Sanitary gasket materials

Bonded Envelope: is the world’s only unified gasket, setting new standards for purity, performance and flexibility. A bonded envelope gasket’s contact surface is a layer of PTFE unitized to an EPDM rubber inner core. This totally bonded construction provides a PTFE gasket with the mechanical characteristics, including memory, of an elastomer gasket. Designed to meet critical requirements in biopharmaceutical, ultra-pure water, WFI (water-for-injection) and difficult food and beverage processing, bonded envelope outperforms other gaskets while eliminating costly process interruptions. Achieve higher performance under SIP/CIP conditions.

PTFE/Stainless Steel: is a unique 50/50 blend of non-pigmented PTFE and 316L water-atomized and passivated stainless steel. PTFE/stainless steel delivers leak-proof performance. PTFE/stainless steel is the choice for leak-proof, perfect surface performance and outstanding durability in SIP (steam-in-place) and WFI (water-for-injection) applications. PTFE/stainless steel is ideal for sanitary steam pipe connections in extreme temperatures ranging from -20°F to 500°F. The superior strength of PTFE/stainless steel eliminates cold flow and creep to prevent maintenance problems and system downtime.

FKM Fluoroelastomer and EPDM: is specified by many process equipment manufacturers, these materials are generally suitable for a variety of applications. See life must be considered and a preventative maintenance program be implemented to mitigate degradation. These materials are acceptable, but not recommended for continuous use in SIP procedures.

PTFE: is the material of choice whenever low temperature flexibility or gasket memory is not required (not recommended where large temperature variations occur frequently as leakage can occur). PTFE has almost no extractables, has a low absorption rate and excellent resistance to process fluids. It can remain in service for longer periods of time in both water and steam for continuous use. High-pressure clamps are recommended to prevent leakage resulting from temperature variations. PTFE envelope gaskets with an FKM Fluoroelastomer inner core should be used if slight misalignment is observed.

Platinum-Cured Silicone: is the material of choice in sanitary water systems when PTFE is not feasible due to severely misaligned fittings, or if the cost of high-pressure clamp does not outweigh the benefits of PTFE (extended service life).

Our Commitment is Certified: Trelleborg Sealing Solutions successfully meets the goals and standards set forth by the U.S. Pharmacopeia Class VI certification, passes cytotoxicity criteria and complies with FDA Title 21 CFR 177.2600 and 177.1550 standards.

Sanitary gasket capabilities

Serving the world’s processing industries

Table: Sanitary Gasket Material Comparison

<table>
<thead>
<tr>
<th>Gasket Type</th>
<th>Temperature Range</th>
<th>Pure Water</th>
<th>Water for Injection</th>
<th>Process Fluids</th>
<th>Process Fluids</th>
<th>Process Fluids</th>
<th>Process Fluids</th>
<th>Process Fluids</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bonded Envelope</td>
<td>-100°F to 350°F</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>PTFE/Stainless Steel</td>
<td>-100°F to 500°F</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>PTFE</td>
<td>-100°F to 500°F</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Silicone (platinum)</td>
<td>-40°F to 450°F</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>FKM Fluoroelastomer</td>
<td>-30°F to 392°F</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>EPDM (peroxide)</td>
<td>-30°F to 350°F</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>

1 = Excellent  2 = Good  3 = Acceptable  4 = Marginal  5 = Poor  X = Do Not Use

* Applications dependent

This table is a general guide to material selection. Please consult your local Trelleborg Sealing Solutions sales office for more information.

Gasket life dependent upon time and temperature exposure.
Sanitary gasket capabilities

Validation Gasket Accessories

Thermometers
This versatile instrument measures temperature in both °C and °F. The internal memory of the micro-computer stores the minimum and maximum measured temperature for instant recall via the LCD display.

Temperature Range:
-40°C to +400°C
-40°F to +752°F
Resolution Accuracy:
0.1°C, 0.2°F +/-0.05%
Calculating accuracy is specified for operating ambient temperature of
23°C/73°F +/-5°C
Cold junction error for thermocouples:
For operating ambient temperature for 0°C to +18°C / +32°F to +64°F and +28°C to +50°C / +82°F to +122°F, and an additional error of
 +/-0.03°C or 0.05°F
Accuracy is specified for operating temperature using type T or K thermocouple probes.

Resolution Accuracy:
-130°F to +752°F
-90°C to +400°C
Temperature Range:
Accuracy is specified for operating ambient temperature of
23°C/73°F +/-5°C
Reading +/-0.7°C or 1.3°F
Resolution Accuracy:
0.1°C, 0.2°F +/-0.05%
Resolution Accuracy:
-130°F to +752°F
-90°C to +400°C
Temperature Range:
Resolution Accuracy:
0.1°C, 0.2°F +/-0.5%
Accuracy is specified for operating ambient temperature of
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Cold junction error for thermocouples:
For operating ambient temperature for 0°C to +18°C / +32°F to +64°F and +28°C to +50°C / +82°F to +122°F, and an additional error of
 +/-0.03°C or 0.03°F
Model ACC-701CH is a high-performance, precision handheld instrument for the measurement of temperature using type T or K thermocouple probes.

Extension Leads
Male to male (sub-miniature type T connectors) 28 gauge. Stranded type to thermocouple wire with blue PVC insulation.

Hole Plug
Chrome-plated brass head with stainless steel shaft 1-1/2” long, .095 diameter.

Temperature Probes
Short and long temperature probe for thermocouple gasket. Copper Constantan thermocouple wire with blue PVC insulation.

Stopcock
To fit sampling/injection tube; chrome-plated brass construction female luer fitting to male luer lock.

Sampling/Injection Tube
Chrome-plated brass female luer head with stainless hypodermic tube, .095 OD, .071 ID.

Thermocouple Wire Probes
Coated thermocouple wire probe 1.0’ long with male mini quick disconnect connector for use with thermometer. Specify Kaption or FEP when ordering.

