

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: P915487

Luminaire Tested: DFN2DIP-TR4F0-040D120US927-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P915487  
REPORT IS A COMBINATION OF REPORTS P902033 AND P898849  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR4F0-040D120US927-FLLONL  
Description: 4 foot, Triangle Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

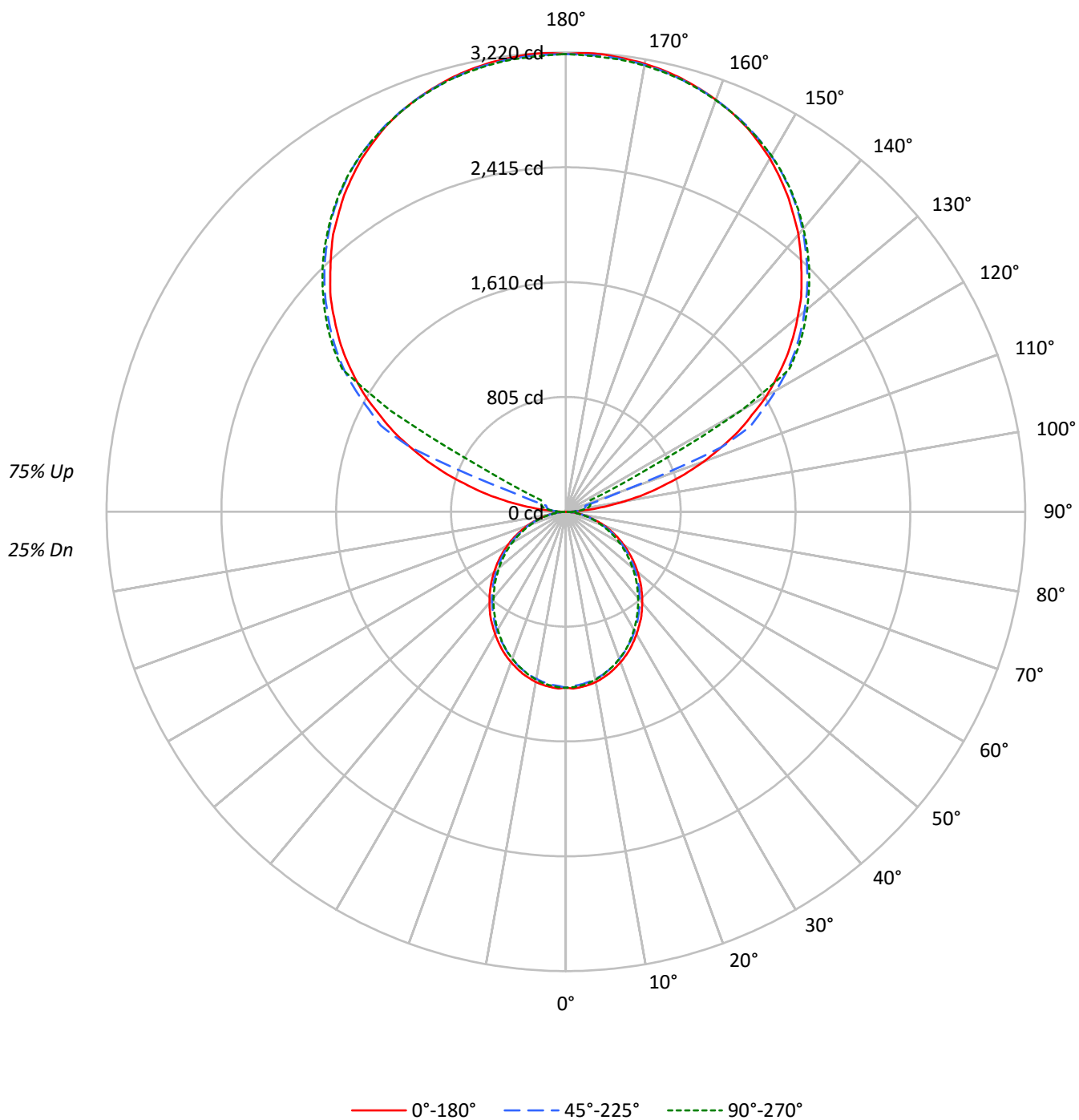
Lumens per Lamp: N/A  
Luminaire Lumens: 12548.1 lumens  
Efficiency: N/A  
Efficacy: 101.8 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.43' x L: 3.96' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 123.3  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9952  
Total Harmonic Distortion (THDi): 0.069  
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: P915487

CATALOG NUMBER: DFN2DIP-TR4F0-040D120US927-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   | 101 | 101 | 101 | 101 | 90 | 90 | 90 | 90 | 69 | 69 | 69 | 51 | 51 | 51 | 33 | 33 | 33 |
| 1   | 92  | 88  | 84  | 81  | 82 | 79 | 75 | 73 | 61 | 59 | 57 | 44 | 43 | 42 | 29 | 29 | 28 |
| 2   | 84  | 77  | 71  | 66  | 74 | 69 | 64 | 59 | 53 | 50 | 47 | 39 | 37 | 35 | 26 | 25 | 24 |
| 3   | 76  | 67  | 60  | 55  | 68 | 60 | 54 | 50 | 47 | 43 | 39 | 34 | 32 | 30 | 23 | 21 | 20 |
| 4   | 70  | 60  | 52  | 46  | 62 | 53 | 47 | 42 | 42 | 37 | 33 | 31 | 28 | 25 | 20 | 19 | 17 |
| 5   | 64  | 53  | 45  | 39  | 57 | 47 | 41 | 36 | 37 | 32 | 29 | 27 | 24 | 22 | 18 | 16 | 15 |
| 6   | 59  | 47  | 40  | 34  | 52 | 42 | 36 | 31 | 33 | 28 | 25 | 25 | 21 | 19 | 17 | 15 | 13 |
| 7   | 54  | 43  | 35  | 30  | 48 | 38 | 32 | 27 | 30 | 25 | 22 | 22 | 19 | 17 | 15 | 13 | 12 |
| 8   | 50  | 38  | 31  | 26  | 45 | 35 | 28 | 24 | 27 | 23 | 19 | 20 | 17 | 15 | 14 | 12 | 10 |
| 9   | 47  | 35  | 28  | 23  | 41 | 31 | 25 | 21 | 25 | 20 | 17 | 19 | 15 | 13 | 13 | 11 | 9  |
| 10  | 43  | 32  | 25  | 20  | 39 | 29 | 23 | 19 | 23 | 18 | 15 | 17 | 14 | 12 | 12 | 10 | 8  |

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

|     | 0°  | 45° | 90° |
|-----|-----|-----|-----|
| 0°  | 980 | 980 | 980 |
| 5°  | 981 | 966 | 972 |
| 10° | 973 | 953 | 959 |
| 15° | 959 | 937 | 939 |
| 20° | 939 | 915 | 918 |
| 25° | 920 | 889 | 893 |
