

# DEFORM<sup>®</sup> News

## Training:

- December 11-14, 2018: DEFORM training will be conducted at the SFTC office in Columbus, Ohio.
- February 19-22, 2019: DEFORM training will be conducted at the SFTC office in Columbus, Ohio.

## Events:

- November 6-8, 2018: SFTC will exhibit at FABTECH 2018 (Booth A2161) in Atlanta, Georgia. DEFORM applications in forming, stamping, joining, extrusion and spinning will be highlighted.
- May 21-23, 2019: SFTC will exhibit at Forge Fair 2019 (Booth 212) in Cleveland, Ohio. Forge Fair is North America's largest forging industry event.

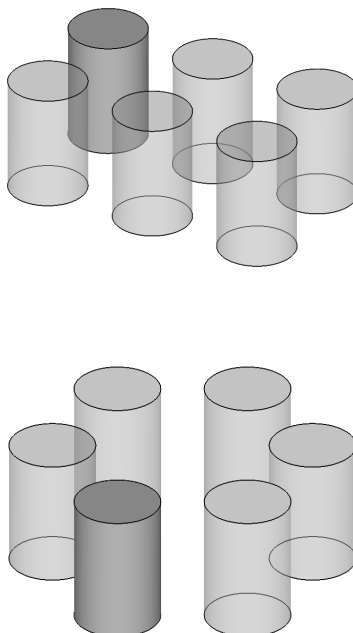
## DEFORM V11.3

DEFORM V11.3 was recently released to active users. The new version focuses on usability enhancements and bug fixes. It further refines the Multiple Operation (MO) user interface and finite-element modeling foundation introduced in prior V11.x releases. A short list of changes can be found at the end of this newsletter. A full list of changes will be provided in the V11.3 release notes. Notable usability enhancements are described below.

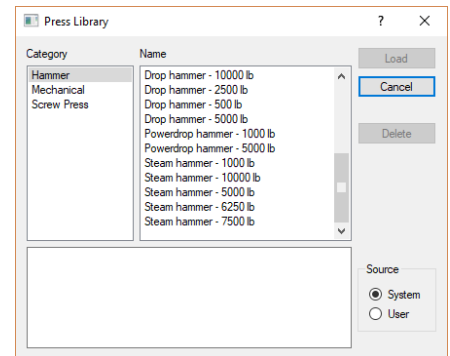
## Preprocessing

Preprocessing improvements were focused on making setup procedures more efficient and powerful. The following new features reduce repetitive data entry and model setup time.

The new "Copy Object" tool allows for the creation of periodic arrays based on a single object. Furnace modeling setups will particularly benefit from this new feature. It is accessed by right-clicking on an object in the process tree. Users have control over the number of objects and the pattern direction, layers and spacing. Linear and circular patterns are supported, as shown below.



The Equipment Library has been added to the MO interface. It provides quick and convenient access to predefined movement controls. The built-in "System" library includes definitions for common presses and hammers. Many users have created definitions for their own shop equipment. These can be saved to the integrated "User" library for later reuse. A single, centralized user library may also be shared among staff.



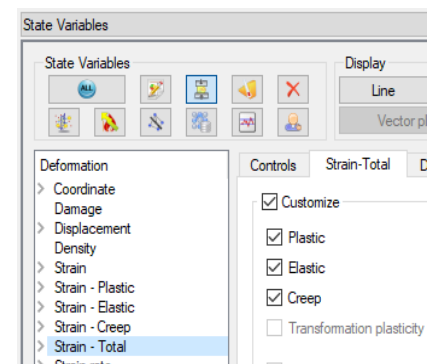
## Postprocessing

The postprocessor has also received a number of improvements to increase ease of use. For example, the popular