Superior logistics support
Trelleborg Sealing Solutions operates an advanced logistics support system that delivers products to our customers worldwide from central warehouses in the United States, Europe and Asia/Pacific.

Total - Sealing technology
Trelleborg Sealing Solutions is a major international sealing force uniquely positioned to offer a dedicated design and development service for sealing arrangements from our market-leading product portfolio. Our direct experience with unique and challenging applications positions us well to offer custom design and industry-specific development services for sealing components.

Expertise - Our proven capabilities
With over 50 years of experience developing and applying sealing systems, Trelleborg Sealing Solutions engineering personnel contribute to their knowledge of this specialized technology directly to customers. This includes customer 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).

Purity - In materials and supply
The state-of-the-art facility that manufactures our sanitary gasket products maintains superior quality control and purity of materials with rigorous standards during each critical step of production. After production, the sanitary gaskets are inspected and packaged in our cosmetic particulate-free box. A step beyond standard packaging, our box is made with cosmetic quality material that gives you a product free of particulates. Each box is clearly labeled with product information for clean inventory control. Lot and batch numbers provide traceability.

Commitment - To our customers’ long-term needs
We help our customers achieve cost-effective, durable solutions that are precisely matched to their specific system requirements and business needs. This includes our logistical support which effectively delivers over 40,000 different sealing and bearing systems to our customers worldwide. We are one of the world’s foremost experts in polymer sealing technology. We develop, manufacture and market safety-critical polymer-based precision seals and bearings and associated systems.

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Trelleborg Sealing Solutions sanitary gaskets meet these stringent standards for purity:

- FDA Title 21 CFR 177.2600, 177.1550
- USP U.S. Pharmacopeia Class VI cer tification
- USP Cytotoxicity criteria
- 3.4 and P3-A Sanitary standards
- ASME-BPE standards
- NSF
- Current Good Manufacturing Practices (CGMP)
- European Pharmacopea 3.1.19
- Animal-derived ingredient-free

1 These data not from U.S. Pharmacopeia Class VI certification standards. Cytotoxicity and all are ADI free.

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- Animal-derived ingredient-free

1 These data not from U.S. Pharmacopeia Class VI certification standards. Cytotoxicity and all are ADI free.
Sanitary gasket capabilities

**Standard Gaskets**

All Trelleborg Sealing Solutions standard sanitary gaskets are molded from FDA-compliant compounds. Our clamp gaskets have all passed 3-A testing. Our EPDM, FKM Fluorosilicone, Silicone and TPF clamp gaskets have all passed USP Class VI testing. These gaskets are molded in the United States and are available in Flanged (Type A) and Non-Flanged (Type B) styles.

**AVAILABLE Materials:**
- NR, URETHANE, FKM Fluorosilicone, PTFE, Fluoroelastomer, Silicone, Tuf-Flex®/PTFE, Tuf-Steel® (PTFE and Stainless Steel) (bonded envelope gaskets)

**AVAILABLE SIZES:**

Please contact your local Trelleborg Sealing Solutions sales office for available materials and specific sizes and types.

**Bonded Envelope Gaskets**

Tuf-Flex® (bonded envelope gaskets) are utilized gaskets - setting new standards for purity, performance and flexibility. The bonding surface is a layer of PTFE unidirectional to an EPDM rubber inner core. This totally bonded construction provides a PTFE gasket with the mechanical characteristics, including memory, of an elastomer gasket. Designed to meet critical requirements in biopharmaceutical, ultra-pure water, WFI (water-for-injection) and difficult food and beverage processing, this gasket outperforms other gaskets while eliminating costly process interruptions. Achieve higher performance under SIP/CIP conditions.

**AVAILABLE Materials:**
- Tuf-Flex/PTFE/FPD-MATIC, Tuf/Flex/PTFE-NBR

**AVAILABLE SIZES:**

Please contact your local Trelleborg Sealing Solutions sales office for available materials and specific sizes and types.

**PTFE/Stainless Steel Standard Gaskets**

Tuf-Steele® (PTFE and Stainless Steel) delivers leak-proof performance and is composed of a unique 50/50 blend of non-pigmented PTFE and 316L passivated and atomized stainless steel. This gasket is the choice for leak-proof, perfect surface performance and outstanding durability in SIP (steam-in-place) and WFI (water-for-injection) applications. It is ideal for sanitary steam pipe connections in extreme temperatures ranging from -20°F to 500°F. Its superior strength eliminates cold flow and creep to prevent maintenance problems and system downtime.

**AVAILABLE SIZES:**

**Engraved Gaskets**

Laser Engraved® Gaskets (engraved gaskets), screen gaskets and orifice plate gaskets ensure permanent batch and lot traceability. Engaging remains readable throughout the service life of the gasket. Compound type and/or special application markings can also be laser engraved on gaskets at the customer’s request.

**AVAILABLE Materials:**
- Available on all gaskets and fittings, adaptors and crimp collars

**AVAILABLE SIZES:**
- Order new ASME BPE specifications

Please contact your local Trelleborg Sealing Solutions sales office for spacing and size limitations.

**Clamps**

Trelleborg Sealing Solutions offers a wide variety of sanitary gasket clamps. Clamps can be Hinged 1-pin, Hinged 2-pin, 2-bolt high pressure or special hinged clamps with custom ports for both validation access and/or spore trap access. It is ideal for sanitary steam pipe connections in extreme temperatures ranging from -20°F to 500°F. Its superior strength eliminates cold flow and creep to prevent maintenance problems and system downtime.

**AVAILABLE Materials:**
- Available on all gaskets and fittings, adaptors and crimp collars

**AVAILABLE SIZES:**

Please contact your local Trelleborg Sealing Solutions sales office for more information.

