

Table of Contents

Preface and Committee

Chapter 1: Material Engineering, Technology and Material Application

Fluorite Flotation of a Fluorite-Bearing Pb-Zn Tailings S.Q. Liu, X.J. Li, M. Zhang and W.P. Wang	3
Flotation of a Lead Sulphide Ore in Sichuan, China S.Q. Liu, X.J. Li, W.P. Wang and M. Zhang	7
Beneficiation of a Low Grade Lead Ore by Gravity Pre-Concentration and Flotation S.Q. Liu, X.J. Li, Y. Zhao and T.T. Li	11
Research of Environmental Materials with Sewage Marine Discharge Diffusion Effect in YangKou Port H. Yu, J.F. Bai, X.H. Wang and H.X. Zhao	15
Study on Energy Materials with an Important Source of China's Energy - Kazakhstan Crude Oil Pipeline Transportation G.M. Liu and L. Zhang	20
Potato Starch Processing Wastewater Physical Property Estimation Based on Material Properties Z.Q. Gao, W.J. Ding and J. Xu	24
Determination of Clenbuterol and Florfenicol in Milk Using Miniaturized Solid-Phase Extraction Based on Hybrid Material H. Wang, Y.H. Han and X.M. Cai	28
Preparation and Properties of Ni-TiB₂-Gd₂O₃ Composite Coatings by Electrodeposition X.Z. Liu, W.W. Qu, L.L. Song, X.D. Yu and T. Rao	32
Application of Nanomaterial in Sports and its Safety Research Y.L. Meng and J.Q. Zhu	36
The Sintering Characteristics of Industrial Solid Waste Incinerator W.Y. Li, L. Tan and Y. Kong	40

Chapter 2: Applied Mechanics, Hydrodynamics and Dynamic System, Vibration

Simulation and Research of Multiple Degree Freedom Vibration System Based on MapleSim Z. Wang and T. Wu	47
Research on Fluid Mechanics with Slip Flow of Viscoelastic Fluid in the Micro Channel Z. Liu, J. Zhu and L.C. Zheng	51
Experimental Design and Mechanics Study on Brain Injury Tolerance under Sagittal Angular Acceleration Based on Shearing Strain Equivalent Coupling Method S.X. Liu, Z.Y. Yin, K. Li, D.Q. Tao, Y.F. Luo, C.L. Ye, C. Xu, Q. Jiang, S.Y. Li and Y. Sun	55
Effect of Drive Location on Vibro-Acoustic Characteristics of Submerged Double Cylindrical Shells with Damping Layers C. Zhang, D.J. Shang and Q. Li	59
Prediction for Strength of 3D Braided Composites Based on Helix Geometry Model L.L. Jiang, X.B. Wei, X. Liu and T. Zeng	64
Earthquake Mechanics Study with Health Check for a Seismic-Damaged Tunnel Suffered from the Wenchuan Earthquake J.X. Zhang	68
Experimental and Application Study of a New Type High Strength Repairing Mortar for Hydraulic Concrete F. Wu, C.H. Jiang, Y.D. Liao and L.J. Hou	72

