DEFORM™-3D

DEFORM™-3D is a powerful process simulation system designed to analyze the three-dimensional (3D) flow of complex metal forming processes. DEFORM™-3D is a practical and efficient tool to predict the material flow in industrial forming operations without the cost and delay of shop trials. Typical applications include:

- forging   - machining   - rolling
- extrusion   - heading   - drawing
- cogging   - compaction   - upsetting

Based on the finite element method, DEFORM™ has proven to be accurate and robust in industrial application for more than two decades. The simulation engine is capable of predicting large deformation material flow and thermal behavior with astonishing precision.
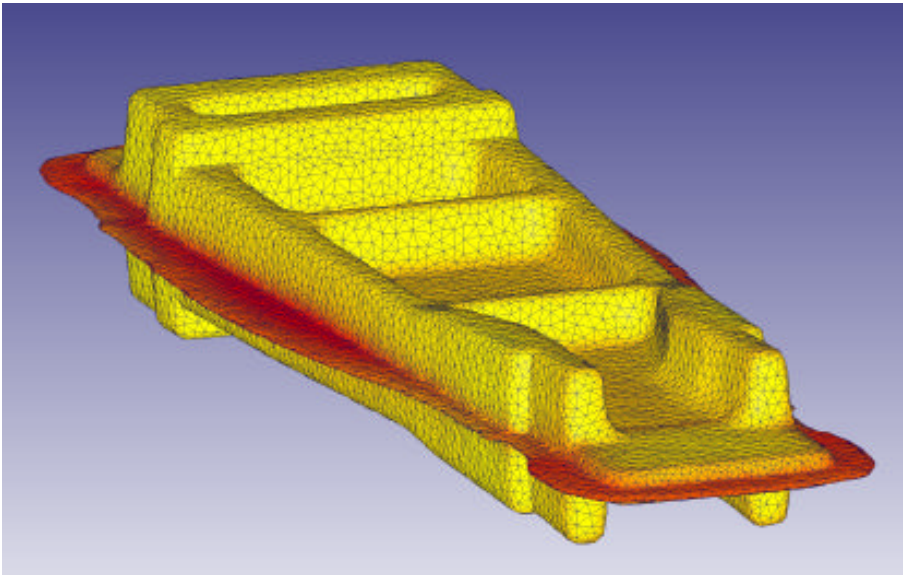
The automatic mesh generator (AMG) produces an optimized mesh system with local element size control based on the specific process being analyzed. This facilitates the enhanced resolution of part features while maintaining good control of the overall problem size and computing requirements. A user-defined local mesh density provides advanced users a flexible control to meet their requirements.

While DEFORM™-3D provides sophisticated analysis capabilities, the graphical user interface is intuitive and easy to learn. Moreover, it provides utilities to manipulate 3D geometry, including boolean capabilities to trim flash. Shearing and trimming operations can also be analyzed using the FEM engine. Even complex machining operations can be modeled. DEFORM™-3D is the foundation for a comprehensive modeling system that integrates raw material production, forming, heat treatment and machining.

DEFORM™-3D continues the tradition of accuracy and state-of-the-art capabilities established in the early 1980's. Scientific Forming Technologies Corporation has the experience and background to provide unparalleled training and technical support.

Product Specifications

- Deformation and heat transfer are automatically calculated in an integrated simulation environment.

- Three-dimensional simulation allows the analysis of complex shapes that can not be accurately modeled using 2D (plane strain or axisymmetric).

- Fully automatic optimized remeshing is performed during simulation.

- DEFORM-3D supports common equipment used in cold heading and hot forging. Models are available for presses and hammers. A library includes popular equipment. User routines provide a facility to study in-depth interactions between the equipment and workpiece.

- The material models include elastic, rigid plastic, thermal elasto-plastic, thermal rigid-viscoplastic, porous and rigid.

- FLOWNET and point tracking deformation, contour plots, load-stroke prediction and more are available in the postprocessor.

- Multiple deforming body simulation allows for the analysis of assembly processes or coupled die stress analysis.

- The FEM engine predicts fracture models based on damage models.

- A self contact boundary condition allows a simulation to continue even after a lap or fold has formed.

- Multiple operations can be set up, for popular forming processes, to run sequentially without intervention.

DEFORM™

Design Environment for FORMing

Computer System Requirements

- DEFORM™-3D runs under WINDOWS XP/2000 or on popular UNIX workstations.

- The minimum recommended configuration is 1 GB RAM. 2 GB RAM may be required for very large models.

- At least 10 GB of free disk space is recommended.

- A WINDOWS system printer can be used for hard copies. For UNIX, a Postscript printer is recommended.

- DEFORM™- 3D is distributed on CD-ROM. A writeable CD or DVD is recommended to back up large database files.

- Internet access is recommended for technical support and to access on-line technical information.

General Information

- Training, support and regular updates are available to active DEFORM™ Users.

