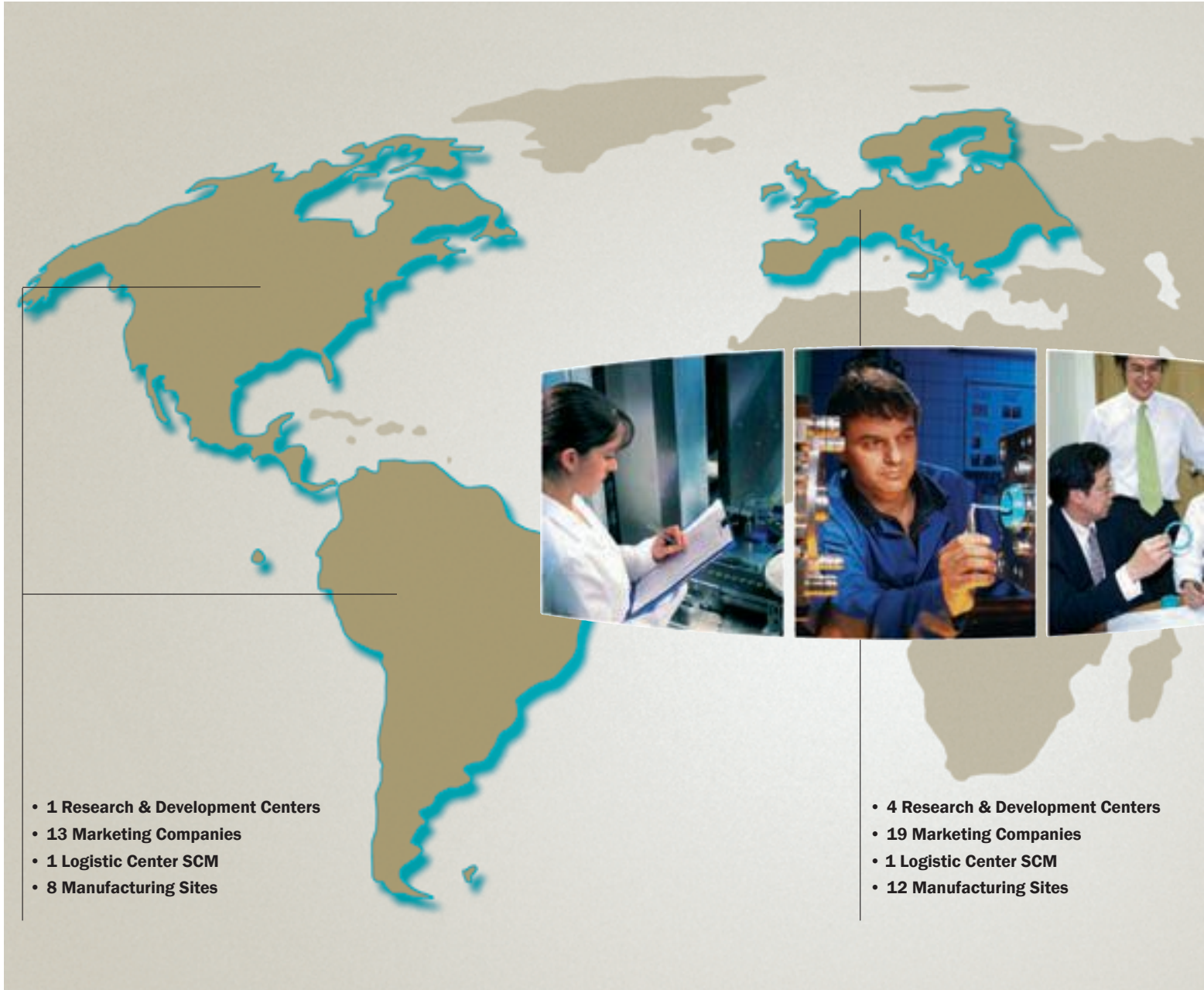




Global Manufacturing Capabilities



Trelleborg Sealing Solutions Global Resources



- **1 Research & Development Centers**
- **13 Marketing Companies**
- **1 Logistic Center SCM**
- **8 Manufacturing Sites**

- **4 Research & Development Centers**
- **19 Marketing Companies**
- **1 Logistic Center SCM**
- **12 Manufacturing Sites**

International excellence in production

Trelleborg Sealing Solutions is one of the largest seal producers in the world, with over 20 strategically located manufacturing facilities on four continents. Continuous investment ensures that we maintain and improve production efficiency, fulfilling our aim of offering customers the most cost effective sealing solutions possible. Manufacturing locations

specialize in a single product group or type, whether it be seals in proprietary Turcon® or Zurcon® materials, exclusive product designs in our unique range of elastomers, including the groundbreaking Isolast® perfluoroelastomer, or bearings in market leading Orkot®, HiMod® or Turcite®. On the basis of its extensive material expertise and

product development capabilities, Trelleborg Sealing Solutions is the partner of first choice for challenging developments in areas such as the Automotive, Aerospace, Medical, Pharmaceutical, Food or Semiconductor industries.

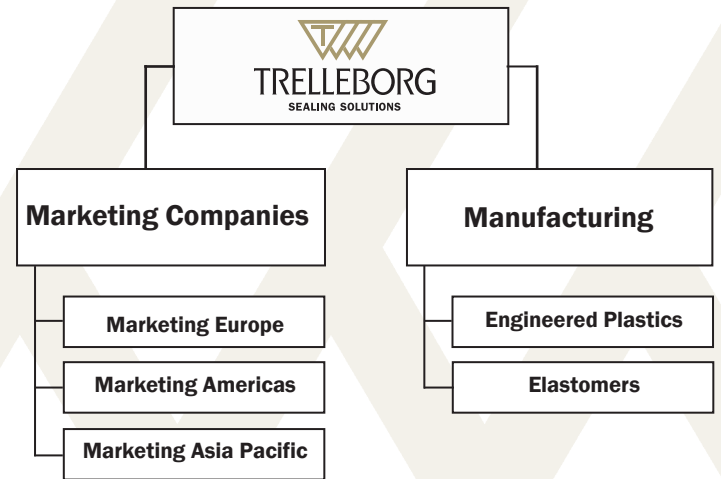
We master the production of both standard parts in high quantities up

to several millions as well as tailor-made customized products, using state-of-the-art equipment and the latest in best practice techniques. We provide our customers with best-in-class on time delivery while maintaining the highest quality standards. Lean manufacturing was successfully implemented several years ago to secure constant quality and the most cost effective production to satisfy our customers.



Trelleborg Sealing Solutions

Trelleborg Sealing Solutions is exclusively responsible for the global sales and marketing of sealing and bearing products manufactured by Trelleborg Sealing Solutions.



Our world renowned manufacturing names

We own many of the longest established and leading names within the seal industry. These include:

- **Variseal:** spring energized and radial lip Turcon® seals
- **Dowty Seals:** high-performance elastomer based sealing products
- **Forsheda:** rotary sealing systems including V-Rings® and Cassette Seals
- **Impervia:** specialized aerospace sealing systems
- **Orkot:** advanced composite bearing materials
- **Palmer Chenard:** diaphragms

reinforced with engineered textiles

- **Polypac:** sealing systems for heavy-duty hydraulic applications
- **Nordex:** innovative compact hydraulic and pneumatic seals in polyurethane
- **Shamban:** Shamban: advanced sealing systems in Turcon® (PTFE based materials) and other engineered plastics
- **Silcofab:** gaskets and moldings from heat-cured silicone rubber
- **Skega:** premium O-Rings, sealing plates and custom-designed seals
- **Stefa:** radial shaft seals for demanding environments
- **Wills:** Wills Rings®, Turcon® Variseal® and PDR rotary shaft seals

Flexible capabilities globally

- Experts at development of tailor-made solutions for the most demanding applications
- Size range from 0.5 mm inside diameter to 15 meters (49 feet)
- Equally capable of supplying standard parts in very high volumes or a single specialized custom-manufactured component
- Production methods matched to the specific needs of each industry served including just-in-time delivery, cell manufacture, direct line feed and kitting
- Cleanroom production with wash and pack to class 100 standards
- Rapid ramp-up from concept to mass production
- Minimal lead times exploiting centralized logistical operations
- In-house elastomer mixing and molding facilities
- Quality certification to a variety of international standards including ISO 9001:2000, QS 9000, AS 9100, VDA 6.1 and TS 16949
- Environmental approval to ISO 14001
- Health & Safety approval to OHSAS 18001

Products & Materials

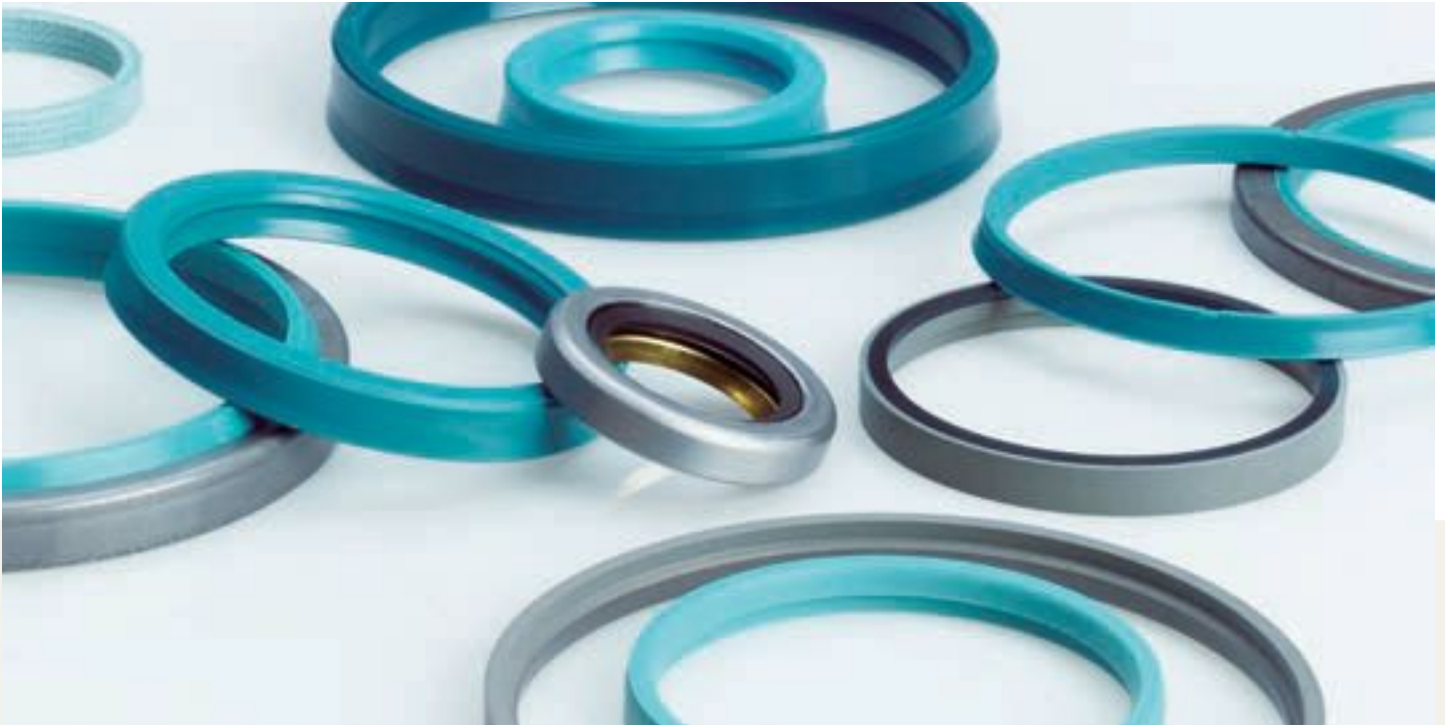


Proprietary materials

Trelleborg Sealing Solutions is involved in the constant development of materials that meet specific application needs including the requirements of standards and approvals, specified typically in water handling applications, pharmaceutical manufacturing and food processing. Expertise in elastomeric compounds allow us to offer formulations that can operate in temperatures from cryogenic up to +325 °C (617 °F) and provide almost universal chemical resistance. Ongoing developments in engineered thermoplastics and polyurethane have yielded some of the most successful materials available of these types for sealing.

