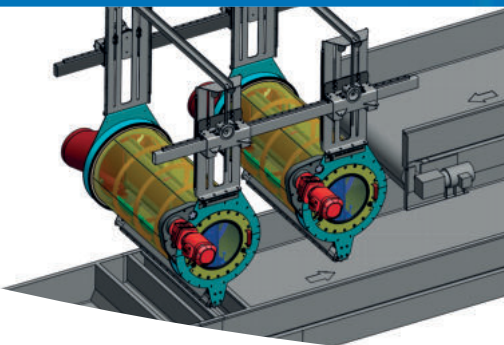


ENGINEERING MANUFACTURING EQUIPMENT CONSTRUCTION ASSEMBLY



*Luft zum Atmen*  
**SCHULZBERGER**  
LUFT- UND VERFAHRENSTECHNIK



# THE COMPANY



Schulz & Berger Luft- und Verfahrenstechnik GmbH has been established for over 65 years and designs, plans and constructs ventilation systems and customised solutions for industrial and commercial operations. From classifier systems, sorting cabin ventilation and activated carbon filters through to large filtration plants. We constantly invest in our machinery, EDP, vehicles and buildings. This allows the workforce in the production facility as well as in administration to be increased and apprenticeships to be provided. The company's service profile is also expanding. Flexibility, quality and quantity are all increasing.

More than 60 employees work in our branch plants in Altenburg and Hohenmölsen in modern production halls and two administration buildings covering a total of approx. 6,000 m<sup>2</sup>. In addition, there are more than 60,000 m<sup>2</sup> of outdoor facilities.

Our modern machinery includes a water-jet system, a laser cutting machine, various welding machines, such as a longitudinal welding machine, flanging machines, 4 roll bending machines, a CNC bending press and a hydraulic plate shear. They enable the efficient machining of steel, stainless steel and aluminium sheets from the raw material through to the finished component.

Modern server and EDP technology and software enable systems to be efficiently planned and drawn and precisely aligned to your wishes. Programs such as AUTO-CAD and inventor guarantee precise progression and prior representation. This improves planning certainty and the long-term performance of the components and systems.

Our fitters travel around the globe installing, assembling and even commissioning complete systems for our customers. We are naturally also at your service after this period. Our service contracts provide peace of mind regarding the function and efficiency of the systems.

Research and development ensure innovation and increased efficiency. We also work closely together with Universities of Applied Science.

In the past 5 years we have registered 6 global patents as well as several utility models.

Our services have resulted in more than 1000 satisfied customers. All these companies combine a high demand for technical solutions with partner reliability.

# PRODUCT OVERVIEW



DEDUSTING



AIR CLASSIFIER  
LIGHT MATTER SEPARATOR



SORTING CABIN VENTILATION



VACUUM SEPARATOR  
UDT1 & UDT2



BINARY SYSTEM  
HIGH PRESSURE MIST SYSTEM



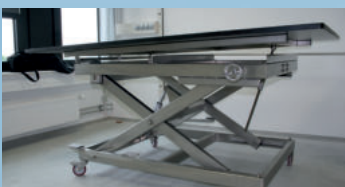
PIPE  
CUSTOMISED CONSTRUCTIONS



WASHER  
ROTTING PIPING



TANK AND VESSEL CONSTRUCTION



LABORATORY TECHNOLOGY

# DEDUSTING

## High performance bag filter RS series

We have been operating in the area of dedusting technology for the waste, paper, metal and timber industry since 1960.

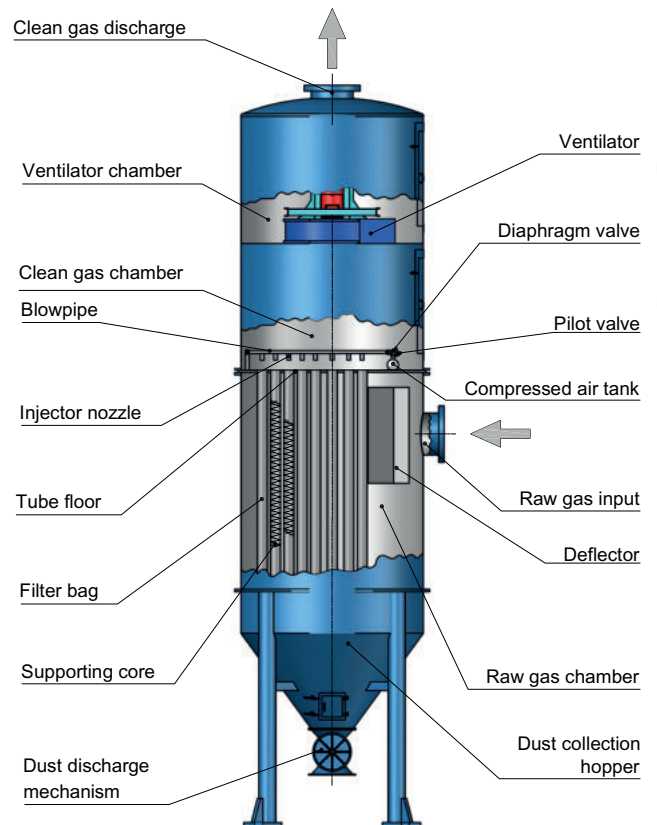
Our many years of experience in these areas make us your first contact for consulting, planning, designing, assembly and commissioning.

**We produce customised systems specifically tailored to your needs:**

- Surface filter in round construction
- Bag filter
- Cartridge filter
- Cyclone separator
- Activated carbon filter

An ATEX design is possible.

Pressure-surge resistant design as per VDI 2263 for dust explosions (TÜV inspection)



# DEDUSTING

## Technical data

- Filter type: RS with a nominal air quantity of 10-85,000 m<sup>3</sup>/h each filter unit (increase the volume flow by multiple switching of several filters)
- Outlet height up to 30 m (possible without separate chimney)
- Max. operating temperature: depends on requirements
- Very little setup space required (ventilator is integrated into the clean gas chamber of the filter housing)
- Stable round construction incl. supporting foot design
- Wall thickness 4-8 mm
- Functions according to the downflow principle
- Electronically controlled compressed air cleaning
- Filter differential pressure system
- Compressed air requirement: 6 - 8 bar, free of oil and water
- Completely integrated filter equipment of the highest quality
- Filter bags made of polyester needle felt or as required
- Dust emission in the clean gas of 2 mg/m<sup>3</sup>-10 mg/m<sup>3</sup>, depending on requirements
- Hose mounting with optimal seal by stainless steel snap ring, combined with internal clamp cuffs
- Simple installation and removal of the filter elements on the clean gas side
- Accessible via large clean gas doors
- Depressurised by explosion bursting disc. vent area according to VDI 3673
- Vertical ladder with railing and platform
- Dust discharge via cell wheel lock or dust collection container
- Colour: chosen by the Buyer
- Corrosion protection with high-quality coating system
- Coating: sand blasted, primed, top coat



Transport/Assembly of a bag filter and activated carbon filter

# DEDUSTING

## Design options



Tipping container with slider



Barrel with slider



Cell wheel lock with big-bag



Cell wheel lock with screw

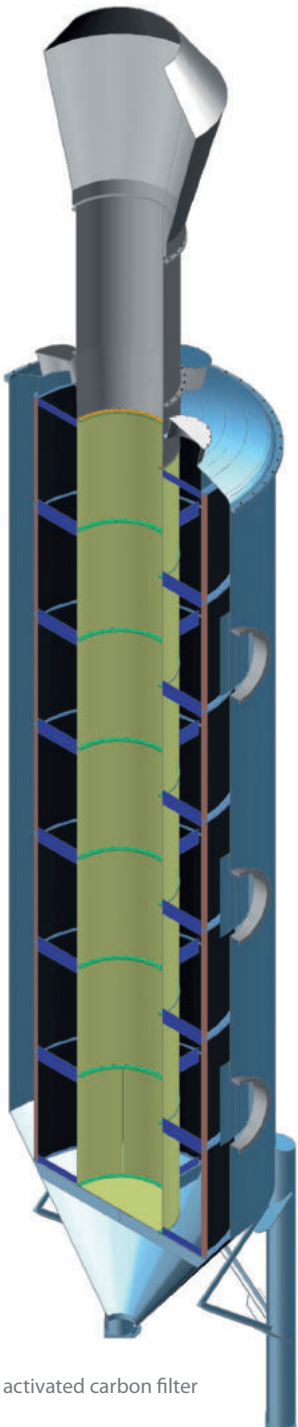
## Benefits of the round construction for bag and activated carbon filters

- No dead corners, i.e. lower risk of bridging and wall condensation
- Highest possible form stability, i.e. no vibrating housing walls regardless of the over/under pressure ratios
- Easy realisation of a pressure shock-resistant construction in case of risk of dust explosion
- Housing wall thickness 4-6 mm
- Easy filling and emptying of the activated carbon through the integrated supply slot with chutes (only one filling and discharge nozzle)
- Minimal floor space thanks to standing construction of the activated carbon filter/dust filter
- No additional space required for the chimney as the activated carbon filter housing is also the chimney base
- Activated carbon filter can be easily extended
- Low wind load thanks to convenient form factor

# DEDUSTING

## Activated carbon filter AR

For the efficient separation of gaseous air pollution. These are often damaging to the health of humans, animals and plants. Activated carbon has proven to be an effective medium against these gases and is therefore used in air-conditioning and ventilation systems to reduce odours, to absorb dangerous gases and to purify the air by cleaning the supply and circulating air.



