Table of Contents

| Preface | |
|--|-----|
| Mechanism of Brittle-Ductile Transition of Single Silicon Wafer at Different Temperatures Y.L. Sun, D.W. Zuo, Y.W. Zhu, D.S. Li, M. Qi and M. Wang | 1 |
| Mechanism of Material Removal and the Generation of Defects by MD Analysis in Three- Dimensional Simulation in Abrasive Processes J.X. Chen, Y.C. Liang, Q.S. Bai, Y.L. Tang and M.J. Chen | 6 |
| Study of the Wettability between Diamond Abrasive and Vitrified Bond with Low Melting Point and High Strength J.B. Zang, J. Lu, Y.H. Wang, X.H. Zhang and Y.G. Yuan | 11 |
| Effect of Si and Ti Coating on Interface Bonding between Diamond and Fe-Based Metal Bond | |
| J. Lu, Y.H. Wang, J.B. Zang and S.X. Shan | 15 |
| Nanodiamond Modified with SHP Y.W. Zhu, F. Xu, J.L. Shen, B.C. Wang and X.Y. Xu | 19 |
| Study on Tribological Performance of Fine-Grained Diamond Films B. Shen, W. Zuo, F.H. Sun and M. Chen | 23 |
| The Experimental Study on Wear Performance of Brazed Diamond Grits Y. Chen, H.J. Xu and Y.C. Fu | 28 |
| Grinding Titanium Alloy with Brazed Monolayer CBN Wheels C.Y. Yang, J.H. Xu, W.F. Ding and S.T. Tong | 33 |
| High Performance Grinding Zirconia Ceramics by Brazed Monolayered Diamond Wheels S.S. Li, J.H. Xu, B. Xiao, Y.C. Fu and H.J. Xu | 38 |
| Laser Brazing of Diamond Grits with a Ni-Based Brazing Alloy Z.B. Yang, J.H. Xu, Y.C. Fu and H.J. Xu | 43 |
| Experimental Study on Porous Metal Bonded Diamond Grinding Wheels (II) — Grinding Performance of Porous Wheels Q.L. Dai, C.B. Luo and C.J. Liao | 48 |
| Research on Interfacial Microstructure of Ti-Coated Diamond Brazed and Uncoated Diamond Brazed by High-Frequency Induction B.J. Ma, Y.C. Fu, W.F. Ding, W. Gao and H.J. Xu | 53 |
| Study on the Wear Mechanism of Brazed Diamond Grains G.Q. Zhang, H. Huang and X.P. Xu | 58 |
| The Characteristic of Organic Bond Grinding Wheel M.W. Chen, J.L. Yuan, Y. Yang and D.Q. Yu | 63 |
| A High-Speed Nickel Plating Bath for Manufacture of Diamond Tools B.S. Pan and Y. Yang | 68 |
| Mechanical Behaviors of Metal-Bonded Diamond Abrasive Tools with Different Grit Sizes Y.Q. Yu, X.R. Tie and X.P. Xu | 73 |
| Vibration Characteristic Analysis of Diamond Saw Blade with Multitude Holes Structure for Vibration and Noise Reduction S.S. Hu, Y.N. Hu, C.Y. Wang and C.X. Chen | 78 |
| Finite Element Modeling and Blister Test to Investigate the Adhesive Strength of Diamond Thin Film | |
| D.H. Xiang, M. Chen and F.H. Sun | 85 |
| Precision form Grinding of Ceramic Materials with Diamond Grinding Wheel Z.M. Cui, D.J. Zhu and L. Du | 90 |
| Passivation Model of Diamond Grinding Wheel in Constant-Force Grinding of Si ₃ N ₄ Ceramic | 0.4 |
| X.L. Tian, Z.Y. Wu, A.Y. She and Z.X. Hu Formation and Control of Burr in Grind-Hardening | 94 |
| G.C. Wang, J.D. Liu, Q.F. Li, Y.M. Zhu, H.J. Pei and J.Y. Zhang | 98 |
| Experimental Investigation on Effects of Depth of Cut on Micro-Geometric Properties in Quick-Point Grinding S.C. Xiu, C.H. Li and G.Q. Cai | 103 |

| High-Efficiency and Precision Grinding Technology of HIPSN All-Ceramic Bearing Race S.H. Li and Y.H. Wu | 108 |
|--|------|
| Experimental Researches on Precision Grinding of KDP Crystal Q.G. Wang, H. Gao, Q.Z. Zhang, X.S. Cao and R.K. Kang | 113 |
| Comparison of Power in CBN Grinding of Steels and Stone X.P. Xu and C.J. Du | 118 |
