

**LÒ XO XOẮN TRU NÉN VÀ KÉO LOẠI II,
CẤP 3 BẰNG THÉP MẶT CẶT TRON**

Thông số cơ bản

Пружины винтовые цилиндрические сжатия и растяжения II класса, разряда 3 из стали круглого сечения. Основные параметры витков

Cylindrical helical compression (tension) springs of II class and 3 category made of round steel. Main parameters of coils.

TCVN

2026 – 77

**Khuyến khích
áp dụng**

1. Tiêu chuẩn này áp dụng cho lò xo nén và kéo loại II, cấp 3 có lực khi biến dạng lớn nhất (P_3) từ 236 đến 10000 N.
2. Thông số cơ bản của lò xo phải phù hợp với chỉ dẫn trong bảng.
3. Vật liệu: dây thép * có đường kính từ 3 đến 12 mm.
4. Phân loại lò xo — theo TCVN 2018 – 77.
5. Phương pháp xác định các kích thước của lò xo — theo TCVN 2019 – 77.

| Số hiệu của lò xo | Lực lò xo khi biến dạng lớn nhất P_3 , N | Đường kính dây d, mm | Đường kính ngoài của lò xo D, mm | Độ cứng của một vòng Z1, N/mm | Biến dạng lớn nhất của một vòng f3, mm. |
|-------------------|--|----------------------|----------------------------------|-------------------------------|---|
| 1 | 2 | 3 | 4 | 5 | 6 |
| 1 | 236 | 3,0 | 40 | 16,00 | 14,750 |
| 2 | 260 | | 38 | 18,88 | 13,240 |
| 3 | 265 | | 36 | 22,54 | 11,760 |
| 4 | 280 | | 34 | 27,22 | 10,290 |
| 5 | 300 | | 32 | 33,18 | 9,042 |
| 6 | 315 | | 30 | 41,15 | 7,655 |

* Tạm thời theo ГОСТ 14963 – 69 và ГОСТ 2771 – 57 của Liên xô hay các tiêu chuẩn tương ứng của các nước khác cho đến khi có tiêu chuẩn Việt Nam tương ứng.

(tiếp theo)

| 1 | 2 | 3 | 4 | 5 | 6 |
|----|-----|-----|----|--------|--------|
| 7 | 335 | 3,5 | 28 | 51,84 | 6,462 |
| 8 | | | 45 | 20,98. | 15,970 |
| 9 | 355 | 3,0 | 26 | 66,57 | 5,333 |
| 10 | | 3,5 | 42 | 26,30 | 13,500 |
| 11 | 375 | 3,0 | 25 | 76,08 | 4,930 |
| 12 | | 3,5 | 40 | 30,85 | 12,160 |
| 13 | 400 | 3,0 | 24 | 87,46 | 4,574 |
| 14 | | 3,5 | 38 | 36,51 | 10,960 |
| 15 | 425 | 3,0 | 22 | 118,30 | 3,592 |
| 16 | | 3,5 | 36 | 43,71 | 9,723 |
| 17 | | 4,0 | 52 | 23,15 | 18,360 |
| 18 | 450 | 3,0 | 21 | 138,90 | 3,240 |
| 19 | | 3,5 | 34 | 52,89 | 8,509 |
| 20 | | 4,0 | 50 | 26,30 | 17,110 |
| 21 | 475 | 3,0 | 20 | 164,60 | 2,886 |
| 22 | | 3,5 | 32 | 64,82 | 7,327 |
| 23 | | 4,0 | 48 | 30,05 | 15,810 |
| 24 | 500 | 3,0 | 19 | 198,10 | 2,524 |
| 25 | | 3,5 | 30 | 80,64 | 6,201 |
| 26 | | 4,0 | 45 | 37,14 | 13,460 |
| 27 | 530 | 3,0 | 18 | 240,00 | 2,208 |
| 28 | | 3,5 | 28 | 102,00 | 5,196 |
| 29 | | 4,0 | 42 | 46,65 | 11,360 |
| 30 | 560 | 3,0 | 17 | 294,60 | 1,901 |
| 31 | | 3,5 | 26 | 131,70 | 4,252 |
| 32 | | 4,0 | 40 | 51,87 | 10,200 |
| 33 | | 4,5 | 60 | 24,01 | 23,320 |
| 34 | 600 | 3,0 | 16 | 368,70 | 1,627 |
| 35 | | 3,5 | 25 | 151,20 | 3,968 |

