

Uncover Design Flaws

The logo consists of five red dots of varying sizes arranged in a semi-circular pattern to the left of the text.

DYNAFORM^{eta/}[®]

DYNAFORM allows engineers to accurately simulate metal stamping to predict formability issues, validate die design and improve manufacturing efficiency reducing product development time and increasing profitability.

Bypass Soft Tooling

DYNIFORM is a complete *die system simulation solution*. It allows organizations to entirely bypass soft tooling, reducing overall tryout time, lowering costs, increasing productivity and providing complete confidence in die

system design. It also allows evaluation of alternative and unconventional designs and materials for an optimal solution.

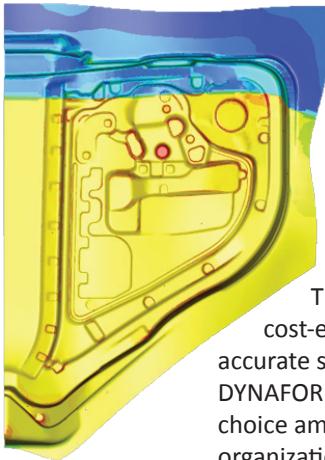
The most cost-effective and accurate solution available, DYNIFORM is the clear choice among progressive organizations seeking to streamline the die analysis system.

DYNIFORM encompasses the entire die system process in one simple interface. By simulating every detail during the design stage, DYNIFORM ensures the highest quality formed part and best manufacturing process.

The system guides the engineer through cost estimation, quoting, die evaluation and formability analysis. Then in a virtual environment, moves the part through the stamping process inside the plant—station by station.

Modules:

- Blank Size Engineering (BSE)
- Formability Simulation (FS)
- Die Evaluation (D-Eval)
- Die System Analysis (DSA)
- Optimization Platform (OP)



Blank, Nest & Generate Quotes

BSE is a complete solution for accurately estimating blank size along with blank nesting for maximum utilization, minimum scrap and piece costs. This powerful module allows the user to predict thinning, thickening, thickness strain, major principal strain, minor principal strain, strain tensor & generate a forming limit diagram (FLD).

The streamlined BSE procedure enables the user to operate easily and perform part design.

BSE is now enhanced with nesting optimization to review all nesting possibilities and to maximize material utilization. BSE also offers enhanced FLD & thickness & thinning contour reporting capabilities.

File Importing

- IGES, VDA, DXF, STL, ACIS, LINE DATA, CATIA, NX, PRO-E, STEP, NASTRAN, DYNA, DYNAIN, ABAQUS

Part Preparation

- Separates top & bottom surfaces of solid-model parts
- Automatically generates middle surface
- Fixes/fills surface gaps & holes
- Automatically meshes

Blank Development

- Blank size estimates (accurately predicts flat blank profiles)
- Supports tailor welded blanks & double attached parts

Nesting

- Supports outline development, editing & deletion
- Optimal 1-up, 2-up, 2-pair, mirror & multiple blank nesting

Forming Analysis

- Generates a forming limit diagram (FLD)
- Predicts thickness, thinning, thickening & strain

Report Generation

- Cost estimation reports (maximum material utilization & product piece cost)
- Formability reports (thickness, thinning & FLD)



Blank Model

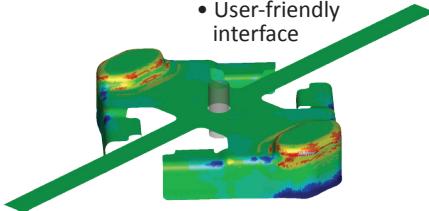
Uncover Design Flaws & Optimize Designs

This powerful module facilitates the rapid development & validation of both single-station and progressive die designs. FS helps to uncover hidden problem areas and enables designers to optimize designs based on accurate LS-DYNA based forming results.

FS is now enhanced with **optimization**. Engineers can go beyond identifying problem areas by using optimization to improve product design.

