

MAHLE

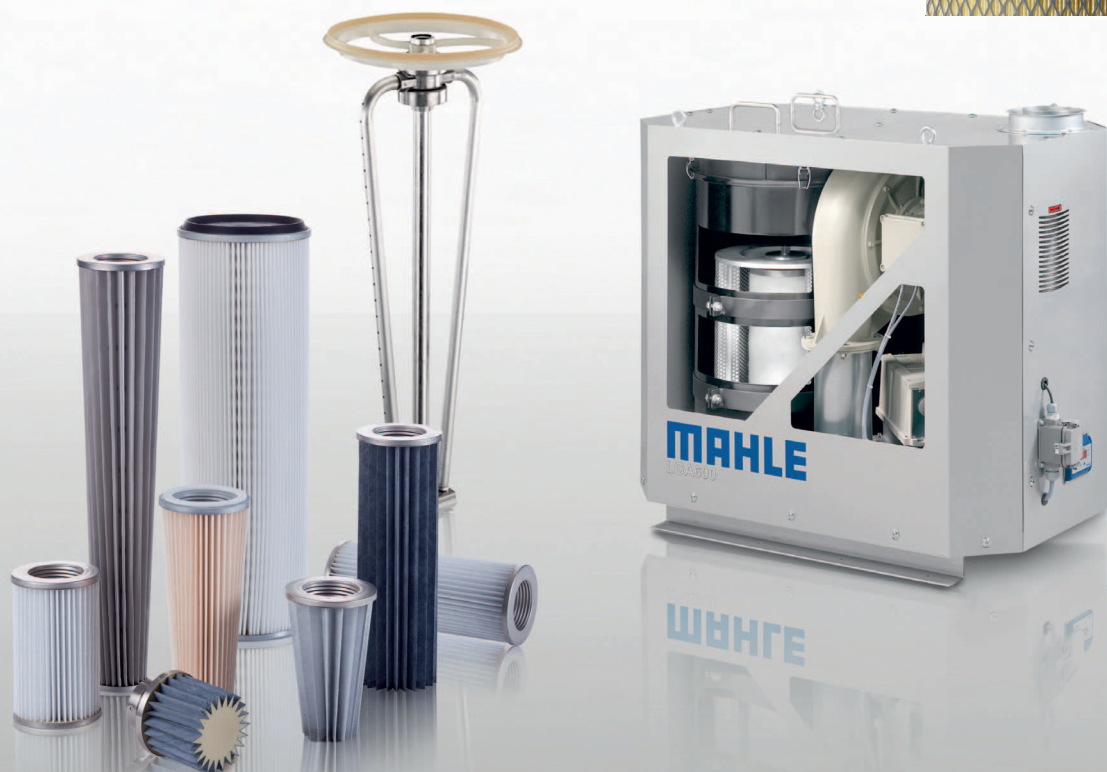
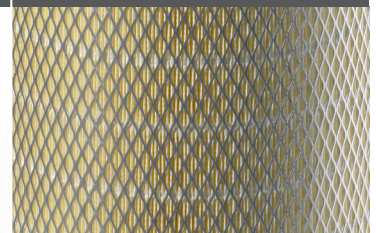
Driven by performance

HIGHER PERFORMANCE FOR PURE AIR

Reliable and efficient air filtration solutions

AIR FILTRATION

INDUSTRIAL
FILTRATION



MORE PERFORMANCE, PRECISION, AND PASSION FOR YOUR SUCCESS.

» We see ourselves not just as a supplier, but much more as a reliable guide and expert partner that helps you better reach your goals. «



MAHLE is a leading global development partner for the automotive and engine industry with unique systems competence in the areas of engine systems, filtration, electrics/mechatronics, and thermal management. Automobile and engine manufacturers worldwide rely on products and solutions from **MAHLE**.

This unique expertise and outstanding development competence can be found in our products and solutions around the globe: in commercial vehicles, ships, trains, agricultural and construction machinery, electric vehicles and other demanding industrial applications such as forklifts, mobile hydraulics and factory equipment.

