



LIMITATIONS OF PHYSICAL TRIBO-MODELING IN METAL FORMING PROCESSES

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Summary: *The significance of contact friction in metal forming processes is very known. The general approach in this area involves the recognition of the influence of the main tribological parameters – pressure, speed and temperature in metal forming. The developed methods are very different for physical modeling of tribological phenomena and influence in a very specific types of metal forming. These methods basically have the appropriate physical model which imitates local area or a complete work piece in metal forming. The indicators of models can be very different: the deformation forces, forming limit parameters, coefficient of friction, temperature distribution, etc. This paper analyzes the physical models in cold metal forming processes, according to their characteristics and limitations.*

Keywords: *Metal forming, friction, tribo model, cold forging*

1. INTRODUCTION

Modern plastic forming technology is characterized by the production of parts of small mass, high productivity and low cost. Metal forming (MF) process depends on many factors, such as material properties, the structure of the system workpiece / tool, strain rate, the operating pressure and temperature. In addition to these factors, the friction is very important and it affects the forming force, energy consumption and limit deformability, accuracy of design, piece surface quality and tool life.

Friction at MF is highly nonlinear phenomenon that is related to (interacts with) many forming parameters, Fig. 1 [1]. The following characteristics of friction have a significant and complex influence on the quality of the piece:

- The process of deformation and deformation forces depend on the friction forces and vice versa.

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