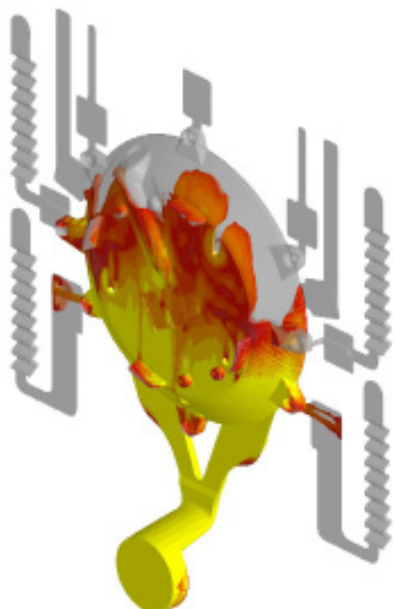# NOVAONE
HPD

NOVACAST

NOVAONE
H P D

NovaOne is NovaCast's elementary collection of casting simulation tools, streamlined to meet the essential demands of specific processes. NovaOne is a slim version of our premium casting simulation system, NovaFlow&Solid.

NovaOne HPD has the essential functionality for the high-pressure die casting process to simulate 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 that it should be easy to learn to use the program. NovaOne HPD can make your casting production greener by guiding you on how to increase your yield and optimize your production process. This will help you save energy, material and eventually use less of our planet's resources. We believe that every casting counts which means that we should work together for a future where casting defects do not exist and you make good business with a good conscience.

Simulations

NovaOne HPD can simulate high pressure die casting with hot or cold chamber. Most HPD casting matreials are possible to simulate. Included in NovaOne HPD are aluminum alloys and zinc-based alloys. Additional alloys can be added for a fee. The system can use all types of mold and core materials that are commercial on the market. Also here, missing materials can be added for a fee.

NovaOne HPD visualizes the consequences of a specific gating system. Casting defects, such as cold-flows, shrinkage porosities and problems due to excessive turbulence can be avoided by optimizing the design of the gating. You can also investigate the efficiency of your venting system or find the optimal placement for your venting system.

Control Volume Method (CVM)

The CVM technology as we call it, 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 works all the time during the simulation. It is especially important during filling since it calculates the actual height/width of a metal front. It fills only the necessary fraction of a cell instead of cell by cell.

Advantages

The CVM technology has the following advantages in comparison with FDM/FEM methods:
· For most castings, simulation time is reduced to around 10 percent with keeping the same or improving it
· You receive a higher accuracy in simulation, due to a perfect description of the 3D model, since all sections are correct in size. CVM technology is exactly as the 3D model dimensions
· Less cells are needed to define the casting geometry, which ensures faster simulations and smaller result files
· The meshing process is completely automatic and only takes seconds

Modules included in NovaOne HPD

• 3D Import
• Import of binary, ASCII STL files and STEP files
• Import of cooling channels
• Import of inserts like cores or mold halves
• Built in STL fixing including re-triangulation
• Built in accuracy setting of STEP
• Boolean functions for taking into account the interactions between solids
• Extension function, for closing gaps between solids
• Positioning functions

Simulation Setup (Pre-processor)

• Meshing with Control Volume Method (CVM)
• Material parameters setting
• 3rd phase prediction = compression phase
• Filling parameter settings
• Setting of solidification porosity parameters

Browser (Post-processor)

• Powerful browsing and slicing in x, y and z directions of the simulated results
• Built-in animation functions for presentation of results, creation of movies and real time movie files
• Two or more simulations can be viewed simultaneously in the browser
• Printing facility in all modules
• Possibility to save simulations in BMP or JPEG formats in each module
• Automatic report generator in doc-format

Flow&Solid module

In the Flow&Solid module, you can run a simulation starting by a mold filling simulation followed by solidification. The module includes the following:
• Simulation of the solidification with the fields Temperature and Liquid phase
• Porosity predictions depending on solidification
• Shrinkage by solids – possibility to evaluate the shrinkages in every part of the gating, venting and casting if they are separated solids
• Autosimulate – Batch simulation system for automatic queuing of simulations
• Simulation of velocity, temperature and liquid phase during the mold filling
• Velocity vectors in both 2D and 3D for turbulence tracking
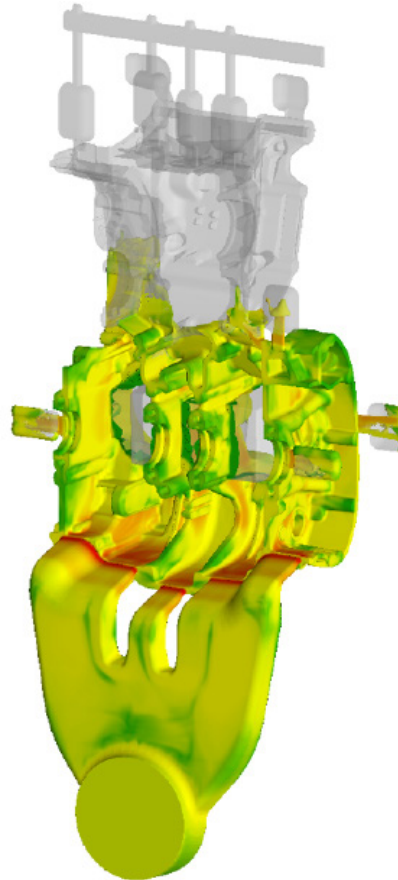
Hardware recommendations

• PC with QUAD Core (4) (Multiple core support)
• Highly recommended: Intel Core i9, 3.3 GHz and higher
• Microsoft Windows 11, 64-bit
• Recommended: 16GB RAM
• 200GB free hard disk space
• Highly recommended: Solid state drive 256GB as primary disc where simulation should run and be stored during simulation, normal HDD 4TB for storage after simulation as secondary disc
• Graphics card: NVidia 8GB or higher
• 3D mouse for rotation, move and zoom. System supports 3D connexion Space navigator.
• High clock frequency is more important than number of cores.