(tiếp theo)

| 1 | 2 | 3 | 4 | 5 | 6 |
|----|-----|-----|----|--------|--------|
| 36 | 600 | 4,0 | 38 | 65,14 | 9,211 |
| 37 | | 4,5 | 55 | 31,84 | 18,840 |
| 38 | 630 | 3,0 | 15 | 468,80 | 1,344 |
| 39 | | 3,5 | 24 | 173,90 | 3,623 |
| 40 | | 4,0 | 36 | 78,12 | 8,064 |
| 41 | | 4,5 | 52 | 38,26 | 16,470 |
| 42 | 670 | 3,5 | 22 | 237,00 | 2,827 |
| 43 | | 4,0 | 34 | 94,81 | 7,067 |
| 44 | | 4,5 | 50 | 43,54 | 15,390 |
| 45 | | 5,0 | 65 | 28,91 | 23,150 |
| 46 | 710 | 3,5 | 21 | 280,00 | 2,536 |
| 47 | | 4,0 | 32 | 116,60 | 6,089 |
| 48 | | 4,5 | 48 | 49,77 | 14,260 |
| 49 | | 5,0 | 63 | 32,03 | 22,170 |
| 50 | 750 | 3,5 | 20 | 334,10 | 2,245 |
| 51 | | 4,0 | 30 | 145,70 | 5,148 |
| 52 | | 4,5 | 45 | 61,73 | 12,150 |
| 53 | | 5,0 | 60 | 37,56 | 19,970 |
| 54 | 800 | 3,5 | 19 | 402,60 | 1,986 |
| 55 | | 4,0 | 28 | 185,20 | 4,320 |
| 56 | | 4,5 | 42 | 77,76 | 10,290 |
| 57 | | 5,0 | 55 | 50,00 | 16,000 |
| 58 | | 5,5 | 75 | 27,26 | 29,350 |
| 59 | 850 | 3,5 | 18 | 492,20 | 1,727 |
| 60 | | 4,0 | 26 | 240,40 | 3,536 |
| 61 | | 4,5 | 40 | 91,65 | 9,274 |
| 62 | | 5,0 | 52 | 60,20 | 14,120 |
| 63 | | 5,5 | 70 | 34,10 | 24,930 |
| 64 | 900 | 3,5 | 17 | 609,90 | 1,476 |
| 65 | | 4,0 | 25 | 276,40 | 3,256 |
| 66 | | 4,5 | 38 | 109,30 | 8,234 |
| 67 | | 5,0 | 50 | 68,59 | 13,120 |
| 68 | | 5,5 | 65 | 43,44 | 20,720 |

(tiếp theo)

