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Titel des Beitrags: Tensile test of very thin sheet metal and determination of flow stress considering the scaling effect

Abstract: The reduction in size of mechanical parts is becoming more and more important in metal forming processes. This trend towards miniaturization leads to new requirements regarding the material and the product. The main object of this research is the so-called scaling effect which can occur during the forming process of very thin sheet metals. The goal is to determine and investigate variables which considerably influence the scaling effect. The optimisation of such forming processes needs a more comprehensive use of simulation and finite element analysis. The conventional model used for large and thick sheet specimens is not sufficient yet. Existing research reports on this topic show that among other things the thickness and the grain size of the material influence the scaling effect. Thus it is important to consider these material characteristics in the determination of the flow stress curve. In this paper the flow stress curve is investigated on a micro scale of up to 10μm specimen thickness considering different sheet thicknesses and widths.

Stichworte: Miniaturization; Sheet Metal; Tensile Test

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