



Photo essay

7. Memories of AMME'2006 Conference, 4th-8th June 2006 in Gliwice – Wisła, Poland
 The Organising Committee of the AMME'2006 Conference



General review

11. Mechanism and types of tool wear; particularities in advanced cutting materials
 S. Dolinšek, J. Kopač (Slovenia)



Materials

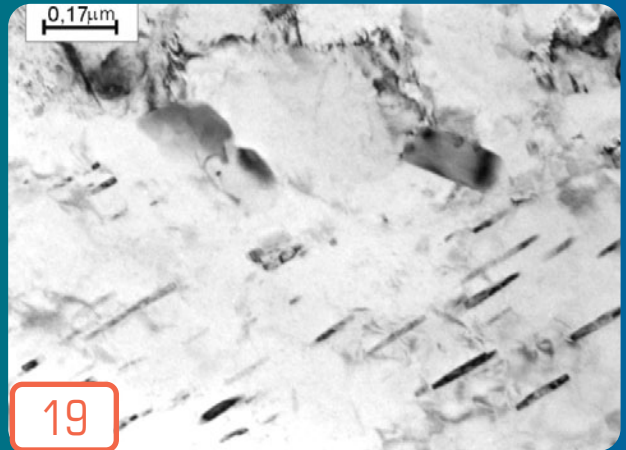
19. The kinetics of phase transformations during the tempering of HS18-0-1 high-speed steel
 P. Bała, J. Pacyna, J. Krawczyk (Poland)
26. Metal clusters in zeolite 4A obtained by synthesis process
 E. David (Romania)
32. Phases created during diffusion bonding of aluminium and aluminium bronze chips
 J. Gronostajski, W. Chmura, Z. Gronostajski (Poland)



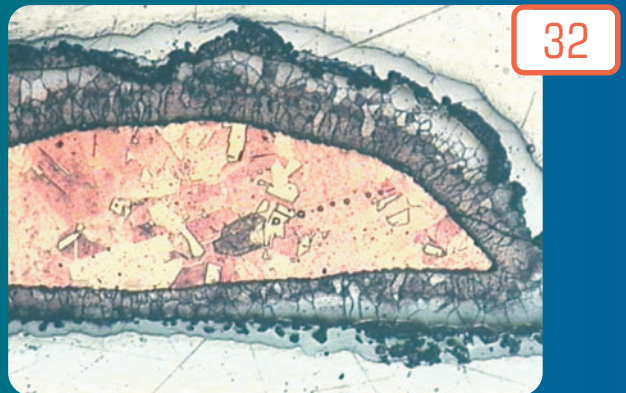
Properties

38. Corrosion resistance properties of sintered duplex stainless steel
 L.A. Dobrzański (Poland), Z. Brytan (Poland), M. Actis Grande (Italy), M. Rosso (Italy)
46. Influence of burnishing on stress corrosion cracking susceptibility of duplex steel
 J. Łabanowski, A. Ossowska (Poland)

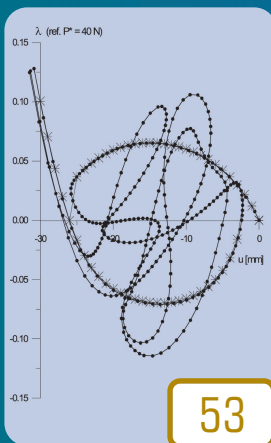
Selected materialographical photo



The paper entitled "The kinetics of phase transformations during the tempering of HS18-0-1 high-speed steel" presented by P. Bała, J. Pacyna and J. Krawczyk on a **page 19** shows the microstructure of the HS18-0-1 high speed steel after hardening from 1260°C and heating with the rate 0,05°C/s up to 790°C (TEM). These are the characteristic temperatures at which the end of precipitation of carbides of M₂C type is observed. During heating up to 790°C the morphology of primary carbides is not changed. Heating to 790°C caused the transformation of martensite into ferrite and precipitation of carbides which can be seen well on a TEM microphotograph. The carbides revealed on the microphotograph of the tested steel after such tempering, observed in TEM, are of M₂C type.



