



Tauring Group drastically cuts development time by replacing trial and error with simulation

THE CHALLENGE

Bending of highly complex profiles in various materials has traditionally been done by trial and error. Not only is this testing process slow and expensive, but it has reached its limits, especially as demands for more complex parts increases.

With PAM-STAMP 2G, ESI's sheet metal forming simulation solution, Tauring Group has replaced "trial and error" with a method that reduces the part delivery times and hence stress for their customers.

THE BENEFITS

- Reduced time-to-market,
- Brand differentiation,
- Competitive edge,
- Improved customer satisfaction.

"Using FEM simulation allowed us to make a critical step towards process improvements and to strengthen Tauring Group's technology leadership on profile bending. PAM-STAMP 2G met project expectations. Moreover, ESI's skills and best practices were a major help in minimizing the learning curve and optimizing results."

Tommaso Beccuti,
Chief Operating Officer, Tauring SpA



Fig. 1: Reality vs. simulation with PAM-STAMP 2G on an extreme bending case. The simulation properly forecasted defects.

Tauring Group, producer of high tech bending machinery, specializes in the bending of complex profiles. Despite its extensive in-house experience and expertise, reaching the complex shapes requested by its customers became more and more challenging. The development time for new parts was increasing, and so were the costs.

Tauring Group was therefore looking for a way to improve its service for its customers by answering the most complex demands in a reasonable time at a lower direct cost.

By introducing Finite Element Method (FEM) simulation, the aim was to predict and simulate cold bending production processes, thereby minimizing the cost and time an empirical approach would require.

There was no doubt that FEM simulation could accelerate process

development, improve R&D know-how, and therefore improve the quality and reliability of Tauring's products and services. However, there was some hesitation due to the fact that FEM simulation is a scientific approach which relies on characterization of materials, kinematics and other data not always readily available to the customer.

The first test performed with FEM was on an extreme bending case. The real sample showed significant defects, and the test was to establish if these would also be visible in simulation.

The results of the test were very promising (Fig.1): defects were forecasted properly. Tauring decided to try a case where the objective was to use simulation to help eliminate problems virtually, before production start.

This part was a complex thin-walled aluminum profile (Fig.2). Freeform bending of such parts is normally critical, and can produce severe wrinkling in the final part. This was such a case.

Tauring used PAM-STAMP 2G, ESI's sheet metal forming simulation solution, to propose modified kinematics for the tools and the usage of compressed sand inside the profile cavities. Their engineers found the best combination of parameters with the help of simulation, and this new tooling and process setup finally led to a good quality part (Fig.2).

Project findings confirm the accuracy of simulation upon precise definition of scientific parameters, and a guaranteed significant cost reduction mainly on complex applications. For standard parts, where in-house expertise provides solutions by experience, gathering all the required data would be slower.

Therefore, it is essential to identify the applications for which FEM simulation makes

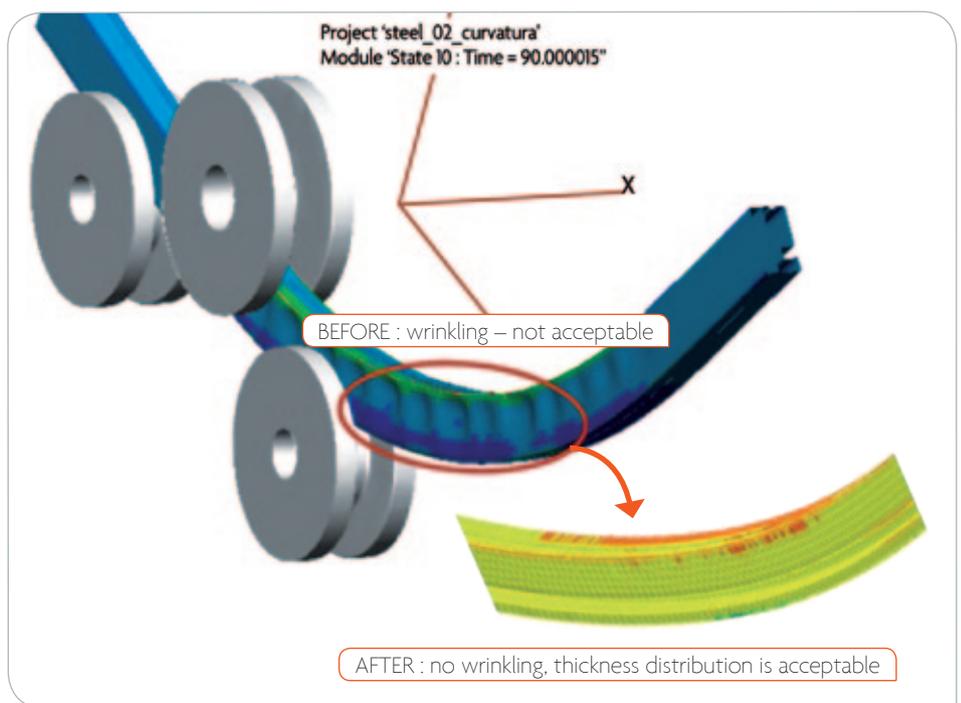


Fig. 2: Freeform bending of a complex aluminium profile.

sense, and the ones for which the traditional way of working is faster. FEM simulation becomes almost mandatory when it comes to mastering complex bending processes. It effectively extends the range of products that can be manufactured without defects, whilst saving time and money.

With that in mind, Tauring Group's commitment to excellence makes

FEM simulation with PAM-STAMP 2G a core competence and a pillar of continuous process and product improvement.

To find out more about ESI's Sheet Metal Forming Simulation Suite, please visit: www.esi-group.com/products/metal-forming

ABOUT TAURING GROUP

Tauring Group (www.tauringroup.com) is an SME whose parent company (Tauring SpA) was founded in the early 1950s and produces cold forming industrial machinery - Roll and Plate Bending. Tauring Group is a technology leader in profile, tube and pipe bending processes - consolidated through the union of Tauring, Roccia, and Saf brands. The group builds high-tech bending machines whose high degree of reliability, accuracy and ease of use provide customers with a high return in terms of quality and costs. Its wide range of products such as angle rolls and pipe bends as well as applications such as pipe and copper pipe benders, square tube bending machines..., together with its distributed sales and customer service networks, meet a wide range of technical and commercial needs.

ABOUT ESI GROUP

ESI is a pioneer and world-leading provider in Virtual Prototyping that takes into account the physics of materials. ESI boasts a unique know-how in Virtual Product Engineering, based on an integrated suite of coherent, industry-oriented applications. Addressing manufacturing industries, Virtual Product Engineering aims to replace physical prototypes by realistically simulating a product's behavior during testing, to fine-tune fabrication and assembly processes in accordance with desired product performance, and to evaluate the impact of product use under normal or accidental conditions. ESI's solutions fit into a single collaborative and open environment for End-to-End Virtual Prototyping. These solutions are delivered using the latest technologies, including immersive Virtual Reality, to bring products to life in 3D; helping customers make the right decisions throughout product development. The company employs about 900 high-level specialists worldwide covering more than 30 countries. ESI Group is listed in compartment C of NYSE Euronext Paris.



ESI Group Headquarters | 100-102 Avenue de Suffren | 75015 Paris | FRANCE | T. +33 (0)1 53 65 14 14 | F. +33 (0)1 53 65 14 12 | info@esi-group.com

All PAM- and SYS- product names as well as other products belonging to ESI's portfolio are tradenames or trademarks of ESI Group, except specified proprietary mention. All other trademarks are the property of their respective owners - Specifications are subject to change without notice.