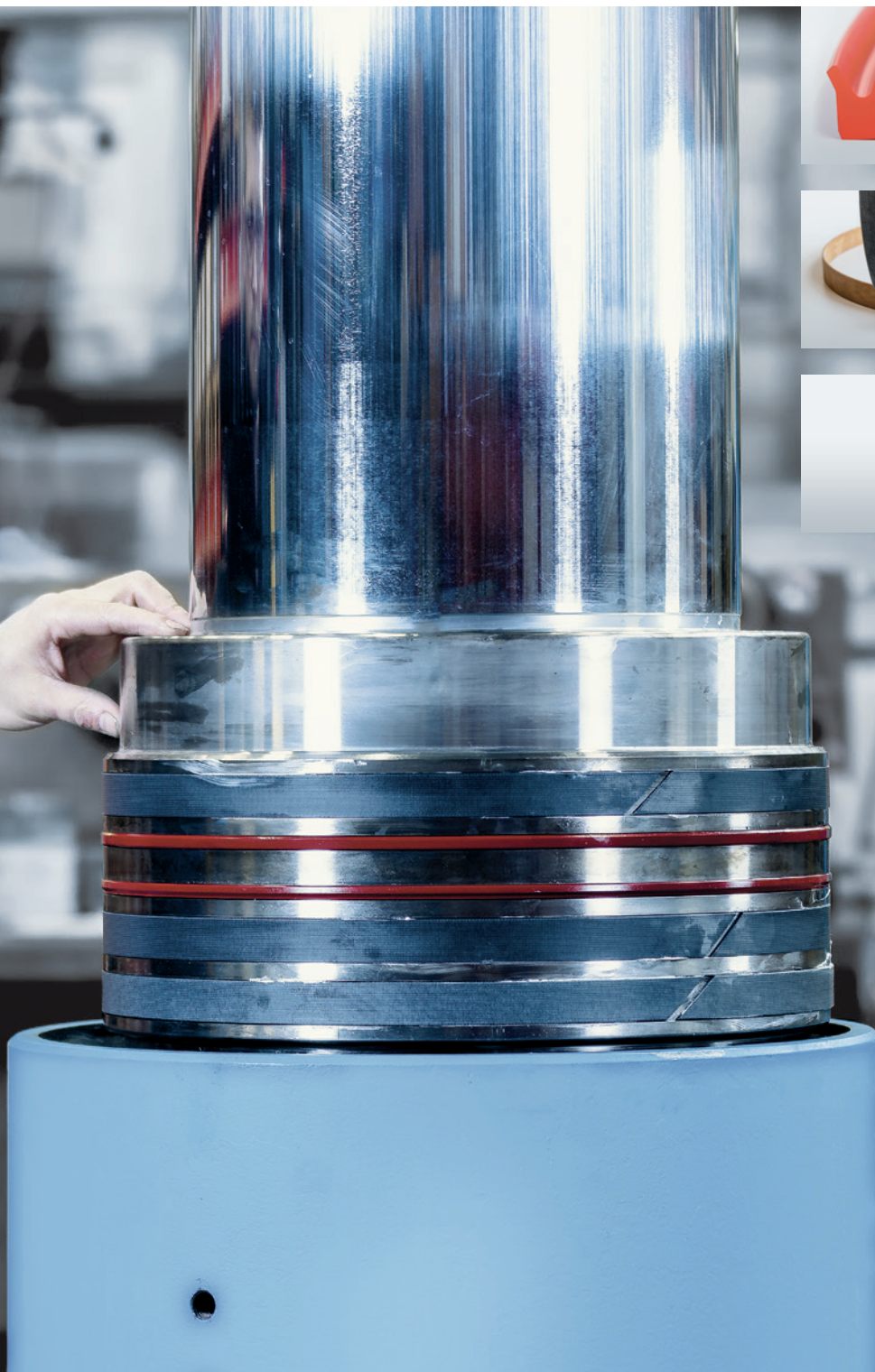


# Sealing solutions for fluid technology in hydraulics and pneumatics



# Trygonal

## Sealing solutions for fluid technology

- 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 international group of independent seal manufacturers and plastics processors. All types of seals and plastic moulded parts such as O-rings, rubber moulded parts, rubber-metal compounds, foam moulded parts, semi-finished products and machines for machining seal production are manufactured in our group. In addition, the most modern production techniques are used.

### Fluid power

Trygonal offers a wide range of sealing solutions for fluid technology components.

Together with our customers, we develop and manufacture seals for individual application requirements and advise them on designs, dimensions and surface qualities.

### Key components

For hydraulic and pneumatic product components, seals and plastic parts such as guides and sliding bushes are key parts. More than 4 decades of sealing experience distinguishes Trygonal as a leading developer and manufacturer of sealing and guiding solutions.

