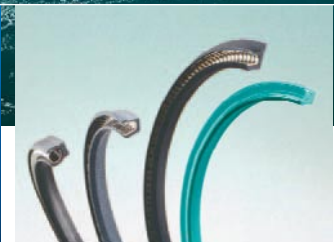
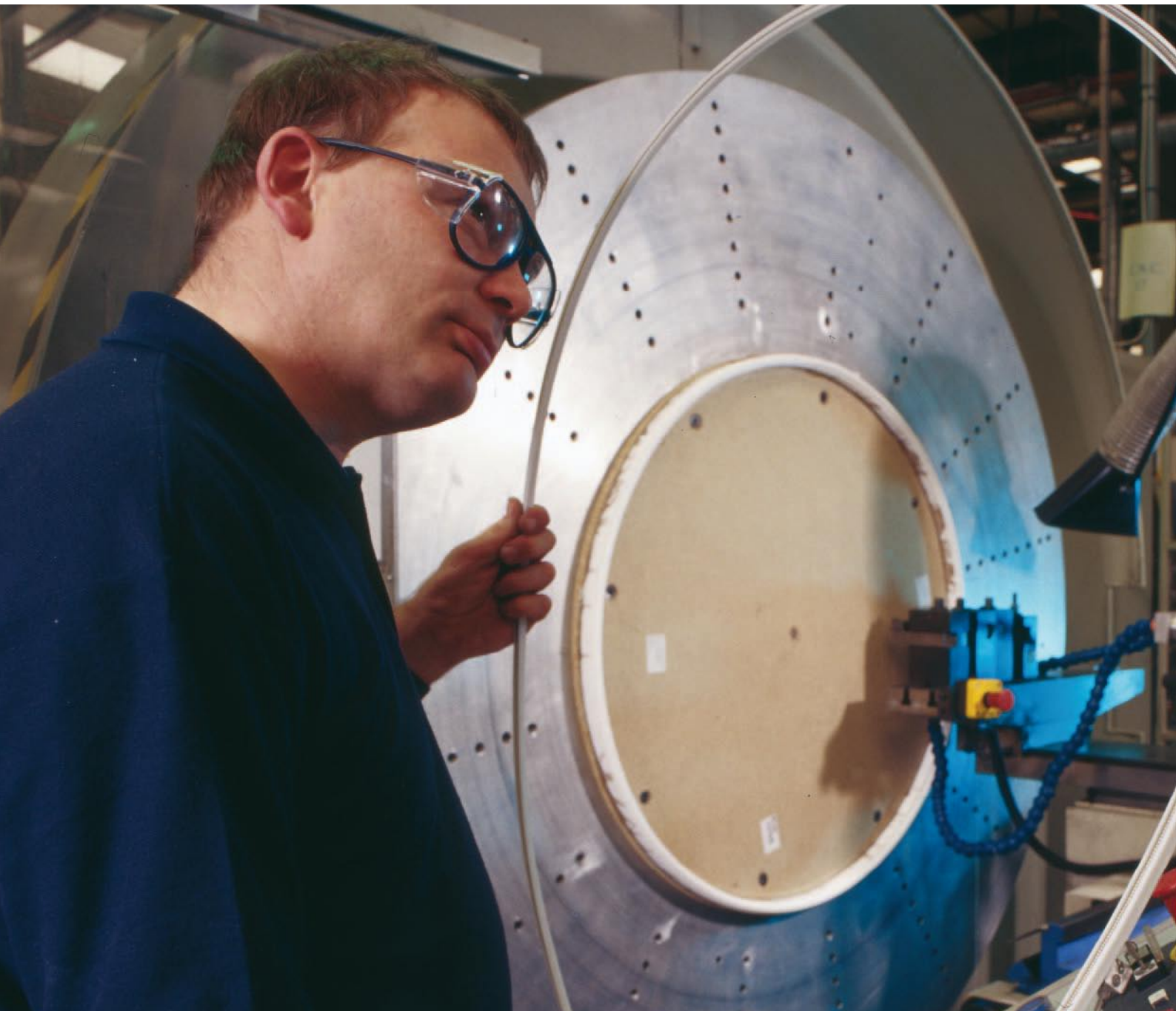


Oil & Gas sealing solutions



Your Partner for Sealing Technology

Ultimate sealing solutions for oil & gas



Exploration applications

In exploration wells, sealing systems must withstand the harshest of environments, with downhole temperatures in excess of +180 °C (+360 °F) and pressures possibly up to 155 MPa (22,500 psi).



