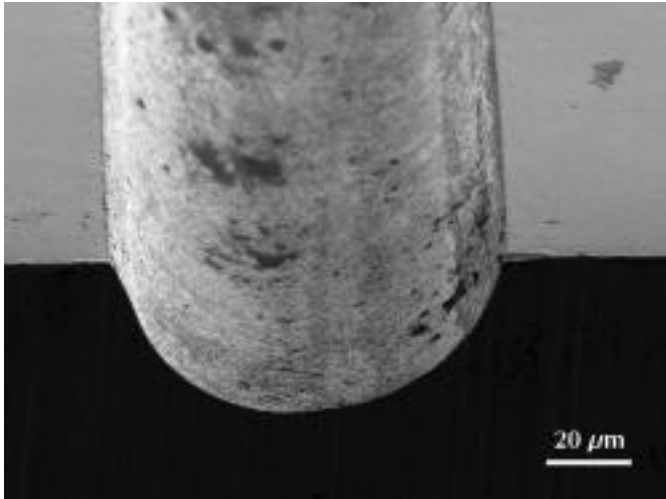


Industrial Production of Microholes by Usage of Ultrashort Pulse Lasers

Date: 06-13-2008 10:01 AM CET

Category: [Industry, Real Estate & Construction](#)

Press release from: [3D-Micromac AG](#)



The drilling of microholes with well-defined geometry is becoming increasingly important in various branches of industry. Applications range from injection nozzles (automotive) over cooling openings in turbine stator vanes (aerospace) and emitter-wrap through perforations (solar) to spinnerets required to adopt more and more complex shapes for the fabrication of functional fibres (textile industry).

Besides electric discharge machining, being very successfully applied in many branches, laser processes are scrutinized and optimized for microhole fabrication due to its inherent, enormous flexibility for many years.

It turned out that many parameters must be very precisely controlled in order to enable the generation of holes of just several 10 μm diameter in materials of a few millimetre thickness. For example, copper-vapour lasers, the beam profile of which can be optimized very well to comply with a flat-top profile, can be deployed for the fabrication of holes possessing very good circularity and directrix quality. The manifold capabilities of laser micromachining, however, are not fully capitalized when just stationary laser beams are used (as in the case of percussion drilling).

In the current perspective, the greatest flexibility can be achieved by using the technically very sophisticated concept of drilling with a moved laser beam. Under the latter technology, trepanning as well as helical drilling are subsumed. Upon trepanning, the laser beam is moved along the surface of a cone with customizable opening angle and is in parallel accomplishing a circular movement with defined diameter on the surface of the work piece.

Helical drilling distinguishes itself by the fact that in addition to the toggling movement of the laser the laser beam is rotating about its axis of propagation. The latter feature helps eliminate imperfections of the beam profile and provides the capability of drilling holes at highest perfection. Helical drilling requires the utilisation of high-definition drilling heads, the core component of which is a hollow-shaft motor bearing an image rotator, e.g., a Dove prism, as well as adjustment modules for adapting the angle of laser impact and the diameter of the circle scribed on the work piece.

For the first time 3D-Micromac AG has combined helical drilling technology with ultrashort pulses (ps laser) in industrial applications. The highest quality of achieved machining results is already now becoming apparent that micromachining utilizing the combination of helical drilling and ultrashort pulses is going to become an integral part of industrial laser application.

Further information and pictures:

3D-Micromac AG

Mrs. Mandy Möckel
Marketing/ Sales
Annaberger Str. 240
D-09125 Chemnitz, GERMANY

Phone: +49 (0)371 400 43-0

Fax: +49 (0)371 400 43-40

E-Mail: info@3d-micromac.com

Web: www.3d-micromac.com

About 3D-Micromac AG

3D-Micromac AG, a leading supplier of customized laser micro machining systems, has gained an established position in the international market over the past several years.

As a developer and manufacturer of complex workstations, as a service provider for materials and surface machining or as a solution provider for the development of specific production processes - we are able to find the best solution for every customer's task.

More: www.3d-micromac.com

[You can find this press release here](#)