ISBN(softcover): 978-0-87849-878-9 ISBN(eBook): 978-3-0357-0394-8

Table of Contents

Chemical Mechanical Polishing (CMP) in Magnetic Float Polishing (MFP) of Advanced Ceramic (Silicon Nitride) and Glass (Silicon Dioxide)
M. Jiang and R. Komanduri 1

Fuzzy Contact and Its Effect on Thermal Damage in Grinding Processes
H.S. Qi, W.B. Rowe and B. Mills 15

Bifractal Characteristics of Ground Workpiece Surfaces
S.F. Lu, Y. Gao and Z. Li 25

Wear Pattern of Coated Carbide Tools in High Speed Threading of a Ni-Cr-Mo Base Steel
E.O. Ezugwu and C.I. Okeke 29

A Study on Surface Quality of Ultraprecision Grinding for Engineering Ceramics
S.Y. Yu, X.S. Han and B. Lin 35

A Complex Thermal Model for Deep Grinding
G.Q. Cai, T. Jin and B.F. Feng 41

A Study of Turning Operation by Oil-Water Combined Mist Lubrication Machining Method
D.C. Chen, Y. Suzuki and K. Sakai 47

Research on Enhancing Heat Transfer in Grinding Contact Zone with Radial Water Jet Impinging Cooling
H.J. Xu, Y.C. Fu and F.H. Sun 53

Significance of Grinding Temperature in Metal Removal
D.W. Zuo and T. Matsuo 57

Stone Sawing Forces by Single Diamond Segment
C.Y. Wang and R. Clausen 61

Study on Surface Grinding of Granites with Resin Bonded Diamond Wheel
X.P. Xu and J.Y. Shen 67

Compliant EDM for Free-Form Surfaces Polishing
J.M. Zhan, J.H. Zhao and M. Yu 73

Study on Performance of CBN Cup Quill for Face Grinding
Q.S. Yan, Z.Q. Zhang and K. Syoji 79

Experimental Research on Flow during CMP Processes
J.L. Yuan, B. Lin, Z.W. Shen, J.J. Zheng, J. Ruan and L.B. Zhang 85

The Application of the Lubrication Theory to the Surface Grinding
P.Q. Ge, J.G. Sun and Z.C. Liu 89

Theoretical Analysis of Temperature Field in Surface Grinding with Cup Wheel
B. Lin and H.L. Zhang 93

Development of a Dicing Blade Using Light-Hardening Resin
W. Peng, W. Huang and X.F. Xu 99

Ultra-Precision Grinding of Ceramic Glass with ELID Technique
F.H. Zhang, Z.J. Qiu and D.R. Luan 103

Surface Integrity and Modification of Diamond Wheel Ground Engineering Ceramics
C.L. Wu, Q.H. Zhang, J.H. Zhang and T.C. Lee 109

Experimental Study on the Single-Grit Grinding Titanium Alloy TC4 and Superalloy GH4169
B.F. Feng and G.Q. Cai 115

Study of the Formation and Propagation Conditions of Grinding Crack for Ceramics
B. Lin, S.Y. Yu and A.B. Yu 121

The Preparation of Super-Fine Alumina Powders with Sol-Gel Technology
C.Z. Huang, J.L. Wang, Z.Q. Li, B.Y. Wang and X. Ai 127

The Mathematical Model for Center Movement of Grinding Wheel while Grinding Cam Part with NC Grinder
Z.X. Zhao, Z.J. Xiao, J.B. Tao and H.Q. Mi 133

Truing of Diamond Wheels by Laser
R.K. Kang, J.T. Yuan, Y.P. Zhang and J.X. Ren 137

Microanalysis of Interface between Ni-Cr Alloy and Diamond (or Steel)
Z.B. Wu, H.J. Xu and B. Xiao 143

Brazing of Ti/Ni-Coated Diamond
Y.H. Wang, H.X. Wang, M.Z. Wang and Y.Z. Zheng 147

Evaluation for Adhesion Performance of Brazed Grains
D.W. Zuo, J. Zhu, G.Z. Xie and M. Wang 151

Investigation on Brazing of Single-Layer Superabrasive Wheel
B. Xiao, H.J. Xu and Z.B. Wu 155

Improvement of Adhesive Strength and Surface Roughness of Diamond-Coated Thin Film Tools
F.H. Sun, M. Chen, Z.M. Zhang and H.S. Shen 159

Polishing of CVD Diamond Films
Z.N. Guo, C.Y. Wang, F.L. Zhang and T.C. Kuang 165

Lap-Grinding of Al_2O_3 Ceramics Assisted by Water-Jet Dressing Metal Bond Diamond Wheel
J.Y. Shen, X.P. Xu, B. Lin and Y.S. Xu 171

