

# **Modelling Orthogonal Cutting of Inconel 718 using Abaqus/Explicit**

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**CanmetMATERIALS**

Simulation of high-speed machining is challenging as the workpiece material is subjected to extreme conditions including large deformations, high strain rates and high temperatures. Predicting the machinability of difficult-to-machine materials such as austenitic stainless steels and nickel-based alloys is particularly difficult due to the potential for excessive tool wear, excessive heat generation, difficulties in chip formation and poor surface quality. In this talk, Coupled Euler Lagrange (CEL) and Arbitrary Lagrangian Eulerian (ALE) simulations of orthogonal cutting of Inconel 718 are presented and compared to experimental results. Additionally, the importance of the choice and calibration of the material hardening and friction constitutive laws on the results are discussed.