- HiMod®: engineered thermoplastic material
- Isolast®: leading edge perfluoroelastomer
- Orkot®: High Performance Composite Bearing Material
- Turcite®: engineered thermoplastic bearing materials
- Turcon®: high performance engineered thermoplastic (seal material)
- Zurcon®: enhanced polyurethane and other engineered plastics





Product development

Trelleborg Sealing Solutions is pioneering within the sealing industry and continuously developing innovative products.

- Turcon® AQ Seal®: QUAD-RING®* Seal inset into a Turcon® sealing element
- D-A-S Compact Seal: Combination of piston seal, back-up and wear rings
- Turcon® Double Delta®: Turcon® sealing element energized by an elastomer O-Ring
- Turcon® Excluder®: O-Ring energized scraper that excludes media ingress
- Turcon® Glyd Ring® T: O-Ring energized rod or piston seal for dynamic applications
- Turcon® Hatseal®: Aerospace seal combining elastomer and Turcon® contact seals
- Zurcon® L-Cup®: Zurcon® rod seal with back pumping ability
- Turcite® Slydring®: Wear ring that prevents metal to metal contact
- Turcite® B-Slydway®: Linear bearing used primarily on machine tools
- Turcon® Stepseal® 2K: O-Ring energized piston or rod seal in Turcon® or Zurcon®
- V-Ring®: Flexible elastomeric axial lip seal that prevents media ingress
- Varilip®: Metal cased PTFE high performance rotary shaft seal
- Turcon® Variseal®: U-shaped Turcon® ring with a metal spring energizer
- Turcon® VL-Seal™: Unidirectional rod and piston seal designed for aerospace
- Turcon® Wedgpak®: triangular elastomer sealing element with two Back-up Rings
- Wills Rings®: Metal O and C Rings for use in severe operating conditions
- Zurcon® Wynseal®: O-Ring energized Zurcon® piston seal for dynamic applications



* QUAD-RING® is a Trademark of Quadion Corporation.

Trelleborg Sealing Solutions Helsingør (Denmark)



Company Profile



Trelleborg Sealing Solutions Helsingør is a world leader in the manufacturing of PTFE based seals and bearings for the most demanding applications in aerospace, oil and gas, automotive, fluid power and many other industries. Our Turcon® and Zurcon® seals are used in equipment around the world where there is demand for dynamic sealing.

We established our factory as W.S. Shamban Europa at Helsingør in Denmark in 1965 and now have around 350 employees. Our modern production equipment enables us to meet the most challenging demands of our customers.

Service

We are determined to be best-in-class in all aspects. Our engineering support and design of customer specific solutions enables our customers to meet the toughest requirements. Our R & D provides development of a wide range of standard and special materials

meeting practically any demand, and our laboratory is equipped with state-of-the-art facilities in order to test, analyze, and document material and sealing performance. And when speed is essential, our emergency and Turcon® Express service ensures delivery in only 24 hrs.



Products and Materials



The company is dedicated to the manufacture of sealing and bearing solutions where low friction, high temperature and long service life are important.

Our highly skilled engineers and chemists, and years of experience in design and production of sealing



solutions, guarantee the successful function of our customers' equipment.

We can provide the majority of sealing solutions from our wide range of standard proprietary materials, including Turcon®, Turcite® and Zurcon®. Our standard proprietary designs (for example



Stepseal® 2K, Glyd Ring® T, Roto Glyd Ring® and Excluder®) have provided years of top performance in all kinds of applications. If necessary, we can also develop special materials and products for specific applications or customers.

Quality, Environment and Health & Safety

We are living up to the highest quality standards and we are certified in accordance with

- ISO 9001
- QS-9000
- ISO/TS 16949
- ISO 14001 and
- OHSAS 18001.

Facilities



Our facilities are equipped with the latest technology to produce advanced high quality designs, quickly, efficiently and with a high degree of flexibility. The focus on quality and efficiency when compounding PTFE and fillers, producing Turcon® materials or machining numerous designs is a top priority for us. We have state-of-the-art equipment throughout the process - from CAD and 3D

modeling for design work, through PLC controlled processes in molding, sintering and CNC machining, to fully automatic equipment for assembly and optical quality controls. Our machines are set up for quick change of designs and materials.

Applications	Products	Materials
<ul style="list-style-type: none"> • Hydraulic applications: such as hydraulic cylinders, presses, injection moulding machines, fork lifts, excavators • Automotive: such as fuel injection, brakes, ride control, suspension, steering • Aerospace: such as landing gear, flight controls 	<p>Piston seals, rod seals, seals for rotary applications, scrapers, bearings etc:</p> <ul style="list-style-type: none"> • Stepseal® 2K • Stepseal® V • Glyd Ring® T • Roto Glyd Ring® • Excluder® • AQ Seal® • VL Seal® • Double Delta® • VL Seal® • Slydring® • Slydway® 	<ul style="list-style-type: none"> • Turcon® • Turcite® • Zurcon®

Trelleborg Sealing Solutions Skelleftea (Sweden)



Company Profile

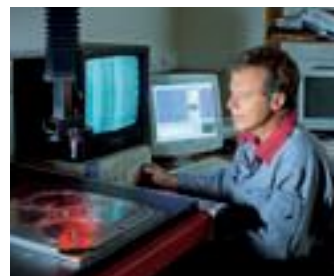


The company started in 1932 by manufacturing shoes and gloves protected with rubber. These products became popular among farmers and woodsmen and in the mines that had recently been established in the area. Contact with the mining industry was significant and Skega AB became a global supplier of heavy wear-resistant components.

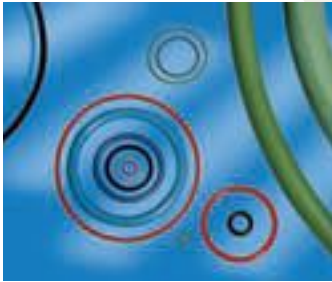
The company introduced its first range of high quality O-Ring products in 1948, used since then by the Swedish Air Force. Skega AB soon became the only significant O-Ring manufacturer in Scandinavia. Today Trelleborg Sealing Solutions Skelleftea is recognised as a world-class supplier of O-Rings and static seals in rubber and polyurethane, along with bonded seals. These are supplied for a wide variety of demanding applications worldwide. The key to our success is our skilled and committed personnel, 230 employees working in the northernmost rubber manufacturing facility in the world.

Service

- Our mission is to supply customers with high quality products, which add value in terms of performance, life-cycle cost, quality and environmental aspects.
 - Extensive technical support, test and laboratory capabilities.
 - We use 3D modelling and finite element analysis to develop and optimize a sealing function.
- This helps us deliver design reliability, uniform product quality and shorter lead times for new product development.
- Key account support, priority- and early warning systems provide rapid response and flexible delivery.
 - Full quality assurance capabilities using core tools as required in ISO/TS 16949 and ISO 14001.



Products and Materials



Our high quality O-Rings can be supplied from moulds up to 1300 mm (51") diameter as well as joint-vulcanised for larger applications. Products include bonded seals along with O-Rings and customer specific static seals. Seals are



available in a wide variety of materials formulated to offer solutions for the most demanding sealing requirements. Materials and their properties are important in our daily work. Trelleborg Sealing Solutions



Skelleftea is recognised as a supplier of world-class elastomer materials, providing compounds to suit our customers' applications. Since 2003 we have extended our product and material portfolio with



Polyurethane O-Rings and special seals in Zurcon® materials Z20, Z22, Z24 and Z30, produced with a high grade of automation and without any second operation needed.

Facilities



Today Trelleborg Sealing Solutions Skelleftea has a reputation for excellent delivery performance utilizing our modern production machinery equipped with advanced control systems, which results in high uniform product quality. Other contributory factors are our extensive technical expertise and efficient production planning.

The facilities are industry leading in process, as well as environmental friendly solutions. Major investments have been made in state-of-the-art equipment. Production equipment available includes injection moulding machines (ranging from 60 to 600 tonnes), compression presses (80 to 640 tonnes) and automatic visual inspection systems.

Applications	Products	Materials
<ul style="list-style-type: none"> • Diesel & Truck • Energy • Automation • CPI 	<ul style="list-style-type: none"> • O-Rings • Bonded Seals • Static and linear seals • Cylinder Seals • D-Seal® • X-Rings 	<ul style="list-style-type: none"> • FKM (GFLT, GLT), Resifluor™ 400 • EPDM • NBR (including "Polar") • HNBR • Q • VMQ • CR • Zurcon® (Z20, Z22, Z24, Z30)

Trelleborg Sealing Solutions Bridgwater (UK)



Company Profile



Trelleborg Sealing Solutions Bridgwater is part of the Global Operations Engineered Plastics division of Trelleborg Sealing Solutions. The company - originally named Wills Pressure Filled Joint Company - was founded by Percy Wills in 1935 following his invention of a gas-filled metal O-Ring. Today Trelleborg Sealing Solutions Bridgwater operates at a modern 4166 square meter site and employs 150 people.

We have been producing high-performance sealing solutions for over seventy years. Wills Rings® is our most well known product worldwide.

We also offer Variseal® and Varilip® PDR product ranges, which allow us to find effective solutions for the most demanding applications.

Service

We provide a combination of design flexibility, experience and customer service. This results in a superior sealing solution that meets the customers' needs and performs well during its long working life.

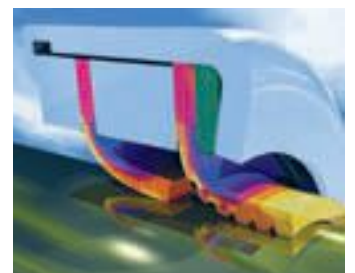
Our highly qualified and experienced employees are focused on designing

and manufacturing effective sealing solutions with attention on customer service and ability to respond promptly and efficiently.

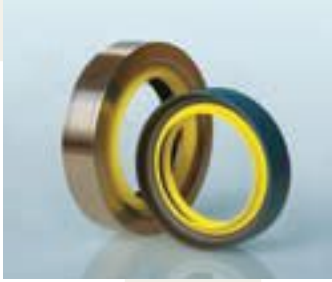
We use modern 2-D and 3-D drawing software and high technology analysis and testing facilities to ensure the right outcome.

