

DEFORM™ News

All training and events will be held at the SFTC office, 2545 Farmers Dr., Suite 200, Columbus, OH 43235.

Training:

- April 19-22, 2016: SFTC will host DEFORM training.
- June 21-24, 2016: SFTC will host DEFORM training.
- August 25, 2016: A one day training, on the mechanics of die stress analysis in DEFORM, will be conducted after the Die Stress Workshop.

Events:

- May 10-11, 2016: The DEFORM Users Group Meeting will be held in Columbus to present and discuss current and future DEFORM developments and applications.
- August 23-24, 2016: The 20th annual Die Stress Workshop will be hosted by SFTC, in conjunction with Marquette University. This workshop covers the theory, application and interpretation of die stress analysis.

Post-Processing in DEFORM V11.1

There are many different ways to post-process simulations in DEFORM. Simulations can be viewed in simulation graphics while they are running, or they can be analyzed after the run is complete. In recent versions (V11+), this post-processing functionality has been available in the QT3-based interface as well as the newer QT4-based Multiple Operations (MO) environment.

In the upcoming DEFORM V11.1, post-processing has been greatly enhanced, and can be performed in the following areas: embedded simulation graphics, MO Post, Next Generation Post and the DEFORM viewer. Each of these will be discussed and new functionality will be detailed.

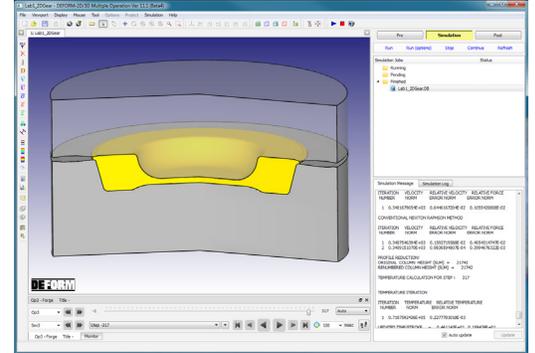
Embedded Simulation Graphics

While a simulation is **running** in the Multiple Operations environment, results can be monitored in the simulation graphics that are now embedded in the user interface. The following enhancements have been added in V11.1:

- State variables (all),
- Load vs. stroke curve,
- Summary data,
- 3D viewer (2D simulations),
- Mirroring (2D or 3D),
- Slicing (3D).

Load vs. stroke graphs can now be plotted in simulation graphics, and the plots automatically update as the simulation progresses. This is true for plots of any other variable available in the summary dialog, such as min/max temperature in an object.

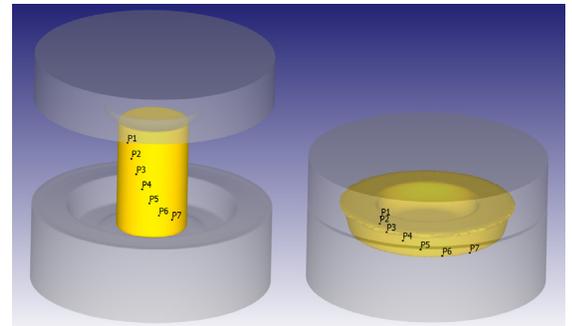
A second tab has been added to simulation graphics that deactivates the step updating. This allows users to easily view any step in the saved database while the simulation is running.



MO Post

When a simulation has **completed** in the Multiple Operations environment, users can view the results by clicking **Post**. This opens the MO Post, which is used to view the results of the current project.

The MO Post includes all the functionality of the embedded simulation graphics, as well as tools like FLOWNET, point tracking and animation creation. The point tracking is enhanced to allow tracking of points along a straight line, defined in a circular pattern or following the surface of an object (shown below).



Next Generation Post

For more advanced post-processing options, the Next Generation Post can be opened from the DEFORM Main dialog by clicking **2D/3D Post *** or from within the MO Post by clicking **Post**.

