

Table of Contents

Preface

Microstructural Characterization of Thermal Barrier Coatings Deposited by APS and LPPS Thin Film Methods

M. Góral, M. Pytel, P. Sosnowy, S. Kotowski and M. Drajewicz 1

The Influence of e-Beam Irradiation on the Morphology and Functional Properties of UHMWPE

J. Maszybrocka, A. Barylski, J. Cybo and P. Czaja 6

The Influence of Plastic Deformation on Structure of Highly Crosslinked UHMWPE Intended for Endoprosthesis Cups

J. Maszybrocka, J. Cybo, J. Cwajna, A. Barylski and P. Czaja 13

Changes in the Molecular Structure of UHMW Polyethylene under the Influence of Thermal and Radiation Modification, as Well as Time

J. Maszybrocka, P. Czaja, J. Cybo, J. Michniowski and A. Barylski 19

The Effect of B and Microalloying Elements (V, Ti, Nb) Additions on the Austenite Grain Growth of Low Alloy Steel

H. Adrian, M. Pelczar, A. Adrian and J. Augustyn-Pieniążek 25

Comparison of Mechanical Properties of Mn-Cr-Mo Steels Sintered in Different Conditions

M. Sulowski and P. Matusiewicz 33

Application of Convex Hull Algorithm for Defect Detection in Selected Biological Materials

R. Petryniak 41

Changes in Microstructure of GX12CrMoVNb9-1 Cast Steel after Low Cycle Fatigue

G. Golański, C. Kolan and J. Kępa 47

The Effect of Austenitizing Temperature on Prior Austenite Grain Size in Martensitic Cast Steel

G. Golański, C. Kolan and J. Kupezyk 53

The Influence of Turbine Blade Geometry and Process Parameters on the Structure of Zr Modified Aluminide Coatings Deposited by CVD Method on the ZS6K Nickel Superalloy

M. Góral, M. Pytel, R. Filip and J. Sieniawski 58

Quantitative Characterization of Shrinkage and Gas Pores in Turbine Blades Made of MAR M247 and IN 713C Superalloys

S. Roskosz 64

Quantitative Microstructural Analysis of Thermal Barrier Coatings Deposited on Inconel 625

G. Galant, J. Duleba, S. Toczek, B. Dubiel and A. Czyrska-Filemonowicz 70

Intermetallic Phases Formation in Hot Dip Galvanizing Process

D. Kopyciński and E. Guzik 77

Modelling of Grain Microstructure of IN-713C Castings

D. Szeliga, K. Kubiak, A.A. Burelko, R. Cygan and W. Żiaja 83

The 3D Imaging and Metrology of CMSX-4 Superalloy Microstructure Using FIB-SEM Tomography Method

A. Kruk, B. Dubiel and A. Czyrska-Filemonowicz 89

Influence of Coatings Deposition Parameters on Microstructure of Aluminide Coatings Deposited by CVD Method on Ni-Superalloys

A. Nowotnik, M. Góral, M. Pytel and K. Dychtoń 95

Stochastic Nature of the Casting Solidification Displayed by Micro-Modelling and Cellular Automata Method

A.A. Burelko, D. Gurgul, W. Kapturkiewicz, J. Początek and M. Wróbel 101

Stereological Characterization of TiC Carbides in Bottom Skull after Melting of Ti-6Al-4V-0.5C Alloy in Vacuum Induction Furnace

A. Szkliniarz and G. Jarczyk 107

Quantitative Characterization of Microstructure of Ti-47Al-2W-0.5Si Alloy after Melting in Vacuum Induction Furnace

W. Szkliniarz and A. Szkliniarz 113

Comparison of the Investigations of Photonic Crystals Using SEM and Optical Technics

A. Starczewska, J. Szala, M. Kępińska, M. Nowak, K. Mistewicz and M. Sozańska 119

Influence of the Pouring Temperature on the Castability and Microstructure of Elektron 21 and QE22 Magnesium Casting Alloys B. Dybowski, R. Jarosz and A. Kielbus	125
Metreology and Morphology of γ' and γ'' Nanoparticles in Inconel 718 Measured by FIB-SEM Tomography K. Kulawik, B. Dubiel and A. Czyska-Filemonowicz	131
Detection of Intermetallic Compounds in a Mg-5Al-3Ca-0.7Sr-0.2Mn Magnesium Alloy T. Rzychoń, J. Szala and T. Kukielka	137
Stereological and Statistical Evaluation of Grain Size in Experimental Ni-Based and Conventional Supercoarse Sintered Carbides J. Richter and M. Maliński	143
The Procedure for Quantitative Analysis of Welded Joints in QE22 Alloy J. Adamiec, M. Młodzieniak and A. Kielbus	149
Preparation and Characterization of Al-Si₃N₄ Composite Particles D. Michalik, N. Valle, J. Guillot, T. Pawlik, M. Sopicka-Lizer, A. Witkowska and J. Myalski	155
The Smooth Bootstrap Approach to the Distribution of a Shape in the Ferritic Stainless Steel AISI 434L Powders J. Pietraszek and A. Gądek-Moszczak	162
Transformations of Phases in Titanium Alloy after High Temperature Hydrogen Treatment M. Sozańska	168
Thermal Gradients Behaviour during the C-E Transition within Solidifying Massive Roll W. Wołczyński, W. Wajda and E. Guzik	174
Effect of Material and Technological Conditions on Quality of Metal Matrix Composite Castings K. Gawdzińska, D. Nagolska and L. Wojnar	180
Description of 3D Microstructure of the Composites with Polypropylene (PP) Matrix and Tuf Particles Fillers A. Gądek-Moszczak and S. Żmudka	186
The Influence of Various Etchants on the Quantitative Analysis of Microstructure of Mg-Nd Alloy M. Stopyra and A. Kielbus	192
Advanced Statistical Refinement of Surface Layer's Discretization in the Case of Electro-Spark Deposited Carbide-Ceramic Coatings Modified by a Laser Beam J. Pietraszek, N. Radek and K. Bartkowiak	198
On γ-γ' Eutectic Quantitative Evaluation in the as-Cast CMSX-4 Nickel-Based Superalloy A. Szczotok	203
Effect of Modification of Rare Earth Elements on the Morphology of Silicon Precipitates in the ZnAl22Cu3Si Alloy A. Tomaszewska, R. Michalik and H. Woźnica	209
The Quantitative Assessment of the Fracture Profile of Magnesium Alloy QE22 Welded Joint J. Adamiec	215
Effect of Cooling Rate on the Porosity of the ZnAl22Cu3 Alloy R. Michalik, H. Woźnica and A. Tomaszewska	221
An Application of Computer Tomography for Structure Characterization of Metallic-Ceramic Composite Foam J. Grabian, K. Gawdzińska, L. Wojnar and W. Przetakiewicz	226
Model of Microstructure Development in Hot Deformed Magnesium Alloy AZ31 Type D. Kuc and E. Hadasik	232
Analysis of Intermetallic Phases in 2024 Aluminium Alloy G. Mrówka-Nowotnik and J. Sieniawski	238
Effect of Modification of Rare Earth Elements on the Morphology of Silicon Precipitates in the ZnAl40Cu3Si Alloy R. Michalik, A. Tomaszewska and H. Woźnica	244
Effect of Processing Conditions on Microstructure of SiC-TiB₂ Composite G. Górny, L. Stobierski, P. Rutkowski and M. Rączka	250