

Table of Contents

Committees

Coordinators Organizers

Acknowledgements

Preface and Overview

Keynote

Next Decades' Challenges for Terrestrial Vehicles' Materials and Manufacturing to Reduce CO₂ Emissions

H.E. Friedrich, P. Steinle, G. Kopp and R. Schöll 3

Evaluation of the Corrosion Protection of Ultra-Thin Plasma Fluorocarbon Film Deposited on 316L Stainless Steel for Long-Term Stable Stents

M. Touzin, P. Chevallier, S. Turgeon, P. Horny and D. Mantovani 10

Anomalous Characteristics of Ti-Nb-Ta-Zr Alloy for Biomedical Applications

M. Niinomi, M. Nakai, T. Akahori and H. Tsutsumi 16

Mechanical Behaviour of Metals under Explosive Loading

R. Montanari and N. Ucciardello 22

Environmental Cracking and Impact Investigations after Short-Term Temperature Treatments: 7050-T7451 Friction Stir Weld

C. Paglia 29

Friction Stir Processing (FSP) of Cast Metals: Microstructure – Property Relationships in NiAl Bronze and AA5083

T.R. McNelley, S. Swaminathan, E. Sarath Menon and J.Q. Su 35

Friction Stir Welding of Ferrous Alloys: Current Status

M. Mahoney, T.W. Nelson, C. Sorenson and S. Packer 41

Creep Strain Behavior in Transient Region and Minimum Creep Rate of Tempered Martensitic 9%Cr Steel

F. Abe 47

Strain Rate Effects and Hardening Mechanisms in Ni Base Superalloys

L. Nazé and J.L. Strudel 53

Methods for Filling Hollow Structures with Aluminium Foam

J. Baumeister 61

Fabrication of Hollow Nano Particles of Metallic Oxides through Oxidation Process

H. Nakajima and R. Nakamura 67

Status of the Development of Creep Resistant Magnesium Materials for Automotive Applications

K.U. Kainer, Y.D. Huang, H. Dieringa and N. Hort 73

Multi Scale Random Models of Complex Microstructures

D. Jeulin 81

Friction Stir Welding of Aluminium Based Composites Reinforced with Al₂O₃ Particles

L. Ceschin, I. Boromei, C. Gambaro, G. Minak, A. Morri and F. Tarterini 87

Hierarchical Structured Nanomaterial Fabricated by Nanopowder Process: Nanopowder Agglomerate Sintering

J.S. Lee, W.K. You and B.H. Cha 93

Mechanisms of Ultrafine Grain Formation in Severe Plastic Deformation

T. Sakai and H. Miura 98

Hydrogen Brittleness of Austenitic Steels

V.G. Gavriljuk, V.N. Shyvanyuk and S.M. Teus 104

Advanced Bainitic and Martensitic Steels with Carbide-Free Microstructures Containing Retained Austenite

D.V. Edmonds 110

Toughness of Advanced High Strength Bainitic Steels

F.G. Caballero, J. Chao, J. Cornide, C. Garcia-Mateo, M.J. Santofimia and C. Capdevila 118

The Alloy Design and Thermomechanically Controlled Processing (TMCP) of Plate for High Pressure, Large Diameter Pipelines	124
C.I. Garcia, K. Cho, M.J. Hua and A.J. DeArdo	
University Impact on Thermomechanical Processing in Corus	130
A.A. Howe	
New Trends in Advanced High Strength Steel Developments for Automotive Application	136
O. Kwon, K.Y. Lee, G.S. Kim and K.G. Chin	
Surface Modification to Enhance Fatigue Performance of Steel: Applications of Deep Rolling	142
D.K. Matlock, M.D. Richards and J.G. Speer	
Effect of Manufacturing Process on the Final Properties of Advanced High Strength Steels for Automotive Applications	148
E.V. Pereloma, I.B. Timokhina, T.B. Hilditch and P. Hodgson	
Problems and Promises of Metal Matrix Composites	154
R. Taillard	
Structure and Hardness of Martensite in Quenched Fe-C Steels	160
O.D. Sherby, J. Wadsworth, D.R. Lesuer and C.K. Syn	
Effect of Carbon and Nitrogen on the Hall-Petch Coefficient of Ferritic Iron (Review on the Hall-Petch Relation in Ferritic Iron)	168
S. Takaki	
Lasers and Thermal Spray	174
M. Jeandin, D. Christoulis, F. Borit, M.H. Berger, S. Guetta, G. Rolland, V. GuiPont, E. Irisso, J.G. Legoux, C. Moreau, M. Nivard, L. Berthe, M. Boustie, W. Ludwig, K. Sakaguchi, Y. Ichikawa, K. Ogawa and S. Costil	
Recrystallization-Texture Theories in Light of Strain-Energy-Release-Maximization	182
D.N. Lee	
Modelling Study of Deformation Texture and Plastic Heterogeneity at Grain Boundaries and Triple Junctions	190
P. van Houtte, A.K. Kanjarla and L. Delannay	
Grain Boundary Texture	196
V. Randle and R. Jones	
Application of a High Magnetic Field during Thermo-Treatment of Metallic Materials as a Potential Means for Microstructure Modification	202
Y.D. Zhang, C. Esling, X. Zhao and L. Zuo	
Advances in Thin Film Technology through the Application of Modulated Pulse Power Sputtering	208
B. Mishra, J.J. Moore, J.L. Lin and W.D. Sproul	
Microstructure and Mechanical Properties of Dissimilar Joints of AZ31 MG Alloy to Aluminium Alloys	214
W.S. Chang, H.J. Kim and S.W. Kim	

1. Aluminum Alloys & Aerospace Structural Metallic Materials

FE Analysis of Microstructure Evolution during Ring Rolling Process of a Large-Scale Ti-6Al-4V Alloy Ring	223
J.T. Yeom, J.H. Kim, J.K. Hong, N.K. Park and C.S. Lee	
Matrix Coherency Strain and Hardening of Al-Mg-Si	229
S. Gulbrandsen-Dahl, K.E. Moen, F.J.H. Ehlers, C.D. Marioara, K.O. Pedersen and K. Marthinsen	
Microstructure and Processing Ability of β-Solidifying TNM-Based γ-TiAl Alloys	235
V.M. Imayev, R.M. Imayev, T.G. Khismatullin, T. Oleneva, V. Gühter and H.J. Fecht	
Thermomechanical Treatment of Aluminum Alloy Fin Stock for Heat Exchanger Produced by Twin Roll Strip Casting Process	241
S.B. Kang, D.B. Kim, S.S. Jung and K.J. Euh	
Effect of Material Property Changes on the Performance of Al Rolling Mills	247
K.F. Karhausen and W. Schneider	
Continuous Casting and Rolling for Aluminum Alloy Wire and Rod	255
M.G. Kim, G.C. Lee and J.P. Park	

The Effect of Deformation on the Work Hardening Behaviour after Aging of Two Commercial Al-Mg-Si Alloys	261
M. Kolar, K.O. Pedersen, S. Gulbrandsen-Dahl, T. Brüggemann and K. Marthinsen	
Iron Removal in Aluminum Melts Containing Scrap by Electromagnetic Stirring	267
G.C. Lee, M.G. Kim, J.P. Park, J.H. Kim, J.H. Jung and E.R. Baek	
Effect of Aging Treatment on Properties and Microstructure of an Al-7.5Zn-1.3Mg-1.4Cu-0.12Zr Alloy	273
X.W. Li, B.Q. Xiong, Y.A. Zhang, G.J. Wang, Z.H. Li, B.H. Zhu, F. Wang and H.W. Liu	
Effect of Titanium Addition on Composite L₁₂ Precipitates in Aluminum-Zirconium Alloy	279
T. Maeshima and H. Matsuoka	
Modelling the Work Hardening Behaviour of AlMgMn Alloys	285
K. Marthinsen, S. Abtahi, B. Holmedal, J. Friis, E. Nes and T. Furu	
Superplasticity of a Sc and Zr Modified Al-6%Cu Alloy Subjected to ECAE	291
I. Nikulin, R. Kaibyshev, S. Mironov, Y.S. Sato, H. Kokawa and Y. Motohashi	
Effect of PFZ and Grain Boundary Precipitate on Mechanical Properties and Fracture Morphologies in Al-Zn-Mg(Ag) Alloys	297
T. Ogura, A. Hirose and T. Sato	
Applicability of Adaptive Neural Networks (ANN) in the Extrusion of Aluminum Alloys and in the Prediction of Hardness and Internal Defects	303
R.C. Campana, P.C. Vieira and R.L. Plaut	
Hot Deformation Behavior of Near-α Ti-Fe Alloy in ($\alpha+\beta$) Two-Phase Region with Different Fe Content	310
B. Poorganji, M. Yamaguchi, Y. Itsumi, K. Matsumoto, T. Tanaka, Y. Asa, G. Miyamoto and T. Furuhara	
Through Process Prevention of Recrystallization in Hot Formed Aluminium Structural Car Components	315
J. Sandvik, O. Jensrud, S. Gulbrandsen-Dahl, H. Hallem and J.I. Moe	
Polynomial vs. Mechanism-Based Response Surface Analysis of the Thermomechanical Treatment of Al-Sn Alloys	321
R. Schouwenaars, H.A. Cortéz, V.H. Jacobo and A. Ortiz	
Recrystallization Behaviors of an Al-Zn-Mg-Cu Alloy during Multi-Pass Hot Compression	327
J. Shen, J.P. Li, L.M. Yan and X.D. Yan	
Strain Hardening and Damage in 6xxx Series Aluminum Alloy Friction Stir Welds	333
A. Simar, K.L. Nielsen, B. de Meester, T. Pardoen and V. Tvergaard	
Effect of Mg Addition on the Mechanical Properties of Rapidly Solidified Al-Mn Alloys at Elevated Temperatures	339
M. Sugamata, A. Tomioka and Y. Kubota	
Effects of Electromagnetic Purification on Properties of Al-RE Rod for Electrical Purpose	345
B.D. Sun, D. Shu and J. Wang	
Alloy Constitution Dependence of Strength and Deformation in Aluminum-Titanium-Vanadium Ternary Alloys Containing Gamma+Beta Dual Phase Microstructures	350
T. Takahashi, N. Liu, Y. Yazawa and T. Nunome	
Formability and Correlation between Formability Indices of Al-0.9Mg-1.0Si-0.7Cu-0.6Mn Alloy for Automotive Body Sheets	356
N. Tian, G. Zhao, L. Zuo and C.M. Liu	
Appearance of Non-Equilibrium α-Aluminum Grains in Hypereutectic Al-Si Alloy through Sono-Solidification	362
Y. Tsunekawa, K. Taga, Y. Fukui and M. Okumiya	
Cutting Performance of Diamond-Like Carbon Coated Tool in Cutting of Aluminum Alloys	368
T. Wada	
On the Microstructures of Spray-Deposited and Homogenized Al-Zn-Mg-Cu Alloys	374
B.Q. Xiong, F. Wang, Y.A. Zhang, B.H. Zhu, H.W. Liu, Z.H. Li, Y.T. Zuo, J.S. Zhang, U. Frichting and K. Bauckhage	
Three-Dimensional Characterization of Fatigue Crack Propagation Behavior in an Aluminum Alloy Using High Resolution X-Ray Microtomography	378
H. Zhang, P.C. Qu, Y. Sakaguchi, H. Toda, M. Kobayashi, K. Uesugi and Y. Suzuki	
TEM <i>In Situ</i> Investigation on Non-Equilibrium Eutectics in Semicontinuous Casting Ingot of Al-6.2Zn-2.3Mg-2.3Cu Super-High Strength Aluminum Alloy	384
F.H. Gao, G. Zhao, W.M. Bian and N. Tian	

The Dual Nature of Precipitates in Al-Mg-Si Alloys	
S.J. Andersen, C.D. Marioara, R. Vissers, M. Torsæter, R. Bjørge, F.J.H. Ehlers and R. Holmestad	390
Roping Phenomena in Aluminium Alloy 6016: A Microtextural Investigation	
T.A. Bennett, J.J. Sidor, R.H. Petrov and L.A.I. Kestens	396
Heat Treatment Variability Effects on the Mechanical Properties of Beta Solution Treated Ti-6Al-4V	
J.R. Calcaterra	401
On the Plastic Flow Behavior of Ti-6Al-4V Alloy during Multi-Stand Tandem Hot Rolling	
L.Q. Chen, S. Liang and X. Liu	407
Casting of Clad Strip by an Unequal Diameter Twin Roll Caster	
R. Nakamura, M. Sawai, R. Nakamura, H. Watari and S. Kumai	413
Reliability Evaluation for Aerospace Anodizing Process of Aluminum	
C.C. Torng, C.K. Huang and H.M. Chang	419
Phase Constitution and Heat Treatment Behavior of Titanium-Manganese Alloys	
M. Ikeda, M. Ueda, R. Matsunaga, M. Ogawa and M. Niinomi	425
Effect of Ultrasonic Melt-Treatment on the Eutectic Silicon and Iron Intermetallic Phases in Al-Si Cast Alloys	
W. Khalifa, Y. Tsunekawa and M. Okumiya	431
New Multi-Material Design Concepts and High Integration Light Metal Applications for Lightweight Body Structures	
G. Kopp and E. Beeh	437
Effect of ECAP on Al 6061 – FEA Approach	
S. Nagaraj, V. Mamtha and M.S. Vinod	443
The Mechanical Properties of AA2024 as Function of the Interrupted Ageing Conditions	
D.D. Risanti, M. Yin, J.H. Chen and S. van der Zwaag	449
Evaluation of the Heat Treatment Role for Light Aluminum Alloys Subjected to Creep and Low Cycle Fatigue	
A. Rutecka, L. Dietrich and Z.L. Kowalewski	455
Precipitation of β' Phase in a Low Cost Beta Titanium Alloy	
T. Sakamoto, Y. Hiagaki, S. Kobayashi and K. Nakai	461
Effect of Cr and Zr Dopes on Hydrogen Behaviour in Rapidly Solidified Aluminium Foils	
I.I. Tashlykova-Bushkevich, T. Shikagawa, T. Suzuki, V.G. Shepelevich and G. Itoh	465
Change in Hardness Statistics during Isothermal Annealing of Cold-Rolled Aluminum	
T. Yukimoto, H. Utsunomiya and T. Sakai	469
Phases and Structure Characteristics of the Near Eutectic Al-Si-Cu Alloy Using Derivative Thermo Analysis	
L.A. Dobrzański, M. Krupiński, K. Labisz, B. Krupinska and A. Grajcar	475
Precipitate Behavior and Microstructure Characterization of An Al-Zn-Mg-Cu Alloy Prepared by Spray Forming Process	
B.H. Zhu, B.Q. Xiong, Y.A. Zhang, U. Fritsching, J.S. Zhang, F. Wang, Z.H. Li and H.W. Liu	481
Anisotropy of Bending Properties in Industrial Heat-Treatable Extruded Aluminium Alloys	
K.E. Snilsberg, I. Westermann, B. Holmedal, O.S. Hopperstad, Y. Langsrud and K. Marthinsen	487

