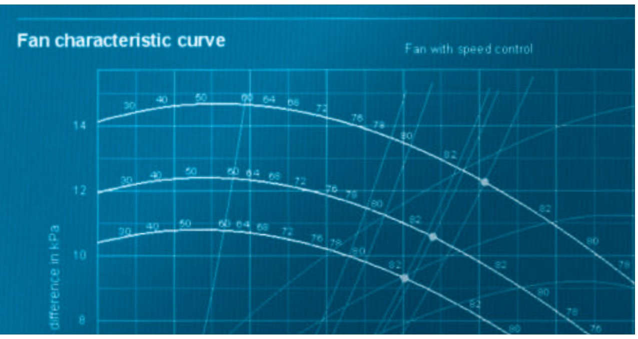
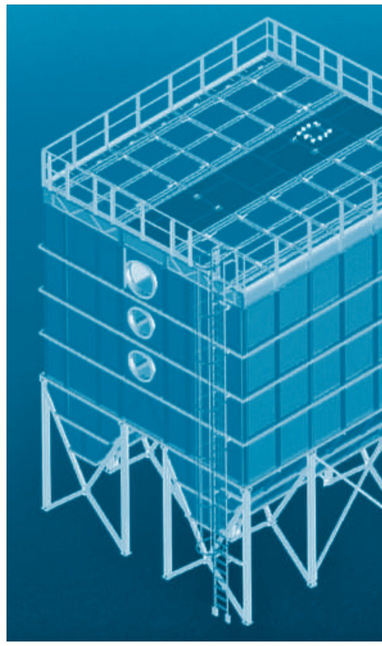
Innovations from Venti Oelde

Recovery of valuable raw materials – flexibility becomes a profit-earning factor





Venti Oelde

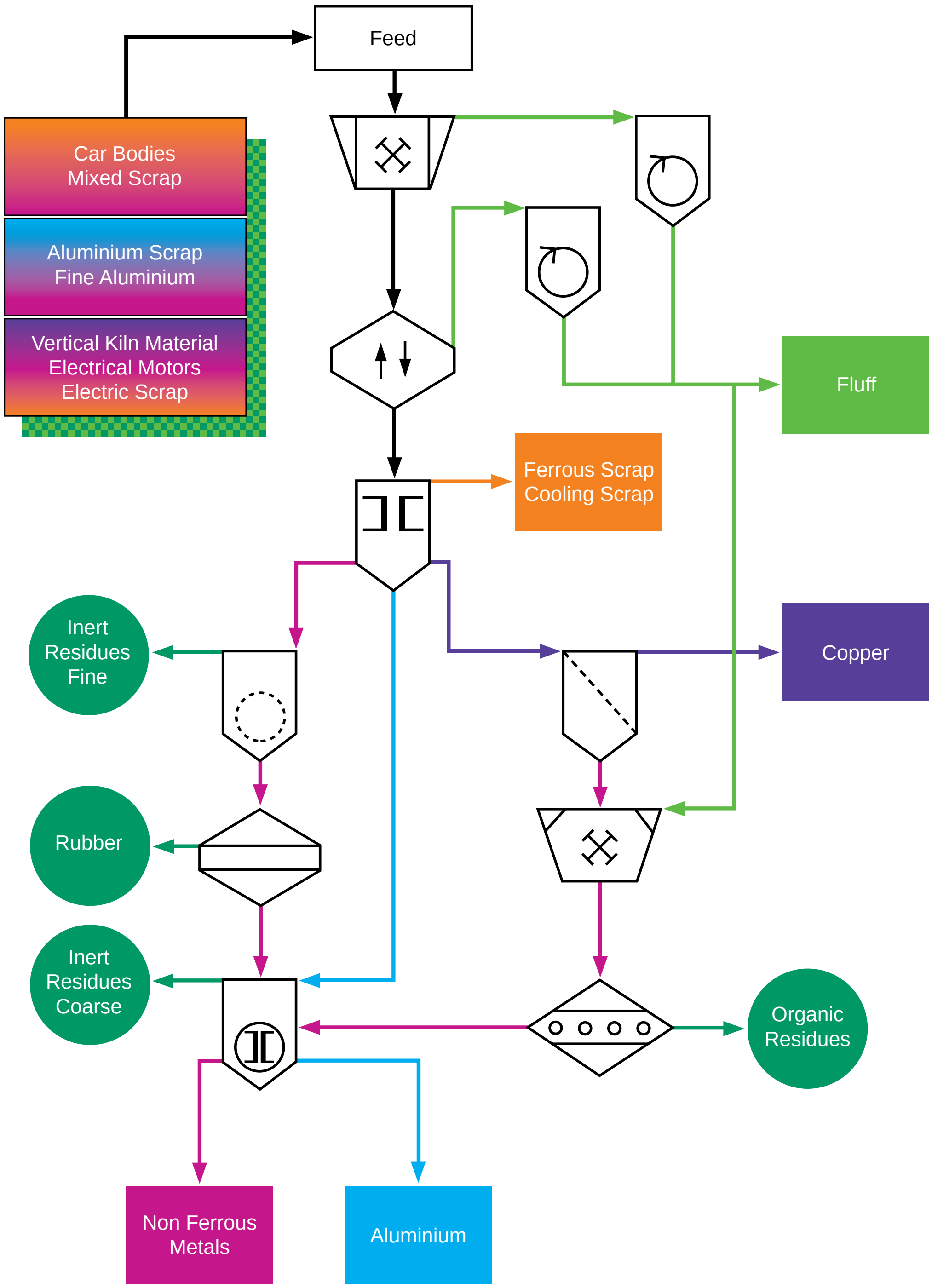
Recycling can become even better and more economical

