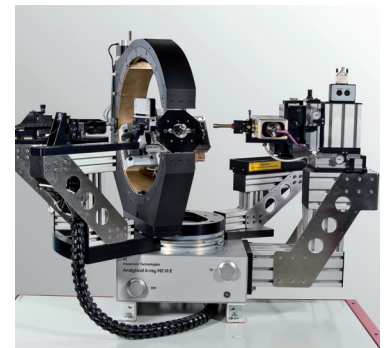


Nanocrystalline Composites for Micro Components

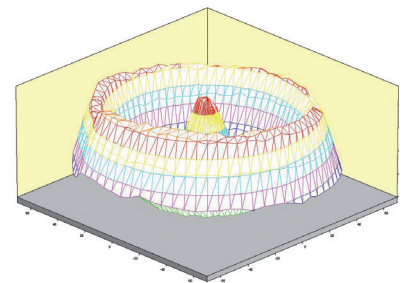
Materials science and engineering deals as an interdisciplinary field with the research, development and optimization of materials. Materials science contributes with a variety of modern analysis and testing equipment for the characterization, to understand the process-structure-property relationships and thus to the development and optimization of new materials and production technologies for industrial applications of micro and nanotechnologies.

As an example: Special modern X-ray diffractometer (figure, top right) with high lateral resolution are necessary to give insight into atomic structures of micro components. Knowledge of the relationship between nanocrystalline fabricated structures, associated textures (pole figure, below right), phase and residual stress states and the determined micromechanical material and component properties enable targeted component development for microsystems.

One example is the development of a metal matrix composite (MMC) for mechanical and thermal high loaded microgears of a micro precision gear.



X-ray diffractometer



Pole figure of {111} lattice planes of nanocrystalline nickel-iron

Project duration:

Internal research project by
colleagues of IMS and TU
Kaiserslautern

Project management:

Prof. Dr.-Ing. Joachim E. Hoffmann
Hochschule Kaiserslautern
Morlauterer Straße 31
67657 Kaiserslautern
Germany

phone: +49 (0)631/3724-2304

fax: +49 (0)631/3724-2105

e-mail: joachim.hoffmann@hs-kl.de

Project partners:

Research center IMS:
Prof. Dr. M. Saumer and Prof. Dr. P. Klär;
scientists at the Technical University
of Kaiserslautern;
Industrial partners

Funding:

Is in applying

