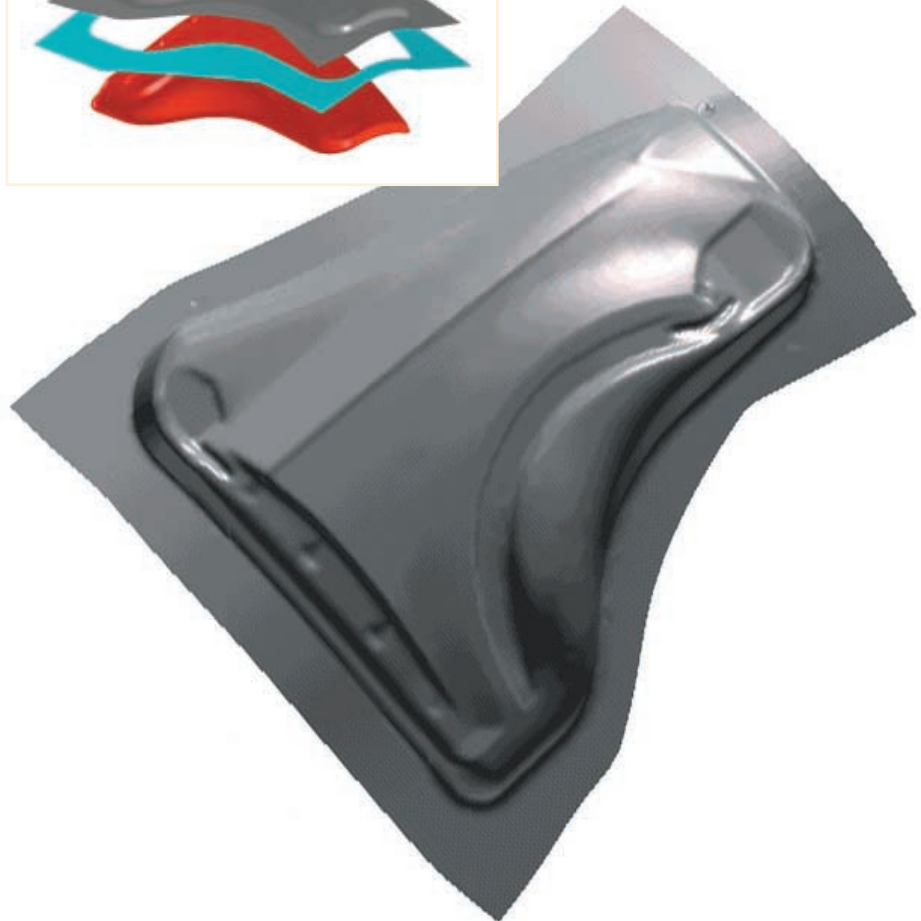# DYNA
MORE

DYNAFORM

STAMPING SIMULATION

FROM PART TO FINISH

STAMPING SIMULATION FROM PART TO FINISH

OVERVIEW

DYNAFORM drastically reduces the risk and costs associated with the tooling design and development cycle by predicting formability problems before tooling takes place. Flawed or marginal die designs that would cost innumerable hours of labour, press time and material to repair and correct are done on the computer at a fraction of the cost. By determing splitting, wrinkling, thinning, and springback effects that would occur during the stamping process before tooling is cut, timing concerns are eliminated while customer confidence and design confidence improve. DYNAFORM is a proven, cost-effective way to improve and insure your bottom-line.

DYNAFORM is efficient and easy to use. It includes a complete CAD interface capable of importing, modeling and analyzing, any die design. Available for PC, LINUX and UNIX, DYNAFORM couples affordable software with today's high-end, low-cost hardware for a complete and affordable metal forming solution.

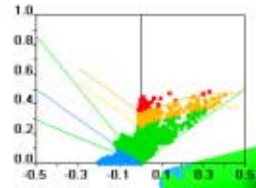## MODULES

DYNAFORM is organized into three major modules

* Formability Simulation Module (FS)
* Die Face Engineering Module (DFE)
* Die Structure Analysis Module (DSA)
* Modules can be licensed separately

APPLICATIONS

* Draw Die Simulation
* Progressive Die Simulation
* Transfer Die Simulation
* Binder Wrap Simulation
* Trim-line evaluation
* Blank Design
* Drawbead Design
* Binder Development
* Addendum Design
* Die Design
* Tonnage Prediction
* Springback
* Material Evaluation
* Hydroforming

DFE (DIE FACE ENGINEERING)

Utilizing a series of automated, surfaced-based tools such as reverse trimming functions, tipping, and binder and addendum generators, the DFE module guides the user from part design to die design within the DYNAFORM interface.

