

SIPHONS FOR EFFECTIVE TAPPING OF POTROOM METAL AND BATH

Siphon tubes are employed primarily in the potroom department of aluminium smelters to extract molten metal and bath (cryolite) from reduction cells. As explained by Pyrotek's Mike Davenport, Global Product Manager—Potroom, Carbon Bake, all aluminium smelters use some form of siphon assembly.

Siphons are useful devices used for drawing off or conveying liquid metal—essentially, a pipe or tube is designed and deployed in an inverted “U” shape and filled until atmospheric pressure is sufficient to force the liquid metal from the reservoir at one end of the tube over a barrier higher than the reservoir and out the other end of the tube.

Many siphon designs consist of an assembly of tubes designed with flanged joints, which are often connected to a vacuum crucible. This type of design is the most common structure employed around the world. However, other siphons in use are designed as stand-alone equipment, meaning they are not attached to a crucible. This type is used primarily in older plants where open-top crucibles are standard.

CUSTOMER PAIN

The typical failure mode for siphons involves wear due to erosion. The constant movement of bath and metal through the tube causes wear to the inside wall of all sections. However, the tip is continuously submerged in molten metal, simultaneously exposing both inner and outer walls of the tube to the molten bath and metal. This reduces the life of the tip and demands more frequent replacements.

In certain environments, damage can also be incurred due to arcing. Some process designs allow the siphon to move off-centre and make simultaneous contact with the anode and the metal pad. This causes arcing at the point of contact, which softens the metal and reduces wall thickness. In extreme cases a hole will develop at the contact point, and the siphon tip will need to be scrapped.

EXTRA SERVICE TO THE CUSTOMER

Siphons are manufactured at Pyrotek's facility in Xi'an, China, which is fully operational and producing a wide range of product categories. As with the company's other products from Xi'an, low cost and high quality allows maximum value to be delivered to customers, avoiding the disadvantages as outlined above. Several Pyrotek storage locations allow an inventory to be held in the U.S. for quick delivery to all customers. The Xi'an production team assures that quality is built into the process and that consistently high standards are achieved and maintained.

PERFORMANCE

Pyrotek has supplied siphons for several years. Through this time, positive results have been recorded on both performance and lead-time. Precisely machined flanges, exact bolt patterns and consistent finish ensure both optimum product aesthetics and ease of use. Siphons are efficiently packaged for container shipments complete with heavy-duty skids and steel bands.

As part of Pyrotek's ongoing technology, developments in this field are aimed at continuously improving product performance. Process trials with latest siphon design configurations have been established by the company's engineers working with leading aluminium smelters, both in the U.S. and worldwide.

www.pyrotek.info/siphons



Pyrotek siphons for key potroom tapping applications



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