2. Biomaterials and Materials in Biomedical Applications

Mechanical Performance of Newly Developed Titanium and Zirconium System Alloys for Biomedical Applications	
T. Akahori, M. Niinomi, M. Nakai, H. Tsutsumi, T. Hattori and H. Fukui	495
Lamellar Surface Structures on Stainless Steel 316 LVM and their Influence on Osteoblastic Cells	
U. Beck, P. Elter, R. Lange and A. Ewald	501
Proliferation and Migration of Human Osteoblasts on Porous Three Dimensional Scaffolds	
C. Bergemann, E.D. Klinkenberg, F. Lüthen, A. Weidmann, R. Lange, U. Beck, R. Bader, K. Schröder and B. Nebe	506
Haematological Performances of Carbon Coated PTFE by Plasma-Based Deposition	
F. Boccafoschi, P. Chevallier, A. Sarkissian and D. Mantovani	512

Numerical Simulations of the Global Behaviour of Implant Supported or Retained Dental Prostheses	
A.S. Bonnet, M. Daas, M. Postaire and P. Lipiński	518
Polymer Surface Processing by Atmospheric Pressure DBD for Post-Discharge Grafting of Washing-Resistant Functional Coatings	
J.P. Borra, A. Valt, F. Arefi-Khonsari and M. Tatoulian	524
Pulsed Laser Deposition of Thin Coatings: Applications on Biomaterials	
A. Carradò, H. Pelletier, J. Faerber, G. Versini and I.N. Mihailescu	530
Structural Analysis of Sintered Materials Used for Low-Temperature Fuel Cell Plates	
A. Dudek, R. Włodarczyk and Z. Nitkiewicz	536
Protein Adsorption on Topographically Structured Surfaces: A Mesoscopic Computer Simulation for the Prediction of Preferred Adsorption Sites	
P. Elter, R. Lange, R. Thull and U. Beck	542
Cyclic Deformation Behaviour and Damage Development on Different Hierarchical Levels in Cortical Bone	
C. Fleck	548
Crack Detection by Wavelet-Based Acoustic Emission Test <i>In Vitro</i> Cemented Implant	
N.E. Dias Gueiral, E.M. da Silva Marques Nogueira and A.M. de Amaral Monteiro Ramos	558
Development of Titanium-Calcium Alloy Resistant to Aqueous Fluoride Solutions	
T. Haruna and I. Shinohara	564
Use of Chitosan as a Material Stabilizer for Acidic Polysaccharides	
P.H. Chen, T.Y. Kuo, D.M. Wang, J.Y. Lai and H.J. Hsieh	570
Orientation of Biological Apatite in Rat Calvaria Analyzed by Microbeam X-Ray Diffractometer	
T. Ishimoto, T. Sakamoto and T. Nakano	576
Effect of Quenching and Reheating on Isothermal Phase Transformation in Ti-15Nb-10Zr Alloy	
S. Kobayashi, R. Ohshima, K. Nakai and T. Sakamoto	582
Bone Regeneration Based on Orientation of Biological Apatite (BAp) C-Axis in Osteopetrotic (op/op) Mice	
J.W. Lee, K. Kawahara and T. Nakano	588
Neutron Diffraction Residual Stress Evaluation and Numerical Modeling of Coating Obtained by PTA Process	
A. Nady, H. Bonnefoy, V. Klosek, M.H. Mathon and A. Lodini	594
A Dual Role of Copper on the Surface of Bone Implants	
F. Lüthen, C. Bergemann, U. Bulnheim, C. Prinz, H.G. Neumann, A. Podbielski, R. Bader and J. Rychly	600
Haematological Performances of Carbon Coated PTFE by Plasma-Based Deposition	
F. Boccafoschi, P. Chevallier, A. Sarkissian and D. Mantovani	606
From Medicinal Chemistry to Functionalized Biomaterials: Development of Graftable RGD-Peptidomimetics for Cell Adhesion and Cell Addressing	
J. Marchand-Brynaert	612
Fatigue and Fretting Fatigue Behavior of Metallic Biomaterials	
N. Maruyama	618
Recent U.S. FDA Reclassification on the Regulation of Tissue Adhesives for Skin Approximation in Clinical Applications	
G.J. Mattamal	624
Coarse Grain Modeling for Microtubule Mechanics	
M.A. Deriu, M. Soncini, T.C. Bidone, A. Redaelli and F.M. Montevercchi	629
Mechanical Properties of Ti-Cr-Sn-Zr Alloys	
Y. Murayama, S. Sasaki, H. Kimura and A. Chiba	635
Mechanical Behavior Study of Plasma Sprayed Hydroxyapatite Coatings onto Ti6Al4V Substrates Using Scratch Test	
A. Behnamghader, D. Najjar, A. Iost and S. Benayoun	641
Osteoblast Sensitivity to Topographical and Chemical Features of Titanium	
B. Nebe, H. Jesswein, A. Weidmann, B. Finke, R. Lange, U. Beck and K. Schröder	652
Structural Analysis of Hydroxyapatite Sinters with Addition of ZrO₂ Phase	
A. Dudek and Z. Nitkiewicz	658

Stress Simulation and Related Bone Ingrowth in Grooves on Implant Surface	664
Y. Noyama, N. Nagayama, T. Ishimoto, K. Kuramoto, T. Sakai, H. Yoshikawa and T. Nakano	
Preparation of Silicon-Containing Poly(lactic acid)-Vaterite Hybrid Membranes	670
A. Obata, T. Wakita, Y. Ota and T. Kasuga	
Comparison of the Cross Sectional Area, the Loss in Volume and the Mechanical Properties of LAE442 and MgCa0.8 as Resorbable Magnesium Alloy Implants after 12 Months	
Implantation Duration	
M. Thomann, N. von der Höh, D. Bormann, D. Rittershaus, C. Krause, H. Windhagen and A. Meyer-Lindenberg	675
Morphological Analysis of Hydroxyapatite Particels Obtained by Different Methods	
E.M. Rivera-Muñoz, R. Velázquez-Castillo and J.L. Cabrera-Torres	681
Relevance of Static and Dynamic Recrystallizations on Austenite Grain Refinement in Nb-Mo Microalloyed Steels	
B. Pereda, B. López and J.M. Rodriguez-Ibabe	687
In Situ Hardening Biodegradable and Malleable Polymer-Nanoapatite Composites	
S. Berger, J. Weisser, E. Müller and M. Schnabelrauch	693
Gas-Discharge Plasma-Assisted Functionalization of Titanium Implant Surfaces	
K. Schröder, B. Finke, M. Polak, F. Lüthen, B. Nebe, J. Rychly, R. Bader, G. Lukowski, U. Walschus, M. Schlosser, A. Ohl and K.D. Weltmann	700
Enhanced Macro and Micro Stress Evaluation Diffraction Techniques Applied to Biomedical Materials	
J.M. Sprauel	706
Study of Alpha-Beta Transformation in Ti-6Al-4V-ELI. Mechanical and Microstructural Characteristics	
P. Tarín, A. Gualo, A.G. Simón, N.M. Piris and J.M. Badía	712
Selenium Nanocluster Coatings: Transforming Current Orthopedic Materials into Inhibiting Bone Cancer	
P.A. Tran, L. Sarin, R.H. Hurt and T.J. Webster	718
Hydrothermal Modification of Titanium Surfaces for Controlling Osteointegration	
M. Ueda, T. Kinoshita, Y. Sasaki, M. Ikeda and M. Ogawa	724
Dielectric Properties in Fresh Trabecular Bone Tissue from 1MHz to 1000MHz: A Fast and Non Destructive Quality Evaluation Technique	
R.M. Irastorza, S. Valente, F. Vericat and E. Blangino	730
Experimental Techniques to Evaluate <i>In Vitro</i> Trabecular Bone Properties and Emerging Numerical Model	
E. Blangino, R.M. Irastorza, S. Valente and F. Vericat	736
Comparison of the <i>In Vivo</i> Degradation Progress of Solid Magnesium Alloy Cylinders and Screw-Shaped Magnesium Alloy Cylinders in a Rabbit Model	
N. von der Höh, D. Bormann, A. Lucas, F. Thorey and A. Meyer-Lindenberg	742
Synchrotron Radiation and Neutron Diffraction Study of Hydroxyapatite in Bone at the Interface with Implant	
A. Benmarouane, H. Citterio-Bigot, G. Geandier, T. Hansen, P. Millet and A. Lodini	748
Ion Leaching from Implantable Medical Devices	
L.E. Eiselstein and R.D. Caligiuri	754
Validation of a Finite Element Model by Neutron Diffraction for the Prediction of Peen Forming	
M. Dubois, A. Nady, A. Krawitz, T. Pirlng and A. Lodini	760

3. Surface Engineering / Coatings

Microstructural and Mechanical Characterization of Gray Cast Iron and AlSi Alloy after Laser Beam Hardening	
W.A. Monteiro, E.M.R. Silva, L.V. Silva, W. de Rossi and S.J. Buso	769
Study of the S Phases Formed on Plasma-Nitrided Austenitic and Ferritic Stainless Steels	
L.C. Gontijo, R. Machado, L.C. Casteletti, S.E. Kuri and P.A.P. Nascente	775
Microstructure and Mechanical Properties of Cr-Al-B-N Coatings Prepared by Reactive D.C. and R.F. Co-Sputtering	
M. Nose, T. Kawabata, S. Ueda, K. Fujii, K. Matsuda and S. Ikeno	781

Electrodeposition of Ferromagnetic Metal Nanowires	787
T. Ohgai, K. Takao, M. Mizumoto, A. Kagawa, Y. Tanaka and S. Sumita	
Surface Protection of Magnesium Alloys via Pack Cementation Coatings with Aluminum Powder and Chlorides	793
J.S. Park, J.M. Kim, H.Y. Kim, C.S. Kang and S.W. Choi	
Shot Peening of Brittle Materials - Status and Outlook	799
W. Pfeiffer and J. Wenzel	
Ceramic Target Materials for Sputtering Applications	805
C. Simons, A. Kastner and G. Kiriakidis	
Effect of Plasma Treatment on Adhesion of DLC Layers to Steels	812
W. Tillmann, E. Vogli and S. Momeni	
Change in Surface States of Amorphous Carbon Nitride Films after Exposure to Oxygen Plasma	818
M. Aono, S. Kikuchi, N. Kitazawa and Y. Watanabe	
Effects of High Magnetic Field Annealing on the Nucleation Sites for Recrystallized Nuclei with {111} <112> Orientation in Cold-Rolled IF Steel Sheet	824
Y. Wu, C.S. He, Y.D. Zhang, X. Zhao, L. Zuo and C. Esling	
Study on the Dimensional Changes and Residual Stresses in Carbonitrided and Ferritic Nitrocarburized SAE 1010 Plain Carbon Steel	829
C.Y. Nan, D.O. Northwood, R.J. Bowers and X.C. Sun	
Mechanism of Whisker Growth Suppression by Lead Co-Deposition on Electroplated Tin Film	835
M. Hino, K. Murakami, Y. Mitooka, M. Takamizawa, T. Naka and K. Nakai	
Production of Rapidly Solidified Composite Deposits Based on Iron with Vanadium Carbide Particles by Plasma Spraying	841
Y. Hoshiyama, K. Hirano and H. Miyake	
Wear and Corrosion Resistance of Electroless Nickel-Boron Coated Mild Steel	846
A.F. Kanta, V. Vitry and F. Delaunois	
Mechanical Properties and Change in Microstructure in the Nitriding Process of Cu-Added Steels	852
K. Kawasaki, K. Ujita, J. Takahashi, M. Sugiyama and K. Kawakami	
Revisiting Carbon Based Metallic Compounds – Nanoscale Surface Science and Environmental Catalysis	858
H. Okumura, K. Arai, Y. Nishiyama, E. Yamasue and K.N. Ishihara	
Microstructure and Properties of Friction Surfaced Stainless Steel and Tool Steel Coatings	864
H. Khalid Rafi, G.D. Janaki Ram, G. Phanikumar and K.P. Rao	
Nanophase Hardfacing New Possibilities for Functional Surfaces	870
U. Reisgen, B. Balashov, L. Stein and C. Geffers	
Influence the Thermal Process of the Removing the Varnish Coats to the Cleanliness of the Surface Aluminium Scrap	876
M. Litwińczyk-Kwaśnicka, M. Rozpondek and J. Siwka	
Unconventional Glow Discharge Nitriding of 316L Austenitic Steel	882
T. Frączek and M. Olejnik	
Control of Polymorphism and Mass-Transfer in Al₂O₃ Scale on Alumina Forming Alloys	888
S. Kitaoka, T. Matsudaira, M. Wada and T. Kuroyama	
Influence of Annealing on the Microstructure and Wear Performance of Diamond/NiCrAl Composite Coating Deposited through Cold Spraying	894
C.J. Li, X.K. Suo, G.J. Yang and C.X. Li	
Microstructure and Thermal Diffusivity of Micro- and Nano-Sized YSZ	900
G. Moskal	
Internal Stress in EB-PVD Thermal Barrier Coating under Heat Cycle	906
K. Suzuki and T. Shobu	
Application of the Concept of Local Fatigue Strength after Shot Peening of Notched Components Based on Numerical Simulations	912
M. Klemenz and V. Schulze	

4. Composites

In Situ Observations of the Densification Behavior of WC-FeAl-B Composites during Liquid Phase Sintering	921
M. Ahmadian, M. Reid, R. Dippenaar, T. Chandra, D. Wexler and A. Calka	
Experimental Study on Drilling Process of CFRP Composite Laminate	927
M.A. Azmir, P. Nair Sivasankaran and Z. Hamedon	
Properties of Small Rotary Engine Housing Fabricated by Aluminum Alloy Matrix Composites	933
N. Fuyama, A. Terayama, T. Fujii, H. Tani, S. Danjo and G. Sasaki	
Effect of Milling Parameters on Morphology and Grain Size of WO_3 and Al Particles for Fabricating WO_3/Al Composites	939
Q.W. Wang, Y.C. Feng, G.H. Fan, G.S. Wang and L. Geng	
Evaluation of Tools and Cutting Conditions on Carbon Fibre Reinforced Laminates	944
D.J.S. Gonçalves, L.M.P. Durão, J.M.R.S. Tavares, V.H.C. Albuquerque and A.T. Marques	
Effect of Calcining Temperature of Ceramic Powders Prepared from TEOS/Boehmite Sol-Gel on Tribological Behavior of Brake Lining Materials	950
K.J. Lee, Y.T. Chen, H.Z. Cheng, J.S.C. Jang, P.C. Chang, S.W. Lin and Y.D. Chen	
Effect of Alumina Fibers on Fabrication Process and Characteristics of Alumina Fiber Reinforced Aluminum Alloy Composites	956
M. Mizumoto, T. Ohgai and A. Kagawa	
High Strength Natural Fibers for Improved Polymer Matrix Composites	961
S.N. Monteiro, K.G. Satyanarayana and F.P.D. Lopes	
Characterization of Metal Matrix Composites by Synchrotron Refraction Computed Topography	967
B.R. Müller, A. Lange, M. Harwardt and M.P. Hentschel	
Fabrication of Mo-Ti₃SiC₂ Layered Material by Spark Plasma Sintering and its Interface Stability at 800°C	973
T.L. Ngai, H.G. Luo, J.J. Zheng, C.X. Hu and Y.Y. Li	
Microstructure and Sintering Behavior of Mullite-Zirconia Composites	979
F. Sahounne, N. Saheb, M. Chegaar and P. Goeuriot	
Development of a Low Cost Process for Manufacturing of Ti-MMC by Roll-Diffusion-Bonding	991
C. Testani and F. Ferraro	
High Temperature Characteristics of Unidirectionally Solidified Eutectic Ceramic Composites and some Potential Applications	997
Y. Waku and H. Yasuda	
Effects of Relative Density and Material Distribution on the Elastic Properties and Yield Strength of Metallic Honeycombs	1003
H.X. Zhu	
Novel MEMS Fabry-Perot Interferometric Pressure Sensors	1009
I. Padron, A.T. Fiory and N.M. Ravindra	