Trygonal seals meet critical requirements and are used in a variety of ways; such as in presses, construction and production machines. The hydraulic seals not only have to prevent leakage, but also withstand high pressure and extremely high and low temperatures. Reliable and durable materials have also been developed for very abrasive and chemically aggressive media.

### Sealing and guiding solutions

Hydraulic-pneumatic seals (piston/rod seals)  
 Static seals  
 Rotary seals  
 Flat seals  
 High-pressure seals  
 Large seals  
 Miniature seals  
 Special seals  
 Guide systems  
 Backup rings  
 Wiper Seals

### Materials

Elastic and semi-elastic materials:  
 - TPU (AU/EU), HPU: premium, diet  
 - EPM, EPDM: diet, detect, spring  
 - NBR, HNBR: diet, detect  
 - FPM: diet, detect  
 - MVQ: diet, detect  
 - 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

### Norms and standards

QS certificates:  
 ISO9001, ISO14001  
 Standards:  
 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

### Applications

Hydraulic power packs and compressors, cylinders, hydraulic & pneumatic rotary and swivel drives, motors and pumps, valves and controls, fittings and couplings, pressure accumulators, filters and water separators, other special applications

# Applications

Trygonal offers sealing and guiding solutions for a variety of production machines. Successfully completed customer projects with tailor-made solutions have made us a leading provider in our industry. Our extensive knowledge of the requirements for all conditions is our strength.

Contact us, we look forward to help you.



## Hydraulic aggregates and compressors

- Hydraulic motors and pumps
- Pneumatic motors
- Piston compressors
- Screw compressors
- Rotary compressors
- Compressed air treatment



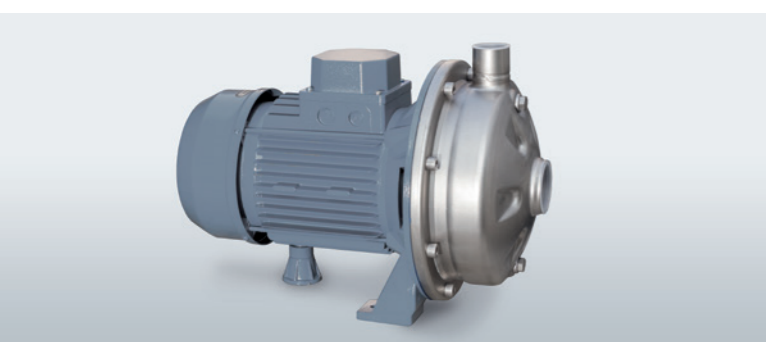
## Hydraulic and pneumatic cylinders

- Excavator bucket pickups
- Attachments for forklifts and excavators
- Telescopic cylinders
- Linear drives
- Steering cylinder
- Cushioning systems
- Pressure intensifier



## Rotary and part-turn drives

- Hydraulic blocks
- Control systems
- Lubricant distributors in machine tools
- Rotary unions on lathes
- Extrusion systems on filament winding machines
- Swivel joints



## Engines and pumps

- Rotary pumps
- Diaphragm pumps
- Pressure and vacuum pumps
- Centrifugal pumps
- Piston pumps



## Valves and controls

- Directly controlled valves
- Proportional valves
- Sandwich plate valves
- Control valves



## Fittings and couplings

- Flanges
- Fittings: flaps valves, taps
- Shut-off fittings and valves
- Non-return valves
- Ball valves
- Seat valves
- Pressure relief valves



## Accumulators

- Hydraulic accumulators
- Pneumatic accumulators
- Piston accumulators
- Diaphragm accumulators



## Filters and separators

- Mechanical filters
- Chemical filters
- Water-oil separators
- Lubricators



## Special applications

- High pressure cleaning machines
- Fans
- Heating and cooking units
- Pressure and temperature sensors
- Pressure intensifiers/reducers
- Shock absorbers
- Assembly tools

## Correct selection of the sealing profile and material

When selecting the seal and the material, a number of important selection criteria must be considered, such as the operating conditions to be expected, the design requirements, approvals, standards and costs.

### Operating temperature



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

### Chemical resistance



- Against which medium must the seal be resistant?
- Are there any interactions, such as acids and alkalis?
- Are oils or greases used during assembly?
- Which cleaning agents are used?
- Are brake fluids (DOT4) used?

### Mechanical properties



- How will the seal be used?
- Is it a stationary, static seal or a non-stationary, dynamic one?
- For dynamic seals: How high is the mechanical stress?
- Is the seal rarely, regularly or constantly moved?

### Engineering requirements



- Component geometry with description
- Critical dimensions and tolerances
- Lifespan specification
- Installation and assembly considerations such as the cavity surface finish

### Approvals



- Which guidelines and approvals apply to the respective production process and must the sealing materials used also comply with them?
- What special approval does the sealing system have to meet?