Cross-section of the activated carbon filter



Activated carbon filter 2 x 45,000 m<sup>3</sup>/h

## Design of the activated carbon filter

- Housing in stable steel sheet construction
- Depressurised by TÜV-tested bursting discs
- Highest quality activated carbon fill and adapted to the separating solvents
- Optimised inflow to the carbon fill
- Corrosion protection of the normal steel parts with high-quality coating system
- Replacement of the carbon fill via gate valves and big-bag
- Filter type: AR
- Volume flow: 1,000-85,000 m<sup>3</sup>/h
- Operating pressure differential: approx. 300 Pa
- Relative humidity: < 60 %
- Solids content in the gas flow: < 2 mg/Nm<sup>3</sup>
- Colour shade arbitrary according to RAL

# AIR CLASSIFIER

## Area of application and use of air classifiers

The task of an air classifier is to separate substances of varying density (heavy and light matter). Various types of air classifiers are used depending on the product, product quantity, area of application and/or performance requirements in order to achieve the ideal solution for our customers.

## Blow/Suck classifier

The material to be classified is fed into the classifier head by a conveyor belt with an adjustable belt speed. The discharge parabola of the material to be sorted is widened using a targeted air flow. The heavy matter falls onto a discharge belt while the light matter is sucked upwards and discharged and fed into a special separator (light matter separator/cyclone) that separates the air from the light matter.

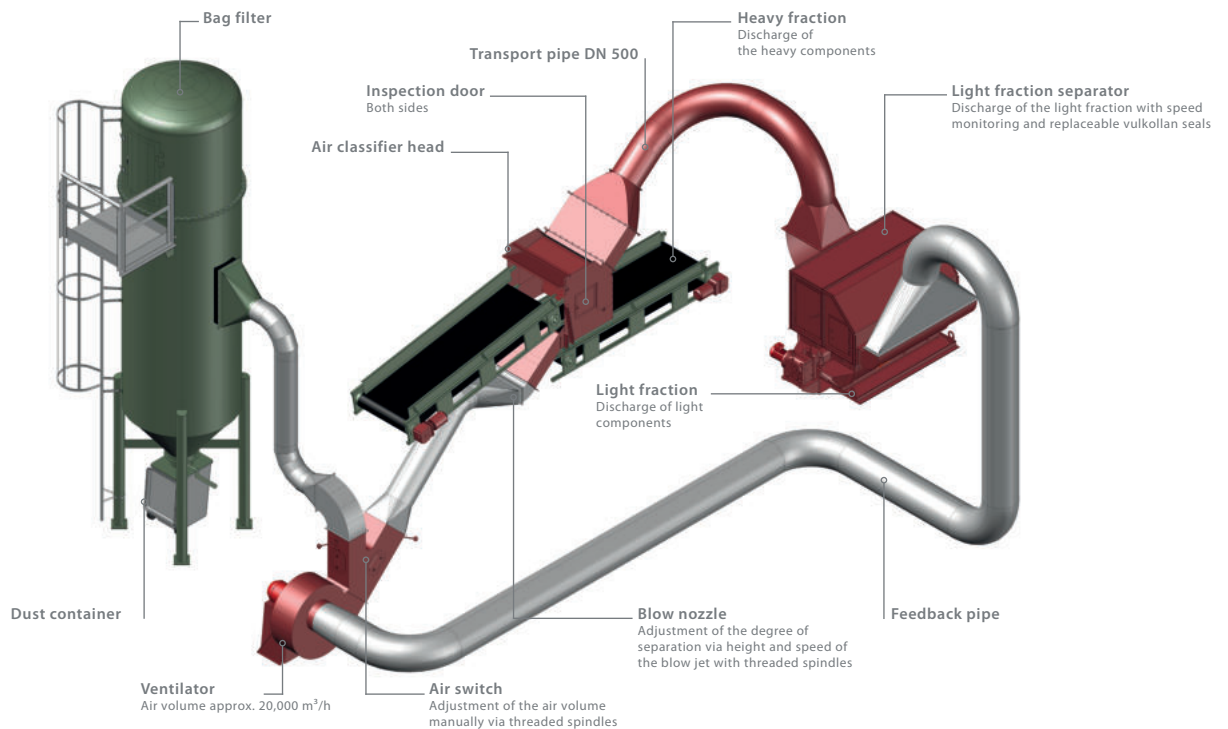
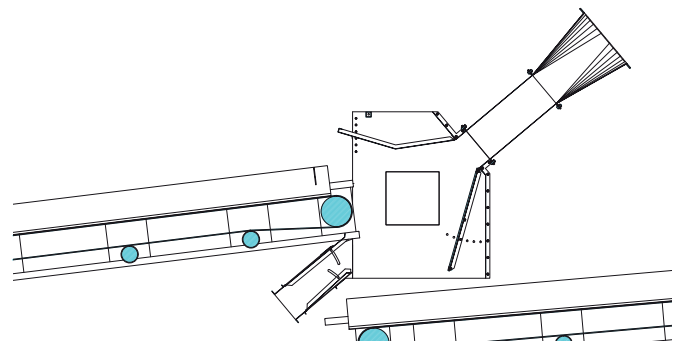
The classifier system operates with a partial amount of circulating air, where between 10-30 % of the excess air is fed into an external deduster.

### Types of air classifiers:

- Blow/Suck classifier
- Stage classifier
- Kidney classifier
- Three-fraction classifier
- Swivel plate classifier
- Parting arbor classifier

### The main components:

- Classifier head (for example parting arbor classifier/ ascending classifier)
- High-performance ventilator
- Separator (material separator/cyclone separator)



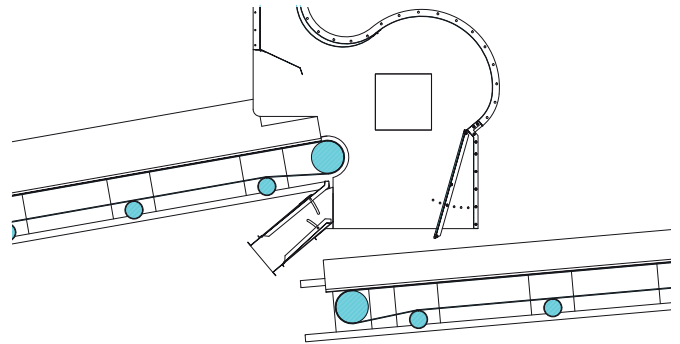


# AIR CLASSIFIER

## Kidney classifier

The newly developed kidney classifier separates bulk material primarily in the medium grain lines of waste management.

An innovative design and functionality with a cyclone-like operation enables the separation of a heterogeneous material flow, which consists of various fractions, into individual components. After successful separation the heavy fractions are transported away over conveyor belts. The light fraction is sucked away.

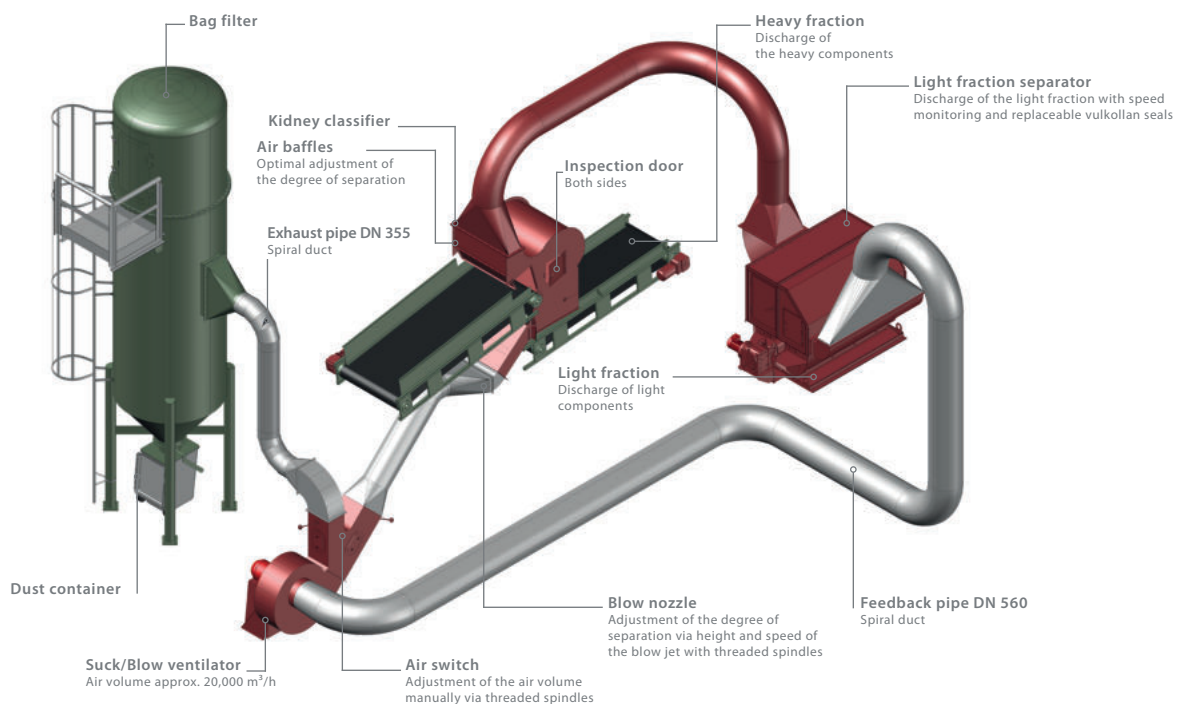
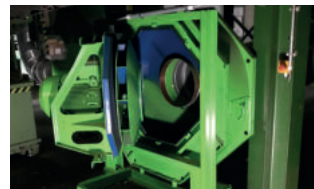


### The kidney classifier provides:

- A high degree of separation purity into individual fractions
- A reduction of hard plastic losses
- High efficiency
- A compact design
- Significantly less blockages on the classifier head



A diverse range of setting options ensures that the kidney classifier adapts to various customer requirements. The kidney classifier can be easily integrated into existing air classifier systems in order to considerably improve their efficiency.



