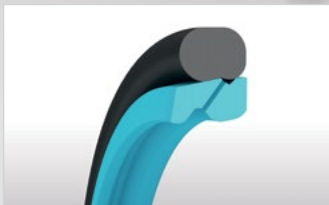
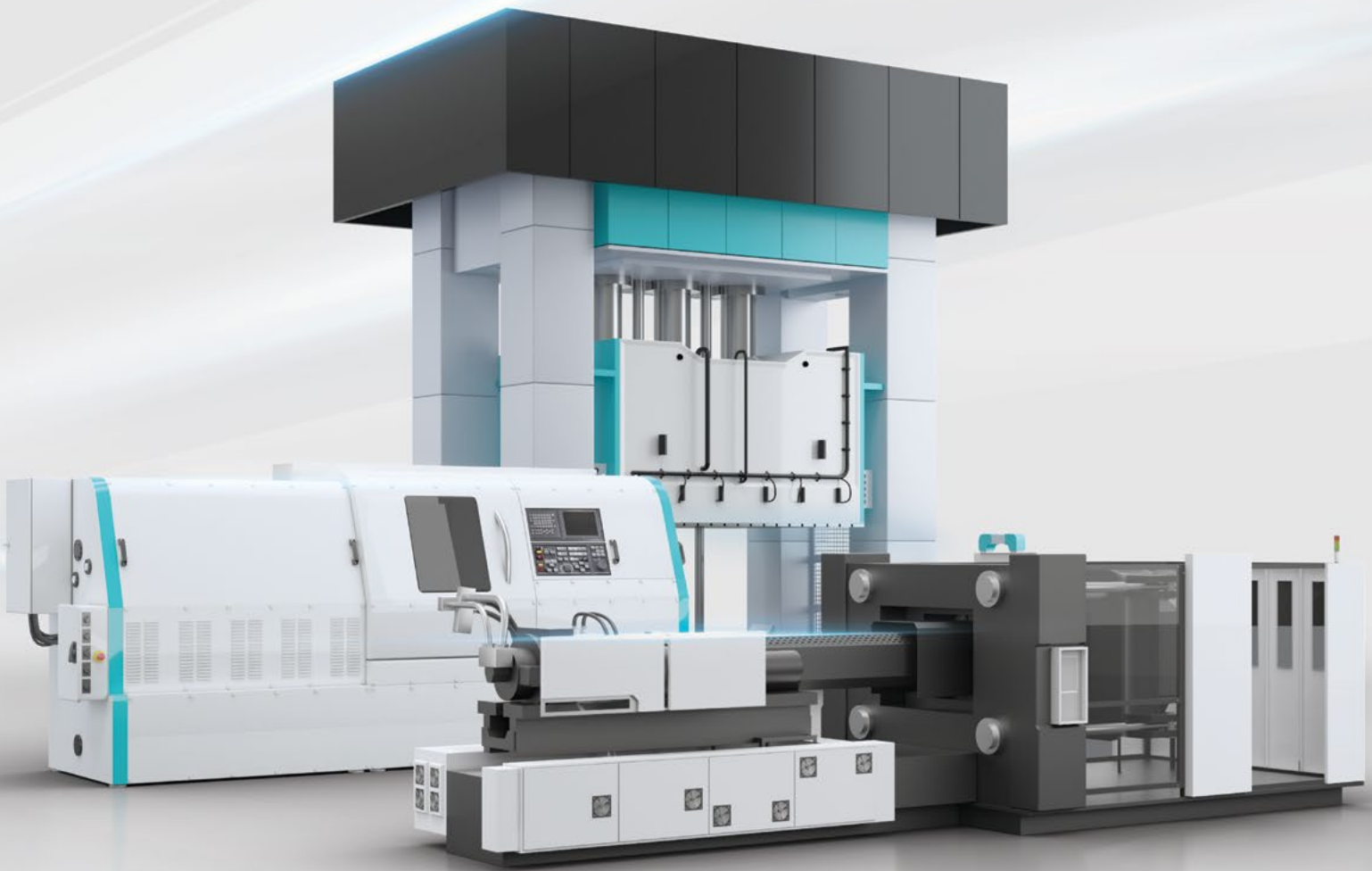


# Sealing Solutions for Machine Tools & Manufacturing Equipment



# Your Partner for Sealing Technology

## DELIVERING RELIABLE, LONG-LASTING PERFORMANCE

Machine tools and manufacturing equipment operate continuously in highly demanding environments. Effective sealing is critical to minimize planned maintenance and emergency break downs, while maximizing performance and lowering total cost of ownership.

