



# Engineered Solutions for Life Sciences



# Explore Our Life Sciences Solutions

**BENEFIT FROM OUR EXPERTISE.  
ENGINEERED SOLUTIONS FOR LIFE SCIENCES.**

**Trelleborg Sealing Solutions develops, manufactures and supplies innovative engineered solutions for demanding medical, biotech and pharmaceutical applications in thermoplastics, silicone and other elastomers.**

From a single global source, backed by the expertise of our worldwide engineering and manufacturing network, we provide you with unrivalled local product development support to optimize solutions for your life sciences sealing and fluid handling challenges.



## **Trelleborg Sealing Solutions in General**

Trelleborg Sealing Solutions offers an outstandingly comprehensive sealing portfolio – a one-stop-shop providing the best in elastomer, thermoplastic, PTFE and composite technologies. Our solutions are featured in virtually every application conceivable within the aerospace, automotive and industrial industries.

- Over 80 facilities worldwide
- Internationally linked design and application centers
- Seven strategically positioned materials and development laboratories
- More than 20 manufacturing sites

## Medical Industry

The life sciences industry is closely associated with innovation, technological advancements and economic growth, leading to new challenges for equipment suppliers.

Medical devices frequently have a number of approvals and lengthy testing requirements, making for long development cycles. The market is globalizing, and suppliers are looking to move their operations into different countries, on different continents.

## Global Supplier

Trelleborg Sealing Solutions is a leading global supplier of high quality sealing solutions.

With over 60 years of experience providing seals to a variety of industries, we are a leading supplier of advanced sealing solutions to diagnostic, biotech, medical device and pharmaceutical equipment manufacturers.

With a network of local marketing companies and manufacturing facilities, Trelleborg Sealing Solutions offers:

- Worldwide logistics network that ensures products are delivered on time, wherever you are in the world, or wherever you're going
- One-stop-shop to consolidate supplier bases, reducing costs and simplifying business
- Product innovations that improve service life and reduce total cost of ownership

## Developed Together

Leading life sciences manufacturers rely on Trelleborg Sealing Solutions for innovative design support, world-class manufacturing technology and quality-assured components.

Decades of material expertise in conjunction with design engineering and dedicated research and development teams work with you to develop solutions that optimize product performance.

- World leading engineering and design of custom components
- Extensive manufacturing and support capabilities, such as automated, flashless liquid silicone rubber production, cleanroom facilities and advanced delivery options
- Rapid prototyping, computer modeling and in-house qualification testing to shorten time to market

## Innovation and Reliability

**Our innovation is a key to your success.**

Solving sealing and bearing challenges using pioneering techniques, we deliver better performance and overall profitability for our customers. Operations run 24 hours a day, 365 days a year, and our international logistics network can meet your scheduling requirements.



## Innovative Online Tools

**Read the Book.  
See the Movie.**

Now that you have the brochure, why not check out our life sciences film on YouTube!

[www.tss.trelleborg.com/films](http://www.tss.trelleborg.com/films)



**Apps at the Slide  
of a Finger**

Check out our latest engineering tools for smart phones.

[www.tss.trelleborg.com/apps](http://www.tss.trelleborg.com/apps)



- Life Sciences Material Compatibility
- Tubing & Hose Selector
- ISO Fits & Tolerances

**Online Services and Tools at the Click of a Mouse**

Trelleborg Sealing Solutions offers a range of cutting-edge online services and tools on our website.

[www.tss.trelleborg.com/tools](http://www.tss.trelleborg.com/tools)

- Full range of Catalogs and Brochures
- Sealing Solutions Configurator
- CAD Service
- O-Ring Calculator

# LABORATORY

**The heart of diagnostic procedures, the laboratory requires high levels of accuracy and performance.**

Trelleborg Sealing Solutions focuses on minimizing downtime and improving performance.

## Tubing and Hose

Trelleborg Sealing Solutions manufactures a complete line of medical grade tubing for all types of peristaltic pump applications.

The highest grades of laboratory-tested silicone materials, combined with decades of application experience, make Trelleborg Sealing Solutions uniquely suited to create custom engineered tubing and hose solutions for the life sciences industry.

All of our tubing is manufactured in a controlled environment in an FDA registered facility to class 100,000 conditions, with ambient temperature, humidity and particulate counts regularly monitored as standard.

## Extra Features

Locking collars can be assembled onto or overmolded using Liquid Injection Molding to reduce secondary operation costs and increase hygiene.

Added value options are also available, such as the addition of springs, custom product labeling and identification, and a variety of color options.



For additional information on tubing and hose solutions, see page 22

## Blood Gas Analyzer

### Solution:

- Custom Silicone Peristaltic Pump Tubing with LIM overmolded collars

By overmolding the collars directly to the pump tubing, Trelleborg Sealing Solutions prevented tubing slippage during rotation of the pump cam.