As your development, systems, and service partner, we know your requirements and processes. We know what you and your customers need and, together with you, we create added value that brings fresh power to your success: tailor-made solutions with the highest performance and reliability, durability, and economic efficiency, which sustainably contribute to increasing energy efficiency and ecological added value.

**WE DRIVE YOUR SUCCESS. WORLDWIDE.
WITH PERFORMANCE, PRECISION, AND PASSION.
MAHLE – DRIVEN BY PERFORMANCE.**



OVERVIEW

GREATER ENVIRONMENTAL PROTECTION AND SAFETY AT WORK WITH EFFICIENT AIR FILTRATION SOLUTIONS.

For over 40 years, MAHLE has been delivering high-performance systems for the filtration of very fine particles from the air, and today is a leading manufacturer in dedusting technology and intake air filtration worldwide. Our filters, components, and systems for the dust filtration of air and other gases increase productivity and systems reliability, and contribute to product recovery and increased environmental protection and safety at work.

Your worldwide systems partner for custom air filtration solutions

MAHLE solutions come into play wherever high-performance, durable, and economical air filtration systems are required. Our proven and reliable filter solutions allow for uninterrupted, economical operation of your equipment, machines, and systems. All solutions are customized to meet your specific requirements and ensure optimal filtration solutions for your applications.

Overview of our range of services:

- Process-optimized filter cartridges with high-performance filter media and complete systems
- Broad product range, available worldwide, from filter cartridges to system solutions

- Applications expertise from many industries and complex operations
- In-house technical center, test benches, and lab service
- Uncompromising quality
- Worldwide service and fast spare parts delivery

Our filtration solutions are used in the following industries, among others:

- Food and beverage industry
- Metal processing/surface technology
- Chemical and pharmaceutical industries
- Construction industry
- Power engineering
- Customer-specific solutions in nearly every industry

APPLICATION EXPERTISE

HIGH LEVEL OF OPERATIONAL SAFETY IN METAL PROCESSING AND THE CONSTRUCTION INDUSTRY.

In metal processing and surface technology, our filter systems make an effective contribution to conserving resources, reducing wear, and optimizing machine utilization. Cartridge filters ensure reliable cleaning of dusty air in mobile machinery for the construction industry.

Filter cartridges for metal processing and surface technology

Machining gray cast iron, free-cutting steels, and brass produces short chips and a great deal of fine dust. MAHLE dust filtration systems effectively separate the large chips in the inlet area and significantly reduce the dust exposure of the machine and the environment—with maximum service life of the filter cartridges thanks to optimized flow.

The advantages at a glance:

- Maximum filter surface in a tight package, with pleat spacing technology (pleat lock/ridges technology)
- Cleaning systems (MJD/RLD) for optimal cleaning even at high differential pressures

The applications:

- Welding fume extraction
- Overspray/wet paint extraction in large painting systems
- Powder coating systems, blasting systems
- Dry machining, flame spraying, grinding, polishing
- Oil mist separation on machine tools

MAHLE filter systems effectively reduce the dust exposure of the machine and the environment in metal processing

Efficient reduction of dust exposure in the construction industry

Construction machines, such as rock drills, should work steadily even under high dust exposure. For reliable cleaning of dust-laden air in mobile machinery, we have developed special cartridge filters with a space-saving, compact design.

The advantages at a glance:

- Robust filter cartridges, resistant to differential pressure
- Special filter media with PTFE membrane
- Conical cartridges for greater performance
- Corrosion-resistant filter cartridges

The applications:

- Suction excavators
- Building reconstruction/tunnel construction
- Tool extraction (e.g., slotting and drilling)
- Rock drilling machinery/rock crushers
- Various types of dust, such as cement dust, rock dust, gypsum, wood

Compact MAHLE cartridge filters ensure clean air in mobile machinery



APPLICATION EXPERTISE

CLEAN PROCESS PERFORMANCE FOR THE FOOD AND PHARMACEUTICAL INDUSTRIES.