Finite Element Analysis (FEA) provides structural and design feedback for specified operating parameters and significantly reduces development lead times and prototype costs.

Comprehensive test work can be carried out to develop and prove designs for customer verification.



Products and Materials



Trelleborg Sealing Solutions Bridgwater is a global supplier of Wills Rings®, and a joint global supplier Variseal® and Turcon® Varilip® PDR. Varilip® products are standard rotary shaft seals made from high-performance metallic materials with proprietary Turcon® polymer dynamic sealing elements. The Turcon® Varilip® PDR (Performance, Durability, Reliability)



product range is a range of standard and custom-designed shaft seals. The products are designed for demanding applications that are too harsh for standard elastomeric rotary shaft seals. Turcon® Varilip® PDR seals are made from high-performance metallic casing materials with a range of specialist and proprietary blended polymer sealing lips.



Our Variseal® products are spring-energized seals in high performance Turcon® PTFE-based and metallic spring materials. They are used for dynamic and static applications often under extreme conditions.

Wills Rings® are superior controlled-compression seals used for static applications. They are designed for extreme conditions, exceeding the capabilities of elastomer and polymer seals. Wills Rings® are made from high performance metallic materials such as stainless steel, copper, Inconel® or Monel® and coated with a softer metal or polymer.

Facilities



Trelleborg Sealing Solutions Bridgwater has on-site facilities that allow us to find effective solutions for the most complex applications:

- Highly specialized material compounding and molding.
- High-performance machining: \varnothing 3.0mm to \varnothing 2.5m available as standard parts.
- Cleaning, packing and inspection including advanced ultrasonic washing and optical measuring.

- Secondary and assembly operations.
- Leading industry certification of Health and Safety, Quality and Environmental management.

Applications	Products	Materials
<ul style="list-style-type: none"> • Aerospace • Automotive • Motorsport • Vacuum • Oil and Gas • Chemical and Processing 	<ul style="list-style-type: none"> • Variseal® • Wills Rings® • Turcon® Varilip® PDR (Catalogue and customer specific non-standard rotary shaft seals) 	<ul style="list-style-type: none"> • Variseal: Turcon® PTFE-based proprietary materials, high-performance metallic spring materials. • Wills Rings®: high performance metallic materials with softer metal or polymer coating. • Turcon® Varilip® PDR: high - performance metallic casing materials with a range of specialized and proprietary blended polymer sealing lips.

Trelleborg Sealing Solutions Tewkesbury (UK)



Company Profile



Trelleborg Sealing Solutions Tewkesbury is one of the prime European production and development facilities within the Global Operations Elastomers division of Trelleborg Sealing Solutions. Becoming fully operational in 2008, Trelleborg Sealing Solutions Tewkesbury is a world-class facility, strategically placed to take global customer and supply partnerships well into the twenty first century.

The company was formed locally in 1945 as Dowty Seals Ltd and was originally a stand-alone business within the Dowty engineering empire, where it supported the highly innovative aircraft equipment companies.

Over the years, Dowty Seals became the industry leader for the supply of technical solutions for arduous sealing applications. The foundations of the business were firmly established in its ability to offer the highest quality standard and custom products in the widest possible range of elastomer materials. Today Trelleborg Sealing Solutions Tewkesbury continues that tradition in providing class-leading innovation at all levels.

Service

The extensive range of materials and manufacturing processes enable our experienced product engineers to offer elastomer-based sealing solutions for every customer requirement.

Our technical support services offer customers the following genuine advantages:

- Superior reliability - cutting planned and unplanned maintenance costs
- Longer service life - driving up efficiency and productivity
- Greater safety and reliability – protecting people and equipment
- More opportunities for standardization and inventory reduction
- Optimized seal solutions - cutting risk, reducing waste and contamination



Products and Materials



The company is a global supplier of standard and custom elastomer products into the aerospace and niche industrial market segments. We are specialists in high quality



mouldings and offer the full range of seals for static and dynamic applications. Areas of particular expertise include piston and rod type seals, radial oil seals and

grease seals as well as O-Rings, gaskets and diaphragms. We also have a unique ability to machine elastomeric parts to very tight tolerances. Bonding rubber to metallic and plastic elements is also a core competence which allows a number of sealing components to be integrated into one part.

TSS Tewkesbury is the global home of the highly specialised Perfluoroelastomer range of materials known as Isolast® as well as the specialty fluoroelastomer

Resifluor™ and XploR™ grades. These materials are offered predominantly to the Oil & Gas, Chemical Processing and Semiconductor industries for sealing applications where chemical and thermal resistance is paramount. Isolast® products can be offered on a same day service and produced in the dedicated Class 100 cleanroom facility. Also, any size of o-ring above 500 mm diameter can be produced without the need for expensive tooling by our proprietary Fleximold process.

Facilities



Trelleborg Sealing Solutions Tewkesbury employs over 130 people in its new manufacturing facility. The company is accredited to design and manufacture seals to numerous International, National and Customer specific standards. These include EN/ISO 9001 and AS/EN 9100. In line with the Trelleborg Group's Environmental policy, Trelleborg Sealing Solutions in Tewkesbury has held the ISO 14001 approval for over a decade.

Applications	Products	Materials
<ul style="list-style-type: none"> • Aerospace <ul style="list-style-type: none"> Military and Civilian aircraft Fixed and Rotary Wing Hydraulic Systems Fuel Systems Environmental Protection • Industrial <ul style="list-style-type: none"> Semiconductor Chemical Processing Oil & Gas 	<ul style="list-style-type: none"> • Bonded Plates • Capped Seal Assemblies • Radial Oil Seals • Grease Seals • Machined Dynamic Seals • O-Rings • Gaskets • Diaphragms • Excluder Seals • Complex Mouldings 	<p>Elastomers</p> <ul style="list-style-type: none"> • Chloroprenes (CR) • Ethylene Propylenes (EPDM) • Fluoroelastomers (FKM) • Fluorosilicones (FVMQ) • Hydrogenated Nitriles (HNBR) • Nitriles (NBR) • Perfluoroelastomers (FFKM) - Isolast® • Silicones (VMQ) <p>PTFE, PEEK and metallic based materials</p>

Trelleborg Sealing Solutions Cadley Hill (UK)



Company Profile



Trelleborg Sealing Solutions Cadley Hill is the principal manufacturer of airframe seals and reinforced elastomeric components for the aerospace industry with leading design and materials expertise, best practice manufacturing and customized distribution capabilities. The company is a division of Trelleborg Sealing Solutions and is based on a modern 5000 square meter site at Cadley, Swadlincote Derbyshire. There are 150 employees. Our manufacturing capability extends to over 9000 different seals.

Airframe seals are used in the engine compartment and throughout the aircraft body on wings, windows and doors, where they contribute to aerodynamic efficiency. Our inflatable seals, individually designed and manufactured for many models of fighter jet, have performed successfully in challenging safety-critical cockpit applications.

Service

We have developed and evolved expertise in the manufacture of annulus filler seals through partnerships with leading aero engine customers. These are custom designed to incorporate

silicone elastomers in conjunction with fabrics and metallic or carbon composites. The use of these has resulted in competitive advantage through improved engine efficiency and lower operating costs.

Our proven capabilities include project management of design, prototyping, production, test and installation using state-of-the-art design, development and manufacturing tools.



Products and Materials



Manufactured to standard or custom profiles, each airframe seal is handfabricated, with absolute attention to detail and quality assured through 100% inspection. Focusing on aerodynamic efficiency, they offer reliability in service, along with efficiency in assembly and maintenance.



The use of advanced FEA combined with product qualification programs, including extensive testing and verification, leads to maximum service life. Airframe seals, often produced from existing tooling are used within the engine, structural gaps, wings, doors, hatches and

windows, to meet customer needs throughout the aircraft.

Inflatable seals from 3-D models, which are translated into tooling the full size of the sealing profile, replicate the increasingly complex geometries of airframe sections of, for instance, cockpits or doors. Such tools incorporate heating and pressurization systems for precise manufacturing control and with testing at line-side; zero defect quality is the objective.

Also manufactured is an advanced composite fire seal, compliant with international standard ISO 2685,

which withstands flame temperatures in excess of the required 15 minutes at 1100°C (2012°F).

Facilities



The dedicated aerospace facility at Trelleborg Sealing Solutions Cadley Hill allows us to manufacture the most complex products. Our solutions are used on all major platforms including the Airbus A380 and the Joint Strike Fighter. This demonstrates our full range of capabilities including:

- Design
- Development
- Technical innovation and solution
- Cellular manufacture
- Self contained logistics and despatching
- Kitting
- Direct line feed

Applications

- Aerospace

- Airframe Seals
- Reinforced elastomeric components

Materials

- Nitriles, EPDM,
- Fluorosilicone, Fluorocarbon

Trelleborg Sealing Solutions Rotherham (UK)



Company Profile



Trelleborg Sealing Solutions Rotherham manufactures Orkot[®] fabric-reinforced composites used in the production of wear rings for the hydraulics industry and bearings for the industrial, marine and hydro-electric power sectors.

The company is part of the Engineered Plastics section of Trelleborg Sealing Solutions and is based in a modern purpose-built factory in Rotherham, UK. The original Orkot[®] business began in 1952 as part of the world renowned Sheffield steel industry. Resin was taken and applied to a cloth reinforcing matrix to make the first composite bearings. This product was developed using cutting edge materials technology to produce the range of composite materials known as Orkot[®].

The current factory, the third in the company's history, was purpose-built in 1998 to manufacture and showcase our products. The 5000 square meter facility employs 110 people.

Service

Our team of experienced customer service staff is able to help develop the correct bearing solution for your application. With a library of materials and a vast knowledge of the application of these materials, we can quickly recommend the right product. Our engineers are able to design the bearing and provide information

on operating parameters such as loads, lubrication, wear life and fitting techniques.

We are equipped with a materials testing laboratory that is able to carry out mechanical tests. We also have several test rigs to permit real

life testing of bearing materials and counter faces in a variety of operating conditions. These rigs perform rotary, reciprocating and linear testing in flat and circular conditions to determine the wear properties of the bearing material under dynamic conditions.



Products and Materials



Trelleborg Sealing Solutions Rotherham is a global supplier of advanced bearing materials with key brand supporting industries around the world. Orkot® is a well known brand in the hydraulics industry where Orkot® C380 wear rings are chosen for their ability to withstand high loads and keep working over many years to provide a "fit-and-forget" solution for hydraulic cylinder users. Orkot® Marine is recognized in

commercial and naval shipbuilding for rudder bearings, water lubricated stern tube bearings, stabilizers and stern rollers. Orkot® TLMM is the normal choice of material for these applications. We also offer a premium grade of material, Orkot® TXMM, which can be used if lower friction and wear properties are required, particularly where there is little or no lubrication. In the offshore industry Orkot® is chosen for its ability to perform

under the extreme conditions i.e. for mooring systems, cranes and FPSO turret bearings.

