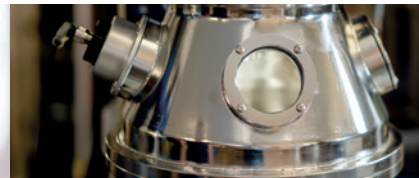


# Sealing Solutions for the Food and Pharmaceutical Industry



# Trygonal

## Sealing Solutions for the Food and Pharmaceutical Industry

- We are a sealing and plastic parts manufacturer
- We see ourselves as a partner to our customers
- We are independent, holistic and solution-oriented
- We are an international network company and we work world-wide
- We see our company culture like life: varied, complex and exciting
- We value greatly the individuality and the expertise of the staff
- We are committed to high professional ethics and integrity in all we do

All this creates a passionate, innovative and dynamic team to support your business.

We are an internationally active group of independent gasket manufacturers and plastics processors. Our group produces all types of seals and plastic mouldings such as O-rings, rubber mouldings, rubber-metal compounds, foam mouldings, semi-finished products and machines for machining seal production. State-of-the-art manufacturing techniques are used for this purpose.

### Food and pharmaceutical industry

Food and pharmaceutical products are key factors that contribute to human well-being and health. The manufacturing processes require a variety of solutions for materials and components and must meet national as well as international standards.

### Key components

For the production of food and beverages – similar to the pharmaceutical industry – seals and plastic components, such as guides and sliding bushings are a key component. Over four decades of sealing experience in the food and pharmaceutical industries distinguishes Trygonal as a developer and manufacturer of sealing and guide solutions. Old seals that no longer meet the current standards can, for example, be replaced by machined seals with the appropriate material pairing – suitable for the appropriate media. Reliable and durable compounds have already been developed for very abrasive and chemically aggressive media, for example.

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### Sealing and guiding solutions

- Hydraulic-pneumatic seals (piston/rod seals)
- Static seals
- Rotary seals
- Gaskets
- High pressure seals
- Large seals
- Miniature seals
- Special seals
- Guiding systems
- Backup rings
- Wipers

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### Materials

- Elastic and semi-elastic materials:
  - TPU (AU/EU), HPU: premium, diet
  - EPM, EPDM: diet, detec, spring
  - NBR, HNBR: diet, detec
  - FPM: diet, detec
  - MVQ: diet, detec
  - SBR & FFKM
- Hard plastics:
  - PTFE: natural, GF, Econol, Peek, Mica, POM, PA, PE, PP, PMMA, PET, PC, PSU, PPSU, PPS, PVDF
- Alternative plastics:
  - Flat gasket materials in various designs

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### Approved Standards

- QS-Certificates:
  - ISO 9001, ISO 14001
- Approvals:
  - FDA (21 CFR 177.1550 and 21 CFR 177.2600)
  - EU 1935/2004, KTW, DVGW, BfR,
  - 3-A Sanitary Standards, ACS, USP (Class VI), NSF, WRAS

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### Applications

Meat processing, milk refinement, beverage filling, confectionery and bakery products, fruit and vegetable pressing, oil and fat processing, milling and starch and starch production, coffee and tea processing machines, spice and sauce bottling, sugar processing, etc.

# Industries and their applications

Trygonal offers sealing and guiding solutions for a wide range of production machinery. Successful customer projects with tailor-made solutions have made us a leading supplier. Our strength is extensive knowledge of your requirements and conditions. Ask us!



## Food in general

- Canning
- Dosing and conveying systems
- Fittings and valve seals for conveyor systems
- Cooling units
- Pigging systems
- Steam ovens
- Fryers



## Pharmaceutical products and cosmetics

- Filling and dosing machines
- Tablet presses
- Laboratory centrifuges
- Powder dosing systems



## Beverage

- Filling plants from ethanol to honey
- Centrifuges
- Separators
- PET blow moulds
- Heat exchangers
- Beer filtration



## Milk and dairy products

- Milk separators
- Milk homogenisers
- Acidified milk production
- Cheese presses
- Packaging machines
- Portioning and dosing machines
- Filling machines for quark, yoghurt, etc.



## Meat and sausage products

- Meat conveyor systems
- Smoking chambers
- Overpressure pasteurisers and sterilisers
- Gut brakes
- Cutter seals
- Bellows for vibration separation



## Baked goods

- Machines to produce baked goods
- Tunnel ovens
- Kneading machines
- Dough scrapers
- Suction cups for soft pastry
- Water mixing and dosing systems



## Confectionery

- Mills and agitators
- Conching machines
- Moulds for chocolate
- Chocolate scrapers
- Valve seals



## Packaging, plant maintenance

- Tube and can production
- Labelling for hot-printing machines
- Accessories for machines (rollers, guides, etc.)
- Separator
- Cleaning machines
- Stackers
- Scales

## Correct selection of materials

When selecting the material, several important selection criteria must be considered, such as the expected operating conditions, design requirements, approvals, standards and costs etc.

**Operating temperature**

- In which temperature range should the seal be used?
- What is the minimum and maximum temperature?
- Are there short-term peaks or continuous levels in these temperature ranges?

