Question of Optimal Cutting Speed for Machining by Conventional and Coated Cutting Tools

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The paper dealt with tool-wear, tool-life and chip creation regarding the cutting speed for machining by conventional and coated tools. The cutting speed is influenced by several parameters. The determination of optimal cutting speed is challenging question. Situation is more complicated in case of coated tools. The important is criterion of optimization. Moreover, the presence of the coating changes chip creation process and stress state during cutting. The paper provides complete experimental T-v_c dependencies obtained in turning regarding various parameters as depth of cut, feed for different machined and cutting tool materials. Paper describes also different tool-wear mechanisms of uncoated and coated tools. Finally, the paper analyzes stress state in tool as simplified model of contact of tool rake and chip for conventional and coated tools involving different mechanical properties of coating and substrate material, temperature and different thicknesses of coatings.

Keywords: cutting conditions, turning, tool wear, coating

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