

- D_t = Wire diameter
- D_m = Mean diameter
- R = Torque arm in mm
- P_o = Pitch
- n = Number of active coils
- L = Length $L = P_o \times n + D_t$
- F = Force in Newtons
- M = Torque in Nmm
- M_n = Maximum permitted torque Nmm
- φ = Torque angle in degrees per coil at M_n . A spring with 4 coils produces a torque of $4 \times \varphi$ at M_n .

Cylindrical wound torsion springs produce a coil deflection when load is applied. The ends of the torsion springs are designed to store the torsion deflection and generally have a fixed tension. Normally, the inside body diameter is mounted on a mandrel or a bush. The mounting has to be conducted in such a way that always allows play between the mandrel and the spring. Normally, the spring is mounted in such a way that the application of torque tightens the body of the spring to the mandrel as the internal diameter decreases.

Torsion springs have a straight spring characteristic. For example, if a spring at 10° torsion produces a torque of 1 Nmm, the same spring will produce a torque of 2 Nmm at 20° torsion.

In order to prevent any friction between the coils, torsion springs are normally wound with a clearance between the coils. The number of coils in the spring is set according to the torsion angle or leg position you wish to obtain.

Permitted load, life

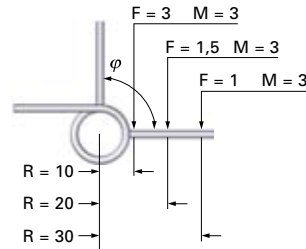
If maximum torsion and torque (φ och M_n) is used in accordance with the following table, a maximum of 4000 load oscillations will be permitted when using material SS1774-04. For SS1774-05 and SS2331-06 this is 10 000 oscillations.

If both φ and M_n are reduced by 20%, the lifespan of the spring increases to 50 000-100 000 oscillations for SS 1774-04 and 200 000-400 000 oscillations for SS 1774-05 and SS 2331-06.

If the table values are reduced by 30%, an almost infinite life can be expected for all materials mentioned with good torsion ends. Above mentioned values are approximate. For detailed design and life calculations, please refer to Lesjöfors Spring Handbook.

From the table data and figures on the following page, the dimensions of a special torsion spring can be determined. Alternative dimensions than the ones stated in the table, as well as other ends, can also be chosen. It is then advisable to enclose a sketch or a drawing with the order. Also see our standard stock of torsion springs, pages 96-105.

Torque



The torque is the sum of the force multiplied by the leg length.

$M = F \times A$. In other words, the closer to the end of the leg the load is applied, the less counter force is created. However, torque remains constant.

Example order specification

SF-VF

D_t : 0,5

D_i : 4

n : 8 + 90° (= 8,25)

Coiling: Right-hand

Ends

First end: Fig. 3 A = 3.5

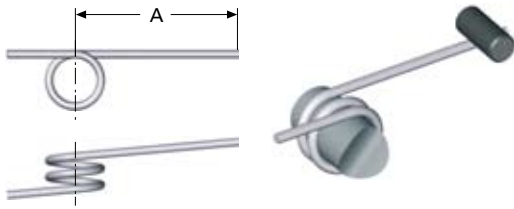
Second end: Fig. 5 A = 15, B = 3

Material quality: SS 1774-04

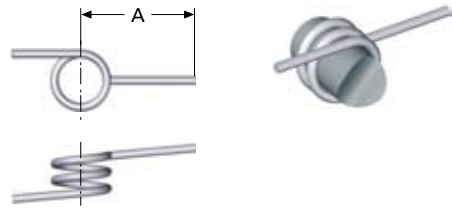
TORSION SPRINGS

SF-VF Ends

TYPE 1



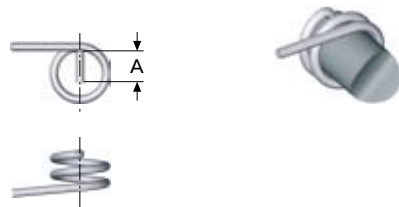
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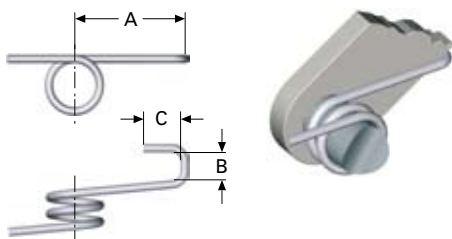
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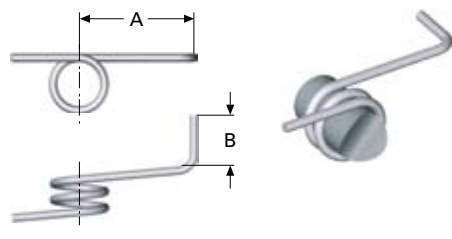
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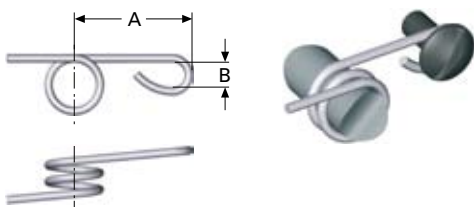
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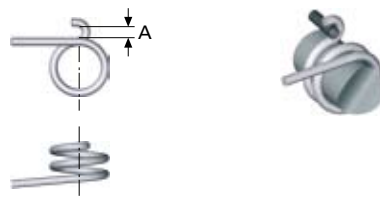
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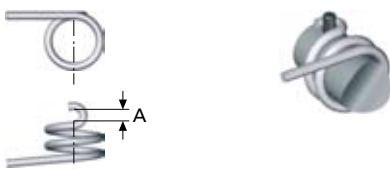
TYPE 7



TYPE 8



TYPE 9



TYPE 10

