

# Our Global Resources



## OUTSTANDING SERVICE

Trelleborg Sealing Solutions is committed to optimizing customer partnerships through value-added services.

### LOCAL PRESENCE, GLOBAL REACH

- Manufacturing and engineering resources in over 40 countries
- Unrivalled global footprint

**Benefit: Consistent product and support worldwide**

### ADVANCED DELIVERY

- Stock holding for rapid delivery
- Global stocking programs

**Benefit: Helps avoid downtime**

### FINITE ELEMENT ANALYSIS (FEA)

- Market leading non-linear analysis
- Qualifies prototype candidates without testing

**Benefit: Accelerates time to market**

### PROVING APPLICATIONS

- Rotary, reciprocation and static testing available
- Utilize customers' test equipment

**Benefit: Proves solutions before fitment**

### ENGINEERING EXPERTISE

- Shoulder-to-shoulder engineering
- Present at all stages, from prototype development to bringing equipment to market

**Benefit: Partnerships for the optimum sealing solution**

### MANUFACTURING CAPABILITIES

- Seals in elastomers, PTFE, PEEK and composites
- Fleximold™ large seal manufacturing

**Benefit: One-stop-shop for all bearing and sealing requirements**



Trelleborg is a world leader in engineered polymer solutions that seal, damp and protect critical applications in demanding environments. Its innovative engineered solutions accelerate performance for customers in a sustainable way. The Trelleborg Group has local presence in over 40 countries around the world.



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# Oil & Gas Sealing Capabilities





# Meeting Oil & Gas Operator Needs

Providing a high performance sealing solution for nearly all applications, our materials and products can be utilized on anything from downhole drilling motors to oil platform tensioner systems, from subsea valves to refinery separation equipment. Seals from Trelleborg Sealing Solutions provide proven performance in a wide variety of systems used in exploration, refining, production and completion activities.

Trelleborg Sealing Solutions has been involved in oil & gas operations since the 1960s. Based on unrivalled experience, we have developed an outstanding range of sealing materials for our products including PTFE, PEEK, elastomers and composites. Meeting industry standards, most of these are proprietary and specifically engineered to withstand severe conditions encountered during offshore or onshore operations.

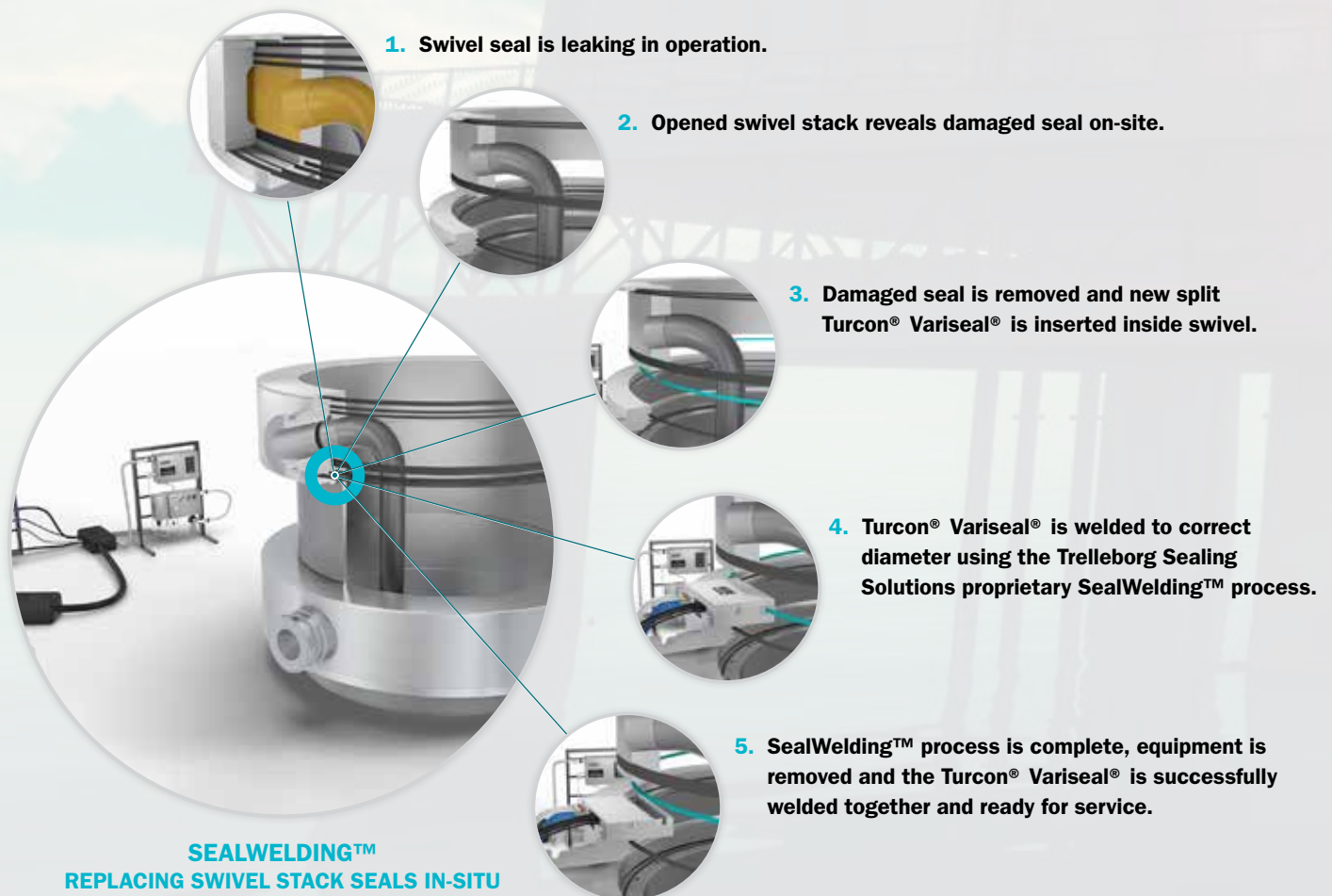
The technological horizon of the oil & gas industry is ever changing. As wells become deeper and processing more aggressive, the working conditions for seals and bearings become more demanding. Through significant investment in research and development, Trelleborg Sealing Solutions meets these challenges with continuous advances.

