

عنوان مقاله:

Analysis of pressure distribution and optimization of working conditions during push bending of circular tubes

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نویسندگان:

M. Sohankar

M. Farzin

خلاصه مقاله:

Thin-walled tube bending is still to be considered a new and advanced technique. The process has been adopted into several industries such as aero and automotive. This process may produce a wrinkling, bulking and tearing phenomenon if the process parameters are inappropriate, especially for tubes with large diameter and thin wall thickness. Push bending process is one of the methods used for bending tubular parts. It is a suitable technique to make considerably small bending radii. The method is performed using a rigid die to guide and form the tube into the required shape while the tube is pushed by a punch. A pressure media is used inside the tube to prevent its wrinkling and buckling. Hyper-elastic (rubber) materials are commonly used as the pressure media. This paper presents the pressure distribution within the tube, before and during the push bending process. Theoretical result of pressure distributions is compared with the finite element simulations. Effects of rubber properties on the tube quality are also studied. Finally optimum working conditions of process is predicted by the finite element method and is compared with previously published experimental observations.

کلمات کلیدی:

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