

Table of Contents

Committees

Preface

Three-Dimensional Thermo-Mechanical Finite Element Simulation for Casting Ladle Structure under Thermal Loadings S.J. Li, Y.X. Liu and H. Yu	1
Experimental Research of Elevated Temperature Creep and Stress Relaxation during Continuous Straightening Y. Man, X.K. Li and L.D. Yang	7
Derivation and Application for Time Step Model in Simulation of Solidification Process W.B. Gong, L.L. Chen and J. Hao	14
The Computer Solidification Simulation of Oceangoing Freighter Rudder Horn J.P. Xie, A.Q. Wang, W.Y. Wang, J.W. Li, H.M. Zhang and J.L. Hou	22
Microstructures of Rapidly Solidified Hypereutectic Al-Si Alloy with Low-Titanium Content A.Q. Wang, J.P. Xie, Z.X. Liu, J.W. Li, W.Y. Wang and S.Q. Yan	27
Numerical Simulation of Rheo-Diecasting Mould Filling Process of Semisolid Magnesium Alloys H. Yan, T. Wang and M.F. Fu	32
Numerical Simulation of Induction Heating Process of Continuous Casting Slab H. Liu, L.L. Chen and J.X. Zhou	37
Application of Level Set Method to the Simulation of Liquid-Gas Two-Phase Flow during Mold Filling J. Hao, L.L. Chen and J.X. Zhou	43
Simulation of Gas-Solid Two-Phase Flow to Process of Filling the Foam Mould J.X. Jiang, Z.C. Wu and L.L. Chen	49
Gate Location Optimization in Injection Molding Based on Empirical Search Method X.Y. Huang, D.Q. Li and Q. Xu	55
Mold Filling Process Control of Molten Aluminum in Permanent Molds with a Web Gating System Q.M. Chang, D. Schwam, C.J. Chen, J.L. Xiong and J.F. Wallace	63
Thermal Simulation on Mechanical Properties of Steel Q345 for Continuous Casting Slab D.F. Chen, L. Huang, M.J. Long, L.Y. Wen and L.Y. Dong	69
Simulation and Investigation on Physical Properties of Continuous Casting Slab AH36 at High Temperature M.J. Long, D.F. Chen, C.G. Bai, L. Huang and L.Y. Wen	75
Numerical Study of Liquid Core Solidification in Influence of Soft Reduction Deformation on Steel Slab Continuous Casting Process J. Luo, X. Lin, Y.H. Ye and K.W. Liu	80
Numerical Study on Mold Filling Process of Casting X.Q. Pan, H.Z. Sun, J.D. Chen and Y.L. Zhu	87
Thermal Analysis of Whirling Unit Attached to Thread Whirling Machine J.H. Son and Y.M. Lee	93
Casting Process Simulation of the Ball Milling Machine End Cover with a Hug Diameter W.Y. Wang, J.P. Xie, J.W. Li, A.Q. Wang, L.L. Li, H. Yan and H.M. Zhang	98
Numerical Simulation of Die-Casting Mold Filling Process by Using Fractional Step Method J. Yang, Y.X. Ren and S.M. Xiong	104
A Cellular Automata Model for Dendrite Structure Simulation L. Yu, L.S. Wu, L.S. Li and Y.C. Dong	109
Numerical Simulation on the Dendritic Spacing and Microporosity in A356 Alloy Ingot P. Zhang, F.S. Du, Z.Q. Xu and L.L. Zhao	115
Coupled Numerical Simulation on Heat, Flow and Solution Transport in Double-Stream-Pouring Continuous Casting W.W. Zhang, H.D. Zhao, J.X. Gao and Y.Y. Li	121

A New Prediction Way to Shrinkage Cavity Formation for Ductile Iron Castings H. Hou, G.W. Zhang, H.K. Mao and J. Cheng	127
Microstructure Simulation of Die Casting Magnesium Alloy Z.N. Fu and S.M. Xiong	135
The Simulation of Thermal Field in Induction Melting with Cold-Crucible and Dual Frequencies S.S. Lian, I.H. Wang and J.J. Ke	141
Control of Liquid Level in Tundish of Strip Caster with Automatic Pouring System Y. Noda, H. Watari and T. Yamazaki	147
Numerical Simulation of Solidified Structure Formation of Al-Si Alloy Casting Using Cellular Automaton Method K. Ohsasa, K. Matsuura, K. Kurokawa and S. Watanabe	154
Material Constants of Ferritic Spheroidal Cast Iron during Hot Deformation X. Zhao	164
Numerical Simulation and Experimental Method for Auto-Panel Forming Defects Analysis H.Y. Xiang, C.J. Leng and Y.X. Zhong	169
Semi-Enclosed Cold Forging Process Analysis and Progressive Die Design of CPU Fin J.H. Su, F.Z. Ren and L. Wang	174
Numerical Simulation and Structure Optimization of the Main-Control Reversing Valve of Electrical-Hydraulic Hammer S.W. Du and Y.T. Li	180
Intelligent Control Experiment Study for V-Shape Free Bending of Wide Sheet Metal J. Zhao, C.J. Su and Y.P. Guan	186
Forecast of Discharge Voltage for Electromagnetic Tube Forming Based on FEM Analysis H.P. Yu, C.F. Li and J.H. Deng	192
