MAHLE Industry

Product range MAHLE Air Filtration
Overview

Whether in surface technology, the chemical, food, and pharmaceutical industries, machinery construction, machine tool manufacturing or energy technology – MAHLE filters, devices and systems for removing the dust from air and gases increase productivity and contribute to product reclamation as well as improved environmental protection and safety at work. Our complete air filtration product range is shown in the table below, subdivided into groups. This list of contents is designed to help you find your way around the folder more easily, so that you never have to look far for the information you are seeking.

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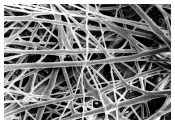
2	**Filter media**	Polyester based media Cellulose based media Special filter media	
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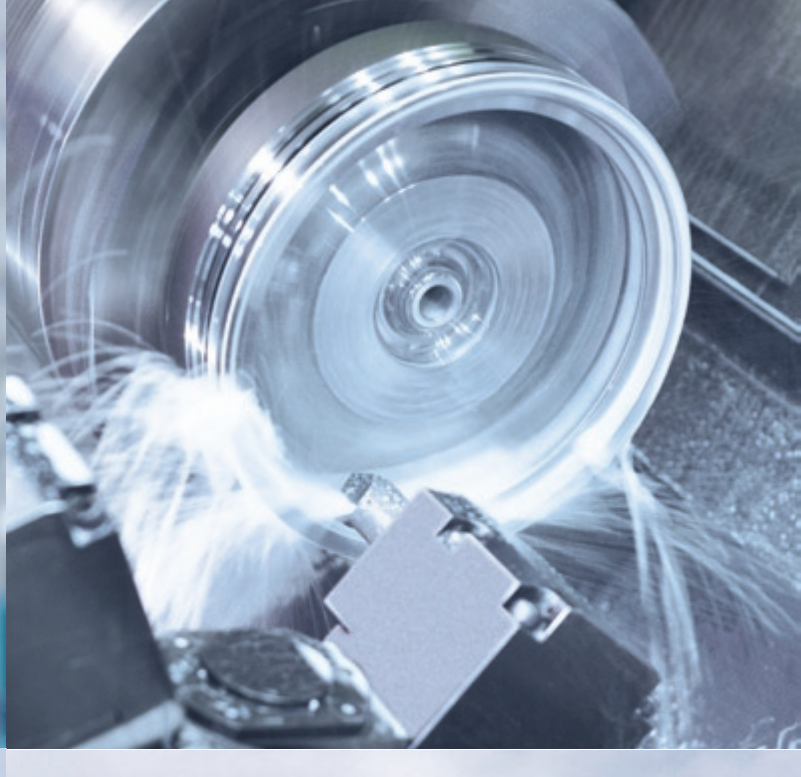
Filtration
Engine Components
Thermal Management

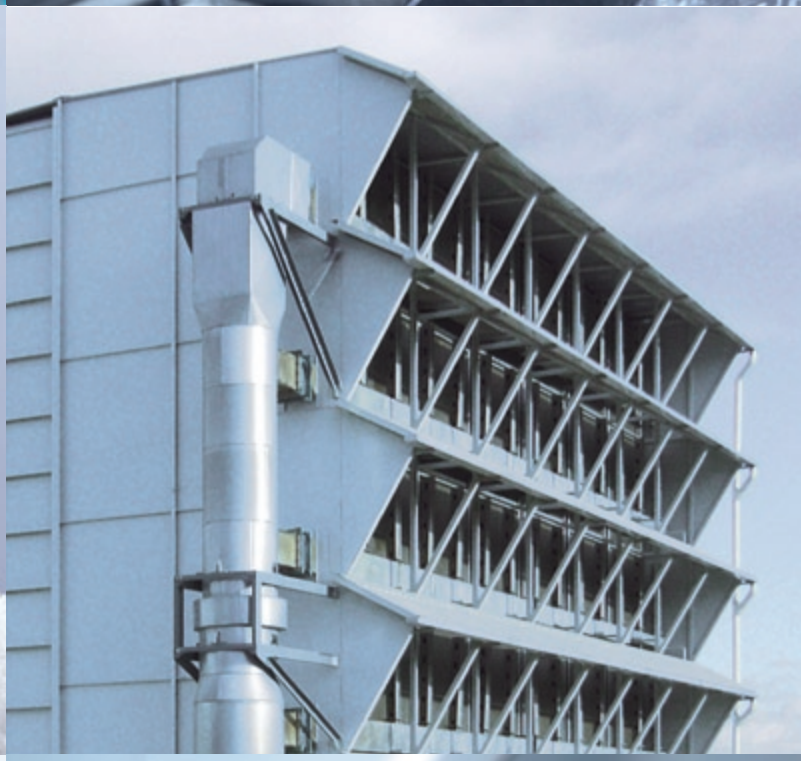
MAHLE
Industry

HIGHER PERFORMANCE

FOR CLEAN AIR

AIR FILTRATION





WORLDWIDE EXPERTISE IS IN THE AIR

Your global partner for air filtration

If you are looking for a higher-performance, more efficient, more cost-effective solution—from initial consultation to service—then our expertise is "in the air." From dedusting to air intake filtration. Worldwide. Our filters, equipment, and systems for the dedusting of air and other gases increase productivity and systems reliability, and contribute to product recovery and increased environmental protection and safety at work.

All over the globe, our innovative, proven, reliable filter solutions are used in equipment, machines, and system solutions to ensure uninterrupted, economical operations: optimally tuned and designed to meet your requirements.

High performance with unique development and process knowledge

For over 40 years, we have been working on the filtration of very fine particles from the air, and are the leading manufacturer in this industry. With extensive engineering expertise, we can provide advanced filtration technologies to give you the cutting edge:

- High-performance filter media, cartridges, and complete system solutions optimized for your process
- Broad product range, available worldwide, from filter medium to systems solutions
- Applications expertise from various industries and complex applications
- In-house research and development, innovative filter media and finishing processes
- In-house production in Germany and Romania, with special manufacturing processes
- In-house technical center, test labs, lab service
- Quality without compromise
- Worldwide service and fast spare parts delivery

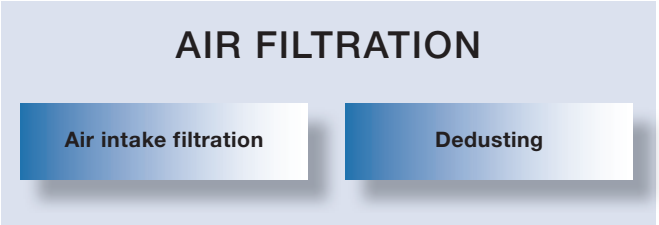
Local presence around the world

As an innovative solutions partner, MAHLE Industriefiltration has developed and produced a wide spectrum of products and systems for many years. They provide our customers around the world with a unique technological advantage in the fields of fluid filtration, air filtration, process technology, separation, and water treatment.

MAHLE Industriefiltration is a division of MAHLE Industry, with its own development, production, and sales. MAHLE's industrial activities are combined in the Industry business unit. These include, among others, the areas of large engines, industrial filtration, as well as cooling and air conditioning systems. The MAHLE Group is one of the 30 largest companies in the automotive supply industry worldwide. With international locations, MAHLE is represented in Europe, the USA, Russia, Brazil, India, Japan, China, and Malaysia, ensuring direct contact with our customers.

Air intake filtration and dedusting—efficiency in applications

- Food industry
- Metal processing/surface technology
- Chemical and pharmaceutical industry
- Construction industry
- Power engineering
- Customer-specific solutions



CONTENTS

CLEAN PROCESS PERFORMANCE FOR THE FOOD INDUSTRY

Higher process quality, reliability, and efficient product recovery

The food industry places the highest requirements on process quality, cleanliness, systems reliability, and environmental protection. In this respect, our products and solutions for air filtration are at home—for example, in the production of sugar and sweeteners, cocoa, chocolate, thickeners, dairy products, and flavorings. Thanks to their high performance, they recover the finest particles, filter contaminants from the air, minimize dust exposure, and thus create the basis for hygiene, quality, and clean, economical processes.

The highly efficient filter systems, cleaning units and systems, filter controllers, dust collectors and systems with FDA food grade certification are optimally tailored to the specific dust exposure of the process. This ensures good separation performance, economical product recovery, and compliance with all safety and environmental requirements. Our products are extremely durable, require little maintenance, and are economically and ecologically sound.

The advantages

- Specially developed FDA filter media
- Food safe sealing systems
- Customized designs
- Filter cartridges with no "dead space"
- Washable filters
- Open pleats at the bottom

Applications

- Pneumatic conveyors
- Dryers/mixers
- Powder handling
- Top silo filters, bunker filters, mixer filters
- From small, integrated deduster to large central exhaust systems
- Filters for potentially explosive areas

Filter cartridges for better filter performance, with open pleats at the bottom

HIGH OPERATIONAL SAFETY FOR METAL PROCESSING/SURFACE TECHNOLOGY

Less dust—more effective

Our filter systems help preserve resources, reduce wear, and increase machine utilization—for example, in machinery and plant construction, and in the automotive and aerospace industries. They exceed all requirements for air quality in workspaces and permissible exhaust air contamination.

Filter cartridges for dry machining

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 reduce the dust exposure of the machine and the environment—with maximum service life thanks to optimized flow.

Oil mist separation in a closed cycle

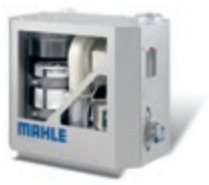
For efficient separation of cooling lubricant emulsions and oils from air, our innovative oil mist separator unit (LGA) is the most economical solution. Using the coalescer principle, very small oil droplets are joined together into larger drops, then discharged and fed back into the cooling lubricant circuit of the machine tool.

The advantages

- Polyester- and cellulose-based filter media, with nanofibers or meltblown technology
- Maximum filter surface in a tight package, with pleat spacing technology (pleat lock)
- Filter aid dosage (overspray with precoating)
- Cleaning system (RJD) for optimal cleaning at high differential pressures
- Coalescer principle for mist separation

Applications

- Welding, smoke extraction (smoke in air)
- Overspray/wet paint extraction in large painting systems
- Powder coating systems, blasting systems
- Dry machining, flame spraying, grinding, polishing
- Oil mist separation (oil in air)



Oil mist separator unit LGA series

Quick-Lock element

GREATER EFFICIENCY FOR CHEMICAL PROCESSES

Dedusting—approved for chemical and pharmaceutical industries

For the chemical and pharmaceutical industry, we provide ecologically and economically superior solutions that sustainably comply with globally increasing requirements and meet the highest requirements for process quality, cleanliness, safety, and environmental protection. Whether in the production of chemical products, paints, dyes, and pesticides, or in filling and packaging machines, for transportation activities, drying processes in fluidized bed or spray dryers—our high-quality filter systems with FDA-approved filter media achieve great filter performance and economical service life with effective cleaning systems in combination with PTFE membrane filter elements, ensuring trouble-free operation.

We offer a wide range of washable filter element solutions for reliable dedusting and clean process performance, including compact, robust, and easily integrated small dust collectors, such as top mixer filters and product separators, as well as large central exhaust systems and filters for potentially explosive areas.

The advantages

- High filter surface loading
- High separation rates
- Easy to clean (rotating wing)
- Thermal and chemical resistance
- Excellent hydrolysis resistance
- Optimized filter media, such as polyphenylene sulfide with a PTFE membrane (Ti 18) or microglass nonwoven Ti 26 (fiberglass H14)
- Wire mesh backing for greater pleat strength

Applications

- Tablet production/pelletizing
- Powder handling
- Mixers, dryers, conveyors
- Clean room technology
- Types of dust, such as talcum, plastic powder, titanium dioxide, rubber, etc.

Filter cartridge with wire mesh

Multijet nozzle

REDUCING DUST EXPOSURE IN THE CONSTRUCTION INDUSTRY

A lot gets caught—and the work goes on

Construction machines, such as rock drills, have to work reliably even under high dust exposure. This dusty air is continuously cleaned by our cleanable filter elements. We have developed special filter cartridges, with a compact, space-saving form factor, for use in mobile machinery. The high-performance cartridges, and matching cleaning units, ensure high operational safety; for instance, in building cleaning, track washing, and suction excavators.

Filter cartridges with optimized filter performance under high dust exposure

The advantages

- Robust filter cartridges, resistant to differential pressure
- Optimal filter performance under high dust exposure
- High separation rates
- Easy to clean
- Special filter media with PTFE membrane
- Conical cartridges for greater performance
- Corrosion-resistant filter cartridges

Applications

- Tunnel construction (cement dust extraction)
- Above-ground/underground/mines
- Suction excavation
- Building reconstruction
- Tool exhaust (slot cutting, drilling, etc.)
- Rock drilling machinery/rock crushers
- Types of dust, such as cement dust, rock dust, gypsum, wood, etc.

PERFORMANCE FROM THE AIR FOR POWER GENERATION AND ENGINEERING

Continuous, powerful performance

In the field of power engineering, uninterrupted performance is a must, for example, using gas turbines or large diesel engines. To accomplish this, inlet air must always be optimally conditioned and filtered. This is where our cleanable and static filter cartridges, developed specially for air intake filtration, use their advantages to the full. With high-quality, optimized filter media, the compact, robust systems operate at a low differential pressure, with long service life, and very good separation performance. They efficiently filter dirt and other contaminants from the air intake at a high performance level, minimize wear on the turbine blades, and contribute to continuous, economical power generation. For new plants or as replacement elements in existing plants.

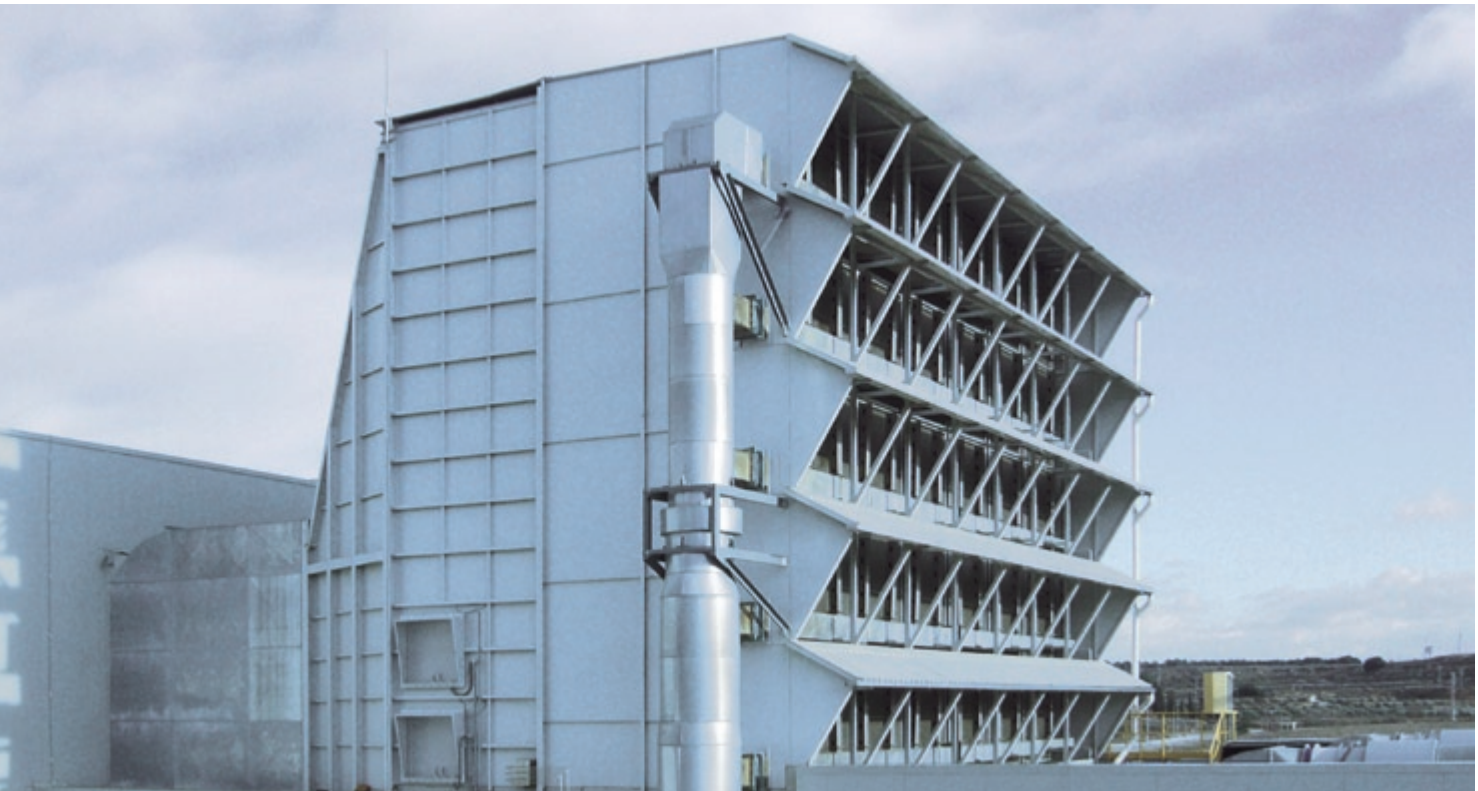
Cleanable conical/ cylindrical cartridge for gas turbines

The advantages

- More efficient power generation (due to lower differential pressure)
- Reduced consumption and costs
- Reduced emissions
- Greater machine availability
- Less wear, less maintenance cost
- High dust holding capacity for static cartridges
- Cleanable filter systems with very long service life
- Low differential pressures, high separation performance
- Special multijet cleaning
- High resistance and load capacity
- Optimized filter media for dry and wet applications
- Filter cartridges use ridges technology and pleat lock for greater performance
- ARAMCO test available upon request

Applications

- Air intake filtration in gas turbines, power plants, and wind power plants
- Production processes, such as production of silicon crystals for solar cells
- Air intake filtration for climate control and electric motors
- Process filtration
- Top silo filtration
- Types of dust: all dusts from the ambient air, desert sand, industrial dust, dust from production processes



STURDY FILTERS WITH CUSTOMER-SPECIFIC SOLUTIONS

Solutions to match your needs

Special dedusting tasks require special solutions. In cooperation with our customers, we develop optimally tuned custom solutions. We will configure your filter cartridge precisely to your specifications and requirements.

The advantages

- Integral systems solutions through development partnership
- Better filter performance
- Flexibility in design
- In-house sample and prototype shop
- Universal applications
- Broad range of technological and applications expertise
- Designed and tested according to DIN and ISO standards, with associated industrial approvals

Applications

- Filter solutions for industrial vacuum cleaners and household appliances, such as pleated round filters or pleated flat filters
- Filter solutions for electric power tools and for cooling or air conditioning systems in trains and special vehicles
- Toner filters
- Filter solutions for cabin air
- Filter solutions for special requirements, such as fiberglass dust, adhesive dusts, paper fibers, silicon dusts, and tow fibers
- Wire mesh filter cartridges for dust filtration in conveyor systems for silo vehicles
- Pleated cartridges with special filter media and customer-specific mounting systems for various applications, such as pneumatic conveyors and dryer applications

Miofilters for air intake filtration

We have developed special miofilter systems for prefiltering air intake for HVAC modules and electric motors in trains. As round filters or filter cells (panel filters), they protect the downstream fine filter system from coarse contaminants or weather effects, such as snow or ice.

Customer-specific filters for extraction

Miofilter

TECHNOLOGY FOR MAXIMUM FILTER EFFICIENCY

From the filter medium to the cleaning system: systems competence for perfect filtration results

We have always taken the lead with our development projects in order to set new standards for our customers. We invented the higher-performance conical cartridge, optimized for service life, and hold the patent for high-efficiency multijet cleaning units. Our innovative air filtration solutions currently play an increasingly critical role 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, to pneumatic control systems (△p control). This perfectly tuned interaction ensures reliable, highly effective filter systems with long service lives.

The advantages

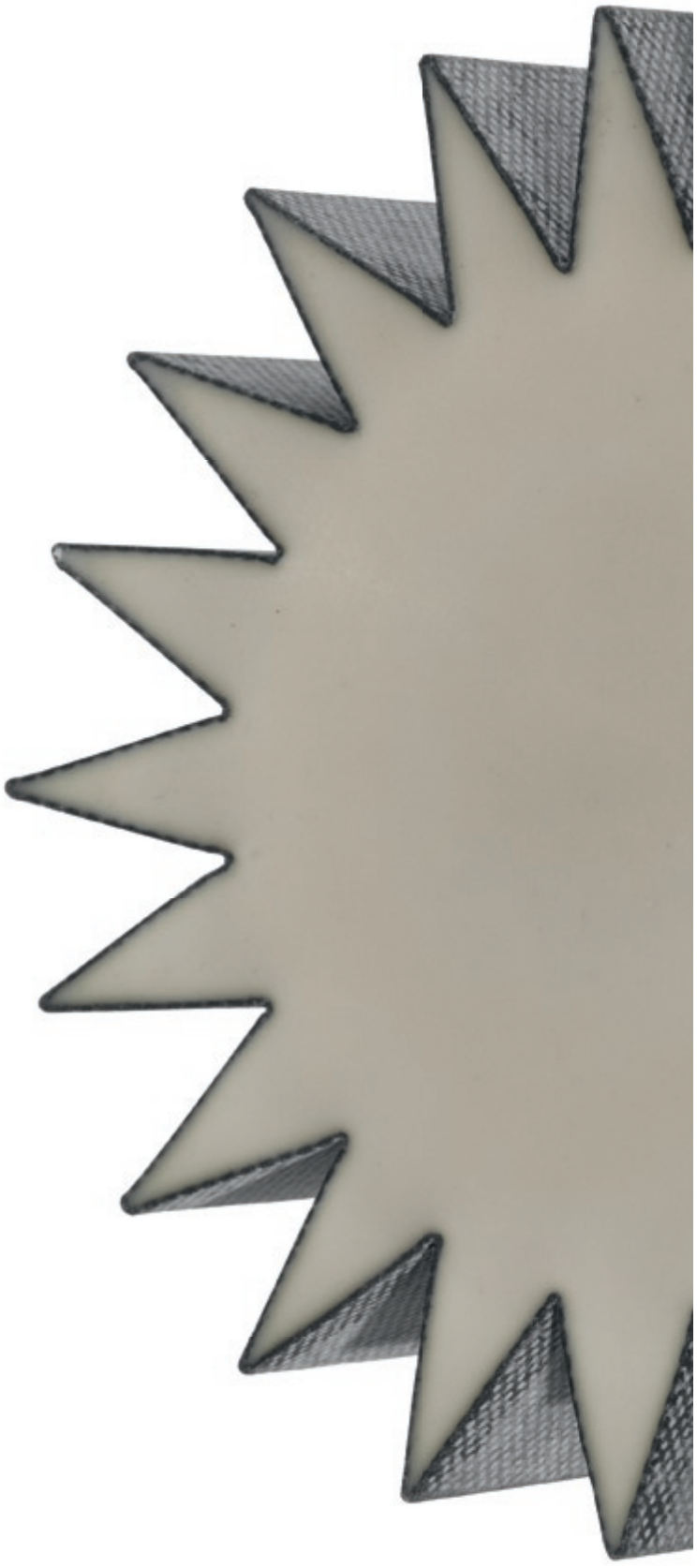
- High separation efficiency
- Low differential pressure
- Good cleaning performance
- High durability
- Long filter service life

The range of solutions extends from washable cartridges, through compact, robust, and easily integrated small dust collectors, such as mixer top filters and product separators, to large systems solutions and filters for potentially explosive areas, meeting the new ATEX directives.

Filter controllers for every application

From compact timer controls to fully programmable differential pressure controllers, you can get the optimal solution for smooth, energy-efficient operations and long service life for your filter elements. With fully selectable differential pressure levels, cleaning cycles can be reduced to an economical minimum.

Standard cartridges
High-quality, pleated filter elements, in conical and cylindrical versions.



THE SUPERIOR SOLUTION: OPTIMIZED DOWN TO THE LAST DETAIL

We do anything and everything to improve filter performance

The thoroughness with which we perfect solutions down to the smallest detail, and tune them to our customers' individual applications, is surely one of the reasons for our worldwide success. Because we know the complex interactions of filter technology better than anyone else, from many industries and from our own research and development activities.

The knowledge gained continuously flows into new media and product developments, which will stand up to the most severe daily conditions at our customers.

In our applications engineering department and state-of-the-art development service, we continually develop for best customer benefits and optimize our products. Application testing in our test systems and on site ensures high-quality, efficient, and operationally reliable products. Our proprietary production processes ensure that filter media processing is optimized for the application.

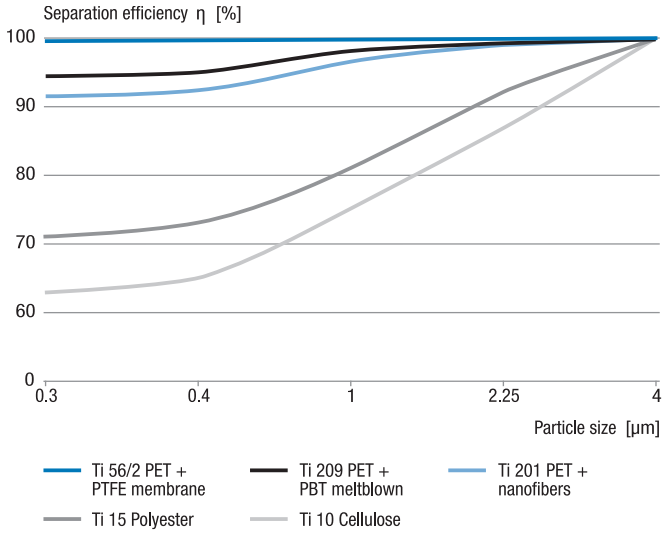
You will always receive the perfect solution, at a certified quality level, with all typical industrial approvals, such as FDA approval for the pharmaceutical and food industries. The consistently high quality of MAHLE filter elements is ensured by regular, extensive materials and performance tests.

OPTIMIZED PROCESS, REFINED FILTER MEDIA

Maximum performance, down to the smallest pore

We have mastered the development of innovative filter media down to the smallest detail, and create media, for example, that even feature nanocoatings. Our core competence lies in providing a wide range of high-quality polyester and cellulose filter materials, which can be tuned for nearly any application by applying various finishing methods, for the most challenging customer applications.

Our special filter media guarantee outstanding filter performance and cost-optimized, reliable, long-term systems operation.

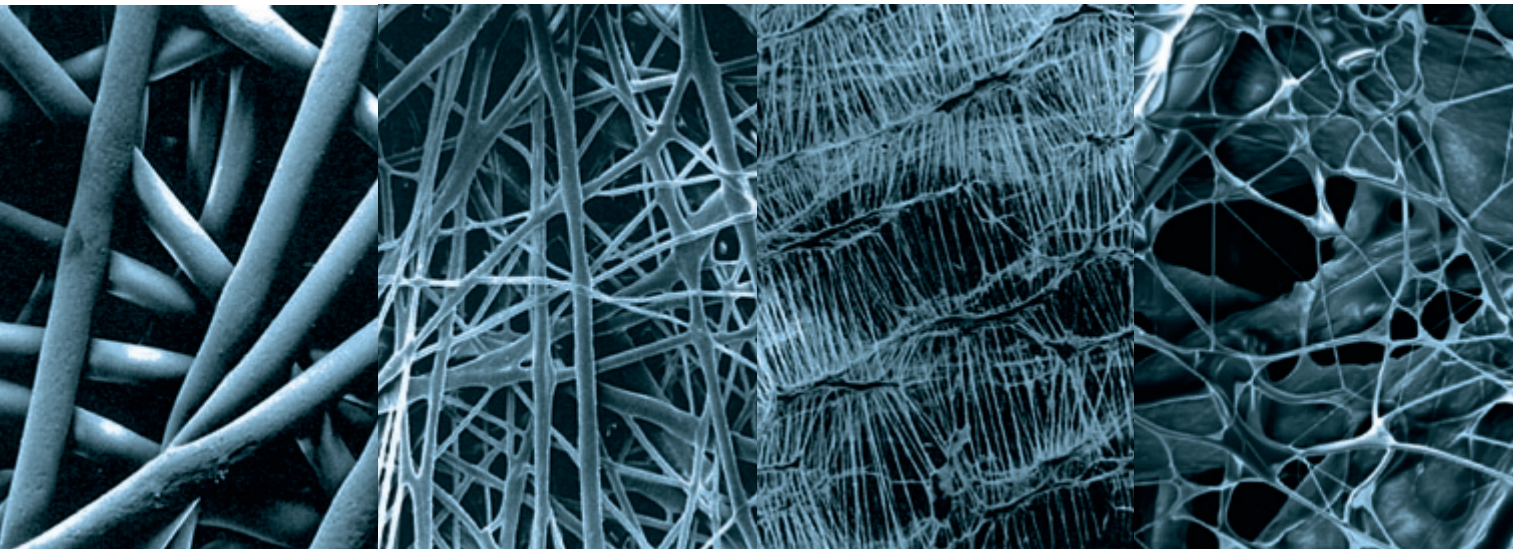


Higher performance, longer service life, and lower maintenance costs. Our innovative filter media achieve retention efficiencies of up to 99.995% (H 14).

Filter media with up to 99.995% retention efficiency

With optimized, tailored retention efficiency, which can be as high as 99.995%, 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 polyester nonwovens with PTFE membranes—our goal is always to deliver the optimal filter performance for your application. The result: high separation efficiencies with low pressure loss, electrical conductivity, oil and water resistant properties, good chemical resistance, and environmental properties. This results in applications even for difficult fine dusts and high load levels, for the chemical and food industries, and for potentially explosive areas.

Filter medium Ti 15 *Filter medium Ti 19* *Filter medium Ti 56* *Filter medium Ti 85*



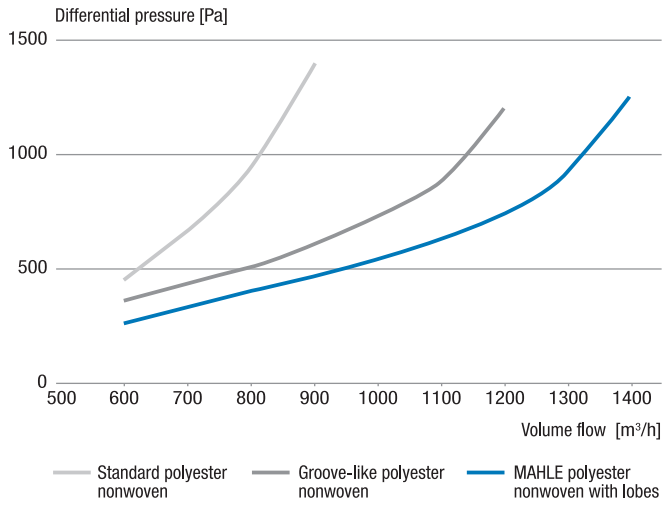
MANUFACTURING TECHNOLOGIES

Ridged, impregnated, and spaced apart—for the best performance

How do you get top filter performance? With specialist know-how that not everyone has, and with cutting-edge production technologies. We fold filters perfectly, and use ridges and pleat lock to obtain perfect spacing, for greater performance and longer service life.

The MAHLE ridges technique

- Our polyester filter media have perfect pleat distribution and are stabilized by lobes in the filter medium
- The entire filter surface is optimally utilized, down to the base of the pleat (for 50 mm pleat depth)
- The filter elements provide very low differential pressures and are easy to clean
- This results in increased performance by up to 44%



Clear performance advantage using the ridges technology: greater volume flow at a lower differential pressure.

The MAHLE pleat lock

- For cellulose filter media, we achieve perfect pleat distribution and stabilization by pleat lock the filter materials with a spacer lense (pleat lock)
- The entire filter surface is optimally utilized, down to the base of the pleat (for 50 mm pleat depth)
- The filter elements provide very low differential pressures and are easy to clean

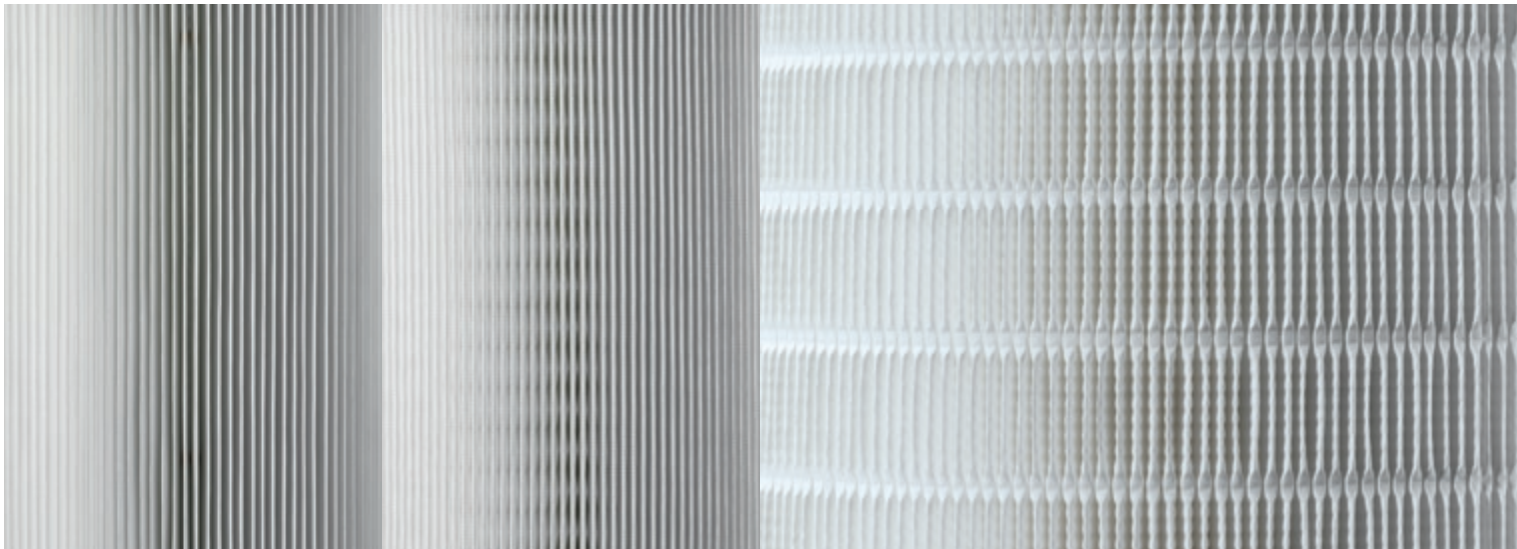
A good star for good air: filter cartridges

Our star-pleated filter cartridges—conical or cylindrical—separate the finest particles from air and other gases in nearly every industrial sector. Their superior properties have made them the preferred choice for air intake 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:

- Very good separation performance, very high efficiency
- Low differential pressure; thanks to ridges technique and pleat lock
- Improved cleaning performance
- Superior flow conditions
- Very long service life
- Optimal utilization of the entire filter surface in a small package
- Very low maintenance

Product range

- Standard cartridges
- Vacuum cleaner elements
- Special cartridges for gas turbines
- Miofilters
- Custom-made designs to meet customers' requirements



CLEANING SYSTEMS

Cleaning with high-performance technologies
As the inventor of the multijet nozzle and the conical filter cartridge, we are the leaders in innovative cleaning systems. Based on many years of hand-on experience and extensive development testing, we provide performant systems for cleaning filter elements gently and economically.

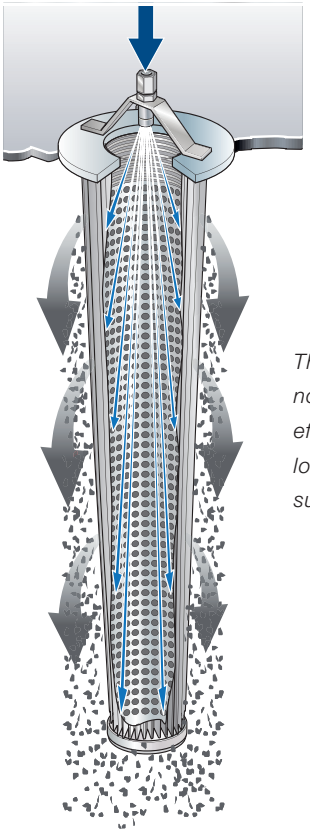
Multijet nozzle—cleaning unit with pressure pulsing
Our optimized multijet nozzle (MJD) is the low-cost, supremely effective pressure pulse cleaning system for star-pleated banded filter cartridges (conical or cylindrical). Targeted air guidance (brief pressure impulse against the flow direction) provides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

The advantages
- High strength and energy efficiency
- Uniform cleaning over the entire length of the filter element
- Optimized cleaning efficiency with optimized nozzle geometry
- Upward compatibility with the rotating wing
- Low noise level (reduced by up to 7 dB(A) compared with typical single-hole nozzles)
- Minimal compressed air consumption

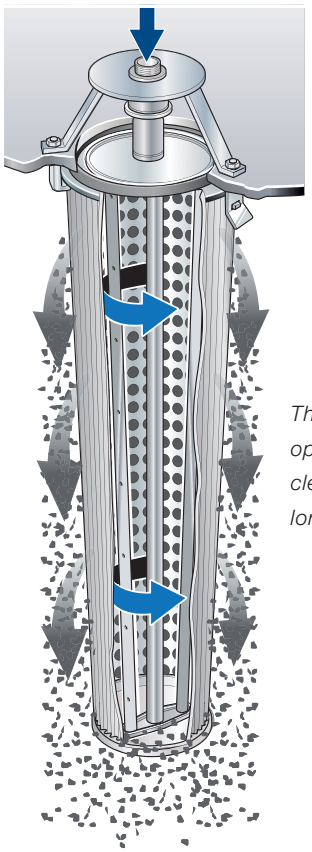
Rotating wing—powerful cleaning unit for conical and cylindrical filter cartridges
The economical all-round solution for star-pleated conical or cylindrical filter cartridges. Our rotating wings provide efficient, uniform cleaning over the entire length of the filter. The filter cake is detached from the cartridge pleats by fine pulsed air jets and simultaneous vibratory movement.

The advantages
- High efficiency, significantly longer filter service life
- Uniform, gentle cleaning of the cartridges
- Low noise level
- Minimal compressed air consumption
- Low cleaning pressure, therefore high energy efficiency
- Suitable for high differential pressure loads and sticky adhesive dust
- Very economical in combination with Quick-Lock dust filter cartridges

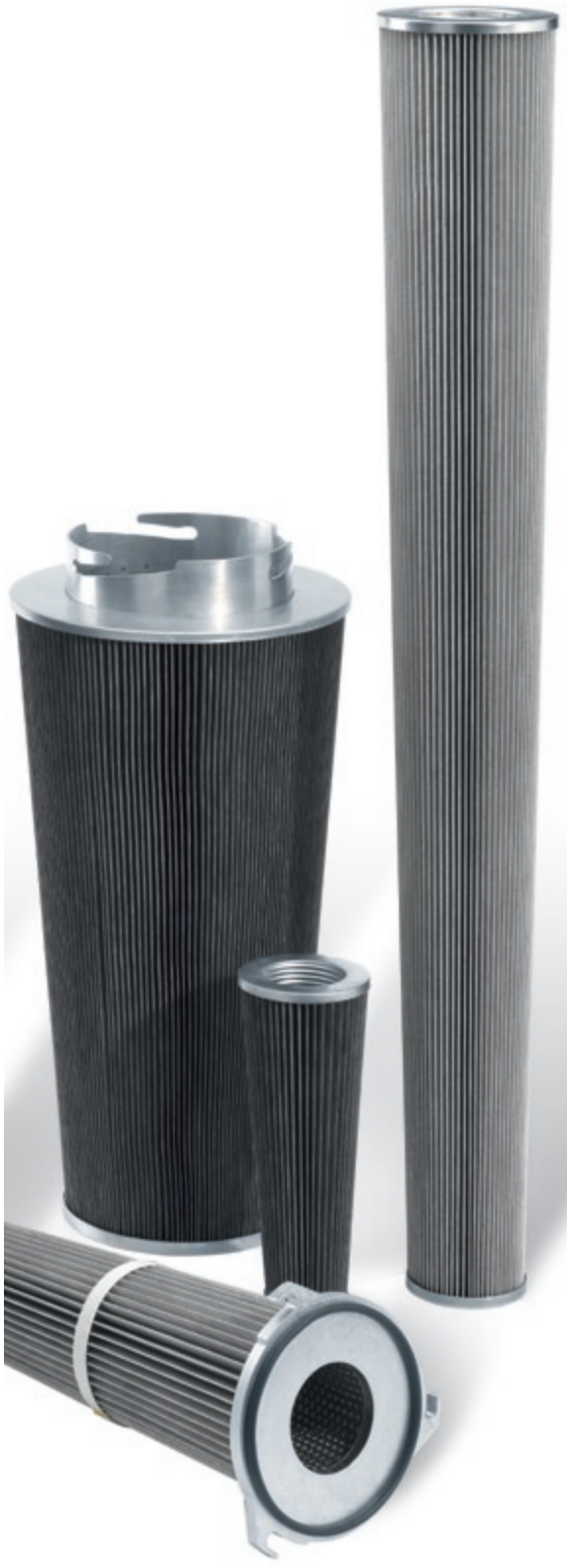
The system runs particularly efficiently with conical cartridges. Thanks to the markedly reduced flow impact speed, these can withstand greater loads of up to 30%, reaching significantly higher operating hours.



The optimized multijet nozzle provides for highly efficient cleaning with low compressed air consumption.



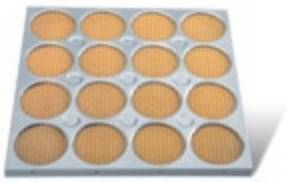
The rotating wing—optimized for gentle cleaning and longer service life.



Cleaning units
Energy-efficient, low-noise cleaning units for long filter service life.

Controllers, valves, pressure vessels
Economical systems operation with optimal control systems and low compressed air consumption.

Customer-specific filters for industrial applications
Optimally tuned filter elements for challenging industrial applications.



Miofilters
Robust, completely regenerative prefiltering systems for air intake filtration.

Oil mist separator unit (LGA series)
Efficient oil mist separation for precision machining in machine tools by using oily lubricants.

OPTIMAL FUNCTIONALITY— PURELY A MATTER OF DESIGN

Optimal design: solutions expertise for all types of dust exposure

Not all dust is created equal. Every process is associated with a very specific type of dust exposure. Due to the variety of the information, data, facts, and systems parameters to be considered, technically and economically optimal filter design is a complex task that requires experienced specialists. Thanks to our decades of expertise as an innovative development partner and reliable supplier to leading manufacturers, we provide the extra competence needed for designing, selecting, and integrating the right filter system for air cleaning, bringing greater performance to your filtration process. With committed engineering experts, extensive applications experience, and modern tools, we ensure technically and economically optimized design in filtration technology:

- We are your competent partner for consulting on difficult dedusting tasks, with lab support
- We have extensive knowledge in process technology
- We have mastered the integration of components and the layout of dedusting systems in complex factory installations

Our consulting and engineering services

- Analysis of the dedusting task, determining the design parameters (application, operating temperature, installation location, air volumes, volume flows, gas composition/water content, type/quantity of dust, particle size, bulk density, minimum operating hours, maximum residual dust content, ATEX zone)
- Recommendation for the filtration task: filter medium, element type, cleaning system
- Design and configuration of the filter system: size, shape, and performance
- Project management
- Mechanical design and testing
- Electrical installation planning and control systems
- 2-D drawings and complete 3-D modeling
- Operating costs and cost-effectiveness calculation

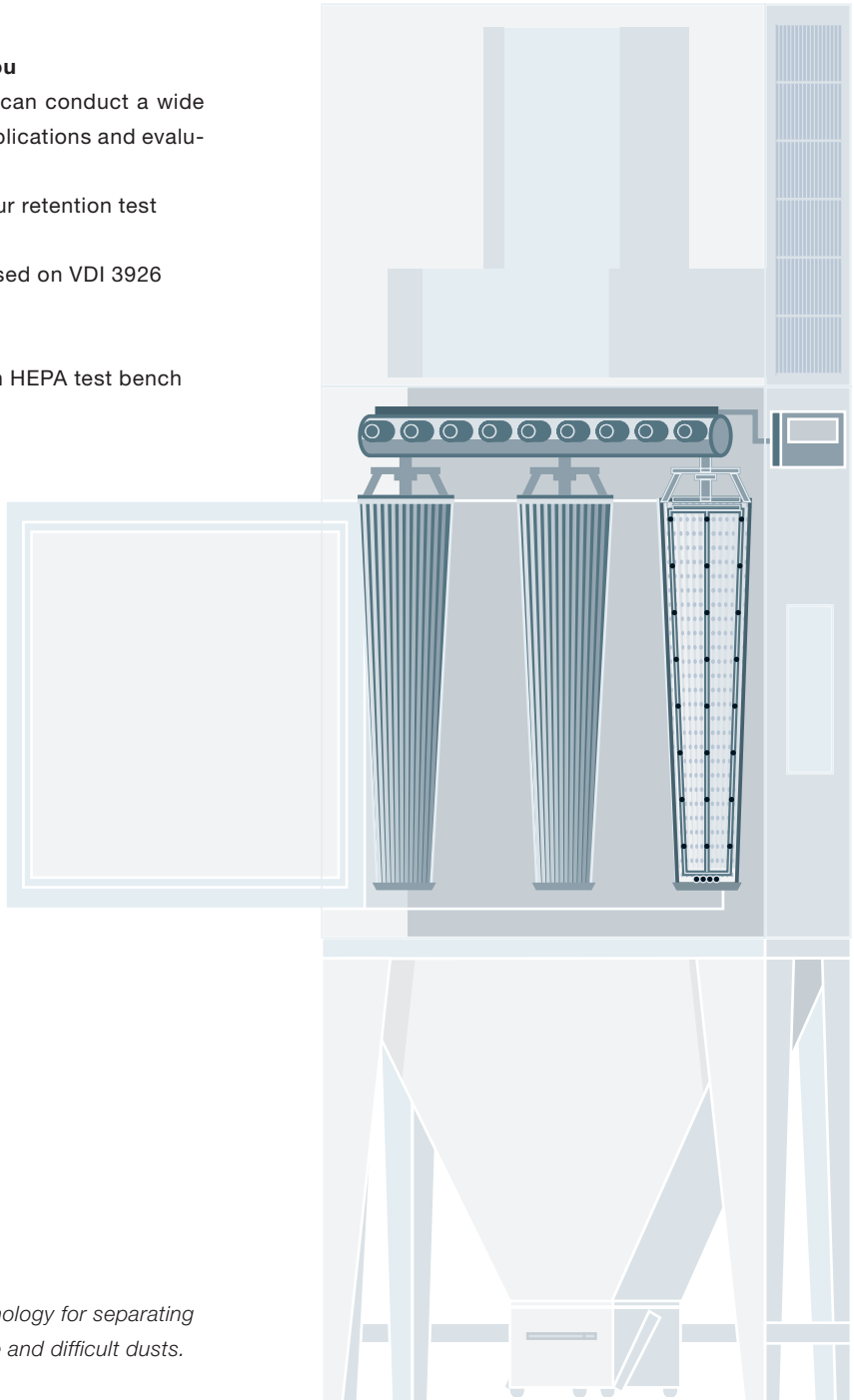
Research and development with in-house labs

In our own research and development labs, we create the foundation for groundbreaking innovations. Using modern applications technology, we carry out basic experiments, volume flow measurements, sample tests, particle size analyses, and pressure and leak testing. In order to test under the toughest real-world conditions, for example, we also start practical pilot tests with test filters on site at our customers' facilities. With the continuous further development of materials and manufacturing technologies, we are pursuing a clear goal: optimal products for uninterrupted and economical operations.

Technical center and lab—services for you

At our technical center and in our labs, we can conduct a wide range of tests for you in order to analyze applications and evaluate filtration efficiency, including:

- Determining separation performance on our retention test bench
- Determining service life of filter media, based on VDI 3926 standard
- Validation and documentation
- Performing tests at H14 quality on our own HEPA test bench (DIN EN 60335-2-69-AA) with certificate
- Microscopic analyses and tests of filter media and dusts in a scanning electron microscope, which can be combined with a microprobe
- Spectral analysis of the composition of a solid sample
- Determining cleanliness classes with automatic particle counters
- Particle distribution analysis of dry and wet samples
- Simulation of IFA retention tests



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

SERVICE FOR GREATER SAFETY AND VALUE RETENTION

Service, from consulting to spare parts supply, maintenance, and training

We are available, no matter where you are. MAHLE Industriefiltration will support you with an extensive scope of services including professional maintenance and repair services, to minimize your operating costs, extend the service life of your systems, and optimize your processes. A dedicated service team, supported by selected qualified partner companies, takes care of on-site services and ensures the availability of your filter systems. For greater functionality, safety, reliability, and economy, our service provides extra performance:

- **Technical consultation:** MAHLE Industriefiltration provides direct access to a team of filtration experts, with specific experience in air filtration
- **Plant installation and start-up:** on-time delivery and commissioning, turnkey systems installation, on-site operator training
- **Maintenance** of MAHLE filter systems and third-party systems
- **Repair** of all components of MAHLE filter systems and third-party systems
- **On-site diagnostics and analyses**
- **Extensive analysis,** expertise, conditioning, and monitoring —also in cooperation with leading institutions
- **Systems optimization:** improving filtration performance, minimizing downtimes and production interruptions, preventive maintenance concept, modernizing existing filter systems
- **Laboratory services:** with cutting-edge labs for diagnosing, analyzing, and optimizing your processes and filtration tasks
- **On-site filterability tests**
- **Accessories for air filtration,** controllers, measurement instruments, and dosing devices for filter aids
- **Numerous alternatives** to competitive products

Reliable global spare parts supply

Our performant spare parts service keeps a wide range of replacement filter cartridges available around the world. These cartridges are manufactured according to the same strict manufacturing criteria as the original MAHLE filter elements. Customer-specific special versions available upon request. Worldwide, our partner vendors ensure quick delivery of original cartridges, wherever they are needed. Identical filter cartridges from other manufacturers are also available—in MAHLE quality, of course.

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.

Individual training programs

In practical training sessions—on site or at our facilities—we provide the knowledge for professional handling and maintenance of your systems solutions. This ensures that your systems retain their value, with reduced operating costs.

Condition Monitoring upon request—the basis for preventive maintenance

By continuously observing and evaluating the condition of your filter system with our Condition Monitoring, all necessary maintenance and repair actions can be performed early, if needed, to reduce stoppage times to the absolute minimum, or even prevent them entirely. Condition Monitoring allows production machines to be monitored around the clock. All measurement values relevant to filter performance are captured, formatted, displayed on the machine, and made available centrally or via Internet.

On the safe side: with a tailor-made maintenance contract

In order to prevent faults and premature wear, your system should be inspected and serviced at least once every year. Even better: you can take advantage of our maintenance contract. It includes all of the prescribed maintenance work and is tailored precisely to your needs. You don't even need to think about warranty coverage any more.

Volume flow meter

Oil mist measuring device

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EN 78357469.10/2011

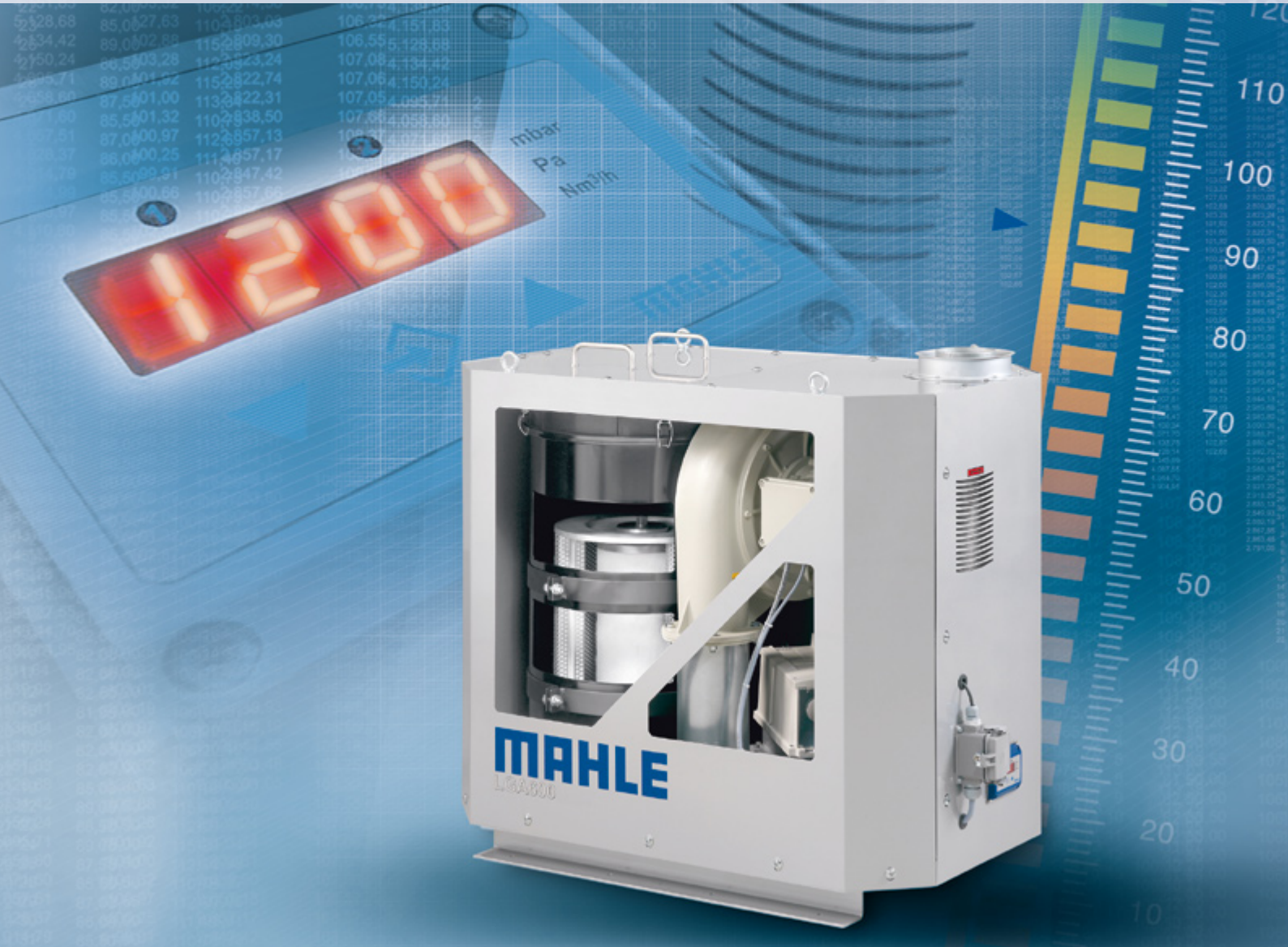
MAHLE

Industrial Filtration

CLEAN AIR TO BREATHE DEEPLY

MAHLE LGA SERIES

OIL MIST SEPARATION



FOR CLEAN AIR AND PERFORMANCE
SEPARATING OIL

Applications of the LGA oil mist separators

- Machinery and plant construction, machine tools, precision machines
- Drive technology
- Automotive
- Energy and power plant technology

We eliminate oil mist

Cooling lubricants (oil or emulsions) are used under high pressure during industrial machining and forming operations – in modern machine tools, for example. As a result, more oil mist and emulsions are released into the air. To ensure that the aerosol level of the maximum workplace concentration (MAK) value is not exceeded, the cooling lubricant mist must be reliably and continually extracted from the work area of the machines and cleaned. Conventional systems frequently struggle with this task.

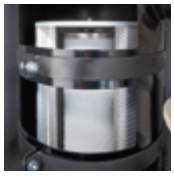
Preventing “thick air” and damage

High aerosol concentrations in production may be harmful to the employees‘ health and result in absences and discomfort. Similarly, damage may be incurred to electronic devices, precision machinery, ventilation systems, and the building structure.

Promoting a productive working environment: MAHLE LGA series

MAHLE oil mist separator units efficiently protect the employees, resources, and production locations from cooling lubricant mists, thereby contributing to increased productivity. With their highly efficient coalescer principle, they achieve separation rates for non-water-soluble cooling lubricants and cooling lubricant emulsions far below the legally stipulated air quality limit values. The units run reliably and have economical maintenance intervals as well as service lives of up to 2 years, even at very high untreated raw-gas loads. Upgrade your systems to meet future requirements and incorporate modern MAHLE filtration technology in your planning right from the start, to ensure up-to-date occupational health and safety, effective protection of the environment, and greater productivity.

MORE EFFICIENTLY



Low-maintenance coalescer filter element with optional prefilter for highly efficient oil mist separation

Digital monitoring of the operating parameters

Preset control electronics with frequency controller for optimum operating state

Energy-efficient and low-noise radial fan for a long service life

Integrated silencer for low noise emissions in the installation area

For attachment to, installation on, or fitting in the machine tool

CLEAN AIR WITH COALESCER FILTER TECHNO

Separation rate over 99% and service life of up to 2 years

Due to their efficient coalescer filter technology, MAHLE LGA series oil mist separator units achieve fractional collection efficiency rates of

- 99% for particulate diameters of 0.5 µm and
- 100% for particulate diameters greater than 0.7 µm.

Considering their performance and proven service lives of up to two years in multishift operations, the virtually maintenance-free units pay off quickly not only for the working environment and the employees‘ health, but also for the business operation.

Coalescer filter principle for higher performance

The efficient separation principle of the LGA series is based on coalescence. The oil mist is extracted from the machining area of the machine tool. In the process, cooling lubricant mists build up on the fiber fleece. The microscopically small oil droplets collect in the fiber glass structure – they “coalesce” to form larger droplets or an oil film. These larger droplets are carried by the air stream to the surface of the filter element and are dissipated downward to the housing bottom in a drainage fleece due to gravity. This drainage effect continuously cleans the filter element and allows for an extremely long service life. The cleaned air stream is drawn off with a high-pressure fan and exhausted upward through a silencer. This technology eliminates all worries about critical values such as the “maximum workplace concentration” (MAK value) and “Technical Instructions on Air Quality Control” (TA Luft).

LOGY

Closed circuit for oil recirculation – clean and cost-efficient

The filtered oil collects at the bottom of the housing. When a level of 500 mm has been reached, a membrane valve opens and the cooling lubricant is recirculated to the reservoir of the machine tool. A clean and economical process that saves valuable lubricant and costs.

Ideal for high raw-gas loads

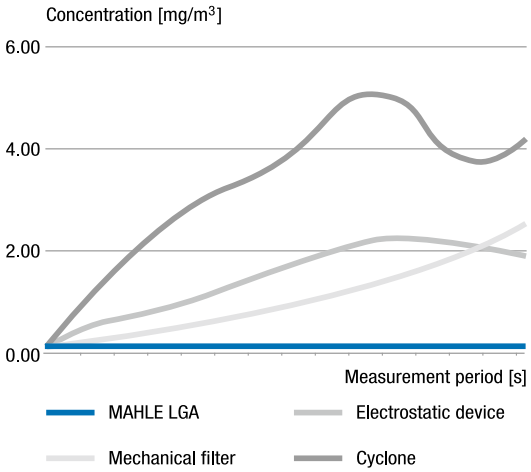
The LGA series proves its superiority at high raw-gas loads of up to 3,000 mg/h and in oil applications (non-water-soluble coolants). Conventional technology – e.g., cyclones or electrostatic filters – typically struggles with this task and require enormous cleaning and maintenance requirements.

Prefilter system optimizes retention and service life

A prefilter element can be integrated in the coalescer filter (LGA series FUW) to achieve even better filtration performance and a longer service life.

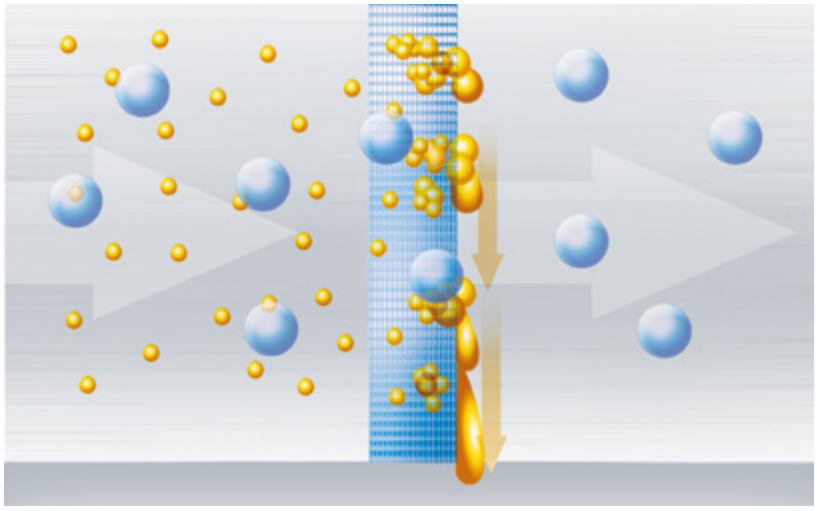
Fast, easy replacement of filter elements

The coalescer filters of the LGA series are virtually maintenance-free. The filter elements are fast and easy to replace – ensuring maximum availability.



Low emissions values substantiate the consistently high retention efficiency of the MAHLE LGA series (in comparison with conventional separators).

Coalescer filter principle



Higher performance, longer service life, and lower maintenance costs thanks to the coalescer filter principle: the oil mist "coalesces" into larger droplets, which are efficiently separated.

THREE UNITS FOR EVERY OCCASION
JUST THE RIGHT

Complete LGA series for every application

Available in three sizes and different versions, FU (regulation of the constant extraction capacity using frequency control) and FUW (like FU, however with prefilter for aqueous emulsions), the LGA series covers a broad application spectrum with different throughputs ranging up to 3,600 m³/h. The optimum nominal operating flow rates are respectively 600, 1,200, and 2,400 m³/h.

Frequency-controlled regulation for consistent extraction capacity and energy efficiency

MAHLE's FU and FUW oil mist separator units are driven by a frequency-controlled motor. The frequency-controlled regulator with digital display ensures energy-efficient operation and a constant volume flow. A flow sensor supplies the actual value and a frequency converter is used to achieve a constant volume flow. If the volume flow falls below the setpoint, the unit outputs an electrical signal. Maintenance procedures can then be implemented in a timely manner based on the evaluation of this signal.

Simple assembly and integration

All connections of the LGA oil mist separators are ready for installation in the existing system – without complex welding and conversion steps. The modular design of the series also allows the direct installation of the main components on and in machining centers.

LGA 600 FUW *LGA 1200 FUW* *LGA 2400 FUW*

SOLUTION

LGA 600 FUW: The convenience system

For attachment to and installation on machine tools. Compact and virtually maintenance-free. Equipped with flow sensor and frequency converter for constant volume flow. Optional prefilter system for optimized service life.

- Volume flow: max. 1,440 m³/h
- Operating volume flow: 600 m³/h
- Dimensions (L x W x H): 930 x 555 x 875 mm
- Sound level (at 1 m distance): < 69 dB (A)

LGA 1200 FUW: Convenience and higher performance

For attachment to and installation on machine tools. Compact and virtually maintenance-free. Equipped with flow sensor and frequency converter for constant volume flow. Optional prefilter system for optimized service life.

- Volume flow: max. 2,150 m³/h
- Operating volume flow: 1,200 m³/h
- Dimensions (L x W x H): 1,155 x 640 x 1,040 mm
- Sound level (at 1 m distance): < 72 dB (A)

LGA 2400 FUW: Central or stand-alone solution – with booster function

The central stationary unit is located next to several machine tools. Virtually maintenance-free, with high-pressure fan, and (optional) booster operation for short-term, fast extraction during workpiece changeovers. Equipped with flow sensor and frequency converter for constant volume flow. Optional prefilter system for optimized service life.

- Volume flow: max. 3,650 m³/h
- Operating volume flow: 2,400 m³/h
- Dimensions (L x W x H): 1,600 x 1,175 x 1,850 mm
- Sound level (at 1 m distance): < 79 dB (A)

Base unit can be integrated in machine tool

The principle of the coalescer filter consists in filter element – fan – frequency controller – system monitoring for optimized extraction efficiency. If the unit cannot be added due to limited space, it is possible to integrate the base system/frame in the machine tool– depending on the space conditions. Customized solutions are part of the MAHLE range of services. Talk to us.

Consulting, service, and modern metrology

We are your one-stop source for the optimal solution to your requirements. Benefit from our global systems expertise – from consulting, to condition monitoring of your production using state-of-the-art metrology (scattered light photometers or isokinetic sampling system), to on-site service. This will ensure high availability and reliability of your production systems.

Coalescer filter

Prefilter

MAHLE

Industrial Filtration

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MAHLE

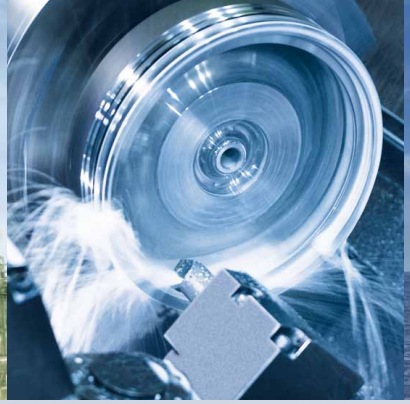
Industry

WELCOME TO THE COMPANY OF

TOTAL FILTRATION

INDUSTRIAL FILTRATION






Dust filter cartridges

High-end cartridge and Topchange filter elements

High-end cartridge filter housings

ProGuard system

MAHLE Industrial Filtration: Partner for clean solutions

As an innovative solutions partner, MAHLE Industrial Filtration has been producing high-quality industrial filters for fluid technology, air filtration, process, and separation technology for many years. Our filters and systems are just as efficient and economical in the plant and machinery construction, chemical, pharmaceutical, and food industries as in environmental, drive, and energy technology, as well as maritime and mobile machinery systems.

Fluid technology

As one of the world's leading fluid filtration partners, we provide machine builders and users of mobile and stationary hydraulic systems with highly effective filters and filter systems, units, and accessories to keep hydraulic and lubricant fluids clean.

Our automatic filters have become indispensable in countless applications. They are used for gross through fine filtration of fluids, pastes, and similar materials, and for homogenization. The advantage to you is rational 24-hour, non-stop operation with automatic cleaning and disposal processes.

Additionally, our product range is extended by simplex, duplex, and back-flushing filters for the filtration of all types of fluids in maritime operations – from fuels to lubricants to seawater.

Air filtration

Whether in surface technology, chemical, food, and pharmaceutical industry, machinery construction, tooling machines or energy technology, our filters, units, and systems for dust removal from air and gases increase productivity, support product recycling, and contribute to increased environmental protection and workplace safety.

Process technology

We can provide a unique spectrum of filtration and separation systems solutions in process technology, which is complemented by our extensive range of complete filters, filter elements, spare parts, and services. Thus we can offer sophisticated overall technical solutions, tailored to the application at hand—with comprehensive engineering capabilities and decades of experience in the use of advanced filtration technologies for many applications.

We have grown to become a leading supplier of high and low pressure filters, of ASME code and non-code filters, and of bag and cartridge filter housings for a wide range of applications and have established our patented systems in the market very well.

Separation and water

With our innovative products we offer even more comprehensive, custom-tailored system solutions, especially for liquid treatment: from oil separation, fuel and oil treatment, to ballast water, process water, waste water, and cooling water treatment.




MAHLE INDUSTRIAL FILTRATION

YOUR COMPETENT PARTNER

FOR FILTRATION AND SEPARATION

PLANT AND MACHINERY CONSTRUCTION

- Oil aerosol separation
- Hydraulic fluid filtration
- Oil removal
- Coolant treatment
- Sand blasting and dry processing
- Washing and waste water treatment
- Industrial parts cleaning

ENERGY TECHNOLOGY AND POWER GENERATION

- Turbine oil filtration, treatment, and dewatering
- Wind power plants
- Transformer oil treatment
- Condensate filtration and deoiling
- Primary coolant filtration
- Pump seal protection
- Spent fuel pool filtration
- Radioactive waste and effluent filtration
- Cooling water treatment
- Boil water treatment
- Particulate control during underwater cutting operations
- Filtration for fire fighting systems
- Suction air filtration for gas turbines

DRIVE TECHNOLOGY

- Lubricating and transmission oil treatment
- Fuel and oil treatment
- Turbine oil filtration, treatment, and dewatering
- Wind power plants
- Cooling water treatment

MOBILE MACHINERY SYSTEMS

- Construction equipment
- Cranes, industrial trucks
- Agricultural machinery
- Railway vehicles
- Fire engines

AUTOMOTIVE

- Wet paint overspray
- Flame gunning
- Powder coating
- Filtration of phosphated baths and priming coat fluids
- KTL and ETL bath filtration
- Condensate deoiling
- Water treatment
- Washing and waste water treatment
- Passivation
- Cooling lubricants treatment
- Phase separation
- Oil treatment

Oil aerosol separator unit

Fuel treatment system

Mechanical emulsion and foam breaker

Bag and cartridge filters

ENVIRONMENTAL TECHNOLOGY

- Filtration of air and gas
- Oily water separation
- Water treatment

WATER MANAGEMENT

- Industrial water management: treatment of cooling water, service water, quench water and process water
- Communal water management: treatment of drinking water, well water, and waste water

OIL AND GAS

- High pressure and gas filtration
- Amin Filtration
- Glycol
- Petrochemical industry
- Oil production
- Crude oil dewatering
- Condensate deoiling
- Slop oil deoiling
- Surface water treatment
- Fuel and oil treatment
- Injection water deoiling
- Waste water treatment
- Fuel treatment
- Rubber and plastics industry

CHEMICAL INDUSTRIES

- Paint and coating production
- Galvanic industry
- Pharmaceutical industry
- Phase separation
- Oil removal
- Bulk chemicals
- Chemical intermediates
- Brine
- Catalyst recovery
- Resins, acids, alkalis, and ink
- Carbon removal
- Sulphur filtration

FOOD AND BEVERAGE

- Production of chocolate, cocoa and gelatine, edible and vegetable oil, sugar and sweeteners, and beverages
- Spec. salt bath filtration in cheese factories
- Filtration in the dairy industry
- Filtration in the starch industry
- Filtration of food additives

MARINE INDUSTRY

- Oily water separation
- Oil treatment and filtration
- Condensate and dock water deoiling
- Treatment of cooling water, bilge water, and ballast water
- Fuel treatment and filtration
- Combustible filtration

Dust collector

Automatic filter

Duplex filter

Filter elements




CERTIFIED

QUALITY AND SERVICE

FROM A SINGLE SOURCE

Service, from spare parts supply to training

Our extensive filter technology program also includes high-performance spare parts service for worldwide availability. The replacement filter elements are manufactured according to the same strict production criteria as the original MAHLE filter elements. Customer-specific special versions are available upon request. We teach professional service and maintenance in practical training sessions. And for commissioning or maintenance on site, our service technicians are available worldwide. The result: more reliability, more efficiency, and more performance for you.

