

## Press Release

### **Kinematic Hardening Model in AutoForm<sup>plus</sup> – A New Level of Accuracy in Springback Simulation**

**Zurich, Switzerland, July 7, 2009: AutoForm Engineering GmbH, the leading supplier of software solutions for the sheet metal forming industry, has developed a new material model. This model is well suited for a wide spectrum of modern materials and is currently one of the best and most advanced material models. It enables AutoForm<sup>plus</sup> R1 users to achieve a new level of accuracy in springback simulation.**

In order to further improve springback simulation results, AutoForm has developed a new material model. This model enables the accurate description of material behavior at unloading, which is crucial for springback. It provides for both the softening of materials through the so-called Bauschinger effect, as well as the reduction of elasticity with increased strain. It is thus one of the most accurate material models currently available. An invaluable benefit is that it is completely compatible with current AutoForm material models, i.e. existing material data which is in widespread use can continue to be applied. With the addition of only four new parameters, the effects of kinematic hardening are taken into consideration. These parameters are not mathematically abstract values, but rather they have a comprehensible, clearly defined physical meaning. They can therefore simply be defined from, for example, tension-compression tests. On the other hand, should this work not be carried out, AutoForm offers default values per material group. This is possible since each of the parameters describes one independent physical effect. By using this kinematic hardening model, with practically no additional work, substantial improvements in accuracy can be achieved. The result is reliable springback compensation of the die faces aided by simulation, which in general significantly reduces the number of tryout loops.

Dr. Waldemar Kubli, CEO of AutoForm Engineering, stated: "We are glad that we can offer such a sophisticated model to our customers. However, the successful solution to springback problems requires not only an accurate springback simulation. What is just as important is an integrated geometry compensator as well as a springback robustness assessment, since only stable processes can be compensated. AutoForm, with its products AutoForm-Compensator and AutoForm-Sigma, is the only integrated software available on the market which can offer all the essential components to successfully tackle challenging springback problems."

**Springback:** *The introduction of new, state-of-the-art materials, such as ultra-high-strength steels and aluminum, which are increasingly being used to reduce the weight of vehicles, promotes the development of new material models that authentically describe their characteristics. Parts stamped from these materials are more affected by springback than those made from mild steels. Springback modifies the final shape of the part and increases manufacturing costs. Predicting the final geometry of a part after springback and designing appropriate tooling to compensate for springback continues to pose practical problems in the manufacturing industry.*

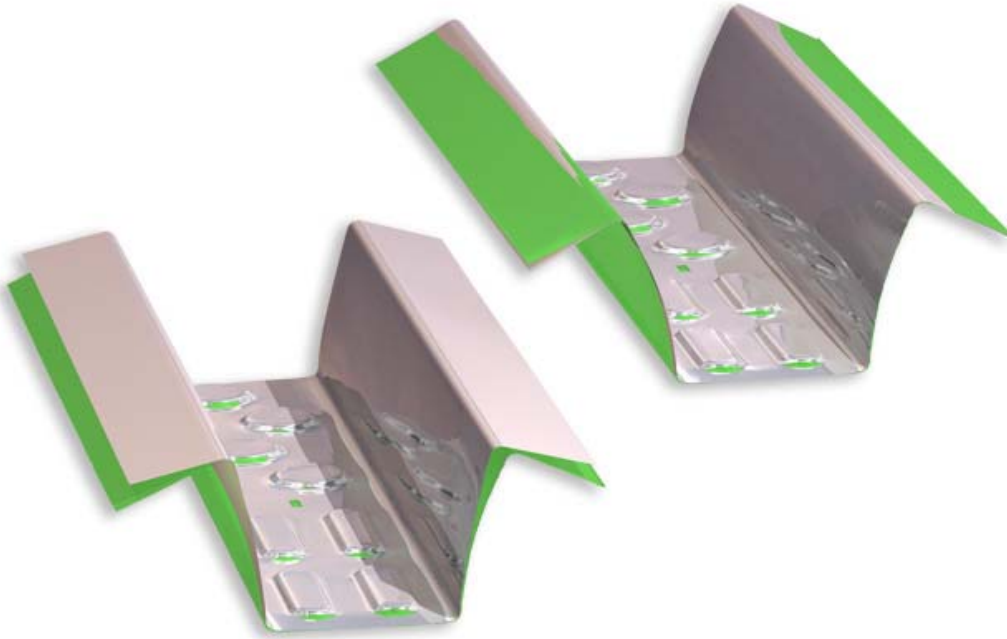
#### **About AutoForm Engineering GmbH**

*AutoForm offers software solutions for the die-making and sheet metal forming industries along the entire process chain. With over 200 employees, AutoForm is recognized as the leading provider of software for product manufacturability, tool and material cost calculation, die face design and virtual process optimization. All of the Top 20 automotive OEMs and most of their suppliers have selected AutoForm as their software of choice. Besides its headquarters in Zurich, AutoForm has offices in Germany, The Netherlands, France, Spain, Italy, USA, Mexico, India, China, Japan and Korea. AutoForm is also present through its agents in more than 15 other countries. For detailed information please visit: [www.autoform.com](http://www.autoform.com)*

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Springback: U-profile simulated without (left) and with (right) kinematic hardening model.

If you need a high resolution image, please contact us.