5. Dynamic Behaviour of Materials

Modeling Aspects of the Dynamic Response of Heterogeneous Materials	1017
A. Ionita, B.E. Clements and E.M. Mas	
Shear Strength of Titanium Diboride under Shock Wave and Static Compressions	1023
D.P. Dandekar	
Recent Developments on the Microstructural Effects Caused by Small-Charge Explosions in FCC Alloys	1029
D. Firrao, P. Matteis and C. Pozzi	
Explosively Driven Expansion and Fragmentation Behavior for Cylinders, Spheres and Rings of 304 Stainless Steel	1035
T. Hiroe, K. Fujiwara, H. Hata, M. Yamauchi, K. Tsutsumi and T. Igawa	
Some Trials on Underwater Explosive Welding of Thin W Plate onto Copper Substrate	1041
K. Hokamoto, P. Manikandan and A. Mori	
Development of Compact Blast Containment Vessel for 10 kg Explosive	1047
S. Kubota, T. Saburi, K. Katoh, T. Homae, Y. Ogata and M. Iida	

Phase Transition Behavior of Solids under Shock Compression	1053
T. Mashimo	
Instrumentation on Impact Shock Study of Polymers and Possibility of Non-Equilibrium Shock Hugoniot	
K. Nagayama and Y. Mori	1059
Advanced Use of a Split Hopkinson Bar Setup for the Extended Characterization of Multiphase Steel Sheets	
J. Van Slycken, P. Verleysen and J. Degrieck	1065
Impact Behavior of Concretes Taking Account of Strain-Rate Effect, Stress-State Effect and Damage Evolution	
L.L. Wang, S.Q. Shi, Y.G. Wang and Y.Z. Wang	1071
In Situ Observation of Grain Growth and Recrystallization of Steel at High Temperature	
Y. Yogo, K. Tanaka and K. Nakanishi	1077

6. Fuel Cells & Hydrogen Storage Technologies

Characterization of Hydrogen Sorption Properties and Microstructure of Cast Mg-10wt%Ni Alloys	
Y.H. Cho and A.K. Dahle	1085
Optimal Precipitation Hardening Conditions in Lead Base Anodes for Copper Electrowinning	
C. Camurri, C. Carrasco, A. Pagliero and R. Colás	1091
Influence of Processing Parameters on the Manufacturing of Anode-Supported Solid Oxide Fuel Cells by Different Wet Chemical Routes	
N.H. Menzler, W. Schafbauer and H.P. Buchkremer	1098
Improvement of DMFC Electrode Kinetics by Using Nanohorns Catalyst Support	
L. Brandão, D.M. Gattia, R. Marazzi, M. Vittori Antisari, S. Licoccia, A. d'Epifanio, E. Traversa and A. Mendes	1106
Ni-Fe-LaGaO₃ Based Alloy Anode Cermet for Direct Hydrocarbon Type Solid Oxide Fuel Cell Using LaGaO₃ Electrolyte	
H. Zhong, T. Ishihara and H. Matsumoto	1112
Impact of Gas-Phase Reactions on SOFC Systems Operating on Diesel and Biomass-Derived Fuels	
I.Y. Kang, H.H. Carstensen and A.M. Dean	1118
Analytical Investigation of Fuel Cells by Using <i>In Situ</i> and <i>Ex Situ</i> Diagnostic Methods	
G. Schiller, E. Gülvow, M. Schulze, N. Wagner and K.A. Friedrich	1125
Hydrogen Diffusion Coefficient, Hydrogen Solution Coefficient and Hydrogen Permeability of Nb-TiNi Eutectic Alloy	
W.L. Wang, K. Ishikawa and K. Aoki	1131
Electronic Stress Tensor Study of Aluminum Nanostructures for Hydrogen Storage	
P. Szarek, K. Watanabe, K. Ichikawa and A. Tachibana	1137
Micro/Nano-Structures and Hydrogen Absorption/Desorption Properties of Mg/Cu Super-Laminates	
K. Tanaka, T. Kiyobayashi, N. Takeichi, H. Miyamura and S. Kikuchi	1143
Enhanced Hydrogen Storage in MWCNTs Decorated by Electroless Nickel Nanoparticles Deposited in Supercritical CO₂ Bath	
C.Y. Chen, J.K. Chang, K.Y. Lin, S.T. Chung and W.T. Tsai	1148
A Study of GDC-Based Micro Tubular SOFC	
N. Sammes, J. Song, B. Roy, K. Galloway, T. Suzuki, M. Awano and A.M.F. Serincan	1152
Physical Characterization of Plasma Deposited Polymeric Proton Exchange Membrane Used in Fuel Cells	
P.L. Polak, R.D. Mansano, R.A. Silva, I.P. Silva and M.C. Ribeiro	1158
Production of Glucose by Starch and Cellulose Acid Hydrolysis and its Use as a Fuel in Low-Temperature Direct-Mode Fuel Cells	
J.P. Spets, M. Kuosa, T. Granström, Y. Kiros, J. Rantanen, M.J. Lampinen and K. Saari	1164
SOFC Stacks for Mobile Applications	
M. Lang, C. Auer, P. Jentsch and T. Weckesser	1170

7. Friction Stir Welding / Processing

The Use of Bobbin Tools for Friction Stir Welding of Aluminium Alloys	
P.L. Threadgill, M.M.Z. Ahmed, J.P. Martin, J.G. Perrett and B.P. Wynne	1179
Study of the Key Issues of Friction Stir Welding of Titanium Alloy	
H.J. Liu, L. Zhou, Y.X. Huang and Q.W. Liu	1185
Friction Stir Processing: A Novel Approach for Microstructure Refinement of Magnesium Alloys	
Z.Y. Ma, B.L. Xiao, J. Yang and A.H. Feng	1191
Metallographic Study of Lapped FSW between Ductile Cast Iron and Austenite Type Stainless Steel	
M. Nakamura, Y. Sawada and Y.S. Sato	1197
Limitation of Distortion in Friction Stir Welded (FSW) Panels Using Needle Peening	
S. Larose, L. Dubourg, C. Perron, M. Jahazi and P. Wanjara	1203
Structure and Mechanical Properties of Friction Stirred Beads of 6082-T6 Al Alloy and Pure Copper	
M.N. Avettand-Fènoël, R. Taillard, C. Herbelot and A. Imad	1209
Prediction and Measurements of Thermal Residual Stresses in AA2024-T3 Friction Stir Welds as a Function of Welding Parameters	
L. Dubourg, P. Doran, M.A. Gharghouri, S. Larose and M. Jahazi	1215
Mechanical and Microstructural Characterisation of Dissimilar Friction Stir Welded AA2024-T3 and AA7075-T6 Aluminium Alloys	
A.A.M. da Silva, E. Aldanondo, P. Alvarez, A. Lizarralde and A. Echeverria	1221
Spot Welding between Aluminum Alloy and Steel by Friction Stirring	
M. Fukumoto, K. Miyagawa, M. Tsubaki and T. Yasui	1227
Study and Researches about the Microhardness's Variation of a Special S.G. Cast Iron	
I. Milosan	1233
Novel Approaches to Friction Spot Welding Thin Aluminium Automotive Sheet	
P.B. Prangnell and D. Bakavos	1237
Friction Stir Spot Welding Phenomena in Al Alloy 6061	
Y.S. Sato, M. Fujimoto, N. Abe and H. Kokawa	1243
Formability of Friction Stir Welded AZ31 Magnesium Alloy Sheets	
A. Forcellese, L. Fratini, F. Gabrielli and M. Simoncini	1249
Quantifying the Usability of a Robot System for Friction Stir Welding	
M. Soron	1255
Effects of Tool Design and Friction Stir Welding Parameters on Weld Morphology in Aluminum Alloys	
C.A. Widener, D.A. Burford and S. Jurak	1261
Development of Local Reinforcement and Local Metallic Foam Using FSP	
K. Yamamura and T. Nishihara	1267

8. Intermetallics

Qualification of an Investment Casting Process for Production of Titanium Aluminide Components for Aerospace and Automotive Applications	
J. Aguilar, U. Hecht and A. Schievenbusch	1275
Fabrication and Processing of Gamma Titanium Aluminides - A Review	
Y.Y. Chen, Y.F. Chen, F.T. Kong and S.L. Xiao	1281
Recrystallization Textures in Heavily Cold-Rolled Ni₃Al Based Single Crystals	
M. Demura, Y. Xu and T. Hirano	1288
Comparison of Different Fluorine Treatments for the Protection of TiAl-Alloys Against High Temperature Oxidation	
A. Donchev and M. Schütze	1294
Hot-Workability of Gamma-Based TiAl Alloys during Severe Deformation	
U. Froebel	1300

Ti-Al-Cr Based Coatings for High Temperature Oxidation Protection of γ-TiAl	1306
M. Fröhlich, R. Braun and C. Leyens	
The Effect of Impact on the TiAl Alloy TNBV3B Produced on Three Different Processing Routes	1312
S. Gebhard, P. Peters, D. Roth-Fagaraseanu, F. Turley and H. Voggenreiter	
Change in Microstructure by Heat-Treatment and Corresponding Deformation Behavior in Ni₃V Single Crystals	1318
K. Hagihara, M. Mori, T. Kishimoto and Y. Umakoshi	
Low Cycle Fatigue and Cyclic Deformation of TiAl Alloys	1324
G. Hénaff, O. Berteaux, M. Jouiad and M. Thomas	
Microstrain Analysis of Titanium Aluminides	1330
E. Héripé, D. Caldémaison, A. Roos and J. Crépin	
Tensile Ductility of Cast TiAl Alloys	1336
D.W. Hu and X.H. Wu	
Physical and Mechanical Properties of Single Crystals of Co-Al-W Based Alloys with L1₂ Single-Phase and L1₂/fcc Two-Phase Microstructures	1342
H. Inui, T. Oohashi, N.L. Okamoto, K. Kishida and K. Tanaka	
Various Properties of Dual-Phase Intermetallic Compound in Ni-Al System	1348
Y. Iwabuchi and I. Kobayashi	
Forging of Titaniumaluminide Parts	1353
P. Janschek	
Microstructure and Magnetic Properties of NdFeB Magnets Using Fluorides Nano-Coated Process	1357
M. Komuro, Y. Satsu and H. Suzuki	
The Influence of Deformation Conditions on Structure of Fe-Al Intermetallic Phase Based Alloys	1362
D. Kuc, G. Niewielski and J. Gawąd	
Microstructure and Mechanical Properties of a Cast Intermetallic Ti-46Al-8Ta Alloy	1368
J. Lapin, Z. Gabalcová, T. Pelachová and O. Bajana	
Comparison of Fluorination Treatments to Improve the High Temperature Oxidation Resistance of TiAl Alloys in SO₂ Containing Environments	1374
P.J. Masset, R. Yankov, A. Kolitsch and M. Schütze	
Microstructure and Mechanical Properties of Zr-Co-Ni Intermetallic Compound	1379
M. Matsuda, K. Hayashi and M. Nishida	
Non-Destructive Fluorine Depth Profiling as Quality Assurance for the Oxidation Protection of TiAl Turbine Blades	1384
S. Neve, K. Stiebing, L.P.H. Schmidt, H.E. Zschau, P.J. Masset and M. Schütze	
Preparation of Homogeneous Nb-Al Intermetallic Compound Sheet by Multi-Layered Rolling and Subsequent Heat Treatment	1390
A. Nishimoto and K. Akamatsu	
Microstructure Formation in Cast β-Solidifying γ-Titanium Aluminide Alloys	1394
M. Oehring, F. Appel, J.H.D. Paul, R.M. Imayev, V.M. Imayev and U. Lorenz	
Second Phase Precipitation within a Laves Phase in the Ir-Y Binary System	1400
N. Sekido and Y. Yamabe-Mitarai	
The Effects of Heat Treatments and Tungsten Additions on Microstructures and Tensile Properties of Powder Metallurgy Ti-48Al-2Nb-2Cr	1406
D.Y. Seo, S. Bulmer, H. Saari and P. Au	
Crystal Growth and Characterization of FeAs-Based Superconductors	1412
H. Takeya, S. Kasahara and K. Hirata	
Study of Refined Microstructures after Two-Step Heat Treatments by Means of EBSD Technique on γ-TiAl Alloys	1416
M. Pérez-Bravo, T. Baudin, D. Boivin, M. Thomas, I. Madariaga, K. Ostolaza and M. Tello	
An Investigation of Fracture Origins in Heat-Treated Ti₄₉Al₄₇Cr₂Nb₂ Powder Compacts	1422
O. Berteaux, R. Valle, M. Raffestin, M. Thomas and G. Henaff	
Fe-6.wt.%Si High Silicon Steel Sheets Produced by Cold Rolling	1428
F. Ye, Y.F. Liang, Y.L. Wang, J.P. Lin and G.L. Chen	
Growth of Crystals and Formation of C40/C11_b Lamellar Structure in (Mo_{0.85}Nb_{0.15})Si₂	1434
L.T. Zhang, O. Zhu, Y. Jiang, A.D. Shan and J.S. Wu	

Effect of Trace Boron Addition on the Microstructure and Tensile Elongation of Ti₂AlNb-Based Orthorhombic Titanium Alloys

M. Hagiwara and T. Kitaura

1439

9. Magnesium Alloys

DSC and Microstructural Investigations of the Elektron 21 Magnesium Alloy

A. Kiełbus, T. Rzychoń and R. Przeliorz

1447

Creation of Fine Structure in Magnesium Alloys by Electromagnetic Vibration Process

K. Miwa, M.J. Li and T. Tamura

1453

Effect of Cooling Rate on Morphology and Crystallography of Lath Martensite in Fe-Ni Alloys

