

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: P924116

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

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P924116  
REPORT IS A COMBINATION OF REPORTS P899128 AND P895967  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-4P4F0-030D070US950-RLLFLL  
Description: 4 foot, 90deg - 4way Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

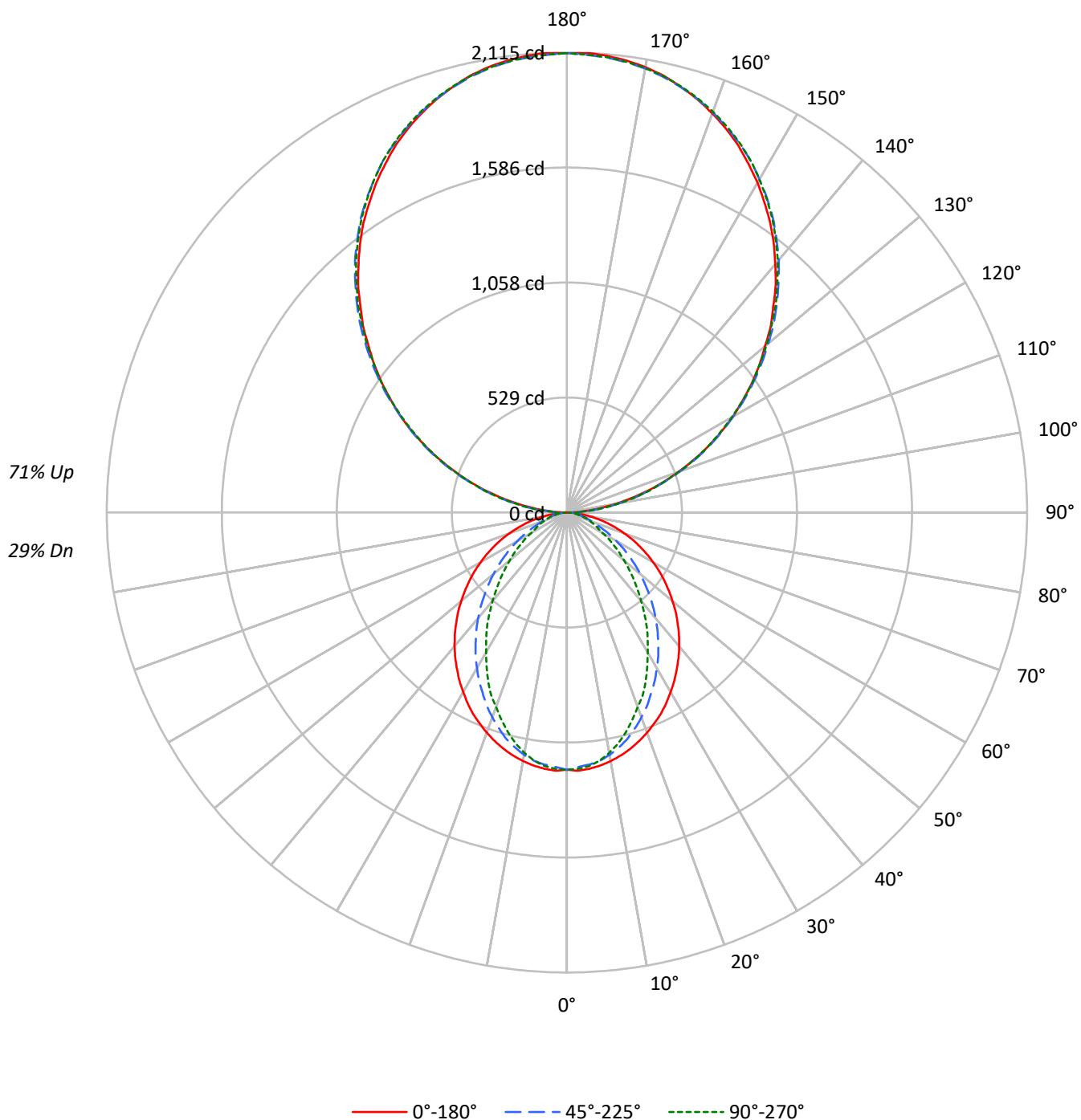
Lumens per Lamp: N/A  
Luminaire Lumens: 8342.7 lumens  
Efficiency: N/A  
Efficacy: 93.9 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 4.07' x L: 4.07' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 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: P924116

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**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 | 37 | 37 | 37 |
| 1   | 93  | 89  | 86  | 82  | 84 | 80 | 77 | 74 | 63 | 61 | 59 | 48 | 46 | 45 | 33 | 32 | 32 |
| 2   | 85  | 78  | 72  | 68  | 76 | 70 | 66 | 61 | 56 | 52 | 49 | 42 | 40 | 38 | 29 | 28 | 27 |
| 3   | 78  | 69  | 62  | 57  | 70 | 62 | 56 | 52 | 49 | 45 | 42 | 37 | 35 | 32 | 26 | 25 | 23 |
| 4   | 71  | 61  | 54  | 48  | 64 | 55 | 49 | 44 | 44 | 39 | 36 | 33 | 30 | 28 | 24 | 22 | 20 |
| 5   | 65  | 54  | 47  | 41  | 59 | 49 | 43 | 38 | 39 | 35 | 31 | 30 | 27 | 24 | 21 | 19 | 18 |
| 6   | 60  | 49  | 41  | 36  | 54 | 44 | 38 | 33 | 35 | 31 | 27 | 27 | 24 | 21 | 20 | 17 | 16 |
| 7   | 56  | 44  | 36  | 31  | 50 | 40 | 33 | 29 | 32 | 27 | 24 | 25 | 21 | 19 | 18 | 16 | 14 |
| 8   | 52  | 40  | 33  | 27  | 46 | 36 | 30 | 25 | 29 | 24 | 21 | 23 | 19 | 17 | 16 | 14 | 13 |
| 9   | 48  | 36  | 29  | 24  | 43 | 33 | 27 | 23 | 27 | 22 | 19 | 21 | 18 | 15 | 15 | 13 | 12 |
| 10  | 45  | 33  | 26  | 22  | 40 | 30 | 24 | 20 | 25 | 20 | 17 | 19 | 16 | 14 | 14 | 12 | 11 |

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

|     | 0°  | 45° | 90° |
|-----|-----|-----|-----|
| 0°  | 767 | 767 | 767 |
| 5°  | 769 | 755 | 760 |
| 10° | 761 | 741 | 736 |
| 15° | 751 | 717 | 698 |
| 20° | 737 | 683 | 651 |
| 25° | 723 | 645 | 606 |
| 30° | 704 | 607 | 549 |
| 35° | 685 | 565 | 498 |
| 40° | 666 | 522 | 441 |
| 45° | 644 | 475 | 388 |
| 50° | 621 | 426 | 337 |
