

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: P918751

Luminaire Tested: DFN2DIP-4P4F0-070D060US935-FLONL

Issue Date: 11/21/2024

Test Information

Test Method: LM-79-2019
Report Number: P918751
REPORT IS A COMBINATION OF REPORTS P900643 AND P897523
Test Lab: INNOVATION CENTER
Issue Date: 11/21/2024
Manufacturer: COOPER LIGHTING SOLUTIONS
Product Line: NEO-RAY
Catalog Number: DFN2DIP-4P4F0-070D060US935-FLLONL
Description: 4 foot, 90deg - 4way Define Geo, with Direct Frosted Lens, Indirect Open No Lens
Light Source: -
Ballast/Driver: -

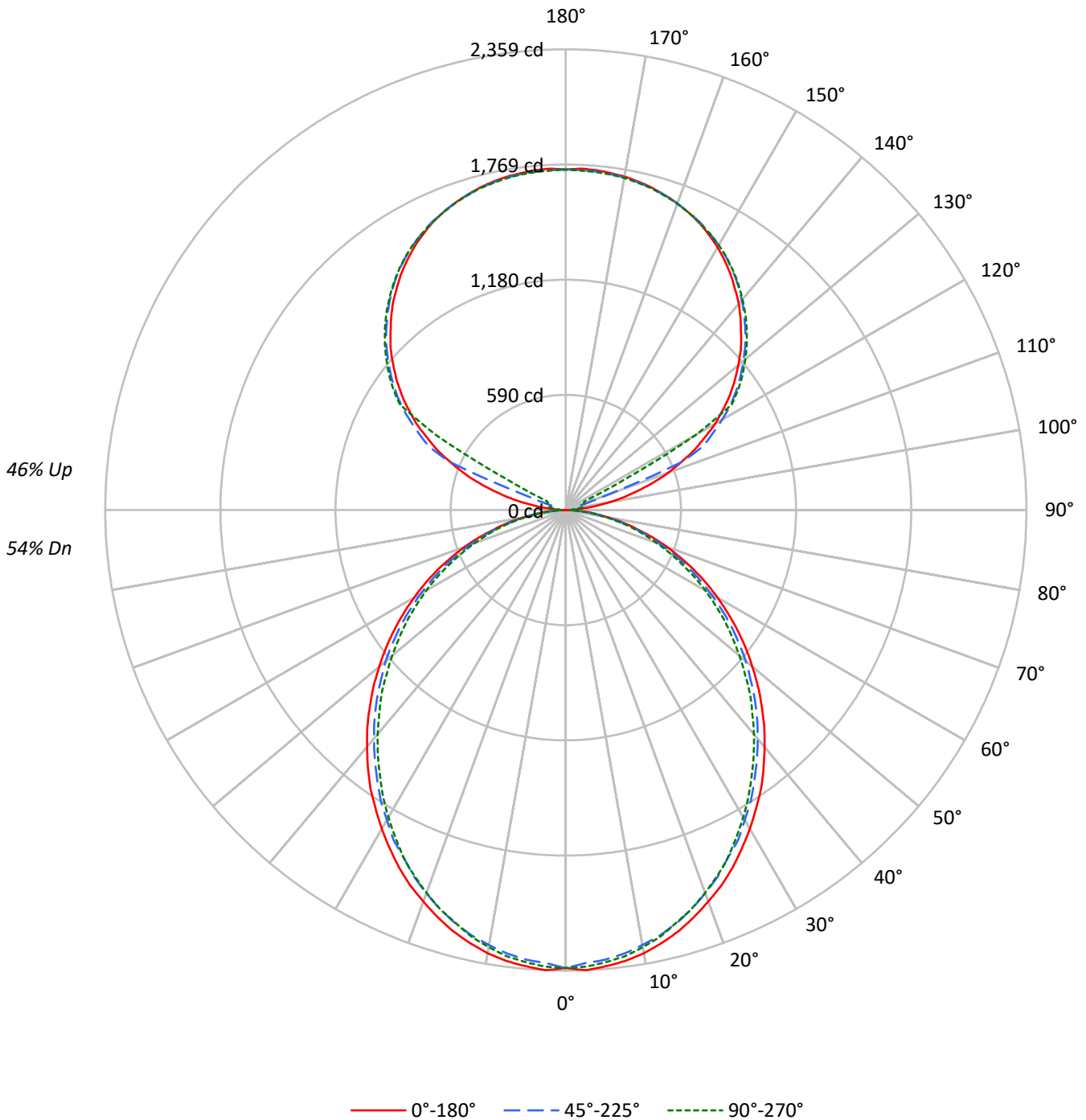
Summary

Lumens per Lamp: N/A
Luminaire Lumens: 11081.1 lumens
Efficiency: N/A
Efficacy: 88.9 lumens/watt
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29
Luminous Opening: Rectangular w/ Sides (W: 4.07' x L: 4.07' x H: 0.1')
CIE Type: General Diffuse

