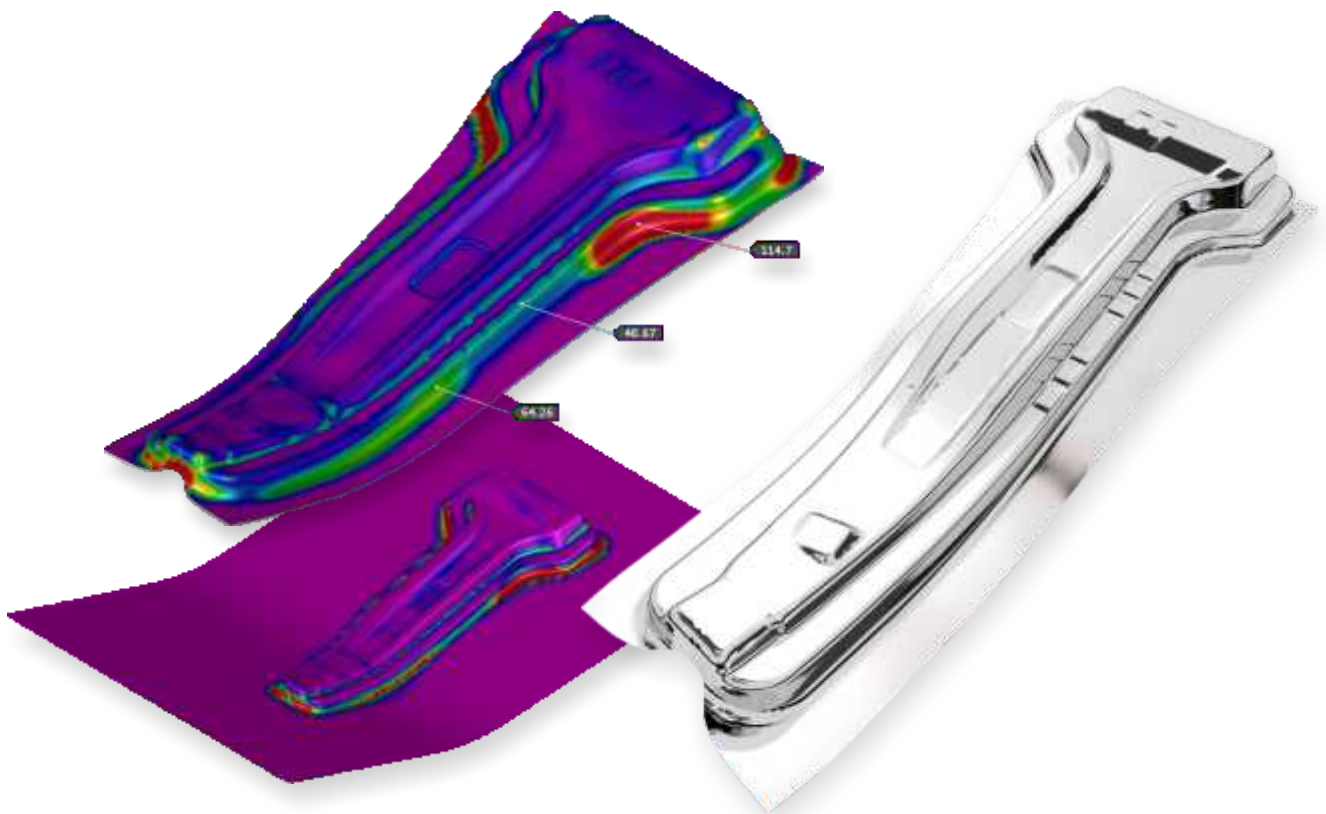# AutoForm-Thermo Plug-In

Software for Simulation of Thermal Effects in Sheet Metal Forming

- ▶ Rapid and accurate simulation of thermal effects in sheet metal forming processes (cold, warm and hot forming)
- ▶ Fully coupled thermo-mechanical simulations
- ▶ Simulation of quenching process for manganese-boron steels in combination with AutoForm-PhaseChange plug-in
- ▶ Temperature-dependent friction behavior in combination with TriboForm plug-in

AUTOFORM

Forming Reality

AutoForm-Thermo Plug-In

Thermal Effects in Cold, Warm and Hot Forming Simulations

AutoForm-Thermo plug-in is used in combination with AutoForm-FormingSolver to consider general thermal effects in cold, warm and hot forming simulations. By taking temperature into account, the accuracy of simulation results is increased for both warm and hot forming of many light metals, such as aluminum alloys, used in various industries.

With this plug-in, thermal behavior can be taken into account while examining part and process feasibility, optimizing forming and production process parameters as well as conducting final validation analyses, as long as there are no phase transformation effects to be considered. In addition, the effects of real forming tool temperatures as well as the effects of temperature on the tribological system, and subsequently on the forming results, can also be analyzed.

In combination with AutoForm-FormingSolver, AutoForm-Thermo plug-in can be used to carry out coupled solutions including mechanical and thermal effects. This can be done for all operations of warm and hot forming processes, including heating, transport and cooling.
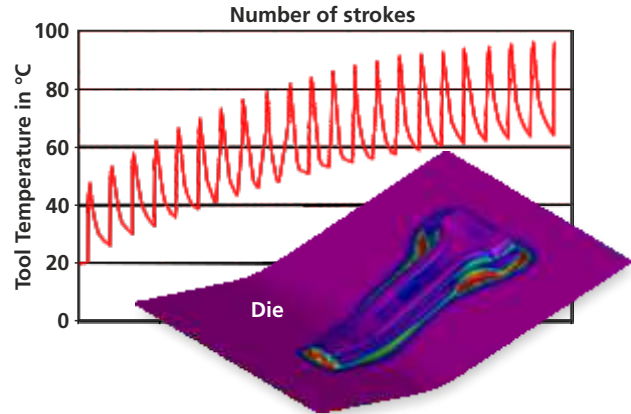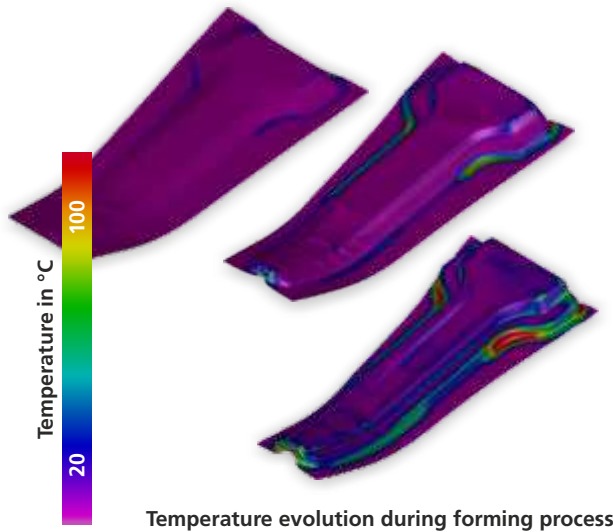

Temperature distribution obtained by cyclic simulations using 3D heat conduction

Temperature evolution during forming process

Within the process, the temperature of the tool surfaces can be defined to be constant or evenly distributed. It can also be mapped as temperature fields obtained from external computations or internally computed as the result of tool temperature control using cooling channels.

AutoForm-Thermo plug-in can be combined with AutoForm-Sigma to analyze the influence of design and noise variables on hot forming processes. Moreover, when used with TriboForm Solver plug-in, engineers can simulate the influence of temperature on the tribology system.

With AutoForm-PhaseChange plug-in, the functionality of AutoForm-FormingSolver and AutoForm-Thermo plug-in can be further extended into the area of phase transformation simulation of manganese-boron steels.

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