| 30° | 896 | 865 | 862 |
| 35° | 873 | 836 | 829 |
| 40° | 845 | 807 | 798 |
| 45° | 817 | 778 | 766 |
| 50° | 787 | 748 | 729 |
| 55° | 754 | 713 | 695 |
| 60° | 718 | 671 | 656 |
| 65° | 679 | 628 | 610 |
| 70° | 628 | 575 | 561 |
| 75° | 559 | 512 | 515 |
| 80° | 475 | 431 | 428 |
| 85° | 344 | 293 | 284 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1704 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 116.0   | 0.9       |
| 10°-20°   | 326.5   | 2.6       |
| 20°-30°   | 479.8   | 3.8       |
| 30°-40°   | 557.3   | 4.4       |
| 40°-50°   | 556.6   | 4.4       |
| 50°-60°   | 485.3   | 3.9       |
| 60°-70°   | 358.8   | 2.9       |
| 70°-80°   | 203.0   | 1.6       |
| 80°-90°   | 59.2    | 0.5       |
| 90°-100°  | 105.8   | 0.8       |
| 100°-110° | 394.4   | 3.1       |
| 110°-120° | 1045.9  | 8.3       |
| 120°-130° | 1734.7  | 13.8      |
| 130°-140° | 1842.7  | 14.7      |
| 140°-150° | 1712.6  | 13.6      |
| 150°-160° | 1376.9  | 11.0      |
| 160°-170° | 887.2   | 7.1       |
| 170°-180° | 305.4   | 2.4       |
| 0°-30°    | 922.4   | 7.4       |
| 0°-40°    | 1479.7  | 11.8      |
| 0°-60°    | 2521.7  | 20.1      |
| 0°-90°    | 3142.7  | 25.0      |
| 90°-120°  | 1546.1  | 12.3      |
| 90°-150°  | 6836.0  | 54.5      |
| 90°-180°  | 9405.0  | 75.0      |
| 0°-180°   | 12548.1 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1233 | 1233  | 1233 | 1233  | 1233 |      |
| 5°   | 1233 | 1228  | 1215 | 1225  | 1222 | 117  |
| 15°  | 1174 | 1167  | 1151 | 1156  | 1150 | 331  |
| 25°  | 1062 | 1053  | 1033 | 1035  | 1033 | 489  |
| 35°  | 916  | 905   | 886  | 878   | 873  | 572  |
| 45°  | 746  | 738   | 720  | 707   | 702  | 576  |
| 55°  | 564  | 557   | 543  | 529   | 523  | 505  |
| 65°  | 381  | 373   | 362  | 351   | 345  | 376  |
| 75°  | 199  | 197   | 191  | 184   | 186  | 213  |
| 85°  | 49   | 48    | 46   | 43    | 42   | 54   |
| 90°  | 2    | 28    | 46   | 58    | 63   | 11   |
| 95°  | 151  | 74    | 90   | 102   | 100  | 179  |
| 105° | 706  | 776   | 142  | 167   | 176  | 754  |
| 115° | 1335 | 1374  | 1432 | 358   | 190  | 1314 |
| 125° | 1887 | 1918  | 1962 | 1978  | 1985 | 1683 |
| 135° | 2335 | 2373  | 2393 | 2417  | 2412 | 1804 |
| 145° | 2709 | 2707  | 2746 | 2762  | 2751 | 1694 |