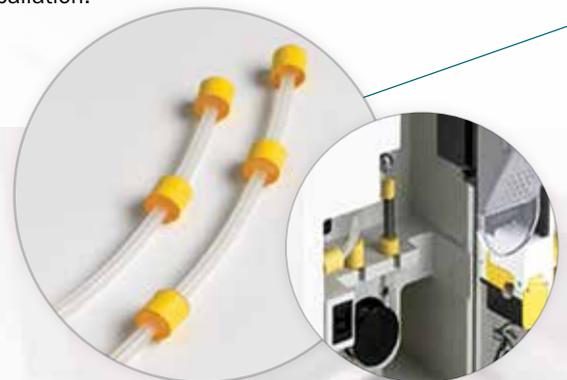
### Trelleborg product:

Custom Peristaltic Pump Tubing

- Designed to meet your specifications
- Manufactured from flexible and chemically resistant silicone tubing
- Customized bonded or overmolded additions, such as stops

Peristaltic Pump Tubing is perfectly suited for use in laboratory equipment, IV pumps, enteral feeding tubes, diagnostic equipment, bio-processing fluid transfer and more.

Manufactured from special grades of high performance silicone, the tubing helps the pump achieve consistent flow rates while reducing the effects of hysteresis and spallation.





# IMAGING SUITE

**Hospital imaging suites host sensitive equipment, requiring solutions not to interfere with processes.**

The tables involved often rotate a full 360-degree range of motion while offering comfort for the patient.

## Bearing Solutions

Our leading edge thermoplastic bearing solutions for the life sciences industry include a broad range of custom and standard bearing options based on various materials such as Nylon, Turcite®, HiMod®, and Orkot®.

Available in both standard designs or customized to your application, bearings and bushings offer improved friction characteristics, minimized wear and longer service life.

### Rolling elements

Typically these are made of Stainless Steel, glass or plastic. The size of element depends on the design envelope, performance requirements and the overall geometry of the Durobal®

### Internal seal

Seals in grease used in some Durobal® to suppress noise and extend life

### Outer Ring

The static part of the bearing pressed into the housing – usually constructed of an acetal base material

### Inner Ring

Fits or presses onto the shaft of a dynamic application – usually constructed of an acetal base material. The I.D. of the inner ring can be of any geometry

### Cage

Stops the rolling elements from contacting each other

### External seal

Where contaminants are very fine, an additional seal is required to avoid ingress

### Shield

Prevents the ingress of environmental contamination – snap fit or welded

**Durobal® bearing construction**



For additional information on bearing solutions, see page 22



## MRI Table

### **Solution:**

- Custom non-metallic Durobal® bearing design

In addition to low friction, self-lubrication and zero maintenance, the bearings also provided extra comfort and security for the patient.

### **Trelleborg product:**

Durobal® Bearings

- Ideal as a guide, mainly for rotating applications
- Prevent metal-to-metal contact
- Low friction
- Self-lubricating for cleaner operating environments

Durobal® bearings are used in a variety of life sciences devices and equipment. The inner and outer rings provide support against the mating hardware, while the cage maintains ball separation. Seals and/or shields may be added to isolate the bearing from the external environment.

# OPERATING ROOM

**Hygiene, performance and downtime reduction lead to a safer and more effective operating room.**

Trelleborg solutions helps improve the safety-critical and often delicate procedures within the operating room.

## Sealed for Success

Our leading edge sealing solutions for the life sciences industry include a broad range of custom and standard seal options based on elastomers including silicone, engineered plastics and metal technologies.

Trelleborg Sealing Solutions products extend component life, minimizing planned maintenance and prevent the ingress of fluid during sterilization regimes.

## Variety of Turcon® Variseal® Products



### Standard

Designed for dynamic leakage control and long term wear resistance. Fitted with a medium spring-load, it gives good flexibility. The Standard Variseal® is available in a Hi-Clean option.



### Face Seal

Similar to the Helical seal but with an axial design, this is the best choice for vacuum, gas and low temperature flange applications.



### Roto

This low friction, no stick-slip seal is designed to minimize break out force and high wear resistance. Its constrained flange eliminates potential seal rotation and is resistant to most liquids and chemicals.



### Hi-Clean

In this seal, the spring-groove is filled with high temperature silicone. Preventing any trapping of contaminants within the seal, the filling ensures that it is easily cleaned.



### Helical

With a rounded surface and high spring-force, this design is ideal for sealing gases at zero or low pressure and for low viscosity fluids. Suitable for static sealing and demanding low speed applications.



### Ultra-Clean™

In this unique design, the spring is fully enclosed within a Turcon® case. This prevents contamination from media trapped in dead space around the spring. Additionally, the seal can be thoroughly cleaned and sterilized in all directions using any CIP media.



### Slantcoil®

This seal's low spring-force makes it ideal for low-friction and low-pressure applications. The Slantcoil® design gives almost constant load over the life of the seal.



For additional information on sealing solutions, see page 20

## Bone Drill Oiler Cartridge Seal

### Solution:

- Variseal® M in Turcon® T17 seal material and medium load V-Spring

The previous seals had excessive wear and leakage. Trelleborg Sealing Solutions engineers proposed a Turcon® Variseal® M which extended seal life and improved application performance.

### Trelleborg product:

Turcon® Variseal®

- Good dynamic and static sealing
- Very low coefficient of friction and dry running properties
- Excellent thermal resistance
- High wear resistance and chemical compatibility

Turcon® Variseal® is an extremely important product within bioprocessing, food, beverage and pharmaceutical production. Commonly installed in filling plants, where demands are high on cleanability, sterilization and hygienic design, it is field proven in such demanding operating conditions.