| 55° | 598 | 375 | 288 |
| 60° | 570 | 321 | 237 |
| 65° | 539 | 266 | 214 |
| 70° | 500 | 215 | 194 |
| 75° | 452 | 190 | 177 |
| 80° | 383 | 160 | 154 |
| 85° | 267 | 108 | 118 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1599 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 110.9  | 1.3       |
| 10°-20°   | 304.3  | 3.6       |
| 20°-30°   | 427.3  | 5.1       |
| 30°-40°   | 465.7  | 5.6       |
| 40°-50°   | 428.1  | 5.1       |
| 50°-60°   | 336.2  | 4.0       |
| 60°-70°   | 218.8  | 2.6       |
| 70°-80°   | 112.6  | 1.4       |
| 80°-90°   | 34.8   | 0.4       |
| 90°-100°  | 130.7  | 1.6       |
| 100°-110° | 415.3  | 5.0       |
| 110°-120° | 710.6  | 8.5       |
| 120°-130° | 934.6  | 11.2      |
| 130°-140° | 1049.0 | 12.6      |
| 140°-150° | 1028.7 | 12.3      |
| 150°-160° | 862.9  | 10.3      |
| 160°-170° | 572.3  | 6.9       |
| 170°-180° | 200.0  | 2.4       |
| 0°-30°    | 842.5  | 10.1      |
| 0°-40°    | 1308.2 | 15.7      |
| 0°-60°    | 2072.5 | 24.8      |
| 0°-90°    | 2438.7 | 29.2      |
| 90°-120°  | 1256.6 | 15.1      |
| 90°-150°  | 4268.9 | 51.2      |
| 90°-180°  | 5904.0 | 70.8      |
| 0°-180°   | 8342.7 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1183 | 1183  | 1183 | 1183  | 1183 |      |
| 5°   | 1183 | 1178  | 1164 | 1173  | 1170 | 112  |
| 15°  | 1125 | 1113  | 1077 | 1057  | 1046 | 317  |
| 25°  | 1021 | 987   | 916  | 872   | 856  | 470  |
| 35°  | 880  | 825   | 731  | 664   | 640  | 551  |
| 45°  | 719  | 648   | 535  | 459   | 434  | 556  |
| 55°  | 547  | 464   | 348  | 284   | 263  | 489  |
| 65°  | 369  | 283   | 186  | 150   | 147  | 366  |
| 75°  | 197  | 122   | 86   | 78    | 77   | 208  |
| 85°  | 46   | 24    | 20   | 20    | 20   | 53   |
| 90°  | 2    | 23    | 62   | 59    | 60   | 8    |
| 95°  | 93   | 111   | 114  | 114   | 111  | 103  |
| 105° | 383  | 388   | 392  | 395   | 395  | 405  |
| 115° | 713  | 723   | 720  | 718   | 713  | 705  |
| 125° | 1037 | 1053  | 1048 | 1042  | 1040 | 927  |
| 135° | 1342 | 1361  | 1365 | 1363  | 1358 | 1037 |
| 145° | 1629 | 1642  | 1652 | 1654  | 1647 | 1018 |
| 155° | 1862 | 1868  | 1873 | 1882  | 1876 | 857  |
| 165° | 2026 | 2024  | 2024 | 2037  | 2028 | 572  |
