

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: P924115

Luminaire Tested: DFN2DIP-4P4F0-030D070US950-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P924115  
REPORT IS A COMBINATION OF REPORTS P900647 AND P897523  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-4P4F0-030D070US950-FLLONL  
Description: 4 foot, 90deg - 4way Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

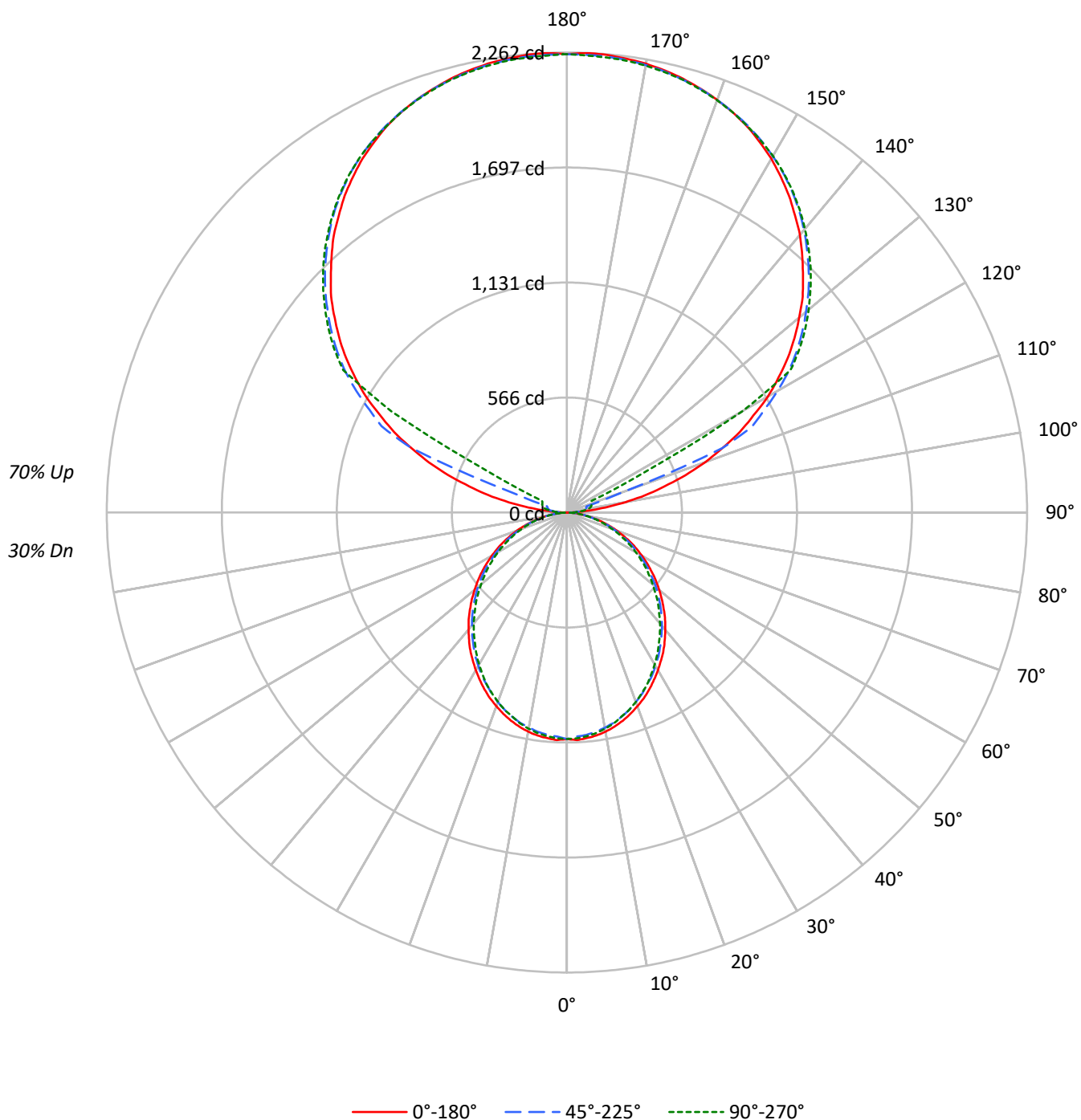
Lumens per Lamp: N/A  
Luminaire Lumens: 9444.6 lumens  
Efficiency: N/A  
Efficacy: 106.4 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 4.07' x L: 4.07' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 88.8  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.983  
Total Harmonic Distortion (THDi): 0.073  
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: P924115

