

DEFORM News

Training

SFTC will offer DEFORM training for U.S. and Canadian customers on the following dates in the first half of 2023.

- April 4-6
- June 13-15

Additional training dates and 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

SFTC will exhibit at Forge Fair 2023 in Cleveland, Ohio on May 23-25. A conference presentation "The State of the Art in Forging Process Simulation with DEFORM" will take place on Wednesday, May 24.

Social Media

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

DEFORM V13.1 Compiler Support

A number of important compiler-related developments will be introduced in the upcoming v13.1 release of the DEFORM® system. The following newsletter highlights the changes and their impact on DEFORM users. The new features and capabilities benefit system performance, compatibility and flexibility.

Most significantly, system support has been added for the free Intel oneAPI Fortran Compiler. Users will choose between a DEFORM FEM engine precompiled using either the Intel or Absoft Fortran compiler. For those running user routines, the choice may also depend on their compiler preference for building customized DEFORM code.

The new Intel compiler provides a significant FEM performance boost over the older Absoft compiler. Internal SFTC testing revealed that Intel-compiled code may run 20%-400% faster than the Absoft compiled code, depending on application. Validation testing and performance studies were summarized at the Fall 2022 DEFORM User Group Meeting (UGM). Slides from past UGMs are available to active users on the DEFORM User Area.

During v13.1 installation, users will must select between an Intel-compiled or Absoft-compiled DEFORM FEM engine. The Intel build is the default and recommended option. An Absoft-compiled option must be selected if the user is running on older hardware or if they require Absoft user routine support.

User routine capabilities allow custom code to be added into the DEFORM environment. User routine integration is available for simulation (FEM), material, movement, friction, wear, fracture, microstructure and other functions. Prior to v13.1, an Absoft Pro Fortran Compiler license was required for anyone wanting to build DEFORM user routines.

Users intending to run Intel-compiled user routines will need to download the free Intel Fortran Compiler, which is available in the Intel oneAPI HPC Toolkit or as a stand-alone download. It is available for Windows and Linux, is built for modern hardware (Intel and AMD) and supports broad Fortran language standards. Intel compiler information is available on the following website.

<https://www.intel.com/content/www/us/en/developer/tools/oneapi/fortran-compiler.html>

While the Intel oneAPI Fortran compiler is free, Microsoft Visual Studio 2017, 2019 or 2022 is required for its use. Fortunately, many companies may already have access to Visual Studio through existing Microsoft subscriptions. For those who do not, the following links to VS Community (non-commercial) and VS Professional (commercial) editions may be useful.

<https://visualstudio.microsoft.com/vs/community/>
<https://visualstudio.microsoft.com/vs/pricing-details/>



Design Environment for FORMing

User Routine Support

DEFORM and its user routines have historically been compiled using the Absoft Pro Fortran compiler. In late 2022, Absoft announced its closure after 42 years in business. The company has ceased selling products and has formally ended technical support. Absoft users requiring Absoft technical support information may still access it using the following link.

<https://www.absoft.com/help/technical-support/>

Existing Absoft users who require its software download should note the following instructions provided by Absoft in late 2022.

"The registration link in the electronic delivery email no longer works. You need to contact Absoft support by email and request a download link. In your email indicate that you need the link for electronic delivery package and include which OS (Windows, Linux, or macOS) and which version. For example, "I need the electronic delivery download link for the Windows Pro Fortran 2022."

SFTC has taken the opportunity to update user routine capabilities in DEFORM v13.1, while maintaining backward compatibility. V13.1 continues to support the traditional static link building workflow. Static linking produces a customized DEFORM FEM engine executable (EXE) by linking a user routine to a standard object library file during compiling. The static linking workflow is compatible with both compilers.

V13.1 will also support a dynamic link library (DLL) building workflow. Dynamic linking produces a DLL file containing the user's custom DEFORM code. A "dynamic" link is established between the custom DLL and the installed FEM engine during runtime. The dynamic linking workflow is compatible with both compilers.

The dynamic link library method offers a number of benefits. First, it does not modify the installed DEFORM EXEs, which is better for maintaining version integrity. It allows various user routines to be built independent of each other. Finally, dynamic link libraries are also faster to build, utilizing a single source file with no linking.

User routine templates, documentation and one-click building scripts will be provided for each compiler in v13.1. The DEFORM v13.1 installation and release notes will also include information on the topics. Additional information and code conversion examples were provided in the Fall 2022 UGM slides.

SFTC will continue to support the Absoft compiler, existing user routines and EXE compilation for the foreseeable future. This approach will allow users time to plan and implement the compiler transition on their schedule. SFTC has worked to minimize the effort required to transition existing user routines to the Intel compiler and DLL building workflow.

Please contact your local DEFORM distributor if you have questions or require assistance with the compiler and user routine changes.

The next issue of DEFORM News will cover new features and tools available in DEFORM v13.1.

DEFORM V13.1 Release

DEFORM v13.1 is scheduled to be released in early 2023. It includes new features, enhancements and bug fixes. Notable changes include:

- Windows 11 support
- Intel Fortran Compiler integration
- FEM performance improvements
- Dynamic link library (DLL) compile
- Meshing enhancements
- 2D to 3D conversion fixes
- 2D local remeshing GUI
- Merge mesh GUI
- Press Model GUI
- Orientation function updates
- Shrink fit enhancements
- 2D parallel processing (MPI)
- 3D Partial Domain solver
- 3D Quick Evaluation method
- Cogging enhancements
- Shape rolling enhancements
- Extrusion bearing control updates
- User flow stress DNN predictor*
- Hensel-Spittel flow stress fitting
- DRX vol. fraction from flow stress
- Fracture element deactivation
- Fracture model updates
- 2D Cutting Template DOE support
- Anisotropic friction DOE support
- Press Model outputs
- Expanded title options
- Import/export user colorbar
- New Colorbar library
- 2D Forming limit diagrams (FLD)
- Geo Mesh Tool product (beta)

* Windows only.

A complete list of changes will be available in the DEFORM v13.1 Release Notes.