

Table of Contents

Preface, Conference Organizers

Microstructure and Properties of the Sintered Diamond Reinforced by Diamond-MWCNTs Composite Fibers

F.M. Deng, X.J. Lu, R.P. Liu, G.J. Xu, Q.W. Chen and W.Z. Li 1

Influence of Zinc Particles on Oxidation Resistance of Diamond/Borosilicate Glass Composites

Y.H. Wang, X.H. Zhang, J.B. Zang, X.Z. Cheng and J.H. Zhang 8

A Method to Investigate Stability of Silicon Coating on Diamond Substrate by First Principle Calculation

D.X. Li, J. Lu and D.L. Yu 13

Coating SiC Whiskers with Protective Si Films for Al Matrix Composite

J. Lu, Y.H. Wang and X.P. Xu 17

Thermal Damage of Diamond Grits during the Brazing Process with Ni-Cr Alloy

Y. Chen, J.H. Xu, Y.C. Fu and H.H. Su 22

CFRP Drilling with Brazed Diamond Core Drill

J. Mu, J.H. Xu, Y. Chen and Y.C. Fu 27

Fracture Morphology of Composite CBN Wheel Segments Based on Graphite Self-Lubricating Effects

Z.Z. Chen, J.H. Xu, W.F. Ding and J.L. Huang 33

Measurement of Forces in Shearing Brazed Diamonds

Z.F. Su, G.Q. Huang, H. Huang, H. Guo and X.P. Xu 38

A Comparative Study: Tool Life and Wear of Thin-Walled Monolayer Brazed Diamond Core Drill Fabricated with Ni-Cr and Ag-Cu-Ti Alloy

H.H. Su, Y.C. Fu, Y. Chen, J.H. Xu and W.F. Ding 42

Effect of Arraying Patterns of Diamond Grits on the Wear of the Mono-Layer Brazed Diamond Tool

Y.M. Zhou, F.L. Zhang, M.J. He and H.P. Huang 47

Slot Grinding of Advanced Ceramics with Brazed Diamond Cut-Off Wheels

M. Chen, F. Zhang, J.Y. Shen, H. Guo and X.P. Xu 52

Energy and Material Removal Mechanisms for the Grinding of Cemented Carbide with Brazed Diamond Wheels

Y.J. Zhan, Y. Li, H. Huang and X.P. Xu 58

Analysis of Energy Consumption Efficiency in Diamond Circular Sawing

G.Q. Huang and X.P. Xu 67

Analysis of Grit Cut Depth in Fixed-Abrasive Diamond Wire Saw Slicing Single Crystal Silicon

Y.F. Gao and P.Q. Ge 72

Research on the Mechanical Properties of CaF₂ Crystal for Ultra-Precision Machining

M.J. Chen, W.B. Jiang, J. Cheng and X. Chu 77

Raman Analysis of the Silicon Wafer Scratched by Single Point Diamond

Z. Chen, X. Wei, X.Z. Xie and Q.L. Ren 82

Material Removal Distribution of Chemical Mechanical Polishing by the Bionic Polishing Pad with Phyllotactic Pattern

Y.S. Lu, J. Wang, N. Li, T. Zhang, M. Duan and X.L. Xing 87

The Effects of the Geometric Parameters of Segmented Sawblades on the Fluctuated Temperatures in Sawing

C.F. Fang, H. Huang and X.P. Xu 93

The Study of Vibration Effects on Precision Grinding Surface Quality

G. Bi and Y.B. Guo 97

Analysis of Effecting Factors on Surface Finish of Fused Silica Glass Grinding with Inclined Ball-Headed Diamond Wheel

M.J. Chen, Z. Li, K.J. Luo, Y.C. Liang, Z. Fang and B. Yu 102

Experimental Study on Damage Mechanism of Nano-Ceramic Surface/Subsurface under Ultrasonic Vibration Aided Grinding

