

Table of Contents

Sponsors and Committees

Preface

Keynotes

Compelling Global Issues in Science and Technology and the Role of Materials Science J. Wadsworth and M. Cobian	1
Strong Ferritic-Steel Welds H.K.D.H. Bhadeshia	6
Effects of Alloying on Deformation Behavior of Low Carbon Steels in the Intercritical Temperature Range E.I. Poliak and D. Bhattacharya	12
Materials Engineering for Solid Oxide Fuel Cell Technology N.P. Brandon	20
Optimization of Nb HSLA Microstructure Using Advanced Thermomechanical Processing in a CSP Plant A.J. DeArdo, R. Marraccini, M.J. Hua and C.I. Garcia	28
Development of New Actuators for Flapping Wing Flight D.T. Chung	36
Microstructural Design for Advanced Structural Steels O. Bouaziz and J.D. Embury	42
New Materials and Construction Methods for Multi-Material-Design, Lightweight Construction and Modularity in Future Vehicle Concepts H.E. Friedrich and G. Kopp	51
Carbon, Nitrogen and Hydrogen in Steel: Similarities and Differences in their Effect on Structure and Properties V.G. Gavriljuk	58
Multi-Scale Numerical-Experimental Analysis of Failure in Solder Alloys M.G.D. Geers, R.L.J.M. Ubachs, M. Erinc and M.A. Matin	66
Developments of Fuel Cell and Hydrogen Technology at NRC's Institute for Fuel Cell Innovation D. Ghosh and S.H. Wu	74
Microstructural Evolution in the Processing of Bulk Samples Using High-Pressure Torsion Z. Horita and T.G. Langdon	80
Microstructure and Texture of Zirconium and Titanium Grain Refined by Equal Channel Angular Pressing S.H. Yu, D.H. Shin and S.K. Hwang	86
Syntheses and Applications of Fe-, Co-, Ni- and Cu-Based Bulk Glassy Alloys A. Inoue, B.L. Shen and A. Takeuchi	92
The Strain Dependence of Post-Deformation Softening during the Hot Compression of 304H Stainless Steel J.J. Jonas, E.I. Poliak and A. Najafizadeh	100
Development of a Magnesium Recycling Alloy Based on AM50 D. Fechner, P. Maier, N. Hort and K.U. Kainer	108
Current Research Activities on High Nitrogen Steel in Japan Y. Katada	114
Microstructure and Mechanical Properties of Twin-Roll Strip Cast Mg Alloys S.S. Park, G.T. Bae, J.G. Lee, D.H. Kang, K.S. Shin and N.J. Kim	119
Strength and Fracture of Aluminium Alloys T. Kobayashi and H. Toda	127
Manufacturing and Oxidation Behavior of Silicide-Based Nanocomposite Coatings on Refractory Metals by Displacement Reaction J.K. Yoon, D.W. Kum and K.T. Hong	135

Mechanical Properties of a Spray-Cast Aluminum Alloy Processed by Severe Plastic Deformation	
C. Xu, M. Kawasaki, M. Furukawa, Z. Horita and T.G. Langdon	141
Changes in Lattice Constants and Orientation of <100> and <111> Grains in Nanocrystalline Ni and Ni-Fe Electrodeposits after Annealing	
D.N. Lee	149
Formation of (Ferrite+Cementite) Microduplex Structure by Warm Deformation in High Carbon Steels	
T. Furuhashi, T. Yamaguchi, S. Furimoto and T. Maki	155
Laparoscopic Surgical Manipulations Affect the Mechanical Properties and the Microstructure of Polymeric Sutures	
S. Tremblay, A. El Maliki, M. Fiset and D. Mantovani	161
Development of Aluminium Alloys with Ultimate Recrystallisation Resistance	
H. Hallem, B. Forbord and K. Marthinsen	167
Multifunctional Ti-Si-B-C-N Tribological Nanocomposite Coatings for Aerospace Applications	
I.W. Park, B. Mishra, K.H. Kim and J.J. Moore	173
Computational Welding Mechanics and Concept of Inherent Strain for Industrial Applications	
H. Murakawa	181
Fabrication of Lotus-Type Porous Metals by Continuous Zone Melting and Continuous Casting Techniques	
H. Nakajima, S.K. Hyun, J.S. Park and M. Tane	187
Recent Research and Development in Metallic Materials for Biomedical, Dental and Healthcare Products Applications	
M. Niinomi	193
On the Size of Representative Volume Element in Elastic, Plastic, Thermoelastic and Permeable Random Microstructures	
M. Ostojic-Starzewski, X. Du, Z.F. Khisaeva and W. Li	201
Understanding Process and Property Relationships in Aluminum Alloy Friction Stir Welds	
A.P. Reynolds	207
The c/a Ratio in Quenched Fe-C and Fe-N Steels - A Heuristic Story	
O.D. Sherby, J. Wadsworth, D.R. Lesuer and C.K. Syn	215
High Temperature Oxidation of Steel; New Description of Structure and Properties of Oxide	
J.A. Szpunar and B.K. Kim	223
Effect of Dislocation Distribution on the Yielding of Highly Dislocated Iron	
S. Takaki, Y. Fujimura, K. Nakashima and T. Tsuchiyama	228
A Neutron Scattering Study on Microstructure and Deformation Behavior in Nitrogen Bearing Austenitic Steels	
Y. Tomota, K. Ikeda, M. Ojima, J. Suzuki and T. Kamiyama	234
Thermal Applications of Cellular Lattice Structures	
H.N.G. Wadley and D.T. Queheillalt	242
Current Status and Next Generation Advances in Fuel Cell Research and Development	
D. Wilkinson	248
Creep Data Rationalization for Power Plant Steels	
B. Wilshire and H. Burt	254
Research and Development of Inconel 718 Type Superalloy	
X.S. Xie, J.X. Dong and M.C. Zhang	262
Deformation Mechanisms of Nanocrystalline Materials	
Y.T. Zhu	270
 Aluminum & Aluminum Alloys	
	1.
Solute and Second Phase Evolution during Industrial Processing of AA3103	
A. Miroux, Z.J. Lok, K. Marthinsen and S. van der Zwaag	281

Application of Local Tomography Technique to High-Resolution Synchrotron X-Ray Imaging	
T. Ohgaki, H. Toda, K. Uesugi, T. Kobayashi, K. Makii, T. Takagi and Y. Aruga	287
Change of Young's Modulus of Cold-Deformed Aluminum AA 1050 and of AA 2024 (T65): A Comparative Study	
A. Villuendas, A. Roca and J. Jorba	293
The Effect of Chemistry and Cooling Rate on the Latent Heat Released during the Solidification of the 3XX Series of Aluminum Alloys	
M.B. Djurdjevic, J. Sokolowski, W.T. Kierkus and G.E. Byczynski	299
Behavior of Hydrogen in Al-4%Mg Alloys during Heat Treatment	
H. Umeda, G. Itoh and Y. Kato	305
Phase Transformation for Primary Particles in the Surface Regions of an AA1200 Alloy	
T. Pettersen	311
Tailoring the Mechanical Properties of Al-Sn-Alloys for Tribological Applications	
R. Schouwenaars, J.A. Torres, V.H. Jacobo and A. Ortiz	317
New Application of Electromagnetic Vibration Process for Creation of High Potential Metallic Materials	
K. Miwa, Y. Mizutani, T. Tamura and N. Omura	323
The Effect of Electromagnetic Vibration on the Structure Control of A356 Alloy	
J.P. Choi, T.W. Nam and E.P. Yoon	329
Increase of Lankford Value of Al-Mg-Si Sheets for Automotive Panel Produced by Asymmetric Warm Rolling	
Y. Miki, K. Koyama, O. Noguchi, Y. Ueno and T. Komatsubara	333
Methodology for Automatic Control of Automotive Al-Si Cast Components	
M. Krupiński, L.A. Dobrzański, J. Sokolowski, W. Kasprzak and G.E. Byczynski	339
Reversion Treatment to Improve Bake Hardening Response of a Twin-Roll Cast 6016 Automotive Sheet	
Y. Birol	345
New Analyses of Pressure Filtration Curves of Al Alloys: A Case Study	
X.J. Cao and M. Jahazi	351
Superplastic Properties of a Newly Developed Al-Mg-High Mn Aluminum Alloy Sheet	
K. Ichitani and T. Tagata	357
In-Situ SEM/EBSP Analysis during Annealing in a Pure Aluminum Foil for Capacitor	
M. Kobayashi, Y. Takayama, H. Kato and H. Toda	362
Damage Mechanisms of 5A06 Al Alloy Weld Joints under Constant Load and Thermal Cycling Condition	
C. Jin, J.T. Niu, S.Y. He, H.B. Geng and G. Long	368
Projection of Extrusion Force of Spray-Formed Al-25wt%Si with High Temperature Compression	
C.H. Chiang and C.Y.A. Tsao	374
Effect of Fe Content on Hot Tearing of High-Strength Al-Mg-Si Alloy	
H. Nagaum, S. Suzuki, T. Okane and T. Umeda	380
Modelling Dispersoid Precipitation in Scandium Containing Aluminium Alloys	
J.D. Robson	386
Alloying with Silicon and Copper in Aluminum Alloys	
R. Mackay, R. Hausenbusch and J. Sokolowski	392
A Study of Bubble Entrainment as Related to Runner Velocity in Aluminum Sand Castings Using the Cosworth Process	
J.C. Burford and J. Sokolowski	398
Surface Treatment of Aluminum Alloy with Laser Irradiation to Increase Wear Resistance	
M. Enomoto, S. Kokubo and K. Nakata	404
Evaluation of Friction Spot Joining Weldability of Al Alloys for Automotive	
W.S. Chang, H.J. Cho, H.J. Kim and C.K. Chun	411
Atomic Bonding of Precipitate and Properties of Al-Cu-Mg Alloy	
Y.J. Gao, X.H. Hou and C.G. Huang	417
Robust Trimming of Automotive Panels	
S.F. Golovashchenko	423

Ultrasonic Leak Test for Automotive Brake Caliper C.H. Johnson, E.A. Druschitz and A.P. Druschitz	429
Influence of Vacancy Formation and Mg Migration on Cracking in Spot Welding AA5754 Alloys X.W. Wang, H.Y. Zhang and A.Q. Sun	433
Ageing Characteristics and Microstructural Evolution in Microalloyed Al Alloys Z.G. Chen, Z.Q. Zheng, J. Zhong and S.P. Ringer	438
Microstructural Aspects by Electron Microscopy Observed in Al-Mg Based Alloys after Special P/M Processes W.A. Monteiro, S.J. Buso and A. Almeida Filho	446
Microsegregation Effect of Copper in Solidification of A356 Alloy J.I. Cho, X. Yan, C.S. Kang, I.H. Oh, J.S. Lee, H.T. Son and J.C. Bae	452
Control of the Alloying Element Distribution in Al-Alloys by High Magnetic Fields Q. Wang, X.J. Pang, C.J. Wang, T. Liu, D.G. Li and J.C. He	457
The Influence of 0.1% Sc Addition on the Microstructure and Texture Development in Al-Zn-Mg-Cu-Zr Alloys D.S. Chung, C.W. Jea, N.J. Park and J.K. Kim	463
Substructures and Fatigue Crack Growth in HIPing and Semi-Liquid Die Casting A356 Alloys S.W. Han and H.M. Lee	469
Behavior Analysis of Environmental Hydrogen in High-Magnesium Al-Mg Alloys by Hydrogen Microprint Technique T. Izumi and G. Itoh	475
Effect of Mn Addition on the Mechanical Properties in Al-Cu-Li-Mg-Ag-Zr Alloys D.S. Chung, C.W. Jea, J.H. Yoon and J.K. Kim	481
Structure and Properties of AlMg3 Alloy with Sc and Zr V. Očenášek, B. Smola, I. Stulíková and J. Pelcová	487
Structure Development during ECAP and Subsequent Creep of Aluminium I. Saxl, V. Sklenička, L. Ilucová, M. Svoboda and P. Král	493
The Continuous Elimination of Inclusions in Molten Aluminum by Direct and Alternate Electromagnetic Force E.P. Yoon, J.P. Choi, Y.S. Seo and T.W. Nam	499

Biomaterials

2.

Nanostructured Shape Memory Alloys for Biomedical Applications K. Tsuchiya, Q.F. Cao, A. Hosokawa, M. Katahira, Y. Todaka and M. Umemoto	505
Nanotechnology: Better Materials for All Implants T.J. Webster	511
Cellular Activity and Biomaterial's Surface Topography B. Nebe, F. Luethen, R. Lange and U. Beck	517
A Prototype Continuous Flow Polymerase Chain Reaction LTCC Device K. Moeller, J. Besecker, G. Hampikian, A. Moll, D. Plumlee, J. Youngsman and J.M. Hampikian	523
Plasma and Electrospray Deposition to Improve the Biocompatibility of Stents M. Tatoulian, E. Gallino, R. Jafari, F. Arefi-Khonsari, L. Tatoulian, J.P. Borra, F. Lewis and D. Mantovani	529
An Injectable Biomaterial for Bone Repair C. Jarry, M. Shive and A. Chenite	535
Evaluating the In Vitro and In Vivo Efficacy of Nano-Dimensional Polymeric Scaffolds for Bladder Tissue Replacement Applications K.M. Haberstroh, M.A. Pattison, M. Kaefer and T.J. Webster	540
Soft Tissue Ingrowth in Metal Rods with Varying Surface Textures and its Clinical Significance W.G. Ward, T.L. Smith, E. Rosencrance, D.N. Deal, E. Dickerson and S. Holsenbeck	545
Biofunctional Materials for Nerve Regeneration Y.M. Kim, J. Gao, B. Zern and Y.D. Wang	547

Calcium Phosphate Films Coated on Titanium by RF Magnetron Sputtering for Medical Applications	
T. Narushima, K. Ueda, T. Goto, T. Katsube, H. Kawamura, C. Ouchi and Y. Iguchi	551
Mechanical Properties and Microstructures of Beta-Type Titanium Alloy for Biomedical Applications	
T. Akahori, M. Niinomi, H. Fukui and M. Ogawa	557
Biofunctional Hybrid of Titanium with Polymers	
T. Hanawa, H. Sakamoto and Y. Tanaka	563
Gamma-Poly(glutamic acid)/Chitosan Composite Scaffolds for Tissue Engineering Applications	
S.P. Tsai, C.Y. Hsieh, C.Y. Hsieh, Y.N. Chang, D.M. Wang and H.J. Hsieh	567
Degradation Studies of Some Polymeric Biomaterials: Polypropylene (PP) and Polyvinylidene Difluoride (PVDF)	
R.A. Silva, P.A. Silva and M.E. Carvalho	573
Chitosan Polyelectrolyte Complexes for Use in Tissue Engineering and Drug Delivery	
S. Bubeníková, I. Lacík, D. Bakoš and L. Vodná	577
Mechanical Characterization of Hydroxyapatite-Based, Organic-Inorganic Composites	
E.M. Rivera-Muñoz, R. Velázquez-Castillo and P. Muñoz-Alvarez	583
Spontaneous and Biomimetic Apatite Formation on Pure Magnesium	
D.A. Cortés-Hernández, H.Y. López and D. Mantovani	589
Electrostatic Nanomechanics of Cantilever Biosensors	
M. Merlo, F. Negretto, M. Soncini and F.M. Montevecchi	595
The Remineralizing Effect of Carbonate-Hydroxyapatite Nanocrystals on Dentine	
L. Rimondini, B. Palazzo, M. Iafisco, L. Canegallo, F. Demarosi, M. Merlo and N. Roveri	602
Tribological Characterization of Surface Treated Titanium for Orthopaedic Joints	
R. Chiesa, G. Cotogno, M. Franchi, S. Rivetti and U. Holzwarth	606
Investigation of the Hydroxyapatite Crystallites in Bone at the Interface with Implant by Neutron Diffraction	
A. Benmarouane, T. Hansen, P. Millet and A. Lodini	612
Preparation of Poly(Lactic Acid) Composites Containing Vaterite for Bone Repair	
T. Kasuga, A. Obata, H. Maeda and L.L. Hench	617
Ageing Studies of Plasma Deposited Organic Films by Surface Chemical Analysis (ESCA, ToF-SIMS, XAS)	
W.E.S. Unger, U. Oran, S. Swaraj and A. Lippitz	623
Common Features on Damage Mechanisms Identified on Various Metal and Ceramic on Polyethylene Articulating Surfaces of Total Hip Prostheses	
D. Najjar, F. Hennebelle, A. Iost and H. Migaud	629
Mechanical Properties and Biocompatibility of Porous Titanium Prepared by Powder Sintering	
I.H. Oh, H.T. Son, C.S. Kang, J.S. Lee, J.I. Cho, J.C. Bae, B.T. Lee and H.Y. Song	635
Receptor-Mediated Gene Delivery Using Chitosan Derivatives In Vitro and In Vivo	
T.H. Kim, J. Hua, H.W. Kim, M.H. Cho, J.W. Nah, Y.J. Choi and C.S. Cho	641
Microstructures and Mechanical Properties of Biologically-Inspired Ti-Nb Based Alloys with Ternary Element Additions	
H.S. Kim and W.Y. Kim	647
Calcium Phosphate Precipitation by Galvanic Current between Titanium and Gold in Pseudo-Body Fluid	
E. Kobayashi, M. Ogo, H. Doi, T. Yoneyama, K. Noda and T. Hanawa	653
Preparation and Characterization of Octyl Methoxy Cinnamate (OMC; 2-Ethylhexyl-p-Methoxy Cinnamate)-Trapped Mesoporous Silica Using Lecithin	
K.S. Chung, J.C. Lee, K.C. Lee, J.E. Lee, S.Y. Eom, Y.C. Park and B.C. Dave	657
Different Processing Methods to Obtain Porous Structure in Shape Memory Polymers	
S. Farè, L. de Nardo, S.D. Cicco, M. Jovenitti and M.C. Tanzi	663
Carbon Nanotubes Grown by Catalytic CVD on Silicon Based Substrates for Electronics Applications	
R. Rizzoli, R. Angelucci, S. Guerri, A. Parisini, G.P. Veronese, V. Vinciguerra and M.F. Bevilacqua	669
Variation in Bone Quality during Regenerative Process	
T. Nakano, T. Ishimoto, Y. Umakoshi and Y. Tabata	675

