

Components with Optimised Properties due to Advanced Thermo-mechanical Process Strategies in Hot Sheet Metal Forming

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The increasing demand for car body structures with optimised energy absorption capacity and the ability to maintain their structural integrity even under the highest dynamic load has stimulated the development of new thermo-mechanical process routes for the production of pressed and roll-formed sheet metal parts in order to combine both extreme formability and a highest level of strength for the final product. These process routes offer a high potential for further improvements in the field of strength-strain correlation and load adapted property distribution of the components, as well as an enhanced process productivity. A new type of thermo-mechanical tailored processing of sheets and profiles is presented, based on the adequate application of differential heating and cooling strategies. By the control of local microstructural effects, the components develop a property distribution adapted to complex load situations. New tooling concepts complement these developments in order to ensure high process efficiency and reliability.

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