

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: P916181

Luminaire Tested: DFN2DIP-HX3F0-030D090US930-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P916181  
REPORT IS A COMBINATION OF REPORTS P899286 AND P896089  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX3F0-030D090US930-RLLFLL  
Description: 3 foot, Hexagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

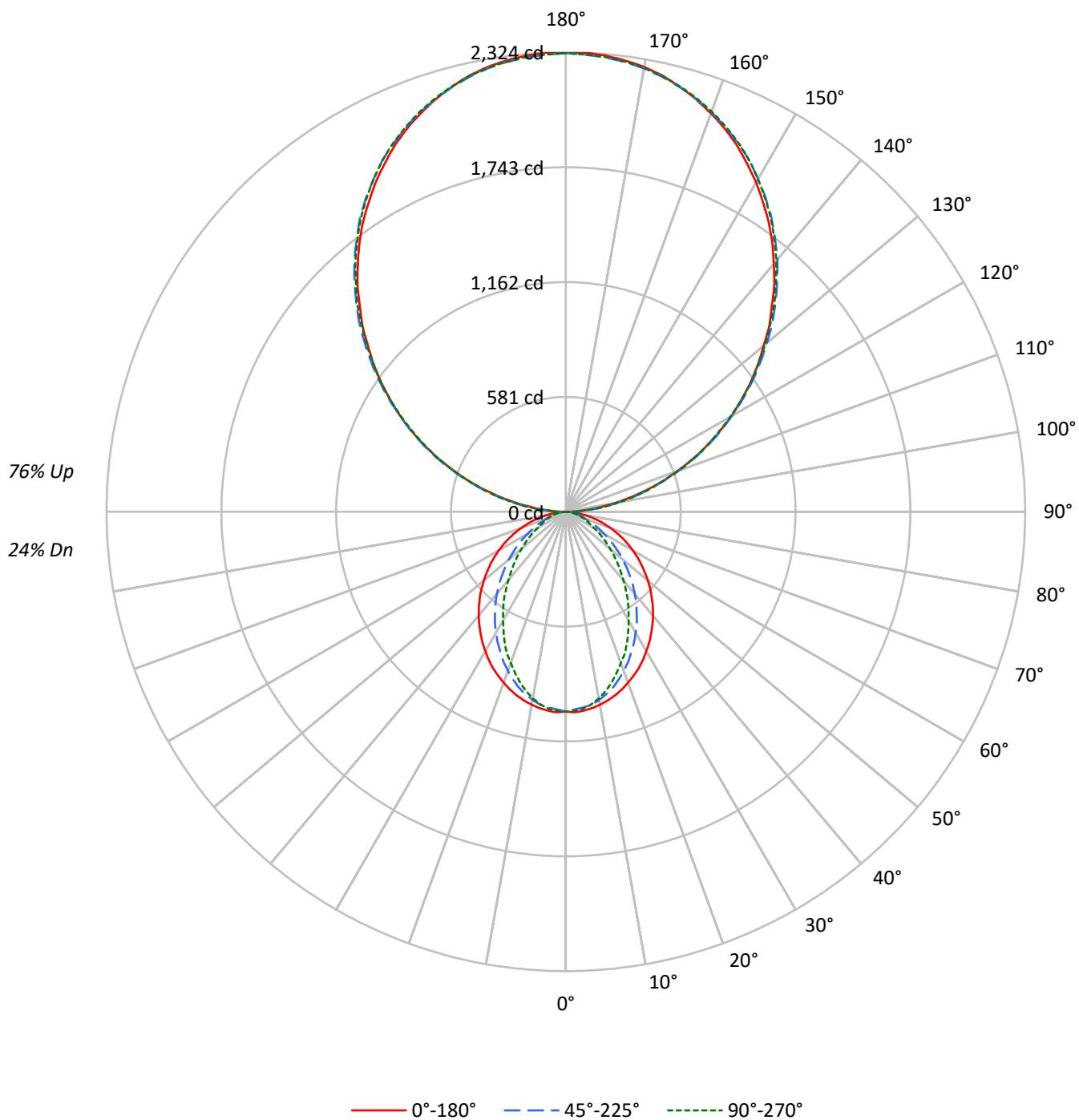
Lumens per Lamp: N/A  
Luminaire Lumens: 8572.8 lumens  
Efficiency: N/A  
Efficacy: 90.4 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 2.84' x L: 3.28' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 94.8  
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: P916181

CATALOG NUMBER: DFN2DIP-HX3F0-030D090US930-RLFL

**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   | 101 | 101 | 101 | 101 | 90 | 90 | 90 | 90 | 69 | 69 | 69 | 50 | 50 | 50 | 33 | 33 | 33 |
| 1   | 92  | 88  | 85  | 81  | 82 | 79 | 76 | 73 | 61 | 59 | 57 | 44 | 43 | 42 | 29 | 28 | 28 |
| 2   | 84  | 77  | 71  | 67  | 75 | 69 | 64 | 60 | 53 | 50 | 47 | 39 | 37 | 35 | 26 | 25 | 24 |
| 3   | 77  | 68  | 61  | 56  | 68 | 61 | 55 | 50 | 47 | 43 | 40 | 35 | 32 | 30 | 23 | 22 | 20 |
| 4   | 70  | 60  | 53  | 47  | 62 | 54 | 48 | 43 | 42 | 38 | 34 | 31 | 28 | 26 | 21 | 19 | 18 |
| 5   | 64  | 54  | 46  | 40  | 57 | 48 | 42 | 37 | 38 | 33 | 29 | 28 | 25 | 22 | 19 | 17 | 16 |
| 6   | 59  | 48  | 40  | 35  | 53 | 43 | 37 | 32 | 34 | 29 | 26 | 25 | 22 | 20 | 17 | 15 | 14 |
| 7   | 55  | 43  | 36  | 30  | 49 | 39 | 32 | 28 | 31 | 26 | 23 | 23 | 20 | 17 | 16 | 14 | 12 |
| 8   | 51  | 39  | 32  | 27  | 45 | 35 | 29 | 24 | 28 | 23 | 20 | 21 | 18 | 16 | 14 | 12 | 11 |
| 9   | 47  | 36  | 29  | 24  | 42 | 32 | 26 | 22 | 25 | 21 | 18 | 19 | 16 | 14 | 13 | 11 | 10 |
| 10  | 44  | 33  | 26  | 21  | 39 | 29 | 23 | 19 | 23 | 19 | 16 | 18 | 15 | 13 | 12 | 10 | 9  |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1171 | 1171 | 1171 |
| 5°  | 1172 | 1152 | 1159 |
| 10° | 1160 | 1128 | 1121 |
| 15° | 1144 | 1090 | 1062 |
| 20° | 1122 | 1038 | 990  |
| 25° | 1100 | 980  | 920  |
| 30° | 1070 | 920  | 832  |
| 35° | 1041 | 856  | 755  |
| 40° | 1012 | 790  | 666  |
| 45° | 977  | 716  | 586  |