B. Zhao, C.Y. Zhao and B.Y. Du 107

Study on Subsurface Damage after Fixed-Abrasive Lapping with Different Particle Size P. Gao, J. Li, Y.W. Zhu, B. Li, Y. Zhang, J.L. Fan, Y.L. Sun, B.L. Jiang and D.W. Zuo	112
A Research on the SiCp Reinforcing Cu-Base Composite Material's Cutting Performance Y.P. Zhang, Y.Y. Tao and Z. Jiang	116
An Adaptive Tool Path Generation for Large Scale Wedge/Aspheric Lens Element Grinding Based on Isophote Interpolation N.N. Zhang, C. Jiang, Z.Z. Wang and Y.B. Guo	121
Research on CBN Grinding Wheel Dressing with Ultrasonic Vibration Assistance and its Grinding Performance G.F. Gao, B. Zhao, Y. Li and J.L. Tong	126
Experiment Study on ELID Grinding of TN85 Cermets F.Q. Tong, F.H. Zhang and D.R. Luan	131
Study on Friction and Wear Properties of Self-Lubricating Impregnated Diamond Bit Cutters B.S. Pan, X.H. Fang and M.Y. Niu	136
A Polishing Method of Single-Incentive Ultrasonic Elliptical Vibration for Tungsten Carbide Mould S.H. Yin, Z.Q. Xu, J.W. Yu and Z.B. Wang	140
Inclined Axis Ultra-Precision Grinding for Spherical Surface S.H. Yin, J. Wang, F.J. Chen, J.W. Yu, Y. Wang, Q.L. Zhao and H.L. Li	145
A Comparative Study on Ultrasonic Machining of Red Granite S.Y. Zheng and X.P. Xu	150
Productivity of EDM Process Assisted by Ultrasonic Waves J.W. Yu, L. Dabrowski, S.H. Yin and Z. Lechniak	157
Sawing Characteristics of a Diamond Circular Blade with Grits in Ordered Distribution G.Q. Huang and X.P. Xu	161
Experiment and Simulation on Residual Stress of Surface Hardened Layer in Grind-Hardening L. Zhang, P.Q. Ge, W.B. Bi and Q. Zhang	166
Flow Dynamic Simulation of Micro Abrasive Water Jet J.M. Fan, C.M. Fan and J. Wang	171
The Designing and Wear Simulation of the Wheel Used in Super-High Speed Point Grinding Y.D. Gong, Y.M. Liu, T.C. Han and J. Cheng	177
Radial Power Ultrasonic Vibration Honing Friction Analysis X.J. Zhu, J.Q. Wang, Q. Cheng and Y. Wang	183
Experiment on Non-Uniformity of Material Removal on Wafer Surface in Wafer CMP J.X. Su, J.X. Du, X.Q. Chen, X. Ning and R.K. Kang	187
Synthesis and Numerical Analysis on Velocity and Pressure Field of Convex Diamond Film D.S. Li, X.L. Zhou, D.W. Zuo and X.Z. Hua	192
Mathematical Model of Unbalanced Response of Spindle System of Ultra-High Speed Grinder C.H. Li, C. Du and Y.C. Ding	196
Effects on the Bending Strength of Metal-Bonded Diamond Segments in DEM Simulation X.Y. Chen, Y.Q. Yu and X.P. Xu	201
The Dynamics Modeling and Simulation of Spindle System of Ultra-High Speed Grinding Machine Tool Y.L. Hou and C.H. Li	206
3D Finite Element Analysis of Pile-up Formation in Abrasive Machining at Low Speed W. Yu, Q. Feng and C.Z. Ren	211
An Accurate Method for Calculating the Contact Subsurface Stress Field of Hybrid Ceramic Ball Bearing C. Wang, W. Yu and C.Z. Ren	215
CVD Diamond Films as Wear-Resistant Coatings for Relief Valve Components in the Coal Liquefaction Equipment X.C. Wang, B. Shen and F.H. Sun	219
Microstructural Property of Silicon Thin Films Deposited on Nanodiamonds Related to QALD Growth Condition J. Lu and Y.H. Wang	226

