

Table of Contents

Preface, Committees and Acknowledgements

Keynote Presentations

Aspects of Thermomechanical Processing of 3rd Generation Advanced High Strength Steels E.I. Poliak and D. Bhattacharya	3
Diffusion Bonding of Duplex Stainless Steel and Ti Alloy with and without Interlayer S. Chatterjee, S. Kundu, S. Sam and B. Mishra	9
Development Status, Applications and Perspectives of Advanced Intermetallic Titanium Aluminides H. Clemens and S. Mayer	15
The Influence of Thermomechanical Controlled Processing on Bainite Formation in Low Carbon High Strength Steel X.J. Liang, M.J. Hua and A.J. DeArdo	21
Mechanical Properties of High-Manganese Austenitic TWIP-Type Steel L.A. Dobrzański, W. Borek and J. Mazurkiewicz	27
{111}<110> Recrystallization Texture Evolution in Al-Mg-Si Alloy Sheets Fabricated by Symmetric/Asymmetric Combined Rolling Process H. Inoue	33
Dynamic Transformation during the Torsion Simulation of Strip Rolling J.J. Jonas, C. Aranas Jr., V.V. Basabe and C. Ghosh	39
Factors Influencing the Shearing Patterns in High-Pressure Torsion Y. Huang, M. Kawasaki and T.G. Langdon	45
The Cube Recrystallization-Texture Related Component in the β-Fiber Rolling-Texture FCC Metals D.N. Lee and H.N. Han	51
Modelling Microstructure and Properties during Annealing of Cold-Rolled Al-Mn-Fe-Si-Alloys with Different Microchemistries K. Marthinsen, N. Wang and K. Huang	57
Development of Fracture Assessment Standards in Japan with Weibull Stress F. Minami	63
Control of Oriented Extracellular Matrix Similar to Anisotropic Bone Microstructure T. Nakano, A. Matsugaki, T. Ishimoto, M. Todai, A. Serizawa, R. Suetoshi, Y. Noyama and W. Fujitani	72
Biofunctional Surface Layer and its Bonding Strength in Low Modulus β-Type Titanium Alloy for Biomedical Applications M. Niinomi, M. Nakai, J. Hieda, K. Cho, T. Goto and T. Hanawa	78
Effects of Austenite Conditioning and Transformation Temperature on the Bainitic Microstructure in Linepipe Steels R.W. Regier, A. Reguly, D.K. Matlock, J.K. Choi and J.G. Speer	85

Chapter 1: Al Alloys

A Numerical Model for Predicting the Zener-Hollomon Parameter in the Friction Stir Processing of AZ31B A.H. Ammouri, A.H. Kheireddine and R. Hamade	93
Corrosion Resistance of Al-Cu Alloys in Function of the Microstructure A.S. Román, C.M. Méndez and A.E. Ares	100
Microstructure, Fracture and Mechanical Properties of ECAPed Aluminum P/M Alloy with Respect to the Porosity J. Bidulská, R. Bidulský and M. Actis Grande	108
Deformation of AA6016 Aluminum Alloy Sheets at High Temperature and Strain Rate P.F. Bariani, S. Bruschi, A. Ghiotti and F. Michieletto	114

High Thermal Conductivity Aluminum Powder Metallurgy Materials I.W. Donaldson	120
Finite Element Simulation of Diffusion and Precipitation with Application to Internal Oxidation of Ni-Xwt%Cr Alloys at 950°C E. Feulvarch	126
Alloy Design for Semi Solid Metal Forming G. Govender, H. Möller and U.A. Curle	136
An Investigation into Double Oxide Film Defects in Aluminium Alloys W.D. Griffiths, A.J. Caden and M.A. El-Sayed	142
A Novel Process for Grain Refining and Semisolid Processing X. Wang, T. Zhao, D. Tie and R.G. Guan	148
Ultrasonic Degassing of Aluminum Alloys Q.Y. Han	155
Morphology of Si Phase in Al-Mg-Si-Cu Alloys with Excess Si Addition Y. Han, C.Y. Wang, T.G. Zhai and H. Nagaumi	161
Dynamic Observation of Hydrogen Gas Release during Crack Propagation in Al-Zn-Mg Alloy K. Horikawa, S. Hokazono and H. Kobayashi	168
Isothermal and Non-Isothermal Annealing of Cold-Rolled Al-Mn-Fe-Si Alloys with Different Microchemistry States K. Huang, Y.J. Li and K. Marthinsen	174
Effect of Heat Treatment Conditions and Small Addition of Cu on Occurrence of Serration in Al-Si Alloys T. Kanadani, N. Nagata, K. Nakagawa, K. Murakami and M. Hino	180
Separation of Pure Silicon from Al-Si Alloy Melts K.Y. Kim, J.S. Shin and D.W. Park	186
The Evolution of Texture and Deformation Anisotropy at an Equal Channel Extruded Aluminum 1050 Alloy W.R. Sussai, R.E. Bolmaro and A.M. Kliauga	192
Onset of the Portevin-Le Chatelier Effect: Role of Synchronization of Dislocations T. Lebedkina, N.P. Kobelev and M. Lebyodkin	198
Multiscale Analysis of Acoustic Emission during Plastic Flow of Al and Mg Alloys: From Microseconds to Minutes M. Lebyodkin, I.V. Shashkov, T. Lebedkina and V.S. Gornakov	204
Quantitative Investigation on Nano-Scale Precipitates in an Al-7.5Zn-1.7Mg-1.4Cu-0.12Zr Alloy under Various Aging Tempers B.Q. Xiong, D.M. Liu, Z.H. Li, X.W. Li, Y.G. Zhang, F. Wang and H.W. Liu	210
Plating on Developed Al-Mg-Zn Alloy Casting and its Glossiness N. Nagata, M. Hino, K. Murakami, H. Kanetsuki, S. Kawai and T. Kanadani	216
Statistical and Physical Micro-Feature-Based Segmentation of Cortical Bone Images Using Artificial Intelligence I.S. Hage and R. Hamade	222
Influence of SDAS on the High Temperature Tensile Behaviour of the C355 Al Alloy L. Ceschini, A. Jarfors, A. Morri, A. Morri, F. Rotundo, S. Seifeddine and S. Toschi	228
Microstructural Characteristics of Diecast AlMgSiMn Alloy S. Ji, Y. Wang, D. Watson and Z.Y. Fan	234
Image Processing Characterization of Microstructures of Al-Si Casting Alloy K. Sugio, S. Furukawa, T. Kengai, J. Tabata and G. Sasaki	240
Microstructure, Properties and Design of Direct Quenched Structural Steels P. Suikkanen and J.I. Kömi	246
Hardening of Al-Mg-Si Alloys and Effective Particle Size in Microstructural Models S. Gulbrandsen-Dahl and K. Marthinsen	252
Effect of Annealing on Structure and Mechanical Behavior of an AA2139 Alloy D. Tagirov, D. Zhemchuzhnikova, M. Gazizov and R. Kaibyshev	258
The Role of Cr in H Desorption Kinetics in Rapidly Solidified Al I.I. Tashlykova-Bushkevich, K. Horikawa and G. Itoh	264
Grain Refinement of Al Cast by Novel Al-Al_{2.5}Cu_{0.5}Ti Refiner Fabricated by Cold Pressing K. Yamanaka, H. Sato and Y. Watanabe	276

Recrystallization Microstructure and Texture of Highly Strained Commercial Purity Aluminium Alloy G.L. Wu	282
Reinforcement of Hypereutectic Al-Si Alloys with Fe-Bearing Compounds and Si Particles Assisted with Ultrasonic Treatment S.S. Wu, C. Lin, S.L. Lü, P. An and L. Wan	288
Development of Homogeneity in an Al-6061 Alloy Processed by ECAP and ECAP-Conform C. Xu and T. Langdon	294
Effect of Contraction Behaviors during Solidification of 7xxx Aluminum Alloys on Hot Tearing Susceptibility H. Nagaumi, G.X. Xue, Z.Z. Zhang and Y.L. Ma	300
Mechanical Properties of Al-10 Mass % Si-Mg High-Pressure Die-Casting Alloy with Different Mg Content E. Yanagihara, S. Orii, S. Takeda, T. Iketani, S. Saikawa, K. Matsuda, K. Terayama and S. Ikeno	307
Influence of Cold Rolling Reduction and Cross Rolling on Recrystallization Texture Formation in Electro Deposited Pure Iron with a Sharp and Homogeneous <111>//ND Fiber N. Yoshinaga, D. Vanderschueren, L.A.I. Kestens, K. Ushioda and N. Sugiura	313
The Numerical and Experimental Study on Electromagnet-Air Knife DC Casting Process of Large-Size AA 7055 Aluminum Alloys H.T. Zhang, J.Z. Cui and H. Nagaumi	319
The Numerical and Experimental Study on DC Casting Process of Three-Layer Composite Ingots of 4045/3004/4045 Aluminum Alloys K. Qin, H.T. Zhang, J.Z. Cui and H.X. Jiang	325
Effect of Processing Conditions on the Microstructure Development during Constrained Groove Pressing of Aluminium J. Zrník, L. Kraus, M. Cieslar and P. Sláma	331

Chapter 2: Mg Alloys (Prof. Karl U. Kainer Symposium)

Tensile Deformation of Magnesium and Magnesium Alloy Single Crystals S. Ando, A. Kodera, K. Fukushima, M. Tsushida and H. Kitahara	341
Corrosion Characterization of Magnesium Alloys – The Role of Process Parameters G. Ben Hamu	346
Parameters Controlling High Temperature Deformability of Wrought Magnesium Alloys P. Lhuissier, L. Salvo and J.J. Blandin	352
The Effect of Ce Addition on the Creep Resistant Mg-Sr-Mn Alloys M. Celikin and M. Pekguleryuz	358
The Orientation Dependence of Strain Hardening and Texture Development in an Extruded Magnesium Alloy D. Sarker and D.L. Chen	363
Effect of Thermomechanical Processes on Twin Roll Casted Magnesium Alloy Sheets O. Duygulu, S. Ucuncuoglu and G.O. Secgin	369
Room Temperature Screw Form Rolling of AZ91D Magnesium Alloy through Processing by Extrusion-Torsion Simultaneous Working M. Furui, S. Sakashita, K. Shimojima, T. Aida, K. Terayama, Y. Ishisaka, M. Yamamoto and M. Ohta	375
Fabrication of Mg Alloy Single Crystals Containing Rare Earth Elements and their Mechanical Behavior J.H. Moon and T.K. Ha	380
Development of New High-Strength and Heat-Resistant Mg-Zn-Y-X (X=Zr and Ag) Casting Alloys Y. Ienaga, K. Inoue, T. Uesugi, Y. Takigawa and K. Higashi	384
Microstructure and Defect Structure Evolution in Ultra-Fine Grained MgAlZn Alloy M. Janeček, J. Stráská, J. Čížek and H.S. Kim	390
Effect of Plane Strain on the Microstructure and Texture of AZ31 Sheet with Various Reduction Ratios D.G. Kim, H.Y. Kim, Y.O. Yoon, S.K. Kim and H.K. Lim	396
Compressive Characteristics of AZ91 Containing Sn Alloy with the Microstructure T.Y. Choi, H.J. Jung, D.H. Kim and S.G. Lim	402