Whatever the application—we are there for you

Based on our experience across many industries, we combine all our expertise in a worldwide network, use synergies, and, as your partner, use the power of innovation to develop the optimal solution for your application, from filter elements to modules. With certified quality, of course. Designed and tested according to DIN and ISO standards, with associated industrial approvals. In short, an engineering partnership for complete system solutions, with the extra service. For more functionality, more safety, more reliability, and efficiency.

Performance that can be measured

In order to evaluate the efficiency of filtration, we can provide a wide range of experiments in our laboratories. For example, determination of cleanliness classes with automatic particle counting, gravimetric analysis of overall contamination, microscopic analysis, and testing with a raster electron microscope in combination with a microprobe. For mobile online measurement in field trial of impurities in pressure fluids and for sampling, we have mobile measurement systems available.

Standards for fluid technology, partly valid for process technology as well—e.g.:	
ISO 16889	ISO 4406
ISO 3968	ISO 2941
ISO 3724	ISO 11170
DIN 24550	

Standards for air filtration—e.g.:	
EN 779	EN 1822
IEC 60335-2-69	VDI 3926

Certifications—e.g.:
DIN EN ISO 9001, DIN EN ISO 14001, EMAS
Retentions test certificates of the BGIA/St. Augustin
FDA approval for food industries
Product specific approvals for various fluid and automatic filters, for air filtration, and process filters, e.g.: ATEX, Type Approval Germanischer Lloyd, Lloyd's Register, GOST-R

Automatic filter variable series

Screen basket duplex filter

Conical filter cartridge for dust filtration

Flange-mounted filter

MAHLE
Industry

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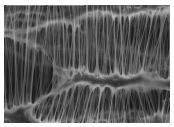
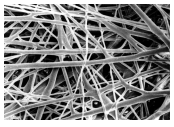
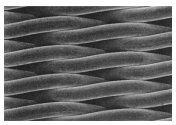
Filter media
Introduction

The development of high-quality filter media is one of the core competencies of MAHLE Industrial Filtration GmbH. The outcome of more than 40 years experience, our filter media master even the most challenging tasks. A wide range of polyester and cellulose based media that can be adapted to virtually any application using a variety of finishing techniques are meanwhile available. The numerous finishing processes that are offered alongside coatings with PTFE membranes or mixed fibres are presented in this section.

	Filter media		
1	**Overview**	The available filter media at a glance	
2	**Polyester based filter media**	Ti 07 Ti 08 Ti 15 Ti 56 Ti 69 Ti201 Ti202	
3	**Cellulose based filter media**	Ti 10 Ti 19 Ti 70 Ti 85 Ti205	
4	**Special filter media**	Ti 18 Ti 26 Ti 35 DRG 5N	

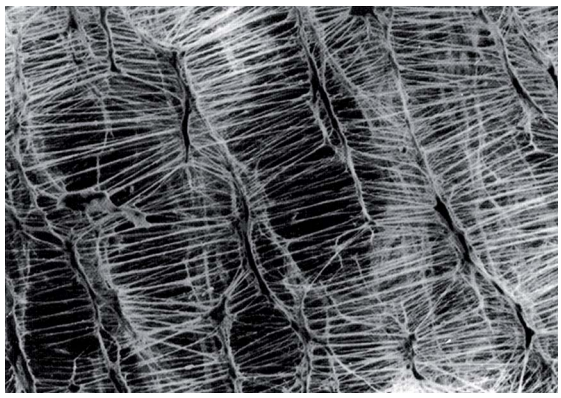
MAHLE

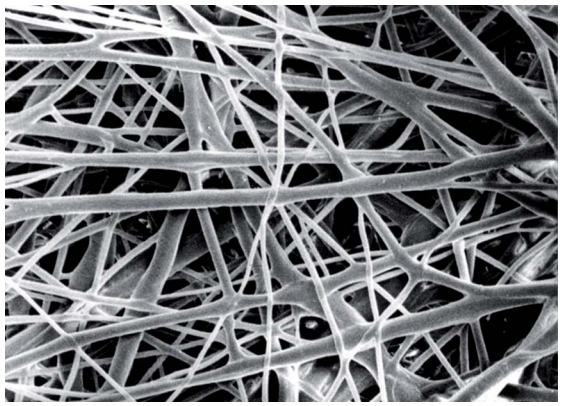
Industry

Filter media
Table

1. Features

MAHLE offers a wide selection of filter media for dust filter cartridges. It is thus ensured that the right solution can be found for nearly any application..
Special filter media with Nano coatings (Web), PTFE membranes or meltblown micro fibre fleece guarantee optimal costs and reliable long-term operation of dust collector systems.
Media with FDA approval are available for the pharmaceutical and food industries.





2. Table

Type	Media	electr. con-ductive	Test certificates/ Dust classes	FDA	Air perme-ability [m³/m²h] Δp 200 pa	max. operating tempe-rature [°C]	Properties/ Applications
Ti 05	Polyester fleece (PET	no	DIN EN 60335-2-69 "M"	yes	1080	130 (perm.) 150 (peaks)	High stability, chemical resistance, washable, food industry
Ti 07	Polyester fleece with PTFE membrane	yes	DIN EN 60335-2-69 "M"	yes	145	130 (perm.) 150 (peaks)	Hazardous areas, statically chargeable dusts, high load, difficult fine dusts
Ti 08	Polyester fleece	yes	DIN EN 60335-2-69 "M"	yes	580	130 (perm.) 150 (peaks)	Hazardous areas, statically chargeable dusts, chemical and food industry
Ti 10	Cellulose with PET fibres	no	DIN EN 60335-2-69 "L" EN 779 "F8"	no	760	90 (perm.)	High air permeability and stability because of hydrophobe proberties, gas turbines
Ti 15	Polyester fleece	no	DIN EN 60335-2-69 "M"	yes	580	130 (perm.) 150 (peaks)	High stability, chemical resistance, washable, food industry
Ti 18	Polyphenyl sulphide with PTFE membrane	no	DIN EN 60335-2-69 "M"	yes	200	160 (perm.) 190*	Very good separation, difficult fine dusts, high chemical resistance to organic solvents, alkalis and acids
Ti 19	Cellulose/polyester carrier with PP meltblown	no	DIN EN 60335-2-69 "M"	no	1230	90 (perm.)**	Very good separation, difficult fine dusts, high air permeability, high load
Ti 26	Glass fibre, laminated	no	DIN EN 60335-2-69 "H" EN 1822-3 "H14"	yes	90	90 (perm.)	Separation of airborne particulates, secundary filter (not cleanable), high separation
Ti 35	Polypropylen (PP)	no	DIN EN 60335-2-69 "L"	yes	1080	80 (perm.)	Very good chemical resistance and against hydrolysis, wash-able, high air permeability, food industry
Ti 42	Polyester fleece	no	EN 779 "F8/F9"	no	2160	130 (perm.)	Very high air permeability, high hydrophobe proberties, gas turbines
Ti 56	Polyester fleece with PTFE-membrane	no	DIN EN 60335-2-69 "M"	yes	250	130 (perm.) 150 (peaks)	Very good separation, difficult fine dusts, high load, washable, food industry
Ti 69	Polyester fleece, oil and water-repellent	no	in progress	no	630	130 (perm.) 150 (peaks)	High air permeability, very good cleanable, high stability, oil and water-repellent, food industry
Ti 70	Cellulose with 30 % PET fibres	no	DIN EN 60335-2-69 "M"	no	450	120 (perm.)	Good cleanable, ecologically harmless fabrication, improved wet strength
Ti 85	Cellulose with PET fibres M-web (PET nano fibres)	no	DIN EN 60335-2-69 "M"	no	600	90 (perm.)	Good cleanable, high separation ratio at poor pressure drop

* with reduced oxygen content

** only dry air

2. Table

Type	Media	electr. con-ductive	Test certificates/ Dust classes	FDA	Air perme-ability [m³/m²h] Δp 200 pa	max. operating tempe-rature [°C]	Properties/ Applications
DRG5N	Stainless steel wire mesh 1.4404	yes		yes	900	240 (perm.) 260 (peaks)	Finely separation, food and pharmaceutical industry, washable
Ti 201	Polyester fleece with PET nano fibres	no	DIN EN 60335-2-69 "M"	no	610	130 (perm.) 150 (peaks)	Good cleanable, high separation ratio at poor pressure drop, washable
Ti 202	Polyester fleece with PTFE membrane	no	DIN EN 60335-2-69 "M"	in pro-gress	250	130 (perm.) 150 (peaks)	Very good separation, high load, washable, food industry
Ti 205	Cellulose with 20 % PET fibres	no	DIN EN 60335-2-69 "M"	no	560	90 (perm.)	High air permeability and stability because of hydrophobe proberties, flame-retardant

* with reduced oxygen content

** only dry air

MAHLE Industry

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MAHLE

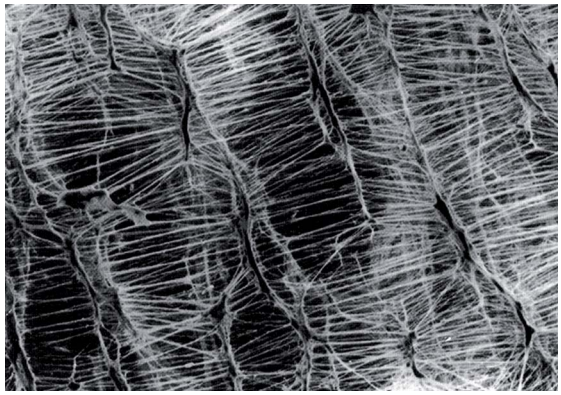
Industry

Filter media
Ti 07

Polyester fleece with PTFE membrane, electrical conductive

1. Features

This pioneering filter media combines a newly developed, electrically conductive polyester media with a PTFE membrane. Statically charged particles transfer their charge via the membrane to the conductive polyester media. Ti 07 is a composite media that makes the advantages of surface filtration accessible to applications in hazardous areas.



Characteristics

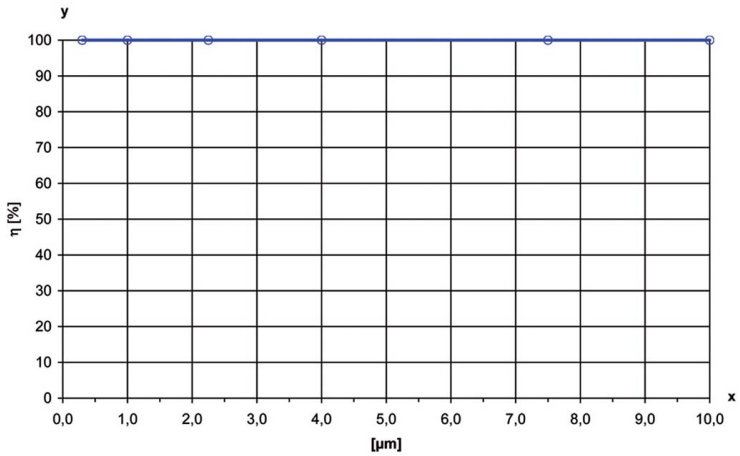
- Specially designed for filtering statically chargeable and explosive fine dusts
- Efficient surface filtration thanks to the microporous PTFE membrane
- High mechanical strength
- Very smooth, fibre-free surface
- Compliance with the requirements of DIN EN 60335-2-69 and EN 1822-3 class H11 at v = 1m/min
- FDA approval acc. to 21 CFR Ch. I § 177.1550
- Worldwide distribution

2. Technical data

Type	Media	Media thickness [mm]	Weight [g/m²]	Air permeability [m³/m²h]	max. operating temperature [°C]	Test certificates/ dust classes
Ti 07	electrically conductive polyester (PET) with polytetrafluoroethylene (PTFE) membrane	0.7	280	150 at Δp 200 Pa	130 (permanent) max. 150 (peaks)	DIN EN 60335-2-69 "M"

Technical data is subject to change without notice!

3. Filtration efficiency



Filtration efficiency:	> 99.99 % at 0.3 µm
Test conditions	
Inflow velocity:	3.36 m/min
Mass concentration:	200 mg/m³
Test dust:	Dolomit DRB 20 (Rock flour)
Electrical resistance:	< 3.4 x 10^7 Ω
x = Particle size [µm]	
y = Filtration efficiency η [%]	

These values may vary depending on the nature of the dust, the composition of the gas and the cartridge design.

4. Chemical resistance/mechanical properties

Chemical resistance	Very good	Good	Limited		Mechanical properties	Very good	Good	Limited
Water	x				Surface quality (smoothness)	x		
Hydrolysis			x		Stability	x		
Acids		x			Abrasion resistance			x
Alkalis			x		Cleanability (jet pulse)	x		
Solvents		x			Washability		x	

These properties are of purely qualitative valuation and depending on the nature of the dust, the composition of the gas and the operating conditions.

5. Design

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Comprehensive documentation on our product range, cleaning units and cartridges can be provided.

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70341999.02/2012

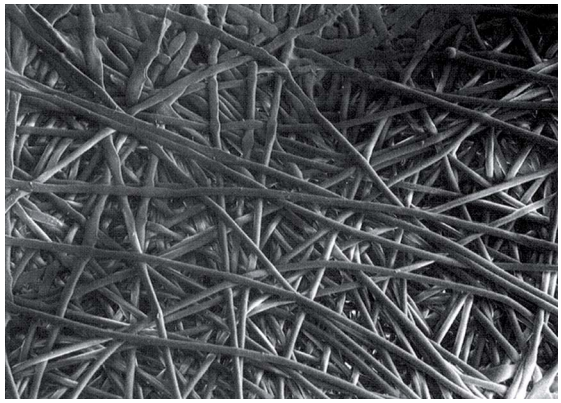
MAHLE Industry

Filter media
Ti 08

Polyester fleece, electrical conductive

1. Features

The polyester fibres on the inflow side (dirt side) have a thin aluminium coating that gives the Ti 08 filter media an electrically conductive surface. This coating is inseparable from the substrate and has no influence on the porosity of the media. Ti 08 is a very economical solution in all dust removal applications where static charges in the dust filter cake have to be eliminated.



Characteristics

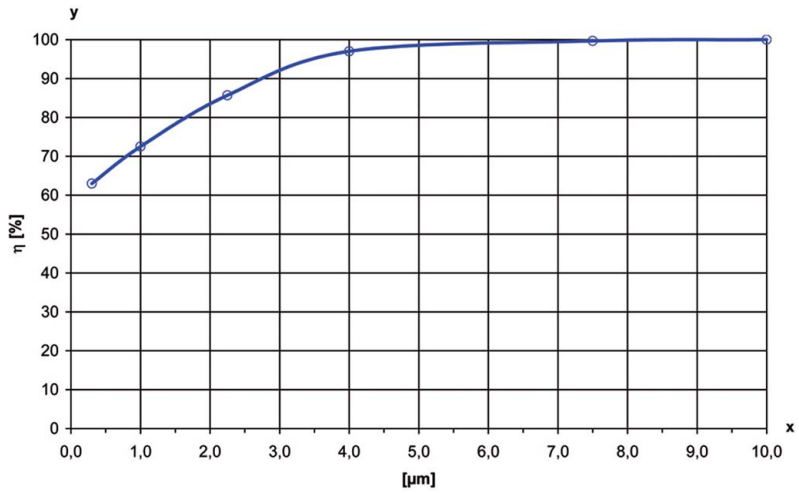
- Smooth surface
- Electrically conductive
- Good separation efficiency
- Excellent cleaning power
- Good cleanability
- Compliance with the requirements of DIN EN 60335-2-69
- FDA approval acc. to 21 CFR Ch. I § 177.1550
- Worldwide distribution

2. Technical data

Type	Media	Media thickness [mm]	Weight [g/m²]	Air permeability [m³/m²h]	max. operating temperature [°C]	Test certificates/ dust classes
Ti 08	Polyester (PET) with aluminium coating	0.6	260	580 at Δp 200 Pa	130 (permanent) 150 (peaks)	DIN EN 60335-2-69 "M"

Technical data is subject to change without notice!

3. Filtration efficiency



Filtration efficiency: > 98 % at 4 µm

Test conditions
Inflow velocity: 3.36 m/min
Mass concentration: 200 mg/m³
Test dust: Dolomit DRB 20 (Rock flour)

Electrical resistance: < 1 x 10³
x = Particle size [µm]
y = Filtration efficiency η [%]

These values may vary depending on the nature of the dust, the composition of the gas and the cartridge design.

4. Chemical resistance/mechanical properties

Chemical resistance	Very good	Good	Limited		Mechanical properties	Very good	Good	Limited
Water	x				Surface quality (smoothness)	x		
Hydrolysis			x		Stability	x		
Acids		x			Abrasion resistance	x		
Alkalis			x		Cleanability (jet pulse)		x	
Solvents		x			Washability		x	

These properties are of purely qualitative valuation and depending on the nature of the dust, the composition of the gas and the operating conditions.

5. Design

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MAHLE

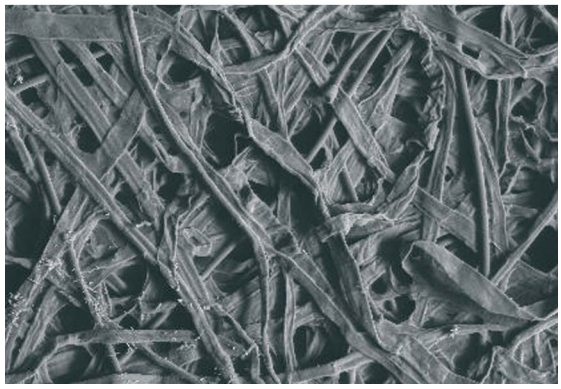
Industry

Filter media
Ti 10

Cellulose with PET fibres

1. Features

The cellulose/polyester fibre blend chosen for this filter media is characterised by high air permaeability and stability as well as very good hydrophobicity. The media combines efficient operation with a low pressure loss.
Ti 10 is consequently ideal for filtering the intake air of gas turbines.



Characteristics

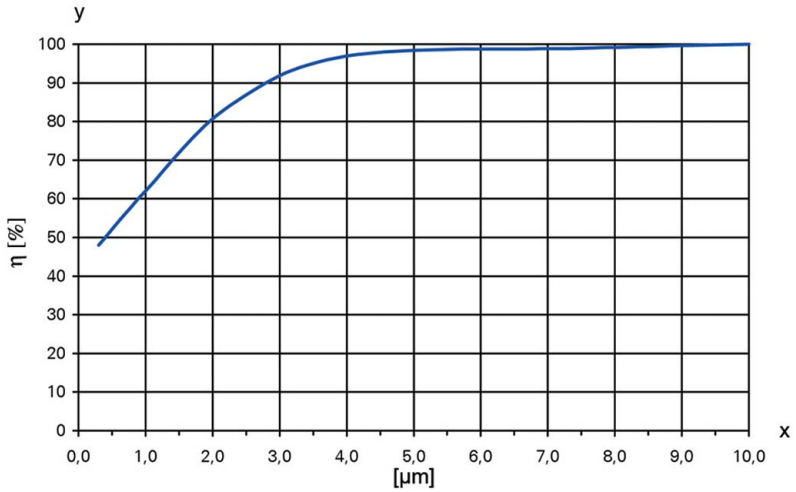
- Water-resistant
- Low pressure loss
- Long service life
- Efficient operation
- Compliance with the requirements of DIN EN 60335-2-69
- Worldwide distribution

2. Technical data

Type	Media	Media thickness [mm]	Weight [g/m²]	Air permeability [m³/m²h]	max. operating temperature [°C]	Test certificates/ dust classes
Ti 10	Cellulose with PET-fibres	0.5	110	760 at Δp 200 Pa	90 (permanent)	DIN EN 60335-2-69 "L" EN 779 "F8"

Technical data is subject to change without notice!

3. Filtration efficiency



Filtration efficiency: > 98 % at 5 µm

Test conditions
Inflow velocity: 3.36 m/h
Mass concentration: 200 mg/m³
Test dust: Dolomit DRB 20 (Rock flour)

x = Particle size [µm]
y = Filtration efficiency η [%]

These values may vary depending on the nature of the dust, the composition of the gas and the cartridge design.

4. Chemical resistance/mechanical properties

Chemical resistance	Very good	Good	Limited		Mechanical properties	Very good	Good	Limited
Water		x			Surface quality (smoothness)		x	
Hydrolysis		x			Stability		x	
Acids		x			Abrasion resistance		x	
Alkalis		x			Cleanability (jet pulse)		x	
Solvents		x			Washability			x

These properties are of purely qualitative valuation and depending on the nature of the dust, the composition of the gas and the operating conditions.

5. Design

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MAHLE

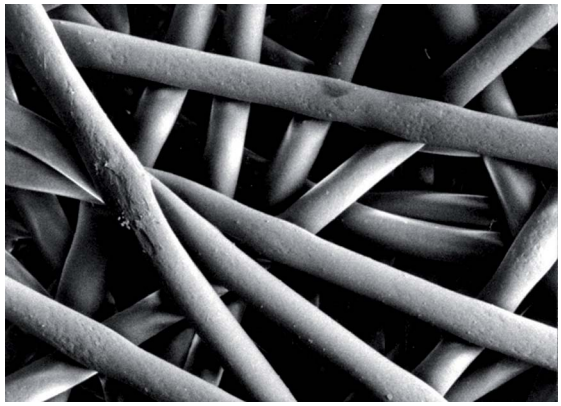
Industry

Filter media
Ti 15

Polyester fleece

1. Features

Ti 15 is a specially optimised polyester filter media offering improved separation efficiency in combination with high air permeability.
The media combines efficient operation with a low pressure loss. That is the reason why Ti 15 is also ideal for filtering the intake air of gas turbines.
The media owes its remarkable stability to the thermoplastic solidification process. No binder is necessary - which is why Ti 15 is also good for many applications in the food processing industry.



Characteristics

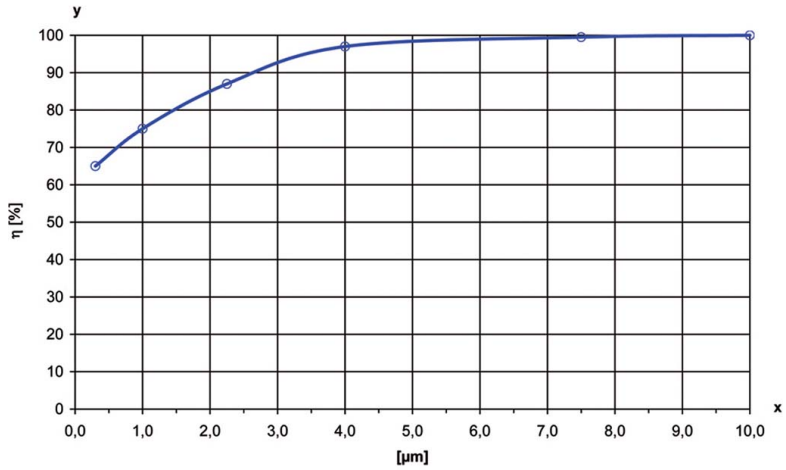
- High mechanical strength (elongation at break 70 %)
- Smooth surface
- Good cleanability
- Resistant to a large number of chemicals
- Thermoplastic binding, no binders can be dispensed
- Hydrophobic properties abetting wet cleaning
- Compliance with the requirements of DIN EN 60335-2-69
- FDA approval acc. to 21 CFR Ch. I § 177.1550
- Worldwide distribution

2. Technical data

Type	Media	Media thickness [mm]	Weight [g/m²]	Air permeability [m³/m²h]	max. operating temperature [°C]	Test certificates/ dust classes
Ti 15	Polyester fleece (PET)	0.6	260	580 at Δp 200 Pa	130 (permanent) 150 (peaks)	DIN EN 60335-2-69 "M"

Technical data is subject to change without notice!

3. Filtration efficiency



Filtration efficiency: > 98 % at 4 µm

Test conditions
Inflow velocity: 3.36 m/h
Mass concentration: 200 mg/m³
Test dust: Dolomit DRB 20 (Rock flour)

x = Particle size [µm]
y = Filtration efficiency η [%]

These values may vary depending on the nature of the dust, the composition of the gas and the cartridge design.

4. Chemical resistance/mechanical properties

Chemical resistance	Very good	Good	Limited		Mechanical properties	Very good	Good	Limited
Water	x				Surface quality (smoothness)	x		
Hydrolysis			x		Stability	x		
Acids		x			Abrasion resistance	x		
Alkalis			x		Cleanability (jet pulse)		x	
Solvents		x			Washability		x	

These properties are of a purely qualitative valuation and depending on the nature of the dust, the composition of the gas and the operating conditions.

5. Design

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MAHLE

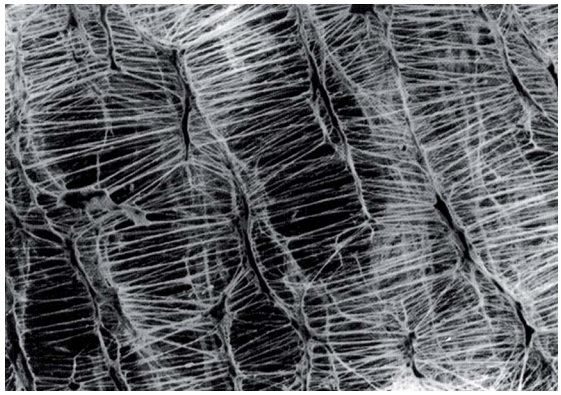
Industry

Filter media
Ti 18

Polyphenyl sulphide with PTFE membrane

1. Features

The two-layer structure of this filter media enables the maximum benefit of the surface filtration.
The fine-pored PTFE membrane separates almost all the dust on the membrane surface.
Especially challenging filtration tasks will be solved with a long service life. Polyphenyl sulphide with a PTFE membrane combines very good filtration efficiency with good cleanability. It also boasts good chemical and temperature resistance as well as excellent resistance to hydrolysis.



Characteristics

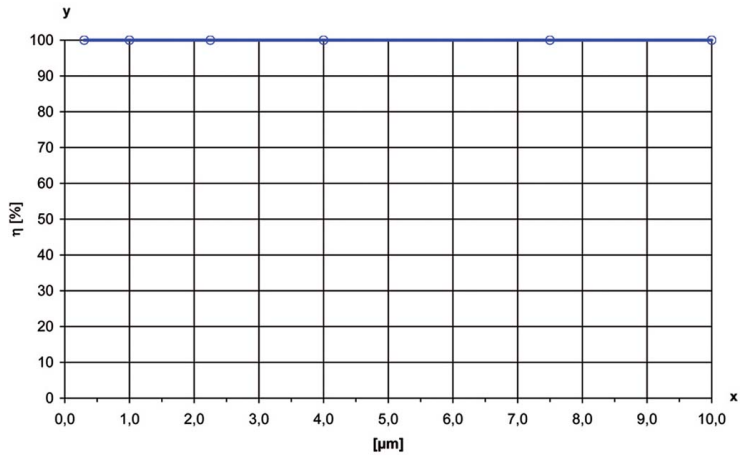
- Efficient surface filtration thanks to microporous PTFE membrane
- High mechanical strength
- Very good chemical resistance to acids, alkalis and organic solvent vapours
- Very smooth, fibre-free surface
- Excellent resistance to hydrolysis
- Good cleanability
- Compliance with the requirements of DIN EN 60335-2-69 and EN 1822-3 class H10 at v = 1m/min
- FDA approval acc. to 21 CFR Ch. I § 177.1550
- Worldwide distribution

2. Technical data

Type	Media	Media thickness [mm]	Weight [g/m²]	Air permeability [m³/m²h]	max. operating temperature [°C]	Test certificates/ dust classes
Ti 18	Polyphenyl sulphide (PPS) with polytetrafluoroethylene (PTFE) membrane	0.7	250	200 at Δp 200 Pa	160 (permanent) 190 *	DIN EN 60335-2-69 "M"

* With reduced oxygen content. Technical data is subject to change without notice!

3. Filtration efficiency



Filtration efficiency: > 99.99 %
at 0.3 µm

Test conditions
Inflow velocity: 3.36 m/h
Mass concentration: 200 mg/m³
Test dust: Dolomit DRB 20 (Rock flour)

x = Particle size [µm]
y = Filtration efficiency η [%]

These values may vary depending on the nature of the dust, the composition of the gas and the cartridge design.

4. Chemical resistance/mechanical properties

Chemical resistance	Very good	Good	Limited		Mechanical properties	Very good	Good	Limited
Water	x				Surface quality (smoothness)	x		
Hydrolysis	x				Stability	x		
Acids		x			Abrasion resistance			x
Alkalis		x			Cleanability (jet pulse)	x		
Solvents		x			Washability		x	

These properties are of a purely qualitative valuation and depending on the nature of the dust, the composition of the gas and the operating conditions.

5. Design

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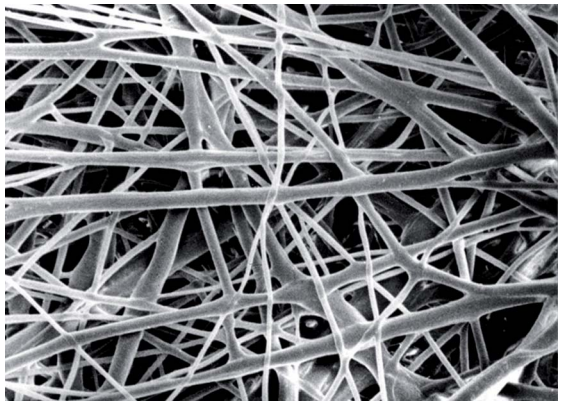
MAHLE Industry

Filter media
Ti 19

Cellulose/polyester carrier with PP meltblown

1. Features

The Ti 19 filter media is an optimally designed composite media for cleanable, pleated dust filter cartridges. Its thin, fine-pored, meltblown microfibre layer assures maximum separation as well as a low air resistance.
The excellent filtration and cleaning properties are the outcome of the small fibre diameter (approximately 2 µm) achieved with the meltblown process.
The stable, coarse-pored substrate gives the media the required strength. Ti 19 is especially suitable for separating dusts with high fine fraction.



Characteristics

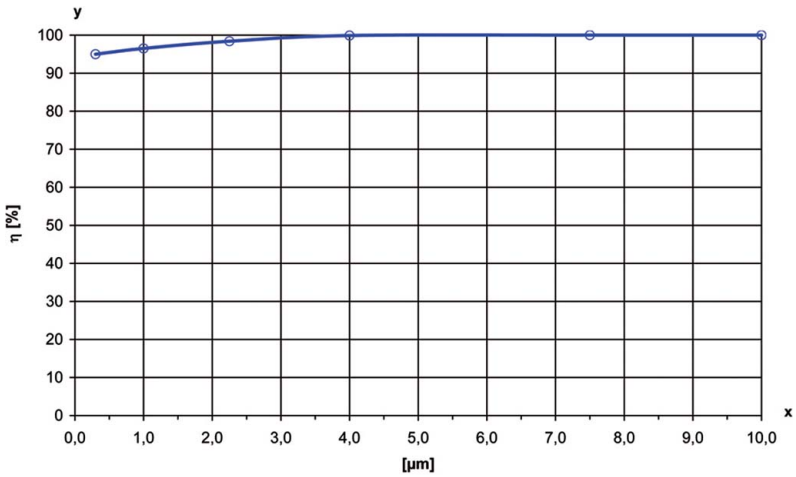
- High porosity and hence a low pressure loss
- Excellent cleanability because the filter layer is made of polypropylene meltblown
- Good chemical and hydrolysis resistance up to the permanent operating temperature
- High filtration efficieny
- Compliance with the requirements of DIN EN 60335-2-69
- Worldwide distribution

2. Technical data

Type	Media	Media thickness [mm]	Weight [g/m²]	Air permeability [m³/m²h]	max. operating temperature [°C]	Test certificates/ dust classes
Ti 19	PP meltblown microfibre with cellulose/polyester carrier	0.85	210	1230 at Δp 200 Pa	90 (permanent) *	DIN EN 60335-2-69 "M"

* Only in dry air. Technical data is subject to change without notice!

3. Filtration efficiency



Filtration efficiency: > 99 % at 2 µm

Test conditions
Inflow velocity: 3.36 m/h
Mass concentration: 200 mg/m³
Test dust: Dolomit DRB 20 (Rock flour)

x = Partcle size [µm]
y = Filtration efficiency η [%]

These values may vary depending on the nature of the dust, the composition of the gas and the cartridge design.

4. Chemical resistance/mechanical properties

Chemical resistance	Very good	Good	Limited		Mechanical properties	Very good	Good	Limited
Water			x		Surface quality (smoothness)		x	
Hydrolysis		x			Stability		x	
Acids			x		Abrasion resistance			x
Alkalis		x			Cleanability (jet pulse)	x		
Solvents			x		Washability			x

These properties are of a purely qualitative valuation and depending on the nature of the dust, the composition of the gas and the operating conditions.

5. Design

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Comprehensive documentation on our product range, cleaning units and cartridges can be provided.

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70342009.02/2012

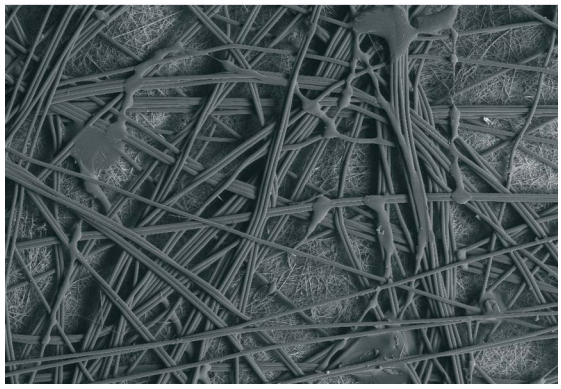
MAHLE Industry

Filter media
Ti 26

Glass fibre, laminated

1. Features

The Ti 26 filter media consists of a microglass fibre fleece with spun-bonded polyester fleece laminated on one side and cellulose paper laminated on the other. It is characterised by good separation in the HEPA range. Cartridges made of this media are normally used in non-cleanable secondary filters.



Characteristics

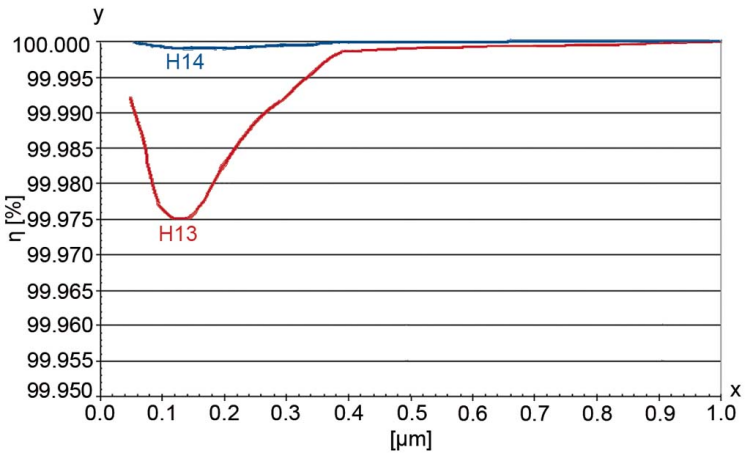
- Very high separation efficiency
- High mechanical strength
- Compliance with the requirements of DIN EN 60335-2-69 and EN 1822-3 class H14 at v = 1m/min
- FDA approval acc. to 21 CFR Ch. I § 177.1550
- Worldwide distribution

2. Technical data

Type	Material	Material thickness [mm]	Weight [g/m²]	Air permeability [m³/m²h]	max. operating temperature [°C]	Test certificates/ dust classes
Ti 26	Glass fibre laminated with PET and cellulose	0.83	210	90 at Δp 200 Pa	90 (permanent)	DIN EN 60335-2-69 "H" EN 1822-3 "H14"

Technical data is subject to change without notice!

3. Filtration efficiency



Filtration efficieny:

H13 at v = 3,5 m/min	> 99,95 % at 0.1 µm
H14 at v = 1 m/min	> 99,995 % at 0.1 µm

Test conditions

Mass concentration:	200 mg/m³
Test dust:	DEHS

x = Particle size [µm]
y = Filtration efficiency η [%]

These values may vary depending on the nature of the dust, the composition of the gas and the cartridge design.

4. Chemical resistance/mechanical properties

Chemical resistance	Very good	Good	Limited		Mechanical properties	Very good	Good	Limited
Water		x			Surface quality (smoothness)		x	
Hydrolysis			x		Stability	x		
Acids		x			Abrasion resistance		x	
Alkalis			x		Cleanability (jet pulse)			x
Solvents		x			Washability			x

These properties are of a purely qualitative valuation and depending on the nature of the dust, the composition of the gas and the operating conditions.

5. Design

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MAHLE Industry

Filter media
Ti 35

Polypropylene

1. Features

Ti 35 is a specially optimised polypropylene filter media offering high separation efficiency in combination with high air permeability. The media owes its enhanced stability to the thermoplastic solidification process. No binder is necessary - therefore you can use Ti 35 for applications in the food processing industry.
The structure of Ti 35 polypropylene filter media entails a very good chemical resistance in a lot of applications.

Characteristics

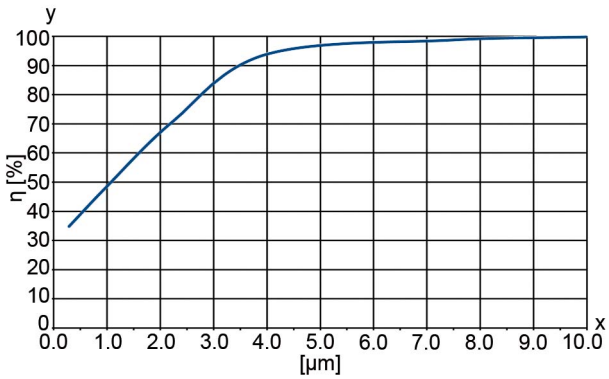
- Very good resistance against hydrolysis
- Smooth surface
- Good cleanability
- Resistant to a large number of chemicals
- Thermoplastic binding, no binders can be dispensed
- Hydrophobic properties abetting wet cleaning
- Compliance with the requirements of DIN EN 60335-2-69
- FDA approval acc. to 21 CFR Ch. I § 177.1550
- Worldwide distribution

2. Technical data

Type	Media	Media thickness [mm]	Weight [g/m²]	Air permeability [m³/m²h]	max. operating temperature [°C]	Test certificates/ dust classes
Ti 35	Polypropylene (PP)	0.7	200	1080 at Δp 200 Pa	80	DIN EN 60335-2-69 "L"

Technical data is subject to change without notice!

3. Filtration efficiency



Filtration efficiency: > 98 %
at 6 µm

Test conditions
Inflow velocity: 3.36 m/h
Mass concentration: 200 mg/m³
Test dust: Dolomit DRB 20 (Rock flour)

x = Particle size [µm]
y = Filtration efficiency η [%]

These values may vary depending on the nature of the dust, the composition of the gas and the cartridge design.

4. Chemical resistance/mechanical properties

Chemical resistance	Very good	Good	Limited		Mechanical properties	Very good	Good	Limited
Water	x				Surface quality (smoothness)	x		
Hydrolysis	x				Stability		x	
Acids		x			Abrasion resistance	x		
Alkalis			x		Cleanability (jet pulse)		x	
Solvents		x			Washability		x	

These properties are of a purely qualitative valuation and depending on the nature of the dust, the composition of the gas and the operating conditions.

5. Design

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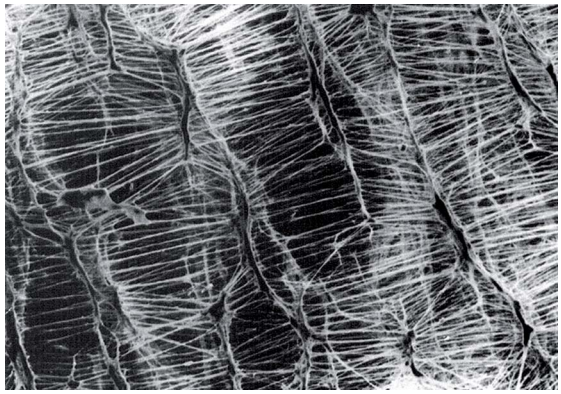
MAHLE Industry

Filter media
Ti 56

Polyester fleece with PTFE membrane

1. Features

The two-layer structure of this filter media enables the maximum benefit of the surface filtration.
The fine-pored PTFE membrane separates almost all the dust on the membrane surface. Owing to its very smooth, fibre-free surface, Ti 56 is especially suitable for cleanable dust filter cartridges. Especially challenging filtration tasks will be solved with a long service life.



Characteristics

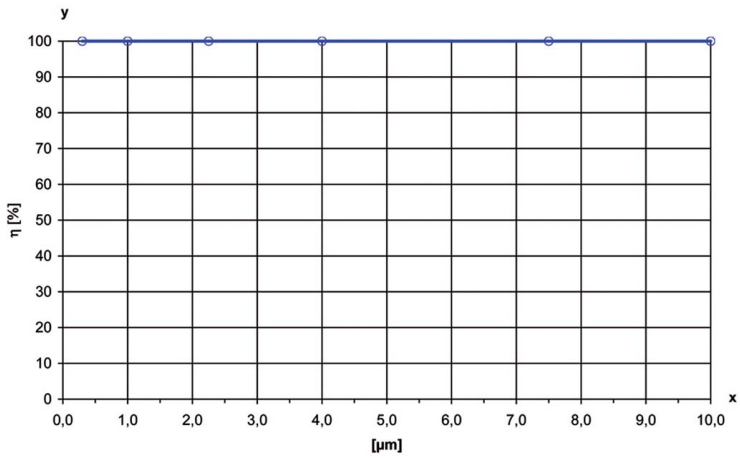
- Efficient surface filtration thanks to the microporous PTFE membrane
- High mechanical strenght
- Very good chemical resistance to acids and organic solvent vapours
- Very smooth, fibre-free surface
- Compliance with the requirements of DIN EN 60335-2-69 and EN 1822-3 class H11 at v = 1m/min
- FDA approval acc. to 21 CFR Ch. I § 177.1550
- Worldwide distribution

2. Technical data

Type	Media	Media thickness [mm]	Weight [g/m²]	Air permeability [m³/m²h]	max. operating temperature [°C]	Test certificates/ dust classes
Ti 56	Polyester fleece (PET) with PTFE membrane	0.65	260	260 at Δp 200 Pa	130 (permanent) 150 (peaks)	DIN EN 60335-2-69 "M"

Technical data is subject to change without notice!

3. Filtration efficiency



Filtration effciency: > 99,99 % at 0.3 µm

Test conditions
Inflow velocity: 3.36 m/h
Mass concentration: 200 mg/m³
Test dust: Dolomit DRB 20 (Rock flour)

x = Particle size [µm]
y = Filtration efficiency η [%]

These values may vary depending on the nature of the dust, the composition of the gas and the cartridge design.

4. Chemical resistance/mechanical properties

Chemical resistance	Very good	Good	Limited		Mechanical properties	Very good	Good	Limited
Water	x				Surface quality (smoothness)	x		
Hydrolysis			x		Stability	x		
Acids		x			Abrasion resistance			x
Alkalis			x		Cleanability (jet pulse)	x		
Solvents		x			Washability		x	

These properties are of a purely qualitative valuation and depending on the nature of the dust, the composition of the gas and the operating conditions.

5. Design

Please contact us for detailed technical information, any open questions and for general expert advice. Completion of the relevant questionnaire would facilitate in the coordination of all the important parameters.
Comprehensive documentation on our product range, cleaning units and cartridges can be provided.

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70342020.02/2012

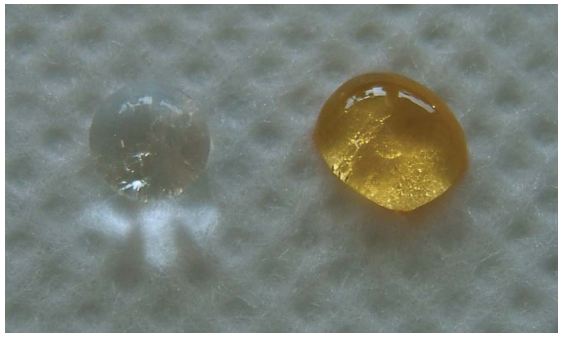
MAHLE Industry

Filter media
Ti 69

Polyester fleece, oil and water-repellent

1. Features

Ti 69 is a specially optimised polyester (PET) filter media offering improved filtration efficiency in combination with high air permeability. Its excellent cleaning properties are the outcome of an oil and water-repellent finishing.
The media owes its remarkable stability to the thermoplastic solidification process. No binders are used - which is why Ti 69 is also ideal for many applications in the food processing industry.



Characteristics

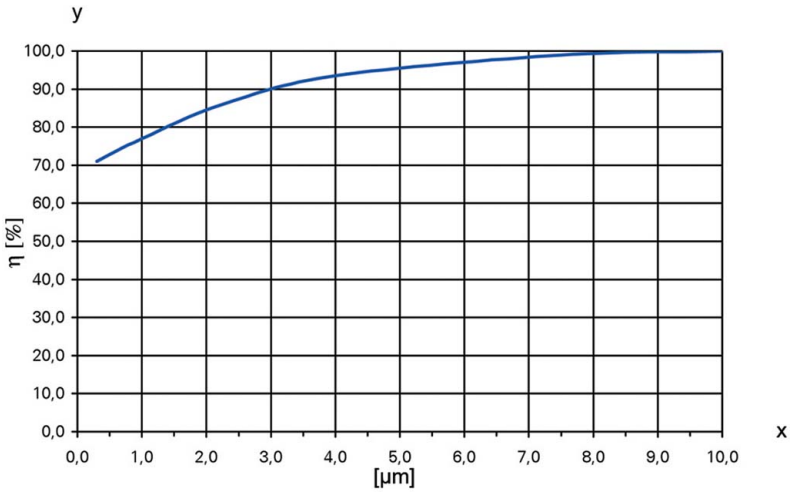
- Oil and water-repellent finishing
- High mechanical strength
- Smooth surface
- Excellent cleaning probertiesr
- Resistant to a large number of chemicals
- Thermoplastic bound, no binding agent
- Compliance with the requirements of DIN EN 60335-2-69
- Worldwide distribution

2. Technical data

Type	Media	Media thickness [mm]	Weight [g/m²]	Air permeability [m³/m²h]	max. operating temperature [°C]	Test certificates/ dust classes
Ti 69	Polyester fleece (PET) with "lotus effect"	0.76	285	635 at Δp 200 Pa	130 (permanent) 150 (peaks)	DIN EN 60335-2-69 "M"

Technical data is subject to change without notice!

3. Filtration efficiency



Filtration effciency: > 98 %
at 5 µm

Test conditions
Inflow velocity: 3.36 m/h
Mass concentration: 200 mg/m³
Test dust: Dolomit DRB 20 (Rock flour)

x = Particle size [µm]
y = Filtration efficiency η [%]

These values may vary depending on the nature of the dust, the composition of the gas and the cartridge design.

4. Chemical resistance/mechanical properties

Chemical resistance	Very good	Good	Limited		Mechanical properties	Very good	Good	Limited
Water	x				Surface quality (smoothness)	x		
Hydrolysis			x		Stability	x		
Acids		x			Abrasion resistance	x		
Alkalis			x		Cleanability (jet pulse)	x		
Solvents		x			Washability		x	

These properties are of a purely qualitative valuation and depending on the nature of the dust, the composition of the gas and the operating conditions.

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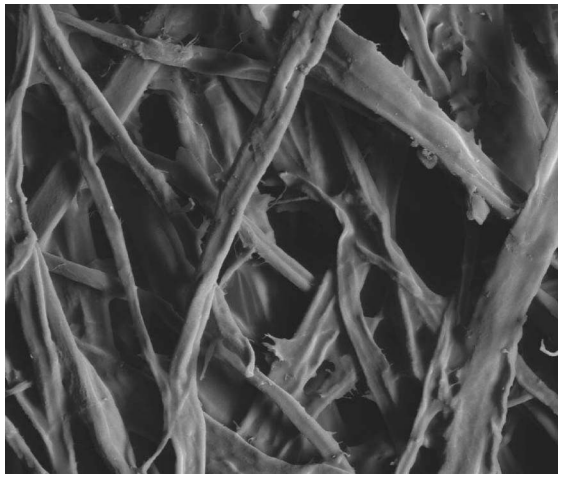
MAHLE Industry

Filter media
Ti 70

70 % Cellulose, 30 % Polyester

1. Features

The cellulose/polyester fibre blend chosen for this filter media consists of 30 % polyester and 70 % cellulose. This filter media is characterised by high stability and very good hydrophobicity.
Using the MAHLE pleat distance control "Pleat Lock" and the deep fluted cellulose media, the Ti 70 obtains high performance, economic efficiency with less differential pressure and high durability.



Charakteristics

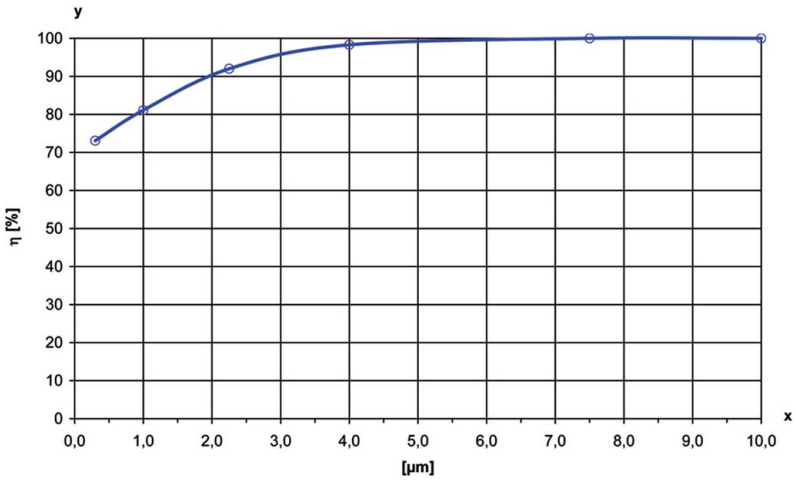
- High mechanical strength
- Better wet resistance than conventional filter papers
- Smooth and fluted surface
- Long filter life and low pressure loss
- Economical under operation conditions
- Good cleanability under operation conditions
- Compliance with the requirements of DIN EN 60335-2-69
- Worldwide distribution

2. Technical data

Type	Media	Media thickness [mm]	Weight [g/m²]	Air permeability [m³/m²h]	max. operating temperature [°C]	Test certificates/ dust classes
Ti 70	Cellulose with 30 % PET fibres	0.63	195	450 at Δp 200 Pa	120 (permanent)	DIN EN 60335-2-69 "M"

Technical data is subject to change without notice!

3. Filtration efficiency



Filtration effciency: > 98 % at 4 µm

Test conditions
Inflow velocity: 3.36 m/h
Mass concentration: 200 mg/m³
Test dust: Dolomit DRB 20 (Rock flour)

x = Particle size [µm]
y = Filtration efficiency η [%]

These values may vary depending on the nature of the dust, the composition of the gas and the cartridge design.

4. Chemical resistance/mechanical properties

Chemical resistance	Very good	Good	Limited		Mechanical properties	Very good	Good	Limited
Water		x			Surface quality (smoothness)		x	
Hydrolysis		x			Stability		x	
Acids		x			Abrasion resistance		x	
Alkalis		x			Cleanability (jet pulse)		x	
Solvents		x			Washability			x

These properties are of a purely qualitative valuation and depending on the nature of the dust, the composition of the gas and the operating conditions.

5. Design

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MAHLE

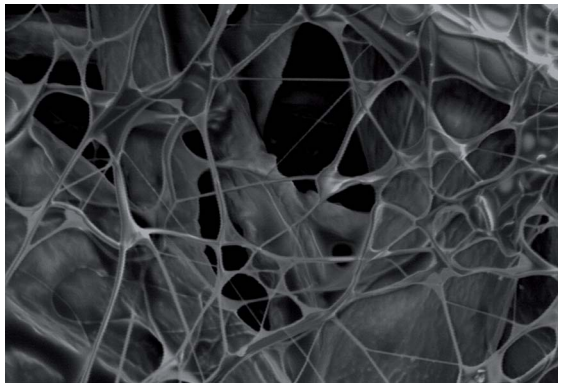
Industry

Filter media
Ti 85

M-Web

1. Features

The Ti 85 filter media is ideal for use in cleanable filter plants. It owes its excellent filtration and cleaning properties to the M-Web coating. The media combines efficient operation with a low pressure loss and high separation efficiency.
Therefore the Ti 85 filter media is especially suitable for vacuum cleaner systems.



Characteristics

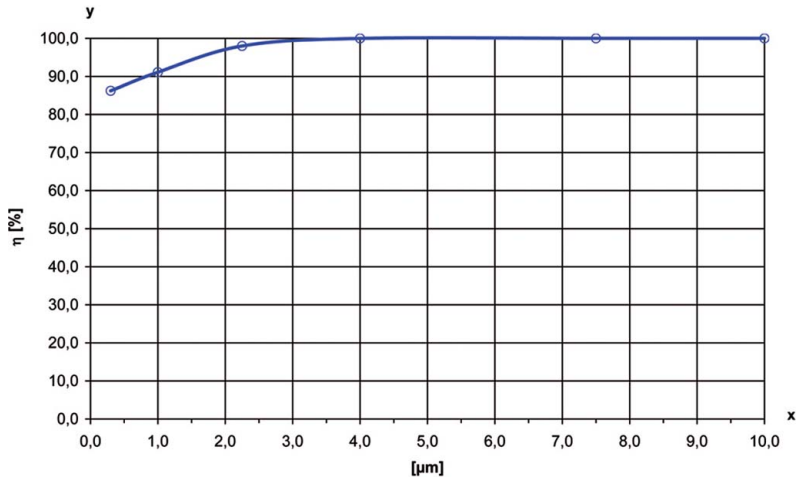
- Optimum cleaning properties
- Water-resistant
- Low pressure loss
- Long filter life
- Efficient operation
- Compliance with the requirements of DIN EN 60335-2-69
- Worldwide distribution

2. Technical data

Type	Media	Media thickness [mm]	Weight [g/m²]	Air permeability [m³/m²h]	max. operating temperature [°C]	Test certificates/ dust classes
Ti 85	Cellulose with PET fibres	0.4	130	600 at Δp 200 Pa	90 (permanent)	DIN EN 60335-2-69 "M"

Technical data is subject to change without notice!

3. Filtration Efficiency



Filtration effciency: > 99 % at 2.5 µm

Test conditions
Inflow velocity: 3.36 m/h
Mass concentration: 200 mg/m³
Test dust: Dolomit DRB 20 (Rock flour)

x = Particle size [µm]
y = Filtration efficiency η [%]

These values may vary depending on the nature of the dust, the composition of the gas and the cartridge design.

4. Chemical resistance/mechanical properties

Chemical resistance	Very good	Good	Limited		Mechanical properties	Very good	Good	Limited
Water		x			Surface quality (smoothness)		x	
Hydrolysis		x			Stability			x
Acids		x			Abrasion resistance			x
Alkalis		x			Cleanability (jet pulse)		x	
Solvents		x			Washability			x

These properties are of a purely qualitative valuation and depending on the nature of the dust, the composition of the gas and the operating conditions.

5. Design

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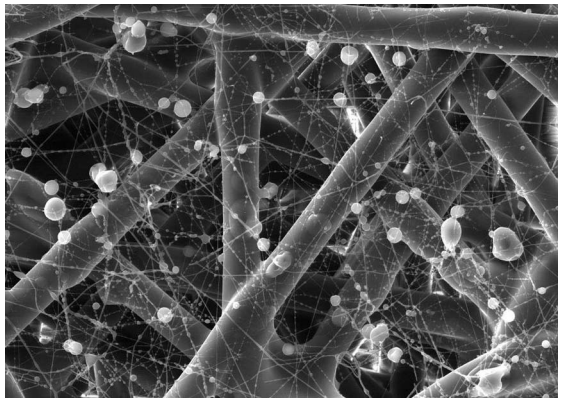
MAHLE Industry

Filter media
Ti 201

M-Web Polyester

1. Features

The Ti 201 filter media is ideal for use in cleanable filter plants.
It owes its excellent filtration and cleaning properties to the M-Web Polyester coating. The media combines efficient operation with a low
pressure loss and high separation efficiency.
Therefore the Ti 201 filter media is especially suitable for filtration of induction air, e.g. vacuum cleaner (wet and dry suction).



Characteristics

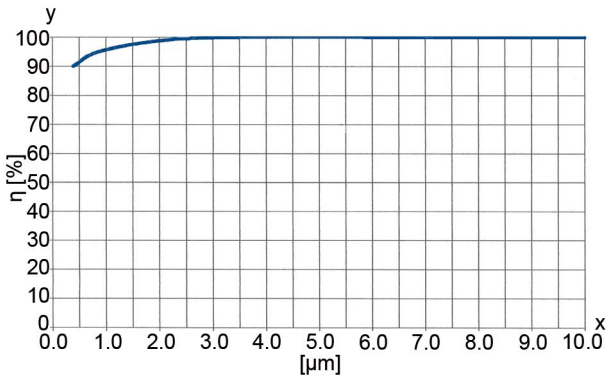
- Optimum cleaning properties
- Water-resistant
- Low pressure loss
- Long filter life
- Efficient operation
- Compliance with the requirements of DIN EN 60335-2-69
- Worldwide distribution

2. Technical data

Type	Media	Media thickness [mm]	Weight [g/m²]	Air permeability [m³/m²h]	max. operating temperature [°C]	Test certificates/ dust classes
Ti 201	Polyester with PET nano fibres	0.6	240	615 at Δp 200 Pa	65 (permanent)	DIN EN 60335-2-69 "M"

Technical data is subject to change without notice!

3. Filtration Efficiency



Filtration effciency: > 99 %
at 2.5 µm

Test conditions
Inflow velocity: 3.36 m/h
Mass concentration: 200 mg/m³
Test dust: Dolomit DRB 20 (Rock flour)

x = Particle size [µm]
y = Filtration efficiency η [%]

These values may vary depending on the nature of the dust, the composition of the gas and the cartridge design.

4. Chemical resistance/mechanical properties

Chemical resistance	Very good	Good	Limited		Mechanical properties	Very good	Good	Limited
Water		x			Surface quality (smoothness)		x	
Hydrolysis		x			Stability			x
Acids		x			Abrasion resistance			x
Alkalis		x			Cleanability (jet pulse)		x	
Solvents		x			Washability			x

These properties are of a purely qualitative valuation and depending on the nature of the dust, the composition of the gas and the operating conditions.

5. Design

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70518375.02/2012

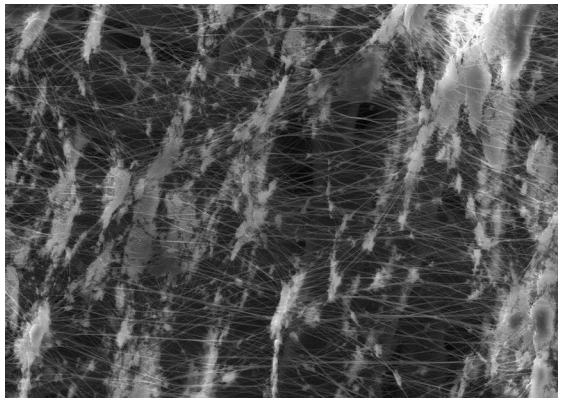
MAHLE Industry

Filter media
Ti 202

Polyester fleece with PTFE membrane

1. Features

The two-layer structure of this filter media enables the maximum benefit of the surface filtration.
The fine-pored PTFE membrane separates almost all the dust on the membrane surface. Owing to its very smooth, fibre-free surface, Ti 202 is especially suitable for cleanable dust filter cartridges. Especially challenging filtration tasks will be solved with a long service life.



Characteristics

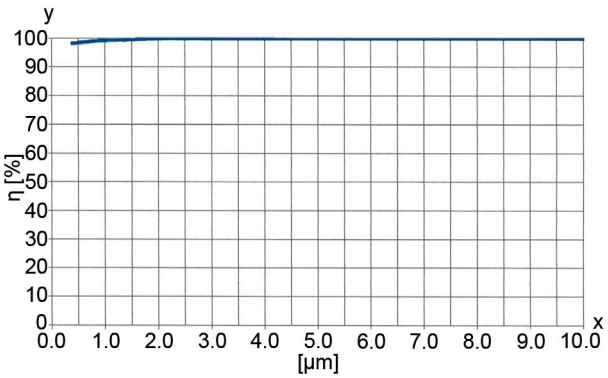
- Efficient surface filtration thanks to the microporous PTFE membrane
- High mechanical strenght
- Very good chemical resistance to acids and organic solvent vapours
- Very smooth, fibre-free surface
- Compliance with the requirements of DIN EN 60335-2-69 and EN 1822-3 class H10 at v = 1m/min
- FDA approval acc. to 21 CFR Ch. I § 177.1550
- Worldwide distribution

2. Technical data

Type	Media	Media thickness [mm]	Weight [g/m²]	Air permeability [m³/m²h]	max. operating temperature [°C]	Test certificates/ dust classes
Ti 202	Polyester fleece (PET) with PTFE membrane	0.50	200	260 at Δp 200 Pa	120 (permanent) 140 (peaks)	DIN EN 60335-2-69 "M"

Technical data is subject to change without notice!

3. Filtration efficiency



Filtration effciency:	> 99,99 % at 0.5 µm
Test conditions	
Inflow velocity:	3.36 m/h
Mass concentration:	200 mg/m³
Test dust:	Dolomit DRB 20 (Rock flour)

x = Particle size [µm]
y = Filtration efficiency η [%]

These values may vary depending on the nature of the dust, the composition of the gas and the cartridge design.

4. Chemical resistance/mechanical properties

Chemical resistance	Very good	Good	Limited		Mechanical properties	Very good	Good	Limited
Water	x				Surface quality (smoothness)	x		
Hydrolysis			x		Stability	x		
Acids		x			Abrasion resistance			x
Alkalis			x		Cleanability (jet pulse)	x		
Solvents		x			Washability		x	

These properties are of a purely qualitative valuation and depending on the nature of the dust, the composition of the gas and the operating conditions.

5. Design

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MAHLE

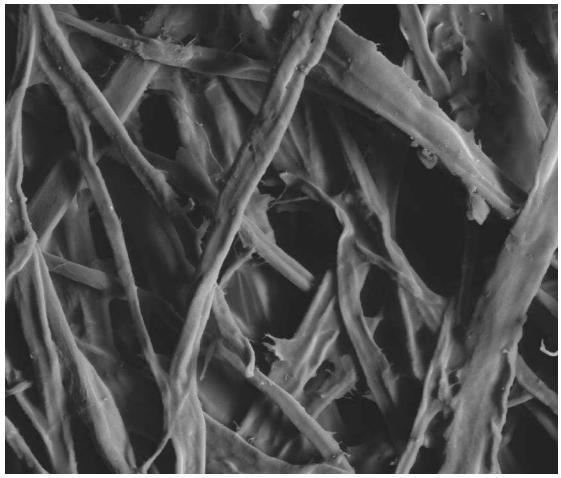
Industry

Filter media
Ti 205

80 % cellulose, 20 % polyester
Flame-retardant

1. Features

The cellulose/polyester fibre blend chosen for this filter media consists of 80 % cellulose and 20 % polyester. This filter media is characterised by high stability and very good hydrophobicity. The media combines efficient operation with a low pressure loss and long filter service life.
Furthermore the filter media Ti 201 is flame-retardant and therefor most suitable for flame spraying, plasma and laser cutting as well as welding applications.



Characteristics

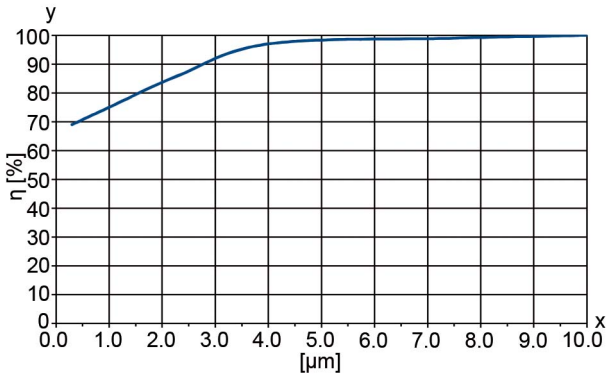
- Flame-retardant
- Water-resistant
- Optimized cleaneability
- Low pressure loss
- High stability
- Long service life
- Efficient operation
- Compliance with the requirements of DIN EN 60335-2-69
- Worldwide distribution

2. Technical data

Type	Media	Media thickness [mm]	Weight [g/m²]	Air permeability [m³/m²h]	max. operating temperature [°C]	Test certificates/ dust classes
Ti 205	Cellulose with 20 % PET-fibres, flame-retardant	0.6 (fluted)	135	560 at Δp 200 Pa	90 (permanent)	DIN EN 60335-2-69 "M"

Technical data is subject to change without notice!

3. Filtration efficiency



Filtration efficiency: > 98 % at 5 µm

Test conditions
Inflow velocity: 3.36 m/h
Mass concentration: 200 mg/m³
Test dust: Dolomit DRB 20 (Rock flour)

x = Particle size [µm]
y = Filtration efficiency η [%]

These values may vary depending on the nature of the dust, the composition of the gas and the cartridge design.

4. Chemical resistance/mechanical properties

Chemical resistance	Very good	Good	Limited		Mechanical properties	Very good	Good	Limited
Water		x			Surface quality (smoothness)		x	
Hydrolysis		x			Stability		x	
Acids		x			Abrasion resistance		x	
Alkalis		x			Cleanability (jet pulse)		x	
Solvents		x			Washability			x

These properties are of purely qualitative valuation and depending on the nature of the dust, the composition of the gas and the operating conditions.

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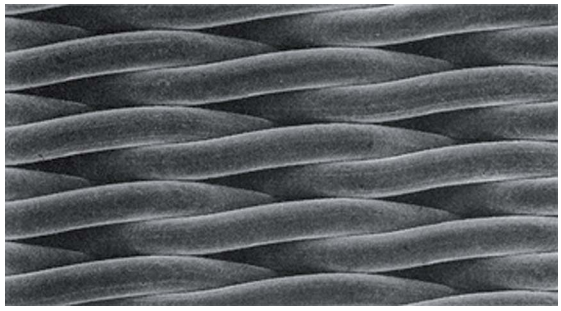
MAHLE Industry

Filter media
DRG 5N

Wire mesh, stainless steel

1. Features

A special form of surface treatment has been used to obtain a very smooth, finely separating filter media. The wire mesh structure of DRG 5N permits wet cleaning without removing the cartridge
This media is preferred for use in cleanable dust filters installed in dry dust removal applications in the food processing and pharmaceuticals industries.



Characteristics

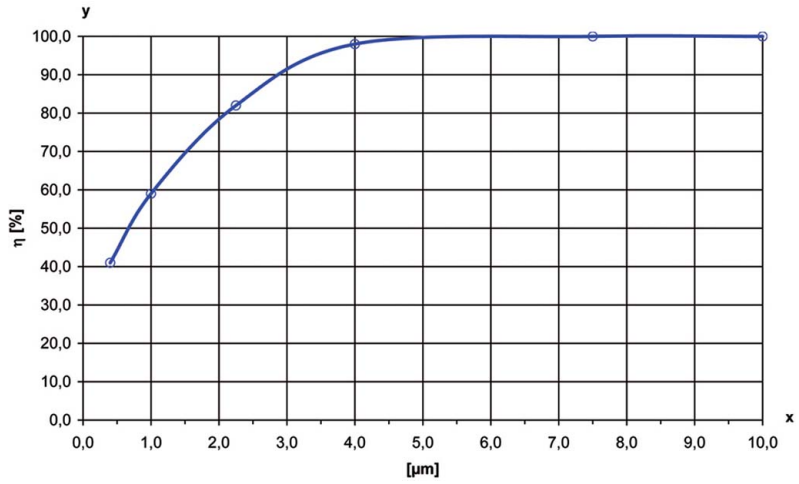
- Smooth surface
- Electrically conductive
- Good separation efficiency
- Excellent cleaning power
- Good cleanability
- Worldwide distribution

2. Technical data

Type	Media	Media thickness [mm]	Weight [g/m²]	Air permeability [m³/m²h]	max. operating temperature [°C]
DRG 5N	Stainless steel wire mesh 1.4404	0.15	750	900 at Δp 200 Pa	240 (permanent) max. 260 (peaks)

Technical data is subject to change without notice!