**Controlled Compression Gaskets**

The Controlled Compression Gasket (CCG) cannot be over-tightened. The CCG is composed of the elastomer of your choice with a ring of Ultem® vulcanized inside the gasket from the ring O.D. to the locating ring of the gasket. This non-compressible ring controls clamp compression to exactly the correct amount, allowing the properly positioned gasket to make a perfect surface seal, seal with the females. No torque restrictions are necessary. CCG is also available in a tabbed gasket making it more user-friendly while isolating it from unnecessary human contact. CCG helps with position locating ring of the gasket. This non-compressible ring controls clamp compression to exactly the

**AVAILABLE Materials:**
- Tuf-Flex®/PTFE, Tuf-Steele® (PTFE and Stainless Steel)

**AVAILABLE SIZES:**

Please contact your local Trelleborg Sealing Solutions sales office for more information.

**Torque Nuts**

Torque-Rite® Nuts (torque nuts) allow you to control clamp compression and expansion while maintaining constant inch/pounds force. Torque nuts eliminate the problems associated with over- or under-tightening a gasket which can lead to an unsanitary system. Torque control is easy! When tightened, the torque nut’s self-tightening internal mechanism will make an audible click, signaling the user they have reached proper inch/pounds force. If further tightening is attempted, there will be more clicks, but no additional force will be applied on the gasket. If emergency conditions arise, torque nuts have a built-in manual override feature. To use, simply unscrew/remove the clamp wing-nut and install the torque nut.

**AVAILABLE:**
- 30 in-lbs for all elastomers and Tuf-Flex®
- 60 in-lbs for custom base for rupture disk applications
- 70 in-lbs for Tuf-Flex® and Tuf-Steel® and stainless steel

**AVAILABLE:**
- Available on all gaskets and fittings, adaptors and crimp collars

**AVAILABLE SIZES:**

Please contact your local Trelleborg Sealing Solutions sales office for more information.

**Note:** Food-Steele® and Tuf-Steele® are trademarks of Rubberfab Technologies Group. Ultem® is a trademark of SABIC Innovative Plastics.
Sanitary gasket capabilities

Smart Tracker

The Smart Tracker™ T (Smart Tracker) is a miniature, battery-powered stand-alone precision temperature recorder. The all-in-one compact, portable, easy-to-use device will measure and record up to 21,845 measurements per channel. The storage medium is non-volatile solid state memory, providing maximum data security even if the battery becomes discharged. The RTD sensor does not suffer from the cold-junction issues of the thermocouple nor the error at high and low temperatures of the thermometer. The device can be started and stopped directly from your computer and its small size allows it to fit almost anywhere. The Smart Tracker makes data retrieval quick and easy. Simply plug it into an empty COM or USB port and our user-friendly software does the rest.

I-Line & Q-Line

I-Line is an interlocking design which creates a self-aligning right union. I-Line unions feature an interlocking, metal-to-metal design that ensures gasket control, minimizing gasket extrusion, thus preventing liquid traps. Perfect for in-place cleaning, a favorite for use in the beverage industry.

AVAILABLE MATERIALS: NBR, EPDM, Silicone, PTFE (blue and white), Tuf-Steel®
AVAILABLE SIZES: 1/2", 3/4", 1", 1-1/2", 2", 2-1/2", 3", 4". A 4" size allows it to fit almost anywhere. The Smart Tracker makes data retrieval quick and easy. Simply plug it into an empty COM or USB port and our user-friendly software does the rest.

Q-Line components are ideal for use in processing pipeline systems for dairy, beverage, food, pharmaceutical and biotech industries. All compounds meet the criteria of the FDA, some have been certified and accepted by the USDA, 3-A Sanitary Standards and USP Class VI certifications.

AVAILABLE MATERIALS: NBR, EPDM, FKM, Silicone

Schedule 5 (Flanged/Non-Flanged)

Components are used in processing pipeline systems for the food, dairy, beverage, pharmaceutical and biotech industries. The products are manufactured from EPDM, FKM, NBR and Silicone, as well as gaskets made with fluoropolymer. All compounds meet the criteria of the FDA, some have been certified and accepted by the USDA, 3-A Sanitary Standards and USP Class VI certifications.

AVAILABLE MATERIALS: NBR (Black), Silicone (Gray), Platinum Silicone, EPDM, FKM, PTFE, Tuf-Steel®
AVAILABLE SIZES: 1/2", 3/4", 1", 1-1/2", 2", 2-1/2", 3", 4". A 4" size allows it to fit almost anywhere. The Smart Tracker makes data retrieval quick and easy. Simply plug it into an empty COM or USB port and our user-friendly software does the rest.

APC

Gaskets for A.P.C. (Alloy Products) fittings.

AVAILABLE MATERIALS: NBR (Gray), NBR (Black)
AVAILABLE SIZES: 1", 1-1/2", 2", 2-1/2", 3", 4"

Validation Gasket

The value of a Smart Gasket® (validation gasket) is proven when validating sterility in a high-purity processing system. A standard sanitary flange utilizing the validation gasket provides the processor the option to capture real-time validation data:

• thermal mapping
• meter fluids in your processing system
• withdraw fluid samples
• facilitate validation using sporetrap challenge test strips

AVAILABLE PORTS: 1 to 4 ports

Special clamps are specifically designed for use with with validation gaskets.

Biological Gasket

The Biological Indicator® gasket (biological gasket) enables the use of a self-contained biological indicator in sanitary process lines. This unique gasket permits either top loading or inline positioning of a self-contained biological indicator and/or a temperature probe. The great advantage of a self-contained biological indicator over the traditional spore strip in glassine is the time saved when confirming spore kill. Results are easily obtained in only 48 hours (versus the five to seven days required with a spore strip) and without problematic laboratory transfer. You can feel secure in knowing that the biological gasket will not be lost downstream in the process. The fail-safe validation gasket holds the indicator in place for easy retrieval.