Orkot® Hydro is becoming known throughout the hydropower industry where there is a requirement to replace oil lubricated bronze bearings with unlubricated bearings. In these applications we normally offer our Orkot® TXMM material because it has been shown to outperform other materials in many applications. Used as

mainshaft bearings or wicket gate bearings, Orkot® TXMM chosen time and again to replace traditional bearings in hydro and river applications.

The industrial applications of Orkot® are numerous with a wide range of materials developed to suit each situation. Five materials - C320, C321, C361, C324 and C369 - cover most applications and product engineers are available to help you in your material selection.

Facilities



Our manufacturing facility includes equipment for manufacturing sheets and tubes in a wide range of sizes up to 2 meters diameter (6.5 feet) and 100mm thickness (3.9"). These materials can be machined in our modern machine shop employing the latest generation of CNC lathes and machining centres with 3, 4 and 5 axes. There are many special-purpose machines for the fast and accurate production of

flat products. These include sanding machines capable of achieving 50 micron tolerances and CNC routers for producing complex shapes.

This is backed up by an extensive materials testing capability and an experienced development team. Our factory holds ISO 9001:2000 quality certification and over 30 specialized marine approvals.

We also have ISO 14001:2004 environmental certification and OHSAS 18001 approval for Health & Safety management systems.

Applications	Products	Materials
<ul style="list-style-type: none"> • Hydraulics • Industrial • Marine • Hydropower • Offshore • Civil engineering 	<ul style="list-style-type: none"> • Orkot® • Orkot® Marine • Orkot® Hydro 	<ul style="list-style-type: none"> • C380 • C320 • C321 • C324 • C361 • C369 • TLMM • TXMM

Trelleborg Sealing Solutions Condé (France)



Company Profile



Trelleborg Sealing Solutions Condé was formed in 1934 and has a long history and experience in aerospace. The company was the first manufacturer of elastomeric and plastic seals in France for the aerospace industry and is now the leading company in this sector in the country. It is a division of Trelleborg Sealing Solutions based at Condé-sur-Noireau in Normandy.

Service

Our services include Direct Line Feed (DLF) and kitting. In addition, we offer customer specific product and material development, including testing.



Products and Materials



Trelleborg Sealing Solutions Condé specializes in molded elastomer, bonded seals, O-Rings, elastomer and elastomer precision seals. We are able to manufacture a wide range of special seals and sealing systems in elastomer and plastics

for aerospace applications. Our wide range of materials can satisfy the requirements of standard and customized products and includes 350 compounds and 620 grades. 25 of these are certified by French approval authorities.

Facilities



Trelleborg Sealing Solutions Condé employs 110 people. Approximately 80 percent of production is supplied to the aerospace sector.

- Flexible mixing unit dedicated to aerospace products
- 80 compression and injection presses dedicated to small quantities and a wide range of molded parts and O-Rings

- Flexible precision seals workshop with CNC machines
- Laboratory for material development
- Engineering office for process and product development

Applications	Products	Materials
<ul style="list-style-type: none"> • Military • Aerospace • Rail • Industrial 	<ul style="list-style-type: none"> • Molded and Extruded Parts • Bonded Seals • O-Rings • Kantseals 	<ul style="list-style-type: none"> • NBR • HNBR • EPDM • BR • Silicone • FPM

Trelleborg Sealing Solutions Czechowice (Poland)



Company Profile



Trelleborg Sealing Solutions Czechowice was founded in 2002 as a low cost, high quality automotive compression and injection molding facility producing a wide range of elastomeric radiator and manifold gaskets. The company is part of the Global Operations Elastomers business unit of Trelleborg Sealing Solutions. It employs 280 people on a 5300 square meter site at Czechowice-Dziedzice, Poland which is approved to ISO/TS 16949 and ISO 14001. The company has an extensive Tier-1 customer base through Trelleborg Sealing Solutions.

Service

Trelleborg Sealing Solutions Czechowice provides high quality expertise in the molding and finishing of automotive and industrial gaskets. We focus on customer service and offer a complete package to our customers which includes:

- Product design
- Finite Element Analysis (FEA)
- Materials
- Tooling
- Process development
- Testing
- Logistics support



Products and Materials



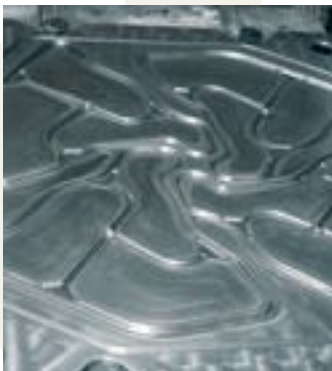
The company molds gaskets and seals in a wide range of materials including:

- Silicones
- EPDM
- HNBR
- NBR
- AEM
- and others as required.

A number of product variations are manufactured including:

- Radiator and manifold gaskets
- Engine seals
- Rubber-to-plastic bonded engine covers
- Machine cut square gaskets
- Insert moldings
- Edge bonded metal to rubber gaskets

Facilities



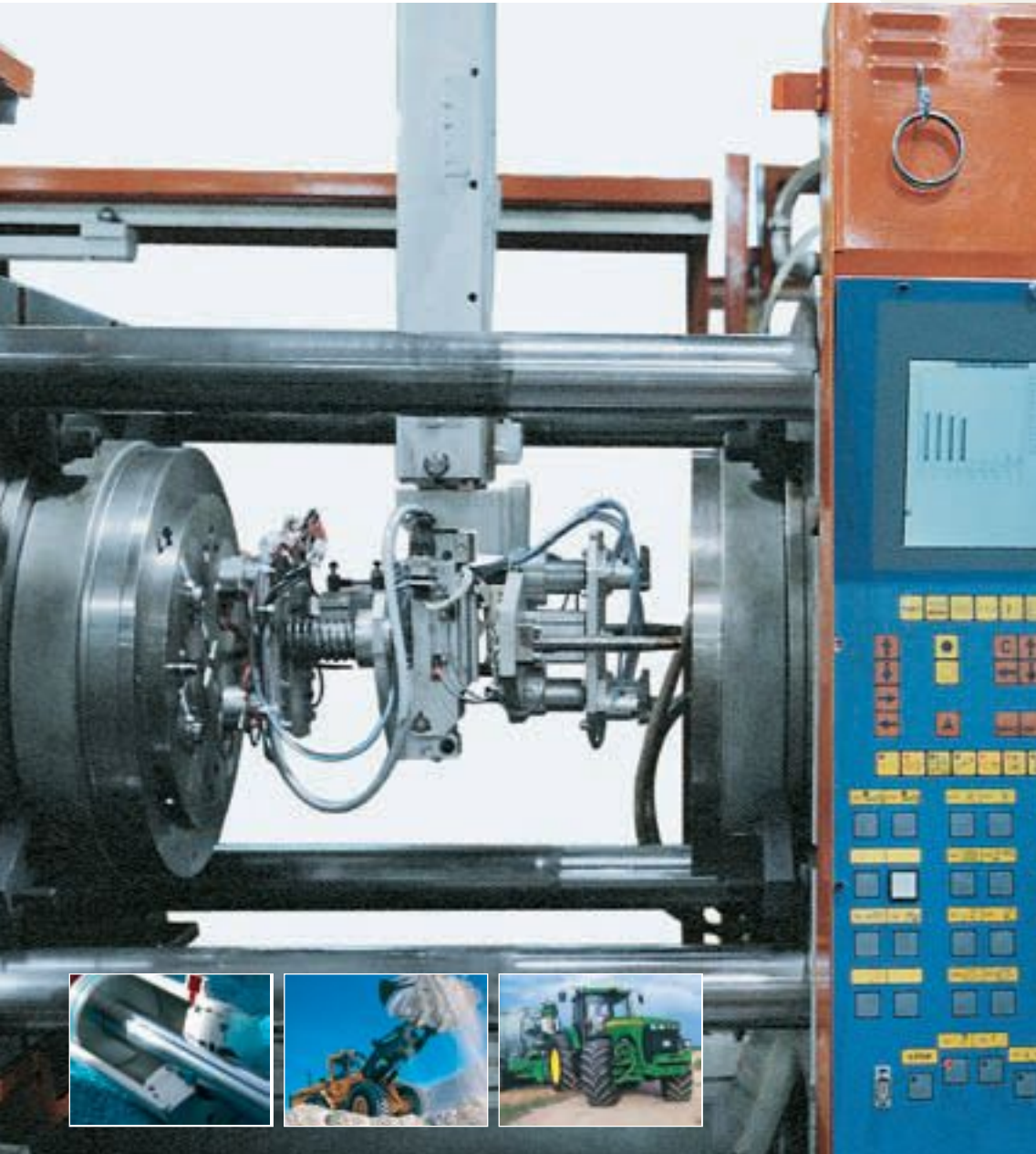
Trelleborg Sealing Solutions Czechowice is developing its facilities to provide comprehensive manufacturing capacity for its products and enhanced customer support:

- Horizontal injection molding
- Vertical injection molding
- Compression shuttle presses
- Cryogenic de-flashing
- Ultrasonic and dry-blast mold cleaning

- Metal insert and gasket preparation facilities
- Unigraphics and AutoCad on site, with a trained design and production engineering resource
- Extensive laboratory testing facilities
- Comprehensive group support on new materials, product development and FEA

Applications	Products	Materials
<ul style="list-style-type: none"> • Automotive • Industrial 	<ul style="list-style-type: none"> • Inlet manifold gaskets • Radiator gaskets • Engine seals • Plate heat exchanger (PHE) gaskets 	<ul style="list-style-type: none"> • Fluorocarbon (FKM) • Fluorosilicone (FMVQ) • Silicone (VMQ) • HNBR • NBR • EPDM

Trelleborg Sealing Solutions Livorno (Italy)



Company Profile



Trelleborg Sealing Solutions Livorno has been producing high quality hydraulic seals in rubber fabric, polyurethane and thermoplastic resins for the last 35 years and sells more than 25 million parts each year.

Trelleborg Sealing Solutions Livorno is the preferred partner of major European manufacturers of earth moving equipment, agricultural machinery, cranes, and hydraulic cylinders. We have a mission to be the preferred partner of our customers all over the world by developing and manufacturing sealing systems of the highest quality, at competitive prices, with benchmark customer service.

Service

The company has a wide range of products and materials. We are able to optimize the seal design for a particular set of operating conditions and produce special items at our customers' request.

We also have access to a vast range of test rigs and other facilities to guarantee efficient and professional technical support for our customers. We work to a zero defect philosophy and are certified to ISO 9001.



Products and Materials



Our ability to supply a complete range of hydraulic seals comes from close co-operation with major European customers. Combined with a wide range of materials,



this means we can provide a sealing solution for a wide variety of applications. Materials can be optimized to give the best performance, whether they are



traditional elastomers or materials specially developed for high temperatures and compatibility with aggressive fluid, different polyurethane grades or vast rubber



compounds. We can also supply a wide range of complementary elements such as guide rings and wipers which allow us to provide a complete sealing package.

