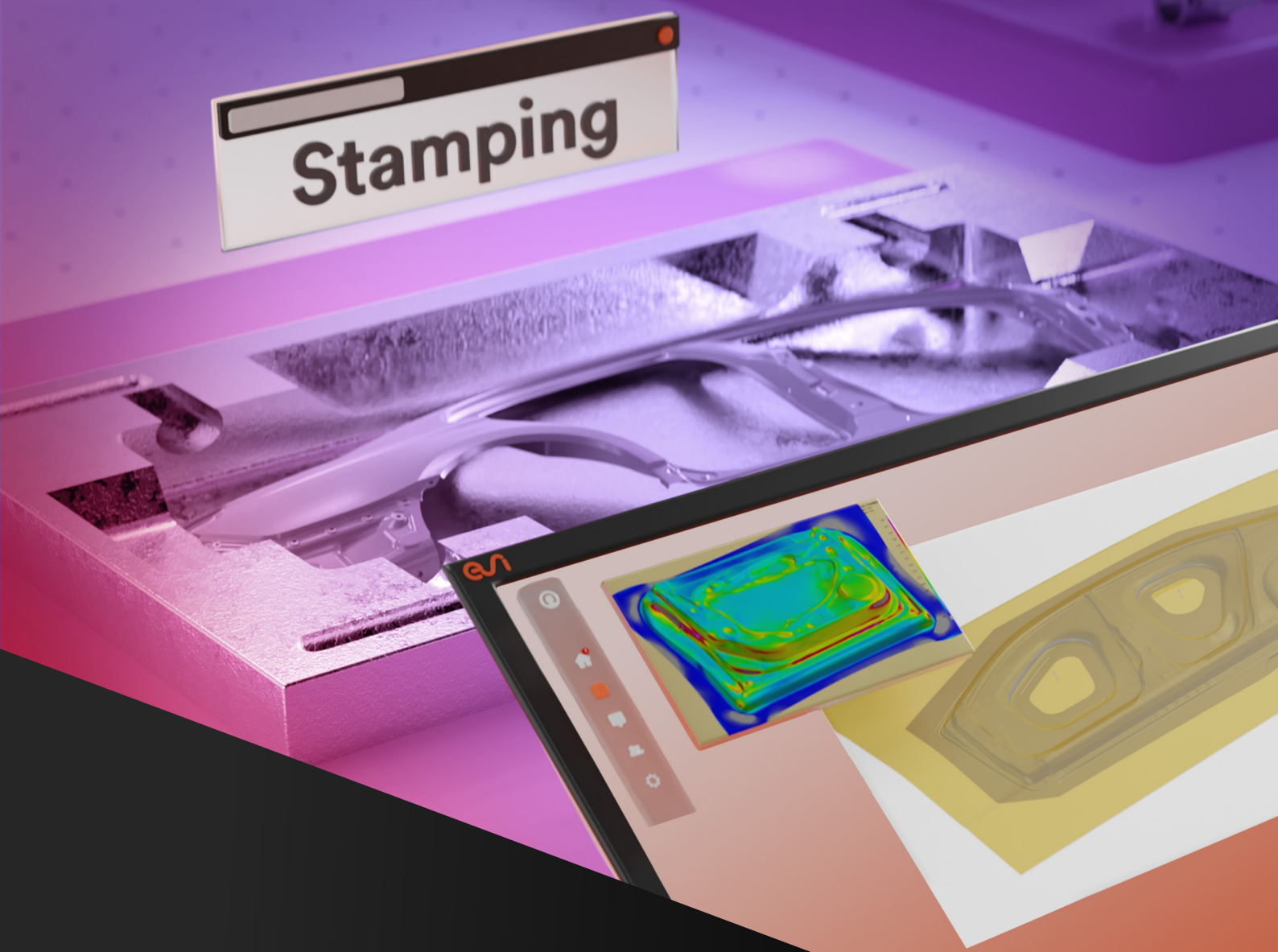

Achieve Superior Quality Stampings in Body & Chassis Manufacturing

Ensuring Defect-Free Sheet Metal Formed Components

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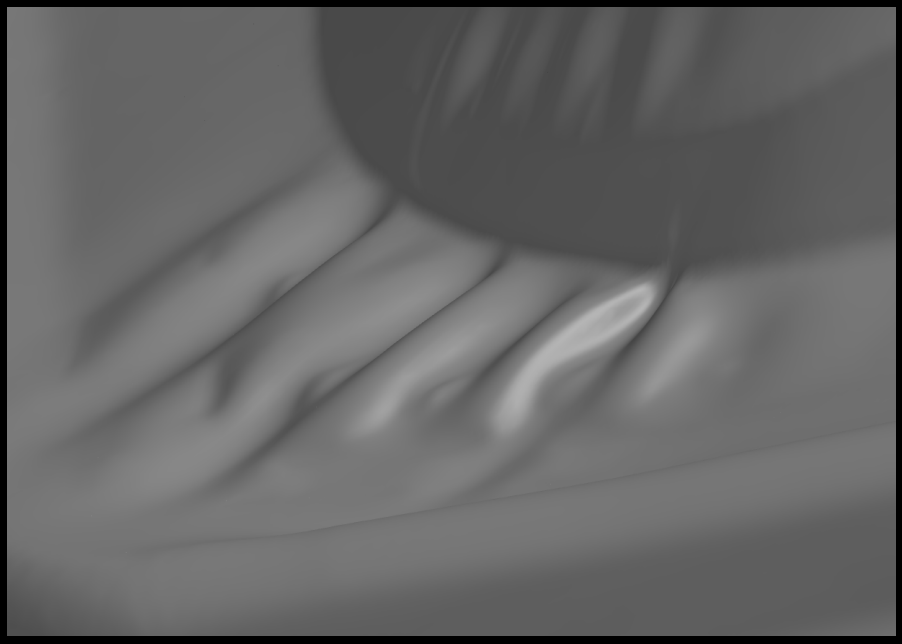
Virtual Manufacturing Solutions | Brochure



Achieving high quality components without defects in **sheet metal stamping** processes is paramount.

Precision in simulation ensures that each component meets stringent quality standards, essential for not only maintaining structural integrity and performance, but for flawless assembly as well. Defects such as cracks, wrinkles and out-of-tolerances can lead to costly rework, material waste, and ultimate delays in production.

Learn more

Transforming Stamping with Simulation: Master Time, Quality, and Cost Challenges

In today's diverse material and design landscape, simulation empowers stamping process engineers to manage Time/Quality/Cost tradeoffs by identifying manufacturing difficulties early, reducing the need for physical prototypes.

