Factors Affecting The Resistance To Deformation In Metal Forming Processes

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"FACTORS AFFECTING THE RESISTANCE
TO DEFORMATION
IN METAL FORMING PROCESSES"

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S U M M A R Y

The present investigation aims at studying the factors affecting the behaviour of the metal under plastic deformation conditions especially those of the rolling process.

A comprehensive review of the relevant published literature was carried out with special reference to the Aluminium & Aluminium alloys. Also some of the theoretical and emperical approaches to the plane strain compression problem have been discussed.

In carrying out the experiments a cam - plastometer was used to give strain rates varying from 1 to 30 / sec. which would cover the practical strain rates used in industry. Two types of cams were employed to give either constant strain rate or variable strain rate similar to that encountered in rolling (starting at a maximum and ending with zero strain rate). The plane compression forces and geometrical behaviour of the deformed zone were studied under different conditions of strains and strain rates as well as different deformation temperatures. The material used was wrought aluminium of commercial purity and aluminium magnesium 1% alloy.

The experimental results and the discussions in the present work led to the following conclusions:

1- The maximum amount of bulge and the coefficient of side way spread decrease as the resistance to deformation of the material increases.