Fretting Fatigue Studies of Surface Modified Biomedical Titanium Alloys A. Vadiraj and M. Kamaraj	681
Formation and In Vitro and In Vivo Evaluation of Surface Modified Implants by HAp, Carbonated-HAp and Titanium Oxide M. Okido, R. Ichino and K. Kuroda	687
U.S. FDA Perspective on the Regulation of Cyanoacrylate Polymer Tissue Adhesives in Clinical Applications G.J. Mattamal	692
Trivalent and Hexavalent Chromium Issues in Medical Implants L.E. Eiselstein, D.M. Proctor and T.C. Flowers	698
Cell Interactions with PDMS Surfaces Modified with Cell Adhesion Peptides Using a Generic Method H. Sheardown, M.A. Brook and H. Chen	704
In Vivo and In Vitro Evaluation of Coated HAp Films with Different Surface Morphology K. Kuroda, R. Ichino and M. Okido	710
Alignment of HAp Crystal Using a Sample Rotation in a Static Magnetic Field K. Iwai, J. Akiyama, T. Tanase and S. Asai	716
Porous Titanium with Porosity Gradients for Biomedical Applications C.E. Wen, Y. Yamada, A. Nouri and P. Hodgson	720
Effects of TiN Film Coating on the Electrochemical Behaviors of Dental Implant Screw Surface Y.M. Ko and H.C. Choe	726
Effect of Calcium Phosphate Glass on Proliferation and Differentiation of MG-63 Cells in HA Scaffolds Y.U. Kim, R.Z. LeGeros, K.N. Kim, K.M. Kim and Y.K. Lee	731

Composites

	3.
Influence of Applied Tensile and Bending Strains on Local and Overall Critical Current of Multifilamentary Bi2223-Composite Superconductor S. Ochiai, D. Doko, H. Okuda, S.S. Oh, D.W. Ha, M. Tanaka, M. Hojo, K. Osamura and M. Miura	739
High Temperature Deformation Behavior and Microstructure Change in Nano Grain Composites N. Miyano, Y. Kumagai, M. Yoshimoto, S. Tanaka, K. Isonishi and K. Ameyama	745
Corrosive-Erosive Wear Studies of Al6061/Albite Composites S.C. Sharma, M. Krishna and H.N.N. Murthy	751
Mechanical Properties of Composite Materials Consisting of M3/2 High Speed Steel Reinforced with Niobium Carbides J.A. Jiménez, G. Frommeyer, M. López, N. Candela and O. Ruano	756
Development of New Low Cost Discontinuously Reinforced Titanium Composites for Commercial Applications M. García de Cortázar, J. Goñi, J. Coletto, I. Agote, P. Egizabal and Y. Lepetitcorps	763
Low Pressure Infiltration of Molten Aluminum Alloy to Metal Fiber Preform G. Sasaki, Y.B. Choi, K. Matsugi, N. Sorita, S. Kondoh and O. Yanagisawa	769
Importance of Composite Design for the Microstructure of Bundle Drawn Multifilamentary Nb₃Sn Wires R. Taillard, S. Guyot and C. Verwaerde	773
SLEEM Study of MgAl₂O₄ at Interface between Al₂O₃ and Matrix in Al₂O₃/Al Alloy Composite Materials S. Ikeno, K. Matsuda, I. Müllerová and L. Frank	779
Reducing Threshold Pressure for Infiltration of Al-12Si Alloys into Carbon Particle Compacts by Placing a Thin Layer of Sn at the Infiltration Front A. Rodríguez-Guerrero, J. Narciso, E. Louis and F. Rodríguez-Reinoso	785
Processing Ti-Al-Nb Composite Sheet Materials Using Cold Roll Bonding and Reaction Annealing V.L. Acoff and R.G. Zhang	791

Evaluation of Wear Behavior of Feldspar Particles Reinforced Copper Alloy Composite Materials B.M. Satish and B.M. Girish	797
Development of High Strength Mo₂NiB₂ Ternary Boride Base Cermets Produced by Reaction Boronizing Sintering K. Takagi, Y. Yamasaki and K. Hirata	803
Combustion Synthesis of TiB₂ Particle Dispersed Metal Matrix Composites K. Matsuura and Y. Obara	809
Plasticity Mechanisms in Multi-Scale Copper-Based Nanocomposite Wires L. Thilly, V. Vidal and F. Lecouturier	814
Phase Transformation and its Effect on Dry Sliding Wear of Electro-Pressure Sintered Cobalt and Cobalt-Base Composites Y.S. Kim, S.H. Kang and T.W. Kim	820
Effect of Milling Condition on Properties and Microstructure of Copper Reinforced with 1% vol. NbC M. López, J.A. Jiménez and R. Benavente	826
Laser Zone-Remelted Alumina-Based Eutectic In Situ Composite J. Zhang, H.J. Su, L. Liu and H.Z. Fu	832
Crystal Structure of the β'-Phase in Al-Mg-Si-Ag Alloy K. Matsuda, J. Nakamura, Y. Nakamura, T. Sato and S. Ikeno	837
Polymer Nanocomposites as Candidates for Tribological Applications M.Q. Zhang, M.Z. Rong and K. Friedrich	842
Analysis of Fine Stress Fields in Metal Matrix Composites Using HOLZ Patterns M. Shibata, Y. Takemoto and I. Shimizu	848
Mechanically Alloyed P/M Composites of Al-Mg-Silicide and Al-Mg-Oxide Systems J. Kaneko, M. Sugamata and H. Akiyama	854
Synthesis of Carbon Nanotube-Reinforced Al Matrix Composites J.H. Ahn, Y.L. Wang, Y.J. Kim, S.J. Kim and H.S. Chung	860
Fabrication and Corrosion Properties of Iron Aluminum Alloy/Steel Laminated Composite Prepared by Clad Rolling N. Masahashi, M. Oku, S. Watanabe and S. Hanada	866
Fabrication and High Temperature Creep Behavior of In Situ Synthesized (TiB+TiC)/Ti Composites L. Geng, Z.Z. Zheng and H.L. Wang	872
Wettability of Basal and Prismatic Plane of Graphite by Molten Aluminum-Magnesium Alloy M. Yoshida, T. Matsunaga, K. Ogata, T. Hatayama and K. Shinozaki	877
Fabrication of Nano-Laminar Glass/Metal Composites by Sintering Glass Flakes H. Kakisawa, K. Minagawa, S. Takamori and Y. Osawa	883
Estimation of Critical Composition for the Transition from Brittle to Ductile in W-Cu Composites Y. Hiraoka, H. Hanado, T. Inoue, N. Akiyoshi and M.K. Yoo	889
Structure and Properties of PM Composite Materials Based on EN AW-AlCu4Mg1(A) Aluminium Alloy Reinforced with the Ti(C,N) Particles L.A. Dobrzański, A. Włodarczyk-Fligier and M. Adamiak	895
Bend and Shear Tests: Suitable Methods for Mechanical Characterization of Laminated Composite Materials F. Carreño, M. Pozuelo, J.A. Jiménez and O. Ruano	901
Binder-Free Tungsten Carbide Fabricated by Pulsed Current Sintering K. Shimojima, H. Hosokawa, T. Nakajima, M. Mizukami and Y. Yamamoto	907
Study of Environmental Corrosion Behavior and Mechanism of the Carbon/Epoxy Composite X.F. Li, Q. Zhang and J.H. Xu	913
Effects of Spatial Distribution of Defects on Bending Deformation and Critical Current in Bi2223/Ag Superconducting Composite Tapes M. Hojo, M. Nakamura, M. Tanaka, T. Adachi, M. Sugano, S. Ochiai and K. Osamura	919
Mechanical Properties of the MG-Based Amorphous/Nano Zirconia Composite Alloy L.J. Chang, J.H. Young, P.T. Chiang, J.S.C. Jang, J.C. Huang and C.Y.A. Tsao	925

Production of MMCs on the Basis of Fibres Coated with the Metal Alloy by Magnetron Sputtering	
P. Peters, J. Hemptenmacher and H. Schurmann	931
Stacking Faults and Growth Mechanism of In Situ TiB Whiskers and Interface Structures in SPSeD TiB/Ti(FeMo) Composites	
Y. Zhou, H.B. Feng, D.C. Jia and Q.C. Meng	936
High Performance Soft Magnetic Composite (SMC) Produced by Improved Process	
K. Morimoto and R. Nakayama	942
Synthesis and Characterization of Exfoliated Natural Mica/Polymer Nanocomposites	
K. Tamura, H. Uno and H. Yamada	948
A Novel Forming Process of Copper Cladding Aluminum Composite Materials with Core-Filling Continuous Casting	
J.X. Xie, C.J. Wu, X.F. Liu and X.H. Liu	956
The Effect of Boron on the Hardness and Fracture Toughness of WC-FeAl-B and WC-Ni₃Al-B Composites	
M. Ahmadian, D. Wexler, A. Calka and T. Chandra	962
Embossing on Epoxy Thermoset Polymer Using SiO₂ Coated Nickel Template	
K.J. Byeon, S.H. Hong, K.Y. Yang, D.K. Kim and H. Lee	968
An Analysis on the Tensile Strength of Hybridized Reinforcement Filament Yarns by Commingling Process	
C.N. Herath, B.B. Hwang, B.S. Ham, J.M. Seo and B.C. Kang	974
An Assessment of Mechanical Properties of Geo-Grid Reinforced Material and its Applicability	
B.B. Hwang, Y.H. Lee, K.H. Min, J.M. Seo and H.Y. Jeon	979
Creep Properties of Alborex Reinforced AZ31 Matrix Mg Composites Containing Ag	
S.D. Hwang, Y.H. Park, D.H. Song, M.S. Lee, K.M. Cho, I.M. Park and Y.H. Park	983
A Study on the Chemical Resistance of GT Composites	
H.Y. Jeon, Y.H. Lee, J.M. Seo, B.B. Hwang and H.S. Koo	988
Microscopic Evaluation of Commingling-Hybrid Yarns	
B.C. Kang, K.H. Min, Y.H. Lee, B.B. Hwang and C.N. Herath	992
Internal Friction and Young's Modulus of 9Al₂O₃ 2B₂O₃ Whisker Reinforced Aluminum Matrix Composite	
C.S. Kang, I.H. Oh, J.I. Cho, J.S. Lee, C.H. Yun, H.T. Son, H.L. Cha and J.C. Bae	997
Novel Processing of Porous Titanium Composite for Producing Open Cell Structure	
M. Kobashi and N. Kanetake	1004
Titanium Carbide Particulate Reinforced Titanium Based Composite by In Situ Process	
M.G. Kim and Y.J. Kim	1010
Effect of Vacuum Infiltration Boehmite Gel on Tribological Behavior of Friction Materials	
K.J. Lee, S.W. Lee and J.S.C. Jang	1016
Particle Size Effects on Complex Permeability and Electromagnetic Wave Absorption Properties of Amorphous Alloy-Epoxy Composites	
K.M. Lim, M.C. Kim, C.G. Park and Y.M. Hong	1022
Novel Separation Technique of Particle Reinforced Metal Matrix Composites by Fused Deposition Method	
M. Mizumoto, T. Ohgai and A. Kagawa	1028
Mechanical Properties of Porous Titanium Compacts Reinforced by UHMWPE	
N. Nomura, Y. Baba, A. Kawamura, S. Fujinuma, A. Chiba, N. Masahashi and S. Hanada	1033
Effects of Fillers on Electrical Properties of PTFE Composites for Circuit Breaker	
H.Y. Park, D.P. Kang, M.S. Ahn, H.W. Lee, S.Y. Yoon and S.S. Park	1038
An Experimental Study on the Frictional Property and Long-Term Performance of GT/HDPE Composites	
J.M. Seo, H.Y. Jeon, B.B. Hwang, Y.H. Lee and H.S. Koo	1043
Preparation of SiC/MoSi₂ Composites by Mechanical Alloying and its Fracture Properties	
H.M. Wu, C.J. Hu and Y.H. Chou	1047

Surface Engineering/Coatings

Effect of Al Content on Corrosion Resistance of (Ti_{1-x}Al_x)N Coatings under NaCl Deposit in Wet Oxygen at 600°C C.J. Feng, M.S. Li, L. Xin, S.L. Zhu and F.H. Wang	1055
Enhancement of TBC (Thermal Barrier Coatings) Characteristics by Gas Tunnel Type Plasma Spraying A. Kobayashi	1061
Local Approach to Thermally-Sprayed Coating/Substrate Adhesion through LASAT (Laser Shock Adhesion Test) S. Barradas, M. Jeandin, R. Molins, F. Borit, L. Berthe, C. Bolis, M. Boustie, M. Arrigoni and M. Ducos	1067
Self-Lubrication and Wear Behavior of TiC/a-C:H Nanocomposite Coatings Y.T. Pei, P. Huizenga, D. Galvan and J.T.M. de Hosson	1074
Grain Refinement of Metal Surface Using Hot Shot Peening Y. Harada, K. Fukaura and N. Tsuchida	1080
Adhesion Study of Cold-Sprayed CoNiCrAlY-Mo Coating of Inconel 625 Using the Laser Shock Adhesion Test (LASAT) Y. Ichikawa, K. Ogawa, M. Nivard, L. Berthe, M. Boustie, M. Ducos, S. Barradas and M. Jeandin	1086
Recrystallization in NiCoCrAlY Coated DS Nickel Base Superalloys during Thermal Aging Q.M. Wang, Y.J. Tang, J. Zhang, J. Gong, C. Sun and L.S. Wen	1092
Fabrication Routes of Microsized Electrochemical Biosensors Based on Single-Walled Carbon Nanotubes F. Valentini, S. Orlanducci, M.L. Terranova and G. Palleschi	1098
Interface Microstructure and Adhesion of Zinc Coatings on TRIP Steels G.M. Song, W.G. Sloof, T. Vystavel and J.T.M. de Hosson	1104
Evaluation with Surface Analysis Equipment, of Casting Defects in Cast Iron Articles (review) H. Kambayashi, Y. Kurokawa, H. Ota, Y. Hoshiyama and H. Miyake	1110
Laser Shock Processing as a Method for the Improvement of Metallic Materials Surface Properties: A Discussion on the Influence of Combined Mechanical and Thermal Effects J.L. Ocaña, M. Morales, C. Molpeceres, J.A. Porro and A. García-Beltrán	1116
Electrochemical Performance of LiNi_{1/3}Co_{1/3}Mn_{1/3}O₂ with Al₂O₃ Nano-Particle Coating H.S. Kim, Y.S. Kim, S.I. Kim and S.W. Martin	1122
Plasma Spray Deposition of Hydroxyapatite Coatings from Sol Precursors T.W. Coyle, E. Garcia, Z. Zhang and L. Gan	1128
In Situ and Ex Situ Investigation of the Spallation of Thermally Grown Oxides P. Lours, Y.H. Qi, Y. Le Maoult and B. Pieraggi	1134
Surface Modification of Steel Using Liquid Jet Peening (Fatigue Performance) R. Gnanamoorthy and A. Sahaya Grinspan	1140
High Temperature Oxidation Resistance of Two Ni(Co)CrAlYSi(Hf) Overlay Coatings Z.H. Huang, Y.N. Tan, X.H. Zhao, J.P. Li and Q. Zhang	1146
Effect of Laser Surface Treatment on Microstructure and Properties of MRI 230D Mg Alloy A.K. Mondal, S. Kumar, C. Blawert and N.B. Dahotre	1153
Cutting Properties of PVD and CVD Coated Al₂O₃ + TiC Tool Ceramic M. Sokovic, L.A. Dobrzański, J. Kopač and L. Kosec	1159
Correlation of Microstructure with Hardness and Corrosion Resistance of Surface Alloyed Materials Fabricated with Fe-Based Metamorphic Powders by Accelerated Electron Beam Irradiation Method D.H. Nam, K.H. Lee, S.H. Lee, N.J. Kim and K.Y. Kim	1165
Numerical Simulation of Thermal History in a Novel Spray Forming Process Y.Z. Liu and Y.Y. Li	1171
Modelling of Nitrogen Deposition Pressure Effect on Grain Size Development and Mechanical Properties of Nanocrystalline Ternary Nitride Coatings R. Wuhrer and W.Y. Yeung	1177
Prospective Applications of Gas-Eutectic Porous Materials (Gasars) in USA V. Shapovalov	1183
Novel High Temperature-Oxidation-Resistant Nanocomposites Developed by Nanocomposite Electrodeposition X. Peng, X. Yang, Y. Zhang, Y. Zhou and F. Wang	1188

Deposition of Multi-Functional Coatings by Physical Vapour Deposition W. Tillmann, E. Vogli and J. Nebel	1194
High-Temperature Tribological Properties of Barite-Type-Sulfate-Coated Substrates with Different Isoelectric Points T. Murakami, K. Umeda, S. Sasaki and J.H. Ouyang	1200
Microstructural Evolution of Durable Thermal Barrier Coatings with Hf and/or Y Modified CMSX-4™ Superalloy Substrates J. Liu, Y.H. Sohn and K.S. Murphy	1206
The Effects of Process Parameters on Mechanical Property and Visual Aspect of Plasma Sprayed Y2O3 Coating H.K. Seok, J.G. Lee and K.H. Baik	1212
Microstructure Characterization and Modeling of Splat Formation during Air Plasma Spraying for Inconel 625 Superalloy F. Azarmi, A. Moradian, J. Mostaghimi, T.W. Coyle and L. Pershin	1218
Mechanical and Electrochemical Properties of Plasma Electrolytic Oxide Coatings on Magnesium Alloys S.Y. Chang, Y.L. Kim, B.H. Song and J.H. Lee	1224
Characteristics of Gallium Oxide Nanowires Synthesized by the Metalorganic Chemical Vapor Deposition H.W. Kim and S.H. Shim	1230
Formation and Characteristic of Room Temperature Electrolytic Sulfidized Coating on Hard Steel Substrate J.H. Jiang, J.Q. Jiang, A. Ma and P.H. Lin	1236
Prediction of Softening of High Speed Steel with Surface Nitriding for Hot Forging A. Minami, Y. Marumo and H. Saiki	1242
Surface Modification Technique Using Interfacial Reaction between Ti-Al Alloy and Steel Y. Morizono, M. Nishida, Y. Kodama, T. Yamamuro and Y. Ohno	1248
Electrodeposition of Metallic Nanowires in Nanoporous Polycarbonate Films T. Ohgai, M. Mizumoto, S. Nomura and A. Kagawa	1253
Analysis on the Microstructure of Ceramic Coating Layer Fabricated by Plasma Electrolytic Oxidation M.R. Ok, E.Y. Kang, J.H. Kim, Y.S. Ji, C.W. Lee, Y.J. Oh and K.T. Hong	1258
Improvement in Wear Resistance of Nano WC-Co Coatings Fabricated by Detonation Gun Spraying S.Y. Park, M.C. Kim and C.G. Park	1264
Corrosion Characteristics of TiN and ZrN Coated Ti-Nb Alloy by RF-Sputtering J.J. Park, H.C. Choe and Y.M. Ko	1270
Zn-Al-Mg Coatings: Thermodynamic Analysis and Microstructure Related Properties E. De Bruycker, Z. Zermout and B.C. De Cooman	1276
Microstructural Features of Plasma Nitrided Molybdenum Alloy Steel M.J. Franklin, S.W. Huang, T. Chandra and A.K. Tieu	1282
Comparison with Physics and Chemical Property of SBS/AA Copolymer Using Thermal Polymerization and UV Graft-Polymerization Methods K.S. Chen, S.C. Chen, Y.C. Yeh, H.R. Lin, W.F. Lee and H.H. Lee	1288
The Influence of Powder Types and Plasma Spray Conditions on Abrasive Wear of Nanostructured and Conventional Al₂O₃/TiO₂ Coatings Y. Wang, D.L. Wang, G. Liu, W. Tian and C.H. Wang	1294

Hydrogen and Fuel Cell Technologies

5.

