

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: P916315

Luminaire Tested: DFN2DIP-HX3F0-090D060US930-FLLONL

Issue Date: 11/21/2024

Test Information

Test Method: LM-79-2019
Report Number: P916315
REPORT IS A COMBINATION OF REPORTS P900775 AND P897645
Test Lab: INNOVATION CENTER
Issue Date: 11/21/2024
Manufacturer: COOPER LIGHTING SOLUTIONS
Product Line: NEO-RAY
Catalog Number: DFN2DIP-HX3F0-090D060US930-FLONL
Description: 3 foot, Hexagon Define Geo, with Direct Frosted Lens, Indirect Open No Lens
Light Source: -
Ballast/Driver: -

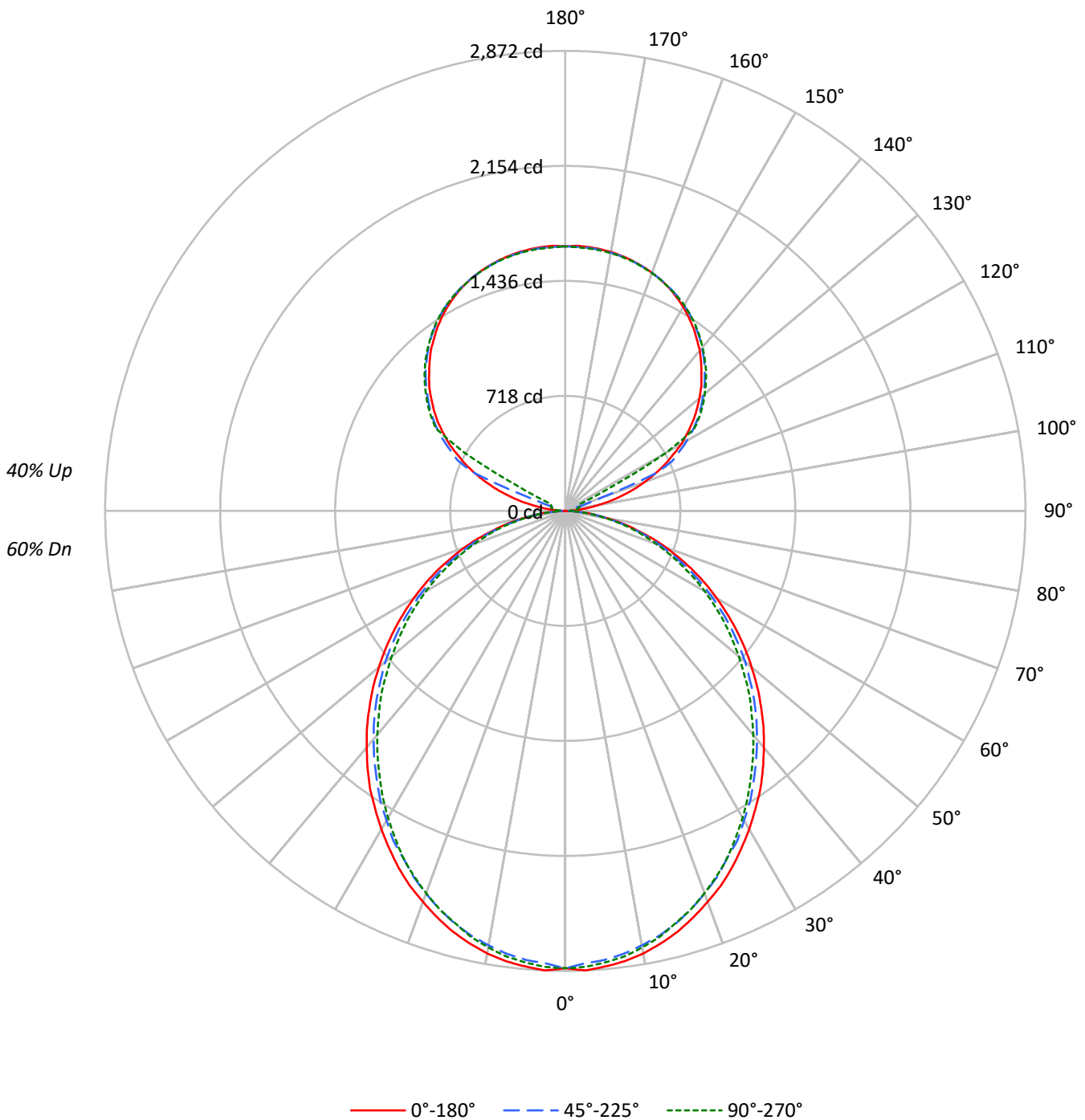
Summary

Lumens per Lamp: N/A
Luminaire Lumens: 12107.2 lumens
Efficiency: N/A
Efficacy: 87.7 lumens/watt
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29
Luminous Opening: Rectangular w/ Sides (W: 2.84' x L: 3.28' x H: 0.1')
CIE Type: Semi-Direct

