3H | 13.34 | 14.27 | 14.15 | 15.10 | 16.14 | 12.87 | 13.80 | 13.68 | 14.63 | 15.67 |
| | 4H | 13.94 | 14.81 | 14.77 | 15.65 | 16.70 | 13.46 | 14.34 | 14.29 | 15.18 | 16.23 |
| | 6H | 14.35 | 15.16 | 15.19 | 16.00 | 17.07 | 13.87 | 14.68 | 14.71 | 15.53 | 16.59 |
| | 8H | 14.46 | 15.23 | 15.31 | 16.09 | 17.16 | 13.98 | 14.75 | 14.83 | 15.62 | 16.68 |
| | 12H | 14.51 | 15.25 | 15.37 | 16.10 | 17.20 | 14.03 | 14.76 | 14.89 | 15.62 | 16.71 |
| 4H | 2H | 12.15 | 13.03 | 12.98 | 13.87 | 14.92 | 11.80 | 12.68 | 12.64 | 13.52 | 14.57 |
| | 3H | 14.03 | 14.76 | 14.88 | 15.64 | 16.70 | 13.64 | 14.37 | 14.48 | 15.24 | 16.31 |
| | 4H | 14.75 | 15.42 | 15.61 | 16.29 | 17.38 | 14.35 | 15.02 | 15.21 | 15.89 | 16.98 |
| | 6H | 15.28 | 15.86 | 16.15 | 16.75 | 17.85 | 14.87 | 15.45 | 15.74 | 16.34 | 17.44 |
| | 8H | 15.43 | 15.97 | 16.31 | 16.86 | 17.97 | 15.02 | 15.56 | 15.90 | 16.45 | 17.56 |
| | 12H | 15.52 | 16.00 | 16.41 | 16.91 | 18.03 | 15.09 | 15.58 | 15.99 | 16.49 | 17.60 |
| 8H | 4H | 14.96 | 15.50 | 15.84 | 16.39 | 17.50 | 14.60 | 15.14 | 15.48 | 16.03 | 17.14 |
| | 6H | 15.60 | 16.05 | 16.51 | 16.98 | 18.09 | 15.24 | 15.69 | 16.15 | 16.62 | 17.73 |
| | 8H | 15.83 | 16.22 | 16.74 | 17.15 | 18.28 | 15.46 | 15.85 | 16.37 | 16.78 | 17.91 |
| | 12H | 15.97 | 16.32 | 16.89 | 17.23 | 18.41 | 15.58 | 15.93 | 16.50 | 16.85 | 18.03 |
| 12H | 4H | 14.96 | 15.45 | 15.86 | 16.35 | 17.47 | 14.61 | 15.09 | 15.50 | 16.00 | 17.12 |
| | 6H | 15.64 | 16.03 | 16.55 | 16.96 | 18.08 | 15.28 | 15.68 | 16.20 | 16.60 | 17.73 |
| | 8H | 15.89 | 16.24 | 16.81 | 17.15 | 18.33 | 15.53 | 15.88 | 16.45 | 16.79 | 17.97 |