Lifetime of PEMFCs L. Jörissen, W. Lehnert, J. Garche and W. Tillmetz	1303
Solid Oxide Fuel Cell (SOFC) Development in Denmark S. Linderroth, P.H. Larsen, M. Mogensen, P.V. Hendriksen, N. Christiansen and H. Holm-Larsen	1309
Manufacturing of Solid Oxide Fuel Cells - Bridging the Gap from Laboratory to Industry N.H. Menzler, H.P. Buchkremer, J. Ernst, R. Kauert, J. Ruska, D. Stöver and S. Stolz	1315
Fuell Cell and Hydrogen Vehicles - State of the Art and Challenges for Improved Materials P. Treffinger, A. Brinner, R. Schöll and H.E. Friedrich	1321

Proton Exchange Membrane Development and Processing for Fuel Cell Application P. Bébin and H. Galiano	1327
Suspension Plasma Spraying of Intermediate Temperature SOFC Components Using an Axial Injection DC Torch J. Oberste Berghaus, J.G. Legoux, C. Moreau, R. Hui and D. Ghosh	1332
Short Stack Performance of Intermediate Temperature - Operating Solid Oxide Fuel Cells with Hydrocarbon Fuel Processor J. Bae, H. Jee, J. Kim and Y.S. Yoo	1338
Pulsed Laser Deposition of $\text{Sm}_{0.2}\text{Ce}_{0.8}\text{O}_{1.9}/\text{Zr}_{0.9}\text{Sc}_{0.1}\text{O}_2$ Bilayer Films for Fuel Cell Application D.F. Yang	1344
Ni-Fe Bimetallic Anode for Intermediate Temperature Solid Oxide Fuel Cells Using LaGaO_3 Based Oxide Electrolyte T. Ishihara, M. Shinagawa, A. Kawakami and H. Matsumoto	1350
Solid - Phase Synthesis of Carbon Nanoparticles and their Application to Direct Methanol Fuel Cell J.M. Shen, G.Q. Lv, N. Zhang, S.S. Zhang, X.H. Kang and H. Zhu	1356
Preparation of High Surface Area $\text{La}_{0.1}\text{Ca}_{0.9}\text{MnO}_3$ and its Electrochemical Activities Y. Kiros and M. Pirjamali	1361
Processing and Properties of Advanced Solid Oxide Fuel Cells D. Stöver, H.P. Buchkremer, A. Mai, N.H. Menzler and M. Zahid	1367
Synthesis and Sintering Behavior of Nano Crystalline Gd-Doped Ceria S.H. Jo, J.H. Kim and D.K. Kim	1373
Development of Zirconium Based Non-Platinum Cathode for Polymer Electrolyte Fuel Cell A. Ishihara, S. Doi, Y. Liu, S. Mitsushima, N. Kamiya and K. Ota	1379
Plasma Spray Processing of Solid Oxide Fuel Cells O. Kesler	1385
A Study on Co and Cu Oxides as Sintering Aids for $\text{Sm}_{0.2}\text{Ce}_{0.8}\text{O}_{1.9}$ Electrolyte X.G. Zhang, C. Decès-Petit, S. Yick, M. Robertson, W. Qu, Y.S. Xie, R. Hui, E. Styles, J. Roller, O. Kesler, R. Maric and D. Ghosh	1391
A Mathematical Model of Ultra-Thin Catalyst Layer in PEFC Q.P. Wang, M. Eikerling, D.T. Song and Z.S. Liu	1397
Development and Demonstration of Membrane Reformer System for Highly-Efficient Hydrogen Production from Natural Gas I. Yasuda and Y. Shirasaki	1403
First-Principle Molecular-Dynamics Study of Hydrogen and Aluminium Nanowires in Carbon Nanotubes K. Doi, H. Nakano, H. Ohta and A. Tachibana	1409
Sintering of Mixed-Conducting Composites for Hydrogen Membranes from Nanoscale Co-Synthesized Powders N.L. Canfield, J.V. Crum, J. Matyas, A. Bandyopadhyay, K.S. Weil, L.R. Pederson and J.S. Hardy	1415
Mechanical Strength and Interface Adhesion of a Solid Oxide Fuel Cell with Doped Ceria Electrolyte Y.S. Xie, X.G. Zhang, M. Robertson, R. Maric and D. Ghosh	1421
Studies on Suppression of Hydrogen Evolution Reaction for Zinc/Air Fuel Cell C.W. Lee, K. Sathiyarayanan, S.W. Eom and M.S. Yun	1427
The Development of the Composite Materials for the Bipolar Plate of the Fuel Cell S.Y. Luo, Y.C. Chen and W.H. Wen	1431
Design of Micro-Structure at Atom Level in Dy Doped CeO_2 Solid Electrolytes for Fuel Cell Applications T. Mori, J. Drennan, D.R. Ou and F. Ye	1437
Neutron Incoherent Scattering Measurements on Hydrogen-Charged Zircaloy-4 E. Garlea, V.O. Garlea, H. Choo, C.R. Hubbard and P.K. Liaw	1443

Intermetallics

Beneficial Effects of Boron Addition into γ-TiAl Alloys Z.X. Li, X. Huang, L.C. Qi and C.X. Cao	1451
Identification of the Chirality and Polarity of Intermetallic Compounds with the Point Groups of 23, 432, 422, and 321 by Electron Diffraction H. Inui, K. Tanaka, K. Kishida and S. Fujio	1457
Vacuum Induction Melting and Investment Casting Technologies Tailored to Near-Gamma TiAl Alloys A. Dlouhý, K. Dočekalová and L. Zemčík	1463
Processing and Mechanical Properties of RuAl-Based Alloys T.D. Reynolds, M. Acosta and D.R. Johnson	1469
Analysis of the Solidification Microstructure of Multi- Component γ-TiAl Alloys M. Oehring, V. Küstner, F. Appel and U. Lorenz	1475
A Numerical Model for the Description of Massive and Lamellar Microstructure Formation in Gamma-TiAl A. Jacot and A. Rostamian	1481
Cold-Working and Annealing of L1₀-Ordering Iron-Palladium Base Intermetallics J.M.K. Wiezorek	1487
Microstructures and Mechanical Properties of Directionally Solidified Intermetallic Composites H. Bei and E.P. George	1495
Effects of Hf on the Microstructure and Mechanical Properties of TiAl Base Alloys J. Muellauer, M. Oehring and F. Appel	1501
Microstructural Control of Nb-Si Alloy with Invariant Reactions S. Miura, J.H. Kim, K. Ohkubo, Y. Kimura, N. Sekido, Y. Mishima and T. Mohri	1507
Texture Memory Effect in Heavily Cold-Rolled Ni₃Al Single Crystals M. Demura, Y. Xu and T. Hirano	1513
A Study of Recrystallization and Phase Transitions in Intermetallic Titanium Aluminides by In Situ High-Energy X-Ray Diffraction K.D. Liss, A. Bartels, H. Clemens, S. Bystrzanowski, A. Stark, T. Buslaps, F.P. Schimansky, R. Gerling and A. Schreyer	1519
Influence of Step Aging on Creep Behavior and Microstructural Evolution of Fine-Grained Fully Lamellar XD TiAl Alloys H.L. Zhu, D.Y. Seo, K. Maruyama and P. Au	1525
High Temperature Deformation Behavior of Beta-Gamma TiAl Alloy J.S. Kim, Y.H. Lee, Y.W. Kim and C.S. Lee	1531
Processing of Gamma-Based TiAl Alloys by Torsional Deformation U. Fröbel and F. Appel	1537
Microstructure and Creep of γ-TiAl Containing β-Stabilizer D.Y. Seo, H. Saari, P. Au and J. Beddoes	1543
Tensile Properties and Creep Behavior of Compositional Modified Orthorhombic Ti₂AlNb Alloys Y. Mao and M. Hagiwara	1549
Influence of Mechanical Surface Treatments on the Fatigue Performance of the Gamma TiAl Alloy Ti-45Al-9Nb-0.2C J. Lindemann, A. Kutzsche, M. Oehring and F. Appel	1553
Thermo-Mechanical Fatigue Behaviour of the Gamma-Titanium Aluminide TNB-V5 with Near-Gamma Microstructure M. Roth and H. Biermann	1559
Microstructure and Hardness of Scandium Trialuminide with Ternary Rare-Earth Additions Y. Harada and D. Dunand	1565
Deformation and Fracture Analysis of a Duplex γ-TiAl Alloy during Low Cycle Fatigue W.F. Cui, C.M. Liu, V. Bauer and H.J. Christ	1571
Effects of Minor Yttrium Addition on Microstructure, Mechanical Properties and Hot Workability of Nb or V Containing TiAl Alloys Y.Y. Chen, B.H. Li, F.T. Kong, Z.G. Liu and J. Tian	1577
Intergranular and Pitting Corrosion Behavior of Fe-25Al-6Cr Intermetallic Compounds Containing Mo, Nb and B H.C. Choe, S.J. Park, S.W. Eun and Y.M. Ko	1583

High Temperature Strength of Ni-Al-Cr Based Alloys Containing Refractory Elements for Advanced Die Materials W.Y. Kim	1589
Grain Boundary Precipitation and Tensile Ductility of Fe-Mn-Ni Alloys Y.U. Heo, S.H. Mun and H.C. Lee	1595
Magnesium Alloys	7.
Brazing of AZ31B Magnesium Alloy Sheet T. Watanabe and K. Oohara	1603
Observations on the Thermal Response and Mold Filling Behavior of an AZ91E Magnesium Alloy Cast by the Lost Foam Casting Process L. Bichler and C. Ravindran	1609
Enhancement of Press Formability of Rolled Mg Alloy Sheet by Using Cross Rolling Processes Y. Chino, K. Sassa, A. Kamiya and M. Mabuchi	1615
New Phases in the Mg-Al-Sr System M. Medraj, M.A. Parvez, E. Essadiqi and J. Li	1620
Cyclic Deformation Behaviour and Potential Automobile Application of Magnesium Die Casting Alloys AZ91 and AM50 Z. Liu, H.T. Ji, L. Lin, L.J. Chen, W. Wu and L. Yang	1626
Effect of Initial Grain Size and Strain Path on Grain Refinement in Magnesium Alloy AZ31 X.Y. Yang, H. Miura and T. Sakai	1632
Mechanical Joining of Magnesium Components by Means of Inductive Heating - Realization and Capability O. Hahn and M. Horstmann	1638
Selected Aspects of Semisolid Forming Magnesium Alloys F. Czerwinski	1644
Properties of AZ31 and AZ91 Sheets Made by Twin Roll Casting M. Numano, N. Mori, Y. Nakai and N. Kawabe	1650
Superior Corrosion Resistance and Mechanical Properties of a Mg Alloy Recycled by Solid-State Process Y. Chino and M. Mabuchi	1656
Effect of RE Elements and Ni Contents on the Microstructure and Mechanical Properties of Rapidly Solidified Mg Ribbons S. Gonzáles, P. Pérez, G. Garcés and P. Adeva	1662
Mechanism of Crack Nucleation Analysed by In Situ Observation on Mg-Al-Zn Alloy G.F. Quan and L.M. Cai	1669
The Influence of Rolling Parameters on Microstructure and Mechanical Properties of the As-Rolled AZ31 Magnesium Alloy Sheet H.G. Jeong, J.B. Lee, W.J. Kim, S.J. Lim and S.G. Choi	1675
Corrosion Properties of Supersaturated Magnesium Alloy Systems C. Blawert, V. Heitmann, W. Dietzel, M. Störmer, Y. Böhne, S. Mändl and B. Rauschenbach	1679
Mechanical Properties and Damping Behavior of Magnesium Alloys Processed by Equal Channel Angular Pressing M.Y. Zheng, X.S. Hu, S.W. Xu, X.G. Qiao, K. Wu, S. Kamado and Y. Kojima	1685
Development of Conductive Anodic Oxidation Coatings on AZ91D Magnesium Alloy M. Hino, K. Murakami, M. Hiramatsu, A. Saijo and T. Kanadani	1691
Effects of Tool Radius on Formability during Forging of AZ80 Magnesium Alloy Wheel Q. Wang, Z.M. Zhang, B.C. Li and B.H. Zhang	1696
Development of a High Strength Mg-Zn-Y-Zr Wrought Alloy R. Chen, W.N. Tang, D.K. Xu and E.H. Han	1701
Influence of Misch Metal Addition and Deformation Processes on Microstructure and Mechanical Properties in AZ61 Alloy S.B. Kang, H.W. Kim, S.S. Jeong and J.W. Kim	1707
Texture Evolution during Uniaxial Compression of Hot-Rolled AZ31 Mg Alloy S.H. Choi, B.J. Kim, S.I. Kim and U.S. Joon	1713

Investigation and Application of Excellent Performance Mg Rare Earth Alloys as a Structural Material	
L.M. Wang, Q.M. Peng, J. Yang, D.Q. Fang, Y.M. Wu, H.F. Liu, J. Meng and H.J. Zhang	1719
The Effect of Twinning on Strain Rate Sensitivity during the Compression of Extruded Magnesium Alloy AZ31	
C.H.J. Davies	1723
Effect of Solidification Grain Refinement on the Development of Wrought Mg Alloys	
M. Easton, C.H.J. Davies, M.R. Barnett and F. Pravidic	1729
Evolution of Microstructures during Laser Surface Cladding of Magnesium Alloy Castings Using Welding Wire	
X.J. Cao, M. Xiao, M. Jahazi and T. Shariff	1735
Linking Meso- and Macroscale Simulations: Crystal Plasticity of hcp Metals and Plastic Potentials	
D. Steglich, S. Graff and W. Brocks	1741
Microstructure and Mechanical Properties of Mg Alloy Sheets Produced by Twin Roll Caster	
K. Matsuzaki, K. Hatsukano, Y. Torisaka, K. Hanada, T. Shimizu and M. Kato	1747
Press Forging of Magnesium Alloy AZ31 Sheets	
S.H. Zhang, Z.G. Li, Y.C. Xu, L.M. Ren, Z.T. Wang and L.X. Zhou	1753
Effects of Differential Speed Rolling on Microstructure and Mechanical Properties of AZ31 Magnesium Alloy	
X.S. Huang, K. Suzuki, Y.J. Kwon, A. Watazu, I. Shigematsu and N. Saito	1759
Influence of Microstructural Change on Damping Capacity of Mg-X%Li Alloys	
J.H. Jun, K.D. Seong, J.M. Kim, K.T. Kim and W.J. Jung	1764
HRTEM Observation of the Precipitates in Heat-Resistant Mg-Gd-Y-Zr Alloy	
T. Kawabata, Y. Fukuda, K. Matsuda, S. Kamado, Y. Kojima and S. Ikeno	1769
Effects of Zn and Sn Additions on the Mechanical Properties of Mg-3%Al Alloy	
J.M. Kim, J.M. Lee, J.H. Jun, K.T. Kim and W.J. Jung	1775
Microstructure and Texture Evolution during Large Strain Hot Rolling of AZ31 Mg Alloy	
J.S. Lee, H.T. Son, I.H. Oh, J.I. Cho, C.S. Kang and J.C. Bae	1780
Microstructural Characteristics and Creep Properties of Mg-5Al-2Si Alloys Modified with Sn and Sr	
D.H. Song, C.W. Lee, K.Y. Nam, S.W. Lee, Y.H. Park, K.M. Cho and I.M. Park	1784
Effect of Aluminum on the Microstructural Characteristics and High Temperature Properties of Mg-xAl-Zn Alloys	
D.H. Song, S.W. Lee, Y.D. Park, Y.H. Park, K.M. Cho and I.M. Park	1790
Method for Horizontal Continuous Casting of AZ31B Slab	
K. Tada	1796
Hydrogenation and Degradation Behaviors of Mg-Ni Alloys	
W. Ha, J.I. Youn and Y.J. Kim	1802
Evolution of Microstructure of Magnesium Alloy AZ91D Solidified with Low-Voltage Electric Current Pulses	
Y.S. Yang, Q. Zhou, W.H. Tong, M.X. Liang and Z.Q. Hu	1807
Microstructure Evolution of AZ31 Magnesium Alloy during Warm Compression Forming	
Z.M. Zhang, Q. Wang, B.C. Li and X. Zhang	1813
The Microstructure of AZ 31 Magnesium Alloy by Forward Extrusion with Various Extrusion Parameters	
D.J. Yoon, K.H. Na and C.D. Cho	1818

Metallic Foam

8.

Integral Foam Molding - A New Process for Foamed Magnesium Castings	
M. Hirschmann, C. Körner and R.F. Singer	1827
Preparation and Characterisation of Open-Cell Microporous Nickel	
Y. Yamada, T. Banno, Z.K. Xie, Y.C. Li and C.E. Wen	1833
Processing of Closed-Cell Magnesium Foams	
K. Kitazono, Y. Kikuchi, E. Sato and K. Kuribayashi	1839

Metal Foam Production Process Using Hydro-Gel and its Improvement T. Shimizu and K. Matsuzaki	1845
Development of Metal Foam for Application of Automotive Part B.Y. Hur, S.Y. Kim, Y.S. Um and Y.M. Ryu	1851
Micromechanical Models of Metallic Sponges with Hollow Struts T. Daxner, R.D. Bitsche and H.J. Böhm	1857
Mechanical Response of Porous Copper Manufactured by Lost Carbonate Sintering Process X.F. Tao, L.P. Zhang and Y.Y. Zhao	1863
New Composite Metal Foams under Compressive Cyclic Loadings A. Rabiei, B. Neville, N. Reese and L. Vendra	1868
Uniaxial Elasto-Plastic Behaviour of Adhesively Bonded Hollow Sphere Structures (HHS): Numerical Simulations and Experiments T. Fiedler, A. Öchsner and J. Grácio	1874
Cellular Structures under Impact Loading H. Zhao, I. Elnasri and H.J. Li	1880
On the Finite Element Simulation of Secondary Operations on Metallic Foams L. Filice, L. Fratini and D. Umbrello	1886
inno.zellmet - A Concerted Approach towards the Application of Non-Foam Type Cellular Metals O. Andersen, W. Hungerbach, G. Stephani and T. Studnitzky	1892
Fabrication of Lotus-Type Porous Copper-Aluminum Alloy by Unidirectional Solidification in Hydrogen Atmosphere S.K. Hyun, T. Awadu, T. Ikeda and H. Nakajima	1898
Density-Graded Aluminum Foams by the Corrosion Method Y. Matsumoto, A.H. Brothers and D. Dunand	1903

Metallic Glasses

9.

