The Properzi Cu Refining Technology

A significant contribution by Continuus-Properzi to reduce the Carbon Footprint in the Copper Sector is made by its Cu Refining Technology, writes Alberto Ghisetti

Copper (Cu), with its unique properties, is central for economic growth, quality of life and sustainability. The future challenges of the economy, in order to maintain its sustainability, minimise carbon and water footprint, and achieve sustainable growth, include aspects related to exploitation and access of new resources, research and innovation, and the reduction of energy and water requirements.

Trade off

The decreasing ore grades result in environmental concerns such as large waste/metal ratio and higher use of resources with respect to the use of energy, explosives, and water. The metal producing sector is, on the one hand, under growing public pressure, while on the other hand it needs to overcome several burdens such as, for example, increased demand for metals and the treatment of lower ore grades.

Fortunately, Cu can be 100% recovered from the majority of its end-products and returned to the production process without loss of quality during recycling. The production of secondary Cu is based on the direct melt of 'new scrap' (waste resulting from either metals discarded in semis fabrication or generated during the initial manufacturing process) and/or the recycling of 'old scrap' (obsolete end-of-life products or structures). Old scrap is often contaminated to a certain degree, depending mainly on its origin and the efficiency of its collection systems.

The main processes used for obtaining secondary Cu are disassembly, sorting (according to different levels of purity), transportation, chopping, melting, and refining to remove the necessary quantities of impurities to reach the desired characteristics. The Properzi Refining Technology allows to melt and refine selected Cu scrap (old, new or a mix of these) with a production ranging from 0.2 to 0.3 t CO_2-eq/t Cu and the average values for the upstream processes, mainly for Cu scrap transportation/preparation, vary from 0.25 to 0.35 t CO_2-eq/t Cu. The data indicates that the variation depends on the quality of the source material, the metallurgical process used and the quality of copper scrap.

Calculated footprint

According to our studies and the available literature we calculated that the Carbon Footprint to obtain 1 t of Cu from an ore (0.45% Cu) can reach 7.65t CO2-eq. However, when Cu was obtained from a mix of 25% 1st quality scrap (>99% Cu), 37.5% of 2nd quality scrap (>96% Cu), and 37.5% of 3rd low quality scrap (>94% Cu), the Carbon Footprint was estimated to be reduced to 0.65 t CO2-eq.

According to this data the production of FRHC Cu products from secondary Cu, that can replace with almost identical characteristics Cu products starting from primary Cu, thanks to the Properzi refining technology, can reduce the Carbon Footprint by as much as 7,000 Kg CO_2-eq per ton of FRHC copper rod products processing 100% copper scrap (old and/or new).

www.properzi.com

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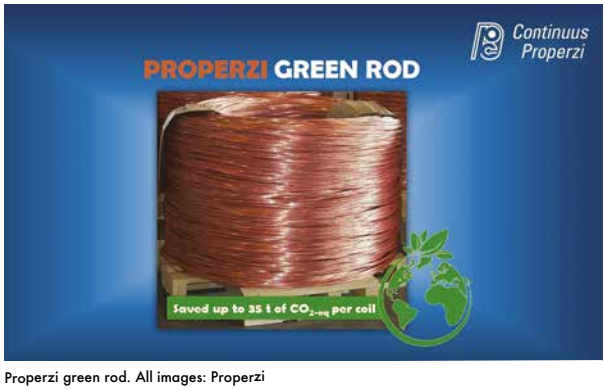
Typical Properzi Continuous Casting & Rolling Cu Rod Line.

Types of scraps processed with Properzi Refining Technology.



Properzi green rod. All images: Properzi

A recycling plant solution in Preston

JAN 3 - British recycling specialist Recycling Lives has commissioned a BHS-Sonthofen recycling plant including an RS 3218 Rotorshredder and designed to handle a variety of materials such as automotive shredder residue (ASR), electric and electronic scrap (WEEE) as well as 'meatballs' (electric motors and motor armatures), then produce market-ready end products.

Plant requirements

In the process of expanding capacities, Recycling Lives decided it required a plant that could process different materials simultaneously at its 15-acre Recycling Park in Preston. After BHS had drawn up an initial concept for a plant, extensive tests were carried out at the Sonthofen test center with about two to three tonnes of each material required by the customer. Data on throughput and material quality, among other parameters, was collected during the tests and analyses in the test centre. This information was then used to create a mass balance and profitability analysis.

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The Rotorshredder of type RS 3218 is the centerpiece of the plant. Photo: BHS-Sonthofen