

VersaCut

High-Precision Laser System for Cutting,
Deburring and Ablation



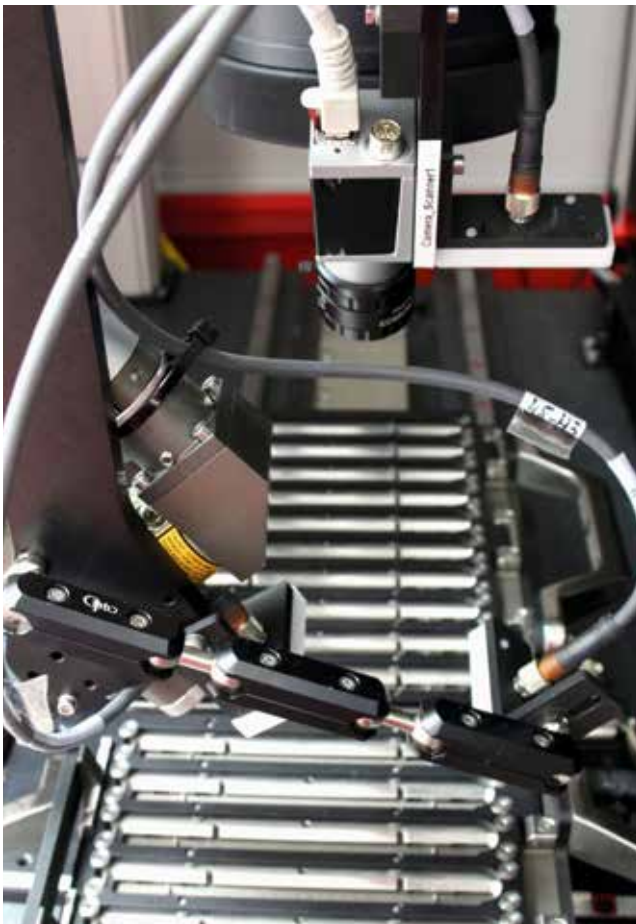
VersaCut

Precision Laser Processing Station

The manufacturing system VersaCut uses a laser for cutting fine structures precisely. In most cases, the systems work with robust and maintenance-free fiber lasers emitting nanosecond pulses with a high repetition rate. A XY scanner directs the laser beam to the desired position within milliseconds and handles any curvature. Focus diameter and laser intensity can be adapted during the process.

Typical applications include the deburring of precision piece parts with complex curvatures and removing holding bars of fine structures, such as on etched flex mounts or similar devices. As the material is vaporized, no supportive gases are needed.

Magazines, feeders, belts and robots allow for the full process automation while exchangeable gripper units provide maximum flexibility.



A XY scanner brings the laser beam to the desired position on the workpiece within milliseconds. A separate camera recognizes the structures for precise processing. VersaCut works with manual or automated loading while the core process of laser processing runs without operator intervention.

Laser Deburring and Fine Cutting

Compared to conventional techniques, the laser-based material processing shows various advantages which support the deburring and fine cutting of precision piece parts.

A laser beam removes the burrs in one processing step or precisely cuts fine structures. Neither tool wear nor deformation caused by mechanical forces occur when using this non-contact method. Even structures in the micrometer regime will be removed precisely.

The processing of metals requires lasers delivering pulses with high peak power. Typically, these lasers emit at a wavelength around 1 μm , generate peak powers of 10 kW and higher with a pulse duration between 10 and 500 ns. Such lasers process non-ferrous metals like aluminum, brass or steel.

Laser sources generating pulse durations in the picosecond or femtosecond regime reach even higher peak powers and work with every material.

For high throughput of a laser deburring system, various workstations recognize the imperfections of the device, deburr with laser, inspect and flip to the second line for processing the backside of the device. Nanosystec offers custom-tailored configurations perfectly meeting the requirements of the specific process for the devices.



