

# MAHLE

## MAHLE Industrial Filters Fluid technology



Highly advanced components and modules manufactured with maximum precision and in top-quality materials. For engines, motor vehicles and industrial applications. Produced by some 30,000 employees worldwide within the MAHLE Group in the Pistons and Engine Components, Filter Systems and Valve Train Systems business units. At our plant in Öhringen, Germany, industrial filters have been developed and produced since 1962. Here, R&D, production and the worldwide marketing of fluid technology, dedusting and automatic filters are today concentrated under the brand name of 'MAHLE Industrial Filters'.

## Perfection in all areas of application

### MAHLE Industrial Filters

Many years of expertise, the outstanding properties of our unique filter materials, advanced procedures and a seamless modular range of proven

filters and equipment for maintaining optimal levels of cleanliness in hydraulic fluids and lubricants – these are the solid foundations on which MAHLE fluid technology is based.





Suction filters



Pressure filters



Duplex filters



Bypass filters



Return-line filters



Breather filters



Accessories

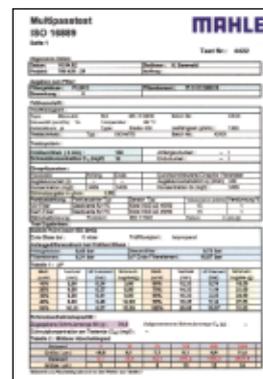
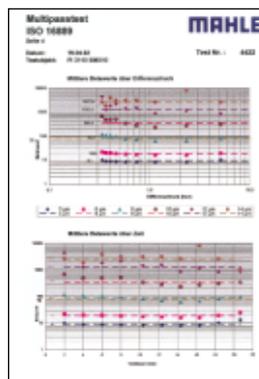
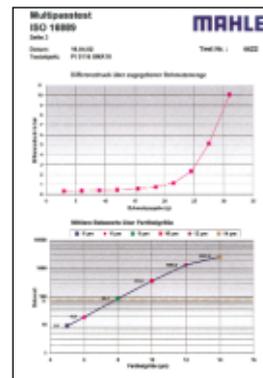
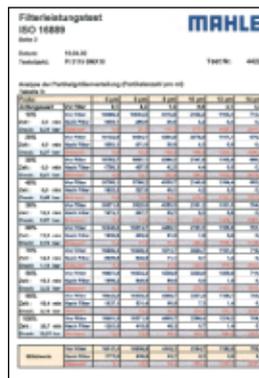
### MAHLE hydraulic filters

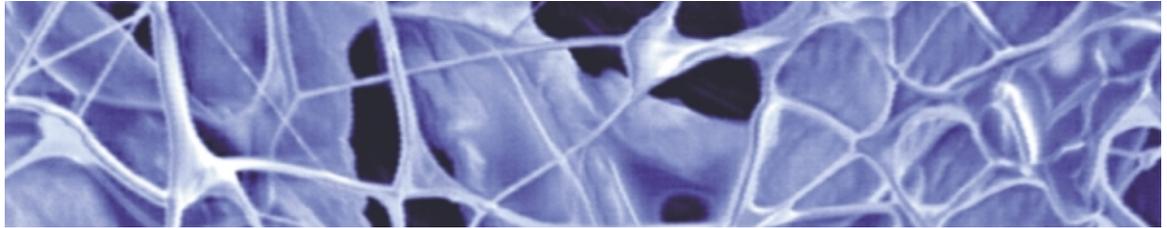
Since the early 1960s MAHLE has been active in the filtration of hydraulic fluids and lubricants.

The MAHLE Group's superior technical expertise and excellent product quality have made the MAHLE Industrial Filter unit one of the world's leading manufacturers of filter systems, equipment and accessories for fluid technology.

The product range covers pressure filters, duplex filters, bypass filters, suction filters, return-line filters, breather filters, highly efficient filter elements in standard versions to industrial norm DIN 24550, and accessories, filters and service equipment for the care of hydraulic fluids and lubricants.

The ongoing development of materials and production technologies ensures top-quality products offering economically and technically optimal benefits. That is why MAHLE industrial filters for hydraulic fluids and lubricants are the products of choice for OEMs and for users of mobile and stationary hydraulic equipment alike.