## Ventilator

**Solution:**

- Insert-molded homogeneous neoprene diaphragm

Molded around two metal inserts with an incorporated sealing bead, this design allows the diaphragm to sustain thousands of cycles with minimal leakage. With stringent internal quality and pressure testing, precision and reduced assembly line downtime are ensured.

**Trelleborg product:**

Diaphragms

- Extend product life
- Reduce deformation
- Thinner sections improve sensitivity of control

All diaphragms are custom-designed to suit the requirements of an application and can either be manufactured from fabric-reinforced or thin membrane rubber-only material. Higher pressures can be accommodated, by increasing the burst resistance, with synthetic fabric reinforcement.



For additional information on Diaphragms, see page 21

# PATIENT ROOM

**Dialysis machines, ventilators and other equipment, used to help a patient's recovery.**

These can be improved by incorporating Trelleborg's cutting-edge solutions. Our custom expertise provides components that reduce downtime, maintenance requirements and improve performance.

**Engineered for Success**

When standard parts don't suit your application, Trelleborg Sealing Solutions dedicated engineering and research departments offer their services in designing new products to increase product lifetime and withstand challenging operating environments.

Working with us, we can take our knowledge and expertise, and apply it to your application. Then, using state-of-the-art manufacturing technologies with Liquid Silicone Rubber and two-shot molding proficiency, we can produce unique components, optimized for your specific requirements.



**Custom Molded Mask**

Manufactured from Liquid Silicone Rubber, the mask ensures effective delivery of anaesthetic and oxygen.

# EVERYDAY LIFE

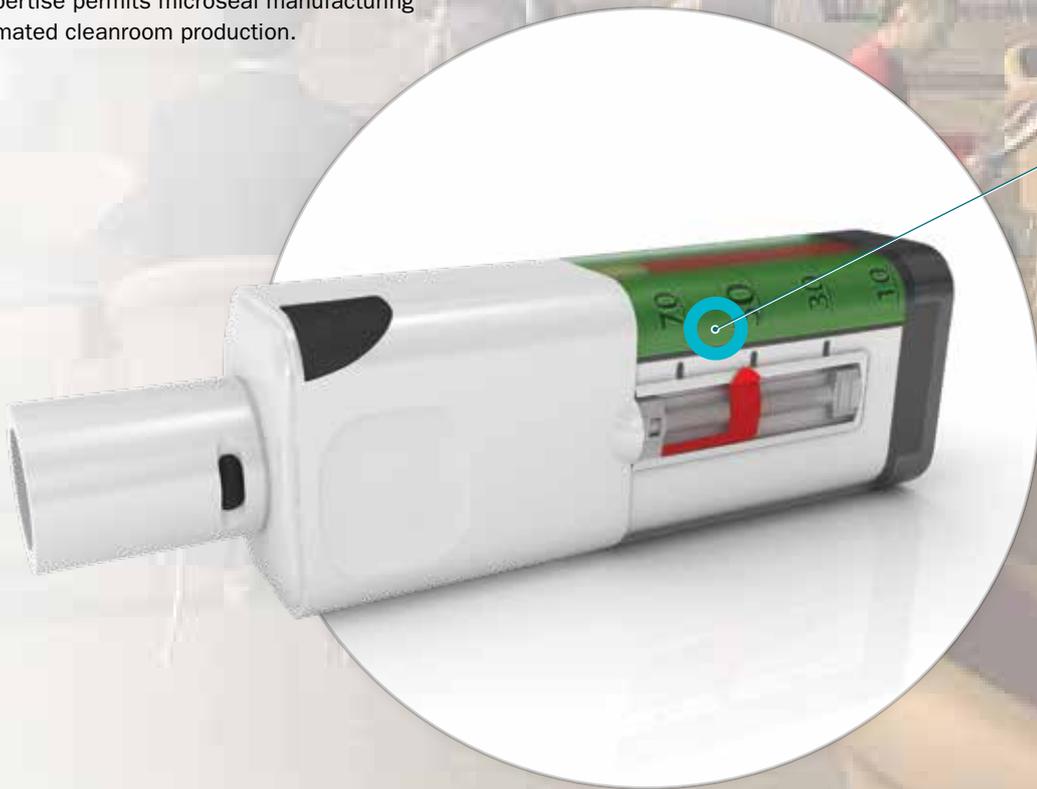
**Trelleborg Sealing Solutions components help make a patient's everyday life easier upon release from the hospital.**

Our solutions improve the performance of artificial limbs and metered dose inhalers, to name a few.

## **Liquid Silicone Rubber**

Our Liquid Silicone Rubber (LSR) centers of excellence have been designed with the intent of offering intrinsically hygienic products with minute tolerances, offering the ultimate in performance and cleanliness.

Flashless, wasteless tool design concepts create parts from 0.002 grams to several hundred grams in weight in Class 7 and 8 cleanroom conditions, with '0' defect quality level checks through in-process controls, guaranteeing a quality product for use in your application. Production expertise permits microseal manufacturing and fully automated cleanroom production.



