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Software for simulation of metal casting

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Developed by researchers at NIIST

Targeted at small and medium-scale foundries

Thiruvananthapuram: Testing out new designs and process innovations in metals presents a formidable challenge to foundries, especially in an era when the application potential of metals is touching new dimensions.

Metals shrink on solidification, leading to cavities in 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 fulfil.

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 finalised by trial and error.

Researchers at the National Institute for Interdisciplinary Science and Technology (NIIST) have developed a software for simulation of metal casting. Named 'Virtual Casting,' the software makes it possible to shift the trials from the shop floor to the computer, saving time, effort, energy and material.

The package predicts where shrinkage defects are likely to occur in a given design. The inputs to the simulation include specific heat, thermal conductivity, pouring temperature of the molten metal, initial temperature of the mould and a solid model of the rigged casting. Targeted at the small and medium-scale foundries, it helps foundry men to design the feeding system before submitting the design to simulations . Students can use it as a virtual laboratory for experimenting with different process variables.