

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: P918685

Luminaire Tested: DFN2DIP-4P4F0-040D070US935-RLONL

Issue Date: 11/21/2024

Test Information

Test Method: LM-79-2019
Report Number: P918685
REPORT IS A COMBINATION OF REPORTS P900650 AND P897523
Test Lab: INNOVATION CENTER
Issue Date: 11/21/2024
Manufacturer: COOPER LIGHTING SOLUTIONS
Product Line: NEO-RAY
Catalog Number: DFN2DIP-4P4F0-040D070US935-RLLONL
Description: 4 foot, 90deg - 4way Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens
Light Source: -
Ballast/Driver: -

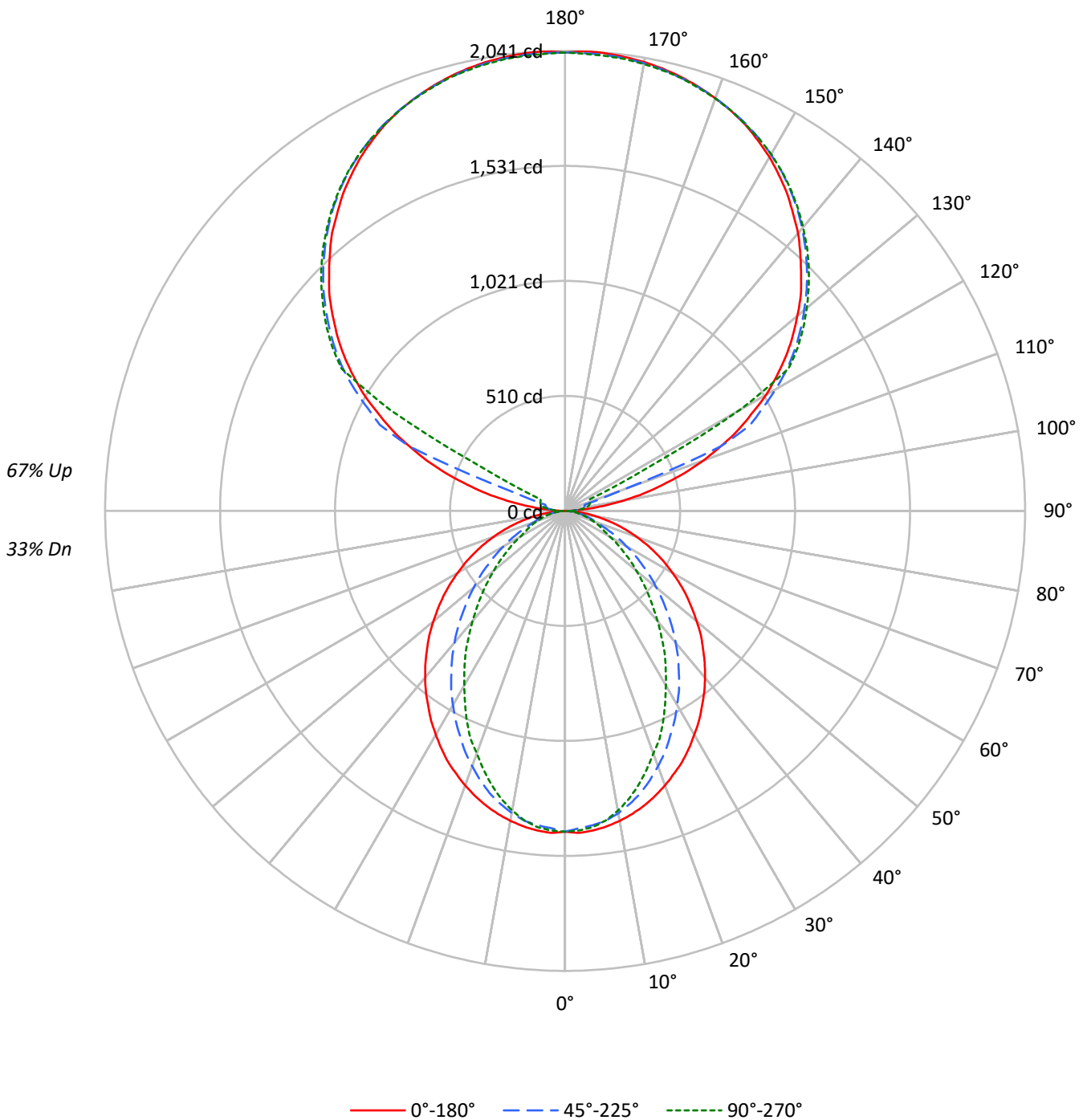
Summary

Lumens per Lamp: N/A
Luminaire Lumens: 8894.1 lumens
Efficiency: N/A
Efficacy: 89.0 lumens/watt
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16
Luminous Opening: Rectangular w/ Sides (W: 4.07' x L: 4.07' x H: 0.1')
CIE Type: Semi-Indirect

