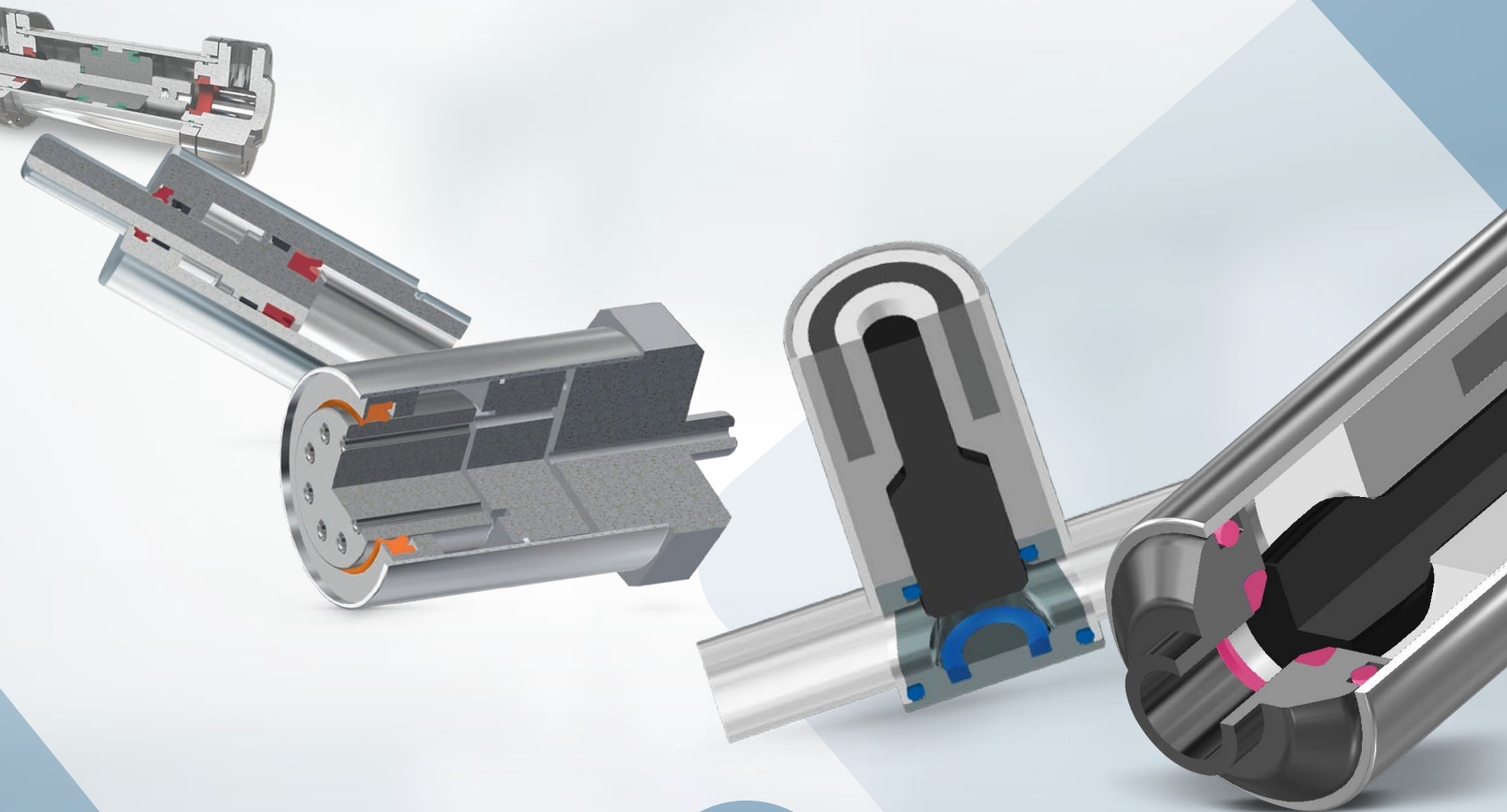


# FiPur<sup>®</sup>

## High-Performance Polyurethane

### Applications



Hydraulic and Gas Spring Applications  
Pneumatics • Valve Technology • Food Industry



## Over 50 Years of Experience

Quality for over 50 years! Continuous innovation and outstanding customer support form the foundation of the success on which the Fietz Group, as a family-run business, relies.