CATALOG NUMBER: DFN2DIP-4P4F0-030D070US950-FLONL

**COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:**

|     |     |     |     |     |    |    |    |    |    |    |    |    |    |    |    |    |    |
|-----|-----|-----|-----|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| RF  | 20  |     |     |     | 20 |    |    |    | 20 |    |    |    | 20 |    |    |    | 20 |
| RC  | 80  |     |     |     | 70 |    |    |    | 50 |    |    |    | 30 |    |    |    | 10 |
| RW  | 70  | 50  | 30  | 10  | 70 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 |
| RCR |     |     |     |     |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 0   | 102 | 102 | 102 | 102 | 92 | 92 | 92 | 92 | 72 | 72 | 72 | 54 | 54 | 54 | 38 | 38 | 38 |
| 1   | 93  | 89  | 85  | 82  | 84 | 80 | 77 | 74 | 63 | 61 | 59 | 48 | 46 | 45 | 33 | 33 | 32 |
| 2   | 85  | 78  | 72  | 67  | 76 | 70 | 65 | 61 | 55 | 52 | 49 | 42 | 40 | 38 | 29 | 28 | 27 |
| 3   | 77  | 68  | 61  | 56  | 69 | 62 | 56 | 51 | 49 | 45 | 41 | 37 | 34 | 32 | 26 | 24 | 23 |
| 4   | 71  | 60  | 53  | 47  | 63 | 54 | 48 | 43 | 43 | 39 | 35 | 33 | 30 | 27 | 23 | 21 | 20 |
| 5   | 65  | 54  | 46  | 40  | 58 | 48 | 42 | 37 | 39 | 34 | 30 | 29 | 26 | 23 | 21 | 19 | 17 |
| 6   | 60  | 48  | 40  | 35  | 53 | 43 | 37 | 32 | 35 | 30 | 26 | 27 | 23 | 20 | 19 | 17 | 15 |
| 7   | 55  | 43  | 35  | 30  | 49 | 39 | 32 | 28 | 31 | 26 | 23 | 24 | 21 | 18 | 17 | 15 | 13 |
| 8   | 51  | 39  | 32  | 26  | 46 | 35 | 29 | 24 | 28 | 24 | 20 | 22 | 19 | 16 | 16 | 14 | 12 |
| 9   | 47  | 36  | 28  | 23  | 42 | 32 | 26 | 22 | 26 | 21 | 18 | 20 | 17 | 14 | 15 | 12 | 11 |
| 10  | 44  | 32  | 26  | 21  | 40 | 30 | 23 | 19 | 24 | 19 | 16 | 19 | 15 | 13 | 14 | 11 | 10 |

