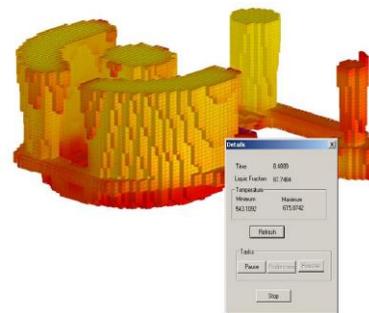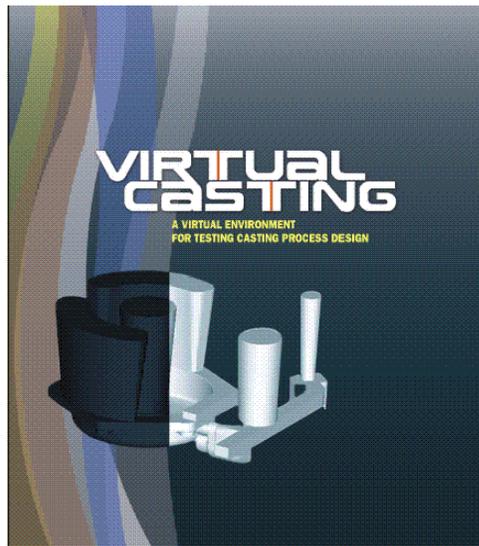# Virtual Casting – Software for simulation of casting solidification


Computer simulations create virtual environments to test out new designs and process innovations before actually implementing them on the shop floor. Such virtual test environments are becoming integral parts of modern technology. As the casting industry in the country gears up to face the challenges of global competition, *Virtual Casting* attempts to make casting simulation useful and affordable to the small and medium scale foundry.

The major issue that this casting simulation package addresses is that of shrinkage defects. Metals shrink on solidification – so if the mould is only just filled, cavities are bound to occur in the casting. So foundry practice insists on providing extra metal in the form of feeders. It is not enough that the feeders are provided; in order to be effective there are a number of design conditions that they have to fulfill. Proper design of feeding has been, over the years, considered an art rather than a science and feeder design for a new casting is usually finalized by trial and error. *Virtual Casting makes it possible to shift the trials from the shop floor to the computer, saving time, effort, energy and material.*

Virtual casting helps the foundry men to design the feeding system before submitting the design to simulations and actual trials, and therefore it holds a large bearing on Indian Foundry outfits, which are fairly large in number. Virtual Casting can

be used, not only for industrial process design, but also in teaching and learning. Students of foundry technology can use it as a virtual laboratory. By experimenting with different process variables and seeing the impact on the final outcome, they can acquire great insight into the design process.
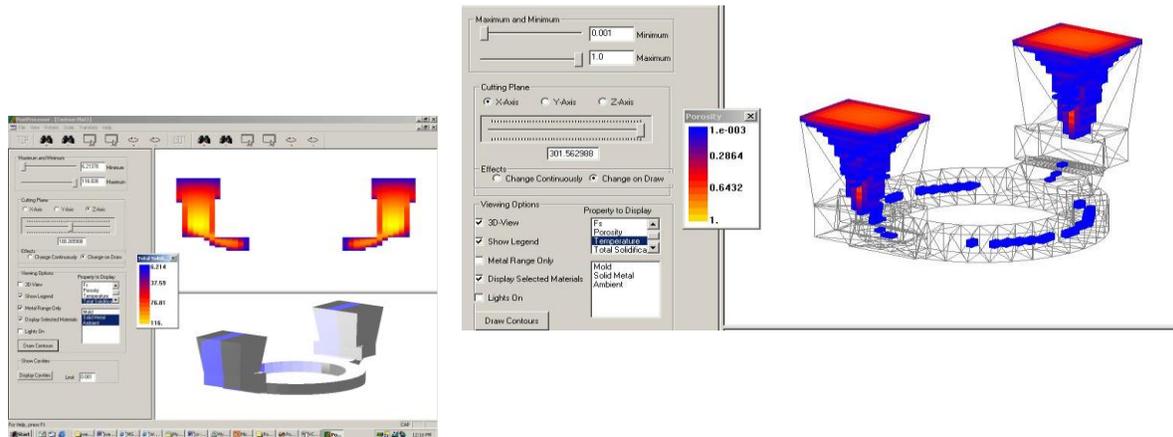
The first licenses for the software were transferred to Institute of Indian Foundrymen R&D Centers at Hyderabad and Vijayawada in April 2004. Installed at a central facility, this software is being used by academics for creating awareness on the benefits of computer simulation to the foundries in the region. Academic licenses have been transferred also to NITK-Suratkal and MS University Baroda, NIT, Warangal and Sree Chitr Tirunal College of Engineering, Trivandrum. Academics are making good use of the package, not only for training students, but also for research in process innovation.

The first industrial license was transferred to PK Steel Castings Pvt. LTD, Kozhikode in June 2005. Since then it is being used on a regular basis on the shop floor for design of chills and risers for their castings.