

Effect of Damper Suction on Anode Spike and Anode Burn off in Aluminium Electrochemical Cell

(Case Study: South Hormoz Co)

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Abstract: Nowadays, dry scrubber is very important in Hall-Héroult aluminum reduction technology, and despite the environmental impact and lower consumption of aluminum fluoride, the duct fan suction also affects on the pot performance and improves the surface temperature of the pot and increases production.

During the production of 1 Kg aluminum, more than 1.2 kilograms of used material are converted to gas. Carbon dioxide and carbon monoxide are removed from the interior of the pot by means of the damper suction; and the anodes, which have high reactivity with carbon dioxide and air, lead to the pot blackness.

Therefore, in the case of failure of the damper, the exiting of gas will be faced with problem and will lead to a series of events, which are discussed in this paper.

At first, the output gas was measured using the pivot tube and then, the static pressure behind the damper was measured and its relationship with the number of spikes and burn off was studied. Moreover, the quantity of dust output from main chimney of the dry purification system, and its effect on burn off and spike were studied. In this research, information were categorized and analyzed using Pivot tables in Excel software and data was compared with the data analysis tool in the Excel program and its correlation with other parameters and pot events was studied. The main reason of the spike is the free carbon inside the butt and the blackness. With the continuity of the blackness in the butt, this excess carbon is bound to the anode end, especially the end of cold anodes, and it intensifies the flow passing through the anode and accelerates the destruction process of the anode. The purpose of this study is to reduce production costs.

Keywords: “FTP, Anode burnoff, anode spike, aluminium smelter”