



Carcano is a very historic plant and was founded in 1880 and has been constantly evolving, facing the new challenges over time and become a major player in the field of aluminium foil rolling and converting. The plant is located near picturesque Lake Como in Northern Italy.

Mechatherm has been supplying Aluminium furnaces for many years for both primary and secondary industry sectors. Mechatherm recently supplied a Turn Key 'state of the art' casthouse incorporating melting and holding furnaces, machinery for tending and charging the furnaces complete the transfer and casting launders to Carcano Antonio S.p.A.

The key specific requirements from Carcano before contract award were high thermal efficiency, reliability, availability, safety, automation with minimal operation staff. During the intensive bidding process against all the leading European furnace suppliers Mechatherm were awarded the contract based on our flexible and bespoke solution to meet this challenging criteria. The complete turnkey casthouse expansion was fully designed and project managed in-house at our offices in Kingswinford.

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**"Firstly, to win this contract against tough and more competitive competition was a fantastic achievement by the Sales team. Carcano Engineering team could see the benefits of placing a contract for the turnkey supply for all equipment from a single source. The superior state of the art proposal was clear for all to see and Carcano put quality and safety above capital equipment cost."**



**Stuart Allen**  
DIRECTOR OF SALES



conditions during the charging process.

Mechatherm supplied a semi-automated furnace skimming machine that was designed to dross and clean furnace refractory. The machine had an integrated dross pan system that carried the dross pan on the machine. The machine again limited to operator exposure during furnace tending operations.

To minimise the melting cycle times a under hearth Altek Siber Force Electro-Magnetic Stirrer was integrated shared between all three furnaces. The EMS was proven to reduce cycle times, dross formation and gas consumption by around 10 – 15%.

Molten metal was transferred from either of the melting furnace to a 60T tilting holding furnace. This furnace was fired utilising cold air burners and design for low casing losses and cold face temperatures.

The control and automation systems were fully integrated by Mechatherm. This was one of the first projects in the EU that had to meet the safety regulations and directives for machinery and combustion systems (EN13849-1, EN62061, EN746-2). This posed new challenges as component suppliers were still trying to develop products and systems to achieve this. Mechatherm led the development of control system working with Siemens to ensure we supplied a system to achieve SIL3 conformance, in particular for combustion ratio control. Two PLC's were integrated S7-300 for distributed safety to general furnace operation and a S7-400 HF for combustion control for the failsafe floating point maths functions. This was a unique and bespoke solution to ensure compliance with the new Machineries Directives in order to obtain the relevant CE mark.

Operator safety was also a key part of the project. Mechatherm integrated safety fences with interlocked safe

The plant is designed to produce 60,000 T/annum of high quality rolling ingot based on melting various prime and internal scraps. Two tilting melting furnaces were supplied with 60T capacity each rated for a nominal 10T/hr instantaneous melt rate. They were fired utilising Bloom Lumi-flame high efficiency regenerative burners with the overall burner system design and supplied by Mechatherm. Low NOx and CO emissions were key to the environmental approval for this project, NOx level <150 mg/Nm<sup>3</sup> are consistently achieved.

Scrap handling, fast cycle times and safe loading of scrap into the melting furnaces were a critical area to success of the melting operation. Mechatherm supplied a 25T capacity rotating charging machine that can load the furnace in 5 minutes. The result of this was that minimal thermal energy was lost from the furnace as the door was only open for a few minutes and no operators were subject to un-safe



## **BENEFITS OF THIS SOLUTION:**

- **Single point turn-key equipment supply**
- **Safe & quick furnace charging**
- **Semi-automated skimming/drossing machine**
- **Fast melt cycles & transfer times**
- **High efficiency energy recovery system**
- **Low environmental emissions**
- **Highest level of operator safety integration**

**GLOBAL  
ALUMINIUM  
EXPERTS.**

access, pit fall protection around the furnace and all the required guarding.

The project was a great success, delivered on time and surpassed all the performance criteria that Mechatherm had guaranteed. This project was deemed by all involved and who has visited to be one of the most efficient, safe aluminium plants the world has ever seen.

After a few minor teething problems with the new control system architecture, the Mechatherm commissioning and start-up process team commissioned the complete equipment ramping up-to full production in a short space of time.

[www.mechatherm.co.uk](http://www.mechatherm.co.uk)

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