

# Table of Contents

## Chapter 1: Analysis of the Materials Properties

<b>Serrated Plastic Flow of Various Metallic Glasses during Nanoindentation</b> M. Hurakova, K. Csach, J. Miškuf, A. Juríková, S. Demcak, V. Ocelík and J.T.M. de Hosson	3
<b>Analysis of Local Plastic Deformation of Machined Surface</b> M. Martinkovič and P. Pokorný	7
<b>Rolling-Contact Hardening Evaluated by Indentation</b> E. Schmidová, U. Kaya, M. Schmid and B. Culek	11
<b>The Attempt of New Approach to Evaluate Surface Integrity</b> J. Malec, F. Červinka, D. Blažíček and J. Suoknuuti	15
<b>The Possibilities of Evaluating the Yield Strength in the Heat Affected Zones of a Weld through Indentation</b> P. Hanus and E. Schmidová	20
<b>Effect of Actual Indenter Shape on the Results of Spherical Nanoindentation</b> J. Čech, P. Haušild, O. Kovářík and M. Škeren	25
<b>Parametric Study of Concentrated Contact of Rigid Indenter with Elastic-Plastic Material</b> D. Zita and J. Menčík	29
<b>Micromechanical Characteristics of Hardly Deformable Mg Alloys</b> S. Gupta, V. Koudelková, V. Hrbek and J. Němeček	33
<b>Wear Behavior of Stoichiometric and Nonstoichiometric Zirconia</b> J. Balko, M. Tatarková and P. Tatarko	37
<b>The Influence of Microstructure, Heat-Treatment and Type of Crystal Lattice of Iron Aluminides on Coefficient of Thermal Expansion</b> M. Švec	41
<b>Effect of Strain History of Steel Sheets on the Mechanical Characteristics of Individual Microstructural Components by Depth Sensing Indentation</b> P. Burik, L. Pešek, Z. Andrssova, P. Kejzlar and P. Zubko	45
<b>Impact of Innovative Cooling System on Mechanical Properties of Moulded Parts</b> J. Habr, M. Seidl and J. Bobek	49

## Chapter 2: Thin Layers, Thin Films and Coating

<b>The Influence of High Temperature Exposure on the Wear of Selected HVOF Sprayed Coatings</b> Š. Houdková and E. Smazalová	55
<b>Influence of Coating Process Parameters on the Mechanical and Tribological Properties of Thin Films</b> T. Bakalova, N. Petkov, T. Blažek, P. Kejzlar, P. Louda and L. Voleský	59
<b>Biocompatibility of Surfaces of TiCN Thin Films</b> T. Bakalova, L. Svobodová, A. Coufalová, N. Petkov, P. Kejzlar, P. Louda and L. Voleský	64
<b>Application of Laser-Ultrasound for Characterization of Plasma-Sprayed Ceramics</b> M. Koller, H.S. Seiner, P. Sedlák, J. Kotlan, P. Ctibor, R. Mušálek and M. Landa	69
<b>Tribological Properties and the Abrasion Resistance Thin Films of Chromium Nitride</b> V. Málek, T. Bakalova, P. Kejzlar, P. Louda and Z. Andrssova	73
<b>Influence of Deposition Parameters on the Properties of Nanocomposite Coatings Prepared by Cathodic Arc Evaporation</b> M. Béger, J. Sondor, M. Sahul, P. Zacková, M. Haršáni and L. Čaplovič	77
<b>Mechanical Properties of Al-Si Galvanic Coating and its Influence on Resistance Weldability of 22MnB5 Steel</b> M. Kolaříková, L. Kolařík, T. Pilvousek and J. Petr	82
<b>Characterization of Silicon Nitride Thin Films on Glass</b> L. Šimůrka, S. Erkan and T. Turutoglu	86

<b>Tribological Properties of Magnetron Sputtered Amorphous Silicon Carbide and Silicon Carbonitride Coatings</b>	91
J. Tomaštík and R. Čtvrtlík	
<b>The Impact of the Deposition Parameters on the Mechanical Properties of Thin Carbon Layers</b>	95
L. Voleský, T. Bakalova, K. Borůvková and P. Louda	
<b>X-Ray Diffraction Analysis of Steel with Oxidised Surface Layer</b>	99
L. Zuzánek, O. Řidký, N. Ganev and K. Kolařík	
<b>Total Appearance Measurements of Special Effect Finish after Real-Live Tests</b>	103
M. Syrovátková, M. Vik, P. Kulhavý and M. Viková	
<b>Mo-B-C and Ta-B-C Nanostructured Layers with Promising Fracture Toughness</b>	107
J. Buršík, I. Kuběna, V. Buršíková, P. Souček, L. Zábranský and P. Vašina	
<b>Study of the Local Mechanical Properties of Magnetron Sputtered Nanolaminate Coatings</b>	111
V. Buršíková, J. Buršík, L. Zábranský, P. Souček and P. Vašina	
<b>High Temperature Nanoindentation Testing of Amorphous SiC and B<sub>4</sub>C Thin Films</b>	115
R. Čtvrtlík, J. Tomaštík and P. Schovánek	

