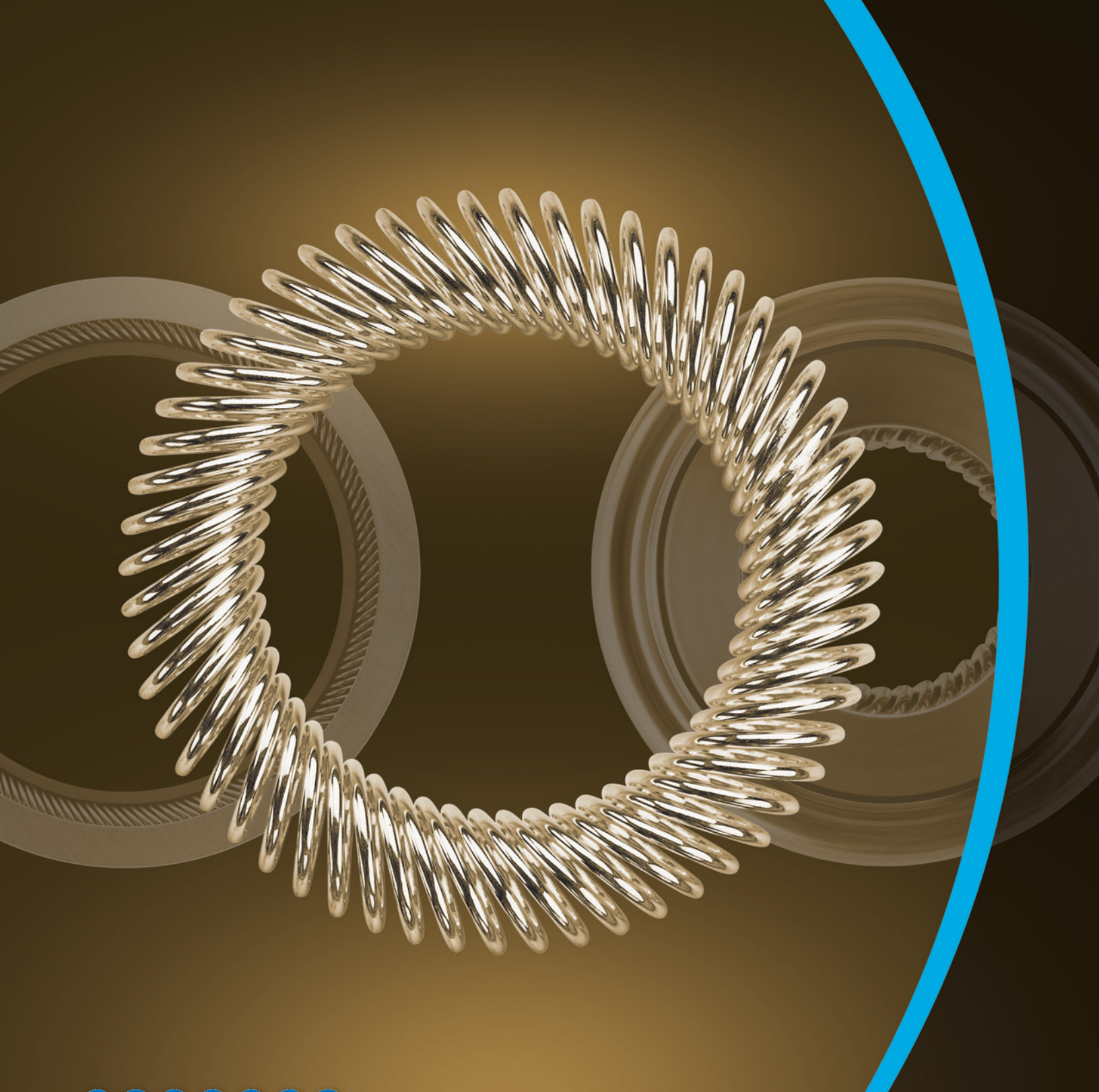