| 175° | 2108 | 2103  | 2099 | 2112  | 2101 | 200  |
| 180° | 2112 | 2112  | 2112 | 2112  | 2112 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1182.9 | 1182.9 | 1182.9 | 1182.9 | 1182.9 |
| 2.5°   | 1188.2 | 1182.9 | 1171.0 | 1181.8 | 1179.7 |
| 5°     | 1182.9 | 1177.5 | 1163.6 | 1173.2 | 1170.0 |
| 7.5°   | 1173.2 | 1166.8 | 1151.9 | 1156.1 | 1150.7 |
| 10°    | 1160.4 | 1152.9 | 1131.5 | 1128.2 | 1121.9 |
| 12.5°  | 1144.3 | 1134.7 | 1105.8 | 1099.4 | 1087.6 |
| 15°    | 1125.1 | 1113.2 | 1076.9 | 1056.6 | 1045.9 |
| 17.5°  | 1102.5 | 1085.5 | 1040.4 | 1017.0 | 999.8  |
| 20°    | 1076.9 | 1055.4 | 1001.9 | 975.3  | 951.6  |
| 22.5°  | 1049.1 | 1024.4 | 962.3  | 926.0  | 909.9  |
| 25°    | 1021.3 | 986.9  | 916.3  | 872.4  | 856.3  |
| 27.5°  | 988.1  | 951.6  | 873.5  | 823.2  | 798.5  |
| 30°    | 952.8  | 912.0  | 826.4  | 771.9  | 742.9  |
| 32.5°  | 918.4  | 869.2  | 781.5  | 717.2  | 690.4  |
| 35°    | 880.0  | 825.3  | 731.1  | 663.7  | 640.1  |
| 37.5°  | 842.5  | 783.5  | 684.0  | 610.1  | 583.5  |
| 40°    | 802.9  | 738.7  | 634.8  | 558.8  | 531.0  |
| 42.5°  | 762.2  | 693.7  | 585.6  | 506.3  | 479.6  |
| 45°    | 719.4  | 647.6  | 535.3  | 459.2  | 433.5  |
| 47.5°  | 678.7  | 602.7  | 487.1  | 411.0  | 387.5  |
| 50°    | 633.7  | 557.7  | 440.0  | 366.0  | 343.6  |
| 52.5°  | 589.8  | 509.5  | 395.1  | 324.4  | 304.0  |
| 55°    | 546.9  | 463.5  | 347.8  | 283.7  | 263.4  |
| 57.5°  | 503.1  | 417.5  | 306.2  | 246.2  | 229.1  |
| 60°    | 458.1  | 372.5  | 262.3  | 207.7  | 190.6  |
| 62.5°  | 414.3  | 328.7  | 224.8  | 173.4  | 164.9  |
| 65°    | 369.3  | 282.6  | 186.2  | 149.9  | 146.6  |
| 67.5°  | 326.6  | 239.7  | 149.9  | 131.7  | 128.4  |
| 70°    | 281.5  | 198.1  | 124.1  | 113.4  | 109.1  |
| 72.5°  | 238.7  | 159.4  | 103.8  | 95.3   | 93.1   |
| 75°    | 196.9  | 122.0  | 85.7   | 78.1   | 77.1   |
| 77.5°  | 155.2  | 86.6   | 67.4   | 63.2   | 61.0   |
| 80°    | 116.7  | 62.1   | 51.3   | 47.1   | 47.1   |
| 82.5°  | 81.3   | 41.8   | 35.3   | 33.2   | 33.2   |
| 85°    | 46.0   | 23.5   | 20.3   | 20.3   | 20.3   |
| 87.5°  | 17.2   | 8.5    | 8.5    | 7.5    | 7.5    |
| 90°    | 1.9    | 22.9   | 62.4   | 58.6   | 60.5   |
