

ALTEK Castings – High Quality at Competitive Prices

ALTEK have over 25 years' experience designing, manufacturing and installing machinery for the aluminium cast house.

When inventing the dross press in the early 1990s it became apparent that there was a requirement for a new, strong and durable material to be developed for a dross pan. ALTEK went about trying to discover the best material to make a high-quality, reliable and efficient product that would stand the test of time.



Durance and strength

The thermal shock of hot dross straight from the furnace demands a material of resistance, durance and strength. To create a dross pan that withstands mechanical shock of a dross press exerting in excess of 100 tonnes of pressure on the dross itself while resisting the dissolution effect of molten aluminium, ALTEK underwent an imperative research and development exercise. The material that of choice was a cast carbon steel alloy; sturdy enough to be fit for purpose, and strong enough to create dross pans of worthy eminence and kudos, worldwide. The process to finding the right material was a lengthy one; one ALTEK felt strongly about investing in to allow cast houses to have full assurance that they would be making an investment in quality and the future.

Achilles' heel to mild steel

In the past, there have of course been cheaper alternatives to alloy. However, through experience the world recognises that fabricated mild steel pans, although cheaper to make, do not last long in the volatile conditions subjected to them. Deforming easily and with a relatively low resistance to dissolution, these pans became unusable after 6 months to a year and were not suitable for periodic use in a dross press, leaving only a long lasting legacy of their Achilles' Heel; weakness and frailty.

The Trials

Cast iron was next to fare the test of time, strength and suitability. Grey cast iron was trialled; with good casting properties, wear resistance and machinability it was promising. However, its tensile strength and elongation are very low, which made this material unsuitable. Attention was then turned to ductile iron, renowned for high strength, pliability, heat resistance and toughness. With this option, although viable, the production process was complex and costly increasing the risk of defects forming and becoming too expensive for industry. The other main disadvantage of cast iron is that it cannot be weld repaired should cracks appear. Once this happens the thermal and mechanical shocks cause the cracks to quickly increase in size. Molten aluminium can get into the cracks, freeze, and make it very difficult to empty the pan of dross, wasting operator time and money.

The Recipe for Success

There were properties from many metals which had benefits, but none without their Achilles' heel or drawbacks, making them unsuitable for the cast house.

During the trials, cast steel proved itself to be the most likely candidate. With excellent design flexibility, chemical composition control and heat treatment capabilities, ALTEK were able to exploit the variability of this material to create a cast steel alloy which met all the desired criteria. From this the RHINO-CAST™ Steel Alloy was made. RHINO-CAST™ is a heat treated, medium carbon steel alloy, balancing ductility and strength whilst having good wear resistance. Steel alloys are weld repairable should cracks begin to form, extending the life of the pan and reducing the risk of wasted operator time. They also act as a very good heat sink which aid in the cooling of dross and other slag, potentially leading to higher aluminium recoveries.

The discovery of RHINO-CAST™ Steel Alloy meant that quality was founded once and for all.



ALTEK Dross Pan Sets – More than a consumable

ALTEK have over 40 dross pan set models available varying in height, width, depth, shape, pan capacity and aluminium drain capacity. These come in single, dual and multi-chamber designs.

Through many years' experience in the Aluminium Industry, ALTEK realises that each cast house has different operational techniques using a variety of different furnace shapes and sizes. These in turn produce differing types and quantities of dross. To be used in a dross press or just on their own, sizing of the dross pan set is still an important procedure and can lead to significant savings over the course of the pan's lifetime. ALTEK have spent many years designing and refining pan set designs, altering the internal shape and the location of drain holes to encourage as much aluminium drain into the sow mold below.

Combining the all the attributes of RHINO-CAST™ steel with a shape for optimised aluminium drain means the ALTEK dross pans are a not just a consumable, but an investment. ALTEK dross pans tend to last many years (averaging over 5), hold their shape and continue to provide consistent recovery benefits over this period of time. When looked at in more detail, the economic benefits of achieving only 1% extra aluminium recovery from one medium capacity pan over the course of a year pays for the casting itself. This does not even take into account the hidden benefits of improved operator efficiency and reduced procurement costs.

Additional Castings

Following on from the great success of dross pans, ALTEK also provide a variety of other durable cast steel castings for the cast house. These include salt slag/rotary slag bins, ingot molds, skimming rakes and cooling lids.

Salt slag/rotary slag bins - very similar to dross pans in material make up, however additional features have been included to aid in the cooling of the slag. Combined with heavy duty cooling lids these are a low cost alternative to the ALTEK Salt Slag Press, improving the cooling time and reducing smoke and fumes emitted from the burning slag.

Ingot molds - since introducing them into their product range, ALTEK have quickly begun to establish themselves in the industry as a reliable supplier of ingot molds. A company's preference on sow mold can depend on a variety of factors such as aluminium quantity production, furnace sill heights, fork truck capacity and favoured designs. ALTEK meets these needs, supplying bespoke customer designs and alloys as well as a range of standard ingot sow mold sizes from 250kg ingot capacity to 2,500kg ingot capacity. All sow molds can have the addition of feet and/or lugs for material handling.

Skimming / Stirring Rakes – ALTEK's Long Life Skimming / Stirring Rakes are a brand new and exclusive product being offered to the aluminium industry made from a unique steel alloy. Trialled and installed in a number of high profile company's around the world, these rakes typically last between 6 to 10 times the life span of mild steel rakes in use creating a range of benefits such as reduced maintenance costs, reduced welding and labour costs, and reduced iron contamination in the aluminium. In the next edition of Aluminium Times, ALTEK will release a full study of the trials that have taken place for this exclusive product.