Computational Relationship of Deformation Behavior and Materials Strength of Amorphous Alloys to Short-Ranged Local Structures Y. Shibutani, M. Wakeda, S. Ogata and J.Y. Park	1911
Crystallization Behavior of $\text{Al}_{87}\text{Ni}_5\text{La}_7\text{Zr}_1$ Metallic Glass N. Wanderka, B. Radigue, K.L. Sahoo and J. Banhart	1917
Soft Magnetic Bulk Glassy Alloy Synthesized by Flux Melting and Water Quenching A. Makino, T. Bitoh, A. Inoue and A.L. Greer	1921
Thermal and Mechanical Properties of Mg-Cu(Ni)-Y(Gd) Amorphous Alloys T.H. Hung, Y.C. Chang, H.M. Chen, Y.L. Tsai, J.C. Huang, J.S.C. Jang and T.G. Nieh	1926
Elastic Properties of Cu-Based Bulk Metallic Glass around Glass Transition Temperature R. Tarumi, H. Ogi, M. Hirao, T. Ichitsubo, E. Matsubara and J. Saida	1932
Metastable Transition-Metal System Bulk Alloys Prepared by MA and Shock Compression T. Mashimo, X. Fan and X.S. Huang	1937
Plastic Deformation Behavior of Bulk Metallic Glass Composite Containing Spherical Ductile Crystalline Precipitates G.Y. Sun, G. Chen and G.L. Chen	1943
Femtosecond Laser Ablation of $\text{Zr}_{55}\text{Al}_{10}\text{Ni}_5\text{Cu}_{30}$ Bulk Metallic Glass T. Sano, K. Takahashi, A. Hirose and K.F. Kobayashi	1951
EXAFS Study on Atomic Distribution Change during Tensile Deformation of Metallic Glass T. Nasu, T. Usuki, Y. Onodera, M. Sakurai, B. He, W. Zhong, Z. Wei, S. Wei, W. Zhang and A. Inoue	1955
Local Structures around Zr, Ni and Cu for the $\text{Zr}_{67}\text{Cu}_{33}$ and $\text{Zr}_{67}\text{Ni}_{33}$ Metallic Glasses M. Matsuura, M. Sakurai, W. Zhang and A. Inoue	1959
Thermal Stability and Nanocrystallization of Amorphous Ti-Ni Alloys Prepared by Cold Rolling and Post-Deformation Annealing V. Brailovski, S. Prokoshkin, E. Bastarash, V. Demers, K.E. Inaekyan and I. Khmelevskaya	1964
Glass Structure Control of Zr-TM-Al (TM: Cu, Ni and Co) BGAs with Small Additive Elements Y. Yokoyama and A. Inoue	1971

Metastable Solids from Undercooled Melts D.M. Herlach	1977
X-Ray Study of Pd₄₀Cu₃₀Ni₁₀P₂₀ Bulk Metallic Glass Brazing Filler for Ti-6Al-7Nb Alloy E. Miura, G.E. Ice, E.D. Specht, J.W.L. Pang, H. Kato, K. Hisatsune and I. Inoue	1983
Analysis of Optimal Compositions of Ternary Bulk Metallic Glasses with Thermodynamic Quantities A. Takeuchi and A. Inoue	1988
Atomistic Analysis of Unstable Deformation in Amorphous Metal Y. Umeno, M. Tagawa and T. Kitamura	1994
Effects of Additional Elements on Microstructures of Zr-Based Metallic Glass Ribbons T. Yamamoto, N. Yodoshi, H. Kimura and A. Inoue	2000
Anomalous SWAXS Analysis of Zr-Cu-Ni-Al Quaternary Metallic Glass Joints H. Okuda, I. Murase, S. Ochiai, Y. Yokoyama and K. Inoue	2006
Structure of Glass and Liquid Studied with a Conical Nozzle Levitation and Diffraction Technique A. Mizuno, S. Kohara, S. Matsumura, M. Watanabe, J.K.R. Weber and M. Takata	2012
Glass Formation Range of Mg-Based Bulk Metallic Alloys J.L. Soubeyroux, S. Gorsse and G. Orveillon	2018
Plasticity in Bulk Metallic Glass Composites Containing Dual Amorphous Phases J.K. Lee, H.J. Kim, T.S. Kim and J.C. Bae	2026
Icosahedral Order in Supercooled Liquids and Glassy Alloys M. Shimono and H. Onodera	2031
Mechanical Properties of an Amorphous or Partially Crystallized Zirconium Based Metallic Glass J.M. Pelletier, S. Gravier and J.J. Blandin	2036
Growth and Atomistic Structure Study of Disordered SiGe Mixed Semiconductors I. Yonenaga, M. Sakurai and M.H.F. Sluiter	2043
Electronic Structure and Phase Stability of Glassy Alloys M. Hasegawa, T. Takeuchi, K. Soda, H. Sato and U. Mizutani	2048
Room Temperature Plasticity of Zr₆₅Al_{7.5}Ni₁₀Cu_{17.5-x}Pd_x Bulk Metallic Glasses K. Yoshimi, H. Kato, J. Saida and A. Inoue	2054
Relaxation Kinetics of Bulk Metallic Glasses below Glass Transition Temperature O. Haruyama, Y. Yokoyama, H. Kimura, A. Inoue and N. Nishiyama	2059
Analysis on the Phase Transition Behavior of Bulk Metallic Glass by Electrical Resistivity Measurement K.T. Hong, Y.S. Ji, S.J. Chung, M.R. Ok, Y.H. Ji and K.S. Lee	2065
Viscosity Measurements of Zr₅₅Cu₃₀Al₁₀Ni₅ Supercooled Liquid Alloy under High-Speed Heating Conditions T. Yamasaki, S. Maeda, D. Okai, T. Fukami, Y. Yokoyama, N. Nishiyama, H. Kimura and A. Inoue	2071
Change of Nanostructure in (Fe_{0.5}Co_{0.5})₇₂B₂₀Si₄Nb₄ Metallic Glass on Annealing A. Hirata, Y. Hirotsu, K. Amiya, N. Nishiyama and A. Inoue	2077
Formation, Mechanical and Magnetic Properties of (Fe,Co)-B-Si-Nb Bulk Glassy Alloys B.L. Shen and A. Inoue	2082
Superplastic Nanoforging of Pt-Based Metallic Glass with Dies of Zr-BMG and Glassy Carbon Fabricated by Focused Ion Beam Y. Saotome, S. Okaniwa, H. Kimura and A. Inoue	2088
Localized Shear Deformation and Fracture in a Zr-Based Bulk Metallic Glass T. Morikawa, T. Kawada and K. Higashida	2094
Structure Instability of Metallic Glass Zr₅₀Cu₄₀Al₁₀ in Low Temperature T. Fukami, A. Nanbu, M. Fukatani, D. Okai, Y. Akeno, Y. Yokoyama, T. Yamasaki and A. Inoue	2100
Glass Forming and Thermal Properties of the Mg₆₅Cu₂₅Gd_{10-x}Nd_x (x=0~10) Amorphous Alloys L.J. Chang, B.C. Yang, P.T. Chiang, J.S.C. Jang and J.C. Huang	2106
High Temperature Deformation Characteristics of Zr_{76.11}Ti_{4.20}Cu_{4.51}Ni_{3.16}Be_{1.49}Nb_{10.53} Bulk Metallic Glass Composite H.J. Jun, K.S. Lee, Y.C. Yoo and Y.W. Chang	2111

Oxidation Behavior of the Y₅₆Al₂₄Co₂₀ Bulk Amorphous Alloy Containing Crystalline Composites at 325-450°C	
H.H. Hsieh, W. Kai, C.Y. Lin and T.S. Chin	2117
Development of a Method for Making Interatomic Potential: An Application to Metallic Systems	
T. Kumagai, S. Hara, S. Izumi and S. Sakai	2123
Estimation of Micro-Formability and FEM Simulation of Micro-Forming Process of a Zr-Based Bulk Metallic Glass	
Y.S. Na, S.G. Kang, K.Y. Park and J.H. Lee	2129

Mechanical Behaviour & Fracture

	10.
Intergranular Fatigue Cracking Enhanced by Impurity Segregation	
C. Daniel, F. Christien and R. Le Gall	2137
Numerical Analysis of Test Methods for Evaluating Shear Strength of Ceramic Composite Joints Using Interface Element	
H. Serizawa, C. Lewinsohn, M. Singh and H. Murakawa	2143
Effect of Dispersion of Coherent and Incoherent Precipitates on High-Temperature Deformation of Copper	
H. Miura and T. Sakai	2149
Application of Local Approach to Hydrogen Embrittlement Fracture Evaluation of High Strength Steels	
S. Takagi, S. Terasaki, K. Tsuzaki, T. Inoue and F. Minami	2155
Stress Corrosion Cracking Failure of Jackbolts for Die Casting Press	
P.A. Manohar	2162
Simulation of Ductile Damage in Two-Phase Structural Steel with Meso-Scale Model	
M. Ohata, A. Ui and F. Minami	2168
Fracture Assessment of Wide Plate Component Subjected to Biaxial Loading	
H. Shimanuki, F. Minami and M. Ohata	2174
Ductile Crack Propagation Characteristics in Steel Thin Single Edge Notched Tension Specimens	
Y. Kayamori, S. Hillmansen, P.S.J. Crofton and R.A. Smith	2180
Prediction of Ductile Crack Growth from Ductility of Steel	
M. Ohata, T. Fukahori and F. Minami	2186
Dynamic Evaluation of Strength-Structure Properties by the Determination of Activation Volume and Mean Slip Distance	
S. Saimoto	2192
Microstructure and Mechanical Properties of Commercial Purity Copper Resulting from Repeated Groove Pressing Followed by Cold Rolling	
A. Krishnaiah, C. Uday and P. Venugopal	2198
Effect of Strength Matching on Ductile Fracture Behavior of X80 Linepipe Girth Welds Subjected to Tensile Loading	
H. Motohashi and N. Hagiwara	2204
Evaluation of Mechanical and Fracture Characteristics Using Instrumented Indentation Technique	
J.S. Lee, K.H. Kim, J.H. Han and D.I. Kwon	2210
Investigations on Structure and High Temperature Properties of Iridium	
J. Merker, B. Fischer, D.F. Lupton and J. Witte	2216
Microstructure Analysis of Cold Worked Holes	
S. Nagaraj and M. Krishna	2222
Strain Scanning in Australia: Instrumentation and Recent Experiments	
O. Kirstein, M.I. Ripley and D. Tawfik	2228
Temperature Distribution, Phase Transformations and Residual Stresses in Heat Treatment of Grinding Balls	
C. Camurri, C. Carrasco and J. Dille	2234
Effects of Applied Bias and Dopants on the Photocatalytic Degradation of Aqueous Dye Solution by TiO₂/Ti Electrode	
J.N. Shen, M.C. Li, D. Liu, X.R. Sun, E.B. Gracien, S.D. Yao and B. Wan	2240

Physical Simulation of Thermo Mechanical Phenomena to Obtain an Optimal Micro Structure for a Soft Magnetic Fe-Co-Alloy S. Kleber and M. Wießner	2246
The Developments of Plasticity Processing: 3M Strategy X.B. Zhou and L.H. Lang	2252
Effect of Dispersoids on Softening Behavior in Cu-Fe-P Alloys for Lead Frames Y. Aruga, N. Hara and K. Kajihara	2258
Detection of Crack Propagation in Alumina Using SrAl₂O₄:(Eu,Dy) Luminescent Paint J.S. Kim, K.S. Sohn, Y.N. Kwon, G.S. Ban and K.H. Lee	2264
Dynamic Deformation and High Velocity Impact Behaviors of Ti-6Al-4V Alloys J.Y. Kim, I.O. Shim, H.K. Kim, S.S. Hong and S.H. Hong	2269
Estimation of Contact Interface between Tool and Workpiece in Cold Forming Using FEM Analysis H. Saiki, Y. Marumo, L.Q. Ruan and J. Kozasa	2275
Neutron Diffraction Profile Analysis to Determine Dislocation Density and Grain Size for Drawn Steel Wires S. Ryufuku, Y. Tomota, Y. Shiota, T. Shiratori, H. Suzuki and A. Moriai	2281

Ecomaterials

	11.
Web-Site Survey of Recent Ecomaterials in Japan K. Yamada, K. Halada and K. Ijima	2289
Study on a Reactor Design and Catalyst for Hydrogen Generation from Alkaline Solution of Sodium Borohydride M.K. Han, J.H. Han, K.J. An, D.S. Jeon, D. Gervasio, I.H. Song, Y.M. Lee and Y.G. Shul	2295
Comparison between Eco-Profiles of Innovative Nanoclay and Traditional TBBPA Flame Retardants B. DeBenedetti, G. Camino, D. Tabuani, L. Maffia, J. Santarén and E. Aguilar	2301
Improvement of Materials Efficiency for a Sustainable Resource Management F.G. Simon	2305
Ecomaterials-Foam Plastics Synthesized from Plant Oil-Based Resins M.Z. Rong, M.Q. Zhang, S.P. Wu, H.J. Wang and T. Czigány	2311
Multi-Valent Metal Salt Hydrates as Catalysts for the Esterification of Fatty Acids and Alcohols K. Mantri, R. Nakamura, Y. Miyata, K. Komura and Y. Sugi	2317
Beta Zeolites Modified with Lanthanum and Cerium Oxides for the Isomerization of Hexane Y. Haga, Pusparatu, K. Aoyama, K. Komura, Y. Nishimura, Y. Sugi, J.H. Kim and G. Seo	2323
A New Challenge of Polymer Thermoelectric Materials as Ecomaterials Y. Shinohara, Y. Imai, Y. Isoda, K. Hiraishi and H. Nakanishi	2329
Application of 3-Dimensional Powder Laminating Fabrication to Metallic Components K. Minagawa, H. Kakisawa, S. Takamori, Y. Osawa and K. Halada	2333
Life-Cycle Evaluation of Ecobalance Performance of Ecomaterial-Type Building Materials by Multiple Eco-Indicator Method T. Fukushima	2339
Controlling of the Solidification Structure for Recycling by Ultrasonic Vibration Y. Osawa, S. Takamori, K. Minagawa, H. Kakisawa and K. Halada	2345

3D Microstructures: Characterization & Modelling

	12.
3-Dimensional Characterization of Polycrystalline Bulk Materials Using High-Energy Synchrotron Radiation U. Lienert, J. Almer, B. Jakobsen, W. Pantleon, H.F. Poulsen, D. Hennessy, C. Xiao and R.M. Suter	2353
Three-Dimensional Simulation of Coarsening and Grain Growth in Sintering F. Wakai	2359

Modelling of Precipitation Hardening in Alloys: Effective Analytical Submodels for Impingement and Coarsening M.J. Starink	2365
Determination of Percolation Threshold for Random Boundary Network on the Basis of EBSD/OIM Observations S. Tsurekawa, S. Nakamichi and T. Watanabe	2371
3-D High-Density Strain Mapping Procedure Based on High-Resolution CT M. Kobayashi, H. Toda, T. Ohgaki, K. Uesugi, D.S. Wilkinson, T. Kobayashi, Y. Kawai and Y. Aoki	2377
Phase-Field Modeling of the Microstructure Evolutions in Fe-Cu Base Alloys T. Koyama and H. Onodera	2383
A Thermodynamic Description of the Al-Ir System T. Abe, M. Ode, H. Murakami, C.S. Oh, C. Kocer, Y. Yamabe-Mitarai and H. Onodera	2389
Free Energy Calculations of Precipitate Nucleation S.R. Nishitani, A. Seko, K. Yuge and I. Tanaka	2395
Abnormal Grain Growth Topology and Kinetics P.R. Rios and M.E. Glicksman	2401
Thermodynamic Assessment of the Al-Cr System by Combining the First Principles and CALPHAD Methods T. Tokunaga, H. Ohtani and M. Hasebe	2407
Thermodynamic Analysis of Steels by Incorporating First-Principles Calculations into the CALPHAD Approach H. Ohtani, N. Hanaya and M. Hasebe	2413
Modeling of HCP/D0₁₉, D0₁₉/L1₀, BCC/B2 Phase Equilibria in a Ti-Al System by the CVM-CALPHAD Method H. Onodera, T. Abe and K. Hashimoto	2419
Theoretical Study of Glass Transition Based on Cluster Variation Method T. Mohri and Y. Kobayashi	2425
Computer Simulation of the Precipitate Evolution during Industrial Heat Treatment of Complex Alloys E. Kozeschnik, B. Sonderegger, I. Holzer, J. Rajek and H. Cerjak	2431
Computer Simulation of Grain Growth in Three Dimensions by the Phase Field Model with Anisotropic Grain-Boundary Mobilities Y. Suwa, Y. Saito and H. Onodera	2437
Phase Transformation Modeling of Medium-Carbon Forging Steel K. Tanaka, M. Hara, Y. Yogo, K. Nakanishi and C. Capdevila	2443
Evolutionary Computing for Metals Properties Modelling M.F. Abbod, M. Mahfouf, D.A. Linkens and C.M. Sellars	2449
Modelling of Dynamic Recrystallisation of 316L Stainless Steel Using a Systems Approach M.F. Abbod, M. Mahfouf, D.A. Linkens and C.M. Sellars	2455
Modelling of Oxide Scale Evolution in Hot Rolling and Descaling M. Krzyzanowsky, J.H. Beynon, M.F. Frolish and S. Clowe	2461
Analytical and Computational Models for Investigations of Local Buckling in Honeycomb Sandwiches D.H. Pahr and F.G. Rammerstorfer	2467
Kinetic Features of Solid-State Reactive Diffusion between Au and Sn-Base Solder M. Kajihara and T. Takenaka	2473
Characterization of the Heat Transfer Boundary Conditions during Cooling of a Horizontal Disk with a Water Column B. Hernández-Morales, J.S. Téllez-Martínez and G. Sánchez-Sarmiento	2479
The Influence of Injection-Molding Parameters on the Dimensional Accuracy Z. Kampuš, B. Berginc and B. Šuštaršič	2485
Identification of Thermal Properties of the System Casting-Mould E. Majchrzak and B. Mochnacki	2491
An Analytic Model for Predicting Roll Force in Billet Rolling Process with Vertical Stands and Horizontal Stands Mounted S.M. Byon and Y.S. Lee	2497

Finite-Element Modeling of Multi-Pass Forging of Nickel-Base Alloys Using a Multi-Mesh Method	
G. Barton, X. Li and G. Hirt	2503
Models and Equations for Atomic Transport Coefficients of Liquid Metals: Viscosity and Self-Diffusivity	
T. Iida, N. Tripathi, M. Isac and R.I.L. Guthrie	2509
A Study on Development of Forming Roller for Miniature Metal Balls Manufacturing Process	
H.S. Joe, J.S. Park and Y.H. Kim	2518
Application of the Shape Sensitivity Analysis in Numerical Modelling of Solidification Process	
B. Mochnacki and E. Majchrzak	2524
Measuring and Modeling Grain, Grain Boundary and Grain Edge Average Curvature and their Application to Grain Growth	
P.R. Rios and G.S. Fonseca	2530
Using of FEM to Analyse of the Reinforcement Bar Rolling Process	
P. Szota and H. Dyja	2536

Multiscale Mechanical Modelling

13.