### Costs



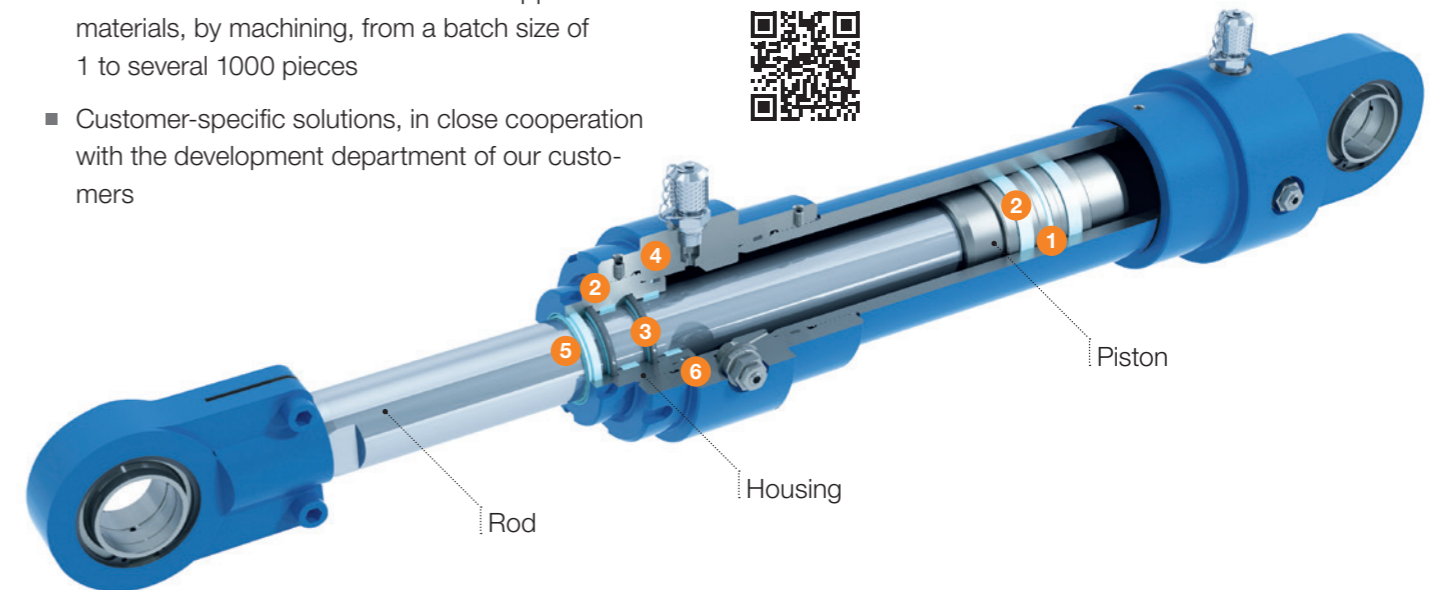
- The design from the prototype to series production from a single source
- When selecting the materials for your components, the guiding principle should be "value-in-use".
- The overall assessment should also take into account the quality, lifespan and any saved maintenance and service costs.

## Seals and sealing materials

Trygonal offers complete sealing solutions:

- Standard O-Rings, Machined O-Rings, FEP, PFA Encapsulated O-Rings
- Standard seals made of suitable and approved materials, by machining, from a batch size of 1 to several 1000 pieces
- Customer-specific solutions, in close cooperation with the development department of our customers

- Seals profile, application and material overview: You will find a large number of suitable seal profile and materials in our brochures:



#### 1 Piston seal

Piston seals separate the chambers in the cylinder and are responsible for the back and forth movement in the cylinder. Piston seals are dynamic on the outside.



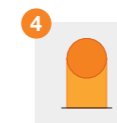
#### 2 Guide ring

Guide rings prevent the piston and rods from tilting and relieve pressure on the seals.



#### 3 Rod seal

Rod seals prevent gases and liquids from escaping from the cylinder. Rod seals are dynamic on the inside.



#### 4 O-rings

O-rings are used statically and prevent the escape of gases and liquids.



#### 5 Wipers

Wipers prevent the ingress of dirt particles and protect rod and piston seals and guides.



#### 6 Backup ring

Backup rings prevent seals from extruding into the housing gap. This means larger gaps can be sealed.

## Customer Service and Production

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

- Technical advice for individual problem solving and molded part design
- Construction and material-specific design of the component
- Prototyping and product optimisation

- Application-related material mixtures, metal types, refinements (e.g. surface treatment) are available on request according to your requirements and drawings
- An extensive range of standard items is always available

#### On-site training – a helpful option

We offer training for your staff in the correct use and handling of seals as well as installation 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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