| 92.5°  | 39.5   | 53.5   | 55.4   | 57.3   | 57.3   |
| 95°    | 92.9   | 110.8  | 114.0  | 114.0  | 110.8  |
| 97.5°  | 154.7  | 171.2  | 178.3  | 178.3  | 178.3  |
| 100°   | 226.0  | 240.7  | 245.8  | 245.8  | 243.8  |
| 102.5° | 301.2  | 312.0  | 319.0  | 320.9  | 319.0  |
| 105°   | 383.3  | 388.4  | 392.2  | 395.4  | 395.4  |
| 107.5° | 464.8  | 472.4  | 472.4  | 473.8  | 464.8  |
| 110°   | 543.8  | 554.0  | 554.0  | 554.0  | 548.8  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 629.1  | 639.9  | 638.0  | 632.9  | 629.1  |
| 115°   | 713.1  | 723.3  | 720.2  | 718.3  | 713.1  |
| 117.5° | 796.5  | 810.5  | 801.6  | 796.5  | 791.4  |
| 120°   | 880.5  | 894.6  | 880.5  | 880.5  | 874.8  |
| 122.5° | 957.0  | 974.8  | 965.9  | 960.8  | 957.0  |
| 125°   | 1037.2 | 1053.1 | 1048.1 | 1042.3 | 1040.4 |
| 127.5° | 1115.5 | 1135.3 | 1128.3 | 1120.7 | 1115.5 |
| 130°   | 1188.8 | 1211.7 | 1208.5 | 1204.7 | 1197.7 |
| 132.5° | 1270.9 | 1288.8 | 1290.0 | 1281.1 | 1276.0 |
| 135°   | 1341.6 | 1361.3 | 1365.2 | 1363.2 | 1358.1 |
| 137.5° | 1420.5 | 1436.4 | 1439.6 | 1438.3 | 1430.7 |
| 140°   | 1490.0 | 1505.9 | 1514.8 | 1514.8 | 1507.8 |
| 142.5° | 1561.2 | 1577.2 | 1582.2 | 1584.1 | 1577.2 |
| 145°   | 1628.8 | 1641.5 | 1651.7 | 1653.6 | 1646.6 |
| 147.5° | 1689.2 | 1705.2 | 1712.8 | 1716.0 | 1709.0 |
| 150°   | 1751.6 | 1762.4 | 1769.5 | 1775.2 | 1769.5 |
| 152.5° | 1807.0 | 1817.8 | 1826.7 | 1833.8 | 1826.7 |
| 155°   | 1862.4 | 1867.5 | 1873.3 | 1882.1 | 1876.4 |
| 157.5° | 1910.2 | 1914.0 | 1917.2 | 1929.9 | 1921.0 |
| 160°   | 1952.8 | 1956.7 | 1958.6 | 1969.3 | 1961.7 |
| 162.5° | 1992.3 | 1992.3 | 1994.2 | 2006.3 | 1997.4 |
| 165°   | 2026.0 | 2024.1 | 2024.1 | 2036.9 | 2027.9 |
| 167.5° | 2056.6 | 2050.9 | 2050.9 | 2063.6 | 2054.7 |
| 170°   | 2079.5 | 2074.5 | 2072.6 | 2085.3 | 2074.5 |
| 172.5° | 2095.5 | 2090.3 | 2088.4 | 2101.2 | 2090.3 |
| 175°   | 2108.1 | 2103.1 | 2099.3 | 2112.0 | 2101.2 |
| 177.5° | 2115.2 | 2110.1 | 2106.2 | 2117.1 | 2106.2 |
| 180°   | 2112.0 | 2112.0 | 2112.0 | 2112.0 | 2112.0 |

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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 | 3.90             | 4.59 | 5.03 | 5.70 | 7.24  | 0.00           | 0.55 | 0.99 | 1.66 | 3.20 |
