

TUBE 2008
in Düsseldorf
March 31st - April 4th

data M: Software and
Hardware Solutions
for the Sheet Metal
Industry

Press Release

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at
TUBE 2008 Düsseldorf
Hall 6, Booth A18

Roll Form and Tube Mill Tooling – COPRA[®] FEA RF Software First presentation of Release “COPRA[®] FEA RF 2009”

At the Tube 2008 exhibition in Düsseldorf taking place from March 31st until April 4th, 2008 data M will present the new version of the Finite Element Simulation solution for the roll form process – **COPRA[®] FEA RF 2009**.

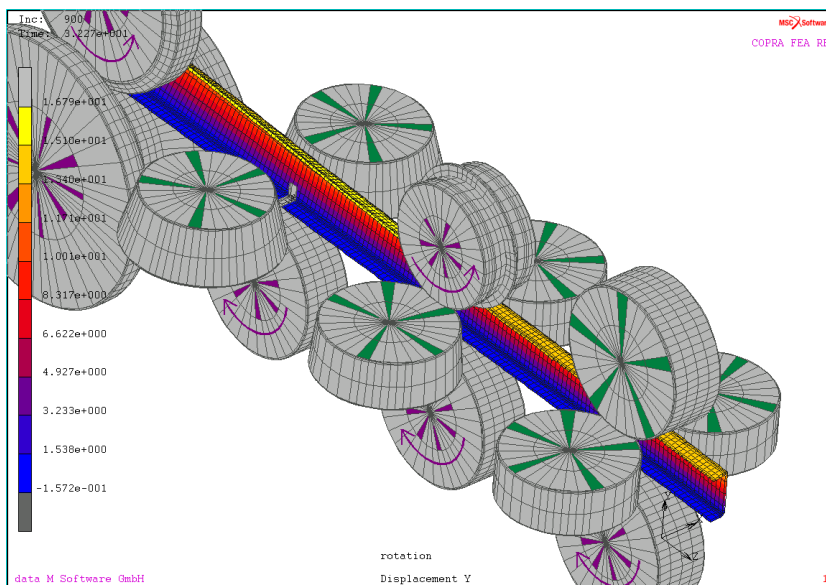
When doing the first steps of development in the middle of the Nineties of the last century we had some dreams what Simulation Technology could do one day. Today these dreams have come true. COPRA[®] FEA RF helps to understand the roll form process, trace for occurring problems and do a target- oriented optimisation. Of course also roll form technology is developing so that it is necessary to add new possibilities into the FEA software.

COPRA[®] RF 2009 comes with a new commercial package and a lot of additional possibilities for the simulation of roll formed tubes and sections.

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This new version has come closer to reality than any other simulation- or analysis software ever. However – not only the FE Analysis software but also our known design package COPRA® RF has got enhanced (see below). One example is the handling of cage forming methods and interfaces to 3D CAD/CAM Systems, Inventor and SolidWorks.



Picture 1: Figure of model with friction / rotating rolls including:

- driven rolls at specific rotational speed (purple arrowed)
- idler rotating rolls, driven by speed of the sheet (green striped)
- welding and deactivating of welding addition
- drawing die (with friction) for improved forming process

Model with driven stations

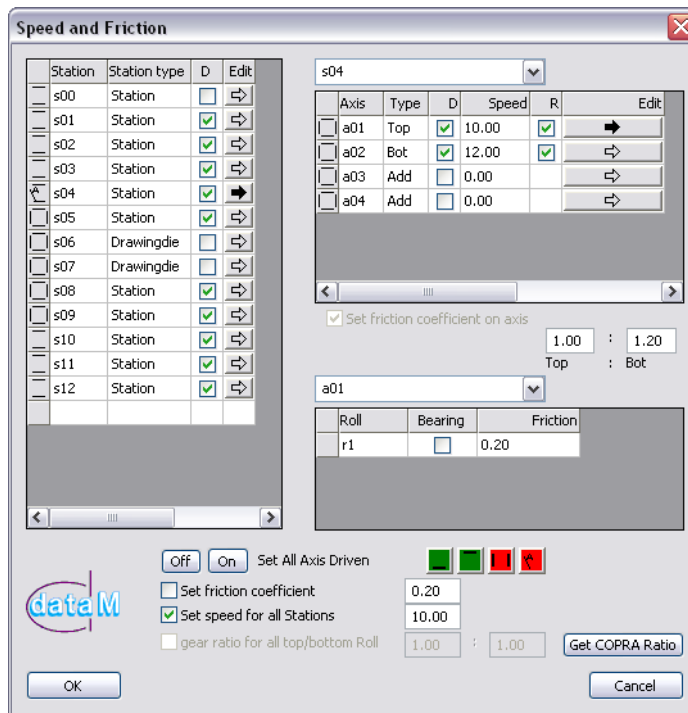
Up to version 2007 COPRA® FEA RF worked without friction and rolls were not rotating. This has advantages for the estimation of the quality of the design itself, but it did not take into account design elements like a step up of the root diameter, longitudinal elongation or hole deflection of the strip caused by different speeds. With COPRA® FEA RF 2009 it is now possible to automatically build an FEA model with rotating rolls and friction.