Robust and long-lasting sealing solutions are therefore required that ensure continuous volume production, at high speed and with precision.

Meeting  
unique  
application  
needs

Broad range  
of innovative  
sealing  
solutions

Our global  
experts  
partner with  
customers  
locally

## SELECTED TOOLS FOR DESIGN ENGINEERS

### Mechanical Design Assistance



Hydraulic  
System  
Calculator



Area &  
Volume  
Calculator



Mechanical  
Engineering  
Calculator



Fluid  
Mechanics  
Calculator



CAD Services

### Standards, Conversions and Norms



ISO Fits &  
Tolerances



Unit &  
Hardness  
Converter

### Learning and Knowledge



Installation  
Instructions



e-Learning  
on Sealing  
Technology

### Product Selection



Electronic  
Catalog



Sealing  
Solutions  
Configurator

### Further Information

To find our complete range of tools and apps for engineers, visit [www.tss.trelleborg.com](http://www.tss.trelleborg.com) or scan the QR code.



### Technical Library

Technical articles, whitepapers and webinars can be found in the Technical Library at [www.tss.trelleborg.com](http://www.tss.trelleborg.com).

● Website Tools & Services

● Mobile Apps

# Unrivalled Services & Capabilities

Trelleborg Sealing Solutions contributes more benefits than a simple seal supplier. Our experts partner with customers across the globe to help them achieve their goals, whether starting from a "black box" specification, aiding testing and qualification to get product to market, or developing solutions to enhance manufacturing and supply chain processes.



## ServicePLUS

- Services to support every step of your value chain:
- Optimize product & application performance
  - Maximize production throughput
  - Enhance supply chain processes
  - Boost customer care



## ENGINEERING

- State-of-the-art CAD tools
- Experienced designers
- On-site support at customer facilities
- Dedicated project management
- FEA modeling
- Prototyping
- Custom-made solutions



## TESTING

- Nine research and development centers globally
- World class material & product testing equipment
- Analytical laboratories



