



Research Monograph

7. Metallurgical products of microalloy constructional steels
 W. Ozgowicz, M. Opiela, A. Grajcar,
 E. Kalinowska-Ozgowicz, W. Krukiewicz (Poland)



Properties

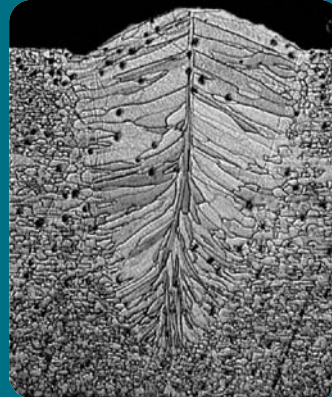
35. Toughness of welded stainless steels sheets for automotive industry
 E. Bayraktar, D. Katundi (France),
 B.S. Yilbas (Saudi Arabia), J. Claeys (France)
42. Topography and the structure of the surface of polyamide – glass composites after the ageing process
 A. Pusz, M. Szymiczek, K. Michalik (Poland)
50. Structure and properties of copper deformed by severe plastic deformation methods
 M. Richert, J. Richert, A. Hotłoś, W. Pachla,
 J. Skiba (Poland)



Methodology of research

57. The numeric modelling of the temperature profile of moulded piece in thermostatic mould form
 A. Gnatowski, T. Stachowiak (Poland)
64. Effect of Al additions and heat treatment on corrosion properties of Mg-Al based alloys
 T. Tański, K. Labisz, L.A. Dobrzański (Poland)

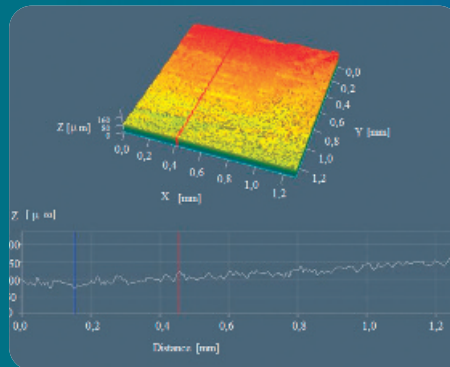
35



The Properties section represented by E. Bayraktar, D. Katundi, B.S. Yilbas and J. Claeys on "Toughness of welded stainless steels sheets for automotive industry" on a page 35 presents information that the automotive industry, more and more is compulsory to develop new grades of stainless steels, such as high resistant Martensitic Stainless Steels (MA-SS) and Ferritic Stainless Steels (FSS) in order to realise certain or many complex

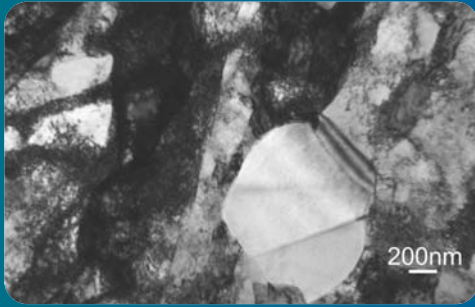
deep drawn pieces. For these grades, resistance spot welding (RSW) is the most widespread process used largely for many parts of the car body in the automotive industry. This paper aims to characterise mechanical behaviour (toughness) of the different steel grades under dynamic test conditions. The specimen is submitted to impact tensile test at different temperatures. According to testing temperature, fracture mode varies: at low temperatures, brittle fracture occurs. Due to stress concentration, fracture always occurs in the notched section. At high temperatures, the specimen fails by ductile fracture. Toughness of the steel sheets (base metals, BM or welded parts) is well compared at different materials and test conditions. Evaluation of welded thin sheets submitted to the dynamic loading in order to correlate in real service conditions to realize a useful correlation between the transition temperature and deep drawability can be used for evaluating of the welding conditions and also of the material characteristics. For detail study, this type of the test needs a standard formulation. This is a new conception of specimen and of the impact/crash machine. It is widely used in automotive industry for practical and economic reason to give rapid answers to designer and also steel makers for ranking the materials.