| 155° | 2983 | 2962  | 2990 | 3004  | 2986 | 1375 |
| 165° | 3143 | 3129  | 3136 | 3153  | 3136 | 888  |
| 175° | 3215 | 3199  | 3204 | 3220  | 3197 | 306  |
| 180° | 3208 | 3208  | 3208 | 3208  | 3208 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1233.0 | 1233.0 | 1233.0 | 1233.0 | 1233.0 |
| 2.5°   | 1240.2 | 1234.2 | 1221.1 | 1233.0 | 1230.7 |
| 5°     | 1233.0 | 1228.3 | 1215.2 | 1224.6 | 1222.4 |
| 7.5°   | 1224.6 | 1217.6 | 1204.5 | 1214.1 | 1211.7 |
| 10°    | 1211.7 | 1203.4 | 1189.2 | 1198.6 | 1195.1 |
| 12.5°  | 1193.8 | 1186.8 | 1172.6 | 1178.5 | 1176.1 |
| 15°    | 1173.7 | 1166.6 | 1151.2 | 1156.0 | 1150.1 |
| 17.5°  | 1148.8 | 1141.8 | 1126.3 | 1132.2 | 1126.3 |
| 20°    | 1121.5 | 1114.4 | 1097.9 | 1101.4 | 1096.8 |
| 22.5°  | 1094.3 | 1083.6 | 1068.2 | 1068.2 | 1065.8 |
| 25°    | 1062.2 | 1052.8 | 1032.7 | 1035.0 | 1032.7 |
| 27.5°  | 1026.7 | 1018.3 | 1003.1 | 999.5  | 993.6  |
| 30°    | 991.2  | 981.7  | 963.9  | 960.4  | 955.6  |
| 32.5°  | 953.2  | 946.2  | 927.2  | 920.0  | 915.2  |
| 35°    | 916.5  | 904.7  | 885.7  | 878.5  | 872.6  |
| 37.5°  | 875.0  | 864.3  | 845.3  | 837.0  | 831.1  |
| 40°    | 832.3  | 822.8  | 803.7  | 793.2  | 788.5  |
| 42.5°  | 790.8  | 781.2  | 762.4  | 750.4  | 743.4  |
| 45°    | 745.8  | 737.5  | 719.6  | 706.7  | 701.9  |
| 47.5°  | 701.9  | 693.6  | 674.6  | 661.6  | 654.5  |
| 50°    | 655.6  | 649.7  | 633.1  | 616.5  | 610.5  |
| 52.5°  | 610.5  | 602.3  | 586.9  | 573.9  | 565.5  |
| 55°    | 564.4  | 557.2  | 543.0  | 528.8  | 522.9  |
| 57.5°  | 518.1  | 512.2  | 496.7  | 482.5  | 477.8  |
| 60°    | 471.8  | 467.1  | 450.6  | 437.5  | 434.0  |
| 62.5°  | 426.8  | 418.5  | 406.7  | 394.8  | 390.1  |
| 65°    | 380.6  | 373.4  | 361.6  | 350.9  | 345.1  |
| 67.5°  | 333.2  | 327.2  | 316.6  | 308.3  | 303.6  |
| 70°    | 289.3  | 284.6  | 273.9  | 265.5  | 260.9  |
| 72.5°  | 244.3  | 239.5  | 233.6  | 225.3  | 221.7  |
| 75°    | 199.2  | 196.9  | 190.8  | 183.8  | 186.2  |
| 77.5°  | 158.8  | 154.1  | 151.7  | 148.1  | 144.7  |
| 80°    | 118.6  | 117.3  | 114.9  | 111.5  | 109.1  |
| 82.5°  | 80.6   | 80.6   | 79.5   | 74.7   | 74.7   |
| 85°    | 48.6   | 47.5   | 46.3   | 42.6   | 41.5   |
| 87.5°  | 21.4   | 19.0   | 16.6   | 13.1   | 11.8   |
