

# Table of Contents

## Preface and Committes

## CHAPTER 1: Surface Engineering/Coatings

<b>Experimental Verification of Decentralized Approach for Modal Identification Based on Wireless Smart Sensor Network</b> X.J. Ye, T.F. Zhu, Q.S. Yan and W.F. Wang	3
<b>Electroless Ni-P-PTFE Composite Coatings on Titanium Alloy and Their Tribological Properties</b> Z.D. Yang, D. Wu and M.F. Liu	12
<b>Electrochemical Behavior of Fe-Cr-Mo-C-B Amorphous Alloy Coating in HCl Solution</b> Q.J. Chen, L.L. Hu, X.L. Zhou and X.Z. Hua	18
<b>Effect of B<sub>4</sub>C-Yb<sub>2</sub>O<sub>3</sub> Compound Additive on Crystallization and Sintering of Fused Quartz Ceramic Materials</b> S.B. Shen, J.L. Bu, L.X. Yu, Z.F. Wang, R.L. Wang and R.S. Wang	24
<b>Electrochemical Hydrogen Storage Characteristics of (Mg<sub>1-x</sub>Zr<sub>x</sub>)<sub>2</sub>Ni (x = 0 - 0.3) Alloys Prepared by Mechanical Alloying</b> Y.H. Zhang, Z.H. Hou, S.H. Guo, G.F. Zhang, X. Li and D.L. Zhao	29
<b>Comparison in Tribological Properties of YBa<sub>2</sub>Cu<sub>3</sub>O<sub>x</sub>/Ag and Bi<sub>2</sub>Sr<sub>2</sub>CaCu<sub>2</sub>O<sub>x</sub>/Ag Self-Lubricating Composites</b> H. Tang, W.J. Li and C.S. Li	34
<b>A Study on Carbon Electro-Conductive Filler for the Epoxy Conductive Coating</b> B. Li, Y.H. Li and W.X. Chen	41
<b>A Comparative Study of Zirconium-Based Coating on Cold Rolled Steel</b> S.H. Wang, C.S. LIU and L. Wang	47
<b>Ultrasonic Polishing of Electric Discharge Machined Surface Using Al<sub>2</sub>O<sub>3</sub> Suspension</b> W.S. Lee, J.S. Seo, S.H. Ko, J.M. Jang, B. Cha and S.H. Son	53
<b>Effect of Carbon Coating on Tensile Strength of SiC Filament by Chemical Vapor Deposition</b> C.X. Liu, Y.Q. Yang and X. Luo	57
<b>Influence of pH Value and Precipitant on Zn<sub>2</sub>SnO<sub>4</sub> Formation via Co-Precipitation Method</b> Y.S. Wu and M.H. Tsau	61
<b>Effect of Corrosive Medium on the Corrosion Resistance of FeCrMoCB Amorphous Alloy Coating</b> Q.J. Chen, L.L. Hu, X.L. Zhou, X.Z. Hua and Y.J. Yang	65
<b>Adsorption Characteristics of Hg<sup>2+</sup> Ions Using Fe<sub>3</sub>O<sub>4</sub>/Chitosan Magnetic Nanoparticles</b> B.L. Liang	72
<b>Research on Vibration Grinding Finishing Technology</b> P. Zhang, X.Y. Guo, Z.G. Guan and A.H. Liu	76
<b>Preparation and Characterizations of NiTi Intermetallic Coatings</b> C.M. Deng, M. Liu, C.G. Deng, H.L. Dai and K.S. Zhou	80
<b>Microstructure Analysis of FeS Layer as Solid Lubrication Composite Coating Produced by Low-Temperature Ion Sulfurization</b> Y.L. Qiao, Y. Zang, S.L. Yang and C.H. Hu	84
<b>Research on the Mechanical Properties and Residual Stress of HVOF Sprayed Nanostructured WC-17Co Coatings</b> G.Q. Gou, N. Huang, H. Chen, D. Li, Y. Liu and H. Ji	88
<b>AOP's Modeling Research and Model Transformation with ATL in MDA</b> J.J. Zhang, F. Wei and H. Li	97
<b>Research on Effect of Ion Nitriding Temperature on Wear Resistance of 40Cr Steel</b> G.X. Pang, Z.L. Li, Z.Y. Chen and Y.J. Wang	101
<b>Microstructure and Wear Properties of Laser-Clad NiCrBSi Coating</b> Y.Q. Guo, H.W. Zhao and R.L. Sun	105

<b>Microstructures and Properties of Plasma Surfaced NiCrBSi+WC/Co Layers</b> W.Q. Wang, B.S. Lu, S.M. Huang and Q. You	109
<b>Spraying Distance Dependence of Microhardness on HVOF WC-Co Coatings</b> W.R. Feng and H. Zhou	113
<b>Microstructure and Abrasive Wear Properties of Plasma Sprayed Nanostructured Al<sub>2</sub>O<sub>3</sub>-TiO<sub>2</sub>-ZrO<sub>2</sub>-CeO<sub>2</sub> Coatings</b> W.Q. Wu, Q. Li, Z.Y. Wei and H. Ye	117
<b>Effects of Mg Addition on Thickness of Galvalume Coating: A First-Principles Study</b> G.X. Wu, J.Y. Zhang and Q. Li	125
<b>Investigation on High-Phosphorus Electroless Ni-P Plating Technology of Stainless Steel</b> X.J. Wu, Z.J. Liu and G.D. Li	129
<b>Effect of TBC Residual Stresses by Uniform Growth of TGO and Typical Interface Topography</b> Z.P. Wang, H. Wang, Z.Y. Han and Q. Zhang	133
<b>Microstructures and Strength of Hot-Rolled Mg-Zn-Y Alloys</b> Y.M. Zhu, Q.R. Gao, F.Z. Ren and S.J. Fang	137
<b>Toughing of ZrAlN Film through Superlattice Design</b> J. Du, X.Y. Zhu, Z.H. Cai and P. Zhang	141
<b>Research on Strip Steel Surface Bright-Field and Dark-Field Images Fusion Method</b> Y.L. Wei, B. Li, Y.H. Yan and S.X. Zhu	146
<b>Research of GaAs Polishing Uniformity on Non-Abrasive Cryogenic Conditions</b> S.P. Qu, T.Z. Liang and Z.S. Zhang	150
<b>Simulation of Inclusions Removal Influenced by Snorkel and Blowing Parameters in RH Refining</b> X.G. Ai, S.L. Li, N. Wang and N. Lv	155
<b>Surface Characteristics and Water Absorption of Sol-Gel Coated Impregnated Paper Pressed onto Plywood</b> S. Wang, S. Jämsä, R. Mahlberg, J. Nikkola, J. Mannila, A.C. Ritschkoff and J. Peltonen	159
<b>Enhancement of Acid Resistance for Ultramarine Blue by Silica Coatings</b> M. Liu, S.F. Li and D. Umereweneza	163
<b>TiC Particle Reinforced Reactive Plasma Cladding Composite Coating by the Precursor Carbonization-Composition Process</b> J.B. Liu, L.M. Wang, J.S. Jiang and G.M. Cao	167
<b>Relation between Concave Cone 3 Dimension Topography and Residual Stress in Thermal Barrier Coatings</b> Z.Y. Han and H. Wang	172
<b>Effects of the Microstructure and Mechanical Properties for Wear Resistant Casting Surface with Vacuum Evaporable Pattern Casting Infiltration Process</b> D.C. Yang	176
<b>Effects of Substrate Bias Voltage on the Critical Failure Load of Cr-Al-N Coatings</b> S.W. Duo, M. Zhu, J.M. Ge, X.M. He and L. Meng	180
<b>Influence of CeO<sub>2</sub> Addition on Microstructure of Vacuum-Melting WC-Ni Base Alloy Coating</b> Y.N. Wang, L. Miao, W. Geng and C.B. Cai	184
<b>Microstructure and Properties of Electrospark Deposition Coating on Die Steel</b> Y.X. Gao and C. Zhao	188
<b>Synthesis Research of Corrosion Inhibitor Similar to Polyepoxysuccinic Acid for Carbon Steel in Sea Water</b> Q.G. Ma, X.L. Zhang and L.H. Han	192
<b>The Frictional Properties and Mechanism of Nano-Diamond/Ni Composite Coatings by Brush-Plating</b> Y. Li, W.J. Zou, B.X. Li and Q.M. Dong	197
<b>Microstructure and Wear Properties of Fe-Based Alloy Hardfacing Layers</b> L. Zong and Z.J. Liu	201
<b>Progress of the Study on the Material and Technology of Heat Insulating Coating</b> Q. Wu, S.Y. Ma and Y.D. Zhou	205
<b>Effect of Additives on Photo-Aging Performance of Polyurethane Coating</b> B. Xiang, R.Q. Zhu, H.Y. He, Z.C. Xu and S. Chen	211

<b>The Corrosion Behavior of Ni-P/SiC Composite Coating</b> G.R. Yang, W.M. Song, X.M. Sun, Y. Ma and Y. Hao	215
<b>Reducing Surface Defects of Cr<sub>x</sub>O<sub>y</sub> Film in Mid-Frequency Dual-Magnetron Sputtering</b> X. Yu, L. Ma, Y. Liu, Z.Z. Yang and H. Meng	219
<b>Study on the Preparation and Property of the Ceramic Film on the LY12 Aluminium Alloy</b> X.W. Chen and D.F. Zhang	223
<b>Properties of Pulse Plating Ni-SiC Nano-Composite Coating</b> J.Q. Zhang, H.M. Jin, J.C. Gao, J. Shi and L. Li	228
<b>Analysis of Morphology and Growth Kinetics of Zn-Mn and Zn-0.2wt.%Al-Mn Hot-Dip Galvanizing Coatings</b> J.H. Wang, Z.S. Wu, X.P. Su, C.J. Wu, Y. Liu and H. Tu	233

## **CHAPTER 2: Modeling, Analysis and Simulation of Manufacturing Processes**

<b>Motion Error Analysis of Planar Optical Waveguide Automatic Aligning and Coupling Platform</b> H. Tang, Y. Zheng and J.A. Duan	239
<b>Analysis of the Relationship between Void Direction and Closure Efficiency in Forging Process</b> X. Li, X.C. Wu, J.W. Li, Y. Luo and Z. Zhang	246
<b>CFD Modeling of Flow Performance inside Subsonic Centrifugal Compressor</b> Y. Wang and Z. Luo	251
<b>Effect of Gas Injection Condition on Fluid Flow in a Two-Strand Tundish</b> J. Li, J.T. Zhu, J.S. Li and L.Y. Sun	255
<b>Research on Simulation Technology for Auto Panel in Drawing Forming Based on Autoform</b> X.F. Liu, Y.H. Hu and W.J. Huang	259
<b>Three Dimensional Thermo-Mechanical Model of Different Thermocouple Embedded Modes Analysis</b> L.G. Sun and J.Q. Zhang	263
<b>Numerical Simulation and Test Research of Continuous Flexible Forming Process for the Spherical Parts</b> Y.W. Lan, Z.Y. Cai and M.Z. Li	269
<b>An Improved Optimization Method on the Material Mixture Ratio of Ship Stern Bearing</b> W. Li and Y.A. Xiao	273
<b>Research on the Heat Exchange Performance of Thermal Insulation Material and Cooling Pipe for Concrete Dam</b> Y. Zhang and S. Qiang	278
<b>Study of Multi-Point Flexible Floating Clamping System of Multi-Roll Stretch Forming Process</b> H.H. Zhang, M.Z. Li, W.Z. Fu and X. Chen	282
<b>Research on a New Flexible Acceleration and Deceleration Algorithm with Continuous Jerk</b> J.R. Sun and C.B. Hu	286
<b>Finite Volume Simulation in Porthole Dies Extrusion of Aluminum Profiles</b> L. Cheng, S.S. Xie, Y.F. He, G.J. Huang and Y. Fu	290
<b>Researches on the Ring Stiffness Condition in Cold Ring Rolling</b> L.B. Pan, L. Hua and D.S. Qian	297
<b>Development of Processing Maps for 3003 Al Alloy</b> G.Q. Chen, G.S. Fu, W.D. Yan, C.Z. Cheng and Z.C. Zou	306
<b>Study on Constitutive Model of 20CrMnTi Gear Steel in Cutting Process</b> G.H. Liu and H.Z. Yan	311
<b>Structural Topography Optimization of Engine Block to Minimize Vibration Based on Sensitivity Analysis</b> X.F. Du, Z.J. Li, F.R. Bi, J.H. Zhang, X. Wang and K. Shao	318
<b>Study on the Forming Process Simulation of Alien Wheel</b> Y. Tong	327

<b>Integrated Process Planning and Scheduling Based on Genetic Algorithms</b> J.F. Wang, S.J. Li and S.C. Fan	331
<b>Simulation Study on Forming Process of the Inner Panel of Automobile Front Fender</b> Y. Tong	335
<b>Research on Feed Processing Parameters of the Cotton Comber</b> J.Z. Ren, G.X. Jia and Q.G. Feng	339
<b>Distance Density Based Clustering Algorithm in Wireless Sensor Network</b> L. Lin, S. Yan and Y. Nian	344
<b>Design of S-Shaped Submerged Inlet</b> G.L. He and X.L. Li	349
<b>Safety Analysis for Rock Slope Reinforced by Piles with Computer Aided Design Method</b> S.Y. Wang and X.G. Xie	355
<b>Numerical Simulation of Unidirectional Solidification on Ingot of Heavy Plate Based on MARC</b> G.W. Ao, M.G. Shen and Z.S. Zhang	359
<b>Finite Element Analysis of Hydro-Viscous Drive Main Transmission Shaft Using ANSYS</b> R.F. So, Q.M. Yang and X.M. Wang	363
<b>Algorithm for Rapid Slicing Based on Coordinate of STL Model</b> X.Y. Mu	369
<b>The Research about Machining Technique of the Parts with Complex Curved Surfaces by WEDM</b> X.R. Wang and X.H. Li	373
<b>Modeling and Simulation of Five-Axis Milling Machine Based on ADAMS</b> Z.C. Zhang, G.Y. Zhong and Y. Gao	377
<b>A Study of Springback of Sheet Metal Formed Parts Using ANSYS</b> X.Z. Wang, S.H. Masood, D. Ng and O. Dawwas	381
<b>Numerical and Experimental Pore Network Study on Drying of Grain Materials</b> Y.J. Yuan, Y.D. Yuan, M. Zhang, J.X. Dong and X.D. Liu	385
<b>Finite Element Simulation Analysis of Thin-Wall Parts Ultrasonic Vibration Turning Device</b> Y.J. Zhao, Y.T.T. Pan and S.Y. Zhao	390
<b>Numerical Analysis of RPC-Filled Circular Steel Tube Columns</b> Y. Wang and G.Y. Zhao	396
<b>Simulation Study on Crash Performance of Vehicle's Front Longitudinal Rails Based on Material Strain Rate</b> P.C. Shi, L.X. Gao and P. Xiao	401
<b>NC Ultrasonic Machining Efficiency: Neural Network-Based Modeling and Simulation</b> G.Y. Zhong and Y.Q. Wang	406
<b>Original Industrial Application of two Numerical Models in Concasting Technology</b> F. Kavička, J. Dobrovská, K. Stránský, B. Sekanina, J. Stetina and M. Masarik	411
<b>Finite Element Design and Numerical Simulation on Non-Pneumatic Beehive Damping Tire</b> G.G. Zhu, C. Xu, L. Yi and N. Li	418
<b>Effects of U-Shape Inner Cooler on Flow and Solidification of Molten Steel in Slab Continuous Casting Mold</b> Y.J. Jin, X.C. Cui and Z. Zhang	423
<b>Tool Errors Compensation in Precision and Ultra-Precision Milling Based on the Least-Square Method</b> K.G. Fan, J.G. Yang and L.Y. Yang	428
<b>Prediction of Quality Index of Injection-Molded Parts by Using Artificial Neural Networks</b> X.F. Sun, P.F. Zhu, Y.J. Lu and H.T. Pan	432
<b>3D Numerical Simulation and Optimization of Processing Parameters in Fine Blanking of Back Plate of Brake</b> C.D. Zhu, F.T. Li and Z.Q. Gu	440
<b>Modelling of Surface Properties of Selected Silicate System</b> J. Dobrovská, R. Dudek, S. Vitásková and F. Kavička	444