page 2

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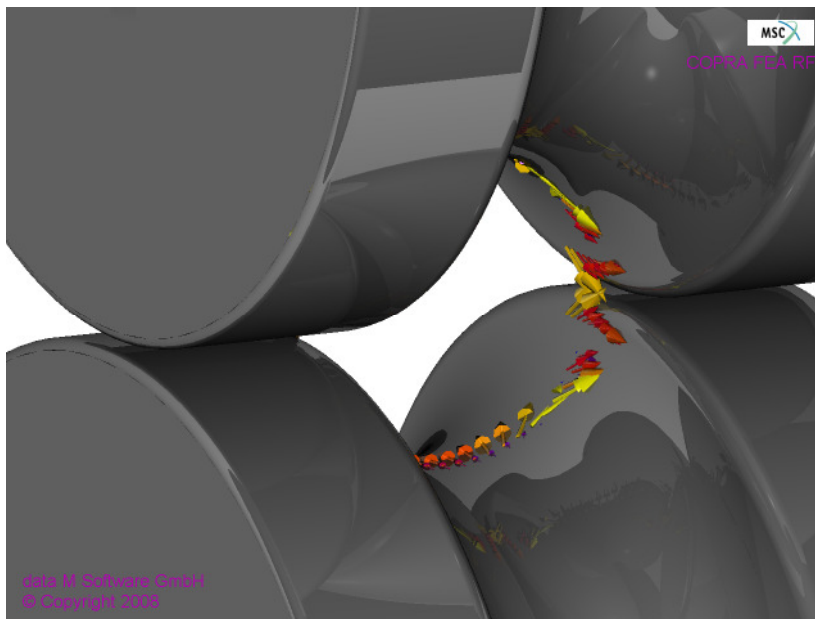
Picture 2: Comfortable input of the machine's speed settings: driven / non-driven axis, rotational speed for driven axis, gear ratio, frictional behaviour

- Comfortable input of the machine's speed settings: driven / non-driven axis, rotational speed for driven axis, gear ratio, frictional behaviour, etc
- Investigation of the elongation of the tube during forming and calibration e.g. due to step up of roll diameter
- Investigate difference in behaviour between driven top and bottom roll or bottom roll driven only
- Shows the pulling and or braking behaviour of driven stations. The simulation will show if the profile will "get stuck"
- Defects caused by e.g. different positions of the drive diameter will be made visible
- Check the braking behaviour of non-driven stations

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- Investigate the line speed as a function of the rotational speed and friction settings of the machine
- Investigate the rotational speed of the non-driven axis
- Investigate the driving torque of the driven axis
- Calculating a simulation with rotating rolls and friction is especially interesting for thin wall tubing where it can make a difference if one station is pushing too much and the continuous tension is not guaranteed over the complete line



Picture 3: Definition of transporting diameter by comparing forward and backward slip between rolls and profile

Display of forming forces

Comfortable investigation of distribution of pressure in e.g. breakdown or idler stations but especially also in the fin stations and calibration stations by the use of representing the contact pressure by arrows. Size, colour and direction of the arrow give information about roll pressure over the circumference of the tube.

page 4

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Improved welding process

The weld process can now also be calculated for unsymmetrical sections and using more than 1 processor. The unsymmetrical welding can also be calculated with or without taking into account the weld addition.

Extended restart possibilities

A restart is now possible during the simulation of the calibration stations (e.g. in round-to-shape) also when started from the round tube (so if the starting station of the original simulation was not the flat strip).

Alternatives for thin walled tubes

With COPRA[®] FEA RF 2009 the calculation time could be even more reduced compared to the current version – Interesting for extremely thin walled or long sheets.

Multi-processor ability

For COPRA[®] FEA RF 2009 two options for parallel processing are available. One is a parallel_2 license allowing calculating one job on 2 processors. This reduces calculation time by up to 40%. The second option is a parallel_4 license reducing the calculation time by up to 65%.

Extended export possibilities

IGES and DXF interface to export the results of a Simulation to e.g. Inventor or AutoCAD. Not only the 2D cross sections are exported, but the complete 3D deformed sheet.

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COPRA[®] RF Software – new features presented at Tube 2008

Cage Forming

The design of a cage can be done very easily, the results will also be automatically prepared for the simulation. Besides optimising the quality of the tube forming, the simulation helps to optimise e.g. downhill and cage-mill-settings.

SolidWorks Interface

Beneath the Inventor interface data M will also present an interface for SolidWorks. It allows to transfer a roll design directly into SolidWorks where it can be completed, e.g. with adding the stations, tool holders for accessory rolls or similar extra equipment.

Download of text and pictures at:

<http://www.datam.de/en/shows-press/press/08tube>

If you have any questions, please do not hesitate to contact:

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Reprint free of charge;
Author's copy kindly requested.

Valley, January 2008