



Conducting,
Shielding, Sealing
& Connecting
Solutions for
the Automotive
Industry

Smart Solutions for Automotive Equipment



When manufacturers of critical automotive equipment need solutions to the toughest conducting, shielding, sealing and connecting challenges, they turn to Bal Seal Engineering. For more than 50 years, our Canted Coil Spring and precision-engineered polymer sealing technologies have been improving the performance, safety and reliability of vehicles all over the world. We're more than just a component supplier - we're your *innovation*

partner. With a vast application knowledge base, **ISO/TS 16949** certified processes and advanced manufacturing capabilities, we can help you develop standard-setting breakthroughs that give you a competitive edge.

Technology at the Core: The Bal Seal Canted Coil Spring®

The Bal Seal Canted Coil spring is a simple, unique technology that serves as a versatile connector for today's demanding electric and hybrid automotive applications. The spring has a unique force vs. deflection curve (fig. 1), and provides nearly constant force across the working deflection, as compared to typical spring technologies where $F = -kx$ (Hooke's Law). This makes it possible to precisely engineer spring force to meet specific application requirements.

Our Canted Coil Springs have independent coils, which provide maximum contact points for optimal current carrying capability in electrical and/or EMI shielding applications (fig. 2). The Canted Coil Spring design is robust enough to withstand thousands of insertion and removal cycles while maintaining optimal performance characteristics. The spring's quick connect/disconnect capability can also provide a time saving solution to connector requirements in the field or on the factory floor.

We can manufacture Canted Coil Springs to inside diameters as small as 0.41mm (.016"), and they can be easily configured to serve as a "tamper-proof" connections.

Improving Seal Performance

We also employ the Canted Coil spring as an energizing component in our broad range of sealing solutions made from PTFE, filled PTFE and other polymers. In this capacity, the spring improves the performance and reliability of the seal by promoting more uniform wear and longer seal life.

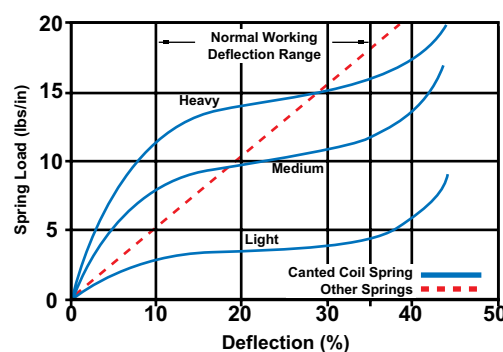


figure 1.

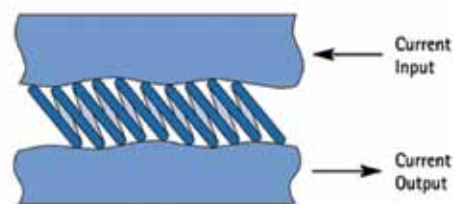
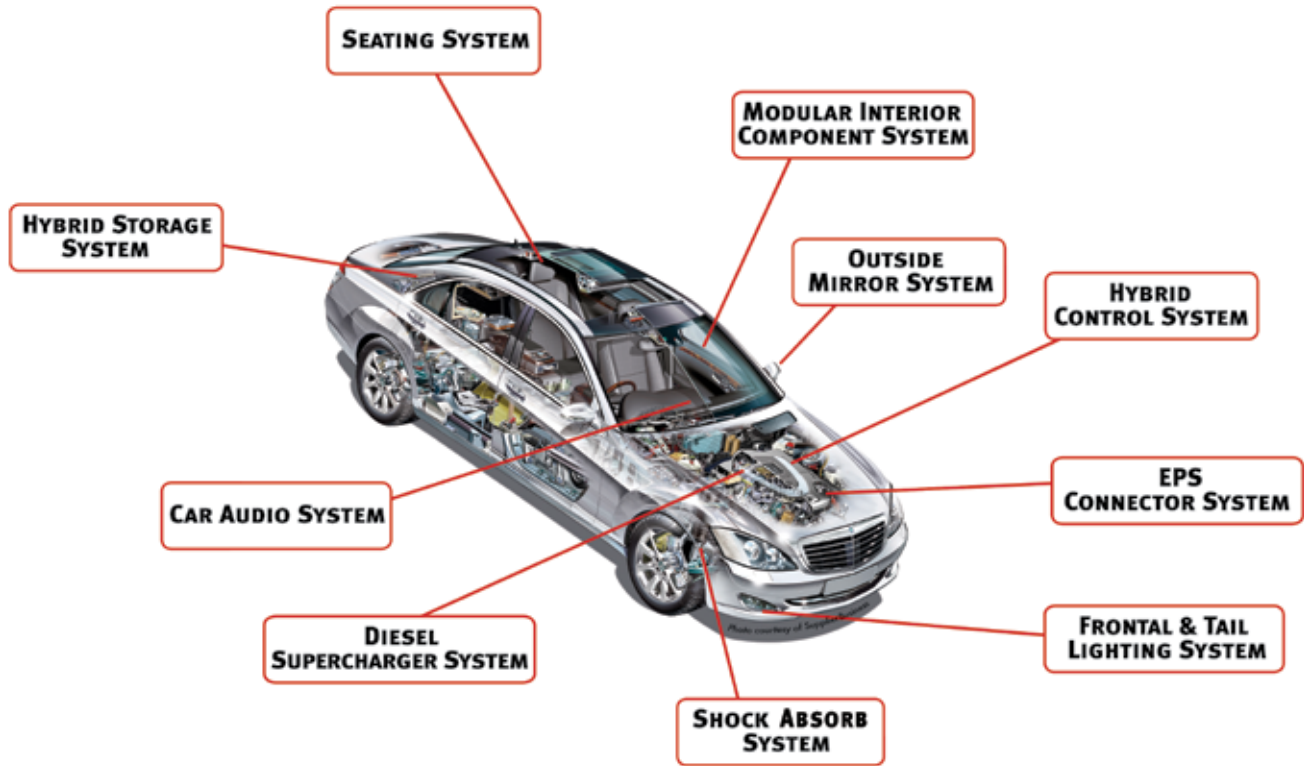


figure 2.