The food and pharmaceutical industries place the highest requirements on process quality, cleanliness, systems reliability, and environmental protection. In this respect, our solutions for air filtration are used, for example, in the production of sugar and sweeteners, cocoa, chocolate, and chemical products. They filter the finest particles and contaminants from the air, minimize dust exposure, and contribute effectively to maximum hygiene, quality, and product recovery.

Higher process quality, safety, and efficient product recovery

The highly efficient cartridges and cleaning units with FDA and EU 10/2011 food grade approval are optimally adapted to the specific dust exposure of your process. They ensure good retention efficiency, economical product recovery, and compliance with all safety and environmental requirements. Extreme durability and minimal maintenance requirements allow for high systems reliability and low operating costs.

The advantages at a glance:

- Specially developed filter media and sealing systems with FDA and EU 10/2011 approval
- Customized designs
- Washable filter cartridges with no “dead space”
- Open pleats at the bottom
- Thermal and chemical resistance
- Excellent hydrolysis resistance
- Wire mesh support for greater pleat strength

The applications:

- Pneumatic conveying
- Powder handling/drying
- Silo top filters, bunker filters, mixer filters, dryers
- Tablet production/pelletizing

Individual filtration with customer-specific solutions

Special dust problems require special solutions. In close co-operation with you, our filtration experts develop optimally adapted custom solutions to fulfill your specific requirements. All cartridges offer maximum retention efficiency, durability, and economic efficiency.

The advantages at a glance:

- Integral systems solutions through development partnership
- Flexible designs
- In-depth technological and applications expertise
- From small, integrated dust collectors to large central exhaust systems
- Filters for potentially explosive areas



» In food manufacturing, the utmost cleanliness is indispensable on the production floor. With filter systems from MAHLE, we reliably maintain strict hygiene standards as well. «

Cartridge with wire mesh support

Cartridge with white, electrically conductive membrane filter medium



AIR FILTRATION SOLUTIONS

PERFECT FILTRATION RESULTS FROM THE FILTER MEDIUM TO THE CLEANING SYSTEM.

Filtration solutions from MAHLE continually set standards in terms of performance, durability, and economic efficiency. We developed the higher-performance conical cartridge, optimized for service life, and hold the patent for high-efficiency multijet cleaning units.

Energy-efficient cleaning units
for a long filter service life



Quick-Lock element



Filter cartridges with optimized filter
performance under high dust exposure



Control systems for economical system
operation



Oil mist separator unit, LGA series



Oil mist separator unit, ASL series



Optimized solutions for efficient production processes

Our innovative air filtration solutions play a crucial role today in uninterrupted operations and efficient production processes. With extensive experience in applications engineering, we optimize the overall system, from the filter medium to the cartridges and specially developed cleaning systems with differential pressure control systems to pneumatic control systems (Δp control). This perfect interaction of all components ensures reliable, highly effective filter systems with a long service life.

The advantages at a glance:

- High separation efficiency
- Low pressure loss
- Good cleaning performance
- High durability
- Long filter service life

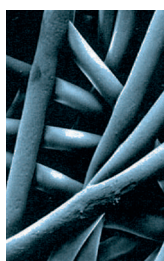
The range of solutions extends from washable filter cartridges through compact, robust, and easily integrated small dust collectors, such as mixer top filters and product separators as well as aerosol separators for machine tools, all the way to large systems solutions and filters for potentially explosive areas that comply with the new ATEX directives.

FILTER MEDIA

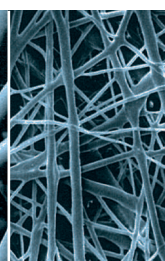
PROCESS-OPTIMIZED, REFINED FILTER MEDIA FOR EVERY APPLICATION.

To turn your individual requirements into actual filter solutions, we develop filter media with high-quality polyester- or cellulose-based filter materials, and even with a nanofiber coating if desired. Using various finishing methods, these filter media can be precisely adapted for nearly any application. The benefit: outstanding filter performance and more cost-efficient, reliable continuous operation of your equipment.