Input Watts (W): 124.6
Input Voltage (V):
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: 0.9789
Total Harmonic Distortion (THDi): 0.074
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 24 FT

TEST NUMBER: P918751
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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 | 108 | 108 | 108 | 108 | 100 | 100 | 100 | 100 | 85 | 85 | 85 | 72 | 72 | 72 | 60 | 60 | 60 | 60 | 60 | 60 | 54 |
| 1 | 99 | 94 | 90 | 87 | 91 | 88 | 84 | 81 | 75 | 73 | 70 | 63 | 62 | 60 | 53 | 52 | 50 | 50 | 50 | 50 | 45 |
| 2 | 90 | 82 | 76 | 71 | 83 | 77 | 71 | 67 | 66 | 62 | 58 | 56 | 53 | 50 | 46 | 44 | 42 | 42 | 42 | 42 | 38 |
| 3 | 82 | 72 | 65 | 59 | 76 | 67 | 61 | 56 | 58 | 53 | 49 | 49 | 46 | 42 | 41 | 38 | 36 | 36 | 36 | 36 | 32 |
| 4 | 75 | 64 | 56 | 50 | 69 | 60 | 53 | 47 | 52 | 46 | 42 | 44 | 40 | 36 | 37 | 34 | 31 | 31 | 31 | 31 | 28 |
| 5 | 69 | 57 | 49 | 43 | 64 | 53 | 46 | 41 | 46 | 40 | 36 | 39 | 35 | 32 | 33 | 30 | 27 | 27 | 27 | 27 | 24 |
| 6 | 63 | 51 | 43 | 37 | 59 | 48 | 41 | 35 | 42 | 36 | 31 | 36 | 31 | 28 | 30 | 27 | 24 | 24 | 24 | 24 | 21 |
| 7 | 59 | 46 | 38 | 33 | 54 | 43 | 36 | 31 | 38 | 32 | 28 | 32 | 28 | 24 | 27 | 24 | 21 | 21 | 21 | 21 | 19 |
| 8 | 54 | 42 | 34 | 29 | 50 | 39 | 32 | 28 | 34 | 29 | 25 | 30 | 25 | 22 | 25 | 22 | 19 | 19 | 19 | 19 | 17 |
| 9 | 51 | 38 | 31 | 26 | 47 | 36 | 29 | 25 | 32 | 26 | 22 | 27 | 23 | 20 | 23 | 20 | 17 | 17 | 17 | 17 | 15 |
| 10 | 47 | 35 | 28 | 23 | 44 | 33 | 27 | 22 | 29 | 24 | 20 | 25 | 21 | 18 | 22 | 18 | 16 | 16 | 16 | 16 | 14 |

AVERAGE LUMINANCE (cd/sqm):

| | 0° | 45° | 90° |
|-----|------|------|------|
| 0° | 1521 | 1521 | 1521 |
| 5° | 1524 | 1501 | 1511 |
| 10° | 1512 | 1481 | 1491 |
| 15° | 1490 | 1457 | 1460 |
| 20° | 1460 | 1424 | 1427 |
| 25° | 1430 | 1384 | 1390 |
| 30° | 1393 | 1346 | 1343 |
| 35° | 1357 | 1302 | 1292 |
| 40° | 1314 | 1258 | 1244 |
| 45° | 1270 | 1214 | 1195 |
| 50° | 1223 | 1167 | 1139 |
| 55° | 1173 | 1113 | 1087 |
| 60° | 1117 | 1049 | 1027 |
| 65° | 1056 | 983 | 957 |
| 70° | 978 | 902 | 882 |
| 75° | 870 | 805 | 813 |
| 80° | 740 | 683 | 680 |
| 85° | 537 | 469 | 459 |

MAXIMUM LUMINANCE 45°-90°:

Horizontal Angle: 0°
 Vertical Angle: 45°
 Luminance: 1270 cd/sqm



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ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|---------|-----------|
| 0°-10° | 220.7 | 2.0 |
| 10°-20° | 621.0 | 5.6 |
| 20°-30° | 912.7 | 8.2 |
| 30°-40° | 1060.0 | 9.6 |
| 40°-50° | 1058.7 | 9.6 |
| 50°-60° | 923.2 | 8.3 |
| 60°-70° | 682.4 | 6.2 |
| 70°-80° | 386.1 | 3.5 |
| 80°-90° | 105.0 | 0.9 |
| 90°-100° | 57.5 | 0.5 |
| 100°-110° | 214.3 | 1.9 |
| 110°-120° | 568.4 | 5.1 |
| 120°-130° | 942.7 | 8.5 |
| 130°-140° | 1001.4 | 9.0 |
| 140°-150° | 930.7 | 8.4 |
| 150°-160° | 748.2 | 6.8 |
| 160°-170° | 482.1 | 4.4 |
| 170°-180° | 165.9 | 1.5 |
| 0°-30° | 1754.4 | 15.8 |
| 0°-40° | 2814.4 | 25.4 |
| 0°-60° | 4796.3 | 43.3 |
| 0°-90° | 5969.8 | 53.9 |
| 90°-120° | 840.2 | 7.6 |
| 90°-150° | 3714.9 | 33.5 |
| 90°-180° | 5111.0 | 46.1 |
| 0°-180° | 11081.1 | 100.0 |

CANDELA DISTRIBUTION:

| | 0° | 22.5° | 45° | 67.5° | 90° | Flux |
|------|------|-------|------|-------|------|------|
| 0° | 2345 | 2345 | 2345 | 2345 | 2345 | |
| 5° | 2345 | 2336 | 2311 | 2329 | 2325 | 223 |
| 15° | 2232 | 2219 | 2190 | 2199 | 2188 | 629 |
| 25° | 2020 | 2002 | 1964 | 1969 | 1964 | 930 |
| 35° | 1743 | 1721 | 1684 | 1671 | 1660 | 1089 |
| 45° | 1418 | 1403 | 1369 | 1344 | 1335 | 1095 |
| 55° | 1074 | 1060 | 1033 | 1006 | 994 | 960 |
| 65° | 724 | 710 | 688 | 668 | 656 | 716 |
| 75° | 379 | 374 | 363 | 350 | 354 | 404 |
| 85° | 92 | 90 | 88 | 81 | 79 | 103 |
| 90° | 1 | 15 | 25 | 32 | 34 | 10 |
| 95° | 82 | 40 | 49 | 56 | 54 | 97 |
| 105° | 384 | 421 | 77 | 91 | 96 | 410 |
| 115° | 725 | 747 | 778 | 194 | 104 | 714 |
| 125° | 1026 | 1042 | 1066 | 1075 | 1079 | 915 |
| 135° | 1269 | 1289 | 1301 | 1313 | 1311 | 980 |
| 145° | 1472 | 1471 | 1492 | 1501 | 1495 | 921 |
| 155° | 1621 | 1610 | 1625 | 1632 | 1622 | 747 |
| 165° | 1708 | 1701 | 1704 | 1713 | 1704 | 483 |
| 175° | 1747 | 1738 | 1741 | 1750 | 1737 | 166 |
| 180° | 1743 | 1743 | 1743 | 1743 | 1743 | |



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CANDELA DISTRIBUTION (FULL):