3. Filtration efficiency



Filtration efficiency : > 98 %
at 5 µm

Test conditions
Inflow velocity: 3.36 m/min
Mass concentration: 200 mg/m³
Test dust: Dolomit DRB 20 (Rock flour)

Electrical resistance: < 4 x 10^4 Ω
x = Particle size [µm]
y = Filtration efficiency η [%]

These values may vary depending on the nature of the dust, the composition of the gas and the cartridge design.

4. Chemical resistance/mechanical properties

Chemical resistance	Very good	Good	Limited		Mechanical properties	Very good	Good	Limited
Water	x				Surface quality (smoothness)	x		
Hydrolysis	x				Stability			x
Acids		x			Abrasion resistance		x	
Alkalis	x				Cleanability (jet pulse)		x	
Solvents	x				Washability	x		

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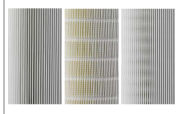
MAHLE
Industry

Filter cartridges
Overview

MAHLE manufactures star-pleated filter cartridges that separate even the finest particles from air and gases in almost any branch of industry. Cylindrical or conical cartridges are offered as standard. MAHLE provides a wide range of high-end solutions – from filtration of gas turbine intake air through product separation in production or transport processes to sample gas filtration in the pharmaceutical and food processing industries. MAHLE cartridges are manufactured with extremely tight tolerances and their emission values are below the detection limit. Allow us to convince you of the numerous advantages of the MAHLE range of industrial filters.

	Filter cartridges		
1	**Advantages of conical cartridges**	All the advantages at a glance	
2	**Manufacturing technologies**	Special pleat distance control for polyester and cellulose based filter media	
3	**M-Web elements**	Cartridges for challenging tasks with nano fibre coating	
4	**Conical Quick Lock cartridge with rotating wing**	All the characteristics of a perfect match	
5	**Air intake filtration of gas turbine systems**	Optimised cartridges for different requirements	
6	**Miofilter**	Rugged, complete regenerative pre-filtration elements	
7	**Questionnaire**	Configure your own cartridge	

MAHLE Industry

Dust filter cartridge
Advantage of conical dust filter cartridges

1. Features

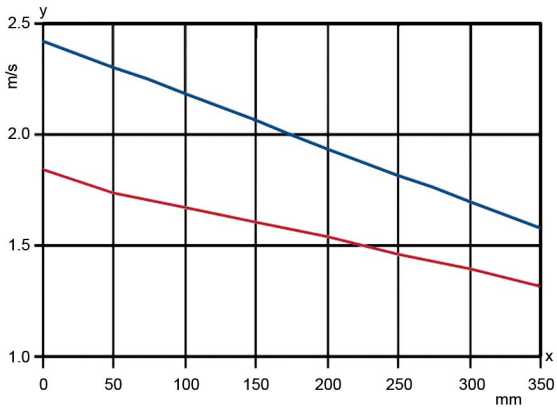
Star-pleated MAHLE dust filter cartridges are used to separate very fine particles from air and gases in nearly all industrial branches. Cylindrical and conical cartridges are offered as standard. The conical geometry offers clear advantages in comparison to cylindrical designs. Conical MAHLE cartridges improve the performance of a system with only minimal effort.

Characteristics

- 30% larger surface means better dust sedimentation
- Uniform cleaning all the way down to the bottom
- Higher mechanical strength facilitates a more compact system
- Lower filter surface load due to the reduced inflow velocity
- Improved cleaning action extends the cartridge life

2. Course of flow on dirt side

Upstream velocity in dirt side area V = 1200 m³/h, 8 cartridges, diameter of filter housing 530 mm

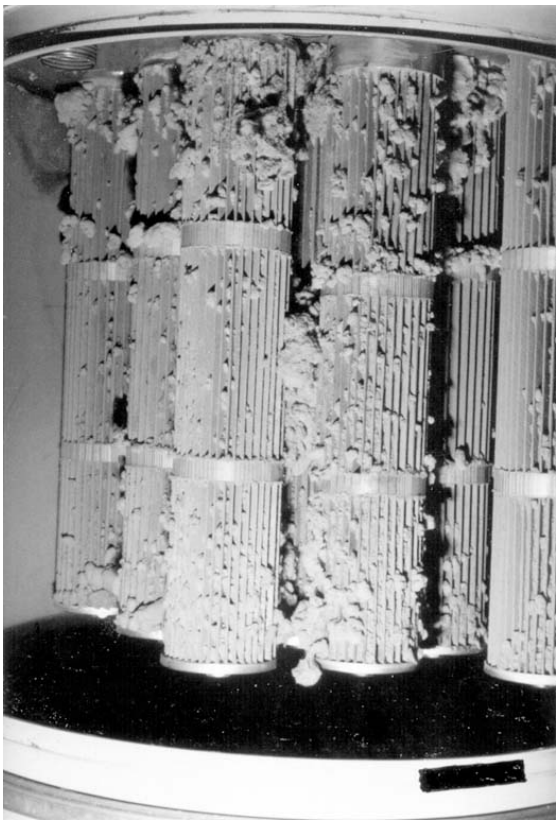


The conical design of the cartridge shows a high reduction of the upstream velocity in the area of the bottom end cap. Through it the element is much better to clean off, especially in use of light dust. The dust can sediment better.
Higher flow from approximately 30 % at compact filter housing is possible.

x = Distance to the bottom end cap in mm
y = Velocity in m/s

Cylindrical cartridge
Conical cartridge

3. Effects in practice – example suction of rare dust



Cylindrical cartridge after 1,170 working hours.
Upper area of cartridges is not cleaned well.

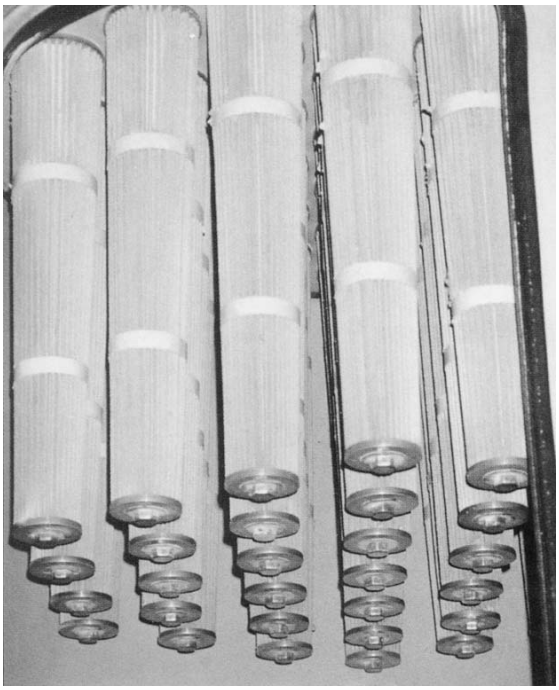
After changing to conical filter cartridges and 4,600 working hours..
Cartridges cleaned over the whole length.

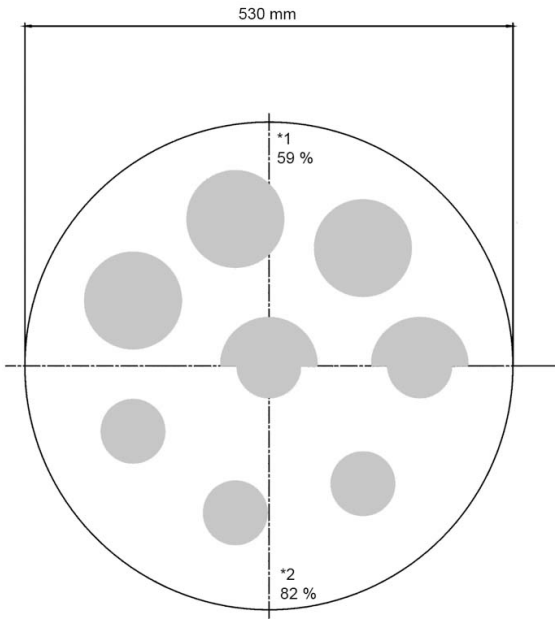
4. Technical Data

For example sand plasting, V = 1200 m³/h, diameter of housing 530 mm

Cartridge diameter in mm	120	120	115
Cartridge design	conical	cylindrical	cylindrical
Connection	RD 72	RD 72	RD 60
Filter area per cartridge in m²	1.6	1.6	1.3
Filter area complete in m²	12.8	12.8	10.4
Filter surface load in m/min	1.56	1.56	1.92
Free area in %	82	59	62
Velocity between bottom end caps in m/s	1.84	2.56	2.42
Velocity on top end cap (RD connection) in m/s	7.15	7.15	14.75
Volume, clean side, cartridge in l	3.23	6.08	3.63

Subject to technical changes without prior notice.





Out of these values the following advantages for the conical cartridges result:

High capacity
(approx. 19 % more filter surface in comparison to cylindrical cartridges with diameter 115 mm)

Better dust sedimentation
(smaller area of the bottom end caps)

More efficient cleaning
(lower volume in comparison to the cylindrical cartridge)

Less flow resistance
(an increased outlet area size at the upper end cap in comparison to cartridges with RD 60 connection)

*1 = Cylindrical cartridges with 59 % free area
*2 = Conical cartridges with 82 % free area

MAHLE Industry

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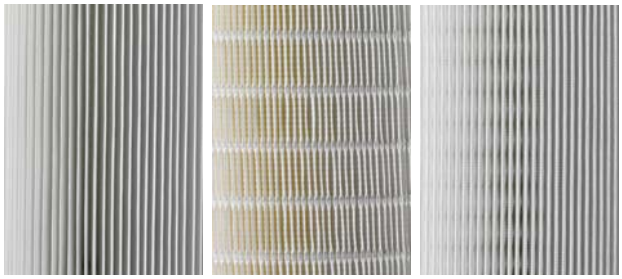
05/2012

MAHLE Industry

Dust filter cartridge
Pleat distance control

special pleat distance control for polyester and cellulose based filter media

1. Features



Star-pleated MAHLE dust filter cartridges are used to separate very fine particles from gases. The gas flows inward through the cartridge and is discharged via the open end cap on the top.
Due to the new MAHLE pleat distance control for polyester and cellulose based filter media, the performance of the MAHLE polyester cartridges increase up to 44 %, compared with standard polyester cartridges on the market. The improved cleaning effect and the optimized flow conditions are leading the performance to a very high level and to a maximum durability of the filter media of the cartridge.
The cleaning effect is highly improved by the engrained ridges/pleat lock of the filter media. Pleat blocking isn´t possible anymore, the air permeability and the air volume flow will be constantly to an extremely high level to get less differential pressure during the process.
Regular, extensive material and performance tests are the key to the consistently high quality of MAHLE dust cartridges. A team of dedicated engineers in our applications department and modern development laboratories constantly endeavour to mature and perfect our products. Applications tests both on the customer´s side and in our own facilities form the backbone of affortable and reliable products.

Characteristics

- Very high retention rate with less differential pressure
- Polyester and cellulose based filter media
- Perfect pleat allocation, due to the pleat distance control with ridges and pleat-lock
- Very high durability
- Very high cleanability
- Maximum useable filter surface
- Very high efficiency
- Very low maintenance necessary
- Worldwide distribution

2. Pleat distance control versions

Standard pleat distance control for polyester based filter media

- Very good and constant pleat allocation by the use of a pleat distance hot melt rope on the backside of the pleats
- Improved cleaning effect of the filter cartridges with less differential pressure and high durability
- Increased stability of the pleats with a pleat depth of 50 mm
- Applicable process for cartridges with a pleat depth of 50 mm and a length up to 1200 mm
- Applicable process for polyester based filter media Ti 08 and Ti 15

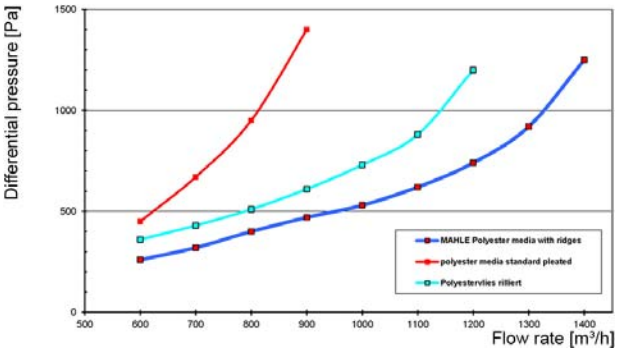
Pleat distance control with ridges for polyester based filter media

- Perfect and constant pleat allocation by the use of ridges for polyester based filter media
- Best cleaning effect of the filter cartridges with less differential pressure and very high durability
- Maximum stability of the pleats with a pleat depth of 50 mm
- Applicable process for cartridges with a pleat depth of 50 mm and a length up to 800 mm
- Applicable process for polyester based filter media Ti 08 and Ti 15

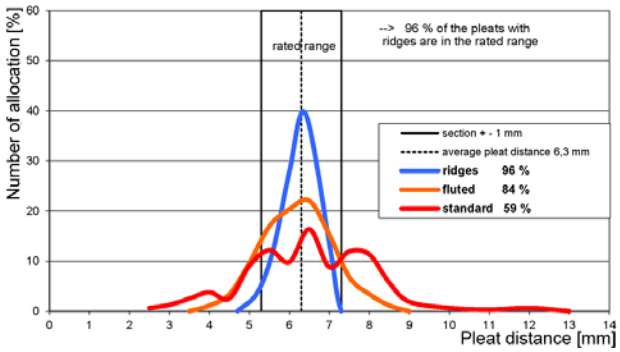
Pleat distance control with Pleat-Lock for cellulose based filter media

- Perfect and constant pleat allocation by the use of engrained lenses ((Pleat-Lock)) for cellulose based filter media
- Usage of the complete filter surface for cartridges with a pleat depth of 50 mm
- Best cleaning effect of the filter cartridges with less differential pressure and very high durability
- Maximum stability of the pleats with a pleat depth of 50 mm
- Applicable process for cartridges with a pleat depth of 50 mm and a length up to 800 mm
- Applicable process for cellulose based filter media Ti 10 and Ti 85

3. Comparison of performance and pleat allocation



Comparison of differential pressure development on load with fluted filter media, with and without the pleat distance control with the MAHLE technology of ridges



Comparison of the pleat allocation between the pleat distance controls of fluted filter media and with or without the MAHLE technology of ridges

4. Design

Please contact us for detailed technical information, any open questions and for general expert advice. Completion of the relevant questionnaire would facilitate in the coordination of all important parameters.
Comprehensive documentation on our product range, cleaning units and cartridges can be provided.

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05/2012

MAHLE Industry

Filter media with Nano-Web surface

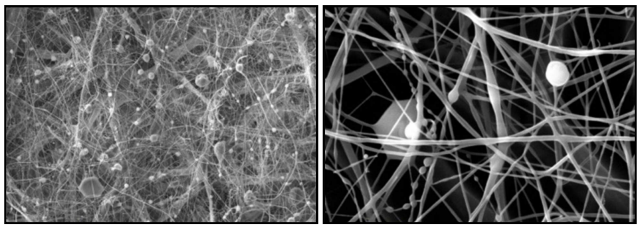
MAHLE M-Web

1. Features

Star-pleated MAHLE dust filter cartridges are used to separate very fine particles from air. The air flows through the cartridge and is discharged through the open end cap on the top.
The Nano-Web Filter media Ti 85 is optimized for the use in cleanable filter systems.
Due to the M-Web surface the filter element is achieving a very good performance in filtration and cleaning.
An economic operating process is obtained by a very high retention rate at an extremely low differential pressure. M-Web filter media are optimized for the use in industrial vacuum cleaners, for air intake filtration of gas turbines, for the filtration of fumes in welding and plasma cutting applications, as well as other critical industrial filtration processes.
The cleaning effect is highly improved by the engrained pleat lock of the filter media. Pleat blocking is not possible any more, the air permeability and the air volume flow will be constantly to an extremely high level to get less differential pressure during the process.
Regular, extensive material and performance tests are the key to the consistently high quality of MAHLE dust cartridges. A team of dedicated engineers in our applications department and modern development laboratories constantly endeavor to mature and perfect our products. Applications tests both on the customer's side and in our own facilities form the backbone of affordable and reliable products.

Characteristics

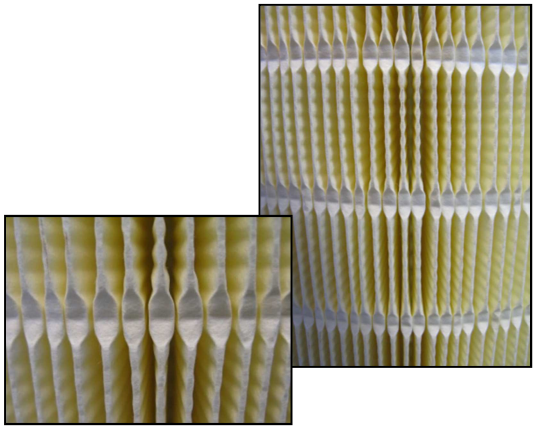
- Very high retention rate with very low differential pressure
- Polyester- and cellulose based filter media
- Optimized pleat distance control due to „Pleat-Lock“
- Very high durability oft he filter elements
- Less differential pressure – no blocking of the pleats will occure, due to the pleat distance control
- Very high cleanability
- Maximum useable filter surface on very small space
- Very high efficiency
- Very low maintenance necessary
- Worldwide distribution



2. MAHLE pleat distance control “Pleat – Lock”

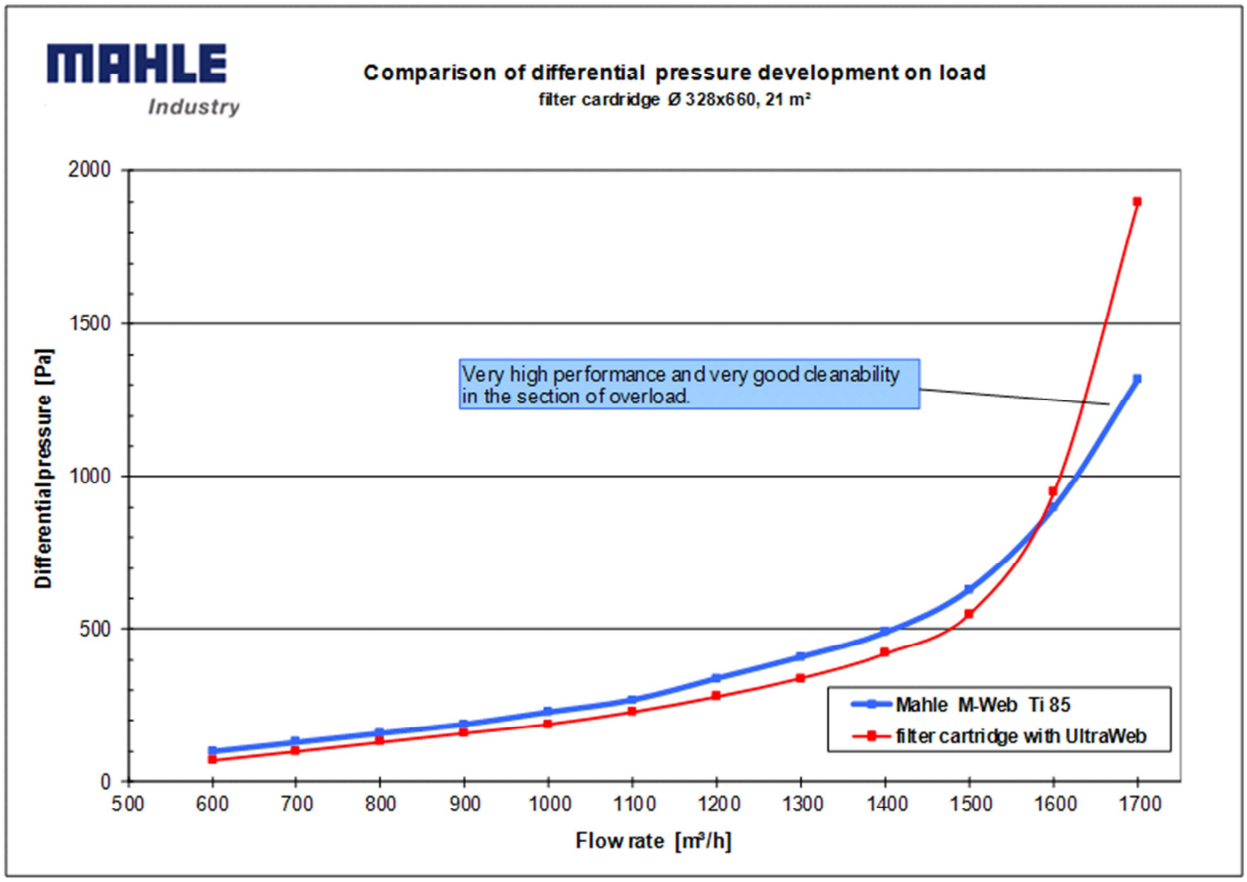
Pleat distance control with MAHLE “Pleat Lock” for cellulose based filter media

- ✓ Perfect and constant pleat allocation by the use of engrained lenses (“Pleat lock”) for cellulose based filter media.
- ✓ Maximum usage of the complete filter surface for cartridges with a pleat depth of 50 mm.
- ✓ Best cleaning effect of the filter cartridges with less differential pressure and very high durability.
- ✓ Maximum stability of the pleats with a pleat depth of 50 mm.
- ✓ Applicable process for cartridges with a pleat depth of 50 mm and a length up to 800 mm.
- ✓ Applicable process for cellulose based filter media TI 10 and TI 85.



3. Comparison Nano – Web filter media

Differential pressure comparison of filter elements with M-Web and UltraWeb filter media on load.



4. Design

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07/2011

MAHLE Industry

Dust filter cartridge
Quick-Lock cartridge with RLK

Quick-Lock cartridge with conical rotating wing

1. Features

The combination of the conical cartridge without bands, the conical rotating wing and the Quick look fixing allows smallest possible mounting height in the dirt side room. The rotating wing ensures quiet, careful and energy efficient cleaning. The conical design benefits a low upstream velocity, increases the performance ratio and improves the cleaning behaviour by effective dust sedimentation.

Characteristics

- Careful cleaning at max 4 bar pressure for a longer cartridge life time at low operating costs
- Conical cartridge without bands
- Compact design allows smallest mounting height in the dirt side room
- Effective cleaning via decreased upstream velocity and improved dust sedimentation
- Worldwide distribution

Applications

- Especially at a high dust load
- Powder coating
- Food industry
- Metalworking

2. Installation





3. Product range dust filtration





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03/2011

MAHLE Industry

Filter cartridges
Cartridges for gas turbines

1. Features

The MAHLE product range includes a series of filter cartridges specifically designed for the filtration of gas turbine intake air. Pleated cartridges are available in cylindrical or conical version as MAHLE standard. A wide range of static or cleanable cartridges is available, according to the customer's requirements. MAHLE filter cartridges for gas turbines are the perfect solution for new projects and also as a replacement in existing filter systems. Various cartridges and sizes can be combined to meet the customers needs. Special customised variants are also available on request.
Regular, extensive material and performance tests are the key to the consistently high quality of MAHLE air intake cartridges. A team of dedicated engineers in our application department and development laboratory are constantly working to bring our products to perfection.
We invite you to take a look at a few typical MAHLE cartridges for gas turbines.

Characteristics

- High loading capacity
- Cleanable filter systems leading to high durability
- Special cleaning nozzles available
- Resistance against atmospheric conditions
- Optimized flow conditions for dry and wet applications
- Very easy handling and installation
- ARAMCO testing on request
- Nano Web Filter Media Ti 85 available
- Universally suitable
- Useable for existing GT filter units
- Worldwide distribution

2. Types

Denomination (cartridge pairs)	Surface [m²]	Volume flow [m³/h]	Turbine capacity (examples)	Intake volume [m³/h]	Description
360-328 GT	37	2700	250 MW	2,075,000	Cleanable cylindrical cartridges in horizontal arrangement Replacement cartridges in existing systems – 768 cartridge pairs
445-328 GT	45	3200	250 MW	2,075,000	Cleanable conical/cylindrical retrofit cartridges in horizontal arrangement Replacement cartridges in existing systems – 648 cartridge pairs
410-360 GT	42	3500	250 MW	1,960,000	Static, non-cleanable cylindrical cartridges in horizontal arrangement Replacement cartridges in existing systems – 560 cartridge pairs

360-328 GT

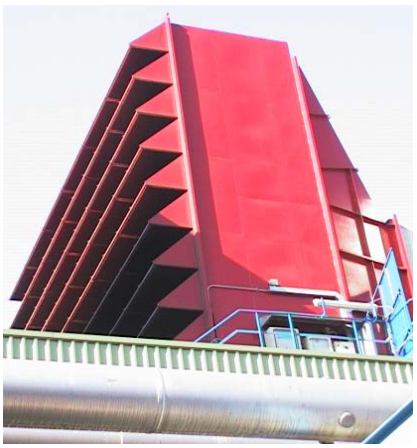
445-328 GT

410-360 GT

3. Applications

Air intake filter housing for gas turbines

Inside the air intake filter housing for gas turbines



Air intake filter housing for gas turbines

4. Design

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03/2011

MAHLE

Industry

Miofilter
Filter cartridge/Panel filter

1. Features

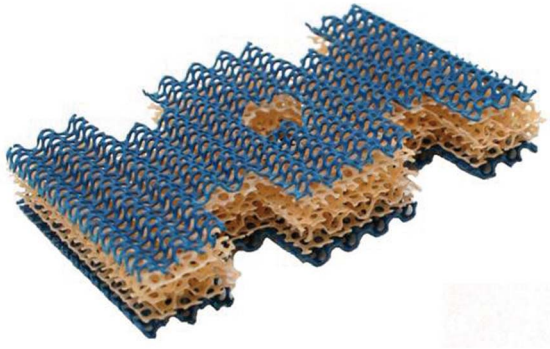
Miofilter products are mainly used for pre-filtration of air intake filtration for air conditioning systems and electrical engines in train applications. In that case, Miofilter products protect the second filter systems from rough pollution and atmospheric influences such as snow ice or leaves.
Miofilter are utilized as round shaped filter cartridges of filter cells (panel filters). They consist of different layers with undulated and perforated filter media, which is moulded in PU end caps or fixed into special metal frames.
Regular, extensive material and performance tests are the key to the consistently high quality of MAHLE dust cartridges. A team of dedicated engineers in our applications department and modern development laboratories constantly endeavour to mature and perfect our products. Applications tests both on the customer´s side and in our own facilities form the backbone of affortable and reliable products.

Characteristics

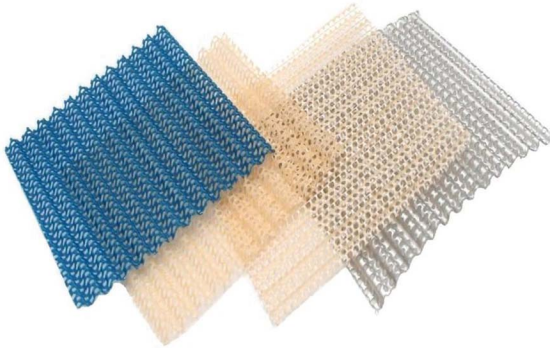
- High retention rate along with low differential pressure
- Filter system with a very high load capacity (velocity up to 4 m/s)
- Cleanable filter systems leading to high durability
- Resistance against atmospheric conditions
- Resistance against high temperatures (up to 400°C)
- Very easy handling and installation
- Simple and rugged construction
- Very high degree of efficiency
- Low amount of maintenance
- Worldwide distribution

2. Filter media

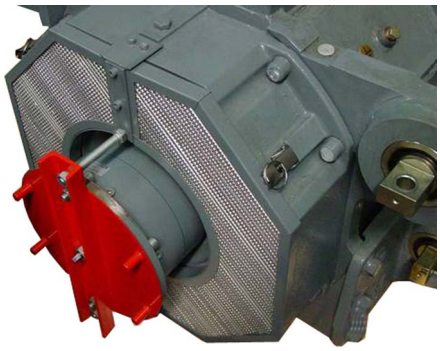
Miovyl
Multilayered filter media made of perforated plastic
Equably layered (standard filter)
90° shifted layers to improve filtration characteristics (AL filter)
Temperature resistant up to 70 °C
Fire resistance M1



Mioval
Multilayered filter media made of perforated aluminum
Equably layered (standard filter)
90° shifted layers to improve filtration characteristics (AL filter)
Temperature resistant up to 120 °C, with a special sealing compound or in a metal frame up to 400 °C
Fire resistance M0



3. Applications



Pre-filtration of air intake filtration for electrical engines

Pre-filtration of air intake filtration for air conditioning systems

Pre-filtration of air intake filtration for air conditioning systems

View of the different filtration efficiency levels

View of the different filtration efficiency levels while installed

4. Design

Please contact us for detailed technical information, any open questions and for general expert advice. Completion of the relevant questionnaire would facilitate in the coordination of all important parameters.
Comprehensive documentation on our product range, cleaning units and cartridges can be provided.

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70562513.03/2012

MAHLE

Industry

Enquiry to filter cartridges and cleaning unit

sender

company: _____ customer-nr.: _____

road: _____ postcode: _____

city: _____

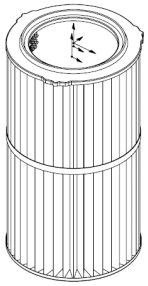
contact person

technical: _____ department: _____

commercial: _____ phone: _____

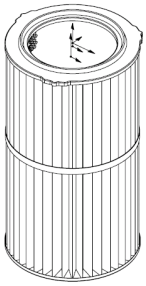
e-mail: _____

Please select from the following types of filter cartridges.
Every type of filter cartridge is available as cylindrical or conical cartridge.
Custom-made cartridges are available on request.



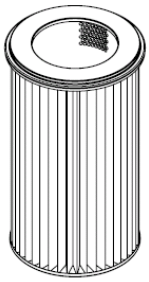
Tie rod –
closed end cap
dirty gas side

☐



Tie rod –
open end cap

☐

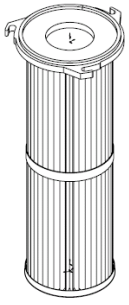


Mounting
clean side

☐

Bayonet cap

☐

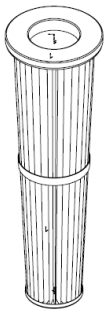


Alu lugs flange

☐

Thread
(RD)

☐



Mounting
clean gas
(clamping)

☐

Quick Lock
(only conical)

☐

Cartirdge Information

Do you need a conical or cylindrical filter cartridge?
For detailed advantages of conical filter cartridges please see data sheet: Advantages of conical dust filter cartridges.

Conical ☐ Cylindrical ☐

Please fill in the needed information for your filter cartridge

Inner diameter (top): _____ mm Outer diameter (top): _____ mm

Inner diameter (bottom): _____ mm Outer diameter (bottom): _____ mm

Lenght: _____ mm Quantity of pleats: _____ Pieces

Pleats depth: _____ mm Filter surface: _____ m²

Serial number of competitive cartridge (if available): _____

If the type of cartridge you need is not shown on this list please fill in some general measures or add a drawing or pictures of the filter cartridge if possible.

Type of cleaning system

Multi-jet-nozzle ☐ Rotation wing ☐

Different system ☐

Please describe: _____

_____

Filter media

Please fill in some information about the filter media for you filter cartridge

Polyester	☐	Cellulose	☐	PTFE	☐
Flame retardant	☐	Conductible	☐	Nano	☐
Median weight	☐	Median thickness	☐	Meltblown	☐

Retention class _____ (L,M,H,…)

Further information: _____

Application data

Volume flow _____ m³/h Residual dust content _____ g/m³

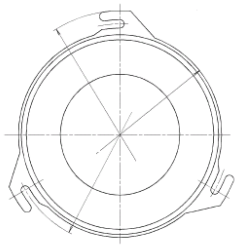
Continuous filter use: ☐ Working temperature: _____ °C

Description of the dust: _____

_____

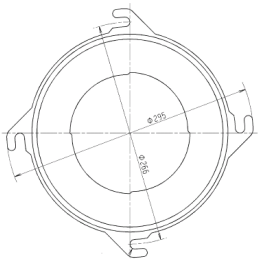
Its also possible to investigate a dust sample in our laboratory to recommend the perfect filter media for your application.

Some mounting systems are available in different versions.
Please choose the mounting system for your filter cartridge.



Alu flange with
3 lugs

☐

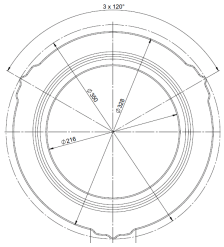


Alu flange
with 4 lugs

☐

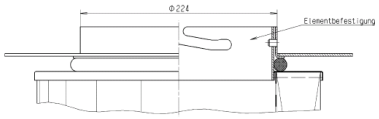
Quick Lock
(only conical)

☐



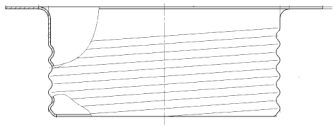
Tie rod
dirty gas side

☐



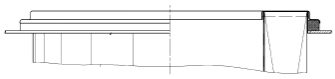
Bayonet cap

☐



Thread
(RD)

☐



Mounting
cleanside

☐

Mounting system

Please give us some additional information about the mounting system for your filter cartridge or add a drawing.

Outer diameter: _____ mm Inner diameter: _____ mm

For some mounting systems we need some special data that are nor suitable for all mounting systems. Please fill in the data that fit for the system you choose above.

Lugs flange:	Bolt circle diameter	_____ mm
Type of thread:		_____ (RD 72, RD 100, RD 60, …)
Bayonet cap:	Number of lugs	_____ pieces
	Diameter of mounting	_____ mm
Tie rod:	Outer diameter	_____ mm
	Inner diameter	_____ mm

Do you have any additional information concerning the filter cartridge or the mounting system?

_____

_____

Technical data is subject to change without notice!

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03/2012

MAHLE
Industry

Enquiry for Miofilter

Sender

Company: _____ Account No.: _____

Zip Code: _____ Street: _____

City: _____ City: _____

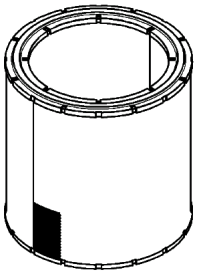
Contact person

Sales: _____ Technical: _____

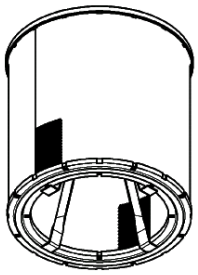
Phone: _____ Phone: _____

E-mail: _____ E-mail: _____

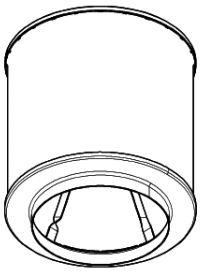
Please choose from the following Versions of filter elements.
Special elements are available on request.



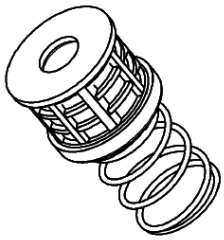
Round filter element ☐



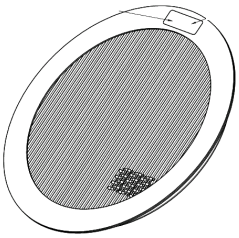
Round filter assembly ☐



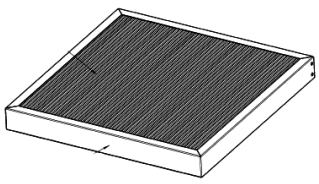
Round filter complete ☐



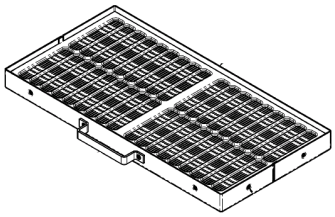
Round filter special ☐



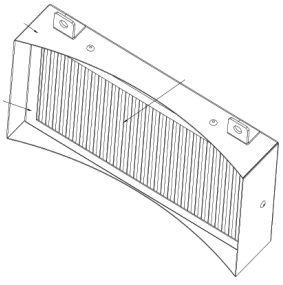
Filter cell round ☐



Filter cell rectangular ☐



Filter cell railway ☐



Filter cell special ☐

Information about the filter

Round filter

Please fill in the required / available information for your **round filter**:

Outer diameter:	_____ mm	Inner diameter :	_____ mm
Length / Height:	_____ mm	Connection diameter	_____ mm (Complete filter only)
		Hole diameter	_____ mm (Assembly only)
Layer configuration	☐ Standard	☐ Alternee (AL)	

Description / Serial number of the competitor's product (if available): _____

If you cannot find the correct measurements or data's for your element, please fill in some general measurements and attach a picture or a drawing if available.

Filter cell

Please fill in the required / available information for your **filter cell**:

Width:	_____ mm	Height:	_____ mm	
Depth:	_____ mm	Handles:	☐ Yes	☐ No
Frame material:	_____	Special painting:	☐ Yes	☐ No
Outer filter Material:	☐ Blue PVC	☐ Aluminuim		

Description / Serial number of the competitor's product (if available): _____

If you cannot find the correct measurements or data's for your element, please fill in some general measurements and attach a picture or a drawing if available.

Application information

Continuous use:	☐	Discontinuous use:	_____ h/day
Volumeflow:	_____ m³/h	Residual dust content:	_____ g/m³
Operating temperature:	_____ °C	Available differential pressure:	_____ Pa
Designated lifetime:	_____ month until cleaning		_____ Month until change

Description of the dust: _____

Do you have further information about your filter element or the application?

_____

_____

Technical data is subject to change without notice!

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MAHLE
Industry

Filter cartridges
Data sheets

MAHLE manufactures star-pleated filter cartridges that separate even the finest particles from air and gases in almost any branch of industry. Cylindrical or conical cartridges are offered as standard. MAHLE provides a wide range of high-end solutions – from filtration of gas turbine intake air through product separation in production or transport processes to sample gas filtration in the pharmaceutical and food processing industries. MAHLE cartridges are manufactured with extremely tight tolerances and their emission values are below the detection limit. Allow us to convince you of the numerous advantages of the MAHLE range of industrial filters.

	Data sheets		
1	**Conical filter cartridges**	120 NK 145 / 156 / 220 / 328 NKH 160 NK 160 NKC 328 NKQ - Quick Lock	
2	**Cylindrical filter cartridges**	115 NZ / NZC 120 NZ 200 NZ 145 / 156 / 220 / 328 NZH 328 NZ / NZC / UZ / XZ	
3	**Special filter cartridges**	120 XK	
4	**Cartridges for gas turbines**	445 GK / 328 GZ	
5	**Customised cartridges**	Specially manufactured according to each customer's specification	

MAHLE Industry

Dust filter cartridge
115 NZ/NZC

Ø 115 mm, Rd 60x4, clean or raw gas side installation

1. Features

Star-pleated MAHLE dust filter cartridges are used to separate very fine particles from gases. The gas flows inward through the cartridge and is discharged via the open end cap on the top. In combination with the MAHLE MJD cleaning unit (pressure cleaning with a multi-jet nozzle), this filter cartridge provides an efficient solution in exceptionally challenging environments. This is also supported by a special method of element pleat stabilisation.
Regular, extensive material and performance tests are the key to the consistently high quality of MAHLE dust cartridges. A team of dedicated engineers in our applications department and modern development laboratories constantly endeavour to mature and perfect our products. Applications tests both on the customer´s side and in our own facilities form the backbone of affortable and reliable products.

Characteristics

- High loading capacity
- Good cleaning properties
- High stability
- Installation on the clean or raw gas side
- Universally suitable
- Secured operation
- Large filter surface
- Optimized filter media
- Optimized energy efficency
- Worldwide distribution

2. Technical Data

Materials

Inner core:	Galvanized steel (standard) or stainless steel V4A (1.4571/AISI 316)
End caps:	Galvanized steel (standard) or stainless steel V4A (1.4571/AISI 316)
Seal:	self-adhesive needle felt
Filter media:	Ti 07 - Electrically conductive polyester fleece with PTFE membrane Ti 08 - Electrically conductive polyester fleece Ti 15 - Polyester fleece other media on request

Cleaning

Nozzle:	Multi jet nozzle G3/8
Cleaning pressure:	6 bar (max. 7 bar)
Differential pressure:	max. 18 mbar
Compressed air consumption per cleaning pulse:	9 l (fad)
Compressed air reservoir capacity:	max. 2 l per filter cartridge/cleaning pulse

Technical data is subject to change without notice!

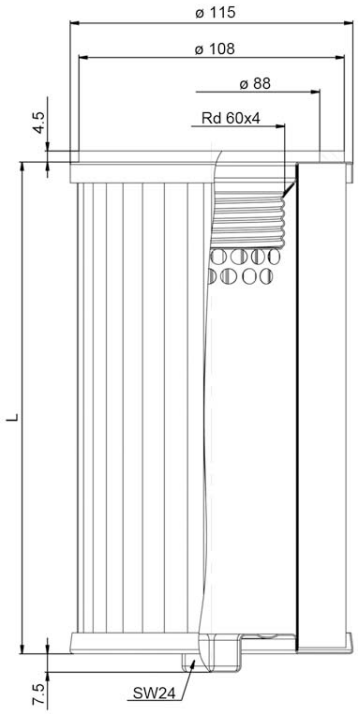
3. Type number key, description and dimensions

3.1 Type number key

Type	Series	Filter material	Filter surface	Material	Design	
852	625	Ti 07	-0.8	V4A	Band	Example

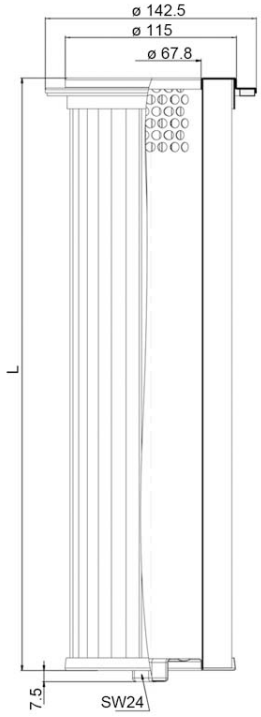
3.2 NZ raw gas side

The dust filter cartridge has a closed bottom end cap with a hexagon bolt. It will be raw gas side mounted within a thread Rd 60x4. The dust filter cartridge will be pulled with a hexagon key with 15 Nm against the filter plate. During the mounting you have to take care, that the thread adapter will be mounted centrical on the filter plate, so that it fits perfect into the Rd 60x4 thread of the cartridge. We recommend cleaning the dust filter cartridge with the MAHLE multi-jet nozzle .



3.3 NZC clean gas side

The dust filter cartridge has a closed bottom end cap. It will be clean gas side mounted and fixed with holding down clamps on top of the cartridge. During the mounting you have to take care, that the dust filter cartridge will be mounted centrical into the filter plate, so that the clamps can hold down the cartridge in a perfect way. We recommend cleaning the dust filter cartridge with the MAHLE multi-jet nozzle.



3.4 NZ Dimensions

Type designation	Length L [mm]	Filter surface [m³]	Max. vol. flow * [m³/h]	Start pressure loss** [Pa]	Max. operating temperature*** [°C]
852 656 Ti ...	200	0.25	25.5	> 250	80 (standard)
852 623 Ti ...	300	0.40	41.0		
852 624 Ti ...	400	0.3/0.5	51.0		
852 625 Ti ...	600	0.8/1.0	81.0		
852 626 Ti ...	1000	1.3/1.65	130.0		

3.5 NZC Dimensions

Type designation	Length L [mm]	Filter surface [m³]	Max. vol. flow* [m³/h]	Start pressure loss** [Pa]	Max. operating temperature*** [°C]
852 763 Ti ...	200	0.25	25.5	> 250	120 (standard)
852 764 Ti ...	300	0.40	41.0		
852 765 Ti ...	400	0.50	51.0		
852 766 Ti ...	600	0.80	81.0		
852 767 Ti ...	1000	1.3/1.65	130.0		
852 633 Ti ...	1200	1.5/2.1	215.0		

Several filter media are available for filter elements (see data sheet filter media).

* Depending on the air to media ratio of 1.7 m³/m² min

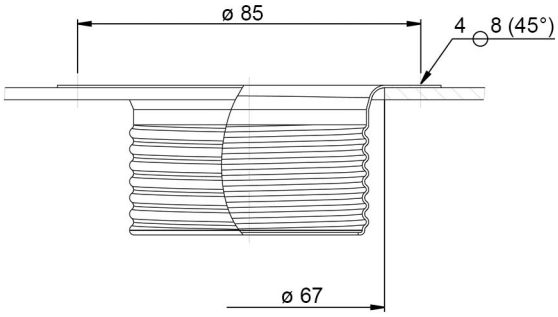
** Depending on volume flow and filter media

*** Depending on media/materials, higher temperature ranges on request

4. Installation

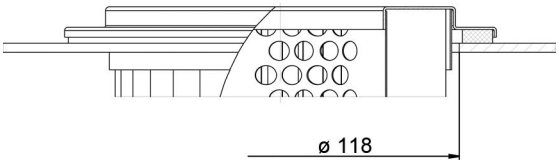
4.1 Raw gas side installation

The dust filter cartridge can be mounted on and dismantled from the filter plate using the Rd 60x4 thread adapter - no tools required (tightening torque max. 15 Nm). A hole with a diameter of 67 mm must be drilled in the filter plate in order to mount the thread adapter. The thread adapter should be spot-welded to the filter plate as shown in the drawing. Various adapters are available for installation on the cleaned side or for mating with Rd 72x5 or Rd 74x4 round threads.



4.2 Clean gas side installation

The dust filter cartridge is fastened to the filter plate on the cleaned side by use of holding down clamps. The cartridge will be put from the clean gas side through the hole in the filter plate into the raw gas side. To protect the pleats against the filter plate, there is a metal ring (approx. 16 mm high) glued into the end cap. We recommend cleaning the dust filter cartridge with the MAHLE multi-jet nozzle. Hole in the filter plate Ø 118.



5. Accessories

Order number	Designation
77834195	Thread adapter Rd 60x4 1.4571
77834187	Thread adapter Rd 60x4 evzk
79325234	Nozzle-M12 3/8 stainless steel
76360275	Nozzle-M12 3/8 Alu
79741232	MJD-12 00 ROH A1
76925655	MJD-12 00 REIN A1
70375835	MJD-12 00 ROH V2

6. Cleaning

We recommend cleaning the dust filter cartridge with the MAHLE multi-jet nozzle. The optimized geometry of the multi-jet nozzle guarantees excellent cleaning results with a significantly lower noise level. The multi-jet nozzle is available from MAHLE in aluminium or stainless steel. It can also be purchased as part of the MAHLE MJD cleaning unit, comprising the nozzle, a stirrup and various small assembly components. The stirrup maintains an optimum distance from the cartridge to ensure maximum cleaning efficiency.

7. Design

Please contact us for detailed technical information, any open questions and for general expert advice. Completion of the relevant questionnaire would facilitate in the coordination of all important parameters.
Comprehensive documentation on our product range, cleaning units and cartridges can be provided.

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70562981.05/2012

MAHLE Industry

Dust filter cartridge
120 NK

Ø 120 mm, RD72x5

1. Features

Star-pleated MAHLE dust filter cartridges are used to separate very fine particles from gases. The gas flows inward through the cartridge and is discharged via the open end cap on the top.
The conical shape is the outcome of the cartridge´s superior flow behaviour and strength. Its performance has been significantly enhanced by the improved cleaning performance and the optimised flow conditions, especially in dust removal filters with jet pulse cleaning.
Regular, extensive material and performance tests are the key to the consistently high quality of MAHLE dust cartridges. A team of dedicated engineers in our applications department and modern development laboratories constantly endeavour to mature and perfect our products. Applications tests both on the customer´s side and in our own facilities form the backbone of affortable and reliable products.

Characteristics

- Very high loading capacity
- Improved cleaning properties
- Optimised flow conditions
- High stability
- Installation on the raw gas side
- Universally suitable
- Worldwide distribution

2. Technical Data

Materials

Inner core: Galvanized steel (standard) or stainless steel V4A - AISI 316

End caps: Galvanized steel (standard) or stainless steel V4A - AISI 316

Seal: self-adhesive needle felt

Filter material: Ti 07 - Electrically conductive polyester fleece with PTFE membrane
Ti 08 - Electrically conductive polyester fleece
Ti 15 - Polyester fleece
Ti 19 - PP meltblown microfibre with support liner
Other filter materials on request

Cleaning

Nozzle: Multi-jet nozzle G3/8

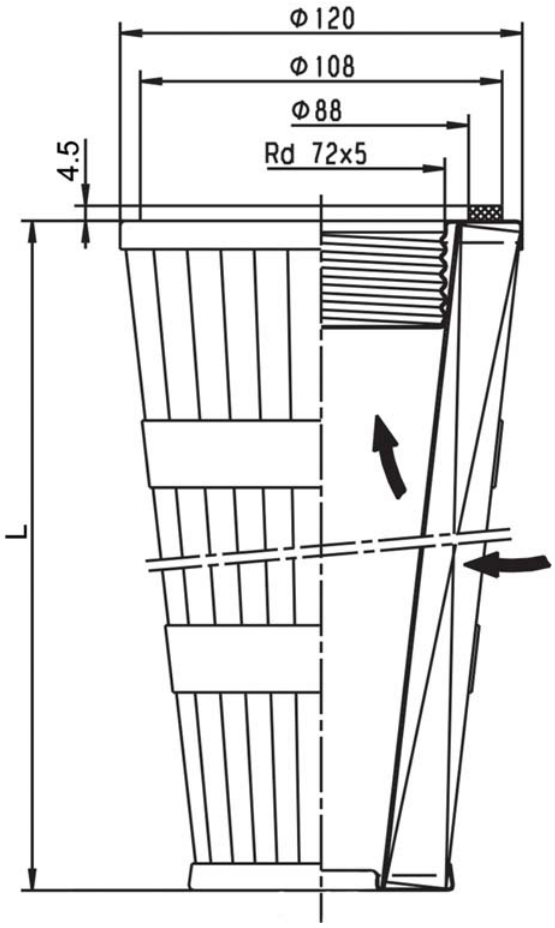
Cleaning pressure: 4 bar to 6 bar (max. 7 bar)

Differential pressure: max. 18 mbar

Compressed air consumption per cleaning pulse: 9 l (fad)

Compressed air reservoir capacity: approx. 2 l per filter cartridge

Technical data is subject to change without notice!



3. Order numbers

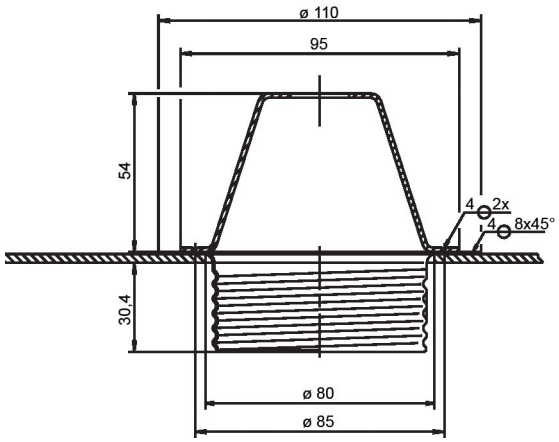
Order number	Type designation	Length L [mm]	Filter material	Filter surface [m²]	Max. vol. flow** [m³/h]	Max. operating temperature [°C]	Electr. con-ductive
76353619	852 902 Ti 07-0.5 V4A*	300	Ti 07	0,5	70	130	yes
76353510	852 902 Ti 08-0.5		Ti 08			120	
76353528	852 902 Ti 15-0.5		Ti 15				no
76930879	852 902 Ti 19-0.5		Ti 19			90	
78345811	852 903 Ti 07-1 V4A*	600	Ti 07	1	120	130	yes
78321649	852 903 Ti 08-1		Ti 08			120	
78311821	852 903 Ti 15-1		Ti 15				no
78388001	852 903 Ti 19-1		Ti 19			90	
78333320	852 904 Ti 07-1.6 V4A*	982	Ti 07	1,6	170	130	yes
78311896	852 904 Ti 08-1.6		Ti 08			120	
78311912	852 904 Ti 15-1.6		Ti 15				no
78388019	852 904 Ti 19-1.6		Ti 19			90	

* Version made of stainless steel V4A - AISI 316 or equivalent

** These values may vary depending on the nature of the dust and the composition of the gas.

4. Installation

The dust filter cartridge can be mounted on and dismantled from the filter plate using the RD72x5 thread adapter - no tools required. A hole with a diameter of 80 mm must be drilled in the filter plate in order to mount the thread adapter. The stirrup and the thread adapter should be spot-welded to the filter plate as shown in the drawing.
Various adapters are available for installation on the cleaned side or for mating with RD60x4 or RD74x4 round threads.



5. Accessories

Order number	Designation
77769201	Thread adapter RD72x5, galvanized steel
79382318	Thread adapter RD72x5, stainless steel V4A - AISI 316
79741232	VAE 12 raw gas 3/8
79325234	Nozzle-M12 3/8, stainless steel
76360275	Nozzle-M12 3/8; aluminium
78330508	Adapter RD60x4/RD72x5, galvanized steel
76315329	Adapter RD60x4/RD72x5, stainless steel V4A - AISI 316
79747148	Adapter RD73x4/RD72x5, stainless steel V4A - AISI 316
76139950	Adapter RD74x4/RD72x5, stainless steel V4A - AISI 316
78314445	Adapter cleaned gas RD72x5, galvanized steel
78314528	Adapter cleaned gas RD72x5, stainless steel V4A - AISI 316

6. Cleaning

We recommend cleaning the dust filter cartridge with the MAHLE multi-jet nozzle. The optimised geometry of the multi-jet nozzle guarantees excellent cleaning results with a significantly lower noise level.
The multi-jet nozzle is available from MAHLE in aluminium or stainless steel. It can also be puchased as part of the MAHLE VAE cleaning unit, comprising the nozzle, a stirrup and various small assembly components. The stirrup maintains an optimum distance from the cartridge to ensure maximum cleaning efficiency.

7. Design

Please contact us for detailed technical information, any open questions and for general expert advice. Completion of the relevant questionnaire would facilitate in the coordination of all important parameters.
Comprehensive documentation on our product range, cleaning units and cartridges can be provided.

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70342653.02/2012

MAHLE Industry

Dust filter cartridge
120 NZ

Ø 120 mm, RD72x5

1. Features

Star-pleated MAHLE dust filter cartridges are used to separate very fine particles from gases. The gas flows inward through the cartridge and is discharged via the open end cap on the top.
Regular, extensive material and performance tests are the key to the consistently high quality of MAHLE dust cartridges. A team of dedicated engineers in our applications department and modern development laboratories constantly endeavour to mature and perfect our products. Applications tests both on the customer´s side and in our own facilities form the backbone of affortable and reliable products.

Characteristics

- Very high loading capacity
- Improved cleaning properties
- High stability
- Installation on the raw gas side
- Universally suitable
- Worldwide distribution

2. Technical Data

Materials

Inner core: Galvanized steel (standard) or stainless steel V4A - AISI 316

End caps: Galvanized steel (standard) or stainless steel V4A - AISI 316

Seal: self-adhesive needle felt

Filter material: Ti 07 - Electrically conductive polyester fleece with PTFE membrane
Ti 08 - Electrically conductive polyester fleece
Ti 15 - Polyester fleece
Ti 19 - PP meltblown microfibre with support liner
Ti 26 - Glass fibre laminated with PET and cellulose

Cleaning

Nozzle: Multi-jet nozzle G3/8

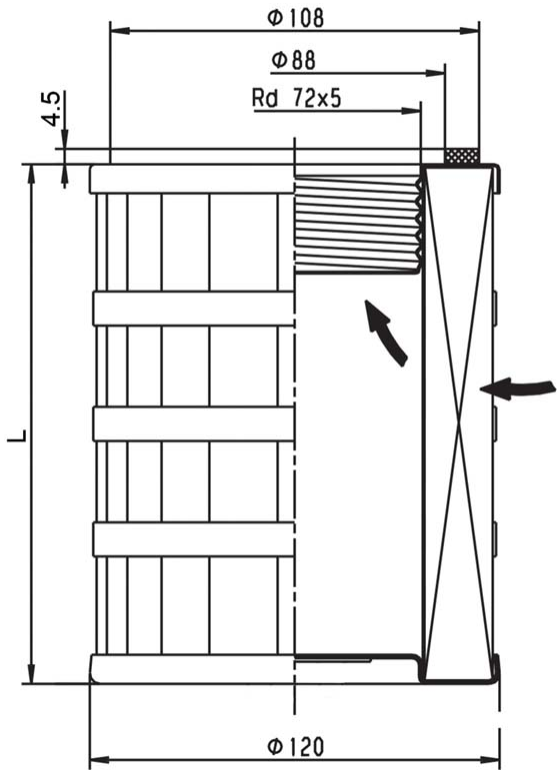
Cleaning pressure: 4 bar to 6 bar (max. 7 bar)

Differential pressure: max. 18 mbar

Compressed air consumption per cleaning pulse: 9 l (fad)

Compressed air reservoir capacity: approx. 2 l per filter cartridge

Technical data is subject to change without notice!



3. Order numbers

Order number	Type designation	Length L [mm]	Filter material	Filter surface [m²]	Max. vol. flow*** [m³/h]	Max. operating temperature [°C]	Electr. con-ductive
78334856*	852 926 Ti 07-0.3 V4A**	200	Ti 07	0.3	40	130	yes
78334864*	852 926 Ti 08-0.3		Ti 08				
78334872*	852 926 Ti 15-0.3		Ti 15				no
76362289*	852 926 Ti 19-0.3		Ti 19			90	
79356049	852 838 Ti 07-0.5 V4A**	300	Ti 07	0.5	70	130	yes
78218562	852 838 Ti 08-0.5		Ti 08				
78218547	852 838 Ti 15-0.5		Ti 15				no
78388043	852 838 Ti 19-0.5		Ti 19			90	
76305130	852 838 Ti 26-0.5		Ti 26		80		
76307136	852 838 Ti 26-0.5 V4A**		Ti 26				
78216293	852 838 Ti 19-0.8		Ti 19	0.8			

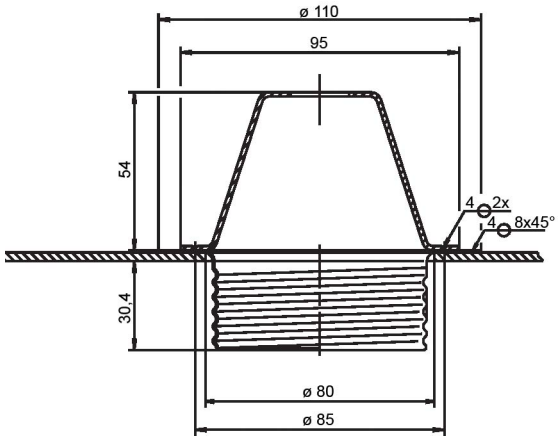
* Pack of 2

** Version made of stainless steel V4A - AISI 316 or equivalent

*** These values may vary depending on the nature of the dust and the composition of the gas.

4. Installation

The dust filter cartridge can be mounted on and dismantled from the filter plate using the RD72x5 thread adapter - no tools required.
A hole with a diameter of 80 mm must be drilled in the filter plate in order to mount the thread adapter. The stirrup and the thread adapter should be spot-welded to the filter plate as shown in the drawing.
Various adapters are available for installation on the cleaned side or for mating with RD60x4 or RD74x4 round threads.



5. Accessories

Order number	Designation
77769201	Thread adapter RD72x5, galvanized steel
79382318	Thread adapter RD72x5, stainless steel V4A - AISI 316
79741232	VAE 12 raw gas 3/8
79325234	Nozzle-M12 3/8, stainless steel
76360275	Nozzle-M12 3/8; aluminium
78330508	Adapter RD60x4/RD72x5, galvanized steel
76315329	Adapter RD60x4/RD72x5, stainless steel V4A - AISI 316
79747148	Adapter RD73x4/RD72x5, stainless steel V4A - AISI 316
76139950	Adapter RD74x4/RD72x5, stainless steel V4A - AISI 316
78314445	Adapter cleaned gas RD72x5, galvanized steel
78314528	Adapter cleaned gas RD72x5, stainless steel V4A - AISI 316

6. Cleaning

We recommend cleaning the dust filter cartridge with the MAHLE multi-jet nozzle. The optimised geometry of the multi-jet nozzle guarantees excellent cleaning results with a significantly lower noise level.
The multi-jet nozzle is available from MAHLE in aluminium or stainless steel. It can also be puchased as part of the MAHLE VAE cleaning unit, comprising the nozzle, a stirrup and various small assembly components. The stirrup maintains an optimum distance from the cartridge to ensure maximum cleaning efficiency.

7. Design

Please contact us for detailed technical information, any open questions and for general expert advice. Completion of the relevant questionnaire would facilitate in the coordination of all important parameters.
Comprehensive documentation on our product range, cleaning units and cartridges can be provided.

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70342657.05/2012

MAHLE Industry

Dust filter cartridge
120 XK

Ø 120 mm, Rd 72x5, temperature-resistant

1. Features

This high-performance dust filter cartridge was developed by MAHLE Filtersysteme for particularly challenging filtration tasks in the chemical and food industries. The conical shape is the outcome of the cartridge´s superior flow behaviour and strength. This cartridge design facilitates optimum cleaning in continuous operation in conjunction with a MAHLE cleaning unit. Typical dust deposits are virtually eliminated by completely filling the end cap on the bottom, because almost all deposits on the cartridge are drained off during cleaning. The key features here are the MAHLE VAE 12 multi-jet nozzle and pleats supported by wire mesh.
All filter materials used have undergone extensive testing.
Regular, extensive material and performance tests are the key to the consistently high quality of MAHLE dust cartridges. A team of dedicated engineers in our applications department and modern development laboratories constantly endeavour to mature and perfect our products. Applications tests on the customer´s site and in our own facilities form the backbone of affortable and reliable products.

Characteristics

- Improved cleaning properties
- Optimised flow conditions
- High stability
- Installation on the raw gas side
- Worldwide distribution

2. Technical Data

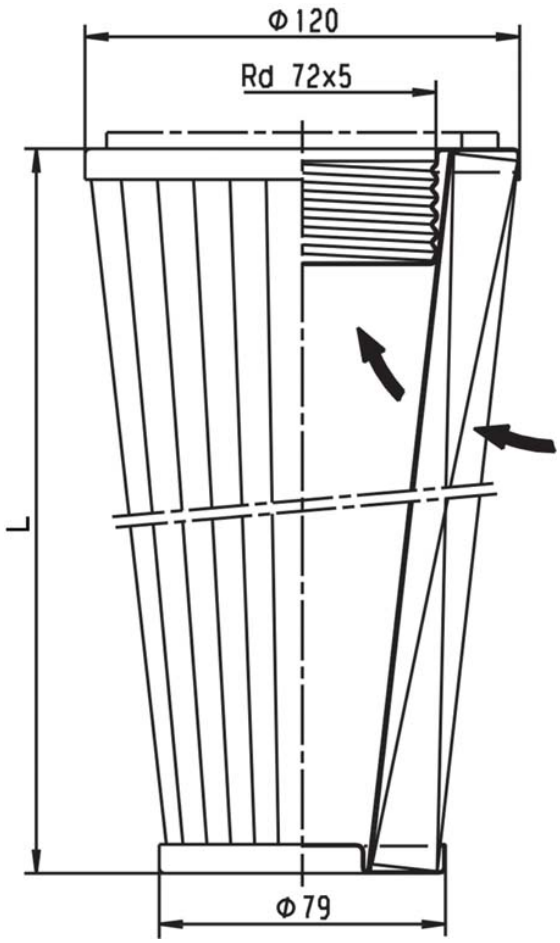
Materials

Inner core: Stainless steel V4A - 1.4316
End caps: Stainless steel V4A - 1.4316
Seal: self-adhesive needle felt* (supplied loose)
Filter material: DRG 5N - Stainless steel wire mesh
Ti 07 - Electrically conductive polyester fleece with PTFE membrane
Ti 18 - Polyphenyl sulphide with PTFE membrane and pleats supported by wire mesh
1100 µm

Cleaning

Nozzle: Multi-jet nozzle G3/8
Cleaning pressure: 3 bar to 6 bar
Differential pressure: max. 25 mbar
Compressed air consumption per cleaning pulse: 9 l (fad)
Compressed air reservoir capacity: approx. 2 l per filter cartridge

* Other sealing systems can be supplied
Technical data is subject to change without notice!



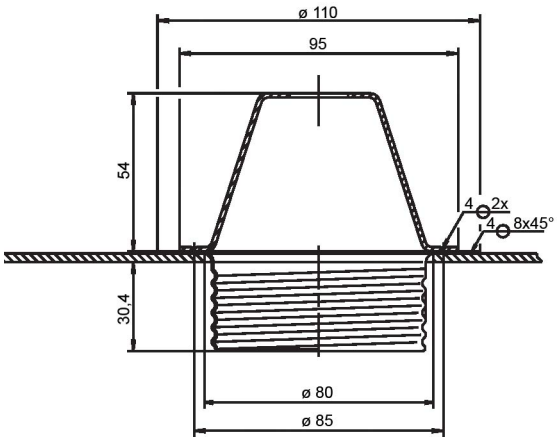
3. Order numbers

Order number	Type designation	Length L [mm]	Filter material	Filter surface [m²]	Max. vol. flow** [m³/h]	Max. operating temperature [°C]	Electr. conductive
76354922	852 902 DRG 5N-0.25 V4A FRV*	300	DRG 5N	0.25	65	130	yes
76354025	852 902 Ti 07-0.25 V4A FRV*		Ti 07				
76354633	852 902 Ti 18-0.25 V4A FRV*		Ti 18				no
79394081	852 903 DRG 5N-0.5 V4A FRV*	600	DRG 5N	0.5	100	240	yes
79748666	852 903 Ti 07-0.5 V4A FRV*		Ti 07			130	
76361984	852 903 Ti 18-0.5 V4A FRV*		Ti 18			160	no
76160311	852 904 Ti 07-0.8 V4A FRV*	982	Ti 07	0.8	150	130	yes

* Version made of stainless steel V4A - 1.4571 or equivalent with glued pleat backs
** These values may vary depending on the nature of the dust and the composition of the gas.

4. Installation

The dust filter cartridge can be mounted on and dismantled from the the filter plate using the Rd 72x5 thread adapter - no tools required. A hole with a diameter of 80 mm must be drilled in the filter plate in order to mount the thread adapter. The thread adapter should be spot-welded to the filter plate as shown in the drawing.
Various adapters are available for installation on the cleaned side or for mating with Rd 60x4 or Rd 74x4 round threads.



5. Accessories

Order number	Designation
79382318	Thread adapter Rd 72x5, stainless steel V4A - 1.4571
79325234	Nozzle-M12 3/8, stainless steel
76315329	Adapter Rd 60x4/Rd 72x5, stainless steel V4A - 1.4571
79747148	Adapter Rd 73x4/Rd 72x5, stainless steel V4A - 1.4571
76139950	Adapter Rd 74x4/Rd 72x5, stainless steel V4A - 1.4571
78314528	Adapter cleaned gas Rd 72x5, stainless steel V4A - 1.4571

6. Cleaning

We recommend cleaning the dust filter cartridge with the MAHLE multi-jet nozzle. The optimised geometry of the multi-jet nozzle guarantees excellent cleaning results with a significantly lower noise level.
The multi-jet nozzle is available from MAHLE in aluminium or stainless steel. It can also be puchased as part of the MAHLE VAE cleaning unit, comprising the nozzle, a stirrup and various small assembly components. The stirrup maintains an optimum distance from the cartridge to ensure maximum cleaning efficiency.

7. Design

Please contact us for detailed technical information, any open questions and for general expert advice. Completion of the relevant questionnaire would facilitate in the coordination of all important parameters.
Comprehensive documentation on our product range, cleaning units and cartridges can be provided.

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70342661.05/2012

MAHLE Industry

Dust filter cartridge
145/156/220/328 NKH

Ø 145/156/220/328 mm, conical with hook-shaped flange

1. Features

Star-pleated MAHLE dust filter cartridges are used to separate very fine particles from gases. The gas flows inward through the cartridge and is discharged via the open end cap on the top.
The conical shape is the outcome of the cartridge´s superior flow behaviour and strength. Its performance has been significantly enhanced by the improved cleaning performance and the optimised flow conditions, especially in dust removal filters with jet pulse cleaning. This is also supported by a special method of element pleat stabilisation.
Regular, extensive material and performance tests are the key to the consistently high quality of MAHLE dust cartridges. A team of dedicated engineers in our applications department and modern development laboratories constantly endeavour to mature and perfect our products. Applications tests both on the customer´s side and in our own facilities form the backbone of affortable and reliable products.