# SWIVEL PLATE CLASSIFIER

## Swivel plate classifier

The newly developed swivel plate classifier can be used to separate large foils in oversize lines.

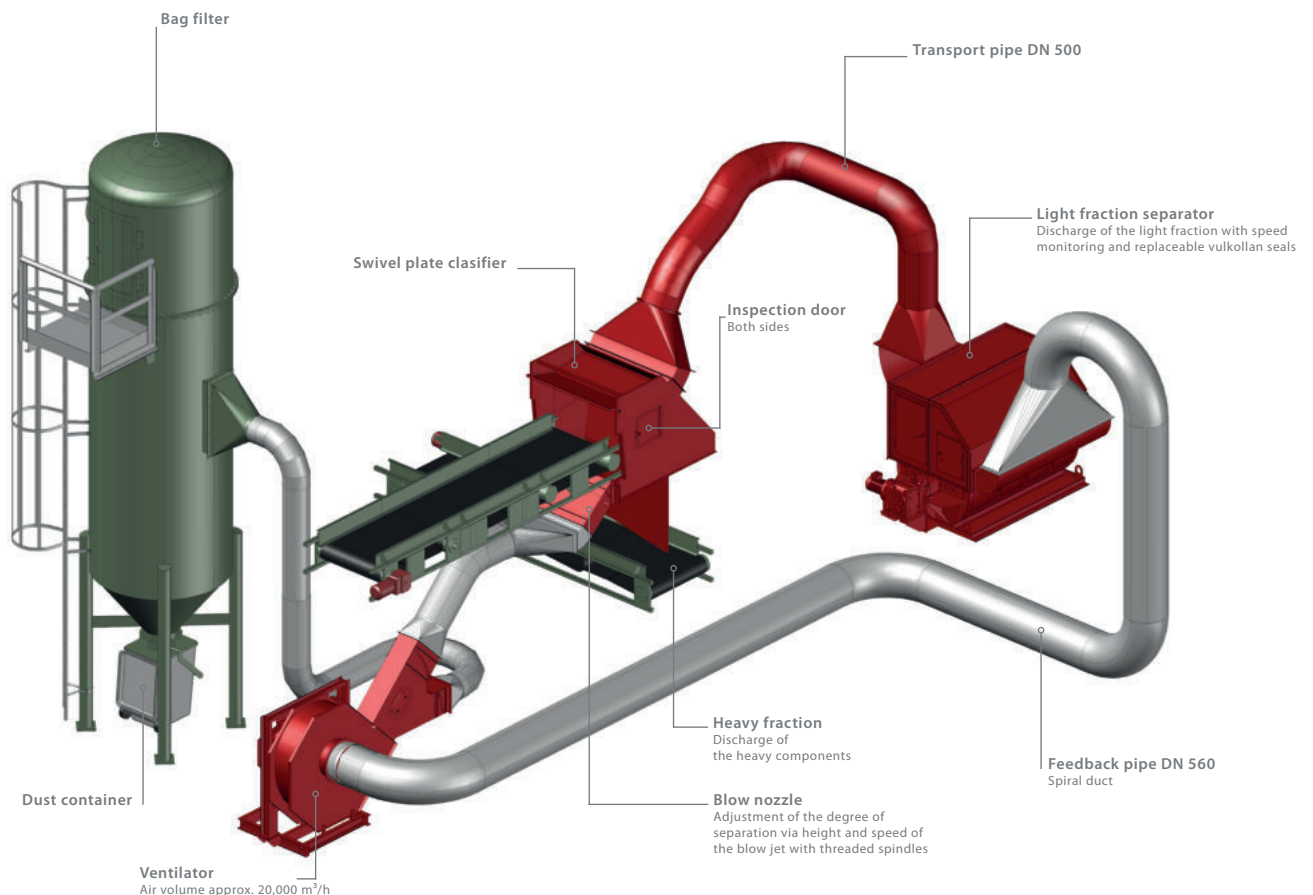
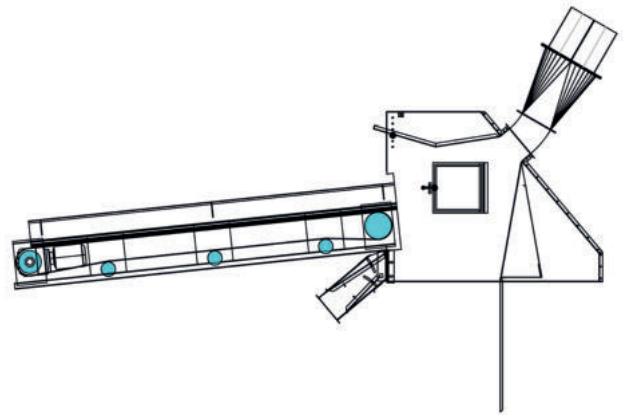
The material flow is fed into the classifier head via a conveyor belt with controllable belt speed. An adjustable blow nozzle creates a targeted air flow which separates the material flow.

The heavy fraction falls down onto a discharge belt. The light fraction is sucked upwards and fed into a special separator (light fraction separator/cyclone). This separates the air from the light fraction.

The classifier system partially operates using circulating air, where 10-30 % of the excess air is conducted into an external dust extraction system.

The swivel plate classifier is characterised by the following benefits:

- Large passage for oversize material
- Reduced risk of blockage due to a swivelling baffle plate
- Compact design
- Easy upgrade options at a conveyor transfer point
- High degree of purity of the separation into individual fractions
- A range of setting options



# AIR CLASSIFIER

## Stage classifier

The new alternative to the zig-zag classifier!

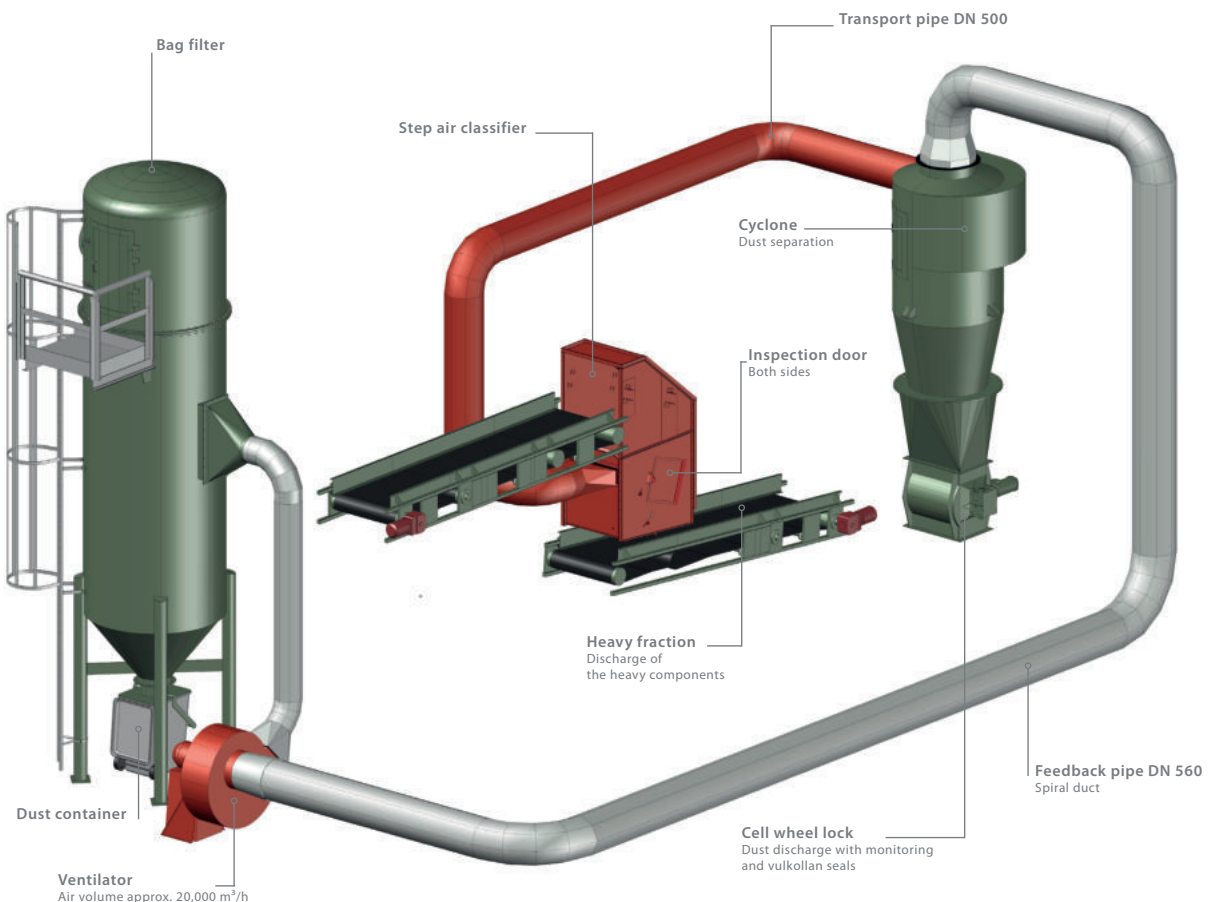
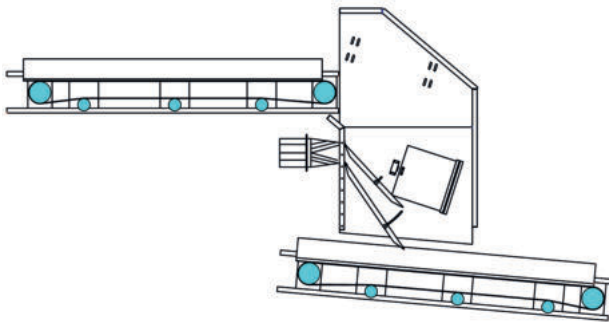
The newly developed stage classifier separates bulk material primarily in the fine or medium grain line of waste management.