S. Morito, R. Igarashi, K. Kamiya, T. Ohba and T. Maki

1459

Corrosion Protection and Microstructure of Magnesium Alloys Anodized by Phosphate Solution

K. Murakami, M. Hino, A. Saijo and T. Kanadani

1464

Effect of Annealing on Microstructure and Mechanical Properties in Mg-Zn-Y Alloy with Long Period Stacking Order Phase

M. Noda and Y. Kawamura

1470

Nanocrystalline LPSO Mg-Zn-Y-Al Alloys with High Mechanical Strength and Corrosion Resistance

H. Okouchi, Y. Seki, T. Sekigawa, H. Hira and Y. Kawamura

1476

High Temperature Deformation of Wrought Zn-Containing Magnesium Alloys

S. Spigarelli, M. El Mehtedi, D. Ciccarelli, M. Bamberger, G. Cupitò and Y. Rami

1482

Optimization of Heat Treatment Conditions of Magnesium Cast Alloys

L.A. Dobrzański, T. Tański and J. Trzaska

1488

Modeling Environment of Friction Stir Joining for AA2017T351 Plates in Butt Joint

S. Tcherniaeff, F. Girot and I. Iordanoff

1494

Friction Stir Welding of SiCp/Al Composite and 2024 Al Alloy

B.L. Xiao, D. Wang, J. Bi, Z. Zhang and Z.Y. Ma

1500

Improvement of Magnesium Sheet Formability by Alloying Addition of Rare Earth Elements

S.B. Yi, D. Letzig, K. Hantsche, R. Gonzalez Martinez, J. Bohlen, I. Schestakow and S. Zaefferer

1506

Impact Properties of TIG Welded AZ31 Magnesium Alloy Joints

T. Asahina, K. Katoh and H. Tokisue

1512

DC Casting - Simulation and Microstructure of Mg-Zn Alloys

G. Harel, M. Bamberger, Y. Rami, S. Spigarelli, M. El Mehtedi and G. Cupitò

1518

Effect of Annealing Treatments on Strain Rate Sensitivity and Anisotropy in a Magnesium Alloy Processed by Severe Rolling

J.A. del Valle and O. Ruano

1524

Extrusion of AZ31 Magnesium Sheet

S. Gall, S. Müller and W. Reimers

1530

Influences of Rolling Conditions on Texture and Formability of Magnesium Alloy Sheets

X.S. Huang, K. Suzuki, A. Watazu, I. Shigematsu and N. Saito

1536

Mechanical Properties of Large-Scale Extruded Mg-Zn-Y Alloys

Y. Ienaga

1541

Microstructure and Creep Properties of AJ62 and AE44 Die-Casting Magnesium Alloys

A. Kiełbus and T. Rzychoń

1546

Creep Behaviour of AE42 Magnesium Alloy and its Composites Using Impression Creep Technique

A.K. Mondal and S. Kumar

1552

Effect of Rare Earth Element on Microstructure and Mechanical Properties of Mg-Sn-Ca Alloys

D.G. Kim, J.S. Lee, S.K. Park, Y.M. Kim, H.T. Son and M.Y. Huh

1558

Modeling and Simulation of Microstructure Evolution of Cast Mg Alloy

L. Huo, Z.Q. Han and B.C. Liu

1562

Formability of AZ31 Alloys Prepared by Hot-Extrusion of their Machined Chips	1569
K. Matsuzaki, Y. Murakoshi, T. Shimizu and K. Kikuchi	
Inhomogeneous Deformation Observed Using High-Precision Markers Drawn by Electron Beam Lithography in a Magnesium Alloy with LPSO Phase	1574
T. Morikawa, Y. Mitani and K. Higashida	
Cross-Sectional Geometry and the Intermetallics Structure in a High Pressure Die Cast Mg-Al Alloy	1579
A.V. Nagasekhar, C.H. Cáceres and M. Easton	
Atomic Scale Simulation of Deformation in Magnesium Single Crystals	1585
D. Phelan, N. Stanford, B. Thijssen and J. Sietsma	
Formation of Fold Defects in Permanent Mold Cast AE42 Magnesium Alloy	1591
L. Bichler and C. Ravindran	
Creep Behavior of Two Series Magnesium Alloys	1596
Y.S. Sun, J. Bai and F. Xue	
Effects of Stacking Faults on High Temperature Creep Behavior in Mg-Y-Zn Based Alloys	1602
M. Suzuki and K. Maruyama	
Microstructure and Mechanical Properties of High Aluminum Content Magnesium Alloys Fabricated by Twin-Roll Casting Process	1608
H. Watari, Y. Nishio, R. Nakamura, K. Davey and N. Koga	
Rotary-Die Equal Channel Angular Pressing Method for Light Metals	1614
A. Watazu, I. Shigematsu, M. Hakamada, K. Suzuki, X.S. Huang and N. Saito	

10. Metallic Glasses / Bulk Metallic Amorphous Materials

Viscosity of Metallic Glass Forming Liquids: Analysis Based on Bond Strength-Coordination Number Fluctuations	1621
M. Aniya and M. Ikeda	
Thermal and Mechanical Properties of the $(\text{Cu}_{36}\text{Zr}_{48}\text{Al}_8\text{Ag}_8)_{100-x}\text{Si}_x$ ($x = 0-1$) Amorphous Alloys	1627
N.Y. Wu, C.J. Hsieh, J.S.C. Jang, S.R. Jian and Y.T. Chen	
Inhomogeneous Amorphous Structure of Bulk Metallic Glasses Examined from Structural Relaxation Kinetics	1632
O. Haruyama, R. Wada, M. Kohda, Y. Yokoyama, N. Nishiyama and T. Egami	
The Prediction of Glass-Forming Compositions in Metallic Systems - The Development of New Bulk Metallic Glasses	1637
K.J. Laws, K.F. Shamlaye, B. Gun, K. Wong and M. Ferry	
High Plastic $\text{Ti}_{66}\text{Nb}_{13}\text{Cu}_8\text{Ni}_{6.8}\text{Al}_{6.2}$ Composites with <i>In Situ</i> β-Ti Phase Synthesized by Spark Plasma Sintering of Mechanically Alloyed Glassy Powders	1642
Y.Y. Li, C. Yang, W.P. Chen, X. Li and S.G. Qu	
Molecular Dynamics Study on Structural Relaxation of Metallic Glasses	1648
M. Shimono and H. Onodera	
Analysis of Optical Properties of GaN/AlGaN Quantum Well Ultra-Violet Laser Diode Using 6X6 Hamiltonian	1653
D.S. Patil and E.P. Samuel	
Fatigue Crack Initiation and Propagation at a Sharp Notch in Zr-Based Bulk Metallic Glass	1659
Y. Nakai, K. Fujihara, N. Sei and B.K. Kim	
Glass Formation and Structural Study of $\text{Ti}_{50}\text{Cu}_{50}$ Alloy by Molecular Dynamics	1665
J.J. Pang, M.J. Tan, A.W.E. Jarfors and P.D. Chuang	
The Role of Casting Temperature in Preparation of Bulk Metallic Glasses	1671
H. Wang	
<i>In Situ</i> Observation of Solidification of Bulk Metallic Glass Forming Alloys from Supercooled Liquid by Using High Energy X-Ray Diffraction Combined with Levitation Techniques	1677
M. Watanabe, A. Mizuno, T. Akimoto and S. Kohara	

11. Nanostructured Materials, Powder Metallurgy & Metallic Foams

Roles of Hydrogen Atmospheres in Growth of Ultrananocrystalline Diamond by Pulsed Laser Deposition	1685
K. Hanada, T. Nishiyama, T. Yoshitake and K. Nagayama	
Nanograined Size Pure Iron Elaborated by Means of Spark Plasma Sintering	1691
D. Fabrègue, J. Piällat, É. Maire, Y. Jorand and V. Massardier-Jourdan	
Carbon-Based Magnetic Nanocomposite Prepared by Arc-Evaporation of Sm/Co/C System	1697
Y.S. Grushko, M. Bänitz, V.T. Lebedev and K. Lüders	
Principles of Fabrication of Bulk Ultrafine-Grained and Nanostructured Materials by Multiple Isothermal Forging	1702
R.M. Imayev, A.A. Nazarov and R.R. Mulyukov	
Characterization of FePt Nanopowder Synthesized by a Chemical Vapor Condensation (CVC) Process	1708
T.S. Jang, J.H. Yu, D.W. Lee and B.K. Kim	
Fabrication of Ultra-Fine Grained Hot Work Tool Steels by Powder Metallurgy Process through Mechanical Alloying Treatment	1714
K. Kataoka and H. Nakatsu	
Fabrication of Metallized Electrospun Copper Nanofiber Webs	1719
I.S. Kim, K. Wei, T. Ohta, B.S. Kim and Y. Watanabe	
Formation of High Density Metal Silicide Nanodots on Ultrathin SiO₂ for Floating Gate Memory Application	1725
S. Miyazaki, M. Ikeda, K. Makihara, K. Shimano and R. Matsumoto	
Grain Boundary Nanostructure and High Temperature Plastic Flow in Polycrystalline Oxide Ceramics	1731
H. Yoshida, K. Morita, B.N. Kim and K. Hiraga	
Crystallographic Features of Ferroelectric States around the Tetragonal /Rhombohedral Phase Boundary in Pb_{1-x}La_x(Zr_{1-y}Ti_y)O₃	1737
M. Arao, Y. Inoue, R. Ando and Y. Koyama	
Magnetic Properties, Nanostructure, and Ordering Kinetics of Nb Additive FePtCu Films	1743
G.J. Chen, Y.H. Shih, J.S.C. Jang, S.R. Jian, P.H. Tsai and H.W. Chen	
Study on the Nanostructure and Magnetic Properties of NdFeNbB Permanent Magnets	1749
X.F. Wang, X.Y. Chen, Z.L. Jiang, Y. Chen and H.M. Chen	
Characterization and Sintering Behaviors of Fe Based Nanopowders Prepared by Arc Discharge Process	1755
C.J. Choi, J.H. Yu and J.G. Lee	
Stability of the Orbital-Modulated State in the Layered Perovskite Manganite Sr_{2-x}R_xMnO₄ (R = Pr, Nd)	1760
Y. Inoue, M. Arao, G. Shindo and Y. Koyama	
Carbon Nanostructures Produced by an AC Arc Discharge	1766
M. Vittori Antisari, D.M. Gattia, L. Brandão, R. Marazzi and A. Montone	
Measurement of Elastic Constants on Nanostructured Iron and Copper	1772
A. Roca, J. Llumà, J. Jorba and N. Llorca-Isern	
Dispersion of Nano-Materials into Polymeric System for Enhanced Properties	1778
S.C. Sharma, H.N.N. Murthy and S. Nagaraj	
Preferred Orientation of Cu₂O Nano-/Micro-Protrusions Grown by Ar Ion Irradiation	1784
S. Oda, H. Tanaka and S. Tanaka	
Effects of Nano / Meso Harmonic Microstructure on Mechanical Properties in Austenitic Stainless Steel Produced by MM / HRS Process	1790
H. Fujiwara, H. Tanaka, M. Nakatani and K. Ameyama	
A Study on the Optimization of Reduction-Diffusion Process for Synthesis of Sm₂Fe₁₇N_x Nanopowder	1796
J.C. Yun, S.S. Jung, J.G. Lee, C.J. Choi and J.S. Lee	
Effect of Die Temperature on Mechanical Properties of Hot Pressed P/M Parts	1802
A. Babakhani and A. Haerian	
Development of Powder Metallurgy High Nitrogen Stainless Steel	1811
C.J. Kuang, H. Zhong, D. Chen, X. Kuang, Q. Li and Q. Hao	
WC-8Co-2Al (wt%) Cemented Carbides Prepared by Mechanical Milling and Spark Plasma Sintering	1817
X. Li, Z.Y. Xiao, Y.Y. Li, C. Yang and M. Shao	

Mechanically Alloyed and Spark Plasma Sintered Aluminium/Precious Metal Oxide Composite Materials	1824
M. Kubota and P. Cizek	
Comparison of Structure and Properties of Hard Coatings on Commercial Tool Materials Manufactured with the Pressureless Forming Method or Laser Treatment	1830
G. Matula, M. Bonek and L.A. Dobrzański	
Cutting Mechanism of Resin Impregnated Sintered Iron	1836
K. Okimoto	
Properties of Al-Si-Fe-Cu-Mg Alloy PM Composites Obtained by Closed - Die Forging and Heat Treatment	1842
S. Szczepanik and M. Wojtaszek	
Study on Bending Ultrasonic Fatigue Behavior of Sinter-Hardened Fe-2Cu-2Ni-1Mo-1C Materials Prepared by Warm Compaction	1848
Z.Y. Xiao, L. Zhou, Y.X. Shen, T.L. Ngai and Y.Y. Li	
Development of Powder Metallurgy High Speed Steel	1854
H.L. Zhong, Y. Fang, C. Kuang, X. Kuang, Q. Hao and X. Li	
Combustion Synthesis of Titanium-Based Cemented Carbides	1860
T. Tanaka, K. Matsuura, K. Kojima and M. Ohno	
Investigation of the Mechanical Properties of Lotus-Type Porous Carbon Steel Made by Continuous Zone Melting Technique	1866
T. Kujime and H. Nakajima	
Micro-Structural Alterations in MoM Hip Implants	1872
R. Pourzal, R. Theissmann, B. Gleising, S. Williams and A. Fischer	
A Theoretical and Experimental Study on the Dynamic Constitutive Model of Aluminum Foams	1878
J.L. Yu, E.H. Wang and L.W. Guo	
Heat Transfer and Fluid Flow in Sintered Metallic Fiber Structures	1884
O. Andersen and J. Meinert	
Microstructure and Compression Properties of Al-Si Alloy Foams by Spark Plasma Sintering Technique	1890
N. Aoyagi, S. Kamado and Y. Kojima	

12. Severe Plastic Deformation

Influence of Annealing on Strength of Ultrafine Grained Low Carbon Steels by ECAP	1899
T. Akita, M. Gotoh, S.V. Dobatkin, K. Kitagawa and Y. Hirose	
Recrystallization Mechanisms in Severely Deformed Dual-Phase Stainless Steel	1905
A. Belyakov, R. Kaibyshev, Y. Kimura and K. Tsuzaki	
Improvement in Drawability (r Value) of an Aluminum Alloy Subjected to Groove Pressing	1911
G. Niranjan and C. Uday	
Recent Development of Equal Channel Angular Rolling (ECAR)	1917
Y.H. Chung	
Comparison for Thermoelectric Properties of BiTe Based Semiconductor Processed by the Mechanical Alloying and the High Pressure Torsion after Melt Grown by the Vertical Bridgman Method	1923
K. Hasezaki, M. Ashida, T. Hamachiyo, H. Matsunoshita and Z. Horita	
Accumulative Roll Bonding of 7075 Aluminium Alloy at High Temperature	1929
P. Hidalgo, C.M. Cepeda-Jiménez, O. Ruano and F. Carreño	
Grain Refinement of Vanadium by Low Temperature Severe Plastic Deformation	1934
Y.B. Chun, S.H. Ahn, D.H. Shin and S.K. Hwang	
Numerical Analysis of the Microstructure and Mechanical Properties Evolution during Equal Channel Angular Pressing	1940
L. Trebacz, H. Paul, Ł. Madej and M. Pietrzik	
Microstructures of Aluminum and Copper Single Crystals Processed by Equal-Channel Angular Pressing	1946
M. Furukawa, Z. Horita and T.G. Langdon	
Mechanical Properties of an Al-Mg-Sc Alloy Subjected to Intense Plastic Straining	1952
R. Kaibyshev, E. Avtokratova and O.S. Situdkov	