Production offshore

Subsea production presents the ultimate challenge to sealing systems engineers, with deep-sea wells now reaching 6,000 metres (19,600 feet) in sea depths of 1,000 metres (3,300 feet).



Providing effective sealing solutions for the oil and gas industry is extremely challenging. Whether for use during exploration, offshore or onshore production, upstream, midstream or downstream, seals must withstand highly destructive and aggressive chemicals and gases, abrasive media, intense downhole temperatures and severe pressures. Further difficulties arise from supplying sealing systems to oilfields located in remote areas of operation, especially as most production now takes place in the harsh Subsea environments in which, to fully exploit diminishing reserves, wells are excavated to previously unbelievable depths.

The considerable practical experience of Trelleborg Sealing Solutions, along with ongoing product testing and qualification, mean we understand the needs of the industry. Whether operating in the Gulf of Mexico, the South China Seas or off the coast of Scotland, our global network can provide the same level of service and support; its primary aim is to minimise maintenance time and to maximise 'life of well' sealing integrity. Whether a seal is 1.2 millimetres (1/16th inch) or 3 metres (10 feet) in diameter, we are able to work with our customers to offer the optimum configuration, often participating in on-site development to meet individual requirements.

A single source for the majority of oil and gas sealing needs, we develop innovative solutions from our extensive range of seal materials and products, some of which are specifically engineered to meet particular industry requirements, ensuring the ultimate in reliability and safety.

The range of products offer:

- Temperature resistance from cryogenic up to +850 °C
- Almost universal chemical resistance; withstanding aggressive sour gas, corrosive fluids, hydrocarbons, carbon dioxide, acids, solvents and amine based corrosion inhibitors
- Excellent thermal stability
- Steam and explosive decompression resistant materials
- Good mechanical strengths
- Low long-term compression set
- NORSOK approved materials



Processing onshore

Seals that are virtually universally chemically compatible allow provision of innovative solutions for refining of hydrocarbons in pipelines, valves and flow meters.

High performance elastomer sealing technology



Advanced elastomers
Ideal for applications where temperatures do not exceed +180 °C (+356 °F), the TSS range of elastomers are engineered for maximum temperature performance and chemical resistance.



FEP encapsulated O-Rings
FEP encapsulated O-Rings consist of a Fluoroelastomer or Silicone elastomer O-Ring housed within a seamless FEP jacket, providing improved chemical compatibility with equivalent elasticity and low friction.



Breadth of range

Due to the breadth of range offered by Trelleborg Sealing Solutions, designers can specify seals that meet the challenge of balancing cost effectiveness with performance. For static applications, any size of O-Ring (standard or custom) is available alongside custom moulded designs and bonded products; in materials ranging from basic elastomer grades to leading edge, high specification compounds, particularly developed for the oil and gas industry. These innovative compounds help meet our aims of minimising maintenance time and improving production efficiency by extending seal life.

Advanced elastomer seals

As one of the leading developers of elastomer compounds for sealing applications, Trelleborg Sealing Solutions offers a range of HNBR and FKM materials engineered to maximise their effectiveness at high temperatures and when in contact with aggressive chemicals. Specification of these is supported by local experts who can recommend the optimum grade for every application.

Inventive designs

A development of the standard O-Ring, FEP encapsulated O-Rings, consist of a Fluoroelastomer or Silicone elastomer O-Ring housed within a seamless FEP jacket and are ideal when a cost effective solution is required that offers improved chemical compatibility, equivalent elasticity and low friction. Quad rings, manufactured from the same materials and to the same groove dimensions as standard O-Rings, can directly replace these when movements are found to cause twisting, reducing sealing integrity.