Investigation of Properties of CaO Added Wrought Mg-Zn-Y and Mg-Y-Zn Alloys H.K. Lim, T.Y. Kwak, W.S. Yang, Y.G. Yoo, D.G. Kim, Y.O. Yoon and S.K. Kim	407
Degradation of Magnesium Alloys in Artificial Urine Solution for Urological Device Applications J.Y. Lock, J. Tu and H.N. Liu	413
Influence of Nd in Extruded Mg10Gd Base Alloys on Fatigue Strength P. Maier, G. Tober, C.L. Mendis, S. Müller and N. Hort	419
Effect of ZrB₂ Nanoparticle Addition: Nano-LPSO-Grain Structured Ultra-High Strength Mg-RE Alloy M. Paramsothy and M. Gupta	425
Low Temperature Warm Forming of Magnesium ZEK 100 Sheets for Automotive Applications X.P. Niu, T. Skrzek, M. Fabischek and A. Zak	431
Effect of CaO on Thermal Conductivities of Mg and Mg-Zn Alloys G.Y. Oh, D.G. Kim, Y.G. Yoo, Y.O. Yoon, S.K. Kim, H.K. Lim and Y.J. Kim	437
Manufacturing Technology and Usable Properties of Magnesium Alloy after Plastic Deformation B. Plonka, K. Remsak, M. Nowak, M. Lech-Grega and P. Korczak	443
Hot Forging of Cast Magnesium Alloy TX31 Using Semi-Closed Die and its Finite Element Simulation K.P. Rao, K. Suresh, Y.V.R.K. Prasad, N. Hort and K.U. Kainer	449
On the Bonding Strength of Mg-Mg and Mg-Al Material Compounds S. Reichelt, H. Saleh, M. Schmidtchen and R. Kawalla	455
A New Model for Discontinuous and Continuous Precipitation in AZ91 Magnesium Alloy J.D. Robson	461
Age-Hardening Behavior of Mg-Al-Zn Alloys Produced by Sand Mold Casting S. Saikawa, Y. Ebata, K. Terayama, S. Ikeno and E. Yanagihara	467
Microstructure and Mechanical Property in Cast AZ91 Magnesium Alloy with Y Addition T. Sakamoto, S.C. Sun, T. Matsumoto, K. Nakai, S. Kobayashi, S. Matsuda, W. Tang and G.F. Tu	472
Method for the Depletion of the Basal Texture in Rolled AZ31 Magnesium Sheets C. Schmidt and R. Kawalla	478
Microstructure Evolution of Mg-10Gd-2Y-0.5Zn-0.3Zr Alloy during Isothermal Forging Process D.B. Shan, X.Z. Han and W.C. Xu	485
High Temperature Creep Behavior and Effects of Stacking Fault Energy in Mg-Y and Mg-Y-Zn Dilute Solid Solution Alloys M. Suzuki, Y. Murata and K. Yoshimi	491
Recrystallization of AZ31 Alloy B. Tunca, E.E. Aşık, G.I. Nakaş and Ş. Bor	497
Microstructural Characteristics and Mechanical Properties of Spray-Deposited Mg-Gd-Y-Zr Alloy F. Wang, B.Q. Xiong, Y.A. Zhang, Z.H. Li, H.W. Liu and X.W. Li	503
Improved Paint Baking Response of a Novel Al-Mg-Si Alloy Automotive Body Panels by Adding Zn Element and Pre-Ageing Matching Z.H. Li, L.Z. Yan, Y.A. Zhang, X.W. Li, F. Wang, H.W. Li and B.Q. Xiong	509
Relaxation of Misfit Dislocations at Nodes S. Shao, J. Wang, A. Misra and R.G. Hoagland	515
Microstructure Change of AZCa912 Magnesium Alloy Continuous Casting Bar by Hot Compression A. Watazu, N. Omura, K. Miwa and N. Saito	521
Twin Roll Casting (TRC) of Magnesium Alloys – Opportunities and Challenges M.A. Wells and A. Hadadzadeh	527
Twin Roll Casting and Rolling of New Mg-Wrought Alloys for Body Protective Safety Equipment J. Wendt, B. Bronfin, L. Stutz, G. Kurz, S. Schmitt, M. Bamberger and D. Letzig	534
Effect of Microstructure on Hot Bulging Deformation for AZ31 Magnesium Alloy Sheet with Resistance Heating K.F. Zhang, J.Y. Liu and C. Li	537

Chapter 3: Ti Alloys/Aerospace Structural Metallic Materials

ATI 425[®] Alloy Formability: Theory and Application D. Bryan	543
Recovery and Recrystallization during Thermo-Mechanical Processing of Ti-6.5Al-1.5Zr-3.5Mo-0.3Si Alloy H.Q. Chen, X.D. Zhao, Y.S. Chai and C.X. Cao	549
Modelling of the Ductile Damage Behaviour of a Beta Solidifying Gamma Titanium Aluminide Alloy during Hot-Working D. Halici, D. Prodinger, C. Poletti, D. Huber, M. Stockinger and C. Sommitsch	556
Effect of Al Addition on Phase Constitution and Heat Treatment Behavior in Ti-8.5mass%Mn-1mass%Fe-Al Alloys M. Ikeda, M. Ueda, Y. Sumi and M. Niinomi	562
Three-Stage Character of Strain Hardening of α-Ti in Tension Conditions A. Roth, K.E.K. Amouzou, M.A. Lebyodkin, T. Richeton, T.A. Lebedkina and J.S. Lecomte	568
Friction Stir Welding of Ti-6Al-4V Alloy P. Leo and E. Cerri	574
Effect of Zr Addition on High Temperature Mechanical Properties of Near Alpha Ti-Al-Zr-Sn Based Alloy M. Jayaprakash, D.H. Ping and Y. Yamabe-Mitarai	580
Dynamic Globularization of α-Phase in Ti6Al4V Alloy during Hot Compression K. Mutombo, C. Siyasiya and W.E. Stumpf	584
Fatigue and Fracture Behavior of Porous TiNi Alloys G.I. Nakaş, E.E. Aşık, B. Tunca and Ş. Bor	591
Mechanical Properties of Ti-Mn-Al-Fe Alloys after Solution Heat Treatment Y. Sumi, S. Ueta, M. Ueda and M. Ikeda	597
Effect of Si and Ge Addition on the Evolution of Microstructure in Near Alpha Titanium Alloy K.S. Suresh, T. Kitashima and Y. Yamabe-Mitarai	602
FEM Study of Superplastic-Like Forming of Ti-6Al-4V Alloy J. Liu, M.L. Guo, M.J. Tan and B.W. Chua	607
Beta-Forging of Ti6Al4V Titanium Alloy Powders Consolidated by HIP: Plastic Flow and Strain-Rate Relation C. Testani, A. Squillace and L. Fratini	613
Tensile Strength and Impact Toughness of Gallium-Bearing Near-α Titanium Alloys T. Kitashima, K.S. Suresh, Y. Yamabe-Mitarai and S. Iwasaki	619

Chapter 4: Steels

Effect of Multipass Welding Using a Low Transformation Temperature Filler Metal on Residual Stress and Toughness H.F.G. Abreu, W.S. Tavares, H.C. de Miranda, M.P. Cindra Fonseca, H.N. Virgens-Neto and M. Béreš	627
18CrNiMo7-6 with TRIP-Effect for Increasing the Damage Tolerance of Gear Components — Part I: Alloy Design M.D. Bambach, A. Stieben and W. Bleck	633
18CrNiMo7-6 with TRIP-Effect for Increasing the Damage Tolerance of Gear Components — Part II: Microstructure and Mechanical Properties M.D. Bambach, A. Stieben and W. Bleck	639
Finite Element Implementation of a Bonding Model and Application to Roll Bonding of Aluminum Sheets of Largely Different Yield Strength M. Bambach, M.P. Pietryga, A. Mikloweit, G. Hirt and K.F. Karhausen	644
Development of Ultrafine Grained Austenitic Stainless Steels by Large Strain Deformation and Annealing A. Belyakov, A. Kipelova, M. Odnobokova, I. Shakhova and R. Kaibyshev	651

Microstructural and Mechanical Properties of the Intercritically Reheated Coarse Grained Heat Affected Zone (ICCGHAZ) of an API 5L X80 Pipeline Steel J.L.M. Andia, L.F.G. de Souza and I.d.S. Bott	657
Hybrid Fiber Laser – Arc Welding of High Strength Low Alloy Steel X.J. Cao, P. Wanjara, A. Bernard, D. Pudo, C. Munro and A.E. Nolting	663
Austenite Grain Structures in Ti and Nb-Containing HSLA Steel during Slab Reheating D. Chakrabarti, S. Roy, D. Srivastava and G.K. Dey	669
Development of Ultra-Fine Grained Dual-Phase Steels: Mechanism of Grain Refinement during Inter-Critical Deformation A. Karmakar, R.D.K. Misra, S. Neogy and D. Chakrabarti	674
Microstructure Evolution of Martensitic Ti-6Al-4V Alloy during Warm Deformation Q. Chao, P. Hodgson and H. Beladi	679
Thermo-Mechanically Controlled Processed Ultrahigh Strength Steels S. Chatterjee, S.K. Ghosh and P.S. Bandyopadhyay	685
Heat Treatment Effects on Distortion, Residual Stress, and Retained Austenite in Carburized 4320 Steel A. Clark, R.J. Bowers and D.O. Northwood	692
A Novel Concept of High Cu, Low Mn, Environmentally-Friendly Weathering Steels O. Comineli	698
The Mechanism of Martensite-Austenite Microconstituents Formation during Thermomechanical Controlling Processing in Low Carbon Bainitic Steel X.J. Liang, M.J. Hua and A.J. DeArdo	704
Fatigue Behavior of High Manganese TWIP Steels and of Low Alloy Q&P Steels for Car-Body Applications P. Matteis, G. Scavino, R. Sesana, F. D’Aiuto and D. Firrao	713
Cold Rolled Superfine Steel M.C. Freitas, M.D. de Moura e Silva and J.S.S. Germano	721
Influence of Heat Treatment on Values of a Strain of Interstitial Free Steel M.C. Freitas, A. Moreira, R. Mota, F. Spânghero, S. Filho and M. Rodrigues	726
Self-Consistent Modelling of TWIP Steel during Uniaxial Tensile Loading A.A. Saleh, E.V. Pereloma and A. Gazder	732
Two-Step Quenching & Partitioning of 42SiCrB Steel N. Grosse-Heilmann, I.M. Zylla, E. Kozeschnik and A. Peters	738
Investigation of Possible Mechanisms for Developing Long Steel Products with Ultrafine Grained Microstructure C. Guarnaschelli, I. Salvatori and T. Coppola	744
Study of Dislocation Substructures in High-Mn Steels by Electron Channeling Contrast Imaging I. Gutierrez-Urrutia and D. Raabe	750
Revealing the Strain-Hardening Mechanisms of Advanced High-Mn Steels by Multi-Scale Microstructure Characterization I. Gutierrez-Urrutia, R. Marceau, M. Herbig and D. Raabe	755
The Mechanical and Deformation Behavior of TWIP Steel Prepared by Directional Solidification D. Wang, K. Wang, Z.M. Shi and F.S. Han	761
Thermodynamic and Kinetic Calculation of Non-Equilibrium Microstructure Design of TRIP Steel Y.L. He, N.Q. Zhu, W.S. Zheng, X.G. Lu and L. Li	766
Effect of Heating Rate and Silicon Content on Kinetics of Austenite Formation during Continuous Heating B. Hernández-Morale, O. Vázquez-Gómez, E. López-Martínez, H.J. Vergara-Hernández and L. Olmos	771
Microstructural Features Intervening in Hot Workability of Free Cutting Steels N. Gonzalez, M.C. Revilla, B. López and J.M. Rodriguez-Ibabe	777
Microstructure-Mechanical Properties Relationships for Complex Microstructures in High Strength Steels A. Iza-Mendia and I. Gutiérrez	783

