STUDY THE PERFORMANCE OF ZrN AND TUNGSTEN THIN FILM COATED CRYO-TREATED HSS CUTTING TOOL

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Abstract:

Wear and tear of cutting tool is a major concern, especially in the small scale and medium scale cutting and drilling industry. Tool wear has considerable significance in the machine and product economics.

The wear of the cutting tool are measured by using a tool makers microscope. The wear and life time of uncoated and non cryo-treated tool is compared with (i) uncoated cryo-treated tool and (ii) cryo-treated thin film coated tool. Thin films of ZrN and tungsten are coated on the tool using thermal evaporation method. The experiments are carried out using cutting fluid. The performance of the tool in respect of life enhancement is studied. The testing is done on the drilling machine with drill bit of diameter 10mm. Improvement in tool life is observed. Regression models are used to study the tool wear for both cryo-treated and thin film coated samples.

Key Words: Tool Wear, tool life, thin film coating, cryo-treatment