Zirconia-Toughened Si_3N_4 Bonding Polycrystalline Cubic Boron Nitride (PCBN)
J.B. Zang, W. Han, M.Z. Wang and Y.Z. Zheng 177

Research on Grinding Wheel Intelligent Dressing System
Y.D. Gong, G.J. Liu and W.S. Wang 181

Rubbing Process Technology of HIPSN Ceramic Balls
Y.H. Wu, K. Zhang and H. Sun 185

On-Line Intelligent Identification in Grinding Process Based on Rough Sets Theory
J.F. Shi, Z.C. Hong and J. Cao 189

Form Grinding Technology of an Irregular Roller and the Electrolytic In-Process Dressing for the Form Grinding Wheel
P.L. Zhu, T.H. Chen and S.P. Wang 193

Effect of Ti Coating on Wear Stages of Diamond in Tools
Y.H. Wang, J.B. Zang, H.X. Wang and M.Z. Wang 199

Experimental Models Coupled Optimal Design of Multi-Blade Sawing with Diamond Abrasive Tools
Y.Q. Yu, J.C. He and X.P. Xu 203

On the Transverse Vibration of Circular Saw
Z.Q. Wang and Z.Z. Peng 211

Development of CBN Wheel with Cold Gas Inner Cooling
H. Gao, J.X. Wang and X.H. Lan 215

Simulation and Optimum for Plunge Grinding
G.F. Li and L.S. Wang 219

The Critical Velocity Model and Surface Characteristics of Mixed Longitudinal Ultrasonic Honing
B. Zhao, C.S. Liu, F. Jiao, D.S. Wang and G.F. Gao 227

New Ultra-Precision Polishing Techniques of Glass BK-7 Optical Plate
J.L. Yuan, B. Lin, Z.W. Shen, J.J. Zheng, J. Ruan and L.B. Zhang 235

The Boring-Grinding-Rolling Techniques for Hydraulic Cylinder of 0.2% Carbon Steel
L.Z. Gu, Y.H. Liu, T. Zhang and D.G. Wang 239

Study on New Type of Matrix Material of Electroplating Diamond Tools
P.S. Pan, C.R. Yang and K.H. Yang 245

Analysis of On-Line Roll Grinding Technology for Hot Strip Mill
Q. Fan, T.Q. Gu and H. Gao 249

Research on Complex Ultrasonic Honing Acoustics System by Statistical Energy Analysis
B. Zhao, F. Jiao, C.S. Liu, D.S. Wang and G.F. Gao 253

Modeling and Simulation of Virtual Grinding Machine
Z. Shao, Y.D. Gong and W.S. Wang 259

The Technology of Laser Honing Applied in Distinctively Improving the Lubrication of Frictional Units
Y.H. Fu, Y.X. Ye, Y.K. Zhang and L. Cai 265

Study on Concurrent Engineering-Based CAPP System
Y.B. Liu and F. Zhang 271

An Experimental Investigation on Rotary Ultrasonic Machining
G. Ya, H.W. Qin, Y.W. Xu and Y.S. Zhang 277

Research on CMP Process Parameters Effect on Slurry Transport
Z.W. Shen, J.L. Yuan, B. Lin, J.J. Zheng, J. Ruan and L.B. Zhang 281

Properties of Granite Grinding Surface
Z.X. Qin, C.Y. Wang, F.L. Zhang and X. Wei 285

Study on the Correlation of Toughness Index and Wear Stages of Diamond
Y.H. Wang, J.B. Zang, H.X. Wang and Y.C. Zhao 289

Measurement and Analysis of Cutting Forces in Circular Sawing of Granite
Y.Y. Li, Y.Q. Yu and X.P. Xu 293

Wear Resistance Analysis of Plateau Honing Surface for Ceramics Mg-PSZ
A.B. Yu, Y.F. Tan, B. Lin, Y.S. Xu and X.L. Tian 299

The Toughening Effect of $ZrO_2(Y_2O_3)$ on SiC Bonding Polycrystalline Diamond (PCD)
J.B. Zang, Y.H. Wang, Y.C. Zhao and Y.Z. Zheng 303

Grinding Titanium Alloy (Ti-6Al-4V) by Cryogenic Cooling
B. Zhu, F.H. Zhang and H. Niu 309

Investigation of an Atomic Force Microscope Diamond Tip Wear in Micro/Nano-Machining
Q.L. Zhao, S. Dong and T. Sun 315

Microcutting of Polymethyl Methecrylate by Atomic Force Microscope
J. Zhu, D.W. Zuo, N. Gu and Z.H. Lu 321

Research on Mechanism of Chip Formation at Small Size Cutting
H.N. Fu 325

Rubbing Process and Monitoring of Precise Ceramic Ball
K. Zhang, Y.H. Wu and S.H. Li 329

