This catalog lists the spring materials and range of coil width that iConn Engineering regularly designs and manufactures. It also covers the basic functions and major advantages of canted coil springs.

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Canted Coil Springs Make Mechanical or Electrical Connectors Simple

Product Range

iConn Engineering's canted coil springs can be categorized in terms of wire materials, wire diameters, and coil dimensions. The table on the right covers the range of canted coil springs we design and manufacture. Due to the nature of customization, iConn typically has no spring stock and every part number is specifically designed and manufactured for each customer.

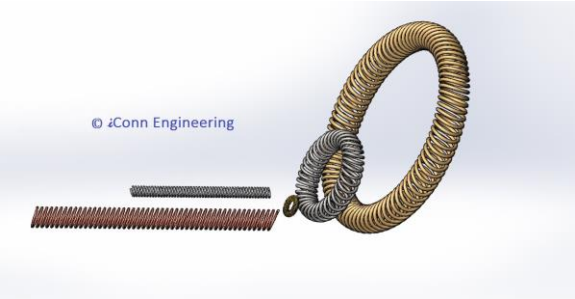


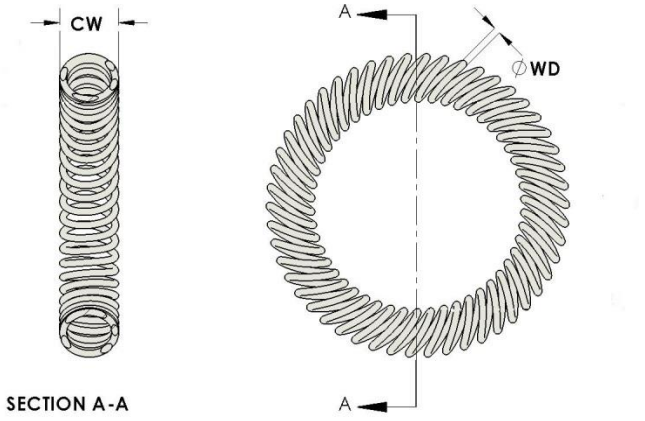
Figure 1. Canted coil springs in straight length or spring ring forms

Our standard wire materials are stainless steel and copper alloy. Other materials can be specially ordered.

In order for springs to work as designed, spring gland dimensions must match the spring deployed. iConn can provide design proposals free of charge if you fill out the application data form (ADF) at the end of this catalog (Page 6). To avoid unnecessary failures, engineers at iConn always ask for your dimensional restrictions, application medium, temperature and its changes, as well as electrical and mechanical requirements before proposing a spring solution.

Table 1. iConn's canted coil spring sizes and wire diameters

	Spring Coil Width (CW) (mm)		
Wire Diameter (WD) (mm)	**Small**	**Medium**	**Large**
0.05 to 0.5	0.3	1.5	2.5
0.5 to 1.0	2.5	4.2	6
1.0 to 1.8	6	9.5	20



iConn Engineering aims to enhance customers' competitive advantages with the most innovative connecting solutions. We look forward to our mutually beneficial collaborations.

iConn's Competitive Advantages

iConn Engineering employs the smartest engineers, the most advanced tools, and the best practice to provide superior design solutions, and to fulfill all customers' connecting, conducting, and shielding needs. We guarantee the product quality and repeatability with the following competitive advantages:

Advanced Spring Technology

iConn applies three-dimensional computer aided design (3D CAD) to model and investigate spring configuration and capabilities. Each spring is virtually analyzed with finite element technique and its mechanical and electrical data are collected to facilitate the design process. Regardless of applications, iConn can propose the right answer on the first try. We also offer fast prototyping services to give our worldwide customers a competitive edge.

Stringent Vendor Selection

iConn's vendors must pass strict qualification criteria and prototype inspections before approval. Materials must pass our proprietary purchasing specifications to meet final product functionalities, and are subject to strict incoming inspections. We also match material certifications to production lots in the quality documentation process for traceability.

Best Production Precision

Besides rigorous design and material control, our dimensional precision and repeatability are achieved with CNC machines and presubscribed inspections. The 3D modeling data enable iConn to maintain a 3% dimensional tolerance, propelling iConn to the front of the industry.