Providing a comprehensive solution for validating the main commonly used automotive sheet metal forming processes,

ESI's Stamping Simulation environment allows to **predict, control, and optimize** part manufacturability, geometrical distortions, and cosmetic surface quality.

Virtually evaluate forming defects, predict and compensate for springback in high-strength steels and aluminum, and assess advanced processes like press hardening of boron steel.

This allows for unlimited virtual try-outs of tool designs, material selections, and process settings to engineer the optimal process route.

Assure production capability of parts, sub-assemblies, and assemblies for all sheet metal parts, simple to complex, conventional steel to advanced lightweight sheet metals.

Comparison of simulated bodyside to reference geometry

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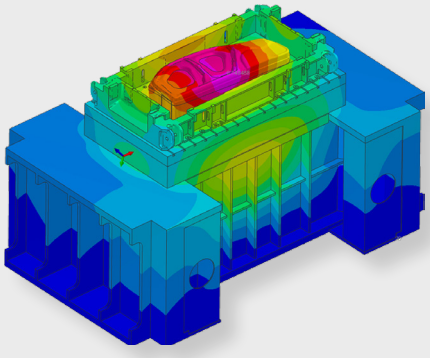
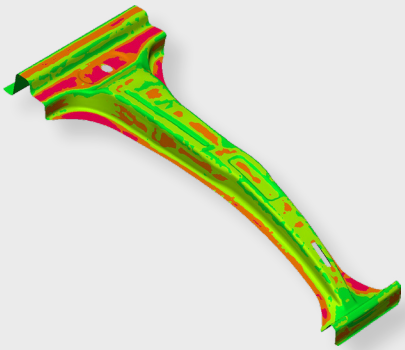
Key Applications

Validate the final part quality by applying full stamping process validation for hot and cold formed sheet metals.



