MAHLE Industrial Filters
Filtration processes for the metal working industry
Pioneering systems, modules and components of the highest precision and quality for engines and vehicles, as well as for industrial applications – this is what the MAHLE Group’s approximately 38,000 employees are working on at more than 75 manufacturing locations worldwide. Research and development, production, and worldwide marketing for fluid technology, dedusting, and automatic filters are concentrated in the Öhringen plant, where industrial filters have been developed and manufactured since 1962.

Product know-how combined with system competence

**MAHLE Industrial Filters**

The Öhringen plant employs about 800 highly-qualified personnel. The manufacturing range in the Industrial Filters Profit Center includes filters and filter equipment, devices and accessories for fluid technology, dedusting devices and equipment, as well as automatic filter systems. Continuous development of materials and manufacturing technologies guarantees the highest quality for economically and technically optimal products. Our production is certified in accordance with DIN EN ISO 9001 and our environmental management is certified in accordance with ISO 14001, as well as EMAS. Naturally, MAHLE products are approved by classification companies like GL, Lloyds or DNV. Thus with increasing success, we shape our future in accordance with the wishes and requirements of our customers.

**Perfection in all fields of application**

Thanks to highly-effective filters and filter equipment, devices and accessories for keeping hydraulic fluids clean, MAHLE is the competent partner for machine manufacturers, as well as users of mobile and stationary hydraulic equipment worldwide.

MAHLE dedusting devices and equipment help protect the environment and improve work safety, and they are used successfully to reclaim product.

Through the advantage of rational non-stop, round-the-clock operation with automatic cleaning and disposal processes, MAHLE automatic filters, which are used for the entire range from rough to superfine filtration, have broad areas of application: Filtration and regeneration of cooling lubricants, rolling, drawing, scouring solutions and similar liquids, or dedusting for dry processing in the metal working industry are just a few keywords.
Performance at the right point
MAHLE Industrial Filters has a complete product portfolio. Whether customer-specific design, or standard product line with filter elements also suitable for filters from other manufacturers: MAHLE is a single-source for handling jobs efficiently and at minimized costs. In this regard, the ability to ship quickly, and perfect service are just as self-evident as flexibility, reliability and first-class quality.

Filters for the metal working industry
In the metal working industry today, time and cost-intensive use of cooling lubricants still predominates (over 90%). Consequently minimal quantity lubrication or dry processing, i.e. dispensing with any auxiliary materials, is becoming more and more significant. With its comprehensive line of high-performance filters and filter processes, MAHLE can take up all challenges encountered in industrial practice.

Classification of metal machining processes

- **Machining processes**
  - with geometric defined cutting edge:
    - e. g. sawing, milling, turning, broaching
  - with geometric undefined cutting edge:
    - e. g. grinding, lapping, superfinsch, coronating

- **Deformation processes**
  - e. g. deep drawing, bending
Since the early 1960s, we have been involved with the filtration of hydraulic fluids and lubricating fluids. Today this product group comprises the focus of the Industrial Filters manufacturing range. Our superior technical know-how and the outstanding quality of the products have made MAHLE into one of the world’s leading manufacturers of filter systems, devices, and accessories for fluid technology.

The fitting system for every implementation

Hydraulic filters
for different installations and functions:

- Suction filters
- Pressure filters
- Duplex filters
- Return line filters
- By-pass filters
- Air filters, tank breathers
- Spin-on cartridges
- Filter devices and elements – seamless in accordance with DIN 24550

Automatic filters
for all possible cooling lubricants, for rolling oils, drawing oils, etc. We have years of practical experience in the dimensioning and correct selection of our systems for the respective application case.
**Process example 1**
MAHLE AF 113 automatic filters with internal pressure segment cleaning are installed downstream from a central band filter for defined fine filtration. The filtrate flow is brought to the machine either directly, or via a collection tank, and the delivery flow from the valves is returned to secondary treatment on the band filter.

Controller for internal pressure segment cleaning
The cleaning process starts after differential pressure of 0.6 bar has been attained, or after an interval of 10 minutes at the latest.

| Drive motor AM | in operation | off |
| Drive motor AM | open | closed |
| Cleaning valve V1 | open | closed |
| Discharge valve V2 | open | closed |
| Time in seconds | 0 | 0.5 | (4) 7 | 0 | 2 |

**Process example 2**
MAHLE AF 133 automatic filters with compressed air segment cleaning are implemented as full-flow fine filters without preliminary separation. Filtrate flow is either directly transported to the machine, or is transported to the machine via a collection tank. Optionally a vent circuit is also possible via the cleaning time.

The delivery flow from the discharge valve can be routed back into the chip conveyor system for secondary treatment in a sedimentation tank with sieve basket.

Controller for compressed air segment cleaning
The cleaning process starts after differential pressure of 0.8 bar has been attained, or after an interval of 10 minutes at the latest.

| Drive motor AM | in operation | off |
| Drive motor AM | open | closed |
| External pressure valve VF | open | closed |
| Discharge valve V1 | open | closed |
| Option vent valve V2 | open | closed |
| Time in seconds | 0 | 0.5 | (4) 7 | 7.5 |
DRY TREATMENT AND OIL MIST SEPARATION

Whether for dry processing of metals, or for oil mist separation: Here as well the innovative solutions provided by MAHLE industrial filters are impressive through long service life, simple handling, and highest quality. For example in the particularly demanding area of dedusting technology, MAHLE industrial filters exceed all requirements placed on air quality in work rooms and permissible exhaust air concentration.

Effective separation of dust or oil

**Maximum filter element service life for dry processing**

Dry processing offers clear advantages for processing gray cast iron, annealed hot-work tool steels and brass. For example, processing gray cast iron generates a mixture of short chips and a significant proportion of fine dust. To keep the dust level of the machine and the environment to a minimum, it must be extracted via suitable capture fixtures. The size of the machine determines whether fine dust and chips will be captured separately or whether they will be captured together. In this regard primarily the highly abrasive effect of the chips must be taken into consideration.

MAHLE dedusting devices for machine tools are designed in such a manner that large chips are effectively separated in the inflow area. Maximum filter element service life is achieved through optimized flow channeling. All parts subject to wear can be replaced simply and cost-effectively.

**MAHLE oil mist separator**

The LGA 600 oil mist separator is used for decentralized extraction of oil mists on machine tools. It is suitable for non water-miscible cooling lubricants, like cutting oil, grinding oil and bore oil. Oil mists are extracted out of the processing area of the machine tools. The oil-laden air stream flows through the coalescer element from the inside to the outside. The oil is deposited on the fiber fleece when flowing through the filter. In this process the smallest droplets of oil are brought together to form larger drops – they „coalesce“.

The oil collects on the casing floor and is re-channeled to the cooling lubricant collection tank of the machine tool via the oil discharge hose. The cleaned air flow is extracted with a high pressure fan and blown off above through a sound suppressor.
Dedusting device for fine dust capture at a processing center for gray cast iron brake discs: High-quality melt blown filter (Ti 19) for extremely low pressure losses at high-performance separation.

Consulting and service

We would be happy to provide you with more detailed information about MAHLE filtration processes in the metal working industry. In this regard, we offer extensive and competent advice concerning the development of custom-tailored solutions for your special needs.

If there are complex requirements, our specialists would be pleased to analyze the situation on site and identify alternative solution approaches. Short-term use of mobile test stands, or use of prototypes over a longer period is possible for testing purposes. This measure provides confidence and security in the selection of the right filter media.

Just contact us by phone or e-mail.