An innovative design and functionality enables the fragmentation of a heterogeneous material flow, which consists of various fractions, into individual components. Following successful separation, the heavy fraction is transported away via conveyor belts. The light fraction is suctioned off and separated by a cyclone or a light fraction separator.

A diverse range of setting options ensure that the stage classifier adapts to various customer requirements.

### The stage classifier provides:

- A high degree of purity of separation into individual fractions
- A high level of efficiency
- Easy upgrade options at a conveyor transfer point
- Rapid adaptation to various material flows
- New rotary valves
- A compact design
- Baffle plates with adjustable inclination

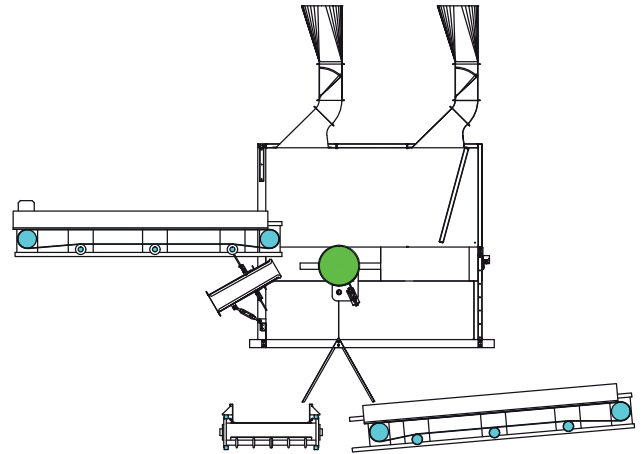


# AIR CLASSIFIER

## Three-fraction classifier

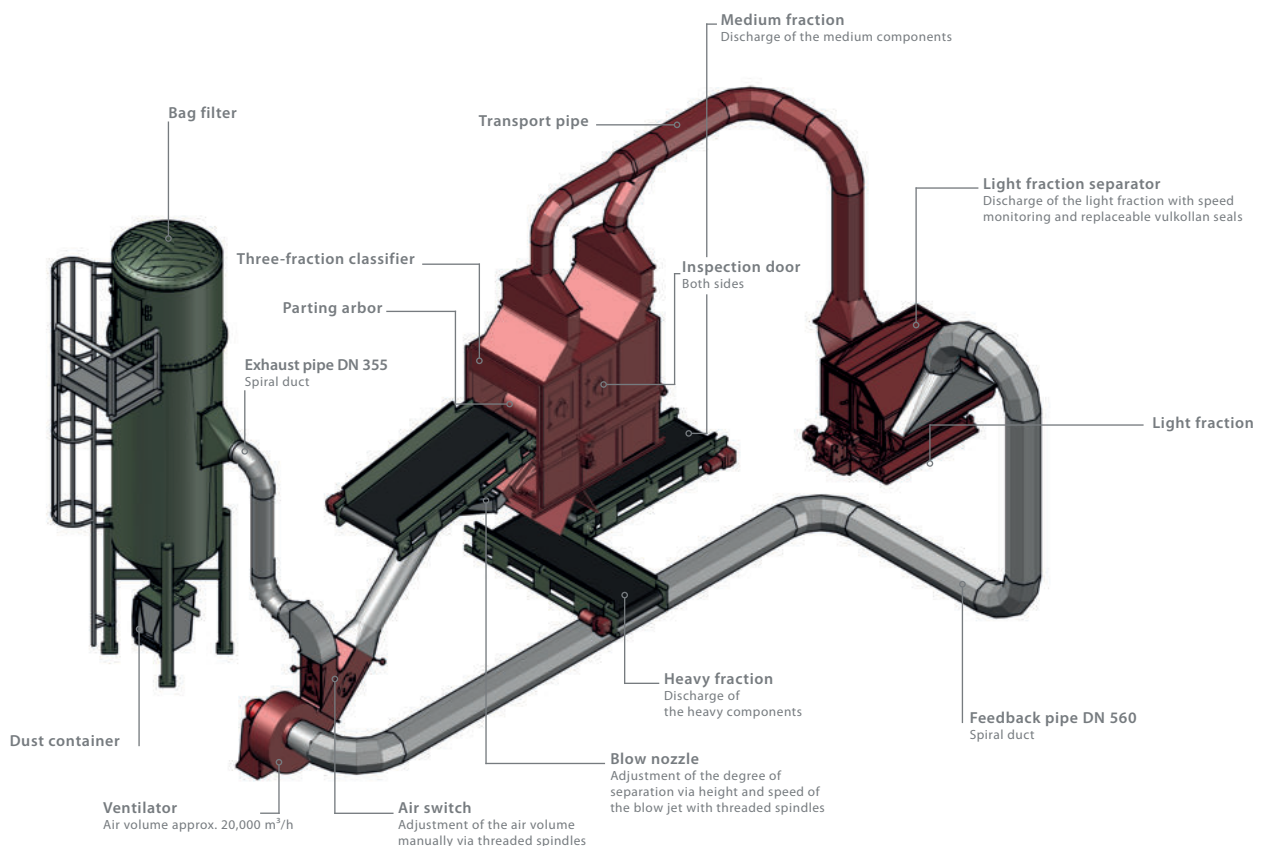
The three-fraction classifier, for which a patent is pending, is another innovation from Schulz & Berger. The system is primarily used in waste management companies and separates heterogeneous material flows into three fractions. It achieves a high degree of purity of the individual fractions at the end of the separating process.

The three-fraction classifier can be used up to a throughput of 25 tonnes per bulk density. The introduced material flow is separated by a specific airflow within the classifier. An adjustable parting arbor made of stainless steel allows the system to be adjusted to various materials. Various conveyor belts, or containers or bunkers, transport the heavy and medium fractions away. The super-light fraction is sucked out via a pneumatic transport.



### The three-fraction classifier is characterised by:

- Three fractions
- An extremely robust construction
- A compact design
- High material throughput
- Extremely high degree of separation
- High availability and low cleaning expense
- A multitude of setting options for adjusting it to specific customer requirements