| 90°    | 2.2    | 27.8   | 46.3   | 58.1   | 62.6   |
| 92.5°  | 58.1   | 48.8   | 55.7   | 60.4   | 62.6   |
| 95°    | 150.8  | 74.1   | 90.4   | 102.3  | 99.8   |
| 97.5°  | 271.6  | 81.4   | 118.3  | 125.4  | 127.6  |
| 100°   | 411.0  | 92.9   | 132.3  | 150.8  | 155.5  |
| 102.5° | 564.0  | 559.6  | 137.0  | 162.4  | 169.5  |
| 105°   | 705.7  | 775.5  | 141.7  | 167.1  | 176.4  |
| 107.5° | 870.5  | 928.4  | 146.4  | 171.7  | 181.1  |
| 110°   | 1028.5 | 1077.0 | 406.3  | 174.2  | 183.3  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1177.1 | 1218.7 | 1179.3 | 178.6  | 185.8  |
| 115°   | 1334.7 | 1374.2 | 1432.3 | 357.5  | 190.5  |
| 117.5° | 1471.8 | 1518.1 | 1557.8 | 1225.6 | 617.5  |
| 120°   | 1625.1 | 1659.8 | 1701.7 | 1729.6 | 1416.1 |
| 122.5° | 1754.9 | 1792.2 | 1838.7 | 1852.5 | 1855.0 |
| 125°   | 1887.2 | 1917.6 | 1961.7 | 1977.9 | 1984.8 |
| 127.5° | 2007.9 | 2040.5 | 2075.5 | 2098.6 | 2100.9 |
| 130°   | 2121.8 | 2159.0 | 2184.4 | 2210.0 | 2207.8 |
| 132.5° | 2237.8 | 2268.2 | 2293.5 | 2314.5 | 2312.3 |
| 135°   | 2335.4 | 2372.7 | 2393.3 | 2416.8 | 2412.1 |
| 137.5° | 2437.5 | 2465.3 | 2488.7 | 2511.8 | 2505.0 |
| 140°   | 2537.3 | 2556.0 | 2581.3 | 2602.3 | 2590.7 |
| 142.5° | 2621.0 | 2637.3 | 2667.4 | 2685.8 | 2674.2 |
| 145°   | 2709.3 | 2706.8 | 2746.2 | 2762.5 | 2750.8 |
| 147.5° | 2785.6 | 2778.7 | 2818.2 | 2829.8 | 2820.6 |
| 150°   | 2860.0 | 2843.8 | 2881.0 | 2894.8 | 2883.2 |
| 152.5° | 2922.6 | 2904.1 | 2938.9 | 2952.9 | 2936.7 |
| 155°   | 2983.0 | 2962.3 | 2990.2 | 3004.0 | 2985.5 |
| 157.5° | 3031.8 | 3013.3 | 3034.3 | 3050.5 | 3031.8 |
| 160°   | 3073.7 | 3059.6 | 3073.7 | 3087.4 | 3071.2 |
| 162.5° | 3110.7 | 3096.9 | 3108.4 | 3124.7 | 3103.8 |
| 165°   | 3143.1 | 3129.4 | 3136.2 | 3152.6 | 3136.2 |
| 167.5° | 3168.8 | 3154.7 | 3161.9 | 3178.2 | 3157.2 |
| 170°   | 3189.7 | 3175.7 | 3180.4 | 3196.6 | 3175.7 |
| 172.5° | 3203.5 | 3189.7 | 3194.5 | 3210.7 | 3189.7 |
| 175°   | 3215.1 | 3198.8 | 3203.5 | 3219.8 | 3196.6 |
| 177.5° | 3219.8 | 3203.5 | 3206.0 | 3222.3 | 3201.4 |
| 180°   | 3208.3 | 3208.3 | 3208.3 | 3208.3 | 3208.3 |

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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 | 4.25             | 4.93 | 5.40 | 6.06 | 7.65  | 3.82           | 4.50 | 4.97 | 5.63 | 7.22  |
