

Mechatherm International boosts overseas exports

Mechatherm International, Limited has achieved an enviable reputation for the supply of a wide range of furnaces and associated plant to the world's aluminium industries. This feature provides an insight into the capabilities of this innovative and highly flexible manufacturer and describes some recent export successes.



The Mechatherm solid scrap preheating oven installed as part of the major project at Metalco, Canada

Mechatherm International, Limited, are leading suppliers of plant and equipment for the aluminium industry. The company are based in Kingswinford in the West Midlands. Founded in 1973, the organisation has expanded greatly in recent years and now employs over 70 people. Current turnover is around US \$ 20 million and it is forecast that this figure will rise to \$ 30 million in 2007. The company now has manufacturing licensees in India, South Africa, Thailand and Russia, with agents in most of the major manufacturing centres worldwide.

The product range can be broadly split into three categories, namely casthouse equipment for primary smelters, casthouse plant for secondary smelters and heat-treatment furnaces for a number of sectors across the aluminium industry.

Within the casthouse, Mechatherm supply charging machines; preheat, melting and holding furnaces; degassing units; launder and filtration systems; d.c. casting machines and associated mechanical handling equipment.

In the context of secondary smelting, Mechatherm also provide an impressive and expanding range of equipment. On the one hand are highly specialised furnaces designed to melt many different types of clean aluminium scrap. On the other are sidewall furnaces and tilting rotary melting furnaces especially suited to handling all types of contaminated scrap and dross. This is an area of Mechatherm's business which has experienced a high order intakes in the recent past.

Mechatherm have vast experience in the supply and installation of all types of aluminium heat-treatment furnace. In the majority of cases, the furnaces utilise

high-powered fans for rapid heat-up and guaranteed close-temperature tolerances during holding. Full SCADA systems are available to track all products through the furnaces, ensuring full traceability, with trending and analysis of furnace performance.

The achievement of a leading global position in the

furnace industry is a reflection of the skill, expertise and technical practical knowhow of the company's Designers, Engineers and commissioning staff. They are also able to bring a very flexible and often innovative response to solving customers' requirements.

The company is also well versed in the latest concepts in computer/plc-based control technology and has the ability to design its own software. As a result, all control systems are designed and built in-house.

Not surprisingly, Mechatherm has been the recipient of a number of awards and other forms of recognition marking its achievements in both high-quality engineering, technical innovation and overseas business. These include two Queen's Awards for Export.

Several of these very recent export successes are described below:

Canadian recycling plant recycles 90,000 tonnes per year

At Matalco, Toronto, Canada, Mechatherm has recently completed the turnkey installation and commissioning of a 90,000 tonnes per year aluminium scrap recycling plant. The equipment includes a Rodecs delacquering system from Chinook Sciences, two 32-tonne-capacity circular top-loaded tilting melting furnaces with electro-magnetic stirring and recuperative burners, a 32-tonne-capacity tilting holding furnace, a SNIF degassing unit and ceramic foam filter; launders and a 30-tonne-capacity vertical d.c. casting machine.



Another essential part of the Metalco contract were these Mechatherm 32 tonne melting furnaces, both equipped with charging buckets



The contract for Metalco, Canada, also includes a 32 tonne tilting holding furnace

The Rodecs machine, together with its dust and fume collection and treatment plant for decoating and removing contaminants (mainly paint and lacquer), was designed and supplied by Chinook Sciences and installed by Mechatherm, together with all ancillary ductwork. The machine is a batch-type rotating oven with integral incinerator which blasts hot air through the scrap as it is tumbled up and down by the rotating action of the oven. Very high levels of cleanliness can be achieved due to the tumbling action of the scrap and the closely-controlled atmosphere and temperature regulation in the oven. The contaminants are burnt off from the aluminium and actually become part of the fuel, so gas consumption is reduced.

The exhaust gases from the decoating oven are taken to a hot filter with ceramic filter bags. The gases exiting the filter, having been cleaned, are used to supply heat to a solid scrap preheating oven. This is a very energy efficient feature and also a significant safety feature as the scrap is thoroughly dried before it is put in the melting furnaces. The solid scrap is placed in the oven and then scrubbed with high velocity air to heat it rapidly in order to drive off any water.

Tilting melting furnaces

The two melting furnaces were supplied complete with a lid lift crane supplied by Kone and are fired with high-velocity burners using hot air from a recuperator system in the exhaust stack. The high-velocity burners are arranged and configured to ensure maximum heat transfer to the aluminium for a melting rate of up to 12 tonnes per hour per furnace. The aluminium is charged into the furnace by using overhead charge buckets with “bomb doors” which can drop 16 tonnes of metal in one charge. The buckets are filled with scrap remotely in a pit near the furnaces.

From either melting furnace, metal is transferred into a tilting holding furnace ready for casting. The metal is treated, temperature corrected and alloyed in the holding furnace prior to casting.

The DC casting machine was also supplied by Mechatherm with an internally guided cylinder and a moving carriage onto which Wagstaff moulds are fitted. For safety reasons, the carriage is traversed away from the pit and then tilted remotely by a separate

machine for maintenance on the underside of the billet moulds. A complete closed-circuit water cooling system was also designed, supplied and installed by Mechatherm to supply an accurate flow of water to the casting machine.

The whole plant, including the continuous homogenising and cooling line supplied by others, is supervised by a SCADA system designed and commissioned by Mechatherm. The system is fully inte-



One of the very impressive items of plant central to the operation of Matalco’s 90,000-tonne-per-year recycling plant was this Mechatherm vertical 30 tonne D.C. billet casting machine

grated with the overall plant computer system and is designed to report on all aspects of the equipment performance and operating parameters. The complete installation was custom-designed in conjunction with Mat-alco and their consultants and took around 18 months to fully commission into operation. A great deal of care and detail was put into ensuring the plant complied with all Canadian regulations for operation, emissions and safety, to make it one of the most efficient and safe plants in the world.