Innovative technology for casthouses

The MQP business concept is to develop and introduce innovative technology for casthouses with the overall aim of improving quality and reducing operating costs.

Innovative technology for casthouses

MQP, under an exclusive manufacturing agreement with Aluminium Alloys (AA) Ltd., supplies an exceptionally powerful TiBAl grain refining rod known as Optifine. Optifine is a highly effective grain refiner and can achieve the level of refinement needed to avoid ingot cracking at up to 80% of production without the need to install new capacity.

In the Optipact system calibration is an important step to determine how a specific alloy responds to addition of fresh nuclei via the Online System. This involves establishing the equations for grain refinement curves for Optifine and commercial TiBAl grain refiners and establishing data such as in the graph shown in Fig.4 for an AA 6000 alloy.

Multi chamber filtration

Within the aluminium casthouse industry there is a need for an efficient, low hold up volume, filtration process capable of treating high flow rate melts.

Optifilter is a three chamber filtration system with a ceramic foam filter as the first stage, a second chamber for the addition of fresh nuclei via the Online System and a third chamber containing a bubble trap filter. The complete MultiChamber system can be tailored and customised to individual customer needs.

Environmetally friendly fluxes

The Refinal range of fused granular refining agents provides an effective alternative to chlorine fluxing in the furnace as a means of removing alkalis and inclusions.

The Refinal range is supplied to smelters worldwide and continuous development programmes have resulted in formulations which offer enhanced performance at low cost.

Refinal 350 based on minimum 35% Magnesium Chloride has proved to be an efficient remover of alkali metals and oxides from molten aluminium. Refinal 552XF, also based on minimum 35% Magnesium Chloride, but with the addition of fluoride, has further enhanced performance and increased efficiency by up to 25%. Refinal 555XF based on partial substitution of the potassium chloride content with up to 80% sodium chloride is proving to be a cost effective remover of alkali metals and oxides from molten aluminium.

MQP has established Refinal as a market leader and the product has excellent synergy with the RefiFlux filter (RFI) produced by STAS and distributed by MQP. (Fig.7)

The RFI, used with Refinal fluxes, provides the ideal product and application system for impeller furnace stirring and fluxing.

The appreciation of reaction kinetics reveals that the rate of removal of alkalis using different addition methods can be compared by the ratio between a constant (k).

The bar chart in Fig.8 illustrates that the k value is much higher and therefore alkali removal greater when using the RFI. A 30kg addition of Refinal is being used in each test.

Studies by Hydro Aluminium Rolled Products have also shown that flux treatments with the RFI impeller system generate 50-70% less dross than alternate flux addition methods or with chlorine gas, a real benefit for casthouses.

MQP through its relationship with STAS, as its European agent, plays a significant role not only in the introduction of the RFI/Refinal system, but also in supporting and customising applications.

Dynamic Concept

MQP and Dynamic Concept, see their collaboration as an ideal means to bring novel engineering expertise to European casthouses.

Dynamic Concept is providing turnkey solutions to the aluminium industry, from the pot room to the casting table. The scope of work embraces a variety of systems technologies, components, equipment and services.

Optimum and powerful grain refinement

MQP has a European agreement with Deschambault, Quebec (Fig 9) where adding two moulds to a 14 strand T bar table has brought a 15% increase in capacity.

To discuss any of the above contact:
MQP Ltd, 6 Hallcroft Way, Knowle, Solihull, West Midlands, B93 9EW, England
Tel: +44(0)1564-200443,
Fax: +44(0)1787-604-274
E-mail: john.courtenay@mqpltd.com

www.mmcpublications.co.uk