

Sealing Solutions for Construction and Mining Equipment



Your Partner for Sealing Technology

WORKING HARD IN EXTREMELY DEMANDING ENVIRONMENTS

Off-highway vehicles and equipment need to perform in extremely harsh conditions, such as construction sites, mines and forests. They require the most robust and durable solutions to provide long-lasting, high-performance sealing.

Importantly, sealing configurations must keep harsh external media out of sensitive hydraulic components, while standing up to system greases and fuels, thus ensuring zero leakage. This prevents environmental contamination and maximizes sustainability.












Trelleborg Sealing Solutions offers a wide range of sealing and bearing systems to meet these needs.

Extended sealing life

Stand up to harsh conditions

High performance, environmentally friendly solutions

SELECTED TOOLS FOR DESIGN ENGINEERS

Mechanical Design Assistance			Standards, Conversions and Norms		Learning and Knowledge	Product Selection
 Hydraulic System Calculator	 Area & Volume Calculator	 Mechanical Engineering Calculator	 ISO Fits & Tolerances	 Unit & Hardness Converter	 Installation Instructions	 Electronic Catalog
 Fluid Mechanics Calculator	 CAD Services				 e-Learning on Sealing Technology	 Sealing Solutions Configurator

 Website Tools & Services

 Mobile Apps

Further Information

To find our complete range of tools and apps for engineers, visit www.trelleborg.com/seals or scan the QR code.



Technical Library

Technical articles, whitepapers and webinars can be found in the Technical Library at www.trelleborg.com/seals.

Unrivaled 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 Mini Excavators

SEALING FROM MINI TO GIANT VEHICLES

Excavators of all sizes work in tough environments, such as mines or urban construction sites, where dirt, dust and harsh media are constant factors.

Sealing solutions need to be extremely robust to withstand some of the harshest of operating conditions, keeping external media out and lubricants in, as well as ensuring the best machine performance.



Scan the QR code to see our full portfolio of products and solutions for construction and mining equipment.



Zurcon® Glydring® D in Z13

Lubrication grooves in Zurcon® Glydring® D create a closed reservoir, reducing friction. Its D-shaped profile and two step sealing prevent blow by and extrusion. Zurcon® Z13 polyurethane material has excellent mechanical and elastic properties, and is compatible with hydraulic, mineral, synthetic and waterbased fluids.

CYLINDERS & ACTUATORS

Within hydraulic and pneumatic systems, cylinders and actuators play a critical part in excavator operations. For these to function effectively, seals within the systems must help achieve maximum performance over a long operating cycle without leakage.

Typical Applications: Boom, stick and bucket cylinders



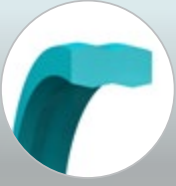
Cassette Seal

Trelleborg Cassette Seals incorporate opposing spring energized lips and a stacked design to reduce friction and wear, extending seal life while improving contaminant exclusion and static sealing ability.

DRIVE SYSTEM

An excavator's drive system performs a vital function, transferring power from the engine to the final drive, which supplies torque to the equipment's tracks or wheels. The drive system can have a variety of configurations and sealing solutions are designed to meet the requirements of each application to keep the excavator operating efficiently. Heavy-duty rotary seals keep oil and grease within the system, while static seals and custom-molded parts prevent ingress of dirt and debris.

Typical Applications: Engines, emission controls, fuel systems, fan drives, front and rear axles, final drives, idlers, hydrostatic drives, clutches, gearboxes, transmissions, swivel joints

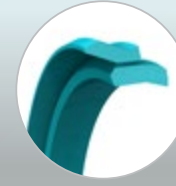
**Dualseal**

Dualseal in Zurcon® polyurethane or elastomeric materials resists twisting and gives stability at pulsating pressures, reducing contamination risk.

