



Sealing, Connecting,  
Conducting and  
EMI Shielding Solutions



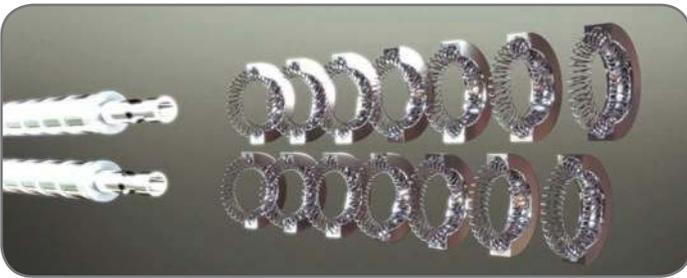
Custom components that drive tomorrow's technologies.

## Product Innovation Through Engineering Collaboration

At Bal Seal Engineering, we create custom sealing, connecting, conducting and EMI shielding solutions that improve the performance and reliability of the equipment you design and manufacture.

For more than half a century, we've helped some of the biggest names in worldwide industry gain a competitive edge. And in many cases, we've helped to develop breakthroughs and shape industry standards along the way. Our collaborative engineering approach enables us to forge "innovation partnerships" with engineers like you who want to make their products stronger, faster, lighter or more functional.

In early development or existing product improvement stages, we combine our proven core products with application engineering, precision manufacturing and material science expertise to produce solutions that deliver.



The Bal Conn® electrical contact is an excellent example of how our collaborative engineering approach can yield breakthrough solutions for OEMs. Created in cooperation with a leading maker of active medical implantables, the Bal Conn is currently ensuring reliable lead interface connections in more than one million cardiac and neuromodulation devices worldwide.

## Custom-Engineered Springs, Seals and Contacts

Because we engineer each component to meet your unique challenge, we don't offer any "standard" products. Instead, we specialize in applying our advanced designs, unique materials and manufacturing capabilities to meet your most demanding sealing, connecting, conducting or EMI shielding needs. All of the solutions we provide fall into one of these three basic categories:



### Bal Spring™ Canted Coil Spring

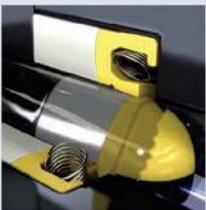
At Bal Seal, the solutions we develop begin with proven canted coil spring technology. In electrical conducting and EMI shielding applications, the spring's individual coils provide multipoint contact, and they compensate for mating surface irregularities and misalignment. As a contact component, the spring offers superior conductivity and power density. It runs cooler than other contact technologies, and it is also self-cleaning. Since it's capable of performing both mechanical and electrical functions, the canted coil spring eliminates unnecessary components and can help reduce system weight. Its highly customizable design also allows for precise control of insertion and breakaway forces. As a stand-alone solution, the Bal Spring canted coil spring is ideal for use in applications that require:

- Latching/locking
- Holding
- Centering
- Conducting
- EMI/RFI Shielding
- Grounding
- Tolerance compensation



### Oil & Gas

Oilfield industry demands include superior resistance to pressure, temperature and aggressive chemicals. Our line of spring-energized seals for upstream and downstream applications meets these demands, providing longer service life, more uptime and increased profitability. Our springs make and maintain critical mechanical and electrical connections in advanced downhole tools. Select materials are NORSOK and NACE compliant.



### Analytical

In HPLC and UHPLC equipment, our custom-engineered spring-energized seals help improve equipment throughput and efficiency. They provide superior performance in a wide range of temperatures, pressures and media types, and exhibit strong resistance to abrasion in mobile phases. Our Canted Coil Spring grounds and efficiently transfers electrical current in mass spectrometers and other diagnostic instruments.



### Power Transmission & Distribution

In gas-insulated switchgear, circuit breakers, current transformers and cable accessories, the Bal Seal Canted Coil Spring serves as the ideal electrical contact. The spring offers high power density with minimal heat rise, and its compact footprint offers exceptional design flexibility.



## Bal Seal® Spring-Energized Seals

We offer a wide range of sealing products machined from polytetrafluoroethylene (PTFE) and other premium polymers. These materials can be blended with engineered fillers, such as carbon fiber, to meet your specific application requirements for durability, temperature resistance and longevity. Typically, our seals are energized with a custom-engineered Bal Spring™ canted coil spring, which exerts a near-constant force over a wide deflection range to ensure more even, consistent wear and longer service life in the following types of applications:

- Rotary
- Reciprocating
- Oscillating
- Face



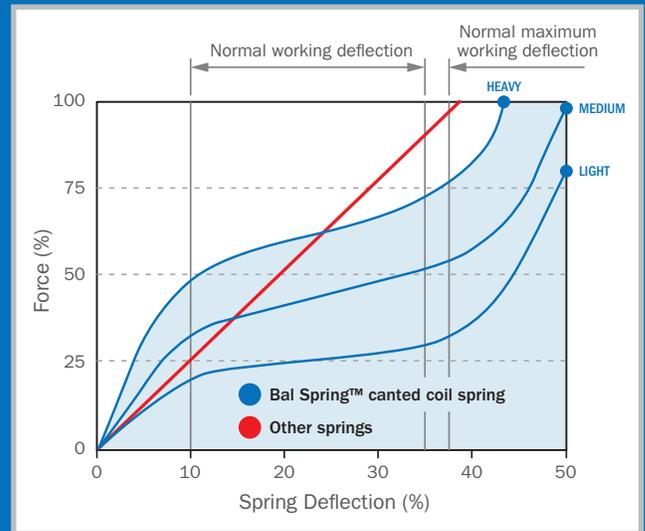
## Bal Contact™ Electrical Contacts & Contact Systems

When combined with precision-engineered metal housings, our Bal Spring canted coil spring serves as an excellent electrical contact, enabling OEMs to effectively manage high, medium and low current in a wide range of applications. The spring's individual coils act independently to compensate for misalignment and surface irregularities, ensuring superior multipoint contact and conductivity with minimal heat rise.