Characteristics

- Very high loading capacity
- Improved cleaning properties
- Optimised flow conditions
- High stability
- Installation on the raw or clean gas side
- Universally suitable
- For high volumen flow
- Optimised filter media
- Worldwide distribution

2. Technical Data

Materials

Inner core:	Galvanized steel (standard)
End caps:	Galvanized steel/aluminium (standard)
Seal:	NBR-seal fitted into notch (ø 328 NKH version glued in)
Filter material:	Ti 07 - Electrically conductive polyester fleece with PTFE membrane Ti 08 - Electrically conductive polyester fleece Ti 15 - Polyester fleece Ti 19 - PP meltblown microfibre with support liner Other filter materials on request

Cleaning

Nozzle:	ø 145/156 mm - Multi jet nozzle G3/8 ø 220 mm - Multi jet nozzle G3/4 ø 328 mm - Multi jet nozzle G1
Cleaning pressure:	4 to 6 bar (max. 7 bar)
Differential pressure:	max. 18 mbar
Compressed air consumption per cleaning pulse:	6 to 90 l (fad)
Compressed air reservoir capacity:	approx. 2 - 32 l per filter cartridge/cleaning pulse

Technical data is subject to change without notice!

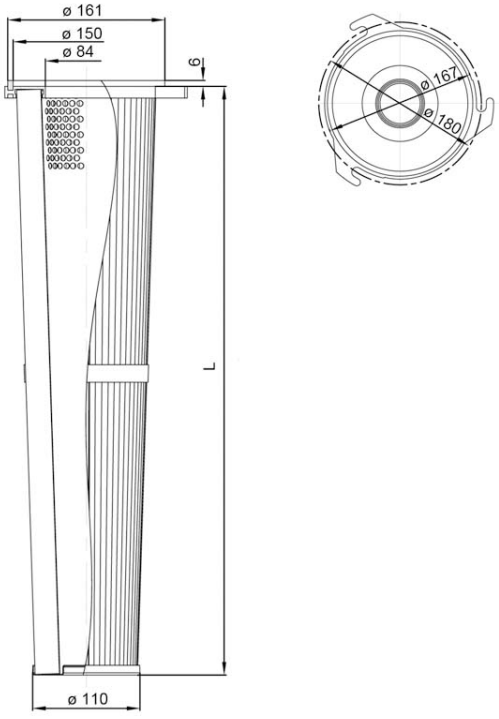
3. Type number key, description and dimensions

3.1 Type number key

Type	Series	Filter material	Filter surface	Material	Design	
852	039	Ti 07	-2.7		BAND	Example

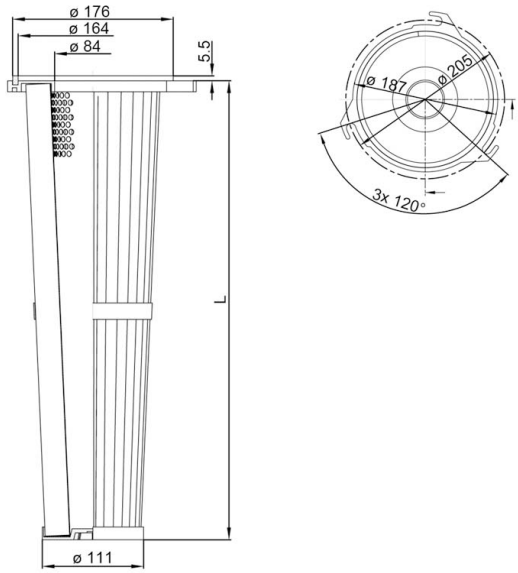
3.2 Description 145 NKH

The dust filter cartridge has a closed bottom end cap. It will be raw or clean gas side mounted with a hook-shaped flange. The filter cartridge is fixed to the filter plate via three studs. We recommend cleaning the dust filter cartridge with the MAHLE multi-jet nozzle.
Recommended hole in the filter plate for clean gas side installation 149 mm.



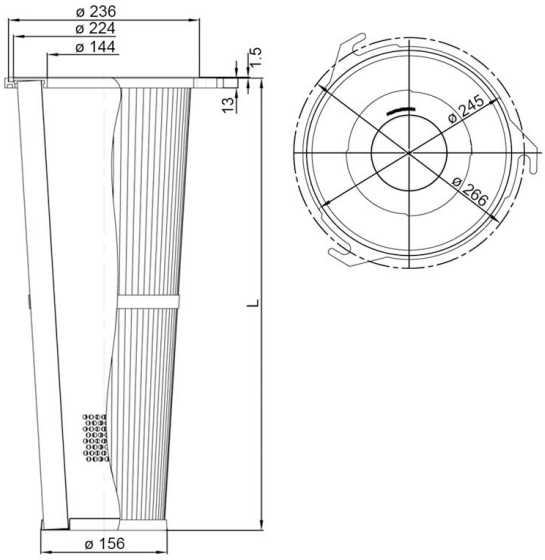
3.3 Description 156 NKH

The dust filter cartridge has a closed bottom end cap. It will be raw or clean gas side mounted with a hook-shaped flange. The filter cartridge is fixed to the filter plate via three studs. We recommend cleaning the dust filter cartridge with the MAHLE multi-jet nozzle.
Recommended hole in the filter plate for clean gas side installation 160 mm.



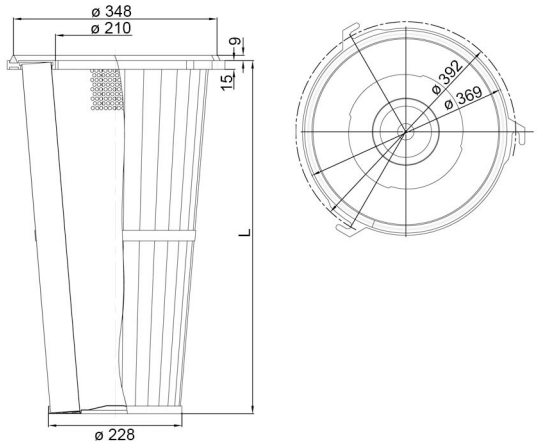
3.4 Description 220 NKH

The dust filter cartridge has a closed bottom end cap. It will be raw or clean gas side mounted with a hook-shaped flange. The cartridge is fixed to the filter plate via three studs. We recommend cleaning the dust filter cartridge with the MAHLE multi-jet nozzle.
Hole in the filter plate for clean gas side installation 225 mm.



3.5 Description 328 NKH

The dust filter cartridge has a closed bottom end cap. It will be raw or clean gas side mounted with a hook-shaped flange. The cartridge is fixed to the filter plate via three studs. We recommend cleaning the dust filter cartridge with the MAHLE multi-jet nozzle.
Hole in the filter plate for clean gas side installation 333 mm.



Several filter media are available for filter elements (see data sheet filter media).

3.6 Dimensions 145 NKH

Type designation	Length L [mm]	Filter surface [m³]	Max. vol. flow* [m³/h]	Start pressure loss** [Pa]	Max. operating temperature*** [°C]
852 082 Ti ...	600	1.6	165	> 250	80 (standard)
852 039 Ti ...	1000	2.7	275		
852 083 Ti ...	1200	3.3	340		

3.7 Dimensions 156 NKH

Type designation	Lenght L [mm]	Filter surface [m³]	Max. vol. flow* [m³/h]	Start pressure loss** [Pa]	Max. operating temperature*** [°C]
852 097 Ti ...	500	1.8	185	> 250	80 (standard)
852 090 Ti ...	600	2.2	225		
852 091 Ti ...	1000	3.6	370		
852 092 Ti ...	1200	4.3	440		

3.8 Dimensions 220 NKH

Type designation	Length L [mm]	Filter surface [m³]	Max. vol. flow* [m³/h]	Start pressure loss** [Pa]	Max. operating temperature*** [°C]
852 018 Ti ...	600	3.0/3.7	380	> 250	80 (standard)
852 056 Ti ...	1000	5.0/6.0	620		
852 093 Ti ...	1200	6.0/7.3	745		

3.9 Dimensions 328 NKH

Type designation	Lenght L [mm]	Filter surface [m³]	Max. vol. flow* [m³/h]	Start pressure loss** [Pa]	Max. operating temperature*** [°C]
852 061 Ti ...	600	7.5	765	> 250	80 (standard)
852 041 Ti ...	1000	12.5	1275		
852 051 Ti ...	1200	12/15	1530		

* Depending on the air to media ratio of 1.7 m³/m² min

** Depending on volume flow and filter media

*** Depending on media/materials, higher temperature ranges on request

4. Installation

4. 1 Raw gas side installation

Three studs with loosened nuts are welded on the filter plate. The cartridge have to be hooked onto the nuts on the raw gas side. The cartridge will be fixed to the filter plate by fastening the nuts. For deinstalling the nuts have to be loosened and the cartridge can be removed downward from the unit easily.

4. 1 Clean gas side installation

Three studs with loosened nuts are welded on the filter plate. The cartridge have to be pushed through the hole in the filter plate from the clean gas side. The cartridge will be fixed to the filter plate by fastening the nuts. For deinstalling the nuts have to be loosened and the cartridge can be removed upward from the unit easily.

5. Accessories

Order number	Designation	Cartridge ø [mm]
76360275	Nozzle-M12 3/8 Alu	145/156
70343824	Nozzle-M16 3/4 Alu Multijet	220
76381198	Nozzle-M32 1 Alu SE Multijet	328

6. Cleaning

We recommend cleaning the dust filter cartridge with the MAHLE multi-jet nozzle. The optimized geometry of the multi-jet nozzle guarantees excellent cleaning results with a significantly lower noise level. The multi-jet nozzle is available from MAHLE in aluminium or stainless steel. It can also be purchased as part of the MAHLE MJD cleaning unit, comprising the nozzle, a stirrup and various small assembly components. The stirrup maintains an optimum distance from the cartridge to ensure maximum cleaning efficiency.

7. Design

Please contact us for detailed technical information, any open questions and for general expert advice. Completion of the relevant questionnaire would facilitate in the coordination of all important parameters.
Comprehensive documentation on our product range, cleaning units and cartridges can be provided.

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70562978.05/2012

MAHLE Industry

Dust filter cartridge
145/156/220/328 NZH

Ø 145/156/220/328 mm, cylindrical with hook-shaped flange

1. Features

Star-pleated MAHLE dust filter cartridges are used to separate very fine particles from gases. The gas flows inward through the cartridge and is discharged via the open end cap on the top.
The conical shape is the outcome of the cartridge´s superior flow behaviour and strength. Its performance has been significantly enhanced by the improved cleaning performance and the optimised flow conditions, especially in dust removal filters with jet pulse cleaning. This is also supported by a special method of element pleat stabilisation.
Regular, extensive material and performance tests are the key to the consistently high quality of MAHLE dust cartridges. A team of dedicated engineers in our applications department and modern development laboratories constantly endeavour to mature and perfect our products. Applications tests both on the customer´s side and in our own facilities form the backbone of affortable and reliable products.

Characteristics

- Very high loading capacity
- Improved cleaning properties
- Optimised flow conditions
- High stability
- Installation on the raw or clean gas side
- Universally suitable
- For high volumen flow
- Optimised filter media
- Worldwide distribution

2. Technical Data

Materials

Inner core:	Galvanized steel (standard)
End caps:	Galvanized steel/aluminium (standard)
Seal:	NBR-seal fitted into notch (ø 328 NKH version glued in)
Filter material:	Ti 07 - Electrically conductive polyester fleece with PTFE membrane Ti 08 - Electrically conductive polyester fleece Ti 15 - Polyester fleece Ti 19 - PP meltblown microfibre with support liner Other filter materials on request

Cleaning

Nozzle:	ø 145/156 mm - Multi jet nozzle G3/8 ø 220 mm - Multi jet nozzle G3/4 ø 328 mm - Multi jet nozzle G1
Cleaning pressure:	4 to 6 bar (max. 7 bar)
Differential pressure:	max. 18 mbar
Compressed air consumption per cleaning pulse:	6 - 90 l (i.N.)
Compressed air reservoir capacity:	approx. 2 to 32 l per filter cartridge/cleaning pulse

Technical data is subject to change without notice!

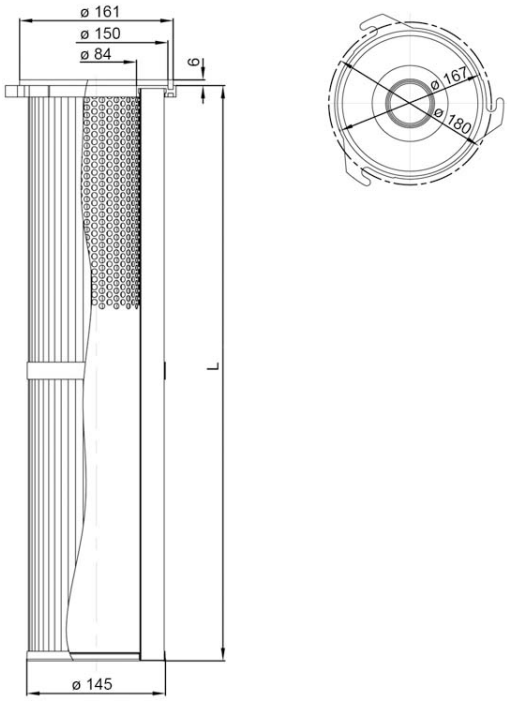
3. Type number key, description and dimensions

3.1 Type number key

Type	Series	Filter material	Filter surface	Material	Design	
852	628	Ti 07	-3.5		BAND	Example

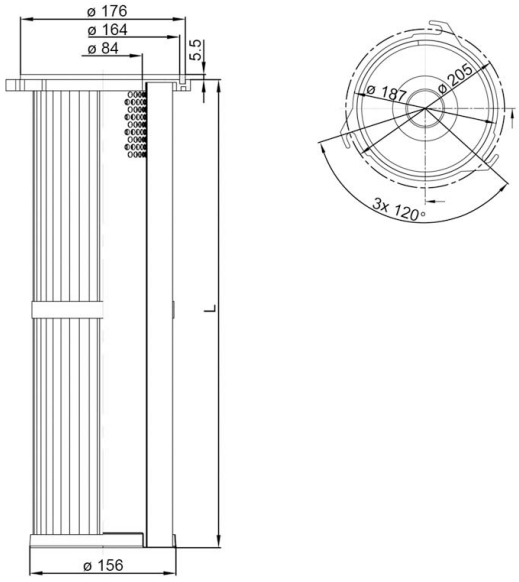
3.2 Description 145 NZH

The dust filter cartridge has a closed bottom end cap. It will be raw or clean gas side mounted with a hook-shaped flange. The filter cartridge is fixed to the filter plate via three studs. We recommend cleaning the dust filter cartridge with the MAHLE multi-jet nozzle.
Recommended hole in the filter plate for clean gas side installation 149 mm.



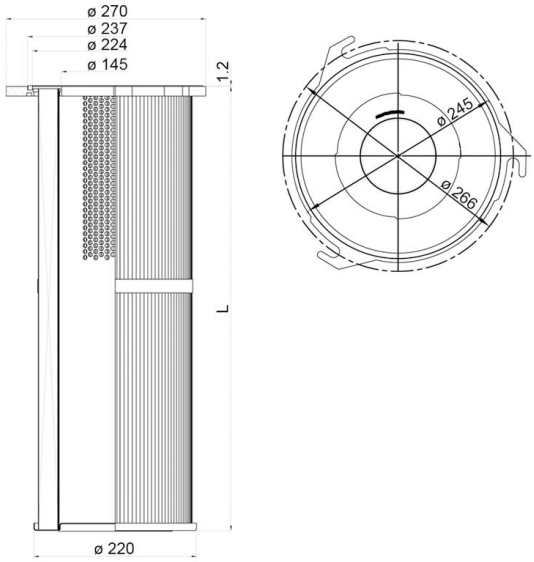
3.3 Description 156 NZH

The dust filter cartridge has a closed bottom end cap. It will be raw or clean gas side mounted with a hook-shaped flange. The filter cartridge is fixed to the filter plate via three studs. We recommend cleaning the dust filter cartridge with the MAHLE multi-jet nozzle.
Recommended hole in the filter plate for clean gas side installation 149 mm.



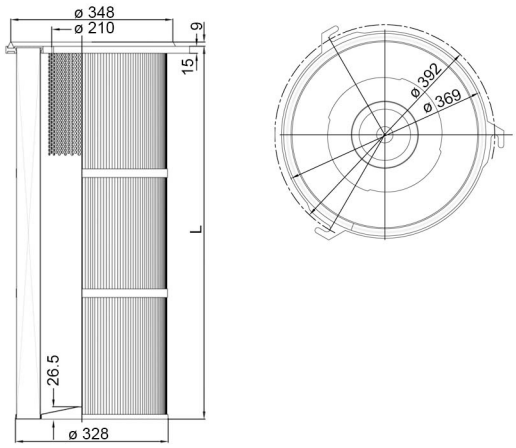
3.4 Description 220 NZH

The dust filter cartridge has a closed bottom end cap. It will be raw or clean gas side mounted with a hook-shaped flange. The cartridge is fixed to the filter plate via three studs. We recommend cleaning the dust filter cartridge with the MAHLE multi-jet nozzle.
Recommended hole in the filter plate for clean gas side installation 225 mm.



3.5 Description 328 NZH

The dust filter cartridge has a closed bottom end cap. It will be raw or clean gas side mounted with a hook-shaped flange. The cartridge is fixed to the filter plate via three studs. We recommend cleaning the dust filter cartridge with the MAHLE multi-jet nozzle.
Recommended hole in the filter plate for clean gas side installation 333 mm.



Several filter media are available for filter elements (see data sheet filter media).

3.6 Dimensions 145 NZH

Type designation	Length L [mm]	Filter surface [m³]	Max. vol. flow* [m³/h]	Start pressure loss** [Pa]	Max. operating temperature*** [°C]
852 627 Ti ...	600	1.7/2.1	215	> 250	80 (standard)
852 628 Ti ...	1000	2.7/3.5	355		
852 629 Ti ...	1200	3.3/4.3	430		

3.7 Dimensions 156 NZH

Type designation	Lenght L [mm]	Filter surface [m³]	Max. vol. flow* [m³/h]	Start pressure loss** [Pa]	Max. operating temperature*** [°C]
852 791 Ti ...	500	1,8	185	> 250	80 (standard)
852 794 Ti ...	600	2,2	225		
852 795 Ti ...	1000	3,6	370		
852 797 Ti ...	1200	4,3	440		

3.8 Dimensions 220 NKH

Type designation	Length L [mm]	Filter surface [m³]	Max. vol. flow* [m³/h]	Start pressure loss** [Pa]	Max. operating temperature*** [°C]
852 792 Ti ...	600	3.0/3.7	380	> 250	80 (standard)
852 963 Ti ...	1000	5.0/6.1	620		
852 798 Ti ...	1200	6.1/7.3	745		

* Depending on the air to media ratio of 1.7 m³/m² min
** Depending on volume flow and filter media
*** Depending on media/materials, higher temperature ranges on request

3.9 Dimensions 328 NZH

Type designation	Lenght L [mm]	Filter surface [m³]	Max. vol. flow* [m³/h]	Start pressure loss** [Pa]	Max. operating temperature*** [°C]
852 xxx Ti ...	300	3.8/5.0	510	> 250	80 (standard)
852 987 Ti ...	600	7.5/10	1020		
852 843 Ti ...	800	13	1326		
852 976 Ti ...	1000	12.5/16	1630		
852 630 Ti ...	1200	15/20	2040		

4. Installation

4. 1 Raw gas side installation

Three studs with loosened nuts are welded on the filter plate. The cartridge have to be hooked onto the nuts on the raw gas side. The cartridge will be fixed to the filter plate by fastening the nuts. For deinstalling the nuts have to be loosened and the cartridge can be removed downward from the unit easily.

4. 1 Clean gas side installation

Three studs with loosened nuts are welded on the filter plate. The cartridge have to be pushed through the hole in the filter plate from the clean gas side. The cartridge will be fixed to the filter plate by fastening the nuts. For deinstalling the nuts have to be loosened and the cartridge can be removed upward from the unit easily.

5. Accessories

Order number	Designation	Cartridge ø [mm]
76360275	Nozzle-M12 3/8 Alu	145/156
70343824	Nozzle-M16 3/4 Alu Multijet	220
76381198	Nozzle-M32 1 Alu SE Multijet	328

6. Cleaning

We recommend cleaning the dust filter cartridge with the MAHLE multi-jet nozzle. The optimized geometry of the multi-jet nozzle guarantees excellent cleaning results with a significantly lower noise level. The multi-jet nozzle is available from MAHLE in aluminium or stainless steel. It can also be purchased as part of the MAHLE MJD cleaning unit, comprising the nozzle, a stirrup and various small assembly components. The stirrup maintains an optimum distance from the cartridge to ensure maximum cleaning efficiency.

7. Design

Please contact us for detailed technical information, any open questions and for general expert advice. Completion of the relevant questionnaire would facilitate in the coordination of all important parameters.
Comprehensive documentation on our product range, cleaning units and cartridges can be provided.

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70562975.05/2012

MAHLE Industry

Dust filter cartridge
160 NK

Ø 160 mm, Type 852 054, 984 mm long

1. Features

The conical MAHLE 852 054 dust filter cartridge unites optimum flow behaviour with excellent cleaning properties for even the most problematic dusts.
The wide range of high-quality media together with our long history of experience in air cleaning technology make MAHLE a trustworthy partner for a multitude of applications.
In combination with the MAHLE VAE cleaning unit (pressure cleaning with a multi-jet nozzle), this filter cartridge provides an efficient solution in exceptionally challenging environments.

Characteristics

- High volume flows
- Optimised flow conditions
- Excellent cleaning properties
- Worldwide distribution

2. Technical data

Materials

Inner core: Galvanized steel (standard) or stainless steel V4A - 1.4571

End caps: Galvanized steel (standard) or stainless steel V4A - 1.4571

Seal: self-adhesive needle felt

Filter material: Ti 07 - Electrically conductive polyester fleece with PTFE membrane
Ti 08 - Electrically conductive polyester fleece
Ti 15 - Polyester fleece
Ti 19 - PP meltblown microfibre with support liner
Ti 56 - Polyester fleece with PTFE membrane

Cleaning

Nozzle: Multi-jet nozzle G ¾

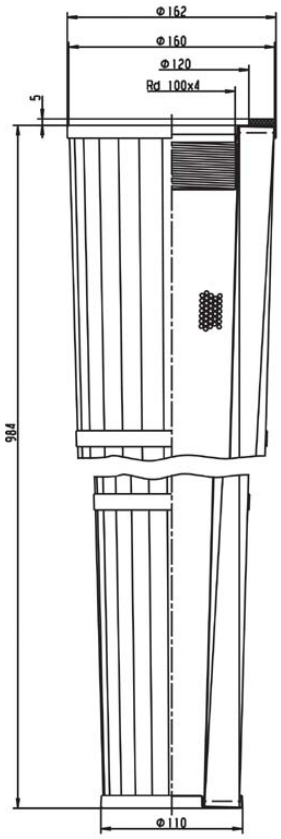
Cleaning pressure: 4 -6 bar (max. 7 bar)

Differential pressure: max. 18 mbar

Compressed air consumption per cleaning pulse: 23 l (fad)

Compressed air reservoir capacity: approx. 5 l per filter cartridge

Technical data is subject to change without notice!



3. Order numbers

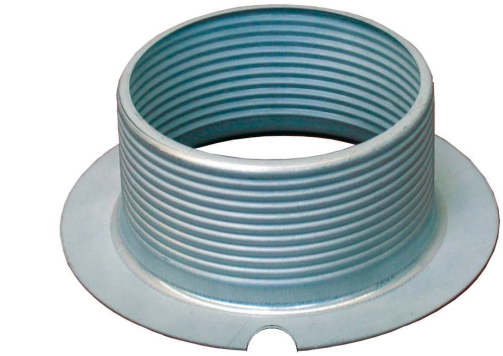
Order number	Type designation	Filter material	Filter surface [m²]	Max. vol. flow** [m³/h]	Max. operating temperature. [°C]	Electr. conductive	Comments
70328072	852 054 Ti 07-2.5	Ti 07	2.5	350	120	yes	for explosive dusts, very high separation efficieny
70328077	852 054 Ti 07-2.5 V4A*				130		for explosive dusts, very high separation efficieny, approved for FDA-applications
70328083	852 054 Ti 08-3.5	Ti 08	3.5		120		for explosive dusts
70328088	852 054 Ti 08-3.5 V4A*				130		for explosive dusts, approved for FDA-applications
70317049	852 054 Ti 15-3.5	Ti 15			120	no	Good chemical resistance, high stability
70317050	852 054 Ti 15-3.5 V4A*				130		Good chemical resistance, high stability
70328092	852 054 Ti 19-2.5	Ti 19	2.5		90		High separation efficieny, especially for fine dusts
70328094	852 054 Ti 56-2.5	Ti 56			120		High separation efficieny, suitable for fine dusts
70328096	852 054 Ti 56-2.5 V4A*				130		

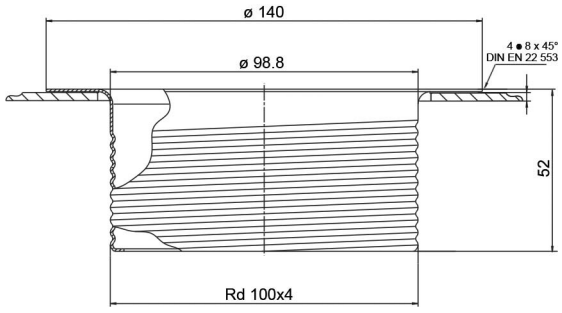
* Version made of stainless steel V4A - 1.4571 or equivalent

** These values may vary depending on the nature of the dust and the composition of the gas.

4. Installation

The 852 054 dust filter cartridge can be mounted on and dismantled from the the filter plate using the Rd100x4 mounting thread adapter - no tools required.
A hole with a diameter 108 mm must be drilled in the filter plate in order to mount the thread adapter. The mounting thread adapter should be spot-welded to the filter plate as shown in the drawing.
The Rd100x4 mounting thread adapter is available from MAHLE in galvanized steel or stainless steel V4A - 1.4571.





5. Accessories

Order number	Designation
70316990	Mounting thread adapter Rd100x4, galvanized steel
70316991	Mounting thread adapter Rd100x4, stainless steel V4A - 1.4571
70343901	VAE 16 row gas ¾
70343906	VAE 16 row gas ¾ V2A - 1.4301
76360283	Nozzle ¾ aluminium
79341447	Nozzle ¾ V4A - 1.4571

6. Cleaning

We recommend cleaning the dust filter cartridge with the MAHLE multi-jet nozzle. The optimised geometry of the multi-jet nozzle guarantees excellent cleaning results with a significantly lower noise level.
The multi-jet nozzle is available from MAHLE in aluminium or stainless steel. It can also be puchased as part of the MAHLE VAE cleaning unit, comprising the nozzle, a tripod and various small assembly components. The tripod maintains an optimum distance from the cartridge to ensure maximum cleaning efficiency.

7. Design

Please contact us for detailed technical information, any open questions and for general expert advice. Completion of the relevant questionnaire would facilitate in the coordination of all important parameters.
Comprehensive documentation on our product range, cleaning units and cartridges can be provided.

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70342665.05/2011

MAHLE Industry

Dust filter cartridge
160 NKC

Ø 160 mm, installation on cleaned side

1. Features

This MAHLE Industriefilter cartridge meets modern demands for waste reduction. Thanks to the reusable iner frame, only plastics parts that are suitable for incineration need to be exchanged if the cartridge is replaced. All metal parts can be reused again. The cartridge can optionally also be supplied with a fixed (non-reusable) inner frame. Star-pleated MAHLE dust filter cartridges are used to separate dust from gases. The cartridge is perfused from outside to inside. The retained dust is cleaned by a air jet pulse. The cartridge performance has been enhanced by the improved cleaning properties and the optimised flow conditions resulting from its conical design.
Regular, extensive material and performance tests are the key to the consistently high quality of MAHLE dust cartridges. Applications tests both on the customer´s site and in our own facilities form the backbone of affortable and reliable products. The results of these tests form the backbone of innvative products, mature production methods and unmatched operational reliability.

Characteristics

- Very high loading capacity
- High stability
- Excellent cleaning properties
- Optimised flow conditions
- Worldwide distribution

Technical Data

Materials

Inner core: Galvanized steel (standard) or stainless steel V4A - AISI 316

End caps: Galvanized steel (standard) or stainless steel V4A - AISI 316

Seal: EPDM or silicone foam

Filter material: Ti 07 - Electrically conductive polyester fleece with PTFE membrane
Ti 08 - Electrically conductive polyester fleece
Ti 15 - Polyester fleece
Ti 19 - PP meltblown microfibre with support liner
Other filter materials on request

Cleaning

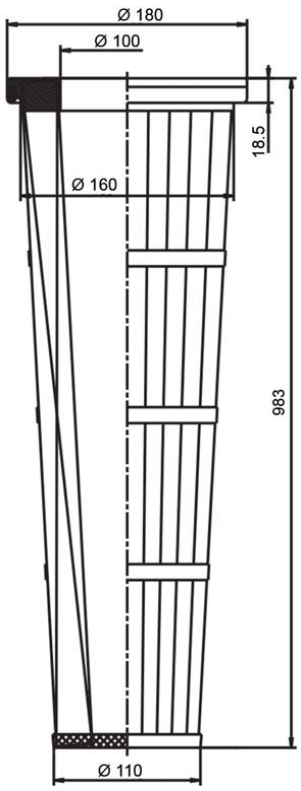
Nozzle: Multi-jet nozzle G ¾

Cleaning pressure: 4 bar to 6 bar (max. 7 bar)

Differential pressure: max. 18 mbar

Compressed air consumption per cleaning pulse: 23 l (fad)

Compressed air reservoir capacity: approx. 5 l per cartridge



Technical data is subject to change without notice!

3. Order numbers

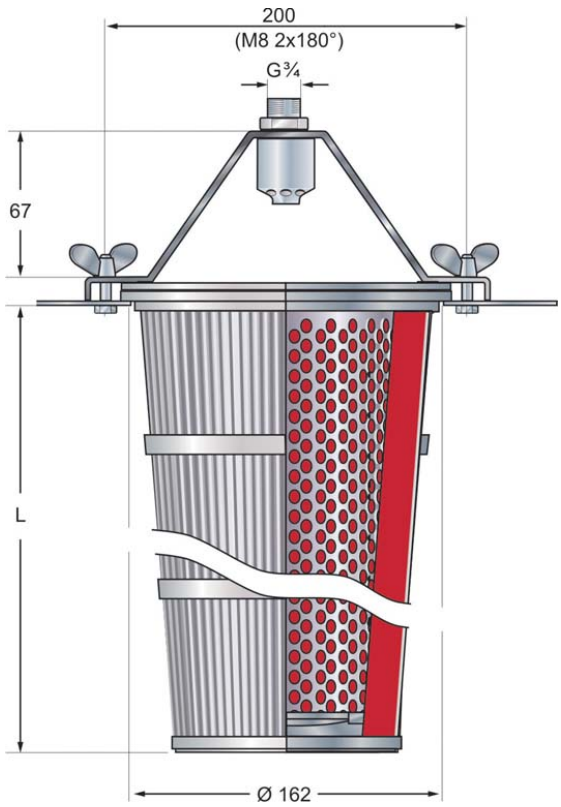
Order number	Type designation	Filter material	Filter surface [m²]	Max. vol. flow** [m³/h]	Max. operating temper-ature [°C]	Electr. con-ductive	Comments
76112031	852 953 Ti 07-2.5 V4A*	Ti 07	2.5	350	130	yes	Encapsulated inner frame
76306070	852 953 Ti 08-3.5	Ti 08	3.5		120		
76161624	852 953 Ti 15-3.5	Ti 15				no	
78386559	852 931 Ti 15-3.5				50		Reusable inner frame
79316159	852 931 Ti 19-2.5	Ti 19	2.5				

* Version made of stainless steel V4A - AISI 316 or equivalent

** These values may vary depending on the nature of the dust and the composition of the gas.

4. Installation

The dust filter cartridge is fastened to the filter plate on the cleaned side by means of retainers.
A hole with a diameter of 162 mm must be drilled in the filter plate.



5. Accessories

Order number	Designation
79741240	VAE 16, clean gas ¾
76360283	Nozzle M 16 ¾, aluminium
79341447	Nozzle M 16 ¾, V2A - AISI 304

6. Cleaning

We recommend cleaning the dust filter cartridge with the MAHLE multi-jet nozzle. The optimised geometry of the multi-jet nozzle guarantees excellent cleaning results with a significantly lower noise level.
The multi-jet nozzle is available from MAHLE in aluminium or stainless steel. It can also be puchased as part of the MAHLE VAE cleaning unit, comprising the nozzle, a stirrup and various small assembly components. The stirrup maintains an optimum distance from the cartridge to ensure maximum cleaning efficiency.

7. Design

Please contact us for detailed technical information, any open questions and for general expert advice. Completion of the relevant questionnaire would facilitate in the coordination of all important parameters.
Comprehensive documentation on our product range, cleaning units and cartridges can be provided.

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70342669.05/2012

MAHLE Industry

Dust filter cartridge
200 NZ

Ø 200 mm

1. Features

Star-pleated MAHLE dust filter cartridges are used to separate very fine particles from gases. The cartridge will be inflowed from the outside with dust loaded air or gas. The cleaned air flows inward through the open end cap to the clean side.
Regular, extensive material and performance tests are the key to the consistently high quality of MAHLE dust cartridges. A team of dedicated engineers in our applications department and modern development laboratories constantly endeavour to mature and perfect our products. Applications tests both on the customer´s side and in our own facilities form the backbone of affortable and reliable products.

Characteristics

- High loading capacity
- Improved cleaning properties
- High stability
- Installation on dirt side
- Universally suitable
- Optimised filter materials
- Worldwide distribution

2. Technical Data

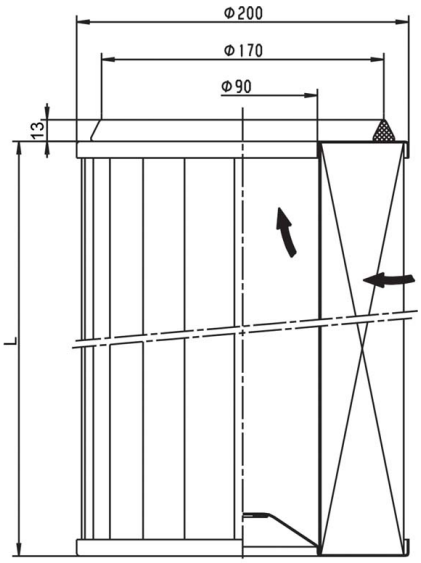
Materials

Inner core:	Galvanized steel
End caps:	Galvanized steel
Seal:	PUR soft material
Filter material:	Ti 08 - Electrically conductive polyester fleece
	Ti 15 - Polyester fleece
	Ti 26 - Glass fibre laminated with PET and cellulose
	Other filter materials on request

Cleaning

Nozzle:	Multi-jet nozzle G1
Cleaning pressure:	3 bar to 4 bar (max. 5 bar)
Differential pressure:	max. 18 mbar
Compressed air consumption:	23 l (fad) per cleaning pulse
Pressure vessel capacity:	approx. 5 l per filter cartridge

Technical data is subject to change without notice!



3. Order numbers

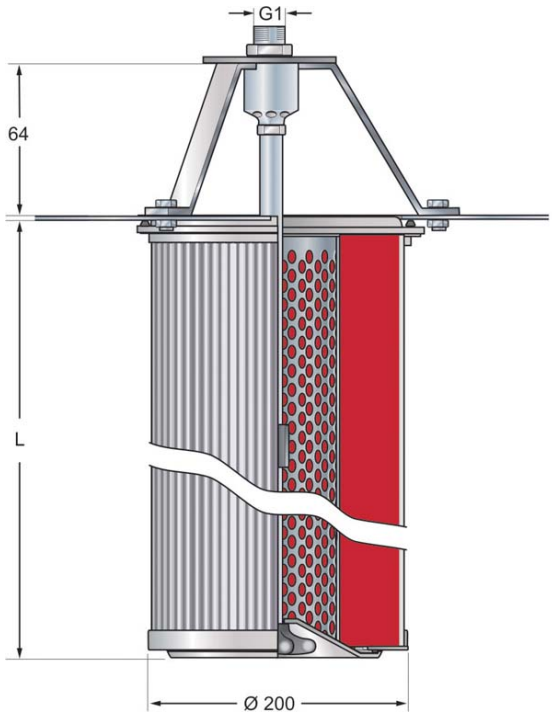
Order number	Type designation	Length L [mm]	Filter material	Filter surface [m²]	Max. volume flow* [m³/h]	Max. operating temperature [°C]	Electr. con-ductive
78330904	852 847 Ti 08-2.5	400	Ti 08	2.5	230	80	yes
78310559	852 847 Ti 15-2.5		Ti 15				no
77951262	852 847 Ti 15-5		Ti 15	5	400		
79395492	852 847 Ti 26-2.5 silicone**		Ti 26	2.5	300		

* These values may vary depending on the nature of the dust and the composition of the gas.

** Depth filter

4. Installation

The 852 847 dust filter cartridge is fastenend to the filter plate from the dirt side by means of a tie rod (tightening torque approx. 15 N m). A hole with a diameter of 88 mm must be drilled in the filter plate.



5. Accessories

Order number	Designation
76335046	Nozzle-M32 1; aluminium Multijet M 12

6. Cleaning

We recommend cleaning the dust filter cartridge with the MAHLE multi-jet nozzle. The optimised geometry of the multi-jet nozzle guarantees excellent cleaning results with a significantly lower noise level.

7. Design

Please contact us for detailed technical information, any open questions and for general expert advice. Completion of the relevant questionnaire would facilitate in the coordination of all important parameters.
Comprehensive documentation on our product range, cleaning units and cartridges can be provided.

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70342672.05/2012

MAHLE Industry

Dust filter cartridge
328 NZ/NZC/UZ/XZ

Ø 328 mm, cylindrical

1. Features

Star-pleated MAHLE dust cartridges are used to separate dust from gases. The gas flows inward through the cartridge and is discharged via the open end cap on the top. The retained dust can be cleaned off with a cleaning pulse or compressed air. Two systems multi-jet nozzle (pressure cleaning) or rotating wing (cleaning pulse) are available.
This is also supported by a special technology of element pleat stabilisation/pleat distance control (see data sheet Pleat Distance Control).
Regular and extensive performance testing of all materials used in production is the key to the consistently high quality of MAHLE dust cartridges. Additional applications tests are carried out both on the test stands in our own development laboratory and on the customer's site. The results of these tests form the backbone of innovative products, mature production methods and unmatched operational reliability.

Characteristics

- High loading capacity
- Improved cleaning properties
- Optimised flow conditions
- Defined pleat allocation for best performance
- High stability
- Installation on the raw or clean gas side
- Universally suitable
- Reliable operation
- Large filter surface
- Optimised filter materials
- High energy efficiency
- Worldwide sales

2. Technical Data

Materials

Inner core:	Galvanized steel (standard) or stainless steel V4A
End caps:	Galvanized steel (standard) or stainless steel V4A
Seal:	self adhesive needle felt alternative silicone form seal/O-Ring
Filter material:	Ti 07 - Electrically conductive polyester fleece with PTFE membrane Ti 08 - Electrically conductive polyester fleece Ti 15 - Polyester fleece Ti 19 - meltblown microfibre with support liner Ti 26 - Glass fibre other media on request

Cleaning

Cleaning unit:	Multi-jet nozzle (MJD) G1 Rotating wing (RLD)
Cleaning pressure:	MJD 6 bar (max. 7 bar) RLD 3 - 4 bar (max. 4.2 bar)
Differential pressure:	max. 18 mbar
Compressed air consumption:	MJD max. 96 l (fad) RLD max. 80 l (i.N.)
Pressure vessel capacity:	max. 32 l per filter cartridge/cleaning unit

Technical data is subject to change without notice!

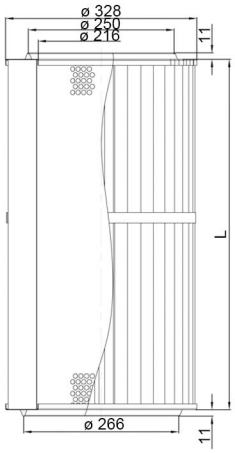
3. Type number key, description and dimensions

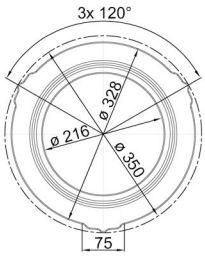
3.1 Type number key

Type	Series	Filter material	Filter surface	Material	Design	
852	781	Ti 15	-10	V4A	FDA	Example

3.2 Description 328 NZ

The dust filter cartridge has an opened bottom end cap. It will be raw or clean gas side mounted by means of a tie rod. The dust filter cartridge will be pulled against the filter plate. The upper end plate has three nibs which can lean on the filter plate mounted holding bolts when installing the cartridge We recommend cleaning the dust filter cartridge with the MAHLE multi-jet nozzle or MAHLE rotating wing.

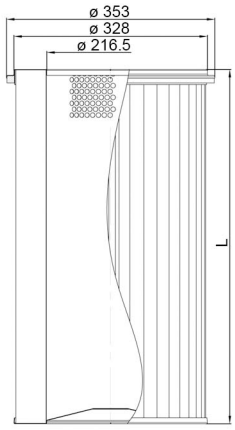




3.3 Description 328 NZC

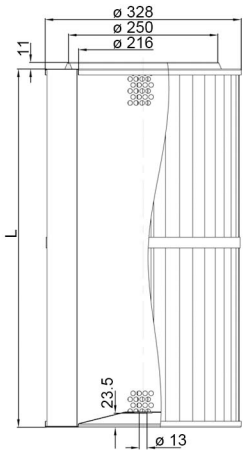
The dust filter cartridge has a closed bottom end cap. It will be raw or clean gas side mounted and fixed with holding down clamps on top of the cartridge. The cartridge have to be pushed through the hole in the filter plate from the clean gas side. To protect the pleats against the filter plate, there is a metal ring (approx. 16 mm high) glued into the end cap. We recommend cleaning the dust filter cartridge with the MAHLE multi-jet nozzle or MAHLE rotating wing.

Recommended diameter of the hole in the filter plate for clean gas side mounting is 330 mm.



3.4 Description 328 UZ

The dust filter cartridge has a closed bottom end cap with a ø 13 mm hole. The dust filter cartridges are fastened to the filter plate on the dirt side by means of a tie rod (tightening torque approx. 15 Nm). The dust filter cartridge will be fastened via a M12 star handle. We recommend cleaning the dust filter cartridge with the MAHLE multi-jet nozzle or rotatating wing.

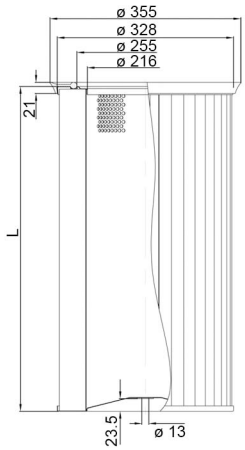


3.5 Description 328 XZ

This high-performance dust filter cartridge was developed by MAHLE Industriefiltration GmbH for particularly challenging filtration tasks in the food, pharmaceuticals and chemical industries.

This cartridge design facilitates optimum cleaning of the filter cake in conjunction with the MAHLE rotating wing. Typical dust deposits are virtually eliminated by completely filling the bottom of the end cap, because almost all deposits on the cartridge are drained off during cleaning. The key features here are the MAHLE rotating wing and the special pleats, which are supported in an innovative way. A special system with form seal is also applied. The unique design of these cartridges permits wet cleaning with the cartridge installed or removed.

The dust filter cartridge has a closed bottom end cap with a ø 13 mm hole. The dust filter cartridges are fastened to the filter plate on the dirt side by means of a tie rod (tightening torque approx. 15 Nm). The dust filter cartridge will be fastened via a M12 star handle.



Several filter media are available for filter elements (see data sheet filter media).

3.6 Dimensions 328 NZ

Type designation	Length L [mm]	Filter surface [m³]	Max. vol. flow* [m³/h]	Start pressure loss** [Pa]	Max. operating temperature*** [°C]
852 907 Ti ...	300	3.7/5	510	> 250	80 (160/240)
852 908 Ti ...	600	7.5/10/13	1000		
852 025 Ti ...	660	11/21	1200		
852 909 Ti ...	1000	8/12.5/16	1630		

3.7 Dimensions 328 NZC

Type designation	Length L [mm]	Filter surface [m³]	Max. vol. flow* [m³/h]	Start pressure loss** [Pa]	Max. operating temperature*** [°C]
852 829 Ti ...	300	3.7/5	510	> 250	80 (160/240)
852 781 Ti ...	600	7.5/10	1000		
852 943 Ti ...	1000	12.5/16	1275		

* Depending on the air to media ratio of 1.7 m³/m² min

** Depending on volume flow and filter media

*** Depending on media/materials, higher temperature ranges on request

3.8 Dimensíons 328 UZ					
Type designation	**Length L [mm]**	**Filter surface [m³]**	**Max. vol. flow* [m³/h]**	**Start pressure losst** [Pa]**	**Max. operating temperature*** [°C]**
852 826 Ti ...	300	3.7/5	510	> 250	80 (160/240)
852 782 Ti ...	600	7.5/10/13	1000		
852 020 Ti ...	660	11/21	1200		
852 876 Ti ...	1000	12.5/16	1630		
852 081 Ti ...	1200	15/20	2040		

3.9 Dimensions 328 XZ					
Type designation	**Length L [mm]**	**Filter surface [m³]**	**Max. vol. flow* [m³/h]**	**Start pressure loss** [Pa]**	**Max. operating temperature*** [°C]**
852 844 Ti ... V4A	600	3/5/10	510	> 250	80 (160/240)
852 979 Ti ... V4A	1000	12,5/8	1275		

* Depending on the air to media ratio of 1.7 m³/m² min

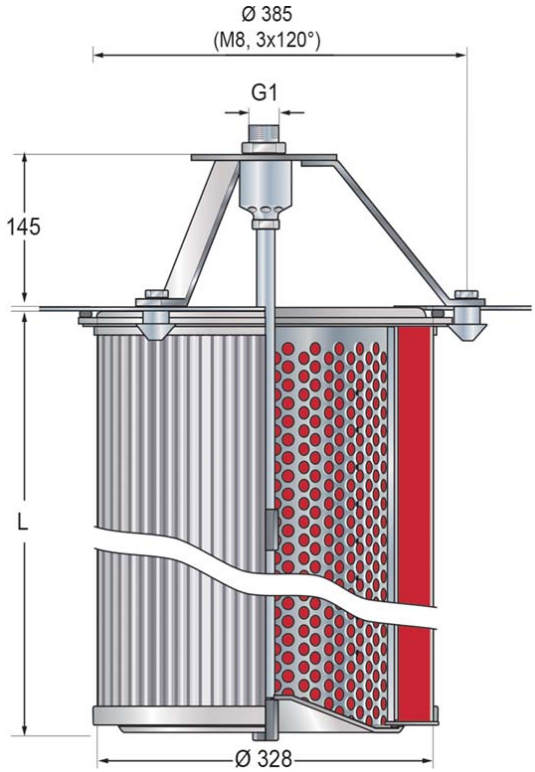
** Depending on volume flow and filter media

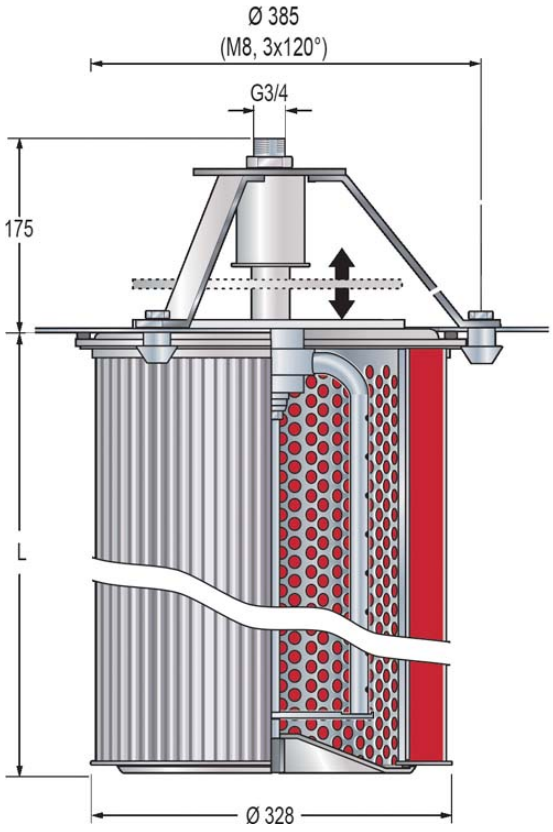
*** Depending on media/materials, higher temperature ranges on request

4. Installation

4.1 Raw gas side installation

The dust filter cartridges with diameter: 328 mm are fastened to the filter plate on the dirt side by means of a tie rod (tightening torque approx. 15 Nm). Mounting is facilitated by a centre ring.
Recommended diameter of the hole in the filter plate for raw gas side mounting is 214 mm.

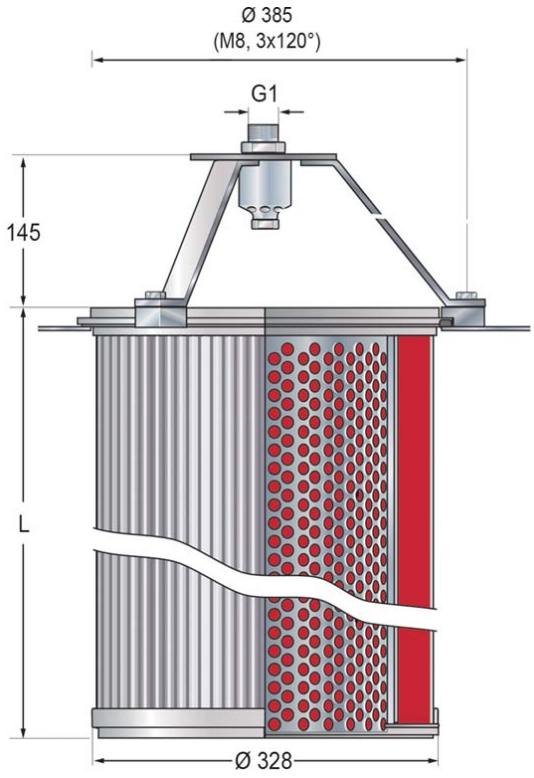


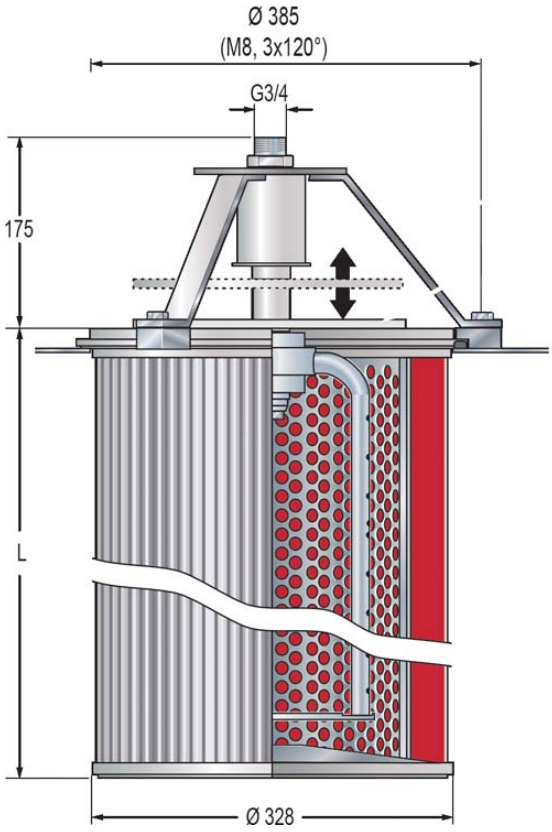


4. 2 Clean gas side installation

Filter cartridges with ø 328 are fastened to the filter plate on the cleaned side by means of retainers.

Recommended diameter of the hole in the filter plate for clean gas side mounting is 330 mm.





5. Accessories

Order number	Designation
77838568	Centre ring-EL 033, galvanized steel
77934326	Centre ring-EL 033, stainless steel V2A - AISI 304
79743709	Centre ring stainless steel V4A - AISI 316
77885031	Centre ring-2E 033 galvanized steel (2x 852 908 Ti ...)
78215220	Centre ring-2E 033 Edelstahl 1.4301 V2A (2x 852 908 Ti ...)
76161913	Reusable end cap, galvanized steel
76161921	Reusable end cap, stainless steel V4A - AISI 316
79791104	Holding bolts PA6, pack of 3
70357074	Form seal SI 355/255/21
Cleaning unit	Multi-jet nozzle MJD-32 (see data sheet MJD)
Cleaning unit	Rotating wing RLD-32 (see data sheet RLD)

6. Cleaning

Two cleaning systems are available for dust filter cartridges with a diameter of 328 mm

MAHLE multi-jet nozzle (MJD)
The optimised geometry of the multi-jet nozzle guarantees excellent cleaning results with a significantly lower noise level. The multi-jet nozzle is available from MAHLE in aluminium or stainless steel. It can also be purchased as part of the MAHLE MJD cleaning unit, comprising the nozzle, a tripod and various small assembly components. The tripod maintains an optimum distance from the cartridge to ensure maximum cleaning efficiency.

MAHLE rotating wing (RLD)
The baffle plate closes during cleaning and the rotating wing begins to turn. The large number of pulsed air jets that are discharged from the wing elements guarantee gentle, uniform cleaning over the complete cartridge length. The simultaneous vibratory movement in the pleats generates a significant improvement in cleaning efficiency, particularly with critical dusts. Each pleat is cleaned several times. The filter life is optimised as a result of the rotating wing.

7. Design

Please contact us for detailed technical information, any open questions and for general expert advice. Completion of the relevant questionnaire would facilitate in the coordination of all important parameters.
Comprehensive documentation on our product range, cleaning units and cartridges can be provided.

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MAHLE Industry

Dust filter cartridge
328 NK Quick-Lock

Ø 328 mm, fastened with spring clips

1. Features

The MAHLE Quick-Lock dust filter cartridge is designed for quick and easy mounting, with only a minimal clearance reqired for installation and dismantling. The conical shape is the outcome of the cartridge´s superior strength and flow behaviour. Its performance has been significantly enhanced by the improved cleaning power and the optimised flow conditions.

Characteristics

- High volume flows
- Optimised flow conditions
- Improved cleaning properties
- Easy mounting
- Minimal clearance required
- Worldwide distribution

2. Technical data

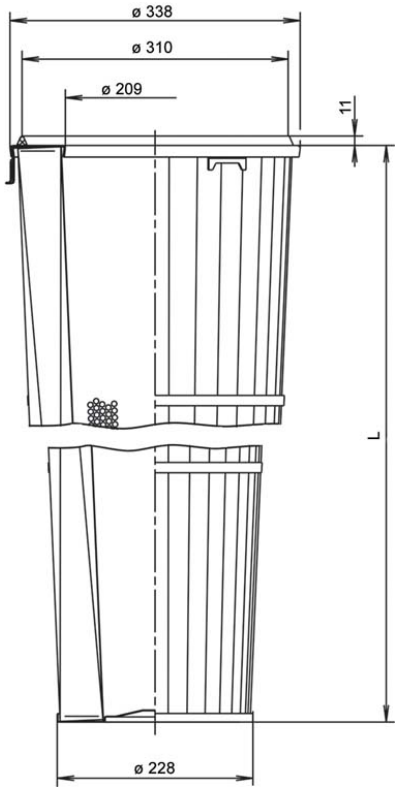
Materials

Inner core: Galvanized steel
End caps: Galvanized steel
Seal: Soft PUR material
Filter material: Ti 07 - Electrically conductive polyester fleece with PTFE membrane
Ti 08 - Electrically conductive polyester fleece
Ti 15 - Polyester fleece
Ti 19 - PP meltblown microfibre with support liner
Ti 56 - Polyester fleece with PTFE membrane

Cleaning

Nozzle: Multi-jet nozzle G1
Cleaning pressure: 4 bar - 6 bar (max. 7 bar)
Differential pressure: max. 15 mbar

Technical data is subject to change without notice!



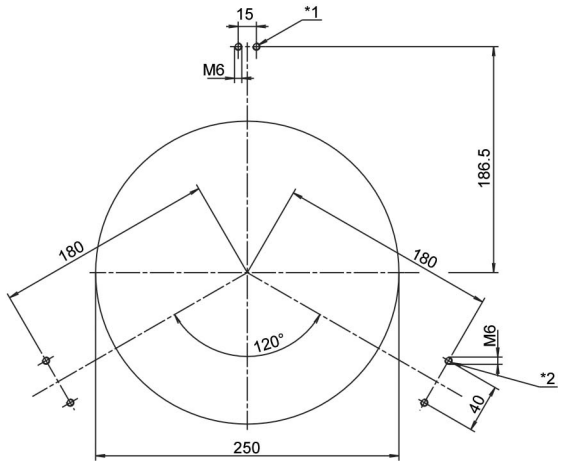
3. Order numbers

Order number	Type designation	Length L [mm]	Filter material	Filter surface [m²]	Max. vol. flow* [m³/h]	Max. operating temperature [°C]	Electr. con-ductive
70308668	852 052 Ti 07-7.5	600	Ti 07	7.5	900	50	yes
70308670	852 052 Ti 08-7.5		Ti 08		700		
70308673	852 052 Ti 15-7.5		Ti 15				no
70308678	852 052 Ti 19-7.5		Ti 19				
70308675	852 052 Ti 56-7.5		Ti 56		900		
70308725	852 062 Ti 07-12.5	985	Ti 07	12.5	1200		yes
70308729	852 062 Ti 08-12.5		Ti 08		1100		
70308734	852 062 Ti 15-12.5		Ti 15				no
70308739	852 062 Ti 19-10		Ti 19	10			
70308736	852 062 Ti 56-12.5		Ti 56	12.5	1200		
70302463	852 032 Ti 07-15	1166	Ti 07	15	1600		yes
76360564	852 032 Ti 08-15		Ti 08		1400		
70302466	852 032 Ti 15-15		Ti 15				no
70302470	852 032 Ti 19-12		Ti 19	12			
70302467	852 032 Ti 56-15		Ti 56	15	1600		

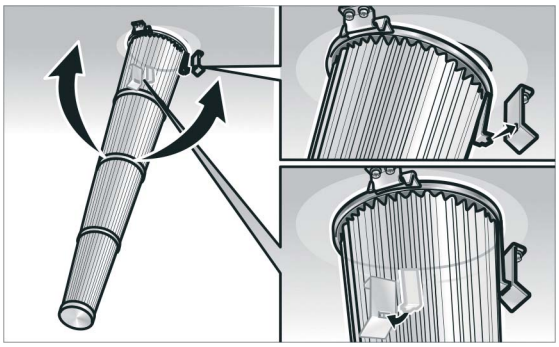
* These values may vary depending on the nature of the dust and the composition of the gas.

4. Installation

The dust filter cartridge can be installed and removed on the dirty side with spring clips (Quick-Lock system - no tools required).
The spring clips should be fastened to the filter plate as shown in the drawing.



*1 = Filter element holder
*2 = Fixing clip



5. Accessories

Order number	Designation
76956668	Quick-Lock fastening set - 1x (1 filter element holder, 2 fixing clips, screws)
76956676	Quick-Lock fastening set - 10x
70304809	MJD-32 00 ROH A1 Quick-Lock cleaning unit (Multi-jet nozzle G1, double nipple 1", tripod, screws)

6. Cleaning

We recommend cleaning the dust filter element with the MAHLE 1" multi-jet nozzle. The optimised geometry of the multi-jet nozzle guarantees excellent cleaning results with a significantly lower noise level.
The multi-jet nozzle is available from MAHLE in aluminium or stainless steel V2A - 1.4301. It can also be puchased as part of the MAHLE MJD cleaning unit, comprising the nozzle, a stirrup and various small assembly components. The stirrup maintains an optimum distance from the filter element to ensure maximum cleaning efficiency.

7. Design

Please contact us for detailed technical information, any open questions and for general expert advice. Completion of the relevant questionnaire would facilitate in the coordination of all important parameters.
Comprehensive documentation on our product range, cleaning units and cartridges can be provided.

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70342683.02/2012

MAHLE

Industry

Gas turbine dust filter cartridge
445 GK/328 GZ

Ø 445 mm, 660 mm long and Ø 328 mm, 600 or 660 mm long

1. Features

Star-pleated MAHLE dust filter cartridges will be used for air intake filtration of gas turbine systems and turbo compressors. For applications in regions with high dust loadings, e.g. deserts, a continuous cleaning with compressed air for filter cartridges is required.
In combination with the MAHLE MJD cleaning unit (pressure cleaning with a multi-jet nozzle), this filter cartridge provides an efficient solution in exceptionally challenging environments.
The filter cartridges are available in different, verified filter media. Regular, extensiv material and performance tests are the key to the consistently high quality of MAHLE dust cartridges. Application tests both on the customers side and in our facilities form the backbone of affortable and reliable products.

Characteristics

- Round shaped design
- Very high capacity
- High dust load capacity
- Optimised flow conditions
- Less differential pressure with high durability
- Maximum usable filter surface
- Optimised filter media
- Dirt side mounting
- Worldwide distribution

2. Technical Data

Material

Inner core:	Expanded sheet metal; galvanized steel
End caps:	Galvanized steel
Seal:	Soft material PUR
Filter media:	Ti 10 - Cellulose with PET fibres Ti 15 - Polyester fleece Ti 85 - Cellulose with PET fibres, M-web (PET nano fibres) Ti 201 - Polyester fleece with PET nano fibres Other filter materials on request
Weight:	approx. 18 kg

Constant pleat allocation by the use of pleat distance control

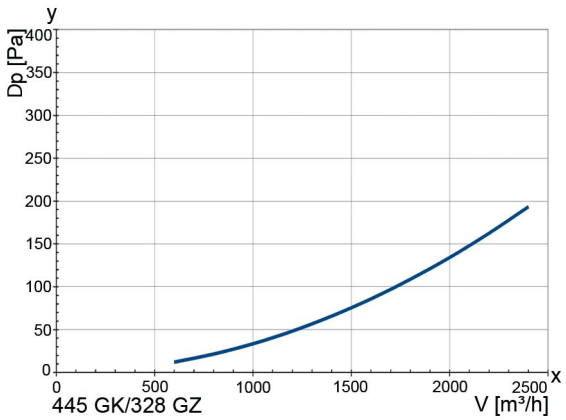
Polyester with an inside hot melt rope and ridges; cellulose with "Pleat Lock"; hot melt spiral rope on the outside of the cartridge

Cleaning

Nozzle:	Multi-jet nozzle G1
Cleaning pressure:	4 to 6 bar (max. 7 bar)
Compressed air consumption per cleaning pulse:	260 l (fad)
Compressed air reservoir capacity:	approx. 58 l per filter cartridge

Technical data is subject to change without notice!

3. Differential pressure development with new condition



4. Type number key

Type number key				
Type				
	Filter material			
		Filter surface in m²		
			Version	
			SG	Inner and outer core expanded sheet metal
			SO	Inner core perforated sheet metal, outer core expanded sheet metal
852 020	**Ti 15**	**-11**	**SO**	**Example for ordering**

6. Versions

Type	Diameter [mm]	Length [mm]	Filter media	Filter classes* EN 779	Filter surface [m²]	Max. volume flow** [m³/h]	Pressure loss in new condition [Pa]	Max. operating temperature [C°]
852 080 Ti 10-23 SO	445	660	Ti 10	F8	19.0	2900	> 250 **	80
852 908 Ti 10-19 SO	328	600			28.0			
852 080 Ti 15-14.5 SO	445	660	Ti 15	F9	10.0	2900	> 250 **	80
852 908 Ti 15-10 SO	328	600			13.5			
852 080 Ti 85-23 SO	445	660	Ti 85	F9	19.0	3100	> 250 **	80
852 908 Ti 85-19 SO	328	600			28.0			
852 080 Ti 201-14.5 SO	445	660	Ti 201	F9	19.0	3100	> 250 **	80
852 908 Ti 201-10 SO	328	600			28.0			
852 080 Ti 10-23 SO	445	660	Ti 10	F8	23.0	3000	> 250 **	80
852 020 Ti 10-21 SO	328	660			21.0			
852 080 Ti 15-14.5 SO	445	660	Ti 15	F9	14.5	3000	> 250 **	80
852 020 Ti 15-11 SO	328	660			11.0			
852 080 Ti 85-23 SO	445	660	Ti 85	F9	23.0	3200	> 250 **	80
852 020 Ti 85-21 SO	328	660			21.0			
852 080 Ti 201-14.5 SO	445	660	Ti 201	F9	14.5	3200	> 250 **	80
852 020 Ti 201-11 SO	328	660			11.0			

Other cartridges on request.

* Retention rate with new condition

** These values for double elements may vary depending on the nature of the dust and the composition of the gas.
Recommended maximum differential pressure of 800 Pa.

7. Mounting

The filter cartridges will be mounted one after another in order conical/cylindrical. The mounting is usually effected horizontal. Both cartridges, conical and cylindrical, will be pushed over a conical fixing device and tensed up. A centre ring warranteds the best and correct alignment of both cartridges.

8. Accessories

Order number	Designation
on request	Cartridge holder 1320/333 conical, horizontal (tripot)
on request	Cartridge holder 1260/333 conical, horizontal (tripot)
76161392	reusable end cap galvanized steel (wiht hole ø 16.5 mm) for cartridge 852 908 ...
76381198	Multi-jet nozzle M32 G1 Alu
77885031	Centre ring
70326304	Centre aid

8. Cleaning

We recommend cleaning the dust filter cartridge with the MAHLE multi-jet nozzle. The optimised geometry of the multi-jet nozzle guarantees excellent cleaning results with a significantly lower noise level.
The multi-jet nozzle is available from MAHLE in aluminium or stainless steel. It can also be puchased as part of the MAHLE MJD cleaning unit, comprising the nozzle, a tripod and various small assembly components. The tripod maintains an optimum distance from the cartridge to ensure maximum cleaning efficiency.

9. Design

Please contact us for detailed technical information, any open questions and for general expert advice. Completion of the relevant questionnaire would facilitate in the coordination of all important parameters.
Comprehensive documentation on our product range, cleaning units and cartridges can be provided.

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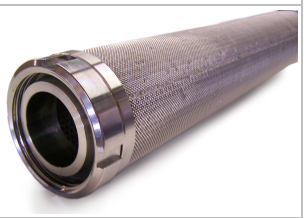
70545547.02/2012

MAHLE
Industry

Filter cartridges
Customised cartridges

MAHLE stocks a large selection of standard filter cartridges. Nevertheless, it can occasionally happen that none of the cartridges available in the marketplace are suitable for your particular dust problem. In this case, MAHLE recommends that you describe your problem with the help of a questionnaire that simultaneously allows you to configure your own personal cartridge. You can find this questionnaire under "Filter cartridges". To achieve even better results, you can also send in a dust sample to us. To do this, please contact one of the MAHLE experts whose details are given under "Other information". We invite you to take a look at a few typical customised cartridges made by MAHLE and see how they can be used.

	Customised cartridges		
	Characteristics	**Applications**	
1	Round pleated filters with special sealing compounds or metal / plastic end caps	This filter cartridge is used in industrial vacuum cleaners	
2	Flat pleated filters	This cartridge is likewise installed in a heavy-duty industrial vacuum cleaner	
3	Wire cloth filter cartridges	Used for dust collection in the conveying equipment of silo vehicles	
4	Pleated cartridges with special filter media and customised mounting systems	Pneumatic transport, dryer applications	

Please use our questionnaire to describe your application.
We look forward to preparing you an offer tailored to your individual requirements.

MAHLE Industry

Cleaning units
Overview

Two optimised cleaning units are available for star-pleated filter cartridges: the MAHLE multi-jet nozzle and the rotating wing. The unique technical details of these components are based on our many years of practical experience and extensive development testing. The cleaning units are consistent with MAHLE's proven concept of energy efficient dust collection technology. The combination of conical MAHLE cartridges and a MAHLE cleaning unit not only improves your filtration performance, it also cuts the overall costs of ownership. We invite you to take a closer look at MAHLE's gentle and energy efficient cleaning units.

	Cleaning units		
1	**Economical cleaning of all filter cartridges**	Multi-jet nozzle MJD	
2	**Gentle cleaning of cylindrical filter cartridges**	Rotating wing RLD	
3	**Gentle cleaning of conical filter cartridges**	Conical rotating wing RLK	

MAHLE Industry

Cleaning unit
MJD

for dust cartridges up to Ø 328 mm

1. Features

The MAHLE cleaning system MJD is a very cost and cleaning efficient jet pulse cleaning system for dust filter cartridges.
By a aimed air flow with the optimized multi-jet nozzle, we can reach a regular cleaning over the whole length of the cartridge.
The cleaning system is available for the different cartridge diameter in optimized sizes. Depending on the application the cleaning system (MJD) is available in aluminium/steel zinc plated, as the standard or stainless steel, as a special version.