<b>Numerical Simulation of Rolling Process and Microstructure Evolution of AM50 Mg Alloy during Hot Rolling Process</b> F. Hua, C.Y. Zhang, Q. Li, B.Y. Yu, W.H. Liu, R.X. Li, S.S. Xie, G.J. Huang, L. Cheng, Y. Fu and H. Wang	449
<b>Three Dimensional Prediction of Microstructure Evolution and Mechanical Properties of Hot Strips</b> G.M. Zhu, C. Lv, Y.L. Kang and G.G. Cheng	455
<b>A Novel Amorphous SiGe Material Used in CMOS Device</b> W. Cui, S.L. Xu, P. Li, T. Ma and Y.H. Yang	465
<b>An Advanced Strip Flatness Forecast and Simulation System for Hot Tandem Mill</b> D.C. Wang and H.M. Liu	469
<b>Optimal Tool Sequence Selection for Semi-Finishing of Mold Cavity</b> X. Pan, Y.J. Cai and T.L. Qi	475
<b>Numerical Simulation of Three Dimensional Extrudate Swell Using Finite Element Method</b> X.M. Xu, S.X. Qin and W. Wang	480
<b>Study on the NO<sub>x</sub> Emission during the Combustion of Low-Quality Anthracite Coal in Supercritical Pressure W-Shaped Flame Boiler</b> W.S. Wang, J. Liu, L.G. Pan, H. Wei, H.S. Zhang, S.S. Li and G. Yan	485
<b>Optimaization of Single-Walled Carbon Nanotube for Adsorption of Methane</b> K.R. He	490
<b>Warm Forming Simulation of Dual-Phase Steel Tailor-Welded Blanks Based on Thermo-Mechanical Coupled Method</b> Y. Ding, X.J. Liu, Y.Q. Guo and W. Chen	494
<b>A Software for Analyzing Structure of Amorphous Alloy</b> H.L. Zhang, Y.B. Jiang and X.L. Tian	499
<b>Simulation Analysis of Splat Deposition in Plasma Spray Forming</b> Z.Y. Zhao, B.B. Xia, S.Z. Zhang and L. Wang	505
<b>Study of Splat Particle Temperature Distribution in Plasma Spray Forming</b> Z.Y. Zhao, B.B. Xia, S.Z. Zhang and L. Wang	509
<b>Numerical Simulation of the Inner Flow Field of Hema-Type ATY Nozzle Based on Fluent</b> C. Liu and Y.H. Qu	513
<b>Error Coupling Analysis and Pre-Compensation in CNC Machining Based on the Empirical Formula</b> K.G. Fan, J.G. Yang and L.Y. Yang	517
<b>Numerical Simulation of Welding Temperature Field on Side Beam of Train Bogie</b> D.L. Ren, M. Fang, J. Li, S.W. Yu, H. Guo and F.J. Qi	522
<b>Gas Bubble Behavior Model in Adhesive Bonding Using Thermosetting Polymer</b> L. Nie, Y.N. Zhong and Y.P. Zhang	527
<b>Finite Element Analysis for Wall Thickness Variation of Seamless Tube in Stretch Reducing Rolling Process</b> H. Yu, Y. Chen and X.Z. Bai	532
<b>Simulation for Handling and Stability of Vehicle Based on SimulationX</b> Y.X. Cao, Y.F. Liu, X.Y. Xu and Y. Yang	537
<b>Three-Dimensional Finite Element Analysis of Polymer Coextrusion through Cylindrical Channel</b> M. Zhang, C.Z. Huang, S. Sun, Y.X. Jia and T.J. Liang	542

### CHAPTER 3: Materials Forming

<b>An Experimental Investigation on Profile Forming of an End Cap Using Al 3003 (O)</b> S.P. Shanmuganatan and V.S. Senthil Kumar	549
<b>Experimental Study of Drawing Load Curves in Forming Conical Parts by Hydroforming and Conventional Deep Drawing Processes</b> S. Norouzi, A.R. Yaghoubi, M. Bakhshi-Jooybari and A. Gorji	556
<b>Measurement and Analysis on Tensile Strength and Crystallinity of Vibrating Extruded High-Density Polyethylene (HDPE) Sheet</b> B.S. Shi, X.M. Qin and B. Li	561

<b>Study on Microstructure and Mechanical Properties of Mg9AlZnGdY Magnesium Alloy after T6 in Lost Foam Casting</b> Z. Zhao, Q. Luo and Z.T. Fan	565
<b>Optimization of Forming Technique during Necking Extrusion of Drill Pipe Joints</b> Y.Q. Guo, C.G. Xu, G.S. Ren and G.H. Liu	569
<b>Fabrication of Hierarchical Microporous Structures with Controlled Morphology and Topography</b> M. Li, C.S. Wang and H.P. Wang	573
<b>Application of Numerical Simulation in Stamping Process of Complex Box-Type Parts</b> G.K. Wang, S.Y. Cheng, S.Y. Li and X.W. Zhang	579
<b>The Analysis to the Forming Process of Welded Pipe by Non-Linear Finite Element Method</b> J.D. Ye, Z. Li and Y.T. Xi	585
<b>The Study and Application of Metal Injection Molding of Fe-Ni-Co Alloy</b> C. Zhang, R. Xiang and J. Luo	590
<b>Investigation on the Formability of Tube in Hydroforming with Radical Crushing under Simple Loading Paths</b> P. Lei, L.F. Yang and Y.X. Zhang	595
<b>Adaptive Learning of Bending Force Presetting Model in a Six-High Cold Rolling Mill</b> J.L. Bai and J.S. Wang	601
<b>Drawing Process Analysis for Electrodeposited Nickel Coating by Finite Element Method</b> L.Q. Zhou, Y.P. Li and C.M. Fu	606
<b>Study of the Structural Characteristics of Mold for Precise Injection Molding</b> H.L. Li and Z.X. Jia	610
<b>Conformation and Activity of Sol-Gels Encapsulated Cross-Linked Enzyme Aggregates of Lipase from <i>Burkholderia cepacia</i></b> Y. Liu, Y.L. Guo, D.W. Chen, C. Peng and Y.J. Yan	614
<b>Model Deduction of Rolling Tension Building Process</b> S.B. Zheng, H.B. Li and T. Wang	621
<b>Wettability of Molten Ti on ZrO<sub>2</sub></b> A.H. Liu, B.S. Li, Y.W. Sui, J.J. Guo, Y.F. Zhu and H.Y. Ding	625
<b>Structure and Properties of TC4 Alloy by Die Forming and Sintering Utilizing Hydrogenated Powder</b> Y.Q. Tian, H.L. Hou and X.P. Ren	629
<b>Hot Deformation Behavior of Zn-8Cu-0.3Ti Alloy and its Flow Stress Model</b> X.Q. Xu, D.F. Li, S.L. Guo and X.P. Wu	635
<b>Hot Deformation Behavior and Microstructure Evolution of GH625 Superalloy Tube during Extrusion Process</b> Q.M. Guo, D.F. Li, S.L. Guo and G.L. Xie	640
<b>Study on the Properties of Magnetization Modified Sodium Silicate Sand</b> Y.F. Fan and D.N. Li	645
<b>Effect of Phosphorus on Microstructure and Properties of Al-Mg<sub>2</sub>Si Alloys Subjected to Electromagnetic Stirring</b> Y.Y. Ren and Y.M. Li	652
<b>Study on the Structure Improvement of Slanted-Guide-Pillar Core-Pulling Mechanism in Die-Casting Die</b> H.F. Zhang and S.B. Ma	658
<b>Wrinkling Identification and Wrinkle Distribution of a Tube in Hydroforming with Radial Crushing</b> X.F. Liu, L.F. Yang and Y.X. Zhang	662
<b>Study on the Rules and Effects of Wear on Die Service Life in Steel Synchronizer Gear Ring Forging Process</b> J. Zhao, J.M. Yi and S.M. Luo	668
<b>The Effect of Anisotropy on Spring-Back of CK67 Steel Sheet in L-Dies Bending Processes</b> J. Bazrafshan, A. Gorji and A.T. Armaky	672
<b>Back-Stepping Design Research of Spline Die Based on Cold-Rolling Forming</b> Z.K. Wang and Q.H. Zhu	676
<b>Numerical Simulation and Optimization of Drawing for Shallow Tapered Surface</b> H.Y. Ding, M.J. Xia, Y. Zhang and G.H. Zhou	682

## CHAPTER 4: Materials Machining

<b>Study on Influencing Factors of the Seaming of Knitted and Woven Fabrics</b> B. Lin and Z. Li	689
<b>Thermomechanical Load Study on FGM Clad Hot Forging Die under Mechanical Press</b> H.J. Wang, Y.Z. Sun, Y.Z. Wu and H.C. Wang	693
<b>Research on Thermocouple Embedded Position for CC Mould Copper Plate with High Casting Speed</b> L.G. Sun and J.Q. Zhang	698
<b>Defect Recovery and Control in Heavy Forgings by Two Times Upsetting and Stretching Process</b> J.H. Su, Y.W. Chen, Y.Y. Chen and Y.L. Shi	706
<b>Study on Mathematical Model of High Speed Milling Force for Plastic Mold Steel 3Cr2Mo</b> J.M. Xiao and Y. Xu	710
<b>Experimental Study on the Cutting Temperature with Micro-Texturing Self-Lubricated Tools</b> Z. Wu, J.X. Deng, Y.S. Lian, Z.J. Wang and J. Zhao	715
<b>Fabrication of SiCp/Cu Composite by Powder Injection Molding</b> J.M. Yang, H.Q. Li, H. Chen, Y.Q. He and L.C. Feng	721
<b>Experimental Study on High-Speed Milling of SiCp/Al Composites</b> Y.F. Ge, J.H. Xu and Y.C. Fu	725
<b>Edge Drop Control Technology of 4-Hi Tandem Cold Rolling Mill on the Premise of Considering Roll Grinding Accuracy</b> G.H. Yang, J.G. Cao, J. Zhang, X.Q. Yin, S.H. Jia and W. Zeng	732
<b>A Study on Novel Gas Atomization Device for Preparing Ultra Fine Metal Powder</b> X.A. Dang, L.L. Wang and L.J. Yang	741
<b>A New Method on Choosing Tool Materials at High Speed Machining</b> H.P. An, Z.Y. Rui, R.F. Wang and J.F. Guo	745
<b>Effects of Rotating Electromagnetic Field on Solidification Microstructure of ZA27 Alloy</b> Z.H. Wang, M. Zhu and G.J. Xu	750
<b>Research on the Machining Methods of UHMWPE Fiber Reinforced Composite Laminates</b> C.Y. Li, Y. Sun and L. Chen	754
<b>Studies on Diamond Brazing Process</b> C. Song, L. Hua, F.C. Wei and J. Liu	758
<b>Studies on High Efficiency Diamond Trimming Saw Bits</b> L. Hua	767
<b>Numerical Simulation and Experimental Study on Warm Forging Process of Half Axle Bevel Gear</b> Y. Tong	774
<b>The Study on High-Temperature Oxidation Law of 20CrMo Steel in the Regenerative Heating Furnace</b> T. Wang, Y.H. Leng and L.S. Chen	778
<b>The Discussion of {111}ND Formation Mechanism</b> T. Wang, Y.H. Leng and L.S. Chen	782
<b>Austenite Phase Transformation of Thermal Analysis</b> L.S. Chen, Y.H. Leng, Y.K. Han and J.Y. Song	786
<b>Temperature Field Simulation of Air Cooling Condition 40Cr ANSYS</b> L.S. Chen, Y.H. Leng, Y.K. Han and J.Y. Song	790
<b>Assessment of Factors Influencing Tool Wear on the Machining of Nimonic C-263 Alloy with PVD Coated Carbide Inserts</b> C. Ezilarasan, K. Zhu, A. Velayudham and K. Palanikumar	794
<b>The Use and Grinding of the New Configuring Finishing Hob</b> Y. Hu, J. Song, Y.L. Wang, M.J. Xiang and F.H. Peng	800
<b>Study on Cutting Force of Diamond Cutter in Special-Shaped Stone Processing</b> B. Huang and Z.W. Liu	804
<b>An Experimental Investigation of the Laser Milling Process for Polycrystalline Diamonds</b> Q. Wu and J. Wang	810

## CHAPTER 5: Welding & Joining

<b>Studies on the Mechanical Property of Ring Nugget Formed in Sheet to Tube Joining</b> C.P. Liang, F.F. Sun and X.H. Liu	819
<b>Modeling of Resistance Spot Welding Process Using Nonlinear Regression Analysis and Neural Network Approach on Galvanized Steel Sheet</b> Y. Luo, C.T. Li and H.B. Xu	823
<b>The Preliminary Study of the Welds between Mg and Al by Friction Stir Welding</b> Y. Chen, C.B. Shen and J.P. Ge	829
<b>Tensile Properties and Strain Hardening Behavior of a Friction Stir Welded AA2219 Al Alloy</b> W.F. Xu, J.H. Liu, D.L. Chen, G.H. Luan and J.S. Yao	833
<b>Technique of Laser-TIG Hybrid T-Shape Joint Welding of Titanium Alloy</b> M. Wang, M.L. Jiang, Q. Wei and K.F. Gu	841
<b>Experimental Study on Composites with Single-Lap Countersunk Head Bolt Joints</b> P.Y. Wang, S.H. Huo, F.S. Wang and Z.F. Yue	848
<b>Microstructures and Properties of FSW Joints of AZ31B Mg Alloy</b> S.R. Yu and X.J. Chen	855
<b>Determination of Optimal Recrystallization Annealing Temperature on Structural Hot Dip Galvanized Steel Sheets</b> M.L. Wang, Z.W. Zheng and G.T. Zhang	860

