



FOUNDRY INSIGHT

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ask the expert...

PYROTEK OVERFLOW TRANSFER SYSTEM

AN IDEAL SOLUTION FOR MOLTEN METAL DELIVERY



Dave Schlicht,
Pyrotek Metaullics
Business Manager

Transfer systems constitute vital elements in molten metal delivery for casting operations. Here, Pyrotek Metaullics Business Manager, Dave Schlicht* responds to a range of customer questions, outlining this novel system which offers a range of major benefits in terms of process performance, cost savings, plant reliability and metal quality.

Q: What is the Overflow Transfer System?

A: The Pyrotek Metaullics Overflow Transfer System (OTS) provides a new and unique way to move and deliver molten metal from a melting furnace. This system has been designed specifically with the ability to transfer metal at a wide range of flow rates, but also deliver it in a very gentle way, so the metal quality remains at a high level.

Q: How does the OTS work?

A: The major components of the OTS are a one-piece cast refractory bowl, and a shaft / impeller assembly, which raises the metal by moving it gently from the bottom to the top of the transfer bowl. Once the metal reaches the top of the bowl, it discharges via a launder—with transfer piping no longer required.

Q: How does the OTS differ from a

conventional transfer pump?

A: The overflow transfer system effectively does the same thing as a conventional pump, but with fewer parts. There are only two parts in contact with the molten metal—a refractory body (transfer bowl) and a shaft / impeller assembly. The riser, support posts, and graphite base assemblies featured in conventional transfer pumps are no longer needed.

The OTS has an extremely low maintenance design with the graphite shaft / impeller assembly being the only consumable component of the system. The equipment has no transfer pump posts to monitor and rebuild, no pump riser or transfer piping, which have associated challenges of freezing or clogging if not used properly, and also no ongoing maintenance and expense as associated with conventional transfer pumps.



OTS in operation filling a ladle

Q: What other advantages does the OTS offer when compared to transfer pumps?

A: Pyrotek customers have reported that there is much less dross generated

from the OTS, and reports indicate that it is close to 50% less, which represents significant cost savings. Also, testing has been carried out that shows the quality of the metal to be much improved when compared to transfer pumps or tap hole transfers. The OTS is able to deliver metal with less dross, and increased quality by greatly reducing the turbulence of the metal. The metal is gently raised in the bowl and smoothly enters the launder, where it is delivered for use in the downstream process.

Q: Why is the wide range of flow rates an advantage?

A: The wide range of flow rates available with the OTS enable the system to be installed for a variety of applications. For example, Pyrotek currently has the OTS filling 30,000 pound over-the-road ladles in 10 minutes, and also ingot and sow moulds. These two applications require much different flow rates and it has been possible to control the rates to be successful in both applications. The OTS can operate at speeds to transfer molten aluminium at 3,000 pounds per minute, or slow it down to a trickle to fill moulds effectively.

Q: How are you able to run such slow flow rates?

A: The OTS has no pump riser or transfer piping. Traditional transfer pumps incorporate risers, which are prone to metal freezing if not run at a sufficiently high speed.

Q: Are major modifications needed to install the OTS in existing furnaces?

A: Not at all. Pyrotek Metaullics has designed the OTS with a very small footprint so it can be readily installed in most existing furnaces. Also, the OTS

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is available with several different bowl heights, so it can fit in either shallow or deeper furnaces. Your Pyrotek sales engineer can recommend the ideal system for each particular application.

Q: Are there future developments related to the OTS?

A: Pyrotek is in the final stage of development for an even smaller OTS. The smaller diameter will facilitate installation of the system in very small wells, and also address some specialty applications, such as emptying degassing boxes.

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**Dave Schlicht is Business Manager, Pyrotek Metallics, Columbia City, Indiana, USA and has extensive field experience with foundry processes and related equipment technologies.*



OTS with electric motor