DEFORM® News

Training:

- June 18-21, 2019: DEFORM training will be conducted at the SFTC office in Columbus, Ohio.

- August 13-16, 2019: DEFORM training will be conducted at the SFTC office in Columbus, Ohio.

Events:

- August 20-21, 2019: The annual Die Stress Workshop will be hosted by SFTC, in conjunction with Marquette University, in Columbus, Ohio.

- August 22, 2019: A one-day training (focused on die stress modeling in DEFORM) will be conducted following the workshop.

DEFORM Version 12

SFTC will soon release Version 12 of the DEFORM system. This release builds upon the next-generation modeling interface and revolutionary multiple operation (MO) workflow introduced in DEFORM V11. V12 introduces many "under the hood" enhancements and new applications. Users of all skill levels can expect improvements that make DEFORM faster, more powerful and easier to use.
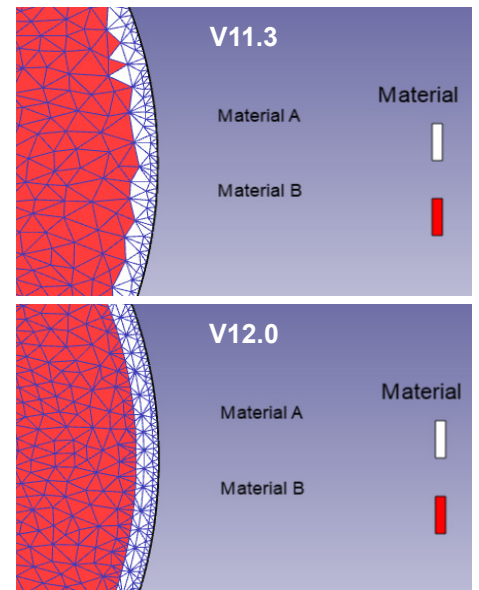
Preprocessor/FEM

The speed of the MUMPS solver has significantly increased. Depending on the process, users may see speed improvements of up to 30%. Computers that are many years old may not be able to utilize the new MUMPS solver. Thus, the legacy MUMPS solver may still be chosen during installation.
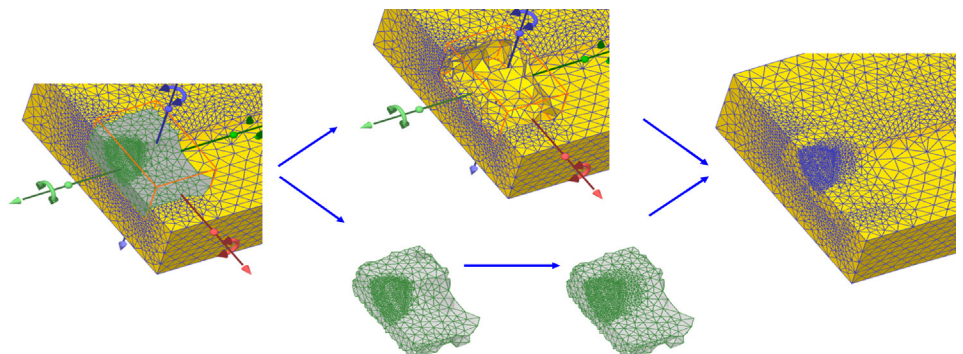
A new contact method, Augmented Lagrangian Contact (ALC), is available. It allows users to take advantage of the Conjugant Gradient (CG) solver for simulations involving multiple deforming objects. This combination notably increases simulation speed on these complex models. This particularly benefits users modeling mechanical joining.

A revised "Run (options)" menu adds two new features to the interface. Parallel remeshing, introduced in V11.3 via a (.dat) control file, is now readily available. It leverages multiple processor cores to reduce remeshing times. An automatic report generation option has also been added. It allows predefined reports to be generated at simulation time.

