

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: P916880

Luminaire Tested: DFN2DIP-PN4F0-060D100US930-FLLFLL

Issue Date: 11/21/2024

Test Information

Test Method: LM-79-2019
Report Number: P916880
REPORT IS A COMBINATION OF REPORTS P899721 AND P896497
Test Lab: INNOVATION CENTER
Issue Date: 11/21/2024
Manufacturer: COOPER LIGHTING SOLUTIONS
Product Line: NEO-RAY
Catalog Number: DFN2DIP-PN4F0-060D100US930-FLLFLL
Description: 4 foot, Pentagon Define Geo, with Direct Frosted Lens, Indirect Frosted Lens
Light Source: -
Ballast/Driver: -

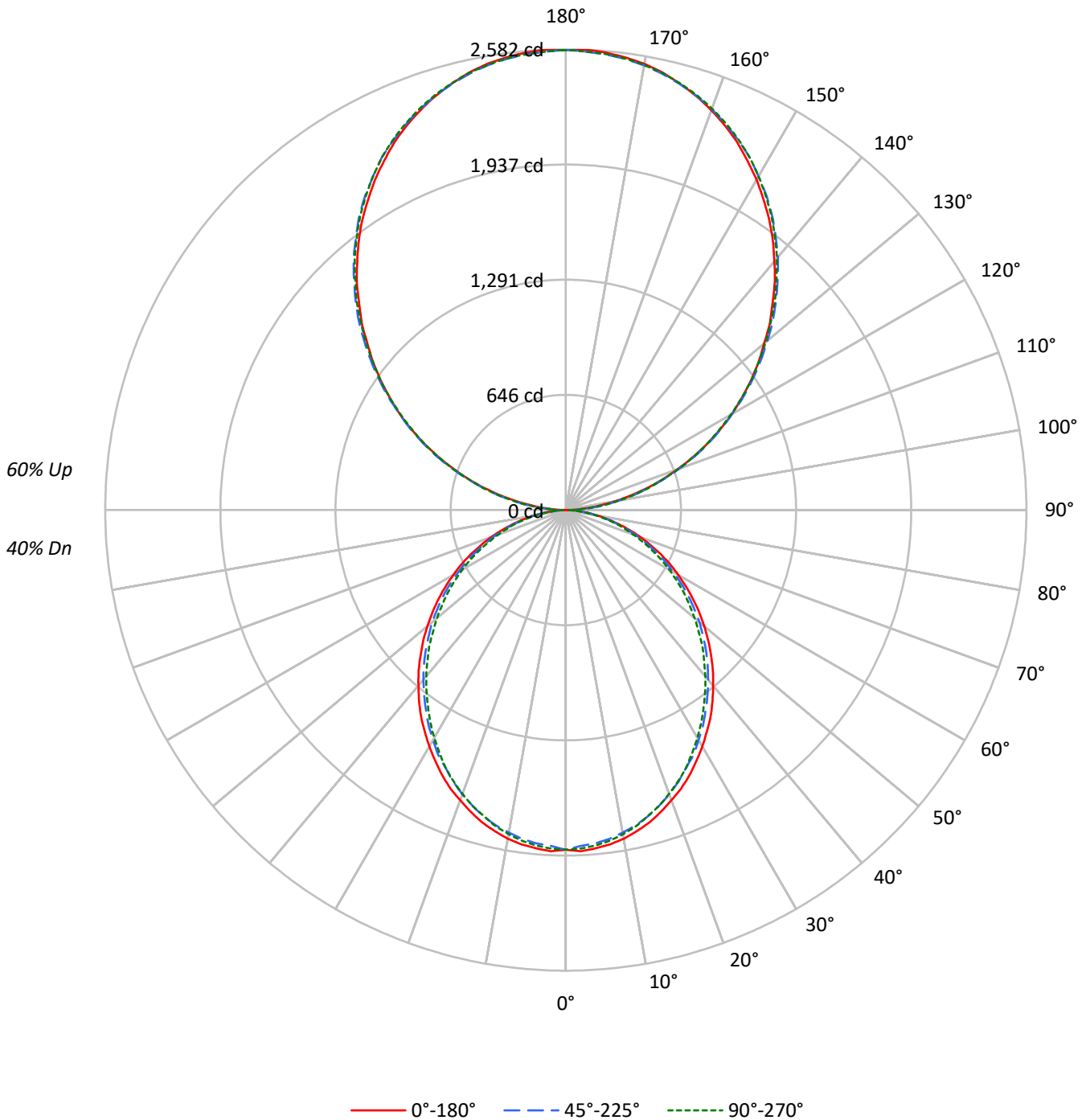
Summary

Lumens per Lamp: N/A
Luminaire Lumens: 12058.3 lumens
Efficiency: N/A
Efficacy: 93.1 lumens/watt
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29
Luminous Opening: Rectangular w/ Sides (W: 3.74' x L: 3.94' x H: 0.1')
CIE Type: General Diffuse

Input Watts (W): 129.5
Input Voltage (V):
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: 0.9933
Total Harmonic Distortion (THDi): 0.066
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: P916880
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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 | 105 | 105 | 105 | 105 | 95 | 95 | 95 | 95 | 78 | 78 | 78 | 62 | 62 | 62 | 47 | 47 | 47 | 47 | 47 | 47 | 40 |
