

STAMPACK

FORMING SIMULATION

Case Study
Kölle GmbH

- Tool developers dare to tackle previously unsolvable tasks -

A photograph of a male worker in a blue polo shirt with the 'Kölle' logo, wearing safety glasses and gloves, operating a large industrial machine. The machine has several vertical metal rods and a large cylindrical component. The background shows a factory environment with yellow safety barriers and other machinery.

Welcome
To Kölle GmbH



Half-shell for thermal insulation of turbochargers. (Pictures: © Kölle GmbH/ Stampack GmbH)

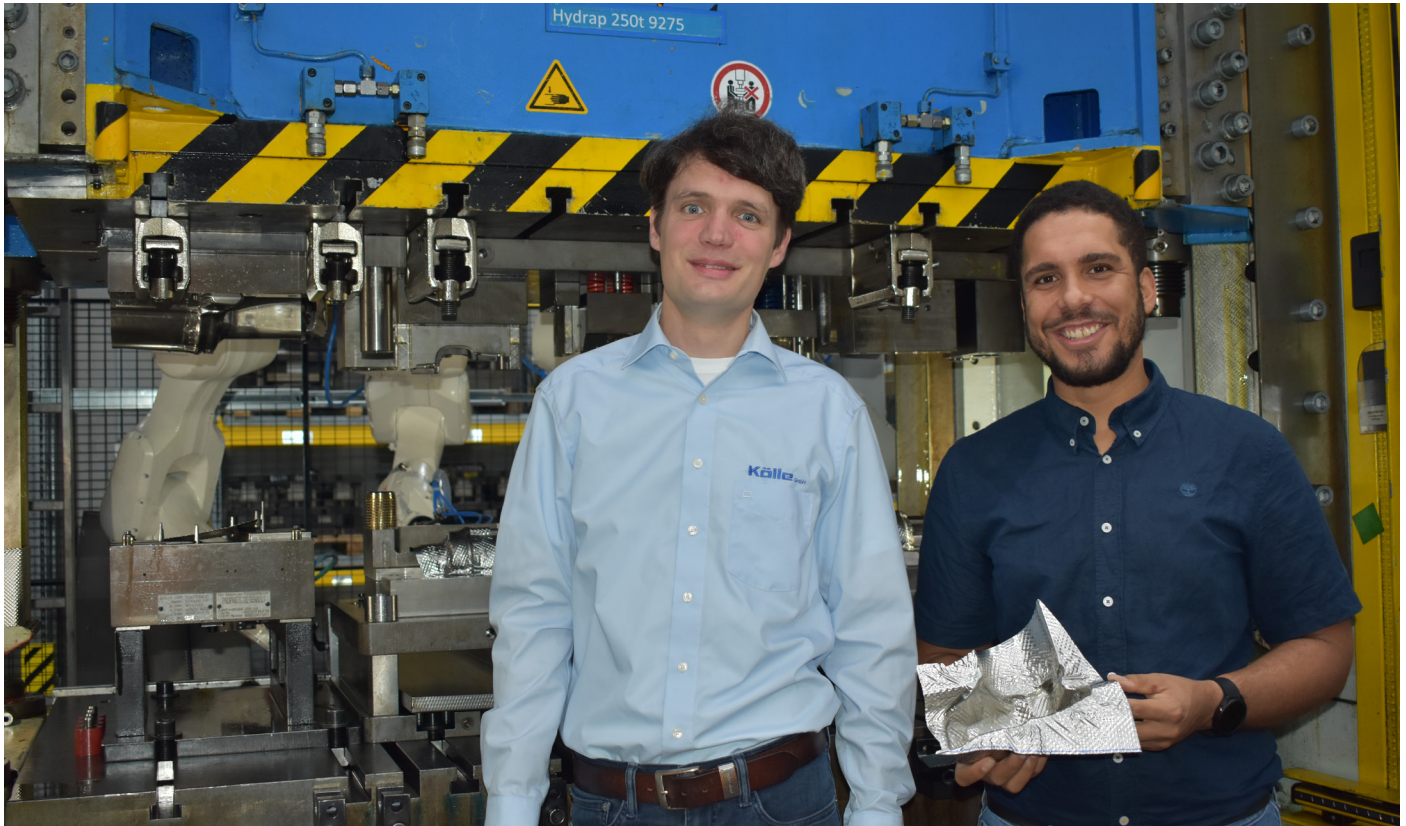
Economic efficiency is becoming increasingly important in the manufacturing of products. “With this in mind, we are forced to develop new concepts to propose new alternatives. At the same time, it is important to note that focusing only on profitability will lead to a dead end”, emphasises Pompeo Boccadamo, Technical Manager and authorised representative at Kölle. “This is because companies with well-trained employees who also use the latest machinery and software systems are more motivated. In addition, they have better conditions to work out favourable alternatives to counter confidently the suppliers from so called low-cost countries.”

