Spring, 2020

Volume 18, No. 2

DEFORM® News

Training/Events

COVID-19 has impacted users of the DEFORM system in many ways. SFTC and its partners remain committed to providing the exceptional training and support customers have come to expect.

SFTC will hold DEFORM training for U.S. and Canadian customers on the following dates in 2020.

- August 11-14
- October 13-16
- December 8-11

Additional training details are available 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.

The 2020 Die Stress Workshop and Die Stress Training, offered in conjunction between SFTC and Marquette University, has been cancelled in response to COVID-19. The group looks forward to the next offering of the annual event.

DEFORM®

Design Environment for FORMing

Shape Rolling

SFTC offers a range of powerful, application-specific modules for DEFORM. In contrast to the general preprocessor, modules provide customized experiences tailored for the modeling of particular processes.

The Shape Rolling Module was recently updated and introduced into the DEFORM multiple-operation (MO) environment. It includes an easy-to-use interface built for rolling, custom tools for capturing rolling behaviors and a range of solution methods.

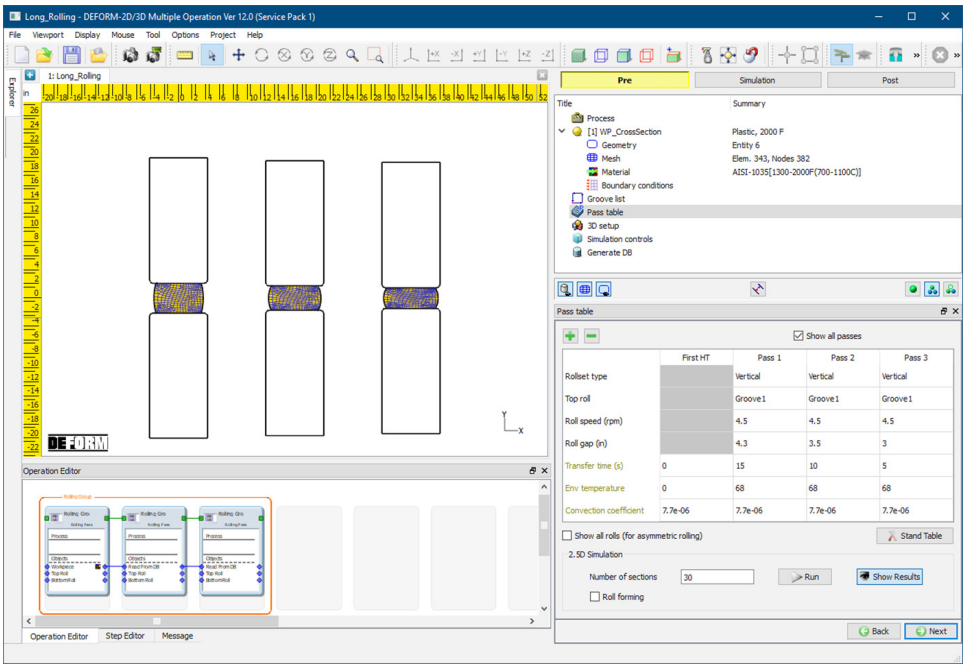
The module was developed based on feedback from industrial users. Much of the repetitive setup involved with modeling many roll stands has been automated by taking advantage of the predictable workflow. The “rolling group” feature is largely responsible for simplifying this setup process.

The rolling group adds, removes and defines operation tiles in the MO project. An extensive rolling sequence may be quickly defined using the structured, tabular inputs.

The rolling group defines inter-stand heat transfer operations, generates 3D object geometries, applies boundary conditions and sets up simulation controls for each and every operation.

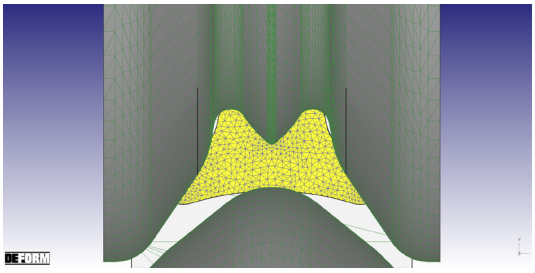
The module also contains unique tools to help simulate challenging aspects of shape rolling. Designers will appreciate an intelligent constraint that prevents product twisting. It replicates the stabilizing influence of complex guides found in long rolling mills. Also included is an automated Boolean tool, which can clean up the workpiece by removing distorted ends after each roll stand (if necessary).

Up to three solution methods are supported in the Shape Rolling Module: 2½D, 3D ALE and 3D Lagrangian. The range of options allows the user to balance runtime with how much of the process will be modeled. The 2½D solution has specifically received much attention for its speed and accuracy in modeling shapes common to the early stages of bar rolling. For a detailed explanation of these methods, please refer to the Winter 2018 DEFORM News.



Russula Success Story

A bar mill in North Macedonia was experiencing quality issues while rolling a difficult pass sequence. They turned to Russula, a global engineering company, who provides equipment and services to steel producers. Russula was contracted to redesign the pass sequence, eliminate defects and achieve consistent performance.



Russula used DEFORM to troubleshoot the original pass sequence and test potential redesigns. The steel producer had encountered not one but many issues while rolling the UPN 30 channel. DEFORM predicted the voids and overfill that were seen in the actual product. After this validation, subsequent designs were tested in DEFORM to ensure proper fill and eliminate defects.

After a few weeks of redesigns and simulations, Russula had established an optimized pass sequence. DEFORM predicted the new design would be defect-free, fill properly and meet required tolerances. The mill received the new pass design and made the required process changes. The first bar rolled through the mill without problems. Its final dimensions were confirmed to be within required tolerance. As the mill continued rolling the UPN 30 channel it was clear that all of the prior issues were eliminated, as predicted by DEFORM.

Operators took samples from each forming pass for analysis. The actual dimensions were nearly identical to those from DEFORM simulations, as shown below.

	DEFORM (mm)	Measurements (mm)	Difference (mm)
h	30.00	30.00	0.00
b	15.10	14.80	0.30
t_w	4.00	3.90	0.10
t_f	4.50	4.30	0.20
r1	4.50	4.50	0.00
r2	2.50	2.50	0.00

By using DEFORM, Russula was able to redesign the entire pass sequence in an aggressive timeline with extremely high accuracy. In total, it took Russula only 4 weeks to analyze, simulate and finalize a new design. The changes required by the mill were implemented in a relatively short 5-6 week time period. Similarly impressive, the optimized design was proven a success in the very first test performed by the steel producer. The mill is now consistently running the UPN 30 channel with no overfill, no defects and within tolerance.

Please contact your local DEFORM distributor for more information about the Shape Rolling Module.

Releases

DEFORM V12.0 Service Pack 1 (V12.0.1) was released in early December. It contains numerous bug fixes and system enhancements. Select changes include:

- V12 Linux support
- Main menu usability
- Forming Express MO handling
- Solver performance
- Running job status
- Object display defaults
- 2D DXF ellipse entities
- Multiobject scheduled meshing
- Coating mesh data
- ALE mesh generation
- DOE advanced thermal BCC
- Contact generation speed
- Spinning roll positioning
- Matched cogging die positioning
- Shape rolling twist prevention
- Ring rolling MO setup
- Material unit notations
- BCC unit notations
- Language translations
- Extrusion lab documentation
- Material Suite lab exercises
- License Manager
- Service Control

The complete list of improvements can be found in the V12.0.1 Release Notes. Release notes are included with the software installation and are also available on the DEFORM User Area.

DEFORM V12.0 Service Pack 2 (V12.0.2) is being prepared for release. A list of changes will be provided in the next issue of DEFORM News.

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