

# Table of Contents

## Preface, Committee

## Chapter 1: Research and Development of Processing Technologies for Metals and Alloys in Engineering Industry

<b>Influence of Cutting Parameters and Tool Geometry on Thrust Force Behavior in Drilling Ti6Al4V</b>	
M. Vrabel, I. Maňková, P. Ižol, M. Franková and M. Paľo	3
<b>Tool Wear and Surface Roughness Evolution in Hole Making Process of Inconel 718</b>	
M. Eckstein, M. Vrabel and I. Maňková	11
<b>Comparison of Milling Strategies when Machining Freeform Surfaces</b>	
P. Ižol, M. Vrabel and I. Maňková	18
<b>Surface Roughness and Cutting Force Components Evaluation in Hard Turning by Differently Shaped Cutting Tools</b>	
M. Kritikos Samardziova	26
<b>Resistance of Cladding Layers Made by FCAW Method to Erosive Wear</b>	
J. Viňáš, J. Brezinová and M. Greš	33
<b>Cladding of Wear-Resistant Layers in Metallurgy and Engineering</b>	
J. Viňáš, M. Greš and T. Vaško	41
<b>Influence of Machining and Heat Treatment on Deformations of Thin-Walled Bearings</b>	
D. Stančeková, D. Steklac, J. Petru, T. Zlámal, M. Sadilek, M. Janota and M. Kordík	49
<b>The Influence of the Filler Material on Weld Joints Made of Duplex Stainless Steels</b>	
J. Ertel, J. Bárta, M. Maronek and J. Bílik	59
<b>Resolving Problems of Finding Surface Boundaries during Laser Machining</b>	
V. Pata, L. Sýkorová, M. Kubišová and M. Malachová	66
<b>Evaluation of Electrochemical Properties of Steel Sheets for Automotive Applications</b>	
J. Koncz and J. Brezinová	72
<b>Aspects of Burnishing Rolling Process of the Surface Prepared in Different Previous Treatments</b>	
A. Kułakowska, M. Kulakowski, Ł. Bohdal and R. Patyk	78
<b>Characterization of Porous Coatings Obtained on Materials by Plasma Electrolytic Oxidation</b>	
K. Rokosz, T. Hryniwicz and W. Malorny	86
<b>The Effect of Technological Conditions of Hard Turning on the Formation of White Layer</b>	
Z. Pálmai and J. Kundrák	96
<b>Selective Laser Melting Technology and Manufacturing of Accurate Thin Structures</b>	
M. Ackermann, J. Šafka and L. Voleský	104

## Chapter 2: Polymer and Composite Materials and Production Technologies

<b>On Flexural Stiffness of Polymer Sandwich Walls</b>	
O. Šuba, L. Fojtl, O. Šuba Jr., L. Sýkorová, S. Rusnáková and J. Baďurová	115
<b>Influence of Different Coupling Agent Type on Processibility and Applicability of Polymer Composites</b>	
M. Seidl, J. Habr, L. Běhálek, J. Šafka, M. Ackermann and J. Bobek	123
<b>Analysis of Parameters with Influence on Material Shrinkage PLA and PLLA</b>	
M. Kučerová and P. Lenfeld	133
<b>The “Laser Machinability” of Polymeric Materials</b>	
L. Sýkorová, V. Pata, M. Kubišová and M. Malachová	141
<b>Thermal Degradation of the Thermoplastic Elastomers during the Injection Moulding Process</b>	
L. Běhálek, J. Habr, M. Seidl, P. Lenfeld and M. Boruvka	148

<b>Effect of Dielectric Barrier Discharge Plasma Surface Treatment on the Properties of Pineapple Leaf Fiber Reinforced Poly(Lactic Acid) Biocomposites</b>	
M. Boruvka, C. Ngaowthong, L. Běhálek, J. Habr and P. Lenfeld	156
<b>Dynamic-Mechanical Properties of Polymer Composites with the Short and Long Glass Fibers</b>	
P. Lenfeld, L. Běhálek, M. Boruvka and J. Prusek	166
<b>Use of Composite Materials for FDM 3D Print Technology</b>	
J. Šafka, M. Ackermann, J. Bobek, M. Seidl, J. Habr and L. Běhálek	174
<b>Mechanical Benefits of Gas Assisted Injection Moulding Application in Design of Structural Parts</b>	
M. Košík, J. Bílik and F. Polakovič	182
<b>Optimal Cutting Conditions for Surface Finishing of Parts Made of Photopolymers</b>	
P. Keller	192
<b>Reduction of Injection Moulded Plastic Part Warpage Using Advanced Gas Assisted Injection Moulding</b>	
M. Košík, J. Bílik and D.R. Delgado Sobrino	200

## **Chapter 3: Computational Methods in Materials Science and Production Technology**

<b>Metal to Composite Plastic Conversion of Mechanically Loaded Part Using Numerical CAE Analyses</b>	
M. Košík, J. Bílik and A. Náplava	213
<b>The Numerical Simulation of the Deep Drawing Process and its Verification by the Adaptation of the Laminated Tooling Concept</b>	
M. Tomáš and J. Hudák	222
<b>Numerical Analysis of Influence of Cutting Edge Radius on the Minimum Thickness of the Machined Layer</b>	
J. Chodor and P. Kaldunski	230
<b>Numerical Investigations of the Effect of Process Parameters on Residual Stresses, Strains and Quality of Final Product in Blanking Using SPH Method</b>	
Ł. Bohdal, A. Kułakowska, R. Patyk and M. Kulakowski	238
<b>Analysis of Strain in Cutting Zone with FEM and Stereological Metallographic Evaluation</b>	
M. Necpal and M. Martinkovič	246
<b>Computer Simulation and Numerical Analysis of the Tailored Blanks Drawing</b>	
P. Kaldunski and J. Chodor	254
<b>Study the Possibility of Controlling the Magnitude and Distribution of Residual Stress in the Surface Layer of the Product after the Process Double Duplex Burnishing</b>	
R. Patyk, Ł. Bohdal and A. Kułakowska	262
<b>Experimental and Numerical Investigation of the Influence of Cutting Speed and Feed Rate on Forces in Turning of Steel</b>	
J. Kundrák, G. Szabó and A.P. Markopoulos	270
<b>Analysis of the States of Deformation and Stress in the Surface Layer of the Product after the Burnishing Cold Rolling Operation</b>	
L. Kukielka, M. Szczesniak, R. Patyk, A. Kułakowska, K. Kukielka, S. Patyk, K. Gotowala and D. Kozak	278
<b>Finite Element Simulation of Physical Phenomena in Real Conditions of a Single Grain Cutting Process</b>	
M. Forsiewicz, L. Kukielka and K. Gotowala	288
<b>Determining of Shear Modulus for the Samples Circular and Hollow Circular Cross-Section</b>	
E. Labašová, R. Duriš and V. Labaš	298

## **Chapter 4: Technology Management in Engineering Industry**

<b>Modeling the Failure Tree Analysis for Safety-Critical Systems in the Production of Hazardous Materials</b>	
D. Gabriska	307

<b>Application of 3D Printing for Specific Tools</b>	
P. Zelený, T. Váňa and J. Stryal	316
<b>Using Contactless Scanning for Quality Control of Automotive Parts</b>	
R. Mendřický	324
<b>Laboratory Tasks and Material and Safety Aspects</b>	
V. Pelantová and L. Kretschmerova	334