## Chapter 5: Welding & Joining

<b>TZM Alloy TIG Welding Process and Microstructure of Welded Joints</b> H. Wang, Y.P. Zhang and X.Y. Zhang	867
<b>Study of Laser Cladding Novel Co-9Al-7.5W Superalloy on 304 Stainless Steel</b> Y.T. Xu, W.J. Zhao, T.D. Xia and X.J. Wang	872
<b>The Interlayer Designation for ZTM Ceramics and Fibre Joining</b> Y.N. Zhao, J.C. Liu, C.F. Wang and W.L. Zhang	878
<b>Effect of Magnetic Field Frequency on Microstructure and Properties of AZ31 Magnesium Alloy Welded Joint with GTAW</b> Y.H. Su, Z.J. Liu and D. Liu	882
<b>Effect of Ca on Grain Size and Toughness in CGHAZ of C-Mn Steel</b> K.N. Jia	886
<b>Completely Inelastic Collision to Confirm Maximum Punch Pressure Force of Cold Pressure Welding</b> S.D. Zhao, F. Xu, R.F. Zhao and B. Zhong	890
<b>Residual Stress Characterization of A7N01-T5 Welds for High Speed Train by X-Ray Diffraction and Verification</b> H. Ji, G.Q. Gou, H. Chen, D. Li, C.P. Ma, A.Q. Tian and Z.C. Guo	896
<b>Study of Type 316L Stainless Steel TIG Welding with MoO<sub>3</sub> Powder</b> K.H. Tseng and K.J. Chuang	901
<b>Evaluation Study on Angular Distortion and Residual Stress of Stainless Steel Pulsed TIG Weldment</b> K.H. Tseng and H.L. Sung	905
<b>Microstructure and Mechanical Performance of Ultrasonically Brazed Joints of High Fraction Volume of SiC Particulate Reinforced Aluminum Matrix Composites</b> Y. Zhang, C. Qin and H. Zhu	910
<b>Electrode Lifetime in Spot Welding Galvanized Sheet with Insert Material</b> G.W. Shuai, P. Fang and Z.H. Guo	915
<b>Effect of Physical Simulation Thermal Parameters on Microstructure Transition and Property Variation of Boron Steel</b> K. Han, Q.S. Li, M. Zhang, R.Y. Fu and L. Li	919
<b>The Chemical Reactions in Solution Synthesis of Aluminum Alloy Brazing Fluorate Flux</b> F.J. Cheng, W.S. Jin, Y. Wang and D.P. Wang	924



<b>The Effect of Nano-Cu Particles on Mechanical Properties of Micro-Joining Joint with Lead-Free Solder</b> Y.M. Shen, F.J. Qi, M. Xie and J. Li	929
<b>Research on Measurement of Residual Stresses in Flash-Butt-Weld Rails Using X-Ray Diffraction</b> S.H. Yan, H. Chen, G.Q. Gou, D. Li, Y. Liu and Z.Y. Zhu	934
<b>Study on Fatigue Crack Growth Rate of Welded Joint of Duplex Stainless Steel</b> Z.L. Wang and Z.X. Wang	941
<b>Liquid Phase Separation of Cu-Fe Weld Metal of Manual SHS Welding</b> W.T. Xin, Z.Z. Li, B.F. Li and Y.S. Wu	945
<b>Study of Silica-Titania Mixed Flux Assisted TIG Welding Process</b> K.H. Tseng and W.C. Wang	949
<b>Interfacial Reaction of Alumina Ceramics to Mild Steel Braze Joint</b> Z.R. Li, G.D. Wu, X.L. Zhang, J.X. Fan and J.C. Feng	954
<b>Analysis on the Residual Stresses in the Aluminum Alloy Friction Stir Welded Joints</b> L.J. Cao	958
<b>Resistance Spot Welding between Titanium and Stainless Steel with an Aluminum Alloy Insert</b> Y.M. Tu, R.F. Qiu, H.X. Shi, X. Zhang and K.K. Zhang	964
<b>Study on Performance of Inertia Radial Friction Welding of Copper-Alloy to 35CrMnSi Steel</b> W. Wu, L.Y. Zhu, G.F. Wu and H.B. Xu	968
<b>Crack Failure Analysis of Q235B Welding with 304 Austenitic Stainless Steel of Tube and Shell Condenser</b> X.L. Zhang, R.F. Chen, L.G. Dai, T. Liu and Y. Pan	975
<b>Effect of Heat Input on Toughness of Deposited Metal at -40°C of Self-Shielded Flux-Cored Wire</b> S.P. Song, Z.X. Li, G.D. Li and T.L. Zhang	979
<b>Documentation and Analysis of Sustainable Design and Application of <i>Tanggap</i> System in Malay Traditional House</b> A.B. Sabil and N. Utaberta	984
<b>Research and Development of High Energy Pulse Precision Cold-Welding Technology</b> L.D. Meng, Z.J. Liang, Q. Zhang and J.W. Yang	988
<b>The Friction Interaction Mechanism of Welding Seam Identifying Based on Force Sensing</b> L. Liu, X.Y. Li and H.M. Gao	995
<b>Effects of Nd: YAG Laser Welding Parameters on the Microstructure of 21% Cr Ferritic Stainless Steel</b> K.P. Geng, S.S. Hu, J.Q. Shen, J. Han and H.G. Xu	999
<b>Study on the Joining Characteristics of Diffusion Welding Lap Joint with Various Temperatures between Aluminum Alloy and Stainless Steel</b> H.X. Shi, R.F. Qiu, Y.M. Tu, H. Yu and D.Q. Yin	1003

## CHAPTER 6: Mechanical Behavior & Fracture

<b>A Study on Tensile Mechanical Properties of Bamboo Plywood</b> J. Han and X.T. Gao	1009
<b>A Useful Curve Fitting Method for Concrete Uniaxial Compressive Experiment Data</b> C. Jin, H. Wang and X.Z. Xia	1015
<b>Fatigue Analysis of the Pipeline Robot's Swing Rod</b> F. He, J.X. Fu and Z.L. Huang	1021
<b>Investigation on Nonlinear Constitutive Relationship for a Honeycomb Sandwich Composite</b> Q. Liu and Z.M. Huang	1025
<b>Determination of Fracture Toughness and K-R Curve for 2524-T3 Aluminum Alloy</b> W. Xie, S.W. Tu, Q.Q. Huang and Y.Z. Li	1039
<b>Study on Fatigue Crack Growth Model of Attachment Lug Subjected to Oblique Pin-Load</b> L.M. Wu, Y.T. He, H.W. Zhang, R.H. Cui, J.Q. Du and H. Ding	1043

<b>Hot Deformation Behavior and Fracture of As-Extruded 7075 Aluminum Alloy</b> Z.C. Sun, J.H. Wang, Y. Wang and H. Yang	1051
<b>Simulation of Crack Tip Plasticity Using 3D Crystal Plasticity Theory</b> W.H. Liu, H. Huang, Z.G. Chen and D.T. Cui	1057
<b>Analysis of the Generation Cause of Scale Shelling Defects on Running Surface of 60kg/m U71Mn Rail</b> J.H. Zhou, Y. Ji, A.C. Ren and Y.D. Zhang	1062
<b>Vacuum Forming Refrigerator Inner Liner Structural Optimization</b> W.B. Su, X.B. Sun, T. Li and B.J. Liu	1069
<b>Surface Crack Search and Marking on Materials with Regional Phase Unwrapping Technology</b> Y.T. Zhang and M.J. Huang	1074
<b>Influence of Plastic Deformation on the Mechanical Properties and Microstructure of Homogenized AZ80 Magnesium Alloy</b> Y.J. Wu, Z.M. Zhang, B.C. Li, B.H. Zhang, J.M. Yu and Y. Xue	1082
<b>Fracture Analysis of Pipe Sleeve on Extrusion Flare-Less Pipe Joints for Aircraft Hydraulic Pipe</b> F.M. Xue, F.G. Li, J. Li, W.J. Yu and J.F. Li	1087
<b>Material Factors Analysis of the Cracking in 0Cr12Mn5Ni4Mo3Al Stainless Steel Pipe Sleeve on Aircraft Flare-Less Pipe Joints</b> F.G. Li, F.M. Xue, W.J. Yu and J.F. Li	1091
<b>Study on Casting Speed and the Speed of on-Line Mould Width Adjustment of Slab Continuous Casting</b> Q. Gao, D.G. Xie, L.D. Yang and X.L. Zhang	1095
<b>A Method of Reducing Volatile Compounds in Polypropylene Packaging Materials</b> D.L. Li, W.C. Xu and Y.B. Fu	1100
<b>Low Cycle Fatigue Behaviour of GX12CrMoVNbN9 -1 Cast Steel at Room Temperature</b> G. Golański, K. Werner and S. Mroziński	1106
<b>Experimental Investigation of Fretting Fatigue of Train Axles under Rotating Bending</b> W.J. Wang, M. Wang, G.X. Yang and J.L. Xie	1110
<b>Experimental Studies on J-Integral of Welded Buried High-Density Polyethylene Pipes</b> F.J. Qi, J. Li, Z.J. Yang and M. Fang	1116
<b>Influence of Aging on Creep Rupture Properties of Heat Resistant Steels for Steam Turbine Rotors of Thermal Power Plants</b> L.B. Niu, I. Matsushima and T. Akiu	1122
<b>The Comparison of Fractal Dimensions of Cracks on Reinforced Concrete Beam</b> H.Q. Sun and J. Ding	1126
<b>Study on Constitutive Relationship of Fe-36Ni Invar Alloy</b> G.H. Li, Y.J. Cai and H.J. Qi	1131
<b>The Experimental Study on Sensitivity of Hydrogen Embrittlement of 20Cr<sub>2</sub>Ni<sub>4</sub>A High-Strength Steel Cleaned by Ultrasonic and Deruster</b> L.D. Meng, Q. Zhang and Z.J. Liang	1136
<b>Study on Fracture Energy of Cement Stabilized Aggregate</b> X.H. Wei and P. Zhang	1141
<b>Study of Shear Fracture Behaviours on 6061 Aluminum Alloy</b> H. Zhu, Y. Zhang and S.W. Yu	1145
<b>Study on Crack Prevention for Concrete Rapid Construction</b> M.Z. Liu, S. Qiang, B.L. Wang, Z.Q. Zhen and X.R. Wang	1149
<b>A New Constitutive Model for Anisotropic Sheet Metal with Isotropic Ductile Damage</b> J.H. Guo, R. Murakami and S.D. Zhao	1154
<b>Construction of a Finite Element Multiresolution Method Based on the Second Generation Wavelets</b> Y. Lin, Y.M. He and X.L. Zhang	1161
<b>Establish Fatigue Life Mechanism for Self Run Bushing By Engineering Analysis Methods</b> Q.C. Hsu and Y.C. Huang	1165
<b>A Model for the Effects of Strain Rate and Temperature on the Deformation Behavior of Ultrafine-Grained Metals</b> Z.L. Xie, L.Z. Sun and F. Yang	1173

<b>The Development of Auxiliary Sets in Novel Cold Roll Forming Line - Continuous Mini Stretching-Bending Straighter and Roller Punching System</b> Y.B. Du, J.T. Han and Y.J. Zhang	1178
<b>Analysis of Axial Subcritical Crack Propagation in X80 Pipeline using Micro-Mechanical Model</b> B.W. Qiu, Z.X. Yuan and G.F. Zhou	1183
<b>Variational Problem of Unloading Fractured Rock Mass</b> L. Yu, M.F. Fu and B. Tu	1190
<b>Dynamic Simulation of Cycloid Wheel at Two Support Points of Needle Gear pin for New Three-Gear Pin-Cycloid Driven Speed Reducer</b> Y.S. Sun, T.M. Guan and X. Zhang	1195

## CHAPTER 7: Material Design of Computer Aided

<b>Effect of Chlorine on Combustion Process of Pulverized Coal in Tuyere Zone</b> B.S. Hu, Y.L. Gui, H.L. Guo and C.Y. Song	1203
<b>Study on CH<sub>4</sub> Adsorption onto the Surfaces of Perovskite ABO<sub>3</sub> (<i>A=La, Ba; B=Zr, Co, Ce</i>) by Density Functional Theory</b> Z.S. Gao, H. An, L. Lv, L.C. Hou, H. Han and X.J. Wang	1208
<b>Analysis in Atmospheric Corrosion Behavior of Bainite Steel Exposed in Offshore Platform Based on the Artificial Neural Network</b> M. Zhang, J.F. Yu, S.W. Yang and X.L. He	1212
<b>Temperature Field Simulation of Flame Deformation Correction for Thin Plate</b> J.P. Zhang and G.W. Wang	1217
<b>Study on Injecting Forming Technology of Railway Locomotive Bearing Retainer</b> H.W. Liu, R.H. Dong and F. Feng	1223
<b>Dynamic Compressive Behavior of Granite under Active Confinement</b> G. Chen, Y.C. Kuang, X.C. Huang and A.M. Xu	1227
<b>Design and Fabrication of Blood Drawing Device</b> C.W. Su and C.H. Chien	1233
<b>Surface Modeling Design and Temperature Field Analysis about Air Intake Cover Based on Pro/E Software</b> H.W. Liu, Z.H. Liu and T.X. Chen	1237

## CHAPTER 8: Tooling Testing and Evaluation of Materials

<b>Electro-Conductive Property of Polymeric Composite under Impact Loading Using a Modified SHPB</b> J.T. Lei, M.H. Zhang and J.K. Chen	1243
<b>Duplex Stainless Steel Microstructure Display and Microscopic Study</b> S.S. Na, G.T. Zhang, Q. Xu and J.H. Gong	1247
<b>Study on Flux-Pinned Interaction between High-Temperature Superconductor and Permanent Magnet and Flux-Pinning's Self-Stability</b> M.L. Zhang, Y. Lu and D. Gao	1251
<b>Mechanical Test on Pipe Collapse under External Pressure</b> K. Yong	1255
<b>Biomaterial Impedance Analyzer Based on Digital Auto Balancing Bridge</b> N. Li, Y.N. Wang, H.S. Nie, H.Q. Yu and H. Xu	1259
<b>Evaluation Method for Fabric Non-Iron Pleat Plasticity</b> L.H. Zhao and F.M. Wang	1263
<b>Determination of Exciting Power and Saturation Characteristics for Dual Laminated Core Models</b> Z.G. Zhao, F.G. Liu and Y.H. Wang	1267
<b>The Equipment on High Sensitive Test of Infrared Directional Emissivity of Materials</b> L.Y. Zhang and Y.K. Liang	1272

