

DUST EXHAUSTING EQUIPMENT AND AIR SEPARATING FOR LARGE CAPACITY SHREDDER

THE TASK

Mixed scrap and discarded metal are crushed by modern large capacity shredders. This includes also shredders suitable to crush complete cars.

Expectations of the shredder plant operators have clearly increased during the last years regarding availability of the units, quality of the end products and energy efficiency. An essential and characteristically shredder part is the air pollution control:

- For a high availability of the air technology it is important that a separator unit resists even an explosion undamaged within the shredder. Right after such events, a separator unit has to be able to directly continue its operation.

- Quality of the shreds heavily depends on reliability and selectivity of the air separator unit regarding separation of light cargo from heavy cargo. The products then can be led to further processings to be able to meet the contingent of the junk car regulations.

- In times of shortage of resources and increasing energy costs, the efficiency of a system is most important as the energy costs are an essential part of the operating expenses. Therefore, optimised air guidances and an energy conservation system dimensioning is necessary.

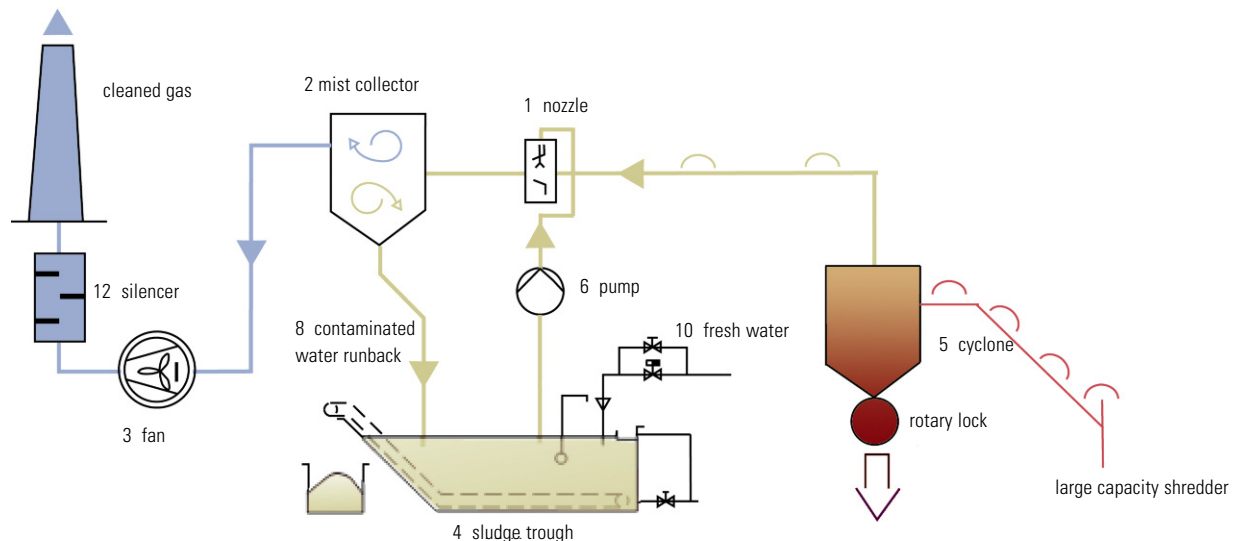
It is obligatory that an exhaust unit for shredders is able to separate the dusts as good as possible so that the emission values are clearly below 20 mg/Nm³.



Dust exhausting for 1400 HP-shredder



Dust exhausting for 3000 HP-shredder



SOLUTION TO EXHAUST A SHREDDER

Keller Lufttechnik develops, projects, manufactures and installs air pollution control systems in all sectors of industry. Best separation practice and individual units care for top operational safety, clean air, operation reliability and environment protection at the highest stage.

Airborne substances differ regarding quality and quantity as well as their physical and chemical features. As a consequence, differentiated demands regarding separation of the air arise. To meet these demands, Keller Lufttechnik offers a large product range of dry or wet working filter types.

