

Table of Contents

Introduction

Chapter 1: Aluminium and Aluminium Alloys

Numerical and Physical Modelling of Aluminium Refining Process Conducted in URO-200 Reactor	
M. Saternus and T. Merder	3
Hydrodynamics of the Aluminium Barbotage Process Conducted in a Continuous Reactor	
M. Saternus	13
Influence of Overheating Degree on Material Reliability of A390.0 Alloy	
J. Piątkowski	23
Mechanism of Grain Refinement in Al after COT Deformation	
K. Rodak and J. Pawlicki	29
Deformation-Induced Grain Refinement in AlMg5 Alloy	
K. Rodak, J. Pawlicki and M. Tkocz	37
CMT and MIG-Pulse Robotized Welding of Thin-Walled Elements Made of 6xxx and 2xxx Series Aluminium Alloys	
J. Adamiec, T. Pfeifer and J. Rykala	45
Fabrication of Ceramic-Metal Composites with Percolation of Phases Using GPI	
A. Boczkowska, P. Chabera, A.J. Dolata, M. Dyzia, R. Kozera and A. Oziębło	57
Producing of Composite Materials with Aluminium Alloy Matrix Containing Solid Lubricants	
A. Posmyk and J. Myalski	67
Machinability of Aluminium Matrix Composites	
J. Wieczorek, M. Dyzia and A.J. Dolata	75
Influence of Particles Type and Shape on the Corrosion Resistance of Aluminium Hybrid Composites	
A.J. Dolata, M. Dyzia and W. Walke	81
Course of Solidification Process of AlMMC – Comparison of Computer Simulations and Experimental Casting	
R. Zagórski, A.J. Dolata and M. Dyzia	89

Chapter 2: Magnesium and Magnesium Alloys

Plasticity and Microstructure of Hot Deformed Magnesium Alloy AZ61	
D. Kuc, E. Hadasik and I. Bednarczyk	101
Effect of Modification on the Structure and Properties of QE22 and RZ5 Magnesium Alloys	
S. Roskosz, B. Dybowski and J. Paśko	109
Influence of Mould Cooling Rate on the Microstructure of AZ91 Magnesium Alloy Castings	
S. Roskosz, B. Dybowski and R. Jarosz	115
Fractography and Structural Analysis of WE43 and Elektron 21 Magnesium Alloys with Unmodified and Modified Grain Size	
S. Roskosz, B. Dybowski and J. Cwajna	123
Precipitate Processes in Mg-5Al Magnesium Alloy	
A. Kiełbus	131
Influence of Pouring Temperature on Castability and Microstructure of QE22 and RZ5 Magnesium Casting Alloys	
B. Dybowski, R. Jarosz, A. Kiełbus and J. Cwajna	137
The Influence of Section Thickness on Microstructure of Elektron 21 and QE22 Magnesium Alloys	
M. Stopyra, R. Jarosz and A. Kiełbus	145

The Influence of Tin on the Microstructure and Creep Properties of Mg-5Al-3Ca-0.7Sr-0.2Mn Magnesium Alloy	151
T. Rzychoń and B. Chmiela	
On the Oxidation Behaviour of WE43 and MSR-B Magnesium Alloys in CO₂ Atmosphere	159
R. Przeliorz and J. Piątkowski	
Galvanic Corrosion Test of Magnesium Alloys after Plastic Forming	169
J. Przondziona, W. Walke and E. Hadasik	
Creep Resistance of WE43 Magnesium Alloy Joints	177
A. Kierzek and J. Adamiec	
Impact of Heat Treatment on the Structure and Properties of the QE22 Alloy Welded Joints	183
A. Kierzek and J. Adamiec	
Microstructure of <i>In Situ</i> Mg Metal Matrix Composites Based on Silica Nanoparticles	189
A. Olszówka-Myalska, S.A. McDonald, P.J. Withers, H. Myalska and G. Moskal	
Microstructure of Mg-Ti-Al Composite Hot Pressed at Different Temperature	199
A. Olszówka-Myalska, R. Przeliorz, T. Rzychoń and M. Misiowiec	

Chapter 3: Titanium and Titanium Alloys

The Chemical Composition and Microstructure of Ti-47Al-2W-0.5Si Alloy Melted in Ceramic Crucibles	211
W. Szkliniarz and A. Szkliniarz	
Grain Refinement of Ti-48Al-2Cr-2Nb Alloy by Heat Treatment Method	221
A. Szkliniarz	
Characteristics of Corrosion Resistance of Ti-C Alloys	235
A. Szkliniarz and R. Michalik	
Effect of a High-Temperature Hydrogen Treatment on a Microstructure and Surface Fracture in Titanium Ti-6Al-4V Alloy	243
M. Sozańska	
Diffusion Brazing of Titanium via Copper Layer	249
M. Różański and J. Adamiec	