Facilities



Trelleborg Sealing Solutions Livorno has a wide range of traditional and innovative equipment for each stage of production:

- Molding units with compression transfer and injection technology for rubber components
- Efficient and completely automated area for polyurethane and plastic products
- Well equipped laboratory and test facilities for internal control

and new materials development

- Fully automatic machines for finishing, assembling and optical quality controls
- New facility for synthesis of polyurethane Zurcon® materials to meet market demand from hydraulic and pneumatic industries
- New prototyping service for Zurcon products made by a dedicated lathing machine



Applications

- Hydraulic cylinders
- Earth moving machines
- Tractors
- Industrial presses
- Cranes
- Forklift trucks
- Gate openers
- High pressure volumetric water pumps
- High pressure process pumps

Products

- Piston seals, rod seals, scrapers, guide rings and special engineering products:
- Polypac Balmaster®
 - Polypac Balsele®
 - Polypac Selemaster®
 - Polypac Duopac®
 - Polypac Veepac®
 - Polypac SWP and UWR/PC
 - Zurcon® U-Cup RU9
 - Zurcon® Glyd Ring® P
 - Zurcon® Buffer seal
 - Zurcon® Roto Glyd® Ring S

Materials

- **Rubber:**
NBR, HNBR, XNBR, EPDM, FKM, VMQ
- **Fabric:**
Cotton and aramid fibre
- **Thermoplastic:**
HiMod®, POM*, PA*, UP,
- **Polyurethane:**
Zurcon® Z20, Z22, Z23, Z24, Z30

*filled and not filled in different grades

Trelleborg Sealing Solutions Modena (Italy)



Company Profile



Since 1960 GNL duo cone & square bore seal groups have been manufacturing in Modena, Italy, according to precise engineering standards. GNL has been recently purchased by Trelleborg Sealing Solutions.

Trelleborg Sealing Solutions Modena seal groups consist of two forged alloy steel rings and two rubber rings, their aim is to guarantee a suitable protection inside the application, to bearings and used lubricant, by the external agents as all undercarriage applications, reduction gear boxes, bitumen conglomerate and /or cement mixers, mining & earthmoving equipment must endure a wearing effect due to abrasive materials they come into contact with.

Thanks to the close tolerances they are made, Trelleborg Sealing Solutions Modena seal groups are interchangeable with other similar designs.

Special purpose rubber rings for either very low or very high temperatures can be supplied. The purpose of this brochure is to show technical features, applications and dimensions of our seal groups.

Service

Trelleborg Sealing Solutions Modena offers its customers a broad range of services including application engineering, co-design, compatibility and function tests, 100 % visual inspection of incoming and outgoing materials and products.



Products and Materials



Trelleborg Sealing Solutions Modena manufactures more than 300 different part numbers with outside diameters from 45 mm up



to 886 mm that can be perfectly used in a wide variety of applications as you can see into below framework.



Special Mechanical Face Seals on Customer's demand can be developed and manufactured. Trelleborg Sealing Solutions Modena



has been working since many years either with the most important O.E.M. or After Market international companies.

Facilities



Facilities include CNC lathe machines lapping and grinding machines, testing, fully integrated supply chain management and quality management certified to ISO 9001:2000.

Applications	Products	Materials
<ul style="list-style-type: none"> • rollers – reduction gears – front idlers and final drives of tracked crawler vehicles • wheeled tractors – graders – shovels – ploughs – ditchers and scrapers • off-highway trucks – drilling machines – hydraulic excavators – conveyors – concrete mixers • asphalt plants – mining equipment – crushing equipment – grass mowers and hay balers 	<p>Mechanical Face Seals:</p> <ul style="list-style-type: none"> • Duo cone seals • L-shaped Seals <p>*All our parts must be used in a peripheral speed range up to 3 meter/sec</p>	<p>Forged alloy steel ring: Material: 100Cr6 according to: UNI 3097; DIN 100Cr6-W3; EURONORM 100Cr6; AISI 52100 Hardness: HRc: 63+/-3 according to: UNI EN 10003-1</p> <p>Rubber Rings:</p> <ul style="list-style-type: none"> • NBR • NBR 2 (Low temperatures) • HNBR • Silicone • FPM

Trelleborg Sealing Solutions Turin (Italy)



Company Profile



Originally called Stensholms Fabriks and renamed in 1967, Stefa Industri AB, now named Trelleborg Sealing Solutions Turin, it is world leading specialist in development, design and manufacturing of Rotary Shaft Seals for engineered applications like automotive, truck, off-road vehicles and specialty gear boxes.

The company consists of two plants in Turin, Italy, with 145 employees. The main plant in Turin specializes in lower volume, high service compression molded seals, whereas the second plant in Leini is highly automated and specializes in high volume seals. The business offers specialized product design and technical support for a wide range of customized sealing solutions for rotary applications.

Trelleborg Sealing Solutions Turin manufactures its products with ZERO DEFECTS, according to ISO/TS 16949 and ISO 14001, with state-of-the-art machinery for injection and compression moulding, using unique cut-lip technology.

Service

TSS Turin it is the competence center for Rotary Shaft Seals: it's mission is to develop innovative and reliable sealing solutions for the most engineered applications, by providing services of codesign,

engineering, testing and validation. It can rely on fully equipped polymer laboratories, on CAD and FEA stations, and on advanced test rigs reproducing field conditions.



Products and Materials



Rotary shaft seals are developed and manufactured to work in the most different environments, thanks to a deep knowhow and availability of tailored compounds like FPM, HNBR, NBR, VMQ in different grades.



More than 300 standard rotary seals following DIN 3760/1 are manufactured, using the Trelleborg proprietary compounds, state of the art manufacturing technology and ZERO DEFECT quality philosophy



Customized and tailored rotary seals are developed and manufactured in codesign with application engineering, following all APQP steps, in order to effectively work in demanding applications like high speed shafts, dual fluid pumps, underwater propellers, robots, etc.



Tailored rotary shaft seals integrated with metal grinded sleeves, dust protecting labirinths, additional high-tech plastic washers are developed, tested and manufactured in order to provide effective and reliable sealing solution in the most various and severe environments

Facilities



Trelleborg Sealing Solutions Turin has a wide and flexible range of equipment dedicated to rotary shaft seal production:

- CAD/CNC tool design and manufacturing
- rubber compression molding presses up to 550mm seal diametre
- rubber injection molding presses up to 520tons
- fully automated production cells for automotive seals
- state of the art CNC trimming process
- 100% quality inspection of finished products
- laboratory and test facilities for internal control and new product development

Applications

- truck and off road axles
- fuel and dual fluid pumps
- washing machines
- robots and gearboxes
- underwater propellers

Products

- RSS following DIN3760/3761
- RSS with TURBO profile
- RSS with patented TANDEM assembly
- RSS combined with engineered washers
- RSS integrated with sleeve and labirinths

Materials

- NBR
- HNBR
- FPM
- FPM low temperature
- VMQ
- steel AISI304

Trelleborg Sealing Solutions Malta



Company Profile



Trelleborg Sealing Solutions Malta was established in 1961 as part of Dowty Seals UK and joined Trelleborg Sealing Solutions in October 2003. The company has over 40 years of experience in producing premium quality elastomeric O-Rings with an emphasis on technical capability and quality assurance. The company produces 25 million O-Rings each week for a global customer base, which includes Bosch, Ford, Visteon, Denso, VW, Continental Teves, Honeywell and Magneti Marelli.

Trelleborg Sealing Solutions Malta is QS 9000, TS 16949 and ISO 14001 certified. With a strong reputation built on proven performance, reliability and value, the company is committed to continuous improvement and exceeding customer expectations.

Service

Trelleborg Sealing Solutions Malta provides a totally integrated service that includes product design, material formulation, product development and testing, manufacturing and aftermarket support. A fully equipped testing laboratory can provide data on

materials and finished components. Our materials research and development department works in close relationship with customers to improve O-Ring performance. We have invested heavily in dedicated mixing lines and fully automated batch-off equipment.

This resource not only provides superior quality materials and service to the production facility in Malta but also to other Trelleborg group facilities and customers worldwide. The company provides full support including in-house tool design and manufacture.



Products and Materials



Trelleborg Sealing Solutions Malta manufactures elastomeric O-Rings for a wide range of automotive and industrial applications in a variety of standard and specially formulated materials including:



- FKM
- FVMQ
- HNBR
- EPDM
- NBR
- VMQ
- PTFE-coated O-Rings
- O-Rings with printed ink markings

So far, we have produced over 300 compounds approved by our customers.

The company's expertise lies in providing customized solutions for an extensive range of automotive and industrial applications including:

- Fuel injectors
- Fuel connectors
- Brakes
- Air conditioning
- Diesel, steering and transmission systems
- Hydraulics and pneumatics
- Water and gas supply systems
- Compressors and vacuum system

Facilities



We provide engineering support at all stages of the manufacturing process. We have the latest in CAD/CAM programming software and FEA capabilities that support seal design. Our application support and technical capabilities extend through to our in-house tool design and manufacture and we are leaders in machine vision inspection technology.

We have relocated operations to brand new premises in Hal Far and there is also a specialized mixing facility in Marsa. In addition to investing in the new factory, we have focused on equipment and technology that will help us retain our competitive position. We consider ourselves to be a leader in machine vision technology and our auto inspection machines have been developed to our specific requirements in-house.

Applications	Products	Materials
<ul style="list-style-type: none"> • Automotive • Industrial 	<ul style="list-style-type: none"> • O-Rings and mouldings • Moulded parts 	<ul style="list-style-type: none"> • FKM • FVMQ • HNBR • EPDM • NBR • VMQ

Trelleborg Sealing Solutions Broomfield (USA)



Company Profile



Trelleborg Sealing Solutions Broomfield designs and manufactures engineered PTFE seals and polymer bearings. These products are suitable for extreme sealing and bearing applications in a variety of industries. Since its incorporation in 1978 in Denver, Colorado our business has been recognized as a world leader in providing advanced polymer sealing and bearing solutions for the oil and gas, industrial, medical, automotive and aerospace markets.

Our quality management system is fully certified to both ISO 9001 and AS 9100. In addition to customer approvals from many leading world-wide companies, we have achieved FAA - TSO C150 registration of many of our seal products for the commercial aircraft market. We maintain an ISO 14001-certified environmental management system as well, which ensures that we constantly strive to lessen the impact on the environment.

Service

We provide product engineering for customer specific solutions and application engineering support and troubleshooting. To underline our world-class customer service, we offer fast prototyping, emergency and

express delivery service for urgent requirements. Technical training of Trelleborg Sealing Solutions marketing company personnel is supported by our comprehensive application knowledge including an extensive database of case histories.



Products and Materials



We produce a full range of engineered spring-energized PTFE seals (Variseal®) and rotary PTFE shaft seals (Varilip®) capable of handling extreme operating



conditions and the most aggressive media. We also design and produce a wide variety of polymer bearings for applications that require low noise, high corrosion resistance



and design flexibility. Rolling-element, sleeve, flange and thrust bearings, as well as integrated seal and bearing solutions, are also produced.