Investigation to the Damage Tolerance of Composite Cylinder for Vehicles by Numerical Simulation Y.H. Xu, Y.S. Li and H.B. Huang	198
Research on Closed Die Forging Process of Car Steering Knuckle D.Y. Zhao, L.D. Zhang and H.X. Sun	204
Study on Effect of Extrusion Velocity on Composites Liquid-Solid Extrusion Process Using 3D Thermo-Mechanical Simulation Z.J. Wang, L.H. Qi and J.M. Zhou	210
Torque Strength and Influencing Factors Analysis for Assembled Camshaft by Knurling Joining J. Qiao, S.Q. Kou, D.Y. He and S.H. Yang	216
Study on Mechanical Behavior for Warm Extrusion of AZ61 Magnesium Alloy X. Zhang, Z.M. Zhang and B.C. Li	222
A Research on Steel Synchronizer Gear Ring's Precision Forging S. Xue and J. Zhou	226
Researches on Rules of the Longitudinal Residual Stress Distribution in Straightening Deformation Zone of Heavy Rail with Multi-Rollers L. Chen, Z.L. Tian, M.C. Gao, W. Zong, J.G. Wang, W.Q. Yang, P.Y. Wang, Z.Z. Wu, Y.Q. Duan and Y.M. Wang	231
The Application on Initial Design of Auto Panel Based on One-Step FEM Z.H. Deng, Y.P. Huang, Y.Q. Zhang and F. Ruan	237
Research on Behavior of Slab Surface Defects in Forward Slip Zone during V-H Rolling Process H.L. Yu, X. Liu, C.S. Li and L.Q. Chen	243
A Goal Oriented Numerical Simulation Approach for Computing Stress Intensity Factors in Bimaterials Z.C. Xuan and J.W. Peng	249
Finite Element Analysis of Stress and Strain in Two-Wedge Cross Wedge Rolling Step-Shaft Part X.D. Xing and X.D. Shu	255
Analysis of Hammering Deformation Processes by the Dynamic Explicit Finite Element Method L.D. Cheng and Z.J. Wang	261

Study on Flow Stress Model of a Microalloyed High Strength Steel in CSP Hot Rolling G. Xu, L. Wan, X.Q. Zhang and Z.L. Xue	267
Thermal-Mechanical Analysis of Metal Forming Based on Meshfree Method G.R. Hua, H.Y. Wen and L.Q. An	273
Finite Element Analysis of Slab Steel in the Process of Induction Heating R.B. Mei, C.S. Li, B. Han and X. Liu	282
Research on Fast Calculation of Rigid Plasticity Finite Element Method in Hot Strip Rolling C.S. Li, S.N. Song, R.B. Mei, G.L. Zhang and X. Liu	288
The Finite Element Analysis of Serrated Chip Formation in High-Speed Cutting Auto Panel Dies J.K. Ruan, Y.L. Ke and Y. Yang	293
Hot Stamping Processing Experiments of Quenchable Boron Steel J. Bao, Z.W. Xing and Y.Y. Yang	299
Research on Cold Taper-Rolling Law of the Spiral Blade Based on Finite Element Method X. Wang, X.B. Fan and H.X. Liu	305
Finite Element Analysis of Optimum Back Pressure during Equal Channel Angular Pressing F.J. Shi and L.G. Wang	311
The Contrast Research of the Finite Element Simulation for Ordinary and Fine Blanking with Negative Clearance H. Du and S.M. Ding	316
Die Design of a Back Panel for a PDP TV Using 3-D Elasto-Plastic Finite Element Analysis D.G. Ahn and H.S. Moon	322
Metal Flow Behavior on the Non-Uniform Wall Thickness Three-Way Valve Extrusion M. Cheng and Z.M. Zhang	328
Hot Forging Process Design Optimization Based on Approximate Model and FEM Simulation X.W. Chen, D.W. Jung and A.X. Sun	334
Macrokinetics Hierarchies of States at Dynamic Superplasticity D.A. Kitaeva and Y.I. Rudaev	340
Qualitative Physical Modeling and Experimental Study on Forging Method with Horizontal V-Shaped Anvil L.Y. Ni, Y.J. Zhang, S.Q. Yu and Z.B. Liu	345
A Method of Bulge Test for Determining the Work Hardening Characteristics of Sheet Metals G.F. Gao and X.W. Ding	350
Releasing Algorithm for Volumetric Locking in Metal Forming Process Simulation Based on Element-Free Galerkin Method Y.J. Guan, X. Wu, G.Q. Zhao and P. Lu	356
Key Technologies for 3D-FE Modeling of Radial-Axial Ring Rolling Process L.G. Guo and H. Yang	367
Numerical Simulation and Response Optimizer Design of Strengthening Effects Induced by Laser Shock Peening S. Huang, J.Z. Zhou, Y.Q. Sun, Y.B. Chen and S.Q. Jiang	373
Improvement of Consumer Properties and Stability of the Technological Process of Hot Rod Stock Production I. Mazur	379
Spatial Structure Injection Molding Analysis of Suspended Bio-Carriers F. Jiang, W.P. Chen and Y.Y. Li	385
