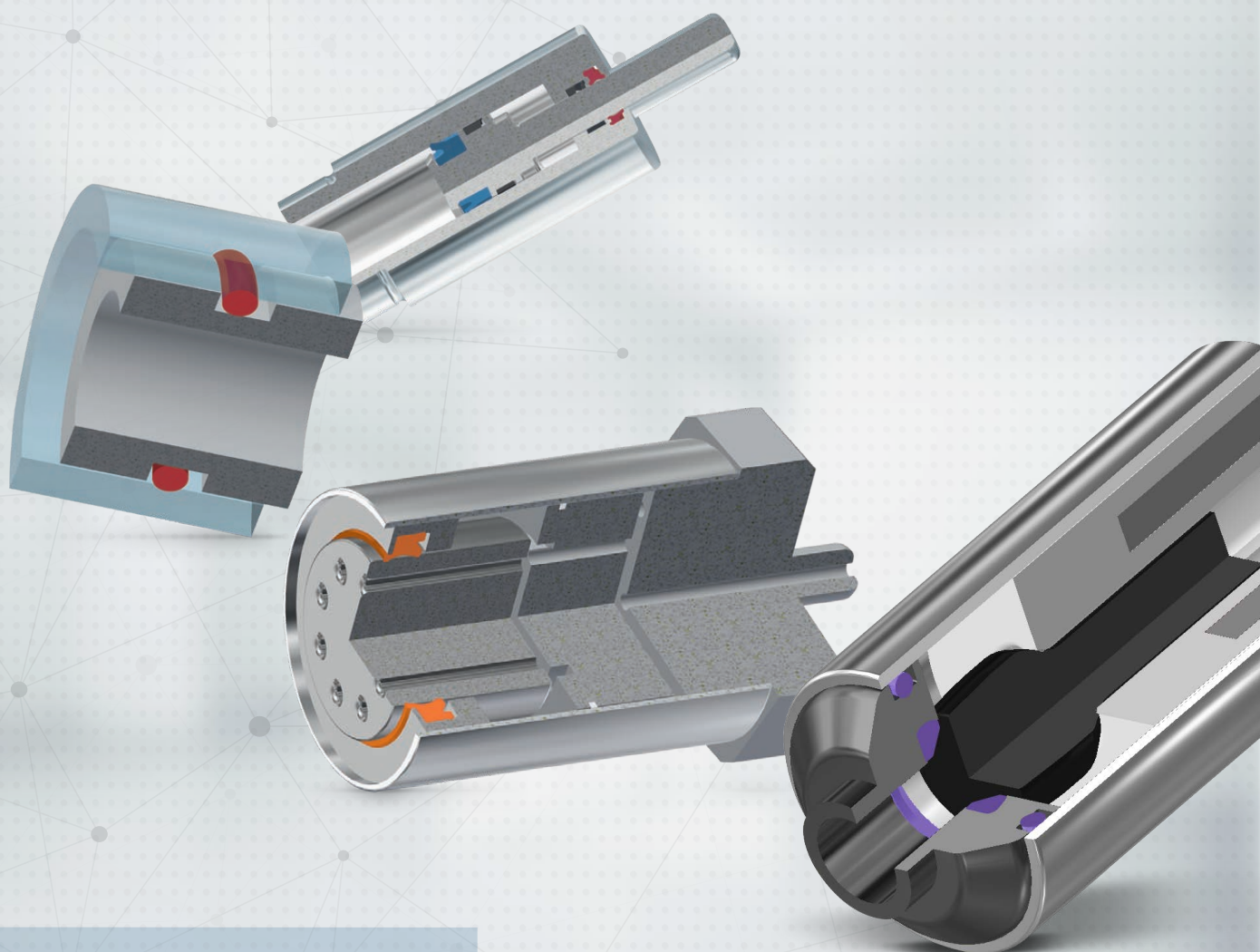


FiPur®
Fietz Thermoplast GmbH

High-Performance Polyurethane FiPur® Applications



VIDEO
[Sealings for hydraulics
resilient and wear resistant](#)

