SPRING-ENERGIZED SEALS

HIGH PERFORMANCE SEALS FOR DEMANDING APPLICATIONS

CHESTERTON®
Global Solutions, Local Service.

What is a Spring-Energized Seal?

A Spring-Energized Seal (SES) consists of a polymer jacket containing a metal spring. The polymer jacket is machined then mechanically energized by the metal spring to form a static or dynamic seal.

Spring-Energized Seals can compensate for system changes brought about by extreme temperatures, varying pressures, or aggressive fluid media. Spring-Energized Seals are a perfect solution in places where conventional seals might fail or where there would be regulatory or environmental consequences to contamination or leakage.

Meet Extreme Sealing Challenges with Confidence

Chesterton® is the sealing solution provider of choice for customers across multiple industries. Our Spring-Energized Seals are tailored to meet challenging applications where reliable sealing is paramount.

Working with Chesterton for your Spring-Energized Seal needs includes the following advantages:

Flexible Manufacturing

- Small and Extra Large Diameters
- Quick Prototyping
- Short Lead Times

Responsive Engineering

- Applications Expertise
- Advanced Finite Element Analysis Support
- Engineer-to-Engineer Contact
- Custom Solutions

A Reliable Partner

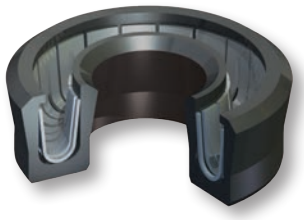
- Personalized Service
- Dedicated Sales Engineers
- Value-Driven Solutions

Spring-Energized Seals are well suited for:

- Cryogenic -180°C (-292°F) to high temperatures 260°C (500°F)
- Vacuum to high pressures 1,380 bar g (20,000 psi)
- Broad chemical spectrum resistance (0 – 14 pH)
- Dynamic sealing for static, reciprocating, rotating, and oscillating applications
- Rapid gas decompression (RGD) resistance
- Minimal outgassing
- Low friction without lubrication
- Compression set resistance

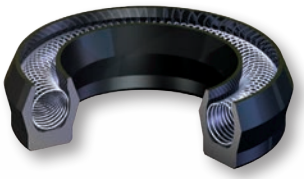
Our Sealing Technology

Whether the challenge is sealing harsh chemicals, extreme temperature, high speed, or variable pressure, Chesterton engineers will design a high performance product to meet your specific needs.



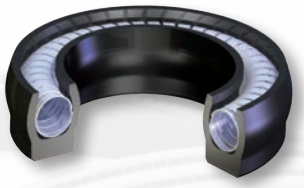
Series 100 Cantilever

Series 100 includes a V-shaped spring with a linear load curve and wide deflection range which makes this our most versatile model. Good for highly dynamic reciprocating and rotary applications.



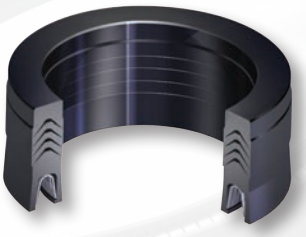
Series 200 Elliptical Coil

Series 200 consists of a canted coil spring which allows for minimal deflection while applying low load. Good for rotary, reciprocating, and static applications where compensation for loose tolerances or a miniature seal is required.



Series 300 Helical Wound

Series 300 includes a flat ribbon coil spring with high load versus deflection range which provides extremely tight sealing. Good for cryogenic and vacuum applications at static or slow speed.



Series 500 Stacked Set

High performance, multi-purpose stacked SES and V-Ring set. Accommodates hardware with deep stuffing boxes.

Series 600 Continuous Profile

Consists of a U-shaped, heavy-duty, high-load spring that is best for challenging static sealing conditions. Good for static and slow oscillating motion, particularly under cryogenic and vacuum conditions or where gas leakage is a particular issue.

Jacket Materials

Chesterton seal jackets can be made from a range of polymers, depending on the requirements of the application. Polymeric material options include PTFE, TFM, UHMW-PE, and PEEK. To suit the needs of specific applications, these can be filled with additives such as carbon, graphite, glass, molybdenum, and other materials.

See our Spring-Energized Seal Guide on our website for in-depth technical details.