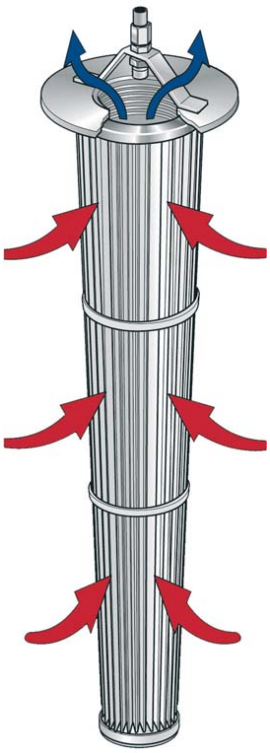
Characteristics

- Extremely effective
- Extreme energy efficiecy
- Uniform cleaning
- Optimized cleaning efficiency in the upper and bottom part of the cartridge
- Versions for both the untreated and cleaned gas sides
- Compatible to the Rotating Wing (G1 valve)
- Low noise level
- Minimal consumption of comressed air due of the optimised nozzle geometry
- Worldwide distribution

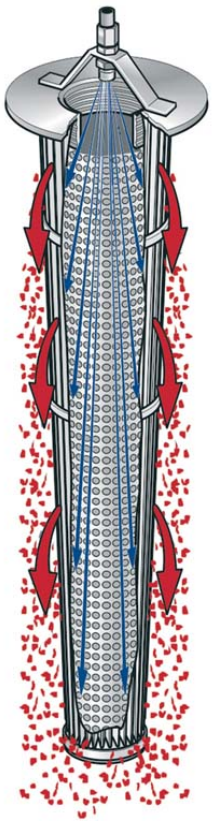
In relation with the MAHLE cartridge the multi-jet cleaning system (MJD) is providing a very efficient and economic solution for a lot of applications.
The optimized multi-jet nozzle (MJD), comparing to the conventional nozzle or jet pipe, shows huge advantages. The advantages are given in the noise reduction (up to 8 dB), energy efficiency and cleaning efficiency.
Thereby you go easy on environment and the live time of the cartridges will increase considerable.

2. Funktion

During the filtration phase dust particles are separated on the cartridge surface. A filter cake forms, which will be cleaned at a time control or differential pressure related.
At the cleaning we get a very quick expansion of the pressure vessel volume in a short time. These will reverse the flow direction and blow off the filter cake.



Filtration phase



Cleaning phase

3. Technical data

Cleaning unit for dust cartridges with an outside diameter up to 328 mm.

Standard version multi-jet nozzle

Material: Aluminium

Special version multi-jet nozzle

Material: stainless steel (1.4301)

Standard and special version

Differential pressure via filter plate: max. 15 mbar*

Cleaning medium: Oil, dust and condensate-free compressed air at operating temperature

Compressed air connection: G3/8 , G3/4, G1 male*

Compressed air: 5 bar to 6 bar (max. 7 bar)

Pulse duration: 0.1 s to 0.3 s

Compressed air consumption		
Type designation	**Capacity of pressure vessel [l]**	**Compressed air consumption per cleaning impuls [l] (fad)**
MJD-12	10	20 - 30
MJD-16	16	36 - 60
MJD-32	32	68 - 92

* Depends on cartridge geometry

Technical data is subject to change without notice!

Multi-jet nozzle during cleaning

4. Ordering example

4.1 Type number key for cleaning units

Type of cleaning

- **MJD** Multi-jet nozzle for conical and cylindrical cartridges
- **RLD** Rotating wing for cylindrical cartridges
- **RLK** Rotating wing for conical cartridges

Cartridge diameter

- **-12** 120 mm
- **-16** 160 mm
- **-32** 328 mm

Cartridge length and mode of installation

- **00** Independent of lenght, installation for example via round thread or bayonet
- **03** 300 mm, installation MJD/RLD via tie rod or RLK via Quick-Lock
- **06** 600 mm, installation MJD/RLD via tie rod or RLK via Quick-Lock
- **10** 1000 mm, installation MJD/RLD via tie rod or RLK via Quick-Lock
- **12** 1200 mm, installation MJD/RLD via tie rod or RLK via Quick-Lock

Installation side of cartridge

- **REIN** Installation on cleaned gas side
- **ROH** Installation on untreated gas side

Versions

- **A1** Nozzle aluminium or galvanized or coated steel, RLD/K with ball bearing
- **V1** Nozzle aluminium or stainless steel, RLD with plain bearing
- **V2** Stainless steel, RLD with plain bearing
- **OS** Only RLD/K with ball bearing without baffle plate, Nozzle aluminium or coated steel

MLD	**-16**	**00**	**REIN**	**A1**	**Ordering example**

4.2 Order numbers

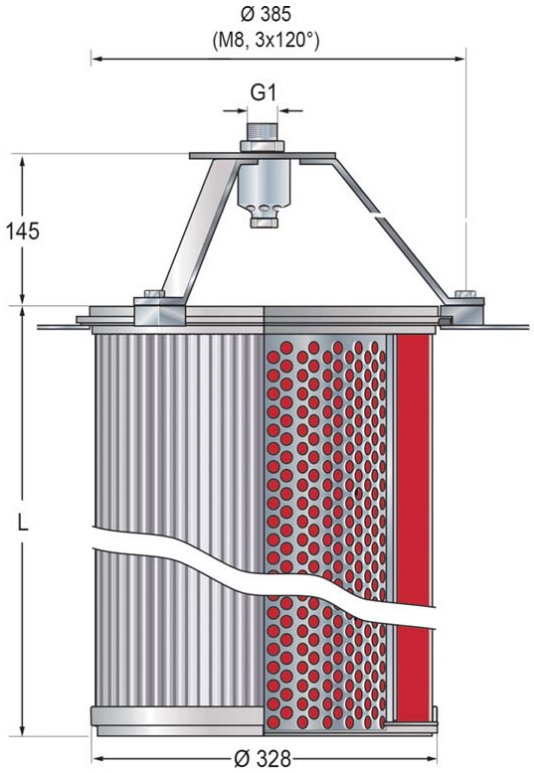
Order number	Cleaning unit	Cartridge geometry	Cartridge mounting
79741232	MJD-12 00 ROH A1 VP	up to Ø 120 mm	Untreated gas side
76925655	MJD-12 00 REIN A1 VP		Cleaned gas side
70375835	MJD-12 00 ROH V2 VP		Untreated gas side
70343901	MJD-16 00 ROH A1 VP	up to Ø 220 mm	
70343906	MJD-16 00 ROH V2 VP		
79741240	MJD-16 00 REIN A1 VP		Cleaned gas side
79356379	MJD-32 03 ROH A1 VP	Ø 328 mm	Untreated gas side
79356387	MJD-32 06 ROH A1 VP		
79356395	MJD-32 10 ROH A1 VP		
70304809	MJD-32 00 ROH A1 VP	Quick-Lock Ø 328 mm	

5. Accessories

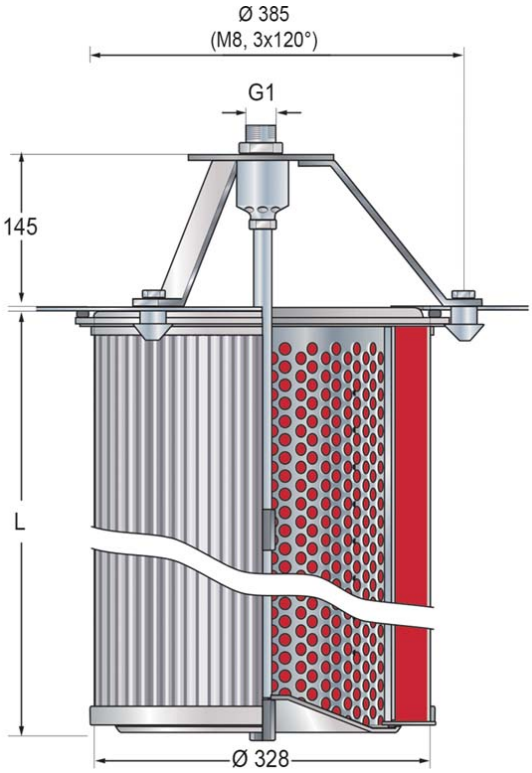
Order numbers	Designation
79791104	Holding bolts PA6, pack of 3
77838568	Centre ring EL 033, galvanized steel
77934326	Centre ring EL 033, V2A stainless steel
77885031	Centre ring 2E 033, galvanized steel
78215220	Centre ring 2E 033, V2A stainless steel
76161913	Reusable end cap, galvanized steel
76161921	Reusable end cap, V4A stainless steel

6. Installation

The multi-jet nozzle can be supplied for installation on the untreated or cleaned gas side.
A membrane valve must be provided on the pressure vessel for each cleaning unit. The cartridges are individually cleaned to ensure the least possible impairment to the volume flow and optimal cleaning results. The membrane valves can be controlled according to a time control or a differential pressure limit.



Installation on the cleaned gas side



Installation on the untreated gas side

7. Design

Please contact us for detailed technical information, any open questions and for general expert advice. Completion of the relevant questionnaire would facilitate in the coordination of all important parameters.
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MAHLE Industry

Cleaning unit
RLD

for cylindrical dust cartridges, Ø 328 mm

1. Features

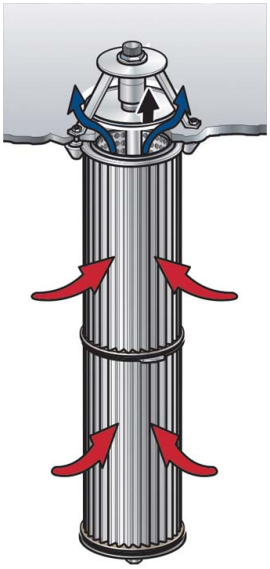
The MAHLE rotating wing is an extremely efficient cleaning system for dust collectors that enables the dust filter cake to be detached over the complete cartridge length.
Depending on the application, the MAHLE rotating wing can be supplied either in a standard steel version with a ball bearing or in a special stainless steel/aluminium version with plain bearing..
In combination with MAHLE dust cartridges, the rotating wing represents an exceptionally effective and economical solution that is suitable for a wide range of applications.

Characteristics

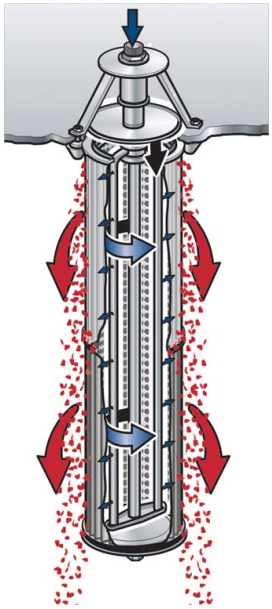
- Extremely efficient
- Uniform cleaning
- Versions for both the untreated and cleaned gas sides
- Low noise level
- Minimal consumption of comressed air
- Careful cleaning of cartridges
- Low cleaning pressure
- Suitable for high differential pressure load
- Worldwide distribution

2. Function

During the filtration phase, the baffle plate is forced upwards by the flow. Dust particles are separated on the cartridge surface and a filter cake forms.
The cleaning pulse forces the baffle plate downwards and moves the cartridge out of the filtered fluid flow. At the same time, the rotating wing element is set in motion by the nozzle holes and the filter cake is detached by the fine pulsed air jets and the simultaneous vibratory movement in the cartridge pleats.



Filtration phase



Cleaning phase

3. Technical data

Cleaning unit for dust cartridges with an outside diameter of 328 mm and an inside diameter of 216 mm.

Standard version with ball bearing

Materials: Aluminium, galvanized steel, polyester
Operating temperature: -20 °C to 100 °C

Special version with plain bearing

Materials: Aluminium, stainless steel (1.4301), PTFE (plain bearing bush), silicone, Silikon
Operating temperature: -40 °C to 200 °C

Standard and special versions

Differential pressure via filter plate: up to max. 30 mbar*
Cleaning medium: Oil, dust and condensate-free compressed air at operating temperature
Compressed air connection: G¾ male
Compressed air: 3 bar to 4 bar (max. 4.2 bar)
Pulse duration: 0.5 s to 3 s (standard 1.5 s)

Rotating wing during cleaning

Compressed air consumption		
Type designation	**Capacity of pressure vessel [l]**	**Compressed air consumption per cleaning impuls [l] (fad)**
RLD-32 03	10	Approx. 30
RLD-32 06	16	Approx. 50
RLD-32 10	32	Approx. 80
RLD-32 12	32	Approx. 90

* Depends on cartridge geometry

Technical data is subject to change without notice!

4. Ordering example

4.1 Type number key for cleaning units

Type of cleaning

- **MJD** Multi-jet nozzle for conical and cylindrical cartridges
- **RLD** Rotating wing for cylindrical cartridges
- **RLK** Rotating wing for conical cartridges

Cartridge diameter

- **-12** 120 mm
- **-16** 160 mm
- **-32** 328 mm

Cartridge length and mode of installation

- **00** Independent of lenght, installation for example via round thread or bayonet
- **03** 300 mm, installation MJD/RLD via tie rod or RLK via Quick-Lock
- **06** 600 mm, installation MJD/RLD via tie rod or RLK via Quick-Lock
- **10** 1000 mm, installation MJD/RLD via tie rod or RLK via Quick-Lock
- **12** 1200 mm, installation MJD/RLD via tie rod or RLK via Quick-Lock

Installation side of cartridge

- **REIN** Installation on cleaned gas side
- **ROH** Installation on untreated gas side

Versions

- **A1** Nozzle aluminium or galvanized or coated steel, RLD/K with ball bearing
- **V1** Nozzle aluminium or stainless steel, RLD with plain bearing
- **V2** Stainless steel, RLD with plain bearing
- **OS** Only RLD/K with ball bearing without baffle plate, Nozzle aluminium or coated steel

RLD	**-32**	**12**	**ROH**	**A1**	**Ordering example**

4.2 Order numbers

Order number*	Cleaning unit	Cartridge model designation**	Dimension L [mm]	Cartridge mounting	Comments
78296741	RLD-32 03 REIN A1	852 829 Ti...	300	Cleaned gas side	Cartridge with closed end cap
78296758	RLD-32 06 REIN A1	852 781Ti...	600		
79340480	RLD-32 10 REIN A1	852 943 Ti...	984		
78331878	RLD-32 03 ROH A1	852 826 Ti...	300	Untreated gas side	
78331852	RLD-32 06 ROH A1	852 908 Ti...	600	Untreated gas side	Cartridge with reusable end cap
78390106	RLD-32 10 ROH A1	852 909 Ti...	984		
78331696	RLD-32 12 ROH A1	852 908 Ti...	1208		

* Ball bearing version, order numbers for plain bearing version on request.

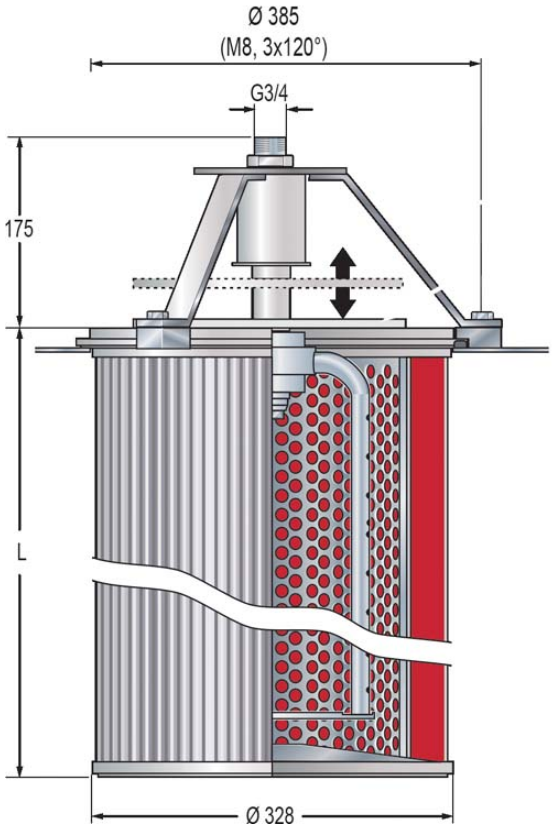
** For more information, refer to the data sheets for the 328 NZ and 328 NZC dust cartridges.

5. Accessories

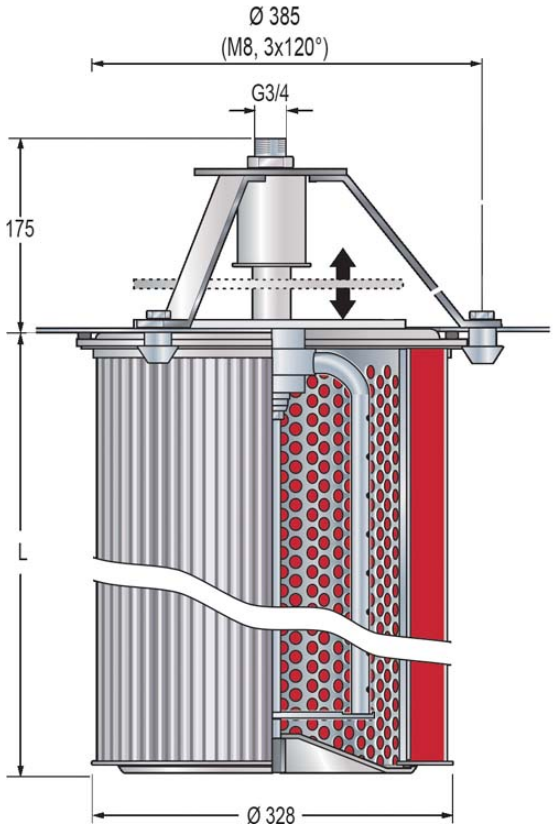
Order number	Designation
79791104	Holding bolts PA6, pack of 3
77838568	Centre ring EL 033, galvanized steel
77934326	Centre ring EL 033, V2A stainless steel
77885031	Centre ring 2E 033, galvanized steel
78215220	Centre ring 2E 033, V2A stainless steel
76161913	Reusable end cap, galvanized steel
76161921	Reusable end cap, V4A stainless steel

6. Installation

Rotating wing versions can be supplied for installation on the untreated or cleaned gas side.
A membrane valve must be provided on the pressure vessel for each cleaning unit. The cartridges are individually cleaned to ensure the least possible impairment to the volume flow and optimal cleaning results. The membrane valves can be controlled according to a preset time or a differential pressure limit.



Installation on the cleaned gas side
A hole with a diameter of 330 mm must be drilled in the filter plate.



Installation on the untreated gas side
A hole with a diameter of 210 mm must be drilled in the filter plate.

7. Design

Please contact us for detailed technical information, any open questions and for general expert advice. Completion of the relevant questionnaire would facilitate in the coordination of all important parameters.
Comprehensive documentation on our product range, cleaning units and cartridges can be provided.

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MAHLE Industry

Cleaning unit
RLK

for conical dust cartridges, Ø 328 mm

1. Features

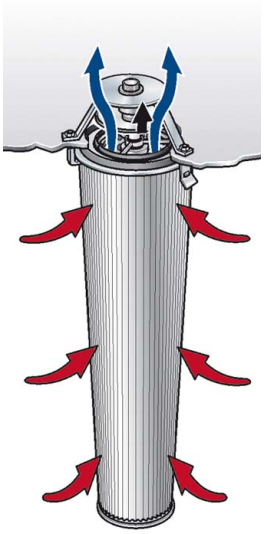
The conical MAHLE rotating wing is an extremely efficient cleaning system for dust collectors that enables the dust filter cake to be detached over the complete cartridge length. This will increase the lifetime of the filter cartridge. Based on the optimized air flow the cleaning has a very low noise level. Comparing to the multi-jet cleaning we can reduce the pressure in the pressure vessel, which gives an efficient energy operating.
In combination with MAHLE Quick-Lock dust cartridges, the rotating wing represents an exceptionally effective and economical solution which is suitable for a wide range of applications.

Characteristics

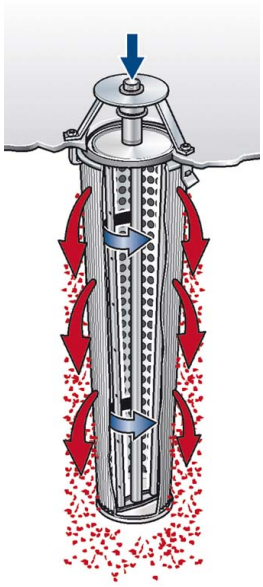
- Extremely efficient
- Uniform cleaning
- Version for the untreated gas side
- Simple installation
- Low mounting height
- Low noise level
- Minimal consumption of comressed air
- Careful cleaning of cartridges
- Low cleaning pressure
- Suitable for high differential pressure load
- Worldwide distribution

2. Function

During the filtration phase, the baffle plate is forced upwards by the flow. Dust particles are separated on the cartridge surface and a filter cake forms.
The cleaning pulse forces the baffle plate downwards and moves the cartridge out of the filtered fluid flow. At the same time, the rotating wing element is set in motion by the nozzle holes and the filter cake is detached by the fine pulsed air jets and the simultaneous vibratory movement in the cartridge pleats.



Filtration phase



Cleaning phase

3. Technical data

Cleaning unit for Quick-Lock dust cartridges with an outside diameter of 328 mm.

Materials:	Aluminium, galvanized steel, polypropylene
Operating temperature:	-20 °C to 50 °C
Differential pressure via filter plate:	max. 30 mbar
Cleaning medium:	Oil, dust and condensate-free compressed air at operating temperature
Compressed air connection:	G¾ male
Compressed air:	3 bar to 4 bar (max. 4.2 bar)
Pulse duration:	0.5 s to 3 s (standard 1.5 s)

Compressed air consumption		
Type designation	**Capacity of pressure vessel [l]**	**Compressed air consumption per cleaning impuls [l] (fad)**
RLK-3206 ROH	16	Approx. 50
RLK-3210 ROH	32	Approx. 80
RLK-3212 ROH	32	Approx. 90

Technical data is subject to change without notice!

Rotating wing during cleaning

4. Type number key and Order numbers

4.1 Type number key for cleaning units

Type of cleaning

- **MJD** Multi-jet nozzle for conical and cylindrical cartridges
- **RLD** Rotating wing for cylindrical cartridges
- **RLK** Rotating wing for conical cartridges

Cartridge diameter

- **-12** 120 mm
- **-16** 160 mm
- **-32** 328 mm

Cartridge length and mode of installation

- **00** Independent of lenght, installation for example via round thread or bayonet
- **03** 300 mm, installation MJD/RLD via tie rod or RLK via Quick-Lock
- **06** 600 mm, installation MJD/RLD via tie rod or RLK via Quick-Lock
- **10** 1000 mm, installation MJD/RLD via tie rod or RLK via Quick-Lock
- **12** 1200 mm, installation MJD/RLD via tie rod or RLK via Quick-Lock

Installation side of cartridge

- **REIN** Installation on cleaned gas side
- **ROH** Installation on untreated gas side

Versions

- **A1** Nozzle aluminium or galvanized or coated steel, RLD/K with ball bearing
- **V1** Nozzle aluminium or stainless steel, RLD with plain bearing
- **V2** Stainless steel, RLD with plain bearing
- **OS** Only RLD/K with ball bearing without baffle plate, Nozzle aluminium or coated steel

RLK	**-32**	**12**	**ROH**	**A1**	**Ordering example**

4.2 Order numbers

Order number	Cleaning unit	Cartridge model designation*	Dimension L [mm]	Cartridge mounting
70363715	RLK-32 06 ROH A1	852 052 Ti ...	600	Untreated gas side
70368951	RLK-32 10 ROH A1	852 062 Ti ...	1000	
70327511	RLK-32 12 ROH A1	852 032 Ti ...	1200	

* For more information, refer to the data sheets for the 328 NK Quick-Lock.

5. Accessories

Order number	Designation
76956668	Fixing kit Quick-Lock (1 cartridge holder, 2 fixing clips, screws)
76956676	Fixing kit Quick-Lock, pack of 10

6. Installation

The conical rotating wing can be installed and removed with the cartridge on the untreated gas side with spring clips (Quick-Lock system - no tools required). The filter plate is to prepare according Fig. 1. Afterwards the tripod with the baffle plate and the fixing kit is to mount on the filterplate. Insert the rotating wing into the cartridge (Fig. 2) and fix the centre ring (Fig. 3). Put the cartridge into the cartridge holder (Fig. 4) and snap it into the fixing clips (Fig. 5).

*1 = Cartridge holder
*2 = Fixing clip

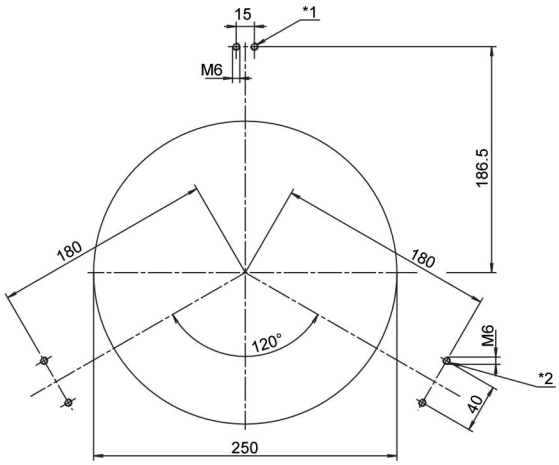


Fig. 1

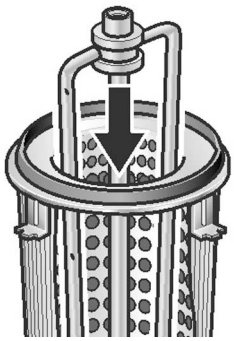


Fig. 2

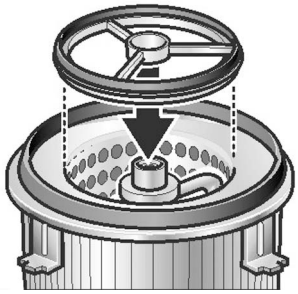


Fig. 3

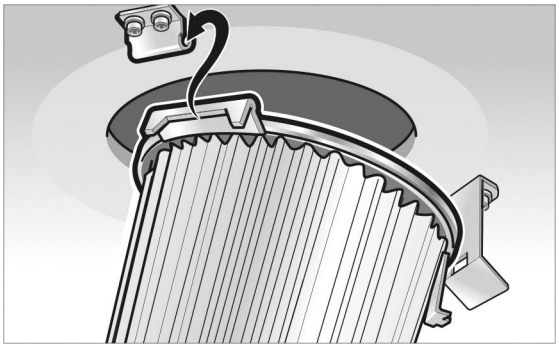


Fig. 4

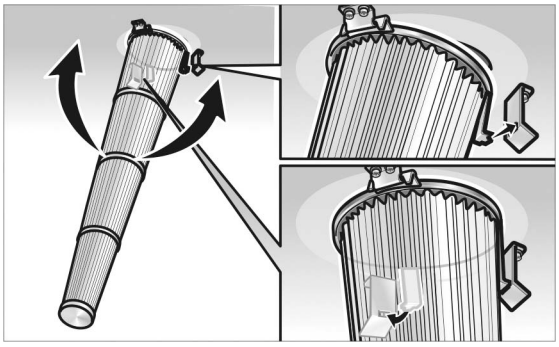


Fig. 5

7. Design

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Comprehensive documentation on our product range, cleaning units and cartridges can be provided.

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MAHLE
Industry

Cleaning systems
MJD, RLD, RLK

1. Features

With MAHLE cleaning systems we developed a product, characterized by highly efficient cleaning. Additionally the system stands out due to remarkably low operating costs and a minimum amount of maintenance.

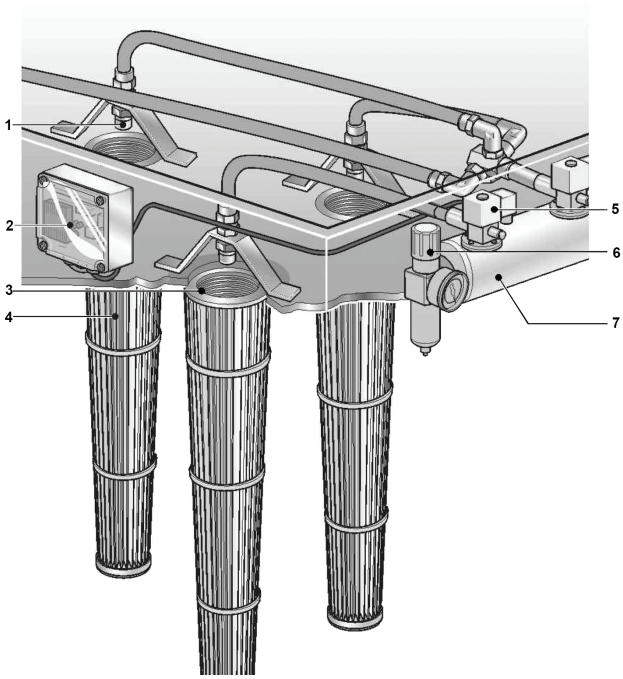
The compact systems are suited for the installation in various dust collectors. Specially developed conical filter cartridges grant an excellent air flow within the filter section. This enables long durability of the cartridges. In addition, an efficient and moderate cleaning contributes to an extended lifetime of the cartridges. The differential pressure control allows ideal cleaning properties and guarantees an operation of the system without any breakdowns.

Regular, extensive material and performance tests are the key to the consistently high quality of MAHLE dust cartridges. A team of dedicated engineers in our applications department and modern development laboratories constantly endeavor to mature and perfect our products. Applications tests both on the customer's side and in our own facilities form the backbone of affordable and reliable products.

Characteristics

- High effectiveness and energy efficiency
- Economic solution through conical filter cartridges
- Gentle and improved cleaning for long filter durability and low operating costs
- Easy to maintain
- Compact and complete system
- Reduced noise level
- Optimized flow conditions

2. Types



1 **Cleaning**
Multi-jet nozzle MJD or rotating wing RLD or RLK

2 **Control**
Time controlled cleaning MFS-05
Differential pressure controlled cleaning MFS-05dp

3 **Installation**
Clean and dirt air side mounting with different fixing devices

4 **Filter cartridges**
Conical cartridges in different dimensions

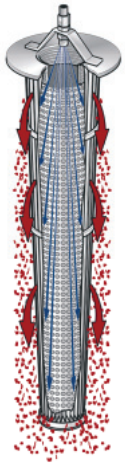
5 **Magnetic valve**

6 **Maintenance unit**
Pressure reducer with manometer

7 **Pressure vessel**
Volume from 2 l to 32 l

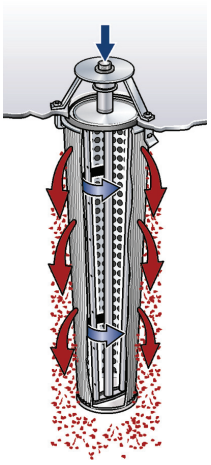
3. Cleaning

Multi-jet nozzle



The optimized multi-jet nozzle grants a highly efficient cleaning with little air consumption.

Rotating wing



With the rotation wing a gentle cleaning is possible, which extends the life of the filter cartridges remarkably.

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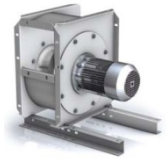
03/2011

Equipment technology
Overview

Equipment technology rounds off the MAHLE product range. MAHLE dust collectors are used in almost every branch of industry. They are offered in manifold variants that comply with tomorrow's standards and regulations today. MAHLE can supply flanged body-type filters, round or rectangular devices and oil mist collectors that can also be specially tailored to each customer's requirements, depending on the application. We invite you to take a closer look at MAHLE's equipment technology or use the questionnaire to enquire about a solution that meets your individual specification.

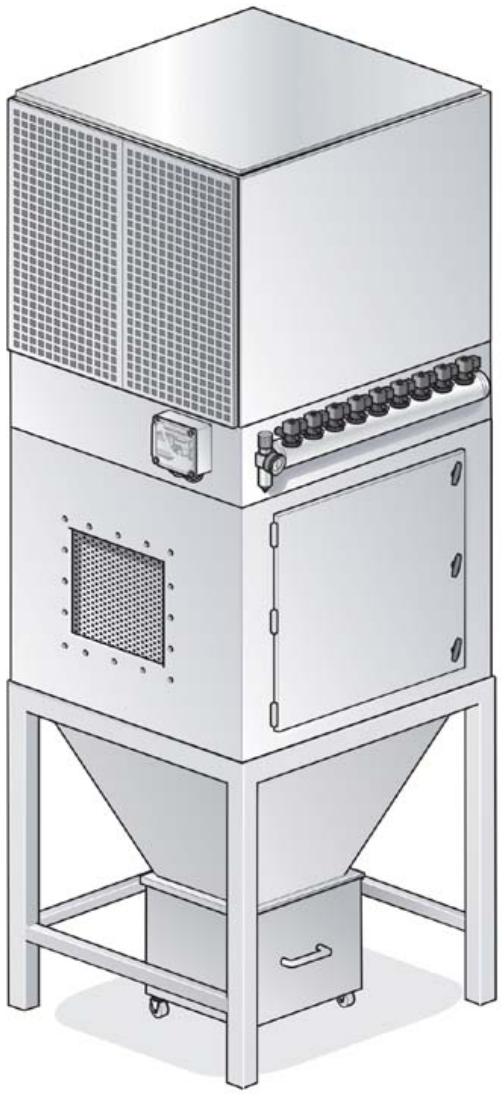
	Equipment technology		
1	**Model code**	Used to identify a particular dust collector	
2	**Overview of assemblies of rectangular devices**	All our rectangular devices at a glance	
3	**Overview of fans**	All our fans at a glance	
4	**ATEX-compliant dust collectors**	More information about MAHLE's explosion-proof dust collectors	
5	**Questionnaire**	Configure your own dust collector	

MAHLE
Industry

Dust Collectors
Model code

1. Features

MAHLE dust collectors are characterized through the features, compact design, minimum energy consumption, long service life of the cartridges and a low nice level. The dust collector must not take a large space, especially at indoor assembly. Due to the use of star pleated cartridges we can fit a large filter area in a small room. For to increase the flow behaviour and with it the capability, MAHLE has also designed the conical cartridge.



2. Model code

Model code dust collectors with selection example

Collector 1. + 2. item

SF	collector with air pressure cleaning
AF	not cleanable collector
RF	collector with vibration motor
NF	collector with air pressure cleaning + secure filter stage

Collector 3. item

K	with conical cartridges
R	with rotating wing
.	with cylindrical cartridges
I	industrial vacuum cleaner

Cartridge type

XX details see model code for cartridge types and mounting position

Number of cartridges

XXX number of mounted cartridges

Dimensions

XXXxXX	rectangular collector (length x width in dm)
DN-XXX	circular collector (nominal diameter in cm)

Design 1. + 2. item type

S1	collector with bin
S2	collector with bag
S3	collector with drawer
S5	bag emptying device
S6	product filter with cone
S7	product filter with wide cone
S.	filter with bottom
A.	flanged body type filter
E.	in take filter

Design 3. item additional options

.	without options
V	fan
S	fan with silencer
W	with cap

Housing material

V2	stainless steel V2A (AISI 304)
V4	stainless steel V4A (AISI 316)
VS	stainless steel special
AL	aluminium
SO	special

S1	steel sheet RAL 7035
S2	steel sheet RAL 7032
SL	steel sheet special colour
SZ	steel sheet zinc plated

Fans

XX	standard fans (see fan list, no. 00-99)
..	without fan
SO	special

Variations 1. item

S	standard design
K	customer design according to drawing
X	special design according to drawing (no. 0-9)

Variations 2. item

D	pressure resistant housing (p < -0.4 bar, p > 1 bar)
B	with pressure relief (pressure burst resistant)
T	pressure burst resistant housing
A	basic design according ATEX RL 94/9/EC
E	with earthing/elektrostatic discharging
Z	with cleaning controller
.	without cleaning controller/without variation type designation

Cartridge

***EXXXXXXXX** cartridge 1. filter stage

SFK	**-02**	**015**	**DN-071**	**S1V**	**S1**	**41**	**S**	**Z**	***E78345811**	**(example circular collector)**
SFR	**-08**	**018**	**016x16**	**S3S**	**S1**	**76**	**K**	**E**	***E79355447**	**(example rectangular collector)**

reserved for MAHLE designation | **from here available for customer design**

3. Model code for cartridges and mounting position

Cartridge type and mounting position							
Code	**Cartridge type**	**Cartridge diameter**	**Cartridge length**	**Alternate**	**Mounting position**	**Mounting**	**Comment**
xx	designation unknown - product in project stage						
00	other cartridge types				vertical	dirt section	
01	852 902	120	300	852 838	vertical	dirt section	RD72x5
02	852 903		600				
03	852 904		1000				
04	852 907	328	300		vertical	dirt section	tie rod, RLD
05	852 908		600	852 782, 852 844			
06	852 909		1000				
07	852 030	328	1000	852 958	vertical	dirt section	bayonet
08	2 x 852 908	328	1200	852 758, 852 782	vertical	dirt section	tie rod, RLD
09	852 032	328					Quick-Lock
10	852 073	160	600		vertical	dirt section	RD100x4
11	852 054		1000				
12	852 052	328	600		vertical	dirt section	Quick-Lock
13	852 062		1000				
20	other cartridge types				vertical	clean section	
21	852 829	328	300		vertical	clean section	
22	852 781		600				
23	852 943		983				
24					vertical	clean section	
25	852 903	120	600		vertical	clean section	with adapter
26	852 904		982				
27	852 931	160	1000	852 953	vertical	clean section	
30						dirt section	with adapter
50	other cartridge types				horizontal	dirt section	
51	852 902	120	300	852 838	horizontal	dirt section	RD72x5
52	852 903		600				
53	852 904		1000				
54	852 073	160	600		horizontal	dirt section	RD100x4
55	852 054		1000				
61	852 907	328	300		horizontal	dirt section	tie rod
62	852 908		600				
63	852 909		1000				
64							
65	2 x 852 908	328	1200		horizontal	dirt section	tripot
70	other cartridge types				horizontal	clean section	
99	other variations						

4. Additional to the model code for dust collectors

Variations 1. item "X"

No. 1
with intermediate flanged filter plate
with intermediate flanged fan plate
fan silencer has the same area as the collector
exceptional at collectors with 4 cartridges, here the silencer is bigger
inlet connection is concentrical in the height
size of inlet connection adjustable with flat adapter plate
big metal sheet panels partly with welded reinforcements

No. 2
pressure resistant up to -56 mbar
with intermediate flanged filter plate
with intermediate flanged fan plate
fan silencer has the same area as the collector
exceptional at collectors with 4 cartridges, here the silencer is bigger
inlet connection is concentrical in the height
size of inlet connection adjustable with flat adapter plate
big metal sheet panels partly with welded reinforcements

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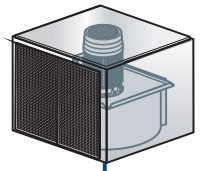
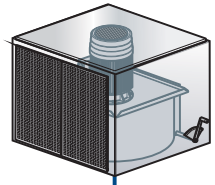
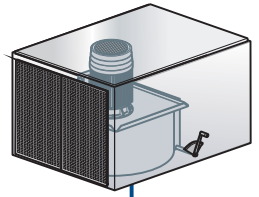
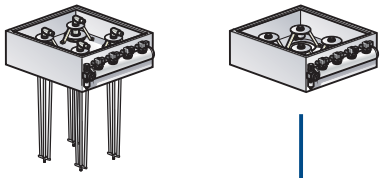
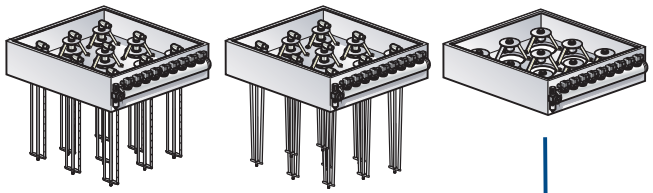
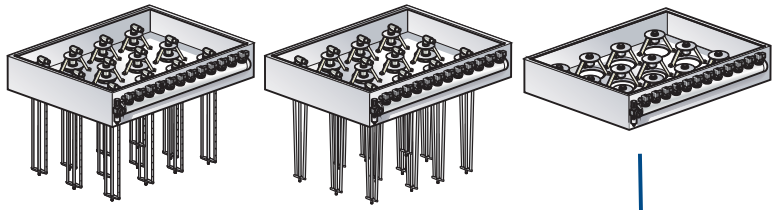
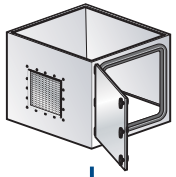
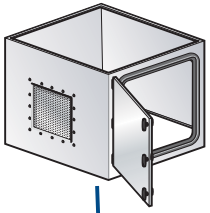
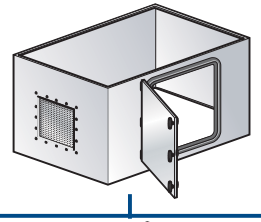
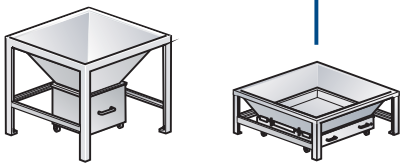
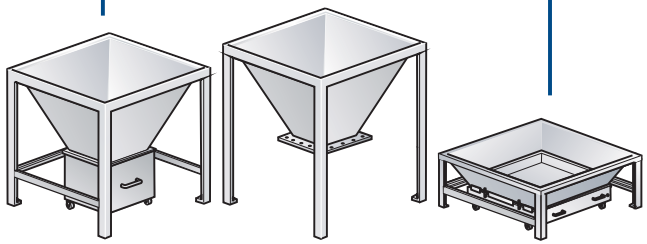
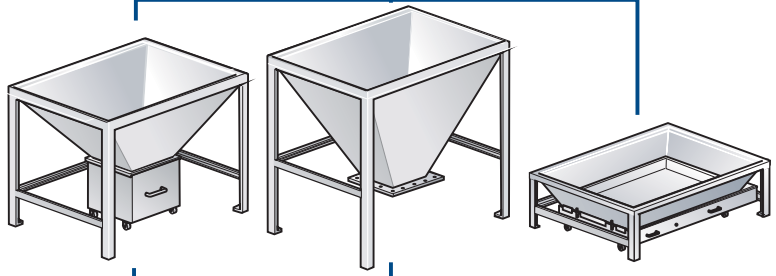
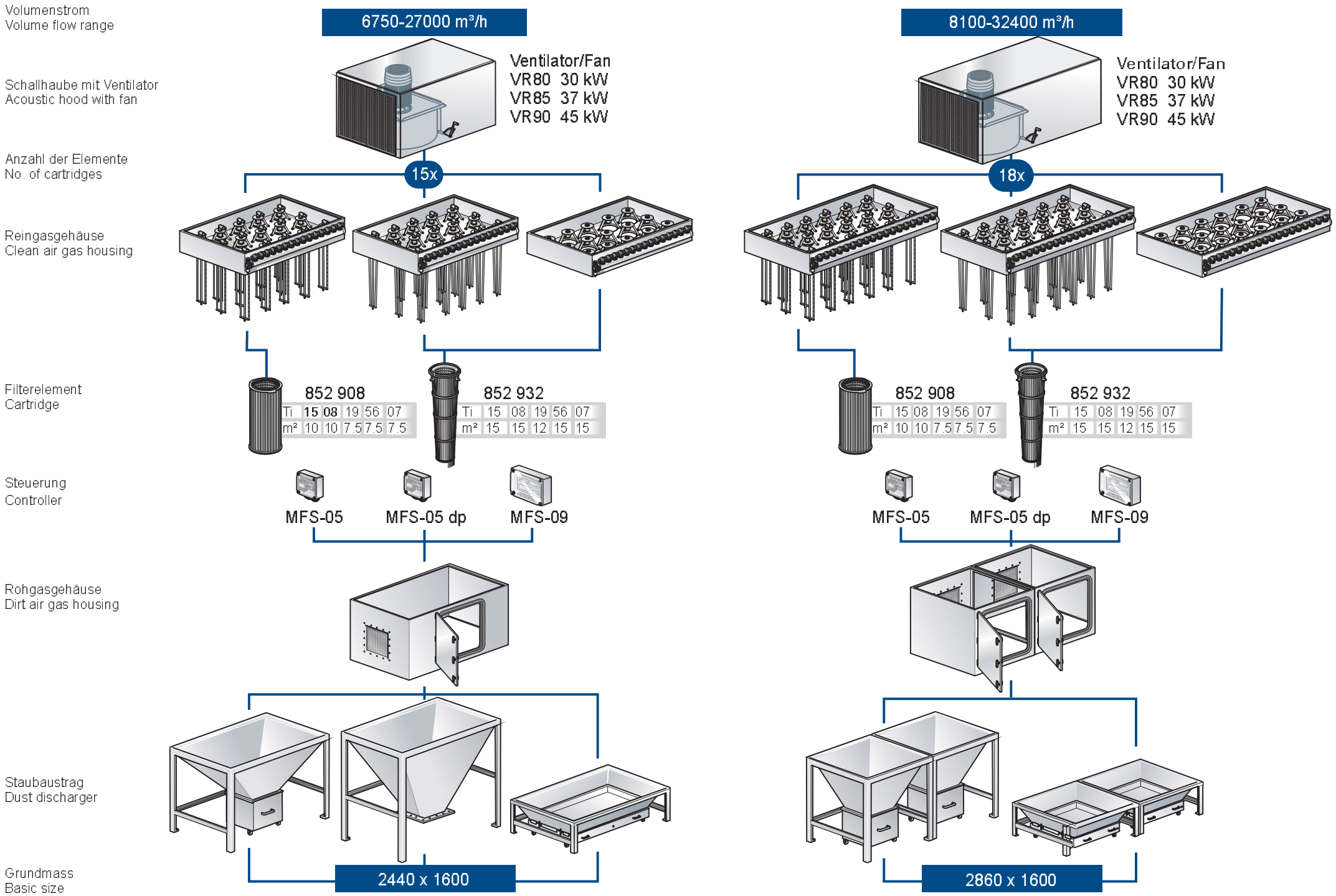
70358364.Version16.02.2012

Modulübersicht/Overview components SFK-09/SFR-09/SFR-08

	1800-7200 m³/h	4050-16200 m³/h	5400-21600 m³/h
Volumenstrom Volume flow range			
Schallhaube mit Ventilator Acoustic hood with fan	 Ventilator/Fan VR48 5.5 kW VR62 11 kW	 Ventilator/Fan VR62 11 kW VR65 15 kW VR71 18.5 kW VR76 22 kW VR60 30 kW	 Ventilator/Fan VR76 22 kW VR80 30 kW VR85 37 kW
Anzahl der Elemente No. of cartridges	4x	9x	12x
Reingasgehäuse Clean air gas housing			
Filterelement Cartridge	 852 932 Ti 15 08 19 56 07 m² 15 15 12 15 15	 852 908 Ti 15 08 19 56 07 m² 10 10 7.5 7.5 7.5  852 932 Ti 15 08 19 56 07 m² 15 15 12 15 15	 852 908 Ti 15 08 19 56 07 m² 10 10 7.5 7.5 7.5  852 932 Ti 15 08 19 56 07 m² 15 15 12 15 15
Steuerung Controller	 MFS-05 MFS-05 dp MFS-09	 MFS-05 MFS-05 dp MFS-09	 MFS-05 MFS-05 dp MFS-09
Rohgasgehäuse Dirt air gas housing			
Staubaustrag Dust discharger			
Grundmass Basic size	1000 x 1000	1600 x 1600	2080 x 1600

Modulübersicht/Overview components SFK-09/SFR-09/SFR-08



Ventilatorenauswahl für/selection of fans for: SFK-02/03/11

Bezugsdichte des Fördermediums (Luft)/basic density of the medium (air) = 1,2 kg/m³

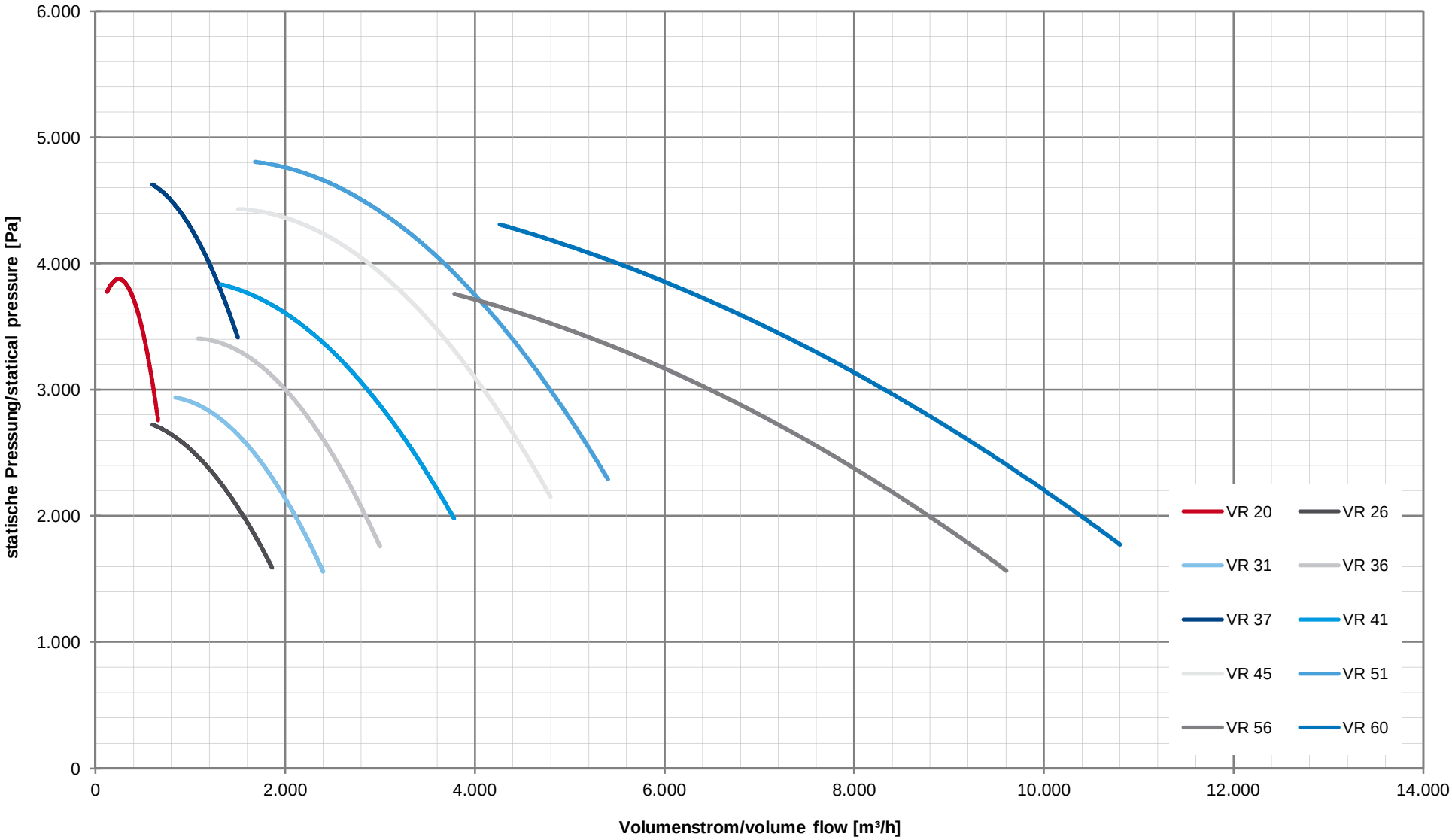
statische Pressung/statical pressure [Pa]	400	500	600	800	1.000	1.500	2.000	2.500	3.000	3.500	4.000	5.000	6.000	8.000
5.500														
4.500			VR 37	VR 37			VR 51	VR 51						
4.000					VR 37	VR 45	VR 45	VR 45	VR 51	VR 51		VR 60		
3.500	VR 20	VR 20				VR 41	VR 41		VR 45	VR 45	VR 51	VR 56	VR 60	
3.000			VR 20		VR 36	VR 36	VR 36	VR 41			VR 45		VR 56	VR 60
2.500				VR 26	VR 26	VR 31		VR 36	VR 41			VR 51		
2.000						VR 26	VR 31		VR 36	VR 41				VR 56
1.500														

Volumenstrom/volume flow [m³/h]

27.02.2012

Ventilatoren für/fans for:
SFK-02/03/11

MAHLE Industry



27.02.2012

Ventilatorenauswahl für/selection of fans for:
Hochdruckventiltoren/high pressure fans

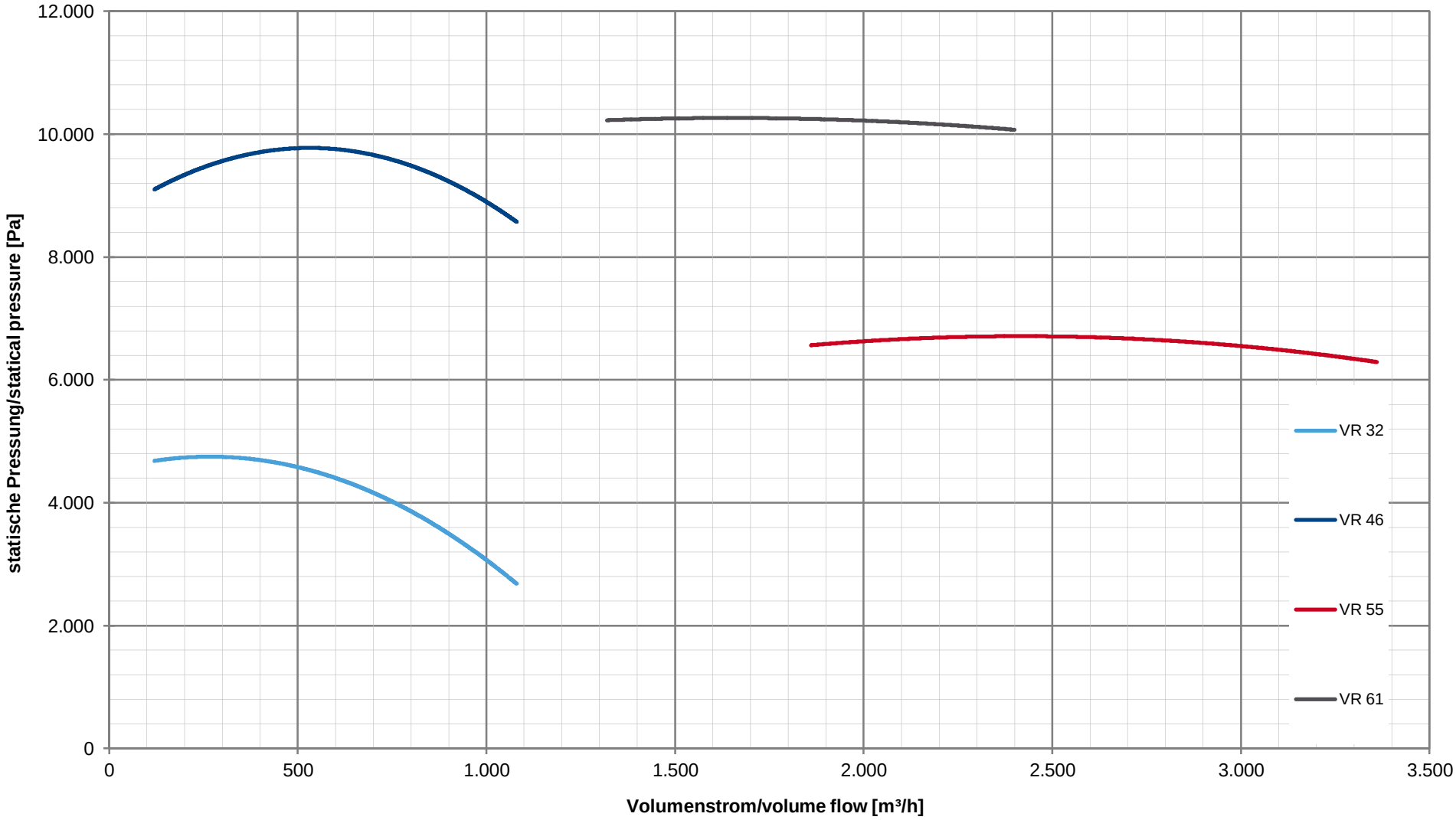
MAHLE Industry

Bezugsdichte des Fördermediums (Luft)/basic density of the medium (air) = 1,2 kg/m³

statische Pressung/statical pressure [Pa]	200	300	400	500	600	800	1.000	1.500	2.000	2.500	3.000	3.500
10.500												
10.000								VR 61	VR 61			
9.500		VR 46	VR 46	VR 46	VR 46							
9.000	VR 46					VR 46						
8.500							VR 46					
8.000												
7.500												
7.000												
6.500									VR 55	VR 55	VR 55	
6.000												
5.500												
5.000												
4.500			VR 32	VR 32	VR 32							
4.000		VR 32				VR 32						

Volumenstrom/volume flow [m³/h]

Hochdruckventilatoren/high pressure fans



27.02.2012

Ventilatorenauswahl für/selection of fans for:
SFK-09, SFR-08/09

Industry

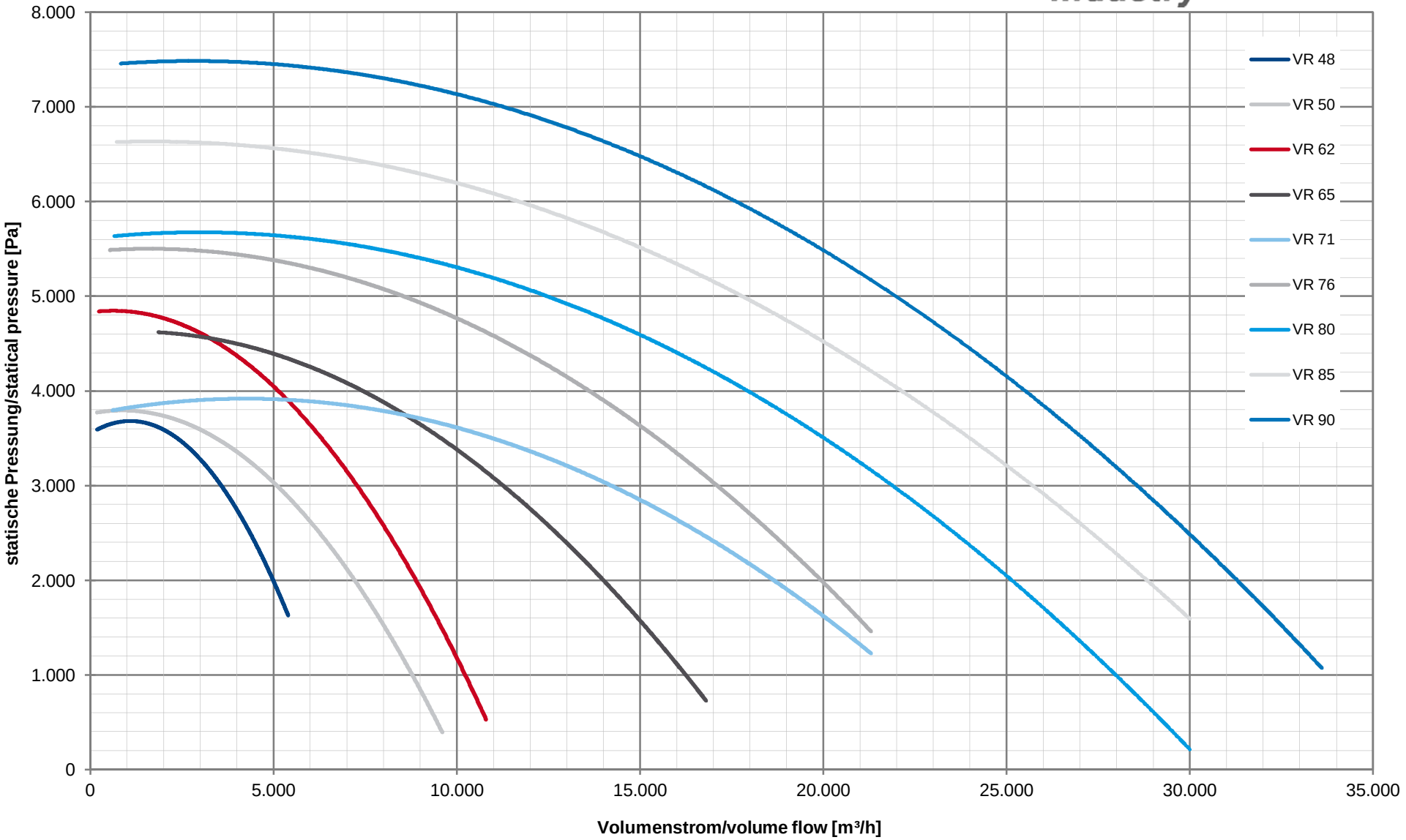
Bezugsdichte des Fördermediums (Luft)/basic density of the medium (air) = 1,2 kg/m³

statische Pressung/statical pressure [Pa]														
	7.000														
	6.500										VR 90				
	6.000									VR 85	VR 85	VR 90			
	5.500								VR 80				VR 90		
	5.000						VR 76	VR 76	VR 76	VR 80	VR 80	VR 85			
	4.500	VR 62	VR 62	VR 62	VR 62					VR 76			VR 85	VR 90	
	4.000					VR 62	VR 62	VR 65			VR 76	VR 80			
	3.500	VR 48	VR 48	VR 50	VR 50	VR 50		VR 62	VR 65	VR 71			VR 80	VR 85	
	3.000			VR 48	VR 48		VR 50			VR 65	VR 71	VR 76			VR 90
	2.500					VR 48		VR 50	VR 62		VR 65	VR 71			
	2.000						VR 48						VR 76	VR 80	VR 85
	1.500							VR 48	VR 50						
		2.000	2.500	3.000	3.500	4.000	5.000	6.000	8.000	10.000	12.000	16.000	20.000	24.000	28.000
		Volumenstrom/volume flow [m³/h]													

27.02.2012

Ventilatoren für/fans for:
SFK-09, SFR-08/09

MAHLE Industry



27.02.2012

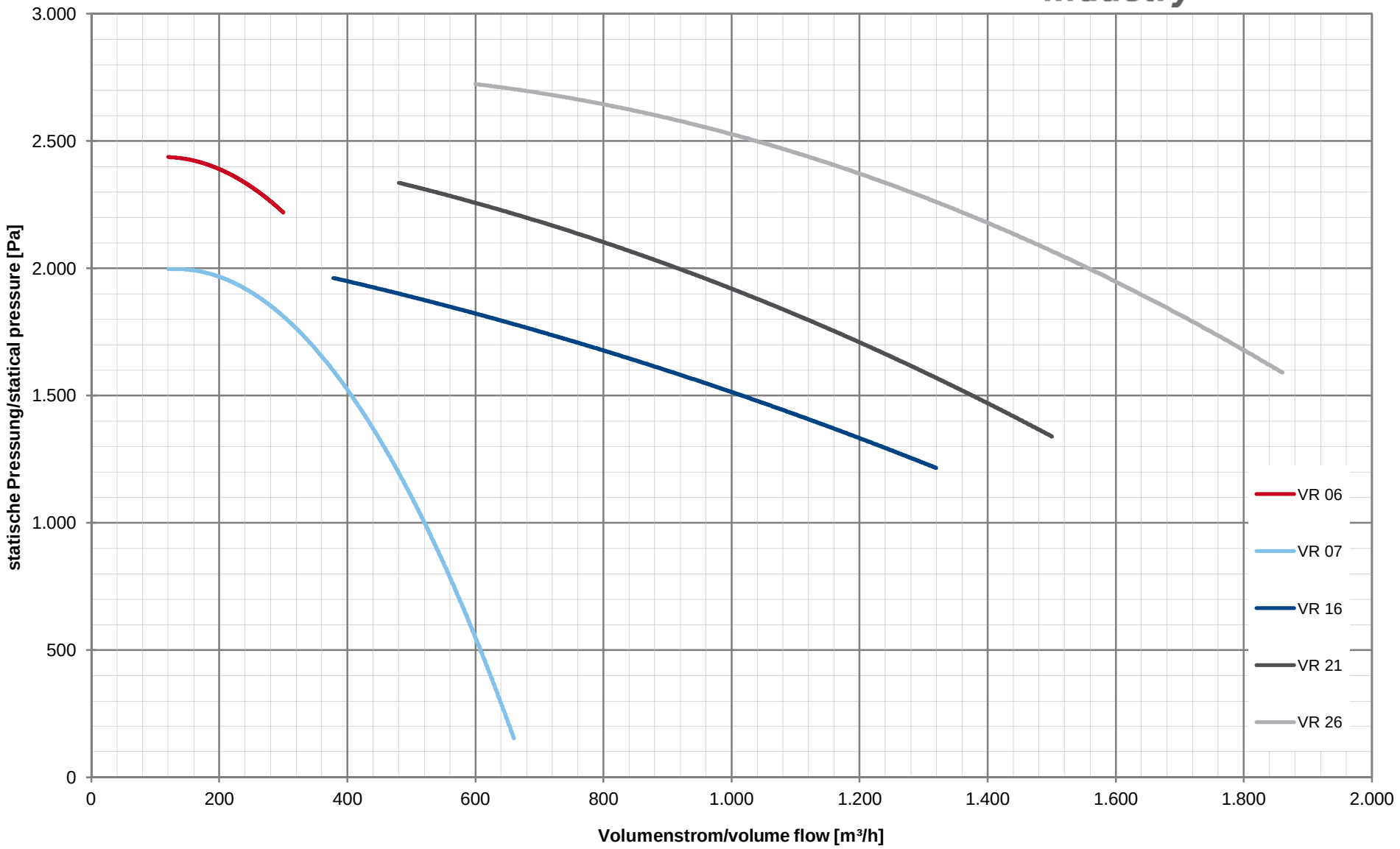
Ventilatorenauswahl für/selection of fans for:
SFK-01/02/03

Bezugsdichte des Fördermediums (Luft)/basic density of the medium (air) = 1,2 kg/m³

statische Pressung/statical pressure [Pa]	100	200	300	400	500	600	800	1.000	1.500	2.000
3.250										
2.750						VR 26				
2.500							VR 26			
2.250	VR 06	VR 06	VR 06		VR 21	VR 21				
2.000	VR 07						VR 21			
1.750		VR 07	VR 07	VR 16	VR 16	VR 16				
1.500				VR 07			VR 16	VR 16		
1.250										
1.000					VR 07					
750										

Volumenstrom/volume flow [m³/h]

Ventilatoren für/fans for:
SFK-01/02/03



MAHLE Industry

Dust removal filters for combustible dusts
Information

ATEX-compliant dust removal filters

1. Features

Explosion protection is stipulated for combustible dusts by the 94/9/EC Directive.

Particles are separated and upgraded on the raw gas side of a cleanable dust removal filter. The dust cloud that is frequently produced when the filter cartridges are cleaned will cause an explosion in the presence of a sufficiently large spark. To avoid the risk of explosion when combustible dusts are separated, explosion-proof designs in line with ATEX regulations have been specified for MAHLE dust removal filters together with an engineering consultant.

A hazard analysis and risk assessment based on DIN EN 13463 provide the starting point for appraising the suitability of a particular application and selecting the device type. The hazard analysis evaluates the possible explosion hazards and the probability of occurrence of potentially explosive atmosphere. The analysis presupposes that the filtration device will be for its "intended purpose" and that it is divided into an installation chamber and a process chamber (zones). The possible explosion hazards to be considered are described in DIN EN 1127-1. Hazard analyses are documented for the various applications of MAHLE dust removal filters.

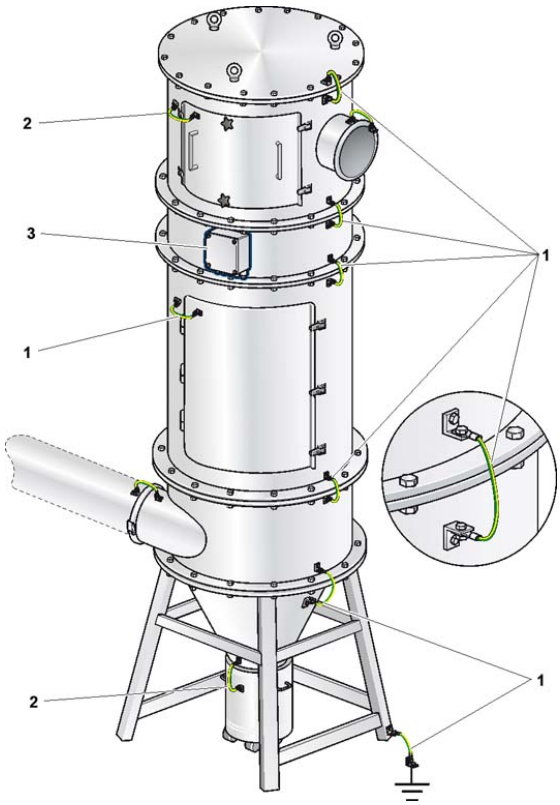
2. Selection of the dust removal filter

The dust removal filter is selected according to the minimum ignition energy of the dust and the envisaged application. MAHLE dust removal filters for installation in Zone 22 are designed with the Ex II 3D c T140 °C type of protection.

Dust removal filter	Minimum ignition energy	Type of dust
Type A	> 10 mJ	Normally flammable
Type A or Type B *	Between 3 and 10 mJ	Highly flammable
Type B	< 3 mJ	Extremely flammable

* Type B must be selected if the dust removal filter is to be used for one of the following purposes: pneumatic conveying, central aspiration or suction, separation downstream of a drying or grinding process, suction with mechanical conveyors operating at a speed of more than 1 m/s or separation of self-igniting powder.

