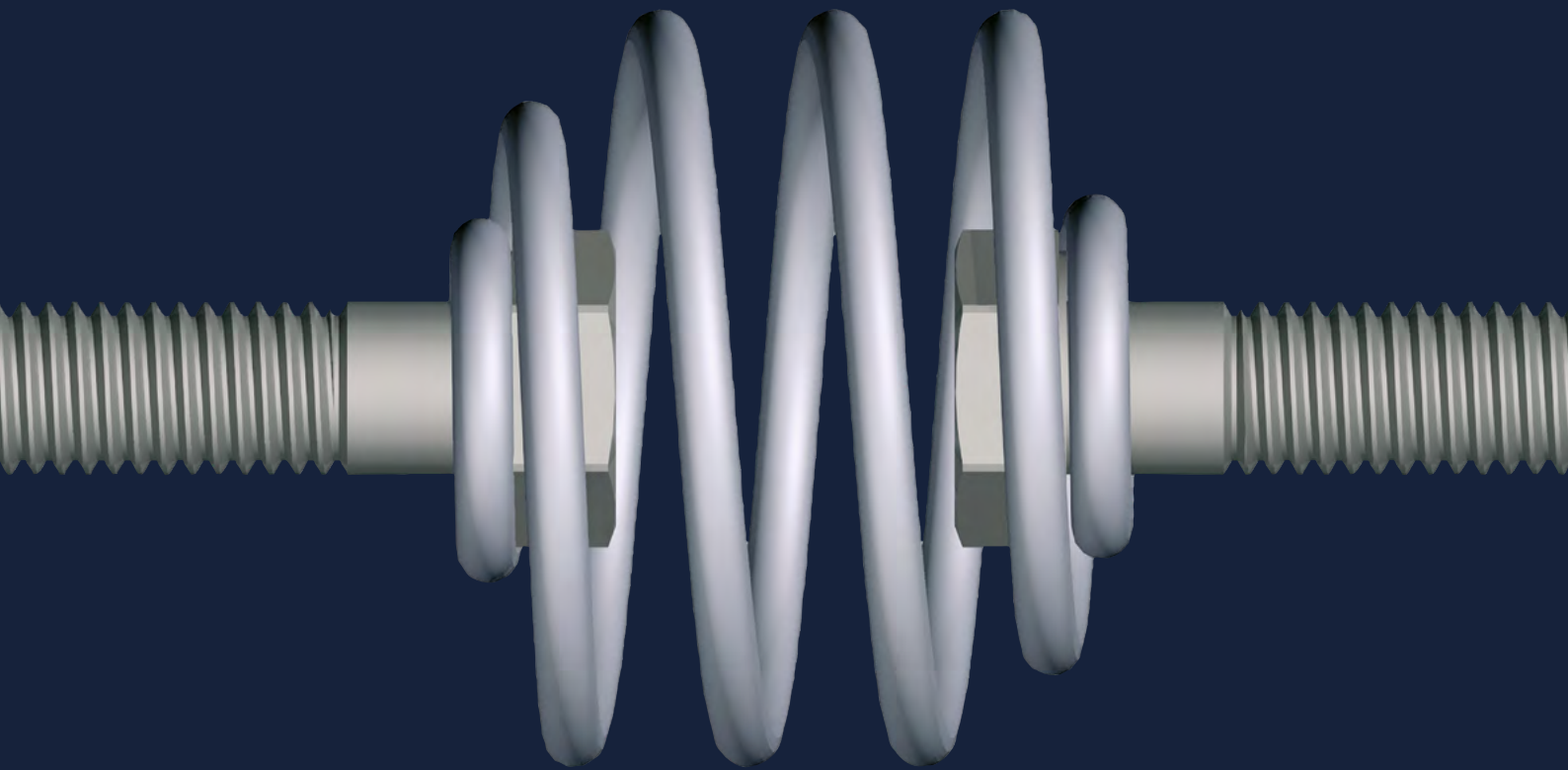
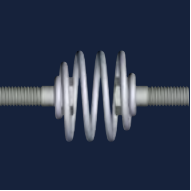


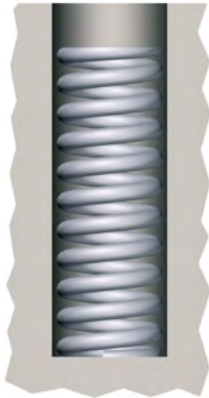
# Springs Custom Designs.