For additional information on silicone solutions, see page 23

## Inhaler

### Solution:

- Precision micro-sized silicone O-Rings produced in a cleanroom

The O-Rings provided are manufactured to extremely tight tolerances, with a mold join burr <0.05 mm / .002 inch, that remain tight against pump pressures.

### Trelleborg product:

Liquid Silicone Rubber Components

- Offer advantages in part consolidation
- Custom-designed based on application
- Available in variety of silicone materials, including FDA, USP and 3-A compliant compounds



# Manufacturing and Support Capabilities

## One-stop-shop

While some manufacturers have to rely on many individual smaller suppliers for a single device, Trelleborg Sealing Solutions extensive range of solutions can reduce your supplier base, simplifying business and reducing total cost of ownership. This benefit, in conjunction with our global supply and logistics network, reduces lead times and ensures products are delivered on time, every time.

## Applications Expertise

Our dedicated and experienced engineers have spent decades supporting customers with innovative solutions that not only fulfill the requirements of an application, but can provide additional benefits such as:

- Optimized application performance
- Part consolidation – saving costs and space
- Increased hygiene and reduced contamination risk
- Reduction or elimination of installation costs and secondary assembly risks
- Reduction of long-term supply costs and total cost of ownership
- Lowered inventories
- Automated production without human contact

## Research & Development

Seven global centers of excellence work constantly to develop new compounds and products, continuously pushing the limits of polymer technology and seal engineering.

Rigorous testing and validation procedures help to improve performance in existing applications or create new products to meet the demands of the latest life sciences equipment manufacturer's technologies.

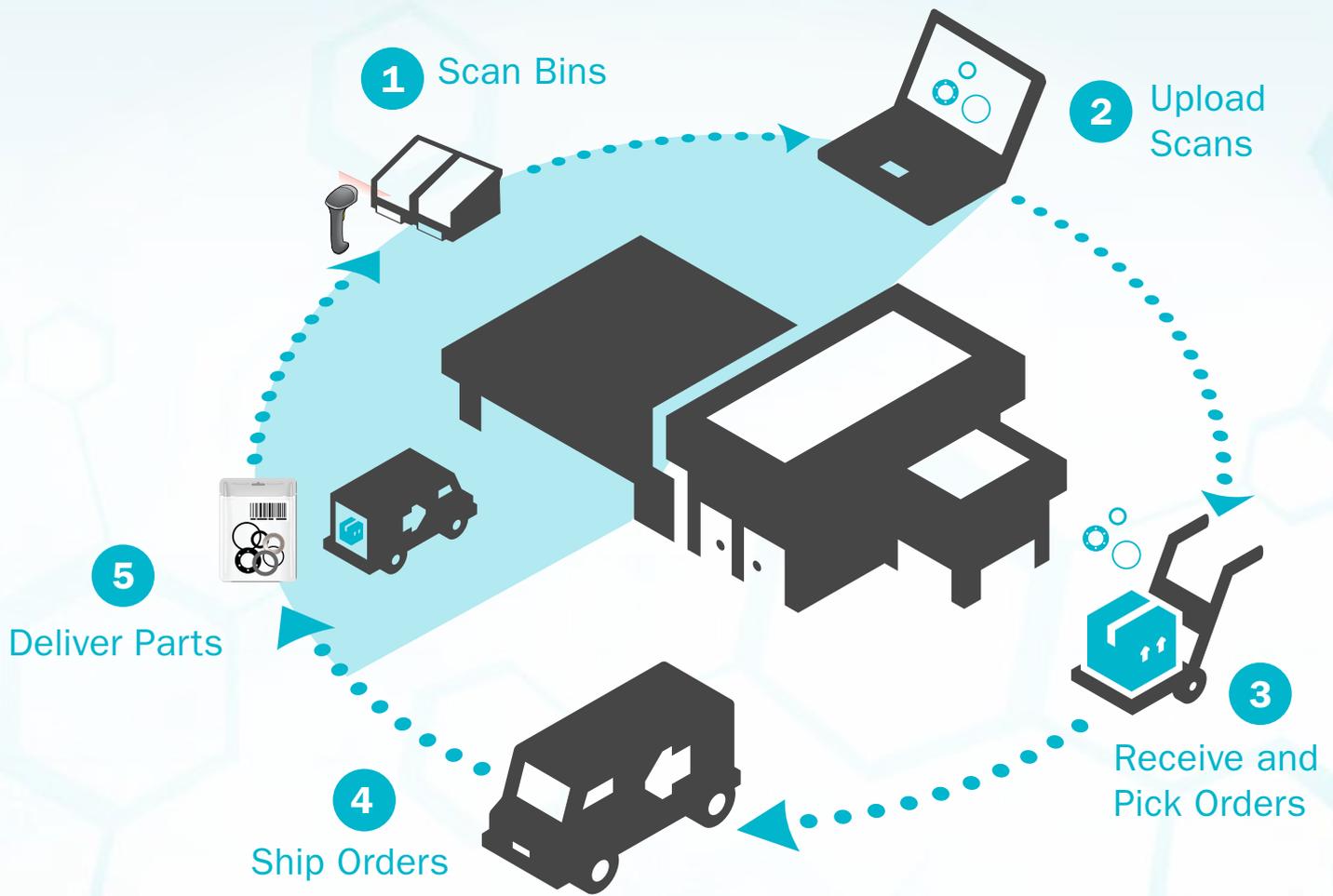
Ongoing material and product development also means that Trelleborg Sealing Solutions is abreast of the latest changes in standards and regulations and the developing trends within the life sciences market. This can improve time to market of new developments.