Fabrication and Applications of Ultra-Smooth Composite Diamond Coated WC-Co Drawing Dies	233
B. Shen, F.H. Sun, Z.M. Zhang, H.S. Shen and S.S. Guo	
Study on Fabrication and Cutting Performance of CVD Diamond Coated Drills in Machining the Carbon Fiber Reinforced Plastics	239
J.G. Zhang, B. Shen and F.H. Sun	
Diamond Films Synthesis with a DC Arc Plasma Jet: Effect of Substrate Temperature on Quality of Diamond Films	245
R.F. Chen, L.G. Dai, R. Zhu, X.L. Zhang, T. Liu, Y. Pan and D.W. Zuo	
A Spraying Method for Development of Diamond Wire Saw	249
C.Y. Yao, J.S. Wang and W. Peng	
Study on Characterization of Cationic Polyelectrolyte Modified Benzoguanamine Formaldehyde/Silica Composite Abrasives Slurry	254
X.F. Xu, B.S. Zhao, Y.Z. Yang, Q. Guo and W. Peng	
The Study of Electrochemical Polishing HVOF Spraying Coating	259
W.H. Li, Y.J. Zhang and X.Z. Song	
Hardness Improvement of Welded Joint by Laser Weld Technology	263
G.J. Liu, X. Wang and A.J. Li	
Adiabatic Shear Behavior and Chip Morphology in Precision Hard Cutting GCr15 Steel	269
G.J. Chen, X.L. Liu, Z.Y. Zhao, S.Y. Ji and K.Q. Li	
Predicting Surface White Layer in Precision Hard Turning	274
T. Chen, M.J. Zhang and X.L. Liu	
Influence of Cutting Parameters on Characteristics of Serrated Chip when High-Efficiency Cutting Ti6Al4V	278
S.C. Yang, M.L. Zheng, D.Q. Zhang, N. Liu and Y.H. Fan	
Study on Effects of Cutter Radial Runout and Deformation on Cutting Force in Ball-End Hard Milling	284
X.F. Zhao, X.L. Liu, F. Xiao, Y.X. Wang and Y.C. Jiang	
Effects of Cutting Parameters on the Surface Roughness of Ti6Al4V Titanium Alloys in Side Milling	289
H. Liu, C.H. Wu and R.D. Chen	
Development Evaluation of Mechanical Properties of Brazed Diamond Wire	294
Y.P. Li, H. Huang and X.P. Xu	
Experiment Study on Impact Disrepair of Different Groove Milling Inserts for Machining High-Strength Steel	300
Y.N. Cheng, X.L. Liu, F.G. Yan, Y.F. Li and Z.J. Li	
Research on the Fracture and Breakage of Heavy-Duty Turning Tool for Rough Machining Hydrogenated Cylindrical Shell	305
G.H. He, X.L. Liu, F.G. Yan, Y.S. Zhai and Z.Y. Zhao	
Research on the Edge Design Precision PCD Thread Milling Tool	311
X.H. Zheng, G.Q. Guo, J.L. Li and M. Chen	
Experimental Study on the Cutting Performance of Cemented Carbide Rods Made by New Process	316
G.C. Wu	
PCD Reamer for Machining Cylinder Head	321
Y.G. Wang, X.G. Chen and G. Liu	
Wear of Milling Cutters in Machining of TC4 (Ti6Al4V) Titanium Alloys	326
J.Y. Lai, L.X. Li and C.H. Wu	
A Numerical Model to Determine Temperature Distribution in Aluminum Alloy (2A12) Micro-Cutting	330
T. Guo, G. Chen and C.Z. Ren	
A Mathematical Modeling Method for Capillary Limit of Micro Heat Pipe with Sintered Wick	335
X.B. Li, C.L. Yang, G.D. Xu, W. Yuan and S.G. Wang	
Study on Prediction Models of Milling Force for T10 Hardened Steel	342
J.Q. Wu, G.H. Li, C. Liu and G.Y. Tan	
Genetic Algorithm-Based Optimization of the Thin-Walled Tube of High Strength Aluminum Alloy in Diamond Turning Process	347
B.X. Zhang, B. Lin, Z.L. Han and L. Zhang	

Finite Element Simulation of Nickel-Based Alloy Cutting Process Based on DEFORM- 3D

J.L. Ren, C.Y. Zhang and D.P. Yuan

352

Study on Speed and Acceleration Characteristics of 100 nm Scale Motion Platform Driven by Linear Servo Motors

G.H. Li, P. Wu, X.L. Ni, W.F. Peng and G.Y. Tan

357