DEFORM News

Training

SFTC offers DEFORM training for U.S. and Canadian customers on the following dates in early 2022.

- April 12-14
- June 7-9

Additional training details are listed on the DEFORM website.

For users outside the U.S. and Canada, please contact your local DEFORM distributor for more information on the training events available in your region.

Events

The Spring 2022 DEFORM User Group Meeting will be held online on May 10-11. Details will be emailed to applicable users.

Social Media

SFTC can be found on LinkedIn and YouTube, via the following links.

www.deform.com/linkedin
www.deform.com/youtube

30th
Anniversary
SFTC

DEFORM®

Design Environment for FORMing

DEFORM V13.0 Features and Highlights

Over the past four decades, the DEFORM system has evolved from its forging roots to be a complete materials processing and manufacturing simulation system. Tools have been added to make complex models easy to set up and quick to run. Speed and accuracy are a priority when modeling anything from billet breakdowns to microstructural evolution. Recent newsletters have covered a few of the significant application trends considered in V13. A few other notable new capabilities and features found in V13 are listed below.

A new DEFORM User Manual is now available through the Help menu. Its HTML5-based framework operates well in modern browsers and provides exceptional search functionality. Existing content has been updated, while new content has been added in response to recent software developments. A wider range of application-specific guidelines and lab exercises is also included. These changes enable users to more easily learn how to model new processes.

DEFORM now supports two dozen theoretical damage models, thanks to the addition of six new models in V13. The new models cover energy and fracture-strain based methods for ductile fracture prediction. They consider variables such as local stress triaxiality and lode parameter. The new models are useful in the prediction of fracture in cross-wedge rolling, hot forging and other processes.

A variety of general enhancements were introduced to the DEFORM pre/postprocessing interfaces. A new "Orientation" positioning method syncs the alignment and/or position of one object relative to another object. This powerful shortcut will allow for more efficient handling of ill-positioned CAD geometry. The "Find axis" tool is accessible from the Orientation positioning menu, as well as other menu dialogs. The scope of the "Find axis" tool has been expanded in V13, where it now supports nearly a dozen axis identification methods. An adaptive, filtered list of applicable identification methods is displayed in its menu dialog during use (above). The following examples show these new features in action.

Find axis: Two planes | Find axis: Two planes | Orientation (Before) | Orientation (After)
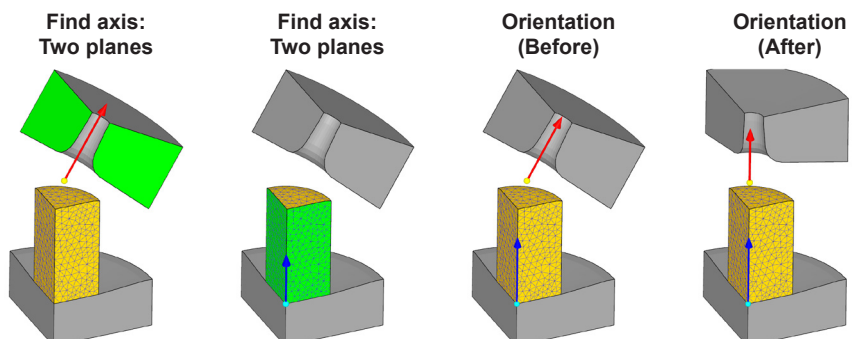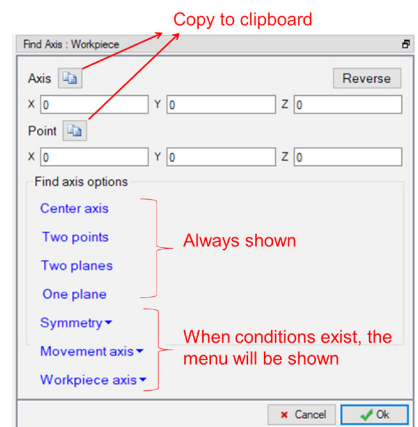
A neural network is a machine learning algorithm whose layered structure mimics the arrangement and function of neurons in a brain. A deep neural network (DNN) is simply a complex neural network involving multiple hidden layers between the input and output layers (right).