## Chapter 3: Compounds, Polymers and Composites

<b>Determination of DC06+ZE Sheet Crack Cause</b>	121
P. Kejzlar, T. Pilvousek and M. Tregler	
<b>Effect of Neighboring Phase Properties on Measured Indentation Data</b>	126
L. Kocmanová, P. Haušild, A. Materna and J. Matějíček	
<b>Testing of Tensile Properties of Carbon Prepreg Composite Rods with Adding of a Non-Composite Part</b>	130
M. Syrovátková, P. Kulhavý, P. Srb and M. Petrů	
<b>The Effect of Ageing on the Micro-Creep Properties of Radiation Cross-Linked Materials</b>	134
M. Reznicek, M. Ovsík, A. Skrobák and D. Manas	
<b>The Behaviour of Cross-Linking Filled PP to Micro-Indentation Test</b>	138
M. Ovsík, V. Senkerík, D. Manas, M. Maňas, M. Stanek and L. Gajzlerová	
<b>Adhesion Additive Influence on Polyamide Nanopolymer Composite Properties</b>	142
J. Habr, J. Bobek, L. Běhálek and M. Seidl	
<b>Manufacturing and Evaluation of Porous PLA Nano/Micro Fibres</b>	146
E. Macajová	
<b>Tensile Test and Analysis of the Geometry of Kevlar/Epoxy Composites</b>	150
V. Mušutová, J. Mourek and P. Tej	
<b>Effect of Recycled Particle Size to Micro-Hardness Properties of Styrene Acrylonitrile</b>	154
V. Senkerík, M. Stanek, M. Maňas, A. Skrobák and M. Ovsík	
<b>Local Mechanical Properties of SiC - TiNbC Composite and its Constituents</b>	158
M. Fides, A. Kovalčíková, P. Hvizdoš, R. Sedláček, R. Bystrický and J. Sedláček	
<b>Micro-Hardness of Irradiated Polyamide</b>	162
D. Manas, M. Ovsík, M. Maňas, M. Stanek, L. Hylová, V. Senkerík and M. Opočenský	
<b>Indentation Fracture Toughness of Al<sub>2</sub>O<sub>3</sub> + GPLs and Si<sub>3</sub>N<sub>4</sub> + GPLs Systems</b>	166
R. Sedláček, A. Kovalčíková, M. Tatarková, P. Rutkowski and J. Dusza	
<b>Mechanical Properties of Metal-Plastic Composite with Internal Fractal Shape Reinforcing Structure</b>	170
J. Bobek, J. Šafka, M. Seidl and J. Habr	
<b>Young's Modulus of Alumina Particles Reinforced Metal-Matrix Composite</b>	174
P. Haušild, O. Kovářík, K. Havlíková and M. Thomasová	
<b>Mechanical Properties of Irradiated Polyamide under Thermal Stress</b>	178
M. Bednárik, D. Manas, M. Maňas, A. Mizera and V. Senkerík	
<b>Impact of Climatic Ageing on the Basic Mechanical Properties of Viscoelastic Sealants</b>	182
J. Minster and P. Šašek	
<b>Nanoindentation Assessed Fracture Toughness of Cement Paste</b>	186
J. Němeček and V. Hrbek	

## **Chapter 4: Special Techniques of Measurements**

<b>Measuring Techniques for Retroreflectivity Levels of Small Signs</b>	
M. Vik, B. Kolčavová Sirková, M. Viková, L. Duchoňová and M. Pechová	193
<b>Polarimetric Sensing Technique for Textile Material</b>	
M. Vik, N. Khan, M. Viková and F. Founě	198
<b>The Potential of AE Sensing in the Indentation Fracture Toughness Measurement</b>	
E. Smazalová and Š. Houdková	203
<b>Evaluation of Local Deformation Values of Stamping in Comparison with Optical Forming Analysis System</b>	
J. Petr, T. Pilvousek and L. Beneš	207