3. Type A dust removal filter in basic ATEX design with proactive explosion protection



Entstaubungsgerät mit vorbeugendem Explosionsschutz

1 . Earth conductor or equipotential bonding conductor
2 . Quick-disconnect earth conductor
3 . Filter controller or terminal box, category II 3D

Characteristics

- Equipotential bonding conductors on all housing parts, incl. earth connection
- ATEX-compliant electrical components with the appropriate type of protection, e.g. filter controller, magnetic valve, electric motor, level indicator for Zone 22
- Terminal strip for connecting more than one magnetic valve to a filter controller or control cabinet
- Filter cartridges capable of electrostatic discharge (MAHLE standard, even for a minimum ignition energy > 4 mJ)

Operating principle

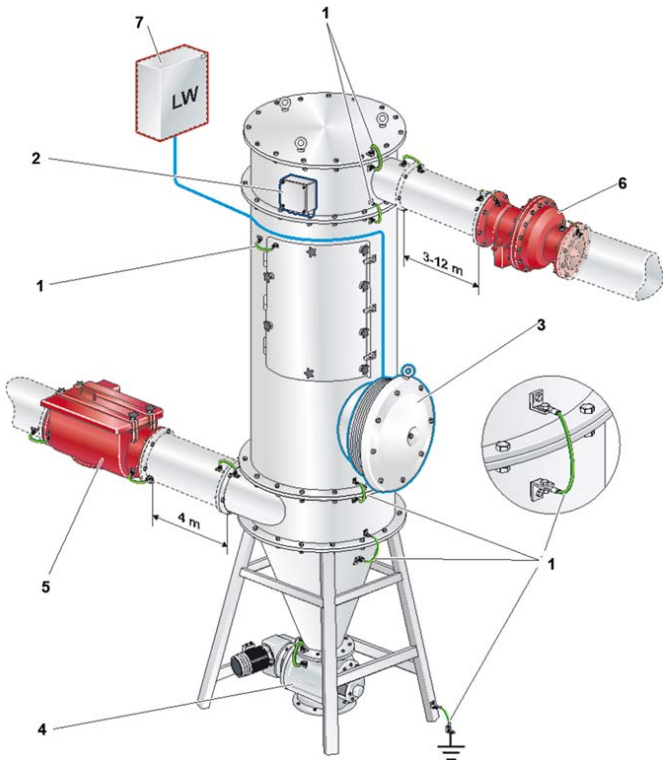
Static electricity cannot build up in the basic ATEX version, so that sparking and explosion are ruled out. Sparking must be reliably prevented. If this is not possible, a type B dust removal filter must be used instead.

4. Type B dust removal filter in explosion-proof ATEX design

In the case of the explosion-proof design, the dust removal filter must be decoupled from explosions in the raw and clean gas lines. All plant components connected upstream or downstream are then protected against dust explosion propagation. The dust is discharged either in an explosion-proof bucket or by means of a flameproof discharge device.

Explosion protection by decoupling a dust removal filter in explosion-proof design with explosion release.

Example 1: Decoupling with a quick-acting valve and check valve



1 . Earth conductor or equipotential bonding conductor
2 . Filter controller or terminal box
3 . Explosion-tested air release valve with integrated flame absorber
4 . Rotary valve
5 . Explosion-tested check valve
6 . VENTEX quick-closing valve
7 . Control room or cabinet

Explosion-proof dust removal filter with air release valve

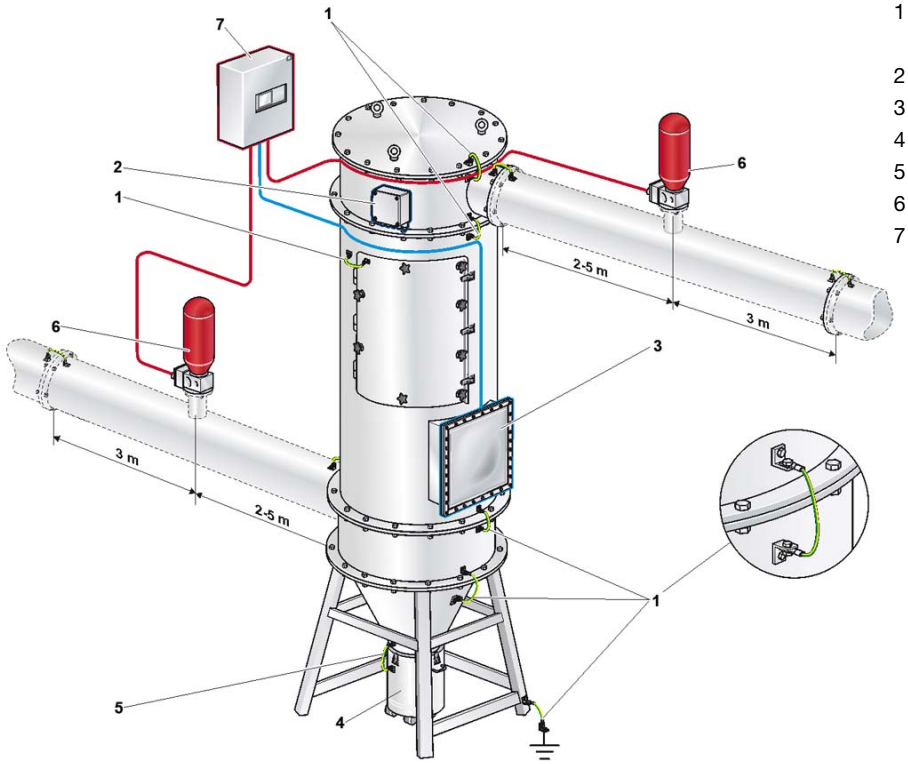
Characteristics

- Equipotential bonding conductors on all housing parts, incl. earth connection
- ATEX-compliant electrical components with the appropriate type of protection, e.g. filter controller, magnetic valve, electric motor, level indicator for Zone 22
- Terminal strip for connecting more than one magnetic valve to a filter controller or control cabinet
- Filter cartridges capable of electrostatic discharge (MAHLE standard, even for a minimum ignition energy > 4 mJ)
- Max. dust constant (Kst value): 300 bar m/s
- Signal transmitter on the air release valve for recording explosions
- Quick-acting valve and check valve for decoupling explosions
- Pressure burst resistance of the housing: 0.5 bar

Operating principle

At the start of an explosion, the fitted spring contact sends a signal to the control room (7) as soon as the air release valve (3) opens. The transmission of the signal causes all electrical components to be disconnected. The check valve on the raw gas side (5) closes automatically by mechanical means in a fraction of a second when the explosion begins. A quick-acting shut-off device (6) decouples the explosion on the clean gas side (6), e.g. the automatic VENTEX quick-closing valve or an active fire barrier. Alternatively, the air release valve (3) can be replaced by a rupture disc or a quench pipe and the rotary valve (4) by a dust bucket.

Example 2: Decoupling with extinguishing agent



1 . Earth conductor or equipotential bonding conductor
2 . Filter controller or terminal box
3 . Rupture disc
4 . Dust bucket with clamping lever
5 . Quick-disconnect earth conductor
6 . Extinguishing agent bottles
7 . Switch box

Explosion-proof dust removal filter with rupture disc

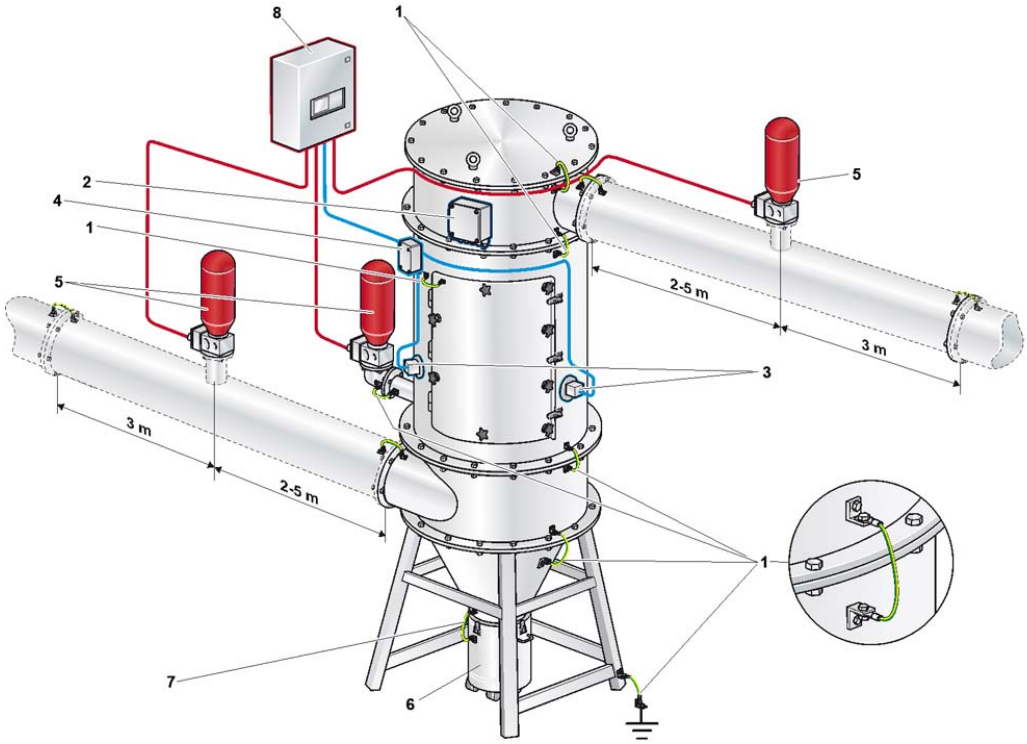
Characteristics

- Equipotential bonding conductors on all housing parts, incl. earth connection
- ATEX-compliant electrical components with the appropriate type of protection, e.g. filter controller, magnetic valve, electric motor, level indicator for Zone 22
- Terminal strip for connecting more than one magnetic valve to a filter controller or control cabinet
- Filter cartridges capable of electrostatic discharge (MAHLE standard, even for a minimum ignition energy > 4 mJ)
- Max. dust constant (Kst value): 300 bar m/s
- Rupture disc with breakwire as a signal transmitter
- Extinguishing agent bottles for decoupling explosions
- Pressure burst resistance of the housing: 0.5 bar

Operating principle

At the start of an explosion, the rupture disc (3) opens at a defined set pressure and the signal is transmitted to the switch box by the breakwire (7). The transmission of the signal causes the extinguishing agent bottles (6) to be activated. The extinguishing agent expelled via the pipes on the raw and clean gas sides prevents the flame front from propagating. At the same time, the signal disconnects all electrical components. Alternatively, the rupture disc (3) can be replaced by an air release valve or a quench pipe and the dust bucket (4) by a rotary valve.

Explosion protection by suppressing the explosion in a dust removal filter in explosion-proof design



Explosion-proof dust removal filter with extinguishing agent bottles

1 . Earth conductor or equipotential bonding conductor
2 . Filter controller or terminal box
3 . Pressure sensor
4 . Socket for pressure sensor
5 . Extinguishing agent bottles
6 . Dust bucket with clamping lever
7 . Quick-disconnect earth conductor
8 . Switch box

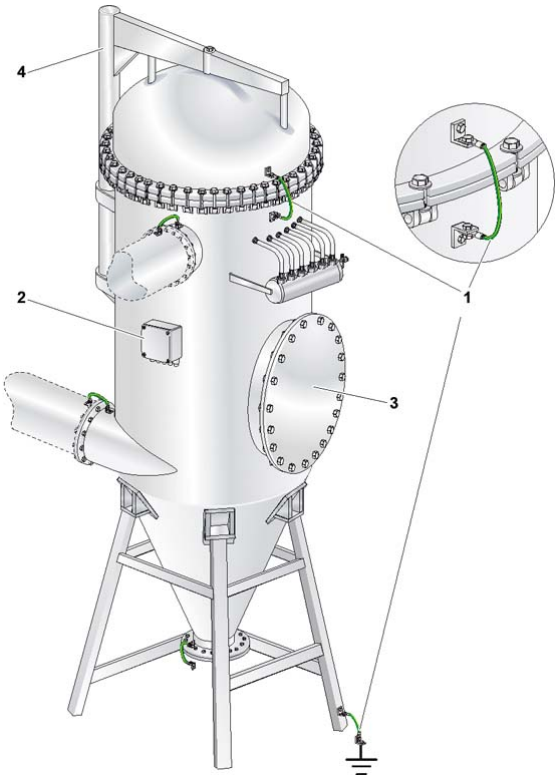
Characteristics

- Equipotential bonding conductors on all housing parts, incl. earth connection
- ATEX-compliant electrical components with the appropriate type of protection, e.g. filter controller, magnetic valve, electric motor, level indicator for Zone 22
- Terminal strip for connecting more than one magnetic valve to a filter controller or control cabinet
- Filter cartridges capable of electrostatic discharge (MAHLE standard, even for a minimum ignition energy > 4 mJ)
- Max. dust constant (Kst value): 300 bar m/s
- Extinguishing agent bottle(s) on the dust removal filter for suppressing explosions
- Extinguishing agent bottles in the pipes on the raw and clean gas sides for decoupling explosions
- Pressure burst resistance of the housing: 0.5 bar

Operating principle

At the start of an explosion, the pressure increase is recorded by two separate pressure sensors (3) and the extinguishing agent bottles (5) are activated by the high-speed electronics. Inside the dust removal filter, the flame is suppressed by the extinguishing agent, so that the explosion pressure is reduced. The number of explosion agent bottles depends on the volume of the raw gas side, the maximum explosion pressure, the dust constant and the ignition temperature. If this pressure reduction is ensured by optimising the design of the dust removal filter, it is possible to minimise the explosive action such that additional pressure relief can be dispensed with. The extinguishing agent expelled via the pipes on the raw and clean gas sides prevents the flame front from propagating. At the same time, the signal from the switch box (8) disconnects all electrical components. Alternatively, the dust bucket (6) can be replaced by a rotary valve.

Explosion protection with dust removal filter in explosion-proof design



Explosion-proof dust removal filter

1 . Earth conductor or equipotential bonding conductor
2 . Filter controller or terminal box
3 . Manhole
4 . Swinging gallows

Characteristics

- Equipotential bonding conductors on all housing parts, incl. earth connection
- ATEX-compliant electrical components with the appropriate type of protection, e.g. filter controller, magnetic valve, electric motor, level indicator for Zone 22
- Terminal strip for connecting more than one magnetic valve to a filter controller or control cabinet
- Filter cartridges capable of electrostatic discharge (MAHLE standard, even for a minimum ignition energy > 4 mJ)
- Dust constant (Kst value) corresponding to the approval for the decoupling elements
- Explosion decoupling must be provided for the dust removal filter in the raw and clean gas lines
- Dust removal filter design optimised for the maximum explosion pressure

Operating principle

In the event of an explosion, the maximum explosion pressure is absorbed by the robust housing. The steel is not stressed beyond the yield point in accordance with the design. All electronic components can be disconnected by tripping an optional pressure switch. Cabinet optional.

5. Type examination with explosion test

The stable design of our apparatus is confirmed by an FSA test certificate. A pressure burst resistance of 0.5 bar was demonstrated in a test series with selectively induced explosions. The devices thus comply with the test requirements of EN 14460 "Explosion resistant equipment".





6. Design

Please contact us for detailed technical information, any open questions and for general expert advice. Completion of the relevant questionnaire would facilitate in the coordination of all important parameters. Comprehensive documentation on our product range, cleaning units and elements can be provided. For more information about installation and operation, please refer to our Instruction Manual

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70373951.02/2012

MAHLE Industry

Enquiry to dust collector

Please give us all technical data you know on this questionnaire, for to quote a filter according to your specification.

sender

company: customer-nr.:

road: postcode:

city:

contact person for questions technical.: / department:

commercial: / department:

phone: e-mail:

desired

☐ offer ☐ depiction

other:

application:

place for sketch of the application, or ☐ as enclosure attached

Application data

volume flow at work condition m³/h

housing: steel sheet coated RAL 7035

design: stand alone filter dust discharge at stand alone filter:

filter in use: continuous working temperature: °C

location: indoor dust: (specification page 3)

clean air outdoor dust properties: not flammable conductive (<10^4 Ωm): no

type of operation: suction side gas load: g/m³

gas type: work hours: h/year

fan : existing motor version: V Hz

If a fan is required, please give the pressure you need for the application: Pa

---

At flammable dust and gas please answer the following questions to ATEX

Details to zone classification for the installation area (operator duty BetrSichV)

dust zone: gas zone:

Process data

Can Source of ignitions come in to the dust filter? no

Special processes: (please check)

Dust data

min. ignition energy: > 10 mJ ignition temperature ° C

Details at a min. ignition energy < 10 mJ

☐ **with pressure relief**, pressure resistant: 0,5 bar, or bar

pressure relief: in door without air duct wishes for relief:

for the calculation of the relief area: K_{ST}-value: bar*m/s

maximal explosion pressure: bar

☐ **without pressure relief**, pressure resistant: 0,5 bar, or bar

Ex-depression with extinguishing agent:

☐ **without pressure relief**, pressure resistant: bar

Gas data

Solvent content in gas flow: no if yes, which gas zone inside:

explosion group: temperature class:

Dust type

bulk density: g/cm³ particle size x_{50}: µm

particle shape: ☐ round ☐ angular ☐ flaky

☐ fibrous ☐ needle shaped ☐ fleecy

dust characteristics:	stark	middle	no		stark	middle	no
pourable	☐	☐	☐	hygroscopic	☐	☐	☐
agglomerating	☐	☐	☐	water soluble	☐	☐	☐
adhesive	☐	☐	☐	flammable	☐	☐	☐
static charged	☐	☐	☐	pyrophoric	☐	☐	☐
sticky	☐	☐	☐	toxic	☐	☐	☐
abrasive	☐	☐	☐	environmental load	☐	☐	☐

rules and constraints:

further info:

Technical data is subject to change without notice!

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MAHLE
Industry

Questionaire / Checklist for oilmist separation (LGA series)

Customer address:

company: customer no.:

street: postal code:

city:

contact person:

technical: department:

commercial: phone number:

e-mail:

machine tooling type:

machining

spin ☐ mold ☐ grind ☐ other ☐

material to be / Processed:

encapsulation of the machine:
☐ full enclosure/working space ___ m³ ☐ part-enclosure

machine utilization:
☐ one-shift ☐ two-shift ☐ three-shift / full utilization

other:

cooling lubricant:

type of the cooling lubricant: ☐ water-based emulsion ☐ oil-based lubricant

Data sheet of lubricant:

Provide Oil sample (50 ml) to determine the vapor pressure	☐ yes	☐ no
The cooling lubricant can be recirculated?	☐ yes	☐ no
Minimum quantity lubrication	☐ yes	☐ no

Further information:

technical changes on reserve

MAHLE
Industry

Equipment technology
Data sheets

MAHLE offers a broad selection of dust and oil mist collecting equipment to help optimise your filtration solution. The MAHLE product range includes dust collectors with a round or rectangular housing as well as flanged body-type and integrated filters. The LGA series of oil mist collectors is designed to separate oil aerosols. With their optimised housing design, MAHLE dust collectors are ideal for separating high dust loads, no matter how problematic the dusts. A MAHLE rectangular collector with optimised conical filter cartridges can easily handle volume flows up to 32.400 m^3/h. Allow us to convince you of the numerous advantages of MAHLE dust collectors. We invite you to take a closer look at our product range.

	Data sheets		
1	**Dust collectors up to 680 m^3/h**	SFK-01/02/03 SP	
2	**Dust collectors up to 7.000 m^3/h**	SFK-02/03/11 FL	
3	**Dust collectors up to 32.400 m^3/h**	SFK-09 SFR-08 SFR-09 SFK-27	
4	**Flanged body-type silo filter**	SFK-27 A	
5	**Oil mist collector**	LGA series	
6	**Customised devices**	Specially manufactured according to each customer's specification	

MAHLE Industry

Dust collector
SFK-01/02/03 SP

Circular construction

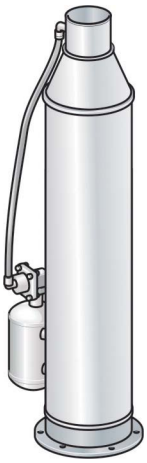
1. Features

This unit is from solidly build stainless steel. The individual housing parts are fastened together by clamp rings and can be freely rotated in relation to one another or easily dismounted if required.

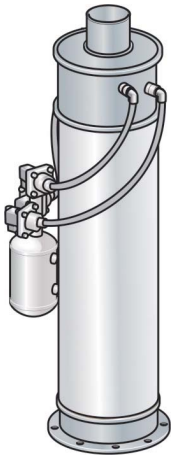
Characteristics

- Efficient, energy-saving cleaning with jet pulse
- Compact, space-saving design
- Volume flow range 30 to 680 m³/h
- Filter surfaces 0.5 to 6.4 m²
- Stainless steel design
- Jacob connection system
- Worldwide distribution

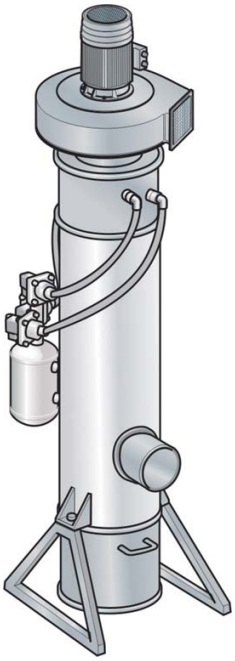
2. Versions



Ø 200 mm with 1 cartridge

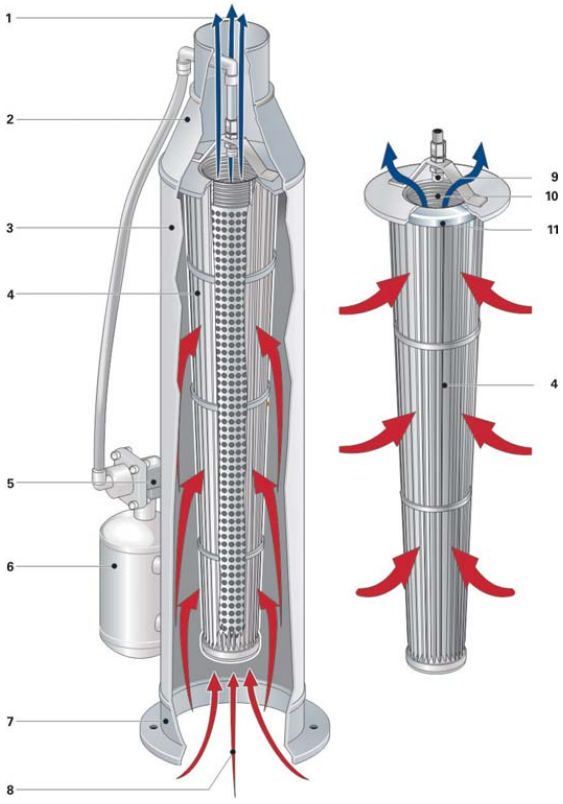


Ø 300 - 400 mm with 3 - 4 cartridges



... plus fan, frame and dust bucket

3. Modules and accessories



1 Outlet pipe-end
2 Clean air section
3 Dirt air section
4 Cartridge
5 Membrane valve
6 Pressure vessel
7 Jacob connection system
8 Dirt air inlet
9 Cleaning nozzle
10 Threaded connection
11 Sealing ring

4. Functional description

The dust-laden air flows into the filter housing (3) at the bottom (8). As it flows through the catridge (4), fine dust is separated on the cartridge surface. The filter cake is cleaned off at fixed intervals, depending on the dust load and the filter surface load. The membrane valve (5) is controlled on customer side. The detached dust drops down. The cleaned air flows into the clean side (2) and is discharged at the top of the filter via the outlet pipe-end (1).

The jet pulse cleaning system comprises a pressure vessel with membrane valves (5) and a cleaning unit (9). The version shown here is designed for intermittent operation. For continuous filtration the variant with several elements and membrane valves should be preferred.

5. Technical Data

Dust collector

Housing material:	Stainless steel V2A - AISI 304
Max. operating pressure:	± 50 mbar
Max. operating temperature:	70 °C
Dust bucket capacity*:	6/14/25 l

Cartridges

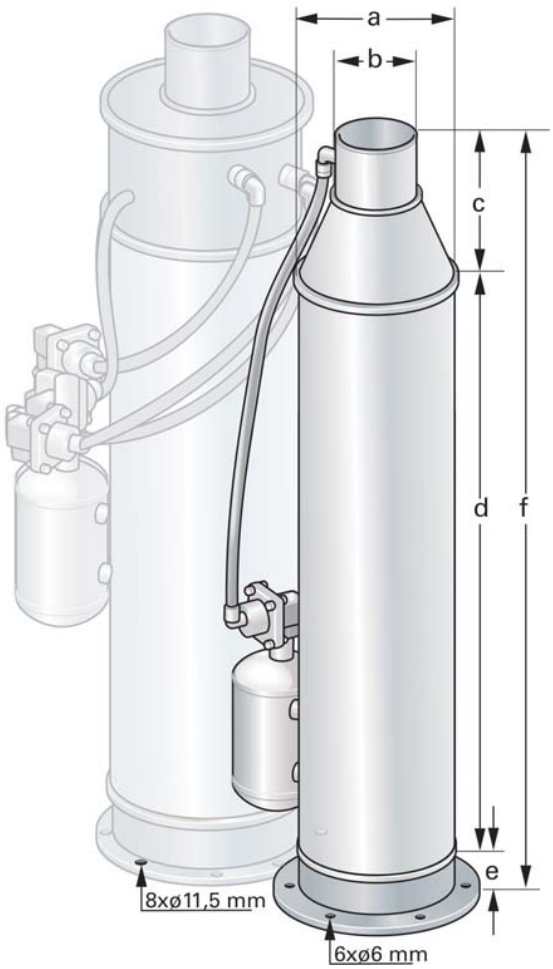
SFK-01:	Type 852 902 Ti ...** (data sheet 120 NK)
SFK-02:	Type 852 903 Ti ...** (data sheet 120 NK)
SFK-03:	Type 852 904 Ti ...** (data sheet 120 NK)

Cleaning

Cleaning system:	MAHLE multi-jet nozzle
Medium:	Oil, dust and condensate-free compressed air at operating temperature
Compressed air connection:	G½ female
Max. air pressure:	6 bar
Compressed air consumption*:	approx. 10 l (fad) for 1 cartridge approx. 17 l (fad) for 3 or 4 cartridges per cleaning cycle
Pulse duration:	0.2 s
Controller:	Optional
Valves:	DC 24 V, 0.5 A, 12 W, IP 65

* According to version

** Filter media depending on application



6. Dimensions

Dust collector						Dimensions [mm]					
Type designation	Volume flow* [m³/h]	No. of cartridges	No. of Valves	Cartridge length [mm]	Weight [kg]	a	b	c	d	e	f
SFK-01 001 DN-020 ...	30 - 80	1	1	300	10	200	120	220	300	40	560
SFK-02 001 DN-020 ...	50 - 120			600	12				600		860
SFK-03 001 DN-020 ...	70 - 170			1000	16				984		1230
SFK-02 003 DN-030 ...	150 - 360	3	1**	600	19	300	150	300	600	50	950
SFK-02 003 DN-030 ...			3***								
SFK-03 003 DN-030 ...	210 - 510		1**	1000	24				984		1335
SFK-03 003 DN-030 ...			3***								
SFK-02 004 DN-040 ...	200 - 480	4	2***	600	32	400	300		600		950
SFK-02 004 DN-040 ...			4***								
SFK-03 004 DN-040 ...	280 - 680		2***	1000	40				984		1335
SFK-03 004 DN-040 ...			4***								

* These values may vary depending on the nature of the dust, the composition of the air and the filter media.

** Intermittent filtration

*** Continious filtration

Technical data is subject to change without notice!

7. Ordering example

Basic unit					Optional equipment		
Type	No. of cartridges	Size	Version	Flanged body-type filter	Dust bucket	Fan	Fan and dust bucket
SFK-02	001	DN-020	A..	■			
			S1.		■		
			A.V			■	
			S1V				■

8. Design

Please contact us for detailed technical information, any open questions and for general expert advice. Completion of the relevant questionnaire would facilitate in the coordination of all important parameters.
Comprehensive documentation on our product range, cleaning units and elements can be provided. For more information about installation and operation, please refer to our Instruction Manual.

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76397624.02/2012

MAHLE Industry

Dust collector
SFK-02/03/11 FL

Circular construction

1. Features

This unit is manufactured from sturdy steel sheets. The individual housing parts are fastened together by bolted flanges.

Characteristics

- Conical cartridges for maximum performance
- Compact, save-spacing design
- Modular system
- Easy to maintain
- High separation efficiency
- Low noise level
- Efficient, energy-saving cleaning with jet pulse
- Volume flow range 450 to 7.000 m³/h
- Filter surfaces 9 to 70 m²
- Worldwide distribution

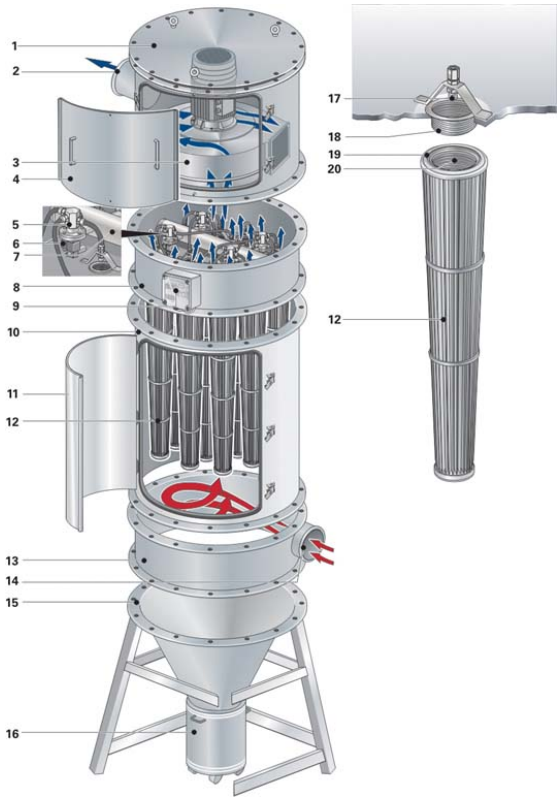
2. Versions

A, Flanged body-type filter with fan

S1, with acoustic hood and dust bucket

S6, with cone and fan

3. Modules and accessories



1 Acoustic hood
2 Blow-out pipe end
3 Fan
4 Maintenance cover, acoustic hood
5 Compressed air distributor
6 Membrane valves
7 Pressure vessel
8 Clean air section
9 Filter controller, time or differential pressure-controlled
10 Untreated gas chamber
11 Maintenance door, dirt air section
12 Cartridge
13 Dust section
14 Dirt air inlet
15 Dust collector hopper with rack
16 Dust bucket
17 Multi-jet nozzle
18 Thread adapter
19 Seal
20 Cartridge, connection thread

4. Functional description

The dust-laden air flows tangentially into the dust section (13). This assures a uniform flow distribution and enables coarse dust particles to be pre-separated. As it flows through the cartridges (12), fine dust is separated on the surface. The filter cake is cleaned off at fixed intervals, depending on the dust load and the filter surface load. The membrane valves (6) are controlled by means of the electronic controller (9) mounted on the side of the filter housing. The detached dust drops down to the bottom and is collected in the dust bucket (16). The cleaned air flows into the clean air section (8) and is discharged at the top of the filter via the blow-out nozzle (2). The fully automatic compressed air cleaning system comprises a pressure vessel with membrane valves (6), an electronic controller (9) and the cleaning nozzles (17).

5. Technical Data

Dust collector

Housing material: 1.0037 (DIN EN 10025)
stainless steel optional

Surface protection: EPS powder coating
RAL 7035 light grey

Max. operating pressure: - 50 mbar

Max. operating temperature: 70 °C without acoustic hood
40 °C with acoustic hood

Dust bucket capacity: 60 l

Cartridges

SFK-02: Type 852 903 Ti ...*
(120 NK data sheet)

SFK-03: Type 852 904 Ti ...*
(120 NK data sheet)

SFK-11: Type 852 054 Ti ...*
(160 NK data sheet)

Cleaning

Cleaning system: MAHLE multi-jet nozzle

Medium: Oil, dust and condensate-free compressed air at operating temperature

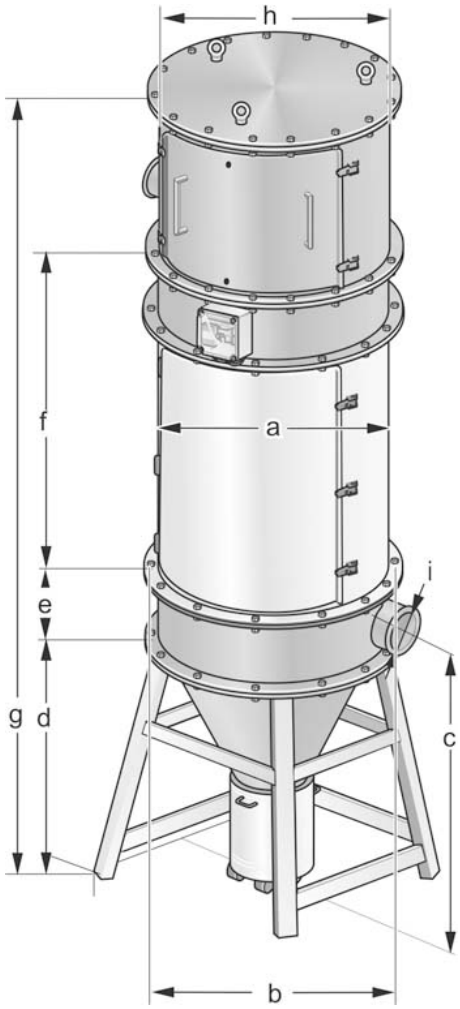
Compressed air connection: G½ female

Compressed air consumption: SFK-02/03: Approx. 35 l (fad) per cleaning pulse
SFK-11: Approx. 80 l (fad) per cleaning pulse

Pulse duration: 0.2 s

Controller: SFK-02/03: Time controlled (MFS-05 data sheet)
SFK-11: Differential pressure-controlled (MFS-05 dp data sheet)

Valves: Electric membrane valve



* Filter media depends on application

6. Dimensions

Dust collector					Dimensions [mm]								
Type designation	Volume flow* [m³/h]	No. of cartridges	Cartridge length [mm]	Weight** [kg]	a	b	c	d	e	f	g***	h	i
SFK-02 009 DN-056...	450-1080	9	600	120	560	760	1230	1070	260	1005	3095	900	200
SFK-03 009 DN-056...	630-1530		1000	160						1405	3495		
SFK-02 015 DN-071...	750-1800	15	600	210	710	1040	1230	1070	320	1005	3155	1000	250
SFK-03 015 DN-071...	1050-2550		1000	260						1405	3555		
SFK-11 012 DN-100...	1800-4200	12	1000	350	1000	1040	1520	1320	400	1405	3880	1000	300
SFK-11 016 DN-112...	2400-5600	16		420	1120	1160	1695	1470	450		4395	1120	350
SFK-11 020 DN-125...	3000-7000	20		470	1250	1290	1770	1520	500		4495	1250	400

* These values may vary depending on the nature of the dust, the composition of the air and the filter media

** Weight of S1 type excluding fan and acoustic hood

*** These values may vary depending on the size of the fan

Technical data is subject to change without notice!

7. Ordering example

Basic unit					Optional equipment		
Type	No. of cartridges	Size	Version	Flanged body-type filter	Bucket	Bucket and fan	Product separator with cone
SFK-02	008	DN-053	A..	■			
			S1.		■		
			S1V			■	
			S6.				■

8. Design

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70351166.05/2012

MAHLE Industry

Dust collector
SFK-09

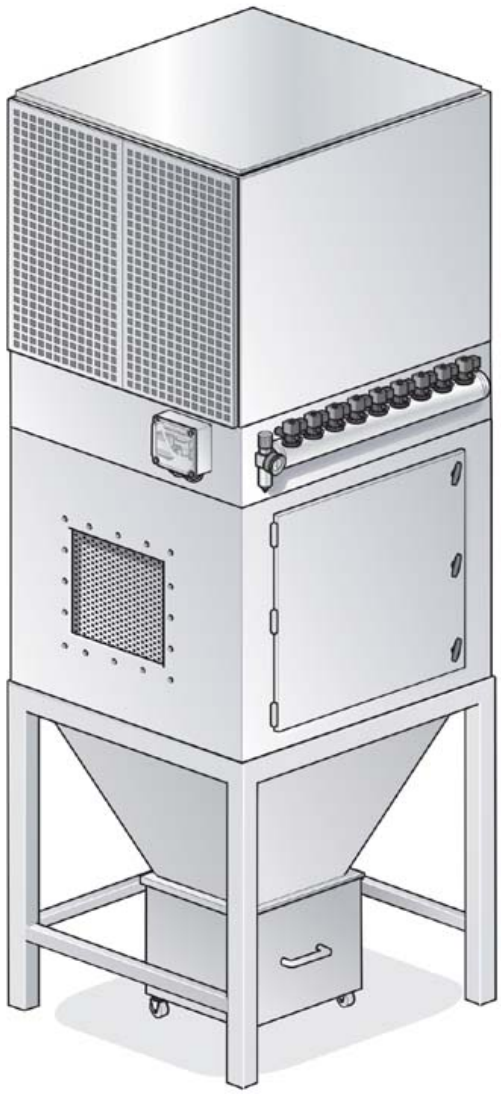
Rectangular type

1. Features

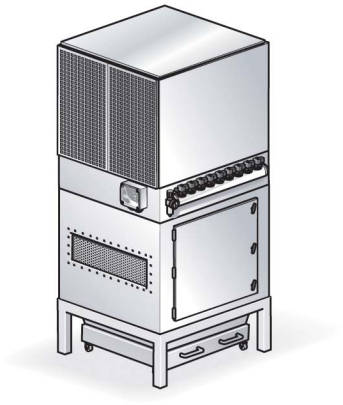
This unit is manufactured from sturdy steel sheets. The individual housing parts are assembled from bended metal segments that are bolted together and sealed with silicone-free seals.

Characteristics

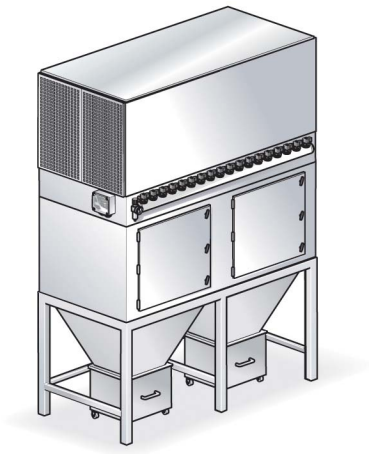
- Compact, space-saving design
- Easy to maintain
- Low noise level
- Efficient, energy-saving cleaning with compressed air by means of MAHLE Multijet nozzle
- Volume flow range 1800 to 32400 m³/h
- Filter surfaces 48 to 540 m²
- Cartridges changed on the dirt air side
- Worldwide distribution

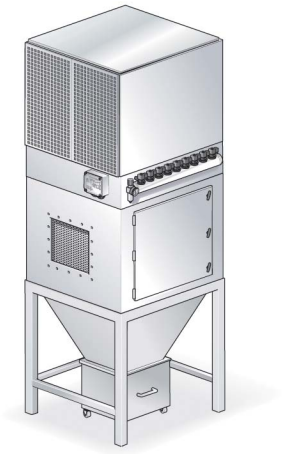


2. Versions



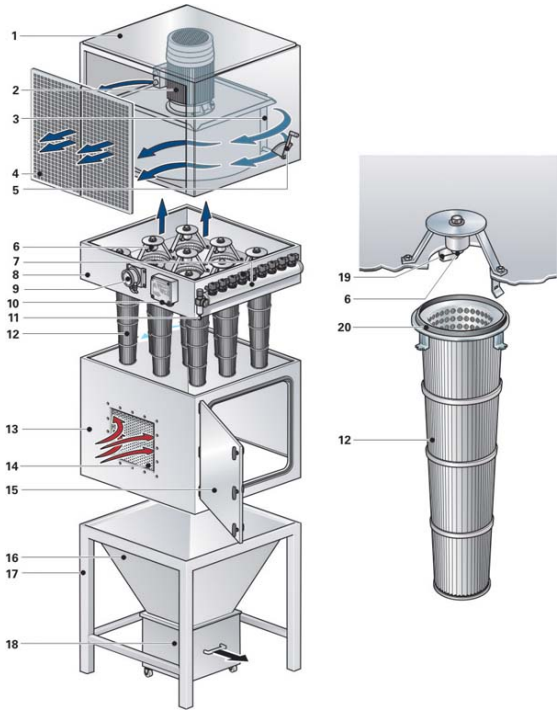
S3, with dust drawer





S1, with dust bucket

3. Modules and accessories



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1		Acoustic hood
2		Fan
3		Lamella valve for volume flow (optional)
4		Blow-out grid
5		Lever for lamella valve for volume flow (optional)
6		Cleaning unit (rotating wing)
7		Pressure vessel with membrane valves
8		Clean air section
9		Differential pressure gauge (optional)
10		Filter controller
11		Pressure reducer
12		Cartridge
13		Dirt air section
14		Dirt air inlet with baffle plate
15		Maintenance door
16		Dust collector hopper
17		Rack
18		Dust bucket
19		Fastening for cartridge
20		Seal

4. Funktional description

The dust-laden air flows into the side of the filter housing (13). The perforated baffle plate (14) in the inlet region assures a uniform flow distribution and enables coarse particles to be pre-separated. As it flows through the cartridge (12), fine dust is separated on the surface. The filter cake is cleaned off at fixed intervals, depending on the dust load and the filter surface load. The detached dust drops down through the hopper (16) and is collected in the bucket (18). The cleaned air flows into the clean air section (8) and is discharged via the blow-out grid (4). The fully automatic compressed air cleaning system comprises a pressure vessel with membrane valves (7), an electronic Δ p controller (10) and the cleaning units (6).

5. Technical Data

Dust collector

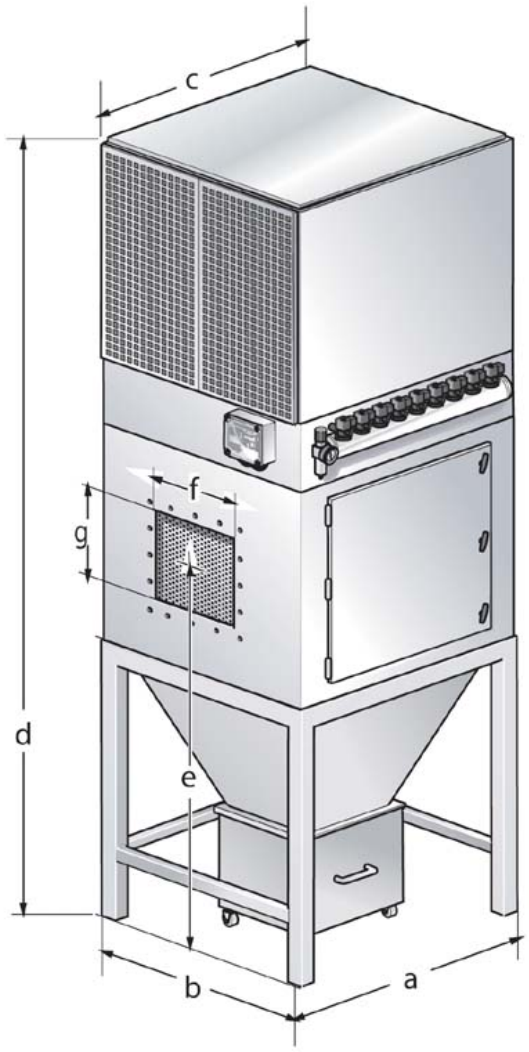
Housing material:	1.0037 (DIN EN 10025)
Surface protection:	EPS powder coating, RAL 7035 light grey
Max. operating pressure:	- 50 mbar
Max. operating temperature:	50 °C without acoustic hood 40 °C with acoustic hood
Dust collector capacity*:	Type S1: 50 l Type S3: 200 l
Maintenance doors:	Sizes 010x1 and 020x16: 1 St. Sizes 024x16 and 029x16: 2 St.
Cartridges	Type 852 032 Ti ...** (328 NKQ data sheet)

Cleaning

Cleaning system:	MAHLE multijet nozzle
Medium:	Oil, dust and condensate-free compressed air at operating temperature
Compressed air connection:	G½ female
Max. air pressure:	6 bar
Compressed air consumption*:	approx. 60 l to 70 l (fad.) per cleaning cycle
Pulse duration:	0.2 s
Controller:	Δp controlled (MFS-05 dp data sheet)
Valves:	Electric membrane valves

* According to version

** Filter material depending on application



6. Dimensions

Dust collector						Dimensions [mm]					
Type designation	Volume flow* [m³/h]	No. of cartridges	Size	Type of construction	Weight** [kg]	a	b	c	d	e	fxg
SFK-09 004 010x10 S1...	1800 - 7200	4	010x10	S1	800	1015	1015	1100	3636	1500	300x300
SFK-09 004 010x10 S3...				S3	780				3356	1220	
SFK-09 009 016x16 S1...	4050 - 16200	9	016x16	S1	1630	1615	1615	1600	4567	2130	450x450
SFK-09 009 016x16 S3...				S3	1470				3786	1349	
SFK-09 012 020x16 S1...	5400 - 21600	12	020x16	S1	2090	2035		2020	4567	2130	600x600
SFK-09 012 020x16 S3...				S3	1940				3786	1349	
SFK-09 015 024x16 S1...	6750 - 27000	15	024x16	S1	2410	2455		2440	4567	2130	2x450x450
SFK-09 015 024x16 S3...				S3	2180				3786	1349	
SFK-09 018 029x16 S1...	8100 - 32400	18	029x16	S1	2780	2875		2860	4567	2130	
SFK-09 018 029x16 S3...				S3	2520				3786	1349	

* These values may vary depending on the nature of the dust, the composition of the air and the filter media.

** Weight with fan and acoustic hood. These values may vary depending on the size of the fan.

7. Ordering example

Basic unit				Optional equipment	
Type	**No. of cartridges**	**Size**	**Version**	**Dust bucket**	**Dust drawer**
SFK-09	018	016 x 16	S1		
			S3		

8. Design

Please contact us for detailed technical information, any open questions and for general expert advice. Completion of the relevant questionnaire would facilitate in the coordination of all important parameters.
Comprehensive documentation on our product range, cleaning units and elements can be provided. For more information about installation and operation, please refer to our Instruction Manual.

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MAHLE

Industrial Filtration

Dust collector
SFR-08

Rectangular type

1. Features

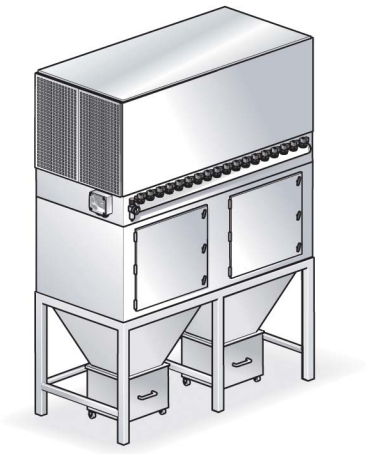
This unit is manufactured from sturdy steel sheets. The individual housing parts are assembled from bended metal segments that are bolted together and sealed with silicone-free seals.

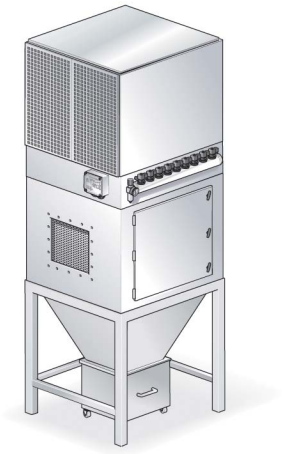
Characteristics

- Compact, space-saving design
- Easy to maintain
- Low noise level
- Efficient, energy-saving cleaning with compressed air by means of MAHLE rotating wing
- Volume flow range 5400 to 26900 m³/h
- Filter surfaces 135 to 360 m²
- Cartridges changed on the dirt air side
- Worldwide distribution

2. Versions

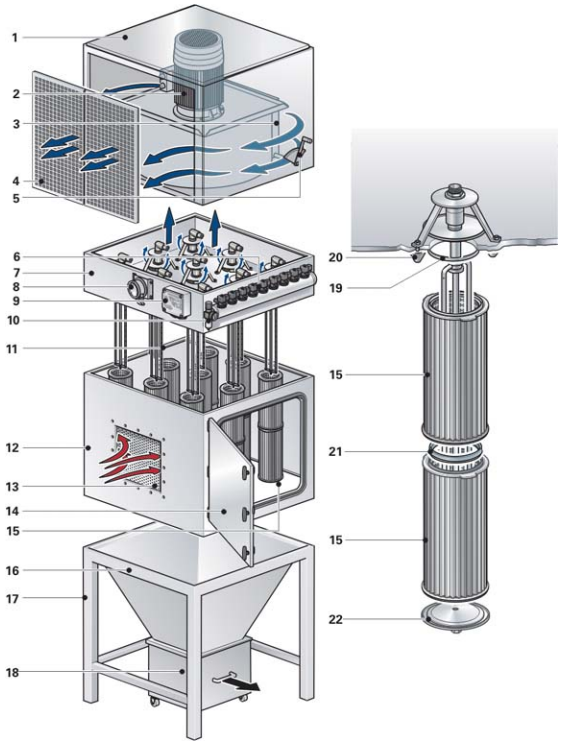
S3, with dust drawer





S1, with dust bucket

3. Modules and accessories



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1	Acoustic hood
2	Fan
3	Lamella valve for volume flow (optional)
4	Blow-out grid
5	Lever for lamella valve for volume flow (optional)
6	Pressure vessel with membrane valves
7	Clean air section
8	Differential pressure gauge (optional)
9	Filter controller
10	Pressure reducer
11	Cleaning unit (rotating wing)
12	Dirt air section
13	Dirt air inlet with baffle plate
14	Maintenance door
15	Cartridge
16	Dust collector hopper
17	Rack
18	Dust bucket
19	Centre ring
20	Holding bolt
21	Double centre ring
22	Reusable end cap

4. Funktional description

The dust-laden air flows into the side of the filter housing (12). The perforated baffle plate (13) in the inlet region assures a uniform flow distribution and enables coarse particles to be pre-separated. As it flows through the cartridge (15), fine dust is separated on the surface. The filter cake is cleaned off at fixed intervals, depending on the dust load and the filter surface load. The detached dust drops down through the hopper (16) and is collected in the bucket (18). The cleaned air flows into the clean air section (7) and is discharged via the blow-out grid (4). The fully automatic compressed air cleaning system comprises a pressure vessel with membrane valves (6), an electronic Δ p controller (9) and the cleaning units (11).

5. Technical Data

Dust collector

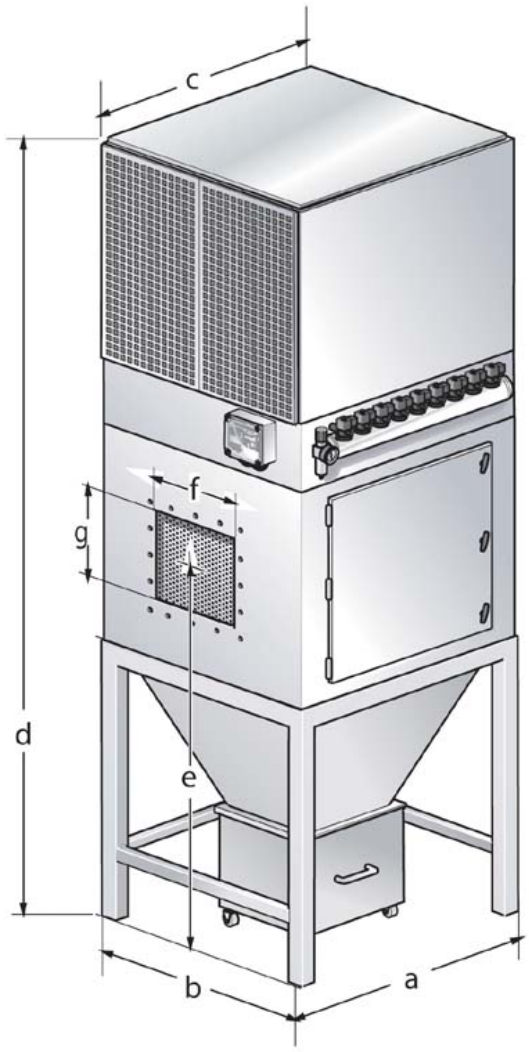
Housing material:	1.0037 (DIN EN 10025)
Surface protection:	EPS powder coating, RAL 7035 light grey
Max. operating pressure:	- 50 mbar
Max. operating temperature:	70 °C without acoustic hood 40 °C with acoustic hood
Dust collector capacity*:	Type S1: 50 l Type S3: 200 l
Maintenance cover (doors):	Sizes 016x16 and 020x16: 1 St. Sizes 024x16 and 029x16: 2 St.
Cartridges	Type 852 908 Ti ...** (328 NZ data sheet)

Cleaning

Cleaning system:	MAHLE rotating wing
Medium:	Oil, dust and condensate-free compressed air at operating temperature
Compressed air connection:	G½ female
Max. air pressure:	4 bar
Compressed air consumption*:	approx. 60 l to 70 l (fad.) per cleaning cycle
Pulse duration:	1.5 s
Controller:	Δp controlled (MFS-05 dp data sheet)
Valves:	Electric membrane valves

* According to version

** Filter media depending on application



6. Dimensions

Dust collector						Dimensions [mm]					
Type designation	**Volume flow* [m³/h]**	**No. of cart-ridges**	**Size**	**Type of con-struction**	**Weight [kg]**	**a**	**b**	**c**	**d**	**e**	**f x g**
SFR-08 018 016x16 S1	5400 - 14400	18	016x16	S1	1630	1615	1615	1600	4567	2130	450x450
SFR-08 018 016x16 S3				S3	1470				3786	1349	450x450
SFR-08 024 020x16 S1	7200 - 18800	24	020x16	S1	2090	2035		2020	4567	2130	600x600
SFR-08 024 020x16 S3				S3	1940				3786	1349	600x600
SFR-08 030 024x16 S1	9000 - 22200	30	024x16	S1	2410	2455		2440	4567	2130	2x450x450
SFR-08 030 024x16 S3				S3	2180				3786	1349	
SFR-08 036 029x16 S1	10800 - 26900	36	029x16	S1	2780	2875		2860	4567	2130	
SFR-08 036 029x16 S3				S3	2520				3786	1349	

* These values may vary depending on the nature of the dust, the composition of the air and the filter media.

Technical data is subject to change without notice!

7. Ordering example

Basic unit				Optional equipment	
Type	**No. of cartridges**	**Size**	**Version**	**Dust bucket**	**Dust drawer**
SFR-08	018	016x16	S1		
			S3		

8. Design

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MAHLE Industry

Dust collector
SFR-09

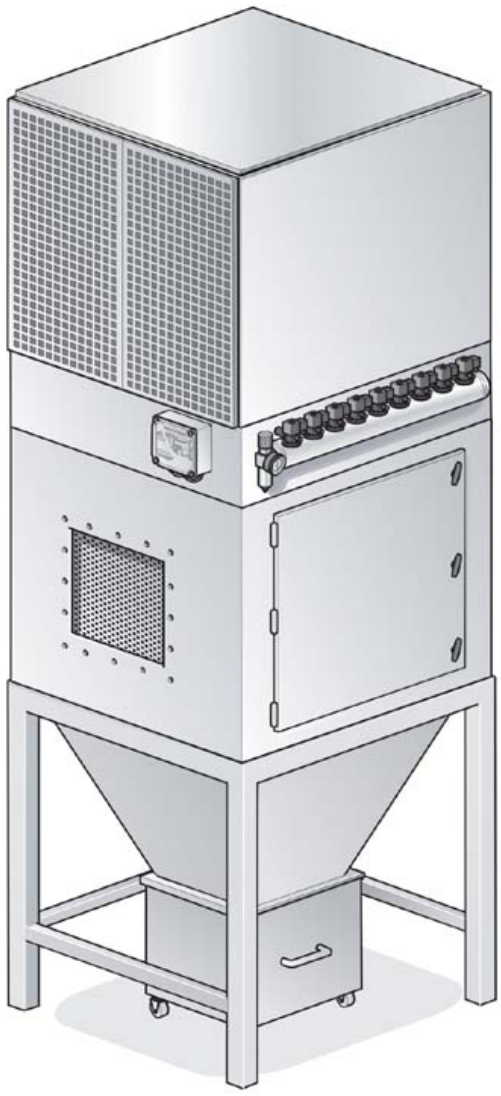
Rectangular type

1. Features

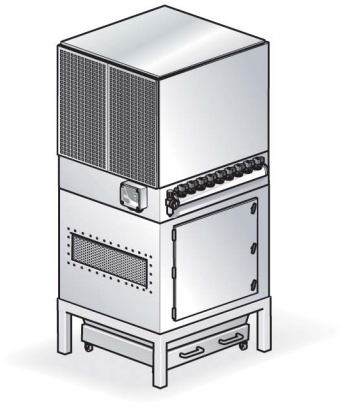
This unit is manufactured from sturdy steel sheets. The individual housing parts are assembled from bended metal segments that are bolted together and sealed with silicone-free seals.

Characteristics

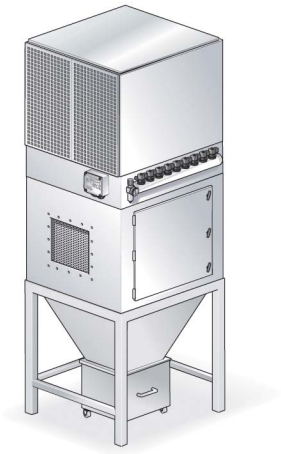
- Compact, space-saving design
- Easy to maintain
- Low noise level
- Efficient, energy-saving cleaning with compressed air by means of MAHLE rotating wing
- Volume flow range 1800 to 32400 m³/h
- Filter surfaces 60 to 270 m²
- Cartridges changed on the dirt section
- Worldwide distribution



2. Versions

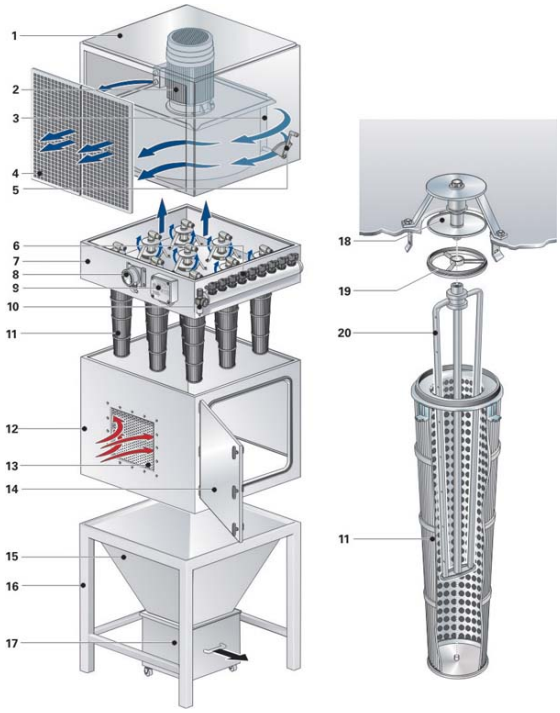


S3, with dust drawer



S1, with collection bin

3. Modules and accessories



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1	Fan silencer
2	Fan
3	Volume control damper (optional)
4	Discharge grille
5	Adjusting lever for volume control damper (optional)
6	Pressure vessel with membrane valves
7	Clean section
8	Differential pressure gauge (optional)
9	Cleaning controller
10	Pressure reducer
11	Cartridge
12	Dirt section
13	Air inlet with baffle plate
14	Access door
15	Discharge hopper
16	Support frame
17	Collection bin
18	Dam plate
19	Center ring
20	Cartridge cleaning nozzle (rotating wing)

4. Funktional description

The dust-laden air flows into the side of the filter housing (12). The perforated baffle plate (13) in the inlet region assures a uniform flow distribution and enables coarse particles to be pre-separated. As it flows through the cartridge (11), fine dust is separated on the surface. The filter cake is cleaned off at fixed intervals, depending on the dust load and the filter surface load. The detached dust drops down through the hopper (15) and is collected in the bin (17). The cleaned air flows into the clean section (7) and is discharged via the discharge grille (4). The fully automatic compressed air cleaning system comprises a pressure vessel with membrane valves (6), an electronic Δ p controller (9) and the cleaning nozzles (20).

5. Technical Data

Dust collector

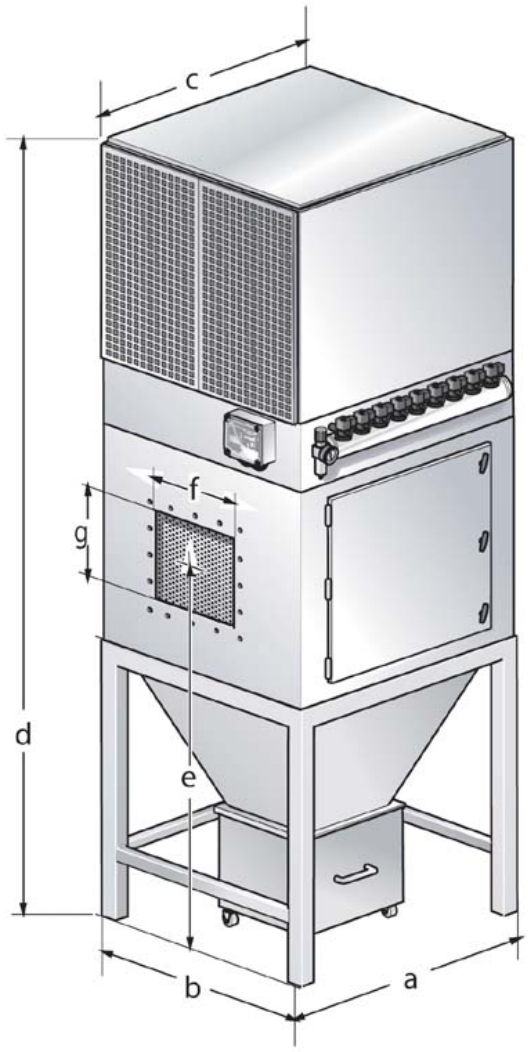
Housing material:	1.0037 (DIN EN 10025)
Surface protection:	EPS powder coating RAL 7035 light grey
Max. operating pressure:	- 50 mbar
Max. operating temperature:	50 °C without fan silencer 40 °C with fan silencer
Dust collector capacity*:	Type S1: 50 l Type S3: 200 l
Access doors:	Sizes 010x10 to 020x16: 1 x Sizes 024x16 and 029x16: 2x
Cartridges	Type 852 032 Ti ...** (338 NKQ data sheet)

Cleaning

Cleaning system:	MAHLE rotating wing
Medium:	Oil, dust and condensate-free compressed air at operating temperature
Compressed air connection:	G½ female
Compressed air:	4 bar (max. 6 bar)
Compressed air consumption*:	Approx. 60 l to 70 l (fad) per cleaning pulse
Pulse duration:	1.5 s
Controller:	Δ p controlled (MFS-05 dp data sheet)
Valves:	Electric membrane valves

* Depending on version

** Filter media depending on application



6. Dimensions

Dust collector						Dimensions [mm]					
Type designation	Volume flow* [m³/h]	No. of cart-ridges	Size	Ver-sion	Weight** [kg]	a	b	c	d	e	fxg
SFR-09 004 010x10 S1...	1800 - 7200	4	010x10	S1	800	1015	1015	1100	3636	1500	300x300
SFR-09 004 010x10 S3...				S3	780				3356	1220	
SFR-09 009 016x16 S1...	4050 - 16200	9	016x16	S1	1630	1615	1615	1600	4567	2130	450x450
SFR-09 009 016x16 S3...				S3	1470				3786	1349	
SFR-09 012 020x16 S1...	5400 - 21600	12	020x16	S1	2090	2035		2020	4567	2130	600x600
SFR-09 012 020x16 S3...				S3	1940				3786	1349	
SFR-09 015 024x16 S1...	6750 - 27000	15	024x16	S1	2410	2455		2440	4567	2130	2x450x450
SFR-09 015 024x16 S3...				S3	2180				3786	1349	
SFR-09 018 029x16 S1...	8100 - 32400	18	029x16	S1	2780	2875		2860	4567	2130	
SFR-09 018 029x16 S3...				S3	2520				3786	1349	

* These values may vary depending on the nature of the dust, the composition of the air and the filter media.

** Weight with fan and fan silencer. These values may vary depending on the size of the fan.

Technical data is subject to change without notice!

7. Ordering example

Basic unit				Optional equipment	
Type	**No. of cartridges**	**Size**	**Version**	**Collection bin**	**Dust drawer**
SFR-09	009	016x16	S1	■	
			S3		■

8. Design

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MAHLE Industry

Dust collector
SFK-27

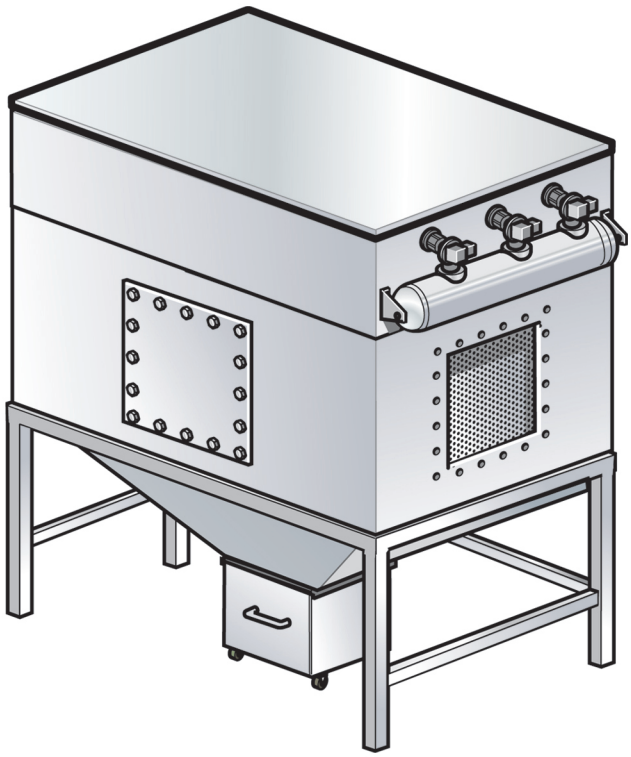
Rectangular type

1. Features

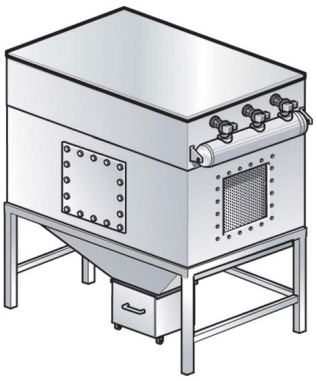
This unit is manufactured from sturdy steel sheets. The individual housing parts are assembled from bended metal segments that are bolted together and sealed with silicone-free seals.

Characteristics

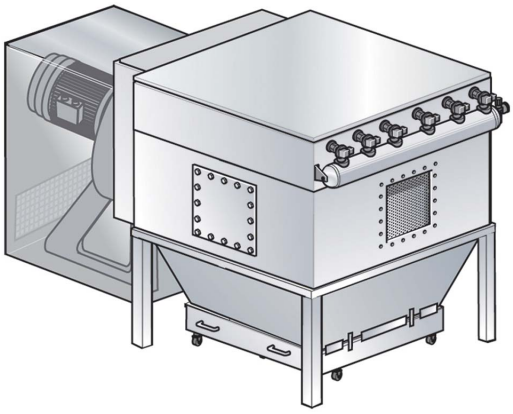
- Compact, space-saving design
- Easy to maintain
- Cartridges changed on the clean side
- Volume flow range 4500 to 24,000 m³/h
- Filter surfaces 73.5 to 196 m²
- Worldwide distribution



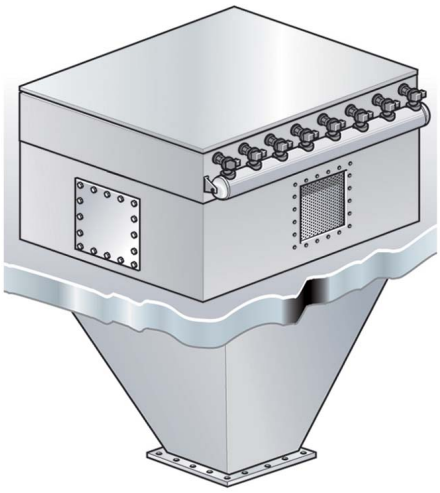
2. Versions



S1, with dust bucket

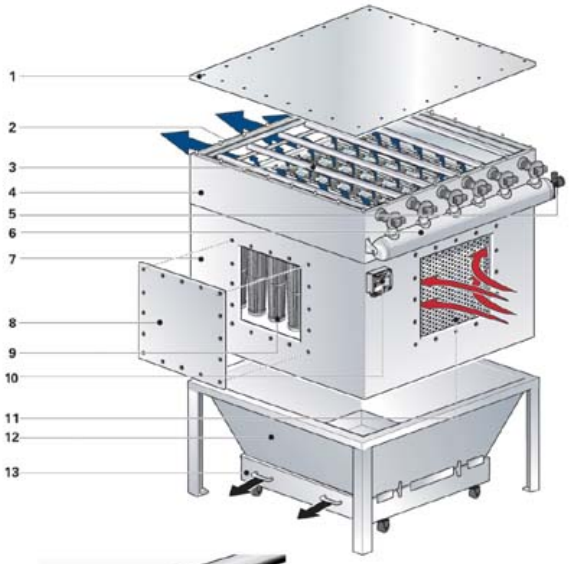


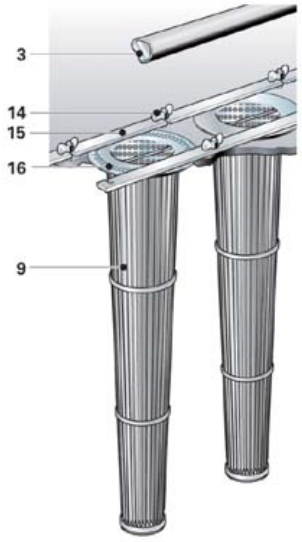
S3, with dust drawer and external fan



S6, with cone

3. Modules and accessories





1 Maintenance cover
2 Blow-out opening
3 Cleaning pipe
4 Clean air section
5 Pressure reducer
6 Pressure vessel with membrane valves
7 Dirt air section
8 Maintenance cover (2x)
9 Cartridge
10 Filter controller
11 Dirt air inlet with baffle plate
12 Dust collector hopper with rack
13 Dust drawer
14 Wing screws
15 Filter mounting angle
16 Seal

4. Functional description

The dust-laden air flows into the side of the filter housing (7). The perforated baffle plate in the inlet region assures a uniform flow distribution and enables coarse dust particles to be pre-separated. As it flows through the cartridge (9), fine dust is separated on the surface. The filter cake is cleaned off at fixed intervals, depending on the dust load and the filter surface load. The detached dust drops down through the hopper (12) and is collected in the drawer (13). The cleaned air flows into the clean air section (4) and is discharged via the blow-out opening (2). The fully automatic compressed air cleaning system comprises a pressure vessel with membrane valves (6), an electronic time controller (10) and the cleaning pipes (3).