DNN support was added to the DEFORM Data Analytics (DA) module in V13. DNNs and other data analytics models find (learn) input/output relationships in known data sets via "training". With a trained model in hand, users can predict how a system will respond to a new set of inputs.

Deep Neural Network

Inputs   Hidden Layers   Outputs
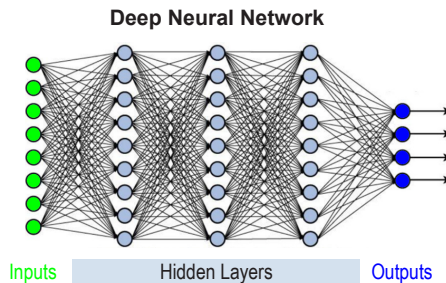
For example, a DNN model was trained on the steel flow stress definitions in the DEFORM material library. A beta version of this trained model is now accessible, within the material library, for predicting flow stress based on steel chemistry.
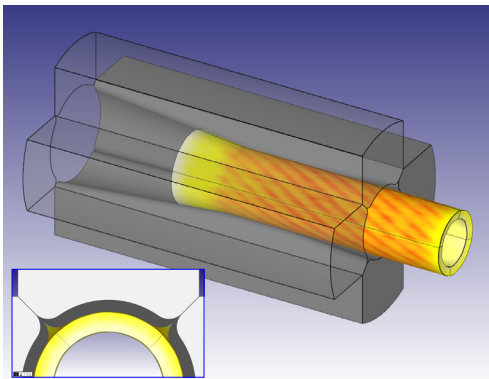

Notable changes were made to the Cogging template. The pass table now supports Boolean cropping of brick meshes between passes. It also supports scheduling of reheats between passes. As part of this change, adaptive reheat settings were consolidated with the new pass table reheat options. Other Cogging template enhancements include support for multi-pass infeed swaging (GFM), as shown on the left.

A Welding template was introduced in V13 for the simulation of arc welding processes. Such DEFORM application-specific templates strive to provide efficient, easy-to-use interfaces for modeling relatively complex processes. The Welding template combines core technologies applicable to arc welding within a guided, wizard-based workflow. Core technologies include the elasto-plastic material model, weld bead generation, element activation, heat source models, path movement and pass scheduling (below).

Element activation zone

Bead1   Bead2
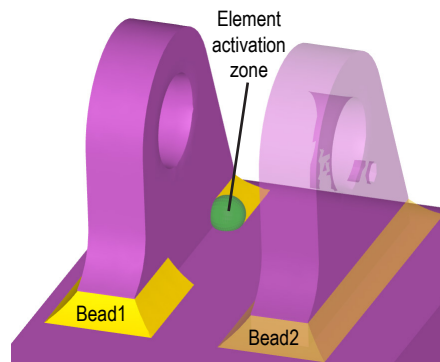
The Welding template will evolve as its core technologies develop. A limited, beta version of the template is currently available as a multiple-operation (MO) selection and as a stand-alone system. Please contact your local DEFORM distributor for more information.

We hope that you enjoy the many new features in DEFORM V13, as well as its existing capabilities. Four decades of development have yielded a powerful and comprehensive process simulation system. We look forward to delivering new and exciting solutions to our customers in the years to come.

DEFORM V13.0 Release

DEFORM V13.0 was recently released in February 2022. This major release introduces an exciting set of new tools, capabilities and applications. V13.0 changes include:

- Full 64-bit support
- 64-bit 2D simulations
- 2D local remeshing
- Additional hybrid friction models
- New damage models
- New object orientation tools
- Expanded "Find axis" functions
- Press stiffness DOE variable
- Worn geometry updating
- Enhanced "State variable between two points" capabilities
- RZ velocity plot
- ASTM grain size measure
- Show minimum die distance
- "Diff step" results exporting
- More hot keys
- New themes
- Deep neural network (DNN) integration
- Steel flow stress prediction DNN
- Project/database archive tool
- Recycle Bin support
- New user manual
- Next-gen Presentation Player
- ALE tube piercing
- Cogging enhancements
- New Shot Peening template
- Enhanced RVE inclusion model
- CFD turbulent flow update
- New 2D/3D meshers (beta)
- Tool Life Prediction study (beta)
- Arc Welding template (beta)
- Geo Mesh Tool product (beta)

The complete list of changes is available in the V13.0 Release Notes.