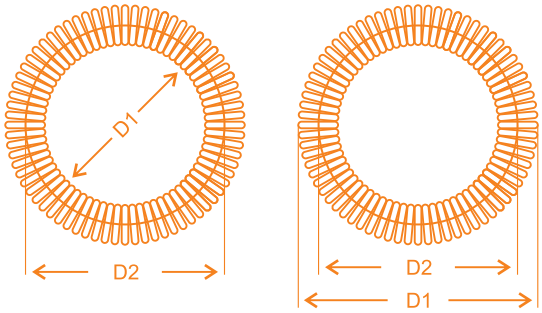
GARTER SPRING

WIRECOM™ (INDIA) PRIVATE LIMITED
Where... Quality Springs to Life!

Garter springs are essentially helical springs with connected ends; it forms a circle to provide a strong radial force. Garter springs are basically extension springs or compression springs whose ends are connected to make a garter belt that will exert force from its inner diameter. Compression garter springs exert outward radial forces, while extension garter springs exert inward radial forces. Their design is crucial to guarantee maximum functionality, so it's important that factors like where & how the spring will be used are taken into consideration. They are usually produced with Carbon steel or Stainless steel wire. Since they are able to withstand forces from all directions, they are effective at handling changes in volume, pressure, temperature & viscosity.



How to Design a Garter Spring

- What type of environment will this spring be in? The answer to this question will allow determining the correct wire type for your design. Certain restrictions such as temperature or liquid will have a tremendous impact on the type of wire and cost of material.
- We must know the outer and inner diameter of spring formed ring. Since a garter spring is most often used as a seal, it needs to fit precisely over the cylinder that it is preventing liquid from escaping or entering. Determine the outer and inner diameter of the Garter spring. Then determine what coil spring diameter needs to be. We will also have to figure out how much radial force will need in seal or application at a given expansion point.
- Max force being put on the garter spring. This will allow spring maker to design garter spring to withstand the amount of pressure that intend placing the spring under. If we do not know this value it can cause spring to be too weak or too strong for design.

List of Parameters

- **Garter Belt:** Other term for garter springs.
- **Wire Diameter:** Measurement of wire thickness.
- **Garter Spring Outer Diameter:** Measurement of the outside dia. of the garter spring/belt once the ends are connected.
- **Garter Spring Inner Diameter:** Measurement of the inside dia. of the garter spring/belt once the ends are connected.
- **Mean Diameter:** The medium or intermediate diameter between the outer and inner diameter. Calculated by adding one wire diameter to the inner diameter or subtracting one wire diameter from the outer diameter.

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- **Spring Index:** The proportional ratio between a spring's wire diameter and mean diameter. It describes the tightness of the spring's coils.
- **Body Length:** The extension spring's body is the section where you have the coils so the body length is the measurement of the body's length.
- **Active Coils:** The active coils that make your garter spring function.
- **Loop Connections:** Hooks which are made from the ends of the extension spring that'll hook with each other in order to connect the garter spring.
- **Connector Ends:** One of the spring ends is tapered so that it may be inserted into the other end thus making male and female connecting parts.
- **Rate (Constant):** The constant amount of force it will take the spring to travel a certain amount of distance.
- **Initial Tension:** This force is energy already gathered in between the coils and is released when the tension spring is extended just enough so that you may see light in between the coils.
- **Travel (Deflection):** The motion in which an extension spring is pulled or extended. The distance travelled is calculated by subtracting the length inside hooks from the extended length.
- **Load (Force):** The weight being applied on the spring's hooks in order for it to reach an extended length.
- **Maximum Safe Travel Considering Hook Stress:** The maximum amount of travel your spring is able to achieve considering the strength of its hooks.
- **Maximum Load Possible Considering Hook Stress:** The maximum amount of load your spring is able to undergo considering the strength of its hooks.
- **Endurance Limit:** Maximum Stress at which your garter spring will perform indefinitely without failure for a given minimum stress limit.
- **Permanent Set:** The product of exceeding the elastic properties of an extension spring thus keeping it from returning to its original unloaded length once the load has been released.

Key Parameters

- **Outer Diameter:** Measurement of the outside dia. of the garter spring/belt once the ends are connected.
- **Inner Diameter:** Measurement of the inside dia. the garter spring/belt once the ends are connected.
- **Initial Tension:** Additional force to the one already listed in rate. This force is energy already gathered in between the coils and is released when the tension spring is extended just enough so that you may see light in between the coils.
- **Rate:** The constant amount of force it will take the spring to travel a certain amount of distance.

WIRE – RANGE : 0.25 MM - 1.5 MM

Material

- High Carbon Spring Steel Wire
- Stainless Steel 302,304,316

Finish

Bright finish or with plating

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Manufacturing Process

Conical Springs are manufactured on imported CNC Spring Coiling Machines with SPC on line with free length sorting device for critical load value.

Testing & Certification Process

Each spring manufactured goes through a series of rigorous tests conducted on in house testing facilities such as Computerized Load Testing, UTS Testing, Torsion testing, Profile Projector amongst others. All springs are supplied with ROHS raw material compliant report. We also provide PPAP documents for automobiles and electrical industries as per requirement.

Common Applications

The primary application is to maintain lip seal pressure on a shaft. Garter Springs used in oil seals, shaft seals, belt-driven motors, and electrical connectors.

Reference Standards

- **IS4454(Part 1) :2001 –** Cold Drawn unalloyed Steel Wire - wire grades SL, SM, SH, DM & DH
- **IS4454 (Part 2) : 2001 –** Stainless Steel Wire

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