Easy-to-use software to enhance the productivity and profitability of your foundry

- More accurately simulate filling and solidification processes
- Pinpoint probable defects and problems – before casting
- Identify viable designs more quickly
- Decrease the number of design iterations
- Improve scrap rates
- Reduce overall casting costs
FLOW-3D: Designed for Exceptional Accuracy

When casting a part, a number of defects can occur during the filling and solidification processes. Without a clear understanding of potential problems before casting begins, you risk multiple design iterations and high scrap rates, which can quickly drive up casting costs.

Optimize your designs before casting and lower your costs with FLOW-3D, powerful computational fluid dynamics software for more accurate modeling. This easy-to-use software takes the trial and error out of casting designs with advanced modeling techniques that precisely simulate the casting process, enabling you to refine designs and reduce costs.

FLOW-3D applies unique modeling principles that differentiate it from other applications and enhance the accuracy of your results:

Advanced fluid surface modeling
Called TruVOF, FLOW-3D’s method for modeling moving fluids goes beyond the traditional Volume of Fluid (VOF) techniques to achieve the most accurate tracking of the location of moving metal fronts as a part fills.

Better flow representation
While traditional structured grid systems require cells to be either entirely blocked or entirely filled, leaving designs rough and imprecise, FLOW-3D’s FAVOR™ technique allows for partial filling of cells, creating a smoother and more accurate representation of the flow domain while making meshing fast and simple.

Enhanced modeling of detailed regions
With Multi-Block meshing capabilities in FLOW-3D, you can easily capture complex geometries and apply varying degrees of resolution for sharper modeling of areas of particular interest.

"We have had a great deal of success using FLOW-3D to predict casting performance, to optimize quality, and to reduce cost by reducing rework, scrap, and lead-time."

Richard Emmerich, Senior Metallurgical Development Engineer
MetalTek International/Wisconsin Centrifugal Division
Access a wide variety of models with FLOW-3D’s all-inclusive package, including:

**Defect Tracking and Air Entrainment**
Predict where casting defects are most likely to occur and take steps to correct designs before the production process begins. *FLOW-3D* offers the most accurate defect tracking available with its advanced free surface modeling technology, enabling the prediction of trapped surface oxides and air pockets.

**Solidification and Shrinkage**
As metal cools and shrinks, the integrity of the part can be threatened by the appearance of porosity in key areas. *FLOW-3D* has a complete suite of tools for modeling solidification and pinpointing areas of excessive shrinkage or porosity, allowing you to add or modify chills and risers or adjust pouring temperatures.

**Microporosity**
Microporosity, the formation of small internal pores, is caused by a reduction in pressure as metal cools and shrinks. *FLOW-3D* has a model specially designed to predict the occurrence and location of microporosity. With this information in hand, you can make design adjustments and avoid these critical defects.

**Thermal Stress**
It’s important to understand how cooling-induced stresses can warp and possibly fracture metal parts. *FLOW-3D*’s thermal stress model enables you to predict precisely where stresses will occur and how a casting will distort.
An All-Inclusive Application
From Model Set Up to Simulation to Detailed Results Analysis

FLOW-3D includes *all* the functionality you need in one simple-to-use application, driven by an intuitive graphical user interface. Easily set up a model and quickly mesh it through its graphical model builder, screen out model incompatibilities and configuration errors, and perform detailed analysis through extensive post-processing capabilities.

**Dedicated Support**
The professionals at Flow Science work closely with end users to understand their needs and ensure the software continuously meets their real-world challenges. Flow Science offers valuable training to help customers maximize their use of FLOW-3D. Most importantly, Flow Science provides accessible, responsive technical support when the need arises.

**Flow Science, Inc.**
For more than two decades, Flow Science has been an innovator in flow modeling software, serving a global clientele of business, government and academic institutions.

Call **505-982-0088** for more information about how FLOW-3D can enhance the reliability and quality of your casting designs and help you reduce overall costs.

*FLOW-3D has unique modeling capabilities to simulate the filling of a lost foam mold and for tracking the potential defects that can arise during this specialized process.*

**In addition to its strength in modeling flow, FLOW-3D is equally strong in accurately predicting the formation of defects in the solidification of metal in a mold.**

*Above: Time step series showing the cooling of a sand cast engine block.*