# SeaWelding™ Lowers Downtime

**A revolutionary seal welding technology from Trelleborg Sealing Solutions allows seals to be welded in-situ on an FPSO platform, eliminating the need for the vessel to disconnect and return to shore.**

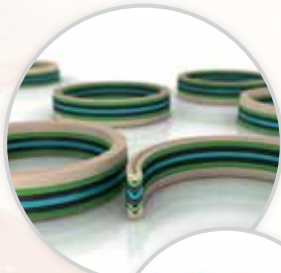
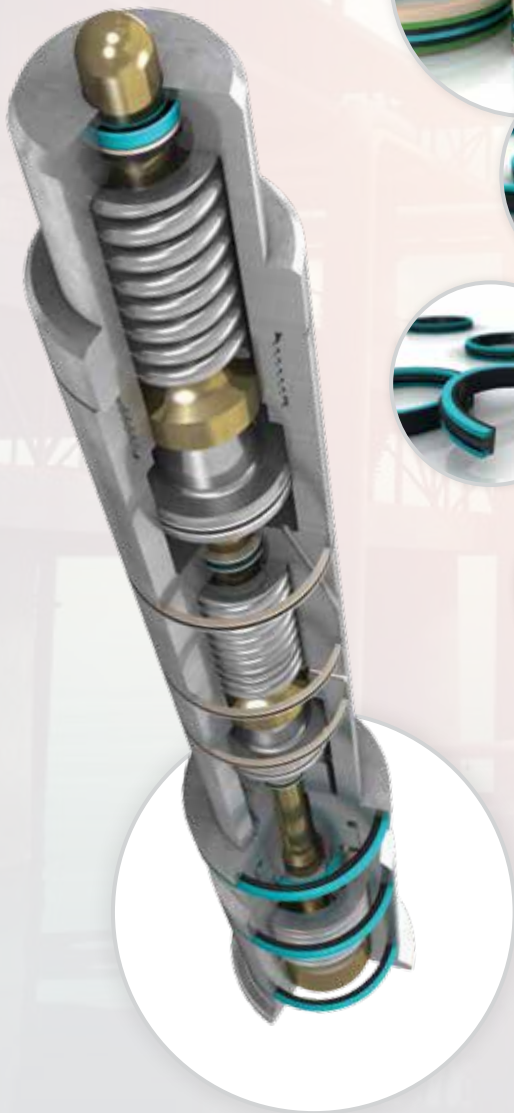
Utilizing Trelleborg's already well-established seal materials, this technology will massively reduce the downtime and associated costs that come from maintaining an FPSO swivel stack. Currently, swivel stack maintenance requires a vessel to travel back to shore so that components can be completely disassembled and seals replaced. Through optimized billet welding, Trelleborg's SealWelding™ technology means a replacement seal can be welded in-situ in its original material.

Offshore, onboard the FPSO, the seal is unpacked and installed onto the swivel by personnel from Trelleborg's service team; the skilled engineer installs it in the Weld Head Enclosure (part of the welding machine) which, certified to ATEX zone 1, is then pressurized so that the welding can take place. Fully enclosed, production on other swivel stacks can continue without risk.



# From Topside To Seabed

The broad range of Trelleborg Sealing Solutions products feature in numerous demanding and critical applications.



## DOWNHOLE TOOLS

Downhole tools need solutions that withstand extreme temperatures and aggressive media. Offering extended life they allow oil & gas extraction from the lowest depths – reliability and leak-free operation are critical.

