Summer, 2025

Volume 23, No. 3

DEFORM News

Training

SFTC will offer online DEFORM training classes for U.S. and Canadian customers on the following dates in 2025:

- October 14-16
- December 9-11

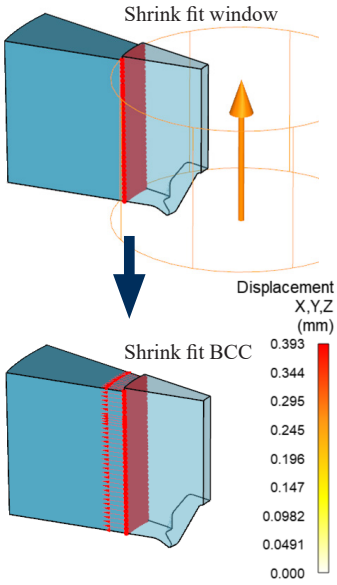
Detailed training and registration information is available on the DEFORM website.

Customers in other regions should contact their local DEFORM distributor for training options.

Events

The Fall 2025 DEFORM User Group Meeting (UGM) will be held online on November 4-5, 2025. UGM presentations allow companies to stay up to date on recent and future DEFORM developments. More information about the event will be released soon.

New Features in DEFORM V14.1



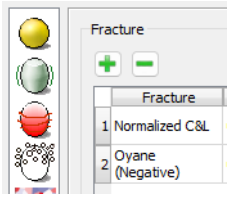
This latest issue of DEFORM News covers a few of the developments available in the upcoming DEFORM V14.1 release.

Shrink fits are utilized in cold forming and hot forging processes to place die inserts into a beneficial, compressive stress state. A well-designed shrink fit significantly prolongs die life by reducing the risk of fatigue cracking. DEFORM has traditionally supported manual (interactive) and contact-based shrink fit definitions. While practical for one-time setups, these approaches are not easily reused or ideal for design of experiments (DOE) studies.

New cylindrical (top right) and ring-shaped shrink fit windows have been introduced. They support uniform or variable shrink fits relative to an axial direction (bottom right). Settings are stored in new keyword commands, so shrink fit details may be modified after initial setup, viewed in completed databases and varied in DOE studies.

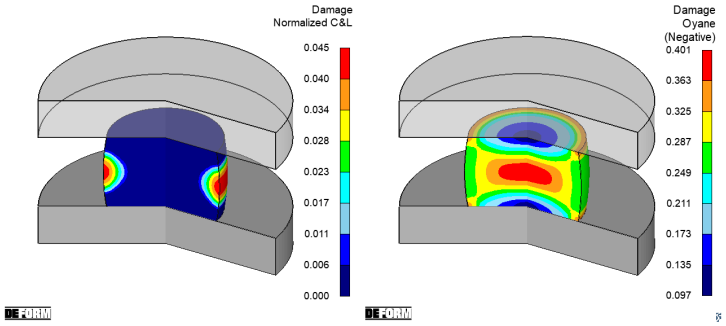
DEFORM has received many fracture modeling enhancements over the last few years. Damage models based on forming limit curves and stress triaxiality were introduced in V12 and V13, respectively. V13 also added “critical damage value as a function of temperature” and “softening as a function of damage” support. V14.1 introduces a “processing map” instability damage model and two hybrid damage models, which account for both ductile and shear failure modes.

Up to now, only one damage model could be defined in a single simulation. Users were required to run multiple simulations in order to compare damage models or settings. With the release of V14.1, a database supports multiple damage definitions, each with a unique combination of damage model type and parameter settings (right).



The enhancements significantly benefit users evaluating fracture behavior in forming, fine blanking, bar shearing and flash trimming. Results for the various damage definitions are easily compared using multiple viewports (below).

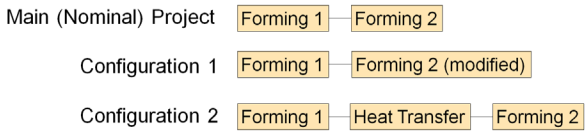
.