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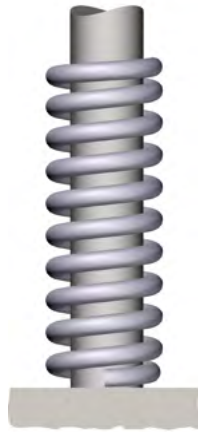




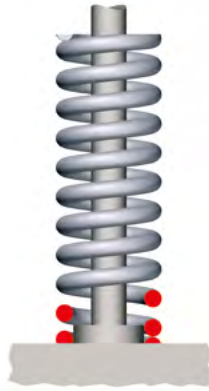
# Compression Springs. | Examples of end forms



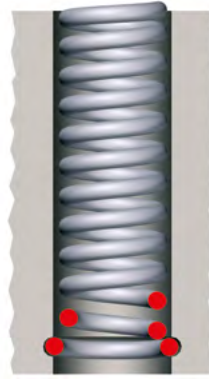
1. Ground with external location



2. Not ground with internal location



3. End piece



4. Enlarged end coil for mounting in groove



5. Reduced end coil for mounting on shaft



6. Progressive pitch



7. Conical compression spring gives a progressive spring characteristic

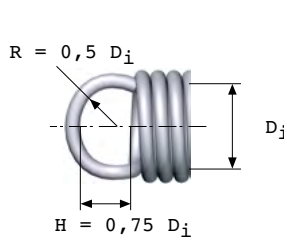
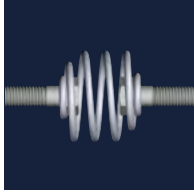


8. Loops with bolt mounting

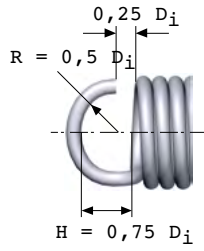


9. Rectangularly wound compression spring (magazine spring)

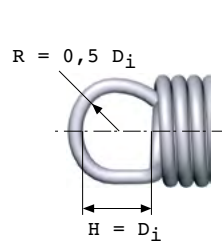
# Extension Springs. | End designs



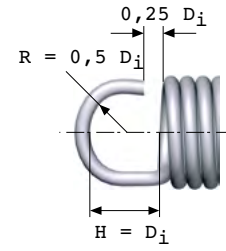
4. Normal loop



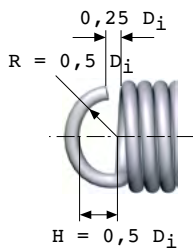
5. Normal hook



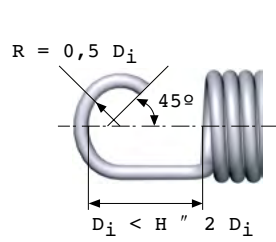
6. High loop



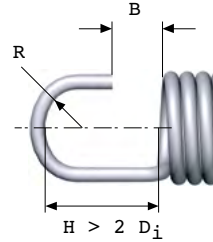
7. High hook



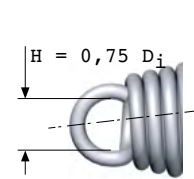
8. Low hook



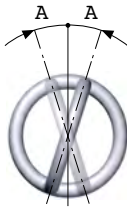
9. Long hook



10. Long hook with straight end



11. Coned spring with reduced loop



Angle deflection for loop or hook

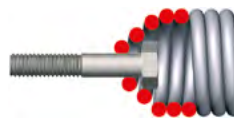
Number of coils	≤20	(20) - 60	>60
Deviation A	20°	1°/ coil	indeterminate



