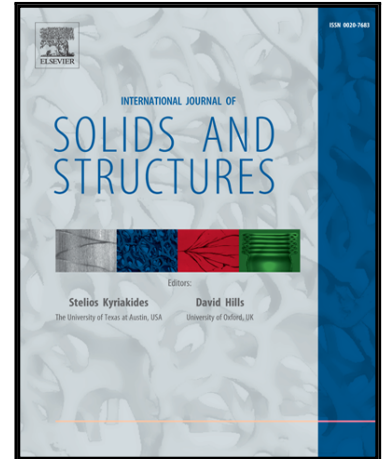


Accepted Manuscript

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Y. Shi , H. Jin , P.D. Wu , D.J. Lloyd

PII: S0020-7683(17)30095-1
DOI: [10.1016/j.ijsolstr.2017.02.027](https://doi.org/10.1016/j.ijsolstr.2017.02.027)
Reference: SAS 9485



To appear in: *International Journal of Solids and Structures*

Received date: 17 October 2016
Revised date: 16 January 2017
Accepted date: 27 February 2017

Please cite this article as: Y. Shi , H. Jin , P.D. Wu , D.J. Lloyd , Effects of superimposed hydrostatic pressure on necking and fracture of tube under hydroforming , *International Journal of Solids and Structures* (2017), doi: [10.1016/j.ijsolstr.2017.02.027](https://doi.org/10.1016/j.ijsolstr.2017.02.027)

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

Y. Shi^{1,*}, H. Jin², P.D. Wu¹, D.J. Lloyd³

¹Department of Mechanical Engineering
McMaster University
1280 Main Street West, Hamilton, Ontario, Canada L8S 4L7

²CanmetMATERIALS, Natural Resources Canada
183 Longwood Road South
Hamilton, Ontario, Canada L8P 0A5

³Aluminum Materials Consultants
106 Nicholsons Point Road, Bath, Ontario, Canada K0H 1G0

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 strain 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

* Corresponding author. Tel.: +1 (647)888-8160 ; Fax: +1 (905) 572-7944;
E-mail: shiyh@mcmaster.ca

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