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## A study on Wire Breakage in Electrical Discharge Machining of Polyurethane Foam

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### Abstract

The present work discusses the feasibility of cutting polyurethane foam using wire electrical discharge machining (WEDM) process. The foam consists of nickel copper coated polyester (PET) fabric. Three different thicknesses of foam constitute to different surface and volume resistivity were chosen as work material. The effect of various processing parameters on machining length was investigated. The process experiences a high-energy loss which leads to frequent wire breakages due to the low electrical conductivity of polyurethane foam. In case of increasing the pulse-on time, the length of cut became shorter since the wire breakage was provoked by a decrease in the discharge frequency. The length of cut increases with increase in pulse-off time as a result of sufficient time to remove the debris. At a higher peak current, the length of cut increases due to an increase in current intensity. The length of cut also decreases at lower servo voltage since machining at lower voltages was unstable with frequent wire breakages. It is important to have a special care while machining these foams.

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