5. Technical data

Dust collector

Housing material: 1.0037 (DIN EN 10025)
Surface protection: EPS powder coating, RAL 7035 light grey
Max. operating pressure: - 50 mbar
Max. operating temperature: 70 °C without acoustic hood
40 °C with acoustic hood
Dust collector capacity *: Type S1: 50 l
Type S3: 80 l
Maintenance covers: Dirt air side: 2 x
Clean air side: 1 x

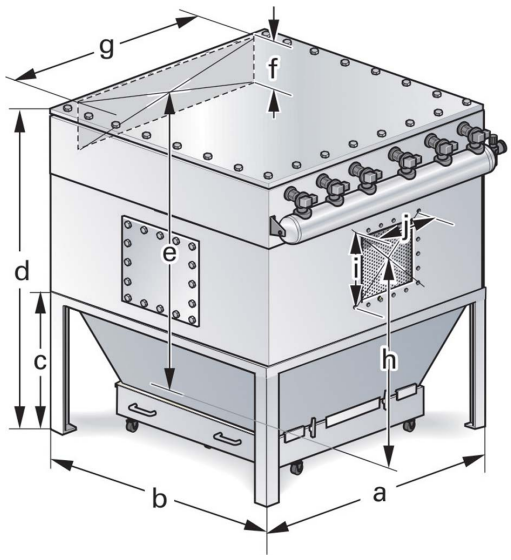
Cartridges

Reusable inner frame: Type 852 931 Ti ...**
(160 NKC data sheet)
Integrally moulded inner frame: Type 852 954 Ti ...**
(160 NKC data sheet)

Cleaning

Cleaning system: MAHLE cleaning pipe
Medium: Oil, dust and condensate-free compressed air at operating temperature
Compressed air connection: G½ female
Max. compressed air.: 6 bar
Compressed air consumption*: Approx. 120 l (fad) per cleaning pulse
Pulse duration: 0.2 s
Controller: Time controlled
(MFS-05 data sheet)
Valves: Electric membrane valves

* Depending on version
** Filter media depends on application



6. Dimensions

Dust collector						Dimension [mm]							
Type designation	Volume flow* [m³/h]	No. of cartridges	Size	Type of construction	Weight [kg]	a	b	c	d	e	f x g	h	i x j
SFK-27 021 010x16 S1	4500-9000	21	010x16	S1	840	1050	1615	1471	2816	2130	330x800	1916	450x450
SFK-27 021 010x16 S3				S3	710			655	2000	1349		1100	
SFK-27 042 016x16 S1	9000-18000	42	016x16	S1	1010	1615		1471	2816	2130	330x1200	1916	600x600
SFK-27 042 016x16 S3				S3	850			685	2000	1349		1100	
SFK-27 056 021x16 S1	12000-24000	56	021x16	S1	1350	2095		1471	2816	2130	330x1700	1916	700x700
SFK-27 056 021x16 S3				S3	1200			685	2000	1349		1100	

* These values may vary depending on the nature of the dust, the composition of the air and the filter media.

Technical data is subject to change without notice!

7. Ordering example

Basic unit				Optional equipment		
Type	Number of cartridges	Size	Version	Dust bucket	Dust drawer	Cone
SFK-27	042	016x16	S1	■		
			S3		■	
			S6			■

8. Design

Please contact us for detailed technical information, any open questions and for general expert advice. Completion of the relevant questionnaire would facilitate in the coordination of all important parameters.
Comprehensive documentation on our product range, cleaning units and cartridges can be provided. For more information about installation and operation, please refer to our Instruction Manual.

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MAHLE Industry

Dust collector
SFK-27 A

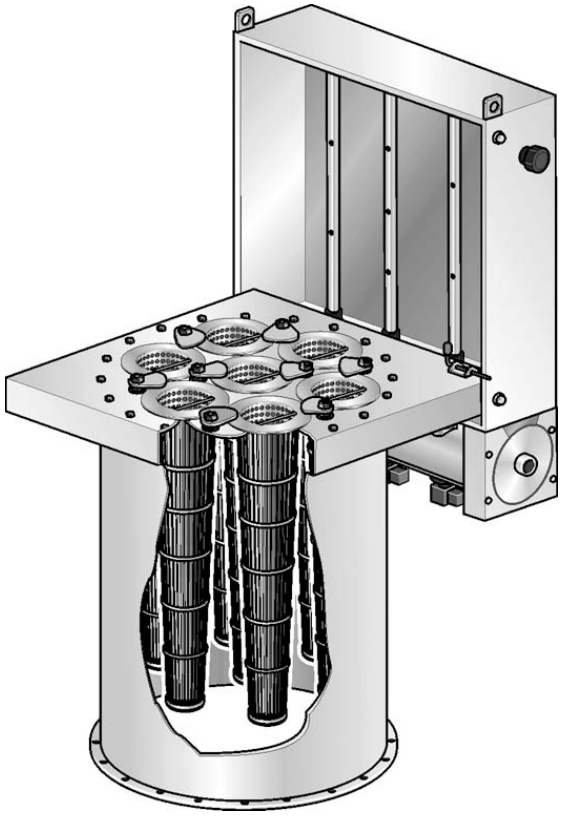
Flanged-body-type-filter, circular construction

1. Features

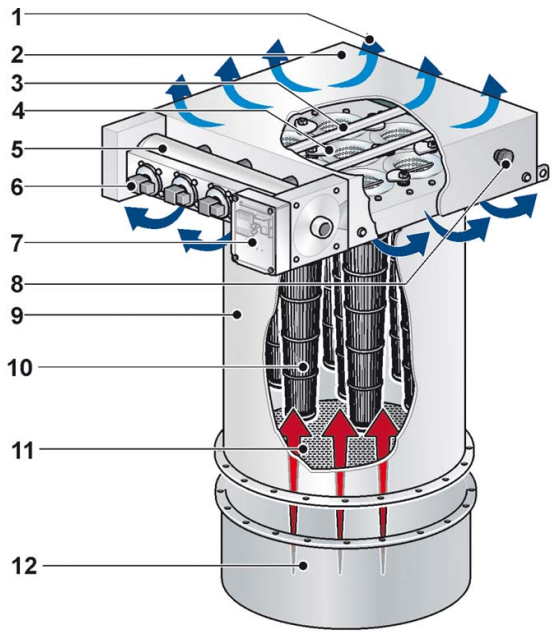
The unit is manufactured from sturdy steel sheets. It is flanged onto the top of a silo or tank. For fast changing of the cartridges the hood is to be swing opened.

Characteristics

- Maximum performance due to the conical cartridges
- Compact, save-spacing design
- High separation efficiency
- Max. volume flow up to 2100 m³/h
- Max. filter surface 24,5 m²
- Cartridges changed on the clean air side
- Easy to maintain
- Worldwide distribution



2. Modules and accessories



1 Clean air outlet
2 Hood
3 Cleaning pipes
4 Cartridge fixing
5 Pressure vessel
6 Membrane valves
7 Filter controller
8 Star handle
9 Dirt air section
10 Cartridges
11 Dirt air inlet
12 Welded frame (option)

3. Functional description

Die staubbeladene Verdrängungsluft, die beim pneumatischen Befüllen von Silos und Behältern mit Schüttgütern entsteht, tritt von unten (11) in das Filtergehäuse (9) ein. As it flows through the cartridges (10) fine dust is separated on the surface (10. The filter cake is cleaned off at fixed intervals, depending on the dust load and the filter surface load. The membrane valves (6) are controlled by means of the electronic controller(7). Der abgelöste Staub fällt nach unten zurück in den Silo oder Behälter. Die gereinigte Verdrängungsluft (1) tritt seitlich an der Wetterhaube (2) aus.
Die vollautomatische Spülluftabreinigung besteht aus einem Druckluftbehälter (5) mit Membranventilen (6), einer elektronischen Filtersteuerung (7) und den Abreinigungslanzen (3).

4. Technical data

Dust collector

Housing material:	1.0037/S235JR optional stainless steel
Surface protection:	zinc coated
Weight:	100 kg
Volumene flow:	1000 m³/h
Max. operating pressure:	-0,3 to +1 bar
Max. operating temperature:	-20 to +50 °C

Cartridges

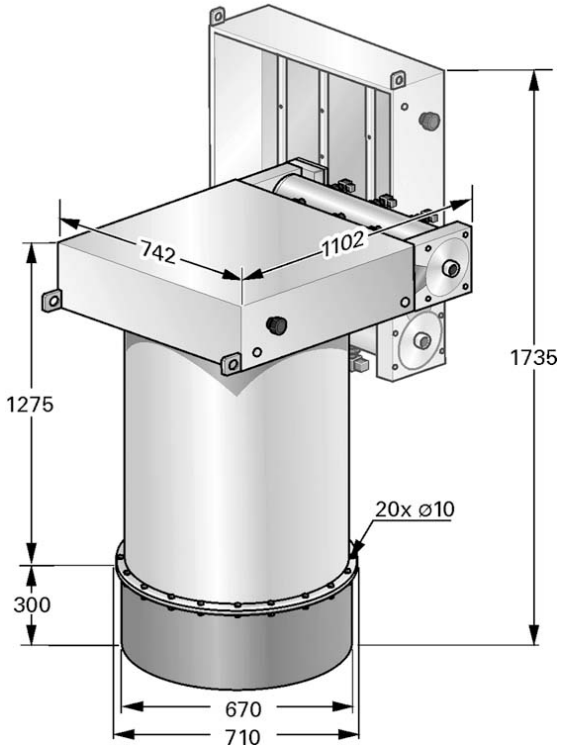
Number of cartridges:	6 or 7
Reusable inner frame:	Type 852 931 Ti ...** (Data sheet 160 NKC)
Integrally moulded inner frame:	Type 852 954 Ti ...** (Data sheet 160 NKC)

Cleaning

Cleaning system:	MAHLE cleaning pipe
Medium:	Oil, dust and condensate-free compressed air at operating temperature
Compressed air connection:	G½
Max. air pressure:	6 bar
Compressed air consumption*:	Approx. 17 m³/h
Pulse duration:	0,2 s
Controller:	Time controlled 110/240 V, 50 Hz
Valves:	Electric membrane valve

* These values may vary depending on the nature of the dust, the composition of the air and the filter media.
** Filter media depends on application

5. Dimensions



6. Ordering example

Basic unit			
Type	**No. of cartridges**	**Size**	**Version**
SFK-27	007	DN-063	A

see data sheet dust collectors model code

7. Design

Please contact us for detailed technical information, any open questions and for general expert advice. Completion of the relevant questionnaire would facilitate in the coordination of all important parameters.
Comprehensive documentation on our product range, cleaning units and elements can be provided. For more information about installation and operation, please refer to our Instruction Manual.

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70373949.05/2012

MAHLE Industry

Oil Mist Separator Unit
LGA 600 F/FU

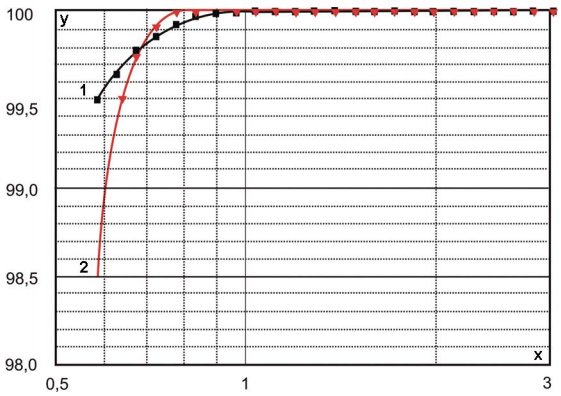
Nominal volume flow 600 m³/h

1. Features

High performance oil mist separator unit for separation of coolant from tooling machine exhaust air

- Compact design
- High oil mist load capacity
- Excellent retention rates
- Quality filters, easy to service
- Equipped with high-efficient coalescer elements
- Optimized service life
- Modular design for direct installation of main components into tooling machines
- Worldwide distribution

2. Fractional collection efficiency

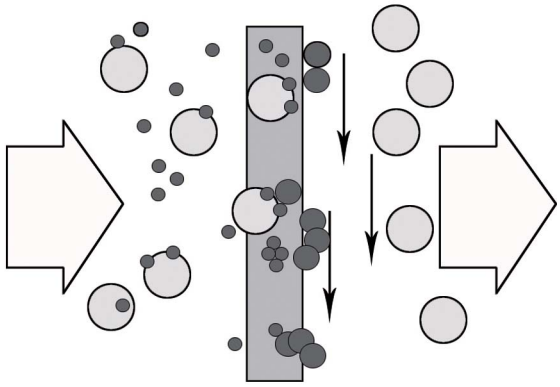


x = Particle size in µm
y = Fractional retention rate in %

Aerosol: Wiolan SH 10
Raw gas concentration: 50 mg/m³
Volume flow: 600 m³/h

1 = Filter cartridge as delivered
2 = Filter cartridge after 100 operating hours

3. Operating principle



Oil aerosols are sucked away from the machining space of machine tools. The oil-laden air flows outward through the coalescer element from the inside. The oil attaches itself to the fibre media as it passes through the filter. Minute oil droplets "coalesce" to form larger drops. These larger droplets migrate downwards on the coalescer element due to gravity. The oil accumulates at the bottom of the housing and is returned to the cooling lubricant storage reservoir via the oil drain hose and the membrane valve. The vacuum in the filter housing causes external air to be sealed off by the membrane valve. The valve opens automatically when the oil in the drain hose reaches a height of at least 500 mm. The cleaned airflow is sucked away by means of a high-pressure fan and blown out at the top through a silencer.

4. Application

Suitable for non-water-miscible cooling lubricants (cutting oil, grinding oil, drilling oil) and oil aerosol exhausted by machine tools and also for water-miscible cooling lubricants.

Operating limits

If oil is used as cooling lubricant for machining processes, air usually has to be sucked away from the working area to prevent the atomized oil from dispersing. The concentrations that often occur in the cooling lubricant jet or in the machine room could result in ignition in case of tool breakage, for example. If the machining process involves flammable cooling lubricants or flammable materials, safe operation must be ensured by providing suitable fire and explosion protection devices in conformance with statutory regulations.

5. Product information

LGA 600 F
The LGA 600 F is driven by a frequency controlled motor. The motor runs at the maximum permissible speed. At initial operation the volume flow achieves approx. 1300 m³/h at low differential pressure. This flow rate is reduced to around 600 m³/h within one or two days, depending on the raw gas concentration.

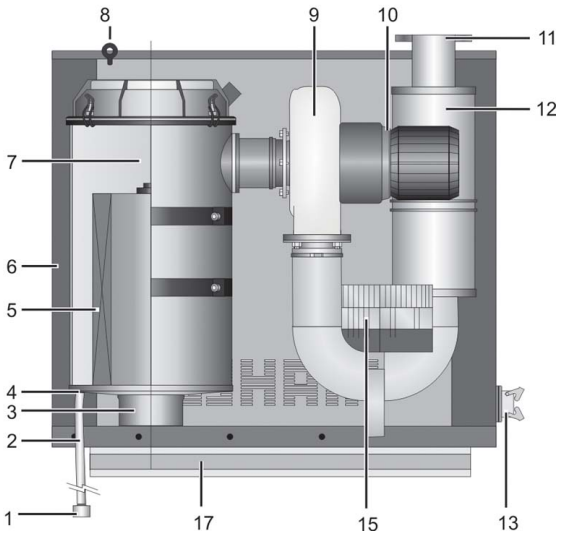
LGA 600 FU
The LGA 600 FU is driven by a frequency controlled motor. A volumetric flowrate sensor supplies the actual value required to obtain a constant volume flow of 600 m³/h. If this value falls below the setpoint, an electrical signal is output at approximately 450 m³/h. These signals can be evaluated to enable suitable maintenance action to be taken.

Installation in potentially explosive atmosphere (Zones 0, 1 and 2) is not permitted!

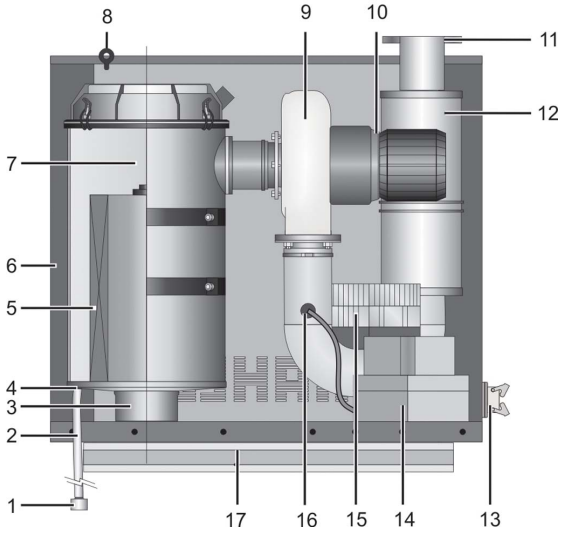
6. Order numbers

Type	Order number
LGA 600 F	70353616
LGA 600 FU	70329105
LGA 600 F (special voltage)	70359300
LGA 600 FU (special voltage)	On request

7. Modules/main components



LGA 600 F



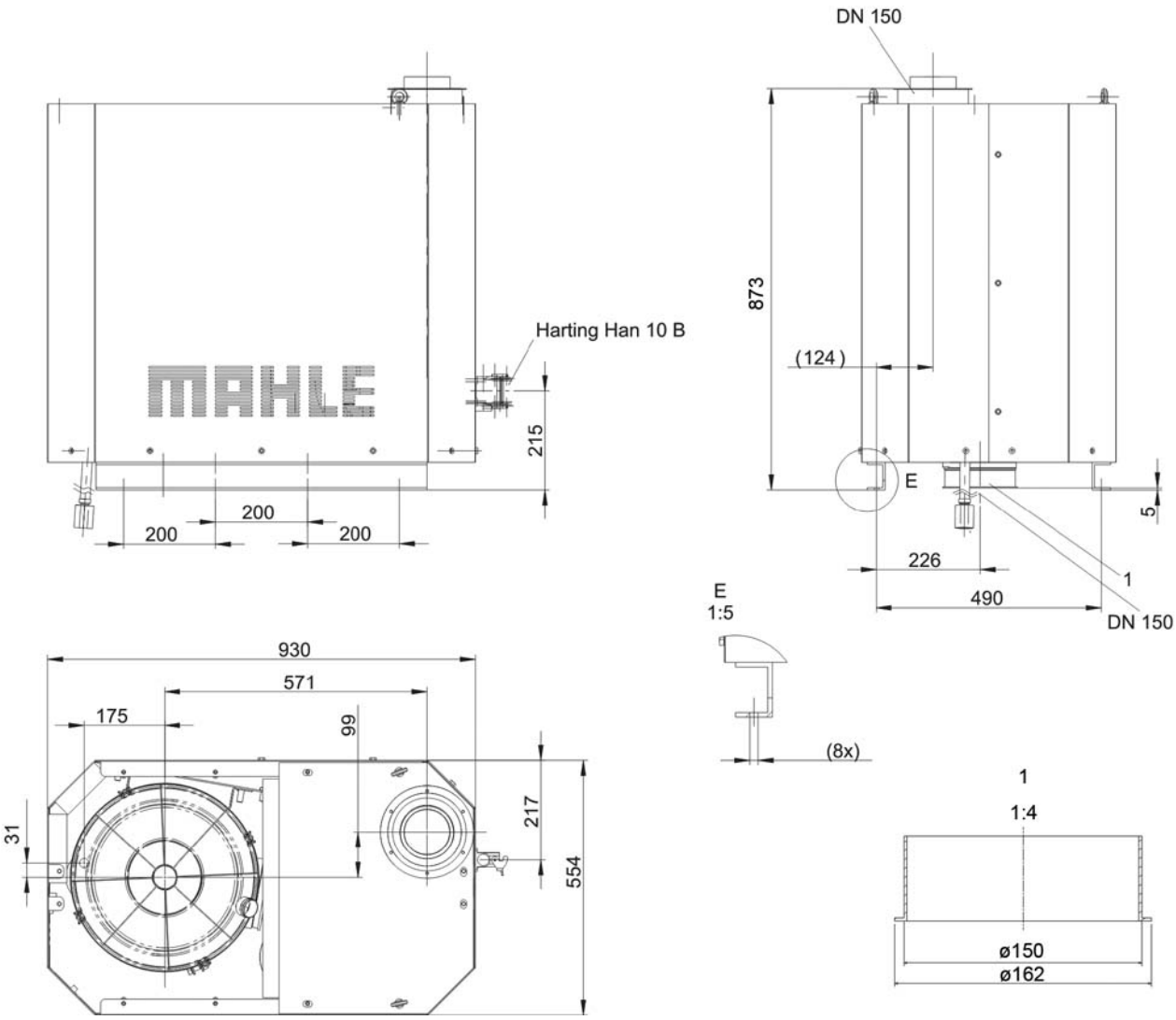
LGA 600 FU

1	Membrane valve
2	Oil hose
3	Air inlet nozzle
4	Oil drain nozzle
5	Coalescer element
6	Housing
7	Filter housing
8	Eyebolt for transport
9	Fan
10	Electric motor
11	Air outlet nozzle
12	Silencer
13	Connection port
14	Control unit
15	Frequency converter
16	Volumetric flowrate sensor
17	Mounting base plate

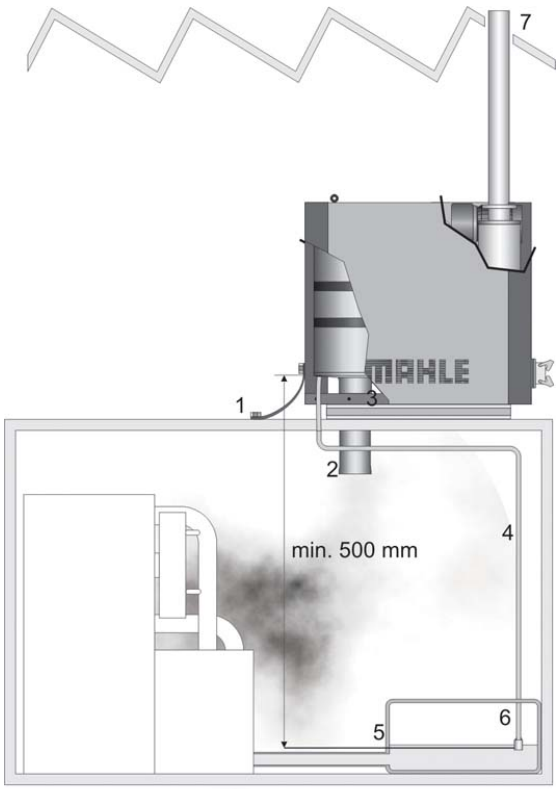
8. Technical data

	LGA 600 F/FU, 400 V/50-60 Hz (standard)	**LGA 600 F/FU, 200 V/50-60 Hz (special)**
Volume flow	600 m³/h	600 m³/h
Temperature range	+ 10 °C to + 60 °C	+ 10 °C to + 60 °C
Nozzles	150 mmm (2x Jacob)	150 mmm (2x Jacob)
Oil hose	PVC transparent 15x2 mm (3 m)	PVC transparent 15x2 mm (3 m)
Filter	1 coalescer element	1 coalescer element
Filter surface	4.6 m²	4.6 m²
Dimensions (LxWxH)	930x555x780 mm	930x555x780 mm
Weight	140 kg	140 kg
Supply voltage	3 AC 400 V/N/PE, 50-60 Hz	3 AC 200 V/N/PE, 50-60 Hz
Current consumption	6.9/4.0 A	7.8/4.6 A
Protection class	IP 54	IP 54
Backup fuse	16 A	16 A
Connection port	Harting 10 B	Harting 10 B
Motor output	2.2 kW	2.2 kW
Motor speed	6140 U/min	6140 U/min
Sound level	72 dB (A)	72 dB (A)

9. Dimensions



10. Installation



1 Equipotential bonding
2 Suction pipe
3 Air inlet nozzle
4 Oil hose
5 Oil storage reservoir
6 Membrane valve
7 Exhaust air

Note the minimum clearance of 480 mm is required for element removal!

11. Spare parts and accessories

Order numbers for spare parts and accessories	
Designation	**Order number**
Coalescer element	79354390
Membrane valve	78769697
Harting easy hood (19 30 010 1540)	70360184
Harting bush insert (09 33 010 2716)	70345233
Jacob hose nozzles	70346551
Jacob clamp ring	79389081
Jacob NBR flanged sealing ring	76141121
Jacob 90° pipe bend	70365712

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70302266.03/2012

MAHLE
Industry

Oil Mist Separator Unit
LGA 600 FUW

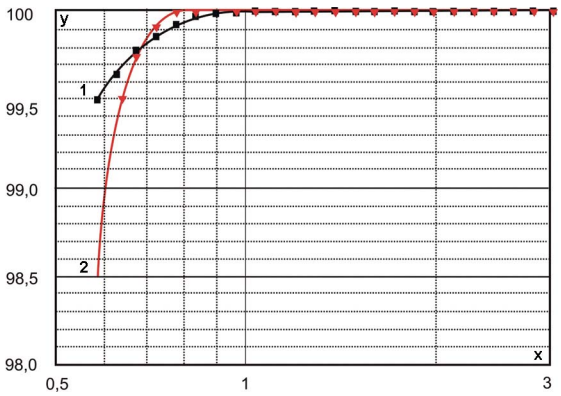
Nominal volume flow 600 m³/h

1. Features

High performance oil mist separator unit for separation of coolant from tooling machine exhaust air

- Compact design
- High oil mist load capacity
- Excellent retention rates
- Quality filters, easy to service
- Equipped with high-efficient coalescer elements
- High dirt holding and optimized service life
- Modular design for direct installation of main components onto tooling machines
- Pre-separation system for optimized service life
- Worldwide distribution

2. Fractional collection efficiency

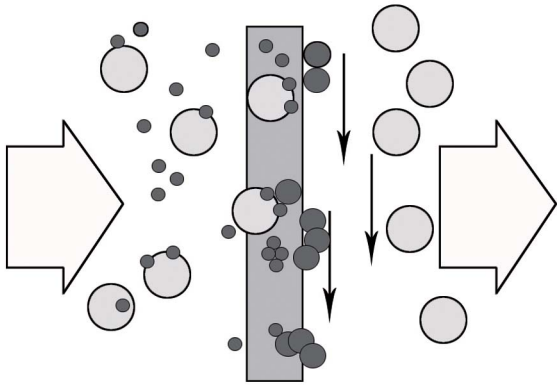


x = Particle size in µm
y = Fractional retention rate in %

Aerosol: Wiolan SH 10
Raw gas concentration: 50 mg/m³
Volume flow: 600 m³/h

1 = Filter cartridge as delivered
2 = Filter cartridge after 100 operating hours

3. Operating principle



Oil aerosols are sucked away from the machining space of machine tools. The oil-laden air flows outward through the coalescer element from the inside. The oil attaches itself to the fibre media as it passes through the filter. Minute oil droplets "coalesce" to form larger drops. These larger droplets migrate downwards on the coalescer element due to gravity. The oil accumulates at the bottom of the housing and is returned to the cooling lubricant storage reservoir via the oil drain hose and the membrane valve. The vacuum in the filter housing causes external air to be sealed off by the membrane valve. The valve opens automatically when the oil in the drain hose reaches a height of at least 500 mm. The cleaned airflow is sucked away by means of a high-pressure fan and blown out at the top through a silencer.

4. Application

Suitable for non-water-miscible cooling lubricants (cutting oil, grinding oil, drilling oil) and oil aerosol exhausted by machine tools and also for water-miscible cooling lubricants.

Operating limits

If oil is used as cooling lubricant for machining processes, air usually has to be sucked away from the working area to prevent the atomized oil from dispersing. The concentrations that often occur in the cooling lubricant jet or in the machine room could result in ignition in case of tool breakage, for example. If the machining process involves flammable cooling lubricants or flammable materials, safe operation must be ensured by providing suitable fire and explosion protection devices in conformance with statutory regulations.

5. Product information

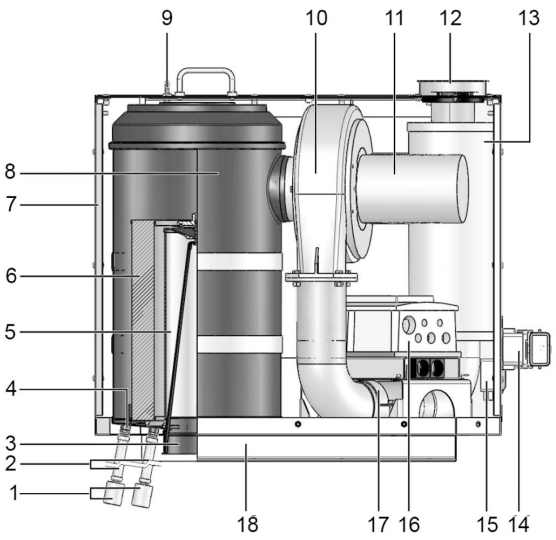
LGA 600 F
The LGA 600 FUW is a filtering separator with optional pre-separation.
It is driven by a frequency controlled motor. A volumetric flowrate sensor supplies the actual value required to obtain a constant volume flow of 600 m³/h. If this value falls below the setpoint, an electrical signal is output at approximately 450 m³/h. These signals can be evaluated to enable suitable maintenance action to be taken.

Installation in potentially explosive atmosphere (Zones 0, 1 and 2) is not permitted!

6. Order numbers

Type	Order number
LGA 600 FUW	70384284

7. Modules/main components

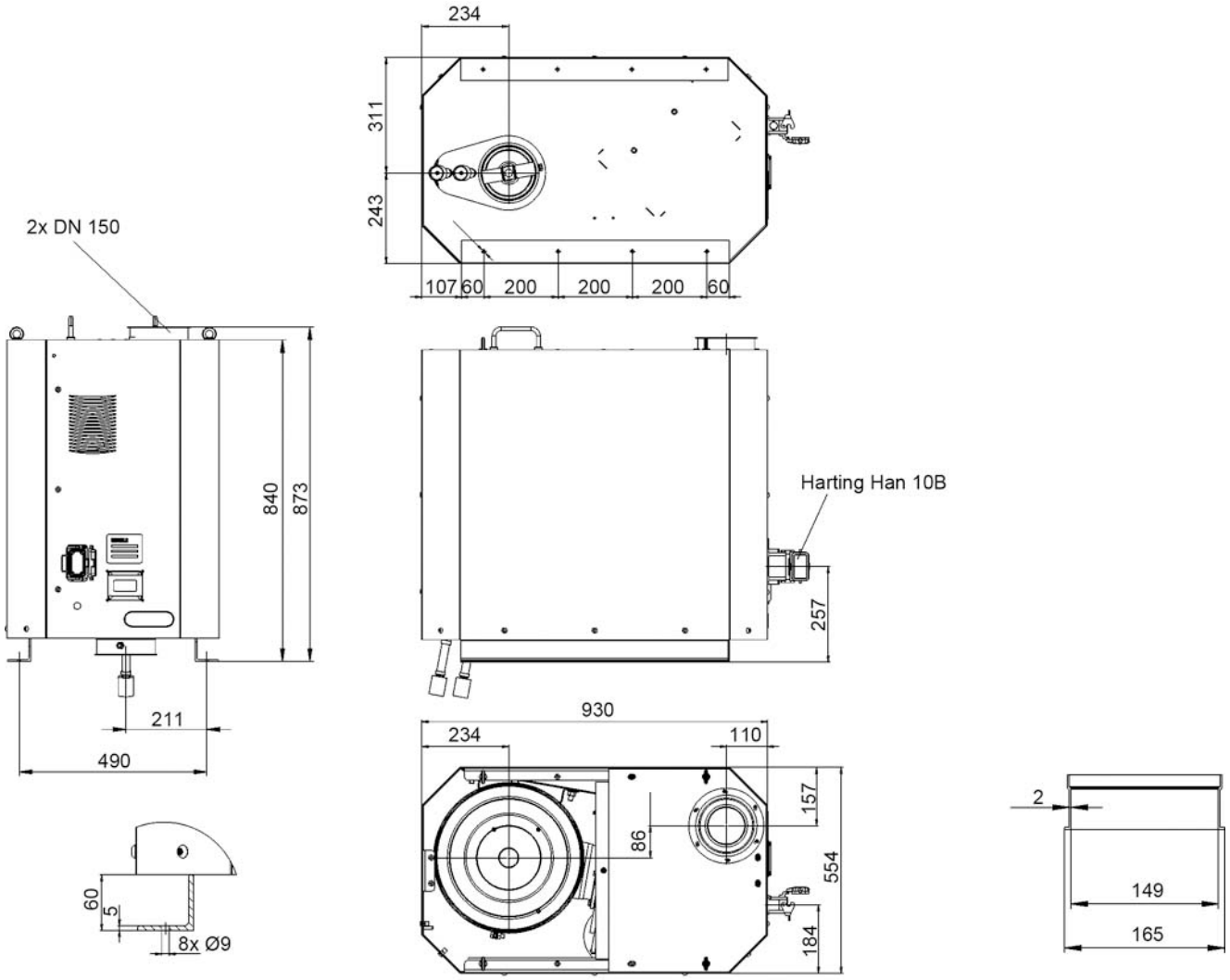


1	Membrane valve (2x)
2	Oil hose (2x)
3	Air inlet nozzle
4	Oil drain nozzle (2x)
5	Pre-separation element
6	Coalescer element
7	Housing
8	Filter housing
9	Eyebolt for transport
10	Fan
11	Electric motor
12	Air outlet nozzle
13	Silencer
14	Connection port
15	Volume flow display
16	Frequency converter
17	Volumetric flowrate sensor
18	Mounting base plate

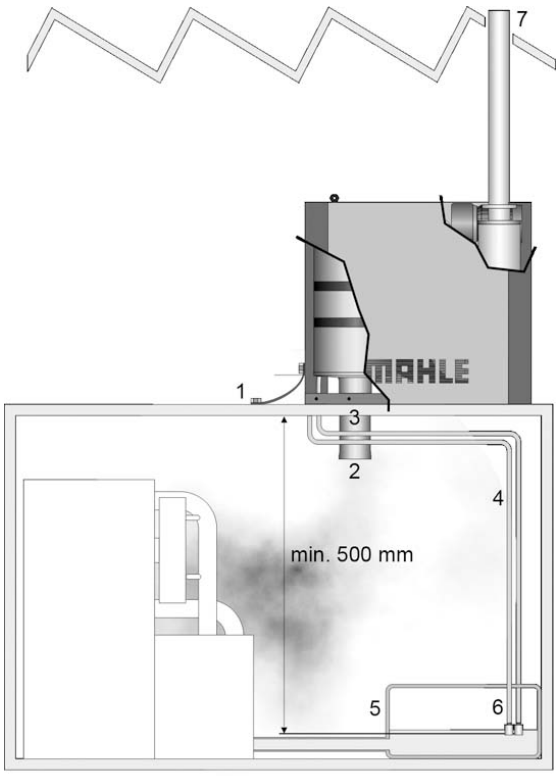
8. Technical data

Volume flow	600 m³/h
Temperature range	+ 10 °C to + 60 °C
Air nozzles (2x Jacob)	150 mmm
Oil hose (2x)	PVC transparent 15x2 mm (3 m)
Filter	1 pre-separation element and 1 coalescer element
Filter surface	4.8 m²
Dimensions (LxWxH)	930x554x840 mm
Weight	140 kg
Supply voltage	3 AC 400 V/PE, 50-60 Hz
Current consumption	3.3 A
Protection class electrical devices	IP54
Backup fuse	10 A
Connection port	Harting 10B
Motor output	1.5 kW
Motor speed	5920 U/min
Sound level	69 dB (A)

9. Dimensions



10. Installation



1 Equipotential bonding
2 Suction pipe
3 Air inlet nozzle
4 Oil hose (2x)
5 Oil storage reservoir
6 Membrane valve (2x)
7 Exhaust air pipe

Note the minimum clearance of 480 mm is required for element removal!

11. Spare parts and accessories

Order numbers for spare parts and accessories	
Designation	**Order number**
Pre-separation element	70517413
Coalescer element	79354390
Membrane valve	78769697
Harting easy hood (19 30 010 1540)	70360184
Harting bush insert (09 33 010 2716)	70345233
Jacob pipe nozzle (11151431)	70346551
Jacob clamp ring (12152903)	79389081
Jacob NBR flanged sealing ring (10156951)	76141121
Jacob 90° bend	70365712

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70517224.02/2012

MAHLE Industry

Equipment technology
Customised devices

If you cannot find the optimal solution to your dust problem in our standard equipment technology, MAHLE can develop a unit specifically tailored to your requirements. Use the questionnaire under "Equipment technology" to describe your problem and simultaneously configure your own personal unit. We invite you to take a look at a few typical customised devices made by MAHLE.

	Customised devices		
	Optional features	**Applications**	
1	Volume flows up to 10.000 m^3/h Pressure burst-proof designs Integrated cyclone effect thanks to tangential air inflow All accessories offered in ATEX design Accessories developed to specification	MAHLE can design special round devices for almost any branch of industry. The special round filter shown here is used for explosive food dusts.	
2	Volume flows greater than 10.000 m^3/h Pressure burst-proof designs All accessories offered in ATEX design Accessories developed to specification	MAHLE can also design special rectangular devices for almost any branch of industry. The special rectangular filter shown here is used to remove dust from a flame spraying system at a volume flow of 15.000 m^3/h.	

Please use our questionnaire to describe your application.
We look forward to preparing you an offer tailored to your individual requirements.

MAHLE
Industry

MAHLE filter controllers
Overview

MAHLE offers the optimum filter controller for any application. Regardless of whether your system needs a simple time control or a fully programmable differential pressure control, MAHLE can deliver the perfect solution. The MAHLE MFS series guarantees trouble-free – and above all energy efficient – filtration and extends the life of your filter cartridges. Your cleaning cycles are reduced to a minimum because you are free to choose your own differential pressure. In combination with conical MAHLE cartridges and a compressed air tank optimised by MAHLE, you can further increase the performance and longevity of your filtration process. We invite you to take a closer look at MAHLE's MFS series in this section and discover the filter controller that most closely matches your needs.

	Filter controllers		
1	**Compact time control**	MFS-05	
2	**Compact differential pressure control**	MFS-05 dp	
3	**Fully programmable differential pressure control**	MFS-09	

MAHLE Industry

Control
MFS-05

Time controlled filter controller

1. Features

The MAHLE filter controller MFS-05 is an easy to operate time control.

Characteristics

- Inexpensive, compact design
- Cleaning with electrically isolated contact
- Instant cleaning with test switch
- Remote signalling by two defined relays: Operation/fault and cleaning optional available
- Remote access to parameters via an RS 485 port (read only) possible
- Worldwide distribution

2. Technical data

Housing

Material:	ABS
Design:	Dust-tight, max. 3x M32/M20 possible, ATEX Ex II 3D T60°C
Protection class:	IP 65
Operating temperature:	0 - 50 °C
Climatic category:	KWF acc. DIN 400040 (≤ 75 % relative humidity, no condensation allowed)

Control lamp

Operation:	LED green
Cleaning:	LED yellow
Fault:	LED red
Valve display:	LED red
Alarm threshold:	LED red

Electrical data

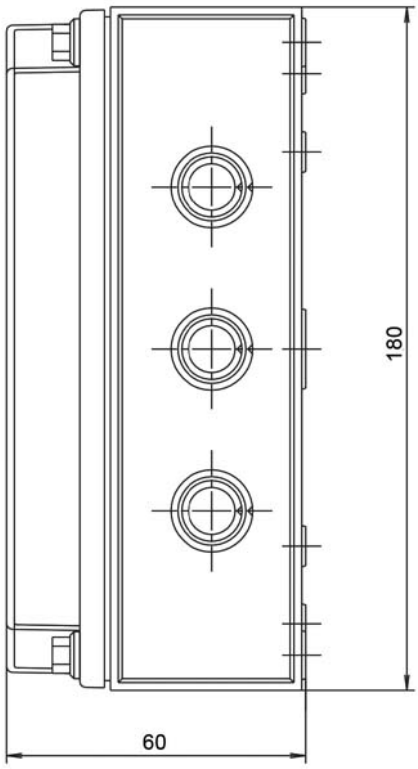
Electrical connection:	Terminal strip 2.5 mm²/valve 1
Voltage (primary):	DC 24 V, AC 230 V/50-60 Hz
Tolerance:	± 10 %
Power:	42 W/30 VA
Mains fuse:	3.15 A time-lag/0.315 A time-lag
Valve outputs:	12 (extendable to 24)
Valve voltage:	DC 24 V
Tolerance:	± 10 %
Valve current:	1 A (for pulse time ≤ 1 s and interval time ≥ pulse time, otherwise 0.5 A)
Relay outputs: (Version with 2 output ralays)	Pin wiring DC 24 V/0.3 A, AC 250/5 A 1 change-over contact for operating/fault message (fail-safe circuit) 1 normaly open for cleaning message
Inputs:	Start or dp input Enable (contact closed)/Stop (contact open) Instant cleaning Fault acknowledgement (button) dp switch (optional)

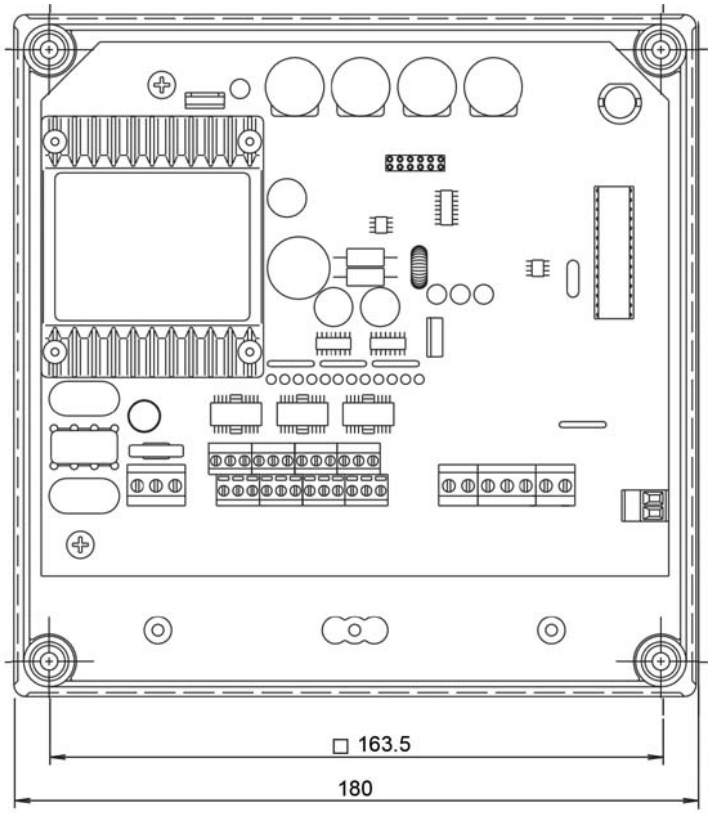
Technical data is subject to change without notice!

3. Order numbers

Order number	Type designation
79743071	MFS-05 DC 24 V, standard
79743477	MFS-05 DC 24 V, 2 relay outputs
79743055	MFS-05 AC 230 V, 50 - 60 Hz, standard
79742974	MFS-05 AC 230 V, 50 - 60 Hz, 2 relay outputs

4. Dimensions





5. Accessories

Order number	Designation
76109664	Valve extension 13 to 24
76186605	Replacement fuses for MFS-05 24 V, 3.15 A time-lag (pack of 5)
76186597	Replacement fuses for MFS-05 230 V, 0.315 A time-lag (pack of 5)

6. Default settings

The controller is delivered with a standard setting to facilitate optimum operation in almost any application. This setting should be checked when the controller is started up for the first time. A service expert can be called in if necessary to alter the setting in the field.
Comprehensive documentation for our product range, cleaning units and cartridges can be provided.
For more information about installation and operation, please refer to our Instruction Manual.

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76399125.05/2012

MAHLE Industry

Control
MFS-05 dp

Differential pressure-controlled filter controller

1. Features

The MAHLE MFS-05 dp filter controller reduces the number of cleaning cycles to a necessary minimum compared to the simple time control principle. It facilitates a longer cartridge service life, improved cleaned gas values, smaller variations in the volume of exhaust air and lower costs for compressed air. The filter controller can be operated in three different modes:

1 . Interval time control: Cyclic cleaning with a variable interval time (time between two cleaning cycles) according to dp
2 . Switching threshold control: A cleaning cycle is tripped when settable dp threshold is reached
3 . Time control: Cyclic cleaning with a fixed interval time

Characteristics

- Inexpensive, compact design
- Settable number of cleaning cycles when the dp threshold is reached
- Remote signalling by three defined relays: Operation/fault, cleaning and settable dp alarm
- Cleaning through potential free contact
- Instant cleaning with test switch
- Remote access to parameters via an RS 485 port (read only) possible
- Digital dp display (0 - 40 bar)
- Worldwide distribution

2. Technical data

Housing

Material:	ABS
Design:	Dust-tight, max. 3x M32/M20 possible, ATEX Ex II 3D T60°C
Protection class:	IP 65
Operating temperature:	0 - 50 °C
Climatic category:	KWF acc. DIN 400040 (≤ 75 % relative humidity, no condensation allowed)

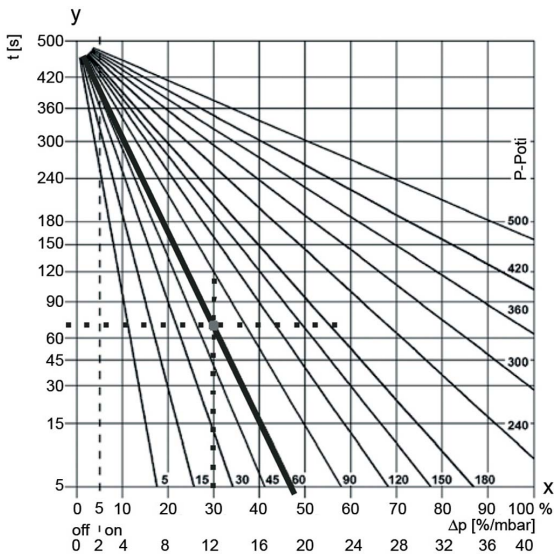
Control lamp

Operation:	LED green
Cleaning:	LED yellow
Fault:	LED red
Valve display:	LED red
Alarm threshold:	LED red

Electrical data

Electrical connection:	Terminal strip 2,5 mm²/valve 1
Voltage (primary):	DC 24V, AC 230 V/50-60 Hz
Tolerance:	± 10 %
Power:	42 W/30 VA
Mains fuse:	3.15 A time-lag, 0.315 A time-lag
Valve outputs:	12 (extendable to 24)
Valve voltage:	DC 24 V
Tolerance:	± 10 %
Valve current:	1 A (for pulse time ≤ 1 s and interval time ≥ pulse time, otherwise 0.5 A)
Relay outputs:	Pin wiring DC 24 V/0.3 A, AC 250/5 A
Analogue output:	0 (4) ... 20 mA
Inputs:	Start or dp input Enable (contact closed)/ Stop (contact open) Post-cleaning Instant cleaning Fault acknowledgement (button)

Technical data is subject to change without notice!

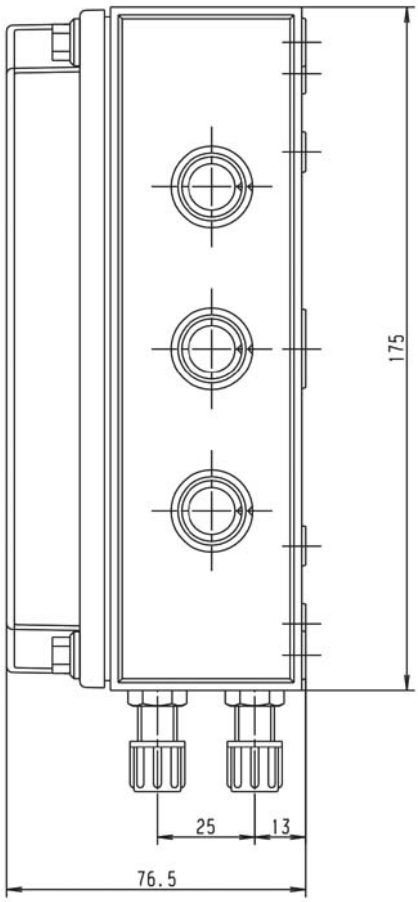


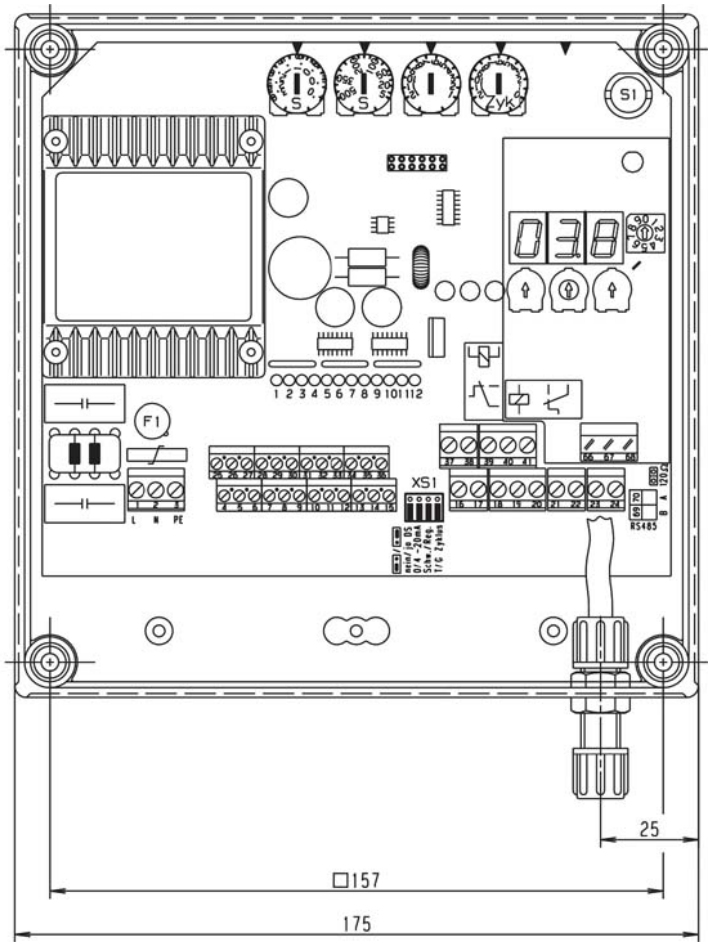
Controller characteristics
x = dp measuring range [%/mbar]
y = interval time t [s]
P-Poti = interval time potentiometer

3. Order numbers

Order number	Type designation
76341846	MFS-05 dp DC 24 V, relay
76341838	MFS-05 dp AC 230 V, 50-60 Hz, relay

4. Dimensions

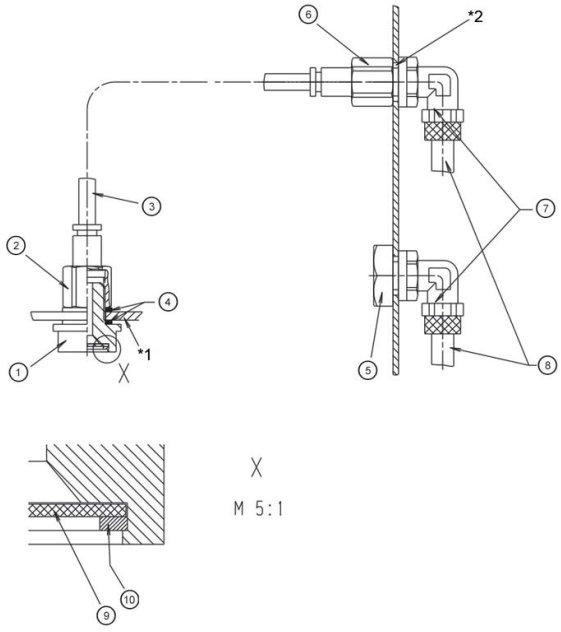




5. Instrument lead set

A set comprising a pressure sensor and instrument lines can be supplied for measuring the differential pressure. Dust protection in the form of a membrane filter is provided at the measuring point for the raw gas. Dirty instrument lines can lead to errors and breakdowns.

Item	Designation
①	Nipple G¼, a/f 21
② ⑥	Screw nut on fitting R¼ OD6, a/f 16
③	Plastic hose PU-4 black, approx. 2 m
④	Sealing ring PVDF
⑤	Pipe nut DIN 431-A-G¼ - 14H
⑦	2x angular screw joint R¼ OD8
⑧	Compressed air hose PU-6 blue, approx. 1.5 m
⑨	Membrane filter
⑩	Snap ring 15x1 DIN 472



*1 = bore Ø 13.5 mm in the filter plate
*2 = bore 2x Ø 14 mm in the housing

6. Accessories

Order number	Designation
76109664	MFS-05 extension
79759846	Instrument lead set for dp sensor
76186605	Replacement fuses for MFS-05 dp 24 V, 3.15 A time-lag (pack of 5)
76186597	Replacement fuses for MFS-05 dp 230 V, 0.315 A time-lag (pack of 5)

7. Default settings

The controller is delivered with a default setting to facilitate optimum in almost any application. This setting should be checked when the controller is started up for the first time. A service engineer can be called in if necessary to alter the setting in the field.
Comprehensive documentation for our product range, cleaning units and cartridges can be provided.
For more information about Installation and operation, please refer to our Instruction Manual.

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MAHLE
Industry

Control
MFS-09

Differential pressure-controlled filter controller

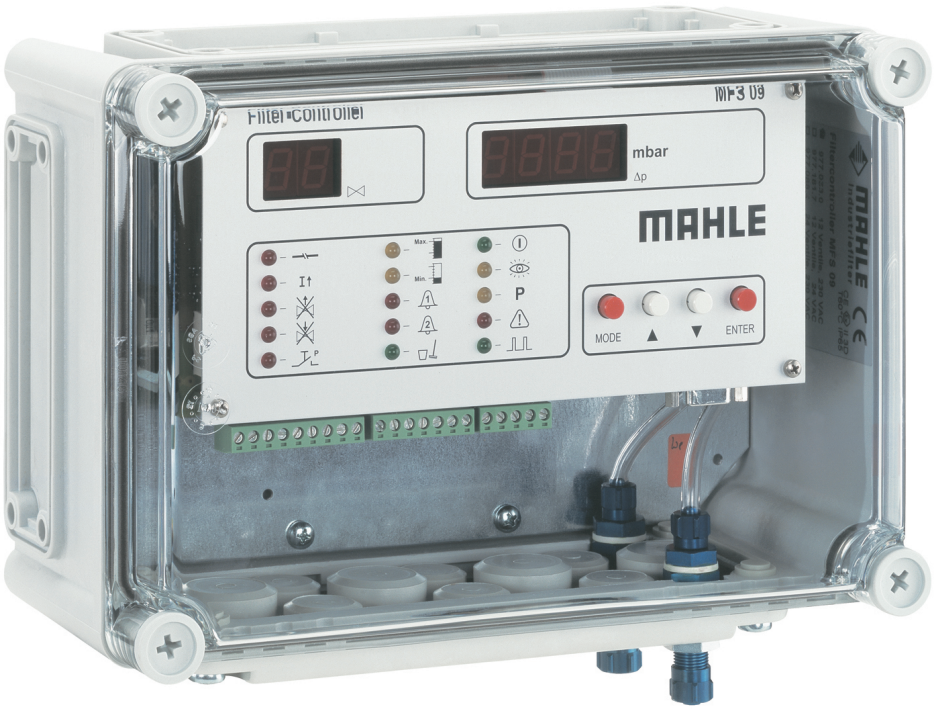
1. Features

The MAHLE MFS-05 dp filter controller reduces the number of cleaning cycles to a necessary minimum compared to the simple time control principle. It facilitates a longer cartridge service life, improved cleaned air values, smaller variations in the volume of exhaust air and lower costs for compressed air.
The filter controller can be operated in seven different modes:

1 . Differential pressure related cleaning
2 . Variable break time (dp-related)
3 . Time controlled cleaning
4 . Pressure switch function
5 . Post cleaning
6 . After-run time for discharge argans
7 . Cycle counting (option)

Characteristics

- Differential value free selectable 0 bis 10 ... 100 mbar
- Digital display of the and current valve
- Exact setting of pulse and break time
- 2 free selectable dp alarms (min./max.)
- 15 LED for operating and fault display
- Flexible selection of functions by menu control, input by 4 buttons
- Optocoupler input for stop, post cleaning, fault acknowledgement and pressure switch
- 3 free selectable relay outputs for operating and fault display
- RS 485 port
- Worldwide distribution



2. Technical data

Housing

Material:	Makrolon
Design:	Dust-tight, max. 10 PG-boltings possible, ATEX Ex II 3D T60°C
Protection class:	IP 65
Operating temperature:	0 - 50 °C
Climatic category:	KWF acc. DIN 400040 (≤ 75 % relative humidity, no condensation allowed)
Control elements:	4 pushbuttons

Displays

Operation:	7 segment display (2 decimal places), 6 LEDs
Δp regulator	7 segment display (4decimal places), 5 LEDs
General:	4 LEDs

Electrical data

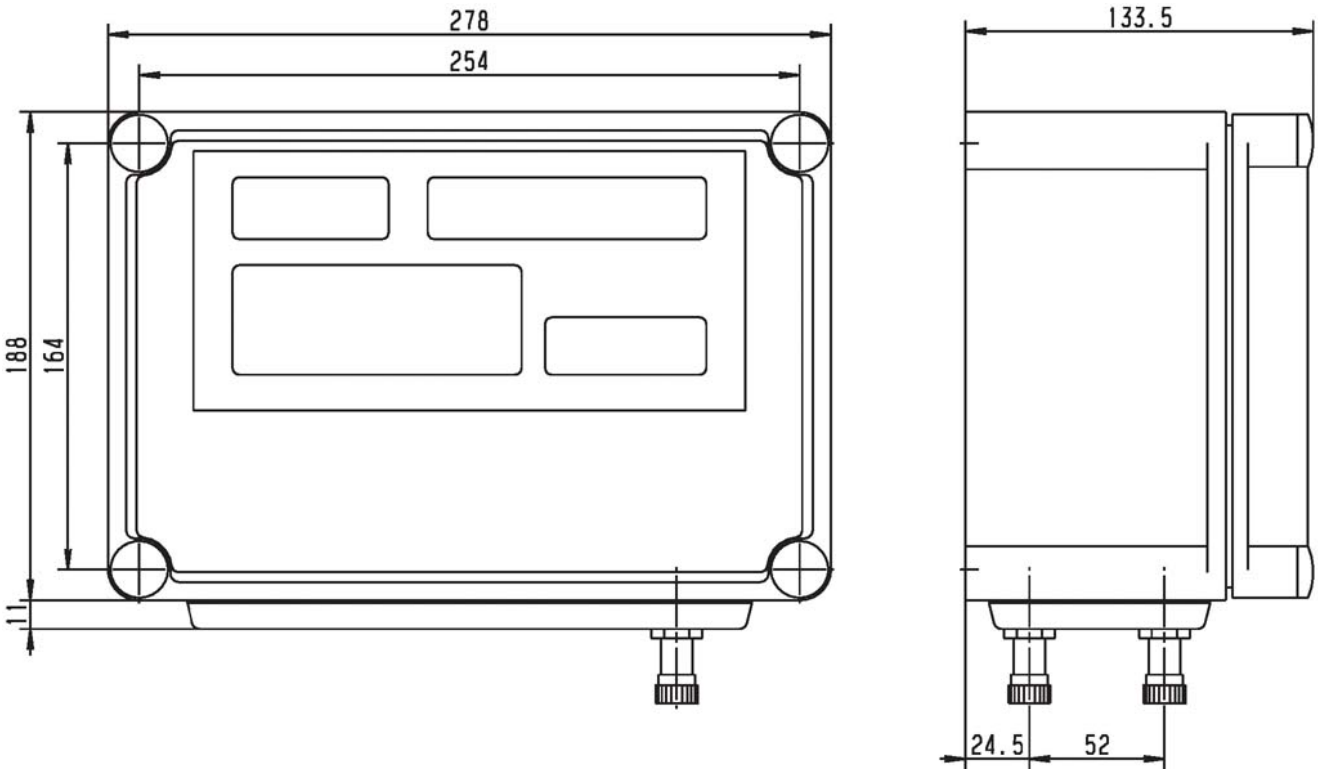
Electrical connection:	Terminal strip 2.5 mm²
Voltage (primary):	DC 24V, AC 115 V/50-60 Hz, AC 230 V/50-60 Hz
Tolerance:	± 10 %
Power:	30 W/30 VA
Mains fuse:	3.15 A time-lag/0.315 A time-lag
Valve outputs:	12 (extendable to 24)
Valve voltage:	DC 24 V
Tolerance:	± 10 %
Valve current:	1 A (for pulse time ≤ 1 s and interval time ≥ pulse time, otherwise 0.5 A)
Analogue output:	0 (4) ... 20 mA
Relay outputs:	3 relay change-over contact, AC 24 V, 5 A
Inputs:	Stop Post-cleaning Fault acknowledgement (Reset-Hold) Pressure switch

Technical data is subject to change without notice!

3. Order numbers

Order number	Type designation
76109490	MFS-09 DC 24 V, 12 valve outputs
76109508	MFS-09 DC 24 V, 24 valve outputs
76109474	MFS-09 AC 115/230 V, 50-60 Hz, 12 valve outputs
76109482	MFS-09 AC 115/230 V, 50-60 Hz, 24 valve outputs

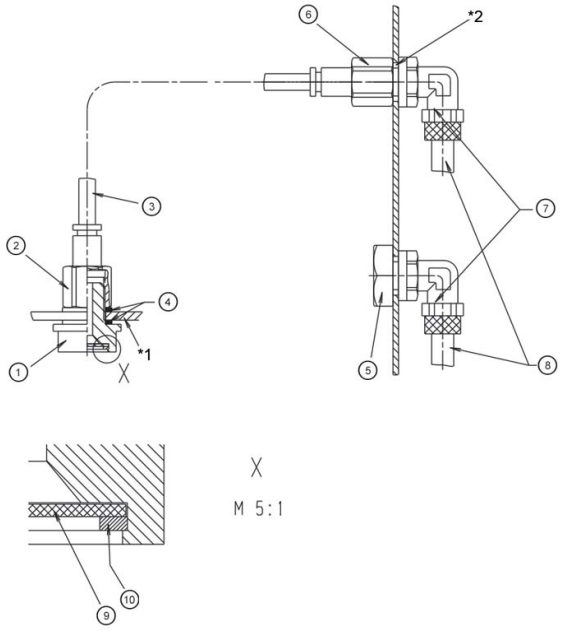
4. Dimensions



5. Instrument lead set

A set comprising a pressure sensor and instrument lines can be supplied for measuring the differential pressure. Dust protection in the form of a membrane filter is provided at the measuring point for the dirt air. Dirty instrument lines can lead to errors and breakdowns.

Item	Designation
①	Nipple G¼, a/f 21
② ⑥	Screw on fitting R¼ OD6, a/f 16
③	Plastic hose PU-4 black, approx. 2 m
④	Sealing ring PVDF
⑤	Pipe nut DIN 431-A-G¼ - 14H
⑦	2x angular screw joint R¼ OD8
⑧	Compressed air hose PU-6 blue, approx. 1.5 m
⑨	Membrane filter
⑩	Snap ring 15x1 DIN 472



*1 = bore Ø 13.5 mm in the filter plate
*2 = bore 2x Ø 14 mm in the housing

6. Accessories

Order number	Designation
76109730	Instrument lead set for dp sensor MFS-09
76186605	Replacement fuses for MFS-09 24 V, 3.15 A time-lag (pack of 5)
76186597	Replacement fuses for MFS-09 115/230 V, 0.315 A time-lag (pack of 5)

7. Default settings

The controller is delivered with a default setting to facilitate optimum in almost any application. This setting should be checked when the controller is started up for the first time. A service engineer can be called in if necessary to alter the setting in the field.
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MAHLE Industry

Accessories Overview

The MAHLE portfolio of standard products and customised devices is rounded off by an extensive range of accessories. With our special adapter, for example, you can install conical MAHLE cartridges in an existing system and achieve a significant improvement in performance with only minimal effort. The dosing device allows you to separate even the most problematic dusts with ease by adding a filter aid. Take a look for yourself at the accessories offered by MAHLE.

	Accessories		
1	**Adapter for conical cartridges**	Install conical filter cartridges in your dust collection system	
2	**Dosing device for filter aid**	SDG-100	
3	**"Dusty" dust detector**	Test the efficiency of your system	

MAHLE Industry

Dust extraction technology
Adapter for conical cartridges

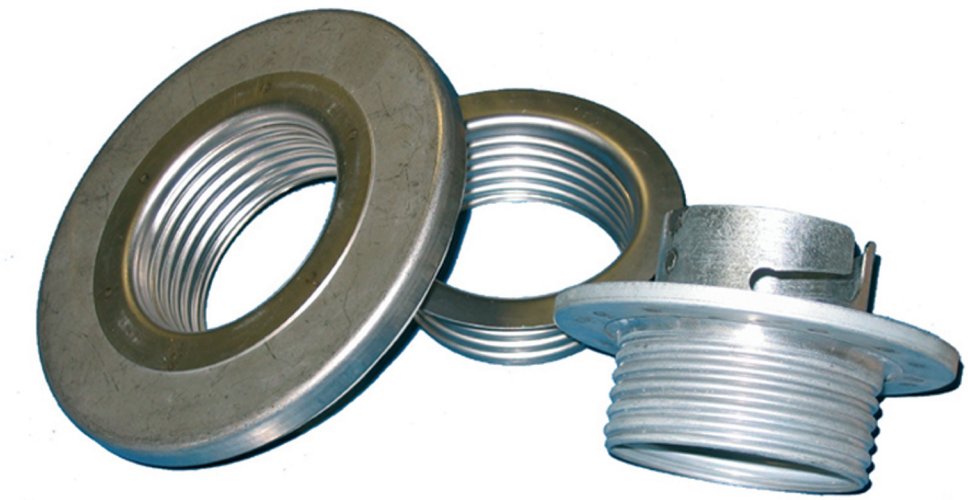
Rd72x5 threaded connection

1. Features

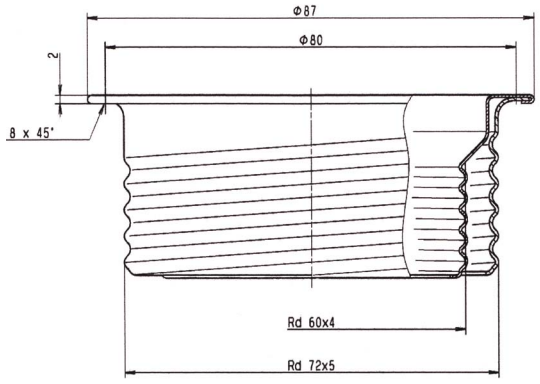
The MAHLE adapter system allows high-quality MAHLE conical cartridges to be used in dust removal equipment where previously cylindrical cartridges with an Rd60x4 threaded connection were suitable.
The cartridges can also be adapted to third-party equipment. If a cartridge is replaced, the adapter can continue to be used.

