

Dross Processing Plant Middle East Gulf Region – Air Fuel



Overview

Investments in scrap re-melting facilities are paying off across the entire spectrum of the aluminum industry, including primary and secondary cast houses and the foundry/die casting sectors. Recycling utilizes resources, and scrap is a low-cost feedstock alternative compared to primary reduction, providing high energy savings.

The key profit drivers for scrap melting are low energy, high productivity and, most notably, maximum metal recovery. As scrap is a highly complex and varied material, to achieve desired outcomes, the furnace and its process technology must be tailored to the individual operator's specific needs.

In January 2020, ALTEK acquired Melting Solutions Limited, gaining its years of experience and a proven track record melting scrap and delivering many cost-effective melting plants worldwide for all types of scrap. Today, the ALTEK Tilt Rotary Plants deliver outstanding outcomes for customers, achieving exceptional results on both oxy fuel and air fuel furnaces.

Approach

At a dross handling plant in the Middle East's Gulf Region, the ALTEK 25T Tilting Rotary Furnace (TRF) (30,000T per year) processes dross from one of the world's largest primary aluminum smelters. It is fired by a single air/natural gas burner system, with a nominal firing rate of 5.4 MW.

The rotary body has an internal volume of 40 m³, an internal door opening of 2m, and a liquid capacity of 11 M³, which is a nominal capacity of 25 tonnes. The furnace is primarily used for melting primary drosses with a capability of more than 30,000 tonnes of dross per year. The burner is fitted with mass flow control, where the fuel ratio is adjusted according to the stage of the melt cycle to reduce oxidation. Metal is either cast directly into sow moulds or directed to a holding furnace where the melt can be alloyed with a dedicated caster to continuously cast 7kg of foundry ingot. The holding furnace is equipped with a non-magnetic stainless steel base plate, ready for upgrading to a non-contact electromagnetic stirrer.

Outcome

Results of the ALTEK 25T TRF integration include:

- Charge input: 25.3 tonnes
- Pure melt time: 3.5 hours
- Gross melt rate: 7.3 tonnes per hour
- Cycle time: 4.7 hours tap-to-tap, including all non-melting activities (charging, pouring and tipping slag)
- Energy usage: 75-kilowatt hour per tonne
- Productivity: Per 24-hour cycle, 129 tonnes (input)

The ALTEK Difference

ALTEK Melting Solutions provides a full service from standalone furnaces to complete melting plants, ensuring compliance with environmental standards. This is backed and supported by a full installation and commissioning service, which often includes extended site periods to train and optimize equipment, working closely with the customer.

ALTEK is an expert partner for the supply of industry proven furnaces for effective scrap melting. The ALTEK Melting Solutions Tilt Rotary Furnace represents the most effective melting furnace technology available for processing mixed scrap and drosses.

The TRF technology bridges the gap between dross presses and ALTEK's AluSalt™ salt slag processing technology. Pressed dross skulls are recycled in a TRF, and the by-product (salt slag) is recycled and processed in ALTEK's AluSalt process.

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