

Modelling of Damage During Hot Forging of Ingots

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Ductile damage modelling in the ingot forging process is discussed. Advantages and disadvantages of both coupled and uncoupled ductile damage models are presented. Some uncoupled damage models are examined in greater detail regarding their applicability to different processes, where hydrostatic compression as well as tension, combined with shear stresses, are present. It is shown that the numerical implementation can influence the results substantially and therefore lead to software user dependent conclusions. It may be advantageous for the user of commercial finite element programs to base the damage analysis on the Cockcroft & Latham criterion, since this with changing cut-off value does not inconsistently change the location of damage, in contradiction to the other investigated criteria, and since it is able to predict damage in processes, which are slightly compressive.

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