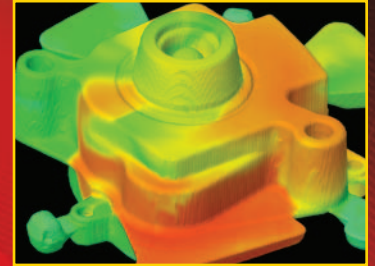
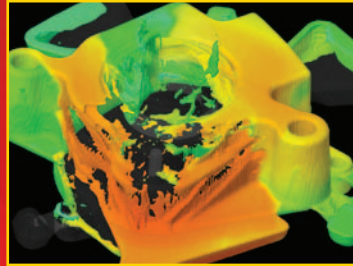
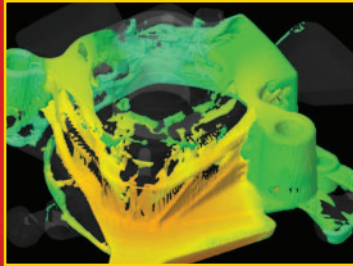


# FLOW-3D CAST

*Powerful computational  
fluid dynamics software for  
accurate casting simulations*



**Easy-to-use simulation software to improve the  
profitability and productivity of your operation**

- **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

[www.flow3d.com/cast](http://www.flow3d.com/cast)

## Easy-to-Use Interface

### 1 Design Flow

FLOW-3D Cast's intuitive interface lets users create accurate simulations quickly.

### 2 Clear Model Input & Interpretation

Input the components of your casting design and define them as gas, metal, chill and core.

### 3 Fast Meshing

Easy, fast, and accurate meshing captures all the details of your design mold.

### 4 Powerful Solver

FLOW-3D's solver can combine multiple physics such as surface defect tracking, air entrainment, conjugate heat transfer, tilting molds and moving ladles.

### 5 Postprocessing

A single compressed format file contains simulation configuration, geometry and postprocessed data that provide clear and accurate results.

### 6 Material Database & Geometry Library

Access information for alloys, molds, cores, filters and add your own materials in the database. And, import risers, runners, filters or export designs from CAD packages in the Geometry Library.

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CAST**

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**FLOW**Science

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## FLOW-3D Cast: Exceptional Accuracy

The image displays the FLOW-3D Cast software interface with several key components highlighted by numbered callouts (1-6) and descriptive labels:

- 1 Model Interpretation:** A dialog box for defining model parameters.
- 2 Meshing:** A 3D visualization of a meshed casting mold.
- 3 Solver Graph:** A line graph showing simulation results over time.
- 4 Postprocessing:** A 3D visualization of a casting part with color-coded stress or temperature distribution.
- 5 Material Database:** A window listing various materials like Al-3Mg alloy, Cu-40 Zn, and Bronze.
- 6 Geometry Library:** A window showing a library of pre-defined casting geometries.

On the left side of the interface, a vertical toolbar contains the following options: New version, Geometry import, Geometry interpretation, Solid objects, Meshing, Border conditions, Metal inputs, Metal parameters, Heat transfer coefficients, Solver parameters, Advanced options, Save, Calculate, Post processing, and Material database. The main simulation area shows a 3D model of a casting mold with a blue and green flow visualization.

### Clear Model Input & Interpretation

## What is FLOW-3D Cast?

**FLOW-3D Cast** is a special version of **FLOW-3D** designed specifically for casting process simulation. It combines an easy-to-use interface with the powerful solver capabilities of **FLOW-3D**.

**FLOW-3D Cast** provides engineers and designers with highly-accurate flow and solidification results. With **FLOW-3D Cast**, quality and productivity issues can be solved in less time and with lower costs by evaluating alternative concepts with simulation before die steel is cut or molds are modified. And, the effectiveness of new tool development can be improved by solving problems before production begins.

# More Precise Casting Simulations

Access powerful multi-physics models for high pressure die casting

## Defect Tracking and Air Entrainment

Predict where casting defects are most likely to occur and take steps to correct designs before the manufacturing process. **FLOW-3D Cast** 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 Cast** has a complete suite of tools for modeling solidification and pinpointing areas of excessive shrinkage or porosity, allowing you to add or modify cooling lines 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 Cast** 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 Cast**'s thermal stress model enables you to predict precisely where stresses might occur and how a casting might distort.

## Shot Sleeve Optimization

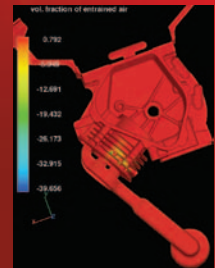
Help determine the optimum shot profile to fill your die – without trapping air – by modeling the interaction between the moving piston and the metal in the shot sleeve.

