Fietz Thermoplast GmbH

FiPur®

High-Performance Polyurethane

FiPur® 111 • FiPur® 112 • FiPur® 150 • FiPur® 180
FiPur® 190 • FiPur® 200 • FiPur® 201

O-rings • Seals • Molded parts

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 m² 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 costefficiencyfor 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

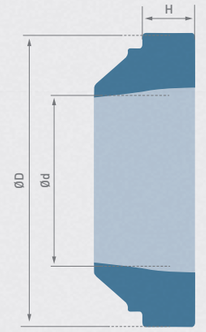
FiPur® Materials

Material	Hardness	Temperature range	Special features	Applications
Polyurethan				
FiPur 111	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
FiPur 112	84 Shore A	ASTM D 1329 TR10 = -57°C TR70 = -46,8°C	Soft material for low temperatures	Pneumatics, Electronics, Special Applications
FiPur 150	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
FiPur 180	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
FiPur 190	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
FiPur 200	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.
FiPur 201	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

Wipers | Double lip-wipers for ISO Grooves

The dirt guard, for protecting the environment

- Outstanding abrasion and extrusion resistance
- Wide range of compatibilities
- For the extended resistance requirements in food technology and biodegradable hydraulic media, a number of suitable materials are available
- Easy to assemble
- Excludes environmental containments
- Many dimensions can be delivered quickly by lathe cutting capabilities



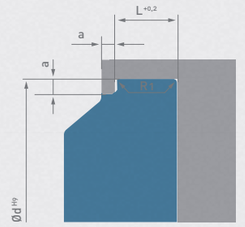
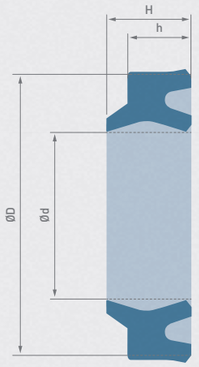


Fig. 1: Cross section of the wiper
Fig. 2: Cross-section of the installation situation



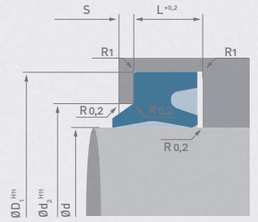


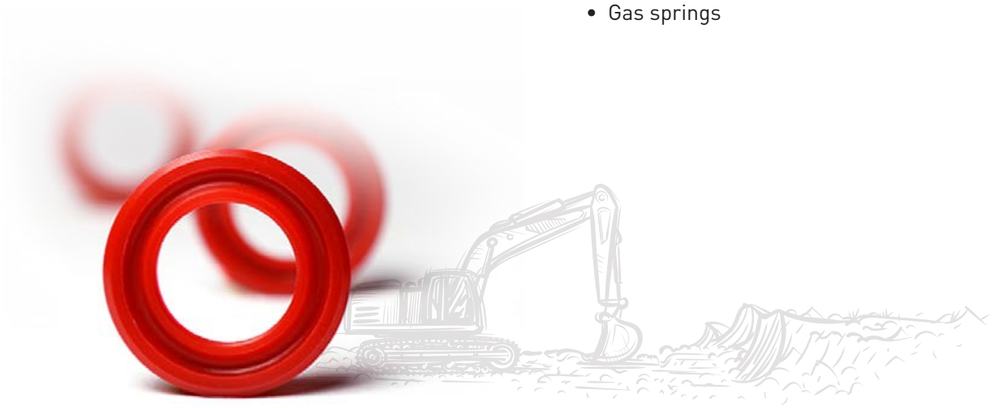
Fig. 1: Cross section of the wiper
Fig. 2: Cross-section of the installation situation

The FiPur® preferred wiper dimensions *SW fit in standard grooves according to DIN ISO 6195 type F. Like all sealing elements of the FiPur® product family, the components are extremely robust and offer the user maximum functional reliability, even under aggressive operating conditions.

The primary task of this profile is to shield the cylinder against contamination such as sand, dirt, ice, etc., as well as to protect effectively against liquids.

All materials are extremely robust and the user maximum functional reliability, even under tough operating conditions. For severe contamination, other compounds can be used. For special exposure to contamination, other engineering solutions can be involved.