Input Watts (W): 99.9
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 | | | | 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 | 103 | 103 | 103 | 103 | 93 | 93 | 93 | 93 | 74 | 74 | 74 | 56 | 56 | 56 | 40 | 40 | 40 | 33 | | | | 33 |
| 1 | 94 | 90 | 87 | 83 | 85 | 81 | 78 | 76 | 65 | 63 | 61 | 50 | 49 | 48 | 36 | 35 | 35 | 28 | | | | 28 |
| 2 | 86 | 79 | 73 | 68 | 77 | 72 | 67 | 62 | 57 | 54 | 51 | 44 | 42 | 40 | 32 | 31 | 30 | 24 | | | | 24 |
| 3 | 79 | 70 | 63 | 57 | 71 | 63 | 57 | 53 | 51 | 47 | 43 | 39 | 37 | 34 | 29 | 27 | 26 | 21 | | | | 21 |
| 4 | 72 | 62 | 54 | 49 | 65 | 56 | 50 | 45 | 45 | 41 | 37 | 35 | 32 | 30 | 26 | 24 | 22 | 18 | | | | 18 |
| 5 | 66 | 55 | 47 | 42 | 59 | 50 | 43 | 38 | 41 | 36 | 32 | 32 | 28 | 26 | 24 | 21 | 20 | 16 | | | | 16 |
| 6 | 61 | 49 | 42 | 36 | 55 | 45 | 38 | 33 | 37 | 32 | 28 | 29 | 25 | 23 | 21 | 19 | 17 | 14 | | | | 14 |
| 7 | 56 | 45 | 37 | 32 | 51 | 41 | 34 | 29 | 33 | 28 | 25 | 26 | 23 | 20 | 20 | 17 | 16 | 13 | | | | 13 |
| 8 | 52 | 41 | 33 | 28 | 47 | 37 | 31 | 26 | 30 | 25 | 22 | 24 | 21 | 18 | 18 | 16 | 14 | 12 | | | | 12 |
| 9 | 49 | 37 | 30 | 25 | 44 | 34 | 27 | 23 | 28 | 23 | 20 | 22 | 19 | 16 | 17 | 14 | 13 | 10 | | | | 10 |
| 10 | 45 | 34 | 27 | 22 | 41 | 31 | 25 | 21 | 26 | 21 | 18 | 20 | 17 | 15 | 16 | 13 | 12 | 10 | | | | 10 |

AVERAGE LUMINANCE (cd/sqm):

| | 0° | 45° | 90° |
|-----|-----|-----|-----|
| 0° | 923 | 923 | 923 |
| 5° | 925 | 909 | 915 |
| 10° | 916 | 891 | 885 |
| 15° | 903 | 862 | 840 |
| 20° | 887 | 822 | 784 |
| 25° | 870 | 777 | 729 |
| 30° | 847 | 730 | 660 |
| 35° | 824 | 680 | 600 |
| 40° | 802 | 629 | 530 |
| 45° | 775 | 571 | 467 |
| 50° | 748 | 513 | 405 |
| 55° | 719 | 451 | 346 |
| 60° | 686 | 386 | 286 |
| 65° | 648 | 320 | 257 |
| 70° | 602 | 259 | 233 |
| 75° | 544 | 229 | 213 |
| 80° | 460 | 193 | 186 |
| 85° | 322 | 131 | 142 |

MAXIMUM LUMINANCE 45°-90°:

Horizontal Angle: 90°
 Vertical Angle: 90°
 Luminance: 1049 cd/sqm



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ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10° | 133.4 | 1.5 |
| 10°-20° | 366.2 | 4.1 |
| 20°-30° | 514.2 | 5.8 |
| 30°-40° | 560.5 | 6.3 |
| 40°-50° | 515.1 | 5.8 |
| 50°-60° | 404.5 | 4.5 |
| 60°-70° | 263.3 | 3.0 |
| 70°-80° | 135.6 | 1.5 |
| 80°-90° | 38.2 | 0.4 |
| 90°-100° | 67.1 | 0.8 |
| 100°-110° | 250.0 | 2.8 |
| 110°-120° | 663.1 | 7.5 |
| 120°-130° | 1099.8 | 12.4 |
| 130°-140° | 1168.3 | 13.1 |
| 140°-150° | 1085.8 | 12.2 |
| 150°-160° | 872.9 | 9.8 |
| 160°-170° | 562.5 | 6.3 |
| 170°-180° | 193.6 | 2.2 |
| 0°-30° | 1013.8 | 11.4 |
| 0°-40° | 1574.2 | 17.7 |
| 0°-60° | 2493.9 | 28.0 |
| 0°-90° | 2931.0 | 33.0 |
| 90°-120° | 980.2 | 11.0 |
| 90°-150° | 4334.1 | 48.7 |
| 90°-180° | 5963.0 | 67.0 |
| 0°-180° | 8894.1 | 100.0 |

CANDELA DISTRIBUTION:

| | 0° | 22.5° | 45° | 67.5° | 90° | Flux |
|------|------|-------|------|-------|------|------|
| 0° | 1423 | 1423 | 1423 | 1423 | 1423 | |
| 5° | 1423 | 1417 | 1400 | 1412 | 1408 | 135 |
| 15° | 1354 | 1340 | 1296 | 1271 | 1259 | 382 |
| 25° | 1229 | 1188 | 1103 | 1050 | 1030 | 565 |
| 35° | 1059 | 993 | 880 | 799 | 770 | 663 |
| 45° | 866 | 779 | 644 | 553 | 522 | 668 |
| 55° | 658 | 558 | 419 | 341 | 317 | 588 |
| 65° | 444 | 340 | 224 | 180 | 176 | 441 |
| 75° | 237 | 147 | 103 | 94 | 93 | 251 |
| 85° | 55 | 28 | 24 | 24 | 24 | 64 |
| 90° | 1 | 18 | 29 | 37 | 40 | 8 |
| 95° | 96 | 47 | 57 | 65 | 63 | 113 |
| 105° | 448 | 492 | 90 | 106 | 112 | 478 |
| 115° | 846 | 871 | 908 | 227 | 121 | 833 |
| 125° | 1196 | 1216 | 1244 | 1254 | 1258 | 1067 |
| 135° | 1481 | 1504 | 1517 | 1532 | 1529 | 1144 |
| 145° | 1718 | 1716 | 1741 | 1751 | 1744 | 1074 |
| 155° | 1891 | 1878 | 1896 | 1904 | 1893 | 872 |
| 165° | 1993 | 1984 | 1988 | 1999 | 1988 | 563 |
| 175° | 2038 | 2028 | 2031 | 2041 | 2027 | 194 |
| 180° | 2034 | 2034 | 2034 | 2034 | 2034 | |



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CANDELA DISTRIBUTION (FULL):