## Our global logistics and supply chain offers:

- The same level of service and support wherever you are in the world
- KANBAN and Vendor Managed Inventory programs
- SealScan™ automated replenishment
- Vendor consolidation / "C" class management
- Forward stocking locations
- Value-added handling and packaging services, including bag and tag, kitting and surface treatments

# SealScan™ Overview



# Advanced Manufacturing Capabilities

## Pure Molding

Trelleborg Sealing Solutions has decades of experience using injection molding technology with many proprietary and specialized elastomer materials. It is at the forefront of the latest developments and innovation in silicone and two-component injection molding, as well as overmolding, pushing tool design and process engineering to new heights.

## Key Benefits

- **Pure** – Silicone is one of the most extensively tested biomaterials with a long history of safe use
- **Precise** – Flashless, wasteless tool design concepts for parts from 0.002 grams to several hundred grams in weight
- **Reliable** – Using latest technology in machinery, tooling and automation
- **Quality** – '0' Defect Quality Level through in-process controls
- **Fast** – Able to produce quantities from several thousand to millions
- **Clean** – Utilizing state-of-the-art processing techniques and production in Class 7 and 8 cleanrooms
- **Cost Effectiveness** – Lowest Total Cost of Ownership (TCO)

## Advanced Automation

At Trelleborg Sealing Solutions, Liquid Silicone Rubber and LIM processing is fully automated. This provides all the advantages needed for success in the life sciences industry, today and in the future:

- A closed loop system ensures that no external impurities can be introduced through either the process or human contact
- In-process quality control avoids extra control steps
- Automation guarantees repeatability and reliability of process across millions of parts produced every year
- Closed loop manufacturing set-ups in Class 7 and 8 cleanrooms guarantee the highest level of cleanliness

## Precision Micro-molding

Tiny precision tooling can produce big results in the life sciences industry and Trelleborg Sealing Solutions has the capability of producing miniature components through micro-molding. The smallest piece manufactured is a septum, the membrane in the cap of a medicine bottle through which one can insert and withdraw a syringe. This weighs just 0.003 grams and standard molding burrs are bigger than the object itself.

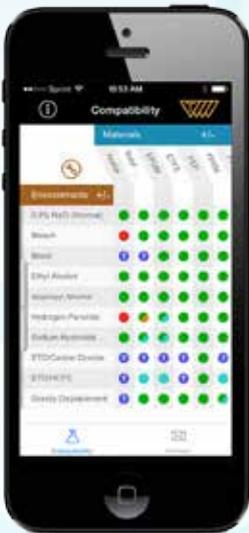
## Manufacturing micro-components is achieved by:

- Extreme accuracy in tool construction
- Control of shot weight and the molding process
- Automatic handling of the product after molding is done by a unique, specially developed robot gripper arm
- Accuracy maintained reliably for millions of shots

# Digital Tools and Services

## DIGITAL TOOLS AND SERVICES

Trelleborg Sealing Solutions offers an innovative range of digital tools and apps that simplify the working life of an engineer, either at the desktop or on the go.



### Material Compatibility App

Compare the performance of different materials against a wide variety of commonly used process and cleaning chemicals.



### Tubing & Hose Selector

Easily find tubing and hose solutions for your application and contact Trelleborg Sealing Solutions directly from the app.



For more information, and to download our full range of mobile tools, visit [www.tss.trelleborg.com](http://www.tss.trelleborg.com)

# Product Spotlight

## Prosthetic Knee Application using a variety of seals

**With years of experience designing components for the life sciences industry, Trelleborg Sealing Solutions possesses an extensive portfolio of products ready-for-use in applications.**

Available in a variety of materials and sizes, our solutions offer cost savings, lower friction and minimized downtime.