Spring Materials

Chesterton seal springs are fabricated using a range of high performance, corrosion-resistant metals and alloys based on the application temperatures and chemical requirements. Stainless steel is typical for fluids up to 127°C (260°F) and corrosive applications at lower temperatures. Eligiloy®, Hastelloy®, and nickel alloy materials are used for cryogenic and high-temperature, corrosive fluid environments.

Our Engineering Difference

Chesterton works closely with customers to provide solutions that help them operate more reliably, efficiently, and economically. We provide best-in-class responsiveness, engineering, and application experience as well as differentiated manufacturing capabilities with unrivaled quality.

Expertise

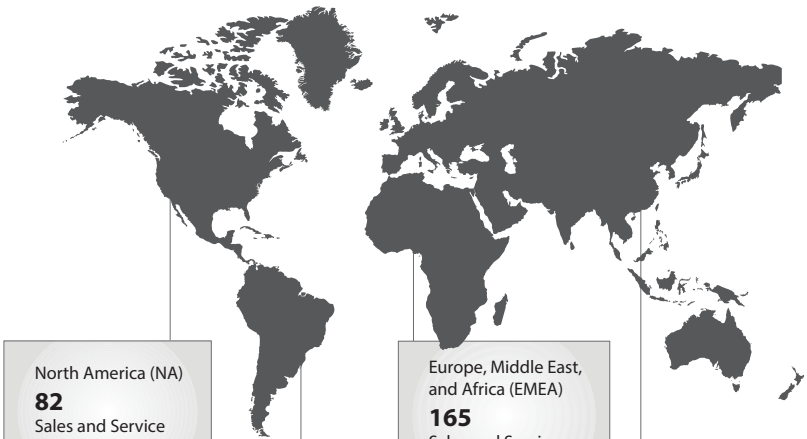
Chesterton's engineering staff leverages decades of experience in design, materials, and sealing to develop custom solutions for specific equipment. Working as trusted advisors with you, they can shed light on problems that impact production, performance, and reliability and help to provide robust solutions.

One-on-One Engineer Support

One reason for our success is our belief in engineer-to-engineer contact for clear communication and project efficiency. Your team works with customer-focused Chesterton engineers every step of the way—from product conception through validation—to develop the appropriate solution for your specific needs.

Local Support

With over 500 Service Centers and Sales Offices and locations in 113 countries worldwide, Chesterton combines global reach with local support. We provide troubleshooting suggestions, product recommendations, and installation assistance.



Where Spring-Energized Seals Are Crucial

Sample Equipment	SES Benefits
Engineered valves operating in a temperature range of -45 – 177°C (-50 – 350°F), pressures up to 1,035 bar g (15,000 psi), while controlling a wide spectrum of fluids.	• Wide temperature operating range • Chemical inertness • Low friction
Cryogenic valves controlling LNG, nitrogen, oxygen, argon, and helium at temperatures to -180°C (-292°F).	• Low-temperature operation • RGD resistance • Low friction
Automotive paint pumps, adhesive pumps, and paint dispensers	• Abrasion resistance • Chemical resistance • Elimination of contaminants
High performance liquid chromatography (HPLC) plungers generating 345 bar g (5,000 psi) and beyond; over thousands of cycles in the presence of highly aggressive solvents.	• Long service life • Reduces leaks • Chemical inertness
Food, dairy, and beverage applications such as homogenizers, mixers, and dispensing equipment requiring low friction and chemical sterilization to meet cleanliness requirements and improve food safety.	• Wide temperature operating range • Chemical inertness • Low friction without lubricants • Minimal risk of contamination

Other equipment possibilities include:

- Actuators
- Analyzers
- Cryopumps
- Dispensers
- Downhole Equipment
- Gearboxes
- Nozzles
- Metering Equipment
- Mixers
- Motors
- Pumps
- Rotary and Swivel Joints

Global Solutions, Local Service

Since its founding in 1884, the A.W. Chesterton Company has successfully met the critical needs of its diverse customer base. Today, as always, customers count on Chesterton solutions to increase equipment reliability, optimize energy consumption, and provide local technical support and service wherever they are in the world.

Chesterton's global capabilities include:

- Servicing plants in over 113 countries
- Global manufacturing operations
- More than 500 Service Centers and Sales Offices worldwide
- Over 1200 trained local Service Specialists and Technicians

Visit our website at chesterton.com

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