Typical Automotive Applications



Advantages of Bal Seal Canted Coil Springs®

- Long term durability: high resistance to compression set provided by high deflection and resilience; suitable for service in shock, vibration and other demanding applications
- Fits small package requirements: available in small ring ID of 0.016" (0.41mm); width as small as 0.070" (1.778mm) (fig. 3)
- High current carrying capability: conductivity across the interface is preserved by highly conductive material, highly concentrated and stable forces, and multiple points of contact; capable of handling the high current carrying requirements of today's electric and hybrid systems
- High mating tolerances, compensation for alignment, and surface irregularities: spring contact force remains nearly constant over a wide range of working deflection
- Easy assembly and installation: canted coils allow for controlled insertion and removal force; spring can be easily stretched over keys and other features, and may also be self-retained in grooves
- Capable of meeting OEM requirements for EMI/RFI shielding

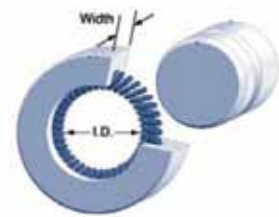


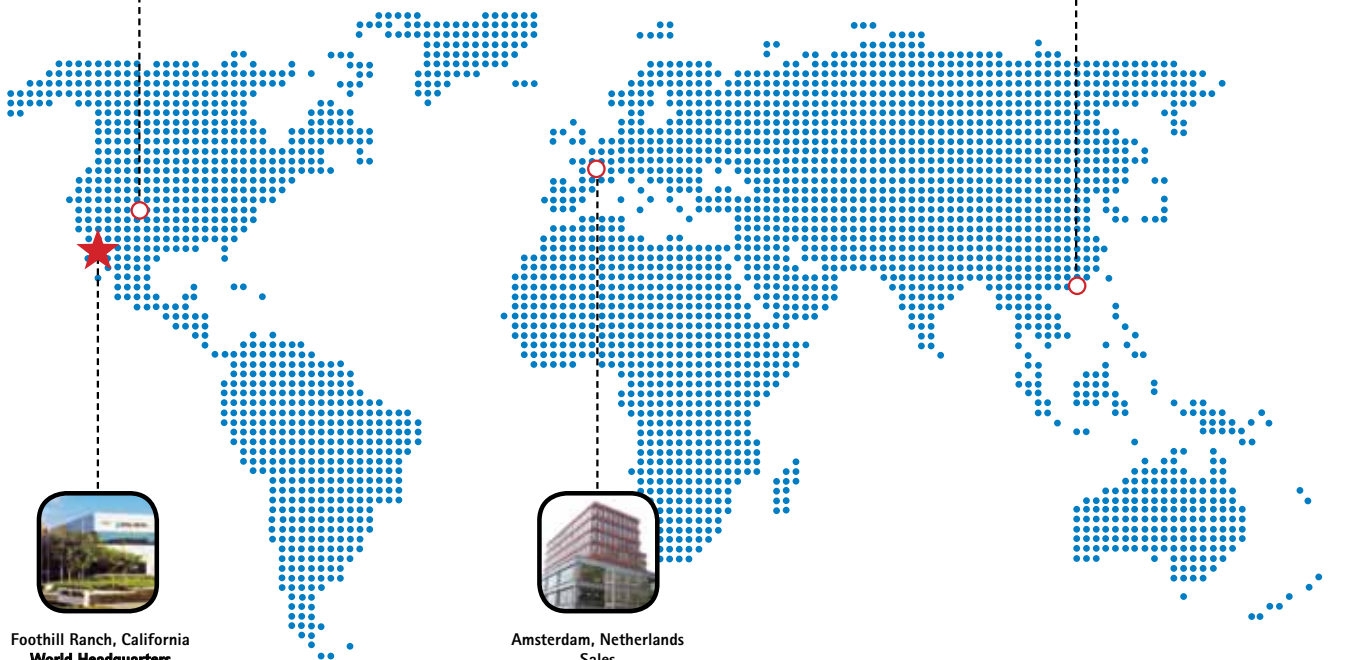
figure 3.

Bal Seal is certified to ISO/TS16949 standards.

Colorado Springs, Colorado
Manufacturing



Hong Kong, China
Sales



Foothill Ranch, California
World Headquarters
Manufacturing/Sales



Amsterdam, Netherlands
Sales



www.balseal.com



Bal Seal Engineering, Inc.
19650 Pauling
Foothill Ranch, CA 92610-2610
Telephone (949) 460-2100
Toll Free (800) 366-1006
Fax (949) 460-2300
E-mail sales@balseal.com

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
E-mail info@balseal.nl

Bal Seal Asia Limited
Suite 901, Chinachem Century Tower
178 Gloucester Road
Wanchai, Hong Kong
Telephone +(852)-28681860
Fax +(852)-22956753
E-mail sales@balseal.com.hk