

Table of Contents

Preface, Committees, Sponsors

Chapter 1: Structure, Physical, Chemical and Mechanical Properties of Titanium Materials and Alloys

The Role of Martensitic Transformation in Thermomechanical Development of Microstructure and Plasticity of Two-Phase Ti-6Al-4V Titanium Alloy M. Motyka, J. Sieniawski and W. Ziaja	3
The Structure and Properties Formation of the NiTi Shape Memory Rods after Hot Rotary Forging Z. Lekston, M. Zubko, J. Lelątko, D. Stróż, T. Goryczka, T. Wierzchoń, J. Sieniawski and J. Dybich	11
The Structure and Shape Memory of the Hot Extruded NiTi Alloy T. Goryczka, Z. Lekston, J. Dybich, M. Zubko, T. Wierzchoń, D. Stróż and J. Lelątko	19
Microstructure and Interconnections Characteristics of Titanium Foam K. Pałka, G. Adamek and J. Jakubowicz	25
Structure and Martensitic Transformation in $Ti_{50}Ni_{(50-X)}Nb_X$ (X=5; 10) Alloy Produced by Powder Metallurgy T. Goryczka, K. Piżuch and M. Dworak	33
Correlation of Tribological Properties of Titanium Alloys with their Microstructures Ł. Frocisz, J. Krawczyk, M. Madej and M. Kopyściański	41
Dynamic Recrystallization in Titanium Alloys J. Krawczyk, T. Tokarski, A. Łukaszek-Sołek, R. Dąbrowski, T. Śleboda and O. Lypchanskyi	47
Influence of the Supersaturating Temperature on the Microstructure and Hardness of $Ti_{24}Nb_{4}Zr_{8}Sn$ Alloy R. Dąbrowski, G. Cios and J. Krawczyk	55

Chapter 2: Coatings and Surface Engineering of Titanium Alloys

Investigation on Bioactivity of Zirconium-Calcium Coatings on Titanium Surface Obtained by Sol-Gel and Electrophoretic Deposition (EPD) Methods E. Długoń, M. Szymańska, M. Leśniak, P. Jeleń, W. Niemiec and M. Sitarz	65
Influence of Adopted Heat Treatments on Properties of Tri-Layer Composite AA2519 – AA1050 – Ti GR.5 Made by Explosive Cladding Method M. Najwer and G. Kwiatkowski	71
Corrosion Resistance of Ti6Al4V Alloy in Modified SBF Environments J. Szewczenko, M. Grygiel-Pradelok, W. Walke, K. Nowińska, J. Granieczny, M. Kaczmarek and J. Marciniak	79
Protection of Orthorhombic Alloy by AlCrN Coating J. Małecka	87
Corrosion Resistance of NiTi Shape Memory Alloy after Nitriding and Oxynitriding Processes under Glow Discharge Conditions for Medical Applications J. Kamiński, J. Witkowska and T. Wierzchoń	92
Studies of Fretting Processes in Titanium Implantation Alloys from the Ti-Al-V Group M. Klekotka, J.R. Dąbrowski, B. Kalska-Szostko and U. Klekotka	98
The Influence of the Reaction Time in the Micro-Arc Oxidation Process on the Microstructure of the Coatings Deposited on $Ti_{6}Al_{7}Nb$ Alloy J. Karbowniczek, S. Metwally, G. Cempura and A. Czyska-Filemonowicz	106
The Methods of Surface Preparations of Titanium Alloys Applicable for Friction Pairs in Endoprostheses M. Nabrdalik and M. Sobociński	111
The Destruction Mechanism of Titanium Subjected to Cavitation Erosion R. Jasionowski, W. Polkowski and D. Zasada	117

Chapter 3: Technologies of Production, Processing and Uses of Titanium and its Alloys

Cross-Wedge Rolling of Driving Shaft from Titanium Alloy Ti6Al4V	
Z. Pater, T. Bulzak and J. Tomczak	125
A Rotary Compression Process for Producing Titanium Alloy Ti6Al4V Shafts	
J. Tomczak, Z. Pater and T. Bulzak	133
Comparative Analysis of Forging Rolling and Cross-Wedge Rolling of forgings from Titanium Alloy Ti6Al4V	
A. Tofil, J. Tomczak and T. Bulzak	141
Porous Titanium Materials Produced Using the HIP Method	
W. Leśniewski, M. Wawrylak, P. Wieliczko, Ł. Boroń and I. Krzak	149
An Influence of Frictional Model on Temperature Distribution during a Friction Spot Stir Welding Process of Titanium Grade 2	
P. Lacki, Z. Kucharczyk and T. Walasek	155
Lubricants Based on Vegetable Oils as Effective Lubricating Agents in Sheet-Titanium Forming	
J. Adamus, K. Dyja and W. Więckowski	163
Determination of FLD for Ti-6Al-4V Titanium Alloy Sheet	
P. Lacki	171
The Use of Incremental Technology to Produce 3D-Truss Ti6Al4V Implants which Improves the Spinal Treatment Effectiveness	
L. Ciupik, A. Kierzkowska, J. Cecek, J. Pieniazek, J. Sterna and M. Cieslik-Gorna	179
The Influence of Type and Design of Denture Attachment on its Efficiency of Operation in Model Tests	
M. Jabrzykowski	185
Numerical Analysis of Mechanical Phenomena in Coronary Stent Made of Titanium Alloy Ti-13Nb-13Zr	
A. Idziak-Jabłońska	191
The Application of Direct Metal Laser Sintering (DMLS) of Titanium Alloy Powder in Fabricating Components of Aircraft Structures	
R.E. Śliwa, J. Bernaczek and G. Budzik	199
Numerical Simulation of Forming Process for Cover with Stiffening Components Made of Grade 2 Titanium Sheet Metal	
W. Więckowski	206
Evaluation of Load-Bearing Capacity of Resistance Spot Welding (RSW) Joints Made of Titanium Gr 5 Sheets	
A. Derlatka, M. Dyner and P. Lacki	212
Application of Titanium Properties in Civil Engineering and Architecture	
M. Tubielewicz-Michalcuk	220
Analysis of SCM Sill Beam Reinforced with Steel or Titanium Profile	
M. Pomada, J. Adamus and A. Boruszewski	228
Analysis of Heat Transfer through PVC Window Profile Reinforced with Ti6Al4V Alloy	
P. Lacki, J. Różycza and M. Rogoziński	236
Application of Titanium Dioxide in Cement and Concrete Technology	
A. Pietrzak, J. Adamus and B. Langier	243
The Assessment of Mechanical Properties of Titanium Sheets Applied to Building Elevations and Roofs	
J. Winowiecka and K. Adamus	250