FiPur® is a registered trademark of Fietz Group

for hydraulics · mobile hydraulics · pneumatics · power
transmission · gas springs · industrial applications

www.fipur.de

High **Versatility**



Mobile Hydraulics

Pneumatics

Gas Springs

Industry

Piston Seals



Rod Seals



Valve Seals



Seal/Wiper Ring Profiles



Wipers



Special Seals



Cushioning Rings



O-Rings



Back-Up Rings



Guiding Rings





Diaphragms




Multifunctional Solutions




 FiPur® 100


 FiPur® 105

 FiPur® 110


 FiPur® 150


 FiPur® 180

 FiPur® 190

 FiPur® 200

 PTFE

 EP Engineering Plastics

 S Special Materials



Materials and Development

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Materials

Excellent basic properties for FiPur®

- High abrasion resistance, lowest wear values
- Outstanding pressure resistance (up to 400 bar)
- Very low permanent deformation
- Good dynamic properties: higher safety against leakage
- Sustainable solutions: by reducing maintenance costs, improved environmental protection and more favourable plant availability
- FiPur® materials are tailor-made for optimal installation conditions
- FiPur® polyurethane seals have the best prerequisites for problem-free snapping into the given installation spaces



FiPur® – High-Performance in many ways

For the optimal design of the individual products, it is necessary to use or develop the right material with the properties specified for the application.

Because the synthesis of this TPU is carried out entirely at Fietz, the structure and property profile can be precisely controlled.

FiPur® Technical Center – the crucial difference

Tailor made High-Performance TPUs are developed and manufactured in the FiPur Technical Center. Adjacent to the series production, there is a development laboratory where new materials are created in small-scale laboratory reactors. Individual material solutions to support customers with unique requirements are made here as well.

Material Laboratory – Competence in material durability

In addition to comprehensive physical property profiles, we deter-

mine both the thermo-mechanical and the thermo-caloric properties.

Resistance in all market-relevant media such as hydraulic fluids, lubricating greases, cleaning agents and process fluids can be analyzed. Using different measuring stations, the chemical stability of polyurethanes can be evaluated in a meaningful way.

In total, this results in comprehensive, precisely documented material property profiles, which are indispensable as a basis for meeting customer requirements.

FiPur® meets the requirements

- WEEE (Waste Electrical and Electronic Equipment 2012/19/EU)
- RoHS EC Directive 2011/65/EU
- GADSL (Global Automotive Declarable Substance List)
- LABS-free on request



**FiPur®
100** *

- Hardness 94 Shore A
- Tailored to very low swellings in mineral oils
- Temperature range from -30 °C to 110 °C
- Suitable for mobile hydraulic, pneumatic and other applications

**also available as reduced friction version*



**FiPur®
105**

- Hardness 94 Shore A
- Tailored to very low swellings in mineral oils
- Temperature range from -30 °C to 110 °C
- Applications: Wipers for hydraulics



**FiPur®
110**

- Hardness 94 Shore A
- Outstanding deep temperature flexibility without reduction in wear behaviour
- Temperature range from -50 °C to 110 °C
- Suitable for mobile hydraulic, gas springs or automotive applications



**FiPur®
150**

- Hard TPU material (Hardness 55 Shore D)
- Excellent compatibility in mineral oils (HL, HLP, HLPD etc.)
- Temperature range from -30 °C to 110 °C
- Outstanding extrusion resistance by high pressure impact of the sealing elements
- Good resilience, despite high degree of hardness, the ring can be snap-fit assembled
- Applications as piston seals and wiper elements in element in hydraulic and gas spring technology



**FiPur®
180**

- Soft polyurethane (82 Shore A) with very good dynamic
- Outstanding wear values with very good dynamic tightness, allow very low leakage
- Temperature range from -40 °C to 90 °C
- Due to the soft character low friction coefficients can be generated
- Applications primarily in pneumatic cylinders and valves



**FiPur®
190**

- Hardness 90 Shore
- Very high wear resistance and good cold behaviour
- Temperature range from -35 °C to 110 °C
- Good resistance to mineral oils and greases
- Developed for pneumatics and low-pressure hydraulics as well as for gas springs



**FiPur®
200**

- Hardness 94 Shore A
- Excellent stability under influence of hydrolysing media
- Temperature range from -30 °C to 110 °C
- Ideal solution when tropical humidity causes material degradation
- Very good stability when using alkaline thickened greases in pneumatic cylinders
- Good resistance in contact with alkaline / acidic cleaners
- Suitable for hydraulic and gas spring applications in the field of critical media such as bio-fluids, synthetic esters, water-based liquids like HFA, HFC etc ...