Analysis of the Polished Surface Layer on the Glossy Granite Machined by Diamond Abrasives
H. Huang, J.Y. Shen, X.P. Xu and H.J. Xu 333

Research on Increasing Diamond-Holding Strength of Saw Blade Segment Matrix
B.C. Liu 339

An Investigation into the Effects of Rare Earth on the Properties of Fe-Based Diamond Composites
Q.L. Dai, X.P. Xu and Y.C. Wang 345

On the Diamonds in Contact Zone of Saw Blade
Y.W. Zhu, X.M. Zhang, G.Z. Xie and Z.P. Zhou 349

Research on Metal Cement Grinding Wheel for ELID Precision Mirror Surface Grinding
J.L. Guan, J.W. Fan, C.M. Ma, Z.J. Yuan and D.M. Guo 355

Study of Acoustics Characteristics of Bending Vibration Disc --- Theoretical Analysis
D.S. Wang, B. Zhao, A.P. Zhou, C.S. Liu, G.F. Gao and F. Jiao 359

Study on Application of Grinding Wheel for Bearing Internal Grinding
Z. Zhu and K.W. Mo 365

Creep Feed Grinding of a Nickel Base Superalloy with a Segmented Wheel Containing Coated CBN
X.P. Xu, H. Huang and H.J. Xu 369

Research on Optimization of Technological Parameters for Grinding Bearing Race
S.W. Lin and Z.W. Xue 375

Determination of the Character of Grinding Wheel in Form Processing of High-Speed Steel Cutter
Q. Li, J.F. Chen and S.X. Zhang 381

The Research and Application of Honing Technology
L. Li and D.M. Chai 385

Study of Assembled Electroplated CBN Gear-Honing Cutter
Z.L. Xu, Z.J. Chen, Y.H. Ding and P. Xu 389

Dynamic Response on the Ceramic Surface Residual Stresses for Grinding Temperature
X.L. Tian, B. Lin and A.B. Yu 393

Computer Simulation Technology in the Process of Shaping Milling Cutter Relief Grinding
Y.Y. Zheng, Q.X. He, F. Jiao and A.H. Gao 397

The Research of the Deep-Hole Strong Honing of Titanium Alloy
L. Zhu and H.B. Zhao 403

Study on the Technology of New Ultrasonic Honing
X.J. Zhu 407

On Trans-Characteristics of Coarse Grit Ultrasonic Honing Hard-Brittle Materials in the Ductile Mode from Brittleness to Ductility
Z.X. Tie and B. Zhao 411

Research on Relationship between Surface Waviness in Ground Bearing Race and Technological Parameters
S.W. Lin and Z.W. Xue 415

The Application of ELID Grinding Technology on External Precision Mirror Surface
J.L. Guan, J.W. Fan, C.M. Ma, Z.J. Yuan and D.M. Guo 419

The Defects and Solutions of the Surface Quality in Grinding Process
J.F. Chen, Q. Li, J.H. Cheng and J.H. Cui 423

Fuzzy Estimation of Uncertainty for Grinding Force
W.P. Wang, Y.H. Peng and X.Y. Li 429

The Application of Linear Motor in High-Speed Precision Cylindrical Grinding
D.W. Fu, Y.H. Wu and Q.L. Ai 433

The Application of ELID Grinding Technology in Precision and Super-Precision Grinding of Hard and Brittle Materials
J.L. Guan, J.W. Fan, C.M. Ma, Z.J. Yuan and D.M. Guo 437

Research on Intelligent Localizing Technique for Complex Curved Surface Parts Grinding
K. Zhou, D.Z. Mao and Y. Liu 441

A Novel Biglide Parallel Grinder
P. Zou 447

A Study on the Movement Accuracy Analysis and Control for CNC Grinding Machine
J.W. Fan, J.L. Guan, W.C. Wang, J. Guan and X.Y. Wang 451

The Application of Intelligent Fuzzy Control Technique to Grinding Long-Thin Shaft
J.B. Wang 455

An Electro-Hydraulic Grinding Feed Drive Digital Control System
J.L. Yang, J. Ruan, J.L. Yuan and L.B. Zhang 459

Machine Tool Spindles and Active Magnetic Bearings
X.P. Wang, X.J. Chen, L.J. Zhu and W. Wang 465

Study of High-Speed Positioning System Actuated by Stepper Motor
X. Pei, J.J. Zheng, J. Ruan, J.L. Yuan and L.B. Zhang 469

Research on Curved Surface Grinder with 5-DOF Paralled Mechanism
K. Zhou, D.Z. Mao and Y. Liu 475

Design of CNC System for Beam-Rotatable Grinding Machines
M.H. Xie, G.L. Zhu and Z.C. Duan 479

Research into Bit for Extra-Hard Rock
S.H. Zhang, K.H. Yang and F. Lu 485