



# Industrial Micro & Nano Fabrication (Micro and Nano Technologies)

*Regina Luttge*

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## **Industrial Micro & Nano Fabrication (Micro and Nano Technologies) Regina Luttge**

This book focuses on the industrial perspective for micro- and nanofabrication methods including large-scale manufacturing, transfer of concepts from lab to factory, process tolerance, yield, robustness, and cost. It gives a history of miniaturization, micro- and nanofabrication, and surveys industrial fields of application, illustrating fabrication processes of relevant micro and nano devices.

Concerning sub-micron feature manufacture, the book explains: the philosophy of micro/ nanofabrication for integrated circuit industry; thin film deposition; (waveguide, plastic, semiconductor) material processing; packaging; interconnects; stress (e.g., thin film residual); economic; and environmental aspects.

Micro/nanomechanical sensors and actuators are explained in depth with information on applications, materials (incl. functional polymers), methods, testing, fabrication, integration, reliability, magnetic microstructures, etc.

- Shows engineers & students how to evaluate the potential value of current and nearfuture manufacturing processes for miniaturized systems in industrial environments
- Explains the top-down and bottom up approaches to nanotechnology, nanostructures fabricated with beams, nano imprinting methods, nanoparticle manufacturing (and their health aspects), nanofeature analysis, and connecting nano to micro to macro
- Discusses issues for practical application cases; possibilities of dimension precision; large volume manufacturing of micro- & nanostructures (machines, materials, costs)
- Explains applications of Microsystems for information technology, e.g.: data recording (camera, microphone), storage (memories, CDs), communication; computing; and displays (beamers, LCD, TFT)
- Case studies are given for sensors, resonators, probes, transdermal medical systems, micro- pumps & valves, inkjets, DNA-analysis, lab-on-a-chip, & micro-cooling

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