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EKO-SWIAT orders complete foundry plant from Presezzi

EKO-SWIAT in Poland recently awarded Presezzi Extrusion's Melting Technology division the order for the design and manufacture of a complete aluminium foundry plant. The new plant will comprise a 40-tonne melting furnace equipped with a low energy consumption stirrer for metal recirculation, a 35-tonne holding furnace, an automatic charging machine, a dross cooler system and a fume treatment plant. The complete plant will be designed with the aim of achieving optimum performance in terms of productivity, metal loss reduction and energy savings.

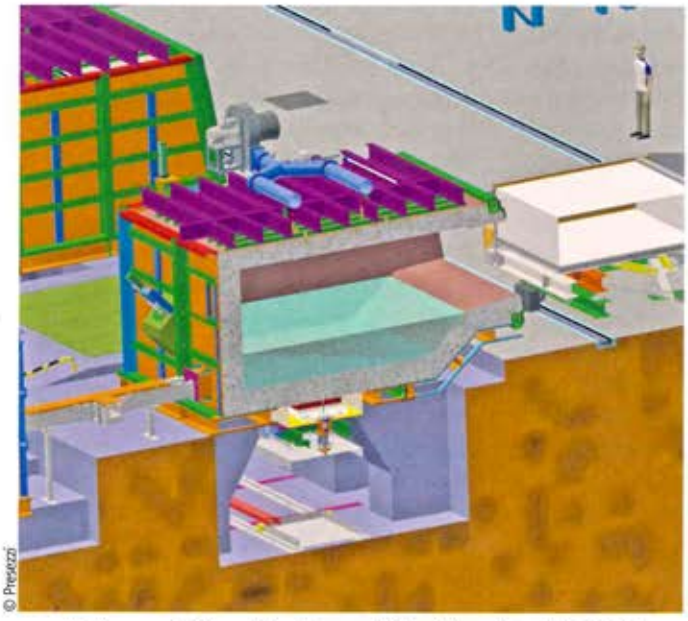
Archive photo of a similar melting furnace, with higher capacity, manufactured by Presezzi a couple of years ago

The furnace is designed to melt clean as well as contaminated scrap. The charging machine will facilitate and speed up the loading of scrap and primary ingots into the furnace in order to optimize production and reduce heat loss. The oxy-air-fuel burners use independently controlled streams of gas, air and oxygen to overcome the conventional limitations of oxygen use. The burners produce a flame with high temperature, luminosity and velocity, thus increasing radiation and convective heat transfer.

The use of oxygen instead of air leads to a high-efficiency combustion process thanks to the elimination of N_2. With oxy-combustion the melting cycle is faster due to the increased rate of energy absorption by the metal.

Decreasing the percentage of solid inside the aluminium bath significantly reduces the capacity to absorb energy by the metal contained in the furnace. Under these conditions, the application of an oxygen burner can result in surplus thermal energy that the metal cannot absorb and which is then dissipated in the fumes and through the furnace walls. During the refining, holding and fluxing phases, the two burners can operate with air to save energy consumption.

The furnace will be equipped with a refractory-lined chimney in which an automatic gate valve is installed, and a new concept of air blade, controlled automatically by the internal pressure of the furnace. The shutter material is metal fibre reinforced refractory so as to ensure reliability and durability.



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3D diagram of the melting furnace to be delivered to EKO-SWIAT

An innovative, low energy consumption stirrer provides for the recirculation of the molten metal. This stirrer neither requires water piping, pumps and water treatment nor an insulation transformer. The stirrer ensures better efficiency than any other conventional electromagnetic system, says Presezzi, because there is no heat loss due to the Joule effect. The combination of rotation and translation movements contributes considerably to maximizing the metal yield and minimizing the specific fuel consumption.

The aluminium bath, before being transferred into the holding furnace, will be thermally homogeneous (the temperature difference is only 2-3 °C between start and end of transfer) and chemically uniform (the heavy elements will become homogeneously distributed over the whole bath volume, avoiding the stratification phenomenon). The dross will be treated with Presezzi's Argon Dross Cooler (ADC) which ensures a high recovery of aluminium as combustion loss stops as soon as the inert gas is applied. The ADC is capable of processing up to 1,000 kg and is absolutely safe because no water is used either for cooling the dross or with the equipment; it is environmentally sound as there is no emission of dust or fumes; it provides for easy working conditions and is therefore operator-friendly, and it treats all kinds of dross (black and non-reactive or white and reactive).

The new plant supplied by Presezzi Extrusion will offer the following advantages to EKO-SWIAT:

- The possibility to increase the share of contaminated material in the load mix
- Reduction of CO, TOC, NOx, acids and particulate emissions
- Reduction of the specific gas consumption
- Increase in melting performance, metal quality and metal yield
- Dross with higher sales value.