VALVES & PUMPS

In hydraulic systems, valves direct and control flow generated by pumps. The resulting force operates the hydraulic components within the excavator itself, as well as any on attachments. To maximize efficiency for the operator, seals extend valve and pump service life by enabling them to run precisely by excluding external media.

Typical Applications: Directional control valves, Pneumatic valves, cartridge valves, control valves, piston pumps

**Scaper DA24**

The Zurcon® Scaper DA24 is a double-acting polyurethane scraper for severe operating conditions and heavy dirt attack.

IMPLEMENTS & ATTACHMENTS

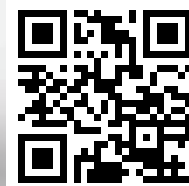
The implements and attachments on excavators enable them to perform a wide range of functions, from digging and earth moving to breaking rocks, compacting ground material and demolishing buildings. Static seals are vital in keeping dirt and contamination out of the system. Linear and rotary seals allow for the smooth operation of the hydraulic equipment while preventing leakage into the environment.

Typical Applications: Blade and swing cylinders, demolition equipment, hydraulic hammer and other attachments

TRACKS & TIRES

Trelleborg Wheel Systems is a leading supplier of tracks, tires and wheels for construction & mining equipment.

Scan the QR Code to find out more or visit www.trelleborg.com/wheels

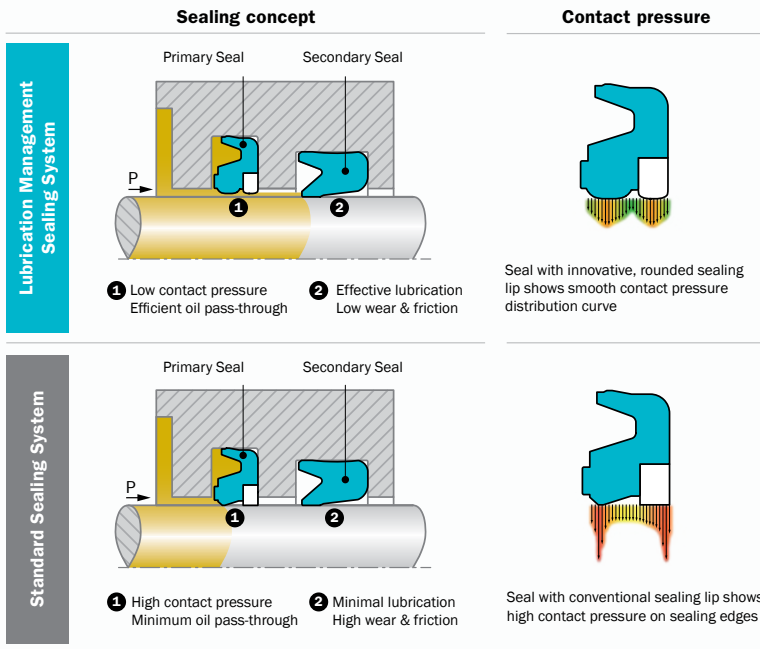


LEADING TECHNOLOGY

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.