Simulation of Hydroformed High Strength Steel Chassis Parts K.J. Kim, J.S. Kim, B.I. Choi, K.H. Kim, Y.S. Kang, C.W. Sung and S.T. Won	390
Computer Simulation of Metal Forming Processes K.N. Solomonov and V.P. Abashkin	396
A New Optimization Method of Constitutive Equation for Hot Working Based on Physical Simulation and Numerical Simulation F.G. Li, X.N. Wang and X.L. Yu	402
Process Optimization of Laser Micro-Bending Using iSIGHT J. Liu, Y.J. Guan, S. Sun and G.C. Wang	408

Mechanics Analysis and Numerical Simulation on the Precise Forming Process of Spline Cold Rolling	
Y.T. Li, J.L. Song, D.W. Zhang and Q.G. Zheng	416
Simulation of Molding Flow of Sheet Molding Compound in Complicated Dies	
Q.L. Mei, S.L. Yan, Z.X. Huang and J.J. Guo	422
Finite Element and Experimental Analysis of Three-Dimensional Flow State of Plastic Melt in Slit Die Section	
S.X. Qin, G.Q. Zhao, Y. Mu and X.M. Xu	427
Temperature Prediction of Seven-Pass Finishing Rolling of Hot Thin Strips by FEM	
Z.D. Qu, Q. Zhang, S.H. Zhang and C. Lei	432
Research on the Intramode Canning Hot Forging Process for Mn18Cr18N Retaining Ring	
J.H. Tian, J.S. Liu, H.G. Guo and H.Q. Chen	438
Research of Favorable Conversion of Friction during Powder Compaction	
D.G. Wang, Y.C. Wu, M.H. Jiao, T. Xie and J.W. Yu	443
Simulation of Three-Dimensional Stress Distribution in Compression Dies	
C.Y. Huang, S.Y. Wang, T. Yang and X.D. Yan	449
Simulation of the FGH96 Superalloy Microstructural Changes under Different Deformation Conditions	
X.N. Wang, F.G. Li and Y.H. Liu	455
Investigation into the Warm Extrusion for Micropart with Laser-Aided Heating Method	
Y. Wang, Z.Y. Xu, P.L. Dong, G.D. Yuan and L. Cai	462
Strength Analysis of Elastic Bar Based on ANSYS Simulation	
S.N. Wu, Z.H. Yang, G.Z. Dai, Z.J. Zhang, L. Zhang, L.X. Dong, L.L. Liu and F. He	468
Investigation on the Key Technologies of Mechanical Expanding of Large Diameter LSAW Pipe	
S.H. Xiao and C.L. Zha	472
Shrinkage Optimization of Flat Receptacle Using the Finite Element Method	
Z.Y. Xu, Y. Wang, P.L. Dong and K. Xiao	478
Numerical Simulation of Wire-Rod Hot Continuous Rolling Process with Multi-Field Coupling	
L.C. Yang, J.X. Hu, L.W. Ning and Y.C. Liu	483
Investigation of Relationship between Material Flow Direction and Local Stress Field in Plastic Deformation	
J. Zhang, Z.B. He and S.J. Yuan	489
Heat-Stress Fields Numerical Simulation of Aluminum Profile Extrusion by Porthole Die	
Z. Jian, Y.T. Li, L. Chu, D.S. Bi and H.X. Cui	495
A Mathematical Approach for Modeling Real Hot Forming Process Using Physical Simulation Results	
S.H. Zhang, H.W. Song, M. Cheng and Z.T. Wang	502
Elasto-Plastic Dynamic Explicit Analysis of Cold Ring Rolling Process	
X.B. Zhang, Z.G. Li, Y.Q. Liu and M.H. Wu	508
Numerical Simulation Analysis on Cold Closed-Die Forging of Differential Satellite Gear in Car	
Y.Z. Zhang, J.B. Huang, X. Lin and Q.S. Fang	517
Fast Prediction of Springback at Product Design Stage for Sheet Metal Forming	
Z.B. Zhang, Y.Q. Liu, T. Du and Z.G. Li	525
3D Thermal Mechanical Coupled Elasto-Plastic Finite Element Analysis in the Whole Rolling Process of H-Beam	
G.M. Zhu, Y.L. Kang, W. Chen and G.T. Ma	532
Modeling Stress Strain Curves for Nonlinear Analysis	
H.S. Gao	539
Rheological Models as the Basic Element of Metal Forming Processes Simulation	
O.M. Smirnov and M.A. Tsepin	545
Deforming Mechanisms of Two-Pass Drawing Process of an Aluminum Tube from Circular to Rectangle Section	
G.Z. Quan, M.H. Wang, J. Zhou and Y. Tong	549
Investigation of the Billet Deformation Process in the Dies with Elastic Elements Realizing a Cross and a Longitudinal Shear	
A.B. Naizabekov and S.N. Lezhnev	555

Numerical Simulation on Pharmaceutical Powder Compaction L.H. Han, J. Elliott, S. Best, R. Cameron, A.C. Bentham, A. Mills, G.E. Amidon and B.C. Hancock	560
The Establishment of Mathematics Model of Velocity Field in Strip Cast-Rolling Deformant Area B.Y. Sun and S.J. Yuan	566
Numerical Simulation on Laser Peen Forming of Sheet Metal J.Z. Zhou, Y.J. Fan, S. Huang, S.Q. Jiang and J.J. Du	572
A 3D Rigid-Plastic FEM Simulation on Radius of Incremental In-Plane Bending of Strip Metal W.T. Tang, L. Jin, J. Zhang and H. Yang	579