Made in Germany

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

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

From the polymerisation of the high-performance polyurethane to the tool, which is produced in the own tool shop, from metal-cutting rapid prototyping 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 our **high degree of vertical integration**, we are **virtually independent of external suppliers or trade restrictions**.

Toolmaking
Tool Design &
Manufacturing



Seal Production
Injection Molding
Process
(SPC-control)



Finishing
Cutting of seal lips
(SPC-control)



Automated
100% check



Warehousing



Packaging
and shipping



Incoming goods
Check of single
components



Polymerization FiPur®



Batch-Approval
according to
Specification



Rapid Prototyping
Small-series
production





Hydraulic Valves

FiPur® 150, PTFE

- 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

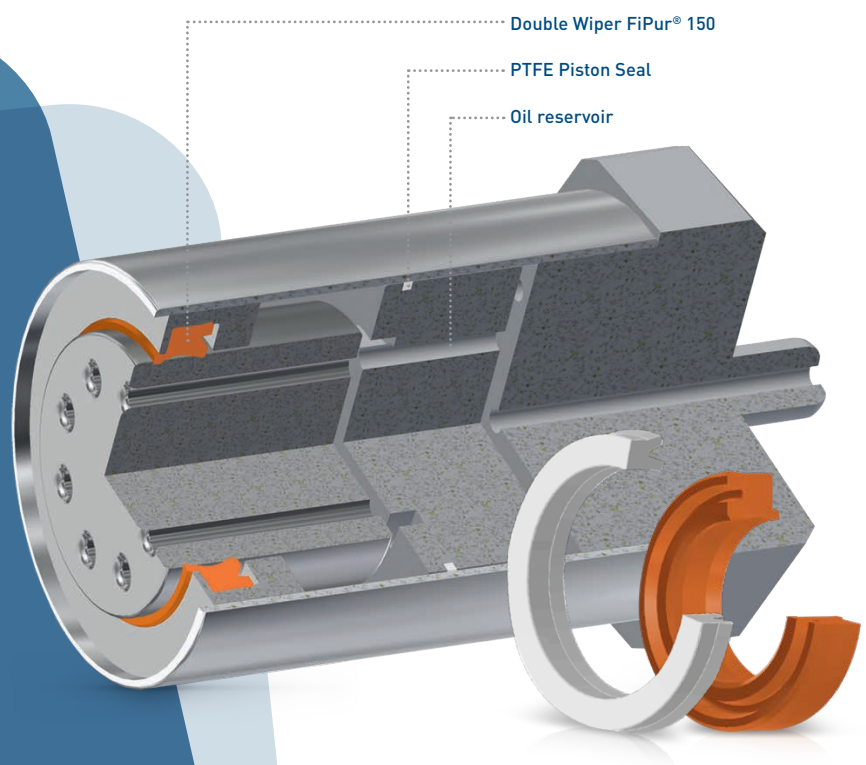
New design

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

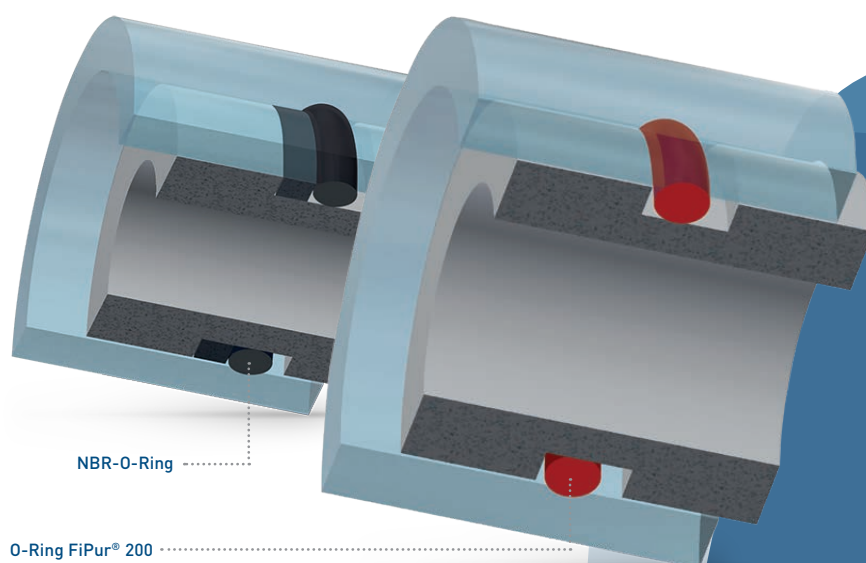
- High-pressure plunger seal
- Pressure: > 500 bar
- Temperature: > 0°C to +80°C
- Media: Water and cleaning additives