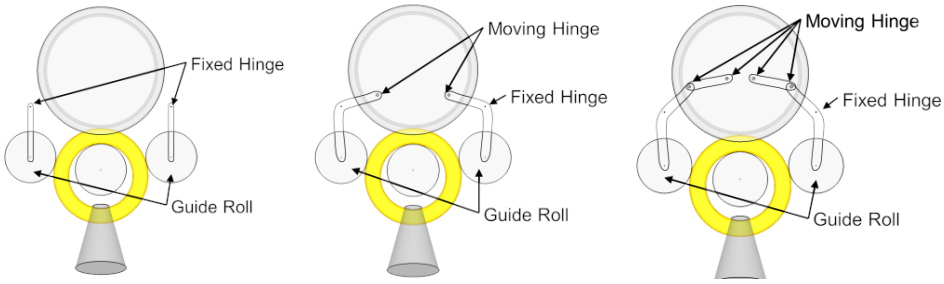
DEFORM®

Design Environment for FORMing

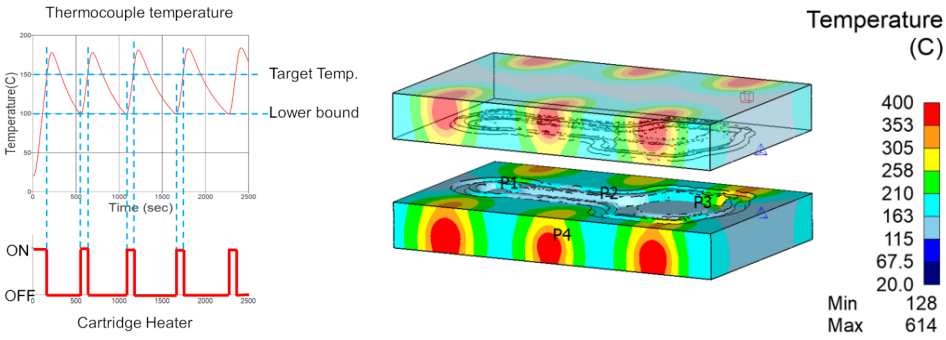
A new Configuration feature introduces subproject management, whereby multiple simulation setups may be saved under a single multiple operation (MO) project. By saving the nominal project and its alternate configurations under the same high-level project folder, users avoid the need to create separate projects for each alternative. Configuration operations start “locked” (linked) to the nominal project and must be “unlocked” (unlinked) when making changes. Operations may be added, modified or removed in each configuration (below).



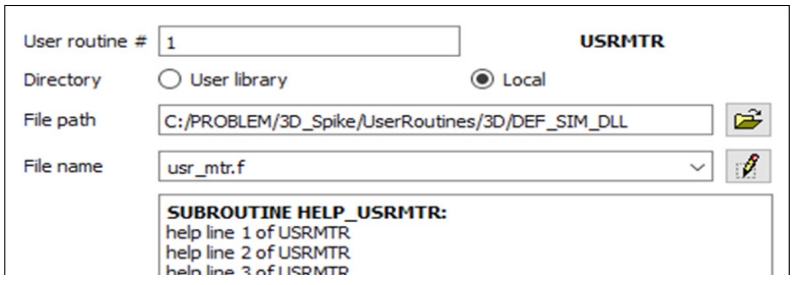
Historically, guide rolls (below) had not been included in DEFORM because ring stability was automatically controlled by the specialized ring rolling solver. At users’ request, guide roll support has been added for the prediction of behaviors and defects related to contact between the guide rolls and ring.



Cartridge heaters are heating elements which are embeded into forge tooling and used to maintain a desired die temperature. Support has been added to DEFORM-3D for PID-controlled cartridge heaters, whose behavior is dictated by thermocouple feedback (below left). The new interface and solver additions permit users to run advanced simulations with precise, local control of die temperature during heating or forming processes (below right).



Finally, improved user routine organization and identification is included in V14.1. Individual user routine scripts are customizable with a unique file name and set of help comments (below). These details are now stored in keyword, database and user-compiled executable files. Identifying information associated with a specific user routine script is therefore retrievable after initial preprocessing.



DEFORM V14.1 Release

The upcoming DEFORM V14.1 point release brings menu new features and updates to the DEFORM system.

- MO project configurations
- Better session setting saving
- Advanced thermal BCC preview
- Die shrink fit enhancements
- Multi-ram press model updates
- Multi-ram movement preview
- Die vent channel modeling
- Instability damage model
- Hybrid damage model
- Multiple damage model support
- PID-controlled cartridge heaters
- Thermocouple PID feedback
- User routine save/retrieve
- Intel MPI beta support
- MPI library switching script
- Ring roll guide roll support
- Ring roll mandrel PID control
- 2D ALE drawing template
- CFD conjugate heat transfer
- Discontinuous dynamic recrystallization (mb-DDRX) model
- Continuous dynamic recrystallization (CDRX) model
- CNGT precipitation modeling
- DOE/OPT shrink fit support
- GeoMesh Tool enhancements

Full details on the new release will be available in the V14.1 Release Notes.

Scientific Forming Technologies Corporation
2545 Farmers Drive
Suite 200
Columbus, OH 43235
Tel: (614) 451-8330
Fax: (614) 451-8325
www.deform.com