Prediction of Rolling Force during Temper Rolling J. Larkiola, J. Nylander, V. Kähkönen and M. Judin	584
The Innovative Production Developments in Sheet Hydroforming L.H. Lang, H.L. Li, X.B. Zhou, J. Danckert and Y.L. Ghen	589
Research on Simulating of Controlled Rolling and Controlled Cooling Process for Mo Micro-Alloy Steel G.Y. Li, B.C. Zhao, Z.F. Pang, Y.H. Liu and H.X. Ma	595
Application Research on Expert System of Incremental In-Plane Bending W.T. Tang, C.L. Tang, L. Huang and H. Yang	600
Deformation Pattern of the Large Generator's Retaining Rings during Hydraulic Bulging Strengthening W.W. He, J.S. Liu, H.G. Guo and J.K. Chen	606
Density Functional Theory Applying in the Computation to the Properties of Copper Surface H.T. Cheng, J.G. Yang and H.Y. Fang	612
Finite Element Simulation for Evolutions of Profiles during Hot Compression B.H. Tian, S. Kleber and V. Wieser	616
Simulation of Internal Stress in Injection Molded Parts H.H. Wu, Z.F. Zhao and C.Y. Shen	622
A Study of the Microstructure and Grain Size at the Welding Heat Affected Zone of a Ferrite Stainless Steel S.X. Zhang, S. Guan, X.T. Liu and C.L. Mo	627
Study on Temperature Distribution of Plasma Surface Alloying Furnace Z.H. Li, S.S. Liu and Z.Y. Cheng	633
Reliability Calculation of Welded Pressure Pipe with Circumferential Crack Based on 3-D Elastic-Plastic SFEM B.L. He, Y.X. Yu, L.X. Huo and Y.F. Zhang	639
Numerical Simulation of Basal Parameters for Fatigue Evaluation of Electromotor Rotor Welded Structure Z.L. Zhao, J.G. Yang, X.S. Liu and H.Y. Fang	643
Numerical Simulation of Temperature Field and Stress Field of Electron Beam Brazing Stainless Steel Radiator J.M. Li and F.R. Chen	649
The Research of a Pulse Laser Powder Materials' Sintering Process A. Saprykin, N. Saprykina and O. Krovina	654
Numerical Simulation on Temperature Field of Electron Beam Welding of Magnesium Alloy and Study on Properties and Microstructure of Joint H. Ye, Y. Luo, Z.L. Yan and B. Shen	660
Numerical Simulation of Residual Stress in the Glass-to-Metal Diffusion Seals D. Xu and X. Ling	666
Investigation of the Influence of Shot Peening on Stress Corrosion Cracking of Stainless Steel Welded Joints X. Ling, H.F. Ni and G. Ma	672
Numerical Simulation of Laser Surface Micro-Texturing H.X. Liu, Y.X. Chen, X. Wang, X.X. Meng, Y.H. Fu and L. Cai	678
Analysis and Evaluation for Usability of the Low Hydrogen Type Structural Steel Covered Electrode Y. Wang, B. Wang and J.H. Gao	684

Investigation on M-A Constituent in Weld CGHAZ of High-Strength Microalloyed Steel C.X. Chen, W.S. Li and H.F. Peng	690
FE Simulation of Complex Contour Forming of Sheet Metals Based on Laser Bending Y.B. Chen, J.Z. Zhou, S. Huang and Y.Q. Sun	696
Numerical Analysis on Temperature Field of Axial Alternating Magnetic Field-Assisted Electric Field-Activated Sintering L. Guo, Y.Y. Li, X. Li and J.Y. Yang	702
Investigation on the Simulation System of GTAW Operation Based on Virtual Reality Technology Z.X. Liang, J.X. Zhang and Y. Pei	709
Numerical Simulation and Analysis of Flow Field in TIG Arc Braze Filler Metal Droplet R.F. Li, Z.S. Yu and K. Qi	716
Quality Measure and Control System for the Whole Process of Arc Welding Z.Y. Li, B. Wang and J.B. Ding	722
Research on One New Type of Rapid Prototyping Based on Laser-Induced Chemical Liquid Deposition D.L. Song, D.F. Zhao, K.R. Chen, X.P. Yao and W.C. Chen	728
Simplified Heat Model of the Weaving Welding Processes J.G. Yang, J.S. Gao, H.Y. Fang, G.T. Zhou and J.F. Hu	735
Grain Refinement Behavior of Pipeline Steel in Welding Heat Affected Zone S.F. Yu, Y. Lei and Z.Y. Li	741
Numerical Simulation of Welding Residual Stress and Post-Weld Heat Treatment for Dissimilar Steel Welded Joint G.D. Zhang and C.Y. Zhou	747
The Electrical Contact Resistance in Resistance Welding Evaluated by Gleeble Testing Machine W.M. Zhou	753
Numerical Modeling of High Power MAG Welding on the Plate J. Huang, F.W. Bach and D. Windelberg	757
Analysis of Arc Welded Thin-Walled Cylinders to Investigate the Effects of Welding Process Parameters on Residual Stresses A.M. Malik, E.M. Qureshi and N.U. Dar	763