| | 0° | 22.5° | 45° | 67.5° | 90° |
|--------|--------|--------|--------|--------|--------|
| 0° | 1423.4 | 1423.4 | 1423.4 | 1423.4 | 1423.4 |
| 2.5° | 1429.9 | 1423.4 | 1409.2 | 1422.2 | 1419.5 |
| 5° | 1423.4 | 1416.9 | 1400.2 | 1411.8 | 1408.0 |
| 7.5° | 1411.8 | 1404.1 | 1386.1 | 1391.1 | 1384.7 |
| 10° | 1396.4 | 1387.3 | 1361.6 | 1357.6 | 1350.0 |
| 12.5° | 1377.1 | 1365.5 | 1330.6 | 1322.9 | 1308.7 |
| 15° | 1353.8 | 1339.6 | 1295.9 | 1271.4 | 1258.6 |
| 17.5° | 1326.8 | 1306.1 | 1252.0 | 1223.7 | 1203.1 |
| 20° | 1295.9 | 1270.1 | 1205.7 | 1173.5 | 1145.1 |
| 22.5° | 1262.4 | 1232.8 | 1158.0 | 1114.2 | 1095.0 |
| 25° | 1228.9 | 1187.7 | 1102.6 | 1049.9 | 1030.4 |
| 27.5° | 1189.0 | 1145.1 | 1051.1 | 990.6 | 960.9 |
| 30° | 1146.5 | 1097.4 | 994.4 | 928.8 | 894.0 |
| 32.5° | 1105.3 | 1045.9 | 940.4 | 863.1 | 830.8 |
| 35° | 1058.9 | 993.2 | 879.9 | 798.7 | 770.2 |
| 37.5° | 1013.8 | 942.9 | 823.1 | 734.2 | 702.1 |
| 40° | 966.1 | 888.9 | 763.9 | 672.4 | 638.9 |
| 42.5° | 917.1 | 834.7 | 704.6 | 609.2 | 577.1 |
| 45° | 865.6 | 779.3 | 644.1 | 552.6 | 521.7 |
| 47.5° | 816.7 | 725.3 | 586.2 | 494.6 | 466.3 |
| 50° | 762.6 | 671.1 | 529.4 | 440.5 | 413.5 |
| 52.5° | 709.7 | 613.1 | 475.4 | 390.3 | 365.8 |
| 55° | 658.2 | 557.8 | 418.6 | 341.4 | 316.9 |
| 57.5° | 605.5 | 502.4 | 368.4 | 296.3 | 275.7 |
| 60° | 551.3 | 448.2 | 315.6 | 249.9 | 229.4 |
| 62.5° | 498.6 | 395.5 | 270.4 | 208.7 | 198.5 |
| 65° | 444.4 | 340.0 | 224.1 | 180.4 | 176.4 |
| 67.5° | 393.0 | 288.5 | 180.4 | 158.4 | 154.5 |
| 70° | 338.8 | 238.3 | 149.4 | 136.6 | 131.3 |
| 72.5° | 287.3 | 191.9 | 124.9 | 114.7 | 112.1 |
| 75° | 236.9 | 146.8 | 103.1 | 94.0 | 92.8 |
| 77.5° | 186.8 | 104.3 | 81.2 | 76.0 | 73.4 |
| 80° | 140.3 | 74.7 | 61.7 | 56.7 | 56.7 |
| 82.5° | 97.9 | 50.3 | 42.5 | 39.9 | 39.9 |
| 85° | 55.4 | 28.3 | 24.5 | 24.5 | 24.5 |
| 87.5° | 20.7 | 10.2 | 10.2 | 9.0 | 9.0 |
| 90° | 1.4 | 17.7 | 29.4 | 36.9 | 39.7 |
| 92.5° | 36.9 | 30.9 | 35.3 | 38.3 | 39.7 |
| 95° | 95.6 | 47.0 | 57.3 | 64.8 | 63.3 |
| 97.5° | 172.1 | 51.6 | 75.0 | 79.6 | 80.9 |
| 100° | 260.6 | 58.9 | 83.9 | 95.6 | 98.6 |
| 102.5° | 357.6 | 354.8 | 86.9 | 103.0 | 107.5 |
| 105° | 447.5 | 491.6 | 89.8 | 105.9 | 111.8 |
| 107.5° | 551.9 | 588.7 | 92.8 | 108.9 | 114.9 |
| 110° | 652.1 | 682.9 | 257.6 | 110.5 | 116.2 |



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CANDELA DISTRIBUTION (continued):

| | 0° | 22.5° | 45° | 67.5° | 90° |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 746.3 | 772.7 | 747.7 | 113.2 | 117.8 |
| 115° | 846.3 | 871.2 | 908.1 | 226.7 | 120.8 |
| 117.5° | 933.1 | 962.5 | 987.7 | 777.1 | 391.5 |
| 120° | 1030.3 | 1052.3 | 1078.9 | 1096.6 | 897.8 |
| 122.5° | 1112.6 | 1136.2 | 1165.8 | 1174.5 | 1176.0 |
| 125° | 1196.5 | 1215.7 | 1243.7 | 1254.0 | 1258.3 |
| 127.5° | 1273.1 | 1293.6 | 1315.9 | 1330.6 | 1332.0 |
| 130° | 1345.2 | 1368.8 | 1384.9 | 1401.2 | 1399.8 |
| 132.5° | 1418.8 | 1438.0 | 1454.1 | 1467.4 | 1466.0 |
| 135° | 1480.7 | 1504.2 | 1517.4 | 1532.2 | 1529.3 |
| 137.5° | 1545.3 | 1563.1 | 1577.9 | 1592.6 | 1588.2 |
| 140° | 1608.6 | 1620.5 | 1636.6 | 1649.8 | 1642.5 |
| 142.5° | 1661.7 | 1672.1 | 1691.1 | 1702.8 | 1695.5 |
| 145° | 1717.7 | 1716.1 | 1741.1 | 1751.4 | 1744.1 |
| 147.5° | 1766.1 | 1761.8 | 1786.7 | 1794.1 | 1788.3 |
| 150° | 1813.3 | 1803.0 | 1826.6 | 1835.3 | 1828.0 |
| 152.5° | 1853.0 | 1841.2 | 1863.3 | 1872.2 | 1861.9 |
| 155° | 1891.3 | 1878.1 | 1895.7 | 1904.5 | 1892.8 |
| 157.5° | 1922.2 | 1910.5 | 1923.7 | 1934.1 | 1922.2 |
| 160° | 1948.8 | 1939.8 | 1948.8 | 1957.5 | 1947.1 |
| 162.5° | 1972.2 | 1963.4 | 1970.7 | 1981.1 | 1967.8 |
| 165° | 1992.8 | 1984.1 | 1988.4 | 1998.7 | 1988.4 |
| 167.5° | 2009.1 | 2000.1 | 2004.7 | 2015.0 | 2001.7 |
| 170° | 2022.3 | 2013.4 | 2016.4 | 2026.7 | 2013.4 |
| 172.5° | 2031.1 | 2022.3 | 2025.3 | 2035.6 | 2022.3 |
| 175° | 2038.4 | 2028.1 | 2031.1 | 2041.3 | 2026.7 |
| 177.5° | 2041.3 | 2031.1 | 2032.6 | 2043.0 | 2029.6 |
| 180° | 2034.0 | 2034.0 | 2034.0 | 2034.0 | 2034.0 |



