Winter, 2010

Volume 8, No. 1

DEFORM™ News

Events:

- April 20-22, 2010: SFTC will exhibit DEFORM at Forge Fair in Cincinnati, Ohio.
- May 4 & 5, 2010: The Spring DEFORM User Group Meeting will be held at a location to be determined. Call for more information.

Training:

- February 2 & 3, 2010: DEFORM-2D training (includes DEFORM-F2) will be conducted at SFTC in Columbus, Ohio.
- February 4 & 5, 2010: DEFORM-3D training (includes DEFORM-F3) will be conducted at the SFTC office.
- March 30 & 31, 2010: DEFORM-2D training (includes DEFORM-F2) will be conducted at the SFTC office.
- April 1 & 2, 2010: DEFORM-3D training (includes DEFORM-F3) will be conducted at the SFTC office.
- Advanced Training will be held on May 5th and 6th in conjunction with the Spring User Group Meeting.
- August: The annual Die Stress Analysis Workshop is being planned for mid-August in Milwaukee, Wisconsin.

Simulation Batch Queue

It is frequently necessary to run several simulations overnight or during the weekend. Starting each simulation manually can result in lost simulation capacity. The DEFORM simulation (Batch) Queue is a software solution that allows automated sequencing of simulations as licenses become available. With the Batch Queue, a series of simulations can be run back-to-back without user intervention.

When simulations are submitted to the Batch Queue they can be run locally or on a remote computer. Simulations will start immediately if there is a license and computer available. Otherwise, the simulation will remain in the queue to be run on a first-come-first-served basis. The queue provides a facility to reprioritize the order simulations start, so that those requiring faster results will run first.

The DEFORM Batch Queue can also help manage solver usage. When simulation demand exceeds license capacity, it may be beneficial to use a powerful remote computer to run simulations. Using this setup, the simulation data can be stored on the hard drive of the remote computer. Users can then setup, post process, run and monitor the simulations from their local computer. Alternatively, if there are enough solvers for every user, it may make more sense to run the simulations locally. Each user will submit their simulations to their own computer.

Please contact SFTC if you would like to learn more about licensing options and how Batch Queue can be configured to meet your requirements.

2D-3D Integration

DEFORM was first released as a 2D version in the late 80's. The 2D approximation was essential for producing models that would run in a reasonable amount of time on available hardware. In the 90's, DEFORM-3D was released to model full three dimensional problems, with continuous improvements in DEFORM-2D. As a result, each system maintained its own data structure.

For cases where some operations were axisymmetric, users frequently ran those operations in 2D, followed by 3D simulations. SFTC developed a utility (M23) to convert 2D objects to 3D, with field variables. While the conversion was functional, the 2D and 3D results remained in separate files, requiring separate post processing.

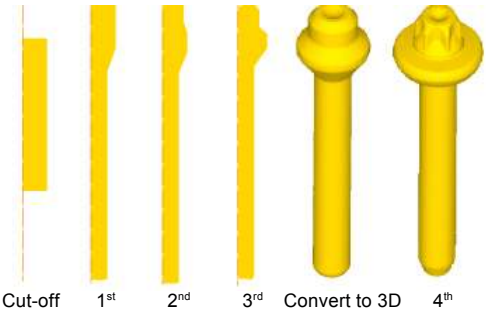
In version 10, 2D and 3D systems were integrated. The new data structure allows 2D and 3D operations to reside in the same database. Objects can be converted from 2D to 3D in the preprocessor GUI. The postprocessor has been enhanced to seamlessly support most functions with both 2D and 3D operations.

The conversion utility works by rotating the 2D geometry around the center axis. Workpiece geometry can be revolved a full 360 degrees for full models or any arbitrary rotation angle to take advantage of planar or rotational symmetry. During conversion, state variables, boundary conditions and mesh windows are automatically interpolated.

The progression in the image on the next page is an example of a process that has benefited from the integrated version of DEFORM. In the past, each operation was run in 3D to keep all the operations in the same database for postprocessing. The Flownet tool was then used to determine the likelihood of failure in the head. With integrated DEFORM, this progression was run with three 2D operations and finished with a 3D operation.

DEFORM™

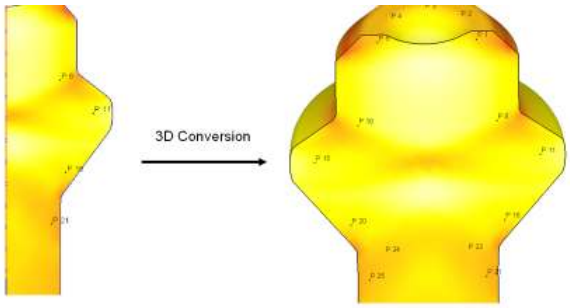
Design Environment for FORMing



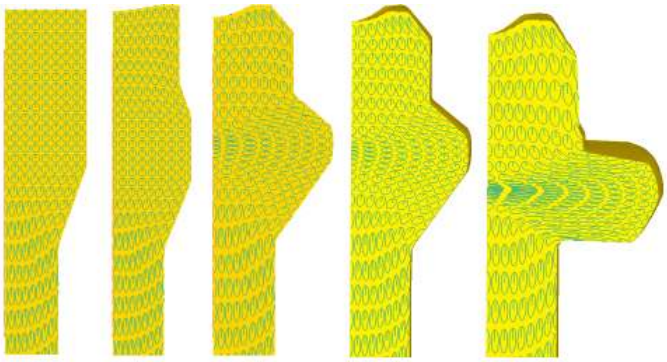
The progression starts with three 2D operations and is converted to 3D for the final operation.

Using the integrated postprocessor, seamless animations could be created using the 3D viewer to display 2D geometry. As seen below, point tracking was used to track state variables in-between 2D and 3D operations. Additional points were automatically added to track state variables at different revolution angles in the 3D workpiece. Finally, the Flownet was used to track the material flow through each operation (below). With the improvements provided to the postprocessor, this process was successfully run in far less time without sacrificing post processing functionality.

Integrated DEFORM and integrated DEFORM-F23 are now available. To use this product, both 2D and 3D licenses must be present. Please contact SFTC if you would like to use integrated DEFORM on a trial basis.



Strain and point tracking are shown before and after the 3D conversion.



The Flownet is seamless in-between the 2D and 3D operations.

Releases

DEFORM v10.0 was released in July 2009 and included the following components:

- DEFORM-2D
- DEFORM-3D
- DEFORM-F2
- DEFORM-F3
- Integrated DEFORM (Beta)
- Integrated DEFORM-F23 (Beta)

DEFORM v10.1 will be released this spring. Integrated DEFORM and integrated DEFORM-F23 will be officially released for the first time. A 64-bit FEM, beta version, will be available for Windows. The 64-bit version is compiled with an updated compiler that has shown improved simulation times.

The 10.1 release will include several enhancements and bug fixes. Some of the enhancements include the ability to create HD AVI animations, improvements to the shape rolling template to model sheet metal parts and the ability to export geometry from the postprocessor in the integrated versions. Additionally, Material Library updates will be available in the Steel, Aluminum, Copper, Titanium, Zinc and Magnesium categories.

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