

TRIBOLOGICAL MODEL OF THE IRONING PROCESS IN SHEET METAL FORMING FOR LUBRICANTS TESTING

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ABSTRACT

In this paper is shown an original laboratory device for the tribological simulation of ironing process in sheet metal forming. The adopted model respects all the physical and geometrical conditions of the real process and enables determination of the friction coefficient, both between the thin sheet and the die and between the die and the punch in various contact conditions.

The presented and analysed results in this work show that the device is very convenient for fast comparative testing of tribological properties of various lubricants that are used in ironing.

Keywords: tribological model, ironing, lubricants tribological properties.

AIMS AND BACKGROUND

Characteristics of friction that appears on contact surfaces between the tool and the work piece in metal forming by ironing are significantly different from properties that are typical for sliding friction in various machine elements. Their studying and formulating of the corresponding parameters have exceptional importance, both from the aspect of determination of the necessary deformation forces, deformation energy, tool wear intensity and quality of the machined pieces, and from the aspect of metal plastic flow, distribution of the resulting deformations, material machinability, etc.¹ In ironing, the contact surface value changes during the process that means that the parts of material, which in the previous phase were not in contact, now enter into contact with the tool.

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