Improving Machinability Of Difficult-To-Cut Advanced Aerospace Materials Through High-Speed End-Milling

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ABSTRACT
This paper presents preliminary research work and results, in improving the machinability of difficult-to-cut metals. The cutting forces generated during high-speed end-milling of these metals with uncoated carbide tool were acquired and investigated. Slot end-milling experiments were conducted using a four-flute 0.5 inch diameter uncoated carbide. Experiments were conducted on a vertical machining center. Cutting force components (Fx, Fy, and Fz) were acquired using a dynamometer. The work-piece was clamped on the dynamometer, and fastened on the vice of the CNC machine. The dynamometer was connected to an amplifier, which was in turn connected to an oscilloscope which was used to process the acquired cutting force. The maximum cutting force in a slot was obtained, as well as cutting force variation before and during tool engagement for a slot. The nature of chips produced was also observed.