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Heated Machining Process Investigation using Finite Element Simulation

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Abstract: *To examine hot machining operations of hard-to-machine materials like titanium alloys, Inconel, and hardened steels, the current research explores Finite Element Simulation (FES) applications. The machining of these materials is significantly improved with the addition of thermal assistance using various heating techniques, including resistance heating or induction heating. The research simulates temperature distribution, stress-strain characteristics, chip formation in cutting processes by employing FEA software such as ANSYS. Preheating reduces cutting forces, tool wear, and enhances surface smoothness based on the testing results. This approach could improve performance in high-precision industries and optimize machining parameter.*

Keywords: Finite Element Simulation

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