

New Equipment Spotlight...

Upgraded Furnace Tending Systems

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The contaminated scrap available on the market today often leads to excessive dross formation, despite the latest generation of melting furnaces installed and operated in many casthouses today. The presence of dross generally results in several negative factors, including a high oxidation rate, poor thermal efficiency, and reduced furnace melting efficiency. Therefore, effective furnace tending is an important factor in achieving an efficient and cost effective melt operation.

Dross Management

T.T. Tomorrow Technology in Due Carrare, Italy, develops and manufactures automatic or semiautomatic equipment and vehicles designed to skim and clean furnaces in order to improve dross management within aluminum casthouses. The company's development process is driven not only by productivity and quality issues, but also by health and safety regulations that require operators to be protected from injury, heat, and other hazards near furnace doors.

Dross acts as a thermal insulator on the surface of the molten bath and reduces the efficiency of heat transfer from the flame to the metal. T.T. Tomorrow provides precise skimming machines that are able to quickly remove dross from the furnace, while minimizing the unintentional removal of aluminum. This results in a higher heat exchange efficiency within the furnace, enabling it to operate at a lower chamber temperature and resulting in reduced metal oxidation and a shorter melting cycle. The operator can operate the skimmer from within a safe cabin on the machine, or manage the process via a remote control console to further reduce the potential risk of metal splashes from the furnace.

Another concern regarding dross is its tendency to adhere and build up in the furnace walls and corners. The presence of solid dross deposits and heavy metals on the furnace bottom reduces bath capacity, as well as lowering metal quality due to the presence of uncontrolled alloy constituents and composition-polluting elements (especially iron) that can easily dissolve in aluminum. The company's cleaning machines are able to quick-



Figure 1. A new generation of automatic tending systems on rails are able to perform multiple functions, including charging, skimming, alloying, and furnace cleaning.

ly, accurately, and automatically clean dross, sludge, and metal build-up from the surfaces of the refractory lining inside the furnace. This leads to reduced downtime and extends the service life of the refractory material.

In addition to skimming and furnace cleaning systems, T.T. Tomorrow's casthouse products include various types of furnace-charging machines, material handling systems (for scrap, liquid metal, coils, billet, slab, and rolls), dross treatment, and other downstream equipment.

Updated Furnace Tending

In response to customer requests, T.T. Tomorrow has updated its entire range of furnace tending vehicles and robots, enabling new multi-purpose systems. Due to their high flexibility, the rubber-tired, diesel-powered vehicles are not limited to a single operation. Rather, a single machine is able to perform multiple tasks, combining furnace tending operations (skimming and cleaning) with scrap feeding.

Operation of this new generation of skimming machines has been further improved with the integration of full WiFi controls. Already, many of these machines have been delivered to cus-

tomers in Europe, North America, Mexico, and other countries around the world.

The company has also introduced rail-guided automatic multi-function tending systems. A great advantage of the automatic tending system on rails is that no special foundations or complex construction work are required for its installation (Figure 1). In most cases, these systems are shipped to the aluminum producer already assembled and ready to be placed on the rail prepared in front of the furnaces, which allows for quick start up of operation after operator training. As a result, a single operator in a multi-furnace casthouse can perform all tending work, including charging, skimming, alloying, and furnace cleaning—providing flexibility, excellent reliability, and a high economic return.

In addition, T.T. Tomorrow's entire fleet of vehicles and equipment for charging, skimming, and cleaning the furnaces has recently been outfitted with a remote connection to the T.T. Tomorrow office in Italy. This enables the supplier to provide remote diagnostic checks, software upgrades, and control system modifications, enabling real-time service to customers in any part of the world. ■