Isolast® Perfluoroelastomer

Trelleborg Sealing Solutions Isolast® presents the ultimate in elastomer sealing. These high performance Perfluoroelastomers (FFKM) are virtually inert and demonstrate almost universal chemical compatibility, making them ideal for hydrocarbon processing applications. Specialist grades can operate at continuous temperatures up to +325°C (+617°F) and specially formulated explosive decompression and steam resistant compounds are available. In addition, the resistance of Isolast® to amines extends the life of seals in contact with corrosion inhibitors, a known problem in environmentally friendly water based drilling equipment.



Isolast® Perfluoroelastomer

The ultimate in elastomer sealing, these virtually inert and almost universally chemical compatibility materials have been specifically designed to operate effectively in aggressive oil & gas processing systems.

Innovative engineered sealing options



Variseal® extreme sealing

Field-proven in extreme gas and liquid handling situations, Variseal® have been used in the most demanding of oil & gas sealing applications including high pressure and corrosive environments.



Wills Rings® for the optimum solution
Wills Rings® in O or C cross sections can operate within continuous temperatures from cryogenic up to +850°C (+1560°F) and are ideal for fire safe sealing.



Variseal®

An extremely important product to the oil and gas industry, Variseal® spring energised Turcon® PTFE seals are field-proven in extreme gas and liquid handling situations, having been used in the most demanding of production and refining applications. Designed to fit in existing O-Ring grooves, with the correct selection of PTFE, filled PTFE compounds and appropriate spring material and profile, Variseal® can provide the highest level of system integrity, even in the most aggressive and corrosive of chemical media; providing the ultimate explosive decompression resistance.

Wills Rings®

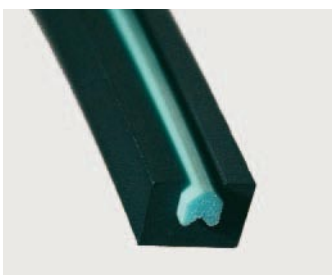
Wills Rings® are the original metal seals, providing the optimum solution in static sealing on connectors, flanges and plates for gases and liquids. They operate effectively under extremes of temperature, ranging from cryogenic to 850°C (1560°F) and severe pressures, often being utilised when fire safe sealing is required. Wills Rings® are available in a variety of metals, O or C cross section with either pressure filled or system pressure activation.

Turcon® PTFE

A range of Turcon® PTFE solutions offers advanced sealing for rotary applications. In Turcon® Glyd Ring, Turcon® Roto Glyd Ring and Turcon® AQ Seal an elastomer O-Ring or Quad Ring energises a PTFE sealing ring. Engineered to reduce friction with high wear and abrasion resistance, they are ideal for high-pressure situations. The Double Delta fits in an existing O-Ring groove and expands the parameters of the O-Ring used with it, improving wear and friction characteristics.

Bearing solutions

Bearings manufactured from Turcite®, an engineered PTFE based thermoplastic, prevent metal to metal contact between piston and rods, bores and glands, absorbing transverse load and with low friction, minimise stick-slip. Bearings from Orkot®, a non-asbestos synthetic, composite material incorporating solid lubricants, provide exceptional wear resistance and virtually no swell in water. Ideal for Subsea environments they offer effective and maintenance free solutions in seawater.