Features

- Quick & easy set-up
- Multiple tools & multi-station progressive die simulations
- User-friendly interface



Thickness Map

Material Library

- Standard material types
- Mild, high strength & stainless steel materials
- New dual phase steel, aluminum & metallic alloys

Functions

- Superplastic forming, Hot Forming, Hydroforming & Roller Hemming capabilities
- Springback Analysis & Springback Compensation
- Tube Bending for multi-stage rotary draw bending simulations

Usable Feedback Results

- Forming limit diagram (FLD)
- Predict splitting, thinning & wrinkling
- Springback compensation

New! FS Add-ons

- Trim Line Development
- Rotary Tube Bending
- Hot Forming
- Die Structure Cooling

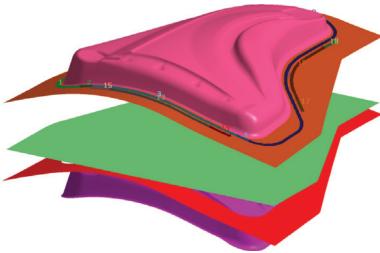
Analyze CAD Based Tooling

Since most tooling designs are done in a CAD environment, DYNAFORM's D-Eval Module was specially created to support and analyze CAD based tooling and engineering designs.

A Computer Aided Engineering (CAE) solution, the D-Eval module is tailored to support engineers in the early stages of the product design cycle. It allows engineers to take a part's manufacturability into consideration in the early stages of the design process, ahead of the tooling stage.

D-Eval Provides CAE Tools for "What If" Studies

- Tipping Adjustments
- Binder Generation & Modifications
- Morphing
- Drawbead Layout
- Line Bead & Geometry Bead Conversion
- Addendum Modifications
- Die Design Modifications
- CAM Trim Evaluation
- Trim Line Checks



D-Eval includes the INCSolver, which allows engineers to generate reliable formability results within a reasonable response time.

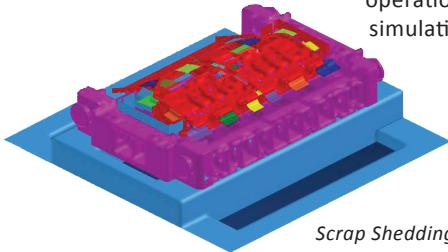
Die Evaluation

Analyze Die System Operations

The finite element approach to die system design is an efficient way to predict and resolve many stamping related concerns within the die production line. DSA simulations can help to streamline die system design from the analysis of scrap shedding and removal and die structural integrity, to sheet metal transferring and handling.

Scrap Shedding & Removal

- Streamline modeling for scrap, trim dies, chutes & trim steel
- Create trimming operations & shedding simulations



Scrap Shedding & Removal

Die Structural Integrity

- Simulate operational loads
- Generate FEA models of the die structure
- Define operational & stamping loads
- Evaluate die structure strength & durability
- Implicit & explicit solutions

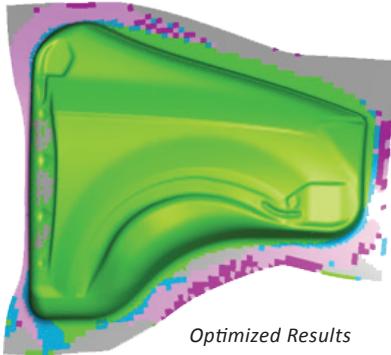
Sheet Metal Transferring & Handling

- Simulate metal transfer during manufacturing
- Simulate transfer to die station, between stations & placement of finished piece on shipping rack
- Predict interference between work-piece & tools
- Use stress/strain results to prevent damage during transportation, & during loading & unloading operations

DYNAFORM Enhanced with *Optimization*

Optimization of sheet metal forming is now possible using the DYNAFORM Optimization Platform Module (OP), which utilizes SHERPA, the optimization search engine developed by Red Cedar Technology.

For many years, DYNAFORM has been used by tooling engineers as a virtual tryout for metal stamping, but using OP, engineers can go beyond identifying problem areas and find design solutions.



Optimized Results

Using the optimization module, the engineer specifies the necessary constraints and then allows the computer to run many simulation iterations to search for and find the best possible solution.

The solution is able to optimize drawbead rates, identify the optimal values and update the database automatically.

Incorporating design optimization improves performance and quality by reducing wrinkling, thinning and tearing. It also streamlines die design, improves product performance, improves manufacturing efficiency and reduces overall costs.



Engineering Technology Associates, Inc. (ETA), the developer of DYNAFORM, has been a leading engineering services supplier to the global automotive industry for over three decades. ETA's expertise in the areas of vehicle durability, NVH, metal forming, crashworthiness, occupant safety and product design have provided in-depth knowledge of the challenges & needs of the product development engineer. For more information, please visit www.eta.com.



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