Application examples
FiPur® wipers are primarily used to protect the entire system against external influences:
- Mobile and stationary hydraulics
- Various types of hydraulic valves
- Gas springs



* SW Single Wiper

The FiPur® preferred dimensions of the double wiperprofile * DW fit in the grooves according to DIN ISO 6195 type C. By the combination of wiper lip and secondary sealing lip a very thin residual lubricating film is achieved on the rod, which leads to extremely low leakage.

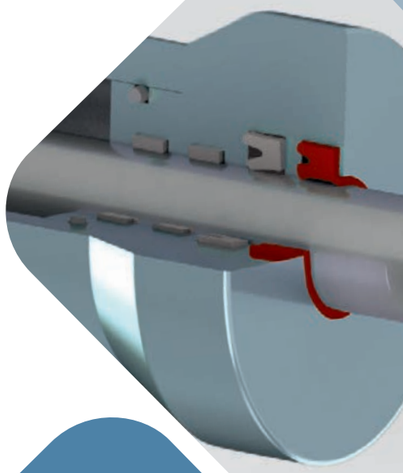
Whenever special requirements in addition to the primary function of dirt protection are needed, FiPur® double wipers come for use. The wiper lip of the double wiper reduces the oil film on the piston rod, which is important for low-wear operation to an absolute minimum and prevents undesirable drag leakage.

Technical Data

Operating Temperature	-30 °C to +110 °C
Sliding Speed	⩽ 2 m/s
Media	Hydraulic oils based on mineral oil ** biodegradable media

* DW Double Wiper ** when using FiPur® 200

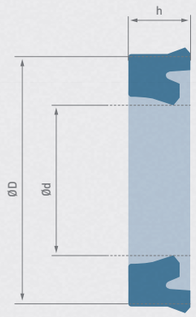
Application examples
- Forklifts in the food processing industry
- Agricultural and forestry machines
- Earth moving machines
- Industrial hydraulic cylinders that require clean operation
- Use in water protection areas



Rod Seals for ISO grooves

What matters is the tightness

- Outstanding abrasion and extrusion resistance
- Wide range of media resistances
- For the extended resistance requirements of food processing technology and biodegradable hydraulic medias, a number of suitable materials are available
- Excellent assembly ability
- Many dimensions can be delivered quickly by lathe cutting



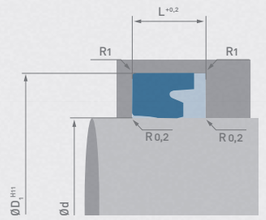


Fig. 1: Cross section of the rod seal
Fig. 2: Cross-section of the installation situation

The FiPur® preferred dimensions of the rod seal profile *RS fit in the grooves according to ISO 5597. Like all sealing elements of the FiPur® product family, the components are extremly robust and offer the user maximum functional reliability, even under rough operating conditions.

The primary task of this sealing profile is to keep the cylinder free of leakage even under the influence of changing ambient temperatures, diverse working conditions and acting lateral forces.

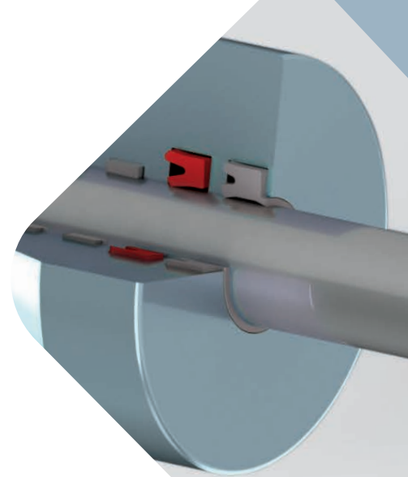
As a result, the environment will be protected against contamination from escaping pressure fluid.

The standard material FiPur® 200 used here is a highly wear-resistant polyurethane, tailor-made for applications in mobile and stationary hydraulics.

