NOVAONE
GRAVITY

A NOVACAST SYSTEMS PRODUCT

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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 Gravity is an innovative casting process simulation tool that 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. NovaOne Gravity can make your casting production greener 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.
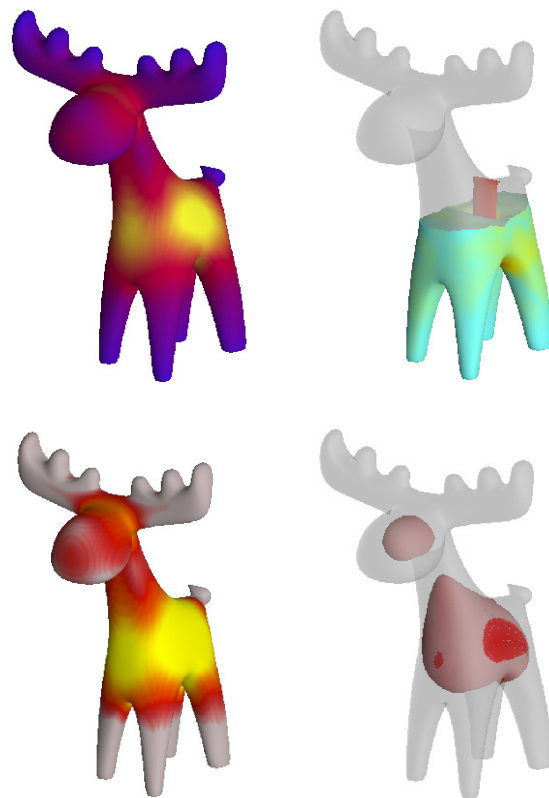
Simulations

NovaOne Gravity can simulate gravity sand casting, gravity permanent mold and lost wax method. Casting materials possible to simulate is (provided that data exists or can be retrieved): Gray- and Ductile iron, Steel alloys and Aluminum alloys. 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 work with foam filters if the 3D models existed.

NovaOne Gravity visualizes the consequences of a specific gating and feeding system. Casting defects, such as cold-flows and macro and micro shrinkages can be avoided by optimizing the design of the gating and feeding system.

Finite Volume Method technology (FVM)

Finite Volume Method technology as we call it 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. FVM 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.

Advantages

FVM 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).

· 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 FVM 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)

3D Import
• Import of binary and ASCII STL files and STEP files
• Import of filter
• STL fixing
• Boolean functions
• Expansion functions
• 3D Positioning functions

Characteristics
• Includes advanced database based on constitution diagrams
• Accounts for gravity during simulation
• Calculates air gap formation or heat transfer coefficient
• Gravity casting filling
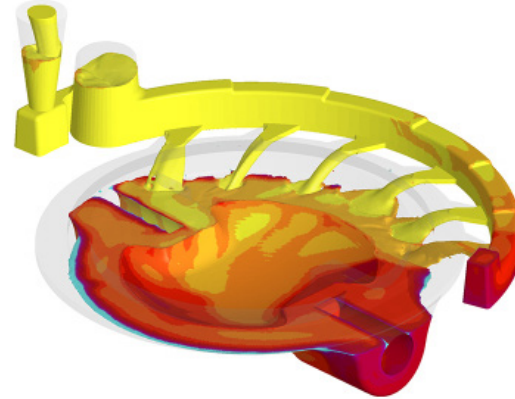• 2D and 3D velocity vectors

Results presentation
• Powerful browsing and slicing in x, y and z directions
• Built-in animation functions presenting results
• Creation of AVI and real time AVI video files as well as WMV
• Two or more simulations can be viewed simultaneously in the browser
• You can synchronize different simulation results viewing them simultaneously
• Printing facility in all modules
• Possibility to save simulations in PNG, BMP or JPEG formats in each module
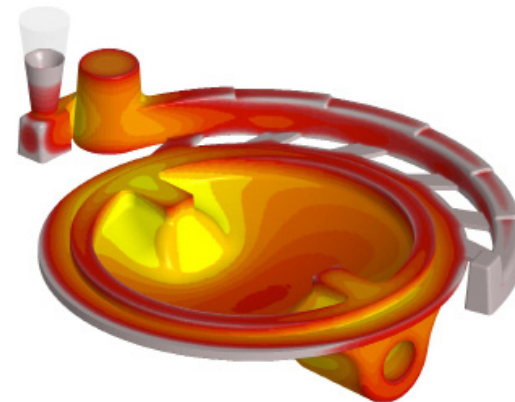• Automatic report generator in doc-format

Hardware recommendations
• PC with QUAD Core (4) (Multiple core support)
• Highly recommended: Intel Xeon or Intel Core i9, 3.3 GHz and higher
• Microsoft Windows 11, 64-bit
• Recommended: 16 GB RAM
• 200 GB free hard disk space
• Highly recommended: Solid state drive 256 GB as primary disc where simulation should run and be stored during simulation, normal HDD 1TB for storage after simulation as secondary disc

• Graphics card: NVidia 2GB and higher

TEMPERATURE DURING FILLING

LIQUID PHASE FRACTION