

5.8

Die System Simulation Solution

Modules:

Blank Size Engineering {BSE}
Blank, Nest & Generate Quotes

Die Face Engineering {DFE}
Die Design Made Easy

Formability Simulation {FS}
Complete Virtual Tool Shop

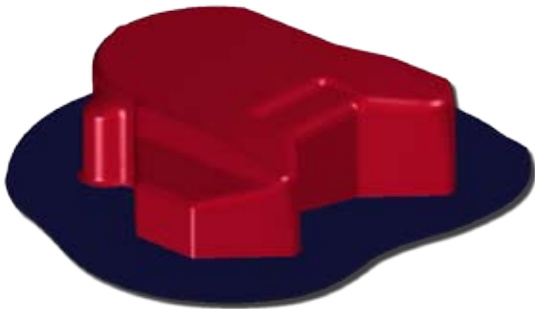
Die System Analysis {DSA}
Analyze Die System Operations



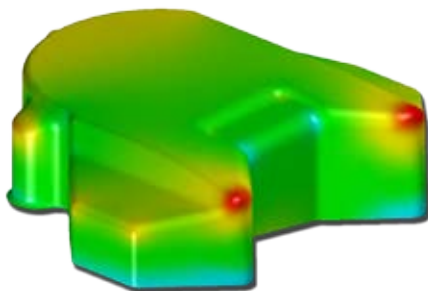
DYNAFORM

Blank, Nest & Generate Quotes

BSE is a complete solution for accurately estimating blank size along with blank nesting for maximum material usage, scrap and piece price. This powerful module allows the user to predict thinning, thickening & generates a forming limit diagram (FLD).



Blank Development



Finite Element Analysis

File Importing

- Import IGES, DXF and NAS formats
- Translators for CATIA, NX, PRO-E, STEP

Part Preparation

- Split top and bottom of the part
- Automatically generate the middle surface
- Fix & fill surface gaps & holes

Auto Tipping

- Automatically determine the best forming position
- Examine undercut conditions
- Measure draw depth

Blank Development

- Accurately predict flat blank profiles
- Linear bends & material stretch are considered

Nesting

- Optimal 1-out, 2-out and multiple blank nesting
- Material usage, fall-off & piece price calculations

Finite Element Analysis (FEA)

- NEW: *BSE Preparation* toolset provides a host of new geometry & mesh tools
- Generate a forming limit diagram (FLD)
- Predict deformation, thinning, thickening & strain

Report Generation

- Generate cost estimation reports for new tooling
- Maximize material utilization
- Determine product piece price

BSE

Blank Size Engineering

Die Face Modification Toolset

- **NEW:** *Functional Tool Preparation* for streamlined surface & mesh data modification
- Revise unworkable angles
- Finish incomplete geometry for forming
- Display draw depth & undercut
- Automatically tip part from design to die position
- **NEW:** *Element Morph* function to generate morphed elements within defined regional shapes by adding control curves/points
- Line, surface & mesh morphing available
- Easily manipulate PO lines, reverse trimming, addendum designs & binders
- **NEW:** *Embossment* function
- **NEW:** *Curve Editor* function allows the user to create & edit spline curve, rectangle, circle/ellipse & sector regions

Binder/Addendum Generation

- Generate binders automatically or manually
- Edit & morph binders to meet design criteria
- Create profiles based on size, depth & material
- Surface/mesh profiles to create an addendum
- Interactive graphic profile editing
- Punch opening (PO) line morphing

NEW: INC Solver

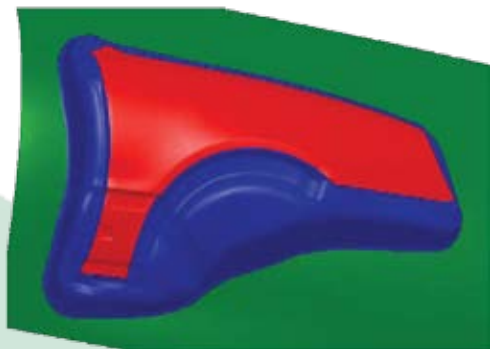
- Supports rapid die face design
- Analyze formability concerns

Surface Exporting

- Export die surfaces to a CAD/CAM system



Binder Design



Addendum Design

Die Design Made Easy

A complete die face engineering package, this module is used to create the tooling design, including binder and addendum, from the part geometry. DFE features a set of automated tools such as reverse trimming, part-tipping, binder and addendum generators to guide the engineer.

Complete Virtual Tool Shop

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 forming results.

Automatic Set-up

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

Customizable Material Library

- Large selection of standard material types
- Mild, high strength & stainless steel materials
- New dual phase steel, aluminum & metallic alloys

Functions

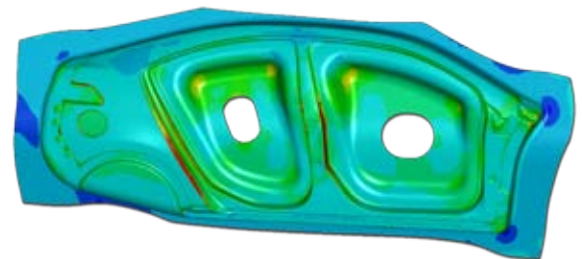
- *Stoning* to detect minor surface imperfections, measure size of severe wrinkling
- **NEW:** *Tube Bending* to perform multi-stage rotary draw bending simulations
- **NEW:** *Roller Hemming* to allow hemming of separate blank mesh geometries
- **NEW:** *Blank Generator* to create and prepare initial blank geometry & edit blank mesh
- **NEW:** *Tool Preparation* toolset to create & modify line/surface geometry & generate/modify mesh

Accurate Solver

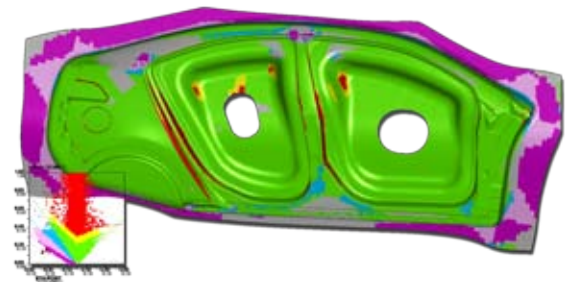
- Uses the accurate LS-DYNA® solver

Usable Feedback Results

- Output a forming limit diagram (FLD)
- Predict splitting, thinning & wrinkling
- Determine springback compensation



Thickness Plot



Forming Limit Diagram

Formability Simulation

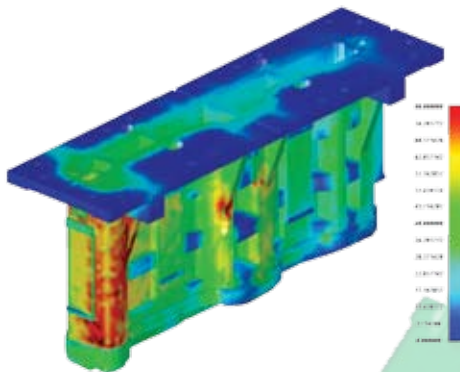
FS

DSA

Die System Analysis



Scrap Shedding



Die Structural Integrity

Scrap Shedding & Removal

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

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 the transfer of metal as it progresses through the manufacturing process
- Simulate transfer of the work-piece to initial die station, between stations, pick-up of the finished part & placement on the shipping rack
- Predict interference between work-piece & tools
- Use stress/strain results to prevent damage during transportation, & during loading & unloading operations

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.



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