Characteristics

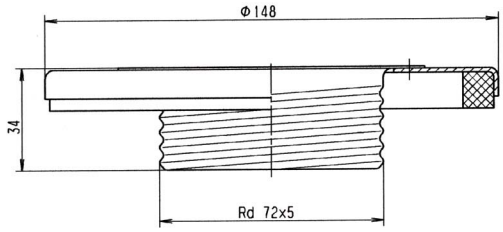
- Easy installation of the cartridge thanks to the proven assembly system
- Wide choice of standard cartridges available
- Lower warehousing costs owing to reduced type diversity
- Worldwide distribution



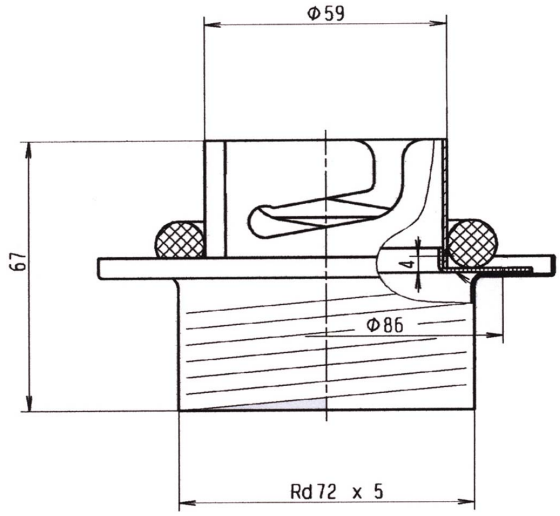
2. Technical data



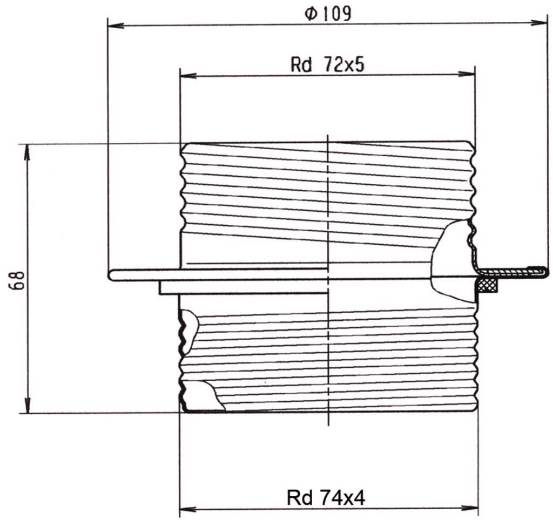
Rd60x4 to Rd72x5 adapter



Rd72x5 adapter for installation on the clean side



Bayonet to Rd72x5 adapter



Rd74x4 to Rd72x5 adapter

Technical data subject to change without notice!

3. Order numbers

Order number	Type designations	Material
78330508	Adapter RD60x4/RD72x5 VZK	VZK
76315329	Adapter RD60x4/RD72x5 V4A	V4A
78314445	Adapter cleaned gas RD72x5 VZK	VZK
78314528	Adapter cleaned gas RD72x5 V4A	V4A
79756131	Adapter RD72x5/Bajonett VZK	VZK
76139950	Adapter RD74x4/RD72x5 V4A	V4A

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MAHLE Industry

Dust extraction technology
SDG-100

Dosing device for filter aid

1. Features

A filter aid sometimes needs to be added to optimise the dust removal process. The filter aid is blown into the row gas via an injector nozzle, so that it forms a filter aid layer on the cartridges. This improves the cleaning and filtration efficiency in applications with sticky or very fine dusts.

- Compact design
- Easy maintenance
- Affordable
- Good dispersion
- Worldwide distribution

2. Technical data

Operating pressure:	3 - 4 bar
Housing/cover material:	Sheet steel
Surface treatment:	EPS
Colour:	RAL 7035
Electrical data:	
Max. voltage:	DC 24 V
Max. switching current:	1 A

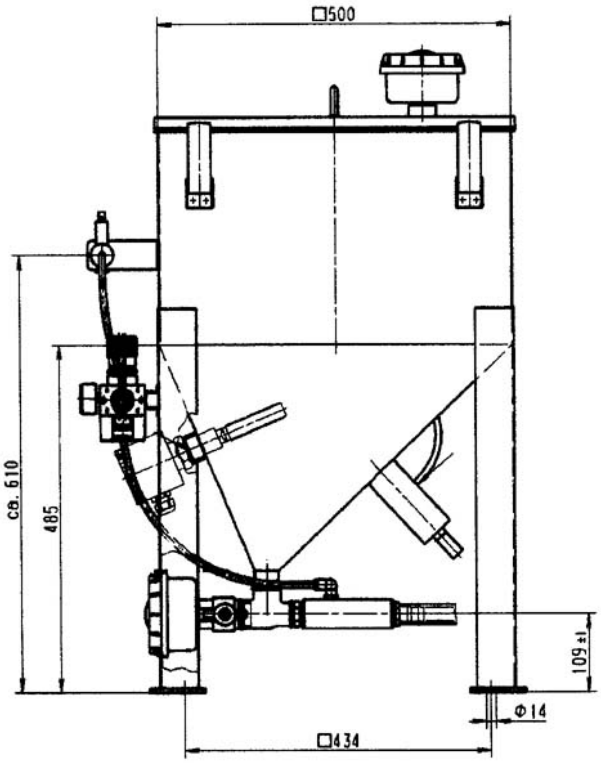
The selected filter aid depends on the type of dust and the untreated gas.
The compressed air consumption varies according to the dosing setting.

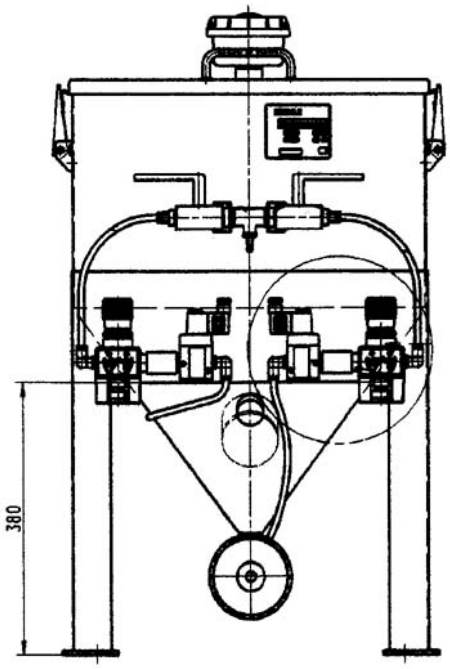
Typical range:	0,2 - 2 m³/h (normal operation)
Filter aid dosing rate:	0,3 - 3,5 kg/h

3. Dimensions

All dimensions except "V" in mm.

Type	H	B	L	V [l]
SDG-100	877	504	504	50





4. Components/spare parts

Qty.	Part name
2	Magnetic valve ¼"
2	Solenoid DC 24 V/1 A
2	Pressure valve with gauge
2	Ball valve ½"
1	Injector nozzle
1	Piston vibrator
1	Discharge hose
2	Vent filter Pi 0140 Mic
1	Level limit switch (optional)
1	Control cabinet for dosing device (optional)

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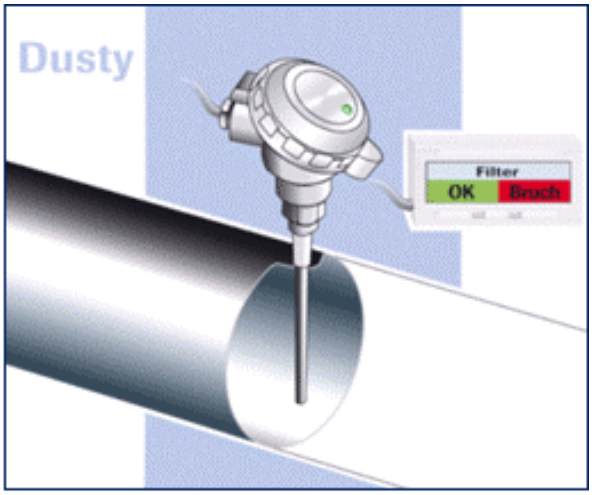
70328226.05/2012

MAHLE
Industrial Filtration

Entstaubungstechnik
Staubdetektor Dusty

1. Kurzdarstellung

Der „Dusty“ arbeitet nach dem bewährten triboelektrischen Prinzip. Das heißt, sobald bewegte, elektrisch geladene Staubpartikel auf den Sensorstab aufprallen oder daran vorbeifliegen, erfolgt ein elektrischer Ladungstransfer von den Partikeln zum Sensorstab. Diese sehr kleinen Signale werden in der Elektronik verstärkt und somit sichtbar gemacht. Zur Inbetriebnahme muss lediglich der im Gehäuse befindliche Setup-Button gedrückt werden. In den folgenden 5 Minuten hinterlegt sich der Sensor den Staubgehalt im Kanal als Normalniveau. Während dieser Justierungsphase muss sichergestellt sein, dass der Filter fehlerlos arbeitet. Erhöht sich nun die Staubmenge erhält der Nutzer einen Voralarm bei Erreichen des 5fachen über „Normal“. Bei Überschreiten des 20fachen zu „Normal“ wird der Hauptalarm ausgelöst. Beide Alarme werden sowohl als elektrischer Schaltkontakt wie auch optisch durch eine auf dem Gehäusedeckel angebrachte LED ausgegeben. Der „Dusty“ kann grundsätzlich alle Staubarten detektieren. Belagsbildungen auf dem Sensorstab beeinflussen die Funktion des Gerätes nicht. Der massive Edelstahl-Sensorstab ist serienmäßig 22 cm lang und kann bei kleinen Kanaldurchmessern beliebig auf die erforderliche Länge gekürzt werden.



2. Montage

Festlegung der Einbaustelle
Die beste Einbaustelle für den Sensor in einen Kanal oder eine Rohrleitung befindet sich in einem Bereich, in dem die Partikel einer gleichmäßigen Verteilung unterliegen und mit gleichmäßiger Geschwindigkeit fließen.
Im idealen Fall verläuft der Kanal oder die Rohrleitung horizontal oder vertikal, und Einbauten wie Krümmungen, Klappen oder Schieber sollten einen Mindestabstand von dem 5fachen Leitungs-durchmesser in jeder Strömungsrichtung zum Sensorstab haben.

Bei Anwendungen, welche nicht alle der genannten Anforderungen erfüllen können, sollte die maximal mögliche Realisierung angestrebt werden.
Der Dusty muss in einen metallischen Kanal eingebaut werden, um eine ausreichende Abschirmung gegen elektrische Einflüsse von außen und eine gute Erdung zu erreichen. Bei nichtmetallischen Leitungen muss eine Ummantelung aus Metall oder in Form einer Metallfolie oder einem feinmaschigen Metallnetz mit einer Länge von ca. dem 5fachen Rohrdurchmesser um den Messbereich der Leitung vorgenommen werden.

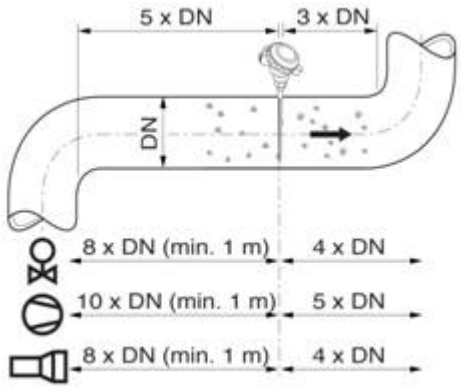


Abb. 1 Empfohlene Distanzen zu Ventilen, etc.
(DN = nominaler Durchmesser)

1. Der Dusty sollte in einer Position eingebaut werden, wo der Gasfluss auf den Sensorstab in einem Winkel von 90 ° auftrifft.
2. In Leitungen mit rundem Durchmesser kann der Dusty in jeder Position über der horizontalen Achse (zw. 9 Uhr und 3 Uhr) eingebaut werden (siehe Abb. 2).
3. Der Einbau in Leitungen mit quadratischem Durchmesser kann oben oder seitlich jeweils in der Mitte stattfinden (siehe Abb. 3).
4. Auch wenn der Sensor durch Vibration nicht in seiner Funktion nicht beeinträchtigt wird, sollten starke Vibrationen vermieden werden.
5. Die Elektronik sollte keiner direkten Sonneneinstrahlung ausgesetzt sein oder in Bereichen mit einer Umgebungstemperatur von mehr als 55 °C eingesetzt werden.
6. Der Sensorstab darf keinen Kontakt zur gegenüberliegenden Leitungswand oder irgendeiner anderen Vorrichtung haben! Hierzu kann die Länge des Sensors auf eine Mindestlänge von 100 mm gekürzt werden.

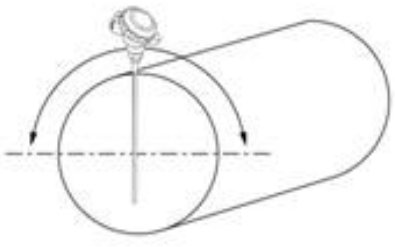


Abb. 2 Runder Querschnitt, in der horizontalen Achse

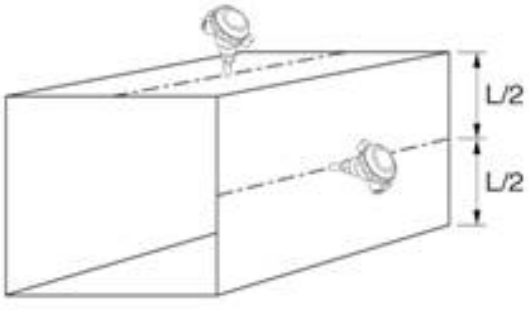


Abb. 3 Quadratischer Querschnitt, mittig auf der Leitung oder seitlich

3. Installation

Zuerst wird am ausgewählten Einbauort die R1/2“ Innengewindemuffe an die Leitungswand aufgeschweißt. Dann wird der Dusty mittels des Außengewindes fest eingeschraubt bis eine dichte Verbindung zum Prozess besteht.

Hierbei sind ein zu festes Einschrauben, wegen möglicher Beschädigung von Sensor oder Elektronik, sowie ein Öffnen der Innensechskantschraube im Außengewinde für die Drehung des Kopfes, wegen möglichem Abreißen der Kabel von der Platine, zu vermeiden.

4. Technische Daten

Messobjekte:	Partikel im Gasfluss
Partikelgröße:	0,3 µm oder größer
Messbereich:	ab 0,1 mg/m³
Prozess-temperatur:	max. 140 °C
Umgebungs-temperatur:	- 20 °C bis + 60 °C
Druck:	max. 2 bar
Fluss-geschwindigkeit:	min. 4 m/s
Feuchtigkeit:	95 % RH (nicht kondensierend)
Messprinzip:	Triboelektrik
Dämpfungszeit:	10 s
Ausgabesignale:	2 feste Schaltkontakt-Zustände (mit max.170 mA versorgen) 3farbiges LED im Gehäusedeckel
Sensorstab:	Edelstahl (220 mm)
Gehäuse:	Aluminium
Schutzart:	IP 65; StaubEx 22 (optional)
Spannungs-versorgung:	DC 12 V bis 24 V
Leistung:	3 W
Elektrischer Anschluss:	2 m Kabel, M12 Stecker (optional)
Montage:	über 1/2” Einschraubgewinde
Gewicht:	ca. 0,7 kg

5. Auslegung

Für technische Detailinformationen und Rückfragen bzgl. einer sicheren Auslegung wenden Sie sich bitte an uns. Ein entsprechender Fragebogen erleichtert die Zusammenstellung aller wichtigen Parameter.
Zu Geräteprogramm, Abreinigungseinheiten und Filterelementen stehen umfangreiche Unterlagen zur Verfügung.

MAHLE Industrial Filtration

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11/2007

MAHLE Industrial Filtration
Other information

MAHLE is much more than just a filter manufacturer – we are also a reliable partner for expert support. We invite you to take a closer look at MAHLE's service spectrum. The typical applications described here illustrate MAHLE's ability to come up with a perfect solution for even the most complex dust problem. Contact MAHLE today to find out more about what we can do for you.

	Other information		
1	**Image brochure**	Industrial filtration	
2	**MAHLE service brochure**	Competent support whenever you need it	
3	**Typical applications**	What MAHLE can do for you	
4	**Notes**	Space for notes	

MAHLE

Industrial Filtration

SERVICE-PARTNER

FÜR MEHR SICHERHEIT UND PRODUKTIVITÄT

INDUSTRIEFILTRATION

Ihr Service-Partner mit führender Filterkompetenz

Hochwertige MAHLE Industriefilter sorgen weltweit für sicheren und wirtschaftlichen Betrieb – in Maschinen und Anlagen, in der Antriebs- und Energietechnik, der Schiffsbetriebstechnik, in mobilen Maschinensystemen, der Chemie, Lebensmittel-, Umwelttechnik, Stahl- und Papierherstellung und der Kraftstoffaufbereitung. Es gibt wohl kaum eine Branche, die auf unsere innovativen Lösungen und Dienstleistungen

MAHLE Industriefiltration ist als eigenständiger Leistungsbereich mit eigener Entwicklung, Produktion und eigenem Vertrieb und Service in den MAHLE Konzern integriert und hat damit die gesamte Kraft eines Weltmarktführers im Rücken. Der MAHLE Konzern zählt weltweit zu den Top-3-Systemanbietern für Kolbensysteme, Zylinderkomponenten, Ventiltriebsysteme, Luftmanagement-Systeme und Flüssigkeitsmanagement-Systeme.

SERVICE HEISST FÜR UNS:

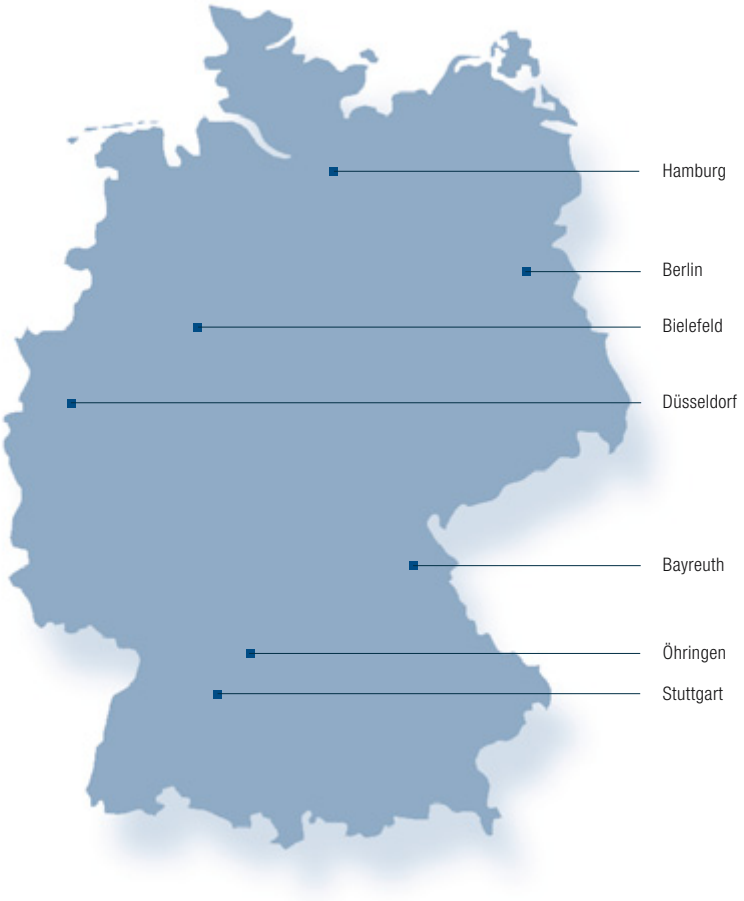
WIR SIND FÜR SIE VERFÜGBAR

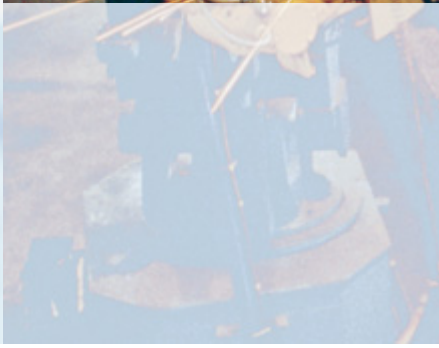
GANZ GLEICH, WO SIE SIND

verzichten könnte. Überall stehen Prozess- und Produktionssicherheit, Verfügbarkeit und Produktivitätssteigerung an erster Stelle.

Deshalb bieten wir unseren Kunden umfassende Service-Leistungen in allen Kompetenzfeldern – in der Fluidfiltration, Entstaubung, bei Automatikfiltern und in der industriellen Separation.

Ein eigenes Service-Team, ergänzt durch ausgewählte, qualifizierte Partnerunternehmen, führt alle Service-Leistungen vor Ort durch und stellt so die Verfügbarkeit Ihrer Filtersysteme sicher. So bieten wir Ihnen ein Plus an Leistung: für mehr Funktionalität, mehr Sicherheit, mehr Zuverlässigkeit und Wirtschaftlichkeit.





Damit alles läuft, wie Sie es wollen: unser Service-Konzept

Die dauerhafte Verfügbarkeit und Effizienz von Filtersystemen ist der Schlüssel für hohe Produktivität und Leistung Ihrer Anlagen. Ein professioneller Wartungsservice ist deshalb unerlässlich. Er sichert die Funktionstüchtigkeit und die Einhaltung der erforderlichen Werte. Die Intensität und Häufigkeit der durchzuführenden Wartungs- und Service-Arbeiten hängt dabei von den Umgebungseinflüssen und der Beanspruchung ab.

Wir bieten nicht nur geeignete Prüfmethoden und spezielle Geräte, wie Wartungsanzeiger, die den wirtschaftlichen Betrieb von Filtern und Anlagen steuern und überwachen. Wir übernehmen auch den kompletten Wartungs- und Instandhaltungsservice: von der Inbetriebnahme über den Austausch der Elemente bis zur kontinuierlichen Ersatzteilverfügbarkeit für die von uns gelieferten Systeme. Und mehr noch: Unsere Analyse-Dienstleistungen in eigenen Labors liefern Ihnen genaueste Messergebnisse über die Filter-Effizienz.

Auf der sicheren Seite: mit einem maßgeschneiderten Wartungsvertrag

Störungen und vorzeitiger Verschleiß von Anlagen sind oft die Folge mangelnder Wartung. Mindestens einmal jährlich sollte Ihre Anlage überprüft und gewartet werden. Besser noch: Sie schließen einen Wartungsvertrag ab. Er beinhaltet alle vorgeschriebenen Wartungsarbeiten und ist genau auf Ihren Bedarf zugeschnitten – für einen optimalen Betrieb Ihrer Anlage. Damit brauchen Sie sich über Garantieleistungen keine Gedanken mehr zu machen.

MEHR PRODUKTIVITÄT
DURCH MASSGESCHNEIDERTEN SERVICE

Von der Ersatzteilversorgung bis zur Schulung

Ein ausgeklügeltes Logistikkonzept sichert die leistungsfähige, schnelle Ersatzteilversorgung. Dabei werden die Filterelemente für den Ersatzbedarf nach denselben strengen Qualitätskriterien wie original MAHLE Filterelemente hergestellt – auf Wunsch auch als kundenspezifische Sonderausführungen. Know-how zur fachgerechten Bedienung und Wartung vermitteln wir in praxisgerechten Schulungen. Das Ergebnis: mehr Sicherheit, mehr Wirtschaftlichkeit und mehr Performance für Sie.

Unser Service-Angebot für Sie:

- Inbetriebnahme von MAHLE Filteranlagen
- Wartung von MAHLE Filteranlagen
- Reparatur aller Komponenten von MAHLE Filteranlagen
- Reklamationsbearbeitung von MAHLE Filteranlagen vor Ort
- Diagnosen und Analysen vor Ort
- Umfassende Analytik, Expertise, Konditionierung und Monitoring – auch in Zusammenarbeit mit führenden Instituten
- Optimierungsempfehlungen für Ihre Anlage
- Maßgeschneiderte Wartungsverträge

Mobile Messgeräte und Filteraggregate

Für die laufenden Kontrollen vor Ort bieten wir Ihnen mobile Messgeräte an:

- Unser mobiles, leicht zu handhabendes Partikelzählgerät PiC 9100 zeigt die absoluten Partikelzahlen und Reinheitsklassen
- Wir bieten Prüfgeräte für Wartungsanzeiger, Differenzdruckanzeiger, Staudruckanzeiger

Darüber hinaus stellen wir Ihnen z. B. auch mobile Filtersysteme zur Verfügung – z. B. unser Nebenstrom-Filteraggregat Typ Pi 8100 oder die Coalescer-Filteranlage Typ KE 2600.

Unsere Laborleistungen für Sie

Zur Beurteilung der Filtrations-Effizienz, wie z. B. der Abscheideleistung, der Schmutzaufnahmekapazität und der Standzeit von Filterelementen, können in unseren Labors eine Vielzahl von Untersuchungen für Sie durchgeführt werden:

- Einfache Ölprobenauszählung nach ISO 4406 (1999) und AS 4059
- Umfangreiche Öluntersuchung (Paket)
  - Gravimetrie nach ISO 4405
  - Ölprobenauszählung nach ISO 4406 (1999) und AS 4059
  - Mikroskopische Beurteilung der Schmutzart und Fotodokumentation
- Untersuchung für gebrauchte Filterelemente aus Hydraulikkreisläufen nach DIN 65669-1
  - Gravimetrie der Feststoffanteile
  - Mikroskopische Beurteilung der Schmutzart und Fotodokumentation
- Wasser- und Emulsionsanalyse
  - Gravimetrie mittels Siebanalyse
- Bestimmung des Wassergehaltes einer Ölprobe nach Karl Fischer
- Bestimmung der Viskosität einer Ölprobe
- Bestimmung der Leistungsdaten von Hydraulik-Filterelementen nach ISO 16889 (Multipasstest)
- Mikrosondenanalyse in Verbindung mit einer EDX für Feststoffpartikel
- Spektralanalyse der Zusammensetzung (Übersicht) einer Feststoffprobe
- Partikelverteilungsanalyse von trockenen und nassen Proben
- Weitere Analysenmethoden stehen zur Verfügung und können nach Absprache für Sie durchgeführt werden

Qualitative Materialanalyse

Partikelzählgerät

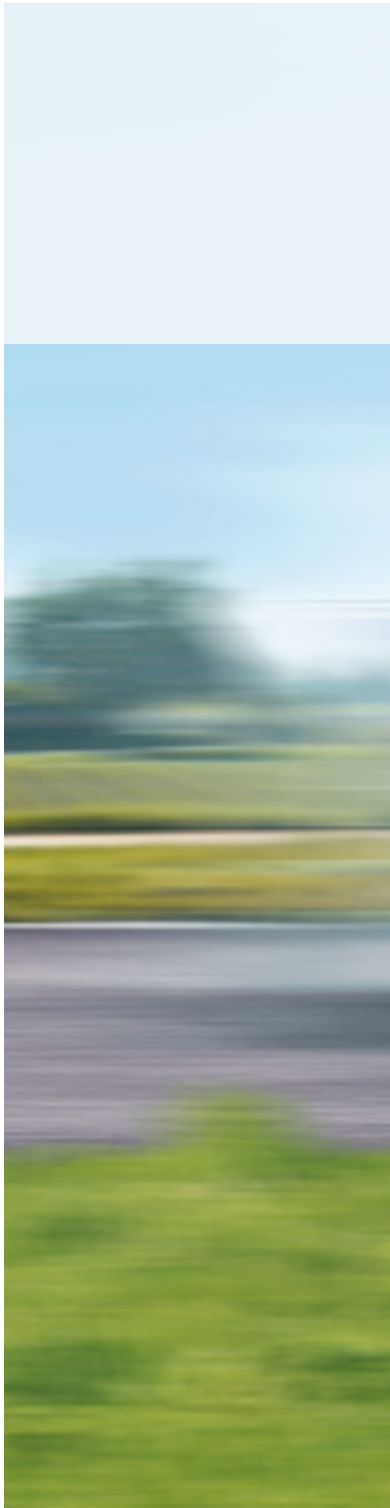
Probeentnahmekoffer

Ölprobenauswertung im Labor

MAHLE

Industrial Filtration

www.mahle-industriefiltration.com



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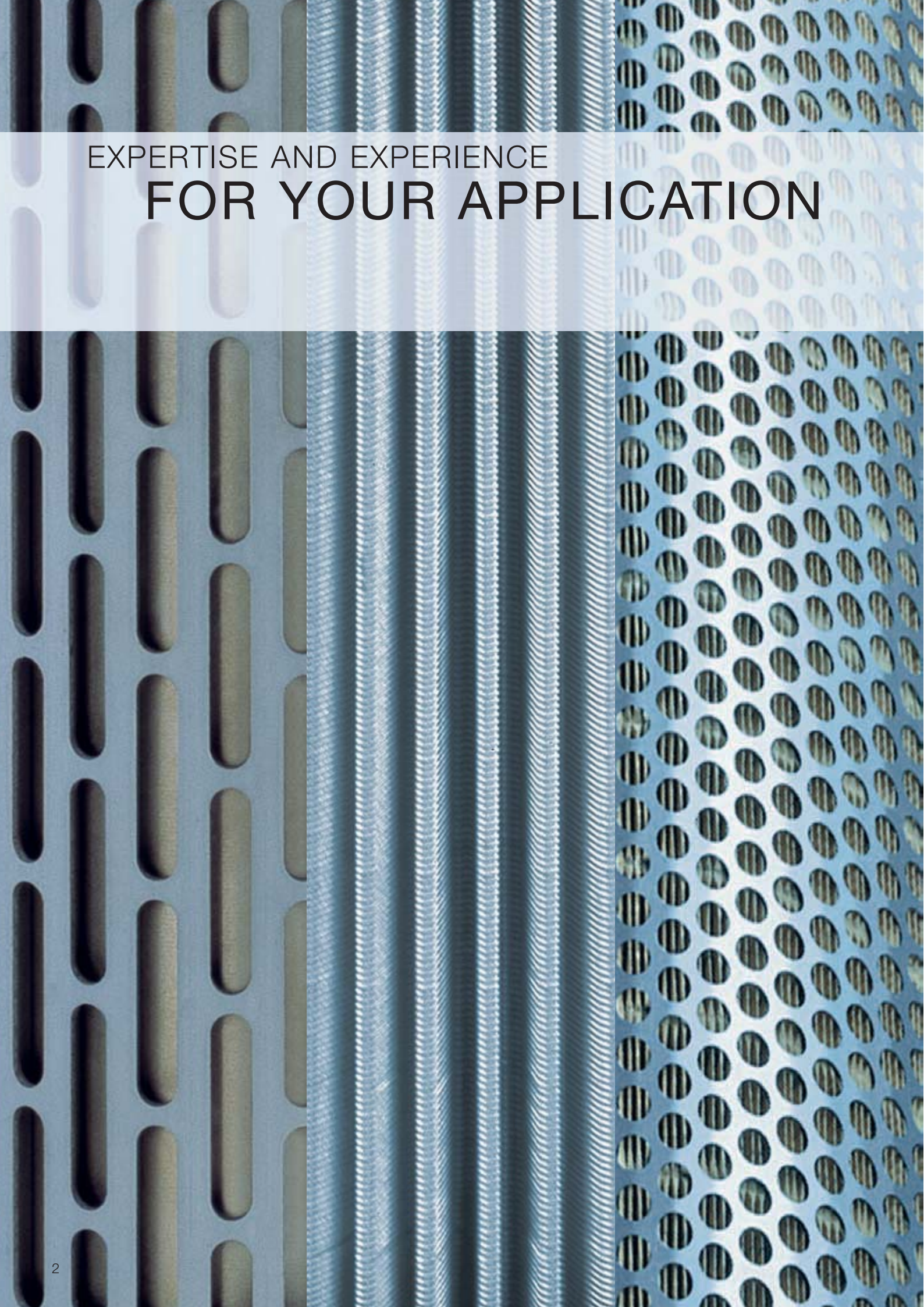
MAHLE

Industrial Filtration

PARTNER
FOR CLEAN SOLUTIONS

INDUSTRIAL FILTRATION



EXPERTISE AND EXPERIENCE

FOR YOUR APPLICATION

An innovative solution partner in your industry

There is hardly any industry that could do without our innovative solutions in fluid filtration, dust removal, and process technology. From the automotive industry to chocolate-making, MAHLE Industrial Filtration has been developing and producing high-quality industrial filters for any application for decades. They are just as efficient and economical in the machine and system building, chemical, pharmaceutical, and food industries as in environmental, drive, and energy technology, as well as maritime and mobile machinery systems.

Your leading partner with all-around filter expertise

As one of the world's leading **fluid filtration** partners, we provide machine builders and users of mobile and stationary hydraulic systems with highly effective filters and filter systems, units, and accessories to keep hydraulic and lubricant fluids clean.

Whether in surface technology, chemical, food, and pharmaceutical industry, machinery construction, tooling machines or energy technology, our filters, units, and systems for **dust removal** from air and gases increase productivity, support product recycling, and contribute to increased environmental protection and workplace safety.

Our **automatic filters** have become indispensable in countless applications. They are used for gross through fine filtration of fluids, pastes, and similar materials, and for homogenization. The advantage to you is rational 24-hour, non-stop operation with automatic cleaning and disposal processes. The cosmetics, plastics, and paint industries rely on them, as do food producers and the petroleum industry.

For the mechanical processes of **filtration and separation**, we provide complete, tailored solutions, from oil separation, fuel and oil care, to process water, wastewater, and cooling water treatment.

MAHLE filter systems are also specified as mandatory in the plant requirements of many industrial fields, including automotive manufacturers.

Our **services** range from analysis to engineering, commissioning, diagnostics, and repair. Our service team is on the spot for you. We also provide extensive analysis, expertise, conditioning, and monitoring in conjunction with leading institutions.

Whatever the application – we are there for you

Based on our experience across many industries, we combine all our expertise in a worldwide network, use synergies, and, as your partner, use the power of innovation to develop the optimal solution for your application, from filter elements to modules. With certified quality, of course. Designed and tested to DIN and ISO standards, with associated industrial approvals. In short, an engineering partnership for complete system solutions, with the extra service. For more functionality, more safety, more reliability and efficiency.

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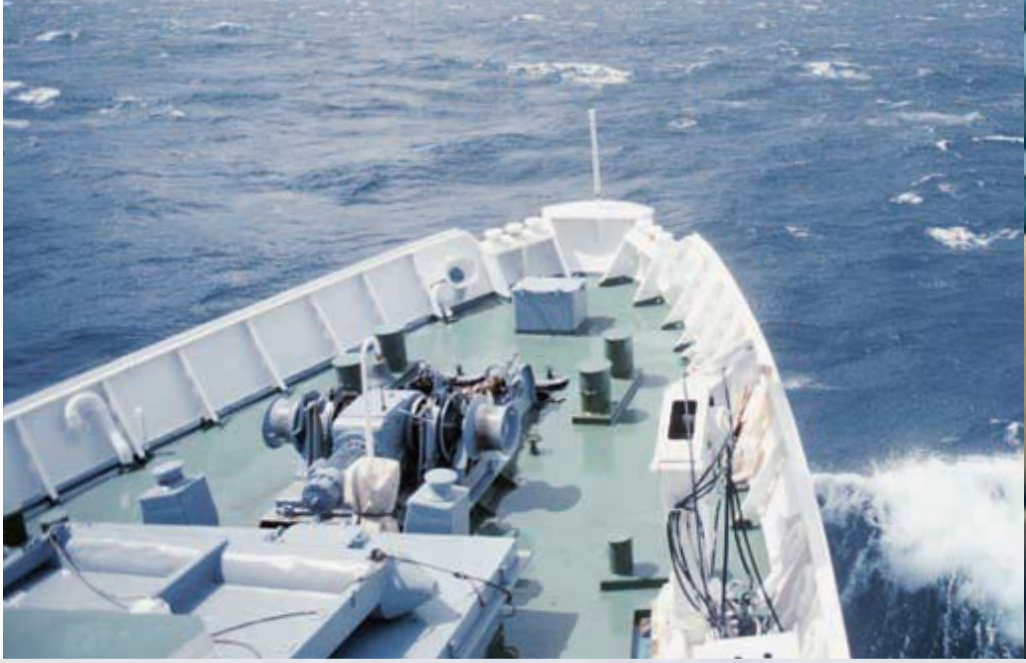


WORLDWIDE LEADER
DRIVEN BY PERFORMANCE

MAHLE Industrial Filtration is an independent service area with its own engineering, production, and sales teams, integrated in the MAHLE Group, and thus is backed by the strength of a worldwide market leader.

The **MAHLE Group** is one of the top 3 systems suppliers in the world for piston systems, cylinder components, valve train systems, air management systems, and fluid management systems. As one of the 30 largest corporate suppliers, and worldwide engineering partners of the automotive and engine industries, MAHLE has unique systems expertise in the areas of internal combustion engines and their periphery. From small engines, to large industrial and ship engines, to motorsports.

IN TECHNOLOGY

MAHLE is present in every important market in the world. Over 40,000 employees are engaged at seven research and development centers and 110 production locations. Around 2,300 development engineers and technicians around the world are at work on forward-looking concepts, products, and systems to further develop the internal combustion engine.

Above-average enthusiasm for performance, precision, perfection, and the power of innovation – that's what the MAHLE brand stands for. We have been pushing technical development forward, together with our customers, and setting new standards for over 80 years. Driven by performance. Worldwide.

CUSTOMER
KNOWS NO BOUNDARIES

Our customers are at home all over the world. That's why we are on site for you worldwide. We are globally organized, and are expanding our strategically networked presence in important core and future markets in many industries. Through regional proximity, we can work together closely and efficiently with our customers on projects around the world.

ORIENTATION

Expertise for plant and machinery construction

- Return-line filters
- Low-pressure filters
- Medium-pressure filters
- High-pressure filters
- Duplex-filters
- Fine dirt discharge with automatic filters
- Filter devices for dry dust removal
- Air breathers
- Oil aerosol filters
- Filters for cleaning fluids
- Separators and filters
- Automatic filters
- Line filters
- Oil aerosol separator units
- Turbidity sensors
- Coalescer-filters

Purity law: efficient filter solutions for technical fluid applications

In plant and machinery construction, highly sensitive systems require effective filtration of fluid media, to remove solid or liquid impurities that cause abrasion, wear, and corrosion. The prescribed purity levels of the fluid media must be maintained under all conceivable circumstances. We provide a unique filter program for this purpose, in both a standard version and a DIN 24550 compliant version. Our filters separate water from oil circuits, and oil from water circuits. They reduce solid contamination to the prescribed contamination level, prevent intrusion of extraneous dirt, and maintain the properties of the pressure fluid over the long term. The clear advantage: longer service life, increased reliability, operational cost savings, and increased efficiency and profitability of your systems.

This is why we are in demand as a partner in important key industries, such as the auto industry, with superior technical capability. In the area of cooling lubricant processing, our fluid filters are used as safety filters. And for the separation of cooling lubricant emulsions from the air – in machine tools, for instance – our innovative oil aerosol separation unit (LGA 600) is the efficient solution.

Less dust – more effective

In the particularly challenging area of dust removal, MAHLE industrial filters exceed all requirements for air quality in work areas, and for allowable exhaust air emissions. They are therefore the first choice for plant and machinery builders, and for end users. Our filter elements are optimized, based on technical application experience, so that we can provide you with compact, reliable filter systems together with specially developed cleaning systems, with extremely economical service lives. For example,

MORE OPERATIONAL RELIABILITY FOR
YOUR PLANT AND

for dry processing in machine tools; as mixer accessory filters for ventilating silos, containers, and mixers; for automotive industry applications; and for pneumatic conveyance. Our systems have been tried and tested around the world in surface technology, powder coating systems, and blasting plants. They make short work of any type of dust load: flame spraying, grinding and polishing, or wet paint overspray exhaust in large painting lines.

Non-stop reliability: automatic filters for plants and machinery

Industrial production processes have to run without interruption. Even for maintenance and disposal actions. Our automatic filters allow rational, highly efficient non-stop operations – with automatic cleaning and disposal operations. For example, when filtering liquids in metal processing, or washing, degreasing, paint stripping, and rustproofing in industrial part cleaning, they meet the strictest environmental regulations.

Hydraulic filter

Duplex-filter

Oil aerosol separator unit

Automatic filter

Dust removal unit

MACHINERY

MORE EFFICIENCY ALL THROUGH THE PROCESS CHAIN

Expertise for plant and machinery operations

- Return-line filters
- Low-pressure filters
- Medium-pressure filters
- High-pressure filters
- Duplex-filters
- Air breathers
- Oil aerosol filters
- Aerosol separator units
- Filters for cleaning fluids
- Separators and filters
- Process filters
- Automatic filters
- Automatic return-line filters
- Line filters
- Turbidity sensors
- Coalescer-filters
- Bag filter replacement with adapters
- Central and distributed dust removal systems

Process quality starts with the right filter technology

Wherever manufacturing and industrial processes need high reliability and operational efficiency, operators can rely on our filter systems. They play an efficient role in the optimized use of production materials, and help to conserve resources, reduce wear, and increase machine utilization. MAHLE filter systems have been tried and tested in many branches of industry: in machine building, the automotive industry, and aerospace, where the highest quality standards are set. They filter washing substances in a washing system just as reliably as printing inks, paraffins, and caustic soda.

Worldwide service and reliable spare parts delivery

Our replacement filter elements are available all over the world. The same high quality standards apply to them as to the original equipment. There are no compromises. Our partner vendors in every country ensure quick delivery of original filter elements, wherever they are needed. There are also identical filter elements to other manufacturers – at MAHLE quality levels, of course.

Fluid filters: original performance – available worldwide

Our fluid filter solutions ensure the functionality of modern hydraulic systems under all operating conditions, with long service life at all prescribed purity levels. We use our extensive systems expertise to optimally match filter systems to your application.

Perfect solutions for every type of dust load

Not all dust is created equal. Each process has a very specific dust load. Based on decades of experience, we provide a bonus in expertise in designing, selecting, and integrating the right filter system, which gives you more reliability.

Washed in all “waters”: automatic filters

Our automatic filters show long-term cleaning performance in filtering washing fluids for metal components, and cleaning process water, washing materials, solvents, inks, and countless other materials that need to be filtered in plant and machinery operations. For process filtration, such as filtration of cleaning fluids, paints, inks, etc., we provide a newly developed series of filters, cartridge filter elements, and bag filter replacement elements with high filtration performance.

Central dust removal unit

Line filter

Automatic filter elements

YOUR DRIVING FORCE FOR

HIGH AVAILABILITY

Duplex-filter

Oil separators

Maintenance indicators

Expertise for drive technology

- Automatic filters
- Suction filters
- Low-pressure filters
- Medium-pressure filters
- High-pressure filters
- Duplex-filters
- Bypass filters
- Return-line filters
- Air breathers
- Maintenance indicators
- Service units
- Mobile filter units
- Filter elements
- Oil separators
- Air filters
- Turbidity sensors
- Coalescer-filters
- Inlet air filters

Smoothly economical in the flow

Complex, challenging systems, such as stationary internal combustion engines, drives, and air compressors, require availability and reliability – often around the clock. Induction air for engines, as well as fuels and lubricants, must be effectively filtered. As your partner, MAHLE Industrial Filters provides convincing filter solutions all around the internal combustion engine.

For lubricating large drives, our user-friendly lubricant oil filters ensure the required oil purity over a long service life. In compressors, our systems clean the compressed air to remove lubricants, and reduce energy losses at the same time.

Pure materials, around the clock

They are relatively small, but have big performance: our automatic filters are in constant use for fuel and lubricant filtration in the large diesel and gas engines of well-known customers. They cover the variable load and safety requirements of drive technology with effective cleaning systems. Tailor-made for their applications, they help to increase reliability.

Clean inlet air

Clean inlet air is the foundation of low wear in operations. Our filter systems and cleaning systems, effectively tuned to their high quality filter elements, ensure high availability.

YOUR ENERGY GETS FLOWING ECONOMICALLY

Expertise for energy technology

- Suction filters
- Low-pressure filters
- Medium-pressure filters
- High-pressure filters
- Duplex-filters
- Bypass filters
- Return-line filters
- Air breathers
- Maintenance indicators
- Oil separators
- Air filters
- Turbidity sensors
- Coalescer-filters
- Filter elements
- Cleaning systems
- Cleanable inlet air filters
- Automatic filters

Uninterrupted availability

No one, especially in the energy industry, can afford to have a hydraulic system shut down. Fluid filtration systems are put to use only if they guarantee absolute reliability in long-term operation. Whether in power plants, gas turbines, wind energy systems, or emergency power generators, operators and manufacturers trust our industrial filters. As the leader in technology, we provide a range of fluid filters for controlling and regulating hydraulic systems, and for lubricating turbines and drives, that have been tried and tested a million times over around the world.

For continuous, powerful performance

In the energy industry, uninterrupted performance is the goal, using gas turbines or large diesel engines, for example. To accomplish this, inlet air must always be optimally conditioned. Especially for inlet air filtration in areas with high dust levels, our cleanable cartridge filters provide high performance density with their compact and robust construction. The use of high quality, optimized filter materials for dust removal leads to long service life, low pressure loss, and very good separation performance. Thus your energy plants never run out of steam.

High performance as a matter of fact

Our reliable automatic filters are used in power generation, including in power plants, to filter fuels and lubricants. High reliability is especially important here, and non-stop operation is understood to be a necessity for the plant to run economically. It is just as vital that our systems meet all the specifications and performance levels needed in operations. Exactly tailored to your specific requirements.

Return-line filters

Flange-mounted filter

Photo: Vestas

Expertise for maritime operations

- Lubricant oil filters
- Hydraulic filters
- Transmission fluid filters
- Fuel filters (diesel and MBO)
- Process and cooling water filters
- Inlet air filters
- Bilge water filters
- Grey and black water filters
- Water treatment filters
- Coalescer-filters
- Turbidity sensors

Systems expertise for maritime operations

Whether on the Aida cruise ship or large container vessels: our innovative filter systems stand for clean performance, without compromise – from fuel and air treatment for drives and hydraulic and lubrication operations, to cleaning and treatment of water.

Full speed ahead: fuel, inlet air, and dust filters

MAHLE filter systems, approved by various classification agencies, ensure long-term, trouble-free, low-maintenance fuel care operations for drive systems. In large engines, for instance, our duplex-filters, with patented one-hand diversion, or our modular filter systems, ensure better performance. Automatic variable filter systems are ideally tuned for the demands of large diesel engines and gas turbines. Single variable filters clean up to 24 tons of fuel per day – in parallel circuits, they can do many times that amount.

For clean air: MAHLE inlet air and dust filters

With low flow resistance and high dust collection capacity, our inlet air and dust filters continuously provide clean air for compressors, vacuum pumps, internal combustion engines, and turbines.

Hydraulics and lubrication: everything runs smoothly

Long service life, high operational reliability, less maintenance, and resource savings – our maritime operations systems pay off in the care, cleaning, and filtration of hydraulic, lubricating, and control fluids. They reduce particle contamination in your systems to the required purity class level, in compliance with international standards.

A CLEAN PROGRAM
RELIABILITY ON BOARD

Water filters: all-around reliability for operations and the environment

Our bilge water oil removal systems make a prominent contribution to water protection worldwide – tailored to each type of ship. Bilge water separators clean bilge water so efficiently that the strictest civil and military limit levels and protective regulations can be met, today and into the future. MAHLE automatic filters clean all kinds of water, such as for the treatment of grey and black water into process water. We provide efficient treatment technologies for cooling water circuits, pretreatment and post-treatment systems for the treatment of process and waste water, and additional sterilization, metering unit, membrane, and activated charcoal filters. MAHLE turbidity sensors reliably detect water in hydraulic and fuel systems. Coalescer-filters economically separate free water from oils and fuels. And our mechanical demulsifiers achieve the highest purity levels for all oil-in-water applications, washing lye, and cooling lubricant emulsions.

Automatic filter variable series

Coalescer-filter

Turbidity sensor

Multiphase demulsifier for bilge water oil removal

Fluid filtration for reliable “workflow”

MAHLE fluid filtration systems do the whole job, in large concrete pumps and other construction equipment, in agricultural machinery, cranes, industrial trucks, mobile lift platforms, forklifts, fire engines, railway and underground vehicles, and in many other types of mobile machinery. Filter solutions of the highest quality are needed everywhere, since any machinery stoppage means loss of productivity and increased costs. Our customer-oriented systems are optimally tailored to the tight working spaces in mobile machinery. They are notable for their light-weight, energy-saving design, and high reliability in the toughest conditions.

Module development

We develop customer-specific modular solutions for your special requirements. By integrating plastic components, such as inlet lines, or tanks with special filters, you get a complete, fully assembled module.

A lot gets caught – and the work goes on

Construction machines, such as rock drilling machines, have to work reliably even under high dust loads. The inlet air for their engines is continuously cleaned by our cleanable inlet air filters. We have developed special cartridge filters with a compact, space-saving form factor, for use in

Expertise for mobile machinery systems

- Suction filters
- Pressure filters
- Return-line filters
- Bypass filters
- Air breathers
- Filter elements
- Cleaning systems

We provide hydraulic filters in special mobile versions, such as inlet air filters and return-line filters that serve as internal tank filters or line filters to protect the hydraulic system. Our changeout filters, with high-efficiency filter inserts, guarantee high dirt holding capacity. Inlet air filters ensure that internal combustion engines, compressors, and vacuum pumps are always provided with clean inlet air. With outstanding knowledge of plastics processing, we are developing entirely new filter designs with improved performance. However different your range of applications may be, we can provide you with complete modular solutions for filters, containers, and systems.

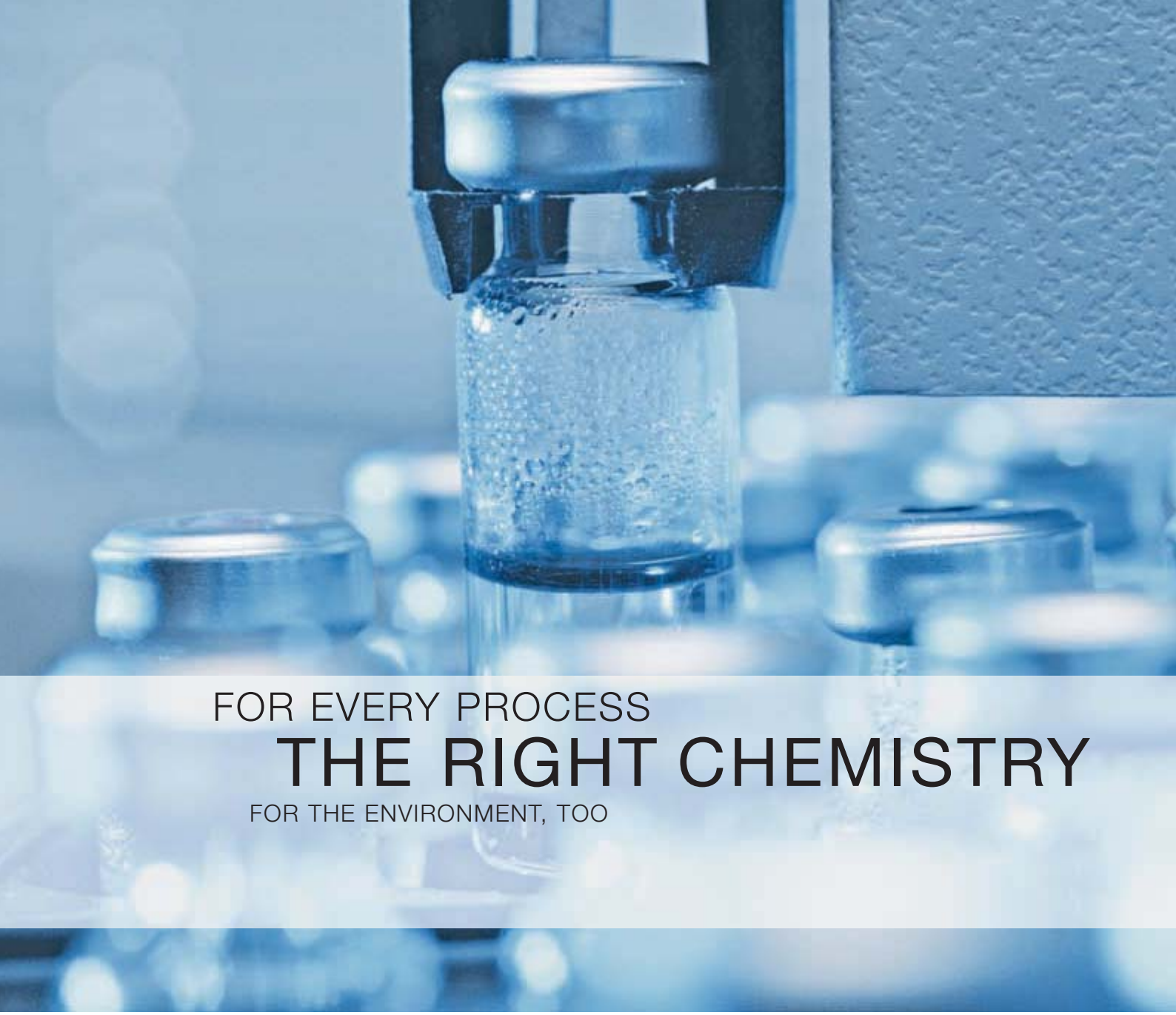
mobile machinery. These high-performance filter elements and matching cleaning systems ensure high operational reliability; for instance, in building cleaning, track washing, and suction excavators.

High-pressure filters with cold start valve

Pressure filters

Spin-on cartridges

FILTER SYSTEMS FOR PRODUCTIVE MOBILITY



FOR EVERY PROCESS
THE RIGHT CHEMISTRY
FOR THE ENVIRONMENT, TOO

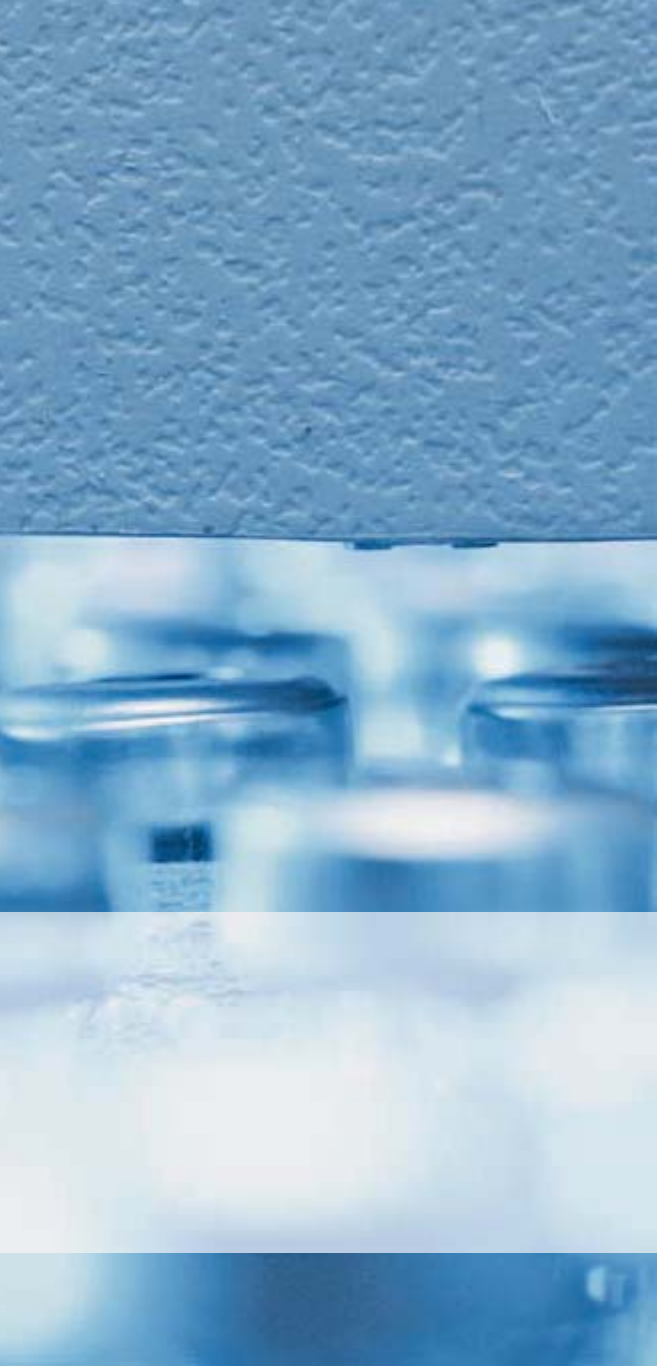
Dust removal – approved for the chemical, pharmaceutical, and food industries

In the chemical industry, pharmaceuticals, and food production, the highest requirements are set for process quality, purity, safety, and environmental protection. We provide ecologically and economically convincing solutions that will continue to meet worldwide increasing requirements. Our high-quality filter elements, with FDA-approved filter materials for dust removal from air and gases, achieve high filtration performance and economical service life for trouble-

Filter elements for dust removal

Dust removal unit

Automatic filter



free operations, through the use of effective cleaning systems combined with PTFA membrane filter elements.

Our solutions range from washable filter elements, through compact, robust, and easily integrated small dust removal systems, such as mixer accessory filters and product separators, to large central exhaust systems and filters for potentially explosive areas. They meet and even partially exceed the latest ATEX directives.

Whether for manufacturing processes in the pharmaceutical and food industries, the production of inks, paints, and plant preservatives, in filling and packaging machines, transport processes, drying in fluidized bed or spray dryers – our filters and cleaning systems ensure reliable dust removal and clean process performance everywhere.

Expertise for chemical, food, and environmental technology

- Filter elements
- Cleaning systems
- Small dust removal systems
- Attachment and insert filters
- Product separators
- Sack pouring
- Individual exhaust
- Central dust removal
- Filters for explosion proof areas
- Automatic filters
- Automatic metal-edge filters

Automatically reliable: process optimization

Well-known companies around the world rely on our automatic filters in the production and processing of fats, oils, pastes, adhesives, fluids, and products such as chocolates, doughs, or fruit pomaces. Because they filter particularly efficiently and reliably – in continuous 24-hour operations – in the chemical and food industries, in refineries, and extraction and ink production of low to high viscosity products.

Using a wide range of cleaning systems, filter materials, and optional combinations, compact automatic filters can be set up in a variety of ways to meet the filtration needs of various materials and requirements. The advantage: you adjust to changing operational conditions, clean without interrupting the filtering process, reduce maintenance costs, and increase system life of safety filters in series. Our automatic metal-edge filters, with radial scraper cleaning, for example, are right in their element in adhesive or chocolate production.

STEEL OR PAPER – YOUR PLANT

RUNS RELIABLY

Ensuring that your production runs smoothly

In steel and paper manufacturing, production processes have to run economically without interruption. With increasing cost pressures, the smooth interaction of process steps is important to ensure that rationalization potential is utilized to the full. MAHLE filter technology helps you achieve this.

For complex processes: Hydraulic filter solutions

Our fluid filter systems have mastered challenging filter tasks, not just in the paper industry. In foundries, roll forming plants, and casting machines, they protect the highly-stressed hydraulic systems from contaminants, thus ensuring system reliability. We have developed completely new filter solutions in the area of fluid filtration to meet the increased requirements for cleanliness of components and media. For example, a new series of cartridge filter elements optimized by application – for the highest purity requirements, with filter performance that has never before been achieved. Add to this a completely new series of innovative stainless steel filter housings for cartridge filter elements. And, for the commonly used bag filter, whose filter quality no longer meets today's increased requirements, we provide more efficient replacement solutions.

Relief from dust

Our modern filter elements and distributed filter systems represent an efficient and reliable reduction of dust loads in foundries and steelworks, casting plants, and in the galvanic industry. Due to their high separation performance and economical operation, the pulp and paper industry also counts on them around the world.

Cleaning without interruption

MAHLE automatic filters have had a solid position in the cooling water and process water circuits of the steel and paper industries for many years. Because our automatic filters allow rational, highly efficient non-stop operations, with automatic cleaning and disposal.

Expertise for steel and paper production

- Return-line filters
- Low-pressure filters
- Medium-pressure filters
- High-pressure filters
- Duplex-filters
- Fine dirt discharge with automatic filters
- Filter devices for dry dust removal
- Air breathers
- Oil aerosol filters
- Filters for cleaning fluids
- Separators and filters
- Automatic filters
- Line filters
- Oil aerosol separator units
- Turbidity sensors
- Coalescer-filters
- Bag filter replacement with adapters
- Process filters
- Automatic return-line filters

Filter for cleaning fluids

Duplex-filter

Backflush filter

Filter elements for cleaning fluids

WELL FILTERED – THE SUBSTANCE FOR MORE PERFORMANCE

Expertise for fuel processing

- Automatic return-line filters
- Automatic filters
- MAHLE NFV fuel filters
- MAHLE NFV automatic filters
- MAHLE NFV separators
- MAHLE AKO automatic filters
- MAHLE AKO backflush filters

For clean, high-performance power development

Without fuel filters, nothing would work in a modern internal combustion engine or turbine. Water, contaminant particles, and other undesired impurities in fuels lead to corrosion and wear in the fuel system, impede combustion, and compromise reliability. MAHLE filter systems for fuel care and processing ensure low-maintenance, trouble-free operations in mobile and stationary applications, from small gasoline engines to the largest diesel power plant. Worldwide.

MAHLE fuel filters are approved by various classification agencies. We adapt our fuel filters to a wide range of applications, in type, quality, and design. A wide range of filter materials and favorable flow filter housings are available for any conceivable application.

Against water and other fuel system contaminants

For example, our tailor-made filters and water separators ensure the best fuel quality. Our double diversion switch filters provide high filter performance, with a patented one-hand switch and modular filter systems, for separation in the range of 25 µm – 2 µm. And compact MAHLE automatic variable filter systems can be ideally tuned for the demands of large diesel engines and gas turbines. This is how we have stuck up for clean performance in many areas around the world.

Fuel care system

Automatic filter

Chained low-pressure filter

MORE INNOVATION, MORE PERFORMANCE

THOROUGHNESS

FROM DETAILS TO THE COMPLETE SYSTEM

Setting standards with knowledge, capability, experience, and curiosity

The thoroughness with which we perfect solutions down to the smallest detail, and tune them to our customers' individual applications, is surely one of the reasons for our worldwide success. Because we know the complex interactions of filter technology better than anyone, from many industries and from our own research and development activities. That is why we always look at the complete system so as to develop a technically and economically optimized filter design. We take into consideration a great deal of information, data, and system parameters in order to tailor everything to your needs, from the fineness to the location of the filter.

In our own research and development lab, we create the foundation for groundbreaking innovations. Using modern applications technology, we carry out basic experiments, volume flow measurements, sample tests, particle size analyses, and pressure and leak testing. The knowledge gained flows continuously into new material and product developments, which will need to stand up to the most severe daily conditions at our customers. To do this, for example, we start with practical principle experiments with test filters at our customers' sites. With the continuous further development of materials and production technologies, we are pursuing a clear goal: optimal products for trouble-free, economical operations.

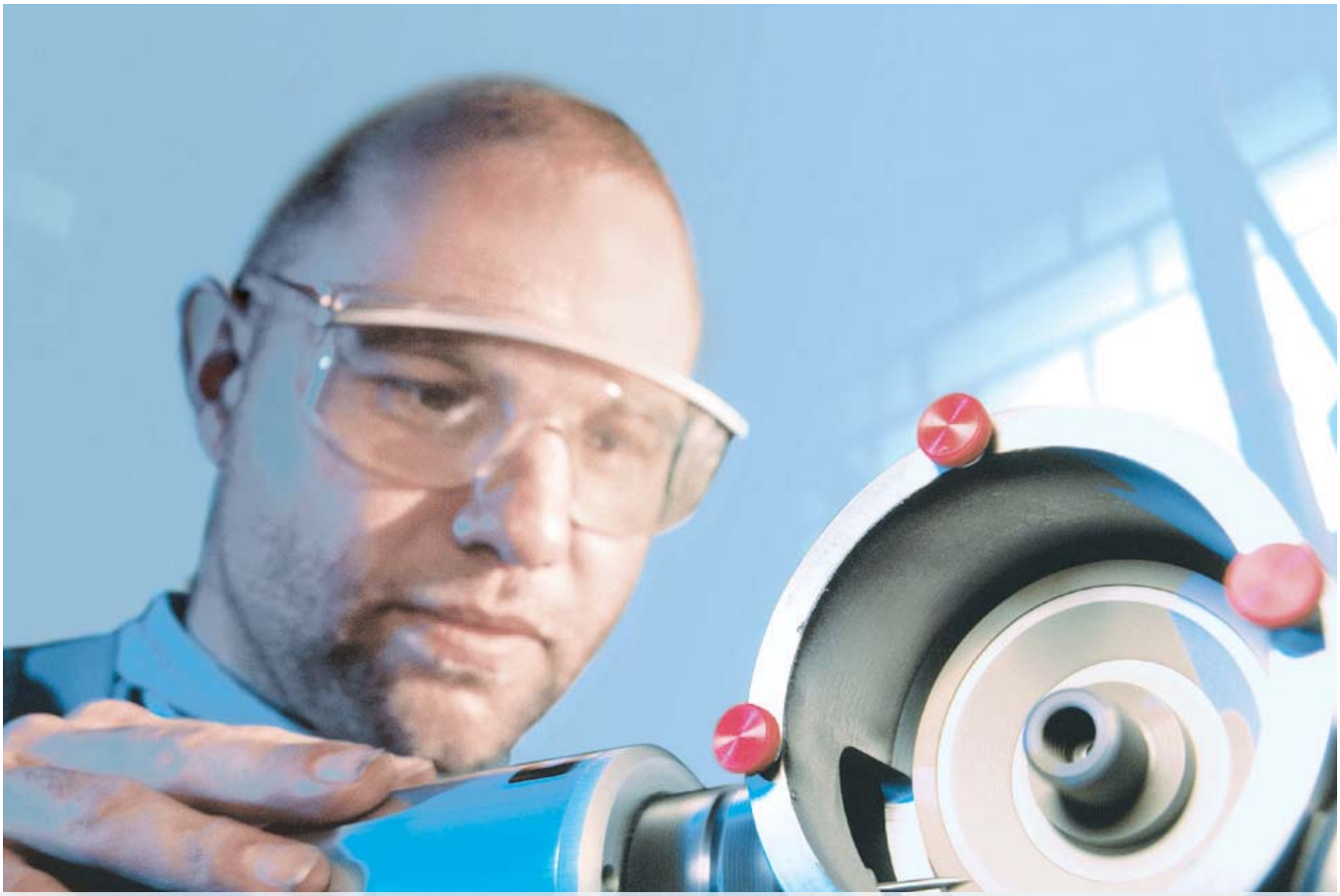
Performance that can be measured

In order to evaluate the efficiency of filtration, we can provide a wide range of experiments in our lab. For example, overall contamination levels with particle counts, or as a concentration, gravimetric sieve analysis, automatic particle counting, microscopic analysis and testing with a raster electron microscope or microprobe. For mobile online measurement of impurities in fluids and for sampling, we have mobile measurement systems available.

Service, from spare parts supply to training

Our extensive filter technology program also includes high-performance spare parts service for worldwide availability. The replacement filter elements are manufactured according to the same strict quality criteria as the original MAHLE filter elements. Customer-specific special versions available upon request. We teach professional service and maintenance in practical training sessions. And for commissioning or maintenance on site, our service technicians are available worldwide.

The result: more reliability, more efficiency, and more performance for you.



Service vehicle

Portable contamination measuring systems

Sampling case

Filter elements

MAHLE

Industrial Filtration

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MAHLE
Industry

MAHLE Industrial Filtration
Typical applications

MAHLE supplies filter cartridges and filtration devices to almost every industry. In more than 35 years, MAHLE has completed a host of impressive projects and developed many powerful products. The following are just a few examples of what MAHLE filter cartridges and filtration devices can do and how they can be used. If you would like to receive in-depth information about a particular application or a specific product, please do not hesitate to get in touch with the person responsible at MAHLE. You can find the contact details later on in this section.

	Typical applications	
	Filter cartridges for gas turbines	Filtration of gas turbine intake air with star-pleated static or cleanable filter cartridges
	Customised filter cartridges for industrial vacuum cleaners	Filter cartridges tailor made for industrial vacuum cleaners, manufactured according to each customer's specification
	HEPA test bench	Every cartridge tested complies with the certified HEPA quality Suitable for (industrial) vacuum cleaner cartridges as well as clean room applications
	Pneumatic transport	Filtration in connection with pneumatic transport processes in the chemical and pharmaceutical industries as well as in food processing and silo vehicles
	Drying systems	After-filters for drying systems
	Flanged body-type filter for the food processing industry	Each cartridge has a very long service life because the filter medium has a PTFE membrane and conical rotating wings for explosive food dusts.
	FDA sealing systems	Perfect hygienic conditions in the pharmaceutical and food processing industries thanks to the washable seal with no dead spaces and no product deposits on the edges
	Activated carbon dust	Removal of conductive activated carbon dust during the processing of activated carbon filter media Coarse or fine abraded particles of activated carbon are reliably separated
	Dry machining on machine tools	Removal of a cast iron / spheroidal graphite dust mixture by suction Filter system with H13 after-filter stage and conical rotating wings
	After-filter for powder coating systems	Perfect filtration of overspray on single or multiple-colour systems

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