| 1 | 96 | 91 | 87 | 84 | 87 | 83 | 80 | 77 | 68 | 66 | 64 | 54 | 53 | 51 | 42 | 41 | 40 | 40 | 40 | 40 | 34 |
| 2 | 87 | 80 | 74 | 69 | 79 | 73 | 68 | 63 | 60 | 56 | 53 | 48 | 45 | 43 | 37 | 35 | 33 | 33 | 33 | 33 | 28 |
| 3 | 79 | 70 | 63 | 57 | 72 | 64 | 58 | 53 | 53 | 48 | 44 | 42 | 39 | 36 | 32 | 30 | 28 | 28 | 28 | 28 | 24 |
| 4 | 73 | 62 | 54 | 48 | 66 | 57 | 50 | 45 | 47 | 42 | 38 | 38 | 34 | 31 | 29 | 27 | 25 | 25 | 25 | 25 | 21 |
| 5 | 67 | 55 | 47 | 41 | 60 | 51 | 44 | 38 | 42 | 37 | 33 | 34 | 30 | 27 | 26 | 23 | 21 | 21 | 21 | 21 | 18 |
| 6 | 61 | 49 | 41 | 36 | 56 | 45 | 38 | 33 | 38 | 32 | 28 | 30 | 27 | 24 | 24 | 21 | 19 | 19 | 19 | 19 | 16 |
| 7 | 57 | 45 | 37 | 31 | 51 | 41 | 34 | 29 | 34 | 29 | 25 | 28 | 24 | 21 | 22 | 19 | 17 | 17 | 17 | 17 | 14 |
| 8 | 52 | 40 | 33 | 28 | 48 | 37 | 30 | 26 | 31 | 26 | 22 | 25 | 21 | 18 | 20 | 17 | 15 | 15 | 15 | 15 | 13 |
| 9 | 49 | 37 | 29 | 24 | 44 | 34 | 27 | 23 | 28 | 23 | 20 | 23 | 19 | 17 | 18 | 16 | 14 | 14 | 14 | 14 | 11 |
| 10 | 46 | 34 | 27 | 22 | 41 | 31 | 25 | 20 | 26 | 21 | 18 | 21 | 18 | 15 | 17 | 14 | 12 | 12 | 12 | 12 | 10 |