## Die Erosion

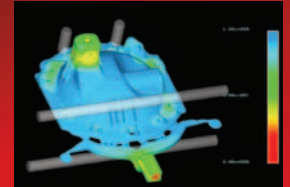
One of the causes for die erosion is cavitation, which occurs when metal pressure drops below a critical level due to flow separation and high velocities. This unsteady flow can be very damaging to dies. **FLOW-3D Cast**'s cavitation potential model helps you determine where cavitation-induced die erosion might occur and make adjustments before the actual casting.

*With the goal of compressing process and die cast die development time, modeling with **FLOW-3D** has become an integral part of Albany Chicago's engineering department.*

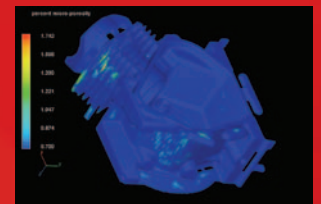
—Alex Reikher, Senior Design Engineer, Albany Chicago Co.



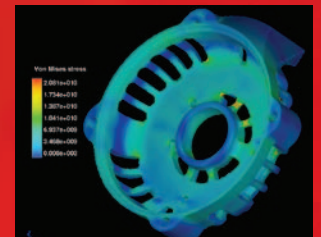
Air Entrainment



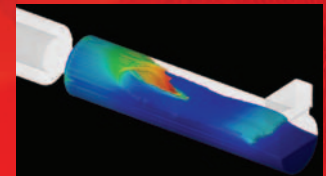
Solidification & Shrinkage



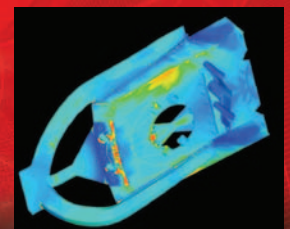
Microporosity



Thermal Stress



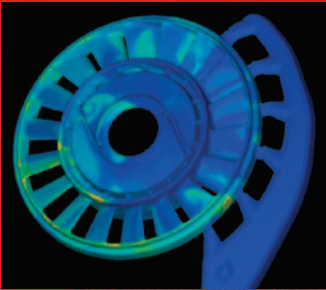
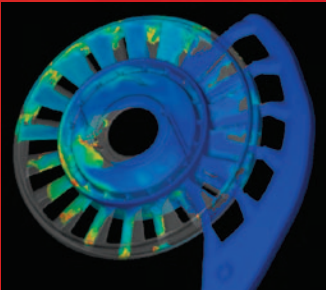
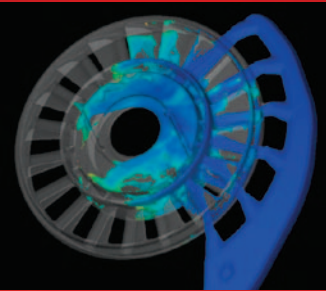
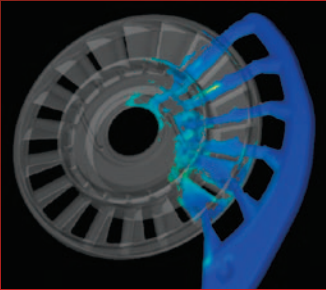
Shot Sleeve Optimization



Die Erosion

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**CAST**  
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## Surface Defect Prediction



**FLOW-3D Cast's** defect tracking capabilities help casting engineers predict where defects will most likely occur during the filling process. This time series shows the filling of an aluminum transmission impeller, colored by surface defect concentration.

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CAST**  
from  
**FLOW Science**  
www.flow3d.com

## FLOW-3D Cast: BASIC, EXTENDED, ADVANCED

**FLOW-3D Cast** is available in three versions: **BASIC**, **EXTENDED** and **ADVANCED** and has been translated into multiple languages. Read the features list to find out which version of **FLOW-3D Cast** is right for you.



### **Dedicated Support**

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

### **Flow Science, Inc.**

For over 30 years, Flow Science has been an innovator in flow modeling software, serving a global clientele of business, government and academic institutions.

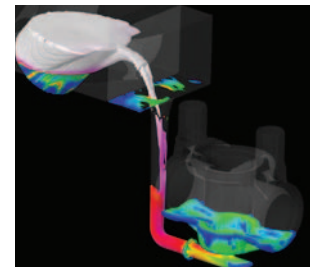
Call **505-982-0088** or email [sales@flow3d.com](mailto:sales@flow3d.com) for more information about how **FLOW-3D Cast** can enhance the reliability and quality of your casting designs and help you reduce overall costs.

*Simulation quickly helped us understand how molten metal moved through the cavity and pointed the way towards the improvements needed to solve the problems. The key to obtaining these benefits is accurate simulation and we have found that **FLOW-3D** consistently delivers the accuracy we need to solve real-world problems.*

—**Mark Littler**, Mechanical Engineer, Littler Diecast Corporation

### **Modeling Ladle Pours**

**FLOW-3D Cast's** general moving objects model simulates moving casting parts such as this ladle pour example.



### **Flow Science, Inc.**

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