**AVERAGE LUMINANCE (cd/sqm):**

|     | 0°  | 45° | 90° |
|-----|-----|-----|-----|
| 0°  | 722 | 722 | 722 |
| 5°  | 724 | 713 | 717 |
| 10° | 718 | 703 | 708 |
| 15° | 707 | 692 | 693 |
| 20° | 693 | 676 | 678 |
| 25° | 679 | 657 | 660 |
| 30° | 661 | 639 | 638 |
| 35° | 645 | 618 | 614 |
| 40° | 624 | 597 | 591 |
| 45° | 603 | 576 | 568 |
| 50° | 581 | 554 | 541 |
| 55° | 557 | 529 | 516 |
| 60° | 530 | 498 | 488 |
| 65° | 501 | 467 | 455 |
| 70° | 464 | 428 | 419 |
| 75° | 413 | 383 | 386 |
| 80° | 351 | 324 | 323 |
| 85° | 255 | 223 | 218 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1163 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 104.8  | 1.1       |
| 10°-20°   | 294.9  | 3.1       |
| 20°-30°   | 433.4  | 4.6       |
| 30°-40°   | 503.4  | 5.3       |
| 40°-50°   | 502.7  | 5.3       |
| 50°-60°   | 438.4  | 4.6       |
| 60°-70°   | 324.1  | 3.4       |
| 70°-80°   | 183.3  | 1.9       |
| 80°-90°   | 52.3   | 0.6       |
| 90°-100°  | 74.3   | 0.8       |
| 100°-110° | 277.0  | 2.9       |
| 110°-120° | 734.8  | 7.8       |
| 120°-130° | 1218.6 | 12.9      |
| 130°-140° | 1294.5 | 13.7      |
| 140°-150° | 1203.1 | 12.7      |
| 150°-160° | 967.2  | 10.2      |
| 160°-170° | 623.3  | 6.6       |
| 170°-180° | 214.5  | 2.3       |
| 0°-30°    | 833.1  | 8.8       |
| 0°-40°    | 1336.5 | 14.2      |
| 0°-60°    | 2277.6 | 24.1      |
| 0°-90°    | 2837.3 | 30.0      |
| 90°-120°  | 1086.1 | 11.5      |
| 90°-150°  | 4802.2 | 50.8      |
| 90°-180°  | 6607.0 | 70.0      |
| 0°-180°   | 9444.6 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1114 | 1114  | 1114 | 1114  | 1114 |      |
| 5°   | 1114 | 1109  | 1098 | 1106  | 1104 | 106  |
| 15°  | 1060 | 1054  | 1040 | 1044  | 1039 | 299  |
| 25°  | 959  | 951   | 933  | 935   | 933  | 441  |
| 35°  | 828  | 817   | 800  | 793   | 788  | 517  |
| 45°  | 674  | 666   | 650  | 638   | 634  | 520  |
| 55°  | 510  | 503   | 490  | 478   | 472  | 456  |
| 65°  | 344  | 337   | 327  | 317   | 312  | 340  |
| 75°  | 180  | 178   | 172  | 166   | 168  | 192  |
| 85°  | 44   | 43    | 42   | 38    | 38   | 49   |
| 90°  | 2    | 20    | 32   | 41    | 44   | 9    |
| 95°  | 106  | 52    | 64   | 72    | 70   | 125  |
| 105° | 496  | 545   | 100  | 117   | 124  | 530  |
| 115° | 938  | 965   | 1006 | 251   | 134  | 923  |
| 125° | 1326 | 1347  | 1378 | 1390  | 1394 | 1182 |
| 135° | 1641 | 1667  | 1681 | 1698  | 1694 | 1267 |
| 145° | 1903 | 1902  | 1929 | 1941  | 1932 | 1190 |
| 155° | 2096 | 2081  | 2100 | 2110  | 2097 | 966  |
| 165° | 2208 | 2198  | 2203 | 2215  | 2203 | 624  |
| 175° | 2259 | 2247  | 2250 | 2262  | 2246 | 215  |
| 180° | 2254 | 2254  | 2254 | 2254  | 2254 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1113.6 | 1113.6 | 1113.6 | 1113.6 | 1113.6 |
| 2.5°   | 1120.1 | 1114.7 | 1102.9 | 1113.6 | 1111.6 |
| 5°     | 1113.6 | 1109.4 | 1097.6 | 1106.2 | 1104.1 |
| 7.5°   | 1106.2 | 1099.8 | 1087.9 | 1096.6 | 1094.4 |
| 10°    | 1094.4 | 1086.9 | 1074.1 | 1082.6 | 1079.5 |
| 12.5°  | 1078.3 | 1071.9 | 1059.1 | 1064.4 | 1062.3 |
| 15°    | 1060.1 | 1053.8 | 1039.8 | 1044.1 | 1038.7 |
| 17.5°  | 1037.6 | 1031.3 | 1017.3 | 1022.6 | 1017.3 |
| 20°    | 1013.0 | 1006.6 | 991.6  | 994.7  | 990.5  |
| 22.5°  | 988.4  | 978.8  | 964.8  | 964.8  | 962.6  |
| 25°    | 959.4  | 950.9  | 932.7  | 934.8  | 932.7  |
| 27.5°  | 927.3  | 919.8  | 905.9  | 902.8  | 897.4  |