<b>Design and Experiment of Electromagnetically Induced Acoustic Emission for Metal Crack Detection</b>	
C. Zhang, S.Z. Liu, Q.X. Yang, L. Jin and Y.H. Kan	1278
<b>Research on the Sorption of Anticorrosion and Antiwear Additives on Surface of Axletree</b>	
B. Feng, S.H. Liu, G.X. Chen, K. Wang and P.H. Shang	1284
<b>Determination Methods of the Minimum Safety Thickness of Acrylate Waterproof Membrane</b>	
J.M. Zhao, G.Q. Li, Y.S. Wang, Q.X. Yang, D.M. Liu and X.P. Ren	1289
<b>An Experimental Setup to Test Thermal Contact Conductance Across Solid/Solid Interface</b>	
S.W. Liu, W.F. Zhang and Q.Y. Tang	1293
<b>Realization and Analysis of Bending Fatigue Strength Test for Gears under Random Loading</b>	
J.J. Hu, H.B. Xu, S.H. Zu and X.W. Gao	1297
<b>Damage Evaluation of 16Mn Steel in Tensile Test</b>	
H.W. Wang, H.Y. Luo, Z.Y. Han and Q.P. Zhong	1303
<b>Infrared Thermography Non-Destructive Testing of Composite Materials</b>	
C.Q. Wu, W.P. Wang, Q.G. Yuan, Y.J. Li, W. Zhang and X.D. Zhang	1307

## CHAPTER 9: Microwave Processing of Materials

<b>Microwave Joining 95-Al<sub>2</sub>O<sub>3</sub> Ceramics Used Al-Si Alloy as Interlayer</b>	
Y.N. Zhao, J.C. Liu, H. Xu and W.L. Zhang	1313
<b>Experiment Study on the High-Phosphorus Hematite Carbothermal Reduction in Microwave Field</b>	
Z.J. He, Y.L. Jin and H. Zhang	1317
<b>Influence of Hoop Coefficient on Dynamic Response of Railway Bridge Protective Frame under Impact Load</b>	
A.T. Ju, S.Y. Qu, X.M. Hou and J.T. Wang	1321
<b>Experiment Research on Combustion of Microwave Modified PC</b>	
Z.J. He, Y.L. Jin and Q.H. Pang	1327
<b>Microwave Assisted Solid State Reaction Synthesis of Complex Amino Acid Complexes of Mn ()</b>	
B.L. Liang, N. Zhang and M.J. Zhou	1331
<b>Microwave-Irradiated Preparation of Super Absorbent Resin by Graft Copolymerization of Starch and Acrylic Acid</b>	
D.B. Zhao	1335
<b>Effect of Ultrasonic Wave on <i>Lentinan</i> Extraction</b>	
W.B. Zhang, H.R. Li, J. Tao and B.B. Dong	1339
<b>Viscoelastic Characterization of Microwave Drying Nature Rubber</b>	
F.Q. Zhang, Y.Z. Wang, M. Chen and M.F. Huang	1344
<b>Hybrid Control for Isolation and Energy Dissipation Systems of Flexible Pile</b>	
L.H. Zou, K. Huang, Q. Sun and L.Y. Wang	1351
<b>Mechanism Study on the High-Phosphorus Hematite Carbothermal Reduction in Microwave Field</b>	
Z.J. He, H. Zhang and Y.L. Jin	1358

## CHAPTER 10: Laser Processing Technology

<b>Effect of Laser Surface Melting on Structure and Properties of a High Speed Tool Steel</b>	
M. Bonek, G. Matula and L.A. Dobrzański	1365
<b>Microstructure Research of Magnesium with Laser Surface Cladding by Al-Si Alloy</b>	
S. Yang and X.Q. Wan	1369
<b>Direct Writing Micro/Nano Structures on PZT Wafer by Laser Micromaching</b>	
Y.G. Li, J.Q. Liu, C.S. Yang, D.N. He, K. Tanaka and S. Sugiyama	1373
<b>Research on the Application of DVD Pick-Up Head in Three-Dimensional Optical Storage</b>	
J.W. Cai, F. Meng, Y.F. Zhang, M.F. Zhang and X.T. Pan	1377

<b>Development of Numerical Model and Coupled Thermal/Mechanical Analysis in the Laser Transmission Joining of PET and Stainless Steel</b>	
M.F. Jiang, X.H. Song, P. Li, Y. Hu, K. Wang, X. Wang and H.X. Liu	1381
<b>Influence of Re-Melting Technology on Properties and Microstructures of Ferrous Matrix Composites Reinforced with Tungsten Carbide Particle</b>	
Y.P. Song, H.G. Wang, Z.M. Feng and Z.K. Zhao	1389
<b>Patterning of ITO on Glass with Two-Step Using Excimer Laser and Wet Chemical Re-Etching</b>	
X.F. Shen, T. Chen and N. Liu	1393
<b>Development of Porous Scaffolds Using Selective Laser Sintering of Polylactic Acid/Hydroxyapatite for Bone Tissue Engineering</b>	
Q. Zhang, F.R. Liu and J.M. Chen	1399
<b>Study on Thermal Fatigue Resistance of Non-Smooth Cast Iron Treated by Laser Surface Alloying of CrNi Powders</b>	
T. Xin, Z. Hong and L. Min	1405
<b>Characteristic of Laser Texturing Surface Aided with Abbott Curve</b>	
J.Y. Dai, Y.H. Zhang, Z.Q. Wang, X.J. Hua and Y.H. Fu	1412
<b>Laser Repair Cladding of K418 Ni-Base Superalloy by CoCrNiW Powder</b>	
C.J. Chen, Q. Cao, M. Zhang, Q.M. Chang and S.C. Zhang	1417
<b>Study on Anti-Corrosion of the HAZ of 30CrMnSi Treated by Laser Remelting</b>	
Y.L. Li, R.X. Huang, P.Z. Zhao and D.X. Yi	1421
<b>Surface Layer Properties of Sintered Ferritic Stainless Steel Remelted and Alloyed with FeNi and Ni by HPDL Laser</b>	
Z. Brytan, M. Bonek, L.A. Dobrzański and W. Pakielna	1425
<b>Laser Cladding of Al+nano-Al<sub>2</sub>O<sub>3</sub> Powder on ZM5 Magnesium Alloy</b>	
C.J. Chen, Q. Cao, X. Xu, M. Zhang and S.C. Zhang	1429
<b>Optimization of Laser Transmission Joining Process between Different Thermoplastics using Response Surface Methodology</b>	
Z.K. Xu, K. Wang, M.F. Jiang, Y. Hu, C. Zhang, P. Li and H.X. Liu	1433
<b>Transverse Superplastic Deformation of Laser Welded Ti-6Al-4V Sheet</b>	
D.H. Cheng, Y.P. Zhou, Q. Wei, Y.P. Chen and D.A. Hu	1440

## CHAPTER 11: Theory and Application of Friction and Wear

<b>Influence of Silica Fume/Nanosilica on the Strength and Microstructure of Phosphoaluminate Cement</b>	
C.J. Lv, S.X. Ren and X.S. Tian	1447
<b>Tribological Testing Method between Knitted Fabric and Skin in Wet States</b>	
X. Wang and F.M. Wang	1450
<b>Experimental Study on the Tribological Properties of Water-Lubricated Rubber Bearings</b>	
Y.Q. Wang and M.S. Wang	1454
<b>Tribological Behaviors of Nanocrystalline Nickel Coatings under Lubricated Conditions</b>	
Y.Q. Xia and X. Feng	1458
<b>A New Method of Numerical Differential and Time Domain Integral Based on the Analysis of Vibration Response</b>	
J. Hu and X.N. Zhang	1462
<b>Cyclic Spectrum Analysis on Rolling-Element Bearing with Inner-Race Point Defect</b>	
W. Ke, Y.X. Zhang and L. Li	1469
<b>The Effect of Rail Material on Wear Behavior of Wheel and Rail</b>	
W.J. Jiang, X.L. Zhang, W. Zhong and Q.Y. Liu	1474
<b>Inhibition Behaviour of a Mixed Additive upon Zinc Electrowinning from Sulphate Solutions Containing Germanium</b>	
C.X. Liu, Q.F. Shen, M. Xiong, Y. Shan, S.F. He and Y.P. He	1479
<b>Computer Analysis of Radar Graph Fractal Method for Wear Debris Contour</b>	
J.L. Liu, H.T. Liu, S.R. Ge and C.H. Xie	1484
<b>Investigation of Grease Lubrication Effects on the Fretting Wear Behavior of Ball Bearings</b>	
S.M. Wang, H.L. Gao and M.H. Xu	1491

<b>A Study of (<i>N</i>-octylic acid)-<i>N</i>-Quinazolin-4-One Methylester as an Oil Additive</b> P. Ouyang and X.M. Zhang	1496
<b>A Two-Disk Test Rig for Researching the Damage Behavior of Rolling/Sliding Contact Surfaces under Extreme Conditions</b> B. Peng, L.Q. Wang, S.X. Fan, D.Z. Zheng and L. Gu	1500
<b>A Shakedown Limit under Hertz Contact Pressure</b> J.S. Shiau	1506
<b>Key Problems in Study on Fretting Fatigue of Aluminum Alloy</b> L. Xu, Y.L. Chen, L. Yi and H. Luo	1511
<b>Research on Static Characteristics of Deep/Shallow Pockets Hybrid Bearing under Laminar and Turbulent Mixed Regimes</b> H. Guo, S.L. Zhang and S.Q. Cen	1516
<b>Influence of DC Steady Magnetic Field on Friction and Wear Characteristics of Friction Pair of High-Speed Steel / 2Cr13 Stainless Steel</b> Y.H. Wei, Y.Z. Zhang, Y. Chen and S.M. Du	1521
<b>Tribological Performances of FeS Solid Lubrication Duplex Layer under Liquid Paraffin Oil with n-Al<sub>2</sub>O<sub>3</sub> Lubrication</b> C.H. Hu, J. Huang, H.S. Zhao, S.N. Ma and Y.L. Qiao	1526

## **CHAPTER 12: Dynamic Mechanical Analysis, Optimization and Control**

<b>Analytical Model of a Simple Supported Beam with Variable Section Subjected by a Moving Load</b> J. Zhang, Z.W. Zhou, J. Xu and X.L. Ni	1535
<b>Study on a New Series of DNA Dodecahedral Links</b> Y.M. Yang, J.Y. Di and L.P. Du	1539
<b>Flapping Mechanism Design and Aerodynamic Analysis for the Flapping Wing Micro Air Vehicle</b> Y. Qin, W.P. Zhang, W.Y. Cheng, W. Liu, H.Y. Li, P.C. Chi, K. Meng, F. Cui and X.S. Wu	1543
<b>House Renovations and Extensions in Malaysia: An Investigation of Mechanical Changes and Modification of House in Klang Valley, Malaysia</b> M.A. Jamel and N. Utaberta	1547
<b>The Modal Analysis of Roller Chain Drives</b> B.L. Li, S. Fan and Y. Zhang	1551
<b>Decentralized Semi-Global Stabilization of Large-Scale Nonlinear Systems with Mixed-Order Nonlinearities</b> H. Ye and J.Y. Zhai	1555
<b>Analysis of Stress Response for the Super High Rise Double-Tower Connected Structure with the Trusses of Changing Rigidity</b> Z.G. Mu, L. Wang and Z. Fan	1559
<b>Analysis on High-Speed Sampling Device with Big Interior Force</b> J. Feng, J.L. Zhang and Y.T. Ma	1564
<b>Simulation and Fuzzy Control Strategy Analysis on 4WD Hybrid Electric Off-Road Vehicle</b> S.Z. Zhu and Y. Wang	1568
<b>Review and Prospect on Dynamic FE Model Updating Methods of Footbridge Structures Based on Ambient Excitation</b> R. Zhao and Y.G. Zhang	1572
<b>Non-Linear Finite Element Analysis of Contact-Impact between Drill String and Wellbore under Air Drilling</b> B.F. Yu, X.Z. Yan, X.J. Yang and G.S. Li	1578
<b>Dynamic Stiffness Identification of Bolted Joints</b> T.N. Guo, B. Song, D.L. Guo and Z.Q. Chen	1582
<b>Research on Topology Optimization Method for Continuum Structure under Geometric Constraints</b> L. Ren, R. Yang and W.X. Zhang	1589

<b>The Analysis of Radial Magnetic Bearing's Magnetic Field in Active Magnetic Bearing Electric Spindle Unit</b>	1593
P. Liao, S.Y. Ma, G.Q. Wu, J.F. Mao and A.D. Jiang	
<b>Haptic Control for Minimally Invasive Robotic Surgery</b>	1600
Z.H. Xu, C.L. Song and S.J. Yan	
<b>The Method of Parametric Design of Mixing Blades Based on Subdividing Functions</b>	1604
A.L. Wang, F. Li and P.Y. Zan	
<b>Optimization of Concrete Open-Loop Pumping Displacement Control Parameters under Variable Loads</b>	1608
A.L. Wang, Z.Q. Shi, C.X. Yuan, Y.Q. Hu, T. Jiang and Q. Zhang	
<b>The Finite Element Model (FEM) Updating of Mirror Frame System Based on Response Surface Method</b>	1615
X.Q. Chen, S.F. Xiao and X.E. Liu	
<b>Nonlinear Primary Vibration of Circular Sandwich Plates and Modal Analysis</b>	1621
X.M. Liu, G.J. Du, Y.D. Hu and X.X. Niu	
<b>Influences of Semi-Rigidity of End-Plate Joints on Structures</b>	1625
Q.F. Wang, Y.C. Liu, L. Cao, J. Yao and J.F. Huang	
<b>Analysis of the Mixed Control System of Damper and TMD</b>	1630
Q. Lin, Z.Y. Xu and J.L. Zhang	
<b>Stress Spectrum Analysis on Steel Structure of Gantry Crane</b>	1634
L.H. Xiong and F. Wang	
<b>Dynamic Optimization Design of Stochastic Finite Element</b>	1640
W.H. Mo	
<b>Variability of WPT-Based Dynamic Identification of a Suspension Bridge under Changing Temperature, Wind and Traffic Conditions</b>	1644
R.C. Lin, Y.L. Ding, A.Q. Li and Y. Deng	

