

NOVA STRESS

ZERO WARPAGE &
CORRECT DIMENSIONS

A NOVACAST SYSTEMS PRODUCT

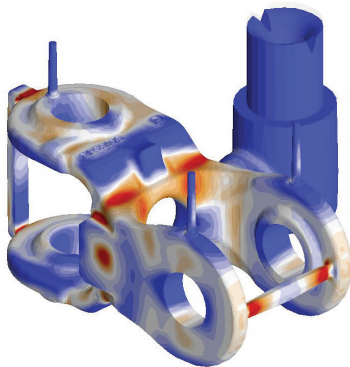


NOVASTRESS

NovaStress is the analysis tool to use when you have quality issues related to stresses. Analyze your current design and compare alternative ones to find a quick solution and reduce the need of expensive trials in production.

NovaStress is a solution for predicting how the part will contract. Using the simulated result of the pattern to design the physical mold will help you reach zero warpage and correct dimensions of the part. Making such die predictions means that you can save time, money and production resources.

PRINCIPAL STRESS



Fast and precise

NovaStress is fully integrated into the NovaFlow&Solid package and gives the ultimate casting simulation solution. The program uses the same meshing technology as NovaFlow&Solid, CVM (Control Volume Mesh), which exactly describes the original solid geometry. The calculation speed is very fast thanks to a specific calculation method with full contact task.

Avoid cracks

Areas with plastic deformations that might have resulted in cracks can be found using the hot tear prediction or the cold tear prediction. By simulating the residual stresses you can test variants of design and process parameters in order to get a more even stress distribution.

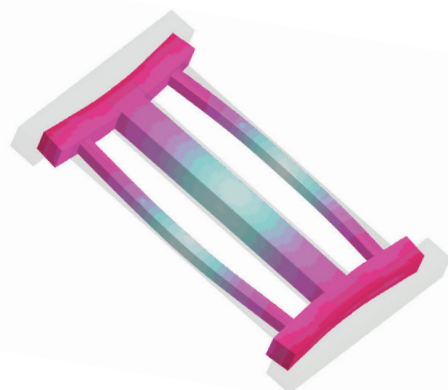
Export stress results

NovaStress can export the different stress results to any FEM based programs (Finite Element Method). These results can be used as the starting point to load calculations.

Advantages

- Calculates the deformation of the casting during solidification with full contact task solved. Deformation values can be used to compensate the pattern so that accurate tolerances can be achieved.
- Maximize the lifetime of your die – identify areas in your tool prone to cracking and adjust the cooling channels through iterations in NovaFlow&Solid and NovaStress.
- Extremely easy to use (startup time 1 - 5 minutes)
- The stresses in the casting will indicate where the risk for cracks during solidification might occur. If the stress concentration is big and very sharp, the risk is higher.
- Save money and decrease the castings environmental footprint by optimizing the machining allowance and keep it to a minimum.
- Reduce the need of costly and energy demanding heat treatment processes by redesigning your casting and improving your process with NovaStress.
- The stresses can also be used to dimension the casting so that the pay loads on the casting components do not end up in the same place as the highest stresses.
- Criterion for cold tear as well as hot tear prediction.

DEFORMATION OF CLASSIC STRESS HARP



Calculation models

- Elasto-plastic model
- Isotropic hardening
- Contact task - mechanical contact between casting and mould and cores
- Built on known calculation theories
- Built on CVM meshing technology

Calculated fields

- Von Mises stresses
- Yield stress - plotting of database values at any time
- Deformation in x, y and z direction
- Effective plastic strain for cold tear prediction
- Hot tear prediction criteria
- Work of plastic deformation
- Maximal principal stress
- Minimal principal stress/pressure

Graphics functions

- Full 3D functions with real-time rendering
- Smart 3D positioning
- Zoom function
- Rotation of solid objects
- Very fast graphics
- Transparent 3D
- Exaggeration factor
- Viewing of the original casting for easy viewing of the deformation

Results presentation

- Powerful browsing and slicing in x, y and z directions
- Built-in animation functions for presentation of results, creation of AVI and WMV
- Two or more simulations can be viewed simultaneously in the browser
- Printing facilities
- Possibility to save BMP or JPEG formats in each module

VON MISES STRESS



DEFORMATION



HOT TEARS