Input Watts (W): 138
Input Voltage (V):
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: 0.9968
Total Harmonic Distortion (THDi): 0.064
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 | 110 | 110 | 110 | 110 | 102 | 102 | 102 | 102 | 89 | 89 | 89 | 77 | 77 | 77 | 65 | 65 | 65 | 65 | 65 | 65 | 60 |
| 1 | 100 | 96 | 92 | 88 | 93 | 90 | 86 | 83 | 78 | 75 | 73 | 67 | 66 | 64 | 58 | 56 | 55 | 55 | 55 | 55 | 51 |
| 2 | 91 | 84 | 77 | 72 | 85 | 78 | 73 | 68 | 68 | 64 | 61 | 59 | 56 | 53 | 51 | 49 | 47 | 47 | 47 | 47 | 42 |
| 3 | 83 | 73 | 66 | 60 | 77 | 69 | 62 | 57 | 60 | 55 | 51 | 52 | 48 | 45 | 45 | 42 | 40 | 40 | 40 | 40 | 36 |
| 4 | 76 | 65 | 57 | 51 | 71 | 61 | 54 | 48 | 54 | 48 | 44 | 47 | 42 | 39 | 40 | 37 | 34 | 34 | 34 | 34 | 31 |
| 5 | 70 | 58 | 50 | 44 | 65 | 55 | 47 | 42 | 48 | 42 | 38 | 42 | 37 | 34 | 36 | 33 | 30 | 30 | 30 | 30 | 27 |
| 6 | 64 | 52 | 44 | 38 | 60 | 49 | 42 | 36 | 43 | 37 | 33 | 38 | 33 | 30 | 33 | 29 | 26 | 26 | 26 | 26 | 24 |
| 7 | 60 | 47 | 39 | 33 | 56 | 44 | 37 | 32 | 39 | 33 | 29 | 35 | 30 | 26 | 30 | 26 | 23 | 23 | 23 | 23 | 21 |
| 8 | 55 | 43 | 35 | 30 | 52 | 40 | 33 | 28 | 36 | 30 | 26 | 32 | 27 | 23 | 28 | 24 | 21 | 21 | 21 | 21 | 19 |
| 9 | 52 | 39 | 32 | 26 | 48 | 37 | 30 | 25 | 33 | 27 | 23 | 29 | 24 | 21 | 26 | 22 | 19 | 19 | 19 | 19 | 17 |
| 10 | 48 | 36 | 29 | 24 | 45 | 34 | 27 | 23 | 30 | 25 | 21 | 27 | 22 | 19 | 24 | 20 | 17 | 17 | 17 | 17 | 15 |

AVERAGE LUMINANCE (cd/sqm):

| | 0° | 45° | 90° |
|-----|------|------|------|
| 0° | 3307 | 3307 | 3307 |
| 5° | 3311 | 3259 | 3281 |
| 10° | 3283 | 3213 | 3235 |
| 15° | 3233 | 3158 | 3164 |
| 20° | 3166 | 3082 | 3091 |
| 25° | 3100 | 2992 | 3007 |
| 30° | 3017 | 2907 | 2901 |
| 35° | 2938 | 2809 | 2788 |
| 40° | 2842 | 2709 | 2682 |
| 45° | 2745 | 2608 | 2572 |
| 50° | 2640 | 2503 | 2445 |
| 55° | 2529 | 2381 | 2328 |
| 60° | 2404 | 2237 | 2194 |
| 65° | 2267 | 2087 | 2036 |
| 70° | 2093 | 1904 | 1865 |
| 75° | 1853 | 1685 | 1705 |
| 80° | 1562 | 1405 | 1404 |
| 85° | 1107 | 930 | 910 |

MAXIMUM LUMINANCE 45°-90°:

Horizontal Angle: 0°
 Vertical Angle: 45°
 Luminance: 2745 cd/sqm



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ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|---------|-----------|
| 0°-10° | 268.7 | 2.2 |
| 10°-20° | 756.1 | 6.2 |
| 20°-30° | 1111.2 | 9.2 |
| 30°-40° | 1290.5 | 10.7 |
| 40°-50° | 1288.9 | 10.6 |
| 50°-60° | 1123.9 | 9.3 |
| 60°-70° | 830.8 | 6.9 |
| 70°-80° | 470.1 | 3.9 |
| 80°-90° | 127.0 | 1.0 |
| 90°-100° | 54.4 | 0.4 |
| 100°-110° | 202.9 | 1.7 |
| 110°-120° | 538.2 | 4.4 |
| 120°-130° | 892.7 | 7.4 |
| 130°-140° | 948.2 | 7.8 |
| 140°-150° | 881.3 | 7.3 |
| 150°-160° | 708.5 | 5.9 |
| 160°-170° | 456.5 | 3.8 |
| 170°-180° | 157.1 | 1.3 |
| 0°-30° | 2136.0 | 17.6 |
| 0°-40° | 3426.5 | 28.3 |
| 0°-60° | 5839.4 | 48.2 |
| 0°-90° | 7267.2 | 60.0 |
| 90°-120° | 795.6 | 6.6 |
| 90°-150° | 3517.8 | 29.1 |
| 90°-180° | 4840.0 | 40.0 |
| 0°-180° | 12107.2 | 100.0 |

CANDELA DISTRIBUTION:

| | 0° | 22.5° | 45° | 67.5° | 90° | Flux |
|------|------|-------|------|-------|------|------|
| 0° | 2855 | 2855 | 2855 | 2855 | 2855 | |
| 5° | 2855 | 2844 | 2814 | 2836 | 2831 | 271 |
| 15° | 2718 | 2702 | 2666 | 2677 | 2663 | 765 |
| 25° | 2460 | 2438 | 2391 | 2397 | 2391 | 1132 |
| 35° | 2122 | 2095 | 2051 | 2034 | 2021 | 1325 |
| 45° | 1727 | 1708 | 1666 | 1636 | 1625 | 1333 |
| 55° | 1307 | 1290 | 1257 | 1225 | 1211 | 1169 |
| 65° | 881 | 865 | 837 | 813 | 799 | 871 |
| 75° | 461 | 456 | 442 | 426 | 431 | 492 |
| 85° | 112 | 110 | 107 | 99 | 96 | 125 |
| 90° | 1 | 14 | 24 | 30 | 32 | 11 |
| 95° | 78 | 38 | 47 | 53 | 51 | 92 |
| 105° | 363 | 399 | 73 | 86 | 91 | 388 |
| 115° | 687 | 707 | 737 | 184 | 98 | 676 |
| 125° | 971 | 987 | 1009 | 1018 | 1021 | 866 |
| 135° | 1202 | 1221 | 1232 | 1244 | 1241 | 928 |
| 145° | 1394 | 1393 | 1413 | 1422 | 1416 | 872 |
| 155° | 1535 | 1524 | 1539 | 1546 | 1536 | 707 |
| 165° | 1618 | 1610 | 1614 | 1622 | 1614 | 457 |
| 175° | 1654 | 1646 | 1648 | 1657 | 1645 | 157 |
| 180° | 1651 | 1651 | 1651 | 1651 | 1651 | |



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CANDELA DISTRIBUTION (FULL):

