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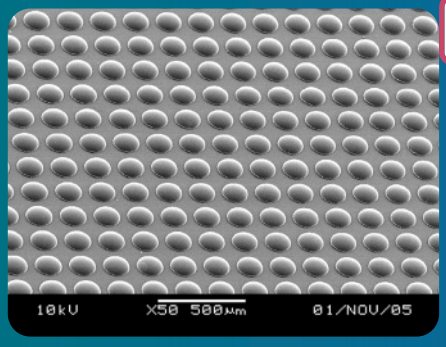
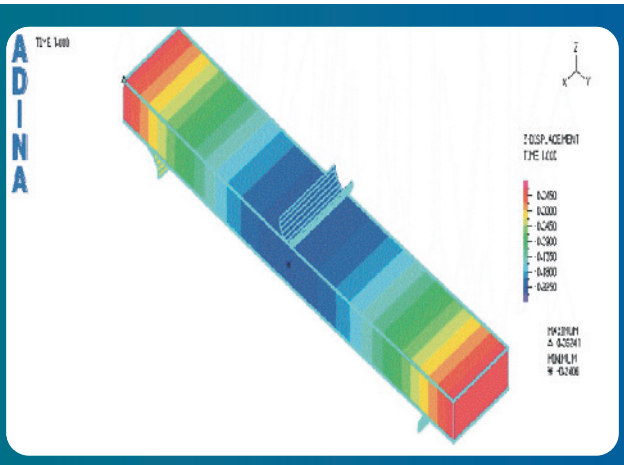
Cover story – continued

Metal alloys, mostly of the non-ferrous ones, have found the particular application in the dental prosthetics. Employment of many groups of the contemporary engineering materials for dental prosthetics, at the significantly scattered network of numerous small prosthetic laboratories cooperating with many dentists working as independent professionals running their own dentist's offices, and the need to implement the state-of-the-art materials and manufacturing technologies, call for the thorough and interdisciplinary knowledge connected with the deep knowledge in the area of dentistry, which only can ensure the proper fulfilment of the vast set of requirements posed to the dental prosthetics by the patients, according to the market, medical, and technical stipulations. The technical aspects of these issues may be easily acquired by the supplementary specialist training of engineers and masters of engineering who have the very high level of the required engineering knowledge guaranteeing understanding of the processes and phenomena occurring in the engineering materials during the technological processes of manufacturing and processing of various products and being well versed in the principles of the engineering materials selection and design needed for various products and in the principles of selection and design of their technological processes, including nanotechnology, and also knowing the engineering calculations methods making products design possible using the computer aided tools, which is the guarantee of the innovative engineering stance, very helpful, and ever desirable, in the contemporary dental prosthetics.
Among all artificial devices substituted for the soft or hard tissues of the oral cavity and surrounding area one may differentiate mainly the removable and fixed prostheses along with the dental implants, and other elements used in the dental prosthetics, and made from metals and their alloys. Many demands are made to materials used for fabrication of these devices. Therefore, the properly selected prosthetic restoration should meet a number of biological, mechanical, and engineering requirements. Alloys of noble metals, technical titanium and its alloys, cobalt alloys are of the particular importance among materials used for the prosthetic appliances. Use of nickel alloys or others containing this element was the reason for which their use has been abandoned in Europe because of health related considerations. Employment of the engineering materials for instruments used for the relevant clinical interventions connected with fixing the appliances features the separate area of knowledge. Photos of dental implants made by Innova Corporation from Toronto, Canada and ORALTRONICS Dental Implant Technology from Bremen, Germany, are shown on the cover.

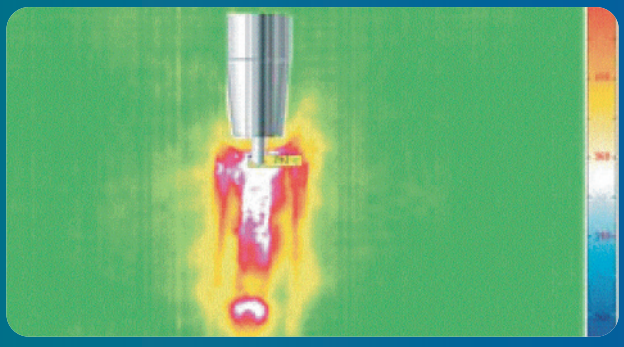
Selected materialographical photo



In the paper entitled "Innovative Approach to Uniform Imprint of Micron and Submicron Features" presented by H. Hocheng and T. - T. Wen on a **page 79** the facilities have been designed, constructed and tested. Uniform embossing throughout the area is achieved. Under the condition of 180ŻC, 40kgf/cm^2 and 90 seconds, high quality and uniformity of micro-optical components can be fabricated. For electromagnetic force-assisted imprinting technology, a large area of sub-micron pattern with a line width of 502nm and a pitch of 1um can be successfully fabricated under the condition of pressure of 1.6kgf/cm^2 for 30 seconds and UV curing for 0.5 minute. Using ferromagnetic UV-curable resist, the structures can be successfully fabricated under the pressure of 0.92kgf/cm^2 with the same UV-curable time. These results indicate good uniformity and controllability on both the gas-assisted hot embossing and electromagnetic force-assisted imprinting for efficient fabrication of micron- or submicron-scale structures. There are advantages of high uniformity, low pressure and low temperature for various applications in micron and sub-micron features and other micro-optical components such as gratings and waveguides etc.



47 The paper from Analysis and Modelling area made by A. Gnatowski, P. Palutkiewicz and E. Bociąga on "Numerical analysis of stress state during single point bending in DMTA examinations" on a **page 47** determines the stresses at the change of Young's modulus values in temperature function for samples made of PA 6.6 filled with glass fibre, by DMTA method. Investigations were carried out for samples subjected to the one-axial bending. The change in the value of the dynamic Young modulus and the mechanical loss tangent in function of temperature and oscillation frequency by the DMTA method was determined. The computer simulations of changes of the stress and strain distribution within the range of elastic strains and the glass transition phase were done. To characterise properties of investigated composite and to estimate the composite usage in particular conditions, dependences of the storage module and the mechanical losses tangent were determined in function of temperature at the one-axial bending.



87 The paper written by A. Klimpel, T. Kik, A. Czupryński, J. Górka and M. Fidali on "Thermovision researches of temperature fields distribution in GMA brazed joints of solar collectors" on a **page 87** discusses the temperature fields distribution during GMA brazing of solar collectors. Basic information about distribution of temperature fields in the GMA brazed joints is the background of the researches of GMA brazing parameters providing highest quality joints. IR-pictures were recorded with 50 Hz frequency. After recording, thermovision pictures were analysed in Irbis software module. This software permits to match recording parameters, the identification of temperature values in arbitrary picture points, assign temperature profiles. The researches were provided using the newest filler material for GMA brazing of solar collectors parts using IR recording equipment.