Dislocation-Source Hardening in Nanostructured Steel Produced by Severe Plastic Deformation		
N. Kamikawa, X.X. Huang and N. Hansen		1959
Characteristics of High Temperature Creep in Pure Aluminum Processed by Equal-Channel Angular Pressing		
M. Kawasaki and T.G. Langdon		1965
Grain Refinement Efficiency in Equal Channel Angular Extrusion of FCC Metals Inferred from Crystal Plasticity Simulations of Slip Activities		
S.Y. Li		1971
On the Utilization of Plastic Instability Criterion in Ductility Assessment of Ultrafine-Grained Microalloyed Steel		
J. Majta, K. Doniec and K. Muszka		1977
Ultrafine Grain Evolution in Copper Alloys Induced by Mechanisms of Continuous Dynamic and Static Recrystallization		
H. Miura and T. Sakai		1983
Effect of Equal Channel Angular Pressing on the Pitting Corrosion Resistance on the Aluminum Alloys with/without Anodization		
H. Nakano, I.J. Son, S. Oue, S. Kobayashi, H. Fukushima and Z. Horita		1989
EBSD Characterization of Pure Iron Deformed by ECAE		
R.A. Renzetti, M.J.R. Sandim, H.R.Z. Sandim, K.T. Hartwig, H.H. Bernardi and D. Raabe		1995
Structure, Chemical Stability and Properties of NiAl-Al₂O₃ Interface Modified by hBN and MAX-Phase Interlayers		
J. Song, W.P. Hu, Y.L. Zhong, H. Chen and G. Gottstein		2001
Thermo-Mechanical Problem of Torque in Beam with Annular Cross-Section		
J. Stropnik and F. Kosel		2007
Effect of Preliminary Treatment on Grain Refinement of Medium Carbon Steel Using ECAP at Increased Temperature		
J. Zrník, S.V. Dobatkin, M. Fujda and J. Džugan		2013

13. Smart / Intelligent Materials / Processes

Solubility Control of αTCP-HAp Functionally Graded Porous Beads in SBF for Biomaterial Use		
T. Asaoka, Y. Kajihata, K. Furukawa, T. Ushida and T. Tateishi		2021
Using Thin Film Stress for Nanoscaled Sensors		
S. Jebril, Y.K. Mishra, M. Elbahri, L. Kienle, H. Greve, E. Quandt and R. Adelung		2028
A Systematic Approach to Performance Evaluation of Shape Memory Alloys as Actuator Material		
V. Brailovski and P. Terriault		2034
Structure and Phase Stability of NiMnGa Ferromagnetic Shape Memory Alloys by Experimental and <i>Ab Initio</i> Techniques		
C. Esling, D.Y. Cong, J. Bai, Y.D. Zhang, J.M. Raulot, X. Zhao and L. Zuo		2040
Effect of Carbon Addition of Shape Memory Properties of TiNb Alloys		
H. Hosoda, Y. Horiuchi, T. Inamura, K. Wakashima, H.Y. Kim and S. Miyazaki		2046
Recent Advances in Microwave, Millimeter-Wave and Plasma-Assisted Processing of Materials		
M.A. Imam, A.W. Fliflet, R.W. Bruce, C.R. Feng, C. Stephenson, A.K. Kinkead and S.H. Gold		2052
Design of Joint Properties by Friction Powder Processing		
K. Inada, H. Fujii, Y.S. Ji, Y. Morisada and K. Nogi		2058
Stress Amplitude Dependence of Internal Friction in TiNbAl Shape Memory Alloy		
T. Inamura, Y. Yamamoto, H.Y. Kim, K. Wakashima, S. Miyazaki and H. Hosoda		2064
Shape Memory Behavior of Ti-Ni-X (X= Pd, Cu) Ternary Alloy Thin Films Prepared by Triple-Source DC Magnetron Sputtering		
S. Inoue, K. Hori, N. Sawada, N. Nakamoto and T. Namazu		2068
Closed Cellular Materials for Smart Materials		
S. Kishimoto		2074
Heating Behaviors of Powdered Metal Silicon Compact Under Microwave Irradiation		
Y. Kunieda, H. Shimofuruya, T. Tanigawa and Y. Ito		2080

Laser Sintering of Silver Nanoparticles for Electronic Use	2085
K. Maekawa, K. Yamasaki, T. Niizeki, M. Mita, Y. Matsuba, N. Terada and H. Saito	
Synthesis of New Structural and Functional Materials by SPS Processing	2091
Y. Makino, K. Mizuuchi, M. Tokita, Y. Agari, M. Kawahara and K. Inoue	
Influence of High Melting Glasses on Selected Properties of PtRh-Alloys for Application in Glass Fiber Bushings	2097
J. Merker, C. Schechenbach, B. Fischer, D.F. Lupton and I. Kravchenko	
Metal-Containing Diamond-Like Carbon Coating as a Smart Sensor	2103
T. Takagi, T. Takeno and H. Miki	
Influence of Internal Pulsed Current on the Sintering Behavior of Pulsed Current Sintering Process	2109
T. Misawa, N. Shikatani, Y. Kawakami, T. Enjoji and Y. Ohtsu	
Thermal Properties of Diamond-Particle-Dispersed Cu-Matrix-Composites Fabricated by Spark Plasma Sintering (SPS)	2115
K. Mizuuchi, K. Inoue, Y. Agari, S. Yamada, M. Tanaka, M. Sugioka, T. Takeuchi, J. Tani, M. Kawahara, J.H. Lee and Y. Makino	
Electron Beam Surface Modification of Cobalt Chrome Molybdenum Alloy Formed by a Laminate Molding Method	2121
T. Nagae, S. Kakiuchi, K. Himi, S. Tomida, E. Yamaguchi and T. Yoneda	
Preparation of Ti-Based and Zr-Based Bio-Metallic Wires by Arc-Melting Type Melt-Extraction Method	2127
T. Nagase, K. Kinoshita, T. Nakano, Y. Umakoshi and M. Niinomi	
Second Step Approach for Self Healing Ceramics	2133
W. Nakao	
Properties of New TiC/TiB₂/Fe-Al Cermet Alloy	2138
H. Nakayama, S. Tada, M. Mikami, K. Ozaki and K. Kobayashi	
Al/Ni Self-Propagating Exothermic Film for MEMS Application	2142
T. Namazu and S. Inoue	
High-Temperature Oxidation Resistance and Crack-Healing Function of Ni/Al₂O₃ Nano-Hybrid Materials	2148
M. Nanko	
(Zn,Mn)Te-Based Nanowires for Spintronic Applications: A TEM Study of Structural and Chemical Properties	2154
H. Kirmse, W. Neumann, S. Kret, E. Janik, W. Zaleszczyk, G. Karczewski and T. Wojtowicz	
Fabrication of Cu-Based Functionally Graded Materials Dispersing Fine Sic Particles by a Centrifugal Mixed-Powder Method	2160
H. Sato, Y. Inaguma and Y. Watanabe	
FEM Analysis of Joint Interface Formation in Magnetic Pressure Seam Welding	2166
H. Serizawa, I. Shibaharar, S. Rashed and H. Murakawa	
Microstructure and Thermoelectric Properties of Al-Doped ZnO Sintered Body	2172
N. Shikatani, T. Misawa, Y. Kawakami and M. Ohta	
Electrochemical Characteristics of Pure Titanium Produced by MIM (Metal Injection Molding) Process	2178
S. Sunada, N. Nunomura and K. Majima	
Preparation of Lithium Sulfide-Carbon Composites Using Spark-Plasma-Sintering Process and their Electrochemical Properties	2184
T. Takeuchi, H. Sakaeb, T. Sakai and K. Tatsumi	
Fabrication and Two-Way Deformation of Shape Memory Composite with SMA and SMP	2189
H. Tobushi, S. Hayashi, Y. Sugimoto and K. Date	
Investigation of Lattice Contraction in Mn₃XN(X=Zn, Cu, Sn)	2195
C. Wang, Y. Sun, Y.C. Wen, L.H. Chu and M. Nie	
Training Effects on Damping Capacity in Fe-Mn and Fe-Mn-Cr Alloys	2201
Y. Watanabe, H. Sato, Y. Nishino and I.S. Kim	

14. Superalloys & Heat Resistant Steels

Influence of Plastic Deformation on Recrystallized Microstructure of Fe-Base ODS Alloy	2209
C. Capdevila, I. Toda, J. Chao and C. García de Andrés	

Two-Phase Microstructures Formed by Phase-Separation of Coherent Precipitates in Elastically Constrained Alloy Systems	2215
M. Doi	
Mechanisms of New Grain Formation in a Ni-20%Cr Alloy during Warm to Hot Working	2221
N. Dudova, R. Kaibyshev and A. Belyakov	
Characterisation of the Structure of Single-Crystal Nickel-Base Superalloys	2227
A. Epishin, T. Link and U. Brückner	
Virtual Jet Engine System	2239
M. Fukuda, H. Harada, T. Yokokawa and T. Kitashima	
A Study on the Formation of Serrated Grain Boundaries and its Applications in Nimonic 263	2245
H.U. Hong, H.W. Jeong, I.S. Kim, B.G. Choi, Y.S. Yoo and C.Y. Jo	
Simulation of the Solidification Parameters of Single Crystal Casting	2251
H.P. Jin, J.R. Li and S.Z. Liu	
Role of Rhenium in Single Crystal Ni-Based Superalloys	2257
T. Jin, W.Z. Wang, X.F. Sun and Z.Q. Hu	
Fabrication Process for a High Strength 9Cr-2W Steel Sheet	2263
T.K. Kim, C.H. Han, S.H. Kim and C.B. Lee	
Dislocation Substructure of Single Crystal Ni-Based Superalloy, CMSX-4, Crept at 1073-1273K and 250-600MPa	2268
Y. Kondo and N. Miura	
Phase-Separation of B2 Precipitates in an Fe-Ni-Al Alloy	2274
Y. Kuno, Y. Nakane, T. Kozakai, M. Doi, J. Yamanaka, C. Yamamoto and S. Naito	
Effects of Surface Recrystallization on the Microstructures and Creep Properties of Single Crystal Superalloy DD6	2279
J.R. Li, F.L. Sun, J.C. Xiong, S.Z. Liu and M. Han	
Analysis of Creep Curves of Haynes 230 Superalloy	2285
M. Maldini, G. Angella and V. Lupinc	
Morphology of γ' Precipitates in Second Stage High Pressure Turbine Blade of Single Crystal Nickel-Based Superalloy after Serviced	2291
N. Miura, K. Nakata, M. Miyazaki, Y. Hayashi and Y. Kondo	
New Creep Deformation Concept Based on Creep under Lower Stresses	2297
T. Matsuo	
Modeling Grain Boundary Mobility during Dynamic Recrystallization of Metallic Alloys	2303
F. Montheillet, G. Damamme, D. Piot and S.L. Semiatin	
Creep Behavior and Microstructure of 8Cr Oxide Dispersion Strengthened Martensitic Steel	2309
K. Shinozuka, H. Esaka, M. Tamura and H. Tanigawa	
Microstructure Evolution in a 9%Cr Heat Resistant Steel during Creep Tests	2315
V. Skorobogatykh, I. Schenkova, V. Dudko, A. Belyakov and R. Kaibyshev	
Dynamic Recrystallization Modeling during Hot Forging of a Nickel Based Superalloy	2321
D. Solas, J. Thébault, C. Rey and T. Baudin	
Metadynamic Recrystallization of the Nickel-Based Superalloy Allvac 718PlusTM	2327
C. Sommitsch, D. Huber and M. Stockinger	
Effect of Thermomechanical Processes on $\Sigma 3$ Grain Boundary Distribution in a Nickel Base Superalloy	2333
N. Souaï, R.E. Logé, Y. Chastel, N. Bozzolo, V. Maurel and L. Nazé	
Directional Diffusion and Effect Factors of the Elements during Creep of Nickel-Base Single Crystal Superalloys	2339
S.G. Tian, M.G. Wang, X.F. Yu, X.D. Lu and B.J. Qian	
Phase Transformation Behavior of Boron Containing 9% Cr Heat Resistant Steels	2345
T. Tokunaga, H. Kaku, H. Miyazaki and F. Masuyama	
Heat Treatment and Oxidation Characteristics of Nb-20Mo-15Si-5B-20(Cr,Ti) Alloys from 700 to 1400°C	2351
S. Natividad, A. Acosta, K. Amato, J. Ventura, B. Protillo and S.K. Varma	
Dynamic Recrystallization Behavior of GH4586 Superalloy during Hot Compression	2357
L. Wang, S.A. Wang, Y. Liu and G.P. Zhao	

The Precipitation Strengthening Effect of Nb, Ti and Al in Cast/Wrought Ni-Base Superalloys	2363
X.S. Xie, S.H. Fu, S.Q. Zhao and J.X. Dong	
Study on the Ultrahigh Speed Grinding of Superhard Materials with Squeeze Film Damping Technology	2369
T.B. Yu, H. Li, J.Y. Yang and W.S. Wang	
The Halogen Effect for Ni-Base Superalloys – A Thermodynamic Study	2375
H.E. Zschau, P.J. Masset and M. Schütze	