Optimization of Welding Process Parameters for Rotating Arc Welding Sensor Based on Genetic Algorithm J.P. Jia, H. Zhang and H. Huang	769
Numerical Simulation on Temperature Field in Laser Welding for Aluminum Alloy with Different Thickness Y.S. Rong, X.J. Hui and F. Ding	774
Evaluation of Corrosion Property for Repair Welding Zone of Exhaust Valve K.M. Moon, H.R. Cho, M.H. Lee and Y.H. Kim	780
Numerical Simulation of Pulsed Arc Welding by Melting Electrode O.I. Shpigunova and A.A. Glazunov	786
Numerical Simulation of Hydrostatic Extruding Cu/Al Bimetal Clad through Equal-Strain Contour Concave Die C.H. Zhang, Y. Liang and F.C. Wang	792
A Study on Numerical Analysis and Residual Stress Evaluation of Welded Joint S. Huh	799
Overview of Modeling Strength Evolution during Friction Stir Welding J.H. Cho, H.W. Kim and S.B. Kang	805
Numerical Computation of a Linear Friction Welding Process J. Tao, T.C. Zhang, P.T. Liu, J. Li and Y. Mang	811
The Simulation of Residual Stress for Stud Welding and Establishment of Strength Estimating Model G.T. Zhou, X.S. Liu, G.L. Liang, P.Z. Liu, D.J. Yan and H.Y. Fang	816
The Application of Welding Heat Cycle Computer Software Y.Y. Feng, Z.A. Luo, D.H. Zhang, J. Wei and L.J. Wang	821
NiCr Alloy Coating Deposited on the Surface of 35CrMo Steel by the Electrospark Process H. Yu, H.X. Shi, Y.L. Wang, K.K. Zhang, W.Y. Wang, L.J. Han and Q.H. Pang	827

Computer Simulation of Thermo-Mechanical Processes at Fusion Welding of Alloyed Steels D.A. Chinakhov and E.P. Agrenich	833
Gas Tungsten Arc Welding and Hybrid Laser-TIG Welding Temperature Field Analysis of AZ31B Magnesium Alloy G.L. Liang, S.Q. Yuan, G.T. Zhou, X.D. Sun and Y. Mang	837
Study on Computer Emulation of PTFE's Wearability Improvement by Al³⁺ Ion Implantation J.P. Shao, H. Tang and Y.Q. Zhang	843
Influence of Temperature on Field-Induced Reorientation Strain in Magnetic Shape Memory Alloy Y.P. Zhu and G.S. Dui	848
Application and Research of Numerical Simulation for Rubber Like Material with MSC.Marc J.B. Sang, B. Liu, Z.L. Wang, S.F. Xing and J. Chen	854
Optimization Design for the Interface Modulus of C_{sf}/Al Composite G.X. Tang, G.A. Zhang, H.B. Wu, W.T. Tian and H. Guo	859
A Study of the Environment-Friendly Chrome-Free Chemical Conversion Coating on 2024 Aluminium Alloy D.C. Chen, W.H. Gong, Z.Z. Huang and W.F. Li	864
Numerical Simulation of Interfacial Bonding Degradation of Composites under Two-Stage Loading Y.H. Chen and Q.J. Zhu	869
Study on the Freeze-to-Crack Test of Asphalt Modified by Waste-PE in Packing C.Q. Fang, T.H. Li, D.Q. Jing and Y.B. Ji	875
Mullite Interlayer of C/Si-C-N Composites Fabricated by PIP G.F. Lu, S.R. Qiao, J.T. Hou and M.F. Gong	881
Numerical Simulation of Thermal Induced Crack Propagation in Laminated Composites T. Xu, J.Y. Yang, C.A. Tang and S.B. Tang	886
Modified Tartagli Method for Calculation of Jominy Hardenability Curve W. Sitek, J. Trzaska and L.A. Dobrzański	892
Study on Deformation Induced Ferrite Transformation in Mild Steels with or without Niobium L.J. Wang, L.D. Yao, H.P. Ren and C.M. Liu	898
Determination of the Kinetics for Dynamic and Static Recrystallization by Using the Flow Curves J. Wang and H. Xiao	904
Microstructures and Toughness in Simulated Coarse Grain Heat-Affected Zones of Copper-Bearing Steel W.Y. Liu, L. Wang, J.B. Liu, P.H. Li, K. Miao and R.D. Han	910
Structure Optimization in the Stacked Package of IC Microstructures H.P. Li, Y.T. He, H.X. Zhang and R.H. Cui	915
Influence of Delamination of Epoxy/Dielectric Interfaces on Pattern Shift and Passivation Cracking under Aeronautical Conditions Y.T. He, H.P. Li, R.H. Cui and C.H. Fan	919
(225)_A Martensite Transformation and Kurdjumow-Sachs Mechanism C.Q. Xu, X.M. Cao and G.J. Li	924
Numerical Modeling of the Electrical Resistivity of Carbon Black Filled Rubber Z.M. Xie, Y.J. Yum, H.G. Min and J.H. Son	930
Numerical Simulation of Thermal Stress Fields during Gas Quenching Z.L. Li, H.M. Cheng, J.R. Chen and M.H. Liu	935
