Cutting edge recycling for cost-conscious aluminium producers
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A new, unique and innovative recycling concept, introduced by thermal process engineers Dyson Hotwork, allows cost-conscious aluminium producers to make substantial savings by on-site recovery of valuable product from process dross and scrap materials. Payback on plant and equipment, it is claimed, can be as low as one year.

The Dyson Hotwork Aluminium Recycling Management (ARM) concept – which is keenly focused on the supply and installation of advanced turnkey rotary tilting furnaces for the recovery of all forms of aluminium – can be extended to include complete and continuous management of the process. Dyson Hotwork is able to operate and maintain furnaces on behalf of the customer or provide sound training for existing company operatives. All ARM packages are tailored to individual customer requirements.

In discussing the relative merits of the new ARM recycling concept, Tom Evans, Dyson Hotwork's ARM general manager said: "By using Dyson Hotwork engineering skills and aluminium recycling process 'know-how', producers are able to reprocess scrap and dross on site and recover metal units at much lower cost. The middleman is effectively cut out of the equation. With the ability to reprocess all types of scrap (dirty, coated and clean) as well as dross, an ARM customer is also able to purchase and process aluminium scrap from companies outside its existing supply chain."

There are numerous economic and environmental reasons why the recycling of aluminium is so important. Firstly, recycling of aluminium requires only 5% of the energy consumed in the primary smelter production process on a tonne per tonne basis and, secondly, it saves on raw materials such as carbon and alumina. A further advantage is that waste aluminium products can be recycled instead of being sent to landfill. In economic terms, companies which recycle aluminium play an essential role in the industry supply chain, for without such activity, the use of aluminium and its associated alloys would not be economically viable in many traditional markets.

The Dyson Hotwork ARM package provides a typical processing cost of US$130 or A150/ tonne throughput of dross or scrap feedstock – inclusive of all processing, operational, consumable, maintenance and disposal costs – with a payback period as short as one year, the company says.

THE FURNACE

With throughputs of 30,000 - 35,000 tonnes/yr, Dyson Hotwork's new advanced generation of 18tonne capacity rotary tilting furnaces are designed to maximise metal recovery rates and achieve higher levels of productivity than other conventional RTF systems – a process attributed to their furnace controls, faster melt rate and shorter charge/discharge times. Units are capable of processing product at a rate of 100 -120 tonnes/day, with typical process cycles of 12 to 15 tonnes per 2 1/2 to 3 hr, depending on the type of scrap being processed.

At the end of the process cycle, metal can be poured into crucibles, transferred by launders to holders or directly cast into ingots. The furnaces are built by Wood Jenks Technology Ltd who has supplied, in the last three years, seven 18 tonne furnaces for facilities in Munich, Düsseldorf and Wales.

Innovative concept derives substantial savings from process scrap and dross recovery.

CONTROL

To ensure optimum, cost-effective production, sophisticated SCADA technology provided by Platinum Controls Ltd, is installed on all Dyson Hotwork rotary tilting furnaces, to continually monitor and control the furnace, the cooler, the baghouse, lime injection and weigh scales of both feedstock and aluminium out.

Management of the entire furnace is paperless, and collected information can be trended, graphed and formulated into spreadsheets and reports. All information from the SCADA control system can be archived for reference, so that any process changes can be maximised at all times. Operating via a modem link, the Dyson Hotwork technical support team is able to provide 24hr/day world-wide customer assistance.

Dyson Hotwork will be exhibiting its rotary tilting furnace technology at 'Aluminium UK 2001' on Stand A82. ●

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Pechiney boosts dross handling capability

The largest ever 'TARDIS' aluminium dross handling system has now been commissioned at Pechiney Nederland in Vlissingen. The machine, a TARDIS 1599, weighs in at a massive 20 tonnes and is able to press and cool up to 1400kg of aluminium dross at one time.

Developed specifically for, and in conjunction with Pechiney, the equipment formed part of an 8-month development project. The Pechiney machine incorporates a special pot design, together with TARDIS patented technological advances, which combine to create a system said to be now proven to be the best available solution to dross cooling.

The cornerstones of the TARDIS technology include the air-cooled press head, which rapidly cools even the hottest drosses thereby minimising the oxidation of available metal and ensuring maximum overall metal recovery. Other advances include the emission removal system, which ensures complete compliance with all known environmental legislation, and a unique rocking head device which manipulates the dross to encourage maximum separation of metal from oxides. Early results already indicate a significant improvement in aluminium recoveries from dross for the Pechiney plant.

In the past few weeks, TARDIS manufacturers J. McIntyre Machinery Ltd have also shipped three machines to New Zealand Aluminium Smelters, and machines to Alcoa in the USA, and Toten in Norway. Orders for TARDIS, which are presently under construction in McIntyre's Nottingham-based factory, include two machines for the ALBA plant in Bahrain, units for Epalme in Greece and Hydro Deeside, which is the latest in a long line of recent Hydro orders.

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