| 50° | 942  | 642  | 508  |
| 55° | 904  | 563  | 433  |
| 60° | 861  | 480  | 356  |
| 65° | 812  | 397  | 319  |
| 70° | 752  | 319  | 288  |
| 75° | 676  | 279  | 261  |
| 80° | 567  | 232  | 224  |
| 85° | 387  | 151  | 165  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 2182 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 94.7   | 1.1       |
| 10°-20°   | 260.1  | 3.0       |
| 20°-30°   | 365.1  | 4.3       |
| 30°-40°   | 398.0  | 4.6       |
| 40°-50°   | 365.8  | 4.3       |
| 50°-60°   | 287.3  | 3.4       |
| 60°-70°   | 187.0  | 2.2       |
| 70°-80°   | 96.3   | 1.1       |
| 80°-90°   | 31.2   | 0.4       |
| 90°-100°  | 143.6  | 1.7       |
| 100°-110° | 456.3  | 5.3       |
| 110°-120° | 780.8  | 9.1       |
| 120°-130° | 1026.9 | 12.0      |
| 130°-140° | 1152.6 | 13.4      |
| 140°-150° | 1130.3 | 13.2      |
| 150°-160° | 948.2  | 11.1      |
| 160°-170° | 628.8  | 7.3       |
| 170°-180° | 219.8  | 2.6       |
| 0°-30°    | 720.0  | 8.4       |
| 0°-40°    | 1118.0 | 13.0      |
| 0°-60°    | 1771.2 | 20.7      |
| 0°-90°    | 2085.6 | 24.3      |
| 90°-120°  | 1380.7 | 16.1      |
| 90°-150°  | 4690.5 | 54.7      |
| 90°-180°  | 6487.0 | 75.7      |
| 0°-180°   | 8572.8 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1011 | 1011  | 1011 | 1011  | 1011 |      |
| 5°   | 1011 | 1006  | 994  | 1003  | 1000 | 96   |
| 15°  | 962  | 951   | 920  | 903   | 894  | 271  |
| 25°  | 873  | 843   | 783  | 746   | 732  | 401  |
| 35°  | 752  | 705   | 625  | 567   | 547  | 471  |
| 45°  | 615  | 553   | 458  | 392   | 370  | 475  |
| 55°  | 467  | 396   | 297  | 242   | 225  | 418  |
| 65°  | 316  | 242   | 159  | 128   | 125  | 313  |
| 75°  | 168  | 104   | 73   | 67    | 66   | 178  |
| 85°  | 39   | 20    | 17   | 17    | 17   | 45   |
| 90°  | 2    | 25    | 69   | 64    | 66   | 9    |
| 95°  | 102  | 122   | 125  | 125   | 122  | 114  |
| 105° | 421  | 427   | 431  | 434   | 434  | 444  |
| 115° | 784  | 795   | 791  | 789   | 784  | 775  |
| 125° | 1140 | 1157  | 1152 | 1145  | 1143 | 1018 |
| 135° | 1474 | 1496  | 1500 | 1498  | 1492 | 1139 |
| 145° | 1790 | 1804  | 1815 | 1817  | 1809 | 1118 |
| 155° | 2046 | 2052  | 2058 | 2068  | 2062 | 942  |