Modeling of Generalized Continua on Macroscopic Scales: Towards Computational Mechanics of Microstretch Continua	
N. Kirchner and E. Kirchner	2545
A Multiscale Approach for Composite Materials as Multifield Continua	
P. Trovalusci, V. Sansalone and F. Cleri	2551
Phase Field Model Simulation of Abnormal Grain Growth by Solid-State Wetting	
K.J. Ko, P.R. Cha and N.M. Hwang	2557
Macro and Macro/Micro Models of Solidification - Numerical Aspects of Process Simulation	
R. Szopa	2564
Kinetics of the Austenite-to-Ferrite Phase Transformation - From the Intrinsic to an Effective Interface Mobility	
E. Gamsjäger	2570
Modelling the Dependence of Uniform Elongation on Grain Size	
W.J. Liu	2576
A Coupled-Volume Approach to the Multi-Scale Modelling of Quasi-Brittle Materials	
I.M. Gitman, H. Askes and L.J. Sluys	2582
A Multi-Scale Model of Martensitic Transformation Induced Plasticity at Finite Strains	
V.G. Kouznetsova and M.G.D. Geers	2588
Multiscale Modelling of Stick-Slip Transition of Rough (Fractal) Surfaces	
B. Chiaia and M. Borri-Brunetto	2594
Out of Plane Models for Composite Brickwork-Like Materials	
A. Cecchi and K. Sab	2601
Multiscale Modelling of the Mechanical Behaviour of Oriented Semicrystalline Polymers	
J.A.W. van Dommelen, W.A.M. Brekelmans and L.E. Govaert	2607
Nonlocal Interface Mechanical Model	
G. Borino, B. Failla and F. Parrinello	2613
Structural Models of Progressive Interface Failure under Shear Stresses	
I. Monetto	2619
Multifield Potentials and Derivation of Extremum Principles in Rate Plasticity	
F. De Angelis	2625

Powder Metallurgy

14.

Consolidation and Mechanical Properties of Gas Atomized Al-Si Powder	
Y.J. Kim, J.C. Kim and J.H. Ahn	2633

Powder Injection Molding of Ti6Al4V Alloy X.H. Qu, S.B. Guo, C.F. Tang, M.L. Qin, X.B. He and S.H. Islam	2639
Effects of Alloying Elements on the Sintering and Heat Treatment of Elementally Mixed Aluminum Powder Alloys H.S. Chung, M.T. Kim, J.H. Choi and J.H. Ahn	2645
3D Coupled Thermomechanical Finite Element Analysis of Ultrasonic Consolidation C.J. Huang and E. Ghassemieh	2651
Investigation of Sintering of Spherical Copper Powder by Micro Focus Computed Tomography (μCT) and Synchrotron Tomography M. Nöthe, M. Schulze, R. Grupp, B. Kieback and A. Haibel	2657
Difficulties with Ti-Ni Powder Metallurgy Process and Multi-Stage Sintering Technique for TiNi SMA C.T. Hu and Y.C. Chen	2663
Prealloyed Cu-Fe Powder Materials N. Llorca-Isern, I. Laborde, X. Mirabet, P. Molera and A. Roca	2669
Development of Pre-Alloyed Powders for Diamond Tools and their Characteristics Y.C. Fang, X.Y. Luo and X.Y. Li	2675
Direct Metal Laser Sintering Some Improvements of the Materials and Process S. Dolinsek	2681
Influence of Additives and Hot-Press Sintering on Lipophilic Properties of Silicon Nitride Ceramics T. Tokuda, M. Kido, R.G. Wang, G. Katayama and F. Suzumura	2687
Gas Atomization of High Melting Reactive Metals by a Crucible- and Ceramic-Free Technique R. Gerling, M. Hohmann and F.P. Schimansky	2693
Investigation on the Densification Mechanism of Warm Compaction Z.Y. Xiao, T.L. Ngai and Y.Y. Li	2699
Fe₃Al Based Alloys Fabricated by Spark Plasma Sintering from Mechanically Activated Powders C.C. Jia, Q. He and J. Meng	2706
X-Ray Diffraction Study of Stress in a Magnesium-Hydrogen System Produced by High-Energy Milling of Powders G. Roy, J. Neima, Z.S. Wronski and R.A. Varin	2713
Fracture Behaviors of Niobium Alloys by Hydrogenation and its Application for Fine Powder Fabrication S. Semboshi, N. Masahashi, T.J. Konno and S. Hanada	2719
Evolution of Microstructure during Hot Deformation of the PM Molybdenum Alloy TZM T. Mroczek, A. Hoffmann, U. Martin and H. Oettel	2725
Nanotubes Obtained from Mono and Bimetallic Carbides Produced by Mechanical Alloying L. Díaz-Barriga Arceo, L. Rendón-Vázquez, E. Orozco, V. Garibay-Febles, E. Palacios Gonzalez and F. Leyte Guerrero	2731
Preparation of Ti₃SiC₂ Particulate Reinforced Cu Matrix Composite by Warm Compaction Powder Metallurgy Y.Y. Li, T.L. Ngai, Z.Y. Xiao and Z.Y. Zhou	2737
Production of Titanium Nitride by Carbothermic Reduction of the Anatase and Rutile Forms of Titanium Dioxide A. Saidi, N. Setoudeh and N.J. Welham	2743
Effect of Manufacturing Methods on Structure and Properties of the Gradient Tool Materials with the Non-Alloy Steel Matrix Reinforced with the HS6-5-2 Type High-Speed Steel A. Kloc, L.A. Dobrzański, G. Matula and J.M. Torralba	2749
The Phase Evolution of the TiC Cermet Fabricated by Spark Plasma Sintering I.S. Ahn, S.Y. Bae, T.K. Sung and D.K. Park	2755
A Study on the Development of Environment-Friendly Ag-SnO₂ Electric Contact Materials through a Powder Metallurgy H. Cho, D.Y. Hwang and H.H. Jo	2761
Formation of Ni₅₇Zr₂₀Ti₂₂Pb₁ Amorphous Powders by Mechanical Alloying P.Y. Lee, S.S. Hung, J.S.C. Jang and G.S. Chen	2767

Microstructure and Thermoelectric Properties of Rapidly Solidified and Hot Pressed N-Type 95% Bi₂Te₃-5%Bi₂Se₃ Alloys	
H.T. Son, I.H. Oh, J.S. Lee, C.S. Kang, J.I. Cho and J.C. Bae	2773
Fabrication of Micro Porous Aluminum by Powder Sintering	
Z.K. Xie, Y. Yamada and T. Banno	2778
Synthesis of Mono-Dispersed Fine Spherical Silver Powders by Chemical Reduction Method	
J.G. Ahn, D.J. Kim, J.R. Lee, H.S. Jung and B.G. Kim	2782
Role of Strain Gradient and Dynamic Transformation on the Formation of Nanocrystalline Structure Produced by Severe Plastic Deformation	
M. Umemoto, Y. Todaka, J.G. Li and K. Tsuchiya	2787
An Effect of High Magnetic Field on Grain Growth in Nanocrystalline Iron	
W.P. Tong, L.M. Wang, G.J. Ma, N.R. Tao and L. Zuo	2793
Progress and Current Status in Research on Nanostructured Cu-Ag Microcomposites for Conductor Wires	
L. Meng and J.B. Liu	2798
Multiscale Molecular Dynamics Simulations of Nanostructured Materials	
K. Tsuruta, A. Uchida, C. Totsuji and H. Totsuji	2804
Non-Equilibrium Solute Partitioning and Microstructure Formation in Rapidly Solidified Al-Sm Alloys	
H. Meco and R.E. Napolitano	2810
Deformation Mechanism Map of Nanocrystalline Metallic Materials	
H.S. Kim	2816
Effect of Zr-Doped Ceria Catalyst on Carbon Deposition on Ni/YSZ Cermets	
H.P. He and J.M. Hill	2822
Enhanced Strength and Ductility at a Cryogenic Temperature in a Nanostructured Ni-Fe Alloy	
H.Q. Li, K.X. Tao, H. Choo and P.K. Liaw	2828

Severe Plastic Deformation

	15.
Grain Size Saturation during Severe Plastic Deformation	
N. Tsuji, N. Kamikawa and B.L. Li	2837
Nanostructuring a Zr-Hf Alloy via Large Strain Rolling	
M.T. Pérez-Prado, F. Salort, L. Jiang, O. Ruano and M.E. Kassner	2843
Microstructural Characteristics of Cu-Fe-P Alloys Severely Deformed by Accumulative Roll Bonding Process	
C.Y. Lim, S.Z. Han and S.H. Lee	2849
Application of Equal-Channel Angular Pressing to Aluminum and Copper Single Crystals	
M. Furukawa, Z. Horita and T.G. Langdon	2853
Coarse Second Phase Particle Size Distribution of UFG Al Alloys Processed by Severe Plastic Deformation: Effect on Cavitation during Superplastic Deformation	
K.T. Park, E.G. Lee, W.J. Nam and Y.S. Lee	2859
An Alternative Constitutive Equation for Superplasticity	
B. Naik	2865
Controlling the Thickness Uniformity in Equal Channel Angular Rolling (ECAR)	
Y.H. Chung, J.W. Park and K.H. Lee	2872
Nanostructured Titanium Based Materials	
P. Matteazzi	2878
Development and Properties of High Strengthened Carbon Steels Produced by Repetitive Side Extrusion and Heat Treatment Process	
K. Aoki and A. Azushima	2884
Corrosion Behavior of Al-7wt% Si-1.5wt% Cu Severely Deformed by Equal-Channel Angular Pressing	
Z.G. Zhang, E. Akiyama, Y. Watanabe, Y. Katada and K. Tsuzaki	2892
Grain Refinement in High-Purity α-Iron Base Alloys during Thermomechanical Processing	
S.M. Lim, C. Desrayaud, S. Girard and F. Montheillet	2898
Effect of Equal-Channel Angular Pressing (ECAP) on Creep in Aluminium Alloys	
V. Sklenička, J. Dvořák, M. Kvapilová, M. Svoboda, P. Král, I. Saxl and Z. Horita	2904

Study of Ultrafine Grain Structure of a Pipeline Steel W. Chen, D. Ferguson, G.Y. Li, L.G. Ao, C.M. Wang, J. Zhang and H.X. Ma	2910
Mechanical Properties of Al-5.7wt% Ni Eutectic Alloy Severely Deformed by Equal-Channel Angular Pressing Y. Watanabe, Z.G. Zhang, H. Sato, T. Inamura and H. Hosoda	2916
Microstructural Changes in As-Cast 7475 Al Alloy during Warm Sever Forging A. Goloborodko, T. Sakai, O. Sitdikov and H. Miura	2922
Structure of Low Cobalt Alloy for Permanent Magnets of Basis System Fe-Cr-Co at Complex Two-Level Loading in Isothermal Conditions V.S. Yusupov, A.I. Milyaev, G.F. Korznikova, A.V. Korznikov and J.K. Kovneristii	2928
Superplasticity of Fine-Grained 20VOL%SiC Whiskers Reinforced 2024 Aluminum Alloy Produced by ECAP with a Rotary Die A. Ma, Y. Nishida, M. Nagase, J.H. Jiang, J.C. Kim, N. Saito and I. Shigematsu	2934
Superplastic Deformation of a Mg-8% Li Alloy Processed at Room Temperature by ECAP M. Furui, H. Kitamura, M. Fukuta, H. Anada and T.G. Langdon	2940

Superalloys & Heat-Resistant Steels

16.

Investigation, Application and Assessment of T122 Heat Resistant Steel Z.D. Liu, S.C. Cheng, H.S. Bao, G. Yang and Y. Gan	2949
Development and Improvement of 9-12%Cr Steels by a Holistic R&D Concept H. Cerjak, G. Dimmler, I. Holzer, E. Kozeschnik, P. Mayr, C. Pein and B. Sonderegger	2954
Effect of Non-Metallic Inclusions on Notched Low Cycle Fatigue in P/M IN100 Nickel-Base Superalloy A.M. Wusatowska-Sarnek, P. Bhowal, D. Gynther and R. Montero	2960
Hot Working of High-Purity Nickel-Niobium Alloys F. Montheillet, S. Girard, C. Desrayaud, S.L. Semiatin and J. Le Coze	2966
Effect Factors of Internal Stress and Deformation Mechanism for Single Crystal Nickel-Base Superalloys during Creep X.F. Yu, S.G. Tian, M.G. Wang, H.Q. Du, F.L. Meng and Z.Q. Hu	2972
Effect of Ausageing on the Precipitation Behavior of MX Carbonitride in Modified 9Cr-1Mo Steel M. Yoshino, Y. Mishima, Y. Toda, H. Kushima, K. Sawada and K. Kimura	2976
Effect of Boron on Microstructure and Creep Deformation Behavior of Tempered Martensitic 9Cr Steel F. Abe, H. Semba and T. Sakuraya	2982
Interaction of Recrystallization and Precipitation during Hot Forming of Alloy 80A C. Sommitsch, P. Poelt, G. R��f, S. Mitsche and M. Albu	2988
Improvement in Creep Strength of Heat-Resistant Ferritic Steel Precipitation-Strengthened by Intermetallic Compound Y. Toda, H. Kushima, K. Kimura and F. Abe	2994
Contribution of Z-Phase Precipitation to Recovery of Martensitic Structure in High Chromium Creep Resistant Steel K. Sawada, H. Kushima and K. Kimura	3000
Two-Phase Microstructures of Gamma+Gamma-Prime Formed by Phase-Separations due to Heat-Treatments of Elastically Constrained Ni-Al-Ti Alloys M. Doi, T. Kozakai, T. Moritani and S. Naito	3006
Novel Concept of Austenitic Heat Resistant Steels Strengthened by Intermetallics M. Takeyama	3012
On Bainite Transformation Kinetics and Mechanism S.X. Zhao, W. Wang and D.L. Mao	3018
Change in Morphology of γ' of Prior-Crept Single Crystal Nickel-Based Superalloy, CMSX-4, with Simple Aging N. Miura, K. Kurita, Y. Kondo and T. Matsuo	3024
Role of Transient Creep in γ-Single Phase Ni-20Mass%Cr Alloy T. Matsuo	3030

Precipitation of Gamma-Prime and Gamma-Double Prime Coherent Phases in Three-Phase Ni-V-Si Alloys T. Kozakai, C. Aoki, T. Moritani and M. Doi	3036
Influence of Prolonged Exposure on the Microstructure and Stress-Rupture Property of a Single Crystal Ni-Base Superalloy Z.Q. Hu, Y.L. Ren, T. Jin, X.F. Sun and H.R. Guan	3042
Temperature Dependence of Lattice Distortion in Strongly Creep-Deformed Single Crystal Superalloy SC16 G. Schumacher, N. Darowski, I. Zizak, H. Klingelhöffer, W. Chen and W. Neumann	3048
Some Behaviors of Phosphorus in Several Typical Superalloys W.R. Sun, S.L. Yang, Z.G. Wei, S.R. Guo and Z.Q. Hu	3053
Time Dependence of γ/γ' Lattice Mismatch in Creep-Deformed Single Crystal Superalloy SC16 at 1173 K G. Schumacher, N. Darowski, I. Zizak, H. Klingelhöffer, W. Chen and W. Neumann	3059
The Validation of Microstructural Prediction in Nickel Superalloys J.W. Brooks, S. Tin and R.P. Guest	3064
The Combination of Modeling Techniques to Predict the Service Behaviour of Heat Resistant Alloys F. Tancrét and J. Laigo	3070
Development of New Alloys with Excellent High Temperature Creep Characteristics of 700°C or More S. Muneki, H. Okubo, H. Okada, M. Igarashi and F. Abe	3076
Optimization of Weld Conditions and Alloy Composition for Welding of Single-Crystal Nickel-Based Superalloys J.M. Vitek, S.A. David and S.S. Babu	3082
Drawbacks to the Application of Long-Term Degradation Tests, with Reference to Metal Dusting of Nickel-Base Alloys at High Temperatures F.H. Stott, F. Di Gabriele and Z. Liu	3088
Recrystallization and Grain Growth during Alloy 718 Processing N.K. Park, J.H. Kim and J.T. Yeom	3094
Stress Exponent of Minimum Creep Rate of Single Crystal Nickel-Based Superalloy, CMSX-4, AT 1273K Y. Kondo, N. Miura and T. Matsuo	3100
Recent Activities on Directional Solidification at the State Key Laboratory of Solidification Processing L. Liu, F.Q. Xie, J. Zhang and H.Z. Fu	3106
Creep Strength Assessment of High Chromium Ferritic Creep Resistant Steels K. Kimura, K. Sawada, Y. Toda and H. Kushima	3112
Creep Behavior of Single Crystal Superalloy DD6 at 760°C and 980°C J.R. Li, K.G. Wang, Y.S. Luo, S.Z. Liu, M. Han and C.X. Cao	3118
Manufacturing and Analysis of Mechanical Properties of Superalloy 718 in Hydraulic Forging Y.S. Song, M.R. Lee and J.T. Kim	3124
Computer Simulation on Formation of Precision Forgings of Titanium Alloy and Superalloy R.H. Wu and K.C. Pang	3130

Smart/Intelligent Materials and Processes

17.

