

# Aluminium Scrap Processing with Star Ring Shredders

(Hk/23.03.17)

When recycling aluminium, the disintegration and separation of impurities is one of the most important tasks, in order to maintain high quality wrought

sought that would provide high quality mechanical disintegration combined with limited wear and high availability.

shredder, as is, e.g. available in mobile shredders, among other aggregates.

It was quickly apparent that dual shaft shredders, originally used for the processing of commercial waste and provided for scrap processing by various manufacturers, may require little investment, but would not be a viable option due to the wear, costs, sensitivity to impurities, uptime and degree of disintegration.

Hammer shredders, originally used in scrap steel processing, only have a limited use in aluminium processing due to the hammer-anvil approach. In this process the scrap is crushed rather than ripped, which can lead to a greater chance of metallic impurities being cold forged with the aluminium than separated out.



Fig. 1: cut and uncut shredder feed material

alloys for instance. Besides simple impurities such as plastics, paint and anodised surfaces, the separation of iron and copper components is the main purpose of mechanical processing.

Typical aluminium scraps such as window profiles, construction profiles, sheet metal constructions and offset plates are usually tied to metallic impurities in the form of screws, nails and cables, which are included in the alloy during the refounding process and thus negatively influence the metallurgic properties.

An Scandinavian aluminium profile manufacturer runs its own refounding operation with a hearth furnace in which high quality aluminium wrought alloys are smelted from scraps and raw aluminium. A scrap processing installation was

For this reason a variety of processing units were considered closely including the classic hammer mill shredder, the slow-moving dual shaft

Since the team at Scandinavian aluminium profile manufacturer already had experience with shredder processing using a star-ring rotor, this process was also given due consideration.

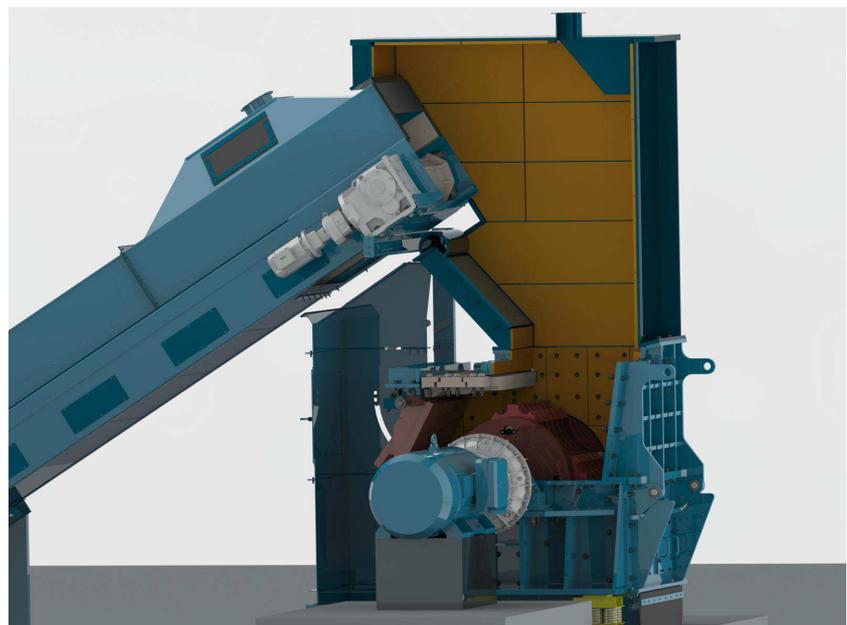


Fig. 2: Oberländer star-ring shredder cross-section

Besides classical shears and presses the company Oberländer Recycling Maschinen GmbH, based in Schwerte/Germany, also provides state of the art star-ring shredders, specially designed for aluminium processing.

The free iron and copper content of the aluminium can be reduced to under 0.1% using the aluminium shredder technology provided by Oberländer, which includes an air classifier and downstream systems technologies such as classical magnetic drums, eddy flow separators, but also X-ray fluorescence spectroscopy.

A bulk part discharge in the shredder allows for the ejection of non-shreddable impurities, such as large chunks of aluminium, before they are able to cause any damage.



Fig. 3: ejected 10 kg chunk of aluminium

In addition, the Oberländer shredder units are characterised by easy maintenance and modern explosion control, the importance of which should not be underestimated in aluminium processing.



Fig.4: explosion proof exhaust filtering unit

The advantageous dry dust collection, which simplifies the recovery of the dust content, is built to ATEX design and has corresponding explosion control using, among other things,

The systems technology in a variety of shredder units and drive capacities ranging from 400 to 1.000 kW, allows for a throughput capacity of 10 – 25 t/h, depending on the type of aluminium scrap.

In the Autumn of 2015 the Scandinavian aluminium profile manufacturer decided on an Oberländer shredder unit, which was successfully put into operation in the summer of 2016.

Besides the required separation of impurities, a shredder fraction scrap density of 0.5 kg/dm<sup>3</sup> was achieved, which guarantees a short smelting time in the hearth furnace.

pressure shock resistance with rupture discs.

The shredder technology with star-ring rotor provided by Oberländer has proved itself for decades in various facilities in e.g. Germany, Hungary and Russia for renowned operators in primary and secondary aluminium production and the automotive industry.