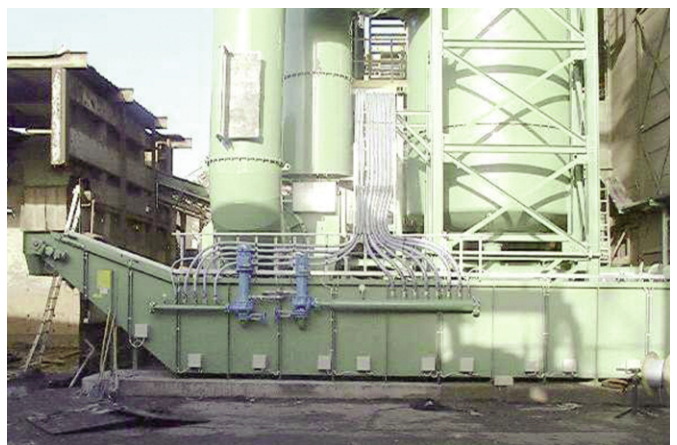
For dust separation of large-capacity shredders, our Venturi wet scrubber line is predestined as the explosion risk and humid fumes are successfully controlled. This wet scrubber line is very reliably in use for a plenty of industries and shows brilliant filtration degrees despite its robust technology.

After collection at the shredder the parts and coarse dust particles are separated within a cyclone (5). The pre-cleaned air is led through a ductwork system to the crude gas inlet of the separator. There is a spraying zone (1) where (at its closest point) water is intensively atomised by high acceleration. A homogeneous water mist film is created that moistens the dust particles. A strong rotation within the following separator housing (2) separates the water film from the air flow by centrifugal force. The cleaned air streams to the radial fan (3) which exits the air through a blow-out nozzle into the outgoing

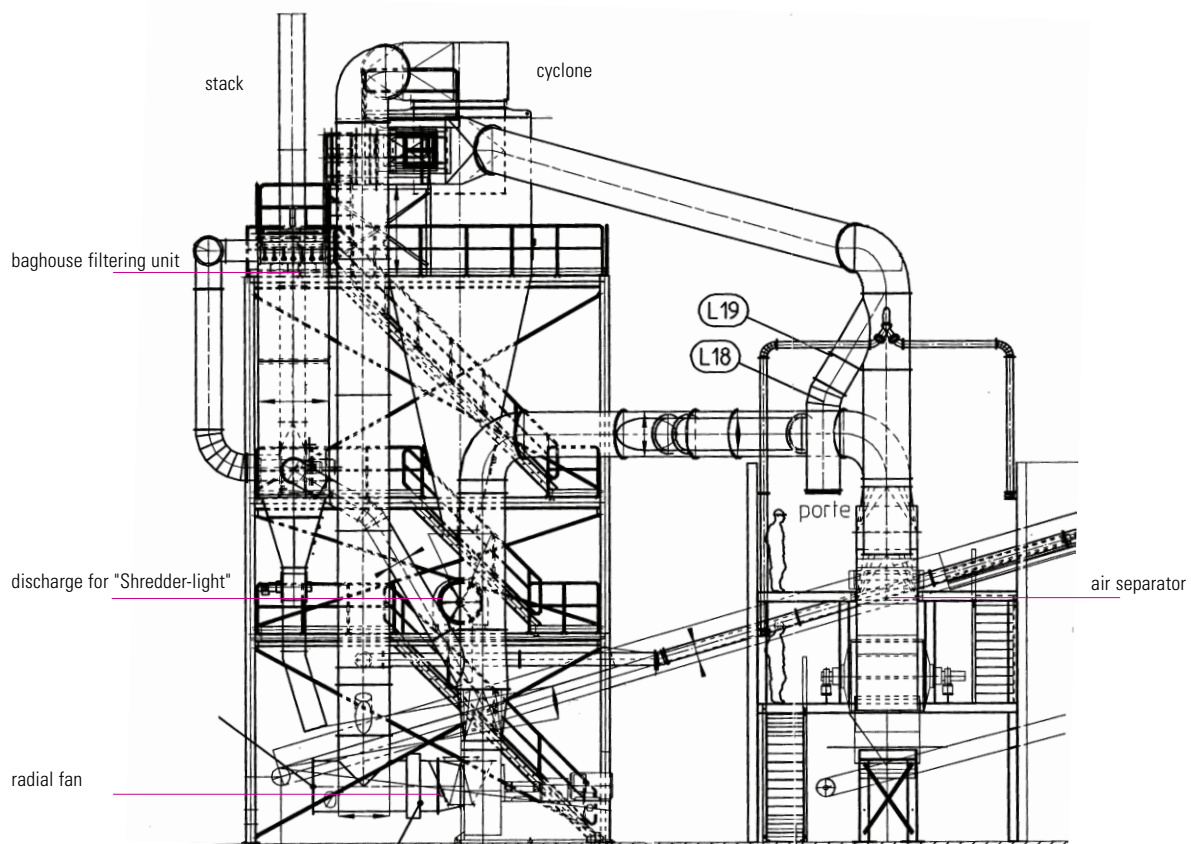
air system (12). The separated dust sediments and is discharged via the contaminated water return piping (8) into the sludge trough (4).