Facilities



We employ the most advanced equipment and process techniques in the design and manufacture of all our products to provide consistent high quality levels and efficient production methods:

- CAD design system with solid modeling capability
- In-house compounding of PTFE and thermoplastic materials
- Extensive spring manufacturing and metal-forming capabilities
- CNC machining of seal and bearing geometries
- PLC-controlled molding and sintering of PTFE materials
- PLC-controlled injection molding and extrusion of thermoplastic bearing materials
- Automated assembly equipment for both seal and bearing products

Applications	Products	Materials
<ul style="list-style-type: none"> • Aerospace: actuators, gearboxes, pumps, valves, ram air turbines • Automotive: AC compressors, EGR valves, transmissions • Oil & Gas: downhole tools, swivels, control valves, safety valves • Semiconductor: wafer processing/transport equipment, direct-drive motors, CVD tools • Medical: oxygen pumps, ultrasound and anaesthesia equipment, precision motors, blood separation devices • Food, Beverage & Pharmaceutical: filling/dispensing equipment, dry blenders, homogenisers 	<ul style="list-style-type: none"> • Seals: rod, piston, face, scraper, rotary • Bearings: rolling element, sleeve, flange and thrust • Variseal™ spring energised seals • Varilip® rotary shaft seals • Durobal® roller element bearings • HiMod® moulded shapes • Turcite® rod 	<ul style="list-style-type: none"> • Turcon® • Zurcon® • Himod® • Turcite® • PEEK • PPS • PFA • Other Thermoplastics

Trelleborg Sealing Solutions Northborough (USA)



Company Profile



Trelleborg Sealing Solutions Northborough was privately started in 1955 as Chase-Walton Elastomers. Bought in 2005, the plant has since moved locally to a more modern facility and has invested extensively into new tooling and equipment. The company has an international reputation, built on a successful track record of meeting the customer's needs in the demanding area of aerospace. We have supplier approvals from the world's leading aircraft and jet engine manufacturers such as Boeing, Airbus, Spirit Aerosystems, GEAE, Bombardier, Honeywell, United Technologies and Goodrich. The facility has earned the internationally recognized quality standard AS9100 and ISO 9001-2000.

Service

Trelleborg Sealing Solutions Northborough specializes in the design and manufacture of reinforced elastomer products for the aerospace industry. Our team of design engineers is constantly researching and coming up with innovative seal designs or materials. We have broad

experience in fire testing and developing methods to prove quality assurance, reliability and durability of our products. We have invested in the latest analytical and development tools such as 3D scanning and modeling, finite element analysis and rapid prototyping abilities.



Products and Materials



Northborough makes aircraft door seals, hatch seals, flap seals, thrust reverser seals, ducts, hoses and other various molded profiles to seal gaps between static and dynamic surfaces. Although many of our



products are handmade using compression molding techniques, we also can produce complex extrusions, hose, and rubber sheeting. We can produce seals from a wide range of silicone



elastomer materials developed to meet industry standards, low temperature flexibility, high temperature resistance, flame retardance or other demanding application requirements.

Most of the products we produce are reinforced with fabrics, metals or composites. By adding various fabrics we can offer added strength and abrasion resistance or reduce surface friction to ensure easier operation over moving surfaces that can further lessen seal wear. In addition we have the latest in fabric and elastomer technology to provide fire protection against flame penetration of the ducts and fire seals we produce.

Facilities



The 29,000 square foot facility is located in Northborough Massachusetts, which is 30 miles West of Boston. There are 107 employees. Our full range of capabilities include Product Development & Design, Elastomer Compounding, Calendaring, Kitting, Compression Molding, Transfer Molding, Extruding, Die Cutting, Splicing, Hose Braiding, Metal to Elastomer Bonding and Product Testing.

Applications	Products	Materials
<ul style="list-style-type: none"> • Aerospace – Environmental Control Systems, Power Plant, Airframes, Wings, Doors Windows, Nacelles 	<ul style="list-style-type: none"> • Fireproof Seals • Aerodynamic Seals • Inflatable Seals • Gaskets • Ducts • Hoses • Sheets 	<ul style="list-style-type: none"> • Silicone • Fluorosilicone • Polyurethane • Ceramics • Nomex • Polyester • Fiberglass • Prepreg • Metal Inserts • Carbon Composite

Trelleborg Sealing Solutions Fort Wayne (USA)



Company Profile



Trelleborg Sealing Solutions Fort Wayne manufactures hydraulic and pneumatic static seals, bearings and rotary seal products for the industrial, aerospace and automotive markets. The facility also has the ability to manufacture sheet PTFE, which is particularly important to the machine tool industry. Our precision-machined PTFE and molded perfluoro-elastomers, polyurethane and elastomer products are marketed worldwide under the Trelleborg Sealing Solutions name. We are now expanding our markets to include the medical, pharmaceutical, food, beverage and semiconductor sectors.

The company was originally founded in 1950 and our 10,000 square meter (108,000 square foot) facility is located in Fort Wayne, Indiana, USA. We have approximately 300 full-time employees. We use the most advanced manufacturing equipment and processes to produce our products.

Service

Our goal is to meet or exceed customer expectations in quality, cost, and delivery of products and services. In order to achieve this goal, our employees are empowered to support the company's quality objectives. The manufacturing facility is supported by the Fort Wayne research and development laboratory to help ensure

the highest quality products. This laboratory provides materials development, material testing, product development, product testing, and HVOEM design engineering.

One of the most significant service opportunities this facility offers is known as ProtoXpress. This provides

customers with standard components and assemblies within 48 hours. Engineered products will be shipped in 72 hours where tooling exists. All products manufactured through ProtoXpress are made from the same high-quality materials and use the same proven manufacturing techniques. Each part is supplied with a certificate of conformance.



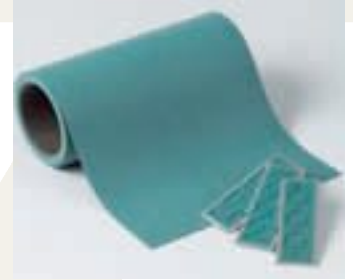
Products and Materials

We are considered a market leader in seal material, design, quality and performance. We specialize in engineered solutions where product performance is paramount and system downtime must be minimized. A broad range of engineered polymers, including Turcite®, Turcon®

and Zurcon® are available to provide solutions that meet the specific customer demands.

We have several site certificates and approvals including ISO 9001, ISO 14001, AS 9000 and QS 9000 and are currently working towards TS 16949.

Our site operates as the North American research and development facility. Through extensive materials development activities, we are able to offer next-generation formulations that fulfill high-end and unique sealing applications.



Facilities



Trelleborg Sealing Solutions Fort Wayne is an outstanding example of cellular manufacturing. The plant has three business units utilizing dedicated manufacturing cells, each differentiated by diameter and product type.

We support all of the other Trelleborg Sealing Solutions facilities in North America with materials development and testing, product development and product testing services.

The Fort Wayne facility is dedicated to ensuring the highest quality products for its customers. The plant achieved its first ISO 9001 certification over a decade ago and AS 9100 certification in 2004. It has also received certification by a number of United States agencies including FAA, TSO-C150, Airworthiness Approval Tags (8130-3), and has numerous customer approvals from leading companies around the world.

Applications	Products	Materials
<ul style="list-style-type: none"> • Industrial: Machine tool, construction equipment • Automotive: suspension systems, EGR valves, transmissions, fuel injectors • Aerospace: flight controls, landing gear, wheel and brake systems 	<ul style="list-style-type: none"> • Piston Seals: dynamic and static • Rod Seals: dynamic and static • Exclusion Devices • Buffer seal • Glydring® II • Roto Glydring® HT • Turcon® J Style • Backup Ring • Turcon® CST™ Seal • Turcon® Wedgpak® II • Turcon® Excluder®2 • Zurcon® Hatseal®II • Turcon® VL Seal • Turcon® Stepseal® 2k • Turcite® Slydring® • Turcite® Slydway® 	<ul style="list-style-type: none"> • HiMod® • Turcite® • Turcon® • Zurcon®

Trelleborg Sealing Solutions Hudson (USA)



Company Profile



Trelleborg Sealing Solutions Hudson is a leading manufacturer of tubing, hoses, sheeting and specialty components for the Life Science Industry. TSS Hudson's unique and diverse capabilities include: extrusion, calendering and liquid injection molding to provide customers with a complete and comprehensive sealing solution.

Trelleborg Sealing Solutions Hudson has gained a vast amount of experience within the Pharmaceutical, Biotechnology, Medical Equipment and Healthcare segments of the Life Science Industry. They are also a key supplier within the Food & Beverage Marketplace.

Service

Trelleborg Sealing Solutions Hudson recognizes that responsiveness and flexibility is the key to success within the Life Science Market. TSS Hudson has an extensive track record of providing customers with both standard products as well as custom design sealing solutions for this highly regulated market. TSS Hudson has also established

itself as an industry leader by providing world class on-time delivery to all parts of the globe. Adding value for the customer is also important to Trelleborg Sealing Solutions Hudson staff. A key differentiator for this facility is the ability to custom blend "Medical Grades" of silicone to respond to the diverse needs of the Life



Science Field. It has one of the most innovative and experienced design teams in the industry and leverages



this strength by providing engineered solutions as well as innovative ideas.

Products and Materials

Since the facility first opened in 1982, Trelleborg Sealing Solutions Hudson has manufactured a broad line of products. These range from silicone tubing to extruded profiles and over-molded assemblies. The SF Medical product line ranges from premium grade silicone tubing, sanitary reinforced hose, silicone sheeting, extruded profiles and liquid injection molded silicone components and over-molding. All products are manufactured from virgin silicone. Customers may choose between peroxide and platinum cured silicone. Trelleborg Sealing Solutions Hudson has an extensive line of "Medical Grade" silicones as well as capabilities for custom blending to meet specific customer needs.

Trelleborg Sealing Solutions Hudson extrudes, liquid injection molds and over-molds products using specialized silicone materials to provide custom-engineered solutions for a variety of medical, device, healthcare, biotechnology and pharmaceutical applications. Our silicone products maintain high pressure ratings, have excellent flexibility, are sterilizable and autoclavable, impart no taste or odor, are available in bulk assemblies and operate under a wide temperature range. Silicone materials are ideal for use in bioprocessing, medical and pharmaceutical production due to their inherent inertness to bacteria, mold and fungi. Trelleborg Sealing



Solutions Hudson provides materials that give excellent heat resistance, cold flexibility and dielectric properties. Trelleborg Sealing Solutions Hudson, though it's capability to custom blend materials, is able to provide customers with both standard "Medical Grade" silicone as well as compounds to meet the specific needs of customers. Customer

needs for color matching, product labeling and special packaging are standard practices for Trelleborg. The company has earned numerous certifications and approvals from its customer base and industry regulatory institutions. TSS Hudson is ISO 9001-2000 registered as well as being an FDA registered facility for the production of Class II Medical Devices.

Facilities



Trelleborg Sealing Solutions Hudson's primary focus is the manufacturing of precision products for the Life Science Market. It operates in a controlled environment equivalent to class 100,000 conditions, with ambient temperature, humidity, and particulate count monitored regularly. This facility follows strict "Good Manufacturing Practices"

as defined by the FDA and in accordance with their quality standards ISO 9001-2000. Trelleborg Sealing Solutions Hudson is a 60,000 sq. ft. facility comprised of 5,000 sq. ft. of clean manufacturing and 700 sq. ft. of HEPA Filtered Clean packaging area. Industry standard gowning procedures are closely followed in all manufacturing areas. The facility

is registered with the FDA and undergoes regular audits by key customers to maintain approvals.

