# Industrial Filters

We make air work for you

Venti Oelde

# High performance with quality

Industrial filters from Venti Oelde prove their worth every day in numerous industrial sectors such as in mineral processing, metalworking & metal processing, in recycling as well as in the fibre and wood industries. Our filters clean unwanted dust from air and process gases. They are very versatile and can be used for flow rates from 1,000 to over 1,000,000 m³/h and for dust quantities up to 1,000 g/Nm³.

Venti Oelde makes the filters as modular or as round filters. They differ in shape, in cleaning method such as online or offline and in type and construction of the filter media. The resulting range puts us in the position of always being able to individually customise the process used and the filter. Standardized, modular construction permits us to extend filters at will or, if space is tight, to use smaller sizes.

For complex requirements, Venti Oelde offers very practical filter solutions. They are functional, reliable and have a long life. They are very efficient. And they are commercially cost-effective.

The designers in our Research & Development department are continually hard at work to improve quality parameters such as efficiency and extraction percentages, noise levels and strength. Our equipment thus makes a decisive contribution to the smooth running of production.

On request, Venti Oelde can supply plants on a turnkey basis. This means that we will take care of all components from the point of extraction right through to the exhaust gas stack, including the control system.

Venti Oelde specialists will be personally on site for all relevant work – during installation and commissioning as well as during maintenance and repair.

In addition to our conventional maintenance services, we can also remotely monitor the systems via electronic data transmission, after this has been enabled by the customer. Remote diagnosis provides us in good time with concrete information about any irregularities and, when necessary, permits us to quickly and precisely prevent damage and to diagnose faults.

# Robust industrial filters – single and double-row

Special separation systems are required for very fine dusts. The same is true for fibrous, sticky or moist dusts, or for dusts which are difficult to agglomerate. Processes with a high concentration of dust and material require filter systems which continue to work reliably when the filter surfaces are subject to maximum loading.

Venti Oelde offers a single- or double-row filter, depending upon the amount of air, the amount of dust it carries and upon the space available. All filters can be used as suction and as pressure filters. The double-row designs are arranged with a centrally located inlet corridor for the unfiltered gas.

The gas to be filtered is fed to the outside of the filter bags in Venti Oelde's industrial filters. The bags are intensively cleaned with pulses of compressed air during normal operation, synchronised to the operation in progress. The filters meet all of the requirements which can be placed on a modern filter system:

- high flow rate through the filter media
- a long service life for the filter bags
- compact construction, low space requirements and adjustable filter height
- cost-effective operation – for example, by controlling the timing of the compressed-air cleaning and the air pressure via the pressure difference across the filter
- best filter quality and highly efficient bag cleaning resulting in low residual dust content and minimum pressure loss

As required, we make our industrial filters in galvanised, painted or stainless steel, with a minimum wall thickness of 3 millimetres for the housing. They are suitable for use both indoors and out.

We make the filters using sophisticated modular technology consisting of bent and bolted wall components. If minimum leakage is required, we can also seal the housing by welding from the inside. The filters are available in a range of heights and are designed for differing bag lengths and varying pressure levels.

The separated material is collected in the hopper and is discharged via a trough worm conveyor and rotary airlock or via double pendulum flaps. Larger quantities of material are taken away pneumatically via a transport duct. If only a small amount of dust arises, it can be discharged into bins or containers beneath the outlet.

# Round and cyclone filters exactly as required

To separate large quantities of bulk materials, our robust and low-maintenance round filters with integrated cyclone separators are tried and tested. They are used as final separators for pneumatic conveying systems.

Venti Oelde makes round and cyclone filters tailored to your requirements. Depending on the application, we use a variety of sheet thicknesses and materials such as stainless steel and very wear-resistant steel.

