

MM 25: HV Riedel

Time: Tuesday 14:00–14:30

Location: H16

Invited Talk

MM 25.1 Tue 14:00 H16

Models for ductile fracture and their application to forming processes — •HERMANN RIEDEL — Fraunhofer-Institut für Werkstoffmechanik, Wöhlerstr. 11, 79108 Freiburg

Models for ductile fracture of metals and alloys describe the nucleation, growth and coalescence of voids. Constitutive models, such as the classical Gurson model and its successors, include the effect of the evolving damage on the strength of the material. In the framework

of the finite element method, these models are useful tools for predicting crack formation in components during forming operations or under crash conditions. Edge cracking in rolled sheets serves as an example to demonstrate the superiority of advanced compared to simpler models. Only mechanism-based models are able to reproduce the characteristic zig-zag pattern of the cracks on the side surface of the sheet. Another important aspect of ductile fracture is the necking of specimens or components and its interaction with the internal void growth.