**Chemical resistance**

- Against which media must the seal function and be resistant?
- Are there any interactions, e.g. acids and alkalis?
- What are the temperatures of the media to be sealed?
- Are oils or greases used during assembly?

**Mechanical properties**

- How is the seal inserted? Is it a static seal, dynamic seal, or a non-static, dynamic seal?
- For dynamic seals:  
How high is the mechanical stress?
- Is the seal rarely, regularly or permanently moved?

**Engineering requirements**

- Component geometry with description
- Critical dimensions and tolerances
- Details of the desired service life
- Installation and assembly considerations

**Approvals**

- Which guidelines and approvals apply to the respective production process and must also be fulfilled by the sealing materials used?
- In addition to material requirements, does the material also have to adhere to hygienic design requirements?

**Costs**

- Cost in relation to value
- When selecting the materials for your components, the guiding principle should be "value-in-use"
- The overall evaluation should also take into account quality, service life as well as saved maintenance and servicing costs.

## Seals and sealing materials

Thanks to many years of experience, Trygonal can offer complete solutions:

- Standard O-rings, machined O-rings, FEP/PFA coated O-rings
- Standard seals made of suitable and approved materials
- Customised solutions

### Your advantages

- Longer service life
- Lower maintenance and life cycle costs

### Sealing materials and plastics

In our brochures you will find a wide range of matching materials and on our website you will find an overview of elastomers and the Media Resistance Guide to help you choose the right material. With this tool you have the possibility to check several media at the same time.

[trygonal.com/information/tools/media-resistance-guide](http://trygonal.com/information/tools/media-resistance-guide)

## Approvals/Certifications

The materials for O-rings and sealing profiles manufactured from them must meet high legal requirements.

Special material mixtures have also been developed for this purpose. Ask us!

Approvals	Description	Materials															
		CR	EPM/EPDM	FFKM	FPM	HNBR	IIR/CIIR	MFO	MVQ	NBR	NK	SBR	TPU (AU/EU)	PEEK	PTFE	TPE	UHMWPE
ACS	Drinking water in France		•														
BfR	Conformity for food in Germany		•														
DIN EN 681-1	Water supply and sewerage		•														
DVGW DIN EN 549	Gas operations																
DVGW W 270	Microorganisms in drinking water		•														
EU 1935/2004	Food in EU		•														
FDA	Medicines and food in USA		•														
KTW	Drinking water in Germany		•														
NSF 51	Food in USA		•														
NSF 61	Drinking water in USA		•														
USP Class VI	Pharmacopeia, USA		•														
WRAS	Drinking water in UK		•														

## Customer service and packaging

Customer service, comprehensive advice and technical support are our top priorities. From development through the production process to the desired packaging, we rely on trusting cooperation with our customers.

- On request, application-specific material mixtures, types of metal and refinements (e.g. surface treatment) are available
- An extensive range of standard articles are available on stock

- Technical advice for individual problem solving and moulded part design
- Construction and material-appropriate design of the component
- Prototype production and product optimisation

### On-site training – a helpful option

We offer training for your staff on the correct handling and use of seals as well as on assembly and storage.

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 Seals
 

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 Customised and Large Sealing Solutions
 

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 O-rings and Static Sealing Profiles
 

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 Materials and Semi-Finished Products
 

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 Machines, Software and Tools
 

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 Rubber Parts and Membranes
 

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 Rubber-Metal and Rubber-Plastic Components
 

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 Vibration Technology and Gripper Rails
 

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 Plastic Turned and Milled Parts,  
 3D Printer Parts
 

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 Form and Foam Parts
 

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**Germany**


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**Trygonal Group GmbH**

 Neue Heimat 22  
 D-74343 Sachsenheim-Ochsenbach

Phone: +49 (0) 7046-9610-0

Fax: +49 (0) 7046-9610-33

info@trygonal.com

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**Switzerland**


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**Trygonal Schweiz AG**

 St. Dionysstrasse 31  
 CH-8645 Jona

Phone: +41 (0) 55 212 45 00

Fax: +41 (0) 55 212 10 04

jona@trygonal.com

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**Austria**


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**Trygonal GmbH**

 Industriering 5  
 A-9020 Klagenfurt

Phone: +43 (0) 463/310095

Fax: +43 (0) 463/310095-5

klagenfurt@trygonal.com

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**France**


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**Trygonal France SAS**

 ZI de Moissy Cramayel  
 555 Avenue Blaise Pascal  
 F-77550 Moissy Cramayel

Phone: +33 (1) 64 05 48 49

france@trygonal.com

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**Trygonal  
 Kunststoffinnovationen GmbH**

 Tragösser Straße 53  
 A-8600 Bruck an der Mur

Phone: +43 (0) 3862 27722-0

Fax: +43 (0) 3862 27722-27

office@trygonal.com

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**Spain**


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**Trygonal Iberia SL**

 Polígono Borda Berri, nº 13 Módulo C4  
 E-20140 Andoain (Gipuzkoa)

Phone: +34 943 303 900

Fax: +34 943 303 953

iberia@trygonal.com

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**Trygonal ATYP SERVICE**

 Beethoven Straße 1  
 A-2231 Strasshof

Phone: +43 (0) 2287/22235

atyp@atyp.com

 Your Contact