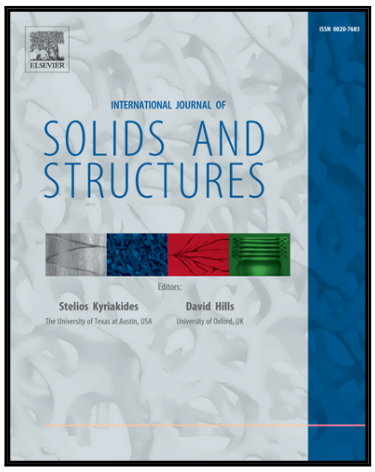

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Effects of superimposed hydrostatic pressure on necking and fracture of tube under hydroforming

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Abstract

The finite element method is used to numerically simulate necking and fracture in hydroforming tubes under internal pressure through using the GTN model. The effect of superimposed hydrostatic pressure on necking (both uniform stain and localized necking), fracture initiation and fracture surface formation are studied. It is found that the superimposed hydrostatic pressure has a great impact on the onset of fracture with the increase of superimposed hydrostatic pressure, but insignificant influence on the uniform strain. As the superimposed hydrostatic pressure increases, the fracture surface of the hydroformed tube is also shifted from the P-type mode to C-type mode, a typical transition found experimentally for sheet tensile test samples deformed under superimposed hydrostatic pressure.

Keywords: Hydrostatic pressure, Necking, Fracture, Finite Element

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