## ≈ 1,000 million individual parts per year

Fietz's production capabilities are unmatched. Custom solutions made from a variety of plastics are what set Fietz apart.

## Over 500 customers worldwide

The Fietz Group supplies industry leaders, suppliers, and innovation drivers worldwide.

## 14.500 m<sup>2</sup> Production area

The Fietz Group is a group of three companies in the plastics processing industry with locations in Burscheid and Radevormwald.



# The Fietz Group

## Plastics Technology at Its Best

Working closely with our customers, the Fietz Group develops and manufactures high-quality technical products. The plastic material is specifically tailored to the intended application of each product. Using mechanical machining and modern injection molding processes, we can produce virtually any type of product.

When designing and optimizing technical functional parts, we always focus on our customers' individual requirements and the highest quality standards. Customer components are manufactured using state-of-the-art machinery and the latest technological advancements.

We offer flexible production – from prototypes and small batches to cost-effective mass production.

### **The customer is our focus**

In this traditional family-owned business, great importance is placed on long-term partnerships. The foundation for this strong partnership has been certified at Fietz in accordance with the Code of Conduct of the German Plastics Processing Industry Association.

Jointly defined values and management guidelines – such as fairness toward all business partners, integrity, and reliability – are set forth in writing in our guidelines and are put into practice every day.

### **Fietz products stand for quality**

The Fietz Group places great importance on continuous in-house production control. To this end, it operates a certified quality and environmental management system.

### **Sustainability**

The Fietz Group is committed to fulfilling its social, environmental and economic responsibilities so that future generations can enjoy a standard of living at least as good as ours today. Therefore, a conscious approach to the environment and its protection, as well as respectful cooperation, are key objectives firmly anchored in the Fietz Group's mission statement. For generations, the Fietz Group has been deeply rooted in the region and its commitment extends far beyond the mere manufacturing process.



# Made in Germany

From FiPur® polymerization to the finished sealing – everything under one roof.

In order to provide the maximum flexibility, know-how and costefficiency for our customers, Fietz made sure that the entire value chain is in own hands.

From the polymerisation of the highperformance polyurethane to the tool, which is produced in the own tool shop, from metal-cutting rapidprototyping to series production using injection moulding – all processes are under constant control.

The finishing of the extremely sharp sealing lips for dynamic seals as well as the 100% visual checks with highly efficient automated testing machines close the loop.

All processes are controlled so that Fietz remain highly flexible and reduce lead times in a way to meet customer demands.

Thanks to the high degree of vertical integration, Fietz is virtually independent of external suppliers or trade restrictions.