Advantages of VersaCut

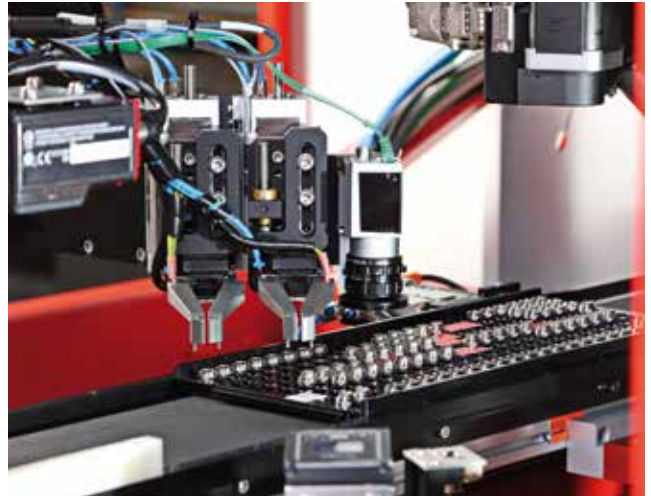
- Non-contact processing
- No wear of tools
- No force on workpieces
- Precision down to micrometers
- Powerful machine vision
- Deburrs complex curvatures
- Removes burrs on tiny features
- Integration into production lines
- Intrinsic part inspection

Powerful Machine Vision Capability

The VersaCut Systems work with automated machine vision algorithms. These include pattern recognition, object detection, edge detection and autofocus. Device-specific algorithms guarantee the flawless recognition of even complex structures with a precision in the micrometer regime. With machine learning over time, algorithms improve to perfection.

Advanced Camera Systems

Several CCD cameras determine the position and orientation of the workpieces. The image acquisition with pulsed LEDs eliminates the disturbing ambient influences. Cameras observing a large working area and parallel cameras with high resolution reduce the image acquisition time substantially. In addition, intelligent cameras provide results of pre-programmed functions in shortest time.



Device trays and feeders increase the throughput and allow for unattended processing of large quantities. Dual grippers allow for parallel processing and reduce the cycle time to a minimum.

Adjustable Illumination in various Colors

Various brightness settings of the LED illumination provide ideal imaging conditions. Different colors help to identify even difficult surfaces and features which are hard to see. Standard illumination consists of coaxial lighting through the lens, a ring light from top and side-mounted LEDs with diffusers or spotlights.

Process Software

The automated processes run in the TestMaster process software. This software works with a direct user interface for teaching positions and adapting the process parameters. The automated process flow is programmed in the sequence editor. The customer has full access rights to this programming and can modify the processes as required.

This structure provides a smooth and secure operation of the systems in high technology production environments.

Process Monitoring

Digital inputs on the general machine control or on the motion controller are permanently monitored and can be displayed. Depending on the process, automated actions follow when an interlock or emergency function change the status. In addition, a possible power, pressure or vacuum outage is detected followed by an automated shut-down depending on the conditions.

Remote Access

The remote access software works over a secured internet connection. This fast and easy access saves time in case any support or trouble shooting needs to be performed on the system.



VersaCut

Full Process Automation

VersaCut accepts various methods for loading the work pieces and transport of the finished product. The modular design allows for a migration from manual loading to full automation when the production volume reaches the necessary capacity.



Feeders allow for unattended and fully automated operation except for cassette loading and unloading.



Loading with robots includes automatic tooling changes in order to provide maximum versatility. In this way, multiple process steps or different products will be processed without operator intervention.

For low volume, the presentation of one set of parts or multiple sets is the most cost-efficient solution. Removable device trays already reduce the process time as an operator loads and unloads the parts on the trays outside the station while the process runs with a second set of devices.

For larger production volumes, the use of one or more feeders presents an efficient solution. Each feeder holds up to 20 Jedic trays, Auer boats or custom pallets in a transportable cassette. As soon as all parts are processed, the cassette with the finished goods is taken out and the next cassette with new parts is loaded.

The presentation of the parts with a conveyor belt is another solution. A continuous flow of material enters the VersaCut station and an exit conveyor brings the parts to the next production step.

Robots complement the loading operations. Mounted inside the station, they take the workpieces from trays or blister packs and insert them into the processing nest.

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