

# THE WORLD LEADER IN RETAINING RINGS AND WAVE SPRINGS

Around the globe, Smalley products have earned a reputation for unsurpassed selection, reliability and performance. Our commitment is to quality, customer service, and finding the most cost-effective solution.



- Smalley Headquarters and World-Class Manufacturing—over 300,000 sq/ft
- Smalley Technical Sales and Warehouse
- Smalley Technical Sales
- Smalley Distribution Network

 **SMALLEY**  
THE ENGINEER'S CHOICE™  
[smalley.com](http://smalley.com)



# THE ENGINEER'S CHOICE™



CONSUMER PRODUCTS



HEAVY MACHINERY



AEROSPACE



AUTOMOTIVE

From aerospace to automotive, medical, off-highway, oil & gas to industrial, Smalley has built a reputation for unsurpassed quality and an expert, collaborative engineering team. For more than 50 years, we have been the industry leader and technological pioneer—working alongside many of the world's most respected companies to give their products a true performance edge.

## All Springs Are Not Equal®

SPACE SAVINGS  
-50%

Reduction of spring height by 50%

Same force and deflection as ordinary coil/compression springs

Stainless steel is standard

Exotic alloys available

Smalley Wave Spring

Standard Coil Spring

## What makes Smalley different?

### Our products:

Unlike rings and springs that are diestamped through the metal grain, our proprietary edgewinding process results in a circumferential metal grain structure that gives Smalley rings and springs exceptional strength, dimensional stability and predictable performance characteristics. All of which result in higher quality for your application. Our unique, low scrap, coiling process allows for the economical production of Stainless and other exotic alloys.

### Our engineers:

We believe that engineers should work with engineers. So our customers work directly with our experienced and talented team. This access to technical expertise and problem solving, prototyping and collaboration is rare in the industry. But it allows you to take your designs further than you thought possible. And our No-Tooling-Charges™ process means cost effective customs and prototypes.

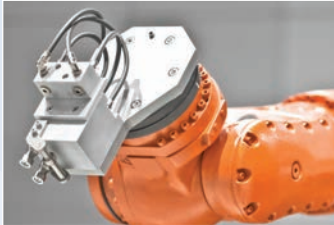
### Our support:

Every Smalley ring and spring is backed by our legendary customer support. Our commitment to service combined with our reputation for on-time delivery has earned us an approved supplier status with leading OEM manufacturers around the world. With regional offices in the Americas, Europe and Asia, Smalley provides total global supply chain solutions to meet your worldwide manufacturing requirements.

FREE: SAMPLES, CAD MODELS AND ENGINEERING ASSISTANCE



When engineers seek a higher level of precision and performance in retaining rings, wave springs or constant section rings, there's only one choice: Smalley.



AUTOMATION



MEDICAL

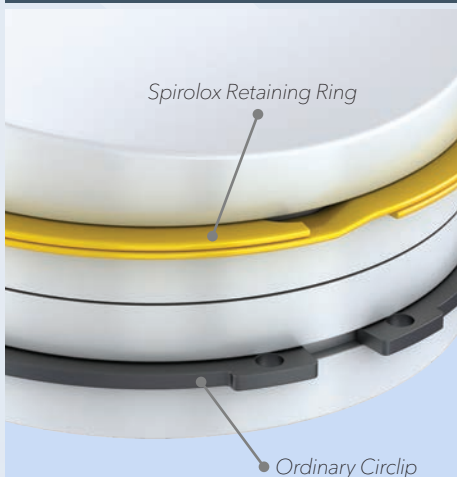


ENERGY



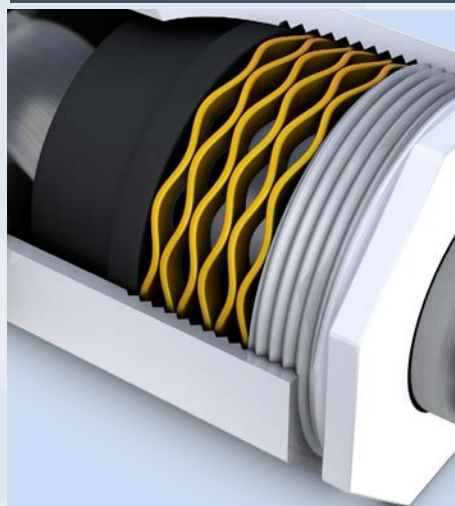
SPACE EXPLORATION

### Retaining Rings



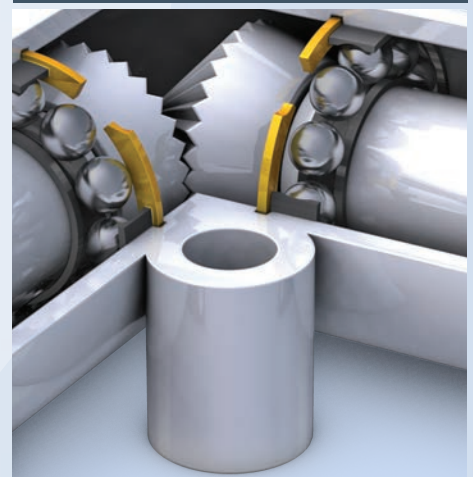
- No ears to interfere with mating assembly components
- Ease to assemble & remove with no special tools
- Interchangeable with standard circlip grooves
- Over 6,000 standards in carbon, 302 & 316 stainless steel
- Coiled, not stamped, allowing a stronger more cost effective solution

