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## ECOLOGICAL METAL FORMING TECHNOLOGIES - POSSIBILITIES AND LIMITATIONS

### Abstract

*Preservation of the existing energy resources on one hand and the reduction of the environmental-pollution on the other hand represent the basic requirements which so called "eco-friendly-green" production technologies must satisfy. Such technologies imply a different approach to solving tribological problems at forming (efficient forming, high piece surface quality, prolongation of tool life etc.). In that sense, in addition to the development of coating procedures, application of dry lubrication films etc., particular attention is given to the development of new lubricants which do not pollute the environment when being removed, and are as efficient as traditional lubricants. In this paper, a systematic approach to recognition of eco-technologies is presented and review of researches in this area is given together with recommendations for ecological "Friendly lubricants" application in particular plastic metal forming procedures.*

**Keywords:** Plastic metal forming, formability, ecology, lubrication

### 1. INTRODUCTION

Production technologies, especially metal forming (MF), have been subjected to a rapid development during the last few decades. The main properties of MF are: development of procedures of numerical-physical modelling of forming process – metal flowing, defining of stress-strain fields etc., with the aim of optimizing the forming parameters, application of CAD/CAM system for design and manufacture of tools, development and application of artificial intelligence and expert systems within the development of forming and tool construction processes, development of various procedures, tools and machines for parts which are not additionally formed ("Net Shape Forming" - NSF forming) etc [1].

From the ecological aspect, as in other technologies, the main issues in MF area are:

- Preservation of available resources, and
- Reduction of influence on the environment

These main two issues can be organized into several complex activities [2], which must be integrated into particular elements of industrial systems systematically:

- Preservation of basic resources and materials,

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