- DEFORM™ Users Group meetings are held regularly.

- Outputs include graphics, raw data, hard copy and animation.

- The DEFORM™ Material Database in excess of 230 materials is supplied by SFTC.
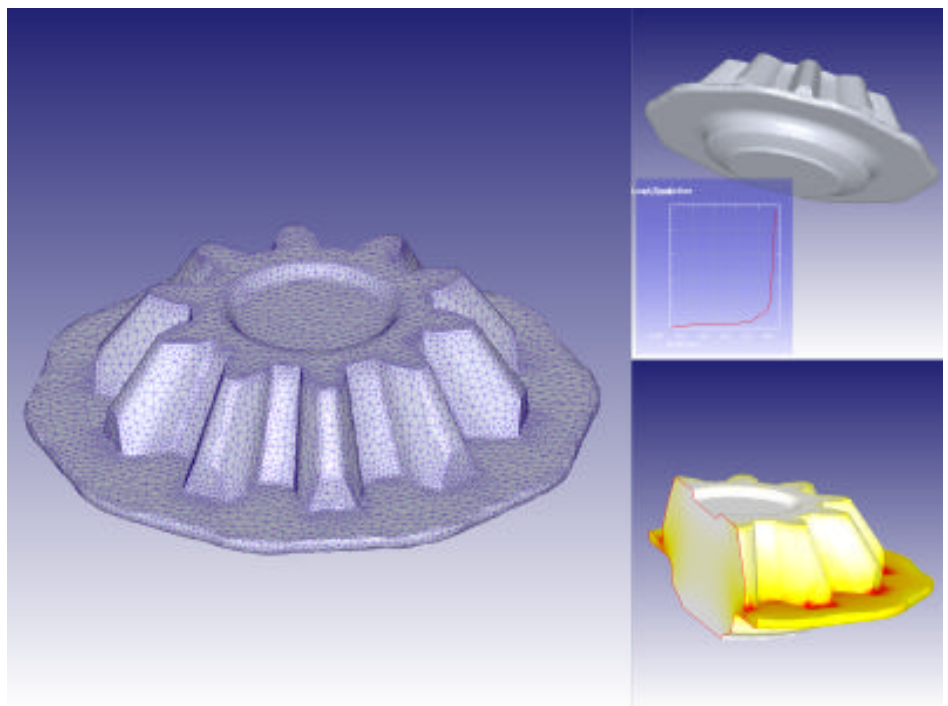
DEFORM™- 3D
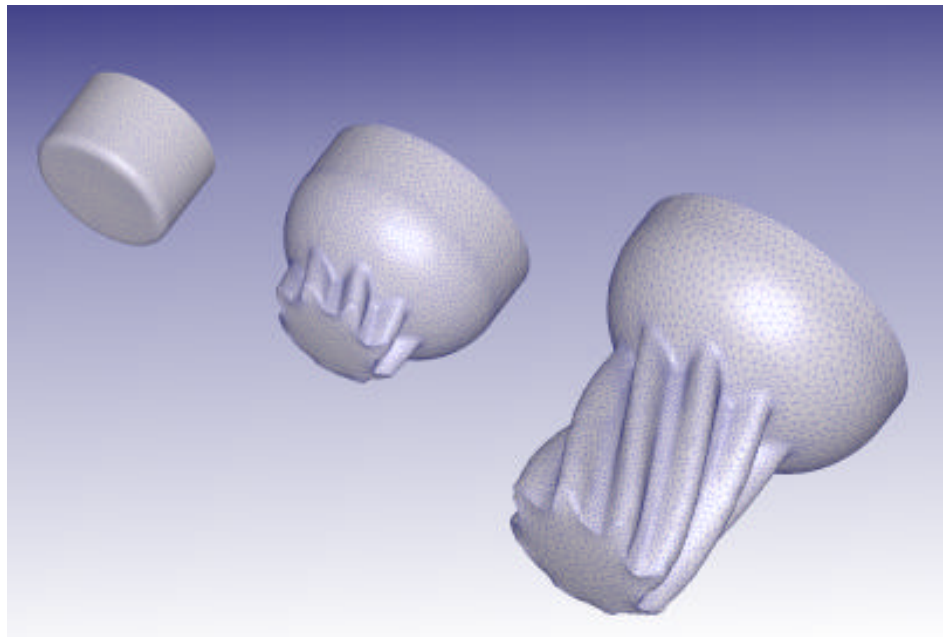
DEFORM-3D provides accurate simulations of net shape parts. This cold formed extruded helical gear was simulated during development. DEFORM provides the competitive edge of faster time to market and cost savings from fewer trials.

DEFORM-3D includes a very sophisticated postprocessor. Over and above the multiple document interface (MDI), each postprocessing session is capable of displaying up to six coupled viewports. The mesh, shape, load-stroke curve, effective strain and sliced section of the workpiece are displayed in the above illustration. It is easy to compare two simulations with slightly different parameters.