Properties of Boron Fiber Reinforced Aluminum Matrix Composites Fabricated by Pulsed Current Hot Pressing (PCHP) K. Mizuuchi, T. Takeuchi, K. Inoue, J.H. Lee, M. Sugioka, M. Itami, M. Kawahara, I. Yamauchi and H. Asanuma	3139
Self-Healing of Creep Cavities by Boron Segregation and Boron Nitride Precipitation Autonomously Developed during High Temperature Use N. Shinya, J. Kyono and K. Laha	3145
TiNi Shape Memory Alloys for MEMS: Thin Film Deposition, Thermophysical Properties and Laser Micromachining Characteristics S.T. Davies	3151

Phase Transformation and Microstructures in Ni and Cu Base Ferromagnetic Shape Memory Alloys	
T. Kushima, K. Tsuchiya, Y. Sho, T. Yamada, Y. Todaka and M. Umemoto	3157
Effect of Aging on Microstructure and Martensitic Transformation in Ti-Zr-Ni Shape Memory Alloys	
A. Sandu, K. Tsuchiya, S. Yamamoto, M. Tabuchi, Y. Todaka and M. Umemoto	3163
Functionally Graded Ti-Ni Shape Memory Alloys	
T.H. Nam, C.A. Yu, Y.J. Lee and Y. Liu	3169
Mechanical Properties of Fe-Pd Ferromagnetic Shape Memory Alloy Thin Films Prepared by Dual Source DC Sputtering	
S. Inoue, T. Namazu, T. Fujimoto, K. Koterazawa and K. Inoue	3173
The Effect of Crucible Configuration on Joule and Pinch Effects in EMCC Process of Silicon	
B. Kim, J.S. Shin, S.M. Lee and B.M. Moon	3179
Fabrication Method for Metallic Closed Cellular Materials Containing Different Materials from that of Cell Walls by SPS Method	
S. Kishimoto and N. Shinya	3184
Characteristics of Ti50-Pd(50-x)-W(x) High Temperature Shape Memory Alloy	
H. Nakayama and M. Taya	3190
Equal Channel Angular Extrusion (ECAE) of Ni-Ti Based Shape Memory Alloy Systems	
C.J. Yu, C.S. Lei, R. Mahapatra, J. Sharp and I. Karaman	3195
Biodegradable Fiber Reinforced Ti Composite Fabricated by Spark Plasma Sintering Method	
H. Sato, S. Umaoka, Y. Watanabe, I.S. Kim, M. Kawahara and M. Tokita	3201
On Cyclical Phase Transformations in Driven Alloy Systems: A Mass-Action Kinetics Approach	
J.K. Lee and W.C. Johnson	3207
Ti-Ni Shape Memory Alloy Film Cantilever Actuator for Micro-Probing	
T. Namazu, Y. Okamura, Y. Tashiro and S. Inoue	3213
Intelligent Materials Synthesis Based on Millimeter-Wave Heating and SPS Methods	
Y. Makino, T. Yoshioka, H. Saito, S. Sano, J. Akedo and S. Miyake	3219
Electrochemical Properties of Type 304 Stainless Steels Produced by Several Methods	
S. Sunada, T. Yamamoto and K. Majima	3225
Effect of Strain Rates on the Transformation Behavior of Ni-Ti Alloy	
H. Date	3231
Piezoelectric Composite and its Multilayer Actuator	
S.J. Jeong, E.C. Park, D.S. Lee, M.S. Kim, J.S. Song and G.S. Yang	3237
Effect of Magnetic Field on Martensitic Transformation Temperature in Ni₂MnGa with Single Variant and Multi-Variant States	
T. Fukuda, J.H. Kim and T. Kakeshita	3243
Recent Advances in Microwave and Millimeter-Wave Processing of Materials	
D. Lewis III, M.A. Imam, A.W. Fliflet, R.W. Bruce, L.K. Kurihara, A.K. Kinkead, M. Lombardi and S.H. Gold	3249
Pitting Corrosion Behavior of Sintered SUS444 Stainless Steel in MgCl₂ Solution	
S. Sunada, Y. Miyazaki and K. Majima	3255
Enlarging the Temperature Range for Maximum Wear Resistance of TiNi Alloy Using a NTE Phase	
I. Radu and D.Y. Li	3261
Magnetic Field-Induced Martensitic Transformation of Heusler-Type Ni₂MnGa System	
K. Inoue, Y. Yamaguchi, Y. Ishii, H. Yamauchi and T. Shishido	3267
High-Temperature Shape Memory Effect of Ti-(Pt,Ir)	
Y. Yamabe-Mitarai, T. Hara, S. Miura and H. Hosoda	3273
Effects of Fiber-Resin Interface Property on Shape Recovery and Mechanical Properties of Denture-Base-Resin Matrix Smart Composite	
K. Hamada, F. Kawano and K. Asaoka	3279
Preparation of Fe₂VAI Thermoelectric Module by RF Sputtering	
A. Matsumoto, M. Mikami, K. Kobayashi, K. Ozaki and T. Nishio	3285

Molecular and Nanometer-Scale Self-Organized System Generated by Protein Motor Functions	
K. Oiwa, R. Kometani, D.Y. Li, Y. Shitaka, R. Nakamori, S. Matsui and H. Sakakibara	3290
Nitrogen Ion Beam Irradiation on Amorphous Carbon	
Y. Watanabe, M. Aono and N. Kitazawa	3297
Study on the Magnetic Properties and Domain Structure of NdFeNbZrB Nanocomposite Permanent Magnets	
W.Y. Qin, X.Y. Chen, Z.L. Jiang, Z.D. Lin and H.M. Chen	3303
Thermoelectric Properties of Arc-Melted $\text{Ba}_8\text{Al}_{16}\text{Si}_{30}$ Clathrate	
J.I. Lee, J.B. Park, S.W. You, J.H. Lee, Y.H. Kim, I.H. Kim, K.W. Jang and S.C. Ur	3309
Shape Memory Characteristics of Ti-Ni Alloy Using Mechanically-Alloyed Powder	
A. Terayama, H. Kyogoku and S. Komatsu	3313
The Effects of Geometrical Factors on the Step-Up Ratio in Piezoelectric Transformer	
M.S. Yoon, T.S. Yoon, J.R. Kim, Y.G. Choi and S.C. Ur	3319
Effect of Aging and Microstructure on Mechanical Rolling CuAlNi Shape Memory Alloy	
G.S. Yang, J.K. Lee, W.Y. Jang, S.J. Jeong and K. Inoue	3326

Texture

18.

Stored Energy and Recrystallization Process	
A. Baczmanski, K. Wierzbanski, A. Benmarouane, A. Lodini, P. Lipiński and B. Bacroix	3335
On the Effect of Texture in Experimental Grades of High-Silicon Electrical Steel	
Y. Houbaert, T. Ros-Yáñez, P. Rodriguez-Calvillo, J. Barros and L.A.I. Kestens	3341
Texture and Orientation Relationships in Phosphorus Added TRIP Steels	
K. Verbeken, L. Barbé and B.C. De Cooman	3347
Effect of Texture on Anisotropic Creep of Pressurized Zr-2.5Nb Tubes	
W.J. Li and R.A. Holt	3353
Texture of AZ31 Magnesium Alloy Sheet Heavily Rolled by High Speed Warm Rolling	
T. Sakai, H. Utsunomiya, H. Koh and S. Minamiguchi	3359
A Comparison of Grain Boundary Engineering Mechanisms in Copper and Brass	
V. Randle and G. Owen	3365
New Grain Interaction Models for Deformation Texture Simulations	
R. Quey, S. Ringeval, D. Piot and J.H. Driver	3371
Texture and Creep Anisotropy in Zirconium Alloys	
I. Charit and K. Linga Murty	3377
Modeling Compression and Tension Reloads in Copper Prestrained by Rolling	
I.J. Beyerlein and C.N. Tomé	3383
Grain Boundary Engineering: Progress and Challenges	
W.G. Wang	3389
Texture and Grain Boundary Character Modification of Metallic Materials by Electromagnetic Processing	
C. Esling, Y.D. Zhang, Z.C. Hu, X. Zhao and L. Zuo	3395
Deformation Conditions and Stability of the Basal Texture in Magnesium	
T. Al-Samman and G. Gottstein	3401
Twinning and Detwinning during Cyclic Deformation of Mg Alloy AZ31B	
D.W. Brown, A. Jain, S.R. Agnew and B. Clausen	3407
Website Publication of Calculation Computer Program and Visualized Pieces both of Bcc and Fcc Pencil Glide Theory for Deformation Texture	
H. Masui and H. Katoh	3414
Improvement in Specific Electric Resistance of $\text{Bi}_{1.5}\text{Pb}_{0.5}\text{Sr}_{1.7}\text{Y}_{0.5}\text{Co}_2\text{O}_{9-\delta}$ by Texture Development	
H. Fukutomi, E. Iguchi and K. Shibuya	3420
Application of Asymmetric Rolling to Texture Control of Silicon Steel	
Y.H. Sha, S.C. Zhou, W. Pei and L. Zuo	3424
Microstructure and Texture Evolution during Annealing after Temper Rolling of a 2 wt.-% Silicon Electric Steel	
L.M.F.G.d. Lima, N.B. de Lima, R.L. Plaut and A.F. Padilha	3430

Texture and Microstructure of Cold Rolled and Recrystallized Pure Niobium H.F.G. Abreu, S.S.M. Tavares, S.S. Carvalho, T.H.T. Eduardo, A.D.S. Bruno and M.H. Prado da Silva	3436
Texture Evolution during Diffusional Heat Treatment from Roll-Bonded Ti/Ni Laminates to TiNi Shape Memory Alloy Sheets H. Inoue, K. Asao, M. Ishio and T. Takasugi	3442
Experimental and Numerical Investigation of Texture Development during Hot Rolling of Magnesium Alloy AZ31 C. Schmidt, R. Kawalla, T. Walde, H. Riedel, A. Prakash and C. Poizat	3448
Multiscale Modelling of Plastic Deformation of Polycrystals: Implementation of Texture-Based Anisotropy in Engineering Applications (FE Codes for Forming, Prediction of Forming Limit Curves) P. van Houtte, A. Van Bael and M. Seefeldt	3454
Texture Development in Polycrystalline Fe-Ga Magnetostrictive Materials L.M. Cheng and E. Summers	3460
Study of Deformation Texture of Equal-Channel Angular Pressed CP-Titanium S.M. Liu, S.H. Chon and J.K. Park	3466
Evolution of Texture in a Ti-IF Steel during Warm Rolling and Cold Rolling Y.H. Guo, Z.D. Wang, G.D. Wang and X. Liu	3472
Effects of Electric Field Annealing on Recrystallization Texture and Plastic Strain Ratio (r-Value) of IF Steel Sheet X. Zhao, C.S. He, J. Xu and L. Zuo	3478

Thin Films

	19.
Bond-Orientational Ordering in Cyclohexyl-Biphenyl Type Liquid Crystals A.K. Schaper, S.R. Zhao and A. Kutoglu	3485
Synthesis of Carbon Nanotubes and its Applications in Composites and Field Emission Light N.H. Tai, M.K. Yeh, C.H. Yang, S.H. Tseng, C.C. Chiu, T.Y. Tsai, J.H. Liu and T.H. Peng	3491
Sputtered Cu Films Containing Various Insoluble Substances for Advanced Barrierless Metallization J.P. Chu and C.H. Lin	3497
Behavior of Oxide Film in Transient-Liquid-Phase Bonding of Tin with Filler of Bismuth Film S. Koyama, M. Takahashi and K. Ikeuchi	3503
Microstructure and Gas Sensing Property of Porous SnO₂ Sputtered Films T. Yamazaki, C.J. Jin, Y.B. Shen, T. Kikuta and N. Nakatani	3508
Luminance Characterization of La₃Ga₅SiO₁₄ Thin Films by Sputtering Deposition Y. Hu, F.W. Wang and H.L. Lin	3514
Effect of Film Thickness and Annealing Temperature in Stress-Induced Damage in Metal Films Y.C. Joo and S.J. Hwang	3520
Self-Assembly of Nano-Sized Arrays on Highly Oriented Thin Films of Poly(tetrafluoroethylene) M. Tosaka, M. Tsuji, S. Kohjiya and K. Nagayama	3525
Atomic Assembly of Thin Film Materials X.W. Zhou, D.A. Murdick, B. Gillespie, J.J. Quan, H.N.G. Wadley, R. Drautz and D. Pettifor	3528
Measuremet of Mechanical Properties of Thin Films and Nanostructured Materials at High Spatial Resolution S.J. Bull	3534
The Role of Segregation in InGaAs Heteroepitaxy D. Litvinov, D. Gerthsen, A. Rosenauer, M. Schowalter, T. Passow and M. Hetterich	3540
Molecular Dynamics Simulation on Formation of Icosahedron and Coalescence of Pt Nanoclusters S.H. Lee, S.S. Han, J.K. Kang and H.M. Lee	3546
Hydrogen Measurements in SiN_x: H/Si Thin Films by ERDA M. Ionescu, B. Richards, K. McIntosh, R. Siegele, E. Stelcer, D.D. Cohen and T. Chandra	3551

Effect of DC Bias Voltage on the Optical Properties of TiO₂ Thin Film Deposited by Plasma Assisted Electron Beam Evaporation	
S.K. Hong, S.B. Jung, Y.C. Kim, W.K. Kee and C.S. Kang	3557
Fabrication of Sputtered TiO_{2-x}N_x Photocatalyst Using Spark Plasma Sintered Targets	
S.J. Kim, Y.H. Oh, S.B. Park, W.I. Kwon, R. Khudayberganov, R. Khamidova, D.S. Kim, S.S. Park, K.B. Park and J.H. Ahn	3562
In Situ Scanning Electron Microscopy Observation of the Pattern Formation on the Surface of Al/Ge Bilayer Films	
H. Kumagai, M. Shibata, T. Moritani, T. Kozakai, M. Doi, M. Takagi and T. Imura	3568
Substrate Effect on the Diamond-Like Carbon Films Synthesized by RF Plasma Enhanced Chemical Vapor Deposition	
S.S. Tzeng, W.M. Wu and J.S. Hsu	3574
Embossing on Epoxy Thermoset Polymer Using SiO₂ Coated Nickel Template	
K.J. Byeon, S.H. Hong, K.Y. Yang, D.K. Kim and H. Lee	3580

Titanium Alloys & Aerospace Structural Metallic Materials

20.

Microstructure and Texture in an Alpha/Beta Titanium Alloy and their Impact on Mechanical Response	
W.J. Evans and F.R. Eng	3589
Ageing of C-Containing and C-Free Ti-15Cr and Ti-15-3	
X.H. Wu, J. Del Prado, D. Hu, A. Huang, M.Q. Chu and M.H. Loretto	3595
Melting and Casting of Titanium Alloys	
S.Y. Sung and Y.J. Kim	3601
Constitutive Analysis of the High-Temperature Deformation Behavior of Single Phase α-Ti and $\alpha+\beta$ Ti-6Al-4V Alloy	
J.H. Kim, J.T. Yeom, N.K. Park and C.S. Lee	3607
The Effect of Oxygen on Heat Treatment Behavior of Titanium-50mass% Tantalum-5mass% Zirconium Alloy	
M. Ikeda and M. Mori	3613
Temperature and Strain Rate Effects on Plastic Deformation of Titanium Alloys	
K. Ogawa	3619
Beta Phase Decomposition in a TiAl Alloy during Continuous Cooling	
D. Hu, H. Jiang, M.H. Loretto and X.H. Wu	3625
Production of Functionally-Graded Samples Using Simultaneous Powder and Wire-Feed	
F. Wang, J. Mei, H. Jiang and X.H. Wu	3631
An Experimental and Modelling Study of Laser Fabricated Samples	
L. Qian, J. Mei and X.H. Wu	3637
New Process-Microstructure Method for Affordable 2024 Series Aerospace Aluminum Alloys	
T. Eto and M. Nakai	3643
Effect of Surface Oxide Films on Degradation of Titanium	
K. Asaoka and K. Maejima	3649
Optimization of the Equal Channel Angular Pressing (ECAP) Process for Strain Homogeneity	
B. Cherukuri and R. Srinivasan	3655
A Physically Based Flow Rule for the Simulation of Ti-6Al-4V Forging in the $\alpha - \beta$ Range	
A. Colin, C. Desrayaud, M. Mineur and F. Montheillet	3661
Micro Metal Injection Molding Process for High Performance Titanium Alloy	
H. Miura, S. Tanaka, T. Osada and M. Uemura	3667
Colloidal Photonic Crystals Using Space -An Academic-Industrial Collaboration-	
T. Kano	3673
Oxidation Effects during High Temperature Deformation of CP Ti Alloy	
M.J. Tan, X.J. Zhu, S. Thiruvarduchelvan and K.M. Liew	3678
On the Nature of the Growth of Bainitic α plates in Metastable β Ti Alloys	
S.M.C. van Bohemen, J. Sietsma and S. van der Zwaag	3684

Microstructure and Mechanical Properties of an Advanced Niobium Based Ultrahigh Temperature Alloy	
X.P. Guo, L.M. Gao, P. Guan, K. Kusabiraki and H.Z. Fu	3690
Prediction of Flow Stress in Ti-6Al-4V Alloy with Hydrogen at High Temperature Using Artificial Neural Network	
Q. Wang, T. Wu, D.L. Sun and J. Lai	3696
Study on a Damage Tolerant Titanium Alloy	
S.X. Hui and X.J. Mi	3702
Microstructures and Cohesiveness of Alkali- and Heat-Treated Films on a Ti-15Zr-4Nb-4Ta Alloy	
S. Kobayashi, K. Murakami, K. Nakai and M. Hino	3706
Characterisation of the Phase Transformations in a Metastable β Titanium Alloy	
A. Lenain, N. Clément, M. Véron and P.J. Jacques	3712