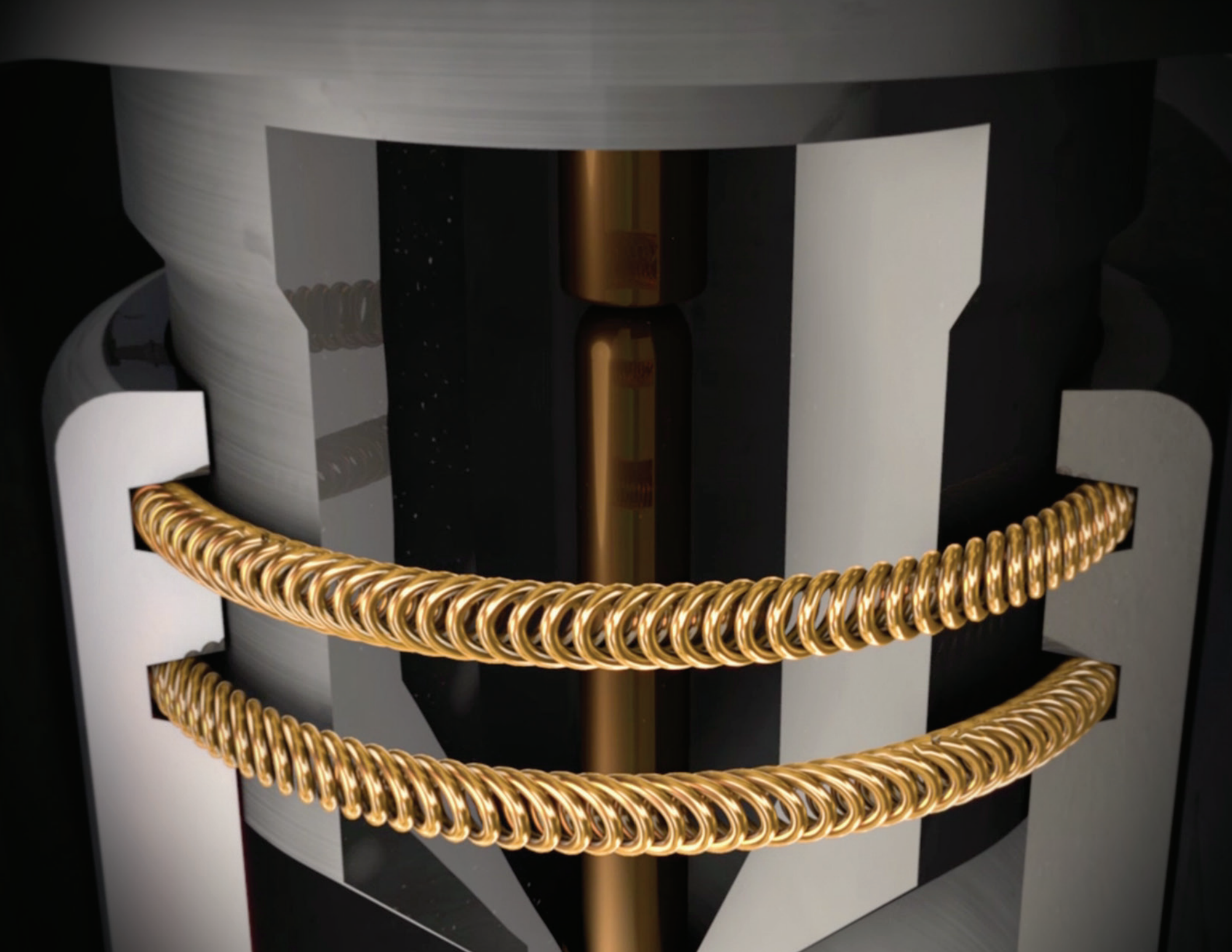