The Next Generation Post is not project-based, so multiple databases can be opened simultaneously for comparison purposes. In addition to the functionality

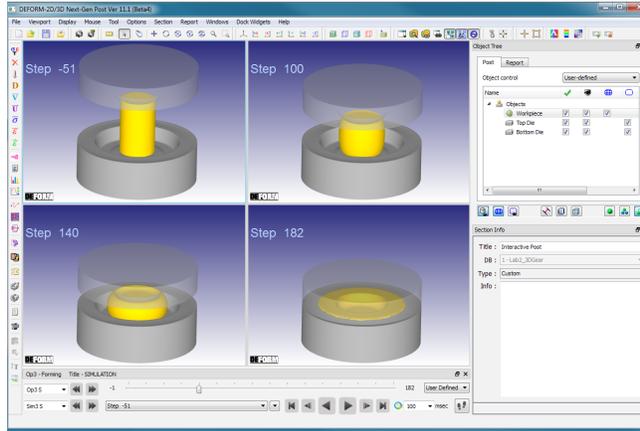


of the MO Post, this post-processor includes additional features such as multiple viewports, text and image importing, viewport and database syncing and report generation.

When multiple viewports are used, the viewports can now be synced in various ways. The viewports can be forced to show the same step, as well as use the same view (rotation angle, position, zoom) and state variable settings. Performed actions (object on/off, transparency, contact, etc.) can also be synced in all viewports.

When multiple databases are loaded, a new database comparison tool can be used to compare steps at approximately the same time or stroke. Step lists of the databases can be updated so that only these matching steps are displayed, making comparison very intuitive.

Reports can now be set up interactively in the post-processor and saved in .pdf or .ppt format. Information on metal flow, state variables, load vs. stroke, point tracking and FLOWNET can be saved in the report. Multiple chapters can be defined if desired, where each chapter might contain information about a particular operation. Once the report has been set up, a template can be saved for use in other simulations.



This report generation functionality is also available as a batch operation that can be added in the Operation Editor before the simulation is run. Information for the report is specified in this operation, and when the simulation completes the report is generated automatically.

DEFORM Viewer

The DEFORM viewer is a portable version of the post-processor that can be installed as a stand-alone program, and it is a new post-processing option available in V11.1. The viewer has the same functionality as the embedded simulation graphics and allows databases to be easily opened and reviewed.

One neat feature is that DEFORM databases can now be opened in the viewer directly from Windows Explorer. Once the .DB file extension is associated with the DEFORM viewer, double-clicking the .DB file will open it.

Below is a chart comparing the features of these various post-processing options.

	Simulation Graphics	MO Post	Next Generation Post	DEFORM viewer
All state variables	✓	✓	✓	✓
Slicing	✓	✓	✓	✓
Mirroring	✓	✓	✓	✓
Load vs. stroke	✓	✓	✓	✓
Point-tracking		✓	✓	
Flow net		✓	✓	
Animations		✓	✓	
Multiple viewports			✓	
Multiple databases			✓	
Text/image import			✓	
Viewport/.DB syncing			✓	
Report generation			✓	

Releases:

DEFORM V11.1 is being targeted for early 2016 release. The extensive list of enhancements and new features include:

Graphical User Interface

- Multiple Operations system (updated)
- Next Generation Post (updated)
- Material Suite (updated)
- DOE (updated)
- Next Generation Pre (new)
- Forming Express (3D & 2D) (new)
- DEFORM viewer (new)
- extensive 64 bit support

3D FEM

- dual mesh solver
- domain decomposition solver
- improved rotational symmetry
- improved mesh generation
- solidification and melting modeling
- induction heating window definition
- CTE as f(carbon content)
- nonuniform friction heat partitioning
- strain rate filtering
- combined iso-kinematic hardening
- improved micro-scale RVE models
- explicit solver enhancements
- improved convergence for air/oil trap
- improved contact search options
- follow object movement accounts for both magnitude and direction
- resistance as f(temp. & pressure)

2D FEM

- 64 bit solver
- ALE continuous casting
- solidification and melting modeling
- combined iso-kinematic hardening
- improved contact area stopping
- constant tau friction for torsion
- direction-dependent CTE

Material Library

- 15 new copper materials added
- 2 new stainless steels added
- 2 new steels added

A complete list of the new features can be found in the V11.1 release notes located in the DEFORM User Area.