Strict Quality Procedures

First article inspection, documented sampling schedules, and final inspections are enforced to ensure product quality. Inspection reports are included in the documentation package. We ensure spring reproducibility and repeatability to protect our customers' best interests.

Uncompromised Customer Service

Communication is essential to any business success. iConn's sales team members diligently guide and provide uncompromised superior service. Engineering and Manufacturing routinely ensure the highest product quality. Customer Service promptly follows up on order acknowledgment and progress update. Your satisfaction is our highest priority.

Canted Coil Spring Introduction

iConn Engineering is the world's leading innovative canted coil spring designer and manufacturer. This type of specialty springs are sometimes called slanting or slanted coil springs. Serving virtually every major industry across the globe, iConn provides unique, patentable, precision connecting solutions for electrically conducting, radio frequency shielding, and mechanically force-sensitive applications. Backed by the best mind, design tools, and a world-class manufacturing and quality system, iConn is dedicated to serve all your connecting, conducting, and shielding needs.

Canted coil springs are compressed on the side of coils, instead of vertically as in helical springs (Figure 2). The springs can be sold in the forms of straight length, or spring rings (Figure 1). For helical springs, the compression force linearly increases with the compression distance Δd (Spring Force = $k \times \Delta d$). But for canted coil springs, after an initial linear increase, the force plateaus regardless of further compression. This feature makes canted coil springs the ideal candidates for constant force connectors, or electrical conductors, as connecting force and contact resistance are directly related to the normal compression force.

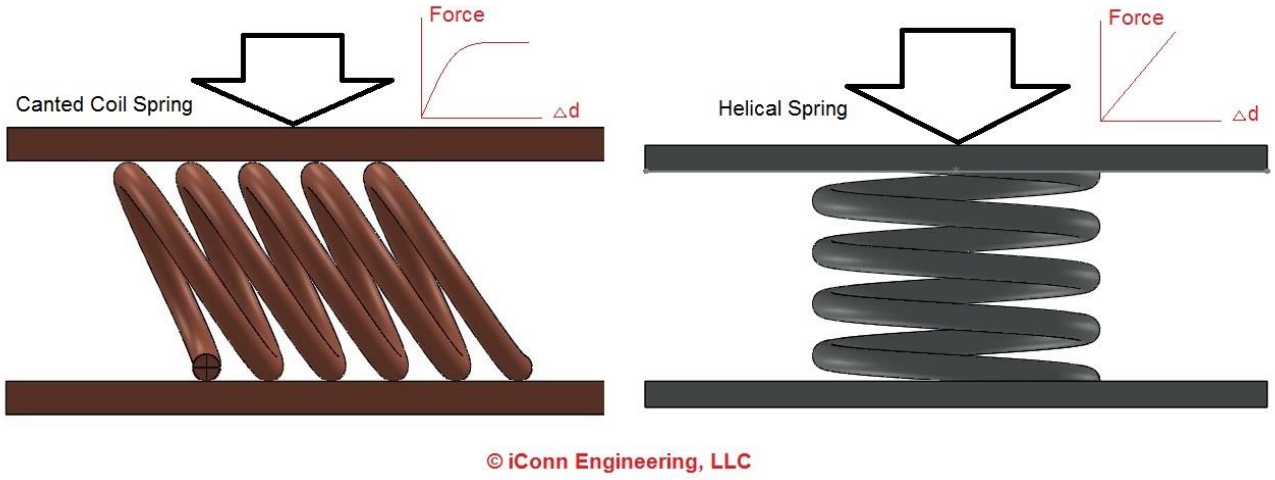


Figure 2. Compression direction and force curve differences between a canted coil spring (left) and a helical spring (right)

Features and Advantages of Canted Coil Springs

Imagine a thermally expanding/shrinking metal or plastic piece, an offset piston, or an unevenly finished surface. The dimensional variations are inevitable in the real world. Canted coil springs solve the force variation problems with the unique **flatness of the spring force**, even when the spring compression varies (Figure 2, left panel). Engineers at iConn pair each spring with specifically designed spring gland/groove dimensions to ensure the application functionality. We also target the connector's engaging/disengaging force, and calculate the specific amount of electric current.