**Incoming goods**  
FiPur® Raw materials

**Polymerization FiPur®**

**Quality control**  
Batch approval

**Manufacturing of seals using the injection molding process**

or

**Rapid Prototyping**  
Small-series production

**Automated 100% check**

**Warehousing**

**Packaging and shipping**

## FiPur® Materials

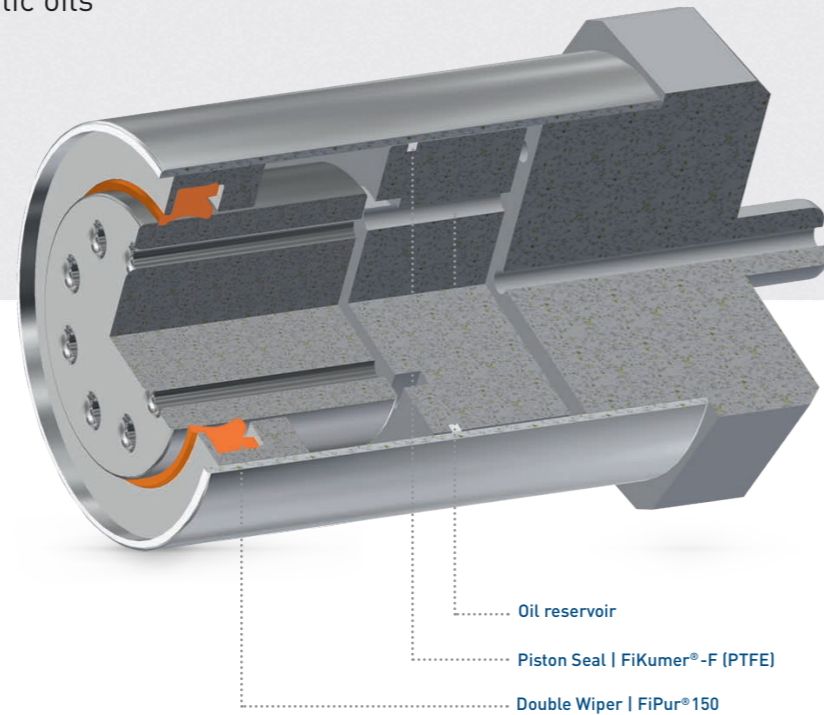
Material	Hardness	Temperature range	Special features	Applications
<b>Polyurethan</b>				
<b>FiPur 111</b>	93 Shore A 	ASTM D 1329 TR10 = -53,0°C TR70 = -28,3°C	Exceptional cold flexibility without compromising wear resistance	Mobile hydraulic, gas spring and automotive applications, as well as other custom applications, e.g., in gas fittings
<b>FiPur 112</b>	84 Shore A 	ASTM D 1329 TR10 = -57°C TR70 = -46,8°C	Soft material for low temperatures	Pneumatics, Electronics, Special Applications
<b>FiPur 150</b>	55 Shore D	-30°C to 110°C	Excellent compatibility with mineral oils (HL, HLP, HLPD, etc.), excellent resistance to extrusion for sealing elements subjected to high stress; good recovery properties despite high hardness, sealing rings can be installed using a snap-fit assembly	Piston seals and wiper elements in hydraulic and gas spring technology, double wipers for valve technology
<b>FiPur 180</b>	82 Shore D	-40°C to 90°C	Excellent dynamic performance, outstanding wear resistance combined with excellent dynamic sealing properties, resulting in very low leakage rates and very low coefficients of friction	in pneumatic cylinders and valves with a service life of over 10,000 km
<b>FiPur 190</b>	90 Shore A 	-35°C to 110°C	Very high wear resistance combined with good low-temperature performance, good resistance to mineral oils and greases	Pneumatic applications, particularly for lip seals in miniature pneumatic cylinders, low-pressure hydraulics, and gas springs
<b>FiPur 200</b>	94 Shore A 	-30°C to 110°C	High resistance to hydrolyzing media; resistant to alkaline greases in pneumatic cylinders as well as to alkaline and acidic cleaners	for hydraulic and gas spring applications involving critical media such as biofluids, synthetic esters, and water-based fluids such as HFA, HFB, etc.
<b>FiPur 201</b>	94 Shore A 	-25°C to 110°C	The material is abrasion- and hydrolysis-resistant, as well as resistant to USDA H1-grade greases and acidic or alkaline cleaners. It is suitable for seals in injection molding as well as for prototypes and small series in turning and meets the requirements of LFGB, (EC) 1935/2004, (EC) 10/2011, FDA 21 CFR 177.2600 e) and f), and 3A Sanitary Standard Class 3.	Food industry



# Hydraulic Valves

FiPur® 150 | FiKumer®-F

- Reliable sealing system consisting Piston Seal, Rod Seal, Wiper, Wear Ring and static O-ring sealing
- Tribological optimization for the dynamic sealing elements
- Pressure: > 500 bar
- Temperature: -30°C to +110°C
- Media: Specified established hydraulic oils (HLP / HLPD / HEES)



**Common design**  
Standard hydraulic elements

- Disadvantages**
- High friction
  - Limited media resistance
  - High wear of the dynamic seals and wiping elements
  - Limited service life

**New design**

Fietz wiper element for hydraulic valves

- Customized wipers for permanent and reliable use in hydraulic valves
- Tailor-made FiPur® materials: high wear resistance FiPur® 150