| Removal Process Technology of Precision Grinding for Complicated Surface Part of High Performance Hard and Brittle Materials T. Ji, D.M. Guo and G.H. Bian | 123 |
| Analysis of Influence Factors for the Contact Length between Wheel and Workpiece in Surface Grinding C. Mao, Z.X. Zhou, D.W. Zhou and D.Y. Gu | 128 |
| Thermal Study in Diamond Grinding of Zirconia J.Y. Shen, F.Y. You and X.P. Xu | 133 |
| A New Technology of Improving Surface Quality of Engine Cylinder X.J. Zhu, H.J. Xu, Y.X. Gao and Z.M. Lu | 138 |
| A Study on Grinding Performance of Porous NiTi Shape Memory Alloy Y.Y. Tao, J.H. Xu and W.F. Ding | 143 |
| Research on Grind-Hardening Temperature and Cooling Rate of 48MnV Microalloyed Steel | |
| B. Xiao, H.H. Su, S.S. Li and H.J. Xu Force Characteristics in Drilling of Engineering Ceramic with a Brazed Diamond Tool | 148 |
| H. Huang, C.F. Huang and X.P. Xu | 153 |
| Parameters Optimization on the Lapping Process of 9Cr18 with Taguchi Method X.F. Zheng, J.L. Yuan, D.H. Wen and F.Y. Lou | 158 |
| Study on the Control and Test of High Precision Honing Machine for Injection Nozzle L. Shi | 162 |
| Numerical Simulation Study on Truing and Dressing of Bronze-Bonded Diamond Wheel with Pulsed Laser | 1.00 |
| G.Y. Chen, L.F. Mei, B. Zhang, D.J. Zhu and G.G. Chen Experimental Research on Erosion and Corrosion of WC-Base Matrix Materials for Drill | 166 |
| Bits under Impingement of Drilling Muds L.C. Duan, A. Neville and Y. Yan | 171 |
| Research and Practice on the On-Line Measurement of Cylindricity Error in a Grinding Machine | |
| L. Zhang, Y. Zhao and L. Ba A Calculating Method of the Least Feeding Times in Cylinder Cam's Grinding | 176 |
| Y.T. Zhang, Z.Q. Hu and H.L. Zhang | 181 |
| The Experiment Method of the Study on the Airflow Field around the Grinding Wheel in Super-High Speed Based on PIV | |
| Y.D. Gong, H. Li, Y.C. Zhang, G.Q. Cai and Z.H. Deng Dynamic Intelligent Prediction Control in Slender Cylindrical Grinding | 185 |
| N. Ding, X.M. Li, Y. Ding, G.F. Li and L.S. Wang | 189 |
| Interpretative Structural Modeling for Ceramic Grindability System A.B. Yu, N. Zhao, Y.L. Wang and X.L. Tian | 194 |
| Study on Self-Configuration Method of Neural Network Model for Grinding Troubles On- Line Monitoring | 100 |
| G.J. Liu, Q. Wang, X.L. Shi and R.K. Kang An Optimal Feed Interpolation with Jerk-Limited Acceleration for Five-Axis Grinding | 199 |
| J.C. Feng, Y.H. Li, Y.H. Wang and M. Chen Peal Time Thormal Error Modeling and Compensation of 5 Axis NC Crinding Machine | 204 |
| Real Time Thermal Error Modeling and Compensation of 5-Axis NC Grinding Machine Tool | 210 |
| X.S. Wang, J.G. Yang, H. Wu and J.Y. Yan Study on Squeeze Oil Film Damper in Ultrahigh Speed Grinding | 210 |
| T.B. Yu, Y.D. Gong, H.F. Zhao, S. Liang and W.S. Wang | 215 |
| Monitoring and Compensation of Thermal Error of Profile Grinding Spindle L.M. Xu, L. Shi, X.M. Zhao and D.J. Hu | 219 |

| Experimental Study on the Hardened Surface Layer of Grinding SKD-11 Hardened Steel W.W. Ming, G. Liu and M. Chen | 224 |
|---|-----|
| Experimental Investigations on Surface Residual Stresses in the As-Sprayed and Ground Nanostructured WC/12Co Coatings Z.H. Deng, Z.W. Hu, Q. Jing and Y.D. Gong | 229 |
| Surface and Sub-Surface Integrity of Ultra- Machined BK7 Using Fine and Coarse Grained | 22) |
| Diamond Wheels Q.L. Zhao, B. Wang, E. Brinksmeier, O. Riemer, K. Rickens and J. Corbett | 234 |