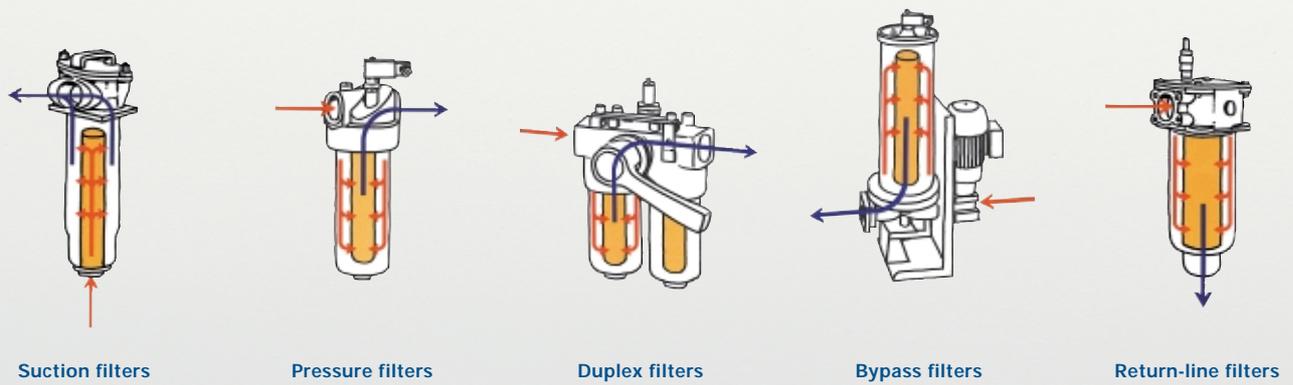
## Requirements made of hydraulic filters

Highly efficient filtration is a prime requisite for the proper functioning of highly sensitive hydraulic circuits. Solid and liquid contaminants are the cause of abrasion, wear and corrosion and both have a negative effect on the physical and chemical properties of hydraulic fluids. The performance of filter elements determines the degree of cleanness of the hydraulic fluid. As the functional tolerances of the various hydraulic equipment and systems become more and more demanding, so it becomes ever more important that the prescribed cleanliness classes of fluid media are strictly observed under all conceivable operating conditions.

The multilayer design of MAHLE filter elements enables a wide range of application and a high level of contamination retention. The filtration efficiency of the elements remains constant even under increasing differential pressures, offering maximum protection even under pulsating loads. Long filter service life with low flow resistance ensures optimal economy of use. MAHLE contamination indicators make service simple, and maximum economy is achieved through the complete utilization of the contamination retention capacity of the filter elements.

### Scope of supply

- Suction filters
- Pressure filters
  - as full-flow or partial flow filters
- Duplex filters
  - with patented single-hand operation
- Bypass filters
- Return-line filters
- Breather filters
- Contamination indicator
- Service equipment
- Mobile filter equipment
- Filter elements in standard versions, to DIN and customized versions
- Oil mist collectors
- Air cleaners
- Turbidity sensors
- Coalescers



### Suction filters

Installed upstream of the pump or accessible from the outside in a particularly service-friendly configuration with a contamination indicator integrated in the suction line, suction filters protect the pump from large-particle contamination. A selection of elements adapted for use with the system protect installations and pumps in the range from 10–25 µm with our micro-quality products, or in the coarse particle range using easy-to-clean wire gauze.

### Pressure filters

Designed for use as full-flow or partial flow filters and for the low pressure range up to 25 (60) bar, medium pressure up to 210 bar and high pressure up to 450 bar, MAHLE pressure filters are ideal for application as main-line filters, flange-mounted filters and filters in intermediate plate design. Rugged casings, streamlined design and an extensive range of accessories provide the optimal solution capable of meeting every market requirement.



### Duplex filters

With patented single-hand operation and zero leakage switching of media flow, MAHLE duplex filters offer excellent economy. In the low and medium pressure range or as return-line filters, in continuous operation, ready for duty twenty-four hours a day, maintenance work can be carried out during operation thus ensuring their contamination retention ability is fully utilized.