15. Residual Stresses & Tomographic Methods in Materials Science

Residual Stress in PVD-Coated Carbide Cutting Inserts - Applications of the $\sin^2\psi$ and the Scattering Vector Method	2383
B. Denkena, G. Erkens and B. Breidenstein	
Influence of Steel Grain Size on Residual Stress in Grinding Processing	2389
M. Gotoh, K. Seki, M. Shozu, H. Hirose and T. Sasaki	
X-Ray Investigation on Strength of Thin Films	2395
H. Takao and M. Shinohara	
The Effect of Grain Size on Strain Determination Using a Neutron Diffractometer	2405
R.C. Wimpory, U. Wasmuth, J. Rebelo-Kornmeier and M. Hofmann	
Development of Twin Fractions and Microstresses of the Hot Extruded Magnesium Alloy AZ31 under Cyclic Loading Conditions	2411
M. Huppmann and W. Reimers	
Single Crystal Elastic Constants of the MAX Phase Ti_3AlC_2 Determined by Neutron Diffraction	2417
O. Kirstein, J.F. Zhang, E.H. Kisi, D.P. Riley, M.J. Styles and A.M. Paradowska	
Real Time Monitoring of the Strain Evolution during Rapid Heat Treatment of Steel Samples by Means of Synchrotron X-Ray Diffraction	2423
V. Kostov, J. Gibmeier, S. Doyle and A. Wanner	
Residual Stresses Relaxation Caused by Pulsed Electric Current	2429
G. Stepanov, A. Babutsky and L. Kruszka	
The X-Ray Diffraction Characteristics of Different Materials	2434
Y.L. Zhang, Z.M. Liu and J.Y. Liu	
Analysis of Residual Stress for Butt Welding of Thick Plate	2440
M. Nakatani, M. Abe, H. Murakawa and T. Sasaki	
Induction of Engineered Residual Stresses Fields and Associate Surface Properties Modification by Short Pulse Laser Shock Processing	2446
J.L. Ocaña, M. Morales, J.A. Porro, M. Blasco, C. Molpeceres, D. Iordachescu, G. Gómez-Rosas and C. Rubio-González	
Residual Stress Measurement by Neutron Diffraction in a Single Bead on Plate Weld - Influence of Instrument and Measurement Settings on the Scatter of the Results	2452
C. Ohms, R.C. Wimpory and D. Neov	
A Study on Area Detector Type Diffraction Stress Measurement and its Application to Shelling Problem in Railway Tracks	2458
T. Sasaki, O. Yaguchi and Y. Kobayashi	
Residual Stress Depth-Profiling in Shot-Peened Al Alloy Components Subjected to Fatigue Testing	2464
C.L. Azanza Ricardo, G. Degan, M. Bandini and P. Scardi	
The New GKSS Materials Science Beamlines at DESY: Recent Results and Future Options	2470
P. Staron, N. Schell, A. Haibel, F. Beckmann, T. Lippmann, L. Lottermoser, J. Herzen, T. Fischer, M. Koçak and A. Schreyer	
Transmission Imaging and Strain Mapping in the Vicinity of Internal Crack Tip Using Synchrotron White X-Ray	2476
J. Shibano, K. Kajiwara, K. Kiriyama, T. Shobu, K. Suzuki, S. Nishimura, S. Miura and M. Kobayashi	
High Temperature Internal Friction Behavior of Unidirectionally Solidified Al_2O_3/YAG Eutectic	2482
S. Ueno, S. Takata, Y. Tanabe, T. Akatsu, E. Yasuda and Y. Waku	

A Step towards a Complete Uncertainty Analysis of Residual Stress Determination Using Neutron Diffraction	2487
R.C. Wimpory and C. Ohms	
Industrial Research and Development with Synchrotron Radiation	2493
K. Kroschewski, A. Webb, T. Wroblewski and K. Wurr	
Comparison of the Mechanical Properties of Hastelloy X Material after Welding by GTAW and Nd-YAG Laser	2499
S.J. Wu, C.W. Du and C.M. Kuo	
Hierarchical 3D/4D Characterization on Deformation Behavior of Austenitic and Pearlitic Steels	2505
Y. Adachi, M. Ojima, S. Morooka and Y. Tomota	
Investigation of Sintering Processes by Tomography	2511
B. Kieback, M. Nöthe, J. Banhart and R. Grupp	
Electron Tomography of Nanostructured Materials – Towards a Quantitative 3D Analysis with Nanometer Resolution	2517
C. Kübel, D. Niemeyer, R. Cieslinski and S. Rozeveld	
Three-Dimensional Visualization and Analysis of Grain Deformation by Means of Synchrotron Radiation	2523
M. Kobayashi, H. Toda and K. Uesugi	

16. Modelling & Simulation / Multiscale Mechanical Modelling

Investigation of the Surface Characteristics for the Micro-Cutting Process with Finite Element Simulation	2531
H. Autenrieth, M. Weber, M. Deuchert and V. Schulze	
Mathematical Modeling of Microstructure Evolution of V Steels during Hot Rolling of Seamless Tubes	2537
R.N. Carvalho, M.A.C. Ferreira, D.B. Santos and R. Barbosa	
A Model of Discontinuous Dynamic Recrystallization and its Application for Nickel Alloys	2543
G. Damamme, D. Piot, F. Montheillet and S.L. Semiatin	
Variational Aspects of the Physically-Based Approach to 3D Non-Local Continuum Mechanics	2549
M. Di Paola and M. Zingales	
Fractal Model for Snow	2555
A. Carbone, B. Chiaia, B. Frigo and C. Türk	
Micro-Polar and Second Order Homogenization of Periodic Masonry	2561
A. Bacigalupo and L. Gambarotta	
Multiscale CAFE Modelling of Dynamic Recrystallization	2567
D. Kuc, J. Gawa&d and M. Pietrzyk	
The Microstructure Change during Modeling of Conventional and Thermo-Mechanical Rolling of S355 Steel Bars	2573
G. Stradomski, H. Dyja and Z. Stradomski	
Simulation of Copper Precipitation in Fe-Cu Alloys	2579
I. Holzer and E. Kozeschnik	
The Analysis of the Process of Asymmetric Rolling of Plates	2585
A. Kawałek, H. Dyja and M. Knapiński	
Physical Simulation at Hot Deformation	2591
R. Kawalla, W. Müller and W. Jungnickel	
Anisotropic Ostwald Ripening in Silicon Nitride: On the Reaction-Controlled Kinetics	2598
M. Kitayama	
The Physical Simulation of the Normalizing Rolling of the Steel Plate in Strength Category 350÷460MPa	2604
M. Knapiński, B. Koczkiewicz, A. Kawałek and H. Dyja	
The Analyze of Phase Transformations in Ultra Fine Grained Constructional Steel	2610
H. Dyja, B. Koczkiewicz and M. Knapiński	
High-Temperature Testing of the Properties of Blast Furnace Coke	2616
A. Konstanciak	

Combined Discrete/Finite Element Multiscale Approach for Modelling of the Tool/Workpiece Interface during High Shear Processing: Hot Rolling and Friction Stir Welding Applications	2622
M. Krzyzanowski, P.S. Davies, W.M. Rainforth and B.P. Wynne	
The Influence of Rolling Temperature on the Energy and Force Parameters during Normalizing Rolling of Plain Round Bars	2628
K.B. Laber, H. Dyja and S. Mróz	
Modeling the Effect of Stress and Plastic Strain on Martensite Transformation	2634
M. Maalekian and E. Kozeschnik	
Sensitivity Analysis as a Tool of Optimal Sensors Location for Solidification Parameters Estimation	2640
E. Majchrzak and J. Mendakiewicz	
Simulative Accelerated Creep Test on Gleeble	2646
S.T. Mandziej	
Simulation of Evolution of Dual-Phase Microstructure	2652
S.T. Mandziej, S. Waengler, J. Noack and R. Kawalla	
Strength of Alloyed Metal Castings Using Multiphase Models and Non-Linear FEM	2658
H. Martikka and I. Pöllänen	
Design of Process Equipment Beam Joints to Utilise Stress Relaxation	2664
I. Pöllänen and H. Martikka	
Numerical Simulation of the Portevin – Le Chatelier Effect in Various Material and at Different Scales	2670
M. Maziere, S. Forest, J. Besson, H.D. Wang and C. Berdin	
Numerical Modeling of Casting Solidification Using Generalized Finite Difference Method	2676
B. Mochnacki and E. Majchrzak	
Numerical Thermo-Mechanical Modelling of Stress Fields and Residual Constraints in Metallic Targets Subject to Laser Shock Processing	2682
M. Morales, C. Molpeceres, J.A. Porro, A. García-Beltrán and J.L. Ocaña	
A Model for Nucleation and Growth Processes of Tin Whisker	2688
K. Nakai, T. Sakamoto, S. Kobayashi, K. Arakawa, H. Mori, M. Takamizawa, K. Murakami and M. Hino	
The Use of Model Systems Based on Fe-30%Ni for Studying the Microstructural Evolution during the Hot Deformation of Austenite	2694
E.J. Palmiere, F. Bai, R.M. Poths, J. Turner, V. Nagarajan, B.P. Wynne and W.M. Rainforth	
Rheological Behavior of Pure Binary Ni–Nb Model Alloys	2700
D. Piot, F. Montheillet and S.L. Semiatin	
Thermal Behaviour of Steel Plate during Accelerated Cooling	2706
J.M. Pyykkönen, D.C. Martin, M.C. Somani and P.T. Mäntylä	
Interaction of the Precipitation Kinetics of δ And γ' Phases in Nickel-Base Superalloy ATI Allvac® 718Plus™	2712
R. Radis, G.A. Zickler, M. Stockinger, C. Sommitsch and E. Kozeschnik	
Heat Transfer Coefficient Measurements (HTC) at the Metal-Mould Interface in Permanent Mould Casting	2718
F. Rossi, J. Lázár, S. Ignat and J. Quesada	
Modelling of Grain Boundary Stability of Materials under Severe Plastic Deformation and Experimental Verification	2724
Y. Saito and C. Masuda	
Calculation of Energies of Coherent Interfaces and Application to the Nucleation, Growth and Coarsening of Precipitates	2730
B. Sonderegger, I. Holzer and E. Kozeschnik	
Modeling and Optimization of Cross-Sectional Microstructure Distribution during Hot Rolling of HSLA Steel Plates	2736
Y.B. Xu, T.Y. Deng, Y.M. Yu, X.Y. Hou, X. Liu and G.D. Wang	
Multiscale Modelling of Gradual Degradation in $\text{Al}_2\text{O}_3/\text{ZrO}_2$ Ceramic Composites under Tension	2743
T. Sadowski and L. Marsavina	
Microcracked Materials as Non-Simple Continua	2749
P. Trovalusci and V. Varano	

Coupling Continuum and Discrete Models of Materials with Microstructure: A Multiscale Algorithm

V. Sansalone and P. Trovalusci

2755

X-Ray Computed Tomography Based Modelling of Polymeric Foams

J.G.F. Wismans, J.A.W. van Dommelen, L.E. Govaert and H.E.H. Meijer

2761

Homogenization of Out-of-Plane Loaded Random Plates

K. Sab

2766

Modeling of Microstructure Evolution in Process with Severe Plastic Deformation by Cellular Automata

D. Svyetlichnyy

2772

17. Texture**Microstructure and Texture Evolution in Cold Rolled Interstitial Free (IF) Steel Sheet during Annealing under AC Magnetic Field**

C.S. He, S. Tsurekawa, H. Kokawa, X. Zhao and L. Zuo

2781

Mechanism on Heterogeneous Nucleation of the Primary Al Phase on TiAl₃ of a Hot-Dip Zn-11%Al-3%Mg-0.2%Si Coating on Steel Sheet

K. Honda, K. Ushioda and W. Yamada

2787

Effect of Deformation Mode on Texture of Ultrafine-Grained Low Carbon Steel Processed by Warm Caliber Rolling

T. Inoue, F.X. Yin and Y. Kimura

2793

Study on Evolution of Partial Texture of Different Grains during Grain Growth in IF Steels

W.P. Tong, W.Y. Chen, F. Wagner, L. Zuo and J.C. He

2799

Phase Alignment Based on Crystal Orientation In Mn-Sb and Al-Ni Alloys Induced by High Magnetic Fields

Q. Wang, T. Liu, C.J. Wang, K. Wang, G.J. Li and J.C. He

2805

Crystallographic Textures Variation in Asymmetrically Rolled Steel

S. Wroński, K. Wierzbanowski, B. Bacroix, M. Wróbel and M. Wroński

2811

The Effects of Different Precipitation States on the Annealing Behaviour of AA6111

C.S.T. Chang and B.J. Duggan

2817

Texture and Strain Experiments at OPAL

U. Garbe, O. Kirstein, A. Studer, V. Luzin and K.D. Liss

2823

Microstructure and Texture Optimization in Fe-Si Ferritic Steels

P. Gobernado, R.H. Petrov, D. Ruiz, E. Leunis and L.A.I. Kestens

2829

Texture and Substructure Development during Dynamic Recrystallization in Ni-30Fe Austenite

H. Beladi, P. Cizek and P. Hodgson

2835

Effect of Plating Current Density and Frequency on the Crystallographic Texture of Electrodeposited Copper

Y.W. Lin, J.C. Kuo, K.T. Lui and D. Chen

2841

A Variant Selection Rule in Transformation in Steel and Prediction of Transformation Texture

T. Tomida, M. Wakita, M. Yoshida and N. Imai

2846

Structure/Property Relationship in Intergranular Corrosion of Archaeological Silver Artefacts

P. Lejček, A. Jäger, V. Gärtnerová, J. Vaníčková, J. Děd and J. Haloda

2852

Grain Boundary Sliding Phenomenon and Its Effect on High Temperature Ductility of Ni-Based Alloys

E.A. Torres, R. Caram and A.J. Ramirez

2858

Relations of Initial Microstructure with Grain Boundary Character Distributions in a Cold Rolled and Annealed Lead Alloy

W.G. Wang, B.X. Zhou and H. Guo

2864

Features of Highly Twinned Microstructures Produced by GBE in FCC Materials

S. Xia, B.X. Zhou, W.J. Chen, X. Luo and H. Li

2870

Application of Laser Surface Remelting in Grain Boundary Engineering

S. Yang and H. Kokawa

2876

Grain Boundary Character of 9Cr Ferritic/Martensitic Heat Resistant Steels Strengthened by Nano-Sized MX Precipitates

F.S. Yin

2882

18. Thin Films

Effects of Thermal Annealing on Electrical, Optical and Structural Properties of Ga-Doped ZnO Films

P.C. Chang, K.H. Lee, A.N. Tu, S.J. Chang and K.L. Lee

2891

Optical-Electrical Properties and Corrosion Behavior of Tantalum-Doped Indium Tin Oxide Films Deposited by Magnetron Sputtering

X.P. Dong, B. Zhang and J.S. Wu

2897

Growth Stresses and Phase Development in Nanostructured Oxide Scales Formed on Iron Aluminides

P. Brito, H. Pinto, A. Rothkirch and A. Pyzalla

2903

Thin Film Depositions of CdTe Semiconductors on Amorphous and Single Crystal Substrates and Comparisons of their Properties

Y. Sato, T. Kodate and M. Arai

2909

Single Crystalline a-Axis Mg Doped ZnO Thin Films Prepared by Sol-Gel Technique for Optoelectronics Applications

B.K. Sonawane, M.P. Bhole and D.S. Patil

2915

Growth of Cubic AlN Films on Sapphire(0001) with Atomic Scale Surface Smoothness by Pulsed Laser Deposition

T. Yoshitake, T. Yoshitake, K. Sumitani, R. Ohtani, Y. Nakagawa, S. Mohri and K. Nagayama

2921

Ultranano-crystalline Diamond/Hydrogenated Amorphous Carbon Films Prepared by a Coaxial Arc Plasma Gun

Y. Nakagawa, T. Yoshitake, K. Hanada, A. Nagano, R. Ohtani, K. Sumitani, H. Setoyama, E. Kobayashi, M. Hirakawa, K. Yamaguchi, N. Tsukahara, Y. Agawa and K. Nagayama