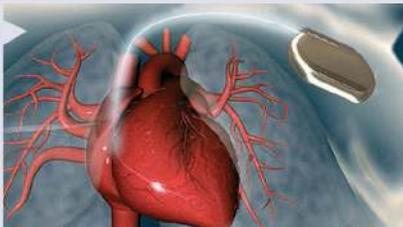
## Technology at the Core

Our core technology, the Bal Spring™ canted coil spring, is a versatile component that functions independently or in combination with precision polymer sealing and metal retaining elements to enhance the performance and reliability of your designs.



### Automotive

In existing and emerging hybrid and electric platforms, our Bal Spring canted coil spring ensures reliable, consistent connection between battery packs and other vehicle systems. The spring's ability to conduct and mechanically fasten enables designers to reduce system complexity while increasing performance and reliability.



### Medical Electronics and Medical Devices

In active medical implantables, our Bal Conn® electrical contacts and SYGNUS® implantable contact system facilitate consistent, reliable therapy delivery. Our canted coil spring shields diagnostic instruments from the harmful effects of EMI. Its customizable insertion and removal forces — coupled with its superior cleanability — also make it ideal for use in orthopedic and surgical instrument fastening applications. Our custom sealing products guard against leakage in medical pumps and drug-delivery systems.



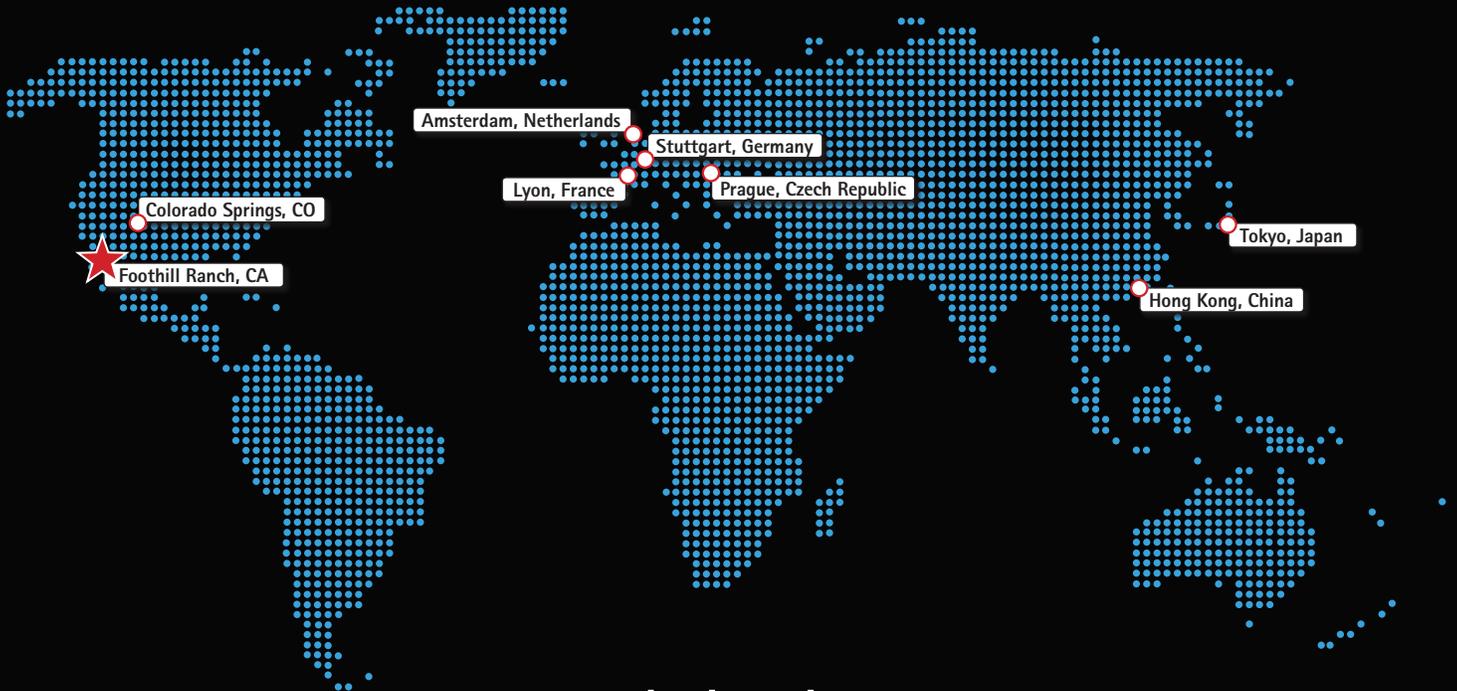
### Aerospace and Defense

Commercial and military aviation systems all over the world are protected from leakage and potential failure by Bal Seal spring-energized seals. Our canted coil springs are used in connecting designs for avionics and lightning strike protection, and they connect and conduct electricity along satellite solar arrays.

# Commitment to Quality

Because our components are used in so many different kinds of critical equipment, from orthopedic devices, surgical hand tools and active medical implantables to commercial aerospace and hybrid automotive systems, everything we do begins and ends with quality. Under our ISO-certified

quality system, each step – from design to manufacturing, packaging and shipping – is closely monitored and controlled. This comprehensive Total Quality Management approach results in custom-engineered solutions that meet or exceed your most demanding quality requirements.



[www.balseal.com](http://www.balseal.com)



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Bal Seal Engineering is certified to ISO 9001 and ISO/TS16949