**User`s benefit**

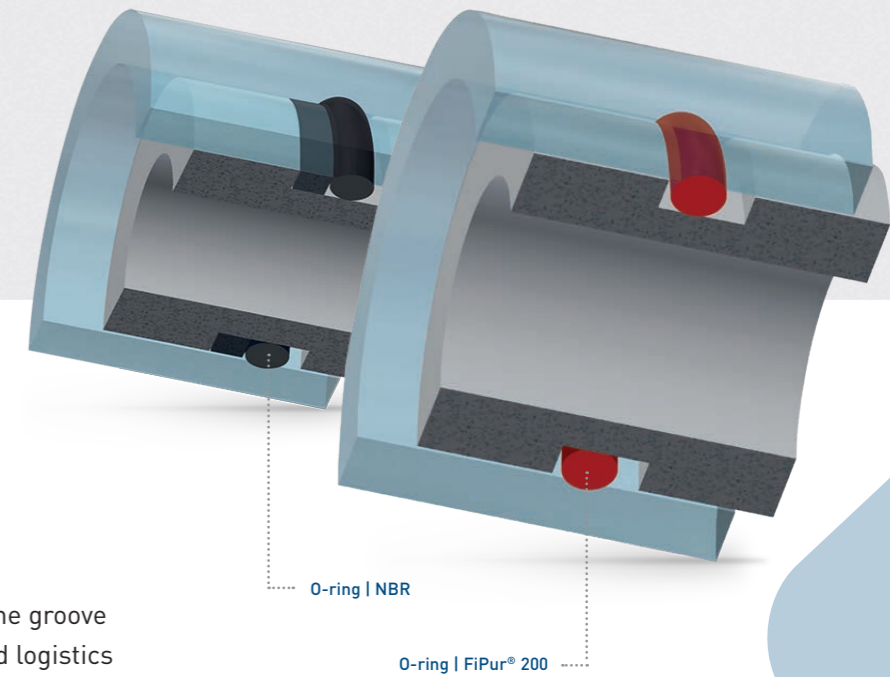
- Reliable and robust function of the hydraulic valve
- Reduced operating cost due to extension of maintenance cycles



# Industrial water pumps

FiPur® 200

- High-pressure plunger seal
- Pressure: > 500 bar
- Temperature: > 0°C to +80°C
- Media: Water and cleaning additives



**Common design**  
NBR O-ring with Back-up ring

- Disadvantages**
- Possible improper assembly location of the required back-up ring
  - Elastomer O-ring could be extruded from the groove
  - Two components results in higher costs and logistics
  - High wear of the elastomer O-ring

**New design**

FiPur® O-ring, 12 x 2 in FiPur® 200, one-piece

**User`s benefit**

- Safe solution for all permissible temperatures and media
- Cost savings through one-piece solution
- Reduced operating cost due to extension of maintenance cycles





# Manifold plates and industrial gas springs

FiPur® 200 | FiMasol®

- Reliable sealing system consisting of Rod Seal, Double Wiper, Wear Ring and Piston Seal
- Pressure: > 600 bar
- Temperature: Room temperature +110°C
- Media: High additive packaged oils, cooling lubrications



**Common design**  
Standard hydraulic elements

- Disadvantages**
- High friction
  - Limited media resistance
  - High wear and extrusion of the dynamic seals
  - Destruction of the guide rings due to extreme radial forces
  - Destruction of the wiping function due to hydrolysis

**New design**

Fietz sealing systems for manifold plates and gas springs

- Optimized design of the seal and wiper geometry for permanent use in gas springs
- Tailor-made FiPur® materials and wear rings made of robust PEEK

**User's benefit**

- Reliable sealing system for the specified application temperatures and media
- Reduced Operating Cost due to extension of maintenance cycles
- Fulfilment of all necessary regulatory and safety requirements



# Adjustable gas springs

FiPur® 200 | FiKumer®-F

- Reliable sealing system consisting of Piston Seal, Rod Seal, Wiper, Wear Ring and O-ring
- Pressure: > 400 bar
- Temperature: > -25°C to +110°C
- Media: High additive packaged oils
- Resistance to compressed nitrogen