| | 0° | 22.5° | 45° | 67.5° | 90° |
|--------|--------|--------|--------|--------|--------|
| 0° | 2345.1 | 2345.1 | 2345.1 | 2345.1 | 2345.1 |
| 2.5° | 2358.8 | 2347.5 | 2322.6 | 2345.1 | 2340.8 |
| 5° | 2345.1 | 2336.3 | 2311.4 | 2329.3 | 2325.0 |
| 7.5° | 2329.3 | 2315.9 | 2291.0 | 2309.3 | 2304.7 |
| 10° | 2304.7 | 2288.9 | 2261.8 | 2279.8 | 2273.1 |
| 12.5° | 2270.7 | 2257.4 | 2230.3 | 2241.5 | 2237.0 |
| 15° | 2232.5 | 2219.0 | 2189.6 | 2198.7 | 2187.5 |
| 17.5° | 2185.0 | 2171.7 | 2142.2 | 2153.5 | 2142.2 |
| 20° | 2133.1 | 2119.8 | 2088.2 | 2094.9 | 2086.0 |
| 22.5° | 2081.5 | 2061.1 | 2031.7 | 2031.7 | 2027.1 |
| 25° | 2020.5 | 2002.5 | 1964.3 | 1968.6 | 1964.3 |
| 27.5° | 1952.7 | 1937.0 | 1907.8 | 1901.1 | 1889.8 |
| 30° | 1885.3 | 1867.1 | 1833.4 | 1826.7 | 1817.6 |
| 32.5° | 1813.0 | 1799.7 | 1763.5 | 1749.9 | 1740.8 |
| 35° | 1743.2 | 1720.7 | 1684.5 | 1670.9 | 1659.7 |
| 37.5° | 1664.2 | 1643.9 | 1607.7 | 1592.0 | 1580.7 |
| 40° | 1583.1 | 1564.9 | 1528.8 | 1508.7 | 1499.6 |
| 42.5° | 1504.2 | 1486.0 | 1450.1 | 1427.4 | 1413.9 |
| 45° | 1418.5 | 1402.7 | 1368.7 | 1344.1 | 1335.0 |
| 47.5° | 1335.0 | 1319.2 | 1283.1 | 1258.2 | 1244.8 |
| 50° | 1247.0 | 1235.7 | 1204.1 | 1172.6 | 1161.3 |
| 52.5° | 1161.3 | 1145.6 | 1116.4 | 1091.5 | 1075.6 |
| 55° | 1073.5 | 1059.9 | 1032.9 | 1005.8 | 994.5 |
| 57.5° | 985.5 | 974.2 | 944.8 | 917.7 | 908.7 |
| 60° | 897.4 | 888.5 | 857.0 | 832.2 | 825.4 |
| 62.5° | 811.7 | 796.0 | 773.5 | 751.0 | 741.9 |
| 65° | 724.0 | 710.3 | 687.9 | 667.5 | 656.3 |
| 67.5° | 633.8 | 622.3 | 602.2 | 586.4 | 577.3 |
| 70° | 550.3 | 541.2 | 520.8 | 505.1 | 496.2 |
| 72.5° | 464.6 | 455.6 | 444.3 | 428.5 | 421.8 |
| 75° | 378.8 | 374.4 | 362.9 | 349.6 | 354.1 |
| 77.5° | 302.2 | 293.1 | 288.5 | 281.8 | 275.2 |
| 80° | 225.6 | 223.3 | 218.7 | 212.0 | 207.4 |
| 82.5° | 153.3 | 153.3 | 151.2 | 142.2 | 142.2 |
| 85° | 92.4 | 90.2 | 88.1 | 81.1 | 79.0 |
| 87.5° | 40.6 | 36.2 | 31.6 | 24.9 | 22.5 |
| 90° | 1.2 | 15.2 | 25.1 | 31.6 | 34.0 |
| 92.5° | 31.6 | 26.5 | 30.2 | 32.8 | 34.0 |
| 95° | 82.0 | 40.3 | 49.2 | 55.6 | 54.2 |
| 97.5° | 147.6 | 44.2 | 64.2 | 68.2 | 69.4 |
| 100° | 223.3 | 50.5 | 71.9 | 82.0 | 84.5 |
| 102.5° | 306.5 | 304.1 | 74.5 | 88.3 | 92.1 |
| 105° | 383.5 | 421.4 | 77.0 | 90.7 | 95.9 |
| 107.5° | 473.1 | 504.5 | 79.6 | 93.3 | 98.4 |
| 110° | 559.0 | 585.3 | 220.8 | 94.7 | 99.6 |



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CANDELA DISTRIBUTION (continued):

| | 0° | 22.5° | 45° | 67.5° | 90° |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 639.6 | 662.3 | 640.8 | 97.0 | 101.0 |
| 115° | 725.4 | 746.8 | 778.4 | 194.3 | 103.5 |
| 117.5° | 799.8 | 825.0 | 846.5 | 666.1 | 335.5 |
| 120° | 883.1 | 902.0 | 924.8 | 939.9 | 769.6 |
| 122.5° | 953.6 | 973.9 | 999.2 | 1006.7 | 1008.1 |
| 125° | 1025.6 | 1042.1 | 1066.0 | 1074.9 | 1078.6 |
| 127.5° | 1091.2 | 1108.9 | 1127.9 | 1140.5 | 1141.7 |
| 130° | 1153.0 | 1173.3 | 1187.1 | 1201.0 | 1199.8 |
| 132.5° | 1216.2 | 1232.6 | 1246.4 | 1257.7 | 1256.5 |
| 135° | 1269.2 | 1289.4 | 1300.6 | 1313.4 | 1310.8 |
| 137.5° | 1324.6 | 1339.7 | 1352.5 | 1365.0 | 1361.3 |
| 140° | 1378.8 | 1389.0 | 1402.8 | 1414.2 | 1407.9 |
| 142.5° | 1424.3 | 1433.2 | 1449.6 | 1459.6 | 1453.3 |
| 145° | 1472.3 | 1470.9 | 1492.4 | 1501.2 | 1495.0 |
| 147.5° | 1513.8 | 1510.0 | 1531.5 | 1537.7 | 1532.8 |
| 150° | 1554.3 | 1545.4 | 1565.6 | 1573.1 | 1566.8 |
| 152.5° | 1588.3 | 1578.2 | 1597.1 | 1604.7 | 1595.9 |
| 155° | 1621.1 | 1609.8 | 1625.0 | 1632.5 | 1622.4 |
| 157.5° | 1647.6 | 1637.5 | 1648.9 | 1657.8 | 1647.6 |
| 160° | 1670.3 | 1662.7 | 1670.3 | 1677.8 | 1669.0 |
| 162.5° | 1690.4 | 1682.9 | 1689.2 | 1698.1 | 1686.7 |
| 165° | 1708.1 | 1700.6 | 1704.3 | 1713.2 | 1704.3 |
| 167.5° | 1722.0 | 1714.4 | 1718.3 | 1727.2 | 1715.7 |
| 170° | 1733.4 | 1725.8 | 1728.4 | 1737.1 | 1725.8 |
| 172.5° | 1740.9 | 1733.4 | 1735.9 | 1744.8 | 1733.4 |
| 175° | 1747.2 | 1738.4 | 1740.9 | 1749.7 | 1737.1 |
| 177.5° | 1749.7 | 1740.9 | 1742.2 | 1751.1 | 1739.7 |
| 180° | 1743.4 | 1743.4 | 1743.4 | 1743.4 | 1743.4 |