# AIR CLASSIFIER

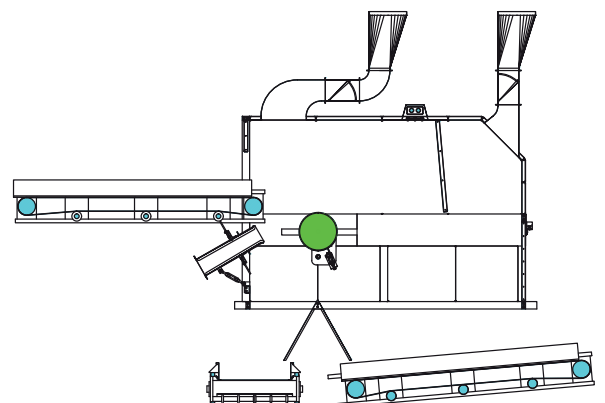
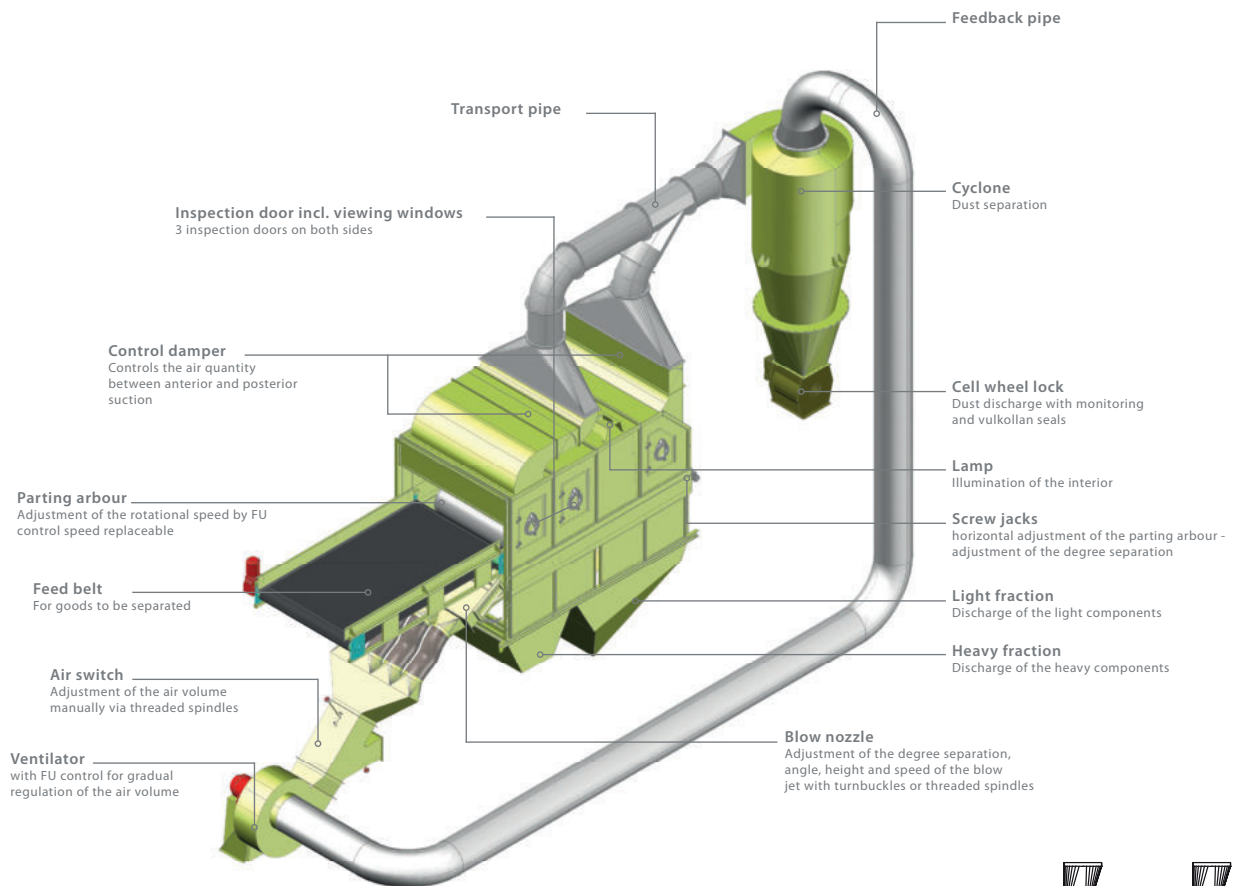
## Drum classifier / Parting arbor classifier

The air classifier separates bulk material with different grain sizes into heavy and light matter. The material to be classified is introduced into the classifier via a feed belt.

A ventilator creates an air stream that the introduced material falls through. This is used to separate the material to be classified into heavy and light material. The heavy material falls down out of the classifier and is transported away via a belt. The light matter is blown into a large expansion chamber by a parting arbor and then falls onto another discharge belt.

The excess air is sucked out of the expansion chamber. This air flow is then once again fed into a cyclone separator.

The parting arbor classifier operates using a partial air circulation operation, i.e. only approx. 10-30 % of the air from a dedusting system is supplied. This allows the dedusting system to be designed with smaller dimensions. This type is therefore also particularly suited for large volume flows.

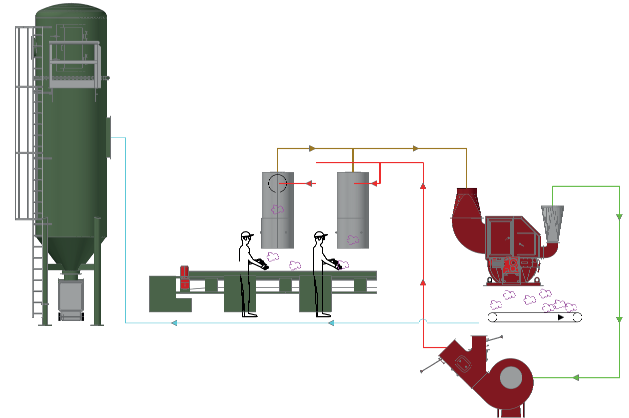


# OVERBELT SUCTION

Overbelt suction is used in sorting cabins by waste management companies where employees manually remove films from the overall mass flow. Previously, shafts at every sorting workstation were used to transport the films away.

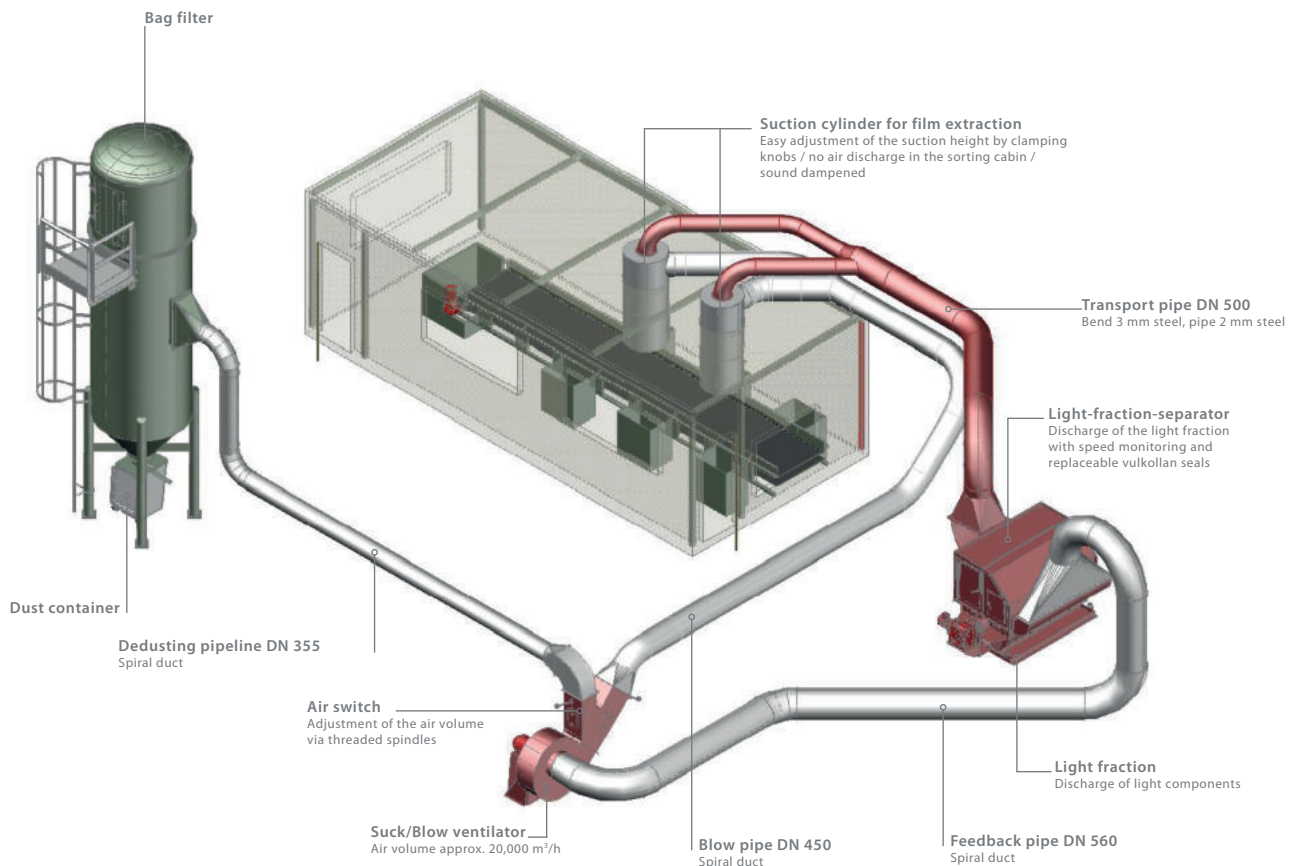
The overbelt suction allows employees to feed the sorted films into the extraction fan above the workstation.

The films are fed into the light fraction separator via a pipeline system where they are separated. The system operates using recirculating air so that the airflow in the sorting cabin is not affected.



## Benefits of the overbelt suction:

- Easily retrofitted
- Optimal workflows



# LIGHT FRACTION SEPARATOR



## Light fraction separator

The light fraction separator is used in waste management companies. It is used for pre-separating film waste for pneumatic conveying.

The light fraction separator consists of steel sheet housing with large service openings. It has an installed sieving device and an integrated cell wheel lock.