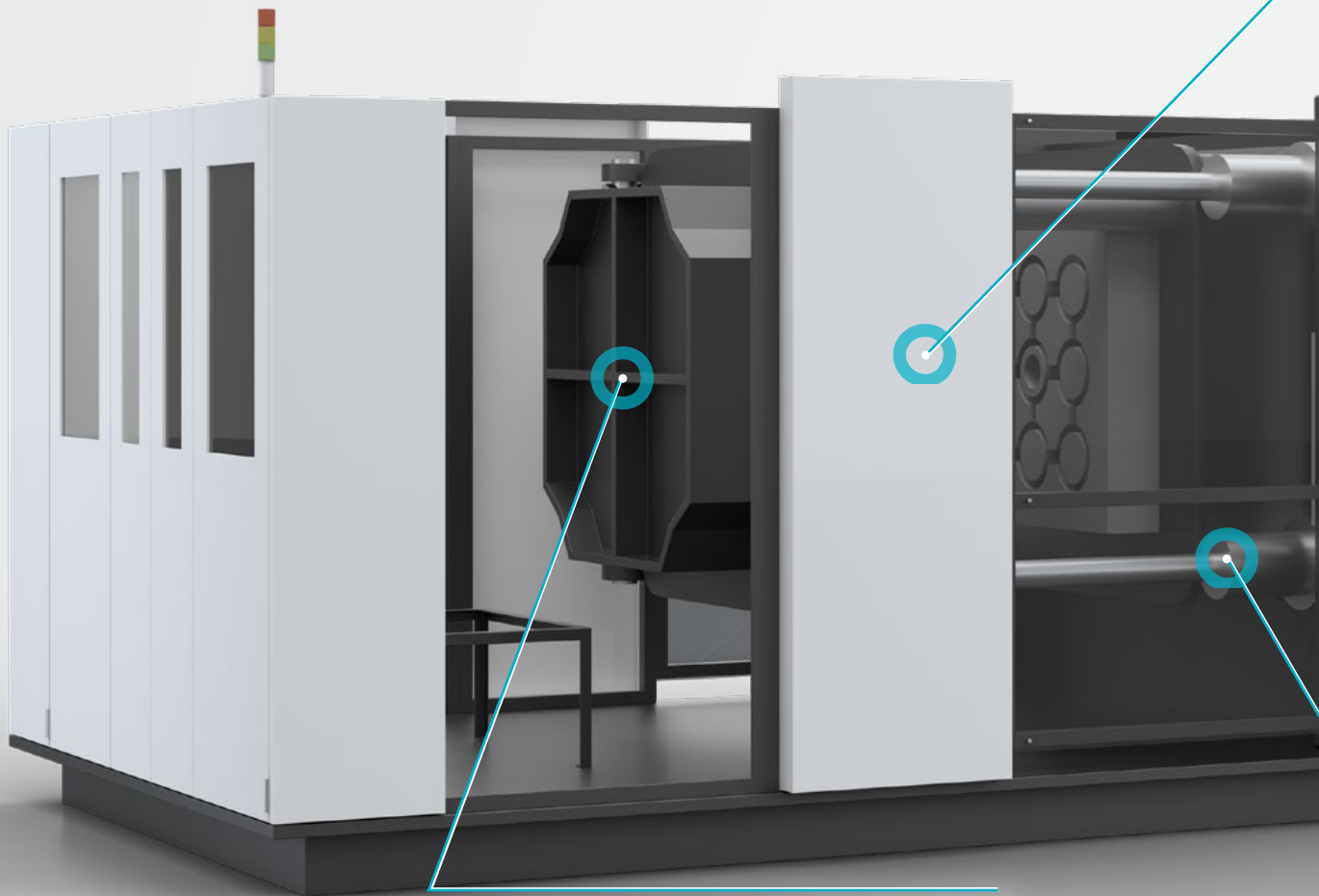
## PROJECT MANAGEMENT & QUALIFICATION

- Comprehensive project management
- From development to serial production and product introduction

# Sealing Solutions for Injection Molding Machines

## THE RIGHT SOLUTIONS TO MAXIMIZE PERFORMANCE

Hydraulic cylinders and other components on injection molding machines require complex sealing solutions to support challenging operating conditions. These elements are expected to operate continuously for long periods of time without any loss of efficiency.



### CLAMP CYLINDER

Special low friction seals can support continuous working in a short stroke environment to help provide long application life.



Scan the QR code to see our full portfolio of products and solutions for machine tools & manufacturing equipment.

### EJECTOR CYLINDER

As this cylinder must operate on every injection cycle, low friction seals with long service lives ensure fine movements are repeatable to fully remove parts each time.

### INJECTION CYLINDER

In revolutionary Lubrication Management technology, seals act together in complex configurations to optimize friction and wear, radically increasing application lifetime and reliability.

### MOLD STROKE CYLINDER

To facilitate actuation of the cylinder just a few times a day, low stick-slip seals are an important requirement.

### ROTATING INJECTION UNIT

This component rotates continuously during the molding process; therefore, seals must be robust and demonstrate low friction characteristics in a dynamic environment.



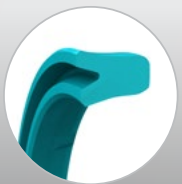
## PRODUCT HIGHLIGHTS

### ROD SEALS



#### **Turcon® Stepseal® V LM/ Zurcon® Buffer Seal LM**

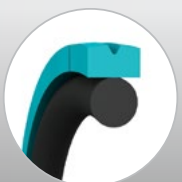
Both these seals can act as primary seals for Trelleborg's Lubrication Management technology, providing low wear and minimized friction over a longer service life.



