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Abstract:
One substantial goal of modern vehicle construction is to reduce weight at a high level of crash safety. When steel is used in lightweight construction, the process of press hardening of boron-alloyed steels can be of great importance. The heat treatment during hot forming process increases the material's tensile strength to a level of approximately 1500 MPa. The increased tensile strength needs to be considered in subsequent manufacturing processes, such as punching operations. At present, laser cutting is a common method to cut press hardened sheet metal, a process which is more cost-intensive and time-consuming as conventional tools and tool steels cannot be produced with a profitable output. One aim of the present project has been the investigation of tool steels as well as the different damage mechanisms occurring during the blanking of press-hardened sheet metal. A new tool concept has therefore been realized, which comprises the entire expertise of the Institute. Thus,
the tool developed is a very good basis for assessing tool steels and their damage behaviour. Tool life and damage mechanisms have been analyzed.

Stichworte: press hardening; blanking; tool life; manganese-boron steel

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