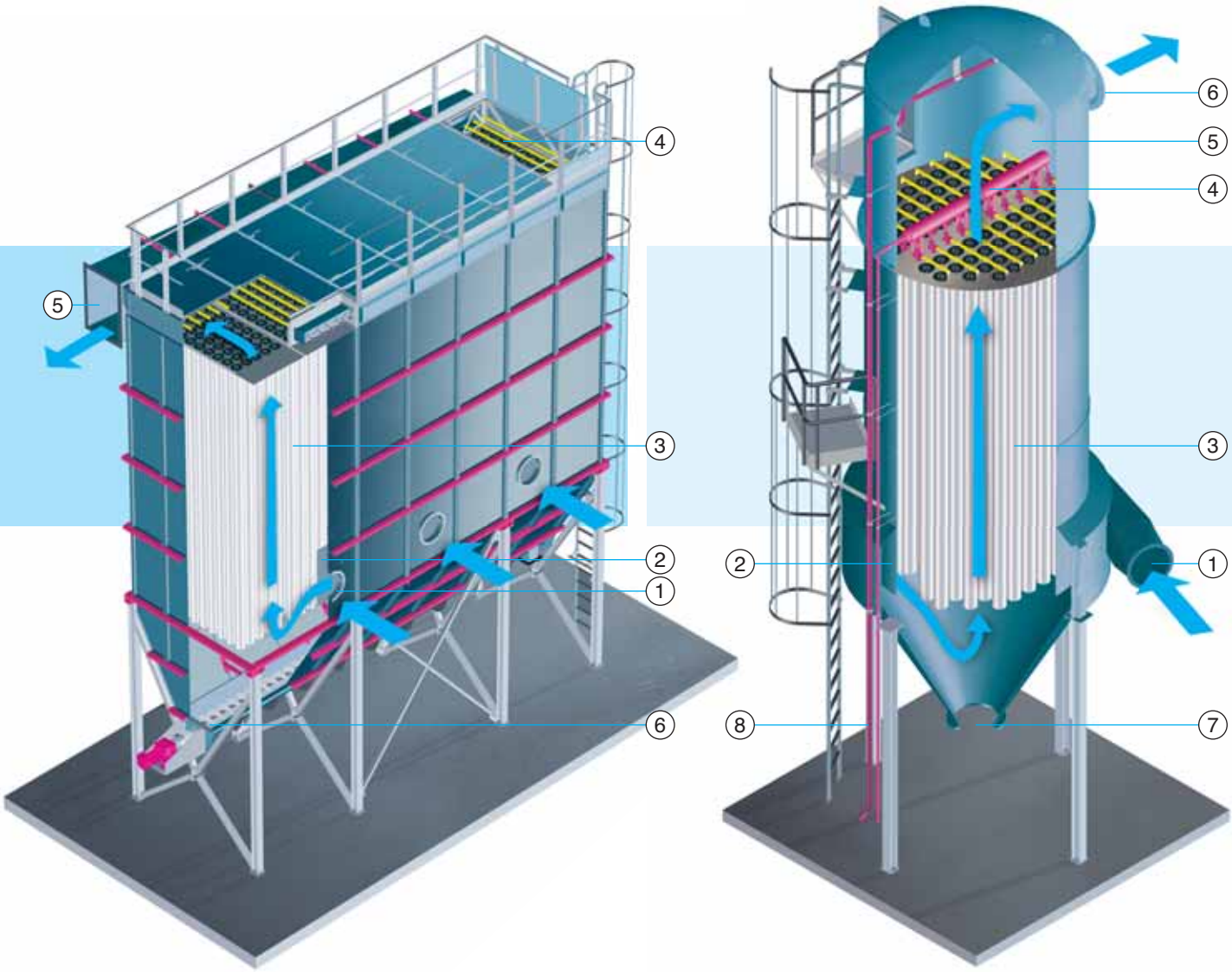
We offer these filters in a variety of types, amongst others, to fit on top of bunkers, with a filtered air dome or with a swivel lid.

As a centrifugal separator with a tangential inlet, these filters offer the greatest possible primary separation. Pressure is carefully applied to the filter bags. The round shape of the housing makes it very robust.

Pressure-shock-resistance up to 10 bar has been proven via tests with water pressure. Use in areas at risk of explosion conforms to ATEX guidelines 94/9/EU. Pipelines with pressure relief baffles prevent the pressure wave from entering downstream equipment. The dust-laden air ducts can be decoupled with tested non-return valves. Even if, despite all of the safety precautions, it should come to a dust explosion, the pressure relief mechanisms will reduce the damage and the resulting system downtime.

Venti Oelde individually adapts the filters to the local circumstances. The flexible height and filter diameters from 1150 mm to 4500 mm in our product range unterline this.

