Abstract: The formability requirements of high-strength steels are increasing as a result of progressive lightweight construction. An innovative two-stage shear cutting process has been developed in order to meet these requirements. It significantly reduces the edge crack sensitivity of the material in the cutting zone. Studying the effect of worn tool elements on process safety is a key focus for the ongoing improvement of this production process. A production-based tool state was simulated by creating different cutting edge radii on the active tool elements. Collaring tests show a reduction of residual formability through wear of up to 65% for high-strength heavy plates (plate thickness $\geq$ 3 mm). © (2015) Trans Tech Publications, Switzerland.

Stichworte: Cutting edge wear; Cutting force; High-strength steel; Shear cutting

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