

## Metal transfer by pressurisation brings savings

Reducing dross generation by half through the new Mecfor Metal Transfer by Pressurisation method into the furnaces has proven to create substantial savings without requiring major changes in our client's operations, writes Eilolse Harvey.

Metal transfer through traditional crucible pouring methods generates a substantial amount of dross (approximately 1% based on literature and various tests) which needs to be removed from the furnace, manipulated and then treated off-site at significant cost. Metal transfer using conventional syphoning generates less than 0.5% of dross, but it needs metal in the furnace to initiate transfer as well as one syphon installation per furnace. Finally, some metal transfer technologies using pressurisation of crucible also result in more than 1% of dross, plus it functions using a custom designed and dedicated crucible.

Mecfor's objective was to develop a technology that would drastically reduce the dross from the transfer operation into the furnace while being adapted to the client's existing electrolysis crucibles. We designed and fabricated a trailer that transfers metal by pressurising the ladle under a controlled pressure during the complete cycle time. The vehicle transfers the metal while the syphoning tube is wholly immersed in the molten furnace metal, thus avoiding contact with air and eliminating turbulence, both of which generate dross. The discharge



The Mecfor MTE50 Crucible Hauler syphoning tube remains wholly immersed in the molten metal during transfer.

cycle is entirely automated, and the crucible tilts laterally to minimise metal leftover. With an onboard weighing system, the equipment allows for partial discharges of ladles.

The molten metal transfer done with Mecfor's vehicle generates a minimal trace of dross. Based on recent experiences, Mecfor's technology offers benefits and improves production costs significantly, delivering a quick return on investment (less than a year)

for the client. Mecfor's vehicles are not at the prototype stage, and a few units (designed to discharge total 20T crucibles with and without table) have been operating for many months to more than two years already.

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## The foundry has a little helper

User friendliness was one of the key factors in designing the Schnorkle 2.0. Furthermore, its closed geometry reduces the danger of liquid metal handling. The handling of liquid metal requires protective measures for people and equipment. This prompted StrikoWestofen (part of Norican Group), the manufacturer of industrial furnaces, to design the optimised Schnorkle 2.0. The closed transport system keeps the melt under control as it travels to the dosing furnace, making accidental overflow or unsafe tilting a thing of the past.

Molten aluminium with its temperature of around 720 deg C is a potential risk to life and limb. That's why foundry suppliers strive to minimise the dangers associated with the handling of liquid metals. The safe transport of the melt poses a particular challenge. This innovative transport system's closed construction reduces temperature loss of the melt during transport, meaning it no longer has to be overheated beforehand. This has a positive impact on energy consumption.

### Safe journeys in the foundry

A conventional forklift truck is all that is needed to move Schnorkle 2.0 safely to the dosing furnace. In contrast to conventional transport ladles, the closed transport system does not need to be tilted at height, instead dispensing its contents via a riser pipe with the help of pneumatics. This means that a

relatively low lifting height is sufficient during melt transfer, allowing Schnorkle to be used in halls with extremely low ceilings. In addition to this, its control system prevents liquid metal from splashing around uncontrollably. In the event of problems or irregularities, the transport system automatically sounds an alarm, displaying error messages to allow the operator to intervene and remedy the issue. Schnorkle 2.0 provides occupational safety and process reliability combined.

### Simplified processes

User friendliness was a key factor in designing Schnorkle 2.0. To ensure a constant material flow while filling the dosing system, operators can select between two speeds at the push of a button. Schnorkle 2.0's compact form makes it easier to manoeuvre in the foundry. "The reduced overall height makes our new transport system about 20 percent lighter than it was in the first generation. In contrast, the filling opening for the melt has become about 50 percent larger," explains Florian Kulawik, Development Engineer at StrikoWestofen.



The Schnorkle 2.0 closed transport system. Photo © StrikoWestofen Group

The impeller can be positioned at the centre, allowing for salt or other popular melt treatments to be added. For a safe and easy heating process, the burner is attached to the main cover, making a separate heating cover unnecessary. Schnorkle 2.0 can be used with all commonly used melting and dosing furnaces. When combined with the Westomat dosing furnace, additional benefits are unlocked for the user. The supply station, available as an option, allows for transport and dosing processes to be synchronised. This also completely prevents overfilling.

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