

Qualitative aspects of ductile fracture by strain localization

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ABSTRACT

This work proposes to evaluate, from a qualitative point of view, ductile failure in metals using the strain localization analysis proposed by Rice [1] and, in particular, the imperfection approach. First, the imperfection approach is compared to the unit cell analyses reported by Dunand and Mohr [2]. It is demonstrated that the imperfection approach is a valuable alternative to unit cell analysis in the perspective of getting qualitative knowledge on ductile failure. In the second part of the study, the localization analyses are applied to a wide range of stress states. Based on the obtained results it is possible to explain some features linked to ductile failure commonly observed by several authors using material tests. Finally, a first attempt to link the imperfection approach to the traditional bifurcation approach is carried out. This study allows to highlight some specific aspects of the imperfection approach.

REFERENCES

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