Application examples
The primary task of the FiPur® Rod Seal is to protect the hydraulic cylinder against leakage and they are used in:
- Mobile and stationary hydraulics
- Piston pumps
- Gas springs

* RS Rod Seal

The highest requirements for leak-free hydraulic systems exist in the following areas:
- Hydraulic systems in the food processing industries
- Hydraulic cylinders in critical industrial areas
- Agricultural and forestry machines
- Earth moving machines
- Use in water protection areas



Technical Data	
Operating Temperature	-30 °C to +110 °C
Sliding Speed	⩽ 0,5 m/s
Media	Hydraulic oils based on mineral oil ** biodegradable media

** when using FiPur® 200

O-rings

Completely tight

- Outstanding sealing ability
- Wide range of fluid compatibility
- Robust and wear-resistant
- High resistance to explosive decompression in gas applications
- Excellent assembly ability
- For extended requirements in food technology, a suitable material solution is available.
- Custom dimensions can be delivered quickly using our turning capabilities

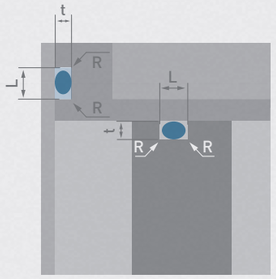


Fig. 1 Cross section of the O-ring

Fig. 2 Cross-section of the installation situation

FiPur® O-rings are very extrusion-resistant in most applications without using a back-up ring. The sum of all properties offers the user a maximum of functional reliability and product service life, even under aggresive operating conditions.

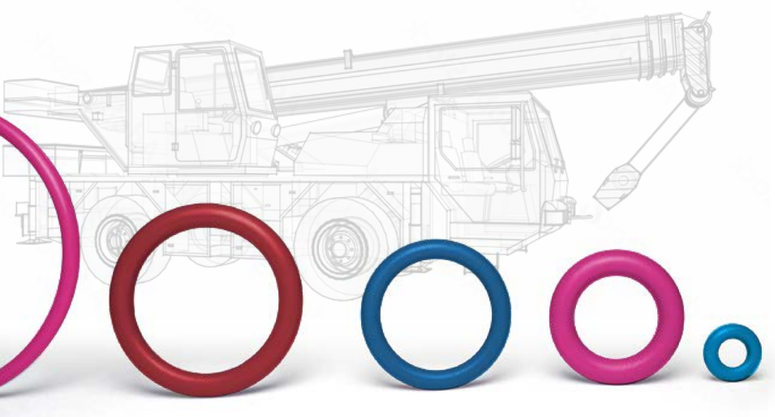
The robust material also enables the use of FiPur® O-rings in dynamic applications such as valves and separated pistons.

Application examples
Static sealing from cylinder to cylinder head and cylinder base, valve housings, flange connections in:

- Mobile and stationary hydraulics
- Piston pumps
- Industrial gas springs
- Lockable gas spring

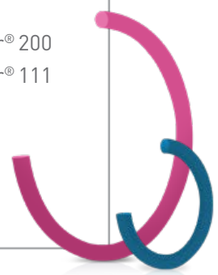
On request, we can also produce complete sealing sets for your cylinders, consisting of

- O-rings for cylinders and pistons
- Rod seals
- Piston seals
- Guide rings



Technical Data

Permissible system pressure	max. 600 bar
Operating Temperature	-30 °C to +110 °C - FiPur® 200 -50 °C to +110 °C - FiPur® 111
Sliding Speed	⩽ 0,5 m/s
Meda	Hydraulic oils based on mineral oil *biodegradable media



* when using FiPur® 200

Single-acting | double-acting Piston Seals

Movement under pressure

- Robust and wear-resistant
- Wide range of media resistance
- A range of suitable materials is available to meet the extended resistance requirements in food technology as well as for readily biodegradable hydraulic fluids
- Excellent installability
- Pistons do not need to be split
- Dimensions not listed can be quickly supplied via machining upon request