At Kölle GmbH Werkzeugbau und Stanzerei, the training and further education of employees is a top priority. Particularly as qualified junior staff is secured with in-company training. Because a good in-company training secures the future demand for skilled workers. However, Stampack Xpress, an advanced and productive simulation software for all kinds of metal forming is known as a modern yet easy-to-use software system. The highlights of Stampack Xpress include the combination of shell solver technology for results in just a few minutes with the highly accurate 3D volume solver, but also springback and his compensation calculation as well as the tolerance check, which is used inside stampack to check if parts are in tolerance or not. Due to the strengths of the volume solver in forming thick sheets and and material compaction, Stampack Xpress is also particularly suitable for the calculation and simulation of progressive die processes.

Stampack is important for Kölle since 2016. After all, the range of services offered by the 140 employees at the Vaihingen/Enz site covers the entire process chain from enquiry, project planning, development/design, toolmaking up to initial sampling and series production over the entire product life cycle. The area of metal parts for thermal and acoustic insulation (structured thin sheets for thermal shielding) has grown strongly in recent years. The parts usually consist of 0.1-0.3 mm thick stainless steel foil (1.4541, 1.4828, ...). The assessment of formability was based almost exclusively on the empirical values of individual employees and the findings from the finished milled series and, ideally, prototype tools. However, with strong growth in enquiries and projects, shortened development times and many changes of CAD models, assessment by experienced staff is not always sufficient.

“Instead, it should be more independent of individuals to alleviate this bottleneck. This is exactly what Stampack Xpress forming simulation enables us to do”, explains Andreas Donath, head of the design department. “However, Stampack Xpress also enable our experts to dare to tackle previously seemingly unsolvable tasks. It should also be taken into account that many customers are increasingly demanding a simulation/feasibility analysis.”

Stampack Xpress provides a variety of valuable services for Kölle GmbH. For example in predicting cracks and wrinkling of structured thin sheets (calotte sheets) which are used for heat shields. Or to find solutions or process development in a few loops for critical forming operations. In these applications, metal forming simulation not only convinces with quick conclusions for the manufacturability evaluation, but it also alleviates the existing bottleneck of experienced employees. In addition, Stampack Xpress scores with its ease of use, quickly created simulations and manageable costs compared to competitor software packages.



Stampack user since 2016: Andreas Donath - Head of Design Department and Julian Kleile - Tool Designer