#### **Zurcon® U-Cup RU9**

This seal provides a long service life by offering outstanding wear and extrusion resistance. It also has wide media and temperature compatibility.

### PISTON SEALS



#### **Turcon Glyd Ring® Hz**

This symmetric, double-acting seal has design features that allow for excellent performance in high frequency, short stroke applications.

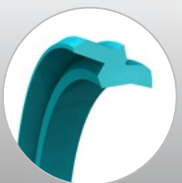
### WEAR RINGS



#### **Slydring® in Orkot® , HiMod® and Turcite®**

Wear rings prevent metal-to-metal contact between hardware components and absorb transverse loads.

### WIPERS



#### **Zurcon® Scraper DA 24**

This double-acting scraper is ideal for severe operating conditions with optimum contact pressure to scrape a residual oil film and prevent ingress of external contamination.

### ROTARY SEALS



#### **Turcon® Roto VL® Seal F**

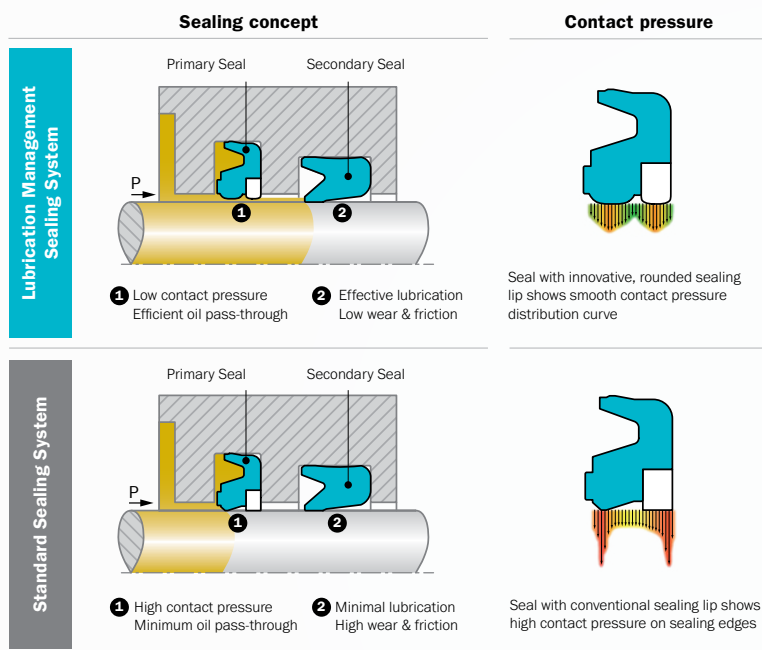
This L-shaped seal element gives optimized low frictional static and dynamic sealing performance in rotary and oscillating applications with a flange feature to prevent spinning in the groove.

## LEADING TECHNOLOGY

Continuing to innovate in sealing of hydraulics, Trelleborg Sealing Solutions optimizes system performance.

## LUBRICATION MANAGEMENT TECHNOLOGY

Effective sealing in demanding hydraulic applications requires seals and lubricants to work together. Trelleborg's Lubrication Management technology transforms hydraulic sealing by adjusting lubrication conditions of all single sealing elements within a sealing system.



## COUNTER SURFACES

Surface competence ensures that the performance requirements for hydraulic applications are met.

Having devoted a high level of R&D into the analysis of surfaces, counter surfaces and lubrication, we can advise on the optimum surface coatings and finishes.

## MATERIAL & DESIGN COMPETENCE

As a pioneer in the development of specialist seals for fluid power applications, the Trelleborg Sealing Solutions range includes many innovative and unique sealing elements specifically engineered for fluid power systems.

Encompassing advanced principles such as back-pumping and Lubrication Management, we work in collaboration with our customers to develop sealing configurations that exceed performance requirements.

# MATERIALS

Trelleborg Sealing Solutions has developed an industry-leading group of materials within each material type. We work with machine tool and manufacturing equipment manufacturers to help specify the compound that best suits their needs.