2927

Effect of Nano-Crystallization on the Mechanical Properties of the $(\text{Zr}_{53}\text{Cu}_{30}\text{Ni}_9\text{Al}_8)_{99.5}\text{Si}_{0.5}$ Bulk Metallic Glass

Z.W. Hsiao, C.C. Fu, P.H. Tsai, J.S.C. Jang, S.R. Jian and J.C. Huang

2933

Structural Changes in Nickel Silicide Thin Films under the Presence of Al and Ga

A.V. Mogilatenko, F. Allenstein, M.A. Schubert, M. Falke, G. Beddies and W. Neumann

2938

Tailoring Exchange Coupling between Magnetic Nano-Grains of High Density Magnetic Recording Media

G.W. Qin and L. Zuo

2944

A Study on Hydrogen in Titanium Thin Films

E. Tal-Gutelmacher, R. Gemma, E. Nikitin, A. Pundt and R. Kirchheim

2950

In Situ S-Doping of Cubic Boron Nitride Thin Films by Plasma Enhanced Chemical Vapor Deposition

H.S. Yang, N. Kurebayashi and T. Yoshida

2956

Doping of ZnO Thin Film with Eu Using Ion Beams

M. Ionescu, P. Photongkam, D. Yu, R. Siegele, S. Li and D.D. Cohen

2962

19. Steels & Thin Slab and Strip Casting

Work Hardening and Tensile Behaviour of an Austenitic Stainless Steel at High Temperature

G. Angella

2973

Influence of Molybdenum and Copper on the Corrosion Resistance of High Strength Austenitic Steels

H. Berns, S. Riedner and B. Hussong

2979

Phase Transformation in Duplex Stainless Steels after Isothermal Treatments, Continuous Cooling and Cold Working

I. Calliari, E. Ramous and P. Bassani

2986

Effects of Deformation Mode on Resistivity Curve Used for Estimating Martensite Induced in Stainless Steel

H. Date

2992

Multiaxial Forging of Super Duplex Steel	2998
S. Kleber and M. Hafok	
Reasons for Formation of Twin-Precipitates in Two Phase Stainless Steel	3004
N. Miyano, A. Takahashi, S. Kataoka and K. Ameyama	
Recrystallization of Coarse-Grained Nb-Containing AISI-430 Ferritic Stainless Steel	3009
R.P. Siqueira, H.R.Z. Sandim and T.R. Oliveira	
Energy of Interatomic Bonds in Austenitic Steels	3015
B.D. Shanina and V.G. Gavriljuk	
The Activity of Nitrogen in the Liquid Fe-N-Cr Alloy Based on the Non-Random Solubility Model by Schmid - Fetzer	3021
J. Siwka and A. Hutny	
Dissolution and Precipitation of Excess Phases in High-Nitrogen Steels	3026
A.G. Svyazhin and L.M. Kaputkina	
Recent Progress and Application of Bainite Steels for High Strength Linepipe up to X120	3032
H. Asahi, Y. Shinohara and T. Hara	
Mn-Series Low Carbon Air Cooling Bainitic Steels Containing Niobium	3038
C. Feng, B.Z. Bai, Y.K. Zheng and H.S. Fang	
Key Factors in Grain Refinement of Martensite and Bainite	3044
T. Furuhara, N. Takayama and G. Miyamoto	
Further Corrosion Behaviors of Low Carbon Bainitic Steel in the Environment Containing Cl⁻ after the Rust Layer Damaged	3050
S.W. Yang, L. Cui, Y. He and X.L. He	
Cyclic Deformation and Fatigue Crack Behavior of Extruded AZ31B Magnesium Alloy	3056
S. Morita, S. Tanaka, N. Ohno, Y. Kawakami and T. Enjoji	
Designing Local Properties of Constructional Elements by Local Use of Ageing Effects in Multiphase Steels	3062
M. Asadi and H. Palkowski	
Effect of Thermomechanical Processing Parameters on the Final Microstructure of Pipeline Steels	3068
N.S. Mouríño, R.H. Petrov, J.H. Bae, K.S. Kim and L.A.I. Kestens	
Hot Forging of Ultra High-Strength TRIP-Aided Steel	3074
K. Sugimoto, S. Sato and G. Arai	
Formation of Martensite Austenite Constituent in Continuously Cooled Nb-Bearing Low Carbon Steels	3080
N. Takayama, G. Miyamoto, N. Kamikawa, H. Nako, T. Maki and T. Furuhara	
In Situ High Temperature X-Ray Studies on Bainitic Transformation of Austempered Silicon Alloyed Steels	3086
E. Vuorinen and X. Chen	
Effect of Cold Deformation on Thermal Stability of Bainite in Nb-Bearing Microalloyed Steels	3093
S.W. Yang, H.Q. Lv, R. Zhang, Y. He and X.L. He	
Influence of Heat Treatment on the Microstructure of a High Chromium Steel Used for the Manufacture of Rolling Rolls	3099
I.F. Pariente, J.M. Artinez, F.J. Belzunce and C. Rodríguez	
Investigation of Bar-Like Carbides in HR3C Boiler Steel	3105
S.C. Cheng, Z.D. Liu, H.S. Bao and J.Z. Wang	
Design of Modern Steels for Automotive Application	3111
H. Hofmann, T. Heller and S. Sikora	
Melting and Solidification in the System Fe-Mn-C	3117
A. Lob, D. Senk and S. Geimer	
Technologies of Nanomodification of Low-Carbon Low Alloyed Steels	3123
V.A. Malyshevsky, E.I. Khlusova and V.V. Orlov	
Mechanical Properties and Forming Behavior of a Type 9%Cr Steel Containing 2%W	3128
F. Peñalba, X. Gómez, R. Allende, M. Carsí and O. Ruano	
Homogenization Strategy and Material Characterization of High-Manganese TRIP and TWIP Steels	3134
B. Wietbrock, M. Bambach, S. Seuren and G. Hirt	

Refinement of CFB/M High Strength Steel Micro-Alloyed with Nb	3140
B.Z. Bai, Y. Yu, D.Y. Liu and J.L. Gu	
Microstructural Evaluation of API 5L X80 Pipeline Steels Submitted to Different Cooling Rates	3146
I.d.S. Bott, A.A.H. Vieira, L.F.G. de Souza and P.R. Rios	
Hot Deformation and Ductility Analysis of Continuous Cast C40 Steel by Means of Tensile and Compression Tests	3152
P. Rodriguez-Calvillo, A. Hernandez-Exposito, A. Boulaajaj and J.M. Cabrera	
Analysis of Hot Tensile and Compression Curves to Assess the Hot Ductility of C-Mn Steels	3158
G. Varela-Castro, J. Calvo and J.M. Cabrera	
Comparative Study of Various Data Conversion Methods for Torsion Tests Applied to a HSLA Steel	3164
J. Castellanos, I. Rieiro, M. Carsí, J. Muñoz and O. Ruano	
Analysis of the Redundant Deformation Factor in the Axisymmetric Drawing of AISI 304 Stainless Steel Bars through Experimental Techniques	3170
E.C. Siqueira Corrêa, M.T. Paulino Aguilar and P.R. Cetlin	
Numerical Simulation of Steel Flow and Behaviour of Non-Metallic Inclusions in the Six-Strand Tundish with Stopper Rod System	3176
A. Cwudziński and J. Jowsa	
Dissolution of Precipitates in Hot Rolled Low Mn, Ti Added Pipeline Steels	3182
A. Dehghan-Manshadi and R. Dippenaar	
Microstructure and Cleavage Resistance of High Strength Steels	3188
A. di Schino and C. Guarnaschelli	
Creep Behavior of an Oxide Dispersion Strengthened Iron with Ultrafine Grain Structure	3194
V. Dudko, R. Kaibyshev, A. Belyakov, Y. Sakai and K. Tsuzaki	
Effect of Prior Heat Treatment on Hardness Profile after Nitrocarburization in Medium Carbon Steel	3200
M. Egashira, S. Nishitani, M. Yuya and N. Sano	
Towards Understanding the Development of Grain Boundary Clusters in Austenitic Stainless Steel	3206
D.L. Engelberg, S. Rahimi and T.J. Marrow	
Effect of Grain Boundary Segregation of Phosphorus on the Hall-Petch Coefficient of Ferritic Iron	3212
M. Fujihara, N. Nakada, T. Tsuchiyama and S. Takaki	
Strengthening of Ferritic Steel by Interface Precipitated Carbides in Rows	3218
Y. Funakawa, K. Seto and H. Nakamichi	
Microstructure Evolution of C-Mn-Si-Al-Nb High-Manganese Steel during the Thermomechanical Processing	3224
L.A. Dobrzański, A. Grajcar and W. Borek	
Isothermal and Thermal Fatigue of Tool Steel AISI H11	3230
A. Grüning, M. Lebsanft and B. Scholtes	
Simulation of Thermo-Mechanical Controlled Rolling and Continuous Cooling of Wire Rods	3236
C. Guarnaschelli, P. Folgarait, S. Matera and D. Ripamonti	
Microstructure and Mechanical Properties of Cooled and Tempered Cu and Nb-Bearing Ultra-Low Carbon Steels	3242
H. Guo, Z.Q. Yao, S.W. Yang and X.L. He	
Dependence of Yield Strength on Ferrite Grain Size in Ferrite/Cementite and Ferrite/Pearlite Structures of Medium Carbon Steel	3248
T. Hanamura and S. Torizuka	
Fatigue Performance of Laser Brazes in Advanced High Strength Steels	3254
M.H.E. Janssen, M.J.M. Hermans, M. Janssen and I.M. Richardson	
Effect of Si on Mechanical Property of Galvannealed Dual Phase Steel	3260
S. Hironaka, H. Tanaka and T. Matsumoto	
Microstructure and Mechanical Properties of Ultra-High Strength Steel Plates with High Deformability	3266
B.C. Hwang, C.G. Lee and S.H. Lee	

Microstructure and Texture Evolution in a High Manganese Austenitic Steel During Tensile Test	3272
J.A. Jiménez and G. Frommeyer	
Static Strain Ageing in Some Austenitic Stainless Steels	3278
T.J. Juuti, L.P. Karjalainen, R. Ruoppa and T. Taulavuori	
Study of the Columnar Grain Growth in IF Steels during Continuous Heat Cycles	3284
W. Kaluba and T. Kaluba	
A Technical and Economic Analysis of Pig Iron Production	3291
E. Kardas	
Action of Displacement Control on Vacuum Free Aluminum/Copper Diffusion Liquefaction Bonding	3297
H. Kawakami, T. Kawabe and J. Suzuki	
Bending Property of Liner Laser Irradiated Thin High Carbon Steel	3302
H. Kawakami, A. Faisal, H. Ozaki and J. Suzuki	
Effect of Martensite in Initial Structure on Bainite Transformation	3307
H. Kawata, K. Hayashi, N. Sugiura, N. Yoshinaga and M. Takahashi	
Effects of Manganese Content and Heat Treatment Condition on Mechanical Properties and Microstructures of Fine-Grained Low Carbon TRIP-Aided Steels	3313
S.J. Kim	
First-Principles Calculations and the Thermodynamics of Cementite	3319
J.H. Jang, I.G. Kim and H.K.D.H. Bhadeshia	
Calculation of Stress-Strain Curve of Two-Phase Microstructure on the Basis of the Extended Secant Method	3325
T. Koyama and H. Onodera	
Modeling of Phase Transformation and Carbon Behaviors after Holding at γ/α Region and Controlled Cooling in Low Carbon Steels	3331
J.M. Choi, B.J. Park, K.S. Lee and K.J. Lee	
The Effect of Cooling Rate on the Damage Micromechanisms of DP Steels	3337
O. León-García, R.H. Petrov and L.A.I. Kestens	
A View on the Strategy in the Processing of Hot Rolled Dual Phase Steels	3343
F. Leysen, J. Penning and Y. Houbaert	
Effect of Coiling Temperature on Microstructure and Mechanical Properties of a Nb-V Microalloyed Steel	3350
M. Olasolo, P. Uranga, J.M. Rodriguez-Ibabe and B. López	
A Study of the Carbides in High-Speed Steel Rolls	3356
Y.K. Luan, N.N. Song, X.H. Kang and D.Z. Li	
Ductility of Microalloyed Steels during Hot Deformation	3362
A. Mannucci, E. Anelli, M. Armengol and M. Vedani	
Microstructure and Mechanical Properties of Low Carbon Al-Killed Steels after Ultra-Rapid Annealing Cycles	3368
V. Massardier-Jourdan, A. Ngansop, D. Fabrègue and J. Merlin	
Effect of Retained Austenite Stability on Mechanical Properties of 590MPa Grade TRIP Sheet Steels	3374
H. Matsuda, H. Noro, Y. Nagataki and Y. Hosoya	
Successful Transition from Wrought Iron to Steel in Hot Work Processing with Mechanism Differences	3380
H.J. McQueen	
Effects of Nb, V, Ti and Al on Recrystallisation/Precipitation Interaction in Microalloyed Steels	3388
M. Gómez, L. Rancel and S.F. Medina	
Monitoring Phase Transition Kinetics in Austempered Ductile Iron (ADI)	3394
L. Meier, P. Schaaf, S. Cusenza, D. Höche, M. Bamberger, Y. Amran, K. Weiss, M. Hofmann and H. Hoffmann	
Alloying Effects on Reverse Transformation to Austenite from Pearlite or Tempered Martensite Structures	3400
G. Miyamoto, Z.D. Li, H. Usuki and T. Furuhara	
Grain Refinement Mechanisms of Plain C-Mn Steel by Super Short Interval Multi-Pass Rolling in Stable Austenite Region	3406
K. Miyata, M. Wakita, S. Fukushima and T. Tomida	