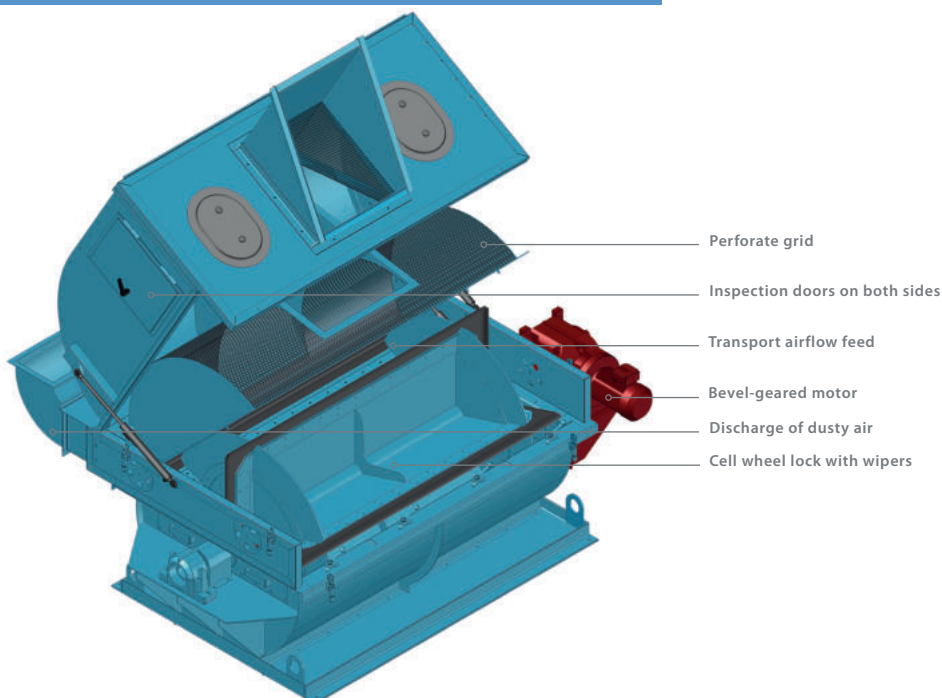
The waste arriving in the waste separation system is blown into the separator together with the dusty air. The coarse material is discharged by a cell wheel lock.

The sieving device separates the majority of the dust from the remaining material. The dust is fed into a filter where it is filtered out of the air.

### The light-fraction air classifier is available in two variants:

- hinge-type
- non-hinge type

To allow the safe and efficient cleaning of the classifier, the hinge-type light-fraction air classifier is opened by means of a hydraulic system using a manual pump.



# SORTING CABIN VENTILATION

## General description

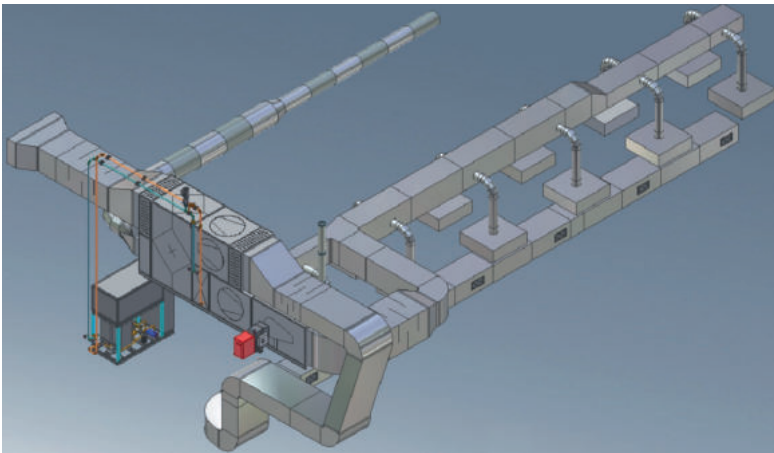
The material flows are manually controlled and sorted in the sorting cabins. The sorting cabins are designed as supply/exhaust air systems or as clean supply air systems depending on the requirements (type of material to be sorted).

The sorting cabin ventilation provides the workstations with air-conditioned outside air. This ensures a comfortable work environment and work protection for the sorting personnel. The treatment of the outside air is performed by an air-

conditioning device that is tailored to the respective application case. The cleaned and tempered outside air is fed into the supply air elements over a galvanised pipeline system, which provides optimal air conditions for the sorting personnel.

The exhaust air is suctioned out from underneath the sorting belts, used to pre-heat the supply air and fed into the hall.

The installation of open/close valves upstream of the supply air elements allows to variably switch on or off the ventilation at the individual workplaces.





# SORTING CABIN VENTILATION

## Functional principle

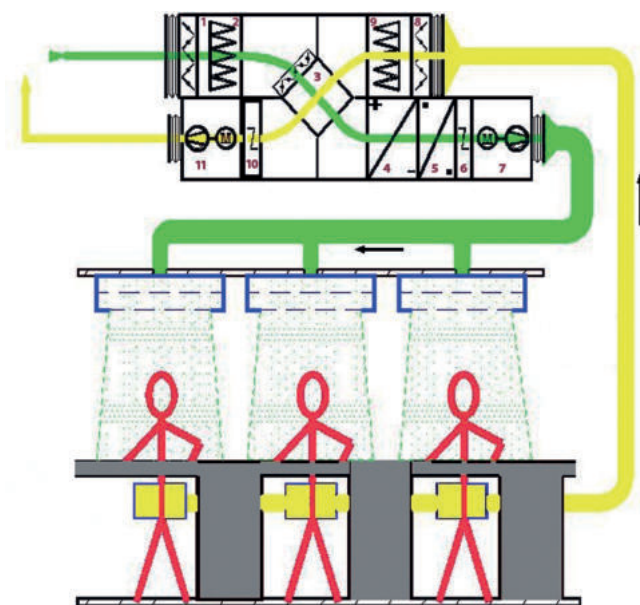
The air-conditioning device has a supply and exhaust air part. The supply air ventilator (7) sucks an amount of air, which has been specifically determined for the workstations, from outside. When the air enters into the device (1) a large bag filter (2), EU 7 quality, retains the dust particles.

In winter the outside air is pre-heated by the exhaust air in the cross-flow heat exchanger (3). The diagonal airflows in the cross-flow heat exchanger are separated by elastic and temperatureresistant, sealed special aluminium plates so that no germs, dust particles, hazardous gases and odours can be transferred.

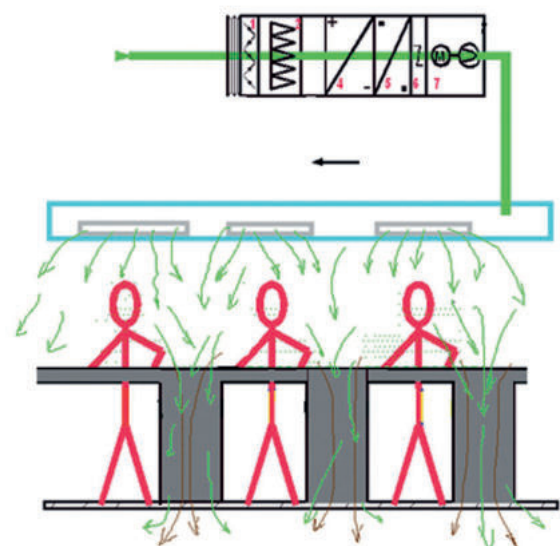
The air then passes the subsequent heat exchanger (4) and is heated to the supply air temperature set in the control cabinet. The heat exchanger can also be directly fuelled by gas or equipped with electric or pump warm water heating. A gas burner is attached to the combustion chamber when using a directly fuelled supply air device and the exhaust gases are fed out into the open via a chimney.

Summer operation: In summer, the supply air is fed past the cross-flow heat exchanger via a bypass after the filter and then cooled to the desired temperature in the cooling register (5) and fed through the droplet separator (6). A cooling device is connected to the air-conditioner's cooling register for this purpose. The supply air radial fan is designed as a low noise drum rotor and feeds the tempered fresh air to the supply air elements mounted on the underside of the cabin ceiling. The entire system is automatically controlled by a control system and operated from the control cabinet.

Supply/Exhaust air system



Supply air system



# VACUUM SEPARATOR

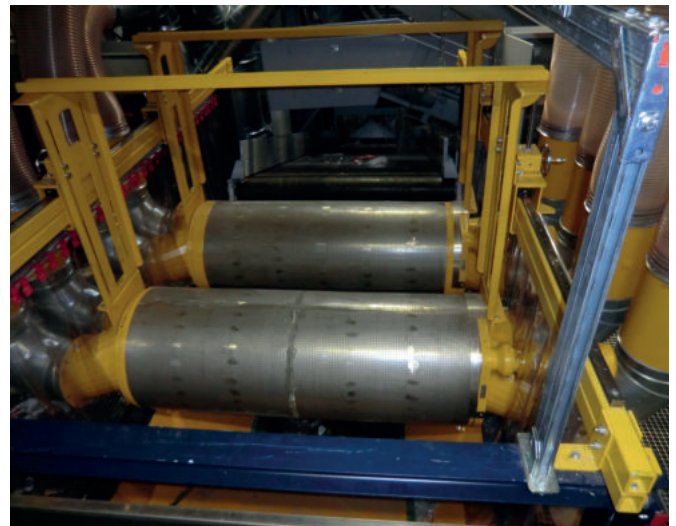
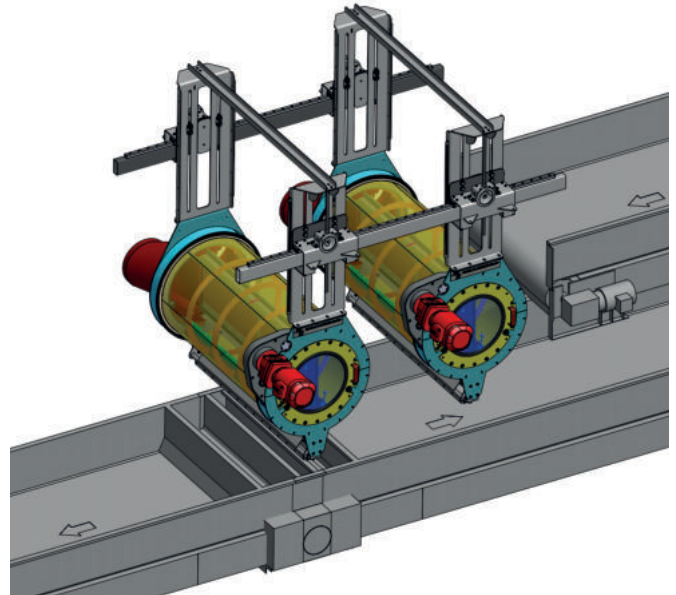
## TYPE UDT2

The vacuum separator is a device for separating the lighter solids and those with greater surface areas from the heavier disturbing solids of a previously joint material flow. The material separation takes place using one or two rotating perforated drums by way of a vacuum created in a section of the drum.

