

Befesa original salt slag cooling system

Befesa Aluminium has its headquarters close to Bilbao Spain. Has been involved in aluminium dross and scrap recycling more than 50 years, previously was known as Remetal until joining Befesa group.

In these years it has developed the largest units worldwide for complete treatment, recovering all components of salt slags, spl and drosses and operates plants in Spain, Germany and UK.

Total production amounts to 200 000 tons of aluminium delivered liquid or in ingot form and more than 500 000 tons per year of aluminium wastes (salt slag, Spl and drosses). All processes are inhouse developments.

In the newest Befesa plant in Bernburg (Germany) the project was faced with the challenge of treating a large volume of salt slags arising from 3 furnaces of 25 tm capacity. Each generated daily 55 tons of salt slags.

A new plant requires new commitments with authorities. Local government did not authorize the accumulations of reacting salt slag boxes emitting fumes for 8 hours, till they got reasonably cold and then tilting the boxes, generating again more fumes, dust ...

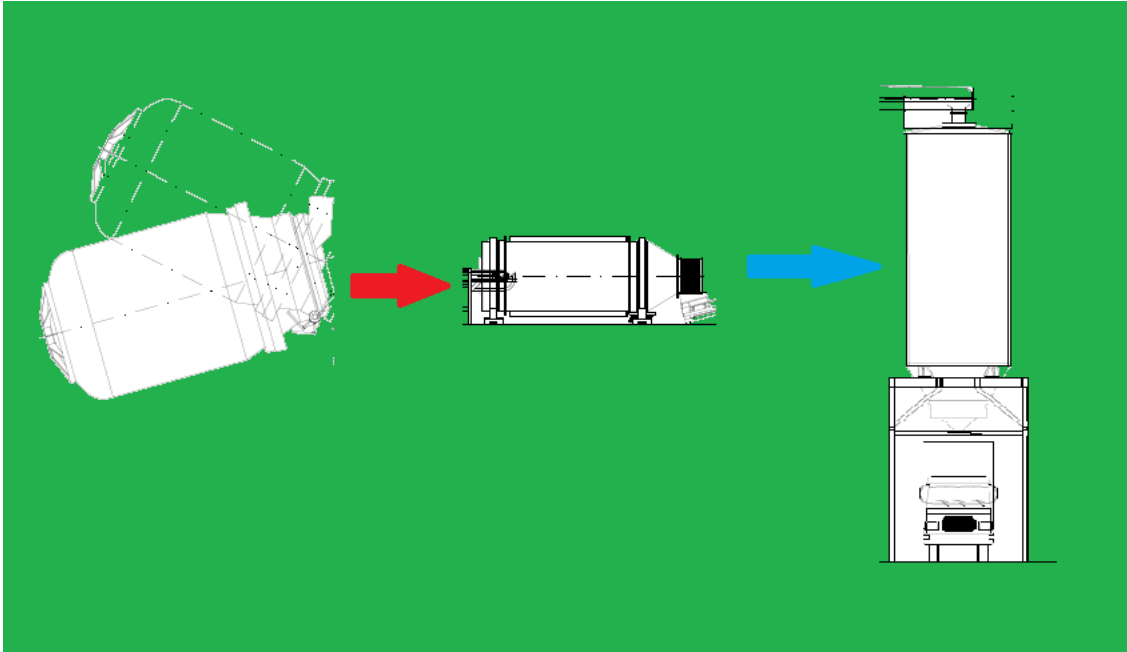
This process that is standard in the industry not only was environmentally objectionable but also had high operating costs in manipulation, box investment, box repair, floor damage, noises...

In the industry there was no proven way that could treat properly this material, especially in these high volumes.

Befesa, as Remetal, had experience in white dross cooling having sold more than 60 units worldwide but this material was more aggressive, easier to thermite, more adherent, the boxes to manipulate it had to be very large to make the slagging cycle logical.

The solution came, as usual in the house, by research and development in smaller scale in its Bilbao Plant.

The outcome was a special conveyor that could receive and transport the hot salt slags directly poured from the rotary tilting furnace and introduce them inside a special very heavy duty rotary drum where they were indirectly cooled to a temperature of 120°C before discharging them through an arrangement of conveyors into a big silo system, from this silo system the material already cold is cleanly loaded to the transport trucks that will take it to the recycling plant.



The installation is fully automated and is controlled by furnace operator from the control room with adequate video systems.

It is handling 165 tons of salt slag per day.

The fumes are all collected by hoods and aspiration system.

Difficulties

The most original system and the one that required more modifications was the conveyor capable of receiving the salts lag at temperatures exceeding 900°C. In this condition salt slag is sticky, can have thermiting parts and often has liquid aluminium entrapped that has the tendency to reach the most undesirable places. The experiences gained in the first conveyor lead after a year to a much-improved design that now runs reliably 24 hours a day. Befesa has protected his original design with a patent.

The cooling drum also had several problems that involved especially hot spots, insufficient cooling that affected welds and wear. The experience in dross cooling helped solving many problems arising from this much more difficult material.

Conveying to silos and unloading did not cause any remarkable issue.

Results

As positive results can be named besides cleaner environment at the plant

- 90% less boxes and less box maintenance
- Less space (this is probably the most valuable)
- Less manning both in dross box manipulation as in shipping truck loading
- Less noise
- More safety especially due to less vehicle movement
- Easier recovery of large aluminium chunks

New installations

The success of the first installation lead to 4 plants more in the following 3 years , all of them executed by the equipment sales department of Befesa (tec@befesa.com). Obviously, each of them had different characteristics depending on flow, furnace size, cycle times, number of furnace and space that has led to other 2 dross cooler loading systems.

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