21 Micro processing with laser radiation
Arnold Gillner

Miniaturization and highly integrated functionalization are the driving factors in the production of innovative products in almost every industrial area today. New Laser systems allow new manufacturing methods meeting the demands of flexible micro production.

26 Laser micro sintering
Horst Exner, Peter Regenfuss, Robby Ebert

Recently a freeform technique – Laser Micro Sintering – has been developed by which micro parts with an overall resolution of 30 µm can be produced from powder materials. The technique is a generative freeform fabrication method based on selective laser sintering.
32 Laser micro processing using short laser pulses
Ulrich Klug, Frank Siegel
Pulsed laser radiation is a powerful tool for micro machining of different materials. Additional to the high peak power, the absence of thermal impact and thus the control of the heat affected zone gives some advantages to the users.

36 Excimer lasers support industrial micromachining diversity
Rainer Paetzel, Gerd Spiecker
The combination of high power, short wavelength and low cost per photon have made the excimer laser the tool of choice in a wide range of micromachining applications.

40 Micromachining with industrial picosecond lasers
Bernhard Klimt
Industrial picosecond laser pulses are used to micro-machine virtually any material with high precision and minimal thermal impact. For high quality with maximum throughput the proper selection of laser and process parameters is significant. Application rules and examples are discussed.

MICRO OPTICS

44 Efficient beam shaping for highpower laser applications
Oliver Homburg, Frank Kubacki, Dirk Hauschild, Vitalij Lissotschenko
Based on computer-aided design it is possible to manufacture high-precision microlens arrays with free programmable surfaces today. Thus, specific beam profiles with superior uniformity and efficiency can be generated - even for kilowatt Laser power.

TUTORIAL

49 Laser sources for ultrashort pulses
Rüdiger Paschotta
Ultrashort light pulses are nowadays used for a wide range of applications including metrology, communications, spectroscopy, terahertz science, ophthalmology, and material processing. It is not surprising that the necessary Laser parameters are as divers as the applications are.

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