|                 | 3H   | 5.90             | 6.50 | 7.05 | 7.64 | 9.25  | 5.43           | 6.03 | 6.58 | 7.17 | 8.78  |
|                 | 4H   | 6.48             | 7.05 | 7.64 | 8.19 | 9.80  | 6.00           | 6.58 | 7.17 | 7.72 | 9.33  |
|                 | 6H   | 6.87             | 7.39 | 8.04 | 8.54 | 10.16 | 6.39           | 6.92 | 7.56 | 8.06 | 9.68  |
|                 | 8H   | 6.97             | 7.47 | 8.14 | 8.63 | 10.24 | 6.49           | 6.99 | 7.66 | 8.15 | 9.77  |
|                 | 12H  | 7.01             | 7.48 | 8.18 | 8.64 | 10.27 | 6.53           | 7.00 | 7.70 | 8.16 | 9.79  |
| 4H              | 2H   | 4.69             | 5.26 | 5.86 | 6.41 | 8.02  | 4.35           | 4.92 | 5.52 | 6.06 | 7.67  |
|                 | 3H   | 6.54             | 7.02 | 7.71 | 8.19 | 9.81  | 6.15           | 6.63 | 7.32 | 7.79 | 9.41  |
|                 | 4H   | 7.25             | 7.69 | 8.42 | 8.84 | 10.48 | 6.84           | 7.28 | 8.02 | 8.44 | 10.08 |
|                 | 6H   | 7.75             | 8.13 | 8.93 | 9.31 | 10.94 | 7.34           | 7.72 | 8.52 | 8.90 | 10.53 |
|                 | 8H   | 7.90             | 8.25 | 9.08 | 9.42 | 11.06 | 7.48           | 7.84 | 8.66 | 9.01 | 10.65 |
|                 | 12H  | 7.96             | 8.28 | 9.16 | 9.46 | 11.11 | 7.54           | 7.86 | 8.73 | 9.04 | 10.69 |
| 8H              | 4H   | 7.43             | 7.78 | 8.61 | 8.95 | 10.60 | 7.07           | 7.42 | 8.25 | 8.59 | 10.24 |
|                 | 6H   | 8.05             | 8.34 | 9.25 | 9.55 | 11.20 | 7.69           | 7.98 | 8.89 | 9.19 | 10.83 |
|                 | 8H   | 8.27             | 8.52 | 9.47 | 9.71 | 11.38 | 7.90           | 8.15 | 9.11 | 9.34 | 11.01 |
|                 | 12H  | 8.39             | 8.61 | 9.60 | 9.80 | 11.50 | 8.01           | 8.23 | 9.22 | 9.42 | 11.11 |
| 12H             | 4H   | 7.40             | 7.72 | 8.60 | 8.91 | 10.56 | 7.05           | 7.37 | 8.25 | 8.55 | 10.20 |
|                 | 6H   | 8.08             | 8.33 | 9.28 | 9.52 | 11.18 | 7.73           | 7.98 | 8.93 | 9.17 | 10.83 |
|                 | 8H   | 8.31             | 8.53 | 9.52 | 9.72 | 11.42 | 7.95           | 8.18 | 9.16 | 9.37 | 11.06 |