

## **Tool Life And Wear Mechanism When Machining Hastelloy C-22HS**

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### **Abstract**

This paper describes the wear mechanism and tool life when machining Hastelloy C-22HS with coated carbide. The experiment was conducted using four different cutting tool materials under wet condition – namely, Physical Vapor Deposition (PVD) coated with TiAlN; TiN/TiCN/TiN; Chemical Vapor Deposition (CVD) coated with TiN/TiCN/Al<sub>2</sub>O<sub>3</sub>; and TiN/TiCN/TiN – to study the tool behavior, in terms of wear and tool life machining of Hastelloy C-22HS. Tool failure modes and wear mechanism were examined at various cutting parameters. Flank wear, chipping, notching, plastic lowering at cutting edge, catastrophic and wear at nose were found to be the predominant tool failure for the four types of cutting tools, especially with CVD tools. Attrition/adhesion, oxidation and built-up edge (BUE) are the wear mechanisms observed in all cutting tools. The results obtained indicated that PVD cutting tools performed better than CVD cutting tools, in terms of tool life with current parameters.

**Keywords:** Wear testing; Other materials; Electron microscopy; Cutting tools

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