AVERAGE LUMINANCE (cd/sqm):

| | 0° | 45° | 90° |
|-----|------|------|------|
| 0° | 1389 | 1389 | 1389 |
| 5° | 1392 | 1370 | 1380 |
| 10° | 1380 | 1352 | 1361 |
| 15° | 1360 | 1330 | 1332 |
| 20° | 1333 | 1299 | 1303 |
| 25° | 1305 | 1262 | 1268 |
| 30° | 1271 | 1228 | 1225 |
| 35° | 1239 | 1188 | 1178 |
| 40° | 1199 | 1147 | 1134 |
| 45° | 1159 | 1106 | 1089 |
| 50° | 1116 | 1063 | 1037 |
| 55° | 1070 | 1014 | 990 |
| 60° | 1019 | 955 | 935 |
| 65° | 962 | 894 | 870 |
| 70° | 891 | 819 | 801 |
| 75° | 792 | 730 | 737 |
| 80° | 673 | 617 | 615 |
| 85° | 486 | 421 | 411 |

MAXIMUM LUMINANCE 45°-90°:

Horizontal Angle: 90°
 Vertical Angle: 90°
 Luminance: 2020 cd/sqm



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ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|---------|-----------|
| 0°-10° | 179.1 | 1.5 |
| 10°-20° | 504.1 | 4.2 |
| 20°-30° | 740.8 | 6.1 |
| 30°-40° | 860.4 | 7.1 |
| 40°-50° | 859.3 | 7.1 |
| 50°-60° | 749.3 | 6.2 |
| 60°-70° | 553.9 | 4.6 |
| 70°-80° | 313.4 | 2.6 |
| 80°-90° | 90.0 | 0.7 |
| 90°-100° | 159.6 | 1.3 |
| 100°-110° | 507.0 | 4.2 |
| 110°-120° | 867.6 | 7.2 |
| 120°-130° | 1141.0 | 9.5 |
| 130°-140° | 1280.7 | 10.6 |
| 140°-150° | 1255.9 | 10.4 |
| 150°-160° | 1053.5 | 8.7 |
| 160°-170° | 698.7 | 5.8 |
| 170°-180° | 244.2 | 2.0 |
| 0°-30° | 1424.0 | 11.8 |
| 0°-40° | 2284.3 | 18.9 |
| 0°-60° | 3892.9 | 32.3 |
| 0°-90° | 4850.2 | 40.2 |
| 90°-120° | 1534.1 | 12.7 |
| 90°-150° | 5211.7 | 43.2 |
| 90°-180° | 7208.0 | 59.8 |
| 0°-180° | 12058.3 | 100.0 |

CANDELA DISTRIBUTION:

| | 0° | 22.5° | 45° | 67.5° | 90° | Flux |
|------|------|-------|------|-------|------|------|
| 0° | 1903 | 1903 | 1903 | 1903 | 1903 | |
| 5° | 1903 | 1896 | 1876 | 1891 | 1887 | 181 |
| 15° | 1812 | 1801 | 1777 | 1785 | 1776 | 510 |
| 25° | 1640 | 1625 | 1594 | 1598 | 1594 | 755 |
| 35° | 1415 | 1397 | 1367 | 1356 | 1347 | 884 |
| 45° | 1151 | 1138 | 1111 | 1091 | 1084 | 889 |
| 55° | 871 | 860 | 838 | 816 | 807 | 779 |
| 65° | 588 | 577 | 558 | 542 | 533 | 581 |
| 75° | 307 | 304 | 295 | 284 | 287 | 328 |
| 85° | 75 | 73 | 71 | 66 | 64 | 84 |
| 90° | 2 | 28 | 76 | 72 | 74 | 12 |
| 95° | 114 | 135 | 139 | 139 | 135 | 126 |
| 105° | 468 | 474 | 479 | 483 | 483 | 494 |
| 115° | 871 | 883 | 879 | 877 | 871 | 861 |
| 125° | 1266 | 1286 | 1280 | 1272 | 1270 | 1132 |
| 135° | 1638 | 1662 | 1667 | 1664 | 1658 | 1266 |
| 145° | 1988 | 2004 | 2016 | 2019 | 2010 | 1242 |
| 155° | 2274 | 2280 | 2287 | 2298 | 2291 | 1047 |
| 165° | 2474 | 2471 | 2471 | 2487 | 2476 | 698 |
| 175° | 2574 | 2568 | 2563 | 2578 | 2565 | 245 |
| 180° | 2578 | 2578 | 2578 | 2578 | 2578 | |



