

# Alloys from recycled materials

At seven locations in Germany and the United States, VDM Metals produces over 100 different high-performance alloys in semi-finished form as well as powders for additive manufacturing. Resource conservation is a vital part of business success.

With around 2,000 employees worldwide, VDM Metals forms the High-Performance Alloys (HPA) division of Acerinox Group. Among other things, the company operates a melting plant in Unna, where ingots and slabs of nickel-based alloys and high-alloy special stainless steels are melted. These are further processed into sheets, strips, rods and wires in the subsequent processes. In addition to nickel and chromium, other high-grade metals such as molybdenum, tungsten, cobalt, copper, titanium or aluminium are used as alloying elements. The proportion of alloying elements varies from material to material.

According to the vision in Acerinox's corporate mission statement, we "distinguish ourselves as part of the transition towards a new circular economy through the efficient production of stainless steels and high performance alloys that respect the environment." Resource protection therefore plays a central role for the HPA division.

Products almost completely Recyclable

Recycling has long been a priority in the steel and metal industry. For the production of VDM's alloys, virgin metals and scrap are equally important raw materials. The alloys produced by VDM Metals are almost completely recyclable. Melting and casting residues that arise during melting

Common sources of scrap here are punching residues, pipes and components from the oil and gas or chemical industry, heat exchanger plates and wire residues.

One of VDM Metals' declared goals is to keep the effect of downgrading via recycling as



Figure 1: Charging of recycling materials during preparation of a melt



Figure 2: Analysis of scrap pieces by means of a spectrometer

are returned directly to the melting process by a short route. The so-called return scrap includes scrap that accumulates in the further internal production stages or during contract processing by external service providers. If possible, even scrap produced by customers and end users is returned to the cycle.

small as possible. The stock management in the scrap receiving area of the melting plant is correspondingly complex: each piece is checked individually, the elements of the alloys are determined with the spectrometer, marked and stored for further use according to the original

material. When new melts are produced, the ERP system first checks whether there is still suitable scrap material on site. This is then used to calculate the compositions in combination with virgin metals that are sourced from mining companies around the globe. Composition in this context means the mixture (blend) of input materials from recycling and virgin metals that is finally charged into the melting furnace.

The majority of the scrap used is the company's own material, which accumulates along the process chain and thus remains directly in the material cycle. Only small quantities are purchased externally. Today, recycling even goes so far that chips from machining processes such as turning or peeling are reprocessed in order to return them to the cycle.

Clean Separation Is the Be-all and End-all

It is particularly important to separate scrap by type as early as possible in the production process. At VDM Metals, the scrap is therefore divided into scrap groups with similar alloy analyses. Impurities introduced by unclean separation, for example, mean an economic and ecological

loss of the under-mixed metals. Furthermore, they can deteriorate the quality of an alloy and even lead to the complete loss of a batch. Heavily contaminated alloys, in turn, can only be used (blended) in small quantities on other melts. Therefore, a detailed quality control is carried out when scrap is delivered.

The efforts in recycling pay off, the meaning is double-

sensed. The Acerinox Group is committed to the Global Compact. Using recycling materials contributes to resource protection, and using recycling materials also makes sense from an economic point of view.



VDM Metals