

Trimet benefits from Workhorse LT pump

Worker safety is always a paramount consideration in aluminium plants. That was one of the key motivations behind Trimet's implementing a launder transfer pump made by Ohio, USA-based MMEI, and purchased through Gerken SA.

Belgium-based Gerken SA (a subsidiary of Gerken Group) specialises in the manufacturing and distribution of degassing shafts, rotors and graphite casting rings. Also it is renowned for its own anti-oxidation impregnation of graphite. In Europe, the firm is the representative for Molten Metal Equipment Innovations (MMEI). The company MMEI manufactures graphite pumps for circulation and transfer of molten metal.

Within Trimet Aluminium SE's massive plant in Essen, Germany, the company operates a 25 t chip melting furnace for mainly 6000 series alloys. Metal from this furnace feeds transfer ladles which are operated by crane to supply other furnaces over a distance ranging from 10 to 250 metres. Prior to the pump's installation, the 5 t ladles were individually lowered 2 metres into a pit in front of the furnace. Filling the ladle put workers in close proximity to molten metal, since it was necessary for them to pull a tapout cone to initiate the process. Each fill would take between 12 and 15 minutes, after which a new cone was placed in the furnace opening to seal it again.

Safe decision

As part of the effort to find a safer alternative that would work within the fill area's space constraints, representatives from Trimet and Gerken visited MMEI's plant and some US aluminium facilities that had been using MMEI's equipment for several years. Trimet valued the opportunity to talk directly with end users. That user input, along with Gerken's local support, and the pump's innovative design, were cited as the leading reasons for Trimet's solution choice.

The new configuration for the area includes a launder section and pump well which were made by a local supplier, and the MMEI Workhorse Launder Transfer Pump. Collectively, these new elements have met the company's primary objective of enhancing worker safety while transferring the metal quickly and efficiently. The use of tapout cones has been eliminated.

A pump well was added to the side of the furnace to accommodate the pump. Metal flows freely from the furnace into the pump well via a small submerged archway. The outlet of the transfer pump is mated up to a small opening in a (division) wall which parallels the furnace wall and connects to the launder. When the pump is not operating, the metal level in the pump well and furnace remains at the same level.

When a ladle needs to be filled, operators turn the pump on using a control panel located at a safe distance from molten metal. The



The pump in situ at Trimet.

Workhorse pushes metal through the divider wall opening, raising the metal level enough to feed metal into the launder. Throughout the fill, the metal level between the furnace and the Workhorse side of the pump well evenly lowers, while metal on the launder side of the pump well is forced high enough to feed the launder into the ladle. The new launder provides a direct path from the furnace to the ladle.

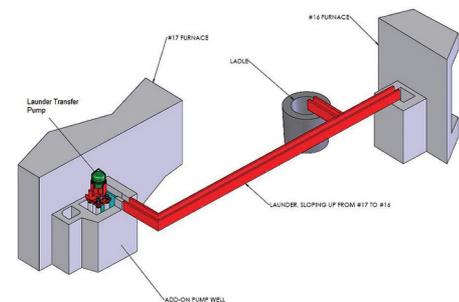
Other additional benefits due to the change in the ladle fill method have been realised. Previously, the metal flow into the ladle generated a considerable amount of dross due to turbulence from high metal velocity exiting the small tapout opening, as well as from splashing. This has been reduced considerably with the use of the launder transfer pump.

The reason for the visible reduction in dross formation is due to the pump's metal delivery method and the use of a wider launder where the metal exits into the ladle. With the Workhorse pump, the metal flow is all sub-surface movement at low velocities creating a quiescent flow. The metal exits the wider launder and gently cascades into the ladle. The result is dramatically less turbulence and dross formation.

Many benefits

Productivity has improved as well. Even though the metal now travels roughly three metres before it exits the launder to fill the ladle, between the high flow rate generated by the pump and the width of the launder, ladle fill time has been reduced by approximately 50% and it now takes only 3 to 7 minutes, a significant reduction in fill time.

In addition, the pump and launder have provided new operating flexibility. A furnace



Layout of the pump at Trimet.

used for casting foundry ingot, located just 10 metres from the melting furnace, had been filled by the cumbersome process of filling ladles and emptying them a short distance later into the furnace. Today, a 'T' in the launder system allows metal to be diverted from the ladle fill exit and routed directly to the furnace. It allows transfers to the furnace to be done directly, safely and efficiently without use of the ladle. It also allows the ladle to be used to fill other furnaces more frequently if needed.

Currently, through the synergy of the chip melting furnace, Workhorse pump, and new T-launder, Trimet is benefitting from the ability to transfer 24 tons of metal every 24 hours while providing a safer work area, and reducing the production cost through the dramatic reduction of dross formation. In addition the transfer capacity by using the pump has increased dramatically.

Gerken SA can be found at Hall 10, stand C71 of ALUMINIUM 2016 in Düsseldorf this November.

www.gerken.be