AVAILABLE SIZES: 3/4", 1", 1-1/2", 2" AVAILABLE PORTS: 1 port (in sizes 1", 1-1/2", 2") not available in 3/4"

Gauge Safeguard

The Gauge Guard® Isolator (gauge safeguard) seal protects expensive diaphragms and instruments from damage without affecting instrument performance. By combining a quality Trelleborg Sealing Solutions hygienic seal with a membrane, the gauge safeguard isolates hot or caustic saline solution from instrumentation, a necessary and cost-effective step in assuring long life and accurate results from your instruments and gauges. As some gauge manufacturers will suggest the use of a gauge safeguard seal, others note that the failure to use a gauge safeguard seal can void most instrument and gauge warranties.

AVAILABLE MATERIALS: NBR (Black), Silicone (Gray), Platinum Silicone, EPDM, PTFE, Tuf-Steel®
AVAILABLE SIZES: 1/2", 3/4", 1", 1-1/2", 2"

Gauge Guard Protectors

The Trelleborg Sealing Solutions gauge guard protector protects expensive, fragile gauge diaphragms and other similar instruments from damage during recalibration, maintenance and autoclave procedures.

By using a quality gauge guard protector during maintenance with a gauge safeguard during processing, you have complete gauge diaphragm protection! A necessary and cost-effective step in assuring maximum service life and accurate results from your instruments and gauges!

AVAILABLE MATERIALS: Platinum-Cured Silicone, 316 Stainless Steel
AVAILABLE SIZES: Size 3/4", 1", 1-1/2", & 2"

Note: Smart Gasket®, Biological Indicator® and Gauge Guard® are trademarks of Rubberfab Technologies Group.
Sock Screen Gaskets

Sock Screen Gaskets are inserted into the I.D. of your stainless steel tubing and provide filtration for a greater soil burden.

**AVAILABLE MATERIALS AND SIZES:**
- NBR: 1" - 1-1/2"; 2", 3-1/2", 4".
- EPDM: 1/2", 3/4", 1", 1-1/2", 2", 3-1/2", 4".
- FKM (Black): 1/2", 3/4", 1", 1-1/2", 2", 3-1/2", 4".
- SILICONE: 1/2", 3/4", 1", 1-1/2", 2", 3-1/2", 4".

**Perforated Metal Gaskets**

The perforated metal gasket is used for flow control and media filtration.

**AVAILABLE MATERIALS AND SIZES:**
- NBR: 1", 1-1/2", 2", 3-1/2", 4".
- EPDM: 1/2", 3/4", 1", 1-1/2", 2", 3-1/2", 4".
- FKM: 1/2", 3/4", 1", 1-1/2", 2", 3-1/2", 4".
- TUF-STEEL®: 1", 1-1/2", 2", 3-1/2", 4".

**Screen Gaskets**

Fluid conditioning screen gaskets in 10 micron through four mesh are available from Trelleborg Sealing Solutions. Screen gaskets also provide prefiltration for critical membrane filters, coalescence of water vapor from process exhaust lines and particulate removal before fill and finish. Also available in a complete elastomer selection are perforated plate fluid conditioning gaskets, removable sanitary gasket holders for all discs, screen disc inserts, perforated plate disc inserts and orifice plate disc inserts.

**AVAILABLE MATERIALS AND SIZES:**
- NBR: 1", 1-1/2", 2", 3-1/2", 4".
- EPDM: 1/2", 3/4", 1", 1-1/2", 2", 3-1/2", 4".
- FKM: 1/2", 3/4", 1", 1-1/2", 2", 3-1/2", 4".
- TUF-STEEL®: 1", 1-1/2", 2", 3-1/2", 4".

**Sanitary Diffuser Gaskets**

Diffuser aeration systems provide increased oxygen content to high-purity water systems. Diffusers can also be used to diffuse digester gases such as hydrogen sulfide and sulphur dioxide, to introduce ozone for oxidizing and destroying bacterial and organic chemical contaminants, as well as for carbon dioxide injection for carbonation and pH adjustment.

**AVAILABLE MATERIALS:**
- EPDM, FKM Fluoroelastomer, Silicone

**AVAILABLE SIZES:**
- 1/2", 3/4", 1", 1-1/2", 2", 3-1/2", 4"

**AVAILABLE MICRON:**
- 1/2 to 2 micron
- 2 micron is standard stock, all other micron is custom.

**V2B Vent Gaskets**

The V2B vent gasket offers an additional answer for vacuum and pressure relief for pharmaceutical and food/beverage processing tank venting when airborne particulate removal is required. Using a 200 mesh screen combined with a 14 mesh screen of sintered construction, the V2B vent gasket is a cost-effective alternative to expensive vacuum breakers and venting systems.

**AVAILABLE MATERIALS:**
- EPDM, FKM, Silicone

**AVAILABLE SIZES:**
- 1", 1-1/2", 2", 2-1/2", 3", 4", 6"

**ANSI Flange 150#**

An Ansi Flex® (ANSI Flange 150#) gasket’s contact surface is PTFE unitized to an EPDM rubber inner core. This totally bonded construction provides a PTFE gasket with the mechanical characteristics, including memory, of an elastomer gasket with exceptional steam resistance. An ANSI Flange 150# gasket is ideal for applications, such as PVC piping and glass lining pipings, where low seating stress is required.

**AVAILABLE SIZES:**
- From available up to 6" including 12"

**AVAILABLE MATERIALS:**
- EPDM, FKM Fluoroelastomer, Silicone

** AVAILABLE MICRON:**
- 1/2 to 2 micron
- 2 micron is standard stock, all other micron is custom.
Sock Screen Gaskets

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Available Materials:
- EPDM
- FKM
- Silicone

Available Sizes:
- 1", 1-1/2", 2", 2-1/2", 3", 4"

Bevel Seat

Bevel seat fittings provide a precision metal-to-metal tight connection. We offer a complete selection of bevel seat gaskets.

