

Table of Contents

Preface

Production of Diamond Sawblades for Stone Sawing Applications J. Konstanty and X.P. Xu	1
Factors Affecting Diamond Retention in Stone Sawblade Segments J. Konstanty	13
Development of Advanced Tools for Economic and Ecological Grinding of Granite B. Denkena, H.K. Tönshoff, T. Friemuth and T. Glatzel	21
Diamond Tools for Wire Sawing Metal Components H.K. Tönshoff, B. Denkena and H.H. Apmann	33
Relationship of Interface Microstructure and Adhesion Strength between Ti Coating and Diamond Y.H. Wang, J.B. Zang, M.Z. Wang and Y.Z. Zheng	41
Improvement of the Performance of Diamond Segments for Rock Sawing, Part 1: Effects of Segment Components Y.Q. Yu and X.P. Xu	46
Improvement of the Performance of Diamond Segments for Rock Sawing, Part 2: Factors Influencing the Use of Coated Diamonds X.P. Xu and Y. Li	54
Improvement of the Performance of Diamond Segments for Rock Sawing, Part 3: Factors Influencing the Use of Rare Earths Y.Q. Yu and X.P. Xu	60
Study of Force and Fracture of Impacted Diamond Grits J.B. Zang, Y.H. Wang, H.X. Wang and X.M. Zhang	68
Study of Doping of Rare-Earth Compounds in Iron-Rich Matrix for Diamond Tools L.C. Duan, F.L. Tang, K.H. Yang and Q.H. Zou	73
Study of the Properties and Application of Ti-Coated Diamond by Measuring Resistance J.B. Zang, Y.H. Wang, M.Z. Wang, X.H. Zhang and Y.Z. Zheng	78
Micro-Analysis of the Use of RE and TiH₂ in the Fabrication of Iron-Based Diamond Segments Q.L. Dai, X.P. Xu and Y.C. Wang	83
Study of a New Type of Matrix Material for Electroplated Diamond Tools Y.D. Li, G.S. Li, H. Jiang and B.J. Li	89
Structure and Properties of Diamond Grits Coated with Corundum Micron Powders Y.H. Wang, Y.C. Zhao, M.Z. Wang and J.B. Zang	94
Theoretical Determination and Experimental Verification of the Structure of Layered Segment of Diamond Saw Blade K.H. Yang, B.S. Pan and L.C. Duan	99
Diamond Tools in Stone and Civil Engineering Industry - Cutting Principles, Wear and Applications H.K. Tönshoff, B. Denkena, H.H. Apmann and J. Asche	103
Distinct Element Modeling of Rock Cutting under Hydrostatic Pressure S.T. Lei and P. Kaitkay	110
Multivariate Statistical Analysis of the Wear on Diamond Beads in the Cutting of Andesitic Rocks Y. Özçelik	118
Machine Vision Inspection for Polished Stone Manufacture M. Smith and L. Smith	131
Diamond Turning of Granite C. Wilson and O.A. Vorono	138
Thermal Study of Rock Grinding, Part 1: Temperature Measurement X.P. Xu and H. Huang	147
Thermal Study of Rock Grinding, Part 2: Temperature Analysis X.P. Xu, H. Huang and W.M. Zeng	155

Thermal Study of Rock Grinding, Part 3: The Effects of Temperatures	163
X.P. Xu and H. Huang	
Frame Sawing of Stone - Theory and Technology	171
C.Y. Wang and C. Rolf	
Investigation of Cutting Forces in Concrete Sawing Process	181
X. Wei, H.W. Du, C.Y. Wang and Y.L. Fang	
The Effects of Swarf in the Diamond Sawing of Granite	187
X.P. Xu and Y. Li	
Effects of Surfactant in Stone Machining	194
C.Y. Wang, X. Wei, Z.C. Pan and Y.X. Song	
Study of Fracture Mechanism of Rock Cutting	200
X. Wei, C.Y. Wang, H.L. Yuan and Z.H. Xie	
Characteristics of Energy in Circular Sawing of Natural Granite	209
Y. Li, H. Huang and X.P. Xu	
Material Removal Mechanisms in Diamond Grinding of Granite, Part 1: The Morphological Changes of Granite from Sawing to Grinding	215
X.P. Xu, H. Huang and Y. Li	
Material Removal Mechanisms in Diamond Grinding of Granite, Part 2: Formation of Gloss on Granite Surface	222
H. Huang and X.P. Xu	
Material Removal Mechanisms in Diamond Grinding of Granite, Part 3: Factors Influencing the Formation of Surface Gloss	228
H. Huang and X.P. Xu	
Thermodynamic Analysis of Diamond Saw Blades for Dry Cutting	233
Y.N. Hu, C.Y. Wang, X. Wei and Z.G. Li	
Development of a System for the Deep Sawing of Granite	239
H.K. Tönshoff, B. Denkena, J. Asche and H.H. Apmann	
Laser Blasting - A New Method for Surface Treatment of Dimension Stones	247
J. Pou, C. Trillo, R. Soto, A.F. Doval, M. Boutinguiza, F. Lusquiños, F. Quintero and M.P. Amor	
Core Drillings with Polycrystalline Diamonds (PCD) - A New Drilling Technology without Water and Dust	253
K. Klug	
Laser Beam Cutting of Concrete	257
T. Rümenapp and A. Lenk	
Laser Microstructuring of Polished Floor Tiles	262
J. Hauptmann and G. Wiedemann	
Potential of Lasers in Slate Tile Processing	268
M. Boutinguiza, J. Pou, F. Lusquiños, F. Quintero, R. Soto, N. Louzán and M.P. Amor	
Numerically Controlled Water Cutter and its Applications in the Machining of Natural Rock Materials	274
X.H. Li, Y. Liao, X.Y. Lei, Y.Y. Lu and B.Q. Jiao	
Performance Evaluation & Action Mechanism Analysis of Extreme Pressure Additives Used for Oil-Based Cutting Fluids	281
P.Q. Ge, J.F. Li, C.H. Lu and Z.C. Liu	
Development of Impact Strength Tester for Diamond Grit	287
B.C. Liu, Z.P. Zhang and Y.H. Sun	
A New Method of Grading the Sawability of Natural Rock Materials	293
S.H. Zhang and F. Lu	
Research and Structure Design on Systems of Stone Frame Sawing Machine with Optimal Cutting Movement	297
L.J. Li, J.R. Wang, J. Li, H. Li and Z.X. Shi	