Minimize material utilization and waste.

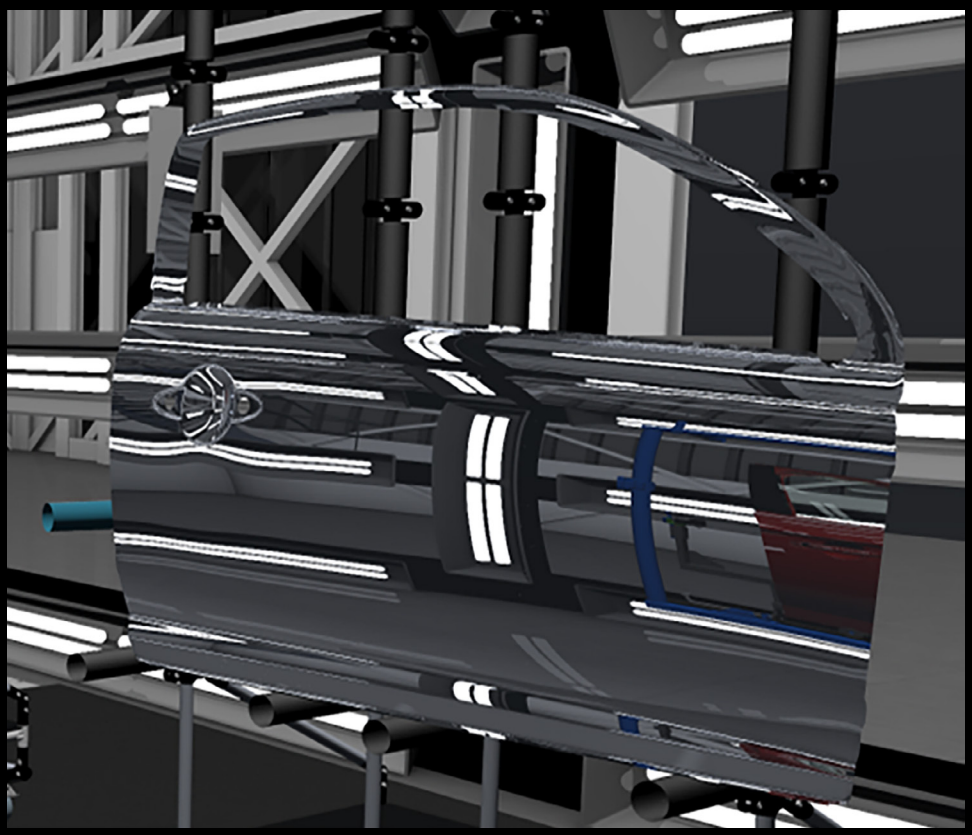


Evaluate and eliminate surface defects by using a virtual light room environment.

During the stamping process, include elastic tool and press deformations for large parts and high strength steel components.

Predict, control and compensate springback (in single or multiple operations).

Determine accurately the minimum required press force to ensure part can be manufactured on a selected press.



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Unlock the Power of Precision:
Key Values of ESI Stamping Simulation Software

Guarantee Manufacturability: Ensure design intent can be achieved without manufacturing or cosmetic issues through highest **predictive confidence**.

Reduce Cost and Time in Physical Try-Out: Validate the stamping process by predicting and **eliminating formability issues** (e.g. cracks, wrinkles), compensating for springback and ensuring required cosmetic surface quality before any physical tool is milled, leading to reduced number of physical iteration loops. As a result, a minimal amount of physical prototypes will be required with the accompanying reduction of material waste.

