FOMET
INDUCTION FURNACES SINCE 1963

Duplex-
A Channel Induction Furnace

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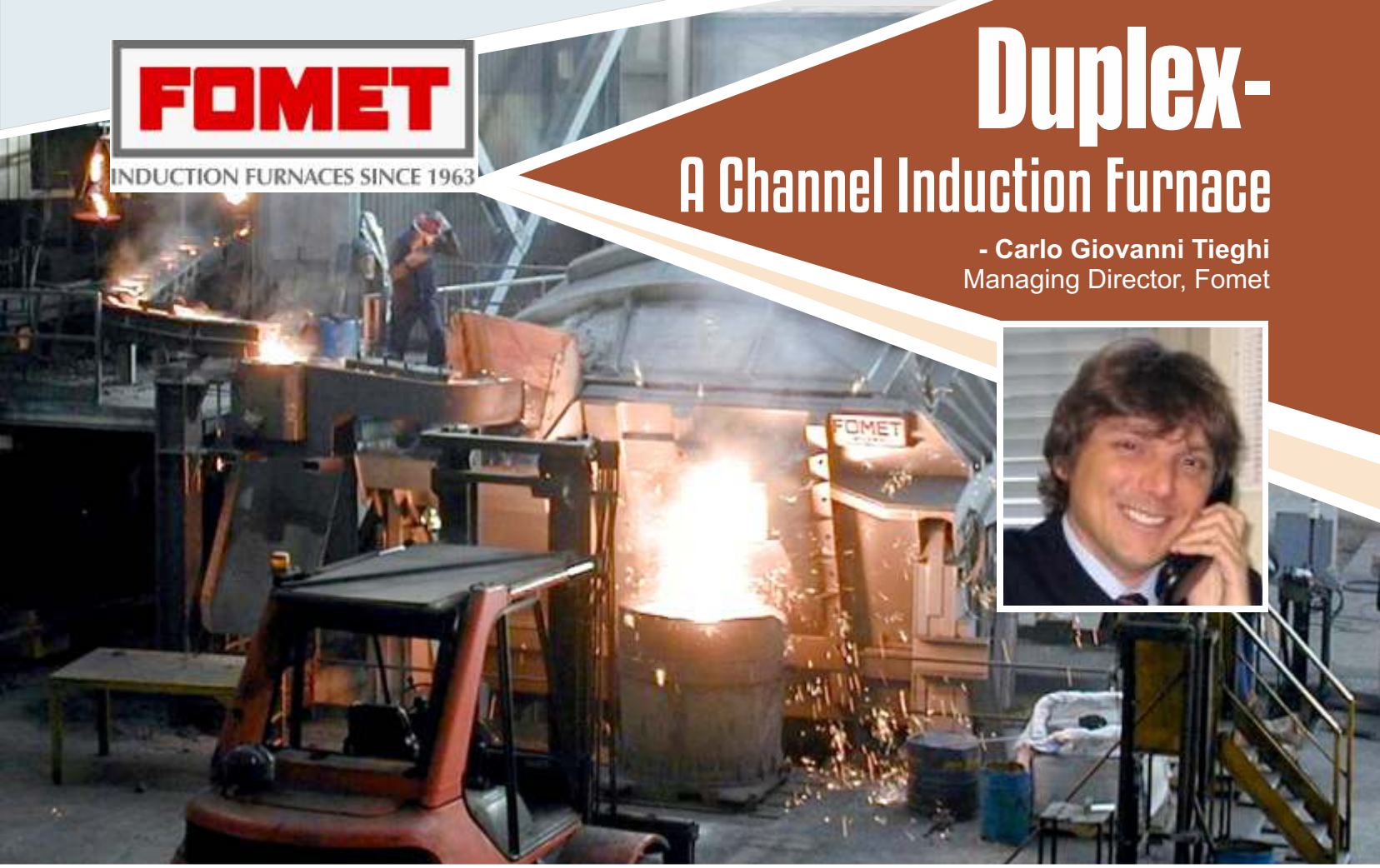


Blackouts and high cost of electricity sometimes suggest to melt with gas or carbon coke and feed a channel induction holding furnace, called "DUPLEX".