With the **simple** ease of **plug and play**, canted coil springs streamline your system by **decreasing space** requirements**, simplifying connector** assembly**,** thereby **diminishing** labor **time, reducing materials**, and **saving** manufacturing and maintenance **cost**.

As mentioned, the plateaus of the force curves provide **compensation for hardware imperfections** and piston misalignment (Figure 3). By exerting similar force on each coil, all coils of a canted coil spring buffer the unevenness of hardware surfaces, compensate thermal variations, and exert similar force even with alignment offset. The springs guarantee the connector's mechanical and electrical **consistency** and integrity. The coils also act to **clean** the surfaces at insertion.

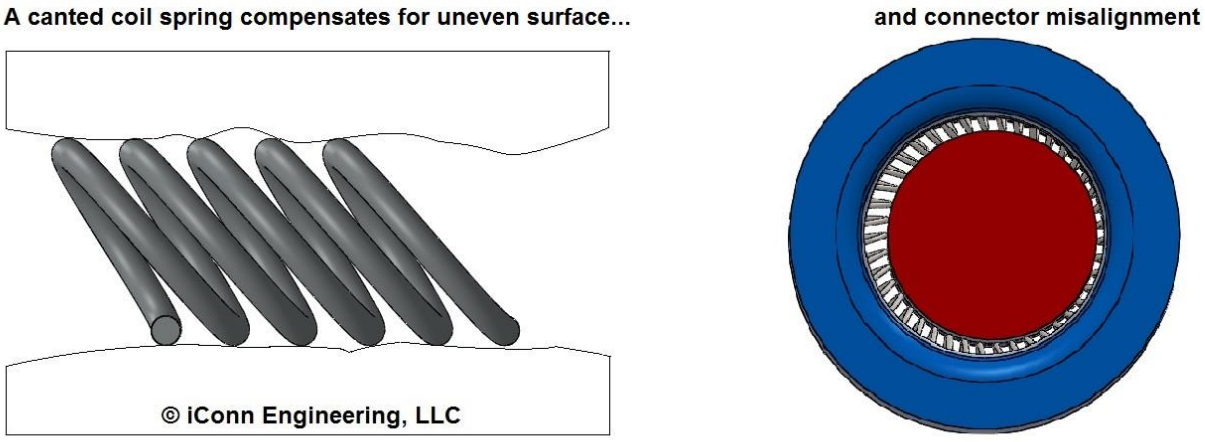


Figure 3. Canted coil springs compensate for surface unevenness, material thermal variations, or assembly misalignment while maintaining force consistency

Mechanical applications

Canted coil springs must be installed in specifically designed glands to ensure dimensional and functional integrities. This requirement cannot be emphasized enough. When a mating component, for example, the piston in Figure 4, is plugged into the housing (blue), the spring is compressed vertically, generating a normal force to the piston. This force is pre-calculated at design time to control the connector's mating force. As a bonus, another horizontal force can designed to push Surfaces 1 and 2 tightly together.

Electrical Connectors

The electric capacity of each spring can be pre-calculated to meet application requirements. Electrically conducting and mechanically force controlling, one canted coil spring serves two purposes, thus lowering the number of components in the connector, saving space and materials, reducing assembly time, and decreasing the system cost.