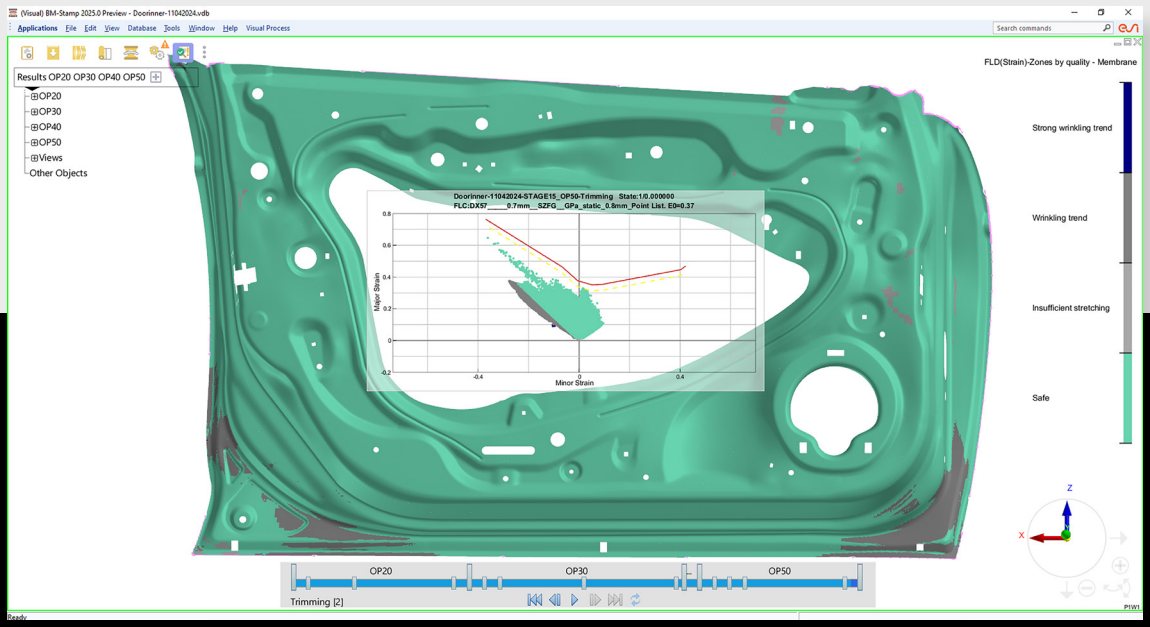
Minimize Material Cost: Through **accurate blank outline prediction**, the initial blank size can be minimized, resulting in huge cost saving possibilities for high volume production parts.

Increase Innovation Power: Experience **unlimited virtual try-outs** and test new materials and processes to find the optimal and most robust process route.

Minimize Time Between Try-Out and Production: Ensure upfront the **required part quality** for selected press line(s), through including the specific behavior (elastic deformations) of the selected tool & press combinations.

Obtain Highest Aesthetical Quality: Use dedicated contours for the detection of possible surface defects and conduct **shopfloor-like analysis in a virtual lightroom** to realistically assess location, size and severity of identified defects.

Get Trained in an Hour and Become Productive in One Day: Engineers of all experience levels can achieve highest predictive outcomes, thanks to a completely redesigned graphical interface with **process-oriented workflow** guiding the user safely through the process setup, while the 100% CAD-based process setup eliminates the need for meshing experts.



Ensure Dimensional Specifications: Accurately predict, control and compensate for part springback to **maintain tight tolerances**.

Reduce the need for physical prototypes, manufacture tools correctly the first time, and deliver parts within required tolerances and with highest quality, all with shorter lead times and lower costs.

Discover how ESI's Stamping Simulation software (BM-Stamp) can help optimize stamping processes.

Stamping Simulation Software:

Learn more

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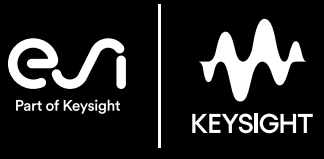

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Keysight is an S&P 500 company delivering market-leading design, emulation, and test solutions to help engineers develop and deploy faster, with less risk, throughout the entire product lifecycle.

For further information, go to: www.esi-group.com