| 30°    | 895.2  | 886.6  | 870.6  | 867.4  | 863.1  |
| 32.5°  | 861.0  | 854.6  | 837.4  | 830.9  | 826.6  |
| 35°    | 827.8  | 817.1  | 799.9  | 793.4  | 788.1  |
| 37.5°  | 790.3  | 780.7  | 763.5  | 755.9  | 750.6  |
| 40°    | 751.8  | 743.2  | 726.0  | 716.5  | 712.2  |
| 42.5°  | 714.3  | 705.7  | 688.6  | 677.8  | 671.4  |
| 45°    | 673.6  | 666.1  | 650.0  | 638.2  | 633.9  |
| 47.5°  | 633.9  | 626.5  | 609.3  | 597.5  | 591.1  |
| 50°    | 592.1  | 586.8  | 571.8  | 556.8  | 551.5  |
| 52.5°  | 551.5  | 544.0  | 530.1  | 518.3  | 510.8  |
| 55°    | 509.8  | 503.3  | 490.5  | 477.7  | 472.3  |
| 57.5°  | 467.9  | 462.6  | 448.7  | 435.8  | 431.5  |
| 60°    | 426.2  | 422.0  | 407.0  | 395.1  | 392.0  |
| 62.5°  | 385.5  | 378.0  | 367.3  | 356.6  | 352.3  |
| 65°    | 343.8  | 337.3  | 326.6  | 317.0  | 311.7  |
| 67.5°  | 301.0  | 295.5  | 285.9  | 278.5  | 274.2  |
| 70°    | 261.3  | 257.0  | 247.4  | 239.8  | 235.6  |
| 72.5°  | 220.7  | 216.3  | 210.9  | 203.5  | 200.3  |
| 75°    | 179.8  | 177.8  | 172.4  | 166.0  | 168.2  |
| 77.5°  | 143.5  | 139.2  | 137.0  | 133.8  | 130.7  |
| 80°    | 107.1  | 106.0  | 103.8  | 100.6  | 98.5   |
| 82.5°  | 72.8   | 72.8   | 71.8   | 67.4   | 67.4   |
| 85°    | 43.9   | 42.8   | 41.8   | 38.5   | 37.5   |
| 87.5°  | 19.3   | 17.2   | 15.0   | 11.8   | 10.7   |
| 90°    | 1.5    | 19.6   | 32.5   | 40.8   | 44.0   |
| 92.5°  | 40.8   | 34.2   | 39.1   | 42.5   | 44.0   |
| 95°    | 105.9  | 52.1   | 63.5   | 71.8   | 70.1   |
| 97.5°  | 190.7  | 57.1   | 83.1   | 88.1   | 89.7   |
| 100°   | 288.8  | 65.3   | 92.9   | 105.9  | 109.2  |
| 102.5° | 396.2  | 393.1  | 96.3   | 114.1  | 119.1  |
| 105°   | 495.8  | 544.7  | 99.5   | 117.3  | 123.9  |
| 107.5° | 611.5  | 652.2  | 102.8  | 120.7  | 127.3  |
| 110°   | 722.6  | 756.6  | 285.4  | 122.4  | 128.8  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 826.9  | 856.1  | 828.5  | 125.5  | 130.5  |
| 115°   | 937.7  | 965.4  | 1006.2 | 251.2  | 133.8  |
| 117.5° | 1033.9 | 1066.5 | 1094.3 | 861.0  | 433.8  |
| 120°   | 1141.6 | 1166.0 | 1195.5 | 1215.0 | 994.8  |
| 122.5° | 1232.8 | 1258.9 | 1291.7 | 1301.4 | 1303.1 |
| 125°   | 1325.8 | 1347.0 | 1378.1 | 1389.5 | 1394.3 |
| 127.5° | 1410.6 | 1433.4 | 1458.0 | 1474.3 | 1475.8 |
| 130°   | 1490.5 | 1516.7 | 1534.5 | 1552.5 | 1551.0 |
| 132.5° | 1572.1 | 1593.4 | 1611.2 | 1625.9 | 1624.4 |
| 135°   | 1640.6 | 1666.7 | 1681.3 | 1697.7 | 1694.5 |
| 137.5° | 1712.2 | 1731.9 | 1748.3 | 1764.6 | 1759.7 |
| 140°   | 1782.4 | 1795.5 | 1813.4 | 1828.1 | 1819.9 |
| 142.5° | 1841.2 | 1852.7 | 1873.8 | 1886.7 | 1878.6 |
| 145°   | 1903.2 | 1901.5 | 1929.2 | 1940.6 | 1932.5 |
| 147.5° | 1956.8 | 1952.1 | 1979.7 | 1987.8 | 1981.5 |
| 150°   | 2009.1 | 1997.8 | 2023.9 | 2033.5 | 2025.4 |
| 152.5° | 2053.1 | 2040.1 | 2064.6 | 2074.4 | 2063.0 |
| 155°   | 2095.6 | 2081.0 | 2100.5 | 2110.2 | 2097.3 |
| 157.5° | 2129.8 | 2116.8 | 2131.5 | 2143.0 | 2129.8 |
| 160°   | 2159.3 | 2149.4 | 2159.3 | 2168.9 | 2157.5 |
| 162.5° | 2185.2 | 2175.5 | 2183.6 | 2195.1 | 2180.4 |
| 165°   | 2208.0 | 2198.4 | 2203.2 | 2214.6 | 2203.2 |
| 167.5° | 2226.1 | 2216.1 | 2221.2 | 2232.6 | 2218.0 |
| 170°   | 2240.8 | 2230.9 | 2234.2 | 2245.6 | 2230.9 |
| 172.5° | 2250.5 | 2240.8 | 2244.1 | 2255.4 | 2240.8 |
| 175°   | 2258.6 | 2247.1 | 2250.5 | 2261.8 | 2245.6 |
| 177.5° | 2261.8 | 2250.5 | 2252.2 | 2263.7 | 2248.9 |
| 180°   | 2253.7 | 2253.7 | 2253.7 | 2253.7 | 2253.7 |

