Institut für
Umformtechnik
und Leichtbau

Master's thesis

Evolution of damage and torsional load capacity of thin-walled welded and cold-drawn tubes using different process parameters

During the forming of metals, microscopic voids develop, which are also referred to as ductile damage. This damage affects the fatigue strength of the components. The development of damage can be influenced by the stress state (Lode angle and triaxiality) during forming.
In the case of cold-drawn tubes, the state of stress can be controlled by the number of drawing stages and the dimensions of the raw material. The aim of this work is to predict the damage caused by cold drawing of tubes for various process parameters by numerically determining the stress states and to develop an optimized set of process parameters.
Together with Mannesmann Precision Tubes GmbH, these tubes will be produced, tested for their cyclic torsional strength and compared with conventionally manufactured tubes.

Requirements:

- **Previous knowledge and interest in simulation (Abaqus/CAE)**
- **Ability to work independently and reliably**

The exact scope
will be defined together

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