

RECYCLING

magazine

Trends and Facts for the Recycling Industry
www.recycling-magazine.com

INTERNATIONAL EDITION



US Job machine – waste management and recycling **Incineration** Finding its purpose in the circular economy **Safety** How footboards help reduce accidents **South Africa** New solution for used tyres **Circular economy** Why free and fair competition is essential **Hybrid machinery** More than just reducing carbon emissions **UK** The impact of waste management on the GDP **Metal scrap** Disposing of life-limited aircraft parts

Recycling makes flying safer

Just like any other means of transport, aircraft require regular maintenance and important parts need to be replaced. The disposal of these components is, however, governed by strict regulations. With its four Specialty Metals Group (SMG) subsidiaries, Cronimet specializes in their beneficiation and disposal.



source: Michael Hirschmar, pixelio.de

On 8 September 1989, the Partnair flight 394, flying from Oslo to Hamburg, crashed into the sea near Hirtshals, Denmark. All of its passengers and the entire crew lost their lives. The reason was that three of the four bolts holding the aircraft's tail fin to the fuselage were counterfeit components that could only withstand around 60 per cent of the actually required stress. A dangerous savings measure had cost the lives of 55 people.

Although we can never be absolutely sure that such cases are no longer possible nowadays, it has definitely become far more difficult to install substandard spare parts in an air-

craft. The recycling industry also plays a role in ensuring this safety, including the company Metalloy Metalle-Legierungen, which is part of the Cronimet Group. Together with the other Cronimet subsidiaries, Cronimet Ferroleg and United Alloys & Metals in Columbus and Los Angeles in the USA, they specialise in recycling nickel- and cobalt-based alloys and refractory metals – and also in the disposal of decommissioned aircraft components.

„Aircraft contain so-called life-limited parts (LLP), which are primarily built into

their engines and undercarriages. After a certain number of operating hours, revolutions,

or in accordance with certain cycles, these parts need to be replaced,“ says

Sebastian Jeanvré, head of technical project development at Cronimet, explaining the underlying reason. „When the parts are replaced, they need to be disabled before they can be recycled.“ For this purpose, the four

Cronimet subsidiaries have developed a process that ensures that substandard components cannot be reintroduced to the market and reinstalled.

All components scheduled for destruction need to be documented

The process is quite elaborate, partly due to the fact that it entails a complex degree of documentation. Firstly, Cronimet provides the customer with sealable containers. The customer is responsible for documenting the collection of the components. Depending on the type of component, they are documented either according to their serial numbers or by weight. Registration by serial number is only required for life-limited parts, which, however, requires every single part to be examined and then disabled. Every container delivered to Cronimet has a defined weight and is also sealed. Moreover, the trucks that transport the containers are monitored by GPS to absolutely ensure that all of the components reach the disabling stage.

The actual process begins after the serial numbers have been compared. „The process involves various regulations that we adhere to,“ Jeanvré explains. There are also various processes, as the parts can be crushed, incinerated or melted down. It can, however, also include removing integral parts or sawing certain components into small parts. A number of processes may also be combined. In any case, all possibilities for identification definitely need to be removed. „After the disabling, we provide the customer with a ‚certificate of destruction,‘“ Jeanvré elaborates. The certificate includes particulars of the numbers and weights of all of the parts

as well as detailed visualised documentation.

Subsequently, the actual material recycling process begins. According to Jeanvré, the process, however, hardly differs from other recycling processes for superalloys – except for a few subtleties. „The parts are operating equipment, which means they are partly greasy and therefore need to be cleaned,“ he explains. „Some parts are even radioactively contaminated, which needs to be tested. But we know quite well where these parts are located and have the proper equipment to deal with them at Cronimet.“

Various qualifications are required to be allowed to carry out this recycling and disposal process. „In Germany, we are, of course, required to be certified as a waste management facility. On a global level, an ISO 9001 certificate is the minimum requirement,“ Jeanvré explains. In addition, Afra (Aircraft Fleet Recycling Association) certification is needed in order to recycle aircraft engines. „The association has published a ‚Best management practice 3.1‘ manual,“ Jeanvré continues. „It is a minimum quality standard that ensures all components are treated as they are meant to be.“ Cronimet is also a member of the association. The location in Los Angeles has also been certified accordingly.

Around 90 per cent of the material that goes into making an engine can be recovered.

However, this is only possible for the engines themselves, not their casings, etc. and the recycling of the existing material is quite lucrative. For example, the turbine contains various types of titanium and numerous superalloys such as Inconel, Waspaloy, Nimonic and Incoloy, which add up to a large volume of material for recycling. According to a study carried out by Cronimet together with Pforzheim University, a turbine weighs on average 3.3 tonnes (based on information from the 15 largest airlines in North America and Europe). The weight may, however, change in future, as titanium is increasingly being replaced with carbon fibre, although it will be at least another ten years before the first of these engines need to be disposed of. There are plenty of aircraft components that will need disposing of in the meantime. Cronimet estimates the current potential to be around 65,000 tonnes and as the parts are replaced in accordance with certain cycles, there is a relatively constant stream of supply. Furthermore, the airlines will need to replace numerous models during the next few years. After 20 or more years of service, the engines are the most valuable parts of an aircraft. According to Jeanvré, the most interesting market is currently North America, with the highest number of aircraft and the oldest fleet. But aircraft require maintenance in other countries too, which means Cronimet does not need to worry about running out of work.

Michael Brunn

**90 per cent
of engine
material can
be recycled**

Advert



*Shredding plants for the recycling
of rest-, domestic- and bulky waste |
Processing of synthetic materials,
RDF and residual wood | Conveyor,
sorting and screening plants*

- ◀ ZENO double roll primary shredder type ZDV;
ZENO plant for the shredding and processing
of synthetic materials and resources;
ZENO sorting plant for DSD construction,
commercial waste & mixed resource waste

ZENO waste shredder type ZTLL ▶