### Wave Springs



- Lower operation height allows for both space and weight savings
- Cost savings realized with smaller spring cavity
- Over 4,000 standards in carbon and stainless steel

### Constant Section Rings



- Often specified for heavy-duty and impact loading
- Large variety of end configurations to meet application requirements
- Over 1,000 standard sizes to select from
- Interchangeable with Eaton style rings

## Engineering and Design Assistance

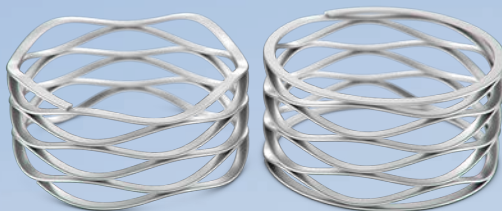
While we offer more than 10,000 standard stock products, there's no guarantee that one of these will exactly match your specific application. All Smalley rings and springs can be manufactured in custom configurations in a variety of alloys. If your specifications don't match a Smalley part number, contact a Smalley engineer to design and prototype a part that fits your needs. Diameters can be manufactured from 5 mm - 3000 mm, with No-Tooling-Charges™.



# PRECISION PRODUCTS FOR ANY APPLICATION

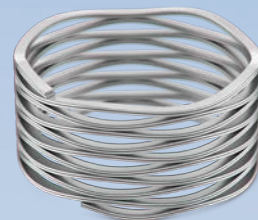


Wavo® Spring

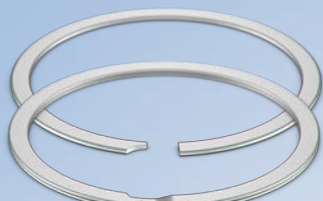


Crest-to-Crest®  
Wave Spring

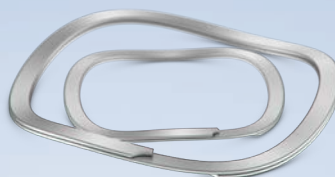
Crest-to-Crest® Wave  
Spring with Shims



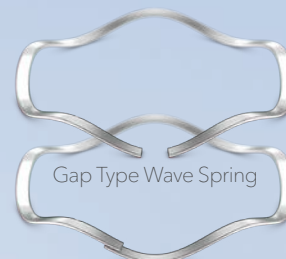
Interlaced Wave Spring



Spirolox® Retaining Rings

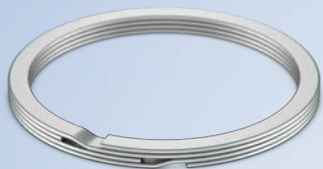


WaveRing®

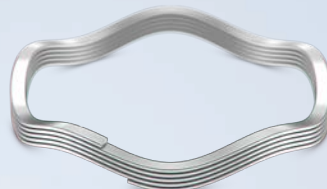


Gap Type Wave Spring

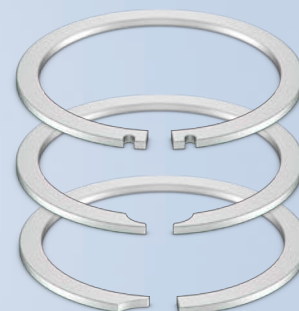
Overlap Type Wave Spring



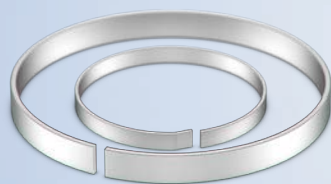
Laminar Seal Rings



Nested Wave® Spring



Constant Section Rings



Hoopster® Rings



Linear Springs

## Quality Assurance

Smalley's Total Quality Management philosophy dictates our commitment to quality and customer satisfaction. While this commitment has earned us official certification (**ISO 9001, ISO/TS 16949, AS 9100 and ISO 14001**), quality assurance and customer satisfaction mean much more at Smalley. They are tradition; the very foundation upon which we have built our company. From the beginning, we have never lost sight of our goal: To supply customers with uncompromising quality and service.

**Smalley has established, and is continuously improving upon, a program that is designed to meet the following objectives:**

- Total product conformance in terms of drawings, specifications and contractual requirements
- 100% on-time delivery performance
- Superior products with exceptional value
- Prompt, professional and courteous response in every facet of design, manufacturing, sales and customer service
- Continued development and use of the latest technology

*Smalley wins the GM Supplier Quality Excellence Award for a third straight year.*



# SMALLEY

THE ENGINEER'S CHOICE™

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