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® 100, FiPur® 200, PEEK

- 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

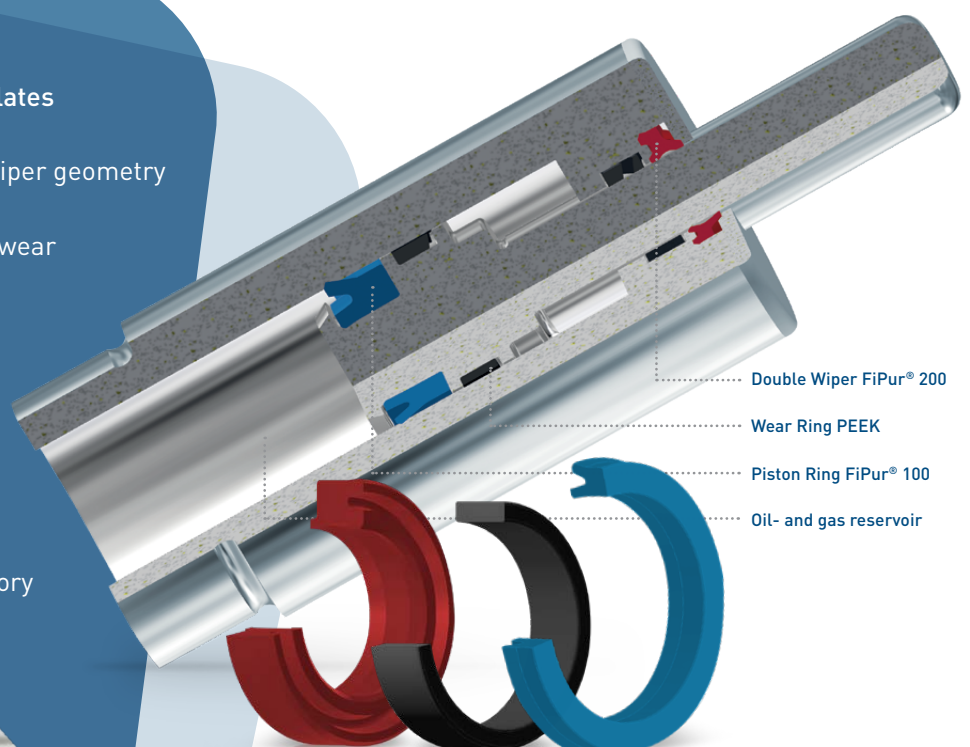
New design

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 & safety requirements





Adjustable gas springs

FiPur® 100, FiPur® 105, PTFE

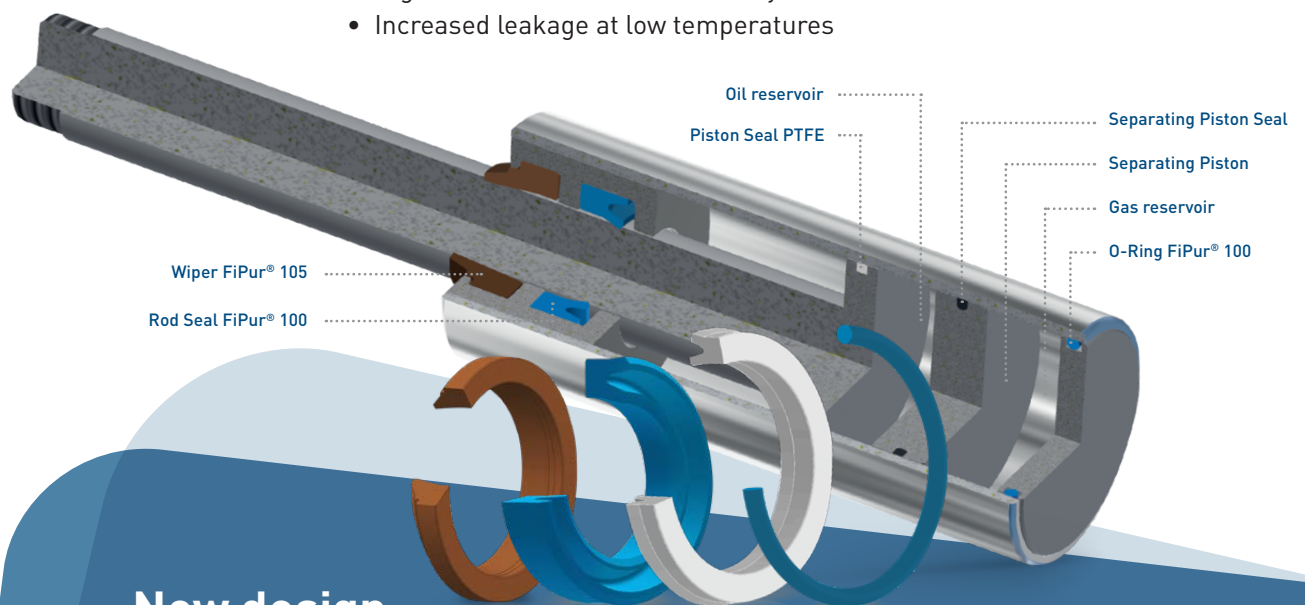
- Reliable sealing system consisting Piston Seal, Rod Seal, Wiper, Wear Ring and O-Ring
- Pressure: > 400 bar
- Temperature: > -25°C to +110°C
- Media: High additive packaged oils
- Resistance to compressed nitrogen

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



New design

Fietz sealing systems for adjustable gas springs

- special customized wear rings, seals and wipers for permanent and reliable use
- tailor-made FiPur® materials: FiPur® 100, FiPur® 110, 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® 100, FiPur® 105, PTFE