Friction Stir Processing

	21.
Friction Stir Processing of Cast NiAl Bronze	
M.W. Mahoney, C.B. Fuller, W.H. Bingel and M. Calabrese	3721
Metallurgical and Mechanical Properties of Friction Stir Welded Ultra Fine Grained Steel	
S. Hirano, K. Okamoto, S.H.C. Park, K. Aota and T. Tsukamoto	3727
Local Manufacture of MMC Using FSW	
T. Nishihara and K. Yamamura	3733
Microstructural Evolution of Cast Mg-Al-Ca Alloy during Friction Stir Processing	
D.T. Zhang, M. Suzuki and K. Maruyama	3739
Microstructure Evolution and Microstructure-Property Relationships in Friction Stir Processing of NiAl Bronze	
T.R. McNelley, K. Oh-ishi and A.P. Zhilyaev	3745
Tensile and Fatigue Properties of Friction Stir Processed NiAl Bronze	
C.B. Fuller, M.W. Mahoney, W.H. Bingel, M. Calabrese and B. London	3751
Microstructure of Friction-Stir-Welded High-Nitrogen Stainless Steel	
S.H.C. Park, Y.S. Sato, H. Kokawa, K. Okamoto, S. Hirano and M. Inagaki	3757
Friction Stir Welding of Precipitation Hardened Ni Based Alloys	
H.J. Jun, R. Ayer, T. Neeraj and R. Steel	3763
Control of Grain Size and Texture in Al Alloys Utilizing Friction Stir Processing	
T. Shibayanagi and M. Naka	3769
Enhancement of Formability in Magnesium Alloy AZ31B via Friction Stir Processing	
Y.S. Sato, A. Sasaki, A. Sugimoto, A. Honda and H. Kokawa	3775
Evaluation of Post-Weld Heat Treatments to Restore the Corrosion Resistance of Friction Stir Welded Aluminum Alloy 7075-T73 vs. 7075-T6	
C.A. Widener, D.A. Burford, B. Kumar, J.E. Talia and B. Tweedy	3781
Relation between Strength and Microstructure in Friction Stir Welded Joints of A383 and A5052 Aluminum Alloys	
M. Kokubo, S. Kazui, T. Kaneuchi, Y. Takayama, H. Kato and S. Hirano	3789
Residual Strain Measurements in a Friction-Stir Processed AZ31B Magnesium Alloy Using Neutron Diffraction	
W. Woo, H. Choo, D.W. Brown, B. Clausen, Z.L. Feng and P.K. Liaw	3795
Experimental Thermal Analysis of Friction Stir Processing	
B.M. Darras, M.A. Omar and M.K. Khraisheh	3801
Controlled Plasticity Burnishing to Improve the Performance of Friction Stir Processed Ni-Al Bronze	
P.S. Prevey, D.J. Hornbach and N. Jayaraman	3807
Microstructural Evolution and Performance of Friction Stir Welded Aluminum Matrix Composites Reinforced by SiC Particles	
Z.Y. Ma, A.H. Feng, B.L. Xiao, J.Z. Fan and L.K. Shi	3814
In Situ Observation of Weld Solidification and Phase Transformation Process Using Synchrotron Radiation	
Y. Komizo, H. Terasaki, M. Yonemura and T. Osuki	3820

Transient Local Melting in Al 7075-T6 Friction Stir Spot Welds T.H. North, G.J. Bendzsak, A. Gerlich, P. Su and G. Cingara	3826
A Thermo-Fluid Analysis of the Friction Stir Welding Process D. Jacquin, C. Desrayaud and F. Montheillet	3832
Friction Stir Welding of Mg-14mass%Li Alloy M. Tsujikawa, Y. Abe, S.W. Chung, S. Oki, M. Kamita and K. Higashi	3838
Friction and Wear of Laser Irradiated Amorphous Metals M. Tsujikawa, D. Azuma, M. Hino, H. Kimura, K. Yubuta and A. Inoue	3844
Influence of Continuous Transversal Inclination of Tool on FSW Joints S. Oki, H. Takahara, Y. Okawa, M. Tsujikawa, Y. Marutani and K. Higashi	3850
Solid State Welding between CPTi and AZ31B Magnesium Alloy by Friction Stirring H. Tanabe, T. Watanabe, Y. Abe and A. Yanagisawa	3856

Welding and Joining

22.

Formation of Intermetallic Compounds in Friction Bonding of Al Alloys to Steel N. Yamamoto, M. Takahashi, M. Aritoshi and K. Ikeuchi	3865
Use of Synergistic Effects in High Power Laser-GMA Hybrid Welding for Manufacturing of Thick Walled Structural Pipes D.R.G. Achar, S. Parhar and U. Dilthey	3872
The Oscillation Behaviour of Liquid Metal in Arc Welding M.J.M. Hermans, B.Y.B. Yudodibroto, Y. Hirata, G. den Ouden and I.M. Richardson	3877
Microstructure of SiC/Cu Interface by Pulsed Electric-Current Bonding A. Nishimoto, K. Akamatsu and K. Ikeuchi	3883
Influence of Alloying Elements on Interfacial Reaction and Strength of Aluminum/Steel Dissimilar Joints for Light Weight Car Body A. Hirose, H. Imaeda, M. Kondo and K.F. Kobayashi	3888
Crystallographic Texture of Dissimilar Laser Welded Al5083-Al6013 Sheets H.G. Brokmeier, S. Lenser, R.A. Schwarzer, V. Ventzke, S. Riekehr, M. Koçak and J. Homeyer	3894
Precise Resistance Welding with Wire Insert T. Terajima and T. Kuroda	3900
Effects of Nitrogen on Weld Metal Microstructure and Toughness in Submerged Arc Welding K.S. Bang, W.Y. Kim, C. Park, Y.H. Ahn and J.B. Lee	3906
Repair Welding of Irradiated Reactor Vessel Steel by Low Heat Input GTAW and LBW K. Kamo, M. Sato and K. Nakata	3912
Ultrasonic Friction Power in Microelectronic Wire Bonding M. Mayer and A. Zwart	3920
A CO₂ Gas Shielded Gas Tungsten Arc and its Application to Welding of Steel Sheets M. Tanaka, T. Shinichi, T. Kashima, J.J. Lowke and A.B. Murphy	3926
Anodic Bonding of Ag-Impregnated Glass and Reaction of Derived Joints to Reverse Voltage M. Takahashi and K. Ikeuchi	3931
Microstructure and Properties of High Strength Weld Metals L.E. Svensson	3937
Advancement in Prediction and Control of Welding Residual Stress and Distortion Y.P. Yang and G. Jung	3943
Joining by Forming with a Flat Counter Tool - A New Way of Joining Magnesium Components R. Neugebauer, S. Dietrich and C. Kraus	3949
Braze Pressure Welding (BPW) - A New Method for Joining Steel Pipes - A. Suzumura	3955
A Study on Fatigue Strength Improvement of Aluminum Alloy Resistant Spot Welds by Cold Working D. Kim, D. Blake, S.J. Ryu and B.S. Lim	3961
Characteristics of Nd:YAG Laser Welded 600MPa Grade TRIP and DP Steels C.Y. Kang, T.K. Han, B.K. Lee and J.K. Kim	3967

Modeling of Molten Drop Oscillation in Gas Shielded Metal Arc Welding Y. Hirata, K. Tsujimura, B.Y.B. Yudodibroto, M.J.M. Hermans and I.M. Richardson	3973
Micro Flash Welding of Super Duplex Stainless Steels T. Kuroda, K. Ikeuchi and T. Terajima	3979
Electron Beam Welding of Crack Sensitive Nickel Super Alloy MAR-M-002 T.P. Mitchell, R. Sanderson and B.G.I. Dance	3985
Laser Hybrid Welding in Stainless Steels and in High Strength Steels L.E. Stridh	3991
Visual Information Acquirement and Real-Time Control Methodologies for Weld Pool Dynamics during Pulsed GTAW S.B. Chen	3996
Modeling of Steel Weld Microstructure Using Monte Carlo and Finite Difference Hybrid Method T. Koseki and T. Araki	4002
Selection and Design of Brazing Fillers for Metal-Ceramic Joints V. Bissig, J. Janczak-Rusch and M. Galli	4008
Steel-to-Aluminum Joining by Control of Interface Microstructures - Laser-Roll Bonding and Magnetic Pulse Welding - M. Marya, M.J. Rathod, S. Marya, M. Kutsuna and D. Priem	4013
Abnormal Tin Whisker Growth in Rare Earth Element-Doped Sn3Ag0.5CuXCe Solder Joints T.H. Chuang and S.F. Yen	4019
FE Modelling of Mechanical Tensioning for Controlling Residual Stresses in Friction Stir Welds D.G. Richards, P.B. Prangnell, P.J. Withers, S.W. Williams, A. Wescott and E.C. Oliver	4025
Brazing of CP-Titanium / CP-Titanium and Titanium Alloy / Stainless Steel with Laminated Ti-Based Filler Metal Y. Miyazawa, C.S. Chang, H. Sato, J. Suda, T. Hiraoka, K. Kanda and T. Ariga	4031
Liquation Cracking in Aluminum Welds C. Huang, G. Cao and S. Kou	4036
The Investigation of Diffusion Welding Process and Interfacial Microstructure and Properties on TiCN/Ni S.Q. Zhou, H. Zhao and Q. Dong	4042
Microstructure of Brazing Joint of Silicon Nitride / 40CrMo Steel J. Zhang, L.B. Zhu, B.Y. Zhang and S.W. Yang	4048
Laser Brazing Phenomena of Heat-Resistant Alloys with Precious Brazing Filler Metals K. Saida, W.H. Song and K. Nishimoto	4053
Laser Grooving and Welding of Cracks Occuring at Dies for Die Casting J. Tušek, B. Taljat, M. Hrženjak and D. Klobčar	4059
Minimization of Heat-Affected Zone Size in Welded Ultra-Fine Grained Steel under Cooling by Liquid Nitrogen during Laser Welding H. Hamatani, Y. Miyazaki, T. Otani and S. Ohkita	4063
Insulated Rail Joints for Signalling Applications S.W. Huang, S. Burgess, L. Németh Wehrmann, D. Nolan and T. Chandra	4069
Development of Al/Cu Dissimilar Brazing Joint Controlled Form of Intermetallic Compound K. Shinozaki and K. Koyama	4075
Micro-Resistance Spot Welding of Nickel Free Austenitic Stainless Steel S. Fukumoto, T. Matsuo, D. Kuroda and H. Tsubakino	4081
Grain Growth Behavior and Mechanical Properties of the Friction Stir Welded Zone of 7055 Al Alloy Followed by Post Weld Heat Treatment W.B. Lee, C.Y. Lee, Y.M. Yeon, J.B. Lee, S.C. Chae and S.B. Jung	4087
Welding Phenomena in Hybrid Laser-Rotating Arc Welding Process H.B. Chae, C.H. Kim, J.H. Kim and S.H. Rhee	4093
Analysis of the Welding Materials by OPA Technique M.L. Li, Z.J. Yang, X.X. Zhang, J.W. Chen and H.Z. Wang	4099
Effects of Chemical Compositions of Welding Rods on J-R Fracture Resistances and Tensile Properties of Type 347 Welds J.H. Yoon, B.S. Lee and E.P. Yoon	4105

HSLA/CSP/Precipitation

23.

Surface Hot-Shortness of Steels Induced by a Small Amount of Copper and Tin from Scrap Steels and its Suppression Methods

K. Kunishige and M. Hatano

4113

Evaluation of Physical Parameters in Modelling Softening-Precipitation Interaction in Hot Worked Nb Microalloyed Austenite

C. Iparraguirre, A.I. Fernández-Calvo, J.M. Rodríguez-Ibabe and B. López

4119

Microstructure Characteristic and Strengthening Mechanism of Ti-Microalloyed Automobile Beam Steel Produced by Compact Strip Production

Y.L. Kang, Z.Z. Zhao, H. Yu, B.Z. He and W. Chen

4125

Tailored Solutions in Microalloyed Engineering Steels for the Power Transmission Industry

F. Hippenstiel

4131

Study of Laboratorial Simulation of V-N Microalloyed CSP Steel

T. Pan, C.F. Yang and Y.Q. Zhang

4137

Modeling of Microstructural Gradients in TMCP Bars to Produce Value Added Products

B. Singh and D. Rai

4143

Physical Simulation of Thin Slab Continuous Casting

S.T. Mandziej, J.D. Vosburgh, R. Kawalla and H.G. Schoss

4149

Experimental Studies into Strip Casting of Steel

D. Phelan, T. Zuidwijk, L. Strezov, J. Sietsma and R. Dippenaar

4155

Effect of Dislocations on Precipitation of Nb-C in α -Fe

A. Deschamps, F. Perrard, F. Bley, P. Donnadiou and P. Maugis

4161

The Effects of Nb Carbo-Nitride Precipitation Conditions on Abnormal Grain Growth in Nb Added Steels

T. Murakami, H. Hatano, Y. Shindo, M. Nagahama and H. Yaguchi

4167

Deformation Banding and the Role of Transition Bands between α -Fibre Components on Recrystallization in Low Carbon Steels Studied by EBSD

M. Díaz-Fuentes, A. Iza-Mendia and I. Gutiérrez

4173

Nitriding Behavior and Strengthening Mechanism of Ti Added Steels

K. Kusumi, T. Senuma, M. Suehiro and M. Sugiyama

4179

Effect of Heat Treatment on the Structure and Morphology of Amorphous Steel Produced Using Spray Metal Forming

A.S. Rao, L. Kohler and L.F. Aprigliano

4185

NbC Precipitation Kinetics during and after γ/α Transformation of a Nb Microalloyed Steel

J.S. Park, D.H. Kim and Y.K. Lee

4191

Precipitation of Niobium Carbonitrides: Chemical Composition Measurements and Modeling

M. Perez, E. Courtois, D. Acevedo Reyes, T. Epicier and P. Maugis

4196

Constitutive Modeling of Stress-Strain Curves of IF Austenite

R.E. Lino and R. Barbosa

4202

Effect of the Annealing Conditions on the Microstructure and Mechanical Properties of a 0.04% C Al Killed Steel

J.J. Cardozo, A.L. Rivas and R. Colas

4208

Effect of Cr on Strain Ageing Behaviour of Low Carbon Steel

E.V. Pereloma, V. Bata, R.I. Scott and R.M. Smith

4214

Study of the Development of Heterogeneous Grain Size in the Through-Thickness Direction of Hot Rolled ELC Steels

F. Leysen, J. Penning and Y. Houbaert

4220

Metal Dusting and Oxidation at 593 and 704°C

S.K. Varma, A. Putrevu, M. Pasala, Z. Zeng and K. Natesan

4226

A Physically Based Model for Bake-Hardening Steels and Dent Resistance

J.L. Uriarte, A. Perlade, X. Lemoine, M. Soler, V. Ballarin and T. Iung

4232

Development of Low Carbon Boron Steel for Wire Drawing

C. Camurri, C. Carrasco, I. Bello and M. Trucco

4238

High-Temperature Phase Transitions and Mechanical Properties in Steel of Peritectic Composition	
R. Dippenaar	4243
Mechanism of Hydrogen Embrittlement of Austenitic Steels	
V. Shivanyuk, V.G. Gavriljuk and J. Foct	4249
Microstructural Development in Bearing Steel during Rolling Contact Fatigue	
N. Mitamura, H. Hidaka and S. Takaki	4255
Niobium in Microalloyed Structural and Engineering Steels	
C. Klinkenberg	4261
Study on the Formation of Ferrite-Cementite Microstructure by Strain Induced Dynamic Transformation in Medium Carbon Steels	
Y.H. Lee, J.S. Kwon and D.L. Lee	4267
Determination of Inclusions of Boron and Titanium in Steel by Original Position Statistic Distribution Analysis Technique	
D.L. Li and H.Z. Wang	4272
Influence of Continuous Annealing Parameters on the Mechanical Properties of Cold Rolled Ultra High Strength Steels	
X.D. Zhu	4277
Characterization of Metallurgical Transformations in Multi-Phase High Strength Steels by Barkhausen Noise Measurement	
A. Hug-Amalric, X. Kleber, J. Merlin, H. Petitgand and P. Meilland	4283
Methods of Tinplate Imperfection Analyses	
J. Lenarthova, V. Kohutekova and A. Lesko	4289
 Steels - Advanced High Strength	 24.
Thixoforming of Steels - A Status Report	
W. Bleck, G. Hirt and W. Püttgen	4297
Role of Manganese and Chromium on the Segregation Kinetics of Carbon and Nitrogen to the Dislocations in Ferritic Steels	
V. Massardier-Jourdan, D. Colas and J. Merlin	4303
Microstructure and Mechanical Properties of Ausformed Ultra High-Strength TRIP-Aided Steels	
K.I. Sugimoto, M. Itoh, T. Hojo, S. Hashimoto, S. Ikeda and G. Arai	4309
Effect of Initial Processing on the Microstructure-Property Relationships in Bake-Hardened C-Mn-Si TRIP Steels	
I.B. Timokhina, E.V. Pereloma and P. Hodgson	4315
Size Distribution of Retained Austenite in Phosphorus-Containing TRIP Steels	
L. Zhao, N.H. van Dijk, E.R. Peekstok, O. Tegus, E. Brück and J. Sietsma	4321
Low-Carbon Manganese TRIP Steels	
M. Merwin	4327
On the Phase Transformations in Hot Rolled TRIP-Assisted Multiphase Steels	
S. Godet, C. Georges and P.J. Jacques	4333
Modelling the Transformations Kinetics from Work-Hardened Austenite in a TRIP Steel	
F. Fazeli and M. Militzer	4339
Development of Seamless Pipes with Improved Strength-Toughness Combination for Hydraulic Cylinders	
C. Guarnaschelli, P. Folgarait, E. Paravicini Bagliani, R. Demarchi and H. Desimone	4345
Crystallography and Mechanical Properties of Ultrafine TRIP-Aided Multi-Phase Steels	
M. Wakita, Y. Adachi and Y. Tomota	4351
Effects of Thermomechanical Processing on Microstructure and Mechanical Properties Multiphase Steels Exhibiting a TRIP Effect	
J. Kliber, G. Plestilova, O. Zacek and M.C. Somani	4357
Formation of Microstructure and Texture in Intercritically Rolled C-Mn Steel	
R.H. Petrov, L.A.I. Kestens and Y. Houbaert	4363
State-of-Art High Strength Steel Sheets for the Automotive Application	
T. Urabe, F. Kitano, T. Fujita, Y. Yamasaki and Y. Hosoya	4369

