

Recycling of aluminium and aluminium sidestreams for resource efficient production

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Efficient recycling processes are critical to meet the increasing demand for critical and strategic raw materials such as aluminium while lowering the costs and environmental impact of production. For example, in 2019, the international aluminium association registered a record intake of post-consumer scrap for recycling of 20 M tonnes with the largest part (5.3 M tonnes) being used packaging (rolled product). In addition, aluminium in incinerator bottom ashes from municipal waste incineration is becoming an increasingly important source of secondary aluminium.

Mixing oxidized or contaminated scrap with salts in rotary furnaces is a common recycling practice, since the molten salt-flux protects the metal from oxidation and separates it from the non-metallic contaminants. White dross, a mixture of primarily aluminium and aluminium oxides from the skimming of aluminium in the casting furnaces is also most often treated with salt to extract its aluminium content.

In the current presentation, different challenges and opportunities in recycling of aluminium scrap and dross is presented. The presentation covers the effect of compaction and pre-treatments of scrap on emissions and metal yield. It also describes other paths for utilisation of Al scrap and Al dross, including metallothermic production of silicon, an important alloying element for aluminium as well as an important raw material for production of e.g. solar cells. In addition, the environmental performance/benchmarking of different recycling routes is described.