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PERFORMANCE OF CARBIDE INSERTS DURING MACHINING OF STAINLESS STEELS IN DIFFERENT CONDITIONS

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ABSTRACT:- The machinability of austenitic stainless steels can be improved due to application of coated cutting tools. Hard PVD coating with low thermal conductivity and improved surface finish should be used in this case. This can result in enhancement of frictional characteristics at the tool/workpiece interface as well as chip evacuation process. In this study, the stainless steel plates were machined using cemented carbide finishing end mills with TiAlN coatings in dry and wet conditions. This coating has high oxidation resistances due to formation of aluminium oxide surface layers and it reduces the adhesion between stainless steel and tool surface. The experimental results show that coating prevents edge chipping and enhances the abrasive wear resistance of the tool. Both the ductility of the workpiece and the tool wear appeared to have influences on the surface finish of the workpiece. It was found that the cutting fluid was effective in preventing catastrophic failure of the tool.

Keywords— End milling; TiAlN coating; Stainless steel; Tool wear

HEAT TRANSFER AUGMENTATION THROUGH A CIRCULAR TUBE FITTED WITH SWIRL FLOW GENERATOR

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ABSTRACT:- Experimental studies on friction factor and heat transfer characteristics for turbulent flow of water in a circular tube fitted with wire coil, screw tape inserts and combination of both under nearly uniform wall temperature conditions are reported in this article. The experimental results reveal that the use of inserts leads to considerable increase in heat transfer and friction loss over those of a plain tube. The Nusselt increases with the rise of Reynolds number for all inserts and average Nusselt number for a combination of wire coil and screw tape insert is found 155 times higher than that of a plain tube.

Keywords— Nusselt number, Reynolds number, screw tape, wire coil, turbulent flow

