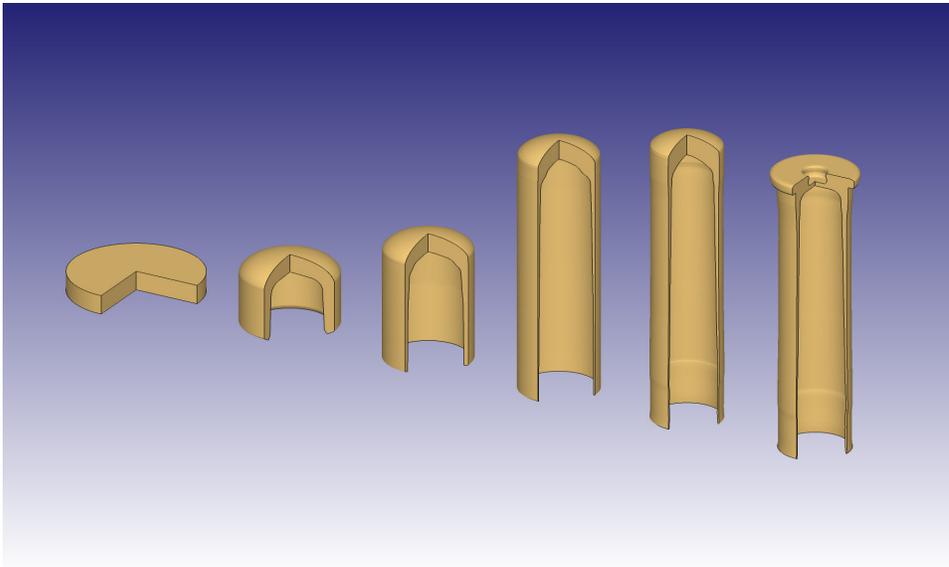


DEFORM[®] - 2D

DEFORM-2D is a Finite Element Method (FEM) based process simulation system designed to analyze two dimensional (2D) behavior in complex metal forming processes. It provides vital information about material and thermal flow during the forming process, facilitating the design of products and required tooling. DEFORM-2D has been used by companies worldwide to analyze forging, extrusion, drawing, heading, upsetting and many other metal forming processes.

DEFORM-2D offers state-of-the-art process simulation technology. Its powerful simulation engine is capable of analyzing complex interactions of multiple deforming objects with different material properties. This allows realistic and accurate modeling of metal forming processes within production environments. Its sophisticated mesh generator automatically creates an optimized mesh system whenever necessary. By considering the solution behavior, the mesh generator creates finer elements in regions where greater solution accuracy is required. This reduces the overall problem size and computing requirements. The flexible and powerful graphical user interface makes the preparation of input data and examination of result data very easy to accomplish.



Axisymmetric cold formed components, such as the bullet casing shown above, can be simulated using DEFORM-2D. This simulation modeled a four station drawing progression followed by an upsetting operation. The result from each operation was passed to the next. Courtesy American ballistics.

DEFORM-2D employs core technologies from decades of research and production application at leading companies worldwide. A 'state of the art' multiple operation interface provides guided data input for a wide range of process types. Individual operations can be combined into process sequences that can be run one-by-one or sequentially. This is the foundation for a comprehensive modeling system that can incorporate forming, material modeling, design of experiments (DOE) and optimization.

Scientific Forming Technologies Corporation (SFTC) staff has extensive manufacturing, academic and software-industry experience. This diverse background enables SFTC to provide unparalleled training and technical support to DEFORM users.

Product Specifications

- Deformation and heat transfer are calculated in an integrated simulation environment.
- Two-dimensional capabilities include axisymmetric, plane-strain and plane-stress simulations.
- Fully-automatic and optimized remeshing is performed during simulations.
- Forming equipment models are available for hydraulic presses, hammers, screw presses and mechanical presses.
- Material models include elastic, rigid-plastic, thermal elasto-plastic, thermal rigid-viscoplastic, porous and rigid types.
- Deformation, contour plots, load-stroke prediction, point tracking, FLOWNET and other features are available in the post-processor.
- Multiple deforming body capability allows the analysis of mechanical joining or coupled die stress.
- The FEM engine predicts fracture based on damage models.
- A self-contact boundary condition allows a simulation to continue after a lap or fold has formed.
- Multiple operation sequences run without user intervention.
- A machining distortion 'template' streamlines the calculation of distortion after material removal.



Design Environment for FORMing

Computer System Requirements

- The minimum recommended configuration is:
 - 4 GB RAM,
 - 300 GB free disk space,
 - dedicated graphics card,
 - Windows 10 (64-bit) or select Linux configurations.