- Base iron molten metal recovery, providing a buffer between melting and pouring bottlenecks
- PLC automated, balanced, controlled and monitored
- Lower energy consumption (small generator can hold the temperature)
- Customizable

These furnaces are particularly suitable for holding and super-heating cast-irons to produce quality alloys with maximum metallurgical control for pouring at the desired temperature.

Ensures the regular operation of the foundry regardless of the level of mechanisation and automation, since it forms a buffer between the melting and the casting section.

It thus copes with the possibility of breakdowns without affecting the quality or the temperature of the metal.

The great flexibility of the system and its adaptability to existing installations, ensures that the DUPLEX receiver furnace respond to the requirements of the most varied production programmes. It is adaptable to any planned hourly production, temperature variations, accepting various launder systems, direct feeding from cupolas, rotary or electric melting, shift work, idle time, down time, etc.

Principle of Operation : Induction Heating

A high voltage electrical source from a primary coil induces a low voltage, high current in the metal or secondary magnetic core. Induction heating is simply a method of transferring heat energy.

Induction furnaces are ideal for melting and alloying a wide variety of metals with minimum melt losses, however, little refining of the metal is possible. There are two main types of induction furnace: coreless and channel.

The channel induction furnace consists of a refractory lined steel shell which contains the molten metal. Attached to the steel shell and connected by a throat is an induction unit which forms the melting component of the furnace. The induction unit consists of a magnetic special iron core in the form of a ring around which a primary induction coil is wound. This assembly forms a simple transformer in which the molten metal loops comprise the secondary component. The heat generated within the loop causes the metal to circulate into the main well of the furnace. The circulation of the molten metal effects a useful stirring action in the melt.

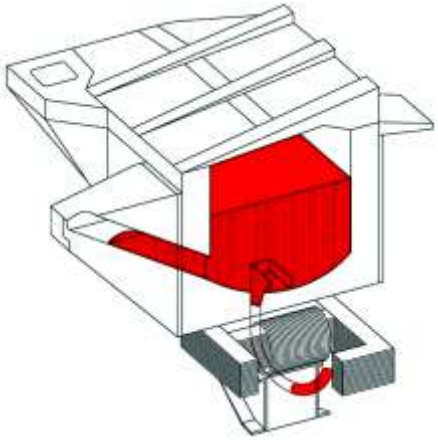
Channel induction furnaces are commonly used for melting low melting point alloys and or as a holding and superheating unit for higher melting point alloys such as cast iron. Channel induction furnaces can be used as holders for metal melted off peak in melting. Holding induction units thereby reducing total melting costs by avoiding peak demand charges.

Easy and quickly interchangeable flanged inductor. Can be powered with

electromechanical switchgear system or transistor IGBT electronic converter system. PLC power factor correction and phase balancing.

The high efficiency of this type of furnace is due to the direct conversion of electrical energy into heat energy.

The unique air cooled quick-



interchangeable inductor that forms the channel where is passing the metal is flanged on the side or on the bottom of the furnace body and the heating of the metal inside the channel

occurs through internal transfer of heat energy continuously and at maximum possible temperature, the unique limit being the refractory resistance of the lining.

Principles of Pouring with Slag-fee Metal Using Siphons.

The charging and pouring siphons (tea pot design) finish in the bottom of the furnace refractory case. Controlled hydraulic tilting of the furnace allows for charging and pouring at the same time. The metal poured in this manner is free from slag.

The tight sealing of the furnace cover avoids air entering, again reducing slag formation from oxidation of the metal.

Pouring operations can be carried out while receiving the charging metal from the melting unit, directly by launder or by ladle.

Advantages

Analysis of the metal poured out from the furnace will be constant, even if the cast iron is held within the furnace for many hours.

A perfect consistency of metal analysis and temperature is maintained by the harmonization of unavoidable variations in the cast iron coming from the melting furnaces.