## ADVANCED ELASTOMER MATERIALS

### NBR (Nitrile Butadiene Rubber)

NBR is primarily used with mineral-based oils and greases and in general the material has good mechanical characteristics. Operating temperatures: -30 °C to +100 °C / -22° F to +212 °F

### HNBR (Hydrogenated Nitrile Butadiene Rubber)

HNBR is often used in high-temperature applications due to its excellent abrasion resistance and good mechanical properties. Operating temperatures: -30 °C to +140 °C / -22 °F to +284 °F

### FKM (Fluorocarbon Rubber)

FKM is known in particular for its very good resistance to fuel, oil and aggressive media, as well as excellent resistance to ozone, weathering and aging. Depending on structure, fluorine content and curing system, FKM materials can differ in their chemical resistance and cold-flexibility. Operating temperatures: -20 °C to +200 °C / -4 °F to +392 °F, for short periods up to +230 °C / +446 °F

### TURCON® – Outstanding Friction Characteristics

Turcon® is the Trelleborg Sealing Solutions range of proprietary materials based on premium-grade Polytetrafluoroethylene (PTFE). The materials demonstrate low friction, with minimized wear in dynamic and high speed applications. They are compatible to virtually all media, even at elevated temperatures, and are resistant to aging. Operating temperatures: -196 °C to +260 °C / -320 °F to +500 °F Recommended material: Turcon® M12

### ZURCON® – Exceptional Wear Resistance

Zurcon® engineered polyurethane-based materials exhibit outstanding friction characteristics, making them ideal for reciprocating, very slow rotating and oscillating situations where high wear resistance is required. Operating temperatures: -60 °C to +260 °C / -76 °F to +500 °F Recommended material: Zurcon® Z20

### ORKOT® – Advanced Composite Polymers

Orkot® bearing materials are thermoset composites incorporating advanced polymer technologies. These consist of technical fabrics impregnated with thermosetting resins, evenly dispersed solid lubricants and further additives to ensure optimum performance. Operating temperatures: -150 °C to +130 °C / -238 °F to +266 °F Recommended material: Orkot® C380

### HIMOD® – Economical Solution for Medium Loads

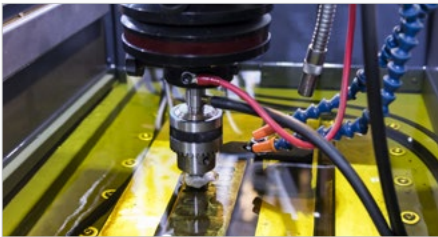
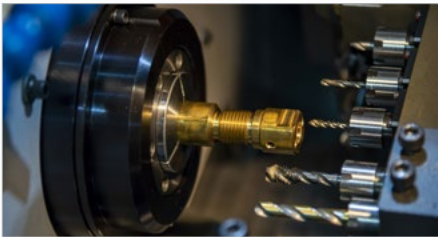
HiMod® provides an economical solution for applications with medium transverse loads, while giving good wear and compression properties. Operating temperatures: -40 °C to +130 °C / -40 °F to +266 °F Recommended materials: HM061 and HM062

### TURCITE® – Stick-slip Free Operation

Turcite® material gives outstanding friction behavior, good load capacity, stick-slip free operation and good resistance to high temperatures and chemicals. Operating temperatures: -60 °C to +200 °C / -75 °F to +390 °F Recommended materials: Turcite® M12, T47, T51

## ADDITIONAL APPLICATIONS – Seals for a full range of fluid power components

- Multi-Task Machining Centers
- Steel Production Machinery
- Textile Machinery
- Die-Casting Machinery
- Bending Machines & Straightening Machines
- Electrical Discharge Machines
- Waterjetting Equipment



Trelleborg is a world leader in engineered polymer solutions that seal, damp and protect critical applications in demanding environments. Its innovative solutions accelerate performance for customers in a sustainable way.

Trelleborg Sealing Solutions is a leading developer, manufacturer and supplier of precision seals, bearings and custom-molded polymer components. It focuses on meeting the most demanding needs of aerospace, automotive and general industrial customers with innovative solutions.

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If you'd like to talk to Trelleborg Sealing Solutions, find your local contact at: [www.tss.trelleborg.com/worldwide](http://www.tss.trelleborg.com/worldwide)