42



Authors: A. Pusz, M. Szymiczek and K. Michalik in the paper entitled "Topography and the structure of the surface of polyamide - glass composites after the ageing process" on a page

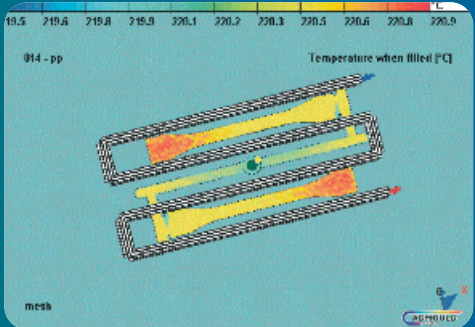
42 discuss results of examinations allowed to show that the absorbency of artificial saliva through composite is dependent on the temperature. Polymers have found applications in such diverse biomedical fields as tissue engineering, implantation of medical devices and artificial organs, prostheses, ophthalmology, dentistry, bone repair and many other medical fields. The requirements for materials used in the construction of removable dentures are becoming more and more demanding. The introduction of improved flexible materials has been a considerable advance. The aim of this work was to determine how the structure of thermoplastic materials changes over time in terms of weight changes and artificial saliva sorption. A purpose of this paper was to evaluate the influence of the ageing process on structure of polyamide - glass composites applied in dentistry. To fully evaluate the influence of the ageing process on mechanical properties of polyamide - glass composites applied in human body environment it is planned to continue described research. Simultaneous influence of the ageing process on mechanical properties of polyamide - glass composites was tested.



50

The Properties area is shown in the paper on "Structure and properties of copper deformed by severe plastic deformation meth-

ods" by M. Richert, J. Richert, A. Hotłoś, W. Pachla and J. Skiba on a **page 50**. The main object of this study is to establish the influence of severe plastic deformation on the microstructure evolution and properties of polycrystalline copper Cu99.99. Polycrystalline copper Cu99.99 was deformed by cyclic extrusion compression (CEC), equal channel angular pressing (ECAP) and hydrostatic extrusion (HE). Additionally the combination of these methods were applied to the sample deformations. The microstructure and properties of samples after different kinds of severe mode of deformations (SPD) were examined and compared as well as their properties. The microstructure was investigated by optical (MO) and transmission electron microscopy (TEM). The microhardness was measured by PMT3 microhardness tester. The results may be utilized for determination of a relation between microstructure and properties of the copper deformed in the severe plastic deformation process. It was found out that increase of deformation diminishing the microstructure and leads to the increase of microhardness of samples.



57

The Methodology of research section represented by A. Gnatowski and T. Stachowiak on "The numeric modelling of the temperature

profile of moulded piece in thermostatic mould form" on a **page 57** presents the results of researches of the flow of polymer materials during the filling the mould. The main purpose of outcarried research estimated the influence thermal conditions of the mould on the temperature profile of injection moulded parts. Research was limited to three thermoplastics polymers. Outcarrying of simulation of injection process requires data input concerning geometrical parameters of moulded piece, conditions of injection process, properties of processed plastic and data referring to injection machine into calculating programme. The most important issues like injection moulding process and the conditions of this process are covered in the paper. Moreover, the computer system used in the process of material conversion like Cadmould-3D by SIMCON is analysed in this work. The simulation of the injection moulding process is done with the variety of different parameters of conversion. The aim of this simulation was to present the distribution of the temperature in the moulded piece. The cooling system of the injection moulding form was taken into analysis during this simulation. The investigation delivered information about temperature profile of moulded piece in thermostatic mould form, what can be useful in practice, when selecting the material for good quality parts.



Analysis and modelling

- 73.** Selected aspects of power distribution for 4wd vehicle driven by diagonal power transmission
A. Baier, J. Mydlarz (Poland)
- 80.** Computer aided generation of construction model for construction similarity theory
M. Cielniak, P. Gendarz (Poland)
- 88.** Artificial neural networks and evolutionary algorithms in engineering design
T. Velsker, M. Eerme, J. Majak, M. Pohlak, K. Karjust (Estonia)



Industrial management and organisation

- 96.** Supervision over technological and measurement processes
T. Karkoszka, K. Galus (Poland)
- 103.** Author index
- 104.** Keywords index
- 105.** Publisher's notice
- 106.** Editor's notice