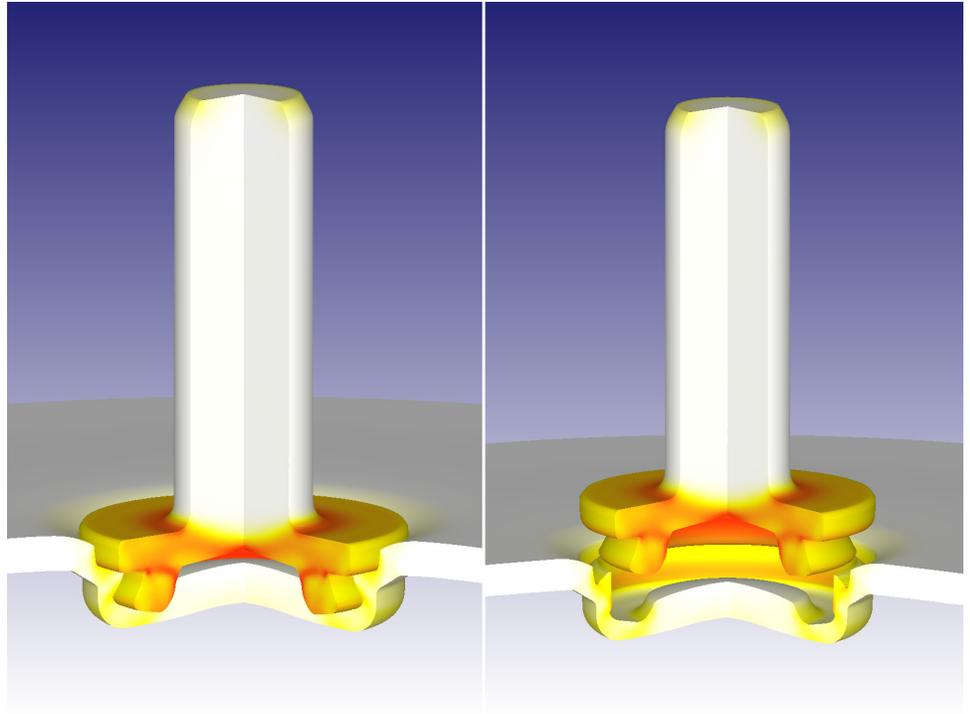
Licensing

- Node-locked licenses support one user on one computer. Floating licenses are available to use within a local-area network.
- One add-on module is included at no extra charge: forming or machining.
- Microstructure (heat treatment) and Inverse Property Extraction Modules are also available.

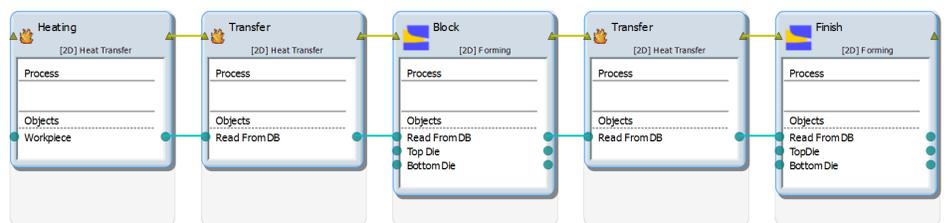
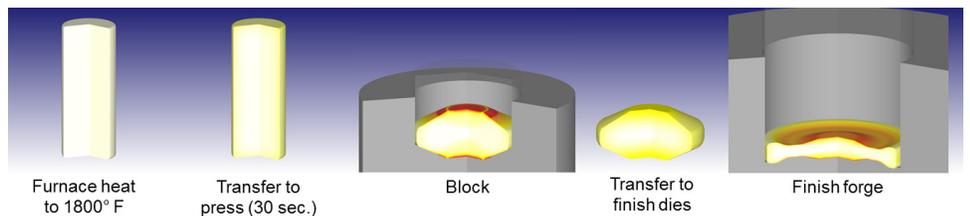
General Information

- Training, support, updates and DEFORM User Group meetings are available to active users.
- Online documentation is provided in HTML and PDF formats.
- The DEFORM Material Database includes a wide range of steel, aluminum, titanium, superalloy, copper and other material data.
- Technical support is readily available by phone, email, web meetings and the online DEFORM User Area.

DEFORM[®]-2D



The cold forming, installation into sheet metal and pull test of this self-clinching fastener was simulated in DEFORM-2D. Before and after images from the pull test are shown above. In this case, the force predicted by DEFORM was within 10% of the experimental value. This demonstrates a powerful multiple deforming body capability for large deformation.



DEFORM is a registered trademark of Scientific Forming Technologies Corporation. SFTC reserves the right to alter the product, price and/or computer system specifications at any time without notice. The SFTC software license agreement, including terms and conditions of software purchase or lease will be applicable. A perpetual license is subject to a maintenance fee for upgrades and ongoing system support.

01/11/2018

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The DEFORM multiple operation environment allows for the automatic simulation of entire process sequences. These are defined using a mix of flowchart, wizard-based and advanced menus. The complete hot forging process shown above was simulated, from start to finish, with a single click of the 'Run' button.