CAD Surface Based

All geometry created with the DFE module includes surfaces which are exportable for tooling reference. Surfaces generated are NURB quality.

Automated

Automated tipping, reverse trimming, draw depth, filleting, and unflanging functions minimize the work required to design the die from the part geometry. Binder and addendum tools are included to complete the geometry.

Binder and Addendum

The advanced addendum generator creates a series of profiles based on the size, depth, and material of the part between the binder and the die cavity. The profiles are then surfaced and meshed to create a complete addendum for forming. Profiles can be edited using an interactive graphic interface or by PO line morphing. Binders are generated based on part geometry and can be edited and morphed based on user input to meet design criteria.
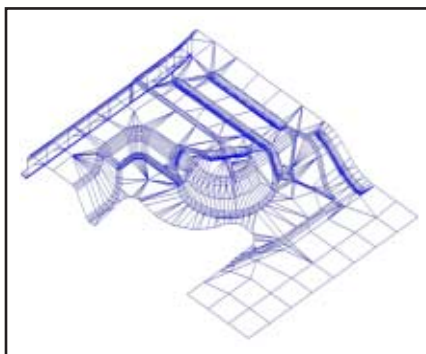
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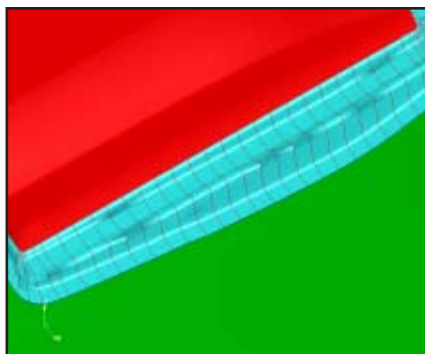
*Binder and Addendum Generation*
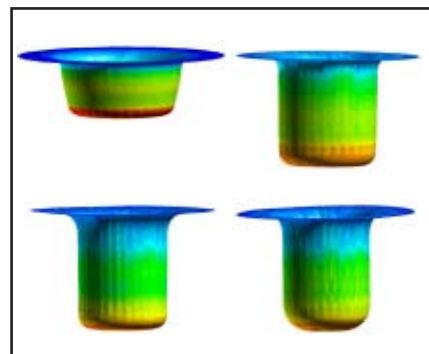
Progressive dies

Wrinkling

FORMABILITY SIMULATION

Utilizing technology developed and used by automotives' largest OEM's for the last 20 years, DYNAFORM is mature, easy to use and accurate. Formability simulation is now considered a "best practice" throughout the stamping industry. With today's extremely fast and cost-effective computers the technology is now more available than ever.
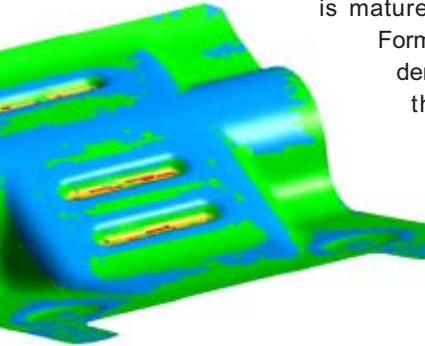
Rapid Die Development Cycle

By predicting design and formability problems before tooling takes place, try-out time has never been shorter. A few hours spent in simulation can save hundreds of hours on the floor.

Increased Confidence in Design

Formability simulation allows the designer to evaluate die designs that would be extremely costly to develop as hard tooling. This allows designers to experiment with alternative, cheaper designs; stations can be removed in a progressive or transfer die, alternate materials can be tried, blanks trimmed. For inexperienced designers, DYNAFORM catches potential design flaws before they hit the floor. For more experienced designers, DYNAFORM allows the freedom to try riskier, more complicated parts and unconventional designs that would take months to develop in a press.