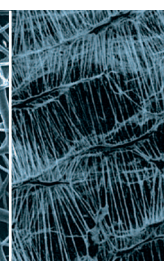
Filter medium
Ti 15



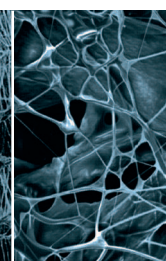
Filter medium
Ti 19



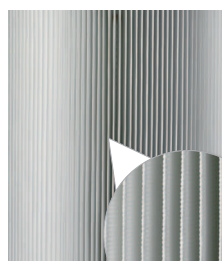
Filter medium
Ti 56



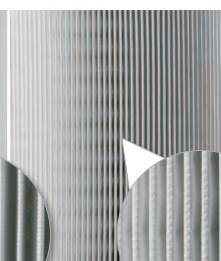
Filter medium
Ti 206



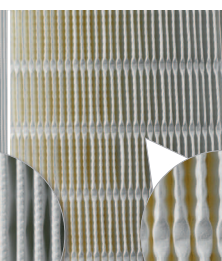
Standard pleating



Polyester filter with
ridges technology



Cellulose filter with pod
embossing (pleat lock)



Filter media with up to 99.995 percent retention efficiency

With optimized, tailor-made filter media providing retention efficiencies as high as 99.995 percent, we are setting forward-looking standards for innovative filter materials. We leave nothing to chance. Whether composite materials, special coatings, mixed fibers, cellulose or polyester nonwovens with PET nanofibers, or electrically conductive polyester nonwovens with PTFE membranes and FDA as well as EU 10/2011 approval—we always deliver the optimal filter performance for your application.

» High-quality filter media and high-performance filter cartridges are the basis for efficient air filtration. At MAHLE, we can rely on leading systems expertise. «



Efficient, proven manufacturing technologies

How do you get top filter performance? With MAHLE's leading expertise and with cutting-edge production technologies. We fold filters perfectly, and use ridges and pod embossing to obtain perfect spacing, for greater performance and a long service life.

MAHLE ridges technology

- Ridges in the filter medium provide perfect pleat distribution and stabilization for polyester filter media
- Optimal utilization of the entire filter surface down to the pleat base (50 mm pleat depth)
- Up to 44 percent greater performance thanks to extremely low differential pressures and easy-to-clean cartridges

MAHLE pod embossing

- Filter material embossing with a spacer pod (pleat lock) provides perfect pleat distribution and stabilization for cellulose filter media
- Optimal utilization of the entire filter surface down to the pleat base (50 mm pleat depth)
- Extremely easy-to-clean cartridges at very low differential pressures

A good star for good air: filter cartridges

Our star-pleated filter cartridges—conical or cylindrical—separate the finest particles from air and other gases in nearly every industrial sector. They are the preferred choice for intake air filtration in gas turbines, product separation in manufacturing and transport processes, sample gas filtration in the pharmaceutical and food industries, and in many other areas of application.

FILTRATION COMPONENTS

FILTER CARTRIDGES AND CLEANING SYSTEMS FOR MAXIMUM EFFICIENCY.

As the inventor of the multijet nozzle and the conical filter cartridge, we are the leaders in innovative components. Based on years of practical experience and extensive development testing, we deliver performance-optimized filtration components and cleaning systems that are both gentle and economical.

Filtration made to order: with standard and customer-specific cartridges

To fully meet every individual requirement for cleaning performance, we offer both high-quality pleated standard cartridges in conical or cylindrical form and optimally adapted, customer-specific filters for complex industrial applications.

Multijet nozzle: cleaning unit with pressure pulsing

Our optimized multijet nozzle (MJD) is the low-cost, supremely effective pressure pulse cleaning system for star-pleated banded filter cartridges (conical or cylindrical). Targeted air guidance (brief pressure impulse against the flow direction) provides uniform cleaning over the entire length of the filter cartridge.