Available Materials:
- PTFE (White)
- PTFE (Blue)
- NBR (Black)
- EPDM
- FKM
- Silicone

Available Sizes:

Sanitary Diffuser Gaskets

Diffuser aeration systems provide increased oxygen content to high-purity water systems. Diffusers can also be used to diffuse digester glasses such as hydrogen sulfide and sulfur dioxide, to introduce ozone for oxidizing and destroying bacterial and organic chemical contaminants, as well as for carbon dioxide injection for carbonization and pH adjustment.

Available Materials:
- EPDM
- FKM
- Silicone

Available Sizes:

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Available Sizes:
- From available up to 6 including 12"
Sanitary gasket capabilities

Smart Tracker

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I-Line & Q-Line

I-Line is an interlocking design which creates a self-aligning right union. I-Line unions feature an interlocking, metal-to-metal design that ensures gasket contact, minimizing gasket extrusion, thus preventing liquid traps. Perfect for in-place cleaning, a favorite for use in the beverage industry.

AVAILABLE MATERIALS: NBR, EPDM, Silicone, PTFE (white and white), Tuf-Steel®

Q-Line components are ideal for use in processing pipeline systems for dairy, beverage, food, pharmaceutical and biotech industries. All compounds meet the criteria of the FDA, some have been certified and accepted by the USDA, 3-A Sanitary Standard and USP Class VI certifications.

AVAILABLE MATERIALS: NBR, EPDM, FKM, PTFE, Silicone

Schedule 5 (Flanged/Non-Flanged)

Components are used in processing pipeline systems for the food, dairy, beverage, pharmaceutical and biotech industries. The products are manufactured from EPDM, FKM, NBR and Silicones, as well as gaskets made with fluoropolymer. All compounds meet the criteria of the FDA, and some compound formulations have also been certified and accepted by the USDA, 3-A Sanitary Standards and USP Class VI certifications.

AVAILABLE MATERIALS: NBR (Blue), EPDM, FKM, Platinum Silicone, PTFE (white)

The Smart Trakr® T is a registered trademark of RubberFab Technologies Group.

Validation Gasket

The value of a Smart Gasket® (validation gasket) is proven when validating sterility in a high-purity processing system. A standard sanitary flange utilizing the validation gasket provides the processor the option to capture real-time validation data:

• Thermal mapping
• Meter fluids in your processing system
• Withstand fluid samples
• Facilitate validation using sporetrap challenge test strips

AVAILABLE SIZES: 1.2", 1.4", 1.5", 1.6", 2", 3", 4"

Gauge Safeguard

The Gauge Guard® Isolator (gauge safeguard) seal protects expensive diaphragms and instruments from damage without affecting instrument performance. By using a quality Trelleborg Sealing Solutions hygienic seal with a membrane, the gauge safeguard isolates hot or caustic saline solution from instrumentation, a necessary and cost-effective step in assuring long life and accurate results from your instruments and gauges. As some gauge manufacturers will suggest the use of a gauge safeguard seal, others note that the failure to use a gauge safeguard seal can void most instrument and gauge warranties.

AVAILABLE MATERIALS: PMT (Punishertrim), Platinum Silicone, EPDM, PTFE, Tuf-Steel®

Gauge Guard Protectors

The Trelleborg Sealing Solutions gauge guard protector protects expensive, fragile gauge diaphragms and other similar instruments from damage during recalibration, maintenance and autoclave procedures.

By using a quality gauge guard protector during maintenance with a gauge safeguard during processing, you have complete gauge diaphragm protection! A necessary and cost-effective step in assuring maximum service life and accurate results from your instruments and gauges!

AVAILABLE MATERIALS: Platinum-Cured Silicone, 316 Stainless Steel

Note: Smart Gasket®, Biological Indicator® and Gauge Guard® are trademarks of RubberFab Technologies Group.

APC

Gaskets for A.P.C. (Alloy Products) fittings.

AVAILABLE MATERIALS: NBR (Gray), NBR (Black)

Gauge Guard Protectors

The Smart Trakr® T is a registered trademark of RubberFab Technologies Group.
Sanitary gasket capabilities

Standard Gaskets

All Trelleborg Sealing Solutions sanitary gaskets are molded from FDA-compliant compounds. Our Tri-Clamp® gaskets have all passed 3 A testing. Our EPDM, FKM, Fluoroelastomer, Silicone and PTFE Tri-Clamp® gaskets have all passed USP Class VI testing. These gaskets are molded in the United States and are available in Flanged (Type A) and Non-Flanged (Type B) styles.

AVAILABLE MATERIALS:
NBR, EPDM, FKM, Fluoroelastomer, PTFE, Platinum & peroxide-cured silicone, Tuf-Flex®/PTFE/EPDM, Tuf-Steel®/PTFE/stainless steel

AVAILABLE SIZES:
1/2", 3/4", 1", 1 1/2", 2", 2 1/2", 3", 4", 6", 8", 10", 12"

Trelleborg Sealing Solutions offers metric sanitary gaskets according to ISO 2852 and DIN 32676. Please contact your local Trelleborg Sealing Solutions sales office for available materials and specific sizes and types.

Bonded Envelope Gaskets

Tuf-Flex® (bonded envelope gaskets) are utilized gaskets - setting new standards for purity, performance and flexibility. The bonding surface is a layer of PTFE unitized to an EPDM rubber inner core. This totally bonded construction provides a PTFE gasket with the mechanical characteristics, including memory, of an elastomer gasket. Designed to meet critical requirements in biopharmaceutical, ultra-pure water, WiFi (water-for-injection) and difficult food and beverage processing, this gasket outperforms other gaskets while eliminating costly process interruptions. Achieve higher performance under SIP/CIP conditions.

AVAILABLE MATERIALS:
PTFE/EPDM, Tuf-Flex®/PTFE/EPDM, Tuf-Steel®/PTFE/stainless steel

AVAILABLE SIZES:
1/2", 3/4", 1", 1 1/2", 2", 2 1/2", 3", 4" 6" 8" 10" 12"

John Perry

Components are used in processing pipeline systems for the food, dairy, beverage, pharmaceutical and biotech industries. The products are manufactured from EPDM, FKM, NBR and Silicone, as well as gaskets made with PTFE. All compounds meet the criteria of the FDA, and some compound formulations have also been certified and accepted by the USDA, 3 A Sanitary Standard and USP Class VI certifications.