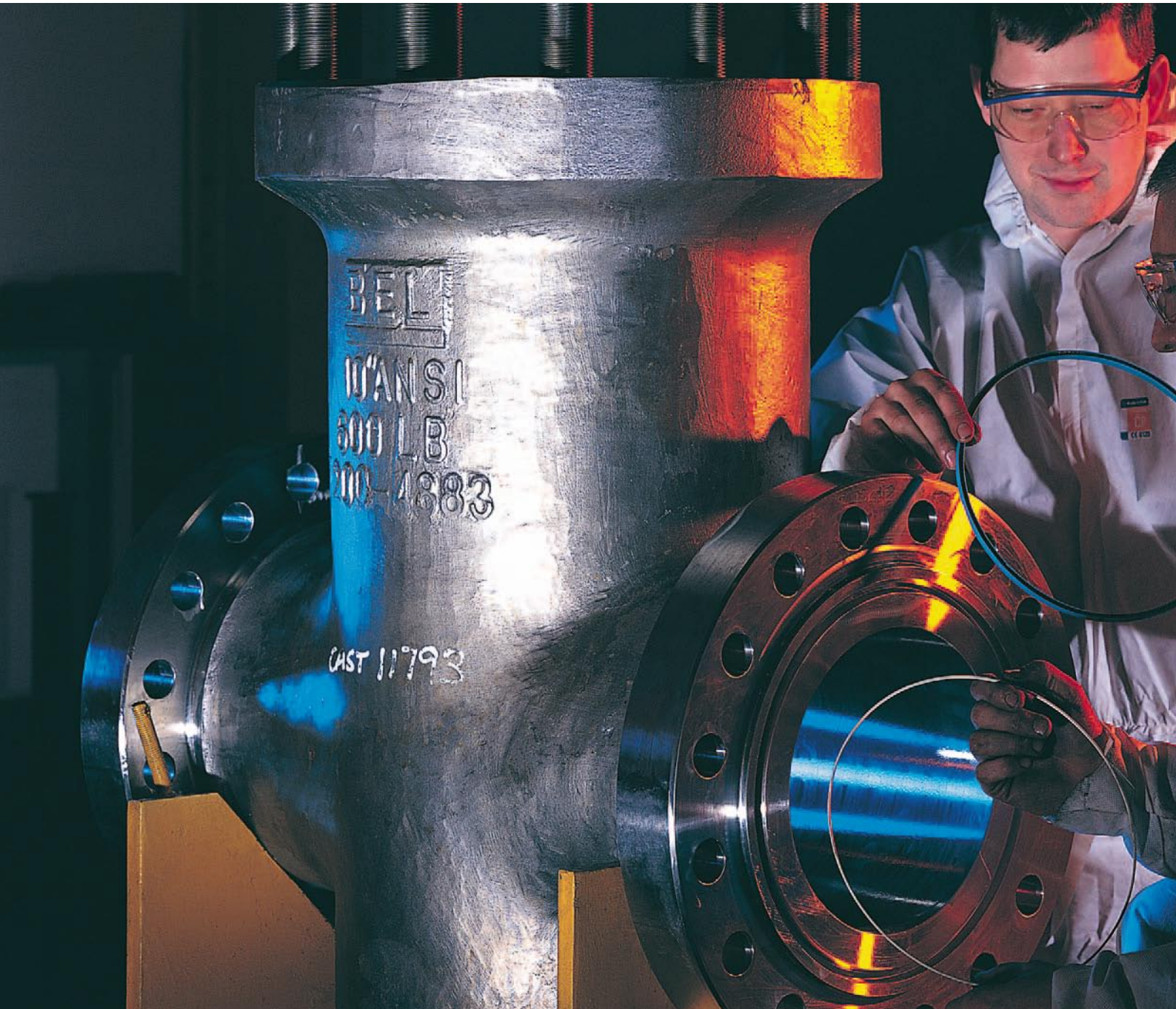


High performance Turcon®
Turcon® PTFE solutions offer advanced sealing for rotary applications, providing reduced friction, high wear and abrasion resistance in high pressure situations.



Advanced bearing options
Bearings manufactured from Turcite®, prevent metal-to-metal contact, while Orkot® with virtually no swell in water offers an effective and maintenance free solution Subsea.

Development partnerships optimise applications



Sealing on FPSO units
Specialist sealing and bearing solutions operating offshore on FPSO turrets and fairleads withstand ingress of seawater and chain breaking forces, typically up to 1,700 tons.



Valve and pump sealing
Within processing systems, seals must operate in harsh environments; facing extreme temperatures and pressures, contact with aggressive chemicals and the possibility of explosive decompression.



Trelleborg Sealing Solutions works with oil and gas customers in development partnerships, identifying the best sealing option for specific applications from a broad choice of materials and seal profiles.

