9. Thermomechanical processing of CuTi4 alloy
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26. The influence of reinforcement shape on wear behaviour of aluminium matrix composite materials
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33. Structure and mechanical properties of PVD coatings for tool materials
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42. Magnetic properties of Co-based amorphous ribbon under cyclic heating and cooling
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50. Crystallisation kinetics of Zn alloys modified with Ce, La, Sr, Ti, B
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58. Image analysis used for aluminium alloy microstructure investigation
M. Krupińska, K. Labisz, L.A. Dobrzański, Z. Rdzawski (Poland)

66. Glass-forming ability analysis of selected Fe-based bulk amorphous alloys
R. Nowosielski, R. Babilas (Poland)
73. Glass forming ability of binary Ni_{60+x}Nb_{40-x} (x=0;1;2) alloys
   R. Nowosielski, A. Januszka, W. Pilarczyk (Poland)

81. Structure and properties of Fe-Cr-Mo-C bulk metallic glasses obtained by die casting method
   W. Pilarczyk, R. Nowosielski, A. Januszka (Poland)

88. Thermographic method of fatigue assessment of polymeric materials
   M. Rojek, G. Wróbel (Poland)

94. Investigations of microstructure and dislocations of cast magnesium alloys
   T. Tański, L.A. Dobrzański, K. Labisz (Poland)

103. Evaluation of hydrogen degradation of high-strength weldable steels
   J. Ćwiek, J. Michalska-Ćwiek (Poland)

111. Selective laser sintering method of manufacturing front electrode of silicon solar cell
   L.A. Dobrzański, M. Musztynaga, A. Drygała (Poland)

120. Corrosion resistance of the sintered composite materials with the EN AW-AlCu4Mg1 (a) alloy matrix reinforced with ceramic particles
   A. Włodarczyk-Fligier, M. Adamiak, L.A. Dobrzański (Poland)

127. A computer model of the process of polymer materials fatigue destruction
   G. Wróbel (Poland)
The research paper entitled “A computer model of the process of polymer materials fatigue destruction” by G. Wróbel on a page 127 demonstrates an evolutionary model of fatigue destruction. The aim is as much as possible faithful modelling of processes during constructional materials exploitation observed, particularly progressing of strength ability loss or other useful characteristics changes. The MES was chosen as a discretisation method. The model evolution goes sequentially – chaotic system modification by actual state analysis is preceded. An evolution stage and material state characteristics evaluation give a basis of destruction extend nondestructive evaluation. A new approach to the problem of investigation of polymeric composite’s fatigue destruction has been demonstrated by means of computer simulation procedure. The developed method should be of interest to the industrial quality control applications and forecasting of important mechanical characteristics of composite materials, exploited in fatigue conditions. The obtained results would be of considerable importance in the computer aided diagnostic method of polymer composite materials.
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Authors: L.A. Dobrzański, A. Pusz, A.J. Nowak and M. Górniak in the paper entitled “Application of FEM for solving various issues in material engineering” on page 134 discuss problems concerning the application of Finite Element Method in materials engineering on the example of chosen programme which makes the most of this method to simulation. The application of FEM method during working out the internal prosthesis of oesophagus which will enable to help people suffering from oesophageal cancer. The method must be applied very carefully because its results do not refer to a real system but only to a model one. The obtained results of FEM calculations can be used to solve many problems at the early step of designing with success. A description of the importance and the utility of FEM during solving of problems dealing with very complicated geometry complex state of loadings, various boundary conditions and/or various materials.

180. Tailoring electronic structure of polyazomethines thin films
J. Weszka, B. Hajduk, M. Domaniški, M. Chwastek, J. Jurusik, B. Jarząbek, H. Bednarski, P. Jarka (Poland)

188. Recycling as an important element of engineering design
R. Nowosielski, A. Kania, M. Spilka (Poland)

196. The idea of material science virtual laboratory
L.A. Dobrzański, R. Honysz (Poland)

The Education and research trends area is shown in the paper on “The idea of material science virtual laboratory” by L.A. Dobrzański and R. Honysz on page 196. A presented laboratory is an open scientific, investigative, simulating and didactic medium helpful in the realisation of the scientific and didactic tasks in the field of materials science. This laboratory is implemented in the Institute of Engineering Materials and Biomaterials of the Silesian University of Technology in Gliwice, Poland. The laboratory is an aggregate of testers and training simulators, placed in the virtual reality and created in various languages and the programming techniques, which represents the properties, functionality and manual principles of real equipment installed and accessible in the real laboratories of scientific universities. Application of the equipment, that is practically imperishable, cheap in exploitation and easy in the use encourages students and scientific workers to independent audits and experiments in situations, where the possibilities of their execution in the real investigative laboratory will be limited because of the high material costs, difficult access to real equipment or the possible risk of his damage. The project of the virtual laboratory corresponds with the global tendency for expand the investigative and academic centres about the possibilities of training and experiments performance with use of the virtual reality. This enriches investigation and education programmes of the new abilities reserved so far exclusively for effecting only on real equipment.