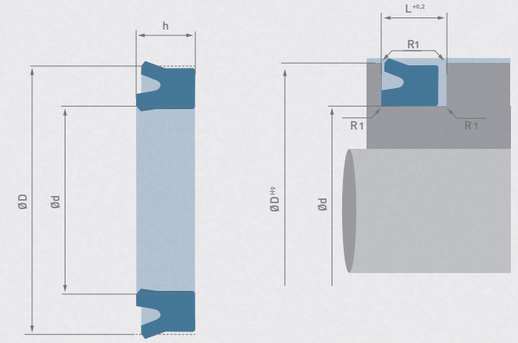


Fig. 1 Cross section of the single-acting piston seal

Fig. 2 Cross-section of the installation situation

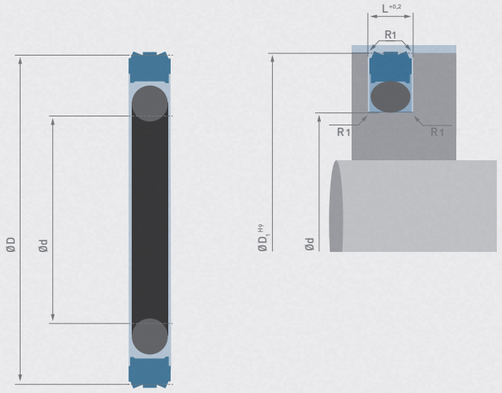


Fig. 1 Cross section of the double-acting piston seal

Fig. 2 Cross-section of the installation situation

The FiPur® preferred dimensions of the double piston profile *PS fit in the installation spaces according to DIN ISO 5597. Like all sealing elements of the FiPur® family the piston seals provide maximum functional reliability, even under aggressive operating conditions.

Piston seals separate the two pressure chambers of the working piston in the cylinder from each other (rod side and bottom side).

If the return stroke of hydraulic cylinders is controlled by compression springs or simply as a result of the available gravity, the piston seal in this process step must have extremely low frictional forces during this process step. For such tasks, the FiPur® PS piston ring profile, which has proven itself millions of times is predestined for such challenges.

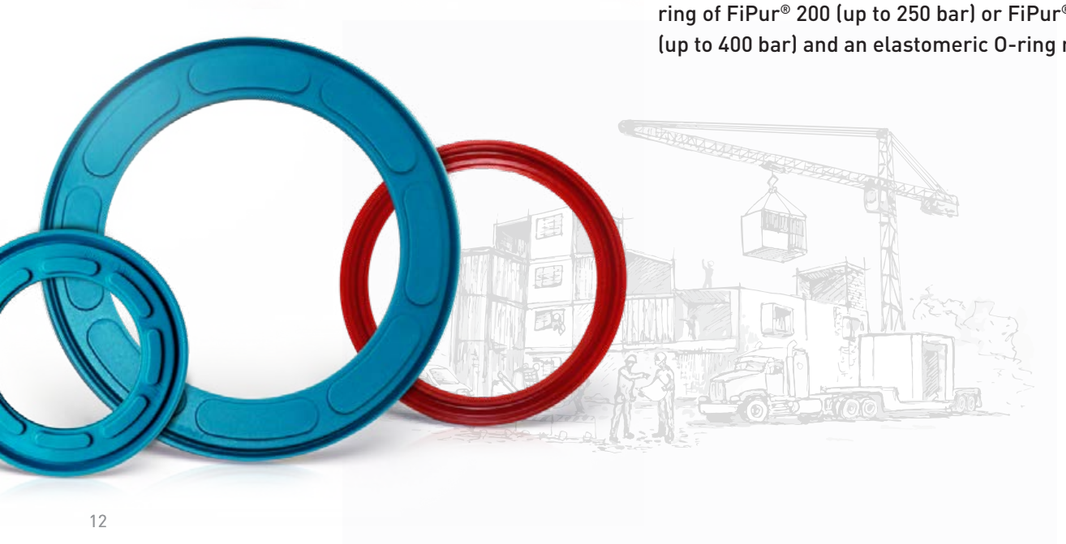
FiPur® preferred series of the double-acting piston seal profile *PD fit into the installation spaces according to DIN ISO 7425-1. Through the combination of a sliding ring of FiPur® 200 (up to 250 bar) or FiPur® 150 (up to 400 bar) and an elastomeric O-ring made of NBR as the preload element offers the user not only excellent low friction, it also offers the user cost advantages cost advantages due to the easy assembly in grooves of a one-piece piston.

All materials are extremely robust and offer the user a maximum functional reliability even under tough operating conditions. For special contamination exposures other materials are available.