Exceptional offshore performance

On FPSO (Floating Production Storage and Offloading) unit turrets a combination of Turcon® Roto Glyd Ring®, NBR O-Ring, Turcon® Variseal® and V-Seals, give exceptional sealing performance. They withstand rigorous ocean movements, allowing low friction turning when connected to subsea buoys. The fairleads to these resist extreme chain breaking forces with the help of high load bearings from Orkot® that exhibit excellent corrosion and wear properties.

Resisting harsh conditions

Valves and pumps within processing systems must operate in harsh environments, facing extreme temperatures ranging from -60°C to +300°C (-75°F to +575°F) in conjunction with high and low pressures. Seals within them may also have to withstand contact with aggressive chemical media and counter the possibility of explosive decompression. Helping to extend service life, Turcon® Variseal® and Isolast® O-Rings are performing excellently in such applications.

Safety critical sealing

The nozzle on gas flare lines, recovering hydrocarbon gas and routing this back to the main process, require a sealing system capable of withstanding intense temperatures reaching +400°C (+750°F) and severe pressures up to 200 MPa (30,000 psi). The best option for this application is Wills Rings® and these metal O-Rings have proved more than capable of withstanding these extremes whilst providing effective fire-safe sealing.

Ensuring downhole integrity

With the increasing depth of wells, the challenge of ensuring logging equipment retains sealing integrity during exploration is paramount. Sealing systems must withstand temperatures in excess of +180°C (+360°F) and pressures over 155 MPa (22,500 psi). In constant contact with destructive well fluids, innovative designs utilising Turcon® Variseal®, Isolast® O-Rings and AQ seals, must fit into compact housings, significantly restricted by tool diameter.



Extremes withstood in flares

The best option for withstanding intense temperatures and severe pressures is Wills Rings® which have proved themselves in extremes whilst providing effective fire-safe sealing.



Effective sealing in exploration

The challenge of ensuring logging equipment retains sealing integrity is paramount and sealing systems must withstand high temperatures and pressures along with destructive well fluids.

Market leading global sealing capabilities



Extensive test facilities
Strategically positioned materials and development laboratories and fully resourced design and application centres, continuously succeed in the delivery of sealing solutions.



Innovative material development
Developing and formulating materials in-house and engaging in on-going programmes of development, TSS is also skilled in the field of applied materials technology.



Total - Sealing technology

Trelleborg Sealing Solutions is a major international sealing force, uniquely placed to offer a dedicated design and development service for sealing arrangements, from our market leading product and material portfolio; one which has provided solutions that feature in virtually every application conceivable within the aerospace, industrial, and automotive industries.

Global - A worldwide presence

Globally servicing, supporting and supplying our customers, Trelleborg Sealing Solutions has an international network of over 70 facilities worldwide including more than 20 manufacturing sites, strategically positioned materials and development laboratories and fully resourced design and application centres. Facilities are certified to ISO 9001:2000, with many manufacturing sites also working to QS9000 and VDA 6.1.

Expertise - Our proven capabilities

With over 50-years experience in development and application of sealing systems, Trelleborg Sealing Solutions engineering personnel contribute their knowledge of this specialised technology directly to customers. This includes project management of design, prototyping, production, test and installation using state-of-the-art design tools, fully customer-compatible CAD systems and leading edge Finite Element Analysis (FEA).

Innovation - In materials and supply

Developing and formulating our materials in-house, Trelleborg Sealing Solutions has acquired significant skills in the field of applied materials technology. Working in close cooperation with worldwide partners, we are engaged in on-going programmes of material and product development, utilising latest technologies and the resource of our material database, which includes over 2,000 proprietary compounds.

Commitment - To customers' needs long-term

The aim of Trelleborg Sealing Solutions is to facilitate customers in the achievement of cost effective, durable solutions. As the global sales and marketing organisation of Trelleborg Sealing Solutions, who develop, manufacture and market safety-critical polymer-based precision seals and associated systems, we have the backing of one of the world's foremost experts in polymer sealing technology.



Superior logistics support

TSS invested in an advanced logistical support system, which effectively delivers products to our customers worldwide from a central European warehouse.

Contact your local marketing company for further information:

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