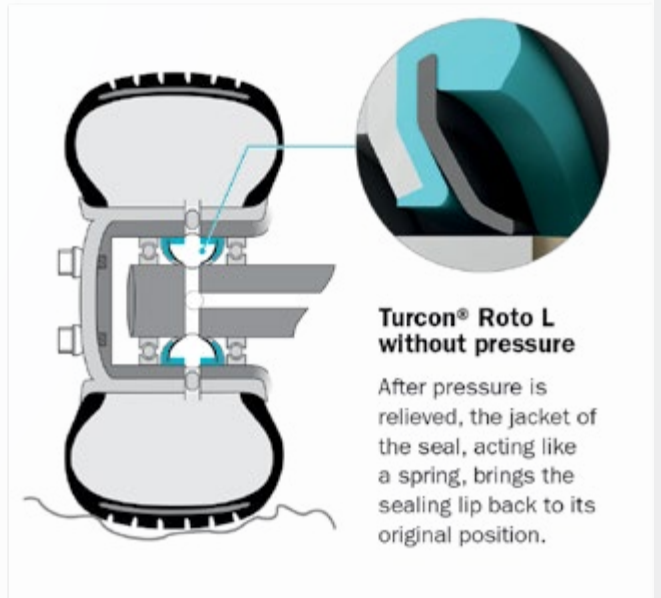
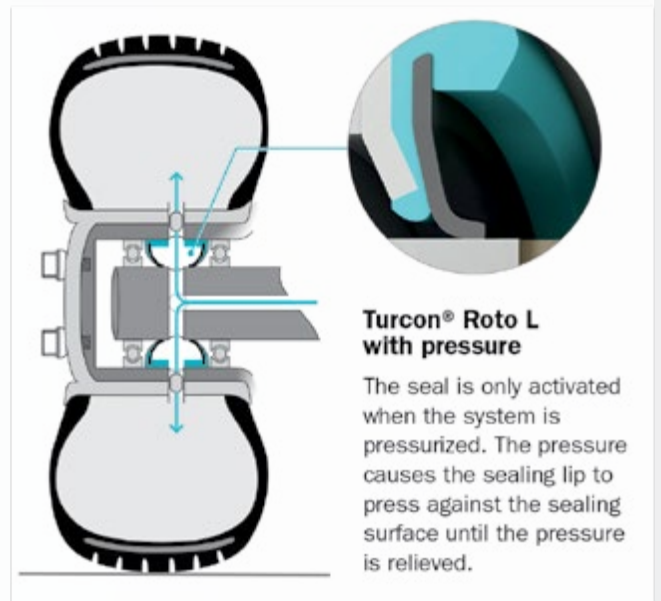
MATERIAL & DESIGN COMPETENCE

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.

CENTRAL TIRE INFLATION SYSTEM

The Turcon® Roto L seal is engineered to extend the lifetime of Central Tire Inflation Systems by lowering friction. Uniquely, it only seals when sealing is required. This reduces friction to lower fuel consumption and thereby conserves energy. As seal wear only occurs when pressure is activated, seal lifetime is four times longer than a standard seal.



MATERIALS

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

ADVANCED ELASTOMER MATERIALS

NBR (Nitrile Butadiene Rubber)

Primarily used with mineral-based oils and greases and in general has good mechanical characteristics.

Operating temperatures: -30 °C to +100 °C / -22° F to +212 °F

HNBR (Hydrogenated Nitrile Butadiene Rubber)

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)

Exhibits very good resistance to fuel, oil and aggressive media, as well as excellent resistance to ozone, weathering and aging.

Dependent on structure, fluorine content and curing system, FKM materials differ in 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

Proprietary Polytetrafluoroethylene (PTFE) based materials provide low friction with minimized wear in dynamic and high-speed applications. Compatible to virtually all media, even at elevated temperatures, and resistant to aging.

Operating temperatures: -196 °C to +260 °C / -320 °F to +500 °F

Recommended material: Turcon® M12

ZURCON® – Exceptional Wear Resistance

Thermoplastic-based materials with 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® Z13 and Zurcon® Z20

ORKOT® – Advanced Composite Polymers

Unique thermoset composite bearing material ensures optimum performance.

Operating temperatures: -150 °C to +130 °C / -238 °F to +266 °F

Recommended material: Orkot® C380

HIMOD® – Economical Solution for Medium Loads

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

Has outstanding friction behavior and good load capacity with stick-slip free operation.

Operating temperatures: -60 °C to +200 °C / -75 °F to +390 °F

Recommended materials: Turcite® M12, T47, T51

SEALS FOR A FULL RANGE OF CONSTRUCTION AND MINING EQUIPMENT:

- Bulldozers
- Backhoes
- Loaders
- Articulated Haulers
- Off-Highway Trucks
- Forestry Forwarders



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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