

Dry High Speed Orthogonal Turning of Ti-6Al-4V Titanium Alloy

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Abstract : The present work is an experimental study on the dry high speed turning of Ti-6Al-4V titanium alloy. The objective of this study is to see for high cutting speeds, how wear occurs on the face of insert and how to evolve cutting forces and chip formation. Cutting speeds tested is 600, 800, 1000, and 1200 m/min in orthogonal turning with a carbide insert tool H13A uncoated on a cylindrical titanium alloy part. Investigation on the wear inserts with 3D scanning microscope revealed the crater formation is instantaneous and a chip adhesion (welded chip) causes detachment of carbide particles. Cutting forces increase and stabilize before removing the tool. The chip reaches a very high temperature.

Keywords : titanium alloy, dry high speed turning, wear insert, MQL technique

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