### Zurcon® Variseal® Scraper

Excludes external contaminants from computer controlled damper

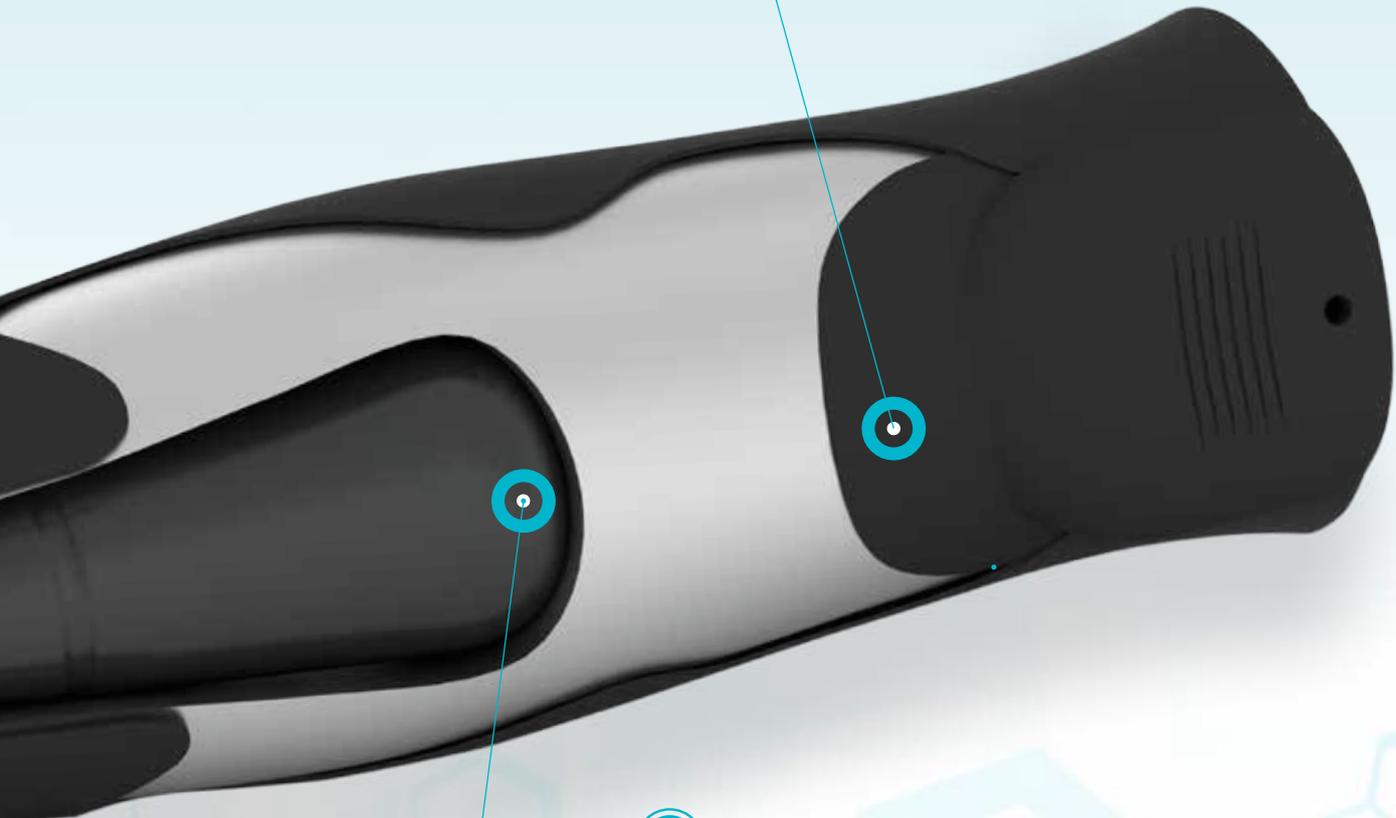


### Zurcon® Variseal®

Provides smoother movement for patients and reduces friction

**Custom FKM Bladder**

Separates pressurized air from the hydraulic fluid



**Turcon® Slydring®**

Provides smoother movement for patients and reduces friction



**Dedicated Website**

Our life sciences website was developed with you in mind, providing information on our products, capabilities, materials and applications to help solve your critical life sciences sealing applications.

Enjoy a tour of our applications—view the film, peruse the case study library, explore our strategically placed manufacturing locations, request a quote or sample and discover local contact resources.

[www.trelleborg-lifesciences.com](http://www.trelleborg-lifesciences.com)



# Precision Sealing Solutions

Highlighted here are a few of the most commonly used sealing solutions for life sciences applications.



## O-Rings

**O-Rings are available in a range of elastomeric materials that allow sealing of practically all liquid and gaseous media, while standing up to even the most rigorous sterilization processes.**

- Static and slow dynamic application
- Flexible usage - easily designed into many applications
- Cost-effective solution
- Available in materials specifically developed for life sciences applications
- Compliant with approvals and standards
- Available in any size, including silicone microseals and giant O-Rings manufactured with our unique Fleximold™ process



## Turcon® Variseal®

**Turcon® Variseal® is comprised of two components: a jacket and energizer. The jacket seals against the mating surface and is generally made of a plastic and is usually energized by a spring.**

- For static, dynamic and rotary applications
- Used as a rod / piston seal or wiper to minimize contamination
- Low friction operation
- Operating temperatures range from -254 °C to +23 °C / -425 °F to +75 °F
- Chemically inert and self lubricating for cleaner operation
- Three spring designs to customize load deflection characteristics



## Diaphragms

**Diaphragms are used in a variety of life sciences applications, particularly in low pressure valves.**

- Manufactured in a variety of elastomers or PTFE based materials
- Available in homogenous or fabric-reinforced materials for higher pressures
- Barrier materials such as PTFE can be applied for chemically aggressive environments
- Plastic or metal-to-rubber bonding to inserts simplifies assemblies
- Materials compliant with relevant life sciences approvals and standards



## More Solutions

### Slydring®

Absorbs side load forces in the rod or piston areas and helps guide the rod or piston, preventing metal-to-metal contact. They operate with low friction, no stick-slip and shock resistant capabilities.