Assessing Dislocation Densities in the Gamma Prime Phase of a Superalloy from High Resolution Diffraction Peak Shape	789
A. Jacques, L. Dirand, J.P. Chateau-Cornu, T. Schenk and P. Bastie	
Surface Roughness and Friction in Hot Rolling of Stainless Steels	795
Z.Y. Jiang, D.B. Wei, X.W. Cheng, X. Gao, J.W. Zhang, J.X. Huang, A.W. Zhang, X. Shi and S.H. Jiao	
Semi-Solid Processing of Powder Steels in Cryogenically-Cooled Die	801
B. Masek, D. Aišman, K. Rubešová and H. Jirková	
The Effect of Niobium Carbides and Laves Phase on the Yielding Behaviour of a Stabilized Ferritic Stainless Steel	807
T.J. Juuti, T. Manninen, L.P. Karjalainen and D.A. Porter	
TiO₂ Nanoparticle Addition into Molten Steel: From Lab Scale to Industrial Scale	813
I. Kaltzakorta, L.M. Callejo and Z. Idoyaga	
Bendability and Microstructure of Direct Quenched Optim[®] 960QC	818
V. Kesti, A. Kaijalainen, A. Väisänen, A. Järvenpää, A. Määttä, A.M. Arola, K. Mäntyjärvi and R. Ruoppa	
Study on the Soaking Condition of High Carbon Chromium Bearing Steels	825
K.H. Kim and C.M. Bae	
Microstructure Evolution in a 304-Type Austenitic Stainless Steel during Multidirectional Forging at Ambient Temperature	831
A. Kipelova, M. Odnobokova, A. Belyakov and R. Kaibyshev	
Mechanical and Corrosion Properties of a F138 Austenitic Stainless Steel after Deformation by Equal Channel Angular Pressing	837
A.M. Kliauga, V.L. Sordi, M. Ferrante, C.A. Rovere and S.E. Curi	
From Micro to Nano Scale Structure by Plastic Deformations	842
T. Kvačák and J. Bidulská	
Kinetics of Sigma Phase Precipitation in Niobium-Stabilized Austenitic Stainless Steel and Effect on the Mechanical Properties	848
X. Ledoux, F. Buy, A. Perron, E. Suzon, J. Farré, B. Marini, T. Guilbert, P. Wident, G. Texier, V. Vignal, F. Cortial and P. Petit	
Optimization of Mechanical Properties of High Strength TRIP Steels	854
L. Li, Y. Gao, Y.L. He, W. Shi, M. Zhang and X.G. Lu	
Microstructure and Mechanical Properties of Extra High Strength Heavy Steel Plate for Bridge Application	859
D.S. Liu, C.X. Yue, H.D. Chen and B.G. Cheng	
The Development and Application of High-Performance Ultra-High Strength Stainless Steel Subject to Marine Environment	867
Z.B. Liu, J.X. Liang, X.L. Zhang, Z.Y. Yang and G.Q. Sun	
Effect of Martensite Fraction on Void Nucleation Behavior and Ductility in DP Steels	875
D. Maeda and O. Kawano	
Dilatometer Analysis of the One Step Quenching and Partitioning Process in a 1.5%Si Steel	880
D. Martin, J. Eliasson, B. Brolund and Y. Granbom	
Temperature and Stress State Influence on Mechanical Properties and Damage Evolution of Dual-Phase Steels	886
M. Martinez, J. Chottin and E. Hug	
Nucleation Rate and Number of Precipitates in V and Nb-Microalloyed Steels	892
S.F. Medina and M. Gómez	
Microstructures and Mechanical Properties of Stainless Steel AISI 316L Processed by Selective Laser Melting	898
A. Mertens, S. Reginster, Q. Contrepolis, T. Dormal, O. Lemaire and J. Lecomte-Beckers	
Effects of Temperature and Strain Rate on Stress-Strain Relationship and Deformation Twinning in Fe-5%Si Alloy	910
T. Mizuguchi, K. Ikeda, N. Karasawa and Y. Tanaka	
Three-Dimensional Approach to Observing Growth of Blocks and Packets in Fe-18Ni Maraging Steel	916
S. Morito, S. Yoshida, R. Hayamizu, T. Hayashi, T. Ohba, H. Terasaki and Y. Komizo	
Fretting Fatigue Behaviour of 12-Cr Steels and Strength Prediction	920
M. Jayaprakash and Y. Mutoh	

Effects of ALPS on Mechanical Property in Bainitic Steels K. Nakai, S. Konishi, T. Sakamoto and S. Kobayashi	926
Effect of Cold Rolling and Isothermal Holding before Austenitization on Mechanical Properties in Steels S. Konishi, K. Nakai, T. Sakamoto, K. Nakai and S. Kobayashi	932
Development of Hot Rolling Schedules for Lean Alloyed Pipeline Steel X80 Produced on Continuous Mill 2000 A.A. Naumov, Y.A. Bezobrazov and E.V. Chernikov	938
Low-Cycle Fatigue Behavior and Microstructural Evolution of the Fe–30Mn–4Si–2Al Alloy I. Nikulin, T. Sawaguchi, K. Ogawa and K. Tsuzaki	944
Assessment of Hydrogen Uptake and Permeation in AHSSs X. Pang, F. Fazeli, M. Attard and C. Shi	950
Development of Hollow Iron Ore Agglomerate and its Characterization S. Pramanik and S.K. Mitra	956
Role of Microstructure in Susceptibility to Hydrogen Embrittlement of X70 Microalloyed Steel D. Hejazi, A.A. Saleh, A. Haq, D. Dunne, A. Calka, A. Gazder and E.V. Pereloma	961
Effects of Thermomechanical Processing on Uniformity of Microstructure and Properties of AHSS A. Marmulev, L.M. Kaputkina, G. Herman and E.I. Poliak	967
EBSD Study of the Microstructural Evolution during Hot Compression Testing of a Superduplex Steel S. Primig, K.S. Raggar and B. Buchmayr	973
Complex Microstructural Banding of Continuously Cooled Carbide-Free Bainitic Steels L. Morales-Rivas, H. Roelofs, S. Hasler, C. Garcia-Mateo and F.G. Caballero	980
Physical Metallurgy Related to the Thermomechanical Process of Hot Rolling of Nb Microalloyed Steel Beams: Prediction of Mechanical Properties E. Garcia Reis and R. Barbosa	986
Effects of Coarsening of Cementite in Pearlite before Austenitization on Formation of BWING and Mechanical Property in a Steel T. Sakamoto, S. Konishi, Y. Nakanishi, K. Nakai and S. Kobayashi	992
Cold Rolled Superfine Steel M.C. Freitas, M.D. de Moura e Silva and J.S.S. Germano	997
Mechanical and Corrosion Properties of Welded Joints in New Generation Ferritic and Duplex Stainless Steels M. Sirén, P. Pohjanne, V. Kujanpää, J. Hirn, J. Romu and H.P. Heikkinen	1003
Innovation and Processing of Novel Tough Ductile Ultra-High Strength Steels through TMR-DQP Processing Route M.C. Somani, D.A. Porter, L.P. Karjalainen, P. Suikkanen and R.D.K. Misra	1009
The Effects of Cooling Rate on Retained Austenite Characteristics of a 0.2C-1.5Si-1.5Mn-1.0Cr-0.05Nb TRIP-Aided Martensitic Steel K.I. Sugimoto, J. Kobayashi, Y. Nakajima and T. Kochi	1015
Static Grain Growth in an Austenitic Stainless Steel Subjected to Intense Plastic Straining M. Tikhonova, A. Belyakov and R. Kaibyshev	1021
Effect of Austenite Grain Size on the Mechanical Properties in Air-Cooled 0.1C-5Mn Martensitic Steel T. Hanamura, S. Torizuka, S. Tamura, S. Enokida and H. Takech	1027
Impact Toughness of 0.3 Mass% Carbon Tempered Martensitic Steels Evaluated by Instrumented Charpy Test S. Takebayashi, K. Ushioda, N. Yoshinaga and S. Ogata	1033
Inter-Relationship among Skin Pass Reduction, 3D and 2D Roughness Parameters and the Stampability/Paintability of Cold Rolled Steel Sheets for the Automotive Industry: A Preliminary Analysis E. Nunes, A.F. de Oliveira, T. Sekeres, C. Wichern and R.L. Plaut	1039
Research and Development of a Yield Strength 400 MPa Class Structural Steel Plate with Enhanced Weldability Y. Zhang, X.B. Li and X. Pan	1046

Effects of Mn, Si and Cr Addition on the Spheroidization of Cementite in Hypereutectoid Fe-1mass%C Steel	
G.H. Zhang, D.W. Suh and K.M. Wu	1053

Chapter 5: TMP Microalloyed Steels (Prof. A.J. DeArdo Symposium)

Investigation of Possible Mechanisms for Developing Long Steel Products with Ultrafine Grained Microstructure	
C. Guarnaschelli, I. Salvatori and T. Coppola	1061
Modification of Banding in Dual-Phase Steels via Thermal Processing	
K. Mukherjee, L.S. Thomas, C. Bos, D.K. Matlock and J.G. Speer	1067
Nucleation Rate and Number of Precipitates in V and Nb-Microalloyed Steels	
S.F. Medina and M. Gómez	1073
Experimental Study on the Formation of Non-Metallic Inclusions Acting as Nuclei for Acicular Ferrite in HSLA Steels through Specific Deoxidation Practice and Defined Cooling Conditions	
S.K. Michelic, D. Loder, G. Arth and C. Bernhard	1079