Sealing, Connecting, Conducting and EMI/RFI Shielding Solutions

Custom components that drive tomorrow's technologies.®

BAL SEAL® ENGINEERING, INC.



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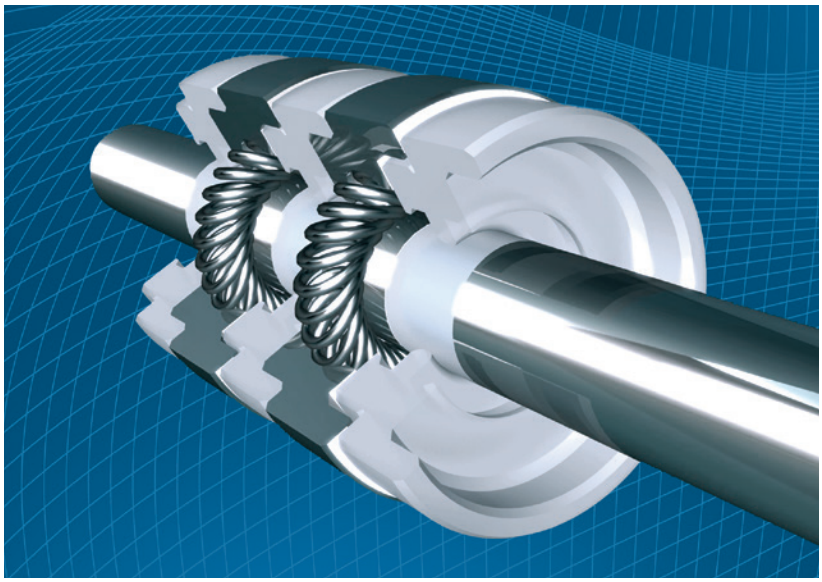
Product Innovation Through Engineering Collaboration

At Bal Seal Engineering, we create custom sealing, connecting, conducting and EMI/RFI 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.

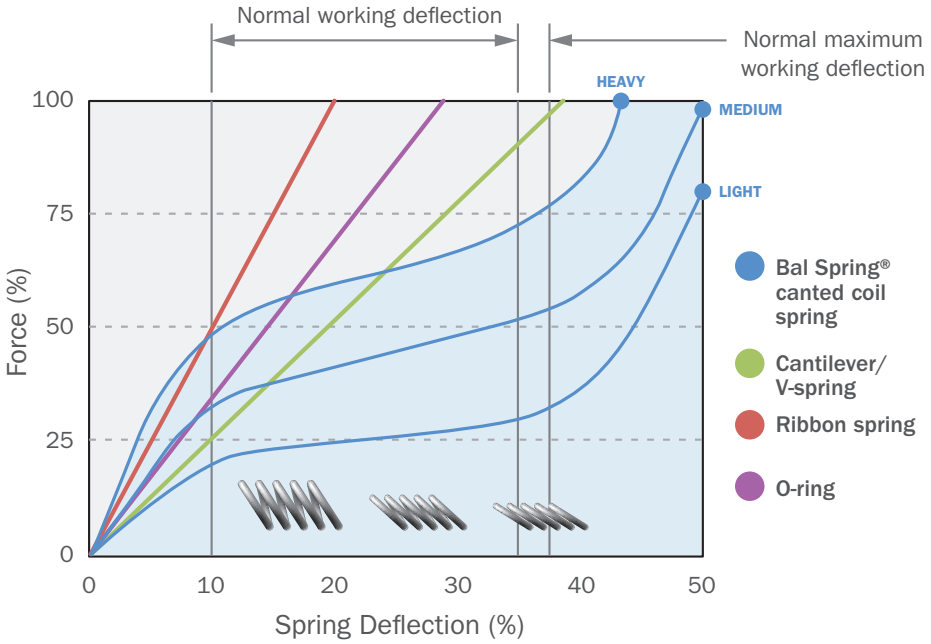


The Bal Conn® electrical contact is an excellent example of how our collaborative engineering approach can yield breakthrough solutions for OEMs. Created in cooperation with a leading maker of active medical implantables, the Bal Conn is currently ensuring reliable lead interface connections in more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

Technology at the Core

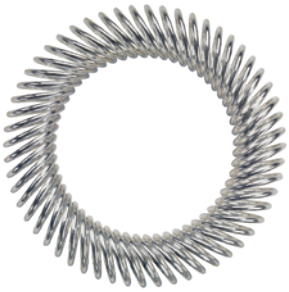
The Bal Spring® canted coil spring is a versatile component that mechanically fastens, conducts electricity, and shields sensitive electronics from the harmful effects of electromagnetic interference (EMI), and radio-frequency interference (RFI). The spring's independent coils, which serve as multiple contact points for optimal current carrying capability in electrical and shielding applications, ensure consistent, reliable connection—even under shock and vibration.