Kölle GmbH

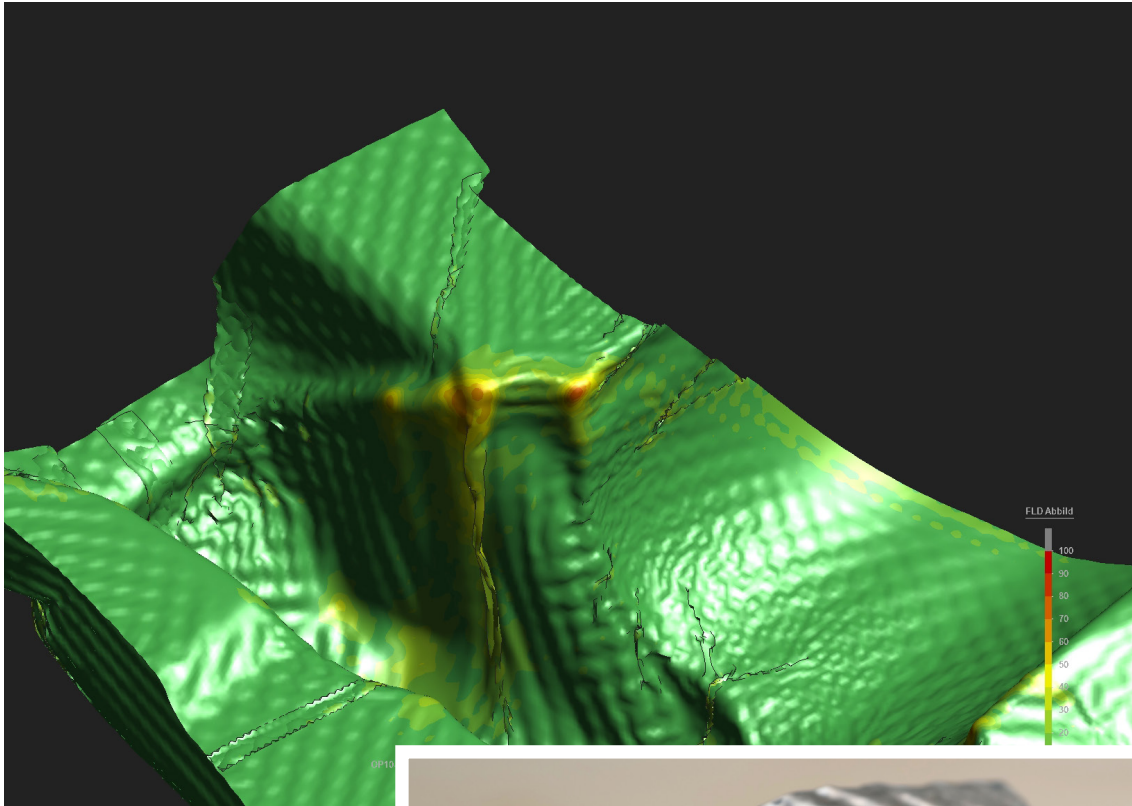
Kölle GmbH Werkzeugbau und Stanzerei manufactures high-quality stamping parts and the associated tools for customers in the automotive, electrical engineering, solar and construction industries. Founded in 1933, the owner-managed family business has many years of experience and expertise in stamping and forming technology, especially in progressive die technology and in stamping and crash forming.

Kölle's core products include stainless steel shells for insulation, support frames for seals, general stamping/bending parts, stampings for battery applications and the processing of extruded profiles. In addition, the Vaihingen/Enz-based company has become a partner in the field of e-mobility for housing parts as well as for cell connectors in various designs. For the adjacent processes, such as degreasing and assembly, Kölle additionally offers optimal solutions.

Stampack Xpress shows its strengths not least in heat shields. The reason for this are very thin calotte-coated sheets (with dimples) and severe wrinkling. Wrinklings are allowed at some places in the sheet metal and forbidden in many others.

The manufacturability and position of the wrinkles is finally assessed with the simulation. “No matter whether it’s cracks or wrinkles in ‘crash forming’ or in drawn,

bent and stamped parts - the hurdle to start a forming simulation has dropped significantly for our employees thanks to Stampack. And that represents a great benefit for us”, summarises Pompeo Boccadamo. “Stampack Xpress confirms the result of the selection process with several competitors. Exact prediction of the forming process with ‘easy-to-use’ handling by the designers.”



Wrinkle pattern and material stress of an embossed shell made of 1.4541 with a sheet thickness of $t = 0.15$ mm



Cracked shell due to unfavorable folds.