# One principle – many options

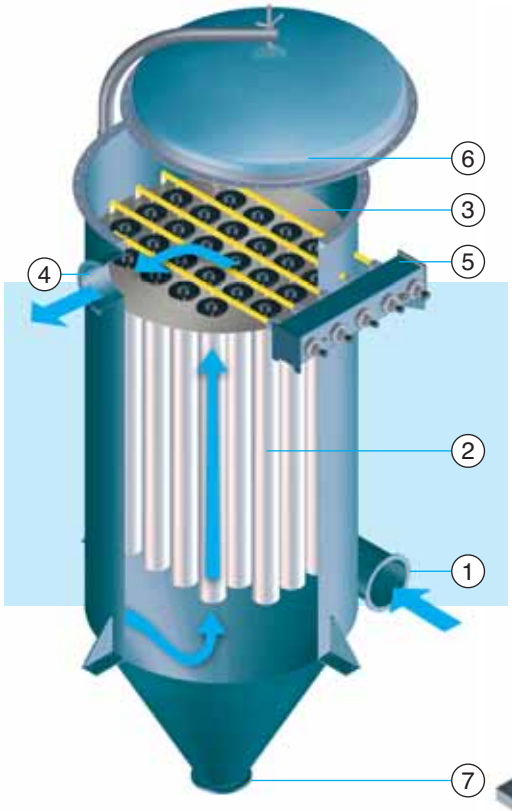


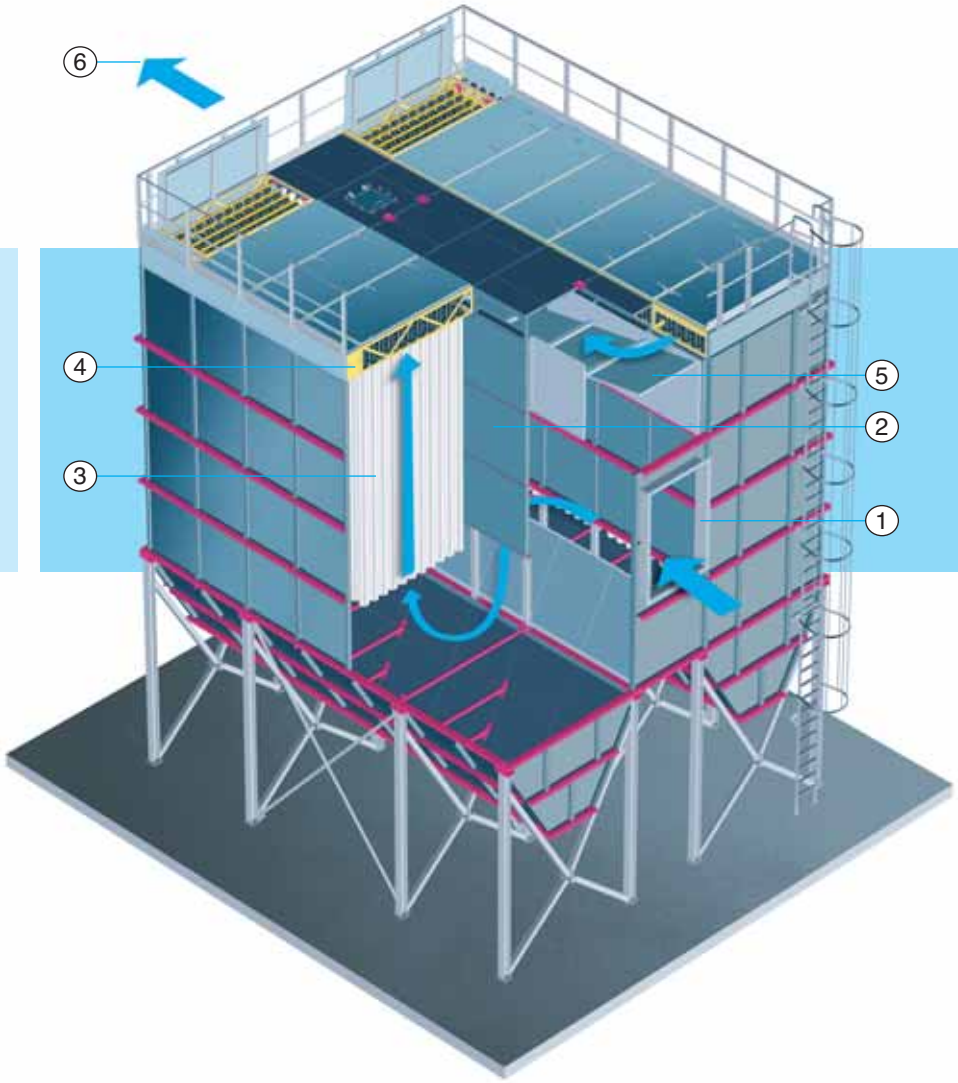

## Single-row filter

① Dust-laden gas inlet
② Dust-laden gas baffle
③ Filter bags
④ Filter head
⑤ Filtered gas outlet
⑥ Trough worm conveyor

## Round cyclone filter

① Tangential dust-laden gas inlet
② Inlet duct
③ Filter bags
④ Compressed air tank
⑤ Walk-in filtered air plenum
⑥ Filtered gas outlet
⑦ Dust outlet
⑧ Extinguisher line



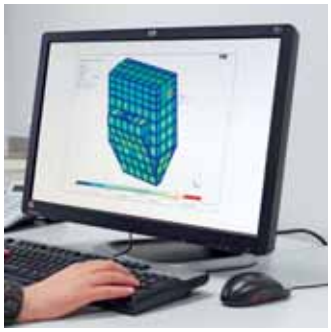

## Round filter

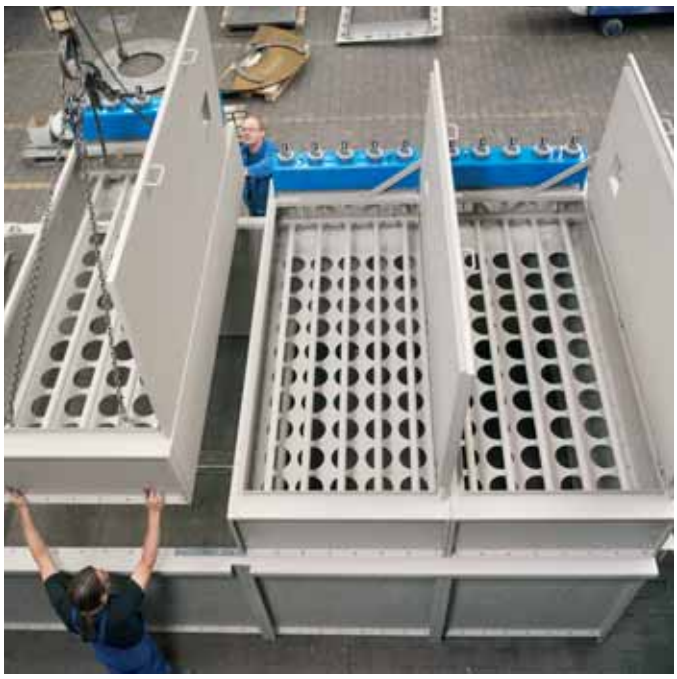
① Dust-laden gas inlet
② Filter bags
③ Filtered gas plenum
④ Filtered gas outlet
⑤ Compressed air tank
⑥ Swivel lid
⑦ Dust outlet

## Double-row filter

① Dust-laden gas inlet
② Dust-laden gas baffle
③ Filter bags
④ Filter head
⑤ Dust/filtered gas duct partition
⑥ Filtered air outlet

# A fully mature technology



The right choice of filter media brings a decisive reduction in operating costs. We use only high-quality materials. The surface of the filters can be treated in different ways. We can thus make special adjustments according to dust to be separated and its characteristics. The cleaned air can frequently be fed back into the workrooms significantly reducing energy costs, especially during cold periods.

For dusts in hot gases up to 250°C, we equip our filters with filter media suitable for high temperatures. Through careful design, we take

account of extreme thermal expansion. The filters are thermally insulated, as required, or are heated, if necessary.