The Bal Spring is robust enough to withstand thousands of insertion and removal cycles, and it can be precisely engineered to meet virtually any connector force requirement. Available in a broad range of wire materials, sizes, and finishes, the spring can be manufactured to inside diameters as small as 0.41 mm (0.016 in.), and can also be easily configured to serve as a "tamper-proof" connection. The spring's compact design and multi-function capabilities help reduce system complexity and weight without compromising performance.



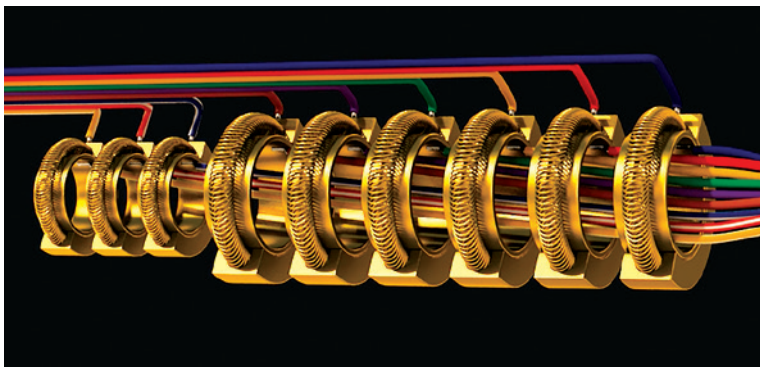
Custom-Engineered Springs, Seals and Contacts

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/RFI shielding applications. All of the solutions we provide fall into one of these three basic categories:



Bal Spring® Canted Coil Spring

The solutions we develop typically begin with proven Bal Spring® canted coil spring technology. In electrical conducting and EMI/RFI shielding applications, the spring's individual coils provide multipoint contact, and they compensate for mating surface irregularities and misalignment.



Bal Spring canted coil springs reliably conduct isolated current and signals along connectors and through tool strings in high shock/vibration environments.

As a contact element, 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 Bal Spring 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

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
- Static/Face

Bal Contact® Electrical Contacts & Contact Systems

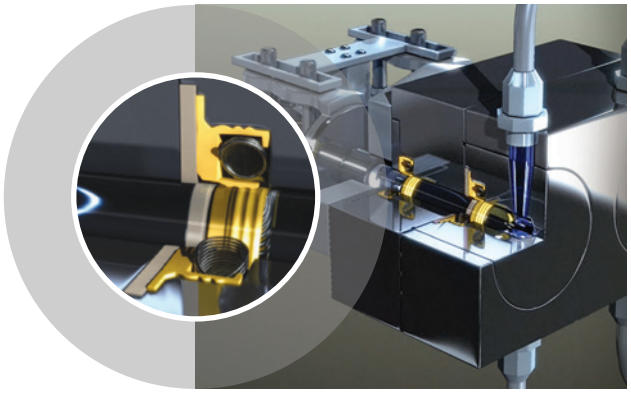
When combined with a precision-engineered metal housing, our Bal Spring canted coil spring creates a highly reliable electrical contact that enables OEMs to effectively manage high, medium and low current in a wide range of applications – both large and small. The spring's coils act independently to compensate for misalignment and surface irregularities, ensuring superior multipoint contact and conductivity with minimal heat rise. Bal Contact electrical contacts, integrated with our seals made from silicone and other materials, can also be supplied as systems for applications requiring both electrical conducting and protection against contaminants.

50+ Years Of Problem-Solving Experience

From medical to energy, defense to automotive, we help OEMs and tier suppliers in a broad range of industries solve their toughest sealing, connecting, conducting and EMI/RFI shielding/grounding challenges. Our unique Bal Spring®, Bal Seal®, and Bal Contact® technology, combined with our collaborative engineering approach and more than 50 years of problem-solving experience, enables us to help you enhance your product performance and gain a competitive edge.