| Experiment Study on Residual Stresses Based on Quick-Point Grinding with Vitrified CBN Wheel | 220 |
| Z.R. Pang, S.X. Yuan, W.S. Wang and C.X. Zhu | 239 |
| Experimental Investigation into Surface Integrity Finished by Abrasive Jet with Grinding Wheel as Restraint C.H. Li, S.C. Xiu and G.Q. Cai | 244 |
| Lapping Process of Diamond Cutting Tool by Molecular Dynamics Simulating Z.Q. Li, T. Sun, Y.D. Yan, J.J. Zhang, Y.C. Liang and S. Dong | 249 |
| Study on Contact Mechanism of Interface in Wafer CMP Based on Abrasion Behavior J.X. Su, X.L. Zhang, X.Q. Chen, J.X. Du and D.M. Guo | 254 |
| Design of Surface Finish Using Synchronous Process of Grinding and Electrochemical | |
| Finishing P.S. Pa | 259 |
| Hydrodynamic Analysis of Circular Translational Polishing under Mixed Lubrication W.J. Zhai, C.X. Liu and P.L. Feng | 264 |
| Research on Nanoscale Material Removal Process Using Atomic Force Microscopy F.H. Zhang, H.L. Zhang, Y.D. Yan and J.H. Wang | 269 |
| Experimental Study of Precision Polishing of Hard and Brittle Material L.H. Dong, C.H. Fan, J. Huang and H.X. Luo | 274 |
| Influences of Machining Parameters on Silicon Wafer Polished with Gel-Coupled Ultra- Fine Abrasive Polishing Pads J. Liu and X.P. Xu | 279 |
| Study on Mechanical Polishing for CVD Diamond Films of Forming Nucleus Surface and Growing Surface | |
| R.F. Chen, D.W. Zuo, W.Z. Lu, D.S. Li, F. Xu, T. Ji and M. Wang | 285 |
| Research on the Hydrodynamic Electro-Chemical Mechanical Polishing for Silicon Wafer with Suspension Fluid J.M. Zhan and D. Zheng | 290 |
| Study of Finishing Internal Surface Using Magnetic Force Generated by Rotating Magnetic | |
| Field in Electromotor X.G. Yao, S.Y. Wang, Y.H. Ding, G. Ya and J. Zhang | 295 |
| Experimental Study on Increasing Magnetic Abrasive Finishing Efficiency of Finishing Nonferromagnetic Materials S.R. Zhang, L.F. Yang and G.X. Wu | 300 |
| Optimize Parameters of Floating Polishing with Tri-Polishing-Disk X.C. Xu, Z.J. Yuan and B. Lin | 305 |
| Study on Pad Conditioning Parameters in Silicon Wafer CMP Process Z.Z. Zhou, J.L. Yuan, B.H. Lv and J.J. Zheng | 309 |
| Technique Optimization of Dual Rotation Plates Lapping Method for Ceramic Ball X. Lv, J.L. Yuan and Y. Dai | 314 |
| Study on the Surface Integrity of Polished Diamond Thick Film Prepared by EACVD F. Xu, D.W. Zuo, R.F. Chen, W.Z. Lu and M. Wang | 319 |
| The Performance and Optimization of Slurry on the Double Sided Polishing Process of Silicon Wafer | |
| W. Li, G.X. Hu, X.D. Hu and X.Z. Hu | 324 |
| New Thought for Designing the Multi-Phase and Multi-Scale Nanocomposite Ceramic Tool Materials | • |
| H.L. Liu, C.Z. Huang, X.Y. Teng and H. Wang | 329 |
| Crown Modification of Cylinder-Roller Bearing Raceway Using Electrochemical Abrasive Belt Grinding W.J. Xu, B. Tao, G.B. Pang, X.Y. Wang and X.H. Zhao | 335 |

| Surface Texturing Technology by Laser Honing Based on Hydrodynamic Lubrication Y.K. Zhang, C.J. Yang, Y.H. Fu, J.Z. Zhou, X.J. Hua and J.H. Ji | 340 |
|---|--------|
| Research on Micro-Mechanism of Nanocomposite Ceramic in Two-Dimensional Ultrasound Grinding | |
| B. Zhao, Y. Wu, G.F. Gao and F. Jiao | 344 |
| Experimental Study on the Ultraprecision Lapping Technology of the Copper Substrates for Alloy Films C.R. Zhu, Q. Xu, J.L. Yuan, D.H. Wen and B.H. Lv | 349 |
