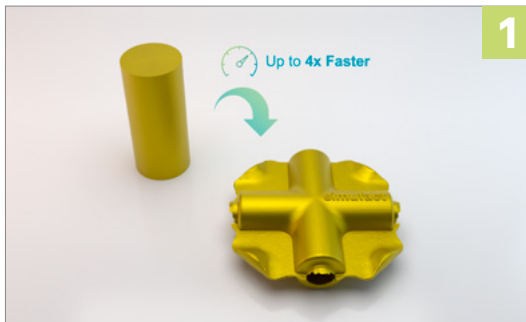


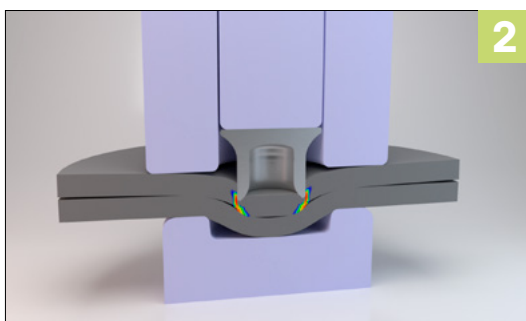


Top 3 Highlights in Simufact Forming 2022



Faster FV simulations – dramatically increasing productivity at no additional cost

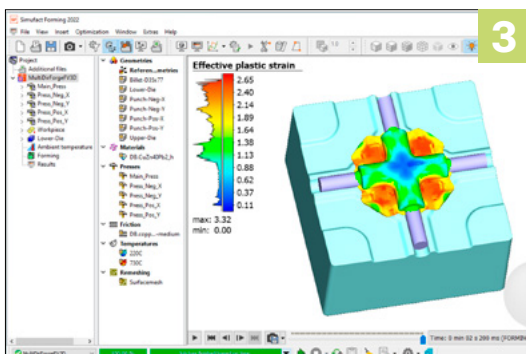
Hot closed die metal forming simulations using the Finite-Volume solver (First Order and Accelerated Mode) have been sped up by a factor of 4x allowing customers to dramatically reduce the calculation duration. These performance improvements can be used to model ever larger models and/or increase the level of detail of the simulations without compromising run times. The speed-up is achieved by a Domain Decomposition parallelization method of the FV-Solver.



Improvements to cutting and damage modelling

Shearing and cutting processes are widely used in creating the ingots for metal forming operations and their geometry and strain-hardening of the sheared surfaces influence the subsequent forming operations. In the field of (thick) sheet metal forming processes fine-blanking steps are used to produce parts with higher geometrical complexity while reducing the number of operations which impact the forming processes in a similar way. Also, mechanical joining processes have been adopted by leading manufacturers which incorporate high-strength materials as well as cast components for BIW manufacturing. We have extended the scope of numerical optimizations of these joining techniques to these materials.

For the use with brittle or higher-strength materials we implemented damage-based separation criteria as an alternative to geometry-based separation criteria (like minimum sheet thickness) to accurately model the cracking behaviour which starts much earlier in these material groups. The new method identifies the crack path by the calculated damage gradient with the benefit of a significantly more realistic material separation. This ensures a realistic representation, e.g. of shearing processes as well as self-piercing riveting even with brittle or higher-strength materials. The cuts/cracks are modelled by mesh-separation techniques in 2D models to avoid volume losses due to element deletions. In 3D models the conventional approach to use element deletion was kept for performance and stability reasons.



Modernised GUI

Our users enjoy an extensive modernisation of the Simufact Forming 2022 GUI for two reasons:

1. Continuous development of the GUI to achieve a modern look, better and simpler usability and UX.
2. Easier usability when switching between Simufact Forming and Simufact Welding by unifying the UI and UX.