The default global remeshing program has also been further improved in V12. Its robustness has been enhanced, as proven through rigorous testing across a wide range of applications. Additionally, multi-material meshes now better preserve the interface between two different materials in a single body. The V11.3 and V12.0 behaviors are compared (below) for a coated billet in an upset forging process.
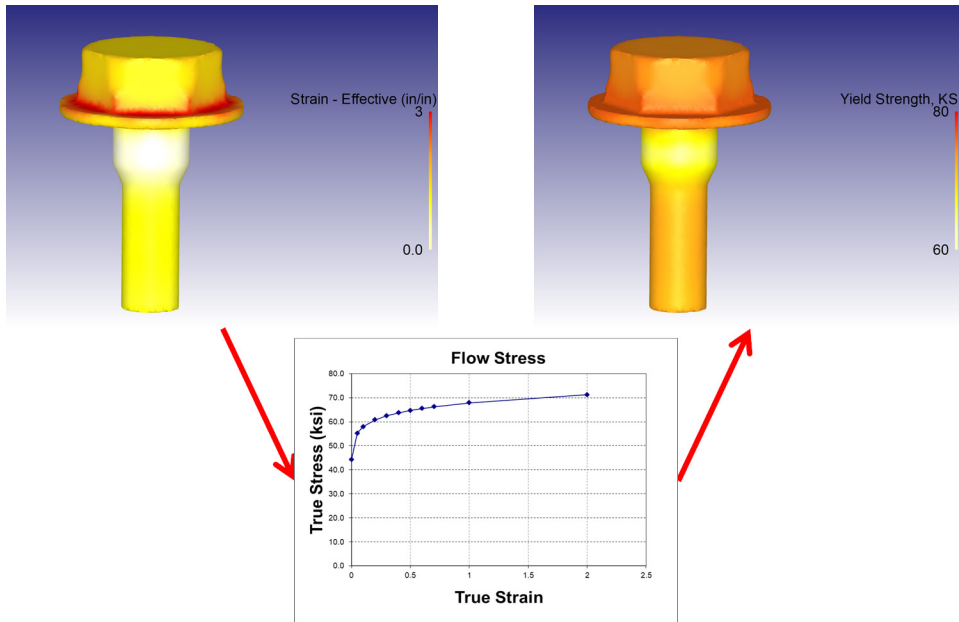

New local remeshing methods allow users to remesh a specific portion of the workpiece, rather than the entire part. State variables and geometry outside of the local zone thus remain unmodified. This benefits applications that require fine detail but involve many remeshes, such as in machining (bottom). Here, a user-defined window, which follows a cutting tool, defines the remeshing zone.

DEFORM®

Design Environment for FORMing

Designers and engineers using the Forming Express interface will notice that it has received a number of upgrades. The enhancements widen the systems's range of applications and simplify model setup. New feature additions include rigid contact for sliding dies, hybrid friction, a faster 2D solver and setup assistance for hydraulic presses.

Postprocessor

The new "State Variable Mapping" feature allows users to plot custom variables based on known data relationships. A simple look-up table allows an existing state variable to be converted to a different output variable. This provides an easy way to display custom variables, such as yield strength or hardness, based on their relationship to a standard state variable, such as strain (below).

The ability to compare different simulations has been enhanced through the new superimpose feature. Models and graphs can be overlaid on one another by dragging and dropping content between windows. This enables a more direct comparison of results.

Animation creation has been modernized in V12, making it easy to show off DEFORM results. High resolution animations can be exported with file sizes small enough for email. More control is provided over frame rates and scheduled pauses throughout a multiple operation sequence. Higher quality animations are possible and more widely available video formats are supported.

Miscellaneous

Upon first opening V12, one of the most apparent changes will be that of the new DEFORM Main Menu. The program has been visually updated and offers several new features. New problem creation now allows users to start a problem from scratch, import a saved template or import a preinstalled example. The Problem Explorer tree now updates automatically, includes standard file explorer functions and includes a search feature. The preview window will display images of all these simulations under the selected folder. It also displays comprehensive DOE/optimization summary graphics.

A guiding vision behind DEFORM is the goal of modeling the entire manufacturing flow-path for formed metal components. Thus, new application support was a strong focus in V12. Several new modules and capabilities were added in processes that are challenging to setup and simulate. New modules have been introduced for shot peening, ring rolling, spinning, extrusion and data analytics. New capabilities were also added to support additive manufacturing, arc welding, gas nitriding and linear friction welding.

Releases:

DEFORM V12.0 enhancements and new features include:

- New DEFORM Main Menu
- New Data Analytics Module
- New Shot Peening Module
- Next-generation Ring Rolling Template
- Next-generation Extrusion Template
- Next-generation Spinning Template
- Cogging Template enhancements
- 2.5D linear friction welding (LFW)
- 2.5D roll forming
- 3D electromagnetic forming
- 3D ALE stir welding
- 3D ALE spinning
- Hyperelastic (rubber) materials
- Improved porous material model
- Arc welding support
- Additive manufacturing (AM)
- Gas nitriding/nitrocarburizing
- Enhanced MO project templating
- Forming Express enhancements
- Updated boolean capabilities
- Multiple material group mesh
- Mesh layer slicing
- Inconel 625 microstructure data
- Augmented Lagrangian Contact
- Solver additions/updates
- MUMPS solver speed-up
- New local remeshing methods
- Improved global remeshing
- Parallel remeshing
- Automatic report generation
- Postprocessor graphics overlays
- State variable mapping
- Relative motion postprocessing tool
- New animation controls
- Steady-state wear model
- DOE/optimization case studies
- Expanded DOE options
- Extended optimization functions
- Revised DOE Postprocessor
- Expanded RVE options
- Titanium MEDC model
- Lab exercises for new applications
- Updated License Manager
- Updated Service Control

The complete list of the new features can be found in the V12.0 release notes. Release notes are included with the software installation and are also available on the DEFORM User Area.

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