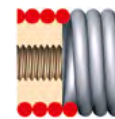
14. Loose coned wire loop



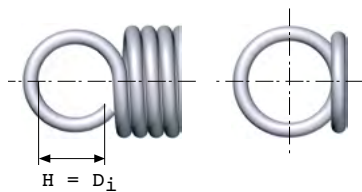
15. Loose coned steel loop



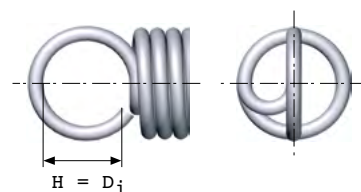
16. Loose coned bolt



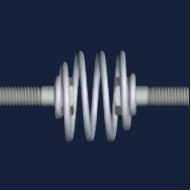
17. Screwed end for bolt



18. Side loop

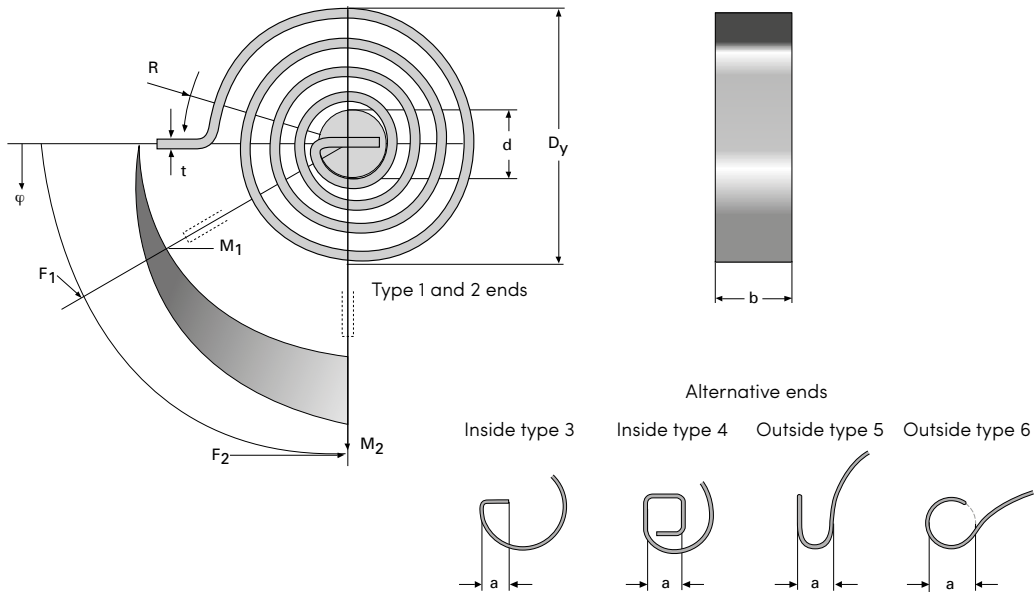


19. English loop

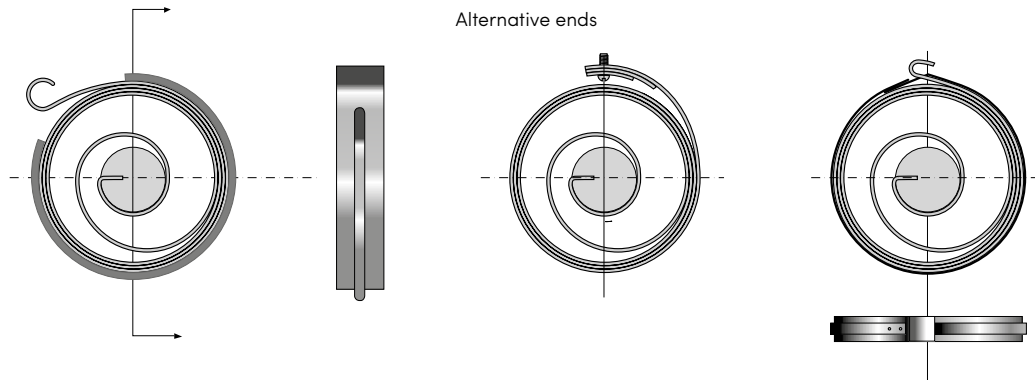


# Clock Springs.

## TYPE A



## TYPE B



The clock spring is designed to produce a torque force (circular movement) and appears in two basic models: one with open coils (type A) and one with tight coils (type B). Type A is in normal applications completely without friction and is basically used at minor torsion angles, up to 360°, e.g. locking mechanisms.

Type B is mounted in housings and can be designed to deflect several coils. It has a low force increase and is used as e.g. a drive spring. Normally, this spring is delivered with a locking ring or wrapped by a metal strip.

- $t$  = Material thickness
- $b$  = Material width
- $d$  = Shaft diameter
- $D_y$  = Outer diameter
- $R$  = Torque arm
- $M$  = Spring torque
- $F$  = Spring force