Chapter 6: High & Ultra High Temperature Materials

Creep Deformation of 10 mol% La₂O₃ + YSZ Ceramic Composite Prepared by Spark Plasma Sintering	
K.D. Robles-Arellano and L. Bichler	1087
Degradation of Spark Plasma Sintered (0, 5, 10 and 15 mol%) CeO₂ + YSZ Composites in Supercritical Water	
A. Siebert-Timmer and L. Bichler	1093
Nickel-Chromium Alloys: Engineered Microstructure via Spark Plasma Sintering	
S. Pasebani, A.K. Dutt, I. Charit and R.S. Mishra	1099
Investigation of Plastic Instability in TWIP Steels by <i>In Situ</i> Diffraction of High Energy X-Rays	
J.P. Chateau-Cornu, A. Jacques, J.P. Tinnes and T. Schenk	1105
Slip System Analysis in the Cold Rolling of a Ni₃Al Single Crystal	
M. Demura, D. Raabe, F. Roters, P. Eisenlohr, Y. Xu, T. Hirano and K. Kishida	1111
Effective Fluorine Treatment for Improved High Temperature Oxidation Behavior of Novel Cu, Mo and Si Containing TiAl-Alloys	
A. Donchev, M. Galetz and M. Schütze	1117
Microstructure and Mechanical Properties of NbSi₂/MoSi₂ Crystals with Lamellar Structure	
K. Hagihara, Y. Hama, T. Fushiki, K. Yuge and T. Nakano	1123
High Temperature Compression Properties of Ni₃(Si,Ti) Based Intermetallic Compounds	
T. Hagiwara, H. Madarame, S. Tanaka, Y. Kaneno and T. Takasugi	1129
Role of Ti/Al Ratio of Ti-Al-X (X=Cr, Nb, Ta and W) Intermetallics on High Temperature Tensile Properties	
K. Hashimoto	1136
Evaluation of Tool Performance of Recycle-Type Fe₃Al Based Alloy for Pure Cu	
T. Itoi, T. Sudo and K. Yoshimi	1142
Effects of Geometric Constraint on Solidification Microstructural Development of Peritectic TiAl Alloys	
S. Zhang, M.J.M. Krane and D.R. Johnson	1147
High Temperature Tensile Behavior of Directionally Solidified MAR-M247 Superalloy	
H.Y. Bor, C.N. Wei, A.C. Yeh, W.B. He, H.S. Wang and C.M. Kuo	1153
Feasibility of Cast and Wrought Co-Al-W-X Gamma-Prime Superalloys	
E.T. McDevitt	1159
Metals for High Temperature Applications under Extreme Conditions – Development and Testing	
J. Merker and M. Koch	1165
Phase Equilibrium between B2 Aluminide NiAl and Nb-Mo bcc Solid Solution Phase	
S. Miura, Y. Sekito, T. Okawa, T. Yamanouchi and T. Mohri	1171

Spark Plasma Heat Treated ZrB₂-SiC and HfB₂-SiC Composites N. Seetala and M.T. Webb	1176
Mechanical Behaviors of Alloy 617 with Varied Strain Rates at High Temperatures M. Calmunger, G.C. Chai, S. Johansson and J. Moverare	1182
Damage and Fracture Mechanism of a Nickel-Based Single Crystal Superalloy during Creep at Moderate Temperature S.G. Tian, Z.G. Guo, D.L. Shu and J. Xie	1188
Effects of Alloying Elements on Physical and Mechanical Properties of Co-Al-W-Based L1₂/fcc Two-Phase Alloys K. Tanaka and H. Inui	1195
A Material Genomic Design of Advanced High Performance, Non-Corroding Steels for Ambient and High Temperature Applications Q. Lu, W. Xu and S. van der Zwaag	1201
Microstructure and Mechanical Behaviour of NbTiAl Based Alloys Doped with Low Additions of Silicon Z. Zhao, A. Denquin, S. Drawin and J. Barreau	1207

Chapter 7: Bio Materials

Mechanical Performance and Biocompatibility of Biomedical Beta-Type Titanium Alloy Subjected to Micro-Shot Peening T. Akahori, Y. Oguchi, T. Hattori, H. Fukui and M. Niinomi	1215
Fatigue Behavior of 51 Vol.% Porous Ti-6Al-4V Alloy E.E. Aşık, B. Tunca, G.I. Nakaş and Ş. Bor	1221
Layer-by-Layer Thin Films of Alginate/Chitosan and Hyaluronic Acid/Chitosan with Tunable Thickness and Surface Roughness T.B. Taketa and M.M. Beppu	1226
Mechanical and Biological Biocompatibility of Novel β-Type Ti-Mn Alloys for Biomedical Applications K. Cho, M. Niinomi, M. Nakai, J. Hieda, P.F. Santos, Y. Itoh, T. Hattori and M. Ikeda	1232
Anti-Adhesive Finishing of Temporary Implant Surfaces by a Plasma-Fluorocarbon-Polymer B. Finke, H. Testrich, H. Rebl, B. Nebe, R. Bader, U. Walschus, M. Schlosser, K.D. Weltmann and J. Meichsner	1238
Characterization of the Superelasticity and the Martensitic Transformation from Ti-Nb-(O,N) Biomedical Alloys T. Gloriant, P. Castany, A. Ramarolahy, P. Laheute, F. Prima and C. Curfs	1244
3D Printing of Meso-Decorated Gels and Foods J. Gong, M. Shitara, R. Serizawa, M. Makino, M.H. Kabir and H. Furukawa	1250
The Influence of Heat Treatment on the Structure and Microstructure of Ti-15Mo-xNb System Alloys for Biomedical Applications J.R.S. Martins and C.R. Grandini	1255
Biomedical Polymer Surface Modification of Beta-Type Titanium Alloy for Implants through Anodic Oxide Nanostructures J. Hieda, M. Niinomi, M. Nakai, K. Cho, T. Mohri and T. Hanawa	1261
Analysis of Osteocyte Morphology in Terms of Sensation of <i>In Vivo</i> Stress Applied on Bone T. Ishimoto, K. Kawahara, A. Matsugaki, J. Wang, H. Kamioka and T. Nakano	1265
Challenges and Opportunities in Electrochemically Coating Calcium Phosphate on Magnesium Alloys for Biodegradable Implant Applications M.B. Kannan	1269
Effect of Hydrolysis on Mechanical Behavior of Bioabsorbable Composites S. Kobayashi and S. Yamaji	1274
Effect of Fe Addition on the Microstructure Formation and Mechanical Properties of Ti-2.0, 3.0at%Mo Alloys S. Kobayashi, A. Miyamoto, S. Okano, M.A. Gepreel, M.M. Ibrahim, M. Ueda, M. Ikeda, K. Nakai and T. Sakamoto	1280
Additive Manufacturing for Medical and Biomedical Applications: Advances and Challenges A. Koptioug, L.E. Rännar, M. Bäckström and M. Cronskär	1286

Osteoblast Ingrowth into Titanium Scaffolds Made by Electron Beam Melting A. Koptioug, C. Bergemann, R. Lange, V.E. Jaggi, L.E. Rännar and J.B. Nebe	1292
Osteoconductivity of Hydrothermal-Treated Valve Metals K. Kuroda, M. Zuldesmi and M. Okido	1298
Oriented Collagen Scaffolds for Anisotropic Bone Tissue Construction <i>In Vitro</i> A. Matsugaki, R. Ozasa, Y. Isobe, T. Saku and T. Nakano	1303
Optimization of Mo Content in Beta-Type Ti-Mo Alloys for Obtaining Larger Changeable Young's Modulus during Deformation for Use in Spinal Fixation Applications M. Nakai, M. Niinomi, J. Hieda, K. Cho, K. Narita and X.F. Zhao	1307
Relationship between Heterogeneous Microstructure and Fatigue Strength of Ti-Nb-Ta-Zr Alloy for Biomedical Materials Subjected to Aging Treatments K. Narita, M. Niinomi and M. Nakai	1313
Geometrical Micropillars Combined with Chemical Surface Modifications – Independency of Actin Filament Spatial Distribution in Primary Osteoblasts J.B. Nebe, B. Finke, A. Koertge, H. Rebl and S. Staehlke	1320
Fabrication of Antibacterial Titanium Implant Using Anodic Oxidation Technique N. Ohtsu, S. Komiya, K. Sakamoto, T. Kuji and F. Sumisa	1326
Osteoconductivity of Superhydrophilic Anodized TiO₂ Films Using Hydrothermal Treatment M. Okido and K. Kuroda	1332
Plasma-Activated Electrospun Polylactide Fiber Meshes as Matrices for Tissue Engineering M. Schnabelrauch, R. Wyrwa, H. Rebl, C. Bergemann, B. Finke, M. Schlosser, U. Walschus, S. Lucke, K.D. Weltmann and J.B. Nebe	1337
Bioengineering Application in Kinesitherapy of Children with Lower Limbs Dysfunction I. Chuchnowska, A. Sękala and W. Wolany	1343
Microstructure of Co-Cr Alloy Products with Three-Dimensional Geometry Fabricated by Laser Beam Sintering A. Serizawa, T. Tanaka and T. Nakano	1349
Carbides and their Role in Advanced Mechanical Properties of L605 Alloy: Implications for Medical Devices F. Sun, D. Mantovani and F. Prima	1354
Deformation Microstructure and Mechanisms in a Metastable β Titanium Alloy Exhibiting TWIP and TRIP Effects F. Sun, J.Y. Zhang, M. Marteleur, T. Gloriant, P. Vermaut, P. Castany, C. Curfs, P.J. Jacques and F. Prima	1360
Octacalcium Phosphate: A Potential Scaffold Material for Controlling Activity of Bone-Related Cells <i>In Vitro</i> O. Suzuki and T. Anada	1366
Effect of Phase Stability on Some Physical and Mechanical Properties in β-Ti Single Crystal for Biomedical Applications M. Todai, P. Wang, K. Fukunaga and T. Nakano	1372
Biocompatibility of Titanium Dioxide Film Modified by Femtosecond Laser Irradiation M. Tsukamoto, T. Shinonaga, A. Nagai, K. Yamashita, T. Hanawa, N. Matsushita, G.Q. Xie and N. Abe	1377
Chemical-Hydrothermal Synthesis of Zr-Containing Titanium Oxide Film on CP-Ti M. Ueda and M. Ikeda	1383
Substrate Independent Approach for Immobilisation of Quaternary Ammonium Compounds to Surfaces to Reduce Bio-Burden A. Cavallaro, P. Majewski, M. Barton and K. Vasilev	1389
Plasma Modification of DLC Films and the Resulting Surface Biocompatibility M. Wang, Y. Zhao, R.Z. Xu, M. Zhang, R.K.Y. Fu and P.K. Chu	1396

Chapter 8: Advanced Protective Coatings/Surface Engineering

Comparison of Various Electroless Nickel Coatings on Steel: Structure, Hardness and Abrasion Resistance V. Vitry, A. Sens and F. Delaunois	1405
--	------

