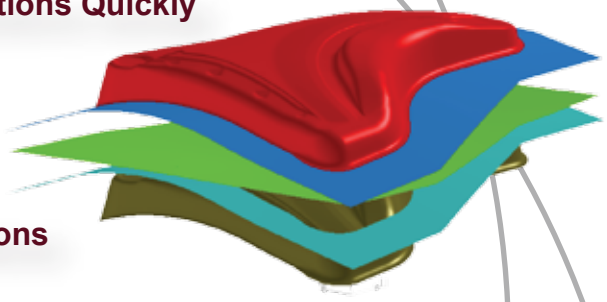
# eta/DYNAFORM version 5.7

## DIE SYSTEM SIMULATION SOLUTION

## eta/DYNAFORM 5.7 MODULES

- **BSE** – Blank, Nest & Process Quotations Quickly
- **DFE** – Die Design Made Easy
- **FS** – Complete Virtual Tool Shop
- **DSA** – Analyze Die System Operations



**Streamlined Pre-Processor Functions**
- 30 New or Enhanced Functions!
- Select Element & Surface Function
- Enhanced Split Surface Function
- New Label Dimension Function
- New Contact Check
- Free Format into Material Library
- Enhanced Tool Mesher

**Improved Blank Size Engineering**
- 8 New / Enhanced Functions!
- Enhanced Model Display
- New Quick Unfold Function
- New Batch BSE Function
- New Batch MSTEP Function

**Enhanced Die Face Engineering**
- 14 New / Enhanced Features!
- New SideStep Function
- New Fillet Mesh Function
- New Double Fill Function
- New Addendum Shape Transition Functions

**Powerful AutoSetup**
- 26 New / Enhanced Features!
- Quick & Easy Set-up
- Over 50 New Materials

**New Post-Processor Features**
- 11 New / Improved Features!
- Enhanced Edge Movement Function
- Enhanced Curve Copy/Paste Function
- New Tonnage Prediction Function

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## DIE SYSTEM SIMULATION SOLUTION

# BLANK SIZE ENGINEERING

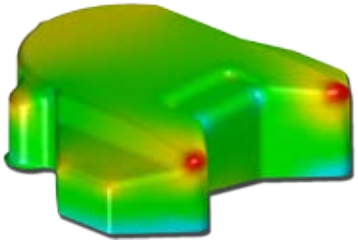
Blank, nest and process quotations from 3D part geometry in minutes. BSE is a complete solution for accurately estimating blank size along with blank nesting for maximum material usage, scrap and piece price. BSE includes a very accurate FEA solver, which predicts thinning, thickening & generates a forming limit diagram (FLD).

BLANKING

### FILE IMPORT
- Import IGES, DXF and NAS formats.
- Optional translators for CATIA, NX, PRO-E, STEP.

### PART PREPARATION
- Split top and bottom of the part to show material from both inside and outside.
- Automatically generate the middle surface, fix & fill surface gaps & holes.

### AUTO TIPPING
- Automatically determines the best forming position (manual tip also available).
- Indicates undercut conditions & measures depth of draw.

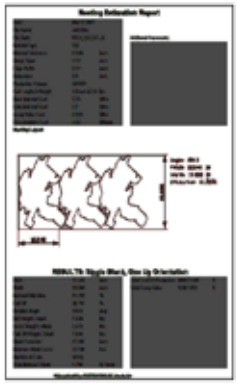


SIMULATION

### BLANK DEVELOPMENT
- Accurate prediction of flat blank profiles from 3-D part geometry.
- Blank predictions consider both linear bends & material stretch.

### NESTING
- Provides optimal 1-out, 2-out and multiple blank nesting.
- Includes material usage, fall-off & piece prices calculations.

### FINITE ELEMENT ANALYSIS (FEA)
- Calculate forming conditions in seconds & generate a forming limit diagram (FLD).
- Calculate deformation, % thinning, % thickening, major & minor strain.



REPORT

### PRESSURE PADS / BINDERS / DRAWBEADS
- Feasibility study includes pressure pads, binders and drawbeads.

### REPORT GENERATOR
- Automatically generate cost estimation & quotation reports for new tooling.
- Output overall blank size, nesting configuration, coil width & pitch.
- Maximize material utilization & determine product piece price.

# New in 5.7

- **New!** Quick Unfold function.
- **New!** Batch BSE function.
- **New!** Batch MSTEP function.

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## DIE SYSTEM SIMULATION SOLUTION

# DIE FACE ENGINEERING

DFE makes die design easy. A complete die face engineering package, it 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.

### FILLET
- Quickly change unworkable angles to a user defined radius in the part geometry.

### REVERSE TRIMMING
- Finish incomplete part geometry for forming.

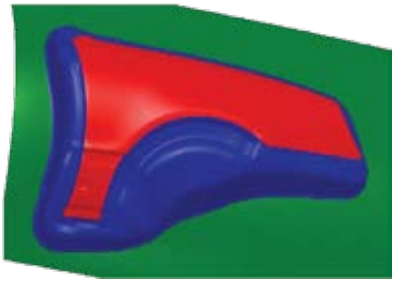
### DRAW DEPTH / UNDERCUT
- Graphically display draw depth & undercut for a part.