Applications	Products	Materials
<ul style="list-style-type: none"> • Orthopedic Products • Peristaltic Pumps • Intravenous Lines • Catheters • Medical Equipment Components • Feeding tubes • TPN Tubing • TFF Filtering • IV Infusion • Dialysis Equipment • Fluid Transfer 	<ul style="list-style-type: none"> • Pharmatube™ - Silicon Tubing • PharmaSil™ - Silicone Hose – Platinum Cured • NutraSil™ - Silicone Hose – Peroxide Cured • PharmElast™ - Silicone Sheeting • PharmaLim™ - Liquid Injection Molded Products • Pharmedable™ - Encapsulated Silicone Labeling • SilFit™ - Permanent & Reusable Fittings 	<p>Silicone:</p> <ul style="list-style-type: none"> • Peroxide Cured • Platinum Cured • Medical Grade • Multi-Color • Multi-Durometer • Liquid Injection Molded Silicone • Gum Stock

Trelleborg Sealing Solutions Somersworth (USA)



Company Profile



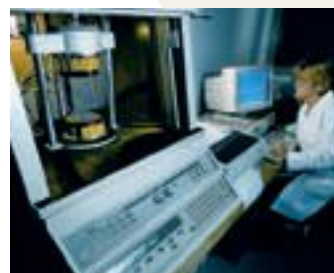
Trelleborg Sealing Solutions Somersworth is a world leader in fabric-reinforced diaphragms and high performance radial oil lip seals.

With the broadest selection of elastomer formulations and our ability to irreversibly bond elastomers to plastic and metal inserts, high performance fabrics, and PTFE barrier films, Trelleborg Sealing Solutions Somersworth is able to design and manufacture fabric reinforced diaphragms and radial oil lip seals for the world's most demanding applications.

The company was established in 1963 as Palmer Chenard and we operate a 6510 square meter (70,000 square foot) facility. Since being founded in 1963, the company has continuously expanded its product line, offering diaphragm assemblies and custom molded parts. Trelleborg Sealing Solutions Somersworth has proprietary, high flow elastomers that can achieve tight tolerances through formulation modification and advanced tool design.

Service

Our internal staff and customers' engineers are trained to provide engineering support for design of customer-specific solutions, testing, analysis and selection of materials and design.



Products and Materials



Trelleborg Sealing Solutions Somersworth has a line of patented radial oil lip seals that have the industry's highest pressure ratings and are able to withstand pressure



exceeding 4500psi (310 bar). The HP series is able to withstand elevated temperature and pressure through proper material selection and design and is perfect for the



hydraulic motor market. Our innovative diaphragm designs and extensive material selection have allowed our customers to



improve product performance, and value, by increasing stroke length, pressure, and sensitivity of actuators, regulators, pumps and valves.

Facilities



Trelleborg Sealing Solutions Somersworth has the latest technology available to design and manufacture fabric reinforced diaphragms, lip seals and associated tooling for low and high volume production.

We use state-of-the-art equipment throughout the process, including compound mixing, fabric cutting, PLC controlled molding processes, CNC machining, CAD/CAM tool design and manufacture, all supported by optical measuring equipment.

Applications

- Flow Control Valves & Hygienic Valves
- Pneumatic Actuators
- Diaphragm Pumps
- Pressure Regulators
- Turbo Wastegate Actuators
- High Pressure Hydraulic Motor Seals
- Heavy Duty Seals
- Gearbox Seals
- Chemical Dosage Pumps
- Fuel Delivery/Vapor Recovery Systems
- Compressor Seals

Products

- Diaphragms:**
- Fabric reinforced diaphragms for high temperature and pressure applications
 - Diaphragm assemblies for Aerospace actuators, regulators, valves and pumps
 - Large diameter, deep draw, fabric reinforced diaphragms
 - PTFE bonded diaphragms
 - Thin, ultrasensitive, fabric reinforced diaphragms
- Radial Lip Seals:**
- High pressure, balanced seal designs
 - Increased sideload capability
 - Spring loaded and nonspring loaded designs
 - Fractional horse power, low friction seal designs
- Custom Molded Parts:**
- Belleville Washers for Heavy Duty Seals
 - Custom gaskets and other elastomeric seals

Materials

- Elastomers:**
- Ethylene Propylenes (EPDM)
 - Epichlorohydrins (CO)
 - Nitriles (NBR)
 - Hydrogenated Nitriles (HNBR)
 - Chloroprenes (CR)
 - Fluorocarbons (FKM)
 - Fluorosilicones (FVMQ)
 - Silicones (VMQ)
 - Perfluoroelastomers (FFKM)-Isolast
- High Performance fabrics:**
- Nylons
 - Polyesters
 - Meta-polyaramides (Conex/Nomex)

Trelleborg Sealing Solutions Streamwood (USA)



Company Profile



For more than forty years, Trelleborg Sealing Solutions Streamwood, formerly Hydro-Components Research & Development, has been setting the pace in sealing and wear technology for hydraulic and engineered components. Our reputation was built on two founding principles: tight tolerances and superior materials. This dedication to precision and quality has only strengthened over the years. Today, this productive tandem remains the cornerstone of all our efforts to deliver maximum value to customers. Creating value is a matter of solving customer problems by maintaining the tightest tolerances, incorporating the latest statistical process control methods and consistently improving material specifications. By combining our design expertise and ingenuity in tooling development, we have earned a reputation for making things work. Our greatest source of pride comes from doing things others can't... or won't. This is made possible by unique blends of nylons and other engineered plastics fabricated into components designed to take on the toughest hydraulic and structural applications. These days, some judge success based on the ability to do it faster or cheaper. Trelleborg Sealing Solutions Streamwood remains committed to doing things better.

Service

Our internal staff and customers' engineers are trained to provide engineering support for design of customer-specific solutions, testing, analysis and selection of materials and design.



Products and Materials



Our HM803 (formerly Hydro-Components 1903) material is a recognized industry standard for use in hydraulic systems. This special glass-filled, heat-stabilized material is a fundamental building block for



wear rings and bearings specified throughout North America and around the world. Originally developed as a replacement for bronze and phenolic components, HM803 offers across-the-board



improvements in strength, imbeddability and tribological properties. With the addition of a lubricant, our HM852 (formerly Hydro-Components 1952) material has



long been the cylinder designer's choice for marginally lubricated applications. A variety of other proprietary compounds including Acetal, PEEK and other high temperature materials are used for specialty applications.

Facilities



Trelleborg Sealing Solutions Streamwood has always made research and development our first priority. Armed with a strong understanding of mechanics, particularly in hydraulic systems, we promote the use of nylon and other engineered plastics as the most cost-effective solution to reduce friction and improve

component life in cylinder applications. Today, customers can choose from engineered materials precisely suited to their specific applications. Focusing on high-grade nylon-based materials, we also offer features such as internal lubricants and high temperature grades.

Applications	Products	Materials
<ul style="list-style-type: none"> • Hydraulic cylinders • Elevators • Injection molding machines • High pressure water forming equipment • Mining trucks • Excavators • Shears • Mining shovels • Forestry equipment • Wheel loaders and backhoe loaders • Thrust Washers • Agricultural equipment • Cranes • Rock crushers 	<ul style="list-style-type: none"> • Back-up rings • Bearings - solid and split • Guidelock assemblies • Piston assemblies • Piston rings • Piston seals • Rod seal sets • Rod wipers • Structural components • Thrust washers • U-cups • Vee rings • Wear pads • Wear rings 	<ul style="list-style-type: none"> • Engineered plastics

Trelleborg Sealing Solutions Tijuana (Mexico)



Company Profile



Trelleborg Sealing Solutions Tijuana manufactures Rubber gaskets, Orings and extruded pipe for the automotive and industrial markets. The company was formed as a joint venture between the Dowty Group and a California-based customer in 1990 and now supplies markets throughout the Americas. It has a modern 6,500 square meter facility on the edge of Tijuana with 250 employees.

A warehouse in San Diego, California and the Trelleborg Sealing Solutions marketing office in Mexico City ensure that Trelleborg Sealing Solutions Tijuana is able to meet the requirements of the most demanding customers.

Service

From a strong background in automotive O-Rings, we have expanded to become a natural partner for all customers who require high quality rubber gaskets in volume. We can manufacture gaskets ranging from three

millimeters in diameter to three meters (9.8 feet) in length. Our modern joining facilities enable us to make even larger gaskets for the fast-growing plate heat exchanger (PHE) and other industrial markets.



Products and Materials



Trelleborg Sealing Solutions Tijuana has most forms of elastomer including EPDM, NBR, HNBR, FKM and silicone.

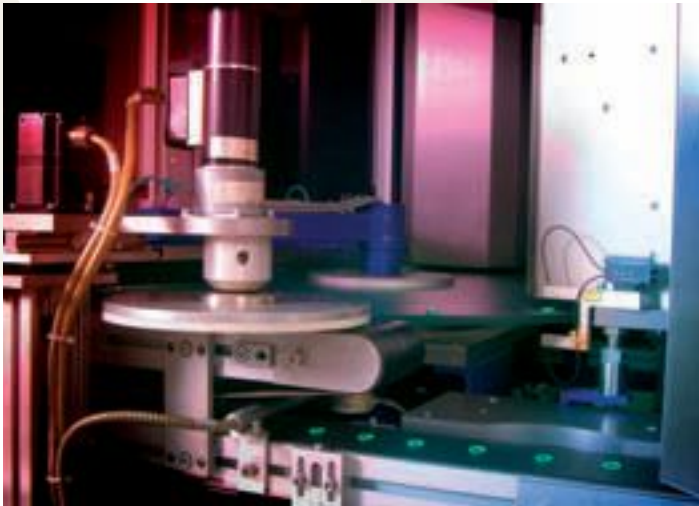


Our materials include fluorocarbons, silicones, and fluorosilicones. All our material requirements are produced in LA, this insures that TSS Tijuana can offer short lead times and quick response to even the most demanding of customers.



Whilst being an established plant for many years TSS Tijuana still has excellent opportunity for growth with approximately 19,000 square feet of available manufacturing space and 40% spare capacity on both our compression presses and our extrusion lines.

Facilities



Our facilities include compression and injection molding capabilities ranging from 150 to 1000 tonne (150 to 1000 tons) and platen sizes from 250cm to 3m (10 inches to 10 feet). Our new extrusion machines have a wide range of capabilities ranging from extruded appliance gaskets to various tubing. The modern laboratory and inspection equipment maintain the quality levels our customers deserve. Our certification to TS 16949 and ISO 14001, ensure we operate to the highest standards in the industries we serve.

Applications	Products	Materials
<ul style="list-style-type: none"> • Automotive • Industrial 	<ul style="list-style-type: none"> • Plate Heat Exchanger (PHE) gaskets • Radiator Gaskets • Extruded Industrial gaskets • Extruded Tubing • Extruded appliance gaskets • Toric ORings • Electrical Grommets and seals • Bonded valve seals • Specialty moldings 	<ul style="list-style-type: none"> • FKM fluorocarbon • FMVQ flourosilicone • VMQ silicone • HNBR • NBR • EPDM • CR • BUTYL

Trelleborg Sealing Solutions São Paulo (Brazil)



Company Profile



Trelleborg Sealing Solutions São Paulo manufactures seals for industrial, aerospace and automotive segments for all markets in the Americas. The manufacturing site was established in São Jose dos Campos in 1999 and is now a low cost, high quality 1000 square meter facility with over 50 employees. Modern production equipment, high quality raw material suppliers and a lean manufacturing philosophy are our main drivers, assuring competitiveness and recognized quality in the market.