Cost Reduction - Larger Margins

Quicker development cycles mean leaner production. DYNAFORM allows both. Not only does it predict costly mistakes before they hit the floor, DYNAFORM frees up valuable resources such as press time, personnel, and materials.

PROCESS GUIDANCE

Model setup is now faster and easier than ever before. At the heart of the process guidance approach is the "QuickSetup" interface. After meshing the model surfaces, the user selects the type of simulation and the quick setup interface graphically guides the user through the automated setup. Each component of the model is graphically represented and it's definition is color coded so the user knows what has been defined (green) and what remains to be defined (red). After selecting the model components (die, binder, drawbeads, blank), all travel curves and mating components are automatically generated and can be previewed in motion. Submission for analysis is done directly from the Quick Setup menu.
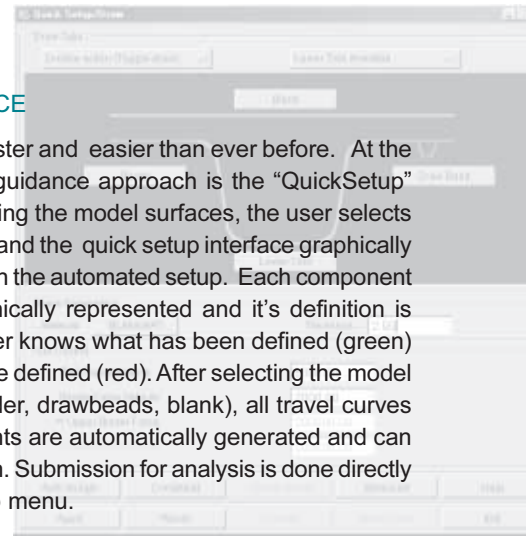
Direct CAD Interface

In addition to IGES translation, DYNAFORM has a direct CAD interface to support the most popular CAD packages. The interface uses the native graphic library to import and export geometry data.
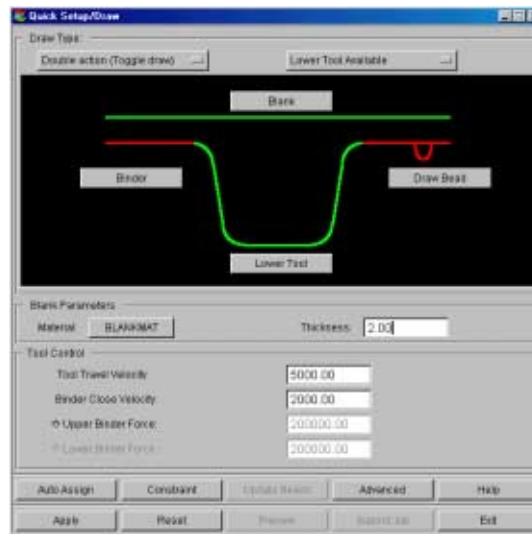
- Gravity Load
- Draw Die
  - Crash Form
  - Inverted Draw (Single Action)
  - Toggle Draw (Double Action)
  - Four Piece Draw (Double Action)
- Springback
- Springback Compensation
- Hydroforming
- Hemming and Flanging
- Multiple Stage Tooling
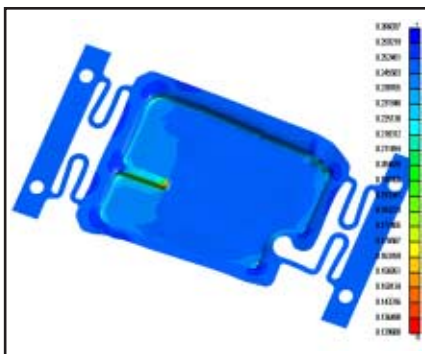
Thinning Maps
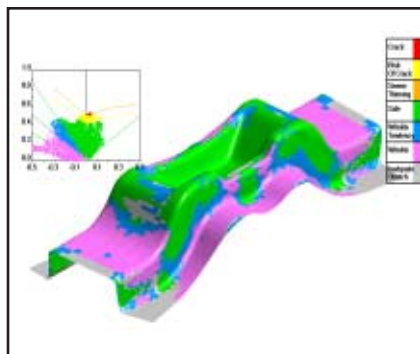
Forming Limit Diagram

Blank Size Estimation

STAMPING SIMULATION FROM PART TO FINISH

DFE

Die design tools for part design feasibility study; the Die Face Engineering (DFE) module delivers die designs from only part geometry within the DYNAFORM interface.