**Common design**  
Standard hydraulic Elements

- Disadvantages**
- High friction values
  - Limited media resistance
  - High wear and extrusion for the dynamic seals
  - Increased leakage at low temperatures

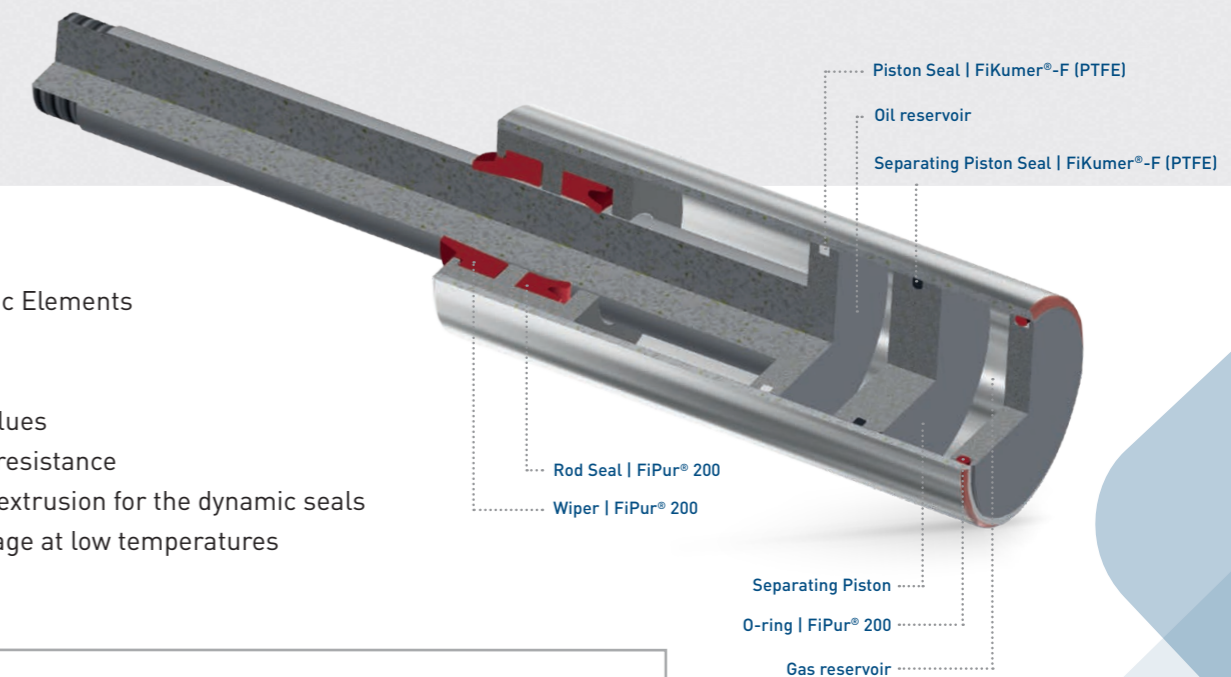
**New design**

Fietz sealing systems for adjustable gas springs

- special customized wear rings, seals and wipers for permanent and reliable use
- tailor-made material FiPur® 200

**User's benefit**

- Reliable sealing system for wide range of application temperatures and media
- Reduced operating cost extension of maintenance cycles

