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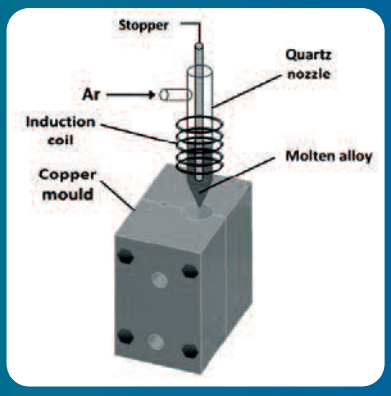
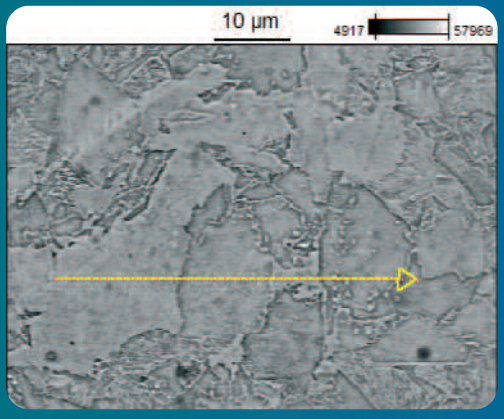


The paper from Materials area made by R. Nowosielski, K. Cesarz and R. Babilas on "Digital modelling of a human skull" on a **page 7** describes the structure and corrosion properties of amorphous and crystalline Mg-based alloys for biodegradable implants. This paper presents a preparation method and the structure, microhardness and corrosion properties characterization of $Mg_{70}Zn_{30}$ and $Mg_{66}Zn_{30}Ca_4$ alloys in the form of plates. The studied samples were prepared by the pressure die-casting to copper mould. The structure of the both alloys was examined by X-ray diffractometry (XRD) and a scanning electron microscope (SEM). The thermal properties of the samples were examined using a differential scanning calorimeter (DSC). In addition, corrosion properties research (immersion tests) were performed in a physiological fluid. Microhardness was measured using the Vickers microtester. The results of X-ray diffraction investigations confirmed that the sample of $Mg_{66}Zn_{30}Ca_4$ alloy is amorphous and sample of $Mg_{70}Zn_{30}$ alloy has crystalline structure. Immersion tests of both samples have shown homogeneous progress of corrosion. The changes of a structure caused by calcium addition resulted in an increase of microhardness for sample $Mg_{66}Zn_{30}Ca_4$ compared with the sample of $Mg_{70}Zn_{30}$ alloy. Mg-based alloys can be applied as the medical implants. The chemical composition of the samples $Mg_{66}Zn_{30}Ca_4$ and $Mg_{70}Zn_{30}$ was chosen, because they meet the requirements of a biodegradable material, that is, material, which after completing their stability function will dissolve in the body of the patient without the harmful effects on health. Crystalline and amorphous magnesium alloys are examined as a material for biodegradable medical implants. This new concept is an alternative to previously used conventional implant materials. New concept does not require re-operation, and allows a foreign object to remain in the human body.



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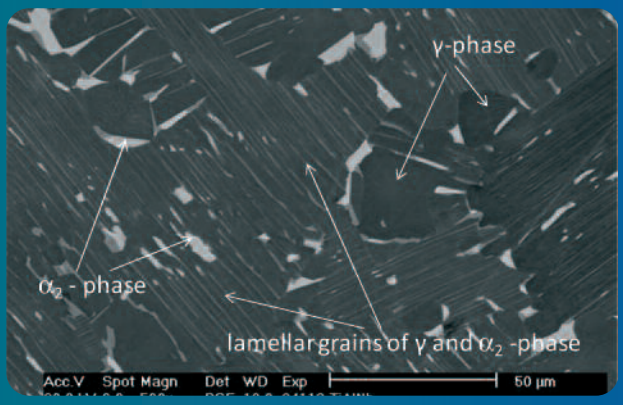
The research paper entitled "Designing and controlling the microstructure of 37MnNiMo6-4-3 hypoeutectoid steel after continuous cooling" by E. Rożniata on a **page 24** presents the research on the kinetics of phase transformation of undercooled austenite of 37MnNiMo6-4-3 hypoeutctoid steel. The kinetics of phase transformation of under cooled austenite of investigated alloy was presented on CCT diagram (continuous cooling transformation). Also the methodology of a dilatometric samples preparation and the method of the critical points determination were described. The austenitising temperature was defined in a standard way i. e. 30°C ÷ 50°C higher than Ac_3 temperature for hypoeutectoid steels. The technology of full annealing was proposed for the iron based alloy. The CCT diagram was made on the grounds of dilatograms recorded for samples cooled with various rates. The microstructure of each dilatometric sample was photographed after its cooling to the room temperature and the sample hardness was measured. Also EDS analysis was performed using scanning microscope. The paper contains a description of one from a group of iron based model alloys with 0.35% ÷ 0.40% carbon content. According to PN-EN 10027 standard this steel should have a symbol 37MnNiMo6-4-3.