### Turcon® V-Stack

- Custom stack of Chevron rings and/or Variseal® elements
- Suits specific working requirements
- Robust sealing with proven success

### Turcon® Wedgpak®

- Compact, space saving bi-directional seal
- Improvement on traditional seal options

### Turcon® T-Seal

- Fits into standard O-Ring grooves for retrofit
- Long proven track record

### Turcon® Captive Glyd Ring®

- Utilized for crossing ports under pressure
- Minimizes or eliminates damage from port or undercut crossing

## ALL SEALS

- Available in industry approved materials – NORSOK M-710, API
- Accelerated speed to market with rapid prototyping

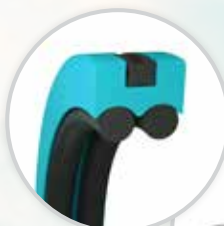


### BALL VALVES & GATE VALVES

Seals must withstand elevated temperatures and pressures in severe-service valve stem applications.

#### Turcon® Variseal® MC

- Spring-energized PTFE based seal for low break out even after extended installation periods
- Compatible with virtually all media
- Inherently immune to RGD (Rapid Gas Decompression) effects



### TENSIONER CYLINDERS

Twenty year or longer maintenance-free seal life is critical to prevent downtime and loss of revenue.

#### Turcon® AQ-5

- Available in large diameters with no tooling charges
- Proven extended life with low maintenance costs
- Very low coefficient of friction

### HYDRAULIC SWIVELS

Increasing speeds and pressures require innovative and unique seal designs to handle challenges in swivels.

#### Turcon® Roto Glyd Ring® II

- Double-acting elastomer-energized seal with unique rubber-to-PTFE bonded profile
- Low-friction operation
- Made for any diameter or hardware retrofit



# Fully Approved

Trelleborg Sealing Solutions offers a number of industry specific compounds compliant with various national and international standards. A range of elastomer and thermoplastic materials are available which are tested in accordance with NORSOK M-710 specifications.

ELASTOMERS	XploR™ H9T20	HNBR	One of the more popular choices for EDR service conditions
	XploR™ V9T20	FKM	Our standard XploR™ fluoroelastomer (FKM) EDR elastomer
	XploR™ V9T22	FKM	Offers high and low temperature EDR capability
	XploR™ J9513	FFKM	Extreme H <sub>2</sub> S resistance combined with high temperature performance
POLYTETRAFLUOROETHYLENE (PTFE)	Turcon® T05	PTFE	Offers gas-tight sealing with long service life
	Turcon® T07	PTFE	Preferred material for downhole tool service
	Turcon® T12	PTFE	Gives very good performance in valve applications
	Turcon® T24	PTFE	Ideal for slow rotation or poorly lubricated applications
	Turcon® T29	PTFE	Offers excellent performance in rotary or linear applications
	Turcon® T42	PTFE	Good for service in hydraulic systems with good dielectric properties
	Turcon® T99	PTFE	Preferred compound for dry running or poorly lubricated applications
	Turcon® M12	PTFE	Unrivalled across-the-board performance
	TFM Q2J	TFM	Offers outstanding stability at elevated temperatures
	TFM M02	TFM	For cryogenic applications due to ultra-low temperature resilience
POLYETHERETHERKETONE (PEEK) FOR BEARINGS AND BACK-UP RINGS	HiMod® 550	PEEK	Standard virgin PEEK
	HiMod® 914	PEEK	Excellent chemical resistance and good thermal properties
	HiMod® 921	PEEK	Highly lubricated, medium-modulus compound
	HiMod® 924	PEEK	Provides low thermal expansion and high mechanical properties
	HiMod® 960	PEEK	Standard virgin PEEK
	Zurcon® Z43	PEEK	For high pressure and temperature applications
	Zurcon® Z431	PEEK	Standard virgin PEEK

Additionally, Trelleborg Sealing Solutions has a large number of materials independently tested against ISO 10423 Annex F.1.13.5.2 for use in drilling and production equipment:

PEEK	HiMod® 550	PEEK	PTFE	Turcon® T07	PTFE	ELASTOMERS	TFM M02	TFM
	HiMod® 914	PEEK		Turcon® T12	PTFE		XploR™ V9T22	FKM
	HiMod® 924	PEEK		Turcon® T29	PTFE		XploR™ V9T82	FKM
	HiMod® 960	PEEK		Turcon® T42	PTFE		XploR™ J9503	FFKM
	Zurcon® Z43	PEEK		Turcon® T99	PTFE		XploR™ J9510	FFKM
	Zurcon® Z431	PEEK		TFM Q2J	TFM			

For more information on Trelleborg's comprehensive portfolio of approved materials, visit [tss.trelleborg.com](http://tss.trelleborg.com) or contact your local Trelleborg Sealing Solutions marketing company.