



MANUFACTURING A PROFIT

MINIMIZING COSTS AND MAXIMIZING YIELD WITH A SIMULATION APPROACH FOR CASTING METHODS DEVELOPMENT

About the Customer

Established over 50 years ago, Hadleigh Castings is a leading UK aluminum foundry supplying services including pattern making, boxless sand molding, precision sand casting, gravity die-casting and more. The company has extensive inspection facilities, both dimensional and physical, and offers final finishing and assembled product for its clients throughout the UK and Europe.

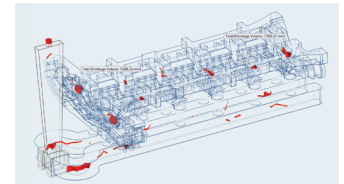
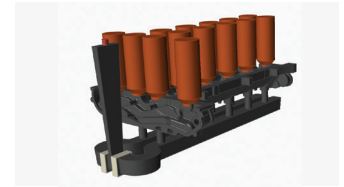
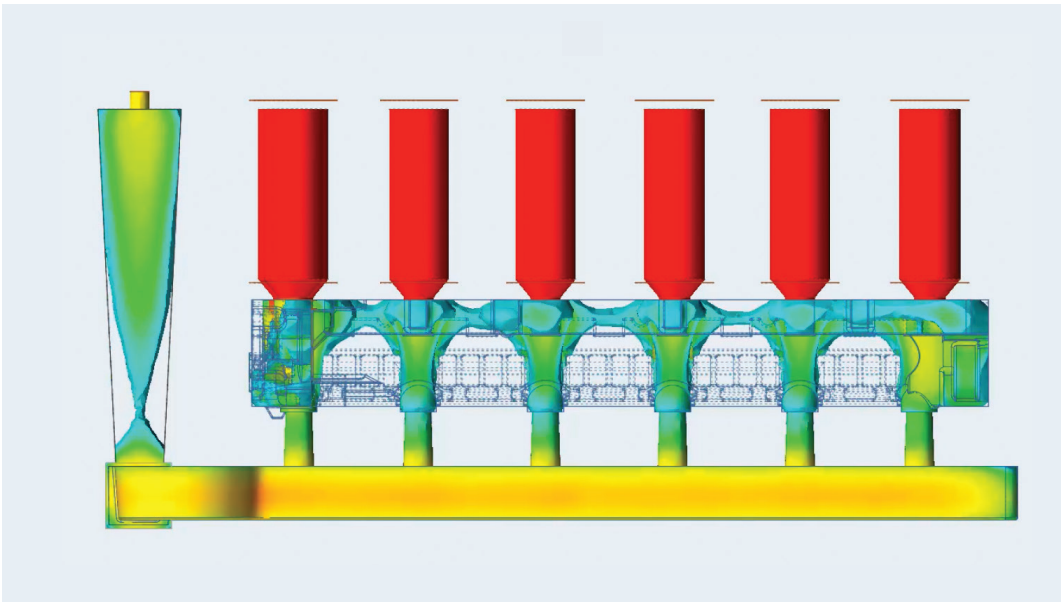


Since using Inspire Cast the cost savings in raw materials, increased productivity, improved quality and accuracy are substantial. We have worked all these years without simulation – how did we ever manage? Now it's an integral part of our business process.

Patrick Spatchett,
Engineering / Process
Development Manager,
Hadleigh Castings Ltd



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Their Challenge

Casted parts need to meet rigorous quality, safety and performance standards, but the traditional approach to develop castings, which relies on the past experience of specialist metallurgists, can result in expensive trial and error practices. Patterns often need to go back to the design phase to add riser, sleeves, widen the ingate and more to get the cast product to a sufficient standard. A process which takes time and can add significant cost. Hadleigh Castings relied heavily on the experience of its specialist metallurgist to develop its methods, however, when this expert retired, the company was left with a significant skills gaps that proved extremely hard to replace. The company wanted to explore the potential of a simulation approach to their methods development to build a more future proof process, less reliant on individual experiences.

Our Solution

Following an extensive review of the casting simulation solutions on the market, Hadleigh Castings opted to trail Altair® Inspire™ Cast, supported by UK Channel Partner, Origin Engineering. The first test case was a motorsport lower crankcase sump casting which used a 3D printed mold. The component would traditionally make use of several chillers along its length during the metal pouring process to ensure the liquid cools at the ideal rate. This is done to help create a final product with the highest possible level of metal integrity, however, the use of these chillers can be expensive, especially when using a 3D printed mold. Following a personal training session conducted by Origin Engineering, Inspire Cast was used by Hadleigh's in-house team to simulate the casting process and identify any potential defects such as air entrapment, shrinkage porosity, cold shuts, or mold degradation. To the team's surprise, Inspire Cast demonstrated that the casting did not actually require any risers or chillers to achieve the product quality the client required. This made the mold design far simpler to set up and far less costly.

Results

The team is now able to experiment with the methods prior to manufacture, identify common casting defects and rectify them ahead of any physical molds being created. Since adopting the technology, the company now has a 100% record of getting their castings right first time, with simulation now a standard part of Hadleigh Castings services, even supplying clients with simulation reports as part of their services. The success of the removal of chillers from the motorsport lowercrank case sump has prompted its team to revisit past methods to see if they can also benefit from simplification of the manufacturing process. Inspire Cast has enabled the company to enhance its services to its clients, minimize raw material wastage, and reduce the time and cost of its methods development.

To learn more, please visit altair.com/inspire-cast

LEFT: Rapidly simulating the solidification process.
TOP: Importing the geometry and setting up the casting simulation.
BOTTOM: Identifying areas of potential shrinkage.