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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 | 5.05 | 5.76 | 6.14 | 6.85 | 8.34 | 1.01 | 1.72 | 2.10 | 2.81 | 4.30 |
| | 3H | 6.72 | 7.35 | 7.83 | 8.45 | 9.97 | 2.19 | 2.82 | 3.29 | 3.92 | 5.44 |
| | 4H | 7.33 | 7.93 | 8.44 | 9.03 | 10.55 | 2.64 | 3.24 | 3.75 | 4.34 | 5.86 |
| | 6H | 7.75 | 8.30 | 8.87 | 9.40 | 10.94 | 2.95 | 3.50 | 4.07 | 4.61 | 6.14 |
| | 8H | 7.87 | 8.40 | 9.00 | 9.52 | 11.04 | 3.04 | 3.56 | 4.17 | 4.68 | 6.21 |
| | 12H | 7.93 | 8.43 | 9.07 | 9.54 | 11.09 | 3.08 | 3.58 | 4.21 | 4.69 | 6.24 |
| 4H | 2H | 5.05 | 5.65 | 6.17 | 6.75 | 8.27 | 1.59 | 2.19 | 2.71 | 3.29 | 4.81 |
| | 3H | 6.88 | 7.37 | 8.00 | 8.50 | 10.03 | 2.93 | 3.43 | 4.06 | 4.56 | 6.09 |
| | 4H | 7.57 | 8.03 | 8.70 | 9.14 | 10.69 | 3.48 | 3.94 | 4.61 | 5.05 | 6.61 |
| | 6H | 8.08 | 8.47 | 9.22 | 9.61 | 11.16 | 3.89 | 4.28 | 5.03 | 5.42 | 6.97 |
| | 8H | 8.26 | 8.62 | 9.39 | 9.75 | 11.31 | 4.02 | 4.39 | 5.16 | 5.52 | 7.08 |
| | 12H | 8.35 | 8.68 | 9.50 | 9.82 | 11.39 | 4.08 | 4.41 | 5.23 | 5.55 | 7.12 |
| 8H | 4H | 7.53 | 7.89 | 8.66 | 9.02 | 10.58 | 3.75 | 4.12 | 4.89 | 5.25 | 6.81 |
| | 6H | 8.09 | 8.40 | 9.25 | 9.57 | 11.13 | 4.27 | 4.57 | 5.43 | 5.74 | 7.30 |
| | 8H | 8.31 | 8.58 | 9.48 | 9.73 | 11.31 | 4.46 | 4.72 | 5.62 | 5.88 | 7.45 |
| | 12H | 8.45 | 8.68 | 9.62 | 9.83 | 11.44 | 4.58 | 4.81 | 5.74 | 5.96 | 7.57 |
| 12H | 4H | 7.47 | 7.80 | 8.63 | 8.95 | 10.51 | 3.75 | 4.08 | 4.91 | 5.23 | 6.79 |
| | 6H | 8.07 | 8.33 | 9.23 | 9.49 | 11.06 | 4.32 | 4.58 | 5.48 | 5.74 | 7.31 |
| | 8H | 8.29 | 8.52 | 9.46 | 9.67 | 11.28 | 4.53 | 4.76 | 5.69 | 5.91 | 7.52 |