| | 0° | 22.5° | 45° | 67.5° | 90° |
|--------|--------|--------|--------|--------|--------|
| 0° | 2855.1 | 2855.1 | 2855.1 | 2855.1 | 2855.1 |
| 2.5° | 2871.7 | 2858.0 | 2827.8 | 2855.1 | 2849.9 |
| 5° | 2855.1 | 2844.3 | 2814.1 | 2835.9 | 2830.6 |
| 7.5° | 2835.9 | 2819.6 | 2789.3 | 2811.5 | 2805.9 |
| 10° | 2805.9 | 2786.7 | 2753.8 | 2775.6 | 2767.4 |
| 12.5° | 2764.5 | 2748.2 | 2715.4 | 2729.0 | 2723.5 |
| 15° | 2718.0 | 2701.7 | 2665.8 | 2676.9 | 2663.2 |
| 17.5° | 2660.2 | 2643.9 | 2608.1 | 2621.8 | 2608.1 |
| 20° | 2597.1 | 2580.7 | 2542.3 | 2550.4 | 2539.7 |
| 22.5° | 2534.1 | 2509.4 | 2473.5 | 2473.5 | 2468.0 |
| 25° | 2459.8 | 2438.0 | 2391.4 | 2396.7 | 2391.4 |
| 27.5° | 2377.4 | 2358.2 | 2322.7 | 2314.6 | 2300.9 |
| 30° | 2295.3 | 2273.1 | 2232.0 | 2223.9 | 2212.9 |
| 32.5° | 2207.3 | 2191.0 | 2147.0 | 2130.5 | 2119.4 |
| 35° | 2122.3 | 2094.9 | 2050.9 | 2034.3 | 2020.6 |
| 37.5° | 2026.2 | 2001.4 | 1957.4 | 1938.2 | 1924.5 |
| 40° | 1927.4 | 1905.3 | 1861.2 | 1836.8 | 1825.8 |
| 42.5° | 1831.2 | 1809.1 | 1765.4 | 1737.8 | 1721.5 |
| 45° | 1727.0 | 1707.8 | 1666.4 | 1636.4 | 1625.4 |
| 47.5° | 1625.4 | 1606.1 | 1562.1 | 1531.9 | 1515.6 |
| 50° | 1518.2 | 1504.5 | 1466.0 | 1427.6 | 1413.9 |
| 52.5° | 1413.9 | 1394.6 | 1359.1 | 1328.9 | 1309.6 |
| 55° | 1307.0 | 1290.4 | 1257.4 | 1224.6 | 1210.9 |
| 57.5° | 1199.8 | 1186.1 | 1150.3 | 1117.4 | 1106.3 |
| 60° | 1092.6 | 1081.8 | 1043.3 | 1013.1 | 1004.9 |
| 62.5° | 988.3 | 969.1 | 941.7 | 914.4 | 903.3 |
| 65° | 881.4 | 864.8 | 837.4 | 812.7 | 799.0 |
| 67.5° | 771.6 | 757.7 | 733.1 | 714.0 | 702.9 |
| 70° | 669.9 | 658.8 | 634.1 | 614.9 | 604.1 |
| 72.5° | 565.7 | 554.6 | 540.9 | 521.7 | 513.6 |
| 75° | 461.1 | 455.8 | 441.9 | 425.6 | 431.1 |
| 77.5° | 367.9 | 356.9 | 351.3 | 343.2 | 335.0 |
| 80° | 274.7 | 271.7 | 266.2 | 258.0 | 252.6 |
| 82.5° | 186.7 | 186.7 | 184.1 | 173.0 | 173.0 |
| 85° | 112.4 | 109.8 | 107.2 | 98.7 | 96.1 |
| 87.5° | 49.5 | 43.9 | 38.5 | 30.3 | 27.4 |
| 90° | 1.1 | 14.3 | 23.8 | 29.9 | 32.2 |
| 92.5° | 29.9 | 25.1 | 28.6 | 31.1 | 32.2 |
| 95° | 77.6 | 38.2 | 46.6 | 52.7 | 51.4 |
| 97.5° | 139.7 | 41.8 | 60.8 | 64.6 | 65.7 |
| 100° | 211.5 | 47.8 | 68.1 | 77.6 | 80.0 |
| 102.5° | 290.2 | 288.0 | 70.5 | 83.6 | 87.2 |
| 105° | 363.1 | 399.0 | 72.9 | 85.9 | 90.8 |
| 107.5° | 448.0 | 477.8 | 75.3 | 88.4 | 93.2 |
| 110° | 529.3 | 554.2 | 209.1 | 89.7 | 94.3 |



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CATALOG NUMBER: DFN2DIP-HX3F0-090D060US930-FLLONL

CANDELA DISTRIBUTION (continued):

| | 0° | 22.5° | 45° | 67.5° | 90° |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 605.7 | 627.1 | 606.8 | 91.9 | 95.6 |
| 115° | 686.9 | 707.2 | 737.1 | 184.0 | 98.0 |
| 117.5° | 757.3 | 781.2 | 801.6 | 630.7 | 317.7 |
| 120° | 836.3 | 854.1 | 875.7 | 890.0 | 728.7 |
| 122.5° | 903.0 | 922.2 | 946.2 | 953.2 | 954.6 |
| 125° | 971.2 | 986.8 | 1009.4 | 1017.8 | 1021.3 |
| 127.5° | 1033.3 | 1050.0 | 1068.0 | 1079.9 | 1081.1 |
| 130° | 1091.8 | 1111.0 | 1124.1 | 1137.3 | 1136.1 |
| 132.5° | 1151.6 | 1167.2 | 1180.2 | 1191.0 | 1189.8 |
| 135° | 1201.8 | 1221.0 | 1231.6 | 1243.7 | 1241.2 |
| 137.5° | 1254.3 | 1268.6 | 1280.7 | 1292.6 | 1289.1 |
| 140° | 1305.6 | 1315.3 | 1328.4 | 1339.1 | 1333.2 |
| 142.5° | 1348.7 | 1357.1 | 1372.6 | 1382.1 | 1376.1 |
| 145° | 1394.2 | 1392.9 | 1413.2 | 1421.6 | 1415.6 |
| 147.5° | 1433.5 | 1429.9 | 1450.2 | 1456.1 | 1451.5 |
| 150° | 1471.8 | 1463.4 | 1482.5 | 1489.6 | 1483.7 |
| 152.5° | 1504.0 | 1494.4 | 1512.3 | 1519.6 | 1511.2 |
| 155° | 1535.0 | 1524.4 | 1538.7 | 1545.8 | 1536.3 |
| 157.5° | 1560.2 | 1550.6 | 1561.4 | 1569.8 | 1560.2 |
| 160° | 1581.7 | 1574.4 | 1581.7 | 1588.8 | 1580.5 |
| 162.5° | 1600.7 | 1593.6 | 1599.5 | 1607.9 | 1597.2 |
| 165° | 1617.5 | 1610.4 | 1613.9 | 1622.3 | 1613.9 |
| 167.5° | 1630.6 | 1623.4 | 1627.1 | 1635.5 | 1624.6 |
| 170° | 1641.4 | 1634.2 | 1636.6 | 1644.9 | 1634.2 |
| 172.5° | 1648.5 | 1641.4 | 1643.8 | 1652.2 | 1641.4 |
| 175° | 1654.5 | 1646.1 | 1648.5 | 1656.8 | 1644.9 |
| 177.5° | 1656.8 | 1648.5 | 1649.8 | 1658.2 | 1647.4 |
| 180° | 1650.9 | 1650.9 | 1650.9 | 1650.9 | 1650.9 |