### Glyd Ring®

Recommended for applications requiring long service life where the part is exposed to high pressures and side loads. Simple installation and wear resistant materials provide an optimal solution for many reciprocating cylinder applications.



For more information on our complete range of seals go to [www.tss.trelleborg.com](http://www.tss.trelleborg.com)

# Custom Products

**When a standard solution doesn't satisfy operating requirements, our dedicated engineering, design and research teams work with you to create new components that will.**

Trelleborg Sealing Solutions has a history of developing long-term partnerships with its customers to develop unique and innovative solutions for demanding applications. Our manufacturing processes can involve complex geometries and special requirements like waste-free production, in-process quality checks and batch-by-cavity.



## Tubing and Hose

**A wide variety of tubing & hose including anti-microbial, custom peristaltic pump, and polyester braid varieties.**

- Custom overmolded or bonded stops and fittings increase cleanliness and reduce installation costs
- Customized to application – resists process media, cleaning regimes and other aggressive chemicals
- Biocompatible, inert and flexible
- Cleanroom production as standard and in accordance with Good Manufacturing Practices (GMP) principles with governmental approvals



## Bearings and Bushings

**Our leading edge thermoplastic bearing solutions include a broad range of custom and standard bearing options based on various materials such as Nylon, Turcite®, HiMod®, and Orkot®.**

- Part consolidation, reducing secondary operation costs, increasing integrity and enhancing hygiene
- Prevent metal-to-metal contact with low friction and no stick-slip to increase product life
- Self-lubricating for cleaner operating environments

# INDUSTRY SPOTLIGHT

## Biotech

### Manifold Systems

Trelleborg Sealing Solutions manifold systems are produced with injection molded medical grade silicone and configured to the customer's design requirements. The design configuration can be a singular connector or a multiple string of "T"s and elbows. The manifold system combines the flexibility of traditional plastic push on connectors with the advanced performance of liquid injection molding of silicone over-molding.



### Liquid Silicone Rubber

**Our Liquid Silicone Rubber (LSR) facilities are the pinnacle of advanced manufacturing technology and live the innovation that defines the life sciences industry.**

- Designed to meet your specifications, reducing total cost of ownership
- Can be overmolded to plastics and metals
- Lower inventories
- Cost-effective solutions, reducing installation costs and total cost of ownership
- Available in materials specifically developed for life sciences applications
- Suitable for both low and high volume applications
- Automated and flashless production possible

# Material Spotlight

## Engineered for Performance

Based on decades of experience working with leading equipment manufacturers and end users around the globe, Trelleborg Sealing Solutions has developed a tailor-made portfolio of materials to meet the demanding requirements of the life sciences industry.



### Industry Leading Plastics

#### Turcon® PTFE

Turcon® premium-grade PTFE compounds have excellent low-friction performance, giving long life and superior chemical resistance.

- Compatible with virtually all media
- Excellent friction, slide properties and no stick-slip
- Long service life, high sealing efficiency
- Individual grades specialized to applications

<b>Min Temp.</b>	-253 °C / -423 °F
<b>Max Temp.</b>	+260 °C / +500 °F
<b>Hardness</b>	60 Shore D
<b>Material Complies</b>	FDA CFR177.1550, 3-A, USP Class VI, 2002/72/EC and sanitary standards

#### PEEK

Polyether Ether Ketone (PEEK) is a good choice for applications where fluid compatibility is a concern. It is virtually inert and has good mechanical properties, providing low friction and wear.

- High strength, toughness and biocompatibility
- Excellent chemical resistance
- Can be extruded or injection molded

<b>Min Temp.</b>	Not Applicable
<b>Max Temp.</b>	+249 °C / +480 °F
<b>Hardness</b>	124 Rockwell R
<b>Material Complies</b>	FDA CFR177.1550, 3-A, USP Class VI, 2002/72/EC and sanitary standards

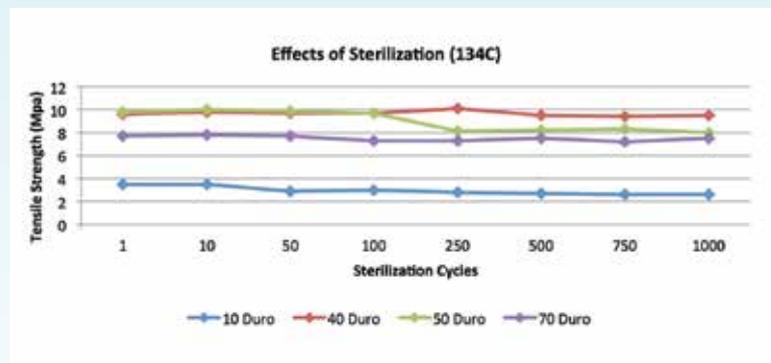
## Silicone

### The ultimate in medical performance

Silicone is used across a wide array of applications in the life sciences industry. Offering a unique combination of chemical and mechanical properties, its inherent purity, inertness and biocompatibility make silicone the preferred choice of elastomer in the biomedical, pharmaceutical and healthcare industries.