Application examples

FiPur® piston seals are used in long-lasting, low-maintenance hydraulic cylinders:

- Mobile and stationary hydraulics
- Construction machinery, agricultural and forestry machines, cranes, pumps, industrial trucks, etc.
- Presses, lifting tables, injection moulding machines



Technical Data	
Permissible system pressure	max. 400 bar
Operating Temperature	-30 °C to +110 °C
Sliding Speed	≤ 0,5 m/s
Media	Hydraulic oils based on mineral oil **biodegradable media

* PS Piston Seal

** when using FiPur® 200

Molded parts

We bring polyurethane into shape

- Highly wear-resistant
- Very good tensile strength and tear resistance
- Highly pressure resistant
- Very good oxidation resistance
- Low permeation rate

Diaphragms are used in applications where a hermetic seal is required, for example in pumps and valves.

NBR is often used as the industry standard material. However, Fipur® materials are far superior in terms of mechanical properties and wear.

Moulded High-performance polyurethane parts can be found in a wide variety of applications.

Fietz is your development partner for moulded parts according to customer specifications and provides support with:

- Layout and design of the moulded seal / moulded part engineering
- Material design
- Evaluation of the moulded seal (moulded part) within the entire assembly
- Support in the validation of the moulded seal
- Improvement of existing applications

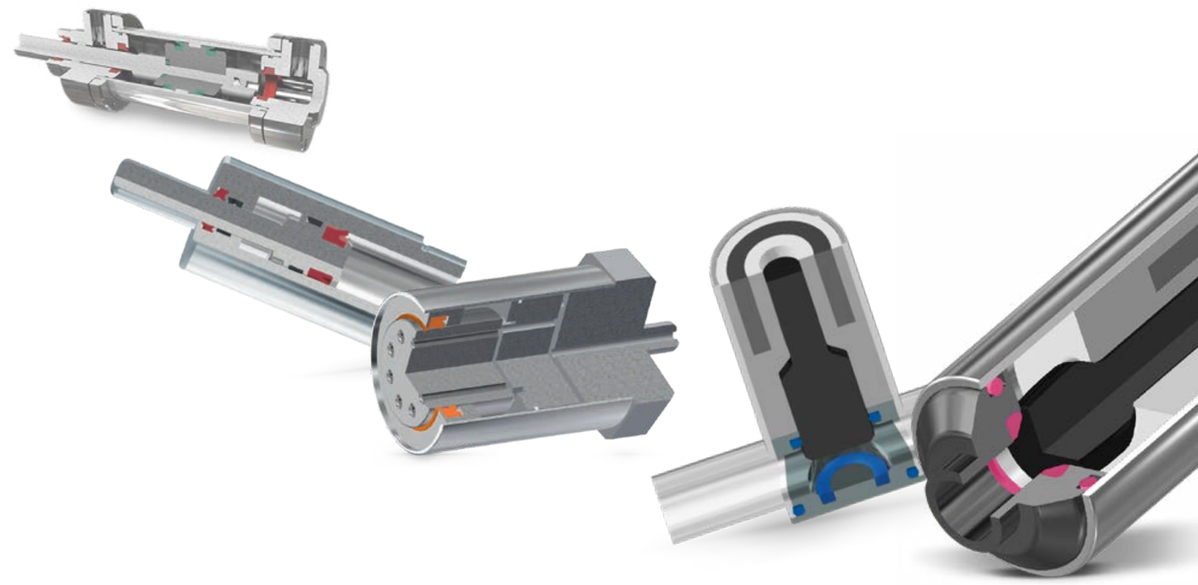
FiPur® Applications

High-performance polyurethane for the most demanding requirements

- Seals and wiper elements in hydraulic and pneumatic cylinders
- Coupling elements
- Seals for industrial applications
- Seals for shock absorbers

With FiPur®, the Fietz Group offers high-performance polyurethanes that deliver outstanding performance where abrasion resistance, pressure resistance and excellent resilience are required.

These materials combine the elasticity of rubber with the hardness and wear resistance of plastic – making them ideal for components that must function reliably under constant stress.



Fietz Thermoplast GmbH

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**

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