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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 | 12.26 | 13.22 | 13.13 | 14.11 | 15.23 | 11.83 | 12.79 | 12.70 | 13.68 | 14.80 |
| | 3H | 13.92 | 14.78 | 14.80 | 15.68 | 16.83 | 13.45 | 14.31 | 14.33 | 15.21 | 16.36 |
| | 4H | 14.51 | 15.32 | 15.40 | 16.22 | 17.38 | 14.04 | 14.85 | 14.93 | 15.76 | 16.91 |
| | 6H | 14.91 | 15.66 | 15.81 | 16.57 | 17.74 | 14.44 | 15.19 | 15.34 | 16.10 | 17.27 |
| | 8H | 15.01 | 15.73 | 15.92 | 16.65 | 17.82 | 14.54 | 15.26 | 15.46 | 16.18 | 17.35 |
| | 12H | 15.06 | 15.74 | 15.98 | 16.66 | 17.86 | 14.59 | 15.27 | 15.50 | 16.19 | 17.38 |
| 4H | 2H | 12.73 | 13.55 | 13.63 | 14.45 | 15.60 | 12.39 | 13.20 | 13.29 | 14.11 | 15.26 |
| | 3H | 14.60 | 15.28 | 15.51 | 16.21 | 17.38 | 14.21 | 14.89 | 15.12 | 15.82 | 16.99 |
| | 4H | 15.31 | 15.93 | 16.23 | 16.86 | 18.06 | 14.91 | 15.53 | 15.83 | 16.46 | 17.65 |
| | 6H | 15.82 | 16.36 | 16.76 | 17.31 | 18.51 | 15.42 | 15.95 | 16.35 | 16.91 | 18.10 |
| | 8H | 15.97 | 16.47 | 16.91 | 17.42 | 18.63 | 15.56 | 16.06 | 16.50 | 17.01 | 18.22 |
| | 12H | 16.05 | 16.50 | 17.00 | 17.46 | 18.68 | 15.63 | 16.08 | 16.59 | 17.05 | 18.26 |
| 8H | 4H | 15.51 | 16.01 | 16.45 | 16.96 | 18.17 | 15.15 | 15.65 | 16.09 | 16.60 | 17.81 |
| | 6H | 16.14 | 16.55 | 17.10 | 17.54 | 18.75 | 15.78 | 16.19 | 16.74 | 17.18 | 18.39 |
| | 8H | 16.35 | 16.72 | 17.33 | 17.70 | 18.93 | 15.99 | 16.36 | 16.96 | 17.33 | 18.56 |
| | 12H | 16.48 | 16.81 | 17.46 | 17.78 | 19.06 | 16.11 | 16.43 | 17.08 | 17.40 | 18.68 |
| 12H | 4H | 15.50 | 15.95 | 16.46 | 16.92 | 18.13 | 15.15 | 15.60 | 16.11 | 16.57 | 17.78 |
| | 6H | 16.17 | 16.53 | 17.14 | 17.51 | 18.74 | 15.82 | 16.18 | 16.79 | 17.16 | 18.39 |
| | 8H | 16.41 | 16.73 | 17.38 | 17.70 | 18.98 | 16.05 | 16.38 | 17.03 | 17.35 | 18.62 |