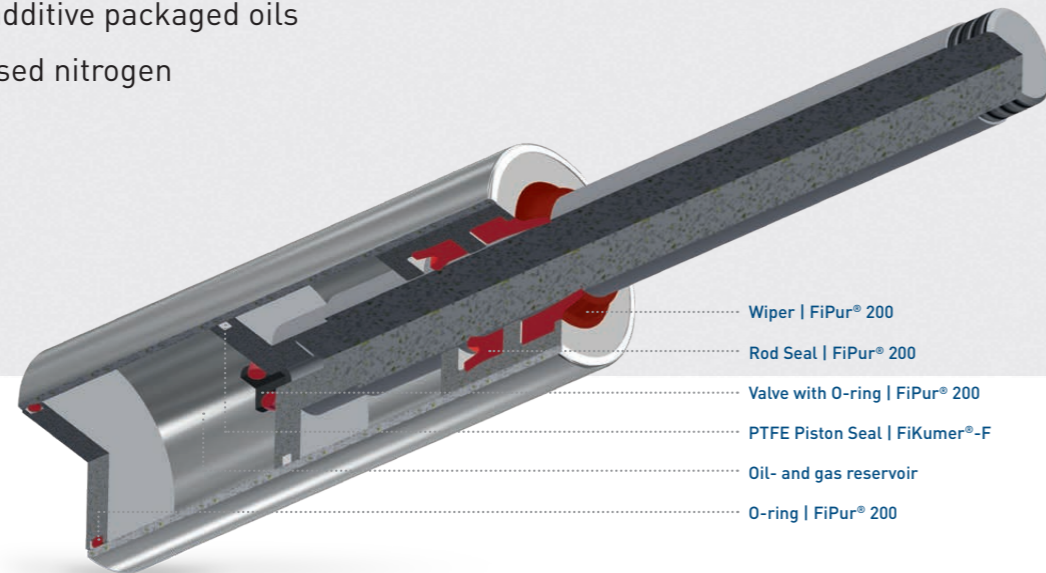




# Blockable gas springs

FiPur® 200 | FiKumer®-F

- Reliable sealing system consisting Piston Seal, Rod Seal, Wiper, Wear Ring and O-ring
- Pressure: > 400 bar
- Temperature: > -25°C to +110°C
- Media: High additive packaged oils
- Resistance to compressed nitrogen



**Common design**  
Standard hydraulic elements

- Disadvantages**
- High friction values
  - Limited media resistance
  - High wear and extrusion for the dynamic seals
  - Increased leakage at low temperatures
  - Destruction of the wiper due to hydrolysis if commodity PU materials are in use

- New design**  
Fietz sealing systems for blockable gas springs
- Special designed wear rings, seals and wipers for permanent and reliable use
  - Tailor-made material FiPur® 200
  - Mini O-ring solution made of FiPur® 200 for the valve

- User's benefit**
- Reliable sealing system for specified application temperatures and media
  - Reduced operating cost due to extension of maintenance cycles

