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Drawing of Cu-AL sheet with hardening property

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***Abstract*— The tensile process is one of the metal forming processes. In this process, the rod or sheet is drawn by applying tensile force and decreases in diameter or thickness after passing through the mold space. The purpose of this study was to investigate the factors affecting the tensile force, double rod with aluminum core and copper shell. The finite element-based diaphragm software was used. The obtained results were compared with experimental values, and the accuracy of the acceptable results was evaluated. Increasing the hard work factor means that the metal is softer and requires less tensile strength. The percentage of deformation is directly proportional to the optimum angle of the stretching mold. Because the theory calculations are based on the optimal angle of the mold. In the above deformations, the optimum angle value is increased and vice versa. The shell thickness and core diameter also have a direct effect on the amount of tensile force. As the percentage of deformation in the tensile process increases, the frictional power share increases and this increase is lower than the internal force. At the same time, the share of internal power is higher than the rest of us.**

Key words: Hardworking, Drawing process, Finite element Method.

I. INTRODUCTION

Traction is a metalworking process in which tensile forces are used to draw metal or glass. When the metal is drawn, it becomes thinner and reaches the desired shape and thickness. The tensile process is divided into two categories: working sheet and tensile, strip, and tube [1].

In the tensile process, the deformation involves the plastic and elastic segments, which is more important for the permanent deformation of the plastic segments. The material is assumed to be constant throughout the process, with the volume of wired wire fixed before and after the stretch. By reducing the diameter, the length of the wire is added and the law of mass survival, this process applies. Figure 1 schematically shows the cross section of the stretching process.

Traction is different from rolling. In rolling the pressure is passed through the material through the rollers, while in the pulling process it depends on the force applied near the compression site. This means that the amount of tensile strength may be limited by the tensile strength of the material, a fact that is particularly evident when making thin wires.

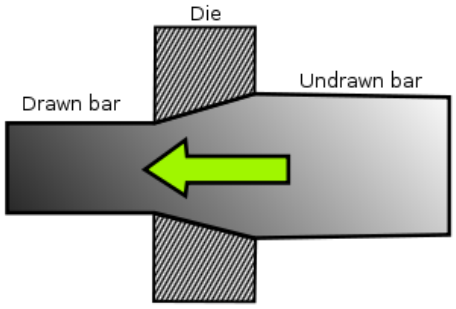

Figure 1- Wire, tape or pipe stretching process.

Two factors are important for proper shaping: flow and pulling of materials. The mold needs to pass through the mold. Material flow is controlled by pressure control in the mold and lubrication pores. If the sheet passes through the mold quickly, it creates a wave. To correct this, it increases the pressure in the mold spores or does less lubrication to reduce the flow of material. If the pressure in the pores becomes excessive, part of the sheet becomes too thin and broken, so it is important to