**Laser Welding**

The laser beam welding is mainly used for joining components that need to be joined with high welding speeds.The laser welding is a common joining method in the modern industrial production.  
  
The application range covers finest welding of non-porous seams in medical technology to precision spot welding in electronics or the jewelry industry, to deposit welding in tool and mold-making and welding complete car bodies in automobile construction.  
  
However, new and efficient production processes are often not possible without the advantages of laser technology. Thus, diverse sheet thicknesses and qualities are turned into tailored blanks by welding and resistance spot welding is replaced by laser seams.

# Laser Drilling

High flexibility and high speeds are the big benefits of laser technology when it comes to drilling of blind and through holes. .  
Choosing the appropriate wavelength and power density of the laser beam, practically all solid materials (metals, semiconductors, plastics, ceramics, diamonds) can be laser drilled.

### Various Techniques for Laser Drilling

Pulse drilling of blind holes whith a depth of some microns is used for selective roughening of surfaces for gluing and coating processes. For through holes in small workpiece thicknesses, single-pulse processes can be used. For thicker materials percussion drilling is first choice and with which the required depth can be achieved by applying several laser pulses. For large diameters trepanning drilling, a combined drilling-cutting process, or the multi-pass method are used

# Laser Cutting

Laser cutting and laser fine cutting are applied for different kinds of materials where complex contours demand precise, fast and force-free processing. Lasers achieve high-precision cuts. This method does not show any distortion and in many cases post-processing is not necessary as the component is subject to only little heat input and can mostly be cut dross-free.  
  
Almost all kinds of metals can be laser cut: mild steel, stainless steel and aluminum are the most common applications. Other laser cut parts are made from wood, plastics, glass and ceramics. laser cutting is cost-efficient for small-batch production. The big benefit of laser cutting is the localized laser input providing small focal diameters and minimal heat input.

Energy

A laser diode, also known as an injection laser or diode laser, is a [semiconductor](http://searchcio-midmarket.techtarget.com/definition/semiconductor) device that produces coherent radiation (in which the waves are all at the same frequency and phase) in the visible or [infrared](http://searchnetworking.techtarget.com/definition/infrared-radiation) (IR) spectrum when [current](http://searchcio-midmarket.techtarget.com/definition/current) passes through it. Laser diodes are used in [optical fiber](http://searchtelecom.techtarget.com/definition/optical-fiber) systems, compact disc ([CD](http://searchstorage.techtarget.com/definition/compact-disc)) players, [laser printer](http://whatis.techtarget.com/definition/laser-printer)s, remote-control devices, and [intrusion detection](http://searchmidmarketsecurity.techtarget.com/definition/intrusion-detection) systems.

Laser diodes differ from conventional lasers, such as the helium-neon (He-Ne), ruby, and gas types, in several ways.

* **Small size and weight**: A typical laser diode measures less than one millimeter across and weighs a fraction of a gram, making it ideal for use in portable electronic equipment.
* **Low current,**[**voltage**](http://searchcio-midmarket.techtarget.com/definition/voltage)**, and power requirements:** Most laser diodes require only a few milliwatts of power at 3 to 12 volts DC and several milliamperes. Therefore, they can operate using small battery power supplies.
* **Low intensity:** A laser diode cannot be used for spectacular purposes such as burning holes in metal, bringing down satellites, or blinding aircraft pilot