### TIPPING
- Automatically move the part from the design position to the die position.

**Binder Design**

### BINDER GENERATOR
- Generate binders automatically or manually based on part geometry.
- Binders can be edited & morphed to meet design criteria.

### ADDENDUM GENERATOR
- Generate a series of profiles based on size, depth & material.
- Profiles are surfaced and meshed to create an addendum.
- Profiles can be edited using an interactive graphic profile editing interface or by punch opening (PO) line morphing.



**Addendum Design**

### MORPHING
- Line morphing, surface morphing & mesh morphing available
- Easily manipulate PO lines, reverse trimming, addendum designs & binders.

### SURFACE EXPORT
- Easily export die surfaces to a CAD/CAM system.

# New in 5.7

- **New!** SideStep function.
- **New!** Double Attach Tipping function.
- **New!** Fillet Mesh function.
- **New!** Double Fill function.
- **New!** Die Trim function.
- **New!** Addendum Control Profile function.
- **New!** Addendum Shape Transition Functions


**Surface Export**

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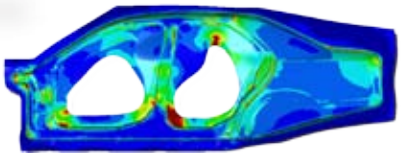
## DIE SYSTEM SIMULATION SOLUTION

# FORMABILITY SIMULATION

FS is a complete virtual tool shop, incorporating a system of simulation modules to facilitate the rapid development & validation of both single-station and progressive die designs. A proven tool for uncovering hidden problem areas, this module enables designers to optimize designs based on accurate forming results.

### NEW AUTOMATIC SETUP

- Quick & easy set-up.
- Supports multiple tools & multi-station progressive die simulations.
- User-friendly interface with little or no knowledge of FEA required.



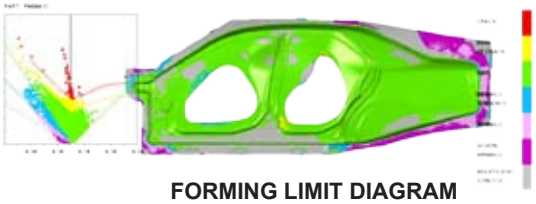
THINNING PLOT

### MATERIAL LIBRARY

- Bundled library contains a large selection of standard material types.
- Selections include many mild, high strength & stainless steel materials.
- Also includes new dual phase steel, aluminum and other metallic alloys.
- Library can be customized to meet specific needs.

### ACCURATE SOLVER

- Includes the powerful & accurate LS-DYNA® solver.



FORMING LIMIT DIAGRAM

### USABLE FEEDBACK RESULTS

- Output a forming limit diagram (FLD)
- Determine areas of splitting, thinning, potential wrinkling & spring back compensation.

### STONING FUNCTION

- Detect minor surface imperfections on class “A” surfaces.
- Measure depth, length & size of severe wrinkling.

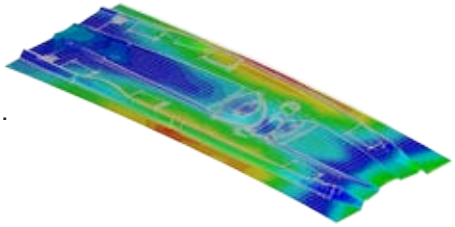
### SIMULATING A DIE WITH PILOT PIN

- Simulate part surface changes around a fixed pilot pin in a progressive die.

MULTIPLE STATION SET-UP

# New in 5.7

- **New!** Function to easily select anisotropy axis of material.
- **New!** Supports symmetry in tube for Hydroforming.
- **New!** Automatic calculation of adaptive frequency from tool travel distance.
- **New!** Time scale factor to scale thermal material parameters.
- **New!** Function to view and edit parametric velocity load curves.
- **New!** 50 additional steel & aluminum materials available.



STONING FUNCTION

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## DIE SYSTEM SIMULATION SOLUTION

# DIE SYSTEM ANALYSIS

DSA offers an LS-DYNA™ based FEA solution to analyze die system operations including scrap shedding/removal, die structural integrity and sheet metal transferring/handling. Further development will include trimming, flanging and hemming operations.

### Scrap Shedding & Removal (SHR)

- Streamlines model generation for scrap, trim dies, chutes & trim steel.
- Trimming operations and shedding simulations can be easily created in the scrap shedding graphic interface.

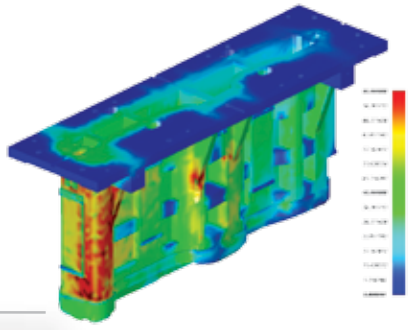
Scrap Shedding

### Die Structural Integrity (DSI)

- Simulate operational loads to analyze die design integrity.
- Generate FEA models of the die structure.
- Define operational & stamping loads.
- Evaluate die structure strength & durability through implicit & explicit solutions.

### Sheet Metal Transferring & Handling (SMTH)

- 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 the work-piece & tools from simulated part deformation.
- Use stress/strain results to prevent damage during transportation, as well as during loading and unloading operations.



Die Structural Integrity

Sheet Metal Transferring & Handling

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