| 1 | 2 | 3 | 4 | 5 | 6 |
|-----|------|-----|----|--------|--------|
| 69 | 950 | 4,0 | 24 | 320,00 | 2,969 |
| 70 | | 4,5 | 36 | 131,20 | 7,241 |
| 71 | | 5,0 | 48 | 78,60 | 12,070 |
| 72 | | 5,5 | 63 | 48,14 | 19,730 |
| 73 | | 6,0 | 80 | 32,01 | 29,680 |
| 74 | 1000 | 4,0 | 22 | 439,00 | 2,278 |
| 75 | | 4,5 | 34 | 159,70 | 6,262 |
| 76 | | 5,0 | 45 | 97,66 | 10,240 |
| 77 | | 5,5 | 60 | 56,53 | 17,690 |
| 78 | | 6,0 | 75 | 39,45 | 25,350 |
| 79 | 1060 | 4,0 | 21 | 521,00 | 2,034 |
| 80 | | 4,5 | 32 | 197,30 | 5,372 |
| 81 | | 5,0 | 42 | 123,40 | 8,590 |
| 82 | | 5,5 | 55 | 75,44 | 14,050 |
| 83 | | 6,0 | 70 | 49,39 | 21,460 |
| 84 | 1120 | 4,0 | 20 | 625,00 | 1,792 |
| 85 | | 4,5 | 30 | 246,90 | 4,536 |
| 86 | | 5,0 | 40 | 145,80 | 7,682 |
| 87 | | 5,5 | 52 | 91,03 | 12,300 |
| 88 | | 6,0 | 65 | 63,10 | 17,750 |
| 89 | 1180 | 4,5 | 28 | 316,40 | 3,729 |
| 90 | | 5,0 | 38 | 173,90 | 6,786 |
| 91 | | 5,5 | 50 | 103,80 | 11,370 |
| 92 | | 6,0 | 63 | 70,00 | 16,860 |
| 93 | 1250 | 4,5 | 26 | 412,60 | 3,030 |
| 94 | | 5,0 | 36 | 209,80 | 5,958 |
| 95 | | 5,5 | 48 | 119,20 | 10,460 |
| 96 | | 6,0 | 60 | 82,30 | 15,190 |
| 97 | 1320 | 4,5 | 25 | 476,00 | 2,773 |
| 98 | | 5,0 | 34 | 256,30 | 5,150 |
| 99 | | 5,5 | 45 | 148,50 | 8,889 |
| 100 | | 6,0 | 55 | 110,00 | 12,000 |
| 101 | | 7,0 | 90 | 41,96 | 31,460 |

(tiếp theo)

| 1 | 2 | 3 | 4 | 5 | 6 |
|-----|------|------|-----|--------|--------|
| 102 | 1400 | 4,5 | 24 | 553,00 | 2,532 |
| 103 | | 5,0 | 32 | 317,50 | 4,409 |
| 104 | | 5,5 | 42 | 188,20 | 7,439 |
| 105 | | 6,0 | 52 | 133,60 | 10,530 |
| 106 | | 7,0 | 85 | 50,63 | 27,650 |
| 107 | | 1500 | 4,5 | 22 | 761,50 |
| 108 | 5,0 | | 30 | 400,90 | 3,750 |
| 109 | 5,5 | | 40 | 222,80 | 6,732 |
| 110 | 6,0 | | 50 | 152,40 | 9,842 |
| 111 | 7,0 | | 80 | 61,70 | 24,310 |
| 112 | 1600 | 5,0 | 28 | 513,70 | 3,115 |
| 113 | | 5,5 | 38 | 266,60 | 6,002 |
| 114 | | 6,0 | 48 | 174,90 | 9,148 |
| 115 | | 7,0 | 75 | 76,36 | 20,950 |
| 116 | 1700 | 5,0 | 26 | 674,80 | 2,519 |
| 117 | | 5,5 | 36 | 322,60 | 5,270 |
| 118 | | 6,0 | 45 | 218,50 | 7,780 |
| 119 | | 7,0 | 70 | 96,02 | 17,700 |
| 120 | | 8,0 | 105 | 44,91 | 37,830 |
| 121 | 1800 | 5,0 | 25 | 781,20 | 2,304 |
| 122 | | 5,5 | 34 | 395,20 | 4,555 |
| 123 | | 6,0 | 42 | 277,80 | 6,479 |
| 124 | | 7,0 | 65 | 123,30 | 14,600 |
| 125 | | 8,0 | 109 | 52,60 | 34,220 |
| 126 | 1900 | 5,5 | 32 | 491,80 | 3,863 |
| 127 | | 6,0 | 40 | 329,70 | 5,762 |
| 128 | | 7,0 | 63 | 136,70 | 13,900 |
| 129 | | 8,0 | 95 | 62,20 | 30,550 |
| 130 | 2000 | 5,5 | 30 | 622,40 | 3,213 |
| 131 | | 6,0 | 38 | 396,20 | 5,048 |
| 132 | | 7,0 | 60 | 161,40 | 12,390 |
| 133 | | 8,0 | 90 | 74,29 | 26,920 |