Effects of Thermal Treatment on the Morphology and Properties of CSM/Poly(Urethane-Isocyanurate) Composites Formed by SRIM Process H.Y. Tang, J.H. Wang, G.Q. Gao and W.X. Chen	941
High Temperature Mechanical Behavior of 16Mnq under Constant Constraint Conditions Y. Gao and Z. Pan	947
Phase Formation and Structure of Mullite-Alumina-Zirconia and Spinel-Enstatite Ceramics Developed from Synthetic and Mineral Raw Materials G.M. Sedmale, I. Sperberga, A. Hmelov, U. Sedmalis and A. Actins	953

Mechanical and Processing Characterisation of Effective Behaviour of Wood-Plastic Composites by Analytical and Numerical Simulation	
A. Hančič, K. Kuzman, F. Kosel, A. Glojek, A.M. Cunha and G. Gantar	959
The <i>In Situ</i> Study on the Micro-Structural Characters of IF Steel at Early Stage of Recrystallization Using High-Energy X-Ray	
H. Tong, Y.D. Liu, Q.W. Jiang, Y. Ren, G. Wang, Y.D. Wang, X. Zhao and L. Zuo	972
Topology Optimization of Orthotropic Material Structure	
H.P. Jia, C.D. Jiang, G.P. Li, R.Q. Mu, B. Liu and C.B. Jiang	978
Investigating the Mechanical Property and Rolling Contact Fatigue Life of Diamond-Like Carbon Films on Bearing Steel	
H.X. Liu, Y.H. Jiang, R. Zhou, Z.L. Li and B.Y. Tang	990
Finite-Element Analysis of Thermal Stresses in Diamond Film Deposition on Mo Substrate with Ti Interlayer	
Z. Liu, C.M. Li, D.C. Niu, H. Lan, W.Z. Tang, G.C. Chen, J.H. Song, Y.M. Tong and F.X. Lu	996
Application of Physical Simulation for Developing New Steel Types	
L.P. Karjalainen, M.C. Somani and A.S. Hamada	1002
Dislocation Distribution Function of Two Fracture Dynamics Problems Concerning Aluminum Alloys	
N.C. Lü, Y.H. Cheng, C. Jin and Y.L. Chen	1008
A New Optimization Algorithm for Inverse Analysis to Material Parameters	
Y.H. Lu, S.L. Wang and H. Jiang	1013
Nonlinear Bending of the FGM Circular Plates with Temperature-Dependent Properties	
L.S. Ma, C.Z. Deng and Z.Y. Ou	1020
Influence of Ceramic Aggregate on the Microstructure of Filtration Materials	
X.E. Ma, H. Guo and Y.G. Li	1025
The Effect of Nonequilibrium Structure State on the Creep and Superplastic Behaviour of Materials	
M.M. Myshlyayev	1031
Research on the Accurate Control of Initial and Finishing Cooling Temperatures for X70 Pipeline Steels	
T. Niu, H. Yu, Y.L. Kang and M.J. Long	1038
Residual Stresses of Fiber-Reinforced Functionally Graded Composites	
Z.Y. Ou, D.X. Lei and L.S. Ma	1044
Research on Creep Constitutive Model of TC11 Titanium Alloy Based on RBFNN	
X.H. Peng, Y.S. Luo, J.Y. Zhou, M. Yu and T. Luo	1050
Hot Ductility of Fe-18Cr-12Mn-0.55N High Nitrogen Austenitic Stainless Steel	
F. Shi, L.J. Wang, W.F. Cui, Z.B. Li, M.Z. Xu and C.M. Liu	1056
Simulation of Intercritical Austenization of a C-Mn Cold Rolled Dual Phase Steel	
S. Kuang, Y.L. Kang, H. Yu and R.D. Liu	1062
Research on Heat Treatment Techniques and Structure Properties of CuNi₂TiCrZr Alloy	
Y.S. Xu and X.L. Wang	1070
Effect of Molybdenum on Hot Deformation and Processing Maps of Austenitic Stainless Steels	
M.J. Wang, S.S. Long, S.M. Mu, Y. Wang and L. Chen	1076
Physical Simulation of Dynamic Recrystallization Behavior of 7050 Aluminum Alloy	
Y.P. Yi and Y. Shi	1083
Study on Preparation of Ti Powder by Self-Propagating High-Temperature Synthesis (SHS) with Magnesiothermit Reductive Process	
P.L. Zhang, T.D. Xia, G.D. Zhang and L.J. Yan	1086
Effect of Zinc Content on the Ageing Behavior of Al-Zn-Mg-Cu-Li Alloys	
Z.K. Zhao, Q.Z. Sun, P.Q. Zhang, C.L. Li, X.J. Wang and C.Q. Chen	1093
Effects of Gas Multicomponent Thermochemical Treatment Process on Structure and Properties of Steel 20	
H. Zhou, C. Fei, Y.G. Yang, H.C. Wan, J.Q. Chen, B. Yao and M. Xi	1097
Study on High Temperature Mechanical Properties of Bearing Steel GCr15	
L.G. Zhu, W.G. Lu and Y.H. Han	1101
Predicting Modulus of Elasticity for Wood-Based Composites	
Y.C. Hu	1106

Amorphous Compositions for Production of Thick Films J. Setina and V. Akishins	1111
Achieving the Dual Phase Structure in Low Alloyed Steel with Slow Cooling Rate T. Jäppinen and S. Kivivuori	1117
Influence of High Shearing Stress-Induced Strengthen Effect on GF/HDPE Composites G.Z. Dai, X.F. Zhou, L.X. Dong, S.N. Wu, L.L. Liu and Q.Q. Ni	1123