### Bypass filters

In stationary design, bypass filters are the perfect solution for the filtration of large quantities of oil which cannot be adequately filtered with full-flow filters, or only at disproportionately high cost. In the mobile version, bypass filters offer a highly flexible solution as flushing, filling or filter aggregates.



### Return-line filters

Return-line filters retain all the contamination created within the equipment and flushed out of the hydraulic circuit, thus preventing contamination entering the circuit via the tank and pump, with all its negative implications.



### Breather filters

Anticorrosion and impact-resistant breather filters supply contamination-free air to reservoirs. A wide range of replaceable filter elements adapted to the needs of the system ensures the degree of filtration required by the hydraulic filter is obtained.



### Mobile filter equipment

Efficient equipment (with a capacity of 27 and 55 l/min) for mobile bypass filtration in hydraulic and lubricating equipment ensures conformity with predefined cleanliness classes if the correct filter elements are used. It can also be applied in connection with highly viscous media. A rugged pump with high level resistance to contamination guarantees long service life and can be used across a broad area of application. With its service-friendly handling and high contamination retention ability, mobile filter equipment made by MAHLE is the perfect solution when filling systems and reservoirs, when pumping out reservoir contents or to relieve system filters at start-up or following repair work.



### Air cleaners

MAHLE air cleaners ensure that compressors, vacuum pumps and combustion engines have a continuous supply of clean intake air. The use of intake silencers also reduces the noise level.



### Oil mist collectors

Made of superior quality materials in state-of-the-art procedures, MAHLE oil mist collectors ensure the economical generation of high-quality compressed air in oil injection cooled screw compressors over a long service life (up to 5,000 hours operation).



### Filter elements

Designed always to meet the needs of the cleanliness class, pressure requirements and characteristics of the medium, stable and constant pressure MAHLE filter elements with their high contamination retention ability ensure economical and trouble-free operation. Our extensive range of standard and DIN version products also contains alternative variants for virtually every make of filter and filter element for aggressive fluids, cooling lubricants and aqueous media. We will also develop special versions to meet individual customer requirements.



### Contamination indicator

Filter elements can only be used with optimal economy if their ability to retain contamination is fully utilized without risk. Mechanical and electronic sensors integrated in the filters or retrofitted react to continuous changes in pressure resulting from changes in the degree of contamination. These changes are then indicated via pressure gauge or visual and optoelectrical switch, depending on the version used. On suction filters the negative pressure is registered, on pressure filters differential pressure, and on return-line filters banking-up pressure. This enables the operator to determine the optimal time to change the filter elements without entailing any risk.



### Turbidity sensor PIT 400

The presence of free water in hydraulic fluids results in turbidity, impeding the proper function of the entire system and reducing the service life of the hydraulic fluid and of the circuit components. The PIT 400 sensor has been designed to identify the ingress of water in a circuit, rapidly and reliably. The PIT 400 can be applied in all fluid-based circuits where there is a risk of contamination by water.



### Coalescer PIW 1975

The coalescer has been especially designed to remove free water from hydraulic circuits. Cost-effective and simple in design, it functions without absorption material: special filter material in special configuration retains the small water droplets floating in the medium and removes them.



### Service equipment

Mobile, easy-to-handle measuring instruments incorporating various measuring procedures allow the rapid analysis and measurement of hydraulic fluid contamination. Calibrated to ISO 11171: 1999 and evaluated to ISO 4406: 1999 and NAS 1638, the MAHLE PIC 9100 portable contamination measuring device records, identifies and registers all particles in both suction and impeller mode and provides a reliable display of absolute particle numbers and cleanliness classes. An essential piece of equipment for maintenance and service!





## System competence

The sheer volume of information, data, facts and system parameters available makes the optimal design of a filter, from a technical and economic viewpoint a difficult matter. Such complexity can only be effectively dealt with by an experienced technician.

With many years experience in fluid technology and as innovative development partner and reliable supplier to

the world's leading manufacturers of hydraulic circuits and equipment, MAHLE Industrial Filters is your competent systems partner in all matters regarding the filtration of hydraulic fluids.



Proven and reliable hydraulic filters from MAHLE Industrial Filters ensure trouble-free, economical operation in countless machines, systems and pieces of equipment worldwide.



# MAHLE

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