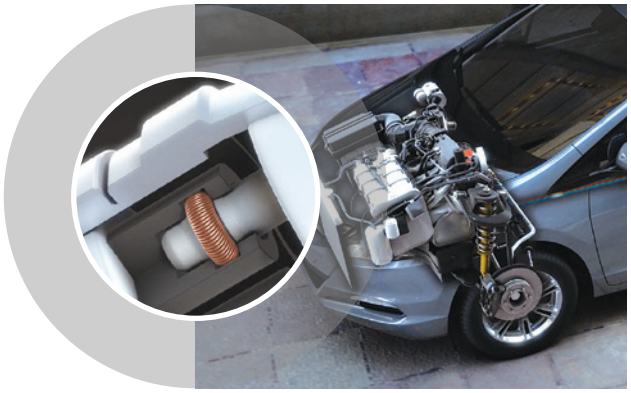
Aerospace and Defense

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



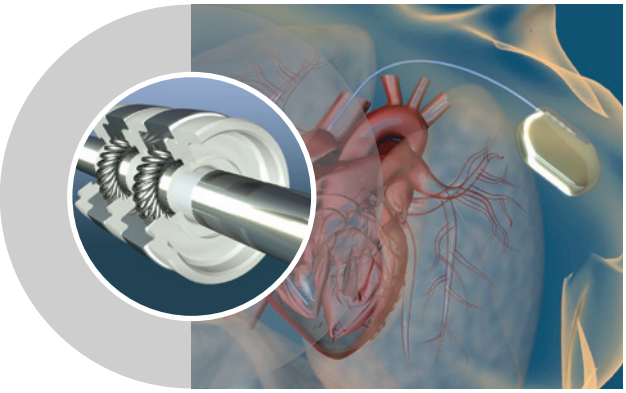
Analytical

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 Bal Spring canted coil spring grounds and efficiently transfers electrical current in mass spectrometers and other diagnostic instruments.



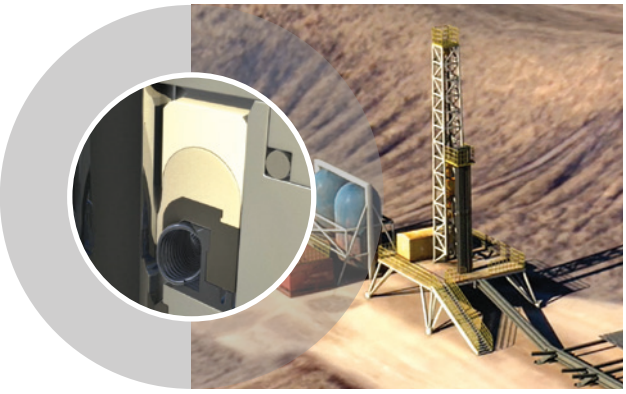
Automotive

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 and weight while increasing performance and reliability.



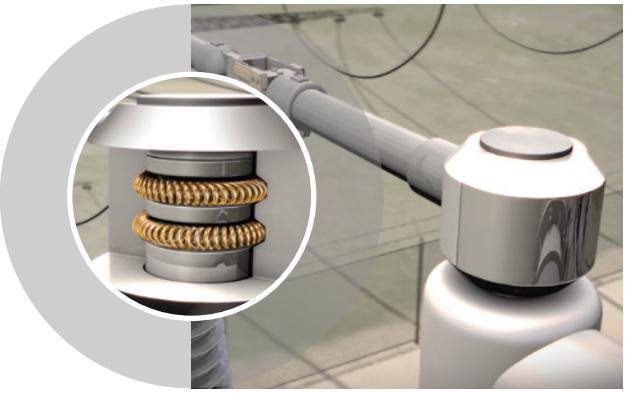
Medical Electronics and Medical Devices

In active medical implantables, our Bal Conn® electrical contacts and SYGNUS® implantable contact system facilitate consistent, reliable therapy delivery. The customizable insertion and removal forces—coupled with their superior cleanability—also make them ideal for use in orthopedic and surgical instrument fastening applications. Our custom Bal Seal® spring-energized seals sealing products guard against leakage in medical pumps and drug-delivery systems.



Oil & Gas

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



Power Transmission & Distribution

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

Important Information

CLEANING

Bal Seal Engineering products may require cleaning and/or sterilization before use, depending on the application.