AVAILABLE MATERIALS:
NBR, EPDM, FKM, PTFE (White), PTFE (Black)

AVAILABLE SIZES:
1", 1 1/2", 2", 2 1/2", 3", 4" & 6"

PTFE/Stainless Steel Standard Gaskets

Tuf-Steel® (PTFE and Stainless Steel) delivers leak-proof performance and is composed of a unique 50/50 blend of non-pigmented PTFE and 316L passivated and atomized stainless steel. This gasket is the choice for leak-proof, perfect surface performance and outstanding durability in SIP (steam-in-place) and WiFi (water-for-injection) applications. It is ideal for sanitary steam pipe connections in extreme temperatures ranging from -20°F to 500°F. Its durability in SIP (steam-in-place) and WFI (water-for-injection) applications. It is ideal for sanitary steam pipe connections in extreme temperatures ranging from -20°F to 500°F. Its stainless steel core. This totally bonded construction provides a PTFE gasket with the mechanical characteristics, including memory, of an elastomer gasket. Designed to meet critical requirements in biopharmaceutical, ultra-pure water, WiFi (water-for-injection) and difficult food and beverage processing, this gasket outperforms other gaskets while eliminating costly process interruptions. Achieve higher performance under SIP/CIP conditions.

AVAILABLE MATERIALS:
Tuf-Steel®/PTFE/EPDM, Tuf-Flex®/PTFE/EPDM

AVAILABLE SIZES:
1/2", 3/4", 1", 1 1/2", 2", 2 1/2", 3", 4", 6", 8", 10", 12"

Clamps

Trelleborg Sealing Solutions offers a wide variety of sanitary gasket clamps. Clamps can be Hinged 5-pinned, Hinged 2-pinned, 2 bolt high pressure or special hinged clamps with custom ports for both validation access and/or wiping trap access and/or compression controlled tabbed gaskets. Most clamps are stainless steel. We also offer Nylon Hinge clamps. Also available are gold clamps and/or wing nuts for line identification.

Note: Consult your local Trelleborg Sealing Solutions sales office for more information.

Engraved Gaskets

Laser Engraved® Gaskets (engraved gaskets), screen gaskets and orifice plate gaskets ensure permanent batch and lot traceability. Engraving remains readable throughout the service life of the gasket. Compounds and/or special application markings can also be laser engraved on gaskets at the customer’s request.

AVAILABLE MATERIALS:
Available on all gaskets and fittings, adaptors and crimp collars

NOTE: Consult your local Trelleborg Sealing Solutions sales office for spacing and size limitations.

Note: Food-Flex®, Tuf-Flex® and Tuf-Steel® are trademarks of RubberFab Technologies Group. Ultem® is a trademark of SABIC Innova tive Plastics. Tri-Clamp® is a trademark of Alfa Laval.

John Perry

Components are used in processing pipeline systems for the food, dairy, beverage, pharmaceutical and biotech industries. The products are manufactured from EPDM, FKM, NBR and Silicone, as well as gaskets made with PTFE. All compounds meet the criteria of the FDA, and some compound formulations have also been certified and accepted by the USDA, 3 A Sanitary Standard and USP Class VI certifications.

AVAILABLE MATERIALS:
NBR, EPDM, FKM, PTFE (White), PTFE (Black)

AVAILABLE SIZES:
1", 1 1/2", 2", 2 1/2", 3", 4" & 6"

Available on all gaskets and fittings, adaptors and crimp collars.

Clamps

Trelleborg Sealing Solutions offers a wide variety of sanitary gasket clamps. Clamps can be Hinged 5-pinned, Hinged 2-pinned, 2 bolt high pressure or special hinged clamps with custom ports for both validation access and/or wiping trap access and/or compression controlled tabbed gaskets. Most clamps are stainless steel. We also offer Nylon Hinge clamps. Also available are gold clamps and/or wing nuts for line identification.

Note: Consult your local Trelleborg Sealing Solutions sales office for more information.

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Available on all gaskets and fittings, adaptors and crimp collars

NOTE: Consult your local Trelleborg Sealing Solutions sales office for spacing and size limitations.

Note: Food-Flex®, Tuf-Flex® and Tuf-Steel® are trademarks of RubberFab Technologies Group. Ultem® is a trademark of SABIC Innovative Plastics. Tri-Clamp® is a trademark of Alfa Laval.
Validation Gasket Accessories

Thermometers
This versatile instrument measures temperature in both °C and °F. The internal memory of the micro-computer stores the minimum and maximum measured temperature for instant recall via the LCD display.

Temperature Range: -50°C to +400°C, -58°F to +752°F
Resolution Accuracy: 0.1°C, 0.2°F +/-0.05% READING +/-0.7°C or 0.3°F
Accuracy is specified for operating ambient temperature of 23°C/73°F +/-5°C
Cold junction error for thermocouples:
For operating ambient temperature for 0°C to +18°C / +32°F to +64°F and +28°C to +50°C / +82°F to 122°F, and an additional error of +/- 0.03°C or 0.03°F

Model ACC-7001H is a high-performance, precision handheld instrument for the measurement of temperature using type T or K thermocouple probes.

Resolution Accuracy:
-130°F to +752°F
-90°C to +400°C

Temperature Range:
LCD display.
maximum measured temperature for instant recall via the
This versatile instrument measures temperature in both °C and °F.

Validation Gasket Accessories

Thermometers
This versatile instrument measures temperature in both °C and °F. The internal memory of the micro-computer stores the minimum and maximum measured temperature for instant recall via the LCD display.

