

1. Record Nr.	UNINA9910826060503321
Titolo	Micro cutting : fundamentals and applications // Kai Cheng, Dehong Huo, editors
Pubbl/distr/stampa	Chichester, West Sussex, United Kingdom ; ; New York, : John Wiley & Sons Inc., 2013
ISBN	1-118-53661-4 1-118-53660-6 1-118-53662-2
Edizione	[1st ed.]
Descrizione fisica	1 online resource (368 p.)
Collana	Wiley Microsystem and nanotechnology series (ME20)
Altri autori (Persone)	ChengK (Kai) HuoDehong
Disciplina	671.3/5
Soggetti	Micromachining Micromechanics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Micro-Cutting: Fundamentals and Applications; Copyright; Contents; List of Contributors; Series Preface; Preface; Part One Fundamentals; 1 Overview of Micro Cutting; 1.1 Background and Scope; 1.2 Materials in Micro Cutting; 1.3 Micro Cutting Processes; 1.4 Micro Cutting Framework; References; 2 Micro Cutting Mechanics; 2.1 Introduction; 2.2 Characterization of Micro Cutting; 2.3 Micro Cutting Mechanics; 2.4 Micro Machinability Issues and the Scientific Approaches; 2.5 Summary; References; 3 Micro Tooling Design and Manufacturing; 3.1 Tool Size and Machining Scale 3.2 Manufacturing Methods for Solid Shank Micro Tools 3.3 Coatings and Coated Solid Shank Micro Tools; 3.4 Importance of Coated Micro Tools; 3.5 Diamond Micro Cutting Tools; 3.6 Micro Cutting Tool Wear; 3.7 Smart Cutting Tools; References; 4 Ultraprecision and Micro Machine Tools for Micro Cutting; 4.1 Introduction; 4.2 Components of High Precision Machine Tools; 4.3 Diamond Turning Machines and Components; 4.4 Precision Milling Machines; References; 5 Engineering Materials for Micro Cutting; 5.1 Introduction; 5.2 'Size' Effects; 5.3 Strain and Stress in Cutting

5.4 Elastic and Plastic Behaviours at the Micro-scale; 5.5 Fracture; 5.6 Metals, Brittle Materials and Others; 5.7 Summary; References; 6 Modelling and Simulation of Micro Cutting; 6.1 FE Modelling and Analysis; 6.2 Molecular Dynamics (MD) Modelling and Analysis; 6.3 Multiscale Modelling and Analysis; 6.4 Summary; References; Part Two Applications; 7 Diamond Turning and Micro Turning; 7.1 Introduction; 7.2 Ultra-precision Diamond Turning; 7.3 Micro Turning; 7.4 Challenges Arising from Micro Turning; References; 8 Micro Milling: The State-of-the-art Approach Towards Applications 8.1 Introduction; 8.2 Fundamental Elements in Micro Milling; 8.3 Micro Milling Mechanics; 8.4 Modelling of the Micro Milling Process; 8.5 Metrology and Instrumentation; 8.6 Scientific and Technological Challenges; 8.7 Application Perspectives; 8.8 Concluding Remarks; References; 9 Micro Drilling Applications; 9.1 Chapter Overview; 9.2 Investigation of Chatter in Mesoscale Drilling; 9.3 Investigation of Chatter in Micro Drilling; 9.4 Case Study: Micro Drilling Medical Polymer Materials and Composites; 9.5 Conclusions; Acknowledgements; References; 10 Micro Grinding Applications 10.1 Introduction; 10.2 Principles and Methodologies; 10.3 Implementation Perspectives; 10.4 Application Cases; Acknowledgements; References; 11 In-Process Micro/Nano Measurement for Micro Cutting; 11.1 Introduction; 11.2 The Hybrid Instrument for Micro Cutting and In-process Measurement; 11.3 In-process Measurement of Micro Cutting Force; 11.4 In-process Measurement of Micro Wear of Cutting Tool; 11.5 In-process Measurement of Micro Surface Form; 11.6 Summary; References; Index

Sommario/riassunto

Micro-Cutting: Fundamentals and Applications comprehensively covers the state of the art research and engineering practice in micro/nano cutting: an area which is becoming increasingly important, especially in modern micro-manufacturing, ultraprecision manufacturing and high value manufacturing. This book provides basic theory, design and analysis of micro-toolings and machines, modelling methods and techniques, and integrated approaches for micro-cutting. The fundamental characteristics, modelling, simulation and optimization of micro/nano cutting processes are emphasized with
