STAMP-CRASH PROCESS: COUPLING OF FORMING AND CRASH SIMULATIONS AT BMW

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ABSTRACT
In automotive industry, the accuracy of crash simulations can be considerably improved by accounting for also the manufacturing process of the body-in-white components. To this end, the forming history of deep-drawn body parts is used to enhance the virtual models for both the body in white and the full vehicle. We here present an interlinking approach, the "stamp-crash" process, to systematically connect the engineering of deep-drawing tools with the design and development of the body parts. The stamp-crash process involves the following components:

1) An already existing simulation data management (SDM) system used at BMW to build, mesh, and process the CAE model of the vehicle;
2) An interface to a central database containing all model data as well as the forming results for relevant body parts;
3) An ANSA-based mapping tool to initially transfer the forming history of each individual part to the overall CAE model; and
4) An automatic re-mapping procedure developed in cooperation between BMW and BETA CAE Systems.

Using the same database in both the crash and deep-drawing "worlds" offers several advantages: it allows for version control of all models during the entire design process and is crucial for the automatic re-mapping. this re-mapping accelerates building the CAE model, e.g. by using commonality of body parts or capturing re-meshing. overall, by improving the quality of both crash simulations and strength or stiffness computations, the stamp-crash process accelerates the entire design and development of new vehicles at BMW.