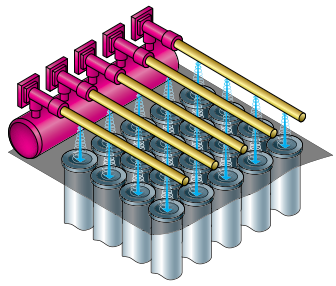
As standard, filter bags with a diameter of 160 mm are installed. We offer bag lengths varying up to 5.5 m. Maintenance is particularly easy when it comes to exchanging the filter bags. Our snap ring fixtures form a particularly air-tight seal. They press the filter bag firmly into the opening in the base plate, providing a good seal. The double bead also prevents assembly errors. The filter bags are exchanged via the vertical hatch in the area of the filter head. For protection from the weather when changing filter bags, a penthouse is a good idea, especially for larger filter systems. Access is via a stair tower or ladders.

We reduce pollutants which arise during melting and burning processes. We introduce additives such as calcium hydroxide to the flow of unfiltered air.

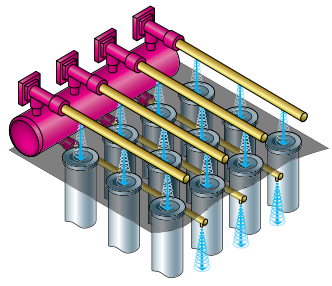
Special materials and plates protect the parts of the filter which are at risk from abrasive dust. We take particular care in choosing the material of filters to protect them from corrosion. A special coating provides additional protection.

To determine the necessary resistance to high or low pressure, we use the finite element method.

**Normal filter bag spacing**



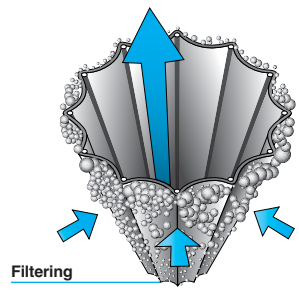
**Extended filter bag spacing**

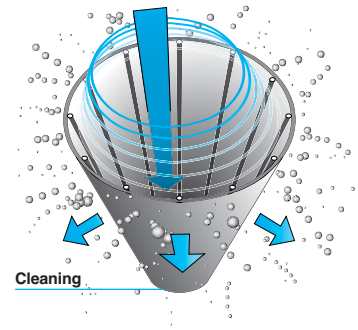


# Automatic cleaning – convenient and efficient

Depending on the product and the process, filter bags are cleaned either at regular intervals or on the basis of pressure difference, in part with pulse pressure control. A brief, powerful pulse of compressed air dislodges the caked dust from the filter bag and transports it to the hopper to be discharged.

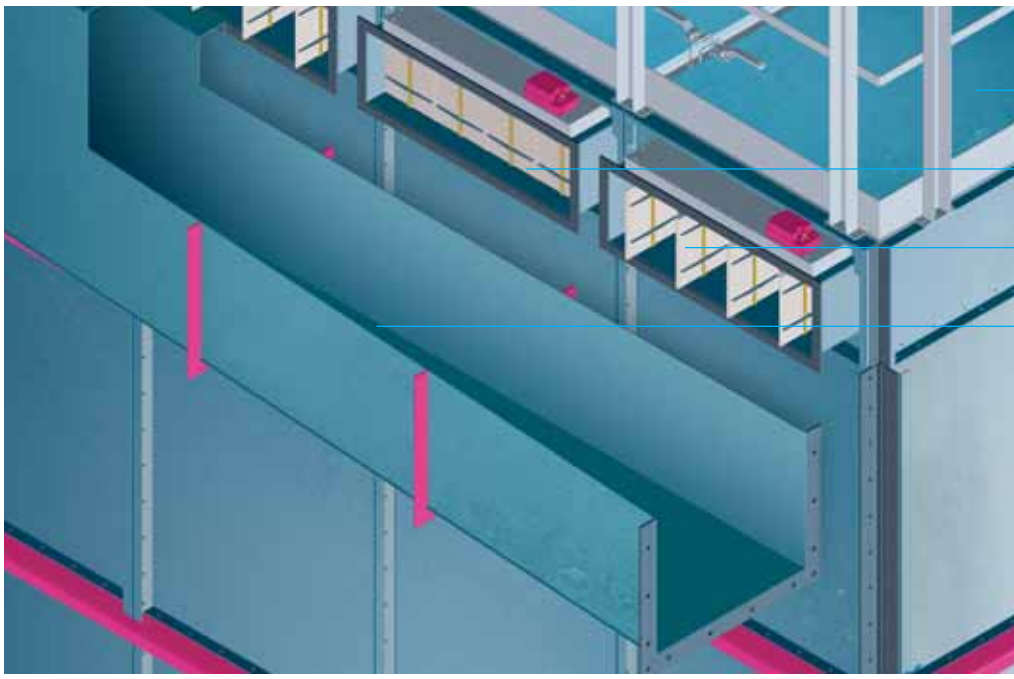
**Behaviour of the filter bags during cleaning**