Formation of Fe-Al Intermetallic Compound Film on High-Speed Tool Steel by Shot Lining and Heat Treatment	
Y. Harada, M. Ishida and K. Takahashi	1414
Influence of SiO₂ Nanoparticle Codeposition on Homogeneity of Zinc-Nickel Alloy Plating from an Acid Sulphate Bath	
M. Hino, K. Murakami, K. Muraoka, N. Nagata and T. Kanadani	1420
Mechanical and Structural Properties of Superhard TiAlSiN Coatings Deposited by Arc Ion Plating of Cylindrical Cathode	
W.R. Kim, M.C. Kwon, J.H. Lee, U.C. Jung and W.S. Chung	1426
Silica-Containing Hybrid Nanocomposite "Melting Gels"	
L.C. Klein, B. McClarren and A. Jitianu	1432
Role of Sn on the Adhesion between Cu-Sn Alloy Coated Steel and SBR Based Rubber	
A. Banerjee, M. Dutta, A.K. Bhowmick and T. Laha	1438
Electronic Properties of Cubic Boron Nitride with Impurity Atoms and Vacancy	
Y.B. Li, T.Y. Cheng and H.S. Yang	1444
Effect of Dopant Configuration on Oxygen Shielding Properties of Polycrystalline Alumina	
T. Matsudaira, M. Wada, M. Tanaka, Y. Kagawa and S. Kitaoka	1452
Effect of Se Content in High-Cyanide Silver Plating Solution on {200} Crystal Plane Orientation Ratio of Electrodeposited Silver Layer	
H. Miyazawa, M. Ogata, K. Shinohara, A. Sugawara and I. Shohji	1458
Friction and Wear Properties of the Siliconized, Chromized and Boro-chromized Steel Substrates	
T. Murakami, Y. Hibi, H. Mano, K. Matsuzaki and H. Inui	1464
Fabrication of Nanoporous Crystalline Alumina Membrane by Anodization of Aluminum	
S. Ono, M. Nakamura, T. Masuda and H. Asoh	1470
Interfacial Reactions during Explosive Bonding	
H. Paul	1476
Deposition of Self-Assembled Monolayer on Vanadate Conversion Coated AZ31 Mg Alloy	
S.A. Salman, N. Akira, K. Kuroda and M. Okido	1482
Development of Microtextured Photocatalytic Surface by Vibration-Assisted Scratching	
J. Shimizu, T. Yamamoto, L.B. Zhou, T. Onuki and H. Ojima	1488

Chapter 9: Composites (MMC, CMC)/Nanocomposites/Synthetic & Foams)

Sandwich Lightweight Design in Automotive Usage	
S.M. Brückmann, H.E. Friedrich, G. Kopp and M. Kriescher	1497
Structure of Nanocomposites Based on Carbon Nanotubes Decorated with Platinum Nanoparticles	
A.D. Dobrzańska-Danikiewicz, M. Pawlyta and D. Łukowiec	1503
Effect of Surface Modification on the Sound Absorption Behavior of Open Celled Aluminum Foams	
Y.J. Li, Y.L. Ren, Z.D. Li and F.S. Han	1509
Particle Pushing during Solidification of Metals and Alloys	
M. Wang and Q.Y. Han	1513
Influence of Laser Process on Mechanical Behavior during Cutting of Carbon Fiber Reinforced Plastic Composites	
Y. Harada, M. Muramatsu, T. Suzuki, M. Nishino and H. Niino	1518
Aluminum Di-Borides for Engineered Surfaces for Low Friction Applications	
I. Sudeep and P. Rajeshwari	1524
Dry Sliding Wear Behaviour of Magnesium Alloy Based Hybrid Composites in Transverse Direction	
A.K. Mondal and S. Kumar	1530
Role of Sn on the Adhesion between Cu-Sn Alloy Coated Steel and SBR Based Rubber	
A. Banerjee, M. Dutta, A.K. Bhowmick and T. Laha	1536
Synthesis of Physically Functionalized Carbon Nanotube Reinforced Al-Si Nanocomposite by Spark Plasma Sintering	
A. Maiti, R.S. Maurya and T. Laha	1542

Influence of Oxide Additions in Cu-Co-Fe Composite Powders Obtained by Mechanical Alloying	
N. Llorca-Isern, C. Artieda-Guzman, J.A. Vique and A. Roca	1548
Effect of Yarn Structure on Mechanical Properties of Twisted Yarn Composites	
R. Nakamura and K. Goda	1554
Processing-Property Relationships in Advanced Multi-Functional Composite Materials: Management of Dielectric Behavior	
K. Reifsnider, F. Rabbi, J. Baker, J.M. Adkins and Q. Liu	1560
Cast Al-Based Nanocomposites Reinforced with Thermal Plasma-Synthesized Ceramic Nanoparticles	
M. Boselli, L. Ceschini, V. Colombo, E. Ghedini, M. Gherardi, A. Morri, F. Rotundo, P. Sanibondi and S. Toschi	1567
Effect of Dispersibility of TiB₂ Particles on Electrical Conductivity in TiB₂/Al Composites	
G. Sasaki, K. Ishikawa, Y.B. Choi, K. Sugio and K. Mastugi	1573
Fabrication of Self-Lubricating Cu-Based Composite Containing Graphite Particle by Centrifugal Mixed-Powder Casting	
H. Sato, W. Wei, K. Oguri, M. Yamada and Y. Watanabe	1579
Positron Lifetime Studies of Irradiated Ultra-High Molecular Weight Polyethylene and Composites Made of Martian Regolith	
N. Seetala, N. Tull-Walker, A. Baburaj, J.R. Zhou, R. Wilkins and M. Barnett	1585
TEM and XRD Study of Nanostructured Composite Materials Reinforced with the Halloysite Particles	
L.A. Dobrzański, B. Tomiczek, M. Pawlyta and P. Nuckowski	1591
Fatigue and Fracture Behavior of MMC in the HCF- and VHCF-Regime	
M. Wolf, G. Wagner and D. Eifler	1597
Thermal Properties of Porous Copper Manufactured by Lost Carbonate Sintering	
Z. Xiao and Y.Y. Zhao	1603
Measuring Threshold Pressure of Melt Magnesium Infiltrating into Al₂O_{3sf} Porous Preform with Fast Method	
J.M. Zhou, X.H. Gu, F. Yang and L.H. Qi	1609

Chapter 10: Interfaces & Grain Boundaries

Atomic Resolution Microscopy of Nitrides in Steel	
H.K. Danielsen	1617
Interfacial Magnetoelectric Switching in Multiferroic Heterostructures	
W. Kleemann, P. Borisov, X. Chen and C. Schmitz-Antoniak	1623
Plasticity and Fracture of InP/Si Substructures	
E. Le Bourhis, K. Pantzas, G. Patriarche, I. Sagnes, D. Troadec and A. Talneau	1628
Effect of Grain Boundary Energy Anisotropy on Faceting and Migration of Low Angle Grain Boundaries	
D.A. Molodov, J.E. Brandenburg, L.A. Barrales-Mora and G. Gottstein	1634
Ti and Zr Transition Metals Effect in the D03 Fe3Al by <i>Ab Initio</i> Study Approach	
J.M. Raulot, S. Chentouf, T. Grosdidier and H. Aourag	1640
Phases Stability of Ni-Mn-Ga Alloys Studied by <i>Ab Initio</i> Calculations	
N. Xu, J.M. Raulot, Z.B. Li, Y.D. Zhang, J. Bai, W. Peng, X. Zhao, L. Zuo and C. Esling	1646
Properties of GaN-Related Epitaxial Thin Films Grown on Sapphire Substrates as Transparent Conducting Electrodes	
Y. Sato and T. Matsunaga	1652
On the Role of the Crystallographic Grain Characteristics in the Corrosion Behavior of Polycrystalline Copper	
L. Lapeire, E. Martinez Lombardia, K. Verbeken, I. de Graeve, L.A.I. Kestens and H. Terryn	1658

Chapter 11: Fuel Cells, Hydrogen Storage Technologies, Batteries, Supercapacitors & Thermoelectric Materials

Research Progress of a New Solid Oxide Metal-Air Redox Battery for Advanced Energy Storage	
X. Zhao, Y.H. Gong, X. Li, N.S. Xu and K. Huang	1667
Surface Modifications of TiO₂ by Ion Implantation	
M. Ionescu, A. Atanacio, J. Davies, J. Nowotny, D. Gregg, L. Vance and T. Bak	1674
Reversible Solid State Fe-Air Rechargeable Battery Using LaGaO₃ Based Oxide Ion Conducting Electrolyte	
T. Ishihara, A. Inoishi and S. Ida	1680
High-Pressure Synthesis of Novel Hydrides and Intermetallic Compound in Al-X Systems (X=Sr, V, Hf)	
A. Kamegawa, T. Abiko and M. Okada	1686
Nafion – Azole Composite Membranes for High Temperature PEMFC	
J.D. Kim and M.S. Jun	1692
Performance of an Anode-Supported Honeycomb Solid Oxide Fuel Cell	
H. Nakajima	1698
Mechanical Analysis to Improve Reliability and Durability of Solid Oxide Fuel Cells	
K. Sato and T. Hashida	1704
Enhanced Performance of Ag-Doped Oxygen Electrode Based Solid Oxide Electrolyser Cell under High Temperature Electrolysis of Steam	
S. Hu, Q.S. Li, Y.F. Zheng, S.H. Wei and C. Xu	1708
Effect of Gaseous Impurities on Degradation of SOFC Materials	
K. Yamaji	1714

Chapter 12: Friction Stir Processing/Welding

Fabrication of Al6061-AMC by Adding Copper-Coated SiC Reinforcement by Friction Stir Processing (FSP)	
J.N. Aoh, C.W. Huang and W.J. Cheng	1721
Friction Stir Welding of Al Alloys: Analysis through a Multi-Objective Optimization Tool	
P. Cavaliere	1729
Effect of Friction Stir Processing on Microstructure and Mechanical Properties of a HPDC Magnesium Alloy	
E. Cerri and P. Leo	1735
Influence of Galvanized Coatings on Abrasion Circle Friction Stir Spot Welding Aluminium to Steel for Automotive Applications	
Y.C. Chen, S.F. Liu and P.B. Prangnell	1741
Challenges in Joining Aluminium with Copper for Applications in Electro Mobility	
J. Kaspar, M. Zimmermann, A. Ostwaldt, G. Goebel, J. Standfuß and B. Brenner	1747
Friction Stir Welding of Carbon Steel for Application in Used Fuel Containers	
M. Mahoney, S. Sanderson, P. Maak, R. Steel, J. Babb and D. Fleck	1753
Friction Stir Welding of Line-Pipe Steels	
S. Sanderson, M. Mahoney, Z.L. Feng, S. Larsen, R. Steel and D. Fleck	1759
Numerical Simulation Model for FSW Employing Particle Method – Effect of Tool Angle on Fluid Motion	
F. Miyasaka, G. Yoshikawa and S. Matsuzawa	1765
Assessment of the Advantages of Static Shoulder FSW for Joining Aluminium Aerospace Alloys	
H. Wu, Y.C. Chen, D. Strong and P.B. Prangnell	1770
Evaluation of FSW on High Yield Strength Steels for Shipbuilding	
G. Rückert, M. Chargy, F. Cortial and F. Jorez	1776
Effect of Relative Motion between Weld Tool and Work Piece on Microstructure of Ultrasonically Welded Joint	
T. Sasaki and Y. Hosokawa	1782
The Influence of Gaps and Misalignment on Friction Stir Welded Butt Joints of Medium-Sized Parts	
S. Schulze, G. Göbel, V. Richter-Trummer, U. Füssel and E. Beyer	1788

