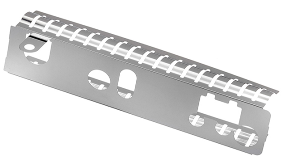
Xiamen Hongsheng SPRING Co.,Ltd.

Hongsheng – Product catalog

Custom Springs and Stamping parts





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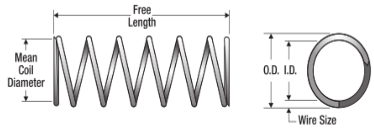

Product catalog

COMPRESSION SPRINGS	Basic forms:	Cylindrical, convex & concave, conical
	Spring ends:	Open, closed, ground
	Wire:	Round and square wires from ø 0.15 mm to ø 10.00 mm(0.006" to 0.394")
TENSION SPRINGS	Basic forms:	Customized lug form for every customer application
	Wire:	Round and square wires from ø 0.20 mm to ø 10.00 mm(0.006" to 0.394")
TORSION SPRINGS	Basic forms:	EA helical body / helical body combinations, double torsion springs, variable custom-built leg geometry
	Wire:	Round and square wires from ø 0.20 mm to ø 10.00 mm(0.006" to 0.394")
WIRE FORMS	Basic forms:	Customized form
	Materials:	Steel, Stainless steel, carbon
	Wire:	Round, flat and square wires from 0.2 mm to 10 mm
BATTERY SPRING	Materials:	SWC,SUS, music wire,cold roller steel etc phosphor copper, brass etc
	Surface treatment:	Nickel, gold plating, silver etc
PREFORMED FLAT METAL	Materials:	SWC,SUS,cold roller steel, beryllium copper, phosphor copper, brass, 60Si2Mn, 55CrSi etc
	Surface treatment:	Zinc,nickel,chrome,silver,blacking, gold plating, powder coated etc

MATERIAL: MW - Music Wire	**ENDS :** C - Closed	**FINISH :** Z - Zinc
SPR - Spring Steel	G - Ground	BO - Black Oxide
SUS - Stainless Steel	O - Open	N - None

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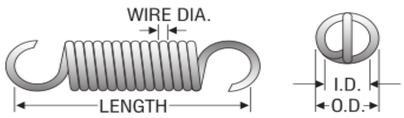


1.How do you figure out how many active coils a spring has?

In any spring, some portion of the end coils will obably be inactive. The number of inactive coils varies depending on the spring end configuration and mating component geometry. The following equations give approximate active coil counts, ween parallel plates.

For closed ends (ground or unground): Na ≈ Nt – 2

For open ground ends: Na ≈ Nt – 1

For open unground ends: Na ≈ Nt

In practice, the number of inactive coils varies s lightly as a spring is compressed. If the spring output at two operating heights is known, the nu-mber of active coils over the operating height ge can be calculated using the following equation for any end configuration.

$$N_a = \frac{Gd^4(h_1-h_2)}{8(OD-d)^3(P_2-P_1)}$$

G = shear modulus of the spring material

d = wire diameter

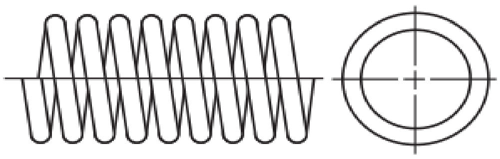
OD = spring outside diameter

h1 , h2 = spring operating heights

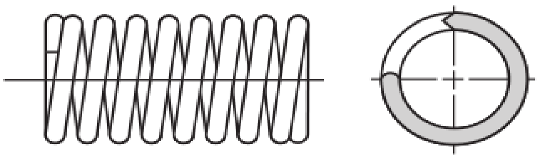
P1 , P2 = spring force at heights h1 and h2.

2.What is the difference between closed and closed ground ends?

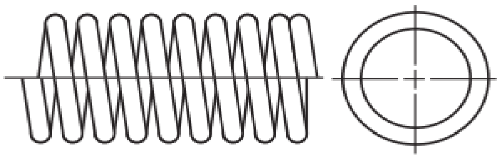
Springs can be coiled with a variety of end urations. If the space between the coils is to the point where the wire at the tip makes with the next coil, the end is said to be “closed”. Stock springs are listed in the catalog with speci-fic ends (C = Closed, CG = Closed & Ground or O = Open). If you need a different type of end what is listed, we can custom manufacture for



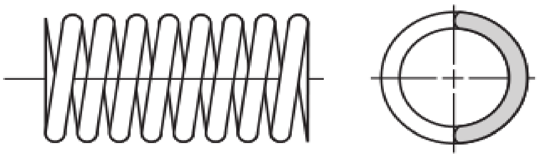
Open Ends
Coiled Right-hand



Closed, Squared and Ground
Ends Coiled Left-hand



Closed Ends Not Ground
Coiled Right-hand



Open Ends Ground Square
Coiled Left-hand

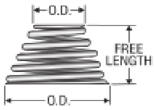
3.What is a safe design stress for a compression spring?

This question does not have a single, simple wer.The answer depends heavily on the type of material used (e.g. music wire, SUS, chrome-silicon,etc.), material grade (e.g. commercial vs. valve spring quality, standard or high strength, and the service environment (e.g., static vs. corrosive atmosphere, extremely high or low tem-peratures, etc.).

