Burr control using modified tool geometry: A 3D FEM approach

Author: Muhammad Asad

Abstract:
Three dimensional turning operation simulations exploiting the capabilities of FE based software Abaqus have been produced in this contribution. Coupled temperature displacement simulations for orthogonal cutting case for AA2024-T351 are performed. Quantitative prediction of negative burr with foot type chip formation on exit edge of workpiece for various cutting parameters has been made. Numerically acquired chip morphology and associated cutting forces are compared with the experimental data. Onwards, cutting simulations with a modified cutting tool geometry have been reproduced. It has been figured out that controlled material deformation in cutting direction using modified tool geometry helps reducing negative burr (Exit/end burr) formation and edge breakout.

Keywords: Machining simulation, chip formation, negative burr, burr control