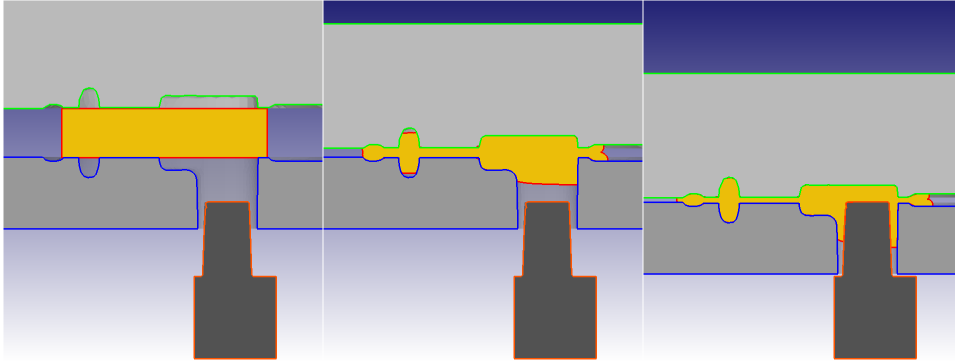
"View Back" feature has been added to the MO interface. It restores the model view to the previous view state (orientation and zoom). This is equivalent to an "undo" function for view manipulation.

A new "Strain - Total" plot is included in the state variable menu. It provides granular control over which strain components are represented in the plot.

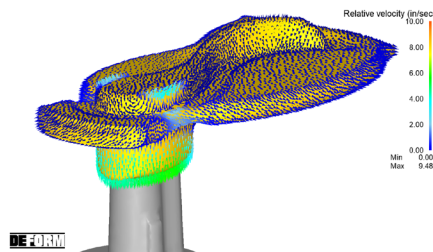
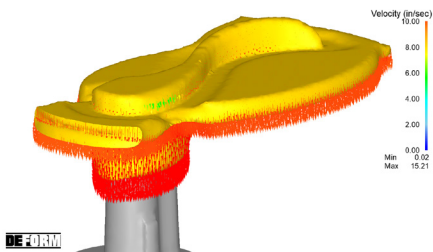


Those who customize the appearance of their results will appreciate new user defaults. "Plot Type" has been added as a global default setting. V11.3 also introduces a "Color Bar Type" default unique to each state variable. Defaults may be set or cleared directly from the color bar right-click menu. A user might define "General" colors for strain plots, "Temperature" colors for temperature plots and "Tension/Compression" colors for principal stress plots. Defaults are saved across postprocessing sessions.

Some simulations include a workpiece that undergoes significant rigid body motion. The workpiece might be supported by a sliding die, pulled through a set of rolls or pushed by another object. In the example shown below, the part is supported by a sliding die and forged over a stationary plug. The sliding die allows the top/bottom die set to close before moving down over the plug.



Such rigid body motion has typically made analysis of the velocity distribution difficult. Prior versions of DEFORM have only included the (absolute) "Velocity" state variable. The plot shown below, at left, demonstrates what absolute velocity looks like when the part undergoes significant rigid body motion. The rigid body velocity field overwhelms the more subtle local velocity contributions.



The plot shown above, at right, illustrates the new "Relative Velocity" state variable. To use this state variable, a reference object must first be defined. The velocity of this reference object is subtracted from the absolute velocity field of the workpiece. The difference represents the relative velocity due to material deformation.

This velocity information is much more useful to the analysis of material flow. In the above example, the bottom die is defined as the reference object. Local velocity fields are clearly shown in the relative velocity plot. It highlights where material is extruding down the plug, flowing into the flash and filling the top die cavity.

## DEFORM V12

The next major release of DEFORM, V12, is targeted for beta testing in the coming months. This release will introduce a broad range of new features and capabilities. The new developments will extend DEFORM to an even wider range of applications. Many of the upcoming simulation technologies have been described during recent User Group Meetings. Users will be notified of the beta version availability once it has been released on the DEFORM User Area.

## DEFORM V11.3 Release

DEFORM V11.3 enhancements and new features include:

- MO user variable initialization
- Operation "Open task folder"
- Thermal property scheduling
- Step Editor magnifier on/off
- Operation copy/paste numbering
- DB merging
- Friction window preview
- Copy object
- STL 3D window import
- Custom total strain plots
- Enhanced velocity plotting
- "Diff step" options
- Report backward point tracking
- Cooling curve graph
- Cylindrical point tracking graph
- View back
- State variable default plot type
- State variable default color bar type
- Viewport settings
- PIP windows/graphing
- 2D contact area calculation
- Slicing improvements
- Discrete DOE iterations
- Spring/sliding die DOE variable
- Forming Express error checking
- Material Suite additions
- License/queue server improvements
- IMI 834 material data
- Titanium material data updates
- New lab exercises
- New license manager
- DEFORM Service Control update

The complete list of the new features can be found in the V11.3 release notes. Release notes are included with the software installation and available on the DEFORM User Area.