Study on Hydromechanics with Critical Instability Flowrate of Two Ends Supported Pipe Conveying Fluid R.D. Bao	77
The Dispersion Estimation Method for Assembly Stress of Silicone Rubber Foam Pad Based on Extreme Value Distribution F. Wang and F.M. Wan	85
The Research Nonlinear Mechanics for Non-Backlash Output Mechanism of Precision Ball Planetary Drive Z.J. An, Z.M. Yang and L.Y. Duan	90
Force and Simulation Analysis of Thrust Rod on Heavy Commercial Vehicle Balanced Suspension Z. Li, W.K. Shi, Q. Wang, J. Ke, T. Teng, Y.F. Zhou, T.Y. Liu, Z.Y. Wu and Y.W. Dong	94
Simplified Analysis of Different Types of Slope Reinforcements in a Rigid Grid-Pile Composite Foundation W.F. Huang, H.H. Mo and Y.G. Fang	100
Waste Fiber Recycled Concrete Performance Based on Fracture Mechanics Research J.H. Zhou, L. Cheng and W. Dong	105
The Study of Winding Performance in Key Stage on a Parallel Grooved Drum Q. Zhang, J.F. Zheng, Y.Y. Xiao, X.R. Qin, Y.T. Sun and L.D. Zhang	110
Strength Analysis of Parallel Grooved Drum Q. Zhang, K. Zhao, Y.Y. Xiao, X.R. Qin, Y.T. Sun and L.D. Zhang	115
Research on Tensioning Scheme of Spatial Steel Arch Bridge H.X. Huang, S.S. Cheng, Y. Zhang and P. Chen	120
Simulation and Experimental Verification of Typical Aircraft Panel Structure Using Piezoelectric Effect for Vibration and Noise Reduction L. Zhang, X.S. Sun and K.X. Li	125
Effect of Crack Statically Growing on Stress and Strain at Crack Tip for Power Hardening Materials H. Xue, M. Qiao, Z.W. Wang and X.Y. Gong	133
Experiment Research on Dynamic Characteristics of Ground Fissure Belt Loess in Xi 'an Area Y.H. Deng, H.D. Mu, J.B. Peng, Y.Q. Leng, Z.F. Sun and J. Xue	138
Dynamic Modeling on Smart Flexible Beam with Large Overall Planar Motion J. Zhang, Y.F. Shu and B. Bai	147
An Early-Warning Method for Agglomeration Detection in Gas-Solid Fluidized Bed Based on Hydromechanics M. Guo, W.G. Lin, H.Y. Wu, Z. Zhao and J.W. Liu	152
Three Dimensional Dynamic Analyses on Stroller Wheel with Shock Absorber Y.C. Hsieh, M.H. Doan and C.T. Chang	159
The Shear Failure Modes and Anisotropy Based on the Shear Strength Theory in Classical Solid Mechanics S.H. Guo	164
Degradation Characteristics of Combined Rotor for Turbine Considering Stress Relaxation of Rod Y.L. Su, A.L. Wang and X.P. Li	168
The Research on a General Dynamic Model for Torsional Vibration for Disc-Type Rod Fastening Rotor Systems S.X. Gao, A.L. Wang and Y.L. Su	174
Analysis on Additional Pressure of Tube Sidewall of Immersed Tube Tunnel in Sinking Process of Tube Segment Y.D. Li, H.H. Mo and J.S. Chen	180
Failure Analysis of CCF300/5428 Laminates under Low Velocity Impact Based on Properties of Advanced Composite Material J.Y. Zhang, M. Li, L.B. Zhao and B.J. Fei	185
Numerical Simulation of Compressive Experiment of Coal Seam in Deep Underground for Geological Storage of Carbon Dioxide F.S. Han and X.L. Wu	189

Extended Kalman Filtering and its Application to Intelligent Missile Formation Flight Mechanics	
X. Zhang, N.G. Cui and X.G. Wang	193
Analysis of Nonlinear Local Buckling of Crane Telescopic Boom	
X.L. Huang and A.M. Ji	197
Loading Behavior Investigation of Composite Single Lap Adhesive Joints	
H.X. Hu, Y.D. Ji, A.Q. Ni and J.H. Wang	202
Experiment Research of Environment Effect on Mechanical Properties of PMMA	
J.Y. Wang, J.Y. Zhang and X.H. Shi	208
Study of Fatigue Properties of PMMA with Typical Damage	
J.Y. Wang, J.Y. Zhang and X.H. Shi	212
FEM and Experimental Modal Analysis of a Large-Scale Quayside Container Crane	
X.R. Qin, Y.H. Liu, Y.Y. Liu, Q. Zhang and Y.T. Sun	216
Fatigue Damage Research on Rod-Fastening Rotor of Gas Turbine Considering Start-Up Stage	
X.P. Li, A.L. Wang and S.X. Gao	221
The Abrasive Resistance Study about the Cutting Picker 40Cr of Coal Cutter	
N. Zhang, S.C. Wang, N. Shi and H. Chen	227
Study on Microstructure and Properties of Plasma Arc Surfacing Layer for Cutting Pick	
N. Zhang, L. Yang, F. Yang, M. He and M. Shi	231

Chapter 3: Mechanical Engineering, Control and Automation Technologies, Equipment