Numerical Analysis of Multi-Field Coupled Phenomena in Friction Stir Welding and Applications	
Q.Y. Shi, G.Q. Chen, X.B. Wang and X. Kang	1794
Friction Stir Welding for a Nuclear Fusion Reactor	
Z. Pramann, B. Thompson, J. Chrzanowski and D. Mennel	1808
Realization of Al/Mg-Hybrid-Joints by Ultrasound Supported Friction Stir Welding	
B. Strass, G. Wagner and D. Eifler	1814
FSW Process Tolerance According to the Position and Orientation of the Tool: Requirement for the Means of Production Design	
S. Zimmer-Chevret, N. Jemal, L. Langlois, A. Ben Attar, J. Hatsch, G. Abba and R. Bigot	1820

Chapter 13: Materials under Extreme Conditions

Behavior of Decomposed Ammonia Borane at High Pressure up to ~10 GPa	
Y.Z. Sun, J.H. Chen, V. Drozd and S. Najiba	1829
High Pressure Materials Physics Research at UNLV	
A.L. Cornelius, B. Abeln, D. Antonio, J. Baker, P.E. Kalita and R.S. Kumar	1836
Effect of Long-Term Creep on Microstructure of a 9% Cr Heat Resistant Steel	
V. Dudko, A. Fedoseeva, P. Kozlov, V. Skorobogatykh, I. Schenkova and R. Kaibyshev	1839
Fatigue Designing of High Strength Steels Components Considering Aggressive Fuel Environment and Very High Cycle Fatigue Effects	
S. Issler, M. Bacher-Hoechst and S. Schmid	1845
Advanced Degradable Alloys for Multi-Stage Fracturing Applications	
M. Marya, T. Reyes, T. Dunne and C.N. Wang	1851
Comparative Performance of Three High-Strength Ni-Cr-Mo Alloys in Oilfield Simulated H₂S Environment	
I. Roy, M. Marya, D. Susnitzky and H.Q. Deng	1857
Production of SiC Materials by Reactive Infiltration	
M. Caccia and J. Narciso	1863
Advanced Microstructures for Increased Creep Rupture Strength of MARBN Steels	
E. Plesiutchnig, C. Beal, S. Paul, G. Zeiler, S. Mitsche and C. Sommitsch	1867
Simulation of Radiation-Induced Segregation by the Hybrid Potts-Phase Field Model	
E. Hernández-Rivera, V. Tikare and L.M. Wang	1872
Experimental Studies on Melting Behavior of Silicon Powders by In-Flight Plasma Melting Technique	
S. Yoo, K.H. Moon, S.Y. Hyun, S.K. Won and G. Shin	1880

Chapter 14: Metallic Glasses/Bulk Metallic Amorphous Materials

Analysis of Cooperativity in Metallic Glass Forming Liquids	
M. Aniya and M. Ikeda	1889
Effect of B₂O₃ Fluxing on Glass-Forming Ability and Soft Magnetic Properties of Fe(-Co)-B-Si-Nb Bulk Metallic Glasses	
T. Bitoh	1895
A Gold-Based Bulk-Solidifying Amorphous Alloy for Jewelry — Comparison with a Palladium-Based Amorphous Alloy	
S. Cardinal, J.C. Qiao and J.M. Pelletier	1901
Anomalous X-Ray Scattering Investigations on Metallic Glasses	
S. Hosokawa	1907
Properties of Indium Tin Oxide/Amorphous Alloys Bi-Layer Films as Transparent Electrodes	
H.K. Lin, K.C. Cheng, T.P. Cho and J.C. Huang	1913
Warm Rolling Technique for Amorphous Alloy Strip Produced by Ultrarapid Cooling-Thermal Spraying Based on Hydraulic-Stress-Induced Structural Relaxation	
R. Kurahashi, T. Morimoto, Y. Fukudome and S. Ishiura	1920

Monolithic Nanoporous Copper with Novel Electrochemical Properties Fabricated by Dealloying Cu-Zr(-Al) Metallic Glasses C.L. Qin, Z.F. Wang, H. Liu, L. Liu, H. Wang, J. Ding and W.M. Zhao	1925
Mg-Based Bulk Amorphous Alloy Composites Fabricated by Spark Plasma Sintering F.X. Qin, Z.H. Dan and G.Q. Xie	1931
Tuning of Soft Magnetic Properties in FeCo- and FeNi-Based Amorphous and Nanocrystalline Alloys by Thermal Processing in External Magnetic Field I. Škorvánek, J. Marcin, J. Kováč, P. Švec, N. Lupu and H. Chiriac	1937
Production of Zr-Based Metallic Glass Matrix Composites by Semisolid Process T. Tamura	1943
Shape Memory Behavior of Zr-Cu-Al Bulk Metallic Glass Matrix Composite T. Hitoo, F. Kazutaka and Y. Yokoyama	1949
Application of Recrystallization Texture Evolution Model to Predict Plastic Formability in Steel Strips T. Morimoto, Y. Fuyuki, A. Yanagida and J. Yanagimoto	1954
Cu Particulates Dispersed Bulk Metallic Glass Composites with High Strength and High Electrical Conductivity Fabricated by Spark Plasma Sintering G.Q. Xie, F.X. Qin and H. Kimura	1961
Correlation between the Enhanced Plasticity of Glassy Matrix Composites and the Volume Fraction, Size and Intrinsic Mechanical Property of Reinforcements Z.H. Chu, H. Kato, G.Q. Xie, D.R. Yan and G.Y. Yuan	1967

Chapter 15: Nanomaterials for Structural & Energy Applications

Preparation of ATO Thin Films from SPS-Derived Large Size ATO Ceramic Targets by PVD Methods F. Chen, J.Y. Wu, Q. Shen, J.M. Schoenung and L.M. Zhang	1973
On the Comprehension of Mechanical, Thermal and Chemical Evolution of Exhaust Gases after Treatment Catalysts M. Adamowska, O. Haddad, D. Leguillon and P. da Costa	1979
The Refinement of the Nanoporous Copper by Adding Third Elements Z.H. Dan, F.X. Qin and N. Hara	1986
Bottom-Up Formation of Vertical Free-Standing Semiconductor Nanowires Hybridized with Ferromagnetic Nanoclusters S. Hara	1990
Structure Controlled Nanoparticle Conjugates Synthesized by Gas-Liquid Interfacial Plasmas T. Kaneko, S. Takahashi and T. Kato	1996
Plasma Synthesis of Silicon Nanocrystals: Application to Organic/Inorganic Photovoltaics through Solution Processing T. Nozaki, Y. Ding and R. Gresback	2002
Synthesis of Nanoporous Materials and their Functionalization for Environmental Applications A.M. Ramírez, P.G. Melo and J.M.A. Robles	2005
Gas-Liquid <i>In Situ</i> Production of Ceramic Reinforced Aluminum Matrix Nanocomposites L. Ceschini, A. Morri, F. Rotundo and S. Toschi	2011
Local Strain Distribution in AlN Thick Films Analyzed by X-Ray Microdiffraction D.T. Khan, S. Takeuchi, Y. Nakamura, H. Miyake, K. Hiramatsu, Y. Imai, S. Kimura and A. Sakai	2016
Nanostructure Control of Si and Ge Quantum Dots Based Solar Cells Using Plasma Processes M. Shiratani, G. Uchida, H.W. Seo, D. Ichida, K. Koga, N. Itagaki and K. Kamataki	2022
III-V/Ge Device Engineering for CMOS Photonics M. Takenaka and S. Takagi	2028
Formation of Self-Organized Pore Arrays on Metallic Substrates by Anodization and their Applications H. Tsuchiya	2034

Catalytic Properties of Ni-Al Intermetallic Nanoparticles Fabricated by Thermal Plasma Process	
Y. Xu, J.Y. Yang, M. Demura, T. Hirano, Y. Matsushita, M. Tanaka and Y. Katsuya	2040
Development of Nanoalloy Catalysts for Realization of Carbon-Neutral Energy Cycles	
M. Yamauchi, M. Heima and M. Sadakiyo	2046
Enhanced Wettability of Cubic Boron Nitride Films by Plasma Treatment	
J.H.C. Yang, S. Kawakami, K. Teii and S. Matsumoto	2051

Chapter 16: Neutron Scattering & X-Ray Studies of Advanced Materials

Study of Micromechanical Behaviour of Two Phase Polycrystalline Materials Using Diffraction and Self Consistent Model	
A. Baczmański, E. Gadalińska, C. Braham, S. Wroński, L. le Joncour, B. Panicaud, M. François and V. Klosek	2059
Role of the Tilting of Oxygen Octahedra in the Stabilization of the Orbital-Modulated State in the Layered Perovskite Manganite $\text{Ca}_{2-x}\text{Nd}_x\text{MnO}_4$	
Y. Inoue, M. Arai, I. Tanaka and Y. Koyama	2065
Utilization of an Event-Recording System for Neutron Diffraction Experiments	
T. Ito, S. Harjo, Y. Inamura, T. Nakatani, T. Kawasaki, J. Abe and K. Aizawa	2071
High Resolution Diffraction of a Superalloy during HT Processing and Mechanical Testing: Experiments and Modeling	
A. Jacques, M. Biskri, J.P. Chateau-Cornu, T. Schenk and P. Bastie	2075
Recent R&D on Superconducting Wires for High-Field Magnet	
X.Z. Jin, T. Nakamoto, K. Tsuchiya, A. Yamamoto, T. Ogitsu, M. Sugano, S. Harjo, J. Abe, W. Gong, T. Iwahashi, A. Kikuchi, T. Takeuchi, Y. Yanagisawa, M. Takahashi and H. Maeda	2081
Stress Measurements in Polished Al-Mg Alloy and CrN Coating Using Multireflection Grazing Incidence Method	
M. Marciszko, A. Baczmański, K. Wierzbowski, J.P. Chopart, A. Lodini, N. Zazi, C. Braham and W. Seiler	2091
The Use of <i>In Situ</i> Characterization Techniques for the Development of Intermetallic Titanium Aluminides	
S. Mayer, E. Schwaighofer, M. Schloffer and H. Clemens	2097
New Generation X-Ray Stress Measurement Using Debye Ring Image Data by Two-Dimensional Detection	
T. Sasaki	2103
Radiographic and Tomographic Neutron Bragg Imaging for Quantitative Visualization of Wide Area Crystalline Structural Information	
H. Sato, Y. Shiota, Y. Todaka, T. Shinohara, T. Kamiyama, M. Ohnuma, M. Furusaka and Y. Kiyonagi	2109
Analysis of Retained Austenite and Residual Stress Distribution in Ni-Cr Type High Strength Steel Weld by Neutron Diffraction	
H. Sueyoshi, N. Ishikawa, H. Inoue, K. Hiraoka, T. Kasuya, K. An and H. Skorpenske	2115