TEST NUMBER: P916880

CATALOG NUMBER: DFN2DIP-PN4F0-060D100US930-FLLFLL

CANDELA DISTRIBUTION (FULL):

| | 0° | 22.5° | 45° | 67.5° | 90° |
|--------|--------|--------|--------|--------|--------|
| 0° | 1903.4 | 1903.4 | 1903.4 | 1903.4 | 1903.4 |
| 2.5° | 1914.5 | 1905.4 | 1885.1 | 1903.4 | 1899.9 |
| 5° | 1903.4 | 1896.2 | 1876.0 | 1890.6 | 1887.1 |
| 7.5° | 1890.6 | 1879.8 | 1859.5 | 1874.3 | 1870.6 |
| 10° | 1870.6 | 1857.8 | 1835.8 | 1850.4 | 1844.9 |
| 12.5° | 1843.1 | 1832.1 | 1810.2 | 1819.3 | 1815.7 |
| 15° | 1811.9 | 1801.1 | 1777.2 | 1784.6 | 1775.5 |
| 17.5° | 1773.5 | 1762.7 | 1738.8 | 1747.8 | 1738.8 |
| 20° | 1731.4 | 1720.5 | 1694.8 | 1700.3 | 1693.1 |
| 22.5° | 1689.5 | 1672.9 | 1649.0 | 1649.0 | 1645.4 |
| 25° | 1639.9 | 1625.4 | 1594.2 | 1597.7 | 1594.2 |
| 27.5° | 1584.9 | 1572.1 | 1548.4 | 1543.0 | 1533.9 |
| 30° | 1530.2 | 1515.4 | 1488.1 | 1482.6 | 1475.2 |
| 32.5° | 1471.5 | 1460.7 | 1431.3 | 1420.2 | 1412.9 |
| 35° | 1414.9 | 1396.6 | 1367.3 | 1356.2 | 1347.0 |
| 37.5° | 1350.8 | 1334.2 | 1305.0 | 1292.1 | 1283.0 |
| 40° | 1284.9 | 1270.2 | 1240.9 | 1224.6 | 1217.2 |
| 42.5° | 1220.8 | 1206.1 | 1177.0 | 1158.5 | 1147.6 |
| 45° | 1151.4 | 1138.5 | 1110.9 | 1091.0 | 1083.5 |
| 47.5° | 1083.5 | 1070.7 | 1041.5 | 1021.2 | 1010.3 |
| 50° | 1012.1 | 1003.0 | 977.4 | 951.7 | 942.6 |
| 52.5° | 942.6 | 929.8 | 906.0 | 885.9 | 873.1 |
| 55° | 871.3 | 860.2 | 838.3 | 816.4 | 807.2 |
| 57.5° | 799.9 | 790.8 | 766.9 | 744.9 | 737.5 |
| 60° | 728.4 | 721.2 | 695.6 | 675.4 | 669.9 |
| 62.5° | 658.8 | 646.0 | 627.8 | 609.5 | 602.2 |
| 65° | 587.6 | 576.6 | 558.3 | 541.8 | 532.6 |
| 67.5° | 514.4 | 505.1 | 488.8 | 476.0 | 468.6 |
| 70° | 446.6 | 439.3 | 422.7 | 409.9 | 402.8 |
| 72.5° | 377.1 | 369.7 | 360.6 | 347.8 | 342.3 |
| 75° | 307.4 | 303.9 | 294.6 | 283.7 | 287.4 |
| 77.5° | 245.2 | 237.9 | 234.2 | 228.8 | 223.3 |
| 80° | 183.1 | 181.2 | 177.5 | 172.0 | 168.4 |
| 82.5° | 124.5 | 124.5 | 122.7 | 115.4 | 115.4 |
| 85° | 74.9 | 73.2 | 71.4 | 65.8 | 64.1 |
| 87.5° | 33.0 | 29.4 | 25.6 | 20.2 | 18.3 |
| 90° | 2.4 | 28.0 | 76.1 | 71.5 | 73.9 |
| 92.5° | 48.2 | 65.3 | 67.7 | 70.0 | 70.0 |
| 95° | 113.5 | 135.3 | 139.2 | 139.2 | 135.3 |
| 97.5° | 188.9 | 209.1 | 217.7 | 217.7 | 217.7 |
| 100° | 276.0 | 293.8 | 300.0 | 300.0 | 297.7 |
| 102.5° | 367.7 | 380.9 | 389.5 | 391.8 | 389.5 |
| 105° | 468.0 | 474.2 | 478.8 | 482.7 | 482.7 |
| 107.5° | 567.4 | 576.8 | 576.8 | 578.4 | 567.4 |
| 110° | 663.9 | 676.3 | 676.3 | 676.3 | 670.1 |