(tiếp theo)

| 1 | 2 | 3 | 4 | 5 | 6 |
|-----|------|------|-----|--------|--------|
| 134 | 2120 | 5,5 | 28 | 803,30 | 2,639 |
| 135 | | 6,0 | 36 | 480,00 | 4,417 |
| 136 | | 7,0 | 55 | 216,80 | 9,778 |
| 137 | | 8,0 | 85 | 89,72 | 23,630 |
| 138 | | 9,0 | 120 | 47,98 | 44,180 |
| 139 | 2240 | 6,0 | 34 | 590,40 | 3,794 |
| 140 | | 7,0 | 52 | 263,40 | 8,504 |
| 141 | | 8,0 | 80 | 109,70 | 20,420 |
| 142 | | 9,0 | 110 | 63,72 | 35,150 |
| 143 | 2360 | 6,0 | 32 | 737,40 | 3,200 |
| 144 | | 7,0 | 50 | 302,40 | 7,804 |
| 145 | | 8,0 | 75 | 135,90 | 17,360 |
| 146 | | 9,0 | 105 | 74,16 | 31,830 |
| 147 | 2500 | 6,0 | 30 | 937,50 | 2,667 |
| 148 | | 7,0 | 48 | 347,90 | 7,186 |
| 149 | | 8,0 | 70 | 171,80 | 14,550 |
| 150 | | 9,0 | 100 | 87,09 | 28,700 |
| 151 | 2650 | 7,0 | 45 | 437,60 | 6,056 |
| 152 | | 8,0 | 65 | 221,20 | 11,980 |
| 153 | | 9,0 | 95 | 103,00 | 25,730 |
| 154 | | 10,0 | 130 | 57,87 | 45,790 |
| 155 | 2800 | 7,0 | 42 | 560,00 | 5,000 |
| 156 | | 8,0 | 63 | 245,60 | 11,400 |
| 157 | | 9,0 | 90 | 123,50 | 22,680 |
| 158 | | 10,0 | 125 | 65,75 | 42,580 |
| 159 | 3000 | 7,0 | 40 | 668,10 | 4,430 |
| 160 | | 8,0 | 60 | 291,30 | 10,300 |
| 161 | | 9,0 | 85 | 149,70 | 20,040 |
| 162 | | 10,0 | 120 | 75,13 | 32,930 |
| 163 | 3150 | 7,0 | 38 | 805,90 | 3,909 |
| 164 | | 8,0 | 55 | 394,50 | 7,984 |
| 165 | | 9,0 | 80 | 183,20 | 17,190 |
| 166 | | 10,0 | 110 | 100,00 | 31,500 |

(tiếp theo)

| 1 | 2 | 3 | 4 | 5 | 6 |
|-----|------|------|-----|---------|--------|
| 167 | 3350 | 7,0 | 36 | 984,50 | 3,403 |
| 168 | | 8,0 | 52 | 480,80 | 6,968 |
| 169 | | 9,0 | 75 | 228,20 | 14,680 |
| 170 | | 10,0 | 105 | 116,60 | 28,730 |
| 171 | | 11,0 | 140 | 68,15 | 49,160 |
| 172 | 3550 | 8,0 | 50 | 552,90 | 6,421 |
| 173 | | 9,0 | 70 | 288,70 | 12,300 |
| 174 | | 10,0 | 100 | 137,20 | 25,870 |
| 175 | | 11,0 | 130 | 86,88 | 40,860 |
| 176 | 3750 | 8,0 | 48 | 640,00 | 5,859 |
| 177 | | 9,0 | 65 | 374,10 | 10,020 |
| 178 | | 10,0 | 95 | 162,80 | 23,030 |
| 179 | | 11,0 | 125 | 98,83 | 37,950 |
| 180 | | 12,0 | 160 | 64,02 | 58,580 |
| 181 | 4000 | 8,0 | 45 | 808,60 | 4,947 |
| 182 | | 9,0 | 63 | 416,70 | 9,599 |
| 183 | | 10,0 | 90 | 195,30 | 20,480 |
| 184 | | 11,0 | 120 | 113,00 | 35,400 |
| 185 | | 12,0 | 150 | 78,90 | 50,700 |
| 186 | 4250 | 8,0 | 42 | 1042,00 | 4,079 |
| 187 | | 9,0 | 60 | 494,60 | 8,593 |
| 188 | | 10,0 | 85 | 237,00 | 17,930 |
| 189 | | 11,0 | 110 | 150,90 | 28,160 |
| 190 | | 12,0 | 140 | 98,88 | 42,990 |
| 191 | 500 | 8,0 | 40 | 1250,00 | 3,600 |
| 192 | | 9,0 | 55 | 674,50 | 6,672 |
| 193 | | 10,0 | 80 | 291,50 | 15,440 |
| 194 | | 11,0 | 105 | 176,30 | 25,530 |
| 195 | | 12,0 | 130 | 126,30 | 35,630 |
| 196 | 4750 | 9,0 | 52 | 825,20 | 5,756 |
| 197 | | 10,0 | 75 | 364,20 | 13,040 |
| 198 | | 11,0 | 100 | 207,70 | 22,870 |
| 199 | | 12,0 | 125 | 143,70 | 33,050 |