## **CHAPTER 13: Thermal Engineering Theory and Applications**

<b>Experimental Study on Ammonia-Water Bubble Absorption in External Magnetic Field</b>	1653
W.D. Wu, Z.Y. Li, S.X. Chen and S.M. Liu	
<b>Analysis of the Heat Transfer Coefficients on the Top of a Marine Diesel Piston Using the Inverse Heat Conduction Method</b>	1657
T. He, X.Q. Lu and Y.B. Guo	
<b>Research on the Local Upwind DQ-Lagrange Method for Solving the Flow Field in Labyrinth Seal</b>	1662
D. Sun, J.G. Yang, R. Guo, H. Cao and W.F. Zhang	
<b>Influences of New Electrical Material on Transient Heat Transfer in IMCCR</b>	1669
J.C. Cao, W.L. Li, X.C. Zhang and Y.H. Zhang	
<b>Reviews of Studying on Thermal Management System in EV/HEV Battery Pack</b>	1674
Z.P. Wang, C. Lu and P. Liu	
<b>The Analysis on Circulating Fluidized Bed Boiler Heat Tube Failure</b>	1679
B. Zhao, J.H. Li, J.Q. Shen and G.Z. Wang	
<b>Design of Vacuum System of Steam Jet Bursting Unit for Chestnut Shell</b>	1685
X.N. Dang, Q.F. Chen and L.J. Yang	
<b>Study on the Porous Media Used in Numerical Simulation of Temperature Characteristic for Isothermal Chambers</b>	1689
L.H. Yang and D.H. Liu	
<b>Optimization of the Cooling Channels in a Journal Bearing Based on Thermohydrodynamic Analysis</b>	1693
J. Guo, B. Huang, Z.L. Chen and L.Q. Wang	
<b>Integrated Optimal Design of Ducted Propeller Based on DOE</b>	1698
Z.Y. Yang, Y. Ma and Y.X. Chen	
<b>SABER-Based Simulation for Compact Dynamic Electro-Thermal Modeling Analysis of Power Electronic Devices</b>	1704
M. Chen, A. Hu, Y. Tang and B. Wang	

<b>Compositional Design of Ceramic Extrusion Die Materials Based on the Residual Stress Analyses in the Die Manufacturing Process</b>	
C.H. Xu, J.J. Zhang, Z.Y. Jiang and M.D. Yi	1709
<b>Numerical Simulation of Body Heat Transfer Coefficient Test of a Railway Vehicle</b>	
J.B. Zang, M.W. Cai and N.P. Gao	1713

## **CHAPTER 14: Precision Manufacturing Technology and Measurements**

<b>Experimental Research on Ultrasonic Vibration Milling Metal Matrix Composites SiCp/Al</b>	
G.F. Gao, Y.Y. Zhao, D.H. Xiang and B. Zhao	1725
<b>Study on Dynamic Minimum Thickness of Cut by Nanoscratch Testing</b>	
H.L. Zhang, J.C. Kuai and F.H. Zhang	1729
<b>Detection Status of Surface Defect for Precise Optical Element</b>	
H.Y. Chu, Z.J. Xie, X. Xu, L.D. Zhou and Q. Liu	1733

## **Chapter 14: Precision Manufacturing Technology and Measurements**

<b>Research on Progress of Micro Processing Technology</b>	
Y.F. Wang and H.X. Zhang	1741
<b>Marine Authigenic Deposits Mineral - New Fields for the Development of Rare Earth Resources</b>	
Y. Zhang, C.S. Liu, L.F. Gao, Z.G. Zhang and P. Zhang	1748
<b>A Method of Double-Side Displacement-Rotation Flat-Lapping with Solid Abrasives</b>	
W. Yan, Y.M. Huang, F. Gao and Y. Liu	1752
<b>Ultra-Precision Shaping and Polishing Experiments in Nanoparticle Colloid Jet Machining</b>	
X.Z. Song, Y. Zhang and F.H. Zhang	1759
<b>A Study on Surface Quality of GaN with CMP Polishing Process</b>	
W. Li, M.M. Ma and B. Hu	1764
<b>Experimental Investigation on the Influence of Tool System Imbalance on its Vibration Characteristics</b>	
C.G. Shen, G.C. Wang, S.L. Wang and G. Liu	1768
<b>The Computational Analysis of Hanging-Weight Method Used in High Speed Rail</b>	
H.Y. Wang, H. Xiao and B.W. Hou	1773

## **CHAPTER 15: Waste Engineering and Management**

<b>A System Dynamics Model for Water Quality Management - Waste Load Allocation</b>	
W. Yang, M.J. Chen, Y. Liu and F.Y. Jin	1781
<b>A Watershed's Environmental-Economic Optimization and Management Framework Based on Environmental Carrying Capacity</b>	
K. Huang, H.P. Tang and H.L. Guo	1786
<b>Physico-Chemical Characters of Pyrolysis Oil Obtained from Sewage Sludge</b>	
A.M. Ji, H.Y. Li, Z.Q. Li, H.Y. Liu and Y. Gao	1790
<b>The Effect of MgO-Al<sub>2</sub>O<sub>3</sub> Spinel on Refractory Bricks Made from Al<sub>2</sub>O<sub>3</sub>-Cr<sub>2</sub>O<sub>3</sub> Slag</b>	
L.J. Zheng, G.D. Zhang, D.L. Qu and F. Liu	1795
<b>Preparation of the Al<sub>2</sub>O<sub>3</sub>-ZrO<sub>2</sub>-C Sliding Nozzle Using Recovery Refractory and Improvement of its Performance</b>	
L. Tian, S.J. Chen, X.N. Zhang and G.H. Li	1800
<b>Removal of Phosphate from Aqueous Solution by Using Red Mud</b>	
X.F. Zhu, H.Y. Liu, P.H. Shi, J.F. Wu and Y.F. Guo	1804
<b>Production of Si-Al-Fe Alloy with Carbothermal Reduction of Coal Fly Ash</b>	
G.J. Ma, Y.B. Jin and D.B. Yang	1808
<b>Research of the Excellent Engineers' Quality Training</b>	
C.M. Liu	1812



<b>Uncertainty Analysis of Thermal Protection by Microencapsulated Phase Change Micro/Nanoparticles during Hyperthermia</b> Y.G. Lv, Y. Zou and L. Yang	1816
<b>Influence of Operation Procedures on Vicat Softening Temperature of Thermoplastic Materials</b> H.B. Li, Q. Li and M.L. Yan	1820
<b>The Influence of Hadifield Steel-Bonded TiC Preparation Process on Microstructure and Properties</b> S.F. Rong, C. Liu, J.W. Guo, M.X. Wang and Q.L. Liu	1825
<b>Simplified Analysis Research on Ancient Chinese Timber Structure</b> W. Li, D.F. Gao, P.N. Cao and X.J. Ding	1831
<b>Various Cooling Methods to Prepare Single Polytetrafluoroethylene Composites</b> Z.H. Zhao and J.N. Chen	1837
<b>Study on the Control Technology of Piezoelectric Transducer Assembly</b> Y.D. Zhang and W.W. Hong	1841
<b>Exploration on Methods of Making PAFC Using Coal Gangue</b> X.L. Wang, P.H. Shi, J.F. Wu and P.M. Zhu	1847
<b>Study of Modification of High Temperature Melting Compound Steel Slag-Fly Ash</b> Y. Long, Y. Shi, Y.B. Lei, H.W. Xing, J. Li and Y.Z. Zhang	1851
<b>Optimization of Underwater Body's Shape</b> D.X. Zhang, W.G. An, Z.X. Fan and L. Liu	1856
<b>Performance Analysis of Coupled System of CO<sub>2</sub> Transcritical Heat Pump and Rankine Cycle</b> H.L. Wang, J.R. Tian, Y.T. Ma and X.J. Hou	1860
<b>Study on Papermaking Processes Wastewater Treatment</b> S. Wang, X.P. Li, A.L. Zhang and Z.R. Wang	1866
<b>Using of Different Type Cement in Solidification/Stabilization of MSWI Fly Ash</b> G.X. Wei, H.Q. Liu and S.G. Zhang	1870
<b>Influence of Zeolite NaA on Thermogravimetric Behavior of Sodium Alginate for the Purpose of Processing Plastic Wastes</b> Z. Huang, X.H. Shi, W.J. Jiang and J. Zhang	1875
<b>Study on Parameter Optimize of High-Speed Mobile and Matlab Simulate</b> K.Z. Li, C.H. Zhang and C.G. Zhang	1879
<b>Mechanical Method for Recycling Original State Aggregate from Demolished Concrete</b> J.W. Cai, Q.Y. Cai, J.X. Wu, Z.H. Lü and G.L. Gao	1883
<b>Sulfonated Chemi-Mechanical Pulp of Cotton Stalk and Bleaching</b> S.S. Liu, G.G. Fang, Y.J. Deng and Q. Wang	1887
<b>The Influence of Cutting Conditions on Friction and Wear Properties of PEEK, CF/PEEK and GF/PEEK Composites Using PCD Tools</b> W.X. Wang	1892

## CHAPTER 16: Mechanical Dynamics and Its Applications

<b>Study on Dynamics of Electrochemical Degradation for Chitosan</b> Y.C. Huang, C.Y. Zhao, F. Yang and R. He	1899
<b>Tool Wear Measurement of Ball-End Cutter Based on Shape Mapping</b> C. Zhang	1905
<b>Optimal Design for Partial Inertia Force Cancellation in Ultra High Speed Pressing Machine</b> J.Y. Bai, Z. Yu, S.L. Tong and D. Zheng	1909
<b>Hull Design and Structural Analysis of an Underwater Robotic Vehicle</b> S. Negahdaripour, J.H. Bae, Y.H. Kim and J.Y. Kim	1917
<b>Subdivision of Machining Stable Region Based on Vibration Frequencies</b> Q.H. Song and X. Ai	1921
<b>Optimization of Underwater Cavity's Shape</b> D.X. Zhang, X.B. Shao, L. Lou and L. Liu	1925

<b>Test Method for Rheological Behaviors of Magnetorheological Grease Based on Coaxial Cylinder Shear Mode and Rheometer</b> L.J. Fu, C.R. Liao and J.Z. Ma	1929
--	------

## CHAPTER 17: Vibration, Noise Analysis and Control

<b>The Optimization of a Middle-Sized Passenger Car Steering Wheel Vibration at Idle Speed</b> L. Su, H. Zhou and L.S. Zhu	1937
<b>Nonlinear Dynamic Behaviors of an Imbalance Rotor Supported on Fixed-Tilting Pad Journal Bearings</b> X.B. Qi, L. Feng, Y.F. Zhang and Y.J. Lu	1941
<b>Finite Element Analysis on Axial-Torsional Coupled Vibration of Drill String</b> X.L. Bi, J. Wang, Z.L. Wang and S.H. Sun	1952
<b>Application of Ant Colony Algorithm in Fault Diagnosis of Roller Bearing</b> L.Y. Song, H.Q. Wang, J. Pan, J.J. Gao and K. Li	1957
<b>Acoustic Radiation Simulation of Marine Sliding-Thrust Bearing Shell Based on SYSNOISE</b> G.L. Zhao	1961
<b>Experimental Identification for Seals Rotordynamic Coefficients Based on Double Plane Balance Method</b> H. Cao, J.G. Yang, W.F. Zhang and R. Guo	1965
<b>Study on Dynamic Characteristics and Dynamic Response of Woodworking Four-Side Planer</b> S.Q. Zhang, J. Hua and W. Xu	1970
<b>Performance Testing for Bamboo Charcoal Knitting Fabrics of Different Structures</b> Y.Y. Qiu	1977
<b>Effects of High Density Ultrasonic Field Coupling on the Microstructures and Properties of Al-Si Alloy</b> Y.L. Li, H. Ding and F.R. Cao	1981
<b>Identification of Acoustic Emission Signals Based on Multi-Resolution Correlation Filtering</b> T.H. Zhang, M. Guo and X. Yan	1994
<b>Design and Test of Silent Chain Including Silicon Fluorine Rubber Link Plate</b> X.L. Liu, S. Ding, W. Sun, W.C. Wang, J.J. Liu and B. Jiang	2002
<b>Fault Diagnosis based on Wavelet Analysis for Bearings under Low Rotating Speed</b> H.Q. Wang, Y.W. Guo, J.J. Gao and F. Wang	2006
<b>The Trial Research on Suppressing the Chatter by Variable Speed Milling</b> Z.J. Gou	2010
<b>The Green's Function and its Oscillatory Properties for a Single Branch Structure of a Pinned Beam-Rod System</b> M. He and Q.S. Wang	2014
<b>Piezoelectric Equation and Two Types of Piezoelectric Sensors Model</b> J. Yao, Z.Y. Zhu and H. Wang	2021
<b>Factorial Hidden Markov Model Recognition Method Based on Multi-Channel Information Fusion</b> Z.N. Li, G.H. Wu, J. Jiang and F.Z. Feng	2027
<b>Experimental Research of Characteristics of Fluid-Induced Force in Eccentric Seal</b> W.F. Zhang, J.G. Yang, H. Cao, R. Guo and D. Sun	2034
<b>The Research of Civil Structural Damage Identification Based on Lifting Wavelet Entropy Index</b> Z.S. Sun, K.J. Fan, X.G. Yin and P.J. Han	2041
<b>Modal Analysis of the Iced Transmission Line Based on Three-Dimensional Curved Beam Element</b> H. Xiong, Z.L. Li and Z.T. Yan	2049
<b>A Numerical Analysis of Infilling-Wall Multi-Functional Vibration Reduction</b> J.W. Zheng, M.S. He and G.J. Shi	2055
<b>The Testing and Improving of Acoustic Performance on Muffler</b> G.Y. Hu, P.Q. Xia and W.F. Lu	2060

<b>Displacement Governing Equations of Moderately Thick Cylindrical Shallow Shells by Transverse Shearing Deformation and the General Solution</b> H.R. Huang, J.P. Hao, H.X. Zhang and Y. Huang	2066
<b>Displacement Fundamental Equations and Analysis of Governing Equations of the Circular Moderately Thick Shallow Spherical Shells</b> H.R. Huang, J.P. Hao, H.X. Zhang and Y. Huang	2071
<b>Vibration and Noise Monitoring of Ceramic Motorized Spindles</b> L.X. Zhang and Y.H. Wu	2076
<b>The Denoising Method for Transient Speed Signal of Diesel Engine</b> J.F. Pan and Y. Zhang	2081
<b>Test Verification of a Design Method for a Fluid Viscous Damper</b> J.H. Jia and H.X. Hua	2085
<b>A Study of the Screening Efficiency of a Probability Sieve Based on Higher-Order Spectrum Analysis and Support Vector Machines</b> Z.Z. Shi and Y.J. Huang	2089
<b>Vibration Cosine Solutions of Free Orthotropic Rectangular Plates on the Elastic Half-Space</b> C.L. Wang, H. Ding and H.X. Zhang	2094
<b>Study on Trispectrum Slices for the Magnetorheological Damper</b> Y. Gao and Y.J. Huang	2098
<b>A Study on Relevance between Distortion of Distributed Mode Loudspeaker and Characteristic of Sound Panel</b> L.J. Luo	2105
<b>Modal Analysis of Water-Lubricated Rubber Stern Bearing Based on ANSYS</b> Y. Jin and F. Lan	2111
<b>Hybrid Multi-Mode Input Shaping Suppresses the Vibration of a 3-DOF Parallel Manipulator</b> B. Li, Y.L. Wei, S.X. Zhu and Y.Q. Zheng	2115
<b>Combination of Wave Atoms Shrinkage with Bilateral Filtering for Oscillatory Textural Image Denoising</b> Y.M. Ma and G.J. Liu	2119
<b>Numerical and Experimental Studies on Aerodynamic Characteristics of Pneumatic Exhaust with Perforated Panel Muffler</b> J.X. Li, S.D. Zhao, K. Ishihara and H.S. Shi	2125