Temperature Range: -50°C to +400°C, -58°F to +752°F
Resolution Accuracy: 0.1°C, 0.2°F +/-0.05% READING +/-0.7°C or 0.3°F
Accuracy is specified for operating ambient temperature of 23°C/73°F +/-5°C
Cold junction error for thermocouples:
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Model ACC-7001H is a high-performance, precision handheld instrument for the measurement of temperature using type T or K thermocouple probes.

Resolution Accuracy:
-130°F to +752°F
-90°C to +400°C

Temperature Range:
LCD display.
maximum measured temperature for instant recall via the
This versatile instrument measures temperature in both °C and °F.
Serving the world’s processing industries

Bonded Envelope: is the world’s only unitized gasket, setting new standards for purity, performance and flexibility. A bonded envelope gasket’s contact surface is a layer of PTFE unitized to an EPDM rubber inner core. This totally bonded construction provides a PTFE gasket with the mechanical characteristics, including memory, of an elastomer gasket. Designed to meet critical requirements in biopharmaceutical, ultra-pure water, WFI (water-for-injection) and difficult food and beverage processing, bonded envelope outperforms other gaskets while eliminating costly process interruptions. Achieve higher performance under SIP/CIP conditions.

PTFE/Stainless Steel: is a unique 50/50 blend of non-pigmented PTFE and 316L water-atomized and passivated stainless steel. PTFE/stainless steel delivers leak-proof performance. PTFE/stainless steel is the choice for leak-proof, perfect surface performance and outstanding durability in SIP (steam-in-place) and WFI (water-for-injection) applications. PTFE/stainless steel is ideal for sanitary steam pipe connections in extreme temperatures ranging from -20°F to 500°F. The superior strength of PTFE/stainless steel eliminates cold flow and creep to prevent maintenance problems and system downtime.

FKM Fluoroelastomer and EPDM: is specified by many process equipment manufacturers, these materials are generally suitable for a variety of applications. Service life must be considered and a preventative maintenance program be implemented to mitigate degradation. These materials are acceptable, but not recommended for continuous use in SIP procedures.

PTFE: is the material of choice whenever low temperature flexibility or gasket memory is not required (not recommended where large temperature variations occur frequently as leakage can occur). PTFE has almost no extractables, has a low absorption rate and excellent resistance to process fluids. It can remain in service for longer periods of time in both water and steam for continuous use. High-pressure clamps are recommended to prevent leakage resulting from temperature variations. PTFE envelope gaskets with an FKM Fluoroelastomer inner core should be used if slight misalignment is observed.

Platinum-Cured Silicone: is the material of choice in sanitary water systems when PTFE is not feasible due to severely misaligned fittings, or if the cost of high-pressure clamps does not outweigh the benefits of PTFE (extended service life).

Our Commitment is Certified: Trelleborg Sealing Solutions successfully meets the goals and standards set forth by the U.S. Pharmacopeia Class VI certification, passes cytotoxicity criteria and complies with FDA Title 21 CFR 177.2600 and 177.1550 standards.

Extensive test facilities
Strategically positioned materials and development laboratories and fully resourced design and application centers deliver the latest product innovations and customer-focused seal, bearing and custom solutions.

Innovative material development
Developing and formulating materials unique and engaging in staging programs of development, Trelleborg Sealing Solutions is also skilled in the field of applied materials technology.

Sanitary gasket materials

<table>
<thead>
<tr>
<th>Gasket</th>
<th>Temperature Continuous Range</th>
<th>Pure Water Hot</th>
<th>Pure Water Ambient</th>
<th>Process Fluids Hot</th>
<th>Process Fluids Ambient</th>
<th>Process Fluids (32°F to &gt;212°F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bonded Envelope</td>
<td>-100°F to 350°F</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>PTFE/Stainless Steel</td>
<td>-100°F to 500°F</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>PTFE</td>
<td>-100°F to 500°F</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
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<tr>
<td>Silicone (platinum)</td>
<td>-40°F to 450°F</td>
<td>2</td>
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<td>2</td>
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<tr>
<td>FKM Fluoroelastomer</td>
<td>-30°F to 392°F</td>
<td>3</td>
<td>2</td>
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<td>EPDM (peroxide)</td>
<td>-30°F to 300°F</td>
<td>3</td>
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* Applications dependant
This table is a general guide to material selection. Please consult your local Trelleborg Sealing Solutions sales office for more information. Gasket life dependent upon time and temperature exposure.
## LOCAL CONTACTS