Chapter 17: Modelling & Simulation

On the Stress Development in SA508 Autogenous Weld	
H. Abdolvand, M. Keavey, H. Dai, A. Mark, N. O'Meara, J. Walsh, S. Bate, B. Pellereau, J.A. Francis and P.J. Withers	2123
Local Brittle Zones and the Role of Niobium	
H.K.D.H. Bhadeshia	2129
Comparative Analysis by the Newton Method of New Constitutive Strain Dependent Creep Equations Based on the Garofalo Equation	
M. Carsí, V. Gutiérrez, I. Rieiro, E. Benavente and O.A. Ruano	2136
Integrated Database Development for Casting Design and its Application to Casting Simulation	
I.S. Cho, J.T. Kim and J.K. Choi	2142

Grain Competitive Growth Prediction during Solidification in Single Crystal Superalloy DD6 Castings H.P. Jin and J.R. Li	2148
Predicting the Microstructural Evolution of an Austenitic Stainless Steel by Hybrid Modeling A. Johnsson and M. Karlberg	2154
Thermo-Mechanically Coupled Modeling of Cooling Temperature History Effects on Precipitation Hardening in Hot Strip Coiled Products M. Karlberg	2160
Towards a 3-Dimensional Phase-Field Model of Non-Isothermal Alloy Solidification A.M. Mullis, P.C. Bollada and P.K. Jimack	2166
Density Functional Theory Study of H₂O Molecules on Cr₂O₃ Surfaces N. Nunomura and S. Sunada	2172
Microstructure Computation for Phase Transition in Steels R.S. Qin	2176
Martensite Spread: Analytical Modeling and Computer Simulation P.R. Rios, G. da Silva Drumond, T. Neves and J.R.C. Guimarães	2182
Discovery of New Materials and Heat Treatments: Accelerated Metallurgy and the Case of Ferrous and Magnesium Alloys I. Toda-Caraballo, E.I. Galindo-Nava and P.E.J. Rivera-Díaz-del-Castillo	2188
Simulation of Inhomogeneous Materials Evolution in Hot Rolling Using a Layer Model M. Schmidtchen, R. Kawalla and A. Rimnac	2194
Modeling of Hydrogen Diffusion in Piled Slabs P. Sideslam, M. Karlberg and J. Niska	2201
Use of Electronic Stress Tensor Density and Energy Density in Chemistry K. Ichikawa, H. Nozaki and A. Tachibana	2207
Limitations of ICME and ICMS due to Variability – Alternative Strategies for Alloy Design F. Tancret	2213
Microstructure Evolution and Precipitation Modeling in Ni-Based Alloy C-263 S. Vujic, S.F. Di Martino, S. Matera, O. Tassa, S. Hogg, J. Zurek, C. Beal and C. Sommitsch	2219
Hybrid Modelling Approach for Investigating the Thermal Contact during Solid State Joining H. Wang, P.A. Colegrove and J.F. Dos Santos	2225
Solidification of Immiscible Alloys and Convective Effect J.Z. Zhao and H.X. Jiang	2231

Chapter 18: Materials Performance

Comparison of Material Flow Stress Models toward More Realistic Simulations of Friction Stir Processes of Mg AZ31B A.H. Ammouri and R. Hamade	2239
Performance of Modern DCI Materials – Investigation of Microstructural, Temperature and Loading Rate Effects on Mechanical and Fracture Mechanical Properties W. Baer	2244
Electrochemical Study of Diffusion Bonded Joints between Micro-Duplex Stainless Steel and Ti6Al4V Alloy S.M. Bhola, S. Kundu, B. Mishra and S. Chatterjee	2250
Improving the Working Life of Steel Grinding Balls by Optimizing their Hardness and Tenacity C. Camurri, C. Carrasco and R. Colàs	2260
On Fatigue Crack Initiation in the Matrix in Very High Cycle Fatigue Regime G.C. Chai	2266
New Algorithm to Determine the Yield Stress from FIMEC Test L. Ciambella and R. Montanari	2272
Energy Dissipation and Self-Heating due to Microplastic Deformation Mechanisms at Very High Cycle Fatigue for Single-Phase Ductile Metals V. Favier, A. Blanche, N.L. Phung, N. Ranc and A. Chrysochoos	2278

Additive Manufacturing Viewed from Material Science: State of the Art & Fundamentals J.Y. Hascoet, K.P. Karunakaran and S. Marya	2284
Impact of Metallurgical Size Effects on Plasticity of Thin Metallic Materials E. Hug, C. Keller and A.M. Habraken	2290
Computation of Wave Propagation in Damped Specimen for Damage Detection V. Jawali, P. Parasivamurthy and A. Nagesh	2296
Analysis of Environmental Performance of Green Geosynthetics Based on Degradability H.Y. Jeon	2302
Fatigue, Fatigue Crack Propagation and Mechanical Fracture Behaviour of Laser Beam-Welded AZ31 Magnesium Sheets N. Kashaev, S. Riekehr, M. Horstmann and V. Ventzke	2310
Application of Indirect Laser Peening to SUS304 Stainless Steel H. Kawakami, A. Kondo, M. Kutsuna, K. Saito, H. Inoue, H. Ozaki and J. Suzuki	2316
Plastic Rotational Factor Calculation for Shallow-Notched SE(B) Specimens Y. Kayamori, T. Inoue and Y. Hagihara	2322
Contribution of the Nanoindentation to the Study of HCP Metals J.S. Lecomte, L.T. Nguyen, F. Abbès, C. Schuman and J.M. Raulot	2327
Particle Dispersion Simulator for Gel Printer M. Makino, M.H. Kabir, J. Gong and H. Furukawa	2333
Microstructural Barriers against Fatigue Crack Growth A.F. Knorr and M. Marx	2339
Additive Manufacturing Viewed from Material Science: State of the Art & Fundamentals J.Y. Hascoet, K.P. Karunakaran and S. Marya	2347
Effects of Heat Treatments on Tungsten for Armours in NFR L. Ciambella, R. Donnini and R. Montanari	2353
Evaluation of Fatigue Damage by Diffraction Contrast Tomography Using Synchrotron Radiation D. Shiozawa, Y. Nakai, R. Miura and S. Matsuda	2359
High Performance Materials by Laser Deposition J.W. Newkirk and F.F. Liou	2365
RETRACTED: Microstructural Characterization and Mechanical Properties of Laser Deposited High Entropy Alloys H. Sistla, J.W. Newkirk and F.F. Liou	2370
Effect of Thermal Treatments on the Mechanical Properties Enhancement of High Reliability Metallic Materials by Laser Shock Processing J.L. Ocaña, M. Díaz, J.A. Porro, L.R. de Lara and C. Correa	2376
Can Young's Modulus of Metallic Alloys Change with Plastic Deformation? A. Roca, A. Villuendas, I. Mejía, J.A. Benito, N. Llorca-Isern, J. Llumà and J. Jorba	2382
Constrained Thermal Fatigue Performance of Several Cast Ferrous Alloys A. Shyam, S. Hawkins, D. Erdman, R. England and G. Muralidharan	2388
Analysis of Statistical Scatter in Charpy Impact Toughness Y. Takashima, M. Ohata and F. Minami	2394
Crystallographic Features of the Relaxor State in the Mixed Ferroelectric System Ba(Ti_{1-x}Zr_x)O₃ H. Tsukasaki, Y. Inoue and Y. Koyama	2400
Orientation Correlation during $\alpha \rightarrow \beta$ Up-Transformation Induced by Electric Current Pulses in a Cu-Zn Alloy X. Zhao, X.L. Wang, D.X. Li and W.B. Dai	2406
Damage Evolution and Crack Growth in Nickel-Based Alloys during Ultrasonic Fatigue M. Zimmermann, A. Kolyshkin, C. Stöcker, J.W. Jones and H.J. Christ	2410

Chapter 19: Smart/Intelligent Materials & Processes

Magnetic Properties of Off-Stoichiometric Ni-X-In (X=Mn, Fe and Co) Magnetic Shape Memory Alloys by First-Principles Calculations J. Bai, J.M. Raulot, Y.D. Zhang, C. Esling, X. Zhao and L. Zuo	2419
Mechanical Properties of Ti-Fe-Sn Biomedical Alloys with or without Aging Treatment H. Hosoda, K. Kasuya, M. Tahara, T. Inamura and S. Miyazaki	2423

Controllable Electrostriction of Polyurethane Film M. Kanda, K. Yuse, D. Guyomar and Y. Nishi	2429
Effects of Sintering Conditions on the Mechanical Properties of Alumina Particle Dispersed Magnesium SPS Compacts S. Kawamori, H. Fujiwara and Y. Kasuga	2433
Geometric Modeling of Ceramics Dendrites to Modulate Energy and Material Flows by Using Stereolithography S. Kiriwara	2439
Ti-50.2Ni-5Zr Shape Memory Alloy Square Rots Production by the Casting Technique K. Kitamura	2445
A Study of Solid State Bonding Strength of Nonferrous Metals by Using Metal Salt Generation Bonding Method S. Koyama	2450
Progress on High Pressure Pneumatic Forming and Warm Hydroforming of Titanium and Magnesium Alloy Tubular Components G. Liu, Y. Wu, J.L. Wang and W.D. Zhang	2456
Bimodal and Monomodal Diamond Particle Effect on the Thermal Conductivity of Diamond Particle Dispersed Al Matrix Composite Produced by SPS K. Mizuuchi, K. Inoue, Y. Agari, M. Sugioka, M. Tanaka, T. Takeuchi, J. Tani, M. Kawahara, Y. Makino and M. Ito	2462
Influence of Co on Strength of Cu-Ni-Co-Si Alloy A. Ozawa, C. Watanabe and R. Monzen	2468
Near-Net Shaping of Silicon for Optical Lens by One-Shot Pressing at Temperature just below Silicon Melting Point and Improvement of Infrared Transmittance by Primary Recrystallization K. Morishita, K. Nakajima, T. Fujii and M. Shiinoki	2474
Preparation of Textured $\text{Li}_{1+x-y}\text{Nb}_{1-x-3y}\text{Ti}_{x+4y}\text{O}_3$ Solid Solution in a High Magnetic Field H. Nakano, S. Suehiro and T.S. Suzuki	2480
Mechanical and Electrical Properties of Carbon Nanofiber Dispersed Ti Composite Formed by Compression Shearing Method at Room Temperature N. Nakayama, M. Horita, H. Miki, T. Takagi and H. Takeishi	2485
Development of Nickel Based Superalloys for Advanced Turbine Engines A. Nowotnik, K. Kubiak, J. Sieniawski, P. Rokicki, P. Pędrak and G. Mrówka-Nowotnik	2491
Effect of Zr Addition on Magnetostriction of Tb-Dy-Fe Alloys Prepared by Micro-Pulling-Down Method K. Oikawa, T. Shoji and K. Anzai	2497
Amorphousization and Superconducting Property for Zr-Nb Based Alloy D. Okai, K. Mori, G. Motoyama, H. Kimura and H. Kato	2503
Polymer Matrix Composites with Shape Memory Properties F. Quadrini	2509
X-Ray Diffraction Studies on Ti-Pd Shape Memory Alloys R. Arockiakumar, M. Takahashi, S. Takahashi and Y. Yamabe-Mitarai	2517
Recent Developments in the Field of Shape Memory Epoxy Foams L. Santo	2523
Development of a Combined Method between MPS and FEM for Simulating Friction Stir Welding H. Serizawa, J. Shimazaki, F. Miyasaka, G. Yoshikawa and H. Murakawa	2531
Electrochemical Evaluation for Rust Preventive Properties of Rust Preventive Oils Coated on Fe-Cu-C Sintered Steel S. Sunada, N. Nunomura, S. Hirata and N. Nagase	2537
High-Temperature Shape Memory Alloys Based on Ti-Platinum Group Metals Compounds Y. Yamabe-Mitarai, A. Wadood, R. Arockiakumar, T. Hara, M. Takahashi, S. Takahashi and H. Hosoda	2541