Friction and Wear Properties of Zr and TiC-Based Cermet Specimens in a Hydrogen Gas Atmosphere	3412
T. Murakami, K. Kaneda, H. Mano, M. Hata, S. Sasaki and J. Sugimura	
Influence of Strain Path on Microstructure Evolution of Low Carbon Steels	3418
K. Muszka, L. Sun, B.P. Wynne, E.J. Palmiere and W.M. Rainforth	
Temperature Dependence of Austenite Nucleation Site on Reversion of Lath Martensite	3424
N. Nakada, T. Tsuchiyama, S. Takaki and N. Miyano	
Influence of High-Mobility Boundaries on the Selective Growth of Goss Grain in Grain-Oriented Electrical Steel	3430
T. Omura and Y. Hayakawa	
High Corrosion Resistance 21%Cr-0.4%Cu Ferritic Stainless Steel Contributing to Resource Conservation	3435
H. Ota, T. Ishii, T. Samukawa, T. Ujiro and H. Yamashita	
Microstructure and Toughness of 1000 MPa High Strength Weld Metal	3441
W.S. Du, Y. Peng, H.J. Xiao, C.H. He and Z.L. Tian	
OIM Analysis of Microstructure and Texture of a TRIP Assisted Steel after Static and Dynamic Deformation	3447
R.H. Petrov, J. Bouquerel, K. Verbeken, L.A.I. Kestens, P. Verleysen and Y. Houbaert	
Mechanical Properties of a Medium Carbon Low Alloy Steel Processed by Two Step Austempering Process	3453
S.K. Putatunda, A. Deokar and G. Bingi	
Influence of V and N on Transformation Behavior and Mechanical Properties of Medium Carbon Forging Steels	3459
N. Radović, A. Koprivica, D. Glišić, A. Fadel and D. Drobnjak	
Linking Crystallographic, Chemical and Nano-Mechanical Properties of Phase Constituents in DP and TRIP Steels	3465
R.A. Rijkenberg, M.P. Aarnts, F.A. Twisk, M.J. Zuijderwijk, M. Knieps and H. Pfaff	
Genetic Alloy Design of Ultra High Strength Stainless Steels: From Thermodynamics to Quantum Mechanics	3473
P.E.J. Rivera-Díaz-del-Castillo, W. Xu and S. van der Zwaag	
Influence of Continuous Annealing Conditions on the Microstructure and Mechanical Properties of a C-Mn Dual Phase Steel	3479
R.O. Rocha, T.M.F. Melo and D.B. Santos	
The Complexity of the Microstructural Changes during the Partitioning Step of the Quenching and Partitioning Process in Low Carbon Steels	3485
M.J. Santofimia, L. Zhao, Y. Takahama and J. Sietsma	
Precipitation and Precipitation Hardening Behavior of V and/or Cu Bearing Middle Carbon Steels	3491
T. Senuma, M. Sakamoto and Y. Takemoto	
Comparison of Grain Growth between Fine-Grained and Coarse-Grained Austenite in a Nb-V-Ti Microalloyed Steel	3496
Q.Y. Sha, L.F. Qiao, R.J. Xu, G.J. Huang and Z.Q. Sun	
Modeling of C-Mn Chromium Containing Steel to Produce DP600 through Thin Slab Direct Rolling	3502
M. Wagih, M. Shahtout and A. Kady	
The High Nb Content Microalloying Approach for Developing High Performance Structural Steel	3508
X.C. Li, C.J. Shang, D.X. Xia and X.L. He	
Direct Observation of the Change in Microstructure with Deformation in Ferrous Lath Martensite by Using Micro-Sized Specimen	3514
A. Shibata, Y. Ogawa, M. Sone and Y. Higo	
The Formation of Multiphase Microstructures in Low-Alloy Steel	3520
J. Sietsma	
The Influence of Deformation on Microstructure Evolution of Low Alloy TRIP Steel	3531
L. Suarez, J.A. Benito, P. Rodriguez-Calvillo, D. Casellas, Y. Houbaert, R.H. Petrov and J.M. Prado	
Evaluation of Hydrogen Embrittlement for High Strength Steel Sheets	3537
Y. Toji, S. Takagi, M. Yoshino, K. Hasegawa and Y. Tanaka	

Formability of Ultrafine Grained Steel S. Torizuka and E. Muramatsu	3543
Effect of Grain Refinement on Mechanical Properties in 25Cr-1N Austenitic Steel T. Tsuchiyama, T. Onomoto, K. Tsuboi and S. Takaki	3549
Development of 780MPa Grade Steel Plate by Microstructural Control Containing M-A through the On-Line Heating Process K. Ueda, S. Suzuki, S. Mitao, N. Shikanai and T. Ito	3555
Effect of Hot and Cold Rolling on Grain Size and Texture in Fe-Si Strips with Si-Content Larger than 2 wt% E. Gomes, J. Schneider, K. Verbeken, H. Hermann and Y. Houbaert	3561
Control of the Austenite Recrystallization in Niobium Microalloyed Steels S. Vervynckt, K. Verbeken, P. Thibaux, M. Liebeherr and Y. Houbaert	3567
Precipitation Behavior of Steels with Various Copper during Continuous Cooling X.M. Wang, C. Li, C.J. Shang, C.A. Zheng and X.L. He	3573
Temperature Development during Step-Wise Tensile Tests on a TRIP Steel L. Zhao, C. Thomser, K. Schneider, W. Bleck and J. Sietsma	3579
Static and Impact-Dynamic Characterization of Multiphase TRIP Steels J. Van Slycken, J. Bouquerel, P. Verleysen, K. Verbeken, J. Degrieck and Y. Houbaert	3585
Microstructure and its Formation Mechanism of Weld Metal of Al-Bearing TRIP Steel Y. Peng, Y.C. Qi, C.H. He, Z.L. Tian and H.J. Xiao	3591
Discontinuous Precipitation in a High-Nitrogen Austenitic Steel L. Rovatti, R. Montanari, N. Ucciardello, A. Mezzi, S. Kaciulis and A. Carosi	3597
Transverse Surface Cracks in Continuously Cast Steel Slabs, Oscillation Marks and Austenite Grain Size R. Dippenaar	3603
20 Years of Experience in Thin Slab Casting and Rolling State of the Art and Future Developments C. Klinkenberg, C. Bilgen, T. Boecker and J. Schlüter	3610
High Temperature Deformation Mechanisms and Processing Map for Hot Working of Cast-Homogenized Mg-3Sn-2Ca Alloy K.P. Rao, Y.V.R.K. Prasad, N. Hort and K.U. Kainer	3616
Recent Developments and Future Potentials of Near Net Shape Casting Belt Casting Technology H. Fischer and M. Schäperkötter	3622
Effects of Casting Flux Interaction with Steel Melt on Lubrication in CC Moulds D. Senk	3628
Near-Net-Shape Casting of Steel - The Belt Casting Technology J. Wans, J. Bausch, J. Hecken and J. Schlüter	3634

20. Welding & Joining

Physical and Chemical Mechanisms Occuring during A-TIG Welding: Comparison between Experimental Investigations and Simulations A. Berthier, M. Carin, S. Pellerin, F. Valensi and P. Paillard	3643
Proper Design and Fabrication of Socket Welds for Use in Sour Service R.D. Caligiuri, L.E. Eiselstein and L.N. Eastep	3649
Effect of Post-Weld Heat Treatment on Nd: YAG Laser Welded Ti-6Al-4V Alloy Quality X.J. Cao, G. Debaecker, M. Jahazi, S. Marya, J. Cuddy and A. Birur	3655
Friction Stir Welding of Dissimilar AA 2024-T3 to AZ31B-H24 Alloys X.J. Cao and M. Jahazi	3661
Butt Joining of High Strength Steel Sheet and Dissimilar Metal Sheet by Shot Peening Y. Harada and T. Uemori	3667
Weld Pool Shaping and Microstructural Control Using Novel Computer Generated Holographic Optic Laser Welding of Steel and Stainless Steel R.L. Higginson, M. Gibson, J. Kell and J. Tyrrer	3673
Consideration on the Toughness Requirement to the Austenitic Weld Metal in the LNG Storage Tanks Subjected to a Partial Height Hydro Test T. Kawabata, N. Konda, K. Arimochi, H. Hirose, S. Muramoto and S. Hirai	3679

Effect of Oxygen Content on Toughness in High Strength Weld Metal	3687
S. Nakamura, T. Hasegawa, R. Shimura and I. Kimoto	
Comparison of Microstructures at As Welded Zone and Reheated Zone in 9%Ni Steel Similar Composition Weld Metal	3693
H. Nako, Y. Okazaki, H. Takeda, K. Suenaga and K. Nakanishi	
Research on High Heat Input Welding of the High Strength Electro-Gas Flux-Cored Wire Used for Large Storage Tank	3699
Z.X. Qu and H.Q. Zhang	
Microstructure and Mechanical Property Development in the Heat Affected Zone of Ultrafine Grained HSLA Steel	3704
P.J. Modenesi, R.F. Fajardo and D.B. Santos	
Influence of the Hardening Model on the Predicted Welding Distortion of DP600 Lap Joints	3710
T. Schenk, I.M. Richardson, G. Eßer and M. Kraska	
Thermomechanical Joining of Aluminium Alloys: Effects of the Shear on the Quality of the Joining	3716
O. Siret, C. Desrayaud and M.A. Tourabi	
In Situ Observation of Solidification Behavior during Welding	3722
Y. Komizo and H. Terasaki	
Fatigue Behaviour of Friction Stir Processed Cast Aluminium and Magnesium Alloys	3727
Y. Uematsu and K. Tokaji	
Effect of Weld Tip Geometry on Ultrasonic Welding of Aluminum Alloy	3733
T. Watanabe, K. Nishihara and T. Sasaki	
Characteristics of Laser Welded Joints of HDT580X Steel	3739
M.S. Weglowski, S. Stano, K. Krasnowski, M. Łomozik, K. Kwiecinski and R. Jachym	
Effect of Boron Carbide Addition on Wear Behaviour of Cobalt Based Hardfacings by Plasma Transferred Arc Process	3745
D.R.G. Achar, M. Kamaraj and C.S. Ganesh Bavisetty	
Intelligent Control of Arc Welding Dynamics during Robotic Welding Process	3751
S.B. Chen, W.Y. Wang and H.B. Ma	
Interfacial Behavior of Dissimilar Friction Welded Nodular Cast Irons with Low Carbon Steels	3757
I. Mitelea, C.M. Crăciunescu and R. Gugu	
A Weldability Study of Nickel-Iron-Cobalt Hydrogen Resistant Alloys Using Weld Simulation in Parallel with Variable Restraint Testing	3763
D.W. Walsh, M.L. Bright, T.L. Jackson and D.B. Gibbs	
In Situ Observation of Phase Transformations during Welding of Low Transformation Temperature Filler Material	3769
A. Kromm, T. Kannengiesser and J. Gibmeier	
Microstructure of Bonding Interface in Explosively Welded Metal/Ceramic Clad	3775
S. Ii, C. Iwamoto, S. Satonaka, K. Hokamoto and M. Fujita	
Friction Welding Structures of Carburized Steels	3781
I. Mitelea and C.M. Crăciunescu	
Bonding and Separation Behaviors between Ti-Sn Alloys and High Carbon Steel	3787
Y. Morizono, S. Nakatsukasa and M. Nishida	
Experimental Setup for the Determination of Mechanical Solder Materials Properties at Elevated Temperatures	3793
W.H. Müller, H. Worrack and J. Sterthaus	
Weldability Study of Aluminum Alloys Using Weld Simulation and Complimentary Variable Restraint Testing	3799
D.W. Walsh and D.B. Gibbs	
The Mechanism of Failure of the Axisymmetrical Welded Joint under Thermomechanical Loading	3805
P. Lacki, K. Wojsyk and A. Służalec	
Microstructure Evolution of Sn-2.5Ag-2.0Ni Solder Joint with Various Ni Platings on SiC_p/Al Composites	3811
M. Wu, X.B. He, S.B. Ren, M.L. Qin and X.H. Qu	

21. Mechanical Behaviour & Fracture

Effect of Plastic Anisotropy on the Predictive Capacity of Flaw Assessment Procedures S. Alexandrov	3821
Incompatibility Stresses and Elastic Energy Stored in Polycrystalline Materials A. Baczmanski, R. Wawszczak, W. Seiler, C. Braham, S. Wroński, M. Wróbel and K. Wierzbowski	3827
Effect of Strain Heterogeneity on the Recrystallization Behavior of an Oxide Dispersion Strengthened Ferritic Alloy C.L. Chen, G.J. Tatlock and A.R. Jones	3833
Study on Very High Cycle Fatigue Fracture of High Strength Steel with CFB/M Complex Microstructure Y. Yu, B.Z. Bai and J.L. Gu	3839
Fracture Toughness of a Silica-Doped Cubic Zirconia (8Y-CSZ) K. Hiraga, K. Morita, B.N. Kim and H. Yoshida	3846
A Proposal for Two Characteristic Ratios of ASTM-CTOD to BS-CTOD Y. Kayamori, T. Inoue and T. Tagawa	3852
Deformation in Ti-Nb-Ta-Zr-O Alloy at Near Ideal Strength S. Kuramoto, T. Furuta, N. Nagasako and M. Hara	3858
Effect of Parameters of Notch on Fatigue Life of Shaft Based on Product Lifecycle Management Y.T. Li, B. Chen and C.F. Yan	3864
Predication of Fatigue Life of Notched Torus under Random Scan Vibration Y.T. Li, C.F. Yan and W.Y. Jin	3870
The Structure and its Dependence on the Magnetic Properties of $Ni_5Co_xCu_{95-x}$ Alloys Produced by Mechanical Alloying and Subsequent Annealing M. López, M.E. Gómez, D. Reyes, K. Ramam, R.V. Mangalaraja, P. Prieto and J.A. Jiménez	3876
Thermomechanical Process Innovation via Computer Modeling and Simulation P.A. Manohar	3883
Failure Analysis of a Hammer Drill Shaft under Complex Loading Paths and Severe Environmental Conditions P.A. Manohar	3889
Fracture Process of Aluminum/Aluminum Nitride Interfaces during Thermal Cycling Y. Nagatomo, R. Muranaka, H. Hayashi, Y. Kuromitsu and N. Kuwano	3895
Metallurgical Investigation on Low Ductility Failures of Cu-ETP Components G. Pantazopoulos, A. Vazdirvanidis and D.C. Papamantellos	3901
Grain Boundary Pinning by Particles P.R. Rios and G.S. da Fonseca	3907
On the Effects Associated with Control Parameters Delay during Biaxial Cyclic Loading of Engineering Materials Z.L. Kowalewski and T. Szymczak	3913
Tools and Technologies for Hot Forming with Local Adjustment of Part Properties R. Kolleck and R. Veit	3919
Simulating Phase Coarsening of Ultra-High Volume Fractions K.G. Wang and X. Ding	3925
Method of Constraint Loss Correction for CTOD Fracture Toughness under Welding Residual Stress Field Y. Yamashita and F. Minami	3931
Evaluation of High Temperature Fatigue Behaviour of P22 by Miniature Specimen Testing M.D. Callaghan, S.R. Humphries, M. Law, H.J. Li and W.Y. Yeung	3937
Characterization of Lanthanoid and Aluminum Based Oxide Film for Wide Bandgap Semiconductors H. Aoki, N. Komatsu, M. Honjo, K. Masumoto, C. Kimura and T. Sugino	3943
Microstructural and Mechanical Studies in Al-Mg Based Alloys Obtained by Conventional and P/M Processes after Special Thermomechanical Treatments W.A. Monteiro, S.J. Buso and R.B. Ferrari	3949

Friction Stir Welding of Magnesium Alloys under Different Process Parameters	
C. Bruni, G. Buffa, L. Fratini and M. Simoncini	3954
The Effect of Ultrasonic Injection on the Microstructure and Mechanical Properties of A356 Alloy	
B.I. Kang, D.G. Ko, J.I. Youn and Y.J. Kim	3960
System for Process Analysis and Hardness Prediction when Quenching Axially-Symmetrical Workpieces of any Shape in Liquid Quenchants	
B. Liščić	3966