### EUROPE

<table>
<thead>
<tr>
<th>Country</th>
<th>City</th>
<th>Phone</th>
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<tbody>
<tr>
<td>Austria – Vienna</td>
<td>(Slovenia)</td>
<td>+43 (0) 1 406 47 33</td>
</tr>
<tr>
<td>Belgium – Dion-Valmont</td>
<td>(Luxembourg)</td>
<td>+32 (0) 10 22 57 50</td>
</tr>
<tr>
<td>Bulgaria – Sofia</td>
<td>(Azerbaijan, Belarus, Greece, Romania, Ukraine)</td>
<td>+359 (0) 2 969 95 99</td>
</tr>
<tr>
<td>Croatia – Zagreb</td>
<td>(Albania, Bosnia and Herzegovina, Macedonia, Serbia, Montenegro)</td>
<td>+385 (0) 1 24 56 387</td>
</tr>
<tr>
<td>Czech Republic – Rakovnik</td>
<td>(Slovakia)</td>
<td>+40 313 529 111</td>
</tr>
<tr>
<td>Denmark – Copenhagen</td>
<td></td>
<td>+45 48 22 80 80</td>
</tr>
<tr>
<td>Finland – Vantaa</td>
<td>(Estonia, Latvia)</td>
<td>+358 (0) 207 12 13 50</td>
</tr>
<tr>
<td>France – Maisons-Laffitte</td>
<td></td>
<td>+33 (0) 1 30 86 56 00</td>
</tr>
<tr>
<td>Germany – Stuttgart</td>
<td></td>
<td>+49 (0) 711 7864 0</td>
</tr>
<tr>
<td>Hungary – Budaörs</td>
<td></td>
<td>+36 (06) 23 50 21 21</td>
</tr>
<tr>
<td>Italy – Livorno</td>
<td></td>
<td>+39 0566 22 6111</td>
</tr>
<tr>
<td>The Netherlands – Rotterdam</td>
<td></td>
<td>+31 (0) 10 29 22 11</td>
</tr>
<tr>
<td>Norway – Oslo</td>
<td></td>
<td>+47 22 64 60 80</td>
</tr>
<tr>
<td>Poland – Warsaw</td>
<td>(Lithuania)</td>
<td>+48 (0) 22 863 30 11</td>
</tr>
<tr>
<td>Russia – Moscow</td>
<td></td>
<td>+7 495 627 57 22</td>
</tr>
<tr>
<td>Spain – Madrid</td>
<td>(Portugal)</td>
<td>+34 (0) 91 71057 30</td>
</tr>
<tr>
<td>Sweden – Jönköping</td>
<td></td>
<td>+46 (0) 36 34 15 00</td>
</tr>
<tr>
<td>Switzerland – Crissier</td>
<td></td>
<td>+41 (0) 21 631 41 11</td>
</tr>
<tr>
<td>Turkey – Istanbul</td>
<td></td>
<td>+90 216 569 73 00</td>
</tr>
<tr>
<td>United Kingdom – Solihull</td>
<td>(Eire, South Africa)</td>
<td>+44 (0) 121 744 1221</td>
</tr>
<tr>
<td>Aerospace Hub Europe, North</td>
<td></td>
<td>(UK and Nordic Countries)</td>
</tr>
<tr>
<td>Aerospace Hub Europe, South &amp; West</td>
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<td>(Continental Europe and Middle East)</td>
</tr>
<tr>
<td>Automotive Hub Europe</td>
<td></td>
<td>+33 (0) 1 30 86 56 00</td>
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### AMERICAS

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<tr>
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<th>Phone</th>
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<tbody>
<tr>
<td>Americas Regional</td>
<td>+1 260 749 9631</td>
</tr>
<tr>
<td>Brazil – São José dos Campos</td>
<td></td>
</tr>
<tr>
<td>Canada Central – Etobicoke, ON</td>
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<tr>
<td>Canada East – Montreal, QC</td>
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</tr>
<tr>
<td>Canada West – Langley, BC</td>
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</tr>
<tr>
<td>Mexico – Mexico City</td>
<td>+52 55 57 19 50 05</td>
</tr>
<tr>
<td>USA, Great Lakes - Fort Wayne, IN</td>
<td></td>
</tr>
<tr>
<td>USA, East - Mt. Juliet, TN</td>
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<tr>
<td>USA, Midwest - Schaumburg, IL</td>
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<td>USA, Northern California - Fresno, CA</td>
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<td>USA, Northwest - Portland, OR</td>
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<tr>
<td>USA, Southwest - Houston, TX</td>
<td></td>
</tr>
<tr>
<td>Malaysia - Kuala Lumpur</td>
<td>+60 (0) 3 9053 9266</td>
</tr>
<tr>
<td>Taiwan – Taichung</td>
<td>+886 4 2382 8886</td>
</tr>
<tr>
<td>Vietnam – Ho Chi Minh City</td>
<td></td>
</tr>
<tr>
<td>Singapore and all other countries in South East Asia, Australasia</td>
<td></td>
</tr>
<tr>
<td>Aerospace Hub Airframe</td>
<td>+1 303 469 1357</td>
</tr>
<tr>
<td>Aerospace Hub Distribution &amp; Engineering</td>
<td></td>
</tr>
<tr>
<td>Aerospace Hub East</td>
<td>+1 610 828 3209</td>
</tr>
<tr>
<td>Aerospace Hub West</td>
<td>+1 310 371 1025</td>
</tr>
<tr>
<td>Automotive Hub North America</td>
<td></td>
</tr>
<tr>
<td>Automotive Hub South America</td>
<td></td>
</tr>
<tr>
<td>Aerospace Hub China</td>
<td>+86 (0) 21 6145 1830</td>
</tr>
<tr>
<td>Aerospace Hub Singapore</td>
<td>+65 6 577 1778</td>
</tr>
<tr>
<td>Automotive Hub China</td>
<td>+86 (0) 21 6145 1830</td>
</tr>
<tr>
<td>Automotive Hub India</td>
<td>+91 (0) 80 3372 9200</td>
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</table>

### ASIA PACIFIC

<table>
<thead>
<tr>
<th>Region</th>
<th>Phone</th>
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<tbody>
<tr>
<td>Asia Pacific Regional</td>
<td>+65 6 577 1778</td>
</tr>
<tr>
<td>China – Hong Kong</td>
<td>+852 2366 9165</td>
</tr>
<tr>
<td>China – Shanghai</td>
<td>+86 (0) 21 6145 1830</td>
</tr>
<tr>
<td>India – Bangalore</td>
<td>+91 (0) 80 3372 9000</td>
</tr>
<tr>
<td>Japan – Tokyo</td>
<td>+81 (0) 3 5633 8008</td>
</tr>
<tr>
<td>Korea – Seoul</td>
<td>+82 (0) 2 761 3471</td>
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### AFRICA, CENTRAL ASIA AND MIDDLE EAST

<table>
<thead>
<tr>
<th>Region</th>
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<tr>
<td>Africa &amp; Iran (excluding South Africa (see UK))</td>
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</tr>
<tr>
<td>Central Asia (Armenia, Georgia, Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan)</td>
<td>+7 495 627 57 22</td>
</tr>
<tr>
<td>Middle East and Gulf Region</td>
<td></td>
</tr>
</tbody>
</table>

WWW.TSS.TRELLEBOR.COM
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.