| 165° | 2226 | 2224  | 2224 | 2238  | 2228 | 628  |
| 175° | 2316 | 2311  | 2307 | 2321  | 2309 | 220  |
| 180° | 2321 | 2321  | 2321 | 2321  | 2321 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1010.9 | 1010.9 | 1010.9 | 1010.9 | 1010.9 |
| 2.5°   | 1015.5 | 1010.9 | 1000.8 | 1010.0 | 1008.2 |
| 5°     | 1010.9 | 1006.3 | 994.4  | 1002.7 | 999.9  |
| 7.5°   | 1002.7 | 997.2  | 984.4  | 988.0  | 983.4  |
| 10°    | 991.6  | 985.3  | 967.0  | 964.2  | 958.8  |
| 12.5°  | 978.0  | 969.7  | 945.0  | 939.5  | 929.4  |
| 15°    | 961.5  | 951.4  | 920.3  | 902.9  | 893.8  |
| 17.5°  | 942.2  | 927.6  | 889.2  | 869.1  | 854.4  |
| 20°    | 920.3  | 902.0  | 856.2  | 833.5  | 813.3  |
| 22.5°  | 896.6  | 875.5  | 822.4  | 791.3  | 777.6  |
| 25°    | 872.8  | 843.4  | 783.1  | 745.6  | 731.8  |
| 27.5°  | 844.4  | 813.3  | 746.5  | 703.5  | 682.4  |
| 30°    | 814.2  | 779.4  | 706.2  | 659.7  | 634.9  |
| 32.5°  | 784.9  | 742.8  | 667.9  | 612.9  | 590.0  |
| 35°    | 752.0  | 705.3  | 624.8  | 567.2  | 547.1  |
| 37.5°  | 720.0  | 669.6  | 584.6  | 521.4  | 498.6  |
| 40°    | 686.2  | 631.3  | 542.5  | 477.5  | 453.8  |
| 42.5°  | 651.3  | 592.9  | 500.4  | 432.7  | 409.9  |
| 45°    | 614.8  | 553.4  | 457.5  | 392.4  | 370.5  |
| 47.5°  | 580.0  | 515.1  | 416.3  | 351.2  | 331.2  |
| 50°    | 541.6  | 476.6  | 376.0  | 312.8  | 293.7  |
| 52.5°  | 504.0  | 435.5  | 337.6  | 277.2  | 259.8  |
| 55°    | 467.4  | 396.1  | 297.3  | 242.5  | 225.1  |
| 57.5°  | 430.0  | 356.8  | 261.7  | 210.4  | 195.8  |
| 60°    | 391.5  | 318.4  | 224.1  | 177.5  | 162.9  |
| 62.5°  | 354.1  | 280.9  | 192.1  | 148.2  | 141.0  |
| 65°    | 315.6  | 241.5  | 159.1  | 128.1  | 125.3  |
| 67.5°  | 279.1  | 204.9  | 128.1  | 112.5  | 109.7  |
| 70°    | 240.6  | 169.3  | 106.1  | 96.9   | 93.3   |
| 72.5°  | 204.0  | 136.2  | 88.7   | 81.4   | 79.6   |
| 75°    | 168.3  | 104.3  | 73.2   | 66.8   | 65.9   |
| 77.5°  | 132.6  | 74.0   | 57.6   | 54.0   | 52.1   |
| 80°    | 99.7   | 53.1   | 43.9   | 40.3   | 40.3   |
| 82.5°  | 69.5   | 35.7   | 30.2   | 28.4   | 28.4   |
| 85°    | 39.3   | 20.1   | 17.4   | 17.4   | 17.4   |
| 87.5°  | 14.7   | 7.3    | 7.3    | 6.4    | 6.4    |