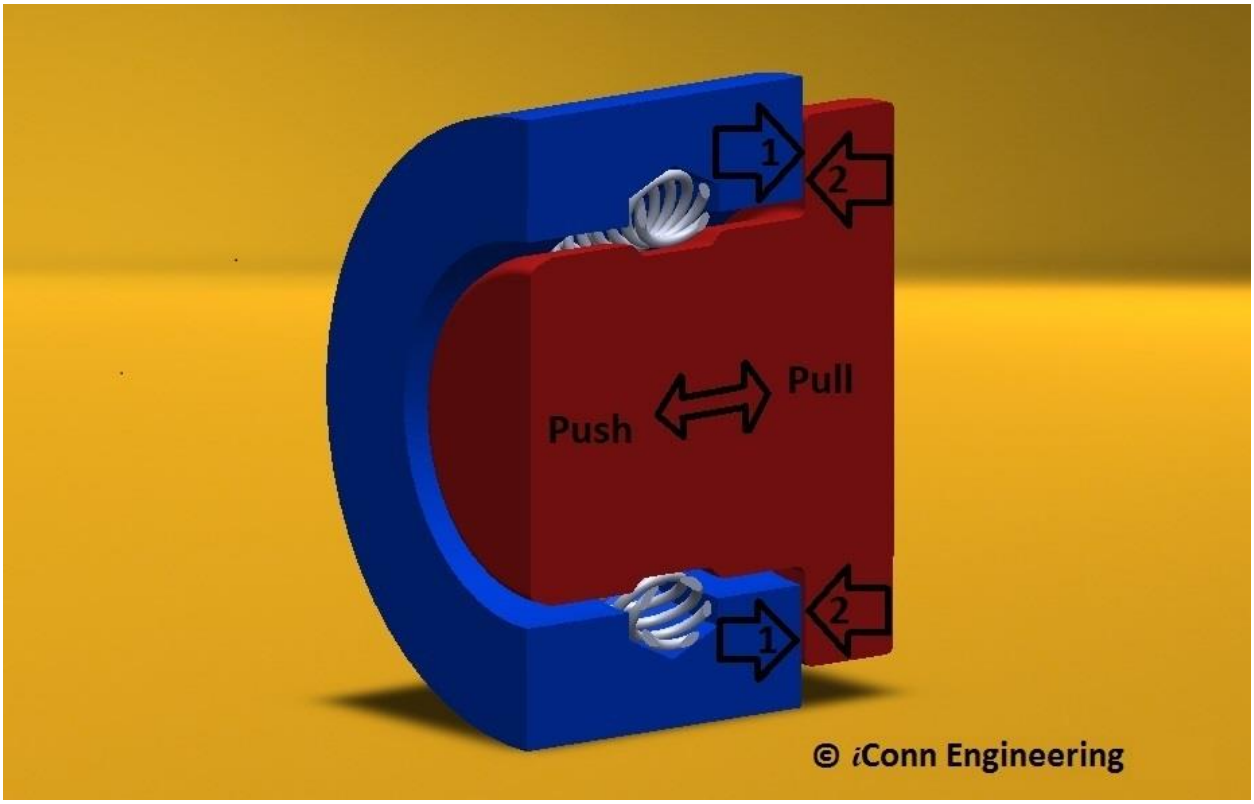


Figure 4. A simple canted coil spring connector multi-functionally pulls Surfaces 1 and 2 tightly together, prescribes specific amount of connecting and disconnecting force, and conducts pre-calculated amount of electric current

To facilitate spring design, please provide what you can on your connecting needs:

iConn Engineering Canted Coil Spring Application Requirements

Your Information:

Company: _____ Date:
Address: _____ Name: _____
_____ Title: _____
Phone: _____
Website: _____ Email: _____

Your Product Data: ☐ Prototype Stage ☐ Production Stage ☐ Replacement

Equipment Type: _____
Annual Spring Usage: _____ Spring Qty: _____ Spring used: ☐ Mechanically ☐ Electrically
Expected Production Date: _____

Your Application Conditions:

Insertion Force: _____ ○ kg ○ lbs Continuous Current: _____ ☐ A ☐ kA
Removal Force: _____ ○ gram ○ N Short Circuit Current: _____ ☐ A ☐ kA
Compression Force: _____ Short Circuit Duration: _____ ☐ Sec ☐ mSec
Motion: ☐ Static ☐ Dynamic ☐ Oscillatory Δ temperature Rise: _____ ☐ °C ☐ °F

Mounting and Spring Type:

☐ Piston Mounted Spring Ring ☐ Housing Mounted Spring Ring ☐ Spring in Length Length:

Your Piston / Plug Info.:

Diameter: _____ ☐ mm ☐ Inch
Tol: + _____ - _____
Groove Width: _____ ± _____
Groove Depth: _____ ± _____
Material: _____
Plating/Treatment: _____
Surface Hardness: _____
☐ Piston groove can be modified

Your Socket / Housing Info.:

Diameter: _____ ☐ mm ☐ Inch
Tol: + _____ - _____
Groove Width: _____ ± _____
Groove Depth: _____ ± _____
Material: _____
Plating/Treatment: _____
Surface Hardness: _____
☐ Housing groove can be modified

More comments if any:

Please email the filled form to: info@iconneng.com, or call the numbers below.

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