For each filter head, a compressed air reservoir is used to clean the individual rows of filter bags with a maximum cleaning pressure of 6 bar. Via electronic membrane valves, the reservoirs are controlled so that the rows of filter bags are cleaned in sequence via their associated nozzle pipe. The filter control system sets the cleaning intervals. The nozzle pipe is responsible for directing the compressed air pulse into the row of filter bags. Secondary air is also sucked in via inlet nozzles at the head of the filter bags. This supplements the compressed air pulse which inflates the filter bags, dislodging the caked-on dust layer. This reverse flow of air also cleans the material of the filter.

After the cleaning pulse, and after the excess air has dissipated, the filter bags are freshly regenerated and ready for use again in the normal filtration process. In this way, the filter bags are continuously cleaned, row by row. The cleaning process is extremely quick. This means that the entire filtering bag surface is almost always effective, as you would expect for online cleaning.



**Online/offline cleaning**

**Filter head**

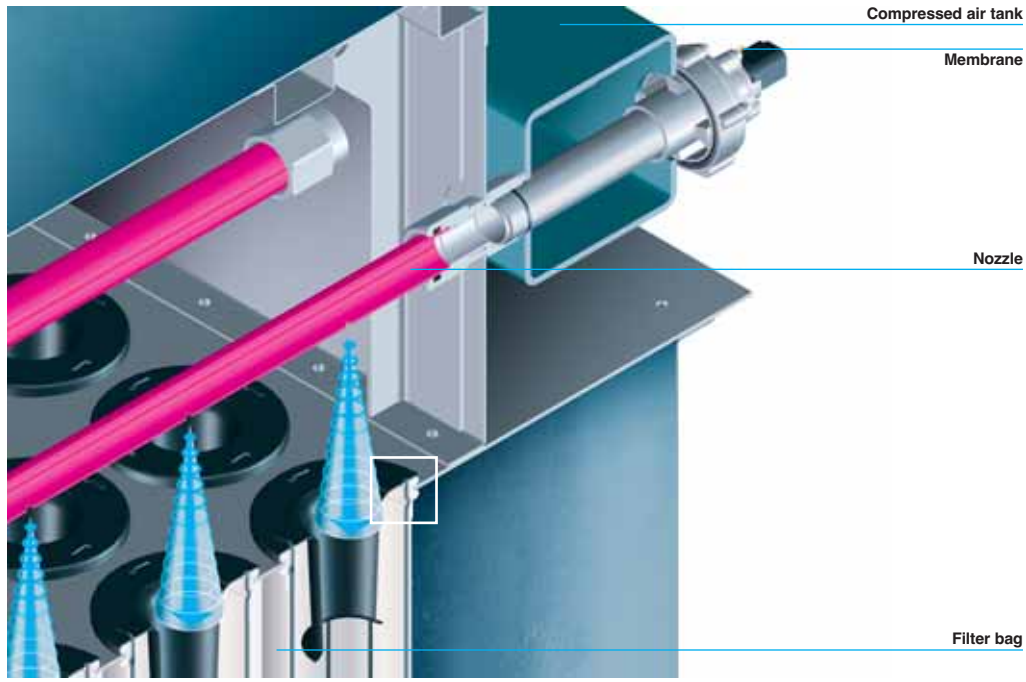
**Filtered gas flap closed**
**=> Filter chamber is being cleaned**

**Filtered gas flap open**
**=> Filter chamber is operating normally**

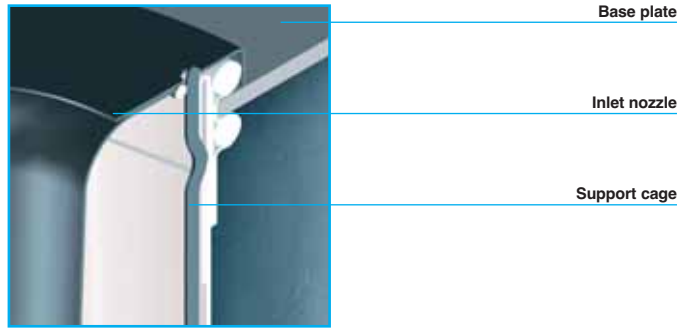
**Filtered gas duct**

For especially fine and difficult dusts, the filter can be subdivided into individual chambers. These are sealed off section by section and are then cleaned using the offline process.