- 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

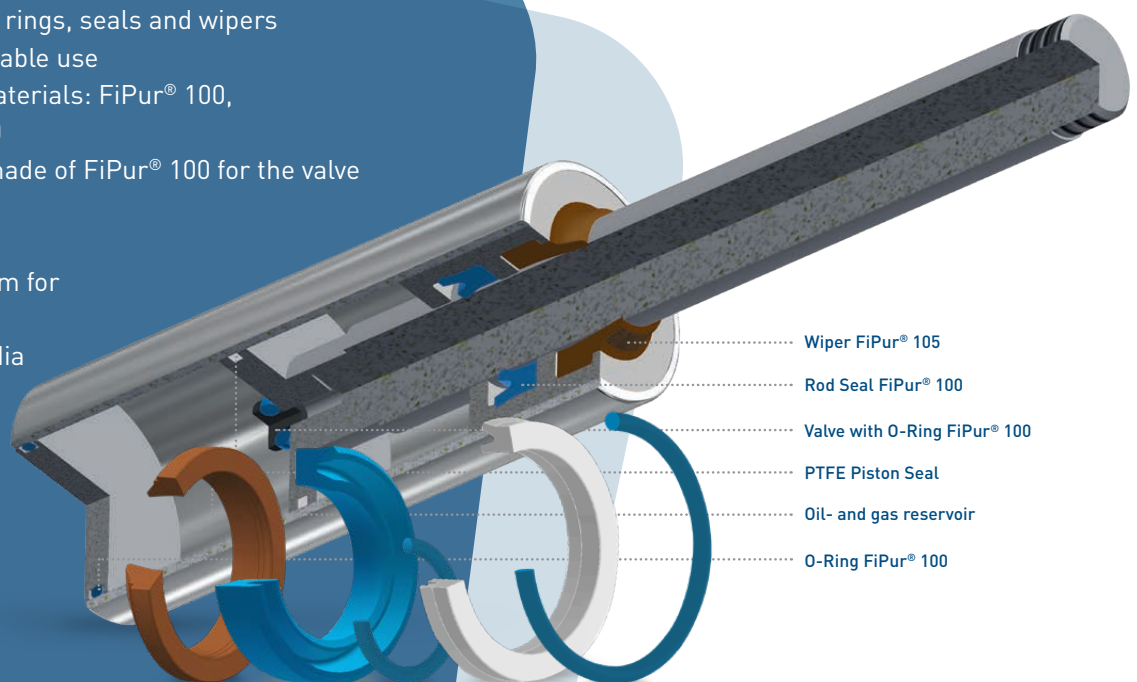
New design

Fietz sealing systems for blockable gas springs

- Special designed wear rings, seals and wipers for permanent and reliable use
- Tailor-made FiPur® materials: FiPur® 100, FiPur® 110, FiPur® 200
- Mini O-Ring solution made of FiPur® 100 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® 110

- 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

Common design

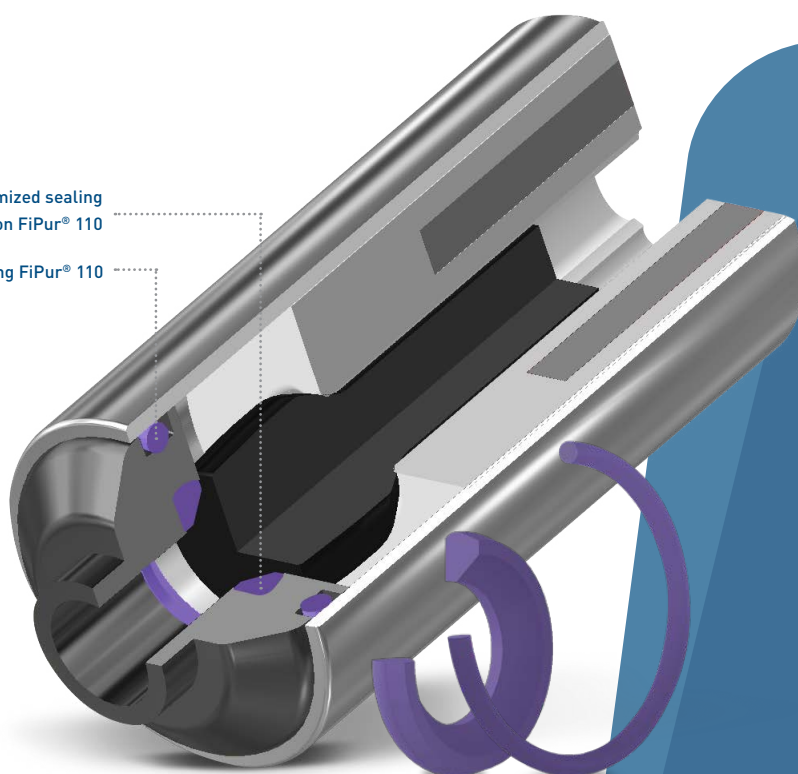
O-Ring with Back up Ring

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

Customized sealing
solution FiPur® 110

O-Ring FiPur® 110



New design

FiPur® O-ring or Formed Part

- 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



Do you wish to **optimise the sealing solutions** in your application

- a quotation?
- a consultation?
- a design proposal?

Simply send your enquiry to fipur@fietz.com.



VIDEO
Sealings for hydraulics
[resilient and wear resistant](#)

Fietz Group

Consulting, development and production –
everything from one source



High Performance Polyurethane

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