Rotating wing: cleaning unit for conical and cylindrical filter cartridges

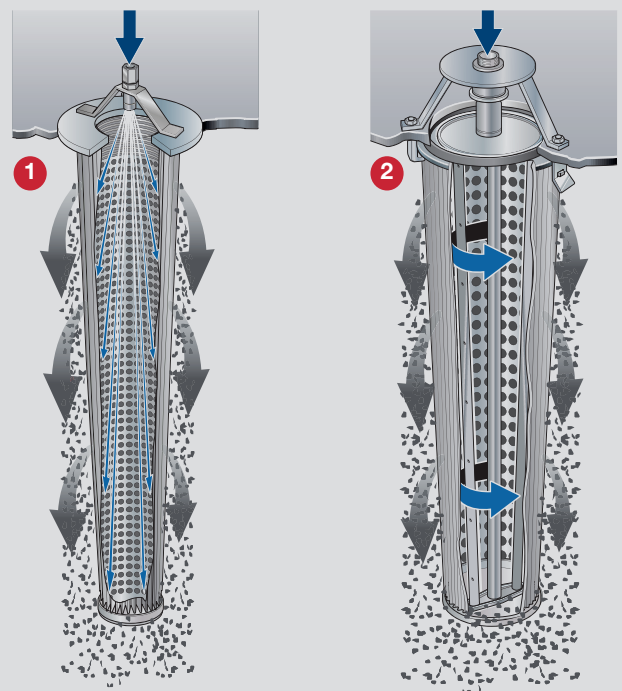
The economical all-round solution for star-pleated conical or cylindrical filter cartridges. Our rotating wings (RLD/RLK) provide efficient, uniform cleaning over the entire length of the filter. The filter cake is reliably detached from the cartridge pleats by fine pulsed air jets and simultaneous vibratory movement.

This system runs particularly efficiently with conical cartridges. Thanks to the markedly reduced flow impact speed, these can withstand greater loads of up to 30 percent, reaching significantly higher operating hours.

Standard cartridges:
high-quality, pleated filter
cartridges, as conical and
cylindrical versions



- 1 The optimized multijet nozzle (MJD) provides for highly efficient cleaning with low compressed air consumption.
- 2 The rotating wing (RLD/RLK)—optimized for gentle cleaning and longer service life.



COMPLETE FILTER SYSTEMS AND OIL MIST SEPARATION UNITS

OPTIMALLY DESIGNED COMPLETE FILTER SYSTEMS FOR CLEAN AIR.

High dust and aerosol concentrations in production can pose a risk to the health of employees and cause costly damage to electronic devices, precision machinery, ventilation systems, and building structures. Complete filter systems and oil mist separation units of the LGA and ASL series provide economical solutions in such cases. The optimal design of the filter systems provides optimal performance and function.



» With LGA and ASL oil mist separators from MAHLE that are designed for specific applications, we can optimally protect our employees and systems from toxic cooling lubricant mists. «

Optimal protection against cooling lubricant mists

Oil mist separation units from MAHLE protect your employees, equipment, and production locations effectively against cooling lubricant mists, thereby increasing productivity. With their highly efficient coalescer principle, they achieve high retention rates for non-water-soluble cooling lubricants and cooling lubricant emulsions that are well below the legally required limits for air quality. Systems run reliably, even at very high raw-gas loads, with economical maintenance intervals and a long service life of up to two years.

An overview of the benefits of oil mist separators:

- Lower lubricant consumption and costs owing to closed oil recirculation circuit
- Optimal application for high raw-gas loads of up to 3,000 mg/m³ and oil applications (non-water-soluble cooling lubricants)
- Outstanding cleaning performance and low-maintenance operation in comparison with centrifugal separators or electrostatic filters
- Optimal separation and service life with optional prefilter element in the coalescer filter (LGA FUW series)
- Highest degree of availability thanks to simple and quick replacement of filter cartridges