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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 | 9.10 | 10.00 | 10.02 | 10.94 | 12.15 | 8.66 | 9.55 | 9.58 | 10.49 | 11.71 |
| | 3H | 10.77 | 11.57 | 11.70 | 12.52 | 13.76 | 10.28 | 11.08 | 11.21 | 12.03 | 13.27 |
| | 4H | 11.36 | 12.12 | 12.31 | 13.08 | 14.33 | 10.87 | 11.63 | 11.82 | 12.58 | 13.83 |
| | 6H | 11.77 | 12.47 | 12.73 | 13.43 | 14.69 | 11.27 | 11.97 | 12.23 | 12.93 | 14.19 |
| | 8H | 11.88 | 12.54 | 12.84 | 13.52 | 14.78 | 11.37 | 12.04 | 12.34 | 13.02 | 14.28 |
| | 12H | 11.93 | 12.56 | 12.90 | 13.54 | 14.82 | 11.42 | 12.05 | 12.39 | 13.03 | 14.31 |
| 4H | 2H | 9.57 | 10.33 | 10.52 | 11.28 | 12.53 | 9.21 | 9.97 | 10.17 | 10.93 | 12.18 |
| | 3H | 11.44 | 12.08 | 12.41 | 13.06 | 14.32 | 11.03 | 11.67 | 12.00 | 12.65 | 13.92 |
| | 4H | 12.16 | 12.74 | 13.14 | 13.72 | 15.01 | 11.74 | 12.32 | 12.71 | 13.30 | 14.58 |
| | 6H | 12.68 | 13.19 | 13.67 | 14.19 | 15.47 | 12.25 | 12.75 | 13.24 | 13.76 | 15.04 |
| | 8H | 12.84 | 13.31 | 13.83 | 14.30 | 15.60 | 12.40 | 12.87 | 13.39 | 13.86 | 15.16 |
| | 12H | 12.92 | 13.34 | 13.92 | 14.35 | 15.65 | 12.47 | 12.89 | 13.47 | 13.90 | 15.21 |
| 8H | 4H | 12.36 | 12.83 | 13.35 | 13.83 | 15.13 | 11.99 | 12.45 | 12.97 | 13.45 | 14.75 |
| | 6H | 13.00 | 13.39 | 14.02 | 14.43 | 15.72 | 12.62 | 13.01 | 13.63 | 14.04 | 15.34 |
| | 8H | 13.23 | 13.57 | 14.25 | 14.59 | 15.91 | 12.83 | 13.18 | 13.86 | 14.20 | 15.52 |
| | 12H | 13.36 | 13.66 | 14.39 | 14.68 | 16.04 | 12.95 | 13.25 | 13.98 | 14.27 | 15.63 |
| 12H | 4H | 12.35 | 12.77 | 13.36 | 13.78 | 15.09 | 11.98 | 12.40 | 12.99 | 13.42 | 14.72 |
| | 6H | 13.03 | 13.37 | 14.05 | 14.40 | 15.71 | 12.66 | 13.00 | 13.68 | 14.03 | 15.34 |
| | 8H | 13.28 | 13.58 | 14.31 | 14.60 | 15.96 | 12.90 | 13.20 | 13.93 | 14.22 | 15.58 |