| Influences of Ultrasonic Assistance in High Speed Lapping of Nano ZTA Engineering | 343 |
| Ceramic on the Surface Machining Quality F. Jiao, B. Zhao, C.S. Liu and X.S. Zhu | 355 |
| Electrochemical Grinding for Unclosed Internal Cylinder Surface P.M. Ming, D. Zhu and Z.Y. Xu | 360 |
| Study on the Performances of the Ferromagnetic Poles Based on the Curved Surface Magnetic Abrasive Finishing | |
| Y.H. Ding, X.G. Yao, X.X. Wang and S.C. Yang | 365 |
| Basic Experimental Research on the NC-Contour Evolution Ultrasonic Assisted Grinding Ceramic Blade Surface J.X. Zheng and J.W. Xu | 369 |
| Experimental Research on Small Holes by Electrical Discharge Machining Combined with | 50) |
| Ultrasonic Vibration and Assisted Inwall Polish with the Ultrasonic Vibrating M.R. Cao, S.C. Yang, W.H. Li and S.Q. Yang | 374 |
| Experimental Study on Lapping Force Characteristics of Hard-Brittle Materials in | |
| Ultrasonic Vibration Lapping C.J. Zhang, C.S. Liu, B. Zhao and W.J. Jiang | 379 |
| A Mechanistic Model of Material Removal in Magnetorheological Finishing (MRF) F.J. Chen, S.H. Yin, J.W. Yu, H. Ohmori, W.M. Lin and Y. Uehara | 384 |
| A Study of Micro Machining with Instantaneous Tiny-Grinding Wheel Based on the Fe ₃ O ₄ Magnetorheological Fluid J.B. Lu, Q.S. Yan, J. Yu, H. Tian and W.Q. Gao | 389 |
| Theoretic Analysis and Experimental Research on Barrel Finishing Uniformity of Crank | 367 |
| Shafts with Larger Size W.H. Li, S.Q. Yang and S.C. Yang | 394 |
| Surface Waviness Analysis for Axisymmetric Aspheric Lens in Precision Grinding Z.Z. Wang and Y.B. Guo | 399 |
| Effect of Nozzle Type and Abrasive on Machinablity in Micro Abrasive Air Jet Machining of Glass | |
| J.M. Fan, C.Y. Wang, J. Wang and G.S. Luo | 404 |
| Fabrication of WC-6Co-1.5Al (wt%) Hardmetal by High Energy Milling and Electrical Current Sintering | 400 |
| X.Q. Li, Y.Y. Li, Y. Long, M. Shao and J.B. Zhang | 409 |
| Study on Dynamical Characteristics of Catenary Transformer in Gear Honing S.Y. Wang, M. Lv and G. Ya Ultrasonia Machining Aided Tool Potation of Sintared NdFap Magnet | 414 |
| Ultrasonic Machining Aided Tool Rotation of Sintered NdFeB Magnet L. Li, D. Wang, Z.W. Niu, Z.Y. Li and G.M. Yuan | 420 |
| Experimental Investigation of Intermittent Rotary Ultrasonic Machining W.M. Zeng, Z.C. Li, X.P. Xu, Z.J. Pei, J.D. Liu and J. Pi | 425 |
| Modeling of Material Removal Rate in Two-Dimensional Ultrasonic Grinding Complex Ceramics G.F. Gao, B. Zhao, Q.H. Kong and C.S. Liu | 431 |
| Research on Design and Manufacture of Ultrasonic-Vibration-Based Gear-Honing Device | r.J.I. |
| M. Lv, L. Ma, G.X. Liang and Y. Zhang Injection of Thermoplastic Polyurethane to Fix Diamond Beads on Wire Saws | 436 |
| H. Guo, X.S. Wu, Y.J. Zhang, Y.X. Chen and X.P. Xu | 441 |
| Researching and Manufacturing of Endless Diamond Wire Saws and the Cutting Experiment | |
| W. Gao, B.J. Ma, T.K. Cao and Z.C. Liu | 445 |

| Study on Removal Mechanism of Fixed-Abrasive Diamond Wire Saw Slicing | |
|--|-----|
| Monocrystalline Silicon Y.F. Gao, P.Q. Ge and Z.J. Hou | 450 |
| The Numerical Analysis on Action Mechanism of Slurry in Free Abrasive Wiresaw Slicing P.Q. Ge, B. Sang and Y.F. Gao | 455 |
| Research on Cryogenic Pneumatic Mist Jet Impinging Cooling and Lubricating of Grinding Processes Q.L. An, Y.C. Fu and J.H. Xu | 460 |