|                 | 3H   | 5.58             | 6.19 | 6.71 | 7.31 | 8.87  | 1.04           | 1.66 | 2.17 | 2.78 | 4.33 |
|                 | 4H   | 6.18             | 6.76 | 7.32 | 7.88 | 9.45  | 1.49           | 2.07 | 2.63 | 3.19 | 4.75 |
|                 | 6H   | 6.60             | 7.13 | 7.75 | 8.26 | 9.83  | 1.80           | 2.34 | 2.95 | 3.46 | 5.04 |
|                 | 8H   | 6.73             | 7.23 | 7.88 | 8.37 | 9.94  | 1.89           | 2.40 | 3.04 | 3.54 | 5.10 |
|                 | 12H  | 6.78             | 7.27 | 7.94 | 8.40 | 9.99  | 1.93           | 2.41 | 3.08 | 3.54 | 5.13 |
| 4H              | 2H   | 3.90             | 4.49 | 5.05 | 5.61 | 7.17  | 0.44           | 1.03 | 1.59 | 2.15 | 3.71 |
|                 | 3H   | 5.73             | 6.21 | 6.88 | 7.36 | 8.93  | 1.78           | 2.27 | 2.93 | 3.41 | 4.99 |
|                 | 4H   | 6.42             | 6.86 | 7.57 | 8.00 | 9.59  | 2.33           | 2.77 | 3.48 | 3.91 | 5.50 |
|                 | 6H   | 6.93             | 7.31 | 8.09 | 8.47 | 10.05 | 2.74           | 3.12 | 3.90 | 4.28 | 5.87 |
|                 | 8H   | 7.11             | 7.46 | 8.26 | 8.61 | 10.21 | 2.87           | 3.22 | 4.03 | 4.37 | 5.98 |
|                 | 12H  | 7.20             | 7.52 | 8.37 | 8.68 | 10.29 | 2.93           | 3.25 | 4.10 | 4.41 | 6.02 |
| 8H              | 4H   | 6.37             | 6.73 | 7.53 | 7.88 | 9.48  | 2.60           | 2.95 | 3.76 | 4.10 | 5.71 |
|                 | 6H   | 6.94             | 7.23 | 8.12 | 8.43 | 10.03 | 3.12           | 3.41 | 4.29 | 4.60 | 6.20 |
|                 | 8H   | 7.16             | 7.42 | 8.35 | 8.59 | 10.21 | 3.31           | 3.56 | 4.49 | 4.73 | 6.35 |
|                 | 12H  | 7.30             | 7.52 | 8.49 | 8.69 | 10.34 | 3.42           | 3.65 | 4.61 | 4.81 | 6.47 |
| 12H             | 4H   | 6.32             | 6.64 | 7.50 | 7.80 | 9.41  | 2.60           | 2.92 | 3.77 | 4.08 | 5.69 |
|                 | 6H   | 6.92             | 7.17 | 8.10 | 8.34 | 9.96  | 3.17           | 3.42 | 4.35 | 4.59 | 6.21 |
|                 | 8H   | 7.13             | 7.36 | 8.32 | 8.53 | 10.18 | 3.37           | 3.60 | 4.56 | 4.76 | 6.42 |