

# Benefits of automatic slotting of backed anodes

New profile, flexible, fast and deep slots in backed anodes are produced by the T. T. Tomorrow Technology automatic slotting machine.

At T.T. Tomorrow Technology workshop near Padova in Italy, a new automatic anode slotting line is under commissioning before being delivered to a major European aluminium smelter. The automatic machine is enclosed inside a soundproof cabin with a system for air filtration and removal of the carbon and dust created during the slotting operation. One hundred per cent of the carbon material is recovered and recycled in the anode paste production plant.

The proprietary design, based upon already developed and tested solutions, is by Tomorrow Technology, and permits the Automatic Slotting Machine to groove anodes with different slot profiles and on different anode dimensions. The trolley holding the anodes is adjusted automatically according to the dimensions of the incoming anodes (which is determined automatically by the machine) and does not require any operator intervention to work at random with anodes from 500 mm to about 900 mm width. Working with one or two blades simultaneously, the slots can be inclined, interrupted or have the full length of the anode, and the depth of the slot can be set up by the operator at the HMI panel.

The electrolytic production of aluminium is an energy intensive process. Reduction in energy consumption as well as increased cell stability can



1 Automatic anodes slotting line manufactured by the Italian company T. T. Tomorrow Technology.

be achieved by reducing the cell voltage drop with slotted anodes to allow the escape of electrolysis gases. For a medium sized aluminium smelter, the energy cost saving when slotted anodes are used amounts to several million Euro per year.

Limitations and difficulties in managing slots formed in the vibrocompaction of anode paste and its high rate of rejections make the technology of cut slots much more effective and easy to use, with the big advantages of:

- the lengthwise slot direction in the anodes
- deep slot grooves (ensuring advantages during the whole anodes cycle)
- different slot profiles and shapes (inclined, interrupted, passing through or any of these combinations may be in house designed and developed).

The slots represent the best way of escape for the gas bubbles which are otherwise entrapped under the anodes, decreasing pot stability and increasing current loss. Improved energy efficiency strategy



2 Single slot cut by automatic anodes slotting line

goes commonly toward slotted anodes, but the parameters to be observed are very sensitive and adhere to the peculiar parameters of each pot room. The flexible and adjustable slotting parameters of the Automatic Anodes Slotting Machine designed, patented and manufactured by T.T. Tomorrow Technology, gives an efficient and effective answer to the issue of slot configuration and dimensions.



3 Twin slots are cut in a big anode by the automatic anodes slotting line

At high production capacity deep slots up to 450 mm are to be cut in the Automatic Anodes Slotting Machine which will be shortly in operation in the Northern part of Europe, confirming the leadership that Tomorrow Technology has in this very cost effective technology. As far as economic benefits (or gains) are concerned, the use of properly slotted anodes in aluminium electrolysis cells has been proved to result in:

- reduction in energy costs (due to the higher current efficiency)
- increased production capacity (due to the consequent increased potline amperage)

- environmental protection (thanks to significant reduction of greenhouse gas emissions).

The capacity to tailor projects to customer needs in order to meet productivity targets and to reach the maximum efficiency and reliability, is a well-recognised and appreciated behaviour of T. T. Tomorrow Technology, which, thanks to the short delivery time, high level of automation, flexibility and high quality of realisations, improves its market shares both in the sectors of anodes technology and cast house equipment.

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4 The discharge conveyor with anodes after 2 deep slots having been cut