The sludge trough has got an automatical sludge remover. A scraper conveyor continuously or occasionally discharges the sediments (dust / sludge). Floating dusts are discharged, too. The circulation water is returned to the nozzle by means of a non-chocable pump (6). If the water level falls below a pre-set value, a solenoid valve within the fresh water fitting (10) opens and water is refilled up to the setpoint.

The complete shredder exhaust unit is designed in strong wall thickness and explosion-proof. Experiences with performed units show that the filter is able to resist heavy explosions within the shredder without damage.



Water treatment



Light material separation

SOLUTION OF A LIGHT MATERIAL AIR SEPARATION

Subsequent to the actual shredder process, the light shreds are separated by an air separator. The cleaned heavy fraction mainly contains Fe-scrap whereas the light fraction mainly consists of plastics and composite materials.

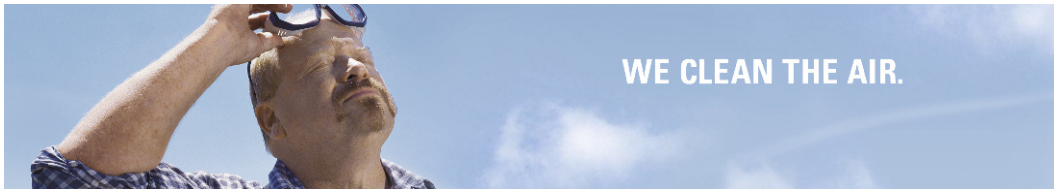
Keller Lufttechnik offers air separator units providing a good separation efficiency. The air separator is basically operated with circulating air that reduces the energy demand of the separator. Furthermore, the air separator is flexible and adjustable to each individual material input and provides an ideal result to the operator.

Air separator and downstream cyclone have got a wear protection and are operated within an ideal speed range, whereby the filtration efficiency is maximised and abrasion minimised.

A partial air stream is sucked off the air separator so that there is no dust outlet. This partial air stream is cleaned by means of a baghouse filtering unit.

YOUR BENEFIT WHEN USING DUST EXTRACTION AND AIR SEPARATION:

- excellent separation of heavy and light fractions
- minimised maintenance efforts regarding abrasion because of adjustable dimensioning and exchangeable wear protection
- low energy consumption and effective pre-separation because of ideal dimensioned separators
- very low residual dust concentrations
- high availability



OUR PROGRESSING SOLUTIONS

Keller Lufttechnik also offers solutions in addition to the proper components. These are:

- consulting, project planning, manufacturing and erection of dust control equipment
- service and maintenance
- dust control equipment for shreds residue preparation
- filter units to reduce volatile organic compounds (VOC).



Light material separation subsequent to a 1400 HP-shredder



Shredder-light-fraction: sifter/extraction for 2 shredder lines



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