TEST NUMBER: P916880

CATALOG NUMBER: DFN2DIP-PN4F0-060D100US930-FLLFLL

CANDELA DISTRIBUTION (continued):

| | 0° | 22.5° | 45° | 67.5° | 90° |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 768.0 | 781.2 | 778.9 | 772.7 | 768.0 |
| 115° | 870.7 | 883.0 | 879.2 | 876.9 | 870.7 |
| 117.5° | 972.5 | 989.6 | 978.7 | 972.5 | 966.2 |
| 120° | 1075.1 | 1092.2 | 1075.1 | 1075.1 | 1068.1 |
| 122.5° | 1168.3 | 1190.1 | 1179.2 | 1173.1 | 1168.3 |
| 125° | 1266.3 | 1285.7 | 1279.5 | 1272.5 | 1270.2 |
| 127.5° | 1362.0 | 1386.0 | 1377.4 | 1368.2 | 1362.0 |
| 130° | 1451.3 | 1479.3 | 1475.4 | 1470.7 | 1462.2 |
| 132.5° | 1551.6 | 1573.4 | 1574.9 | 1564.1 | 1557.8 |
| 135° | 1637.9 | 1662.0 | 1666.6 | 1664.3 | 1658.1 |
| 137.5° | 1734.3 | 1753.7 | 1757.6 | 1756.1 | 1746.7 |
| 140° | 1819.0 | 1838.4 | 1849.3 | 1849.3 | 1840.8 |
| 142.5° | 1906.1 | 1925.5 | 1931.7 | 1934.1 | 1925.5 |
| 145° | 1988.4 | 2004.0 | 2016.5 | 2018.8 | 2010.2 |
| 147.5° | 2062.3 | 2081.8 | 2091.1 | 2095.0 | 2086.4 |
| 150° | 2138.5 | 2151.7 | 2160.3 | 2167.2 | 2160.3 |
| 152.5° | 2206.1 | 2219.3 | 2230.2 | 2238.8 | 2230.2 |
| 155° | 2273.8 | 2280.0 | 2287.0 | 2297.8 | 2290.8 |
| 157.5° | 2332.1 | 2336.7 | 2340.6 | 2356.1 | 2345.3 |
| 160° | 2384.2 | 2388.8 | 2391.1 | 2404.3 | 2395.0 |
| 162.5° | 2432.4 | 2432.4 | 2434.6 | 2449.4 | 2438.6 |
| 165° | 2473.5 | 2471.2 | 2471.2 | 2486.7 | 2475.9 |
| 167.5° | 2510.9 | 2503.9 | 2503.9 | 2519.4 | 2508.5 |
| 170° | 2538.8 | 2532.6 | 2530.3 | 2545.9 | 2532.6 |
| 172.5° | 2558.2 | 2552.0 | 2549.7 | 2565.3 | 2552.0 |
| 175° | 2573.8 | 2567.6 | 2563.0 | 2578.5 | 2565.3 |
| 177.5° | 2582.4 | 2576.2 | 2571.5 | 2584.7 | 2571.5 |
| 180° | 2578.5 | 2578.5 | 2578.5 | 2578.5 | 2578.5 |