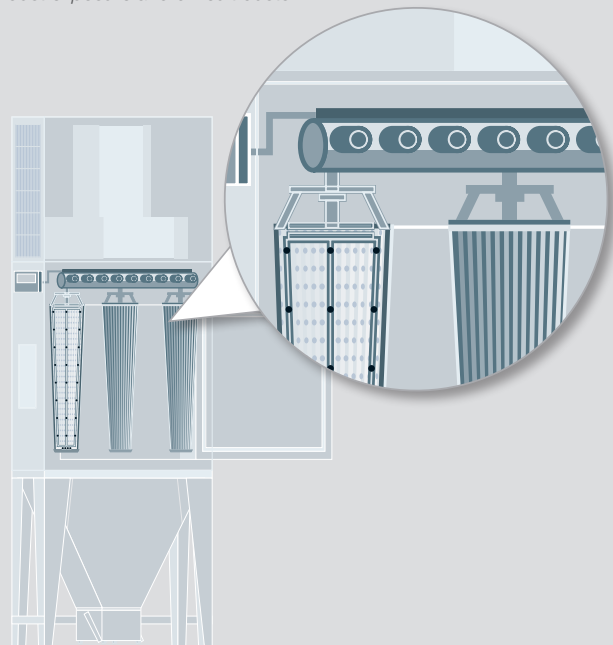
Purely a matter of design: optimal filter function for maximum filter performance

Every industrial application is associated with a specific type of dust exposure. As countless system parameters have to be taken into account, achieving the optimal filter design in terms of technology and economic efficiency is a complex task. Based on our decades of experience as an innovative development partner to leading manufacturers, our engineering experts provide the extra competence needed for designing, selecting, and integrating the right filter system for air cleaning, bringing greater performance to your filtration process.

Our consulting and engineering services:

- Analysis of the problem description and determination of the design parameters
- Recommendations for filter media and cleaning systems
- Design and configuration of the filter system
- Mechanical design and testing
- Electrical installation planning and control systems
- 2D drawings and 3D modeling
- Operating costs and cost-effectiveness calculation

Highly efficient filter technology for separation under high dust exposure and difficult dusts



CUSTOMER SERVICE

CLEAN AIR AT ALL TIMES. SERVICE FOR GREATER SAFETY AND VALUE RETENTION.

MAHLE offers comprehensive service and maintenance services to help you lower your operating costs, prolong the service life of your equipment, and optimize your processes. Our global service team and qualified partner companies take care of on-site services and ensure the availability of your filter systems.

Volume flow meter



Aerosol measuring device



Comprehensive maintenance services for optimal filter performance at all times

An overview of our services:

- Technical advice from our filtration experts
- Turnkey system installation and commissioning services
- On-site employee training
- Repair and maintenance of MAHLE filter systems and third-party equipment
- System optimization for greater filtration performance, minimized downtimes and product malfunctions, preventive maintenance concepts, and modernization of existing filtration equipment
- Lab services to diagnose, analyze, and optimize your processes and filtration tasks, among others
- On-site determination of filterability
- Accessories for air filtration, controllers, measurement instruments, and dosing devices for filter aids

Mobile measuring devices and filter units

For continuous monitoring on site, we offer mobile measuring devices, such as test devices for maintenance indicators, differential pressure indicators, and back pressure indicators.

Preventive maintenance through condition monitoring

By continuously observing your filter system, you can perform all necessary maintenance and repair measures at an early stage to reduce stoppage times. With condition monitoring, you are checking your production machines around the clock. All measurement values relevant to filter performance are captured, formatted, displayed on the machine, and made available centrally or via Internet.

Customized maintenance contracts

In order to prevent faults and premature wear, your system should be inspected and serviced at least once every year. Our maintenance contracts include all of the prescribed maintenance work and are tailored to your needs. You don't even have to think about warranty coverage any more.



EUROPE
NORTH AMERICA
SOUTH AMERICA
ASIA/PACIFIC

» We can trust blindly
in the reliable operation
of the filter systems
from MAHLE. Worldwide
spare parts supply is
also guaranteed at all
times.



ALWAYS THERE FOR YOU: WITH COMPETENT CONTACTS WORLDWIDE.

SHIPPING ADDRESSES AND BRANCHES INDUSTRIAL FILTRATION PROFIT CENTER

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