Knowing the answers to the following questions will greatly assist the spring designer.

Will the spring operate under static or cyclic itions? If cyclic, what are the minimum and maxi-mum operating loads, deflections, or heights?

- What is the desired life?
- What is the operating environment?
- What is the operating temperature?
- Does the assembly include physical stops to limi spring deflection? If so, what are the limits?



4.Which material gives the best corrosion resistance?

Once again, the actual operating environment a significant role. Many coatings are available that can provide adequate corrosion resistance for wire types that would not themselves resist corrosion. These include powder coating, phosphating with an oil dip or spray, and plating in some cases. Generally speaking, a coated spring produced from a traditional spring material will involve less cost than producing a spring from stainless steel. When the application is such that coated spring wire will not meet the requirements of the application, the focus turns to stainless steel 302 stainless steel is generally the first choice. Wire can yield very corrosion-resistant springs for most environments. When the application calls for high operating temperatures as well, carbon steel and 304 stainless steel wire will also likely be considered.

5.What is free length?

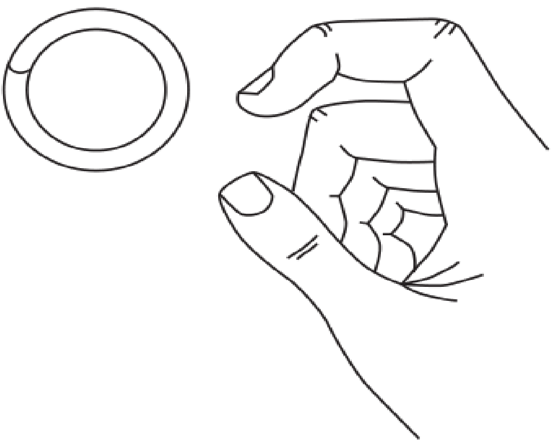
For a compression spring, it is the length of the spring from one end to the other when no load is applied. For a tension spring, it is the length between the inside diameter of the two end hooks when no load is applied.

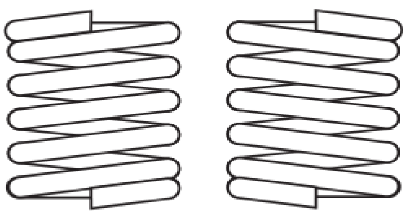
6.How long will a compression spring last?

The effective life of a compression spring depends heavily on the operating environment. A spring designed for a static application with a properly chosen material should last indefinitely. In cyclic applications, springs are generally designed for infinite life; however,application nuances such as resonant vibration could drastically reduce spring life.

7.How do I know if a spring is RHW or LHW?

When looking along the axis of a spring, curl your index finger so that it follows the same direction as the wire from the spring body to the wire tip nearest you. If the end coil wraps in the same direction as your index finger (picture below) then it is that hand (right or left). See illustration below for method and a Right Hand Wound spring.





8.Does it make a difference on a torsion spring whether its left or right hand wound?

Yes. To reduce the likelihood of torsion springs taking a set, the spring should be coiled in the direction that results in increased coil count as load is applied. In other words, the spring should be coiled such that it“winds up” when load is applied. If the spring “unwinds” as load is applied, it should probably be coiled in the opposite direction.

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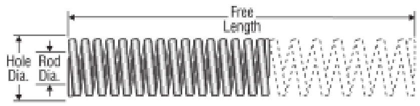

9.How are extension spring loads calculated?

Most simply, the force exhibited by an extension spring will be the spring rate times the deflection from free plus the initial tension. Mathematically,

$$P = (k * \delta) + P_i = k * (l - l_F) + P_i$$

P = Spring force,
k = Spring rate,
δ = Deflection from free length,
PI = Initial tension,
l = Spring length, and
lF = Spring free length

10.Tolerance (OD, FL, Load, Total Coils)

Achievable spring tolerances depend heavily on spring geometry characteristics. Empirical have resulted in a complex series of calculations that can predict appropriate tolerances for any given spring geometry. These calculations are involved for this discussion and best suited for automation through software. Please consult with a Century Spring design engineer to determine appropriate tolerances for your particular design or application.

11.How long will a compression spring last?

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12.If I cut a spring in half, would the rate stay the same?

Cutting springs generally decreases the number active coils. This forces an increase in spring The spring rate is proportional to 1/Na , so reducing the number of active coils by half doubles spring rate.

13.What material is best for high temperature applications?

As temperature resistance increases, the and processing cost typically increases significantly.Therefore, it is usually wise to select a rial that provides resistance for the intended erature range with minimal excess capability. The table below lists a variety of spring materials and their maximum service temperatures.

Wire Type	Max Temp.	Wire Type	Max Temp.
Music Wire	250°F	302 Stainless	500°F
Hard Drawn Carbon	250°F	17-7 PH	600°F
Oil Tempered Carbon	300°F	NiCr A286	950°F
Chrome Vanadium	425°F	Inconel 600	700°F
Chrome Silicon	475°F	Inconel X750	1100°F

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