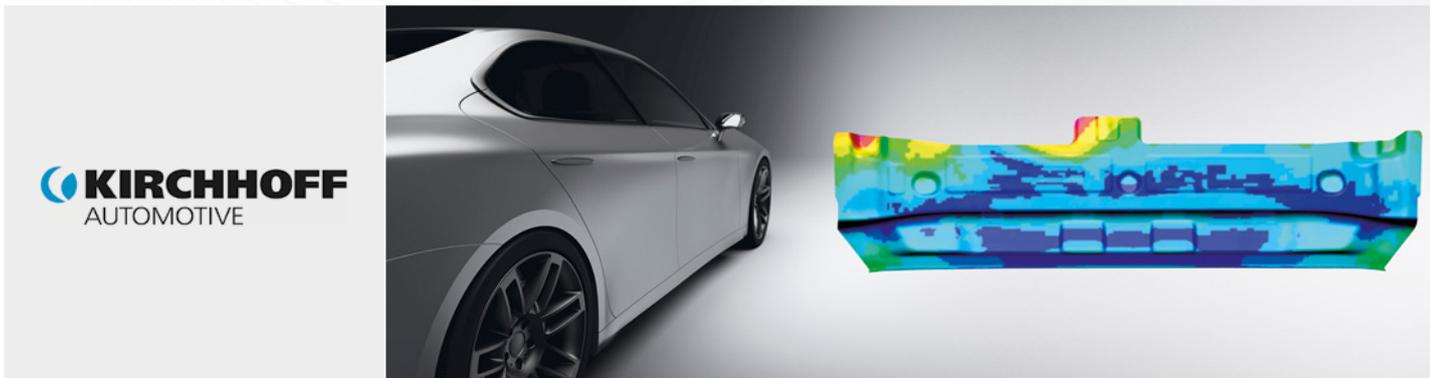


Combating Springback with Virtual Prototyping Makes Cutting-Edge Materials Possible for Kirchhoff Polska



Challenge

New, lighter materials not only bring great advances and better products, but also new problematics. For Kirchhoff Polska, the use of ultra-high strength steel (UHSS) for their parts created a springback issue that caused them to rethink how they designed and validated their die design and forming process.

Benefits

Paweł Bałon, a Kirchhoff Polska Senior Tooling Designer & Simulation Engineer, states: "The most important thing to us is accuracy of simulation". With the use of simulation software, specifically ESI PAM-STAMP, that is exactly what they got. Dies and forming processes could be designed right the first time and in a shorter time than ever before.

Story

In the ever-changing automotive world, the one thing that never seems to change is the pressure suppliers and OEM's are under to build lighter vehicles in shorter timeframes. Responding to the need to reduce weight, the automotive industry is making increasing use of ultra-high strength steels (UHSS). These offer a lightweight option to traditional steels and can thereby contribute to reduced CO₂ emissions.

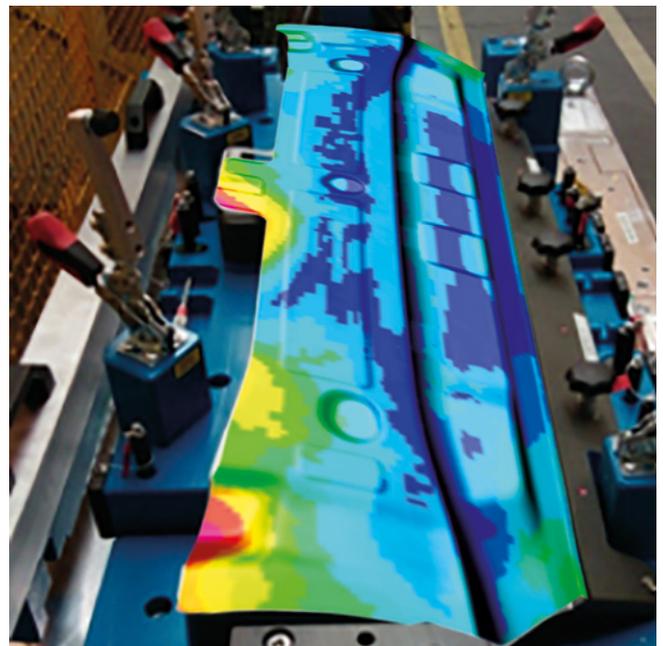
It comes as no surprise that great new products bring new challenges. For UHSS, the main challenge is the springback that occurs after forming and trimming operations – a phenomenon with which Kirchhoff Polska became all too familiar. Historically, the company designed tooling using physical trial and error and relied on their designers' experience. Facing the challenge of UHSS, they recognized this approach was not sustainable and that it was necessary to turn to virtual prototyping to address the problematics and arrive at the correct parts.

"The PAM-STAMP software has allowed us to reduce the time of reducing the springing effect several times compared to the current trial and error method. The compensation process determines the relaxed surface of the tool, which minimizes the costs associated with additional structural changes and additional machining"

Paweł Bałon, Ph.D
Senior Tooling Designer & Simulation Engineer
Kirchhoff Polska

Kirchhoff Polska began using ESI PAM-STAMP for their tooling design and forming processes. With models of the stamping process, they were able to predict the springback of the blank after each press cycle and automatically correct the tool's surface to compensate. They were quickly able to refine tooling design and avoid delay until start of production. Parts could be stamped without cracks and wrinkles and be produced on the assigned press line within tolerance specifications. The number of physical try-outs was drastically reduced.

The team at Kirchhoff Polska found PAM-STAMP beneficial not only in producing their part without flaws and within tolerances but also in exploring and predicting forming possibilities. They were able to achieve optimal and robust manufacturing processes and benefiting from process engineering. They were able to deliver parts in a shorter timeframe and with fewer resources than ever before.



Checking part on controlling devices on the shop floor.



for more information
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