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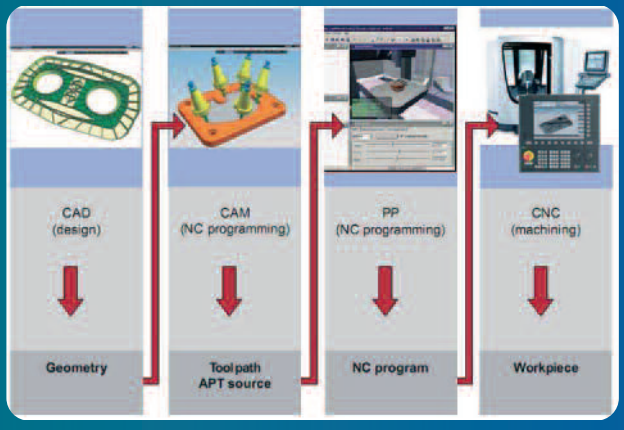
The paper from Properties area made by J. Małecka on "The surface layer degradation of γ-TiAl phase based alloy" on a **page 31** describe the chemical composition and microstructure of the surface layer of Ti-46Al-7Nb-0,7Cr-0,1Si-0,2Ni alloy after the test of isothermal oxidation in 9%O_2+0,2%HCl+0,08%SO_2+N_2 during 250h. The objectives were achieved using several techniques including conventional metallography, SEM, BSE, EDX. The oxides scales and their effects were investigated at temperatures 750°C. Original value of the paper is the assessing of the oxidation resistance of Ti–46Al–7Nb–0.7Cr–0.1Si–0.2Ni-based intermetallic alloy at the conditions combining high temperature and sulphur and chlorine compounds-containing atmosphere. The novelty of this research deals with the mechanism of oxidation at such boundary conditions. This knowledge can support the design of parts made of the intermetallic alloy. The problem considered is currently important for aeroplane and automotive industry, especially for gas turbine manufacturers. This investigation confirms that the better protection of the substrate was determined using AlCrN coating. One of practical outcomes is to select the coatings which guarantee the reduction of oxidation behavior. It is recommended to use alloys with AlCrN coating.



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The research paper entitled "Manufacturing of injection moulding tool with five axis milling machine" by A. Stoić, J. Kopač, M. Duspara, I. Micetic and M. Stoić on a **page 38** shows the advanced technology for production of the electrode for EDM that has a relatively complex geometry. Five axes CNC machining centre is used for production of an example ice scrapers since application of other type of machine requires a lot of auxiliary time and resources. Advanced manufacturing technology involves the application of various software tools and technologies, among them the tools and technology to automate the design, analysis, testing and manufacturing occupy a key position. The practical part included the design of electrode in the CAD system, SolidWorks 2010, production of NC programme for the operating unit Haidenhain iTNC 530 in CAM system ESPRIT 2010, and finally making the electrode on five axis machine center DMG DMU 40 Monoblock. Presented technology for a five-axis machining centre, ensures a great advantages in the process preparation while reduced set-up time, reduced number of required accessories and devices, reduced number of special tools is needed. This knowledge can support the development and design of technological processes. The main outcomes are decrease of production time, better quality of surface and product geometry. Decrease of cutting time refers to decrease of number of used tools, preparation time is lower in comparison with conventional machines.

Manufacturing and processing