TESTING

It is essential that the customer run evaluation tests to determine if the proposed, supplied, or purchased Bal Seal Engineering products are suitable for the intended purpose. Run tests under actual service conditions with an adequate safety factor.

Welded springs have an increased probability of breaking or failing at or near the weld. This probability is magnified if the spring is used in an application involving extension of the spring. In addition, temperature affects the properties of the spring (i.e., tensile strength, elongation, etc.) Failure of Bal Seal Engineering products can cause equipment failure, property damage, personal injury, or death. Equipment containing Bal Seal Engineering products must be designed to provide for any eventuality that may result from a partial or total failure of Bal Seal Engineering products.

Bal Seal Engineering products must be tested with a sufficient safety factor after installation and be subjected to a program of regular maintenance and inspection. The customer, through analysis and testing, is solely responsible for making the final selection of the products and for ensuring that all performance, safety, and other requirements of the application are met.

All information and recommendations contained herein are based on tests Bal Seal Engineering believes to be reliable, but the accuracy or completeness is not guaranteed. Any such information or recommendation is given solely for purposes of illustration and is not to be construed as a warranty that any goods will conform to such information or recommendation. No one, including Bal Seal Engineering employees, salespersons, representatives, wholesalers, or distributors is authorized to make any warranty or representation, and no customer or other user may rely on any such warranty or representation. Bal Seal Engineering reserves the right to make any changes (such as dimensional data, force, torque, materials, pressures, temperatures, surface finishes, surface speed, etc.) without notice to its products and to the contents of this document.

Nothing contained herein or in any of Bal Seal Engineering's literature constitutes a license or recommendation to use any process, or to manufacture, or to use any product in conflict with existing or future patents covering any product material or its use.

DISCLAIMER OF ALL WARRANTIES

The implied warranties of merchantability and fitness for a particular purpose and all other implied warranties are expressly disclaimed. There are no express warranties, except those, if any, specifically enumerated in this document.

In order to design your Bal Spring® canted coil spring solution, please use the "Design Request Form" on our website at www.balseal.com to tell us about your application. A copy of your submitted information will be e-mailed to you at the address you've provided, and we'll contact you shortly with a customized design proposal.

LIMITATION OF LIABILITY/REMEDIES

The liability of Bal Seal Engineering, whether as a result of breach of any warranty, failure to provide timely delivery products, product malfunction, negligence or otherwise, shall be limited to repairing or replacing the non-conforming products or any part thereof, or, at Bal Seal Engineering's option, to the repayment to the customer all sums paid by the customer upon return to Bal Seal Engineering of the non-conforming products or part thereof. It is expressly agreed that the customer's remedy, as stated above, shall be exclusive and that under no circumstances shall Bal Seal Engineering be liable for any other damages, including direct, indirect, incidental, or consequential damages (LE-173-5 Rev. 0).

PATENTS

The products described herein include those which are the subject of pending and issued patents, both foreign and domestic, including patents 9,534,625; 8,480,437; 8,437,855; 8,328,202; 8,167,285; 6,835,084; (LE-173 Rev. F) (Report#621-7).

We're more than just a component maker. In early development or existing product improvement stages, we combine our proven seals, springs, and electrical contacts with engineering, material science, and precision manufacturing expertise to produce solutions that break down performance barriers.

Americas

Bal Seal Engineering
19650 Pauling, Foothill Ranch, CA 92610-2610
Telephone +1 949 460 2100 or Toll Free +1 800 366 1006
Fax +1 949 460 2300

Europe, Middle East, Africa

Bal Seal Engineering Europe B.V.
VIDA Building, 1st floor,
Kabelweg 57
1014 BA Amsterdam
The Netherlands
Telephone +31 20 638 6523
Fax +31 20 625 6018

Asia Pacific

Bal Seal Asia Limited
Suite 901, Chinachem Century Tower
178 Gloucester Road, Wanchai, Hong Kong
Telephone +852 28681860
Fax +852 22956753

ISO 9001 · IATF 16949 · AS 9100D · NORSOK COMPLIANT MATERIALS · NACE COMPLIANT MATERIALS

BAL SEAL® ENGINEERING, INC.

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www.balseal.com sales@balseal.com

GENCAP-R02-02/19