Computer Simulation of Heat Treatment Process for 125MN Plunger C.L. Mo, J. Ling, Y.K. Luan and C.P. Shen	1129
Simulation of the Processes of Aluminum Alloys Preforms and Semifinished Products Manufacture under Influence of Technological Heredity and Phase Transitions N.L. Lisunets, O.M. Smirnov and M.A. Tsepin	1134
Finite Element Simulation for Forging Process Using Euler's Fixed Meshing Method C.C. Wang	1139
Research on the Mechanisms of Laser Forming for the Micro-Structural Element Y. Jin, J.H. Wu, Y.J. Shi, H. Shen and Z.Q. Yao	1145
Application of Time-Ageing Time and Time-Temperature-Stress Equivalence to Nonlinear Creep of Polymeric Materials R.G. Zhao, W.B. Luo, Q.F. Li and C.Z. Chen	1151
The Influence of Temperature on Cr-Ti Coating in Carbon Steel B.Y. Lou, K.C. Luo and B. Xu	1157
A Study on Fatigue Crack Propagation Properties Using the X-Ray Diffraction Method M.A. Hossian, M.B. Lim, S. Huh and W.J. Park	1162
A Study on Tribology Characteristics of SM53C by High Frequency Heat Treatment T.H. Song, K.Y. Lee, S. Huh and W.J. Park	1170
The Austenite Inverse Phase Transformation Quenching in Zero Time Holding of 20MnV Steel A.M. Li, X.J. Wang and L.J. Huang	1177
Comparison of Microstructural Aspects by Electron Microscopy Observed in Al-Mg Based Alloys Obtained by Conventional and P/M Processes After Thermomechanical Treatments W.A. Monteiro, S.J. Buso, A. Almeida Filho and R.B. Ferrari	1184
The Corrosion Behaviors of Heat-Treated SAE 8620 Steels S. Hong, H.C. Lin, Y. Lee, T.S. Lian, L.Y. Tseng and K.M. Lin	1190
Displacement Field Simulation and Deformation Prediction of Longitudinal Straight Seam Welding of Thin-Wall Aluminium Alloys Cylinder G.T. Zhou, X.S. Liu, D.J. Yan and H.Y. Fang	1199
Simulation of Mold Filling and Solidification on Gravity Casting of Al-Si Alloy (A357) G.F. Mi, H.T. Zhao, K.F. Wang, Z.A. Xu and J.T. Niu	1204
A Study on Constitutive Model and Parameters of Rock Slope Stability Z.X. Yan, J. Duan, P. Jiang and H.Y. Wang	1210
Analysis and Simulation of Sensor Structure Parameters and Filling Materials Characteristics for Electrical Capacitance Tomography System D.Y. Chen, L.L. Wang and Y. Chen	1217
Pad Effects on Slurry Flows in CMP System C.H. Zhang and J.Q. Zhang	1222
Dynamic Characteristic Analysis of the Micropump Considering the Diaphragm Stiffness D. Jiang, S.J. Li and G. Bao	1228
Numerical Simulation of Gas-Solid Flow in a Precalciner of Cement Industry J.L. Xie and S.X. Mei	1234
Thermodynamic Analysis of Friction Pairs inside a High Temperature Flow Rate Control Valve for Scramjet Engines S.J. Li, Z.W. Zang, Y.H. Li and W. Bao	1240
Application of RFPA^{2D} in Sublevel Caving Mining Extra-Thick Coal Seams H. Nan, T. Xu and Z.D. Wei	1246
The Fabrication of 2-D Global Fiducial Grid with High Resolution for Spatial Phase Locked e-Beam Lithography J.F. Dai, Q. Wang, W.X. Li, Y.F. Cui, F. Zhang and H.I. Smith	1252

Analyses of the Influencing Factors of Rotating Impeller Degassing Process and Water Simulation Experiment	
G.F. Mi, X.Y. Liu, K.F. Wang, S.P. Qi, H.W. Wang and J.T. Niu	1258
Modelling Fabric's Optical Behaviors	
H.Y. Yang, S.K. Zhu, K.J. Li and N. Pan	1266
Study on Medicinal Properties of Red 1%NaOH Extractives of Castanopsis Fissa Wood by GC/MS	
Z.F. Zhang, W.X. Peng, K.F. Li and Q.Z. Ma	1272
The Effects of Substrate Temperature on the Residual Stress for EBPVD TBCs	
Y.S. Zhong, L.P. Shi, J. Yu and X.D. He	1276
Study on Temperature Distribution in Double Glow Discharge Zone	
P.Z. Zhang, Z.Y. He, G.H. Zhang, X.F. Rong, H.Y. Wu and Z. Xu	1281
Stability Analysis of Diversion Tunnels in Jinping II Hydropower Station Project	
C.Q. Zhang, X.T. Feng, H. Zhou, S.L. Huang and Q. Jiang	1287
Study on Method of the Multi Control Task and Synchronized Data Acquisition of the Thermo-mechanical Simulator	
H.L. Su, Z.A. Luo, J. Wei, D.H. Zhang and L.J. Wang	1293
Analysis and Experiments of Eddy Current Brakes with Moving Magnets	
J.K. Shiau, D.M. Ma and M. Jou	1299
Flashover Condition Analysis on Passenger Carriage Fire by Using Swallowtail Catastrophe Theory	
B. Lei, G.Z. Dai and Q.Y. Wang	1305
