

WIDER SUCCESS FOR LOTUSS REMELT SYSTEM



The increasing use of aluminum for a wide variety of product applications has been supported by the industry's ability to recycle aluminium effectively.

Careful optimisation of the melting process is an important requirement for the economic recycling of aluminium.

A continuing need for improved productivity, strictly controlled costs and an ability to react positively to increasingly stringent environmental legislation has sharpened the focus of manufacturers and producers of industrial equipment. There is also work toward improving processes and systems capable of being used in-house with minimum effort and risk and with maximum return. Keeping this firmly in mind, Metaullics Systems, a division of Pyrotek, offers a range of highly efficient and comprehensive systems, which can be tailored to customers' requirements. One of these is the Low Turbulence Scrap Submergence (LOTUSS) system.

The LOTUSS system is designed to provide fast submergence of lightweight aluminium scrap into molten metal. It severely limits high temperature exposure to atmospheric oxygen to give very high liquid yields and reduced opportunities for aluminium oxide formation. When recycling light-gauge scrap, the system effectively satisfies the critical needs of producers and fabricators who require efficient, low cost remelting, high metal recovery rates and increased productivity.

The LOTUSS can only operate in conjunction with a Metaullics

circulation pump or an EMP pump, delivering metal from the main furnace chamber into a circular refractory well.

This article highlights one of the successes with the LOTUSS and the Metaullics circulation pump. Metaullics Systems, the mechanical pump division of Pyrotek, has always worked together with various furnace equipment manufacturers in different countries and will continue to do so. However, a leading German furnace system builder, Mainz-Kastel based StrikoWestofen GmbH now uses a metal pump fitted with the LOTUSS system as standard on its furnaces to deliver maximum metal yield.

StrikoWestofen is one of the world leaders in bulk aluminium melters, large capacity holders, high efficiency tower melters (shaft melters), baleout units, dosing furnaces and precision aluminium casting units. One key unit in the catalogue is the well-known and widely used StrikoMelter® melting and holding furnace.

Metaullics first made contact with StrikoWestofen at the "Metef 2004" exhibition in Italy and initially discussed being able to offer a small furnace, which included a pump and the LOTUSS system. This equipment had great success and Metaullics was looking to explore this application on a different level. StrikoWestofen was interested in Metaullics' proposal to install a side-well on its furnace and this innovation led to eventual success in plant applications.

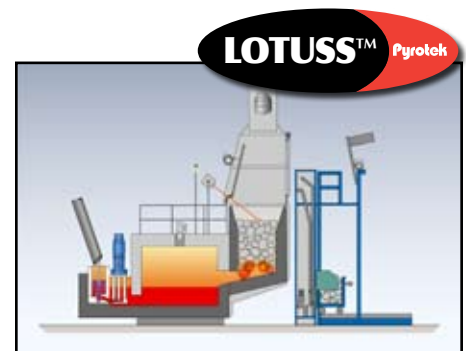
In 2005, Metaullics undertook the first installation with StrikoWestofen in Italy for melting chips on a 5 t single-chamber tilting furnace. The customer's process performance was subsequently improved by replacing the equipment technology with a T25 circulation pump and a 17" LOTUSS. With this combination the customer is able to melt

chips at 800 kg/hr. The 17 inch LOTUSS was developed especially for smaller furnace types, up to approximately 8 t. Metaullics already has several types of LOTUSS sizes for larger furnaces.

References for the Metaullics LOTUSS system on a StrikoWestofen furnace now include Hayes Lemmerz plants in the Czech Republic, Turkey and Spain; Brembo in Italy, and Cehver Dokum in Turkey.

Case Study

Turkish wheel producer, Hayes Lemmerz operates a 7 t capacity single-chamber tilting furnace with side well, giving a melting rate of 800 kg/hr. The furnace is fitted with a Metaullics T25 circulation pump and a 17" LOTUSS system.



LOTUSS and pump system – schematic

The pump speed is 400 RPM: The material charged comprises aluminium chips and the customer reports it is pleased with the recovery rate of 98% realised.

CHIP MELTING WITH AIR EXCLUDED

The LOTUSS system as incorporated by StrikoWestofen, fulfils the requirements of chip melting technology very effectively. As chip material enters the LOTUSS, it encounters a sheer force which breaks the oxide layer of the chips as they are drawn under the surface of the metal bath to melt in the absence of air.

For this application the foundry systems manufacturer has upgraded its StrikoMelter® furnace with a refractory lined chip pocket, fitted on the front side, to accommodate the mechanical metal pump and the LOTUSS system.

The block for the LOTUSS is a cast portion of the pocket. The pump rests on steel beams and can be easily raised out of the metal bath for maintenance or cleaning. The LOTUSS system and pump form one process unit. The pump draws in the metal from the furnace's holding chamber and feeds it into the LOTUSS system. Through a special configuration, it generates a "vortex" and, as a result, a downward flow of metal that draws the chips rapidly beneath the metal bath surface, melting them with the air excluded. The circulation of the metal leads to a thermal as well as chemical homogeneity of the metal bath. The continuous movement of the metal bath enables a reduction of the bath-heating energy and a high consistency of tapping temperature. By varying the delivery rate of the mechanical pump it is possible to adjust the system to the chip quality and required melting rate and to optimise process effectiveness and cost-efficiency.



Tilting furnace with chip pocket - accomodating the LOTUSS system and Mechanical pump for "Späne KombiM"