TEST NUMBER: P916880
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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 | 7.44 | 8.22 | 8.48 | 9.27 | 10.67 | 7.00 | 7.78 | 8.04 | 8.83 | 10.23 |
| | 3H | 9.10 | 9.80 | 10.15 | 10.85 | 12.27 | 8.62 | 9.31 | 9.66 | 10.37 | 11.79 |
| | 4H | 9.69 | 10.35 | 10.74 | 11.40 | 12.83 | 9.20 | 9.86 | 10.26 | 10.91 | 12.35 |
| | 6H | 10.08 | 10.69 | 11.15 | 11.75 | 13.19 | 9.59 | 10.20 | 10.66 | 11.26 | 12.70 |
| | 8H | 10.19 | 10.77 | 11.26 | 11.84 | 13.28 | 9.69 | 10.27 | 10.77 | 11.35 | 12.79 |
| | 12H | 10.23 | 10.79 | 11.31 | 11.85 | 13.31 | 9.73 | 10.29 | 10.81 | 11.35 | 12.81 |
| 4H | 2H | 7.89 | 8.56 | 8.96 | 9.61 | 11.04 | 7.54 | 8.21 | 8.61 | 9.26 | 10.69 |
| | 3H | 9.76 | 10.31 | 10.83 | 11.39 | 12.83 | 9.35 | 9.91 | 10.43 | 10.99 | 12.43 |
| | 4H | 10.47 | 10.98 | 11.55 | 12.05 | 13.51 | 10.05 | 10.56 | 11.13 | 11.63 | 13.10 |
| | 6H | 10.98 | 11.42 | 12.07 | 12.51 | 13.97 | 10.56 | 10.99 | 11.64 | 12.09 | 13.55 |
| | 8H | 11.13 | 11.54 | 12.22 | 12.63 | 14.10 | 10.70 | 11.11 | 11.79 | 12.20 | 13.67 |
| | 12H | 11.20 | 11.57 | 12.31 | 12.67 | 14.15 | 10.76 | 11.13 | 11.87 | 12.23 | 13.71 |
| 8H | 4H | 10.66 | 11.07 | 11.75 | 12.15 | 13.63 | 10.29 | 10.69 | 11.38 | 11.78 | 13.26 |
| | 6H | 11.29 | 11.63 | 12.40 | 12.76 | 14.23 | 10.91 | 11.25 | 12.02 | 12.38 | 13.85 |
| | 8H | 11.51 | 11.81 | 12.63 | 12.92 | 14.41 | 11.13 | 11.42 | 12.24 | 12.53 | 14.03 |
| | 12H | 11.64 | 11.90 | 12.76 | 13.01 | 14.54 | 11.24 | 11.50 | 12.36 | 12.61 | 14.14 |
| 12H | 4H | 10.64 | 11.01 | 11.75 | 12.11 | 13.59 | 10.28 | 10.65 | 11.38 | 11.75 | 13.23 |
| | 6H | 11.32 | 11.61 | 12.44 | 12.73 | 14.22 | 10.95 | 11.25 | 12.07 | 12.36 | 13.85 |
| | 8H | 11.56 | 11.82 | 12.68 | 12.93 | 14.46 | 11.19 | 11.45 | 12.31 | 12.55 | 14.08 |