

1. Record Nr.	UNINA9910784884003321
Autore	Grzesik Wit
Titolo	Advanced machining processes of metallic materials [[electronic resource] ] : theory, modelling and applications / / Wit Grzesik
Pubbl/distr/stampa	Amsterdam ; ; Boston, : Elsevier, 2008
ISBN	1-281-17209-X 9786611172091 0-08-055749-X
Edizione	[1st ed.]
Descrizione fisica	1 online resource (489 p.)
Disciplina	671.35
Soggetti	Metal-cutting Metal-cutting tools Metal-cutting - Data processing
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	Front Cover; Advanced Machining Processes of Metallic Materials; Copyright Page; Table of Contents; Preface; Nomenclature; Chapter 1. Introduction; References; Chapter 2. Metal Cutting Operations and Terminology; 2.1 Classification of Machining Processes; 2.2 Kinematics of Cutting Process and Cutting Parameters; 2.3 Geometry of Cutting Tools; References; Chapter 3. Trends in Metal Cutting Theory and Practice; 3.1 Evolution of Manufacturing Methods and Systems; 3.2 Driven Factors in Modern Machining Technology; 3.3 The Future of Manufacturing; References; Chapter 4. Cutting Tool Materials 4.1 Classification and Properties of Cutting Tool Materials4.2 High Speed Steels and Cast-Cobalt Alloys; 4.3 Sintered Tungsten Carbides; 4.4 Ceramics; 4.5 Superhard Materials; 4.6 Cutting Tool Coatings; 4.7 Rules for Applications of Cutting Tool Coatings; References; Chapter 5. Modelling and Simulation of Machining Processes and Operations; 5.1 The Role of Modelling in Modern Production Systems; 5.2 Classification of Models for Machining Processes; 5.3 Modelling Techniques for Machining Processes; 5.4 Data Needed for Modelling of Machining Processes; References Chapter 6. Orthogonal and Oblique Cutting Mechanics6.1 Geometrical

and Kinematical Characterization; 6.2 Forces in the Cutting Zone; 6.3 Cutting Energy; 6.4 Stresses on the Shear Plane; 6.5 Plastic Deformation in the Cutting Zone; References; Chapter 7. Chip Formation and Control; 7.1 Chip Classification; 7.2 Chip Formation Mechanisms; 7.3 Modelling of Chip Formation; 7.4 Chip Flow; 7.5 Chip Breaking; References; Chapter 8. Cutting Vibrations; 8.1 Classification of Cutting Vibrations and their Sources; 8.2 Forced Vibrations in Milling Operations  
8.3 Mechanisms of Self-excitation in Metal Cutting  
8.4 Stability of Chatter; 8.5 Methods for Improving Machine Tool Stability; References; Chapter 9. Heat in Metal Cutting; 9.1 Heat Sources in Metal Cutting and Cutting Temperature; 9.2 Heat Flow and Distribution in the Cutting Zone; 9.3 Prediction and Modelling of Temperatures in the Cutting Zone; 9.3.1 Calculation of temperature rise due to plastic deformation in the PDZ; 9.3.2 Calculation of average and maximum interface temperatures; 9.3.3 FEM and FDA prediction of cutting temperature; 9.4 Measurements of Temperatures in the Cutting Zone  
References  
Chapter 10. Cutting Fluids; 10.1 Basic Categories of Cutting Fluids; 10.2 Functions and Action of Cutting Fluids; 10.3 Application of Cutting Fluids and Other Cooling/Lubrication Media; 10.4 Maintenance and Disposal of Cutting Fluids; References; Chapter 11. Tribology of Metal Cutting; 11.1 Tribological Characterization of the Cutting Zone; 11.2 Distribution of Stresses in the Tool/Chip Interface; 11.3 Characterization of Friction at the Tool/Chip Interface; 11.4 Measurements and Predictions of Contact Stresses and Friction; References; Chapter 12. Tool Wear and Damage  
12.1 Types of Tool Wear

---

### Sommario/riassunto

This book updates our knowledge on the metal cutting processes in relation to theory and industrial practice. In particular, many topics reflect recent developments, e.g. modern tool materials, computational machining, computer simulation of various process phenomena, chip control, monitoring of the cutting state, progressive and hybrid machining operations, and generation and modelling of surface integrity. This book addresses the present state and future development of machining technologies. It provides a comprehensive description of metal cutting theory, experimental and modelling tech

---