Eliminates the waste from having to ingot, because it ensures that the iron is at the correct temperature right from the first pour. Also, the tailings residue of the pouring ladle can be recycled into the receiver furnace rather that being poured into ingots. Permits correction of the analysis of the iron through the possible addition of iron alloy and additives, while the melting furnace maintains a feed of standard cast-iron directly through the launder.

In this way the receiver furnace can produce special cast-irons for the production of nodular, ductile and compacted grades of iron.

Cast irons free from slag, thanks to the inlet and outlet teapot designed siphons.

Minimum investment against environmental pollution. Real improvement in working conditions.

Good management of electrical energy on a planned and regular basis from known costs.

Advantages of FOMET DUPLEX : Unique Air Cooled Inductor up to 500 kW

- Easy and quickly interchangeable inductor with patented flange mounting system for sealing the inductor to the furnace body.
- Simple and fast (2 to 4 hours) hot changing of the inductor thanks to the exclusive FOMET sealing system.
- High efficiency inductor with unique air cooling of the coil for power up to 500 kW.
- Mixed air and cooled water circulation within a closed loop system for higher power.
- Energy black outs and interruption of the cooling, even for a matter of hours, can be overcome without damage.
- Low energy consumption of up to 30% energy saving when compared against competitors.
- High customizable design, size and configuration adaptable to meet every foundries need.

Main Features

- Separate charging and pouring siphons allow to charge and pour molten metal at the same time.
- Tight cover to avoid metal oxidation.
- Minimum power consumption to maintain temperature.
- Melting capability during holding time.
- Slag skimming and inspection door.
- Monitored, balanced and automatic control by PLC system

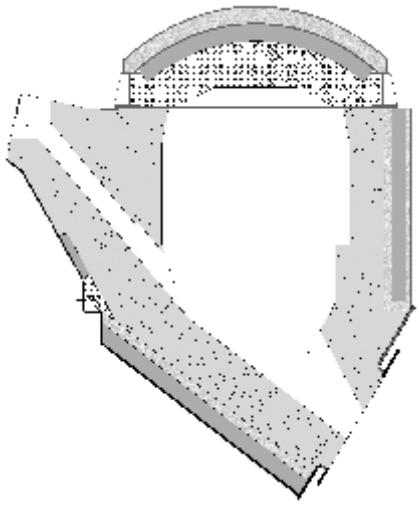
Environment Friendly

Use of clean energy, no water consumption, no emission of dust or fume combined with minimum operating noise, leading to a cleaner foundry working environment.

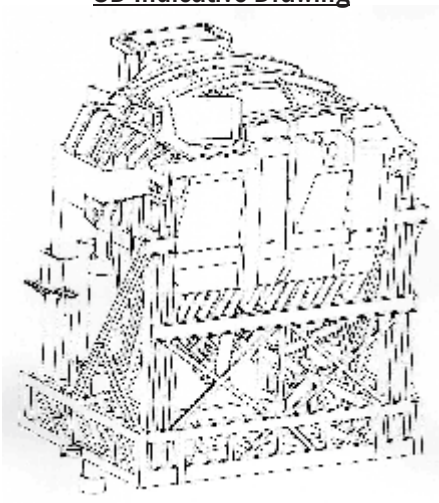
Monitoring and Operational Safety

Continuous monitoring of the furnace system guarantees a safe operation at any time.

(DUPLEX FURNACE)
Refractory Lining Indicative Drawing



(DUPLEX FURNACE)
3D Indicative Drawing



The total control of the entire operating procedure is possible.

Competitive Costing

- Low initial investment requirement : simple technology
- Low running costs with low energy consumption , FOMET furnaces saving 30% against competitors
- Reduced labour requirements, no requirement for skilled and dedicated operator

Additional Feature

- Electronic weighing system by load cells to indicate the exact available useful metal inside the furnace.
- Sideward tilting for easier removal of slag.
- High customizable design, size and configuration adaptable to meet every foundries needs.