

## Finite Elemental Simulation of the Combined Process of Asymmetric Rolling and Plastic Bending

**Authors :** A. Pesin, D. Pustovoytov, M. Sverdlik

**Abstract :** Traditionally, the need in items represents a large body of rotation (e.g. shrouds of various process units: a converter, a mixer, a scrubber, a steel ladle and etc.) is satisfied by using them at engineering enterprises. At these enterprises large parts of bodies of rotation are made on stamping units or bending and forming machines. In Nosov Magnitogorsk State Technical University in alliance with JSC "Magnitogorsk Metal and Steel Works" there was suggested and implemented the technology for producing such items based on a combination of asymmetric rolling processes and plastic bending under conditions of the plate mill. In this paper, based on finite elemental mathematical simulation in technology of a combined process of asymmetric rolling and bending plastic has been improved. It is shown that for the same curvature along the entire length of the metal sheet it is necessary to introduce additional asymmetry speed when rolling front end and tape trailer. Production of large bodies of rotation at mill 4500 JSC "Magnitogorsk Metal and Steel Works" showed good convergence of theoretical and experimental values of the curvature of the metal. Economic effect obtained more than 1.0 million dollars.

**Keywords :** asymmetric rolling, plastic bending, combined process, FEM

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