

1. Record Nr.	UNINA9911006498203321
Autore	Rowe W. B (William Brian)
Titolo	Principles of modern grinding technology / / W. Brian Rowe
Pubbl/distr/stampa	Oxford, : William Andrew, c2009
ISBN	1-282-48173-8 9786612481734 0-8155-2019-0 0-08-095192-9
Descrizione fisica	1 online resource (451 p.)
Disciplina	621.9/2 671.35 621.92
Soggetti	Grinding and polishing Surface preparation
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; Principles of Modern Grinding Technology; Copyright Page; Contents; Preface; Abbreviations; Notations for Grinding Parameters; Basic Units and Conversion Factors; Chapter 1 Introduction; 1.1 The Role of Grinding in Manufacture; 1.2 Basic Grinding Processes; 1.3 Specification of the Grinding System Elements; 1.4 The Book and Its Contents; Chapter 2 Basic Material Removal; 2.1 The Removal Process; 2.2 Depth of Material Removed; 2.3 Equivalent Chip Thickness; 2.4 Material Removal Rate; 2.5 Specific Grinding Energy; 2.6 Forces and Power; 2.7 Maximising Removal Rate Chapter 3 Grinding Wheel Developments3.1 Introduction; 3.2 Abrasives; 3.3 Wheel Bonds; 3.4 Grinding Wheels; 3.5 Wheel Specification; 3.6 Wheel Design and Application; 3.7 High-speed Wheels; 3.8 Wheel Elasticity and Vibrations; Chapter 4 Grinding Wheel Dressing; 4.1 Introduction; 4.2 Stationary Dressing Tools; 4.3 Rotary Dressing Tools; 4.4 Grinding Performance; 4.5 Touch Dressing for CBN Wheels; 4.6 Continuous Dressing; 4.7 Electrolytic In-process Dressing (ELID); Chapter 5 Wheel Contact Effects; 5.1 The Abrasive Surface; 5.2 Grain Wear; 5.3 Wheel-Workpiece Conformity; 5.4 Contact Length

Chapter 6 High-speed Grinding 6.1 Introduction; 6.2 Trends in High-speed Grinding; 6.3 High-speed Domains; 6.4 High-Efficiency Grinding; 6.5 Creep-Feed Grinding; 6.6 High-Efficiency Deep Grinding (HEDG); 6.7 High Work Speed Grinding; Chapter 7 Avoiding Thermal Damage; 7.1 Introduction; 7.2 The Iron-Carbon Diagram; 7.3 Burn and Temper Damage; 7.4 Re-hardening Damage; 7.5 Residual Stresses; 7.6 Grind Hardening; 7.7 Process Monitoring; Chapter 8 Application of Fluids; 8.1 Introduction; 8.2 Water-Based Fluids; 8.3 Neat Oils; 8.4 MQL and Gas-Jet Cooling; 8.5 Pumping System; 8.6 Fluid Delivery 8.7 Nozzle Design Calculations 8.8 Nozzle Flow Rate Requirements; 8.9 Power Required to Accelerate the Fluid; Chapter 9 Cost Reduction; 9.1 Introduction; 9.2 Analysis of Cost per Part; 9.3 Cost Reduction Trials; 9.4 Cost Comparisons for AISI 52100; 9.5 Cost Comparisons for Inconel 718; Chapter 10 Grinding Machine Developments; 10.1 Machine Requirements; 10.2 Grinding Machine Elements; 10.3 Machine Stiffness and Compliances; 10.4 Design Principles for Machine Layout; 10.5 Spindle Bearings and Wheel Heads; 10.6 Plain Hydrodynamic Spindle Bearings; 10.7 Rolling Bearings 10.8 Hydrostatic and Hybrid Bearings 10.9 Air-Bearing Spindles; 10.10 Machine Base; 10.11 Column Deflections and Thermal Effects; 10.12 Joints, Slide-Ways, and Feed Drives; 10.13 Trends in Grinding Machine Development; 10.14 Ultra-Precision Grinders; Chapter 11 Process Control; 11.1 Process Variability; 11.2 Classes of Machine Control; 11.3 Intelligent Control of Grinding; 11.4 Knowledge-Based Intelligent Control Systems; Chapter 12 Vibration Problem Solving; 12.1 Introduction; 12.2 Dynamic Relationships for Grinding; 12.3 Grinding Wheel Contact Length Filtering 12.4 Machine Stiffness Characteristics

Sommario/riassunto

The book is aimed at practitioners, engineers, researchers, students and teachers. The approach is direct, concise and authoritative. Progressing through each major element of the grinding system and then on to machine developments and process control, the reader becomes aware of all aspects of operation and design. Trends are described demonstrating key features. Coverage includes abrasives and super-abrasives, wheel design, dressing technology, machine accuracy and productivity, grinding machine design, high-speed grinding technology, cost optimization, ultra-precision grinding, process cont