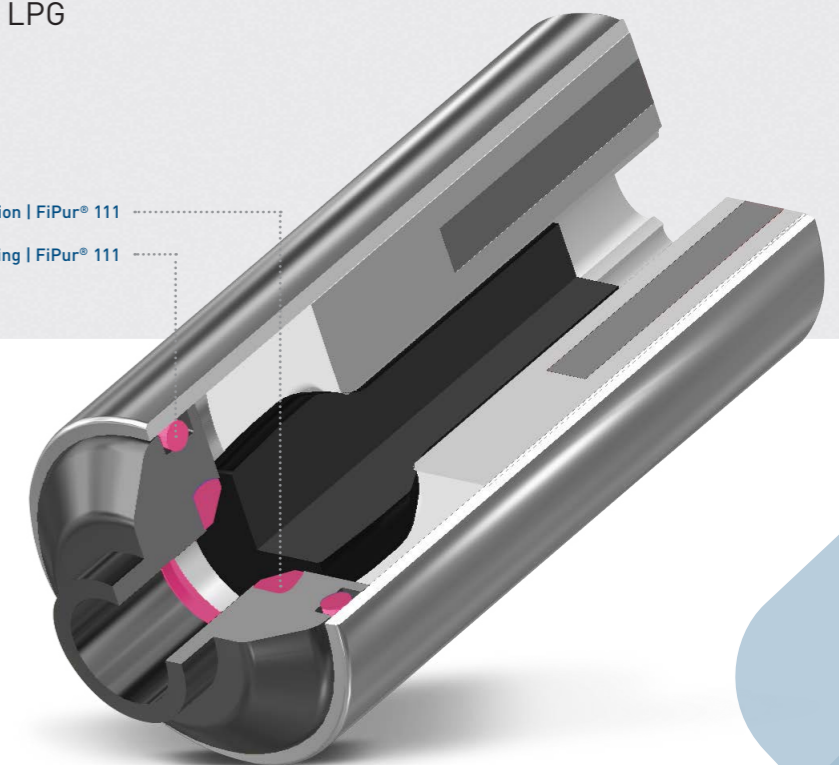


# Gas-Fittings, LPG, CNG and Hydrogen Tanks

FiPur® 111

- Tough and gastight seal for valves and couplings
- Pressure: LPG 14 bar, CNG 250 bar, up to 700 bar for hydrogen
- Temperature: -50° to 80°C
- Resistant against Hydrogen, CNG and LPG
- Low permeability

Customized sealing solution | FiPur® 111  
O-ring | FiPur® 111



**Common design**  
O-ring with Back up Ring

- Disadvantages**
- Larger installation spaces for combination with Back Up Ring
  - Higher permeability of gas through the use of elastomers
  - Latent risk of fault caused by explosive decompression
  - Mechanical damages caused by coupling processes

- New design**
- Robust FiPur® O-ring or Formed Part
  - Tailor made low-temperature TPU (TR10 - 50°C)

- User's benefit**
- Reliable and durable sealing solution
  - Outstanding flexibility at low temperatures

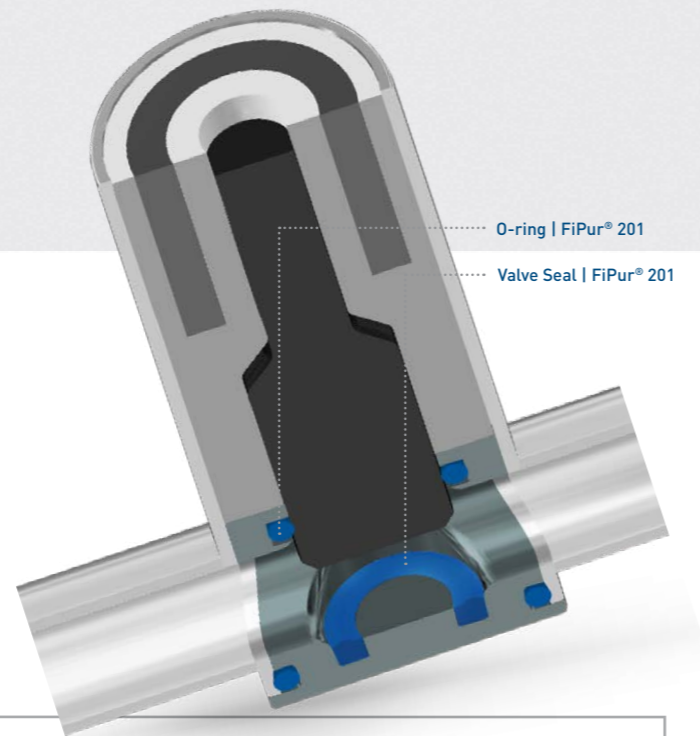




# Process control valves for the food industry

## FiPur® 201

- Reliable sealing system consisting of valve seals and O-rings
- Maximum pressure 200 bar
- Temperature >15°C to + 110°C
- Media compatibility: milk, beer, spirits, wine, juice, pastes, cleaning fluids and disinfectants
- Greases in alignment with USDA-H1



**Common design**  
Elastomer seals

**Disadvantages**

- High friction
- Limited media resistances
- Short maintenance intervals, higher wear
- Risk of damage from assembly

**New design**

Process control valves for the food industry

- Optimized sealing geometry tailor made for long-term used shut off valves
- Lower friction
- Tailor made for food contact applications - FiPur® 201 is approved according to LFGB, (EG) 1935/2004, (EG) 10/2011, FDA 21 CFR 177.2600 e) und f) and 3A Sanitary Standard Class 3