Chapter 20: Texture of Materials (Prof. G. Gottstein Symposium)

Microstructures and Mechanical Properties of Two-Phase FeNiMnAl Alloys I. Baker, X.L. Wu, F.L. Meng and P.R. Munroe	2549
---	------

Effect of Warm-Rolling on the Formation of Microstructure and Microtexture of the Constituent Phases in a Duplex Steel P.B. Pinaki and Z.A. Mohammed	2555
Identification of Crystal Structure and Crystallographic Features of NiMnGa Thin Films by Combination of X-Ray Diffraction (XRD) and Electron Backscatter Diffraction (EBSD) B. Yang, Z.B. Li, Y.D. Zhang, C. Esling, G.W. Qin, X. Zhao and L. Zuo	2561
Influence of Strain Path on Work Hardening and Texture in an Austenitic Stainless Steel M. Gärdback, G.C. Chai, D. Hedström and K. Persson	2567
Formation of Multiple Twinned Structural Units in Electrodeposited Nickel after Annealing A. Kahrmanidis and U. Klement	2573
Influence of New System Nano-Inhibitors on the Abnormal Grain Growth with Goss Crystallographic Orientation of Silicon Steels F. Kováč, I. Petryshynets, J. Buršík and M. Sopko	2579
Disorientation Relations during the Early Stages of Recrystallization in Medium and Low SFE fcc Metals M. Miszczyk, H. Paul, J.H. Driver and C. Maurice	2585
Effect of the Channel Angle of One-Pass ECAP Prior to Cold Rolling on the Microstructure and Texture of Metallic Sheets H. Miyamoto, M. Ueda and H. Fujiwara	2591
Deformation Texture and Microstructure Evolution in Nickel and Nickel-Cobalt Alloys R. Madhavan, R.K. Ray and S. Suwas	2597
Texture Formation in Flow Formed Ferritic Steel Tubes and the Influence of the Process Parameters D. Tsivoulas, G. Timar, M. Tuffs, J.Q. da Fonseca and M. Preuss	2602

Chapter 21: Ultra-Fine – Grained Materials (Prof. T.G. Langdon Symposium)

Structure and Fatigue Properties of Cr-Ni-Ti Austenitic Steel after Equal Channel Angular Pressing S.V. Dobatkin, W. Skrotzki, V. Terent'ev, O. Rybalchenko, A. Belyakov, D. Prosvirnin and E. Zolotarev	2611
Processing Different Magnesium Alloys through HPT L.R.C. Malheiros, R.B. Figueiredo and T. Langdon	2617
Consolidation of High Performance AA6061 and AA6061-SiC_p Composite Processed by High Pressure Torsion W.H. El-Garaihy, E.S.M.A. Rassoul and H.G. Salem	2623
Effect of Second Phase Particles on the Tensile Instability of a Nanostructured Al-1%Si Alloy T.L. Huang, G.L. Wu, Q. Liu and X.X. Huang	2629
Microstructural Evolution and Grain Refinement in a Cu-Zr Alloy Processed by High-Pressure Torsion J. Wongsan-Ngam and T. Langdon	2635
The Role of Deformation Banding in Grain Refinement under ECAP R. Kaibyshev, S. Malopheyev, V. Kulitskiy and M. Gazizov	2641
Microstructure Development and Superplasticity in a Zn-22% Al Eutectoid Alloy Processed by Severe Plastic Deformation M. Kawasaki and T. Langdon	2647
Micro Hole Piercing for Ultra Fine Grained Steel T. Komatsu, H. Kobayashi, S. Torizuka and S. Nagayama	2653
Effect of Microstructure State of Titanium Alloy Ti-6Al-4V on Structure and Mechanical Properties of Joints Produced by Diffusion Bonding Process N. Lopatin, K. Senkevich and E.A. Kudryavtsev	2659
Effect of Process Control Agents (PCAs) on Mechanochemical Processes and Contamination Science D. Shiba, E. Yamasue, K.N. Ishihara and H. Okumura	2665
Mossbauer Spectroscopy of Grain Boundaries in Ultrafine-Grained Metal Materials V.V. Popov	2671

Effect of Grain Refinement on Cold Formability Behavior on Medium C-Boron Steel I. Salvatori, C. Guarnaschelli and T. Coppola	2677
Ultrafine Grain Evolution in a Cu-Cr-Zr Alloy during Warm Multidirectional Forging I. Shakhova, A. Belyakov, A.P. Zhilyaev and R. Kaibyshev	2683
Microstructure Evolution and Creep Behavior in ECAP Processed Metallic Materials V. Sklenička, P. Král, J. Dvořák, M. Kvapilová and M. Svoboda	2689
High Strength Microscrew with Ultrafine Grained Structure S. Torizuka and E. Muramatsu	2695
An Investigation of Hardness Homogeneity and Microstructure in Pure Titanium Processed by High Pressure Torsion C.T. Wang, A.G. Fox and T. Langdon	2701
Microstructure and Aging Behavior of Cu-Be Alloy Processed by High-Pressure Torsion C. Watanabe, R. Monzen, S. Ii and K. Tsuchiya	2707
Two-Scale Finite Element Analysis of Equaled Channeling Angular Extrusion of Polycrystalline Metal I. Watanabe	2713
Nano-Structuring of 316L Type Steel by Severe Plastic Deformation Processing Using Two-Dimensional Linear Plane Strain Machining J.M.K. Wiezorek, G. Facco, Y. Idell, A. Kulovits and M.R. Shankar	2720
Micro-Tensile Behavior at a High Temperature in an AZ31 Magnesium Alloy Processed by ECAP J. Xu, B. Guo, D.B. Shan and T. Langdon	2726
Twinning-Induced Formation of Nanostructure in Commercial-Purity Titanium S.V. Zharebtsov, G. Dyakonov, M. Klimova and G.A. Salishchev	2732

Chapter 22: Welding & Joining of Advanced and Special Materials

Thermal Joining with Zinc Based Solder – New Potentials for Structural Lightweight Design M. Angerhausen, C. Geffers, U. Reisgen, K. Willms, S. Hof, F. Prenger and K. Deckert	2741
Microstructural Evolution in Dissimilar Joint of Al Alloy and Cu during Ultrasonic Welding H.T. Fujii, Y. Goto, Y.S. Sato and H. Kokawa	2747
The Effect of Shielded Metal Arc and Gas Tungsten Arc Welding Methods on 308L Stainless Steel Weldments S.P. Lin, G.P. Yu, J.Y. Huang, H.J. Chen, R.C. Kuo, E.W. Huang and J.H. Huang	2753
Advanced TSV Filling Technology for 3-Dimensional Electronic Packaging C.W. Lee, Y.K. Ko, Y.H. Ko and J.H. Bang	2758
Effects of Material Property and Structural Design on the Stress Reduction of the Joints in Electronics Devices M. Matsushima, N. Nakashima, T. Fujimoto, S. Fukumoto and K. Fujimoto	2765
Laser Beam Welding for Reduced Activation Ferritic/Martensitic Steel F82H H. Mori, H. Ogiwara, K. Saida, H. Serizawa, T. Hirose and H. Tanigawa	2771
Sources and Consequences of Residual Stresses due to Welding T. Nitschke-Pagel and K. Dilger	2777
Microscale Evaluation of Mechanical Properties and the Interfacial Microstructures of Friction Stir Welded Aluminum Alloy/Stainless Steel Dissimilar Lap Joints T. Ogura, T. Nishida, H. Nishida, M. Fujimoto and A. Hirose	2786
Novel Micro-Welding of Silicon and Glass by Ultrashort Pulsed Laser Y. Okamoto, I. Miyamoto, J. Vihinen and A. Okada	2792
Metallurgical Study of Friction Stir Welded High Strength Steels for Shipbuilding M. Allart, A. Benoit, P. Paillard, G. Rückert and M. Chargy	2798
Enhanced Weld Penetrations in GTA Welding with Activating Fluxes Case Studies: Plain Carbon & Stainless Steels, Titanium and Aluminum G. Rückert, N. Perry, S. Sire and S. Marya	2804
Effect of Strain Rate on Tensile Properties of Miniature Size Specimens of Several Lead-Free Alloys I. Shohji and Y. Toyama	2810

A Study on the Effect of the Interpass Temperatures in Properties and Microstructures of the Alloy 625 Dissimilar Fusion Zone	
C.C. Silva, H.C. de Miranda, M.F. Motta, D.C.F. Ferreira, R.M. Reppold and G. Dalpiaz	2816
Evaluation of the Corrosion Resistant Weld Cladding Deposited by the TIG Cold Wire Feed Process	
C.C. Silva, C.R.M. Afonso, A.J. Ramirez, M.F. Motta, H.C. de Miranda and J.P. Farias	2822
Plasma Diagnostics of Arc during MIG Welding of Aluminum	
M. Tanaka	2828
Hybrid Laser-Arc Welding of AA6061-T6 Butt Joints	
P. Wanjara and X.J. Cao	2833
Process Window for Friction Stir Lap Welding of Aluminum Alloy 6061	
S. Larose, M. Guérin and P. Wanjara	2839
Optimisation of Diffusion Bonding Parameters of Ti Alloys through the Structure and Surface Conditions	
E. Yakushina, A. Reshetov and A. Rosochowski	2845
Hardness Prediction for Temper Bead Welding of Non-Consistent Layer Technique	
L.N. Yu, K. Saida, M. Mochizuki, M. Kameyama, T. Sera, S. Hirano and K. Nishimoto	2851
Thermal Recovery of Plastic Deformation in Dissimilar Metal Weld	
D.X. Qiao, X.H. Yu, W. Zhang, P.C. Yu, S. David and Z.L. Feng	2857
Surface Property Enhancement of UNS N07718 and G41400 by Ultrasonic Impact Treatment	
V. Singh, M. Marya, I. Roy, C. Mathews, D. Spinner and M. Gopalakrishnana	2863
Deformation Behavior of Fe-Al-Co Single Crystals Containing CoAl Precipitates	
H.Y. Yasuda, K. Soma and Y. Odawara	2869