World-wide economical changes and environmental demands are encouraging the installation of small, integral systems in international processing technology.
The time for huge shredder plants appears to have passed. A large starter capital, an inordinate energy consumption, high personnel requirement, bottlenecks in the requisitioning of input material, leading to a hindrance in multi-shift operation and poor separation of the shredded materials have led to a questioning of the economical reliability of large plants. The answer is: small designs, modular structures and, therefore, more adaptable (flexible) system technology. Multi Metal Separating Systems, for example.

Profitability with economy and ecology

These shredding and separating plants, almost always very compact in form, include specifically adapted peripheral systems, automating dispersion, cleaning, separating and sorting of each material and making it economically interesting.
This means that multi metal separating systems can be designed to process a variety of materials. Their flexibility also facilitates a quick change of the raw and input materials. The flow diagram shows an example of the process cycle of a multi metal separating system.

Vertical kiln material with very high copper content



Example

Depending on the input material (Table 1) different processing lines can be used within an MMS plant. The main line comprises the ferrous recovery. This is mainly fed by car bodies and mixed scrap. After shredding, the airborne material, such as fluff, foam rubber, plastic, paper, etc. is removed in a windsifter. Ferrous and non-ferrous metals are separated from one another in a drum-type magnetic separator. All ferrous components are then passed via conveyor belts to be loaded onto railway wagons or trucks or, alternatively, onto a waste tip. All non-magnetic components can then be led directly to non-ferrous loading or returned on a reversible belt for further separation.

The non-ferrous line comprises the screening drum, where the fine residue is separated and the vibrating separator, which mainly separates out rubber parts. The non-ferrous material finally passes through an eddy-current separator, where it is separated into an aluminium fraction and a residual fraction.

Variability = flexibility

The shredder can be modified to permit electric motors, vehicle starters and dynamos to be processed. The most profit in this case comes from the aluminium fraction and a pure copper fraction. The main components of the copper line are a special screen with undulating surface, the granulating mill and the so-called gravity separator. The overflow after screening, consisting of cohesive non-ferrous metals, is granulated and loosened. This portion is then separated into light and heavy fractions on the gravity separator. The light fraction is waste; the heavy fraction is passed via conveyor belts to the eddy-current magnetic separator and is split there into a non-ferrous and residual waste fraction.

