

Development of the Low-Carbon Wrought Aluminium Alloys based on Post-Consumed Scrap

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The recycling of wrought aluminium alloys from end-of-life products is only carried out to a limited extent. The obstacles are the lack of: (i) appropriate chemical composition of the recycled melt and (ii) sufficient reliable sources. Both can be eliminated through the consistent traceability of alloys in end-of-life products at all stages of circular aluminium management. This paper describes the process of ensuring the universal traceability of aluminium alloys by type of alloy, by manufacturer, and by location in the end-of-life product. Tracking begins with the disassembly of end-of-life products into their components or components made from wrought aluminium alloys. We have built an innovative basic concept of ensuring the traceability of aluminium alloys using barcodes, well-adaptable for further upgrading. The solution enables the consistent separation and extraction of the highest-quality scrap from end-of-life products, comparable to the quality of the return material. This is, as an option, usually returned to the alloy manufacturer, and can be melted directly into wrought alloys. The solution enables a significant decarbonization of production and an increase in the added value of the products.

The innovation enables the production of selected types of wrought aluminium alloys for the automotive and aviation industries, with a carbon footprint and sustainability index chosen and defined by the customer. With this aim in mind, we designed alloys with a large proportion (>70%) of scrap based on end-of-life products and an appropriate production technology that allowed us to maintain the standard quality of the produced alloys. The production of wrought aluminium alloys with a large proportion of scrap from end-of-life products is a significant innovative step toward the decarbonization of the aluminum industry.