Effect of Processing Route on Mechanical Behavior of C-Mn Multiphase High Strength Cold Rolled Steel	
D.B. Santos, É.G. Neves and E.V. Pereloma	4375
Steel Sheets Mechanical Properties Improvement	
A. Traino, A. Baschenko, A. Zavrazhnov and V. Ivoditov	4381
Advanced High Strength Steels for Automobile Body Structures	
M. Takahashi, A. Uenishi, H. Yoshida and H. Kuriyama	4386
Microstructure Model for a Dual-Phase Steel	
D.S. Liu, M. Militzer and W.J. Poole	4391
Historical Aspects of Thermomechanical Processing for Steels	
H.J. McQueen	4397
Innovative Annealing Techniques for the Production of Advanced High Strength Steels	
C. Elgoyhen, A. De Paepe, A. Lucas and Y. Hardy	4405
Effect of Niobium on Zn-Coated Dual Phase Steel Sheet	
S. Hashimoto	4411
Mechanical Properties in Ultrahigh Strength Secondary Hardening Steels Bearing Co and Ni	
H.S. Sim, K.S. Cho, K.B. Lee, H.R. Yang and H. Kwon	4417
Workability and Straining Behaviour of High Silicon Steels (3.0-6.3%Si) by Hot Torsion and RT Compression Tests	
T. Ros-Yáñez, P. Rodriguez-Calvillo, R. Colas and Y. Houbaert	4422
Effect of Aluminum and Titanium Content on Grain Growth, Texture and Magnetic Properties in 3%Si Non-Oriented Electrical Steel	
Y. Arita and Y. Ushigami	4428
Creep Property Evaluation of Heat-Resistant Steels by Small Punch Creep Test	
S. Komazaki, T. Nakata, T. Sugimoto and Y. Kohno	4434
Saw Welded Joints of Two API Steels Subject to SCC Laboratory Testing	
F.A. Martins, J.A. Ponciano and I. de S. Bott	4440
Original Position Statistic Distribution Analysis (OPA)-Novel Statistic Characterization Method of Different Chemical Compositions and its States of the Materials	
H.Z. Wang	4446
Effects of Heat Treatment and Composition Modification on SAE 8620 Steels	
S. Hong, H.C. Lin, C.H. Yang, L.Y. Tseng and K.M. Lin	4452
Static Recrystallization of Tool Steels	
C.A.C. Imbert and H.J. McQueen	4458
Retained Austenite - Residual Stress - Distortion Relationships in Carburized SAE 6820 Steel	
D.O. Northwood, L. He, E. Boyle and R.J. Bowers	4464
Advanced Material and Processing for the High Temperature Carburising of Microalloyed Case Hardening Steels	
S. Trute, W. Bleck and C. Klinkenberg	4470
Quenching and Partitioning of Ni-Added High Strength Steels	
F.C. Rizzo, A.R. Martins, J.G. Speer, D.K. Matlock, A. Clarke and B.C. De Cooman	4476
The Characterisation of Oxide Scales Grown on Nickel Containing Steel Substrates Using Electron Backscatter Diffraction	
R.L. Higginson, G.D. West and M.A.E. Jepson	4482
Comparison between Charpy Transition Temperature T_{CVN} and Reference Temperature T_0 for 10Ni3CrMoV Steel	
Y.F. Gao, J.C. Shen and B.Q. Wu	4488
 Steels (Pearlitic/Bainitic/Martensitic) Phase Transformation	
	25.
The Development of New-Typed Air-Cooled Mn-Series Bainitic Steels	
H.S. Fang, Z.L. Tan, B.Z. Bai and F.B. Yang	4497
The Development of Ultra-Fine High Performance Low Carbon Bainitic Structural Steel	
X.L. He, C.J. Shang, X.M. Wang, S.W. Yang and H.X. Hou	4503

Study on Corrosion Fatigue Behavior of a High Strength Steel with Carbide Free Bainite/Martensite Duplex-Phase Structure	
B.Z. Bai, X.X. Xu, J.L. Gu, D.Y. Wei and H.S. Fang	4509
Martensitic Structural Steels for Increased Strength and Wear Resistance	
B. Ahlblom, P. Hansson and T. Narström	4515
Intermediate Transformation Structure and Control Cooling Process in Low Carbon Bainitic Steel	
C.J. Shang, Y. Nie, H.X. Hou, J. Li and X.L. He	4521
Optimized Thermomechanical Treatment for Strong and Ductile Martensitic Steels	
A.A. Barani and D. Ponge	4526
Study of Ultra-Long Life Fatigue of High Strength Steel with Duplex-Phase of Carbide-Free Bainite and Martensite	
W.L. Cui, J.L. Gu, B.Z. Bai and H.S. Fang	4532
Effect of Manufacturing Conditions on Toughness in the Middle Carbon Martensitic Steels Produced by the Reheat - Quenching Process	
Y. Murota, S. Mitao and T. Sadasue	4538
On the Formation of a Non-Traditional Pearlite Morphology	
E.B. Damm, R.E. Hackenberg and C.J. van Tyne	4544
Graphitization Behavior of a Spray Formed Ultra High Carbon Steel during Hot Rolling	
H.S. Shi, G.M. Luo, J.F. Fan, Y.J. Lin and J.G. Zhang	4550
Recrystallization and Spheroidization Behavior of High Carbon Pearlitic Steels Investigated by Means of Orientation Imaging Microscopy	
K.Y. Lee, Y.R. Im, L.A.I. Kestens and G.S. Kim	4556
Refinement of Sub-Grain and Enhancement of Impact Energy Absorption for Ultra-High Strength Bainitic Steel	
L.D. Wang, M. Zhu, W.M. Zhou, J.D. Chen, Y.J. Shi, G.D. Chen and W. Zhang	4562
The Ultra-Fine Bainitic Steels and Refinement Technology	
X.M. Wang, X.L. He, S.W. Yang and C.J. Shang	4566
The Effect of Plastic Deformation on the Formation of Different Morphologies of Ferrite upon Cooling	
Y. van Leeuwen and J. Sietsma	4572
Three-Dimensional Observation and Growth Kinetics of Proeutectoid Ferrite Formed at Austenite Grain Boundary in a Low Carbon Microalloyed Steel	
K.M. Wu, A.M. Guo and L. Cheng	4578
Modeling the Effect of Austenite Grain Size Distribution on Austenite Decomposition Kinetics	
A. Samoilov, Y. Titovets, N.Y. Zolotarevsky, G. Hribernic and A. Pichler	4584
Modeling Austenite-to-Ferrite Transformation Kinetics in Low-Carbon Manganese Steels during Continous Cooling	
A.A. Santos and R. Barbosa	4590
Effect of Micro-Segregation on Phase Transformation and Residual Stress	
T. Siwecki, T. Koziel, W.B. Hutchinson and P. Hansson	4596
Simulation of the Process of Hot Rolling of Seamless Tubes	
R.N. Carvalho, M.A.C. Ferreira, D.B. Santos and R. Barbosa	4602
A Phase Transformation Model for the Austenitisation of Martensite in Dual-Phase Steel	
R.G. Thiessen, J. Sietsma and I.M. Richardson	4608
An EBSD Study of Orientation Relationships during Phase Transformations in Ultra High Performance Steels	
S. Godet, Y.L. He, J.J. Jonas and P.J. Jacques	4614
Effect of Hot Deformation and Cooling Rate on Phase Transformations in Low Carbon HN5MVNb Bainitic Steel	
A.K. Lis and J. Lis	4620
Transformation Behavior of Supercooled Austenite during Hot Deformation of Plain Medium Carbon Steel within ($\gamma+\alpha$) 2-Phase Field at a Low Strain Rate	
K.H. Kim, J.H. Chung and J.K. Park	4626
Effect of Annealing Time on Microstructural Evolution and Corresponding Mechanical Properties of Cold Drawn Pearlitic Steel Wires	
W.J. Nam, H.R. Song and D.B. Park	4632

Austenite Formation in C35 and C45 Alloys V.I. Savran, Y. van Leeuwen, D.N. Hanlon and J. Sietsma	4637
Cold Workability and Magnetic Properties of 6% Si Steel J.S. Shin, B.H. Kim, S.M. Lee and B.M. Moon	4643
Interactions between Recrystallisation and Phase Transformations during Annealing of Cold Rolled Nb-Added TRIP-Aided Steels V. Andrade-Carozzo and P.J. Jacques	4649
Steels (Fine-Grained & Pipeline)	26.
Influence of Magnetic Field on the Mechanical Properties of Austempered Ductile Iron (ADI) S.K. Putatunda	4657
Gas Quenching with Controllable Heat Extraction B. Liščić	4663
Morphological Evolutions in Steels during Continuous Rapid Heating W. Kaluba, T. Kaluba and A. Zielinska-Lipiec	4669
Weldability of Ultra-Fine Grained Atmospheric Corrosion Resistant Steel Y. Peng, H.J. Xiao, C.H. He, Z.L. Tian, C.Y. Ma and X.M. Zhang	4675
Stress- and Strain Induced Phase Transformations in Pearlitic Steels J. Ivanisenko, W. Łojkowski and H.J. Fecht	4681
Nanocrystallization of Bulk Steels through γ/α Transformation L.X. Du, M.X. Xiong, X. Liu and G.D. Wang	4687
Equal Channel Angular Pressing in a Pearlitic Structured Steel J.X. Huang and J.T. Wang	4692
Ultrafine Grained Steels due to Super Short Interval Multi-Pass Rolling in Stable Austenite Region K. Miyata, M. Wakita, S. Fukushima, M. Eto, T. Sasaki and T. Tomida	4698
Influence of Deformation Parameters on Deformation Induced Ferrite Transformation (DIFT) in Plain Low Carbon Steel Z.M. Yang	4704
Effect of Ultra-Fast Cooling after Rolling in Stable Austenite Region on Grain Refinement of C-Mn Steel T. Tomida, N. Imai, M. Yoshida and S. Fukushima	4708
Work Hardening in a Fine Grained Austenitic Stainless Steel C.W. Sinclair, H. Proudron and J.D. Mithieux	4714
Refinement of Cementite in High Strength Steel Plates by Rapid Heating and Tempering A. Nagao, K. Hayashi, K. Oi, S. Mitao and N. Shikanai	4720
Prospects and State of the Art of TMCP Steel Plates for Structural and Linepipe Applications V. Schwinn, W. Schuetz, P. Fluess and J. Bauer	4726
Transformation and Precipitation Behavior in the New Conceptual TMCP Process Utilizing Heat Treatment On-Line Process T. Shinmiya, N. Ishikawa, S. Endo, M. Okatsu and H. Nakamichi	4732
Inner Crack Heat-Healing in Low Carbon Steel with Lanthanum J.T. Han, Z.L. Zhao, Y.J. Zhang, J. Liu and Z.W. Liu	4738
Steels with Ferrite-Bainite Microstructure with Improved Weldability and Cold Resistance for Main Pipelines S.Y. Nastich, Y.D. Morozov, L.I. Efron and M.Y. Matrosoy	4744
Microstructure and Properties of Pipeline Steel with Acicular Ferrite L. Zheng and S. Gao	4750
Development of Modern Heavy Plate Steels for Pipelines Y.I. Matrosoy, O.A. Bagmet and A.O. Nosochenko	4756
Grain Scale Assessment of Variant Selection in a Thermomechanically Processed TRIP Steel Y.L. He, S. Godet and J.J. Jonas	4762

Diffusion-Controlled Phase Transformation under High Magnetic Field in Medium and High Carbon Steels	
Y.D. Zhang, C. Esling, X. Zhao and L. Zuo	4768
Rust Layer Structure and Corrosion Resistance of High Strength Microalloyed Steels	
Y.T. Zhao, S.W. Yang, H. Guo, X.M. Wang, C.J. Shang and X.L. He	4774

Steels: Advances in Structure Property Relations

27.

Effect of Carbon on Work Hardening Behavior of 18%Ni Martensitic Steel	
K. Nakashima, Y. Fujimura, T. Tsuchiyama and S. Takaki	4783
Nano-Carbides and the Strength of Steels as Assessed by Electrical Resistivity Studies	
D.R. Lesuer, G. Frommeyer, O.D. Sherby and C.K. Syn	4789
Modeling of Microstructure Evolution of Athermal Transformation of Lath Martensite	
D.H. Sherman, B.J. Yang, A.V. Catalina, A.A. Hattiangadi, P. Zhao, L. Chuzhoy and M.L. Johnson	4795
The Ultrahigh Ductility of an Ultrahigh Carbon Steel Containing 3%Si	
O. Ruano, T. Oyama and O.D. Sherby	4801
Ultra Rapid Softening of High Strength Structural Steels by Thermomechanical Treatment	
Y. Adachi and K. Tsuzaki	4807
Coarsening Behavior of Nanometer-Sized Carbides in Hot-Rolled High Strength Sheet Steel	
Y. Funakawa and K. Seto	4813
Microstructural Features of 'Quenching and Partitioning': A New Martensitic Steel Heat Treatment	
D.V. Edmonds, K. He, M.K. Miller, F.C. Rizzo, A. Clarke, D.K. Matlock and J.G. Speer	4819
Thermomechanical Treatments of Ultrahigh Carbon Steels and Optimal Microstructures to Improve Toughness	
M. Carsí, A. Fernández-Vicente, O.D. Sherby, F. Peñalba and O. Ruano	4826
Substructure and Crystallography of Degenerate Pearlite in an Fe-C Binary Alloy	
T. Furuhashi, T. Moritani, K. Sakamoto and T. Maki	4832
Effect of Niobium on HAZ Microstructure and Toughness of HSLA Steels	
E. El-Kashif and T. Koseki	4838
Mechanical and Thermal Properties of Ultra-High Carbon Steel Containing Aluminum	
C.K. Syn, D.R. Lesuer, A. Goldberg, H.C. Tsai and O.D. Sherby	4844
Advanced Technology of Automotive Connecting Rod	
T. Kubota and H. Yamagata	4850
Development of Anti-Coarsening Steel for Carburizing	
M. Kubota and T. Ochi	4855
Evaluation of Damping Property of Aluminum-Alloyed Cast Iron by Several Methods	
S. Takamori, Y. Osawa, H. Kakisawa, K. Minagawa and K. Halada	4861
Analysis of Spherical Carbides Formed in Chromium Added Hypereutectoid Bearing Steels	
A. Yamamoto, K. Inoue and H. Tsubakino	4866

Steels: Stainless and High Nitrogen

28.

Processing of Submicron Grained Microstructures and Enhanced Mechanical Properties by Cold-Rolling and Reversion Annealing of Metastable Austenitic Stainless Steels	
M.C. Somani, L.P. Karjalainen, A. Kyröläinen and T. Taulavuori	4875
Intragranularly Nucleated Austenite in a 2205 Duplex Stainless Steel	
C.Y. Chen, H.W. Yen, T.H. Yu and J.R. Yang	4881
Retardation of 20%Cr Steel Oxidation with Laves Phase Precipitation	
S. Ide, Y. Funakawa, Y. Kato and O. Furukimi	4887
Static Strain Aging in Cold Rolled Metastable Austenitic Stainless Steels	
P. Antoine, B. Soenen and N. Akdut	4891
Effects of Si on Oxidation Behaviors in Cr-Mn-Ni Austenitic Stainless Steels	
T. Oshima, Y. Habara and K. Kuroda	4897
TRIP Effect and Deformation Damaging of Metastable Austenitic Steels	
H. Oettel, M. Glavatskikh, U. Martin and A. Nikulin	4903

Effects of Drawing Strain and Annealing on the Mechanical Properties for Heavily Cold Drawn Hyper-Eutectoid Steel Wires Y.S. Yang, J.G. Bae and C.G. Park	4909
Effect of Precipitation on Cryogenic Toughness in N-Containing Austenitic Stainless Steels M.L. Saucedo-Muñoz, T. Hashida, Y. Watanabe, T. Shoji and V.M. Victoria-Hernández	4914
Prediction of Properties in Type 347 Austenitic Stainless Steel after Long-Term Service at High Temperatures J.O. Nilsson	4920
Texture Evolution of Ferritic (AISI 430) Stainless Steel Strips during Cold Rolling, Annealing and Drawing A. Ferreira Filho, C. Herrera, N.B. de Lima, R.L. Plaut and A.F. Padilha	4926
The Strain-Independence of Interpass Softening during the Hot Compression of 304 H Stainless Steel A. Najafizadeh and J.J. Jonas	4932
Electron Beam Freeform Fabrication on Stainless Steel P. Wanjara, M. Brochu and M. Jahazi	4938
Thermal Fatigue Characteristics of Heat-Resisting Stainless Steel for Automotive Exhaust T.K. Ha and H.J. Sung	4944
Decomposition of Austenite in Fe-25Cr-1N Alloy Produced by Solution Nitriding T. Tsuchiyama, N. Hirakawa, N. Nakada and S. Takaki	4950
Stainless Austenitic CrMnCN Steels of Superior Strength Part I: Alloy Design and Properties H. Berns, S. Riedner and A. Tyshchenko	4956
Grain Boundary Engineering of High-Nitrogen Austenitic Stainless Steel H. Kokawa, W.Z. Jin, Z.J. Wang, M. Michiuchi, Y.S. Sato, W. Dong and Y. Katada	4962
The Individual and Cumulative Effect of C and N on the Hardening and Structure of High-Nitrogen Hot Plastic Worked Steels L.M. Kaputkina, W.G. Prokoszkina, J. Siwka, A.G. Svjazin, B. Koczurkiewicz and M. Knapieński	4968
Properties of Low Carbon High Nitrogen Martensitic Stainless Steels S. Hamano, T. Shimizu and T. Noda	4975
Influence of the Shot Peening Process on the Fatigue Behaviour of Duplex Stainless Steel Reinforcing Bars E. Real, C. Rodríguez, A. Fernández Canteli and F.J. Belzunce	4981
N--H Interaction in Nitrided Fe--Nb Alloys M. Sakamoto	4987
Atomic Interactions in Stainless Austenitic CrMn Steels Alloyed with C, N or (C+N) B.D. Shanina, V.G. Gavriljuk and H. Berns	4993

Nanocrystalline Materials

29.

Processing and Property of Net-Shaped Fe-Based Nanoparticulate Material J.S. Lee, B.H. Cha, H.G. Kang and Y.S. Kang	5001
Nanoscale Behaviour of Certain Materials/Surfaces P.K. Datta, Z. Klusek, H.L. Du and J.S. Burnell-Gray	5007
Structural Change during Cold Rolling of Electrodeposited Copper X. Huang, Q.H. Lu, M.L. Sui, D.X. Li and N. Hansen	5013
Diffusion Properties of Internal Interfaces in Bulk Nanocrystalline Materials: Radiotracer Investigation S.V. Divinski, J.S. Lee and C. Herzig	5019
Hydrogen Sensing Characteristics of High Electron Mobility Transistor with a Catalytic Pd Metal K.W. Lin	5025
Effect of Crystalline Phase on Dynamic Deformation Properties of Zr-Based BMG Alloys D.G. Lee, Y.T. Lee, J.T. Yeon, J.H. Kim, N.K. Park and S.H. Lee	5031
Thermal Flow Simulation and Concave Type Slot Nozzle Design for Twin Roll Casting of Magnesium Alloy AZ31 X.D. Hu, D.Y. Ju and H.Y. Zhao	5037