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Nota di contenuto	Nano and Micromachining; Table of Contents; Preface; Chapter 1. Nanoscale Cutting; 1.1. Introduction; 1.2. Basic elements of molecular dynamics modeling; 1.2.1. Material representation and microstructure; 1.2.2. Atomic interaction; 1.2.3. System dynamics and numerical description; 1.2.4. Boundary conditions; 1.3. Design and requirements for state-of-the-art MD cutting process simulations; 1.4. Capabilities of MD for nanoscale material removal process analysis; 1.4.1. Analysis of microstructure and deformation; 1.4.2. Obtaining cutting forces, stress and temperature 1.5. Advances and recent developments in material removal process simulation1.5.1. Complete 3D surface machining simulation; 1.5.2. Consideration of fluids in MD cutting simulation; 1.6. Summary and outlook; 1.7. References; Chapter 2. Ductile Mode Cutting of Brittle Materials: Mechanism, Chip Formation and Machined Surfaces; 2.1. Introduction; 2.2. The mechanism of ductile mode cutting of brittle materials; 2.2.1. Transition of chip formation mode from ductile to

brittle; 2.2.2. MD modeling and simulation of nanoscale ductile mode cutting of silicon
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3.3.2. Pre-treatment of substrate
3.4. Modified HFCVD process; 3.4.1. Modification of filament assembly; 3.4.2. Process conditions; 3.5. Nucleation and diamond growth; 3.5.1. Nucleation; 3.5.2. Bias-enhanced nucleation (BEN); 3.5.3. Influence of temperature; 3.6. Deposition on complex substrates; 3.6.1. Diamond deposition on metallic (molybdenum) wire; 3.6.2. Deposition on WC-Co microtools; 3.6.3. Diamond deposition on tungsten carbide (WC-Co) microtool; 3.7. Diamond micromachining; 3.7.1. Performance of diamond-coated microtool; 3.8. Conclusions; 3.9. References
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Sommario/riassunto

This book provides the fundamentals and recent advances in nano and micromachining for modern manufacturing engineering. It begins by outlining nanomachining before discussing various advances in field and machining processes. The coverage concludes with an evaluation of subsurface damages in nano and micromachining and a presentation of applications in industry. As such, this book serves both as a useful classroom text for engineering and machining courses at the undergraduate and graduate level, and as a reference for academics and engineers in these areas.