Design and Development of Folded Table Bicycle Based on Solid Edge and ANSYS	
X. Liu, T. Wu, Z.Q. Xiang and W.Q. Jia	237
Fluid Structure Interaction Simulation on the Bionic Airfoil of the Small Unmanned Plane	
Z.Q. Qiao and Y.B. Yang	241
The Civil Airports Machinery and Equipment Innovative Design Preferred	
Z.Y. Xue, X.Q. Yu, M. Lin and N. Wei	246
Design of the Sled Motor Based on the Bionics	
Q.L. Du and L.A. Pan	250
Study on Direct Current Controlled Distribution Static Synchronous Compensator with Mechanical Properties Used for Improvement of Voltage Quality	
Q.F. Zhu, L. Huang, D.X. Yang and G.Y. Zhu	254
The Track-Controlling System for Mobile Greenhouse Robots	
L. Huang, D.X. Yang and Q.F. Zhu	258
Comparative Analysis of Rotor Position Detection Technology in the SFC Soft Starting of Pump Storage Motor	
L.T. Ji, D.S. Wang, B. Yang and G.J. Li	262
Study on Mechanical Automation With Intelligent Control System in Tea Crank	
C.B. Shao, J. Zhang and Y. Wan	267
Summary of the Developing Status of Greenhouse Tray Seeder and Seed Metering Device	
H.P. Si, L. Sun, C. Jie, J.H. Wu and K.Y. Lin	271
Study on Mechanical Automation with Airborne Guiding Ammunition Automatic Testing Equipment Development	
N. Zhang, L. Chen and T. Li	280
The Fuzzy Decoupling Control of the Electric Vehicle Steering and Speed Systems	
G. Li and Y. Sun	284
The Optimum Adaptive Cooperative Control of the Vehicle Steering and Anti-Lock Braking System	
G. Li and H. Liu	288
The Application of Multi-Model Control on Vehicle Chassis Coordination Control	
G. Li, W.Z. Zhang and Y.J. Hou	292
The Study of Mechanical Seal Leakage Detection System	
Z.G. Sun, C.N. Yang and L. Chen	296

Simulation Research on Asynchronous Motor Vector Control System C.J. Han and F.C. Rui	301
Affecting Study on Flow Regeneration Noise from Muffler Element with Perforated Plate H.J. Zhao and G.H. Wang	305
Steady Motions Performance of an Underwater Glider with Pump on the Vertical Plane Q.J. Li, J.N. Gu, Z.H. Zhang, C. Wang, B.R. Li and L. Gao	310
Deflecting Features of Gas from Double-Faced Deflector and Structure Optimization of Deflector S.Y. Shi, Y. Jiang and X.T. Dong	314
Design and Application of the Butt Auxiliary Device for the Erection of Steel Tower Using Helicopter Y.J. Xia, Q. Miao and K.X. Huang	319
Effect Factors of Flow Regenerated Noise from Muffler Unit with Simple Expansion H.J. Zhao, X.G. Zhao and G.H. Wang	323
The Herringbone Gear Box Modal Analysis and Experimental Study F. Wang and Z.D. Fang	328
Common Problem Analysis in Electromechanical Equipments of Highway External Field Y.X. Liu and X. Jia	332
Study on Simulation and Performance of Open-Type Screw Discharging Structure Y.X. Li, S.G. Gong and H.S. Lu	337
Anti-Collision Risk Assessment Method Based on Relevance Vector Machine H.L. Cui, X.S. Gan, Y.R. Wu and H.L. Gao	341
Study of Turbulence Characteristics in Different Advanced Vortex Combustor Structure Z.J. Wang, Z.X. Zeng and G.H. Tu	345
Optimal Design of Compensatory Cam for Precision Corn Planting Device of Furrow Seeder with Vertical Dropping with Whole Plastic-Film Mulching on Double Ridges W.Y. Zhao, X.P. Tang, F. Dai and Z. Yang	350
Study on Mechanical and Electrical Automation with System Design of Frequency Meter Based on EDA Technology L. Jin and Q. Liu	356
Air-Gap Magnetic Field Optimization to Reduce Losses in High Speed Bearingless Permanent Magnet Synchronous Motor T. Zhang, H.Y. Jia, H.P. Zhang and J.X. Ji	360
Induction Motor Direct Torque Control Method of Fuzzy Adaptive C. Fan, G. Zhang and Y.P. Liu	365
Design and Performance Analysis of Digital Pressure Relief Valve of Water-Based Hydraulic T.C. Jia, Z.Y. Wu, J. Wang, R.G. Feng and Y.J. Qin	369
Energy-Saving Switch - Boost Converter C.J. Han and F.C. Rui	374