We produce O-Rings, custom rubber molded parts, Turcon® seals, thermoplastic seals and rotary shaft seals for a global customers base which includes Bosch, Visteon, Magneti Marelli, Modine, John Crane, Valtra, Rexroth, TI Auto, Festo, Hyco Hidrover, Embraer and Eleb.



Service

We offer the best sealing solution to our customers utilizing all TSS Group expertise. We also provide technical training for customers' engineers and technicians.



Products and Materials



We supply Turcon® seals for rotary and reciprocating applications, thermoplastic seals for hydraulic applications (Zurcon® and HiMod® materials), PTFE rotary shaft seals and automotive custom-molded rubber products.

Proprietary materials

Turcon®: a range of high performance polymers developed for specific duties and service within sealing applications. HiMod®: a range of high modulus, high

performance thermoplastics. Zurcon®: a full range of high performance engineered thermoplastic compounds developed for use in sealing elements.

Facilities



We are certified ISO 9001, ISO TS 16949, NBR 15100 (AS 9100) and ISO 14001 (under TI's umbrella). The facility incorporates five production cells:

- Rubber - Compression Cell: produces more than 1.2 million O-Rings each month in FKM,

FVQM and NBR for the automotive sector

- Rubber - Injection Cell: producing EPDM and NBR customized parts for radiators and mechanical seals applications
- PTFE Cell: producing Turcon® seals and Varilip® and PDR® lips with external diameter up to

400mm (15.7") using CNC machines

- TPU Cell: dedicated to production of polyurethane and polyacetal gaskets and wear rings
- PDR® Cell: dedicated to production of rotary shaft seals and Varilip®

Applications	Products	Materials
<ul style="list-style-type: none"> • Automotive Segment: Fuel injection nozzle, quick connectors, radiators, intake manifold, supercharges, mechanical seal • Hydraulic and Pneumatic Segment: Cylinders, pumps, compressors and machine tools • Agricultural Segment: Engine • Home Appliance Segment: Mechanical Seal • Aerospace Segment: Landing gear, hydraulic cylinders 	<ul style="list-style-type: none"> • O-Rings • Rubber gaskets • Molded parts • PDR® • U-Cups • WAE scrapers • Wear rings • Glyd Ring® T • Stepseal® K • Excluder® • Roto Glyd Ring® • AQ Seal® • Backup ring CST seal • PTFE rotary shaft seals • Custom rubber molded products 	<ul style="list-style-type: none"> • FKM • FVQM • NBR • EPDM • HNBR • Silicon • Turcon® • Zurcon®

Trelleborg Sealing Solutions Bangalore (India)



Company Profile



Trelleborg Sealing Solutions Bangalore began as a joint venture of Busak+Shamban in the year 1998. In the year 2003, taken over by Trelleborg Sealing Solutions and moved over to a new premise in the year 2006.

Presently employed about eighty five people in the work force. Quality system certified to ISO9001 and Environment Management System to ISO14001. Certification target for TS16949 is November 2008.

Service

We are in the production of high-quality precision seals. Seal materials includes PTFE and polyurethane. Our production system is based on MTO/MTS and quick response.

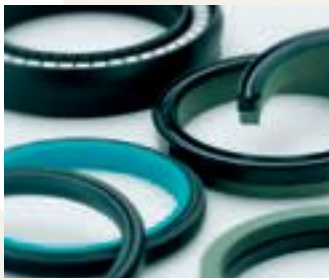
Our product design and engineering is supported by Trelleborg Sealing Solutions Helsingor,

Trelleborg Sealing Solutions Fortwayne, Trelleborg Sealing Solutions Broomfield and Trelleborg Sealing Solutions Bridgewater.

We facilitate Indian, LCE, LCA and Group company requirements.



Products and Materials



Raw material for producing seals is imported from Trelleborg Sealing Solutions facilities in Fort Wayne and Helsingør. We have recently installed PDR® seal manufacturing equipment.



- Turcon® and Zurcon® Seals: 3mm to 450mm (0.12" to 17.7") diameter
- Varilip® PDR Rotary Shaft seals: 20mm to 250mm (0.78" to 9.8") diameter



Present Turcon® raw material production capability: Up to 300mm diameter tubes. Turcon tubes above 300mm diameter and Zurcon are imported from group companies.

Facilities

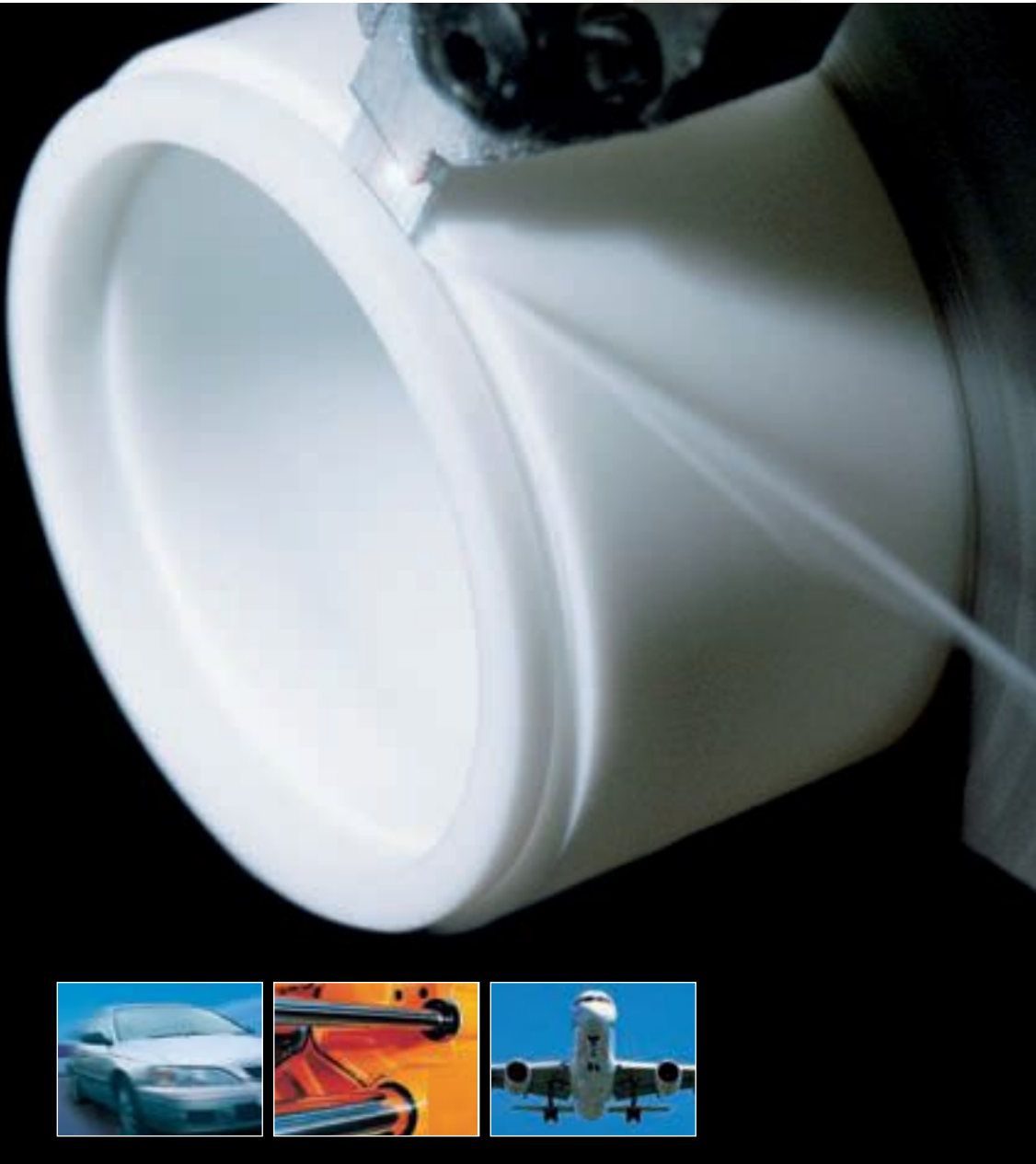


Our facility includes Turcon® Tube manufacturing, Seal Machining Cell, Varilip® PDR cell and Inspection and Material Test laboratory to take care of the manufacturing needs.

Process improvements through Six Sigma and SPC.

Applications	Products	Materials
<ul style="list-style-type: none"> • Construction • Automotive • Farm Equipments • Railways • Defense • Power • Industrial • Chemical, Oil & Gas • Life Sciences 	<ul style="list-style-type: none"> • Step seal® 2K • Glyd Ring® • Roto Glyd Ring® T • Roto Glyd Ring® • Excluder® • AQ seal® • Double delta • Varilip® PDR seal • Variseal® • Rim seal® • Roto glyd ring® S • Vector seal® • Spiral Back-up ring 	<ul style="list-style-type: none"> • Turcon® (T01, T03, T05, T06, T08, T10, T24, T29, T40, T42, T46, T99) • Zurcon® (Z51, Z52, Z80)

Trelleborg Sealing Solutions Shanghai (China)



Company Profile



Production of high-quality precision seals in materials including elastomers, PTFE and polyurethane is the focus of the new plant in Shanghai, China. Also housing a technical center and a sales office approximately 200 people will be employed there.

The plant strengthens Trelleborg Sealing Solutions' presence in this important growth region and facilitates further expansion through increased service to new and existing customers in the area.

Service

The technical center encompasses 2-D and 3-D CAD design capabilities and product testing in order to provide customer-specific solutions. Our highly trained and certified staff provides qualified solutions and expertise for the growing demands in

Asia. Our Application Engineers and Sales Engineers have sufficient breadth and depth of knowledge about sealing technology, the related applications and all of our extensive range of sealing products.



Products and Materials



We can provide the majority of sealing solutions from our wide range of proprietary materials, including Turcon® and Zurcon®.



Our seals are used in equipment throughout Asia where there is demand for dynamic and static sealing under demanding conditions.



Our products and materials are developed in-house and controlled by our specialists.

Facilities



Trelleborg Sealing Solutions Shanghai has on-site facilities that allow for efficient design, production, testing, inspection and shipping of sealing solutions throughout Asia.

Applications	Products	Materials
<ul style="list-style-type: none"> • Industrial applications: such as hydraulic cylinders, presses, injection molding machines, forklifts or excavators • Automotive • Aerospace 	<p>Piston seals, rod seals, seals for rotary applications, scrapers, bearings etc:</p> <ul style="list-style-type: none"> • Stepseal® 2K • Glyd Ring® T • Roto Glyd Ring® • Excluder® • AQ Seal® • Double Delta® • Slydring® • Slydway® • O-Rings 	<ul style="list-style-type: none"> • Turcon® • Zurcon® • Orkot® • Isolast®

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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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