## **CHAPTER 18: Mechanical Reliability Theory and Engineering**

<b>An Analytical Solution for Stress and Displacement in Casing-Cement Combined Cylinder under Non-Uniform Loading</b> M.H. Fan, Y.S. Jiao and Z.X. Cai	2133
<b>The Effect of Anisotropy of Medium on the Stress State around a Borehole</b> Y.S. Jiao, M.H. Fan, L.J. Li and Z.X. Cai	2139
<b>Study on Reliability and Safety of Automatic Speed Control System Based on Dual Redundant Model</b> J.Z. Yu and Y.S. Chen	2145
<b>Based the GM Reliability on the Application of Mechanical Product Evaluation</b> S.R. Qian	2149
<b>Reliability of Cermet Cladding Parts Based on the Failure Tree Series</b> J.R. Yang, L.L. Zhang, C.X. Zhang and Z.Q. Li	2153
<b>The Study of Fuzzy Reliability of Concrete Durability after Corrosion of Steel-Bars</b> Y.H. Shi, L. Zhang and D.H. Yu	2159
<b>Reliability Assessment of a Certain Diesel Engine with Multi-Parameter Degradation Based on SVDD</b> H. Cong, G.P. Wu and F.Z. Feng	2164
<b>Research on Multi-Excitation Source United Controlling Test Method Based on Distributed Actuation</b> J. Yao, Y.F. Wu and M.G. Xu	2168

<b>Stress Conditions for Surface Analysis of Butyl Rubber Lining</b> J. Racek, E. Kalabisová and K. Vaclavikova	2175
<b>An Approach to Fatigue Reliability Analysis Based on the Hybrid Model of Probability and Non-Probability</b> H. An and W.G. An	2179
<b>Local Monte Carlo Simulation for the Reliability Sensitivity Analysis</b> D.W. Li, Z.Z. Lu and Z.C. Tang	2183
<b>Important Sampling for Structural Reliability Based on Radial Basis Function Neural Network</b> L.H. Gao, G.N. Xu and P. Yang	2189
<b>Study of Sequential Sampling Method for Weibull Distribution</b> X.Z. Xu, H.L. Lou and X.L. Li	2195
<b>Analysis of Latest Application Movement of Laser Surface Heat Treatment Technologies</b> G.M. Lin, L.X. Peng and Y.F. Zhao	2199
<b>Experimental Study on the Durability of Square-Section Columns Externally Wrapped with Carbon Fiber Reinforced Polymer</b> L.L. Zhang, J.X. Ma and L. Zhang	2205
<b>Maximum-Likelihood Estimation of the Parameters with Constraints in Step-Stress Accelerated Life Tests</b> Y.H. Xing and R.Y. Liu	2211
<b>Design Improvement through Reliability Analysis of Belt-Type CVT Systems for Scooters</b> J.S. You and W.F. Wu	2215
<b>Dynamic Reliability Analysis of Drill String System in Deep &amp; Ultra-Deep Well Based on the First Excursion Failure Criterion</b> S.Y. Yang, X.J. Yang, X.Z. Yan and G.S. Li	2222

## CHAPTER 19: CAD/CAM/CAE

<b>Research on the Method of Class_A Surface Reconstruction in Automotive Body External Panel Design</b> Y.B. Cao	2229
<b>Web-Aided Design for Dimensioning Power Cables</b> Q.Z. Zhai, J.H. Yang and Y. Chen	2233
<b>Simulation and Analysis of Frame Structure of Military Transport Truck</b> G.N. Yao, H.Y. Huang and L.J. Wang	2237
<b>A Research of Parting Design Frame of Telecontrolled Boat Hull by UG on Case-Based Reasoning</b> Y.D. Ren, X. Wang and X.G. Rui	2241
<b>Integration of Moving Least Squares Method and Multilevel B-Spline Method for Scattered Data Approximation</b> S.J. Yan and B. Ge	2245
<b>Automatic Generation of the CAE Parametric Model from the CATIA Model for an Aircraft Hydraulic Tube Structure</b> Y.K. Wu, Y.Y. Qiu, C.H. Li and Y. Sheng	2250
<b>Parametric Design of Roller Oscillating Follower Disc Cam on UG</b> H.J. Ye and Y. Zhang	2256
<b>The Geometric Modeling of Pieces in Virtual Milling Simulation</b> H.X. Bi, S.J. Li and Y.R. Zhang	2262
<b>Study on Mechanism of Hammer Bit and Rock Interaction in Geophysical Prospecting Percussion Drilling</b> Z.Q. Huang, Q. Li, Y.T. Fan, Z.Q. Wei and H.Y. Zhu	2266
<b>Optimization of Cooling System of Linac Collinear Load</b> G.X. Xu, L.G. Shen, Z. Shu, Y. Sun and Y.J. Pei	2272
<b>Simulation of Dynamic Carry-Loading Characteristics for Vehicle Body of High-Speed Train</b> F. Qin and L.L. Zhang	2276
<b>Study on Hydraulic Circuit Simulation Based on MSC·EASY5 for the Arm of Excavator</b> L.R. Wan, Y.Q. Gong and C.L. Wang	2281

<b>Function Design of PDM System for Small-Medium Scale Pressure Vessel Manufacturing Enterprises</b>	
G. Wang and Z.G. Chen	2287
<b>Research Status and Countermeasure of Temperature Rise of Hydraulic Dynamic and Static Bearing</b>	
J.F. Zhou and J.X. Yang	2291
<b>Study of FPBS Model for Conceptual Design of Mechanical Product</b>	
K. Liu, Y. Li, W. Zhao and W.Q. Li	2296
<b>Finite Element Analysis on Thermal Characteristic of the Headstock of NC Machine Tool</b>	
Y.M. Zhang, Q.W. Liu and J.L. Han	2302
<b>Structure Optimization Design of Drum of High-Speed Tire Test-Bed</b>	
S.W. Li, J.J. Tian, Z.F. Yang, H.Z. Wang and L. Chen	2306
<b>Powder Mixed EDM Stirrer Designing and Simulation</b>	
L. Tang, Y.F. Guo and M.X. Wang	2311
<b>An Automotive Die Face Compensation Method Considering Blank Thinning and Die Deformation</b>	
C.F. Men, Q. Yu, D.H. Miao and Y.J. Cai	2315
<b>Study on Fengdu Second Yangtze River Bridge the Cable Anchorage Structure in a Girder Transfer Mechanism</b>	
X.D. Zhang, J.Z. Wang and X.D. Wang	2320
<b>Random Vibration Analysis of the Deployable Structure for Satellite Antenna</b>	
Q. Zou, G.L. Wu, Y. Hu, X.G. Liu, F.Y. Wei, J. Li, H.J. Wang, B. Li, S.W. Zhang and X.P. Li	2324
<b>Boundary Conditions for Numerical Simulation of Diesel Water Jacket</b>	
Z. Xin, S.X. Wang, K.P. Zhang, Z.J. Li and F. Yun	2328
<b>Application of Computer and Network Technology in Welding Power Source Design</b>	
L.Y. Dai, J.H. Zhu and H.X. Shi	2334
<b>A New Approach to Integrating Algorithm Modules in CAD Software Applications</b>	
Y.Q. He, G.Z. Liang and X.K. Shen	2338
<b>Modeling of Heat Transfer in Spent-Nuclear-Fuel Container during Forced-Chilling Process</b>	
L.P. Wang, D.R. Liu and E.J. Guo	2342
<b>Different Finite Element Software on Electric Field Analysis of Magnesium Electrolysis Cell</b>	
C.L. Liu, Z. Sun, Y. Zhao, X.F. Song, G.M. Lu and J.G. Yu	2352
<b>Retrieval Algorithm of Images and its Applications in Recognition of Metallographic Pictures</b>	
L. Ling and W.X. Ling	2356
<b>Research on Vehicle Ride Comfort Based on Virtual Prototyping Technology</b>	
D.Y. Chen and F.Y. Yi	2360
<b>Application of Computer Simulation Technology in the Analysis for Gilling Machine Structure</b>	
L.J. Pan, Z.T. Yu and Y.M. He	2364
<b>Mining Mobile Telecommunication Services Using Apriori Algorithm</b>	
M.H. Jiang	2369
<b>Coal Face "Three-Machine" Selection and Matching Knowledge Modeling Based on Ontology</b>	
Q.L. Zeng, X.W. Wang, L.R. Wan, Z.H. Liu and Y.J. Wang	2374
<b>The MultiAgent Forming Stress Analysis and Design of Cold Bending Centre Sill</b>	
G.C. Li	2379
<b>Research on Calculation and Smoothing of Grinding Wheel Profile for Machining Screw Rotor</b>	
Z.H. Shen, R.S. Lu, Z.S. Zhang and B. Yao	2383
<b>Design and Implementation of Virtual Royal Garden in Northern Song Dynasty with Stereoscopic Display</b>	
Y. Zhang and G. Yang	2388
<b>Research on Ship Parts Nesting with Immune Ant Colony Algorithm</b>	
X.Q. Zhong and L.D. Liang	2393

## CHAPTER 20: Product Design and Development

<b>Finite Element Analysis and Structural Improvement of S195 Diesel Engine Connecting Rod</b>	
B. Zheng, Y.Q. Liu, R.X. Liu and J. Meng	2399
<b>The Numerical Simulation and Optimal Design of Nozzle Jet for Gas-Fluid Two Phase Flow</b>	
Y.M. Li and F. Ma	2403
<b>Design and Implementation of an ATmega8L Microcontroller Based Adjustable Closed Loop Speed Controller of a DC Motor</b>	
S. Seeraji, E.G. Ovy, T. Alam and R. Afsar	2407
<b>Finite Element Analysis and Structural Improvement of Farm Engine Connecting Rod</b>	
B. Zheng, Y.Q. Liu, R.X. Liu and J. Meng	2413
<b>Design and Simulation of the Torsion-Free-Body between the Vehicle Oil Can and the Chassis</b>	
J. Chen, Y.G. Zuo and J. Yang	2417
<b>3D Design on Eddy Current Retarder</b>	
D.Y. Chen and F.Y. Yi	2421
<b>FEM Analyses on Stress and Deformation of a C-Type Expansion Bolt</b>	
Z.H. Chen, W.Q. Wang, M. Zhang and N.N. Dong	2425
<b>The Optimum Design of Mechanism Scheme Based on the Functional Analysis</b>	
J.B. He, Z.Y. Yang and W.J. Jiang	2429
<b>Development Design of New Age Children's Toy</b>	
X.W. Jiang	2434
<b>Dynamic Characteristics Analysis of High Water-Based Large Flow Safety Valve</b>	
J.L. Zhang, D.L. Li, S.G. Ma, Y.Q. Wang and P.D. Fu	2438
<b>Digital Design of Children's Battery Car</b>	
Q.L. Du	2443
<b>Research on Component Attributes in Domain Problem Solving</b>	
C.Q. Gao, H.H. Su, B. Yang, B. Lv and Y.Z. Wang	2447
<b>Symmetric Beauty: Press Based on Reconfigurable Toggle Mechanism Driven by Pneumatic Muscle</b>	
P.L. Qin and K.M. Zhong	2452
<b>Optimization of Parameters for Children's T-Shirt Neckline</b>	
L.P. Xu and M.Z. Miao	2456
<b>Effect of Bacteriostats on Cells Growth and Contamination-Resistant Capability of Rhizobium Inoculants</b>	
J.F. Li, P.H. Huo, S.L. Shi, S.Q. Zhang and L.Y. Chen	2460
<b>The Structure Design and Analysis of Predigest Laser Combine Bind and Extend Bind Flat Roof</b>	
X.D. Han, B. Wang, K. Shi, C.S. Liu, H.K. Wang and Z.B. Chen	2466
<b>The Fast Measuring and Processing Method of 3D Measuring System in Reverse Designing</b>	
F. Su	2471
<b>Research on Collaborative Design System of Mobile Crane</b>	
K.X. Guo, H. Zong and Y. Huang	2476
<b>Innovative Design for Supply Mode of Steam in Drying Cylinder</b>	
R.H. Li, Y.D. Yuan, H.F. Chen, Y.J. Yuan and M. Ma	2480
<b>Human Dimension and its Application in Product Design</b>	
B.J. Luo, Y.Q. Li and L. Wang	2485
<b>Study on the Information Coding Design Humanity of Man-Machine Display Interface</b>	
Y.W. Zhou, D.M. Zhuang, G.L. Song and X.R. Wanyan	2489
<b>The Design of Moving Mongolia Yurt</b>	
H.Y. Jin and Z.W. Zhu	2493
<b>Discussion on the Transportation Speed of the Horizontally Vibrating Conveyor</b>	
Y.M. He, Q. Liu, Y. Lin and X.L. Zhang	2497
<b>Study on Layered Fracturing String for Deep Compact Gas Reservoirs</b>	
D.K. Xu and F. Gao	2501

<b>Application and Design of Plunger Pump Lifting Viscoelastic Fluid</b> J. Li, H.Z. Yang, M. Han, J.C. Xu, X.D. Li and X.T. Han	2507
<b>Conceptual Design Methodology of Mechatronic Systems</b> Y. Xu	2512
<b>Popular Evolution and Styles Reusability of Platform Shoes</b> W.L. Peng, J.J. Tan and W.N. Zhang	2517