**Customer benefit**

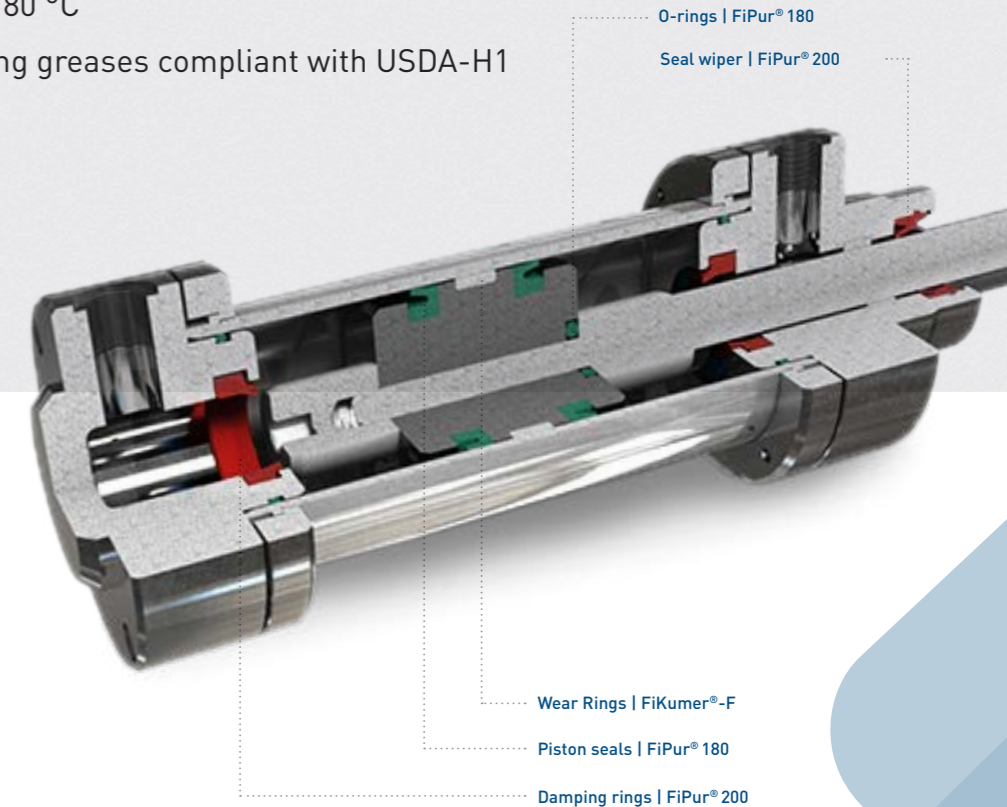
- Reliable sealing system for any emerging temperatures and media
- Permanent resistance in USDA-H1 based lubricants
- Low wear, higher reliability
- Good assembly behaviour, easy snap-in into the installation grooves
- No contamination risk due to the extensive tested material for food simulants



# Sealing products for pneumatics

## FiPur® 180 | FiPur® 200 | FiKumer®-F

- Coordinated sealing system consisting of scrapers, piston seals, guide bands, and damping rings
- Temperature range: -50 °C to 80 °C
- Media: Lubricating greases compliant with USDA-H1
- Wear-resistant



**Common design**  
NBR Sealing Elements

**Disadvantages**

- Short service life at high speeds
- Tearing under load
- Crevice extrusion

**New Solution**

Fietz Sealing Systems made of FiPur® High-Performance Polyurethane

- Application-specific seal geometries
- Special materials for standard, cryogenic or food-grade applications

**Customer Benefits**

- A single supplier for the complete sealing system
- Coordinated sealing elements
- Longer service life
- Higher mechanical strength



Co-Engineering • Sealing systems • Precision plastics

# Fietz Thermoplast GmbH

High Precision Polymer Solutions



## Interested?

Our team of **application engineering and materials experts** looks forward to hearing from you and assisting you with:

- Application consulting
- Seal design
- Prototypes
- Project management
- Material design
- Series production

[sales-thermoplast@fietz.com](mailto:sales-thermoplast@fietz.com)



**FiPur**<sup>®</sup>

High-Performance  
Polyurethane



**FiMasol**<sup>®</sup>

High-Performance  
Technical Polymers



**FiKumer**<sup>®</sup>

High-Performance  
Elastomers

[www.fietz.com](http://www.fietz.com)