The falling partial flow of lighter solids and those with greater surface areas is sucked onto the surface of the perforated drum in the vacuum section and is held and fed over its peak in the drum's direction of rotation.

The arrangement of an opposing overpressure area in the perforated drum separates the previously suctioned material to the desired location of the drum's circumference. The separated light solids and those with larger surface areas fall to the desired position as a result of the centrifugal force and the blowing effect.

In contrast, the suction effect in the vacuum area on the surface of the perforated drum is not sufficient for the heavier disturbing solids (in the original joint material flow with the lighter solids and those with greater surface areas) so that, as a result of their weight, these solids fall into a shaft and onto an impurities belt – against the direction of movement of the rotating perforated drum.



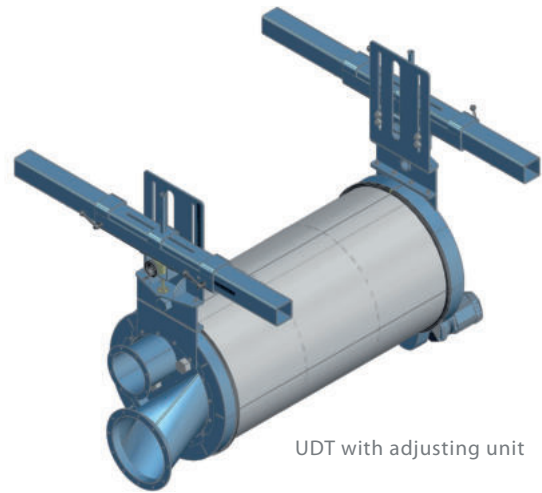
### The benefit of the dual vacuum separator combination:

- Relieving of the subsequent system units as films with large surface areas are removed from the material flow
- High purity of the film fraction

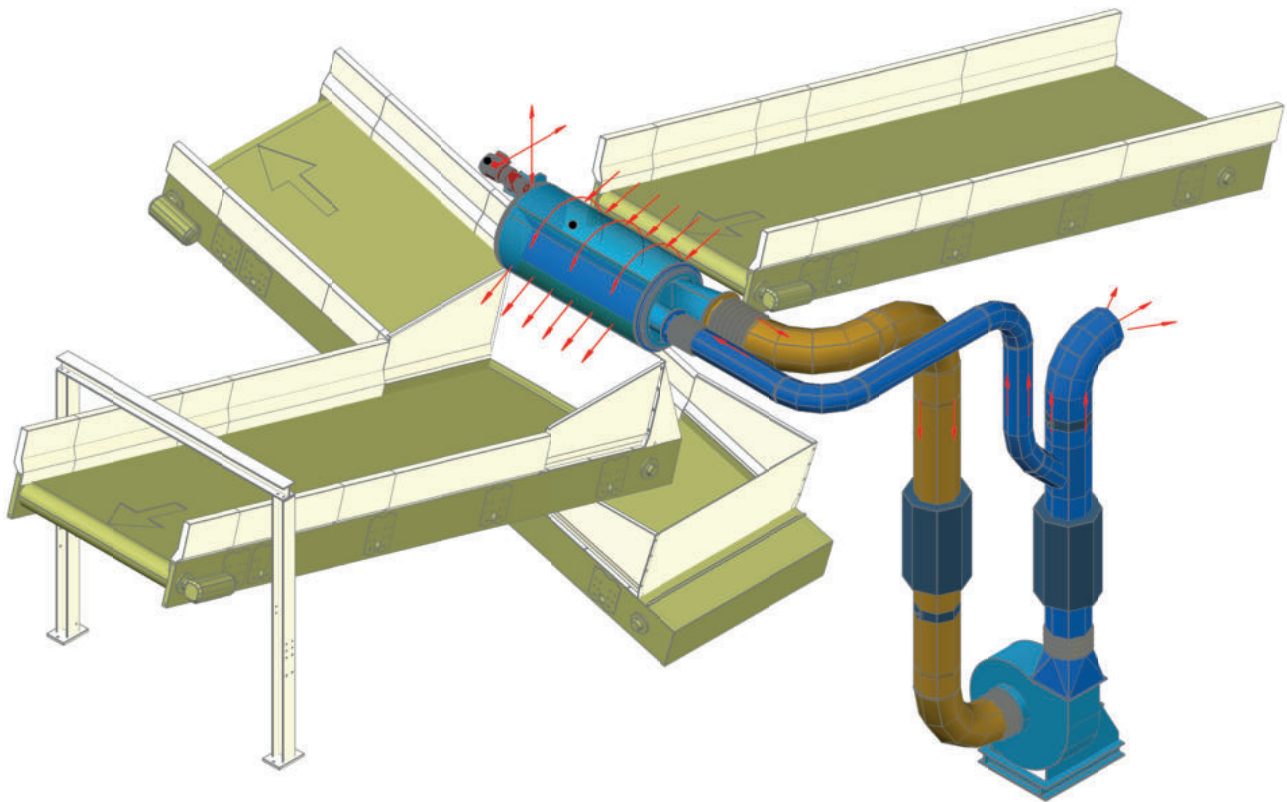
# VACUUM SEPARATOR

## TYPE UDT1

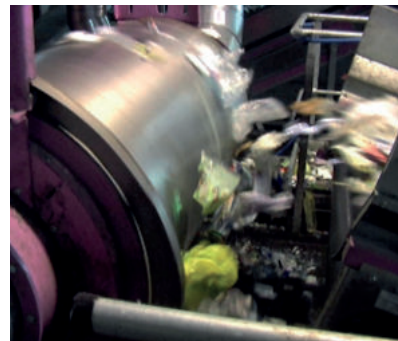
The vacuum separator is a device for removing hazardous and/or quality improvement.



UDT with adjusting unit



UDT for film fraction



UDT for mixed plastics

# BINARY SYSTEM HIGH PRESSURE MIST SYSTEM

## General description

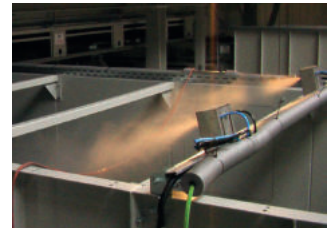
Binary systems/high pressure mist systems are used in areas where dust cannot be captured by suction hoods. For example, in the delivery area, when loading and unloading, for belt transfers or potentially even when transporting goods to be sorted.

The use of binary systems/high pressure mist systems binds the dust in the air with very fine water droplets. Either fixed or mobile mist cannons are used depending on the area of use and system type.

Planning takes place according to the customer requirements and is precisely tailored to their individual needs.



Spray head



Pivotable mist cannon



Spray bar

## Binary system / Functional principle

The binary system creates a very fine mist that binds the interfering dust. This mixing of water and compressed air takes place directly in the binary nozzles. It is characterised by its economical water usage. The mist is created by spray bars. To ensure functionality, the pressure hose is electrically heated and insulated. Wetting agents are used to reduce lime scale.

The system operates with the following technical connection values depending on the application:

**Compressed air connection** 0.5 to 2.5 bar

**Water connection** 0.2 to 3.0 bar

## Designs

- Spray bar
- Mist cannon
  - Stationary
  - Speed controlled (variable spray distance)
  - Pivotable (large coverage)

# CUSTOMISED COMPONENTS

We manufacture components and customised components to meet your needs. Our modern machinery (water jet system, longitudinal welding machine, various metalworking machines) provides us with the flexibility to meet the highest demands when manufacturing components.

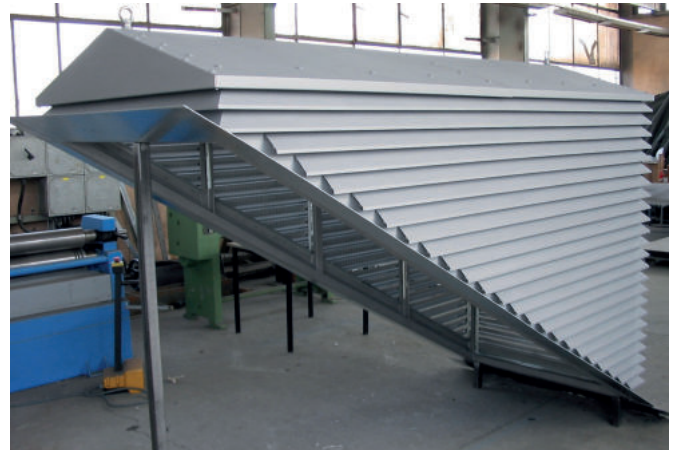
The range includes piping components and canal components made of:

- Steel
- Aluminium
- Stainless steel

New additions to our manufacturing range include internally coated AL pipes, which can be used as a replacement for stainless steel pipes. The coating is made of plastic.