| 90°    | 2.1    | 25.2   | 68.6   | 64.3   | 66.4   |
| 92.5°  | 43.4   | 58.8   | 60.9   | 62.9   | 62.9   |
| 95°    | 102.2  | 121.7  | 125.2  | 125.2  | 121.7  |
| 97.5°  | 170.0  | 188.2  | 195.9  | 195.9  | 195.9  |
| 100°   | 248.3  | 264.5  | 270.0  | 270.0  | 268.0  |
| 102.5° | 330.9  | 342.8  | 350.5  | 352.6  | 350.5  |
| 105°   | 421.2  | 426.7  | 431.0  | 434.5  | 434.5  |
| 107.5° | 510.7  | 519.1  | 519.1  | 520.5  | 510.7  |
| 110°   | 597.5  | 608.7  | 608.7  | 608.7  | 603.1  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 691.2  | 703.1  | 701.0  | 695.4  | 691.2  |
| 115°   | 783.6  | 794.8  | 791.2  | 789.2  | 783.6  |
| 117.5° | 875.2  | 890.6  | 880.8  | 875.2  | 869.6  |
| 120°   | 967.6  | 982.9  | 967.6  | 967.6  | 961.2  |
| 122.5° | 1051.5 | 1071.1 | 1061.4 | 1055.7 | 1051.5 |
| 125°   | 1139.7 | 1157.2 | 1151.6 | 1145.2 | 1143.2 |
| 127.5° | 1225.7 | 1247.4 | 1239.7 | 1231.3 | 1225.7 |
| 130°   | 1306.2 | 1331.4 | 1327.9 | 1323.6 | 1316.0 |
| 132.5° | 1396.4 | 1416.0 | 1417.4 | 1407.6 | 1402.1 |
| 135°   | 1474.1 | 1495.7 | 1500.0 | 1497.9 | 1492.3 |
| 137.5° | 1560.8 | 1578.3 | 1581.8 | 1580.5 | 1572.1 |
| 140°   | 1637.1 | 1654.6 | 1664.3 | 1664.3 | 1656.7 |
| 142.5° | 1715.5 | 1732.9 | 1738.5 | 1740.7 | 1732.9 |
| 145°   | 1789.7 | 1803.6 | 1814.8 | 1816.9 | 1809.2 |
| 147.5° | 1856.1 | 1873.6 | 1882.0 | 1885.5 | 1877.8 |
| 150°   | 1924.7 | 1936.6 | 1944.2 | 1950.5 | 1944.2 |
| 152.5° | 1985.5 | 1997.4 | 2007.2 | 2014.9 | 2007.2 |
| 155°   | 2046.4 | 2051.9 | 2058.3 | 2068.1 | 2061.8 |
| 157.5° | 2098.8 | 2103.1 | 2106.6 | 2120.5 | 2110.7 |
| 160°   | 2145.7 | 2149.9 | 2152.1 | 2163.9 | 2155.5 |
| 162.5° | 2189.1 | 2189.1 | 2191.2 | 2204.5 | 2194.7 |
| 165°   | 2226.2 | 2224.1 | 2224.1 | 2238.1 | 2228.3 |
| 167.5° | 2259.8 | 2253.5 | 2253.5 | 2267.4 | 2257.6 |
| 170°   | 2285.0 | 2279.3 | 2277.3 | 2291.2 | 2279.3 |
| 172.5° | 2302.4 | 2296.9 | 2294.7 | 2308.8 | 2296.9 |
| 175°   | 2316.4 | 2310.8 | 2306.6 | 2320.7 | 2308.8 |
| 177.5° | 2324.1 | 2318.5 | 2314.3 | 2326.2 | 2314.3 |
| 180°   | 2320.7 | 2320.7 | 2320.7 | 2320.7 | 2320.7 |

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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 | 4.57             | 5.22 | 5.72 | 6.36 | 7.96  | 0.54           | 1.20 | 1.70 | 2.34 | 3.94 |