(tiếp theo)

| 1 | 2 | 3 | 4 | 5 | 6 |
|-----|------|------|-----|---------|--------|
| 200 | 5000 | 9,0 | 50 | 951,90 | 5,253 |
| 201 | | 10,0 | 70 | 463,00 | 10,800 |
| 202 | | 11,0 | 95 | 246,70 | 20,270 |
| 203 | | 12,0 | 120 | 164,60 | 30,380 |
| 204 | 5300 | 9,0 | 48 | 1109,00 | 4,779 |
| 205 | | 10,0 | 65 | 601,10 | 8,817 |
| 206 | | 11,0 | 90 | 297,20 | 17,810 |
| 207 | | 12,0 | 110 | 220,10 | 24,080 |
| 208 | 5600 | 9,0 | 45 | 1406,00 | 3,983 |
| 209 | | 10,0 | 63 | 671,70 | 8,337 |
| 210 | | 11,0 | 85 | 360,90 | 15,520 |
| 211 | | 12,0 | 105 | 257,80 | 21,720 |
| 212 | 6000 | 10,0 | 60 | 800,00 | 7,500 |
| 213 | | 11,0 | 80 | 446,20 | 13,450 |
| 214 | | 12,0 | 100 | 304,30 | 19,720 |
| 215 | 6300 | 10,0 | 55 | 1097,00 | 5,743 |
| 216 | | 11,0 | 75 | 558,50 | 11,280 |
| 217 | | 12,0 | 95 | 362,70 | 17,370 |
| 218 | 6700 | 10,0 | 52 | 1350,00 | 4,963 |
| 219 | | 11,0 | 70 | 712,90 | 9,399 |
| 220 | | 12,0 | 90 | 437,00 | 15,330 |
| 221 | 7100 | 10,0 | 50 | 1562,00 | 4,547 |
| 222 | | 11,0 | 65 | 929,80 | 7,636 |
| 223 | | 12,0 | 85 | 533,00 | 13,320 |
| 224 | 7500 | 11,0 | 63 | 1040,00 | 7,212 |
| 225 | | 12,0 | 80 | 659,50 | 11,370 |

(tiếp theo)

| 1 | 2 | 3 | 4 | 5 | 6 |
|-----|-------|------|----|---------|---------|
| 226 | 8000 | 11,0 | 60 | 1248,00 | 6,410 |
| 227 | | 12,0 | 75 | 829,30 | 9,647 |
| 228 | 8500 | 11,0 | 55 | 1719,00 | 4,945 |
| 229 | | | | 70 | 1063,00 |
| 230 | 9000 | 12,0 | 65 | 1390,00 | 6,475 |
| 231 | 9500 | | 63 | 1563,00 | 6,078 |
| 232 | 10000 | | 60 | 1875,00 | 5,333 |