## Other special applications and operational areas

- Material conducting pipes
- Pipes for aggressive media (rotting technology)
- Roof hoods / transition pieces / special components



Stainless steel roof hoods



Pipelines and suction hoods



Pipe components



Ventilation components

# ROTTING PIPING / WASHER

## Pipeline and canal systems

We plan, produce and assemble pipeline and canal systems for air transport including multileaf dampers, weather protection grids, air diffusers, air washers, filter boxes, etc. made of steel, stainless steel (1.4301 / 1.4571) and aluminium (AlMg3).



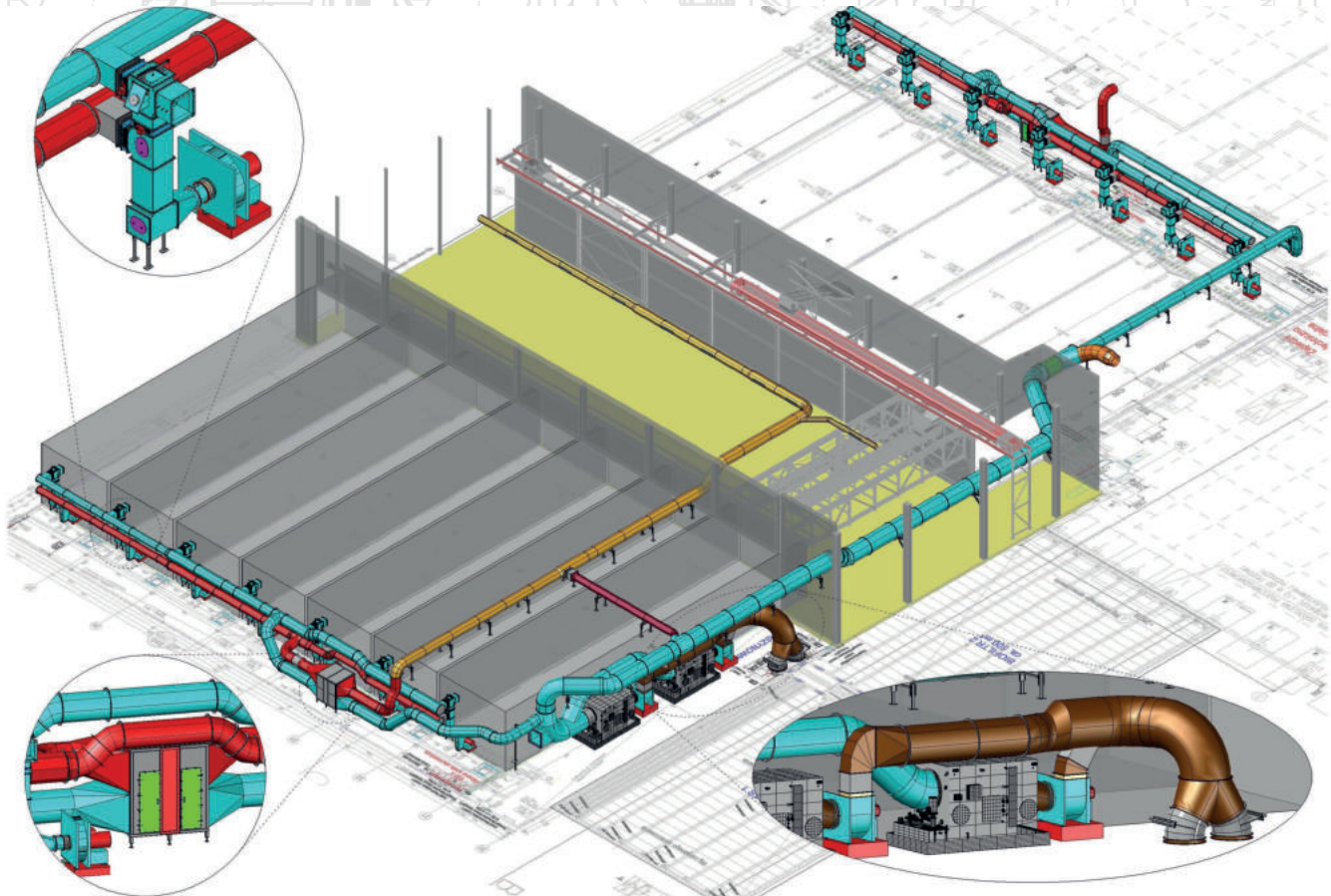
## Process air technology:

- Rotting systems
- Fermentation and biogas systems
- Dedusting



Ventilation of rotting tunnels

Rotting tunnels



# TANK AND VESSEL CONSTRUCTION

Apart from air conditioning and ventilation technology, the construction of the tank and vessel systems has also been included in the range of products supplied by Schulz & Berger GmbH since 1 January 2013. Our membership in the quality association for storage tanks, approval under the German Water Resources Act and under the Pressure Equipment Directive RL97/23/EC / AD2000 data sheet as well as manufacturing inspections held by the TÜV groups and the competencies available on site enable us to provide excellent quality and reliability to our customers.



**Our product range covers the following tanks:**

## **Cylindrical storage tanks made of steel**

Tanks for the unpressurized storage of water-pollutant, flammable and non-flammable liquids above or under ground, in a single-walled or double-walled design, for horizontal and vertical installation, with quality label RAL-RG 998, as per

- DIN 6608 (DIN EN 12285-1) - capacity of 1,000 to 100,000 litres
- DIN 6616 (DIN EN 12285-2) - capacity of 1,000 to 100,000 litres
- DIN 6623 - capacity of 600 to 950 litres
- DIN 6624 - capacity of 1,000 to 5,000 litres

## **Double-walled pressure vessels made of stainless steel**

with bottom drains and DIBt1 approval Z-38.14-258

## **Single-walled and double-walled vertical-type storage tanks**

with DIBt approvals by Z-38.11-238, Z-38.12-263 and Z-38.12-272

## **Tank, small tank and self-consumption systems**

Tanks for fuel supply (diesel) with special equipment

## **Rain-water tanks made of steel**

Reservoirs for rain water (drinking water approval), with quality label RAL-GZ 994/5

## **Dome manholes and manhole collars**

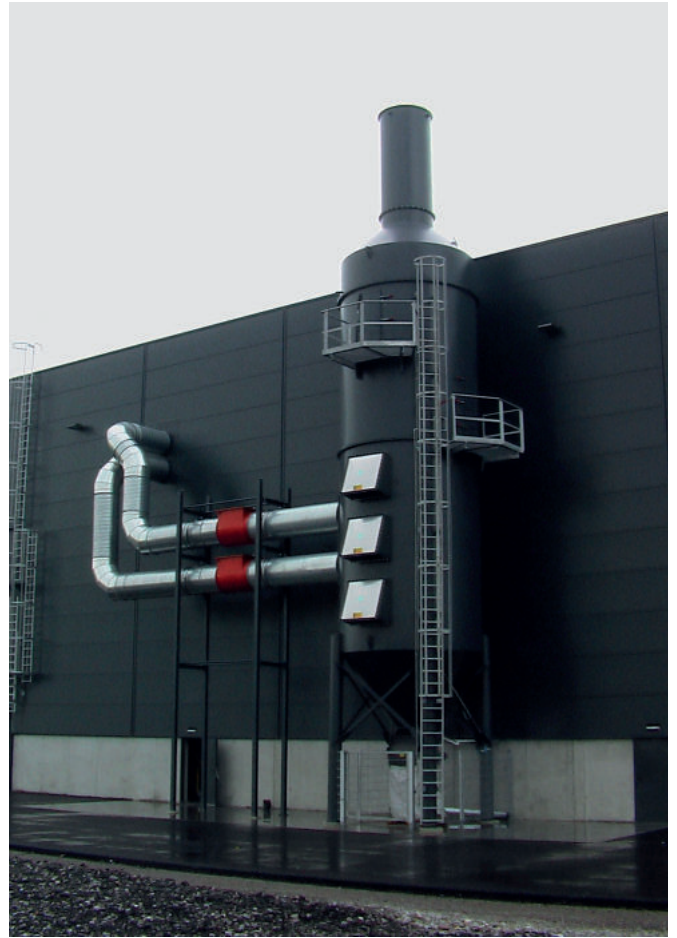
These units are intended for underground storage tanks and allow the detection and removal of waste quantities while also avoiding any penetration of ground water and soil wetness, as per DIN 6626

## **Special-purpose tanks**

Tanks and apparatuses of variable design made of high-carbon steel and alloy steels

- Tanks for the non-pressurized storage of liquids made of, e.g., CrNi steel
- Pressure vessels as per PED
- Process technology apparatuses (adsorbers, absorbers, filters, impeller-type mixers)
- Tanks for energy management/heat supply (condensate tanks, buffer tanks)

# SAMPLE OF PRODUCTION





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# NOTES

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