| Two Domensional Simulation of Velocity Field of Two-Phase Flow for Gas and Solid in the Abrasive Air Jet Nozzle | |
| C.Z. Huang, R.G. Hou, Z.W. Liu, Q.L. Li and H.T. Zhu | 465 |
| Simulation of the Gas-Liquid-Solid Three-Phase Flow Velocity Field Outside the Abrasive Water Jet(AWJ) Rectangle Nozzle and Ellipse Nozzle R.G. Hou, C.Z. Huang, L. Li, Z.W. Niu and Z.Y. Li | 470 |
| The Modeling and Finite Elements Simulation for Pressure Field of Abrasive Jet Precision Finishing With Grinding Wheel as Restraint S.X. Yuan, X.Y. Liu, G.Q. Cai and J.P. Shao | 474 |
| Real-Time Measurement and Compensation for Wheel Wear in Curve Grinding Based on | |
| Image Processing Method Y.M. Luo and D.J. Hu | 479 |
| Fractal Tool-Path Planning for Free-Form Surface Polishing System Y.H. Li, J.C. Feng and Y.H. Wang | 484 |
| Apply Image Registration to the Wear Measurement and Analysis of Different PVD-Coating Drills Y.C. Chiou and Y.T. Liang | 489 |
| Nonlinearity Analysis and Wavelet Package Transform of Measured Chatter Vibrations in Grinding Process | 407 |
| Q.K. Han and B.C. Wen | 494 |
| Detection of Grinding Surface's Quality Based on Image Technique X.L. Liu, C.Y. Wu, Y.Z. Liu, F.G. Yan, Y.F. Li and P. Wang | 499 |
| A Fundamental Study on the Digital Recognition of Grinding Wheel J.F. Gong and X.P. Xu | 504 |
| Analysis and Simulation of Grinding Wheel Surface Topography B. Lin and X.Y. Huang | 509 |
| Evaluation and Measurement of 3D Form Errors of Ground Curve Surface J. Xie, J.L. Guo and J. Xu | 513 |
| Study on Remote Control and Fault Diagnosis for Ultrahigh Speed Grinding W.S. Wang, T.B. Yu, X.Y. Jiang and J.Y. Yang | 518 |
| 3D Fractal Analysis of Ultra Precision Grinding Influencing on the Surface Topography of Brittle Material | |
| M.J. Chen, Q.L. Pang, J.H. Wang and K. Cheng | 523 |
| Grinding Process Fuzzy Control on CNC Tool Grinder J. Kang, C.J. Feng, H.Y. Hu and Q. Shao | 528 |
| Experiment on Dynamics of the Hybrid Polishing Kinematics Machine Tool with Clearance Based on the Flexible Multi-Body Systems M. Yu and Y.M. Zhang | 533 |
| Structural Parameter Optimal Design of a 3-TPS Parallel Grinding Machine Tool Based on Stiffness L. Zhoo, V.D. Gong and G.O. Coi | 520 |
| L. Zhao, Y.D. Gong and G.Q. Cai Study on a Grinding Quality Assessing Method Based on Fuzzy Decision Combined with | 538 |
| Analytic Hierarchy Process (AHP) X.L. Shi, G.J. Liu, Q. Wang and R.K. Kang | 543 |
| The Experimental Study of Phase Transformation Heat—Transfer in Simulation of Grinding of Ti Alloy J.L. Ren, W. Li, H. Hang and X.Y. Guan | 548 |
| On Programming for NC Grinding of Grooved Cam with Discretional Plane Curve Profile | 5.0 |
| Z.Q. Zhang, Y.C. Ge, Z.D. Zheng and S.B. Chen | 554 |

| Technology Improvement and Parameter Optimization on the Electroplating Superhard | |
|---|-----|
| Grinding Material | |
| Y.W. Wang, Y.Z. Liu, X.L. Liu, G.B. Wang and H.C. Deng | 559 |
| Research on Design Knowledge Expression Method of Abrasive Machine Tool Based on | |
| Axiomatic Design | |
| Y.X. Feng, B. Zheng, Z. Wei and J.R. Tan | 564 |
| Research on Thermal Error Compensation Technology of Grinding Machine Based on | |
| Neural Networks | |
| Q.J. Guo, J.G. Yang and X.N. Qi | 569 |
| Development of the 6-Axles CNC Abrasive Belt Grinding Machine | |
| Z. Huang, Y. Huang, M.D. Zhang and X.D. Guo | 574 |
| | |