## **CHAPTER 21: Engineering Optimization**

<b>Optimization of Extraction Conditions of Active Constituents from Siraitia Grosvenorii</b> J. Liu, L. Rong, C. Liu and Y.H. Rong	2523
<b>Dynamic Analysis on Steel Tower of Vertical Axis Wind Turbine</b> J.J. Si, K.J. Zhu, B. Liu and Y. Ding	2529
<b>The Optimization of Flexible Job Shop Scheduling Problem Based on Improved Dual Coding Non-Dominated Sorting Genetic Algorithm</b> L.Y. Ju, J.J. Yang and B.Y. Liu	2537
<b>Hydrodynamic Analysis of Oil Storage Vessels for National Strategic Petroleum Reserve</b> G.J. Zhai, Y. Cheng, W.H. Wang and Y. Huang	2541
<b>The Reflector Bracket Mirror Structure Optimization and Design of the IR Warring System</b> B. Wang and Z.B. Chen	2552
<b>The Project Research for Optimal Scheduling Based on Particle Swarm Optimization</b> P. Fengshan, C.M. Ye, C. Jin and M.S. Kou	2556
<b>View Angle Characters of the Chiral HAN-Mode LCD</b> N. Yu, G.Y. Li and Z.Q. Huang	2561
<b>APDL-Based Optimization of the Boom of Luffing Jib Tower Cranes</b> J.Y. Wang, L. Li, S.J. Song and L.L. Hao	2566
<b>An Effective Resolution Algorithm for the Two Dimensional Bin Packing Problem</b> Y.Y. Zhou, Y.Q. Rao, C.Y. Zhang and G.J. Zhang	2574
<b>Structural Optimization on the Hydraulic Press by FEM and Mathematical Programming Algorithm</b> W.J. Xu, K.W. Chen and Y.F. Ding	2579
<b>The Extractive Technique of Active Constituent in Six Insecticidal Plants</b> H. Wang, L. Ma and W. Ma	2586
<b>Analysis of Flameproof Diesel Performance</b> B.L. Li, J.P. Fan and Y. Zhang	2591
<b>Optimization of Earth Observation Satellite System Based on Design of Experiment and Surrogate Model</b> X.L. Liu, Y.G. Chen and Y.W. Chen	2595
<b>Topological Optimization Design for Pedestal of Horizontal Rocket Rivet Fixture</b> Z.Y. Li, W.T. Gu, M.J. Wang and Y.N. Lei	2601
<b>Numerical Simulation of Internal Flow in Stamping and Welding Multistage Centrifugal Pump</b> Y.Y. Liu, R.G. Li and K. Sun	2608

## **CHAPTER 22: Measure Control Technologies and Intelligent Systems**

<b>The Lag Comparator of the Two-State Modulation Technology to the Development of a New Type of Dynamic Electronic Load</b> X.C. Zhao, Y.K. Wang and E.Y. Hu	2615
<b>Harmonic Detection Based on Improved Adaptive Method and its Performance</b> J.M. Zhang	2620
<b>2-D Circle Measurement System for Small Rule Parts Based on Machine Vision</b> Q.H. Wu, N. Dai and T. He	2624
<b>Design of a Fuzzy Control System for Integrative Irrigation in Field</b> Y.M. Zhang and L.L. Yao	2630

<b>Design of Multi-Channel Data Acquisition System Based-On DSP</b> J.P. Leng, W.Y. Liu, S.H. Liu and S.M. Shen	2635
<b>Measuring Method for Differential Sensing Gratings Modulated with Matching Grating</b> J. Shao, J.H. Liu, X.G. Qiao and Z.A. Jia	2639
<b>Digital Control Hydraulic Variable Pump Based on Mechatronic-Hydraulic-Air Integration Driven by Compressed Air</b> X.M. Sheng	2643
<b>Predictive Controller Design and Simulation of Time-Varying System Based on IGPC</b> Q.H. Gao and W.L. Guan	2647
<b>Algorithm Considering Signal Correlation for Denoising of the Magnetic Flux Leakage of Wire Rope</b> W.X. Zhan, J.W. Tan and Y. Wen	2652
<b>Design and Implementation of SPI Communication Based-On FPGA</b> X.C. Tian, J. Li, Y.B. Fan, X.N. Yu and J. Liu	2658
<b>Research and Application on Controllable Starting Circumstance of Trough and Flexible Rubber Transfer</b> D.X. An, B.G. Geng and H. Song	2662
<b>Computation and Analysis of Disk-Type Magneto-Rheological Fluids Brake</b> F.Y. Yi and C.Y. Liu	2667
<b>Digital Signal Processing for Open-Loop Fiber-Optic Gyroscope</b> W. Zhang, Y.Z. Chen, Z.Q. Song and M.Y. Yang	2671
<b>New Locating Method of Spatial Target with 3-R Range-Only</b> J.M. Liu, W.H. Yang, J.L. Yang and Y.L. Liu	2676
<b>Virtual Reality Based Auxiliary Robot System for Liver</b> X.H. Xie, C.C. Zhao, R.X. Du, X.F. Yu and Y. Zhang	2682
<b>The Fluorescence <i>In Situ</i> Hybridization Approach Applied in the Study of the Denitrifying Bacteria on Nitration Tank of the Metal Membrane Bioreactor</b> P. Zhang and L. Chen	2686
<b>Energy Efficient Rout Algorithm Based on Ant</b> Z.H. Lin, W.X. Wang and J.Q. Lu	2690
<b>A Simple Calibration Method for the Relationship of the Eye-in-Hand of Robot Vision</b> X.M. Zhang, S.W. Song and Q.J. Pan	2695
<b>The Analysis and Improvement of S-MAC Protocol for Wireless Sensor Networks</b> J.Q. Lu, W.X. Wang and Z.H. Lin	2699
<b>Research on Algorithm of Detection of Weld Image Edge Based on Lines Positioning Theory</b> J. Li, P. Huo, X.Y. Li and J.B. Jia	2704
<b>Computerized Simulation on Energy Saving Characteristics of Variable Displacement of Double Action Vane Pump</b> L. Chen and P. Zhang	2709
<b>The High-Precision Relative Rotational Speed Measurement System Based on Magnetic Signal and Spectrum Correction</b> G.B. Chen, X.M. Zhang, X. Cui, Y.H. Li and J. Liu	2713
<b>Study on PIDNN-Based Flow Control in Layered Water Injection Technology in Oilfield</b> D.L. Jia, F.S. Wang and D.K. Xu	2718
<b>A Design of Sheet Metal Handling Manipulator Based on PLC</b> P.P. Huang, J.F. Chen and Q. Lei	2723
<b>A Novel Dimension Measurement System of Hot Large Open Die Forgings</b> J.T. Liang, S.D. Zhao and J.W. Zhao	2728
<b>Research and Development of Embedded CNC System for Drilling Based on ARM</b> B.F. Wang	2733
<b>The Research on Snake-Like Robot Design Based on Single Chip Microprocessor</b> T.L. Song and Z.Y. Li	2737
<b>Multi-Class SVMs Based on Priority for Computer-Aided Diagnosis of Lung Nodules in CT Images</b> Q.Z. Wang, X.Z. Wang, J.S. Bie and B. Wang	2742
<b>Study on the Soil Slope Stability Based on the Support Vector Machine</b> Y.F. Wang, L.P. Wang, F.P. Zhong and H.B. Chu	2746



<b>Fluorescence Spectroscopy as a Potential Monitoring Tool for Recycled Water Systems</b>	2750
<b>Robust Control of Variable Pitch Wind Turbines Base on Linear Matrix Inequality</b>	
L.F. Qin, T. Sun and H.F. Guo	2754

## **CHAPTER 23: Mechanical Control and Information Processing Technology**

<b>Study on Control Strategy of Train Automatic Speed Control System</b>	
J.Z. Yu and Y.S. Chen	2763
<b>Design of Open Motion Control System in Fully Electrical Plastic Injection Molding Machine</b>	
H.W. Zhang	2767
<b>A Maximum Power Point Tracking Algorithm Based on Fuzzy Neural Networks for Grid-Connected Photovoltaic System</b>	
H.B. Su and Z.C. Cheng	2771
<b>Based on Synchronized Timed Petri Nets for Emergency Vehicle Preemption Systems</b>	
Y.S. Huang and Y.S. Weng	2775
<b>A Novel Transformer Fault Diagnosis Method Based on Gross Error Examination</b>	
J. Su and X.G. Wang	2779
<b>Research Progress of Wavelet Analysis in Flow Structure Characterization</b>	
Z.H. Liu, Q.Q. Zeng, X.X. Zhou, W.Z. Ning, R.X. Sun and C.Y. Tao	2787
<b>An Improved H.264 Codec Algorithm Based on Regions of Interest</b>	
Z.Y. Wang, Z.X. Li and J.H. Ming	2794
<b>Research on a Method and Mechanism of Ocean Current Sensor Calibration</b>	
Y. Wang and J.H. Sun	2799
<b>A Collision Avoidance System for Dam Concrete Construction Based on GPS and GIS</b>	
H. Wu, J. Tao, X.P. Li, X.W. Chi, N. Chen and H. Li	2805
<b>Study of Gas Injection System for EBIT Facilities</b>	
S.L. An and Y.F. He	2809
<b>Experiment Research on Control Method and Mathematic Models during Energy Storage to the Double Function Flywheel System</b>	
Z.H. Liu, Y.M. Li and C.L. Wang	2814
<b>The Study of the Dynamic Testing System of Modern Measurement and Monitoring Platform</b>	
Y. Chen and D.Z. Xu	2818
<b>Design of Live Video Monitoring System Based on DM642</b>	
J.Q. Liu and Q.Z. Fan	2823
<b>A Fault-Tree Based Intelligent Fault Diagnostic System of Heavy CNC Equipments</b>	
M. Chen, Y.L. Li and Y. Yu	2829
<b>Research of Servo System for WEDM Based on DSP</b>	
L. Chen	2834
<b>Development of Energy Saving Control System for Street Lamps Based on SCM</b>	
S.L. An, R. Qian, X.Y. Lu and Y. Lu	2838
<b>Rotation Shaft Twist Angle Measurement Based on Moiré Fringe and Error Analysis</b>	
H. Zhao	2842
<b>Design of Plasma Cutting Tracking Device for Spiral SAW Pipe</b>	
C.L. Wang, T. Yuan, C.L. Dong and F.W. Zhan	2846
<b>Design and Implementation of Automatic Drainage in Coal Mine</b>	
Z.H. Liu, Q.L. Zeng, Z.C. Wu and G.Y. Zhou	2851

## **CHAPTER 24: Transmission and Control of Fluid**

<b>Numerical Simulation of Combusting Flow Field in Ram-Compressed Rotor Chamber</b>	
Y. Wang and Z.X. Zeng	2857

<b>Ratio Control Strategy for an Electromechanical Continuously Variable Transmission Based on Engine Models</b>	
Q. Jiang, H.Y. Liu, J.J. Hao and Y. Cheng	2861
<b>Numerical Simulation and Experimental Research on a Splash-Proof Water Injector</b>	
Z.Y. Wang, J. Han, X. Yang and T. Sun	2866
<b>Research on Indirect Stator-Quantities Sliding Model Control for Induction Motor</b>	
L.H. Zou	2871
<b>Design and Research of PMSM Control System Based on FPGA</b>	
H. Qi and C.S. Gong	2875

## **CHAPTER 25: Quality Monitoring and Control of the Manufacturing Process**

<b>Analyses of Influencing Factors of Pore Formation during Resistance Spot Welding of Magnesium Alloy</b>	
Y.M. Tu, R.F. Qiu, H.X. Shi, H. Yu and K.K. Zhang	2885
<b>Modeling Variation Propagation Based on State Space and its Application to Dimensional Variation Prediction in Shipbuilding</b>	
X.R. Liu and Z.Y. Zhang	2889
<b>Key Technology of Automatic Ultrasonic Testing System for Corkscrewed Steel Pipes</b>	
Y.H. Kang, J. Tu, J.B. Wu and Y.H. Sun	2893
<b>The Design of Control System of Rapid Prototyping Machine for Ceramic Parts Based on SIEMENS S7-200</b>	
D.Q. Gao, F. Zhang, Z.Y. Mao and Z.Y. Li	2898
<b>Centering Performance Analysis of Static Balancing Measure for Marine Propeller</b>	
J.G. Zhang and C.T. Wang	2906
<b>A Non-Destructive and Effective Metrology to Automatically Monitor Kink Effect of MOSFETs</b>	
M.C. Wang and H.C. Yang	2910
<b>Evaluation of 18 Year-Service Lifetime of NR-SBR Lining</b>	
J. Racek and E. Kalabisová	2914
<b>A Kinetic Model for Cassava Starch Hydrolysis under Cold Enzyme Two-Stage Hydrolysis Condition</b>	
Y.L. Bao, L. Chen, H.L. Wang and Z.C. Yan	2918
<b>Uniformity Assessment of Digital Prints based on NPS and CSF</b>	
L.J. Kong, Z.M. Jiang and X.L. Gao	2922

## **CHAPTER 26: Automation Technology of Production Process**

<b>The Recognition of Target and Attitude of Bucket for Excavator Robot Based on Color Mark Tracking</b>	
F.B. Wang, J. Liu, C.W. Jiao and Z.K. Chen	2929
<b>The Improvement of PID Control Based on Programming Transition Process</b>	
Z.Q. Zhang, X.M. Zhu and J.Y. Li	2934
<b>Decentralized IMC-PID Controller Design for Multivariable System</b>	
Q.B. Jin and S.Q. Jia	2938
<b>Electro-Hydraulic Servo Central Position Control System of Strip Based on the Principle of Differential Capacitance</b>	
B.Q. Jin and Y.K. Wang	2943
<b>J-Automatic Welding Robot Software Design</b>	
H.F. Song, X.Q. Lv and S.S. Hu	2949
<b>PID Parameters Adjustment Based on PMAC Control Card</b>	
M.X. Zhu and Z.Y. Yang	2954