- Fully sterilizable and resistant to a broad range of process and cleaning chemicals
- Biocompatible, non-allergenic, no toxic combustion products and neutral in taste and odor
- Excellent heat resistance, dielectric strength and cold flexibility
- Cleanroom manufacturing for the highest levels of hygiene

### Silicone shows minimal deterioration of tensile strength after sterilization



Momentive Performance Materials Inc. Silicone Elastomers. Albany, NY: Momentive Performance Materials, 2012. Print.

## Advanced Elastomer Materials

### Isolast® FFKM

The widest range of high specification compounds on the market, combining the advantages of an elastomer with the chemical resistance of PTFE.

- Nearly universal chemical resistance
- Exceptional hysteresis properties
- High purity and complete traceability
- Reduced downtime and increased production efficiency

<b>Min Temp.</b>	-25 °C / -13 °F
<b>Max Temp.</b>	+325 °C / +617 °F
<b>Hardness</b>	70 Shore A
<b>Material</b>	FDA 21 CFR.2400 (d), 3-A,
<b>Compliances</b>	USP Class VI, Cytotoxicity (USP 87)

### EPDM

Cost-effective materials engineered to achieve enhanced chemical and thermal stability along with compliance to a variety of standards and approvals.

- Superior compatibility with polar fluids and solvents at elevated temperatures
- Resistant to cleaning regimes involving polar chemicals, steam and alkaline fluids

<b>Min Temp.</b>	-45 °C / -49 °F
<b>Max Temp.</b>	+160 °C / +320 °F
<b>Hardness</b>	70 Shore A
<b>Material</b>	FDA CFR177.2600, 3-A,
<b>Compliances</b>	USP Class VI, Cytotoxicity (USP 87)

# Our Global Resources



## Local presence, global reach

49 Marketing companies on six continents provide local support and understand local markets, communicating in your language. Our 22 manufacturing facilities can move with your expansion and provide the same quality and standards of products wherever you are and wherever you're going.

## Contact your local marketing company for further information:

Europe	Telephone	Americas	Telephone
<b>AUSTRIA - Vienna</b> (ALBANIA, BOSNIA AND HERZEGOVINA, MACEDONIA, SERBIA AND MONTENEGRO, SLOVENIA)	+43 (0) 1 406 47 33	<b>AMERICAS - REGIONAL</b>	+1 260 749 9631
<b>BELGIUM - Dion-Valmont</b> (LUXEMBOURG)	+32 (0) 10 22 57 50	<b>BRAZIL - São José dos Campos</b>	+55 12 3932 7600
<b>BULGARIA - Sofia</b> (BELARUS, ROMANIA, TURKEY, UKRAINE)	+359 (0)2 969 95 99	<b>CANADA - Etobicoke, ON</b>	+1 416 213 9444
<b>CROATIA - Zagreb</b>	+385 (0) 1 24 56 387	<b>MEXICO - Mexico City</b>	+52 55 57 19 50 05
<b>CZECH REPUBLIC - Rakovnik</b> (SLOVAKIA)	+420 313 529 111	<b>USA, East - Plymouth Meeting, PA</b>	+1 610 828 3209
<b>DENMARK - Copenhagen</b>	+45 48 22 80 80	<b>USA, Great Lakes - Fort Wayne, IN</b>	+1 260 482 4050
<b>FINLAND - Vantaa</b> (ESTONIA, LATVIA)	+358 (0) 207 12 13 50	<b>USA, Midsouth - Mt. Juliet, TN</b>	+1 615 800 8340
<b>FRANCE - Maisons-Laffitte</b>	+33 (0) 1 30 86 56 00	<b>USA, Midwest - Hanover Park, IL</b>	+1 630 539 5500
<b>GERMANY - Stuttgart</b>	+49 (0) 711 7864 0	<b>USA, Mountain - Broomfield, CO</b>	+1 303 469 1357
<b>GREECE</b>	+41 (0) 21 631 41 11	<b>USA, Northern California - Fresno, CA</b>	+1 559 449 6070
<b>HUNGARY - Budaörs</b>	+36 (06) 23 50 21 21	<b>USA, Northwest - Portland, OR</b>	+1 503 595 6565
<b>ITALY - Livorno</b>	+39 0586 22 6111	<b>USA, South - N. Charleston, SC</b>	+1 843 747 7656
<b>THE NETHERLANDS - Barendrecht</b>	+31 (0) 10 29 22 111	<b>USA, Southwest - Houston, TX</b>	+1 713 461 3495
<b>NORWAY - Oslo</b>	+47 2264 60 80	<b>USA, West - Torrance, CA</b>	+1 310 371 1025
<b>POLAND - Warsaw</b> (LITHUANIA)	+48 (0) 22 863 30 11		
<b>RUSSIA - Moscow</b>	+7 495 982 39 21	<b>Asia Pacific</b>	<b>Telephone</b>
<b>SPAIN - Madrid</b> (PORTUGAL)	+34 (0) 91 71057 30	<b>ASIA PACIFIC REGIONAL</b>	+65 6 577 1778
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<b>SWITZERLAND - Crissier</b>	+41 (0) 21 631 41 11	<b>CHINA - Shanghai</b>	+86 (0) 21 6145 1830
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		<b>THAILAND - Bangkok</b>	+66 (0) 2732-2861
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		<b>and all other countries in Asia</b>	+65 6 577 1778
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