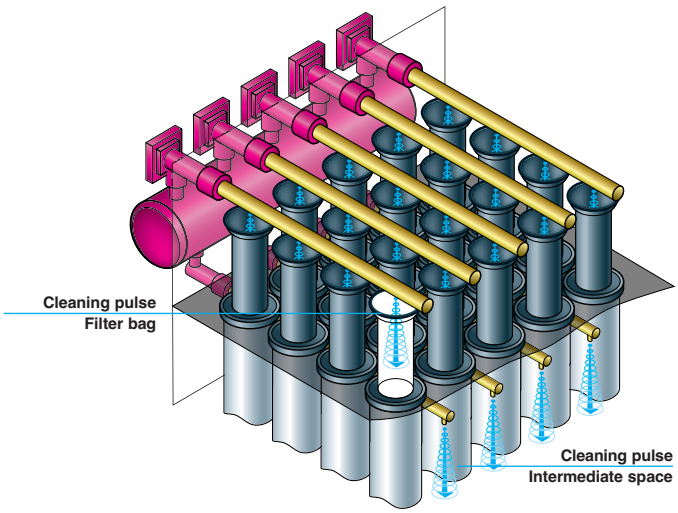
## Cleaning with filter bag fixing




## Detail of filter bag fixing: Snap ring fixture




## Cleaning the intermediate spaces




In addition to conventional jet cleaning, Venti Oelde offers another cleaning process which also keeps the spaces between the filter bags free. This is located in the unfiltered gas space and is primarily used to separate lighter, fibrous materials.

An additional empty chamber serves to calm the gas for large quantities of dust. Here, a large part of the dust will separate out.

# Modern safety technology including accessories

Dust fires and explosions occur on an almost daily basis. You should thus make use of our extensive experience in the field of safety technology. Venti Oelde cooperates with its customers to plan and integrate both active and passive safety measures. Speak to our engineers, who cooperate with renowned companies.

Venti Oelde reduces the risk of fire and explosions. We offer equipment to suppress fires and explosions, such as a spark detection system with an automatic extinguisher. This detects and extinguishes sparks before they can reach the endangered filter system.

For additional protection from explosions, we can decouple the systems from one another so as to deflect the pressure wave. Non-return valves in the unfiltered gas pipes protect other parts in the system and prevent the pressure wave from spreading through the workshops. The explosive force is directed and reduced by the use of adequately dimensioned pressure relief areas.

Local monitoring equipment is of central importance in a safety concept – equipment such as

- Infra-red detectors
- Spark detectors
- Pressure monitors
- Rupture sensors
- Fill-level sensors
- Rotation sensors

When faults occur, monitoring equipment detects this and prevents dust from being discharged to the atmosphere or to the return air by switching off the system in good time. The control systems designed by Venti Oelde evaluate the signals received and control the actions to be taken as a result.

If pipes conveying material go through several fire protection zones, we can separate them. Safety components are used to do this such as certified quick-acting gate valves or VDS-approved fire protection flaps.

Venti Oelde has developed pressure-shock-resistant and flame-proof rotary airlocks. They are suitable for large, high-volume quantities of materials such as, for instance, arise when conveying MDF fibres. The airlock has flexible sealing strips. This ensures that explosions or fires are decoupled – for example, between filter systems or separators and the next part of the conveyor system. The rotary airlocks have been tested and certified to ATEX guidelines 94/9/EU, and may be used as protective systems in areas at risk of explosions.

To prevent the temperature from falling below the dew point, the filter can be insulated. Heating can also be installed for the lower part of the hopper.

With our help, you can reduce the risk of fire or explosions in your systems to a minimum. We would be happy to advise you.

Subject to alterations B 1/10/10/5.Stu

- Industrial fans
- Dust collection and process air cleaning plants
- Exhaust air treatment plants
- Ventilating, heating and air conditioning plants
- Recycling and waste processing plants
- Surface technology

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