FORMABILITY

With hundreds of thousands of stamping simulations run, DYNAFORM's formability simulation (FS) module is the most accurate die analysis solution available today. Able to predict forming problems such as cracking, wrinkling, thinning, springback, etc. before tooling takes place.

DSA

DYNAFORM's Die Structure Analysis (DSA) module predicts die structural intregrity using fatigue analysis. The durability of the die can be analyzed and an overall lifetime predicted for a quantity of parts.
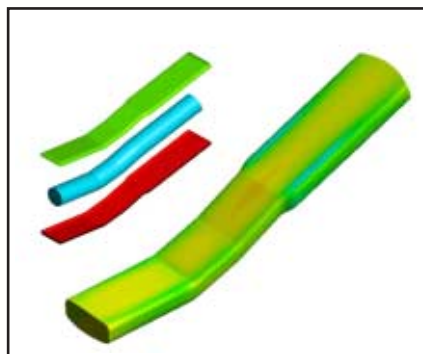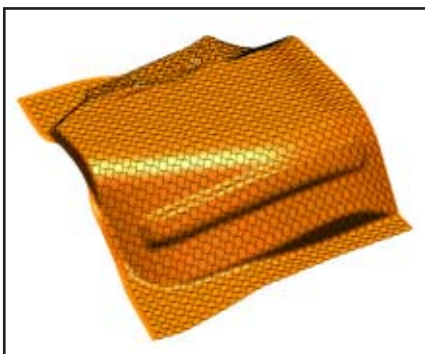
LS-DYNA

LS-DYNA is the unique dual solver analysis engine of DYNAFORM. Integrated in the DYNAFORM interface, LS-DYNA is capable of implicit and explicit solutions for a complete forming analysis.
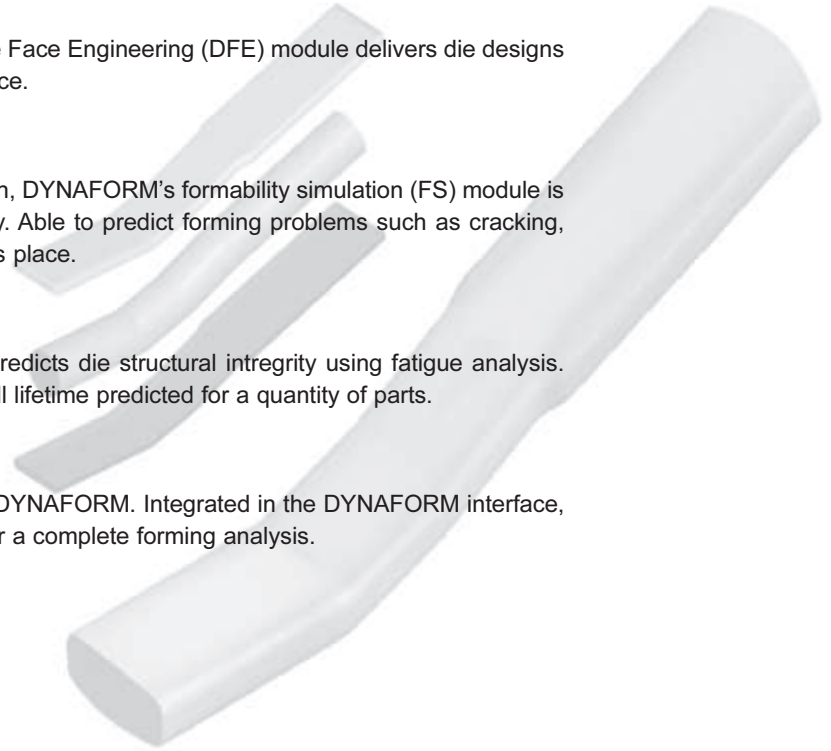
Circle Grid Analysis   *Hydroforming*   *Drawbead Design*