## **CHAPTER 27: Advanced Manufacturing Technology**

<b>Research on Large Steam Butterfly Valve for Steam Turbine DFMEA Tool System Based on Knowledge Management</b> Z.Y. Wu, X.G. Ming, W.Y. Song, B.T. Zhu and J.M. Ni	2961
<b>Research on Feedrate Optimization Based on Cutting Force Model with Double Effect for the Ball-End Milling</b> Y.J. Cai, H. Shen and T.L. Qi	2965
<b>Rapid Manufacturing Technique of Casting Mould Based on the SLS</b> H.F. Zhang and W.H. Chang	2970
<b>Singular Problem and Improved Plane Interpolation Algorithm</b> B. Shen, D.J. Qi, L.Q. Fan and Z.H. Zhu	2974
<b>High Efficiency Strategy in Mould Cavity Roughing Oriented Machining Features</b> Y.J. Cai, T.L. Qi and S.L. Chen	2979
<b>Effect of Different Particles Distribution on Microstructure and Corrosion Resistance of Nickel-Base Laser Cladding Coatings</b> Y.X.L. Cao, M.X. Ma, Q.W. Wu, X.Y. Ye, W.J. Liu and H.J. Zhang	2983
<b>Verification of Surface Finish as an Indicator of Machinability in Turning Steel X6Cr16Ni10MoTiN</b> J. Jurko	2987
<b>Comparison of Forecasting Methods for Thermal Error on High-Speed Motorized Spindle</b> C.L. Lei, Z.Y. Rui, J. Liu and J.F. Fang	2991
<b>Proposal for Machining Optical Free Form Surfaces Using Atmospheric Pressure Plasma Jet</b> Y.F. Zhang, B. Wang and S. Dong	2995
<b>Study on Machining and Measurement for Borosilicate Glass Conical Ellipsoid</b> W.H. Zhao, Z.Y. Duan and Z.W. Ren	2999
<b>Synchronous Control of Multi-Integrated System of Electro-Hydraulic with Mechanic Based on Virtual Axis Model</b> J.D. Yang, J.Q. Wu and Y.Q. Deng	3003
<b>Research on Output Power of Plasma for PCVD Synthesizing Silica Glass</b> Y.F. Wang, X.F. Song and Y.C. Sun	3009
<b>Investigation of Dry Cutting and Applications of Cutting Fluid in Ball-End Milling Process</b> S. Tangjitsitharoen and C. Rungruang	3013
<b>Development of Recycled TiH<sub>2</sub> Feedstock for Powder Injection Molding</b> B. Cha, J.M. Jang, W.S. Lee, J.S. Seo, S.H. Ko, S.H. Son, W.K. You and J.S. Lee	3024
<b>In-Mold Rheology Curves with Feedstock and Mold Dimension</b> J.M. Jang, B. Cha, W.S. Lee, J.S. Seo, S.H. Ko and S.H. Son	3028
<b>Manufacturing Technology of <math>\mu</math>-Gear and Mold by Fe-Ni Alloy Electroforming</b> S.H. Son, W.S. Lee, H.K. Lee, H.J. Kim and S.C. Park	3032
<b>In-Process Monitoring and Estimation of Tool Wear on CNC Turning by Applying Multi-Sensor with Back Propagation Technique</b> S. Tangjitsitharoen and C. Rungruang	3036
<b>Development of a HLA/RTI for High Performance Simulation</b> H.B. Liang, Y.P. Yao and X.D. Mu	3044
<b>Color Separation Technique of Jacquard Fabric and the Improved Method Thereof</b> B.J. Luo and L.L. Shao	3050
<b>Research on Reusable and Sharing Manufacturing Resource Based on Command Intelligent Multi-Agent</b> X. Shang, J. Liu and G.F. Yin	3056
<b>Modeling and Optimization of Mould Non-Sinusoidal Oscillation Process</b> H.M. Wang, B.F. Yang, B.M. Song, T.W. Zhang and Y.Q. Yan	3060
<b>A New Approach to Precision Cropping with Radial Forging</b> S.D. Zhao, B. Zhong, Y. Tang and R.F. Zhao	3064
<b>Manufacture Probe with EDM Single Pulse Discharge Research</b> L. Chen	3069
<b>Study of the Effect of Electric Field Distribution to the Pulse Electrochemical Machining</b> Z.L. Li, S.C. Di, D.B. Wei and P.X. Lv	3073
<b>The Vibration Analysis and Modal Experimental Study of High Speed Motorized Spindle</b> J. Meng	3078

<b>Cutting Performance of Cemented Carbide-Based Self-Lubricating Tool Embedded with CaF<sub>2</sub> Solid Lubricants</b>	
W.L. Song, L.Y. Zhang, C.Z. Xu, X.Q. Li, J.F. Yan, J.X. Deng and L. Zhang	3083
<b>Progress on Investigation of Pores During Selective Laser Melting of Metal Powders and Future Work Discussion</b>	
J.H. Liu, W.J. Xie, Q.S. Wei and L. Wang	3088

## **CHAPTER 28: NEMS/MEMS Technology and Devices**

<b>A Fast Method for Analyzing the Effect of Mask Error on Photolithography Pattern Quality</b>	
M.J. Li, H.C. Ye and L.G. Shen	3097
<b>Anti-Overload of a High-G Acceleration Sensor</b>	
Y.B. Shi, H. Zhang, J. Tang, R. Zhao and J. Liu	3103
<b>Performance Optimization for a 3-DOF Micro-Motion Device</b>	
D. Zhang, I. Fassi and P.G. Jiang	3108
<b>Three-Dimensional Micro-Channel Structure of Graphene Field-Effect Transistor</b>	
H.Z. Liu, W.H. Liu, J.H. Liu and X. Li	3112
<b>Optimization of Deformation Shape of an Active Electro-Optical Focusing Device</b>	
T. Yuan, U. Mescheder, W. Kronast and C.L. Wang	3116
<b>Channel Direction Effect on the GaAs Mesfet Performances for MEMS Accelerometer Application</b>	
W.L. Shi, C.Y. Xue, Z.X. Tan, J. Liu and W.D. Zhang	3121
<b>Simulation of Miniature Vapor Compression Heat Pump System</b>	
X.H. Zhong, Y.J. Gou, S.G. Zhou and Z.M. Wen	3126
<b>Performance of Surface Carrier Mobility for Nano-Node Strained (110) MOSFETs with Temperature Effect</b>	
M.C. Wang, H.C. Yang and W.S. Liao	3131
<b>Design, Fabrication and Analysis of Microrobotic Insect Wings and Thorax with Different Materials by MEMS Technology</b>	
P.C. Chi, W.P. Zhang, W.Y. Chen, H.Y. Li and K. Meng	3135
<b>The Theory Based on the Displacement of Mass of MEMS Gyroscope Used in Spinning Projectiles Analysis and Simulation</b>	
X. Cui, X.M. Zhang, G.B. Chen, Y.H. Li and J. Liu	3139

## **CHAPTER 29: System Analysis and Industrial Engineering**

<b>Clothing Workshop Production Line Analysis and Improvement Research Based on IE</b>	
L. Zhao and J. Yang	3147
<b>Modeling and Exergy Analysis of Seawater Source Heat Pump System</b>	
Z.G. Shi, X.Q. Li and S.T. Hu	3152
<b>Dynamic Analysis of Physical Modeling of Underground Gas Storage</b>	
L. Shi, S.S. Gao and Z.M. Hu	3157
<b>Application the Cumulative Exergy Analysis to the Optimal Heat Exchange Process</b>	
P. Zhu	3161
<b>Study on the Method of Measuring the Inertia Moment of Multi-Cylinder Engine</b>	
Y.X. Zhang, L. Li and W. Ke	3165
<b>Modeling and Simulation on the New Technology Diffusion of Cars Using Cellular Automata</b>	
F. Ma and G.L. Chao	3171
<b>Production Logistics System Simulation about Automobile Parts Shop Based on Witness and E-Factory</b>	
R. Zhou, H. Zhao and K. Chen	3175
<b>Interval Analysis Method of Uncertain Structural Systems Based on Random Model</b>	
Z. Wang and M. Huang	3180

## CHAPTER 30: Production and Operation Management

<b>Design and Implementation of Performance Appraisal System for Foundry Enterprises</b> L. Chen, J.X. Zhou, H. Wang and X.Y. Ji	3189
<b>Flask Management in the Foundry Moulding Plan</b> X.Y. Ji, J.X. Zhou and D.M. Liao	3195
<b>Research on Protocol-Based Mechanism and Algorithm for Customer Collaborative Design Task Allocation</b> L.J. Song and K.Q. Zhou	3201
<b>FTA-Based Human Unsafe Behavior Control in Coal Mine Intrinsic Safety Management</b> T.B. Sheng, Y.L. Zhang and Q.Y. Wei	3207
<b>An Assessment of Subway Station Capacity</b> X.Y. Xu, J. Liu, H.Y. Li and L.M. Zhao	3212
<b>Agent-Based Modeling and Simulation on Multi-Stage Supply Chain Operation</b> C.C. Zhao, X.D. Zhang, S.J. Lei and J.J. Qiu	3216
<b>The Profit and Loss Accounting Method to Propel the Management of the Key Customer in the Coach Industry</b> L. Han and C.L. Lin	3221
<b>Research of Customization Model Based on MES</b> P. Wang, X.J. Li and X. Huang	3225
<b>Challenges and Opportunities of Logistics Cost Reduction in China under the Background of Low-Carbon Economy</b> L. Han and X.X. Li	3229
<b>Research and Application of Inventory Management System of Foundry ERP Based on Multi-Agent</b> H.T. Tang, J.X. Zhou and J. Song	3233

## CHAPTER 31: Other related Topics

<b>Fisher Discriminant Analysis Model of Drilling Downhole Accidents and its Application</b> J.C. Liu, H.T. Wang, W.H. Li and C.B. Xu	3241
<b>A New Type of Packing Apparatus with High Efficiency and the Experimental Research of its Mass-Transfer Performance</b> S.P. Zhou and X.M. Lu	3245
<b>DOA Estimation Algorithm in Switch Antenna Array with a Single Cycle of Sampled Data</b> K. Zhang, P. Ma and J.Y. Zhang	3250
<b>Study on MgO-MgO·Al<sub>2</sub>O<sub>3</sub> Bricks Used Burned Zone of Cement Rotary Kiln</b> G.H. Li, S.J. Chen and L. Tian	3255
<b>Application of High Pressure Jet Grouting Technology in the Seepage Control of Earth Dam Reinforcement</b> C.J. Zhang, S.B. Zhang and F.S. Fan	3259
<b>Macro Analysis Would Like to Drop Half a Drop of Solution</b> L. Chen	3264
<b>The Design of Monitoring System Static Model for Storage and Retrieval Vehicles in an Automated Warehouse</b> L. Li and Z.S. Shi	3268
<b>Computing Acceleration of FMM Algorithm on the Basis of FPGA and GPU</b> Y.H. Chai, W.F. Shen, W.M. Xu and Y.H. Zheng	3272
<b>Reforming Teaching and Management System and Improving Engineering and Technical Personnel Practice and Innovation Ability</b> X.M. Gong, J.Y. Zhang and L.W. Guo	3278
<b>Finite Element Analysis of the Effect of Surface Hardening Depth in Port Crane Wheel</b> J.W. Wu and P. Wang	3282
<b>Design of Dual-Core Architecture Industrial Robot Controller Based on FPGA</b> L.G. Sun, X.W. Sun, F. Xiang and S.J. Li	3287

<b>CFD-Based Design of the Natural Ventilation System of the Traffic Center of T3 in Beijing International Airport</b> J.S. Ma, X.T. Liu, D.M. Zhuang and S.G. Wang	3292
<b>Analysis and Application of Deflection Curve Equation Expressed in Terms of Geometrical Parameters for Compressed Bars</b> R. Zhao, L. Sun and R. Li	3296
<b>Sampling Distribution of the Coefficient of Variation when the Population Takes Normal Distribution <math>N(\theta, \sigma^2)</math></b> J.M. Xu and L. Bai	3300
<b>An Analytic Iteration Method of Geometrical Nonlinear Analysis for Frame Structures and its Application Program Research</b> L. Sun, R. Zhao and R. Li	3305
<b>So<sub>4</sub><sup>2-</sup>/ZrO<sub>2</sub> Solid Super-Strong Acid Esterification Catalyst Prepared by Supersonic Wave Technique</b> X.M. Luo, P.N. Li, D.Q. Wu and H.J. Ren	3311
<b>An Analysis Method with Equivalent Circuit for the Electrical Effect Induced by Laser Plasma</b> Y.J. Ji, C.Y. Wang, B.M. Bian and Z.H. Li	3318
<b>Simulation Study of Converter Coherent Jet Oxygen Lance</b> M.G. Shen, L. Zhang and Z.S. Zhang	3322
<b>Effect of Some Factors on Fabrication of Clad Strip by a Roll Caster</b> T. Haga, R. Nakamura, T. Yamabayashi, T. Tsuge, S. Kumai and H. Watari	3327
<b>Multiscale Coupling of Meshless Particle Method and Molecular Dynamics and its Applications at the Nanoscale</b> J.H. Tian	3331
<b>Odor Source Localization Using Multiple Robots in Complicated City-Like Environments</b> Z.Z. Liu, Y.J. Wang and T.F. Lu	3337
<b>Perturbation Method of Light Scattering for the Probability Distribution Function of Particles' Shape</b> Q.Y. Cui, Y.W. Wang and M. Bu	3345
<b>Financial Evaluation of the Listed Electric Power Enterprises in China Based on Entropy TOPSIS</b> J.H. Zhang, Z.W. Wang and D. Yuan	3349
<b>Performance Analysis and Numerical Simulation in Elliptical Tubes</b> S.B. Zhang and J. Lv	3354
<b>A Numerical Simulation of the Working Process of Diesel Engine</b> Q. Wang, J. Wang, H.S. Ji and C. Gu	3359
<b>Product distribution during Datong Coal Pyrolysis and Hydropyrolysis</b> Q.R. Liu and H. Xia	3363
<b>Research on Shaft-Less Technology of Inking System</b> J.B. Zhao and X.L. Li	3368
<b>Experimental Research on Modifier Optimization of Flotation Process in a Molybdenum Ore in Inner Mongolia</b> L. Li, X.J. Lu and J. Qiu	3372
<b>Numerical Simulation of Electromagnetic Induction Heating in the Material Heat Treatment</b> J.M. Chen and M. Zhang	3377
<b>A Method for Calculating Deformation of Long-Distance Pipeline Based on Strain</b> L.Q. Yi, K.Q. Ding and C.F. Qian	3385
<b>The GPU-Based Parallel Implementation of Phase Information Extraction of Multi-View Images</b> J.T. Zhang, J.F. Yan, S.R. Gong and D.L. Pu	3391
<b>Gear Fault Diagnosis Method Based on Cyclostationary Degree and HMM</b> B. Wu, J. Kang and Y.G. Luo	3397
<b>Wireless Sensor Network (WSN) Using in Tunnel Environmental Monitoring for Disaster Prevention</b> D.T.T. Chang, Y.S. Tsai, H.C. Lee, L.L. Guo and K.C. Yang	3401

<b>Effects of Cellulase Modification on Fiber Surface and Quality of Masson Pine Mechanical Pulp</b>	
Q. Luo, X.P. Li and Y. Liu	3405
<b>The Research on Green Project Management Evaluation Method of Construction</b>	
B.K. Qi, Y. Qu and J.M. Zhao	3409
<b>Study on the Coordination Compound of Human-Like Collagen with Copper (II)</b>	
Y.Y. Yu and D.D. Fan	3415
<b>Analysis on Evolution of Landscape Pattern in Dianchi Basin Based on RS and GIS</b>	
Z.Q. Han, J. Ye, Z. Wang, J. Liu and S.X. Yu	3419
<b>The Research of Impact in Pipe Pile Squeezing Soil to Bearing Capacity of the Pile</b>	
J. Xu and J. He	3424
<b>The Application of Fuzzy Analytic Hierarchy Process in Community Informatization Level Evaluation</b>	
J.J. Wu, Y. Wang and Q. Xie	3429
<b>A Study on Speed of Fluid in Swirling Abrasive Jet Nozzle and Drilling Hole Performance</b>	
D.S. Zhang and L.H. Liu	3434
<b>Emergence of Difficulties among Organizations in Applying Supply Chain Management</b>	
M.N.A. Rahman, M. Manzouri and H. Arshad	3440
<b>Via Structure Optimized Design and Study of Copper Interconnect</b>	
M. Du and R. Zhang	3445
<b>Analysis Methods of Bottom Pressure for Fractured-Vuggy Reservoir</b>	
B.H. Chang, W. Xiong and S.S. Gao	3449
<b>Index Properties of Organic and Slightly Organic Soils</b>	
A. Safari and F. Ahmad	3454