|                 | 3H   | 6.22             | 6.81 | 7.39 | 7.96 | 9.57  | 1.71           | 2.30 | 2.87 | 3.45 | 5.06 |
|                 | 4H   | 6.82             | 7.38 | 7.99 | 8.52 | 10.14 | 2.15           | 2.71 | 3.32 | 3.86 | 5.47 |
|                 | 6H   | 7.22             | 7.74 | 8.40 | 8.89 | 10.52 | 2.46           | 2.97 | 3.64 | 4.12 | 5.75 |
|                 | 8H   | 7.34             | 7.83 | 8.52 | 8.99 | 10.61 | 2.54           | 3.03 | 3.72 | 4.20 | 5.82 |
|                 | 12H  | 7.40             | 7.86 | 8.58 | 9.02 | 10.66 | 2.58           | 3.04 | 3.76 | 4.20 | 5.84 |
| 4H              | 2H   | 4.56             | 5.12 | 5.74 | 6.27 | 7.88  | 1.11           | 1.67 | 2.29 | 2.82 | 4.43 |
|                 | 3H   | 6.37             | 6.83 | 7.55 | 8.00 | 9.63  | 2.44           | 2.90 | 3.62 | 4.08 | 5.71 |
|                 | 4H   | 7.05             | 7.47 | 8.23 | 8.63 | 10.28 | 2.98           | 3.41 | 4.16 | 4.57 | 6.21 |
|                 | 6H   | 7.54             | 7.91 | 8.73 | 9.09 | 10.73 | 3.38           | 3.75 | 4.57 | 4.93 | 6.57 |
|                 | 8H   | 7.71             | 8.05 | 8.90 | 9.23 | 10.88 | 3.51           | 3.85 | 4.69 | 5.02 | 6.68 |
|                 | 12H  | 7.79             | 8.10 | 9.00 | 9.29 | 10.95 | 3.56           | 3.87 | 4.76 | 5.06 | 6.71 |
| 8H              | 4H   | 7.00             | 7.34 | 8.19 | 8.52 | 10.17 | 3.24           | 3.58 | 4.43 | 4.76 | 6.41 |
|                 | 6H   | 7.55             | 7.83 | 8.76 | 9.05 | 10.70 | 3.75           | 4.03 | 4.95 | 5.25 | 6.90 |
|                 | 8H   | 7.76             | 8.01 | 8.97 | 9.20 | 10.87 | 3.93           | 4.18 | 5.14 | 5.37 | 7.04 |
|                 | 12H  | 7.89             | 8.10 | 9.10 | 9.29 | 11.00 | 4.04           | 4.26 | 5.26 | 5.45 | 7.15 |
| 12H             | 4H   | 6.94             | 7.25 | 8.15 | 8.44 | 10.10 | 3.24           | 3.55 | 4.44 | 4.73 | 6.39 |
|                 | 6H   | 7.53             | 7.77 | 8.74 | 8.96 | 10.64 | 3.79           | 4.04 | 5.00 | 5.23 | 6.90 |
|                 | 8H   | 7.73             | 7.95 | 8.95 | 9.14 | 10.84 | 3.99           | 4.21 | 5.21 | 5.40 | 7.10 |