

## عنوان مقاله:

Three Dimensional Finite Element Simulation and Theoretical Investigation on the Forming Forces for Three Roller Flow Forming Process

## محل انتشار:

دومین کنفرانس بین المللی پژوهش ها و دستاوردهای نو در علوم، مهندسی و فناوری های نوین (سال: 1401)

تعداد صفحات اصل مقاله: 14

## نویسندگان:

Seyed Saman Hosseini - *Department of Mechanical Engineering, Khomeini shahr Branch, Islamic Azad University, Khomeini shahr, Iran*

Hossein Ghazavi - *Department of Mechanical Engineering, Najafabad Branch, Islamic Azad University, Najafabad, Iran*  
\* *Modern Manufacturing Technologies Research Center, Najafabad Branch, Islamic Azad University, Najafabad, Iran*

## خلاصه مقاله:

Flow forming as a type of metal spinning processes is used in production of thin-walled high-precision tubular components. Due to the flexibility and low tool load requirement, the process may be employed for forming the mentioned shapes from bulk raw material, such as solid bars, cast or forged preforms. In the last two decades or so, flow forming has gradually matured as metal forming processes for the production of engineering components in small to medium batch quantities. The researches on the flow forming force aims to optimize the machine design and the processing parameters selection. However, studies on the flow forming of solid cylindrical components have not been documented. In this paper, a simulation model has been performed using the commercial finite element code ABAQUS/EXPLICIT to study the internal and kinetic energy, radial, axial and tangential forces in a Three-roller flow forming process in one pass. The result show that, for a cylindrical roller moving axially along the work-piece, metal moves predominantly in a radial direction. The difficulties in simulating flow forming are outlined and the model using different formulations are compared for their efficiency in analyzing the process. This paper illustrates the possibility of adopting flow-forming processes for the production of thin section, which would be difficult and expensive to produce by press forming. In addition, it also showed that although FEM is an effective tool to optimize process parameters, computational time remains as the main barrier for its prevalent usage especially for incremental processes such as flow forming. All studies presented in this paper have been carried out on Aluminum alloy EN AW-7108-T6.

## کلمات کلیدی:

Flow-Forming, Finite Element Simulation, Theoretical Investigation, Three Roller, Forming Forces, Aluminium Alloy EN AW-7108-T6

## لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/1515365>