Numerical Simulation of Temperature Distribution in Conductive Asphalt Solar Collector due to Pavement Material Parameters	
S.P. Wu, B. Li, H. Wang and J. Qiu	1314
Study on Healthful Function of Superheated Water Extractives of Phyllostachys Heterocycla by GC/MS	
Q.Z. Ma, W.X. Peng, D.Q. Zhang, Q.M. Liu and Y.Q. Wu	1320
Determination of Chemical Components of Red 1%NaOH Extractives of E. Urograndis Wood by GC-MS	
W.X. Peng, K.F. Li, D.Q. Zhang and Y.Q. Wu	1325
An Abrasive Wear Model of Interpenetrating Composites	
S.R. Wang, P.Q. Guo, H.Y. Wang and M. Wang	1329
The Effect of Temperature and Content of Conductive Filler on the Conductivity of Conductive Rubber	
T.T. Wang, Y.G. Zhang, L.F. Yang, J.C. Zhang and S.M. Liu	1335
Study of Electroplating Zn-Sn-Ni Alloy	
Z. Wang, M.Z. An, J. Yu and X.R. Hu	1338
The Influence of Surveying Method on Mechanical-Electrical Properties of Smart Mortar	
R. Yao, Y.B. Zhang and Z.C. Wang	1343
Calculation on Temperature Rise of CMP Process: Roughness Effects Considered	
W. Ye and C.H. Zhang	1348
Weight Calculation of Steel Pipe by Visual Basic Programme	
Y.W. Zhang, J.H. Wang and Y.D. Ji	1354
Research on the Proper Selection of Soil Constitutive Relation in Modeling Underground Excavation	
Y.T. Zhang, L.J. Tao, S.H. Tang and B. Sun	1358
Research on Hydrogen Induced Cracking of 08Cr2AlMo Steel Based on the Empirical Electron Theory	
B.Q. Gu, Y.F. Zhang and Y. Ding	1364
A FEM Study on Chip Formation in Orthogonal Turning Nickel-Based Superalloy GH80A	
J.L. Li, G. Liu, D.J. Zhang and M. Chen	1370
Numerical Analysis of Electromagnetic Field of Solid Rotor Asynchronous Permanent Magnetic Coupling by Finite Element Method	
C.J. Yang, Q.W. Li, H.L. Ma and S.F. Jiang	1376
Comparison between Plasma-MIG and MIG Procedures on 5A06 Aluminum Alloy	
H.M. Gao, Y. Bai and L. Wu	1382

Numerical Simulation for Low Pressure Die Casting of Al-Alloy Motor Enclosure and Technology Improvement G.F. Mi, X.Y. Liu, K.F. Wang and J.T. Niu	1389
Investigation of Forming Conditions on Microstructure Development and Mechanical Stability of Trip Steel J. Zrník, O. Murnsky, P. Horňák and M. Fujda	1396
Analysis of Worm Cutting Characteristics in Whirling Process Y.M. Lee, W.S. Choi, J.H. Son, K.J. Oh, S.I. Kim, G.W. Park and H.C. Jung	1402
Analysis on Section Effect of Heavy Plate by Finite Element Method during Controlled Cooling N. Li, C.F. Yang and T. Pan	1407
Effects of Vanadium and Rare-Earth on Carbides and Properties of High Chromium Cast Iron W.M. Zhao, Z.X. Liu, Z.L. Ju, B. Liao and X.G. Chen	1414
The Multi Physical Fields Modeling for 7B50 Aluminum Alloy Semi-Continuous Casting Process S.C. Hu, W.C. Ma, X.Q. Li and J. Zhong	1422
Development and Application of Experimental Facilities for Steel Forming Z.A. Luo, G.D. Wang, X. Liu, J.P. Li, L.J. Wang and F.A. Hua	1428
The Multi-Scale FEM Simulation of Wire Fracture during Drawing of Perlite Steel A. Milenin, Z. Muskalski and P. Kustra	1433
Research and Simulation of Influence of Different Pressing Velocity on Powder Metallurgic Products Properties M.H. Jiao, D.G. Wang, T. Xie, J.W. Yu, Y.G. Yin and Y.C. Wu	1439
Impact of Rolling Conditions on Propagation of a Potential Crack R. Fabík, J. Kliber and S. Aksenov	1445
Applications of Dyes in Material Science Research Z.Y. Cao, F. Zhao and X.Y. Li	1451
Finite Element Analysis on Microstructure Evolution of Hot Ring Rolling Process Z.C. Sun, H. Yang and X.Z. Ou	1455
Finite Element Analysis of the Rolling Contact Fatigue Life of Railcar Wheels B.C. Goo and J.W. Seo	1461
Effect of Scanning Frequency on Temperature Distribution Y.S. Wang, J.J. Wang and X.C. Yang	1467
Study on One Kind of Antenna Radomes Materials Numerical Algorithm Simulation Based on DBEM Y.W. Fang and Y. Wang	1471
Diffusion Interaction between Two Metals, One of Which is in Liquid State A.P. Savitskii	1477
The Study of Thermal Boundary Condition for CFRP Pressure Vessel with Metallic Liner during Manufacture Process Z.H. Hu, R.G. Wang, L. Ma and S.Y. Du	1483
Numerical Simulation of Process of Cavity Filling and Solidifying in TiAl Alloy Investment Casting Y.L. Guo, S.L. Xiao and L.J. Xu	1489