NOVAFLOW
& SOLID 6.0

FASTER, EASIER AND
MORE ACCURATE SIMULATIONS

NOVACAST

NOVAFLOW
& SOLID 6.0

NovaFlow&Solid 6.0 is an innovative casting process simulation tool that helps you work faster, easier and achieve more accurate castings.

NovaFlow&Solid 6.0 is an innovative casting process simulation tool that basically simulates mold filling and solidification. It also contains much more than that and it really gives you the possibility to simulate the casting production that you dream to have. We think that you should be able to find solutions faster and more accurate than before and it should be easy to learn to use the program. NovaFlow&Solid 6.0 can make your casting production more green by letting you investigate and be guided how to increase your yield and optimize your production process. This will help you save energy, material and eventually use less of the resources on our planet. We believe that every casting counts which means that we should work together for a future where casting defects does not exist and you make good business with a good conscience.

Simulations

NovaFlow&Solid 6.0 can simulate most commercial casting methods, such as gravity sand casting, gravity permanent mould, low pressure die casting, high pressure die casting, lost wax method, tilt pouring, counter gravity casting, centrifugal casting and lost foam process. Casting materials possible to simulate is (provided that data exists or can be retrieved): Gray- and Ductile iron, Steel alloys, Aluminum alloys, Copper-, Zinc- and Magnesium-based alloys, Super alloys like nickelor chrome based and Titanium. The system can use all types of mold and core materials that is commercial on the market and also exothermic materials, chills and both foam and extruded filters. The meshing method enables the simulation of real extruded filters and would also with foam filters if the 3D models existed.

One can also simulate re-meltable materials (Chills or inserts) as well as pouring of two different

materials (like steel and cast iron) in the same mould enabling a number of possibilities. NovaFlow&Solid 6.0 visualises the consequences of a specific gating and feeding system. Casting defects, such as oxide inclusions due to excessive turbulence, cold-flows, shrinkage porosities and slag inclusions, can be avoided by optimizing the design of the gating and feeding system. Commercial alloys can be simulated such as grey- and ductile iron, steel, aluminium alloys, copper-, zinc- and magnesium-based alloys, super alloys, all types of mould and core materials that exist on the market and exothermic materials as well as chills.

Simulations visualize the consequences of a specific design of gating systems and moulds. Casting defects, such as oxide inclusions due to excessive turbulence, cold-shuts, shrinkage cavities and slag inclusions, can be avoided by optimising the design of the gating and venting system.

GRAVITY CASTINGS (COURTESY OF FINECAST)
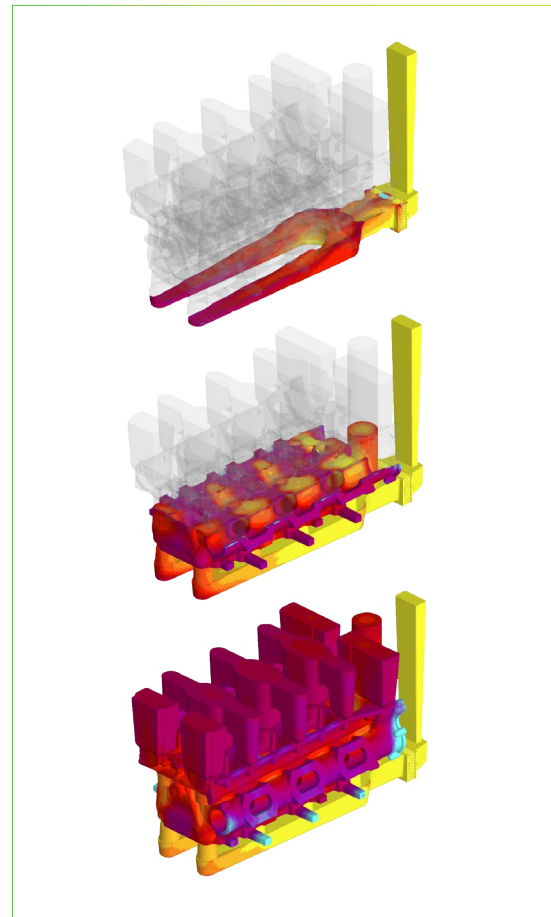
Control Volume Mesh technology (CVM)

CVM technology as we call it or also known under the name Finite Volume Method allows the surface of the 3D model to control the shape of the mesh elements on the border of the casting. This creates cubic elements inside the casting and border cells on the boundary of the casting, which generates much faster and more accurate results. CVM also works all the time during the simulation. It is especially important during filling when it is possible to really calculate height/width of a metal front. It fills only the necessary fraction of a cell instead of cell by cell which is the case with FDM.

HIGH PRESSURE DIE CASTING SIMULATION
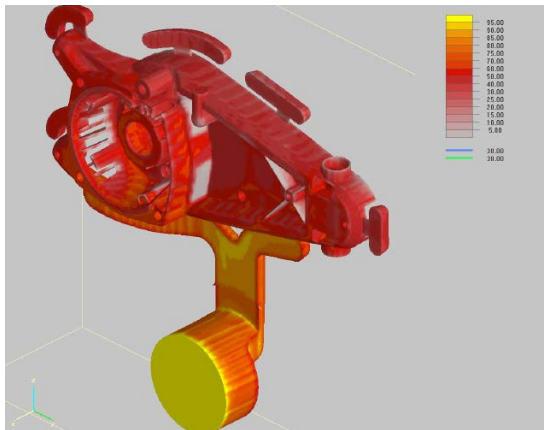
Advantages

CVM technology has the following advantages in comparison with FDM/FEM methods:

· For most castings, simulation time is reduced to around 10 percent with the same or improved accuracy (FDM). While using the new Multi mesh, time is reduced even further when you during a simulation can use fewer elements at certain stages. This also applies during filling

· You receive a higher accuracy in simulation, due to perfect description of the 3D model, since all sections are correct in size. FDM is always an approximation where CVM technology is as the 3D model dimensions

· Less cells are needed to define the casting geometry which ensures faster simulations and smaller result files (FDM)

· The meshing process is completely automatic and only takes seconds (FEM)

· Advanced calculations are enabled, such as gas flow, full contact task (stress) or full mould process (FDM)

New features in version 6.0

· Multi meshing: Use different mesh during filling and later also solidification
· Good Guy´s Index: Compare different simulation from technical and environmental point of view; see what score your castings will get
· Microstructure: Average values for austenite, graphite and cementite for cast irons
· Irregular mold mesh
· New updated more intuitive Windows interface
· Full contact task for stress, even mold stresses
· Parameter optimization
· Shrinkage prediction for cast irons taking the graphite precipitation into account

IRREGULAR MESH