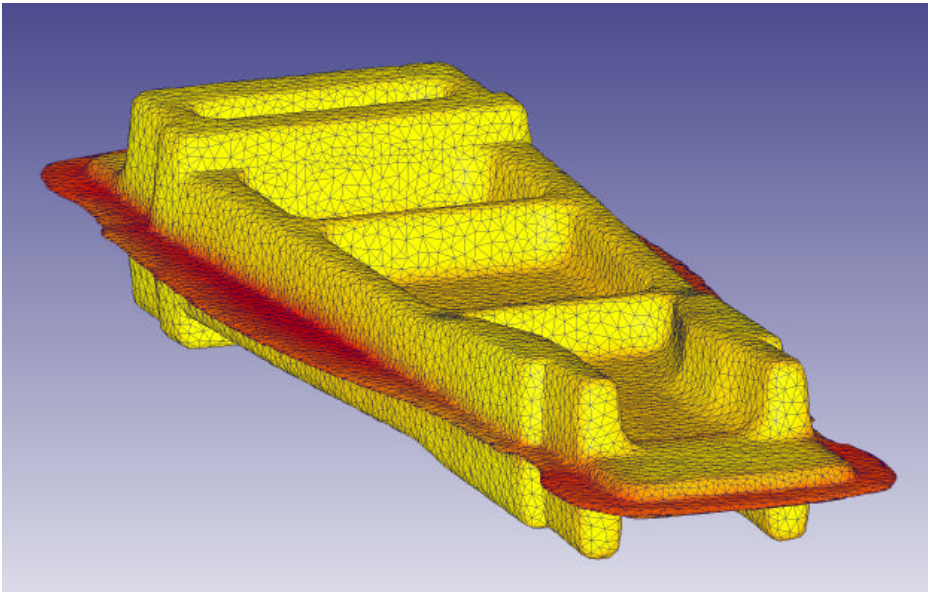


DEFORM™-3D

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, 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 calculated in an integrated simulation environment for multiple discrete objects.
- 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.
- 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 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 user intervention.
- A machining distortion 'template' is being developed to streamline the calculation of distortion after material removal.



Design Environment for FORMing

Computer System Requirements

- DEFORM-3D runs on WINDOWS XP/2000 or Linux.
- The minimum recommended configuration is:
 - 2 GB RAM,
 - 2 to 4 processors,
 - 500 GB free disk space,
 - read/write DVD.

Licensing

- The FEM engine is licensed to run on one CPU. Parallel processing options are available using MPI.
- 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 charge: forming (DEFORM-F3), cogging, machining, shape rolling or extrusion.

General Information

- Training, support, regular updates and DEFORM User Group meetings are available to active users.
- Outputs include graphics, raw data, hardcopy and animation.
- The DEFORM Material Database, supplied by SFTC, includes more than 250 materials.
- Internet access is required for on-line technical support and service pack updates.

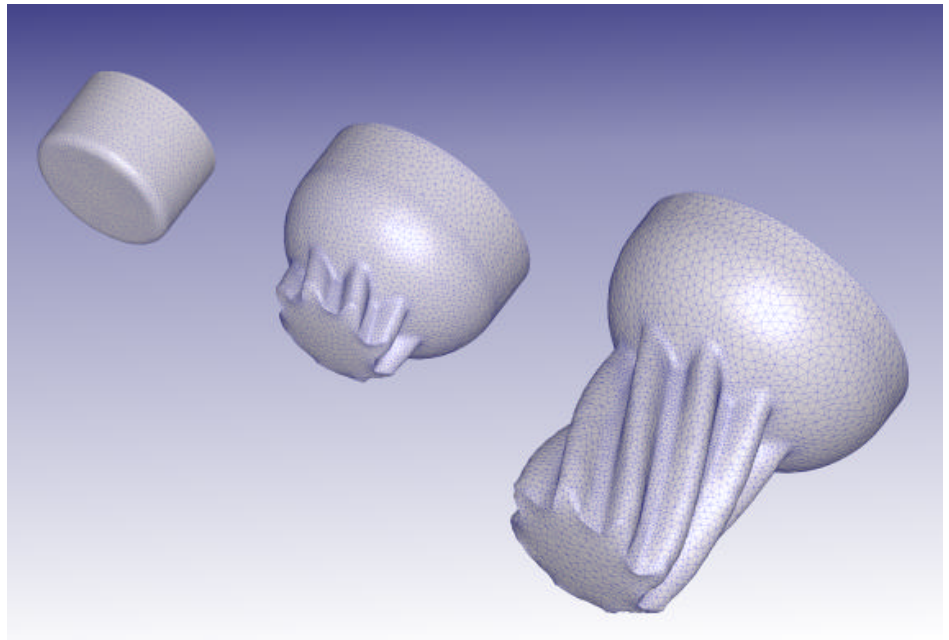
DEFORM is a trade mark of Scientific Forming Technologies Corporation. SFTC reserves the right to alter the product, price and/or computer system specifications at any time without notice. The SFTC software license agreement, including terms and conditions of software purchase or lease will be applicable.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

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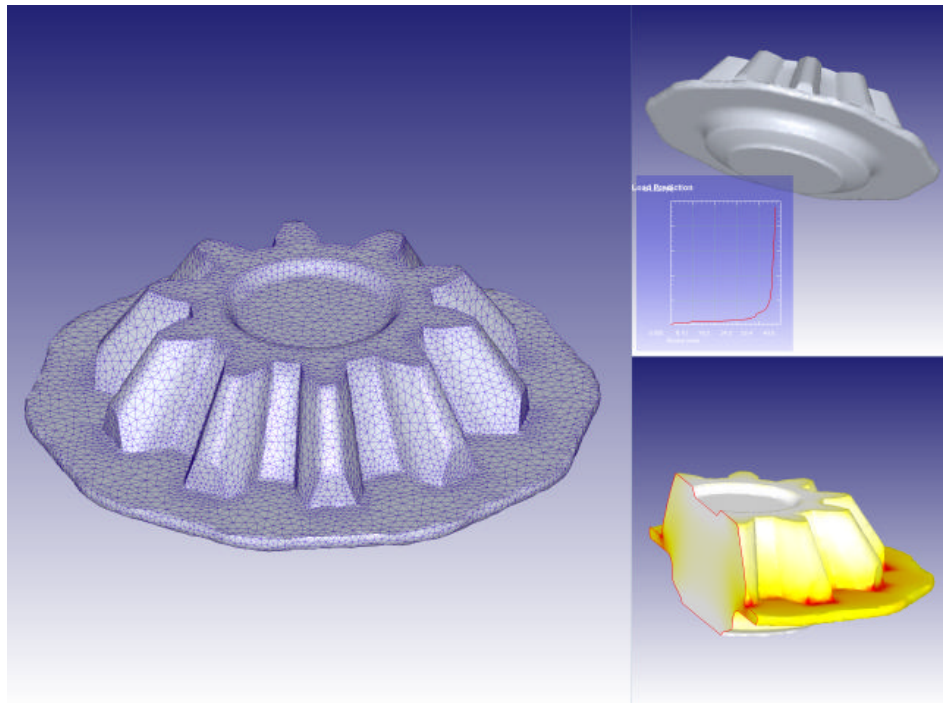


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DEFORM™-3D



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. 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.