The research paper entitled "Phases created during diffusion bonding of aluminium and aluminium bronze chips" by J. Gronostajski, W. Chmura and Z. Gronostajski on a **page 32** describes an original concept of producing a composite, consisting in the mixing and the bonding of aluminium chips with aluminium bronze chips through press moulding and extrusion. As a result of the reciprocal diffusion of copper and aluminium during extrusion and heat treatment applied just after extrusion a creation of hard phases leading to an increase of wear resistant takes place. Diffusion bonding process of aluminium and aluminium bronze chips leads to creation of phases typical for Cu-Al alloys. The bonding takes place during extrusion of cold compacted mixture of aluminium and aluminium bronze chips and during heat treatment applied after extrusion. In this way, without the participation of metallurgical processes good bearing materials can be manufactured. The proposed new sintering criterion allows to determine the condition of sintering and deformation in order to obtain a good product.



The purpose of the paper on "Numerical solution techniques for structural instability problems" by E. Armentani, C. Calí, G. Cricri, F. Caputo and R. Esposito on a **page 53** is to overcome numerical problems arising in structural instability numerical computations for equilibrium configurations corresponding to increasing loads on structures having points of instability or more generally large non linearity. The used numerical methodology was the finite element method with the particular technique of non linear transient dynamic analysis. In such a way dynamic equilibrium paths, which are able to lead to required corresponding static ones, can be obtained. A methodology to develop this kind of analyses as

well as a procedure to set some initial parameters and to check the accuracy of the solution have been investigated and pointed out. In the future it will be possible to apply the investigated numerical procedure to other practical cases.



Authors: B. Mursec and F. Cus in the paper "Use of electronic catalogs for planning of machining processes" on a **page 65** present the electronic catalogues for selection of tools and cutting conditions, their advantages and disadvantages. Electronic catalogues of tools contain the data on the tools of different makers and the further development is so oriented

that the tool user will obtain all the necessary information through the Internet. The OPTIS expert system serves for the optimisation of cutting conditions with respect to the minimisation of the manufacturing costs by taking into account the cutting process limitations. The Internet can be efficiently used in modernly organised computer-supported system for tool management. By means of the Internet it is possible to follow up particularly the products and novelties of the individual tool makers and to become familiarised with their ranges of products sold.



Analysis and modelling is shown in the paper on "Model optimization for mould filling analysis with application CAE package C-Mold" by J. Nabialek and J. Koszkuł on a **page 75**. The aim of the research was to determine the sources of the lack of accuracy

in numerical simulations of plastic flow during the injection moulding. The tensile test specimen has been used as a model. The experimental verification of numerical simulations of different FEM models reflecting different injection conditions has been performed. The results of the numerical simulations depend mostly on input data accuracy. Accuracy means here the knowledge of detailed description of the real materials with use of FEM model as well as the material and process parameters. In order to eliminate an error of the simulation the region between the end of nozzle and the last thermocouple in barrel was modelled as a part of a runner. A point at the level of thermocouple was assumed to be the plastic entrance point. This "additional" part of runner was modelled both as a cold and hot runner.



Analysis and modelling

- 53.** Numerical solution techniques for structural instability problems
E. Armentani, C. Calí, G. Cricri, F. Caputo, R. Esposito (Italy)
- 65.** Use of electronic catalogues for planning of machining processes
B. Mursec, F. Čuš (Slovenia)
- 75.** Model optimisation for mould filling analysis with application CAE package C-Mold
J. Nabialek, J. Koszkuł (Poland)



Manufacturing and processing

- 83.** Effect of laser alloying on thermal fatigue and mechanical properties of the 32CrMoV12-20 steel
L.A. Dobrzański, K. Labisz, A. Klimpel (Poland)
- 91.** Acoustic emission in drilling carbon steel and nodular gray iron
J. Kopač, S. Sali (Slovenia)



Industrial management and organisation

- 96.** Six Sigma process improvements in automotive parts production
M. Soković (Slovenia), D. Pavletić (Croatia), E. Krulčić (Croatia)



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