All waste material (i.e. all fluff as well as the dust collected from the shredder), produced during the process, is collected and either passed to disposal as shredder light fraction or to the waste processing line. This consists of a granulating unit and the following separation of the components into light and heavy material. The light fraction is disposed of as waste and the heavy material is conveyed to the eddy-current magnetic separators and can be used as pure non-ferrous fraction.

Overband magnetic separators and magnetic pulleys, distributed over the whole plant, discharge the small residual ferrous components.

Downstream plant behind MMS Shredder

The ferrous fraction, which has been separated in this way can be added to the ferrous scrap and marketed accordingly.

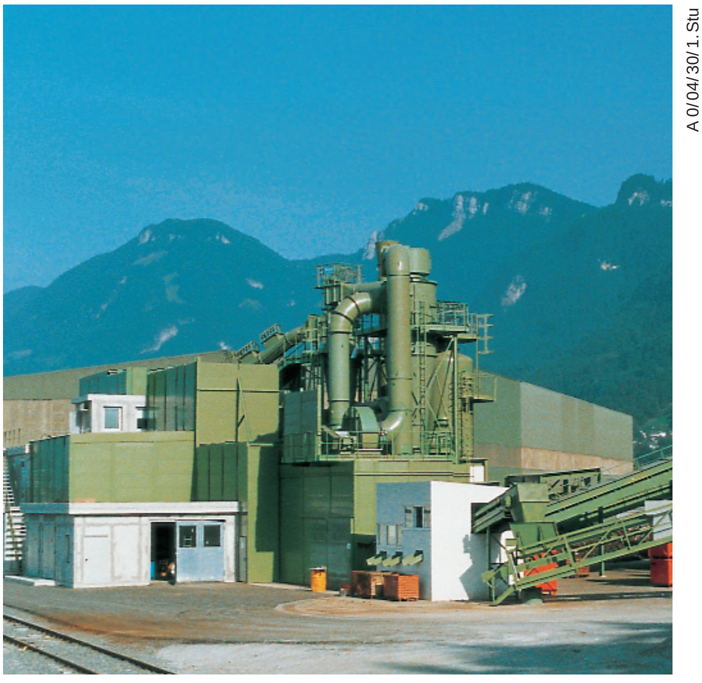
General waste fractions come from the fines on the screening drum, overflow fraction on the Vibrosort (rubber) and the non-metallic fractions on the eddy-current magnetic separator. The volume and costs of disposal of the final amounts of waste can, therefore, be kept to a minimum.

The complete plant is controlled from a central control unit, where the software to determine the different processes is also located.

	INPUT	OUTPUT
car bodies	25 t/h	20 t/h ferrous (bulk density > 1,0 t/m³) 1 t/h non ferrous 4 t/h SLF (shredder light fraction)
cut-off plate	12 t/h	11 t/h ferrous (bulk density 1,8 t/m³) 1 t/h SLF
aluminium scrap	8 t/h	6 t/h aluminium, purity > 93 % (residue Fe/Al impurities)
fine aluminium	3 t/h	3 t/h aluminium < 30 mm
vertical kiln scrap	14 t/h	2 t/h Cu; 8 t/h Fe; 4 t/h Cu and plastics
electric motors up to 7,5 kW	18 t/h	similar to vertical kiln scrap, depending on the composition of the input material

Table 1: Advantages – Versatility of the plant

The flexibility of the control and process technology support and underpin the profitability of the multi metal separating plant. Flexibility, therefore, becomes a profit-earning factor. Only the shredding equipment in the shredder has to be adapted to the different input materials. The appropriate equipment to facilitate a quick and easy replacement is provided. Multi metal separating plants can, therefore, be profitably operated by smaller metal processing companies.
The energy consumption of about 1400 kW is kept within reasonable limits and the constructor guarantees compliance with national and international environmental directives.



Ferrous/nonferrous processing downstream of car shredder

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