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Examining of Tool Wear in Cryogenic Machining of Cobalt-Based Haynes 25 Superalloy

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Abstract : Haynes 25 alloy (also known as L-605 alloy) is cobalt based super alloy which has widely applications such as aerospace industry, turbine and furnace parts, power generators and heat exchangers and petroleum refining components due to its excellent characteristics. However, the workability of this alloy is more difficult compared to normal steels or even stainless. In present work, an experimental investigation was performed under cryogenic cooling to determine cutting tool wear patterns and obtain optimal cutting parameters in turning of cobalt based superalloy Haynes 25. In experiments, uncoated carbide tool was used and cutting speed (V) and feed rate (f) were considered as test parameters. Tool wear (VBmax) were measured for process performance indicators. Analysis of variance (ANOVA) was performed to determine the importance of machining parameters.

Keywords : cryogenic machining, difficult-to-cut alloy, tool wear, turning
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