

Courtesy of ThyssenKrupp Budd

PAM-TUBE 2G

The professional solution for tube bending and hydroforming

Key features

- CAD-import
- Fast strain predictions
- Automatic addendum design
- Weld line consideration for mass production
- Automatic bending curve
- Automatic tipping and split line
- Automatic bending and hydroforming tools creation
- CAD-export of tools
- Inverse and accurate bending simulation
- Ovalisation prediction
- Multi-stage bending and hydroforming simulations

PAM-TUBE 2G is a new product in the stamping simulation solution line, tailored made for tube bending and hydroforming processes. PAM-TUBE 2G easy-to-use user environment ensures time-saving process setup and tool design and helps the user handle the complexity of hydroforming processes.

Tube bending

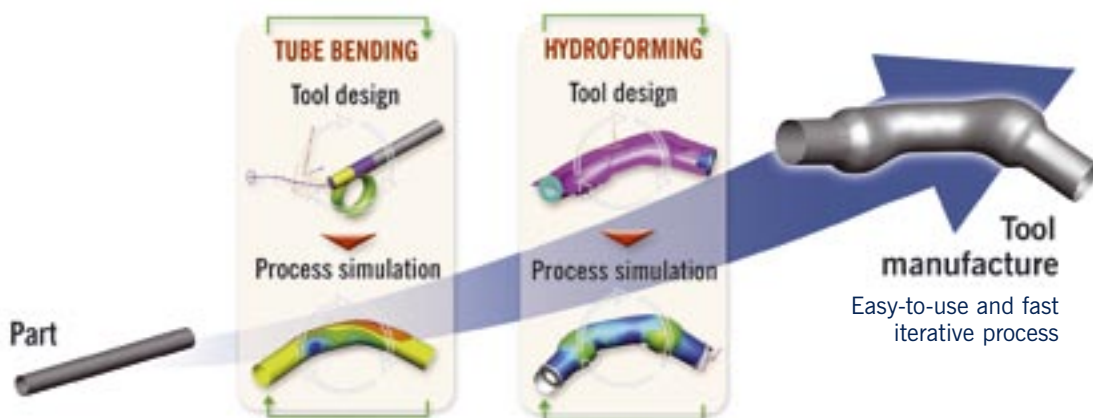
In response to market demand to form complex parts with small bend ratios, PAM-TUBE 2G offers accurate tube bending simulation with realistic tool modelling and behaviour for better forming results to avoid downstream problems.

Tube hydroforming

Hydroforming is an advanced forming technique that gives the possibility of forming complex parts and improving surface quality. Liquid Bulge Forming and High Pressure Techniques can be modelled separately or combined within PAM-TUBE 2G, covering the whole range of tube forming processes.

A single software package covers the full chain from import of the final part geometry via die and process design to validation of the bending and hydroforming process and CAD data export for tool manufacture.

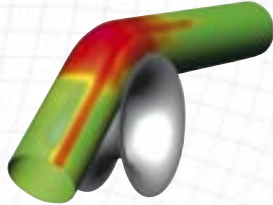
Sharing of models and process data between the modules allows the user to focus on the process rather than software issues.



PAM-TUBE 2G enables users to model tube bending and hydroforming processes to achieve predictive realistic simulation results.



Ovalisation prediction
In cooperation with the
University of Siegen / BU
Engineering



Weldline consideration
in tube bending

Design & process setup

The basic philosophy behind PAM-TUBE 2G is to offer a complete software package, where the user is guided through the design and setup of the process. This guidance does not restrict in any way the full flexibility offered. For instance, user defined cross sections are supported and both bending curve and addendum have full user flexibility in the shape and position.

Stamp toolkit

The stamp toolkit has been expanded to include multistage macro templates for tube bending and hydroforming. This innovative technology allows the user to predefine a set of macro templates for his/her most common processes.

Unique Solver performance

- New fast inverse solver for bending
- Accurate explicit solver for bending and hydroforming
- Multi-body system for realistic and accurate simulation of bending processes
- Annealing option
- Realistic modeling of hydroforming processes based on fluid cells
- Multi-stage bending and hydroforming processes
- Distributed parallel processing for bending

Inverse and explicit solvers

Bending tools

Hydroforming tools
and end pistons

Separating plane

Addendum generation

Strain estimation

Courtesy of hde Solutions GmbH

About ESI Group

ESI Group is a pioneer and world leading provider of digital simulation software for prototyping and manufacturing processes that take into account the physics of materials. ESI Group has developed an entire suite of coherent, industry-oriented applications to realistically simulate a product's behavior during testing, to fine tune the manufacturing processes in synergy with the desired product performance, and to evaluate the environment's impact on product usage. ESI Group's product portfolio, which has been industrially validated and combined in multi-trade value chains, represents a unique collaborative, virtual engineering solution, known as the Virtual Try-Out Space (VTOS), enabling a continuous improvement on the virtual prototype. By drastically reducing costs and development lead times, VTOS solutions offer major competitive advantages by progressively eliminating the need for physical prototypes.

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