

**Abstract:**

Determination of material data for automotive crash simulation is a costly and time consuming process. Especially the measurement of material behaviour like strain rate sensitivity and stress state dependent fracture is a difficult task for experimental testing. Therefore a novel and efficient material data determination process is introduced including standard quasistatic tension and compression tests and dynamic 3-point-bending and compression tests.

The 3-point-bending and compression tests are carried out with the innovative material testing device Impetus® developed by 4a engineering GmbH. Using this device and the coupling of experimental, simulation and optimization methods (also called system identification or reverse engineering methods) strain rate dependent hardening parameters can be determined for sheet metals, plastics and foam materials.

The fracture behaviour of ductile metals is characterized with the fracture model of Johnson&Cook based on the results of quasistatic tension and shear tests.

The benefit of the developed process is validated material data for crash simulation models, the inexpensive determination of strain rate sensitivity and fracture behaviour and a standardized material data determination method.