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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 | 3.95             | 4.66 | 5.06 | 5.77 | 7.30  | 3.51           | 4.22 | 4.62 | 5.32 | 6.85  |
|                 | 3H   | 5.61             | 6.24 | 6.73 | 7.36 | 8.90  | 5.12           | 5.75 | 6.24 | 6.87 | 8.41  |
|                 | 4H   | 6.19             | 6.79 | 7.32 | 7.91 | 9.46  | 5.70           | 6.30 | 6.83 | 7.41 | 8.97  |
|                 | 6H   | 6.59             | 7.14 | 7.73 | 8.26 | 9.82  | 6.09           | 6.64 | 7.23 | 7.76 | 9.32  |
|                 | 8H   | 6.69             | 7.22 | 7.83 | 8.35 | 9.91  | 6.19           | 6.71 | 7.33 | 7.85 | 9.41  |
|                 | 12H  | 6.74             | 7.24 | 7.88 | 8.36 | 9.94  | 6.23           | 6.73 | 7.37 | 7.85 | 9.43  |
| 4H              | 2H   | 4.40             | 5.00 | 5.53 | 6.11 | 7.66  | 4.04           | 4.64 | 5.18 | 5.76 | 7.31  |
|                 | 3H   | 6.25             | 6.76 | 7.40 | 7.90 | 9.46  | 5.85           | 6.35 | 6.99 | 7.49 | 9.05  |
|                 | 4H   | 6.97             | 7.43 | 8.11 | 8.56 | 10.14 | 6.54           | 7.00 | 7.69 | 8.13 | 9.72  |
|                 | 6H   | 7.48             | 7.87 | 8.63 | 9.03 | 10.60 | 7.05           | 7.44 | 8.20 | 8.59 | 10.17 |
|                 | 8H   | 7.63             | 8.00 | 8.78 | 9.14 | 10.73 | 7.19           | 7.56 | 8.34 | 8.70 | 10.30 |
|                 | 12H  | 7.70             | 8.03 | 8.86 | 9.19 | 10.78 | 7.25           | 7.58 | 8.41 | 8.74 | 10.33 |
| 8H              | 4H   | 7.15             | 7.52 | 8.30 | 8.67 | 10.26 | 6.78           | 7.14 | 7.93 | 8.29 | 9.88  |
|                 | 6H   | 7.78             | 8.09 | 8.95 | 9.27 | 10.86 | 7.40           | 7.70 | 8.57 | 8.89 | 10.48 |
|                 | 8H   | 8.01             | 8.27 | 9.18 | 9.44 | 11.05 | 7.61           | 7.88 | 8.79 | 9.04 | 10.65 |
|                 | 12H  | 8.13             | 8.37 | 9.32 | 9.53 | 11.17 | 7.72           | 7.96 | 8.90 | 9.12 | 10.76 |
| 12H             | 4H   | 7.13             | 7.46 | 8.30 | 8.62 | 10.22 | 6.76           | 7.10 | 7.93 | 8.25 | 9.85  |
|                 | 6H   | 7.81             | 8.08 | 8.99 | 9.24 | 10.85 | 7.44           | 7.71 | 8.62 | 8.87 | 10.48 |
|                 | 8H   | 8.05             | 8.28 | 9.23 | 9.45 | 11.09 | 7.67           | 7.90 | 8.85 | 9.07 | 10.71 |